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Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D5GHzV2-1191_Sep16**

CALIBRATION CERTIFICATE

Object **D5GHzV2 - SN:1191**

Calibration procedure(s) **QA CAL-22.v2**
Calibration procedure for dipole validation kits between 3-6 GHz

BNV
09-28-2016

Calibration date: **September 21, 2016**

Extended
09/2017
SC

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	06-Apr-16 (No. 217-02288/02289)	Apr-17
Power sensor NRP-Z91	SN: 103244	06-Apr-16 (No. 217-02288)	Apr-17
Power sensor NRP-Z91	SN: 103245	06-Apr-16 (No. 217-02289)	Apr-17
Reference 20 dB Attenuator	SN: 5058 (20k)	05-Apr-16 (No. 217-02292)	Apr-17
Type-N mismatch combination	SN: 5047.2 / 06327	05-Apr-16 (No. 217-02295)	Apr-17
Reference Probe EX3DV4	SN: 3503	30-Jun-16 (No. EX3-3503_Jun16)	Jun-17
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (No. 217-02223)	In house check: Oct-16
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Jun-15)	In house check: Oct-16
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

Calibrated by: **Leif Klysner** *Leif Klysner*
 Name: **Leif Klysner** Function: **Laboratory Technician**

Approved by: **Katja Pokovic** *Katja Pokovic*
 Name: **Katja Pokovic** Technical Manager

Signature

Issued: September 22, 2016

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



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Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5250 MHz $\pm$ 1 MHz 5600 MHz $\pm$ 1 MHz 5750 MHz $\pm$ 1 MHz	

Head TSL parameters at 5250 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.9	4.71 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	34.5 $\pm$ 6 %	4.59 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5250 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.96 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	78.9 W/kg $\pm$ 19.9 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.29 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	22.6 W/kg $\pm$ 19.5 % (k=2)

Head TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.5	5.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.0 ± 6 %	4.93 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5600 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.45 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	83.6 W / kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.41 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	23.8 W/kg ± 19.5 % (k=2)

Head TSL parameters at 5750 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.4	5.22 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	33.8 ± 6 %	5.08 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5750 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.99 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	79.1 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.27 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	22.4 W/kg ± 19.5 % (k=2)

Body TSL parameters at 5250 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.9	5.36 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.4 ± 6 %	5.52 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5250 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.74 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	77.0 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.17 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	21.6 W/kg ± 19.5 % (k=2)

Body TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.5	5.77 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.8 ± 6 %	6.00 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5600 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.96 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	79.2 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.24 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	22.2 W/kg ± 19.5 % (k=2)

Body TSL parameters at 5750 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.3	5.94 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.5 ± 6 %	6.21 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5750 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.65 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	76.1 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.14 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	21.2 W/kg ± 19.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL at 5250 MHz

Impedance, transformed to feed point	55.7 Ω - 4.3 j Ω
Return Loss	- 23.4 dB

Antenna Parameters with Head TSL at 5600 MHz

Impedance, transformed to feed point	58.3 Ω - 3.2 j Ω
Return Loss	- 21.8 dB

Antenna Parameters with Head TSL at 5750 MHz

Impedance, transformed to feed point	58.1 Ω + 4.8 j Ω
Return Loss	- 21.2 dB

Antenna Parameters with Body TSL at 5250 MHz

Impedance, transformed to feed point	56.1 Ω - 3.7 j Ω
Return Loss	- 23.4 dB

Antenna Parameters with Body TSL at 5600 MHz

Impedance, transformed to feed point	58.9 Ω - 1.7 j Ω
Return Loss	- 21.7 dB

Antenna Parameters with Body TSL at 5750 MHz

Impedance, transformed to feed point	59.5 Ω + 6.9 j Ω
Return Loss	- 19.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.204 ns
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After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	August 28, 2003

DASY5 Validation Report for Head TSL

Date: 21.09.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1191

Communication System: UID 0 - CW; Frequency: 5250 MHz, Frequency: 5600 MHz, Frequency: 5750 MHz
Medium parameters used: $f = 5250$ MHz; $\sigma = 4.59$ S/m; $\epsilon_r = 34.5$; $\rho = 1000$ kg/m³, Medium parameters used: $f = 5600$ MHz; $\sigma = 4.93$ S/m; $\epsilon_r = 34$; $\rho = 1000$ kg/m³, Medium parameters used: $f = 5750$ MHz; $\sigma = 5.08$ S/m; $\epsilon_r = 33.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.42, 5.42, 5.42); Calibrated: 30.06.2016, ConvF(4.89, 4.89, 4.89); Calibrated: 30.06.2016, ConvF(4.85, 4.85, 4.85); Calibrated: 30.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5250 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 68.49 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 28.6 W/kg

SAR(1 g) = 7.96 W/kg; SAR(10 g) = 2.29 W/kg

Maximum value of SAR (measured) = 18.2 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 69.34 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 32.9 W/kg

SAR(1 g) = 8.45 W/kg; SAR(10 g) = 2.41 W/kg

Maximum value of SAR (measured) = 20.0 W/kg

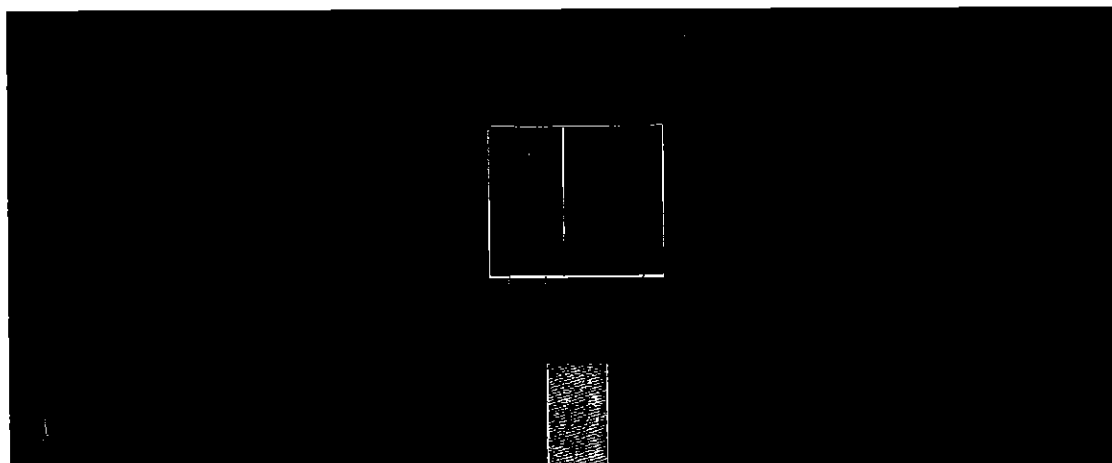
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 67.15 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 32.3 W/kg

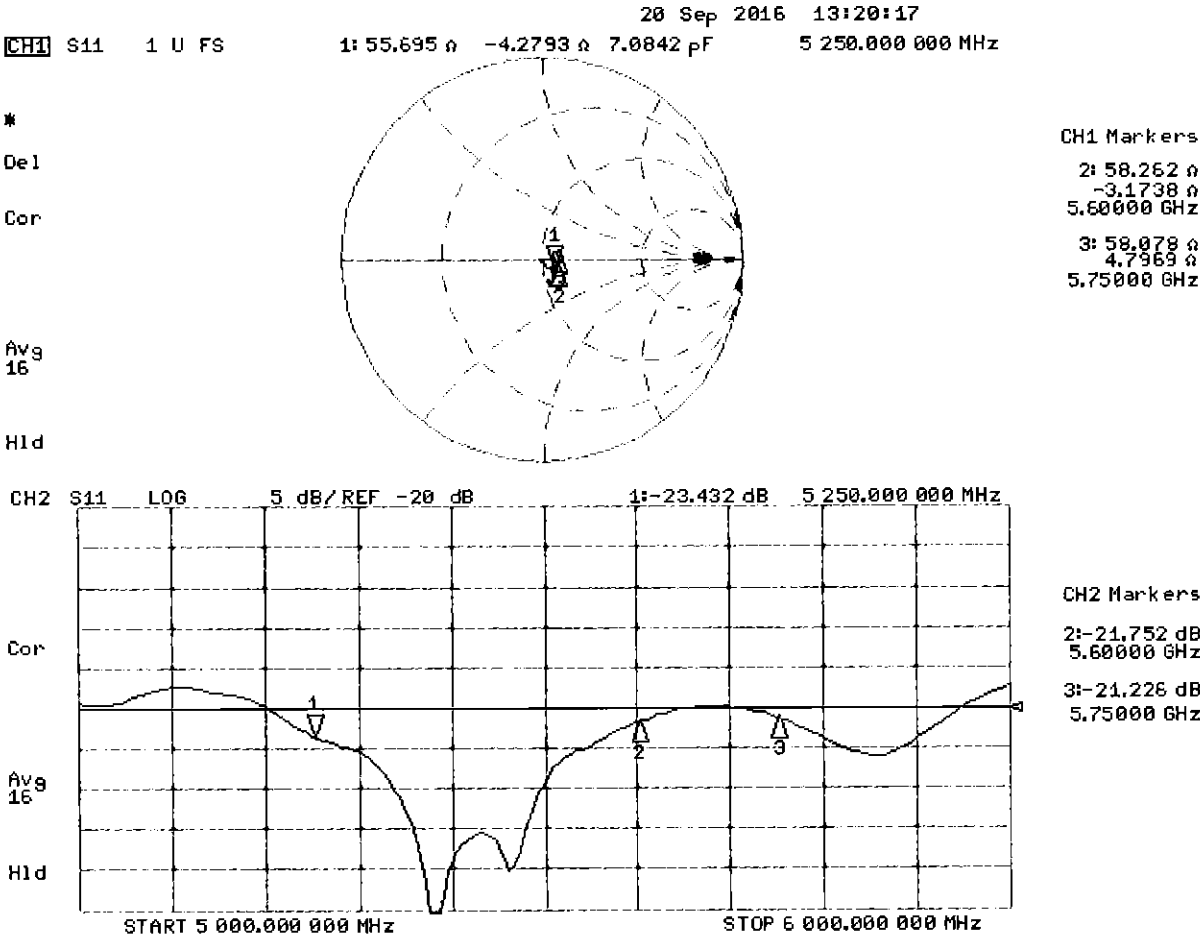
SAR(1 g) = 7.99 W/kg; SAR(10 g) = 2.27 W/kg

Maximum value of SAR (measured) = 19.3 W/kg



0 dB = 18.2 W/kg = 12.60 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 20.09.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1191

Communication System: UID 0 - CW; Frequency: 5250 MHz, Frequency: 5600 MHz, Frequency: 5750 MHz
Medium parameters used: $f = 5250$ MHz; $\sigma = 5.52$ S/m; $\epsilon_r = 47.4$; $\rho = 1000$ kg/m³, Medium parameters used: $f = 5600$ MHz; $\sigma = 6$ S/m; $\epsilon_r = 46.8$; $\rho = 1000$ kg/m³, Medium parameters used: $f = 5750$ MHz; $\sigma = 6.21$ S/m; $\epsilon_r = 46.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(4.85, 4.85, 4.85); Calibrated: 30.06.2016, ConvF(4.35, 4.35, 4.35); Calibrated: 30.06.2016, ConvF(4.3, 4.3, 4.3); Calibrated: 30.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5250MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 66.49 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 29.1 W/kg

SAR(1 g) = 7.74 W/kg; SAR(10 g) = 2.17 W/kg

Maximum value of SAR (measured) = 17.7 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 65.85 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 32.5 W/kg

SAR(1 g) = 7.96 W/kg; SAR(10 g) = 2.24 W/kg

Maximum value of SAR (measured) = 18.8 W/kg

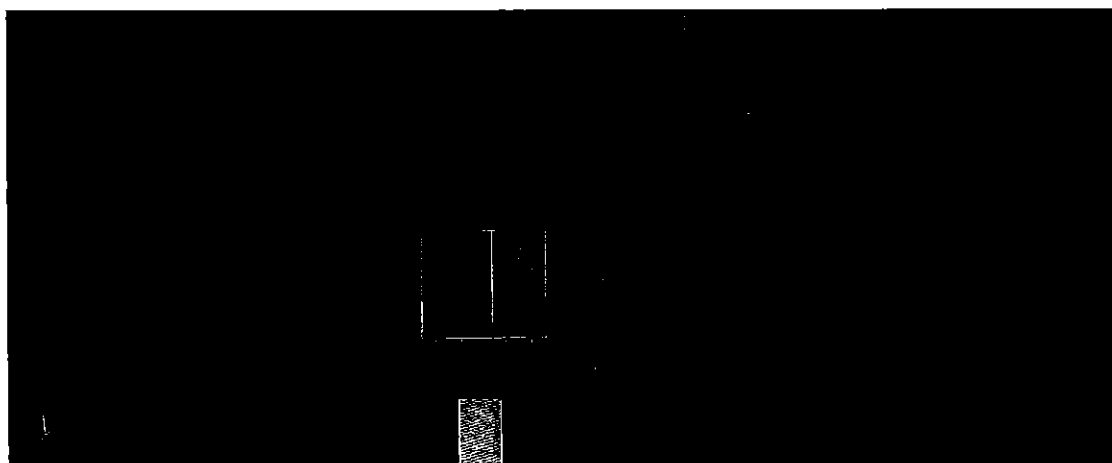
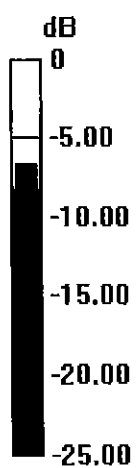
Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 64.21 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 32.7 W/kg

SAR(1 g) = 7.65 W/kg; SAR(10 g) = 2.14 W/kg

Maximum value of SAR (measured) = 18.5 W/kg

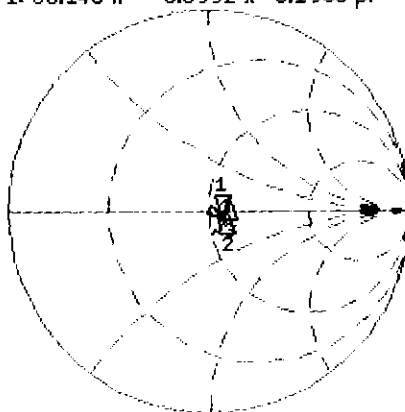


0 dB = 17.7 W/kg = 12.48 dBW/kg

Impedance Measurement Plot for Body TSL

20 Sep 2016 13:19:13
 CH1 S11 1 U FS 1: 56.143 Ω -3.6992 Ω 8.1950 pF 5 250.000 000 MHz

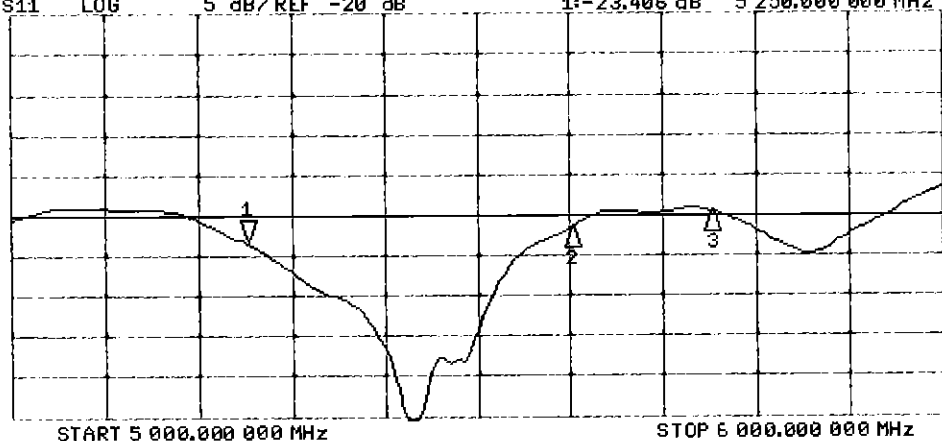
*
 Del
 Cor
 Avg
 16
 H1d



CH1 Markers
 2: 58.887 Ω
 -1.6504 Ω
 5.60000 GHz
 3: 59.510 Ω
 6.9121 Ω
 5.75000 GHz

CH2 S11 LOG 5 dB/REF -20 dB 1: -23.406 dB 5 250.000 000 MHz

Cor
 Avg
 16
 H1d



CH2 Markers
 2: -21.616 dB
 5.60000 GHz
 3: -19.400 dB
 5.75000 GHz

Certification of Calibration

Object D5GHzV2 – SN: 1191

Calibration procedure(s) Procedure for Calibration Extension for SAR Dipoles.

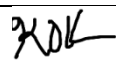
Extension Calibration date: 9/19/2017

Description: SAR Validation Dipole at 5250, 5600, and 5750 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Control Company	4040	Therm./Clock/Humidity Monitor	3/31/2017	Biennial	3/31/2019	170232394
Control Company	4352	Ultra Long Stem Thermometer	5/2/2017	Biennial	5/2/2019	170330156
Amplifier Research	1551G6	Amplifier	CBT	N/A	CBT	433971
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/1/2017	Annual	6/1/2018	MY53401181
Agilent	8753ES	S-Parameter Network Analyzer	10/26/2016	Annual	10/26/2017	US39170118
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/10/2017	Annual	5/10/2018	1070
SPEAG	EX3DV4	SAR Probe	1/13/2017	Annual	1/13/2018	3589
SPEAG	EX3DV4	SAR Probe	2/13/2017	Annual	2/13/2018	3914
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/16/2017	Annual	1/16/2018	1466
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/9/2017	Annual	2/9/2018	665
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1207364
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1339018
Anritsu	ML2495A	Power Meter	10/16/2015	Biennial	10/16/2017	941001
Agilent	N5182A	MXG Vector Signal Generator	2/28/2017	Annual	2/28/2018	MY47420800
Seekonk	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	N/A
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A

Measurement Uncertainty = $\pm 23\%$ (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halfoster	Test Engineer	
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	

DIPOLE CALIBRATION EXTENSION

Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

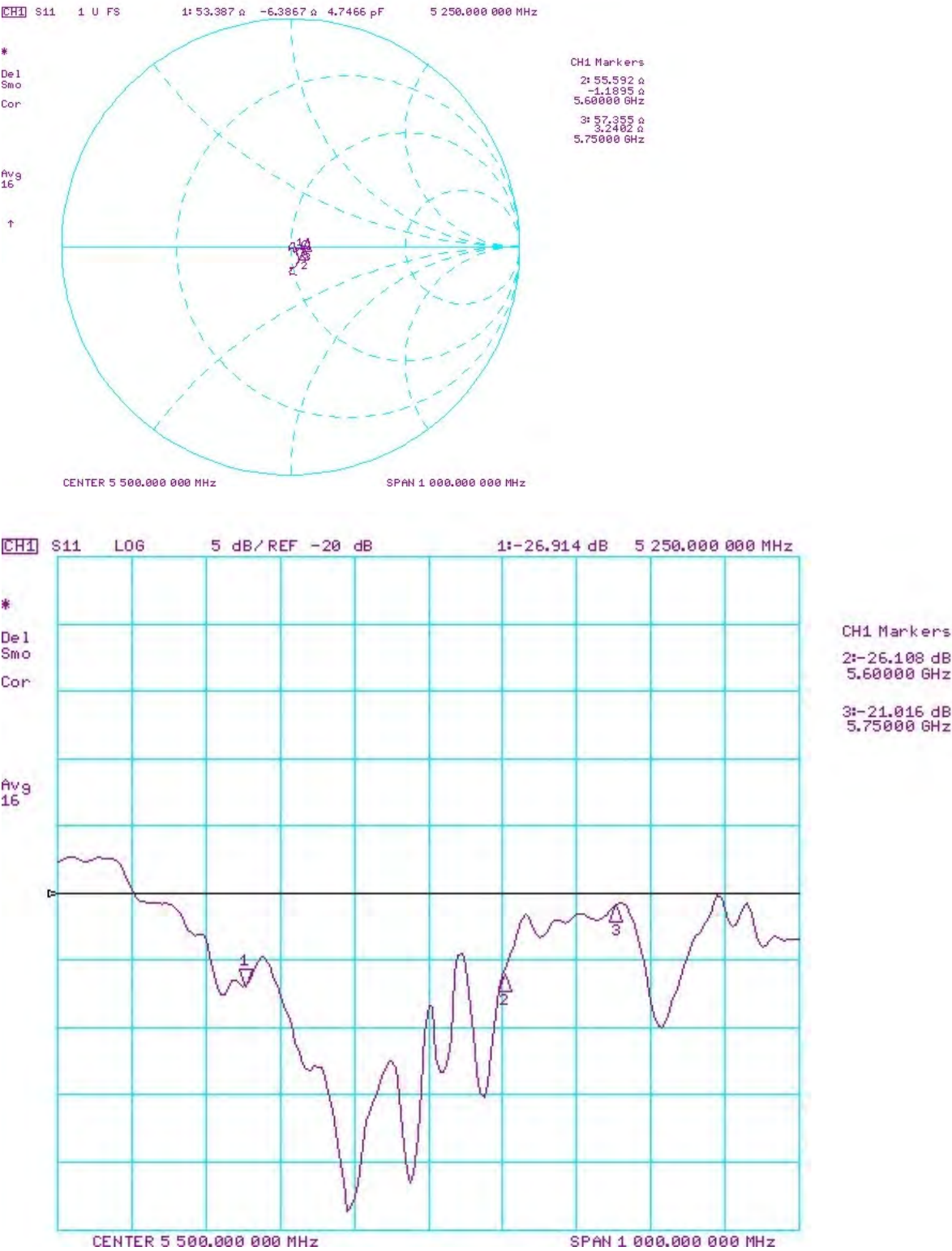
1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

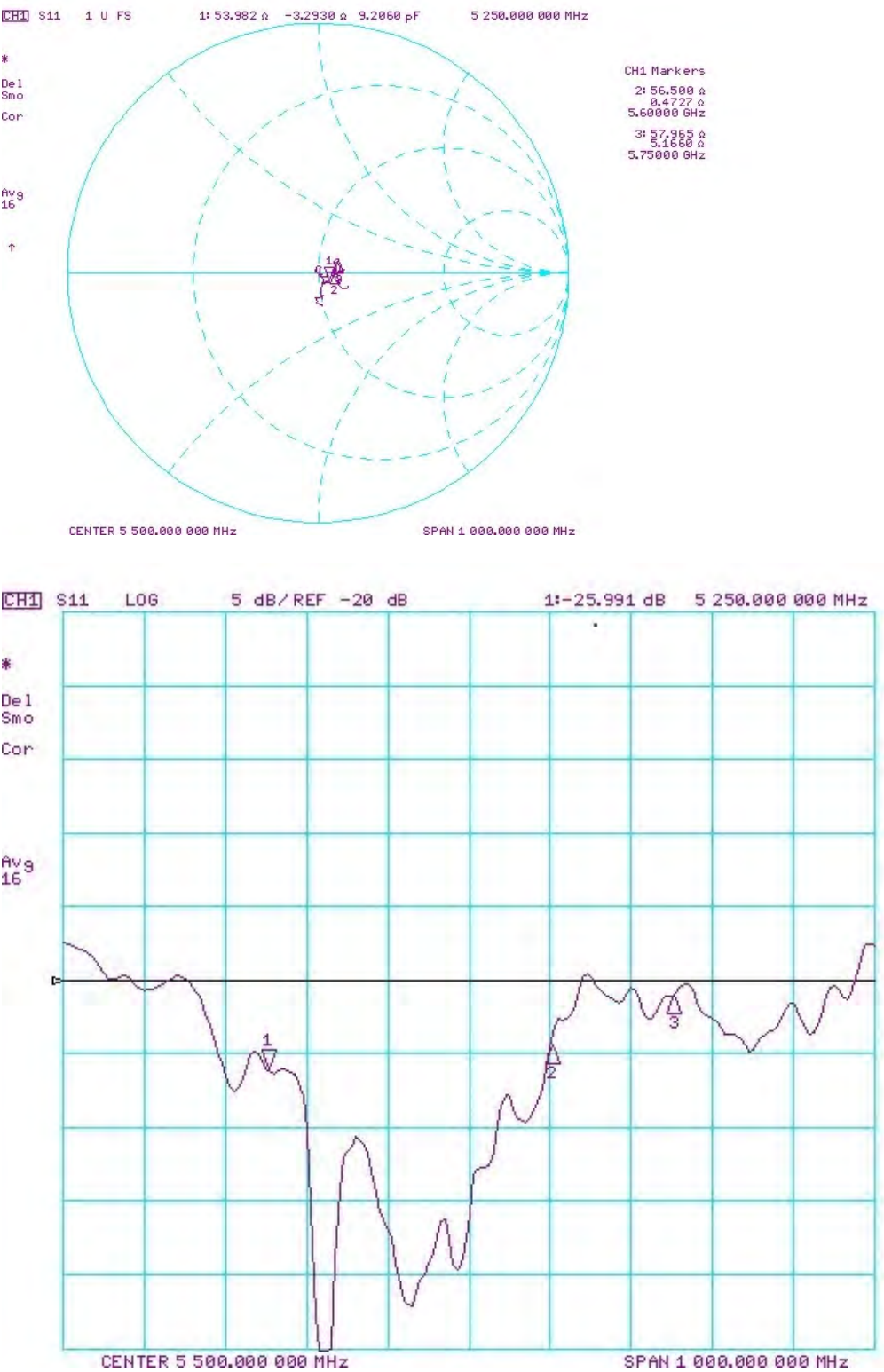
Frequency (MHz)	Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g W/kg @ 17.0 dBm)	Measured Head SAR (1g W/kg @ 17.0 dBm)	Deviation 1g (%)	Certificate SAR Target Head (10g W/kg @ 17.0 dBm)	Measured Head SAR (10g W/kg @ 17.0 dBm)	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
6250	9/21/2016	9/19/2017	1.204	3.95	3.70	-6.21%	1.13	1.05	-7.08%	55.7	53.4	2.3	-4.3	-6.4	2.1	-23.4	-26.9	-15.00%	PASS
5600	9/21/2016	9/19/2017	1.204	4.18	4.03	-3.59%	1.19	1.13	-5.04%	58.3	55.6	2.7	-3.2	-1.2	2.0	-21.8	-26.1	-19.80%	PASS
8750	9/21/2016	9/19/2017	1.204	3.96	3.84	-3.08%	1.12	1.10	-1.79%	58.1	57.4	0.7	4.8	3.2	1.6	-21.2	-21.0	0.90%	PASS

Frequency (MHz)	Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g W/kg @ 17.0 dBm)	Measured Body SAR (1g W/kg @ 17.0 dBm)	Deviation 1g (%)	Certificate SAR Target Body (10g W/kg @ 17.0 dBm)	Measured Body SAR (10g W/kg @ 17.0 dBm)	Deviation 10g (%)	Certificate Impedance Body (Ohm) Real	Measured Impedance Body (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Body (Ohm) Imaginary	Measured Impedance Body (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Body (dB)	Measured Return Loss Body (dB)	Deviation (%)	PASS/FAIL
6250	9/21/2016	9/19/2017	1.204	3.85	3.80	-1.30%	1.08	1.06	-1.85%	55.1	54.0	2.1	-3.7	-3.3	0.4	-23.4	-26.0	-11.10%	PASS
5600	9/21/2016	9/19/2017	1.204	3.96	4.06	2.53%	1.11	1.13	1.80%	58.9	56.5	2.4	-1.7	0.5	2.2	-21.7	-24.5	-12.80%	PASS
8750	9/21/2016	9/19/2017	1.204	3.81	3.66	-3.81%	1.06	1.02	-3.77%	59.5	58.0	1.5	6.9	5.2	1.7	-19.4	-21.1	-8.70%	PASS

Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL





Accredited by the Swiss Accreditation Service (SAS)
 The Swiss Accreditation Service is one of the signatories to the EA
 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D750V3-1054_Mar17**

CALIBRATION CERTIFICATE

Object **D750V3 - SN:1054**

Calibration procedure(s) **QA CAL-05.v9**
Calibration procedure for dipole validation kits above 700 MHz

BNV ✓

03-27-2017

Calibration date: **March 07, 2017**

BNV ✓

04-04-2018

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	06-Apr-16 (No. 217-02288/02289)	Apr-17
Power sensor NRP-Z91	SN: 103244	06-Apr-16 (No. 217-02288)	Apr-17
Power sensor NRP-Z91	SN: 103245	06-Apr-16 (No. 217-02289)	Apr-17
Reference 20 dB Attenuator	SN: 5058 (20K)	05-Apr-16 (No. 217-02292)	Apr-17
Type-N mismatch combination	SN: 5047.2 / 06327	05-Apr-16 (No. 217-02295)	Apr-17
Reference Probe EX3DV4	SN: 7349	31-Dec-16 (No. EX3-7349_Dec16)	Dec-17
DAE4	SN: 601	04-Jan-17 (No. DAE4-601_Jan17)	Jan-18

Secondary Standards	ID #	Check Date (In house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (In house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (In house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (In house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (In house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (In house check Oct-18)	In house check: Oct-17

Calibrated by: **Johannes Kurikka** Name: **Johannes Kurikka** Function: **Laboratory Technician**

Signature

J. Kurikka

Approved by: **Katja Pokovic** Name: **Katja Pokovic** Function: **Technical Manager**

K. Pokovic

Issued: March 14, 2017

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:* SAR measured at the stated antenna input power.
- SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	40.9 $\pm$ 6 %	0.91 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.14 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.37 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.40 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.60 W/kg $\pm$ 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	54.6 $\pm$ 6 %	0.99 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.21 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	8.61 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.45 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	5.68 W/kg $\pm$ 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.7 Ω - 0.7 j Ω
Return Loss	- 26.8 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.7 Ω - 3.6 j Ω
Return Loss	- 28.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.033 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	November 08, 2011

DASY5 Validation Report for Head TSL

Date: 07.03.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1054

Communication System: UID 0 - CW ; Frequency: 750 MHz

Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.91 \text{ S/m}$; $\epsilon_r = 40.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.17, 10.17, 10.17); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.01.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

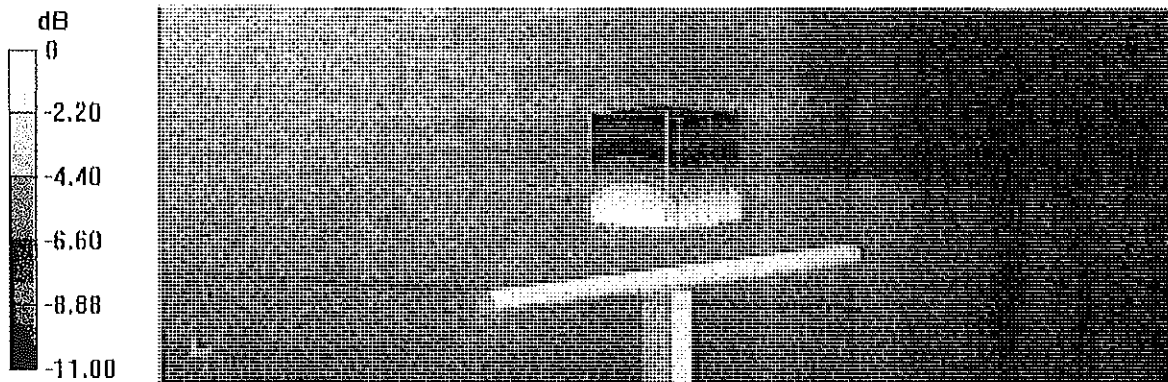
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 59.71 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 3.21 W/kg

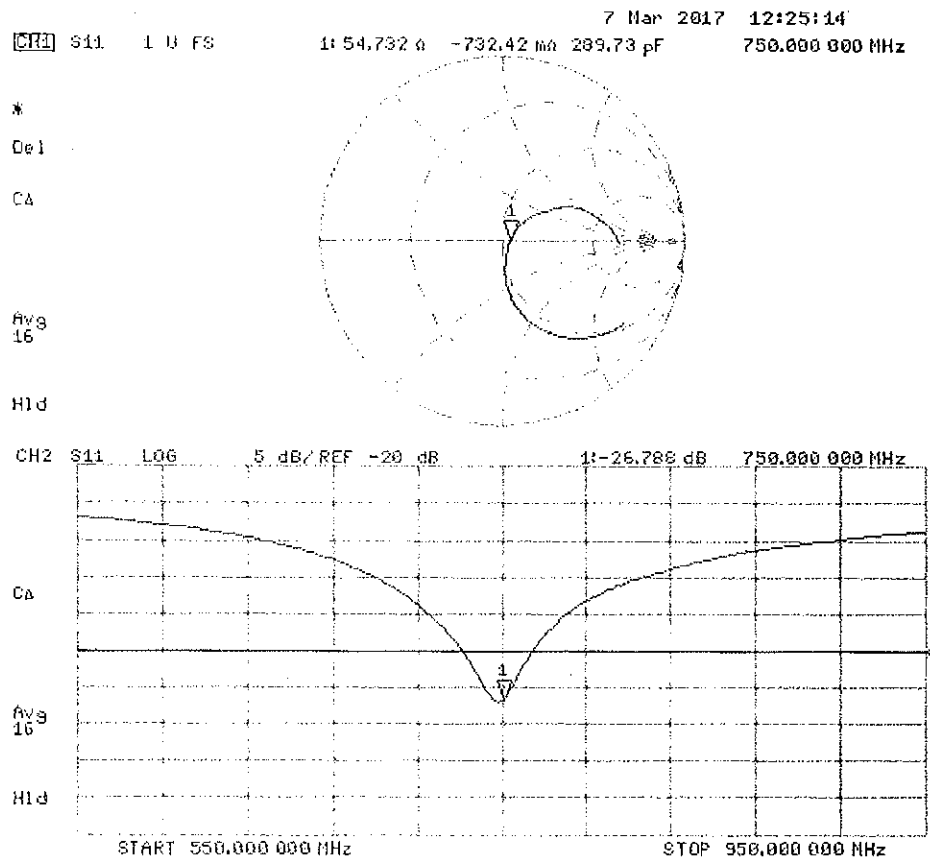
SAR(1 g) = 2.14 W/kg; SAR(10 g) = 1.4 W/kg

Maximum value of SAR (measured) = 2.85 W/kg



0 dB = 2.85 W/kg = 4.55 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 07.03.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1054

Communication System: UID 0 - CW ; Frequency: 750 MHz

Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.99 \text{ S/m}$; $\epsilon_r = 54.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.99, 9.99, 9.99); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.01.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Dipole Calibration for Body Tissue/Pin=250 mW, $d=15\text{mm}$ /Zoom Scan (7x7x7)/Cube 0:

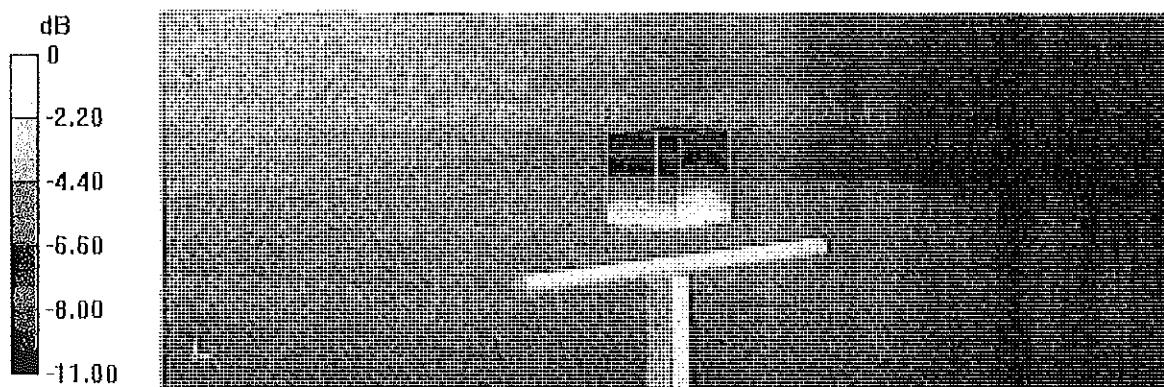
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 57.88 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.31 W/kg

SAR(1 g) = 2.21 W/kg; SAR(10 g) = 1.45 W/kg

Maximum value of SAR (measured) = 2.94 W/kg



0 dB = 2.94 W/kg = 4.68 dBW/kg

Impedance Measurement Plot for Body TSL

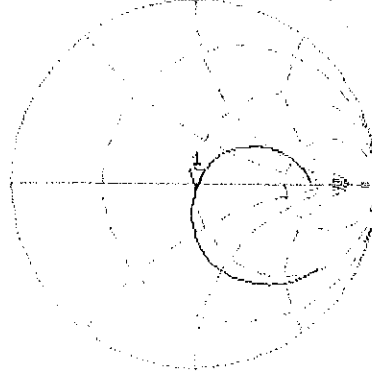
7 Mar 2017 11:51:37
 CH1 S11 1 U FS 1: 50.666 Ω -3.6309 Ω 58.445 pF 750.000 000 MHz

*
 Da1

CA

Avg
 16

H1d

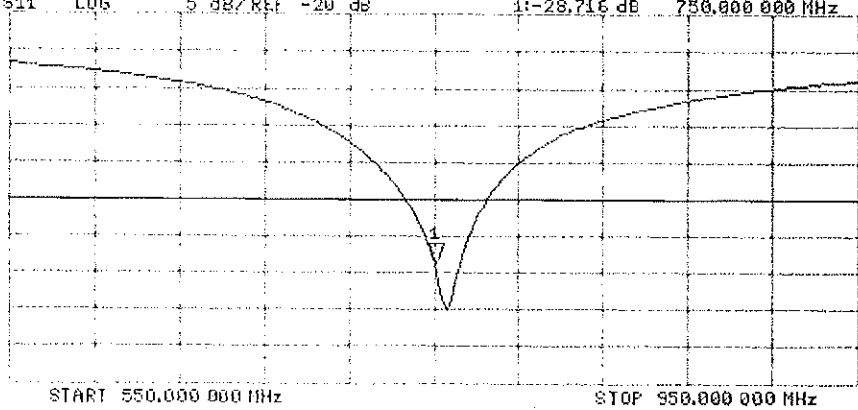


CH2 S11 LOG 5 dB/REF -20 dB 1: -28.716 dB 750.000 000 MHz

CA

Avg
 16

H1d



Certification of Calibration

Object: D750V3 – SN:1054

Calibration procedure(s): Procedure for Calibration Extension for SAR Dipoles.

Extended Calibration date: March 07, 2018

Description: SAR Validation Dipole at 750 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8753ES	S-Parameter Network Analyzer	8/3/2017	Annual	8/3/2018	MY40000670
Agilent	N5182A	MXG Vector Signal Generator	1/24/2018	Annual	1/24/2019	MY47420651
Amplifier Research	1551G6	Amplifier	CBT	N/A	CBT	433971
Anritsu	MA2411B	Pulse Power Sensor	3/2/2018	Annual	3/2/2019	1207364
Anritsu	MA2411B	Pulse Power Sensor	10/16/2017	Annual	10/16/2018	1126066
Anritsu	ML2495A	Power Meter	10/22/2017	Annual	10/22/2018	1328004
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/1/2017	Annual	6/1/2018	MY53401181
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	1/22/2018	Annual	1/22/2019	N/A
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/13/2017	Annual	7/13/2018	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/21/2017	Annual	6/21/2018	1333
SPEAG	EX3DV4	SAR Probe	7/17/2017	Annual	7/17/2018	7410
SPEAG	ES3DV3	SAR Probe	9/18/2017	Annual	9/18/2018	3287

Measurement Uncertainty = $\pm 23\%$ (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halfoster	Test Engineer	<i>BRODIE HALFOSTER</i>
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	<i>KOK</i>

DIPOLE CALIBRATION EXTENSION

Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

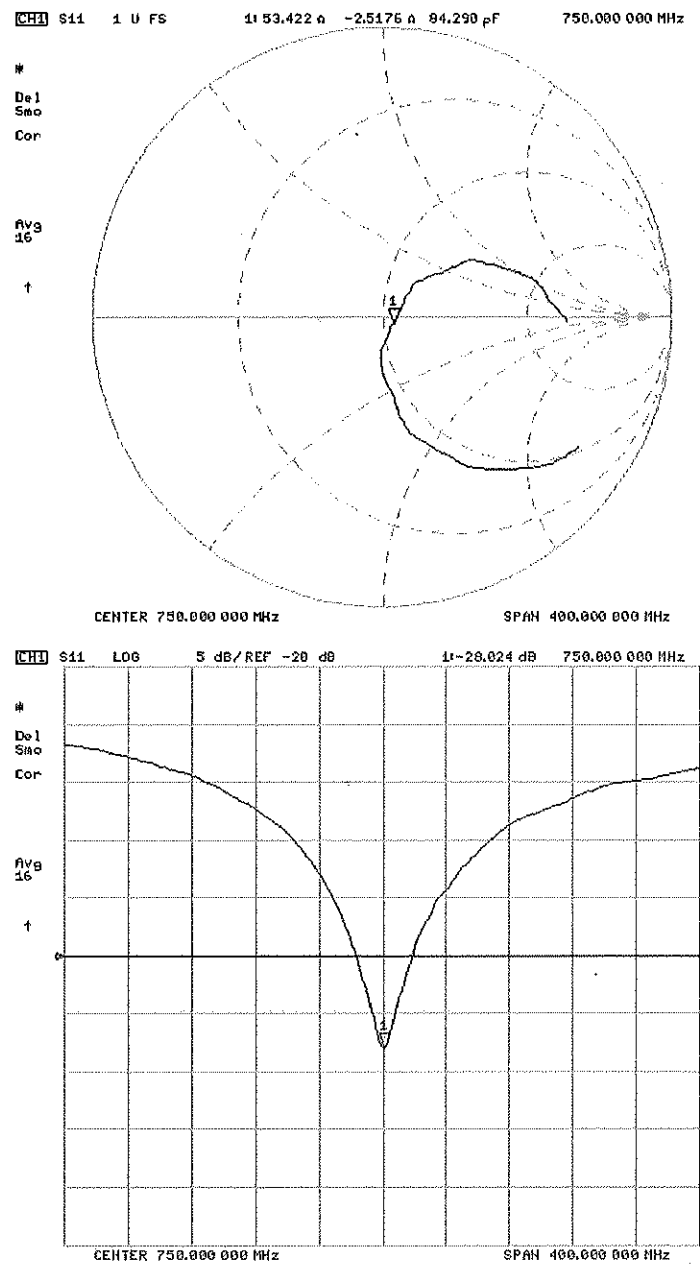
1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

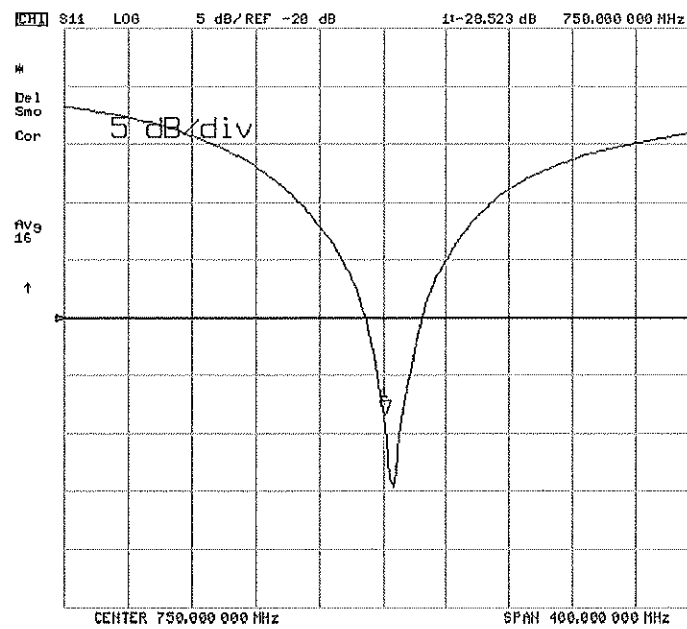
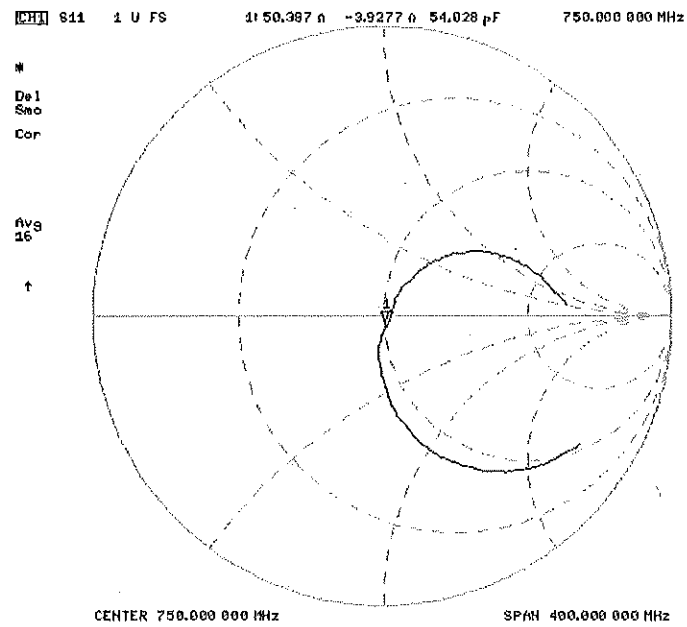
Calibration Date	Extension Date	Certificate Elect Cal Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 210 MHz	Measured Head SAR (1g) W/kg @ 210 MHz	Deviation 1g (%)	Certificate SAR Target Body (1g) W/kg @ 210 MHz	Measured Head SAR (1g) W/kg @ 210 MHz	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
3/7/2017	3/7/2018	1.033	1.67	1.70	1.86%	1.10	1.11	0.09%	54.7	53.4	1.3	-0.7	-2.5	1.8	-20.6	-20.0	-4.69%	PASS

Calibration Date	Extension Date	Certificate Elect Cal Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 210 MHz	Measured Body SAR (1g) W/kg @ 210 MHz	Deviation 1g (%)	Certificate SAR Target Body (1g) W/kg @ 210 MHz	Measured Body SAR (1g) W/kg @ 210 MHz	Deviation 10g (%)	Certificate Impedance Body (Ohm) Real	Measured Impedance Body (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Body (Ohm) Imaginary	Measured Impedance Body (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Body (dB)	Measured Return Loss Body (dB)	Deviation (%)	PASS/FAIL
3/7/2017	3/7/2018	1.033	1.72	1.70	-1.20%	1.14	1.12	-1.41%	50.7	60.4	9.7	-3.6	-3.0	0.6	-28.7	-28.5	0.69%	PASS

Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL





Accredited by the Swiss Accreditation Service (SAS)
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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D750V3-1003_Jan18**

CALIBRATION CERTIFICATE

Object **D750V3 - SN:1003**

Calibration procedure(s) **QA CAL-05.v9**
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: **January 15, 2018**

BN
01-25-2018

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

Calibrated by: **Leif Klysner** Function: **Laboratory Technician**

Approved by: **Katja Pokovic** Technical Manager

Signature

Leif Klysner

Katja Pokovic

Issued: January 15, 2018

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Calibration Laboratory of

Schmid & Partner

Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5.0 mm	
Frequency	750 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	40.9 $\pm$ 6 %	0.90 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.10 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.28 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.42 W/kg $\pm$ 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	55.0 $\pm$ 6 %	0.96 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.15 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	8.58 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.43 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	5.71 W/kg $\pm$ 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.8 Ω - 2.1 j Ω
Return Loss	- 27.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.2 Ω - 6.2 j Ω
Return Loss	- 24.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.043 ns
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After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	January 21, 2009

Appendix (Additional assessments outside the scope of SCS 0108)

Measurement Conditions

DASY system configuration, as far as not given on page 1 and 3.

