FCC SAR Test Report

APPLICANT	:	ZTE CORPORATION
EQUIPMENT	:	LTE Tablet
BRAND NAME	:	ZTE
MODEL NAME	:	K90U
FCC ID	:	SRQ-K90U
STANDARD	:	FCC 47 CFR Part 2 (2.1093) ANSI/IEEE C95.1-1992 IEEE 1528-2013

We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and had been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.

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2627

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA671906	Rev. 01	Initial issue of report	Sep. 13, 2016

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **ZTE CORPORATION, LTE Tablet, K90U** are as follows.

Equipment Class	Frequency Band		Highest SAR Summary Body 1g SAR (W/kg)	Highest Simultaneous Transmission 1g SAR (W/kg)
Licensed	LTE	Band 12	0.95	1.34
		Band 5	1.06	
		Band 4	1.19	
		Band 25	**1.20**	
DTS	WLAN	2.4GHz WLAN	1.02	1.34
NII		5GHz WLAN	1.17	1.21
DSS	2.4GHz Band	Bluetooth	0.16	1.23
Date of Testing:			2016/08/21 ~ 2016/08/30	

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.

2. Administration Data

Testing Laboratory	
Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958

Applicant	
Company Name	ZTE CORPORATION
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Manufacturer	
Company Name	ZTE CORPORATION
Address	ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

3. Guidance Applied

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards:

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 616217 D04 SAR for laptop and tablets v01r02
- FCC KDB 941225 D05 SAR for LTE Devices v02r05

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	LTE Tablet
Brand Name	ZTE
Model Name	K90U
FCC ID	SRQ-K90U
IMEI Code	990006081531151
Wireless Technology and Frequency Range	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 25: 1850 MHz ~ 1915 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	· LTE: QPSK, 16QAM · 802.11b/g/n HT20/HT40 · 802.11a/n HT20/HT40 · 802.11ac VHT20/VHT40/VHT80 · Bluetooth v3.0+EDR, Bluetooth v4.1 LE
HW Version	u1pA
SW Version	K90UV1.0.0B06
EUT Stage	Identical Prototype
Remark: 1. This device supports voice function but limited to speakerphone mode, and will not work near the head. 2. This device implanted proximity sensor function at Bottom Face and Edge 2. Power reduction will be implemented immediately for LTE Band 2/4/5/12/25.	

4.2 General LTE SAR Test and Reporting Considerations

Summarized necessary items addressed in KDB 941225 D05 v02r05	
FCC ID	SRQ-K90U
Equipment Name	LTE Tablet
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 25: 1850 MHz ~ 1915 MHz
Channel Bandwidth	LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 25:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
uplink modulations used	QPSK, and 16QAM
LTE Voice / Data requirements	Data only
LTE MPR permanently built-in by design	Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

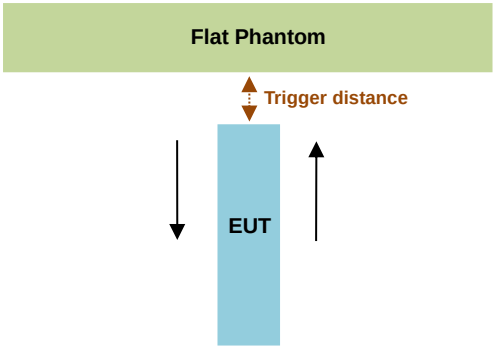
LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.
Power reduction applied to satisfy SAR compliance	1. Yes, Proximity Sensor. 2. Power reduction will be active at LTE Band 2/4/5/12/25.
LTE Release	R9,Cat 4
CA Support	NO

Transmission (H, M, L) channel numbers and frequencies in each LTE band												
LTE Band 2												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900
LTE Band 4												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745
LTE Band 5												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	20407	824.7	20415	825.5	20425	826.5	20450	829				
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5				
H	20643	848.3	20635	847.5	20625	846.5	20600	844				
LTE Band 12												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	23017	699.7	23025	700.5	23035	701.5	23060	704				
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5				
H	23173	715.3	23165	714.5	23155	713.5	23130	711				
LTE Band 25												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	26047	1850.7	26055	1851.5	26065	1852.5	26090	1855	26115	1857.5	26140	1860
M	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880
H	26683	1914.3	26675	1913.5	26665	1912.5	26640	1910	26615	1907.5	26590	1905

5. Proximity Sensor Triggering Test

<Proximity Sensor Triggering Distance (KDB 616217 D04 section 6.2)>:

Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed. The details are illustrated in the exhibit “P-Sensor operational description”, and the shortest triggering distances were reported and used for SAR assessment.
In the preliminary triggering distance testing, the tissue-equivalent medium for different frequency bands were used for verification; no other frequency bands tissue-equivalent medium was found to result in shortest triggering distance than that for 1900MHz, and the tissue-equivalent medium for 1900MHz was used for formal proximity sensor triggering testing.



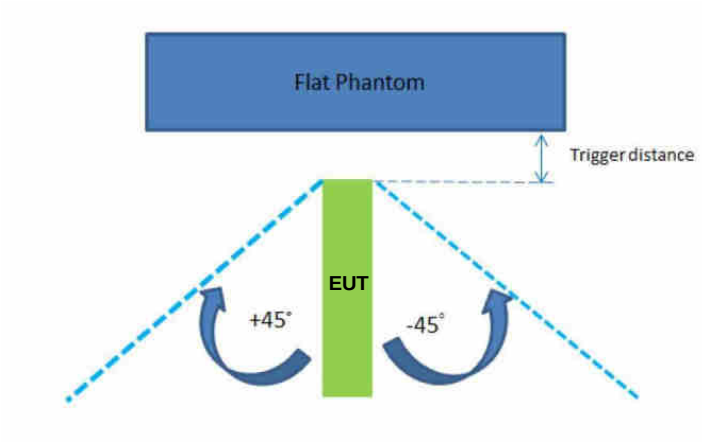
Proximity Sensor Trigger Distance (mm)		
Position	Bottom Face	Edge 2
Minimum	27	20

<Proximity Sensor Triggering Coverage (KDB 616217 D04 section 6.3)>:

If a sensor is spatially offset from the antenna(s), it is necessary to verify sensor triggering for conditions where the antenna is next to the user but the sensor is laterally further away to ensure sensor coverage is sufficient for reducing the power to maintain compliance. For p-sensor coverage testing, the device is moved and “along the direction of maximum antenna and sensor offset”.
Illustrated in the internal photo exhibit, although the senor is spatially offset, there is no trigger condition where the antenna is next to the user but the sensor is laterally further away, therefore proximity sensor coverage testing is not required.
This procedure is not required because antenna and sensor are collocated and the peak SAR location is overlapping with the sensor.

<Tablet Tilt angle influences to proximity sensor triggering (KDB 616217 D04 section 6.4)>:

The influence of table tilt angles to proximity sensor triggering was determined by positioning each tablet edge that contains a transmitting antenna, perpendicular to the flat phantom, at 20 mm separation.
Rotating the tablet around the edge next to the phantom in ≤ 10° increments until the tablet is ± 45° from the vertical position at 0°, and the maximum output power remains in the reduced mode.



The Sensor Trigger Distance (mm)	
Position	Edge 2
Minimum	20

Proximity sensor power reduction

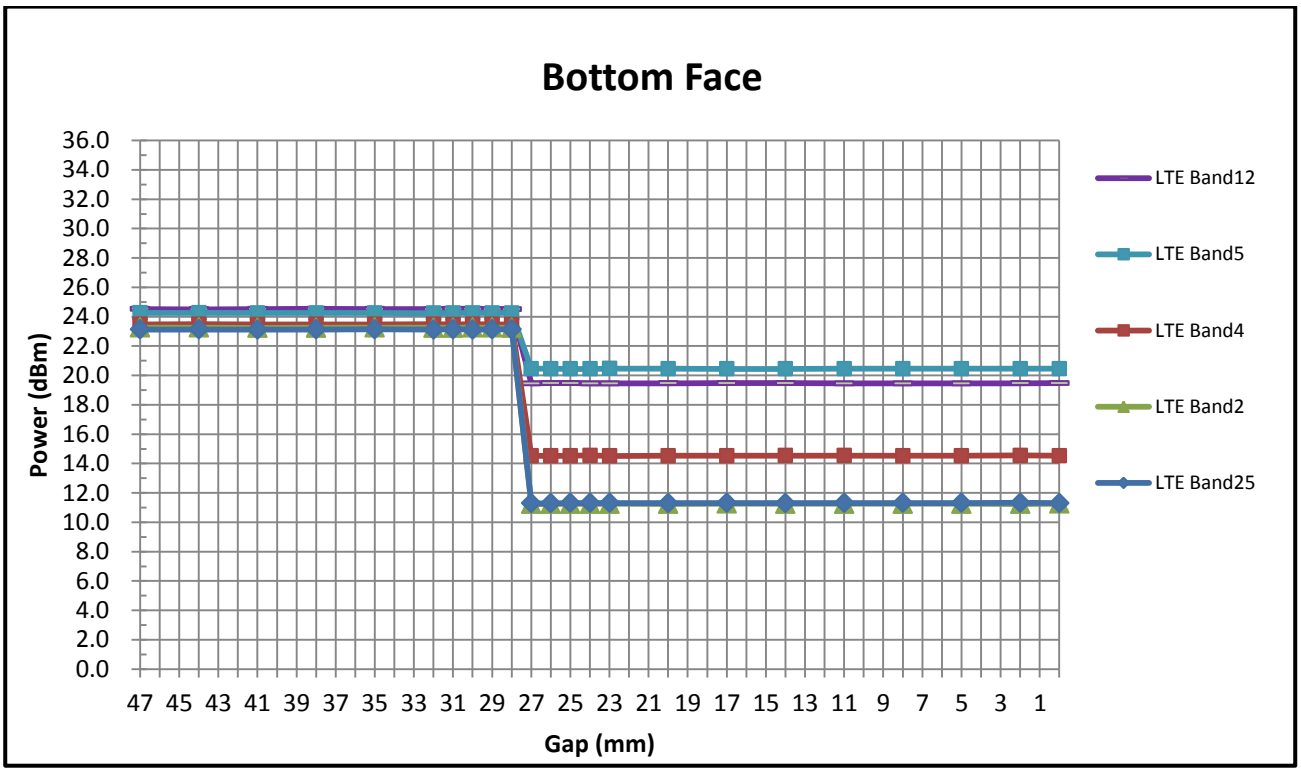
Exposure Position / wireless mode	Bottom Face(1)	Edge 1	Edge 2(1)	Edge 3	Edge 4
LTE Band 2	12.5 dB	0 dB	12.5 dB	0 dB	0 dB
LTE Band 4	9.5 dB	0 dB	9.5 dB	0 dB	0 dB
LTE Band 5	4.5 dB	0 dB	4.5 dB	0 dB	0 dB
LTE Band 12	5.5 dB	0 dB	5.5 dB	0 dB	0 dB
LTE Band 25	12.5 dB	0 dB	12.5 dB	0 dB	0 dB

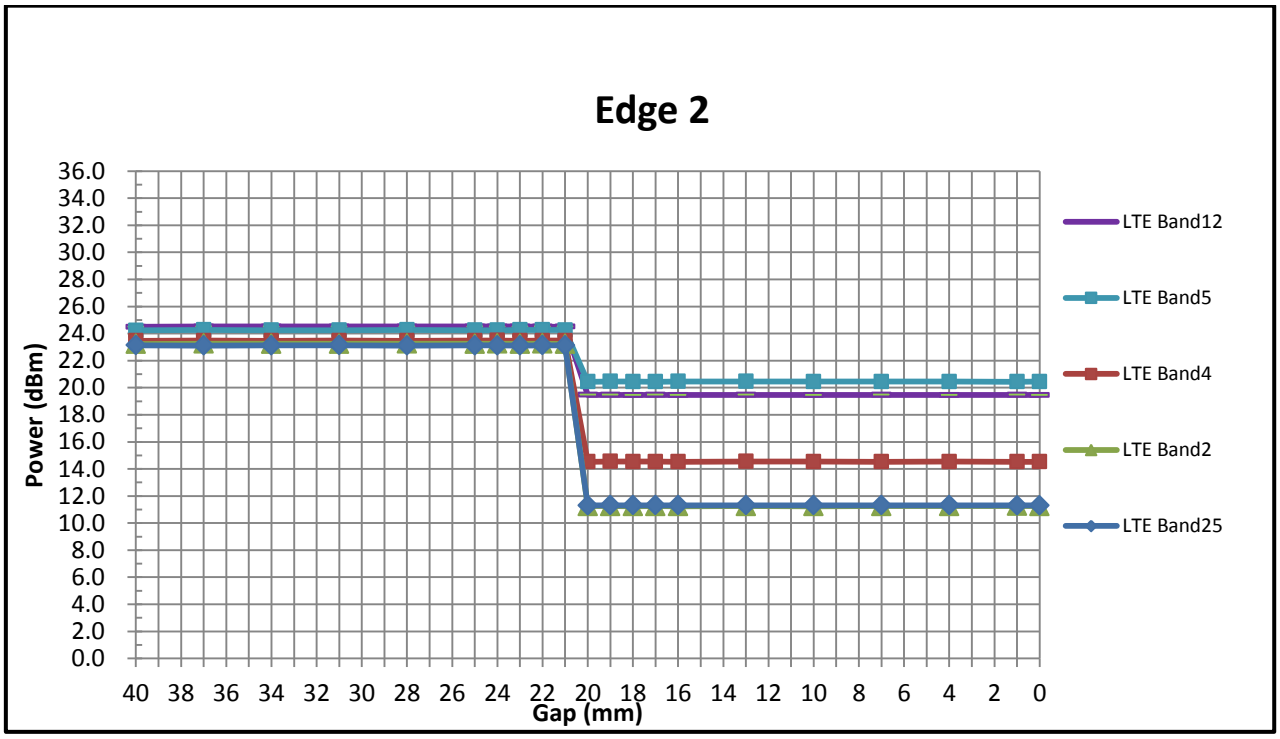
Remark:

1. (1): Reduced maximum limit applied by activation of proximity sensor.
2. Power reduction is not applicable for WLAN and Bluetooth.
3. Tests were performed in accordance with KDB 616217 D04 section 6.1, 6.2, 6.3, 6.4 and 6.5 and compliant results are shown and described in exhibit “P-Sensor operational description
4. For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance was performed:
   - Bottom Face: 15 mm
   - Edge 2: 15 mm

Power Measurement during Sensor Trigger distance testing

Band/Mode	Ch #	Measured power reduction (dBm)		Reduction Levels
		w/o power back-off	w/ power back-off	(dB)
LTE Band 2 20MHz 1RB 99offset	18900	22.80	10.56	12.24
LTE Band 4 20MHz 1RB 49offset	20175	23.46	14.52	8.94
LTE Band 5 10MHz 1RB 0offset	20525	24.24	20.00	4.24
LTE Band 12 10MHz 1RB 25offset	23095	24.50	19.45	5.05
LTE Band 25 20MHz 1RB 49offset	26340	22.99	10.76	12.23




Edge 2
Power (dBm)
36.0
34.0
32.0
30.0
28.0
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
40 38 36 34 32 30 28 26 24 22 20 18 16 14 12 10 8 6 4 2 0
Gap (mm)
LTE Band12
LTE Band5
LTE Band4
LTE Band2
LTE Band25

6. RF Exposure Limits

6.1 Uncontrolled Environment

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

6.2 Controlled Environment

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. The exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

1. Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

7. Specific Absorption Rate (SAR)

7.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

7.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

$$\mathbf{SAR} = \frac{\mathbf{d}}{\mathbf{dt}}\left(\frac{\mathbf{dW}}{\mathbf{dm}}\right) = \frac{\mathbf{d}}{\mathbf{dt}}\left(\frac{\mathbf{dW}}{\boldsymbol{\rho}\mathbf{dv}}\right)$$

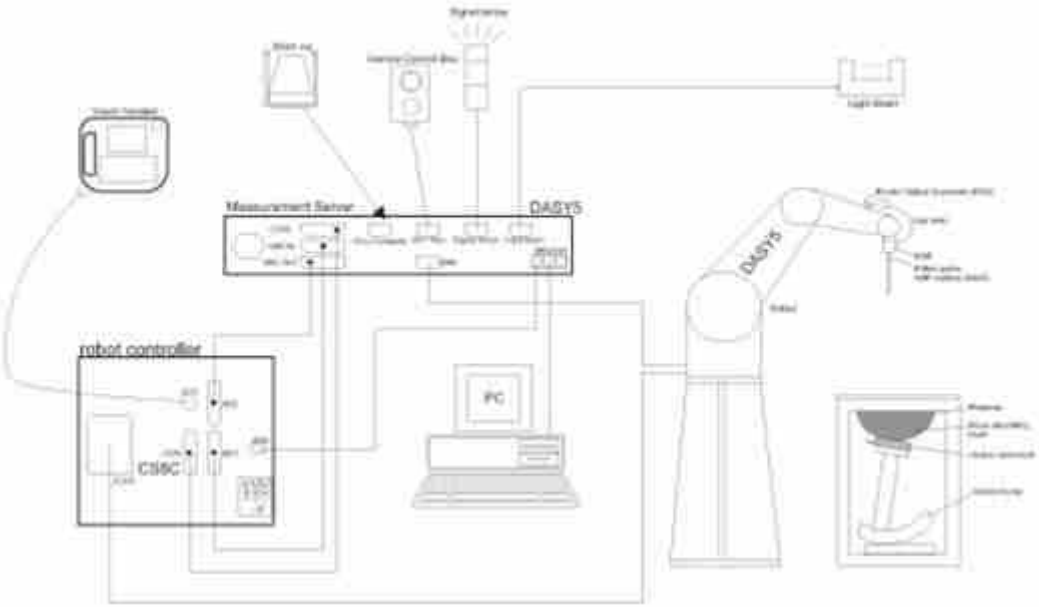
SAR is expressed in units of Watts per kilogram (W/kg)

$$\mathbf{SAR} = \frac{\boldsymbol{\sigma}|\mathbf{E}|^{\mathbf{2}}}{\boldsymbol{\rho}}$$

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

8. System Description and Setup

The DASY system used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP or Win7 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

8.1 E-Field Probe

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG).The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

<EX3DV4 Probe>

Construction	Symmetric design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz – >6 GHz Linearity: ±0.2 dB (30 MHz – 6 GHz)	
Directivity	±0.3 dB in TSL (rotation around probe axis) ±0.5 dB in TSL (rotation normal to probe axis)	
Dynamic Range	10 µW/g – >100 mW/g Linearity: ±0.2 dB (noise: typically <1 µW/g)	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

8.2 Data Acquisition Electronics (DAE)

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.1 Photo of DAE

8.3 Phantom

<SAM Twin Phantom>

Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

<ELI Phantom>

Shell Thickness	2 ± 0.2 mm (sagging: <1%)
Filling Volume	Approx. 30 liters
Dimensions	Major ellipse axis: 600 mm Minor axis: 400 mm

The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

8.4 Device Holder

<Mounting Device for Hand-Held Transmitter>

In combination with the Twin SAM V5.0/V5.0c or ELI phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat). And upgrade kit to Mounting Device to enable easy mounting of wider devices like big smart-phones, e-books, small tablets, etc. It holds devices with width up to 140 mm.

Mounting Device for Hand-Held Transmitters

Mounting Device Adaptor for Wide-Phones

<Mounting Device for Laptops and other Body-Worn Transmitters>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.

Mounting Device for Laptops

9. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

(a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
(b) Read the WWAN RF power level from the base station simulator.
(c) For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power in each supported wireless interface and frequency band
(d) Connect EUT RF port through RF cable to the power meter, and measure WLAN/BT output power

<SAR measurement>

(a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power, in the highest power channel.
(b) Place the EUT in the positions as Appendix D demonstrates.
(c) Set scan area, grid size and other setting on the DASY software.
(d) Measure SAR results for the highest power channel on each testing position.
(e) Find out the largest SAR result on these testing positions of each band
(f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

9.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

(a) Extraction of the measured data (grid and values) from the Zoom Scan
(b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
(c) Generation of a high-resolution mesh within the measured volume
(d) Interpolation of all measured values form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

9.2 Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

9.3 Area Scan

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in dB0 is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan), if only one zoom scan follows the area scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of zoom scans has to be increased accordingly.

Area scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

9.4 Zoom Scan

Zoom scans are used assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The zoom scan measures points (refer to table below) within a cube shoes base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the zoom scan evaluates the averaged SAR for 1 gram and 10 gram and displays these values next to the job's label.

Zoom scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

9.5 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

9.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drifts more than 5%, the SAR will be retested.

10. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1065	2015/11/24	2016/11/23
SPEAG	835MHz System Validation Kit	D835V2	4d091	2015/11/24	2016/11/23
SPEAG	1750MHz System Validation Kit	D1750V2	1069	2015/11/23	2016/11/22
SPEAG	1900MHz System Validation Kit	D1900V2	5d118	2015/11/23	2016/11/22
SPEAG	2450MHz System Validation Kit	D2450V2	840	2015/11/25	2016/11/24
SPEAG	5000MHz System Validation Kit	D5GHzV2	1113	2015/11/26	2016/11/25
SPEAG	Data Acquisition Electronics	DAE4	1210	2016/5/18	2017/5/17
SPEAG	Data Acquisition Electronics	DAE4	1279	2016/4/4	2017/4/3
SPEAG	Dosimetric E-Field Probe	EX3DV4	3857	2016/5/25	2017/5/24
SPEAG	Dosimetric E-Field Probe	EX3DV4	3954	2015/11/27	2016/11/26
SPEAG	ELI4 Phantom	QD OVA 001 BB	TP-1079	NCR	NCR
SPEAG	ELI4 Phantom	QD OVA 001 BB	TP-1127	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201300654	2016/8/8	2017/8/7
Agilent	ENA Series Network Analyzer	E5071C	MY46111157	2016/4/22	2017/4/21
SPEAG	DAK Kit	DAK3.5	1144	2015/11/24	2016/11/23
R&S	Signal Generator	SMBV100A	258305	2016/1/20	2017/1/19
Anritsu	Power Senor	MA2411B	0917070	2016/1/20	2017/1/19
Anritsu	Power Meter	ML2495A	1005002	2016/1/20	2017/1/19
Anritsu	Power Senor	MA2411B	1339163	2016/1/20	2017/1/19
Anritsu	Power Meter	ML2495A	1435004	2016/1/20	2017/1/19
R&S	CBT BLUETOOTH TESTER	CBT	101137	2016/8/9	2017/8/8
R&S	Spectrum Analyzer	FSV7	101631	2016/8/8	2017/8/7
ARRA	Power Divider	A3200-2	NA	Note1	
Agilent	Dual Directional Coupler	778D	50422	Note1	
PASTERNACK	Dual Directional Coupler	PE2214-10	N/A	Note1	
AR	Amplifier	5S1G4	333096	Note1	
mini-circuits	Amplifier	ZVE-3W-83+	162601250	Note1	
MCL	Attenuation1	BW-S10W5+	N/A	Note1	
MCL	Attenuation2	BW-S10W5+	N/A	Note1	
MCL	Attenuation3	BW-S10W5+	N/A	Note1	

General Note:

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.

11. System Verification

11.1 Tissue Verification

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (εr)
For Body								
750	51.7	47.2	0	0.9	0.1	0	0.96	55.5
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
1800, 1900, 2000	70.2	0	0	0.4	0	29.4	1.52	53.3
2450	68.6	0	0	0	0	31.4	1.95	52.7

Simulating Liquid for 5GHz, Manufactured by SPEAG

Ingredients	(% by weight)
Water	64~78%
Mineral oil	11~18%
Emulsifiers	9~15%
Additives and Salt	2~3%

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
750	Body	22.8	0.928	55.228	0.96	55.50	-3.33	-0.49	±5	2016/8/21
835	Body	22.8	0.969	55.694	0.97	55.20	-0.10	0.89	±5	2016/8/22
1750	Body	22.7	1.499	53.463	1.49	53.40	0.60	0.12	±5	2016/8/23
1900	Body	22.7	1.550	54.720	1.52	53.30	1.97	2.66	±5	2016/8/24
2450	Body	22.5	1.989	51.422	1.95	52.70	2.00	-2.43	±5	2016/8/30
5250	Body	22.6	5.366	48.688	5.36	48.95	0.11	-0.54	±5	2016/8/29
5750	Body	22.6	6.068	47.579	5.94	48.28	2.15	-1.45	±5	2016/8/29

11.2 System Performance Check Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2016/8/21	750	Body	250	1065	3857	1210	2.1	8.86	8.4	-5.19
2016/8/22	835	Body	250	4d091	3857	1210	2.24	9.55	8.96	-6.18
2016/8/23	1750	Body	250	1069	3857	1210	9.56	35.9	38.24	6.52
2016/8/24	1900	Body	250	5d118	3857	1210	10.5	40.6	42	3.45
2016/8/30	2450	Body	250	840	3857	1210	12.5	51.1	50	-2.15
2016/8/29	5250	Body	100	1113	3954	1279	7.48	76.5	74.8	-2.22
2016/8/29	5750	Body	100	1113	3954	1279	7.2	76.6	72	-6.01

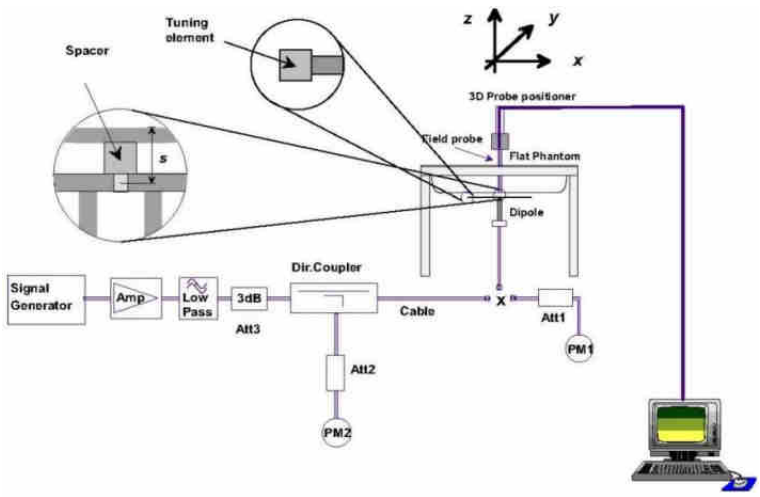


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

12. RF Exposure Positions

12.1 SAR Testing for Tablet

This device can be used also in full sized tablet exposure conditions, due to its size. Per FCC KDB 616217, the back surface and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom. The SAR exclusion threshold in KDB 447498 D01v06 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom.

