Variant FCC SAR Test Report

Report No.	:	**SA171218C14B**
Applicant	:	**HTC Corporation**
Address	:	**88 Section 3, Zhongxing Road, Xindian District, New Taipei City 231, Taiwan**
Product	:	**Smartphone**
FCC ID	:	**NM82Q55200**
Brand	:	**HTC**
Model No.	:	**2Q55200**
Standards	:	**FCC 47 CFR Part 2 (2.1093), IEEE C95.1:1992, IEEE Std 1528:2013 KDB 865664 D01 v01r04, KDB 865664 D02 v01r02 KDB 248227 D01 v02r02, KDB 447498 D01 v06, KDB 648474 D04 v01r03 KDB 941225 D01 v03r01, KDB 941225 D05 v02r05, KDB 941225 D05A v01r02 KDB 941225 D06 v02r01**
Sample Received Date	:	**Jan. 24, 2018**
Date of Testing	:	**Feb. 24, 2018 ~ Feb. 28, 2018**
Lab Address	:	**No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.**
Test Location	:	**No. 19, Hwa Ya 2nd Rd, Wen Hwa Vil, Kwei Shan Dist., Taoyuan City 33383, Taiwan (R.O.C)**

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.
This report is issued as a supplementary report to BV CPS report no.: SA171218C14.

Prepared By : Evonne Liu / Specialist

Approved By : Eli Hsu / Senior Engineer

FCC Accredited No.: TW0003

Table of Contents

Release Control Record

Report No.	Reason for Change	Date Issued
SA171218C14B	Initial release	Mar. 15, 2018

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)	Highest SAR-10g Product Specific Tested at 0 mm (W/kg)
PCE	GSM850	0.14	0.01	0.01	N/A
	GSM1900	0.27	0.09	0.15	N/A
	WCDMA II	0.58	0.14	0.38	N/A
	WCDMA IV	0.31	0.19	0.36	N/A
	WCDMA V	0.22	0.07	0.07	N/A
	LTE 2	0.48	0.15	0.27	N/A
	LTE 4 / 66	0.22	0.16	0.38	N/A
	LTE 5	0.20	0.05	0.05	N/A
	LTE 7	0.61	0.41	0.43	N/A
	LTE 12 / 17	0.19	0.05	0.05	N/A
	LTE 13	0.13	0.06	0.06	N/A
	LTE 41	0.26	0.26	0.26	N/A
DTS	2.4G WLAN	0.33	0.03	0.03	N/A
NII	5.2G WLAN	N/A	N/A	0.11	N/A
	5.3G WLAN	0.11	0.09	N/A	0.30
	5.6G WLAN	0.16	0.24	N/A	0.62
	5.8G WLAN	0.08	0.24	0.24	N/A
DSS	Bluetooth	0.00	0.00	0.00	N/A

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 12 and band 17. The frequency span of LTE band 12 can completely cover LTE band 17, and they has the same tune-up power. SAR was tested for LTE band 12 only.
3. 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.

2. Description of Equipment Under Test

EUT Type	Smartphone
FCC ID	NM82Q55200
Brand Name	HTC
Model Name	2Q55200
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 13 : 779.5 ~ 784.5 (BW: 5M, 10M) LTE Band 17 : 706.5 ~ 713.5 (BW: 5M, 10M) LTE Band 41 : 2498.5 ~ 2687.5 (BW: 5M, 10M, 15M, 20M) LTE Band 46 : 5150 ~ 5925 (Rx only) 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 ANT+ : 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 ANT+ : GFSK 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	Production Unit

Note:

1. This report is issued as a supplementary report to BV CPS report no.: SA171218C14.
2. 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.

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:

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

SAR is expressed in units of Watts per kilogram (W/kg)
SAR measurement can be related to the electrical field in the tissue by

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

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

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 form the optical into digital electric signal of the DAE and transfers data to the PC.

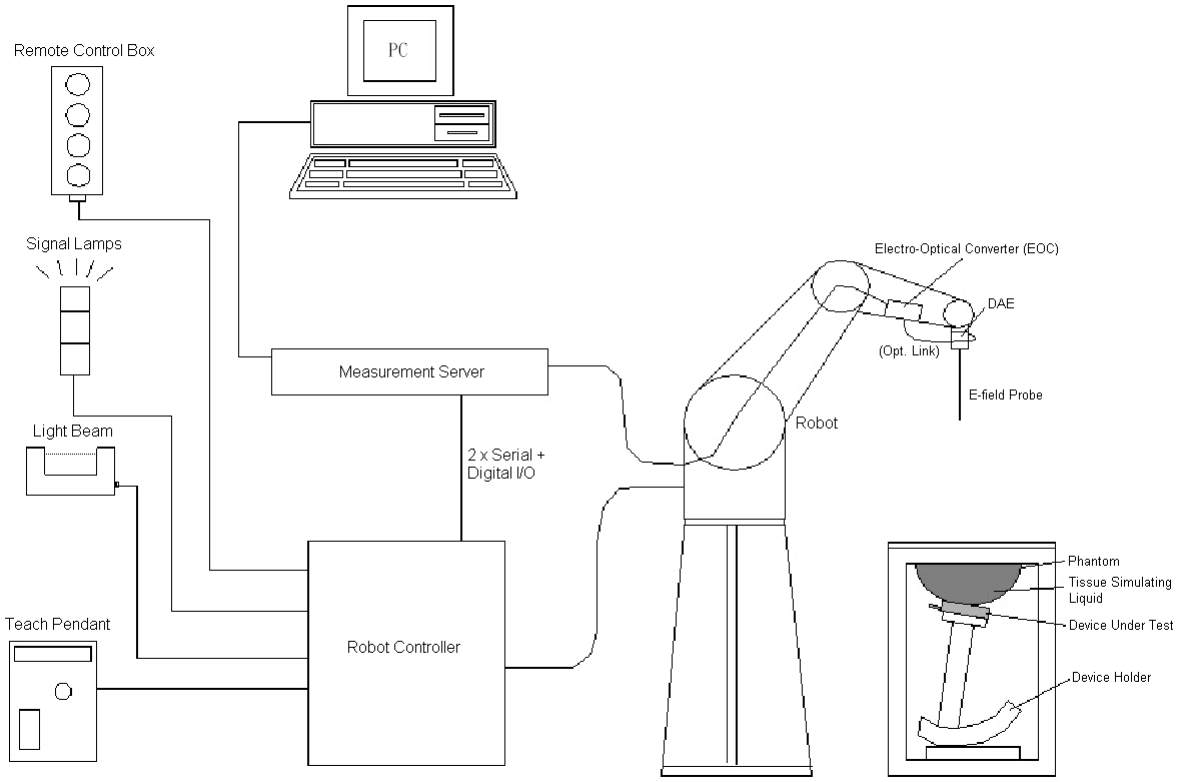


Fig-3.1 SPEAG DASY52 System Setup

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

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 µW/g to 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 µW/g)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm

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 µW/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 µW/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	< 5µV (with auto zero)
Input Bias Current	< 50 fA
Dimensions	60 x 60 x 68 mm

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 l/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.

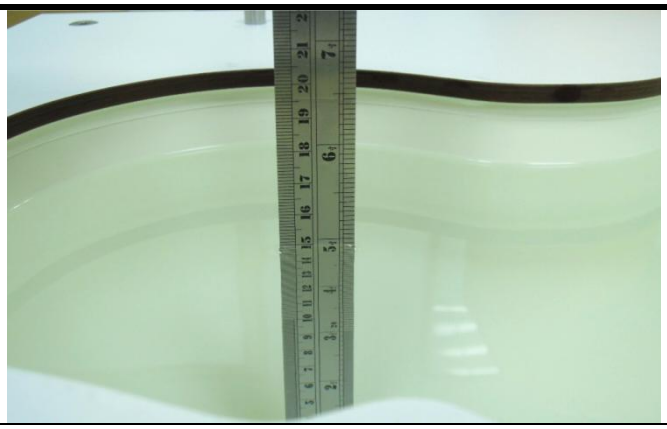
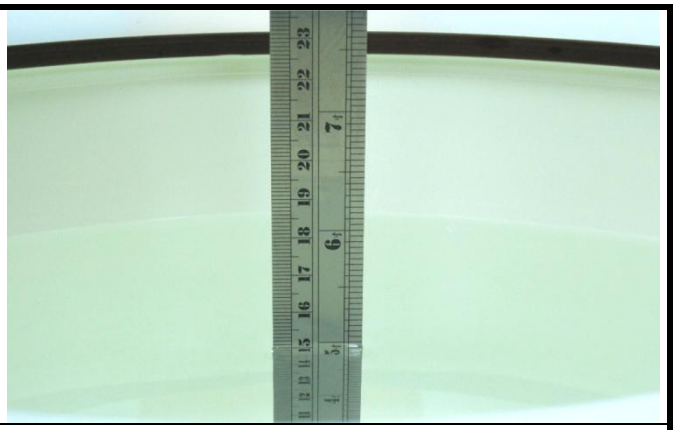
	

Photo of Liquid Height for Head Position	**Photo of Liquid Height for Body Position**

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

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.

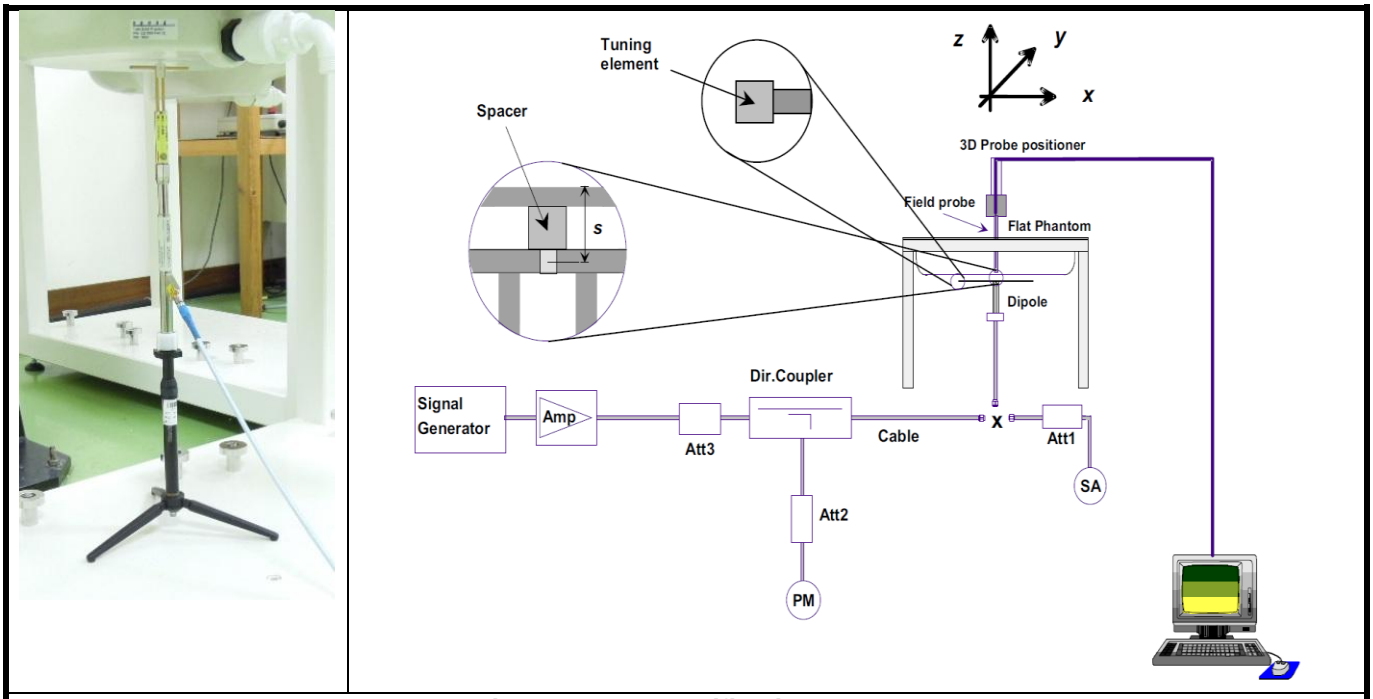


Fig-3.3 System Verification Setup

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 (Δx, Δy)	<= 15 mm	<= 12 mm	<= 12 mm	<= 10 mm	<= 10 mm
Zoom Scan (Δx, Δy)	<= 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 <= 1.4 W/kg, the zoom scan resolution of Δx / Δy (2-3GHz: <= 8 mm, 3-4GHz: <= 7 mm, 4-6GHz: <= 5 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 33 (max. uplink: 4, max. downlink: 5, total timeslots: 6)
3. This EUT supports EDGE multi-slot class 33 (max. uplink: 4, max. downlink: 5, total timeslots: 6)
4. This EUT supports DTM multi-slot class 33 (max. uplink: 4 for 1 CS & 3 PS, max. downlink: 5, total timeslots: 6)

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.

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	β_{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 Δ_{CQI} = 30/15 with β_{HS} = 30/15 * β_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 Δ_{NACK} = 30/15 with β_{HS} = 30/15 * β_c, and Δ_{CQI} = 24/15 with β_{HS} = 24/15 * β_c.
Note 3: CM = 1 for β_c/β_d = 12/15, β_{HS}/β_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 β_c = 11/15 and β_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	β_{HS} (1)	β_{ec}	β_{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	β_{ed}1: 47/15 β_{ed}2: 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 Δ_{CQI} = 30/15 with β_{HS} = 30/15 * β_c. For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with β_{HS} = 5/15 * β_c.
Note 2: CM = 1 for β_c/β_d = 12/15, β_{HS}/β_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 β_c = 10/15 and β_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.

HSPA+ SAR Guidance

The 3G SAR test reduction procedure is applied to HSPA+ (uplink) with 12.2 kbps RMC as the primary mode. Otherwise, when SAR is required for Rel. 6 HSPA, SAR is required for Rel. 7 HSPA+. Power is measured for HSPA+ that supports uplink 16QAM according to configurations in Table C.11.1.4 of 3GPP TS 34.121-1 to determine SAR test reduction.

Sub-test	β_c (3)	β_d	β_{HS} (1)	β_{ec}	β_{ed} (4) (2xSF2)	β_{ed} (4) (2xSF4)	CM (2) (dB)	MPR (2) (dB)	AG (4) Index	E-TFCI (5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed}1: 30/15 β_{ed}2: 30/15	β_{ed}3: 24/15 β_{ed}4: 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{HS} = 30/15 * β_c.
Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).
Note 3: DPDCH is not configured, therefore the β_c is set to 1 and β_d = 0 by default.
Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.
Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.

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.

<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**		
13			**V**	**V**		
17			**V**	**V**		
41			**V**	**V**	**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**

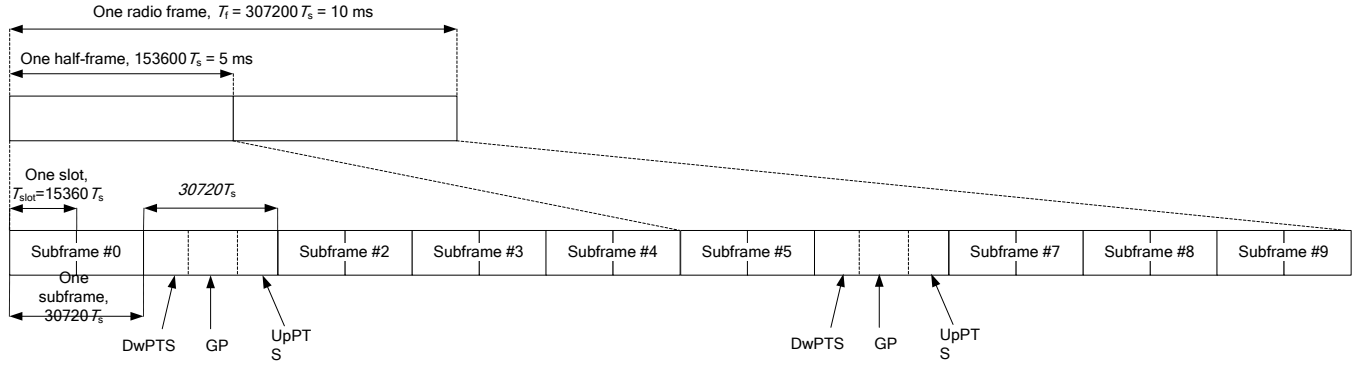
Note: MPR is according to the standard and implemented in the circuit (mandatory).

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.

TDD-LTE Setup Configurations

According to KDB 941225 D05, SAR testing for TDD-LTE device must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP TDD-LTE configurations. The TDD-LTE of this device supports frame structure type 2 defined in 3GPP TS 36.211 section 4.2, and the frame structure configuration can be referred to below.



3GPP TS 36.211 Figure 4.2-1: Frame Structure Type 2

Special Subframe Configuration	Normal Cyclic Prefix in Downlink			Extended Cyclic Prefix in Downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal Cyclic Prefix in Uplink	Extended Cyclic Prefix in Uplink		Normal Cyclic Prefix in Uplink	Extended Cyclic Prefix in Uplink
0	6592 • Ts	2192 • Ts	2560 • Ts	7680 • Ts	2192 • Ts	2560 • Ts
1	19760 • Ts			20480 • Ts		
2	21952 • Ts			23040 • Ts		
3	24144 • Ts			25600 • Ts		
4	26336 • Ts			7680 • Ts	4384 • Ts	5120 • Ts
5	6592 • Ts	4384 • Ts	5120 • Ts	20480 • Ts		
6	19760 • Ts			23040 • Ts		
7	21952 • Ts			12800 • Ts		
8	24144 • Ts			-	-	-
9	13168 • Ts			-	-	-

3GPP TS 36.211 Table 4.2-1: Configuration of Special Subframe

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-Point Periodicity	Subframe Number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

3GPP TS 36.211 Table 4.2-2: Uplink-Downlink Configurations

The variety of different TD-LTE uplink-downlink configurations allows a network operator to allocate the network's capacity between uplink and downlink traffic to meet the needs of the network. The uplink duty cycle of these seven configurations can readily be computed and shown in below.

UL-DL Configuration	0	1	2	3	4	5	6
Highest Duty-Cycle	63.33%	43.33%	23.33%	31.67%	21.67%	11.67%	53.33%

Considering the highest transmission duty cycle, TDD-LTE was tested using Uplink-Downlink Configuration 0 with 6 uplink subframe and 2 special subframe. The special subframe was set to special subframe configuration 7 using extended cyclic prefix uplink. Therefore, SAR testing for TDD-LTE was performed at the maximum output power with highest transmission duty cycle of 63.33%.

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]	Channel Bandwidths for Carrier-4 [MHz]		
CA_2C	5	20			40	0
	10	15, 20				
	15	10, 15, 20				
	20	5, 10, 15, 20				
CA_7C	15	15			40	0
	20	20				
	10	20			40	1
	15	15, 20				
	20	10, 15, 20				
	15	10, 15			40	2
	20	15, 20				
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				

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_7A-7A	5	15		40	0
	10	10, 15			
	15	15, 20			
	20	20			
	5, 10, 15, 20	5, 10, 15, 20		40	1
	5, 10, 15, 20	5, 10		30	2
	10, 15, 20	10, 15, 20		40	3
CA_66A-66A	5, 10, 15, 20	5, 10, 15, 20		40	0
CA_66A-66C	5, 10, 15, 20	Refer to CA_66C (BCS0)		60	0
	Refer to CA_66C (BCS0)		5, 10, 15, 20		

LTE CA Configurations and Bandwidth Combination Sets defined for Inter-Band CA

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-2A-4A	2	Refer to CA_2A-2A (BCS0)	60	0
	4	5, 10, 15, 20		
CA_2A-4A-4A	2	5, 10, 15, 20	60	0
	4	Refer to CA_4A-4A (BCS0)		
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-13A	2	5, 10, 15, 20	30	0
	13	10		
	2	5, 10	20	1
	13	10		
CA_2A-17A	2	5, 10	20	0
	17	5, 10		
CA_2A-46A	2	5, 10, 15, 20	40	0
	46	20		
CA_2A-46C	2	5, 10, 15, 20	60	0
	46	Refer to CA_46C (BCS0)		

Downlink CA Configuration	LTE Bands	Channel Bandwidths for Carrier (MHz)	Maximum Aggregated Bandwidth (MHz)	Bandwidth Combination Set
CA_2A-2A-46A	2	Refer to CA_2A-2A (BCS0)	60	0
	46	20		
CA_2A-2A-66A	2	Refer to CA_2A-2A (BCS0)	60	0
	66	5, 10, 15, 20		
CA_2A-13A-46A	2	5, 10, 15, 20	50	0
	13	5, 10		
	46	20		
CA_2A-46A-46A	2	5, 10, 15, 20	60	0
	46	Refer to CA_46A-46A (BCS0)		
CA_2A-46A-46C	2	5, 10, 15, 20	60	0
	46	Refer to CA_46C (BCS0)		
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-66B	2	5, 10, 15, 20	40	0
	66	Refer to CA_66B (BCS0)		
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		
CA_4A-7A	4	5, 10	30	0
	7	5, 10, 15, 20		
	4	5, 10, 15, 20	40	1
	7	5, 10, 15, 20		
CA_4A-7A-7A	4	5, 10, 15, 20	60	0
	7	Refer to the CA_7A-7A (BCS1)		
CA_4A-12A	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		
CA_4A-4A-12A	4	Refer to CA_4A-4A (BCS0)	50	0
	12	5, 10		
CA_4A-13A	4	5, 10, 15, 20	30	0
	13	10		
	4	5, 10	20	1
	13	10		
CA_4A-17A	4	5, 10	20	0
	17	5, 10		

Downlink CA Configuration	LTE Bands	Channel Bandwidths for Carrier (MHz)	Maximum Aggregated Bandwidth (MHz)	Bandwidth Combination Set
CA_4A-46A	4	5, 10, 15, 20	40	0
	46	20		
CA_4A-46A-46A	4	5, 10, 15, 20	60	0
	46	Refer to CA_46A-46A (BCS0)		
CA_4A-46A-46C	4	5, 10, 15, 20	80	0
	46	Refer to CA_46A-46C (BCS0)		
CA_4A-46C	4	5, 10, 15, 20	60	0
	46	Refer to CA_46C (BCS0)		
CA_4A-46D	4	5, 10, 15, 20	80	0
	46	Refer to CA_46D (BCS0)		
CA_5A-7A	5	1.4, 3, 5, 10	30	0
	7	10, 15, 20		
	5	5, 10	30	1
	7	10, 15, 20		
CA_5A-46A	5	5, 10	30	0
	46	20		
	5	3, 5, 10	30	1
	46	10, 20		
CA_5A-46C	5	5, 10	50	0
	46	Refer to CA_46C (BCS0)		
	5	5, 10	50	1
	46	Refer to CA_46C (BCS1)		
CA_5A-46D	5	5, 10	70	0
	46	Refer to CA_46D (BCS0)		
	5	5, 10	70	1
	46	Refer to CA_46D (BCS1)		
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_7A-46A	7	5, 10, 15, 20	40	0
	46	20		
	7	5, 10, 15, 20	40	1
	46	10, 20		
CA_7A-46C	7	5, 10, 15, 20	60	0
	46	Refer to CA_46C (BCS0)		
	7	5, 10, 15, 20	60	1
	46	Refer to CA_46C (BCS1)		
CA_12A-66C	12	5, 10	50	0
	66	Refer to CA_66C (BCS0)		

Downlink CA Configuration	LTE Bands	Channel Bandwidths for Carrier (MHz)	Maximum Aggregated Bandwidth (MHz)	Bandwidth Combination Set
CA_13A-46A	13	5, 10	30	0
	46	20		
CA_13A-46C	13	5, 10	50	0
	46	Refer to CA_46C (BCS0)		
CA_13A-66A	13	5, 10	30	0
	66	5, 10, 15, 20		
CA_13A-66A-66A	13	5, 10	50	0
	66	Refer to CA_66A-66A (BCS0)		
CA_13A-66B	13	5, 10	30	0
	66	Refer to CA_66B (BCS0)		
CA_13A-66C	13	5, 10	50	0
	66	Refer to CA_66C (BCS0)		
CA_46A-66A	46	20	40	0
	66	5, 10, 15, 20		
CA_46A-46A-66A	46	Refer to CA_46A-46A (BCS0)	60	0
	66	5, 10, 15, 20		
CA_46A-46C-66A	46	Refer to CA_46A-46C (BCS0)	80	0
	66	5, 10, 15, 20		
CA_46A-66A-66A	46	20	60	0
	66	Refer to CA_66A-66A (BCS0)		
CA_46C-66A	46	Refer to CA_46C (BCS0)	60	0
	66	5, 10, 15, 20		
CA_46C-66A-66A	46	Refer to CA_46C (BCS0)	60	0
	66	Refer to CA_66A-66A (BCS0)		
CA_46D-66A	46	Refer to CA_46D (BCS0)	80	0
	66	5, 10, 15, 20		
CA_2A-4A-12A	2	5, 10, 15, 20	50	0
	4	5, 10, 15, 20		
	12	5, 10		
CA_2A-5A-46A	2	5, 10, 15, 20	50	0
	5	5, 10		
	46	20		
CA_5A-7A-46A	5	5, 10	50	0
	7	10, 15, 20		
	46	20		
CA_5A-46A-66A	5	5, 10	50	0
	46	20		
	66	5, 10, 15, 20		
CA_5A-46C-66A	5	5, 10	70	0
	46	Refer to CA_46C (BCS0)		
	66	5, 10, 15, 20		
CA_13A-46A-66A	13	5, 10	50	0
	46	20		
	66	5, 10, 15, 20		
CA_2A-2A-46C	2	Refer to CA_2A-2A (BCS0)	80	0
	46	Refer to 46C (BCS0)		
CA_2A-5A-46C	2	5, 10, 15, 20	70	0
	5	5, 10		
	46	Refer to 46C (BCS0)		

Downlink CA Configuration	LTE Bands	Channel Bandwidths for Carrier (MHz)	Maximum Aggregated Bandwidth (MHz)	Bandwidth Combination Set
CA_2A-13A-46C	2	5, 10, 15, 20	70	0
	13	5, 10		
	46	Refer to 46C (BCS0)		
CA_2A-46A-46A-66A	2	5, 10, 15, 20	80	0
	46	Refer to CA_46A-46A (BCS0)		
	66	5, 10, 15, 20		
CA_2A-46C-66A	2	5, 10, 15, 20	80	0
	46	Refer to CA_46C (BCS0)		
	66	5, 10, 15, 20		
CA_2A-46D	2	5, 10, 15, 20	80	0
	46	Refer to CA_46D (BCS0)		
CA_7A-46D	7	5, 10, 15, 20	80	0
	46	Refer to CA_46D (BCS0)		
	7	5, 10, 15, 20	80	1
	46	Refer to CA_46D (BCS1)		
CA_12A-46D	12	5, 10	70	0
	46	Refer to CA_46D (BCS0)		
	12	5, 10	70	1
	46	Refer to CA_46D (BCS1)		
CA_13A-46C-66A	13	5, 10	70	0
	46	Refer to CA_46C (BCS0)		
	66	5, 10, 15, 20		
CA_13A-46D	13	5, 10	70	0
	46	Refer to CA_46D (BCS0)		
CA_5A-7A-46C	5	5, 10	70	0
	7	10, 15, 20		
	46	Refer to CA_46C (BCS0)		
CA_13A-46D-66A	13	5, 10	90	0
	46	Refer to CA_46D (BCS0)		
	66	5, 10, 15, 20		
CA_2A-13A-46D	2	5, 10, 15, 20	90	0
	13	5, 10		
	46	Refer to 46D (BCS0)		
CA_2A-2A-46D	2	Refer to CA_2A-2A (BCS0)	80	0
	46	Refer to CA_46D (BCS0)		
CA_2A-46A-46C-66A	2	5, 10, 15, 20	100	0
	46	Refer to CA_46A-46C (BCS0)		
	66	5, 10, 15, 20		
CA_2A-46D-66A	2	5, 10, 15, 20	100	0
	46	Refer to CA_46D (BCS0)		
	66	5, 10, 15, 20		
CA_2A-5A-46D	2	5, 10, 15, 20	90	0
	5	5, 10		
	46	Refer to CA_46D (BCS0)		
CA_46D-66A-66A	46	Refer to CA_46D (BCS0)	100	0
	66	Refer to CA_66A-66A (BCS0)		
CA_5A-46D-66A	5	5, 10	90	0
	46	Refer to CA_46D (BCS0)		
	66	5, 10, 15, 20		
CA_5A-7A-46D	5	5, 10	90	0
	7	10, 15, 20		
	46	Refer to CA_46D (BCS0)		

LTE CA Configurations and Bandwidth Combination Sets defined for Intra-Band Contiguous CA (4*4 MIMO)

2CA 4x4 MIMO						
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]	Channel Bandwidths for Carrier-4 [MHz]		
CA_7C	15	15			40	0
	20	20				
	10	20			40	1
	15	15, 20				
	20	10, 15, 20				
	15	10, 15			40	2
	20	15, 20				

LTE CA Configurations and Bandwidth Combination Sets defined for Intra-Band Non-Contiguous CA (4*4 MIMO)

2CA 4x4 MIMO					
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_7A-7A	5	15		40	0
	10	10, 15			
	15	15, 20			
	20	20			
	5, 10, 15, 20	5, 10, 15, 20		40	1
	5, 10, 15, 20	5, 10		30	2
	10, 15, 20	10, 15, 20		40	3

LTE CA Configurations and Bandwidth Combination Sets defined for Inter-Band CA (Two Bands) (4*4 MIMO)

2CA 4x4 MIMO				
Downlink CA Configuration	LTE Bands	Channel Bandwidths for Carrier (MHz)	Maximum Aggregated Bandwidth (MHz)	Bandwidth Combination Set
CA_7A-46A	7	5, 10, 15, 20	40	0
	46	20		
	7	5, 10, 15, 20	40	1
	46	10, 20		
CA_7A-46B	7	5, 10, 15, 20	40	0
	46	20		
	7	5, 10, 15, 20	40	1
	46	10, 20		
CA_7A-46C	7	5, 10, 15, 20	60	0
	46	Refer to CA_46C (BCS0)		
	7	5, 10, 15, 20	60	1
	46	Refer to CA_46C (BCS1)		

LTE Uplink Carrier Aggregation (CA) Setup Configurations

This device supports LTE uplink CA with a maximum of two 20 MHz carrier components in the uplink. The maximum output power for uplink intra-band contiguous CA specified in Table 6.2.2A-1 of 3GPP TS 36.101 is the same as single carrier specified in Table 6.2.2-1 of 3GPP TS 36.101. In Table 6.2.3A-1 of 3GPP TS 36.101, the MPR (maximum power reduction) for several dB is allowed due to modulation and contiguously aggregated transmit bandwidth configuration. All the RF parameters in this device have followed above 3GPP criteria.

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]	Channel Bandwidths for Carrier-4 [MHz]		
CA_7C	15	15			40	0
	20	20				
	10	20			40	1
	15	15, 20				
	20	10, 15, 20				
	15	10, 15			40	2
	20	15, 20				

This device does not support full CA (Carrier Aggregation) features on 3GPP release 12. Its capability for LTE CA is for LTE band 41 only and supported configuration is shown in above. For network enhancement features, it does not support Wi-Fi Offloading, Enhanced SC-FDMA, Uplink MIMO, CoMP, HetNet, Relay, SON, Cross-Carrier Scheduling, eICIC, Enhanced Downlink MIMO, MBMS, M2M/D2D. All other uplink communications are identical to the LTE Release 8 specifications.

<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 ≤ 1.2 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 ≤ 1.2 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 ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration.

<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.

4.2 EUT Testing Position

This variant report is made for verification. All the worst SAR configurations specified in the original SAR report was repeated and verified to ensure the device remains compliant.

4.3 Tissue Verification

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

Test Date	Tissue Type	Frequency (MHz)	Liquid Temp. (℃)	Measured Conductivity (σ)	Measured Permittivity (ε_r)	Target Conductivity (σ)	Target Permittivity (ε_r)	Conductivity Deviation (%)	Permittivity Deviation (%)
Feb. 24, 2018	Head	750	23.1	0.893	43.394	0.89	41.9	0.34	3.57
Feb. 24, 2018	Head	835	23.2	0.923	42.162	0.9	41.5	2.56	1.60
Feb. 26, 2018	Head	835	23.4	0.919	41.728	0.9	41.5	2.11	0.55
Feb. 24, 2018	Head	1750	23.3	1.322	38.975	1.37	40.1	-3.50	-2.81
Mar. 21, 2018	Head	1750	23	1.327	41.208	1.37	40.1	-3.14	2.76
Feb. 24, 2018	Head	1900	23.3	1.448	38.478	1.4	40	3.43	-3.81
Mar. 21, 2018	Head	1900	23	1.457	40.841	1.4	40	4.07	2.10
Feb. 26, 2018	Head	2450	23.4	1.88	38.637	1.8	39.2	4.44	-1.44
Mar. 21, 2018	Head	2450	23	1.87	37.896	1.8	39.2	3.89	-3.33
Feb. 24, 2018	Head	2600	23.4	2.034	37.947	1.96	39	3.78	-2.70
Feb. 26, 2018	Head	5250	23.4	4.905	36.808	4.71	35.9	4.14	2.53
Feb. 26, 2018	Head	5600	23.4	5.237	36.225	5.07	35.5	3.29	2.04
Feb. 26, 2018	Head	5800	23.4	5.495	35.86	5.27	35.3	4.27	1.59
Feb. 28, 2018	Body	750	23.5	0.968	53.81	0.96	55.5	0.83	-3.05
Mar. 21, 2018	Body	750	23	0.967	56.1	0.96	55.5	0.73	1.08
Feb. 27, 2018	Body	835	23.2	1.005	57.812	0.97	55.2	3.61	4.73
Feb. 27, 2018	Body	1750	23.2	1.429	51.822	1.49	53.4	-4.09	-2.96
Feb. 27, 2018	Body	1900	23.2	1.564	51.433	1.52	53.3	2.89	-3.50
Mar. 21, 2018	Body	1900	23	1.571	51.274	1.52	53.3	3.36	-3.80
Feb. 28, 2018	Body	2450	23.6	1.999	50.532	1.95	52.7	2.51	-4.11
Mar. 22, 2018	Body	2450	23.3	1.997	51.334	1.95	52.7	2.41	-2.59
Feb. 28, 2018	Body	2600	23.6	2.167	50.128	2.16	52.5	0.32	-4.52
Feb. 28, 2018	Body	5250	23.3	5.405	47.547	5.36	48.9	0.84	-2.77
Mar. 22, 2018	Body	5250	23.4	5.482	46.96	5.36	48.9	2.28	-3.97
Feb. 28, 2018	Body	5600	23.3	5.894	46.817	5.77	48.5	2.15	-3.47
Feb. 28, 2018	Body	5800	23.3	6.172	46.486	6	48.2	2.87	-3.56
Test Date	Tissue Type	Frequency (MHz)	Liquid Temp. (℃)	Measured Conductivity (σ)	Measured Permittivity (ε_r)	Target Conductivity (σ)	Target Permittivity (ε_r)	Conductivity Deviation (%)	Permittivity Deviation (%)
Feb. 28, 2018	Body	5250	23.3	5.405	47.547	5.36	48.9	0.84	-2.77
Mar. 22, 2018	Body	5250	23.4	5.482	46.96	5.36	48.9	2.28	-3.97
Feb. 28, 2018	Body	5600	23.3	5.894	46.817	5.77	48.5	2.15	-3.47

Note:

The dielectric properties of the tissue simulating liquid must be measured within 24 hours before the SAR testing and within ±5% of the target values. Liquid temperature during the SAR testing must be within ±2 ℃.

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
Feb. 24, 2018	3650	Head	750	0.893	43.394	Pass	Pass	Pass	N/A	N/A	N/A
Feb. 24, 2018	3650	Head	835	0.923	42.162	Pass	Pass	Pass	N/A	N/A	N/A
Feb. 26, 2018	3971	Head	835	0.919	41.728	Pass	Pass	Pass	GMSK	Pass	N/A
Feb. 24, 2018	3650	Head	1750	1.322	38.975	Pass	Pass	Pass	N/A	N/A	N/A
Mar. 21, 2018	3578	Head	1750	1.327	41.208	Pass	Pass	Pass	N/A	N/A	N/A
Feb. 24, 2018	3650	Head	1900	1.448	38.478	Pass	Pass	Pass	N/A	N/A	N/A
Mar. 21, 2018	3578	Head	1900	1.457	40.841	Pass	Pass	Pass	GMSK	Pass	N/A
Feb. 26, 2018	3971	Head	2450	1.88	38.637	Pass	Pass	Pass	OFDM	N/A	Pass
Mar. 21, 2018	3578	Head	2450	1.87	37.896	Pass	Pass	Pass	OFDM	N/A	Pass
Feb. 24, 2018	3650	Head	2600	2.034	37.947	Pass	Pass	Pass	N/A	N/A	N/A
Feb. 26, 2018	3971	Head	5250	4.905	36.808	Pass	Pass	Pass	OFDM	N/A	Pass
Feb. 26, 2018	3971	Head	5600	5.237	36.225	Pass	Pass	Pass	OFDM	N/A	Pass
Feb. 26, 2018	3971	Head	5800	5.495	35.86	Pass	Pass	Pass	OFDM	N/A	Pass
Feb. 28, 2018	3650	Body	750	0.968	53.81	Pass	Pass	Pass	N/A	N/A	N/A
Mar. 21, 2018	3578	Body	750	0.967	56.1	Pass	Pass	Pass	N/A	N/A	N/A
Feb. 27, 2018	3650	Body	835	1.005	57.812	Pass	Pass	Pass	GMSK	Pass	N/A
Feb. 27, 2018	3650	Body	1750	1.429	51.822	Pass	Pass	Pass	N/A	N/A	N/A
Feb. 27, 2018	3650	Body	1900	1.564	51.433	Pass	Pass	Pass	GMSK	Pass	N/A
Mar. 21, 2018	3578	Body	1900	1.571	51.274	Pass	Pass	Pass	N/A	N/A	N/A
Feb. 28, 2018	3650	Body	2450	1.999	50.532	Pass	Pass	Pass	OFDM	N/A	Pass
Mar. 22, 2018	3578	Body	2450	1.997	51.334	Pass	Pass	Pass	OFDM	N/A	Pass
Feb. 28, 2018	3650	Body	2600	2.167	50.128	Pass	Pass	Pass	N/A	N/A	N/A
Feb. 28, 2018	3650	Body	5250	5.405	47.547	Pass	Pass	Pass	OFDM	N/A	Pass
Mar. 22, 2018	3578	Body	5250	5.482	46.96	Pass	Pass	Pass	OFDM	N/A	Pass
Feb. 28, 2018	3650	Body	5600	5.894	46.817	Pass	Pass	Pass	OFDM	N/A	Pass
Feb. 28, 2018	3650	Body	5800	6.172	46.486	Pass	Pass	Pass	OFDM	N/A	Pass
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
Feb. 28, 2018	3650	Body	5250	5.405	47.547	Pass	Pass	Pass	OFDM	N/A	Pass
Mar. 22, 2018	3578	Body	5250	5.482	46.96	Pass	Pass	Pass	OFDM	N/A	Pass
Feb. 28, 2018	3650	Body	5600	5.894	46.817	Pass	Pass	Pass	OFDM	N/A	Pass

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
Feb. 24, 2018	Head	750	8.25	2.02	8.08	-2.06	1013	3650	1431
Feb. 24, 2018	Head	835	9.41	2.34	9.36	-0.53	4d121	3650	1431
Feb. 26, 2018	Head	835	9.41	2.4	9.60	2.02	4d121	3971	861
Feb. 24, 2018	Head	1750	36.20	8.74	34.96	-3.43	1055	3650	1431
Mar. 21, 2018	Head	1750	36.20	9.17	36.68	1.33	1055	3578	360
Feb. 24, 2018	Head	1900	40.70	10.5	42.00	3.19	5d036	3650	1431
Mar. 21, 2018	Head	1900	40.70	10.3	41.20	1.23	5d036	3578	360
Feb. 26, 2018	Head	2450	50.80	13.5	54.00	6.30	737	3971	861
Mar. 21, 2018	Head	2450	50.80	13.37	53.48	5.28	737	3578	360
Feb. 24, 2018	Head	2600	56.90	14.9	59.60	4.75	1020	3650	1431
Feb. 26, 2018	Head	5250	78.60	8.36	83.60	6.36	1019	3971	861
Feb. 26, 2018	Head	5600	83.70	9.03	90.30	7.89	1019	3971	861
Feb. 26, 2018	Head	5800	79.70	8.51	85.10	6.78	1019	3971	861
Feb. 28, 2018	Body	750	8.72	2.11	8.44	-3.21	1013	3650	1431
Mar. 21, 2018	Body	750	8.72	2.18	8.72	0.00	1013	3578	360
Feb. 27, 2018	Body	835	9.61	2.36	9.44	-1.77	4d121	3650	1431
Feb. 27, 2018	Body	1750	37.10	8.89	35.56	-4.15	1055	3650	1431
Feb. 27, 2018	Body	1900	40.20	10.3	41.20	2.49	5d036	3650	1431
Mar. 21, 2018	Body	1900	40.20	9.8	39.20	-2.49	5d036	3578	360
Feb. 28, 2018	Body	2450	49.70	11.9	47.60	-4.23	737	3650	1431
Mar. 22, 2018	Body	2450	49.70	12.2	48.80	-1.81	737	3578	360
Feb. 28, 2018	Body	2600	54.30	12.7	50.80	-6.45	1020	3650	1431
Feb. 28, 2018	Body	5250	76.50	8.1	81.00	5.88	1019	3650	1431
Mar. 22, 2018	Body	5250	76.50	7.39	73.90	-3.40	1019	3578	360
Feb. 28, 2018	Body	5600	79.70	7.81	78.10	-2.01	1019	3650	1431
Feb. 28, 2018	Body	5800	76.90	7.69	76.90	0.00	1019	3650	1431
Test Date	**Mode**	**Frequency (MHz)**	**1W Target SAR-10g (W/kg)**	**Measured SAR-10g (W/kg)**	**Normalized to 1W SAR-10g (W/kg)**	**Deviation (%)**	**Dipole S/N**	**Probe S/N**	**DAE S/N**
Feb. 28, 2018	Body	5250	21.30	2.29	22.90	7.51	1019	3650	1431
Mar. 22, 2018	Body	5250	21.30	2.11	21.10	-0.94	1019	3578	360
Feb. 28, 2018	Body	5600	22.30	2.22	22.20	-0.45	1019	3650	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)	34.0	31.0	25.0	22.0
GPRS (GMSK, 1Tx-slot)	34.0	31.0	25.0	22.0
GPRS (GMSK, 2Tx-slot)	31.5	29.0	25.5	23.0
GPRS (GMSK, 3Tx-slot)	30.5	28.0	26.2	23.7
GPRS (GMSK, 4Tx-slot)	29.0	27.5	26.0	24.5
EDGE (8PSK, 1Tx-slot)	27.0	26.0	18.0	17.0
EDGE (8PSK, 2Tx-slot)	26.5	26.0	20.5	20.0
EDGE (8PSK, 3Tx-slot)	26.5	24.0	22.2	19.7
EDGE (8PSK, 4Tx-slot)	24.0	23.0	21.0	20.0
DTM (GMSK, 2Tx-slot)	31.5	29.0	25.5	23.0
DTM (GMSK, 3Tx-slot)	30.0	28.0	25.7	23.7
DTM (8PSK, 2Tx-slot)	26.0	25.0	20.0	19.0
DTM (8PSK, 3Tx-slot)	26.0	24.0	21.7	19.7

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:
   Frame-averaged power = 10 x log (Burst-averaged power mW x Slot used / 8)

Mode	WCDMA Band II	WCDMA Band IV	WCDMA Band V
RMC 12.2K	25.0	25.0	25.0
HSDPA / HSUPA / DC-HSDPA	24.0	24.0	24.0

