FCC SAR Test Report

Report No.	:	**SA170616C12**
Applicant	:	**Huawei Technologies Co., Ltd.**
Address	:	**Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C**
Product	:	**LTE Module**
FCC ID	:	**QISME906S-158**
Brand	:	**HUAWEI**
Model No.	:	**ME906s-158**
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 616217 D04 v01r02, KDB 941225 D01 v03r01, KDB 941225 D05 v02r05**
Sample Received Date	:	**Jun. 16, 2017**
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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.

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Release Control Record

Report No.	Reason for Change	Date Issued
SA170616C12	Initial release	Aug. 01, 2017

1. Summary of Maximum SAR Value

Equipment Class	Mode	Highest SAR-1g Body (W/kg)
PCB	GSM850	0.84
	GSM1900	0.79
	WCDMA II	1.06
	WCDMA V	0.64
	LTE 2	0.89
	LTE 5	0.77
	LTE 7	1.18
DTS	2.4G WLAN	0.6
NII	5.3G WLAN	0.64
	5.6G WLAN	0.42
	5.8G WLAN	0.47
DSS	Bluetooth	N/A
Highest Simultaneous Transmission SAR		Body
		1.58

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. Description of Equipment Under Test

EUT Type	LTE Module
FCC ID	QISME906S-158
Brand Name	HUAWEI
Model Name	ME906s-158
Tx Frequency Bands (Unit: MHz)	GSM850 : 824.2 ~ 848.8 GSM1900 : 1850.2 ~ 1909.8 WCDMA Band II : 1852.4 ~ 1907.6 WCDMA Band V : 826.4 ~ 846.6 LTE Band 2 : 1850.7 ~ 1909.3 (BW: 1.4M, 3M, 5M, 10M, 15M, 20M) LTE Band 5 : 824.7 ~ 848.3 (BW: 1.4M, 3M, 5M, 10M) LTE Band 7 : 2502.5 ~ 2567.5 (BW: 5M, 10M, 15M, 20M) WLAN : 2412 ~ 2462, 5180 ~ 5240, 5260 ~ 5320, 5500 ~ 5700, 5745 ~ 5825 Bluetooth : 2402 ~ 2480
Uplink Modulations	GPRS : GMSK EDGE : 8PSK WCDMA : QPSK LTE : QPSK, 16QAM 802.11b : DSSS 802.11a/g/n/ac : OFDM Bluetooth : GFSK, π/4-DQPSK, 8-DPSK
Maximum Tune-up Conducted Power (Unit: dBm)	GSM850 : 33.5 GSM1900 : 30.5 WCDMA Band II : 24.0 WCDMA Band V : 24.0 LTE Band 2 : 24.0 LTE Band 5 : 24.0 LTE Band 7 : 24.0 WLAN 2.4G : 14.5 WLAN 5.2G : 9.5 WLAN 5.3G : 9.5 WLAN 5.6G : 9.5 WLAN 5.8G : 9.5 Bluetooth : 4.0
Antenna Type	WWAN: Fixed Internal Antenna WLAN/ BT: PCB Antenna (Peak Antenna Gain : 1.64 dBi for 2.4GHz, 3.68 dBi for 5GHz)
EUT Stage	Identical Prototype

Note:

1. The EUT was installed in ASUS Tablet (Brand: ASUS, Model: T103H /R107H /H103H).
2. The information of WLAN and WWAN module collocated in this EUT is listed as below.

Item	Brand Name	Model Name	Specification
WLAN module	Qualcomm Atheros AZWAVE	QCNFA425 AW-CM251NF	802.11 a/b/g/n/ac WLAN+ Bluetooth

3. 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.

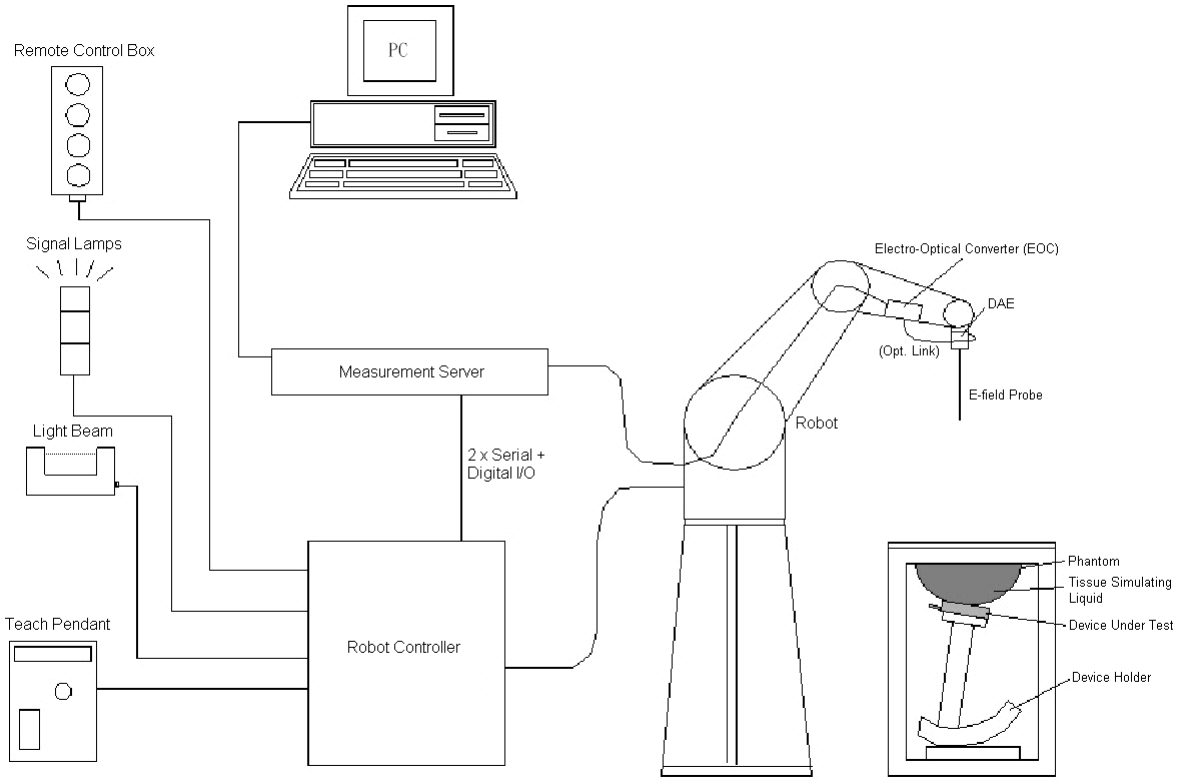


Fig-3.1 SPEAG DASY52 System Setup

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.

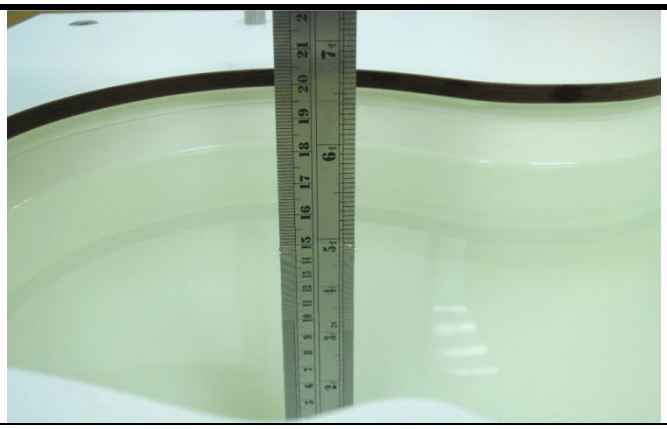
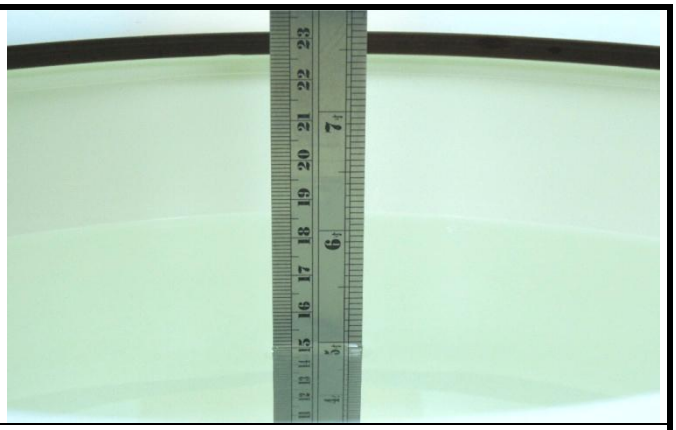
	

Photo of Liquid Height for Head Position	**Photo of Liquid Height for Body Position**

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.

