

FCC SAR Test Report

Report No. : SA180822C04
 Applicant : Kyocera Corporation c/o Kyocera International, Inc.
 Address : 8611 Balboa Avenue, San Diego, CA 92123
 Product : Smart Phone
 FCC ID : V65E6920
 Brand : Kyocera
 Model No. : E6920
 Standards : FCC 47 CFR Part 2 (2.1093), IEEE C95.1:1992, IEEE Std 1528:2013
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CERTIFICATION: The above equipment have been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch – Lin Kou Laboratories**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's SAR characteristics under the conditions specified in this report. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product certification, approval, or endorsement by TAF or any government agencies.

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Release Control Record

1. Summary of Maximum SAR Value

Equipment Class	Mode	Highest SAR-1g Head (W/kg)	Highest SAR-1g Body-worn Tested at 10 mm (W/kg)	Highest SAR-1g Hotspot Tested at 10 mm (W/kg)
PCE	GSM850	0.46	0.56	0.56
	GSM1900	0.82	0.58	0.58
	WCDMA II	1.33	0.75	0.75
	WCDMA IV	1.29	0.92	0.92
	WCDMA V	0.60	0.57	0.57
	LTE 2	1.19	0.66	0.66
	LTE 4 / 66	1.19	0.94	0.94
	LTE 5	0.40	0.51	0.51
	LTE 7	0.66	0.56	0.65
	LTE 12	0.30	0.49	0.49
	LTE 14	0.32	0.51	0.51
	LTE 30	0.23	1.12	1.12
DTS	2.4G WLAN	0.25	0.20	0.20
NII	5.3G WLAN	0.16	0.80	N/A
	5.6G WLAN	0.12	0.63	N/A
	5.8G WLAN	0.19	1.01	N/A
DSS	Bluetooth	0.03	0.02	0.02
DXX	NFC	N/A	N/A	N/A

Highest Simultaneous Transmission SAR	Highest SAR-1g Head (W/kg)	Highest SAR-1g Body-worn Tested at 10 mm (W/kg)	Highest SAR-1g Hotspot Tested at 10 mm (W/kg)
	1.43	1.57	1.32

Note:

1. The SAR criteria (**Head & Body: SAR-1g 1.6 W/kg, and Extremity: SAR-10g 4.0 W/kg**) for general population / uncontrolled exposure is specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992.
2. This device supports both LTE band 66 and band 4. The frequency span of LTE band 66 can completely cover LTE band 4, and they has the same tune-up power. SAR was tested for LTE band 66 only.

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2. Description of Equipment Under Test

EUT Type	Smart Phone
FCC ID	V65E6920
Brand Name	Kyocera
Model Name	E6920
Tx Frequency Bands (Unit: MHz)	GSM850 : 824.2 ~ 848.8 GSM1900 : 1850.2 ~ 1909.8 WCDMA Band II : 1852.4 ~ 1907.6 WCDMA Band IV : 1712.4 ~ 1752.6 WCDMA Band V : 826.4 ~ 846.6 LTE Band 2 : 1850.7 ~ 1909.3 (BW: 1.4M, 3M, 5M, 10M, 15M, 20M) LTE Band 4 : 1710.7 ~ 1754.3 (BW: 1.4M, 3M, 5M, 10M, 15M, 20M) LTE Band 5 : 824.7 ~ 848.3 (BW: 1.4M, 3M, 5M, 10M) LTE Band 7 : 2502.5 ~ 2567.5 (BW: 5M, 10M, 15M, 20M) LTE Band 12 : 699.7 ~ 715.3 (BW: 1.4M, 3M, 5M, 10M) LTE Band 14 : 790.5 ~ 795.5 (BW: 5M, 10M) LTE Band 30 : 2307.5 ~ 2312.5 (BW: 5M, 10M) LTE Band 66 : 1710.7 ~ 1779.3 (BW: 1.4M, 3M, 5M, 10M, 15M, 20M) WLAN : 2412 ~ 2462, 5180 ~ 5240, 5260 ~ 5320, 5500 ~ 5700, 5745 ~ 5825 Bluetooth : 2402 ~ 2480 NFC : 13.56
Uplink Modulations	GSM & GPRS : GMSK EDGE : 8PSK WCDMA : QPSK LTE : QPSK, 16QAM, 64QAM 802.11b : DSSS 802.11a/g/n/ac : OFDM Bluetooth : GFSK, π/4-DQPSK, 8-DPSK NFC : ASK
Maximum Tune-up Conducted Power (Unit: dBm)	Please refer to section 4.6.1 of this report
Antenna Type	Fixed Internal Antenna
EUT Stage	Identical Prototype

Note:

1. The above EUT information is declared by manufacturer and for more detailed features description please refers to the manufacturer's specifications or User's Manual.
2. Antenna support Band information:

Antenna	Support Band
WWAN-0	GSM850 / WCDMA V / LTE 5 / 12 / 14
WWAN-1	GSM1900 / WCDMA II / IV / LTE 2 / 4 / 7 / 66
WWAN-2	LTE 30
WLAN	WLAN2.4G / WLAN5G / BT

3. SAR Measurement System

3.1 Definition of Specific Absorption Rate (SAR)

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.

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:

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

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

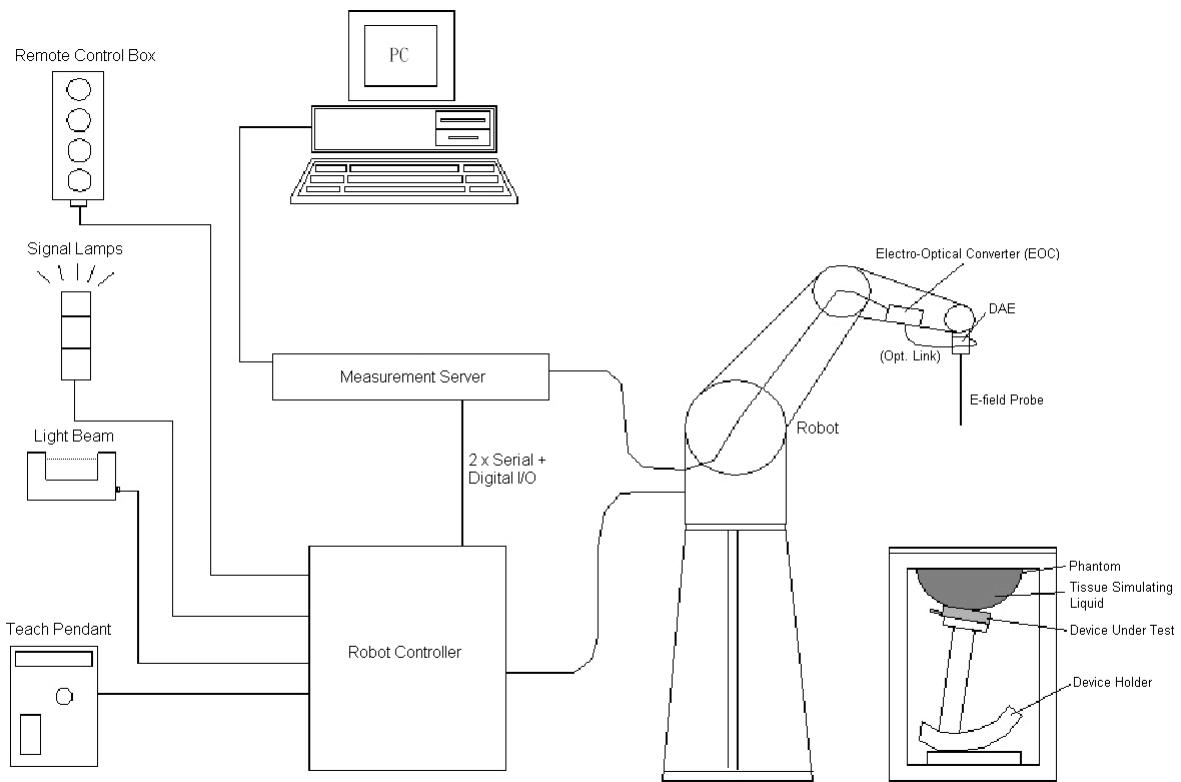
SAR measurement can be related to the electrical field in the tissue by

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

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

3.2 SPEAG DASY52 System

DASY52 system consists of high precision robot, probe alignment sensor, phantom, robot controller, controlled measurement server and near-field probe. The robot includes six axes that can move to the precision position of the DASY52 software defined. The DASY52 software can define the area that is detected by the probe. The robot is connected to controlled box. Controlled measurement server is connected to the controlled robot box. The DAE includes amplifier, signal multiplexing, AD converter, offset measurement and surface detection. It is connected to the Electro-optical coupler (ECO). The ECO performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC.


Fig-3.1 SPEAG DASY52 System Setup

3.2.1 Robot

The DASY52 systems use the high precision robots from Stäubli SA (France). For the 6-axis controller system, the robot controller version of CS8c from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability ± 0.035 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)


Fig-3.2 SPEAG DASY52 System

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3.2.2 Probes

The SAR measurement is conducted with the dosimetric probe. 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.

Model	EX3DV4	
Construction	Symmetrical design with triangular core. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).	
Frequency	10 MHz to 6 GHz Linearity: ± 0.2 dB	
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	10 μ W/g to 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μ W/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	

Model	ES3DV3	
Construction	Symmetrical design with triangular core. Interleaved sensors. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).	
Frequency	10 MHz to 4 GHz Linearity: ± 0.2 dB	
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	5 μ W/g to 100 mW/g Linearity: ± 0.2 dB	
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm	

Model	ET3DV6	
Construction	Symmetrical design with triangular core. Built-in optical fiber for surface detection system. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz to 2.3 GHz; Linearity: ± 0.2 dB	
Directivity	± 0.2 dB in TSL (rotation around probe axis) ± 0.4 dB in TSL (rotation normal to probe axis)	
Dynamic Range	5 μ W/g to 100 mW/g; Linearity: ± 0.2 dB	
Dimensions	Overall length: 337 mm (Tip: 16 mm) Tip diameter: 6.8 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.7 mm	

3.2.3 Data Acquisition Electronics (DAE)

Model	DAE3, DAE4	
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.	
Measurement Range	-100 to +300 mV (16 bit resolution and two range settings: 4mV, 400mV)	
Input Offset Voltage	< 5 μ V (with auto zero)	
Input Bias Current	< 50 fA	
Dimensions	60 x 60 x 68 mm	

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3.2.4 Phantoms

Model	Twin SAM	
Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.	
Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)	
Dimensions	Length: 1000 mm Width: 500 mm Height: adjustable feet	
Filling Volume	approx. 25 liters	

Model	ELI	
Construction	Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.	
Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2.0 ± 0.2 mm (bottom plate)	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	
Filling Volume	approx. 30 liters	

3.2.5 Device Holder

Model	Mounting Device	
Construction	In combination with the Twin SAM Phantom or ELI4, the Mounting Device enables the rotation of the mounted transmitter device in spherical coordinates. Rotation point is the ear opening point. Transmitter devices can be easily and accurately positioned according to IEC, IEEE, FCC or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat).	
Material	POM	

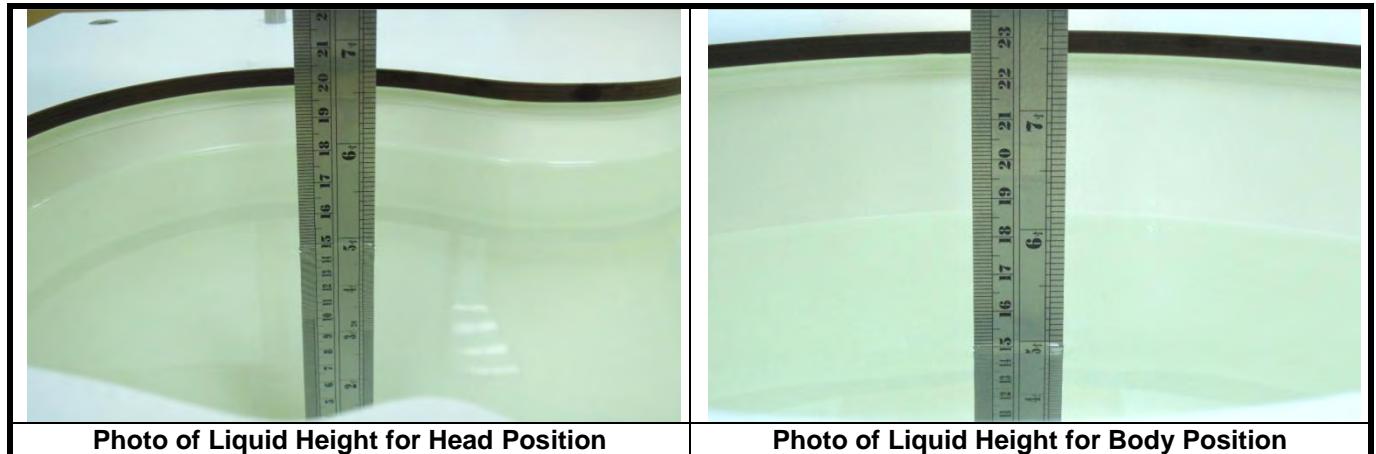
Model	Laptop Extensions Kit	
Construction	Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices according to IEC 62209-2 (e.g., laptops, cameras, etc.). It is lightweight and fits easily on the upper part of the Mounting Device in place of the phone positioner.	
Material	POM, Acrylic glass, Foam	

3.2.6 System Validation Dipoles

Model	D-Serial	
Construction	Symmetrical dipole with 1/4 balun. Enables measurement of feed point impedance with NWA. Matched for use near flat phantoms filled with tissue simulating solutions.	
Frequency	750 MHz to 5800 MHz	
Return Loss	> 20 dB	
Power Capability	> 100 W (f < 1GHz), > 40 W (f > 1GHz)	

3.2.7 Tissue Simulating Liquids

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15 cm. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed in Table-3.1.



The dielectric properties of the head tissue simulating liquids are defined in IEEE 1528, and KDB 865664 D01 Appendix A. For the body tissue simulating liquids, the dielectric properties are defined in KDB 865664 D01 Appendix A. The dielectric properties of the tissue simulating liquids were verified prior to the SAR evaluation using a dielectric assessment kit and a network analyzer.



Table-3.1 Targets of Tissue Simulating Liquid

Frequency (MHz)	Target Permittivity	Range of ±5%	Target Conductivity	Range of ±5%
For Head				
750	41.9	39.8 ~ 44.0	0.89	0.85 ~ 0.93
835	41.5	39.4 ~ 43.6	0.90	0.86 ~ 0.95
900	41.5	39.4 ~ 43.6	0.97	0.92 ~ 1.02
1450	40.5	38.5 ~ 42.5	1.20	1.14 ~ 1.26
1640	40.3	38.3 ~ 42.3	1.29	1.23 ~ 1.35
1750	40.1	38.1 ~ 42.1	1.37	1.30 ~ 1.44
1800	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
1900	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
2000	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
2300	39.5	37.5 ~ 41.5	1.67	1.59 ~ 1.75
2450	39.2	37.2 ~ 41.2	1.80	1.71 ~ 1.89
2600	39.0	37.1 ~ 41.0	1.96	1.86 ~ 2.06
3500	37.9	36.0 ~ 39.8	2.91	2.76 ~ 3.06
5200	36.0	34.2 ~ 37.8	4.66	4.43 ~ 4.89
5300	35.9	34.1 ~ 37.7	4.76	4.52 ~ 5.00
5500	35.6	33.8 ~ 37.4	4.96	4.71 ~ 5.21
5600	35.5	33.7 ~ 37.3	5.07	4.82 ~ 5.32
5800	35.3	33.5 ~ 37.1	5.27	5.01 ~ 5.53
For Body				
750	55.5	52.7 ~ 58.3	0.96	0.91 ~ 1.01
835	55.2	52.4 ~ 58.0	0.97	0.92 ~ 1.02
900	55.0	52.3 ~ 57.8	1.05	1.00 ~ 1.10
1450	54.0	51.3 ~ 56.7	1.30	1.24 ~ 1.37
1640	53.8	51.1 ~ 56.5	1.40	1.33 ~ 1.47
1750	53.4	50.7 ~ 56.1	1.49	1.42 ~ 1.56
1800	53.3	50.6 ~ 56.0	1.52	1.44 ~ 1.60
1900	53.3	50.6 ~ 56.0	1.52	1.44 ~ 1.60
2000	53.3	50.6 ~ 56.0	1.52	1.44 ~ 1.60
2300	52.9	50.3 ~ 55.5	1.81	1.72 ~ 1.90
2450	52.7	50.1 ~ 55.3	1.95	1.85 ~ 2.05
2600	52.5	49.9 ~ 55.1	2.16	2.05 ~ 2.27
3500	51.3	48.7 ~ 53.9	3.31	3.14 ~ 3.48
5200	49.0	46.6 ~ 51.5	5.30	5.04 ~ 5.57
5300	48.9	46.5 ~ 51.3	5.42	5.15 ~ 5.69
5500	48.6	46.2 ~ 51.0	5.65	5.37 ~ 5.93
5600	48.5	46.1 ~ 50.9	5.77	5.48 ~ 6.06
5800	48.2	45.8 ~ 50.6	6.00	5.70 ~ 6.30



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The following table gives the recipes for tissue simulating liquids.

Table-3.2 Recipes of Tissue Simulating Liquid

Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
H750	0.2	-	0.2	1.5	56.0	-	42.1	-
H835	0.2	-	0.2	1.5	57.0	-	41.1	-
H900	0.2	-	0.2	1.4	58.0	-	40.2	-
H1450	-	43.3	-	0.6	-	-	56.1	-
H1640	-	45.8	-	0.5	-	-	53.7	-
H1750	-	47.0	-	0.4	-	-	52.6	-
H1800	-	44.5	-	0.3	-	-	55.2	-
H1900	-	44.5	-	0.2	-	-	55.3	-
H2000	-	44.5	-	0.1	-	-	55.4	-
H2300	-	44.9	-	0.1	-	-	55.0	-
H2450	-	45.0	-	0.1	-	-	54.9	-
H2600	-	45.1	-	0.1	-	-	54.8	-
H3500	-	8.0	-	0.2	-	20.0	71.8	-
H5G	-	-	-	-	-	17.2	65.5	17.3
B750	0.2	-	0.2	0.8	48.8	-	50.0	-
B835	0.2	-	0.2	0.9	48.5	-	50.2	-
B900	0.2	-	0.2	0.9	48.2	-	50.5	-
B1450	-	34.0	-	0.3	-	-	65.7	-
B1640	-	32.5	-	0.3	-	-	67.2	-
B1750	-	31.0	-	0.2	-	-	68.8	-
B1800	-	29.5	-	0.4	-	-	70.1	-
B1900	-	29.5	-	0.3	-	-	70.2	-
B2000	-	30.0	-	0.2	-	-	69.8	-
B2300	-	31.0	-	0.1	-	-	68.9	-
B2450	-	31.4	-	0.1	-	-	68.5	-
B2600	-	31.8	-	0.1	-	-	68.1	-
B3500	-	28.8	-	0.1	-	-	71.1	-
B5G	-	-	-	-	-	10.7	78.6	10.7

3.3 SAR System Verification

The system check verifies that the system operates within its specifications. It is performed daily or before every SAR measurement. The system check uses normal SAR measurements in the flat section of the phantom with a matched dipole at a specified distance. The system verification setup is shown as below.

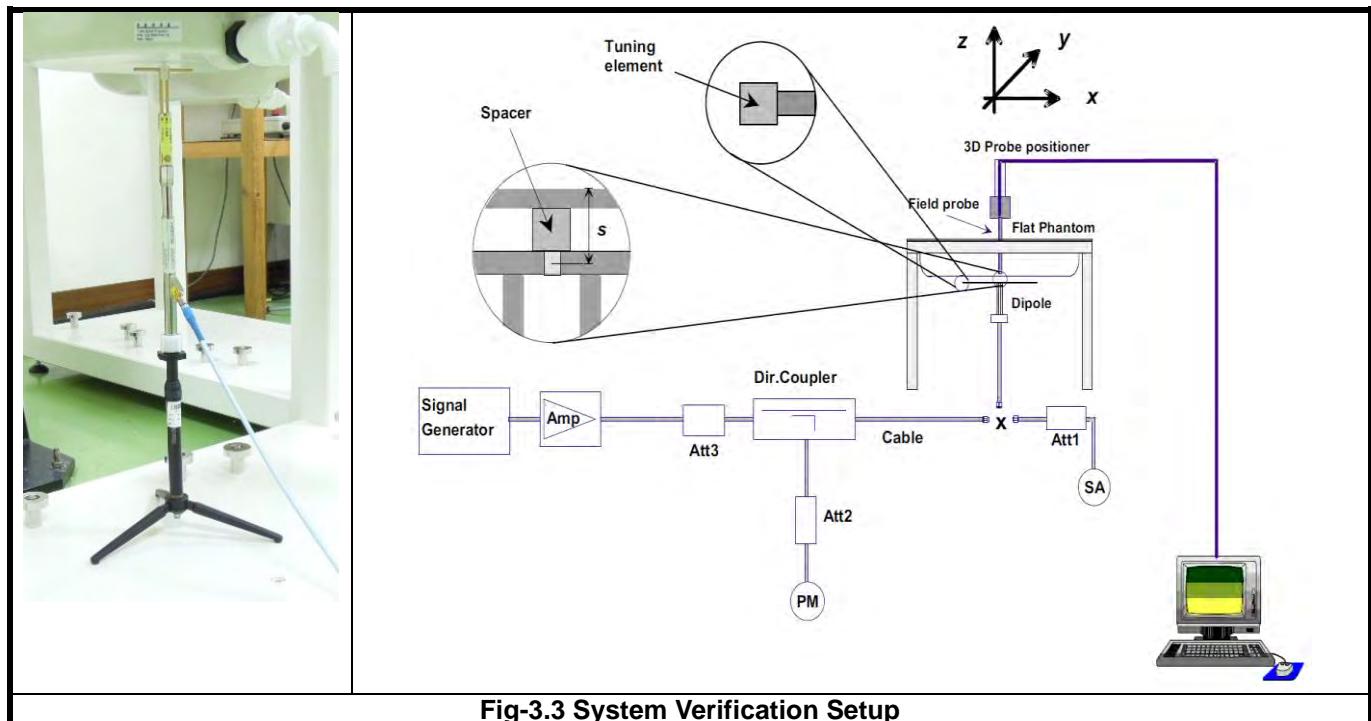


Fig-3.3 System Verification Setup

The validation dipole is placed beneath the flat phantom with the specific spacer in place. The distance spacer is touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The spectrum analyzer measures the forward power at the location of the system check dipole connector. The signal generator is adjusted for the desired forward power (250 mW is used for 700 MHz to 3 GHz, 100 mW is used for 3.5 GHz to 6 GHz) at the dipole connector and the power meter is read at that level. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter.

After system check testing, the SAR result will be normalized to 1W forward input power and compared with the reference SAR value derived from validation dipole certificate report. The deviation of system check should be within 10 %.

3.4 SAR Measurement Procedure

According to the SAR 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

The SAR measurement procedures for each of test conditions are as follows:

- (a) Make EUT to transmit maximum output power
- (b) Measure conducted output power through RF cable
- (c) Place the EUT in the specific position of phantom
- (d) Perform SAR testing steps on the DASY system
- (e) Record the SAR value

3.4.1 Area & Zoom Scan Procedure

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g. According to KDB 865664 D01, the resolution for Area and Zoom scan is specified in the table below.

Items	<= 2 GHz	2-3 GHz	3-4 GHz	4-5 GHz	5-6 GHz
Area Scan ($\Delta x, \Delta y$)	<= 15 mm	<= 12 mm	<= 12 mm	<= 10 mm	<= 10 mm
Zoom Scan ($\Delta x, \Delta y$)	<= 8 mm	<= 5 mm	<= 5 mm	<= 4 mm	<= 4 mm
Zoom Scan (Δz)	<= 5 mm	<= 5 mm	<= 4 mm	<= 3 mm	<= 2 mm
Zoom Scan Volume	>= 30 mm	>= 30 mm	>= 28 mm	>= 25 mm	>= 22 mm

Note:

When zoom scan is required and report SAR is $\leq 1.4 \text{ W/kg}$, the zoom scan resolution of $\Delta x / \Delta y$ (2-3GHz: $\leq 8 \text{ mm}$, 3-4GHz: $\leq 7 \text{ mm}$, 4-6GHz: $\leq 5 \text{ mm}$) may be applied.

3.4.2 Volume Scan Procedure

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.

3.4.3 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 drift more than 5%, the SAR will be retested.

3.4.4 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

3.4.5 SAR Averaged Methods

In DASY, the interpolation and extrapolation are both based on the modified Quadratic Shepard's method. The interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5 mm.

4. SAR Measurement Evaluation

4.1 EUT Configuration and Setting

<Connections between EUT and System Simulator>

For WWAN SAR testing, the EUT was linked and controlled by base station emulator. Communication between the EUT and the emulator was established by air link. The distance between the EUT and the communicating antenna of the emulator is larger than 50 cm and the output power radiated from the emulator antenna is at least 30 dB smaller than the output power of EUT. The EUT was set from the emulator to radiate maximum output power during SAR testing.

<Considerations Related to GSM / GPRS / EDGE for Setup and Testing>

The maximum multi-slot capability supported by this device is as below.

1. This EUT is class B device
2. This EUT supports GPRS multi-slot class 12 (max. uplink: 4, max. downlink: 4, total timeslots: 5)
3. This EUT supports EDGE multi-slot class 12 (max. uplink: 4, max. downlink: 4, total timeslots: 5)

For GSM850 frequency band, the power control level is set to 5 for GSM mode and GPRS (GMSK: CS1), and set to 8 for EDGE (GMSK: MCS1, 8PSK: MCS9). For GSM1900 frequency band, the power control level is set to 0 for GSM mode and GPRS (GMSK: CS1), and set to 2 for EDGE (GMSK: MCS1, 8PSK: MCS9).

SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.

<Considerations Related to WCDMA for Setup and Testing>

WCDMA Handsets Head SAR

SAR for next to the ear head exposure is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”. The 3G SAR test reduction procedure is applied to AMR configurations with 12.2 kbps RMC as the primary mode.

WCDMA Handsets Body-worn SAR

SAR for body-worn configurations is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”. The 3G SAR test reduction procedure is applied to other spreading codes and multiple DPDCH_n configurations supported by the handset with 12.2 kbps RMC as the primary mode.

Handsets with Release 5 HSDPA

The 3G SAR test reduction procedure is applied to HSDPA body-worn configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSDPA using the HSDPA body SAR procedures in the “Release 5 HSDPA Data Devices”, for the highest reported SAR body-worn exposure configuration in 12.2 kbps RMC. Handsets with both HSDPA and HSUPA are tested according to Release 6 HSPA test procedures.

Handsets with Release 6 HSUPA

The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body-worn configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSPA using the HSPA body SAR procedures in the “Release 6 HSPA Data Devices”, for the highest reported body-worn exposure SAR configuration in 12.2 kbps RMC. When VOIP is applicable for next to the ear head exposure in HSPA, the 3G SAR test reduction procedure is applied to HSPA with 12.2 kbps RMC as the primary mode; otherwise, the same HSPA configuration used for body-worn measurements is tested for next to the ear head exposure.



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Release 5 HSDPA Data Devices

The 3G SAR test reduction procedure is applied to body SAR with 12.2 kbps RMC as the primary mode. Otherwise, body SAR for HSDPA is measured using an FRC with H-Set 1 in Sub-test 1 and a 12.2 kbps RMC configured in Test Loop Mode 1, for the highest reported SAR configuration in 12.2 kbps RMC without HSDPA. HSDPA is configured according to the applicable UE category of a test device. The number of HS-DSCH / HS-PDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4 ms and a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors (β_c , β_d), and HS-DPCCH power offset parameters (Δ_{ACK} , Δ_{NACK} , Δ_{CQI}) are set according to values indicated in below. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set.

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	$\beta_{HS}^{(1)(2)}$	CM ⁽³⁾ (dB)	MPR ⁽³⁾ (dB)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 ⁽⁴⁾	15/15 ⁽⁴⁾	64	12/15 ⁽⁴⁾	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and $\Delta_{NACK} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$, and $\Delta_{CQI} = 24/15$ with $\beta_{HS} = 24/15 * \beta_c$.

Note 3: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{HS}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$.

Release 6 HSUPA Data Devices

The 3G SAR test reduction procedure is applied to body SAR with 12.2 kbps RMC as the primary mode. Otherwise, body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 and power control algorithm 2, according to the highest reported body SAR configuration in 12.2 kbps RMC without HSPA. When VOIP applies to head exposure, the 3G SAR test reduction procedure is applied with 12.2 kbps RMC as the primary mode. Otherwise, the same HSPA configuration used for body SAR measurements are applied to head exposure testing. Due to inner loop power control requirements in HSPA, a communication test set is required for output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSPA are configured according to the β values indicated in below.

Sub-test	β_c	β_d	β_d (SF)	β_c / β_d	$\beta_{HS}^{(1)}$	β_{ec}	$\beta_{ed}^{(4)(5)}$	β_{ed} (SF)	β_{ed} (Codes)	CM ⁽²⁾ (dB)	MPR ⁽²⁾⁽⁶⁾ (dB)	AG ⁽⁵⁾ Index	E-TFCI
1	11/15 ⁽³⁾	15/15 ⁽³⁾	64	11/15 ⁽³⁾	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}: 47/15$ $\beta_{ed2}: 47/15$	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$. For sub-test 5, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 5/15$ with $\beta_{HS} = 5/15 * \beta_c$.

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{HS}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$.

Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

DC-HSDPA SAR Guidance

The 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Otherwise, when SAR is required for Rel. 5 HSDPA, SAR is required for Rel. 8 DC-HSDPA. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1 to determine SAR test reduction. A primary and a secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.



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<Considerations Related to LTE for Setup and Testing>

This device contains LTE transmitter which follows 3GPP standards, is category 3, supports both QPSK and QAM modulations, and supported LTE band and channel bandwidth is listed in below. The output power was tested per 3GPP TS 36.521-1 maximum transmit procedures for both QPSK and QAM modulation. The results please refer to section 4.6 of this report.

EUT Supported LTE Band and Channel Bandwidth						
LTE Band	BW 1.4 MHz	BW 3 MHz	BW 5 MHz	BW 10 MHz	BW 15 MHz	BW 20 MHz
2	V	V	V	V	V	V
4	V	V	V	V	V	V
5	V	V	V	V		
7			V	V	V	V
12	V	V	V	V		
14			V	V		
30			V	V		
66	V	V	V	V	V	V

The LTE maximum power reduction (MPR) in accordance with 3GPP TS 36.101 is active all times during LTE operation. The allowed MPR for the maximum output power is specified in below.

Modulation	Channel Bandwidth / RB Configurations						LTE MPR Setting (dB)
	BW 1.4 MHz	BW 3 MHz	BW 5 MHz	BW 10 MHz	BW 15 MHz	BW 20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	1
16QAM	<= 5	<= 4	<= 8	<= 12	<= 16	<= 18	1
16QAM	> 5	> 4	> 8	> 12	> 16	> 18	2
64QAM	<= 5	<= 4	<= 8	<= 12	<= 16	<= 18	2
64QAM	> 5	> 4	> 8	> 12	> 16	> 18	3

Note: MPR is according to the standard and implemented in the circuit (mandatory).

In addition, the device is compliant with additional maximum power reduction (A-MPR) requirements defined in 3GPP TS 36.101 section 6.2.4 that was disabled for all FCC compliance testing.

During LTE SAR testing, the related parameters of operating band, channel bandwidth, uplink channel number, modulation type, and RB was set in base station simulator. When the EUT has registered and communicated to base station simulator, the simulator set to make EUT transmitting the maximum radiated power.



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LTE Downlink Carrier Aggregation (CA) Setup Configurations

LTE Carrier Aggregation (CA) was defined in 3GPP release 10 and higher. The LTE device in CA mode has one Primary Component Carrier (PCC) and one or more Secondary Component Carriers (SCC). PCC acts as the anchor carrier and can optionally cross-schedule data transmission on SCC. The RRC connection is only handled by one cell, the PCC for downlink and uplink communications. After making a data connection to the PCC, the LTE device adds the SCC on the downlink only. All uplink communications and acknowledgements remain identical to release 8 specifications on the PCC. The combinations of downlink carrier aggregation supported by this device are listed in below.

LTE CA Configurations and Bandwidth Combination Sets defined for Intra-Band Contiguous CA

Downlink CA Configuration	Component carriers in order of increasing carrier frequency			Maximum Aggregated Bandwidth (MHz)	Bandwidth Combination Set
	Channel bandwidths for carrier-1 (MHz)	Channel bandwidths for carrier-2 (MHz)	Channel bandwidths for carrier-3 (MHz)		
CA_5B	5, 10	10		20	0
	10	5			1
	3	5		8	
	5	3			
CA_66B	5	5, 10, 15		20	0
	10	5, 10			
	15	5			
CA_66C	5	20		40	0
	10	15, 20			
	15	10, 15, 20			
	20	5, 10, 15, 20			
CA_66D	5	20	20	60	0
	20	5	20		
	20	20	5		
	10	20	15		
	15	20	10		
	10, 15, 20	15, 20	20		
	15, 20	10	20		
	15	15, 20	15		
	20	15, 20	10, 15		
	20	10	15		

LTE CA Configurations and Bandwidth Combination Sets defined for Intra-Band Non-Contiguous CA

Downlink CA Configuration	Component Carriers in order of Increasing Carrier Frequency			Maximum Aggregated Bandwidth (MHz)	Bandwidth Combination Set
	Channel Bandwidths for Carrier-1 (MHz)	Channel Bandwidths for Carrier-2 (MHz)	Channel Bandwidths for Carrier-3 (MHz)		
CA_2A-2A	5, 10, 15, 20	5, 10, 15, 20		40	0
CA_4A-4A	5, 10, 15, 20	5, 10, 15, 20		40	0
	5, 10	5, 10		20	1
CA_5A-5A	5, 10	5, 10		20	0
	3	5		8	1
CA_66A-66A	5, 10, 15, 20	5, 10, 15, 20		40	0



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LTE CA Configurations and Bandwidth Combination Sets defined for Inter-Band CA (Two Bands)

Downlink CA Configuration	LTE Bands	Channel Bandwidths for Carrier (MHz)	Maximum Aggregated Bandwidth (MHz)	Bandwidth Combination Set
CA_2A-4A	2	1.4, 3, 5, 10, 15, 20	40	0
	4	5, 10, 15, 20		
	2	5, 10	20	1
	4	5, 10		
	2	5, 10, 15, 20	40	2
	4	5, 10, 15, 20		
CA_2A-5A	2	5, 10, 15, 20	30	0
	5	5, 10		
	2	5, 10	20	1
	5	5, 10		
CA_2A-12A	2	5, 10, 15, 20	30	0
	12	5, 10		
	2	5, 10, 15, 20	30	1
	12	3, 5, 10		
	2	5, 10	20	2
	12	5, 10		
CA_2A-2A-12A	2	Refer to CA_2A-2A (BCS0)	50	0
	12	5, 10		
CA_2A-29A	2	5, 10	20	0
	29	3, 5, 10		
	2	5, 10	20	1
	29	5, 10		
	2	5, 10, 15, 20	30	2
	29	5, 10		
CA_2A-30A	2	5, 10, 15, 20	30	0
	30	5, 10		
CA_2A-66A	2	1.4, 3, 5, 10, 15, 20	40	0
	66	5, 10, 15, 20		
	2	5, 10	20	1
	66	5, 10		
	2	5, 10, 15, 20	40	2
	66	5, 10, 15, 20		
CA_2A-66C	2	5, 10, 15, 20	60	0
	66	Refer to CA_66C (BCS0)		
CA_2A-66A-66A	2	5, 10, 15, 20	60	0
	66	Refer to CA_66A-66A (BCS0)		
CA_4A-5A	4	5, 10	20	0
	5	5, 10		
	4	5, 10, 15, 20	30	1
	5	5, 10		
	4	Refer to CA_4A-4A (BCS0)	50	0
CA_4A-12A	5	5, 10		
	4	1.4, 3, 5, 10	20	0
	12	5, 10		
	4	1.4, 3, 5, 10, 15, 20	30	1
	12	5, 10		
	4	5, 10, 15, 20	30	2
	12	3, 5, 10		
	4	5, 10	20	3
	12	5, 10		
	4	5, 10, 15, 20	30	4
	12	5, 10		
	4	5, 10, 15	20	5
	12	5		

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Downlink CA Configuration	LTE Bands	Channel Bandwidths for Carrier (MHz)	Maximum Aggregated Bandwidth (MHz)	Bandwidth Combination Set
CA_4A-4A-12A	4	Refer to CA_4A-4A (BCS0)	50	0
	12	5, 10		
CA_4A-29A	4	5, 10	20	0
	29	3, 5, 10		
	4	5, 10	20	1
	29	5, 10		
	4	5, 10, 15, 20	30	2
	29	5, 10		
CA_4A-30A	4	5, 10, 15, 20	30	0
	30	5, 10		
CA_5A-30A	5	5, 10	20	0
	30	5, 10		
CA_5A-66A	5	5, 10	30	0
	66	5, 10, 15, 20		
CA_5A-66A-66A	5	5, 10	50	0
	66	Refer to CA_66A-66A (BCS0)		
CA_5A-66B	5	5, 10	30	0
	66	Refer to CA_66B (BCS0)		
CA_5A-66C	5	5, 10	50	0
	66	Refer to CA_66C (BCS0)		
CA_12A-30A	12	5, 10	20	0
	30	5, 10		
CA_12A-66A	12	5, 10	20	0
	66	1.4, 3, 5, 10		
	12	5, 10	30	1
	66	1.4, 3, 5, 10, 15, 20		
	12	3, 5, 10	30	2
	66	5, 10, 15, 20		
	12	5, 10	20	3
	66	5, 10		
	12	5, 10	30	4
	66	5, 10, 15, 20		
CA_12A-66A-66A	12	5	20	5
	66	5, 10, 15		
CA_30A-29A	12	5, 10	50	0
	66	Refer to CA_66A-66A (BCS0)		
CA_30A-66A	29	5, 10	20	0
	30	5, 10		
CA_30A-66A-66A	30	5, 10	30	0
	66	Refer to CA_66A-66A (BCS0)		



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LTE CA Configurations and Bandwidth Combination Sets defined for Inter-Band CA (Three Bands)

Downlink CA Configuration	LTE Bands	Channel Bandwidths for Carrier (MHz)	Maximum Aggregated Bandwidth (MHz)	Bandwidth Combination Set
CA_2A-4A-5A	2	5, 10, 15, 20	50	0
	4	5, 10, 15, 20		
	5	5, 10		
CA_2A-5A-30A	2	5, 10, 15, 20	40	0
	5	5, 10		
	30	5, 10		
CA_2A-5A-66A	2	5, 10, 15, 20	50	0
	5	5, 10		
	66	5, 10, 15, 20		
CA_2A-12A-30A	2	5, 10, 15, 20	40	0
	12	5, 10		
	30	5, 10		
CA_2A-12A-66A	2	5, 10, 15, 20	50	0
	12	5, 10		
	66	5, 10, 15, 20		
	2	5, 10	40	1
	12	5, 10		
CA_2A-29A-30A	2	5, 10, 15, 20	40	0
	29	5, 10		
	30	5, 10		
CA_4A-5A-30A	4	5, 10, 15, 20	40	0
	5	5, 10		
	30	5, 10		
CA_4A-12A-30A	4	5, 10, 15, 20	40	0
	12	5, 10		
	30	5, 10		
CA_4A-29A-30A	4	5, 10, 15, 20	40	0
	29	5, 10		
	30	5, 10		
CA_5A-30A-66A	5	5, 10	40	0
	30	5, 10		
	66	5, 10, 15, 20		
CA_12A-30A-66A	12	5, 10	40	0
	30	5, 10		
	66	5, 10, 15, 20		

<Considerations Related to WLAN for Setup and Testing>

In general, various vendor specific external test software and chipset based internal test modes are typically used for SAR measurement. These chipset based test mode utilities are generally hardware and manufacturer dependent, and often include substantial flexibility to reconfigure or reprogram a device. A Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement. The test frequencies established using test mode must correspond to the actual channel frequencies. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92 - 96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. In addition, a periodic transmission duty factor is required for current generation SAR systems to measure SAR correctly. The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

According to KDB 248227 D01, this device has installed WLAN engineering testing software which can provide continuous transmitting RF signal. During WLAN SAR testing, this device was operated to transmit continuously at the maximum transmission duty with specified transmission mode, operating frequency, lowest data rate, and maximum output power.

Initial Test Configuration

An initial test configuration is determined for OFDM transmission modes in 2.4 GHz and 5 GHz bands according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. 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 in the initial test configuration, for each frequency band.

Subsequent Test Configuration

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units. Additional power measurements may be required to determine if SAR measurements are required for subsequent highest output power channels in a subsequent test configuration. When the highest reported SAR for the initial test configuration according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is $\leq 1.2 \text{ W/kg}$, SAR is not required for that subsequent test configuration.



SAR Test Configuration and Channel Selection

When multiple channel bandwidth configurations in a frequency band have the same specified maximum output power, the initial test configuration is using largest channel bandwidth, lowest order modulation, lowest data rate, and lowest order 802.11 mode (i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n). After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following.

- 1) The channel closest to mid-band frequency is selected for SAR measurement.
- 2) For channels with equal separation from mid-band frequency; for example, high and low channels or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

Test Reduction for U-NII-1 (5.2 GHz) and U-NII-2A (5.3 GHz) Bands

For devices that operate in both U-NII bands using the same transmitter and antenna(s), SAR test reduction is determined according to the following.

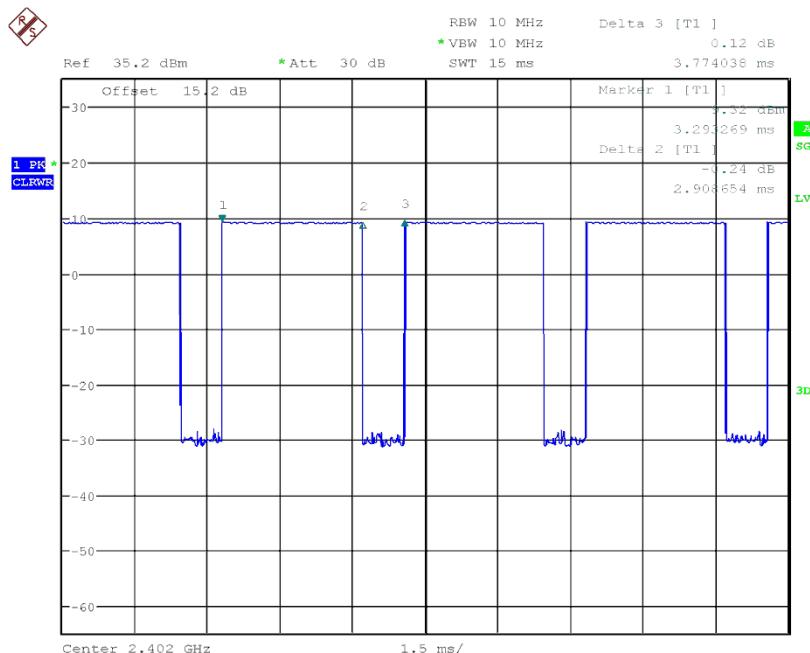
- 1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is $\leq 1.2 \text{ W/kg}$, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition).
- 2) When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is $\leq 1.2 \text{ W/kg}$, SAR is not required for the band with lower maximum output power in that test configuration.

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<Considerations Related to Bluetooth for Setup and Testing>

This device has installed Bluetooth engineering testing software which can provide continuous transmitting RF signal. During Bluetooth SAR testing, this device was operated to transmit continuously at the maximum transmission duty with specified transmission mode, operating frequency, lowest data rate, and maximum output power.

The Bluetooth call box has been used during SAR measurement and the EUT was set to DH5 mode at the maximum output power. Its duty factor was calculated as below and the measured SAR for Bluetooth would be scaled to the 100% transmission duty factor to determine compliance.



Date: 10.SEP.2018 15:01:49

Time-domain plot for Bluetooth transmission signal

The duty factor of Bluetooth signal has been calculated as following.

$$\text{Duty Factor} = \text{Pulse Width} / \text{Total Period} = 2.908654\text{ms} / 3.774038\text{ms} = 77.10\%$$

4.2 EUT Testing Position

According to KDB 648474 D04, handsets are tested for SAR compliance in head, body-worn accessory and other use configurations described in the following subsections.

4.2.1 Head Exposure Conditions

Head exposure is limited to next to the ear voice mode operations. Head SAR compliance is tested according to the test positions defined in IEEE Std 1528-2003 using the SAM phantom illustrated as below.

1. Define two imaginary lines on the handset

- (a) The vertical centerline passes through two points on the front side of the handset - the midpoint of the width w_t of the handset at the level of the acoustic output, and the midpoint of the width w_b of the bottom of the handset.
- (b) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.
- (c) The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.

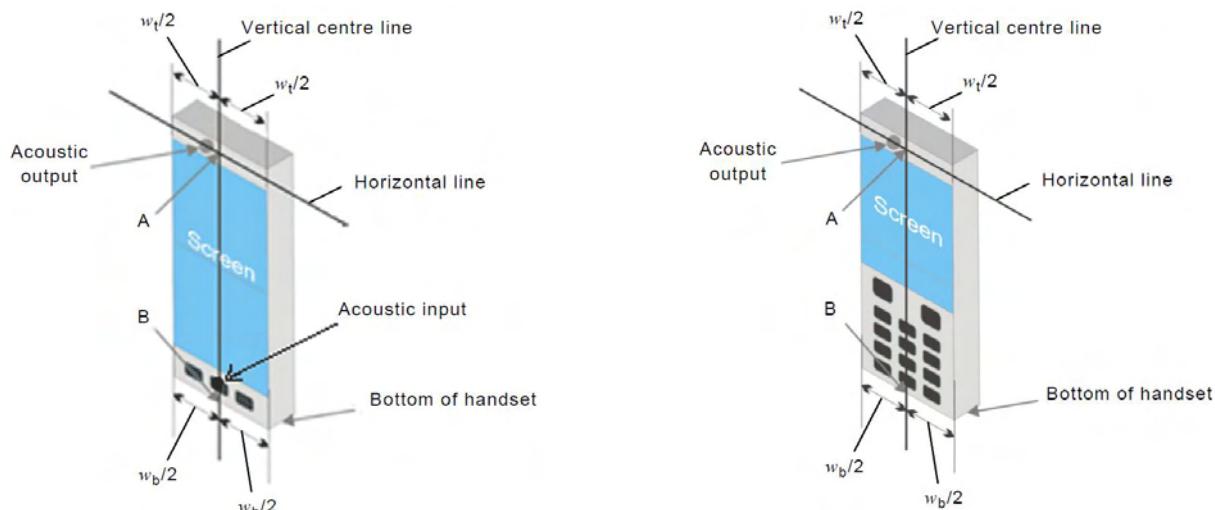


Fig-4.1 Illustration for Handset Vertical and Horizontal Reference Lines

2. Cheek Position

- (a) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.
- (b) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost (see Fig-4.2).

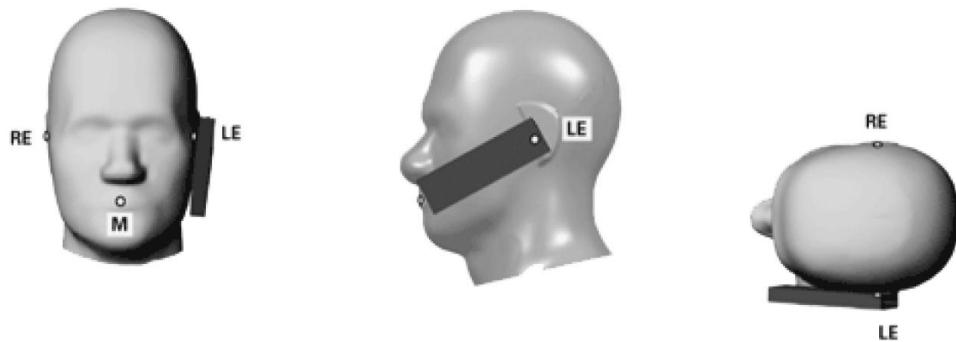


Fig-4.2 Illustration for Cheek Position

3. Tilted Position

- (a) To position the device in the “cheek” position described above.
- (b) While maintaining the device the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost (see Fig-4.3).

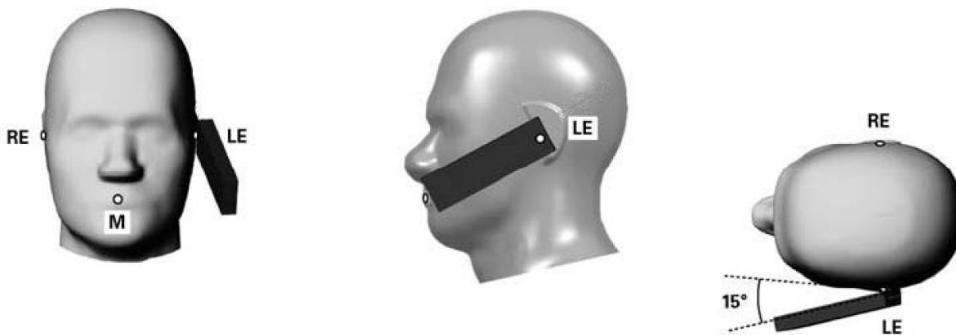


Fig-4.3 Illustration for Tilted Position

4.2.2 Body-worn Accessory Exposure Conditions

Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB 447498 D01 are used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is $> 1.2 \text{ W/kg}$, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

Body-worn accessories that do not contain metallic or conductive components may be tested according to worst-case exposure configurations, typically according to the smallest test separation distance required for the group of body-worn accessories with similar operating and exposure characteristics. All body-worn accessories containing metallic components are tested in conjunction with the host device.

Body-worn accessory SAR compliance is based on a single minimum test separation distance for all wireless and operating modes applicable to each body-worn accessory used by the host, and according to the relevant voice and/or data mode transmissions and operations. If a body-worn accessory supports voice only operations in its normal and expected use conditions, testing of data mode for body-worn compliance is not required.

A conservative minimum test separation distance for supporting off-the-shelf body-worn accessories that may be acquired by users of consumer handsets is used to test for body-worn accessory SAR compliance. This distance is determined by the handset manufacturer, according to the requirements of Supplement C 01-01. Devices that are designed to operate on the body of users using lanyards and straps, or without requiring additional body-worn accessories, will be tested using a conservative minimum test separation distance $\leq 5 \text{ mm}$ to support compliance.

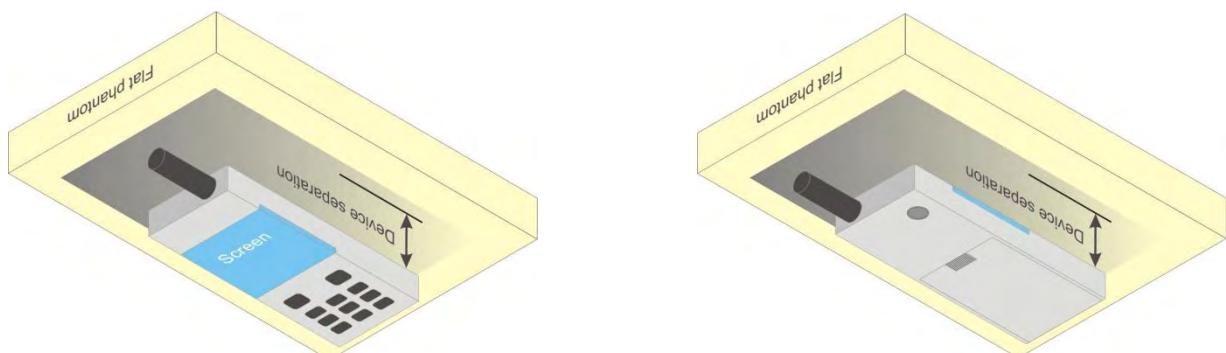
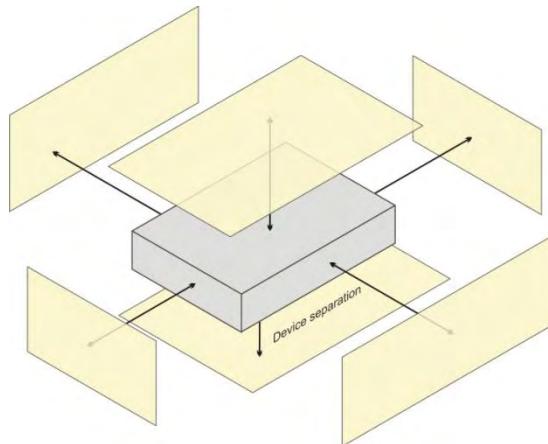


Fig-4.4 Illustration for Body Worn Position

4.2.3 Hotspot Mode Exposure Conditions

For handsets that support hotspot mode operations, with wireless router capabilities and various web browsing functions, the relevant hand and body exposure conditions are tested according to the hotspot SAR procedures in KDB 941225 D06. A test separation distance of 10 mm is required between the phantom and all surfaces and edges with a transmitting antenna located within 25 mm from that surface or edge. When the form factor of a handset is smaller than 9 cm x 5 cm, a test separation distance of 5 mm (instead of 10 mm) is required for testing hotspot mode. When the separation distance required for body-worn accessory testing is larger than or equal to that tested for hotspot mode, in the same wireless mode and for the same surface of the phone, the hotspot mode SAR data may be used to support body-worn accessory SAR compliance for that particular configuration (surface).