Mode	LTE 2	LTE 4	LTE 5	LTE 7
Maximum Target Power	25.0	25.0	25.5	25.0

Mode	LTE 12	LTE 13	LTE 17
Maximum Target Power	25.5	25.5	25.5

Mode	LTE 41	LTE 66
Maximum Target Power	25.0	25.0

Mode	2.4G WLAN	5.2G WLAN	5.3G WLAN	5.6G WLAN	5.8G WLAN
802.11b	ANT0: 20.0 ANT1: 20.0	N/A	N/A	N/A	N/A
802.11g	ANT0: 18.5 ANT1: 18.5	N/A	N/A	N/A	N/A
802.11a	N/A	ANT0: 18.5 ANT1: 18.5	ANT0: 18.5 ANT1: 18.5	ANT0: 18.5 ANT1: 18.5	ANT0: 18.5 ANT1: 18.5
802.11n HT20	ANT0: 18.5 ANT1: 18.5 ANT0+1: CH1: 19.5 CH6-11: 21.5	ANT0: 18.5 ANT1: 18.5 ANT0+1: 21.5	ANT0: 18.5 ANT1: 18.5 ANT0+1: 21.5	ANT0: 18.5 ANT1: 18.5 ANT0+1: 21.5	ANT0: 18.5 ANT1: 18.5 ANT0+1: 21.5
802.11n HT40	ANT0: 18.0 ANT1: 18.0 ANT0+1: CH3: 18.0 CH6: 21.5 CH9: 19.5	ANT0: 18.5 ANT1: 18.5 ANT0+1: CH38: 18.5 CH46: 21.5	ANT0: 18.5 ANT1: 18.5 ANT0+1: CH54: 21.5 CH62: 19.0	ANT0: 18.5 ANT1: 18.5 ANT0+1: CH102: 19.5 CH110-134: 21.5	ANT0: 18.5 ANT1: 18.5 ANT0+1: 21.5
802.11ac VHT20	ANT0: 18.5 ANT1: 18.5 ANT0+1: CH1: 19.5 CH6-11: 21.5	ANT0: 18.5 ANT1: 18.5 ANT0+1: 21.5	ANT0: 18.5 ANT1: 18.5 ANT0+1: 21.5	ANT0: 18.5 ANT1: 18.5 ANT0+1: 21.5	ANT0: 18.5 ANT1: 18.5 ANT0+1: 21.5
802.11ac VHT40	ANT0: 18.0 ANT1: 18.0 ANT0+1: CH3: 18.0 CH6: 21.5 CH9: 19.5	ANT0: 18.5 ANT1: 18.5 ANT0+1: CH38: 18.5 CH46: 21.5	ANT0: 18.5 ANT1: 18.5 ANT0+1: CH54: 21.5 CH62: 19.0	ANT0: 18.5 ANT1: 18.5 ANT0+1: CH102: 19.5 CH110-134: 21.5	ANT0: 18.5 ANT1: 18.5 ANT0+1: 21.5
802.11ac VHT80	N/A	ANT0: 18.5 ANT1: 18.5 ANT0+1: 18.5	ANT0: 18.5 ANT1: 18.5 ANT0+1: 18.0	ANT0: 18.5 ANT1: 18.5 ANT0+1: CH106: 17.0 CH122: 21.5	ANT0: 18.5 ANT1: 18.5 ANT0+1: 21.5

Mode	2.4G Bluetooth
Bluetooth DH	11.0
Bluetooth LE	6.0

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)	32.33	32.47	**32.49**	29.24	**29.27**	29.14
GPRS (GMSK, 1Tx-slot)	32.31	32.45	32.47	29.21	29.24	29.11
GPRS (GMSK, 2Tx-slot)	30.55	30.69	30.71	27.92	27.95	27.82
GPRS (GMSK, 3Tx-slot)	28.92	29.08	29.06	27.02	27.05	26.92
GPRS (GMSK, 4Tx-slot)	27.86	28.00	28.02	25.65	25.68	25.55
EDGE (8PSK, 1Tx-slot)	25.88	26.02	26.04	25.04	25.07	24.94
EDGE (8PSK, 2Tx-slot)	25.24	25.38	25.40	24.32	24.35	24.22
EDGE (8PSK, 3Tx-slot)	24.98	25.12	25.14	23.08	23.11	22.98
EDGE (8PSK, 4Tx-slot)	22.62	22.76	22.78	21.77	21.80	21.67
DTM (GMSK, 2Tx-slot)	30.60	30.74	30.76	27.98	28.01	27.88
DTM (GMSK, 3Tx-slot)	29.09	29.23	29.25	27.00	27.03	26.90
DTM (8PSK, 2Tx-slot)	24.79	24.93	24.95	23.89	23.92	23.79
DTM (8PSK, 3Tx-slot)	24.88	25.02	25.04	23.05	23.08	22.95

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	23.60	**23.71**	23.68	23.69	**24.11**	23.91	24.17	**24.35**	24.18	-
HSDPA Subtest-1	22.55	22.67	22.76	22.75	23.15	23.01	23.19	23.15	23.22	0
HSDPA Subtest-2	22.53	22.65	22.71	22.88	23.21	23.15	23.20	23.16	23.25	0
HSDPA Subtest-3	22.14	22.23	22.29	22.32	22.72	22.67	22.71	22.69	22.67	0.5
HSDPA Subtest-4	22.04	22.21	22.23	22.30	22.70	22.65	22.68	22.64	22.74	0.5
DC-HSDPA Subtest-1	22.52	22.66	22.74	22.74	23.14	23.00	23.17	23.13	23.20	0
DC-HSDPA Subtest-2	22.50	22.63	22.71	22.87	23.20	23.14	23.18	23.14	23.23	0
DC-HSDPA Subtest-3	22.10	22.20	22.30	22.31	22.71	22.66	22.69	22.67	22.65	0.5
DC-HSDPA Subtest-4	22.08	22.18	22.24	22.29	22.69	22.64	22.66	22.62	22.72	0.5
HSUPA Subtest-1	22.48	22.70	22.72	22.32	22.53	22.45	23.21	23.24	23.28	0
HSUPA Subtest-2	20.41	20.79	20.62	20.11	20.34	20.26	21.26	21.14	21.31	2
HSUPA Subtest-3	21.88	22.23	22.01	21.30	21.50	21.39	22.05	22.11	22.21	1
HSUPA Subtest-4	20.42	20.52	20.59	20.11	20.32	20.20	21.00	20.99	21.01	2
HSUPA Subtest-5	22.57	22.70	22.65	22.36	22.55	22.30	23.20	23.20	23.30	0

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	24.44	**24.48**	24.39	0	15M	QPSK	1	0	24.38	24.42	24.33	0
		1	50	24.32	24.42	24.25	0			1	37	24.26	24.36	24.19	0
		1	99	24.30	24.32	24.24	0			1	74	24.24	24.26	24.18	0
		50	0	23.38	23.44	23.35	1			36	0	23.32	23.38	23.29	1
		50	25	23.33	23.40	23.31	1			36	19	23.27	23.34	23.25	1
		50	50	23.36	23.42	23.33	1			36	39	23.30	23.36	23.27	1
		100	0	23.33	23.36	23.32	1			75	0	23.27	23.30	23.26	1
	16QAM	1	0	23.42	23.46	23.37	1		16QAM	1	0	23.36	23.40	23.31	1
		1	50	23.30	23.40	23.23	1			1	37	23.24	23.34	23.17	1
		1	99	23.28	23.30	23.22	1			1	74	23.22	23.24	23.16	1
		50	0	22.36	22.42	22.33	2			36	0	22.30	22.36	22.27	2
		50	25	22.31	22.38	22.29	2			36	19	22.25	22.32	22.23	2
		50	50	22.34	22.40	22.31	2			36	39	22.28	22.34	22.25	2
		100	0	22.31	22.34	22.30	2			75	0	22.25	22.28	22.24	2
	64QAM	1	0	22.43	22.47	22.38	2		64QAM	1	0	22.37	22.41	22.32	2
		1	50	22.31	22.41	22.24	2			1	37	22.25	22.35	22.18	2
		1	99	22.29	22.31	22.23	2			1	74	22.23	22.25	22.17	2
		50	0	21.37	21.43	21.34	3			36	0	21.31	21.37	21.28	3
		50	25	21.32	21.39	21.30	3			36	19	21.26	21.33	21.24	3
		50	50	21.35	21.41	21.32	3			36	39	21.29	21.35	21.26	3
		100	0	21.32	21.35	21.31	3			75	0	21.26	21.29	21.25	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		18650	18900	19150				Channel		18625	18900	19175	
		Frequency (MHz)		1855.0	1880.0	1905.0				Frequency (MHz)		1852.5	1880.0	1907.5	
10M	QPSK	1	0	24.30	24.34	24.25	0	5M	QPSK	1	0	24.25	24.29	24.20	0
		1	24	24.18	24.28	24.11	0			1	12	24.13	24.23	24.06	0
		1	49	24.16	24.18	24.10	0			1	24	24.11	24.13	24.05	0
		25	0	23.24	23.30	23.21	1			12	0	23.19	23.25	23.16	1
		25	12	23.19	23.26	23.17	1			12	6	23.14	23.21	23.12	1
		25	25	23.22	23.28	23.19	1			12	13	23.17	23.23	23.14	1
		50	0	23.19	23.22	23.18	1			25	0	23.14	23.17	23.13	1
	16QAM	1	0	23.28	23.32	23.23	1		16QAM	1	0	23.23	23.27	23.18	1
		1	24	23.16	23.26	23.09	1			1	12	23.11	23.21	23.04	1
		1	49	23.14	23.16	23.08	1			1	24	23.09	23.11	23.03	1
		25	0	22.22	22.28	22.19	2			12	0	22.17	22.23	22.14	2
		25	12	22.17	22.24	22.15	2			12	6	22.12	22.19	22.10	2
		25	25	22.20	22.26	22.17	2			12	13	22.15	22.21	22.12	2
		50	0	22.17	22.20	22.16	2			25	0	22.12	22.15	22.11	2
	64QAM	1	0	22.29	22.33	22.24	2		64QAM	1	0	22.24	22.28	22.19	2
		1	24	22.17	22.27	22.10	2			1	12	22.12	22.22	22.05	2
		1	49	22.15	22.17	22.09	2			1	24	22.10	22.12	22.04	2
		25	0	21.23	21.29	21.20	3			12	0	21.18	21.24	21.15	3
		25	12	21.18	21.25	21.16	3			12	6	21.13	21.20	21.11	3
		25	25	21.21	21.27	21.18	3			12	13	21.16	21.22	21.13	3
		50	0	21.18	21.21	21.17	3			25	0	21.13	21.16	21.12	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		18615	18900	19185				Channel		18607	18900	19193	
		Frequency (MHz)		1851.5	1880.0	1908.5				Frequency (MHz)		1850.7	1880.0	1909.3	
3M	QPSK	1	0	24.18	24.22	24.13	0	1.4M	QPSK	1	0	24.15	24.19	24.10	0
		1	7	24.06	24.16	23.99	0			1	2	24.03	24.13	23.96	0
		1	14	24.04	24.06	23.98	0			1	5	24.01	24.03	23.95	0
		8	0	23.12	23.18	23.09	1			3	0	23.59	23.65	23.56	0
		8	3	23.07	23.14	23.05	1			3	1	23.54	23.61	23.52	0
		8	7	23.10	23.16	23.07	1			3	3	23.57	23.63	23.54	0
		15	0	23.07	23.10	23.06	1			6	0	23.04	23.07	23.03	1
	16QAM	1	0	23.16	23.20	23.11	1		16QAM	1	0	23.13	23.17	23.08	1
		1	7	23.04	23.14	22.97	1			1	2	23.01	23.11	22.94	1
		1	14	23.02	23.04	22.96	1			1	5	22.99	23.01	22.93	1
		8	0	22.10	22.16	22.07	2			3	0	22.87	22.93	22.84	1
		8	3	22.05	22.12	22.03	2			3	1	22.82	22.89	22.80	1
		8	7	22.08	22.14	22.05	2			3	3	22.85	22.91	22.82	1
		15	0	22.05	22.08	22.04	2			6	0	22.02	22.05	22.01	2
	64QAM	1	0	22.17	22.21	22.12	2		64QAM	1	0	22.14	22.18	22.09	2
		1	7	22.05	22.15	21.98	2			1	2	22.02	22.12	21.95	2
		1	14	22.03	22.05	21.97	2			1	5	22.00	22.02	21.94	2
		8	0	21.11	21.17	21.08	3			3	0	21.88	21.94	21.85	2
		8	3	21.06	21.13	21.04	3			3	1	21.83	21.90	21.81	2
		8	7	21.09	21.15	21.06	3			3	3	21.86	21.92	21.83	2
		15	0	21.06	21.09	21.05	3			6	0	21.03	21.06	21.02	3

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	23.98	**24.11**	24.02	0	15M	QPSK	1	0	23.93	24.06	23.97	0
		1	50	23.79	23.92	23.83	0			1	37	23.74	23.87	23.78	0
		1	99	23.67	23.80	23.71	0			1	74	23.62	23.75	23.66	0
		50	0	22.85	22.98	22.89	1			36	0	22.80	22.93	22.84	1
		50	25	22.82	22.95	22.86	1			36	19	22.77	22.90	22.81	1
		50	50	22.80	22.93	22.84	1			36	39	22.75	22.88	22.79	1
		100	0	22.74	22.87	22.78	1			75	0	22.69	22.82	22.73	1
	16QAM	1	0	22.96	23.09	23.00	1		16QAM	1	0	22.91	23.04	22.95	1
		1	50	22.77	22.90	22.81	1			1	37	22.72	22.85	22.76	1
		1	99	22.65	22.78	22.69	1			1	74	22.60	22.73	22.64	1
		50	0	21.83	21.96	21.87	2			36	0	21.78	21.91	21.82	2
		50	25	21.80	21.93	21.84	2			36	19	21.75	21.88	21.79	2
		50	50	21.78	21.91	21.82	2			36	39	21.73	21.86	21.77	2
		100	0	21.72	21.85	21.76	2			75	0	21.67	21.80	21.71	2
	64QAM	1	0	21.91	22.04	21.95	2		64QAM	1	0	21.86	21.99	21.90	2
		1	50	21.72	21.85	21.76	2			1	37	21.67	21.80	21.71	2
		1	99	21.60	21.73	21.64	2			1	74	21.55	21.68	21.59	2
		50	0	20.78	20.91	20.82	3			36	0	20.73	20.86	20.77	3
		50	25	20.75	20.88	20.79	3			36	19	20.70	20.83	20.74	3
		50	50	20.73	20.86	20.77	3			36	39	20.68	20.81	20.72	3
		100	0	20.67	20.80	20.71	3			75	0	20.62	20.75	20.66	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		20000	20175	20350				Channel		19975	20175	20375	
		Frequency (MHz)		1715.0	1732.5	1750.0				Frequency (MHz)		1712.5	1732.5	1752.5	
10M	QPSK	1	0	23.87	24.00	23.91	0	5M	QPSK	1	0	23.82	23.95	23.86	0
		1	24	23.68	23.81	23.72	0			1	12	23.63	23.76	23.67	0
		1	49	23.56	23.69	23.60	0			1	24	23.51	23.64	23.55	0
		25	0	22.74	22.87	22.78	1			12	0	22.69	22.82	22.73	1
		25	12	22.71	22.84	22.75	1			12	6	22.66	22.79	22.70	1
		25	25	22.69	22.82	22.73	1			12	13	22.64	22.77	22.68	1
		50	0	22.63	22.76	22.67	1			25	0	22.58	22.71	22.62	1
	16QAM	1	0	22.85	22.98	22.89	1		16QAM	1	0	22.80	22.93	22.84	1
		1	24	22.66	22.79	22.70	1			1	12	22.61	22.74	22.65	1
		1	49	22.54	22.67	22.58	1			1	24	22.49	22.62	22.53	1
		25	0	21.72	21.85	21.76	2			12	0	21.67	21.80	21.71	2
		25	12	21.69	21.82	21.73	2			12	6	21.64	21.77	21.68	2
		25	25	21.67	21.80	21.71	2			12	13	21.62	21.75	21.66	2
		50	0	21.61	21.74	21.65	2			25	0	21.56	21.69	21.60	2
	64QAM	1	0	21.80	21.93	21.84	2		64QAM	1	0	21.75	21.88	21.79	2
		1	24	21.61	21.74	21.65	2			1	12	21.56	21.69	21.60	2
		1	49	21.49	21.62	21.53	2			1	24	21.44	21.57	21.48	2
		25	0	20.67	20.80	20.71	3			12	0	20.62	20.75	20.66	3
		25	12	20.64	20.77	20.68	3			12	6	20.59	20.72	20.63	3
		25	25	20.62	20.75	20.66	3			12	13	20.57	20.70	20.61	3
		50	0	20.56	20.69	20.60	3			25	0	20.51	20.64	20.55	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		19965	20175	20385				Channel		19957	20175	20393	
		Frequency (MHz)		1711.5	1732.5	1753.5				Frequency (MHz)		1710.7	1732.5	1754.3	
3M	QPSK	1	0	23.79	23.92	23.83	0	1.4M	QPSK	1	0	23.72	23.85	23.76	0
		1	7	23.60	23.73	23.64	0			1	2	23.53	23.66	23.57	0
		1	14	23.48	23.61	23.52	0			1	5	23.41	23.54	23.45	0
		8	0	22.66	22.79	22.70	1			3	0	23.39	23.52	23.43	0
		8	3	22.63	22.76	22.67	1			3	1	23.36	23.49	23.40	0
		8	7	22.61	22.74	22.65	1			3	3	23.34	23.47	23.38	0
		15	0	22.55	22.68	22.59	1			6	0	22.48	22.61	22.52	1
	16QAM	1	0	22.77	22.90	22.81	1		16QAM	1	0	22.70	22.83	22.74	1
		1	7	22.58	22.71	22.62	1			1	2	22.51	22.64	22.55	1
		1	14	22.46	22.59	22.50	1			1	5	22.39	22.52	22.43	1
		8	0	21.64	21.77	21.68	2			3	0	22.37	22.50	22.41	1
		8	3	21.61	21.74	21.65	2			3	1	22.34	22.47	22.38	1
		8	7	21.59	21.72	21.63	2			3	3	22.32	22.45	22.36	1
		15	0	21.53	21.66	21.57	2			6	0	21.46	21.59	21.50	2
	64QAM	1	0	21.72	21.85	21.76	2		64QAM	1	0	21.65	21.78	21.69	2
		1	7	21.53	21.66	21.57	2			1	2	21.46	21.59	21.50	2
		1	14	21.41	21.54	21.45	2			1	5	21.34	21.47	21.38	2
		8	0	20.59	20.72	20.63	3			3	0	21.32	21.45	21.36	2
		8	3	20.56	20.69	20.60	3			3	1	21.29	21.42	21.33	2
		8	7	20.54	20.67	20.58	3			3	3	21.27	21.40	21.31	2
		15	0	20.48	20.61	20.52	3			6	0	20.41	20.54	20.45	3

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	24.48	**24.64**	24.56	0	5M	QPSK	1	0	24.41	24.57	24.49	0
		1	24	24.32	24.47	24.37	0			1	12	24.25	24.40	24.30	0
		1	49	24.34	24.48	24.39	0			1	24	24.27	24.41	24.32	0
		25	0	23.37	23.64	23.42	1			12	0	23.30	23.57	23.35	1
		25	12	23.27	23.48	23.40	1			12	6	23.20	23.41	23.33	1
		25	25	23.35	23.55	23.42	1			12	13	23.28	23.48	23.35	1
		50	0	23.33	23.55	23.50	1			25	0	23.26	23.48	23.43	1
	16QAM	1	0	23.47	23.63	23.55	1		16QAM	1	0	23.40	23.56	23.48	1
		1	24	23.31	23.46	23.36	1			1	12	23.24	23.39	23.29	1
		1	49	23.33	23.47	23.38	1			1	24	23.26	23.40	23.31	1
		25	0	22.36	22.63	22.41	2			12	0	22.29	22.56	22.34	2
		25	12	22.26	22.47	22.39	2			12	6	22.19	22.40	22.32	2
		25	25	22.34	22.54	22.41	2			12	13	22.27	22.47	22.34	2
		50	0	22.32	22.54	22.49	2			25	0	22.25	22.47	22.42	2
	64QAM	1	0	22.49	22.65	22.57	2		64QAM	1	0	22.42	22.58	22.50	2
		1	24	22.33	22.48	22.38	2			1	12	22.26	22.41	22.31	2
		1	49	22.35	22.49	22.40	2			1	24	22.28	22.42	22.33	2
		25	0	21.38	21.65	21.43	3			12	0	21.31	21.58	21.36	3
		25	12	21.28	21.49	21.41	3			12	6	21.21	21.42	21.34	3
		25	25	21.36	21.56	21.43	3			12	13	21.29	21.49	21.36	3
		50	0	21.34	21.56	21.51	3			25	0	21.27	21.49	21.44	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		20415	20525	20635				Channel		20407	20525	20643	
		Frequency (MHz)		825.5	836.5	847.5				Frequency (MHz)		824.7	836.5	848.3	
3M	QPSK	1	0	24.36	24.52	24.44	0	1.4M	QPSK	1	0	24.28	24.44	24.36	0
		1	7	24.20	24.35	24.25	0			1	2	24.12	24.27	24.17	0
		1	14	24.22	24.36	24.27	0			1	5	24.14	24.28	24.19	0
		8	0	23.25	23.52	23.30	1			3	0	23.97	24.24	24.02	0
		8	3	23.15	23.36	23.28	1			3	1	23.87	24.08	24.00	0
		8	7	23.23	23.43	23.30	1			3	3	23.95	24.15	24.02	0
		15	0	23.21	23.43	23.38	1			6	0	23.13	23.35	23.30	1
	16QAM	1	0	23.35	23.51	23.43	1		16QAM	1	0	23.27	23.43	23.35	1
		1	7	23.19	23.34	23.24	1			1	2	23.11	23.26	23.16	1
		1	14	23.21	23.35	23.26	1			1	5	23.13	23.27	23.18	1
		8	0	22.24	22.51	22.29	2			3	0	22.96	23.23	23.01	1
		8	3	22.14	22.35	22.27	2			3	1	22.86	23.07	22.99	1
		8	7	22.22	22.42	22.29	2			3	3	22.94	23.14	23.01	1
		15	0	22.20	22.42	22.37	2			6	0	22.12	22.34	22.29	2
	64QAM	1	0	22.37	22.53	22.45	2		64QAM	1	0	22.29	22.45	22.37	2
		1	7	22.21	22.36	22.26	2			1	2	22.13	22.28	22.18	2
		1	14	22.23	22.37	22.28	2			1	5	22.15	22.29	22.20	2
		8	0	21.26	21.53	21.31	3			3	0	21.98	22.25	22.03	2
		8	3	21.16	21.37	21.29	3			3	1	21.88	22.09	22.01	2
		8	7	21.24	21.44	21.31	3			3	3	21.96	22.16	22.03	2
		15	0	21.22	21.44	21.39	3			6	0	21.14	21.36	21.31	3

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	23.77	**23.81**	23.79	0	15M	QPSK	1	0	23.68	23.72	23.70	0
		1	50	23.66	23.71	23.69	0			1	37	23.57	23.62	23.60	0
		1	99	23.60	23.65	23.63	0			1	74	23.51	23.56	23.54	0
		50	0	22.76	22.81	22.79	1			36	0	22.67	22.72	22.70	1
		50	25	22.74	22.79	22.77	1			36	19	22.65	22.70	22.68	1
		50	50	22.68	22.73	22.71	1			36	39	22.59	22.64	22.62	1
		100	0	22.73	22.78	22.76	1			75	0	22.64	22.69	22.67	1
	16QAM	1	0	22.75	22.79	22.77	1		16QAM	1	0	22.66	22.70	22.68	1
		1	50	22.64	22.69	22.67	1			1	37	22.55	22.60	22.58	1
		1	99	22.58	22.63	22.61	1			1	74	22.49	22.54	22.52	1
		50	0	21.74	21.79	21.77	2			36	0	21.65	21.70	21.68	2
		50	25	21.72	21.77	21.75	2			36	19	21.63	21.68	21.66	2
		50	50	21.66	21.71	21.69	2			36	39	21.57	21.62	21.60	2
		100	0	21.71	21.76	21.74	2			75	0	21.62	21.67	21.65	2
	64QAM	1	0	21.77	21.81	21.79	2		64QAM	1	0	21.68	21.72	21.70	2
		1	50	21.66	21.71	21.69	2			1	37	21.57	21.62	21.60	2
		1	99	21.60	21.65	21.63	2			1	74	21.51	21.56	21.54	2
		50	0	20.76	20.81	20.79	3			36	0	20.67	20.72	20.70	3
		50	25	20.74	20.79	20.77	3			36	19	20.65	20.70	20.68	3
		50	50	20.68	20.73	20.71	3			36	39	20.59	20.64	20.62	3
		100	0	20.73	20.78	20.76	3			75	0	20.64	20.69	20.67	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		20800	21100	21400				Channel		20775	21100	21425	
		Frequency (MHz)		2505.0	2535.0	2565.0				Frequency (MHz)		2502.5	2535.0	2567.5	
10M	QPSK	1	0	23.60	23.64	23.62	0	5M	QPSK	1	0	23.52	23.56	23.54	0
		1	24	23.49	23.54	23.52	0			1	12	23.41	23.46	23.44	0
		1	49	23.43	23.48	23.46	0			1	24	23.35	23.40	23.38	0
		25	0	22.59	22.64	22.62	1			12	0	22.51	22.56	22.54	1
		25	12	22.57	22.62	22.60	1			12	6	22.49	22.54	22.52	1
		25	25	22.51	22.56	22.54	1			12	13	22.43	22.48	22.46	1
		50	0	22.56	22.61	22.59	1			25	0	22.48	22.53	22.51	1
	16QAM	1	0	22.58	22.62	22.60	1		16QAM	1	0	22.50	22.54	22.52	1
		1	24	22.47	22.52	22.50	1			1	12	22.39	22.44	22.42	1
		1	49	22.41	22.46	22.44	1			1	24	22.33	22.38	22.36	1
		25	0	21.57	21.62	21.60	2			12	0	21.49	21.54	21.52	2
		25	12	21.55	21.60	21.58	2			12	6	21.47	21.52	21.50	2
		25	25	21.49	21.54	21.52	2			12	13	21.41	21.46	21.44	2
		50	0	21.54	21.59	21.57	2			25	0	21.46	21.51	21.49	2
	64QAM	1	0	21.60	21.64	21.62	2		64QAM	1	0	21.52	21.56	21.54	2
		1	24	21.49	21.54	21.52	2			1	12	21.41	21.46	21.44	2
		1	49	21.43	21.48	21.46	2			1	24	21.35	21.40	21.38	2
		25	0	20.59	20.64	20.62	3			12	0	20.51	20.56	20.54	3
		25	12	20.57	20.62	20.60	3			12	6	20.49	20.54	20.52	3
		25	25	20.51	20.56	20.54	3			12	13	20.43	20.48	20.46	3
		50	0	20.56	20.61	20.59	3			25	0	20.48	20.53	20.51	3

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				Frequency (MHz)		701.5	707.5	713.5	
10M	QPSK	1	0	24.31	**24.44**	24.38	0	5M	QPSK	1	0	24.23	24.36	24.30	0
		1	24	24.25	24.33	24.31	0			1	12	24.17	24.25	24.23	0
		1	49	24.28	24.42	24.35	0			1	24	24.20	24.34	24.27	0
		25	0	23.43	23.51	23.48	1			12	0	23.35	23.43	23.40	1
		25	12	23.35	23.40	23.32	1			12	6	23.27	23.32	23.24	1
		25	25	23.38	23.45	23.37	1			12	13	23.30	23.37	23.29	1
		50	0	23.37	23.49	23.41	1			25	0	23.31	23.41	23.33	1
	16QAM	1	0	23.29	23.42	23.36	1		16QAM	1	0	23.21	23.34	23.28	1
		1	24	23.23	23.31	23.29	1			1	12	23.15	23.23	23.21	1
		1	49	23.26	23.40	23.33	1			1	24	23.18	23.32	23.25	1
		25	0	22.41	22.49	22.46	2			12	0	22.33	22.41	22.38	2
		25	12	22.33	22.38	22.30	2			12	6	22.25	22.30	22.22	2
		25	25	22.36	22.43	22.35	2			12	13	22.28	22.35	22.27	2
		50	0	22.37	22.47	22.39	2			25	0	22.29	22.39	22.31	2
	64QAM	1	0	22.31	22.44	22.38	2		64QAM	1	0	22.23	22.36	22.30	2
		1	24	22.25	22.33	22.31	2			1	12	22.17	22.25	22.23	2
		1	49	22.28	22.42	22.35	2			1	24	22.20	22.34	22.27	2
		25	0	21.43	21.51	21.48	3			12	0	21.35	21.43	21.40	3
		25	12	21.35	21.40	21.32	3			12	6	21.27	21.32	21.24	3
		25	25	21.38	21.45	21.37	3			12	13	21.30	21.37	21.29	3
		50	0	21.39	21.49	21.41	3			25	0	21.31	21.41	21.33	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	24.18	24.31	24.25	0	1.4M	QPSK	1	0	24.11	24.24	24.18	0
		1	7	24.12	24.20	24.18	0			1	2	24.05	24.13	24.11	0
		1	14	24.15	24.29	24.22	0			1	5	24.08	24.22	24.15	0
		8	0	23.30	23.38	23.35	1			3	0	24.03	24.11	24.08	0
		8	3	23.22	23.27	23.19	1			3	1	23.95	24.00	23.92	0
		8	7	23.25	23.32	23.24	1			3	3	23.98	24.05	23.97	0
		15	0	23.26	23.36	23.28	1			6	0	23.19	23.29	23.21	1
	16QAM	1	0	23.16	23.29	23.23	1		16QAM	1	0	23.09	23.22	23.16	1
		1	7	23.10	23.18	23.16	1			1	2	23.03	23.11	23.09	1
		1	14	23.13	23.27	23.20	1			1	5	23.06	23.20	23.13	1
		8	0	22.28	22.36	22.33	2			3	0	23.01	23.09	23.06	1
		8	3	22.20	22.25	22.17	2			3	1	22.93	22.98	22.90	1
		8	7	22.23	22.30	22.22	2			3	3	22.96	23.03	22.95	1
		15	0	22.25	22.34	22.26	2			6	0	22.17	22.27	22.19	2
	64QAM	1	0	22.18	22.31	22.25	2		64QAM	1	0	22.11	22.24	22.18	2
		1	7	22.12	22.20	22.18	2			1	2	22.05	22.13	22.11	2
		1	14	22.15	22.29	22.22	2			1	5	22.08	22.22	22.15	2
		8	0	21.30	21.38	21.35	3			3	0	22.03	22.11	22.08	2
		8	3	21.22	21.27	21.19	3			3	1	21.95	22.00	21.92	2
		8	7	21.25	21.32	21.24	3			3	3	21.98	22.05	21.97	2
		15	0	21.26	21.36	21.28	3			6	0	21.19	21.29	21.21	3

LTE Band 13																	
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			23230					Channel		23205	23230	23225	
		Frequency (MHz)			782.0					Frequency (MHz)		779.5	782.0	784.5	
10M	QPSK	1	0		**24.52**		0	5M	QPSK	1	0	24.18	24.37	24.32	0
		1	24		24.51		0			1	12	24.16	24.35	24.30	0
		1	49		24.47		0			1	24	24.13	24.32	24.27	0
		25	0		23.52		1			12	0	23.26	23.45	23.40	1
		25	12		23.5		1			12	6	23.23	23.42	23.37	1
		25	25		23.44		1			12	13	23.20	23.39	23.34	1
		50	0		23.48		1			25	0	23.22	23.41	23.36	1
	16QAM	1	0		23.50		1		16QAM	1	0	23.16	23.35	23.30	1
		1	24		23.49		1			1	12	23.14	23.33	23.28	1
		1	49		23.45		1			1	24	23.11	23.30	23.25	1
		25	0		22.50		2			12	0	22.24	22.43	22.38	2
		25	12		22.48		2			12	6	22.21	22.40	22.35	2
		25	25		22.42		2			12	13	22.18	22.37	22.32	2
		50	0		22.46		2			25	0	22.20	22.39	22.34	2
	64QAM	1	0		22.47		2		64QAM	1	0	22.18	22.37	22.32	2
		1	24		22.46		2			1	12	22.16	22.35	22.30	2
		1	49		22.42		2			1	24	22.13	22.32	22.27	2
		25	0		21.47		3			12	0	21.26	21.45	21.40	3
		25	12		21.45		3			12	6	21.23	21.42	21.37	3
		25	25		21.39		3			12	13	21.20	21.39	21.34	3
		50	0		21.43		3			25	0	21.22	21.41	21.36	3

LTE Band 17																	
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		23780	23790	23800				Channel		23755	23790	23825	
		Frequency (MHz)		709.0	710.0	711.0				Frequency (MHz)		706.5	710.0	713.5	
10M	QPSK	1	0	24.44	**24.48**	24.38	0	5M	QPSK	1	0	24.38	24.42	24.32	0
		1	24	24.37	24.42	24.32	0			1	12	24.31	24.36	24.26	0
		1	49	24.27	24.32	24.22	0			1	24	24.21	24.26	24.16	0
		25	0	23.41	23.46	23.36	1			12	0	23.35	23.40	23.30	1
		25	12	23.35	23.40	23.30	1			12	6	23.29	23.34	23.24	1
		25	25	23.38	23.43	23.33	1			12	13	23.32	23.37	23.27	1
		50	0	23.31	23.36	23.26	1			25	0	23.25	23.30	23.20	1
	16QAM	1	0	23.41	23.45	23.35	1		16QAM	1	0	23.35	23.39	23.29	1
		1	24	23.34	23.39	23.29	1			1	12	23.28	23.33	23.23	1
		1	49	23.24	23.29	23.19	1			1	24	23.18	23.23	23.13	1
		25	0	22.38	22.43	22.33	2			12	0	22.32	22.37	22.27	2
		25	12	22.32	22.37	22.27	2			12	6	22.26	22.31	22.21	2
		25	25	22.35	22.40	22.30	2			12	13	22.29	22.34	22.24	2
		50	0	22.28	22.33	22.23	2			25	0	22.22	22.27	22.17	2
	64QAM	1	0	22.36	22.40	22.30	2		64QAM	1	0	22.30	22.34	22.24	2
		1	24	22.29	22.34	22.24	2			1	12	22.23	22.28	22.18	2
		1	49	22.19	22.24	22.14	2			1	24	22.13	22.18	22.08	2
		25	0	21.33	21.38	21.28	3			12	0	21.27	21.32	21.22	3
		25	12	21.27	21.32	21.22	3			12	6	21.21	21.26	21.16	3
		25	25	21.30	21.35	21.25	3			12	13	21.24	21.29	21.19	3
		50	0	21.23	21.28	21.18	3			25	0	21.17	21.22	21.12	3

LTE Band 41

BW	MCS Index	RB Size	RB Offset	Low	Mid	Mid	Mid	High	3GPP MPR (dB)
		Channel		39750	40185	40620	41055	41490	
		Frequency (MHz)		2506.0	2549.5	2593.0	2636.5	2680.0	
20M	QPSK	1	0	23.57	23.47	**23.77**	23.68	23.75	0
		1	50	23.47	23.37	23.65	23.58	23.67	0
		1	99	23.44	23.34	23.62	23.55	23.64	0
		50	0	22.60	22.50	22.78	22.71	22.77	1
		50	25	22.58	22.48	22.76	22.69	22.77	1
		50	50	22.51	22.41	22.69	22.62	22.71	1
		100	0	22.57	22.47	22.75	22.68	22.74	1
	16QAM	1	0	22.55	22.45	22.73	22.66	22.75	1
		1	50	22.45	22.35	22.63	22.56	22.65	1
		1	99	22.42	22.32	22.60	22.53	22.62	1
		50	0	21.58	21.48	21.76	21.69	21.78	2
		50	25	21.56	21.46	21.74	21.67	21.76	2
		50	50	21.49	21.39	21.67	21.60	21.69	2
		100	0	21.55	21.45	21.73	21.66	21.75	2
	64QAM	1	0	21.54	21.44	21.72	21.65	21.74	2
		1	50	21.44	21.34	21.62	21.55	21.64	2
		1	99	21.41	21.31	21.59	21.52	21.61	2
		50	0	20.57	20.47	20.75	20.68	20.77	3
		50	25	20.55	20.45	20.73	20.66	20.75	3
		50	50	20.48	20.38	20.66	20.59	20.68	3
		100	0	20.54	20.44	20.72	20.65	20.74	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	Mid	Mid	High	3GPP MPR (dB)
		Channel		39725	40173	40620	41068	41515	
		Frequency (MHz)		2503.5	2548.3	2593.0	2637.8	2682.5	
15M	QPSK	1	0	23.55	23.45	23.73	23.66	23.75	0
		1	37	23.45	23.35	23.63	23.56	23.65	0
		1	74	23.42	23.32	23.60	23.53	23.62	0
		36	0	22.58	22.48	22.76	22.69	22.78	1
		36	19	22.56	22.46	22.74	22.67	22.76	1
		36	39	22.49	22.39	22.67	22.60	22.69	1
		75	0	22.55	22.45	22.73	22.66	22.75	1
	16QAM	1	0	22.53	22.43	22.71	22.64	22.73	1
		1	37	22.43	22.33	22.61	22.54	22.63	1
		1	74	22.40	22.30	22.58	22.51	22.60	1
		36	0	21.56	21.46	21.74	21.67	21.76	2
		36	19	21.54	21.44	21.72	21.65	21.74	2
		36	39	21.47	21.37	21.65	21.58	21.67	2
		75	0	21.53	21.43	21.71	21.64	21.73	2
	64QAM	1	0	21.52	21.42	21.70	21.63	21.72	2
		1	37	21.42	21.32	21.60	21.53	21.62	2
		1	74	21.39	21.29	21.57	21.50	21.59	2
		36	0	20.55	20.45	20.73	20.66	20.75	3
		36	19	20.53	20.43	20.71	20.64	20.73	3
		36	39	20.46	20.36	20.64	20.57	20.66	3
		75	0	20.52	20.42	20.70	20.63	20.72	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	Mid	Mid	High	3GPP MPR (dB)
		Channel		39700	40160	40620	41080	41540	
		Frequency (MHz)		2501.0	2547.0	2593.0	2639.0	2685.0	
10M	QPSK	1	0	23.52	23.42	23.70	23.63	23.72	0
		1	24	23.42	23.32	23.60	23.53	23.62	0
		1	49	23.39	23.29	23.57	23.50	23.59	0
		25	0	22.55	22.45	22.73	22.66	22.75	1
		25	12	22.53	22.43	22.71	22.64	22.73	1
		25	25	22.46	22.36	22.64	22.57	22.66	1
		50	0	22.52	22.42	22.70	22.63	22.72	1
	16QAM	1	0	22.50	22.40	22.68	22.61	22.70	1
		1	24	22.40	22.30	22.58	22.51	22.60	1
		1	49	22.37	22.27	22.55	22.48	22.57	1
		25	0	21.53	21.43	21.71	21.64	21.73	2
		25	12	21.51	21.41	21.69	21.62	21.71	2
		25	25	21.44	21.34	21.62	21.55	21.64	2
		50	0	21.50	21.40	21.68	21.61	21.70	2
	64QAM	1	0	21.49	21.39	21.67	21.60	21.69	2
		1	24	21.39	21.29	21.57	21.50	21.59	2
		1	49	21.36	21.26	21.54	21.47	21.56	2
		25	0	20.52	20.42	20.70	20.63	20.72	3
		25	12	20.50	20.40	20.68	20.61	20.70	3
		25	25	20.43	20.33	20.61	20.54	20.63	3
		50	0	20.49	20.39	20.67	20.60	20.69	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	Mid	Mid	High	3GPP MPR (dB)
		Channel		39675	40148	40620	41093	41565	
		Frequency (MHz)		2498.5	2545.8	2593.0	2640.3	2687.5	
5M	QPSK	1	0	23.50	23.40	23.68	23.61	23.70	0
		1	12	23.40	23.30	23.58	23.51	23.60	0
		1	24	23.37	23.27	23.55	23.48	23.57	0
		12	0	22.53	22.43	22.71	22.64	22.73	1
		12	6	22.51	22.41	22.69	22.62	22.71	1
		12	13	22.44	22.34	22.62	22.55	22.64	1
		25	0	22.50	22.40	22.68	22.61	22.70	1
	16QAM	1	0	22.48	22.38	22.66	22.59	22.68	1
		1	12	22.38	22.28	22.56	22.49	22.58	1
		1	24	22.35	22.25	22.53	22.46	22.55	1
		12	0	21.51	21.41	21.69	21.62	21.71	2
		12	6	21.49	21.39	21.67	21.60	21.69	2
		12	13	21.42	21.32	21.60	21.53	21.62	2
		25	0	21.48	21.38	21.66	21.59	21.68	2
	64QAM	1	0	21.47	21.37	21.65	21.58	21.67	2
		1	12	21.37	21.27	21.55	21.48	21.57	2
		1	24	21.34	21.24	21.52	21.45	21.54	2
		12	0	20.50	20.40	20.68	20.61	20.70	3
		12	6	20.48	20.38	20.66	20.59	20.68	3
		12	13	20.41	20.31	20.59	20.52	20.61	3
		25	0	20.47	20.37	20.65	20.58	20.67	3

LTE Band 66

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		132072	132322	132572	
		Frequency (MHz)		1720.0	1745.0	1770.0	
20M	QPSK	1	0	23.59	**23.95**	23.83	0
		1	50	23.31	23.64	23.54	0
		1	99	23.36	23.65	23.57	0
		50	0	22.48	22.78	22.62	1
		50	25	22.41	22.65	22.52	1
		50	50	22.43	22.73	22.57	1
		100	0	22.46	22.77	22.58	1
	16QAM	1	0	22.56	22.92	22.80	1
		1	50	22.28	22.61	22.51	1
		1	99	22.33	22.62	22.54	1
		50	0	21.45	21.75	21.59	2
		50	25	21.38	21.62	21.49	2
		50	50	21.40	21.70	21.54	2
		100	0	21.43	21.73	21.55	2
	64QAM	1	0	21.51	21.87	21.75	2
		1	50	21.23	21.56	21.46	2
		1	99	21.28	21.57	21.49	2
		50	0	20.40	20.70	20.54	3
		50	25	20.33	20.57	20.44	3
		50	50	20.35	20.65	20.49	3
		100	0	20.38	20.68	20.50	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		132047	132322	132597	
		Frequency (MHz)		1717.5	1745.0	1772.5	
15M	QPSK	1	0	23.51	23.87	23.75	0
		1	37	23.23	23.56	23.46	0
		1	74	23.28	23.57	23.49	0
		36	0	22.40	22.70	22.54	1
		36	19	22.33	22.57	22.44	1
		36	39	22.35	22.65	22.49	1
		75	0	22.38	22.69	22.50	1
	16QAM	1	0	22.48	22.84	22.72	1
		1	37	22.20	22.53	22.43	1
		1	74	22.25	22.54	22.46	1
		36	0	21.37	21.67	21.51	2
		36	19	21.30	21.54	21.41	2
		36	39	21.32	21.62	21.46	2
		75	0	21.35	21.65	21.47	2
	64QAM	1	0	21.43	21.79	21.67	2
		1	37	21.15	21.48	21.38	2
		1	74	21.20	21.49	21.41	2
		36	0	20.32	20.62	20.46	3
		36	19	20.25	20.49	20.36	3
		36	39	20.27	20.57	20.41	3
		75	0	20.30	20.60	20.42	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		132022	132322	132622	
		Frequency (MHz)		1715.0	1745.0	1775.0	
10M	QPSK	1	0	23.46	23.82	23.70	0
		1	24	23.18	23.51	23.41	0
		1	49	23.23	23.52	23.44	0
		25	0	22.35	22.65	22.49	1
		25	12	22.28	22.52	22.39	1
		25	25	22.30	22.60	22.44	1
		50	0	22.33	22.64	22.45	1
	16QAM	1	0	22.43	22.79	22.67	1
		1	24	22.15	22.48	22.38	1
		1	49	22.20	22.49	22.41	1
		25	0	21.32	21.62	21.46	2
		25	12	21.25	21.49	21.36	2
		25	25	21.27	21.57	21.41	2
		50	0	21.30	21.60	21.42	2
	64QAM	1	0	21.38	21.74	21.62	2
		1	24	21.10	21.43	21.33	2
		1	49	21.15	21.44	21.36	2
		25	0	20.27	20.57	20.41	3
		25	12	20.20	20.44	20.31	3
		25	25	20.22	20.52	20.36	3
		50	0	20.25	20.55	20.37	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		131997	132322	132647	
		Frequency (MHz)		1712.5	1745.0	1777.5	
5M	QPSK	1	0	23.43	23.79	23.67	0
		1	12	23.15	23.48	23.38	0
		1	24	23.20	23.49	23.41	0
		12	0	22.32	22.62	22.46	1
		12	6	22.25	22.49	22.36	1
		12	13	22.27	22.57	22.41	1
		25	0	22.30	22.61	22.42	1
	16QAM	1	0	22.40	22.76	22.64	1
		1	12	22.12	22.45	22.35	1
		1	24	22.17	22.46	22.38	1
		12	0	21.29	21.59	21.43	2
		12	6	21.22	21.46	21.33	2
		12	13	21.24	21.54	21.38	2
		25	0	21.27	21.57	21.39	2
	64QAM	1	0	21.35	21.71	21.59	2
		1	12	21.07	21.40	21.30	2
		1	24	21.12	21.41	21.33	2
		12	0	20.24	20.54	20.38	3
		12	6	20.17	20.41	20.28	3
		12	13	20.19	20.49	20.33	3
		25	0	20.22	20.52	20.34	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		131987	132322	132657	
		Frequency (MHz)		1711.5	1745.5	1778.5	
3M	QPSK	1	0	23.38	23.74	23.62	0
		1	7	23.10	23.43	23.33	0
		1	14	23.15	23.44	23.36	0
		8	0	22.27	22.57	22.41	1
		8	3	22.20	22.44	22.31	1
		8	7	22.22	22.52	22.36	1
		15	0	22.25	22.56	22.37	1
	16QAM	1	0	22.35	22.71	22.59	1
		1	7	22.07	22.40	22.30	1
		1	14	22.12	22.41	22.33	1
		8	0	21.24	21.54	21.38	2
		8	3	21.17	21.41	21.28	2
		8	7	21.19	21.49	21.33	2
		15	0	21.22	21.52	21.34	2
	64QAM	1	0	21.30	21.66	21.54	2
		1	7	21.02	21.35	21.25	2
		1	14	21.07	21.36	21.28	2
		8	0	20.19	20.49	20.33	3
		8	3	20.12	20.36	20.23	3
		8	7	20.14	20.44	20.28	3
		15	0	20.17	20.47	20.29	3

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		131979	132322	132665	
		Frequency (MHz)		1710.7	1745.0	1779.3	
1.4M	QPSK	1	0	23.35	23.71	23.59	0
		1	2	23.07	23.40	23.30	0
		1	5	23.12	23.41	23.33	0
		3	0	23.11	23.41	23.25	0
		3	1	23.04	23.28	23.15	0
		3	3	23.06	23.36	23.20	0
		6	0	22.22	22.53	22.34	1
	16QAM	1	0	22.32	22.68	22.56	1
		1	2	22.04	22.37	22.27	1
		1	5	22.09	22.38	22.30	1
		3	0	22.08	22.38	22.22	1
		3	1	22.01	22.25	22.12	1
		3	3	22.03	22.33	22.17	1
		6	0	21.19	21.49	21.31	2
	64QAM	1	0	21.27	21.63	21.51	2
		1	2	21.02	21.32	21.22	2
		1	5	21.04	21.33	21.25	2
		3	0	21.93	22.23	22.07	2
		3	1	21.86	22.10	21.97	2
		3	3	21.88	22.18	22.02	2
		6	0	20.14	20.44	20.26	3

<WLAN 2.4G>

Mode	Channel	Frequency (MHz)	Average Power (Ant-0)	Average Power (Ant-1)	Average Power (Ant-0 + Ant-1)
802.11b	1	2412	19.56	19.52	-
	6	2437	19.79	19.75	-
	11	2462	19.55	19.49	-
802.11n (HT40)	3	2422	-	-	17.90
	6	2437	-	-	19.66
	9	2452	-	-	19.13

<WLAN 5.2G>

Mode	Channel	Frequency (MHz)	Average Power (Ant-0)	Average Power (Ant-1)	Average Power (Ant-0 + Ant-1)
802.11ac (VHT40)	38	5190	-	-	18.44
	46	5230	-	-	21.25
802.11ac (VHT80)	42	5210	18.42	18.19	-

<WLAN 5.3G>

Mode	Channel	Frequency (MHz)	Average Power (Ant-0)	Average Power (Ant-1)	Average Power (Ant-0 + Ant-1)
802.11ac (VHT40)	54	5270	-	-	21.39
	62	5310	-	-	18.51
802.11ac (VHT80)	58	5290	18.44	18.41	-

<WLAN 5.6G>

Mode	Channel	Frequency (MHz)	Average Power (Ant-0)	Average Power (Ant-1)	Average Power (Ant-0 + Ant-1)
802.11ac (VHT80)	106	5530	18.24	18.23	16.88
	122	5610	18.41	18.32	21.41

<WLAN 5.8G>

Mode	Channel	Frequency (MHz)	Average Power (Ant-0)	Average Power (Ant-1)	Average Power (Ant-0 + Ant-1)
802.11ac (VHT80)	155	5775	18.25	18.18	21.45

<Bluetooth>

Mode	Channel	Frequency (MHz)	Average Power
Bluetooth EDR	0	2402	9.11
	39	2441	10.36
	78	2480	10.22
Bluetooth LE	0	2402	4.1
	19	2440	4.92
	39	2480	5.98

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) ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz

(2) ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz

(3) ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

<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 ≤ 1/4 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 ≤ 1.2 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.