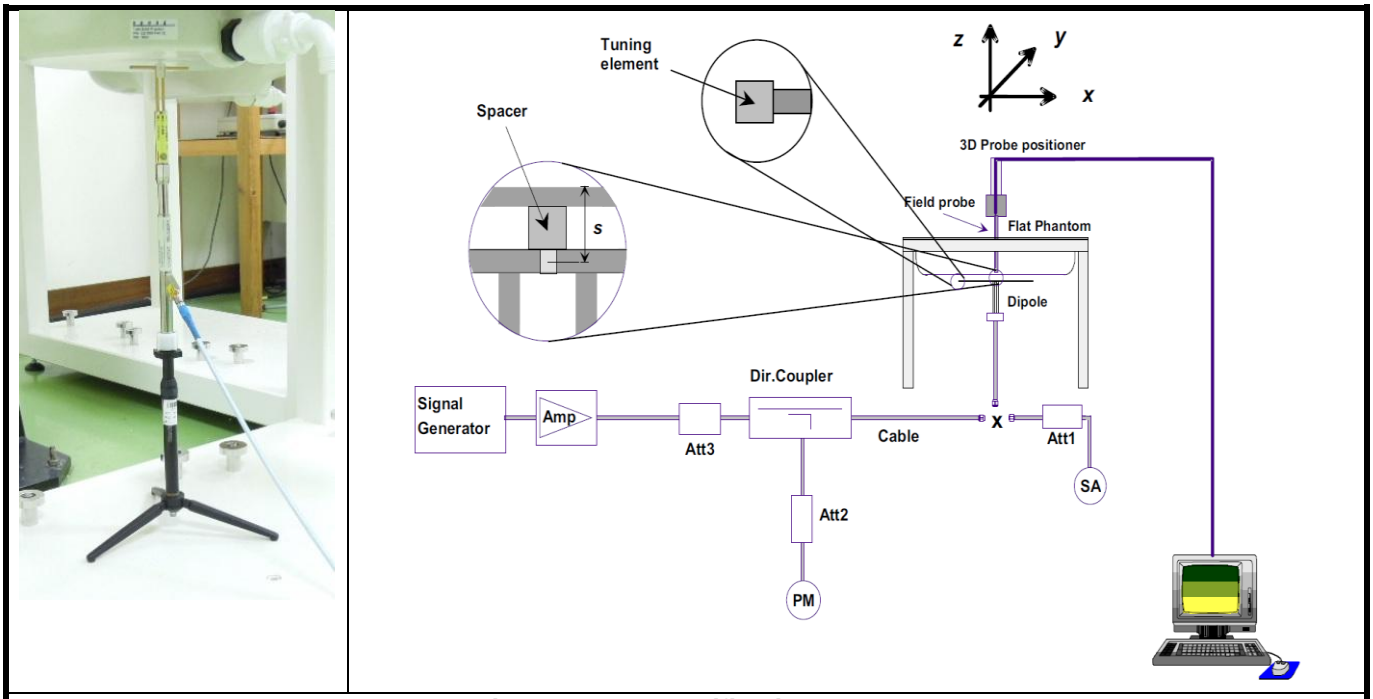


Fig-3.3 System Verification Setup

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

<Considerations Related to Proximity Sensor>

The device supports WWAN, WLAN, and Bluetooth capabilities. It is designed with a proximity sensor which can trigger/not trigger power reduction for GSM, WCDMA and LTE on Rear Face and Top Side of EUT for SAR compliance. Others RF capability (WLAN and Bluetooth) have no power reduction. The power levels for all wireless technologies and the power reduction please refer to section 4.6 of this report.

Proximity Sensor Triggering Distances (KDB 616217 D04 §6.2)

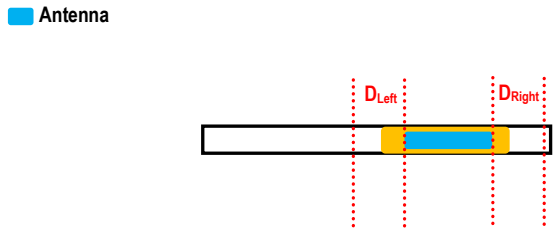
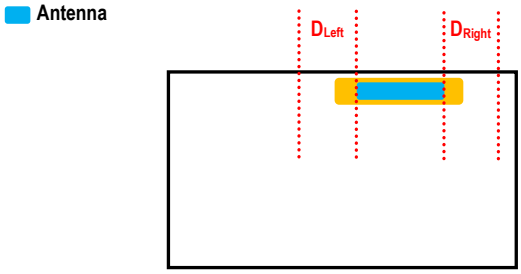
The proximity sensor triggering distance was determined per KDB 616217 for rear face and applicable edge. Summary for power verification per distance was tabulated in the below table.

Output Power Verification in dBm for EUT Rear Face											
Distance (mm)	13	14	15	16	17	18	19	20	21	22	23
GSM850, GPRS 1Tx	27.2	27.1	26.8	27.2	26.8	27.0	33.0	32.5	32.6	32.6	32.5
GSM850, GPRS 2Tx	24.4	24.1	24.2	24.5	24.4	24.1	30.9	30.7	30.7	30.7	30.7
GSM850, GPRS 3Tx	23.9	23.9	24.0	24.1	24.2	23.9	29.4	29.6	29.7	29.6	29.4
GSM850, GPRS 4Tx	21.9	21.9	21.7	21.7	21.7	21.7	27.8	27.7	27.9	27.8	27.6
GSM850, EDGE 1Tx	22.0	21.8	22.0	22.1	22.1	21.6	26.9	27.0	27.3	27.4	27.2
GSM850, EDGE 2Tx	19.5	19.3	19.2	19.6	19.4	19.2	24.8	24.7	24.6	24.9	24.6
GSM850, EDGE 3Tx	19.1	19.1	19.1	19.2	19.4	18.9	24.5	24.5	24.3	24.6	24.7
GSM850, EDGE 4Tx	16.7	16.9	16.7	16.8	16.7	16.9	22.0	22.1	22.2	22.4	22.5
GSM1900, GPRS 1Tx	20.8	20.4	20.7	20.6	20.5	20.8	30.3	30.2	30.2	30.1	30.0
GSM1900, GPRS 2Tx	18.2	18.4	18.3	18.6	18.2	18.5	28.4	28.2	28.4	28.4	28.5
GSM1900, GPRS 3Tx	17.8	17.7	17.5	17.9	17.7	17.7	27.3	27.1	27.2	27.0	27.4
GSM1900, GPRS 4Tx	15.9	15.7	15.9	15.7	16.0	15.6	25.2	25.3	25.4	25.6	25.6
GSM1900, EDGE 1Tx	15.6	15.8	15.4	15.7	15.6	15.3	26.4	26.3	26.2	26.4	26.1
GSM1900, EDGE 2Tx	13.5	13.3	13.6	13.3	13.2	13.3	24.3	24.3	23.9	24.0	24.3
GSM1900, EDGE 3Tx	12.9	12.7	12.7	12.7	12.6	12.8	23.4	23.0	23.1	23.3	23.3
GSM1900, EDGE 4Tx	10.6	10.4	10.7	10.7	10.5	10.7	21.2	21.2	20.8	21.2	21.2
WCDMA II	13.4	13.4	13.9	13.7	13.9	13.5	23.1	23.2	23.4	23.3	23.2
WCDMA V	17.8	17.4	17.6	17.8	17.5	17.7	22.9	22.9	23.1	23.3	23.0
LTE 2	13.5	13.5	13.9	13.5	13.7	13.5	23.2	23.4	23.1	23.4	23.4
LTE 5	18.1	18.0	18.0	18.2	18.3	18.1	23.1	22.7	22.7	22.7	23.1
LTE 7	13.9	13.9	13.7	13.7	14.2	14.1	23.1	23.3	23.2	22.8	23.2

Output Power Verification in dBm for EUT Top Edge											
Distance (mm)	12	13	14	15	16	17	18	19	20	21	22
GSM850, GPRS 1Tx	26.9	27.0	26.8	26.9	27.2	26.8	32.5	32.8	32.5	32.5	32.7
GSM850, GPRS 2Tx	24.3	24.5	24.1	24.6	24.3	24.2	30.7	30.4	30.7	30.9	30.5
GSM850, GPRS 3Tx	24.4	23.9	24.3	24.0	24.2	24.4	29.4	29.7	29.5	29.5	29.7
GSM850, GPRS 4Tx	21.8	21.8	22.0	22.1	21.8	21.8	27.6	27.6	27.4	27.5	27.8
GSM850, EDGE 1Tx	22.0	21.6	22.1	21.8	22.1	21.7	27.2	27.1	27.2	27.0	27.4
GSM850, EDGE 2Tx	19.6	19.1	19.1	19.2	19.3	19.3	24.5	24.8	24.9	24.4	24.8
GSM850, EDGE 3Tx	19.1	19.3	19.0	19.4	18.9	19.4	24.3	24.3	24.7	24.5	24.3
GSM850, EDGE 4Tx	16.9	16.9	16.7	17.1	17.1	16.9	22.5	22.5	22.5	22.2	22.3
GSM1900, GPRS 1Tx	20.8	20.8	20.5	20.6	20.3	20.8	30.1	30.1	30.2	30.0	30.1
GSM1900, GPRS 2Tx	18.3	18.5	18.4	18.6	18.6	18.3	28.0	28.2	28.4	28.1	28.5
GSM1900, GPRS 3Tx	18.0	17.8	17.6	17.9	17.8	18.0	27.2	27.0	27.2	27.4	27.0
GSM1900, GPRS 4Tx	15.8	16.0	15.6	15.8	15.8	15.9	25.3	25.6	25.5	25.3	25.6
GSM1900, EDGE 1Tx	15.4	15.6	15.5	15.7	15.5	15.3	26.5	26.3	26.4	26.3	26.3
GSM1900, EDGE 2Tx	13.6	13.3	13.3	13.6	13.6	13.3	24.1	24.1	24.2	24.3	23.9
GSM1900, EDGE 3Tx	12.6	12.8	12.5	12.9	12.9	12.7	23.4	22.9	22.9	22.9	23.3
GSM1900, EDGE 4Tx	10.4	10.5	10.8	10.9	10.6	10.5	21.0	20.8	21.1	21.3	20.9
WCDMA II	13.8	13.4	13.4	13.5	13.5	13.8	23.3	23.0	23.0	23.0	23.0
WCDMA V	17.6	17.9	17.5	17.7	17.9	17.7	22.8	23.1	23.3	22.9	22.8
LTE 2	13.4	13.6	13.8	13.5	13.4	13.6	23.6	23.6	23.3	23.3	23.4
LTE 5	18.0	18.1	18.2	17.9	17.9	18.2	23.2	23.1	22.8	23.0	22.8
LTE 7	14.2	14.2	13.7	13.9	14.0	14.1	23.0	22.9	23.1	23.2	23.1

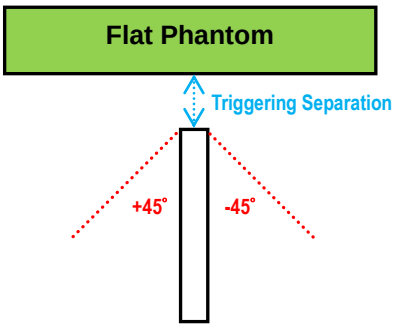
Proximity Sensor Coverage (KDB 616217 D04 §6.3)

The proximity sensor coverage was determined per KDB 616217 for rear face and applicable edge. Summary for proximity sensor active region is illustrated in below.