Phantom	SAM Head Phantom	For usage with cSAR3DV2-R/L
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SAR result with SAM Head (Top)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.98 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	7.94 W/kg ± 17.5 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.33 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.32 W/kg ± 16.9 % (k=2)

SAR result with SAM Head (Mouth)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.05 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.22 W/kg ± 17.5 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.38 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.52 W/kg ± 16.9 % (k=2)

SAR result with SAM Head (Neck)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.01 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.06 W/kg ± 17.5 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.38 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.52 W/kg ± 16.9 % (k=2)

SAR result with SAM Head (Ear)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.67 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.70 W/kg ± 17.5 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.15 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	4.60 W/kg ± 16.9 % (k=2)

DASY5 Validation Report for Head TSL

Date: 12.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1003

Communication System: UID 0 - CW; Frequency: 750 MHz

Medium parameters used: $f = 750$ MHz; $\sigma = 0.9$ S/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.22, 10.22, 10.22); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

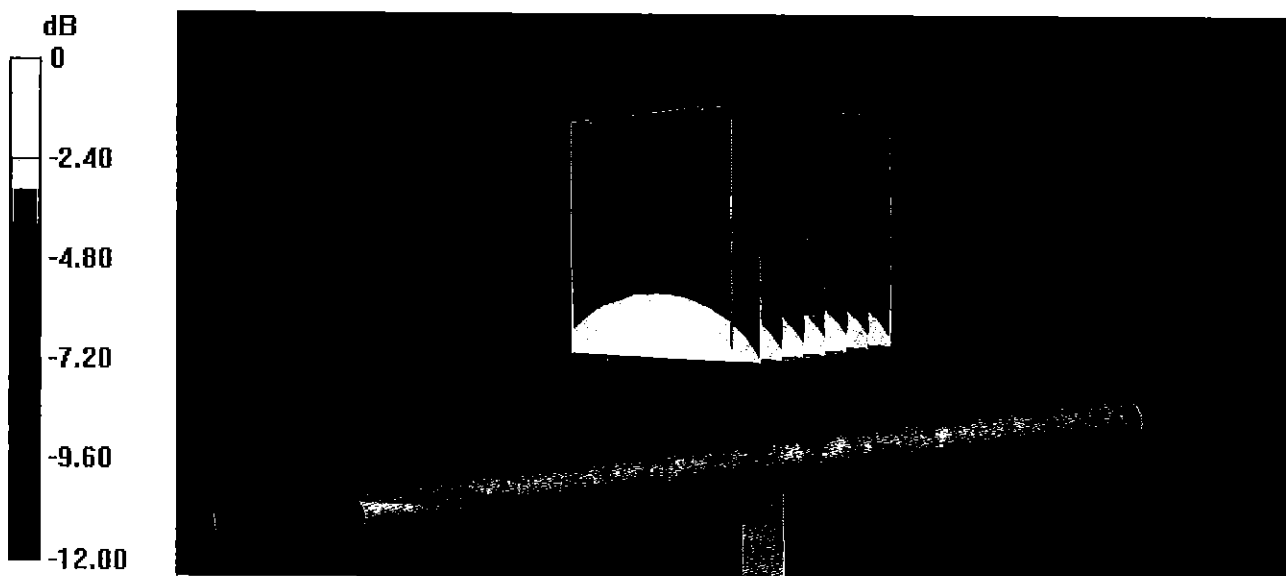
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 59.11 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 3.15 W/kg

SAR(1 g) = 2.1 W/kg; SAR(10 g) = 1.37 W/kg

Maximum value of SAR (measured) = 2.80 W/kg

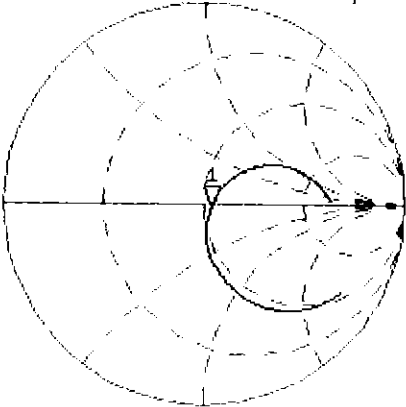


0 dB = 2.80 W/kg = 4.47 dBW/kg

Impedance Measurement Plot for Head TSL

12 Jan 2018 13:14:07
CH1 S11 1 U FS 1: 53.754 Ω -2.0996 Ω 101.07 pF 750.000 000 MHz

*
De1
CA

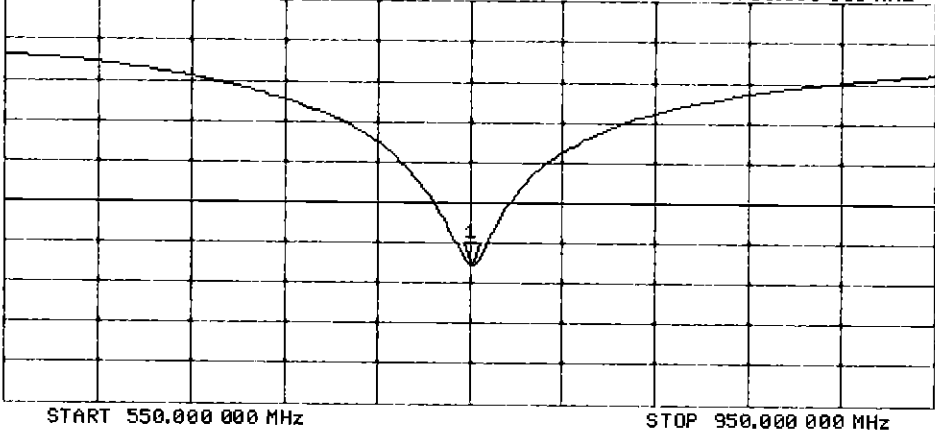


Avg
16
H1d

CH2 S11 LOG 5 dB/REF -20 dB 1:-27.643 dB 750.000 000 MHz

CA

Avg
16
H1d



DASY5 Validation Report for Body TSL

Date: 12.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1003

Communication System: UID 0 - CW; Frequency: 750 MHz

Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.96 \text{ S/m}$; $\epsilon_r = 55$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.19, 10.19, 10.19); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x8x7)/Cube 0:

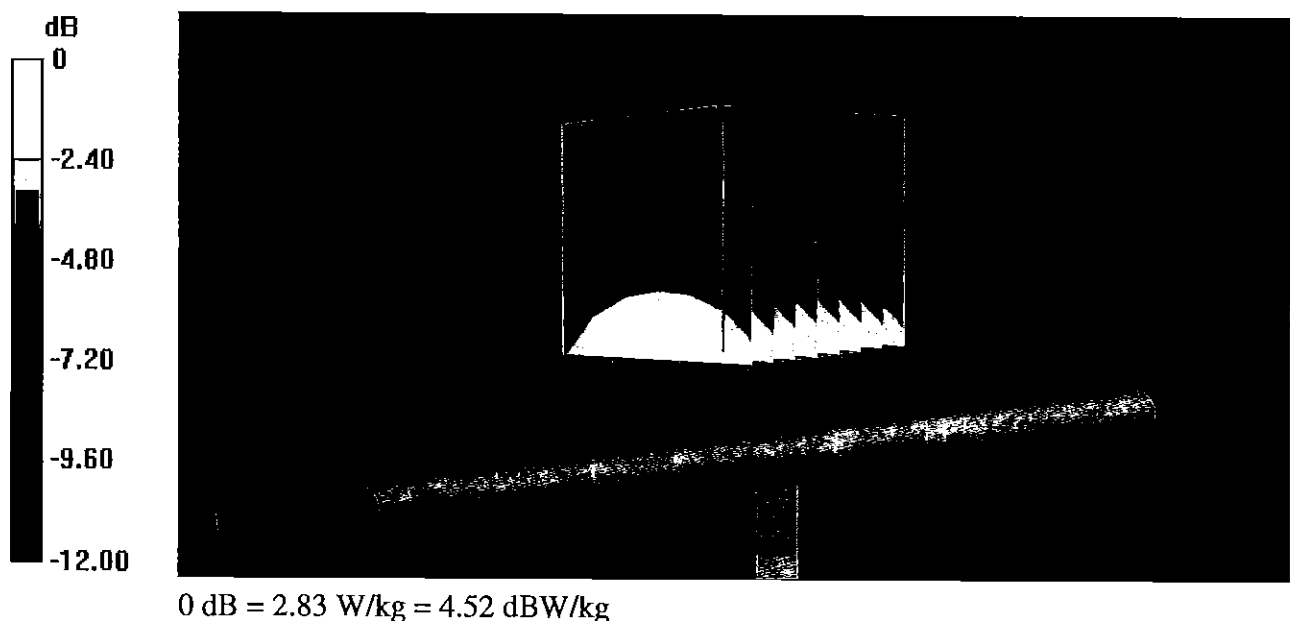
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 57.31 V/m; Power Drift = -0.01 dB

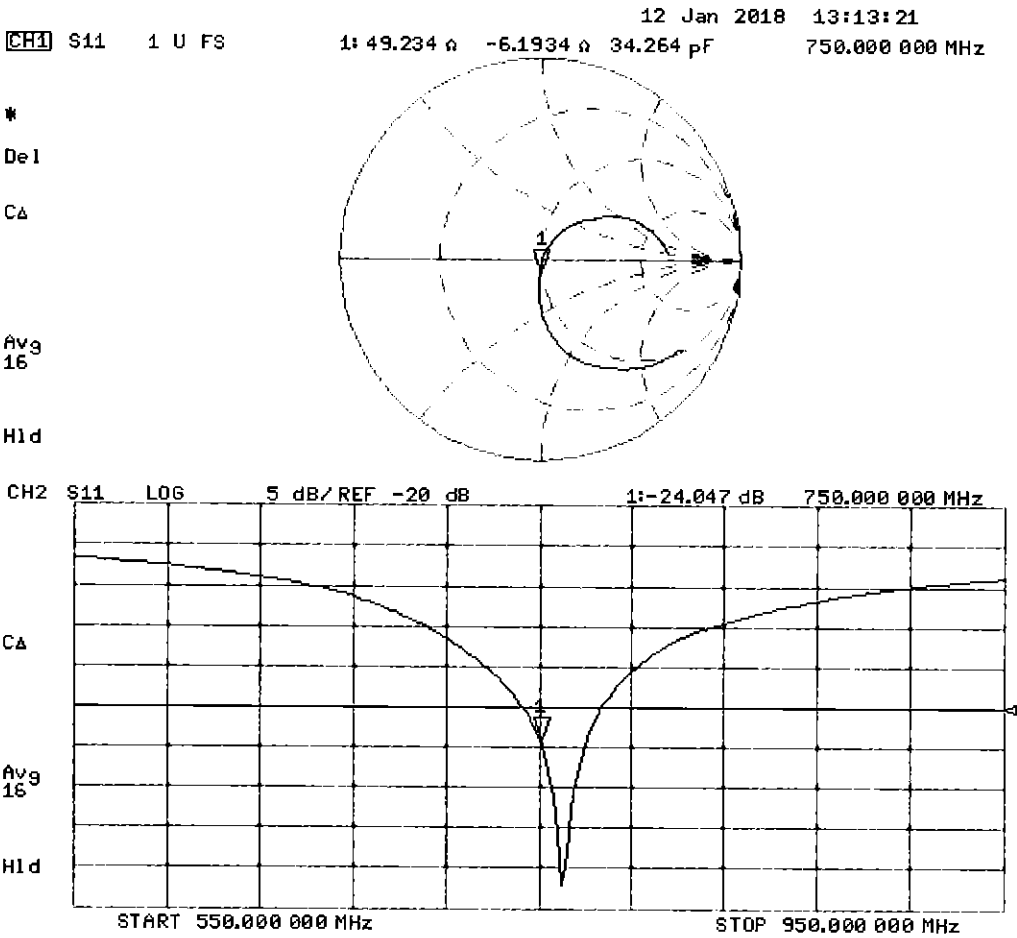
Peak SAR (extrapolated) = 3.17 W/kg

SAR(1 g) = 2.15 W/kg; SAR(10 g) = 1.43 W/kg

Maximum value of SAR (measured) = 2.83 W/kg



Impedance Measurement Plot for Body TSL



DASY5 Validation Report for SAM Head

Date: 15.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1003

Communication System: UID 0 - CW; Frequency: 750 MHz

Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.9 \text{ S/m}$; $\epsilon_r = 44.2$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.22, 10.22, 10.22); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: SAM Head
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

SAM Head/Top/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 56.79 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 2.89 W/kg

SAR(1 g) = 1.98 W/kg; SAR(10 g) = 1.33 W/kg

Maximum value of SAR (measured) = 2.58 W/kg

SAM Head/Mouth/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 56.85 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 2.94 W/kg

SAR(1 g) = 2.05 W/kg; SAR(10 g) = 1.38 W/kg

Maximum value of SAR (measured) = 2.62 W/kg

SAM Head/Neck/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 56.29 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 2.78 W/kg

SAR(1 g) = 2.01 W/kg; SAR(10 g) = 1.38 W/kg

Maximum value of SAR (measured) = 2.56 W/kg

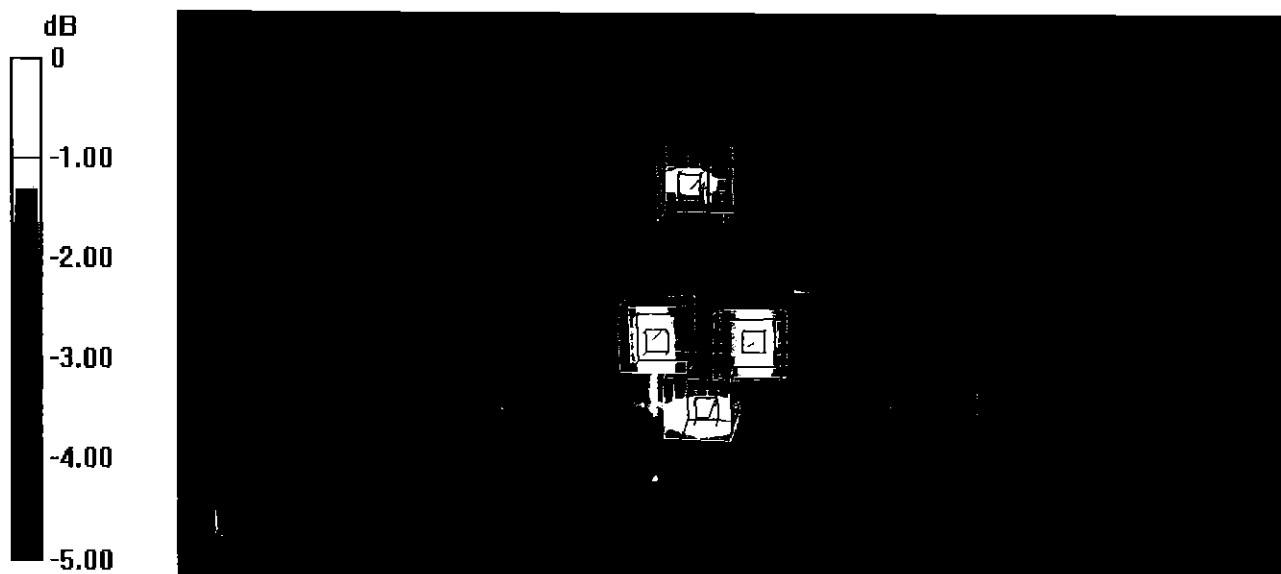
SAM Head/Ear/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 51.01 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 2.31 W/kg

SAR(1 g) = 1.67 W/kg; SAR(10 g) = 1.15 W/kg

Maximum value of SAR (measured) = 2.11 W/kg



0 dB = 2.58 W/kg = 4.12 dBW/kg



Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D835V2-4d047_Jul16**

CALIBRATION CERTIFICATE

Object **D835V2 - SN:4d047**

Calibration procedure(s) **QA CAL-05.v9**
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: **July 13, 2016**

BNV
7/16/2016

Extended
7/2017
SCV

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	06-Apr-16 (No. 217-02288/02289)	Apr-17
Power sensor NRP-Z91	SN: 103244	06-Apr-16 (No. 217-02288)	Apr-17
Power sensor NRP-Z91	SN: 103245	06-Apr-16 (No. 217-02289)	Apr-17
Reference 20 dB Attenuator	SN: 5058 (20k)	05-Apr-16 (No. 217-02292)	Apr-17
Type-N mismatch combination	SN: 5047.2 / 06327	05-Apr-16 (No. 217-02295)	Apr-17
Reference Probe EX3DV4	SN: 7349	15-Jun-16 (No. EX3-7349_Jun16)	Jun-17
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (No. 217-02223)	In house check: Oct-16
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Jun-15)	In house check: Oct-16
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

Calibrated by: **Jeton Kastrati** Name: **Jeton Kastrati** Function: **Laboratory Technician**

Signature

Approved by: **Katja Pokovic** Name: **Katja Pokovic** Function: **Technical Manager**

Issued: July 13, 2016

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



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Accreditation No.: **SCS 0108**

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Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	40.6 $\pm$ 6 %	0.94 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.13 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.53 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.95 W/kg $\pm$ 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	54.9 $\pm$ 6 %	1.01 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.47 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	9.57 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.60 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	6.24 W/kg $\pm$ 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.8 Ω - 5.9 j Ω
Return Loss	- 24.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	45.8 Ω - 8.2 j Ω
Return Loss	- 20.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	None ns
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After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	August 16, 2006

DASY5 Validation Report for Head TSL

Date: 13.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz D835V2; Type: D835V2; Serial: D835V2 - SN:4d047

Communication System: UID 0 - CW; Frequency: 835 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.94 \text{ S/m}$; $\epsilon_r = 40.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.72, 9.72, 9.72); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

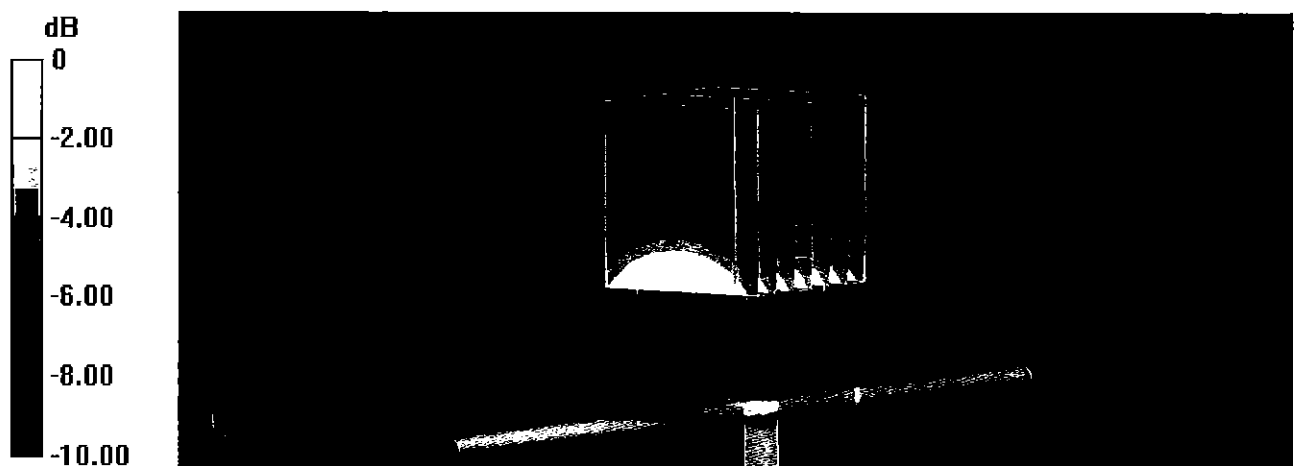
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 60.98 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 3.56 W/kg

SAR(1 g) = 2.37 W/kg; SAR(10 g) = 1.53 W/kg

Maximum value of SAR (measured) = 3.17 W/kg

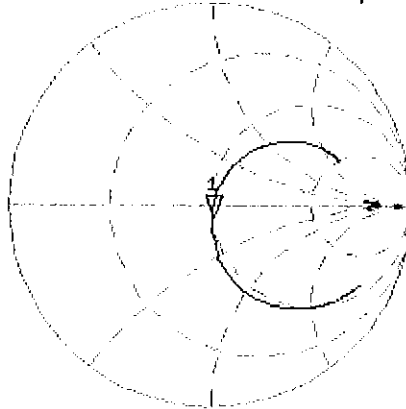


0 dB = 3.17 W/kg = 5.01 dBW/kg

Impedance Measurement Plot for Head TSL

13 Jul 2016 12:00:27
 CH1 S11 1 U FS 1: 49.820 Ω -5.9316 Ω 32.134 pF 835.000 000 MHz

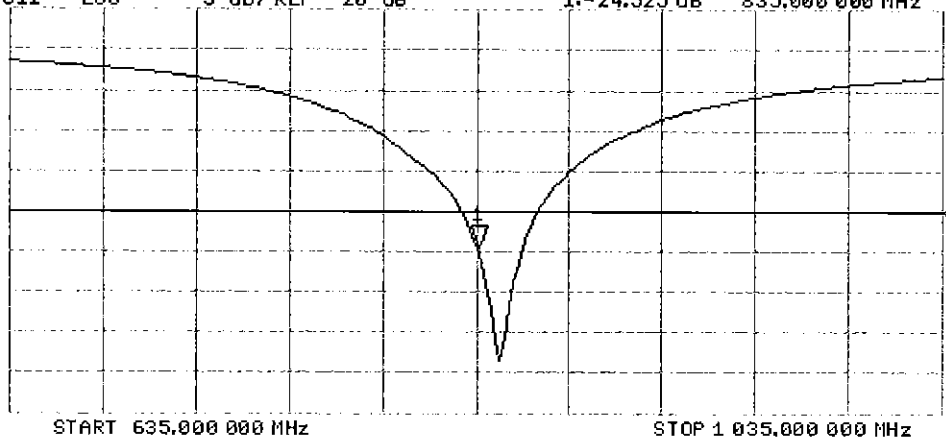
*
 Del
 CA



Avg
 16
 H1d

CH2 S11 LOG 5 dB/REF -20 dB 1:-24.525 dB 835.000 000 MHz

CA
 Avg
 16
 H1d



DASY5 Validation Report for Body TSL

Date: 13.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz D835V2; Type: D835V2; Serial: D835V2 - SN:4d047

Communication System: UID 0 - CW; Frequency: 835 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 1.01 \text{ S/m}$; $\epsilon_r = 54.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.73, 9.73, 9.73); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 59.88 V/m; Power Drift = -0.01 dB

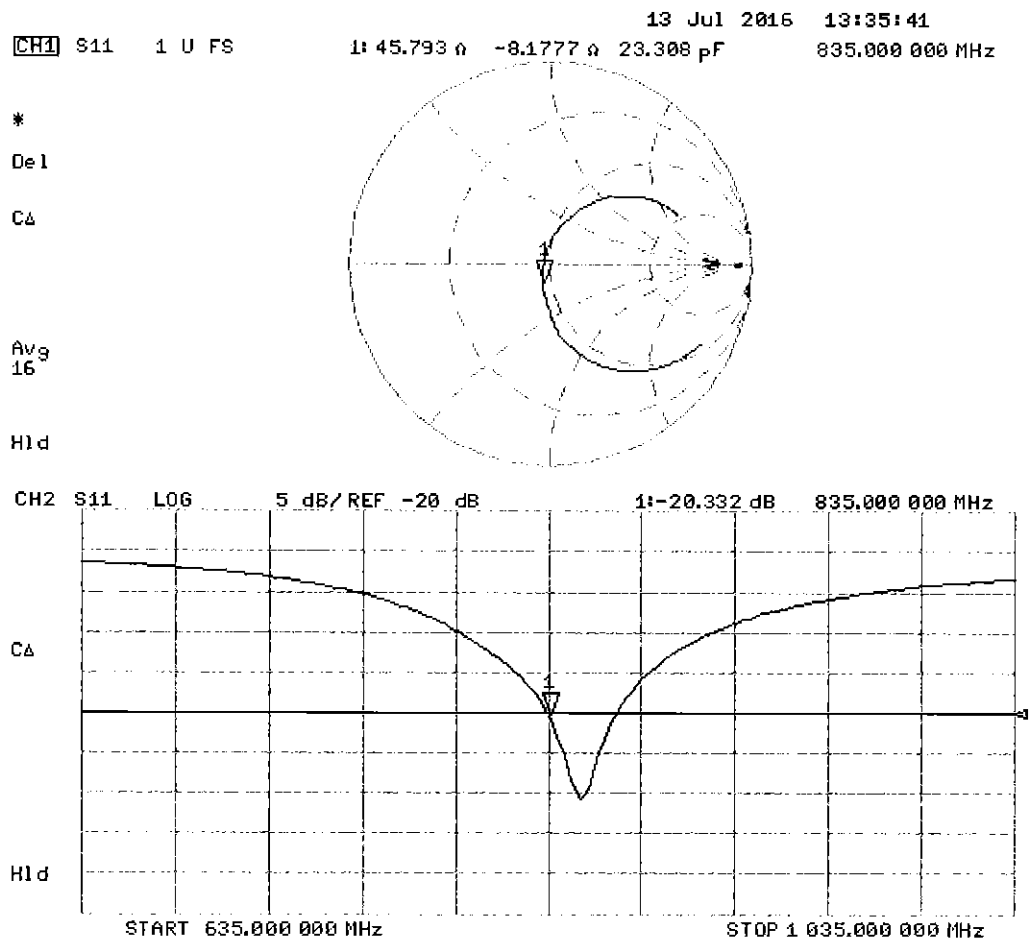
Peak SAR (extrapolated) = 3.67 W/kg

SAR(1 g) = 2.47 W/kg; SAR(10 g) = 1.6 W/kg

Maximum value of SAR (measured) = 3.27 W/kg



Impedance Measurement Plot for Body TSL



Certification of Calibration

Object D835V2 – SN: 4d047

Calibration procedure(s) Procedure for Calibration Extension for SAR Dipoles.

Calibration date: July 13, 2017

Description: SAR Validation Dipole at 835 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Control Company	4040	Therm./Clock/Humidity Monitor	3/31/2017	Biennial	3/31/2019	170232394
Control Company	4352	Ultra Long Stem Thermometer	5/2/2017	Biennial	5/2/2019	170330156
Amplifier Research	1551G6	Amplifier	CBT	N/A	CBT	433971
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/1/2017	Annual	6/1/2018	MY53401181
Agilent	8753ES	S-Parameter Network Analyzer	10/26/2016	Annual	10/26/2017	US39170118
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/8/2017	Annual	3/8/2018	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/13/2017	Annual	3/13/2018	1415
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/10/2017	Annual	5/10/2018	1070
SPEAG	ES3DV3	SAR Probe	3/14/2017	Annual	3/14/2018	3209
SPEAG	ES3DV3	SAR Probe	3/14/2017	Annual	3/14/2018	3319
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1207364
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1339018
Anritsu	ML2495A	Power Meter	10/16/2015	Biennial	10/16/2017	941001
Agilent	N5182A	MXG Vector Signal Generator	2/28/2017	Annual	2/28/2018	MY47420800
Seekonk	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A

Measurement Uncertainty = $\pm 23\%$ (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halfoster	Test Engineer	<i>BRODIE HALFOSTER</i>
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	<i>KOK</i>

DIPOLE CALIBRATION EXTENSION

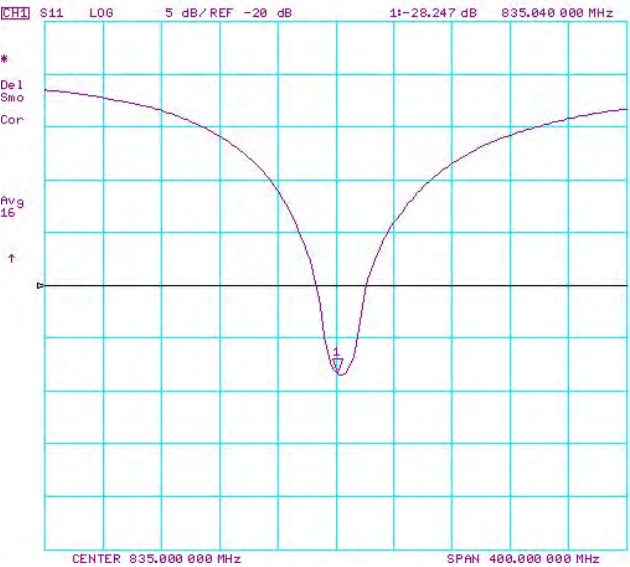
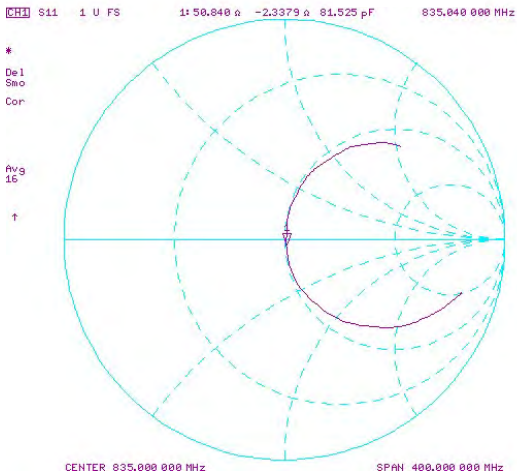
Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

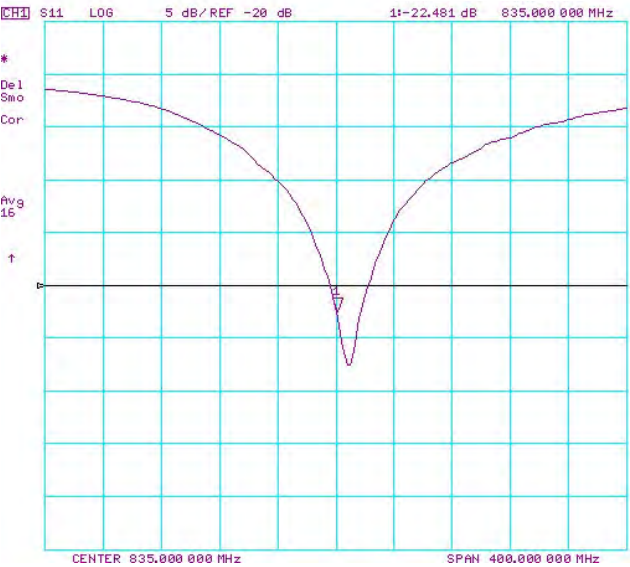
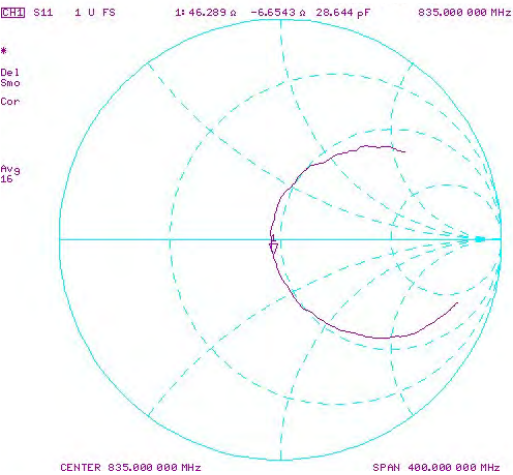
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 23.0 dBm	Measured Head SAR (1g) W/kg @ 23.0 dBm	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 23.0 dBm	Measured Head SAR (10g) W/kg @ 23.0 dBm	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
7/13/2016	7/13/2017	0	1.83	1.95	6.79%	1.19	1.28	7.56%	49.8	50.8	1	-5.9	-2.3	3.6	-24.5	-26.2	-15.10%	PASS
Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 23.0 dBm	Measured Body SAR (1g) W/kg @ 23.0 dBm	Deviation 1g (%)	Certificate SAR Target Body (10g) W/kg @ 23.0 dBm	Measured Body SAR (10g) W/kg @ 23.0 dBm	Deviation 10g (%)	Certificate Impedance Body (Ohm) Real	Measured Impedance Body (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Body (Ohm) Imaginary	Measured Impedance Body (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Body (dB)	Measured Return Loss Body (dB)	Deviation (%)	PASS/FAIL
7/13/2016	7/13/2017	0	1.91	1.99	3.97%	1.25	1.31	4.97%	45.8	46.3	0.5	-8.2	-6.7	1.5	-20.3	-22.5	-10.80%	PASS

Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL





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The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D1750V2-1150_Jul16**

CALIBRATION CERTIFICATE

Object **D1750V2 - SN:1150**

Calibration procedure(s) **QA CAL-05.v9**
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: **July 14, 2016**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	06-Apr-16 (No. 217-02288/02289)	Apr-17
Power sensor NRP-Z91	SN: 103244	06-Apr-16 (No. 217-02288)	Apr-17
Power sensor NRP-Z91	SN: 103245	06-Apr-16 (No. 217-02289)	Apr-17
Reference 20 dB Attenuator	SN: 5058 (20k)	05-Apr-16 (No. 217-02292)	Apr-17
Type-N mismatch combination	SN: 5047.2 / 06327	05-Apr-16 (No. 217-02295)	Apr-17
Reference Probe EX3DV4	SN: 7349	15-Jun-16 (No. EX3-7349_Jun16)	Jun-17
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (No. 217-02223)	In house check: Oct-16
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Jun-15)	In house check: Oct-16
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

Calibrated by: **Name** **Function**
Jeton Kastrati **Laboratory Technician**

Approved by: **Katja Pokovic** **Technical Manager**

Signature

[Handwritten signatures]

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Issued: July 14, 2016



Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1750 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	38.8 $\pm$ 6 %	1.36 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.06 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	36.1 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.80 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	19.2 W/kg $\pm$ 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.4	1.49 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	53.4 $\pm$ 6 %	1.48 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.09 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	36.5 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	4.85 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	19.5 W/kg $\pm$ 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	$50.9 \Omega + 0.4 j\Omega$
Return Loss	- 40.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	$46.4 \Omega - 0.5 j\Omega$
Return Loss	- 28.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.218 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	April 10, 2015

DASY5 Validation Report for Head TSL

Date: 14.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz D1750V2; Type: D1750V2; Serial: D1750V2 - SN:1150

Communication System: UID 0 - CW; Frequency: 1750 MHz

Medium parameters used: $f = 1750$ MHz; $\sigma = 1.36$ S/m; $\epsilon_r = 38.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.46, 8.46, 8.46); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

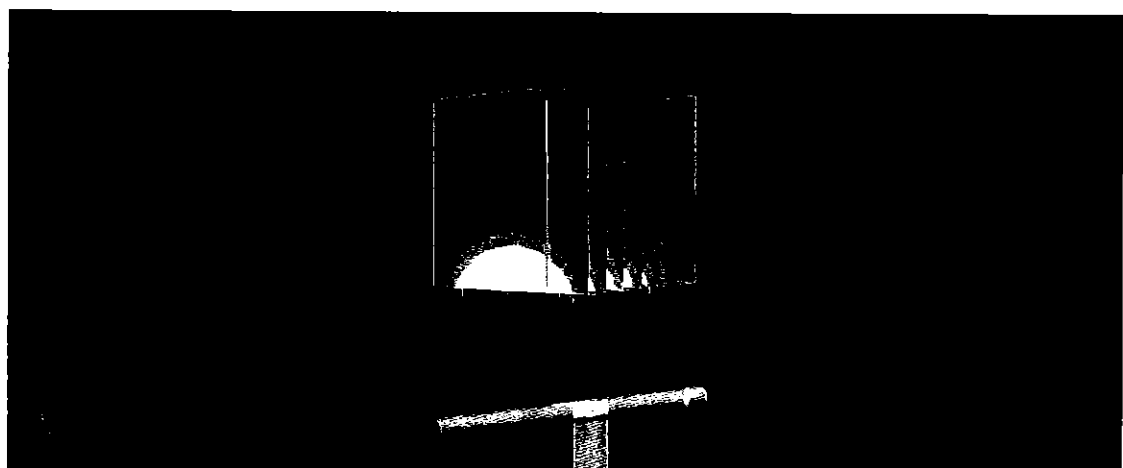
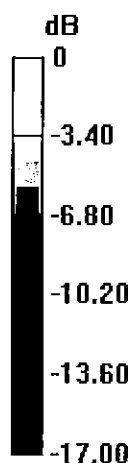
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 104.4 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 16.6 W/kg

SAR(1 g) = 9.06 W/kg; SAR(10 g) = 4.8 W/kg

Maximum value of SAR (measured) = 13.9 W/kg

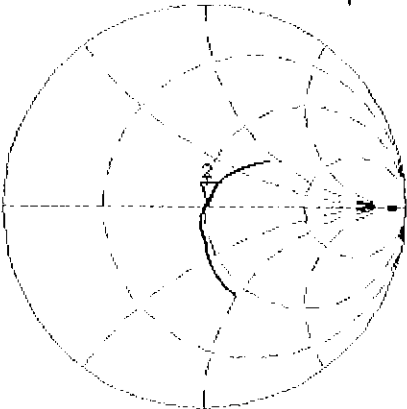


0 dB = 13.9 W/kg = 11.43 dBW/kg

Impedance Measurement Plot for Head TSL

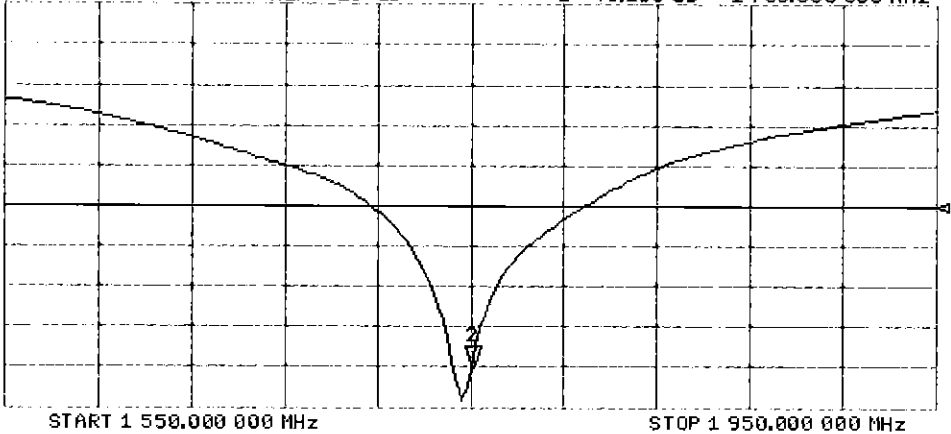
14 Jul 2016 13:09:21
[CH1] S11 1 U FS 2: 50.889 Ω 0.4121 Ω 37.479 pF 1 750.000 000 MHz

*
De1
CA
Avg
16
H1d



CH2 S11 LOG 5 dB/REF -20 dB 2:-40.230 dB 1 750.000 000 MHz

CA
Avg
16
H1d



DASY5 Validation Report for Body TSL

Date: 14.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz D1750V2; Type: D1750V2; Serial: D1750V2 - SN:1150

Communication System: UID 0 - CW; Frequency: 1750 MHz

Medium parameters used: $f = 1750$ MHz; $\sigma = 1.48$ S/m; $\epsilon_r = 53.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.25, 8.25, 8.25); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

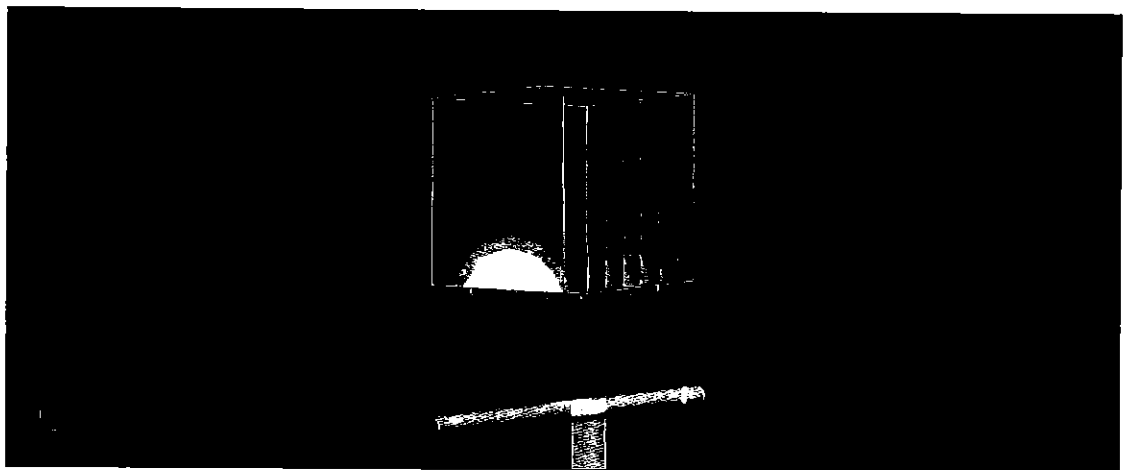
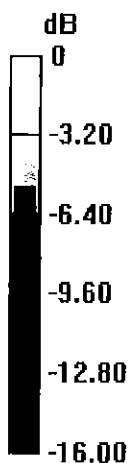
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 100.4 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 16.0 W/kg

SAR(1 g) = 9.09 W/kg; SAR(10 g) = 4.85 W/kg

Maximum value of SAR (measured) = 13.7 W/kg

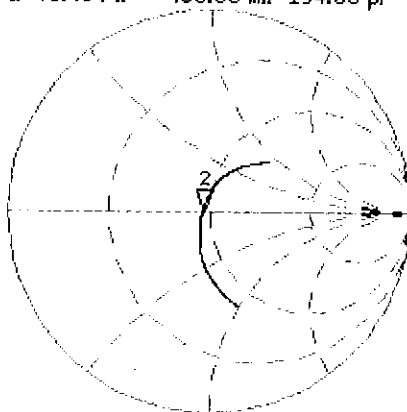


0 dB = 13.7 W/kg = 11.37 dBW/kg

Impedance Measurement Plot for Body TSL

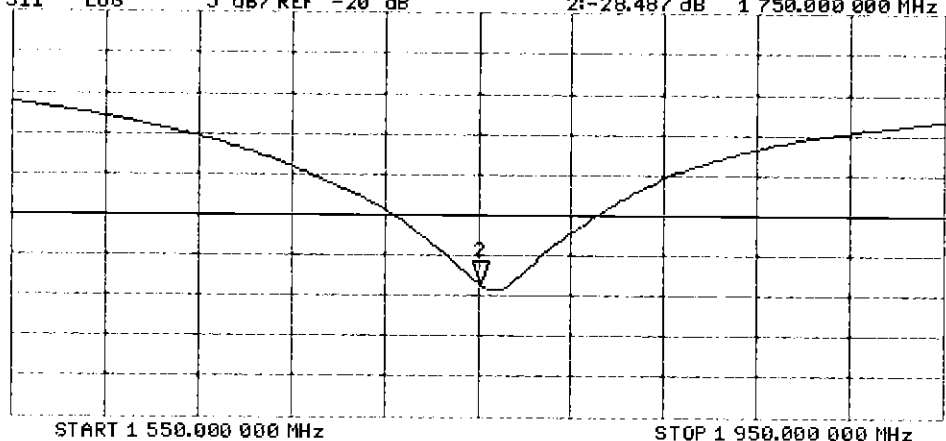
14 Jul 2016 13:08:43
 CH1 S11 1 U FS 2: 46.404 Ω -466.80 m Ω 194.83 pF 1 750.000 000 MHz

*
 Del
 CA
 Avg
 16
 H1d



CH2 S11 LOG 5 dB/REF -20 dB 2:-28.487 dB 1 750.000 000 MHz

CA
 Avg
 16
 H1d



Certification of Calibration

Object D1750V2 – SN: 1150

Calibration procedure(s) Procedure for Calibration Extension for SAR Dipoles.

Calibration date: July 07, 2017

Description: SAR Validation Dipole at 1750 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Control Company	4040	Therm./Clock/Humidity Monitor	3/31/2017	Biennial	3/31/2019	170232394
Control Company	4352	Ultra Long Stem Thermometer	5/2/2017	Biennial	5/2/2019	170330156
Amplifier Research	1551G6	Amplifier	CBT	N/A	CBT	433971
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/1/2017	Annual	6/1/2018	MY53401181
Agilent	8753ES	S-Parameter Network Analyzer	10/26/2016	Annual	10/26/2017	US39170118
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/8/2017	Annual	3/8/2018	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/13/2017	Annual	3/13/2018	1415
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/10/2017	Annual	5/10/2018	1070
SPEAG	ES3DV3	SAR Probe	3/14/2017	Annual	3/14/2018	3209
SPEAG	ES3DV3	SAR Probe	3/14/2017	Annual	3/14/2018	3319
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1207364
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1339018
Anritsu	ML2495A	Power Meter	10/16/2015	Biennial	10/16/2017	941001
Agilent	N5182A	MXG Vector Signal Generator	2/28/2017	Annual	2/28/2018	MY47420800
Seekonk	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A

Measurement Uncertainty = $\pm 23\%$ (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halfoster	Test Engineer	<i>BRODIE HALFOSTER</i>
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	<i>KOK</i>

DIPOLE CALIBRATION EXTENSION

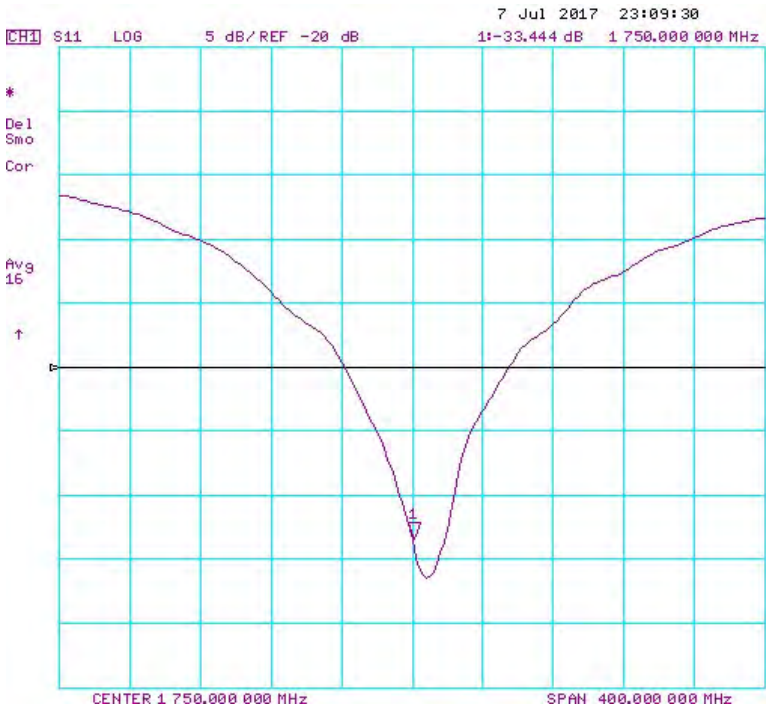
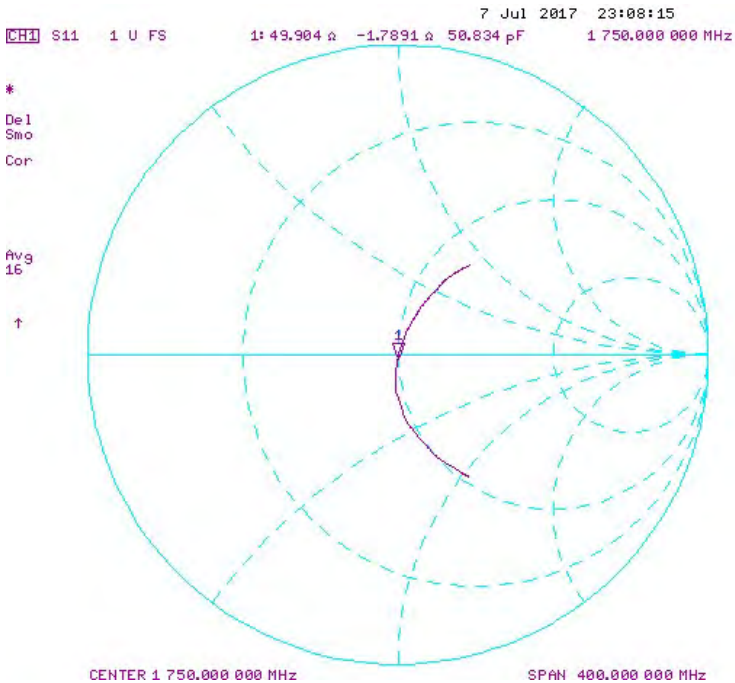
Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

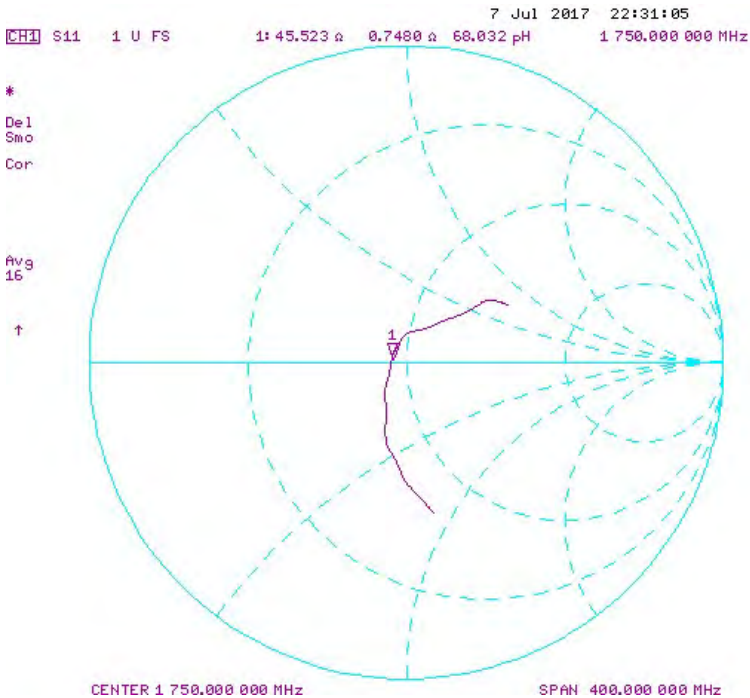
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 20.0 dBm	Measured Head SAR (1g) W/kg @ 20.0 dBm	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 20.0 dBm	Measured Head SAR (10g) W/kg @ 20.0 dBm	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
7/14/2016	7/7/2017	1.218	3.61	3.57	-1.11%	1.92	1.88	-2.08%	50.9	49.9	1	0.4	-1.5	2.1	-40.2	-33.4	16.90%	PASS
Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 20.0 dBm	Measured Body SAR (1g) W/kg @ 20.0 dBm	Deviation 1g (%)	Certificate SAR Target Body (10g) W/kg @ 20.0 dBm	Measured Body SAR (10g) W/kg @ 20.0 dBm	Deviation 10g (%)	Certificate Impedance Body (Ohm) Real	Measured Impedance Body (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Body (Ohm) Imaginary	Measured Impedance Body (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Body (dB)	Measured Return Loss Body (dB)	Deviation (%)	PASS/FAIL
7/14/2016	7/7/2017	1.218	3.65	3.68	0.82%	1.95	1.97	1.03%	46.4	45.5	0.9	-0.5	0.7	1.2	-28.5	-23.6	17.20%	PASS

Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL





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The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D2300V2-1073_Jul16**

CALIBRATION CERTIFICATE

Object **D2300V2 - SN:1073**

Calibration procedure(s) **QA CAL-05.v9**
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: **July 25, 2016**

VPY
8/9/16
Extended
7/20/17
SC

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	06-Apr-16 (No. 217-02288/02289)	Apr-17
Power sensor NRP-Z91	SN: 103244	06-Apr-16 (No. 217-02288)	Apr-17
Power sensor NRP-Z91	SN: 103245	06-Apr-16 (No. 217-02289)	Apr-17
Reference 20 dB Attenuator	SN: 5058 (20k)	05-Apr-16 (No. 217-02292)	Apr-17
Type-N mismatch combination	SN: 5047.2 / 06327	05-Apr-16 (No. 217-02295)	Apr-17
Reference Probe EX3DV4	SN: 7349	15-Jun-16 (No. EX3-7349_Jun16)	Jun-17
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (No. 217-02223)	In house check: Oct-16
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Jun-15)	In house check: Oct-16
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

Calibrated by: **Michael Weber** Function: **Laboratory Technician**

Signature

M. Weber

Approved by: **Katja Pokovic** Technical Manager

Katja Pokovic

Issued: July 26, 2016

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2300 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.5	1.67 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	38.6 $\pm$ 6 %	1.69 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	12.3 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	48.6 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.90 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	23.4 W/kg $\pm$ 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.9	1.81 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	52.2 $\pm$ 6 %	1.85 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.2 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	48.1 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.85 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	23.2 W/kg $\pm$ 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	48.9 Ω - 4.9 j Ω
Return Loss	- 25.8 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	45.5 Ω - 4.1 j Ω
Return Loss	- 23.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.171 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	November 16, 2015

DASY5 Validation Report for Head TSL

Date: 13.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2300 MHz; Type: D2300V2; Serial: D2300V2 - SN:1073

Communication System: UID 0 - CW; Frequency: 2300 MHz

Medium parameters used: $f = 2300$ MHz; $\sigma = 1.69$ S/m; $\epsilon_r = 38.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.99, 7.99, 7.99); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

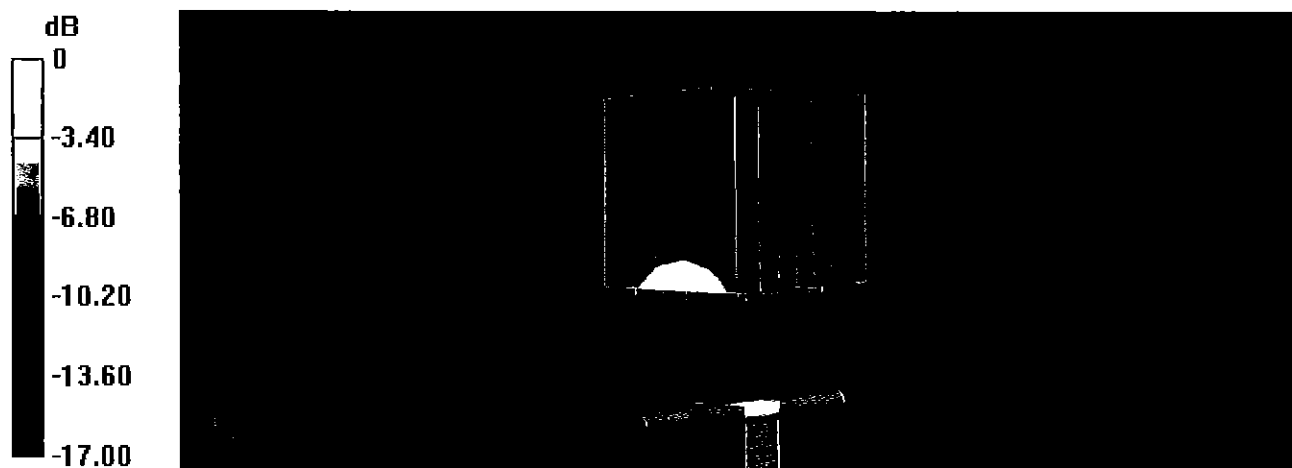
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 113.1 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 24.1 W/kg

SAR(1 g) = 12.3 W/kg; SAR(10 g) = 5.9 W/kg

Maximum value of SAR (measured) = 19.8 W/kg



0 dB = 19.8 W/kg = 12.97 dBW/kg

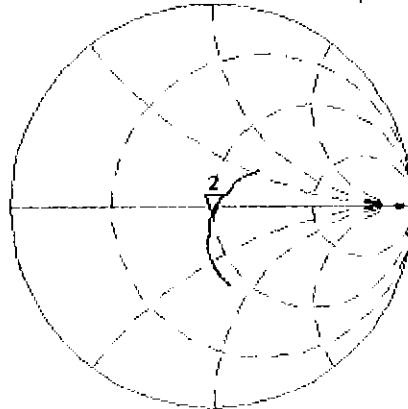
Impedance Measurement Plot for Head TSL

13 Jul 2016 12:44:09
 CH1 S11 1 U FS 2: 48.926 Ω -4.9414 Ω 14.004 pF 2 300.000 000 MHz

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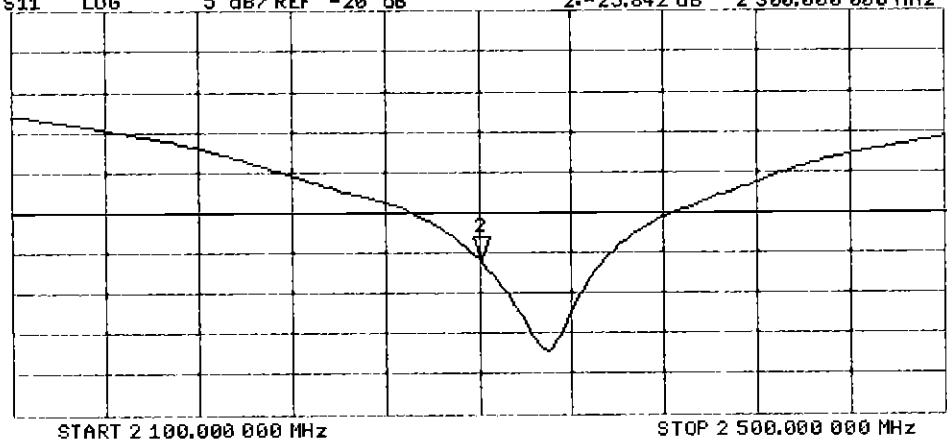


CH2 S11 LOG 5 dB/REF -20 dB 2:-25.842 dB 2 300.000 000 MHz

CA

Avg
 16

H1d



DASY5 Validation Report for Body TSL

Date: 25.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2300 MHz; Type: D2300V2; Serial: D2300V2 - SN:1073

Communication System: UID 0 - CW; Frequency: 2300 MHz

Medium parameters used: $f = 2300$ MHz; $\sigma = 1.85$ S/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.79, 7.79, 7.79); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

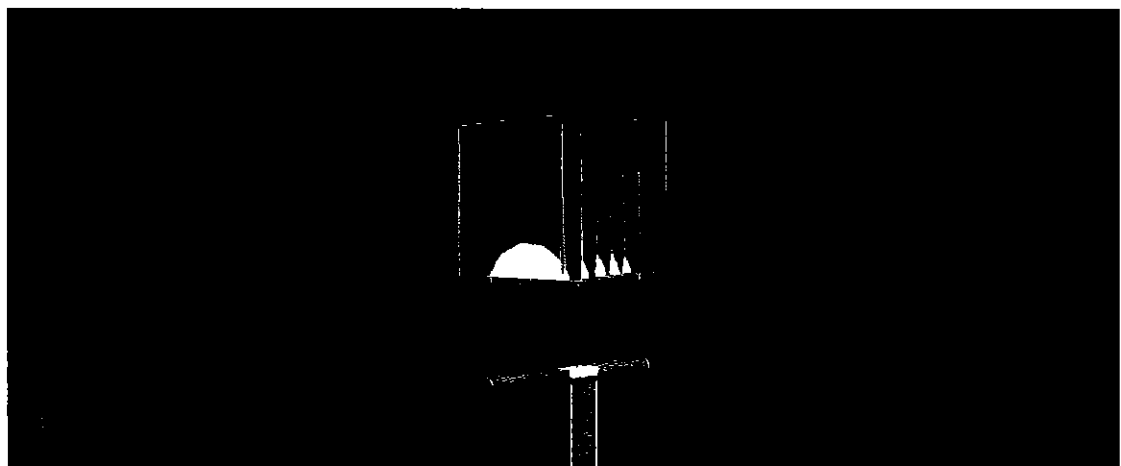
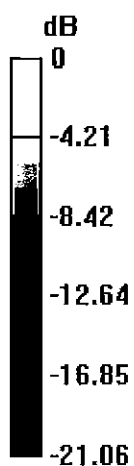
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 104.8 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 23.8 W/kg

SAR(1 g) = 12.2 W/kg; SAR(10 g) = 5.85 W/kg

Maximum value of SAR (measured) = 19.0 W/kg



0 dB = 19.0 W/kg = 12.79 dBW/kg

Impedance Measurement Plot for Body TSL

25 Jul 2016 14:32:48

CR1 S11 1 U FS

1: 45.496 Ω -4.1348 Ω 16.736 pF

2 300.000 000 MHz

✱

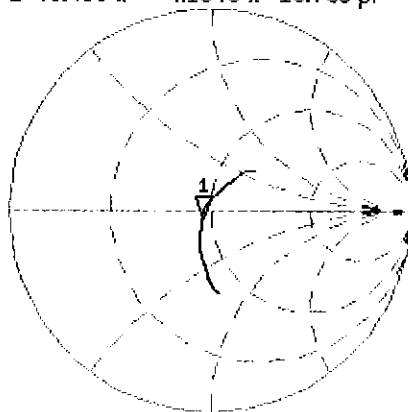
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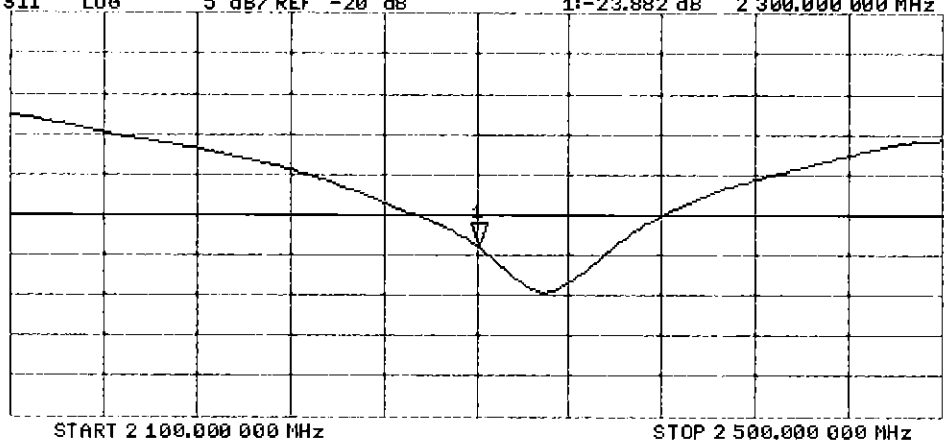
CH2 S11 LOG

5 dB/REF -20 dB

1: -23.882 dB 2 300.000 000 MHz

 C_{Δ}

H1d



Certification of Calibration

Object D2300V2 – SN: 1073

Calibration procedure(s) Procedure for Calibration Extension for SAR Dipoles.