13. Conducted RF Output Power (Unit: dBm)

<LTE Conducted Power>

General Note:

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B12 / B5 / B4 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
9. LTE band 2 SAR test was covered by Band 25; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
    a. the maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion
    b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band

Maximum Average RF Power (Proximity Sensor Inactive)

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	22.67	22.68	22.74	23.50	0
20	QPSK	1	49	22.60	22.74	22.84		
20	QPSK	1	99	22.91	22.80	23.23		
20	QPSK	50	0	21.99	22.01	22.04	22.50	1
20	QPSK	50	24	21.87	21.93	21.91		
20	QPSK	50	50	21.63	21.89	22.01		
20	QPSK	100	0	21.82	21.91	22.01		
20	16QAM	1	0	21.73	21.71	21.73	22.50	1
20	16QAM	1	49	21.71	21.60	21.85		
20	16QAM	1	99	21.43	21.79	21.85		
20	16QAM	50	0	20.89	20.94	20.99	21.50	2
20	16QAM	50	24	20.79	21.04	21.02		
20	16QAM	50	50	20.62	20.99	21.04		
20	16QAM	100	0	20.81	21.00	20.93		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	22.82	22.95	22.96	23.50	0
15	QPSK	1	37	23.10	23.12	23.03		
15	QPSK	1	74	22.66	22.93	23.13		
15	QPSK	36	0	21.86	22.04	21.98	22.50	1
15	QPSK	36	20	21.81	21.91	22.02		
15	QPSK	36	39	21.80	21.89	22.03		
15	QPSK	75	0	21.77	21.93	21.95		
15	16QAM	1	0	21.72	21.86	21.90	22.50	1
15	16QAM	1	37	21.84	21.69	22.03		
15	16QAM	1	74	21.56	21.66	21.93		
15	16QAM	36	0	20.94	21.05	21.00	21.50	2
15	16QAM	36	20	20.89	20.93	21.05		
15	16QAM	36	39	20.99	20.90	21.16		
15	16QAM	75	0	20.95	21.04	20.97		

Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	22.65	22.86	22.80	23.50	0
10	QPSK	1	25	22.59	22.85	23.01		
10	QPSK	1	49	22.90	22.68	22.91		
10	QPSK	25	0	21.86	21.94	21.97	22.50	1
10	QPSK	25	12	21.83	21.89	22.07		
10	QPSK	25	25	21.73	21.89	22.08		
10	QPSK	50	0	21.86	21.95	22.01		
10	16QAM	1	0	21.71	21.92	22.16	22.50	1
10	16QAM	1	25	21.65	21.70	22.03		
10	16QAM	1	49	21.73	21.81	22.11		
10	16QAM	25	0	20.95	21.16	21.00	21.50	2
10	16QAM	25	12	20.97	21.00	21.11		
10	16QAM	25	25	20.70	20.99	21.24		
10	16QAM	50	0	20.86	21.16	21.05		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	22.51	22.80	23.04	23.50	0
5	QPSK	1	12	22.81	22.93	23.37		
5	QPSK	1	24	22.87	22.79	22.93		
5	QPSK	12	0	21.73	21.84	22.05	22.50	1
5	QPSK	12	7	21.81	21.83	22.06		
5	QPSK	12	13	21.83	21.85	22.11		
5	QPSK	25	0	21.80	21.86	22.03		
5	16QAM	1	0	21.64	21.54	22.06	22.50	1
5	16QAM	1	12	21.63	21.70	22.01		
5	16QAM	1	24	21.52	21.70	21.96		
5	16QAM	12	0	20.73	20.95	21.01	21.50	2
5	16QAM	12	7	20.80	20.76	20.97		
5	16QAM	12	13	20.80	20.76	20.98		
5	16QAM	25	0	20.80	20.75	21.07		

Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	22.79	22.68	23.12	23.50	0
3	QPSK	1	8	22.94	22.90	23.35		
3	QPSK	1	14	22.79	22.94	22.99		
3	QPSK	8	0	21.81	21.80	22.14	22.50	1
3	QPSK	8	4	21.82	21.96	22.13		
3	QPSK	8	7	21.85	21.88	22.18		
3	QPSK	15	0	21.82	21.87	22.10		
3	16QAM	1	0	21.61	21.67	22.00	22.50	1
3	16QAM	1	8	21.54	21.45	21.94		
3	16QAM	1	14	21.68	21.87	22.01		
3	16QAM	8	0	20.93	20.98	21.19	21.50	2
3	16QAM	8	4	21.05	20.92	21.25		
3	16QAM	8	7	21.17	20.92	21.15		
3	16QAM	15	0	21.00	21.08	21.23		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	22.64	22.87	23.15	23.50	0
1.4	QPSK	1	3	22.92	23.05	23.20		
1.4	QPSK	1	5	22.84	22.90	23.10		
1.4	QPSK	3	0	22.89	23.01	23.20		
1.4	QPSK	3	1	22.97	23.01	23.24		
1.4	QPSK	3	3	23.00	22.82	23.24		
1.4	QPSK	6	0	21.94	21.79	22.06	22.50	1
1.4	16QAM	1	0	21.90	21.71	22.03	22.50	1
1.4	16QAM	1	3	21.59	21.67	21.97		
1.4	16QAM	1	5	21.50	21.41	22.20		
1.4	16QAM	3	0	21.83	21.82	22.19		
1.4	16QAM	3	1	21.91	21.96	22.22		
1.4	16QAM	3	3	21.95	21.95	22.20		
1.4	16QAM	6	0	20.79	20.76	20.79	21.50	2

<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	23.41	23.07	23.38	24.00	0
20	QPSK	1	49	23.43	23.46	23.41		
20	QPSK	1	99	23.32	23.13	23.21		
20	QPSK	50	0	22.37	22.39	22.38	23.00	1
20	QPSK	50	24	22.33	22.36	22.32		
20	QPSK	50	50	22.28	22.28	22.31		
20	QPSK	100	0	22.31	22.35	22.31		
20	16QAM	1	0	22.03	22.17	22.16	23.00	1
20	16QAM	1	49	22.00	22.20	21.88		
20	16QAM	1	99	22.20	21.92	21.84		
20	16QAM	50	0	21.29	21.21	21.32	22.00	2
20	16QAM	50	24	21.34	21.34	21.38		
20	16QAM	50	50	21.34	21.33	21.37		
20	16QAM	100	0	21.32	21.33	21.40		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	23.54	23.28	23.29	24.00	0
15	QPSK	1	37	23.33	23.57	23.48		
15	QPSK	1	74	22.85	23.35	23.11		
15	QPSK	36	0	22.37	22.39	22.41	23.00	1
15	QPSK	36	20	22.34	22.37	22.31		
15	QPSK	36	39	22.29	22.39	22.33		
15	QPSK	75	0	22.33	22.35	22.31		
15	16QAM	1	0	21.89	22.12	21.89	23.00	1
15	16QAM	1	37	22.07	22.21	21.99		
15	16QAM	1	74	21.96	21.99	21.86		
15	16QAM	36	0	21.31	21.36	21.50	22.00	2
15	16QAM	36	20	21.37	21.50	21.48		
15	16QAM	36	39	21.45	21.46	21.30		
15	16QAM	75	0	21.37	21.50	21.36		

Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	23.11	23.25	23.29	24.00	0
10	QPSK	1	25	23.18	23.34	23.31		
10	QPSK	1	49	23.14	23.19	23.17		
10	QPSK	25	0	22.29	22.34	22.40	23.00	1
10	QPSK	25	12	22.31	22.38	22.34		
10	QPSK	25	25	22.34	22.39	22.32		
10	QPSK	50	0	22.31	22.35	22.34		
10	16QAM	1	0	22.25	22.22	21.94	23.00	1
10	16QAM	1	25	22.12	22.23	21.83		
10	16QAM	1	49	21.90	22.13	21.76		
10	16QAM	25	0	21.36	21.32	21.48	22.00	2
10	16QAM	25	12	21.27	21.35	21.31		
10	16QAM	25	25	21.49	21.57	21.38		
10	16QAM	50	0	21.36	21.54	21.31		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	23.10	23.38	23.02	24.00	0
5	QPSK	1	12	23.28	23.33	23.26		
5	QPSK	1	24	23.09	23.17	22.96		
5	QPSK	12	0	22.30	22.36	22.29	23.00	1
5	QPSK	12	7	22.19	22.41	22.23		
5	QPSK	12	13	22.28	22.43	22.25		
5	QPSK	25	0	22.27	22.37	22.29		
5	16QAM	1	0	22.02	22.04	21.81	23.00	1
5	16QAM	1	12	22.01	22.56	22.32		
5	16QAM	1	24	22.13	22.48	22.19		
5	16QAM	12	0	21.17	21.34	21.26	22.00	2
5	16QAM	12	7	21.15	21.30	21.20		
5	16QAM	12	13	21.10	21.47	21.21		
5	16QAM	25	0	21.35	21.27	21.26		

Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	23.35	23.11	23.38	24.00	0
3	QPSK	1	8	23.27	23.37	23.21		
3	QPSK	1	14	23.24	23.51	23.51		
3	QPSK	8	0	22.34	22.45	22.28	23.00	1
3	QPSK	8	4	22.29	22.42	22.25		
3	QPSK	8	7	22.24	22.46	22.28		
3	QPSK	15	0	22.21	22.35	22.28		
3	16QAM	1	0	21.99	22.16	22.59	23.00	1
3	16QAM	1	8	22.02	21.87	21.81		
3	16QAM	1	14	21.94	22.32	21.98		
3	16QAM	8	0	21.34	21.28	21.30	22.00	2
3	16QAM	8	4	21.30	21.55	21.27		
3	16QAM	8	7	21.24	21.48	21.30		
3	16QAM	15	0	21.03	21.24	21.15		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	23.19	23.37	23.33	24.00	0
1.4	QPSK	1	3	23.50	23.37	23.49		
1.4	QPSK	1	5	23.34	23.20	23.31		
1.4	QPSK	3	0	23.40	23.54	23.40		
1.4	QPSK	3	1	23.33	23.68	23.45		
1.4	QPSK	3	3	23.32	23.51	23.45		
1.4	QPSK	6	0	22.31	22.36	22.19	23.00	1
1.4	16QAM	1	0	21.82	22.31	22.07	23.00	1
1.4	16QAM	1	3	21.85	22.23	22.02		
1.4	16QAM	1	5	22.08	22.52	22.09		
1.4	16QAM	3	0	22.03	22.30	22.42		
1.4	16QAM	3	1	22.18	22.40	22.55		
1.4	16QAM	3	3	22.36	22.47	22.54		
1.4	16QAM	6	0	21.10	21.33	21.45	22.00	2

<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	24.32	24.24	24.18	25.00	0
10	QPSK	1	25	24.17	24.17	24.04		
10	QPSK	1	49	23.93	24.19	24.12		
10	QPSK	25	0	24.43	24.26	24.27	25.00	0
10	QPSK	25	12	24.26	24.24	24.26		
10	QPSK	25	25	24.24	24.25	24.24		
10	QPSK	50	0	24.30	24.29	24.29		
10	16QAM	1	0	24.14	24.23	24.05	25.00	0
10	16QAM	1	25	24.26	24.00	24.26		
10	16QAM	1	49	23.97	23.56	24.13		
10	16QAM	25	0	23.24	23.18	23.27	24.00	1
10	16QAM	25	12	23.26	23.22	23.39		
10	16QAM	25	25	23.28	23.13	23.18		
10	16QAM	50	0	23.21	23.30	23.27		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	24.04	24.00	24.14	25.00	0
5	QPSK	1	12	24.30	24.18	24.19		
5	QPSK	1	24	23.93	24.33	24.03		
5	QPSK	12	0	24.49	24.30	24.26	25.00	0
5	QPSK	12	7	24.38	24.29	24.18		
5	QPSK	12	13	24.26	24.27	24.22		
5	QPSK	25	0	24.31	24.22	24.31		
5	16QAM	1	0	23.85	24.35	23.82	25.00	0
5	16QAM	1	12	23.85	23.99	23.98		
5	16QAM	1	24	23.94	24.08	23.86		
5	16QAM	12	0	23.53	23.31	23.20	24.00	1
5	16QAM	12	7	23.08	23.35	23.14		
5	16QAM	12	13	23.06	23.32	23.10		
5	16QAM	25	0	23.12	23.27	23.37		

Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	24.04	24.41	24.14	25.00	0
3	QPSK	1	8	24.38	24.52	24.27		
3	QPSK	1	14	24.01	24.51	24.28		
3	QPSK	8	0	24.40	24.31	24.27	25.00	0
3	QPSK	8	4	24.55	24.23	24.41		
3	QPSK	8	7	24.36	24.21	24.38		
3	QPSK	15	0	24.38	24.21	24.33		
3	16QAM	1	0	23.97	23.97	24.04	25.00	0
3	16QAM	1	8	23.91	23.99	23.91		
3	16QAM	1	14	24.16	24.04	24.08		
3	16QAM	8	0	23.31	23.42	23.19	24.00	1
3	16QAM	8	4	23.45	23.24	23.32		
3	16QAM	8	7	23.36	23.32	23.22		
3	16QAM	15	0	23.34	23.28	23.29		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	24.19	24.06	24.31	25.00	0
1.4	QPSK	1	3	24.35	24.25	24.37		
1.4	QPSK	1	5	24.13	24.12	24.15		
1.4	QPSK	3	0	24.37	24.18	24.39		
1.4	QPSK	3	1	24.42	24.23	24.51		
1.4	QPSK	3	3	24.38	24.22	24.39		
1.4	QPSK	6	0	24.30	24.10	24.38	25.00	0
1.4	16QAM	1	0	23.94	24.00	24.26	25.00	0
1.4	16QAM	1	3	24.09	23.99	24.23		
1.4	16QAM	1	5	24.01	23.77	24.22		
1.4	16QAM	3	0	24.28	24.35	24.51		
1.4	16QAM	3	1	24.33	24.40	24.55		
1.4	16QAM	3	3	24.34	24.45	24.54		
1.4	16QAM	6	0	23.00	23.13	23.24	24.00	1

<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23060	23095	23130		
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	24.04	23.99	24.00	25.00	0
10	QPSK	1	25	24.30	24.50	24.49		
10	QPSK	1	49	24.18	24.24	23.79		
10	QPSK	25	0	23.24	23.25	23.26	24.00	1
10	QPSK	25	12	23.28	23.31	23.28		
10	QPSK	25	25	23.26	23.25	23.27		
10	QPSK	50	0	23.32	23.41	23.25		
10	16QAM	1	0	23.11	22.82	22.85	24.00	1
10	16QAM	1	25	23.02	23.06	22.72		
10	16QAM	1	49	23.13	23.05	22.93		
10	16QAM	25	0	22.26	22.44	22.32	23.00	2
10	16QAM	25	12	22.34	22.34	22.20		
10	16QAM	25	25	22.33	22.31	22.45		
10	16QAM	50	0	22.48	22.21	22.42		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	24.06	24.06	23.77	25.00	0
5	QPSK	1	12	24.64	24.65	24.35		
5	QPSK	1	24	24.25	24.29	23.71		
5	QPSK	12	0	23.35	23.29	23.22	24.00	1
5	QPSK	12	7	23.30	23.35	23.13		
5	QPSK	12	13	23.21	23.31	23.16		
5	QPSK	25	0	23.08	23.28	23.14		
5	16QAM	1	0	23.23	22.92	22.81	24.00	1
5	16QAM	1	12	22.83	23.10	22.79		
5	16QAM	1	24	22.59	22.97	22.82		
5	16QAM	12	0	22.22	22.17	22.11	23.00	2
5	16QAM	12	7	22.27	22.46	22.05		
5	16QAM	12	13	22.04	22.53	22.00		
5	16QAM	25	0	22.14	22.34	22.16		

Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	24.25	24.14	24.09	25.00	0
3	QPSK	1	8	24.52	24.64	24.30		
3	QPSK	1	14	24.18	24.22	24.02		
3	QPSK	8	0	23.35	23.15	23.20	24.00	1
3	QPSK	8	4	23.45	23.32	23.24		
3	QPSK	8	7	23.39	23.27	23.30		
3	QPSK	15	0	23.41	23.30	23.19		
3	16QAM	1	0	22.74	23.02	23.11	24.00	1
3	16QAM	1	8	22.89	23.09	23.30		
3	16QAM	1	14	22.73	23.06	22.92		
3	16QAM	8	0	22.03	22.26	22.00	23.00	2
3	16QAM	8	4	22.34	22.43	22.28		
3	16QAM	8	7	22.27	22.48	22.21		
3	16QAM	15	0	22.34	22.29	22.16		
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	24.25	24.17	24.29	25.00	0
1.4	QPSK	1	3	24.34	24.28	24.51		
1.4	QPSK	1	5	24.45	24.35	24.31		
1.4	QPSK	3	0	24.50	24.29	24.32		
1.4	QPSK	3	1	24.39	24.45	24.27		
1.4	QPSK	3	3	24.43	24.48	24.30		
1.4	QPSK	6	0	23.25	23.28	23.26	24.00	1
1.4	16QAM	1	0	22.76	22.34	23.08	24.00	1
1.4	16QAM	1	3	22.97	23.96	23.21		
1.4	16QAM	1	5	22.85	23.00	23.09		
1.4	16QAM	3	0	23.40	23.44	23.21		
1.4	16QAM	3	1	23.36	23.12	23.31		
1.4	16QAM	3	3	23.39	23.35	23.30		
1.4	16QAM	6	0	22.25	22.11	22.11	23.00	2

<LTE Band 25>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				26140	26340	26590		
Frequency (MHz)				1860	1880	1905		
20	QPSK	1	0	22.83	22.94	22.95	23.50	0
20	QPSK	1	49	22.85	22.99	23.11		
20	QPSK	1	99	22.69	22.98	22.85		
20	QPSK	50	0	21.98	22.00	22.22	22.50	1
20	QPSK	50	24	21.95	21.95	22.13		
20	QPSK	50	50	21.83	21.96	22.19		
20	QPSK	100	0	21.86	22.04	22.13		
20	16QAM	1	0	21.76	21.86	22.29	22.50	1
20	16QAM	1	49	21.79	21.82	22.19		
20	16QAM	1	99	21.65	21.84	21.80		
20	16QAM	50	0	20.90	20.97	21.44	21.50	2
20	16QAM	50	24	20.88	21.06	21.29		
20	16QAM	50	50	20.84	21.11	21.35		
20	16QAM	100	0	20.82	21.03	21.12		
Channel				26115	26340	26615	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1907.5		
15	QPSK	1	0	22.72	22.96	23.21	23.50	0
15	QPSK	1	37	23.06	23.14	23.33		
15	QPSK	1	74	22.84	23.06	23.25		
15	QPSK	36	0	21.93	22.01	22.17	22.50	1
15	QPSK	36	20	21.91	21.98	22.31		
15	QPSK	36	39	21.87	22.11	22.25		
15	QPSK	75	0	21.85	22.01	22.16		
15	16QAM	1	0	21.78	21.88	21.99	22.50	1
15	16QAM	1	37	21.99	21.58	22.40		
15	16QAM	1	74	21.69	21.99	22.03		
15	16QAM	36	0	20.92	20.90	21.43	21.50	2
15	16QAM	36	20	20.98	20.97	21.36		
15	16QAM	36	39	20.97	21.13	21.37		
15	16QAM	75	0	20.93	21.01	21.34		

Channel				26090	26340	26640	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1910		
10	QPSK	1	0	22.65	22.93	23.40	23.50	0
10	QPSK	1	25	22.62	23.02	23.30		
10	QPSK	1	49	22.90	23.08	23.04		
10	QPSK	25	0	21.87	21.95	22.19	22.50	1
10	QPSK	25	12	21.89	21.99	22.28		
10	QPSK	25	25	21.89	21.99	22.28		
10	QPSK	50	0	21.88	21.95	22.10		
10	16QAM	1	0	21.74	21.74	22.13	22.50	1
10	16QAM	1	25	21.75	21.70	22.10		
10	16QAM	1	49	21.45	22.03	21.97		
10	16QAM	25	0	20.88	21.02	21.48	21.50	2
10	16QAM	25	12	20.89	21.09	21.35		
10	16QAM	25	25	21.05	20.99	21.04		
10	16QAM	50	0	20.97	20.86	21.39		
Channel				26065	26340	26665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1912.5		
5	QPSK	1	0	22.80	22.69	23.20	23.50	0
5	QPSK	1	12	22.80	22.92	23.16		
5	QPSK	1	24	22.53	23.06	23.05		
5	QPSK	12	0	21.84	21.84	22.28	22.50	1
5	QPSK	12	7	21.91	21.93	22.10		
5	QPSK	12	13	21.85	21.85	22.12		
5	QPSK	25	0	21.82	21.86	22.20		
5	16QAM	1	0	21.67	21.81	22.05	22.50	1
5	16QAM	1	12	21.70	21.67	21.99		
5	16QAM	1	24	21.63	21.64	22.05		
5	16QAM	12	0	20.65	20.86	21.36	21.50	2
5	16QAM	12	7	20.66	20.98	21.03		
5	16QAM	12	13	20.65	20.96	20.97		
5	16QAM	25	0	20.61	20.97	20.99		

Channel				26055	26340	26675	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1913.5		
3	QPSK	1	0	22.85	22.95	23.03	23.50	0
3	QPSK	1	8	22.87	22.94	23.21		
3	QPSK	1	14	22.93	22.98	23.27		
3	QPSK	8	0	21.86	21.87	22.17	22.50	1
3	QPSK	8	4	21.97	22.04	22.30		
3	QPSK	8	7	21.91	21.96	22.17		
3	QPSK	15	0	21.88	21.95	22.21		
3	16QAM	1	0	21.51	21.85	22.11	22.50	1
3	16QAM	1	8	21.44	21.51	21.93		
3	16QAM	1	14	21.75	21.65	22.10		
3	16QAM	8	0	20.60	20.73	21.25	21.50	2
3	16QAM	8	4	20.82	20.81	21.27		
3	16QAM	8	7	20.96	21.07	21.24		
3	16QAM	15	0	20.89	20.79	21.02		
Channel				26047	26340	26683	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1914.3		
1.4	QPSK	1	0	22.84	22.84	23.19	23.50	0
1.4	QPSK	1	3	22.94	23.02	23.18		
1.4	QPSK	1	5	22.84	22.88	23.19		
1.4	QPSK	3	0	22.97	23.21	23.30		
1.4	QPSK	3	1	22.91	23.08	23.50		
1.4	QPSK	3	3	22.83	22.98	23.47		
1.4	QPSK	6	0	21.82	21.88	22.13	22.50	1
1.4	16QAM	1	0	21.71	21.70	22.07	22.50	1
1.4	16QAM	1	3	21.70	21.67	22.37		
1.4	16QAM	1	5	21.56	21.76	22.16		
1.4	16QAM	3	0	21.86	21.90	22.00		
1.4	16QAM	3	1	21.86	22.05	22.03		
1.4	16QAM	3	3	22.05	21.96	22.01		
1.4	16QAM	6	0	20.75	20.83	20.86	21.50	2

Reduced Average RF Power (Proximity Sensor active)

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	9.59	9.78	10.36	11.50	0
20	QPSK	1	49	11.17	10.81	11.24		
20	QPSK	1	99	10.11	10.56	10.70		
20	QPSK	50	0	10.63	10.45	10.94	11.50	0
20	QPSK	50	24	11.03	10.89	11.27		
20	QPSK	50	50	10.43	10.72	10.98		
20	QPSK	100	0	10.62	10.51	11.00		
20	16QAM	1	0	10.09	10.18	10.74	11.50	0
20	16QAM	1	49	11.48	11.13	11.44		
20	16QAM	1	99	10.43	10.84	10.82		
20	16QAM	50	0	10.69	10.46	10.94	11.50	0
20	16QAM	50	24	11.05	10.90	11.27		
20	16QAM	50	50	10.44	10.75	10.84		
20	16QAM	100	0	10.65	10.54	10.83		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	9.73	10.12	10.58	11.50	0
15	QPSK	1	37	11.07	10.88	11.29		
15	QPSK	1	74	10.13	10.46	10.61		
15	QPSK	36	0	10.51	10.46	10.86	11.50	0
15	QPSK	36	20	11.04	10.78	11.26		
15	QPSK	36	39	10.84	10.73	11.11		
15	QPSK	75	0	10.65	10.68	11.03		
15	16QAM	1	0	10.18	10.48	10.98	11.50	0
15	16QAM	1	37	11.35	11.16	11.41		
15	16QAM	1	74	10.47	10.58	10.74		
15	16QAM	36	0	10.55	10.47	10.85	11.50	0
15	16QAM	36	20	11.05	10.78	11.26		
15	16QAM	36	39	10.87	10.76	11.00		
15	16QAM	75	0	10.69	10.69	10.86		

Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	9.94	10.32	10.81	11.50	0
10	QPSK	1	25	10.97	10.93	11.46		
10	QPSK	1	49	10.69	10.75	10.81		
10	QPSK	25	0	10.61	10.54	11.20	11.50	0
10	QPSK	25	12	10.91	10.77	11.41		
10	QPSK	25	25	10.77	10.79	11.25		
10	QPSK	50	0	10.73	10.68	11.20		
10	16QAM	1	0	10.36	10.72	11.11	11.50	0
10	16QAM	1	25	11.24	11.23	11.43		
10	16QAM	1	49	10.98	10.99	10.99		
10	16QAM	25	0	10.66	10.57	11.06	11.50	0
10	16QAM	25	12	10.92	10.79	11.28		
10	16QAM	25	25	10.82	10.81	11.12		
10	16QAM	50	0	10.77	10.71	11.08		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	9.94	10.24	10.94	11.50	0
5	QPSK	1	12	10.74	10.60	11.38		
5	QPSK	1	24	10.46	10.49	10.83		
5	QPSK	12	0	10.29	10.40	11.17	11.50	0
5	QPSK	12	7	10.73	10.63	11.40		
5	QPSK	12	13	10.61	10.53	11.27		
5	QPSK	25	0	10.47	10.49	11.18		
5	16QAM	1	0	10.32	10.54	11.18	11.50	0
5	16QAM	1	12	11.11	11.01	11.49		
5	16QAM	1	24	10.73	10.79	10.95		
5	16QAM	12	0	10.35	10.42	11.04	11.50	0
5	16QAM	12	7	10.76	10.74	11.29		
5	16QAM	12	13	10.70	10.63	11.14		
5	16QAM	25	0	10.53	10.51	11.07		

Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	10.19	10.46	11.16	11.50	0
3	QPSK	1	8	10.59	10.66	11.35		
3	QPSK	1	14	10.60	10.59	11.06		
3	QPSK	8	0	10.39	10.59	11.33	11.50	0
3	QPSK	8	4	10.60	10.65	11.35		
3	QPSK	8	7	10.63	10.56	11.23		
3	QPSK	15	0	10.51	10.57	11.27		
3	16QAM	1	0	10.46	10.77	11.41	11.50	0
3	16QAM	1	8	10.90	11.08	11.50		
3	16QAM	1	14	10.93	10.91	11.22		
3	16QAM	8	0	10.46	10.75	11.25	11.50	0
3	16QAM	8	4	10.68	10.81	11.27		
3	16QAM	8	7	10.70	10.71	11.15		
3	16QAM	15	0	10.55	10.68	11.16		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	10.14	10.45	11.06	11.50	0
1.4	QPSK	1	3	10.41	10.67	11.21		
1.4	QPSK	1	5	10.33	10.45	10.98		
1.4	QPSK	3	0	10.32	10.61	11.17		
1.4	QPSK	3	1	10.42	10.66	11.20		
1.4	QPSK	3	3	10.46	10.67	11.18		
1.4	QPSK	6	0	10.39	10.62	11.15	11.50	0
1.4	16QAM	1	0	10.48	10.85	11.29	11.50	0
1.4	16QAM	1	3	10.75	11.06	11.46		
1.4	16QAM	1	5	10.65	10.82	11.22		
1.4	16QAM	3	0	10.39	10.74	11.14		
1.4	16QAM	3	1	10.48	10.79	11.18		
1.4	16QAM	3	3	10.51	10.79	11.16		
1.4	16QAM	6	0	10.50	10.81	11.09	11.50	0

<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	14.30	14.05	14.17	15.00	0
20	QPSK	1	49	14.38	14.52	14.29		
20	QPSK	1	99	14.27	14.39	14.27		
20	QPSK	50	0	14.43	14.46	14.42	15.00	0
20	QPSK	50	24	14.35	14.44	14.38		
20	QPSK	50	50	14.33	14.33	14.27		
20	QPSK	100	0	14.33	14.45	14.28		
20	16QAM	1	0	13.81	14.07	14.29	15.00	0
20	16QAM	1	49	14.18	14.15	14.05		
20	16QAM	1	99	14.08	13.99	13.76		
20	16QAM	50	0	14.31	14.37	14.31	15.00	0
20	16QAM	50	24	14.48	14.54	14.38		
20	16QAM	50	50	14.22	14.45	14.38		
20	16QAM	100	0	14.34	14.38	14.33		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	14.33	14.27	14.29	15.00	0
15	QPSK	1	37	14.57	14.68	14.44		
15	QPSK	1	74	14.19	14.22	14.07		
15	QPSK	36	0	14.42	14.40	14.39	15.00	0
15	QPSK	36	20	14.36	14.47	14.45		
15	QPSK	36	39	14.41	14.42	14.41		
15	QPSK	75	0	14.43	14.45	14.38		
15	16QAM	1	0	14.22	14.53	13.89	15.00	0
15	16QAM	1	37	14.15	14.14	13.91		
15	16QAM	1	74	13.64	13.93	14.09		
15	16QAM	36	0	14.44	14.40	14.39	15.00	0
15	16QAM	36	20	14.26	14.40	14.40		
15	16QAM	36	39	14.41	14.43	14.31		
15	16QAM	75	0	14.40	14.45	14.39		

Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	14.21	14.12	14.23	15.00	0
10	QPSK	1	25	14.64	14.51	14.40		
10	QPSK	1	49	14.25	14.11	14.10		
10	QPSK	25	0	14.37	14.35	14.35	15.00	0
10	QPSK	25	12	14.33	14.48	14.37		
10	QPSK	25	25	14.30	14.42	14.38		
10	QPSK	50	0	14.38	14.49	14.41		
10	16QAM	1	0	13.87	14.14	13.91	15.00	0
10	16QAM	1	25	14.11	14.18	13.76		
10	16QAM	1	49	13.68	14.03	13.73		
10	16QAM	25	0	14.27	14.37	14.62	15.00	0
10	16QAM	25	12	14.34	14.42	14.61		
10	16QAM	25	25	14.44	14.78	14.35		
10	16QAM	50	0	14.40	14.49	14.43		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	14.04	14.04	14.03	15.00	0
5	QPSK	1	12	14.41	14.58	14.34		
5	QPSK	1	24	13.99	14.19	13.91		
5	QPSK	12	0	14.34	14.38	14.35	15.00	0
5	QPSK	12	7	14.45	14.52	14.37		
5	QPSK	12	13	14.39	14.53	14.28		
5	QPSK	25	0	14.33	14.39	14.24		
5	16QAM	1	0	14.09	13.96	13.84	15.00	0
5	16QAM	1	12	14.00	13.89	14.15		
5	16QAM	1	24	14.08	14.11	13.85		
5	16QAM	12	0	14.18	14.22	14.16	15.00	0
5	16QAM	12	7	14.23	14.57	14.33		
5	16QAM	12	13	14.52	14.68	14.19		
5	16QAM	25	0	14.34	14.41	14.50		

Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	14.26	14.14	14.10	15.00	0
3	QPSK	1	8	14.48	14.41	14.30		
3	QPSK	1	14	14.05	14.35	14.12		
3	QPSK	8	0	14.40	14.47	14.33	15.00	0
3	QPSK	8	4	14.43	14.43	14.42		
3	QPSK	8	7	14.37	14.46	14.34		
3	QPSK	15	0	14.33	14.47	14.33		
3	16QAM	1	0	14.00	13.99	14.13	15.00	0
3	16QAM	1	8	14.06	13.78	13.75		
3	16QAM	1	14	13.88	14.28	14.05		
3	16QAM	8	0	14.36	14.35	14.40	15.00	0
3	16QAM	8	4	14.26	14.53	14.38		
3	16QAM	8	7	14.20	14.46	14.41		
3	16QAM	15	0	14.12	14.31	14.25		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	14.34	14.11	14.23	15.00	0
1.4	QPSK	1	3	14.47	14.42	14.22		
1.4	QPSK	1	5	14.31	14.23	14.25		
1.4	QPSK	3	0	14.28	14.48	14.39		
1.4	QPSK	3	1	14.35	14.53	14.44		
1.4	QPSK	3	3	14.37	14.42	14.43		
1.4	QPSK	6	0	14.31	14.38	14.29	15.00	0
1.4	16QAM	1	0	13.75	14.13	14.02	15.00	0
1.4	16QAM	1	3	13.87	14.11	14.01		
1.4	16QAM	1	5	13.83	14.13	14.03		
1.4	16QAM	3	0	14.32	14.35	14.26		
1.4	16QAM	3	1	14.40	14.53	14.34		
1.4	16QAM	3	3	14.29	14.61	14.39		
1.4	16QAM	6	0	14.18	14.41	14.18	15.00	0

<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	19.89	20.00	20.11	21.00	0
10	QPSK	1	25	20.20	20.44	20.17		
10	QPSK	1	49	19.63	20.18	19.98		
10	QPSK	25	0	20.21	20.04	20.16	21.00	0
10	QPSK	25	12	20.23	20.21	20.19		
10	QPSK	25	25	20.05	20.20	20.13		
10	QPSK	50	0	20.08	20.17	20.15		
10	16QAM	1	0	19.84	19.96	20.03	21.00	0
10	16QAM	1	25	20.04	19.87	20.09		
10	16QAM	1	49	19.58	19.92	20.00		
10	16QAM	25	0	20.02	20.20	20.20	21.00	0
10	16QAM	25	12	20.28	20.27	20.19		
10	16QAM	25	25	20.12	20.36	20.16		
10	16QAM	50	0	20.08	20.28	20.22		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	19.88	19.91	20.09	21.00	0
5	QPSK	1	12	20.35	20.38	20.27		
5	QPSK	1	24	19.78	20.14	19.82		
5	QPSK	12	0	20.24	20.11	20.09	21.00	0
5	QPSK	12	7	20.25	20.15	20.17		
5	QPSK	12	13	20.14	20.15	20.13		
5	QPSK	25	0	20.19	20.15	20.18		
5	16QAM	1	0	19.70	19.67	19.82	21.00	0
5	16QAM	1	12	20.22	19.83	19.83		
5	16QAM	1	24	19.86	20.08	19.87		
5	16QAM	12	0	20.49	19.99	20.08	21.00	0
5	16QAM	12	7	20.25	20.13	20.04		
5	16QAM	12	13	20.13	20.21	20.10		
5	16QAM	25	0	20.34	20.21	20.42		

Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	19.95	20.04	19.97	21.00	0
3	QPSK	1	8	20.27	20.23	20.23		
3	QPSK	1	14	20.20	20.10	20.25		
3	QPSK	8	0	20.20	20.17	20.20	21.00	0
3	QPSK	8	4	20.35	20.00	20.23		
3	QPSK	8	7	20.17	20.10	20.23		
3	QPSK	15	0	20.26	20.18	20.16		
3	16QAM	1	0	19.89	20.32	19.92	21.00	0
3	16QAM	1	8	19.81	20.02	20.01		
3	16QAM	1	14	19.94	20.01	20.06		
3	16QAM	8	0	20.26	20.20	19.84	21.00	0
3	16QAM	8	4	20.30	20.12	20.25		
3	16QAM	8	7	20.18	20.21	20.03		
3	16QAM	15	0	20.18	20.05	20.13		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	19.80	19.89	20.23	21	0
1.4	QPSK	1	3	20.00	20.03	20.40		
1.4	QPSK	1	5	19.91	19.82	20.36		
1.4	QPSK	3	0	20.21	20.05	20.43		
1.4	QPSK	3	1	20.27	20.12	20.46		
1.4	QPSK	3	3	20.18	20.02	20.38		
1.4	QPSK	6	0	20.23	19.96	20.25	21	0
1.4	16QAM	1	0	20.35	20.06	20.15	21	0
1.4	16QAM	1	3	20.48	20.28	20.17		
1.4	16QAM	1	5	20.30	20.15	20.11		
1.4	16QAM	3	0	20.12	20.25	20.14		
1.4	16QAM	3	1	20.19	20.03	20.27		
1.4	16QAM	3	3	20.19	19.72	20.25		
1.4	16QAM	6	0	20.10	19.91	20.27	21	0

<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23060	23095	23130		
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	18.94	18.76	18.92	20.00	0
10	QPSK	1	25	19.28	19.45	19.34		
10	QPSK	1	49	19.14	19.15	18.97		
10	QPSK	25	0	19.24	19.22	19.18	20.00	0
10	QPSK	25	12	19.27	19.20	19.23		
10	QPSK	25	25	19.28	19.29	19.28		
10	QPSK	50	0	19.26	19.28	19.27		
10	16QAM	1	0	18.91	18.81	18.64	20.00	0
10	16QAM	1	25	18.89	18.99	18.71		
10	16QAM	1	49	18.97	18.87	18.75		
10	16QAM	25	0	19.44	19.27	19.44	20.00	0
10	16QAM	25	12	19.30	19.20	19.35		
10	16QAM	25	25	19.25	19.11	19.50		
10	16QAM	50	0	19.21	19.21	19.33		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	19.05	18.78	19.15	20.00	0
5	QPSK	1	12	19.45	19.49	19.43		
5	QPSK	1	24	18.84	18.98	18.89		
5	QPSK	12	0	19.37	19.24	19.21	20.00	0
5	QPSK	12	7	19.26	19.28	19.26		
5	QPSK	12	13	19.20	19.29	19.15		
5	QPSK	25	0	19.26	19.21	19.09		
5	16QAM	1	0	19.16	18.72	18.65	20.00	0
5	16QAM	1	12	18.69	18.93	18.77		
5	16QAM	1	24	18.99	18.83	18.72		
5	16QAM	12	0	19.40	19.15	19.00	20.00	0
5	16QAM	12	7	19.35	19.40	19.10		
5	16QAM	12	13	19.27	19.47	19.07		
5	16QAM	25	0	19.22	19.27	19.09		

Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	19.12	19.00	19.11	20.00	0
3	QPSK	1	8	19.57	19.53	19.35		
3	QPSK	1	14	19.07	19.07	19.03		
3	QPSK	8	0	19.39	19.26	19.26	20.00	0
3	QPSK	8	4	19.40	19.32	19.29		
3	QPSK	8	7	19.35	19.25	19.18		
3	QPSK	15	0	19.35	19.20	19.12		
3	16QAM	1	0	18.64	18.98	18.88	20.00	0
3	16QAM	1	8	18.80	18.90	19.09		
3	16QAM	1	14	18.68	19.02	18.72		
3	16QAM	8	0	19.21	19.21	18.89	20.00	0
3	16QAM	8	4	19.35	19.47	19.16		
3	16QAM	8	7	19.29	19.30	19.24		
3	16QAM	15	0	19.17	19.32	19.24		
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	19.32	19.19	19.10	20.00	0
1.4	QPSK	1	3	19.34	19.21	19.21		
1.4	QPSK	1	5	19.37	19.26	19.23		
1.4	QPSK	3	0	19.32	19.34	19.34		
1.4	QPSK	3	1	19.34	19.49	19.28		
1.4	QPSK	3	3	19.38	19.44	19.24		
1.4	QPSK	6	0	19.35	19.27	19.28	20.00	0
1.4	16QAM	1	0	18.69	19.01	19.58	20.00	0
1.4	16QAM	1	3	18.78	18.98	18.79		
1.4	16QAM	1	5	18.83	18.81	19.12		
1.4	16QAM	3	0	19.21	19.16	19.16		
1.4	16QAM	3	1	19.15	19.23	19.21		
1.4	16QAM	3	3	19.19	19.25	19.24		
1.4	16QAM	6	0	19.21	19.12	19.34	20.00	0

<LTE Band 25>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				26140	26340	26590		
Frequency (MHz)				1860	1880	1905		
20	QPSK	1	0	10.06	10.00	10.91	11.50	0
20	QPSK	1	49	10.78	10.76	11.29		
20	QPSK	1	99	9.96	10.50	10.87		
20	QPSK	50	0	10.42	10.20	10.96	11.50	0
20	QPSK	50	24	10.67	10.65	11.33		
20	QPSK	50	50	10.38	10.55	11.03		
20	QPSK	100	0	10.39	10.37	10.99		
20	16QAM	1	0	10.40	10.28	11.17	11.50	0
20	16QAM	1	49	11.10	11.05	11.42		
20	16QAM	1	99	10.23	10.81	10.95		
20	16QAM	50	0	10.41	10.19	10.95	11.50	0
20	16QAM	50	24	10.79	10.75	11.15		
20	16QAM	50	50	10.37	10.59	10.86		
20	16QAM	100	0	10.37	10.37	10.80		
Channel				26115	26340	26615	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1907.5		
15	QPSK	1	0	9.89	9.86	10.50	11.50	0
15	QPSK	1	37	10.69	10.61	11.20		
15	QPSK	1	74	10.03	10.20	10.66		
15	QPSK	36	0	10.39	10.19	10.96	11.50	0
15	QPSK	36	20	10.68	10.63	11.29		
15	QPSK	36	39	10.49	10.55	11.10		
15	QPSK	75	0	10.43	10.41	11.06		
15	16QAM	1	0	10.21	10.12	10.90	11.50	0
15	16QAM	1	37	11.09	10.99	11.38		
15	16QAM	1	74	10.28	10.49	10.89		
15	16QAM	36	0	10.37	10.19	10.95	11.50	0
15	16QAM	36	20	10.79	10.72	11.12		
15	16QAM	36	39	10.49	10.58	10.92		
15	16QAM	75	0	10.42	10.42	10.88		

Channel				26090	26340	26640	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1910		
10	QPSK	1	0	10.05	10.15	10.95	11.50	0
10	QPSK	1	25	10.61	10.66	11.34		
10	QPSK	1	49	10.34	10.47	10.99		
10	QPSK	25	0	10.49	10.37	11.19	11.50	0
10	QPSK	25	12	10.56	10.62	11.39		
10	QPSK	25	25	10.63	10.60	11.06		
10	QPSK	50	0	10.49	10.52	11.21		
10	16QAM	1	0	10.39	10.42	11.02	11.50	0
10	16QAM	1	25	10.99	11.03	11.46		
10	16QAM	1	49	10.60	10.77	11.10		
10	16QAM	25	0	10.49	10.38	11.03	11.50	0
10	16QAM	25	12	10.66	10.72	11.25		
10	16QAM	25	25	10.64	10.65	10.87		
10	16QAM	50	0	10.49	10.55	11.04		
Channel				26065	26340	26665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1912.5		
5	QPSK	1	0	10.11	10.16	10.89	11.50	0
5	QPSK	1	12	10.57	10.62	11.22		
5	QPSK	1	24	10.26	10.39	10.99		
5	QPSK	12	0	10.41	10.42	11.07	11.50	0
5	QPSK	12	7	10.59	10.64	11.26		
5	QPSK	12	13	10.50	10.54	11.09		
5	QPSK	25	0	10.44	10.50	11.06		
5	16QAM	1	0	10.43	10.40	10.98	11.50	0
5	16QAM	1	12	10.96	11.01	11.30		
5	16QAM	1	24	10.52	10.69	11.06		
5	16QAM	12	0	10.48	10.43	10.91	11.50	0
5	16QAM	12	7	10.69	10.74	11.10		
5	16QAM	12	13	10.61	10.64	10.92		
5	16QAM	25	0	10.44	10.51	10.88		

Channel				26055	26340	26675	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1913.5		
3	QPSK	1	0	10.38	10.48	11.16	11.50	0
3	QPSK	1	8	10.62	10.67	11.31		
3	QPSK	1	14	10.58	10.60	11.25		
3	QPSK	8	0	10.52	10.48	11.18	11.50	0
3	QPSK	8	4	10.63	10.68	11.29		
3	QPSK	8	7	10.50	10.58	11.30		
3	QPSK	15	0	10.64	10.59	11.33		
3	16QAM	1	0	10.69	10.77	11.23	11.50	0
3	16QAM	1	8	10.94	11.08	11.35		
3	16QAM	1	14	10.87	10.92	11.31		
3	16QAM	8	0	10.61	10.68	11.07	11.50	0
3	16QAM	8	4	10.71	10.84	11.18		
3	16QAM	8	7	10.63	10.74	11.19		
3	16QAM	15	0	10.67	10.71	11.19		
Channel				26047	26340	26683	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1914.3		
1.4	QPSK	1	0	10.37	10.38	11.20	11.50	0
1.4	QPSK	1	3	10.54	10.67	11.38		
1.4	QPSK	1	5	10.46	10.47	11.25		
1.4	QPSK	3	0	10.46	10.63	11.32		
1.4	QPSK	3	1	10.55	10.67	11.37		
1.4	QPSK	3	3	10.59	10.69	11.36		
1.4	QPSK	6	0	10.53	10.64	11.33	11.50	0
1.4	16QAM	1	0	10.66	10.76	11.28	11.50	0
1.4	16QAM	1	3	10.85	11.05	11.47		
1.4	16QAM	1	5	10.76	10.83	11.33		
1.4	16QAM	3	0	10.50	10.75	11.19		
1.4	16QAM	3	1	10.59	10.80	11.24		
1.4	16QAM	3	3	10.62	10.80	11.21		
1.4	16QAM	6	0	10.62	10.81	11.22	11.50	0

<WLAN Conducted Power>

General Note:

1. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
2. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
3. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel for each frequency band.
4. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.18 The initial test position procedure is described in the following:
   a. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
   b. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
   c. For all positions/configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

<2.4GHz WLAN>

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b	CH 1	2412	1Mbps	12.15	13.00	97.59
		CH 6	2437		12.66	13.00	
		CH 11	2462		**12.77**	13.00	
	802.11g	CH 1	2412	6Mbps	12.19	13.00	87.04
		CH 6	2437		12.51	13.00	
		CH 11	2462		11.93	13.00	
	802.11n-HT20	CH 1	2412	MCS0	12.44	13.00	86.76
		CH 6	2437		12.63	13.00	
		CH 11	2462		12.68	13.00	
	802.11n-HT40	CH 3	2422	MCS0	12.09	12.50	76.30
		CH 6	2437		11.70	12.50	
		CH 9	2452		12.48	12.50	

<5GHz WLAN >

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a	CH 36	5180	6Mbps	**8.29**	8.50	87.44
		CH 40	5200		8.14	8.50	
		CH 44	5220		8.20	8.50	
		CH 48	5240		8.09	8.50	
	802.11n-HT20	CH 36	5180	MCS0	8.09	8.50	86.70
		CH 40	5200		8.19	8.50	
		CH 44	5220		7.88	8.50	
		CH 48	5240		7.65	8.50	
	802.11n-HT40	CH 38	5190	MCS0	7.81	8.00	71.01
		CH 46	5230		7.22	8.00	
	802.11ac-VHT20	CH 36	5180	MCS0	8.03	8.50	83.33
		CH 40	5200		8.15	8.50	
		CH 44	5220		7.83	8.50	
		CH 48	5240		7.58	8.50	
	802.11ac-VHT40	CH 38	5190	MCS0	7.91	8.00	71.13
		CH 46	5230		7.42	8.00	
	802.11ac-VHT80	CH 42	5210	MCS0	7.98	8.00	55.34

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a	CH 149	5745	MCS0	7.98	8.50	87.44
		CH 157	5785		8.19	8.50	
		CH 165	5825		**8.23**	8.50	
	802.11n-HT20	CH 149	5745	MCS0	7.49	8.00	86.70
		CH 157	5785		7.70	8.00	
		CH 165	5825		7.78	8.00	
	802.11n-HT40	CH 151	5755	MCS0	7.84	8.00	71.01
		CH 159	5795		7.75	8.00	
	802.11ac-VHT20	CH 149	5745	MCS0	7.43	8.00	83.33
		CH 157	5785		7.72	8.00	
		CH 165	5825		7.58	8.00	
	802.11ac-VHT40	CH 151	5755	MCS0	7.64	8.00	71.13
		CH 159	5795		7.51	8.00	
	802.11ac-VHT80	CH 155	5775	MCS0	7.76	8.00	55.34

<2.4GHz Bluetooth>

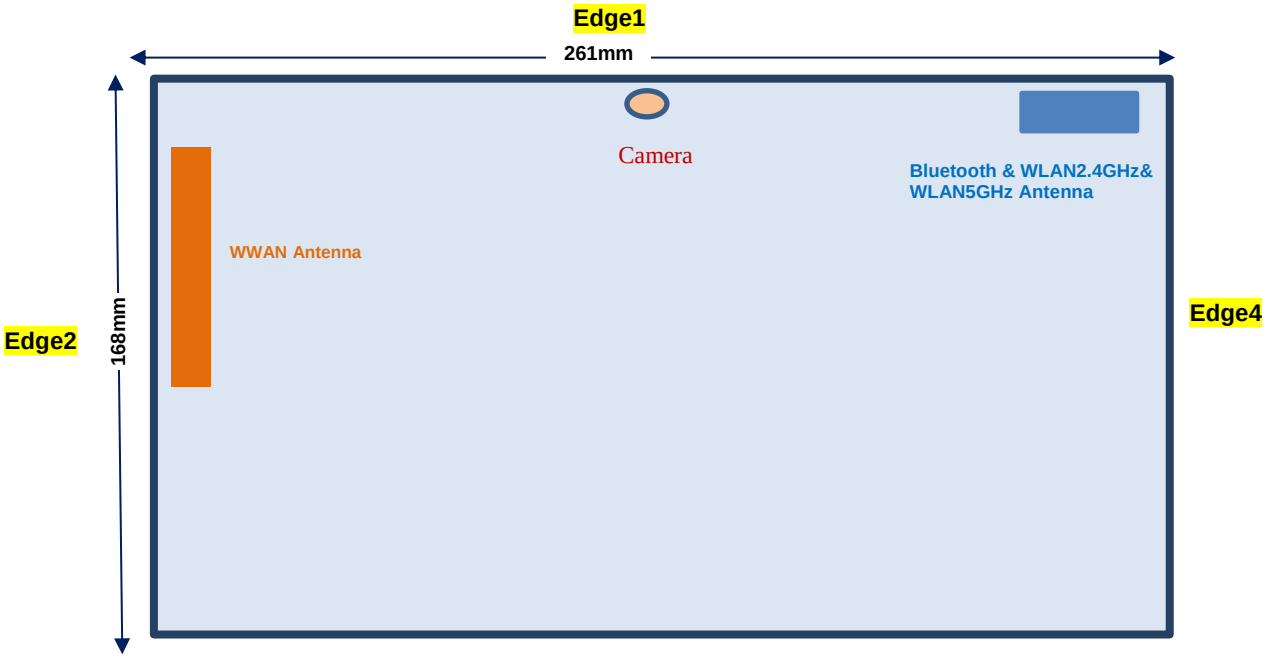
General Note:

For 2.4GHz Bluetooth SAR testing was selected 1Mbps, due to its highest average power.