Based on the antenna location shown on appendix D of this report, the SAR testing required for hotspot mode is listed as below.

Antenna	Front Face	Rear Face	Left Side	Right Side	Top Side	Bottom Side
WWAN Ant-0	V	V		V		V
WWAN Ant-1	V	V	V			V
WWAN Ant-2	V	V	V			V
WLAN (2.4G)/BT	V	V	V		V	

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4.3 Tissue Verification

The measuring results for tissue simulating liquid are shown as below.

Test Date	Tissue Type	Frequency (MHz)	Liquid Temp. (°C)	Measured Conductivity (σ)	Measured Permittivity (ϵ_r)	Target Conductivity (σ)	Target Permittivity (ϵ_r)	Conductivity Deviation (%)	Permittivity Deviation (%)
Sep. 11, 2018	Head	750	23.3	0.887	43.364	0.89	41.9	-0.34	3.49
Sep. 11, 2018	Head	835	23.3	0.908	41.843	0.9	41.5	0.89	0.83
Sep. 11, 2018	Head	1750	23.3	1.336	39.717	1.37	40.1	-2.48	-0.96
Sep. 11, 2018	Head	1900	23.3	1.453	39.688	1.4	40	3.79	-0.78
Sep. 11, 2018	Head	2300	23.3	1.728	39.256	1.67	39.5	3.47	-0.62
Oct. 12, 2018	Head	2450	23.1	1.869	38.083	1.8	39.2	3.83	-2.85
Sep. 11, 2018	Head	2600	23.3	2.03	38.178	1.96	39	3.57	-2.11
Oct. 12, 2018	Head	5250	23.1	4.621	34.556	4.71	35.9	-1.89	-3.74
Oct. 12, 2018	Head	5600	23.1	4.956	34.103	5.07	35.5	-2.25	-3.94
Oct. 12, 2018	Head	5750	23.1	5.106	33.879	5.22	35.4	-2.18	-4.30
Sep. 08, 2018	Body	750	23.3	0.963	53.923	0.96	55.5	0.31	-2.84
Sep. 08, 2018	Body	835	23.3	1.015	56.023	0.97	55.2	4.64	1.49
Sep. 11, 2018	Body	835	23.2	0.983	54.141	0.97	55.2	1.34	-1.92
Sep. 08, 2018	Body	1750	23.3	1.443	51.726	1.49	53.4	-3.15	-3.13
Sep. 08, 2018	Body	1900	23.3	1.56	51.445	1.52	53.3	2.63	-3.48
Sep. 11, 2018	Body	1900	23.5	1.584	50.723	1.52	53.3	4.21	-4.83
Sep. 11, 2018	Body	2300	23.5	1.834	51.754	1.81	52.9	1.33	-2.17
Oct. 11, 2018	Body	2450	23.1	2.043	50.506	1.95	52.7	4.77	-4.16
Sep. 08, 2018	Body	2600	23.3	2.18	50.248	2.16	52.5	0.93	-4.29
Oct. 10, 2018	Body	5250	23.2	5.398	47.416	5.36	48.9	0.71	-3.03
Oct. 10, 2018	Body	5600	23.2	5.885	46.679	5.77	48.5	1.99	-3.75
Oct. 10, 2018	Body	5750	23.2	6.115	46.433	5.94	48.3	2.95	-3.87

Note:

The dielectric properties of the tissue simulating liquid must be measured within 24 hours before the SAR testing and within $\pm 5\%$ of the target values. Liquid temperature during the SAR testing must be within $\pm 2^{\circ}\text{C}$.

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4.4 System Validation

The SAR measurement system was validated according to procedures in KDB 865664 D01. The validation status in tabulated summary is as below.

Test Date	Probe S/N	Calibration Point		Measured Conductivity (σ)	Measured Permittivity (ϵ_r)	Validation for CW			Validation for Modulation		
						Sensitivity Range	Probe Linearity	Probe Isotropy	Modulation Type	Duty Factor	PAR
Sep. 11, 2018	3650	Head	750	0.887	43.364	Pass	Pass	Pass	N/A	N/A	N/A
Sep. 11, 2018	3650	Head	835	0.908	41.843	Pass	Pass	Pass	GMSK	Pass	N/A
Sep. 11, 2018	3650	Head	1750	1.336	39.717	Pass	Pass	Pass	N/A	N/A	N/A
Sep. 11, 2018	3650	Head	1900	1.453	39.688	Pass	Pass	Pass	GMSK	Pass	N/A
Sep. 11, 2018	3650	Head	2300	1.728	39.256	Pass	Pass	Pass	N/A	N/A	N/A
Oct. 12, 2018	3898	Head	2450	1.869	38.083	Pass	Pass	Pass	OFDM	N/A	Pass
Sep. 11, 2018	3650	Head	2600	2.03	38.178	Pass	Pass	Pass	N/A	N/A	N/A
Oct. 12, 2018	3898	Head	5250	4.621	34.556	Pass	Pass	Pass	OFDM	N/A	Pass
Oct. 12, 2018	3898	Head	5600	4.956	34.103	Pass	Pass	Pass	OFDM	N/A	Pass
Oct. 12, 2018	3898	Head	5750	5.106	33.879	Pass	Pass	Pass	OFDM	N/A	Pass
Sep. 08, 2018	3898	Body	750	0.963	53.923	Pass	Pass	Pass	N/A	N/A	N/A
Sep. 08, 2018	3898	Body	835	1.015	56.023	Pass	Pass	Pass	N/A	N/A	N/A
Sep. 11, 2018	3650	Body	835	0.983	54.141	Pass	Pass	Pass	GMSK	Pass	N/A
Sep. 08, 2018	3898	Body	1750	1.443	51.726	Pass	Pass	Pass	N/A	N/A	N/A
Sep. 08, 2018	3898	Body	1900	1.56	51.445	Pass	Pass	Pass	N/A	N/A	N/A
Sep. 11, 2018	3650	Body	1900	1.584	50.723	Pass	Pass	Pass	GMSK	Pass	N/A
Sep. 11, 2018	3650	Body	2300	1.834	51.754	Pass	Pass	Pass	N/A	N/A	N/A
Oct. 11, 2018	3971	Body	2450	2.043	50.506	Pass	Pass	Pass	OFDM	N/A	Pass
Sep. 08, 2018	3898	Body	2600	2.18	50.248	Pass	Pass	Pass	N/A	N/A	N/A
Oct. 10, 2018	3971	Body	5250	5.398	47.416	Pass	Pass	Pass	OFDM	N/A	Pass
Oct. 10, 2018	3971	Body	5600	5.885	46.679	Pass	Pass	Pass	OFDM	N/A	Pass
Oct. 10, 2018	3971	Body	5750	6.115	46.433	Pass	Pass	Pass	OFDM	N/A	Pass

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4.5 System Verification

The measuring result for system verification is tabulated as below.

Test Date	Mode	Frequency (MHz)	1W Target SAR-1g (W/kg)	Measured SAR-1g (W/kg)	Normalized to 1W SAR-1g (W/kg)	Deviation (%)	Dipole S/N	Probe S/N	DAE S/N
Sep. 11, 2018	Head	750	8.41	2.00	8.00	-4.88	1132	3650	1232
Sep. 11, 2018	Head	835	9.37	2.28	9.12	-2.67	4d120	3650	1232
Sep. 11, 2018	Head	1750	36.30	9.19	36.76	1.27	1023	3650	1232
Sep. 11, 2018	Head	1900	40.70	9.53	38.12	-6.34	5d036	3650	1232
Sep. 11, 2018	Head	2300	49.50	12	48.00	-3.03	1004	3650	1232
Oct. 12, 2018	Head	2450	52.30	12.8	51.20	-2.10	869	3898	1277
Sep. 11, 2018	Head	2600	55.80	13.7	54.80	-1.79	1058	3650	1232
Oct. 12, 2018	Head	5250	78.60	7.99	79.90	1.65	1019	3898	1277
Oct. 12, 2018	Head	5600	84.90	8.35	83.50	-1.65	1019	3898	1277
Oct. 12, 2018	Head	5750	79.40	7.71	77.10	-2.90	1019	3898	1277
Sep. 08, 2018	Body	750	8.74	2.17	8.68	-0.69	1132	3898	1277
Sep. 08, 2018	Body	835	9.68	2.43	9.72	0.41	4d120	3898	1277
Sep. 11, 2018	Body	835	9.68	2.44	9.76	0.83	4d120	3650	1232
Sep. 08, 2018	Body	1750	36.80	9.01	36.04	-2.07	1023	3898	1277
Sep. 08, 2018	Body	1900	40.20	10.3	41.20	2.49	5d036	3898	1277
Sep. 11, 2018	Body	1900	40.20	10.7	42.80	6.47	5d036	3650	1232
Sep. 11, 2018	Body	2300	47.30	12.3	49.20	4.02	1004	3650	1232
Oct. 11, 2018	Body	2450	50.50	13.2	52.80	4.55	869	3971	1431
Sep. 08, 2018	Body	2600	54.40	13.3	53.20	-2.21	1058	3898	1277
Oct. 10, 2018	Body	5250	74.90	8.06	80.60	7.61	1019	3971	1431
Oct. 10, 2018	Body	5600	79.30	8.4	84.00	5.93	1019	3971	1431
Oct. 10, 2018	Body	5750	74.50	7.93	79.30	6.44	1019	3971	1431

Note:

Comparing to the reference SAR value provided by SPEAG, the validation data should be within its specification of 10 %. The result indicates the system check can meet the variation criterion and the plots can be referred to Appendix A of this report.

4.6 Maximum Output Power

4.6.1 Maximum Target Conducted Power

The maximum conducted average power (Unit: dBm) including tune-up tolerance is shown as below.

Mode	Maximum Burst-Averaged Output Power		Maximum Frame-Averaged Output Power	
	GSM850	GSM1900	GSM850	GSM1900
GSM (GMSK, 1Tx-slot)	33.90	30.90	24.90	21.90
GPRS (GMSK, 1Tx-slot)	33.90	30.90	24.90	21.90
GPRS (GMSK, 2Tx-slot)	30.90	27.90	24.90	21.90
GPRS (GMSK, 3Tx-slot)	29.10	26.10	24.84	21.84
GPRS (GMSK, 4Tx-slot)	27.90	24.90	24.90	21.90
EDGE (8PSK, 1Tx-slot)	27.90	26.90	18.90	17.90
EDGE (8PSK, 2Tx-slot)	27.90	26.90	21.90	20.90
EDGE (8PSK, 3Tx-slot)	27.10	26.10	22.84	21.84
EDGE (8PSK, 4Tx-slot)	25.90	24.90	22.90	21.90

Note:

1. SAR testing was performed on the maximum frame-averaged power mode.
2. The frame-averaged power is linearly proportion to the slot number configured and it is linearly scaled the maximum burst-averaged power based on time slots. The calculated method is shown as below:

$$\text{Frame-averaged power} = 10 \times \log (\text{Burst-averaged power mW} \times \text{Slot used} / 8)$$

Mode	WCDMA Band II	WCDMA Band IV	WCDMA Band IV
RMC 12.2K	24.2	24.7	24.7
HSDPA / HSUPA / DC-HSDPA	23.2	23.7	23.7

Mode	LTE 2	LTE 4	LTE 5	LTE 7
QPSK	24.2	25.2	25.2	24.2
16QAM	23.2	24.2	24.2	23.2
64QAM	22.2	23.2	23.2	22.2

Mode	LTE 12	LTE 14	LTE 30	LTE 66
QPSK	25.2	24.2	25.2	25.2
16QAM	24.2	23.2	24.2	24.2
64QAM	23.2	22.2	23.2	23.2

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Mode	2.4G WLAN	5.2G WLAN	5.3G WLAN	5.6G WLAN	5.8G WLAN
802.11b	19.0	N/A	N/A	N/A	N/A
802.11g	18.0	N/A	N/A	N/A	N/A
802.11a	N/A	Ch 36: 18.0 Ch 40: 18.5 Ch 44: 18.5 Ch 48: 18.5	Ch 52: 18.5 Ch 56: 18.5 Ch 60: 18.5 Ch 64: 18.0	Ch 100: 16.0 Ch 116: 18.5 Ch 120: 18.5 Ch 124: 18.5 Ch 132: 18.5 Ch 140: 16.0	Ch 149: 14.0 Ch 153: 18.5 Ch 157: 18.5 Ch 161: 18.5 Ch 165: 18.0
802.11n HT20	18.0	Ch 36: 18.0 Ch 40: 18.5 Ch 44: 18.5 Ch 48: 18.5	Ch 52: 18.5 Ch 56: 18.5 Ch 60: 18.5 Ch 64: 18.0	Ch 100: 16.0 Ch 116: 18.5 Ch 120: 18.5 Ch 124: 18.5 Ch 132: 18.5 Ch 140: 16.0	Ch 149: 14.0 Ch 153: 18.5 Ch 157: 18.5 Ch 161: 18.5 Ch 165: 18.0
802.11n HT40	N/A	Ch 38: 14.0 Ch 46: 16.0	Ch 54: 16.0 Ch 62: 14.0	Ch 102: 13.0 Ch 110: 16.0 Ch 118: 16.0 Ch 126: 16.0 Ch 134: 16.0	Ch 151: 14.0 Ch 159: 16.0
802.11ac VHT80	N/A	15.0	16.0	Ch 106: 16.0 Ch 122: 16.0	15.0

Mode	2.4G Bluetooth
Bluetooth DH	10.3
Bluetooth LE	4.5



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4.6.2 Measured Conducted Power Result

The measuring conducted average power (Unit: dBm) is shown as below.

Band	GSM850			GSM1900		
Channel	128	189	251	512	661	810
Frequency (MHz)	824.2	836.4	848.8	1850.2	1880.0	1909.8
Maximum Burst-Averaged Output Power						
GSM (GMSK, 1Tx-slot)	32.73	32.64	32.69	29.35	29.36	29.38
GPRS (GMSK, 1Tx-slot)	32.70	32.59	32.66	29.21	29.33	29.32
GPRS (GMSK, 2Tx-slot)	30.12	30.06	30.11	26.62	26.66	26.81
GPRS (GMSK, 3Tx-slot)	27.79	27.73	27.78	24.91	25.01	25.04
GPRS (GMSK, 4Tx-slot)	26.39	26.33	26.38	23.74	23.81	23.72
EDGE (8PSK, 1Tx-slot)	26.67	26.78	26.82	25.06	25.16	25.21
EDGE (8PSK, 2Tx-slot)	26.39	26.40	26.46	24.91	24.93	24.94
EDGE (8PSK, 3Tx-slot)	25.51	25.52	25.54	24.11	24.16	24.22
EDGE (8PSK, 4Tx-slot)	24.12	24.04	24.12	22.92	22.96	23.05

Band	WCDMA Band II			WCDMA Band IV			WCDMA Band V			3GPP MPR (dB)
Channel	9262	9400	9538	1312	1413	1513	4132	4182	4233	
Frequency (MHz)	1852.4	1880.0	1907.6	1712.4	1732.6	1752.6	826.4	836.4	846.6	
RMC 12.2K	23.17	23.25	23.09	23.86	23.81	23.62	23.19	23.33	23.35	-
HSDPA Subtest-1	22.36	22.47	22.29	23.64	23.57	23.40	22.21	22.32	22.30	0
HSDPA Subtest-2	22.34	22.38	22.36	23.65	23.56	23.41	22.26	22.38	22.27	0
HSDPA Subtest-3	21.87	21.92	21.76	23.12	23.07	22.94	21.72	21.90	21.27	0.5
HSDPA Subtest-4	21.89	22.02	21.84	23.19	23.09	22.88	21.76	21.94	21.66	0.5
DC-HSDPA Subtest-1	22.17	22.44	22.25	23.55	23.48	23.30	22.13	22.24	22.22	0
DC-HSDPA Subtest-2	22.33	22.11	22.16	23.56	23.45	23.32	22.18	22.30	22.06	0
DC-HSDPA Subtest-3	21.76	21.84	21.71	23.06	22.98	22.82	21.64	21.82	21.52	0.5
DC-HSDPA Subtest-4	21.81	21.93	21.74	23.14	23.00	22.79	21.68	21.86	21.58	0.5
HSUPA Subtest-1	22.58	22.47	22.41	23.64	23.63	23.48	22.23	22.39	22.35	0
HSUPA Subtest-2	20.59	20.46	20.44	21.70	21.60	21.45	20.24	20.41	20.39	2
HSUPA Subtest-3	21.42	21.47	21.39	22.60	22.59	22.46	21.20	21.39	21.43	1
HSUPA Subtest-4	20.37	20.43	20.39	21.68	21.61	21.47	20.31	20.44	20.41	2
HSUPA Subtest-5	22.42	22.48	22.36	23.60	23.60	23.50	22.20	22.40	22.30	0

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LTE Band 2															
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		18700	18900	19100				Channel		18675	18900	19125	
		Frequency (MHz)		1860.0	1880.0	1900.0				Frequency (MHz)		1857.5	1880.0	1902.5	
20M	QPSK	1	0	23.84	23.79	23.96	0	15M	QPSK	1	0	23.79	23.76	23.92	0
		1	50	23.91	23.86	24.03	0			1	37	23.89	23.79	23.99	0
		1	99	23.93	23.88	24.05	0			1	74	23.93	23.81	23.96	0
		50	0	22.88	22.83	23.00	1			36	0	22.84	22.74	23.00	1
		50	25	22.91	22.86	23.03	1			36	19	22.82	22.78	22.93	1
		50	50	22.88	22.83	23.00	1			36	39	22.80	22.73	22.99	1
		100	0	22.89	22.84	23.01	1			75	0	22.84	22.84	22.95	1
	16QAM	1	0	22.78	22.69	22.90	1		16QAM	1	0	22.68	22.68	22.86	1
		1	50	22.91	22.78	22.94	1			1	37	22.73	22.79	22.90	1
		1	99	22.84	22.86	22.98	1			1	74	22.80	22.77	22.88	1
		50	0	21.85	21.80	22.00	2			36	0	21.71	21.76	21.97	2
		50	25	21.81	21.83	21.95	2			36	19	21.80	21.71	21.90	2
		50	50	21.88	21.79	21.98	2			36	39	21.76	21.73	21.89	2
		100	0	21.85	21.78	21.92	2			75	0	21.82	21.76	21.98	2
	64QAM	1	0	21.81	21.71	21.96	2		64QAM	1	0	21.75	21.63	21.88	2
		1	50	21.84	21.84	21.95	2			1	37	21.86	21.75	21.94	2
		1	99	21.89	21.78	22.02	2			1	74	21.86	21.69	21.94	2
		50	0	20.84	20.73	20.92	3			36	0	20.79	20.69	20.93	3
		50	25	20.87	20.79	20.98	3			36	19	20.85	20.73	20.92	3
		50	50	20.88	20.80	20.90	3			36	39	20.73	20.77	20.93	3
		100	0	20.86	20.83	20.98	3			75	0	20.75	20.74	20.95	3
10M	QPSK	1	0	23.61	23.59	23.91	0	5M	QPSK	1	0	23.75	23.71	23.90	0
		1	24	23.68	23.85	23.97	0			1	12	23.76	23.77	23.77	0
		1	49	23.74	23.76	23.90	0			1	24	23.82	23.69	23.84	0
		25	0	22.74	22.67	22.90	1			12	0	22.69	22.65	22.88	1
		25	12	22.74	22.74	22.97	1			12	6	22.86	22.66	22.85	1
		25	25	22.70	22.62	22.90	1			12	13	22.78	22.68	22.77	1
		50	0	22.86	22.75	22.90	1			25	0	22.81	22.76	22.87	1
	16QAM	1	0	22.67	22.58	22.91	1		16QAM	1	0	22.57	22.62	22.78	1
		1	24	22.76	22.64	22.79	1			1	12	22.64	22.64	22.95	1
		1	49	22.77	22.71	22.82	1			1	24	22.75	22.72	22.93	1
		25	0	21.64	21.69	21.89	2			12	0	21.66	21.72	21.76	2
		25	12	21.74	21.75	21.95	2			12	6	21.63	21.76	21.83	2
		25	25	21.78	21.64	21.94	2			12	13	21.72	21.66	21.77	2
		50	0	21.72	21.59	21.83	2			25	0	21.70	21.70	21.83	2
	64QAM	1	0	21.69	21.59	21.71	2		64QAM	1	0	21.74	21.59	21.86	2
		1	24	21.71	21.84	21.80	2			1	12	21.73	21.58	21.86	2
		1	49	21.70	21.65	21.87	2			1	24	21.78	21.82	21.80	2
		25	0	20.64	20.53	20.85	3			12	0	20.77	20.61	20.93	3
		25	12	20.66	20.66	20.89	3			12	6	20.76	20.72	20.84	3
		25	25	20.87	20.70	20.82	3			12	13	20.71	20.61	20.82	3
		50	0	20.71	20.65	20.78	3			25	0	20.73	20.64	20.87	3
3M	QPSK	1	0	23.73	23.72	23.88	0	1.4M	QPSK	1	0	23.59	23.68	23.79	0
		1	7	23.78	23.67	23.93	0			1	2	23.73	23.84	23.95	0
		1	14	23.74	23.70	23.96	0			1	5	23.73	23.72	23.86	0
		8	0	22.75	22.61	22.82	1			3	0	23.82	23.73	23.97	0
		8	3	22.87	22.77	22.87	1			3	1	23.73	23.86	23.97	0
		8	7	22.74	22.69	22.85	1			3	3	23.68	23.64	23.83	0
		15	0	22.81	22.81	22.93	1			6	0	22.76	22.75	22.88	1
	16QAM	1	0	22.63	22.64	22.70	1		16QAM	1	0	22.72	22.58	22.79	1
		1	7	22.71	22.60	22.96	1			1	2	22.77	22.77	22.86	1
		1	14	22.73	22.70	23.02	1			1	5	22.83	22.73	22.87	1
		8	0	21.73	21.64	21.83	2			3	0	22.71	22.67	22.92	1
		8	3	21.86	21.70	21.74	2			3	1	22.80	22.74	22.86	1
		8	7	21.83	21.59	21.89	2			3	3	22.68	22.68	22.71	1
		15	0	21.65	21.62	21.87	2			6	0	21.76	21.72	21.78	2
	64QAM	1	0	21.69	21.66	21.77	2		64QAM	1	0	21.63	21.62	21.79	2
		1	7	21.76	21.66	21.85	2			1	2	21.71	21.68	21.91	2
		1	14	21.82	21.64	21.76	2			1	5	21.67	21.69	21.99	2
		8	0	20.79	20.63	20.83	3			3	0	21.63	21.63	21.78	2
		8	3	20.82	20.73	20.92	3			3	1	21.76	21.75	21.91	2
		8	7	20.71	20.66	20.89	3			3	3	21.59	21.70	21.83	2
		15	0	20.87	20.67	20.76	3			6	0	20.66	20.59	20.73	3

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LTE Band 4															
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20050	20175	20300				Channel		20025	20175	20325	
		Frequency (MHz)		1720.0	1732.5	1745.0				Frequency (MHz)		1717.5	1732.5	1747.5	
20M	QPSK	1	0	24.98	24.87	24.94	0	15M	QPSK	1	0	24.96	24.80	24.86	0
		1	50	25.01	24.90	24.97	0			1	37	24.95	24.80	24.93	0
		1	99	24.78	24.67	24.74	0			1	74	24.71	24.63	24.68	0
		50	0	24.01	23.90	23.97	1			36	0	23.99	23.83	23.97	1
		50	25	24.06	23.95	24.02	1			36	19	24.06	23.92	24.00	1
		50	50	23.88	23.77	23.84	1			36	39	23.85	23.71	23.78	1
		100	0	23.92	23.81	23.88	1			75	0	23.86	23.72	23.85	1
	16QAM	1	0	23.96	23.87	23.86	1		16QAM	1	0	23.90	23.84	23.82	1
		1	50	24.01	23.85	23.94	1			1	37	23.95	23.80	23.84	1
		1	99	23.78	23.65	23.71	1			1	74	23.66	23.55	23.62	1
		50	0	22.96	22.89	22.96	2			36	0	22.87	22.85	22.92	2
		50	25	23.05	22.87	22.93	2			36	19	23.01	22.80	22.89	2
	64QAM	50	50	22.88	22.74	22.79	2			36	39	22.73	22.66	22.74	2
		100	0	22.86	22.74	22.86	2			75	0	22.92	22.67	22.85	2
		1	0	22.94	22.86	22.84	2		64QAM	1	0	22.82	22.75	22.90	2
		1	50	22.93	22.82	22.96	2			1	37	22.91	22.77	22.85	2
		1	99	22.77	22.59	22.71	2			1	74	22.71	22.59	22.57	2
	64QAM	50	0	21.98	21.85	21.91	3			36	0	21.94	21.88	21.82	3
		50	25	22.02	21.95	21.98	3			36	19	21.94	21.84	21.91	3
		50	50	21.83	21.75	21.84	3			36	39	21.78	21.62	21.75	3
		100	0	21.85	21.81	21.85	3			75	0	21.81	21.67	21.82	3
10M	QPSK	1	0	24.79	24.84	24.88	0	5M	QPSK	1	0	24.89	24.78	24.67	0
		1	24	24.90	24.72	24.79	0			1	12	24.83	24.80	24.64	0
		1	49	24.64	24.59	24.57	0			1	24	24.77	24.53	24.44	0
		25	0	23.84	23.74	23.83	1			12	0	23.89	23.76	23.74	1
		25	12	23.91	23.76	23.84	1			12	6	23.97	23.79	23.90	1
		25	25	23.79	23.70	23.68	1			12	13	23.78	23.54	23.60	1
		50	0	23.71	23.63	23.74	1			25	0	23.71	23.60	23.63	1
	16QAM	1	0	23.80	23.67	23.73	1		16QAM	1	0	23.84	23.74	23.63	1
		1	24	23.86	23.71	23.79	1			1	12	23.82	23.84	23.82	1
		1	49	23.71	23.51	23.53	1			1	24	23.56	23.55	23.60	1
		25	0	22.88	22.72	22.77	2			12	0	22.85	22.82	22.77	2
		25	12	22.83	22.79	22.83	2			12	6	22.93	22.73	22.91	2
	64QAM	25	25	22.75	22.57	22.63	2			12	13	22.78	22.50	22.61	2
		50	0	22.78	22.68	22.65	2			25	0	22.79	22.59	22.65	2
		1	0	22.85	22.67	22.70	2			1	12	22.81	22.58	22.80	2
		1	24	22.84	22.75	22.76	2			1	24	22.57	22.40	22.43	2
		1	49	22.62	22.46	22.50	2			12	0	21.77	21.64	21.81	3
	64QAM	25	0	21.78	21.66	21.75	3			12	6	21.91	21.91	21.80	3
		25	12	21.87	21.69	21.93	3			12	13	21.75	21.57	21.59	3
		25	25	21.78	21.64	21.64	3			25	0	21.76	21.53	21.74	3
3M	QPSK	1	0	24.78	24.74	24.80	0	1.4M	QPSK	1	0	24.81	24.74	24.79	0
		1	7	24.82	24.77	24.85	0			1	2	24.94	24.81	24.92	0
		1	14	24.64	24.48	24.65	0			1	5	24.68	24.53	24.66	0
		8	0	23.88	23.76	23.85	1			3	0	24.97	24.67	24.78	0
		8	3	24.02	23.80	23.90	1			3	1	24.97	24.75	24.87	0
		8	7	23.71	23.64	23.68	1			3	3	24.80	24.72	24.70	0
		15	0	23.75	23.63	23.74	1			6	0	23.72	23.68	23.72	1
	16QAM	1	0	23.83	23.64	23.83	1		16QAM	1	0	23.85	23.72	23.86	1
		1	7	23.76	23.65	23.88	1			1	2	23.80	23.78	23.72	1
		1	14	23.70	23.39	23.68	1			1	5	23.66	23.50	23.55	1
		8	0	22.82	22.61	22.85	2			3	0	23.75	23.75	23.79	1
		8	3	22.84	22.75	22.79	2			3	1	23.93	23.76	23.86	1
	64QAM	8	7	22.69	22.55	22.61	2			3	3	23.65	23.59	23.66	1
		15	0	22.73	22.77	22.69	2			6	0	22.78	22.65	22.69	2
		1	0	22.66	22.64	22.70	2			1	2	22.76	22.78	22.85	2
		1	7	22.83	22.64	22.77	2			1	5	22.81	22.80	22.70	2
		1	14	22.56	22.44	22.52	2			3	0	22.76	22.50	22.51	2
	64QAM	8	0	21.81	21.78	21.94	3			3	1	22.89	22.91	22.77	2
		8	3	21.86	21.81	21.80	3			8	3	22.76	22.63	22.59	2
		8	7	21.72	21.55	21.67	3			15	0	21.66	21.60	21.70	3

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LTE Band 5															
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel	20450	20525	20600	Channel				20425	20525	20625			
		Frequency (MHz)	829.0	836.5	844.0	Frequency (MHz)				826.5	836.5	846.5			
10M	QPSK	1	0	24.41	24.55	24.85	0	5M	QPSK	1	0	24.39	24.52	24.77	0
		1	24	24.47	24.61	24.91	0			1	12	24.42	24.53	24.90	0
		1	49	24.44	24.58	24.88	0			1	24	24.44	24.58	24.81	0
		25	0	23.44	23.58	23.88	1			12	0	23.35	23.53	23.79	1
		25	12	23.56	23.70	24.00	1			12	6	23.46	23.68	23.92	1
		25	25	23.49	23.63	23.93	1			12	13	23.43	23.59	23.90	1
		50	0	23.55	23.69	23.99	1			25	0	23.55	23.60	23.90	1
	16QAM	1	0	23.33	23.51	23.77	1		16QAM	1	0	23.28	23.46	23.79	1
		1	24	23.45	23.57	23.83	1			1	12	23.44	23.52	23.89	1
		1	49	23.37	23.55	23.80	1			1	24	23.36	23.49	23.83	1
		25	0	22.34	22.54	22.85	2			12	0	22.25	22.47	22.77	2
		25	12	22.56	22.69	22.96	2			12	6	22.49	22.57	22.97	2
		25	25	22.46	22.62	22.83	2			12	13	22.43	22.44	22.92	2
		50	0	22.55	22.64	22.93	2			25	0	22.36	22.60	22.85	2
	64QAM	1	0	22.41	22.49	22.75	2		64QAM	1	0	22.28	22.51	22.71	2
		1	24	22.45	22.57	22.82	2			1	12	22.31	22.44	22.74	2
		1	49	22.39	22.57	22.88	2			1	24	22.42	22.47	22.82	2
		25	0	21.44	21.57	21.88	3			12	0	21.30	21.50	21.73	3
		25	12	21.47	21.65	21.95	3			12	6	21.52	21.65	21.80	3
		25	25	21.43	21.55	21.91	3			12	13	21.41	21.49	21.83	3
		50	0	21.49	21.64	21.90	3			25	0	21.45	21.64	21.82	3
3M	QPSK	1	0	24.30	24.43	24.78	0	1.4M	QPSK	1	0	24.20	24.41	24.70	0
		1	7	24.37	24.57	24.90	0			1	2	24.47	24.41	24.83	0
		1	14	24.31	24.39	24.74	0			1	5	24.20	24.46	24.78	0
		8	0	23.22	23.52	23.65	1			3	0	24.35	24.43	24.75	0
		8	3	23.42	23.65	23.92	1			3	1	24.34	24.67	24.84	0
		8	7	23.30	23.54	23.80	1			3	3	24.42	24.51	24.74	0
		15	0	23.49	23.55	23.83	1			6	0	23.52	23.50	23.92	1
	16QAM	1	0	23.20	23.36	23.71	1		16QAM	1	0	23.25	23.41	23.75	1
		1	7	23.30	23.40	23.71	1			1	2	23.35	23.36	23.78	1
		1	14	23.31	23.33	23.70	1			1	5	23.39	23.43	23.74	1
		8	0	22.36	22.31	22.76	2			3	0	23.33	23.44	23.55	1
		8	3	22.46	22.54	22.72	2			3	1	23.33	23.55	23.78	1
		8	7	22.17	22.46	22.79	2			3	3	23.35	23.53	23.68	1
		15	0	22.45	22.50	22.80	2			6	0	22.45	22.44	22.79	2
	64QAM	1	0	22.25	22.39	22.74	2		64QAM	1	0	22.32	22.30	22.71	2
		1	7	22.24	22.54	22.70	2			1	2	22.41	22.40	22.77	2
		1	14	22.27	22.36	22.59	2			1	5	22.28	22.45	22.75	2
		8	0	21.28	21.37	21.71	3			3	0	22.27	22.40	22.75	2
		8	3	21.30	21.67	21.96	3			3	1	22.44	22.58	22.74	2
		8	7	21.27	21.45	21.76	3			3	3	22.31	22.43	22.74	2
		15	0	21.50	21.53	21.82	3			6	0	21.37	21.47	21.87	3



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LTE Band 7															
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20850	21100	21350				Channel		20825	21100	21375	
		Frequency (MHz)		2510.0	2535.0	2560.0				Frequency (MHz)		2507.5	2535.0	2562.5	
20M	QPSK	1	0	23.91	23.78	23.62	0	15M	QPSK	1	0	23.87	23.69	23.62	0
		1	50	23.88	23.75	23.59	0			1	37	23.86	23.69	23.49	0
		1	99	23.94	23.81	23.65	0			1	74	23.85	23.79	23.58	0
		50	0	22.82	22.69	22.53	1			36	0	22.73	22.63	22.44	1
		50	25	22.93	22.80	22.64	1			36	19	22.90	22.71	22.54	1
		50	50	22.98	22.85	22.69	1			36	39	22.93	22.78	22.69	1
		100	0	23.00	22.87	22.71	1			75	0	22.99	22.80	22.63	1
	16QAM	1	0	22.81	22.70	22.54	1		16QAM	1	0	22.89	22.69	22.53	1
		1	50	22.84	22.69	22.51	1			1	37	22.83	22.68	22.43	1
		1	99	22.85	22.71	22.62	1			1	74	22.81	22.71	22.65	1
		50	0	21.77	21.64	21.44	2			36	0	21.71	21.68	21.42	2
		50	25	21.90	21.73	21.62	2			36	19	21.78	21.73	21.53	2
		50	50	21.88	21.85	21.59	2			36	39	21.93	21.72	21.58	2
		100	0	21.91	21.78	21.65	2			75	0	21.97	21.77	21.61	2
	64QAM	1	0	21.84	21.77	21.55	2		64QAM	1	0	21.76	21.75	21.51	2
		1	50	21.87	21.67	21.52	2			1	37	21.81	21.67	21.54	2
		1	99	21.88	21.81	21.61	2			1	74	21.85	21.67	21.63	2
		50	0	20.76	20.60	20.53	3			36	0	20.69	20.61	20.50	3
		50	25	20.86	20.77	20.54	3			36	19	20.82	20.64	20.54	3
		50	50	20.93	20.80	20.65	3			36	39	20.88	20.78	20.52	3
		100	0	21.00	20.86	20.70	3			75	0	20.91	20.69	20.62	3
10M	QPSK	1	0	23.86	23.56	23.54	0	5M	QPSK	1	0	23.81	23.75	23.46	0
		1	24	23.76	23.59	23.39	0			1	12	23.72	23.57	23.39	0
		1	49	23.88	23.69	23.56	0			1	24	23.85	23.63	23.56	0
		25	0	22.69	22.51	22.32	1			12	0	22.69	22.60	22.29	1
		25	12	22.76	22.71	22.44	1			12	6	22.83	22.65	22.46	1
		25	25	22.90	22.77	22.58	1			12	13	22.74	22.69	22.49	1
		50	0	22.83	22.73	22.48	1			25	0	22.82	22.81	22.45	1
	16QAM	1	0	22.73	22.55	22.45	1		16QAM	1	0	22.74	22.66	22.43	1
		1	24	22.66	22.57	22.27	1			1	12	22.76	22.65	22.38	1
		1	49	22.71	22.66	22.53	1			1	24	22.68	22.61	22.44	1
		25	0	21.64	21.45	21.42	2			12	0	21.52	21.57	21.39	2
		25	12	21.70	21.73	21.51	2			12	6	21.73	21.70	21.45	2
		25	25	21.81	21.63	21.48	2			12	13	21.85	21.69	21.52	2
		50	0	21.78	21.69	21.55	2			25	0	21.76	21.73	21.50	2
	64QAM	1	0	21.73	21.60	21.48	2		64QAM	1	0	21.81	21.58	21.52	2
		1	24	21.71	21.67	21.44	2			1	12	21.73	21.59	21.42	2
		1	49	21.84	21.67	21.48	2			1	24	21.74	21.67	21.47	2
		25	0	20.58	20.55	20.38	3			12	0	20.75	20.61	20.41	3
		25	12	20.76	20.65	20.52	3			12	6	20.90	20.58	20.41	3
		25	25	20.89	20.70	20.53	3			12	13	20.83	20.75	20.53	3
		50	0	20.77	20.75	20.51	3			25	0	20.81	20.64	20.57	3

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LTE Band 12

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel	23060	23095	23130	Channel				23035	23095	23155			
		Frequency (MHz)	704.0	707.5	711.0 <th data-kind="ghost"></th> <th data-kind="ghost"></th> <th data-kind="ghost"></th> <th data-kind="ghost"></th> <th>Frequency (MHz)</th> <td>701.5</td> <td>707.5</td> <td>713.5</td> <th data-kind="ghost"></th>					Frequency (MHz)	701.5	707.5	713.5		
10M	QPSK	1	0	24.80	24.76	24.93	0	5M	QPSK	1	0	24.74	24.72	24.84	0
		1	24	24.86	24.82	24.99	0			1	12	24.82	24.79	24.93	0
		1	49	24.85	24.81	24.98	0			1	24	24.80	24.78	24.91	0
		25	0	23.86	23.82	23.99	1			12	0	23.81	23.79	23.96	1
		25	12	23.89	23.85	24.02	1			12	6	23.86	23.76	24.01	1
		25	25	23.85	23.81	23.98	1			12	13	23.84	23.74	23.88	1
		50	0	23.86	23.82	23.99	1			25	0	23.76	23.75	23.98	1
	16QAM	1	0	23.80	23.74	23.83	1		16QAM	1	0	23.80	23.60	23.86	1
		1	24	23.85	23.72	23.94	1			1	12	23.79	23.69	23.79	1
		1	49	23.78	23.75	23.93	1			1	24	23.75	23.70	23.97	1
		25	0	22.85	22.72	22.97	2			12	0	22.79	22.67	22.95	2
		25	12	22.84	22.78	22.98	2			12	6	22.84	22.76	22.88	2
		25	25	22.75	22.75	22.91	2			12	13	22.83	22.69	22.94	2
		50	0	22.79	22.82	22.99	2			25	0	22.76	22.63	22.91	2
	64QAM	1	0	22.71	22.76	22.85	2		64QAM	1	0	22.74	22.71	22.78	2
		1	24	22.85	22.80	22.94	2			1	12	22.72	22.71	22.87	2
		1	49	22.75	22.72	22.94	2			1	24	22.82	22.67	22.93	2
		25	0	21.82	21.72	21.90	3			12	0	21.73	21.80	21.94	3
		25	12	21.84	21.78	22.01	3			12	6	21.74	21.69	21.85	3
		25	25	21.84	21.80	21.91	3			12	13	21.79	21.79	21.93	3
		50	0	21.85	21.73	21.89	3			25	0	21.73	21.72	21.88	3
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel	23025	23095	23165					Channel	23017	23095	23173		
		Frequency (MHz)	700.5	707.5	714.5					Frequency (MHz)	699.7	707.5	715.3		
3M	QPSK	1	0	24.72	24.68	24.81	0	1.4M	QPSK	1	0	24.72	24.65	24.88	0
		1	7	24.71	24.69	24.96	0			1	2	24.81	24.62	24.89	0
		1	14	24.70	24.80	24.80	0			1	5	24.74	24.75	24.80	0
		8	0	23.67	23.70	23.90	1			3	0	24.81	24.66	24.92	0
		8	3	23.72	23.70	23.99	1			3	1	24.81	24.79	24.97	0
		8	7	23.82	23.73	23.84	1			3	3	24.76	24.70	24.76	0
		15	0	23.63	23.65	23.93	1			6	0	23.72	23.70	23.81	1
	16QAM	1	0	23.54	23.54	23.77	1		16QAM	1	0	23.72	23.63	23.80	1
		1	7	23.58	23.63	23.72	1			1	2	23.69	23.67	23.73	1
		1	14	23.61	23.65	23.76	1			1	5	23.70	23.65	23.67	1
		8	0	22.74	22.67	22.73	2			3	0	23.68	23.62	23.84	1
		8	3	22.63	22.66	22.89	2			3	1	23.68	23.60	23.86	1
		8	7	22.75	22.62	22.79	2			3	3	23.63	23.58	23.84	1
		15	0	22.67	22.67	22.65	2			6	0	22.56	22.64	22.93	2
	64QAM	1	0	22.55	22.56	22.77	2		64QAM	1	0	22.64	22.60	22.75	2
		1	7	22.60	22.73	22.84	2			1	2	22.63	22.57	22.82	2
		1	14	22.70	22.72	22.71	2			1	5	22.69	22.68	22.86	2
		8	0	21.74	21.69	21.89	3			3	0	22.63	22.68	22.92	2
		8	3	21.64	21.69	21.85	3			3	1	22.69	22.60	22.87	2
		8	7	21.72	21.55	21.83	3			3	3	22.81	22.70	22.81	2
		15	0	21.76	21.62	21.69	3			6	0	21.72	21.67	21.69	3

LTE Band 14

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel	23330			Channel				23305	23330	23355			
		Frequency (MHz)	793.0			Frequency (MHz)				790.5	793	795.5 <th data-kind="ghost"></th>			
10M	QPSK	1	0	23.87		0	5M	QPSK	1	0	23.64	23.75	23.47	0	
		1	24		23.86	0			1	12	23.58	23.69	23.41	0	
		1	49		23.80	0			1	24	23.40	23.51	23.23	0	
		25	0		22.82	1			12	0	22.53	22.64	22.36	1	
		25	12		22.81	1			12	6	22.44	22.55	22.27	1	
		25	25		22.85	1			12	13	22.53	22.64	22.36	1	
		50	0		22.83	1			25	0	22.51	22.62	22.34	1	
	16QAM	1	0		22.84	1		16QAM	1	0	22.60	22.72	22.41	1	
		1	24		22.80	1			1	12	22.53	22.68	22.38	1	
		1	49		22.75	1			1	24	22.38	22.48	22.20	1	
		25	0		21.78	2			12	0	21.44	21.55	21.31	2	
		25	12		21.80	2			12	6	21.43	21.49	21.18	2	
		25	25		21.84	2			12	13	21.48	21.57	21.34	2	
		50	0		21.76	2			25	0	21.48	21.62	21.28	2	
	64QAM	1	0		21.84	2		64QAM	1	0	21.55	21.66	21.40	2	
		1	24		21.81	2			1	12	21.56	21.68	21.38	2	
		1	49		21.79	2			1	24	21.34	21.50	21.13	2	
		25	0		20.76	3			12	0	20.45	20.56	20.28	3	
		25	12		20.72	3			12	6	20.36	20.47	20.25	3	
		25	25		20.81	3			12	13	20.46	20.60	20.31	3	
		50	0		20.76	3			25	0	20.49	20.52	20.24	3	

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LTE Band 30																					
BW	MCS Index	RB Size	RB Offset		Mid		3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)						
		Channel								27735	27685	27710	27735	27685							
		Frequency (MHz)								2312.5	2307.5	2310.0	2312.5	2307.5							
10M	QPSK	1	0		24.85		0	5M	QPSK	1	0	24.82	24.68	24.75	0						
		1	24		24.68		0			1	12	24.68	24.65	24.61	0						
		1	49		24.61		0			1	24	24.70	24.58	24.60	0						
		25	0		23.74		1			12	0	23.81	23.67	23.68	1						
		25	12		23.77		1			12	6	23.67	23.68	23.71	1						
		25	25		23.71		1			12	13	23.70	23.58	23.57	1						
		50	0		23.71		1			25	0	23.72	23.73	23.76	1						
	16QAM	1	0		23.82		1		16QAM	1	0	23.75	23.64	23.71	1						
		1	24		23.67		1			1	12	23.63	23.64	23.60	1						
		1	49		23.59		1			1	24	23.70	23.57	23.57	1						
		25	0		22.70		2			12	0	22.75	22.70	22.67	2						
		25	12		22.71		2			12	6	22.58	22.79	22.68	2						
		25	25		22.67		2			12	13	22.63	22.77	22.54	2						
		50	0		22.69		2			25	0	22.63	22.81	22.69	2						
	64QAM	1	0		23.06		2		64QAM	1	0	22.73	22.79	22.71	2						
		1	24		22.85		2			1	12	22.62	22.76	22.59	2						
		1	49		22.70		2			1	24	22.69	22.72	22.52	2						
		25	0		21.79		3			12	0	21.74	21.81	21.61	3						
		25	12		21.81		3			12	6	21.61	21.84	21.70	3						
		25	25		21.73		3			12	13	21.68	21.83	21.56	3						
		50	0		21.78		3			25	0	21.69	21.81	21.70	3						

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LTE Band 66															
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel	132072	132322	132572	Channel				Channel	132047	132322	132597	Channel	
		Frequency (MHz)	1720.0	1745.0	1770.0	Frequency (MHz)				Frequency (MHz)	1717.5	1745.0	1772.5	Frequency (MHz)	
20M	QPSK	1	0	25.08	25.18	24.83	0	15M	QPSK	1	0	25.16	25.03	24.79	0
		1	50	25.06	24.91	24.71	0			1	37	25.06	24.84	24.65	0
		1	99	25.04	24.89	24.69	0			1	74	24.97	24.81	24.60	0
		50	0	24.09	23.94	23.74	1			36	0	24.00	23.85	23.64	1
		50	25	24.08	23.93	23.73	1			36	19	23.99	23.89	23.71	1
		50	50	24.11	23.96	23.76	1			36	39	24.08	23.92	23.72	1
		100	0	24.07	23.92	23.72	1			75	0	24.01	23.92	23.68	1
	16QAM	1	0	24.15	23.97	23.79	1		16QAM	1	0	24.13	23.96	23.73	1
		1	50	24.05	23.91	23.61	1			1	37	23.99	23.85	23.63	1
		1	99	24.03	23.82	23.61	1			1	74	23.98	23.76	23.58	1
		50	0	23.02	22.91	22.74	2			36	0	22.94	22.85	22.60	2
		50	25	23.08	22.85	22.69	2			36	19	23.03	22.89	22.56	2
		50	50	23.07	22.93	22.67	2			36	39	23.04	22.84	22.74	2
		100	0	23.05	22.88	22.66	2			75	0	23.04	22.80	22.66	2
	64QAM	1	0	23.08	22.97	22.75	2		64QAM	1	0	23.06	22.92	22.68	2
		1	50	23.01	22.82	22.63	2			1	37	22.97	22.82	22.51	2
		1	99	23.01	22.86	22.59	2			1	74	22.95	22.76	22.52	2
		50	0	22.04	21.87	21.66	3			36	0	22.00	21.88	21.60	3
		50	25	22.04	21.92	21.63	3			36	19	21.98	21.82	21.60	3
		50	50	22.06	21.94	21.68	3			36	39	22.00	21.90	21.60	3
		100	0	22.02	21.87	21.69	3			75	0	21.93	21.79	21.62	3
10M	QPSK	1	0	25.05	24.96	24.78	0	5M	QPSK	1	0	24.99	24.94	24.63	0
		1	24	24.96	24.72	24.58	0			1	12	25.00	24.82	24.42	0
		1	49	24.89	24.76	24.59	0			1	24	24.87	24.75	24.54	0
	16QAM	25	0	23.99	23.84	23.53	1		16QAM	12	0	23.86	23.93	23.64	1
		25	12	23.97	23.73	23.59	1			12	6	24.01	23.72	23.61	1
		25	25	23.95	23.77	23.65	1			12	13	24.05	23.79	23.42	1
		50	0	23.99	23.90	23.68	1			25	0	23.98	23.75	23.61	1
		1	0	24.06	23.91	23.63	1			1	0	24.03	23.83	23.70	1
		1	24	23.78	23.62	23.53	1			1	12	23.80	23.73	23.54	1
		1	49	23.86	23.72	23.58	1			12	0	22.99	22.76	22.48	2
	64QAM	25	0	22.90	22.79	22.65	2			12	6	23.03	22.81	22.43	2
		25	12	22.84	22.75	22.59	2			12	13	23.01	22.66	22.52	2
		25	25	23.00	22.75	22.58	2			25	0	22.93	22.85	22.56	2
		50	0	22.82	22.84	22.44	2			1	0	23.06	22.89	22.60	2
		1	24	22.90	22.60	22.46	2			1	12	22.88	22.75	22.44	2
		1	49	22.84	22.70	22.56	2			1	24	22.96	22.73	22.66	2
		25	0	21.97	21.83	21.59	3			12	0	21.95	21.78	21.65	3
3M	QPSK	1	0	23.07	22.87	22.56	2	1.4M	QPSK	1	0	25.04	24.79	24.64	0
		1	24	22.90	22.60	22.46	2			1	2	24.91	24.88	24.62	0
		1	49	22.84	22.70	22.56	2			1	5	24.97	24.66	24.52	0
	16QAM	8	0	23.91	23.83	23.57	1		16QAM	3	0	24.95	24.86	24.59	0
		8	3	23.87	23.78	23.64	1			3	1	24.98	24.87	24.69	0
		8	7	24.09	23.76	23.69	1			3	3	24.94	24.73	24.62	0
		15	0	24.00	23.70	23.61	1			6	0	24.05	23.73	23.58	1
		1	0	24.02	23.81	23.76	1			1	0	24.06	23.86	23.73	1
		1	7	23.91	23.71	23.53	1			1	2	23.91	23.78	23.54	1
		1	14	23.92	23.74	23.57	1			1	5	23.77	23.73	23.51	1
	64QAM	8	0	22.98	22.80	22.50	2		64QAM	3	0	23.79	23.82	23.65	1
		8	3	22.90	22.82	22.47	2			3	1	23.91	23.71	23.60	1
		8	7	22.90	22.69	22.55	2			3	3	23.93	23.83	23.62	1
		15	0	22.93	22.75	22.60	2			6	0	22.82	22.77	22.58	2
		1	0	23.12	22.81	22.60	2			1	0	22.94	22.89	22.65	2
		1	7	22.95	22.81	22.46	2			1	2	22.82	22.73	22.69	2
		1	14	22.94	22.87	22.65	2			1	5	22.73	22.82	22.53	2
	Report Format Version 5.0.0	8	0	21.88	21.79	21.64	3		Report No. : SA180822C04	3	0	22.96	22.73	22.49	2
		8	3	22.01	21.82	21.68	3			3	1	22.98	22.74	22.54	2
		8	7	21.85	21.75	21.58	3			3	3	23.04	22.70	22.72	2
		15	0	21.72	21.76	21.51	3			6	0	21.87	21.82	21.55	3



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<WLAN 2.4G>

Mode	Channel	Frequency (MHz)	Average Power
802.11b	1	2412	18.58
	6	2437	18.61
	11	2462	18.93

<WLAN 5.3G>

Mode	Channel	Frequency (MHz)	Average Power
802.11a	52	5260	18.23
	56	5280	18.13
	60	5300	18.37
	64	5320	17.83

<WLAN 5.6G>

Mode	Channel	Frequency (MHz)	Average Power
802.11a	100	5500	15.93
	116	5580	18.24
	120	5600	18.14
	124	5620	18.17
	132	5660	18.18
	140	5700	15.98

<WLAN 5.8G>

Mode	Channel	Frequency (MHz)	Average Power
802.11a	149	5745	13.78
	153	5765	18.36
	157	5785	18.48
	161	5805	18.42
	165	5825	17.73

<Bluetooth>

Mode	Channel	Frequency (MHz)	Average Power
Bluetooth EDR	0	2402	9.42
	39	2441	8.91
	78	2480	8.37
Bluetooth LE	0	2402	3.59
	19	2440	3.09
	39	2480	3.51

4.7 SAR Testing Results

4.7.1 SAR Test Reduction Considerations

<KDB 447498 D01, General RF Exposure Guidance>

Testing of other required channels within the operating mode of a frequency band is not required when the reported SAR for the mid-band or highest output power channel is:

- (1) $\leq 0.8 \text{ W/kg}$ or 2.0 W/kg , for 1-g or 10-g respectively, when the transmission band is $\leq 100 \text{ MHz}$
- (2) $\leq 0.6 \text{ W/kg}$ or 1.5 W/kg , for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
- (3) $\leq 0.4 \text{ W/kg}$ or 1.0 W/kg , for 1-g or 10-g respectively, when the transmission band is $\geq 200 \text{ MHz}$

When SAR is not measured at the maximum power level allowed for production units, the measured SAR will be scaled to the maximum tune-up tolerance limit to determine compliance. The scaling factor for the tune-up power is defined as maximum tune-up limit (mW) / measured conducted power (mW). The reported SAR would be calculated by measured SAR x tune-up power scaling factor.