Calibration date: July 24, 2017

Description: SAR Validation Dipole at 2300 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Control Company	4040	Therm./Clock/Humidity Monitor	3/31/2017	Biennial	3/31/2019	170232394
Control Company	4352	Ultra Long Stem Thermometer	5/2/2017	Biennial	5/2/2019	170330156
Amplifier Research	1551G6	Amplifier	CBT	N/A	CBT	433971
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/1/2017	Annual	6/1/2018	MY53401181
Agilent	8753ES	S-Parameter Network Analyzer	10/26/2016	Annual	10/26/2017	US39170118
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/14/2016	Annual	9/14/2017	1408
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/9/2017	Annual	2/9/2018	1272
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/10/2017	Annual	5/10/2018	1070
SPEAG	ES3DV3	SAR Probe	9/19/2016	Annual	9/19/2017	3287
SPEAG	ES3DV3	SAR Probe	2/10/2017	Annual	2/10/2018	3213
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1207364
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1339018
Anritsu	ML2495A	Power Meter	10/16/2015	Biennial	10/16/2017	941001
Agilent	N5182A	MXG Vector Signal Generator	2/28/2017	Annual	2/28/2018	MY47420800
Seekonk	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A

Measurement Uncertainty = $\pm 23\%$ (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halfoster	Test Engineer	<i>BRODIE HALFOSTER</i>
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	<i>KOK</i>

DIPOLE CALIBRATION EXTENSION

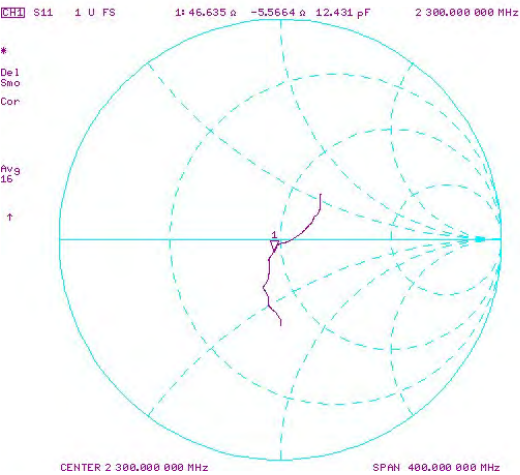
Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

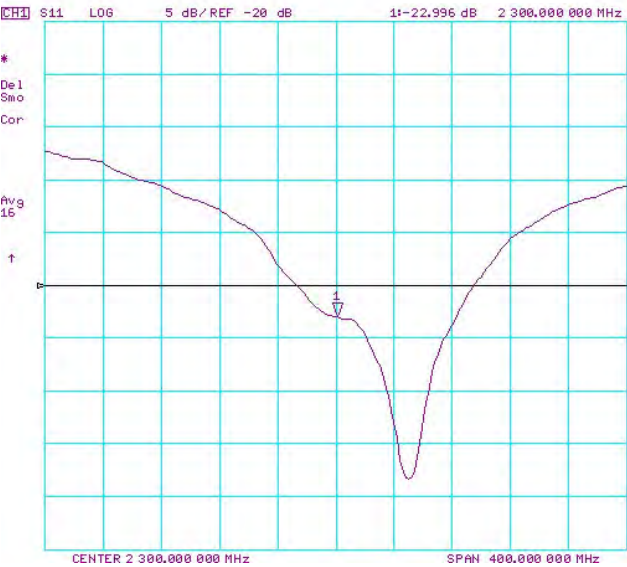
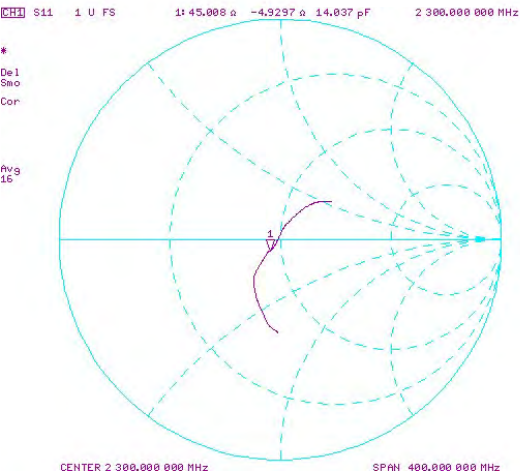
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 20.0 dBm	Measured Head SAR (1g) W/kg @ 20.0 dBm	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 20.0 dBm	Measured Head SAR (10g) W/kg @ 20.0 dBm	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
7/25/2016	7/24/2017	1.171	4.86	5.06	4.12%	2.34	2.40	2.56%	48.9	46.6	2.3	-4.9	-5.6	0.7	-25.8	-22.5	12.80%	PASS
Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 20.0 dBm	Measured Body SAR (1g) W/kg @ 20.0 dBm	Deviation 1g (%)	Certificate SAR Target Body (10g) W/kg @ 20.0 dBm	Measured Body SAR (10g) W/kg @ 20.0 dBm	Deviation 10g (%)	Certificate Impedance Body (Ohm) Real	Measured Impedance Body (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Body (Ohm) Imaginary	Measured Impedance Body (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Body (dB)	Measured Return Loss Body (dB)	Deviation (%)	PASS/FAIL
7/25/2016	7/24/2017	1.171	4.81	4.63	-3.74%	2.32	2.18	-6.03%	45.5	45.0	0.5	-4.1	-4.9	0.8	-23.9	-23.0	3.80%	PASS

Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL





Accredited by the Swiss Accreditation Service (SAS)
 The Swiss Accreditation Service is one of the signatories to the EA
 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D2450V2-797_Sep17**

CALIBRATION CERTIFICATE

Object **D2450V2 - SN:797**

Calibration procedure(s) **QA CAL-05.v9**
Calibration procedure for dipole validation kits above 700 MHz

SC ✓
 10/03/2017

Calibration date: **September 11, 2017**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	31-May-17 (No. EX3-7349_May17)	May-18
DAE4	SN: 601	28-Mar-17 (No. DAE4-601_Mar17)	Mar-18
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

Calibrated by: **Michael Weber** Name: **Michael Weber** Function: **Laboratory Technician**

Approved by: **Katja Pokovic** Name: **Katja Pokovic** Function: **Technical Manager**

Signature

Issued: September 11, 2017

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	37.8 $\pm$ 6 %	1.86 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.5 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	52.7 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.28 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.8 W/kg $\pm$ 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	51.9 $\pm$ 6 %	2.04 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	13.1 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	51.1 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.14 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	24.2 W/kg $\pm$ 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	$53.8 \Omega + 7.4 j\Omega$
Return Loss	- 21.9 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	$49.7 \Omega + 9.1 j\Omega$
Return Loss	- 20.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.152 ns
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After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	January 24, 2006

DASY5 Validation Report for Head TSL

Date: 11.09.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 797

Communication System: UID 0 - CW; Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.86$ S/m; $\epsilon_r = 37.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.12, 8.12, 8.12); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

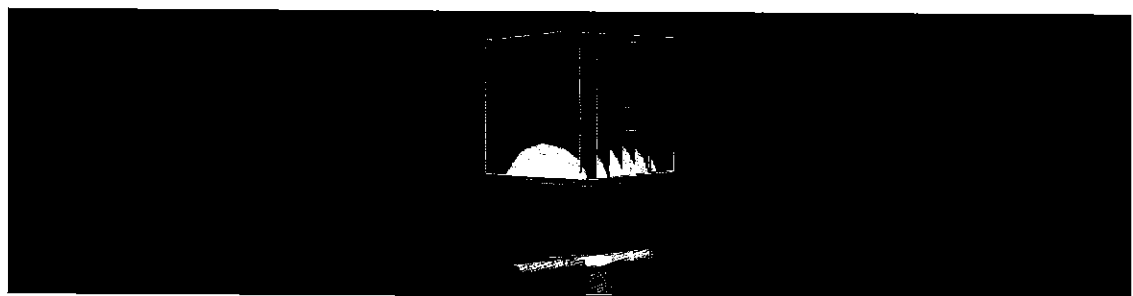
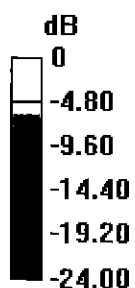
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 113.5 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 26.9 W/kg

SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.28 W/kg

Maximum value of SAR (measured) = 21.6 W/kg

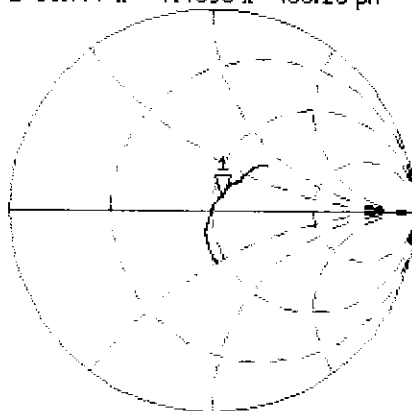


0 dB = 21.6 W/kg = 13.34 dBW/kg

Impedance Measurement Plot for Head TSL

11 Sep 2017 11:52:57
 CH1 S11 1 U FS 1: 53.777 Ω 7.4395 Ω 483.28 μH 2 450.000 000 MHz

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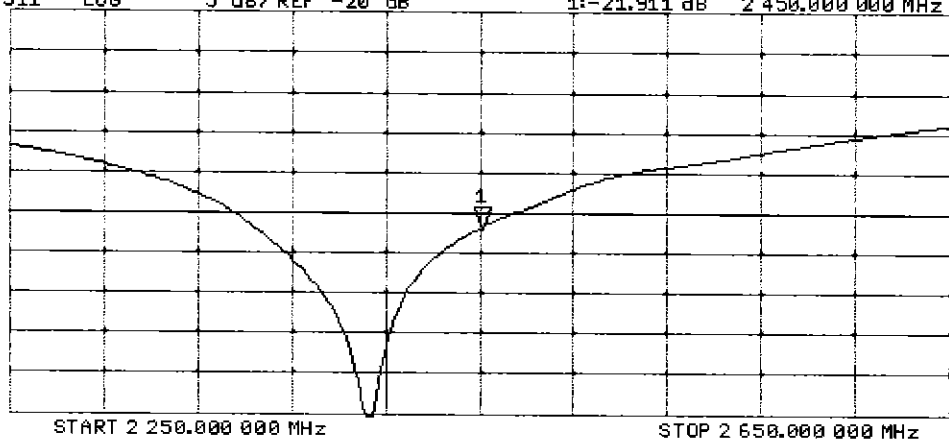
H1d

CH2 S11 LOG 5 dB/REF -20 dB 1: -21.911 dB 2 450.000 000 MHz

CA

Avg
 16

H1d



DASY5 Validation Report for Body TSL

Date: 11.09.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 797

Communication System: UID 0 - CW; Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 2.04$ S/m; $\epsilon_r = 51.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.1, 8.1, 8.1); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

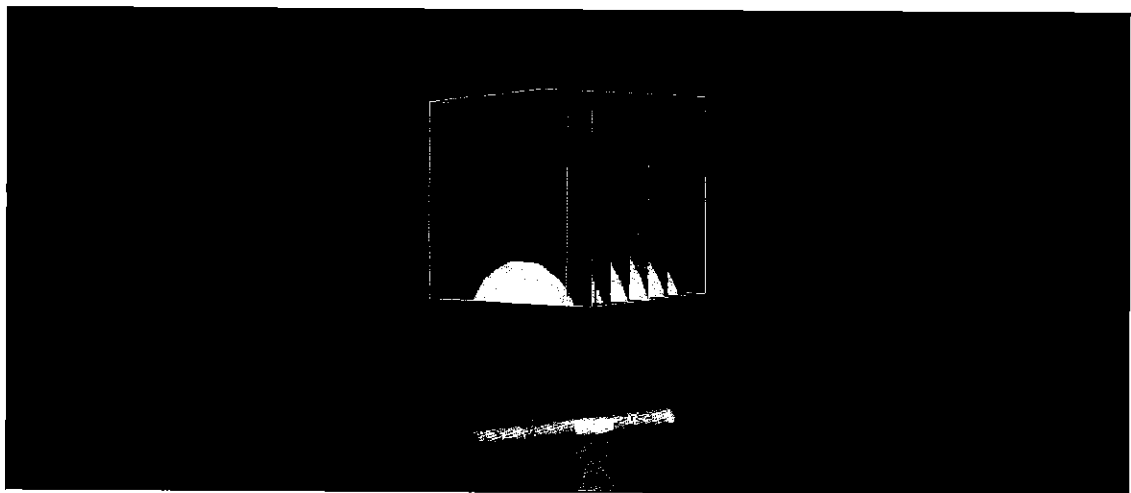
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 105.4 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 25.6 W/kg

SAR(1 g) = 13.1 W/kg; SAR(10 g) = 6.14 W/kg

Maximum value of SAR (measured) = 20.3 W/kg



0 dB = 20.3 W/kg = 13.07 dBW/kg

Impedance Measurement Plot for Body TSL

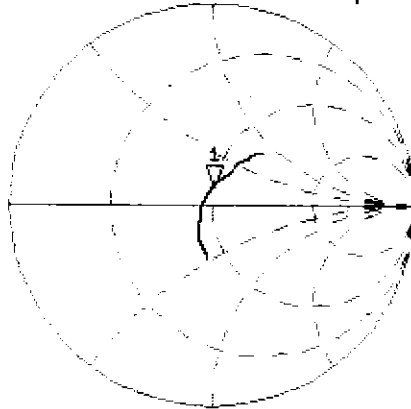
11 Sep 2017 11:52:10
CH1 S11 1 U FS 1: 49.725 Ω 9.0703 Ω 589.22 pH 2 450.000 000 MHz

Del

CA

Avg
16

H1d

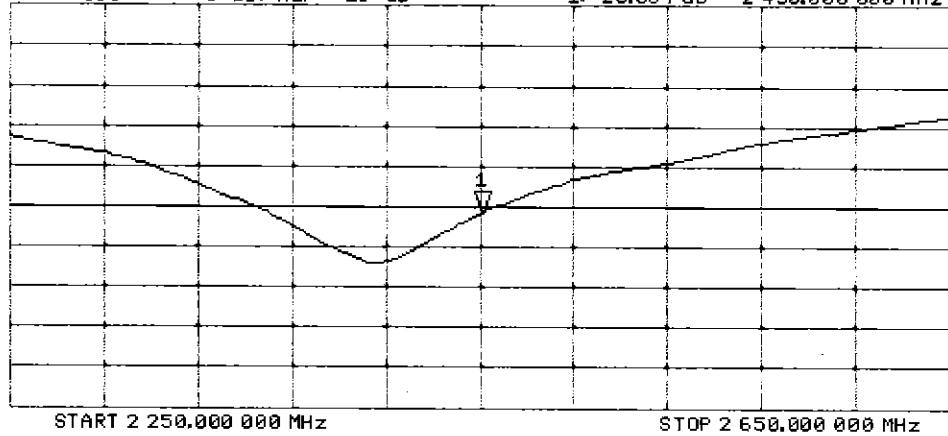


CH2 S11 LOG 5 dB/REF -20 dB 1: -20.854 dB 2 450.000 000 MHz

CA

Avg
16

H1d





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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D2450V2-719_Aug17**

CALIBRATION CERTIFICATE

Object **D2450V2 - SN:719**

Calibration procedure(s) **QA CAL-05.v9**
Calibration procedure for dipole validation kits above 700 MHz

PN ✓
8/27/17

Calibration date: **August 17, 2017**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	31-May-17 (No. EX3-7349_May17)	May-18
DAE4	SN: 601	28-Mar-17 (No. DAE4-601_Mar17)	Mar-18
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

Calibrated by: **Michael Weber** **Laboratory Technician**

Approved by: **Katja Pokovic** **Technical Manager**

Signature

[Signature of Michael Weber]
[Signature of Katja Pokovic]

Issued: August 17, 2017

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Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 0108**

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	37.8 $\pm$ 6 %	1.86 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.3 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	51.9 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.15 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.3 W/kg $\pm$ 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	51.9 $\pm$ 6 %	2.03 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.8 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	50.1 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.00 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	23.7 W/kg $\pm$ 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	55.7 Ω + 7.0 j Ω
Return Loss	- 21.4 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	51.4 Ω + 8.1 j Ω
Return Loss	- 21.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.150 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 10, 2002

DASY5 Validation Report for Head TSL

Date: 17.08.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 719

Communication System: UID 0 - CW; Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.86$ S/m; $\epsilon_r = 37.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.12, 8.12, 8.12); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

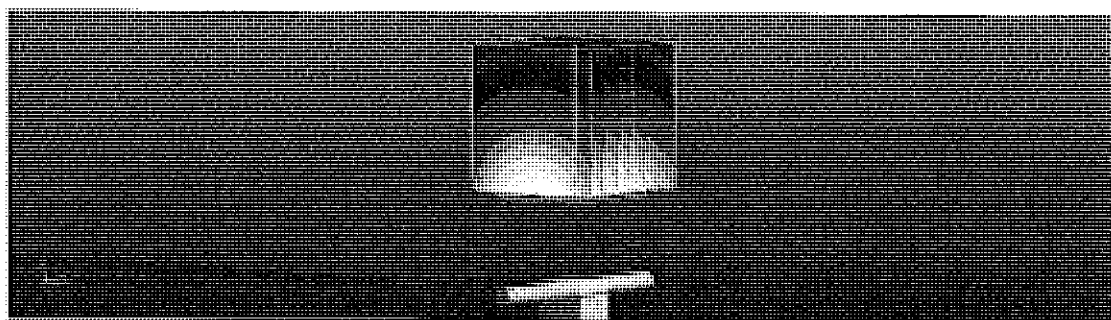
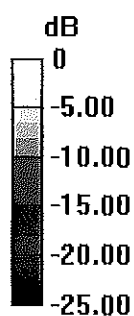
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 112.8 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 26.9 W/kg

SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.15 W/kg

Maximum value of SAR (measured) = 21.6 W/kg

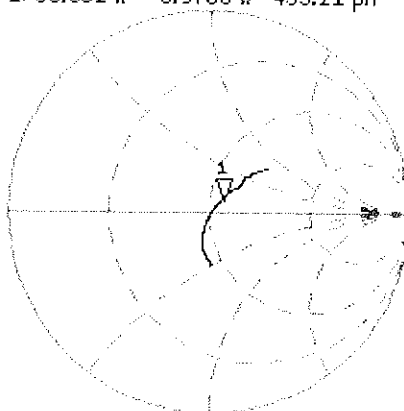


0 dB = 21.6 W/kg = 13.34 dBW/kg

Impedance Measurement Plot for Head TSL

17 Aug 2017 12:38:03
 CH1 S11 1 U FS 1: 55.682 Ω 6.9766 Ω 453.21 μH 2 450.000 000 MHz

*
 Del
 CA



Avg
 16

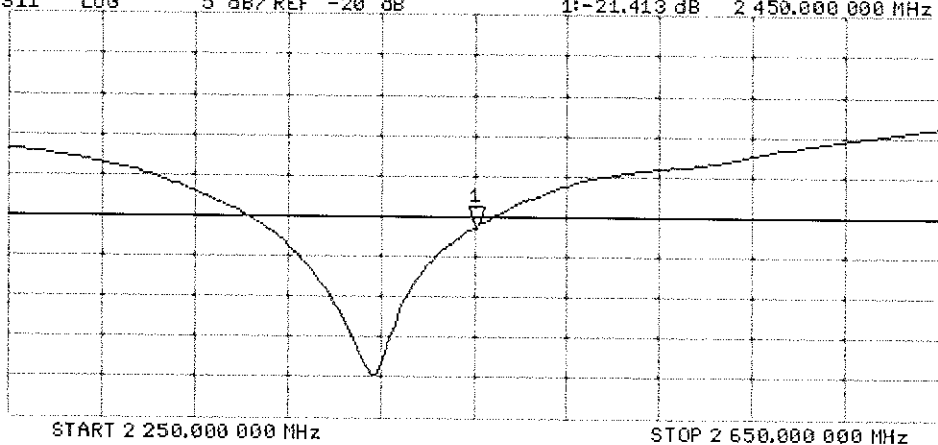
H1d

CH2 S11 LOG 5 dB/REF -20 dB 1: -21.413 dB 2 450.000 000 MHz

CA

Avg
 16

H1d



DASY5 Validation Report for Body TSL

Date: 17.08.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 719

Communication System: UID 0 - CW; Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 2.03$ S/m; $\epsilon_r = 51.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.1, 8.1, 8.1); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

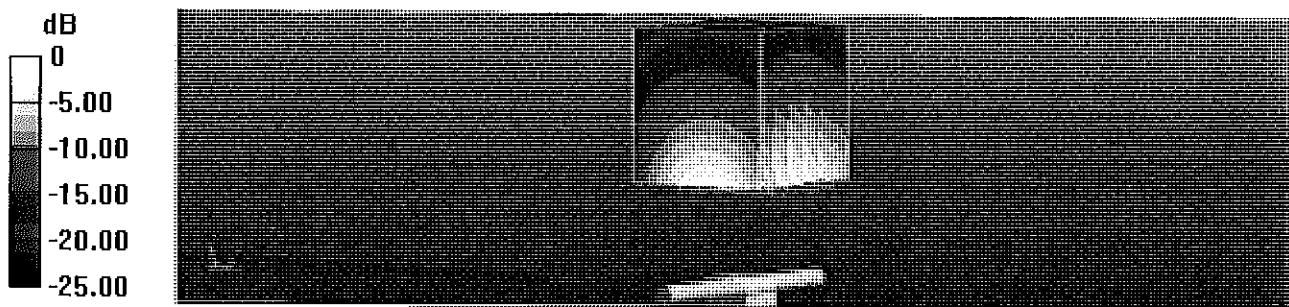
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 103.0 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 25.2 W/kg

SAR(1 g) = 12.8 W/kg; SAR(10 g) = 6 W/kg

Maximum value of SAR (measured) = 19.8 W/kg

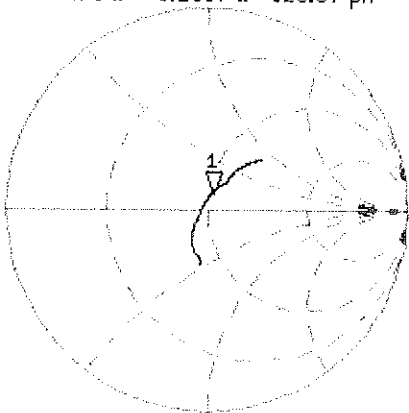


0 dB = 19.8 W/kg = 12.97 dBW/kg

Impedance Measurement Plot for Body TSL

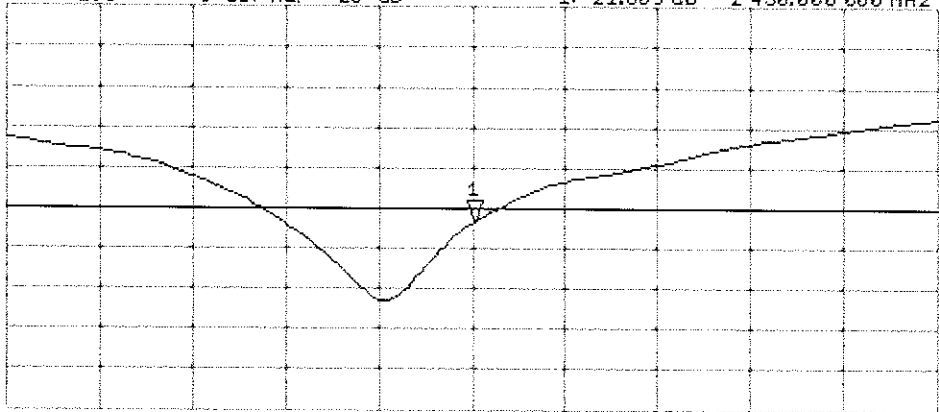
17 Aug 2017 12:37:27
[CH1] S11 1 U FS 1: 51.379 Ω 8.1367 Ω 528.57 μ H 2 450.000 000 MHz

*
De1
C4
Avg
16
H1d



CH2 S11 LOG 5 dB/REF -20 dB 1: -21.809 dB 2 450.000 000 MHz

C4
Avg
16
H1d



START 2 250.000 000 MHz STOP 2 650.000 000 MHz



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Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D2600V2-1126_Jul17**

CALIBRATION CERTIFICATE

Object **D2600V2 - SN:1126**

Calibration procedure(s) **QA CAL-05.v9**
Calibration procedure for dipole validation kits above 700 MHz

BNV
8/3/2017

Calibration date: **July 10, 2017**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	31-May-17 (No. EX3-7349_May17)	May-18
DAE4	SN: 601	28-Mar-17 (No. DAE4-601_Mar17)	Mar-18
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

Calibrated by: **Jeton Kastrati** Name Function
Laboratory Technician

Approved by: **Katja Pokovic** Name Function
Technical Manager

Signature

Issued: July 11, 2017

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2600 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.0	1.96 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	37.2 $\pm$ 6 %	2.04 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	14.5 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	56.4 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.40 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	25.2 W/kg $\pm$ 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.5	2.16 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	51.6 $\pm$ 6 %	2.22 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	13.8 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	54.3 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.16 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	24.4 W/kg $\pm$ 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	47.8 Ω - 7.7 j Ω
Return Loss	- 21.8 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	44.8 Ω - 5.8 j Ω
Return Loss	- 21.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.154 ns
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After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	October 22, 2015

DASY5 Validation Report for Head TSL

Date: 10.07.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN:1126

Communication System: UID 0 - CW; Frequency: 2600 MHz

Medium parameters used: $f = 2600$ MHz; $\sigma = 2.04$ S/m; $\epsilon_r = 37.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.96, 7.96, 7.96); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

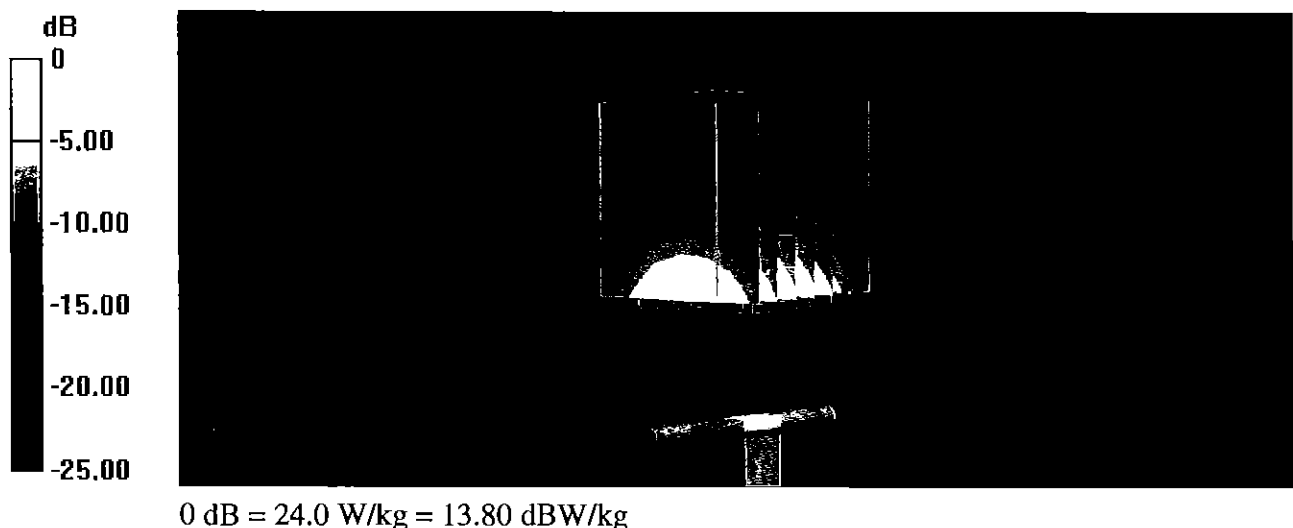
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 113.2 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 31.3 W/kg

SAR(1 g) = 14.5 W/kg; SAR(10 g) = 6.4 W/kg

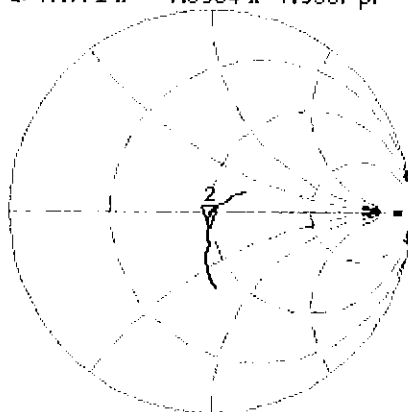
Maximum value of SAR (measured) = 24.0 W/kg



Impedance Measurement Plot for Head TSL

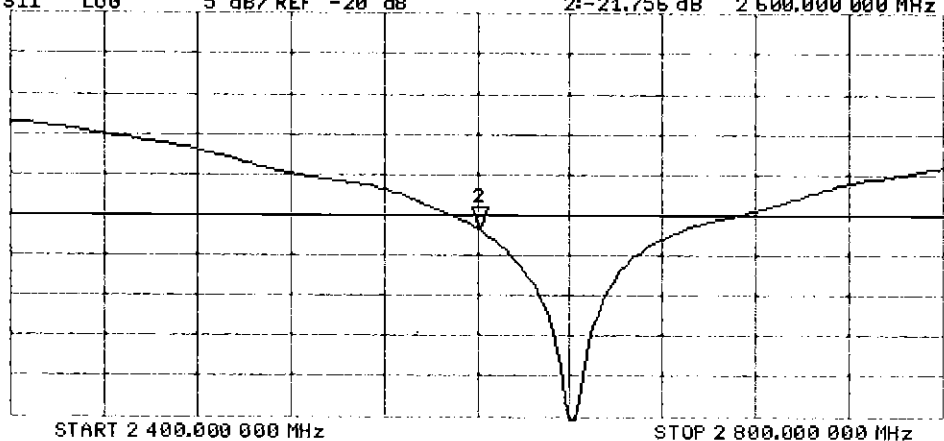
10 Jul 2017 14:28:06
 CH1 S11 1 U FS 2: 47.771 Ω -7.6934 Ω 7.9567 pF 2 600.000 000 MHz

*
 De1
 CA
 Avg
 16
 H1d



CH2 S11 LOG 5 dB/REF -20 dB 2:-21.756 dB 2 600.000 000 MHz

CA
 Avg
 16
 H1d



DASY5 Validation Report for Body TSL

Date: 10.07.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN:1126

Communication System: UID 0 - CW; Frequency: 2600 MHz

Medium parameters used: $f = 2600$ MHz; $\sigma = 2.22$ S/m; $\epsilon_r = 51.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.94, 7.94, 7.94); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

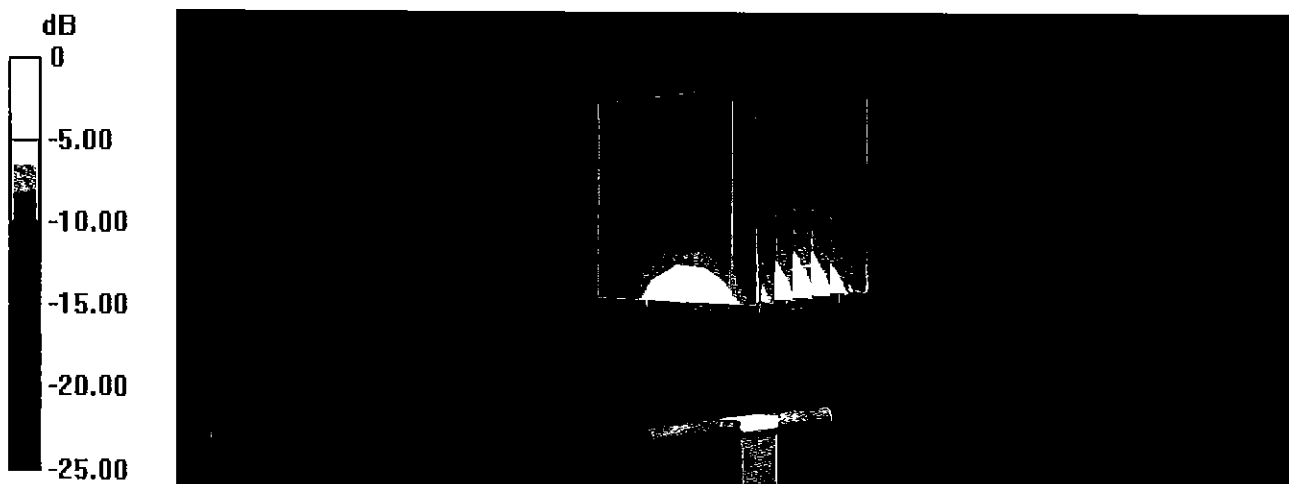
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 103.8 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 28.9 W/kg

SAR(1 g) = 13.8 W/kg; SAR(10 g) = 6.16 W/kg

Maximum value of SAR (measured) = 22.2 W/kg

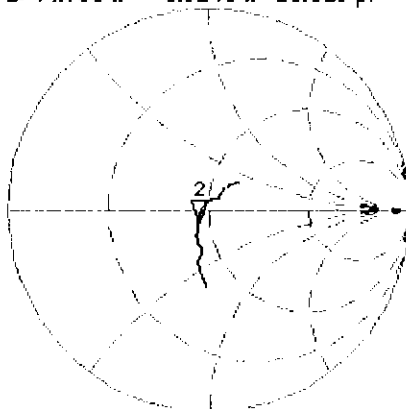


0 dB = 22.2 W/kg = 13.46 dBW/kg

Impedance Measurement Plot for Body TSL

10 Jul 2017 14:27:30
 CH1 S11 1 U FS 2: 44.785 Ω -5.8145 Ω 10.528 pF 2 600.000 000 MHz

*
 Del
 CA



Avg
 16

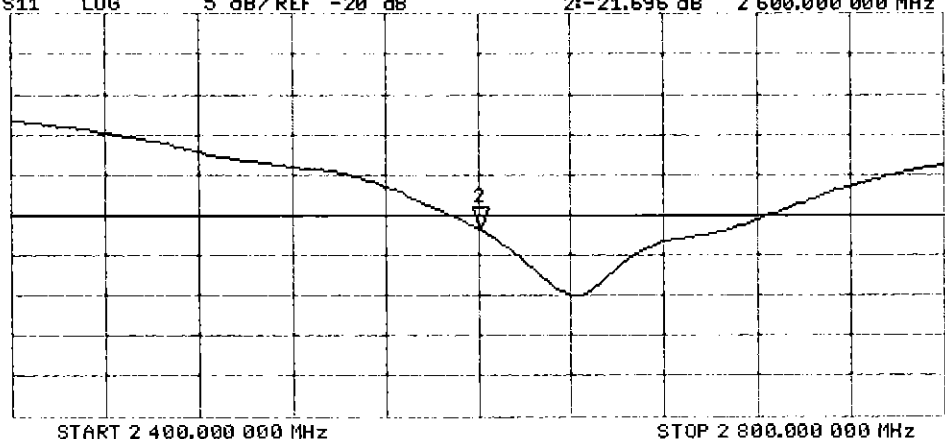
H1d

CH2 S11 LOG 5 dB/REF -20 dB 2: -21.696 dB 2 600.000 000 MHz

CA

Avg
 16

H1d





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Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D5GHzV2-1237_Aug17**

CALIBRATION CERTIFICATE

Object **D5GHzV2 - SN:1237**

Calibration procedure(s) **QA CAL-22.v2**
Calibration procedure for dipole validation kits between 3-6 GHz

PMV
 8/27/17

Calibration date: **August 15, 2017**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 3503	31-Dec-16 (No. EX3-3503_Dec16)	Dec-17
DAE4	SN: 601	28-Mar-17 (No. DAE4-601_Mar17)	Mar-18
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

Calibrated by: **Johannes Kurikka** Function: **Laboratory Technician**

Signature

Approved by: **Katja Pokovic** Technical Manager

[Signature of Johannes Kurikka]
[Signature of Katja Pokovic]

Issued: August 16, 2017

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Accreditation No.: **SCS 0108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5250 MHz $\pm$ 1 MHz 5600 MHz $\pm$ 1 MHz 5750 MHz $\pm$ 1 MHz	

Head TSL parameters at 5250 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.9	4.71 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	34.7 $\pm$ 6 %	4.49 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5250 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.14 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	80.7 W/kg $\pm$ 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.33 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	23.0 W/kg $\pm$ 19.5 % (k=2)

Head TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.5	5.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.2 ± 6 %	4.84 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5600 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.33 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	82.5 W / kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.38 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	23.5 W/kg ± 19.5 % (k=2)

Head TSL parameters at 5750 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.4	5.22 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.0 ± 6 %	4.99 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5750 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.10 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	80.2 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.31 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	22.8 W/kg ± 19.5 % (k=2)

Body TSL parameters at 5250 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.9	5.36 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.0 ± 6 %	5.46 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5250 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.75 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	76.9 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.17 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	21.5 W/kg ± 19.5 % (k=2)

Body TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.5	5.77 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.4 ± 6 %	5.93 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5600 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.91 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	78.5 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.23 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	22.1 W/kg ± 19.5 % (k=2)

Body TSL parameters at 5750 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.3	5.94 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.2 ± 6 %	6.13 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5750 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.77 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	77.1 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.16 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	21.4 W/kg ± 19.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL at 5250 MHz

Impedance, transformed to feed point	49.9 Ω - 5.3 j Ω
Return Loss	- 25.5 dB

Antenna Parameters with Head TSL at 5600 MHz

Impedance, transformed to feed point	51.9 Ω + 2.3 j Ω
Return Loss	- 30.7 dB

Antenna Parameters with Head TSL at 5750 MHz

Impedance, transformed to feed point	55.6 Ω - 0.5 j Ω
Return Loss	- 25.5 dB

Antenna Parameters with Body TSL at 5250 MHz

Impedance, transformed to feed point	46.9 Ω - 4.2 j Ω
Return Loss	- 25.4 dB

Antenna Parameters with Body TSL at 5600 MHz

Impedance, transformed to feed point	50.2 Ω + 3.0 j Ω
Return Loss	- 30.4 dB

Antenna Parameters with Body TSL at 5750 MHz

Impedance, transformed to feed point	53.4 Ω + 0.2 j Ω
Return Loss	- 29.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.194 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	May 04, 2015

DASY5 Validation Report for Head TSL

Date: 15.08.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1237

Communication System: UID 0 - CW; Frequency: 5250 MHz, Frequency: 5600 MHz, Frequency: 5750 MHz
Medium parameters used: $f = 5250$ MHz; $\sigma = 4.49$ S/m; $\epsilon_r = 34.7$; $\rho = 1000$ kg/m³,
Medium parameters used: $f = 5600$ MHz; $\sigma = 4.84$ S/m; $\epsilon_r = 34.2$; $\rho = 1000$ kg/m³,
Medium parameters used: $f = 5750$ MHz; $\sigma = 4.99$ S/m; $\epsilon_r = 34$; $\rho = 1000$ kg/m³
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.58, 5.58, 5.58); Calibrated: 31.12.2016, ConvF(5.09, 5.09, 5.09); Calibrated: 31.12.2016, ConvF(5.02, 5.02, 5.02); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5250 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 70.08 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 30.6 W/kg

SAR(1 g) = 8.14 W/kg; SAR(10 g) = 2.33 W/kg

Maximum value of SAR (measured) = 19.2 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 70.04 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 32.7 W/kg

SAR(1 g) = 8.33 W/kg; SAR(10 g) = 2.38 W/kg

Maximum value of SAR (measured) = 19.8 W/kg

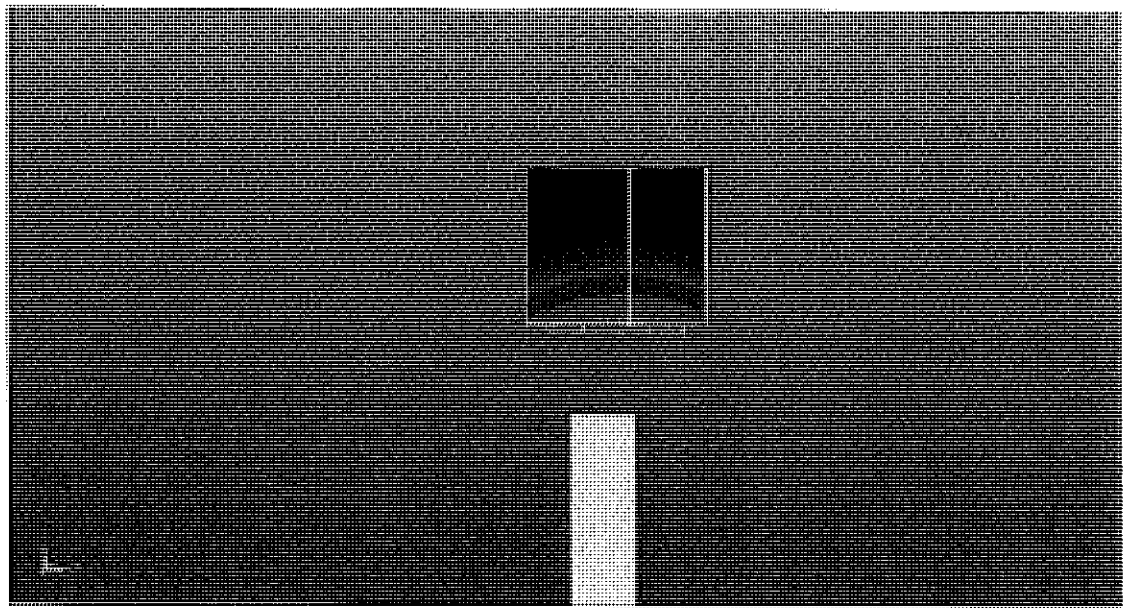
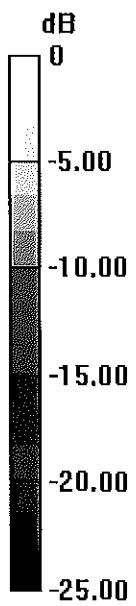
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 69.11 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 32.4 W/kg

SAR(1 g) = 8.1 W/kg; SAR(10 g) = 2.31 W/kg

Maximum value of SAR (measured) = 19.6 W/kg

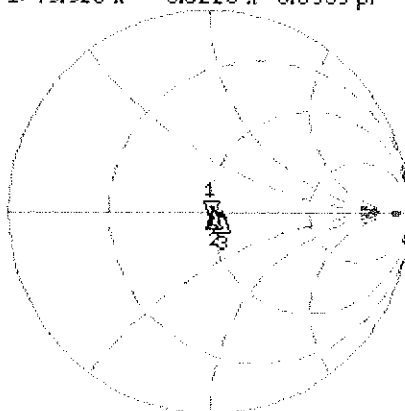


0 dB = 19.2 W/kg = 12.83 dBW/kg

Impedance Measurement Plot for Head TSL

9 Aug 2017 12:04:29
 CH1 S11 1 U FS 1: 49.920 Ω -5.3223 Ω 5.6959 pF 5 250.000 000 MHz

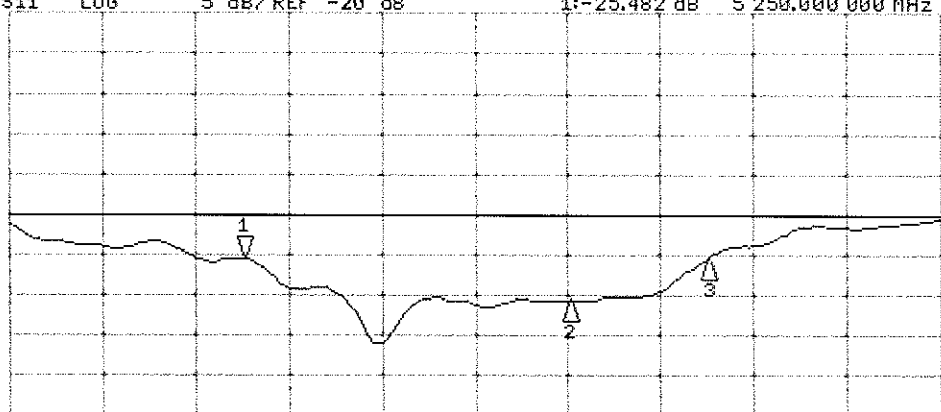
*
 Del
 Cor
 Avg
 16
 H1d



CH1 Markers
 2: 51.904 Ω
 2.3008 Ω
 5.60000 GHz
 3: 55.609 Ω
 -492.19 m Ω
 5.75000 GHz