Mode	Channel	Frequency (MHz)	Average power (dBm)		
			1Mbps	2Mbps	3Mbps
v3.0 with EDR	CH 00	2402	7.57	5.20	5.17
	CH 39	2441	**9.27**	6.85	6.80
	CH 78	2480	6.21	3.92	3.80
Tune-up Limit			10.00	7.50	7.50

Mode	Channel	Frequency (MHz)	Average power (dBm)
			GFSK
v4.1 with LE	CH 00	2402	7.47
	CH 19	2440	**9.05**
	CH 39	2480	6.09
Tune-up Limit			9.50

14. Antenna Location



Back View

Diagonal: 179mm

The separation distance for antenna to edge:

Antenna	To Edge1 (mm)	To Edge2 (mm)	To Edge3 (mm)	To Edge4 (mm)
WWAN Antenna	18	3	79	244
Bluetooth & WLAN Antenna	2	227	155	5

General Note:

1. The below table, when the distance is < 50 mm exclusion threshold is "Ratio", when the distance is > 50 mm exclusion threshold is "mW"
2. Maximum power is the source-based time-average power and represents the maximum RF output power among production units
3. Per KDB 447498 D01v06, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
4. Per KDB 447498 D01v06, standalone SAR test exclusion threshold is applied; If the test separation distance is < 5mm, 5mm is used to determine SAR exclusion threshold.
5. Per KDB 447498 D01v06, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:
   [(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] ·[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR
   - f(GHz) is the RF channel transmit frequency in GHz
   - Power and distance are rounded to the nearest mW and mm before calculation
   - The result is rounded to one decimal place for comparison
6. Per KDB 447498 D01v06, at 100 MHz to 6 GHz and for *test separation distances* > 50 mm, the SAR test exclusion threshold is determined according to the following
   a) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW, at 100 MHz to 1500 MHz
   b) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·10] mW at > 1500 MHz and ≤ 6 GHz

Exposure Position	Wireless Interface	LTE Band 12	LTE Band 5	LTE Band 4	LTE Band 25	BT	2.4GHz WLAN	5GHz WLAN
	Calculated Frequency	848MHz	1754MHz	1909MHz	1914MHz	2480MHz	2462MHz	5825MHz
	Maximum power (dBm)	25	25	24	23.5	10	13	8.5
	Maximum rated power(mW)	316.0	316.0	251.0	224.0	10.0	20.0	7.0
Bottom Face	Separation distance(mm)	0.0				0.0	0.0	0.0
	exclusion threshold	58.2	83.7	69.4	62.0	3.2	6.3	3.4
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Edge 1	Separation distance(mm)	18.0				2.0	2.0	2.0
	exclusion threshold	16.2	23.3	19.3	17.2	3.2	6.3	3.4
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Edge 2	Separation distance(mm)	3.0				227.0	227.0	227.0
	exclusion threshold	58.2	83.7	69.4	62.0	1865.0	1866.0	1832.0
	Testing required?	Yes	Yes	Yes	Yes	No	No	No
Edge 3	Separation distance(mm)	79.0				155.0	155.0	155.0
	exclusion threshold	327.0	403.0	399.0	398.0	1145.0	1146.0	1112.0
	Testing required?	No	No	No	No	No	No	No
Edge 4	Separation distance(mm)	244.0				5.0	5.0	5.0
	exclusion threshold	1260.0	2053.0	2049.0	2048.0	3.2	6.3	3.4
	Testing required?	No	No	No	No	Yes	Yes	Yes

15. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For WWAN/Bluetooth: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   d. For WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.

Tablet Note:

1. For the exposure positions that proximity sensor power reduction is applied for SAR compliance, additional SAR testing with EUT transmitting full power in normal mode was performed; 15mm for bottom face, 15mm for edge2
2. Considering the curvature transition from bottom face to the edge, SAR testing at the curvature was performed. The SAR test setup is included in test setup photo exhibit.
3. For SAR testing of the curved region of the device, the device was placed directly against the phantom at the point where the distance between the antenna and device exterior is a minimum.

LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B12 / B5 / B4 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE band 2 SAR test was covered by Band 25; according to TCB workshop, SAR test for overlapping LTE bands can be reduced if
   a. The maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion.
   b. The channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band.

WLAN Note:

1. Per KDB 248227 D01v02r02, for 2.4GHz 802.11g/n SAR testing is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
2. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
3. For all positions / configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions / configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
4. During SAR testing the WLAN transmission was verified using a spectrum analyzer.
5. WLAN/Bluetooth bottom face 15mm SAR tested for co-located with WWAN analysis.

15.1 Body SAR

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 12	10M	QPSK	1RB	25Offset	Bottom Face	0mm	Sensor On	23095	707.5	19.45	20	1.135	-0.16	0.778	0.883
01	LTE Band 12	10M	QPSK	25RB	25Offset	Bottom Face	0mm	Sensor On	23095	707.5	19.29	20	1.178	-0.08	0.806	**0.949**
	LTE Band 12	10M	QPSK	50RB	0Offset	Bottom Face	0mm	Sensor On	23095	707.5	19.28	20	1.180	0.03	0.789	0.931
	LTE Band 12	10M	QPSK	1RB	25Offset	Curved of Edge 2	0mm	Sensor On	23095	707.5	19.45	20	1.135	-0.18	0.516	0.586
	LTE Band 12	10M	QPSK	25RB	25Offset	Curved of Edge 2	0mm	Sensor On	23095	707.5	19.29	20	1.178	0.13	0.521	0.614
	LTE Band 12	10M	QPSK	1RB	25Offset	Edge 1	0mm	Sensor Off	23095	707.5	24.50	25	1.122	-0.16	0.158	0.177
	LTE Band 12	10M	QPSK	25RB	12Offset	Edge 1	0mm	Sensor Off	23095	707.5	23.31	24	1.172	-0.02	0.124	0.145
	LTE Band 12	10M	QPSK	1RB	25Offset	Edge 2	0mm	Sensor On	23095	707.5	19.45	20	1.135	0.07	0.317	0.360
	LTE Band 12	10M	QPSK	25RB	25Offset	Edge 2	0mm	Sensor On	23095	707.5	19.29	20	1.178	0.07	0.325	0.383
	LTE Band 12	10M	QPSK	1RB	25Offset	Bottom Face	15mm	Sensor Off	23095	707.5	24.50	25	1.122	0.09	0.299	0.335
	LTE Band 12	10M	QPSK	25RB	12Offset	Bottom Face	15mm	Sensor Off	23095	707.5	23.31	24	1.172	-0.01	0.100	0.117
	LTE Band 12	10M	QPSK	1RB	25Offset	Edge 2	15mm	Sensor Off	23095	707.5	24.50	25	1.122	0.09	0.179	0.201
	LTE Band 12	10M	QPSK	25RB	12Offset	Edge 2	15mm	Sensor Off	23095	707.5	23.31	24	1.172	0.02	0.140	0.164
	LTE Band 5	10M	QPSK	1RB	25Offset	Bottom Face	0mm	Sensor On	20525	836.5	20.44	21	1.138	-0.09	0.888	1.010
	LTE Band 5	10M	QPSK	25RB	12Offset	Bottom Face	0mm	Sensor On	20525	836.5	20.21	21	1.199	-0.09	0.878	1.053
02	LTE Band 5	10M	QPSK	50RB	0Offset	Bottom Face	0mm	Sensor On	20525	836.5	20.17	21	1.211	-0.07	0.873	**1.057**
	LTE Band 5	10M	QPSK	1RB	25Offset	Curved of Edge 2	0mm	Sensor On	20525	836.5	20.44	21	1.138	0.03	0.713	0.811
	LTE Band 5	10M	QPSK	25RB	12Offset	Curved of Edge 2	0mm	Sensor On	20525	836.5	20.21	21	1.199	-0.04	0.691	0.829
	LTE Band 5	10M	QPSK	50RB	0Offset	Curved of Edge 2	0mm	Sensor On	20525	836.5	20.17	21	1.211	0.03	0.700	0.847
	LTE Band 5	10M	QPSK	1RB	0Offset	Edge 1	0mm	Sensor Off	20525	836.5	24.24	25	1.191	0.03	0.237	0.282
	LTE Band 5	10M	QPSK	25RB	0Offset	Edge 1	0mm	Sensor Off	20525	836.5	24.26	25	1.186	-0.09	0.206	0.244
	LTE Band 5	10M	QPSK	1RB	25Offset	Edge 2	0mm	Sensor On	20525	836.5	20.44	21	1.138	0.02	0.337	0.383
	LTE Band 5	10M	QPSK	25RB	12Offset	Edge 2	0mm	Sensor On	20525	836.5	20.21	21	1.199	0.12	0.337	0.404
	LTE Band 5	10M	QPSK	1RB	0Offset	Bottom Face	15mm	Sensor Off	20525	836.5	24.24	25	1.191	0.01	0.376	0.448
	LTE Band 5	10M	QPSK	25RB	0ffset	Bottom Face	15mm	Sensor Off	20525	836.5	24.26	25	1.186	-0.06	0.131	0.155
	LTE Band 5	10M	QPSK	1RB	0Offset	Edge 2	15mm	Sensor Off	20525	836.5	24.24	25	1.191	-0.07	0.161	0.192
	LTE Band 5	10M	QPSK	25RB	0ffset	Edge 2	15mm	Sensor Off	20525	836.5	24.26	25	1.186	0.08	0.143	0.170

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 4	20M	QPSK	1RB	49Offset	Bottom Face	0mm	Sensor On	20175	1732.5	14.52	15	1.117	0.02	0.984	1.099
	LTE Band 4	20M	QPSK	50RB	0Offset	Bottom Face	0mm	Sensor On	20175	1732.5	14.46	15	1.132	0.06	0.932	1.055
	LTE Band 4	20M	QPSK	100RB	0Offset	Bottom Face	0mm	Sensor On	20175	1732.5	14.45	15	1.135	0.03	0.986	1.119
	LTE Band 4	20M	QPSK	1RB	49Offset	Curved of Edge 2	0mm	Sensor On	20175	1732.5	14.52	15	1.117	-0.07	1.050	1.173
	LTE Band 4	20M	QPSK	50RB	0Offset	Curved of Edge 2	0mm	Sensor On	20175	1732.5	14.46	15	1.132	-0.09	1.020	1.155
03	LTE Band 4	20M	QPSK	100RB	0Offset	Curved of Edge 2	0mm	Sensor On	20175	1732.5	14.45	15	1.135	-0.07	1.050	**1.192**
	LTE Band 4	20M	QPSK	1RB	49Offset	Edge 1	0mm	Sensor Off	20175	1732.5	23.46	24	1.132	-0.03	0.746	0.845
	LTE Band 4	20M	QPSK	50RB	0Offset	Edge 1	0mm	Sensor Off	20175	1732.5	22.39	23	1.151	-0.12	0.723	0.832
	LTE Band 4	20M	QPSK	100RB	0Offset	Edge 1	0mm	Sensor Off	20175	1732.5	22.35	23	1.161	-0.17	0.571	0.663
	LTE Band 4	20M	QPSK	1RB	49Offset	Edge 2	0mm	Sensor On	20175	1732.5	14.52	15	1.117	-0.07	0.526	0.587
	LTE Band 4	20M	QPSK	50RB	0Offset	Edge 2	0mm	Sensor On	20175	1732.5	14.46	15	1.132	-0.17	0.517	0.585
	LTE Band 4	20M	QPSK	1RB	49Offset	Bottom Face	15mm	Sensor Off	20175	1732.5	23.46	24	1.132	-0.08	0.608	0.688
	LTE Band 4	20M	QPSK	50RB	0Offset	Bottom Face	15mm	Sensor Off	20175	1732.5	22.39	23	1.151	-0.18	0.445	0.512
	LTE Band 4	20M	QPSK	1RB	49Offset	Edge 2	15mm	Sensor Off	20175	1732.5	23.46	24	1.132	-0.01	0.480	0.544
	LTE Band 4	20M	QPSK	50RB	0Offset	Edge 2	15mm	Sensor Off	20175	1732.5	22.39	23	1.151	-0.1	0.369	0.425

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 25	20M	QPSK	1RB	49Offset	Bottom Face	0mm	Sensor On	26590	1905	11.29	11.5	1.050	-0.11	0.819	0.860
	LTE Band 25	20M	QPSK	1RB	49Offset	Bottom Face	0mm	Sensor On	26140	1860	10.78	11.5	1.180	-0.01	0.866	1.022
	LTE Band 25	20M	QPSK	1RB	49Offset	Bottom Face	0mm	Sensor On	26340	1880	10.76	11.5	1.186	0.02	0.809	0.959
	LTE Band 25	20M	QPSK	50RB	24Offset	Bottom Face	0mm	Sensor On	26590	1905	11.33	11.5	1.040	0.03	1.070	1.113
	LTE Band 25	20M	QPSK	50RB	24Offset	Bottom Face	0mm	Sensor On	26140	1860	10.67	11.5	1.211	-0.07	0.872	1.056
	LTE Band 25	20M	QPSK	50RB	24Offset	Bottom Face	0mm	Sensor On	26340	1880	10.65	11.5	1.216	0.09	0.826	1.005
	LTE Band 25	20M	QPSK	100RB	0Offset	Bottom Face	0mm	Sensor On	26590	1905	10.99	11.5	1.125	-0.05	0.776	0.873
	LTE Band 25	20M	QPSK	1RB	49Offset	Curved of Edge 2	0mm	Sensor On	26590	1905	11.29	11.5	1.050	-0.15	1.120	1.175
	LTE Band 25	20M	QPSK	1RB	49Offset	Curved of Edge 2	0mm	Sensor On	26140	1860	10.78	11.5	1.180	-0.06	0.975	1.151
	LTE Band 25	20M	QPSK	1RB	49Offset	Curved of Edge 2	0mm	Sensor On	26340	1880	10.76	11.5	1.186	-0.06	0.914	1.084
04	LTE Band 25	20M	QPSK	50RB	24Offset	Curved of Edge 2	0mm	Sensor On	26590	1905	11.33	11.5	1.040	0.09	1.150	**1.196**
	LTE Band 25	20M	QPSK	50RB	24Offset	Curved of Edge 2	0mm	Sensor On	26140	1860	10.67	11.5	1.211	-0.08	0.836	1.012
	LTE Band 25	20M	QPSK	50RB	24Offset	Curved of Edge 2	0mm	Sensor On	26340	1880	10.65	11.5	1.216	-0.08	0.743	0.904
	LTE Band 25	20M	QPSK	100RB	0Offset	Curved of Edge 2	0mm	Sensor On	26590	1905	10.99	11.5	1.125	-0.08	0.952	1.071
	LTE Band 25	20M	QPSK	1RB	49Offset	Edge 1	0mm	Sensor Off	26590	1905	23.11	23.5	1.094	-0.01	0.606	0.663
	LTE Band 25	20M	QPSK	50RB	0Offset	Edge 1	0mm	Sensor Off	26590	1905	22.22	22.5	1.067	-0.05	0.482	0.514
	LTE Band 25	20M	QPSK	1RB	49Offset	Edge 2	0mm	Sensor On	26590	1905	11.29	11.5	1.050	-0.17	0.459	0.482
	LTE Band 25	20M	QPSK	50RB	24Offset	Edge 2	0mm	Sensor On	26590	1905	11.33	11.5	1.040	-0.06	0.468	0.487
	LTE Band 25	20M	QPSK	1RB	49Offset	Bottom Face	15mm	Sensor Off	26590	1905	23.11	23.5	1.094	0.14	1.050	1.149
	LTE Band 25	20M	QPSK	1RB	49Offset	Bottom Face	15mm	Sensor Off	26140	1860	22.85	23.5	1.161	0.14	0.834	0.969
	LTE Band 25	20M	QPSK	1RB	49Offset	Bottom Face	15mm	Sensor Off	26340	1880	22.99	23.5	1.125	0.14	0.897	1.009
	LTE Band 25	20M	QPSK	50RB	0Offset	Bottom Face	15mm	Sensor Off	26590	1905	22.22	22.5	1.067	0.14	0.777	0.829
	LTE Band 25	20M	QPSK	50RB	0Offset	Bottom Face	15mm	Sensor Off	26140	1860	21.98	22.5	1.127	-0.08	0.655	0.738
	LTE Band 25	20M	QPSK	50RB	0Offset	Bottom Face	15mm	Sensor Off	26340	1880	22.00	22.5	1.122	-0.07	0.683	0.766
	LTE Band 25	20M	QPSK	100RB	0Offset	Bottom Face	15mm	Sensor Off	26590	1905	22.13	22.5	1.089	-0.03	0.763	0.831
	LTE Band 25	20M	QPSK	1RB	49Offset	Edge 2	15mm	Sensor Off	26590	1905	23.11	23.5	1.094	-0.05	0.896	0.980
	LTE Band 25	20M	QPSK	1RB	49Offset	Edge 2	15mm	Sensor Off	26140	1860	22.85	23.5	1.161	0.01	0.740	0.859
	LTE Band 25	20M	QPSK	1RB	49Offset	Edge 2	15mm	Sensor Off	26340	1880	22.99	23.5	1.125	-0.01	0.791	0.890
	LTE Band 25	20M	QPSK	50RB	0Offset	Edge 2	15mm	Sensor Off	26590	1905	22.22	22.5	1.067	-0.05	0.696	0.742
	LTE Band 25	20M	QPSK	100RB	0Offset	Edge 2	15mm	Sensor Off	26590	1905	22.13	22.5	1.089	-0.03	0.622	0.677

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Bottom Face	0mm	11	2462	12.77	13	1.054	97.59	1.025	0.02	0.741	0.801
	WLAN2.4GHz	802.11b 1Mbps	Bottom Face	0mm	6	2437	12.66	13	1.081	97.59	1.025	0.02	0.849	0.941
	WLAN2.4GHz	802.11b 1Mbps	Edge 1	0mm	11	2462	12.77	13	1.054	97.59	1.025	0.16	0.458	0.495
	WLAN2.4GHz	802.11b 1Mbps	Edge 4	0mm	11	2462	12.77	13	1.054	97.59	1.025	0.01	0.162	0.175
05	WLAN2.4GHz	802.11b 1Mbps	Curved of Edge 1	0mm	11	2462	12.77	13	1.054	97.59	1.025	0.03	0.941	**1.017**
	WLAN2.4GHz	802.11b 1Mbps	Curved of Edge 1	0mm	6	2437	12.66	13	1.081	97.59	1.025	0.1	0.906	1.004
	WLAN2.4GHz	802.11b 1Mbps	Bottom Face	15mm	11	2462	12.77	13	1.054	97.59	1.025	0.02	0.050	0.054

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN5.2GHz	802.11a 6Mbps	Bottom Face	0mm	36	5180	8.29	8.5	1.050	87.44	1.144	0.13	0.846	1.016
	WLAN5.2GHz	802.11a 6Mbps	Bottom Face	0mm	44	5220	8.20	8.5	1.072	87.44	1.144	0.05	0.828	1.015
	WLAN5.2GHz	802.11a 6Mbps	Edge 1	0mm	36	5180	8.29	8.5	1.050	87.44	1.144	0.02	0.147	0.176
	WLAN5.2GHz	802.11a 6Mbps	Edge 4	0mm	36	5180	8.29	8.5	1.050	87.44	1.144	0.06	0.030	0.036
06	WLAN5.2GHz	802.11a 6Mbps	Curved of Edge 1	0mm	36	5180	8.29	8.5	1.050	87.44	1.144	0.14	0.971	**1.166**
	WLAN5.2GHz	802.11a 6Mbps	Curved of Edge 1	0mm	44	5220	8.20	8.5	1.072	87.44	1.144	0.11	0.888	1.089
	WLAN5.2GHz	802.11a 6Mbps	Bottom Face	15mm	36	5180	8.29	8.5	1.050	87.44	1.144	0.09	0.020	0.024
	WLAN5.8GHz	802.11a 6Mbps	Bottom Face	0mm	165	5825	8.23	8.5	1.064	87.44	1.144	0.12	0.674	0.821
	WLAN5.8GHz	802.11a 6Mbps	Bottom Face	0mm	157	5785	8.19	8.5	1.074	87.44	1.144	0.15	0.726	0.892
	WLAN5.8GHz	802.11a 6Mbps	Edge 1	0mm	165	5825	8.23	8.5	1.064	87.44	1.144	-0.07	0.303	0.369
	WLAN5.8GHz	802.11a 6Mbps	Edge 4	0mm	165	5825	8.23	8.5	1.064	87.44	1.144	-0.15	0.024	0.029
07	WLAN5.8GHz	802.11a 6Mbps	Curved of Edge 1	0mm	165	5825	8.23	8.5	1.064	87.44	1.144	0.05	0.945	**1.150**
	WLAN5.8GHz	802.11a 6Mbps	Curved of Edge 1	0mm	157	5785	8.19	8.5	1.074	87.44	1.144	0.15	0.914	1.123
	WLAN5.8GHz	802.11a 6Mbps	Bottom Face	15mm	165	5825	8.23	8.5	1.064	87.44	1.144	0.18	0.024	0.029

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	Bluetooth	1Mbps	Bottom Face	0mm	39	2441	9.27	10	1.183	0.01	0.096	0.114
	Bluetooth	1Mbps	Edge 1	0mm	39	2441	9.27	10	1.183	0.03	0.055	0.065
	Bluetooth	1Mbps	Edge 4	0mm	39	2441	9.27	10	1.183	0.02	0.014	0.017
08	Bluetooth	1Mbps	Curved of Edge 1	0mm	39	2441	9.27	10	1.183	0.02	0.133	**0.157**
	Bluetooth	1Mbps	Bottom Face	15mm	39	2441	9.27	10	1.183	0.12	0.010	0.012

15.2 Repeated SAR Measurement

No.	Band	BW (MHz)	Mode	RB Size	RB offset	Test Position	Gap (mm)	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	LTE Band 12	10M	QPSK	25RB	25 Offset	Bottom Face	0	Sensor On	23095	707.5	19.29	20	1.178	-	-	-0.08	0.806	1	0.949
2nd	LTE Band 12	10M	QPSK	25RB	25 Offset	Bottom Face	0	Sensor On	23095	707.5	19.29	20	1.178	-	-	-0.04	0.803	1.004	0.946
1st	LTE Band 5	10M	QPSK	1RB	25 Offset	Bottom Face	0	Sensor On	20525	836.5	20.44	21	1.138	-	-	-0.09	0.888	1	1.010
2nd	LTE Band 5	10M	QPSK	1RB	25 Offset	Bottom Face	0	Sensor On	20525	836.5	20.44	21	1.138	-	-	-0.03	0.885	1.003	1.007
1st	LTE Band 4	20M	QPSK	100RB	0 Offset	Curved of Edge 2	0	Sensor On	20175	1732.5	14.45	15	1.135	-	-	-0.07	1.050	1	1.192
2nd	LTE Band 4	20M	QPSK	100RB	0 Offset	Curved of Edge 2	0	Sensor On	20175	1732.5	14.45	15	1.135	-	-	-0.11	1.020	1.029	1.158
1st	LTE Band 25	20M	QPSK	50RB	24 Offset	Curved of Edge 2	0	Sensor On	26590	1905	11.33	11.5	1.040	-	-	0.09	1.150	1	1.196
2nd	LTE Band 25	20M	QPSK	50RB	24 Offset	Curved of Edge 2	0	Sensor On	26590	1905	11.33	11.5	1.040	-	-	0.07	1.130	1.018	1.175
1st	WLAN2.4GHz	-	802.11b 1Mbps	-	-	Curved of Edge 1	0	-	11	2462	12.77	13	1.054	97.59	1.025	0.03	0.941	1	1.017
2nd	WLAN2.4GHz	-	802.11b 1Mbps	-	-	Curved of Edge 1	0	-	11	2462	12.77	13	1.054	97.59	1.025	0.02	0.938	1.003	1.014
1st	WLAN5.2GHz	-	802.11a 6Mbps	-	-	Curved of Edge 1	0	-	36	5180	8.29	8.5	1.050	87.44	1.144	0.14	0.971	1	1.166
2nd	WLAN5.2GHz	-	802.11a 6Mbps	-	-	Curved of Edge 1	0	-	36	5180	8.29	8.5	1.050	87.44	1.144	0.03	0.969	1.002	1.163
1st	WLAN5.8GHz	-	802.11a 6Mbps	-	-	Curved of Edge 1	0	-	165	5825	8.23	8.5	1.064	87.44	1.144	0.05	0.945	1	1.150
2nd	WLAN5.8GHz	-	802.11a 6Mbps	-	-	Curved of Edge 1	0	-	165	5825	8.23	8.5	1.064	87.44	1.144	0.03	0.942	1.003	1.147

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. The ratio is the difference in percentage between original and repeated *measured SAR*.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

16. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Tablet
		Body
1.	LTE + WLAN2.4GHz	Yes
2.	LTE + Bluetooth	Yes
3.	LTE + WLAN5GHz	Yes

General Note:

1. EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment.
2. The Scaled SAR summation is calculated based on the same configuration and test position.
3. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
4. All WLAN 5G chose the worse SAR for co-located with WWAN analysis.
5. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
   i) Scalar SAR summation < 1.6W/kg.
   ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of [(x1-x2)2 + (y1-y2)2 + (z1-z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
   iii) If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.
   iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.

