

**MOTOROLA SOLUTIONS**

MS ISO/IEC 17025
TESTING
SAMM No.0826

DECLARATION OF COMPLIANCE SAR ASSESSMENT Part 2 of 2

Motorola Solutions Inc.
EME Test Laboratory

Motorola Solutions Malaysia Sdn Bhd (Innoplex)
Plot 2A, Medan Bayan Lepas,
Mukim 12 SWD 11900 Bayan Lepas Penang, Malaysia.

Date of Report: 12/03/2018
Report Revision: B

Responsible Engineer: Saw Sun Hock (EME Engineer)
Report Author: Saw Sun Hock (EME Engineer)
Date/s Tested: 11/2/2018, 11/7/2018, 11/9/2018
Manufacturer: Motorola Solutions Inc.
DUT Description: Video RSM Si500 (Fusion), display, BT, 5GHz WiFi
Test TX mode(s): WLAN 802.11b/g/n (2.4 GHz), WLAN 802.11 ac/n (5 GHz), Bluetooth, Bluetooth LE
Max. Power output: Refer to Part 1. Table 3
Nominal Power: Refer to Part 1. Table 3
Tx Frequency Bands: WLAN 2.4 GHz 802.11 b/g/n, WLAN 5 GHz 802.11 ac/n, Bluetooth, Bluetooth LE
Signaling type: DSSS, OFDM & FHSS (Bluetooth)
Model(s) Tested: N7001A
Model(s) Certified: N7001A
Serial Number(s): 372TTX0098
Classification: Occupational / Controlled (comply with General Population / Uncontrolled limit)
FCC ID: AZ489FT7105; WLAN 2.4 GHz 802.11 b/g/n, WLAN 5 GHz 802.11 ac/n, Bluetooth, Bluetooth LE.
This report contains results that are immaterial for FCC equipment approval, which are clearly identified.

IC 109U-89FT7105; This report contains results that are immaterial for IC equipment approval, which are clearly identified

ISED Test Site Registration: 109AK

FCC Test Firm Registration Number: 823256

The test results clearly demonstrate compliance with FCC General Population/Uncontrolled RF Exposure limits of 1.6 W/kg averaged over 1 gram per the requirements of FCC 47 CFR § 2.1093 and ISED RSS-102 (Issue 5).

Based on the information and the testing results provided herein, the undersigned certifies that when used as stated in the operating instructions supplied, said product complies with the national and international reference standards and guidelines listed in section 4.0 of this report. This report shall not be reproduced without written approval from an officially designated representative of the Motorola Solutions Inc EME Laboratory. I attest to the accuracy of the data and assume full responsibility for the completeness of these measurements. This reporting format is consistent with the suggested guidelines of the TIA TSB-150 December 2004. The results and statements contained in this report pertain only to the device(s) evaluated.

Digitally signed
by Tiong
Date:
2018.12.03
22:35:40 +08'00'

Tiong
Tiong Nguk Ing
Deputy Technical Manager (Approved Signatory)
Approval Date: 12/3/2018

Appendix C

Dipole Calibration Certificates

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



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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 **Motorola Solutions MY**

Certificate No: **D2450V2-782_Feb17**

CALIBRATION CERTIFICATE

Object **D2450V2 - SN:782**

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

Calibration date: **February 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 $(22 \pm 3)^{\circ}\text{C}$ 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-16)	In house check: Oct-17

	Name	Function	Signature
Calibrated by:	Johannes Kurikka	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 15, 2017

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

Certificate No: D2450V2-782_Feb17

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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**

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	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	37.5 $\pm$ 6 %	1.87 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	13.7 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	53.3 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	6.30 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	51.6 $\pm$ 6 %	2.02 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	12.9 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	50.5 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	5.94 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	23.5 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	$51.9 \Omega + 4.0 j\Omega$
Return Loss	- 27.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	$48.3 \Omega + 5.7 j\Omega$
Return Loss	- 24.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.151 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	May 06, 2005

DASY5 Validation Report for Head TSL

Date: 15.02.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:782

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

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.87$ S/m; $\epsilon_r = 37.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.72, 7.72, 7.72); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.01.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7331)

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

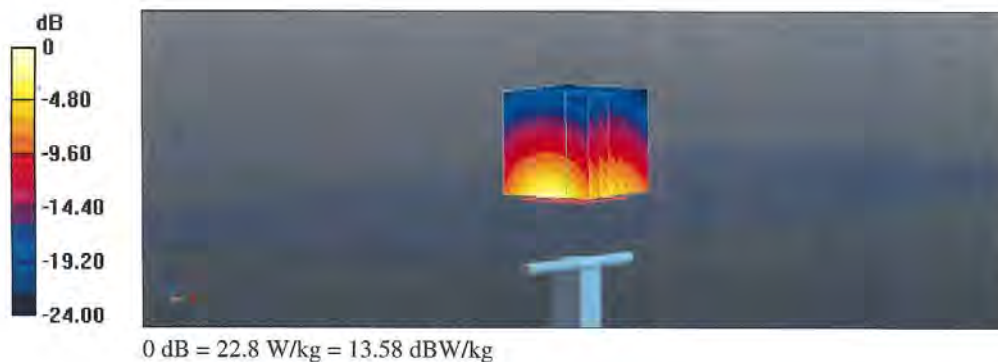
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 115.0 V/m; Power Drift = -0.07 dB

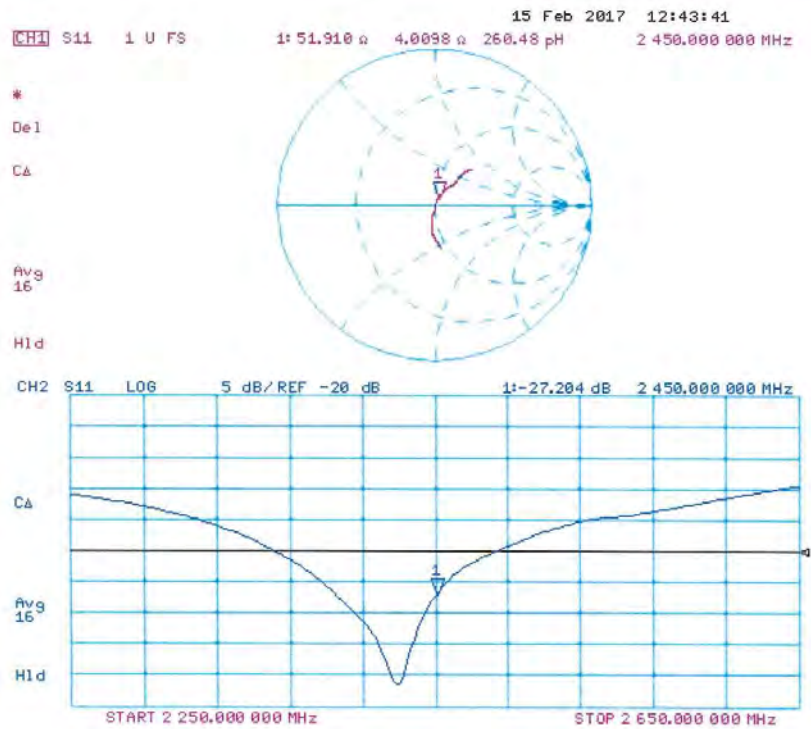
Peak SAR (extrapolated) = 28.4 W/kg

SAR(1 g) = 13.7 W/kg; SAR(10 g) = 6.3 W/kg

Maximum value of SAR (measured) = 22.8 W/kg



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 15.02.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:782