CH2 S11 LOG 5 dB/ REF -20 dB 1: -25.482 dB 5 250.000 000 MHz

Cor
 Avg
 16
 H1d



CH2 Markers
 2: -30.654 dB
 5.60000 GHz
 3: -25.460 dB
 5.75000 GHz

START 5 000.000 000 MHz

STOP 6 000.000 000 MHz

DASY5 Validation Report for Body TSL

Date: 08.08.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1237

Communication System: UID 0 - CW; Frequency: 5250 MHz, Frequency: 5600 MHz, Frequency: 5750 MHz
Medium parameters used: $f = 5250 \text{ MHz}$; $\sigma = 5.46 \text{ S/m}$; $\epsilon_r = 47$; $\rho = 1000 \text{ kg/m}^3$,
Medium parameters used: $f = 5600 \text{ MHz}$; $\sigma = 5.93 \text{ S/m}$; $\epsilon_r = 46.4$; $\rho = 1000 \text{ kg/m}^3$,
Medium parameters used: $f = 5750 \text{ MHz}$; $\sigma = 6.13 \text{ S/m}$; $\epsilon_r = 46.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.14, 5.14, 5.14); Calibrated: 31.12.2016, ConvF(4.57, 4.57, 4.57); Calibrated: 31.12.2016, ConvF(4.51, 4.51, 4.51); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5250MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 65.87 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 29.9 W/kg

SAR(1 g) = 7.75 W/kg; SAR(10 g) = 2.17 W/kg

Maximum value of SAR (measured) = 18.4 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 65.11 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 33.0 W/kg

SAR(1 g) = 7.91 W/kg; SAR(10 g) = 2.23 W/kg

Maximum value of SAR (measured) = 19.3 W/kg

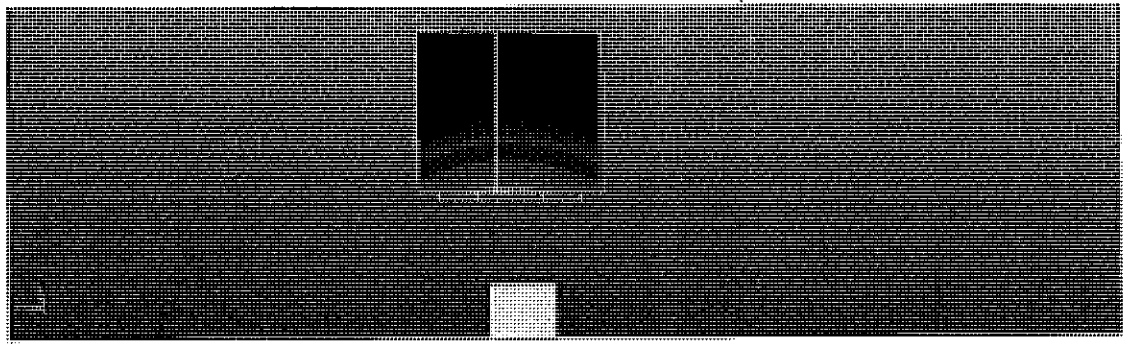
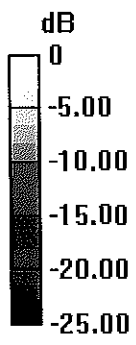
Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 63.64 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 33.8 W/kg

SAR(1 g) = 7.77 W/kg; SAR(10 g) = 2.16 W/kg

Maximum value of SAR (measured) = 19.1 W/kg

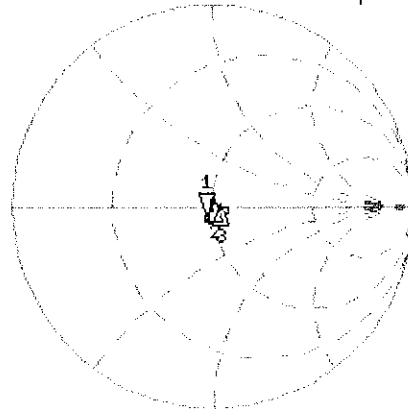


0 dB = 18.4 W/kg = 12.65 dBW/kg

Impedance Measurement Plot for Body TSL

8 Aug 2017 15:23:50
 CH1 S11 1 U FS 1: 46.885 Ω -4.1973 Ω 7.2226 pF 5 250.000 000 MHz

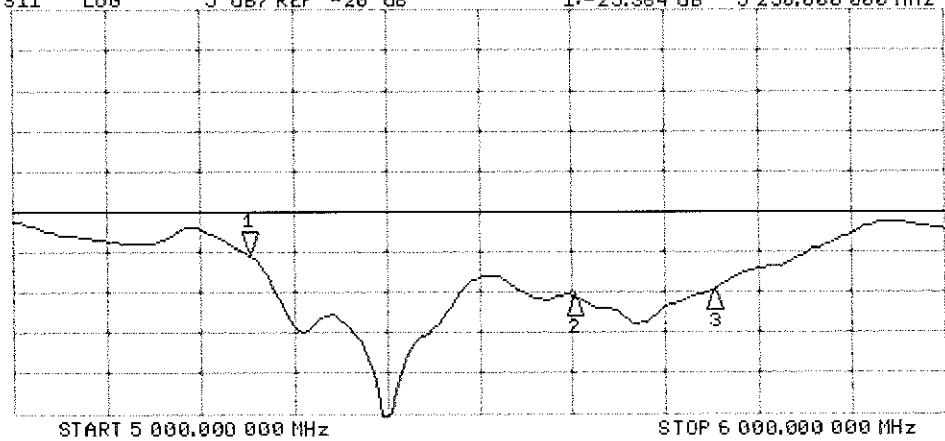
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 H1d



CH1 Markers
 2: 50.184 Ω
 3: 0.215 Ω
 5.60000 GHz
 3: 53.363 Ω
 0.1719 Ω
 5.75000 GHz

CH2 S11 LOG 5 dB/REF -20 dB 1: -25.364 dB 5 250.000 000 MHz

Cor
 Avg
 16
 H1d



CH2 Markers
 2: -30.389 dB
 5.60000 GHz
 3: -29.742 dB
 5.75000 GHz



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Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D1750V2-1051_Apr18**

CALIBRATION CERTIFICATE

Object **D1750V2 - SN: 1051**

Calibration procedure(s) **QA CAL-05.v10
Calibration procedure for dipole validation kits above 700 MHz**

Calibration date: **April 19, 2018**

BN ✓
05-01-2018

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

Calibrated by: **Name** **Michael Weber** **Function** **Laboratory Technician**

Signature

[Signature]

Approved by: **Katja Pokovic** **Technical Manager**

[Signature]

Issued: April 19, 2018

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Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1750 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	39.2 $\pm$ 6 %	1.35 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.10 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	36.5 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.82 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	19.3 W/kg $\pm$ 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.4	1.49 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	52.4 $\pm$ 6 %	1.46 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.21 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	37.2 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	4.94 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	19.9 W/kg $\pm$ 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.7 Ω + 2.5 j Ω
Return Loss	- 30.4 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.6 Ω + 1.3 j Ω
Return Loss	- 31.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.222 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	February 19, 2010

DASY5 Validation Report for Head TSL

Date: 19.04.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1051

Communication System: UID 0 - CW; Frequency: 1750 MHz

Medium parameters used: $f = 1750$ MHz; $\sigma = 1.35$ S/m; $\epsilon_r = 39.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.5, 8.5, 8.5); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

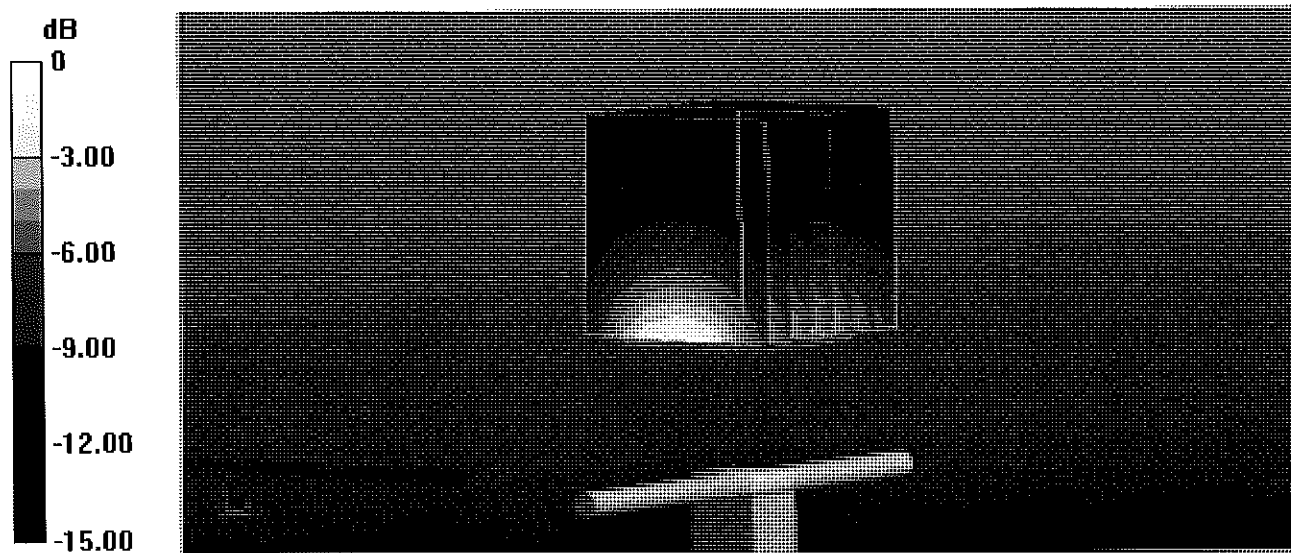
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 107.3 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 16.7 W/kg

SAR(1 g) = 9.1 W/kg; SAR(10 g) = 4.82 W/kg

Maximum value of SAR (measured) = 14.0 W/kg

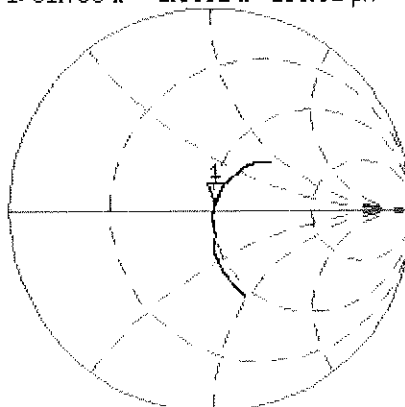


0 dB = 14.0 W/kg = 11.46 dBW/kg

Impedance Measurement Plot for Head TSL

19 Apr 2018 16:34:28
 CH1 S11 1 U FS 1: 51.703 Ω 2.5391 Ω 230.92 pH 1 750.000 000 MHz

*
 Del
 CA



Avg
 16

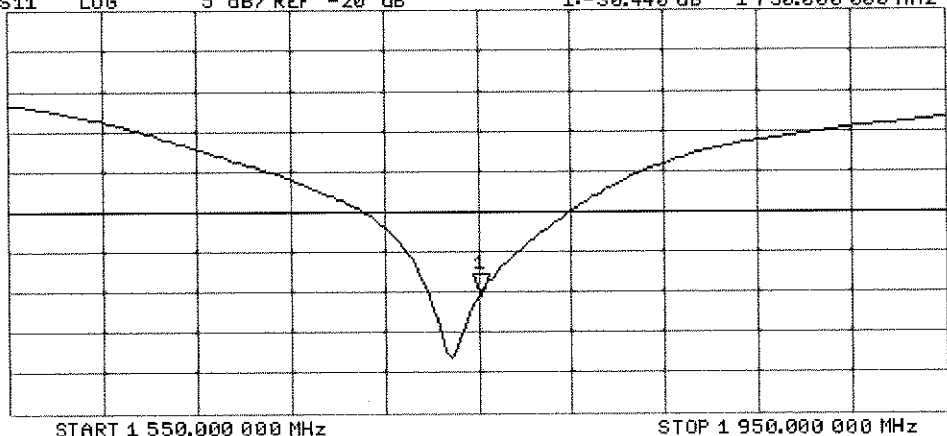
H1d

CH2 S11 LOG 5 dB/REF -20 dB 1:-30.440 dB 1 750.000 000 MHz

CA

Avg
 16

H1d



DASY5 Validation Report for Body TSL

Date: 19.04.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1051

Communication System: UID 0 - CW; Frequency: 1750 MHz

Medium parameters used: $f = 1750$ MHz; $\sigma = 1.46$ S/m; $\epsilon_r = 52.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.35, 8.35, 8.35); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

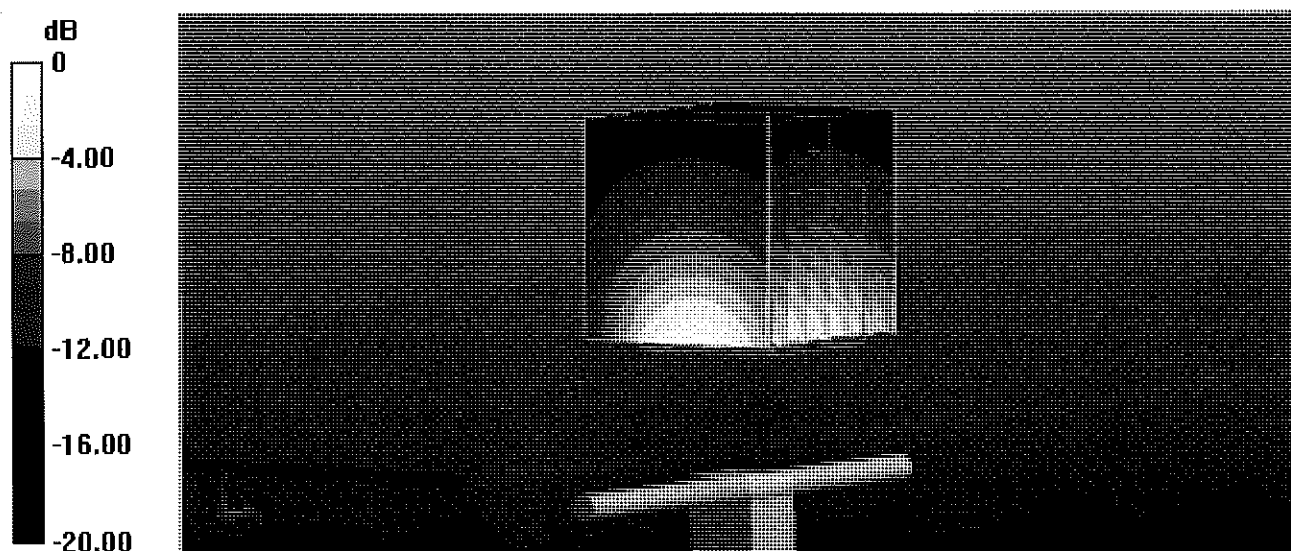
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 99.30 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 16.2 W/kg

SAR(1 g) = 9.21 W/kg; SAR(10 g) = 4.94 W/kg

Maximum value of SAR (measured) = 13.3 W/kg

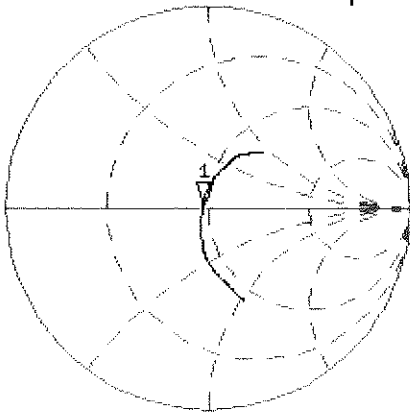


0 dB = 13.3 W/kg = 11.24 dBW/kg

Impedance Measurement Plot for Body TSL

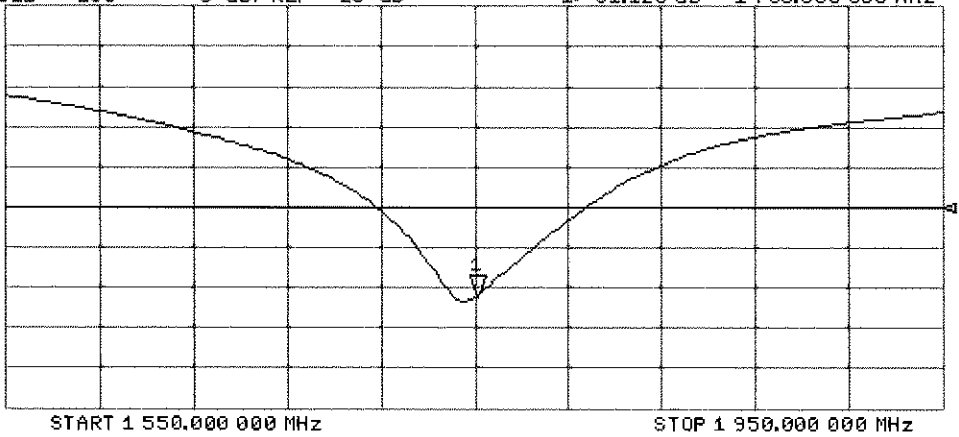
19 Apr 2018 17:21:05
[CH1] S11 1 U FS 1: 47.590 Ω 1.2520 Ω 113.86 pF 1 750.000 000 MHz

*
Del
CA
Avg
16
H1d



CH2 S11 LOG 5 dB/REF -20 dB 1:-31.120 dB 1 750.000 000 MHz

CA
Avg
16
H1d



APPENDIX D: SAR TISSUE SPECIFICATIONS

Measurement Procedure for Tissue verification:

- 1) The network analyzer and probe system was configured and calibrated.
- 2) The probe was immersed in the tissue. The tissue was placed in a nonmetallic container. Trapped air bubbles beneath the flange were minimized by placing the probe at a slight angle.
- 3) The complex admittance with respect to the probe aperture was measured
- 4) The complex relative permittivity ϵ' can be calculated from the below equation (Pournaropoulos and Misra):

$$Y = \frac{j2\omega\epsilon_r\epsilon_0}{[\ln(b/a)]^2} \int_a^b \int_a^b \int_0^\pi \cos\phi' \frac{\exp[-j\omega r(\mu_0\epsilon_r'\epsilon_0)^{1/2}]}{r} d\phi' d\rho' d\rho$$

where Y is the admittance of the probe in contact with the sample, the primed and unprimed coordinates refer to source and observation points, respectively, $r^2 = \rho^2 + \rho'^2 - 2\rho\rho'\cos\phi'$, ω is the angular frequency, and $j = \sqrt{-1}$.

Table D-I
Composition of the Tissue Equivalent Matter

Frequency (MHz)	750	750	835	835	1750	1750	1900	1900	2450	2450	5200-5800	5200-5800
Tissue	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Ingredients (% by weight)												
Bactericide			0.1	0.1								
DGBE					47	31	44.92	29.44		26.7		
HEC			1	1								
NaCl	See page 2-3	See page 2	1.45	0.94	0.4	0.2	0.18	0.39	See page 4	0.1	See page 5	
Sucrose			57	44.9								
Polysorbate (Tween) 80												20
Water			40.45	53.06	52.6	68.8	54.9	70.17		73.2		80

FCC ID: A3LSMN960U		SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 05/07/18 - 06/11/18	DUT Type: Portable Handset			APPENDIX D: Page 1 of 5

2 Composition / Information on ingredients

The Item is composed of the following ingredients:

H ₂ O	Water, 35 – 58%
Sucrose	Sugar, white, refined, 40 – 60%
NaCl	Sodium Chloride, 0 – 6%
Hydroxyethyl-cellulose	Medium Viscosity (CAS# 9004-62-0), <0.3%
Preventol-D7	Preservative: aqueous preparation, (CAS# 55965-84-9), containing 5-chloro-2-methyl-3(2H)-isothiazolone and 2-methyl-3(2H)-isothiazolone, 0.1 – 0.7%
Relevant for safety; Refer to the respective Safety Data Sheet*.	

Figure D-1

Composition of 750 MHz Head and Body Tissue Equivalent Matter

Note: 750MHz liquid recipes are proprietary SPEAG. Since the composition is approximate to the actual liquids utilized, the manufacturer tissue-equivalent liquid data sheets are provided below.

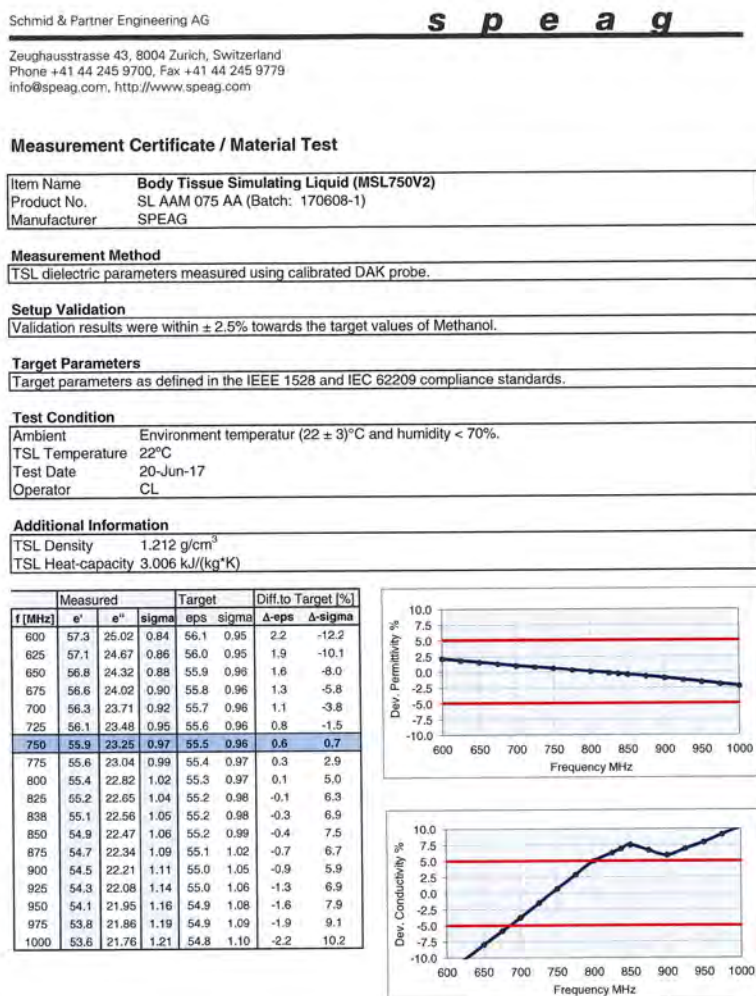


Figure D-2

750MHz Body Tissue Equivalent Matter

FCC ID: A3LSMN960U		SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 05/07/18 - 06/11/18	DUT Type: Portable Handset			APPENDIX D: Page 2 of 5

Measurement Certificate / Material Test

Item Name **Head Tissue Simulating Liquid (HSL750V2)**
 Product No. SL AAH 075 AA (Batch: 170612-4)
 Manufacturer SPEAG

Measurement Method

TSL dielectric parameters measured using calibrated DAK probe.

Setup Validation

Validation results were within $\pm 2.5\%$ towards the target values of Methanol.

Target Parameters

Target parameters as defined in the IEEE 1528 and IEC 62209 compliance standards.

Test Condition

Ambient Environment temperatur ($22 \pm 3^\circ\text{C}$ and humidity $< 70\%$).
 TSL Temperature 22°C
 Test Date 20-Jun-17
 Operator CL

Additional Information

TSL Density 1.284 g/cm^3
 TSL Heat-capacity $2.701 \text{ kJ/(kg}^\circ\text{K)}$

f [MHz]	Measured			Target		Diff.to Target [%]	
	e'	e''	sigma	eps	sigma	$\Delta\text{-eps}$	$\Delta\text{-sigma}$
600	45.6	22.97	0.77	42.7	0.88	6.7	-13.1
625	45.2	22.73	0.79	42.6	0.88	6.2	-10.6
650	44.9	22.49	0.81	42.5	0.89	5.6	-8.2
675	44.5	22.27	0.84	42.3	0.89	5.1	-5.8
700	44.2	22.05	0.86	42.2	0.89	4.6	-3.5
725	43.8	21.88	0.88	42.1	0.89	4.2	-1.0
750	43.5	21.72	0.91	41.9	0.89	3.8	1.4
775	43.2	21.55	0.93	41.8	0.90	3.4	3.7
800	42.9	21.38	0.95	41.7	0.90	2.9	6.0
825	42.6	21.24	0.97	41.6	0.91	2.4	7.5
850	42.5	21.17	0.99	41.5	0.91	2.2	8.2
875	42.3	21.09	1.00	41.5	0.92	2.0	8.9
900	42.0	20.98	1.02	41.5	0.94	1.2	8.3
925	41.7	20.87	1.05	41.5	0.97	0.5	7.7
950	41.5	20.76	1.07	41.5	0.98	0.0	8.7
975	41.2	20.64	1.09	41.4	0.99	-0.6	9.7
1000	40.9	20.55	1.11	41.4	1.00	-1.1	10.9
1000	40.6	20.46	1.14	41.3	1.01	-1.7	12.1

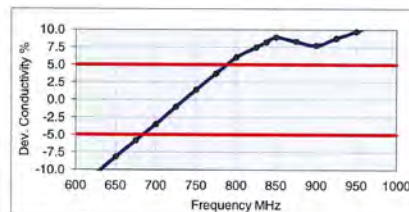
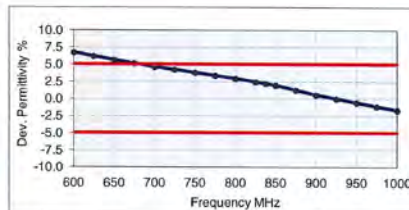


Figure D-3
750MHz Head Tissue Equivalent Matter

FCC ID: A3LSMN960U		SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 05/07/18 - 06/11/18	DUT Type: Portable Handset			APPENDIX D: Page 3 of 5

3 Composition / Information on ingredients

The Item is composed of the following ingredients:

Water	50 – 73 %	
Non-ionic detergents	25 – 50 %	polyoxyethylenesorbitan monolaurate
NaCl	0 – 2 %	
Preservative	0.05 – 0.1 %	Preventol-D7

Safety relevant ingredients:

CAS-No. 55965-84-9	< 0.1 %	aqueous preparation, containing 5-chloro-2-methyl-3(2H)-isothiazolone and 2-methyl-3(2H)-isothiazolone
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CAS-No. 9005-64-5	< 50 %	polyoxyethylenesorbitan monolaurate
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According to international guidelines, the product is not a dangerous mixture and therefore not required to be marked by symbols.

Figure D-4
Composition of 2.4 GHz Head Tissue Equivalent Matter

Note: 2.4 GHz head liquid recipes are proprietary SPEAG. Since the composition is approximate to the actual liquids utilized, the manufacturer tissue-equivalent liquid data sheets are provided below.

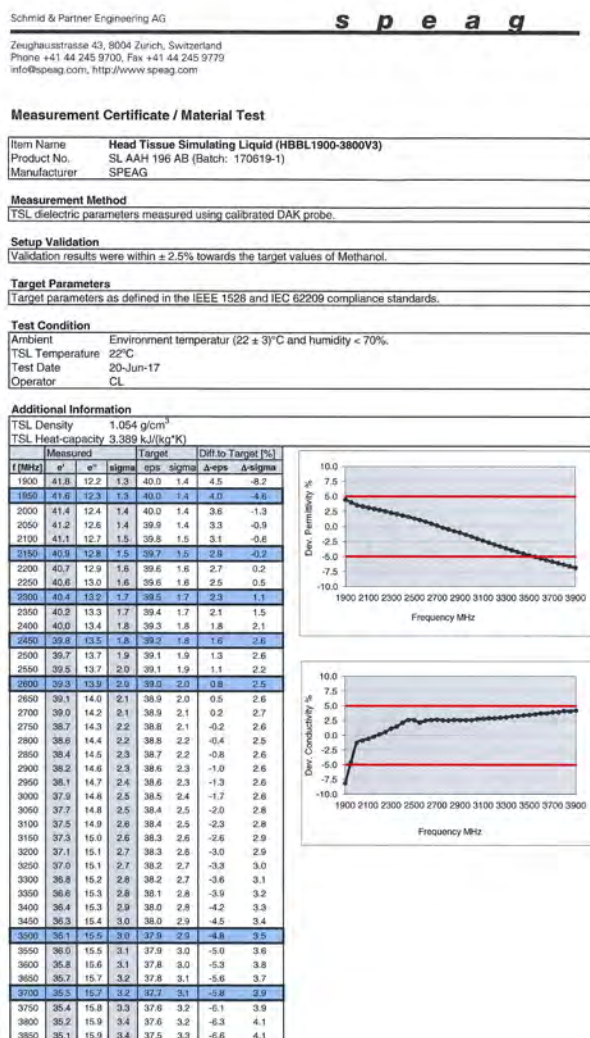


Figure D-5
2.4 GHz Head Tissue Equivalent Matter

FCC ID: A3LSMN960U		SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 05/07/18 - 06/11/18	DUT Type: Portable Handset			APPENDIX D: Page 4 of 5

2 Composition / Information on ingredients

The Item is composed of the following ingredients:

Water	50 – 65%
Mineral oil	10 – 30%
Emulsifiers	8 – 25%
Sodium salt	0 – 1.5%

Figure D-6

Composition of 5 GHz Head Tissue Equivalent Matter

Note: 5GHz head liquid recipes are proprietary SPEAG. Since the composition is approximate to the actual liquids utilized, the manufacturer tissue-equivalent liquid data sheets are provided below.

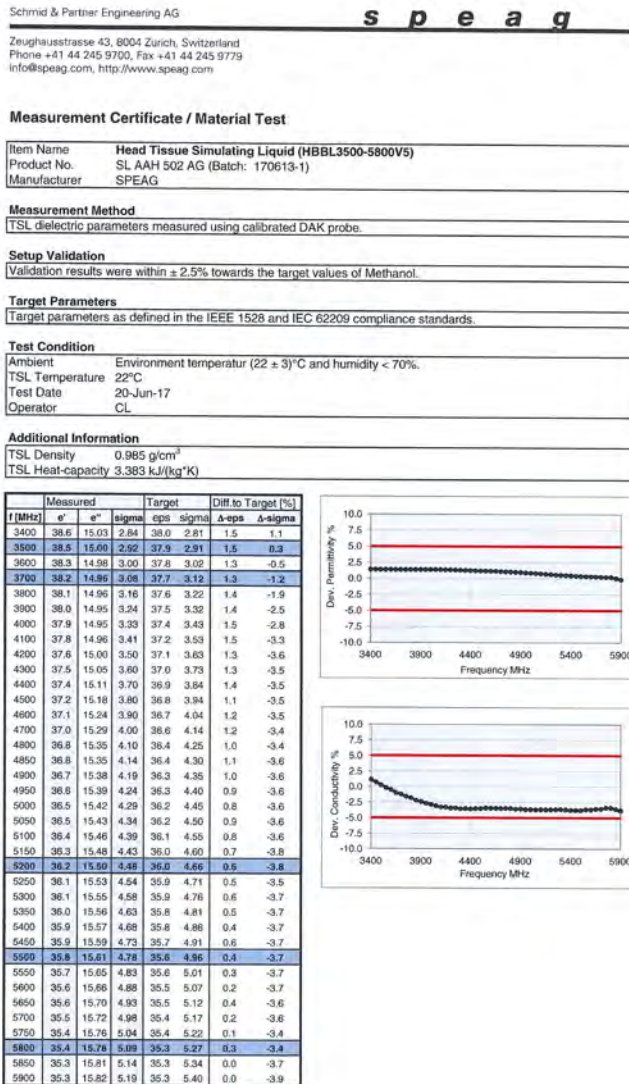


Figure D-7

5GHz Head Tissue Equivalent Matter

FCC ID: A3LSMN960U		SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 05/07/18 - 06/11/18	DUT Type: Portable Handset			APPENDIX D: Page 5 of 5

APPENDIX E: SAR SYSTEM VALIDATION

Per FCC KDB Publication 865664 D02v01r02, SAR system validation status should be documented to confirm measurement accuracy. The SAR systems (including SAR probes, system components and software versions) used for this device were validated against its performance specifications prior to the SAR measurements. Reference dipoles were used with the required tissue- equivalent media for system validation, according to the procedures outlined in FCC KDB Publication 865664 D01v01r04 and IEEE 1528-2013. Since SAR probe calibrations are frequency dependent, each probe calibration point was validated at a frequency within the valid frequency range of the probe calibration point, using the system that normally operates with the probe for routine SAR measurements and according to the required tissue-equivalent media.

A tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probes and tissue dielectric parameters has been included.

Table E-1
SAR System Validation Summary – 1g

SAR SYSTEM #	FREQ. [MHz]	DATE	PROBE SN	PROBE TYPE	PROBE CAL. POINT		COND.	PERM.	CW VALIDATION			MOD. VALIDATION		
							(σ)	(ε _r)	SENSITIVITY	PROBE LINEARITY	PROBE ISOTROPY	MOD. TYPE	DUTY FACTOR	PAR
E	750	3/11/2018	3213	ES3DV3	750	Head	0.890	40.788	PASS	PASS	PASS	N/A	N/A	N/A
E	835	3/5/2018	3213	ES3DV3	835	Head	0.925	43.335	PASS	PASS	PASS	GMSK	PASS	N/A
E	1750	3/2/2018	3213	ES3DV3	1750	Head	1.397	38.415	PASS	PASS	PASS	N/A	N/A	N/A
G	1900	8/31/2017	3332	ES3DV3	1900	Head	1.457	40.398	PASS	PASS	PASS	GMSK	PASS	N/A
G	2300	10/16/2017	3332	ES3DV3	2300	Head	1.715	39.101	PASS	PASS	PASS	N/A	N/A	N/A
G	2450	10/16/2017	3332	ES3DV3	2450	Head	1.880	38.615	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
G	2600	10/16/2017	3332	ES3DV3	2600	Head	2.051	38.039	PASS	PASS	PASS	TDD	PASS	N/A
H	5250	1/31/2018	3589	EX3DV4	5250	Head	4.516	36.066	PASS	PASS	PASS	OFDM	N/A	PASS
H	5600	1/31/2018	3589	EX3DV4	5600	Head	4.869	35.597	PASS	PASS	PASS	OFDM	N/A	PASS
H	5750	1/31/2018	3589	EX3DV4	5750	Head	5.112	35.351	PASS	PASS	PASS	OFDM	N/A	PASS
H	750	8/30/2017	7410	EX3DV4	750	Body	0.956	56.276	PASS	PASS	PASS	N/A	N/A	N/A
I	835	4/24/2018	3287	ES3DV3	835	Body	0.998	53.355	PASS	PASS	PASS	GMSK	PASS	N/A
J	1750	5/14/2018	3347	ES3DV3	1750	Body	1.516	52.662	PASS	PASS	PASS	N/A	N/A	N/A
J	1900	4/30/2018	3347	ES3DV3	1900	Body	1.529	53.419	PASS	PASS	PASS	GMSK	PASS	N/A
K	2300	4/3/2018	3319	ES3DV3	2300	Body	1.871	51.575	PASS	PASS	PASS	N/A	N/A	N/A
K	2450	4/3/2018	3319	ES3DV3	2450	Body	2.043	51.130	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
D	2450	12/18/2017	3318	ES3DV3	2450	Body	2.029	51.304	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
K	2600	4/3/2018	3319	ES3DV3	2600	Body	2.225	50.665	PASS	PASS	PASS	TDD	PASS	N/A
D	5250	10/24/2017	7308	EX3DV4	5250	Body	5.405	48.529	PASS	PASS	PASS	OFDM	N/A	PASS
D	5600	10/24/2017	7308	EX3DV4	5600	Body	5.910	47.818	PASS	PASS	PASS	OFDM	N/A	PASS
D	5750	10/24/2017	7308	EX3DV4	5750	Body	6.135	47.546	PASS	PASS	PASS	OFDM	N/A	PASS

Table E-2
SAR System Validation Summary – 10g

SAR SYSTEM #	FREQ. [MHz]	DATE	PROBE SN	PROBE TYPE	PROBE CAL. POINT		COND.	PERM.	CW VALIDATION			MOD. VALIDATION		
							(σ)	(ε _r)	SENSITIVITY	PROBE LINEARITY	PROBE ISOTROPY	MOD. TYPE	DUTY FACTOR	PAR
I	1750	3/12/2018	3287	ES3DV3	1750	Body	1.462	52.350	PASS	PASS	PASS	N/A	N/A	N/A
J	1900	4/30/2018	3347	ES3DV3	1900	Body	1.529	53.419	PASS	PASS	PASS	GMSK	PASS	N/A
K	2300	4/3/2018	3319	ES3DV3	2300	Body	1.871	51.575	PASS	PASS	PASS	N/A	N/A	N/A
K	2450	4/3/2018	3319	ES3DV3	2450	Body	2.043	51.130	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
K	2600	4/3/2018	3319	ES3DV3	2600	Body	2.225	50.665	PASS	PASS	PASS	TDD	PASS	N/A
D	5250	10/24/2017	7308	EX3DV4	5250	Body	5.405	48.529	PASS	PASS	PASS	OFDM	N/A	PASS
D	5600	10/24/2017	7308	EX3DV4	5600	Body	5.910	47.818	PASS	PASS	PASS	OFDM	N/A	PASS
D	5750	10/24/2017	7308	EX3DV4	5750	Body	6.135	47.546	PASS	PASS	PASS	OFDM	N/A	PASS

NOTE: While the probes have been calibrated for both CW and modulated signals, all measurements were performed using communication systems calibrated for CW signals only. Modulations in the table above represent test configurations for which the measurement system has been validated per FCC KDB Publication 865664 D01v01r04 for scenarios when CW probe calibrations are used with other signal types. SAR systems were validated for modulated signals with a periodic duty cycle, such as GMSK, or with a high peak to average ratio (>5 dB), such as OFDM according to FCC KDB Publication 865664 D01v01r04.

FCC ID: A3LSMN960U		SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 05/07/18 - 06/11/18	DUT Type: Portable Handset			APPENDIX E: Page 1 of 1

APPENDIX G: POWER REDUCTION VERIFICATION

Per the May 2017 TCBC Workshop Notes, demonstration of proper functioning of the power reduction mechanisms is required to support the corresponding SAR configurations. The verification process was divided into two parts: (1) evaluation of output power levels for individual or multiple triggering mechanisms and (2) evaluation of the triggering distances for proximity-based sensors.

1.1 Power Verification Procedure

The power verification was performed according to the following procedure:

1. A base station simulator was used to establish a conducted RF connection and the output power was monitored. The power measurements were confirmed to be within expected tolerances for all states before and after a power reduction mechanism was triggered.
2. Step 1 was repeated for all relevant modes and frequency bands for the mechanism being investigated.
3. Steps 1 and 2 were repeated for all individual power reduction mechanisms and combinations thereof. For the combination cases, one mechanism was switched to a 'triggered' state at a time; powers were confirmed to be within tolerances after each additional mechanism was activated.

1.2 Distance Verification Procedure

The distance verification procedure was performed according to the following procedure:

1. A base station simulator was used to establish an RF connection and to monitor the power levels. The device being tested was placed below the relevant section of the phantom with the relevant side or edge of the device facing toward the phantom.
2. The device was moved toward and away from the phantom to determine the distance at which the mechanism triggers and the output power is reduced, per KDB Publication 616217 D04v01r02 and FCC Guidance. Each applicable test position was evaluated. The distances were confirmed to be the same or larger (more conservative) than the minimum distances provided by the manufacturer.
3. Steps 1 and 2 were repeated for all relevant frequency bands.
4. Steps 1 through 3 were repeated for all distance-based power reduction mechanisms.

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1.3 Main Antenna Verification Summary

Table G-1
Power Measurement Verification for Main Antenna

Mechanism(s)	Mode/Band	Conducted Power (dBm)		
		Un-triggered (Max)	Mechanism #1 (Reduced)	Mechanism #2 (Reduced)
Hotspot On	GSM 1900	30.35	26.32	
Hotspot On	UMTS B4	24.92	19.76	
Hotspot On	UMTS B2	24.76	19.58	
Hotspot On	CDMA BC1	24.82	19.65	
Hotspot On	LTE B4	24.46	20.04	
Hotspot On	LTE B66	25.08	20.2	
Hotspot On	LTE B2	24.3	19.11	
Hotspot On	LTE B25	24.26	19.3	
Hotspot On	LTE B30 Ant A	23.27	20.24	
Hotspot On	LTE B30 Ant B	22.73	19.78	
Hotspot On	LTE B7 Ant A	23.58	19.57	
Hotspot On	LTE B7 Ant B	23.62	19.53	
Hotspot On	LTE B38	23.02	20.98	
Hotspot On	LTE B41 PC3	23.68	21.08	
Hotspot On	LTE B41 PC2	27.06	21.41	
Grip	GSM 1900	30.3	26.34	
Grip	UMTS B4	24.96	21.27	
Grip	UMTS B2	24.7	19.51	
Grip	CDMA BC1	24.85	19.85	
Grip	LTE B4	24.64	21.04	
Grip	LTE B66	25.06	21.22	
Grip	LTE B2	24.31	19.55	
Grip	LTE B25	24.25	19.76	
Grip	LTE B30 Ant A	23.24	21.75	
Grip	LTE B30 Ant B	22.77	21.26	
Grip	LTE B7 Ant A	23.57	20.11	
Grip	LTE B7 Ant B	23.63	20.19	
Grip	LTE B41 PC3	23.64	22.65	
Grip	LTE B41 PC2	27.11	22.9	
Hotspot On, then Grip	GSM 1900	30.31	26.38	26.39
Hotspot On, then Grip	UMTS B4	24.95	19.7	19.73
Hotspot On, then Grip	UMTS B2	24.8	19.6	19.61
Hotspot On, then Grip	CDMA BC1	24.78	19.74	19.76
Hotspot On, then Grip	LTE B4	24.63	20.1	20.08
Hotspot On, then Grip	LTE B66	25.07	20.19	20.21
Hotspot On, then Grip	LTE B2	24.17	19.27	19.28
Hotspot On, then Grip	LTE B25	24.27	19.3	19.31
Hotspot On, then Grip	LTE B30 Ant A	23.23	20.27	20.25
Hotspot On, then Grip	LTE B30 Ant B	22.75	19.78	19.77
Hotspot On, then Grip	LTE B7 Ant A	23.59	19.56	19.53
Hotspot On, then Grip	LTE B7 Ant B	23.6	19.55	19.56
Hotspot On, then Grip	LTE B41 PC3	23.66	21.06	21.11
Hotspot On, then Grip	LTE B41 PC2	27.1	21.42	21.4
Grip, then Hotspot On	GSM 1900	30.28	26.31	26.32
Grip, then Hotspot On	UMTS B4	24.94	21.25	19.78
Grip, then Hotspot On	UMTS B2	24.68	19.55	19.48
Grip, then Hotspot On	CDMA BC1	24.79	19.88	19.76
Grip, then Hotspot On	LTE B4	24.68	21.03	20.03
Grip, then Hotspot On	LTE B66	25.09	21.26	20.24
Grip, then Hotspot On	LTE B2	24.22	19.16	19.14
Grip, then Hotspot On	LTE B25	24.3	19.79	19.31
Grip, then Hotspot On	LTE B30 Ant A	23.21	21.74	20.23
Grip, then Hotspot On	LTE B30 Ant B	22.77	21.23	19.72
Grip, then Hotspot On	LTE B7 Ant A	23.59	20.11	19.55
Grip, then Hotspot On	LTE B7 Ant B	23.62	20.8	19.57
Grip, then Hotspot On	LTE B41 PC3	23.64	22.55	21.16
Grip, then Hotspot On	LTE B41 PC2	27.09	22.9	21.4

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Table G-2

Distance Measurement Verification for Main Antenna

Mechanism(s)	Test Condition	Band	Distance Measurements (mm)		Distance per Manufacturer
			Moving Toward	Moving Away	
Grip	Phablet - Back Side	Mid	11	15	8
Grip	Phablet - Back Side	High	11	14	8
Grip	Phablet - Front Side	Mid	9	10	6
Grip	Phablet - Front Side	High	9	10	6
Grip	Phablet - Bottom Edge	Mid	12	15	11
Grip	Phablet - Bottom Edge	High	12	14	11

Note: Mid band refers to: CDMA BC1, GSM1900, UMTS B2/4, LTE B2/4/25/66;

High band refers to: LTE B7/30 Ant A & Ant B/LTE B41 PC2 & PC3.

1.4 WIFI Verification Summary

Table G-3

Power Measurement Verification WIFI

Mechanism(s)	Mode/Band	Conducted Power (dBm)	
		Un-triggered (Max)	Mechanism #1 (Reduced)
Held-to-Ear	802.11b	19.04	15.02
Held-to-Ear	802.11g	16.58	15.1
Held-to-Ear	802.11n (2.4GHz)	16.71	15.45
Held-to-Ear	802.11a	16.97	11.6
Held-to-Ear	802.11n (5GHz, 20MHz BW)	17.04	11.58
Held-to-Ear	802.11ac (20MHz BW)	17.01	11.76
Held-to-Ear	802.11n (5GHz, 40MHz BW)	15.8	11.5
Held-to-Ear	802.11ac (40MHz BW)	15.01	11.67
Held-to-Ear	802.11ac (80MHz BW)	15.07	11.6

Table G-4

Distance Measurement Verification for WIFI

Mechanism(s)	Test Condition	Band	Distance Measurements (mm)		Minimum Distance per Manufacturer (mm)
			Moving Toward	Moving Away	
Held-to-Ear	Head - Right Cheek	2.4GHz	55	71	50
Held-to-Ear	Head - Right Cheek	5GHz	59	74	50
Held-to-Ear	Head - Left Cheek	2.4GHz	52	65	50
Held-to-Ear	Head - Left Cheek	5GHz	52	71	50

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APPENDIX H: DOWNLINK LTE CA RF CONDUCTED POWERS

1.1 LTE Downlink Only Carrier Aggregation Test Reduction Methodology

SAR test exclusion for LTE downlink Carrier Aggregation is determined by power measurements according to the number of component carriers (CCs) supported by the product implementation. Per April 2018 TCBC Workshop Notes, the following test reduction methodology was applied to determine the combinations required for conducted power measurements.

LTE DLCA Test Reduction Methodology:

- The supported combinations were arranged by the number of component carriers in columns.
- Any limitations on the PCC or SCC for each combination were identified alongside the combination (e.g. CA_2A-2A-4A-12A, but B12 can only be configured as a SCC).
- Power measurements were performed for "supersets" (LTE CA combinations with multiple components carriers) and any "subsets" (LTE CA combinations with fewer component carriers) that were not completely covered by the supersets.
- Only subsets that have the exact same components as a superset were excluded for measurement.
- When there were certain restrictions on component carriers that existed in the superset that were not applied for the subset, the subset configuration was additionally evaluated.
- Both inter-band and intra-band downlink carrier aggregation scenarios were considered.
- Downlink CA combinations for SISO and 4x4 Downlink MIMO operations were measured independently, per May 2017 TCBC Workshop notes.