16.1 Body Exposure Conditions

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	SPLSR	Case No
LTE	Band 12	Bottom Face at 15mm-	0.335	0.054	0.39		
		Edge 2 at 15mm-	0.201		0.20		
		Bottom Face at 0mm	0.949	0.941	**1.89**	**0.01**	**#01**
		Edge 1 at 0mm	0.177	0.495	0.67		
		Edge 2 at 0mm	0.383		0.38		
		Bottom Face Curved Edge 1 at 0mm		1.017	1.02		
		Edge 4 at 0mm		0.175	0.18		
		Bottom Face Curved Edge 2 at 0mm	0.614		0.61		
	Band 5	Bottom Face at 15mm-	0.448	0.054	0.50		
		Edge 2 at 15mm-	0.192		0.19		
		Bottom Face at 0mm	1.057	0.941	**2.00**	**0.01**	**#02**
		Edge 1 at 0mm	0.282	0.495	0.78		
		Edge 2 at 0mm	0.404		0.40		
		Bottom Face Curved Edge 1 at 0mm		1.017	1.02		
		Edge 4 at 0mm		0.175	0.18		
		Bottom Face Curved Edge 2 at 0mm	0.847		0.85		
	Band 4	Bottom Face at 15mm-	0.688	0.054	0.74		
		Edge 2 at 15mm-	0.544		0.54		
		Bottom Face at 0mm	1.119	0.941	**2.06**	**0.01**	**#03**
		Edge 1 at 0mm	0.845	0.495	**1.34**		
		Edge 2 at 0mm	0.587		0.59		
		Bottom Face Curved Edge 1 at 0mm		1.017	1.02		
		Edge 4 at 0mm		0.175	0.18		
		Bottom Face Curved Edge 2 at 0mm	1.192		1.19		
	Band 25	Bottom Face at 15mm-	1.149	0.054	1.20		
		Edge 2 at 15mm-	0.980		0.98		
		Bottom Face at 0mm	1.113	0.941	**2.05**	**0.01**	**#04**
		Edge 1 at 0mm	0.663	0.495	1.16		
		Edge 2 at 0mm	0.487		0.49		
		Bottom Face Curved Edge 1 at 0mm		1.017	1.02		
		Edge 4 at 0mm		0.175	0.18		
		Bottom Face Curved Edge 2 at 0mm	1.196		1.20		

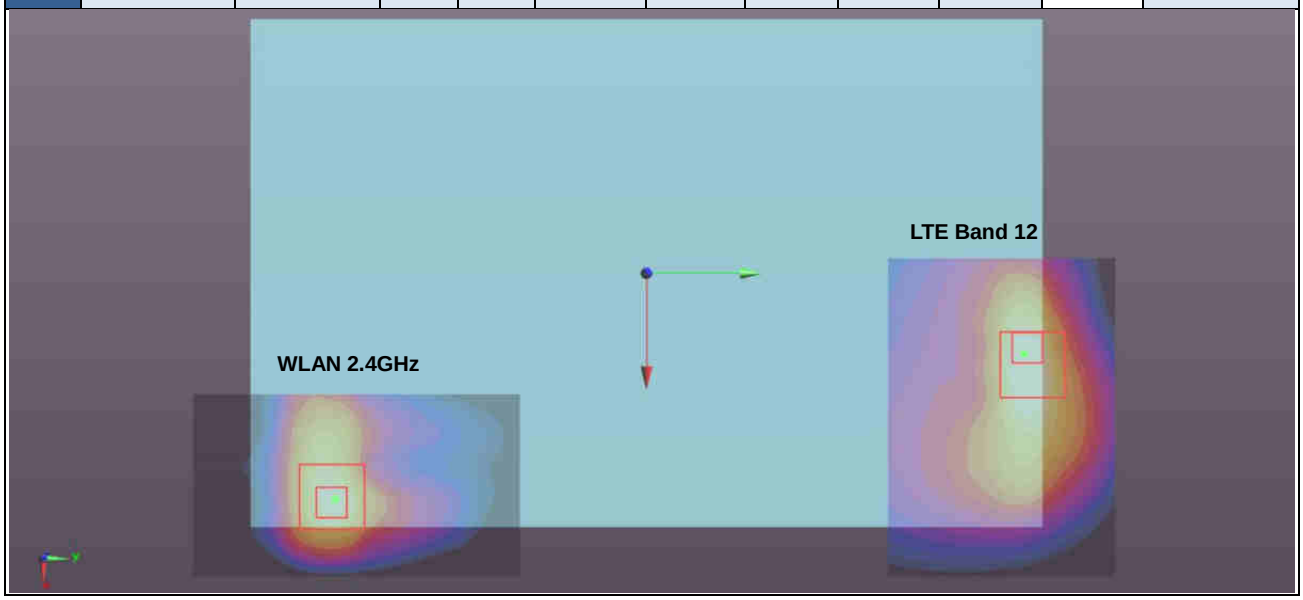
WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	3 5GHz WLAN 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	SPLSR	Case No
LTE	Band 12	Bottom Face at 15mm-	0.335	0.029	0.36		
		Edge 2 at 15mm-	0.201		0.20		
		Bottom Face at 0mm	0.949	1.016	**1.97**	**0.01**	**#05**
		Edge 1 at 0mm	0.177	0.369	0.55		
		Edge 2 at 0mm	0.383		0.38		
		Bottom Face Curved Edge 1 at 0mm		1.166	1.17		
		Edge 4 at 0mm		0.036	0.04		
		Bottom Face Curved Edge 2 at 0mm	0.614		0.61		
	Band 5	Bottom Face at 15mm	0.448	0.029	0.48		
		Edge 2 at 15mm-	0.192		0.19		
		Bottom Face at 0mm	1.057	1.016	**2.07**	**0.01**	**#06**
		Edge 1 at 0mm	0.282	0.369	0.65		
		Edge 2 at 0mm	0.404		0.40		
		Bottom Face Curved Edge 1 at 0mm		1.166	1.17		
		Edge 4 at 0mm		0.036	0.04		
		Bottom Face Curved Edge 2 at 0mm	0.847		0.85		
	Band 4	Bottom Face at 15mm	0.688	0.029	0.72		
		Edge 2 at 15mm-	0.544		0.54		
		Bottom Face at 0mm	1.119	1.016	**2.14**	**0.01**	**#07**
		Edge 1 at 0mm	0.845	0.369	**1.21**		
		Edge 2 at 0mm	0.587		0.59		
		Bottom Face Curved Edge 1 at 0mm		1.166	1.17		
		Edge 4 at 0mm		0.036	0.04		
		Bottom Face Curved Edge 2 at 0mm	1.192		1.19		
	Band 25	Bottom Face at 15mm	1.149	0.029	1.18		
		Edge 2 at 15mm-	0.980		0.98		
		Bottom Face at 0mm	1.113	1.016	**2.13**	**0.01**	**#08**
		Edge 1 at 0mm	0.663	0.369	1.03		
		Edge 2 at 0mm	0.487		0.49		
		Bottom Face Curved Edge 1 at 0mm		1.166	1.17		
		Edge 4 at 0mm		0.036	0.04		
		Bottom Face Curved Edge 2 at 0mm	1.196		1.20		

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	4 Bluetooth Estimated 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)	SPLSR	Case No
LTE	Band 12	Bottom Face at 15mm-	0.335	0.012	0.35		
		Edge 2 at 15mm-	0.201		0.20		
		Bottom Face at 0mm	0.949	0.114	1.06		
		Edge 1 at 0mm	0.177	0.065	0.24		
		Edge 2 at 0mm	0.383		0.38		
		Bottom Face Curved Edge 1 at 0mm		0.157	0.16		
		Edge 4 at 0mm		0.017	0.02		
		Bottom Face Curved Edge 2 at 0mm	0.614		0.61		
	Band 5	Bottom Face at 15mm-	0.448	0.012	0.46		
		Edge 2 at 15mm-	0.192		0.19		
		Bottom Face at 0mm	1.057	0.114	1.17		
		Edge 1 at 0mm	0.282	0.065	0.35		
		Edge 2 at 0mm	0.404		0.40		
		Bottom Face Curved Edge 1 at 0mm		0.157	0.16		
		Edge 4 at 0mm		0.017	0.02		
		Bottom Face Curved Edge 2 at 0mm	0.847		0.85		
	Band 4	Bottom Face at 15mm-	0.688	0.012	0.70		
		Edge 2 at 15mm-	0.544		0.54		
		Bottom Face at 0mm	1.119	0.114	**1.23**		
		Edge 1 at 0mm	0.845	0.065	0.91		
		Edge 2 at 0mm	0.587		0.59		
		Bottom Face Curved Edge 1 at 0mm		0.157	0.16		
		Edge 4 at 0mm		0.017	0.02		
		Bottom Face Curved Edge 2 at 0mm	1.192		1.19		
	Band 25	Bottom Face at 15mm-	1.149	0.012	1.16		
		Edge 2 at 15mm-	0.980		0.98		
		Bottom Face at 0mm	1.113	0.114	1.23		
		Edge 1 at 0mm	0.663	0.065	0.73		
		Edge 2 at 0mm	0.487		0.49		
		Bottom Face Curved Edge 1 at 0mm		0.157	0.16		
		Edge 4 at 0mm		0.017	0.02		
		Bottom Face Curved Edge 2 at 0mm	1.196		1.20		

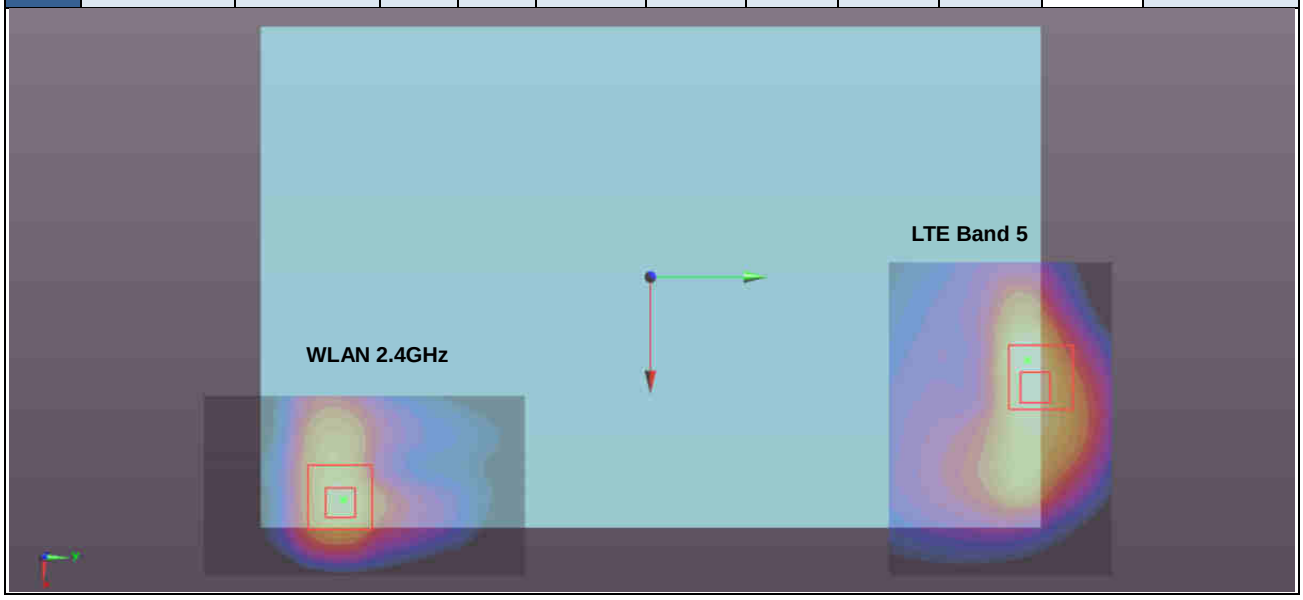
16.2 SPLSR Evaluation and Analysis

General Note:
SPLSR = $(SAR_1 + SAR_2)^{1.5}$ / (*min. separation distance, mm*). If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary

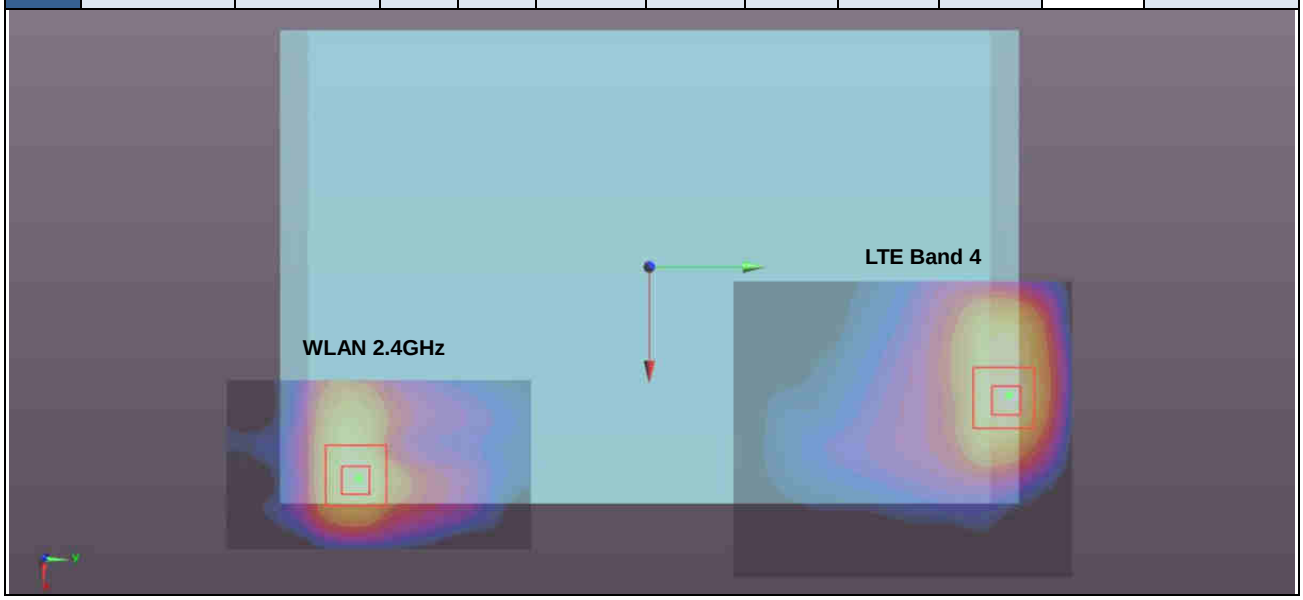
Case 1	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 12	Bottom Face	0.949	0	0.0185	0.125	-0.179	234.9	1.89	0.01	Not required
	WLAN 2.4GHz		0.941	0	0.0748	-0.103	-0.181				



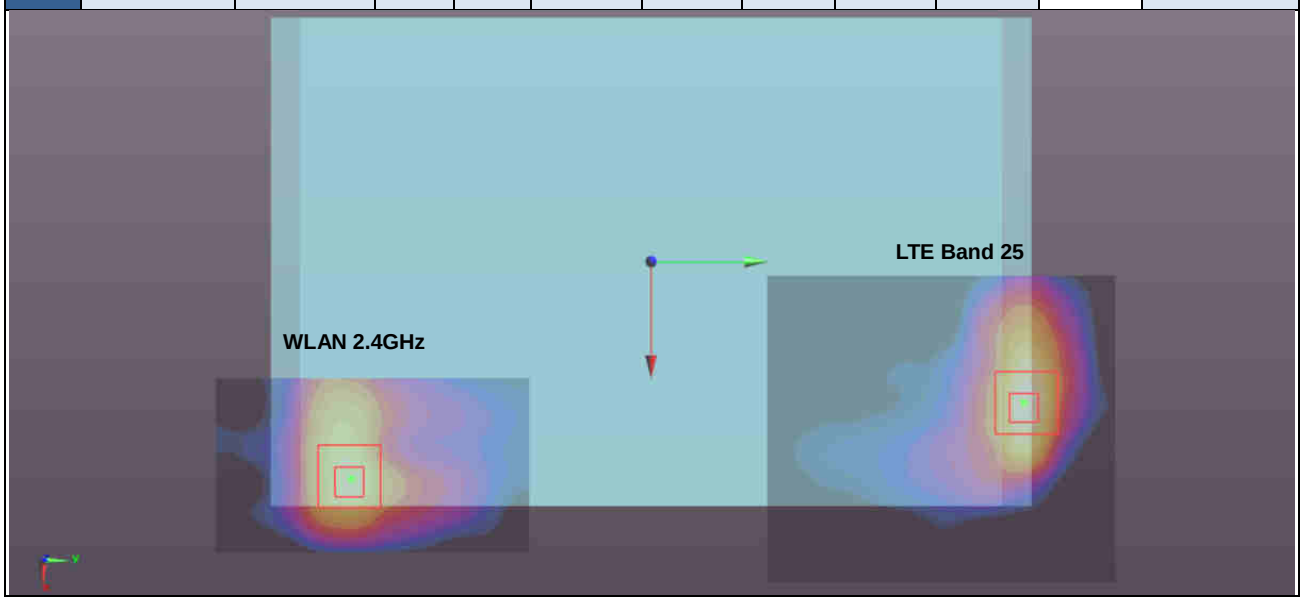
Case 2	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 5	Bottom Face	1.057	0	0.028	0.127	-0.178	234.7	2.00	0.01	Not required
	WLAN 2.4GHz		0.941	0	0.0748	-0.103	-0.181				



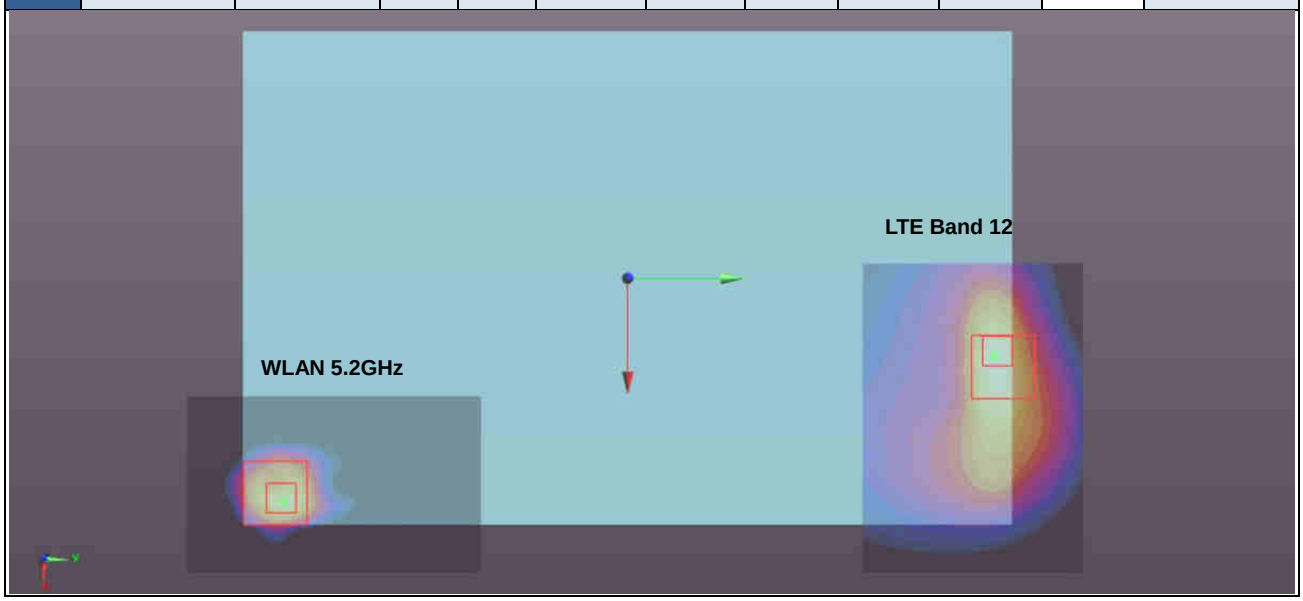
Case 3	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 4	Bottom Face	1.119	0	0.0455	0.127	-0.177	231.9	2.06	0.01	Not required
	WLAN 2.4GHz		0.941	0	0.0748	-0.103	-0.181				



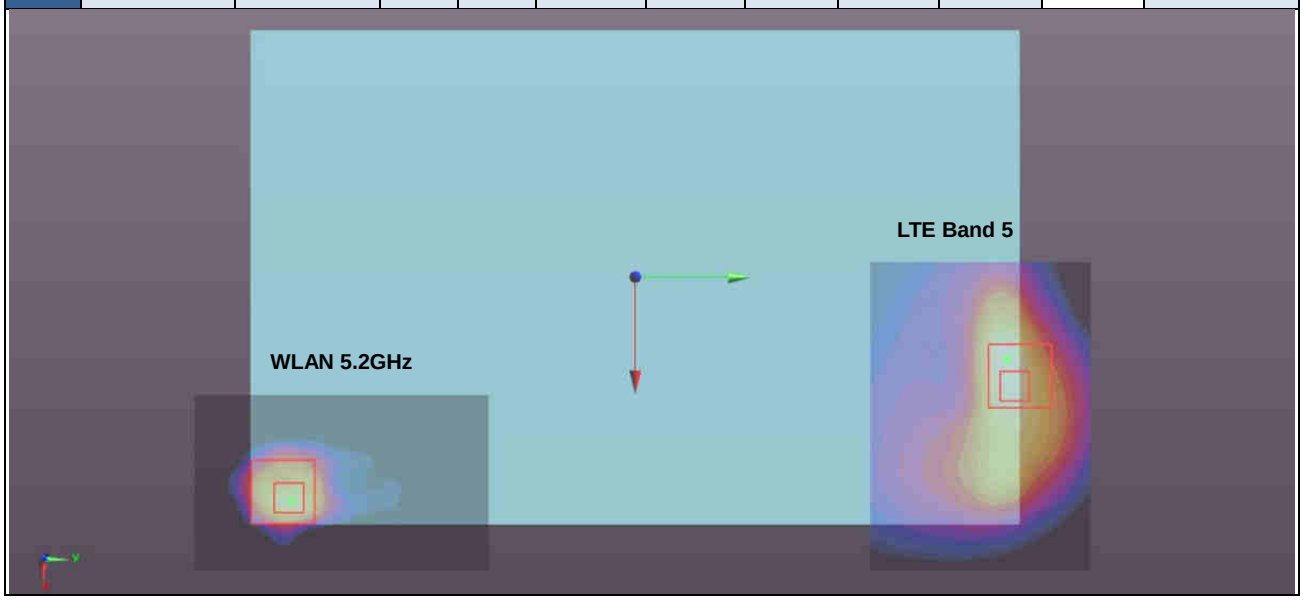
Case 4	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 25	Bottom Face	1.113	0	0.0485	0.128	-0.177	232.5	2.05	0.01	Not required
	WLAN2.4GHz		0.941	0	0.0748	-0.103	-0.181				