The SAR has been measured with highest transmission duty factor supported by the test mode tools for WLAN and/or Bluetooth. When the transmission duty factor could not achieve 100%, the reported SAR will be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up power. The scaling factor for the duty factor is defined as 100% / transmission duty cycle (%). The reported SAR would be calculated by measured SAR x tune-up power scaling factor x duty cycle scaling factor.

<KDB 941225 D01, 3G SAR Measurement Procedures>

The mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq 1/4 \text{ dB}$ higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is $\leq 1.2 \text{ W/kg}$, SAR measurement is not required for the secondary mode.

<KDB 941225 D05, SAR Evaluation Considerations for LTE Devices>

(1) QPSK with 1 RB and 50% RB allocation

Start with the largest channel bandwidth and measure SAR, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

(2) 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.

(3) Higher order modulations

SAR is required only when the highest maximum output power for the configuration in the higher order modulation is $> 1/2$ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

(4) Other channel bandwidth

SAR is required when the highest maximum output power of the smaller channel bandwidth is $> 1/2$ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

<SAR Test Exclusion Evaluations for LTE Downlink CA>

According to Nov 2017 TCB Workshop, SAR test exclusion for LTE downlink Carrier Aggregation is determined by power measurements according to the number of component carriers (CCs) supported by the product implementation. The downlink Carrier Aggregation configurations are tabulated in separate columns. DL CA would be listed in the columns corresponding to Intra Band contiguous, Intra Band Non-contiguous, 2bands/2CCs, 2bands/3CCs and 3bands/3CCs. The CA/CC combinations in each columns are sorted so that frequency bands listed in subsequent columns on each row are ascending subsets, as illustrated below; i.e., columns to the right correspond to increasing number of frequency bands and CCs.

	Intra Band		Inter Band		
	Contiguous	2CC Non-Contiguous	2 Bands / 2CC	2 Bands / 3CC	3 Bands / 3CC
Configure	66B	CA_4A-4A	CA_2A-4A	CA_4A-4A-5A	CA_2A-4A-5A
			CA_4A-2A	CA_5A-4A-4A	CA_4A-2A-5A
		CA_2A-5A			
			CA_5A-2A		
			CA_4A-5A		CA_5A-2A-4A
			CA_5A-4A		
			CA_2A-30A		CA_2A-5A-30A
			CA_30A-2A		CA_5A-2A-30A
			CA_5A-30A		CA_30A-2A-5A
			CA_30A-5A		
		CA_66A-66A	CA_2A-2A-66A	CA_2A-5A-66A	
		CA_66A-2A	CA_66A-2A-2A	CA_5A-2A-66A	
		CA_5A-66A	CA_2A-66C		
		CA_66A-5A	CA_66C-2A		
			CA_5A-66A-66A		
			CA_66A-66A-5A		
Configure	66C		CA_5A-66B		
			CA_66B-5A		CA_66A-2A-5A
			CA_5A-66C		
			CA_66C-5A		
			CA_2A-66A-66A		
			CA_66A-2A-66A		
		CA_2A-2A	CA_2A-12A	CA_2A-2A-12A	CA_2A-12A-30A
			CA_12A-2A	CA_12A-2A-2A	CA_12A-2A-30A
			CA_12A-30A		CA_30A-2A-12A
			CA_30A-12A		
			CA_12A-66A	CA_12A-66A-66A	CA_2A-12A-66A
			CA_66A-12A	CA_66A-12A-66A	CA_12A-2A-66A
					CA_66A-2A-12A
			CA_2A-29A		CA_2A-29A-30A
			CA_30A-29A		CA_30A-2A-29A
			CA_30A-66A		CA_2A-30A-66A
			CA_66A-30A		CA_30A-2A-66A
Configure	5B				CA_66A-2A-30A
		CA_4A-30A			CA_4A-5A-30A
		CA_30A-4A			CA_5A-4A-30A
					CA_30A-4A-5A
		CA_4A-12A	CA_4A-4A-12A	CA_4A-12A-30A	
		CA_12A-4A	CA_12A-4A-4A	CA_12A-4A-30A	
					CA_30A-4A-12A
		CA_4A-29A			CA_4A-29A-30A
					CA_30A-4A-29A
					CA_5A-30A-66A
					CA_30A-5A-66A
					CA_66A-5A-30A
					CA_12A-30A-66A
					CA_30A-12A-66A
					CA_66A-12A-30A
		CA_5A-5A			
		5B			
		66D			

- Only yellow highlighted cells need power measurement.

<Power Confirmation for SAR Test Exclusion for LTE Downlink CA>

According to KDB 941225 D05A, the uplink maximum output power below was measured with downlink CA active on the channel with highest measured maximum output power when downlink CA is inactive. The downlink SCC channel was paired with the uplink channel as normal operation. For intra-band contiguous CA, the downlink channel spacing between the component carriers was set to multiple of 300 kHz less than the nominal channel spacing per section 5.4.1A of 3GPP TS36.521. For intra-band non-contiguous CA, the downlink channel spacing between the component carriers was set to maximum separation from PCC and remain fully within the downlink transmission band. For Inter-band CA, the SCC downlink channel was set to near the middle of its transmission band.

Power Measurements for Intra-Band Contiguous Downlink CA

CA Combination	PCC							SCC1				SCC2				Power		
	LTE Band	BW (MHz)	UL Channel	UL Freq. (MHz)	RB Size	RB Offset	DL Channel	DL Freq. (MHz)	LTE Band	BW (MHz)	DL Channel	DL Freq. (MHz)	LTE Band	BW (MHz)	DL Channel	DL Freq. (MHz)	Single Carrier Tx Power (dBm)	Tx Power with DL-CA Active (dBm)
5B	5	10	20600	844	1	24	2600	889	5	10	2501	879.1					24.91	24.66
66D	66	20	132224	1735.2	1	0	66688	2135.2	66	20	66886	2155	66	20	67084	2174.8	25.18	24.86

Power Measurements for Intra-Band Non-Contiguous Downlink CA

CA Combination	PCC							SCC1				SCC2				Power		
	LTE Band	BW (MHz)	UL Channel	UL Freq. (MHz)	RB Size	RB Offset	DL Channel	DL Freq. (MHz)	LTE Band	BW (MHz)	DL Channel	DL Freq. (MHz)	LTE Band	BW (MHz)	DL Channel	DL Freq. (MHz)	Single Carrier Tx Power (dBm)	Tx Power with DL-CA Active (dBm)
CA_5A-5A	5	10	20600	844	1	24	2600	889	5	10	2450	874					24.91	24.68



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Power Measurements for Inter-Band Downlink CA

CA Combination	PCC							SCC1				SCC2				Power		
	LTE Band	BW (MHz)	UL Channel	UL Freq. (MHz)	RB Size	RB Offset	DL Channel	DL Freq. (MHz)	LTE Band	BW (MHz)	DL Channel	DL Freq. (MHz)	LTE Band	BW (MHz)	DL Channel	DL Freq. (MHz)	Single Carrier Tx Power (dBm)	Tx Power with DL-CA Active (dBm)
CA_2A-4A-5A	2	20	19100	1900	1	99	1100	1980	4	20	2175	2132.5	5	10	2525	881.5	24.05	23.81
CA_2A-5A-30A	2	20	19100	1900	1	99	1100	1980	5	10	2525	881.5	30	10	9820	2355	24.05	23.77
CA_2A-5A-66A	2	20	19100	1900	1	99	1100	1980	5	10	2525	881.5	66	20	66886	2155	24.05	23.79
CA_2A-12A-30A	2	20	19100	1900	1	99	1100	1980	12	10	5095	737.5	30	10	9820	2355	24.05	23.80
CA_2A-12A-66A	2	20	19100	1900	1	99	1100	1980	12	10	5095	737.5	66	20	66886	2155	24.05	23.86
CA_2A-29A-30A	2	20	19100	1900	1	99	1100	1980	29	10	9715	722.5	30	10	9820	2355	24.05	23.83
CA_2A-30A-66A	2	20	19100	1900	1	99	1100	1980	30	10	9820	2355	66	20	66886	2155	24.05	23.88
CA_4A-2A-5A	4	20	20050	1720	1	50	2050	2120	2	20	900	1960	5	10	2525	881.5	25.01	24.88
CA_4A-5A-30A	4	20	20050	1720	1	50	2050	2120	5	10	2525	881.5	30	10	9820	2355	25.01	24.86
CA_4A-12A-30A	4	20	20050	1720	1	50	2050	2120	12	10	5095	737.5	30	10	9820	2355	25.01	24.83
CA_4A-29A-30A	4	20	20050	1720	1	50	2050	2120	29	10	9715	722.5	30	10	9820	2355	25.01	24.81
CA_5A-2A-4A	5	10	20600	844	1	24	2600	889	2	20	900	1960	4	20	2175	2132.5	24.91	24.71
CA_5A-2A-30A	5	10	20600	844	1	24	2600	889	2	20	900	1960	30	10	9820	2310	24.91	24.76
CA_5A-2A-66A	5	10	20600	844	1	24	2600	889	2	20	900	1960	66	20	66786	2145	24.91	24.77
CA_5A-4A-30A	5	10	20600	844	1	24	2600	889	4	20	2175	2132.5	30	10	9820	2310	24.91	24.72
CA_5A-30A-66A	5	10	20600	844	1	24	2600	889	30	10	9820	2355	66	20	66886	2155	24.91	24.79
CA_30A-2A-5A	30	10	27710	2310	1	0	9820	2355	2	20	900	1960	5	10	2525	881.5	24.85	24.77
CA_30A-2A-12A	30	10	27710	2310	1	0	9820	2355	2	20	900	1960	12	10	5095	737.5	24.85	24.81
CA_30A-2A-29A	30	10	27710	2310	1	0	9820	2355	2	20	900	1960	29	10	9715	722.5	24.85	24.73
CA_30A-2A-66A	30	10	27710	2310	1	0	9820	2355	2	20	900	1960	66	20	66786	2145	24.85	24.76
CA_30A-4A-5A	30	10	27710	2310	1	0	9820	2355	4	20	2175	2132.5	5	10	2525	881.5	24.85	24.79
CA_30A-4A-12A	30	10	27710	2310	1	0	9820	2355	4	20	2175	2132.5	12	10	5095	737.5	24.85	24.80
CA_30A-4A-29A	30	10	27710	2310	1	0	9820	2355	4	20	2175	2132.5	29	10	9715	722.5	24.85	24.74
CA_30A-5A-66A	30	10	27710	2310	1	0	9820	2355	5	10	2525	881.5	66	20	66786	2145	24.85	24.74
CA_30A-12A-66A	30	10	27710	2310	1	0	9820	2355	12	10	5095	737.5	66	20	66786	2145	24.85	24.79
CA_12A-2A-30A	12	10	23130	711	1	24	5130	741	2	20	900	1960	30	10	9820	2310	24.99	24.88
CA_12A-2A-66A	12	10	23130	711	1	24	5130	741	2	20	900	1960	66	20	66786	2145	24.99	24.81
CA_12A-4A-30A	12	10	23130	711	1	24	5130	741	4	20	2175	2132.5	30	10	9820	2310	24.99	24.83
CA_12A-30A-66A	12	10	23130	711	1	24	5130	741	30	10	9820	2355	66	20	66886	2155	24.99	24.84
CA_66A-2A-5A	66	20	132322	1745	1	0	66786	2145	2	20	900	1960	5	10	2525	881.5	25.18	24.95
CA_66A-2A-12A	66	20	132322	1745	1	0	66786	2145	2	20	900	1960	12	10	5095	737.5	25.18	24.93
CA_66A-2A-30A	66	20	132322	1745	1	0	66786	2145	2	20	900	1960	30	10	9820	2355	25.18	24.91
CA_66A-5A-30A	66	20	132322	1745	1	0	66786	2145	5	10	2525	881.5	30	10	9820	2355	25.18	24.90
CA_66A-12A-30A	66	20	132322	1745	1	0	66786	2145	12	10	5095	737.5	30	10	9820	2355	25.18	24.87



Summary for SAR Test Exclusion for LTE Downlink CA

Per power confirmation results in above, the uplink maximum output power with downlink CA active remains within the specified tune-up tolerance and not more than 0.25 dB higher than the maximum output power with downlink CA inactive. According to KDB 941225 D05A, the SAR test exclusion applies to LTE downlink CA operation.

<KDB 248227 D01, SAR Guidance for Wi-Fi Transmitters>

- (1) For handsets operating next to ear, hotspot mode or mini-tablet configurations, the initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When the reported SAR of initial test position is $\leq 0.4 \text{ W/kg}$, SAR testing for remaining test positions is not required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is $\leq 0.8 \text{ W/kg}$ or all test positions are measured.
- (2) For WLAN 2.4 GHz, the highest measured maximum output power channel for DSSS was selected for SAR measurement. When the reported SAR is $\leq 0.8 \text{ W/kg}$, no further SAR testing is required. Otherwise, SAR is evaluated at the next highest measured output power channel. When any reported SAR is $> 1.2 \text{ W/kg}$, SAR is required for the third channel. For OFDM modes (802.11g/n), SAR is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and it is $\leq 1.2 \text{ W/kg}$.
- (3) For WLAN 5 GHz, the initial test configuration was selected according to the transmission mode with the highest maximum output power. When the reported SAR of initial test configuration is $> 0.8 \text{ W/kg}$, SAR is required for the subsequent highest measured output power channel until the reported SAR result is $\leq 1.2 \text{ W/kg}$ or all required channels are measured. For other transmission modes, SAR is not required when the highest reported SAR for initial test configuration is adjusted by the ratio of subsequent test configuration to initial test configuration specified maximum output power and it is $\leq 1.2 \text{ W/kg}$.



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4.7.2 SAR Results for Head Exposure Condition

Plot No.	Band	Mode	Test Position	Ch.	Tx Antenna	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
01	GSM850	GPRS12	Right Cheek	128	Ant 0	27.9	26.39	1.42	0.10	0.284	0.40
	GSM850	GPRS12	Right Tilted	128	Ant 0	27.9	26.39	1.42	0.05	0.211	0.30
	GSM850	GPRS12	Left Cheek	128	Ant 0	27.9	26.39	1.42	-0.09	0.325	0.46
	GSM850	GPRS12	Left Tilted	128	Ant 0	27.9	26.39	1.42	-0.10	0.214	0.30
	GSM850	GPRS12	Left Cheek	189	Ant 0	27.9	26.33	1.44	0.09	0.295	0.42
	GSM850	GPRS12	Left Cheek	251	Ant 0	27.9	26.38	1.42	0.01	0.259	0.37
02	GSM1900	GPRS12	Right Cheek	661	Ant 1	24.9	23.81	1.29	-0.05	0.205	0.26
	GSM1900	GPRS12	Right Tilted	661	Ant 1	24.9	23.81	1.29	0.02	0.134	0.17
	GSM1900	GPRS12	Left Cheek	661	Ant 1	24.9	23.81	1.29	-0.12	0.634	0.82
	GSM1900	GPRS12	Left Tilted	661	Ant 1	24.9	23.81	1.29	-0.10	0.181	0.23
	GSM1900	GPRS12	Left Cheek	512	Ant 1	24.9	23.74	1.31	0.08	0.599	0.78
	GSM1900	GPRS12	Left Cheek	810	Ant 1	24.9	23.72	1.31	0.09	0.621	0.81
03	WCDMA II	RMC12.2K	Right Cheek	9400	Ant 1	24.2	23.25	1.24	0.03	0.363	0.45
	WCDMA II	RMC12.2K	Right Tilted	9400	Ant 1	24.2	23.25	1.24	-0.12	0.227	0.28
	WCDMA II	RMC12.2K	Left Cheek	9400	Ant 1	24.2	23.25	1.24	-0.04	1.07	1.33
	WCDMA II	RMC12.2K	Left Tilted	9400	Ant 1	24.2	23.25	1.24	0.06	0.335	0.42
	WCDMA II	RMC12.2K	Left Cheek	9262	Ant 1	24.2	23.17	1.27	-0.05	1.04	1.32
	WCDMA II	RMC12.2K	Left Cheek	9538	Ant 1	24.2	23.09	1.29	0.01	1.01	1.30
	WCDMA II	HSDPA Subtest-1	Left Cheek	9400	Ant 1	23.2	22.47	1.18	-0.08	0.891	1.05
	WCDMA II	HSDPA Subtest-1	Left Cheek	9262	Ant 1	23.2	22.36	1.21	-0.11	0.863	1.04
	WCDMA II	HSDPA Subtest-1	Left Cheek	9538	Ant 1	23.2	22.29	1.23	0.09	0.832	1.02
	WCDMA II	DC-HSDPA Subtest-1	Left Cheek	9400	Ant 1	23.2	22.44	1.19	0.05	0.867	1.03
	WCDMA II	DC-HSDPA Subtest-1	Left Cheek	9262	Ant 1	23.2	22.17	1.27	0.08	0.855	1.09
	WCDMA II	DC-HSDPA Subtest-1	Left Cheek	9538	Ant 1	23.2	22.25	1.24	0.06	0.879	1.09
	WCDMA II	HSUPA Subtest-1	Left Cheek	9262	Ant 1	23.2	22.58	1.15	-0.07	0.907	1.04
	WCDMA II	HSUPA Subtest-1	Left Cheek	9400	Ant 1	23.2	22.47	1.18	0.11	0.884	1.04
	WCDMA II	HSUPA Subtest-1	Left Cheek	9538	Ant 1	23.2	22.41	1.20	0.03	0.871	1.05
	WCDMA II	RMC12.2K	Left Cheek	9400	Ant 1	24.2	23.25	1.24	0.06	1.06	1.31
	WCDMA IV	RMC12.2K	Right Cheek	1312	Ant 1	24.7	23.86	1.21	0.03	0.285	0.34
	WCDMA IV	RMC12.2K	Right Tilted	1312	Ant 1	24.7	23.86	1.21	0.07	0.182	0.22
	WCDMA IV	RMC12.2K	Left Cheek	1312	Ant 1	24.7	23.86	1.21	-0.06	0.951	1.15
	WCDMA IV	RMC12.2K	Left Tilted	1312	Ant 1	24.7	23.86	1.21	-0.11	0.191	0.23
	WCDMA IV	RMC12.2K	Left Cheek	1413	Ant 1	24.7	23.81	1.23	0.03	0.942	1.16
04	WCDMA IV	RMC12.2K	Left Cheek	1513	Ant 1	24.7	23.62	1.28	-0.01	1.01	1.29
	WCDMA IV	HSDPA Subtest-2	Left Cheek	1312	Ant 1	23.7	23.65	1.01	-0.07	0.998	1.01
	WCDMA IV	HSDPA Subtest-2	Left Cheek	1413	Ant 1	23.7	23.56	1.03	0.02	0.984	1.01
	WCDMA IV	HSDPA Subtest-2	Left Cheek	1513	Ant 1	23.7	23.41	1.07	0.00	0.962	1.03
	WCDMA IV	DC-HSDPA Subtest-2	Left Cheek	1312	Ant 1	23.7	23.56	1.03	0.04	0.869	0.90
	WCDMA IV	DC-HSDPA Subtest-2	Left Cheek	1413	Ant 1	23.7	23.45	1.06	0.09	0.871	0.92
	WCDMA IV	DC-HSDPA Subtest-2	Left Cheek	1513	Ant 1	23.7	23.32	1.09	0.05	0.877	0.96
	WCDMA IV	HSUPA Subtest-1	Left Cheek	1312	Ant 1	23.7	23.64	1.01	-0.07	0.98	0.99
	WCDMA IV	HSUPA Subtest-1	Left Cheek	1413	Ant 1	23.7	23.63	1.02	0.02	0.986	1.01
	WCDMA IV	HSUPA Subtest-1	Left Cheek	1513	Ant 1	23.7	23.48	1.05	0.01	0.97	1.02
	WCDMA IV	RMC12.2K	Left Cheek	1513	Ant 1	24.7	23.62	1.28	-0.01	0.997	1.28
	WCDMA V	RMC12.2K	Right Cheek	4233	Ant 0	24.7	23.35	1.36	0.03	0.377	0.51
	WCDMA V	RMC12.2K	Right Tilted	4233	Ant 0	24.7	23.35	1.36	0.01	0.248	0.34
	WCDMA V	RMC12.2K	Left Cheek	4233	Ant 0	24.7	23.35	1.36	0.02	0.443	0.60
	WCDMA V	RMC12.2K	Left Tilted	4233	Ant 0	24.7	23.35	1.36	0.11	0.227	0.31
	WCDMA V	RMC12.2K	Left Cheek	4132	Ant 0	24.7	23.19	1.42	-0.03	0.411	0.58
	WCDMA V	RMC12.2K	Left Cheek	4182	Ant 0	24.7	23.33	1.37	-0.13	0.421	0.58

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Plot No.	Band	Mode	Test Position	Ch.	RB#	RB Offset	Tx Antenna	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
06	LTE 2	QPSK20M	Right Cheek	19100	1	99	Ant 1	24.2	24.05	1.04	0.03	0.394	0.41
	LTE 2	QPSK20M	Right Tilted	19100	1	99	Ant 1	24.2	24.05	1.04	0.09	0.234	0.24
	LTE 2	QPSK20M	Left Cheek	19100	1	99	Ant 1	24.2	24.05	1.04	0.00	1.14	1.19
	LTE 2	QPSK20M	Left Tilted	19100	1	99	Ant 1	24.2	24.05	1.04	0.01	0.344	0.36
	LTE 2	QPSK20M	Right Cheek	19100	50	25	Ant 1	23.2	23.03	1.04	0.03	0.304	0.32
	LTE 2	QPSK20M	Right Tilted	19100	50	25	Ant 1	23.2	23.03	1.04	-0.11	0.221	0.23
	LTE 2	QPSK20M	Left Cheek	19100	50	25	Ant 1	23.2	23.03	1.04	-0.06	0.916	0.95
	LTE 2	QPSK20M	Left Tilted	19100	50	25	Ant 1	23.2	23.03	1.04	0.13	0.258	0.27
	LTE 2	QPSK20M	Left Cheek	18700	1	99	Ant 1	24.2	23.93	1.06	0.07	1.11	1.18
	LTE 2	QPSK20M	Left Cheek	18900	1	99	Ant 1	24.2	23.88	1.08	-0.03	1.09	1.18
07	LTE 2	QPSK20M	Left Cheek	18700	50	25	Ant 1	23.2	22.91	1.07	-0.09	0.935	1.00
	LTE 2	QPSK20M	Left Cheek	18900	50	25	Ant 1	23.2	22.86	1.08	0.15	0.912	0.98
	LTE 2	QPSK20M	Left Cheek	19100	100	0	Ant 1	23.2	23.01	1.04	-0.11	0.955	0.99
	LTE 2	QPSK20M	Left Cheek	19100	1	99	Ant 1	24.2	24.05	1.04	0.03	1.12	1.16
	LTE 5	QPSK10M	Right Cheek	20600	1	24	Ant 0	25.2	24.91	1.07	0.02	0.304	0.33
	LTE 5	QPSK10M	Right Tilted	20600	1	24	Ant 0	25.2	24.91	1.07	0.09	0.172	0.18
	LTE 5	QPSK10M	Left Cheek	20600	1	24	Ant 0	25.2	24.91	1.07	-0.03	0.378	0.40
	LTE 5	QPSK10M	Left Tilted	20600	1	24	Ant 0	25.2	24.91	1.07	-0.03	0.179	0.19
	LTE 5	QPSK10M	Right Cheek	20600	25	12	Ant 0	24.2	24.00	1.05	0.12	0.245	0.26
	LTE 5	QPSK10M	Right Tilted	20600	25	12	Ant 0	24.2	24.00	1.05	0.06	0.148	0.16
08	LTE 5	QPSK10M	Left Cheek	20600	25	12	Ant 0	24.2	24.00	1.05	0.03	0.304	0.32
	LTE 5	QPSK10M	Left Tilted	20600	25	12	Ant 0	24.2	24.00	1.05	-0.13	0.147	0.15
	LTE 5	QPSK10M	Left Cheek	20450	1	24	Ant 0	25.2	24.47	1.18	-0.06	0.326	0.38
	LTE 5	QPSK10M	Left Cheek	20525	1	24	Ant 0	25.2	24.61	1.15	0.04	0.343	0.39
	LTE 7	QPSK20M	Right Cheek	20850	1	99	Ant 1	24.2	23.94	1.06	0.03	0.284	0.30
	LTE 7	QPSK20M	Right Tilted	20850	1	99	Ant 1	24.2	23.94	1.06	0.05	0.157	0.17
	LTE 7	QPSK20M	Left Cheek	20850	1	99	Ant 1	24.2	23.94	1.06	0.00	0.623	0.66
	LTE 7	QPSK20M	Left Tilted	20850	1	99	Ant 1	24.2	23.94	1.06	-0.06	0.102	0.11
	LTE 7	QPSK20M	Right Cheek	20850	50	50	Ant 1	23.2	22.98	1.05	-0.01	0.214	0.22
	LTE 7	QPSK20M	Right Tilted	20850	50	50	Ant 1	23.2	22.98	1.05	0.06	0.212	0.22
09	LTE 7	QPSK20M	Left Cheek	20850	50	50	Ant 1	23.2	22.98	1.05	-0.12	0.494	0.52
	LTE 7	QPSK20M	Left Tilted	20850	50	50	Ant 1	23.2	22.98	1.05	-0.09	0.078	0.08
	LTE 7	QPSK20M	Left Cheek	21100	1	99	Ant 1	24.2	23.81	1.09	0.04	0.593	0.65
	LTE 7	QPSK20M	Left Cheek	21350	1	99	Ant 1	24.2	23.65	1.14	0.07	0.565	0.64
	LTE 12	QPSK10M	Right Cheek	23130	1	24	Ant 0	25.2	24.99	1.05	-0.08	0.290	0.30
	LTE 12	QPSK10M	Right Tilted	23130	1	24	Ant 0	25.2	24.99	1.05	0.13	0.150	0.16
	LTE 12	QPSK10M	Left Cheek	23130	1	24	Ant 0	25.2	24.99	1.05	0.07	0.192	0.20
	LTE 12	QPSK10M	Left Tilted	23130	1	24	Ant 0	25.2	24.99	1.05	-0.03	0.103	0.11
	LTE 12	QPSK10M	Right Cheek	23130	25	12	Ant 0	24.2	24.02	1.04	0.08	0.223	0.23
	LTE 12	QPSK10M	Right Tilted	23130	25	12	Ant 0	24.2	24.02	1.04	-0.11	0.121	0.13
10	LTE 12	QPSK10M	Left Cheek	23130	25	12	Ant 0	24.2	24.02	1.04	0.04	0.157	0.16
	LTE 12	QPSK10M	Left Tilted	23130	25	12	Ant 0	24.2	24.02	1.04	0.06	0.083	0.09
	LTE 12	QPSK10M	Right Cheek	23060	1	24	Ant 0	25.2	24.86	1.08	0.03	0.242	0.26
	LTE 12	QPSK10M	Right Cheek	23095	1	24	Ant 0	25.2	24.82	1.09	-0.13	0.252	0.27
	LTE 14	QPSK10M	Right Cheek	23330	1	0	Ant 0	24.2	23.87	1.08	0.03	0.290	0.31
	LTE 14	QPSK10M	Right Tilted	23330	1	0	Ant 0	24.2	23.87	1.08	0.04	0.180	0.19
	LTE 14	QPSK10M	Left Cheek	23330	1	0	Ant 0	24.2	23.87	1.08	-0.01	0.294	0.32
	LTE 14	QPSK10M	Left Tilted	23330	1	0	Ant 0	24.2	23.87	1.08	-0.06	0.188	0.20
	LTE 14	QPSK10M	Right Cheek	23330	25	25	Ant 0	23.2	22.85	1.08	-0.03	0.238	0.26
	LTE 14	QPSK10M	Right Tilted	23330	25	25	Ant 0	23.2	22.85	1.08	0.11	0.13	0.14
	LTE 14	QPSK10M	Left Cheek	23330	25	25	Ant 0	23.2	22.85	1.08	0.13	0.246	0.27
	LTE 14	QPSK10M	Left Tilted	23330	25	25	Ant 0	23.2	22.85	1.08	-0.03	0.159	0.17

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Plot No.	Band	Mode	Test Position	Ch.	RB#	RB Offset	Tx Antenna	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
11	LTE 30	QPSK10M	Right Cheek	27710	1	0	Ant 2	25.2	24.85	1.08	0.06	0.11	0.12
	LTE 30	QPSK10M	Right Tilted	27710	1	0	Ant 2	25.2	24.85	1.08	-0.04	0.077	0.08
	LTE 30	QPSK10M	Left Cheek	27710	1	0	Ant 2	25.2	24.85	1.08	-0.06	0.214	0.23
	LTE 30	QPSK10M	Left Tilted	27710	1	0	Ant 2	25.2	24.85	1.08	0.03	0.062	0.07
	LTE 30	QPSK10M	Right Cheek	27710	25	12	Ant 2	24.2	23.77	1.10	0.11	0.084	0.09
	LTE 30	QPSK10M	Right Tilted	27710	25	12	Ant 2	24.2	23.77	1.10	0.06	0.059	0.06
	LTE 30	QPSK10M	Left Cheek	27710	25	12	Ant 2	24.2	23.77	1.10	0.09	0.161	0.18
	LTE 30	QPSK10M	Left Tilted	27710	25	12	Ant 2	24.2	23.77	1.10	0.02	0.048	0.05
12	LTE 66	QPSK20M	Right Cheek	132322	1	0	Ant 1	25.2	25.18	1.00	-0.04	0.342	0.34
	LTE 66	QPSK20M	Right Tilted	132322	1	0	Ant 1	25.2	25.18	1.00	-0.06	0.235	0.24
	LTE 66	QPSK20M	Left Cheek	132322	1	0	Ant 1	25.2	25.18	1.00	0.03	1.04	1.04
	LTE 66	QPSK20M	Left Tilted	132322	1	0	Ant 1	25.2	25.18	1.00	-0.03	0.217	0.22
	LTE 66	QPSK20M	Right Cheek	132072	50	50	Ant 1	24.2	24.11	1.02	0.11	0.272	0.28
	LTE 66	QPSK20M	Right Tilted	132072	50	50	Ant 1	24.2	24.11	1.02	0.13	0.189	0.19
	LTE 66	QPSK20M	Left Cheek	132072	50	50	Ant 1	24.2	24.11	1.02	-0.03	0.855	0.87
	LTE 66	QPSK20M	Left Tilted	132072	50	50	Ant 1	24.2	24.11	1.02	0.04	0.179	0.18
13	LTE 66	QPSK20M	Left Cheek	132072	1	0	Ant 1	25.2	25.08	1.03	-0.01	1.01	1.04
	LTE 66	QPSK20M	Left Cheek	132572	1	0	Ant 1	25.2	24.83	1.09	-0.04	1.09	1.19
	LTE 66	QPSK20M	Left Cheek	132322	50	50	Ant 1	24.2	23.96	1.06	-0.11	0.835	0.89
	LTE 66	QPSK20M	Left Cheek	132572	50	50	Ant 1	24.2	23.76	1.11	0.04	0.942	1.05
	LTE 66	QPSK20M	Left Cheek	132072	100	0	Ant 1	24.2	24.07	1.03	0.06	0.863	0.89
	LTE 66	QPSK20M	Left Cheek	132572	1	0	Ant 1	25.2	24.83	1.09	-0.03	1.08	1.18

Plot No.	Band	Mode	Test Position	Ch.	Duty Cycle	Crest Factor	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
13	WLAN2.4G	802.11b	Right Cheek	11	89.60	1.12	19.0	18.93	1.02	-0.08	0.18	0.21
	WLAN2.4G	802.11b	Right Tilted	11	89.60	1.12	19.0	18.93	1.02	0.03	0.078	0.09
	WLAN2.4G	802.11b	Left Cheek	11	89.60	1.12	19.0	18.93	1.02	-0.11	0.089	0.10
	WLAN2.4G	802.11b	Left Tilted	11	89.60	1.12	19.0	18.93	1.02	0.09	0.028	0.03
	WLAN2.4G	802.11b	Right Cheek	1	89.60	1.12	19.0	18.58	1.10	0.02	0.206	0.25
	WLAN2.4G	802.11b	Right Cheek	6	89.60	1.12	19.0	18.61	1.09	0.07	0.2	0.24
	WLAN5G	802.11a	Right Cheek	60	92.50	1.08	18.5	18.37	1.03	-0.07	0.111	0.12
	WLAN5G	802.11a	Right Tilted	60	92.50	1.08	18.5	18.37	1.03	0.03	0.018	0.02
14	WLAN5G	802.11a	Left Cheek	60	92.50	1.08	18.5	18.37	1.03	-0.11	0.078	0.09
	WLAN5G	802.11a	Left Tilted	60	92.50	1.08	18.5	18.37	1.03	0.00	<0.001	0.00
	WLAN5G	802.11a	Right Cheek	52	92.50	1.08	18.5	18.23	1.06	-0.03	0.144	0.16
	WLAN5G	802.11a	Right Cheek	56	92.50	1.08	18.5	18.13	1.09	0.08	0.114	0.13
	WLAN5G	802.11a	Right Cheek	64	92.50	1.08	18.0	17.83	1.04	0.05	0.085	0.10
	WLAN5G	802.11a	Right Cheek	116	92.50	1.08	18.5	18.24	1.06	-0.08	0.098	0.11
	WLAN5G	802.11a	Right Tilted	116	92.50	1.08	18.5	18.24	1.06	0.00	<0.001	0.00
	WLAN5G	802.11a	Left Cheek	116	92.50	1.08	18.5	18.24	1.06	0.02	0.051	0.06
15	WLAN5G	802.11a	Left Tilted	116	92.50	1.08	18.5	18.24	1.06	0.00	<0.001	0.00
	WLAN5G	802.11a	Right Cheek	100	92.50	1.08	16.0	15.93	1.02	-0.11	0.067	0.07
	WLAN5G	802.11a	Right Cheek	120	92.50	1.08	18.5	18.14	1.09	0.03	0.083	0.10
	WLAN5G	802.11a	Right Cheek	124	92.50	1.08	18.5	18.17	1.08	-0.08	0.079	0.09
	WLAN5G	802.11a	Right Cheek	132	92.50	1.08	18.5	18.18	1.08	-0.04	0.106	0.12
	WLAN5G	802.11a	Right Cheek	140	92.50	1.08	16.0	15.98	1.00	-0.08	0.079	0.09
	WLAN5G	802.11a	Right Cheek	157	92.50	1.08	18.5	18.48	1.00	-0.09	0.167	0.18
	WLAN5G	802.11a	Right Tilted	157	92.50	1.08	18.5	18.48	1.00	0.00	<0.001	0.00
16	WLAN5G	802.11a	Left Cheek	157	92.50	1.08	18.5	18.48	1.00	0.02	0.056	0.06
	WLAN5G	802.11a	Left Tilted	157	92.50	1.08	18.5	18.48	1.00	0.00	<0.001	0.00
	WLAN5G	802.11a	Right Cheek	149	92.50	1.08	14.0	13.78	1.05	0.00	<0.001	0.00
	WLAN5G	802.11a	Right Cheek	153	92.50	1.08	18.5	18.36	1.03	-0.07	0.146	0.16
	WLAN5G	802.11a	Right Cheek	161	92.50	1.08	18.5	18.42	1.02	-0.04	0.177	0.19
	WLAN5G	802.11a	Right Cheek	165	92.50	1.08	18.0	17.73	1.06	0.10	0.066	0.08

Note: "<0.001" means there is no SAR value or the SAR is too low to be measured.



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Plot No.	Band	Mode	Test Position	Ch.	Duty Cycle	Crest Factor	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
17	BT	BR/EDR	Right Cheek	0	77.10	1.30	10.3	9.42	1.22	0.14	0.017	0.03
	BT	BR/EDR	Right Tilted	0	77.10	1.30	10.3	9.42	1.22	-0.09	0.00644	0.01
	BT	BR/EDR	Left Cheek	0	77.10	1.30	10.3	9.42	1.22	0	0.00734	0.01
	BT	BR/EDR	Left Tilted	0	77.10	1.30	10.3	9.42	1.22	0.03	0.00231	0.00
	BT	BR/EDR	Right Cheek	39	77.10	1.30	10.3	8.91	1.38	0.02	0.011	0.02
	BT	BR/EDR	Right Cheek	78	77.10	1.30	10.3	8.37	1.56	-0.08	0.00894	0.02

Note: "<0.001" means there is no SAR value or the SAR is too low to be measured.

4.7.3 SAR Results for Body-worn Exposure Condition (Test Separation Distance is 10 mm)

Plot No.	Band	Mode	Test Position	Ch.	Tx Antenna	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	GSM850	GPRS12	Front Face	128	Ant 0	27.9	26.39	1.42	0.10	0.328	0.47
18	GSM850	GPRS12	Rear Face	128	Ant 0	27.9	26.39	1.42	-0.08	0.395	0.56
	GSM850	GPRS12	Rear Face	189	Ant 0	27.9	26.33	1.44	0.05	0.303	0.44
	GSM850	GPRS12	Rear Face	251	Ant 0	27.9	26.38	1.42	-0.11	0.281	0.40
	GSM1900	GPRS12	Front Face	661	Ant 1	24.9	23.81	1.29	0.12	0.421	0.54
	GSM1900	GPRS12	Rear Face	661	Ant 1	24.9	23.81	1.29	0.03	0.318	0.41
	GSM1900	GPRS12	Front Face	512	Ant 1	24.9	23.74	1.31	0.09	0.415	0.54
19	GSM1900	GPRS12	Front Face	810	Ant 1	24.9	23.72	1.31	-0.01	0.439	0.58
20	WCDMA II	RMC12.2K	Front Face	9400	Ant 1	24.2	23.25	1.24	0.01	0.605	0.75
	WCDMA II	RMC12.2K	Rear Face	9400	Ant 1	24.2	23.25	1.24	0.03	0.445	0.55
	WCDMA II	RMC12.2K	Front Face	9262	Ant 1	24.2	23.17	1.27	0.13	0.525	0.67
	WCDMA II	RMC12.2K	Front Face	9538	Ant 1	24.2	23.09	1.29	0.05	0.486	0.63
21	WCDMA IV	RMC12.2K	Front Face	1312	Ant 1	24.7	23.86	1.21	-0.06	0.757	0.92
	WCDMA IV	RMC12.2K	Rear Face	1312	Ant 1	24.7	23.86	1.21	0.13	0.430	0.52
	WCDMA IV	RMC12.2K	Front Face	1413	Ant 1	24.7	23.81	1.23	-0.09	0.729	0.90
	WCDMA IV	RMC12.2K	Front Face	1513	Ant 1	24.7	23.62	1.28	0.02	0.709	0.91
22	WCDMA V	RMC12.2K	Front Face	4233	Ant 0	24.7	23.35	1.36	0.03	0.417	0.57
	WCDMA V	RMC12.2K	Rear Face	4233	Ant 0	24.7	23.35	1.36	0.01	0.340	0.46
	WCDMA V	RMC12.2K	Front Face	4132	Ant 0	24.7	23.19	1.42	-0.07	0.393	0.56
	WCDMA V	RMC12.2K	Front Face	4182	Ant 0	24.7	23.33	1.37	0.11	0.406	0.56

Plot No.	Band	Mode	Test Position	Ch.	RB#	RB Offset	Tx Antenna	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
23	LTE 2	QPSK20M	Front Face	19100	1	99	Ant 1	24.2	24.05	1.04	0	0.634	0.66
	LTE 2	QPSK20M	Rear Face	19100	1	99	Ant 1	24.2	24.05	1.04	-0.08	0.506	0.53
	LTE 2	QPSK20M	Front Face	19100	50	25	Ant 1	23.2	23.03	1.04	0.03	0.500	0.52
	LTE 2	QPSK20M	Rear Face	19100	50	25	Ant 1	23.2	23.03	1.04	-0.11	0.392	0.41
	LTE 2	QPSK20M	Front Face	18700	1	99	Ant 1	24.2	23.93	1.06	0.05	0.589	0.62
	LTE 2	QPSK20M	Front Face	18900	1	99	Ant 1	24.2	23.88	1.08	0.01	0.563	0.61
	LTE 5	QPSK10M	Front Face	20600	1	24	Ant 0	25.2	24.91	1.07	0.08	0.463	0.50
24	LTE 5	QPSK10M	Rear Face	20600	1	24	Ant 0	25.2	24.91	1.07	-0.01	0.477	0.51
	LTE 5	QPSK10M	Front Face	20600	25	12	Ant 0	24.2	24.00	1.05	0.13	0.351	0.37
	LTE 5	QPSK10M	Rear Face	20600	25	12	Ant 0	24.2	24.00	1.05	0.07	0.386	0.41
	LTE 5	QPSK10M	Rear Face	20450	1	24	Ant 0	25.2	24.47	1.18	-0.06	0.418	0.49
	LTE 5	QPSK10M	Rear Face	20525	1	24	Ant 0	25.2	24.61	1.15	0.02	0.431	0.50
	LTE 7	QPSK20M	Front Face	20850	1	99	Ant 1	24.2	23.94	1.06	0.01	0.413	0.44
25	LTE 7	QPSK20M	Rear Face	20850	1	99	Ant 1	24.2	23.94	1.06	-0.03	0.526	0.56
	LTE 7	QPSK20M	Front Face	20850	50	50	Ant 1	23.2	22.98	1.05	0.01	0.309	0.32
	LTE 7	QPSK20M	Rear Face	20850	50	50	Ant 1	23.2	22.98	1.05	-0.09	0.423	0.44
	LTE 7	QPSK20M	Rear Face	21100	1	99	Ant 1	24.2	23.81	1.09	-0.08	0.508	0.55
	LTE 7	QPSK20M	Rear Face	21350	1	99	Ant 1	24.2	23.65	1.14	0.03	0.478	0.54



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Plot No.	Band	Mode	Test Position	Ch.	RB#	RB Offset	Tx Antenna	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	LTE 12	QPSK10M	Front Face	23130	1	24	Ant 0	25.2	24.99	1.05	-0.07	0.380	0.40
	LTE 12	QPSK10M	Rear Face	23130	1	24	Ant 0	25.2	24.99	1.05	0.02	0.447	0.47
	LTE 12	QPSK10M	Front Face	23130	25	12	Ant 0	24.2	24.02	1.04	0.01	0.307	0.32
	LTE 12	QPSK10M	Rear Face	23130	25	12	Ant 0	24.2	24.02	1.04	0.04	0.364	0.38
26	LTE 12	QPSK10M	Rear Face	23060	1	24	Ant 0	25.2	24.86	1.08	0.08	0.456	0.49
	LTE 12	QPSK10M	Rear Face	23095	1	24	Ant 0	25.2	24.82	1.09	0.13	0.445	0.49
	LTE 14	QPSK10M	Front Face	23330	1	0	Ant 0	24.2	23.87	1.08	-0.08	0.403	0.44
27	LTE 14	QPSK10M	Rear Face	23330	1	0	Ant 0	24.2	23.87	1.08	-0.02	0.473	0.51
	LTE 14	QPSK10M	Front Face	23330	25	25	Ant 0	23.2	22.85	1.08	-0.06	0.323	0.35
	LTE 14	QPSK10M	Rear Face	23330	25	25	Ant 0	23.2	22.85	1.08	0.01	0.379	0.41
	LTE 30	QPSK10M	Front Face	27710	1	0	Ant 2	25.2	24.85	1.08	-0.03	0.277	0.30
28	LTE 30	QPSK10M	Rear Face	27710	1	0	Ant 2	25.2	24.85	1.08	-0.01	1.04	1.12
	LTE 30	QPSK10M	Front Face	27710	25	12	Ant 2	24.2	23.77	1.10	-0.05	0.218	0.24
	LTE 30	QPSK10M	Rear Face	27710	25	12	Ant 2	24.2	23.77	1.10	0.01	0.890	0.98
	LTE 30	QPSK10M	Rear Face	27710	50	0	Ant 2	24.2	23.71	1.12	0.13	0.899	1.01
	LTE 30	QPSK10M	Rear Face	27710	1	0	Ant 2	25.2	24.85	1.08	-0.06	1.02	1.10
	LTE 66	QPSK20M	Front Face	132322	1	0	Ant 1	25.2	25.18	1.00	0.08	0.861	0.86
	LTE 66	QPSK20M	Rear Face	132322	1	0	Ant 1	25.2	25.18	1.00	0.01	0.538	0.54
	LTE 66	QPSK20M	Front Face	132072	50	50	Ant 1	24.2	24.11	1.02	0.03	0.701	0.72
	LTE 66	QPSK20M	Rear Face	132072	50	50	Ant 1	24.2	24.11	1.02	-0.09	0.395	0.40
29	LTE 66	QPSK20M	Front Face	132072	1	0	Ant 1	25.2	25.08	1.03	-0.03	0.913	0.94
	LTE 66	QPSK20M	Front Face	132572	1	0	Ant 1	25.2	24.83	1.09	0.13	0.821	0.89
	LTE 66	QPSK20M	Front Face	132072	100	0	Ant 1	24.2	24.07	1.03	0.06	0.694	0.71
	LTE 66	QPSK20M	Front Face	132072	1	0	Ant 1	25.2	25.08	1.03	0.08	0.901	0.93

Plot No.	Band	Mode	Test Position	Ch.	Duty Cycle	Crest Factor	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	WLAN2.4G	802.11b	Front Face	11	89.60	1.12	19.0	18.93	1.02	0.08	0.041	0.05
30	WLAN2.4G	802.11b	Rear Face	11	89.60	1.12	19.0	18.93	1.02	0.13	0.175	0.20
	WLAN2.4G	802.11b	Rear Face	1	89.60	1.12	19.0	18.58	1.10	0.02	0.131	0.16
	WLAN2.4G	802.11b	Rear Face	6	89.60	1.12	19.0	18.61	1.09	0.07	0.158	0.19
	WLAN5G	802.11a	Front Face	60	92.50	1.08	18.5	18.37	1.03	0	<0.001	0.00
	WLAN5G	802.11a	Rear Face	60	92.50	1.08	18.5	18.37	1.03	0.11	0.637	0.71
31	WLAN5G	802.11a	Rear Face	52	92.50	1.08	18.5	18.23	1.06	0.18	0.697	0.80
	WLAN5G	802.11a	Rear Face	56	92.50	1.08	18.5	18.13	1.09	-0.05	0.666	0.78
	WLAN5G	802.11a	Rear Face	64	92.50	1.08	18.0	17.83	1.04	-0.02	0.279	0.31
	WLAN5G	802.11a	Front Face	116	92.50	1.08	18.5	18.24	1.06	0	<0.001	0.00
32	WLAN5G	802.11a	Rear Face	116	92.50	1.08	18.5	18.24	1.06	0.15	0.554	0.63
	WLAN5G	802.11a	Rear Face	100	92.50	1.08	16.0	15.93	1.02	0.08	0.212	0.23
	WLAN5G	802.11a	Rear Face	120	92.50	1.08	18.5	18.14	1.09	-0.02	0.521	0.61
	WLAN5G	802.11a	Rear Face	124	92.50	1.08	18.5	18.17	1.08	-0.13	0.535	0.62
	WLAN5G	802.11a	Rear Face	132	92.50	1.08	18.5	18.18	1.08	-0.11	0.533	0.62
	WLAN5G	802.11a	Rear Face	140	92.50	1.08	16.0	15.98	1.00	0.02	0.191	0.21
	WLAN5G	802.11a	Front Face	157	92.50	1.08	18.5	18.48	1.00	0	<0.001	0.00
	WLAN5G	802.11a	Rear Face	157	92.50	1.08	18.5	18.48	1.00	0.08	0.876	0.95
	WLAN5G	802.11a	Rear Face	149	92.50	1.08	14.0	13.78	1.05	-0.01	0.133	0.15
	WLAN5G	802.11a	Rear Face	153	92.50	1.08	18.5	18.36	1.03	0.02	0.821	0.91
33	WLAN5G	802.11a	Rear Face	161	92.50	1.08	18.5	18.42	1.02	0.17	0.921	1.01
	WLAN5G	802.11a	Rear Face	165	92.50	1.08	18.0	17.73	1.06	-0.15	0.498	0.57
	WLAN5G	802.11a	Rear Face	161	92.50	1.08	18.5	18.42	1.02	0.11	0.911	1.00

Note: "<0.001" means there is no SAR value or the SAR is too low to be measured.



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Plot No.	Band	Mode	Test Position	Ch.	Duty Cycle	Crest Factor	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	BT	BR/EDR	Front Face	0	77.10	1.30	10.3	9.42	1.22	0	<0.001	0.00
34	BT	BR/EDR	Rear Face	0	77.10	1.30	10.3	9.42	1.22	0.13	0.015	0.02
	BT	BR/EDR	Rear Face	39	77.10	1.30	10.3	8.91	1.38	0.08	0.011	0.02
	BT	BR/EDR	Rear Face	78	77.10	1.30	10.3	8.37	1.56	0.02	0.00744	0.02

Note: "<0.001" means there is no SAR value or the SAR is too low to be measured.