Table 1 – Example of Exclusion Table for SISO Configurations

Index	ACC	Supported Channel Bandwidth (MHz)	Restriction	Completely Covered by Measurement Superset
CCC #1	CA [2A]	5, 10, 15, 20	None	Yes
CCC #2	CA [2A]	5, 10, 15, 20	None	Yes
CCC #3	CA [2A]	5, 10, 15, 20	None	Yes
CCC #4	CA [2A]	5, 10, 15, 20	None	Yes
CCC #5	CA [2A]	5, 10, 15, 20	None	Yes
CCC #6	CA [2A]	5, 10, 15, 20	None	Yes
CCC #7	CA [2A]	5, 10, 15, 20	None	Yes
CCC #8	CA [2A]	5, 10, 15, 20	None	Yes
CCC #9	CA [2A]	5, 10, 15, 20	None	Yes
CCC #10	CA [2A]	5, 10, 15, 20	None	Yes
CCC #11	CA [2A]	5, 10, 15, 20	None	Yes
CCC #12	CA [2A]	5, 10, 15, 20	None	Yes
CCC #13	CA [2A]	5, 10, 15, 20	None	Yes
CCC #14	CA [2A]	5, 10, 15, 20	None	Yes
CCC #15	CA [2A]	5, 10, 15, 20	None	Yes
CCC #16	CA [2A]	5, 10, 15, 20	None	Yes
CCC #17	CA [2A]	5, 10, 15, 20	None	Yes
CCC #18	CA [2A]	5, 10, 15, 20	None	Yes
CCC #19	CA [2A]	5, 10, 15, 20	None	Yes
CCC #20	CA [2A]	5, 10, 15, 20	None	Yes
CCC #21	CA [2A]	5, 10, 15, 20	None	Yes
CCC #22	CA [2A]	5, 10, 15, 20	None	Yes
CCC #23	CA [2A]	5, 10, 15, 20	None	Yes
CCC #24	CA [2A]	5, 10, 15, 20	None	Yes
CCC #25	CA [2A]	5, 10, 15, 20	None	Yes
CCC #26	CA [2A]	5, 10, 15, 20	None	Yes
CCC #27	CA [2A]	5, 10, 15, 20	None	Yes
CCC #28	CA [2A]	5, 10, 15, 20	None	Yes
CCC #29	CA [2A]	5, 10, 15, 20	None	Yes
CCC #30	CA [2A]	5, 10, 15, 20	None	Yes
CCC #31	CA [2A]	5, 10, 15, 20	None	Yes
CCC #32	CA [2A]	5, 10, 15, 20	None	Yes
CCC #33	CA [2A]	5, 10, 15, 20	None	Yes
CCC #34	CA [2A]	5, 10, 15, 20	None	Yes
CCC #35	CA [2A]	5, 10, 15, 20	None	Yes
CCC #36	CA [2A]	5, 10, 15, 20	None	Yes
CCC #37	CA [2A]	5, 10, 15, 20	None	Yes
CCC #38	CA [2A]	5, 10, 15, 20	None	Yes
CCC #39	CA [2A]	5, 10, 15, 20	None	Yes
CCC #40	CA [2A]	5, 10, 15, 20	None	Yes
CCC #41	CA [2A]	5, 10, 15, 20	None	Yes
CCC #42	CA [2A]	5, 10, 15, 20	None	Yes
CCC #43	CA [2A]	5, 10, 15, 20	None	Yes
CCC #44	CA [2A]	5, 10, 15, 20	None	Yes
CCC #45	CA [2A]	5, 10, 15, 20	None	Yes
CCC #46	CA [2A]	5, 10, 15, 20	None	Yes
CCC #47	CA [2A]	5, 10, 15, 20	None	Yes
CCC #48	CA [2A]	5, 10, 15, 20	None	Yes
CCC #49	CA [2A]	5, 10, 15, 20	None	Yes
CCC #50	CA [2A]	5, 10, 15, 20	None	Yes
CCC #51	CA [2A]	5, 10, 15, 20	None	Yes
CCC #52	CA [2A]	5, 10, 15, 20	None	Yes
CCC #53	CA [2A]	5, 10, 15, 20	None	Yes
CCC #54	CA [2A]	5, 10, 15, 20	None	Yes
CCC #55	CA [2A]	5, 10, 15, 20	None	Yes
CCC #56	CA [2A]	5, 10, 15, 20	None	Yes
CCC #57	CA [2A]	5, 10, 15, 20	None	Yes
CCC #58	CA [2A]	5, 10, 15, 20	None	Yes
CCC #59	CA [2A]	5, 10, 15, 20	None	Yes
CCC #60	CA [2A]	5, 10, 15, 20	None	Yes
CCC #61	CA [2A]	5, 10, 15, 20	None	Yes
CCC #62	CA [2A]	5, 10, 15, 20	None	Yes
CCC #63	CA [2A]	5, 10, 15, 20	None	Yes
CCC #64	CA [2A]	5, 10, 15, 20	None	Yes
CCC #65	CA [2A]	5, 10, 15, 20	None	Yes
CCC #66	CA [2A]	5, 10, 15, 20	None	Yes
CCC #67	CA [2A]	5, 10, 15, 20	None	Yes
CCC #68	CA [2A]	5, 10, 15, 20	None	Yes
CCC #69	CA [2A]	5, 10, 15, 20	None	Yes
CCC #70	CA [2A]	5, 10, 15, 20	None	Yes
CCC #71	CA [2A]	5, 10, 15, 20	None	Yes
CCC #72	CA [2A]	5, 10, 15, 20	None	Yes
CCC #73	CA [2A]	5, 10, 15, 20	None	Yes
CCC #74	CA [2A]	5, 10, 15, 20	None	Yes
CCC #75	CA [2A]	5, 10, 15, 20	None	Yes
CCC #76	CA [2A]	5, 10, 15, 20	None	Yes
CCC #77	CA [2A]	5, 10, 15, 20	None	Yes
CCC #78	CA [2A]	5, 10, 15, 20	None	Yes
CCC #79	CA [2A]	5, 10, 15, 20	None	Yes
CCC #80	CA [2A]	5, 10, 15, 20	None	Yes
CCC #81	CA [2A]	5, 10, 15, 20	None	Yes
CCC #82	CA [2A]	5, 10, 15, 20	None	Yes
CCC #83	CA [2A]	5, 10, 15, 20	None	Yes
CCC #84	CA [2A]	5, 10, 15, 20	None	Yes
CCC #85	CA [2A]	5, 10, 15, 20	None	Yes
CCC #86	CA [2A]	5, 10, 15, 20	None	Yes
CCC #87	CA [2A]	5, 10, 15, 20	None	Yes
CCC #88	CA [2A]	5, 10, 15, 20	None	Yes
CCC #89	CA [2A]	5, 10, 15, 20	None	Yes
CCC #90	CA [2A]	5, 10, 15, 20	None	Yes
CCC #91	CA [2A]	5, 10, 15, 20	None	Yes
CCC #92	CA [2A]	5, 10, 15, 20	None	Yes
CCC #93	CA [2A]	5, 10, 15, 20	None	Yes
CCC #94	CA [2A]	5, 10, 15, 20	None	Yes
CCC #95	CA [2A]	5, 10, 15, 20	None	Yes
CCC #96	CA [2A]	5, 10, 15, 20	None	Yes
CCC #97	CA [2A]	5, 10, 15, 20	None	Yes
CCC #98	CA [2A]	5, 10, 15, 20	None	Yes
CCC #99	CA [2A]	5, 10, 15, 20	None	Yes
CCC #100	CA [2A]	5, 10, 15, 20	None	Yes

Table 2 – Example of Exclusion Table for 4x4 Downlink MIMO Configurations

Index	ACC	Supported Channel Bandwidth (MHz)	Restriction	Completely Covered by Measurement Superset
CCC #1	CA [2A]	5, 10, 15, 20	None	Yes
CCC #2	CA [2A]	5, 10, 15, 20	None	Yes
CCC #3	CA [2A]	5, 10, 15, 20	None	Yes
CCC #4	CA [2A]	5, 10, 15, 20	None	Yes
CCC #5	CA [2A]	5, 10, 15, 20	None	Yes
CCC #6	CA [2A]	5, 10, 15, 20	None	Yes
CCC #7	CA [2A]	5, 10, 15, 20	None	Yes
CCC #8	CA [2A]	5, 10, 15, 20	None	Yes
CCC #9	CA [2A]	5, 10, 15, 20	None	Yes
CCC #10	CA [2A]	5, 10, 15, 20	None	Yes
CCC #11	CA [2A]	5, 10, 15, 20	None	Yes
CCC #12	CA [2A]	5, 10, 15, 20	None	Yes
CCC #13	CA [2A]	5, 10, 15, 20	None	Yes
CCC #14	CA [2A]	5, 10, 15, 20	None	Yes
CCC #15	CA [2A]	5, 10, 15, 20	None	Yes
CCC #16	CA [2A]	5, 10, 15, 20	None	Yes
CCC #17	CA [2A]	5, 10, 15, 20	None	Yes
CCC #18	CA [2A]	5, 10, 15, 20	None	Yes
CCC #19	CA [2A]	5, 10, 15, 20	None	Yes
CCC #20	CA [2A]	5, 10, 15, 20	None	Yes
CCC #21	CA [2A]	5, 10, 15, 20	None	Yes
CCC #22	CA [2A]	5, 10, 15, 20	None	Yes
CCC #23	CA [2A]	5, 10, 15, 20	None	Yes
CCC #24	CA [2A]	5, 10, 15, 20	None	Yes
CCC #25	CA [2A]	5, 10, 15, 20	None	Yes
CCC #26	CA [2A]	5, 10, 15, 20	None	Yes
CCC #27	CA [2A]	5, 10, 15, 20	None	Yes
CCC #28	CA [2A]	5, 10, 15, 20	None	Yes
CCC #29	CA [2A]	5, 10, 15, 20	None	Yes
CCC #30	CA [2A]	5, 10, 15, 20	None	Yes
CCC #31	CA [2A]	5, 10, 15, 20	None	Yes
CCC #32	CA [2A]	5, 10, 15, 20	None	Yes
CCC #33	CA [2A]	5, 10, 15, 20	None	Yes
CCC #34	CA [2A]	5, 10, 15, 20	None	Yes
CCC #35	CA [2A]	5, 10, 15, 20	None	Yes
CCC #36	CA [2A]	5, 10, 15, 20	None	Yes
CCC #37	CA [2A]	5, 10, 15, 20	None	Yes
CCC #38	CA [2A]	5, 10, 15, 20	None	Yes
CCC #39	CA [2A]	5, 10, 15, 20	None	Yes
CCC #40	CA [2A]	5, 10, 15, 20	None	Yes
CCC #41	CA [2A]	5, 10, 15, 20	None	Yes
CCC #42	CA [2A]	5, 10, 15, 20	None	Yes
CCC #43	CA [2A]	5, 10, 15, 20	None	Yes
CCC #44	CA [2A]	5, 10, 15, 20	None	Yes
CCC #45	CA [2A]	5, 10, 15, 20	None	Yes
CCC #46	CA [2A]	5, 10, 15, 20	None	Yes
CCC #47	CA [2A]	5, 10, 15, 20	None	Yes
CCC #48	CA [2A]	5, 10, 15, 20	None	Yes
CCC #49	CA [2A]	5, 10, 15, 20	None	Yes
CCC #50	CA [2A]	5, 10, 15, 20	None	Yes
CCC #51	CA [2A]	5, 10, 15, 20	None	Yes
CCC #52	CA [2A]	5, 10, 15, 20	None	Yes
CCC #53	CA [2A]	5, 10, 15, 20	None	Yes
CCC #54	CA [2A]	5, 10, 15, 20	None	Yes
CCC #55	CA [2A]	5, 10, 15, 20	None	Yes
CCC #56	CA [2A]	5, 10, 15, 20	None	Yes
CCC #57	CA [2A]	5, 10, 15, 20	None	Yes
CCC #58	CA [2A]	5, 10, 15, 20	None	Yes
CCC #59	CA [2A]	5, 10, 15, 20	None	Yes
CCC #60	CA [2A]	5, 10, 15, 20	None	Yes
CCC #61	CA [2A]	5, 10, 15, 20	None	Yes
CCC #62	CA [2A]	5, 10, 15, 20	None	Yes
CCC #63	CA [2A]	5, 10, 15, 20	None	Yes
CCC #64	CA [2A]	5, 10, 15, 20	None	Yes
CCC #65	CA [2A]	5, 10, 15, 20	None	Yes
CCC #66	CA [2A]	5, 10, 15, 20	None	Yes
CCC #67	CA [2A]	5, 10, 15, 20	None	Yes
CCC #68	CA [2A]	5, 10, 15, 20	None	Yes
CCC #69	CA [2A]	5, 10, 15, 20	None	Yes
CCC #70	CA [2A]	5, 10, 15, 20	None	Yes
CCC #71	CA [2A]	5, 10, 15, 20	None	Yes
CCC #72	CA [2A]	5, 10, 15, 20	None	Yes
CCC #73	CA [2A]	5, 10, 15, 20	None	Yes
CCC #74	CA [2A]	5, 10, 15, 20	None	Yes
CCC #75	CA [2A]	5, 10, 15, 20	None	Yes
CCC #76	CA [2A]	5, 10, 15, 20	None	Yes
CCC #77	CA [2A]	5, 10, 15, 20	None	Yes
CCC #78	CA [2A]	5, 10, 15, 20	None	Yes
CCC #79	CA [2A]	5, 10, 15, 20	None	Yes
CCC #80	CA [2A]	5, 10, 15, 20	None	Yes
CCC #81	CA [2A]	5, 10, 15, 20	None	Yes
CCC #82	CA [2A]	5, 10, 15, 20	None	Yes
CCC #83	CA [2A]	5, 10, 15, 20	None	Yes
CCC #84	CA [2A]	5, 10, 15, 20	None	Yes
CCC #85	CA [2A]	5, 10, 15, 20	None	Yes
CCC #86	CA [2A]	5, 10, 15, 20	None	Yes
CCC #87	CA [2A]	5, 10, 15, 20	None	Yes
CCC #88	CA [2A]	5, 10, 15, 20	None	Yes
CCC #89	CA [2A]	5, 10, 15, 20	None	Yes
CCC #90	CA [2A]	5, 10, 15, 20	None	Yes
CCC #91	CA [2A]	5, 10, 15, 20	None	Yes
CCC #92	CA [2A]	5, 10, 15, 20	None	Yes
CCC #93	CA [2A]	5, 10, 15, 20	None	Yes
CCC #94	CA [2A]	5, 10, 15, 20	None	Yes
CCC #95	CA [2A]	5, 10, 15, 20	None	Yes
CCC #96	CA [2A]	5, 10, 15, 20	None	Yes
CCC #97	CA [2A]	5, 10, 15, 20	None	Yes
CCC #98	CA [2A]	5, 10, 15, 20	None	Yes
CCC #99	CA [2A]	5, 10, 15, 20	None	Yes
CCC #100	CA [2A]	5, 10, 15, 20	None	Yes

Note: [CC] indicates component carrier with 4x4 DL MIMO antenna configuration

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1.2 LTE Downlink Only Carrier Aggregation Test Selection and Setup

SAR test exclusion for LTE downlink Carrier Aggregation is determined by power measurements according to the number component carriers (CCs) supported by the product implementation. For those configurations required by April 2018 TCBC Workshop Notes, conducted power measurements with LTE Carrier Aggregation (CA) (downlink only) active are made in accordance to KDB Publication 941225 D05Av01r02. The RRC connection is only handled by one cell, the primary component carrier (PCC) for downlink and uplink communications. After making a data connection to the PCC, the UE device adds secondary component carrier(s) (SCC) on the downlink only. All uplink communications and acknowledgements remain identical to specifications when downlink carrier aggregation is inactive on the PCC. Additional conducted output powers are measured with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band.

Per FCC KDB Publication 941225 D05Av01r02, no SAR measurements are required for carrier aggregation configurations when the average output power with downlink only carrier aggregation active is not more than 0.25 dB higher than the average output power with downlink only carrier aggregation inactive.

General PCC and SCC configuration selection procedure

- PCC uplink channel, channel bandwidth, modulation and RB configurations were selected based on section C)3)b)ii) of KDB 941225 D05 V01r02. The downlink PCC channel was paired with the selected PCC uplink channel according to normal configurations without carrier aggregation.
- To maximize aggregated bandwidth, highest channel bandwidth available for that CA combination was selected for SCC. For inter-band CA, the SCC downlink channels were selected near the middle of their transmission bands. For contiguous intra-band CA, the downlink channel spacing between the component carriers was set to multiple of 300 kHz less than the nominal channel spacing defined in section 5.4.1A of 3GPP TS 36.521. For non-contiguous intra-band CA, the downlink channel spacing between the component carriers was set to be larger than the nominal channel spacing and provided maximum separation between the component carriers.
- All selected PCC and SCC(s) remained fully within the uplink/downlink transmission band of the respective component carrier.
- When a device supports LTE capabilities with overlapping transmission frequency ranges, the standalone powers from the band with a larger transmission frequency range can be used to select measurement configurations for the band with the fully covered transmission frequency range.

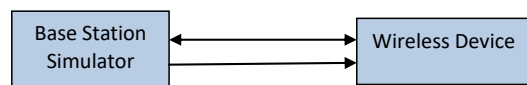


Figure 1
SISO CA Power Measurement Setup

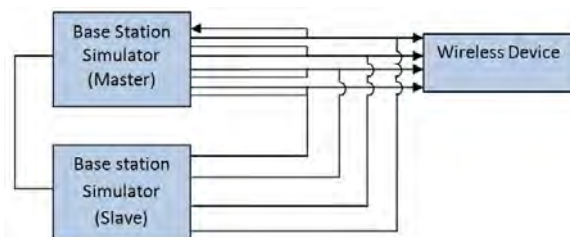


Figure 2
4x4 DL MIMO CA Power Measurement Setup

FCC ID: A3LSMN960U	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Test Dates: 05/07/18 - 06/11/18	DUT Type: Portable Handset			APPENDIX H: Page 2 of 28

1.3 SISO Downlink Carrier Aggregation RF Conducted Powers

1.3.1 LTE Band 12 as PCC

Table 1
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC					SCC 1				SCC 2				Power		
				PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx.Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-12A (1)	LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	LTE B2	20	900	1960	-	-	-	-	24.71	24.64
CA_4A-12A (2)	LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	LTE B4	20	2175	2132.5	-	-	-	-	24.67	24.64
CA_12A-25A	LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	LTE B25	20	8365	1962.5	-	-	-	-	24.66	24.64
CA_12A-66A (1)	LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	LTE B66	20	66786	2145	-	-	-	-	24.68	24.64
CA_2A-2A-12A	LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	LTE B2	20	900	1960	LTE B2	20	700	1940	24.78	24.64
CA_2A-4A-12A	LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	24.79	24.64
CA_2A-7A-12A	LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	LTE B2	20	900	1960	LTE B7	20	3100	2655	24.62	24.64
CA_2A-12B	LTE B12	5	23035	701.5	QPSK	1	24	5035	731.5	LTE B12	10	5107	738.7	LTE B2	20	900	1960	24.66	24.55
CA_2A-12A-30A	LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	LTE B2	20	900	1960	LTE B30	10	9820	2355	24.40	24.64
CA_2A-12A-66A	LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	LTE B2	20	900	1960	LTE B66	20	66786	2145	24.76	24.64
CA_4A-4A-12A	LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	LTE B4	20	2175	2132.5	LTE B4	10	2350	2150	24.80	24.64
CA_4A-12B	LTE B12	5	23035	701.5	QPSK	1	24	5035	731.5	LTE B12	10	5107	738.7	LTE B4	20	2175	2132.5	24.64	24.55
CA_12A-66C	LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	LTE B66	20	66786	2145	LTE B66	20	66984	2164.8	24.79	24.64
CA_12A-66A-66A	LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	LTE B66	20	66786	2145	LTE B66	20	67236	2190	24.81	24.64

1.3.2 LTE Band 17 as PCC

Table 2
Maximum Output Powers

Combination	PCC									SCC 1				Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx.Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-17A	LTE B17	10	23790	710	QPSK	1	0	5790	740	LTE B2	10	900	1960	24.65	24.64

1.3.3 LTE Band 13 as PCC

Table 3
Maximum Output Powers

Combination	PCC									SCC 1			SCC 2			SCC 3			Power				
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-4A-13A	LTE B13	10	22320	782	QPSK	1	25	5230	751	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	-	-	-	-	25.16	25.11
CA_4A-4A-13A	LTE B13	10	22320	782	QPSK	1	25	5230	751	LTE B4	20	2175	2132.5	LTE B4	10	2350	2150	-	-	-	-	25.14	25.11
CA_2A-2A-13A-66A	LTE B13	10	22320	782	QPSK	1	25	5230	751	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B66	20	66786	2145	25.10	25.11
CA_2A-13A-66B	LTE B13	10	22320	782	QPSK	1	25	5230	751	LTE B2	20	900	1960	LTE B66	15	66786	2145	LTE B66	5	66879	2154.3	25.11	25.11
CA_2A-13A-66C	LTE B13	10	22320	782	QPSK	1	25	5230	751	LTE B2	20	900	1960	LTE B66	20	66786	2145	LTE B66	20	66984	2164.8	25.09	25.11
CA_2A-13A-66A-66A	LTE B13	10	22320	782	QPSK	1	25	5230	751	LTE B2	20	900	1960	LTE B66	20	66786	2145	LTE B66	20	67236	2190	25.12	25.11

1.3.4 LTE Band 71 as PCC

Table 4
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC					SCC 1				SCC 2				Power		
				PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx.Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-2A-71A	LTE B71	15	133297	680.5	QPSK	1	36	68761	634.5	LTE B2	20	900	1960	LTE B2	20	700	1940	25.10	25.06
CA_2A-4A-71A	LTE B71	15	133297	680.5	QPSK	1	36	68761	634.5	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	25.09	25.06
CA_2A-66A-71A	LTE B71	15	133297	680.5	QPSK	1	36	68761	634.5	LTE B2	20	900	1960	LTE B66	20	66786	2145	25.09	25.06
CA_4A-4A-71A	LTE B71	15	133297	680.5	QPSK	1	36	68761	634.5	LTE B4	20	2175	2132.5	LTE B4	20	2350	2150	25.11	25.06
CA_66C-71A	LTE B71	15	133297	680.5	QPSK	1	36	68761	634.5	LTE B66	20	66786	2145	LTE B66	20	66984	2164.8	25.08	25.06
CA_66A-66A-71A	LTE B71	15	133297	680.5	QPSK	1	36	68761	634.5	LTE B66	20	66786	2145	LTE B66	20	67236	2190	25.10	25.06

FCC ID: A3LSMN960U		SAR EVALUATION REPORT		Reviewed by: Quality Manager
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1.3.5

LTE Band 5 as PCC

Table 5
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC										SCC 1				SCC 2				SCC 3				SCC 4				Power	
			PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)			
CA_5A-25A	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B25	20	8365	1962.5													24.86	24.80			
CA_2A-2A-4A-5A	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B10	10	9620	2355					24.65	24.60			
CA_2A-2A-5A-30A	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B66	20	66786	2345					24.67	24.60			
CA_2A-2A-5A-66A	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B2	20	900	1960	LTE B4	20	2320	2320	LTE B4	10	66786	2345					24.65	24.60			
CA_2A-4A-5A-30A	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B2	20	900	1960	LTE B4	20	2325	2322.5	LTE B10	10	9620	2355					24.63	24.60			
CA_2A-5A-30A-66A	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B2	20	900	1960	LTE B30	10	9620	2355	LTE B66	20	66786	2345					24.82	24.80			
CA_2A-5A-66A	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B2	20	900	1960	LTE B66	15	66786	2345	LTE B66	5	66779	2344.5					24.85	24.80			
CA_2A-5A-66C	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B2	20	900	1960	LTE B66	20	66786	2345	LTE B66	20	66944	2344.8					24.83	24.80			
CA_2A-5A-66A-66A	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B2	20	900	1960	LTE B66	20	66786	2345	LTE B66	20	67236	2390					24.68	24.60			
CA_5A-30A-66A-66A	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B20	10	9620	2355	LTE B66	20	66786	2345	LTE B66	20	67236	2390					24.85	24.80			
CA_2A-5B-30A-66A	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B5	5	2453	874.3	LTE B2	20	900	1960	LTE B30	10	9620	2355	LTE B66	20	66786	2345	24.84	24.80			
CA_2A-5B-66A-66A	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B5	5	2453	874.3	LTE B30	10	9620	2355	LTE B66	20	66786	2345	LTE B66	20	67236	2390	24.74	24.80			
CA_5B-30A-66A-66A	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	LTE B5	5	2453	874.3	LTE B30	10	9620	2355	LTE B66	20	66786	2345	LTE B66	20	67236	2390	24.38	24.80			

1.3.6

LTE Band 26 as PCC

Table 6
Maximum Output Powers

	PCC										SCC 1				SCC 2				Power	
Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)	
CA 25A-26A	LTE B26	15	26865	831.5	QPSK	1	0	8865	876.5	LTE B25	20	8365	1962.5	-	-	-	-	24.82	24.80	
CA 26A-41A	LTE B26	15	26865	831.5	QPSK	1	0	8865	876.5	LTE B41	20	40620	2593	-	-	-	-	24.82	24.80	
CA 25A-25A-26A	LTE B26	3	26865	831.5	QPSK	1	7	8865	876.5	LTE B25	20	8365	1962.5	LTE B25	20	8590	1985	24.85	24.75	
CA 26A-41C	LTE B26	15	26865	831.5	QPSK	1	0	8865	876.5	LTE B41	20	40620	2593	LTE B41	20	40422	2573.2	24.76	24.80	

1.3.7

LTE Band 4 as PCC

Table 7
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC				PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC 1			SCC 2			SCC 3			LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)	
			PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	SCC (DL) Channel						SCC (DL) Freq. [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]			SCC (DL) Channel
CA_4A-12A(2)	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	24.27	24.24
CA_4A-17A	LTE B4	10	20050	1715	QPSK	1	0	2000	2115	LTE B17	10	5290	740	-	-	-	-	-	-	-	-	24.11	24.08
CA_2A-4A-12A	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B2	20	900	1960	LTE B12	10	5095	737.5	-	-	-	-	24.26	24.24
CA_2A-4A-13A	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B2	20	900	1960	LTE B13	10	5230	751	-	-	-	-	24.26	24.24
CA_2A-4A-71A	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B2	20	900	1960	LTE B71	20	66761	634.5	-	-	-	-	24.36	24.24
CA_4A-4A-7A(1)	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B4	20	2300	2345	LTE B7	20	3100	2655	-	-	-	-	24.14	24.24
CA_4A-4A-12A	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B4	20	2300	2345	LTE B12	10	5095	737.5	-	-	-	-	24.28	24.24
CA_4A-4A-13A	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B4	20	2300	2345	LTE B13	10	5230	751	-	-	-	-	24.23	24.24
CA_4A-4A-29A	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B4	20	2300	2345	LTE B29	10	9715	722.5	-	-	-	-	24.24	24.24
CA_4A-4A-71A	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B4	20	2300	2345	LTE B71	20	66761	634.5	-	-	-	-	24.25	24.24
CA_4A-12B	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B12	5	5095	737.5	LTE B12	5	5047	732.7	-	-	-	-	24.24	24.24
CA_2A-2A-4A-5A	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B5	10	2525	881.5	24.24	24.24
CA_2A-2A-4A-12A	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B12	10	5095	737.5	24.23	24.24
CA_2A-4A-4A-5A	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B4	20	2300	2345	LTE B2	20	900	1960	LTE B5	10	2525	881.5	24.27	24.24
CA_2A-4A-5A-30A	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B30	10	9620	2355	24.04	24.24
CA_2A-4A-7C	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B2	20	900	1960	LTE B7	20	3100	2655	LTE B7	20	2902	2635.2	24.48	24.24
CA_2A-4A-7A-7A	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B2	20	900	1960	LTE B7	20	3100	2655	LTE B7	20	2850	2630	24.49	24.24
CA_2A-4A-7A-12A	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B2	20	900	1960	LTE B7	20	3100	2655	LTE B12	10	5095	737.5	24.46	24.24
CA_2A-4A-12B	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B2	20	900	1960	LTE B12	5	5095	737.5	LTE B12	5	5047	732.7	24.23	24.24
CA_2A-4A-12A-30A	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B2	20	900	1960	LTE B12	10	5095	737.5	LTE B30	10	9620	2355	24.96	24.24
CA_2A-4A-29A-30A	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B2	20	900	1960	LTE B29	10	9715	722.5	LTE B30	10	9620	2355	24.00	24.24

Table 8
Reduced Output Powers – Hotspot Mode Active

Combination	PCC										SCC 1				SCC 2				SCC 3				Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)	
CA_4A-12A(2)	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	-	20.98	21.00
CA_4A-17A	LTE B4	10	20000	1715	16QAM	1	0	2000	2115	LTE B17	10	5290	740	-	-	-	-	-	-	-	-	-	21.00	20.99
CA_2A-4A-12A	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B2	20	900	1960	LTE B12	10	5095	737.5	-	-	-	-	-	20.96	21.00
CA_2A-4A-13A	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B2	20	900	1960	LTE B13	10	5230	751	-	-	-	-	-	20.96	21.00
CA_2A-4A-71A	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B2	20	900	1960	LTE B71	20	66761	634.5	-	-	-	-	-	20.97	21.00
CA_4A-4A-7A(1)	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B4	20	2300	2345	LTE B7	20	3100	2655	-	-	-	-	-	20.89	21.00
CA_4A-4A-12A	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B4	20	2300	2345	LTE B12	10	5095	737.5	-	-	-	-	-	20.99	21.00
CA_4A-4A-13A	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B4	20	2300	2345	LTE B13	10	5230	751	-	-	-	-	-	21.00	21.00
CA_4A-4A-29A	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B4	20	2300	2345	LTE B29	10	9715	722.5	-	-	-	-	-	21.00	21.01
CA_4A-4A-71A	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B4	20	2300	2345	LTE B71	20	66761	634.5	-	-	-	-	-	20.98	21.00
CA_2A-4A-12B	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B2	20	900	1960	LTE B12	10	5095	737.5	-	-	-	-	-	20.99	21.00
CA_2A-4A-5A	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B5	10	2525	881.5	21.05	21.00	
CA_2A-2A-4A-12A	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B12	10	5095	737.5	21.00	21.00	
CA_2A-4A-5A	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B4	20	2300	2345	LTE B2	20	900	1960	LTE B5	10	2525	881.5	21.00	21.00	
CA_2A-4A-5A-3A	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B30	10	9820	2355	20.86	21.00	
CA_2A-4A-7C	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B2	20	900	1960	LTE B7	20	3100	2655	LTE B7	20	2902	2635.2	20.86	21.00	
CA_2A-4A-7A-7A	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B2	20	900	1960	LTE B7	20	3100	2655	LTE B7	20	2902	2635.0	20.88	21.00	
CA_2A-4A-7A-12A	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B2	20	900	1960	LTE B7	20	3100	2655	LTE B12	10	5095	737.5	21.01	21.00	
CA_2A-4A-12B	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B2	20	900	1960	LTE B12	10	5095	737.5	LTE B12	5	5047	732.7	20.98	21.00	
CA_2A-4A-12A-3A	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B2	20	900	1960	LTE B12	10	5095	737.5	LTE B10	10	9820	2355	20.75	21.00	
CA_2A-4A-29A-3A	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B2	20	900	1960	LTE B2	10	9715	722.5	LTE B10	10	8520	2855	20.75	21.00	

Table 9
Reduced Output Powers – Grip Sensor Active

PCC														SCC 1				SCC 2				SCC 3				Power	
Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]
CA 4A-12A (2)	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	-	-	-	-	21.99	21.93
CA 4A-17A	LTE B4	10	20300	1745	16QAM	1	0	2300	2145	LTE B17	10	5790	740	-	-	-	-	-	-	-	-	-	-	-	-	21.88	21.83
CA 2A-4A-12A	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B2	20	900	1960	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	22.00	21.93
CA 2A-4A-13A	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B2	20	900	1960	LTE B13	10	5230	751	-	-	-	-	-	-	-	-	22.00	21.93
CA 2A-4A-71A	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B2	20	900	1960	LTE B71	20	68761	634.5	-	-	-	-	-	-	-	-	21.98	21.93
CA 4A-4A-7A (1)	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B4	20	2050	2120	LTE B7	20	3100	2655	-	-	-	-	-	-	-	-	21.96	21.93
CA 4A-4A-12A	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B4	20	2050	2120	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	21.98	21.93
CA 4A-4A-13A	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B4	20	2050	2120	LTE B13	10	5230	751	-	-	-	-	-	-	-	-	22.00	21.93
CA 4A-4A-29A	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B4	20	2050	2120	LTE B29	10	9715	722.5	-	-	-	-	-	-	-	-	21.97	21.93
CA 4A-4A-71A	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B4	20	2050	2120	LTE B71	20	68761	634.5	-	-	-	-	-	-	-	-	22.00	21.93
CA 4A-12B	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B12	5	5095	737.5	LTE B12	5	5047	732.7	-	-	-	-	-	-	-	-	21.98	21.93
CA 2A-2A-4A-5A	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B5	10	2525	881.5	22.00	21.93	-	-	22.00	21.93
CA 2A-2A-4A-12A	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B2	20	900	1960	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	21.97	21.93
CA 2A-4A-4A-5A	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B4	20	2050	2120	LTE B2	10	900	1960	LTE B5	10	2525	881.5	21.98	21.93	-	-	21.98	21.93
CA 2A-4A-5A-30A	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B30	10	9820	2355	22.00	21.93	-	-	22.00	21.93
CA 2A-4A-7C	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B2	20	900	1960	LTE B7	20	3100	2655	LTE B7	20	2902	2635.2	21.97	21.93	-	-	21.97	21.93
CA 2A-4B-7A-7A	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B2	20	900	1960	LTE B7	20	3100	2655	LTE B7	20	2850	2630	21.98	21.93	-	-	21.98	21.93
CA 2A-4A-7A-12A	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B2	20	900	1960	LTE B7	20	3100	2655	LTE B12	10	5095	737.5	21.94	21.93	-	-	21.94	21.93
CA 2A-4A-12B	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B2	20	900	1960	LTE B12	5	5095	737.5	LTE B12	5	5047	732.7	21.98	21.93	-	-	21.98	21.93
CA 2A-4A-12A-30A	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B2	20	900	1960	LTE B12	10	5095	737.5	LTE B30	10	9820	2355	21.98	21.93	-	-	21.98	21.93
CA 2A-4A-29A-30A	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B2	20	900	1960	LTE B29	10	9715	722.5	LTE B30	10	9820	2355	21.98	21.93	-	-	21.98	21.93

1.3.8 LTE Band 66 as PCC

Table 10
Maximum Output Powers

Combination		PCC										SCC 1				SCC 2				SCC 3				SCC 6				Power	
		PCC Band	PCC BW [MHz]	PCC (UL) Ch	PCC (UL) Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]	
CA 2A-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B2	20	900	1960	-	-	-	-	-	-	-	-	-	-	-	-	-	24.24	24.24	
CA 12A-66A(1)	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	-	-	-	-	-	24.34	24.24	
CA 2C-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B2	20	900	1960	LTE B2	20	700	1940.2	-	-	-	-	-	-	-	-	-	24.29	24.34	
CA 2A-12A-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B2	20	900	1960	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	-	24.27	24.24	
CA 2A-66A-71A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B2	20	900	1960	LTE B71	20	68761	634.5	-	-	-	-	-	-	-	-	-	24.28	24.34	
CA 12A-66C	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	67336	2130	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	-	24.28	24.34	
CA 12A-66A-71A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	67336	2130	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	-	24.28	24.34	
CA 66A-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	67336	2130	LTE B66	20	66932	2159.6	-	-	-	-	-	-	-	-	-	24.27	24.34	
CA 66A-66C	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	67336	2130	LTE B66	20	67336	2130	-	-	-	-	-	-	-	-	-	24.28	24.34	
CA 66C-71A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	66734	2139.8	LTE B71	20	68761	634.5	-	-	-	-	-	-	-	-	-	24.27	24.28	
CA 66A-66A-71A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	67336	2130	LTE B71	20	68761	634.5	-	-	-	-	-	-	-	-	-	24.28	24.34	
CA 66A-66A-66C	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	66734	2139.8	LTE B66	20	67336	2130	-	-	-	-	-	-	-	-	-	24.28	24.34	
CA 2A-2A-5A-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B5	10	2525	881.5	-	-	-	-	-	24.27	24.34	
CA 2A-2A-12A-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B13	10	5095	737.5	-	-	-	-	-	24.29	24.34	
CA 2A-2A-66A-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	67336	2130	LTE B66	20	67336	2130	-	-	-	-	-	-	-	-	-	24.26	24.34	
CA 2A-5A-30A-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B30	10	9820	2355	-	-	-	-	-	24.14	24.34	
CA 2A-5A-66A	LTE B66	15	132047	1717.5	QPSK	1	0	66511	2117.5	LTE B66	5	66604	2126.8	LTE B2	20	900	1960	LTE B5	10	2525	881.5	-	-	-	-	-	24.28	24.33	
CA 2A-5A-66A-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	67336	2130	LTE B66	20	67336	2130	-	-	-	-	-	-	-	-	-	24.30	24.34	
CA 2A-13A-66A-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	67336	2130	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B30	10	9820	2355	-	24.01	24.34	
CA 2A-12A-66A-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	67336	2130	LTE B12	10	5095	737.5	LTE B30	10	9820	2355	-	-	-	-	-	24.28	24.34	
CA 2A-13A-66B	LTE B66	15	132047	1717.5	QPSK	1	0	66511	2117.5	LTE B66	5	66604	2126.8	LTE B2	20	900	1960	LTE B13	10	5230	751	-	-	-	-	-	24.27	24.23	
CA 2A-13A-66C	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	66734	2139.8	LTE B12	10	5095	737.5	LTE B13	10	5230	751	-	-	-	-	-	24.25	24.34	
CA 2A-29A-30A-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B2	20	900	1960	LTE B29	10	9715	722.5	LTE B30	10	9820	2355	-	-	-	-	-	24.26	24.34	
CA 5A-30A-66A-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	67336	2130	LTE B5	10	2525	881.5	LTE B30	10	9820	2355	-	-	-	-	-	24.03	24.34	
CA 12A-30A-66A-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	67336	2130	LTE B12	10	5095	737.5	LTE B30	10	9820	2355	-	-	-	-	-	24.08	24.34	
CA 2A-5B-30A-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B5	5	2453	874.3	LTE B30	10	9820	2355	23.95	24.34		
CA 2A-5B-66A-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	67336	2130	LTE B5	10	2525	881.5	LTE B5	5	2453	874.3	LTE B30	10	9820	2355	24.05	24.34		

Table 12
Reduced Output Powers – Grip Sensor Active

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch	PCC				PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC 1			SCC Band	SCC 2			SCC Band	SCC 3			SCC Band	SCC 4			Power	
				PCC (UL) Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset				SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]		SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]		SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]		SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with 0.6 CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA 2A-66A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B2	20	900	1960	-	-	-	-	-	-	-	-	-	-	-	-	21.99	21.93
CA 12A-66A(1)	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	-	-	-	-	21.98	21.93
CA 2C-66A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B2	20	900	1960	LTE B2	20	762	1940.2	-	-	-	-	-	-	-	-	21.98	21.93
CA 2A-12A-66A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B2	20	900	1960	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	21.98	21.93
CA 2A-2A-12A-66A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B2	20	900	1960	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	21.98	21.93
CA 12A-66C	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B66	20	66615	2127.9	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	21.96	21.93
CA 12A-66A-66A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B66	20	67236	2190	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	21.99	21.93
CA 6C	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B66	20	66615	2127.9	LTE B66	20	66937	2152.1	-	-	-	-	-	-	-	-	21.93	21.93
CA 6A-66C	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B66	20	67038	2170.2	LTE B66	20	67236	2190	-	-	-	-	-	-	-	-	21.94	21.93
CA 6C-71A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B66	20	66615	2127.9	LTE B71	20	68761	634.5	-	-	-	-	-	-	-	-	21.99	21.93
CA 6A-6A-71A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B66	20	67236	2190	LTE B71	20	68761	634.5	-	-	-	-	-	-	-	-	21.99	21.93
CA 6C-66A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B66	20	66615	2127.9	LTE B66	20	67236	2190	-	-	-	-	-	-	-	-	21.97	21.93
CA 2A-2A-5A-66A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B5	10	2525	881.5	-	-	-	-	21.95	21.93
CA 2A-2A-12A-66A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B12	10	5095	737.5	-	-	-	-	21.97	21.93
CA 2A-2A-13A-66A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B13	10	5230	751	-	-	-	-	21.98	21.93
CA 2A-2A-66A-66A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B66	20	67236	2190	LTE B2	20	900	1960	LTE B2	20	700	1940	-	-	-	-	21.97	21.93
CA 2A-5A-30A-66A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B10	10	6820	2355	-	-	-	-	21.97	21.93
CA 2A-5A-66B	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B66	5	66693	2135.7	LTE B2	20	900	1960	LTE B5	10	2525	881.5	-	-	-	-	21.96	21.93
CA 2A-5A-66C	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B66	20	66615	2127.9	LTE B2	20	900	1960	LTE B5	10	2525	881.5	-	-	-	-	21.94	21.93
CA 2A-5A-66A-66A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B66	20	67236	2190	LTE B2	20	900	1960	LTE B5	10	2525	881.5	-	-	-	-	21.98	21.93
CA 2A-12A-30A-66A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B2	20	900	1960	LTE B12	10	5095	737.5	LTE B10	10	6820	2355	-	-	-	-	21.97	21.93
CA 2A-12A-66B	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B66	5	66693	2135.7	LTE B12	10	5095	737.5	LTE B12	10	5095	737.5	-	-	-	-	21.95	21.93
CA 2A-13A-66C	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B66	5	66693	2135.7	LTE B12	10	5095	737.5	LTE B13	10	5230	751	-	-	-	-	21.98	21.93
CA 2A-13A-66A-66A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B66	20	67236	2190	LTE B2	20	900	1960	LTE B13	10	5230	751	-	-	-	-	21.98	21.93
CA 2A-20A-30A-66A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B2	20	900	1960	LTE B20	20	9715	722.5	LTE B10	10	6820	2355	-	-	-	-	21.95	21.93
CA 5A-30A-66A-66A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B66	20	67236	2190	LTE B5	10	2525	881.5	LTE B10	10	6820	2355	-	-	-	-	21.97	21.93
CA 12A-30A-66A-66A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B66	20	67236	2190	LTE B12	10	5095	737.5	LTE B10	10	6820	2355	-	-	-	-	21.96	21.93
CA 2A-5B-30A-66A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B5	5	2453	874.3	LTE B10	10	6820	2355	21.80	21.93
CA 2A-5B-66A-66A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B66	20	67236	2190	LTE B2	20	900	1960	LTE B5	5	2453	874.3	LTE B5	5	2453	874.3	21.87	21.93
CA 5B-30A-66A-66A	LTE B66	15	132322	1745	15QAM	1	0	66786	2145	LTE B66	20	67236	2190	LTE B5	10	2525	881.5	LTE B5	5	2453	874.3	LTE B10	10	6820	2355	21.80	21.93

1.3.9 LTE Band 2 as PCC

Table 13
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC			PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC 1			SCC Band	SCC 2			SCC Band	SCC 3			SCC Band	SCC 4			Power		
				PCC (UL) Freq. [MHz]	Mod.	PCC UL RB				PCC UL RB Offset	SCC BW [MHz]	SCC (DL) Channel		SCC (DL) Freq. [MHz]	SCC BW [MHz]	SCC (DL) Channel		SCC (DL) Freq. [MHz]	SCC BW [MHz]	SCC (DL) Channel		SCC (DL) Freq. [MHz]	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA 2A-12A(1)	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	-	-	-	24.58	24.56	
CA 2A-17A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B17	10	5790	740	-	-	-	-	-	-	-	-	-	-	-	24.58	24.56	
CA 2A-66A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B66	20	66786	2145	-	-	-	-	-	-	-	-	-	-	-	24.57	24.56	
CA 2A-2A-12A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B2	20	700	1940	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	24.59	24.56
CA 2C-66A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B2	20	1006	1970.6	LTE B66	20	66786	2145	-	-	-	-	-	-	-	-	24.68	24.56
CA 2A-2A-71A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B2	20	700	1940	LTE B71	20	68761	634.5	-	-	-	-	-	-	-	-	24.61	24.56
CA 2A-4A-12A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	24.62	24.56
CA 2A-4A-13A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B4	20	2175	2132.5	LTE B13	10	5230	751	-	-	-	-	-	-	-	-	24.60	24.56
CA 2A-4A-71A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B4	20	2175	2132.5	LTE B71	20	68761	634.5	-	-	-	-	-	-	-	-	24.68	24.56
CA 2A-7A-12A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B7	20	3100	2655	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	24.66	24.56
CA 2A-12B	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B12	5	5095	737.5	LTE B12	5	5047	732.7	-	-	-	-	-	-	-	-	24.71	24.56
CA 2A-12A-30A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B12	10	5095	737.5	LTE B10	10	6820	2355	-	-	-	-	-	-	-	-	24.81	24.56
CA 1A-12A-66A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B12	10	5095	737.5	LTE B66	20	66786	2145	-	-	-	-	-	-	-	-	24.64	24.56
CA 2A-66A-71A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B66	20	66786	2145	LTE B71	20	68761	634.5	-	-	-	-	-	-	-	-	24.67	24.56
CA 2A-2A-4A-5A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B2	20	700	1940	LTE B4	20	2175	2132.5	LTE B5	10	2525	881.5	-	-	-	-	24.57	24.56
CA 2A-2A-4A-12A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B2	20	700	1940	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	-	-	-	-	24.56	24.56
CA 2A-2A-5A-30A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B2	20	700	1940	LTE B5	10	2525	881.5	LTE B10	10	6820	2355	-	-	-	-	24.61	24.56
CA 2A-2A-12A-66A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B2	20	700	1940	LTE B12	10	5095	737.5	LTE B66	20	66786	2145	-	-	-	-	24.57	24.56
CA 2A-2A-13A-66A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B2	20	700	1940	LTE B13	10	5230	751	LTE B66	20	66786	2145	-	-	-	-	24.58	24.56
CA 2A-2A-30A-30A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B2	20	700	1940	LTE B10	10	6820	2355	LTE B12	10	5095	737.5	-	-	-	-	24.56	24.56
CA 2A-2A-66A-66A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B2	20	700	1940	LTE B66	20	66786	2145	LTE B66	20	67236	2390	-	-	-	-	24.57	24.56
CA 2A-6A-4A-5A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B4	20	2175	2132.5	LTE B4	20	2300	2150	LTE B5	10	2525	881.5	-	-	-	-	24.59	24.56
CA 2A-4A-5A-30A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B4	20	2175	2132.5	LTE B5	10	2525	881.5	LTE B10	10	6820	2355	-	-	-	-	24.59	24.56
CA 2A-4A-7A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B4	20	2175	2132.5	LTE B7	20	2900	2655	LTE B7	20	2900	2655	-	-	-	-	24.59	24.56
CA 2A-4A-7A-7A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B4	20	2175	2132.5	LTE B7	20	3100	2655	LTE B7	20	2850	2650	-	-	-	-	24.58	24.56
CA 2A-4A-7A-12A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B4	20	2175	2132.5	LTE B7	20	3100	2655	LTE B12	10	5095	737.5	-	-	-	-	24.58	24.56
CA 2A-4A-12B	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B4	20	2175	2132.5	LTE B12	5	5095	737.5	LTE B12	5	5047	732.7	-	-	-	-	24.57	24.56
CA 2A-4A-17A-30A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B4	20	2175	2132.5	LTE B17	20	5995	777.6	LTE B10	10	6820	2355	-	-	-	-	24.61	24.56
CA 2A-4A-2A-30A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B4	20	2175	2132.5	LTE B10	10	6820	2355	LTE B12	10	5095	737.5	-	-	-	-	24.60	24.56
CA 2A-3A-66A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B3	10	2525	881.5	LTE B30	10	6820	2355	LTE B66	20	66786	2145	-	-	-	-	24.59	24.56
CA 2A-1A-66A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B3	10	2525	881.5	LTE B66	20	66786	2145	LTE B66	20	66786	2145	-	-	-	-	24.59	24.56
CA 2A-5A-66C	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	LTE B66	20	66884	2143.8	-	-	-	-	24.48	24.56
CA 2A-5A-66A-66A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	LTE B66	20	67236	2390	-	-	-	-	24.56	24.56
CA 2A-12A-66A-66A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B12	10	5095	737.5	LTE B66	20	66786	2145	LTE B66	20	67236	2390	-	-	-	-	24.56	24.56
CA 2A-12A-66A-66A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B12	10	5095	737.5	LTE B66	20	66786	2145	LTE B66	20	67236	2390	-	-	-	-	24.56	24.56
CA 2A-13A-66C	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B13	10	5230	751	LTE B66	20	66786	2145	LTE B66	20	66879	2154.3	-	-	-	-	24.60	24.56
CA 2A-13A-66C	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B13	10	5230	751	LTE B66	20	66786	2145	LTE B66	20	66879	2154.3	-	-	-	-	24.60	24.56
CA 2A-13A-66A-66C	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B13	10	5230	751	LTE B66	20	66786	2145	LTE B66	20	67236	2390	-	-	-	-	24.60	24.56
CA 2A-2A-3A-66A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B2	10	9725	722.5	LTE B10	10	9820	2355	LTE B66	20	66786	2145	-	-	-	-	24.58	24.56
CA 2A-1A-66A-66A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B5	10	2525	881.5	LTE B5	10	2400	874.3	LTE B66	20	66786	2145	-	-	-	-	24.59	24.56
CA 1A-5A-66A-66A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B5	10	2525	881.5	LTE B5	10	2400	874.3	LTE B66	20	66786	2145	-	-	-	-	24.55	24.56

Table 14
Reduced Output Powers – Hotspot/Grip Sensor Active

Power																												
Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch	PCC (UL) Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)					
CA 2A-12A-11	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	20.48	20.50					
CA 2A-17A	LTE B2	5	18625	1852.5	16QAM	1	0	525	1852.5	LTE B17	10	5790	740	-	-	-	-	-	-	-	-	20.50	20.50					
CA 2A-66A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B66	20	66786	2145	-	-	-	-	-	-	-	-	20.48	20.50					
CA 2A-2A-12A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B2	20	1100	1980	LTE B12	10	5095	737.5	-	-	-	-	-	20.48	20.50				
CA 2C-66A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B2	20	888	1980	LTE B66	20	66786	2145	-	-	-	-	-	20.49	20.50				
CA 2A-2A-71A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B2	20	1100	1980	LTE B71	10	68761	634.5	-	-	-	-	-	20.50	20.50				
CA 2A-7A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	-	-	-	-	-	20.48	20.50				
CA 2A-4A-13A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B4	20	2175	2132.5	LTE B13	10	5230	751	-	-	-	-	-	20.45	20.50				
CA 2A-4A-71A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B4	20	2175	2132.5	LTE B71	10	68761	634.5	-	-	-	-	-	20.47	20.50				
CA 2A-7A-12A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B7	20	3100	2655	LTE B12	10	5095	737.5	-	-	-	-	-	20.48	20.50				
CA 2A-12B	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B12	10	5095	737.5	LTE B12	10	5047	732.7	-	-	-	-	-	20.41	20.50				
CA 2A-12A-30A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B12	10	5095	737.5	LTE B30	10	9820	2355	-	-	-	-	-	20.45	20.50				
CA 2A-12A-66A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B12	10	5095	737.5	LTE B66	20	66786	2145	-	-	-	-	-	20.45	20.50				
CA 2A-6A-71A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B6	20	66786	2145	LTE B71	10	68761	634.5	-	-	-	-	-	20.48	20.50				
CA 2A-2A-4A-1A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B2	20	1100	1980	LTE B4	20	2175	2132.5	LTE B5	10	2525	881.5	-	20.48	20.50				
CA 2A-2A-4A-12A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B2	20	1100	1980	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	-	20.48	20.50				
CA 2A-2A-5A-30A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B2	20	1100	1980	LTE B5	10	2525	881.5	LTE B30	10	9820	2355	-	20.44	20.50				
CA 2A-2A-5A-66A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B2	20	1100	1980	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	-	20.45	20.50				
CA 2A-2A-12A-30A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B2	20	1100	1980	LTE B12	10	5095	737.5	LTE B30	10	9820	2355	-	20.43	20.50				
CA 2A-2A-12A-66A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B2	20	1100	1980	LTE B12	10	5095	737.5	LTE B66	20	66786	2145	-	20.48	20.50				
CA 2A-2A-13A-66A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B2	20	1100	1980	LTE B13	10	5230	751	LTE B66	20	66786	2145	-	20.46	20.50				
CA 2A-2A-66A-66A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B2	20	1100	1980	LTE B26	10	9715	722.5	LTE B30	10	9820	2355	-	20.42	20.50				
CA 2A-2A-66A-66A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B2	20	1100	1980	LTE B26	10	9715	722.5	LTE B66	20	66786	2145	-	20.42	20.50				
CA 2A-4A-4A-5A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B4	20	2175	2132.5	LTE B4	20	2175	2132.5	LTE B5	10	2525	881.5	-	20.38	20.50				
CA 2A-4A-4A-12A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B4	20	2175	2132.5	LTE B5	10	2525	881.5	LTE B12	10	5095	737.5	-	20.42	20.50				
CA 2A-4A-5A-30A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B4	20	2175	2132.5	LTE B7	20	3100	2655	LTE B7	20	3100	2655	-	20.48	20.50				
CA 2A-4A-7A-7A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B4	20	2175	2132.5	LTE B7	20	3100	2655	LTE B7	20	3100	2655	-	20.50	20.50				
CA 2A-4A-7A-12A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B4	20	2175	2132.5	LTE B7	20	3100	2655	LTE B12	10	5095	737.5	-	20.48	20.50				
CA 2A-4A-12B	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	LTE B12	10	5047	732.7	-	20.42	20.50				
CA 2A-4A-12A-30A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	LTE B30	10	9820	2355	-	20.44	20.50				
CA 2A-4A-12A-66A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	LTE B66	20	66786	2145	-	20.47	20.50				
CA 2A-5A-30A-66A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B5	10	2525	881.5	LTE B30	10	9820	2355	LTE B66	20	66786	2145	-	20.39	20.50				
CA 2A-5A-66B	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B5	10	2525	881.5	LTE B66	15	66786	2145	LTE B66	5	66786	2144.9	-	20.42	20.50				
CA 2A-5A-66A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B5	10	2525	881.5	LTE B66	15	66786	2145	LTE B66	20	66786	2145	-	20.43	20.50				
CA 2A-12A-66A-66A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B12	10	5095	737.5	LTE B30	10	9820	2355	LTE B66	20	66786	2145	-	20.41	20.50				
CA 2A-12A-66A-66A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B12	10	5095	737.5	LTE B66	20	66786	2145	LTE B66	20	66786	2145	-	20.41	20.50				
CA 2A-13A-66A-66A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B13	10	5230	751	LTE B66	15	66786	2145	LTE B66	5	66787	2145.3	-	20.39	20.50				
CA 2A-13A-66C	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B13	10	5230	751	LTE B66	20	66786	2145	LTE B66	20	66786	2145	-	20.37	20.50				
CA 2A-13A-66A-66A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B13	10	5230	751	LTE B66	15	66786	2145	LTE B66	20	66786	2145	-	20.39	20.50				
CA 2A-13A-66A-66A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B13	10	5230	751	LTE B66	20	66786	2145	LTE B66	20	66786	2145	-	20.40	20.50				
CA 2A-13A-66A-66A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B13	10	5230	751	LTE B66	20	66786	2145	LTE B66	20	66786	2145	-	20.40	20.50				
CA 2A-5B-30A-66A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B5	10	2525	881.5	LTE B5	5	2453	874.3	LTE B30	10	9820	2355	LTE B66	20	66786	2145	-	20.48	20.50
CA 2A-5B-66A-66A	LTE B2	20	18700	1860	16QAM	1	0	700	1860	LTE B5	10	2525	881.5	LTE B5	5	2453	874.3	LTE B66	20	66786	2145	LTE B66	20	66786	2145	-	20.47	20.50