	
P-sensor Coverage for Rear Face: D_{Left} is 15 mm, D_{Right} is 3 mm	**P-sensor Coverage for Top Edge:** D_{Left} is 3 mm, D_{Right} is 2 mm

Proximity Sensor Tilt Angle Influences (KDB 616217 D04 §6.4)

The proximity sensor tilt angle influence was determined per KDB 616217 for applicable edge. Summary for proximity sensor tilt angle influence is shown in below.



Orientation	Separation Distance (mm)	Tilt Angle										
		-45°	-40°	-30°	-20°	-10°	0°	10°	20°	30°	40°	45°
Top Edge	17	On	On	On	On	On	On	On	On	On	On	On

Summary for Proximity Sensor Triggering Test

According to the procedures noticed in KDB 616217 D04, the proximity sensor triggering distance is 18 mm for EUT Rear Face, and 17 mm for Top Side. The separation distance of 17 mm determined by the smallest triggering distance on Top Side is used to access the tilt angle influence and the sensor does not release during ±45 degree. Therefore, the smallest separation distance for tilt angle influence is 16 mm for the Top Side. The conservation triggering distances based on the separation distance for the sensor trigger / not triggered as EUT with power reduction at 0 mm, and EUT without power reduction at 17 mm for EUT Rear Face, and 16 mm for Top Side were used to test SAR.

The power reduction is depends on the proximity sensor input. For a steady SAR test, the power reduction was enabled or disabled manually by engineering software during SAR testing.

<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 11 (max. uplink: 3, max. downlink: 4, total timeslots: 5)
3. This EUT supports EDGE multi-slot class 11 (max. uplink: 3, max. downlink: 4, total timeslots: 5)

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

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

<Considerations Related to WCDMA for Setup and Testing>

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.

<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**
5	**V**	**V**	**V**	**V**		
7			**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

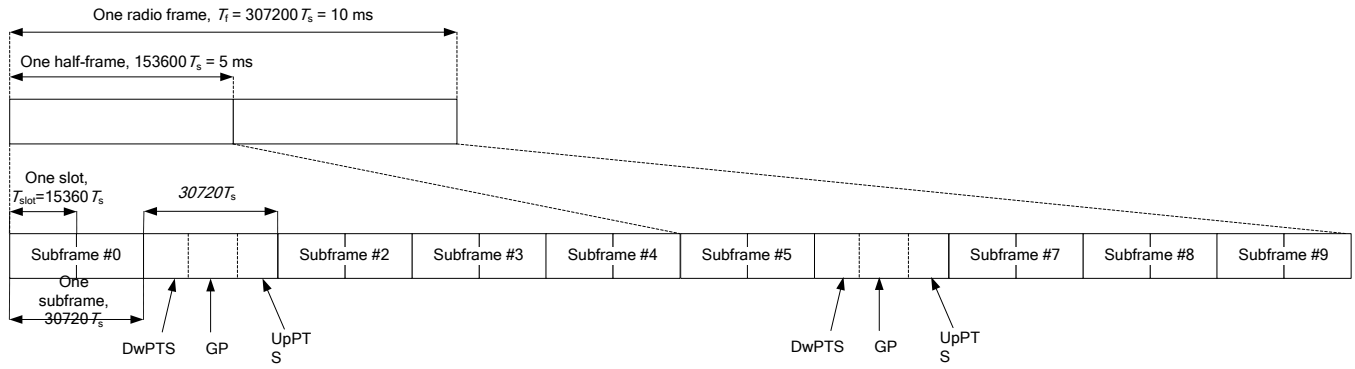
Note: MPR is according to the standard and implemented in the circuit (mandatory).

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%.

<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

4.2.1 Body Exposure Conditions

For laptop PC, according to KDB 616217 D04, SAR evaluation is required for the bottom surface of the keyboard. This EUT was tested in the base of EUT directly against the flat phantom. The required minimum test separation distance for incorporating transmitters and antennas into laptop computer display is determined with the display screen opened at an angle of 90° to the keyboard compartment.

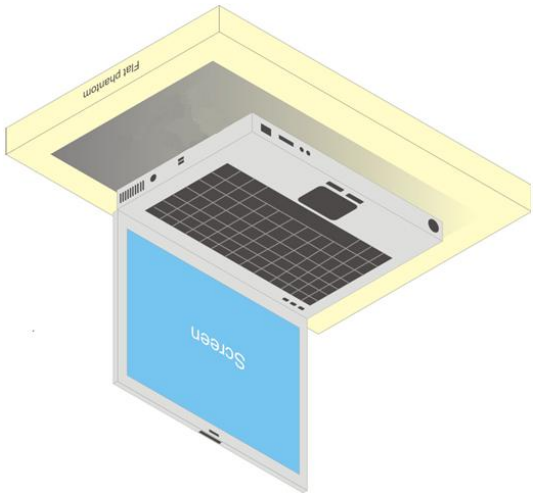


Fig-4.1 Illustration for Laptop Setup

For full-size tablet, according to KDB 616217 D04, SAR evaluation is required for back surface and edges of the devices. The back surface and edges of the tablet are tested with the tablet touching the phantom. Exposures from antennas through the front surface of the display section of a tablet are generally limited to the user's hands. Exposures to hands for typical consumer transmitters used in tablets are not expected to exceed the extremity SAR limit; therefore, SAR evaluation for the front surface of tablet display screens are generally not necessary. When voice mode is supported on a tablet and it is limited to speaker mode or headset operations only, additional SAR testing for this type of voice use is not required.

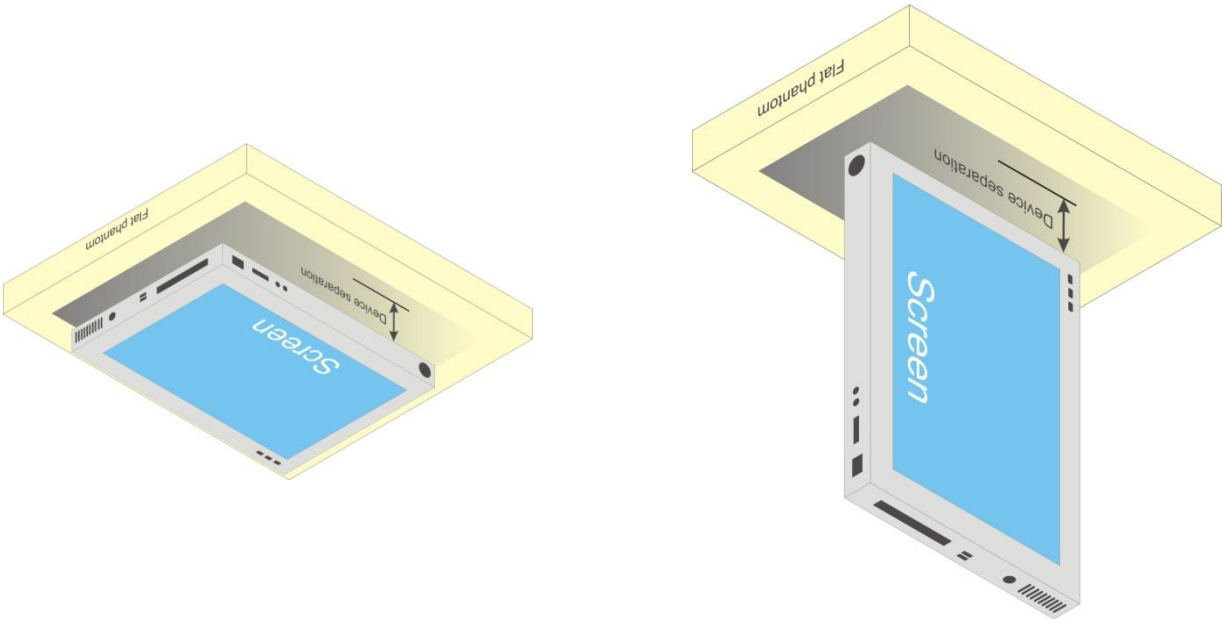


Fig-4.2 Illustration for Tablet Setup

4.2.2 SAR Test Exclusion Evaluations

According to KDB 447498 D01, the SAR test exclusion condition is based on source-based time-averaged maximum conducted output power, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions. The SAR exclusion threshold is determined by the following formula.