<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 Ch	UL Freq. (MHz)	RB Size	RB Offset	DL Ch	DL Freq. (MHz)	LTE Band	BW (MHz)	DL Ch	DL Freq. (MHz)	LTE Band	BW (MHz)	DL Ch	DL Freq. (MHz)	Single Carrier Tx Power (dBm)	Tx Power with DL-CA Active (dBm)
CA_2C	2	20M	18900	1880	1	0	900	1960	2	20M	1098	1979.8					24.48	23.80
CA_7C	7	20M	21100	2535	1	0	3100	2655	7	20M	3298	2674.8					23.81	23.60
CA_66B	66	15M	132322	1745	1	0	66786	2145	66	5M	66882	2154.6					23.95	23.74
CA_66C	66	20M	132322	1745	1	0	66786	2145	66	20M	66984	2164.8					23.95	23.64

Power Measurements for Intra-Band Non-Contiguous Downlink CA

CA Combination	PCC								SCC1				SCC2				Power	
	LTE Band	BW (MHz)	UL Ch	UL Freq. (MHz)	RB Size	RB Offset	DL Ch	DL Freq. (MHz)	LTE Band	BW (MHz)	DL Ch	DL Freq. (MHz)	LTE Band	BW (MHz)	DL Ch	DL Freq. (MHz)	Single Carrier Tx Power (dBm)	Tx Power with DL-CA Active (dBm)
CA_2A-2A	2	20M	18900	1880	1	0	900	1960	2	20M	1100	1980					24.48	23.83
CA_4A-4A	4	20M	20050	1720	1	0	2050	2120	4	20M	2300	2145					24.11	24.10
CA_7A-7A	7	20M	21100	2535	1	0	3100	2565	7	20M	3350	2680					23.81	23.45
CA_66A-66A	66	20M	132322	1745	1	0	66786	2145	66	20M	67036	2170					23.95	23.35
CA_66A-66C	66	20M	132322	1745	1	0	66786	2145	66	20M	65536	2120	66	20M	67036	2170	23.95	23.81

Power Measurements for Inter-Band Downlink CA

CA Combination	PCC								SCC1				SCC2				SCC3				Power	
	LTE Band	BW (MHz)	UL Ch	UL Freq. (MHz)	RB Size	RB Offset	DL Ch	DL Freq. (MHz)	LTE Band	BW (MHz)	DL Ch	DL Freq. (MHz)	LTE Band	BW (MHz)	DL Ch	DL Freq. (MHz)	LTE Band	BW (MHz)	DL Ch	DL Freq. (MHz)	Single Carrier Tx Power (dBm)	Tx Power with DL-CA Active (dBm)
CA_2A-4A	2	20M	18900	1880	1	0	900	1960	4	20M	2175	2132.5									24.48	23.85
CA_2A-2A-4A	2	20M	18900	1880	1	0	900	1960	2	20M	1100	1980	4	20M	2175	2132.5					24.48	23.74
CA_2A-4A-4A	2	20M	18900	1880	1	0	900	1960	4	20M	2050	2120	4	20M	2300	2145					24.48	24.24
CA_2A-5A	2	20M	18900	1880	1	0	900	1960	5	10M	2525	881.5									24.48	23.76
CA_2A-12A	2	20M	18900	1880	1	0	900	1960	12	10M	5095	737.5									24.48	23.78
CA_2A-2A-12A	2	20M	18900	1880	1	0	900	1960	2	20M	1100	1980	12	10M	5095	737.5					24.48	23.59
CA_2A-13A	2	20M	18900	1880	1	0	900	1960	13	10M	5230	751									24.48	23.55
CA_2A-17A	2	10M	18900	1880	1	0	900	1960	17	10M	5790	740									24.48	24.02
CA_2A-46A	2	20M	18900	1880	1	0	900	1960	46	20M	50665	5537.5									24.48	23.65
CA_2A-46C	2	20M	18900	1880	1	0	900	1960	46	20M	50665	5537.5	46	20M	54440	5915					24.48	24.11
CA_2A-2A-46A	2	20M	18900	1880	1	0	900	1960	2	20M	1100	1980	46	20M	50665	5537.5					24.48	24.06
CA_2A-2A-66A	2	20M	18900	1880	1	0	900	1960	2	20M	1100	1980	66	20M	66786	2145					24.48	23.54
CA_2A-13A-46A	2	20M	18900	1880	1	0	900	1960	13	10M	5230	751	46	20M	50665	5537.5					24.48	23.90
CA_2A-46A-46A	2	20M	18900	1880	1	0	900	1960	46	20M	50665	5537.5	46	20M	54440	5915					24.48	24.03
CA_2A-46A-46C	2	20M	18900	1880	1	0	900	1960	46	20M	50090	5480	46	20M	50450	5516	46	20M	50648	5535.8	24.48	23.88
CA_2A-66A	2	20M	18900	1880	1	0	900	1960	66	20M	66786	2145									24.48	24.12
CA_2A-66B	2	20M	18900	1880	1	0	900	1960	66	15M	66786	2145	66	5M	67111	2177.5					24.48	23.94
CA_2A-66C	2	20M	18900	1880	1	0	900	1960	66	20M	66786	2145	66	20M	67036	2170					24.48	24.03
CA_2A-66A-66A	2	20M	18900	1880	1	0	900	1960	66	20M	66786	2145	66	20M	67036	2170					24.48	24.07
CA_4A-5A	4	20M	20175	1732.5	1	0	2175	2132.5	5	10M	2525	881.5									24.11	24.10
CA_4A-7A	4	20M	20175	1732.5	1	0	2175	2132.5	7	20M	3100	2655									24.11	24.02
CA_4A-7A-7A	4	20M	20175	1732.5	1	0	2175	2132.5	7	20M	3100	2565	7	20M	3350	2680					24.11	23.74
CA_4A-12A	4	20M	20175	1732.5	1	0	2175	2132.5	12	10M	5095	737.5									24.11	24.22
CA_4A-4A-12A	4	20M	20050	1720	1	0	2050	2120	4	20M	2300	2145	12	10M	5095	737.5					24.11	23.66
CA_4A-13A	4	20M	20175	1732.5	1	0	2175	2132.5	13	10M	5230	751									24.11	24.03
CA_4A-17A	4	10M	20175	1732.5	1	0	2175	2132.5	17	10M	5790	740									24.11	23.55
CA_4A-46A	4	20M	20175	1732.5	1	0	2175	2132.5	46	20M	50665	5537.5									24.11	24.10
CA_4A-46A-46A	4	20M	20175	1732.5	1	0	2175	2132.5	46	20M	50665	5537.5	46	20M	54440	5915					24.11	23.60
CA_4A-46A-46C	4	20M	20175	1732.5	1	0	2175	2132.5	46	20M	50090	5480	46	20M	50450	5516	46	20M	50648	5535.8	24.11	24.01
CA_4A-46C	4	20M	20175	1732.5	1	0	2175	2132.5	46	20M	50450	5516	46	20M	50648	5535.8					24.11	23.88
CA_4A-46D	4	20M	20175	1732.5	1	0	2175	2132.5	46	20M	50090	5480	46	20M	50288	5499.8	46	20M	50486	5519.6	24.11	23.95
CA_5A-7A	5	10M	20525	836.5	1	0	2525	881.5	7	20M	3100	2655									24.64	24.21
CA_5A-46A	5	10M	20525	836.5	1	0	2525	881.5	46	20M	50665	5537.5									24.64	24.11
CA_5A-46C	5	10M	20525	836.5	1	0	2525	881.5	46	20M	50450	5516	46	20M	50648	5535.8					24.64	24.22
CA_5A-46D	5	10M	20525	836.5	1	0	2525	881.5	46	20M	50090	5480	46	20M	50288	5499.8	46	20M	50486	5519.6	24.64	24.10
CA_5A-66A	5	10M	20525	836.5	1	0	2525	881.5	66	20M	66786	2145									24.64	24.00
CA_5A-66A-66A	5	10M	20525	836.5	1	0	2525	881.5	66	20M	66786	2145	66	20M	67036	2170					24.64	24.33
CA_5A-66B	5	10M	20525	836.5	1	0	2525	881.5	66	15M	66786	2145	66	5M	66882	2154.6					24.64	24.34
CA_5A-66C	5	10M	20525	836.5	1	0	2525	881.5	66	20M	66786	2145	66	20M	66984	2164.8					24.64	24.26
CA_7A-46A	7	20M	21100	2535	1	0	3100	2565	46	20M	50665	5537.5									23.81	23.95
CA_7A-46C	7	20M	21100	2535	1	0	3100	2565	46	20M	50665	5537.5	46	20M	50863	5557.3					23.81	23.76
CA_12A-66C	12	10M	23095	707.5	1	0	5095	737.5	66	20M	66786	2145	66	20M	66984	2164.8					24.44	24.22
CA_13A-46A	13	10M	23230	782	1	0	5230	751	46	20M	50665	5537.5									24.52	24.09
CA_13A-46C	13	10M	23230	782	1	0	5230	751	46	20M	50450	5516	46	20M	50648	5535.8					24.52	24.14
CA_13A-66A	13	10M	23230	782	1	0	5230	751	66	20M	66786	2145									24.52	24.16
CA_13A-66A-66A	13	10M	23230	782	1	0	5230	751	66	20M	66786	2145	66	20M	67036	2170					24.52	24.15
CA_13A-66B	13	10M	23230	782	1	0	5230	751	66	15M	66786	2145	66	5M	66882	2154.6					24.52	24.23
CA_13A-66C	13	10M	23230	782	1	0	5230	751	66	20M	66786	2145	66	20M	66984	2164.8					24.52	24.22
CA_66A-46A	66	20M	132322	1745	1	0	66786	2145	46	20M	50665	5537.5									23.95	23.24
CA_66A-46A-46A	66	20M	132322	1745	1	0	66786	2145	46	20M	50665	5537.5	46	20M	50866	5557.6					23.95	23.55
CA_66A-46A-46C	66	20M	132322	1745	1	0	66786	2145	46	20M	50090	5480	46	20M	50450	5516	46	20M	50648	5535.8	23.95	23.71
CA_66A-66A-46A	66	20M	132322	1745	1	0	66786	2145	66	20M	67036	2170	46	20M	50665	5537.5					23.95	23.82
CA_66A-46C	66	20M	132322	1745	1	0	66786	2145	46	20M	50665	5537.5	46	20M	50863	5557.3					23.95	23.79
CA_66A-66A-46C	66	20M	132322	1745	1	0	66786	2145	66	20M	67036	2170	46	20M	50665	5537.5	46	20M	50863	5557.3	23.95	23.85
CA_66A-46D	66	20M	132322	1745	1	0	66786	2145	46	20M	50090	5480	46	20M	50288	5499.8	46	20M	50486	5519.6	23.95	23.88

CA Combination	PCC								SCC1				SCC2				SCC3				Power	
	LTE Band	BW (MHz)	UL Ch	UL Freq. (MHz)	RB Size	RB Offset	DL Ch	DL Freq. (MHz)	LTE Band	BW (MHz)	DL Ch	DL Freq. (MHz)	LTE Band	BW (MHz)	DL Ch	DL Freq. (MHz)	LTE Band	BW (MHz)	DL Ch	DL Freq. (MHz)	Single Carrier Tx Power (dBm)	Tx Power with DL-CA Active (dBm)
CA_2A-4A-12A	2	20M	18900	1880	1	0	900	1960	4	20M	2175	2132.5	12	10M	5095	737.5					24.48	23.81
CA_2A-5A-46A	2	20M	18900	1880	1	0	900	1960	5	10M	2525	881.5	46	20M	50665	5537.5					24.48	23.98
CA_5A-7A-46A	5	10M	20525	836.5	1	0	2525	881.5	7	20M	3100	2565	46	20M	50665	5537.5					24.64	23.95
CA_5A-46A-66A	5	10M	20525	836.5	1	0	2525	881.5	46	20M	50665	5537.5	66	20M	132322	1745					24.64	23.79
CA_5A-46C-66A	5	10M	20525	836.5	1	0	2525	881.5	46	20M	50450	5516	46	20M	50648	5535.8	66	20M	66786	2145	24.64	23.87
CA_13A-46A-66A	13	10M	23230	782	1	0	5230	751	46	20M	50665	5537.5	66	20M	66786	2145					24.52	24.21
CA_2A-2A-46C	2	20M	18900	1880	1	0	900	1960	2	20M	1100	1980	46	20M	50450	5516	46	20M	50648	5535.8	24.48	23.94
CA_2A-5A-46C	2	20M	18900	1880	1	0	900	1960	5	10M	2525	881.5	46	20M	50450	5516	46	20M	50648	5535.8	24.48	23.25
CA_2A-13A-46C	2	20M	18900	1880	1	0	900	1960	13	10M	5230	751	46	20M	50450	5516	46	20M	50648	5535.8	24.48	23.95
CA_2A-46A-46A-66A	2	20M	18900	1880	1	0	900	1960	46	20M	50665	5537.5	46	20M	50865	5557.5	66	20M	66786	2145	24.48	23.88
CA_2A-46C-66A	2	20M	18900	1880	1	0	900	1960	46	20M	50450	5516	46	20M	50648	5535.8	66	20M	66786	2145	24.48	23.95
CA_2A-46D	2	20M	18900	1880	1	0	900	1960	46	20M	50090	5480	46	20M	50288	5499.8	46	20M	50486	5519.6	24.48	23.90
CA_7A-46D	7	20M	21100	2535	1	0	3100	2565	46	20M	50090	5480	46	20M	50288	5499.8	46	20M	50486	5519.6	23.81	23.70
CA_12A-46D	12	10M	23095	707.5	1	0	5095	737.5	46	20M	50090	5480	46	20M	50288	5499.8	46	20M	50486	5519.6	24.44	24.22
CA_13A-46C-66A	13	10M	23230	782	1	0	5230	751	46	20M	50450	5516	46	20M	50648	5535.8	66	20M	66786	2145	24.52	24.21
CA_13A-46D	13	10M	23230	782	1	0	5230	751	46	20M	50090	5480	46	20M	50288	5499.8	46	20M	50486	5519.6	24.52	24.33
CA_5A-7A-46C	5	10M	20525	836.5	1	0	2525	881.5	7	20M	3100	2565	46	20M	50450	5516	46	20M	50648	5535.8	24.64	24.32

CA Combination	PCC								SCC1				SCC2				SCC3				SCC4				Power	
	LTE Band	BW (MHz)	UL Ch	LTE Band	RB Size	RB Offset	DL Ch	DL Freq. (MHz)	LTE Band	BW (MHz)	DL Ch	DL Freq. (MHz)	LTE Band	BW (MHz)	DL Ch	DL Freq. (MHz)	LTE Band	BW (MHz)	DL Ch	DL Freq. (MHz)	LTE Band	BW (MHz)	DL Ch	DL Freq. (MHz)	Single Carrier Tx Power (dBm)	Tx Power with DL-CA Active (dBm)
CA_13A-46D-66A	13	10M	23230	782	1	0	5230	751	46	20M	50090	5480	46	20M	50288	5499.8	46	20M	50486	5519.6	66	20M	66786	2145	24.52	23.86
CA_2A-13A-46D	2	20M	18900	1880	1	0	900	1960	13	10M	5230	751	46	20M	50090	5480	46	20M	50288	5499.8	46	20M	50486	5519.6	24.48	23.71
CA_2A-2A-46D	2	20M	18900	1880	1	0	900	1960	2	20M	1100	1980	46	20M	50090	5480	46	20M	50288	5499.8	46	20M	50486	5519.6	24.48	23.83
CA_2A-46A-46C-66A	2	20M	18900	1880	1	0	900	1960	46	20M	50090	5480	46	20M	50450	5516	46	20M	50648	5535.8	66	20M	66786	2145	24.48	23.87
CA_2A-66A-46D	2	20M	18900	1880	1	0	900	1960	66	20M	66786	2145	46	20M	50090	5480	46	20M	50288	5499.8	46	20M	50486	5519.6	24.48	23.66
CA_2A-5A-46D	2	20M	18900	1880	1	0	900	1960	5	10M	2525	881.5	46	20M	50090	5480	46	20M	50288	5499.8	46	20M	50486	5519.6	24.48	23.77
CA_66A-66A-46D	66	20M	132322	1745	1	0	66786	2145	66	20M	67036	2170	46	20M	50090	5480	46	20M	50288	5499.8	46	20M	50486	5519.6	23.95	23.87
CA_5A-46D-66A	5	10M	20525	836.5	1	0	2525	881.5	46	20M	50090	5480	46	20M	50288	5499.8	46	20M	50486	5519.6	66	20M	66786	2145	24.64	23.84
CA_5A-7A-46D	5	10M	20525	836.5	1	0	2525	881.5	7	20M	3100	2565	46	20M	50090	5480	46	20M	50288	5499.8	46	20M	50486	5519.6	24.64	24.22

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.

<Power Confirmation for SAR Testing for LTE Uplink CA>

The conducted power for uplink CA active was measured on the highest reported SAR configuration for each exposure condition with both two carrier components was set to largest channel bandwidth.

PCC							SCC							Power	
Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Channel	UL Frequency (MHz)	Band	BW (MHz)	Modulation	RB Size	RB Offset	UL Channel	UL Frequency (MHz)	MPR Level (dB)	Tx Power with UL-CA Active (dBm)
7	20	QPSK	0	0	20850	2510	7	20	QPSK	1	99	21048	2529.8	0	22.69
			1	0						0	0			0	22.73
			100	0						0	0			0-1	22.14
			100	0						100	0			0-2	21.77
			1	0						1	99			0-8.5	15.15
			1	0						1	0			0-4.5	19.41
			1	99						1	0			0	23.79
			100	0						1	99			0-3.5	19.36
7	20	QPSK	0	0	21100	2535	7	20	QPSK	1	99	21298	2554.8	0	22.72
			1	0						0	0			0	22.38
			100	0						0	0			0-1	20.21
			100	0						100	0			0-2	20.11
			1	0						1	99			0-8.5	15.32
			1	0						1	0			0-4.5	19.30
			1	99						1	0			0	22.69
			100	0						1	99			0-3.5	19.44
7	20	QPSK	0	0	21152	2540.2	7	20	QPSK	1	99	21350	2560	0	22.67
			1	0						0	0			0	22.72
			100	0						0	0			0-1	19.86
			100	0						100	0			0-2	20.62
			1	0						1	99			0-8.5	15.34
			1	0						1	0			0-4.5	19.45
			1	99						1	0			0	22.72
			100	0						1	99			0-3.5	19.56
40	20	QPSK	0	0	38750	2310	40	20	QPSK	1	99	38948	2329.8	0	23.69
			1	0						0	0			0	23.73
			100	0						0	0			0-1	22.57
			100	0						100	0			0-2	21.41
			1	0						1	99			0-8.5	15.94
			1	0						1	0			0-4.5	18.01
			1	99						1	0			0	23.01
			100	0						1	99			0-3.5	19.60
40	20	QPSK	0	0	39150	2350	40	20	QPSK	1	99	39348	2369.8	0	23.71
			1	0						0	0			0	23.73
			100	0						0	0			0-1	22.90
			100	0						100	0			0-2	21.54
			1	0						1	99			0-8.5	15.74
			1	0						1	0			0-4.5	19.20
			1	99						1	0			0	23.74
			100	0						1	99			0-3.5	19.12
40	20	QPSK	0	0	39352	2370.2	40	20	QPSK	1	99	39550	2390	0	23.23
			1	0						0	0			0	23.54
			100	0						0	0			0-1	23.56
			100	0						100	0			0-2	22.01
			1	0						1	99			0-8.5	15.95
			1	0						1	0			0-4.5	19.53
			1	99						1	0			0	23.67
			100	0						1	99			0-3.5	19.62

SAR Measurements for Intra-Band Contiguous CA

The SAR testing was performed with the single carrier (uplink CA is inactive) for all test positions for each exposure condition. The LTE uplink CA active was verified with maximum output power on the highest SAR configuration of single carrier for each exposure condition. For intra-band contiguous CA, the SCC channel was set to closest available contiguous channel.

<May 2017 TCB Workshop, SAR Test Exclusion for LTE DL 4x4 MIMO>

Per FCC guidance, SAR testing for LTE DL 4x4 MIMO is not required when the uplink maximum output power with downlink MIMO active remains within the specified tune-up tolerance and not more than 0.25 dB higher than the maximum output power with downlink MIMO inactive. Per power confirmation results, the SAR test exclusion applies to LTE downlink MIMO operation.

Power Measurements for Intra-Band Contiguous Downlink CA

2CA 4x4 MIMO																		
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)	Tx Power with DL-CA Active (dBm)	Single Carrier Tx Power (dBm)
CA_7C (4*4)	7	20M	21100	2535	1	0	3100	2655	7	20M	3298	2674.8					23.74	23.81

Power Measurements for Intra-Band Non-Contiguous Downlink CA

2CA 4x4 MIMO																		
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)	Tx Power with DL-CA Active (dBm)	Single Carrier Tx Power (dBm)
CA_7A(4*4)-7A	7	20M	21100	2535	1	0	3100	2565	7	20M	3350	2680					23.77	23.81
CA_7A(4*4)-7A (4*4)	7	20M	21100	2535	1	0	3100	2565	7	20M	3350	2680					23.76	23.81

Power Measurements for for Inter-Band Downlink CA (Two Bands)

2CA 4x4 MIMO																		
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)	Tx Power with DL-CA Active (dBm)	Single Carrier Tx Power (dBm)
CA_7A(4*4)-46A	7	20M	21100	2535	1	0	3100	2565	46	20M	50665	5537.5					23.74	23.68
CA_7A(4*4)-46B	7	20M	21100	2535	1	0	3100	2565	46	10M	50665	5537.5	46	5M	50764	5547.4	23.74	23.64
CA_7A(4*4)-46C	7	20M	21100	2535	1	0	3100	2565	46	20M	50090	5480	46	20M	50288	5499.8	23.74	23.72

<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 <= 0.4 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 <= 0.8 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 <= 0.8 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 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 <= 1.2 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 W/kg, SAR is required for the subsequent highest measured output power channel until the reported SAR result is <= 1.2 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 <= 1.2 W/kg.

(4) For WLAN MIMO mode, the power-based standalone SAR test exclusion or the sum of SAR provision in KDB 447498 to determine simultaneous transmission SAR test exclusion should be applied. Otherwise, SAR for MIMO mode will be measured with all applicable antennas transmitting simultaneously at the specified maximum output power of MIMO operation.

4.7.2 SAR Results for Head Exposure Condition

Plot No.	Band	Mode	Test Position	Ch.	Sample	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	GPRS11	Right Cheek	189	2nd	Ant 1	30.5	29.08	1.39	-0.07	0.100	**0.14**
02	GSM1900	GPRS12	Right Tilted	661	2nd	Ant 1	27.5	25.68	1.52	0.01	0.179	**0.27**
03	WCDMA II	RMC12.2K	Right Tilted	9400	2nd	Ant 1	25.0	23.71	1.35	-0.13	0.429	**0.58**
04	WCDMA IV	RMC12.2K	Right Cheek	1413	2nd	Ant 1	25.0	24.11	1.23	0.01	0.250	**0.31**
05	WCDMA V	RMC12.2K	Right Cheek	4182	2nd	Ant 1	25.0	24.35	1.16	0.01	0.192	**0.22**

Plot No.	Band	Mode	RB#	RB Offset	Test Position	Ch.	Sample	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	1	0	Right Tilted	18900	2nd	Ant 1	25.0	24.48	1.13	0.12	0.427	**0.48**
07	LTE 5	QPSK10M	1	0	Right Tilted	20525	2nd	Ant 1	25.5	24.64	1.22	0.08	0.164	**0.20**
08	LTE 7	QPSK20M	1	0	Right Cheek	21100	2nd	Ant 3	25.0	23.81	1.32	-0.13	0.465	**0.61**
09	LTE 12	QPSK10M	1	0	Right Cheek	23095	2nd	Ant 1	25.5	24.44	1.28	0.15	0.145	**0.19**
10	LTE 13	QPSK10M	1	0	Right Cheek	23230	2nd	Ant 1	25.5	24.52	1.25	0.01	0.106	**0.13**
11	LTE 41	QPSK20M	1	0	Right Cheek	40620	2nd	Ant 3	25.0	23.77	1.33	-0.07	0.196	**0.26**
12	LTE 66	QPSK20M	1	0	Right Tilted	132322	2nd	Ant 1	25.0	23.95	1.27	-0.08	0.169	**0.22**

Plot No.	Band	Mode	Test Position	Ch.	Sample	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)
13	WLAN 2.4G	802.11b	Left Cheek	6	2nd	Ant 0	20.0	19.79	1.05	-0.16	0.310	**0.33**
14	WLAN 5G	802.11ac VHT80	Left Cheek	58	2nd	Ant 0	18.5	18.44	1.01	0.16	0.107	**0.11**
15	WLAN 5G	802.11ac VHT80	Left Cheek	122	2nd	Ant 0+1	21.5	21.41	1.02	0.18	0.156	**0.16**
16	WLAN 5G	802.11ac VHT80	Left Tilted	155	2nd	Ant 0	18.5	18.25	1.06	0.12	0.075	**0.08**

Plot No.	Band	Mode	Test Position	Ch.	Sample	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	Left Cheek	39	2nd	11.0	10.36	1.16	0.08	0.00351	**0.00**

Note: The SAR testing above was verified based on the worst case of original report.

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

Plot No.	Band	Mode	Test Position	Ch.	Sample	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)
18	GSM850	GPRS11	Rear Face	189	2nd	Ant 0	30.5	29.08	1.39	0	0.00471	**0.01**
19	GSM1900	GPRS12	Front Face	661	2nd	Ant 1	27.5	25.68	1.52	0.09	0.062	**0.09**
20	WCDMA II	RMC12.2K	Rear Face	9400	2nd	Ant 0	25.0	23.71	1.35	-0.01	0.106	**0.14**
21	WCDMA IV	RMC12.2K	Rear Face	1413	2nd	Ant 0	25.0	24.11	1.23	-0.05	0.156	**0.19**
22	WCDMA V	RMC12.2K	Rear Face	4182	2nd	Ant 0	25.0	24.35	1.16	-0.05	0.060	**0.07**

Plot No.	Band	Mode	RB#	RB Offset	Test Position	Ch.	Sample	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	1	0	Front Face	18900	2nd	Ant 1	25.0	24.48	1.13	-0.04	0.135	**0.15**
24	LTE 5	QPSK10M	1	0	Rear Face	20525	2nd	Ant 0	25.5	24.64	1.22	0.09	0.045	**0.05**
25	LTE 7	QPSK20M	1	0	Rear Face	21100	2nd	Ant 2	25.0	23.81	1.32	-0.03	0.315	**0.41**
26	LTE 12	QPSK10M	1	0	Rear Face	23095	2nd	Ant 0	25.5	24.44	1.28	0.11	0.042	**0.05**
27	LTE 13	QPSK10M	1	0	Rear Face	23230	2nd	Ant 0	25.5	24.52	1.25	-0.07	0.049	**0.06**
28	LTE 41	QPSK20M	1	0	Rear Face	40620	2nd	Ant 2	25.0	23.77	1.33	-0.08	0.198	**0.26**
29	LTE 66	QPSK20M	1	0	Rear Face	132322	2nd	Ant 0	25.0	23.95	1.27	-0.07	0.128	**0.16**

Plot No.	Band	Mode	Test Position	Ch.	Sample	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)
30	WLAN 2.4G	802.11n HT40	Rear Face	6	2nd	Ant 0+1	21.5	19.66	1.53	-0.10	0.022	**0.03**
31	WLAN 5G	802.11ac VHT80	Rear Face	58	2nd	Ant 1	18.5	18.41	1.02	0.12	0.090	**0.09**
32	WLAN 5G	802.11ac VHT80	Rear Face	122	2nd	Ant 0+1	21.5	21.41	1.02	-0.15	0.238	**0.24**
33	WLAN 5G	802.11ac VHT80	Rear Face	155	2nd	Ant 0+1	21.5	21.45	1.01	-0.01	0.235	**0.24**

Plot No.	Band	Mode	Test Position	Ch.	Sample	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	Rear Face	39	2nd	11.0	10.36	1.16	0	0.001	0.00

Note: The SAR testing above was verified based on the worst case of original report.

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

Plot No.	Band	Mode	Test Position	Ch.	Sample	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)
18	GSM850	GPRS11	Rear Face	189	2nd	Ant 0	30.5	29.08	1.39	0	0.00471	**0.01**
34	GSM1900	GPRS12	Bottom Side	661	2nd	Ant 0	27.5	25.68	1.52	0	0.101	**0.15**
35	WCDMA II	RMC12.2K	Bottom Side	9400	2nd	Ant 0	25.0	23.71	1.35	-0.15	0.286	**0.38**
36	WCDMA IV	RMC12.2K	Bottom Side	1413	2nd	Ant 0	25.0	24.11	1.23	-0.18	0.296	**0.36**
22	WCDMA V	RMC12.2K	Rear Face	4182	2nd	Ant 0	25.0	24.35	1.16	-0.05	0.060	**0.07**

Plot No.	Band	Mode	RB#	RB Offset	Test Position	Ch.	Sample	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)
37	LTE 2	QPSK20M	1	0	Bottom Side	18900	2nd	Ant 0	25.0	24.48	1.13	-0.02	0.236	**0.27**
24	LTE 5	QPSK10M	1	0	Rear Face	20525	2nd	Ant 0	25.5	24.64	1.22	0.09	0.045	**0.05**
38	LTE 7	QPSK20M	1	0	Right Side	21100	2nd	Ant 2	25.0	23.81	1.32	0.05	0.325	**0.43**
26	LTE 12	QPSK10M	1	0	Rear Face	23095	2nd	Ant 0	25.5	24.44	1.28	0.11	0.042	**0.05**
27	LTE 13	QPSK10M	1	0	Rear Face	23230	2nd	Ant 0	25.5	24.52	1.25	-0.07	0.049	**0.06**
28	LTE 41	QPSK20M	1	0	Rear Face	40620	2nd	Ant 2	25.0	23.77	1.33	-0.08	0.198	**0.26**
39	LTE 66	QPSK20M	1	0	Bottom Side	132322	2nd	Ant 0	25.0	23.95	1.27	-0.09	0.297	**0.38**

Plot No.	Band	Mode	Test Position	Ch.	Sample	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)
30	2.4G WLAN	802.11n HT40	Rear Face	6	2nd	Ant 0+1	21.5	19.66	1.53	-0.10	0.022	**0.03**
40	WLAN 5G	802.11ac VHT40	Rear Face	46	2nd	Ant 0+1	21.5	21.25	1.06	0.15	0.101	**0.11**
33	WLAN 5G	802.11ac VHT80	Rear Face	155	2nd	Ant 0+1	21.5	21.45	1.01	-0.01	0.235	**0.24**

Plot No.	Band	Mode	Test Position	Ch.	Sample	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	Rear Face	39	2nd	11.0	10.36	1.16	0	0.001	0.00

Note: The SAR testing above was verified based on the worst case of original report.

4.7.5 SAR Results for Product Specific (Phablet) Exposure Condition (Test Separation Distance is 0 mm)

Plot No.	Band	Mode	Test Position	Ch.	Sample	Tx Antenna	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-10g (W/kg)	Scaled SAR-10g (W/kg)
41	WLAN 5G	802.11ac VHT80	Rear Face	58	2nd	Ant 1	18.5	18.41	1.02	0.18	0.294	**0.30**
42	WLAN 5G	802.11ac VHT80	Rear Face	122	2nd	Ant 0+1	21.5	21.41	1.02	-0.08	0.604	**0.62**

Note: The SAR testing above was verified based on the worst case of original report.

4.7.6 Simultaneous Multi-band Transmission Evaluation

Since all the verified results are not worse than the results in original report, the simultaneous transmission evaluation has no effect and simultaneous SAR is not required.

Test Engineer：James Chu, and Willy Chang

5. Calibration of Test Equipment

Equipment	Manufacturer	Model	SN	Cal. Date	Cal. Interval
System Validation Dipole	SPEAG	D750V3	1013	Aug. 21, 2017	1 Year
System Validation Dipole	SPEAG	D835V2	4d121	Aug. 21, 2017	1 Year
System Validation Dipole	SPEAG	D1750V2	1055	Aug. 21, 2017	1 Year
System Validation Dipole	SPEAG	D1900V2	5d036	Jan. 18, 2018	1 Year
System Validation Dipole	SPEAG	D2450V2	737	Aug. 17, 2017	1 Year
System Validation Dipole	SPEAG	D2600V2	1020	Aug. 17, 2017	1 Year
System Validation Dipole	SPEAG	D5GHzV2	1019	Aug. 23, 2017	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	3650	Jul. 24, 2017	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	3971	Mar. 24, 2017	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	3578	May. 05, 2017	1 Year
Data Acquisition Electronics	SPEAG	DAE4	861	May. 22, 2017	1 Year
Data Acquisition Electronics	SPEAG	DAE4	1431	Mar. 20, 2017	1 Year
Data Acquisition Electronics	SPEAG	DAE4	360	Nov. 02, 2017	1 Year
Wireless Communication Test Set	Agilent	E5515C	MY50266628	Dec. 06, 2017	1 Year
Radio Communication Analyzer	Anritsu	MT8820C	6201010285	Aug. 08, 2017	1 Year
Spectrum Analyzer	R&S	FSL6	102006	Mar. 27, 2017	1 Year
ENA Series Network Analyzer	Agilent	E5071C	MY46214281	Jun. 09, 2017	1 Year
Vector Signal Generator	Anritsu	MG3710A	6201599977	Mar. 27, 2017	1 Year
Power Meter	Anritsu	ML2495A	1218009	Jul. 12, 2017	1 Year
Power Sensor	Anritsu	MA2411B	1207252	Jul. 12, 2017	1 Year
Thermometer	YFE	YF-160A	130504591	Mar. 24, 2017	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	√3	√0.5	√0.5	1.9	1.9	∞
Hemispherical Isotropy	9.6	Rectangular	√3	√0.5	√0.5	3.9	3.9	∞
Boundary Effect	1.0	Rectangular	√3	1	1	0.6	0.6	∞
Linearity	4.7	Rectangular	√3	1	1	2.7	2.7	∞
Detection Limits	0.25	Rectangular	√3	1	1	0.14	0.14	∞
Probe Modulation Response	3.5	Rectangular	√3	1	1	2.0	2.0	∞
Readout Electronics	0.3	Normal	1	1	1	0.3	0.3	∞
Response Time	0.0	Rectangular	√3	1	1	0.0	0.0	∞
Integration Time	1.7	Rectangular	√3	1	1	1.0	1.0	∞
RF Ambient Conditions – Noise	3.0	Rectangular	√3	1	1	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	√3	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	0.4	Rectangular	√3	1	1	0.2	0.2	∞
Probe Positioning with Respect to Phantom	2.9	Rectangular	√3	1	1	1.7	1.7	∞
Post-processing	2.0	Rectangular	√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	√3	1	1	2.9	2.9	∞
Power Scaling	0.0	Rectangular	√3	1	1	0.0	0.0	∞
Phantom and Setup								
Phantom Uncertainty (Shape and Thickness Tolerances)	6.1	Rectangular	√3	1	1	3.5	3.5	∞
Liquid Conductivity (Temperature Uncertainty)	3.24	Rectangular	√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	√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						± 11.4 %	± 11.2 %	
Expanded Uncertainty (K=2)						**± 22.8 %**	**± 22.4 %**	

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

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	√3	0.7	0.7	1.9	1.9	∞
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	0.7	3.9	3.9	∞
Boundary Effect	2.0	Rectangular	√3	1	1	1.2	1.2	∞
Linearity	4.7	Rectangular	√3	1	1	2.7	2.7	∞
Detection Limits	0.25	Rectangular	√3	1	1	0.14	0.14	∞
Probe Modulation Response	3.5	Rectangular	√3	1	1	2.0	2.0	∞
Readout Electronics	0.3	Normal	1	1	1	0.3	0.3	∞
Response Time	0.0	Rectangular	√3	1	1	0.0	0.0	∞
Integration Time	1.7	Rectangular	√3	1	1	1.0	1.0	∞
RF Ambient Conditions – Noise	3.0	Rectangular	√3	1	1	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	√3	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	0.4	Rectangular	√3	1	1	0.2	0.2	∞
Probe Positioning with Respect to Phantom	6.7	Rectangular	√3	1	1	3.9	3.9	∞
Post-processing	4.0	Rectangular	√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	√3	1	1	2.9	2.9	∞
Power Scaling	0.0	Rectangular	√3	1	1	0.0	0.0	∞
Phantom and Setup								
Phantom Uncertainty (Shape and Thickness Tolerances)	6.6	Rectangular	√3	1	1	3.8	3.8	∞
Liquid Conductivity (Temperature Uncertainty)	3.24	Rectangular	√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	√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

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	√3	√0.5	√0.5	1.9	1.9	∞
Hemispherical Isotropy	9.6	Rectangular	√3	√0.5	√0.5	3.9	3.9	∞
Boundary Effect	1.0	Rectangular	√3	1	1	0.6	0.6	∞
Linearity	4.7	Rectangular	√3	1	1	2.7	2.7	∞
Detection Limits	0.25	Rectangular	√3	1	1	0.14	0.14	∞
Probe Modulation Response	3.5	Rectangular	√3	1	1	2.0	2.0	∞
Readout Electronics	0.3	Normal	1	1	1	0.3	0.3	∞
Response Time	0.0	Rectangular	√3	1	1	0.0	0.0	∞
Integration Time	1.7	Rectangular	√3	1	1	1.0	1.0	∞
RF Ambient Conditions – Noise	3.0	Rectangular	√3	1	1	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	√3	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	0.4	Rectangular	√3	1	1	0.2	0.2	∞
Probe Positioning with Respect to Phantom	2.9	Rectangular	√3	1	1	1.7	1.7	∞
Post-processing	2.0	Rectangular	√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	√3	1	1	2.9	2.9	∞
Power Scaling	0.0	Rectangular	√3	1	1	0.0	0.0	∞
Phantom and Setup								
Phantom Uncertainty (Shape and Thickness Tolerances)	7.2	Rectangular	√3	1	1	4.2	4.2	∞
Liquid Conductivity (Temperature Uncertainty)	3.24	Rectangular	√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	√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

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	√3	0.7	0.7	1.9	1.9	∞
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	0.7	3.9	3.9	∞
Boundary Effect	2.0	Rectangular	√3	1	1	1.2	1.2	∞
Linearity	4.7	Rectangular	√3	1	1	2.7	2.7	∞
Detection Limits	0.25	Rectangular	√3	1	1	0.14	0.14	∞
Probe Modulation Response	3.5	Rectangular	√3	1	1	2.0	2.0	∞
Readout Electronics	0.3	Normal	1	1	1	0.3	0.3	∞
Response Time	0.0	Rectangular	√3	1	1	0.0	0.0	∞
Integration Time	1.7	Rectangular	√3	1	1	1.0	1.0	∞
RF Ambient Conditions – Noise	3.0	Rectangular	√3	1	1	1.7	1.7	∞
RF Ambient Conditions – Reflections	3.0	Rectangular	√3	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	0.4	Rectangular	√3	1	1	0.2	0.2	∞
Probe Positioning with Respect to Phantom	6.7	Rectangular	√3	1	1	3.9	3.9	∞
Post-processing	4.0	Rectangular	√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	√3	1	1	2.9	2.9	∞
Power Scaling	0.0	Rectangular	√3	1	1	0.0	0.0	∞
Phantom and Setup								
Phantom Uncertainty (Shape and Thickness Tolerances)	7.6	Rectangular	√3	1	1	4.4	4.4	∞
Liquid Conductivity (Temperature Uncertainty)	3.24	Rectangular	√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	√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:

Taiwan HwaYa EMC/RF/Safety/Telecom Lab:
Add: No. 19, Hwa Ya 2nd Rd, Wen Hwa Vil., Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.
Tel: 886-3-318-3232
Fax: 886-3-327-0892

Taiwan LinKo EMC/RF Lab:
Add: No. 47-2, 14th Ling, Chia Pau Vil., Linkou Dist., New Taipei City 244, Taiwan, R.O.C.
Tel: 886-2-2605-2180
Fax: 886-2-2605-1924

Taiwan HsinChu EMC/RF Lab:
Add: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 30078, Taiwan, R.O.C.
Tel: 886-3-593-5343
Fax: 886-3-593-5342

Email: service.adt@tw.bureauveritas.com
Web Site: www.adt.com.tw

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

---END---

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_180224

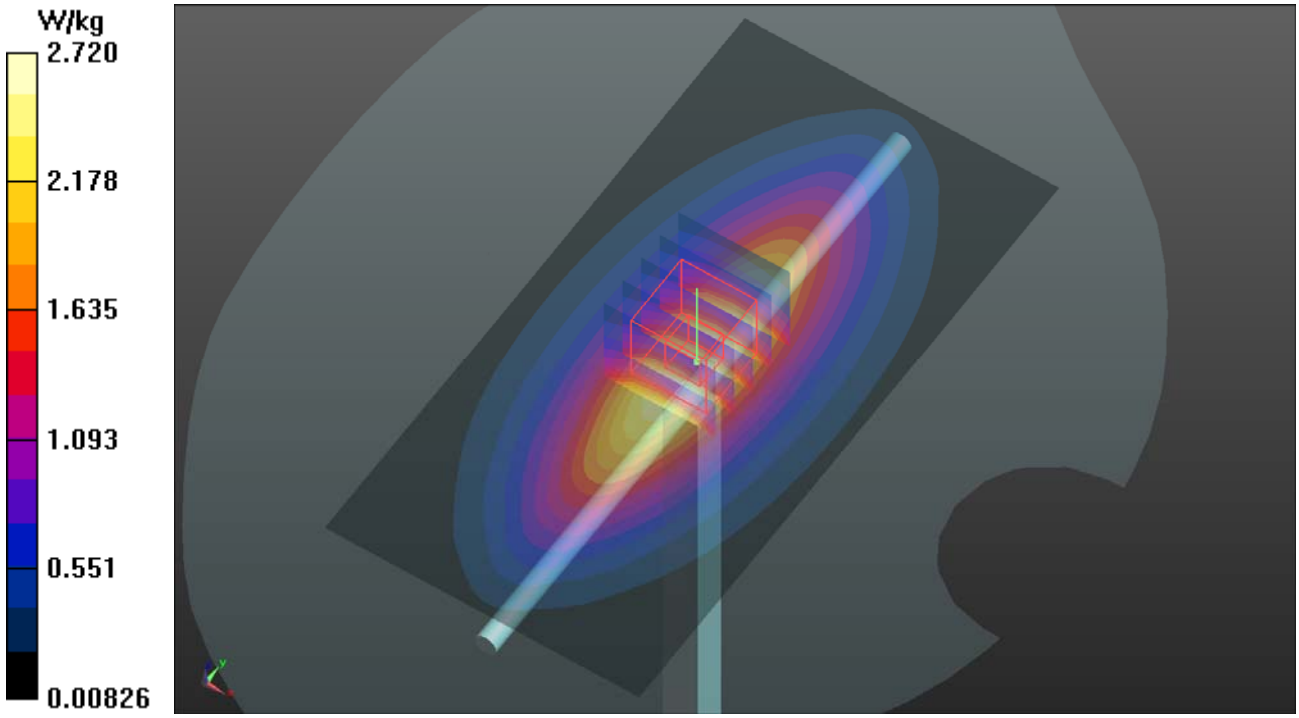
DUT: Dipole 750 MHz; Type: D750V3; SN: 1013

Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: H06T09N1_0224 Medium parameters used: f = 750 MHz; σ = 0.893 S/m; ε_r = 43.394; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃ ； Liquid Temperature：23.1 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(10.31, 10.31, 10.31); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=250mW/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.72 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 57.56 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 3.05 W/kg
SAR(1 g) = 2.02 W/kg; SAR(10 g) = 1.33 W/kg
Maximum value of SAR (measured) = 2.71 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2018/02/26

System Check_H835_180226

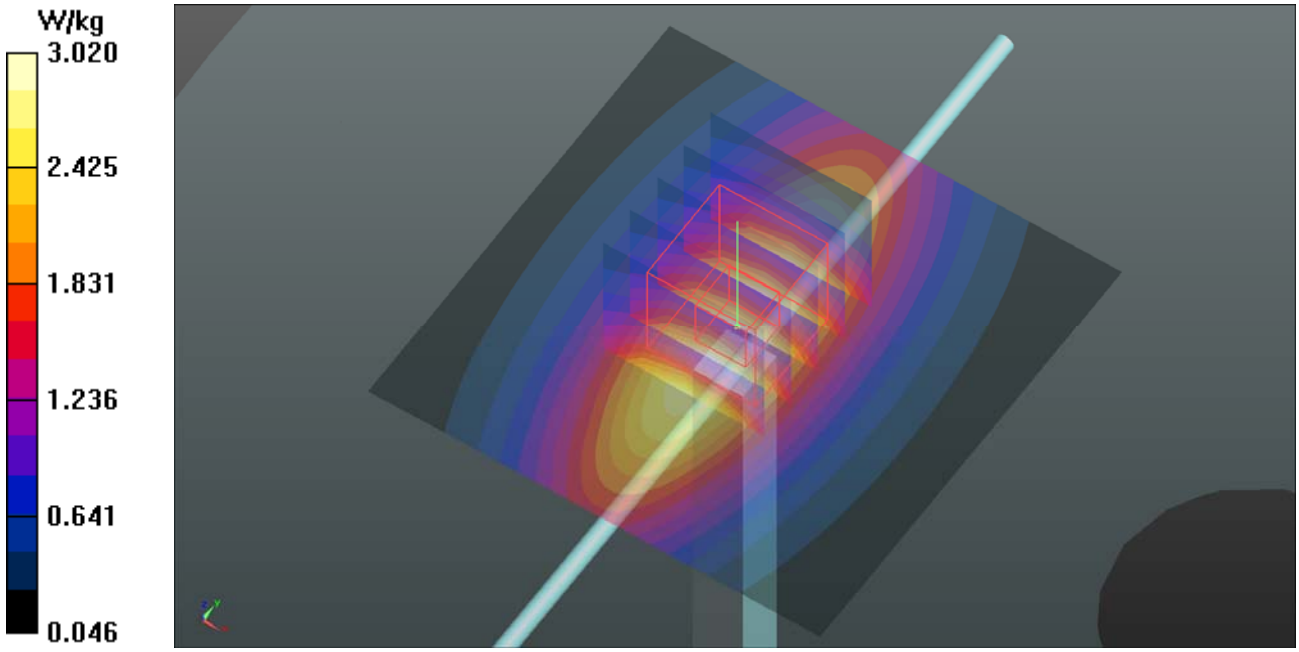
DUT: Dipole 835 MHz; Type: D835V2; SN: 4d121

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: H07T10N1_0226 Medium parameters used: f = 835 MHz; σ = 0.919 S/m; ε_r = 41.728; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3971; ConvF(10.67, 10.67, 10.67); Calibrated: 2017/03/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2017/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.02 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 58.58 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.48 W/kg
SAR(1 g) = 2.4 W/kg; SAR(10 g) = 1.61 W/kg
Maximum value of SAR (measured) = 3.01 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2018/02/24

System Check_H1750_180224

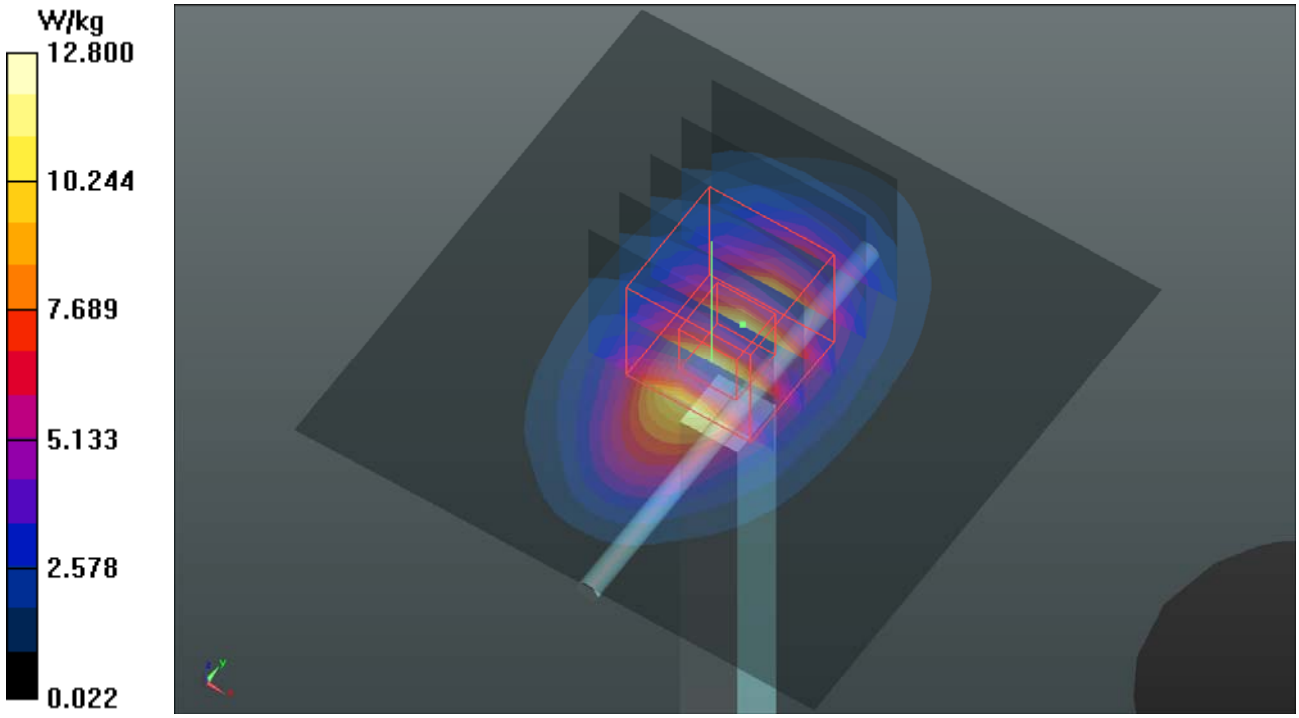
DUT: Dipole 1750 MHz; Type: D1750V2; SN: 1055

Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: H16T20N1_0224 Medium parameters used: f = 1750 MHz; σ = 1.322 S/m; ε_r = 38.975; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(8.56, 8.56, 8.56); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 12.8 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 97.23 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 15.5 W/kg
SAR(1 g) = 8.74 W/kg; SAR(10 g) = 4.75 W/kg
Maximum value of SAR (measured) = 12.2 W/kg



System Check_H1900_180224

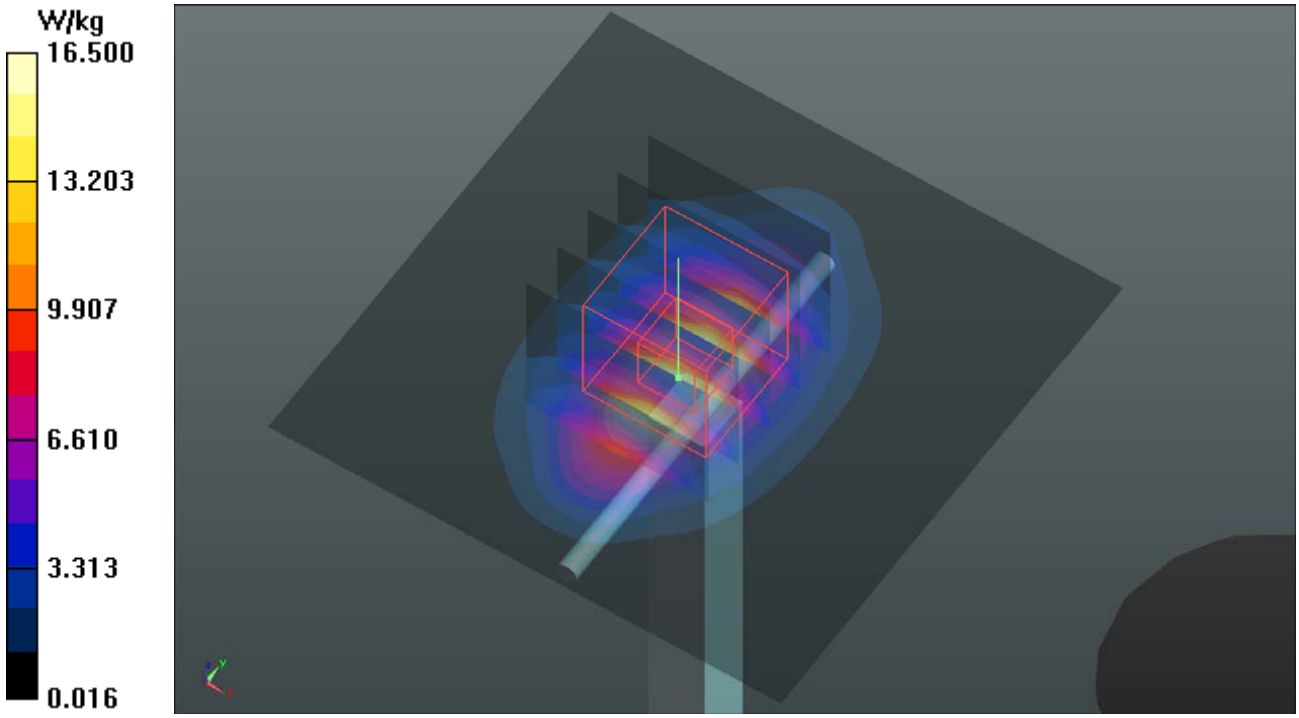
DUT: Dipole 1900 MHz; Type: D1900V2; SN: 5d036

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: H16T20N1_0224 Medium parameters used: f = 1900 MHz; σ = 1.448 S/m; ε_r = 38.478; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(8.28, 8.28, 8.28); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 16.5 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 103.4 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 19.3 W/kg
SAR(1 g) = 10.5 W/kg; SAR(10 g) = 5.46 W/kg
Maximum value of SAR (measured) = 16.2 W/kg



System Check_H2450_180226

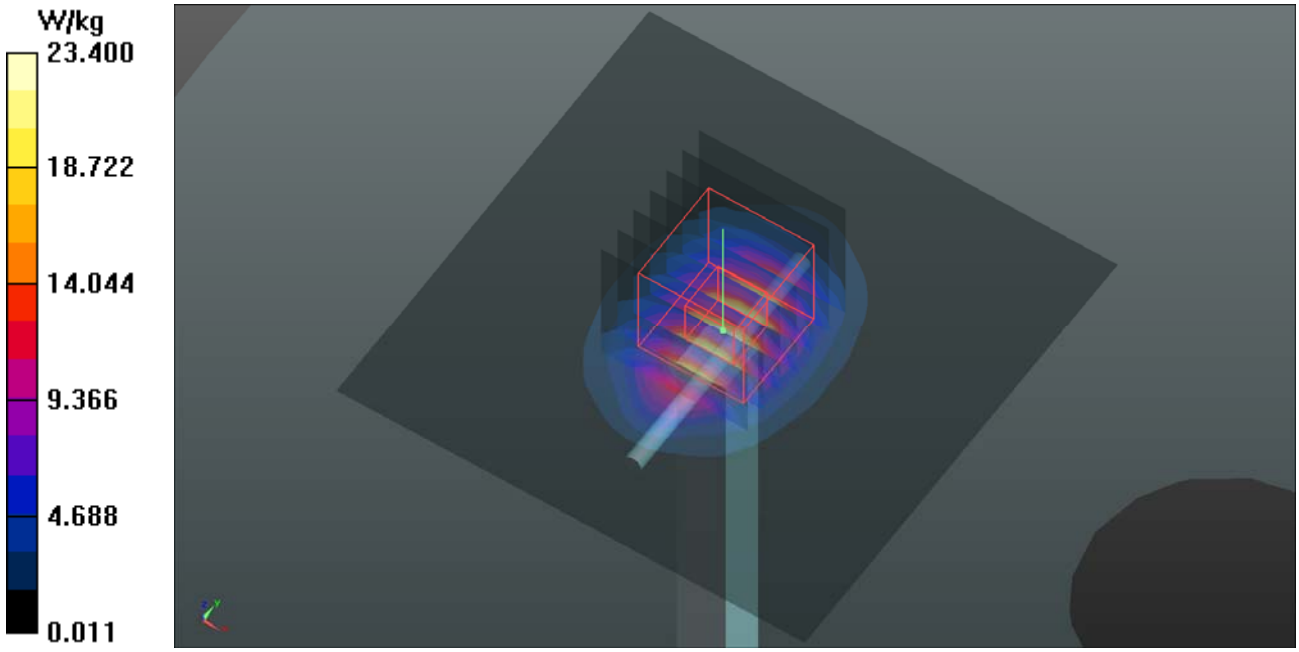
DUT: Dipole 2450 MHz; Type: D2450V2; SN: 737

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: H19T27N3_0226 Medium parameters used: f = 2450 MHz; σ = 1.88 S/m; ε_r = 38.637; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3971; ConvF(7.77, 7.77, 7.77); Calibrated: 2017/03/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2017/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 23.4 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 106.7 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 29.6 W/kg
SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.14 W/kg
Maximum value of SAR (measured) = 23.4 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2015/02/24

System Check_H2600_180224

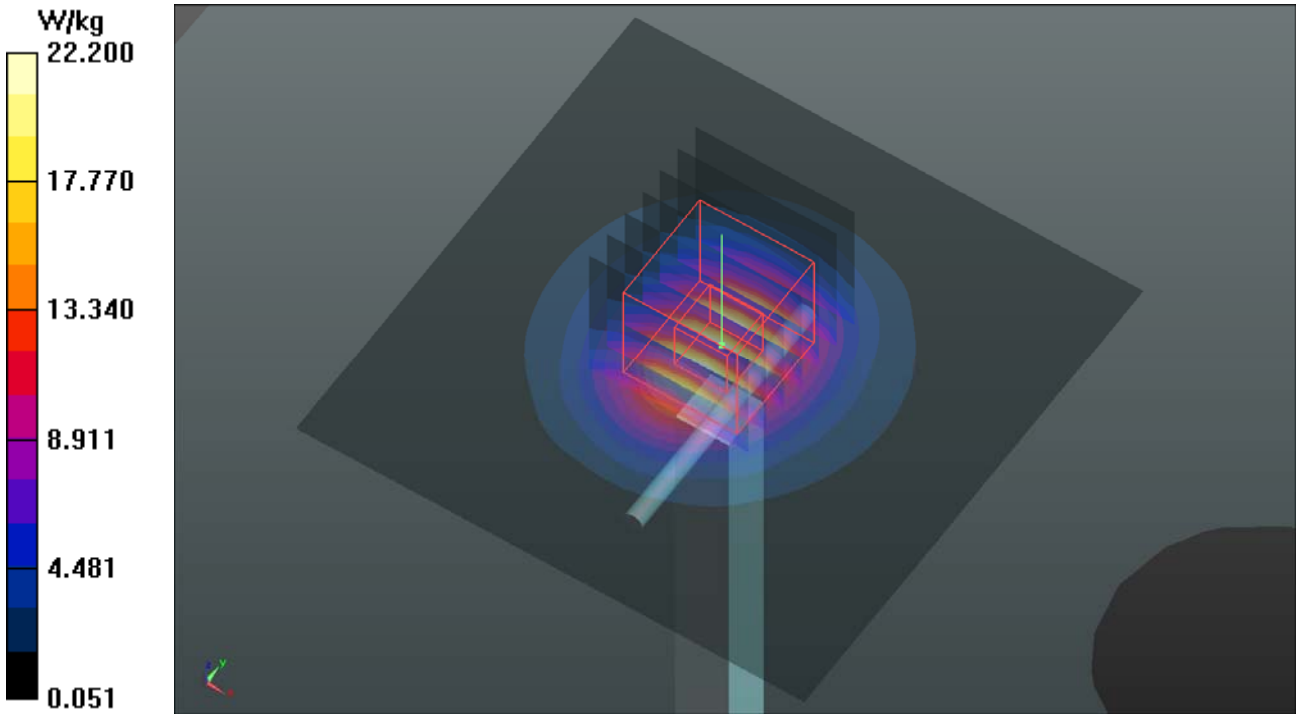
DUT: Dipole 2600 MHz; Type: D2600V2; SN: 1020

Communication System: CW; Frequency: 2600 MHz;Duty Cycle: 1:1
Medium: H19T27N1_0224 Medium parameters used: f = 2600 MHz; σ = 2.034 S/m; ε_r = 37.947; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(7.55, 7.55, 7.55); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 22.2 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 105.4 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 30.7 W/kg
SAR(1 g) = 14.9 W/kg; SAR(10 g) = 6.47 W/kg
Maximum value of SAR (measured) = 22.6 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2018/02/26

System Check_H5250_180226

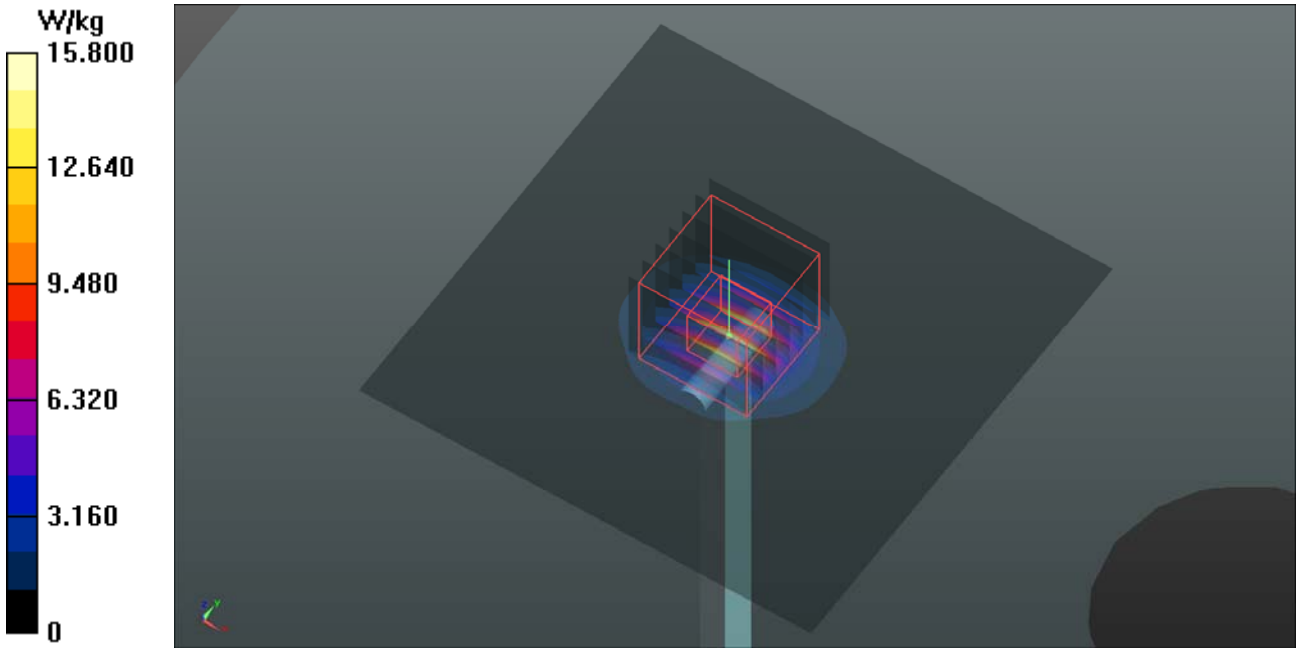
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5250 MHz;Duty Cycle: 1:1
Medium: H34T60N3_0226 Medium parameters used: f = 5250 MHz; σ = 4.905 S/m; ε_r = 36.808; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3971; ConvF(5.34, 5.34, 5.34); Calibrated: 2017/03/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2017/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 15.8 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 61.94 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 36.1 W/kg
SAR(1 g) = 8.36 W/kg; SAR(10 g) = 2.38 W/kg
Maximum value of SAR (measured) = 17.3 W/kg



System Check_H5600_180226

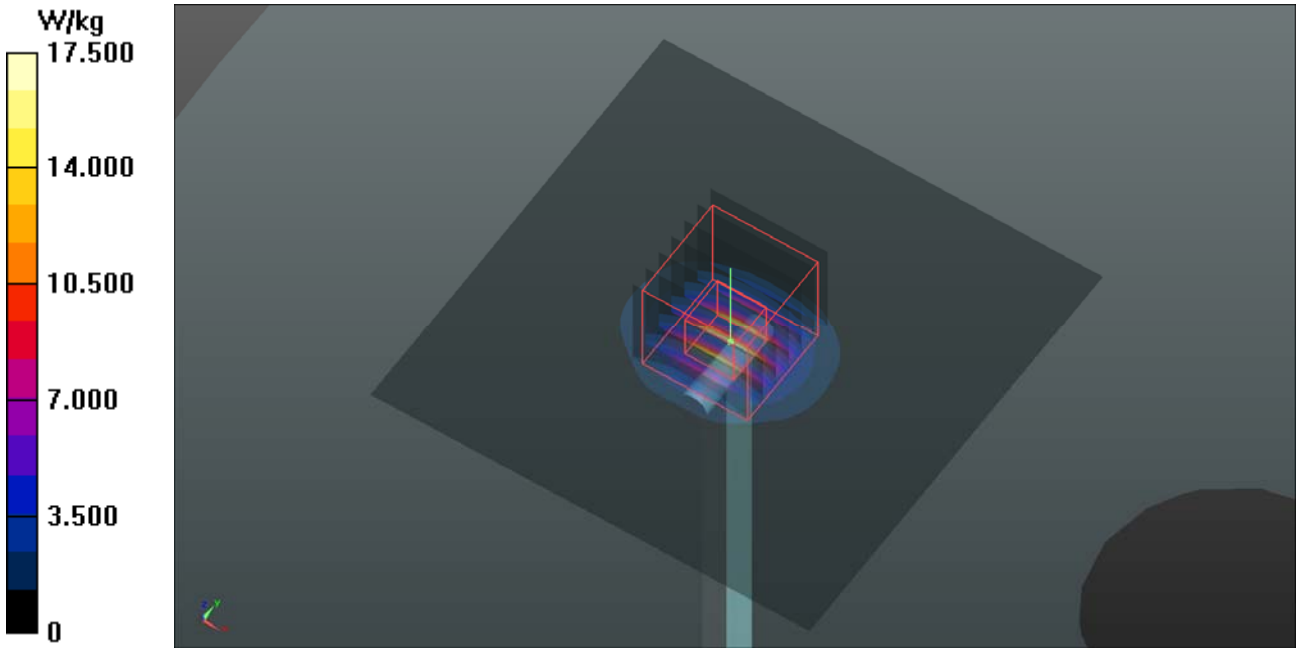
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5600 MHz;Duty Cycle: 1:1
Medium: H34T60N3_0226 Medium parameters used: f = 5600 MHz; σ = 5.237 S/m; ε_r = 36.225; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3971; ConvF(4.96, 4.96, 4.96); Calibrated: 2017/03/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2017/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 17.5 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 63.65 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 40.2 W/kg
SAR(1 g) = 9.03 W/kg; SAR(10 g) = 2.54 W/kg
Maximum value of SAR (measured) = 18.8 W/kg



System Check_H5800_180226

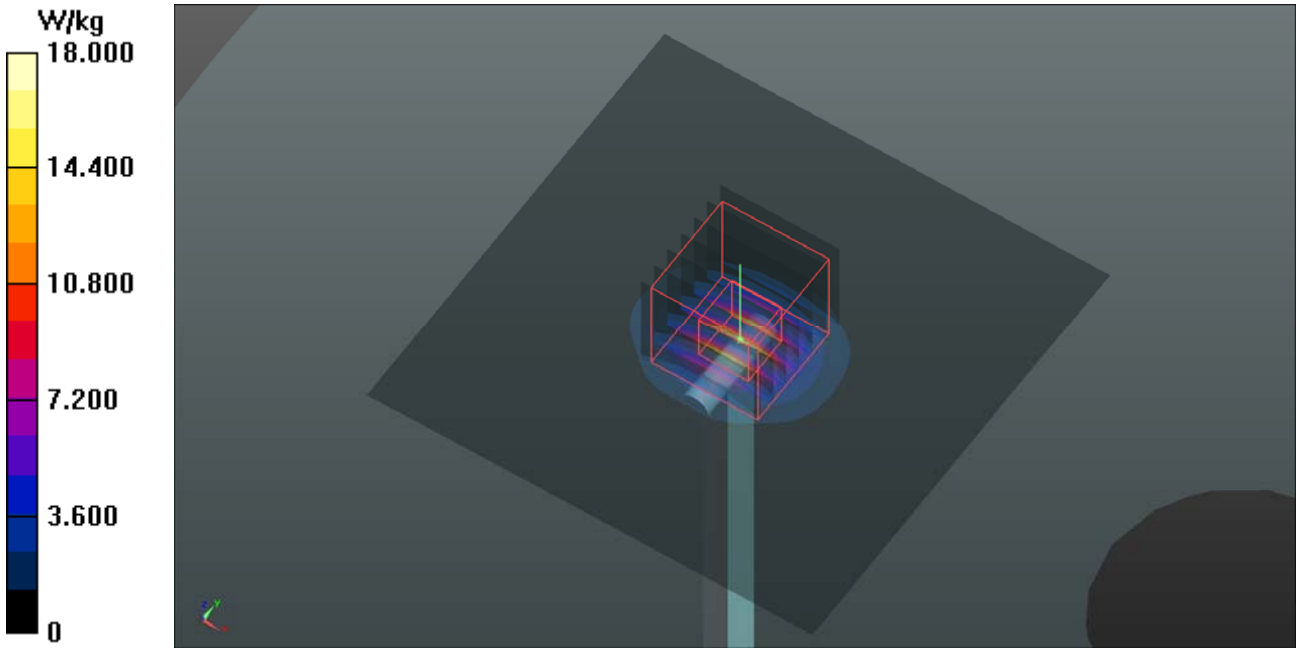
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: H34T60N3_0226 Medium parameters used: f = 5800 MHz; σ = 5.495 S/m; ε_r = 35.86; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3971; ConvF(4.98, 4.98, 4.98); Calibrated: 2017/03/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2017/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 16.8 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 61.05 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 39.5 W/kg
SAR(1 g) = 8.51 W/kg; SAR(10 g) = 2.38 W/kg
Maximum value of SAR (measured) = 18.0 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2018/02/28

System Check_B750_180228

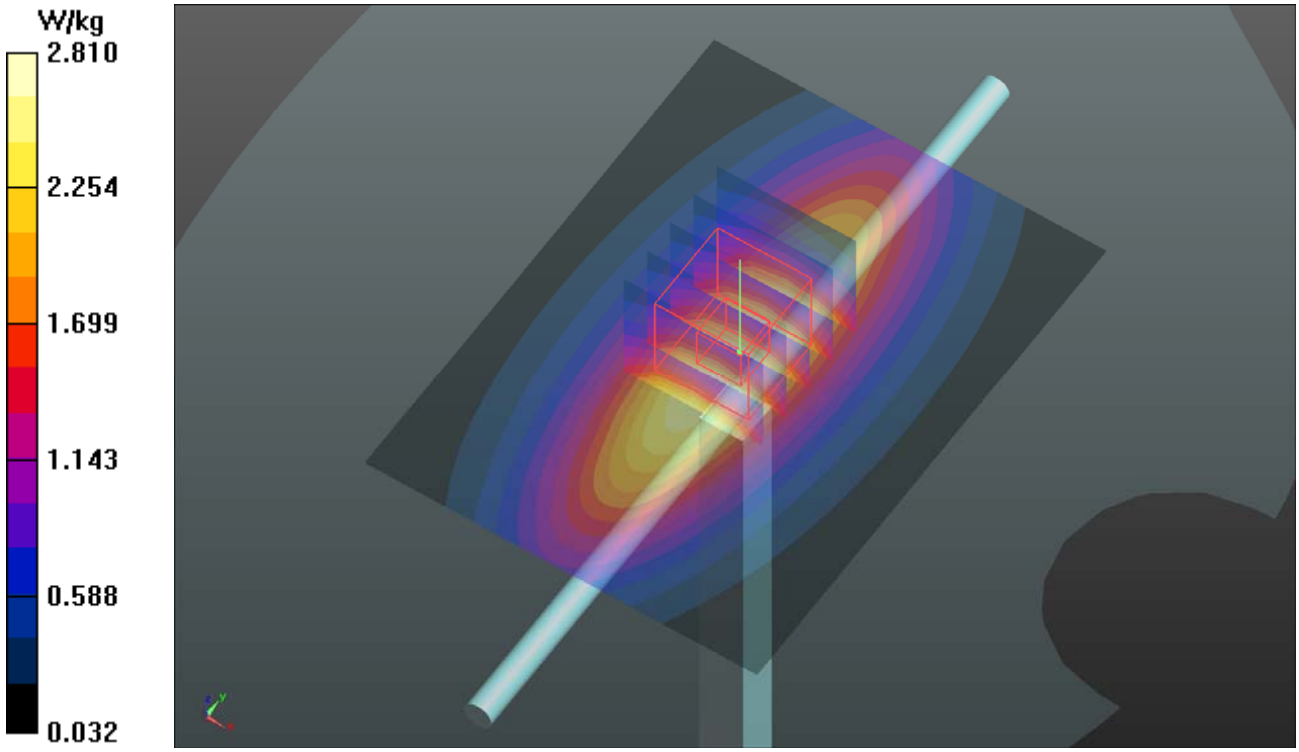
DUT: Dipole 750 MHz; Type: D750V3; SN: 1013

Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: B06T09N1_0228 Medium parameters used: f = 750 MHz; σ = 0.968 S/m; ε_r = 53.81; ρ = 1000 kg/m^3
Ambient Temperature：23.9 ℃ ； Liquid Temperature：23.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(9.89, 9.89, 9.89); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=250mW/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.81 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 56.39 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.12 W/kg
SAR(1 g) = 2.11 W/kg; SAR(10 g) = 1.4 W/kg
Maximum value of SAR (measured) = 2.79 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2018/02/27

System Check_B835_180227

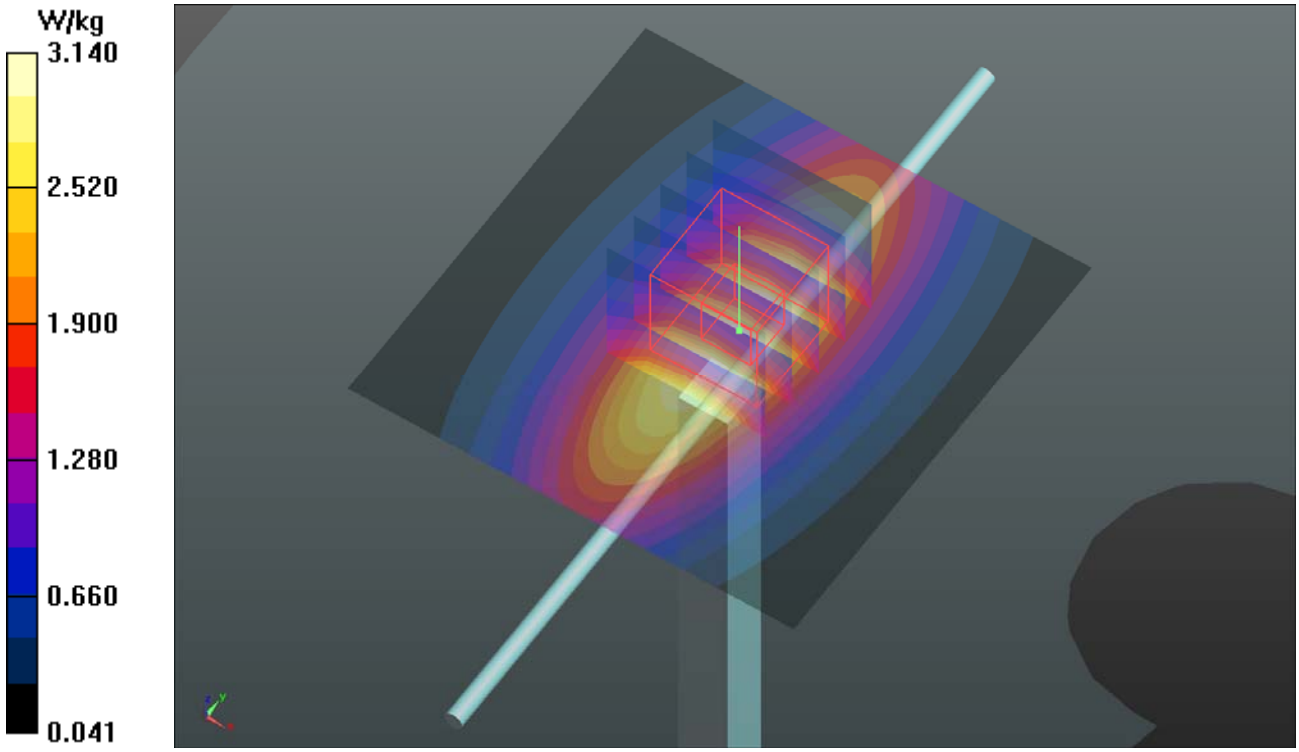
DUT: Dipole 835 MHz; Type: D835V2; SN: 4d121

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: B07T10N1_0227 Medium parameters used: f = 835 MHz; σ = 1.005 S/m; ε_r = 57.812; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(9.76, 9.76, 9.76); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.14 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 51.95 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 3.56 W/kg
SAR(1 g) = 2.36 W/kg; SAR(10 g) = 1.55 W/kg
Maximum value of SAR (measured) = 3.16 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2018/02/27

System Check_B1750_180227

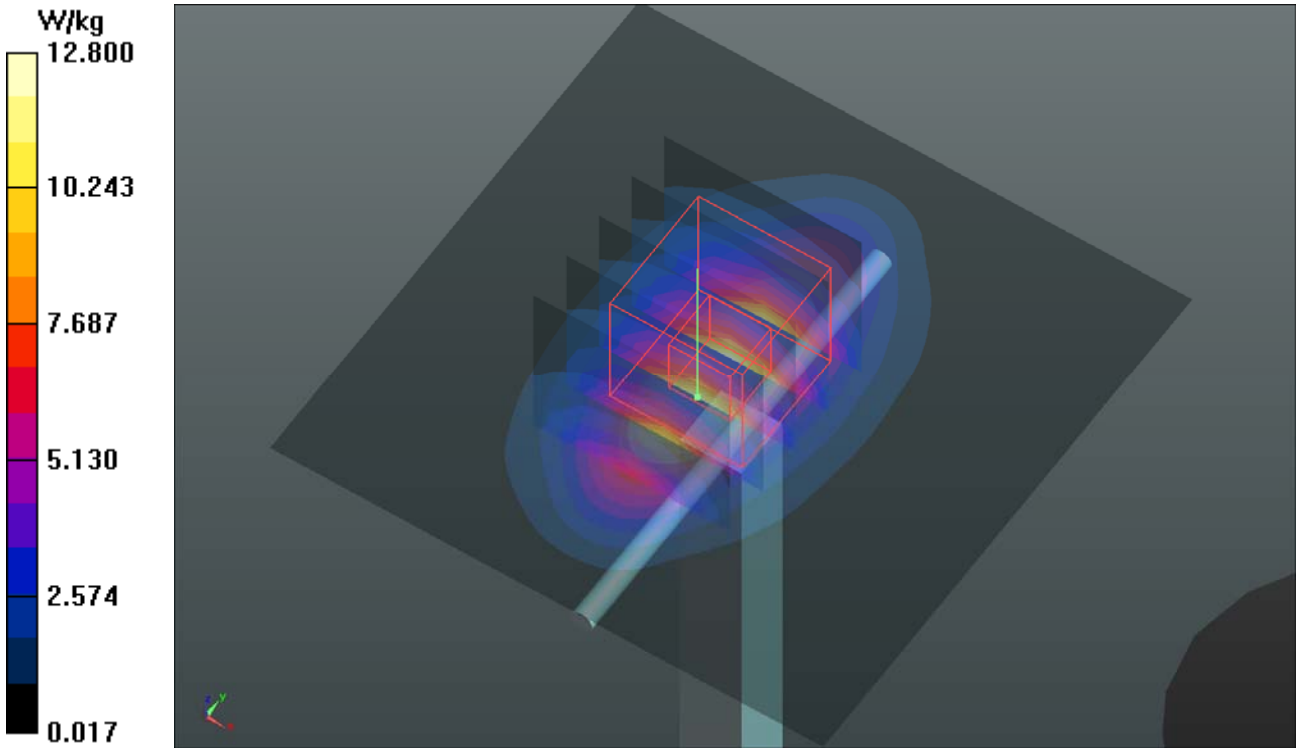
DUT: Dipole 1750 MHz; Type: D1750V2; SN: 1055

Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: B16T20N1_0227 Medium parameters used: f = 1750 MHz; σ = 1.429 S/m; ε_r = 51.822; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(8.27, 8.27, 8.27); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 12.8 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 94.59 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 15.4 W/kg
SAR(1 g) = 8.89 W/kg; SAR(10 g) = 4.81 W/kg
Maximum value of SAR (measured) = 12.3 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2018/02/27

System Check_B1900_180227

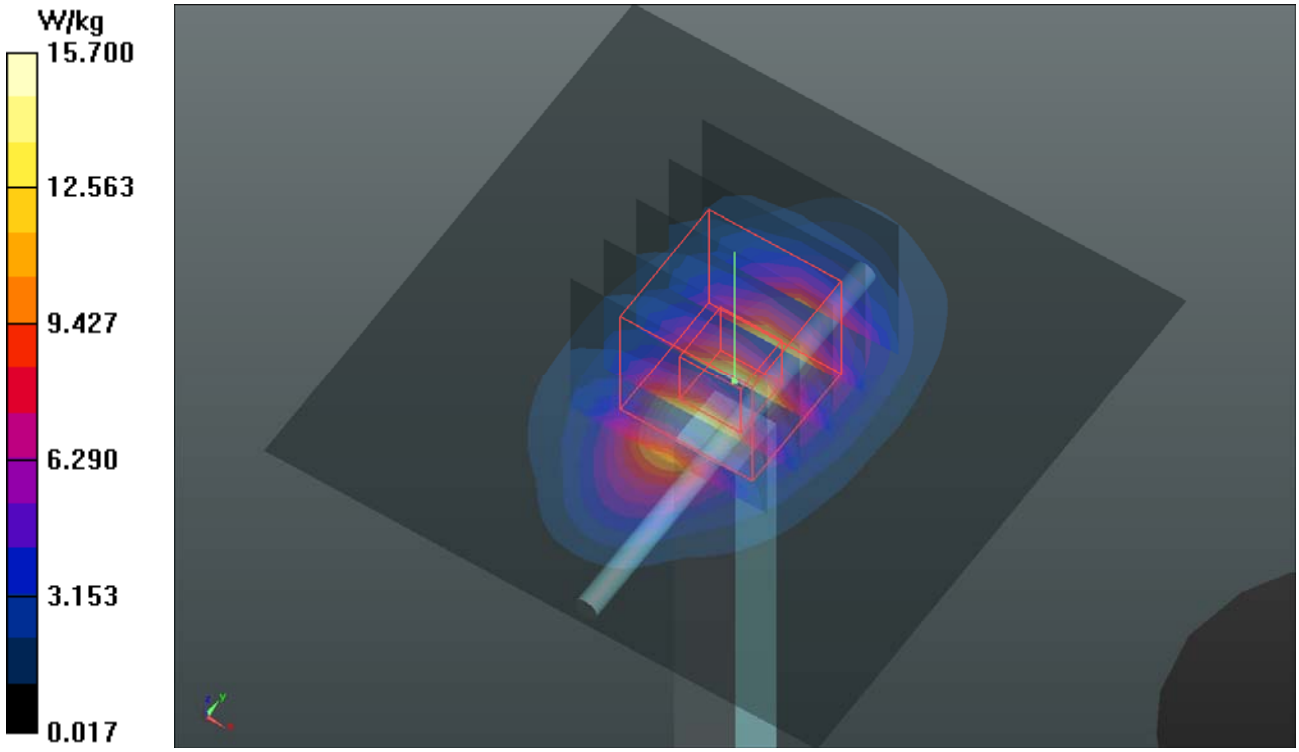
DUT: Dipole 1900 MHz; Type: D1900V2; SN: 5d036