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

Medium parameters used: $f = 2450$ MHz; $\sigma = 2.02$ 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(7.79, 7.79, 7.79); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.01.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7331)

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

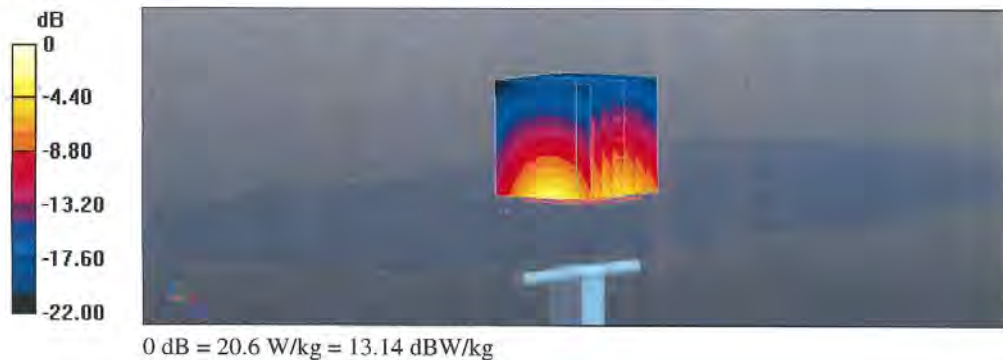
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 105.4 V/m; Power Drift = -0.09 dB

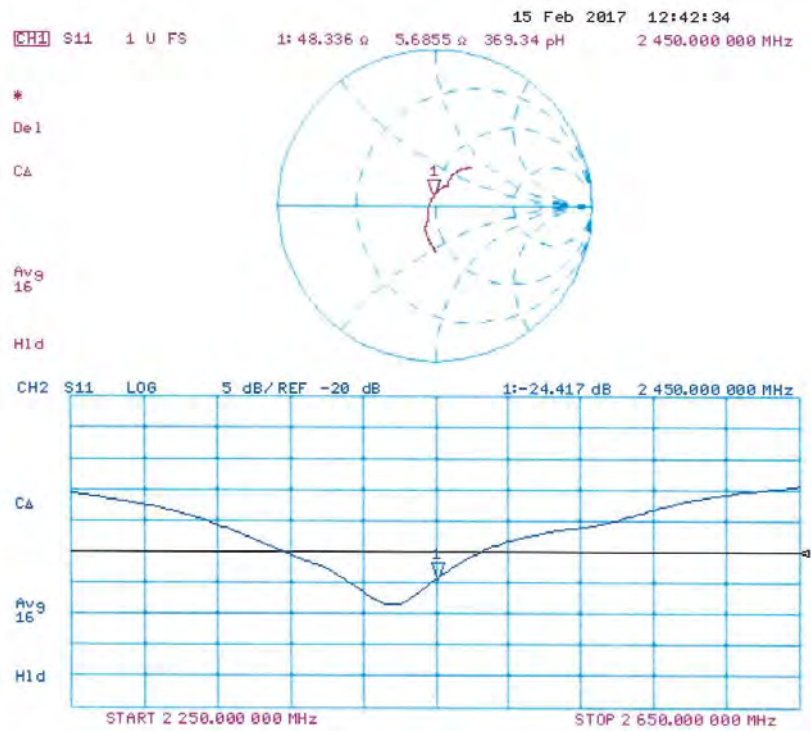
Peak SAR (extrapolated) = 26.6 W/kg

SAR(1 g) = 12.9 W/kg; SAR(10 g) = 5.94 W/kg

Maximum value of SAR (measured) = 20.6 W/kg



Impedance Measurement Plot for Body TSL



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Accreditation No.: **SCS 0108**

Client **Motorola Solutions MY**

Certificate No: **D5GHzV2-1022_Feb18**

CALIBRATION CERTIFICATE

Object **D5GHzV2 - SN:1022**

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

Calibration date: **February 13, 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: 3503	30-Dec-17 (No. EX3-3503_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

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 14, 2018

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Certificate No: D5GHzV2-1022_Feb18

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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	5000 MHz $\pm$ 1 MHz 5250 MHz $\pm$ 1 MHz 5500 MHz $\pm$ 1 MHz 5600 MHz $\pm$ 1 MHz 5750 MHz $\pm$ 1 MHz	

Head TSL parameters at 5000 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	36.2	4.45 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	36.7 $\pm$ 6 %	4.33 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5000 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	6.97 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	69.9 W/kg $\pm$ 19.9 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.04 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	20.4 W/kg $\pm$ 19.5 % (k=2)

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 ± 0.2) °C	36.3 ± 6 %	4.59 mho/m ± 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	8.15 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	81.6 W / kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.34 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	23.4 W/kg ± 19.5 % (k=2)

Head TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.6	4.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	36.0 ± 6 %	4.84 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5500 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.55 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	85.6 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.43 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.3 W/kg ± 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	35.8 ± 6 %	4.95 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5600 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.18 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	81.8 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm³ (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	23.3 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	35.6 ± 6 %	5.10 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5750 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.02 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	80.2 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.28 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	22.8 W/kg ± 19.5 % (k=2)

Body TSL parameters at 5000 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	49.3	5.07 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.9 ± 6 %	5.14 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5000 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.30 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	72.6 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.06 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	20.5 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 %	5.48 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	7.85 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	78.1 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.18 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	21.6 W/kg ± 19.5 % (k=2)

Body TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.6	5.65 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.0 ± 6 %	5.80 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5500 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	8.18 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	81.3 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.27 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	22.5 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	46.8 ± 6 %	5.95 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	8.15 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	81.0 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.27 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	22.5 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 %	6.15 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	7.72 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	76.7 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 5000 MHz**