4.7.4 SAR Results for Hotspot Exposure Condition (Test Separation Distance is 10 mm)

Plot No.	Band	Mode	Test Position	Ch.	Tx Antenna	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	GSM850	GPRS12	Front Face	128	Ant 0	27.9	26.39	1.42	0.10	0.328	0.47
18	GSM850	GPRS12	Rear Face	128	Ant 0	27.9	26.39	1.42	-0.08	0.395	0.56
	GSM850	GPRS12	Right Side	128	Ant 0	27.9	26.39	1.42	0.08	0.153	0.22
	GSM850	GPRS12	Bottom Side	128	Ant 0	27.9	26.39	1.42	-0.07	0.284	0.40
	GSM850	GPRS12	Rear Face	189	Ant 0	27.9	26.33	1.44	0.05	0.303	0.44
	GSM850	GPRS12	Rear Face	251	Ant 0	27.9	26.38	1.42	-0.11	0.281	0.40
	GSM1900	GPRS12	Front Face	661	Ant 1	24.9	23.81	1.29	0.12	0.421	0.54
	GSM1900	GPRS12	Rear Face	661	Ant 1	24.9	23.81	1.29	0.03	0.318	0.41
	GSM1900	GPRS12	Left Side	661	Ant 1	24.9	23.81	1.29	-0.1	0.362	0.47
	GSM1900	GPRS12	Bottom Side	661	Ant 1	24.9	23.81	1.29	-0.11	0.355	0.46
	GSM1900	GPRS12	Front Face	512	Ant 1	24.9	23.74	1.31	0.09	0.415	0.54
19	GSM1900	GPRS12	Front Face	810	Ant 1	24.9	23.72	1.31	-0.01	0.439	0.58
20	WCDMA II	RMC12.2K	Front Face	9400	Ant 1	24.2	23.25	1.24	0.01	0.605	0.75
	WCDMA II	RMC12.2K	Rear Face	9400	Ant 1	24.2	23.25	1.24	0.03	0.445	0.55
	WCDMA II	RMC12.2K	Left Side	9400	Ant 1	24.2	23.25	1.24	-0.05	0.569	0.71
	WCDMA II	RMC12.2K	Bottom Side	9400	Ant 1	24.2	23.25	1.24	-0.08	0.426	0.53
	WCDMA II	RMC12.2K	Front Face	9262	Ant 1	24.2	23.17	1.27	0.13	0.525	0.67
	WCDMA II	RMC12.2K	Front Face	9538	Ant 1	24.2	23.09	1.29	0.05	0.486	0.63
21	WCDMA IV	RMC12.2K	Front Face	1312	Ant 1	24.7	23.86	1.21	-0.06	0.757	0.92
	WCDMA IV	RMC12.2K	Rear Face	1312	Ant 1	24.7	23.86	1.21	0.13	0.430	0.52
	WCDMA IV	RMC12.2K	Left Side	1312	Ant 1	24.7	23.86	1.21	0.05	0.676	0.82
	WCDMA IV	RMC12.2K	Bottom Side	1312	Ant 1	24.7	23.86	1.21	0.07	0.060	0.07
	WCDMA IV	RMC12.2K	Front Face	1413	Ant 1	24.7	23.81	1.23	-0.09	0.729	0.90
	WCDMA IV	RMC12.2K	Front Face	1513	Ant 1	24.7	23.62	1.28	0.02	0.709	0.91
	WCDMA IV	RMC12.2K	Left Side	1413	Ant 1	24.7	23.81	1.23	-0.03	0.687	0.85
	WCDMA IV	RMC12.2K	Left Side	1513	Ant 1	24.7	23.62	1.28	0.01	0.701	0.90
22	WCDMA V	RMC12.2K	Front Face	4233	Ant 0	24.7	23.35	1.36	0.03	0.417	0.57
	WCDMA V	RMC12.2K	Rear Face	4233	Ant 0	24.7	23.35	1.36	0.01	0.340	0.46
	WCDMA V	RMC12.2K	Right Side	4233	Ant 0	24.7	23.35	1.36	0.06	0.217	0.30
	WCDMA V	RMC12.2K	Bottom Side	4233	Ant 0	24.7	23.35	1.36	0.01	0.328	0.45
	WCDMA V	RMC12.2K	Front Face	4132	Ant 0	24.7	23.19	1.42	-0.07	0.393	0.56
	WCDMA V	RMC12.2K	Front Face	4182	Ant 0	24.7	23.33	1.37	0.11	0.406	0.56

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Plot No.	Band	Mode	Test Position	Ch.	RB#	RB Offset	Tx Antenna	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
23	LTE 2	QPSK20M	Front Face	19100	1	99	Ant 1	24.2	24.05	1.04	0	0.634	0.66
	LTE 2	QPSK20M	Rear Face	19100	1	99	Ant 1	24.2	24.05	1.04	-0.08	0.506	0.53
	LTE 2	QPSK20M	Left Side	19100	1	99	Ant 1	24.2	24.05	1.04	0.02	0.538	0.56
	LTE 2	QPSK20M	Bottom Side	19100	1	99	Ant 1	24.2	24.05	1.04	-0.05	0.462	0.48
	LTE 2	QPSK20M	Front Face	19100	50	25	Ant 1	23.2	23.03	1.04	0.03	0.500	0.52
	LTE 2	QPSK20M	Rear Face	19100	50	25	Ant 1	23.2	23.03	1.04	-0.11	0.392	0.41
	LTE 2	QPSK20M	Left Side	19100	50	25	Ant 1	23.2	23.03	1.04	0.07	0.439	0.46
	LTE 2	QPSK20M	Bottom Side	19100	50	25	Ant 1	23.2	23.03	1.04	-0.03	0.380	0.40
	LTE 2	QPSK20M	Front Face	18700	1	99	Ant 1	24.2	23.93	1.06	0.05	0.589	0.62
	LTE 2	QPSK20M	Front Face	18900	1	99	Ant 1	24.2	23.88	1.08	0.01	0.563	0.61
	LTE 5	QPSK10M	Front Face	20600	1	24	Ant 0	25.2	24.91	1.07	0.08	0.463	0.50
24	LTE 5	QPSK10M	Rear Face	20600	1	24	Ant 0	25.2	24.91	1.07	-0.01	0.477	0.51
	LTE 5	QPSK10M	Right Side	20600	1	24	Ant 0	25.2	24.91	1.07	0.01	0.190	0.20
	LTE 5	QPSK10M	Bottom Side	20600	1	24	Ant 0	25.2	24.91	1.07	0.05	0.386	0.41
	LTE 5	QPSK10M	Front Face	20600	25	12	Ant 0	24.2	24.00	1.05	0.13	0.351	0.37
	LTE 5	QPSK10M	Rear Face	20600	25	12	Ant 0	24.2	24.00	1.05	0.07	0.386	0.41
	LTE 5	QPSK10M	Right Side	20600	25	12	Ant 0	24.2	24.00	1.05	0.09	0.178	0.19
	LTE 5	QPSK10M	Bottom Side	20600	25	12	Ant 0	24.2	24.00	1.05	0.05	0.294	0.31
	LTE 5	QPSK10M	Rear Face	20450	1	24	Ant 0	25.2	24.47	1.18	-0.06	0.418	0.49
	LTE 5	QPSK10M	Rear Face	20525	1	24	Ant 0	25.2	24.61	1.15	0.02	0.431	0.50
	LTE 7	QPSK20M	Front Face	20850	1	99	Ant 1	24.2	23.94	1.06	0.01	0.413	0.44
	LTE 7	QPSK20M	Rear Face	20850	1	99	Ant 1	24.2	23.94	1.06	-0.03	0.526	0.56
35	LTE 7	QPSK20M	Left Side	20850	1	99	Ant 1	24.2	23.94	1.06	-0.05	0.612	0.65
	LTE 7	QPSK20M	Bottom Side	20850	1	99	Ant 1	24.2	23.94	1.06	0.08	0.155	0.16
	LTE 7	QPSK20M	Front Face	20850	50	50	Ant 1	23.2	22.98	1.05	0.01	0.309	0.32
	LTE 7	QPSK20M	Rear Face	20850	50	50	Ant 1	23.2	22.98	1.05	-0.09	0.423	0.44
	LTE 7	QPSK20M	Left Side	20850	50	50	Ant 1	23.2	22.98	1.05	0.02	0.437	0.46
	LTE 7	QPSK20M	Bottom Side	20850	50	50	Ant 1	23.2	22.98	1.05	0.03	0.143	0.15
	LTE 7	QPSK20M	Left Side	21100	1	99	Ant 1	24.2	23.81	1.09	0.07	0.561	0.61
	LTE 7	QPSK20M	Left Side	21350	1	99	Ant 1	24.2	23.65	1.14	-0.05	0.528	0.60
	LTE 12	QPSK10M	Front Face	23130	1	24	Ant 0	25.2	24.99	1.05	-0.07	0.380	0.40
	LTE 12	QPSK10M	Rear Face	23130	1	24	Ant 0	25.2	24.99	1.05	0.02	0.447	0.47
	LTE 12	QPSK10M	Right Side	23130	1	24	Ant 0	25.2	24.99	1.05	0.03	0.274	0.29
	LTE 12	QPSK10M	Bottom Side	23130	1	24	Ant 0	25.2	24.99	1.05	0.06	0.177	0.19
	LTE 12	QPSK10M	Front Face	23130	25	12	Ant 0	24.2	24.02	1.04	0.01	0.307	0.32
	LTE 12	QPSK10M	Rear Face	23130	25	12	Ant 0	24.2	24.02	1.04	0.04	0.364	0.38
	LTE 12	QPSK10M	Right Side	23130	25	12	Ant 0	24.2	24.02	1.04	0.03	0.220	0.23
	LTE 12	QPSK10M	Bottom Side	23130	25	12	Ant 0	24.2	24.02	1.04	0.07	0.131	0.14
26	LTE 12	QPSK10M	Rear Face	23060	1	24	Ant 0	25.2	24.86	1.08	0.08	0.456	0.49
	LTE 12	QPSK10M	Rear Face	23095	1	24	Ant 0	25.2	24.82	1.09	0.13	0.445	0.49



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Plot No.	Band	Mode	Test Position	Ch.	RB#	RB Offset	Tx Antenna	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
27	LTE 14	QPSK10M	Front Face	23330	1	0	Ant 0	24.2	23.87	1.08	-0.08	0.403	0.44
	LTE 14	QPSK10M	Rear Face	23330	1	0	Ant 0	24.2	23.87	1.08	-0.02	0.473	0.51
	LTE 14	QPSK10M	Right Side	23330	1	0	Ant 0	24.2	23.87	1.08	0.01	0.278	0.30
	LTE 14	QPSK10M	Bottom Side	23330	1	0	Ant 0	24.2	23.87	1.08	0.05	0.348	0.38
	LTE 14	QPSK10M	Front Face	23330	25	25	Ant 0	23.2	22.85	1.08	-0.06	0.323	0.35
	LTE 14	QPSK10M	Rear Face	23330	25	25	Ant 0	23.2	22.85	1.08	0.01	0.379	0.41
	LTE 14	QPSK10M	Right Side	23330	25	25	Ant 0	23.2	22.85	1.08	-0.03	0.226	0.24
	LTE 14	QPSK10M	Bottom Side	23330	25	25	Ant 0	23.2	22.85	1.08	0.01	0.251	0.27
28	LTE 30	QPSK10M	Front Face	27710	1	0	Ant 2	25.2	24.85	1.08	-0.03	0.277	0.30
	LTE 30	QPSK10M	Rear Face	27710	1	0	Ant 2	25.2	24.85	1.08	-0.01	1.04	1.12
	LTE 30	QPSK10M	Left Side	27710	1	0	Ant 2	25.2	24.85	1.08	0	0.987	1.07
	LTE 30	QPSK10M	Bottom Side	27710	1	0	Ant 2	25.2	24.85	1.08	0.01	0.139	0.15
	LTE 30	QPSK10M	Front Face	27710	25	12	Ant 2	24.2	23.77	1.10	-0.05	0.218	0.24
	LTE 30	QPSK10M	Rear Face	27710	25	12	Ant 2	24.2	23.77	1.10	0.01	0.890	0.98
	LTE 30	QPSK10M	Left Side	27710	25	12	Ant 2	24.2	23.77	1.10	0.05	0.801	0.88
	LTE 30	QPSK10M	Bottom Side	27710	25	12	Ant 2	24.2	23.77	1.10	-0.03	0.112	0.12
29	LTE 30	QPSK10M	Rear Face	27710	50	0	Ant 2	24.2	23.71	1.12	0.13	0.899	1.01
	LTE 30	QPSK10M	Left Side	27710	50	0	Ant 2	24.2	23.71	1.12	-0.05	0.805	0.90
	LTE 30	QPSK10M	Rear Face	27710	1	0	Ant 2	25.2	24.85	1.08	-0.06	1.02	1.10
	LTE 66	QPSK20M	Front Face	132322	1	0	Ant 1	25.2	25.18	1.00	0.08	0.861	0.86
	LTE 66	QPSK20M	Rear Face	132322	1	0	Ant 1	25.2	25.18	1.00	0.01	0.538	0.54
	LTE 66	QPSK20M	Left Side	132322	1	0	Ant 1	25.2	25.18	1.00	-0.05	0.826	0.83
	LTE 66	QPSK20M	Bottom Side	132322	1	0	Ant 1	25.2	25.18	1.00	0.05	0.075	0.08
	LTE 66	QPSK20M	Front Face	132072	50	50	Ant 1	24.2	24.11	1.02	0.03	0.701	0.72
29	LTE 66	QPSK20M	Rear Face	132072	50	50	Ant 1	24.2	24.11	1.02	-0.09	0.395	0.40
	LTE 66	QPSK20M	Left Side	132072	50	50	Ant 1	24.2	24.11	1.02	-0.03	0.695	0.71
	LTE 66	QPSK20M	Bottom Side	132072	50	50	Ant 1	24.2	24.11	1.02	-0.05	0.070	0.07
	LTE 66	QPSK20M	Front Face	132072	1	0	Ant 1	25.2	25.08	1.03	-0.03	0.913	0.94
	LTE 66	QPSK20M	Front Face	132572	1	0	Ant 1	25.2	24.83	1.09	0.13	0.821	0.89
	LTE 66	QPSK20M	Left Side	132072	1	0	Ant 1	25.2	25.08	1.03	-0.05	0.848	0.87
	LTE 66	QPSK20M	Left Side	132572	1	0	Ant 1	25.2	24.83	1.09	-0.03	0.821	0.89
	LTE 66	QPSK20M	Front Face	132072	100	0	Ant 1	24.2	24.07	1.03	0.06	0.694	0.71
29	LTE 66	QPSK20M	Left Side	132572	100	0	Ant 1	24.2	24.07	1.03	0.11	0.685	0.71
	LTE 66	QPSK20M	Front Face	132072	1	0	Ant 1	25.2	25.08	1.03	0.08	0.901	0.93

Plot No.	Band	Mode	Test Position	Ch.	Duty Cycle	Crest Factor	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
30	WLAN2.4G	802.11b	Front Face	11	89.60	1.12	19.0	18.93	1.02	0.08	0.041	0.05
	WLAN2.4G	802.11b	Rear Face	11	89.60	1.12	19.0	18.93	1.02	0.13	0.175	0.20
	WLAN2.4G	802.11b	Left Side	11	89.60	1.12	19.0	18.93	1.02	-0.11	0.123	0.14
	WLAN2.4G	802.11b	Top Side	11	89.60	1.12	19.0	18.93	1.02	0	<0.001	0.00
	WLAN2.4G	802.11b	Rear Face	1	89.60	1.12	19.0	18.58	1.10	0.02	0.131	0.16
	WLAN2.4G	802.11b	Rear Face	6	89.60	1.12	19.0	18.61	1.09	0.07	0.158	0.19

Note: "<0.001" means there is no SAR value or the SAR is too low to be measured.

Plot No.	Band	Mode	Test Position	Ch.	Duty Cycle	Crest Factor	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
35	BT	BR/EDR	Front Face	0	77.10	1.30	10.3	9.42	1.22	0	<0.001	0.00
	BT	BR/EDR	Rear Face	0	77.10	1.30	10.3	9.42	1.22	0.13	0.015	0.02
	BT	BR/EDR	Left Side	0	77.10	1.30	10.3	9.42	1.22	0	<0.001	0.00
	BT	BR/EDR	Top Side	0	77.10	1.30	10.3	9.42	1.22	0	<0.001	0.00
	BT	BR/EDR	Rear Face	39	77.10	1.30	10.3	8.91	1.38	0.08	0.011	0.02
	BT	BR/EDR	Rear Face	78	77.10	1.30	10.3	8.37	1.56	0.02	0.00744	0.02

Note: "<0.001" means there is no SAR value or the SAR is too low to be measured.

4.7.5 SAR Measurement Variability

According to KDB 865664 D01, SAR measurement variability was assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. Alternatively, if the highest measured SAR for both head and body tissue-equivalent media are ≤ 1.45 W/kg and the ratio of these highest SAR values, i.e., largest divided by smallest value, is ≤ 1.10 , the highest SAR configuration for either head or body tissue-equivalent medium may be used to perform the repeated measurement. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR repeated measurement procedure:

1. When the highest measured SAR is < 0.80 W/kg, repeated measurement is not required.
2. When the highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
3. If the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 , or when the original or repeated measurement is ≥ 1.45 W/kg, perform a second repeated measurement.
4. If the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 , and the original, first or second repeated measurement is ≥ 1.5 W/kg, perform a third repeated measurement.

Band	Mode	Test Position	Ch.	Original Measured SAR-1g (W/kg)	1st Repeated SAR-1g (W/kg)	L/S Ratio	2nd Repeated SAR-1g (W/kg)	L/S Ratio	3rd Repeated SAR-1g (W/kg)	L/S Ratio
WCDMA II	RMC12.2K	Left Cheek	9400	1.07	1.06	1.01	N/A	N/A	N/A	N/A
WCDMA IV	RMC12.2K	Left Cheek	1513	1.01	0.997	1.01	N/A	N/A	N/A	N/A
LTE 2	QPSK20M	Left Cheek	19100	1.14	1.12	1.02	N/A	N/A	N/A	N/A
LTE 66	QPSK20M	Left Cheek	132572	1.09	1.08	1.01	N/A	N/A	N/A	N/A
LTE 30	QPSK10M	Rear Face	27710	1.04	1.02	1.02	N/A	N/A	N/A	N/A
LTE 66	QPSK20M	Front Face	132072	0.913	0.901	1.01	N/A	N/A	N/A	N/A
WLAN5G	802.11a	Rear Face	161	0.921	0.911	1.01	N/A	N/A	N/A	N/A

4.7.6 Simultaneous Multi-band Transmission Evaluation

<Possibilities of Simultaneous Transmission>

The simultaneous transmission possibilities for this device are listed as below.

Simultaneous TX Combination	Capable Transmit Configurations	Head Exposure Condition	Body-worn Exposure Condition	Hotspot Exposure Condition
1	WWAN + WLAN	Yes	Yes	Yes
2	WWAN + BT	Yes	Yes	Yes

Note :

1. The WLAN 2.4G and WLAN 5G cannot transmit simultaneously.
2. The WLAN and Bluetooth cannot transmit simultaneously.

<SAR Summation Analysis>

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna. When the sum of SAR_{1g} of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit (SAR_{1g} 1.6 W/kg), the simultaneous transmission SAR is not required. When the sum of SAR_{1g} is greater than the SAR limit (SAR_{1g} 1.6 W/kg), SAR test exclusion is determined by the SPLSR.

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No.	Conditions (SAR1 + SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
1	GSM850 + WLAN (DTS)	Head	Right Cheek	0.40	0.25	0.65	Σ SAR < 1.6, Not required
			Right Tilted	0.30	0.09	0.39	Σ SAR < 1.6, Not required
			Left Cheek	0.46	0.10	0.56	Σ SAR < 1.6, Not required
			Left Tilted	0.30	0.03	0.33	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.47	0.05	0.52	Σ SAR < 1.6, Not required
			Rear Face	0.56	0.20	0.76	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.47	0.05	0.52	Σ SAR < 1.6, Not required
			Rear Face	0.56	0.20	0.76	Σ SAR < 1.6, Not required
			Left Side	0.00	0.14	0.14	Σ SAR < 1.6, Not required
			Right Side	0.22	0.00	0.22	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.40	0.00	0.40	Σ SAR < 1.6, Not required
2	GSM850 + WLAN (NII)	Head	Right Cheek	0.40	0.19	0.59	Σ SAR < 1.6, Not required
			Right Tilted	0.30	0.02	0.32	Σ SAR < 1.6, Not required
			Left Cheek	0.46	0.09	0.55	Σ SAR < 1.6, Not required
			Left Tilted	0.30	0.00	0.30	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.47	0.00	0.47	Σ SAR < 1.6, Not required
			Rear Face	0.56	1.01	1.57	Σ SAR < 1.6, Not required
3	GSM850 + BT (DSS)	Head	Right Cheek	0.40	0.03	0.43	Σ SAR < 1.6, Not required
			Right Tilted	0.30	0.01	0.31	Σ SAR < 1.6, Not required
			Left Cheek	0.46	0.01	0.47	Σ SAR < 1.6, Not required
			Left Tilted	0.30	0.00	0.30	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.47	0.00	0.47	Σ SAR < 1.6, Not required
			Rear Face	0.56	0.02	0.58	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.47	0.00	0.47	Σ SAR < 1.6, Not required
			Rear Face	0.56	0.02	0.58	Σ SAR < 1.6, Not required
			Left Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Right Side	0.22	0.00	0.22	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.40	0.00	0.40	Σ SAR < 1.6, Not required

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No.	Conditions (SAR1 + SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
4	GSM1900 + WLAN (DTS)	Head	Right Cheek	0.26	0.25	0.51	Σ SAR < 1.6, Not required
			Right Tilted	0.17	0.09	0.26	Σ SAR < 1.6, Not required
			Left Cheek	0.82	0.10	0.92	Σ SAR < 1.6, Not required
			Left Tilted	0.23	0.03	0.26	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.58	0.05	0.63	Σ SAR < 1.6, Not required
			Rear Face	0.41	0.20	0.61	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.58	0.05	0.63	Σ SAR < 1.6, Not required
			Rear Face	0.41	0.20	0.61	Σ SAR < 1.6, Not required
			Left Side	0.47	0.14	0.61	Σ SAR < 1.6, Not required
			Right Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.46	0.00	0.46	Σ SAR < 1.6, Not required
5	GSM1900 + WLAN (NII)	Head	Right Cheek	0.26	0.19	0.45	Σ SAR < 1.6, Not required
			Right Tilted	0.17	0.02	0.19	Σ SAR < 1.6, Not required
			Left Cheek	0.82	0.09	0.91	Σ SAR < 1.6, Not required
			Left Tilted	0.23	0.00	0.23	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.58	0.00	0.58	Σ SAR < 1.6, Not required
			Rear Face	0.41	1.01	1.42	Σ SAR < 1.6, Not required
6	GSM1900 + BT (DSS)	Head	Right Cheek	0.26	0.03	0.29	Σ SAR < 1.6, Not required
			Right Tilted	0.17	0.01	0.18	Σ SAR < 1.6, Not required
			Left Cheek	0.82	0.01	0.83	Σ SAR < 1.6, Not required
			Left Tilted	0.23	0.00	0.23	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.58	0.00	0.58	Σ SAR < 1.6, Not required
			Rear Face	0.41	0.02	0.43	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.58	0.00	0.58	Σ SAR < 1.6, Not required
			Rear Face	0.41	0.02	0.43	Σ SAR < 1.6, Not required
			Left Side	0.47	0.00	0.47	Σ SAR < 1.6, Not required
			Right Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.46	0.00	0.46	Σ SAR < 1.6, Not required

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No.	Conditions (SAR1 + SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
7	WCDMA II + WLAN (DTS)	Head	Right Cheek	0.45	0.25	0.70	Σ SAR < 1.6, Not required
			Right Tilted	0.28	0.09	0.37	Σ SAR < 1.6, Not required
			Left Cheek	1.33	0.10	1.43	Σ SAR < 1.6, Not required
			Left Tilted	0.42	0.03	0.45	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.75	0.05	0.80	Σ SAR < 1.6, Not required
			Rear Face	0.55	0.20	0.75	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.75	0.05	0.80	Σ SAR < 1.6, Not required
			Rear Face	0.55	0.20	0.75	Σ SAR < 1.6, Not required
			Left Side	0.71	0.14	0.85	Σ SAR < 1.6, Not required
			Right Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.53	0.00	0.53	Σ SAR < 1.6, Not required
8	WCDMA II + WLAN (NII)	Head	Right Cheek	0.45	0.19	0.64	Σ SAR < 1.6, Not required
			Right Tilted	0.28	0.02	0.30	Σ SAR < 1.6, Not required
			Left Cheek	1.33	0.09	1.42	Σ SAR < 1.6, Not required
			Left Tilted	0.42	0.00	0.42	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.75	0.00	0.75	Σ SAR < 1.6, Not required
			Rear Face	0.55	1.01	1.56	Σ SAR < 1.6, Not required
9	WCDMA II + BT (DSS)	Head	Right Cheek	0.45	0.03	0.48	Σ SAR < 1.6, Not required
			Right Tilted	0.28	0.01	0.29	Σ SAR < 1.6, Not required
			Left Cheek	1.33	0.01	1.34	Σ SAR < 1.6, Not required
			Left Tilted	0.42	0.00	0.42	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.75	0.00	0.75	Σ SAR < 1.6, Not required
			Rear Face	0.55	0.02	0.57	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.75	0.00	0.75	Σ SAR < 1.6, Not required
			Rear Face	0.55	0.02	0.57	Σ SAR < 1.6, Not required
			Left Side	0.71	0.00	0.71	Σ SAR < 1.6, Not required
			Right Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.53	0.00	0.53	Σ SAR < 1.6, Not required

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No.	Conditions (SAR1 + SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
10	WCDMA IV + WLAN (DTS)	Head	Right Cheek	0.34	0.25	0.59	Σ SAR < 1.6, Not required
			Right Tilted	0.22	0.09	0.31	Σ SAR < 1.6, Not required
			Left Cheek	1.29	0.10	1.39	Σ SAR < 1.6, Not required
			Left Tilted	0.23	0.03	0.26	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.92	0.05	0.97	Σ SAR < 1.6, Not required
			Rear Face	0.52	0.20	0.72	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.92	0.05	0.97	Σ SAR < 1.6, Not required
			Rear Face	0.52	0.20	0.72	Σ SAR < 1.6, Not required
			Left Side	0.82	0.14	0.96	Σ SAR < 1.6, Not required
			Right Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.07	0.00	0.07	Σ SAR < 1.6, Not required
11	WCDMA IV + WLAN (NII)	Head	Right Cheek	0.34	0.19	0.53	Σ SAR < 1.6, Not required
			Right Tilted	0.22	0.02	0.24	Σ SAR < 1.6, Not required
			Left Cheek	1.29	0.09	1.38	Σ SAR < 1.6, Not required
			Left Tilted	0.23	0.00	0.23	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.92	0.00	0.92	Σ SAR < 1.6, Not required
			Rear Face	0.52	1.01	1.53	Σ SAR < 1.6, Not required
12	WCDMA IV + BT (DSS)	Head	Right Cheek	0.34	0.03	0.37	Σ SAR < 1.6, Not required
			Right Tilted	0.22	0.01	0.23	Σ SAR < 1.6, Not required
			Left Cheek	1.29	0.01	1.30	Σ SAR < 1.6, Not required
			Left Tilted	0.23	0.00	0.23	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.92	0.00	0.92	Σ SAR < 1.6, Not required
			Rear Face	0.52	0.02	0.54	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.92	0.00	0.92	Σ SAR < 1.6, Not required
			Rear Face	0.52	0.02	0.54	Σ SAR < 1.6, Not required
			Left Side	0.82	0.00	0.82	Σ SAR < 1.6, Not required
			Right Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.07	0.00	0.07	Σ SAR < 1.6, Not required



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No.	Conditions (SAR1 + SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
13	WCDMA V + WLAN (DTS)	Head	Right Cheek	0.51	0.25	0.76	Σ SAR < 1.6, Not required
			Right Tilted	0.34	0.09	0.43	Σ SAR < 1.6, Not required
			Left Cheek	0.60	0.10	0.70	Σ SAR < 1.6, Not required
			Left Tilted	0.31	0.03	0.34	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.57	0.05	0.62	Σ SAR < 1.6, Not required
			Rear Face	0.46	0.20	0.66	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.57	0.05	0.62	Σ SAR < 1.6, Not required
			Rear Face	0.46	0.20	0.66	Σ SAR < 1.6, Not required
			Left Side	0.00	0.14	0.14	Σ SAR < 1.6, Not required
			Right Side	0.30	0.00	0.30	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.45	0.00	0.45	Σ SAR < 1.6, Not required
14	WCDMA V + WLAN (NII)	Head	Right Cheek	0.51	0.19	0.70	Σ SAR < 1.6, Not required
			Right Tilted	0.34	0.02	0.36	Σ SAR < 1.6, Not required
			Left Cheek	0.60	0.09	0.69	Σ SAR < 1.6, Not required
			Left Tilted	0.31	0.00	0.31	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.57	0.00	0.57	Σ SAR < 1.6, Not required
			Rear Face	0.46	1.01	1.47	Σ SAR < 1.6, Not required
15	WCDMA V + BT (DSS)	Head	Right Cheek	0.51	0.03	0.54	Σ SAR < 1.6, Not required
			Right Tilted	0.34	0.01	0.35	Σ SAR < 1.6, Not required
			Left Cheek	0.60	0.01	0.61	Σ SAR < 1.6, Not required
			Left Tilted	0.31	0.00	0.31	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.57	0.00	0.57	Σ SAR < 1.6, Not required
			Rear Face	0.46	0.02	0.48	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.57	0.00	0.57	Σ SAR < 1.6, Not required
			Rear Face	0.46	0.02	0.48	Σ SAR < 1.6, Not required
			Left Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Right Side	0.30	0.00	0.30	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.45	0.00	0.45	Σ SAR < 1.6, Not required

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No.	Conditions (SAR1 + SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
16	LTE 2 + WLAN (DTS)	Head	Right Cheek	0.41	0.25	0.66	Σ SAR < 1.6, Not required
			Right Tilted	0.24	0.09	0.33	Σ SAR < 1.6, Not required
			Left Cheek	1.19	0.10	1.29	Σ SAR < 1.6, Not required
			Left Tilted	0.36	0.03	0.39	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.66	0.05	0.71	Σ SAR < 1.6, Not required
			Rear Face	0.53	0.20	0.73	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.66	0.05	0.71	Σ SAR < 1.6, Not required
			Rear Face	0.53	0.20	0.73	Σ SAR < 1.6, Not required
			Left Side	0.56	0.14	0.70	Σ SAR < 1.6, Not required
			Right Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.48	0.00	0.48	Σ SAR < 1.6, Not required
17	LTE 2 + WLAN (NII)	Head	Right Cheek	0.41	0.19	0.60	Σ SAR < 1.6, Not required
			Right Tilted	0.24	0.02	0.26	Σ SAR < 1.6, Not required
			Left Cheek	1.19	0.09	1.28	Σ SAR < 1.6, Not required
			Left Tilted	0.36	0.00	0.36	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.66	0.00	0.66	Σ SAR < 1.6, Not required
			Rear Face	0.53	1.01	1.54	Σ SAR < 1.6, Not required
18	LTE 2 + BT (DSS)	Head	Right Cheek	0.41	0.03	0.44	Σ SAR < 1.6, Not required
			Right Tilted	0.24	0.01	0.25	Σ SAR < 1.6, Not required
			Left Cheek	1.19	0.01	1.20	Σ SAR < 1.6, Not required
			Left Tilted	0.36	0.00	0.36	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.66	0.00	0.66	Σ SAR < 1.6, Not required
			Rear Face	0.53	0.02	0.55	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.66	0.00	0.66	Σ SAR < 1.6, Not required
			Rear Face	0.53	0.02	0.55	Σ SAR < 1.6, Not required
			Left Side	0.56	0.00	0.56	Σ SAR < 1.6, Not required
			Right Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.48	0.00	0.48	Σ SAR < 1.6, Not required

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No.	Conditions (SAR1 + SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
19	LTE 5 + WLAN (DTS)	Head	Right Cheek	0.33	0.25	0.58	Σ SAR < 1.6, Not required
			Right Tilted	0.18	0.09	0.27	Σ SAR < 1.6, Not required
			Left Cheek	0.40	0.10	0.50	Σ SAR < 1.6, Not required
			Left Tilted	0.19	0.03	0.22	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.50	0.05	0.55	Σ SAR < 1.6, Not required
			Rear Face	0.51	0.20	0.71	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.50	0.05	0.55	Σ SAR < 1.6, Not required
			Rear Face	0.51	0.20	0.71	Σ SAR < 1.6, Not required
			Left Side	0.00	0.14	0.14	Σ SAR < 1.6, Not required
			Right Side	0.20	0.00	0.20	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.41	0.00	0.41	Σ SAR < 1.6, Not required
20	LTE 5 + WLAN (NII)	Head	Right Cheek	0.33	0.19	0.52	Σ SAR < 1.6, Not required
			Right Tilted	0.18	0.02	0.20	Σ SAR < 1.6, Not required
			Left Cheek	0.40	0.09	0.49	Σ SAR < 1.6, Not required
			Left Tilted	0.19	0.00	0.19	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.50	0.00	0.50	Σ SAR < 1.6, Not required
			Rear Face	0.51	1.01	1.52	Σ SAR < 1.6, Not required
21	LTE 5 + BT (DSS)	Head	Right Cheek	0.33	0.03	0.36	Σ SAR < 1.6, Not required
			Right Tilted	0.18	0.01	0.19	Σ SAR < 1.6, Not required
			Left Cheek	0.40	0.01	0.41	Σ SAR < 1.6, Not required
			Left Tilted	0.19	0.00	0.19	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.50	0.00	0.50	Σ SAR < 1.6, Not required
			Rear Face	0.51	0.02	0.53	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.50	0.00	0.50	Σ SAR < 1.6, Not required
			Rear Face	0.51	0.02	0.53	Σ SAR < 1.6, Not required
			Left Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Right Side	0.20	0.00	0.20	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.41	0.00	0.41	Σ SAR < 1.6, Not required



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No.	Conditions (SAR1 + SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
22	LTE 7 + WLAN (DTS)	Head	Right Cheek	0.30	0.25	0.55	Σ SAR < 1.6, Not required
			Right Tilted	0.22	0.09	0.31	Σ SAR < 1.6, Not required
			Left Cheek	0.66	0.10	0.76	Σ SAR < 1.6, Not required
			Left Tilted	0.11	0.03	0.14	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.44	0.05	0.49	Σ SAR < 1.6, Not required
			Rear Face	0.56	0.20	0.76	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.44	0.05	0.49	Σ SAR < 1.6, Not required
			Rear Face	0.56	0.20	0.76	Σ SAR < 1.6, Not required
			Left Side	0.65	0.14	0.79	Σ SAR < 1.6, Not required
			Right Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.16	0.00	0.16	Σ SAR < 1.6, Not required
23	LTE 7 + WLAN (NII)	Head	Right Cheek	0.30	0.19	0.49	Σ SAR < 1.6, Not required
			Right Tilted	0.22	0.02	0.24	Σ SAR < 1.6, Not required
			Left Cheek	0.66	0.09	0.75	Σ SAR < 1.6, Not required
			Left Tilted	0.11	0.00	0.11	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.44	0.00	0.44	Σ SAR < 1.6, Not required
			Rear Face	0.56	1.01	1.57	Σ SAR < 1.6, Not required
24	LTE 7 + BT (DSS)	Head	Right Cheek	0.30	0.03	0.33	Σ SAR < 1.6, Not required
			Right Tilted	0.22	0.01	0.23	Σ SAR < 1.6, Not required
			Left Cheek	0.66	0.01	0.67	Σ SAR < 1.6, Not required
			Left Tilted	0.11	0.00	0.11	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.44	0.00	0.44	Σ SAR < 1.6, Not required
			Rear Face	0.56	0.02	0.58	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.44	0.00	0.44	Σ SAR < 1.6, Not required
			Rear Face	0.56	0.02	0.58	Σ SAR < 1.6, Not required
			Left Side	0.65	0.00	0.65	Σ SAR < 1.6, Not required
			Right Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.16	0.00	0.16	Σ SAR < 1.6, Not required

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No.	Conditions (SAR1 + SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
25	LTE 12 + WLAN (DTS)	Head	Right Cheek	0.30	0.25	0.55	Σ SAR < 1.6, Not required
			Right Tilted	0.16	0.09	0.25	Σ SAR < 1.6, Not required
			Left Cheek	0.20	0.10	0.30	Σ SAR < 1.6, Not required
			Left Tilted	0.11	0.03	0.14	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.40	0.05	0.45	Σ SAR < 1.6, Not required
			Rear Face	0.49	0.20	0.69	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.40	0.05	0.45	Σ SAR < 1.6, Not required
			Rear Face	0.49	0.20	0.69	Σ SAR < 1.6, Not required
			Left Side	0.00	0.14	0.14	Σ SAR < 1.6, Not required
			Right Side	0.29	0.00	0.29	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.19	0.00	0.19	Σ SAR < 1.6, Not required
26	LTE 12 + WLAN (NII)	Head	Right Cheek	0.30	0.19	0.49	Σ SAR < 1.6, Not required
			Right Tilted	0.16	0.02	0.18	Σ SAR < 1.6, Not required
			Left Cheek	0.20	0.09	0.29	Σ SAR < 1.6, Not required
			Left Tilted	0.11	0.00	0.11	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.40	0.00	0.40	Σ SAR < 1.6, Not required
			Rear Face	0.49	1.01	1.50	Σ SAR < 1.6, Not required
27	LTE 12 + BT (DSS)	Head	Right Cheek	0.30	0.03	0.33	Σ SAR < 1.6, Not required
			Right Tilted	0.16	0.01	0.17	Σ SAR < 1.6, Not required
			Left Cheek	0.20	0.01	0.21	Σ SAR < 1.6, Not required
			Left Tilted	0.11	0.00	0.11	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.40	0.00	0.40	Σ SAR < 1.6, Not required
			Rear Face	0.49	0.02	0.51	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.40	0.00	0.40	Σ SAR < 1.6, Not required
			Rear Face	0.49	0.02	0.51	Σ SAR < 1.6, Not required
			Left Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Right Side	0.29	0.00	0.29	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.19	0.00	0.19	Σ SAR < 1.6, Not required

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No.	Conditions (SAR1 + SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
28	LTE 14 + WLAN (DTS)	Head	Right Cheek	0.31	0.25	0.56	Σ SAR < 1.6, Not required
			Right Tilted	0.19	0.09	0.28	Σ SAR < 1.6, Not required
			Left Cheek	0.32	0.10	0.42	Σ SAR < 1.6, Not required
			Left Tilted	0.20	0.03	0.23	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.44	0.05	0.49	Σ SAR < 1.6, Not required
			Rear Face	0.51	0.20	0.71	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.44	0.05	0.49	Σ SAR < 1.6, Not required
			Rear Face	0.51	0.20	0.71	Σ SAR < 1.6, Not required
			Left Side	0.00	0.14	0.14	Σ SAR < 1.6, Not required
			Right Side	0.30	0.00	0.30	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.38	0.00	0.38	Σ SAR < 1.6, Not required
29	LTE 14 + WLAN (NII)	Head	Right Cheek	0.31	0.19	0.50	Σ SAR < 1.6, Not required
			Right Tilted	0.19	0.02	0.21	Σ SAR < 1.6, Not required
			Left Cheek	0.32	0.09	0.41	Σ SAR < 1.6, Not required
			Left Tilted	0.20	0.00	0.20	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.44	0.00	0.44	Σ SAR < 1.6, Not required
			Rear Face	0.51	1.01	1.52	Σ SAR < 1.6, Not required
30	LTE 14 + BT (DSS)	Head	Right Cheek	0.31	0.03	0.34	Σ SAR < 1.6, Not required
			Right Tilted	0.19	0.01	0.20	Σ SAR < 1.6, Not required
			Left Cheek	0.32	0.01	0.33	Σ SAR < 1.6, Not required
			Left Tilted	0.20	0.00	0.20	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.44	0.00	0.44	Σ SAR < 1.6, Not required
			Rear Face	0.51	0.02	0.53	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.44	0.00	0.44	Σ SAR < 1.6, Not required
			Rear Face	0.51	0.02	0.53	Σ SAR < 1.6, Not required
			Left Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Right Side	0.30	0.00	0.30	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.38	0.00	0.38	Σ SAR < 1.6, Not required

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No.	Conditions (SAR1 + SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
31	LTE 30 + WLAN (DTS)	Head	Right Cheek	0.12	0.25	0.37	Σ SAR < 1.6, Not required
			Right Tilted	0.08	0.09	0.17	Σ SAR < 1.6, Not required
			Left Cheek	0.23	0.10	0.33	Σ SAR < 1.6, Not required
			Left Tilted	0.07	0.03	0.10	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.30	0.05	0.35	Σ SAR < 1.6, Not required
			Rear Face	1.12	0.20	1.32	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.30	0.05	0.35	Σ SAR < 1.6, Not required
			Rear Face	1.12	0.20	1.32	Σ SAR < 1.6, Not required
			Left Side	1.07	0.14	1.21	Σ SAR < 1.6, Not required
			Right Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.15	0.00	0.15	Σ SAR < 1.6, Not required
32	LTE 30 + WLAN (NII)	Head	Right Cheek	0.12	0.19	0.31	Σ SAR < 1.6, Not required
			Right Tilted	0.08	0.02	0.10	Σ SAR < 1.6, Not required
			Left Cheek	0.23	0.09	0.32	Σ SAR < 1.6, Not required
			Left Tilted	0.07	0.00	0.07	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.30	0.00	0.30	Σ SAR < 1.6, Not required
			Rear Face	1.12	1.01	2.13	Analyzed as below
33	LTE 30 + BT (DSS)	Head	Right Cheek	0.12	0.03	0.15	Σ SAR < 1.6, Not required
			Right Tilted	0.08	0.01	0.09	Σ SAR < 1.6, Not required
			Left Cheek	0.23	0.01	0.24	Σ SAR < 1.6, Not required
			Left Tilted	0.07	0.00	0.07	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.30	0.00	0.30	Σ SAR < 1.6, Not required
			Rear Face	1.12	0.02	1.14	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.30	0.00	0.30	Σ SAR < 1.6, Not required
			Rear Face	1.12	0.02	1.14	Σ SAR < 1.6, Not required
			Left Side	1.07	0.00	1.07	Σ SAR < 1.6, Not required
			Right Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.15	0.00	0.15	Σ SAR < 1.6, Not required

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No.	Conditions (SAR1 + SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
34	LTE 66 + WLAN (DTS)	Head	Right Cheek	0.34	0.25	0.59	Σ SAR < 1.6, Not required
			Right Tilted	0.24	0.09	0.33	Σ SAR < 1.6, Not required
			Left Cheek	1.19	0.10	1.29	Σ SAR < 1.6, Not required
			Left Tilted	0.22	0.03	0.25	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.94	0.05	0.99	Σ SAR < 1.6, Not required
			Rear Face	0.54	0.20	0.74	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.94	0.05	0.99	Σ SAR < 1.6, Not required
			Rear Face	0.54	0.20	0.74	Σ SAR < 1.6, Not required
			Left Side	0.89	0.14	1.03	Σ SAR < 1.6, Not required
			Right Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.08	0.00	0.08	Σ SAR < 1.6, Not required
35	LTE 66 + WLAN (NII)	Head	Right Cheek	0.34	0.19	0.53	Σ SAR < 1.6, Not required
			Right Tilted	0.24	0.02	0.26	Σ SAR < 1.6, Not required
			Left Cheek	1.19	0.09	1.28	Σ SAR < 1.6, Not required
			Left Tilted	0.22	0.00	0.22	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.94	0.00	0.94	Σ SAR < 1.6, Not required
			Rear Face	0.54	1.01	1.55	Σ SAR < 1.6, Not required
36	LTE 66 + BT (DSS)	Head	Right Cheek	0.34	0.03	0.37	Σ SAR < 1.6, Not required
			Right Tilted	0.24	0.01	0.25	Σ SAR < 1.6, Not required
			Left Cheek	1.19	0.01	1.20	Σ SAR < 1.6, Not required
			Left Tilted	0.22	0.00	0.22	Σ SAR < 1.6, Not required
		Body-Worn	Front Face	0.94	0.00	0.94	Σ SAR < 1.6, Not required
			Rear Face	0.54	0.02	0.56	Σ SAR < 1.6, Not required
		Hotspot	Front Face	0.94	0.00	0.94	Σ SAR < 1.6, Not required
			Rear Face	0.54	0.02	0.56	Σ SAR < 1.6, Not required
			Left Side	0.89	0.00	0.89	Σ SAR < 1.6, Not required
			Right Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Top Side	0.00	0.00	0.00	Σ SAR < 1.6, Not required
			Bottom Side	0.08	0.00	0.08	Σ SAR < 1.6, Not required

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<SAR to Peak Location Separation Ratio Analysis>

The simultaneous transmitting antennas in each operating mode and exposure condition combination are considered one pair at a time to determine the SPLSR. When SAR is measured for both antennas in the pair, the peak location separation distance is computed by the following formula.

$$\text{Peak Location Separation Distance} = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2}$$

Where (x_1, y_1, z_1) and (x_2, y_2, z_2) are the coordinates of the extrapolated peak SAR locations in the area or zoom scans.

When standalone test exclusion applies, SAR is estimated; the peak location is assumed to be at the feed-point or geometric center of the antenna. Due to curvatures on the SAM phantom, when SAR is estimated for one of the antennas in an antenna pair, the measured peak SAR location will be translated onto the test device to determine the peak location separation for the antenna pair.

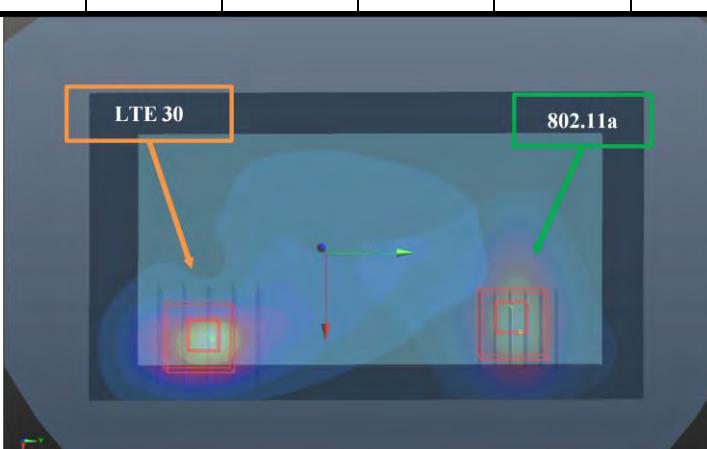
The SPLSR is determined by the following formula.

$$\text{SPLSR} = \frac{(\text{SAR}_1 + \text{SAR}_2)^{1.5}}{R_i}$$

Where SAR_1 and SAR_2 are the highest reported or estimated SAR for each antenna in the pair, and R_i is the separation distance between the peak SAR locations for the antenna pair in mm.

When the SPLSR is ≤ 0.04 , the simultaneous transmission SAR is not required. Otherwise, the enlarged zoom scan and volume scan post-processing procedures will be performed.

Conditions	Exposure Condition	Test Position	SAR Value (W/kg)	Coordinates			Peak Location Separation Distance (R_i , mm)	SPLSR	Simultaneous Transmission SAR Test
				x	y	z			
LTE 30_QPSK10M_Ch27710	Body	Rear Face	1.12	28.4	-53.2	-3.33	99.9	0.03	SPLSR ≤ 0.04 , Not required
802.11a_Ch161			1.01	22.5	46.5	-0.46			



Test Engineer : Willy Chang, and Kevin Yao



5. Calibration of Test Equipment

Equipment	Manufacturer	Model	SN	Cal. Date	Cal. Interval
System Validation Dipole	SPEAG	D750V3	1132	Dec. 18, 2017	1 Year
System Validation Dipole	SPEAG	D835V2	4d120	Jun. 20, 2018	1 Year
System Validation Dipole	SPEAG	D1750V2	1023	Jun. 11, 2018	1 Year
System Validation Dipole	SPEAG	D1900V2	5d036	Jan. 18, 2018	1 Year
System Validation Dipole	SPEAG	D2300V2	1004	Jan. 17, 2018	1 Year
System Validation Dipole	SPEAG	D2450V2	869	Jun. 19, 2018	1 Year
System Validation Dipole	SPEAG	D2600V2	1058	Jun. 19, 2018	1 Year
System Validation Dipole	SPEAG	D5GHzV2	1019	Mar. 22, 2018	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	3898	Jun. 26, 2018	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	3971	Mar. 26, 2018	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	3650	Jul. 27, 2018	1 Year
Data Acquisition Electronics	SPEAG	DAE4	1232	May. 22, 2018	1 Year
Data Acquisition Electronics	SPEAG	DAE4	1431	Mar. 16, 2018	1 Year
Data Acquisition Electronics	SPEAG	DAE4	1277	Jan. 18, 2018	1 Year
Wireless Communication Test Set	Agilent	E5515C	MY50266628	Dec. 06, 2017	1 Year
Radio Communication Analyzer	Anritsu	MT8820C	6201010285	Aug. 06, 2018	1 Year
Universal Radio Communication Tester	Anritsu	MT8821C	6201502978	Jul. 20, 2018	1 Year
Spectrum Analyzer	R&S	FSL6	102006	Mar. 23, 2018	1 Year
ENA Series Network Analyzer	Agilent	E5071C	MY46214281	Jun. 08, 2018	1 Year
MXG Analog Signal Generator	Agilent	N5181A	MY50143868	Jul. 03, 2018	1 Year
Vector Signal Generator	Anritsu	MG3710A	6201599977	Mar. 16, 2018	1 Year
Power Meter	Anritsu	ML2495A	1218009	Jul. 03, 2018	1 Year
Power Sensor	Anritsu	MA2411B	1207252	Jul. 03, 2018	1 Year
Thermometer	YFE	YF-160A	130504591	Mar. 23, 2018	1 Year

6. Measurement Uncertainty

Source of Uncertainty	Uncertainty (± %)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (± %, 1g)	Standard Uncertainty (± %, 10g)	Vi
Measurement System								
Probe Calibration	6.0	Normal	1	1	1	6.0	6.0	∞
Axial Isotropy	4.7	Rectangular	$\sqrt{3}$	$\sqrt{0.5}$	$\sqrt{0.5}$	1.9	1.9	∞
Hemispherical Isotropy	9.6	Rectangular	$\sqrt{3}$	$\sqrt{0.5}$	$\sqrt{0.5}$	3.9	3.9	∞
Boundary Effect	1.0	Rectangular	$\sqrt{3}$	1	1	0.6	0.6	∞
Linearity	4.7	Rectangular	$\sqrt{3}$	1	1	2.7	2.7	∞
Detection Limits	0.25	Rectangular	$\sqrt{3}$	1	1	0.14	0.14	∞
Probe Modulation Response	3.5	Rectangular	$\sqrt{3}$	1	1	2.0	2.0	∞
Readout Electronics	0.3	Normal	1	1	1	0.3	0.3	∞
Response Time	0.0	Rectangular	$\sqrt{3}$	1	1	0.0	0.0	∞
Integration Time	1.7	Rectangular	$\sqrt{3}$	1	1	1.0	1.0	∞
RF Ambient Conditions – Noise	3.0	Rectangular	$\sqrt{3}$	1	1	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	$\sqrt{3}$	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	0.4	Rectangular	$\sqrt{3}$	1	1	0.2	0.2	∞
Probe Positioning with Respect to Phantom	2.9	Rectangular	$\sqrt{3}$	1	1	1.7	1.7	∞
Post-processing	2.0	Rectangular	$\sqrt{3}$	1	1	1.2	1.2	∞
Test Sample Related								
Test Sample Positioning	3.9 / 2.06	Normal	1	1	1	3.9	2.1	35
Device Holder Uncertainty	2.9 / 4.1	Normal	1	1	1	2.9	4.1	11
Power Drift of Measurement	5.0	Rectangular	$\sqrt{3}$	1	1	2.9	2.9	∞
Power Scaling	0.0	Rectangular	$\sqrt{3}$	1	1	0.0	0.0	∞
Phantom and Setup								
Phantom Uncertainty (Shape and Thickness Tolerances)	6.1	Rectangular	$\sqrt{3}$	1	1	3.5	3.5	∞
Liquid Conductivity (Temperature Uncertainty)	3.24	Rectangular	$\sqrt{3}$	0.78	0.71	1.5	1.3	∞
Liquid Conductivity (Measured)	2.88	Normal	1	0.78	0.71	2.2	2.0	43
Liquid Permittivity (Temperature Uncertainty)	1.13	Rectangular	$\sqrt{3}$	0.23	0.26	0.2	0.2	∞
Liquid Permittivity (Measured)	2.50	Normal	1	0.23	0.26	0.6	0.7	54
Combined Standard Uncertainty							$\pm 11.4 \%$	$\pm 11.2 \%$
Expanded Uncertainty (K=2)							$\pm 22.8 \%$	$\pm 22.4 \%$

Head SAR Uncertainty Budget for Frequency Range of 300 MHz to 3 GHz



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Source of Uncertainty	Uncertainty (± %)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (± %, 1g)	Standard Uncertainty (± %, 10g)	Vi
Measurement System								
Probe Calibration	6.55	Normal	1	1	1	6.55	6.55	∞
Axial Isotropy	4.7	Rectangular	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
Hemispherical Isotropy	9.6	Rectangular	$\sqrt{3}$	0.7	0.7	3.9	3.9	∞
Boundary Effect	2.0	Rectangular	$\sqrt{3}$	1	1	1.2	1.2	∞
Linearity	4.7	Rectangular	$\sqrt{3}$	1	1	2.7	2.7	∞
Detection Limits	0.25	Rectangular	$\sqrt{3}$	1	1	0.14	0.14	∞
Probe Modulation Response	3.5	Rectangular	$\sqrt{3}$	1	1	2.0	2.0	∞
Readout Electronics	0.3	Normal	1	1	1	0.3	0.3	∞
Response Time	0.0	Rectangular	$\sqrt{3}$	1	1	0.0	0.0	∞
Integration Time	1.7	Rectangular	$\sqrt{3}$	1	1	1.0	1.0	∞
RF Ambient Conditions – Noise	3.0	Rectangular	$\sqrt{3}$	1	1	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	$\sqrt{3}$	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	0.4	Rectangular	$\sqrt{3}$	1	1	0.2	0.2	∞
Probe Positioning with Respect to Phantom	6.7	Rectangular	$\sqrt{3}$	1	1	3.9	3.9	∞
Post-processing	4.0	Rectangular	$\sqrt{3}$	1	1	2.3	2.3	∞
Test Sample Related								
Test Sample Positioning	3.9 / 2.06	Normal	1	1	1	3.9	2.1	35
Device Holder Uncertainty	2.9 / 4.1	Normal	1	1	1	2.9	4.1	11
Power Drift of Measurement	5.0	Rectangular	$\sqrt{3}$	1	1	2.9	2.9	∞
Power Scaling	0.0	Rectangular	$\sqrt{3}$	1	1	0.0	0.0	∞
Phantom and Setup								
Phantom Uncertainty (Shape and Thickness Tolerances)	6.6	Rectangular	$\sqrt{3}$	1	1	3.8	3.8	∞
Liquid Conductivity (Temperature Uncertainty)	3.24	Rectangular	$\sqrt{3}$	0.78	0.71	1.5	1.3	∞
Liquid Conductivity (Measured)	2.88	Normal	1	0.78	0.71	2.2	2.0	43
Liquid Permittivity (Temperature Uncertainty)	1.13	Rectangular	$\sqrt{3}$	0.23	0.26	0.2	0.2	∞
Liquid Permittivity (Measured)	2.50	Normal	1	0.23	0.26	0.6	0.7	54
Combined Standard Uncertainty							± 12.5 %	± 12.3 %
Expanded Uncertainty (K=2)							± 25.0 %	± 24.6 %

Head SAR Uncertainty Budget for Frequency Range of 3 GHz to 6 GHz



FCC SAR Test Report

BUREAU
VERITAS

Source of Uncertainty	Uncertainty (± %)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (± %, 1g)	Standard Uncertainty (± %, 10g)	Vi
Measurement System								
Probe Calibration	6.0	Normal	1	1	1	6.0	6.0	∞
Axial Isotropy	4.7	Rectangular	$\sqrt{3}$	$\sqrt{0.5}$	$\sqrt{0.5}$	1.9	1.9	∞
Hemispherical Isotropy	9.6	Rectangular	$\sqrt{3}$	$\sqrt{0.5}$	$\sqrt{0.5}$	3.9	3.9	∞
Boundary Effect	1.0	Rectangular	$\sqrt{3}$	1	1	0.6	0.6	∞
Linearity	4.7	Rectangular	$\sqrt{3}$	1	1	2.7	2.7	∞
Detection Limits	0.25	Rectangular	$\sqrt{3}$	1	1	0.14	0.14	∞
Probe Modulation Response	3.5	Rectangular	$\sqrt{3}$	1	1	2.0	2.0	∞
Readout Electronics	0.3	Normal	1	1	1	0.3	0.3	∞
Response Time	0.0	Rectangular	$\sqrt{3}$	1	1	0.0	0.0	∞
Integration Time	1.7	Rectangular	$\sqrt{3}$	1	1	1.0	1.0	∞
RF Ambient Conditions – Noise	3.0	Rectangular	$\sqrt{3}$	1	1	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	$\sqrt{3}$	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	0.4	Rectangular	$\sqrt{3}$	1	1	0.2	0.2	∞
Probe Positioning with Respect to Phantom	2.9	Rectangular	$\sqrt{3}$	1	1	1.7	1.7	∞
Post-processing	2.0	Rectangular	$\sqrt{3}$	1	1	1.2	1.2	∞
Test Sample Related								
Test Sample Positioning	4.38 / 1.35	Normal	1	1	1	4.4	1.4	29
Device Holder Uncertainty	2.9 / 4.1	Normal	1	1	1	2.9	4.1	11
Power Drift of Measurement	5.0	Rectangular	$\sqrt{3}$	1	1	2.9	2.9	∞
Power Scaling	0.0	Rectangular	$\sqrt{3}$	1	1	0.0	0.0	∞
Phantom and Setup								
Phantom Uncertainty (Shape and Thickness Tolerances)	7.2	Rectangular	$\sqrt{3}$	1	1	4.2	4.2	∞
Liquid Conductivity (Temperature Uncertainty)	3.24	Rectangular	$\sqrt{3}$	0.78	0.71	1.5	1.3	∞
Liquid Conductivity (Measured)	2.88	Normal	1	0.78	0.71	2.2	2.0	43
Liquid Permittivity (Temperature Uncertainty)	1.13	Rectangular	$\sqrt{3}$	0.23	0.26	0.2	0.2	∞
Liquid Permittivity (Measured)	2.50	Normal	1	0.23	0.26	0.6	0.7	54
Combined Standard Uncertainty							± 11.8 %	± 11.3 %
Expanded Uncertainty (K=2)							± 23.6 %	± 22.6 %

Body SAR Uncertainty Budget for Frequency Range of 300 MHz to 3 GHz



FCC SAR Test Report

BUREAU
VERITAS

Source of Uncertainty	Uncertainty (± %)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (± %, 1g)	Standard Uncertainty (± %, 10g)	Vi
Measurement System								
Probe Calibration	6.55	Normal	1	1	1	6.55	6.55	∞
Axial Isotropy	4.7	Rectangular	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
Hemispherical Isotropy	9.6	Rectangular	$\sqrt{3}$	0.7	0.7	3.9	3.9	∞
Boundary Effect	2.0	Rectangular	$\sqrt{3}$	1	1	1.2	1.2	∞
Linearity	4.7	Rectangular	$\sqrt{3}$	1	1	2.7	2.7	∞
Detection Limits	0.25	Rectangular	$\sqrt{3}$	1	1	0.14	0.14	∞
Probe Modulation Response	3.5	Rectangular	$\sqrt{3}$	1	1	2.0	2.0	∞
Readout Electronics	0.3	Normal	1	1	1	0.3	0.3	∞
Response Time	0.0	Rectangular	$\sqrt{3}$	1	1	0.0	0.0	∞
Integration Time	1.7	Rectangular	$\sqrt{3}$	1	1	1.0	1.0	∞
RF Ambient Conditions – Noise	3.0	Rectangular	$\sqrt{3}$	1	1	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	$\sqrt{3}$	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	0.4	Rectangular	$\sqrt{3}$	1	1	0.2	0.2	∞
Probe Positioning with Respect to Phantom	6.7	Rectangular	$\sqrt{3}$	1	1	3.9	3.9	∞
Post-processing	4.0	Rectangular	$\sqrt{3}$	1	1	2.3	2.3	∞
Test Sample Related								
Test Sample Positioning	4.38 / 1.35	Normal	1	1	1	4.4	1.4	29
Device Holder Uncertainty	2.9 / 4.1	Normal	1	1	1	2.9	4.1	11
Power Drift of Measurement	5.0	Rectangular	$\sqrt{3}$	1	1	2.9	2.9	∞
Power Scaling	0.0	Rectangular	$\sqrt{3}$	1	1	0.0	0.0	∞
Phantom and Setup								
Phantom Uncertainty (Shape and Thickness Tolerances)	7.6	Rectangular	$\sqrt{3}$	1	1	4.4	4.4	∞
Liquid Conductivity (Temperature Uncertainty)	3.24	Rectangular	$\sqrt{3}$	0.78	0.71	1.5	1.3	∞
Liquid Conductivity (Measured)	2.88	Normal	1	0.78	0.71	2.2	2.0	43
Liquid Permittivity (Temperature Uncertainty)	1.13	Rectangular	$\sqrt{3}$	0.23	0.26	0.2	0.2	∞
Liquid Permittivity (Measured)	2.50	Normal	1	0.23	0.26	0.6	0.7	54
Combined Standard Uncertainty							± 12.8 %	± 12.4 %
Expanded Uncertainty (K=2)							± 25.6 %	± 24.8 %

Body SAR Uncertainty Budget for Frequency Range of 3 GHz to 6 GHz

7. Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Web Site: www.bureauveritas-adt.com

The road map of all our labs can be found in our web site also.