1. For the test separation distance <= 50 mm

$$\frac{\textbf{Max. Tune up Power}_{(mW)}}{\textbf{Min. Test Separation Distance}_{(mm)}} \times \sqrt{f_{(GHz)}} \leq \textbf{3.0 for SAR-1g, ≤ 7.5 for SAR-10g}$$

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

2. For the test separation distance > 50 mm, and the frequency at 100 MHz to 1500 MHz

$$\left[(\text{Threshold at 50 mm in Step 1}) + (\text{Test Separation Distance} - 50\text{ mm}) \times \left(\frac{f_{(MHz)}}{150}\right)\right]_{(mW)}$$

3. For the test separation distance > 50 mm, and the frequency at > 1500 MHz to 6 GHz

$$[(\text{Threshold at 50 mm in Step 1}) + (\text{Test Separation Distance} - 50\text{ mm}) \times 10]_{(mW)}$$

<For Tablet PC Mode>

Mode	Max. Tune-up Power (dBm)	Max. Tune-up Power (mW)	Rear Face			Left Side			Right Side			Top Side			Bottom Side		
			Ant. to Surface (mm)	Calculated Result	Require SAR Testing?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing?
GSM 850	25.7	371.54	5	68.5	**YES**	15	22.8	**YES**	162	797 mW	No	5	68.5	**YES**	157	768 mW	No
GSM 1900	23.7	234.42	5	64.8	**YES**	15	21.6	**YES**	162	1229 mW	No	5	64.8	**YES**	157	1179 mW	No
WCDMA II	24	251.19	5	69.4	**YES**	15	23.1	**YES**	162	1229 mW	No	5	69.4	**YES**	157	1179 mW	No
WCDMA V	24	251.19	5	46.2	**YES**	15	15.4	**YES**	162	795 mW	No	5	46.2	**YES**	157	767 mW	No
LTE 2	24	251.19	5	69.4	**YES**	15	23.1	**YES**	162	1229 mW	No	5	69.4	**YES**	157	1179 mW	No
LTE 5	24	251.19	5	46.2	**YES**	15	15.4	**YES**	162	795 mW	No	5	46.2	**YES**	157	767 mW	No
LTE 7	24	251.19	5	80.4	**YES**	15	26.8	**YES**	162	1214 mW	No	5	80.4	**YES**	157	1164 mW	No

Mode	Max. Tune-up Power (dBm)	Max. Tune-up Power (mW)	Rear Face			Left Side			Right Side			Top Side			Bottom Side		
			Ant. to Surface (mm)	Calculated Result	Require SAR Testing?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing?
WLAN 2.4G	14.5	28.18	5	8.8	**YES**	156	1156 mW	No	105	646 mW	No	5	8.8	**YES**	157	1166 mW	No
WLAN 5.2G	9.5	8.91	5	4.1	**YES**	156	1126 mW	No	105	616 mW	No	5	4.1	**YES**	157	1136 mW	No
WLAN 5.3G	9.5	8.91	5	4.1	**YES**	156	1125 mW	No	105	615 mW	No	5	4.1	**YES**	157	1135 mW	No
WLAN 5.6G	9.5	8.91	5	4.3	**YES**	156	1123 mW	No	105	613 mW	No	5	4.3	**YES**	157	1133 mW	No
WLAN 5.8G	9.5	8.91	5	4.3	**YES**	156	1122 mW	No	105	612 mW	No	5	4.3	**YES**	157	1132 mW	No
BT	4	2.51	5	0.8	No	156	1155 mW	No	105	645 mW	No	5	0.8	No	157	1165 mW	No

Note:

1. When separation distance <= 50 mm and the calculated result shown in above table is <= 3.0 for SAR-1g exposure condition, or <= 7.5 for SAR-10g exposure condition, the SAR testing exclusion is applied.
2. When separation distance > 50 mm and the device output power is less than the calculated result (power threshold, mW) shown in above table, the SAR testing exclusion is applied.

<For Laptop PC Mode>
When the antenna-to-user separation distance exceeds the minimum required under modular SAR (5 mm) and therefore SAR measurement is not required in this configuration.

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 (%)
Jul. 06, 2017	Body	835	23.4	1.001	55.454	0.97	55.2	3.20	0.46
Jul. 05, 2017	Body	1900	23.6	1.560	51.445	1.52	53.3	2.63	-3.48
Jul. 06, 2017	Body	1900	23.7	1.575	51.251	1.52	53.3	3.62	-3.84
Jul. 08, 2017	Body	2450	23.3	2.020	50.572	1.95	52.7	3.59	-4.04
Jul. 07, 2017	Body	2600	23.4	2.157	50.910	2.16	52.5	-0.14	-3.03
Jul. 08, 2017	Body	5250	23.3	5.408	47.300	5.36	48.9	0.90	-3.27
Jul. 08, 2017	Body	5600	23.3	5.889	46.629	5.77	48.5	2.06	-3.86
Jul. 08, 2017	Body	5800	23.3	6.176	46.237	6.00	48.2	2.93	-4.07

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
Jul. 06, 2017	7351	Body	835	1.001	55.454	Pass	Pass	Pass	N/A	N/A	N/A
Jul. 05, 2017	3971	Body	1900	1.560	51.445	Pass	Pass	Pass	N/A	N/A	N/A
Jul. 06, 2017	7351	Body	1900	1.575	51.251	Pass	Pass	Pass	N/A	N/A	N/A
Jul. 08, 2017	3753	Body	2450	2.020	50.572	Pass	Pass	Pass	OFDM	N/A	Pass
Jul. 07, 2017	3753	Body	2600	2.157	50.910	Pass	Pass	Pass	N/A	N/A	N/A
Jul. 08, 2017	3753	Body	5250	5.408	47.300	Pass	Pass	Pass	OFDM	N/A	Pass
Jul. 08, 2017	3753	Body	5600	5.889	46.629	Pass	Pass	Pass	OFDM	N/A	Pass
Jul. 08, 2017	3753	Body	5800	6.176	46.237	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
Jul. 06, 2017	Body	835	9.57	2.51	10.04	4.91	4d121	7351	1431
Jul. 05, 2017	Body	1900	40.10	9.97	39.88	-0.55	5d036	3971	579
Jul. 06, 2017	Body	1900	40.10	10.20	40.80	1.75	5d036	7351	1431
Jul. 08, 2017	Body	2450	51.10	12.10	48.40	-5.28	737	3753	916
Jul. 07, 2017	Body	2600	55.70	14.00	56.00	0.54	1020	3753	916
Jul. 08, 2017	Body	5250	77.60	7.71	77.10	-0.64	1019	3753	916
Jul. 08, 2017	Body	5600	79.60	8.02	80.20	0.75	1019	3753	916
Jul. 08, 2017	Body	5800	77.30	7.60	76.00	-1.68	1019	3753	916

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		Power Reduction (dB)
	GSM850 (without Power Reduction)	GSM850 (with Power Reduction)	GSM850 (without Power Reduction)	GSM850 (without Power Reduction)	
GPRS (GMSK, 1Tx-slot)	33.5	28.0	24.5	19.0	5.5
GPRS (GMSK, 2Tx-slot)	31.0	25.0	25.0	19.0	6.0
GPRS (GMSK, 3Tx-slot)	**30.0**	**25.0**	25.7	20.7	5.0
GPRS (GMSK, 4Tx-slot)	28.0	23.0	25.0	20.0	5.0
EDGE (8PSK, 1Tx-slot)	28.0	23.0	19.0	14.0	5.0
EDGE (8PSK, 2Tx-slot)	25.0	20.0	19.0	14.0	5.0
EDGE (8PSK, 3Tx-slot)	25.0	20.0	20.7	15.7	5.0
EDGE (8PSK, 4Tx-slot)	23.0	18.0	20.0	15.0	5.0

Mode	Maximum Burst-Averaged Output Power		Maximum Frame-Averaged Output Power		Power Reduction (dB)
	GSM1900 (without Power Reduction)	GSM1900 (with Power Reduction)	GSM1900 (without Power Reduction)	GSM1900 (with Power Reduction)	
GPRS (GMSK, 1Tx-slot)	30.5	21.0	21.5	12.0	9.5
GPRS (GMSK, 2Tx-slot)	29.0	19.0	23.0	13.0	10.0
GPRS (GMSK, 3Tx-slot)	**28.0**	**19.0**	23.7	14.7	9.0
GPRS (GMSK, 4Tx-slot)	26.0	17.0	23.0	14.0	9.0
EDGE (8PSK, 1Tx-slot)	27.0	16.0	18.0	7.0	11.0
EDGE (8PSK, 2Tx-slot)	25.0	14.0	19.0	8.0	11.0
EDGE (8PSK, 3Tx-slot)	24.0	13.0	19.7	8.7	11.0
EDGE (8PSK, 4Tx-slot)	22.0	11.0	19.0	8.0	11.0

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 (without Power Reduction)	WCDMA Band II (with Power Reduction)	Power Reduction (dB)
RMC 12.2K	24.0	14.0	10.0
HSDPA / HSUPA	24.0	14.0	10.0

Mode	WCDMA Band V (without Power Reduction)	WCDMA Band V (with Power Reduction)	Power Reduction (dB)
RMC 12.2K	24.0	18.0	6.0
HSDPA / HSUPA	24.0	18.0	6.0