1.3.10 LTE Band 25 as PCC

Table 15
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC		PCC UL RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC 1			SCC 2			SCC 3			Power	
				PCC (UL) Freq. [MHz]	Mod.						SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]
CA 5A-25A	LTE B25	20	26640	1910	QPSK	1	0	8640	1990	LTE B5	10	2525	881.5	-	-	-	-	-	-	-	-
CA 12A-25A	LTE B25	10	26640	1910	QPSK	1	0	8640	1990	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-
CA 25A-25A	LTE B25	20	26640	1910	QPSK	1	0	8640	1990	LTE B5	10	2525	881.5	-	-	-	-	-	-	-	-
CA 25A-41A	LTE B25	10	26640	1910	QPSK	1	0	8640	1990	LTE B41	20	40620	2593	-	-	-	-	-	-	-	-
CA 25A-25A-25A	LTE B25	10	26640	1910	QPSK	1	0	8640	1990	LTE B25	20	8140	1290	LTE B26	5	8865	876.5	-	-	-	-
CA 25A-41A	LTE B25	10	26640	1910	QPSK	1	0	8640	1990	LTE B41	20	40620	2593	-	-	-	-	-	-	-	-
CA 25A-41D	LTE B25	10	26640	1910	QPSK	1	0	8640	1990	LTE B41	20	40432	2573.2	-	-	-	-	-	-	-	-

Reduced Output Powers – Hotspot Mode Active

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	PCC				SCC 1				SCC 2				SCC 3				SCC 4				Power			
					Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Ant. A Tx Power (dBm)	
CA 2A-2A-30A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B3	20	900	1960	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	20.85	20.79	
CA 2A-2A-5A-30A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B5	10	2325	881.5	-	-	-	-	-	20.81	20.79
CA 2A-2A-12A-30A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B12	10	5095	737.5	-	-	-	-	-	20.79	20.79
CA 2A-2A-25A-30A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B29	10	9715	722.5	-	-	-	-	-	20.79	20.79
CA 2A-4A-5A-30A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B5	10	2325	881.5	-	-	-	-	-	20.81	20.79
CA 2A-4A-12A-30A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	-	-	-	-	-	20.84	20.79
CA 2A-4A-25A-30A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B29	10	9715	722.5	-	-	-	-	-	20.88	20.79
CA 2A-5A-30A-66A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	-	-	-	-	-	20.83	20.79
CA 2A-5A-30A-66A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	-	-	-	-	-	20.83	20.79
CA 2A-5A-30A-66A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	-	-	-	-	-	20.83	20.79
CA 2A-5A-30A-66A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	-	-	-	-	-	20.83	20.79
CA 2A-5A-30A-66A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	-	-	-	-	-	20.83	20.79
CA 12A-30A-66A-66A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	-	-	-	-	-	20.82	20.79
CA 12A-30A-66A-66A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	-	-	-	-	-	20.83	20.79
CA 5B-30A-66A-66A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B5	10	2525	881.5	LTE B5	5	2453	874.3	LTE B66	20	66786	2145	-	-	-	-	-	20.75	20.79
CA 5B-30A-66A-66A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B5	10	2525	881.5	LTE B5	5	2453	874.3	LTE B66	20	66786	2145	-	-	-	-	-	20.75	20.79

Table 19
Reduced Output Powers – Grip Sensor Active

PCC										SCC 1										SCC 2										SCC 3										SCC 4										Power	
Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Ant. A Tx Power (dBm)																				
CA 2A-12A-30A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	-	-	-	-	-	22.46	22.46																			
CA 2A-2A-5A-30A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B5	10	2525	881.5	-	-	-	-	-	-	-	-	-	22.40	22.44																			
CA 2A-2A-12A-30A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	-	22.44	22.44																			
CA 2A-2A-25A-30A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B29	10	9715	722.5	-	-	-	-	-	-	-	-	-	22.42	22.44																			
CA 2A-4A-5A-30A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B5	10	2525	881.5	-	-	-	-	-	-	-	-	-	22.42	22.44																			
CA 2A-4A-12A-30A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	-	22.41	22.44																			
CA 2A-4A-25A-30A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B29	10	9715	722.5	-	-	-	-	-	-	-	-	-	22.40	22.44																			
CA 2A-5A-30A-66A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	-	-	-	-	-	-	-	-	-	22.41	22.44																			
CA 2A-5A-30A-66A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	-	-	-	-	-	-	-	-	-	22.40	22.44																			
CA 2A-5A-30A-66A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	-	-	-	-	-	-	-	-	-	22.41	22.44																			
CA 2A-5A-30A-66A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	-	-	-	-	-	-	-	-	-	22.44	22.44																			
CA 12A-30A-66A-66A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	-	-	-	-	-	-	-	-	-	22.45	22.44																			
CA 12A-30A-66A-66A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	-	-	-	-	-	-	-	-	-	22.45	22.44																			
CA 5B-30A-66A-66A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B5	10	2525	881.5	LTE B5	5	2453	874.3	LTE B66	20	66786	2145	-	-	-	-	-	-	-	-	-	22.43	22.44																			
CA 5B-30A-66A-66A	LTE B30-AntA	10	27710	2310	64QAM	1	0	9820	2355	LTE B5	10	2525	881.5	LTE B5	5	2453	874.3	LTE B66	20	66786	2145	-	-	-	-	-	-	-	-	-	22.43	22.44																			

1.3.12 LTE Band 7 Antenna A as PCC

Table 20
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC 1				SCC 2				SCC 3				Power	
										SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Ant. A Tx Power (dBm)
CA 2A-7A-12A	LTE B7-AntA	10	20800	2505	QPSK	1	0	2800	2625	LTE B2	20	900	1960	LTE B12	10	5095	737.5	-	-	-	-	23.49	23.48
CA 4A-4A-7A (1)	LTE B7-AntA	10	20800	2505	QPSK	1	0	2800	2625	LTE B4	20	2175	2132.5	LTE B4	10	2350	2150	-	-	-	-	23.47	23.48
CA 2A-4A-7C	LTE B7-AntA	10	20800	2505	QPSK	1	0	2800	2625	LTE B7	20	2944	2639.4	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	23.44	23.48
CA 2A-4A-7A-7A	LTE B7-AntA	10	20800	2505	QPSK	1	0	2800	2625	LTE B7	20	3350	2680	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	23.42	23.48
CA 2A-4A-7A-12A	LTE B7-AntA	10	20800	2505	QPSK	1	0	2800	2625	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	23.43	23.48

Table 21
Reduced Output Powers – Hotspot Mode Active

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch	PCC				SCC 1				SCC 2				SCC 3				Power			
				PCC (DL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Ant. A Tx Power (dBm)
CA 2A-7A-12A	LTE B7 AntA	15	21100	2535	16QAM	1	0	3100	2655	LTE B2	20	900	1960	LTE B12	10	5095	737.5	-	-	-	-	20.15	20.18
CA 4A-7A-12A (1)	LTE B7 AntA	15	21100	2535	16QAM	1	0	3100	2655	LTE B4	20	2175	2132.5	LTE B4	10	2350	2150	-	-	-	-	20.14	20.18
CA 2A-4A-7C	LTE B7 AntA	15	21100	2535	16QAM	1	0	3100	2655	LTE B7	20	2929	2637.9	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	20.11	20.18
CA 2A-4A-7A-7A	LTE B7 AntA	15	21100	2535	16QAM	1	0	3100	2655	LTE B7	20	2929	2637.9	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	20.11	20.18
CA 2A-6A-7A-12A	LTE B7 AntA	15	21100	2535	16QAM	1	0	3100	2655	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	20.20	20.18

Table 24
Reduced Output Powers – Hotspot Mode Active

Combination	PCC									SCC 1				Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA 7C	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	LTE B7	15	2950	2640	20.40	20.38
CA 7A-7A (1)	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	LTE B7	20	2850	2630	20.42	20.38

Table 25
Reduced Output Powers – Grip Sensor Active

Combination	PCC									SCC 1				Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA 7C	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	LTE B7	15	2975	2642.5	20.66	20.61
CA 7A-7A (1)	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	LTE B7	20	3350	2680	20.65	20.61

1.3.14 LTE Band 41 as PCC

Table 26
Maximum Output Powers

Combination	PCC										SCC 1				SCC 2				SCC 3				SCC 4				Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)	
CA 41A-41A (1)	LTE B41	15	40620	2593	QPSK	1	0	40620	2593	LTE B41	20	39750	2506	-	-	-	-	-	-	-	-	-	-	-	-	-	24.18	24.15
CA 41A-41C	LTE B41	15	40620	2593	QPSK	1	0	40620	2593	LTE B41	20	41292	2660.2	LTE B41	20	41490	2680	-	-	-	-	-	-	-	-	-	24.16	24.15
CA 41C-41A	LTE B41	15	40620	2593	QPSK	1	0	40620	2593	LTE B41	20	40791	2610.1	-	-	-	-	-	-	-	-	-	-	-	-	-	24.18	24.15
CA 41C	LTE B41	15	40620	2593	QPSK	1	0	40620	2593	LTE B41	20	40449	2575.9	LTE B41	20	40791	2610.1	LTE B41	20	40896	2620.6	-	-	-	-	-	24.14	24.15
CA 41A-41D	LTE B41	15	40620	2593	QPSK	1	0	40620	2593	LTE B41	20	41292	2660.2	LTE B41	20	41490	2680	-	-	-	-	-	-	-	-	-	24.15	24.15
CA 41C-41C	LTE B41	15	40620	2593	QPSK	1	0	40620	2593	LTE B41	20	40449	2575.9	LTE B41	20	41292	2660.2	LTE B41	20	41490	2680	-	-	-	-	-	24.14	24.15
CA 41D-41A	LTE B41	15	40620	2593	QPSK	1	0	40620	2593	LTE B41	20	40449	2575.9	LTE B41	20	40791	2610.1	LTE B41	20	41490	2680	-	-	-	-	-	24.14	24.15
CA 41C-41D	LTE B41	15	40620	2593	QPSK	1	0	40620	2593	LTE B41	20	40449	2575.9	LTE B41	20	40791	2610.1	LTE B41	20	41292	2660.2	LTE B41	20	41490	2680	24.16	24.15	
CA 41D-41C	LTE B41	15	40620	2593	QPSK	1	0	40620	2593	LTE B41	20	40449	2575.9	LTE B41	20	40791	2610.1	LTE B41	20	41292	2660.2	LTE B41	20	41490	2680	24.20	24.15	

Table 27
Reduced Output Powers – Hotspot Mode Active

Combination	PCC										SCC 1				SCC 2				SCC 3				SCC 4				Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)	
CA 41A-41A (1)	LTE B41	20	40620	2593	16QAM	1	0	40620	2593	LTE B41	20	39750	2506	-	-	-	-	-	-	-	-	-	-	-	-	-	22.48	22.49
CA 41A-41C	LTE B41	20	40620	2593	16QAM	1	0	40620	2593	LTE B41	20	41292	2660.2	LTE B41	20	41490	2680	-	-	-	-	-	-	-	-	-	22.48	22.49
CA 41C-41A	LTE B41	20	40620	2593	16QAM	1	0	40620	2593	LTE B41	20	40818	2612.8	LTE B41	20	39750	2506	-	-	-	-	-	-	-	-	-	22.47	22.49
CA 41E	LTE B41	20	40620	2593	16QAM	1	0	40620	2593	LTE B41	20	40422	2573.2	LTE B41	20	40818	2612.8	LTE B41	20	41216	2632.6	-	-	-	-	-	22.48	22.49
CA 41A-41D	LTE B41	20	40620	2593	16QAM	1	0	40620	2593	LTE B41	20	41292	2660.2	LTE B41	20	41490	2680	-	-	-	-	-	-	-	-	-	22.47	22.49
CA 41C-41C	LTE B41	20	40620	2593	16QAM	1	0	40620	2593	LTE B41	20	40422	2573.2	LTE B41	20	41292	2660.2	LTE B41	20	41490	2680	-	-	-	-	-	22.46	22.49
CA 41D-41A	LTE B41	20	40620	2593	16QAM	1	0	40620	2593	LTE B41	20	40422	2573.2	LTE B41	20	40818	2612.8	LTE B41	20	41490	2680	-	-	-	-	-	22.47	22.49
CA 41C-41D	LTE B41	20	40620	2593	16QAM	1	0	40620	2593	LTE B41	20	40422	2573.2	LTE B41	20	41292	2660.2	LTE B41	20	41490	2680	-	-	-	-	-	22.46	22.49
CA 41D-41C	LTE B41	20	40620	2593	16QAM	1	0	40620	2593	LTE B41	20	40422	2573.2	LTE B41	20	40818	2612.8	LTE B41	20	41292	2660.2	LTE B41	20	41490	2680	22.49	22.49	

Table 28
Reduced Output Powers – Grip Sensor Active

Combination	PCC										SCC 1				SCC 2				SCC 3				SCC 4				Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)	
CA 41A-41A (1)	LTE B41	20	41490	2680	16QAM	1	0	41490	2680	LTE B41	20	39750	2506	-	-	-	-	-	-	-	-	-	-	-	-	-	22.27	22.30
CA 41A-41C	LTE B41	20	41490	2680	16QAM	1	0	41490	2680	LTE B41	20	39948	2525.8	LTE B41	20	39750	2506	-	-	-	-	-	-	-	-	-	22.29	22.30
CA 41C-41A	LTE B41	20	41490	2680	16QAM	1	0	41490	2680	LTE B41	20	41292	2660.2	LTE B41	20	39750	2506	-	-	-	-	-	-	-	-	-	22.29	22.30
CA 41E	LTE B41	20	41490	2680	16QAM	1	0	41490	2680	LTE B41	20	41292	2660.2	LTE B41	20	41094	2640.4	LTE B41	20	40896	2620.6	-	-	-	-	-	22.30	22.30
CA 41A-41D	LTE B41	20	41490	2680	16QAM	1	0	41490	2680	LTE B41	20	41292	2660.2	LTE B41	20	41094	2640.4	LTE B41	20	39948	2525.8	-	-	-	-	-	22.29	22.30
CA 41C-41C	LTE B41	20	41490	2680	16QAM	1	0	41490	2680	LTE B41	20	41292	2660.2	LTE B41	20	39948	2525.8	LTE B41	20	39750	2506	-	-	-	-	-	22.24	22.30
CA 41D-41A	LTE B41	20	41490	2680	16QAM	1	0	41490	2680	LTE B41	20	41292	2660.2	LTE B41	20	41094	2640.4	LTE B41	20	39750	2506	-	-	-	-	-	22.26	22.30
CA 41C-41D	LTE B41	20	41490	2680	16QAM	1	0	41490	2680	LTE B41	20	41292	2660.2	LTE B41	20	41094	2640.4	LTE B41	20	39948	2525.8	LTE B41	20	39750	2506	22.29	22.30	
CA 41D-41C	LTE B41	20	41490	2680	16QAM	1	0	41490	2680	LTE B41	20	41292	2660.2	LTE B41	20	41094	2640.4	LTE B41	20	39948	2525.8	LTE B41	20	39750	2506	22.32	22.30	

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1.3.15

LTE Band 41 PC2 as PCC

Table 29
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC				SCC 1				SCC 2				SCC 3				SCC 4				Power			
				PCC (UL) Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]
CA_41A-41A(1)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	LTE B41 PC2	20	41490	2680	-	-	-	-	-	-	-	-	-	-	-	-	27.52	27.54
CA_41A-41C	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	LTE B41 PC2	20	41292	2660.2	LTE B41 PC2	20	41490	2680	-	-	-	-	-	-	-	-	27.91	27.94
CA_41C-41A	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	LTE B41 PC2	20	39948	2525.8	LTE B41 PC2	20	41490	2680	-	-	-	-	-	-	-	-	27.48	27.54
CA_41E	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	LTE B41 PC2	20	39948	2525.8	LTE B41 PC2	20	40146	2545.6	LTE B41 PC2	20	40944	2565.4	-	-	-	-	27.50	27.54
CA_41A-41D	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	LTE B41 PC2	20	41094	2640.4	LTE B41 PC2	20	41292	2660.2	LTE B41 PC2	20	41490	2680	-	-	-	-	27.54	27.54
CA_41C-41C	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	LTE B41 PC2	20	39948	2525.8	LTE B41 PC2	20	41292	2660.2	LTE B41 PC2	20	41490	2680	-	-	-	-	27.50	27.54
CA_41D-41A	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	LTE B41 PC2	20	39948	2525.8	LTE B41 PC2	20	40146	2545.6	LTE B41 PC2	20	41490	2680	-	-	-	-	27.52	27.54
CA_41C-41D	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	LTE B41 PC2	20	39948	2525.8	LTE B41 PC2	20	41094	2640.4	LTE B41 PC2	20	41292	2660.2	LTE B41 PC2	20	41490	2680	27.50	27.54
CA_41D-41C	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	LTE B41 PC2	20	39948	2525.8	LTE B41 PC2	20	40146	2545.6	LTE B41 PC2	20	41292	2660.2	LTE B41 PC2	20	41490	2680	27.47	27.54

Table 30
Reduced Output Powers – Hotspot Mode Active

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC				SCC 1				SCC 2				SCC 3				SCC 4				Power			
				PCC (UL) Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]
CA_41A-41A(1)	LTE B41 PC2	20	41055	2636.5	16QAM	1	0	41055	2636.5	LTE B41 PC2	20	39750	2506	-	-	-	-	-	-	-	-	-	-	-	-	27.47	27.50
CA_41A-41C	LTE B41 PC2	20	41055	2636.5	16QAM	1	0	41055	2636.5	LTE B41 PC2	20	39948	2525.8	LTE B41 PC2	20	39750	2506	-	-	-	-	-	-	-	-	27.46	27.50
CA_41C-41A	LTE B41 PC2	20	41055	2636.5	16QAM	1	0	41055	2636.5	LTE B41 PC2	20	40857	2616.7	LTE B41 PC2	20	39750	2506	-	-	-	-	-	-	-	-	27.46	27.50
CA_41E	LTE B41 PC2	20	41055	2636.5	16QAM	1	0	41055	2636.5	LTE B41 PC2	20	40857	2616.7	LTE B41 PC2	20	40659	2596.9	LTE B41 PC2	20	40461	2577.1	-	-	-	-	27.40	27.50
CA_41A-41D	LTE B41 PC2	20	41055	2636.5	16QAM	1	0	41055	2636.5	LTE B41 PC2	20	40146	2545.6	LTE B41 PC2	20	39948	2525.8	LTE B41 PC2	20	39750	2506	-	-	-	-	27.47	27.50
CA_41C-41C	LTE B41 PC2	20	41055	2636.5	16QAM	1	0	41055	2636.5	LTE B41 PC2	20	40857	2616.7	LTE B41 PC2	20	39948	2525.8	LTE B41 PC2	20	39750	2506	-	-	-	-	27.38	27.50
CA_41D-41A	LTE B41 PC2	20	41055	2636.5	16QAM	1	0	41055	2636.5	LTE B41 PC2	20	40857	2616.7	LTE B41 PC2	20	40659	2596.9	LTE B41 PC2	20	39948	2525.8	LTE B41 PC2	20	39750	2506	27.23	27.50
CA_41C-41D	LTE B41 PC2	20	41055	2636.5	16QAM	1	0	41055	2636.5	LTE B41 PC2	20	40857	2616.7	LTE B41 PC2	20	40146	2545.6	LTE B41 PC2	20	39948	2525.8	LTE B41 PC2	20	39750	2506	27.23	27.50
CA_41D-41C	LTE B41 PC2	20	41055	2636.5	16QAM	1	0	41055	2636.5	LTE B41 PC2	20	40857	2616.7	LTE B41 PC2	20	40659	2596.9	LTE B41 PC2	20	39948	2525.8	LTE B41 PC2	20	39750	2506	27.20	27.50

Table 31
Reduced Output Powers – Grip Sensor Active

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC				SCC 1				SCC 2				SCC 3				SCC 4				Power			
				PCC (UL) Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41A-41A(1)	LTE B41 PC2	20	41490	2680	16QAM	1	0	41490	2680	LTE B41 PC2	20	39750	2506	-	-	-	-	-	-	-	-	-	-	-	-	23.61	23.49
CA_41A-41C	LTE B41 PC2	20	41490	2680	16QAM	1	0	41490	2680	LTE B41 PC2	20	39948	2525.8	LTE B41 PC2	20	39750	2506	-	-	-	-	-	-	-	-	23.52	23.49
CA_41C-41A	LTE B41 PC2	20	41490	2680	16QAM	1	0	41490	2680	LTE B41 PC2	20	41292	2660.2	LTE B41 PC2	20	39750	2506	-	-	-	-	-	-	-	-	23.31	23.49
CA_41E	LTE B41 PC2	20	41490	2680	16QAM	1	0	41490	2680	LTE B41 PC2	20	41292	2660.2	LTE B41 PC2	20	41094	2640.4	LTE B41 PC2	20	40896	2620.6	-	-	-	-	23.55	23.49
CA_41A-41D	LTE B41 PC2	20	41490	2680	16QAM	1	0	41490	2680	LTE B41 PC2	20	40146	2545.6	LTE B41 PC2	20	39948	2525.8	LTE B41 PC2	20	39750	2506	-	-	-	-	23.97	23.49
CA_41C-41C	LTE B41 PC2	20	41490	2680	16QAM	1	0	41490	2680	LTE B41 PC2	20	41292	2660.2	LTE B41 PC2	20	39948	2525.8	LTE B41 PC2	20	39750	2506	-	-	-	-	23.59	23.49
CA_41D-41A	LTE B41 PC2	20	41490	2680	16QAM	1	0	41490	2680	LTE B41 PC2	20	41292	2660.2	LTE B41 PC2	20	41094	2640.4	LTE B41 PC2	20	39750	2506	-	-	-	-	23.56	23.49
CA_41C-41D	LTE B41 PC2	20	41490	2680	16QAM	1	0	41490	2680	LTE B41 PC2	20	41292	2660.2	LTE B41 PC2	20	40146	2545.6	LTE B41 PC2	20	39948	2525.8	LTE B41 PC2	20	39750	2506	23.20	23.49
CA_41D-41C	LTE B41 PC2	20	41490	2680	16QAM	1	0	41490	2680	LTE B41 PC2	20	41292	2660.2	LTE B41 PC2	20	41094	2640.4	LTE B41 PC2	20	39948	2525.8	LTE B41 PC2	20	39750	2506	23.23	23.49

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Reviewed by:
Quality Manager

Test Dates:

05/07/18 - 06/11/18

DUT Type:

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1.4 4x4 Downlink MIMO RF Conduction Powers

This device supports downlink 4x4 MIMO operations for some LTE bands. Uplink transmission is limited to a single output stream. When carrier aggregation was applicable, the general test selection and setup procedures described in Section 1.2 were applied.

Per May 2017 TCB Workshop Notes, SAR for 4x4 DL MIMO was not needed since the maximum average output power in 4x4 DL MIMO mode was not more than 0.25 dB higher than the maximum output power with 4x4 DL MIMO inactive. Additionally, SAR for 4x4 MIMO Downlink Carrier Aggregation was not needed since the maximum average output power in 4x4 MIMO Downlink Carrier Aggregation mode was not more than 0.25 dB higher than the maximum output power with 4x4 MIMO Downlink and downlink carrier aggregation inactive.

1.4.1 LTE 4x4 DL MIMO Standalone Powers

Table 32
Maximum Output Powers

LTE Band	Bandwidth [MHz]	Channel	Frequency [MHz]	Modulation	RB Size	RB Offset	4x4 DL MIMO Tx. Power [dBm]	Single Antenna Tx. Power [dBm]	Target Power [dBm]
4	20	20050	1720	QPSK	1	0	24.36	24.24	24.5
66	20	132072	1720	QPSK	1	0	24.33	24.24	24.5
2	10	19150	1905	QPSK	1	0	24.70	24.56	24.2
25	10	26640	1910	QPSK	1	0	24.69	24.56	24.2
7	20	21350	2560	QPSK	1	0	23.59	23.62	23.0
30	5	27710	2310	QPSK	1	24	23.81	23.91	23.5
41	15	40620	2593	QPSK	1	0	24.20	24.15	24.0
41 PC2	20	39750	2506	QPSK	1	0	27.51	27.54	27.2

Table 33
Reduced Output Powers – Hotspot Mode Active

LTE Band	Bandwidth [MHz]	Channel	Frequency [MHz]	Modulation	RB Size	RB Offset	4x4 DL MIMO Tx. Power [dBm]	Single Antenna Tx. Power [dBm]	Target Power [dBm]
4	20	20050	1720	16QAM	1	0	20.99	21.00	20.0
66	20	132072	1720	16QAM	1	0	20.97	21.00	20.0
2	20	18700	1860	QPSK	1	0	20.48	20.50	19.5
25	20	26140	1860	QPSK	1	0	20.44	20.50	19.5
7	15	21100	2535	16QAM	1	0	20.41	20.38	19.5
30	10	27710	2310	16QAM	1	0	20.68	20.78	20.0
41	20	40620	2593	16QAM	1	0	22.48	22.49	21.5
41 PC2	20	41055	2636.5	16QAM	1	0	22.48	22.50	21.5

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Table 34
Reduced Output Powers – Grip Sensor Active

LTE Band	Bandwidth [MHz]	Channel	Frequency [MHz]	Modulation	RB Size	RB Offset	4x4 DL MIMO Tx. Power [dBm]	Single Antenna Tx. Power [dBm]	Target Power [dBm]
4	15	20300	1745	16QAM	1	0	21.96	21.93	21.0
66	15	132322	1745	16QAM	1	0	21.95	21.93	21.0
2	20	18700	1860	16QAM	1	0	20.48	20.50	19.5
25	20	26140	1860	16QAM	1	0	20.44	20.50	19.5
7	15	20825	2507.5	16QAM	1	0	20.64	20.61	20.0
30	10	27710	2310	64QAM	1	0	22.12	22.03	21.5
41	20	41490	2680	16QAM	1	0	23.29	23.30	23.0
41 PC2	20	41490	2680	16QAM	1	0	23.62	23.49	23.0

1.4.2

LTE Band 12 as PCC

Table 35
Maximum Output Powers

Combination	PCC Band	PCC										SCC 1										SCC 2										Power	
		PCC BW [MHz]	PCC [UL] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Cont. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]											
CA {2A1-12A11}	LTE B12	10	23095	707.5	QPSK	1	0	S095	737.5	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	-	-	-	-	-	-	-	-										
CA {4A1-12A11}	LTE B12	10	23095	707.5	QPSK	1	0	S095	737.5	2x2 MIMO	LTE B4	20	2175	2132.5	4x4 MIMO	-	-	-	-	-	-	-	-										
CA {2A-16A11}	LTE B12	10	23095	707.5	QPSK	1	0	S095	737.5	2x2 MIMO	LTE B66	20	66786	2145	4x4 MIMO	-	-	-	-	-	-	-	-										
CA {2A1-2A-12A}	LTE B12	10	23095	707.5	QPSK	1	0	S095	737.5	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B2	20	700	1960	2x2 MIMO	24.67	24.64											
CA {2A1-4A-12A}	LTE B12	10	23095	707.5	QPSK	1	0	S095	737.5	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	24.68	24.64											
CA {2A-4A1-12A}	LTE B12	10	23095	707.5	QPSK	1	0	S095	737.5	2x2 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B4	20	2175	2132.5	4x4 MIMO	24.66	24.64											
CA {2A1-7A-12A}	LTE B12	10	23095	707.5	QPSK	1	0	S095	737.5	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B2	20	3100	2655	2x2 MIMO	24.31	24.64											
CA {2A1-12A-30A}	LTE B12	10	23095	707.5	QPSK	1	0	S095	737.5	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B30	20	19820	2655	2x2 MIMO	24.10	24.64											
CA {2A-12A-30A}	LTE B12	10	23095	707.5	QPSK	1	0	S095	737.5	2x2 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B30	20	19820	2655	4x4 MIMO	24.09	24.64											
CA {2A-12A-66A}	LTE B12	10	23095	707.5	QPSK	1	0	S095	737.5	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B66	20	66786	2145	2x2 MIMO	24.66	24.64											
CA {2A-12A-16A}	LTE B12	10	23095	707.5	QPSK	1	0	S095	737.5	2x2 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B66	20	66786	2145	4x4 MIMO	24.65	24.64											
CA {4A-12A-16A}	LTE B12	10	23095	707.5	QPSK	1	0	S095	737.5	2x2 MIMO	LTE B4	20	2175	2132.5	4x4 MIMO	LTE B4	10	2350	2150	2x2 MIMO	24.67	24.64											
CA {2A-16A1-16A}	LTE B12	10	23095	707.5	QPSK	1	0	S095	737.5	2x2 MIMO	LTE B66	20	66786	2145	4x4 MIMO	LTE B66	20	66786	2145	4x4 MIMO	24.67	24.64											
CA {2A-16A1-66A}	LTE B12	10	23095	707.5	QPSK	1	0	S095	737.5	2x2 MIMO	LTE B66	20	66786	2145	4x4 MIMO	LTE B66	20	67236	2150	2x2 MIMO	24.64	24.64											

1.4.3

LTE Band 17 as PCC

Table 36
Maximum Output Powers

Combination	PCC									SCC 1				Power			
	PCC Band	PCC BW [MHz]	PCC (UL) Ch. Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Ch.	PCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Ch. Freq. [MHz]	DL Ant. Config.	LTE Tx.Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)		
CA 12A-17A	LTE R17	10	23790	710	QPSK	1	0	5790	740	2x2 MIMO	LTE R7	10	900	1960	4x4 MIMO	24.63	24.64

1.4.4

LTE Band 13 as PCC

Table 37
Maximum Output Powers

Combination	PCB Band	PCB				SC1				SC2				SC3				Power						
		PCB BW [MHz]	PCB (UL) Ch.	Mod.	PCB UHF RB	PCB UL RB Offset	PCB (DL) Ch.	PCB (DL) Freq. [MHz]	DL Ant. Config.	SCB Band	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	SCB Band	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	SCB Band	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	LTE Tx Power (dBm)	LTE Single Carrier Tx Power (dBm)	
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	790	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813	10	2320	782	QPSK	1	25	5250	751	2A-MIMO	LTE 82	20	800	1560	4A-MIMO	LTE 82	20	2175	1560	4A-MIMO	LTE 82	20	26.00	26.11
CA (2A) 2A-15A	LTE 813																							

ICC ID: A3LSMN960U	 SAR EVALUATION REPORT 	Reviewed by: Quality Manager
Test Dates: 05/07/18 - 06/11/18	DUT Type: Portable Handset	APPENDIX H: Page 12 of 28

Reduced Output Powers – Hotspot Mode Active

PCB																	SCC 1				SCC 2				SCC 3				Power			
Combination	PCB Band	PCB BW [MHz]	PCB (U) Ch	PCB (D) Freq [MHz]	Mod.	PCB UPLRB	PCB UR Offset	PCB (C) Ch	PCB (D) Freq [MHz]	Dt. Ant. Config.	SCC Band	SCC BW [MHz]	SCC (D) Ch	SCC (D) Freq [MHz]	Dt. Ant. Config.	SCC Band	SCC BW [MHz]	SCC (C) Ch	SCC (D) Freq [MHz]	Dt. Ant. Config.	SCC Band	SCC BW [MHz]	SCC (C) Ch	SCC (D) Freq [MHz]	Dt. Ant. Config.	LTE Tx Power with CA (dBm)	LTE Single Carrier Tx Power (dBm)					
CA [24A] 141 (2)	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	-	-	-	-	-	-	-	-	-	-	-	-	-				
CA [40A] 141	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2050	2145	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	20.5	21.00
CA [40A] 124-125	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2050	2145	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	20.5	21.00
CA [40A] 127A	LTE B4	20	20550	1715	SSB-M	1	0	20550	2115	4x4 MIMO	LTE B17	10	6790	780	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CA [24A] 28-4A	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	2x2 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	20.5	20.95
CA [40A] 140	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2050	2145	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	20.5	21.00
CA [24A] 44-4A	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	2x2 MIMO	LTE B4	20	2100	2145	2x2 MIMO	LTE B2	20	2000	1960	4x4 MIMO	LTE B2	20	2000	1960	4x4 MIMO	LTE B2	20	2000	1960	4x4 MIMO	20.5	21.00
CA [40A] 140	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2050	2145	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	20.5	21.00
CA [24A] 44-4A	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	2x2 MIMO	LTE B4	20	2100	2145	4x4 MIMO	LTE B2	20	2000	1960	4x4 MIMO	LTE B2	20	2000	1960	4x4 MIMO	LTE B2	20	2000	1960	4x4 MIMO	20.5	21.00
CA [24A] 45-5A	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	2x2 MIMO	LTE B2	20	2000	1960	4x4 MIMO	LTE B5	10	2125	2081.5	2x2 MIMO	LTE B2	20	2000	1960	4x4 MIMO	LTE B2	20	2000	1960	4x4 MIMO	20.5	21.00
CA [40A] 140	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2050	2145	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	20.5	21.00
CA [24A] 44-7A	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	2x2 MIMO	LTE B2	20	2000	1960	4x4 MIMO	LTE B7	10	3100	2055	2x2 MIMO	LTE B2	20	2000	1960	4x4 MIMO	LTE B2	20	2000	1960	4x4 MIMO	20.5	21.00
CA [24A] 46-7A	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2000	1960	2x2 MIMO	LTE B7	10	3100	2055	2x2 MIMO	LTE B2	20	2000	1960	4x4 MIMO	LTE B2	20	2000	1960	4x4 MIMO	20.5	21.00
CA [40A] 140	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2050	2145	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	20.5	21.00
CA [40A] 124-125	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2050	2145	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	20.5	21.00
CA [40A] 127A	LTE B4	20	20550	1715	SSB-M	1	0	20550	2115	4x4 MIMO	LTE B17	10	6790	780	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CA [24A] 44-13A	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	2x2 MIMO	LTE B2	20	2000	1960	4x4 MIMO	LTE B11	10	5230	751	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	-	-
CA [24A] 44-13A	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2000	1960	2x2 MIMO	LTE B11	10	5230	751	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	-	-
CA [40A] 140	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2050	2145	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	20.5	21.00
CA [40A] 124-125	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2050	2145	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	20.5	21.00
CA [40A] 127A	LTE B4	20	20550	1715	SSB-M	1	0	20550	2115	4x4 MIMO	LTE B17	10	6790	780	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CA [24A] 44-13A	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	2x2 MIMO	LTE B2	20	2000	1960	4x4 MIMO	LTE B11	10	5230	751	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	-	-
CA [24A] 44-13A	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2000	1960	2x2 MIMO	LTE B11	10	5230	751	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	-	-
CA [40A] 140	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2050	2145	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	20.5	21.00
CA [40A] 124-125	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2050	2145	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	20.5	21.00
CA [40A] 127A	LTE B4	20	20550	1715	SSB-M	1	0	20550	2115	4x4 MIMO	LTE B17	10	6790	780	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CA [24A] 44-13A	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	2x2 MIMO	LTE B2	20	2000	1960	4x4 MIMO	LTE B11	10	5230	751	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	-	-
CA [24A] 44-13A	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2000	1960	2x2 MIMO	LTE B11	10	5230	751	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	-	-
CA [40A] 140	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2050	2145	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	20.5	21.00
CA [40A] 124-125	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2050	2145	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	20.5	21.00
CA [40A] 127A	LTE B4	20	20550	1715	SSB-M	1	0	20550	2115	4x4 MIMO	LTE B17	10	6790	780	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CA [24A] 44-13A	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	2x2 MIMO	LTE B2	20	2000	1960	4x4 MIMO	LTE B11	10	5230	751	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	-	-
CA [24A] 44-13A	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2000	1960	2x2 MIMO	LTE B11	10	5230	751	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	-	-
CA [40A] 140	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2050	2145	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	20.5	21.00
CA [40A] 124-125	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2050	2145	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	20.5	21.00
CA [40A] 127A	LTE B4	20	20550	1715	SSB-M	1	0	20550	2115	4x4 MIMO	LTE B17	10	6790	780	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CA [24A] 44-13A	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	2x2 MIMO	LTE B2	20	2000	1960	4x4 MIMO	LTE B11	10	5230	751	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	-	-
CA [24A] 44-13A	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2000	1960	2x2 MIMO	LTE B11	10	5230	751	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	-	-
CA [40A] 140	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2050	2145	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	20.5	21.00
CA [40A] 124-125	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2050	2145	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	20.5	21.00
CA [40A] 127A	LTE B4	20	20550	1715	SSB-M	1	0	20550	2115	4x4 MIMO	LTE B17	10	6790	780	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CA [24A] 44-13A	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	2x2 MIMO	LTE B2	20	2000	1960	4x4 MIMO	LTE B11	10	5230	751	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	-	-
CA [24A] 44-13A	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2000	1960	2x2 MIMO	LTE B11	10	5230	751	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	-	-
CA [40A] 140	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2050	2145	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	LTE B2	20	2050	1960	4x4 MIMO	20.5	21.00
CA [40A] 124-125	LTE B4	20	20550	1720	SSB-M	1	0	20550	2120	4x4 MIMO	LTE B2	20	2050	2145	4x4 M																	

Table 43
Reduced Output Powers – Grip Sensor Active

Combination	PCB Band	PCB										SSC 1										SSC 2										SSC 3										Power	
		PCB BW [MHz]	PCB (U) Ch.	PCB (D) Freq. [MHz]	Mod.	PCB U/FB	PCB U/FB	PCB (C) Ch.	PCB (D) Freq. [MHz]	Dt. Ant. Config.	SSC Band	SSC BW [MHz]	SSC (C) Ch.	SSC (D) Freq. [MHz]	Dt. Ant. Config.	SSC Band	SSC BW [MHz]	SSC (C) Ch.	SSC (D) Freq. [MHz]	Dt. Ant. Config.	SSC Band	SSC BW [MHz]	SSC (C) Ch.	SSC (D) Freq. [MHz]	Dt. Ant. Config.	SSC Band	SSC BW [MHz]	SSC (C) Ch.	SSC (D) Freq. [MHz]	Dt. Ant. Config.	LTE Tx Power with CA (dBm)	LTE Single Carrier Tx Power (dBm)											
CA [24.124.1] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	444-MIMO	LTE B9	20	9000	1560	444-MIMO																	21.93	21.93										
CA [24.124.2] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	444-MIMO	LTE B9	20	9000	1560	444-MIMO	LTE B7	20	2950	285.5	444-MIMO	LTE B7	20	2950	285.5	444-MIMO	LTE B7	20	2950	285.5	444-MIMO	21.93	21.93											
CA [24.124.3] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	444-MIMO	LTE B13	10	5095	737.5	262-MIMO	LTE B13	10	5095	737.5	262-MIMO	LTE B13	10	5095	737.5	262-MIMO	LTE B13	10	5095	737.5	262-MIMO	21.93	21.93											
CA [44.124.1] (7)	LTE B4	30	20500	1745	SSB-M	1	0	2300	2145	444-MIMO	LTE B17	30	5790	740	262-MIMO																	21.93	21.93										
CA [24.124.20] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B9	20	9000	1560	444-MIMO	LTE B7	20	2950	285.5	444-MIMO	LTE B7	20	2950	285.5	444-MIMO	LTE B7	20	2950	285.5	444-MIMO	21.93	21.93											
CA [24.124.21] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	444-MIMO	LTE B9	20	9000	1560	444-MIMO	LTE B7	20	2950	285.5	444-MIMO	LTE B7	20	2950	285.5	444-MIMO	LTE B7	20	2950	285.5	444-MIMO	21.93	21.93											
CA [24.124.44A] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B4	20	20500	2120	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44B] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B4	20	20500	2120	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44C] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B4	10	2325	881.5	262-MIMO	LTE B4	10	2325	881.5	262-MIMO	LTE B4	10	2325	881.5	262-MIMO	21.93	21.93											
CA [24.124.44D] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44E] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44F] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44G] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44H] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44I] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44J] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44K] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44L] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44M] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44N] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44O] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44P] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44Q] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44R] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44S] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44T] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44U] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44V] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44W] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44X] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44Y] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.44Z] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.45A] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.45B] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.45C] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.45D] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.45E] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.45F] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.45G] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.45H] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93	21.93											
CA [24.124.45I] (9)	LTE B4	15	20500	1745	SSB-M	1	0	2300	2145	262-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	LTE B2	20	900	1560	444-MIMO	21.93												

FCC ID: A3LSMN960U	 PCTEST ANALYSIS - TESTING - CERTIFICATION	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Test Dates: 05/07/18 - 06/11/18	DUT Type: Portable Handset			APPENDIX H: Page 14 of 28

[illegible]

Combination	PCB Band	PCB BW [MHz]	PCB										SCC1										SCC2										SCC3										Power	
			PCF (DU) Ch.	PCF (DL) Freq. [MHz]	Mod.	PCF UL RB	PCF UL RB Offset	PCF (DU) Ch.	PCF (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC (DU) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC (DU) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC (DU) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC (DU) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC (DU) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	LTE Power with DC CA [dBm]	LTE Single Carrier Power [dBm]												
CA 12A-66A	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B2	20	900	1960	4x4 MIMO															20.05	21.00													
CA 2A-66A	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	20.05	21.00												
CA 12A1-66A	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO															20.04	21.00													
CA 12A1-66A1 (1)	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	4x4 MIMO	LTB B12	10	5095	737.5	2x2 MIMO															20.04	21.00													
CA 12A1-66A1 (2)	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	4x4 MIMO	LTB B6	20	68734	2138	4x4 MIMO															20.04	21.00													
CA 12C1-66A	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B2	20	702	1980	4x4 MIMO										20.09	21.00													
CA 3C1-66A	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	4x4 MIMO	LTB B2	20	900	1960	2x2 MIMO	LTB B2	20	702	1980	2x2 MIMO										20.07	21.00													
CA 12C1-66A1 (1)	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B2	20	702	1980	4x4 MIMO	LTB B2	20	702	1980	4x4 MIMO	LTB B2	20	702	1980	4x4 MIMO	20.08	21.00												
CA 12A1-2A-66A	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B2	20	702	1980	2x2 MIMO										20.07	21.00													
CA 12A1-2A-66A1 (1)	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B2	20	702	1980	2x2 MIMO	LTB B2	20	702	1980	2x2 MIMO	LTB B2	20	702	1980	2x2 MIMO	20.08	21.00												
CA 12A1-2A-66A1 (2)	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B2	20	702	1980	2x2 MIMO	LTB B2	20	702	1980	2x2 MIMO	LTB B2	20	702	1980	2x2 MIMO	20.08	21.00												
CA 12A1-5A-66A	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B2	20	702	1980	2x2 MIMO										20.04	21.00													
CA 12A1-5A-66A1 (1)	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	4x4 MIMO	LTB B2	20	900	1960	2x2 MIMO	LTB B5	10	2525	881.5	2x2 MIMO										20.02	21.00													
CA 12A1-5A-66A1 (2)	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	4x4 MIMO	LTB B12	10	5095	737.5	2x2 MIMO														20.02	21.00														
CA 12A1-5A-66A1 (3)	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	4x4 MIMO	LTB B6	20	68734	2138	4x4 MIMO														20.04	21.00														
CA 12A1-66B1	LTB B66	15	132047	1717.5	NSGMM	1	0	66511	2117.5	4x4 MIMO	LTB B6B	5	66604	2126.8	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO										20.00	21.00													
CA 12A1-66B2	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	4x4 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO										20.08	21.00													
CA 12A1-66A1-66B1	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	4x4 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	20.09	21.00												
CA 12A1-66A1-66B2	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	4x4 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	20.09	21.00												
CA 2A-66A-73A	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B7B	10	68911	634.5	2x2 MIMO										20.08	21.00													
CA 2A-66A-73A1	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	4x4 MIMO	LTB B2	20	900	1960	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO										20.07	21.00													
CA 2A-66A-73A2	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	4x4 MIMO	LTB B2	20	900	1960	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	20.07	21.00												
CA 3A-66A-66A	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	4x4 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	20.09	21.00												
CA 3A-66A-66A1	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	4x4 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	20.09	21.00												
CA 3A-66A-66A1-66B1	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	4x4 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	20.09	21.00												
CA 3A-66A-66A1-66B2	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	4x4 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	LTB B2	20	900	1960	4x4 MIMO	20.09	21.00												
CA 12A1-66B1-66A	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	20.07	21.00												
CA 12A1-66B1-66A1	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	20.07	21.00												
CA 12A1-66B1-66A1-66B1	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	20.07	21.00												
CA 12A1-66B1-66A1-66B2	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	20.07	21.00												
CA 12A1-66B1-66A1-66B1-66B1	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	20.07	21.00												
CA 12A1-66B1-66A1-66B1-66B2	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	20.07	21.00												
CA 12A1-66B1-66A1-66B1-66B1-66B1	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	20.07	21.00												
CA 12A1-66B1-66A1-66B1-66B1-66B2	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	20.07	21.00												
CA 12A1-66B1-66A1-66B1-66B1-66B1-66B1	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	20.07	21.00												
CA 12A1-66B1-66A1-66B1-66B1-66B1-66B2	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	20.07	21.00												
CA 12A1-66B1-66A1-66B1-66B1-66B1-66B1-66B1	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	20.07	21.00												
CA 12A1-66B1-66A1-66B1-66B1-66B1-66B1-66B2	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	20.07	21.00												
CA 12A1-66B1-66A1-66B1-66B1-66B1-66B1-66B1-66B1	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	20.07	21.00												
CA 12A1-66B1-66A1-66B1-66B1-66B1-66B1-66B1-66B2	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	20.07	21.00												
CA 12A1-66B1-66A1-66B1-66B1-66B1-66B1-66B1-66B1-66B1	LTB B66	20	132027	1720	NSGMM	1	0	66536	2120	2x2 MIMO	LTB B6B	20	68734	2138	4x4 MIMO	LTB B2	20	900	1960	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	LTB B5	10	68911	634.5	2x2 MIMO	20.07	21.00												
CA 12A1-66B1-66A1-66B1-66B1-66B1-66B1-66B1-66B1-66B2	LTB B66																																											

REV 20.05 M

Reduced Output Powers – Grip Sensor Active

Combination	PCB Brand	PCC BW [MHz]	PCC					SSC1					SSC2					SSC3					Power			
			PCC [MHz]	PCC [Ch]	PCC [D] Freq. [MHz]	Mod.	PCC UHF RB	PCC UL RB Offset	PCC [Ch] Ch.	PCC [D] Freq. [MHz]	DL Ant. Config.	SSC Band	PCC [Ch] Ch.	PCC [D] Freq. [MHz]	DL Ant. Config.	SSC Band	PCC [Ch] Ch.	PCC [D] Freq. [MHz]	DL Ant. Config.	SSC Band	PCC [Ch] Ch.	PCC [D] Freq. [MHz]	DL Ant. Config.	LTE Tx Power [dBm]	LTE Single Carrier Tx Power [dBm]	
CA 12A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	-	-	-	-	-	-	-	-	21.96	21.93	
CA 2A-166A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	-	-	-	-	-	-	-	-	21.96	21.93	
CA 12A1-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	4x4 MIMO	LT1 80	20	900	1560	4x4 MIMO	-	-	-	-	-	-	-	-	21.96	21.93	
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	4x4 MIMO	LT1 812	10	5095	737.5	2x2 MIMO	LT1 812	10	5095	737.5	2x2 MIMO	LT1 812	10	5095	737.5	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 812	10	5095	737.5	2x2 MIMO	LT1 812	10	5095	737.5	21.96	21.93
CA 12C1-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 2C-166A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	4x4 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	21.96	21.93
CA 12A1A-66A	LT1 866	15	132322	1745	NSMAM	1	0	66786	2145	2x2 MIMO	LT1 80	20	900	1560	4x4 MIMO	LT1 82	20	900	1560	4x4 MIMO	LT1 82	20				

FCC ID: A3LSMN960U	 PCTEST ANALYSIS CENTER, LLC	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Test Dates: 05/07/18 - 06/11/18	DUT Type: Portable Handset			APPENDIX H: Page 16 of 28

[illegible]

FCC ID: A3LSMN960U	 SAR EVALUATION REPORT 	Reviewed by: Quality Manager
Test Dates: 05/07/18 - 06/11/18	DUT Type: Portable Handset	APPENDIX H: Page 17 of 28

Table 48
Reduced Output Powers – Hotspot/Grip Sensor Active

Combination	PCC Band	PCC										SCC 1										SCC 2										SCC 3										Power	
		PCC BW (MHz)	PCC (CA) (MHz)	PCC (DL Freq. (MHz))	Mod.	PCC UL/RB	PCC UL/RB Offset	PCC (DL) Ch. (MHz)	PCC (DL) Freq. (MHz)	DL Ant. Config.	SCC Band	SCC (DL) Ch. (MHz)	SCC (DL) Freq. (MHz)	DL Ant. Config.	SCC Band	SCC (DL) Ch. (MHz)	SCC (DL) Freq. (MHz)	DL Ant. Config.	SCC Band	SCC (DL) Ch. (MHz)	SCC (DL) Freq. (MHz)	DL Ant. Config.	SCC Band	SCC (DL) Ch. (MHz)	SCC (DL) Freq. (MHz)	DL Ant. Config.	SCC Band	SCC (DL) Ch. (MHz)	SCC (DL) Freq. (MHz)	DL Ant. Config.	LTE Power (dBm)	LTE Single Carrier Tx Power (dBm)											
CA 12A-12A	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 82	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (4)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-12A (1)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 82	20	1000	1000	262 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-									
CA 12A-12A (2)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 82	20	1000	1000	262 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-									
CA 12A-18A (3)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (4)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (5)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (6)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (7)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (8)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (9)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (10)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (11)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (12)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (13)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (14)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (15)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (16)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (17)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (18)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (19)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (20)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (21)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (22)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (23)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (24)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (25)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (26)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (27)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (28)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (29)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (30)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (31)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (32)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (33)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (34)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (35)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (36)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (37)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (38)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (39)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (40)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (41)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (42)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (43)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (44)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (45)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (46)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (47)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (48)	15.82	20	18000	1800	NSGM	1	0	200	1800	404 MHz	LT 84	20	2175	2132.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
CA 12A-18A (49)	15.82	20	18000	1800	NSGM																																						

FCC ID: A3LSMN960U	 PCTEST ANALYSIS CENTER, LLC	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Test Dates: 05/07/18 - 06/11/18	DUT Type: Portable Handset			APPENDIX H: Page 18 of 28