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Appendix A. SAR Plots of System Verification

The plots for system verification with largest deviation for each SAR system combination are shown as follows.

System Check_H750_180911

DUT: Dipole 750 MHz; Type: D750V3; SN: 1132

Communication System: CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium: H06T09N1_0911 Medium parameters used: $f = 750$ MHz; $\sigma = 0.887$ S/m; $\epsilon_r = 43.364$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.7 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(10.34, 10.34, 10.34); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.70 W/kg

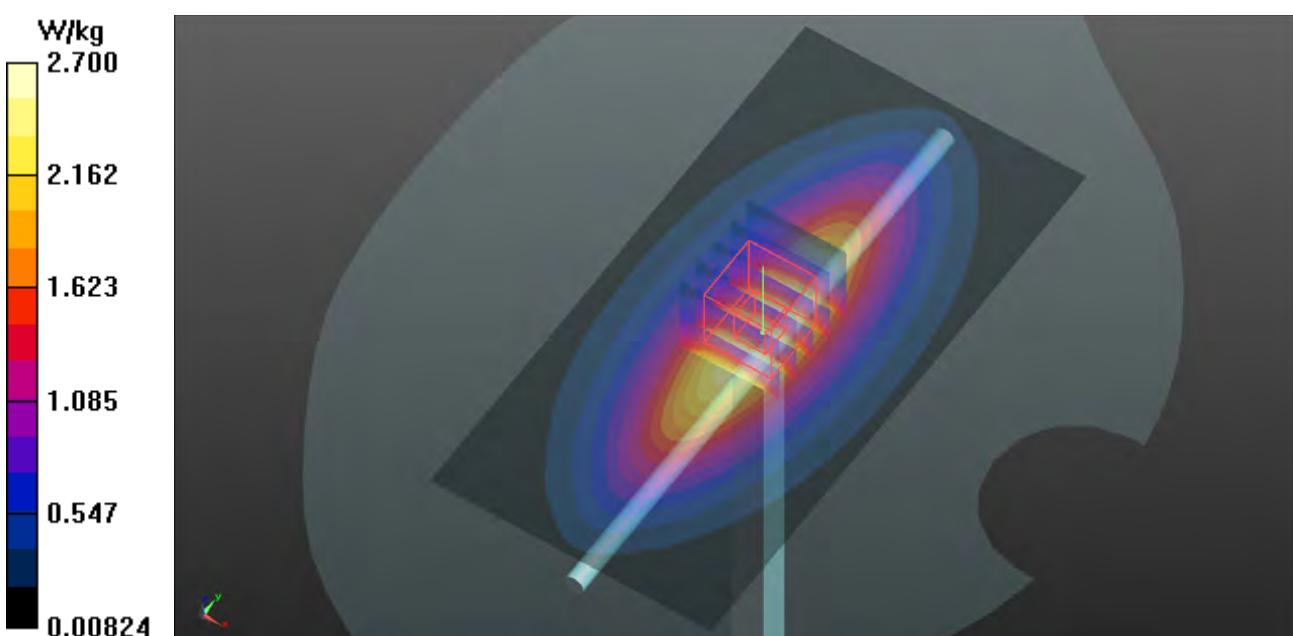
Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 57.57 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 3.03 W/kg

SAR(1 g) = 2 W/kg; SAR(10 g) = 1.32 W/kg

Maximum value of SAR (measured) = 2.69 W/kg



System Check_H835_180911

DUT: Dipole 835 MHz; Type: D835V2; SN: 4d120

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: H07T10N1_0911 Medium parameters used: $f = 835$ MHz; $\sigma = 0.908$ S/m; $\epsilon_r = 41.843$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.7 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(9.88, 9.88, 9.88); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.99 W/kg

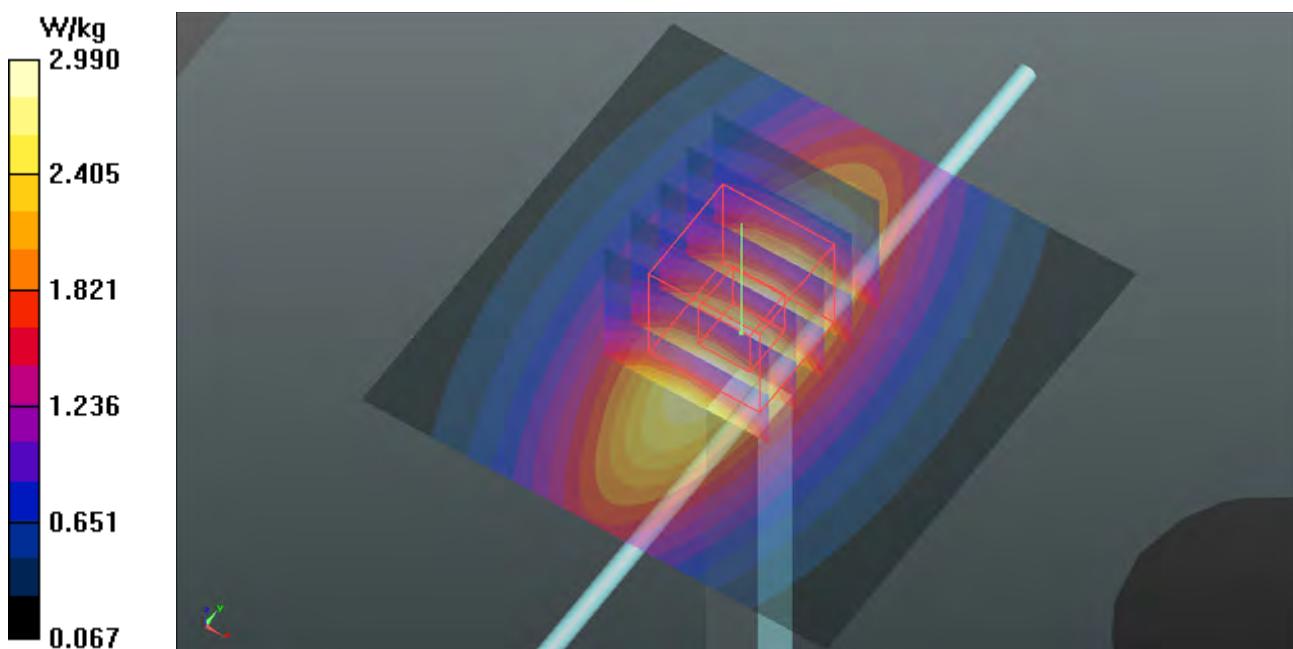
Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 54.65 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 3.35 W/kg

SAR(1 g) = 2.28 W/kg; SAR(10 g) = 1.51 W/kg

Maximum value of SAR (measured) = 3.01 W/kg



System Check_H1750_180911

DUT: Dipole 1750 MHz; Type: D1750V2; SN: 1023

Communication System: CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: H16T20N2_0911 Medium parameters used: $f = 1750 \text{ MHz}$; $\sigma = 1.336 \text{ S/m}$; $\epsilon_r = 39.717$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.7 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(8.6, 8.6, 8.6); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 14.3 W/kg

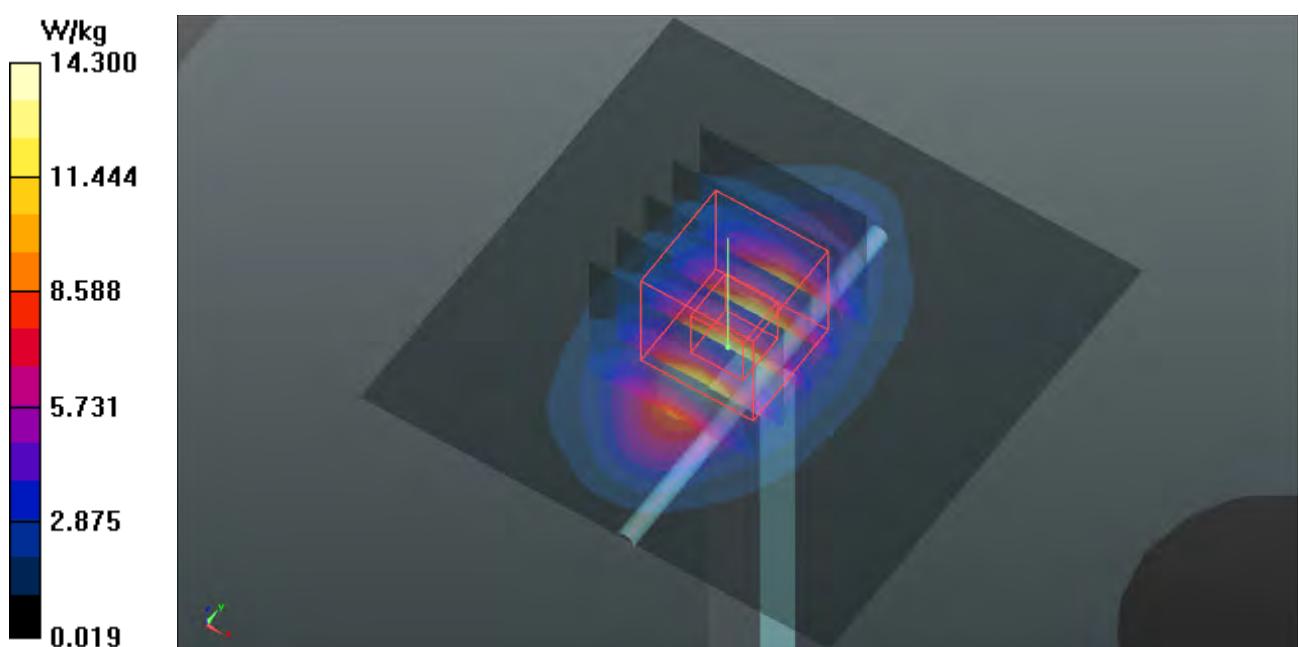
Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 98.36 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 16.8 W/kg

SAR(1 g) = 9.19 W/kg; SAR(10 g) = 4.91 W/kg

Maximum value of SAR (measured) = 14.1 W/kg



System Check_H1900_180911

DUT: Dipole 1900 MHz; Type: D1900V2; SN: 5d036

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: H16T20N1_0911 Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.453 \text{ S/m}$; $\epsilon_r = 39.688$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.7 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(8.28, 8.28, 8.28); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 14.9 W/kg

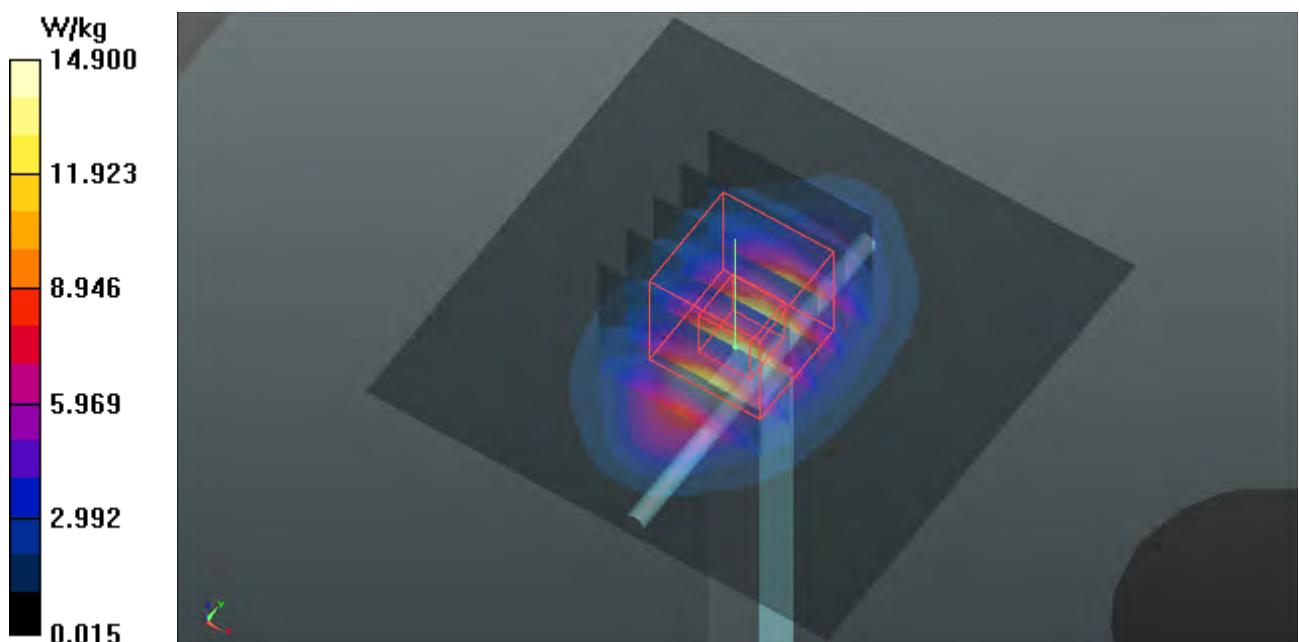
Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 98.53 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 17.5 W/kg

SAR(1 g) = 9.53 W/kg; SAR(10 g) = 4.96 W/kg

Maximum value of SAR (measured) = 14.8 W/kg



System Check_H2300_180911

DUT: Dipole 2300 MHz; Type: D2300V2; SN: 1004

Communication System: CW; Frequency: 2300 MHz; Duty Cycle: 1:1

Medium: H19T27N3_0911 Medium parameters used: $f = 2300$ MHz; $\sigma = 1.728$ S/m; $\epsilon_r = 39.256$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.7 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(8.03, 8.03, 8.03); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

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

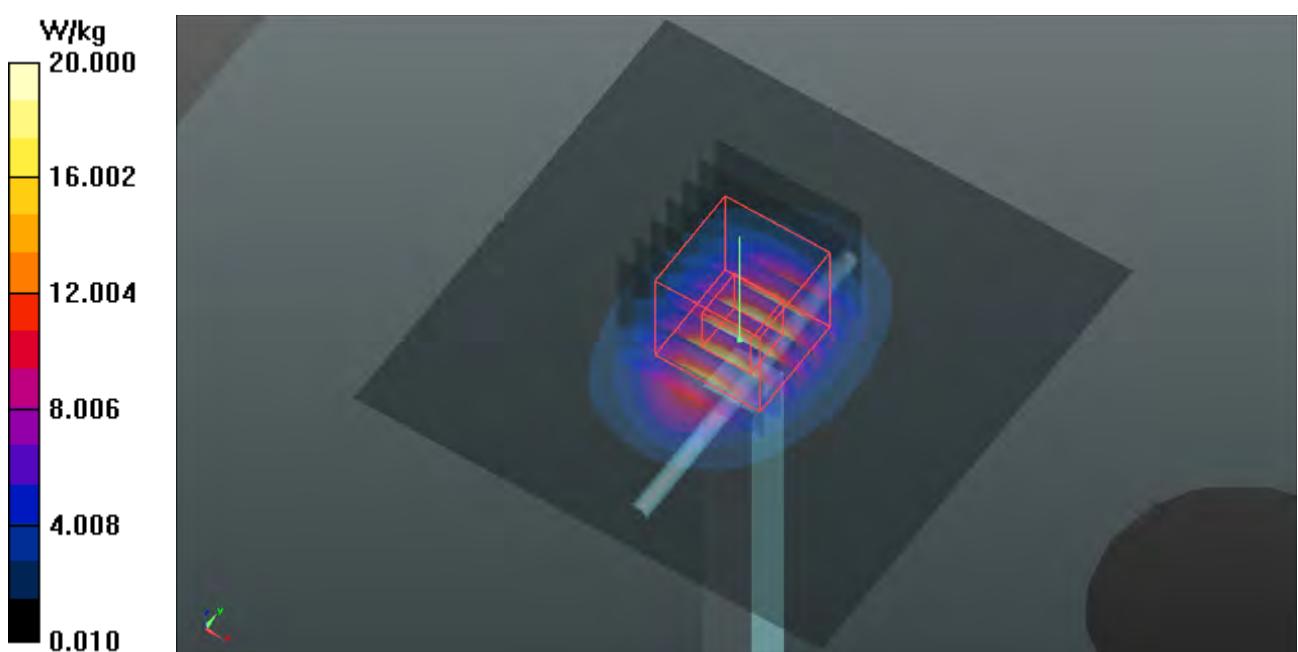
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 111.9 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 24.7 W/kg

SAR(1 g) = 12 W/kg; SAR(10 g) = 5.69 W/kg

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



System Check_H2450_181012

DUT: Dipole 2450 MHz; Type: D2450V2; SN: 869

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: H19T27N1_1012 Medium parameters used: $f = 2450$ MHz; $\sigma = 1.869$ S/m; $\epsilon_r = 38.083$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.8 °C ; Liquid Temperature : 23.1 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(7.59, 7.59, 7.59); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1653; Type: QD000P40;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 21.7 W/kg

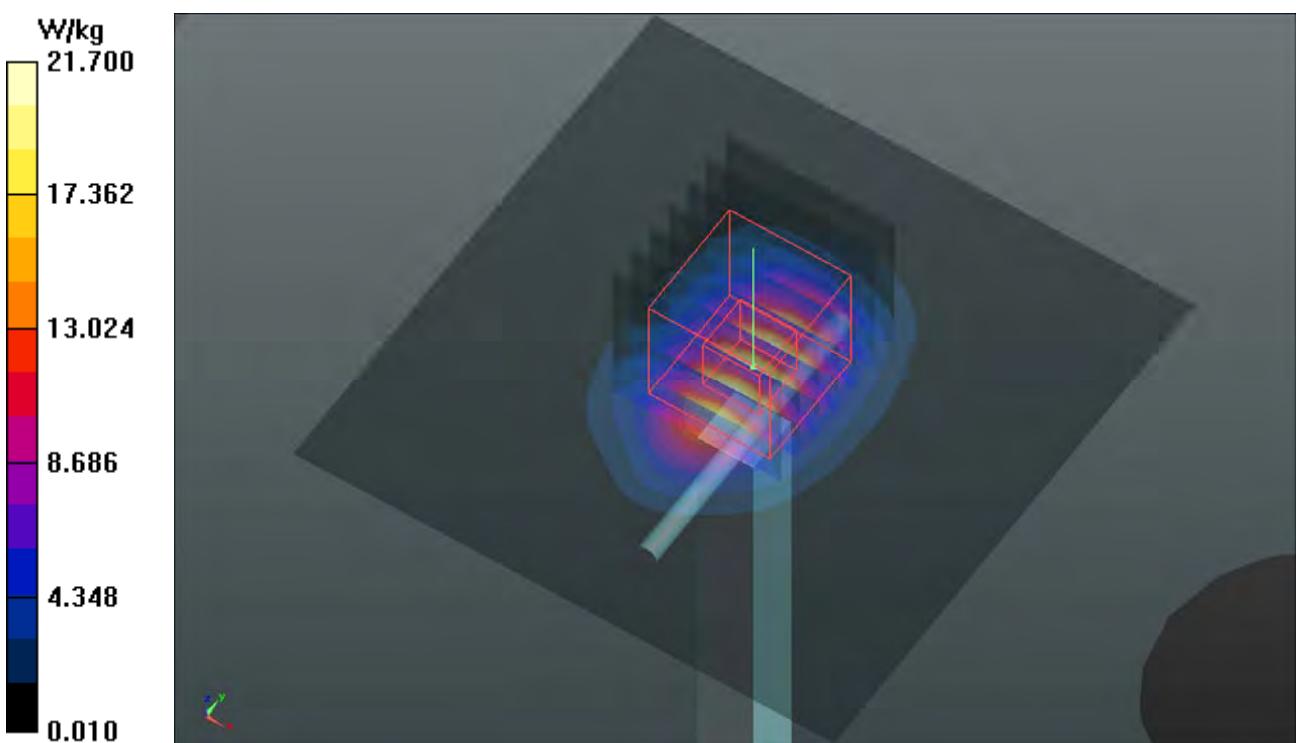
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 103.9 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 26.7 W/kg

SAR(1 g) = 12.8 W/kg; SAR(10 g) = 5.93 W/kg

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



System Check_H2600_180911

DUT: Dipole 2600 MHz; Type: D2600V2; SN: 1058

Communication System: CW; Frequency: 2600 MHz; Duty Cycle: 1:1

Medium: H19T27N3_0911 Medium parameters used: $f = 2600$ MHz; $\sigma = 2.03$ S/m; $\epsilon_r = 38.178$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.7 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.48, 7.48, 7.48); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

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

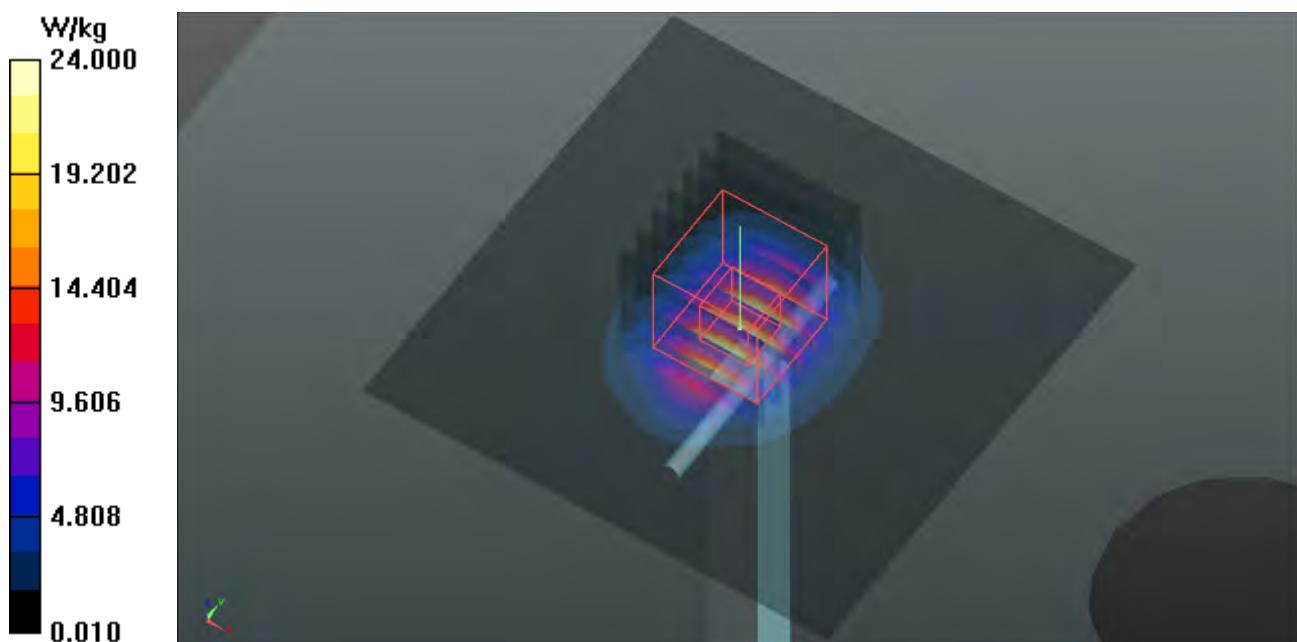
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 105.1 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 30.2 W/kg

SAR(1 g) = 13.7 W/kg; SAR(10 g) = 6.05 W/kg

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



System Check_H5250_181012

DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5250 MHz; Duty Cycle: 1:1

Medium: H34T60N1_1012 Medium parameters used: $f = 5250$ MHz; $\sigma = 4.621$ S/m; $\epsilon_r = 34.556$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.8 °C ; Liquid Temperature : 23.1 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(5.4, 5.4, 5.4); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1653; Type: QD000P40;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 26.0 W/kg

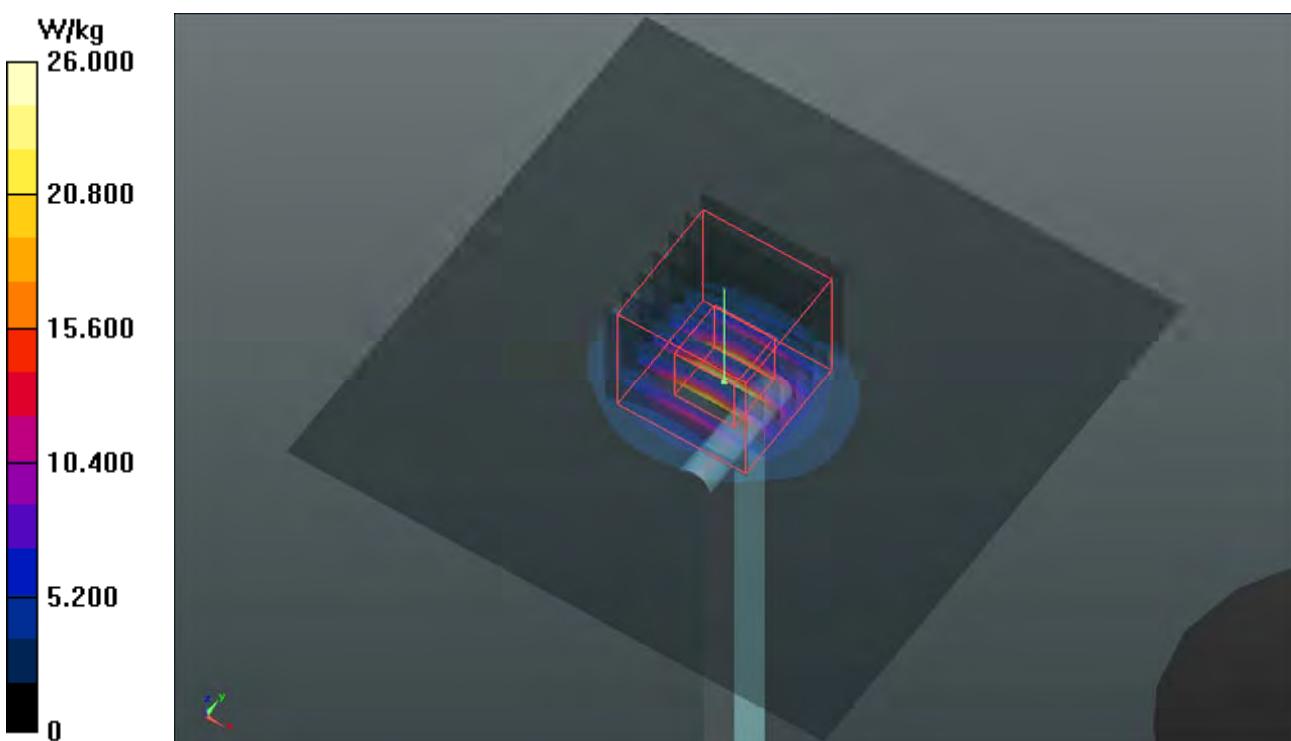
Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 86.35 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 47.5 W/kg

SAR(1 g) = 7.99 W/kg; SAR(10 g) = 2.29 W/kg

Maximum value of SAR (measured) = 28.8 W/kg



System Check_H5600_181012

DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5600 MHz; Duty Cycle: 1:1

Medium: H34T60N1_1012 Medium parameters used: $f = 5600$ MHz; $\sigma = 4.956$ S/m; $\epsilon_r = 34.103$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.8 °C ; Liquid Temperature : 23.1 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(4.88, 4.88, 4.88); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1653; Type: QD000P40;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 30.9 W/kg

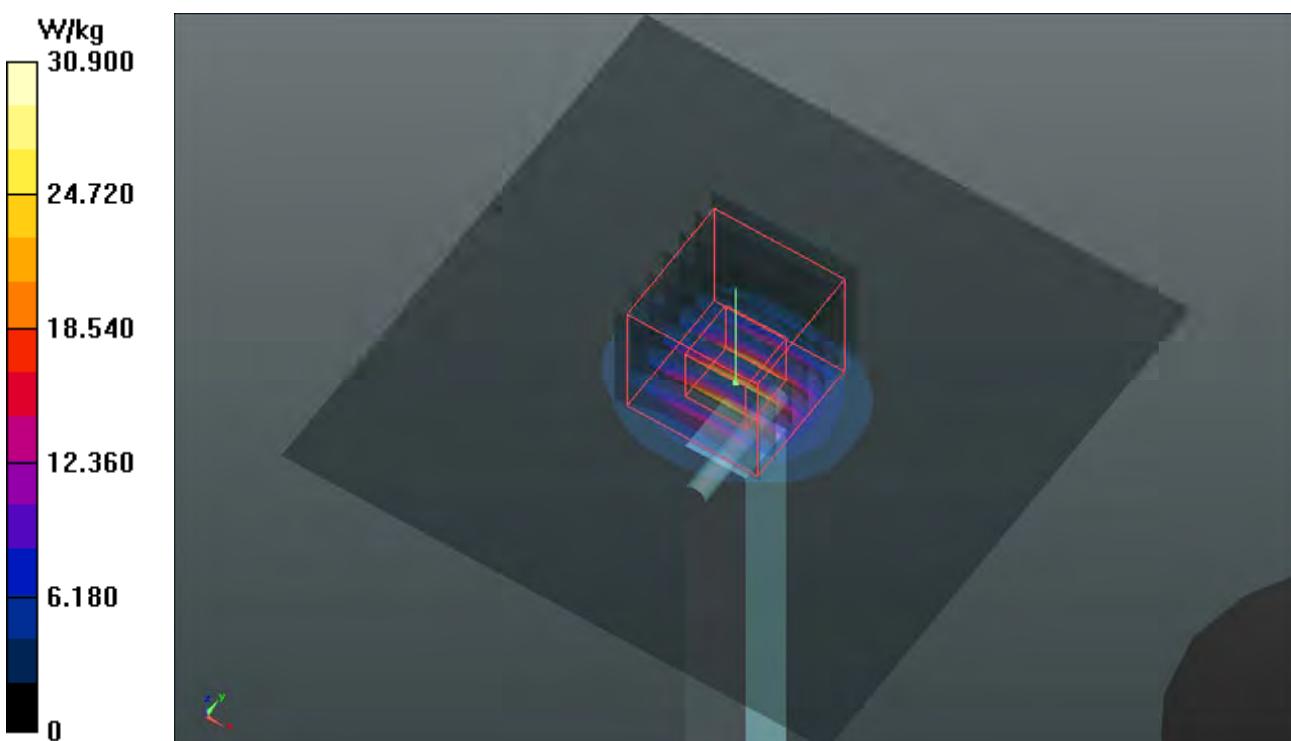
Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 89.97 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 56.7 W/kg

SAR(1 g) = 8.35 W/kg; SAR(10 g) = 2.38 W/kg

Maximum value of SAR (measured) = 32.4 W/kg



System Check_H5750_181012

DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5750 MHz; Duty Cycle: 1:1

Medium: H34T60N1_1012 Medium parameters used: $f = 5750 \text{ MHz}$; $\sigma = 5.106 \text{ S/m}$; $\epsilon_r = 33.879$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.8 °C ; Liquid Temperature : 23.1 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(5.09, 5.09, 5.09); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1653; Type: QD000P40;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 27.4 W/kg

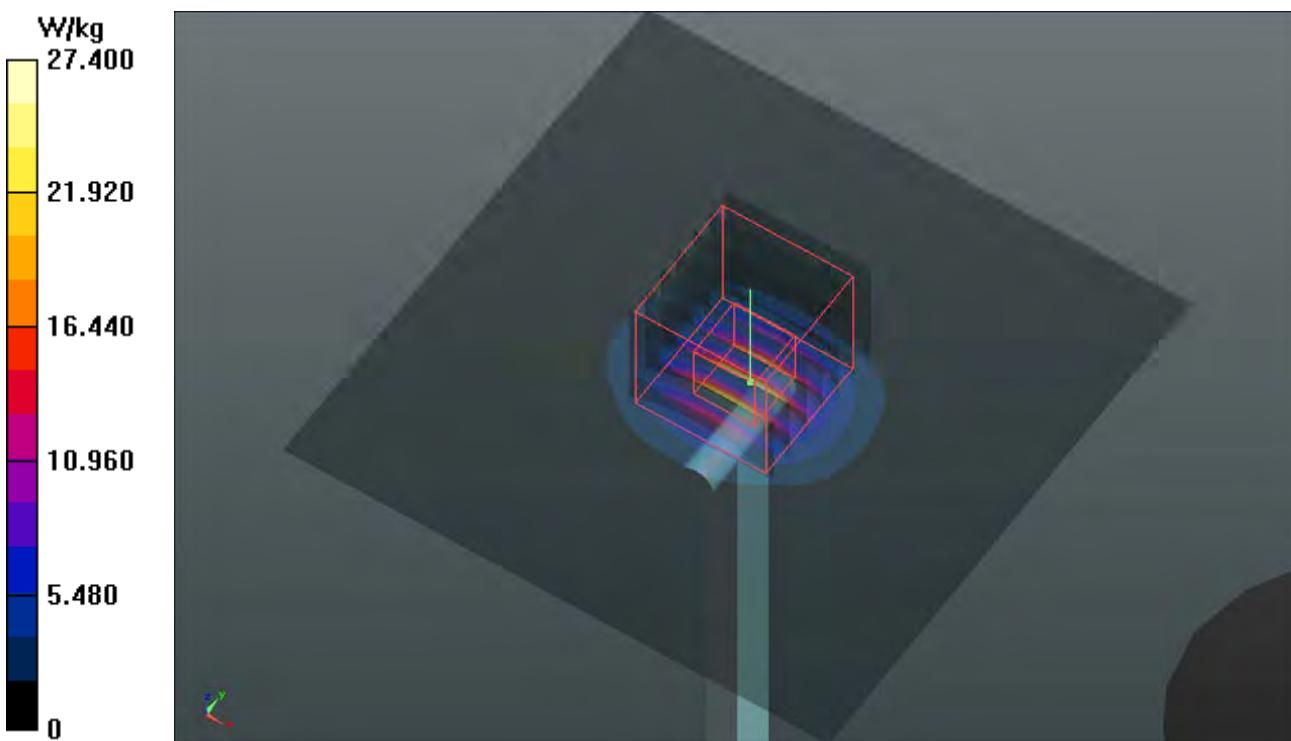
Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 72.96 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 52.6 W/kg

SAR(1 g) = 7.71 W/kg; SAR(10 g) = 2.21 W/kg

Maximum value of SAR (measured) = 29.4 W/kg



System Check_B750_180908

DUT: Dipole 750 MHz; Type: D750V3; SN: 1132

Communication System: CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium: B06T09N1_0908 Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.963 \text{ S/m}$; $\epsilon_r = 53.923$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(10.28, 10.28, 10.28); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1822; Type: QD000P40CD;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (61x81x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 2.71 W/kg

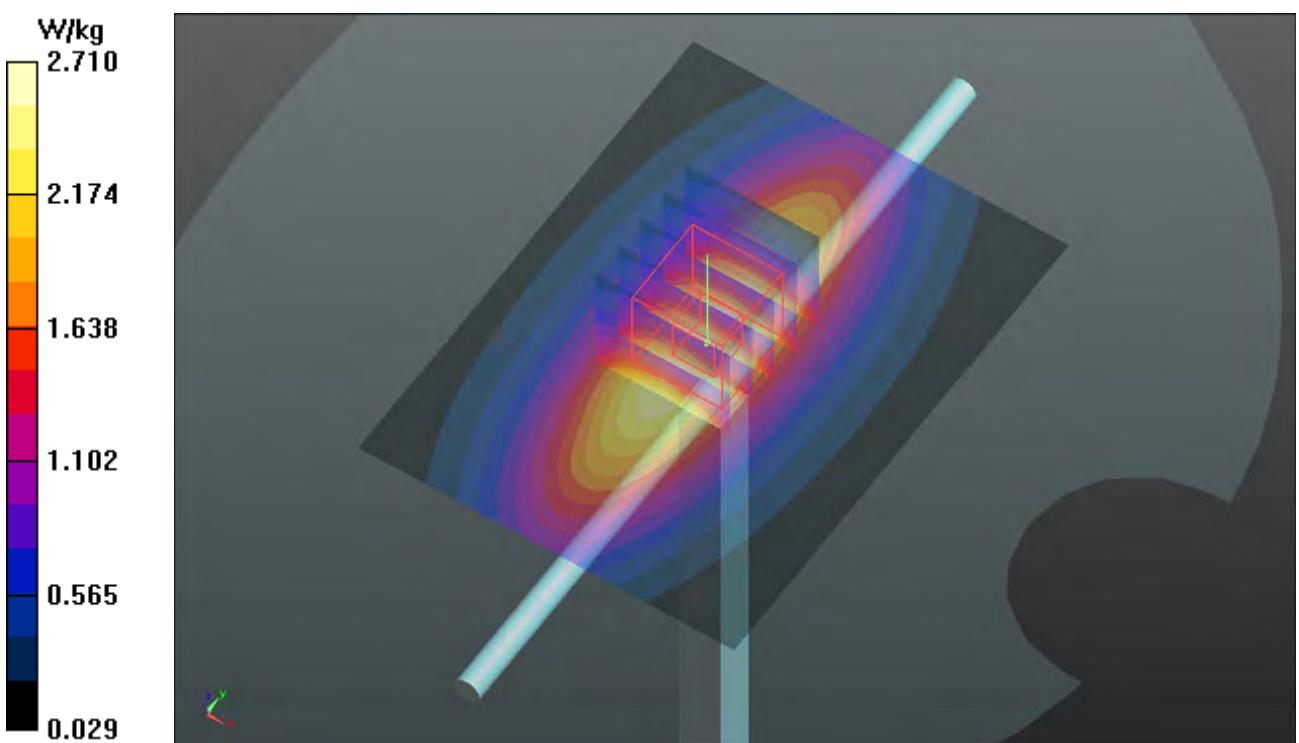
Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 53.78 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 3.11 W/kg

SAR(1 g) = 2.17 W/kg; SAR(10 g) = 1.47 W/kg

Maximum value of SAR (measured) = 2.69 W/kg



System Check_B835_180911

DUT: Dipole 835 MHz; Type: D835V2; SN: 4d120

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: B07T10N2_0911 Medium parameters used: $f = 835$ MHz; $\sigma = 0.983$ S/m; $\epsilon_r = 54.141$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 23.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(9.74, 9.74, 9.74); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 3.12 W/kg

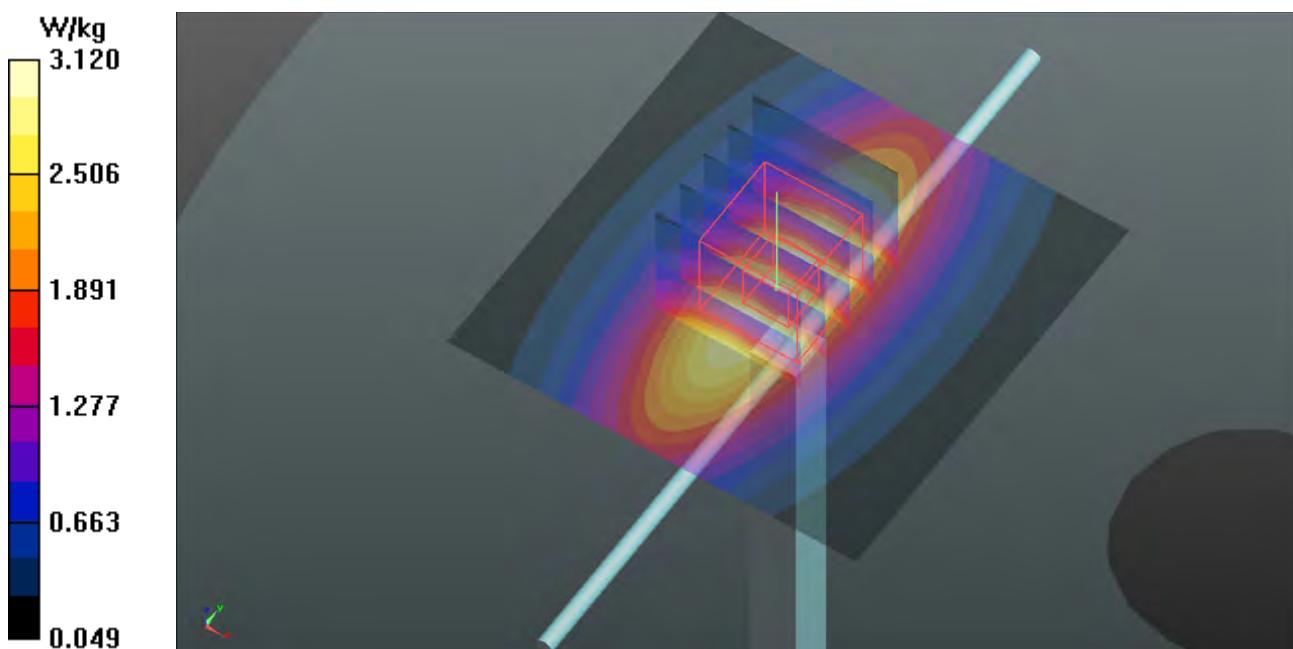
Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 54.28 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.72 W/kg

SAR(1 g) = 2.44 W/kg; SAR(10 g) = 1.56 W/kg

Maximum value of SAR (measured) = 3.14 W/kg



System Check_B1750_180908

DUT: Dipole 1750 MHz; Type: D1750V2; SN: 1023

Communication System: CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: B16T20N1_0908 Medium parameters used: $f = 1750 \text{ MHz}$; $\sigma = 1.443 \text{ S/m}$; $\epsilon_r = 51.726$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(8.28, 8.28, 8.28); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1822; Type: QD000P40CD;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 13.6 W/kg

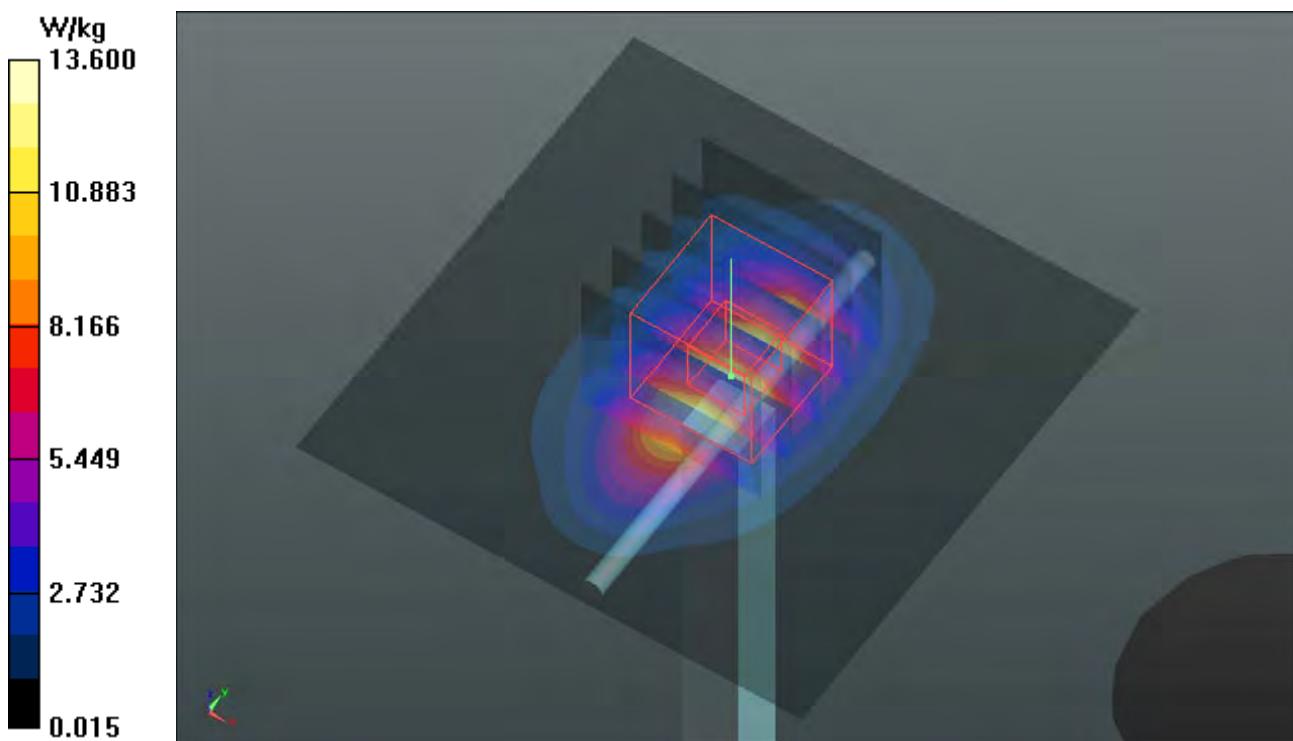
Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 100.5 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 15.8 W/kg

SAR(1 g) = 9.01 W/kg; SAR(10 g) = 4.84 W/kg

Maximum value of SAR (measured) = 13.6 W/kg



System Check_B1900_180911

DUT: Dipole 1900 MHz; Type: D1900V2; SN: 5d036

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: B16T20N1_0911 Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.584 \text{ S/m}$; $\epsilon_r = 50.723$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.8 °C ; Liquid Temperature : 23.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.89, 7.89, 7.89); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 16.9 W/kg