Mode	LTE 2 (without Power Reduction)	LTE 2 (with Power Reduction)	Power Reduction (dB)
Maximum Target Power	24.0	14.0	10.0

Mode	LTE 5 (without Power Reduction)	LTE 5 (with Power Reduction)	Power Reduction (dB)
Maximum Target Power	24.0	19.0	5.0

Mode	LTE 7 (without Power Reduction)	LTE 7 (with Power Reduction)	Power Reduction (dB)
Maximum Target Power	24.0	15.0	9.0

Mode	2.4G WLAN	5.2G WLAN	5.3G WLAN	5.6G WLAN	5.8G WLAN
802.11b	14.5	N/A	N/A	N/A	N/A
802.11g	14.5	N/A	N/A	N/A	N/A
802.11a	N/A	9.5	9.5	9.5	9.5
802.11n HT20	14.5	9.5	9.5	9.5	9.5
802.11n HT40	14.5	9.5	9.5	9.5	9.5
802.11ac VHT80	N/A	9.5	9.5	9.5	9.5

Mode	2.4G Bluetooth
Bluetooth	4.0

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
EUT without Power Reduction (P-Sensor NOT Triggered)						
Maximum Burst-Averaged Output Power						
GPRS (GMSK, 1Tx-slot)	32.98	32.96	**33.00**	30.15	**30.48**	30.30
GPRS (GMSK, 2Tx-slot)	30.89	30.85	30.97	28.21	28.51	28.39
GPRS (GMSK, 3Tx-slot)	29.97	29.93	29.98	27.29	27.58	27.41
GPRS (GMSK, 4Tx-slot)	27.91	27.88	27.95	25.43	25.73	25.57
EDGE (8PSK, 1Tx-slot)	27.44	27.41	27.49	26.16	26.50	26.33
EDGE (8PSK, 2Tx-slot)	24.98	24.95	24.99	24.17	24.47	24.26
EDGE (8PSK, 3Tx-slot)	24.65	24.61	24.71	23.05	23.47	23.29
EDGE (8PSK, 4Tx-slot)	22.51	22.47	22.57	21.04	21.35	21.20
EUT with Power Reduction (P-Sensor Triggered)						
Maximum Burst-Averaged Output Power						
GPRS (GMSK, 1Tx-slot)	27.15	27.06	**27.20**	20.65	20.79	**20.85**
GPRS (GMSK, 2Tx-slot)	24.62	24.53	24.49	18.52	18.66	18.72
GPRS (GMSK, 3Tx-slot)	24.33	24.37	24.46	17.86	18.06	18.00
GPRS (GMSK, 4Tx-slot)	22.16	22.07	22.03	15.89	16.03	16.09
EDGE (8PSK, 1Tx-slot)	22.13	22.04	22.00	15.61	15.75	15.81
EDGE (8PSK, 2Tx-slot)	19.60	19.51	19.47	13.48	13.62	13.68
EDGE (8PSK, 3Tx-slot)	19.44	19.35	19.31	12.82	12.96	12.92
EDGE (8PSK, 4Tx-slot)	17.14	17.05	17.01	10.85	10.99	10.82

Band	WCDMA Band II			WCDMA Band V			3GPP MPR (dB)
Channel	9262	9400	9538	4132	4182	4233	
Frequency (MHz)	1852.4	1880.0	1907.6	826.4	836.4	846.6	
EUT without Power Reduction (P-Sensor NOT Triggered)							
RMC 12.2K	23.57	**23.59**	23.50	23.32	**23.33**	23.14	-
HSDPA Subtest-1	23.31	23.33	23.25	22.92	22.98	22.78	0
HSDPA Subtest-2	23.22	23.27	23.18	22.81	22.85	22.68	0
HSDPA Subtest-3	22.73	22.75	22.68	22.20	22.21	22.01	0.5
HSDPA Subtest-4	22.69	22.73	22.64	22.16	22.18	22.00	0.5
HSUPA Subtest-1	22.88	22.92	22.84	22.44	22.47	22.21	0
HSUPA Subtest-2	20.82	20.87	20.81	21.08	21.17	21.02	2
HSUPA Subtest-3	22.23	22.27	22.16	21.98	21.99	21.77	1
HSUPA Subtest-4	21.14	21.16	21.07	20.94	21.00	20.86	2
HSUPA Subtest-5	23.28	23.30	23.21	22.98	23.00	22.78	0
EUT with Power Reduction (P-Sensor Triggered)							
RMC 12.2K	13.74	**13.98**	13.88	17.88	**17.95**	17.79	-
HSDPA Subtest-1	13.44	13.68	13.58	17.84	17.92	17.76	-
HSDPA Subtest-2	12.67	12.91	12.81	17.26	17.34	17.18	-
HSDPA Subtest-3	12.09	12.33	12.23	16.64	16.72	16.56	-
HSDPA Subtest-4	12.07	12.31	12.21	16.62	16.70	16.54	-
HSUPA Subtest-1	12.87	12.98	12.92	16.90	16.98	16.92	-
HSUPA Subtest-2	10.91	10.97	10.95	14.76	14.84	14.68	-
HSUPA Subtest-3	11.99	12.23	12.13	15.90	15.95	15.88	-
HSUPA Subtest-4	11.10	11.23	11.13	15.89	15.97	15.81	-
HSUPA Subtest-5	13.09	13.21	13.11	17.32	17.40	17.24	-

Band / BW	RB Size	RB Offset	QPSK Low CH 18607 1850.7 MHz	QPSK Mid CH 18900 1880.0 MHz	QPSK High CH 19193 1909.3 MHz	3GPP MPR (dB)	16QAM Low CH 18607 1850.7 MHz	16QAM Mid CH 18900 1880.0 MHz	16QAM High CH 19193 1909.3 MHz	3GPP MPR (dB)
EUT without Power Reduction (P-Sensor NOT Triggered)										
2 / 1.4M	1	0	23.08	22.37	22.70	0	22.11	21.38	21.74	1
	1	2	23.19	22.49	22.85	0	22.23	21.54	21.95	1
	1	5	**23.38**	22.73	23.12	0	**22.48**	21.76	22.13	1
	3	0	22.05	22.01	22.02	0	21.01	21.03	21.01	1
	3	1	22.04	22.02	22.04	0	21.03	21.02	21.03	1
	3	3	22.10	22.03	22.04	0	21.08	21.03	21.04	1
	6	0	21.99	21.10	21.51	1	20.90	20.14	20.54	2
EUT with Power Reduction (P-Sensor Triggered)										
2 / 1.4M	1	0	13.11	13.45	13.34	0	12.10	12.44	12.33	1
	1	2	12.91	13.25	13.14	0	11.90	12.24	12.13	1
	1	5	13.49	13.83	13.72	0	12.48	12.82	12.71	1
	3	0	12.41	12.75	12.64	0	11.40	11.74	11.63	1
	3	1	12.67	13.01	12.90	0	11.66	12.00	11.89	1
	3	3	12.93	13.27	13.16	0	11.92	12.26	12.15	1
	6	0	12.78	13.12	13.01	0	11.77	12.11	12.00	1

Band / BW	RB Size	RB Offset	QPSK Low CH 18615 1851.5 MHz	QPSK Mid CH 18900 1880.0 MHz	QPSK High CH 19185 1908.5 MHz	3GPP MPR (dB)	16QAM Low CH 18615 1851.5 MHz	16QAM Mid CH 18900 1880.0 MHz	16QAM High CH 19185 1908.5 MHz	3GPP MPR (dB)
EUT without Power Reduction (P-Sensor NOT Triggered)										
2 / 3M	1	0	23.08	22.39	22.71	0	22.17	21.45	21.80	1
	1	7	23.25	22.52	22.87	0	22.36	21.60	21.89	1
	1	14	**23.44**	22.76	23.13	0	**22.49**	21.82	22.08	1
	8	0	21.63	21.06	21.23	1	20.71	20.06	20.28	2
	8	3	21.95	21.16	21.61	1	20.99	20.13	20.46	2
	8	7	22.10	21.42	21.74	1	21.12	20.41	20.90	2
	15	0	21.91	21.28	21.70	1	20.98	20.23	20.66	2
EUT with Power Reduction (P-Sensor Triggered)										
2 / 3M	1	0	13.14	13.48	13.37	0	12.13	12.47	12.36	1
	1	7	12.94	13.28	13.17	0	11.93	12.27	12.16	1
	1	14	13.52	13.86	13.75	0	12.51	12.85	12.74	1
	8	0	12.44	12.78	12.67	0	11.43	11.77	11.66	1
	8	3	12.70	13.04	12.93	0	11.69	12.03	11.92	1
	8	7	12.96	13.30	13.19	0	11.95	12.29	12.18	1
	15	0	12.81	13.15	13.04	0	11.80	12.14	12.03	1