Impedance, transformed to feed point	48.9 Ω - 12.9 j Ω
Return Loss	- 17.7 dB

Antenna Parameters with Head TSL at 5250 MHz

Impedance, transformed to feed point	51.4 Ω - 5.1 j Ω
Return Loss	- 25.7 dB

Antenna Parameters with Head TSL at 5500 MHz

Impedance, transformed to feed point	51.2 Ω - 4.4 j Ω
Return Loss	- 26.9 dB

Antenna Parameters with Head TSL at 5600 MHz

Impedance, transformed to feed point	55.7 Ω - 2.7 j Ω
Return Loss	- 24.5 dB

Antenna Parameters with Head TSL at 5750 MHz

Impedance, transformed to feed point	56.4 Ω + 0.4 j Ω
Return Loss	- 24.4 dB

Antenna Parameters with Body TSL at 5000 MHz

Impedance, transformed to feed point	49.8 Ω - 11.4 j Ω
Return Loss	- 18.9 dB

Antenna Parameters with Body TSL at 5250 MHz

Impedance, transformed to feed point	52.0 Ω - 3.3 j Ω
Return Loss	- 28.4 dB

Antenna Parameters with Body TSL at 5500 MHz

Impedance, transformed to feed point	51.3 Ω - 1.8 j Ω
Return Loss	- 33.1 dB

Antenna Parameters with Body TSL at 5600 MHz

Impedance, transformed to feed point	58.1 Ω - 0.9 j Ω
Return Loss	- 22.5 dB

Antenna Parameters with Body TSL at 5750 MHz

Impedance, transformed to feed point	56.6 Ω + 3.1 j Ω
Return Loss	- 23.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.209 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 05, 2004

DASY5 Validation Report for Head TSL

Date: 08.02.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1022

Communication System: UID 0 - CW; Frequency: 5000 MHz, Frequency: 5250 MHz, Frequency: 5500 MHz,
Frequency: 5600 MHz, Frequency: 5750 MHz

Medium parameters used: $f = 5000$ MHz; $\sigma = 4.33$ S/m; $\epsilon_r = 36.7$; $\rho = 1000$ kg/m³,

Medium parameters used: $f = 5250$ MHz; $\sigma = 4.59$ S/m; $\epsilon_r = 36.3$; $\rho = 1000$ kg/m³,

Medium parameters used: $f = 5500$ MHz; $\sigma = 4.84$ S/m; $\epsilon_r = 36$; $\rho = 1000$ kg/m³,

Medium parameters used: $f = 5600$ MHz; $\sigma = 4.95$ S/m; $\epsilon_r = 35.8$; $\rho = 1000$ kg/m³,

Medium parameters used: $f = 5750$ MHz; $\sigma = 5.1$ S/m; $\epsilon_r = 35.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(6.5, 6.5, 6.5); Calibrated: 30.12.2017, ConvF(5.51, 5.51, 5.51);
Calibrated: 30.12.2017, ConvF(5.2, 5.2, 5.2); Calibrated: 30.12.2017, ConvF(5.05, 5.05, 5.05);
Calibrated: 30.12.2017, ConvF(4.98, 4.98, 4.98); 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=100mW, dist=10mm, f=5000 MHz/Zoom Scan, dist=1.4mm

(8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 63.46 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 24.3 W/kg

SAR(1 g) = 6.97 W/kg; SAR(10 g) = 2.04 W/kg

Maximum value of SAR (measured) = 15.4 W/kg

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 = 68.42 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 28.5 W/kg

SAR(1 g) = 8.15 W/kg; SAR(10 g) = 2.34 W/kg

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

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5500 MHz/Zoom Scan, dist=1.4mm

(8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 67.90 V/m; Power Drift = -0.03 dB

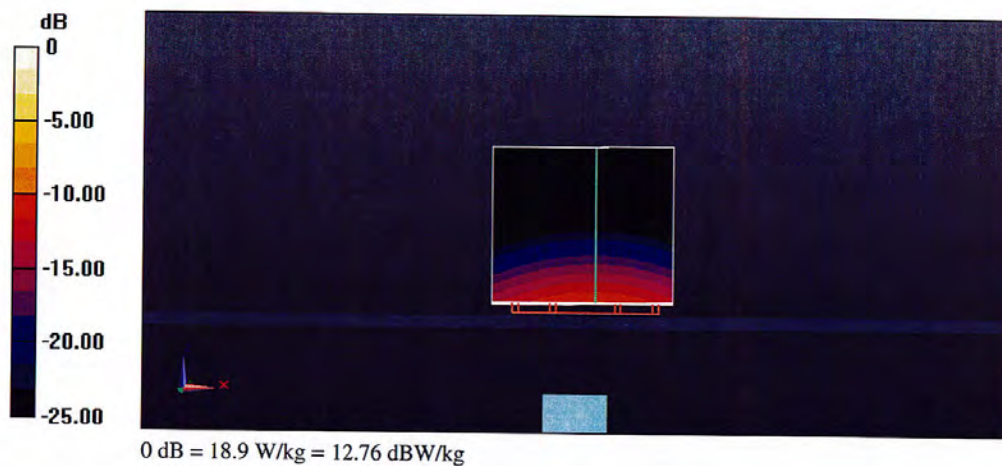
Peak SAR (extrapolated) = 33.5 W/kg

SAR(1 g) = 8.55 W/kg; SAR(10 g) = 2.43 W/kg

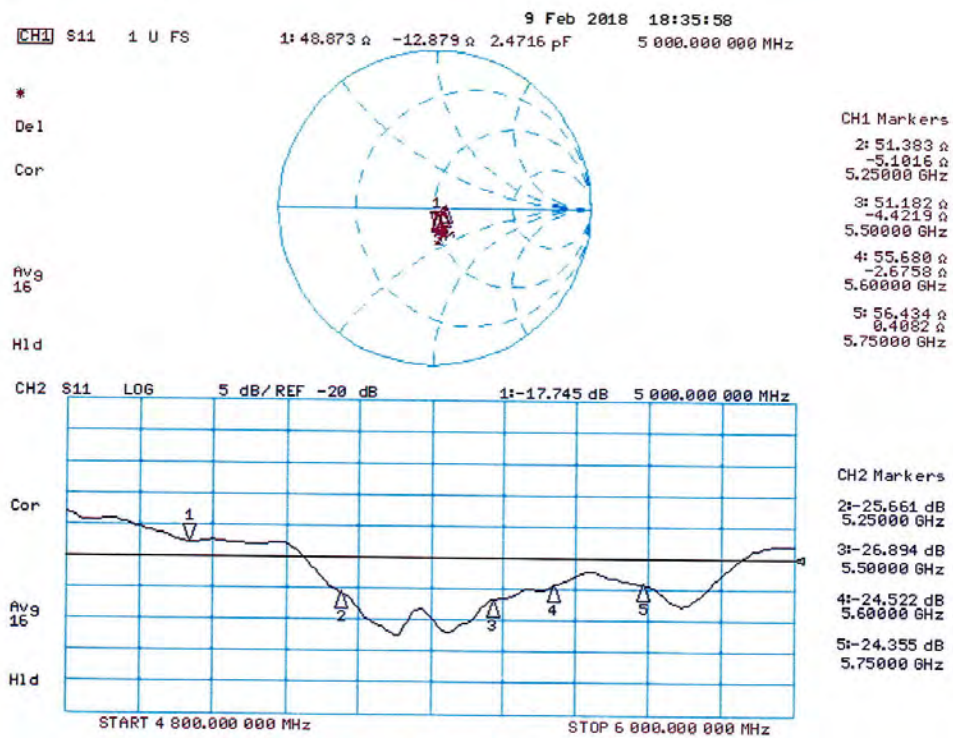
Maximum value of SAR (measured) = 20.0 W/kg