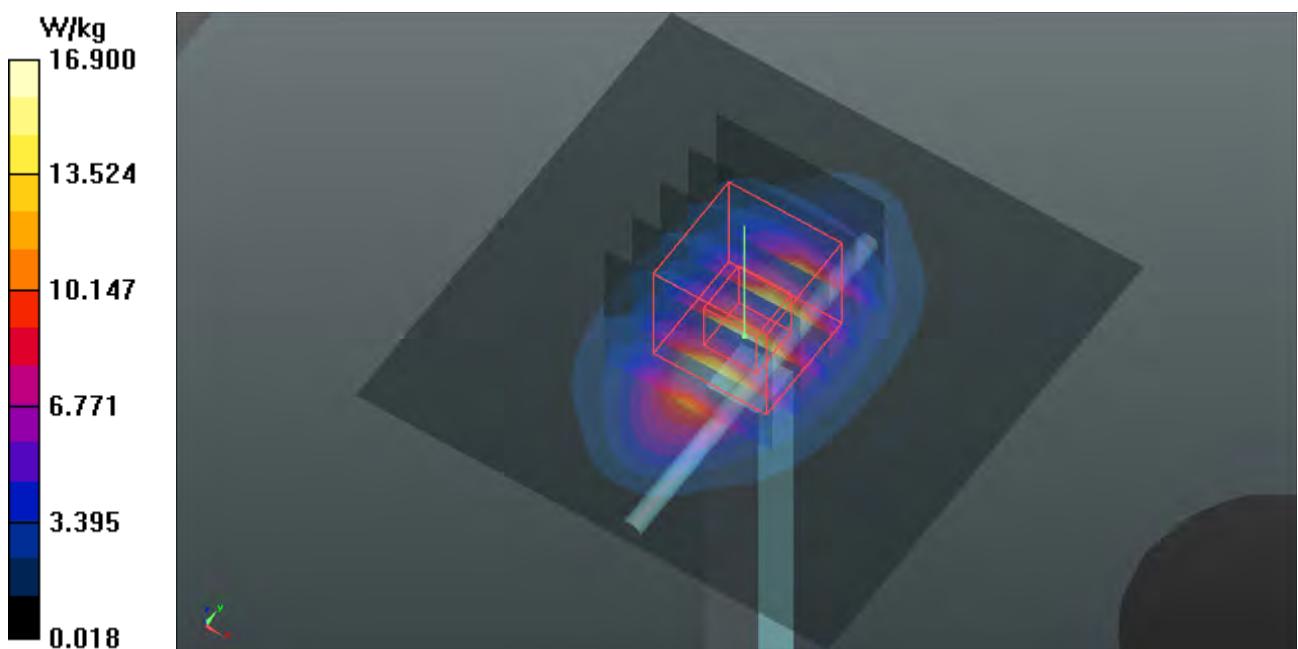
Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 100.3 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 20.5 W/kg

SAR(1 g) = 10.7 W/kg; SAR(10 g) = 5.45 W/kg

Maximum value of SAR (measured) = 17.0 W/kg



System Check_B2300_180911

DUT: Dipole 2300 MHz; Type: D2300V2; SN: 1004

Communication System: CW; Frequency: 2300 MHz; Duty Cycle: 1:1

Medium: B19T27N4_0911 Medium parameters used: $f = 2300$ MHz; $\sigma = 1.834$ S/m; $\epsilon_r = 51.754$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.8 °C ; Liquid Temperature : 23.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.77, 7.77, 7.77); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

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

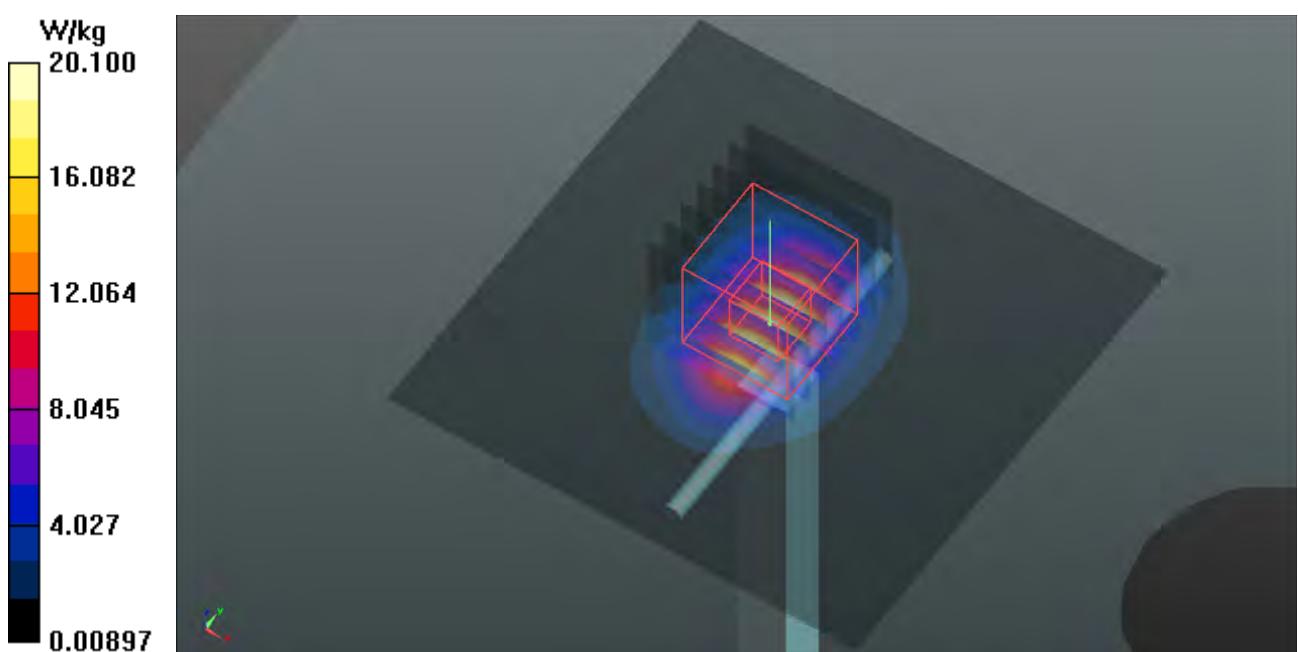
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 106.5 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 24.9 W/kg

SAR(1 g) = 12.3 W/kg; SAR(10 g) = 5.84 W/kg

Maximum value of SAR (measured) = 20.4 W/kg



System Check_B2450_181011

DUT: Dipole 2450 MHz; Type: D2450V2; SN: 869

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: B19T27N1_1011 Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 2.043 \text{ S/m}$; $\epsilon_r = 50.506$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.8 °C ; Liquid Temperature : 23.1 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3971; ConvF(7.7, 7.7, 7.7); Calibrated: 2018/03/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2018/03/16
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 22.5 W/kg

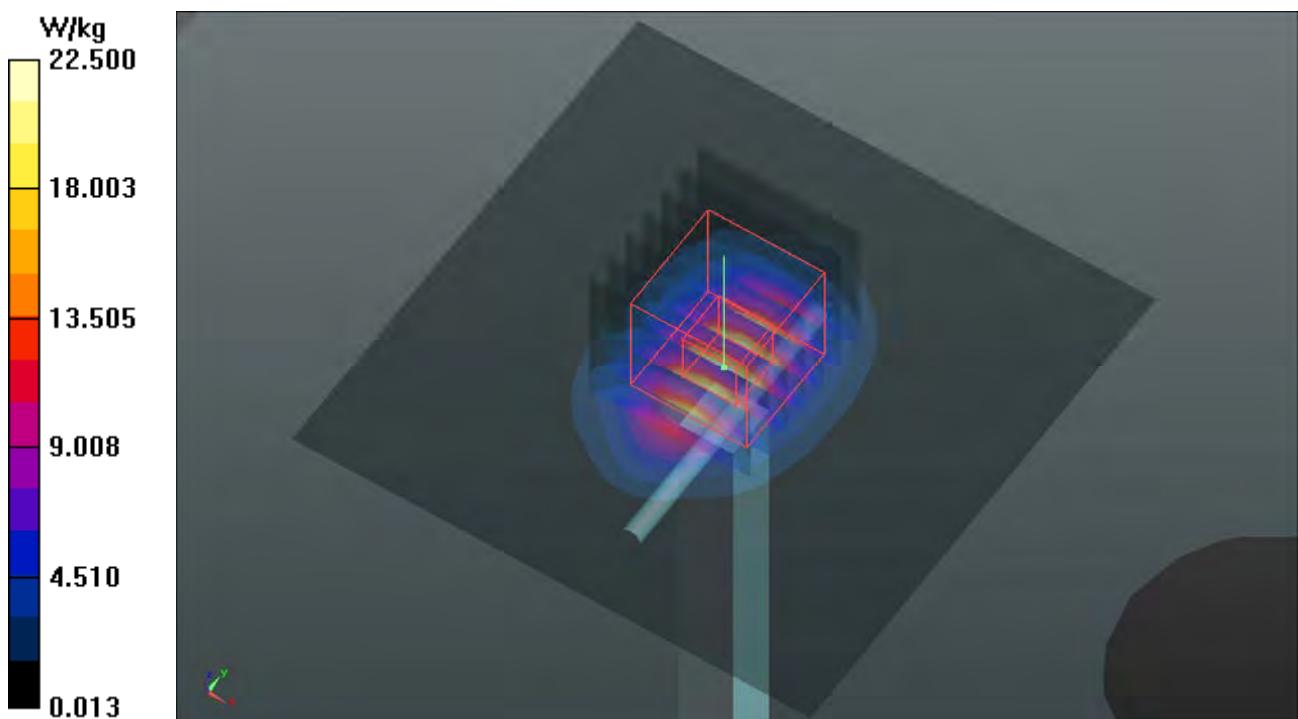
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 109.0 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 27.8 W/kg

SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.06 W/kg

Maximum value of SAR (measured) = 22.4 W/kg



System Check_B2600_180908

DUT: Dipole 2600 MHz; Type: D2600V2; SN: 1058

Communication System: CW; Frequency: 2600 MHz; Duty Cycle: 1:1

Medium: B19T27N1_0908 Medium parameters used: $f = 2600$ MHz; $\sigma = 2.18$ S/m; $\epsilon_r = 50.248$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(7.51, 7.51, 7.51); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1822; Type: QD000P40;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 22.9 W/kg

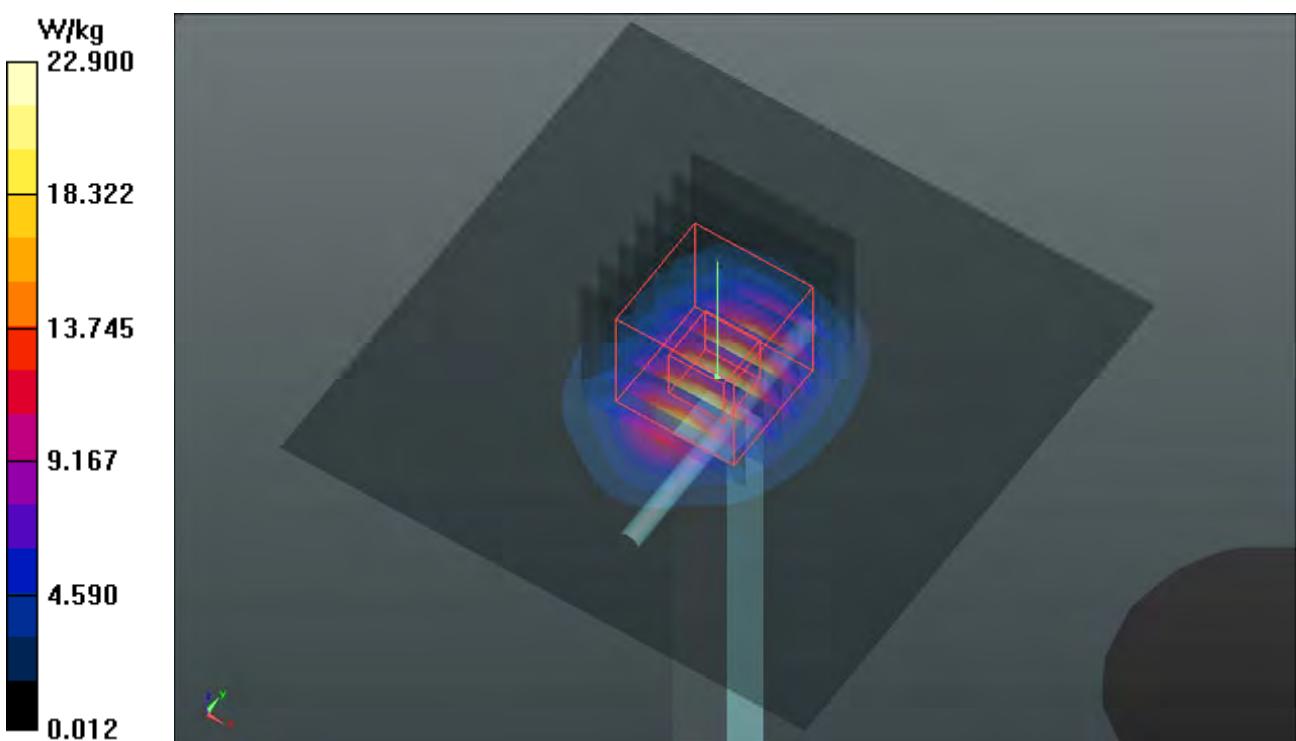
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 105.7 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 29.0 W/kg

SAR(1 g) = 13.3 W/kg; SAR(10 g) = 5.91 W/kg

Maximum value of SAR (measured) = 23.0 W/kg



System Check_B5250_181010

DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5250 MHz; Duty Cycle: 1:1

Medium: B34T60N1_1010 Medium parameters used: $f = 5250 \text{ MHz}$; $\sigma = 5.398 \text{ S/m}$; $\epsilon_r = 47.416$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.7 °C ; Liquid Temperature : 23.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3971; ConvF(4.59, 4.59, 4.59); Calibrated: 2018/03/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2018/03/16
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

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

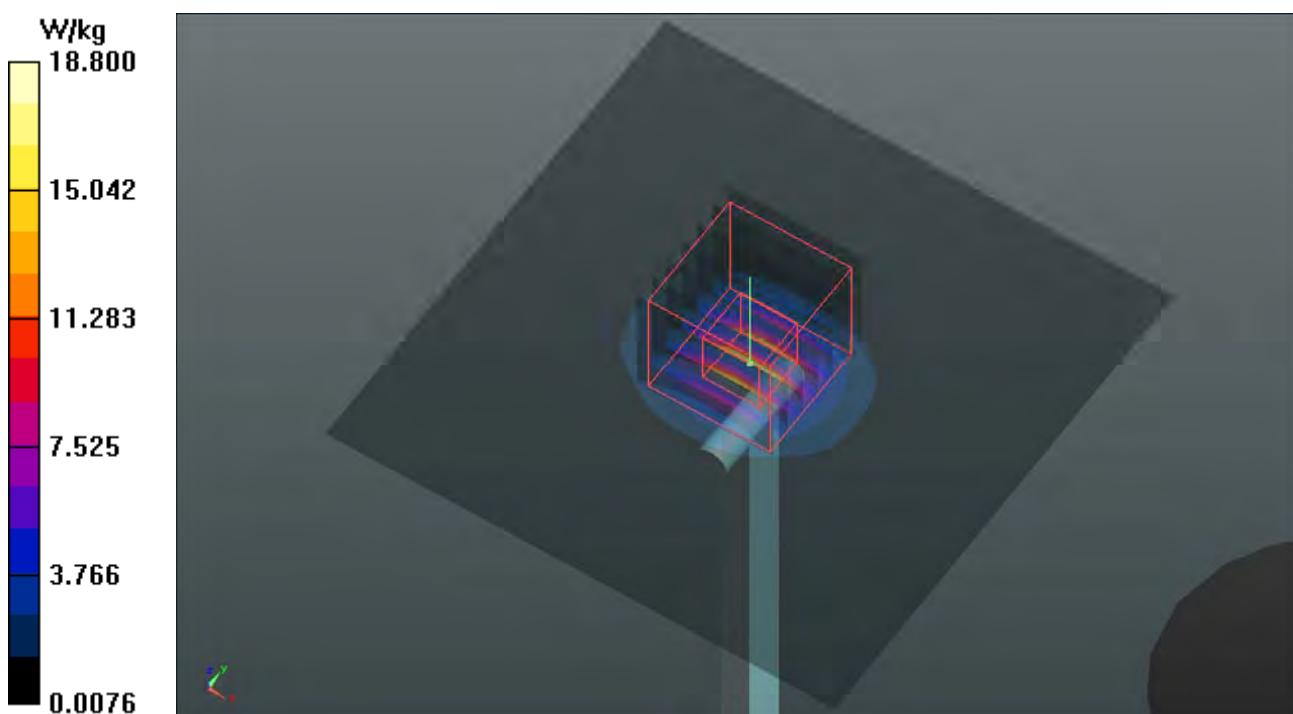
Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 70.46 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 32.6 W/kg

SAR(1 g) = 8.06 W/kg; SAR(10 g) = 2.18 W/kg

Maximum value of SAR (measured) = 20.4 W/kg



System Check_B5600_181010

DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5600 MHz; Duty Cycle: 1:1

Medium: B34T60N1_1010 Medium parameters used: $f = 5600$ MHz; $\sigma = 5.885$ S/m; $\epsilon_r = 46.679$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.7 °C ; Liquid Temperature : 23.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3971; ConvF(4.08, 4.08, 4.08); Calibrated: 2018/03/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2018/03/16
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

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

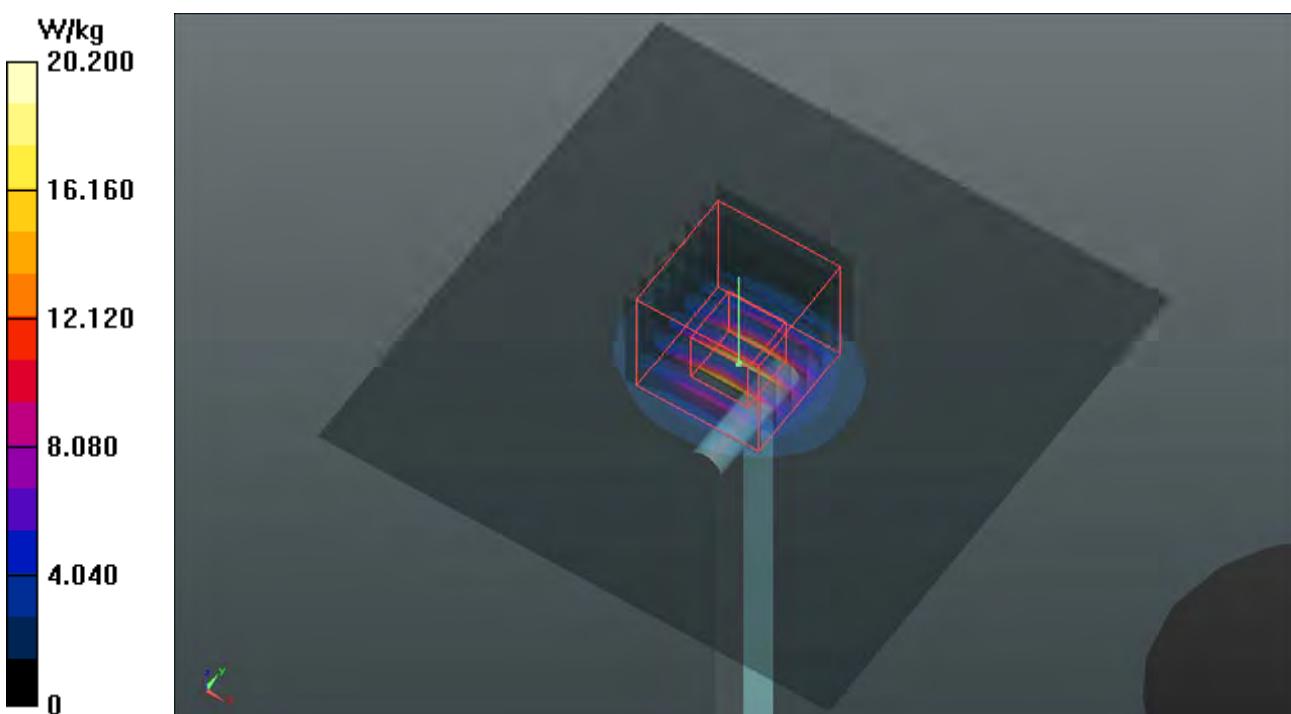
Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 69.74 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 37.5 W/kg

SAR(1 g) = 8.4 W/kg; SAR(10 g) = 2.35 W/kg

Maximum value of SAR (measured) = 22.0 W/kg



System Check_B5750_181010

DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5750 MHz; Duty Cycle: 1:1

Medium: B34T60N1_1010 Medium parameters used: $f = 5750 \text{ MHz}$; $\sigma = 6.115 \text{ S/m}$; $\epsilon_r = 46.433$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.7 °C ; Liquid Temperature : 23.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3971; ConvF(4.22, 4.22, 4.22); Calibrated: 2018/03/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2018/03/16
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 19.7 W/kg

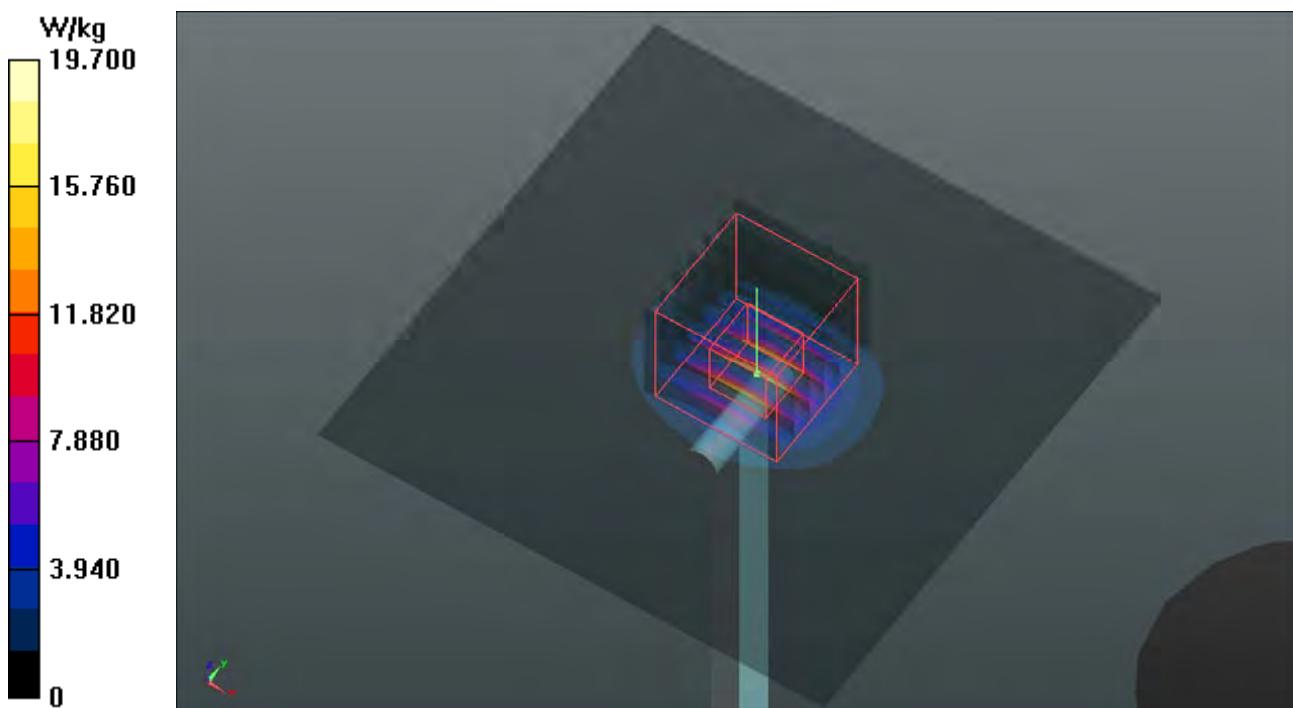
Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 62.67 V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 35.5 W/kg

SAR(1 g) = 7.93 W/kg; SAR(10 g) = 2.17 W/kg

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





FCC SAR Test Report

Appendix B. SAR Plots of SAR Measurement

The SAR plots for highest measured SAR in each exposure configuration, wireless mode and frequency band combination, and measured SAR > 1.5 W/kg are shown as follows.

P01 GSM850_GPRS12_Left Cheek_Ch128_Ant0

DUT: 180822C04

Communication System: GPRS12; Frequency: 824.2 MHz; Duty Cycle: 1:2

Medium: H07T10N1_0911 Medium parameters used: $f = 824.2$ MHz; $\sigma = 0.899$ S/m; $\epsilon_r = 41.985$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(9.88, 9.88, 9.88); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.387 W/kg

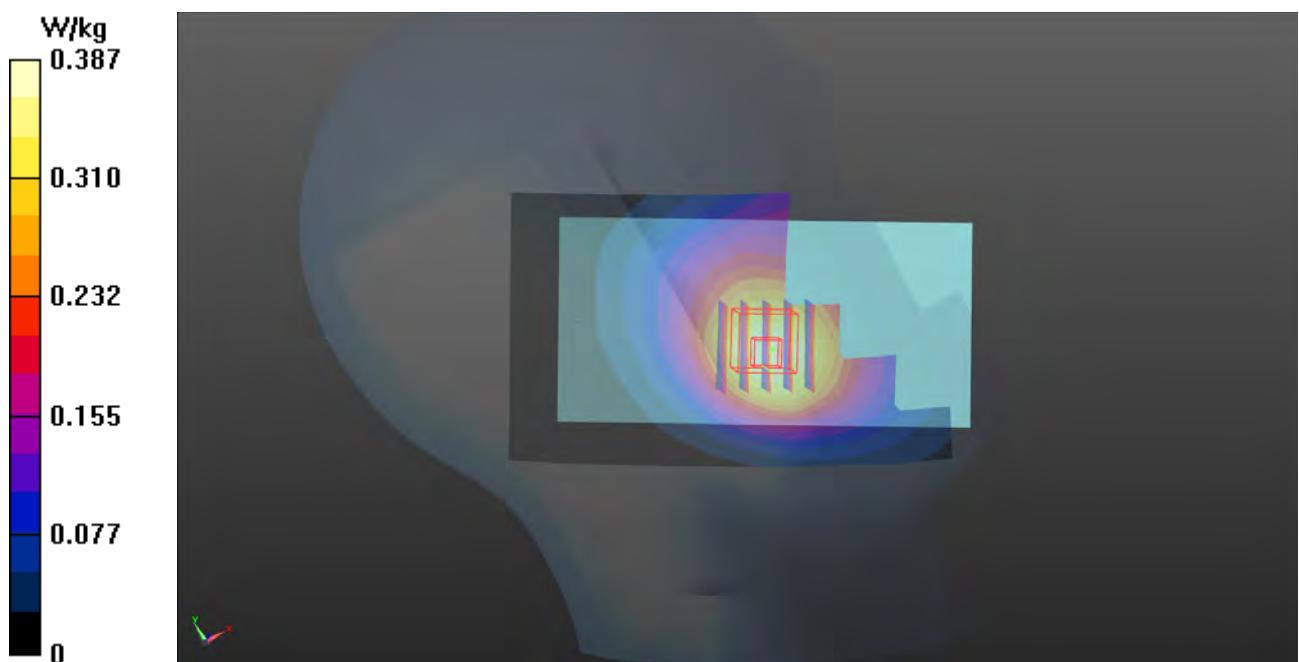
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 20.63 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 0.423 W/kg

SAR(1 g) = 0.325 W/kg; SAR(10 g) = 0.246 W/kg

Maximum value of SAR (measured) = 0.381 W/kg



P02 GPRS1900_GPRS12_Left Cheek_Ch661_Ant1

DUT: 180822C04

Communication System: GPRS12; Frequency: 1880 MHz; Duty Cycle: 1:2

Medium: H16T20N2_0911 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.446 \text{ S/m}$; $\epsilon_r = 39.26$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(8.28, 8.28, 8.28); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (71x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.831 W/kg

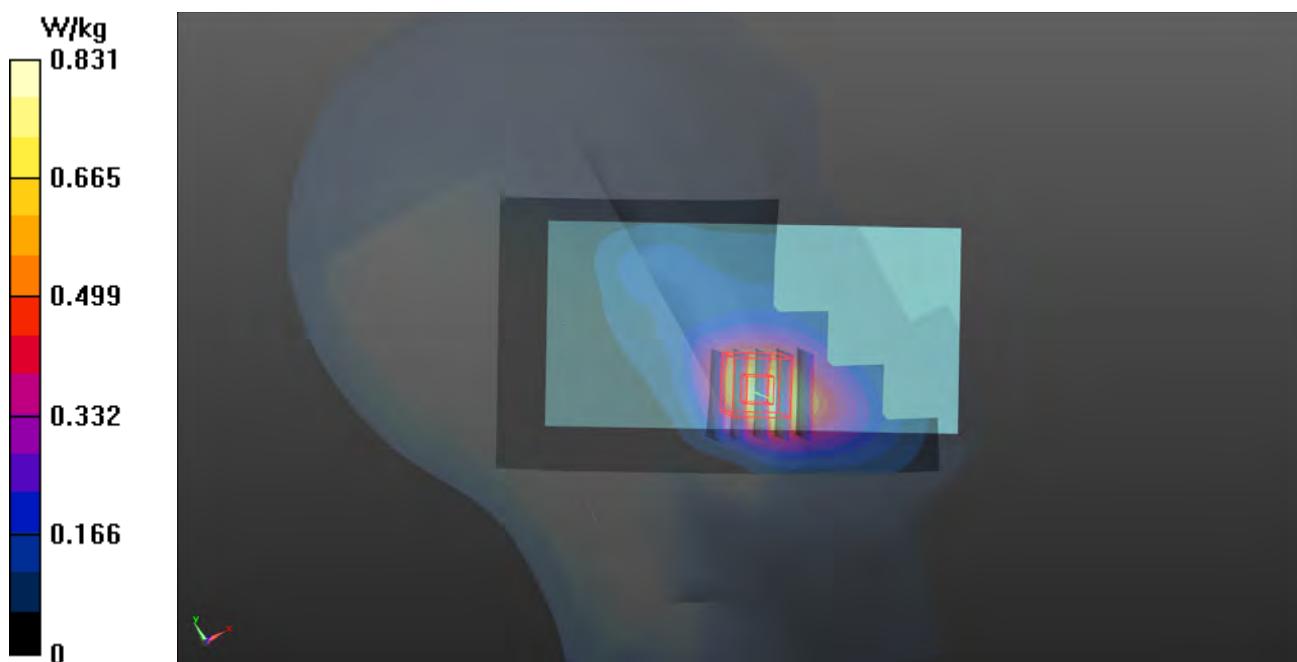
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 22.59 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 1.01 W/kg

SAR(1 g) = 0.634 W/kg; SAR(10 g) = 0.385 W/kg

Maximum value of SAR (measured) = 0.841 W/kg



P03 WCDMA II_RMC12.2K_Left Cheek_Ch9400_Ant1**DUT: 180822C04**

Communication System: WCDMA; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: H16T20N2_0911 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.446 \text{ S/m}$; $\epsilon_r = 39.26$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(8.28, 8.28, 8.28); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (71x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 1.29 W/kg

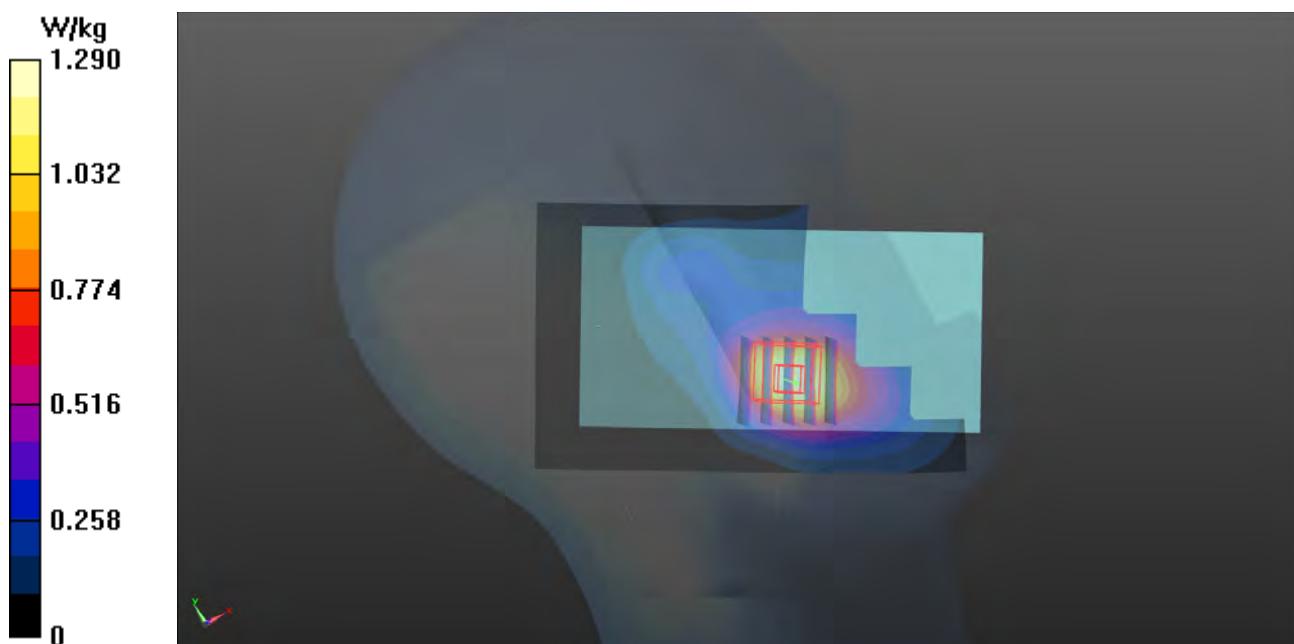
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 27.78 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 1.71 W/kg

SAR(1 g) = 1.07 W/kg; SAR(10 g) = 0.647 W/kg

Maximum value of SAR (measured) = 1.49 W/kg



P04 WCDMA IV_RMC12.2K_Left Cheek_Ch1513_Ant1

DUT: 180822C04

Communication System: WCDMA; Frequency: 1752.6 MHz; Duty Cycle: 1:1

Medium: H16T20N2_0911 Medium parameters used: $f = 1753$ MHz; $\sigma = 1.339$ S/m; $\epsilon_r = 39.707$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(8.6, 8.6, 8.6); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.28 W/kg

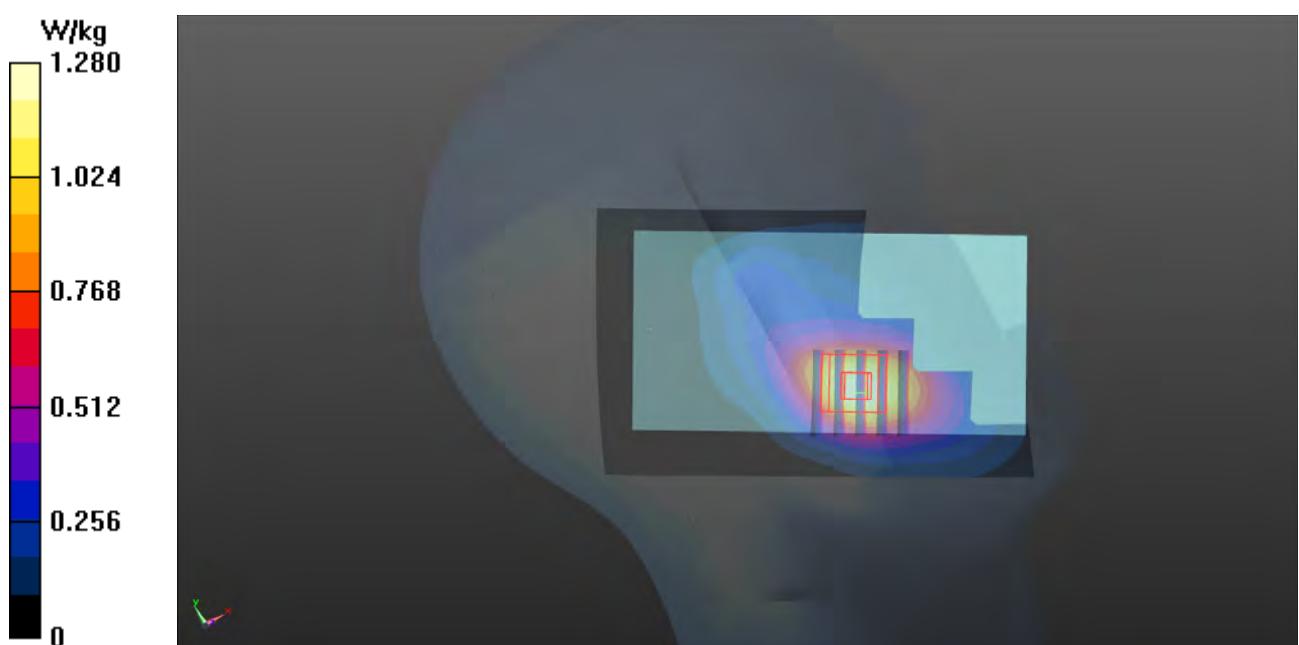
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 28.40 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 1.59 W/kg

SAR(1 g) = 1.01 W/kg; SAR(10 g) = 0.632 W/kg

Maximum value of SAR (measured) = 1.35 W/kg



P05 WCDMA V_RMC12.2K_Left Cheek_Ch4233_Ant0**DUT: 180822C04**

Communication System: WCDMA; Frequency: 846.6 MHz; Duty Cycle: 1:1

Medium: H07T10N1_0911 Medium parameters used: $f = 847 \text{ MHz}$; $\sigma = 0.92 \text{ S/m}$; $\epsilon_r = 41.688$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(9.88, 9.88, 9.88); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (71x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.527 W/kg

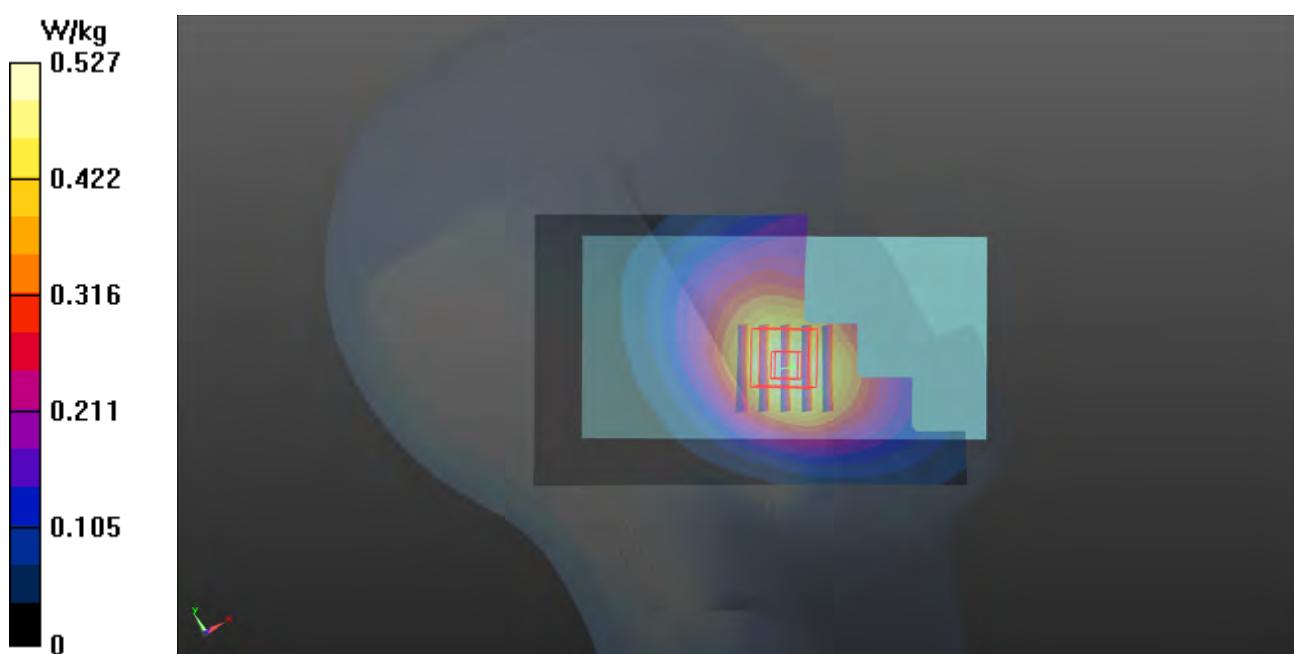
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 23.64 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.572 W/kg

SAR(1 g) = 0.443 W/kg; SAR(10 g) = 0.337 W/kg

Maximum value of SAR (measured) = 0.525 W/kg



P06 LTE 2_QPSK20M_Left Cheek_Ch19100_1RB_OS99_Ant1**DUT: 180822C04**

Communication System: LTE; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: H16T20N2_0911 Medium parameters used: $f = 1900$ MHz; $\sigma = 1.458$ S/m; $\epsilon_r = 39.212$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(8.28, 8.28, 8.28); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.43 W/kg

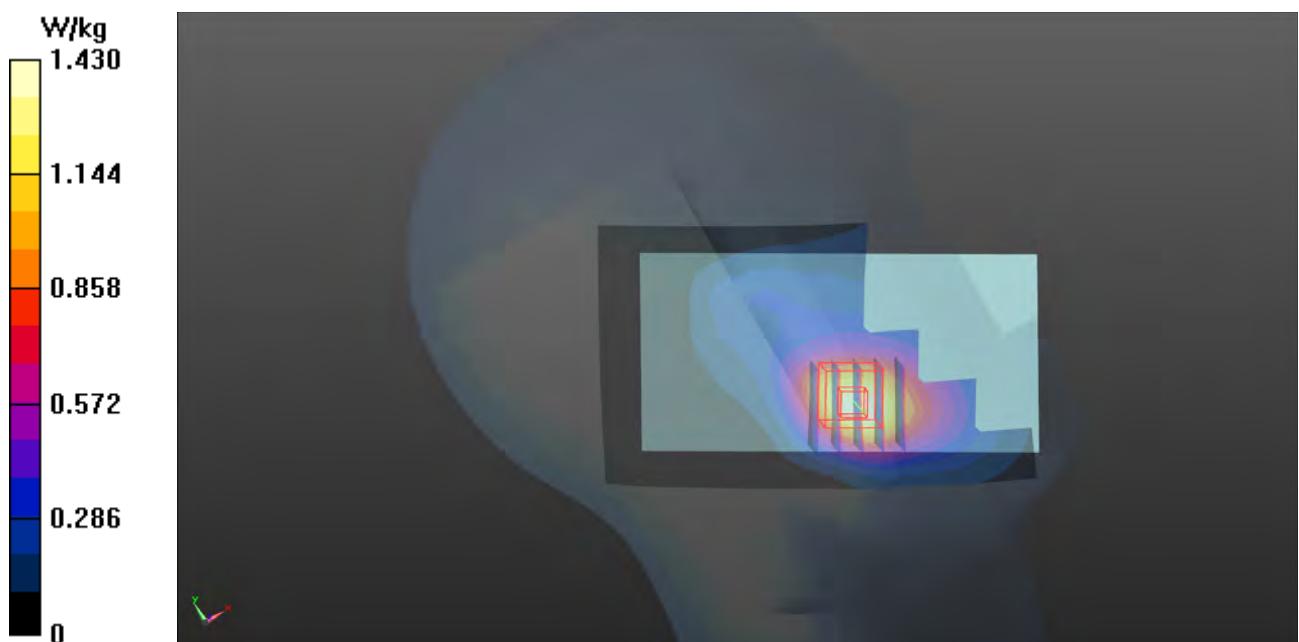
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 29.19 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 1.87 W/kg

SAR(1 g) = 1.14 W/kg; SAR(10 g) = 0.703 W/kg

Maximum value of SAR (measured) = 1.59 W/kg



P07 LTE 5_QPSK10M_Left Cheek_Ch20600_1RB_OS24_Ant0**DUT: 180822C04**

Communication System: LTE; Frequency: 844 MHz; Duty Cycle: 1:1

Medium: H07T10N1_0911 Medium parameters used: $f = 844$ MHz; $\sigma = 0.917$ S/m; $\epsilon_r = 41.73$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(9.88, 9.88, 9.88); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.462 W/kg

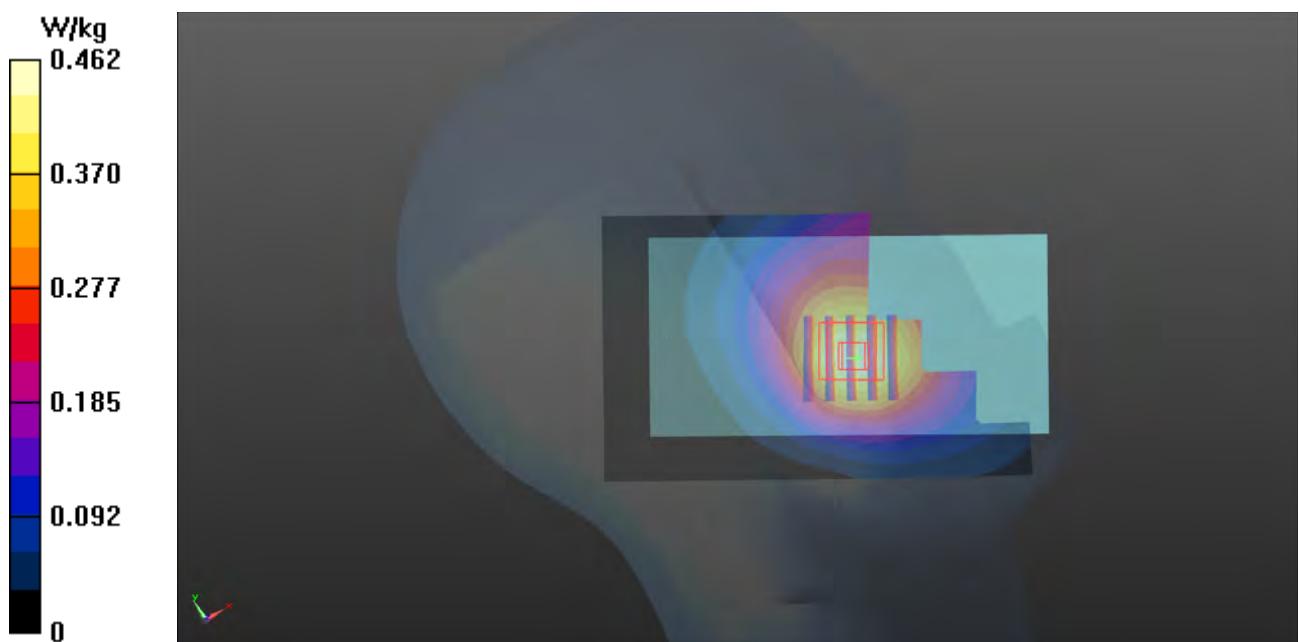
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.96 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.486 W/kg

SAR(1 g) = 0.378 W/kg; SAR(10 g) = 0.289 W/kg

Maximum value of SAR (measured) = 0.449 W/kg



P08 LTE 7_QPSK20M_Left Cheek_Ch20850_1RB_OS99_Ant1**DUT: 180822C04**

Communication System: LTE; Frequency: 2510 MHz; Duty Cycle: 1:1

Medium: H19T27N3_0911 Medium parameters used: $f = 2510$ MHz; $\sigma = 1.936$ S/m; $\epsilon_r = 38.514$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.48, 7.48, 7.48); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (91x151x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.727 W/kg

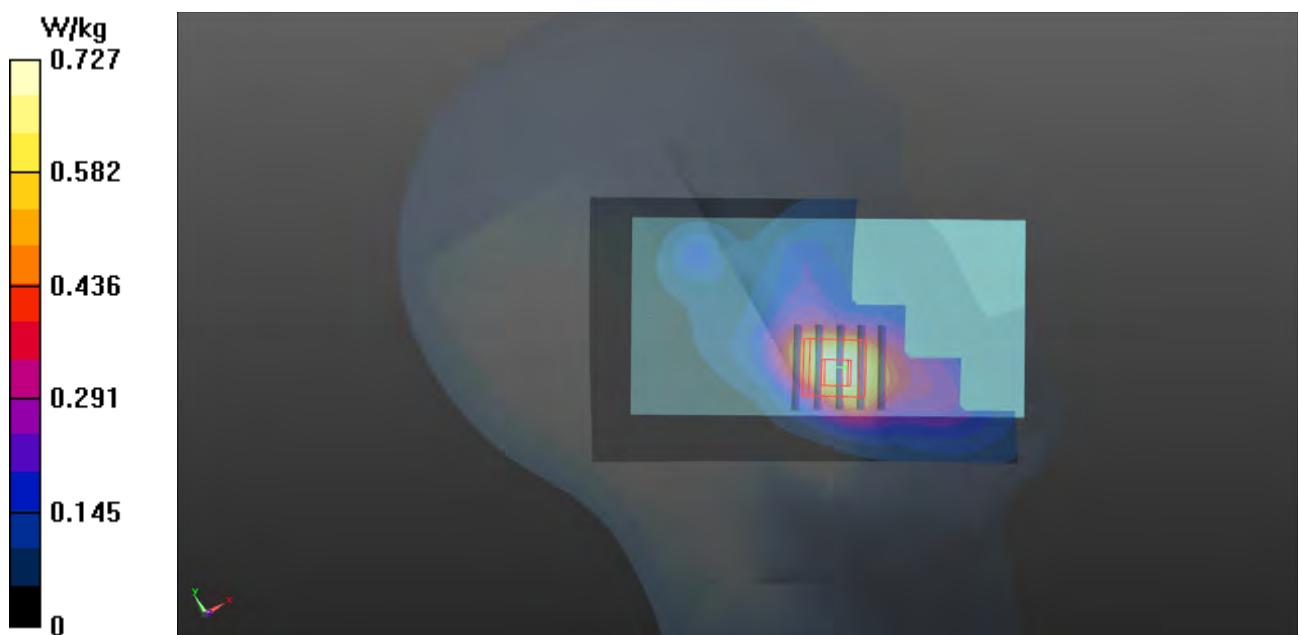
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.89 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 1.12 W/kg

SAR(1 g) = 0.623 W/kg; SAR(10 g) = 0.333 W/kg

Maximum value of SAR (measured) = 0.876 W/kg



P09 LTE 12_QPSK10M_Right Cheek_Ch23130_1RB_OS24_Ant0**DUT: 180822C04**

Communication System: LTE; Frequency: 711 MHz; Duty Cycle: 1:1

Medium: H06T09N1_0911 Medium parameters used: $f = 711$ MHz; $\sigma = 0.855$ S/m; $\epsilon_r = 43.899$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(10.34, 10.34, 10.34); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.351 W/kg

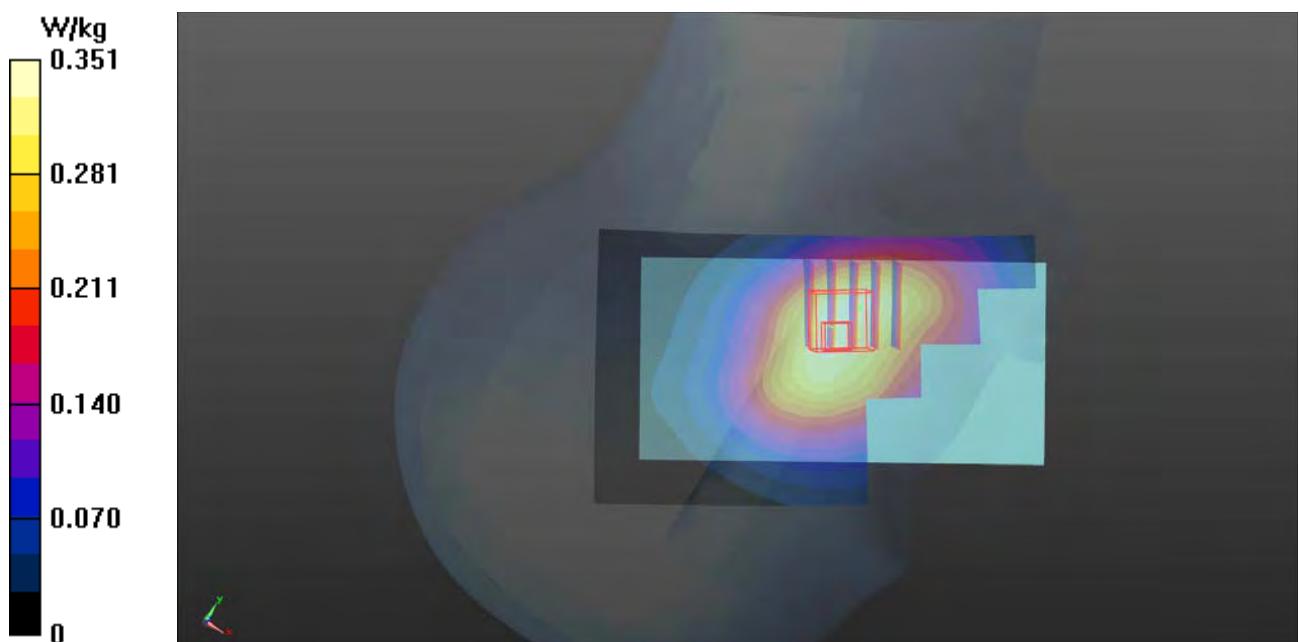
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 20.53 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.373 W/kg