LTE Band 25 as PCC

Table 49
Maximum Output Powers

		PCC										SSC 1					SSC 2					SSC 3					Power	
Combination	PCC Band	PCC BW [MHz]	PCC (DL) Ch.	PCC (UL) Freq. [MHz]	QoS	PCC UL RB	PCC UL RB Offset	PCC (DL) Ch.	PCC (DL) Freq. [MHz]	DL Ant. Config.	PCC BW [MHz]	SSC 1 Band	SSC 1 (DL) Ch.	SSC 1 (DL) Freq. [MHz]	DL Ant. Config.	SSC 2 Band	SSC 2 (DL) Ch.	SSC 2 (DL) Freq. [MHz]	DL Ant. Config.	SSC 3 Band	SSC 3 (DL) Ch.	SSC 3 (DL) Freq. [MHz]	DL Ant. Config.	LTE Tx Power with CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]			
CA [25A] + [25A] (1)	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B25	20	8340	1930	4x4 MIMO	4x4 MIMO	20	8340	1930	4x4 MIMO	20	8340	1930	4x4 MIMO	20	24.50	24.50	
CA [25A] + 26A	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B26	15	8865	876.5	2x2 MIMO	2x2 MIMO	20	8865	876.5	2x2 MIMO	20	8865	876.5	2x2 MIMO	20	24.50	24.50	
CA [25A] + 26A	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 26A	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 26A + 26A	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B25	20	8340	1930	2x2 MIMO	LTE B26	5	8865	876.5	2x2 MIMO	20	8340	1930	4x4 MIMO	20	24.50	24.50	
CA [25A] + 26A	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B25	20	8340	1930	4x4 MIMO	2x2 MIMO	20	8340	1930	4x4 MIMO	20	8340	1930	4x4 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	40620	2573.0	2x2 MIMO	20	24.50	24.50	
CA [25A] + 41C	LTE B25	10	25600	1930	QPS16	1	0	8640	1930	4x4 MIMO	LTE B41	20	40620	2573.0	2x2 MIMO	2x2 MIMO	20	40										

Table 50
Reduced Output Powers – Hotspot/Grip Sensor Active

Combination	PCC Band	PCC										SCC 1										SCC 2										SCC 3										Power	
		PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL RB Offset	PCC (DL) Ch.	PCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	LTE To Power On With SC Ch Enabled	LTE Single Carrier Power (dBm)												
CA (25A)(25A11)	LTE B20	20	26140	1800	1800M	1	0	B140	1940	444 MHz	LTE B20	20	8100	2951	444 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.40	20.50											
CA (25A)(26A)	LTE B20	20	26140	1800	1800M	1	0	B140	1940	444 MHz	LTE B26	15	8895	876.5	262 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.40	20.50												
CA (25A)(26A)	LTE B20	20	26140	1800	1800M	1	0	B140	1940	444 MHz	LTE B26	20	8100	2951	444 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.40	20.50												
CA (25A)(41A)	LTE B20	20	26140	1800	1800M	1	0	B140	1940	262 MHz	LTE B41	20	40020	2573.2	444 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.40	20.50												
CA (25A)(24A)(26A)	LTE B20	20	26140	1800	1800M	1	0	B140	1940	444 MHz	LTE B26	20	8100	2951	262 MHz	LTE B26	5	8895	876.5	262 MHz	-	-	-	-	-	-	-	-	-	-	20.40	20.50											
CA (25A)(24A)(26A)	LTE B20	20	26140	1800	1800M	1	0	B140	1940	444 MHz	LTE B26	20	8100	2951	444 MHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.40	20.50												
CA (25A)(41C)	LTE B20	20	26140	1800	1800M	1	0	B140	1940	444 MHz	LTE B41	20	40020	2573.2	262 MHz	LTE B41	20	40020	2573.2	444 MHz	-	-	-	-	-	-	-	-	-	-	20.40	20.50											
CA (25A)(41C)	LTE B20	20	26140	1800	1800M	1	0	B140	1940	262 MHz	LTE B41	20	40020	2573.2	262 MHz	LTE B41	20	40020	2573.2	444 MHz	-	-	-	-	-	-	-	-	-	-	20.40	20.50											
CA (25A)(41C)	LTE B20	20	26140	1800	1800M	1	0	B140	1940	444 MHz	LTE B41	20	40020	2573.2	262 MHz	LTE B41	20	40020	2573.2	262 MHz	LTE B41	20	40020	2573.2	262 MHz	LTE B41	20	40020	2573.2	262 MHz	20.40	20.50											

LTE Band 30 Antenna A as PCC

Table 51
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC				PCC UL RB Offset	PCC (DL) Ch.	PCC (DL) Freq [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	SCC 1				SCC 2				Power	
			PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL RB										SCC (DL) Freq. [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	LTE Tx-Power with DC A Enabled [dBm]
CA [2A] [2A]	LTE B10-A10A	10	27710	2310	QPSK	1	0	9820	2355	4x4 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B2	20	700	1960	2x2 MIMO	23.60	23.70			
CA [2A] [2A-30A]	LTE B10-A10A	10	27710	2310	QPSK	1	0	9820	2355	2x2 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B2	20	700	1960	2x2 MIMO	23.75	23.70			
CA [2A-2A] [30A]	LTE B10-A10A	10	27710	2310	QPSK	1	0	9820	2355	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B2	20	700	1960	2x2 MIMO	23.71	23.70			
CA [2A-2A-4A] [30A]	LTE B10-A10A	10	27710	2310	QPSK	1	0	9820	2355	2x2 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B2	20	700	1960	2x2 MIMO	23.68	23.70			
CA [2A] [2A-30A]	LTE B10-A10A	10	27710	2310	QPSK	1	0	9820	2355	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B5	10	2525	881.5	2x2 MIMO	23.60	23.70			
CA [2A-5A] [30A]	LTE B10-A10A	10	27710	2310	QPSK	1	0	9820	2355	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B5	10	2525	881.5	2x2 MIMO	23.70	23.70			
CA [2A] [2A-30A]	LTE B10-A10A	10	27710	2310	QPSK	1	0	9820	2355	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	23.71	23.70			
CA [2A] [2A-30A]	LTE B10-A10A	10	27710	2310	QPSK	1	0	9820	2355	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	23.68	23.70			
CA [2A] [2A-30A]	LTE B10-A10A	10	27710	2310	QPSK	1	0	9820	2355	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B29	10	9715	722.5	2x2 MIMO	23.68	23.70			
CA [2A-29A] [30A]	LTE B10-A10A	10	27710	2310	QPSK	1	0	9820	2355	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B29	10	9715	722.5	2x2 MIMO	23.67	23.70			
CA [2A] [30A-66A]	LTE B10-A10A	10	27710	2310	QPSK	1	0	9820	2355	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B66	20	66786	2145	2x2 MIMO	23.72	23.70			
CA [2A-30A] [66A]	LTE B10-A10A	10	27710	2310	QPSK	1	0	9820	2355	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B66	20	66786	2145	2x2 MIMO	23.68	23.70			
CA [4A-5A] [30A]	LTE B10-A10A	10	27710	2310	QPSK	1	0	9820	2355	4x4 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	LTE B5	10	2525	881.5	2x2 MIMO	23.53	23.70			
CA [4A-12A] [30A]	LTE B10-A10A	10	27710	2310	QPSK	1	0	9820	2355	4x4 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	23.68	23.70			
CA [4A-29A] [30A]	LTE B10-A10A	10	27710	2310	QPSK	1	0	9820	2355	4x4 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	LTE B29	10	9715	722.5	2x2 MIMO	23.69	23.70			
CA [5A] [30A]	LTE B10-A10A	10	27710	2310	QPSK	1	0	9820	2355	2x2 MIMO	LTE B5	10	2525	881.5	2x2 MIMO	LTE B66	20	66786	2145	2x2 MIMO	23.69	23.70			
CA [5A-30A] [66A]	LTE B10-A10A	10	27710	2310	QPSK	1	0	9820	2355	2x2 MIMO	LTE B5	10	2525	881.5	2x2 MIMO	LTE B66	20	66786	2145	4x4 MIMO	23.69	23.70			
CA [12A] [30A]-66A	LTE B10-A10A	10	27710	2310	QPSK	1	0	9820	2355	4x4 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	LTE B66	20	66786	2145	2x2 MIMO	23.66	23.70			
CA [12A-30A] [66A]	LTE B10-A10A	10	27710	2310	QPSK	1	0	9820	2355	2x2 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	LTE B66	20	66786	2145	4x4 MIMO	23.67	23.70			
CA [10A] [66A]-66A	LTE B10-A10A	10	27710	2310	QPSK	1	0	9820	2355	2x2 MIMO	LTE B66	20	66786	2145	2x2 MIMO	LTE B66	20	66786	2145	2x2 MIMO	23.69	23.70			
CA [30A] [66A]-66A	LTE B10-A10A	10	27710	2310	QPSK	1	0	9820	2355	2x2 MIMO	LTE B66	20	66786	2145	4x4 MIMO	LTE B66	20	66786	2145	2x2 MIMO	23.68	23.70			

Table 52
Reduced Output Powers – Hotspot Mode Active

Combination	PCC Band	PCC BW [MHz]	PCC				PCC UL RB Offset	PCC [DL] Ch.	PCC [DL Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL Freq. [MHz]	DL Ant. Config.	Power	LTE Tx Power with DCA Enabled (dBm)	LTE Ant. A Tx Power (dBm)
			PCC [UL] Ch.	PCC [UL Freq. [MHz]	Mod.	PCC UL RB																	
CA [2A] (3A)	LTE B30 AWA	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B2	20	900	1960	4x4 MIMO	-	-	-	-	-	-	20.84	20.79
CA [2A] 2A-30A	LTE B30 AWA	10	27710	2310	64QAM	1	0	9820	2355	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B2	20	700	1940	2x2 MIMO	20.84	20.79	
CA 2A-2A (30A)	LTE B30 AWA	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B2	20	700	1940	2x2 MIMO	20.79	20.79	
CA 2A-4A (30A)	LTE B30 AWA	10	27710	2310	64QAM	1	0	9820	2355	2x2 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B4	20	2725	881.5	2x2 MIMO	20.79	20.79	
CA [2A] 5A-30A	LTE B30 AWA	10	27710	2310	64QAM	1	0	9820	2355	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B5	10	2525	881.5	2x2 MIMO	20.74	20.79	
CA 2A-5A (30A)	LTE B30 AWA	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B5	10	2525	881.5	2x2 MIMO	20.75	20.79	
CA [2A] 12A-30A	LTE B30 AWA	10	27710	2310	64QAM	1	0	9820	2355	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	20.63	20.79	
CA 2A-12A (30A)	LTE B30 AWA	10	27710	2310	64QAM	1	0	9820	2355	2x2 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	20.86	20.79	
CA [2A] 12A-30A	LTE B30 AWA	10	27710	2310	64QAM	1	0	9820	2355	2x2 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B29	10	9715	722.5	2x2 MIMO	20.79	20.79	
CA 2A-29A (30A)	LTE B30 AWA	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B29	10	9715	722.5	2x2 MIMO	88.89	20.79	
CA [2A] 30A-66A	LTE B30 AWA	10	27710	2310	64QAM	1	0	9820	2355	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B66	20	66786	2145	2x2 MIMO	20.74	20.79	
CA 2A-30A (66A)	LTE B30 AWA	10	27710	2310	64QAM	1	0	9820	2355	2x2 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B66	20	66786	2145	4x4 MIMO	20.75	20.79	
CA 4A-40A (66A)	LTE B30 AWA	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	LTE B5	10	2525	881.5	2x2 MIMO	20.79	20.79	
CA 4A-12A (30A)	LTE B30 AWA	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	20.75	20.79	
CA 4A-29A (30A)	LTE B30 AWA	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	LTE B29	10	9715	722.5	2x2 MIMO	20.78	20.79	
CA 5A-50A (66A)	LTE B30 AWA	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B5	10	2525	881.5	2x2 MIMO	LTE B66	20	66786	2145	2x2 MIMO	20.77	20.79	
CA 5A-30A (66A)	LTE B30 AWA	10	27710	2310	64QAM	1	0	9820	2355	2x2 MIMO	LTE B5	10	2525	881.5	2x2 MIMO	LTE B66	20	66786	2145	2x2 MIMO	20.79	20.79	
CA [2A] 30A-66A	LTE B30 AWA	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	LTE B66	20	66786	2145	2x2 MIMO	88.89	20.79	
CA 12A-30A (66A)	LTE B30 AWA	10	27710	2310	64QAM	1	0	9820	2355	2x2 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	LTE B66	20	66786	2145	4x4 MIMO	20.76	20.79	
CA [30A] 46A-66A	LTE B30 AWA	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B66	20	66786	2145	2x2 MIMO	LTE B66	20	67326	2160	2x2 MIMO	20.77	20.79	
CA 30A-66A (66A)	LTE B30 AWA	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B66	20	66786	2145	2x2 MIMO	LTE B66	20	67326	2160	2x2 MIMO	20.79	20.79	

FCC ID: A3LSMN960U	 PCTEST TECHNOLOGY CORPORATION, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Test Dates: 05/07/18 - 06/11/18	DUT Type: Portable Handset			APPENDIX H: Page 19 of 28

Table 53
Reduced Output Powers – Grip Sensor Active

Combination	PCC Band	PCC										SCC 1				SCC 2				Power		
		PCC BW [MHz]	PCC (UL) Ch	PCC (UL) Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Ch	PCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Ch	SCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Ch	SCC (DL) Freq. [MHz]	DL Ant. Config.	LTE Tx Power with DL CA Enabled (dBm)	LTE Ant. A Tx Power (dBm)
CA [2A]-[30A]	LTE B30 Ansa	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B2	20	700	1940	2x2 MIMO	22.39	22.44
CA [2A]-[2A]-[30A]	LTE B30 Ansa	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B2	20	700	1940	2x2 MIMO	22.44	22.44
CA [2A]-[4A]-[30A]	LTE B30 Ansa	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	22.85	22.44
CA [2A]-[5A]-[30A]	LTE B30 Ansa	10	27710	2310	64QAM	1	0	9820	2355	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B5	10	2525	881.5	2x2 MIMO	22.40	22.44
CA [2A]-[5A]-[30A]	LTE B30 Ansa	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B5	10	2525	881.5	2x2 MIMO	22.41	22.44
CA [2A]-[12A]-[30A]	LTE B30 Ansa	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	22.39	22.44
CA [2A]-[12A]-[30A]	LTE B30 Ansa	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	22.39	22.44
CA [2A]-[29A]-[30A]	LTE B30 Ansa	10	27710	2310	64QAM	1	0	9820	2355	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B29	10	9715	722.5	2x2 MIMO	22.44	22.44
CA [2A]-[29A]-[30A]	LTE B30 Ansa	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B29	10	9715	722.5	2x2 MIMO	22.41	22.44
CA [2A]-[30A]-[66A]	LTE B30 Ansa	10	27710	2310	64QAM	1	0	9820	2355	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B66	20	66786	2145	2x2 MIMO	22.42	22.44
CA [2A]-[30A]-[66A]	LTE B30 Ansa	10	27710	2310	64QAM	1	0	9820	2355	2x2 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B66	20	66786	2145	2x2 MIMO	22.43	22.44
CA [4A]-[5A]-[30A]	LTE B30 Ansa	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	LTE B5	10	2525	881.5	2x2 MIMO	22.42	22.44
CA [4A]-[12A]-[30A]	LTE B30 Ansa	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	22.40	22.44
CA [4A]-[29A]-[30A]	LTE B30 Ansa	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	LTE B29	10	9715	722.5	2x2 MIMO	22.42	22.44
CA [4A]-[30A]-[66A]	LTE B30 Ansa	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B5	10	2525	881.5	2x2 MIMO	LTE B66	20	66786	2145	2x2 MIMO	22.43	22.44
CA [4A]-[30A]-[66A]	LTE B30 Ansa	10	27710	2310	64QAM	1	0	9820	2355	2x2 MIMO	LTE B5	10	2525	881.5	2x2 MIMO	LTE B66	20	66786	2145	4x4 MIMO	22.41	22.44
CA [12A]-[30A]-[66A]	LTE B30 Ansa	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	LTE B66	20	66786	2145	2x2 MIMO	22.43	22.44
CA [30A]-[66A]-[66A]	LTE B30 Ansa	10	27710	2310	64QAM	1	0	9820	2355	2x2 MIMO	LTE B66	20	66786	2145	2x2 MIMO	LTE B66	20	67236	2190	2x2 MIMO	22.43	22.44
CA [30A]-[66A]-[66A]	LTE B30 Ansa	10	27710	2310	64QAM	1	0	9820	2355	4x4 MIMO	LTE B66	20	66786	2145	4x4 MIMO	LTE B66	20	67236	2190	2x2 MIMO	22.44	22.44

1.4.1 LTE Band 7 Antenna A as PCC

Table 54
Maximum Output Powers

Combination	PCC Band	PCC										SCC 1				SCC 2				SCC 3				Power			
		PCC BW [MHz]	PCC (UL) Ch.	PCC (DL) Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	LTE Tx Power with DL CA Enabled [dBm]	LTE Ant. A Tx Power [dBm]	
CA [2A]-[4A]	LTE B7 Ansa	10	20800	2505	QPSK	1	0	2800	2625	2x2 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	-	-	-	-	-	23.51	23.48
CA [2A]-[4A]-[7A]	LTE B7 Ansa	10	20800	2505	QPSK	1	0	2800	2625	2x2 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	-	-	-	-	-	23.51	23.48
CA [2A]-[4A]-[7A]	LTE B7 Ansa	10	20800	2505	QPSK	1	0	2800	2625	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	-	-	-	-	-	23.38	23.48
CA [2A]-[7A]	LTE B7 Ansa	10	20800	2505	QPSK	1	0	2800	2625	2x2 MIMO	LTE B7 Ansa	20	3350	2680	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	-	-	-	-	-	23.45	23.48
CA [2A]-[7A]-[7A]	LTE B7 Ansa	10	20800	2505	QPSK	1	0	2800	2625	4x4 MIMO	LTE B7 Ansa	20	3350	2680	2x2 MIMO	LTE B2	20	900	1960	2x2 MIMO	-	-	-	-	-	23.45	23.48
CA [2A]-[7A]-[7A]	LTE B7 Ansa	10	20800	2505	QPSK	1	0	2800	2625	2x2 MIMO	LTE B7 Ansa	20	3350	2680	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	-	-	-	-	-	23.50	23.48
CA [2A]-[7A]-[12A]	LTE B7 Ansa	10	20800	2505	QPSK	1	0	2800	2625	2x2 MIMO	LTE B4	20	2175	2132.5	4x4 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	-	-	-	-	-	23.48	23.48
CA [2A]-[7A]-[12A]	LTE B7 Ansa	10	20800	2505	QPSK	1	0	2800	2625	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	-	-	-	-	-	23.38	23.48
CA [4A]-[7A]	LTE B7 Ansa	10	20800	2505	QPSK	1	0	2800	2625	2x2 MIMO	LTE B7 Ansa	20	3350	2680	2x2 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	-	-	-	-	-	23.44	23.48
CA [4A]-[7A]-[7A]	LTE B7 Ansa	10	20800	2505	QPSK	1	0	2800	2625	4x4 MIMO	LTE B7 Ansa	20	3350	2680	2x2 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	-	-	-	-	-	23.52	23.48
CA [4A]-[7A]-[7A]	LTE B7 Ansa	10	20800	2505	QPSK	1	0	2800	2625	2x2 MIMO	LTE B7 Ansa	20	3350	2680	4x4 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	-	-	-	-	-	23.52	23.48
CA [4A]-[7A]-[12A]	LTE B7 Ansa	10	20800	2505	QPSK	1	0	2800	2625	2x2 MIMO	LTE B4	20	2175	2132.5	4x4 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	-	-	-	-	-	23.45	23.48
CA [4A]-[7A]-[12A]	LTE B7 Ansa	10	20800	2505	QPSK	1	0	2800	2625	4x4 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	-	-	-	-	-	23.48	23.48
CA [2A]-[4A]-[7C]	LTE B7 Ansa	10	20800	2505	QPSK	1	0	2800	2625	4x4 MIMO	LTE B7 Ansa	20	2844	2630.4	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	-	-	-	-	-	23.49	23.48

Table 55
Reduced Output Powers – Hotspot Mode Active

Combination	PCC Band	PCC										SCC 1		SCC 2		SCC 3		Power				
		PCC BW [MHz]	PCC (DL) Ch.	PCC (DL) Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Ch.	PCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	LTE Tx Power with DL CA Enabled (dBm)	LTE Ant. A Tx Power (dBm)
CA [2A]-[4A]-[7A]	LTE B7 Ansa	15	21100	2535	16QAM	1	0	3100	2655	2x2 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	20.59	20.56
CA [2A]-[4A]-[7A]	LTE B7 Ansa	15	21100	2535	16QAM	1	0	3100	2655	2x2 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	20.59	20.56
CA [2A]-[4A]-[7A]	LTE B7 Ansa	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	20.58	20.56
CA [2A]-[7A]-[7A]	LTE B7 Ansa	15	21100	2535	16QAM	1	0	3100	2655	2x2 MIMO	LTE B7 Ansa	20	2850	2630	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	20.67	20.56
CA [2A]-[7A]-[7A]	LTE B7 Ansa	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B7 Ansa	20	2850	2630	2x2 MIMO	LTE B2	20	900	1960	2x2 MIMO	20.60	20.56
CA [2A]-[7A]-[7A]	LTE B7 Ansa	15	21100	2535	16QAM	1	0	3100	2655	2x2 MIMO	LTE B7 Ansa	20	2850	2630	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	20.65	20.56
CA [2A]-[7A]-[12A]	LTE B7 Ansa	15	21100	2535	16QAM	1	0	3100	2655	2x2 MIMO	LTE B4	20	900	1960	4x4 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	20.59	20.56
CA [2A]-[7A]-[12A]	LTE B7 Ansa	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	20.58	20.56
CA [4A]-[7A]-[7A]	LTE B7 Ansa	15	21100	2535	16QAM	1	0	3100	2655	2x2 MIMO	LTE B7 Ansa	20	2850	2630	2x2 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	20.67	20.56
CA [4A]-[7A]-[7A]	LTE B7 Ansa	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B7 Ansa	20	2850	2630	4x4 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	20.60	20.56
CA [2A]-[4A]-[7C]	LTE B7 Ansa	15	21100	2535	16QAM	1	0	3100	2655	2x2 MIMO	LTE B4	20	2175	2132.5	4x4 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	20.58	20.56
CA [2A]-[4A]-[7C]	LTE B7 Ansa	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO	LTE B12	10	5095	737.5	2x2 MIMO	20.60	20.56
CA [4A]-[7A]-[12A]	LTE B7 Ansa	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B7 Ansa	20	2850	2630.4	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	20.71	20.66

Table 56
Reduced Output Powers – Grip Sensor Active

Combination	PCC Band	PCC										SCC 1				SCC 2				SCC 3				Power			
		PCC BW [MHz]	PCC (DL) Ch.	PCC (DL) Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Ch.	PCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	LTE Tx Power with DL CA Enabled (dBm)	LTE Ant. A Tx Power (dBm)
CA [2A]-[4A]-[7A]	LTE B7 Ansa	10	21100	2535	64QAM	1	0	3100	2655	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO						20.59	20.56
CA [2A]-[4A]-[7A]	LTE B7 Ansa	10	21100	2535	64QAM	1	0	3100	2655	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO						20.59	20.56
CA [2A]-[4A]-[7A]	LTE B7 Ansa	10	21100	2535	64QAM	1	0	3100	2655	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO						20.59	20.56
CA [2A]-[4A]-[7A]	LTE B7 Ansa	10	21100	2535	64QAM	1	0	3100	2655	2x2 MIMO	LTE B7 Ansa	20	2650	2630	2x2 MIMO	LTE B2	20	900	1960	2x2 MIMO						20.59	20.56
CA [2A]-[4A]-[7A]	LTE B7 Ansa	10	21100	2535	64QAM	1	0	3100	2655	2x2 MIMO	LTE B7 Ansa	20	2650	2630	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO						20.59	20.56
CA [2A]-[4A]-[7A]	LTE B7 Ansa	10	21100	2535	64QAM	1	0	3100	2655	4x4 MIMO	LTE B7 Ansa	20	2650	2630	2x2 MIMO	LTE B12	20	5095	737.5	2x2 MIMO						20.59	20.56
CA [2A]-[4A]-[7A]	LTE B7 Ansa	10	21100	2535	64QAM	1	0	3100	2655	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B12	20	5095	737.5	2x2 MIMO						20.59	20.56
CA [2A]-[4A]-[7A]	LTE B7 Ansa	10	21100	2535	64QAM	1	0	3100	2655	2x2 MIMO	LTE B7 Ansa	20	2650	2630	2x2 MIMO	LTE B4	20	2175	2132.5	2x2 MIMO						20.59	20.56
CA [2A]-[4A]-[7A]	LTE B7 Ansa	10	21100	2535	64QAM	1	0	3100	2655	2x2 MIMO	LTE B7 Ansa	20	2650	2630	4x4 MIMO	LTE B12	20	5095	737.5	2x2 MIMO						20.59	20.56
CA [4A]-[7A]-[2A] (1)	LTE B7 Ansa	10	21100	2535	64QAM	1	0	3100	2655	2x2 MIMO	LTE B4	20	2175	2132.5	4x4 MIMO	LTE B12	20	5095	737.5	2x2 MIMO						20.59	20.56
CA [4A]-[7A]-[2A] (1)	LTE B7 Ansa	10	21100	2535	64QAM	1	0	3100	2655	2x2 MIMO	LTE B4	20	2175	2132.5	4x4 MIMO	LTE B12	20	5095	737.5	2x2 MIMO						20.59	20.56
CA [4A]-[7A]-[2A] (1)	LTE B7 Ansa	10	21100	2535	64QAM	1	0	3100	2655	4x4 MIMO	LTE B7 Ansa	20	2650	2630	4x4 MIMO	LTE B12	20	5095	737.5	2x2 MIMO						20.59	20.56
CA [4A]-[7A]-[2A] (1)	LTE B7 Ansa	10	21100	2535	64QAM	1	0	3100	2655	2x2 MIMO	LTE B7 Ansa	20	2650	2630	2x2 MIMO	LTE B4	20	2175	737.5	2x2 MIMO						20.59	20.56

Table 58
Reduced Output Powers – Hotspot Mode Active

Reduced Power Mode (RPM) Mode																	Power	
Combination	PCC Band	PCC BW [MHz]	PCC						SCC 1						Power			
			PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL #B	PCC UL RB Offset	PCC (DL) Ch.	PCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	LTE Tx Power Enabled (dBm)	LTE Single Carrier Tx Power (dBm)	
CA {7C}	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B7	15	2950	2640	4x4 MIMO	20.15	20.38	
CA {7A}-7A (1)	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B7	20	2850	2630	2x2 MIMO	20.17	20.38	
CA {7A}-7A (1)	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B7	20	2850	2630	4x4 MIMO	20.18	20.38	
CA {7A}-7A (1)	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B7	20	2850	2630	4x4 MIMO	20.13	20.38	

Table 59
Reduced Output Powers – Grip Sensor Active

Combination	PCC Band	PCC BW [MHz]	PCC						SCC 1						Power		
			PCC (UL) Ch.	PCC (DL) Freq. [MHz]	Mod.	PCC UL # RB	PCC UL RB Offset	PCC (DL) Ch.	PCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA, [7C]	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	4x4 MIMO	LTE B7	15	2975	2642.5	4x4 MIMO	20.56	20.61
CA, [7A]-[7A] (1)	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	4x4 MIMO	LTE B7	20	3350	2680	2x2 MIMO	20.59	20.61
CA, [7A]-[7A] (1)	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	2x2 MIMO	LTE B7	20	3350	2680	4x4 MIMO	20.58	20.61
CA, [7A]-[7A] (1)	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	4x4 MIMO	LTE B7	20	3350	2680	4x4 MIMO	20.58	20.61

1.4.3

LTE Band 41 as PCC

Table 60
Maximum Output Powers

[illegible]

Table 61
Reduced Output Powers – Hotspot Mode Active

[illegible]

Table 62
Reduced Output Powers – Grip Sensor Active

[illegible]

1.4.4

LTE Band 41 PC2 as PCC

Table 63
Maximum Output Powers

Combination	PCB Band	PCB BW [MHz]	PCC [UL] Ch	PCC				PCC UL RB Offset	PCC [DL] Ch	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch	SCC [DL] Freq. [MHz]	DL Ant. Config.	LTE Tx Power [dBm]	LTE Single Carrier Power [dBm]
				Mod.	PCCL UL RB	PCCL UL RB Offset	PCCL [DL] Ch																					
CA (4A14)(4A13)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A13)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A13)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	27.50	27.50	
CA (4A14)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	40146	2545.8	4A4 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A13)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	41262	2660.2	2x2 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A13)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	41262	2660.2	2x2 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	41262	2660.2	2x2 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39750	2506	4A4 MIMO	LTE B41 PC2	20	39948	2575.8	4A4 MIMO	LTE B41 PC2	20	41840	2680	2x2 MIMO	-	-	-	-	-	27.50	27.50	
CA (4A14)(4A12)	LTE B41 PC2	20	39750	2506	QPSK	1	0	39																				

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Table 64
Reduced Output Powers – Hotspot Mode Active

Combination	PCC Band	PCC BW [MHz]	PCC				PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC 1				SCC 2				SCC 3				Power			
			PCC [UL] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC UL RB						SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)	
CA_4A1A4A1A1A1	LTE B41 PC2	20	41055	2636.5	100QAM	1	0	41055	2636.5	4A4 MIMO	LTE B41 PC2	20	39750	2506	2A2 MIMO	-	-	-	-	-	-	-	23.00	23.00			
CA_1A1A1A1A1A1	LTE B41 PC2	20	41055	2636.5	100QAM	1	0	41055	2636.5	4A4 MIMO	LTE B41 PC2	20	39750	2506	4A4 MIMO	-	-	-	-	-	-	-	23.00	23.00			
CA_1A1A1A1A1A1	LTE B41 PC2	20	41055	2636.5	100QAM	1	0	41055	2636.5	2A2 MIMO	LTE B41 PC2	20	39750	2506	4A4 MIMO	-	-	-	-	-	-	-	23.00	23.00			
CA_4A1A1A1A1A1	LTE B41 PC2	20	41055	2636.5	100QAM	1	0	41055	2636.5	4A4 MIMO	LTE B41 PC2	20	40657	2526.7	4A4 MIMO	LTE B41 PC2	20	40659	2526.9	4A4 MIMO	-	-	-	22.00	22.00		
CA_1A1A1A1A1A1	LTE B41 PC2	20	41055	2636.5	100QAM	1	0	41055	2636.5	4A4 MIMO	LTE B41 PC2	20	39948	2525.8	4A4 MIMO	LTE B41 PC2	20	39750	2506	4A4 MIMO	-	-	-	23.00	23.00		
CA_1A1A1A1A1A1	LTE B41 PC2	20	41055	2636.5	100QAM	1	0	41055	2636.5	4A4 MIMO	LTE B41 PC2	20	39948	2525.8	4A4 MIMO	LTE B41 PC2	20	39750	2506	4A4 MIMO	-	-	-	23.00	23.00		
CA_1A1A1A1A1A1	LTE B41 PC2	20	41055	2636.5	100QAM	1	0	41055	2636.5	2A2 MIMO	LTE B41 PC2	20	40657	2526.7	2A2 MIMO	LTE B41 PC2	20	39750	2506	4A4 MIMO	-	-	-	22.00	22.00		
CA_1A1A1A1A1A1	LTE B41 PC2	20	41055	2636.5	100QAM	1	0	41055	2636.5	4A4 MIMO	LTE B41 PC2	20	40657	2526.7	4A4 MIMO	LTE B41 PC2	20	39750	2506	2A2 MIMO	-	-	-	22.00	22.00		
CA_1A1A1A1A1A1	LTE B41 PC2	20	41055	2636.5	100QAM	1	0	41055	2636.5	4A4 MIMO	LTE B41 PC2	20	40657	2526.7	4A4 MIMO	LTE B41 PC2	20	39948	2525.8	4A4 MIMO	LTE B41 PC2	20	39750	2506	2A2 MIMO	23.00	23.00
CA_1A1A1A1A1A1	LTE B41 PC2	20	41055	2636.5	100QAM	1	0	41055	2636.5	2A2 MIMO	LTE B41 PC2	20	40657	2526.7	2A2 MIMO	LTE B41 PC2	20	39948	2525.8	4A4 MIMO	LTE B41 PC2	20	39750	2506	4A4 MIMO	23.00	23.00

Table 65
Reduced Output Powers – Grip Sensor Active

Combination	PCC Band	PCC BW [MHz]	PCC				SCC 1				SCC 2				SCC 3				Power								
			PCC [UL] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)						
CA_1A1A1A1A1A1	LTE B41 PC2	20	41490	2680	100QAM	1	0	41490	2680	4A4 MIMO	LTE B41 PC2	20	39750	2506	2A2 MIMO	-	-	-	-	-	23.00	23.00					
CA_1A1A1A1A1A1	LTE B41 PC2	20	41490	2680	100QAM	1	0	41490	2680	4A4 MIMO	LTE B41 PC2	20	39750	2506	4A4 MIMO	-	-	-	-	-	23.00	23.00					
CA_1A1A1A1A1A1	LTE B41 PC2	20	41490	2680	100QAM	1	0	41490	2680	2A2 MIMO	LTE B41 PC2	20	39750	2506	4A4 MIMO	-	-	-	-	-	23.00	23.00					
CA_1A1A1A1A1A1	LTE B41 PC2	20	41490	2680	100QAM	1	0	41490	2680	4A4 MIMO	LTE B41 PC2	20	41292	2660.2	4A4 MIMO	LTE B41 PC2	20	41294	2660.4	4A4 MIMO	-	23.00	23.00				
CA_1A1A1A1A1A1	LTE B41 PC2	20	41490	2680	100QAM	1	0	41490	2680	2A2 MIMO	LTE B41 PC2	20	39948	2525.8	4A4 MIMO	LTE B41 PC2	20	39750	2506	4A4 MIMO	-	23.00	23.00				
CA_1A1A1A1A1A1	LTE B41 PC2	20	41490	2680	100QAM	1	0	41490	2680	2A2 MIMO	LTE B41 PC2	20	39948	2525.8	4A4 MIMO	LTE B41 PC2	20	39750	2506	4A4 MIMO	-	23.00	23.00				
CA_1A1A1A1A1A1	LTE B41 PC2	20	41490	2680	100QAM	1	0	41490	2680	4A4 MIMO	LTE B41 PC2	20	41292	2660.2	4A4 MIMO	LTE B41 PC2	20	39750	2506	4A4 MIMO	-	23.00	23.00				
CA_1A1A1A1A1A1	LTE B41 PC2	20	41490	2680	100QAM	1	0	41490	2680	4A4 MIMO	LTE B41 PC2	20	41292	2660.2	4A4 MIMO	LTE B41 PC2	20	39750	2506	2A2 MIMO	-	23.00	23.00				
CA_1A1A1A1A1A1	LTE B41 PC2	20	41490	2680	100QAM	1	0	41490	2680	4A4 MIMO	LTE B41 PC2	20	41292	2660.2	4A4 MIMO	LTE B41 PC2	20	39948	2525.8	4A4 MIMO	LTE B41 PC2	20	39750	2506	2A2 MIMO	23.00	23.00
CA_1A1A1A1A1A1	LTE B41 PC2	20	41490	2680	100QAM	1	0	41490	2680	4A4 MIMO	LTE B41 PC2	20	41292	2660.2	4A4 MIMO	LTE B41 PC2	20	39948	2525.8	4A4 MIMO	LTE B41 PC2	20	39750	2506	4A4 MIMO	23.00	23.00

1.5 LAA Downlink Carrier Aggregation

This device supports LAA with downlink carrier aggregation only. It uses carrier aggregation in the downlink to combine LTE in the unlicensed spectrum (i.e. LTE Band 46) with LTE in the licensed band (served as PCC). All uplink communications and acknowledgements on the PCC remain identical to specifications when downlink carrier aggregation is inactive. Due to the wide downlink bandwidth, each Band 46 sub-band, represented by subscripts A, B, C, and D, was evaluated independently. The general test selection and setup procedures described in Section 1.2 were applied.

Per FCC KDB Publication 941225 D05Av01r02, no SAR measurements are required for carrier aggregation configurations when the average output power with downlink only carrier aggregation active is not more than 0.25 dB higher than the average output power with downlink only carrier aggregation inactive.

1.5.1 SISO LAA Downlink Carrier Aggregation RF Conducted Powers

1.5.1.1 LTE Band 13 as PCC

Table 66
Maximum Output Powers

Combination	PCC				SCC 1				SCC 2				SCC 3				Power						
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Ch.	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_13A-46,A	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B46 _A	20	47290	5200	-	-	-	-	-	-	-	-	25.05	25.11
CA_13A-46,A	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B46 _B	20	48290	5300	-	-	-	-	-	-	-	-	25.02	25.11
CA_13A-46,A	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B46 _C	20	51290	5600	-	-	-	-	-	-	-	-	25.06	25.11
CA_13A-46,A	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B46 _D	20	53140	5785	-	-	-	-	-	-	-	-	25.03	25.11
CA_13A-46,C	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B46 _A	20	47290	5200	LTE B46 _B	20	47488	5219.8	-	-	-	-	25.06	25.11
CA_13A-46,C	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B46 _B	20	48290	5300	LTE B46 _C	20	48488	5319.8	-	-	-	-	25.02	25.11
CA_13A-46,C	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B46 _C	20	51290	5600	LTE B46 _D	20	51488	5619.8	-	-	-	-	25.12	25.11
CA_13A-46,C	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B46 _D	20	53140	5785	LTE B46 _A	20	53338	5804.8	-	-	-	-	25.04	25.11
CA_13A-46,D	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B46 _A	20	47290	5200	LTE B46 _B	20	47488	5219.8	LTE B46 _C	20	47092	5180.2	25.02	25.11
CA_13A-46,D	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B46 _B	20	48290	5300	LTE B46 _C	20	48488	5319.8	LTE B46 _D	20	48092	5280.2	25.07	25.11
CA_13A-46,D	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B46 _C	20	51290	5600	LTE B46 _D	20	51488	5619.8	LTE B46 _A	20	51092	5580.2	25.06	25.11
CA_13A-46,D	LTE B13	10	23230	782	QPSK	1	25	5230	751	LTE B46 _D	20	53140	5785	LTE B46 _A	20	53338	5804.8	LTE B46 _B	20	52942	5765.2	25.01	25.11

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1.5.1.2

LTE Band 4 as PCC

Table 67
Maximum Output Powers

Combination	PCC										SCC 1				SCC 2				SCC 3				Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Ch.	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)	
CA_4A-46_A-46_A	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B46 ₅	20	47090	5180	LTE B46 ₅	20	53540	5825	-	-	-	-	24.14	24.24	
CA_4A-46_A-46_C	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B46 ₅	20	47090	5180	LTE B46 ₅	20	53540	5825	LTE B46 ₅	20	53342	5805.2	24.19	24.24	
CA_4A-46_D	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B46 ₅	20	47290	5200	LTE B46 ₅	20	47488	5219.8	LTE B46 ₅	20	47092	5180.2	24.25	24.24	
CA_4A-46_D	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B46 ₅	20	48290	5300	LTE B46 ₅	20	48488	5319.8	LTE B46 ₅	20	48092	5280.2	24.28	24.24	
CA_4A-46_D	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B46 ₅	20	51290	5600	LTE B46 ₅	20	51488	5619.8	LTE B46 ₅	20	51092	5580.2	24.27	24.24	
CA_4A-46_D	LTE B4	20	20050	1720	QPSK	1	0	2050	2120	LTE B46 ₅	20	53140	5785	LTE B46 ₅	20	53338	5804.8	LTE B46 ₅	20	52942	5765.2	24.25	24.24	

Table 68
Reduced Output Powers – Hotspot Mode Active

Combination	PCC									SCC 1				SCC 2				SCC 3				Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Ch.	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_4A-46_A-46_A	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B46 ₅	20	47090	5180	LTE B46 ₅	20	53540	5825	-	-	-	-	21.00	21.00
CA_4A-46_A-46_C	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B46 ₅	20	47090	5180	LTE B46 ₅	20	53540	5825	LTE B46 ₅	20	53342	5805.2	20.97	21.00
CA_4A-46_D	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B46 ₅	20	47290	5200	LTE B46 ₅	20	47488	5219.8	LTE B46 ₅	20	47092	5180.2	21.00	21.00
CA_4A-46_D	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B46 ₅	20	48290	5300	LTE B46 ₅	20	48488	5319.8	LTE B46 ₅	20	48092	5280.2	20.99	21.00
CA_4A-46_D	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B46 ₅	20	51290	5600	LTE B46 ₅	20	51488	5619.8	LTE B46 ₅	20	51092	5580.2	20.99	21.00
CA_4A-46_D	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	LTE B46 ₅	20	53140	5785	LTE B46 ₅	20	53338	5804.8	LTE B46 ₅	20	52942	5765.2	20.97	21.00

Table 69
Reduced Output Powers – Grip Sensor Active

Combination	PCC										SCC 1				SCC 2				SCC 3				Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Ch.	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]	
CA_4A-46_A-46_A	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B46 ₅	20	47090	5180	LTE B46 ₅	20	53540	5825	-	-	-	-	21.95	21.93	
CA_4A-46_A-46_C	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B46 ₅	20	47090	5180	LTE B46 ₅	20	53540	5825	LTE B46 ₅	20	53342	5805.2	21.98	21.93	
CA_4A-46_D	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B46 ₅	20	47290	5200	LTE B46 ₅	20	47488	5219.8	LTE B46 ₅	20	47092	5180.2	22.00	21.93	
CA_4A-46_D	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B46 ₅	20	48290	5300	LTE B46 ₅	20	48488	5319.8	LTE B46 ₅	20	48092	5280.2	21.97	21.93	
CA_4A-46_D	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B46 ₅	20	51290	5600	LTE B46 ₅	20	51488	5619.8	LTE B46 ₅	20	51092	5580.2	22.00	21.93	
CA_4A-46_D	LTE B4	15	20300	1745	16QAM	1	0	2300	2145	LTE B46 ₅	20	53140	5785	LTE B46 ₅	20	53338	5804.8	LTE B46 ₅	20	52942	5765.2	21.93	21.93	

1.5.1.3

LTE Band 66 as PCC

Table 70
Maximum Output Powers

Combination	PCC										SCC 1				SCC 2				SCC 3				SCC 4				Power	
	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)	
CA_2A-46_A-46_A-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B2	20	900	1960	LTE B46 ₅	20	47090	5180	LTE B46 ₅	20	53540	5825	-	-	-	-	-	24.34	24.24
CA_2A-46_A-46_C-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B2	20	900	1960	LTE B46 ₅	20	47090	5180	LTE B46 ₅	20	53540	5825	LTE B46 ₅	20	53342	5805.2	24.13	24.24	
CA_2A-46_D-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B2	20	900	1960	LTE B46 ₅	20	47290	5200	LTE B46 ₅	20	47488	5219.8	LTE B46 ₅	20	47092	5180.2	24.14	24.24	
CA_2A-46_D-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B2	20	900	1960	LTE B46 ₅	20	48290	5300	LTE B46 ₅	20	48488	5319.8	LTE B46 ₅	20	48092	5280.2	24.26	24.24	
CA_2A-46_D-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B2	20	900	1960	LTE B46 ₅	20	51290	5600	LTE B46 ₅	20	51488	5619.8	LTE B46 ₅	20	51092	5580.2	24.22	24.24	
CA_2A-46_D-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B2	20	900	1960	LTE B46 ₅	20	53140	5785	LTE B46 ₅	20	53340	5804.8	LTE B46 ₅	20	52942	5765.2	24.19	24.24	
CA_46-D-66A-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	67236	2190	LTE B46 ₅	20	47290	5200	LTE B46 ₅	20	47488	5219.8	LTE B46 ₅	20	47092	5180.2	24.25	24.24	
CA_46-D-66A-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	67236	2190	LTE B46 ₅	20	48290	5300	LTE B46 ₅	20	48488	5319.8	LTE B46 ₅	20	48092	5280.2	24.24	24.24	
CA_46-D-66A-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	67236	2190	LTE B46 ₅	20	51290	5600	LTE B46 ₅	20	51488	5619.8	LTE B46 ₅	20	51092	5580.2	24.26	24.24	
CA_46-D-66A-66A	LTE B66	20	132072	1720	QPSK	1	0	66536	2120	LTE B66	20	67236	2190	LTE B46 ₅	20	53140	5785	LTE B46 ₅	20	53338	5804.8	LTE B46 ₅	20	52942	5765.2	24.25	24.24	

Table 71
Reduced Output Powers – Hotspot Mode Active

Combination	PCC										SCC 1				SCC 2				SCC 3				SCC 4				Power	
	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)	
CA_2A-46_A-46_A-66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	LTE B2	20	900	1960	LTE B46 ₅	20	47090	5180	LTE B46 ₅	20	53540	5825	-	-	-	-	-	20.96	21.00
CA_2A-46_A-46_C-66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	LTE B2	20	900	1960	LTE B46 ₅	20	47090	5180	LTE B46 ₅	20	53540	5825	LTE B46 ₅	20	53342	5805.2	20.80	21.00	
CA_2A-46_D-66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	LTE B2	20	900	1960	LTE B46 ₅	20	47290	5200	LTE B46 ₅	20	47488	5219.8	LTE B46 ₅	20	47092	5180.2	20.83	21.00	
CA_2A-46_D-66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	LTE B2	20	900	1960	LTE B46 ₅	20	48290	5300	LTE B46 ₅	20	48488	5319.8	LTE B46 ₅	20	48092	5280.2	20.86	21.00	
CA_2A-46_D-66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	LTE B2	20	900	1960	LTE B46 ₅	20	51290	5600	LTE B46 ₅	20	51488	5619.8	LTE B46 ₅	20	51092	5580.2	20.85	21.00	
CA_2A-46_D-66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	LTE B2	20	900	1960	LTE B46 ₅	20	53140	5785	LTE B46 ₅	20	53338	5804.8	LTE B46 ₅	20	52942	5765.2	20.84	21.00	
CA_46-D-66A-66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	LTE B66	20	67236	2190	LTE B46 ₅	20	47290	5200	LTE B46 ₅	20	47488	5219.8	LTE B46 ₅	20	47092	5180.2	20.84	21.00	
CA_46-D-66A-66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	LTE B66	20	67236	2190	LTE B46 ₅	20	48290	5300	LTE B46 ₅	20	48488	5319.8	LTE B46 ₅	20	48092	5280.2	20.82	21.00	
CA_46-D-66A-66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	LTE B66	20	67236	2190	LTE B46 ₅	20	51290	5600	LTE B46 ₅	20	51488	5619.8	LTE B46 ₅	20	51092	5580.2	20.85	21.00	
CA_46-D-66A-66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	LTE B66	20	67236	2190	LTE B46 ₅	20	53140	5785	LTE B46 ₅	20	53338	5804.8	LTE B46 ₅	20	52942	5765.2	20.80	21.00	

LTE Band 2 as PCC

Table 73

Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC				SCC 1				SCC 2				SCC 3				SCC 4				Power				
				Mod.	PCC LAR RB	PCC UL RB Offset	PCC (DL) Ch.	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	LTE Tx-Pwr. With DL CA Enabled (dBm)	LTE Single Carrier Tx-Pwr (dBm)		
CA 2A-4A-6A-6A-6A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B46	20	47090	5180	LTE B46	20	47500	5825	LTE B66	20	66786	2145	-	-	-	24.47	24.56		
CA 2A-2A-6A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B2	20	700	1940	LTE B46	20	47920	5200	LTE B46	20	47488	5218	LTE B46	20	47092	5180	2	24.59	24.56
CA 2A-2A-6A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B2	20	700	1940	LTE B46	20	48250	5900	LTE B46	20	48458	5918	LTE B46	20	48992	5280	2	24.61	24.56
CA 2A-2A-6A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B2	20	700	1940	LTE B46	20	51320	5600	LTE B46	20	51348	5618	LTE B46	20	51092	5180	2	24.61	24.56
CA 2A-2A-6A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B2	20	700	1940	LTE B46	20	53140	5785	LTE B46	20	53138	5804	LTE B46	20	52892	5765	2	24.60	24.56
CA 2A-6A-6A-6A-6A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B46	20	47090	5180	LTE B46	20	47540	5825	LTE B46	20	53342	5805	LTE B66	20	66786	2145	-	24.58	24.56
CA 2A-6A-6A-6A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B46	20	47290	5200	LTE B46	20	47488	5218	LTE B46	20	47092	5180	LTE B66	20	66786	2145	-	24.59	24.56
CA 2A-6A-6A-6A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B46	20	48290	5300	LTE B46	20	48488	5318	LTE B46	20	47092	5180	LTE B66	20	66786	2145	-	24.61	24.56
CA 2A-6A-6A-6A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B46	20	51290	5600	LTE B46	20	51348	5618	LTE B46	20	51092	5602	LTE B66	20	66786	2145	-	24.60	24.56
CA 2A-6A-6A-6A	LTE B2	10	19150	1905	QPSK	1	0	1150	1985	LTE B46	20	53140	5785	LTE B46	20	53348	5804	LTE B46	20	52892	5765	LTE B66	20	66786	2145	-	24.47	24.56

Table 74

Reduced Output Powers – Hotspot/Grip Sensor Active

Combination	PCC										SCC 1				SCC 2				SCC 3				Power				
	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC [DL] Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	LTE Tx-Power with DL CA Enabled (dBm)	LTE Single Carrier Power (dBm)		
CA 2A-4A-6A-4A-6GA	LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B46	20	47090	5180	LTE B46	20	53540	5825	LTE B66	20	66786	5215			20.50	20.50		
CA 2A-4A-6A,0	LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B2	20	1100	1980	LTE B46	20	47290	5200	LTE B66	20	47488	5215	LTE B46	20	47092	5180.2	20.48	20.50
CA 2A-4A-6A,0	LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B2	20	1100	1980	LTE B46	20	46290	5300	LTE B46	20	53488	5315	LTE B66	20	46892	5280.2	20.50	20.50
CA 2A-4A-6A,0	LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B2	20	1100	1980	LTE B46	20	56138	5600	LTE B46	20	53488	5615	LTE B66	20	53092	5580.2	20.50	20.50
CA 2A-4A-6A,0	LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B2	20	1100	1980	LTE B46	20	53140	5785	LTE B46	20	53338	5808	LTE B46	20	52942	5765.2	20.47	20.50
CA 2A-4A-6A-6GA	LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B46	20	47090	5180	LTE B46	20	53540	5825	LTE B46	20	53432	5805.2	LTE B66	20	66786	2145	20.48	20.50
CA 2A-4A-6A,0	LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B46	20	47290	5200	LTE B46	20	47488	5215	LTE B46	20	47092	5180.2	LTE B66	20	66786	2145	20.48	20.50
CA 2A-4A-6GA	LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B46	20	47290	5200	LTE B46	20	46892	5280	LTE B46	20	46892	5280	LTE B46	20	66786	2145	20.48	20.50
CA 2A-4A-6GA	LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B46	20	53290	5660	LTE B46	20	53488	5615	LTE B46	20	53092	5580.2	LTE B66	20	66786	2145	20.47	20.50
CA 2A-4A-6,0-6GA	LTE B2	20	18700	1860	QPSK	1	0	700	1940	LTE B46	20	53140	5785	LTE B46	20	53338	5808	LTE B46	20	52942	5765.2	LTE B66	20	66786	2145	20.43	20.50