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 = 66.60 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 31.5 W/kg
SAR(1 g) = 8.18 W/kg; SAR(10 g) = 2.33 W/kg
Maximum value of SAR (measured) = 19.0 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 = 65.77 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 31.5 W/kg
SAR(1 g) = 8.02 W/kg; SAR(10 g) = 2.28 W/kg
Maximum value of SAR (measured) = 18.9 W/kg



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 13.02.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1022

Communication System: UID 0 - CW; Frequency: 5000 MHz, Frequency: 5250 MHz, Frequency: 5500 MHz,
Frequency: 5600 MHz, Frequency: 5750 MHz

Medium parameters used: $f = 5000 \text{ MHz}$; $\sigma = 5.14 \text{ S/m}$; $\epsilon_r = 47.9$; $\rho = 1000 \text{ kg/m}^3$,

Medium parameters used: $f = 5250 \text{ MHz}$; $\sigma = 5.48 \text{ S/m}$; $\epsilon_r = 47.4$; $\rho = 1000 \text{ kg/m}^3$,

Medium parameters used: $f = 5500 \text{ MHz}$; $\sigma = 5.8 \text{ S/m}$; $\epsilon_r = 47$; $\rho = 1000 \text{ kg/m}^3$,

Medium parameters used: $f = 5600 \text{ MHz}$; $\sigma = 5.95 \text{ S/m}$; $\epsilon_r = 46.8$; $\rho = 1000 \text{ kg/m}^3$,

Medium parameters used: $f = 5750 \text{ MHz}$; $\sigma = 6.15 \text{ S/m}$; $\epsilon_r = 46.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.7, 5.7, 5.7); Calibrated: 30.12.2017, ConvF(5.26, 5.26, 5.26);
Calibrated: 30.12.2017, ConvF(4.7, 4.7, 4.7); Calibrated: 30.12.2017, ConvF(4.65, 4.65, 4.65);
Calibrated: 30.12.2017, ConvF(4.57, 4.57, 4.57); 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=100mW, dist=10mm, f=5000MHz/Zoom Scan, dist=1.4mm

(8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 64.76 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 26.5 W/kg

SAR(1 g) = 7.3 W/kg; SAR(10 g) = 2.06 W/kg

Maximum value of SAR (measured) = 17.1 W/kg

Dipole Calibration for Body 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 = 65.28 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 30.2 W/kg

SAR(1 g) = 7.85 W/kg; SAR(10 g) = 2.18 W/kg

Maximum value of SAR (measured) = 18.7 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5500 MHz/Zoom Scan, dist=1.4mm

(8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 65.81 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 33.8 W/kg

SAR(1 g) = 8.18 W/kg; SAR(10 g) = 2.27 W/kg

Maximum value of SAR (measured) = 20.0 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 = 65.54 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 34.2 W/kg

SAR(1 g) = 8.15 W/kg; SAR(10 g) = 2.27 W/kg

Maximum value of SAR (measured) = 20.1 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan, dist=1.4mm

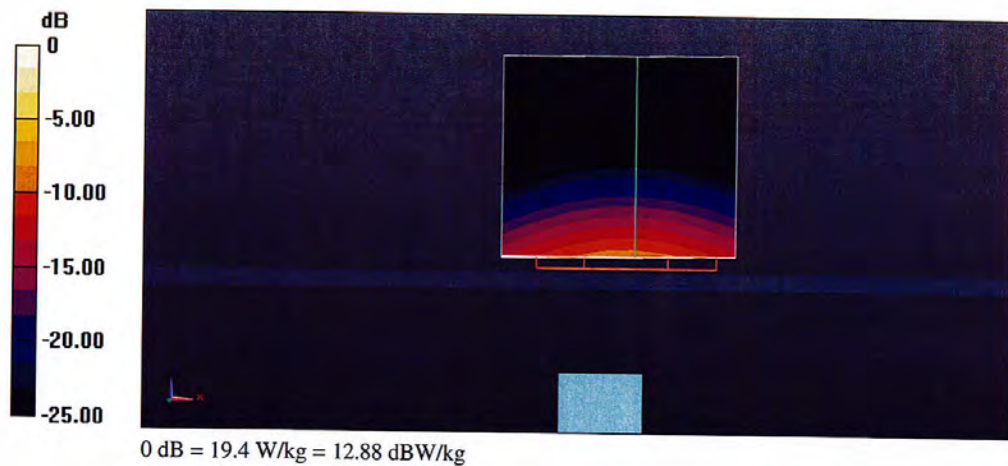
(8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 63.13 V/m; Power Drift = -0.07 dB