SAR(1 g) = 0.290 W/kg; SAR(10 g) = 0.220 W/kg

Maximum value of SAR (measured) = 0.339 W/kg



P10 LTE 14_QPSK10M_Left Cheek_Ch23330_1RB_OS0_Ant0**DUT: 180822C04**

Communication System: LTE; Frequency: 793 MHz; Duty Cycle: 1:1

Medium: H07T10N1_0911 Medium parameters used: $f = 793$ MHz; $\sigma = 0.869$ S/m; $\epsilon_r = 42.358$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(10.34, 10.34, 10.34); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.352 W/kg

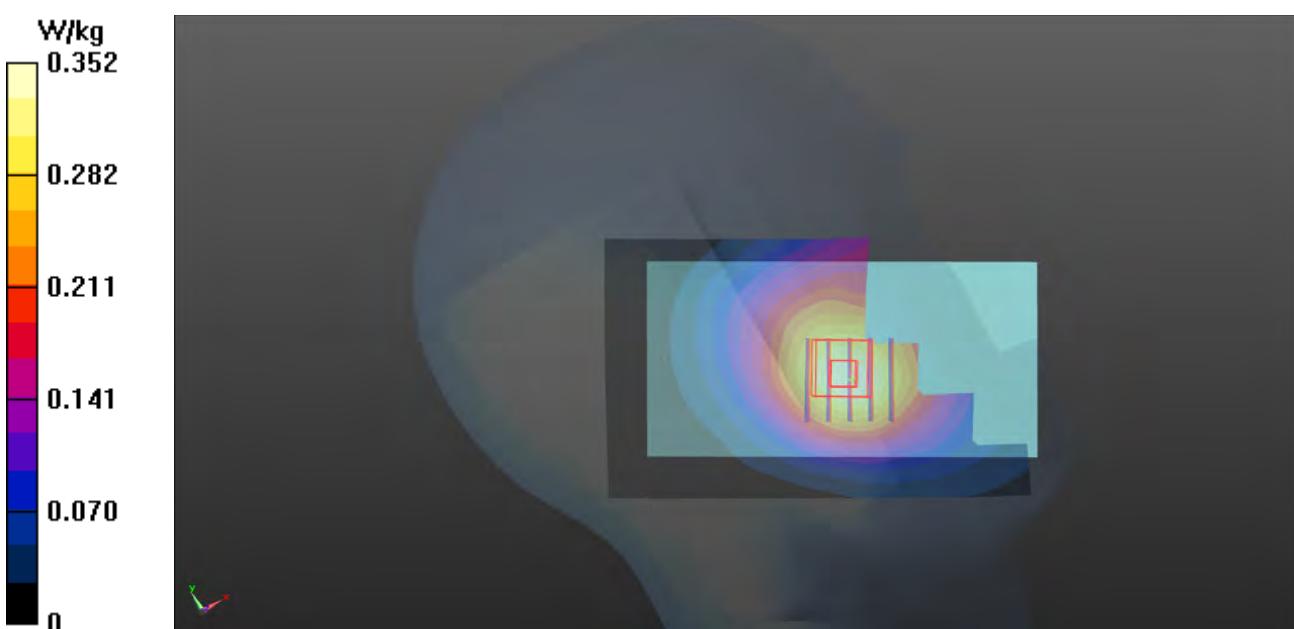
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 19.46 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.368 W/kg

SAR(1 g) = 0.294 W/kg; SAR(10 g) = 0.227 W/kg

Maximum value of SAR (measured) = 0.342 W/kg



P11 LTE 30_QPSK10M_Left Cheek_Ch27710_1RB_OS0_Ant2**DUT: 180822C04**

Communication System: LTE; Frequency: 2310 MHz; Duty Cycle: 1:1

Medium: H19T27N3_0911 Medium parameters used: $f = 2310$ MHz; $\sigma = 1.737$ S/m; $\epsilon_r = 39.226$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(8.03, 8.03, 8.03); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (91x151x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.274 W/kg

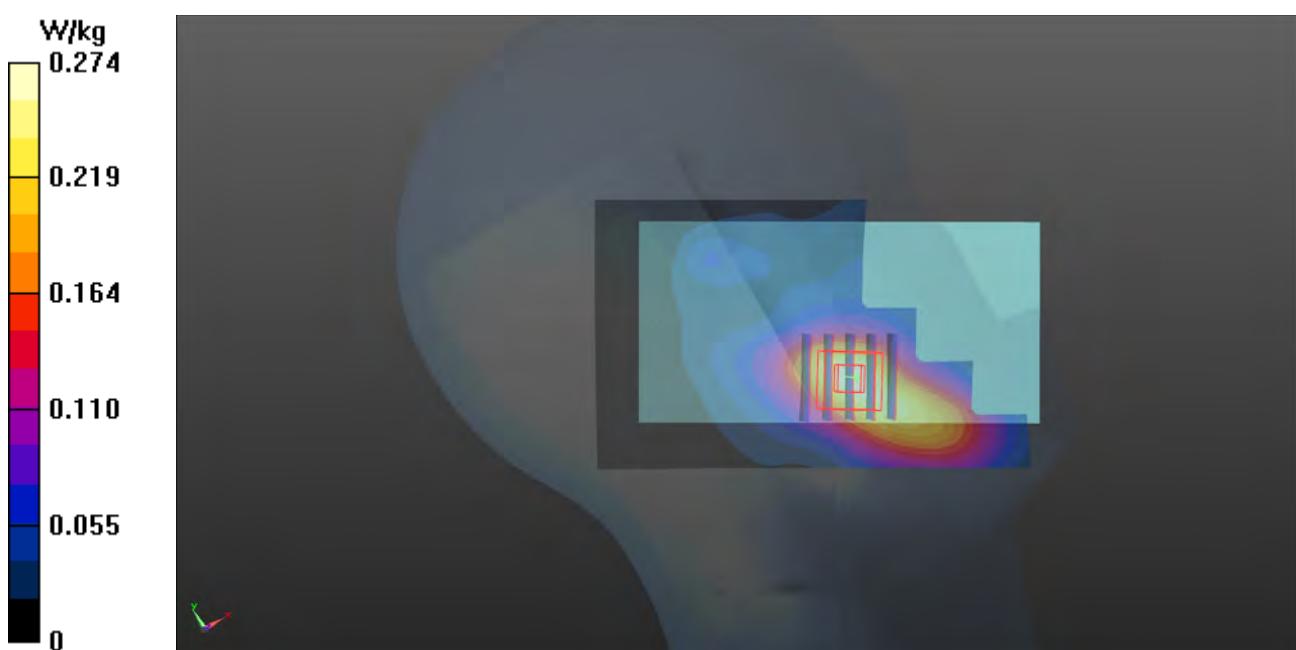
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.65 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 0.382 W/kg

SAR(1 g) = 0.214 W/kg; SAR(10 g) = 0.120 W/kg

Maximum value of SAR (measured) = 0.322 W/kg



P12 LTE 66_QPSK20M_Left Cheek_Ch132572_1RB_OS0_Ant1**DUT: 180822C04**

Communication System: LTE; Frequency: 1770 MHz; Duty Cycle: 1:1

Medium: H16T20N2_0911 Medium parameters used: $f = 1770$ MHz; $\sigma = 1.35$ S/m; $\epsilon_r = 39.653$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(8.6, 8.6, 8.6); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.43 W/kg

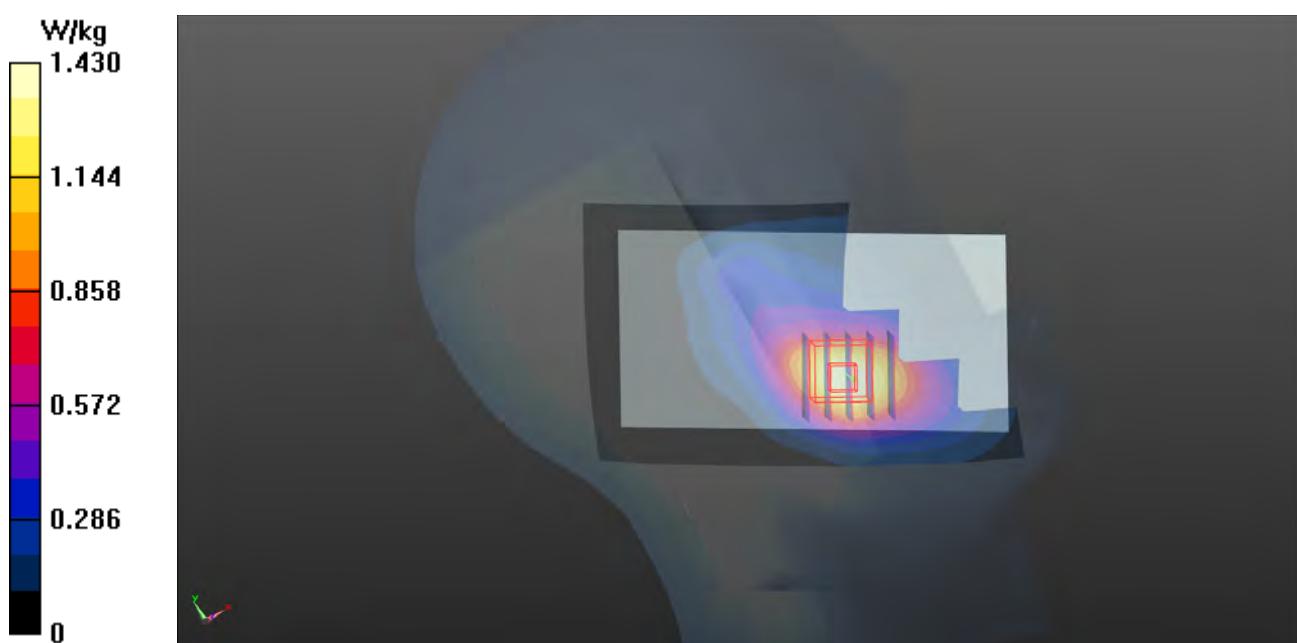
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 30.19 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 1.78 W/kg

SAR(1 g) = 1.09 W/kg; SAR(10 g) = 0.711 W/kg

Maximum value of SAR (measured) = 1.54 W/kg



P13 WLAN2.4G_802.11b_Right Cheek_Ch1

DUT: 180822C04

Communication System: WLAN_2.4G; Frequency: 2412 MHz; Duty Cycle: 1:1.12

Medium: H19T27N1_1012 Medium parameters used: $f = 2412 \text{ MHz}$; $\sigma = 1.827 \text{ S/m}$; $\epsilon_r = 38.239$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.8 °C ; Liquid Temperature : 23.1 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(7.59, 7.59, 7.59); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1653; Type: QD000P40;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (91x151x1): Interpolated grid: $dx=1.200 \text{ mm}$, $dy=1.200 \text{ mm}$

Maximum value of SAR (interpolated) = 0.319 W/kg

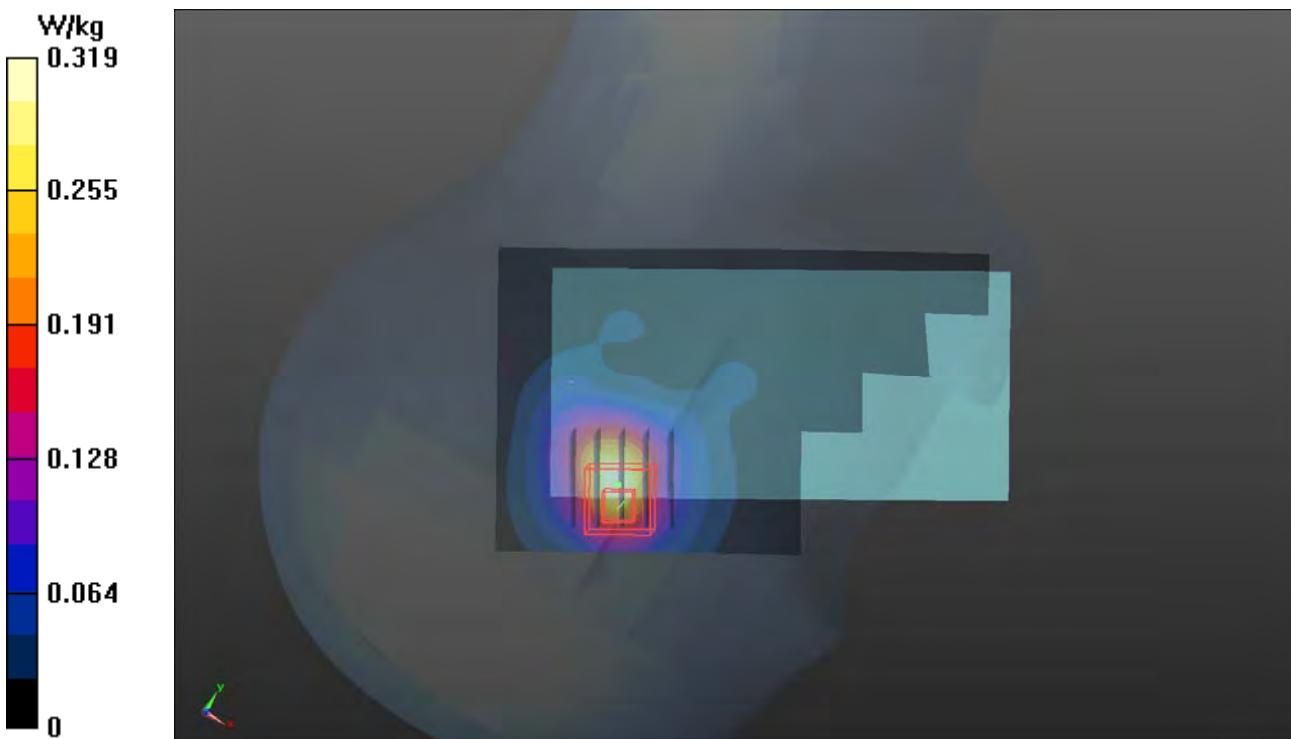
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 13.55 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.421 W/kg

SAR(1 g) = 0.206 W/kg; SAR(10 g) = 0.099 W/kg

Maximum value of SAR (measured) = 0.339 W/kg



P14 WLAN5G_802.11a_Right Cheek_Ch52

DUT: 180822C04

Communication System: WLAN_5G; Frequency: 5260 MHz; Duty Cycle: 1:1.08

Medium: H34T60N1_1012 Medium parameters used: $f = 5260 \text{ MHz}$; $\sigma = 4.634 \text{ S/m}$; $\epsilon_r = 34.54$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.8 °C ; Liquid Temperature : 23.1 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(5.4, 5.4, 5.4); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1653; Type: QD000P40;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (101x181x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 0.290 W/kg

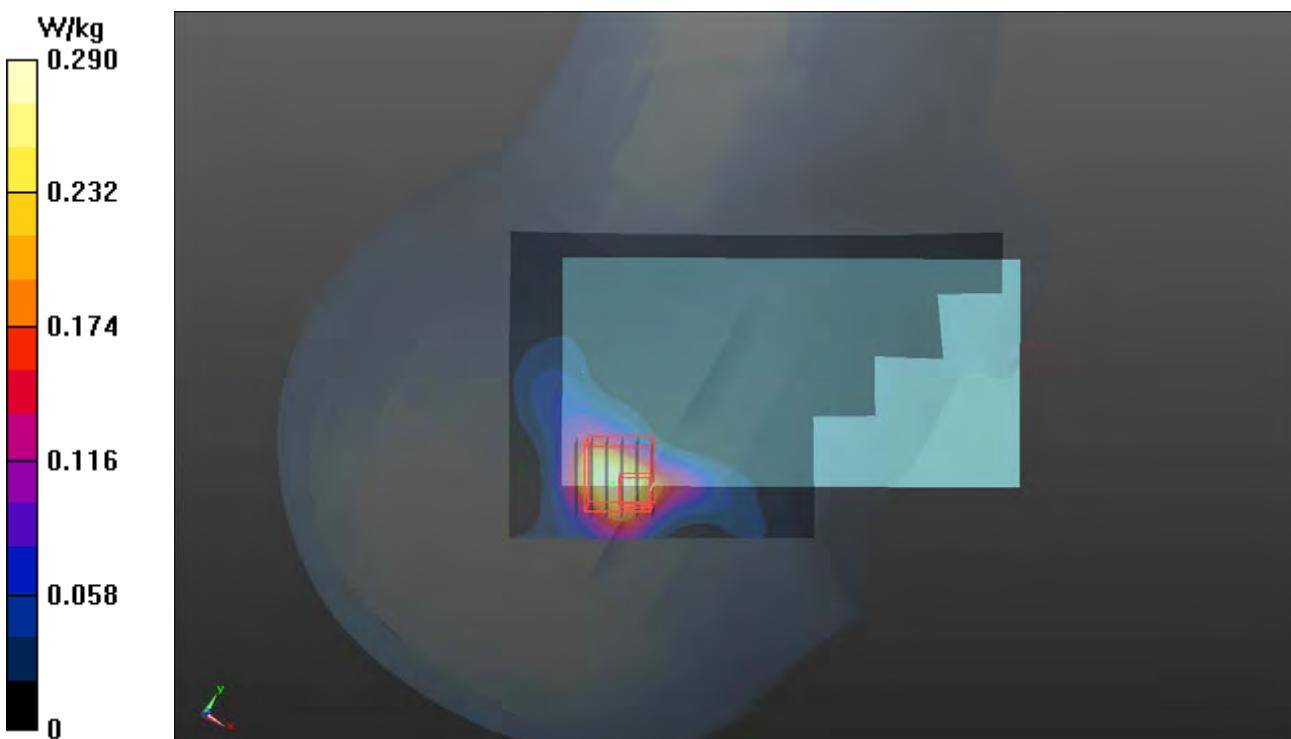
- Zoom Scan (6x6x12)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=2\text{mm}$

Reference Value = 7.887 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.534 W/kg

SAR(1 g) = 0.144 W/kg; SAR(10 g) = 0.054 W/kg

Maximum value of SAR (measured) = 0.345 W/kg



P15 WLAN5G_802.11a_Right Cheek_Ch132

DUT: 180822C04

Communication System: WLAN_5G; Frequency: 5660 MHz; Duty Cycle: 1:1.08

Medium: H34T60N1_1012 Medium parameters used: $f = 5660 \text{ MHz}$; $\sigma = 5.017 \text{ S/m}$; $\epsilon_r = 34.011$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.8 °C ; Liquid Temperature : 23.1 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(4.88, 4.88, 4.88); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1653; Type: QD000P40;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (101x181x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 0.254 W/kg

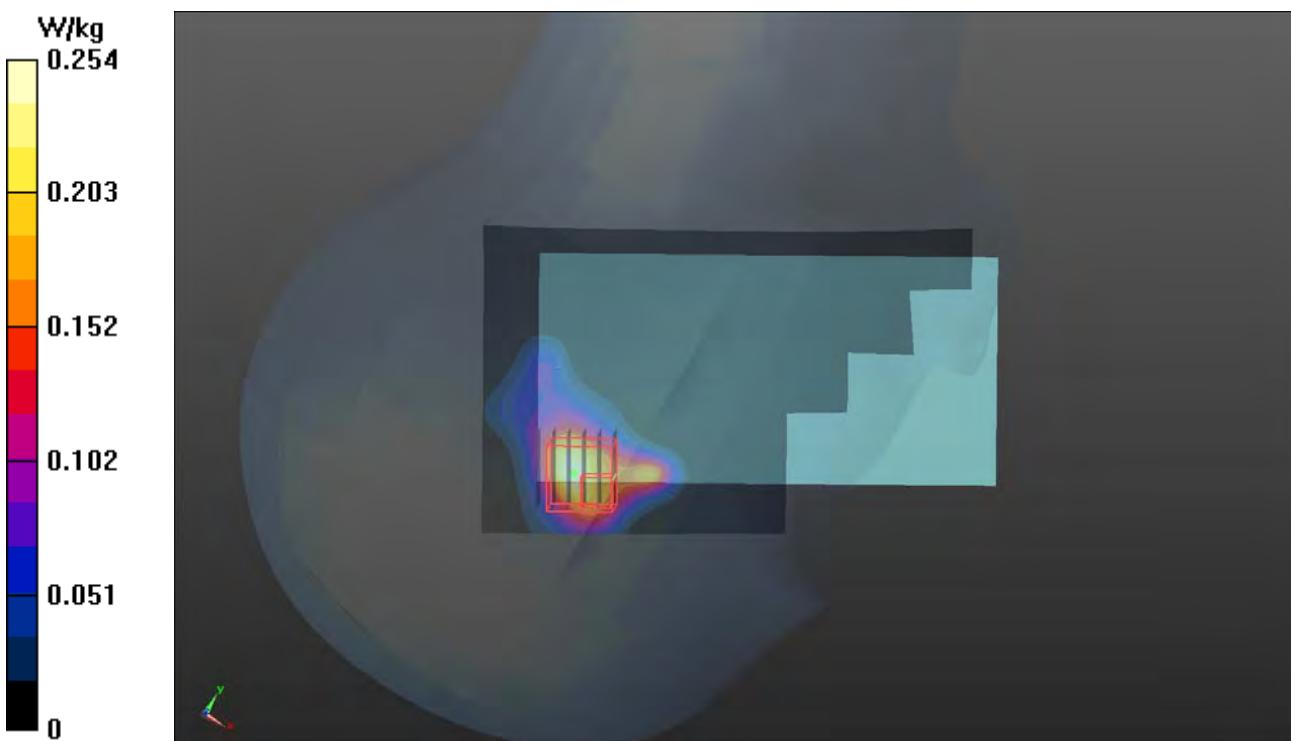
- Zoom Scan (6x6x12)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=2\text{mm}$

Reference Value = 6.546 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.550 W/kg

SAR(1 g) = 0.106 W/kg; SAR(10 g) = 0.036 W/kg

Maximum value of SAR (measured) = 0.310 W/kg



P16 WLAN5G_802.11a_Right Cheek_Ch161

DUT: 180822C04

Communication System: WLAN_5G; Frequency: 5805 MHz; Duty Cycle: 1:1.08

Medium: H34T60N1_1012 Medium parameters used: $f = 5805 \text{ MHz}$; $\sigma = 5.162 \text{ S/m}$; $\epsilon_r = 33.831$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.8 °C ; Liquid Temperature : 23.1 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(5.09, 5.09, 5.09); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1653; Type: QD000P40;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (101x181x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 0.382 W/kg

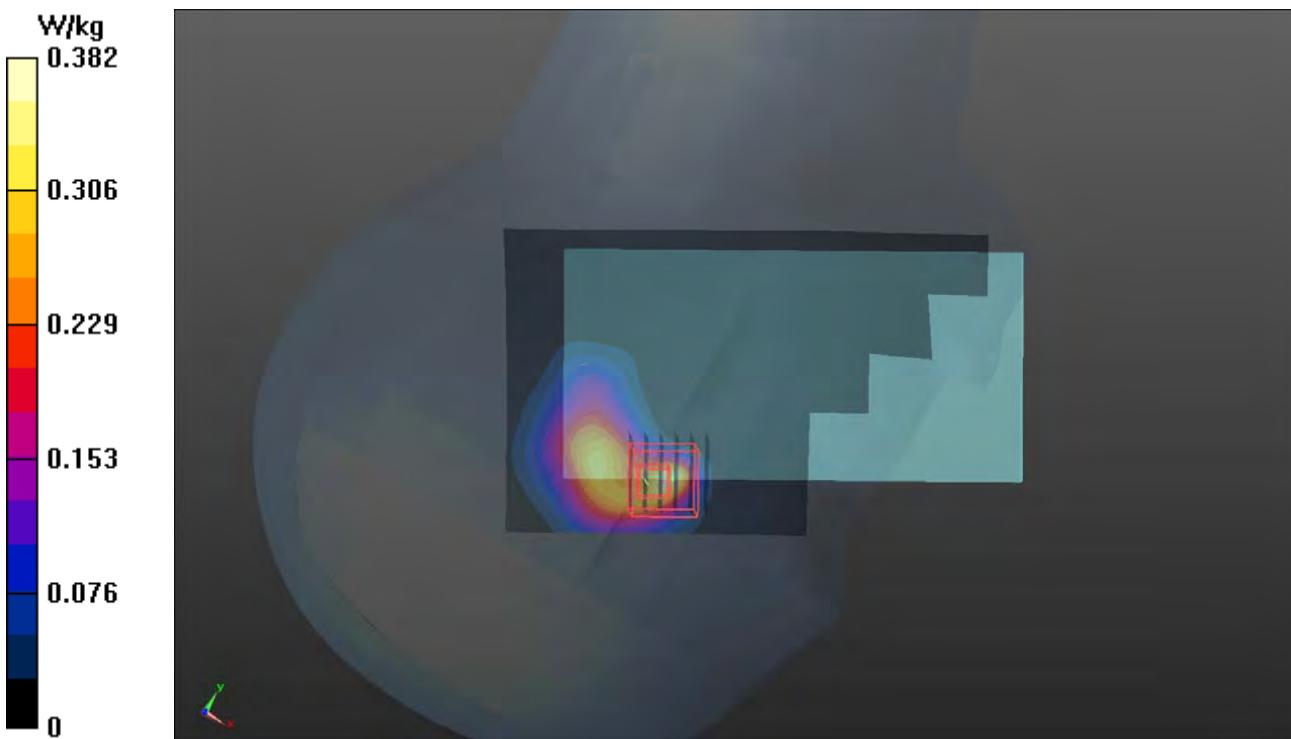
- Zoom Scan (6x6x12)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=2\text{mm}$

Reference Value = 7.428 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.721 W/kg

SAR(1 g) = 0.177 W/kg; SAR(10 g) = 0.055 W/kg

Maximum value of SAR (measured) = 0.415 W/kg



P17 BT_BR_EDR_Right Cheek_Ch0**DUT: 180822C04**

Communication System: BT; Frequency: 2402 MHz; Duty Cycle: 1:1.3

Medium: H19T27N1_1012 Medium parameters used: $f = 2402 \text{ MHz}$; $\sigma = 1.818 \text{ S/m}$; $\epsilon_r = 38.278$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.8 °C ; Liquid Temperature : 23.1 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(7.59, 7.59, 7.59); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1653; Type: QD000P40;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (91x151x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.0226 W/kg

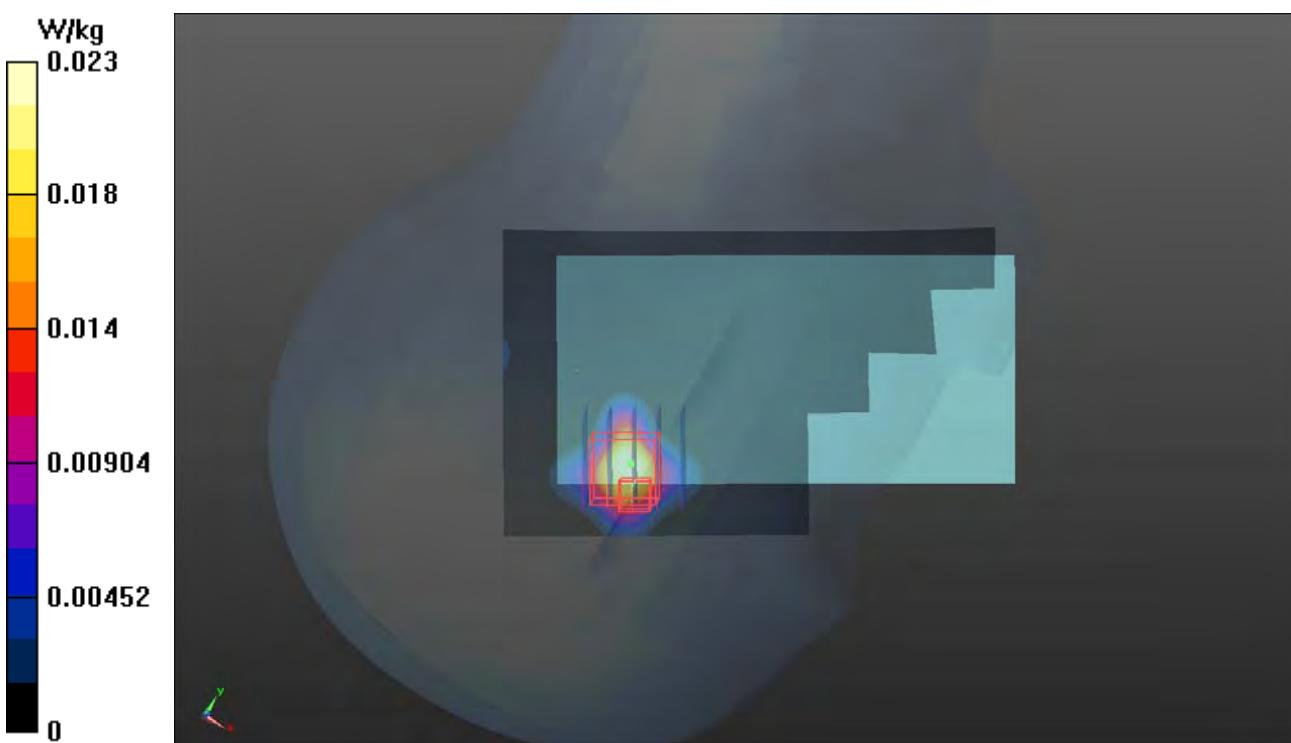
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.820 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.0470 W/kg

SAR(1 g) = 0.017 W/kg; SAR(10 g) = 0.00733 W/kg

Maximum value of SAR (measured) = 0.0286 W/kg



P18_GSM850_GPRS12_Rear Face_10mm_Ch128_Ant0**DUT: 180822C04**

Communication System: GPRS12; Frequency: 824.2 MHz; Duty Cycle: 1:2

Medium: B07T10N2_0911 Medium parameters used: $f = 824.2$ MHz; $\sigma = 0.972$ S/m; $\epsilon_r = 54.244$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 23.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(9.74, 9.74, 9.74); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.480 W/kg

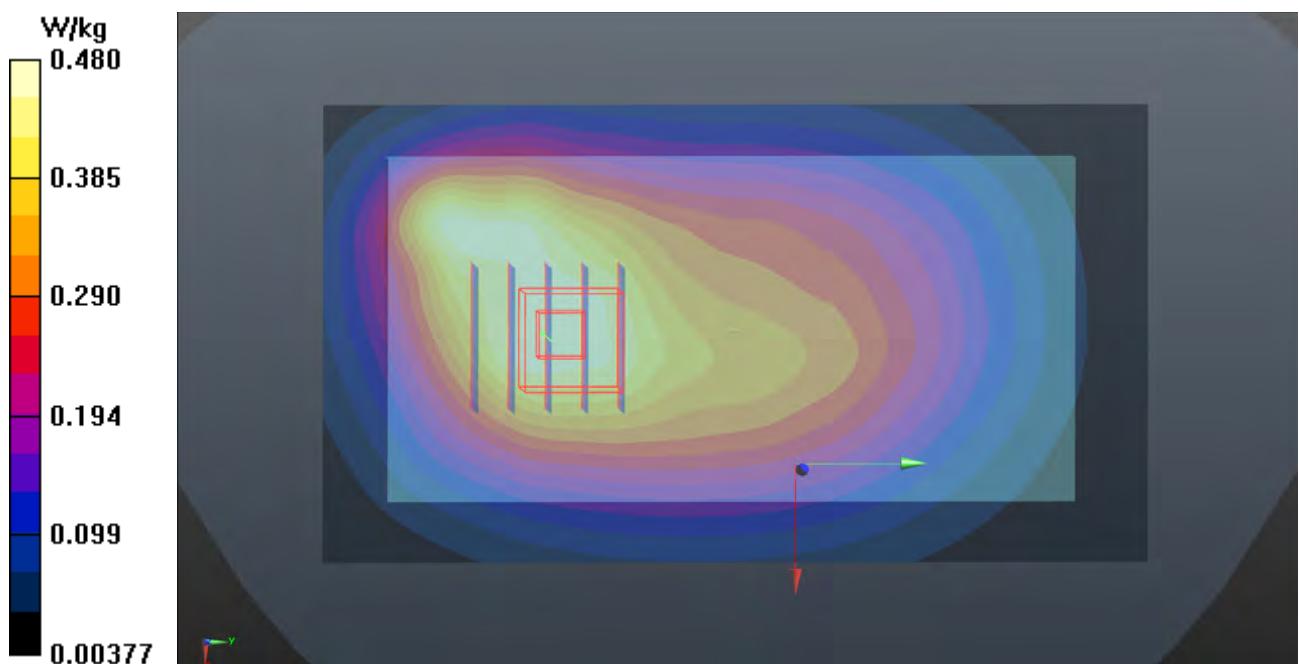
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.13 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.550 W/kg

SAR(1 g) = 0.395 W/kg; SAR(10 g) = 0.281 W/kg

Maximum value of SAR (measured) = 0.490 W/kg



P19_GSM1900_GPRS12_Front Face_10mm_Ch810_Ant1**DUT: 180822C04**

Communication System: GPRS12; Frequency: 1909.8 MHz; Duty Cycle: 1:2

Medium: B16T20N1_0911 Medium parameters used: $f = 1910 \text{ MHz}$; $\sigma = 1.595 \text{ S/m}$; $\epsilon_r = 50.689$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.8 °C ; Liquid Temperature : 23.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.89, 7.89, 7.89); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (71x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.667 W/kg

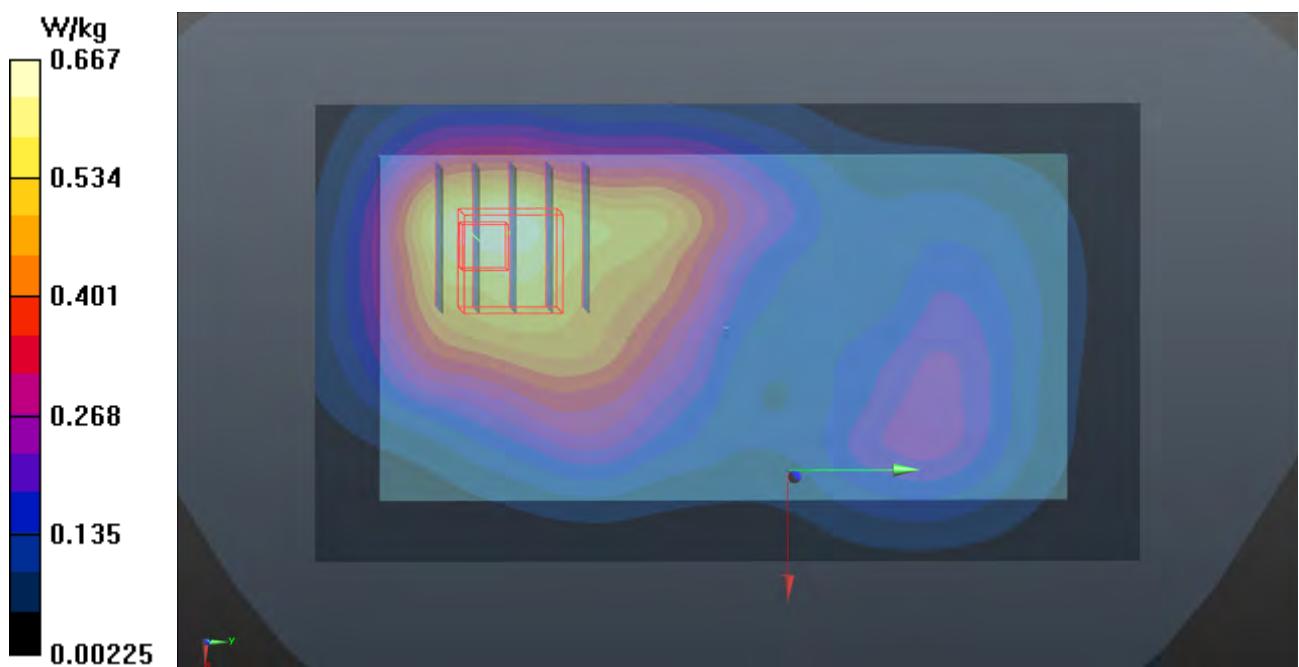
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 18.33 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.720 W/kg

SAR(1 g) = 0.439 W/kg; SAR(10 g) = 0.277 W/kg

Maximum value of SAR (measured) = 0.611 W/kg



P20 WCDMA II_RMC12.2K_Front Face_10mm_Ch9400_Ant1**DUT: 180822C04**

Communication System: WCDMA; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: B16T20N1_0908 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.55 \text{ S/m}$; $\epsilon_r = 51.454$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(7.97, 7.97, 7.97); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1822; Type: QD000P40CD;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (71x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.894 W/kg

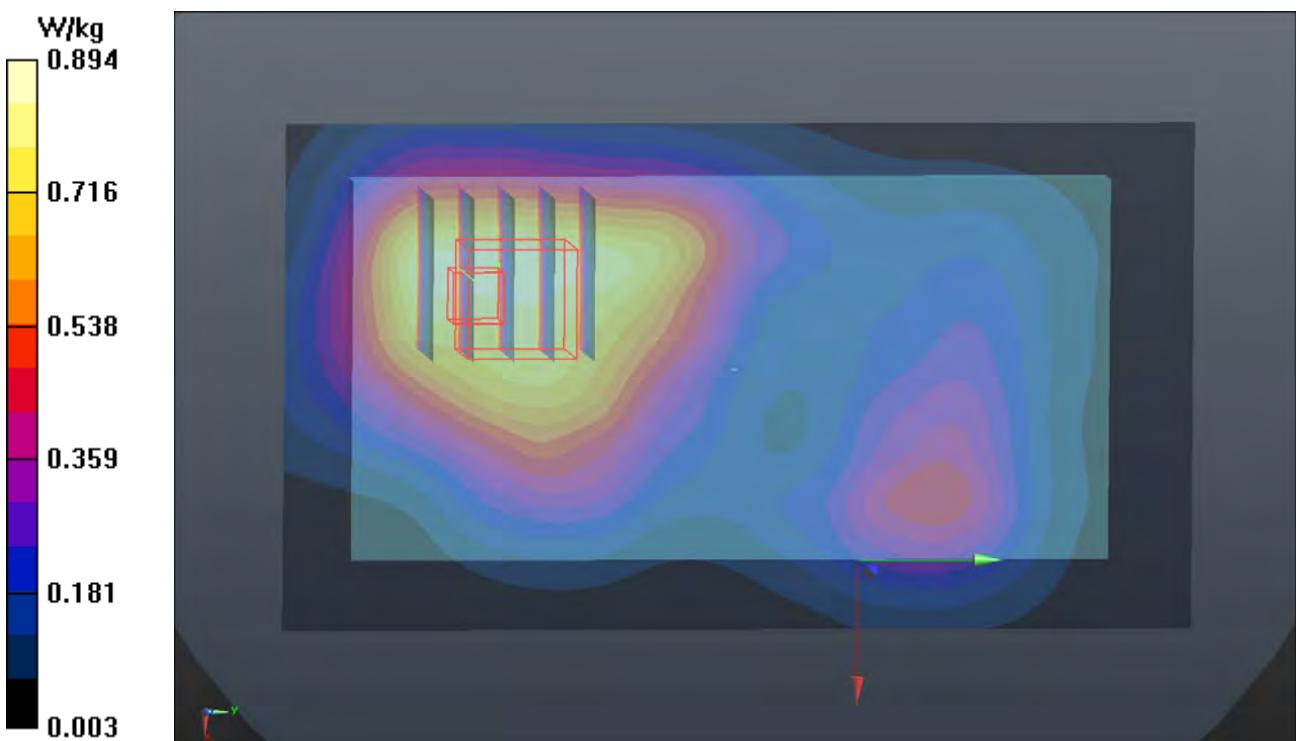
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 22.08 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.923 W/kg

SAR(1 g) = 0.605 W/kg; SAR(10 g) = 0.402 W/kg

Maximum value of SAR (measured) = 0.807 W/kg



P21 WCDMA IV_RMC12.2K_Front Face_10mm_Ch1312_Ant1**DUT: 180822C04**

Communication System: WCDMA; Frequency: 1712.4 MHz; Duty Cycle: 1:1

Medium: B16T20N1_0908 Medium parameters used: $f = 1712.4$ MHz; $\sigma = 1.406$ S/m; $\epsilon_r = 51.775$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(8.28, 8.28, 8.28); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1822; Type: QD000P40CD;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.10 W/kg

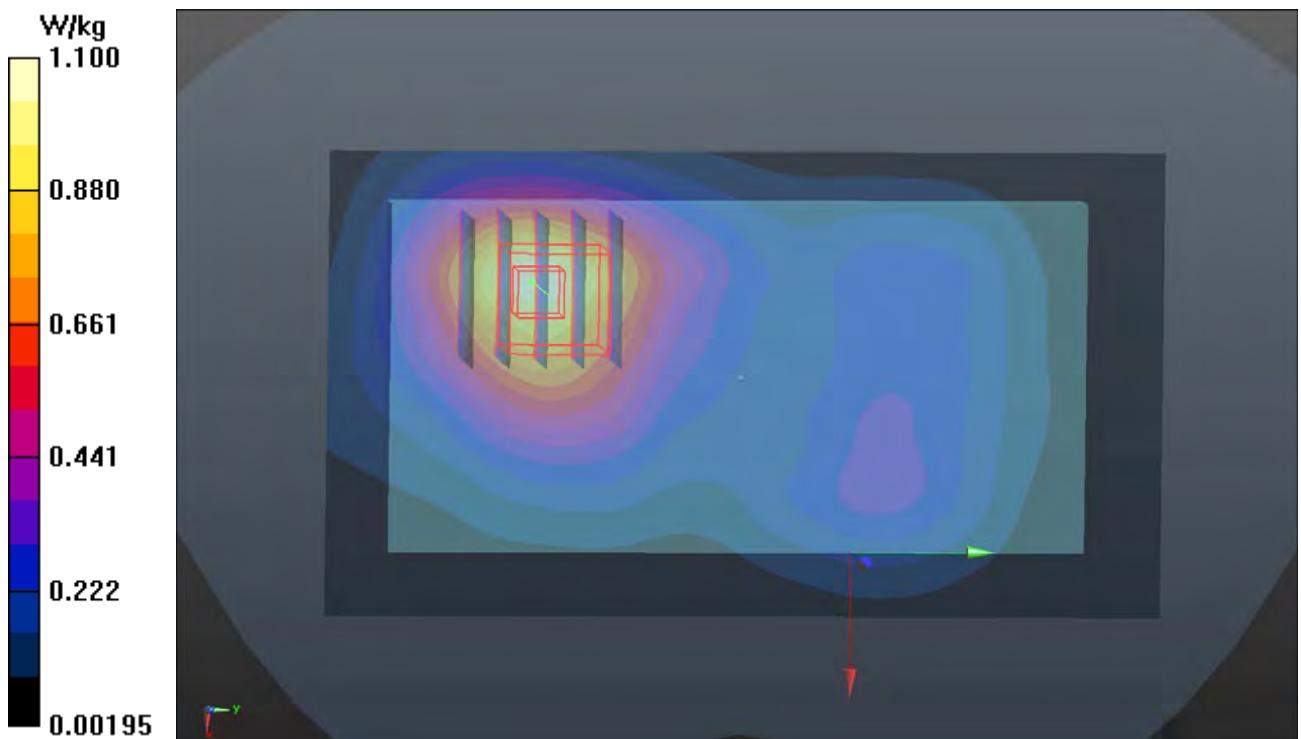
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 24.79 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 1.13 W/kg

SAR(1 g) = 0.757 W/kg; SAR(10 g) = 0.483 W/kg

Maximum value of SAR (measured) = 1.01 W/kg



P22 WCDMA V_RMC12.2K_Front Face_10mm_Ch4233_Ant0**DUT: 180822C04**

Communication System: WCDMA; Frequency: 846.6 MHz; Duty Cycle: 1:1

Medium: B07T10N1_0908 Medium parameters used: $f = 847 \text{ MHz}$; $\sigma = 1.026 \text{ S/m}$; $\epsilon_r = 55.926$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(10.25, 10.25, 10.25); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1822; Type: QD000P40CD;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (71x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.527 W/kg

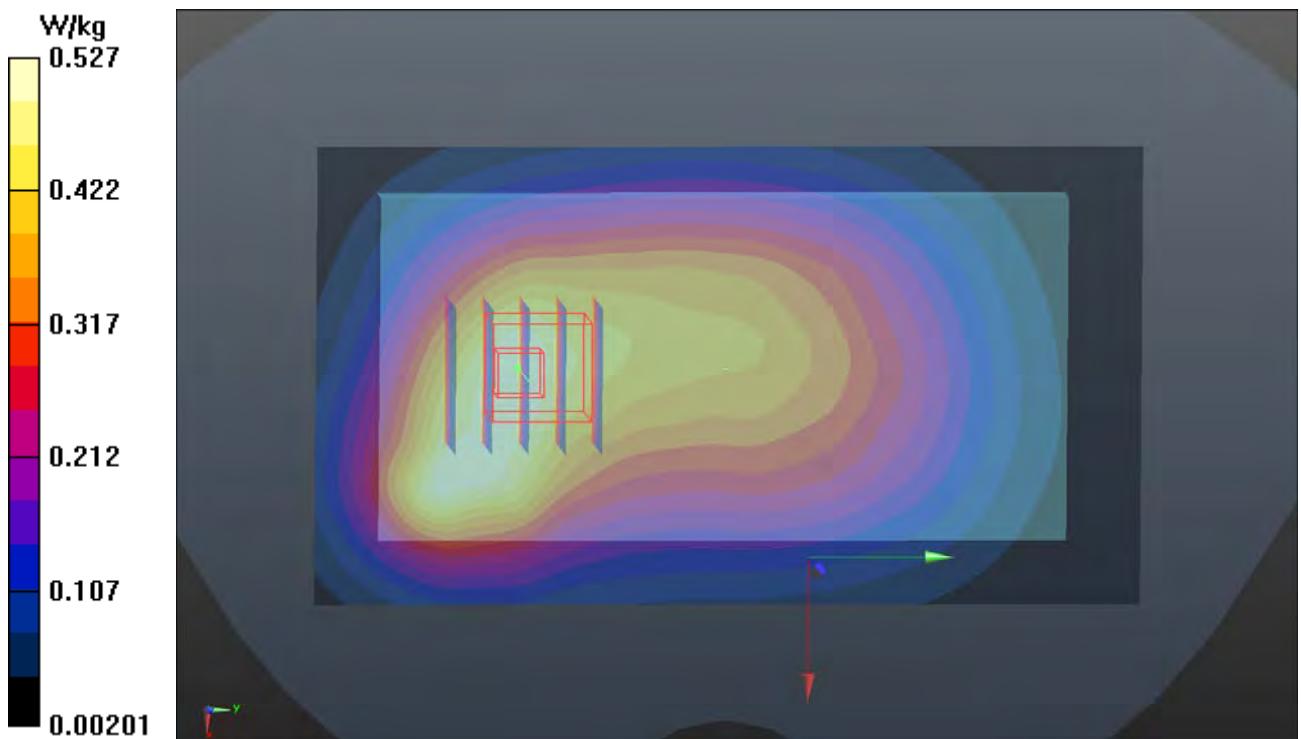
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 22.22 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.582 W/kg

SAR(1 g) = 0.417 W/kg; SAR(10 g) = 0.298 W/kg

Maximum value of SAR (measured) = 0.520 W/kg



P23 LTE 2_QPSK20M_Front Face_10mm_Ch19100_1RB_OS99_Ant1**DUT: 180822C04**

Communication System: LTE; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: B16T20N1_0908 Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.56 \text{ S/m}$; $\epsilon_r = 51.445$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(7.97, 7.97, 7.97); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1822; Type: QD000P40CD;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (71x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.935 W/kg

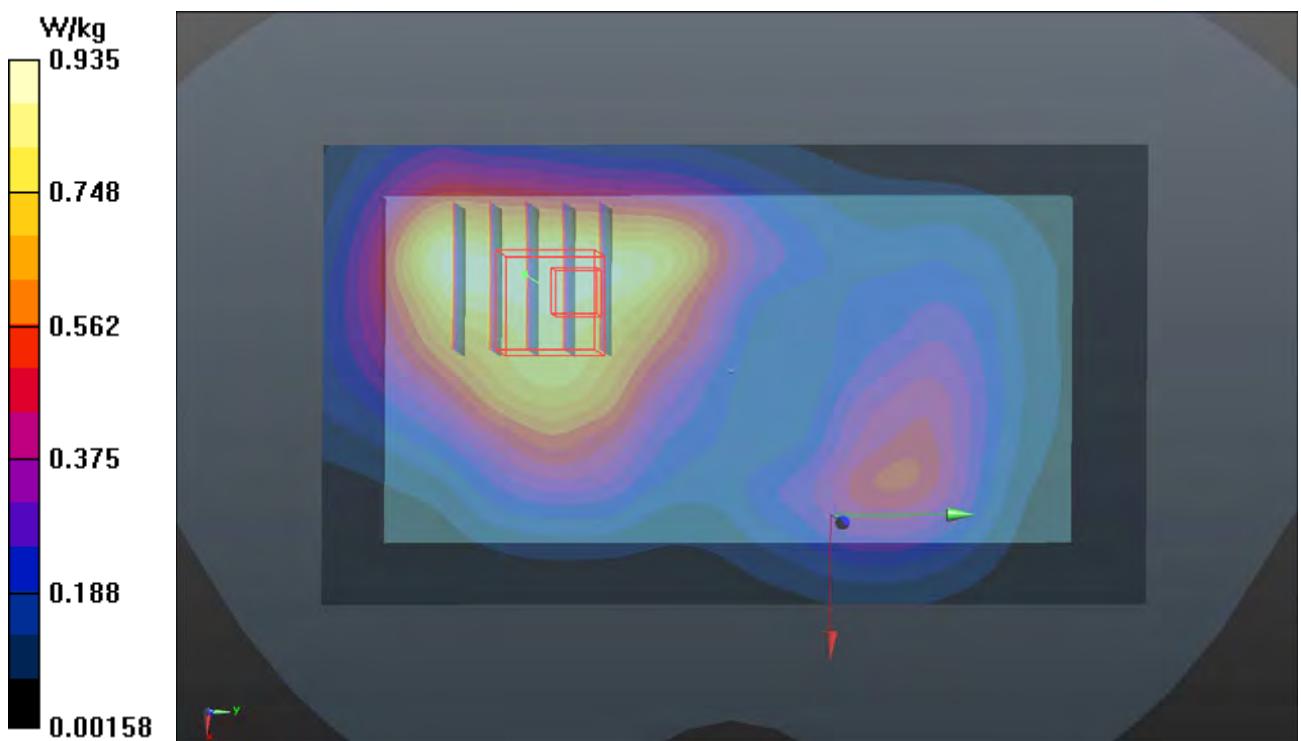
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 22.37 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 0.986 W/kg

SAR(1 g) = 0.634 W/kg; SAR(10 g) = 0.426 W/kg

Maximum value of SAR (measured) = 0.850 W/kg



P24 LTE 5_QPSK10M_Rear Face_10mm_Ch20600_1RB_OS24_Ant0**DUT: 180822C04**

Communication System: LTE; Frequency: 844 MHz; Duty Cycle: 1:1

Medium: B07T10N1_0908 Medium parameters used: $f = 844$ MHz; $\sigma = 1.023$ S/m; $\epsilon_r = 55.948$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(10.25, 10.25, 10.25); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1822; Type: QD000P40CD;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.646 W/kg