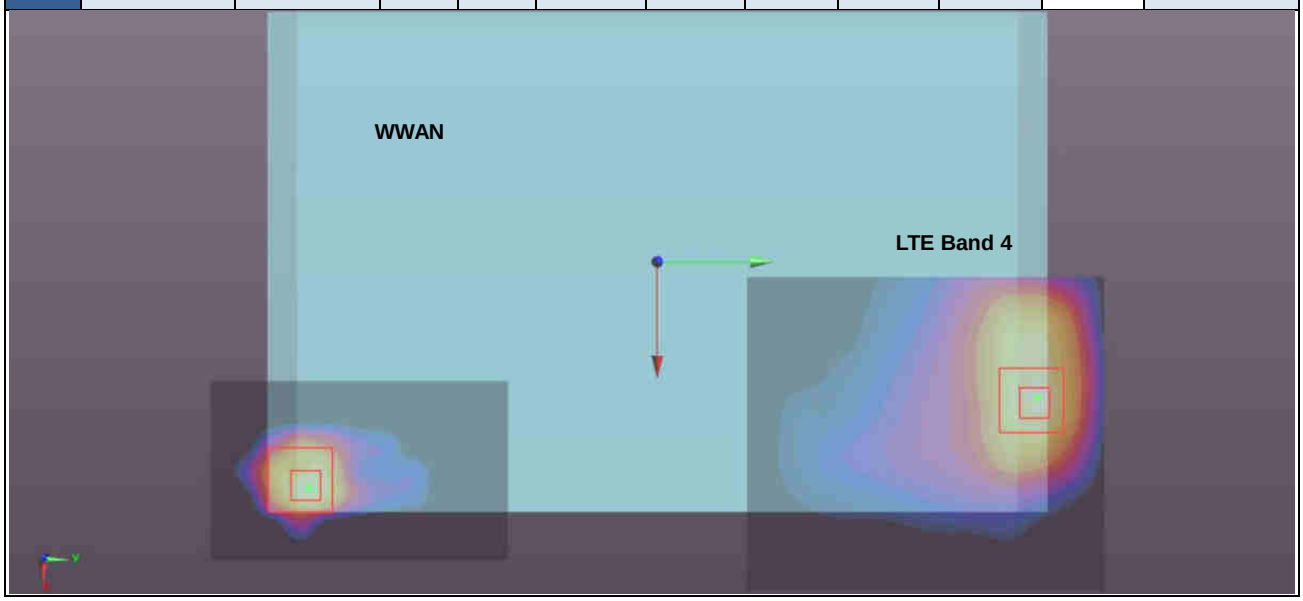
Case 5	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 12	Bottom Face	0.949	0	0.0185	0.125	-0.179	250.2	1.97	0.01	Not required
	WLAN 5.2GHz		1.016	0	0.074	-0.119	-0.18				



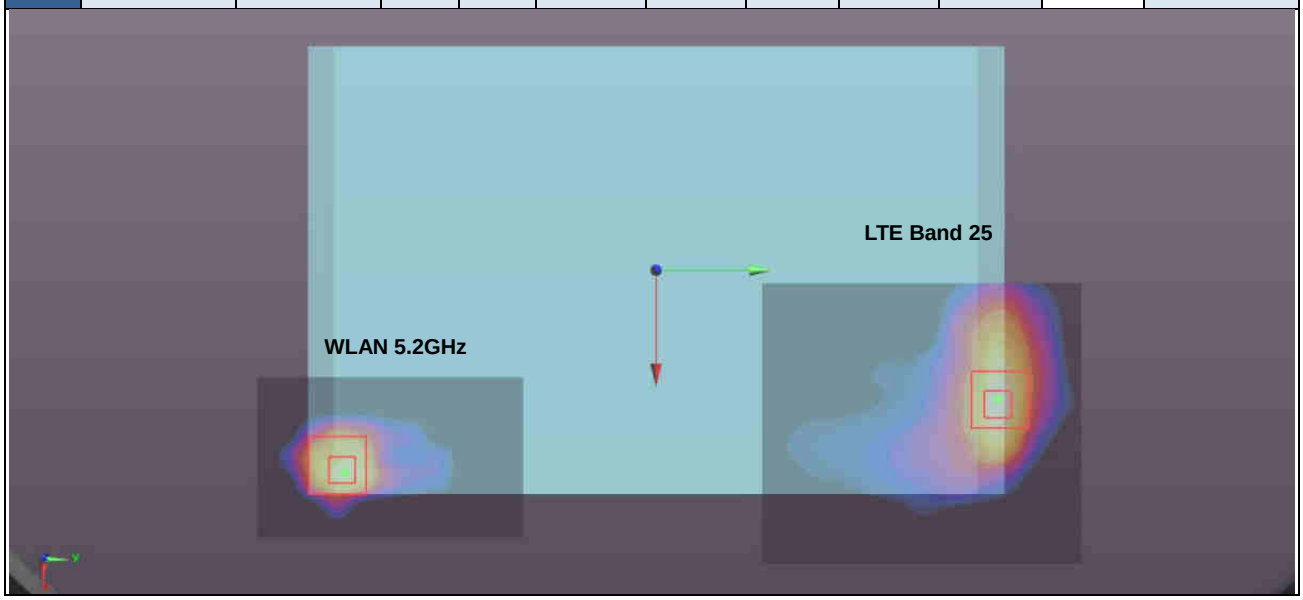
Case 6	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 5	Bottom Face	1.057	0	0.028	0.127	-0.178	250.3	2.07	0.01	Not required
	WLAN 5.2GHz		1.016	0	0.074	-0.119	-0.18				



Case 7	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 4	Bottom Face	1.119	0	0.0455	0.127	-0.177	247.7	2.14	0.01	Not required
	WLAN 5.2GHz		1.016	0	0.074	-0.119	-0.18				



Case 8	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 25	Bottom Face	1.113	0	0.0485	0.128	-0.177	248.3	2.13	0.01	Not required
	WLAN 5.2GHz		1.016	0	0.074	-0.119	-0.18				



Test Engineer： Nick Hu

17. Uncertainty Assessment

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type An evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in table below.

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor[(a)]	1/k[(b)]	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

(a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity

(b) κ is the coverage factor

Table 17.1. Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables.

Error Description	Uncertainty Value (±%)	Probability	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g) (±%)	Standard Uncertainty (10g) (±%)
Measurement System							
Probe Calibration	6.0	N	1	1	1	6.0	6.0
Axial Isotropy	4.7	R	1.732	0.7	0.7	1.9	1.9
Hemispherical Isotropy	9.6	R	1.732	0.7	0.7	3.9	3.9
Boundary Effects	1.0	R	1.732	1	1	0.6	0.6
Linearity	4.7	R	1.732	1	1	2.7	2.7
System Detection Limits	1.0	R	1.732	1	1	0.6	0.6
Modulation Response	3.2	R	1.732	1	1	1.8	1.8
Readout Electronics	0.3	N	1	1	1	0.3	0.3
Response Time	0.0	R	1.732	1	1	0.0	0.0
Integration Time	2.6	R	1.732	1	1	1.5	1.5
RF Ambient Noise	3.0	R	1.732	1	1	1.7	1.7
RF Ambient Reflections	3.0	R	1.732	1	1	1.7	1.7
Probe Positioner	0.4	R	1.732	1	1	0.2	0.2
Probe Positioning	2.9	R	1.732	1	1	1.7	1.7
Max. SAR Eval.	2.0	R	1.732	1	1	1.2	1.2
Test Sample Related							
Device Positioning	3.0	N	1	1	1	3.0	3.0
Device Holder	3.6	N	1	1	1	3.6	3.6
Power Drift	5.0	R	1.732	1	1	2.9	2.9
Power Scaling	0.0	R	1.732	1	1	0.0	0.0
Phantom and Setup							
Phantom Uncertainty	6.1	R	1.732	1	1	3.5	3.5
SAR correction	0.0	R	1.732	1	0.84	0.0	0.0
Liquid Conductivity Repeatability	0.2	N	1	0.78	0.71	0.1	0.1
Liquid Conductivity (target)	5.0	R	1.732	0.78	0.71	2.3	2.0
Liquid Conductivity (mea.)	2.5	R	1.732	0.78	0.71	1.1	1.0
Temp. unc. - Conductivity	3.4	R	1.732	0.78	0.71	1.5	1.4
Liquid Permittivity Repeatability	0.15	N	1	0.23	0.26	0.0	0.0
Liquid Permittivity (target)	5.0	R	1.732	0.23	0.26	0.7	0.8
Liquid Permittivity (mea.)	2.5	R	1.732	0.23	0.26	0.3	0.4
Temp. unc. - Permittivity	0.83	R	1.732	0.23	0.26	0.1	0.1
Combined Std. Uncertainty						11.4%	11.4%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						22.9%	22.7%

Table 17.2. Uncertainty Budget for frequency range 300 MHz to 3 GHz

Error Description	Uncertainty Value (±%)	Probability	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g) (±%)	Standard Uncertainty (10g) (±%)
Measurement System							
Probe Calibration	7.0	N	1	1	1	7.0	7.0
Axial Isotropy	4.7	R	1.732	0.7	0.7	1.9	1.9
Hemispherical Isotropy	9.6	R	1.732	0.7	0.7	3.9	3.9
Boundary Effects	2.0	R	1.732	1	1	1.2	1.2
Linearity	4.7	R	1.732	1	1	2.7	2.7
System Detection Limits	1.0	R	1.732	1	1	0.6	0.6
Modulation Response	3.2	R	1.732	1	1	1.8	1.8
Readout Electronics	0.3	N	1	1	1	0.3	0.3
Response Time	0.0	R	1.732	1	1	0.0	0.0
Integration Time	2.6	R	1.732	1	1	1.5	1.5
RF Ambient Noise	3.0	R	1.732	1	1	1.7	1.7
RF Ambient Reflections	3.0	R	1.732	1	1	1.7	1.7
Probe Positioner	0.4	R	1.732	1	1	0.2	0.2
Probe Positioning	6.7	R	1.732	1	1	3.9	3.9
Max. SAR Eval.	4.0	R	1.732	1	1	2.3	2.3
Test Sample Related							
Device Positioning	3.0	N	1	1	1	3.0	3.0
Device Holder	3.6	N	1	1	1	3.6	3.6
Power Drift	5.0	R	1.732	1	1	2.9	2.9
Power Scaling	0.0	R	1.732	1	1	0.0	0.0
Phantom and Setup							
Phantom Uncertainty	6.6	R	1.732	1	1	3.8	3.8
SAR correction	0.0	R	1.732	1	0.84	0.0	0.0
Liquid Conductivity Repeatability	0.2	N	1	0.78	0.71	0.1	0.1
Liquid Conductivity (target)	5.0	R	1.732	0.78	0.71	2.3	2.0
Liquid Conductivity (mea.)	2.5	R	1.732	0.78	0.71	1.1	1.0
Temp. unc. - Conductivity	3.4	R	1.732	0.78	0.71	1.5	1.4
Liquid Permittivity Repeatability	0.15	N	1	0.23	0.26	0.0	0.0
Liquid Permittivity (target)	5.0	R	1.732	0.23	0.26	0.7	0.8
Liquid Permittivity (mea.)	2.5	R	1.732	0.23	0.26	0.3	0.4
Temp. unc. - Permittivity	0.83	R	1.732	0.23	0.26	0.1	0.1
Combined Std. Uncertainty						12.8%	12.7%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						25.5%	25.4%

Table 17.3. Uncertainty Budget for frequency range 3 GHz to 6 GHz

18. References

[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992

[3] IEEE Std. 1528-2013, “IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, Sep 2013

[4] SPEAG DASY System Handbook

[5] FCC KDB 248227 D01 v02r02, “SAR Guidance for IEEE 802.11 (WiFi) Transmitters”, Oct 2015.

[6] FCC KDB 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 2015

[7] FCC KDB 941225 D05 v02r05, “SAR Evaluation Considerations for LTE Devices”, Dec 2015

[8] FCC KDB 616217 D04 v01r02, “SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers”, Oct 2015

[9] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.

[10] FCC KDB 865664 D02 v01r02, “RF Exposure Compliance Reporting and Documentation Considerations” Oct 2015.

Appendix A. Plots of System Performance Check

The plots are shown as follows.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.8.21

System Check_Body_750MHz_160821

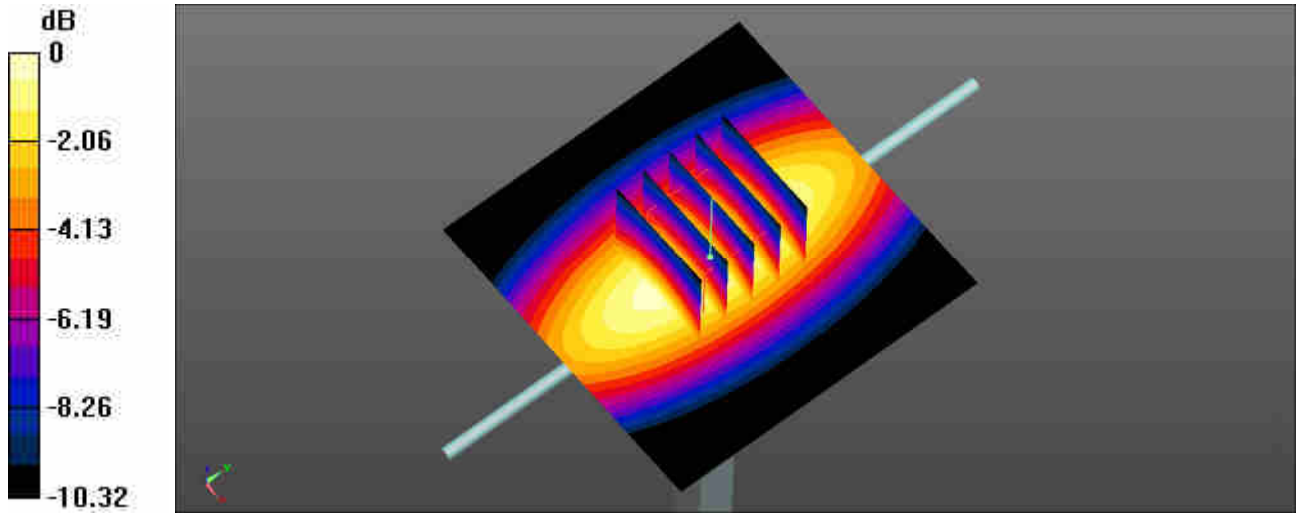
DUT: D735V3 - SN:1065

Communication System: UID 0, CW (0); Frequency: 750 MHz;Duty Cycle: 1:1
Medium: MSL_750_160821 Medium parameters used: f = 750 MHz; σ = 0.928 S/m; ε_r = 55.228; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.45, 9.45, 9.45); Calibrated: 2016.5.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2016.5.18
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.66 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 49.80 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 3.10 W/kg
SAR(1 g) = 2.1 W/kg; SAR(10 g) = 1.39 W/kg
Maximum value of SAR (measured) = 2.66 W/kg



0 dB = 2.66 W/kg = 4.25 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.8.22

System Check_Body_835MHz_160822

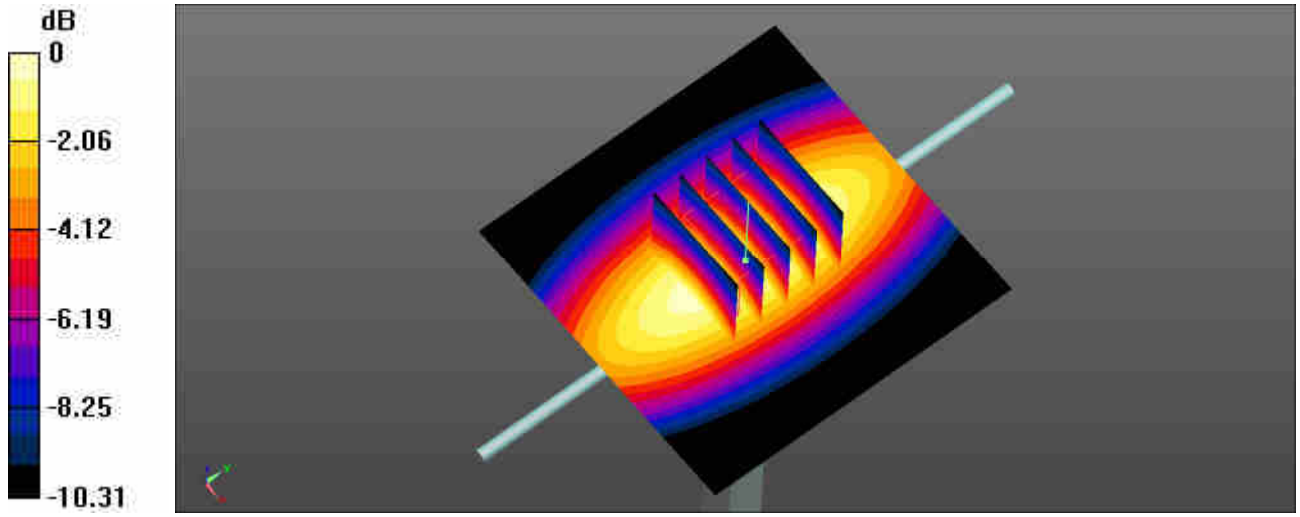
DUT: D835V2 - SN:4d091

Communication System: UID 0, CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: MSL_835_160822 Medium parameters used: f = 835 MHz; σ = 0.969 S/m; ε_r = 55.694; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.25, 9.25, 9.25); Calibrated: 2016.5.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2016.5.18
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.83 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 50.33 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 3.28 W/kg
SAR(1 g) = 2.24 W/kg; SAR(10 g) = 1.49 W/kg
Maximum value of SAR (measured) = 2.83 W/kg



0 dB = 2.83 W/kg = 4.52 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.8.23

System Check_Body_1750MHz_160823

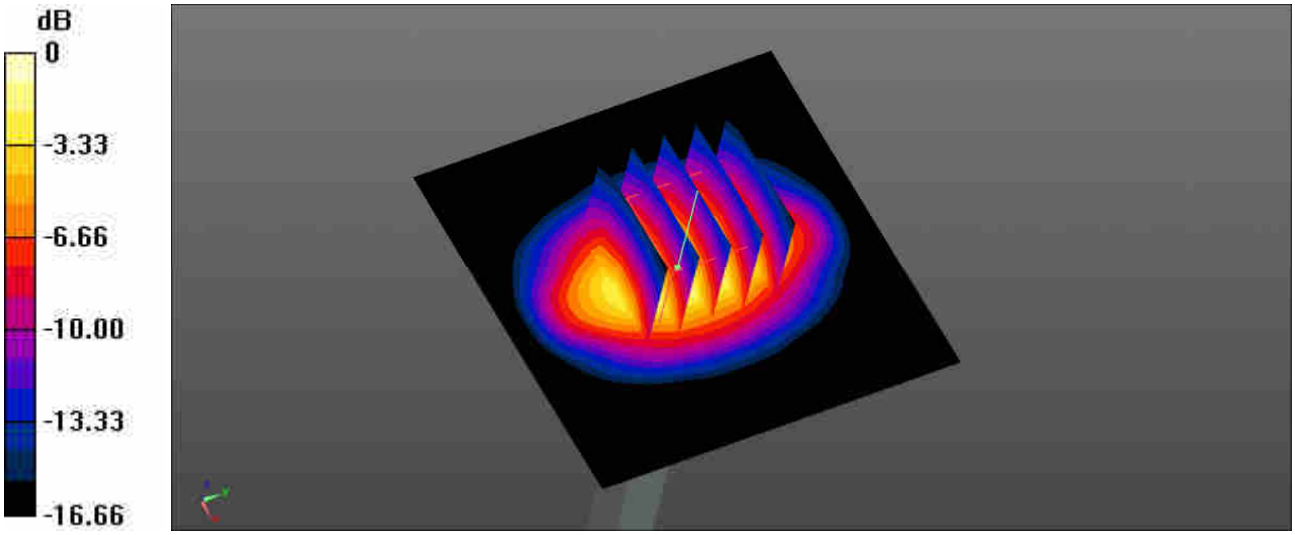
DUT: D1750V2 - SN:1069

Communication System: UID 0, CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: MSL_1750_160823 Medium parameters used: f = 1750 MHz; σ = 1.499 S/m; ε_r = 53.463; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.81, 7.81, 7.81); Calibrated: 2016.5.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2016.5.18
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 13.2 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 85.08 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 16.3 W/kg
SAR(1 g) = 9.56 W/kg; SAR(10 g) = 5.05 W/kg
Maximum value of SAR (measured) = 13.1 W/kg



0 dB = 13.1 W/kg = 11.17 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.8.24

System Check_Body_1900MHz_160824

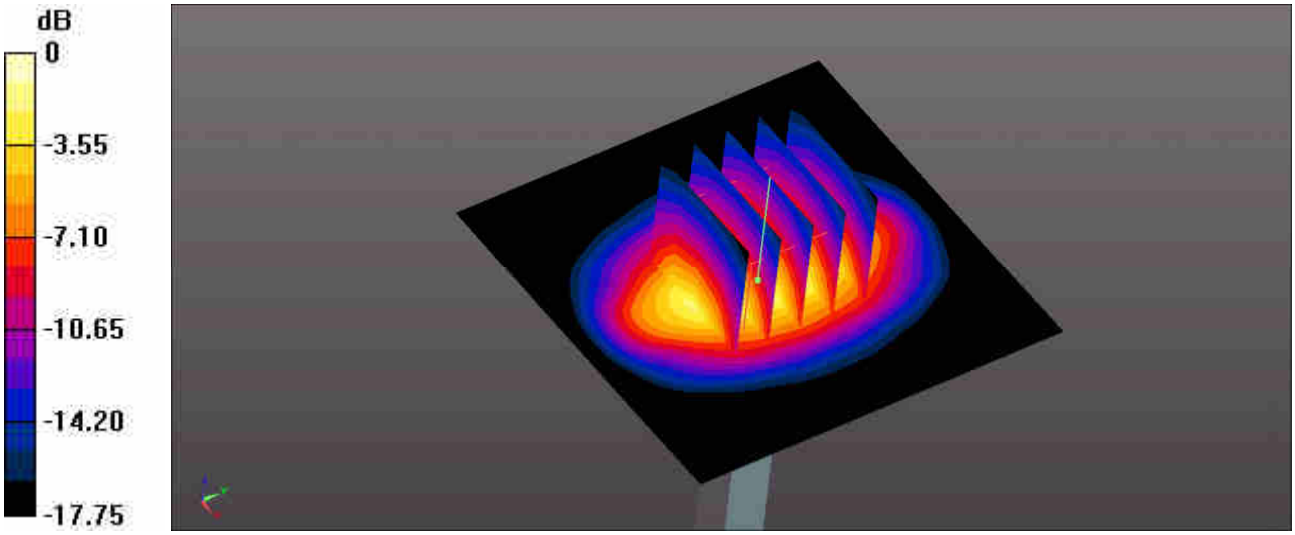
DUT: D1900V2 - SN:5d118

Communication System: UID 0, CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: MSL_1900_160824 Medium parameters used: f = 1900 MHz; σ = 1.55 S/m; ε_r = 54.72; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.55, 7.55, 7.55); Calibrated: 2016.5.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2016.5.18
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 15.0 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 87.19 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 18.8 W/kg
SAR(1 g) = 10.5 W/kg; SAR(10 g) = 5.45 W/kg
Maximum value of SAR (measured) = 15.0 W/kg



0 dB = 15.0 W/kg = 11.76 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.8.30

System Check_Body_2450MHz_160830

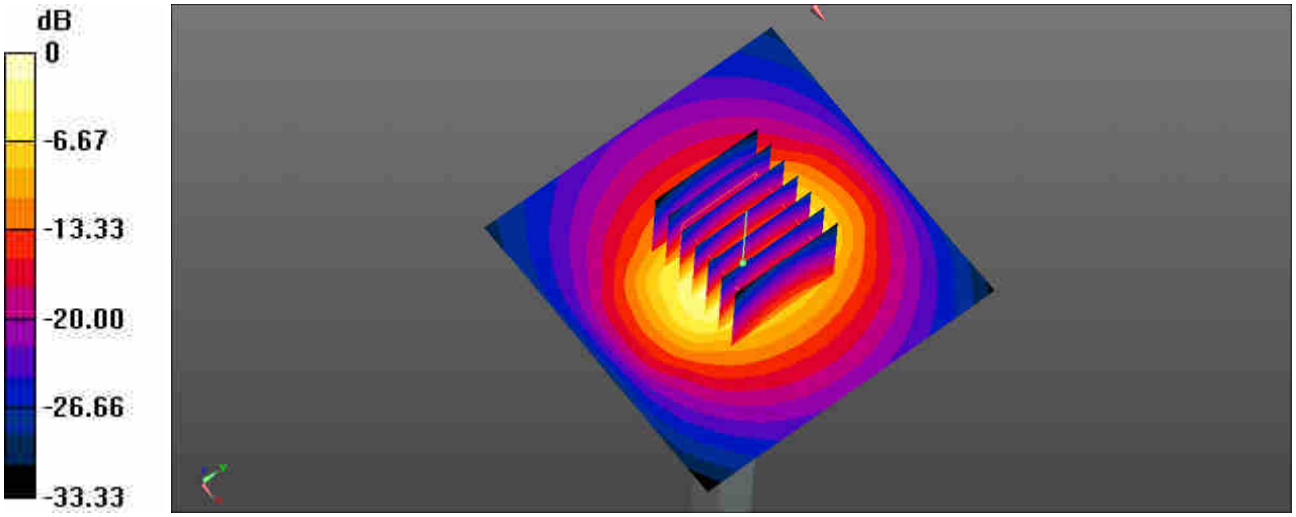
DUT: D2450V2 - SN:840

Communication System: UID 0, CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: MSL_2450_160830 Medium parameters used: f = 2450 MHz; σ = 1.989 S/m; ε_r = 51.422; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.23, 7.23, 7.23); Calibrated: 2016.5.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2016.5.18
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (71x71x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 18.9 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 85.87 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 23.9 W/kg
SAR(1 g) = 12.5 W/kg; SAR(10 g) = 5.76 W/kg
Maximum value of SAR (measured) = 18.9 W/kg



0 dB = 18.9 W/kg = 12.76 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.8.29