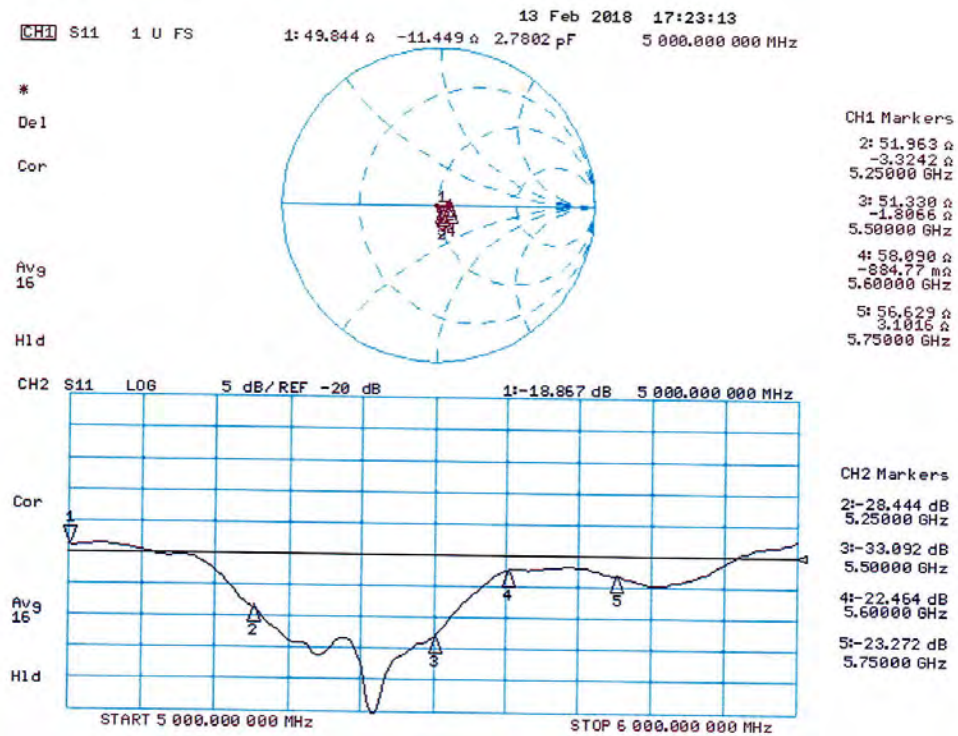
Peak SAR (extrapolated) = 33.3 W/kg

SAR(1 g) = 7.72 W/kg; SAR(10 g) = 2.14 W/kg

Maximum value of SAR (measured) = 19.4 W/kg



Impedance Measurement Plot for Body TSL



Dipole Data

As stated in KDB 865664, for dipole exceeded annual calibration, the test laboratory must ensure that the required supporting information and documentation are included in report to qualify for extended calibration interval.

The table below includes dipole impedance and return loss measurement data measured by Motorola Solutions' EME lab. The results meet requirements stated in KDB 865664.

Dipole D2450V2 (SN 782)	Body		
	Impedance		Return Loss
Date Measured	real Ω	imag $j\Omega$	dB
03/15/17	47.40	6.47	-22.92
01/11/18	47.22	6.23	-23.09

Dipole D5GHzV2 (Serial Number 1022) do not exceed the annual calibration date, therefore further justification and validation for impedance and return loss are not required.

Appendix D

System Verification Check Scans

Motorola Solutions, Inc. EME Laboratory
Date/Time: 11/2/2018 5:25:13 PM

Robot#: DASY5-PG-3 | Run#: ZZ-SYSP-2450B-181102-07
Dipole Model#: D2450V2
Phantom#: TP1174-2
Tissue Temp: 22.6 (C)
Serial#: 782
Test Freq: 2450.0000 (MHz)
Start Power: 250 (mW)
Rotation (1D): 0.100 dB
Adjusted SAR (1W): 52.80 mW/g (1g)

Comments:

Duty Cycle: 1:1, Medium parameters used: $f = 2450$ MHz; $\sigma = 1.96$ S/m; $\epsilon_r = 48$; $\rho = 1000$ kg/m³
Probe: EX3DV4 - SN7486, , Frequency: 2450 MHz, ConvF(7.77, 7.77, 7.77); Calibrated: 3/20/2018
Electronics: DAE4 Sn1488, Calibrated: 3/9/2018

2-3 GHz-Rev.2/System Performance Check/Dipole Area Scan 2 (51x71x1): Interpolated grid:

dx=1.200 mm, dy=1.200 mm

Reference Value = 103.3 V/m; Power Drift = -0.04 dB

Fast SAR: SAR(1 g) = 13.4 W/kg; SAR(10 g) = 6.15 W/kg (SAR corrected for target medium)

Maximum value of SAR (interpolated) = 21.9 W/kg

2-3 GHz-Rev.2/System Performance Check/0-Degree Cube (7x7x7)/Cube 0: Measurement

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

Reference Value = 103.3 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 26.9 W/kg

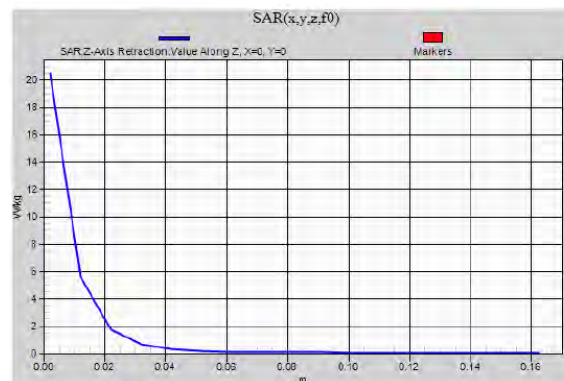
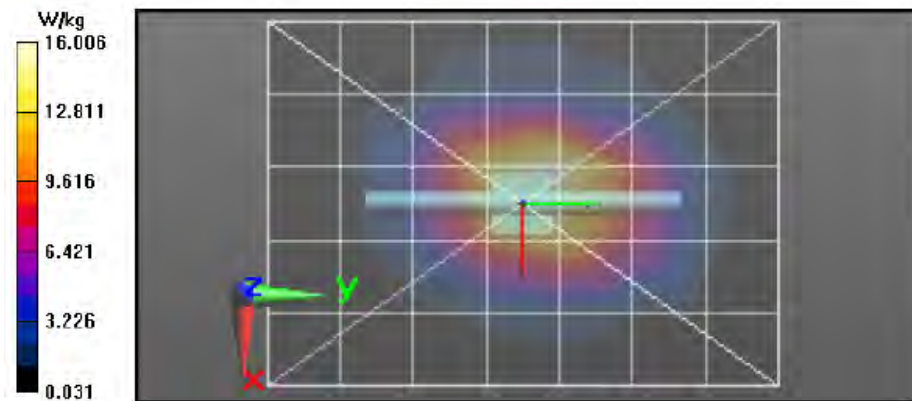
SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.21 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 20.2 W/kg

2-3 GHz-Rev.2/System Performance Check/Z-Axis Retraction (1x1x17): Measurement grid:

dx=20mm, dy=20mm, dz=10mm

Maximum value of SAR (measured) = 20.5 W/kg



Motorola Solutions, Inc. EME Laboratory
Date/Time: 11/7/2018 11:24:55 AM

Robot#: DASY5-PG-3 | Run#: FD-SYSP-2450B-181107-01
 Dipole Model#: D2450V2
 Phantom#: TP1168-2
 Tissue Temp: 21.3 (C)
 Serial#: 782
 Test Freq: 2450.0000 (MHz)
 Start Power: 250 (mW)
 Rotation (1D): 0.099 dB
 Adjusted SAR (1W): 51.60 mW/g (1g)

Comments:

Duty Cycle: 1:1, Medium parameters used: $f = 2450$ MHz; $\sigma = 1.96$ S/m; $\epsilon_r = 47.8$; $\rho = 1000$ kg/m³
 Probe: EX3DV4 - SN7486, , Frequency: 2450 MHz, ConvF(7.77, 7.77, 7.77); Calibrated: 3/20/2018
 Electronics: DAE4 Sn1488, Calibrated: 3/9/2018