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: B16T20N1_0227 Medium parameters used: f = 1900 MHz; σ = 1.564 S/m; ε_r = 51.433; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(8, 8, 8); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 15.7 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 102.6 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 18.9 W/kg
SAR(1 g) = 10.3 W/kg; SAR(10 g) = 5.31 W/kg
Maximum value of SAR (measured) = 16.0 W/kg



System Check_B2450_180228

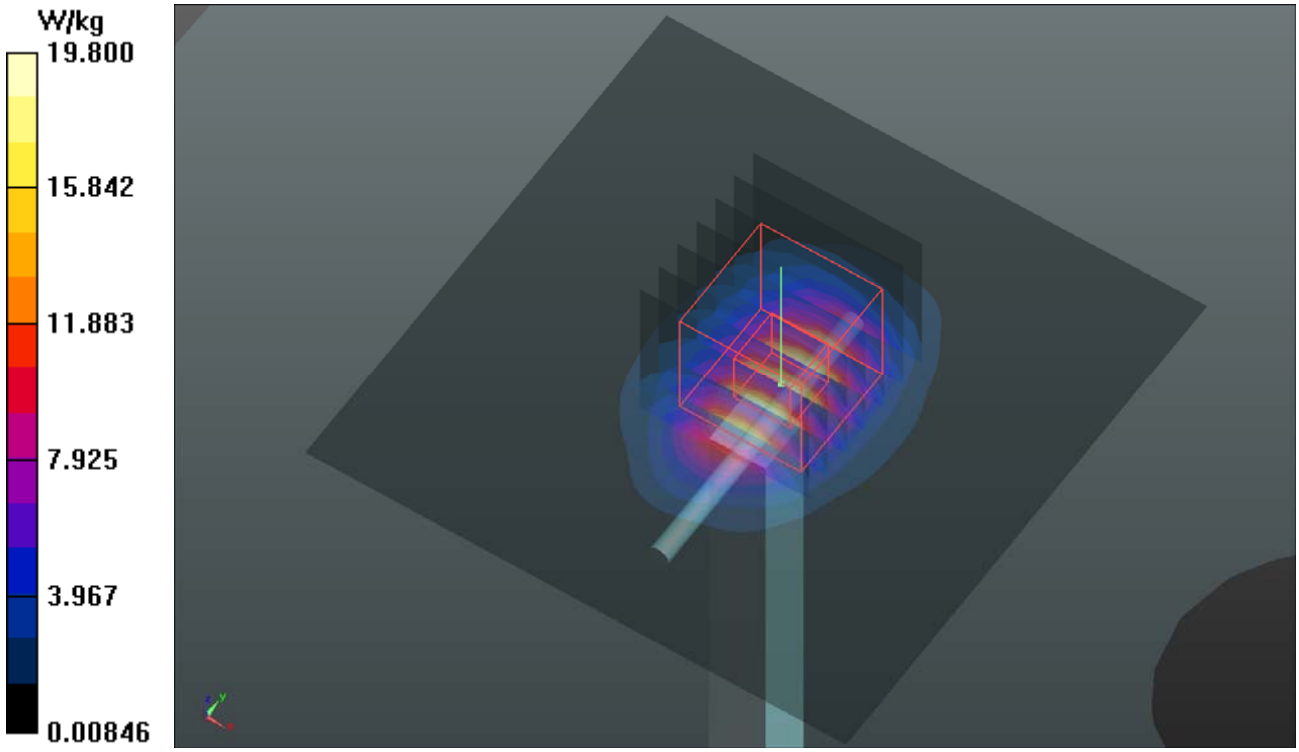
DUT: Dipole 2450 MHz; Type: D2450V2; SN: 737

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: B19T27N1_0228 Medium parameters used: f = 2450 MHz; σ = 1.999 S/m; ε_r = 50.532; ρ = 1000 kg/m^3
Ambient Temperature：23.8 ℃ ； Liquid Temperature：23.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(7.68, 7.68, 7.68); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 19.8 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.18 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 24.6 W/kg
SAR(1 g) = 11.9 W/kg; SAR(10 g) = 5.53 W/kg
Maximum value of SAR (measured) = 20.0 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2018/02/28

System Check_B2600_180228

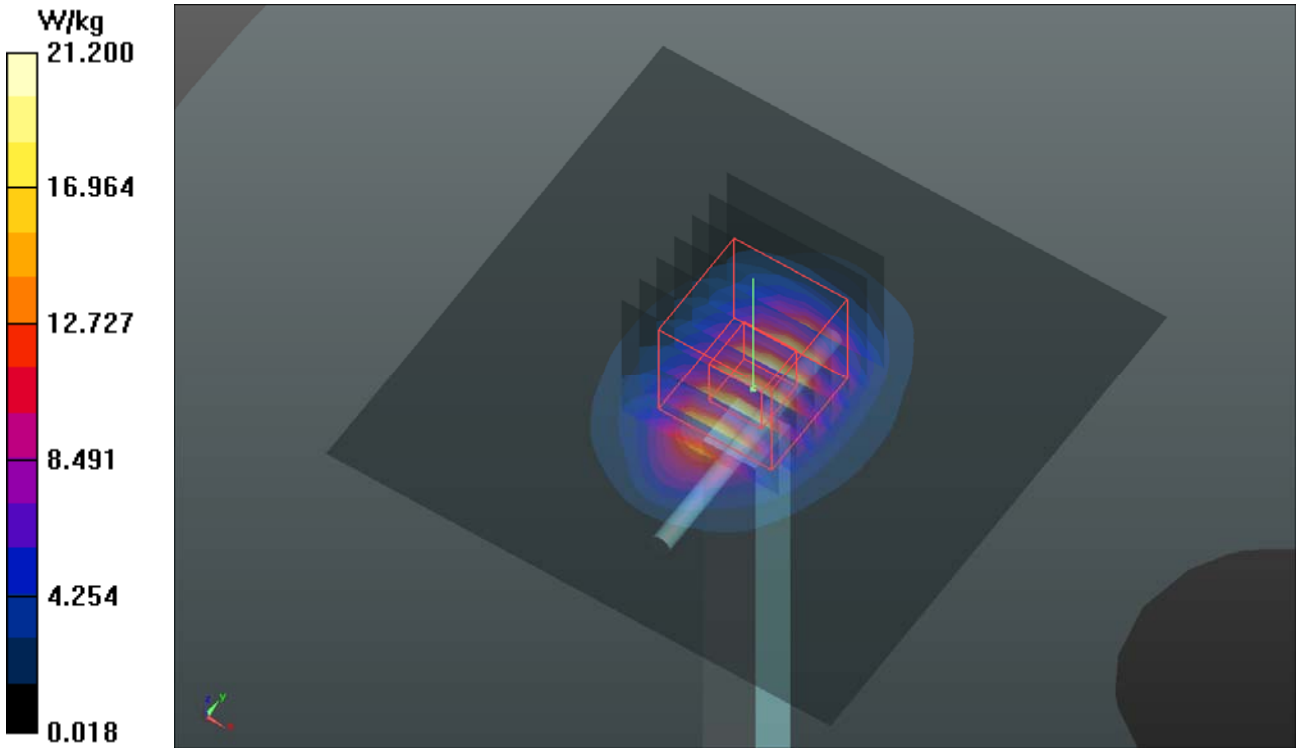
DUT: Dipole 2600 MHz; Type: D2600V2; SN: 1020

Communication System: CW; Frequency: 2600 MHz;Duty Cycle: 1:1
Medium: B19T27N1_0228 Medium parameters used: f = 2600 MHz; σ = 2.167 S/m; ε_r = 50.128; ρ = 1000 kg/m^3
Ambient Temperature：23.8 ℃ ； Liquid Temperature：23.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(7.37, 7.37, 7.37); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 21.2 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 101.9 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 26.3 W/kg
SAR(1 g) = 12.7 W/kg; SAR(10 g) = 6.06 W/kg
Maximum value of SAR (measured) = 21.2 W/kg



System Check_B5250_180228

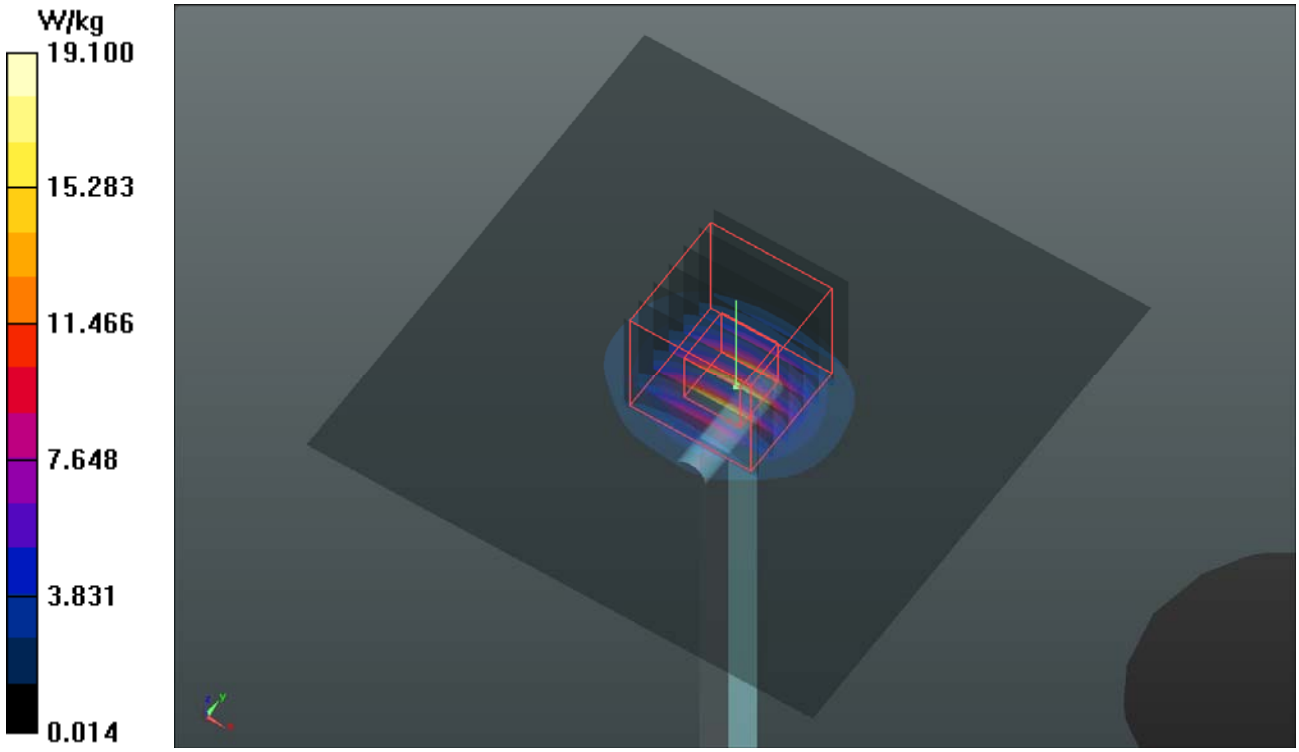
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5250 MHz;Duty Cycle: 1:1
Medium: B34T60N1_0228 Medium parameters used: f = 5250 MHz; σ = 5.405 S/m; ε_r = 47.547; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(5.28, 5.28, 5.28); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 19.1 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 60.08 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 34.2 W/kg
SAR(1 g) = 8.1 W/kg; SAR(10 g) = 2.29 W/kg
Maximum value of SAR (measured) = 20.6 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2018/02/28

System Check_B5600_180228

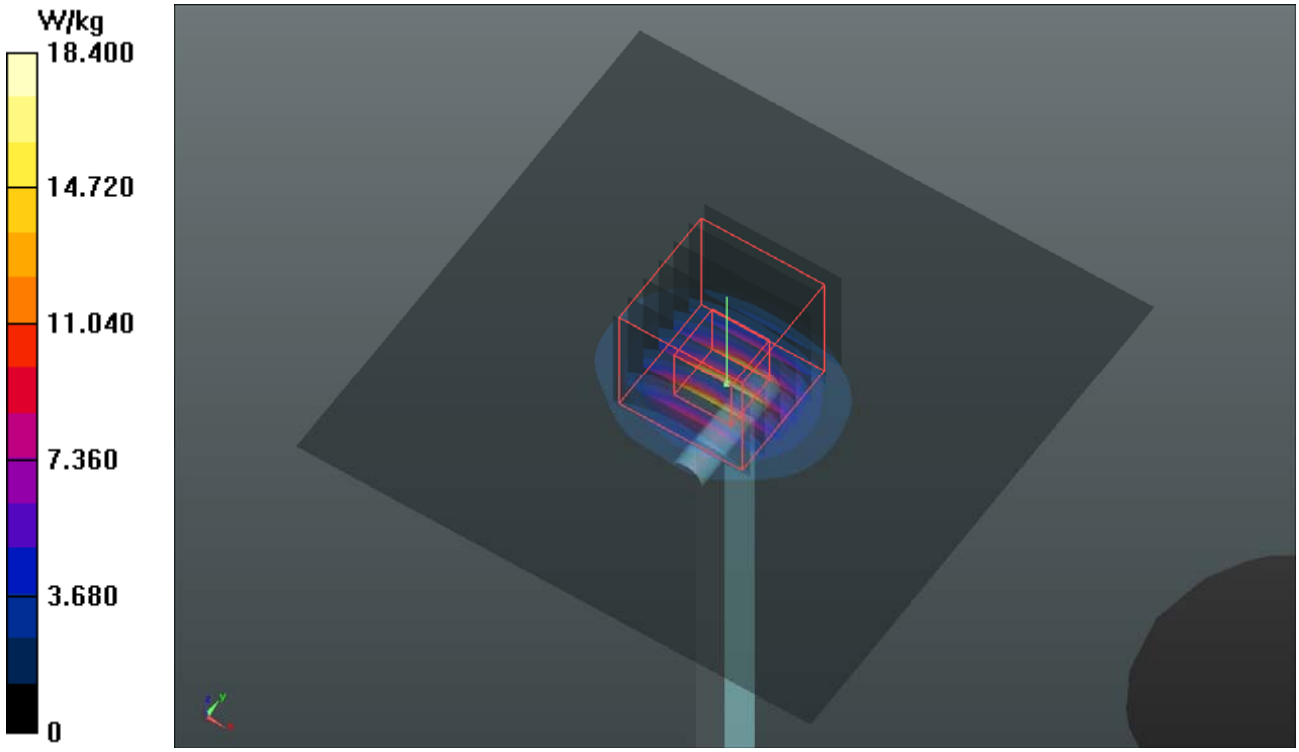
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5600 MHz;Duty Cycle: 1:1
Medium: B34T60N1_0228 Medium parameters used: f = 5600 MHz; σ = 5.894 S/m; ε_r = 46.817; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(4.29, 4.29, 4.29); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 18.4 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 58.68 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 33.2 W/kg
SAR(1 g) = 7.81 W/kg; SAR(10 g) = 2.22 W/kg
Maximum value of SAR (measured) = 20.2 W/kg



System Check_B5800_180228

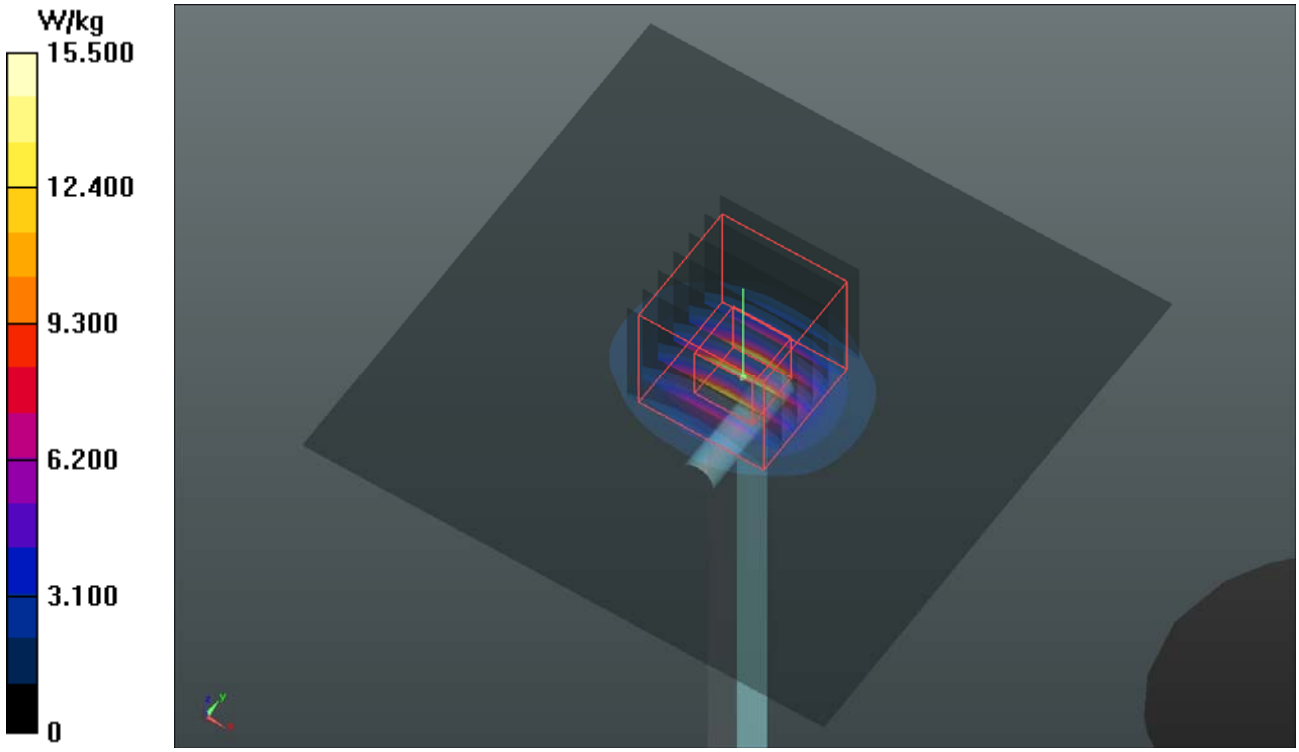
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: B34T60N1_0228 Medium parameters used: f = 5800 MHz; σ = 6.172 S/m; ε_r = 46.486; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(4.61, 4.61, 4.61); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 15.5 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 57.01 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 32.8 W/kg
SAR(1 g) = 7.69 W/kg; SAR(10 g) = 2.16 W/kg
Maximum value of SAR (measured) = 16.5 W/kg



System Check_B5250_180228

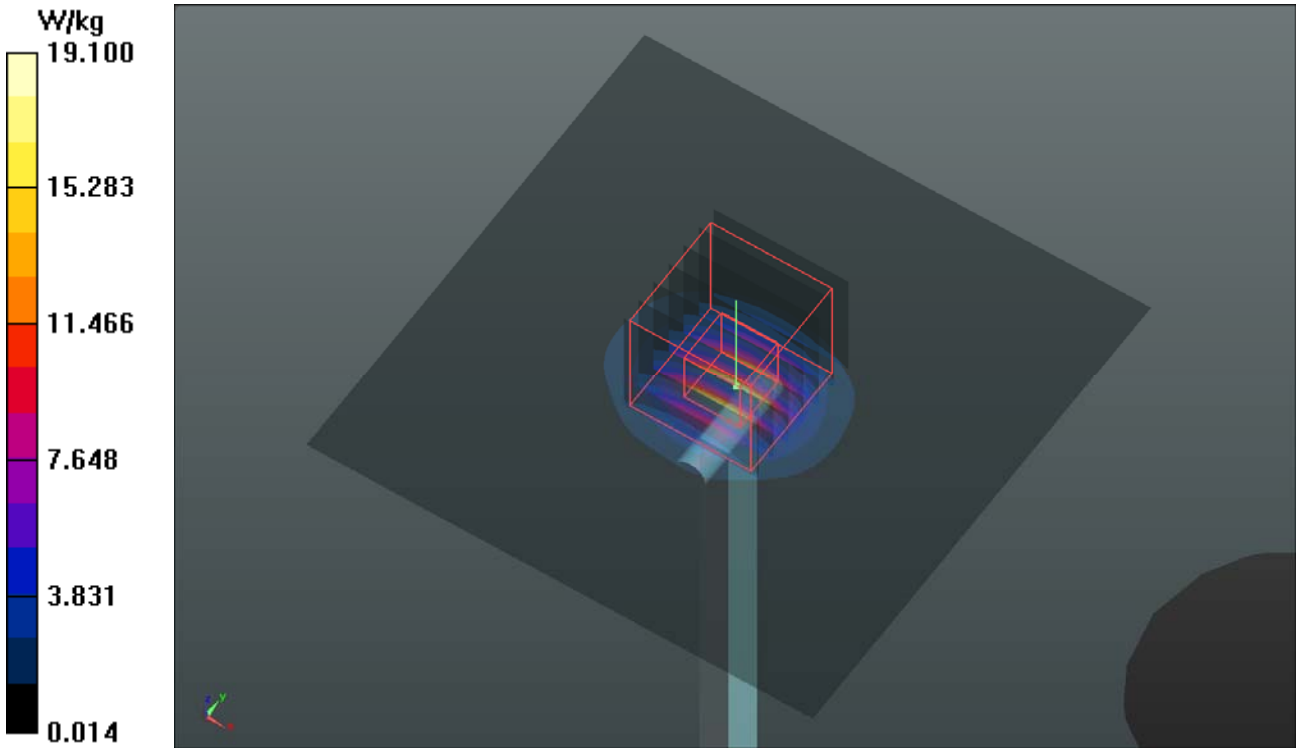
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5250 MHz;Duty Cycle: 1:1
Medium: B34T60N1_0228 Medium parameters used: f = 5250 MHz; σ = 5.405 S/m; ε_r = 47.547; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(5.28, 5.28, 5.28); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 19.1 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 60.08 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 34.2 W/kg
SAR(1 g) = 8.1 W/kg; SAR(10 g) = 2.29 W/kg
Maximum value of SAR (measured) = 20.6 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2018/02/28

System Check_B5600_180228

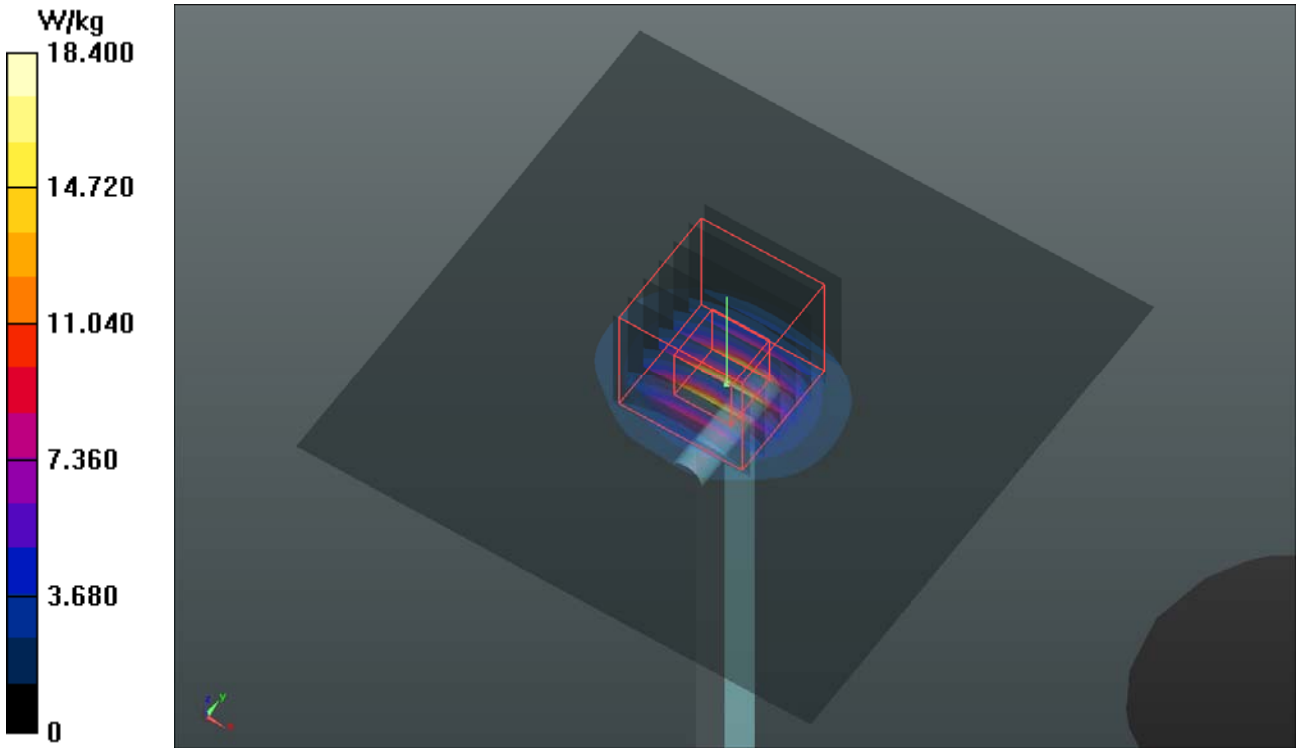
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5600 MHz;Duty Cycle: 1:1
Medium: B34T60N1_0228 Medium parameters used: f = 5600 MHz; σ = 5.894 S/m; ε_r = 46.817; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(4.29, 4.29, 4.29); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 18.4 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 58.68 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 33.2 W/kg
SAR(1 g) = 7.81 W/kg; SAR(10 g) = 2.22 W/kg
Maximum value of SAR (measured) = 20.2 W/kg



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_GPRS11_Right Cheek_Ch189_Sample2nd_Ant1

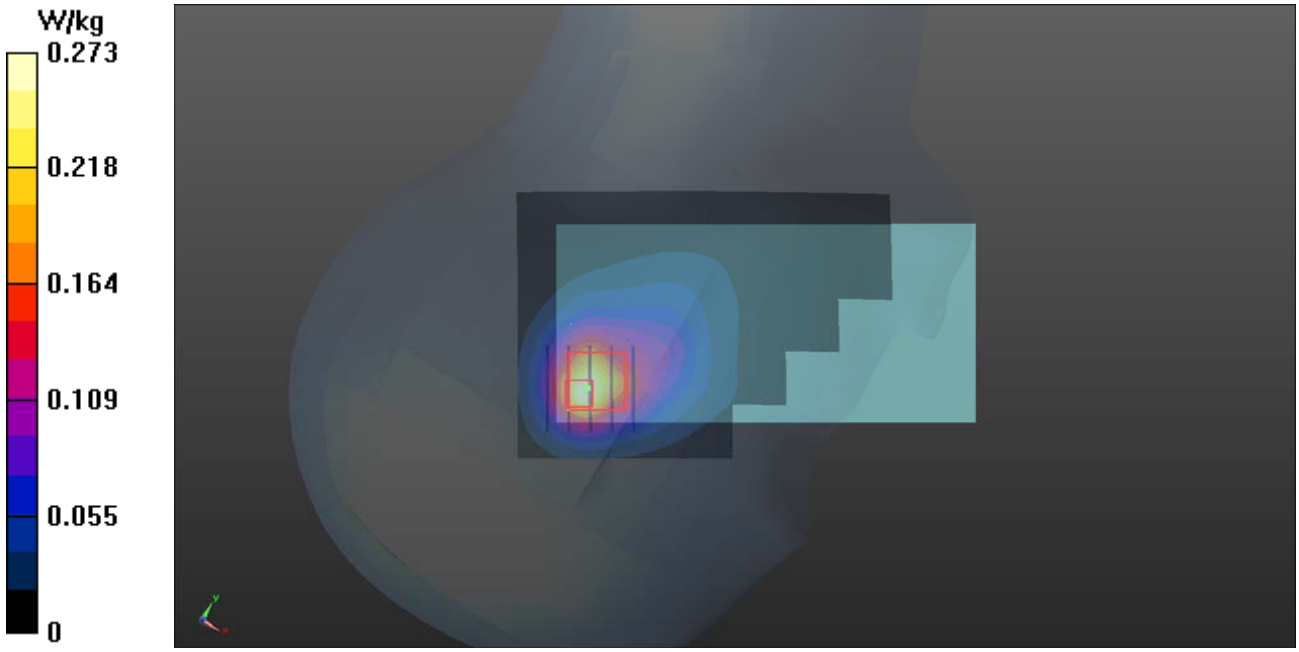
DUT: 171218C14

Communication System: GPRS11; Frequency: 836.4 MHz;Duty Cycle: 1:2.67
Medium: H07T10N1_0226 Medium parameters used: f = 836.4 MHz; σ = 0.92 S/m; ε_r = 41.712; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3971; ConvF(10.67, 10.67, 10.67); Calibrated: 2017/03/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2017/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.273 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.54 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.207 W/kg
SAR(1 g) = 0.100 W/kg; SAR(10 g) = 0.060 W/kg
Maximum value of SAR (measured) = 0.142 W/kg



P02_GSM1900_GPRS12_Right Tilted_Ch661_Sample2nd_Ant1

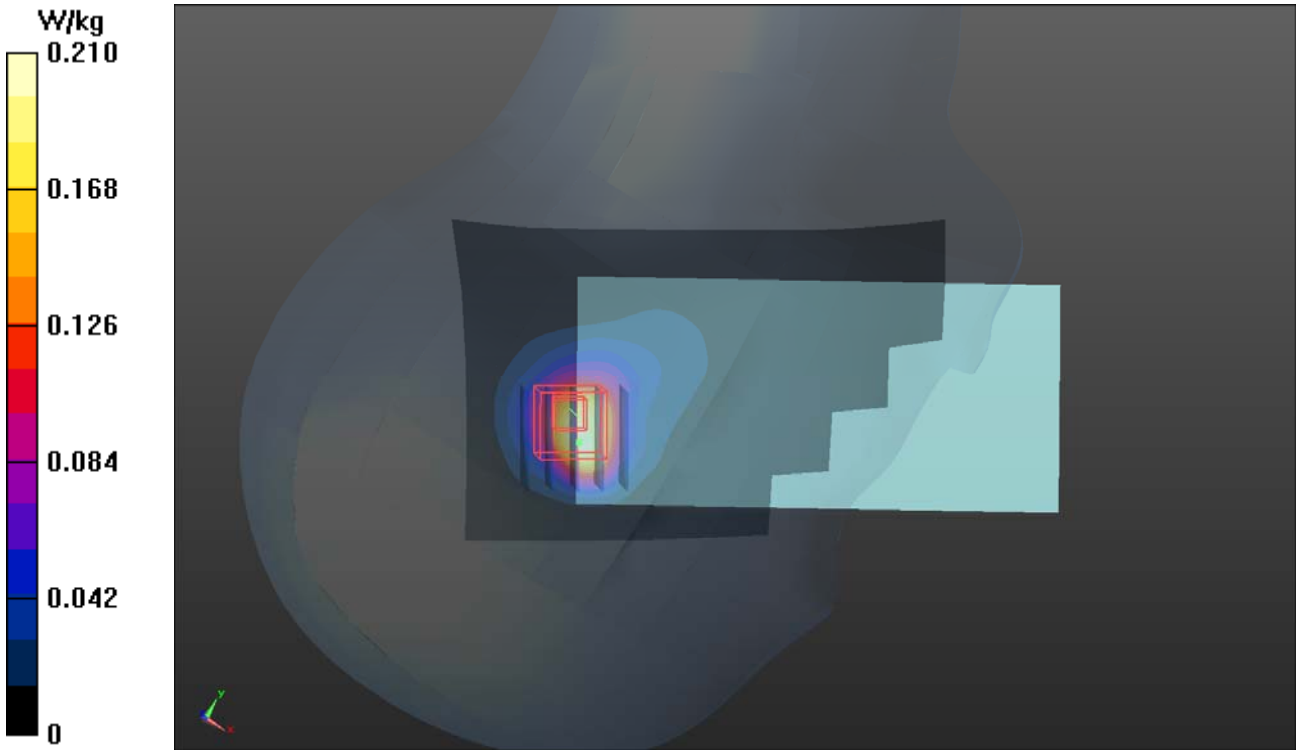
DUT: 180123C31

Communication System: GPRS12; Frequency: 1880 MHz;Duty Cycle: 1:2
Medium: H16T20N1_0321 Medium parameters used: f = 1880 MHz; σ = 1.442 S/m; ε_r = 40.867; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.0 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3578; ConvF(7.94, 7.94, 7.94); Calibrated: 2017/05/05;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2017/11/02
- Phantom: Twin SAM Phantom_1653; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.210 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.730 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.362 W/kg
SAR(1 g) = 0.179 W/kg; SAR(10 g) = 0.082 W/kg
Maximum value of SAR (measured) = 0.275 W/kg



P03_WCDMA II_RMC12.2K_Right Tilted_Ch9400_Sample2nd_Ant1

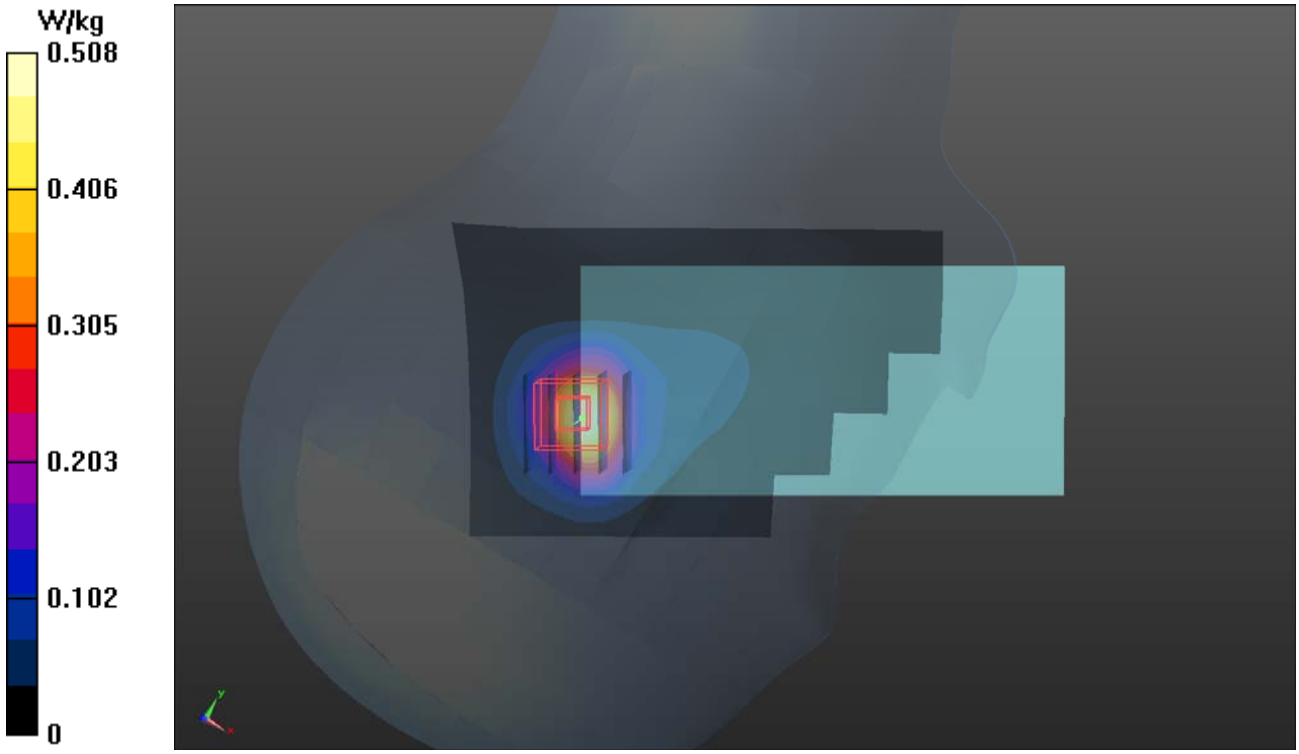
DUT: 180123C31

Communication System: WCDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: H16T20N1_0321 Medium parameters used: f = 1880 MHz; σ = 1.442 S/m; ε_r = 40.867; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.0 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3578; ConvF(7.94, 7.94, 7.94); Calibrated: 2017/05/05;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2017/11/02
- Phantom: Twin SAM Phantom_1653; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.508 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.56 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 0.792 W/kg
SAR(1 g) = 0.429 W/kg; SAR(10 g) = 0.215 W/kg
Maximum value of SAR (measured) = 0.642 W/kg



P04_WCDMA IV_RMC12.2K_Right Cheek_Ch1413_Sample2nd_Ant1

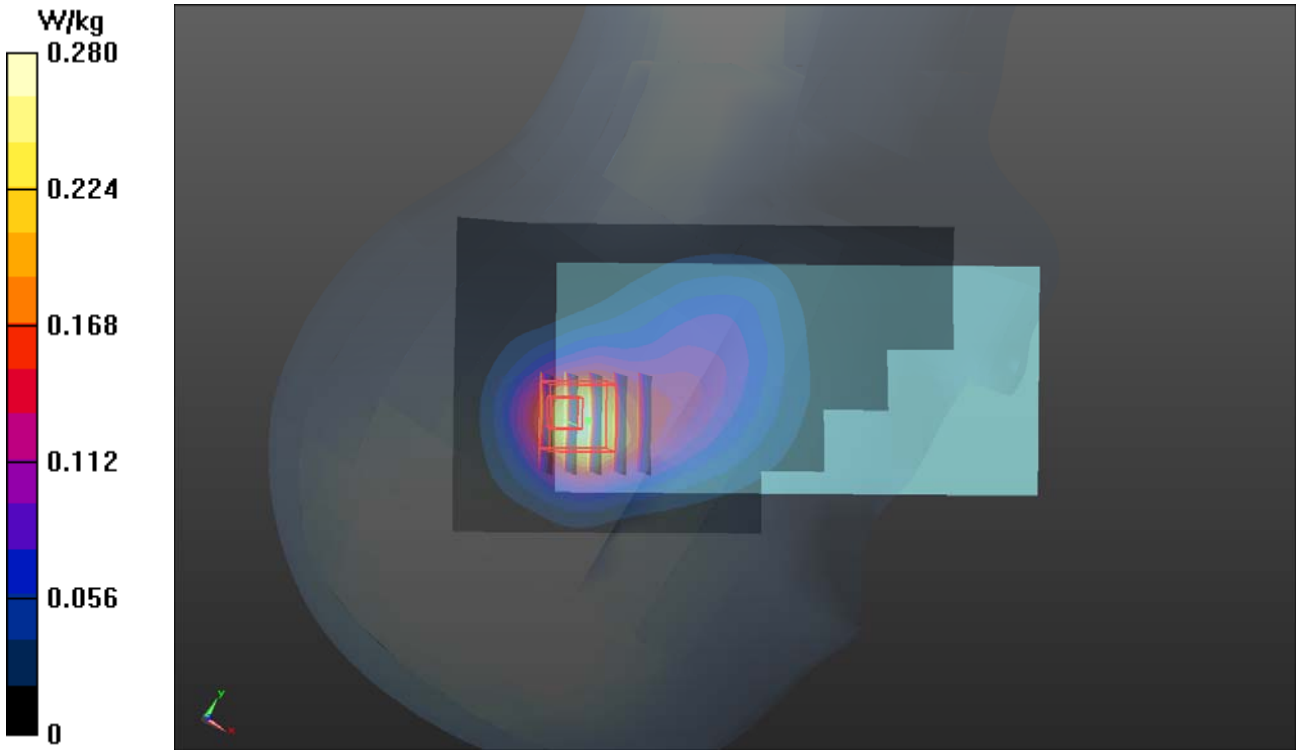
DUT: 180123C31

Communication System: WCDMA; Frequency: 1732.6 MHz;Duty Cycle: 1:1
Medium: H16T20N1_0321 Medium parameters used: f = 1733 MHz; σ = 1.312 S/m; ε_r = 41.244; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.0 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3578; ConvF(8.37, 8.37, 8.37); Calibrated: 2017/05/05;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2017/11/02
- Phantom: Twin SAM Phantom_1653; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.280 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.80 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.314 W/kg
SAR(1 g) = 0.250 W/kg; SAR(10 g) = 0.095 W/kg
Maximum value of SAR (measured) = 0.310 W/kg



P05_WCDMA V_RMC12.2K_Right Cheek_Ch4182_Sample2nd_Ant1

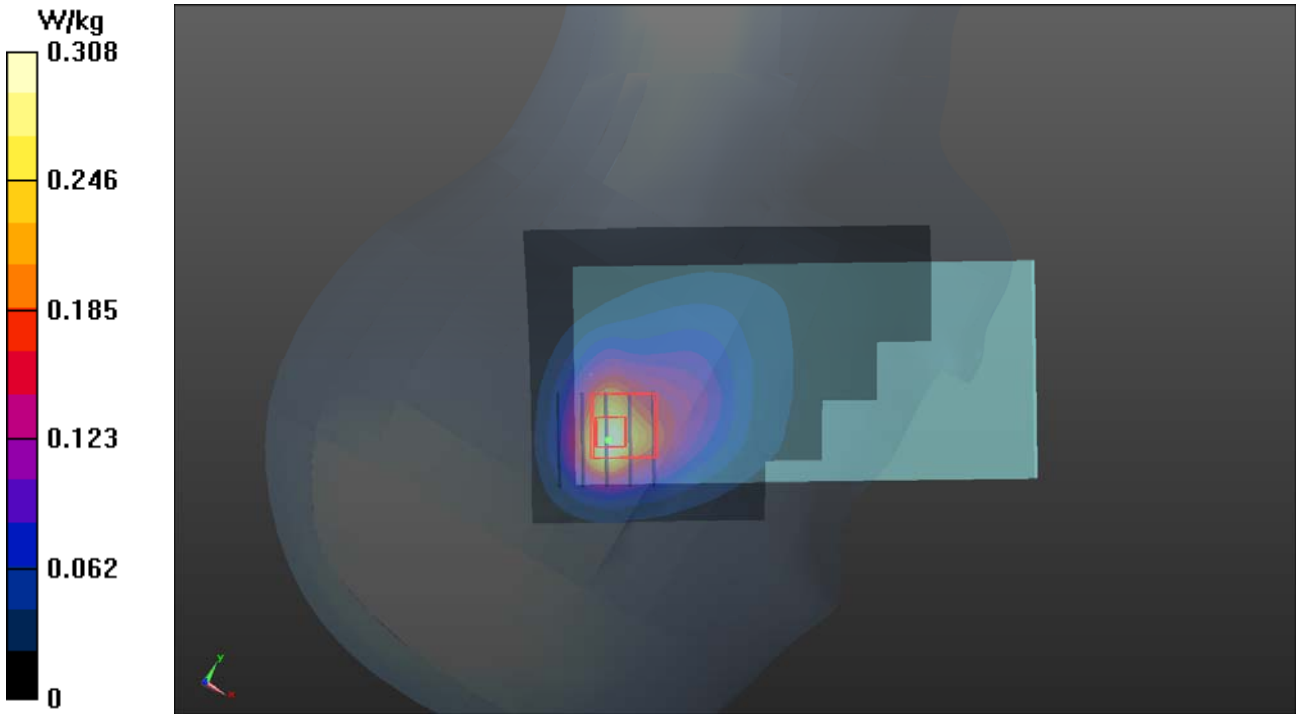
DUT: 171218C14

Communication System: WCDMA; Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: H07T10N1_0224 Medium parameters used: f = 836.4 MHz; σ = 0.924 S/m; ε_r = 42.143; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(9.91, 9.91, 9.91); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.308 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.36 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.326 W/kg
SAR(1 g) = 0.192 W/kg; SAR(10 g) = 0.120 W/kg
Maximum value of SAR (measured) = 0.225 W/kg