System Check_Body_5250MHz_160829

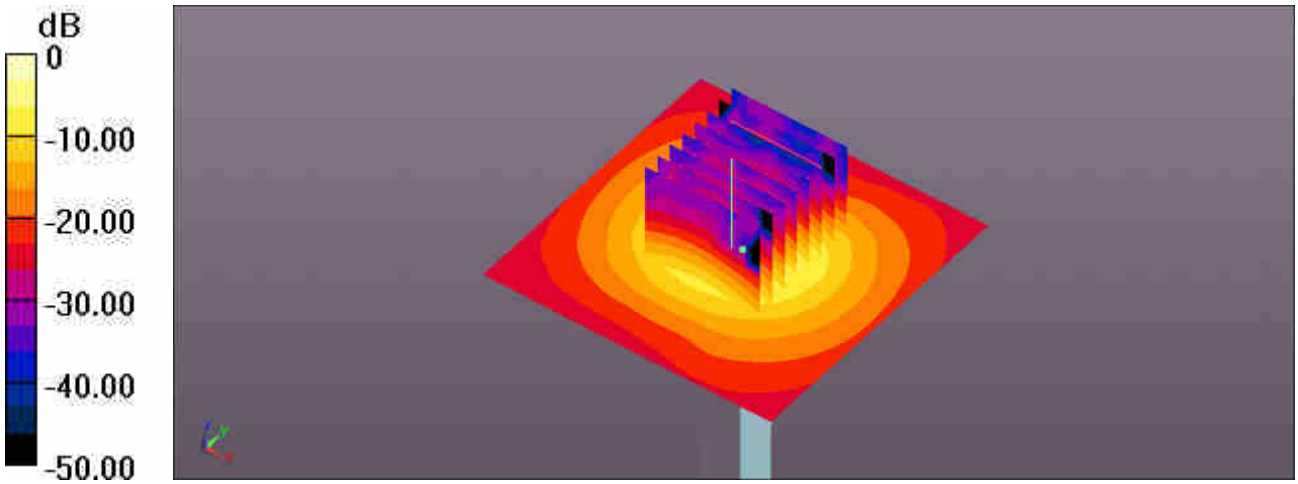
DUT: D5GHzV2-SN:1113

Communication System: UID 0, CW (0); Frequency: 5250 MHz;Duty Cycle: 1:1
Medium: MSL_5000_160829 Medium parameters used: f = 5250 MHz; σ = 5.366 S/m; ε_r = 48.688; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃； Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(4.25, 4.25, 4.25); Calibrated: 2015.11.27;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2016.4.4
- Phantom: SAM3; Type: SAM; Serial: TP-1127
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 17.3 W/kg

Pin=100mW/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 41.11 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 30.5 W/kg
SAR(1 g) = 7.48 W/kg; SAR(10 g) = 2.13 W/kg
Maximum value of SAR (measured) = 17.6 W/kg



0 dB = 17.6 W/kg = 12.46 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.8.29

System Check_Body_5750MHz_150829

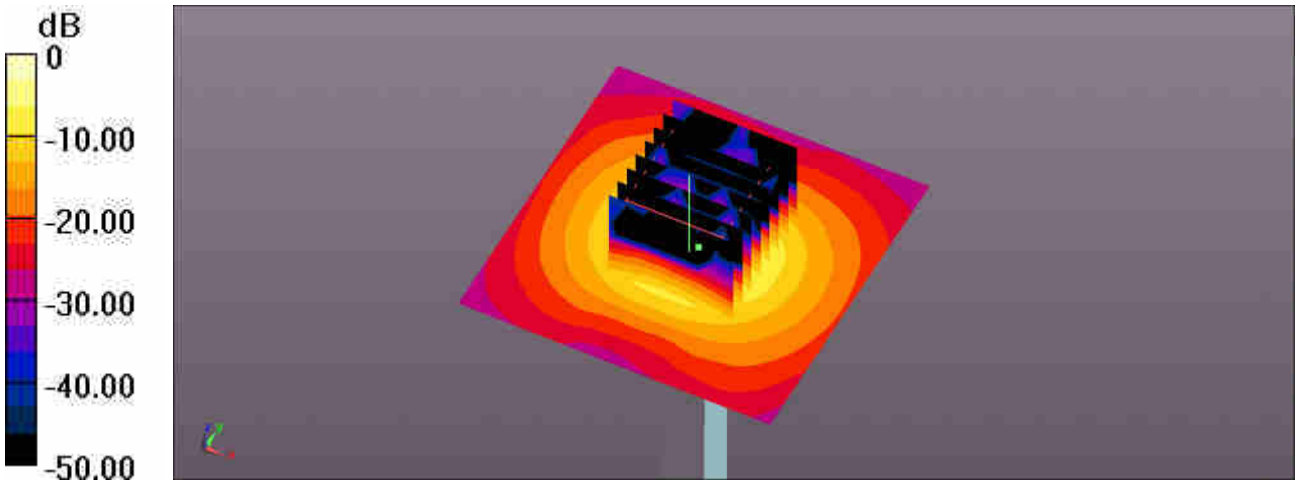
DUT: D5GHzV2-SN:1113

Communication System: UID 0, CW (0); Frequency: 5750 MHz;Duty Cycle: 1:1
Medium: MSL_5000_160829 Medium parameters used: f = 5750 MHz; σ = 6.068 S/m; ε_r = 47.579; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(3.77, 3.77, 3.77); Calibrated: 2015.11.27;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2016.4.4
- Phantom: SAM3; Type: SAM; Serial: TP-1127
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 17.8 W/kg

Pin=100mW/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 36.18 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 33.0 W/kg
SAR(1 g) = 7.2 W/kg; SAR(10 g) = 2.05 W/kg
Maximum value of SAR (measured) = 17.9 W/kg



0 dB = 17.9 W/kg = 12.53 dBW/kg

Appendix B. Plots of High SAR Measurement

The plots are shown as follows.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.8.21

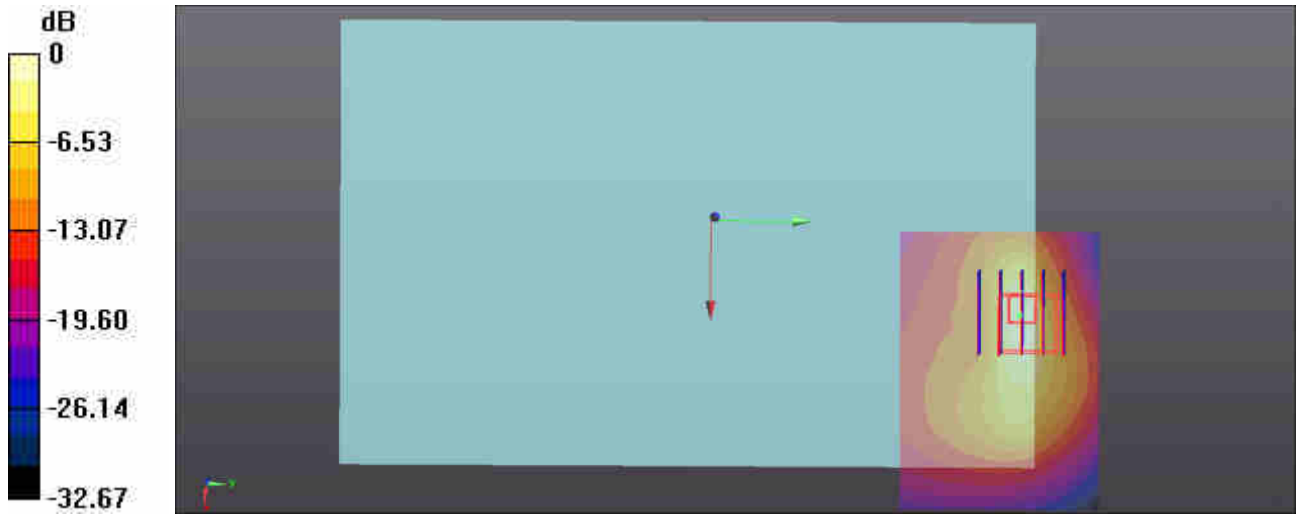
01_LTE Band 12_10M_QPSK_25RB_25Offset_Bottom Face_0mm_Ch23095

Communication System: UID 0, FDD_LTE (0); Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium: MSL_750_160821 Medium parameters used: f = 707.5 MHz; σ = 0.888 S/m; ε_r = 55.765; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.45, 9.45, 9.45); Calibrated: 2016.5.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2016.5.18
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch23095/Area Scan (71x51x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.79 W/kg

Ch23095/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.367 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 2.71 W/kg
SAR(1 g) = 0.806 W/kg; SAR(10 g) = 0.352 W/kg
Maximum value of SAR (measured) = 1.81 W/kg



0 dB = 1.79 W/kg = 2.53 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.8.22

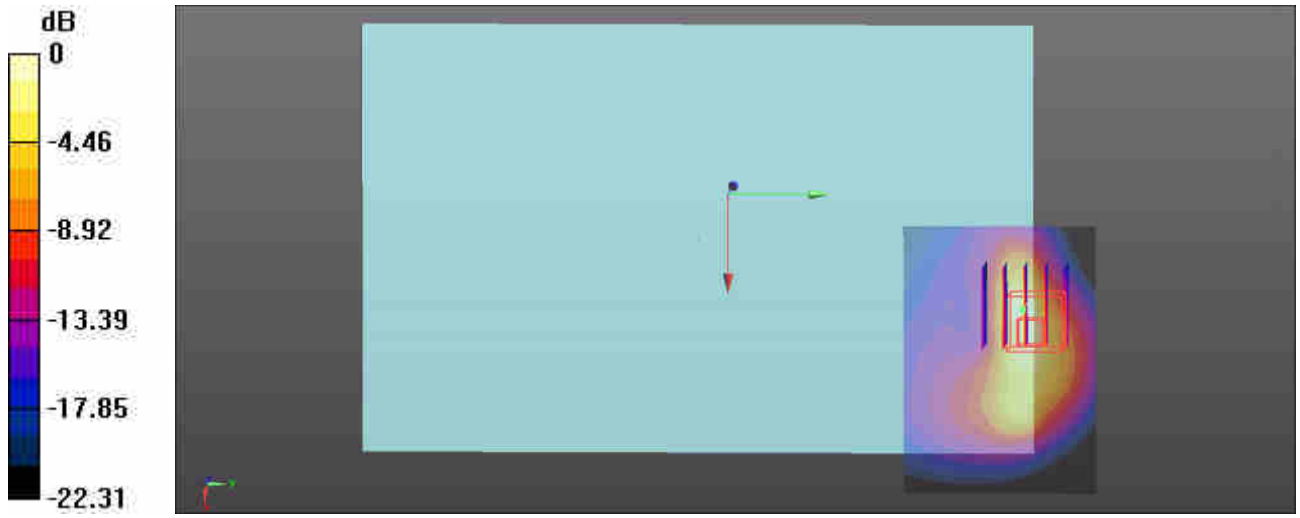
02_LTE Band5_10M_QPSK_50RB_0Offset_Bottom Face_0mm_Ch20525

Communication System: UID 0, FDD_LTE (0); Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium: MSL_850_160822 Medium parameters used: f = 836.5 MHz; σ = 0.971 S/m; ε_r = 55.681; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃； Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.25, 9.25, 9.25); Calibrated: 2016.5.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2016.5.18
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch20525/Area Scan (71x51x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.93 W/kg

Ch20525/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.3250 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 2.52 W/kg
SAR(1 g) = 0.873 W/kg; SAR(10 g) = 0.399 W/kg
Maximum value of SAR (measured) = 1.85 W/kg



0 dB = 1.85 W/kg = 2.67 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.8.23

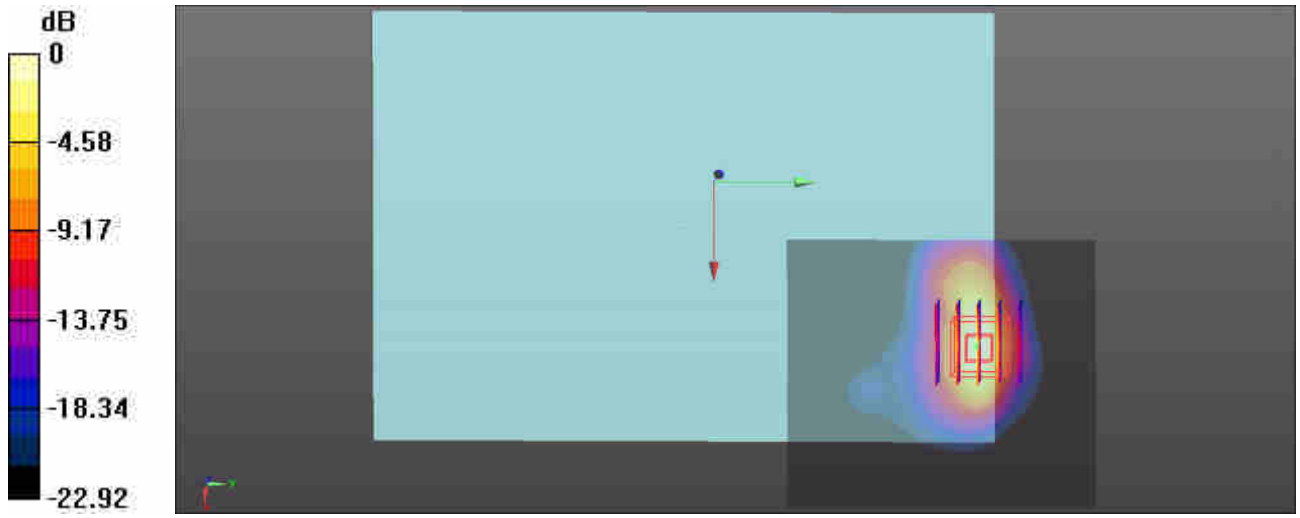
03_LTE Band 4_20M_QPSK_100RB_0Offset_Bottom Face Curved_0mm_Ch20175

Communication System: UID 0, FDD_LTE (0); Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: MSL_1750_160823 Medium parameters used: f = 1732.5 MHz; σ = 1.48 S/m; ε_r = 53.491; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.81, 7.81, 7.81); Calibrated: 2016.5.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2016.5.18
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch20175/Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.92 W/kg

Ch20175/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.5530 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 2.34 W/kg
SAR(1 g) = 1.05 W/kg; SAR(10 g) = 0.471 W/kg
Maximum value of SAR (measured) = 1.90 W/kg



0 dB = 1.90 W/kg = 2.79 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.8.24

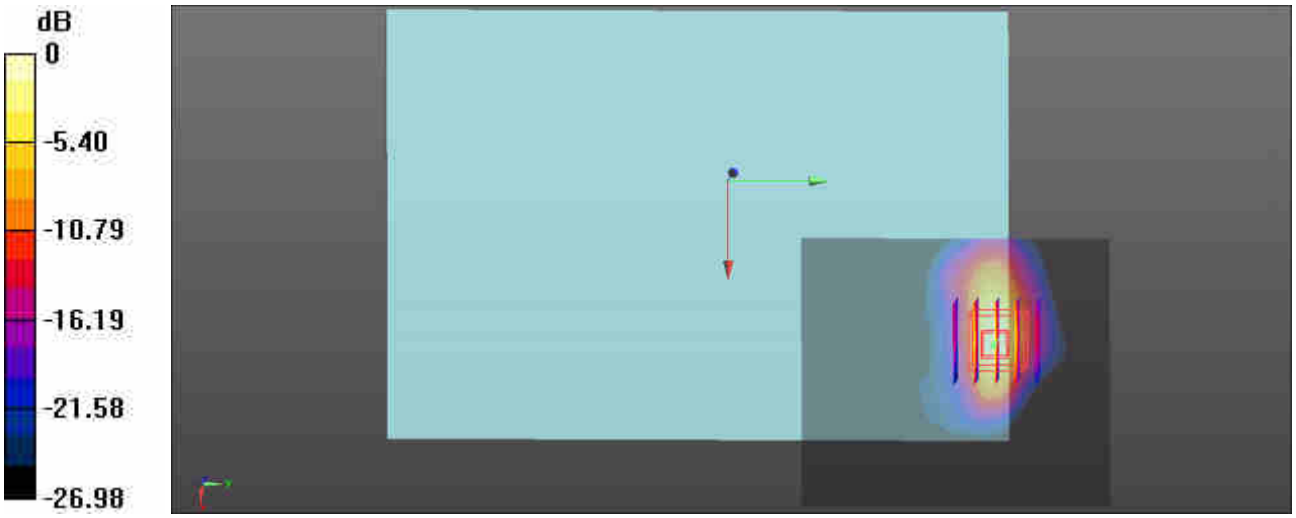
04_LTE Band 25_20M_QPSK_50RB_24Offset_Bottom Face Curved_0mm_Ch26590

Communication System: UID 0, FDD_LTE (0); Frequency: 1905 MHz;Duty Cycle: 1:1
Medium: MSL_1900_160824 Medium parameters used: f = 1905 MHz; σ = 1.555 S/m; ε_r = 54.709; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.55, 7.55, 7.55); Calibrated: 2016.5.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2016.5.18
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch26590/Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.36 W/kg

Ch26590/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 2.74 W/kg
SAR(1 g) = 1.15 W/kg; SAR(10 g) = 0.461 W/kg
Maximum value of SAR (measured) = 2.20 W/kg



0 dB = 2.20 W/kg = 3.42 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.8.30

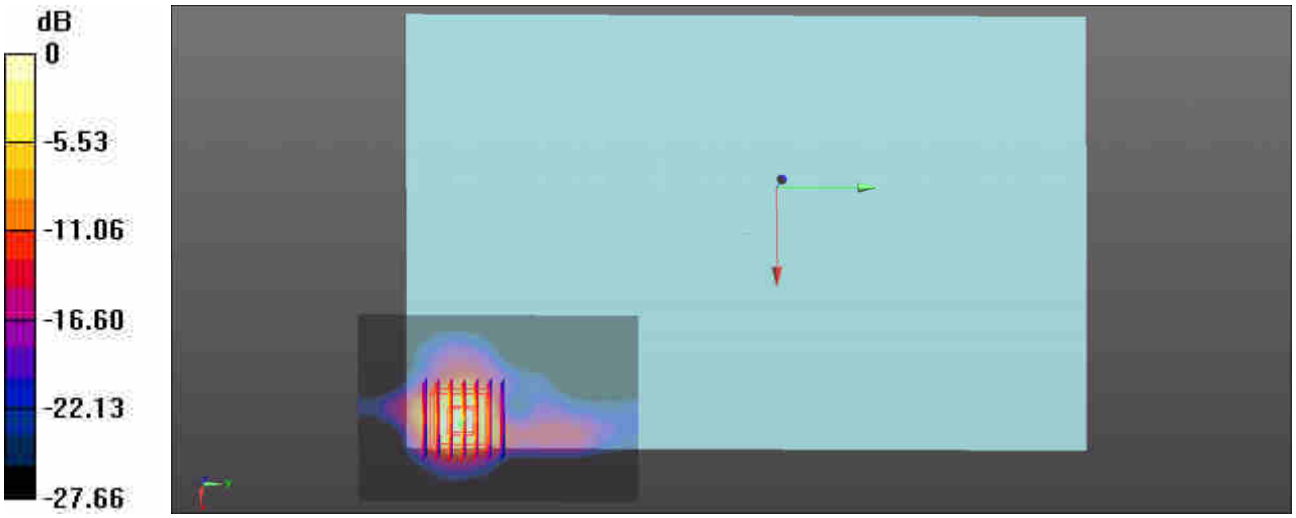
05_WLAN2.4GHz_802.11b 1Mbps_Bottom Face Curved surface of Edge1 _0mm_Ch11

Communication System: UID 0, WIFI (0); Frequency: 2462 MHz;Duty Cycle: 1:1.025
Medium: MSL_2450_160830 Medium parameters used: f = 2462 MHz; σ = 2.006 S/m; ε_r = 51.382; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.23, 7.23, 7.23); Calibrated: 2016.5.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2016.5.18
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch11/Area Scan (61x91x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 1.74 W/kg

Ch11/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 2.30 W/kg
SAR(1 g) = 0.941 W/kg; SAR(10 g) = 0.346 W/kg
Maximum value of SAR (measured) = 1.68 W/kg



0 dB = 1.68 W/kg = 2.25 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.8.29

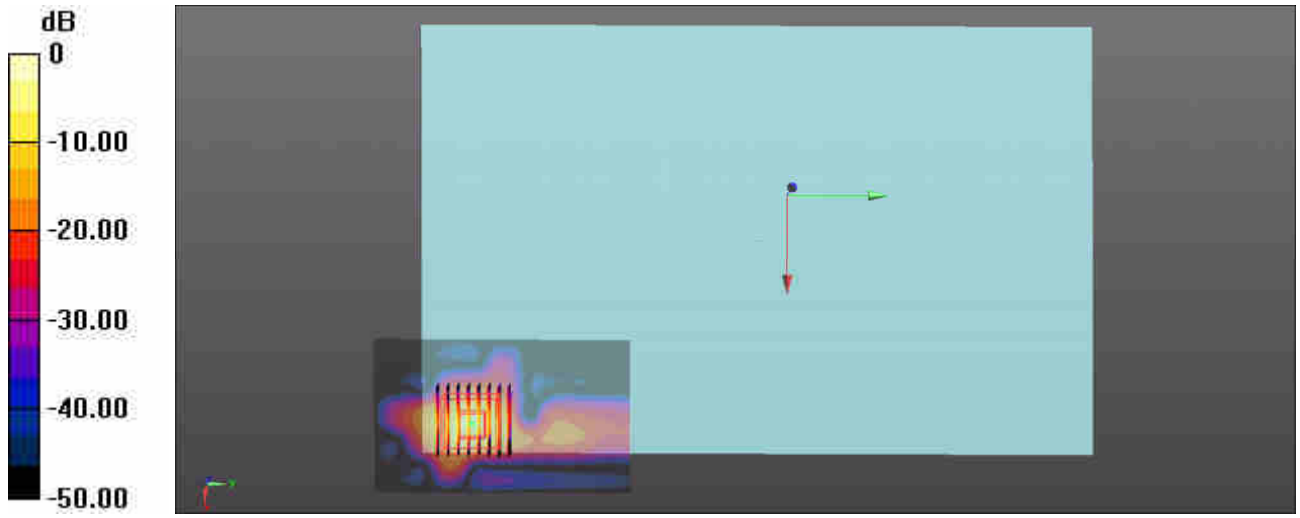
06_WLAN5.2GHz_802.11a 6Mbps_Bottom Face Curved surface of Edge1 _0mm_Ch36

Communication System: UID 0, WIFI (0); Frequency: 5180 MHz;Duty Cycle: 1:1.144
Medium: MSL_5000_160829 Medium parameters used: f = 5180 MHz; σ = 5.257 S/m; ε_r = 48.801; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃； Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(4.25, 4.25, 4.25); Calibrated: 2015.11.27;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2016.4.04
- Phantom: SAM3; Type: SAM; Serial: TP-1127
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch36/Area Scan (61x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.80 W/kg

Ch36/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 0 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 4.60 W/kg
SAR(1 g) = 0.971 W/kg; SAR(10 g) = 0.208 W/kg
Maximum value of SAR (measured) = 2.66 W/kg



0 dB = 2.66 W/kg = 4.25 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.8.29

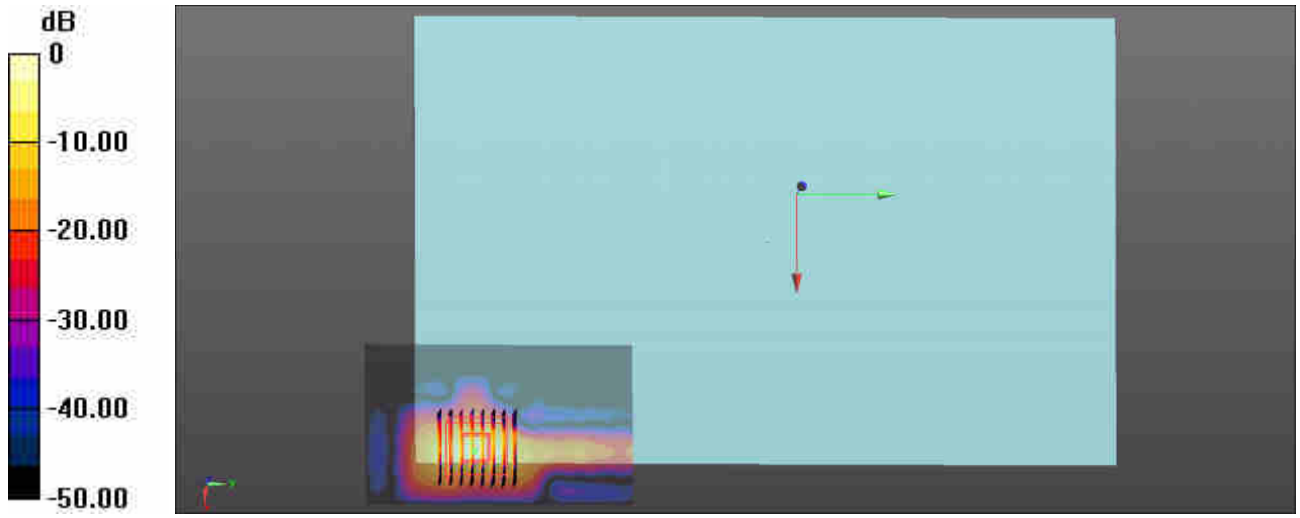
07_WLAN5.8GHz_802.11a 6Mbps_Bottom Face Curved surface of Edge1_0mm_Ch165

Communication System: UID 0, WIFI (0); Frequency: 5825 MHz;Duty Cycle: 1:1.144
Medium: MSL_5000_160829 Medium parameters used: f = 5825 MHz; σ = 6.16 S/m; ε_r = 47.269; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃； Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(3.77, 3.77, 3.77); Calibrated: 2015.11.27;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2016.4.04
- Phantom: SAM3; Type: SAM; Serial: TP-1127
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch165/Area Scan (61x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 2.79 W/kg

Ch165/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 0 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 4.40 W/kg
SAR(1 g) = 0.945 W/kg; SAR(10 g) = 0.225 W/kg
Maximum value of SAR (measured) = 2.56 W/kg



0 dB = 2.56 W/kg = 4.08 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.8.30

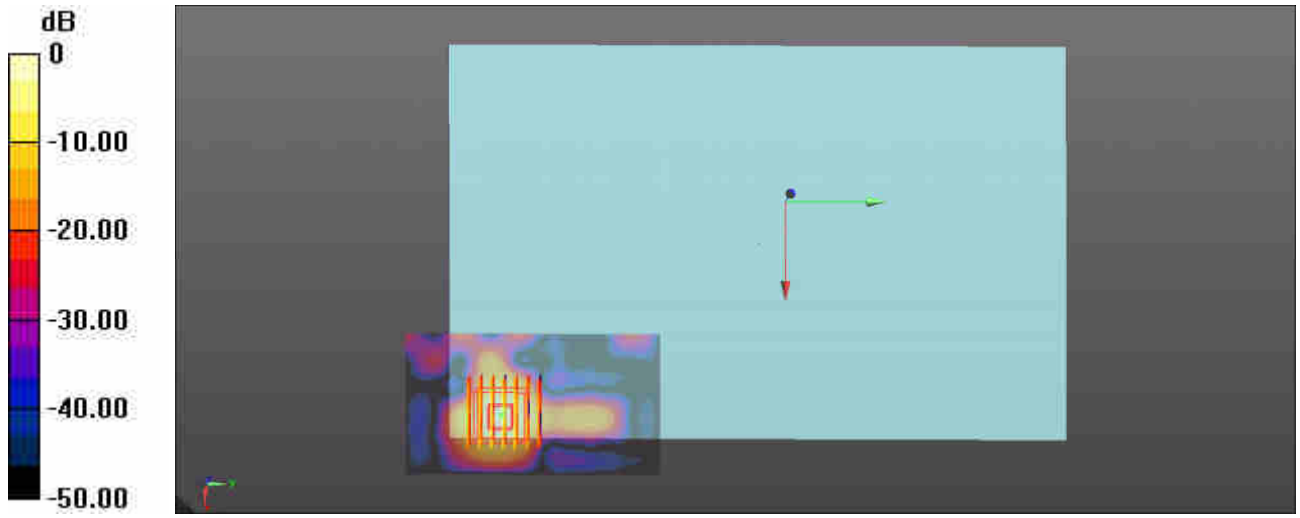
08_Bluetooth_1Mbps_Bottom Face Curved surface of Edge1 _0mm_Ch39

Communication System: UID 0, Bluetooth (0); Frequency: 2441 MHz;Duty Cycle: 1:1.20
Medium: MSL_2450_160830 Medium parameters used: f = 2441 MHz; σ = 1.976 S/m; ε_r = 51.447; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃； Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.23, 7.23, 7.23); Calibrated: 2016.5.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2016.5.18
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch39/Area Scan (51x91x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.304 W/kg

Ch39/Zoom Scan (7x7x4)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.5040 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.403 W/kg
SAR(1 g) = 0.133 W/kg; SAR(10 g) = 0.043 W/kg
Maximum value of SAR (measured) = 0.249 W/kg



0 dB = 0.249 W/kg = -6.04 dBW/kg

Appendix C. DASY Calibration Certificate

The DASY calibration certificates are shown as follows.