2-3 GHz-Rev.2/System Performance Check/Dipole Area Scan 2 (51x71x1): Interpolated grid:

grid: dx=1.200 mm, dy=1.200 mm

Reference Value = 102.5 V/m; Power Drift = -0.04 dB

Fast SAR: SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6 W/kg (SAR corrected for target medium)

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

2-3 GHz-Rev.2/System Performance Check/0-Degree Cube (7x7x7)/Cube 0: Measurement

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

Reference Value = 102.5 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 26.4 W/kg

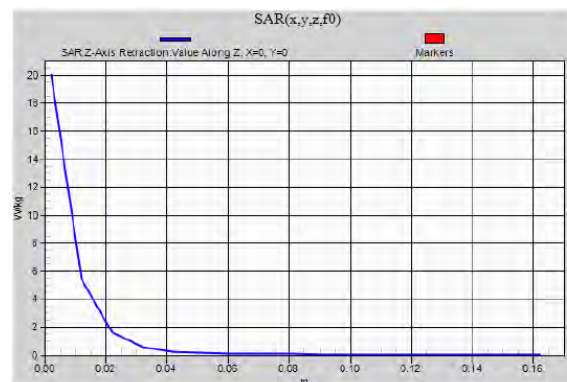
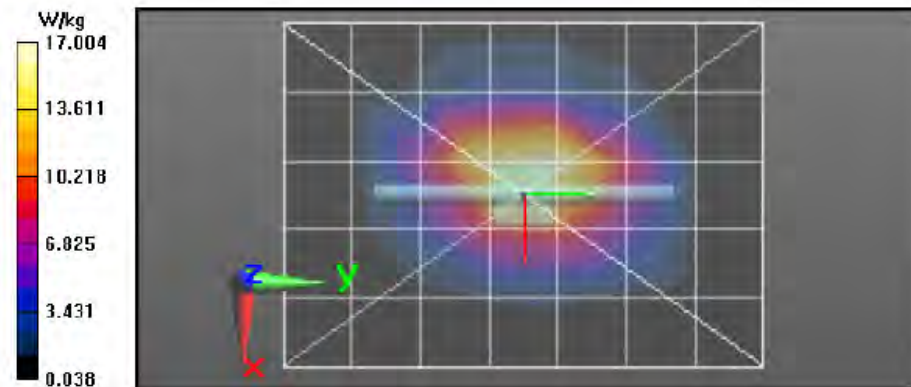
SAR(1 g) = 12.9 W/kg; SAR(10 g) = 6.05 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 19.9 W/kg

2-3 GHz-Rev.2/System Performance Check/Z-Axis Retraction (1x1x17): Measurement grid:

dx=20mm, dy=20mm, dz=10mm

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



Motorola Solutions, Inc. EME Laboratory

Date/Time: 11/2/2018 9:36:17 AM

Robot#: DASY5-PG-3 | Run#: ZZ-SYSP-5750B-181102-04
 Dipole Model#: D5GHzV2
 Phantom#: TP1174-3
 Tissue Temp: 21.5 (C)
 Serial#: 1022
 Test Freq: 5750.0000 (MHz)
 Start Power: 100 (mW)
 Rotation (1D): 0.170 dB
 Adjusted SAR (1W): 72.00 mW/g (1g)

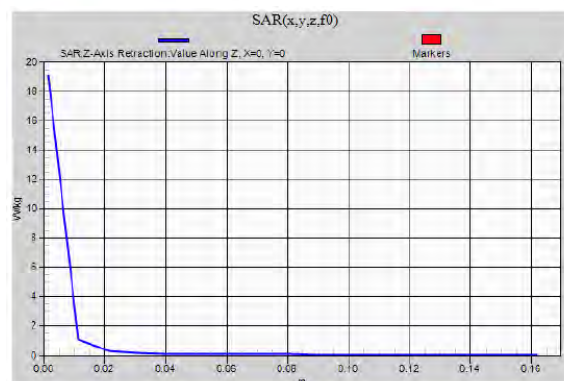
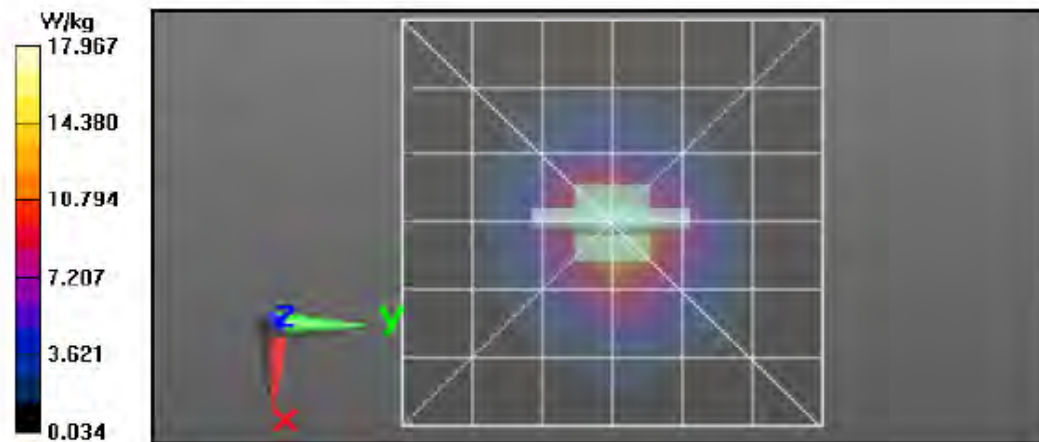
Comments:

Duty Cycle: 1:1, Medium parameters used: $f = 5750$ MHz; $\sigma = 5.9$ S/m; $\epsilon_r = 44.3$; $\rho = 1000$ kg/m³
 Probe: EX3DV4 - SN7486, Frequency: 5750 MHz, ConvF(4.27, 4.27, 4.27); Calibrated: 3/20/2018
 Electronics: DAE4 Sn1488, Calibrated: 3/9/2018

4-6 GHz-Rev.4/System Performance Check/Dipole Area Scan 2 (61x61x1): Interpolated grid:
 $dx=0.9000$ mm, $dy=0.9000$ mm
 Reference Value = 65.63 V/m; Power Drift = -0.05 dB
 Fast SAR: SAR(1 g) = 6.67 W/kg; SAR(10 g) = 1.83 W/kg (SAR corrected for target medium)
 Maximum value of SAR (interpolated) = 18.6 W/kg