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 18625 / 1852.5 MHz	Mid CH 18900 / 1880.0 MHz	High CH 19175 / 1907.5 MHz		Low CH 18625 / 1852.5 MHz	Mid CH 18900 / 1880.0 MHz	High CH 19175 / 1907.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
2 / 5M	1	0	23.20	22.51	22.83	0	22.27	21.48	21.84	1
	1	12	23.37	22.63	23.06	0	22.40	21.63	22.01	1
	1	24	**23.52**	22.86	23.11	0	**22.49**	21.87	22.20	1
	12	0	21.91	21.12	21.45	1	20.80	20.07	20.31	2
	12	6	22.01	21.32	21.71	1	21.01	20.26	20.56	2
	12	13	22.25	21.59	21.85	1	21.24	20.52	20.87	2
	25	0	22.11	21.41	21.79	1	21.08	20.39	20.69	2
EUT with Power Reduction (P-Sensor Triggered)										
2 / 5M	1	0	13.15	13.49	13.38	0	12.14	12.48	12.37	1
	1	12	12.95	13.29	13.18	0	11.94	12.28	12.17	1
	1	24	13.53	13.87	13.76	0	12.52	12.86	12.75	1
	12	0	12.45	12.79	12.68	0	11.44	11.78	11.67	1
	12	6	12.71	13.05	12.94	0	11.70	12.04	11.93	1
	12	13	12.97	13.31	13.20	0	11.96	12.30	12.19	1
	25	0	12.82	13.16	13.05	0	11.81	12.15	12.04	1

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 18650 / 1855.0 MHz	Mid CH 18900 / 1880.0 MHz	High CH 19150 / 1905.0 MHz		Low CH 18650 / 1855.0 MHz	Mid CH 18900 / 1880.0 MHz	High CH 19150 / 1905.0 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
2 / 10M	1	0	23.26	22.62	22.94	0	22.28	21.58	21.93	1
	1	24	23.46	22.75	23.16	0	22.38	21.71	22.07	1
	1	49	**23.58**	22.95	23.34	0	**22.57**	21.95	22.23	1
	25	0	21.92	21.28	21.50	1	20.85	20.22	20.47	2
	25	12	22.10	21.47	21.80	1	21.04	20.41	20.82	2
	25	25	22.36	21.70	22.04	1	21.28	20.65	21.01	2
	50	0	22.21	21.56	21.85	1	21.16	20.52	20.79	2
EUT with Power Reduction (P-Sensor Triggered)										
2 / 10M	1	0	13.18	13.52	13.41	0	12.17	12.51	12.40	1
	1	24	12.98	13.32	13.21	0	11.97	12.31	12.20	1
	1	49	13.56	13.90	13.79	0	12.55	12.89	12.78	1
	25	0	12.48	12.82	12.71	0	11.47	11.81	11.70	1
	25	12	12.74	13.08	12.97	0	11.73	12.07	11.96	1
	25	25	13.00	13.34	13.23	0	11.99	12.33	12.22	1
	50	0	12.85	13.19	13.08	0	11.84	12.18	12.07	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 18675 / 1857.5 MHz	Mid CH 18900 / 1880.0 MHz	High CH 19125 / 1902.5 MHz		Low CH 18675 / 1857.5 MHz	Mid CH 18900 / 1880.0 MHz	High CH 19125 / 1902.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
2 / 15M	1	0	23.30	22.69	22.98	0	22.37	21.74	22.04	1
	1	37	23.48	22.80	23.09	0	22.48	21.85	22.13	1
	1	74	**23.55**	22.99	23.32	0	**22.59**	22.06	22.46	1
	36	0	22.10	21.42	21.78	1	21.06	20.37	20.62	2
	36	19	22.16	21.60	21.91	1	21.17	20.57	20.85	2
	36	39	22.41	21.84	22.19	1	21.44	20.82	21.17	2
	75	0	22.36	21.69	22.02	1	21.28	20.67	20.97	2
EUT with Power Reduction (P-Sensor Triggered)										
2 / 15M	1	0	13.19	13.53	13.42	0	12.18	12.52	12.41	1
	1	37	12.99	13.33	13.22	0	11.98	12.32	12.21	1
	1	74	13.57	13.91	13.80	0	12.56	12.90	12.79	1
	36	0	12.49	12.83	12.72	0	11.48	11.82	11.71	1
	36	19	12.75	13.09	12.98	0	11.74	12.08	11.97	1
	36	39	13.01	13.35	13.24	0	12.00	12.34	12.23	1
	75	0	12.86	13.20	13.09	0	11.85	12.19	12.08	1

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 18700 / 1860.0 MHz	Mid CH 18900 / 1880.0 MHz	High CH 19100 / 1900.0 MHz		Low CH 18700 / 1860.0 MHz	Mid CH 18900 / 1880.0 MHz	High CH 19100 / 1900.0 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
2 / 20M	1	0	23.38	22.79	23.08	0	22.41	21.80	22.09	1
	1	50	23.58	22.90	23.15	0	22.55	21.91	22.18	1
	1	99	**23.60**	23.09	23.40	0	**22.69**	22.11	22.45	1
	50	0	22.14	21.57	21.91	1	21.19	20.52	20.75	2
	50	25	22.41	21.75	22.06	1	21.34	20.70	21.01	2
	50	50	**22.53**	21.96	22.24	1	21.49	20.93	21.25	2
	100	0	**22.36**	21.83	22.09	1	21.40	20.79	21.01	2
EUT with Power Reduction (P-Sensor Triggered)										
2 / 20M	1	0	13.21	13.55	13.44	0	12.20	12.54	12.43	1
	1	50	13.01	13.35	13.24	0	12.00	12.34	12.23	1
	1	99	13.93	13.59	13.82	0	12.58	12.92	12.81	1
	50	0	12.51	12.85	12.74	0	11.50	11.84	11.73	1
	50	25	12.77	13.11	13.00	0	11.76	12.10	11.99	1
	50	50	13.37	13.03	13.26	0	12.02	12.36	12.25	1
	100	0	12.88	13.22	13.11	0	11.87	12.21	12.10	1

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20407	Mid CH 20525	High CH 20643		Low CH 20407	Mid CH 20525	High CH 20643	
			824.7 MHz	836.5 MHz	848.3 MHz		824.7 MHz	836.5 MHz	848.3 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
5 / 1.4M	1	0	22.76	22.90	22.66	0	21.77	21.94	21.65	1
	1	2	22.96	**23.10**	22.86	0	21.98	**22.15**	21.81	1
	1	5	22.61	22.70	22.46	0	21.54	21.70	21.42	1
	3	0	22.01	22.01	22.03	0	21.01	21.01	21.06	1
	3	1	22.02	22.03	22.01	0	21.02	21.04	21.03	1
	3	3	22.03	22.04	22.04	0	21.03	21.04	21.06	1
	6	0	21.06	21.21	21.01	1	20.05	20.16	20.02	2
EUT with Power Reduction (P-Sensor Triggered)										
5 / 1.4M	1	0	18.07	18.33	18.26	0	17.04	17.30	17.23	1
	1	2	18.17	18.43	18.36	0	17.14	17.40	17.33	1
	1	5	18.03	18.29	18.22	0	17.00	17.26	17.19	1
	3	0	17.72	17.98	17.91	0	16.69	16.95	16.88	1
	3	1	17.85	18.11	18.04	0	16.82	17.08	17.01	1
	3	3	17.52	17.78	17.71	0	16.49	16.75	16.68	1
	6	0	17.41	17.67	17.60	0	16.38	16.64	16.57	1

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20415	Mid CH 20525	High CH 20635		Low CH 20415	Mid CH 20525	High CH 20635	
			825.5 MHz	836.5 MHz	847.5 MHz		825.5 MHz	836.5 MHz	847.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
5 / 3M	1	0	22.81	22.95	22.72	0	21.83	21.98	21.72	1
	1	7	23.03	**23.15**	22.87	0	22.09	**22.18**	21.96	1
	1	14	22.67	22.76	22.50	0	21.65	21.75	21.52	1
	8	0	21.47	21.57	21.35	1	20.43	20.57	20.31	2
	8	3	21.67	21.82	21.52	1	20.64	20.81	20.50	2
	8	7	21.27	21.44	21.14	1	20.33	20.43	20.14	2
	15	0	21.20	21.32	21.12	1	20.16	20.27	20.07	2
EUT with Power Reduction (P-Sensor Triggered)										
5 / 3M	1	0	18.09	18.35	18.28	0	17.06	17.32	17.25	1
	1	7	18.19	18.45	18.38	0	17.16	17.42	17.35	1
	1	14	18.05	18.31	18.24	0	17.02	17.28	17.21	1
	8	0	17.74	18.00	17.93	0	16.71	16.97	16.90	1
	8	3	17.87	18.13	18.06	0	16.84	17.10	17.03	1
	8	7	17.54	17.80	17.73	0	16.51	16.77	16.70	1
	15	0	17.43	17.69	17.62	0	16.40	16.66	16.59	1

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20425	Mid CH 20525	High CH 20625		Low CH 20425	Mid CH 20525	High CH 20625	
			826.5 MHz	836.5 MHz	846.5 MHz		826.5 MHz	836.5 MHz	846.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
5 / 5M	1	0	22.90	23.02	22.79	0	21.90	22.04	21.81	1
	1	12	23.07	**23.20**	22.93	0	22.12	**22.23**	22.00	1
	1	24	22.70	22.83	22.55	0	21.70	21.84	21.63	1
	12	0	21.51	21.69	21.48	1	20.48	20.66	20.40	2
	12	6	21.81	21.90	21.65	1	20.74	20.90	20.68	2
	12	13	21.44	21.57	21.33	1	20.43	20.52	20.26	2
	25	0	21.30	21.45	21.25	1	20.29	20.40	20.21	2
EUT with Power Reduction (P-Sensor Triggered)										
5 / 5M	1	0	18.10	18.36	18.29	0	17.07	17.33	17.26	1
	1	12	18.20	18.46	18.39	0	17.17	17.43	17.36	1
	1	24	18.06	18.32	18.25	0	17.03	17.29	17.22	1
	12	0	17.75	18.01	17.94	0	16.72	16.98	16.91	1
	12	6	17.88	18.14	18.07	0	16.85	17.11	17.04	1
	12	13	17.55	17.81	17.74	0	16.52	16.78	16.71	1
	25	0	17.44	17.70	17.63	0	16.41	16.67	16.60	1