P06 LTE 2_QPSK20M_Right Tilted_Ch18900_1RB_OS0_Sample2nd_Ant1

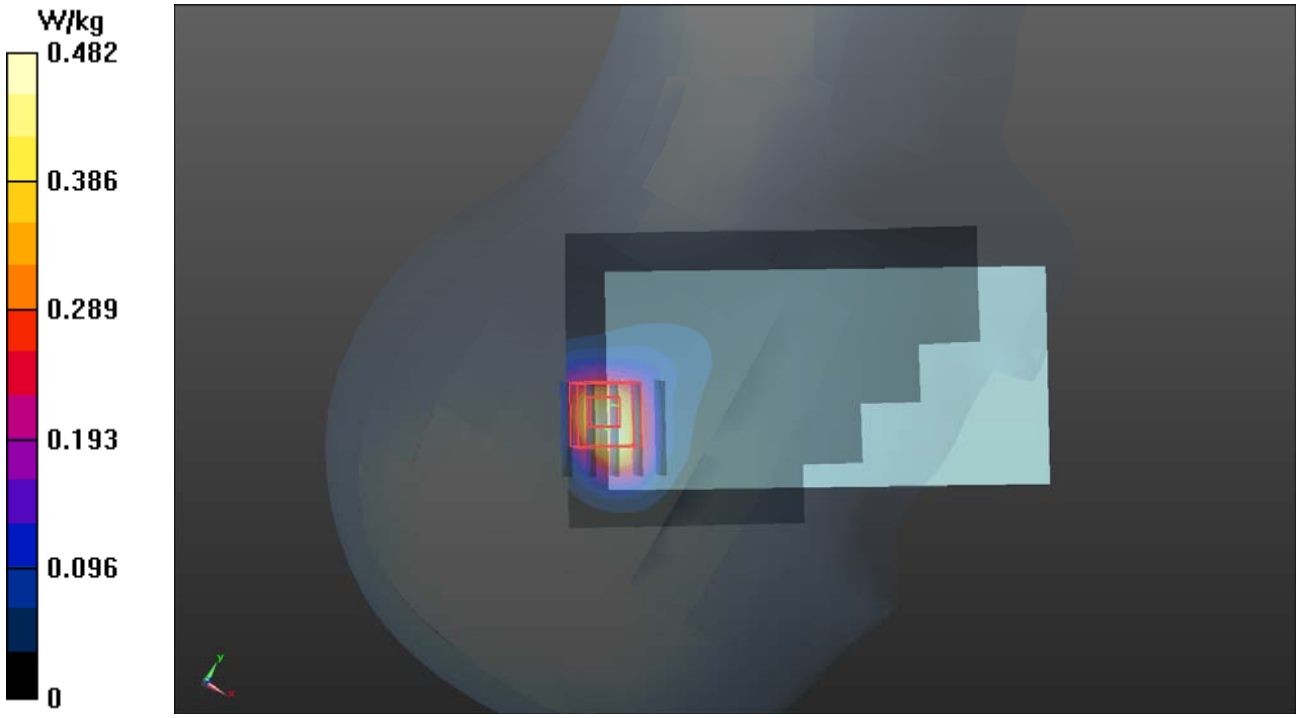
DUT: 171218C14

Communication System: LTE; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: H16T20N1_0224 Medium parameters used: f = 1880 MHz; σ = 1.431 S/m; ε_r = 38.508; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(8.28, 8.28, 8.28); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x121x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.482 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.84 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.905 W/kg
SAR(1 g) = 0.427 W/kg; SAR(10 g) = 0.202 W/kg
Maximum value of SAR (measured) = 0.699 W/kg



P07 LTE 5_QPSK10M_Right Tilted_Ch20525_1RB_OS0_Sample2nd_Ant1

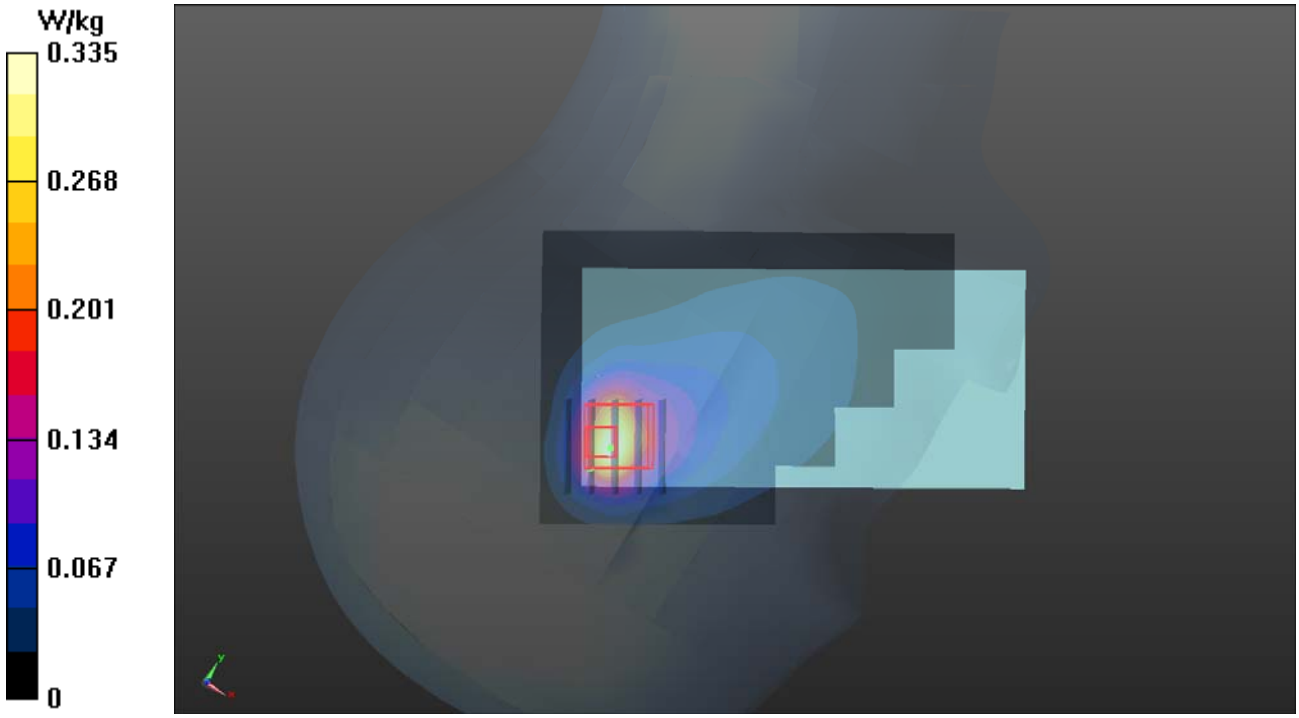
DUT: 171218C14

Communication System: LTE; Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium: H07T10N1_0224 Medium parameters used: f = 836.5 MHz; σ = 0.924 S/m; ε_r = 42.142; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(9.91, 9.91, 9.91); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.335 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.44 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.289 W/kg
SAR(1 g) = 0.164 W/kg; SAR(10 g) = 0.095 W/kg
Maximum value of SAR (measured) = 0.242 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2018/02/24

P08 LTE 7_QPSK20M_Right Cheek_Ch21100_1RB_OS0_Sample2nd_Ant3

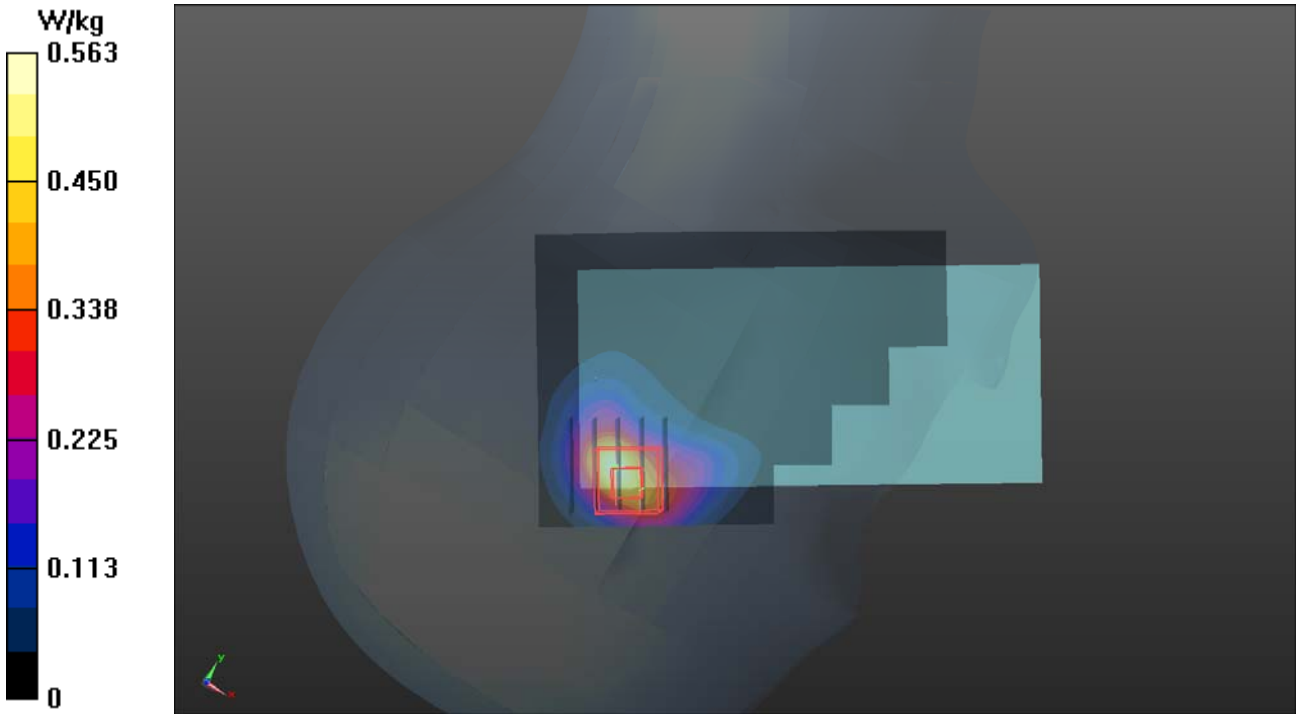
DUT: 171218C14

Communication System: LTE; Frequency: 2535 MHz;Duty Cycle: 1:1
Medium: H19T27N1_0224 Medium parameters used: f = 2535 MHz; σ = 1.963 S/m; ε_r = 38.159; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(7.55, 7.55, 7.55); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (91x151x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.563 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.12 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 1.22 W/kg
SAR(1 g) = 0.465 W/kg; SAR(10 g) = 0.203 W/kg
Maximum value of SAR (measured) = 0.851 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2018/02/24

P09_LTE 12_QPSK10M_Right Cheek_Ch23095_1RB_OS0_Sample2nd_Ant1

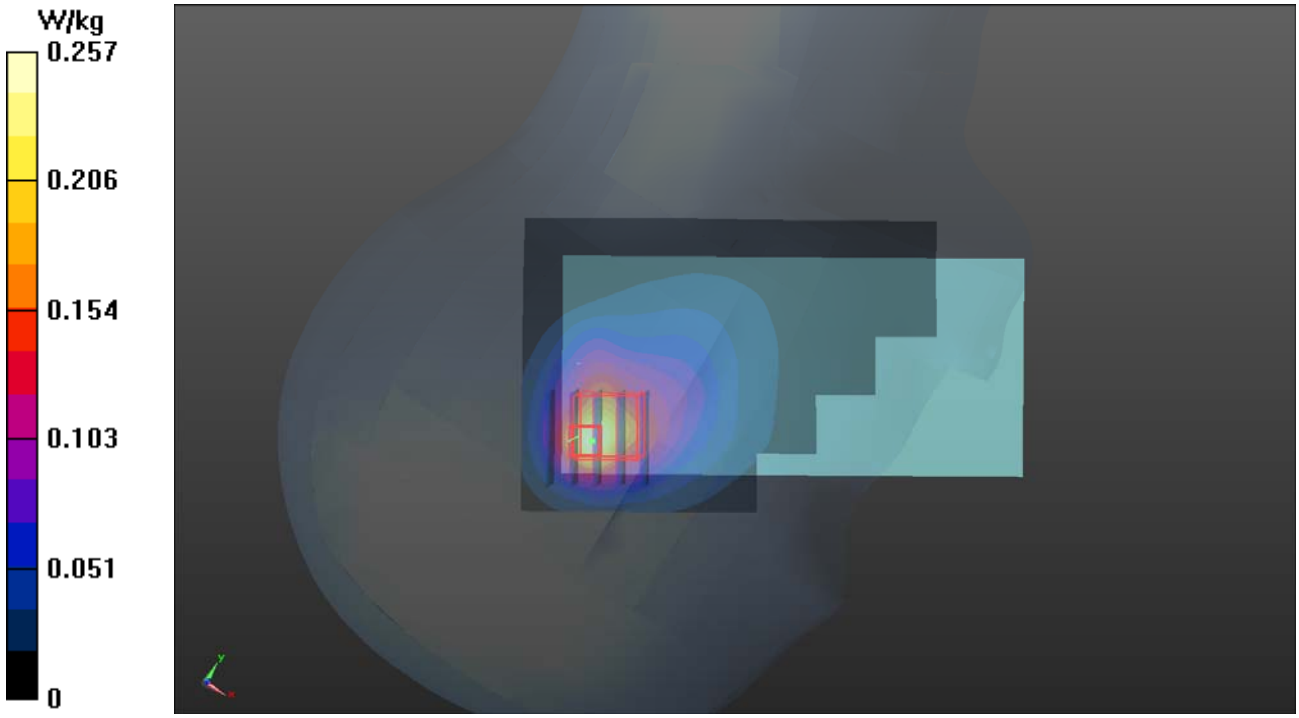
DUT: 171218C14

Communication System: LTE; Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium: H06T09N1_0224 Medium parameters used: f = 707.5 MHz; σ = 0.854 S/m; ε_r = 43.937; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃ ； Liquid Temperature：23.1 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(10.31, 10.31, 10.31); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.257 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.57 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.243 W/kg
SAR(1 g) = 0.145 W/kg; SAR(10 g) = 0.097 W/kg
Maximum value of SAR (measured) = 0.207 W/kg



P10_LTE 13_QPSK10M_Right Cheek_Ch23230_1RB_OS0_Sample2nd_Ant1

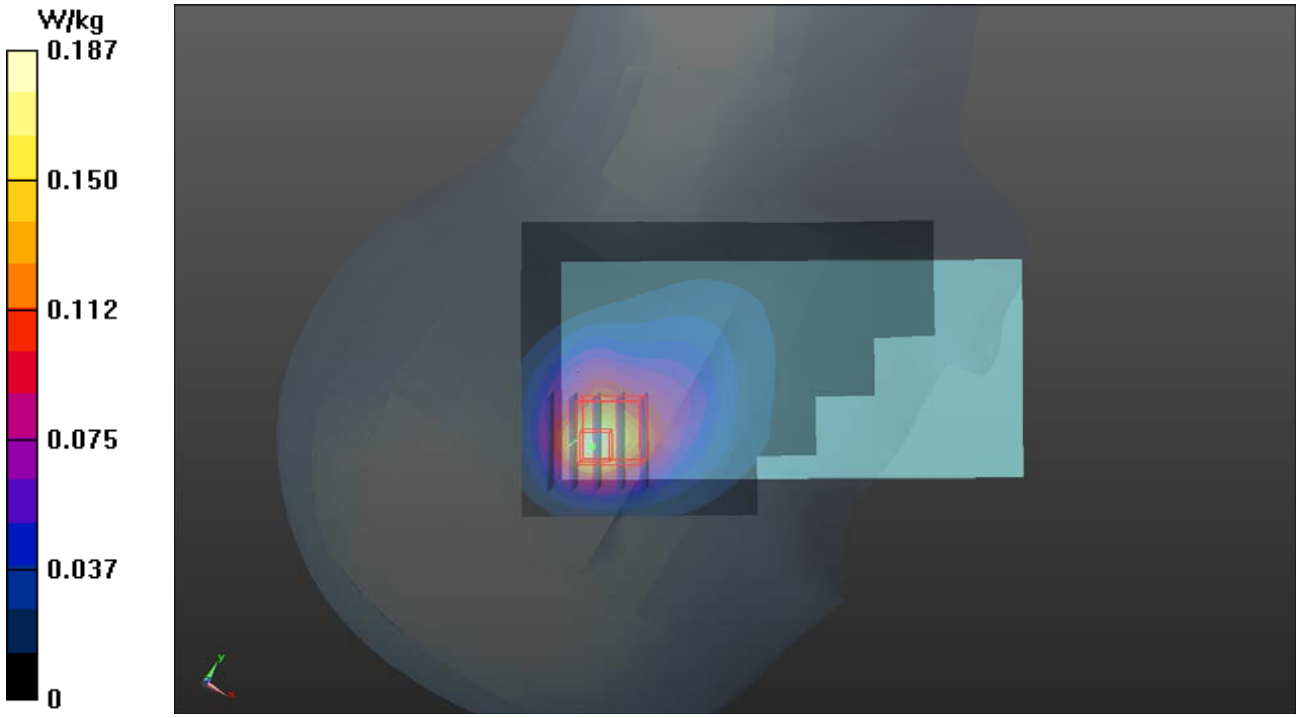
DUT: 171218C14

Communication System: LTE; Frequency: 782 MHz;Duty Cycle: 1:1
Medium: H06T09N1_0224 Medium parameters used: f = 782 MHz; σ = 0.922 S/m; ε_r = 42.993; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃ ； Liquid Temperature：23.1 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(10.31, 10.31, 10.31); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.187 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.67 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.141 W/kg
SAR(1 g) = 0.106 W/kg; SAR(10 g) = 0.057 W/kg
Maximum value of SAR (measured) = 0.103 W/kg



P11 LTE 41_QPSK20M_Right Cheek_Ch40620_1RB_OS0_Sample2nd_Ant3

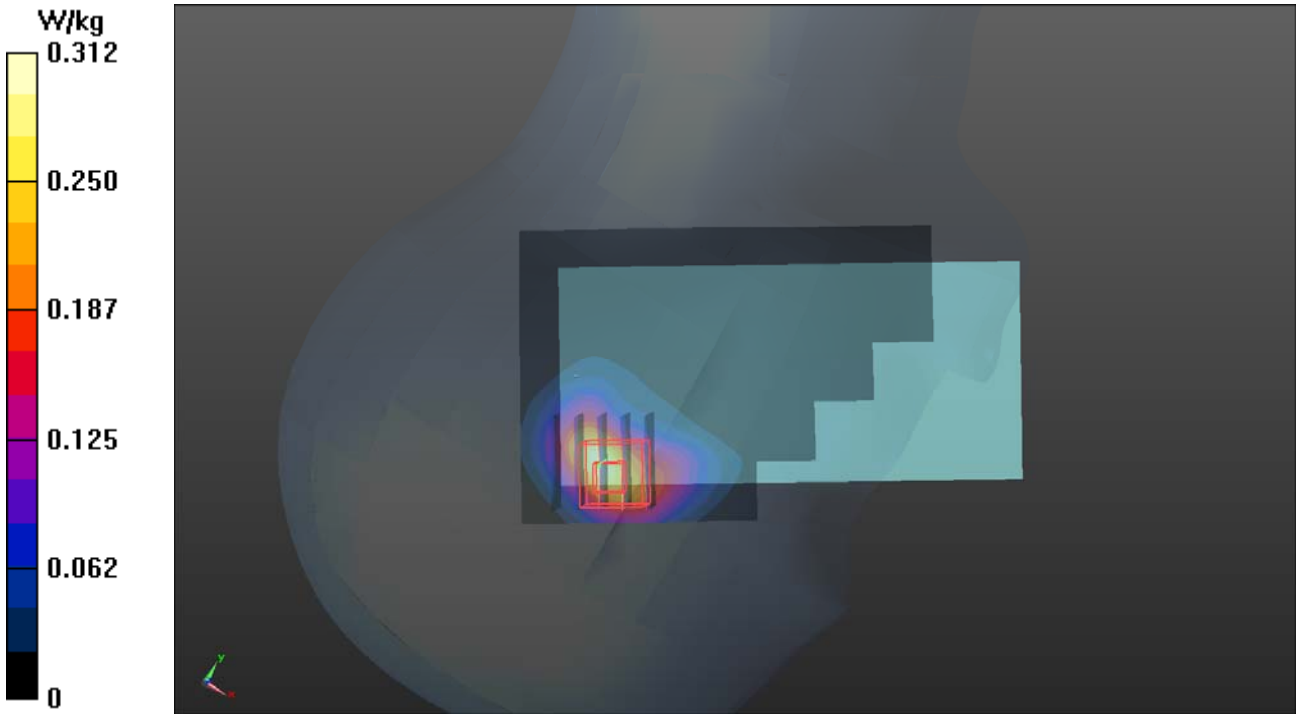
DUT: 171218C14

Communication System: LTE TDD CF0; Frequency: 2593 MHz;Duty Cycle: 1:1.58
Medium: H19T27N1_0224 Medium parameters used: f = 2593 MHz; σ = 2.026 S/m; ε_r = 37.97; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(7.55, 7.55, 7.55); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1654; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (91x151x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.312 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.45 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.469 W/kg
SAR(1 g) = 0.196 W/kg; SAR(10 g) = 0.081 W/kg
Maximum value of SAR (measured) = 0.362 W/kg



P12 LTE 66_QPSK20M_Right Tilted_Ch132322_1RB_OS0_Sample2nd_Ant1

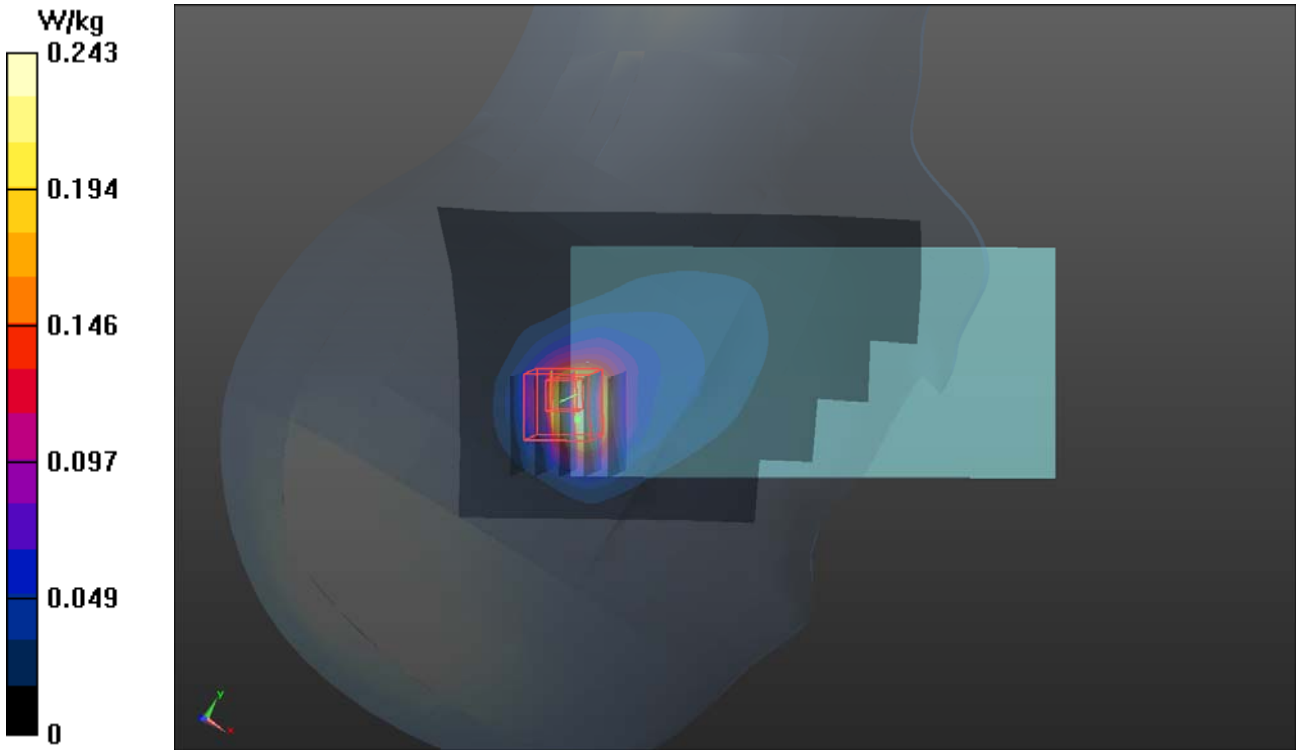
DUT: 180123C31

Communication System: LTE; Frequency: 1745 MHz;Duty Cycle: 1:1
Medium: H16T20N1_0321 Medium parameters used: f = 1745 MHz; σ = 1.323 S/m; ε_r = 41.22; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.0 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3578; ConvF(8.37, 8.37, 8.37); Calibrated: 2017/05/05;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2017/11/02
- Phantom: Twin SAM Phantom_1653; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.243 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.99 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.417 W/kg
SAR(1 g) = 0.169 W/kg; SAR(10 g) = 0.061 W/kg
Maximum value of SAR (measured) = 0.304 W/kg



P13 WLAN2.4G_802.11b_Left Cheek_Ch6_Sample2nd_Ant0

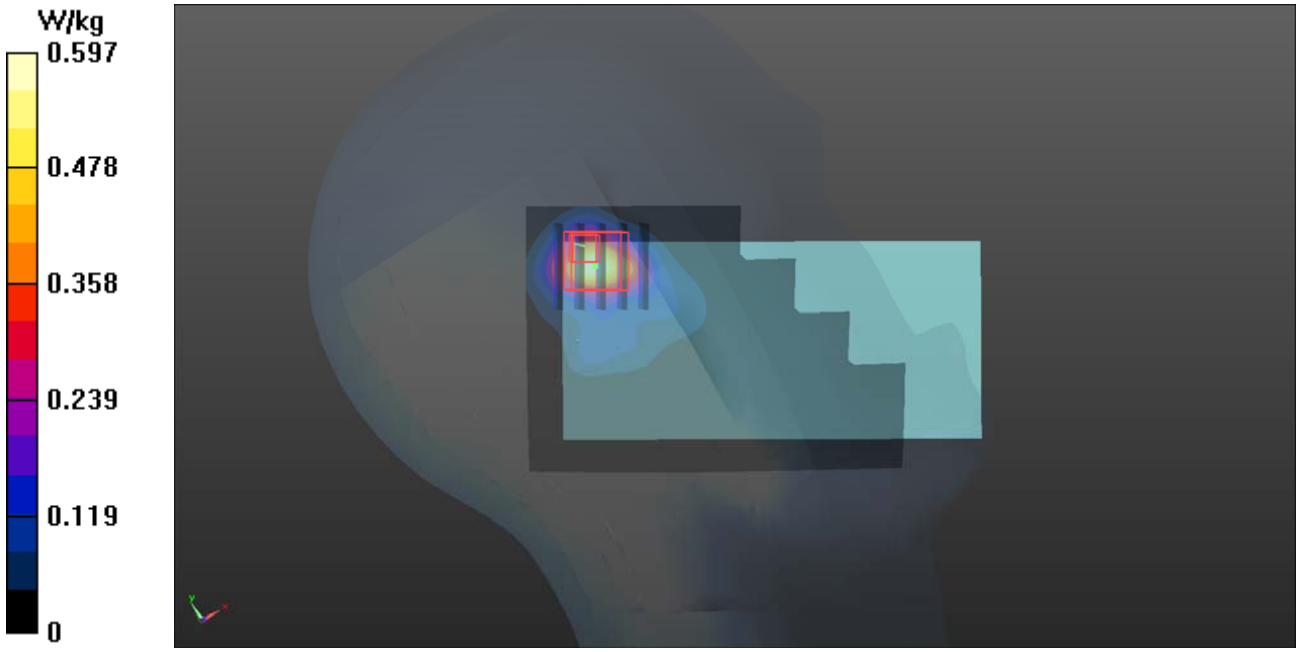
DUT: 171218C14

Communication System: WLAN_2.4G; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: H19T27N3_0226 Medium parameters used: f = 2437 MHz; σ = 1.866 S/m; ε_r = 38.699; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3971; ConvF(7.77, 7.77, 7.77); Calibrated: 2017/03/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2017/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (91x151x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.597 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.33 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 0.825 W/kg
SAR(1 g) = 0.310 W/kg; SAR(10 g) = 0.147 W/kg
Maximum value of SAR (measured) = 0.595 W/kg



P14 WLAN5G_802.11ac VHT80_Left Cheek_Ch58_Sample2nd_Ant0

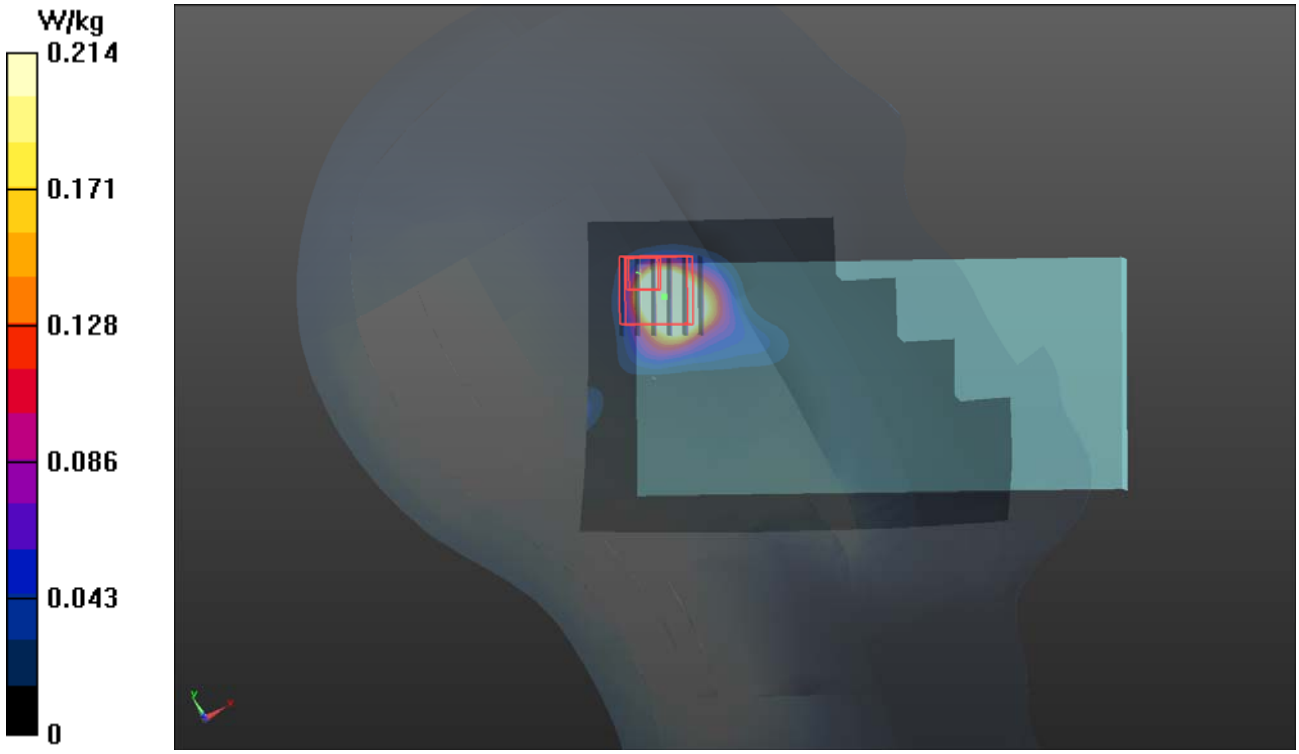
DUT: 171218C14

Communication System: WLAN_5G; Frequency: 5290 MHz;Duty Cycle: 1:1
Medium: H34T60N3_0226 Medium parameters used: f = 5290 MHz; σ = 4.867 S/m; ε_r = 36.464; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3971; ConvF(5.34, 5.34, 5.34); Calibrated: 2017/03/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2017/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (101x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.214 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 4.566 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.619 W/kg
SAR(1 g) = 0.107 W/kg; SAR(10 g) = 0.039 W/kg
Maximum value of SAR (measured) = 0.291 W/kg



P15 WLAN5G_802.11ac VHT80_Left Cheek_Ch122_Sample2nd_Ant0+1

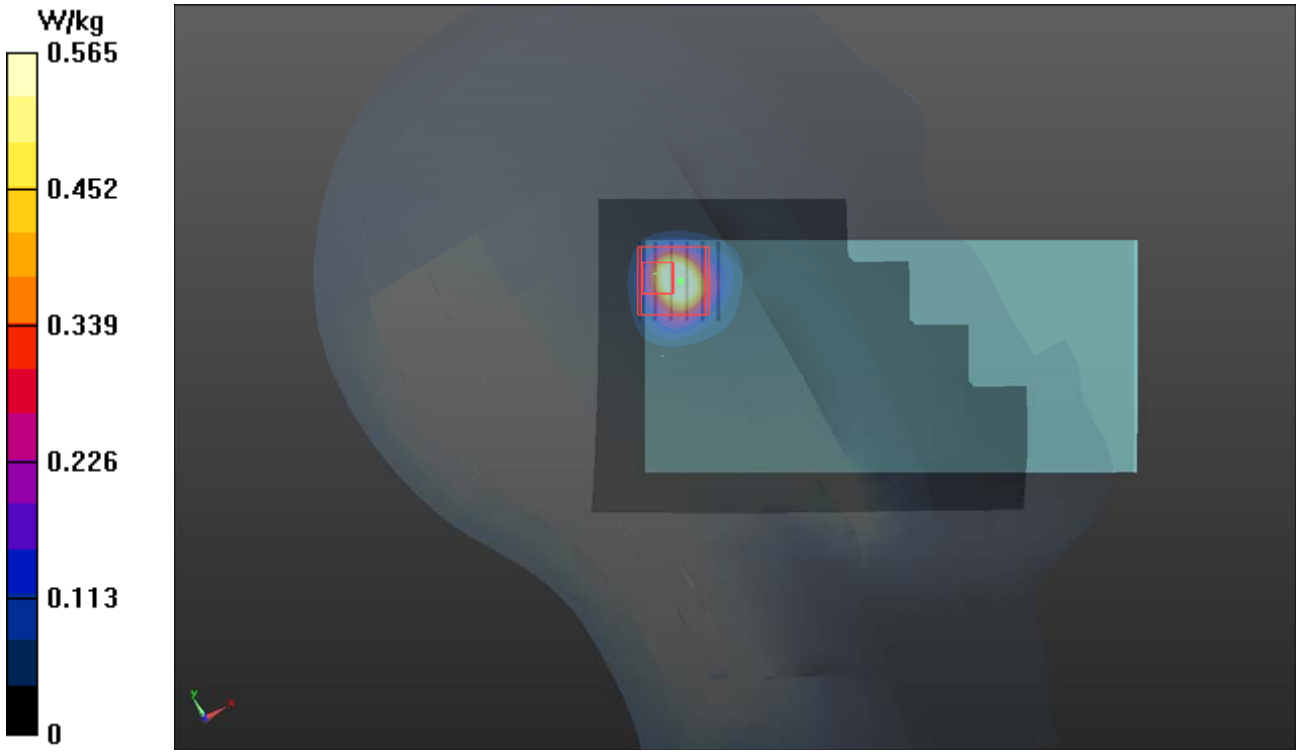
DUT: 171218C14

Communication System: WLAN_5G; Frequency: 5610 MHz;Duty Cycle: 1:1
Medium: H34T60N3_0226 Medium parameters used: f = 5610 MHz; σ = 5.22 S/m; ε_r = 36.159; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3971; ConvF(4.96, 4.96, 4.96); Calibrated: 2017/03/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2017/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (101x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.565 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 9.253 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.663 W/kg
SAR(1 g) = 0.156 W/kg; SAR(10 g) = 0.044 W/kg
Maximum value of SAR (measured) = 0.423 W/kg



P16 WLAN5G_802.11ac VHT80_Left Tilted_Ch155_Sample2nd_Ant0

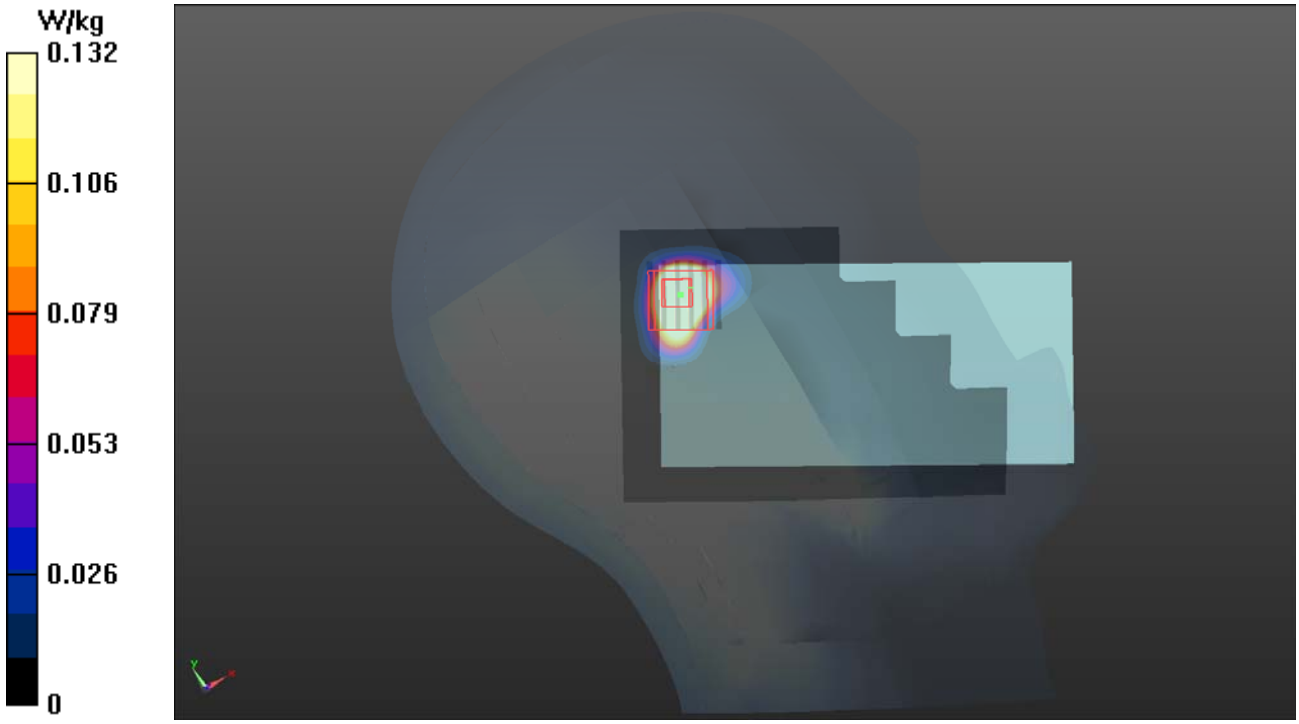
DUT: 171218C14

Communication System: WLAN_5G; Frequency: 5775 MHz;Duty Cycle: 1:1
Medium: H34T60N3_0226 Medium parameters used: f = 5775 MHz; σ = 5.456 S/m; ε_r = 35.718; ρ = 1000 kg/m^3
Ambient Temperature：23.ŵ ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3971; ConvF(4.98, 4.98, 4.98); Calibrated: 2017/03/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2017/05/22
- Phantom: Twin SAM Phantom_1496; Type: QD000P40CA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (101x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.132 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 3.212 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.636 W/kg
SAR(1 g) = 0.075 W/kg; SAR(10 g) = 0.013 W/kg
Maximum value of SAR (measured) = 0.267 W/kg



P17 BT_Left Cheek_Ch39_Sample2nd

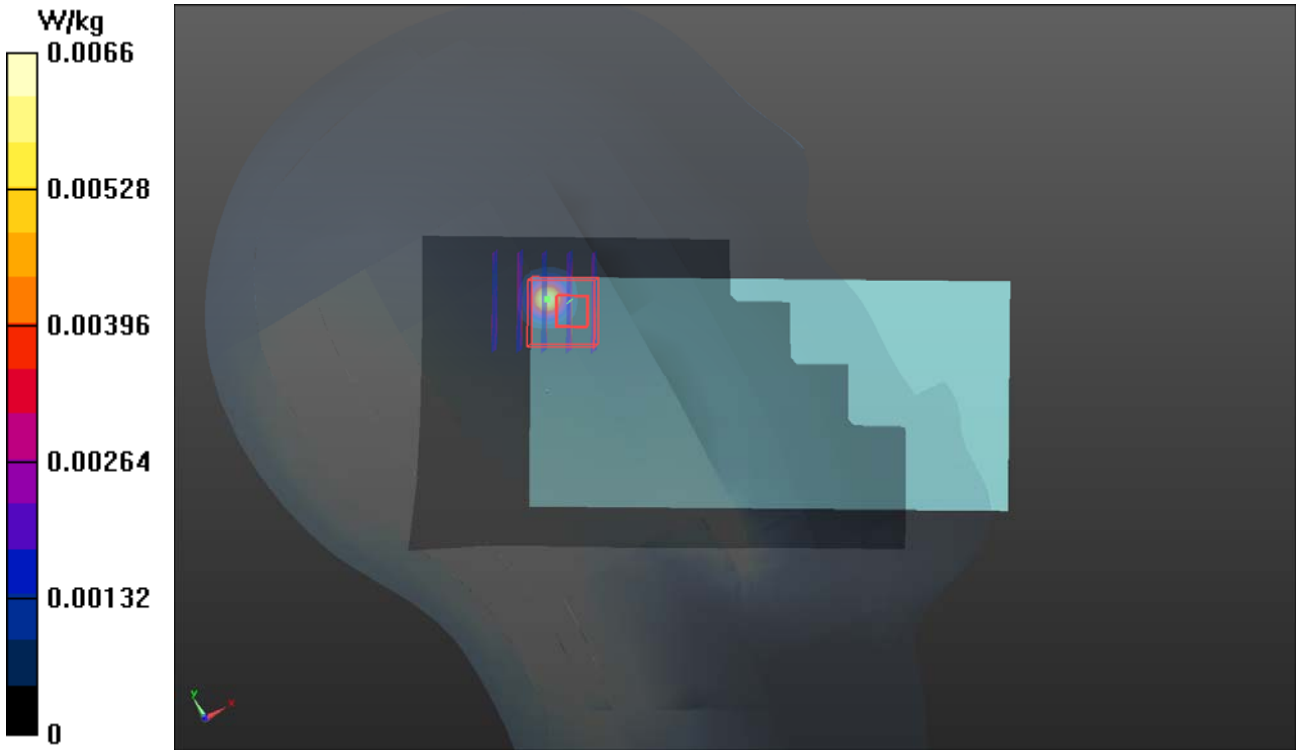
DUT: 180123C31

Communication System: BT; Frequency: 2441 MHz;Duty Cycle: 1:1
Medium: H19T27N1_0321 Medium parameters used: f = 2441 MHz; σ = 1.86 S/m; ε_r = 37.924; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.0 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3578; ConvF(7.44, 7.44, 7.44); Calibrated: 2017/05/05;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2017/11/02
- Phantom: Twin SAM Phantom_1653; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (91x171x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.00660 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.906 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.00936 W/kg
SAR(1 g) = 0.00351 W/kg; SAR(10 g) = 0.00206 W/kg
Maximum value of SAR (measured) = 0.00608 W/kg