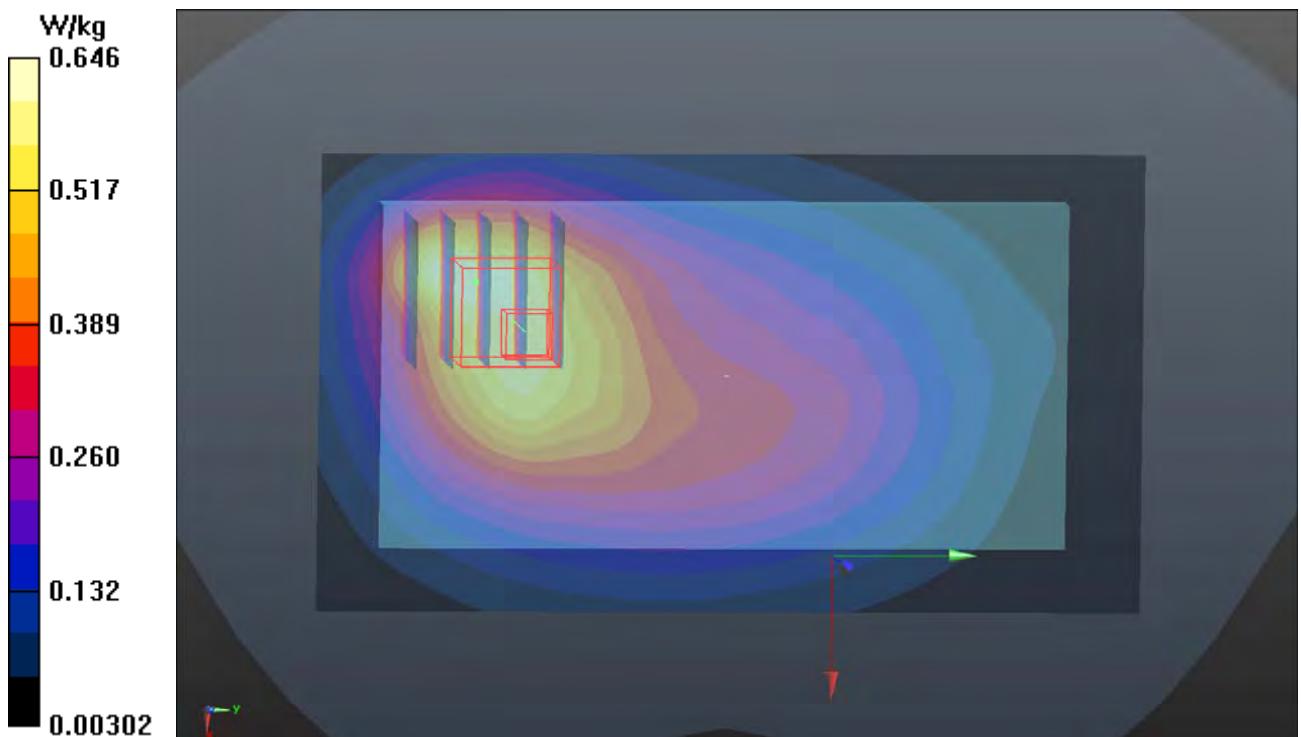
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 24.02 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.675 W/kg

SAR(1 g) = 0.477 W/kg; SAR(10 g) = 0.318 W/kg

Maximum value of SAR (measured) = 0.605 W/kg



P25 LTE 7_QPSK20M_Rear Face_10mm_Ch20850_1RB_OS99_Ant1**DUT: 180822C04**

Communication System: LTE; Frequency: 2510 MHz; Duty Cycle: 1:1

Medium: B19T27N1_0908 Medium parameters used: $f = 2510 \text{ MHz}$; $\sigma = 2.078 \text{ S/m}$; $\epsilon_r = 50.498$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(7.51, 7.51, 7.51); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1822; Type: QD000P40CD;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (91x151x1): Interpolated grid: $dx=1.200 \text{ mm}$, $dy=1.200 \text{ mm}$

Maximum value of SAR (interpolated) = 0.876 W/kg

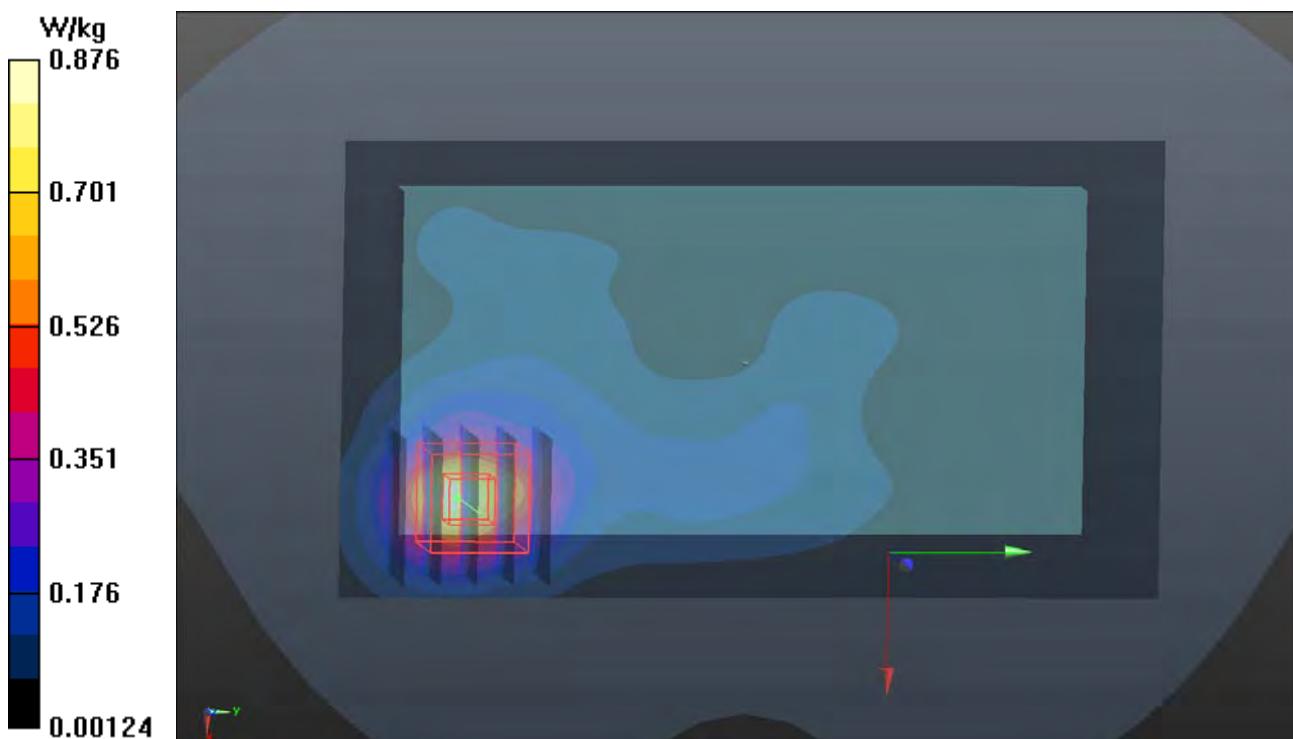
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 17.93 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 1.10 W/kg

SAR(1 g) = 0.526 W/kg; SAR(10 g) = 0.244 W/kg

Maximum value of SAR (measured) = 0.886 W/kg



P26 LTE 12_QPSK10M_Rear Face_10mm_Ch23060_1RB_OS24_Ant0**DUT: 180822C04**

Communication System: LTE; Frequency: 704 MHz; Duty Cycle: 1:1

Medium: B06T09N1_0908 Medium parameters used: $f = 704 \text{ MHz}$; $\sigma = 0.919 \text{ S/m}$; $\epsilon_r = 54.4$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(10.28, 10.28, 10.28); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1822; Type: QD000P40CD;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (71x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.593 W/kg

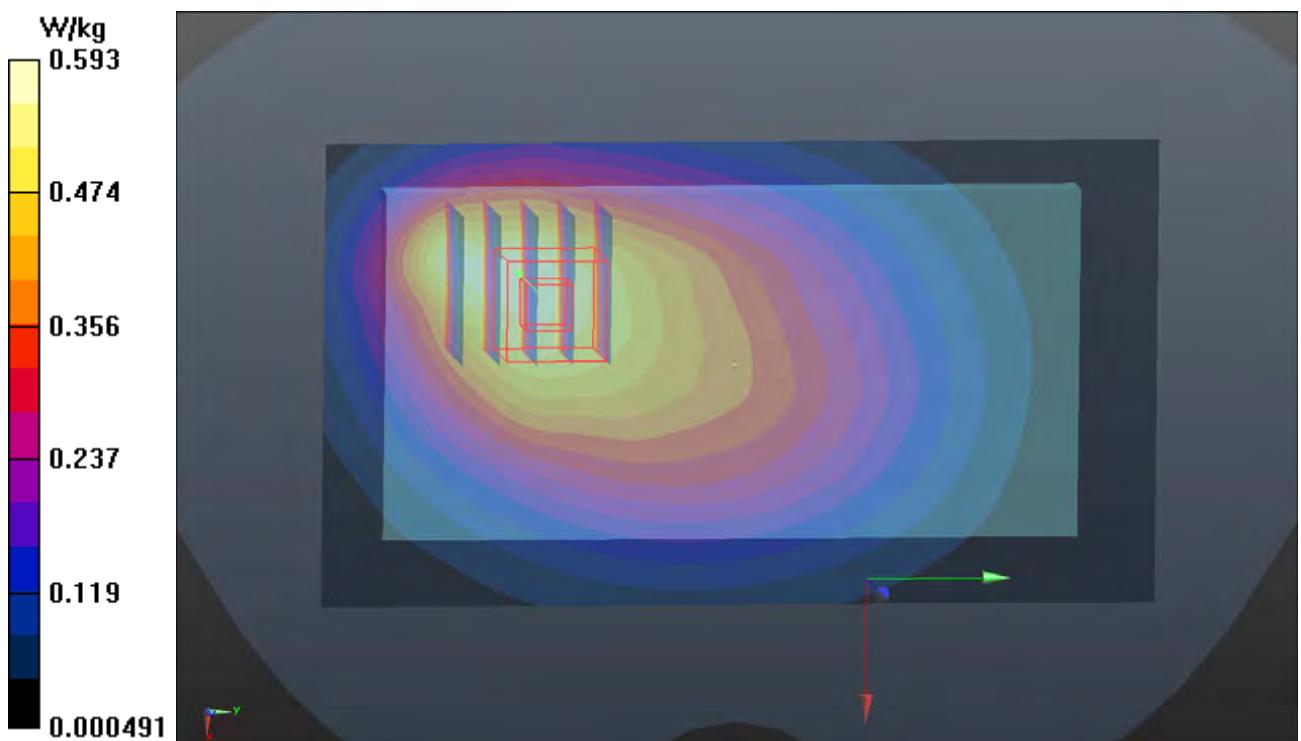
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 23.91 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.640 W/kg

SAR(1 g) = 0.456 W/kg; SAR(10 g) = 0.323 W/kg

Maximum value of SAR (measured) = 0.569 W/kg



P27 LTE 14_QPSK10M_Rear Face_10mm_Ch23330_1RB_OS0_Ant0**DUT: 180822C04**

Communication System: LTE; Frequency: 793 MHz; Duty Cycle: 1:1

Medium: B06T09N1_0908 Medium parameters used: $f = 793 \text{ MHz}$; $\sigma = 1.004 \text{ S/m}$; $\epsilon_r = 53.524$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(10.28, 10.28, 10.28); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1822; Type: QD000P40CD;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (71x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.575 W/kg

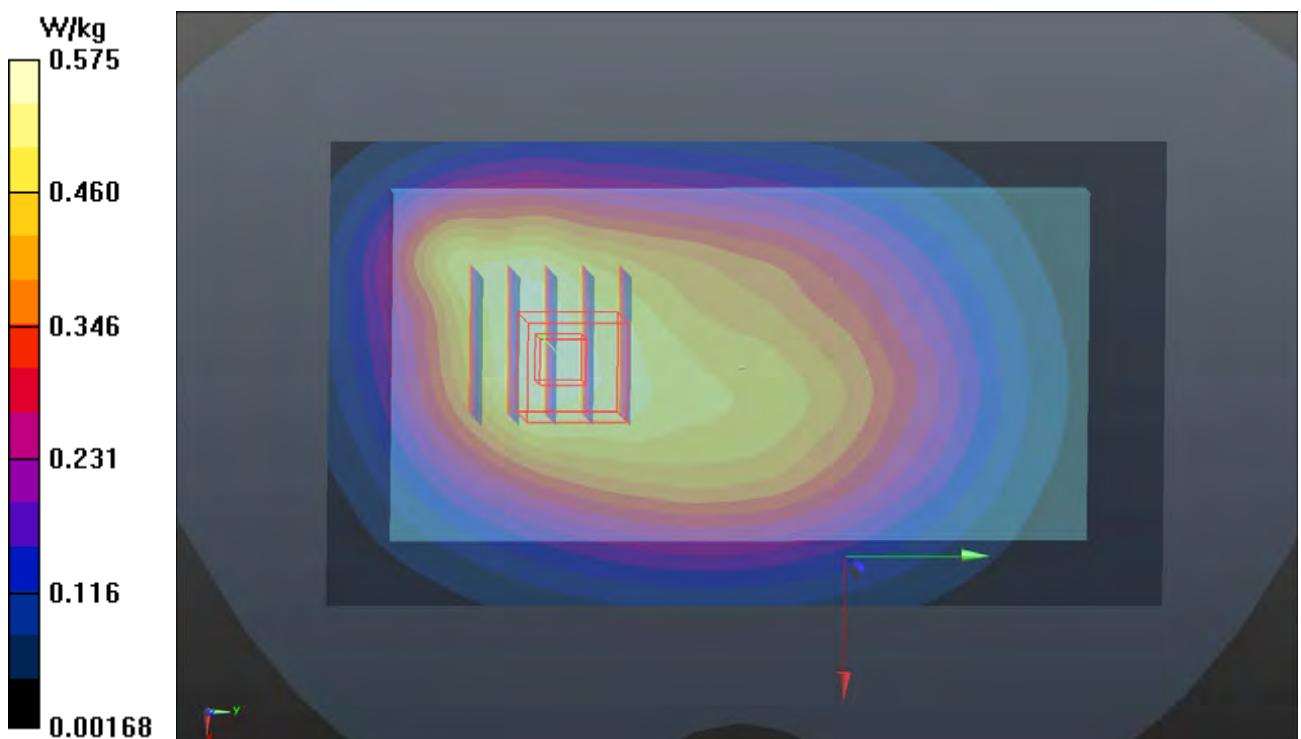
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 23.22 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.639 W/kg

SAR(1 g) = 0.473 W/kg; SAR(10 g) = 0.344 W/kg

Maximum value of SAR (measured) = 0.582 W/kg



P28 LTE 30_QPSK10M_Rear Face_10mm_Ch27710_1RB_OS0_Ant2**DUT: 180822C04**

Communication System: LTE; Frequency: 2310 MHz; Duty Cycle: 1:1

Medium: B19T27N4_0911 Medium parameters used: $f = 2310$ MHz; $\sigma = 1.844$ S/m; $\epsilon_r = 51.726$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.8 °C ; Liquid Temperature : 23.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3650; ConvF(7.77, 7.77, 7.77); Calibrated: 2018/07/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1232; Calibrated: 2018/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (91x151x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 1.60 W/kg

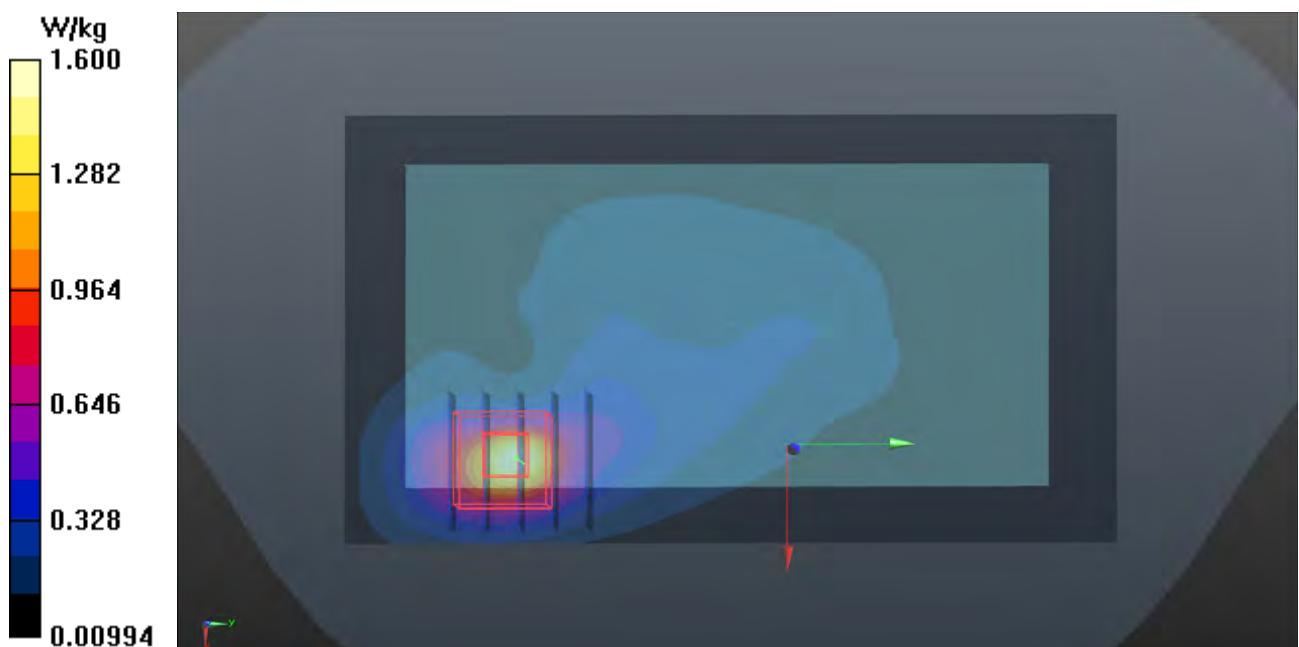
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 28.70 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 1.98 W/kg

SAR(1 g) = 1.04 W/kg; SAR(10 g) = 0.502 W/kg

Maximum value of SAR (measured) = 1.60 W/kg



P29 LTE 66_QPSK20M_Front Face_10mm_Ch132072_1RB_OS0_Ant1**DUT: 180822C04**

Communication System: LTE; Frequency: 1720 MHz; Duty Cycle: 1:1

Medium: B16T20N1_0908 Medium parameters used: $f = 1720 \text{ MHz}$; $\sigma = 1.414 \text{ S/m}$; $\epsilon_r = 51.763$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(8.28, 8.28, 8.28); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1822; Type: QD000P40CD;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (71x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 1.35 W/kg

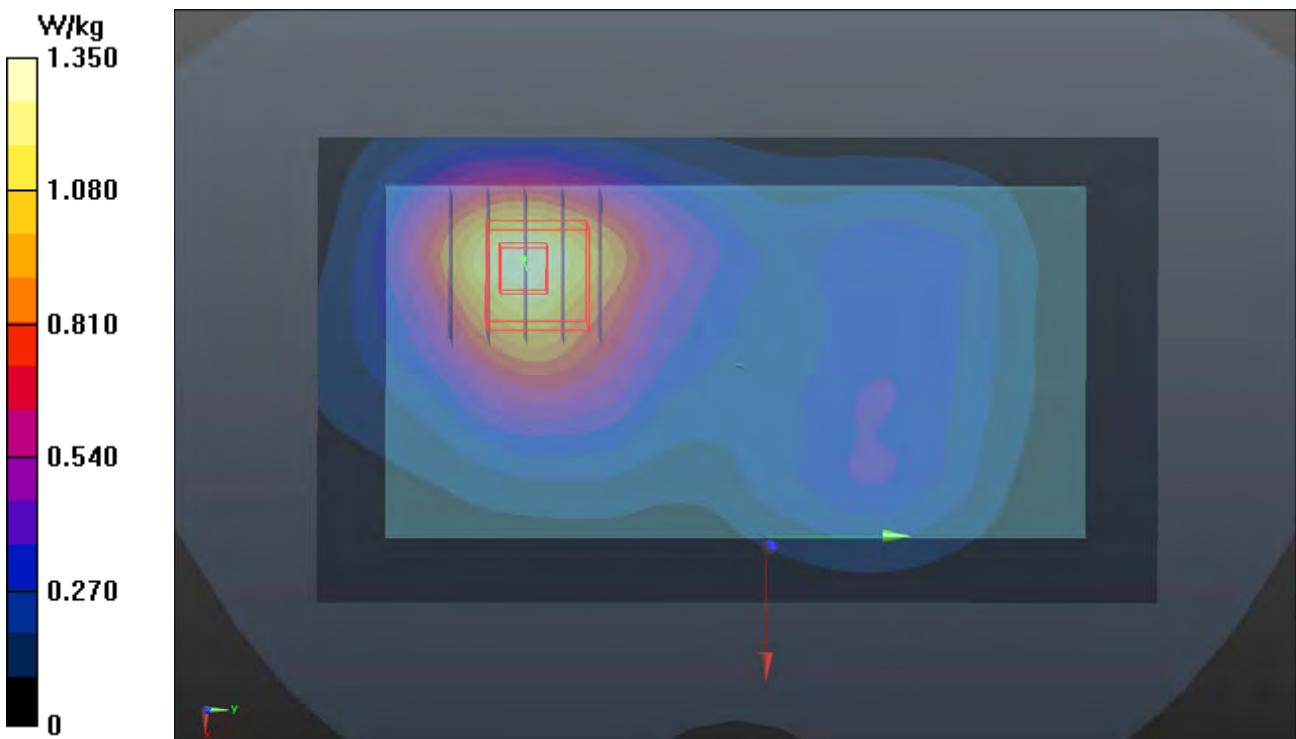
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 27.70 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 1.37 W/kg

SAR(1 g) = 0.913 W/kg; SAR(10 g) = 0.580 W/kg

Maximum value of SAR (measured) = 1.21 W/kg



P30 WLAN2.4G_802.11b_Rear Face_10mm_Ch11**DUT: 180822C04**

Communication System: WLAN_2.4G; Frequency: 2462 MHz; Duty Cycle: 1:1.12

Medium: B19T27N1_1011 Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 2.056 \text{ S/m}$; $\epsilon_r = 50.486$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.8 °C ; Liquid Temperature : 23.1 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3971; ConvF(7.7, 7.7, 7.7); Calibrated: 2018/03/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2018/03/16
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (91x151x1): Interpolated grid: $dx=1.200 \text{ mm}$, $dy=1.200 \text{ mm}$

Maximum value of SAR (interpolated) = 0.214 W/kg

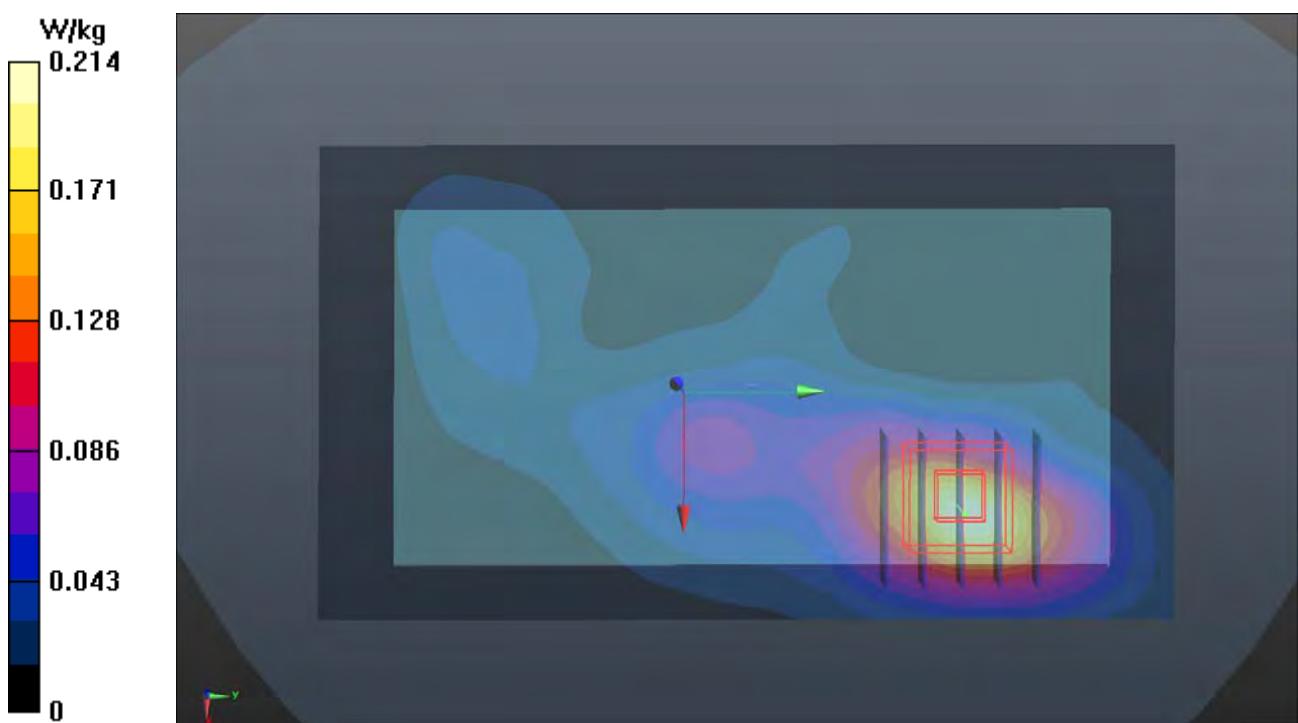
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 9.798 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 0.348 W/kg

SAR(1 g) = 0.175 W/kg; SAR(10 g) = 0.083 W/kg

Maximum value of SAR (measured) = 0.254 W/kg



P31 WLAN5G_802.11a_Rear Face_10mm_Ch52**DUT: 180822C04**

Communication System: WLAN_5G; Frequency: 5260 MHz; Duty Cycle: 1:1.08

Medium: B34T60N1_1010 Medium parameters used: $f = 5260 \text{ MHz}$; $\sigma = 5.411 \text{ S/m}$; $\epsilon_r = 47.382$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.7 °C ; Liquid Temperature : 23.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3971; ConvF(4.59, 4.59, 4.59); Calibrated: 2018/03/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2018/03/16
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (101x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.18 W/kg

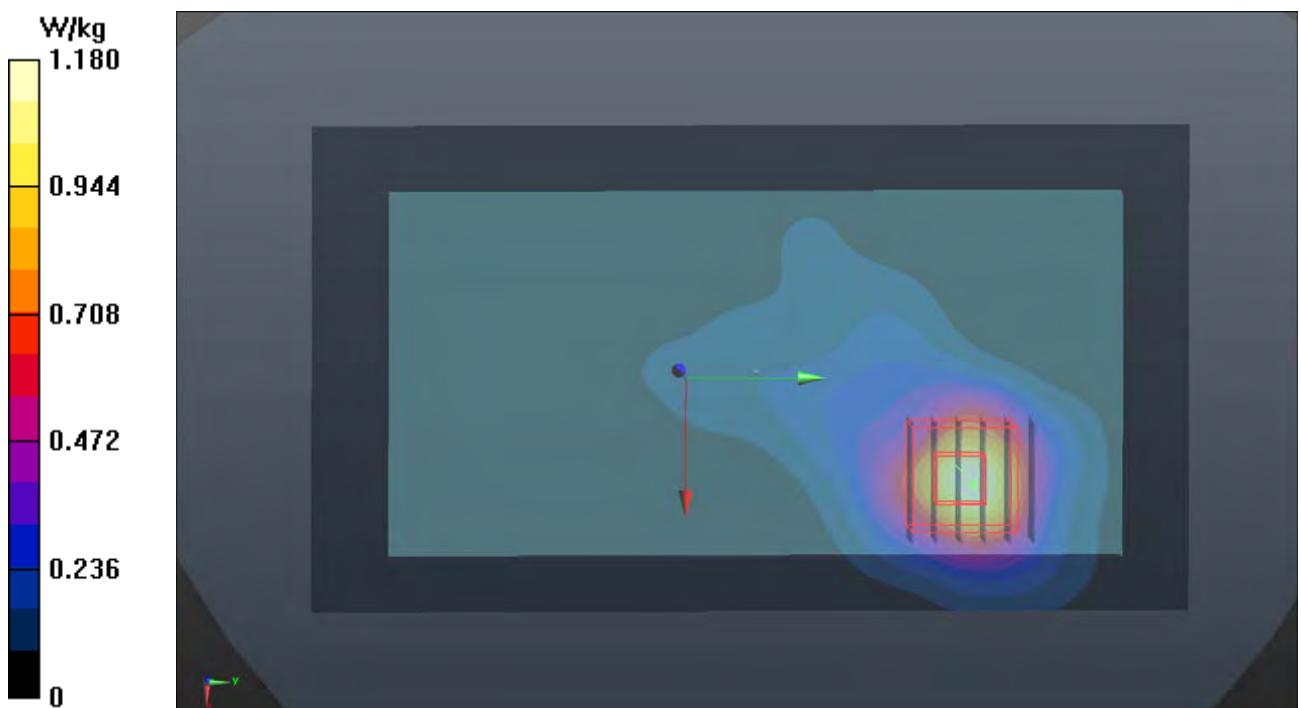
- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm

Reference Value = 13.17 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 2.42 W/kg

SAR(1 g) = 0.697 W/kg; SAR(10 g) = 0.252 W/kg

Maximum value of SAR (measured) = 1.50 W/kg



P32 WLAN5G_802.11a_Rear Face_10mm_Ch116**DUT: 180822C04**

Communication System: WLAN_5G; Frequency: 5580 MHz; Duty Cycle: 1:1.08

Medium: B34T60N1_1010 Medium parameters used: $f = 5580 \text{ MHz}$; $\sigma = 5.852 \text{ S/m}$; $\epsilon_r = 46.754$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.7 °C ; Liquid Temperature : 23.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3971; ConvF(4.08, 4.08, 4.08); Calibrated: 2018/03/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2018/03/16
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (101x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.08 W/kg

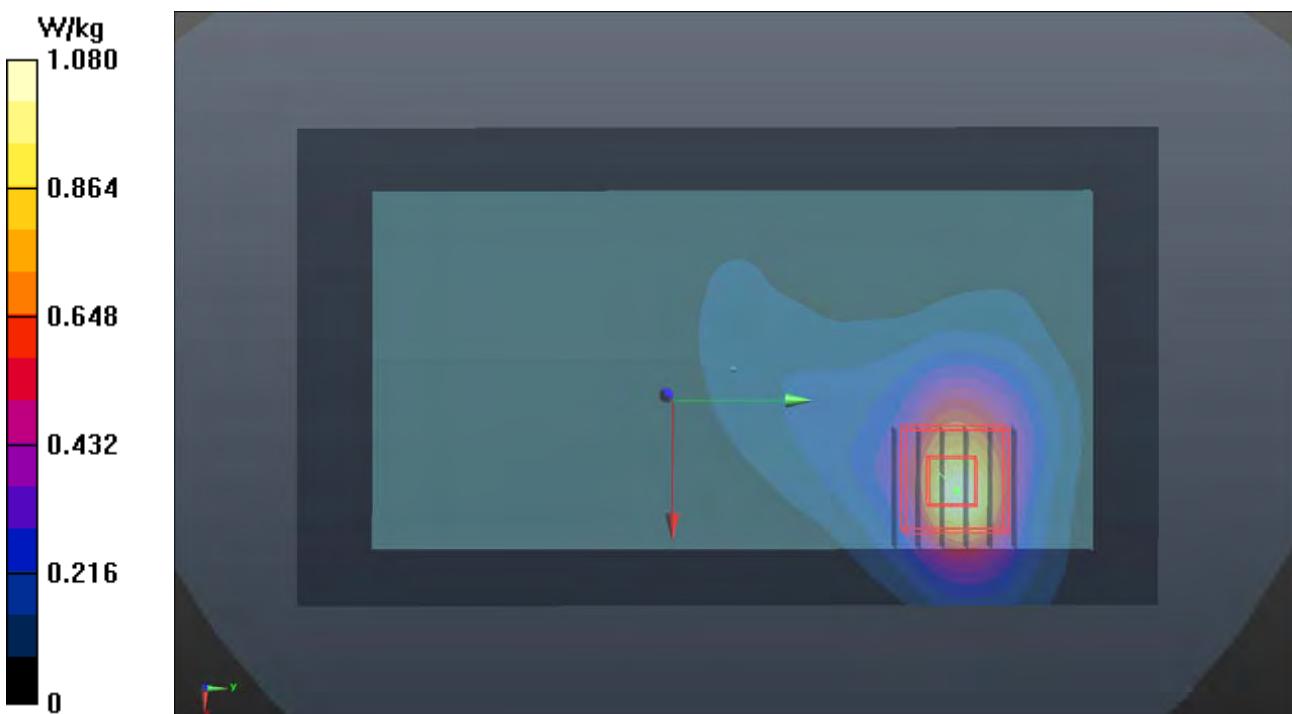
- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm

Reference Value = 13.19 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 2.12 W/kg

SAR(1 g) = 0.554 W/kg; SAR(10 g) = 0.200 W/kg

Maximum value of SAR (measured) = 1.25 W/kg



P33 WLAN5G_802.11a_Rear Face_10mm_Ch161**DUT: 180822C04**

Communication System: WLAN_5G; Frequency: 5805 MHz; Duty Cycle: 1:1.08

Medium: B34T60N1_1010 Medium parameters used: $f = 5805 \text{ MHz}$; $\sigma = 6.169 \text{ S/m}$; $\epsilon_r = 46.321$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.7 °C ; Liquid Temperature : 23.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3971; ConvF(4.22, 4.22, 4.22); Calibrated: 2018/03/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2018/03/16
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (101x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.62 W/kg

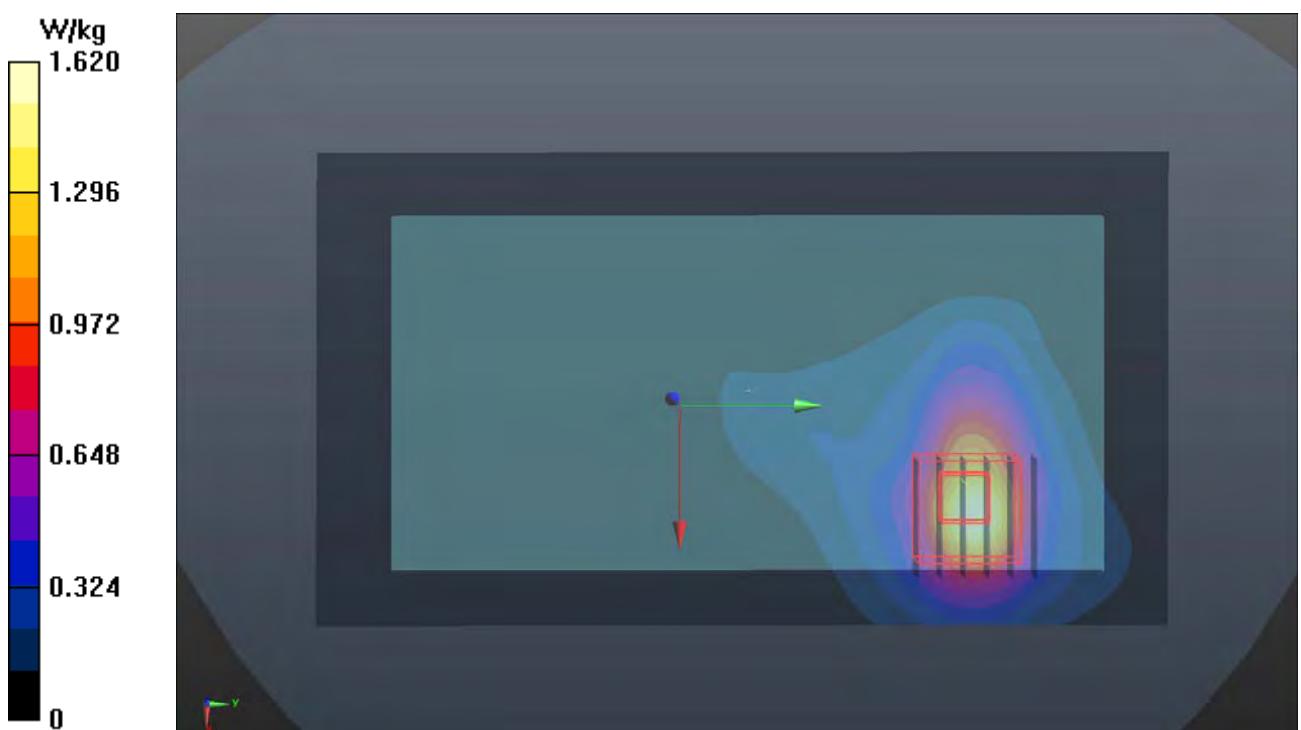
- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm

Reference Value = 15.95 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 3.68 W/kg

SAR(1 g) = 0.921 W/kg; SAR(10 g) = 0.328 W/kg

Maximum value of SAR (measured) = 2.07 W/kg



P34 BT_BR_EDR_Rear Face_10mm_Ch0**DUT: 180822C04**

Communication System: BT; Frequency: 2402 MHz; Duty Cycle: 1:1.3

Medium: B19T27N1_1011 Medium parameters used: $f = 2402 \text{ MHz}$; $\sigma = 1.986 \text{ S/m}$; $\epsilon_r = 50.656$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.8 °C ; Liquid Temperature : 23.1 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3971; ConvF(7.7, 7.7, 7.7); Calibrated: 2018/03/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2018/03/16
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (91x151x1): Interpolated grid: $dx=1.200 \text{ mm}$, $dy=1.200 \text{ mm}$

Maximum value of SAR (interpolated) = 0.0313 W/kg

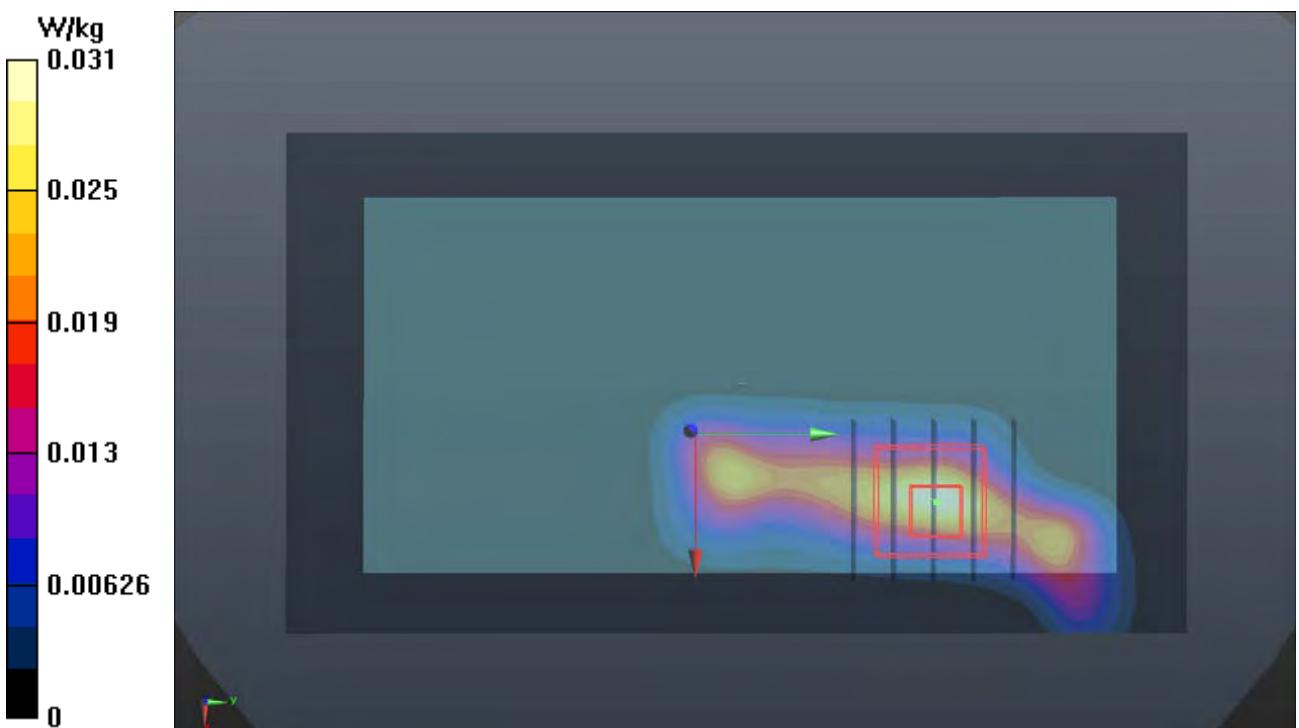
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 2.993 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 0.0430 W/kg

SAR(1 g) = 0.015 W/kg; SAR(10 g) = 0.00502 W/kg

Maximum value of SAR (measured) = 0.0249 W/kg



P35 LTE 7_QPSK20M_Left Side_10mm_Ch20850_1RB_OS99_Ant1**DUT: 180822C04**

Communication System: LTE; Frequency: 2510 MHz; Duty Cycle: 1:1

Medium: B19T27N1_0908 Medium parameters used: $f = 2510 \text{ MHz}$; $\sigma = 2.078 \text{ S/m}$; $\epsilon_r = 50.498$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.6 °C ; Liquid Temperature : 23.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3898; ConvF(7.51, 7.51, 7.51); Calibrated: 2018/06/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2018/01/18
- Phantom: Twin SAM Phantom_1822; Type: QD000P40CD;
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

- Area Scan (51x151x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.860 W/kg

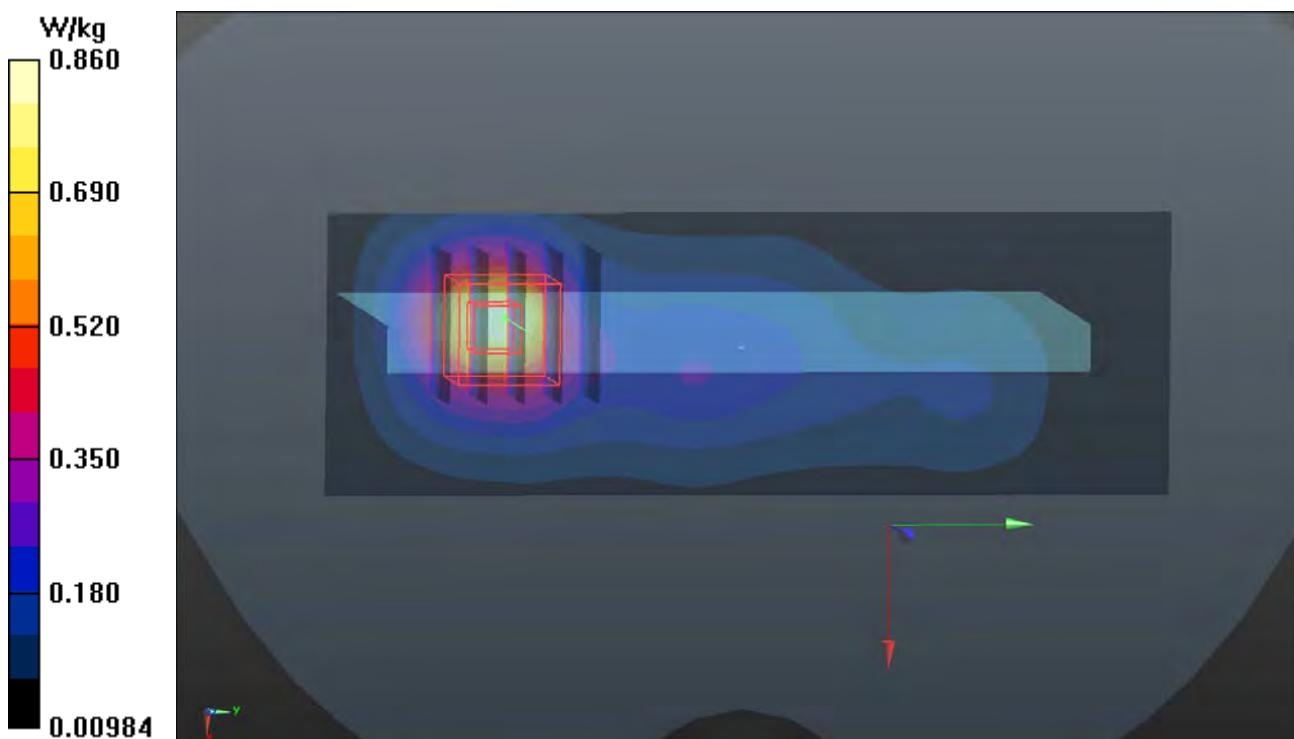
- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 19.43 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 1.19 W/kg

SAR(1 g) = 0.612 W/kg; SAR(10 g) = 0.302 W/kg

Maximum value of SAR (measured) = 0.916 W/kg





Appendix C. Calibration Certificate for Probe and Dipole

The SPEAG calibration certificates are shown as follows.



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 **Auden**

Certificate No: **D750V3-1132_Dec17**

CALIBRATION CERTIFICATE

Object **D750V3 - SN:1132**

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

Calibration date: **December 18, 2017**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	31-May-17 (No. EX3-7349_May17)	May-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

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

Calibrated by:	Name	Function	Signature
	Michael Weber	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

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

Issued: December 18, 2017



Accredited by the Swiss Accreditation Service (SAS)

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

Accreditation No.: **SCS 0108**

Glossary:

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

Calibration is Performed According to the Following Standards:

- 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, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- 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	V52.10.0
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	41.2 ± 6 %	0.89 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	2.11 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.41 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.47 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	54.2 ± 6 %	0.98 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	8.74 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.46 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	5.75 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	55.0 Ω - 0.4 $j\Omega$
Return Loss	- 26.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	51.3 Ω - 2.2 $j\Omega$
Return Loss	- 32.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.035 ns
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After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	October 20, 2014

DASY5 Validation Report for Head TSL

Date: 18.12.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1132

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

Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.89 \text{ S/m}$; $\epsilon_r = 41.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.49, 10.49, 10.49); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

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

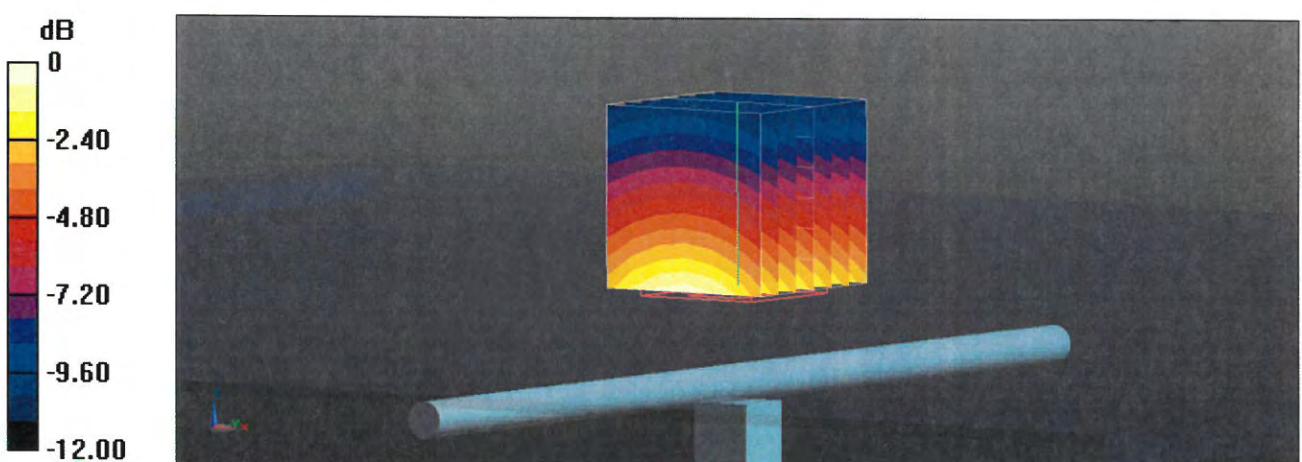
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 59.63 V/m; Power Drift = 0.00 dB

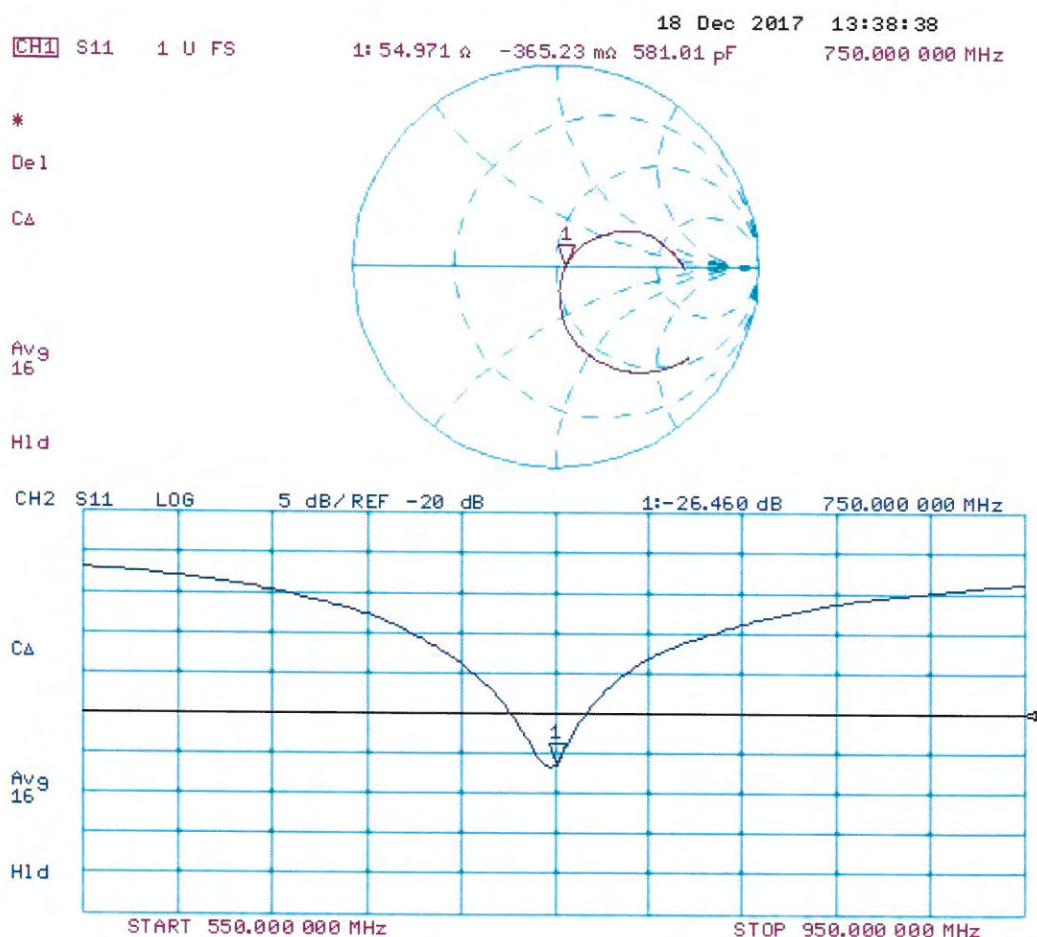
Peak SAR (extrapolated) = 3.31 W/kg

SAR(1 g) = 2.11 W/kg; SAR(10 g) = 1.37 W/kg

Maximum value of SAR (measured) = 2.89 W/kg



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 18.12.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1132

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

Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.98 \text{ S/m}$; $\epsilon_r = 54.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.35, 10.35, 10.35); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

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

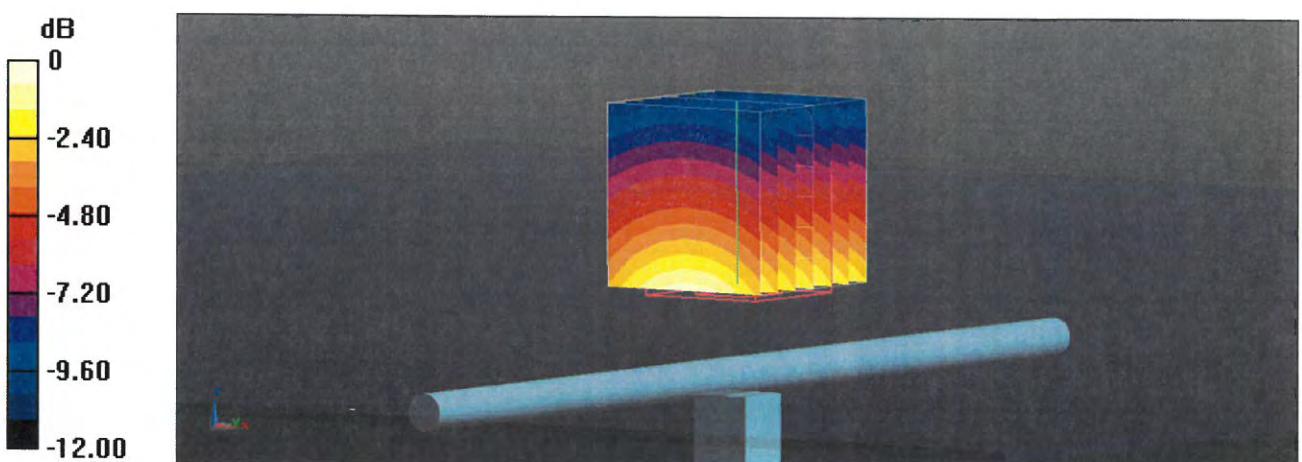
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 58.19 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 3.40 W/kg

SAR(1 g) = 2.23 W/kg; SAR(10 g) = 1.46 W/kg

Maximum value of SAR (measured) = 2.99 W/kg



0 dB = 2.99 W/kg = 4.76 dBW/kg

Impedance Measurement Plot for Body TSL