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20450	Mid CH 20525	High CH 20600		Low CH 20450	Mid CH 20525	High CH 20600	
			829.0 MHz	836.5 MHz	844.0 MHz		829.0 MHz	836.5 MHz	844.0 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
5 / 10M	1	0	22.95	23.07	22.87	0	21.98	22.11	21.90	1
	1	24	23.19	**23.25**	22.97	0	22.16	**22.30**	22.05	1
	1	49	22.78	22.90	22.62	0	21.78	21.93	21.68	1
	25	0	21.68	21.78	21.60	1	20.61	20.77	20.58	2
	25	12	21.92	**21.99**	21.70	1	20.91	20.99	20.69	2
	25	25	21.56	21.67	21.43	1	20.52	20.65	20.40	2
	50	0	21.43	**21.58**	21.41	1	20.42	20.55	20.36	2
EUT with Power Reduction (P-Sensor Triggered)										
5 / 10M	1	0	18.12	18.38	18.31	0	17.09	17.35	17.28	1
	1	24	18.22	18.48	18.41	0	17.19	17.45	17.38	1
	1	49	18.08	18.34	18.27	0	17.05	17.31	17.24	1
	25	0	17.77	18.03	17.96	0	16.74	17.00	16.93	1
	25	12	17.90	18.16	18.09	0	16.87	17.13	17.06	1
	25	25	17.57	17.83	17.76	0	16.54	16.80	16.73	1
	50	0	17.46	17.72	17.65	0	16.43	16.69	16.62	1

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20775	Mid CH 21100	High CH 21425		Low CH 20775	Mid CH 21100	High CH 21425	
			2502.5 MHz	2535.0 MHz	2567.5 MHz		2502.5 MHz	2535.0 MHz	2567.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
7 / 5M	1	0	22.77	22.63	22.81	0	21.81	21.66	21.84	1
	1	12	22.97	22.86	23.07	0	22.05	21.89	22.12	1
	1	24	23.13	22.95	**23.15**	0	22.21	21.99	**22.24**	1
	12	0	22.00	21.86	22.13	1	21.04	20.89	21.09	2
	12	6	21.61	21.48	21.77	1	20.62	20.44	20.78	2
	12	13	21.44	21.35	21.62	1	20.48	20.31	20.53	2
	25	0	21.78	21.59	21.82	1	20.70	20.56	20.83	2
EUT with Power Reduction (P-Sensor Triggered)										
7 / 5M	1	0	14.09	14.15	14.04	0	13.07	13.13	13.02	1
	1	12	13.94	14.00	13.89	0	12.92	12.98	12.87	1
	1	24	14.12	14.18	14.07	0	13.10	13.16	13.05	1
	12	0	14.06	14.12	14.01	1	13.04	13.10	12.99	2
	12	6	13.78	13.84	13.73	1	12.76	12.82	12.71	2
	12	13	13.67	13.73	13.62	1	12.65	12.71	12.60	2
	25	0	13.87	13.93	13.82	1	12.85	12.91	12.80	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20800	Mid CH 21100	High CH 21400		Low CH 20800	Mid CH 21100	High CH 21400	
			2505.0 MHz	2535.0 MHz	2565.0 MHz		2505.0 MHz	2535.0 MHz	2565.0 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
7 / 10M	1	0	22.89	22.72	22.93	0	21.91	21.77	21.96	1
	1	24	23.10	22.96	23.18	0	22.14	21.99	22.19	1
	1	49	23.21	23.05	**23.24**	0	22.27	22.09	**22.29**	1
	25	0	22.08	21.95	22.22	1	21.08	20.99	21.28	2
	25	12	21.78	21.62	21.83	1	20.78	20.61	20.88	2
	25	25	21.65	21.50	21.73	1	20.57	20.46	20.71	2
	50	0	21.88	21.73	21.92	1	20.82	20.71	20.97	2
EUT with Power Reduction (P-Sensor Triggered)										
7 / 10M	1	0	14.12	14.18	14.07	0	13.10	13.16	13.05	1
	1	24	13.97	14.03	13.92	0	12.95	13.01	12.90	1
	1	49	14.15	14.21	14.10	0	13.13	13.19	13.08	1
	25	0	14.09	14.15	14.04	1	13.07	13.13	13.02	2
	25	12	13.81	13.87	13.76	1	12.79	12.85	12.74	2
	25	25	13.70	13.76	13.65	1	12.68	12.74	12.63	2
	50	0	13.90	13.96	13.85	1	12.88	12.94	12.83	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20825	Mid CH 21100	High CH 21375		Low CH 20825	Mid CH 21100	High CH 21375	
			2507.5 MHz	2535.0 MHz	2562.5 MHz		2507.5 MHz	2535.0 MHz	2562.5 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
7 / 15M	1	0	22.96	22.82	23.00	0	21.97	21.81	21.99	1
	1	37	23.12	23.03	23.21	0	22.14	22.03	22.26	1
	1	74	23.25	23.11	**23.29**	0	22.25	22.12	**22.32**	1
	36	0	22.18	22.07	22.30	1	21.18	21.06	21.31	2
	36	19	21.91	21.77	22.02	1	20.89	20.75	21.00	2
	36	39	21.73	21.65	21.88	1	20.70	20.60	20.85	2
	75	0	21.94	21.85	22.04	1	20.95	20.85	21.02	2
EUT with Power Reduction (P-Sensor Triggered)										
7 / 15M	1	0	14.13	14.19	14.08	0	13.11	13.17	13.06	1
	1	37	13.98	14.04	13.93	0	12.96	13.02	12.91	1
	1	74	14.16	14.22	14.11	0	13.14	13.20	13.09	1
	36	0	14.10	14.16	14.05	1	13.08	13.14	13.03	2
	36	19	13.82	13.88	13.77	1	12.80	12.86	12.75	2
	36	39	13.71	13.77	13.66	1	12.69	12.75	12.64	2
	75	0	13.91	13.97	13.86	1	12.89	12.95	12.84	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low CH 20850	Mid CH 21100	High CH 21350		Low CH 20850	Mid CH 21100	High CH 21350	
			2510.0 MHz	2535.0 MHz	2560.0 MHz		2510.0 MHz	2535.0 MHz	2560.0 MHz	
EUT without Power Reduction (P-Sensor NOT Triggered)										
7 / 20M	1	0	23.05	22.91	23.07	0	22.06	21.91	22.08	1
	1	50	23.21	23.10	23.28	0	22.22	22.12	22.30	1
	1	99	23.31	23.18	**23.34**	0	22.35	22.20	**22.38**	1
	50	0	22.26	22.18	22.35	1	21.29	21.17	21.41	2
	50	25	22.00	21.92	22.11	1	20.98	20.87	21.11	2
	50	50	21.92	21.80	21.97	1	20.88	20.75	20.92	2
	100	0	22.13	22.00	**22.16**	1	21.11	20.97	21.15	2
EUT with Power Reduction (P-Sensor Triggered)										
7 / 20M	1	0	14.15	14.21	14.10	0	13.13	13.19	13.08	1
	1	50	14.00	14.06	13.95	0	12.98	13.04	12.93	1
	1	99	14.18	14.24	14.13	0	13.16	13.22	13.11	1
	50	0	14.12	14.18	14.07	1	13.10	13.16	13.05	2
	50	25	13.84	13.90	13.79	1	12.82	12.88	12.77	2
	50	50	13.73	13.79	13.68	1	12.71	12.77	12.66	2
	100	0	13.93	13.99	13.88	1	12.91	12.97	12.86	2

<WLAN 2.4G>

Mode	802.11b		
Channel / Frequency (MHz)	1 (2412)	6 (2437)	11 (2462)
Average Power	14.37	14.36	**14.41**

<WLAN 5.3G>

Mode	802.11ac (VHT80)
Channel / Frequency (MHz)	58 (5290)
Average Power	**9.15**

<WLAN 5.6G>

Mode	802.11ac (VHT80)
Channel / Frequency (MHz)	106 (5530)
Average Power	**9.41**

<WLAN 5.8G>

Mode	802.11ac (VHT80)
Channel / Frequency (MHz)	155 (5775)
Average Power	**9.24**

<Bluetooth>

Mode	Bluetooth		
Channel / Frequency (MHz)	0 (2402)	39 (2441)	78 (2480)
Average Power	3.61	**3.87**	3.78

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.

<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.