P18 GSM850_GPRS11_Rear Face_10mm_Ch189_Sample2nd_Ant0

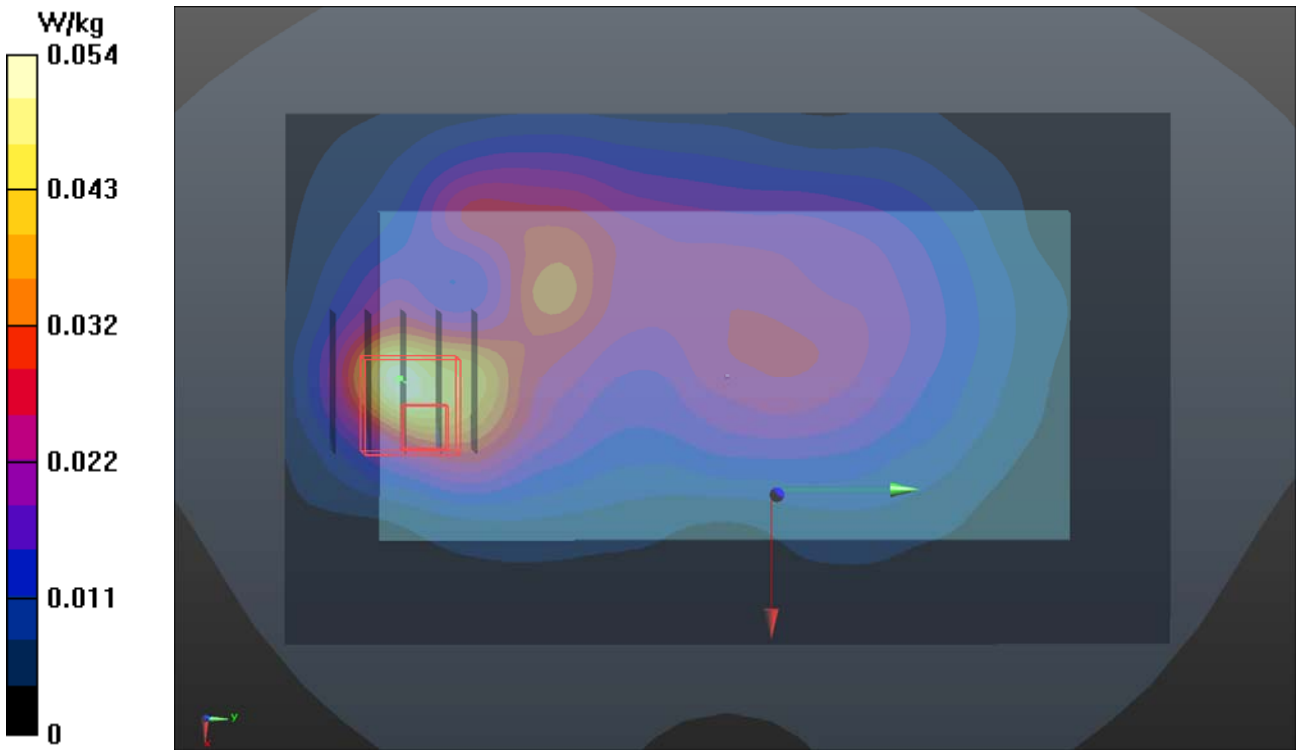
DUT: 180123C31

Communication System: GPRS11; Frequency: 836.4 MHz;Duty Cycle: 1:2.67
Medium: B07T10N1_0227 Medium parameters used: f = 836.4 MHz; σ = 1.006 S/m; ε_r = 57.805; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(9.76, 9.76, 9.76); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0538 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.827 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 0.0460 W/kg
SAR(1 g) = 0.00471 W/kg; SAR(10 g) = 0.00165 W/kg
Maximum value of SAR (measured) = 0.0316 W/kg



P19 GSM1900_GPRS12_Front Face_10mm_Ch661_Sample2nd_Ant1

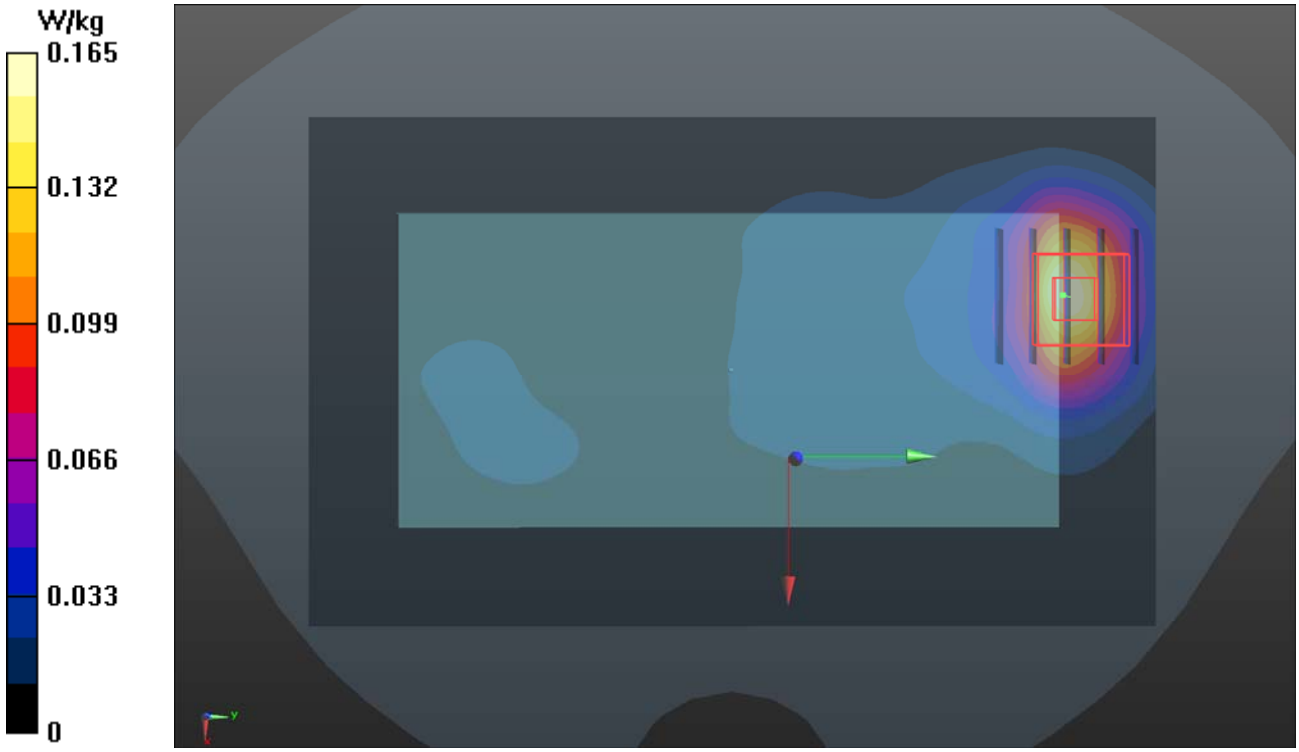
DUT: 180123C31

Communication System: GPRS12; Frequency: 1880 MHz;Duty Cycle: 1:2
Medium: B16T20N1_0227 Medium parameters used: f = 1880 MHz; σ = 1.546 S/m; ε_r = 51.468; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(8, 8, 8); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.165 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.4740 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.183 W/kg
SAR(1 g) = 0.062 W/kg; SAR(10 g) = 0.034 W/kg
Maximum value of SAR (measured) = 0.148 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2018/02/27

P20 WCDMA II_RMC12.2K_Rear Face_10mm_Ch9400_Sample2nd_Ant0

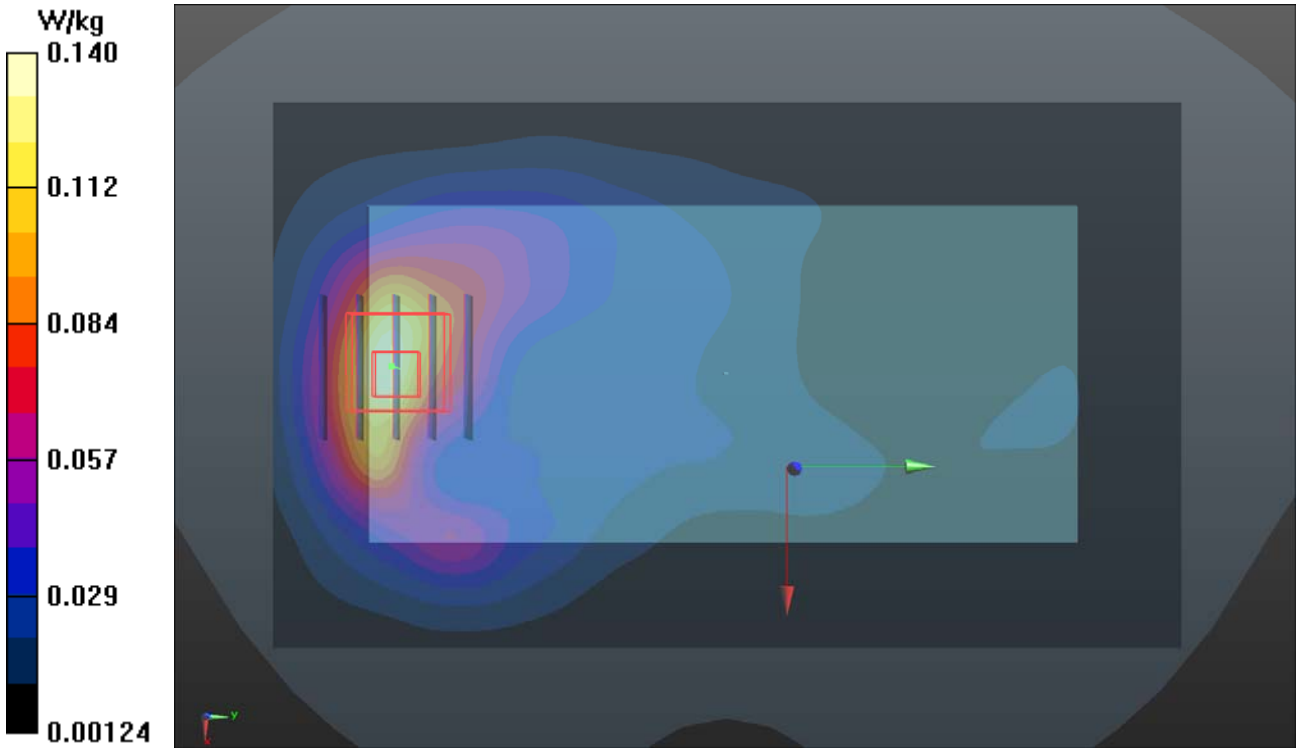
DUT: 180123C31

Communication System: WCDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: B16T20N1_0227 Medium parameters used: f = 1880 MHz; σ = 1.546 S/m; ε_r = 51.468; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(8, 8, 8); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.140 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.223 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.185 W/kg
SAR(1 g) = 0.106 W/kg; SAR(10 g) = 0.060 W/kg
Maximum value of SAR (measured) = 0.153 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2018/02/27

P21 WCDMA IV_RMC12.2K_Rear Face_10mm_Ch1413_Sample2nd_Ant0

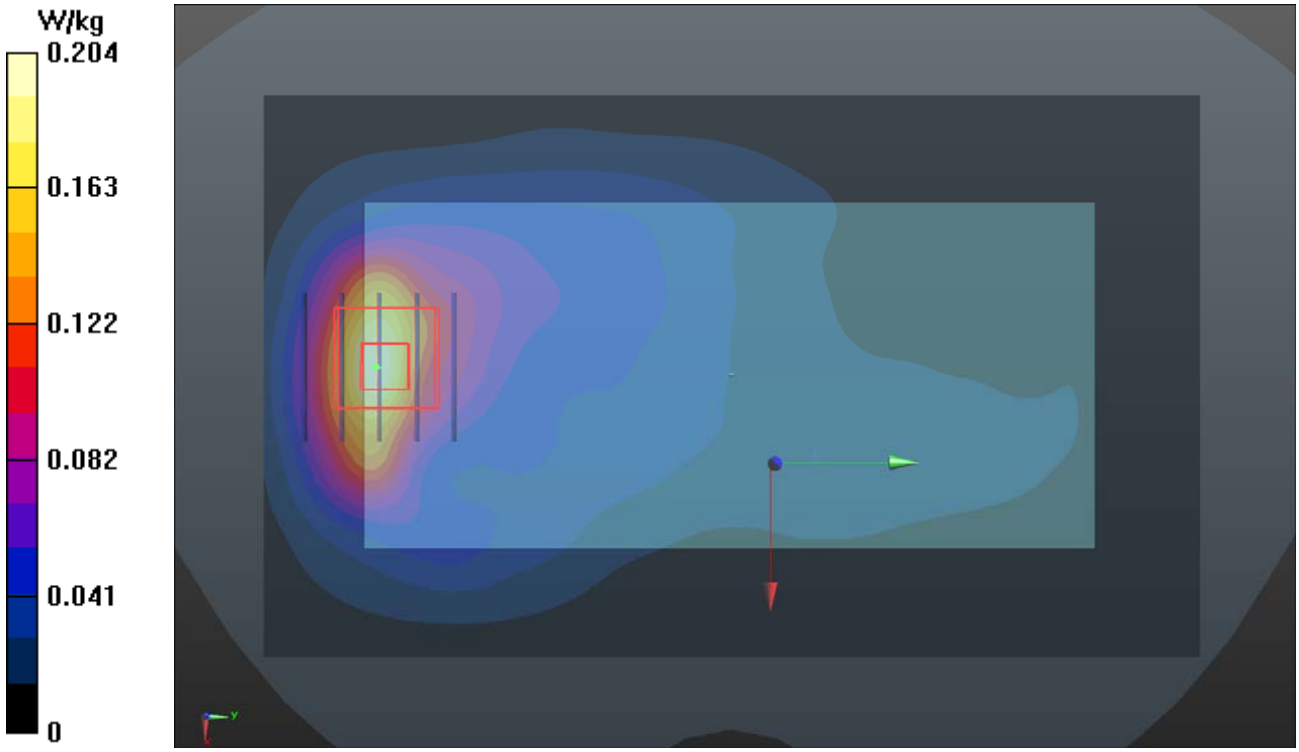
DUT: 180123C31

Communication System: WCDMA; Frequency: 1732.6 MHz;Duty Cycle: 1:1
Medium: B16T20N1_0227 Medium parameters used: f = 1733 MHz; σ = 1.413 S/m; ε_r = 51.87; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(8.27, 8.27, 8.27); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.204 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.81 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.261 W/kg
SAR(1 g) = 0.156 W/kg; SAR(10 g) = 0.089 W/kg
Maximum value of SAR (measured) = 0.220 W/kg



P22 WCDMA V_RMC12.2K_Rear Face_10mm_Ch4182_Sample2nd_Ant0

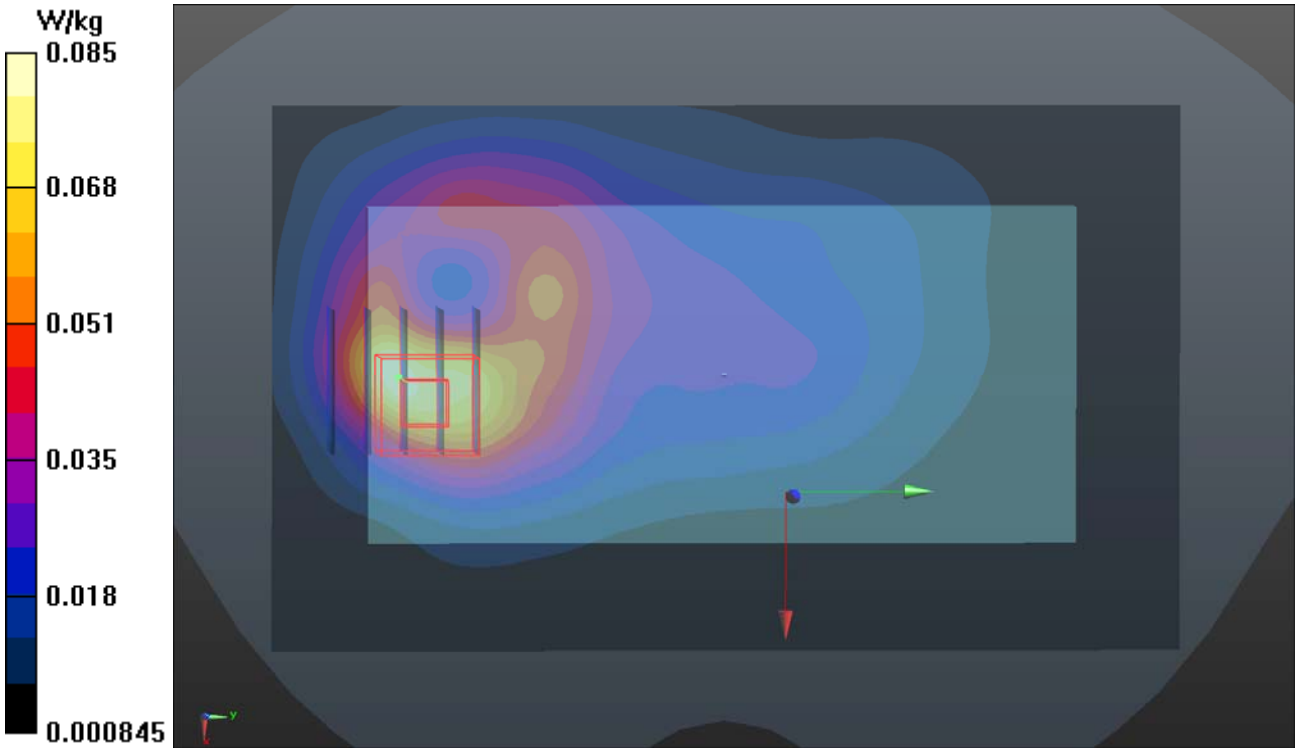
DUT: 180123C31

Communication System: WCDMA; Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: B07T10N1_0227 Medium parameters used: f = 836.4 MHz; σ = 1.006 S/m; ε_r = 57.805; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(9.76, 9.76, 9.76); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0851 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.951 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.107 W/kg
SAR(1 g) = 0.060 W/kg; SAR(10 g) = 0.034 W/kg
Maximum value of SAR (measured) = 0.0846 W/kg



P23_LTE 2_QPSK20M_Front Face_10mm_Ch18900_1RB_OS0_Sample2nd_Ant1

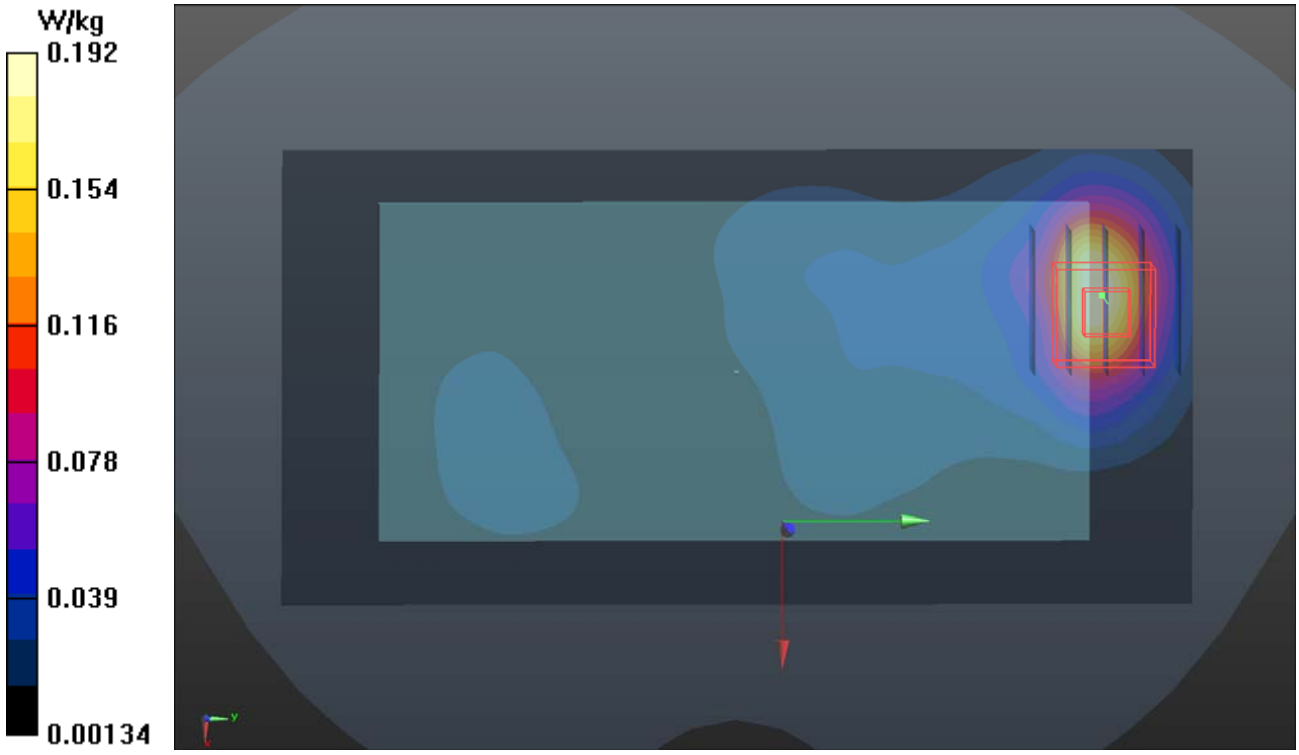
DUT: 180123C31

Communication System: LTE; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: B16T20N1_0321 Medium parameters used: f = 1880 MHz; σ = 1.552 S/m; ε_r = 51.304; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.0 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3578; ConvF(7.79, 7.79, 7.79); Calibrated: 2017/05/05;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2017/11/02
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.192 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.79 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.246 W/kg
SAR(1 g) = 0.135 W/kg; SAR(10 g) = 0.070 W/kg
Maximum value of SAR (measured) = 0.201 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2018/02/27

P24 LTE 5_QPSK10M_Rear Face_10mm_Ch20525_1RB_OS0_Sample2nd_Ant0

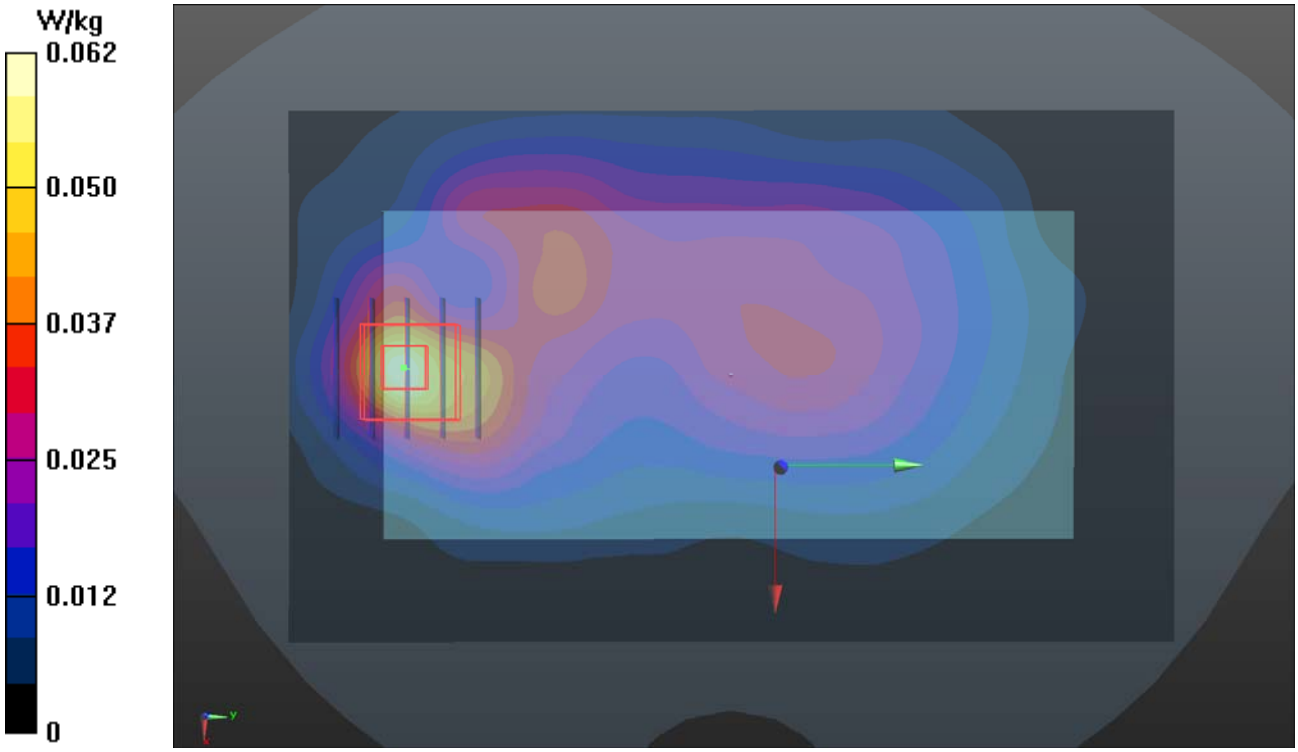
DUT: 180123C31

Communication System: LTE; Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium: B07T10N1_0227 Medium parameters used: f = 836.5 MHz; σ = 1.006 S/m; ε_r = 57.804; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(9.76, 9.76, 9.76); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0622 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.406 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.0790 W/kg
SAR(1 g) = 0.045 W/kg; SAR(10 g) = 0.025 W/kg
Maximum value of SAR (measured) = 0.0668 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2018/02/28

P25 LTE 7_QPSK20M_Rear Face_10mm_Ch21100_1RB_OS0_Sample2nd_Ant2

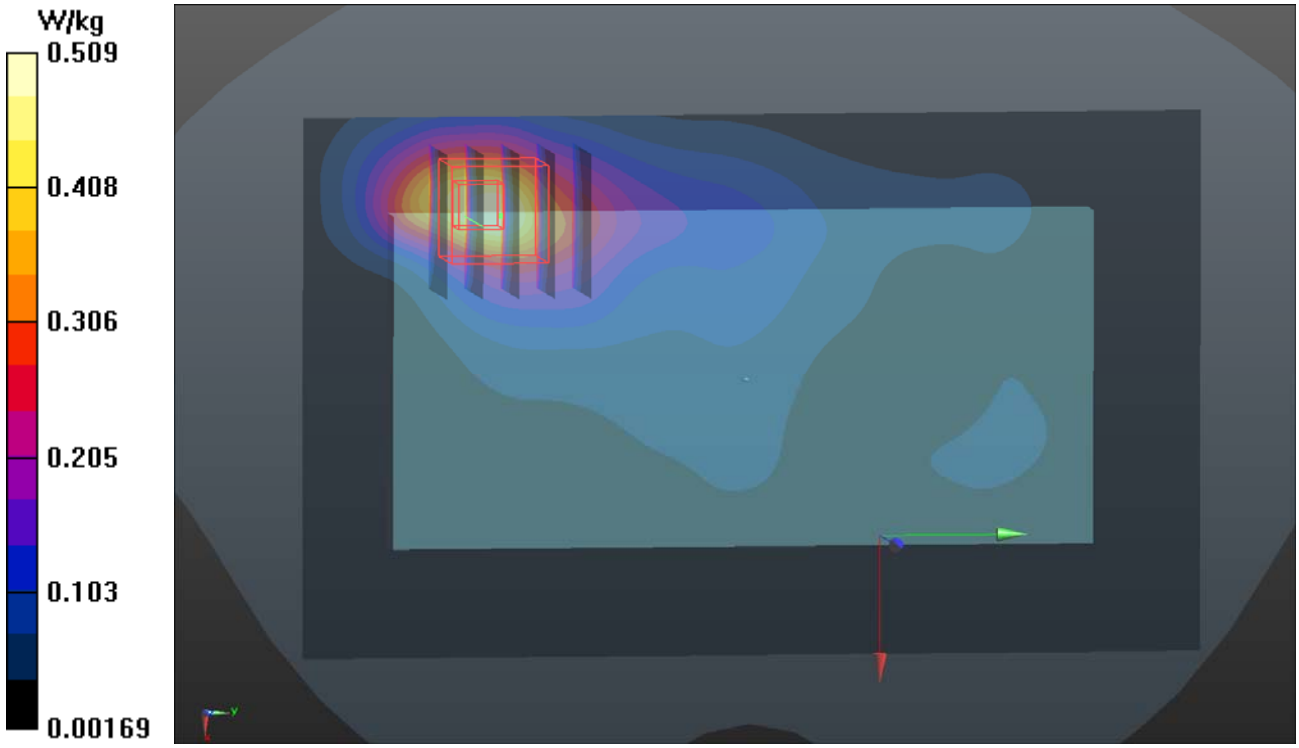
DUT: 180123C31

Communication System: LTE; Frequency: 2535 MHz;Duty Cycle: 1:1
Medium: B19T27N1_0228 Medium parameters used: f = 2535 MHz; σ = 2.091 S/m; ε_r = 50.314; ρ = 1000 kg/m^3
Ambient Temperature：23.8 ℃ ； Liquid Temperature：23.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(7.37, 7.37, 7.37); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (101x171x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.509 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.93 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.618 W/kg
SAR(1 g) = 0.315 W/kg; SAR(10 g) = 0.162 W/kg
Maximum value of SAR (measured) = 0.472 W/kg



P26_LTE 12_QPSK10M_Rear Face_10mm_Ch23095_1RB_OS0_Sample2nd_Ant0

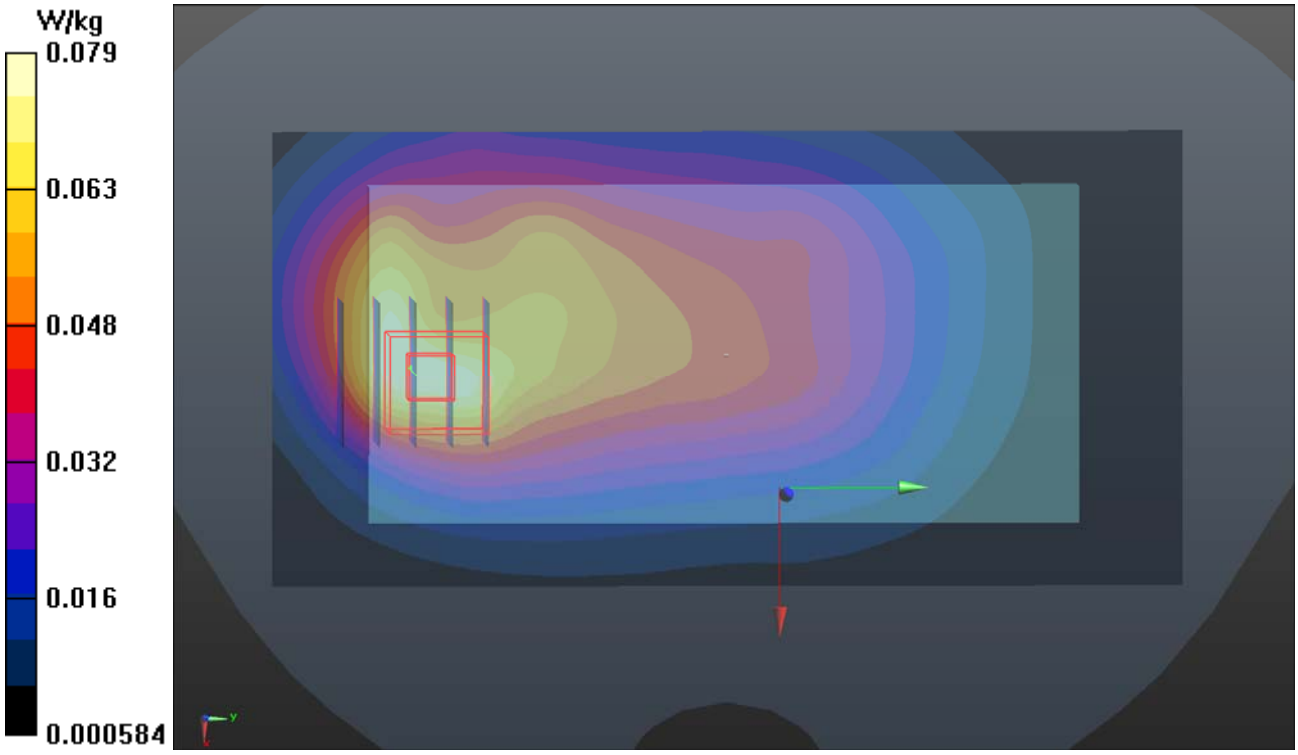
DUT: 180123C31

Communication System: LTE; Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium: B06T09N1_0321 Medium parameters used: f = 707.5 MHz; σ = 0.93 S/m; ε_r = 56.485; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.0 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3578; ConvF(9.77, 9.77, 9.77); Calibrated: 2017/05/05;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2017/11/02
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0791 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.840 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.104 W/kg
SAR(1 g) = 0.042 W/kg; SAR(10 g) = 0.019 W/kg
Maximum value of SAR (measured) = 0.0857 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2018/02/28

P27 LTE 13_QPSK10M_Rear Face_10mm_Ch23230_1RB_OS0_Sample2nd_Ant0

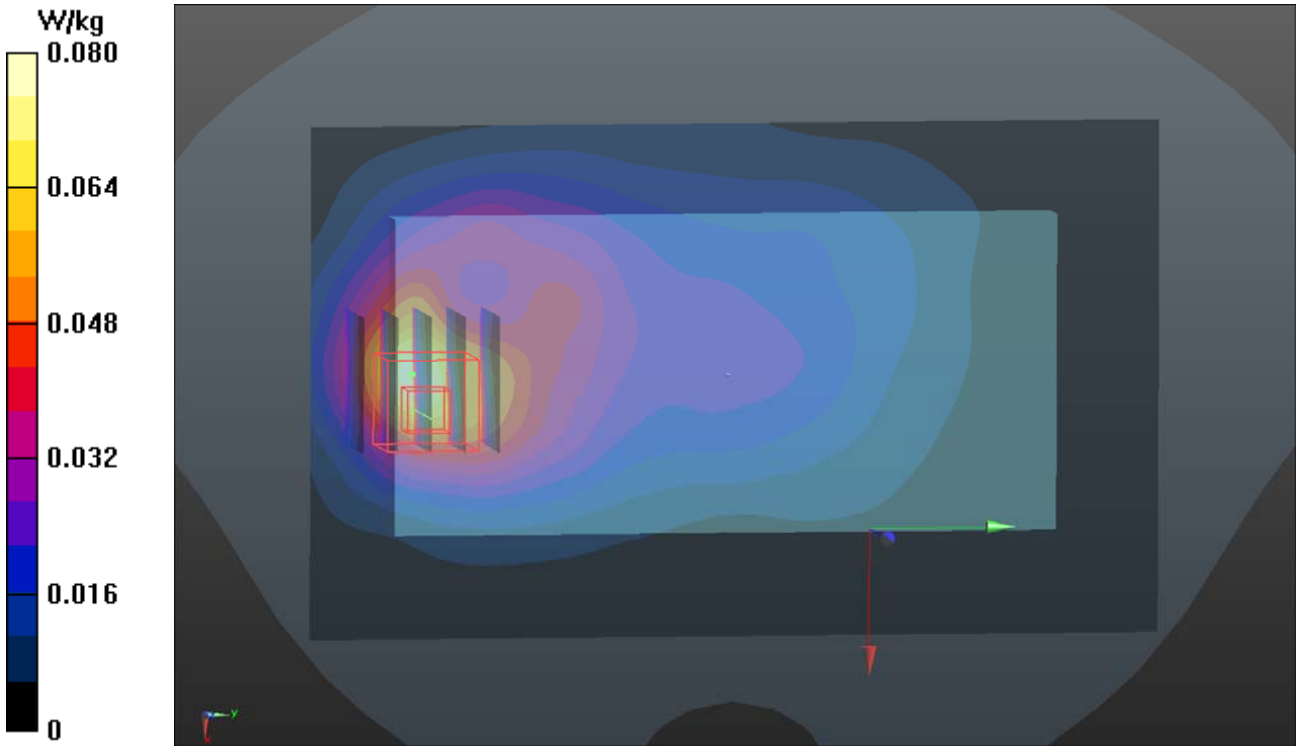
DUT: 180123C31

Communication System: LTE; Frequency: 782 MHz;Duty Cycle: 1:1
Medium: B06T09N1_0228 Medium parameters used: f = 782 MHz; σ = 0.999 S/m; ε_r = 53.471; ρ = 1000 kg/m^3
Ambient Temperature：23.9 ℃ ； Liquid Temperature：23.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(9.89, 9.89, 9.89); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0803 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.802 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.0910 W/kg
SAR(1 g) = 0.049 W/kg; SAR(10 g) = 0.027 W/kg
Maximum value of SAR (measured) = 0.0741 W/kg



P28 LTE 41_QPSK20M_Rear Face_10mm_Ch40620_1RB_OS0_Sample2nd_Ant2

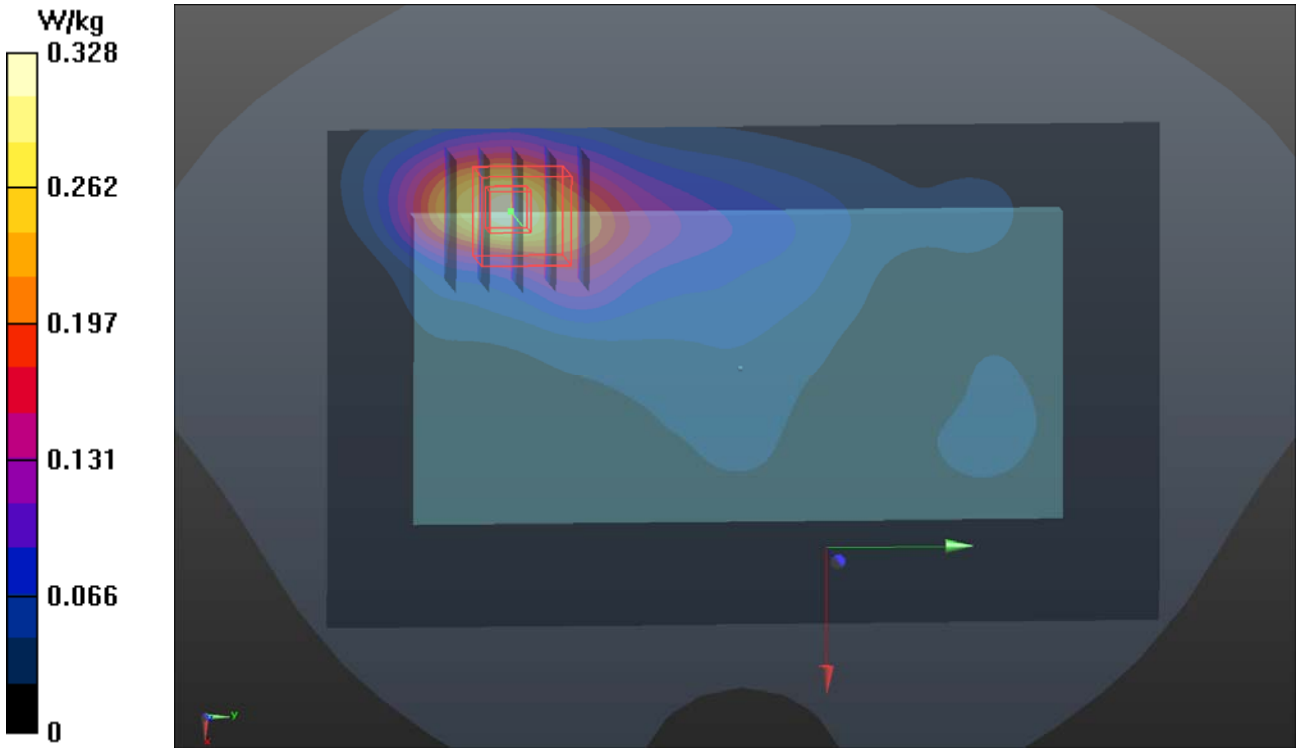
DUT: 180123C31

Communication System: LTE TDD CF0; Frequency: 2593 MHz;Duty Cycle: 1:1.58
Medium: B19T27N1_0228 Medium parameters used: f = 2593 MHz; σ = 2.158 S/m; ε_r = 50.143; ρ = 1000 kg/m^3
Ambient Temperature：23.8 ℃ ； Liquid Temperature：23.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(7.37, 7.37, 7.37); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (101x171x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.328 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.57 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.393 W/kg
SAR(1 g) = 0.198 W/kg; SAR(10 g) = 0.101 W/kg
Maximum value of SAR (measured) = 0.315 W/kg



P29 LTE 66_QPSK20M_Rear Face_10mm_Ch132322_1RB_OS0_Sample2nd_Ant0

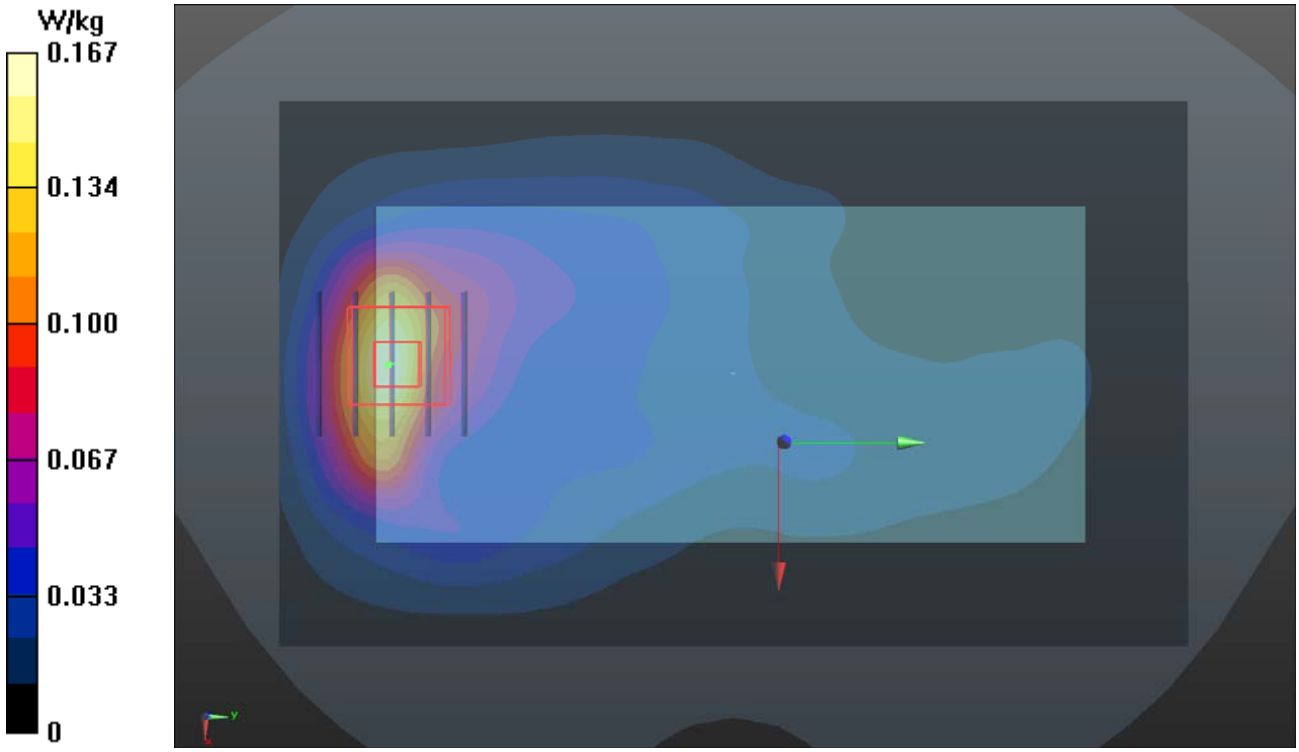
DUT: 180123C31

Communication System: LTE; Frequency: 1745 MHz;Duty Cycle: 1:1
Medium: B16T20N1_0227 Medium parameters used: f = 1745 MHz; σ = 1.425 S/m; ε_r = 51.836; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(8.27, 8.27, 8.27); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.167 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.61 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.214 W/kg
SAR(1 g) = 0.128 W/kg; SAR(10 g) = 0.073 W/kg
Maximum value of SAR (measured) = 0.180 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2018/03/22