4-6 GHz-Rev.4/System Performance Check/0-Degree Cube (8x8x12)/Cube 0: Measurement
 grid: $dx=4$ mm, $dy=4$ mm, $dz=2$ mm
 Reference Value = 65.63 V/m; Power Drift = -0.05 dB
 Peak SAR (extrapolated) = 31.8 W/kg
 SAR(1 g) = 7.2 W/kg; SAR(10 g) = 1.96 W/kg (SAR corrected for target medium)
 Maximum value of SAR (measured) = 18.6 W/kg

4-6 GHz-Rev.4/System Performance Check/Z-Axis Retraction (1x1x17): Measurement grid:
 $dx=20$ mm, $dy=20$ mm, $dz=10$ mm
 Maximum value of SAR (measured) = 19.1 W/kg



Motorola Solutions, Inc. EME Laboratory

Date/Time: 11/9/2018 10:35:50 AM

Robot#: DASY5-PG-3 | Run#: FD-SYSP-5750B-181109-005
 Dipole Model#: D5GHzV2
 Phantom#: TP1174-2
 Tissue Temp: 20.9 (C)
 Serial#: 1022
 Test Freq: 5750.0000 (MHz)
 Start Power: 100 (mW)
 Rotation (1D): 0.120 dB
 Adjusted SAR (1W): 74.00 mW/g (1g)

Comments:

Duty Cycle: 1:1, Medium parameters used: $f = 5750$ MHz; $\sigma = 6.09$ S/m; $\epsilon_r = 44.1$; $\rho = 1000$ kg/m³
 Probe: EX3DV4 - SN7486, , Frequency: 5750 MHz, ConvF(4.27, 4.27, 4.27); Calibrated: 3/20/2018
 Electronics: DAE4 Sn1488, Calibrated: 3/9/2018

4-6 GHz-Rev.4/System Performance Check/Dipole Area Scan 2 (61x61x1): Interpolated grid:

dx=0.9000 mm, dy=0.9000 mm

Reference Value = 64.48 V/m; Power Drift = -0.17 dB

Fast SAR: SAR(1 g) = 6.96 W/kg; SAR(10 g) = 1.91 W/kg (SAR corrected for target medium)

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

4-6 GHz-Rev.4/System Performance Check/0-Degree Cube (8x8x12)/Cube 0: Measurement

grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 64.48 V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 32.1 W/kg

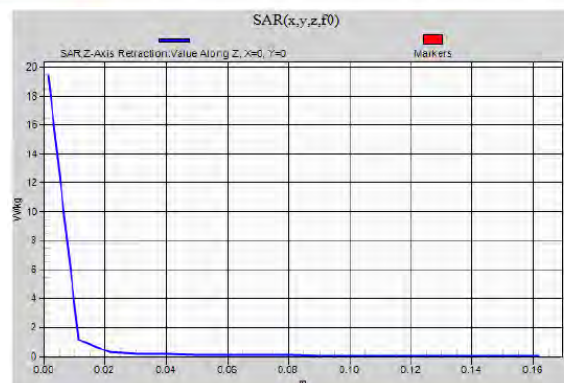
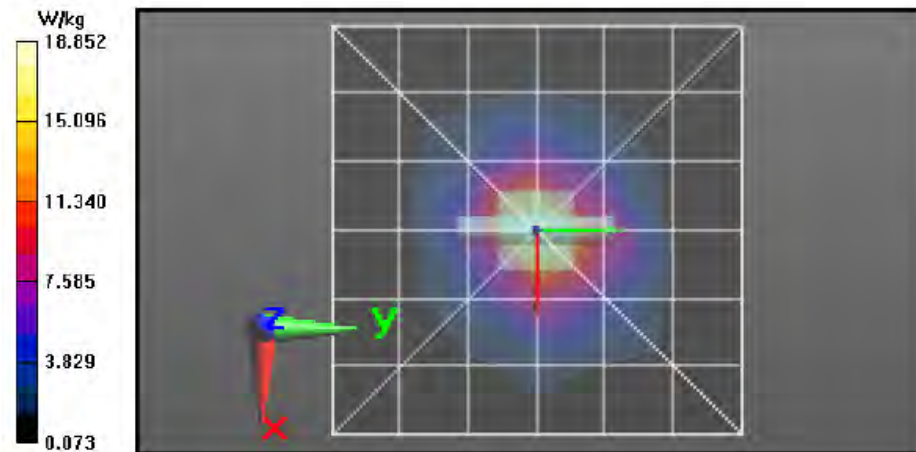
SAR(1 g) = 7.4 W/kg; SAR(10 g) = 2.09 W/kg (SAR corrected for target medium)

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

4-6 GHz-Rev.4/System Performance Check/Z-Axis Retraction (1x1x17): Measurement grid:

dx=20mm, dy=20mm, dz=10mm

Maximum value of SAR (measured) = 19.4 W/kg



Appendix E

DUT Scans

Highest WLAN 2.4GHz SAR configuration Results

Motorola Solutions, Inc. EME Laboratory

Date/Time: 11/2/2018 7:01:01 PM

Robot#: DASY5-PG-3 | Run#: FD-AB-181102-08
 Model#: N7001A
 Phantom#: TP1174-2
 Tissue Temp: 22.3 (C)
 Serial#: 372TTX0098
 Antenna: AN000183A05
 Test Freq: 2412.0000 (MHz)
 Battery: PMNN4549A High Cap Battery
 Carry Acc: PMLN7960A @ Front of DUT
 Audio Acc: None
 Start Power: 0.058 (W)

Comments:

Communication System Band: WLAN 2.4GHz (2412.0 - 2484.0 MHz), Communication System UID: 10415 - AAA, Duty Cycle: 1:1.42561,

Medium parameters used: $f = 2412$ MHz; $\sigma = 1.91$ S/m; $\epsilon_r = 48.1$; $\rho = 1000$ kg/m³

Probe: EX3DV4 - SN7486, Frequency: 2462 MHz, ConvF(7.77, 7.77, 7.77); Calibrated: 3/20/2018

Electronics: DAE4 Sn1488, Calibrated: 3/9/2018

2-3 GHz-Rev.2/Ab Scan/1-Area Scan (101x141x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Reference Value = 7.542 V/m; Power Drift = 0.17 dB

Fast SAR: SAR(1 g) = 0.257 W/kg; SAR(10 g) = 0.131 W/kg (SAR corrected for target medium)

Maximum value of SAR (interpolated) = 0.380 W/kg

2-3 GHz-Rev.2/Ab Scan/3-Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.542 V/m; Power Drift = 0.16 dB