1.5.1.5 LTE Band 7 Antenna B as PCC

Table 75

Maximum Output Powers

Combination	PCC										SCC 1				SCC 2				SCC 3				Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Ch.	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)	
CA_74-6A	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	LTE B46 ₅	20	47290	5200	-	-	-	-	-	-	-	-	-	23.66	23.62
CA_74-6A ₁	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	LTE B46 ₅	20	48290	5300	-	-	-	-	-	-	-	-	-	23.65	23.62
CA_74-6A ₂	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	LTE B46 ₅	20	51290	5600	-	-	-	-	-	-	-	-	-	23.60	23.60
CA_74-6A ₃	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	LTE B46 ₅	20	53140	5785	-	-	-	-	-	-	-	-	-	23.65	23.62
CA_74-6C	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	LTE B46 ₅	20	47290	5300	LTE B46 ₅	20	47488	5219.8	-	-	-	-	-	23.64	23.62
CA_74-6C ₁	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	LTE B46 ₅	20	48290	5300	-	-	-	-	-	-	-	-	-	23.65	23.62
CA_74-6C ₂	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	LTE B46 ₅	20	51290	5600	LTE B46 ₅	20	51488	5619.8	-	-	-	-	-	23.62	23.62
CA_74-6C ₃	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	LTE B46 ₅	20	53140	5785	LTE B46 ₅	20	53338	5804.8	-	-	-	-	-	23.64	23.62
CA_74-6D	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	LTE B46 ₅	20	47290	5300	LTE B46 ₅	20	47488	5219.8	LTE B46 ₅	20	47092	5180.2	-	23.63	23.62
CA_74-6D ₁	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	LTE B46 ₅	20	48290	5300	LTE B46 ₅	20	48488	5319.8	LTE B46 ₅	20	48092	5280.2	-	23.62	23.62
CA_74-6D ₂	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	LTE B46 ₅	20	51290	5600	LTE B46 ₅	20	51488	5619.8	LTE B46 ₅	20	51092	5580.2	-	23.61	23.62
CA_74-6D ₃	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	LTE B46 ₅	20	53140	5785	LTE B46 ₅	20	53338	5804.8	LTE B46 ₅	20	52942	5765.2	-	23.60	23.62

Table 76

Reduced Output Powers – Hotspot Mode Active

Combination	PCC										SCC1				SCC2				SCC3				Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Ch.	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	LTE Tx Power with Enabled (dBm)	LTE Single Carrier Tx Power (dBm)	
CA 7A-46A	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	LTE B46 ₀	20	47290	5200	-	-	-	-	-	-	-	-	20.40	20.38	
CA 7A-46A	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	LTE B46 ₀	20	48290	5300	-	-	-	-	-	-	-	-	20.49	20.48	
CA 7A-46A	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	LTE B46 ₀	20	51290	5600	-	-	-	-	-	-	-	-	20.44	20.38	
CA 7A-46A	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	LTE B46 ₀	20	53140	5785	-	-	-	-	-	-	-	-	20.46	20.38	
CA 7A-46C	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	LTE B46 ₀	20	47290	5200	LTE B46 ₀	20	47488	5219.8	-	-	-	-	20.41	20.38	
CA 7A-46C	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	LTE B46 ₀	20	48290	5300	LTE B46 ₀	20	48488	5319.8	-	-	-	-	20.47	20.38	
CA 7A-46C	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	LTE B46 ₀	20	51290	5600	LTE B46 ₀	20	51488	5619.8	LTE B46 ₀	20	51092	5580.2	20.50	20.38	
CA 7A-46C	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	LTE B46 ₀	20	53140	5785	LTE B46 ₀	20	53338	5804.8	-	-	-	-	20.45	20.38	
CA 7A-46D	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	LTE B46 ₀	20	47290	5200	LTE B46 ₀	20	47488	5219.8	LTE B46 ₀	20	47092	5180.2	20.50	20.38	
CA 7A-46D	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	LTE B46 ₀	20	48290	5300	LTE B46 ₀	20	48488	5319.8	LTE B46 ₀	20	48092	5280.2	20.48	20.38	
CA 7A-46D	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	LTE B46 ₀	20	51290	5600	LTE B46 ₀	20	51488	5619.8	LTE B46 ₀	20	51092	5580.2	20.47	20.38	
CA 7A-46D	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	LTE B46 ₀	20	53140	5785	LTE B46 ₀	20	53338	5804.8	LTE B46 ₀	20	52942	5765.2	20.43	20.38	

Table 77

Reduced Output Powers – Grip Sensor Active

Combination	PCC Band	PCC								SCC 1				SCC 2				SCC 3				Power	
		PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL R	PCC UL RB Offset	PCC (DL) Ch.	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA 7A-46A	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	LTE B46 ₁	20	47290	5200	-	-	-	-	-	-	-	-	20.58	20.61
CA 7A-46A	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	LTE B46 ₂	20	48390	5300	-	-	-	-	-	-	-	-	20.60	20.61
CA 7A-46A	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	LTE B46 ₃	20	51290	5600	-	-	-	-	-	-	-	-	20.62	20.61
CA 7A-46A	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	LTE B46 ₄	20	53140	5785	-	-	-	-	-	-	-	-	20.57	20.61
CA 7A-46C	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	LTE B46 ₅	20	47290	5200	LTE B46 ₁	20	47488	5219.8	-	-	-	-	20.61	20.61
CA 7A-46C	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	LTE B46 ₆	20	48290	5300	LTE B46 ₂	20	48488	5319.8	-	-	-	-	20.63	20.61
CA 7A-46C	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	LTE B46 ₇	20	51290	5600	LTE B46 ₃	20	51488	5619.8	-	-	-	-	20.59	20.61
CA 7A-46C	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	LTE B46 ₈	20	53140	5785	LTE B46 ₄	20	53338	5804.8	-	-	-	-	20.61	20.61
CA 7A-46D	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	LTE B46 ₉	20	47290	5300	LTE B46 ₅	20	47488	5219.8	LTE B46 ₁	20	47092	5180.2	20.58	20.61
CA 7A-46D	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	LTE B46 ₁₀	20	48290	5300	LTE B46 ₆	20	48488	5319.8	LTE B46 ₂	20	48092	5280.2	20.61	20.61
CA 7A-46D	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	LTE B46 ₁₁	20	51290	5600	LTE B46 ₇	20	51488	5619.8	LTE B46 ₃	20	51092	5580.2	20.56	20.61
CA 7A-46D	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	LTE B46 ₁₂	20	53140	5785	LTE B46 ₈	20	53338	5804.8	LTE B46 ₄	20	52942	5765.2	20.57	20.61

FCC ID: A3LSMN960U	 PCTEST PROFICIENT COMMUNICATIONS TESTING, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Test Dates: 05/07/18 - 06/11/18	DUT Type: Portable Handset			APPENDIX H: Page 24 of 28

4x4 DL MIMO LAA Downlink Carrier Aggregation RF Conducted Powers

1.5.2.1

LTE Band 4 as PCC

Table 78
Maximum Output Powers

Combination	Mod												SCC 1				SCC 2				SCC 3				Power									
	PCC Band		PCC BW [MHz]		PCC (UL) Freq. [MHz]		PCC (DL) Freq. [MHz]		PCC UL RB Offset		PCC (DL) Ch.		DL Ant. Config.		SCC Band		SCC BW [MHz]		SCC (UL) Freq. [MHz]		DL Ant. Config.		SCC Band		SCC BW [MHz]		SCC (DL) Freq. [MHz]		DL Ant. Config.		LTE Tx Power with DCA Enabled (dBm)		LTE Single Carrier Tx Power (dBm)	
	UL	DL	UL	DL	UL	DL	UL	DL	UL	DL	UL	DL	UL	DL	UL	DL	UL	DL	UL	DL	UL	DL	UL	DL	UL	DL	UL	DL	UL	DL	UL	DL		
CA {4A}-4A-4E-4E	LTE BA	20	20050	1720	GPSK	1	0	2050	2120	4rd MIMO	LTE BA ₆	20	47090	5180	2x2 MIMO	LTE BA ₆	20	53540	5825	2x2 MIMO	LTE BA ₆	20	53842	5825	2x2 MIMO	LTE BA ₆	20	53842	5825	2x2 MIMO	24.25	24.25		
CA {4A}-4E-4E-4E	LTE BA	20	20050	1720	GPSK	1	0	2050	2120	4rd MIMO	LTE BA ₆	20	47090	5180	2x2 MIMO	LTE BA ₆	20	53540	5825	2x2 MIMO	LTE BA ₆	20	53842	5825	2x2 MIMO	LTE BA ₆	20	53842	5825	2x2 MIMO	24.21	24.24		
CA {4A}-4E-4E	LTE BA	20	20050	1720	GPSK	1	0	2050	2120	4rd MIMO	LTE BA ₆	20	47290	5200	2x2 MIMO	LTE BA ₆	20	53640	5825	2x2 MIMO	LTE BA ₆	20	53942	5825	2x2 MIMO	LTE BA ₆	20	53942	5825	2x2 MIMO	24.21	24.24		
CA {4A}-4E-D	LTE BA	20	20050	1720	GPSK	1	0	2050	2120	4rd MIMO	LTE BA ₆	20	47290	5200	2x2 MIMO	LTE BA ₆	20	53640	5825	2x2 MIMO	LTE BA ₆	20	53942	5825	2x2 MIMO	LTE BA ₆	20	53942	5825	2x2 MIMO	24.21	24.24		
CA {4A}-4E-D	LTE BA	20	20050	1720	GPSK	1	0	2050	2120	4rd MIMO	LTE BA ₆	20	51290	5600	2x2 MIMO	LTE BA ₆	20	51488	5619	2x2 MIMO	LTE BA ₆	20	51502	5619	2x2 MIMO	LTE BA ₆	20	51502	5619	2x2 MIMO	24.28	24.28		
CA {4A}-4E-D	LTE BA	20	20050	1720	GPSK	1	0	2050	2120	4rd MIMO	LTE BA ₆	20	53140	5785	2x2 MIMO	LTE BA ₆	20	53338	5804	2x2 MIMO	LTE BA ₆	20	52942	5765	2x2 MIMO	LTE BA ₆	20	52942	5765	2x2 MIMO	24.24	24.24		

Table 79
Reduced Output Powers – Hotspot Mode Active

Combination	PCB Band	PCC										SCC 1				SCC 2				SCC 3				LTE Tx Power with DCA Enabled (dbm)	LTE Single Carrier Tx Power (dbm)							
		PCC BW [MHz]	PCC [UL] Ch.	PCC [DL] Freq. [MHz]	Mod.	PCC UL#	PCC UL# RB	PCC UL# RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]			SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.				
CA {4A}-4A-4E-4G-A	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	4x4 MIMO	LTE B46	20	47090	5180	2x2 MIMO	LTE B46	20	53540	5825	2x2 MIMO	LTE B46	20	53340	5808.8	2x2 MIMO	LTE B46	20	52942	5765.2	2x2 MIMO	20.68	21.00
CA {4A}-4A-4E-4G-C	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	4x4 MIMO	LTE B46	20	47090	5180	2x2 MIMO	LTE B46	20	53540	5825	2x2 MIMO	LTE B46	20	53340	5808.8	2x2 MIMO	LTE B46	20	52942	5765.2	2x2 MIMO	20.67	21.00
CA {4A}-4E-4G	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	4x4 MIMO	LTE B46	20	47290	5200	2x2 MIMO	LTE B46	20	53540	5825	2x2 MIMO	LTE B46	20	53340	5808.8	2x2 MIMO	LTE B46	20	52942	5765.2	2x2 MIMO	20.65	21.00
CA {4A}-4E-4G	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	4x4 MIMO	LTE B46	20	47290	5200	2x2 MIMO	LTE B46	20	53540	5825	2x2 MIMO	LTE B46	20	53340	5808.8	2x2 MIMO	LTE B46	20	52942	5765.2	2x2 MIMO	20.63	21.00
CA {4A}-4E-4G	LTE B4	20	20050	1720	16QAM	1	0	2050	2120	4x4 MIMO	LTE B46	20	53140	5785	2x2 MIMO	LTE B46	20	53338	5808.8	2x2 MIMO	LTE B46	20	53338	5808.8	2x2 MIMO	LTE B46	20	52942	5765.2	2x2 MIMO	20.63	21.00

Table 80
Reduced Output Powers – Grip Sensor Active

Combination	PCB Band	PCC										SCC 1				SCC 2				SCC 3				Power			
		PCC BW [MHz]	PCC [UL] Ch.	PCC [DL] Freq. [MHz]	Mod.	PCC UL#	PCC UL# RB	PCC UL# RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	LTE Tx Power with DC CA Enabled (dbm)
CA {4A}-46A-46A	LTE BA	15	20300	1745	16QAM	1	0	2300	2145	4A# MIMO	LTE BA#	20	47090	5180	2x2 MIMO	LTE BA#	20	53540	5825	2x2 MIMO	LTE BA#	20	53540	5825	2x2 MIMO	21.64	21.93
CA {4A}-46A-46A	LTE BA	15	20300	1745	16QAM	1	0	2300	2145	4A# MIMO	LTE BA#	20	47090	5180	2x2 MIMO	LTE BA#	20	53540	5825	2x2 MIMO	LTE BA#	20	53340	5825	2x2 MIMO	21.56	21.93
CA {4A}-46D	LTE BA	15	20300	1745	16QAM	1	0	2300	2145	4A# MIMO	LTE BA#	20	47290	5200	2x2 MIMO	LTE BA#	20	53480	5218	2x2 MIMO	LTE BA#	20	53480	5218	2x2 MIMO	21.57	21.93
CA {4A}-46D	LTE BA	15	20300	1745	16QAM	1	0	2300	2145	4A# MIMO	LTE BA#	20	47290	5200	2x2 MIMO	LTE BA#	20	53480	5218	2x2 MIMO	LTE BA#	20	53480	5218	2x2 MIMO	21.57	21.93
CA {4A}-46D	LTE BA	15	20300	1745	16QAM	1	0	2300	2145	4A# MIMO	LTE BA#	20	52340	5600	2x2 MIMO	LTE BA#	20	53340	5785	2x2 MIMO	LTE BA#	20	53340	5785	2x2 MIMO	21.57	21.93
CA {4A}-46D	LTE BA	15	20300	1745	16QAM	1	0	2300	2145	4A# MIMO	LTE BA#	20	53340	5785	2x2 MIMO	LTE BA#	20	53338	5804.8	2x2 MIMO	LTE BA#	20	52942	5765.2	2x2 MIMO	21.57	21.93

1.5.2.2

LTE Band 66 as PCC

Table 81
Maximum Output Powers

Combination	PCB Band	PCC										SCC1				SCC2				SCC3				Power			
		PCC BW [MHz]	PCC [Ch.]	PCC [UL] Freq. [MHz]	PCC [UL] Mod.	PCC UL# RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	PCC [DL] SSB Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	SCC [DL] SSB Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	SCC [DL] SSB Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	LTE Tx Power with CA Enabled (dBm)	LTE Single Carrier Power (dBm)			
CA [2A]-46-6GA	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	42820	5200	2x2 MIMO	-	-	-	24.13	24.24		
CA [2A]-46-6GA	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	42820	5300	2x2 MIMO	-	-	-	24.15	24.24		
CA [2A]-46-6GA	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	42820	5200	2x2 MIMO	-	-	-	24.17	24.24		
CA [2A]-46-6GA	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	42820	5300	2x2 MIMO	-	-	-	24.15	24.24		
CA [2A]-46-6GA	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	42820	5200	2x2 MIMO	-	-	-	24.13	24.24		
CA [2A]-46-6GA	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	42820	5200	2x2 MIMO	-	-	-	24.22	24.24		
CA [2A]-46-6GA	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	42820	5300	2x2 MIMO	-	-	-	24.23	24.24		
CA [2A]-46-6GA	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	42820	5300	2x2 MIMO	-	-	-	24.22	24.24		
CA [2A]-46-6GA	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	4x4 MIMO	LTE B46	20	47090	5180	2x2 MIMO	LTE B46	20	53540	5825	2x2 MIMO	-	-	-	24.23	24.24		
CA [2A]-46-C[66A]	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	42820	5200	2x2 MIMO	LTE B46	20	47488	5218.8	2x2 MIMO	24.30	24.24
CA [2A]-46-C[66A]	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	42820	5300	2x2 MIMO	LTE B46	20	48488	5318.8	2x2 MIMO	24.25	24.24
CA [2A]-46-C[66A]	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	42820	5200	2x2 MIMO	LTE B46	20	51488	56918.8	2x2 MIMO	24.28	24.24
CA [2A]-46-C[66A]	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	42820	5300	2x2 MIMO	LTE B46	20	53318	5802.8	2x2 MIMO	24.24	24.24
CA [2A]-46-6GA	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	42820	5200	2x2 MIMO	LTE B46	20	47488	5218.8	2x2 MIMO	24.27	24.24
CA [2A]-46-6GA	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	42820	5300	2x2 MIMO	LTE B46	20	48488	5318.8	2x2 MIMO	24.23	24.24
CA [2A]-46-6GA	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	42820	5200	2x2 MIMO	LTE B46	20	51488	56918.8	2x2 MIMO	24.28	24.24
CA [2A]-46-6GA	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	42820	5300	2x2 MIMO	LTE B46	20	53318	5802.8	2x2 MIMO	24.24	24.24
CA [2A]-46-6GA	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	4x4 MIMO	LTE B46	20	47090	5180	2x2 MIMO	LTE B46	20	53540	5825	2x2 MIMO	LTE B46	20	53342	5805.2	2x2 MIMO	24.17	24.28
CA [2A]-46-6GA	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	4x4 MIMO	LTE B46	20	47488	5180	2x2 MIMO	LTE B46	20	53408	5825	2x2 MIMO	LTE B46	20	53318	5802.8	2x2 MIMO	24.24	24.24
CA [4A]-60-6GA	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B46	20	50488	5825	2x2 MIMO	LTE B46	20	48022	52802	2x2 MIMO	24.22	24.24
CA [4A]-60-6GA	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B46	20	50488	5825	2x2 MIMO	LTE B46	20	48022	52802	2x2 MIMO	24.22	24.24
CA [4A]-60-6GA	LTE B06	20	130272	1720	QPSK	1	0	66536	2120	4x4 MIMO	LTE B46	20	53140	5785	2x2 MIMO	LTE B46	20	53318	5804.8	2x2 MIMO	LTE B46	20	52942	5765.2	2x2 MIMO	24.27	24.24

Table 82
Reduced Output Powers – Hotspot Mode Active

Combination	PCB Band	PCB BW [MHz]	PCU (Ch.)	PCU (UL) Freq. [MHz]	Mod.	PCC				SCC1				SCC2				SCC3				Power					
						PCU UL RB	PCU UL RB Offset	PCC (Du.) Ch.	PCC (DL) Freq. [MHz]	DL Ant. Config.	SBB Band	SCC BW [MHz]	SCC (Du.) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	SBB Band	SCC BW [MHz]	SCC (Du.) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	SBB Band	SCC BW [MHz]	SCC (Du.) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	LTE Tx Power with CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA [24]-46-A,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	42790	5200	2x2 MIMO	-	-	-	20.73	21.00		
CA [24]-46-A,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	-	-	-	20.67	21.00		
CA [24]-46-A,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	51290	5600	2x2 MIMO	-	-	-	20.66	21.00		
CA [24]-46-A,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	52490	5780	2x2 MIMO	-	-	-	20.65	21.00		
CA 2A-46-A,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	42790	5200	2x2 MIMO	-	-	-	20.66	21.00		
CA 2A-46-A,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	48290	5300	2x2 MIMO	-	-	-	20.68	21.00		
CA 2A-46-A,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	51290	5600	2x2 MIMO	-	-	-	20.65	21.00		
CA 2A-46-A,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	52490	5780	2x2 MIMO	-	-	-	20.67	21.00		
CA 46A-A,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	4x4 MIMO	LTE B46	20	47090	5180	2x2 MIMO	LTE B46	20	53540	5820	2x2 MIMO	-	-	-	20.65	21.00		
CA 2A-46-C,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	42790	5200	2x2 MIMO	LTE B46	20	47488	5219.8	2x2 MIMO	20.69	21.00
CA 2A-46-C,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B46	20	48488	5319.8	2x2 MIMO	20.64	21.00
CA 2A-46-C,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	51290	5600	2x2 MIMO	LTE B46	20	51488	5619.8	2x2 MIMO	20.63	21.00
CA 2A-46-C,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	52490	5780	2x2 MIMO	LTE B46	20	53218	5819.8	2x2 MIMO	20.60	21.00
CA [24]-46-C,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	42790	5200	2x2 MIMO	LTE B46	20	47488	5219.8	2x2 MIMO	20.63	21.00
CA [24]-46-C,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B46	20	48488	5319.8	2x2 MIMO	20.67	21.00
CA [24]-46-C,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	51290	5600	2x2 MIMO	LTE B46	20	51488	5619.8	2x2 MIMO	20.62	21.00
CA [24]-46-C,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	52490	5780	2x2 MIMO	LTE B46	20	53218	5819.8	2x2 MIMO	20.61	21.00
CA 46A-A,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	4x4 MIMO	LTE B46	20	47090	5180	2x2 MIMO	LTE B46	20	53540	5820	2x2 MIMO	-	-	-	20.65	21.00		
CA 46A-C,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	4x4 MIMO	LTE B46	20	47290	5200	2x2 MIMO	LTE B46	20	47488	5219.8	2x2 MIMO	LTE B46	20	47090	5219.8	2x2 MIMO	20.57	21.00
CA 46D-C,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B46	20	48488	5319.8	2x2 MIMO	LTE B46	20	48090	5280.2	2x2 MIMO	20.60	21.00
CA 46D-B,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B46	20	48488	5319.8	2x2 MIMO	LTE B46	20	48090	5280.2	2x2 MIMO	20.60	21.00
CA 46D-B,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B46	20	48488	5319.8	2x2 MIMO	LTE B46	20	48090	5280.2	2x2 MIMO	20.60	21.00
CA 46D-B,66A	LTE B66	20	132072	1720	16QAM	1	0	66536	2120	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B46	20	48488	5319.8	2x2 MIMO	LTE B46	20	48090	5280.2	2x2 MIMO	20.60	21.00

FCC ID: A3LSMN960U	 SAR EVALUATION REPORT 	Reviewed by: Quality Manager
Test Dates: 05/07/18 - 06/11/18	DUT Type: Portable Handset	APPENDIX H: Page 25 of 28

Table 83
Reduced Output Powers – Grip Sensor Active

Combination	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC										SCC 1				SCC 2				SCC 3				Power	
				PCC [UL] Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	LTE Tx Power with DL CA Enabled (dbm)	LTE Single Carrier Tx Power (dbm)
CA [2A]-46A-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	47290	5200	2x2 MIMO	-	-	-	-	-	21.62	21.93
CA [2A]-46A-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	-	-	-	-	-	21.63	21.93
CA [2A]-46A-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	51290	5600	2x2 MIMO	-	-	-	-	-	21.58	21.93
CA [2A]-46A-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	53140	5785	2x2 MIMO	-	-	-	-	-	21.63	21.93
CA [2A]-46A-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	47290	5200	2x2 MIMO	-	-	-	-	-	21.63	21.93
CA [2A]-46A-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	48290	5300	2x2 MIMO	-	-	-	-	-	21.59	21.93
CA [2A]-46A-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	51290	5600	2x2 MIMO	-	-	-	-	-	21.58	21.93
CA [2A]-46A-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	53140	5785	2x2 MIMO	-	-	-	-	-	21.70	21.93
CA [2A]-46A-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	4x4 MIMO	LTE B46	20	47090	5180	2x2 MIMO	LTE B46	20	53540	5825	2x2 MIMO	-	-	-	-	-	21.67	21.93
CA [2A]-46A-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	47290	5200	2x2 MIMO	LTE B46	20	47488	5219.8	2x2 MIMO	21.60	21.93
CA [2A]-46A-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B46	20	48488	5319.8	2x2 MIMO	21.66	21.93
CA [2A]-46A-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	51290	5600	2x2 MIMO	LTE B46	20	51488	5619.8	2x2 MIMO	21.65	21.93
CA [2A]-46A-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	4x4 MIMO	LTE B2	20	900	1960	2x2 MIMO	LTE B46	20	53140	5785	2x2 MIMO	LTE B46	20	53338	5804.8	2x2 MIMO	21.68	21.93
CA [2A]-46A-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	47290	5200	2x2 MIMO	LTE B46	20	47488	5219.8	2x2 MIMO	21.69	21.93
CA [2A]-46A-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B46	20	48488	5319.8	2x2 MIMO	21.67	21.93
CA [2A]-46A-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	51290	5600	2x2 MIMO	LTE B46	20	51488	5619.8	2x2 MIMO	21.73	21.93
CA [2A]-46A-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	2x2 MIMO	LTE B2	20	900	1960	4x4 MIMO	LTE B46	20	53140	5785	2x2 MIMO	LTE B46	20	53338	5804.8	2x2 MIMO	21.71	21.93
CA [4A]-46A-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	4x4 MIMO	LTE B46	20	47090	5180	2x2 MIMO	LTE B46	20	53540	5825	2x2 MIMO	LTE B46	20	53342	5805.2	2x2 MIMO	21.62	21.93
CA [4A]-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	4x4 MIMO	LTE B46	20	47290	5300	2x2 MIMO	LTE B46	20	47488	5219.8	2x2 MIMO	LTE B46	20	47092	5180.2	2x2 MIMO	21.66	21.93
CA [4A]-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B46	20	48488	5319.8	2x2 MIMO	LTE B46	20	48092	5280.2	2x2 MIMO	21.65	21.93
CA [4A]-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	4x4 MIMO	LTE B46	20	51290	5600	2x2 MIMO	LTE B46	20	51488	5619.8	2x2 MIMO	LTE B46	20	51092	5580.2	2x2 MIMO	21.63	21.93
CA [4A]-66A	LTE B66	15	132322	1745	16QAM	1	0	66786	2145	4x4 MIMO	LTE B46	20	53140	5785	2x2 MIMO	LTE B46	20	53338	5804.8	2x2 MIMO	LTE B46	20	52942	5765.2	2x2 MIMO	21.68	21.93

1.5.2.3 LTE Band 2 as PCC

Table 84
Maximum Output Powers

Combination	PCC Band	PCC										SCC 1				SCC 2				SCC 3				Power			
		PCC BW [MHz]	PCC [UL] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	4x4 MIMO	LTE B46	20	47090	5180	2x2 MIMO	LTE B46	20	53540	5825	2x2 MIMO	-	-	-	-	-	24.51	24.56
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	4x4 MIMO	LTE B46	20	47290	5200	2x2 MIMO	LTE B66	20	66786	2145	2x2 MIMO	-	-	-	-	-	24.50	24.56
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B66	20	66786	2145	2x2 MIMO	-	-	-	-	-	24.52	24.56
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	4x4 MIMO	LTE B46	20	51290	5600	2x2 MIMO	LTE B66	20	66786	2145	2x2 MIMO	-	-	-	-	-	24.49	24.56
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	4x4 MIMO	LTE B46	20	53140	5785	2x2 MIMO	LTE B66	20	66786	2145	2x2 MIMO	-	-	-	-	-	24.47	24.56
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	2x2 MIMO	LTE B46	20	47290	5200	2x2 MIMO	LTE B66	20	66786	2145	4x4 MIMO	-	-	-	-	-	24.50	24.56
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	2x2 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B66	20	66786	2145	4x4 MIMO	-	-	-	-	-	24.51	24.56
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	2x2 MIMO	LTE B46	20	51290	5600	2x2 MIMO	LTE B66	20	66786	2145	4x4 MIMO	-	-	-	-	-	24.53	24.56
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	2x2 MIMO	LTE B46	20	53140	5785	2x2 MIMO	LTE B66	20	66786	2145	4x4 MIMO	-	-	-	-	-	24.49	24.56
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	4x4 MIMO	LTE B46	20	47090	5180	2x2 MIMO	LTE B46	20	53540	5825	2x2 MIMO	LTE B46	20	53342	5805.2	2x2 MIMO	24.53	24.56
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	4x4 MIMO	LTE B46	20	47290	5200	2x2 MIMO	LTE B46	20	47488	5219.8	2x2 MIMO	LTE B46	20	47092	5180.2	2x2 MIMO	24.55	24.56
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B46	20	48488	5319.8	2x2 MIMO	LTE B46	20	48092	5280.2	2x2 MIMO	24.51	24.56
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	4x4 MIMO	LTE B46	20	51290	5600	2x2 MIMO	LTE B46	20	51488	5619.8	2x2 MIMO	LTE B46	20	51092	5580.2	2x2 MIMO	24.52	24.56
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	4x4 MIMO	LTE B46	20	53140	5785	2x2 MIMO	LTE B46	20	53338	5804.8	2x2 MIMO	LTE B46	20	52942	5765.2	2x2 MIMO	24.53	24.56
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	4x4 MIMO	LTE B46	20	47290	5200	2x2 MIMO	LTE B46	20	47488	5219.8	2x2 MIMO	LTE B66	20	66786	2145	2x2 MIMO	24.47	24.56
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B46	20	48488	5319.8	2x2 MIMO	LTE B66	20	66786	2145	2x2 MIMO	24.54	24.56
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	4x4 MIMO	LTE B46	20	51290	5600	2x2 MIMO	LTE B46	20	51488	5619.8	2x2 MIMO	LTE B66	20	66786	2145	2x2 MIMO	24.52	24.56
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	4x4 MIMO	LTE B46	20	53140	5785	2x2 MIMO	LTE B46	20	53338	5804.8	2x2 MIMO	LTE B66	20	66786	2145	2x2 MIMO	24.53	24.56
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	2x2 MIMO	LTE B46	20	47290	5200	2x2 MIMO	LTE B46	20	47488	5219.8	2x2 MIMO	LTE B66	20	66786	2145	4x4 MIMO	24.42	24.56
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	2x2 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B46	20	48488	5319.8	2x2 MIMO	LTE B66	20	66786	2145	4x4 MIMO	24.52	24.56
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	2x2 MIMO	LTE B46	20	51290	5600	2x2 MIMO	LTE B46	20	51488	5619.8	2x2 MIMO	LTE B66	20	66786	2145	4x4 MIMO	24.53	24.56
CA [2A]-46A-46A	LTE B2	20	19150	1905	QPSK	1	0	1150	1985	2x2 MIMO	LTE B46	20	53140	5785	2x2 MIMO	LTE B46	20	53338	5804.8	2x2 MIMO	LTE B66	20	66786	2145	4x4 MIMO	24.55	24.56

1.5.2.4

LTE Band 7 Antenna B as PCC

Table 86

Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC				PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC 1				DL Ant. Config.	SCC 2				DL Ant. Config.	SCC 3				DL Ant. Config.	Power	
				Mod.	PCC UL RB	PCC UL RB Offset	PCC [UL] Freq. [MHz]				SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]		SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]		SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]		LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA [7A]-46A	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	4x4 MIMO	LTE B46	20	47290	5200	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	23.58	23.62
CA [7A]-46A	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	23.61	23.62
CA [7A]-46A	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	4x4 MIMO	LTE B46	20	51290	5600	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	23.62	23.62
CA [7A]-46A	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	4x4 MIMO	LTE B46	20	53140	5785	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	23.63	23.62
CA [7A]-46C	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	4x4 MIMO	LTE B46	20	47290	5200	2x2 MIMO	LTE B46	20	47488	5219.8	2x2 MIMO	-	-	-	-	-	23.60	23.62
CA [7A]-46C	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B46	20	48488	5319.8	2x2 MIMO	-	-	-	-	-	23.59	23.62
CA [7A]-46C	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	4x4 MIMO	LTE B46	20	51290	5600	2x2 MIMO	LTE B46	20	51488	5619.8	2x2 MIMO	-	-	-	-	-	23.60	23.62
CA [7A]-46C	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	4x4 MIMO	LTE B46	20	53140	5785	2x2 MIMO	LTE B46	20	53338	5804.8	2x2 MIMO	-	-	-	-	-	23.62	23.62
CA [7A]-46D	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	4x4 MIMO	LTE B46	20	47290	5200	2x2 MIMO	LTE B46	20	47488	5219.8	2x2 MIMO	LTE B46	20	47692	5180.2	2x2 MIMO	23.65	23.62
CA [7A]-46D	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B46	20	48488	5319.8	2x2 MIMO	LTE B46	20	48692	5280.2	2x2 MIMO	23.62	23.62
CA [7A]-46D	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	4x4 MIMO	LTE B46	20	51290	5600	2x2 MIMO	LTE B46	20	51488	5619.8	2x2 MIMO	LTE B46	20	51692	5580.2	2x2 MIMO	23.66	23.62
CA [7A]-46D	LTE B7	20	21350	2560	QPSK	1	0	3350	2680	4x4 MIMO	LTE B46	20	53140	5785	2x2 MIMO	LTE B46	20	53338	5804.8	2x2 MIMO	LTE B46	20	52942	5765.2	2x2 MIMO	23.63	23.62

Table 87

Reduced Output Powers – Hotspot Mode Active

Combination	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC				PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC 1				DL Ant. Config.	SCC 2				DL Ant. Config.	SCC 3				DL Ant. Config.	Power	
				Mod.	PCC UL RB	PCC UL RB Offset	PCC [UL] Freq. [MHz]				SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]		SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]		SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]		LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA [7A]-46A	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B46	20	47290	5200	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	20.18	20.18
CA [7A]-46A	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	20.05	20.18
CA [7A]-46A	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B46	20	51290	5600	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	20.13	20.18
CA [7A]-46A	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B46	20	53140	5785	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	20.12	20.18
CA [7A]-46C	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B46	20	47290	5200	2x2 MIMO	LTE B46	20	47488	5219.8	2x2 MIMO	-	-	-	-	-	20.08	20.18
CA [7A]-46C	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B46	20	48488	5319.8	2x2 MIMO	-	-	-	-	-	20.11	20.18
CA [7A]-46C	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B46	20	51290	5600	2x2 MIMO	LTE B46	20	51488	5619.8	2x2 MIMO	-	-	-	-	-	20.06	20.18
CA [7A]-46C	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B46	20	53140	5785	2x2 MIMO	LTE B46	20	53338	5804.8	2x2 MIMO	-	-	-	-	-	20.12	20.18
CA [7A]-46D	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B46	20	47290	5200	2x2 MIMO	LTE B46	20	47488	5219.8	2x2 MIMO	LTE B46	20	47692	5180.2	2x2 MIMO	20.04	20.18
CA [7A]-46D	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B46	20	48488	5319.8	2x2 MIMO	LTE B46	20	48692	5280.2	2x2 MIMO	20.02	20.18
CA [7A]-46D	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B46	20	51290	5600	2x2 MIMO	LTE B46	20	51488	5619.8	2x2 MIMO	LTE B46	20	51692	5580.2	2x2 MIMO	20.03	20.18
CA [7A]-46D	LTE B7	15	21100	2535	16QAM	1	0	3100	2655	4x4 MIMO	LTE B46	20	53140	5785	2x2 MIMO	LTE B46	20	53338	5804.8	2x2 MIMO	LTE B46	20	52942	5765.2	2x2 MIMO	20.06	20.18

Table 88

Reduced Output Powers – Grip Sensor Active

Combination	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC				PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC 1				DL Ant. Config.	SCC 2				DL Ant. Config.	SCC 3				DL Ant. Config.	Power	
				Mod.	PCC UL RB	PCC UL RB Offset	PCC [UL] Freq. [MHz]				SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]		SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]		SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]		LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA [7A]-46A	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	4x4 MIMO	LTE B46	20	47290	5200	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	20.31	20.61
CA [7A]-46A	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	20.37	20.61
CA [7A]-46A	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	4x4 MIMO	LTE B46	20	51290	5600	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	20.29	20.61
CA [7A]-46A	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	4x4 MIMO	LTE B46	20	53140	5785	2x2 MIMO	-	-	-	-	-	-	-	-	-	-	20.25	20.61
CA [7A]-46C	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	4x4 MIMO	LTE B46	20	47290	5200	2x2 MIMO	LTE B46	20	47488	5219.8	2x2 MIMO	-	-	-	-	-	20.25	20.61
CA [7A]-46C	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B46	20	48488	5319.8	2x2 MIMO	-	-	-	-	-	20.36	20.61
CA [7A]-46C	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	4x4 MIMO	LTE B46	20	51290	5600	2x2 MIMO	LTE B46	20	51488	5619.8	2x2 MIMO	-	-	-	-	-	20.37	20.61
CA [7A]-46C	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	4x4 MIMO	LTE B46	20	53140	5785	2x2 MIMO	LTE B46	20	53338	5804.8	2x2 MIMO	-	-	-	-	-	20.38	20.61
CA [7A]-46D	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	4x4 MIMO	LTE B46	20	47290	5200	2x2 MIMO	LTE B46	20	47488	5219.8	2x2 MIMO	LTE B46	20	47692	5180.2	2x2 MIMO	20.19	20.61
CA [7A]-46D	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	4x4 MIMO	LTE B46	20	48290	5300	2x2 MIMO	LTE B46	20	48488	5319.8	2x2 MIMO	LTE B46	20	48692	5280.2	2x2 MIMO	20.17	20.61
CA [7A]-46D	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	4x4 MIMO	LTE B46	20	51290	5600	2x2 MIMO	LTE B46	20	51488	5619.8	2x2 MIMO	LTE B46	20	51692	5580.2	2x2 MIMO	20.22	20.61
CA [7A]-46D	LTE B7	15	20825	2507.5	16QAM	1	0	2825	2627.5	4x4 MIMO	LTE B46	20	53140	5785	2x2 MIMO	LTE B46	20	53338	5804.8	2x2 MIMO	LTE B46	20	52942	5765.2	2x2 MIMO	20.16	20.61

1.6 Downlink Carrier Aggregation with CA_41C Uplink Carrier Aggregation enabled

This device supports uplink carrier aggregation (ULCA) for CA_41C with additional Carrier Aggregation configurations active in the downlink. Power measurements were performed with ULCA CA_41C active and additional CA configurations active in the downlink for the configuration required for ULCA CA_41C per Fall 2017 TCB Workshop Notes.

Per FCC Guidance, additional SAR measurements for these configurations were not required since their maximum output power was not more than 0.25 dB higher than the maximum output power for ULCA with only CA_41C active.

1.6.1

SISO Carrier Aggregation RF Conducted Powers

Table 89
Maximum Output Powers

Combination	PCC Band	PCC Bandwidth [MHz]	PCC				Modulation	PCC UL RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC1				Modulation	SCC UL RB	SCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC2				SCC UL RB	SCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC3				SCC UL RB	SCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC4				SCC UL RB	SCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	CA-51C ULCA-2A Power with 4x4 CA configuration active in DL (dBm)	CA-41C ULCA-2A Power (dBm)																																																																																																																																																																																																																																																																																																																																												
			PCC [UL/DL] Frequency [MHz]	PCC [UL/DL] Channel	PCC [UL/DL] Frequency [MHz]	PCC [UL/DL] Channel						SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel						SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel					SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel					SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel							SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel	SCC [UL/DL] Frequency [MHz]	SCC [UL/DL] Channel

Table 90
Reduced Output Powers – Hotspot Mode Active

Combination	PCC						SCC1						SCC2						SCC3						SCC4						Power	
	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC DL Channel	SCC DL Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC DL Channel	SCC DL Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC DL Channel	SCC DL Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC DL Channel	SCC DL Frequency [MHz]	LTE Tx Power with UL CA Enabled (dBm)	CA-41C ULCA Tx Power (dBm)
CA_41C-41A	LTE B41	20	40185	2549.5	QPSK	50	0	LTE B41	20	39987	2529.7	QPSK	50	50	LTE B41	20	41490	2680.0													22.19	22.20
CA_41D	LTE B41	20	40185	2549.5	QPSK	50	0	LTE B41	20	39987	2529.7	QPSK	50	50	LTE B41	20	40383	2569.3													22.18	22.20
CA_41E	LTE B41	20	40185	2549.5	QPSK	50	0	LTE B41	20	39987	2529.7	QPSK	50	50	LTE B41	20	40383	2569.3	LTE B41	20	40383	2569.3	LTE B41	20	40383	2569.3	LTE B41	20	40383	2569.3	22.19	22.20
CA_41C-41C	LTE B41	20	40185	2549.5	QPSK	50	0	LTE B41	20	39987	2529.7	QPSK	50	50	LTE B41	20	41292	2660.2	LTE B41	20	41292	2660.2	LTE B41	20	41292	2660.2	LTE B41	20	41292	2660.2	22.22	22.20
CA_41D-41A	LTE B41	20	40185	2549.5	QPSK	50	0	LTE B41	20	39987	2529.7	QPSK	50	50	LTE B41	20	40383	2569.3	LTE B41	20	40383	2569.3	LTE B41	20	40383	2569.3	LTE B41	20	40383	2569.3	22.21	22.20
CA_41C-41D	LTE B41	20	40185	2549.5	QPSK	50	0	LTE B41	20	39987	2529.7	QPSK	50	50	LTE B41	20	41094	2640.4	LTE B41	20	41094	2640.4	LTE B41	20	41292	2660.2	LTE B41	20	41292	2660.2	22.20	22.20
CA_41D-41C	LTE B41	20	40185	2549.5	QPSK	50	0	LTE B41	20	39987	2529.7	QPSK	50	50	LTE B41	20	40383	2569.3	LTE B41	20	40383	2569.3	LTE B41	20	41292	2660.2	LTE B41	20	41292	2660.2	22.22	22.20

Table 91
Reduced Output Powers – Grip Sensor Active

Combination	PCC						SCC1						SCC2						SCC3						SCC4						Power	
	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	CA_41C ULCA Tx Power with add'l CA configuration active in DL (dBm)	CA_41C ULCA Tx Power (dBm)	
CA_41C-41A	LTE B41	20	40185	2549.5	QPSK	50	0	LTE B41	20	39987	2529.7	QPSK	50	50	LTE B41	20	41490	2680.0													22.83	22.82
CA_41D	LTE B41	20	40185	2549.5	QPSK	50	0	LTE B41	20	39987	2529.7	QPSK	50	50	LTE B41	20	40383	2569.3													22.81	22.82
CA_41E	LTE B41	20	40185	2549.5	QPSK	50	0	LTE B41	20	39987	2529.7	QPSK	50	50	LTE B41	20	40383	2569.3	LTE B41	20	40581	2589.1									22.82	22.82
CA_41C-41C	LTE B41	20	40185	2549.5	QPSK	50	0	LTE B41	20	39987	2529.7	QPSK	50	50	LTE B41	20	41292	2660.2	LTE B41	20	41490	2680.0									22.84	22.82
CA_41D-41A	LTE B41	20	40185	2549.5	QPSK	50	0	LTE B41	20	39987	2529.7	QPSK	50	50	LTE B41	20	40383	2569.3	LTE B41	20	41490	2680.0									22.83	22.82
CA_41C-41D	LTE B41	20	40185	2549.5	QPSK	50	0	LTE B41	20	39987	2529.7	QPSK	50	50	LTE B41	20	41094	2640.4	LTE B41	20	41292	2660.2	LTE B41	20	41490	2680.0					22.82	22.82
CA_41D-41C	LTE B41	20	40185	2549.5	QPSK	50	0	LTE B41	20	39987	2529.7	QPSK	50	50	LTE B41	20	40383	2569.3	LTE B41	20	41292	2660.2	LTE B41	20	41490	2680.0					22.85	22.82

1.6.2

4x4 DL MIMO Carrier Aggregation RF Conducted Powers

Note: 4x4 DL MIMO is only operating in the downlink. Uplink transmission is limited to a single output stream for each component carrier of ULCA CA_41C.

Table 92
Maximum Output Powers

Combination	PCC							SCC1							SCC2				SCC3				Power					
	PCC Band	PCC Bandwidth Channel	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	DL Ant. Config.	SCC Bandwidth [MHz]	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	DL Ant. Config.	SCC Bandwidth [MHz]	SCC DL Channel	SCC DL Frequency [MHz]	DL Ant. Config.	SCC Band	SCC DL Channel	DL Ant. Config.	CA_41C ULCA Tx Power with add'l CA configuration active in DL (dBm)	CA_41C ULCA Tx Power (dBm)						
CA_41C(1)	LTE B41	20	41490	QPSK	1	0	4x4 MIMO	LTE B41	20	41292	QPSK	1	99	4x4 MIMO	-	-	-	-	-	-	-	23.98	23.96					
CA_41C-41A	LTE B41	20	41490	2680	QPSK	1	0	2x2 MIMO	LTE B41	20	41292	2660.2	QPSK	1	99	2x2 MIMO	LTE B41	20	39750	2506	4x4 MIMO	-	-	23.98	23.96			
CA_41C-41A	LTE B41	20	41490	2680	QPSK	1	0	4x4 MIMO	LTE B41	20	41292	2660.2	QPSK	1	99	4x4 MIMO	LTE B41	20	39750	2506	4x4 MIMO	-	-	23.97	23.96			
CA_41C-41A	LTE B41	20	41490	2680	QPSK	1	0	4x4 MIMO	LTE B41	20	41292	2660.2	QPSK	1	99	4x4 MIMO	LTE B41	20	39750	2506	4x4 MIMO	-	-	23.94	23.96			
CA_41D(1)	LTE B41	20	41490	2680	QPSK	1	0	4x4 MIMO	LTE B41	20	41292	2660.2	QPSK	1	99	4x4 MIMO	LTE B41	20	41094	2640.4	4x4 MIMO	-	-	23.96	23.96			
CA_41C(1)-41C	LTE B41	20	41490	2680	QPSK	1	0	4x4 MIMO	LTE B41	20	41292	2660.2	QPSK	1	99	4x4 MIMO	LTE B41	20	39948	2525.8	2x2 MIMO	LTE B41	20	39750	2506	2x2 MIMO	23.91	23.96
CA_41C(1)-41C	LTE B41	20	41490	2680	QPSK	1	0	2x2 MIMO	LTE B41	20	41292	2660.2	QPSK	1	99	2x2 MIMO	LTE B41	20	39948	2525.8	4x4 MIMO	LTE B41	20	39750	2506	4x4 MIMO	23.91	23.96

Table 93
Reduced Output Powers – Hotspot Mode Active

Combination	PCC							SCC1							SCC2							SCC3							Power	
	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	DL Ant. Config.	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	DL Ant. Config.	SCC Band	SCC Bandwidth [MHz]	SCC DL Channel	SCC DL Frequency [MHz]	DL Ant. Config.	SCC Band	SCC Bandwidth [MHz]	SCC DL Channel	SCC DL Frequency [MHz]	DL Ant. Config.	LTE Tx Power with UL CA Enabled (dBm)	CA_41C ULCA Tx Power (dBm)			
CA_14(1)(1)	LTE B41	20	40185	2549.5	QPSK	50	0	4x4 MIMO	LTE B41	20	39987	2529.7	QPSK	50	50	4x4 MIMO	-	-	-	-	-	-	-	-	-	-	22.21	22.20		
CA_41C-41A(1)	LTE B41	20	40185	2549.5	QPSK	50	0	2x2 MIMO	LTE B41	20	39987	2529.7	QPSK	50	50	2x2 MIMO	LTE B41	20	41490	2680.0	4x4 MIMO	-	-	-	-	-	-	22.19	22.20	
CA_41C(1)-41A(1)	LTE B41	20	40185	2549.5	QPSK	50	0	4x4 MIMO	LTE B41	20	39987	2529.7	QPSK	50	50	4x4 MIMO	LTE B41	20	41490	2680.0	2x2 MIMO	-	-	-	-	-	-	22.17	22.20	
CA_41C(1)-41A(1)	LTE B41	20	40185	2549.5	QPSK	50	0	4x4 MIMO	LTE B41	20	39987	2529.7	QPSK	50	50	4x4 MIMO	LTE B41	20	41490	2680.0	4x4 MIMO	-	-	-	-	-	-	22.18	22.20	
CA_41D(1)	LTE B41	20	40185	2549.5	QPSK	50	0	4x4 MIMO	LTE B41	20	39987	2529.7	QPSK	50	50	4x4 MIMO	LTE B41	20	40383	2569.3	4x4 MIMO	-	-	-	-	-	-	22.19	22.20	
CA_41C(1)-41C(1)	LTE B41	20	40185	2549.5	QPSK	50	0	4x4 MIMO	LTE B41	20	39987	2529.7	QPSK	50	50	4x4 MIMO	LTE B41	20	41292	2660.2	2x2 MIMO	LTE B41	20	41490	2680.0	2x2 MIMO	22.23	22.20		
CA_41C(1)-41C(1)	LTE B41	20	40185	2549.5	QPSK	50	0	2x2 MIMO	LTE B41	20	39987	2529.7	QPSK	50	50	2x2 MIMO	LTE B41	20	41292	2660.2	4x4 MIMO	LTE B41	20	41490	2680	4x4 MIMO	22.17	22.20		

Table 94
Reduced Output Powers – Grip Sensor Active

Combination	PCC							SCC1							SCC2							SCC3							Power	
	PCC Band	PCC Bandwidth [MHz]	PCC (UL/DL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	DL Ant. Config.	SCC Band	SCC Bandwidth [MHz]	SCC (UL/DL) Channel	SCC (UL/DL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	DL Ant. Config.	SCC Band	SCC Bandwidth [MHz]	SCC DL Channel	SCC DL Frequency [MHz]	DL Ant. Config.	SCC Band	SCC Bandwidth [MHz]	SCC DL Channel	SCC DL Frequency [MHz]	DL Ant. Config.	CA_41C ULCA Tx Power with add'l CA configuration active in DL (dBm)	CA_41C ULCA Tx Power (dBm)			
CA_14C(1)	LTE B41	20	40185	2549.5	QPSK	50	0	4x4 MIMO	LTE B41	20	39987	2529.7	QPSK	50	50	4x4 MIMO	-	-	-	-	-	-	-	-	-	-	22.81	22.82		
CA_41C-41A	LTE B41	20	40185	2549.5	QPSK	50	0	2x2 MIMO	LTE B41	20	39987	2529.7	QPSK	50	50	2x2 MIMO	LTE B41	20	41490	2680.0	4x4 MIMO	-	-	-	-	-	22.81	22.82		
CA_14C(1)-41A	LTE B41	20	40185	2549.5	QPSK	50	0	4x4 MIMO	LTE B41	20	39987	2529.7	QPSK	50	50	4x4 MIMO	LTE B41	20	41490	2680.0	2x2 MIMO	-	-	-	-	-	22.81	22.82		
CA_14C(1)-41A	LTE B41	20	40185	2549.5	QPSK	50	0	4x4 MIMO	LTE B41	20	39987	2529.7	QPSK	50	50	4x4 MIMO	LTE B41	20	41490	2680.0	2x2 MIMO	-	-	-	-	-	22.81	22.82		
CA_14C(1)	LTE B41	20	40185	2549.5	QPSK	50	0	4x4 MIMO	LTE B41	20	39987	2529.7	QPSK	50	50	4x4 MIMO	LTE B41	20	40383	2560.3	4x4 MIMO	-	-	-	-	-	22.81	22.82		
CA_14C(1)-41A	LTE B41	20	40185	2549.5	QPSK	50	0	2x2 MIMO	LTE B41	20	39987	2529.7	QPSK	50	50	2x2 MIMO	LTE B41	20	41292	2660.2	4x4 MIMO	-	-	-	-	-	22.76	22.82		
CA_41C-41A	LTE B41	20	40185	2549.5	QPSK	50	0	2x2 MIMO	LTE B41	20	39987	2529.7	QPSK	50	50	2x2 MIMO	LTE B41	20	41292	2660.2	2x2 MIMO	-	-	-	-	-	22.76	22.82		
CA_41C-41A	LTE B41	20	40185	2549.5	QPSK	50	0	2x2 MIMO	LTE B41	20	39987	2529.7	QPSK	50	50	2x2 MIMO	LTE B41	20	41490	2680.0	2x2 MIMO	-	-	-	-	-	22.76	22.82		