P30 WLAN2.4G_802.11n HT40_Rear Face_10mm_Ch6_Sample2nd_Ant0+1

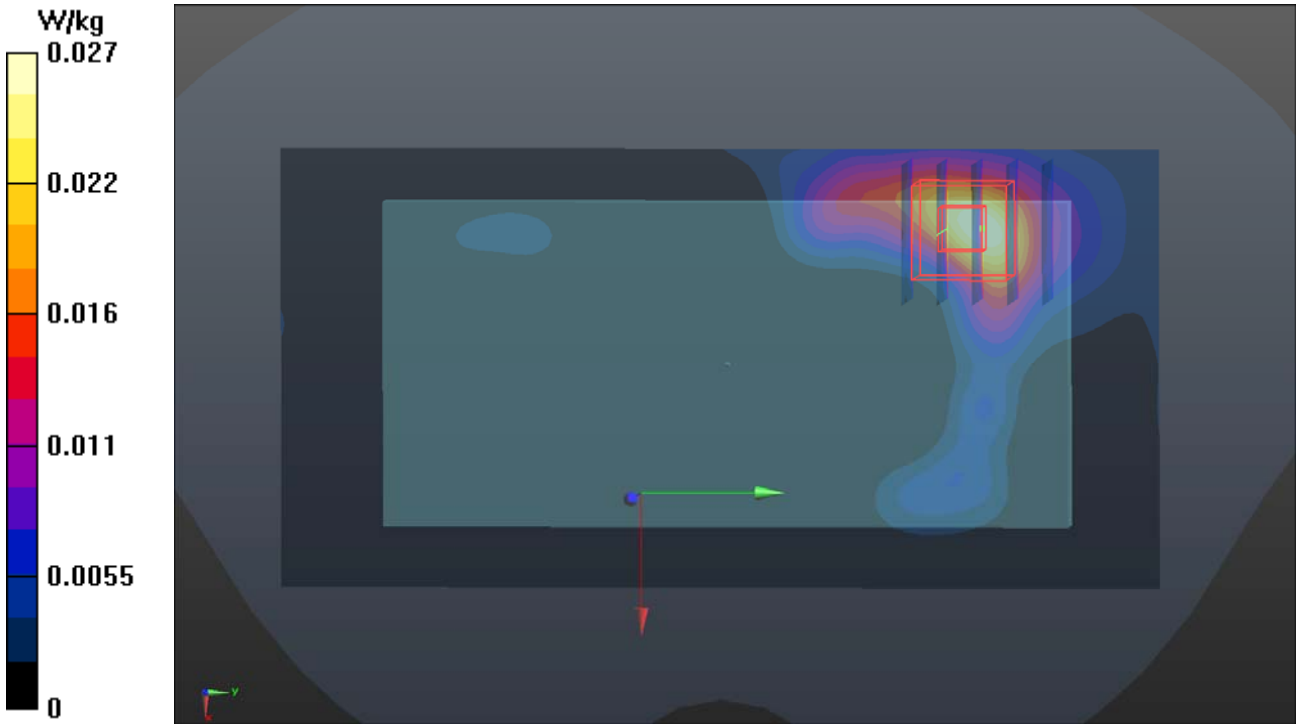
DUT: 180123C31

Communication System: WLAN_2.4G; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: B19T27N5_0322 Medium parameters used: f = 2437 MHz; σ = 1.982 S/m; ε_r = 51.361; ρ = 1000 kg/m^3
Ambient Temperature：23.ŵ ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3578; ConvF(7.43, 7.43, 7.43); Calibrated: 2017/05/05;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2017/11/02
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (91x171x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.0275 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.882 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 0.0400 W/kg
SAR(1 g) = 0.022 W/kg; SAR(10 g) = 0.011 W/kg
Maximum value of SAR (measured) = 0.0294 W/kg



P31 WLAN5G_802.11ac VHT80_Rear Face_10mm_Ch58_Sample2nd_Ant1

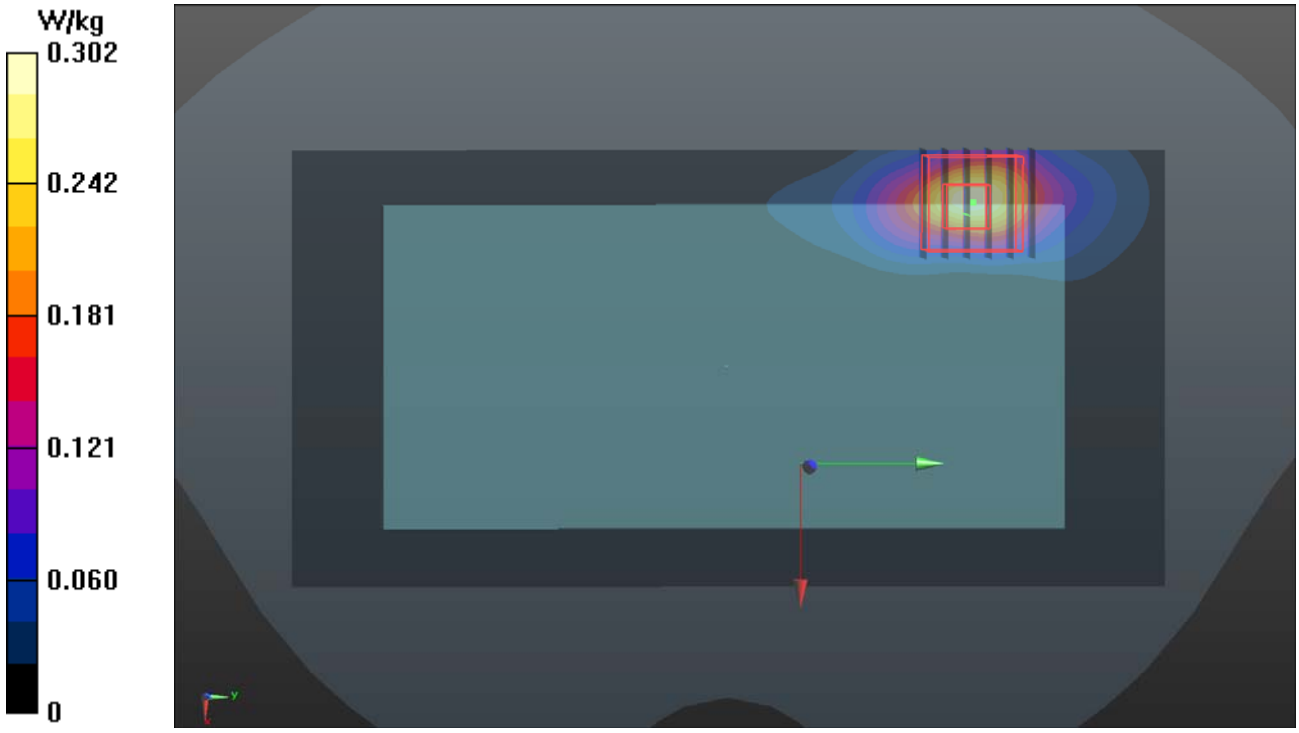
DUT: 180123C31

Communication System: WLAN_5G; Frequency: 5290 MHz;Duty Cycle: 1:1
Medium: B34T60N2_0322 Medium parameters used: f = 5290 MHz; σ = 5.524 S/m; ε_r = 46.847; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3578; ConvF(4.98, 4.98, 4.98); Calibrated: 2017/05/05;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2017/11/02
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (101x201x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.302 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 6.361 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.638 W/kg
SAR(1 g) = 0.090 W/kg; SAR(10 g) = 0.018 W/kg
Maximum value of SAR (measured) = 0.353 W/kg



P32 WLAN5G_802.11ac VHT80_Rear Face_10mm_Ch122_Sample2nd_Ant0+1

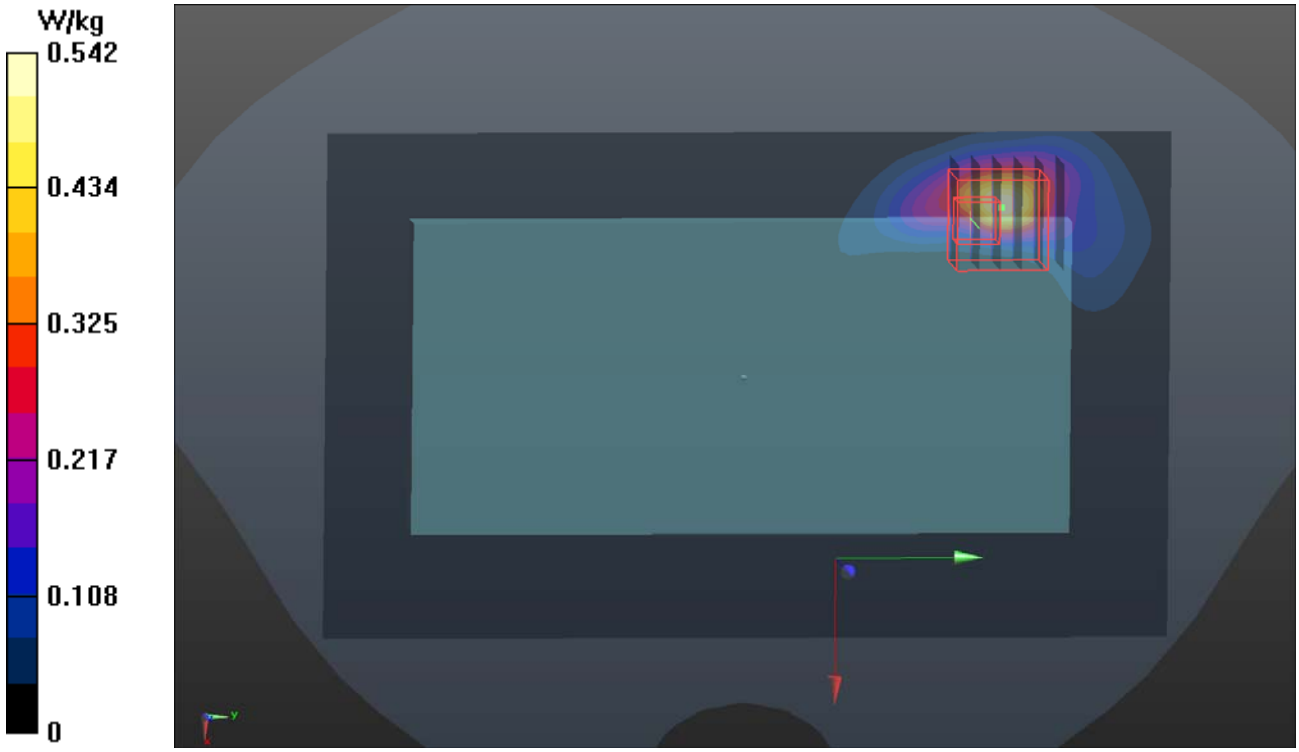
DUT: 180123C31

Communication System: WLAN_5G; Frequency: 5610 MHz;Duty Cycle: 1:1
Medium: B34T60N1_0228 Medium parameters used: f = 5610 MHz; σ = 5.916 S/m; ε_r = 46.793; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(4.29, 4.29, 4.29); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (121x201x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.542 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 10.52 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 1.12 W/kg
SAR(1 g) = 0.238 W/kg; SAR(10 g) = 0.062 W/kg
Maximum value of SAR (measured) = 0.654 W/kg



P33 WLAN5G_802.11ac VHT80_Rear Face_10mm_Ch155_Sample2nd_Ant0+1

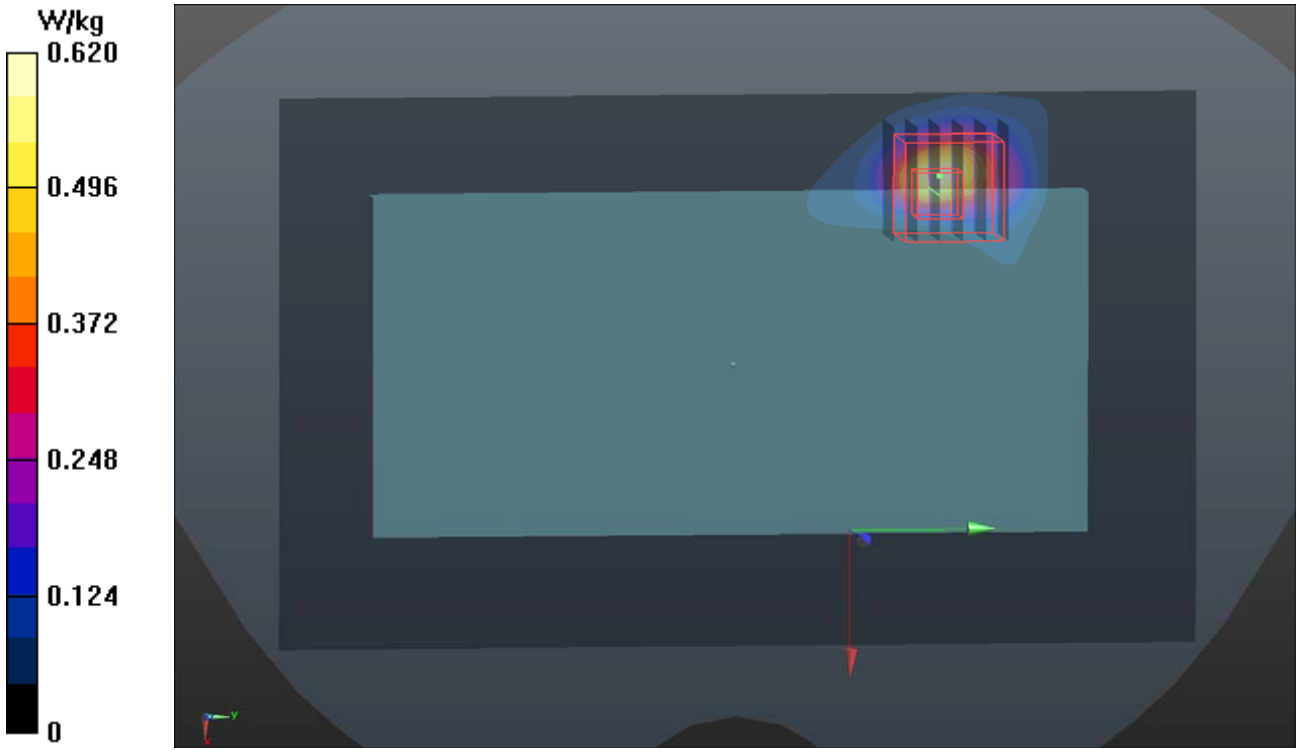
DUT: 180123C31

Communication System: WLAN_5G; Frequency: 5775 MHz;Duty Cycle: 1:1
Medium: B34T60N1_0228 Medium parameters used: f = 5775 MHz; σ = 6.15 S/m; ε_r = 46.565; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(4.61, 4.61, 4.61); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (121x201x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.620 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 10.71 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.13 W/kg
SAR(1 g) = 0.235 W/kg; SAR(10 g) = 0.062 W/kg
Maximum value of SAR (measured) = 0.610 W/kg



P34 GSM1900_GPRS12_Bottom Side_10mm_Ch661_Sample2nd_Ant0

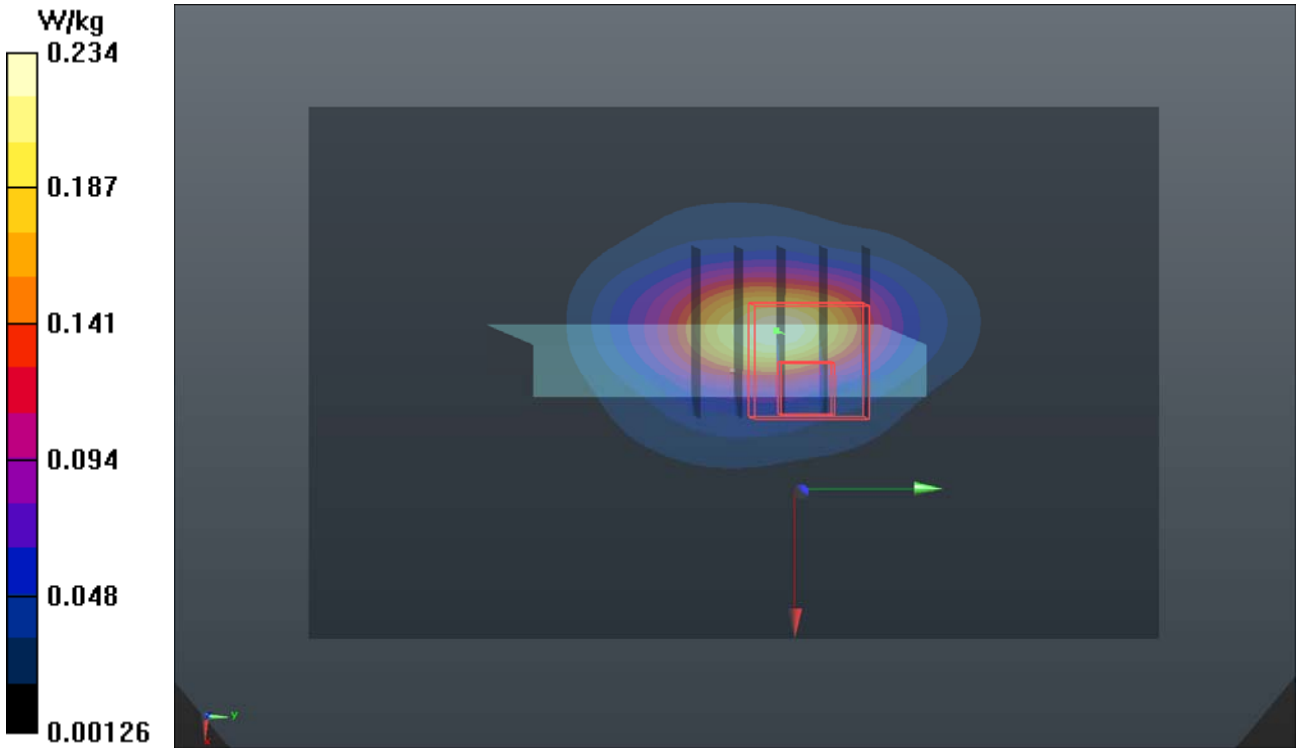
DUT: 180123C31

Communication System: GPRS12; Frequency: 1880 MHz;Duty Cycle: 1:2
Medium: B16T20N1_0227 Medium parameters used: f = 1880 MHz; σ = 1.546 S/m; ε_r = 51.468; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(8, 8, 8); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.234 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.79 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.270 W/kg
SAR(1 g) = 0.101 W/kg; SAR(10 g) = 0.023 W/kg
Maximum value of SAR (measured) = 0.153 W/kg



P35 WCDMA II_RMC12.2K_Bottom Side_10mm_Ch9400_Sample2nd_Ant0

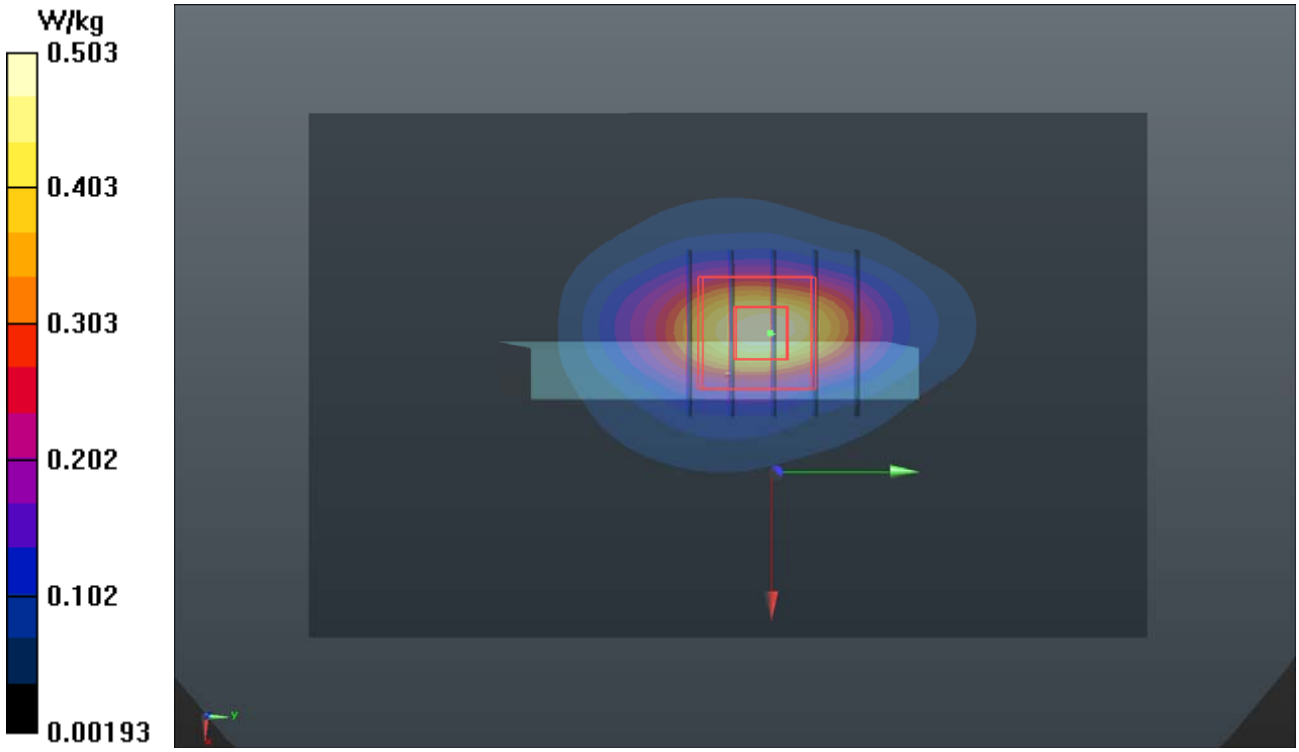
DUT: 180123C31

Communication System: WCDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: B16T20N1_0227 Medium parameters used: f = 1880 MHz; σ = 1.546 S/m; ε_r = 51.468; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(8, 8, 8); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.503 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.87 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.582 W/kg
SAR(1 g) = 0.286 W/kg; SAR(10 g) = 0.155 W/kg
Maximum value of SAR (measured) = 0.489 W/kg



P36 WCDMA IV_RMC12.2K_Bottom Side_10mm_Ch1413_Sample2nd_Ant0

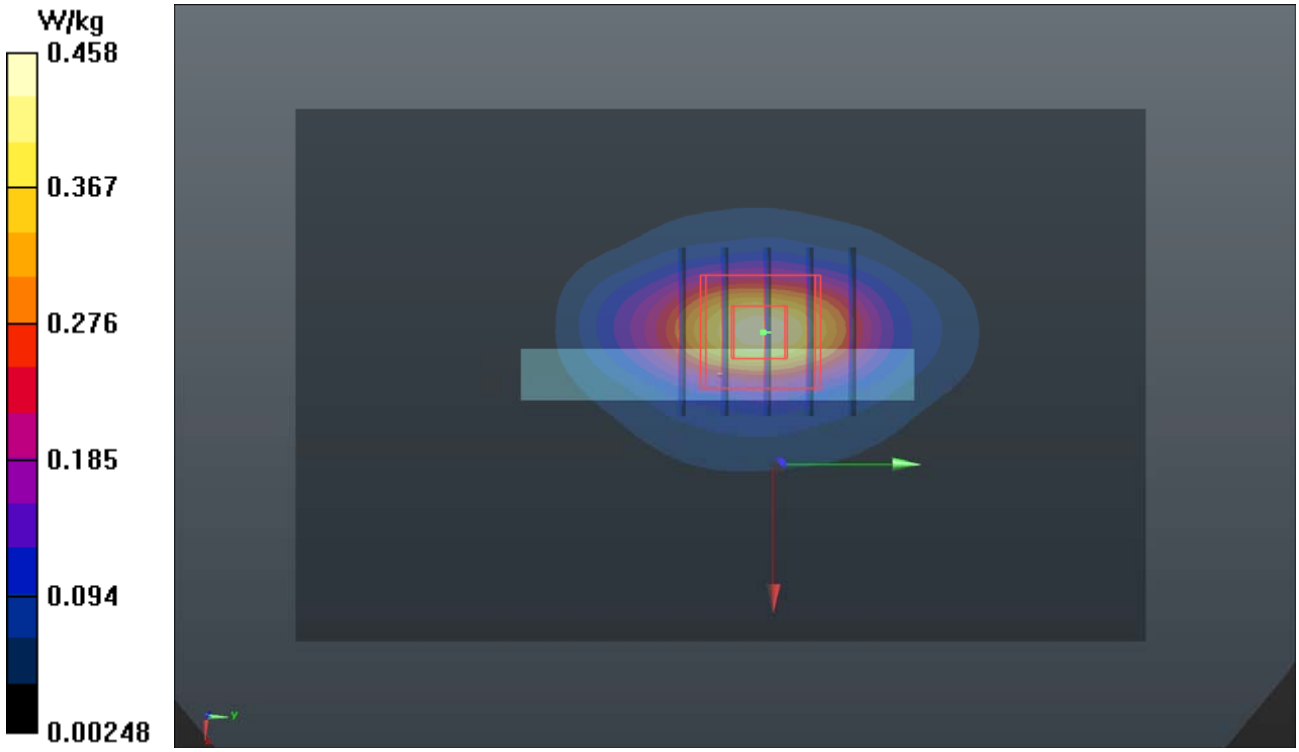
DUT: 180123C31

Communication System: WCDMA; Frequency: 1732.6 MHz;Duty Cycle: 1:1
Medium: B16T20N1_0227 Medium parameters used: f = 1733 MHz; σ = 1.413 S/m; ε_r = 51.87; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(8.27, 8.27, 8.27); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.458 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.45 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 0.519 W/kg
SAR(1 g) = 0.296 W/kg; SAR(10 g) = 0.161 W/kg
Maximum value of SAR (measured) = 0.442 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2018/02/27

P37 LTE 2_QPSK20M_Bottom Side_10mm_Ch18900_1RB_OS0_Sample2nd_Ant0

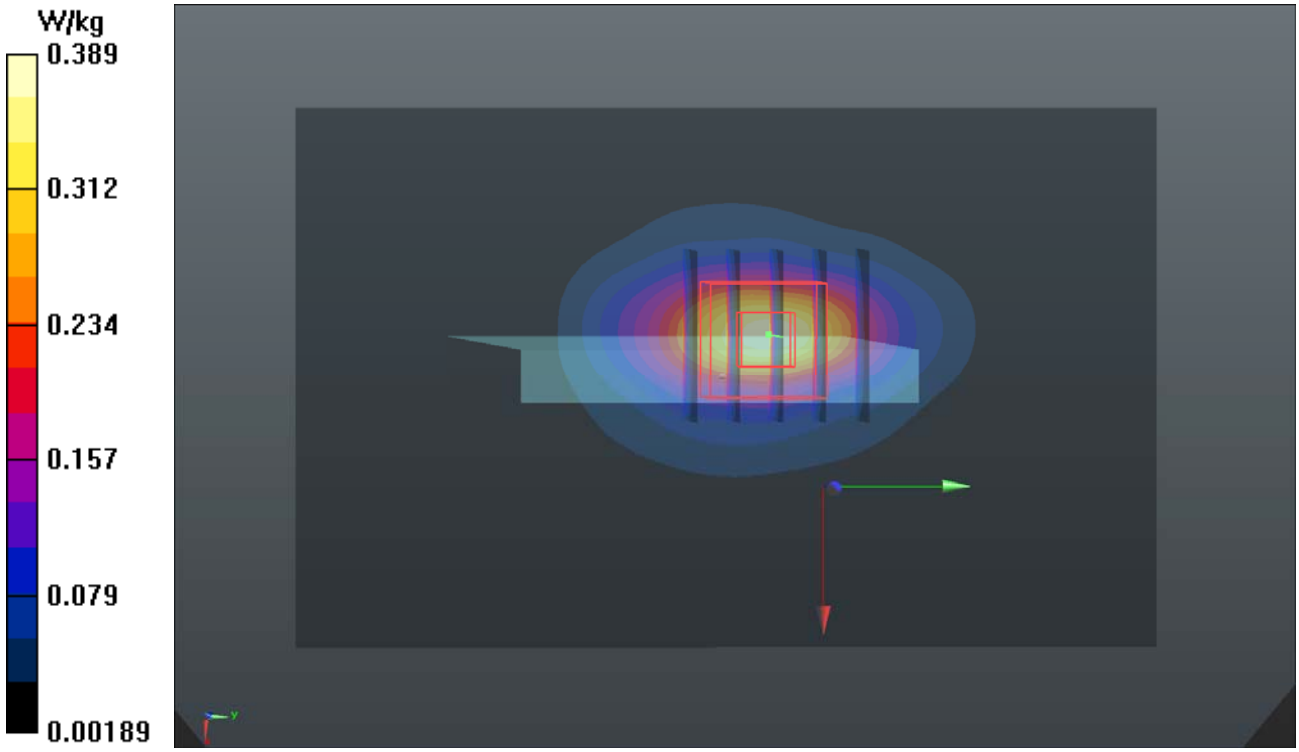
DUT: 180123C31

Communication System: LTE; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: B16T20N1_0227 Medium parameters used: f = 1880 MHz; σ = 1.546 S/m; ε_r = 51.468; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(8, 8, 8); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.389 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.12 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.346 W/kg
SAR(1 g) = 0.236 W/kg; SAR(10 g) = 0.127 W/kg
Maximum value of SAR (measured) = 0.275 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2018/02/28

P38 LTE 7_QPSK20M_Right Side_10mm_Ch21100_1RB_OS0_Sample2nd_Ant2

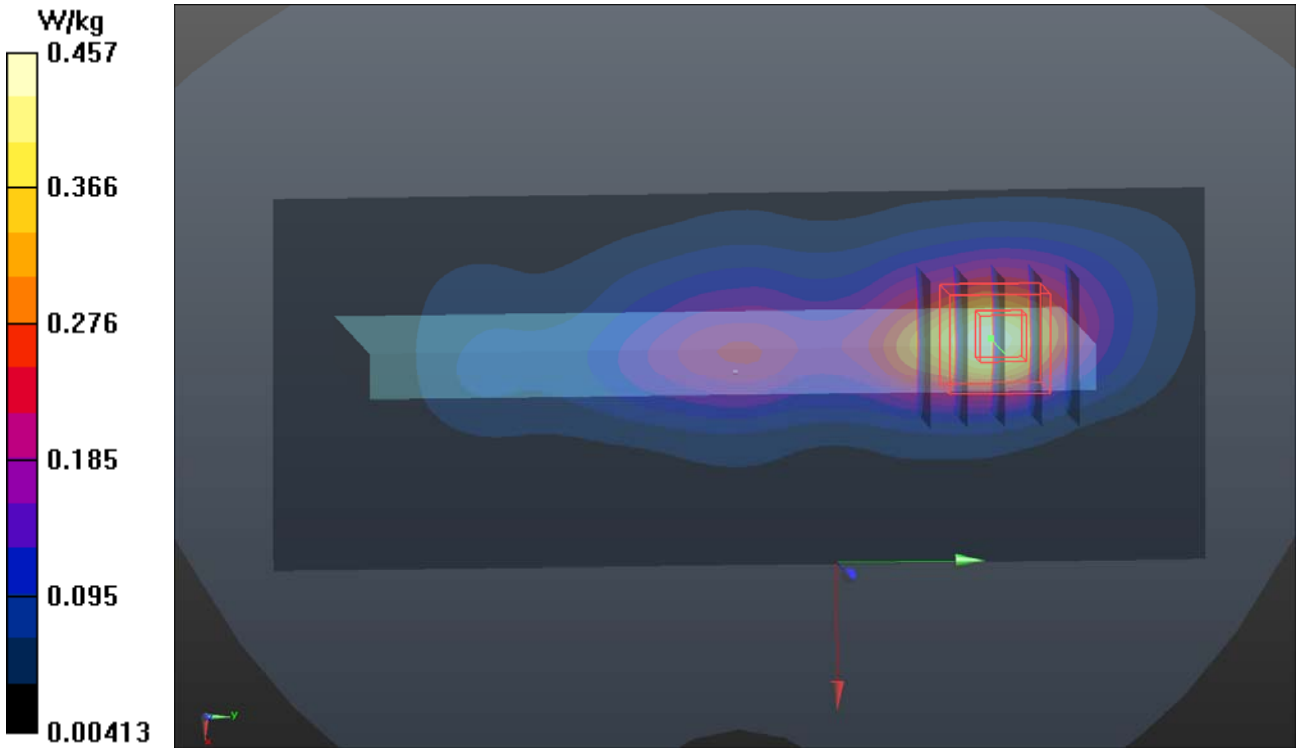
DUT: 180123C31

Communication System: LTE; Frequency: 2535 MHz;Duty Cycle: 1:1
Medium: B19T27N1_0228 Medium parameters used: f = 2535 MHz; σ = 2.091 S/m; ε_r = 50.314; ρ = 1000 kg/m^3
Ambient Temperature：23.8 ℃ ； Liquid Temperature：23.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(7.37, 7.37, 7.37); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x171x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.457 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.28 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.646 W/kg
SAR(1 g) = 0.325 W/kg; SAR(10 g) = 0.161 W/kg
Maximum value of SAR (measured) = 0.522 W/kg



P39 LTE 66_QPSK20M_Bottom Side_10mm_Ch132322_1RB_OS0_Sample2nd_Ant0

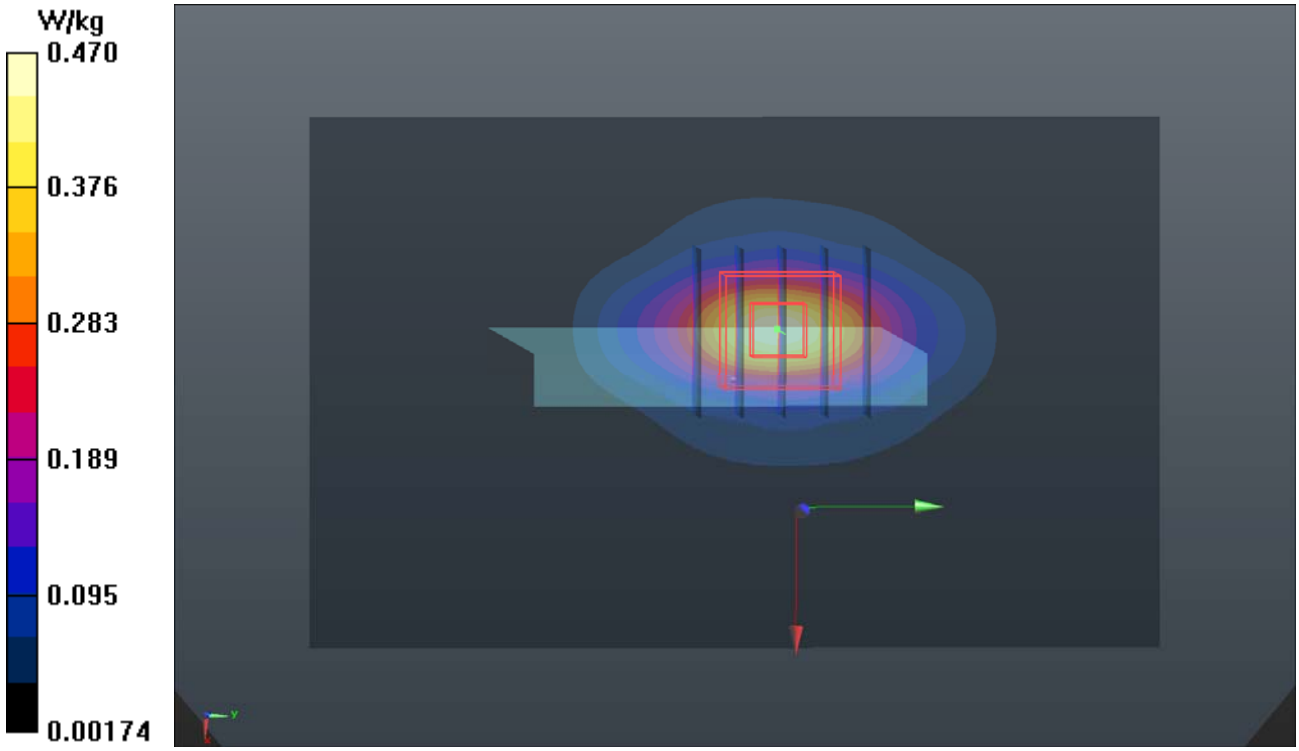
DUT: 180123C31

Communication System: LTE; Frequency: 1745 MHz;Duty Cycle: 1:1
Medium: B16T20N1_0227 Medium parameters used: f = 1745 MHz; σ = 1.425 S/m; ε_r = 51.836; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃ ； Liquid Temperature：23.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(8.27, 8.27, 8.27); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.470 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.50 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.518 W/kg
SAR(1 g) = 0.297 W/kg; SAR(10 g) = 0.162 W/kg
Maximum value of SAR (measured) = 0.442 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2018/03/22

P40 WLAN5G_802.11ac VHT40_Rear Face_10mm_Ch46_Sample2nd_Ant0+1

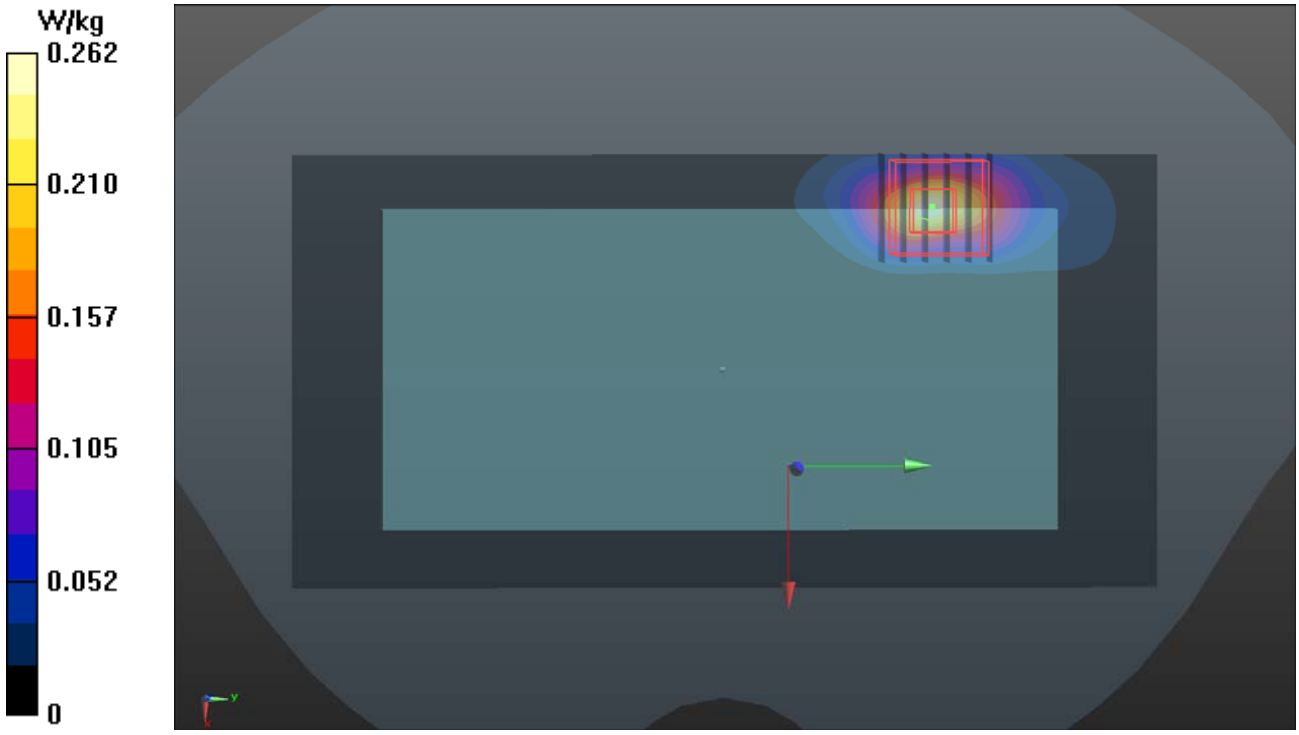
DUT: 180123C31

Communication System: WLAN_5G; Frequency: 5230 MHz;Duty Cycle: 1:1
Medium: B34T60N2_0322 Medium parameters used: f = 5230 MHz; σ = 5.459 S/m; ε_r = 47; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3578; ConvF(4.98, 4.98, 4.98); Calibrated: 2017/05/05;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2017/11/02
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (101x201x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.262 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 6.609 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.814 W/kg
SAR(1 g) = 0.101 W/kg; SAR(10 g) = 0.030 W/kg
Maximum value of SAR (measured) = 0.224 W/kg



P41 WLAN5G_802.11ac VHT80_Rear Face_0mm_Ch58_Sample2nd_Ant1

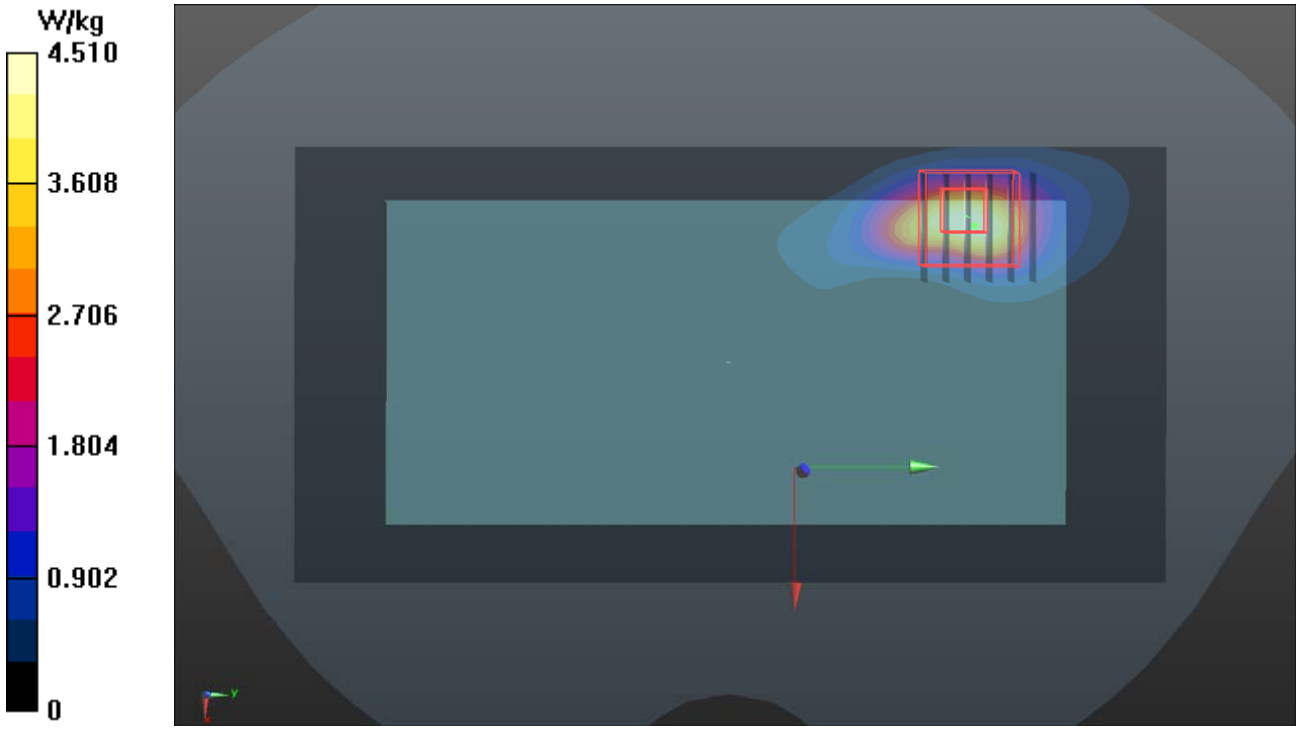
DUT: 180123C31

Communication System: WLAN_5G; Frequency: 5290 MHz;Duty Cycle: 1:1
Medium: B34T60N2_0322 Medium parameters used: f = 5290 MHz; σ = 5.524 S/m; ε_r = 46.847; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3578; ConvF(4.98, 4.98, 4.98); Calibrated: 2017/05/05;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn360; Calibrated: 2017/11/02
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (101x201x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 4.51 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 10.23 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 4.95 W/kg
SAR(1 g) = 1.74 W/kg; SAR(10 g) = 0.294 W/kg
Maximum value of SAR (measured) = 2.50 W/kg



P42 WLAN5G_802.11ac VHT80_Rear Face_0mm_Ch122_Sample2nd_Ant0+1

DUT: 180123C31

Communication System: WLAN_5G; Frequency: 5610 MHz;Duty Cycle: 1:1
Medium: B34T60N1_0228 Medium parameters used: f = 5610 MHz; σ = 5.916 S/m; ε_r = 46.793; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(4.29, 4.29, 4.29); Calibrated: 2017/07/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: Twin SAM Phantom_1652; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (121x201x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 6.17 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 33.57 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 30.9 W/kg
SAR(1 g) = 3.53 W/kg; SAR(10 g) = 0.604 W/kg
Maximum value of SAR (measured) = 11.1 W/kg