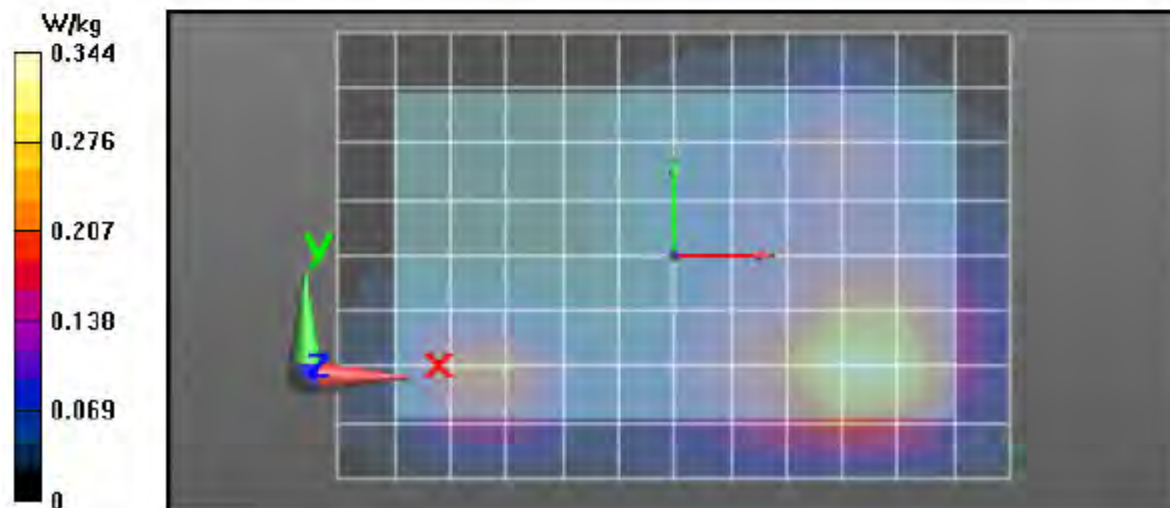
Peak SAR (extrapolated) = 0.442 W/kg

SAR(1 g) = 0.271 W/kg; SAR(10 g) = 0.144 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 0.363 W/kg

2-3 GHz-Rev.2/Ab Scan/4-Z-Axis Scan (1x1x17): Measurement grid: dx=20mm, dy=20mm, dz=10mm

Maximum value of SAR (measured) = 0.364 W/kg



Highest WLAN 5GHz SAR configuration Results

Motorola Solutions, Inc. EME Laboratory

Date/Time: 11/9/2018 7:58:12 PM

Robot#: DASY5-PG-3 | Run#: ZZ-AB-1801109-09
 Model#: N7001A
 Phantom#: TP1174-2
 Tissue Temp: 21.6 (C)
 Serial#: 372TTX0098
 Antenna: AN000183A05
 Test Freq: 5795.0000 (MHz)
 Battery: PMNN4549A High Cap Battery
 Carry Acc: PMLN7960A @ front of DUT
 Audio Acc: None
 Start Power: 0.032 (W)

Comments:

Communication System Band: WLAN 5GHz (4915.0 - 5825.0 MHz), Communication System UID: 10534 - AAB, Duty Cycle: 1.699842,

Medium parameters used: $f = 5795$ MHz; $\sigma = 6.15$ S/m; $\epsilon_r = 44$; $\rho = 1000$ kg/m³

Probe: EX3DV4 - SN7486, Frequency: 5795 MHz, ConvF(4.27, 4.27, 4.27); Calibrated: 3/20/2018

Electronics: DAE4 Sn1488, Calibrated: 3/9/2018

4-6 GHz-Rev.4/Full Ab Scan/1-Area Scan (131x171x1): Interpolated grid: dx=0.9000 mm, dy=0.9000 mm

Reference Value = 12.05 V/m; Power Drift = -0.01 dB

Fast SAR: SAR(1 g) = 0.252 W/kg; SAR(10 g) = 0.092 W/kg (SAR corrected for target medium)

Maximum value of SAR (interpolated) = 0.657 W/kg

4-6 GHz-Rev.4/Full Ab Scan/3-Zoom Scan (9x9x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 12.05 V/m; Power Drift = -0.11 dB

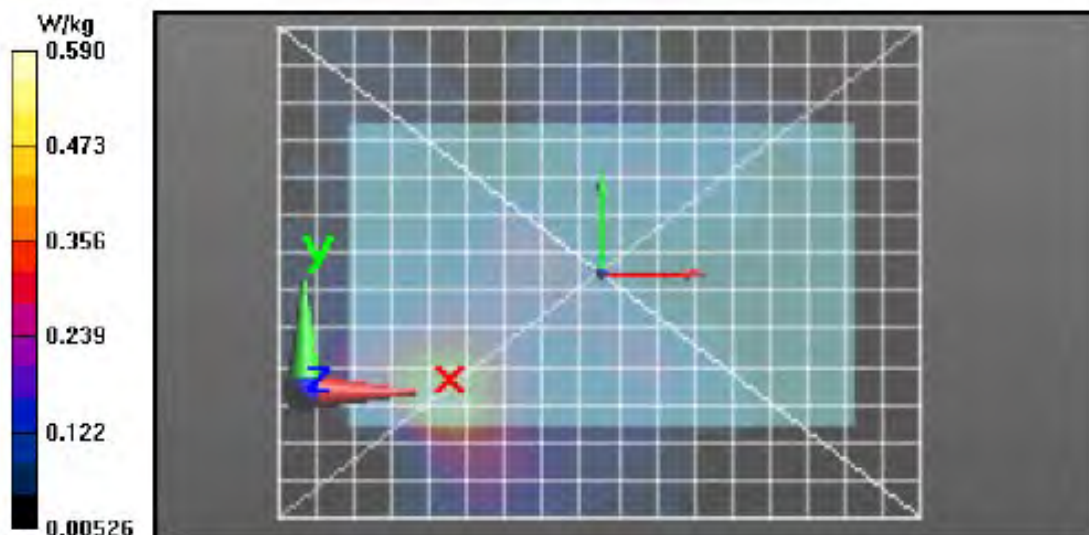
Peak SAR (extrapolated) = 1.15 W/kg

SAR(1 g) = 0.273 W/kg; SAR(10 g) = 0.096 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 0.629 W/kg

4-6 GHz-Rev.4/Full Ab Scan/4-Z-Axis Scan (1x1x17): Measurement grid: dx=20mm, dy=20mm, dz=10mm

Maximum value of SAR (measured) = 0.673 W/kg



APPENDIX F

DUT Test Position Photos

1.0 Highest SAR Test Position per body location

DUT with internal antenna AN000183A05, offered battery PMNN4549A and body worn PMLN7960A against the phantom without an audio accessory attached.



APPENDIX G

Body Worn Photos



PMLN7960A (Front View)



PMLN7960A (Back View)



PMLN7960A (Side View)