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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

Client **Sporton-KS (Auden)**

Certificate No: D750V3-1065_Nov15

CALIBRATION CERTIFICATE

Object	D750V3 - SN: 1065
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	November 24, 2015

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 EPM-442A	GB37480704	07-Oct-15 (No. 217-02222)	Oct-16
Power sensor HP 8481A	US37292783	07-Oct-15 (No. 217-02222)	Oct-16
Power sensor HP 8481A	MY41092317	07-Oct-15 (No. 217-02223)	Oct-16
Reference 20 dB Attenuator	SN: 5058 (20k)	01-Apr-15 (No. 217-02131)	Mar-16
Type-N mismatch combination	SN: 5047.2 / 06327	01-Apr-15 (No. 217-02134)	Mar-16
Reference Probe EX3DV4	SN: 7349	30-Dec-14 (No. EX3-7349_Dec14)	Dec-15
DAE4	SN: 601	17-Aug-15 (No. DAE4-601_Aug15)	Aug-16

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100972	15-Jun-15 (in house check Jun-15)	In house check: Jun-18
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: November 24, 2015

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

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:

a) 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
b) 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
c) 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
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) 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 ± 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 ± 0.2) °C	42.8 ± 6 %	0.90 mho/m ± 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	2.07 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.25 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.35 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.38 W/kg ± 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 ± 0.2) °C	55.9 ± 6 %	0.97 mho/m ± 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	2.23 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**8.86 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.48 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**5.89 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.4 Ω - 2.1 jΩ
Return Loss	- 28.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.1 Ω - 3.9 jΩ
Return Loss	- 27.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.032 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 10, 2012

DASY5 Validation Report for Head TSL

Date: 24.11.2015

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1065

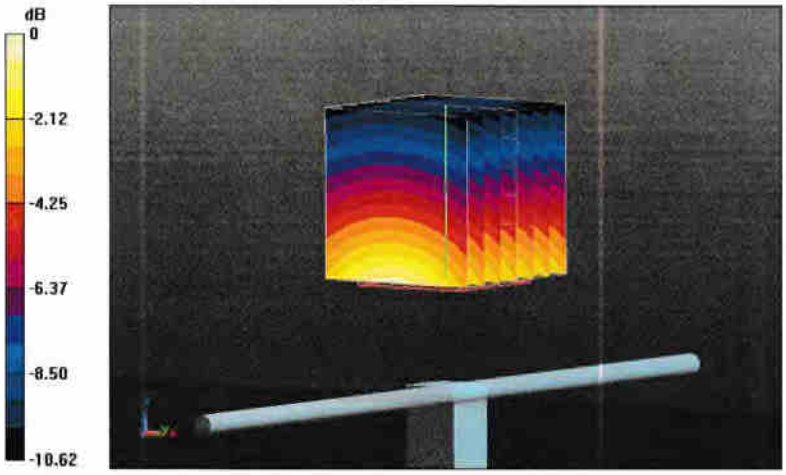
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.9 S/m; ε_r = 42.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.1, 10.1, 10.1); Calibrated: 30.12.2014;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 17.08.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

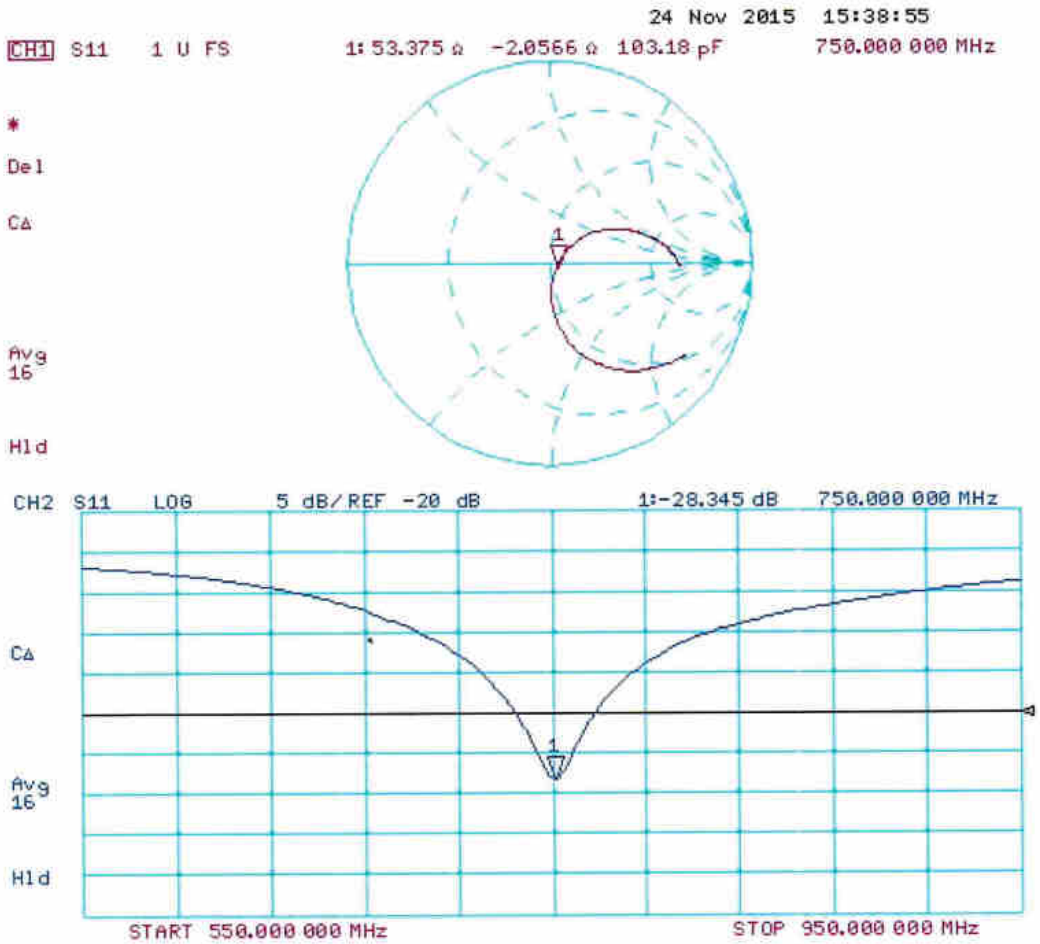
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.14 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 3.09 W/kg
SAR(1 g) = 2.07 W/kg; SAR(10 g) = 1.35 W/kg
Maximum value of SAR (measured) = 2.74 W/kg



0 dB = 2.74 W/kg = 4.38 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 24.11.2015

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1065

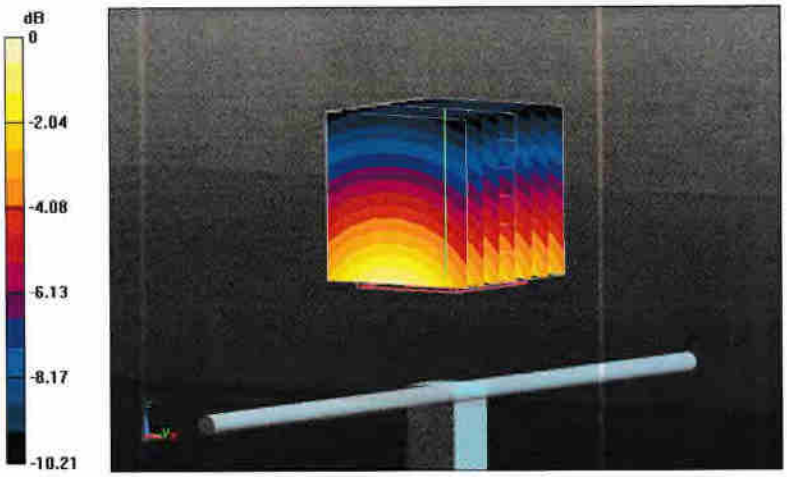
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.97 S/m; ε_r = 55.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.61, 9.61, 9.61); Calibrated: 30.12.2014;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 17.08.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

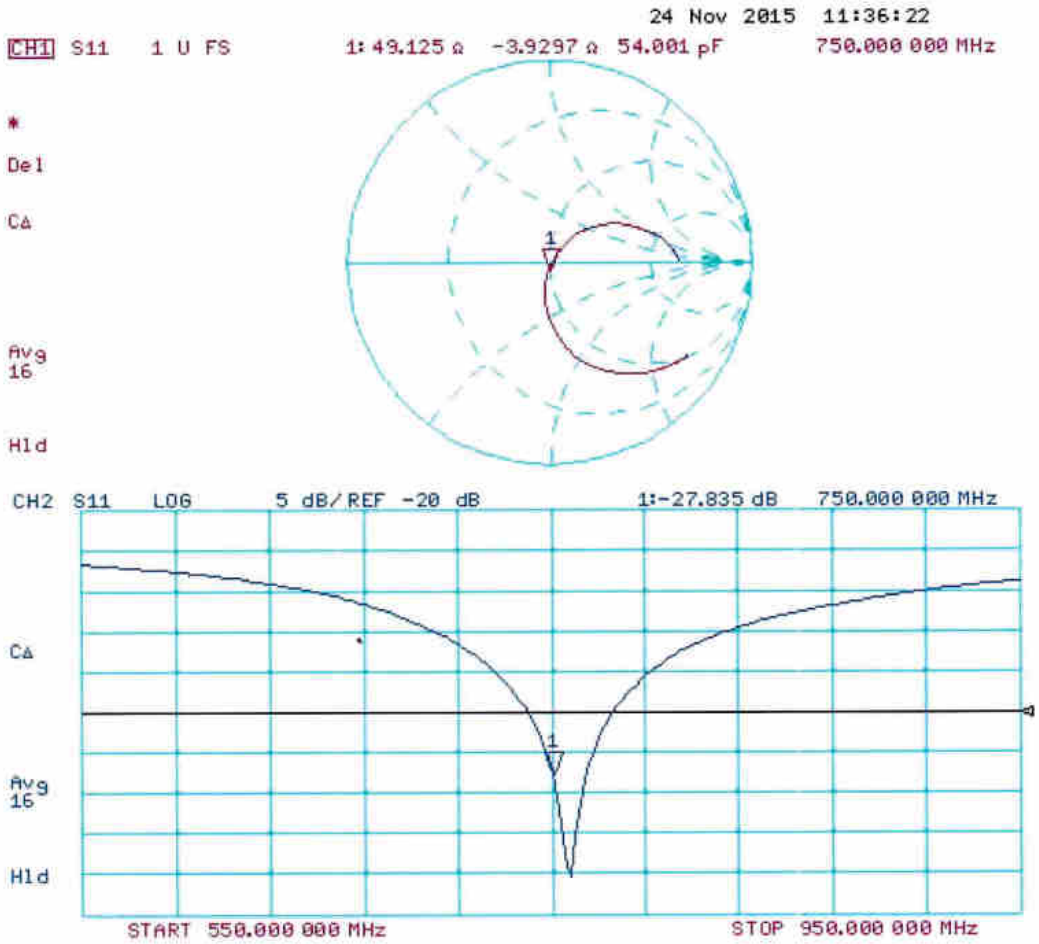
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.13 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.29 W/kg
SAR(1 g) = 2.23 W/kg; SAR(10 g) = 1.48 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



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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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

Client **Sporton-KS (Auden)**

Certificate No: D835V2-4d091_Nov15

CALIBRATION CERTIFICATE

Object	D835V2 - SN: 4d091
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	November 24, 2015

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 EPM-442A	GB37480704	07-Oct-15 (No. 217-02222)	Oct-16
Power sensor HP 8481A	US37292783	07-Oct-15 (No. 217-02222)	Oct-16
Power sensor HP 8481A	MY41092317	07-Oct-15 (No. 217-02223)	Oct-16
Reference 20 dB Attenuator	SN: 5058 (20k)	01-Apr-15 (No. 217-02131)	Mar-16
Type-N mismatch combination	SN: 5047.2 / 06327	01-Apr-15 (No. 217-02134)	Mar-16
Reference Probe EX3DV4	SN: 7349	30-Dec-14 (No. EX3-7349_Dec14)	Dec-15
DAE4	SN: 601	17-Aug-15 (No. DAE4-601_Aug15)	Aug-16

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100972	15-Jun-15 (in house check Jun-15)	In house check: Jun-18
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: November 24, 2015

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

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:

a) 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
b) 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
c) 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
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) 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 ± 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 ± 0.2) °C	42.6 ± 6 %	0.92 mho/m ± 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	2.31 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.14 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.50 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.94 W/kg ± 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 ± 0.2) °C	55.6 ± 6 %	0.99 mho/m ± 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	2.42 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.55 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.59 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.29 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.3 Ω - 4.3 jΩ
Return Loss	- 27.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.3 Ω - 6.3 jΩ
Return Loss	- 23.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.395 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 15, 2009

DASY5 Validation Report for Head TSL

Date: 24.11.2015

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d091

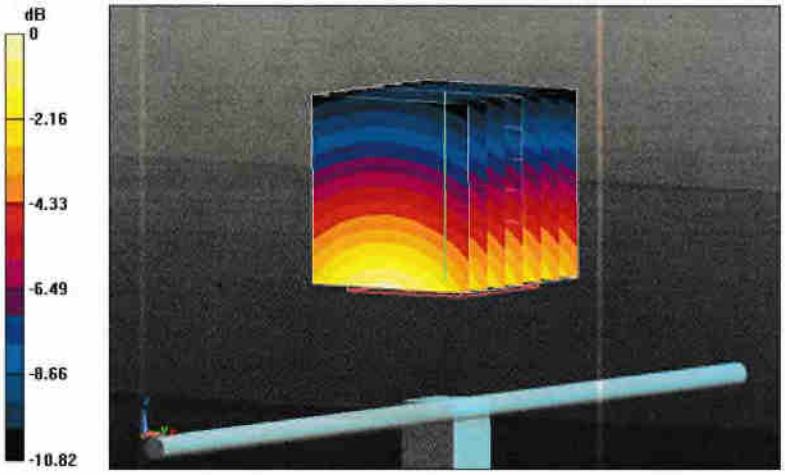
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.92 S/m; ε_r = 42.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.77, 9.77, 9.77); Calibrated: 30.12.2014;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 17.08.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

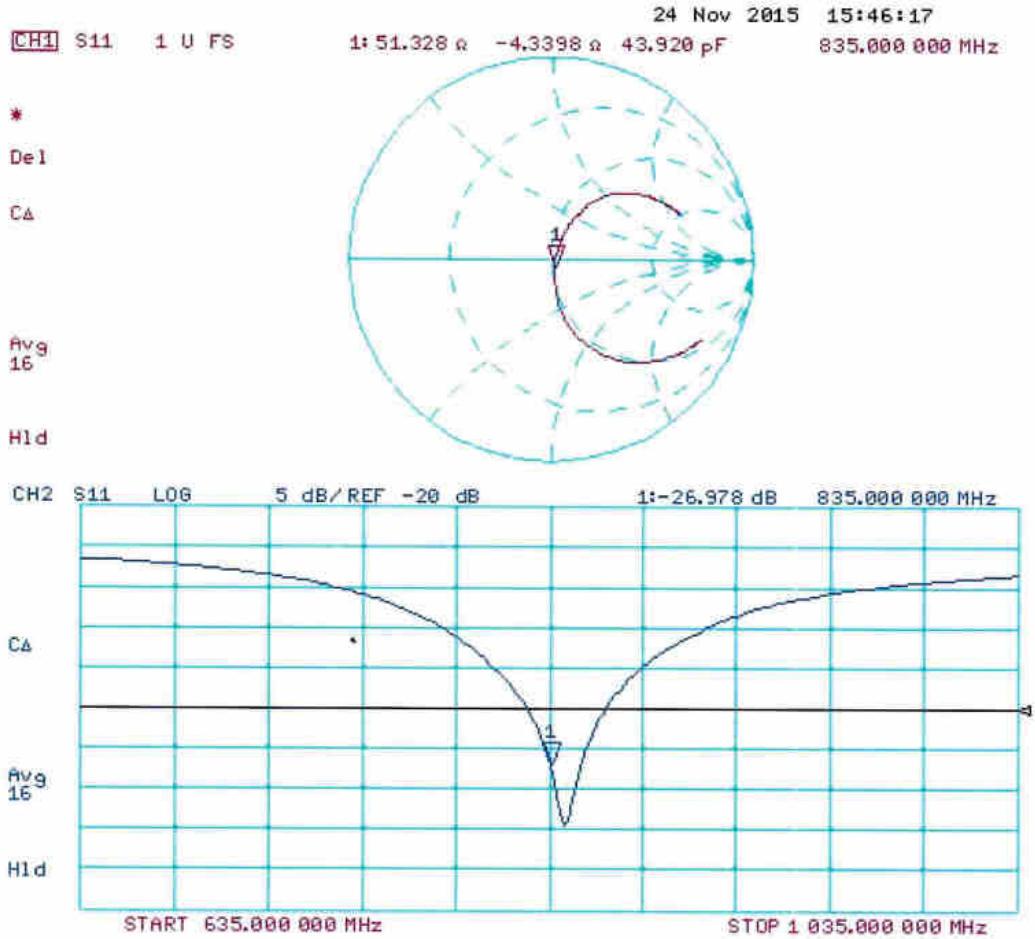
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 60.87 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.43 W/kg
SAR(1 g) = 2.31 W/kg; SAR(10 g) = 1.5 W/kg
Maximum value of SAR (measured) = 3.05 W/kg



0 dB = 3.05 W/kg = 4.84 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 24.11.2015

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d091

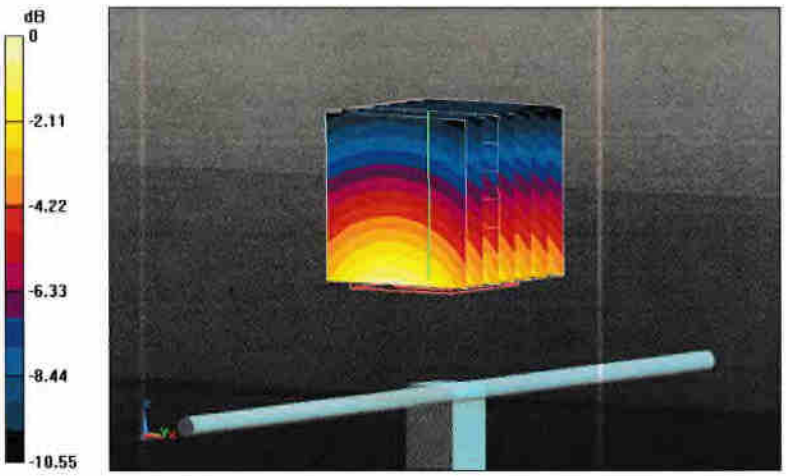
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.99 S/m; ε_r = 55.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

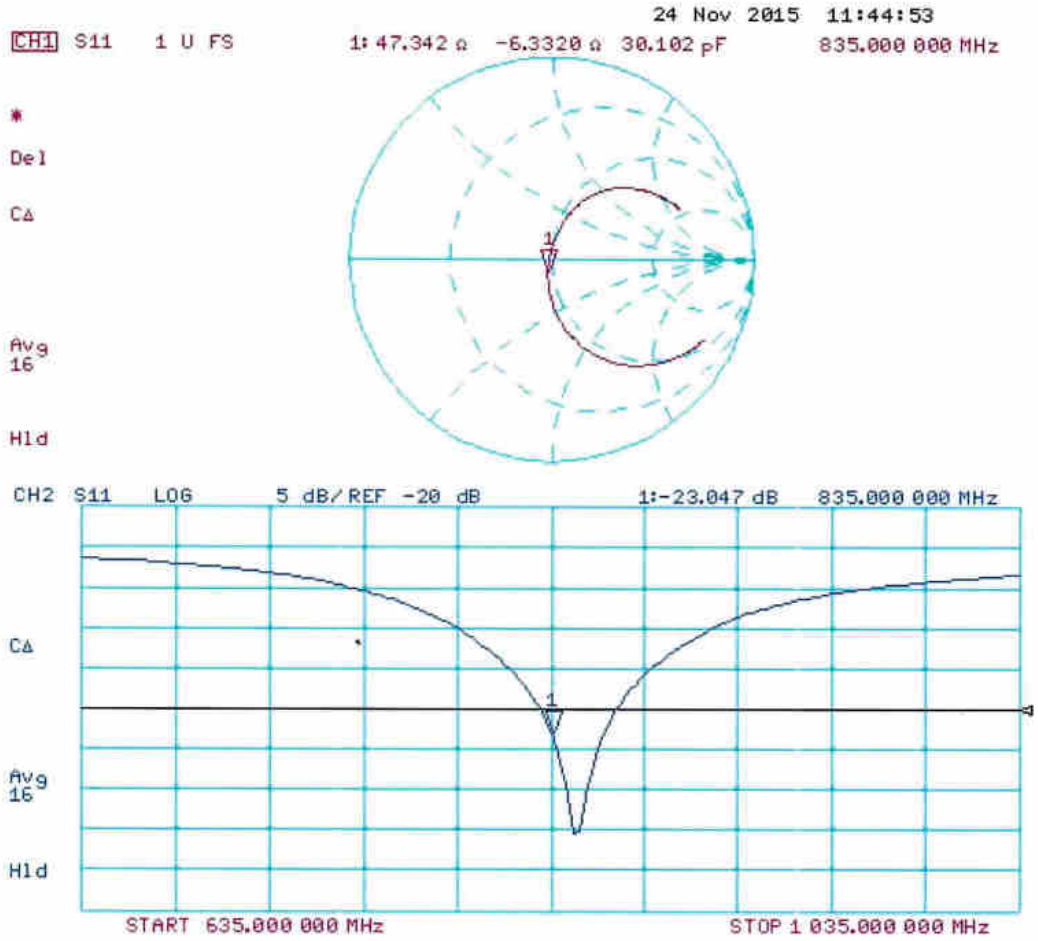
DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.72, 9.72, 9.72); Calibrated: 30.12.2014;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 17.08.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 59.69 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.58 W/kg
SAR(1 g) = 2.42 W/kg; SAR(10 g) = 1.59 W/kg
Maximum value of SAR (measured) = 3.19 W/kg



0 dB = 3.19 W/kg = 5.04 dBW/kg

Impedance Measurement Plot for Body TSL