4.7.2 SAR Results for Body Exposure Condition

<For Tablet PC Mode>

Plot No.	Band	Mode	Test Position	Separation Distance (cm)	Ch.	P-Sensor	Mobile Dock	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	GSM850	GPRS11	Rear Face	1.7	251	w/o	-	30.0	29.98	1.00	-0.09	0.096	0.10
	GSM850	GPRS11	Left Side	0	251	w/o	-	30.0	29.98	1.00	0.03	0.077	0.08
	GSM850	GPRS11	Top Side	1.6	251	w/o	-	30.0	29.98	1.00	0.01	0.084	0.08
01	GSM850	GPRS11	Rear Face	0	251	w/	-	25.0	24.46	1.13	-0.1	0.740	**0.84**
	GSM850	GPRS11	Top Side	0	251	w/	-	25.0	24.46	1.13	-0.04	0.702	0.79
	GSM850	GPRS11	Rear Face	0	128	w/	-	25.0	24.33	1.17	0.01	0.625	0.73
	GSM850	GPRS11	Rear Face	0	189	w/	-	25.0	24.37	1.16	0.12	0.617	0.71
	GSM850	GPRS11	Rear Face	0	251	w/	w/	25.0	24.46	1.13	0.11	0.304	0.34
	GSM1900	GPRS11	Rear Face	1.7	661	w/o	-	28.0	27.58	1.10	-0.03	0.656	0.72
	GSM1900	GPRS11	Left Side	0	661	w/o	-	28.0	27.58	1.10	0.01	0.602	0.66
	GSM1900	GPRS11	Top Side	1.6	661	w/o	-	28.0	27.58	1.10	0.07	0.524	0.58
02	GSM1900	GPRS11	Rear Face	0	661	w/	-	19.0	18.06	1.24	-0.06	0.640	**0.79**
	GSM1900	GPRS11	Top Side	0	661	w/	-	19.0	18.06	1.24	0.02	0.615	0.76
	GSM1900	GPRS11	Rear Face	0	661	w/	w/	19.0	18.06	1.24	0.05	0.207	0.26
	WCDMA II	RMC12.2K	Rear Face	1.7	9400	w/o	-	24.0	23.59	1.10	0.02	0.886	0.97
	WCDMA II	RMC12.2K	Left Side	0	9400	w/o	-	24.0	23.59	1.10	0.12	0.702	0.77
03	WCDMA II	RMC12.2K	Top Side	1.6	9400	w/o	-	24.0	23.59	1.10	0.09	0.967	**1.06**
	WCDMA II	RMC12.2K	Rear Face	0	9400	w/	-	14.0	13.98	1.00	-0.09	0.760	0.76
	WCDMA II	RMC12.2K	Top Side	0	9400	w/	-	14.0	13.98	1.00	0.11	0.775	0.78
	WCDMA II	RMC12.2K	Rear Face	1.7	9262	w/o	-	24.0	23.57	1.10	0.01	0.748	0.83
	WCDMA II	RMC12.2K	Rear Face	1.7	9538	w/o	-	24.0	23.50	1.12	0.11	0.725	0.81
	WCDMA II	RMC12.2K	Top Side	1.6	9262	w/o	-	24.0	23.57	1.10	0.13	0.832	0.92
	WCDMA II	RMC12.2K	Top Side	1.6	9538	w/o	-	24.0	23.50	1.12	0.11	0.938	1.05
	WCDMA II	RMC12.2K	Top Side	1.6	9400	w/o	w/	24.0	23.59	1.10	0.1	0.946	1.04
	WCDMA II	RMC12.2K	Top Side	1.6	9400	w/o	-	24.0	23.59	1.10	0.05	0.962	1.06

Plot No.	Band	Mode	Test Position	Separation Distance (cm)	Ch.	P-Sensor	Mobile Dock	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	WCDMA V	RMC12.2K	Rear Face	1.7	4182	w/o	-	24.0	23.33	1.17	-0.09	0.078	0.09
	WCDMA V	RMC12.2K	Left Side	0	4182	w/o	-	24.0	23.33	1.17	0.05	0.109	0.13
	WCDMA V	RMC12.2K	Top Side	1.6	4182	w/o	-	24.0	23.33	1.17	0.01	0.083	0.10
04	WCDMA V	RMC12.2K	Rear Face	0	4182	w/	-	18.0	17.95	1.01	-0.03	0.636	**0.64**
	WCDMA V	RMC12.2K	Top Side	0	4182	w/	-	18.0	17.95	1.01	-0.11	0.457	0.46
	WCDMA V	RMC12.2K	Rear Face	0	4182	w/	w/	18.0	17.95	1.01	0.08	0.245	0.25

Plot No.	Band	Mode	Test Position	Separation Distance (cm)	Ch.	P-Sensor	Mobile Dock	RB#	RB Offset	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
05	LTE 2	QPSK20M	Rear Face	1.7	18700	w/o	-	1	99	24.0	23.60	1.10	0.07	0.815	**0.89**
	LTE 2	QPSK20M	Left Side	0	18700	w/o	-	1	99	24.0	23.60	1.10	0.03	0.646	0.71
	LTE 2	QPSK20M	Top Side	1.6	18700	w/o	-	1	99	24.0	23.60	1.10	0.04	0.685	0.75
	LTE 2	QPSK20M	Rear Face	0	18700	w/	-	1	99	14.0	13.93	1.02	-0.11	0.662	0.67
	LTE 2	QPSK20M	Top Side	0	18700	w/	-	1	99	14.0	13.93	1.02	0.08	0.643	0.65
	LTE 2	QPSK20M	Rear Face	1.7	18700	w/o	-	50	50	23.0	22.53	1.11	-0.12	0.521	0.58
	LTE 2	QPSK20M	Left Side	0	18700	w/o	-	50	50	23.0	22.53	1.11	0.08	0.450	0.50
	LTE 2	QPSK20M	Top Side	1.6	18700	w/o	-	50	50	23.0	22.53	1.11	-0.09	0.489	0.54
	LTE 2	QPSK20M	Rear Face	0	18700	w/	-	50	50	14.0	13.37	1.16	0.03	0.539	0.62
	LTE 2	QPSK20M	Top Side	0	18700	w/	-	50	50	14.0	13.37	1.16	-0.05	0.566	0.65
	LTE 2	QPSK20M	Rear Face	1.7	18900	w/o	-	1	99	24.0	23.09	1.23	0.07	0.514	0.63
	LTE 2	QPSK20M	Rear Face	1.7	19100	w/o	-	1	99	24.0	23.40	1.15	0.08	0.532	0.61
	LTE 2	QPSK20M	Rear Face	1.7	18700	w/o	-	100	0	23.0	22.36	1.16	-0.03	0.446	0.52
	LTE 2	QPSK20M	Rear Face	1.7	18700	w/o	w/	1	0	24.0	23.60	1.10	0.09	0.448	0.49
	LTE 2	QPSK20M	Rear Face	1.7	18700	w/o	-	1	99	24.0	23.60	1.10	-0.08	0.812	0.89
	LTE 5	QPSK10M	Rear Face	1.7	20525	w/o	-	1	24	24.0	23.25	1.19	-0.09	0.270	0.32
	LTE 5	QPSK10M	Left Side	0	20525	w/o	-	1	24	24.0	23.25	1.19	0.08	0.444	0.53
	LTE 5	QPSK10M	Top Side	1.6	20525	w/o	-	1	24	24.0	23.25	1.19	0.01	0.224	0.27
06	LTE 5	QPSK10M	Rear Face	0	20525	w/	-	1	24	19.0	18.48	1.13	-0.02	0.686	**0.77**
	LTE 5	QPSK10M	Top Side	0	20525	w/	-	1	24	19.0	18.48	1.13	-0.11	0.641	0.72
	LTE 5	QPSK10M	Rear Face	1.7	20525	w/o	-	25	12	23.0	21.99	1.26	0.13	0.221	0.28
	LTE 5	QPSK10M	Left Side	0	20525	w/o	-	25	12	23.0	21.99	1.26	-0.12	0.249	0.31
	LTE 5	QPSK10M	Top Side	1.6	20525	w/o	-	25	12	23.0	21.99	1.26	0.08	0.141	0.18
	LTE 5	QPSK10M	Rear Face	0	20525	w/	-	25	12	19.0	18.16	1.21	0.04	0.629	0.76
	LTE 5	QPSK10M	Top Side	0	20525	w/	-	25	12	19.0	18.16	1.21	0.15	0.556	0.67
	LTE 5	QPSK10M	Rear Face	0	20525	w/	w/	1	24	19.0	18.48	1.13	0.08	0.302	0.34
	LTE 7	QPSK20M	Rear Face	1.7	21350	w/o	-	1	99	24.0	23.34	1.16	0.05	0.546	0.64
07	LTE 7	QPSK20M	Left Side	0	21350	w/o	-	1	99	24.0	23.34	1.16	-0.19	1.01	**1.18**
	LTE 7	QPSK20M	Top Side	1.6	21350	w/o	-	1	99	24.0	23.34	1.16	0.09	0.808	0.94
	LTE 7	QPSK20M	Rear Face	0	21100	w/	-	1	99	15.0	14.24	1.19	0.13	0.518	0.62
	LTE 7	QPSK20M	Top Side	0	21100	w/	-	1	99	15.0	14.24	1.19	-0.14	0.494	0.59
	LTE 7	QPSK20M	Rear Face	1.7	21350	w/o	-	50	0	23.0	22.35	1.16	0.12	0.439	0.51
	LTE 7	QPSK20M	Left Side	0	21350	w/o	-	50	0	23.0	22.35	1.16	0.16	0.674	0.78
	LTE 7	QPSK20M	Top Side	1.6	21350	w/o	-	50	0	23.0	22.35	1.16	-0.05	0.627	0.73
	LTE 7	QPSK20M	Rear Face	0	21100	w/	-	50	0	15.0	14.18	1.21	-0.17	0.644	0.78
	LTE 7	QPSK20M	Top Side	0	21100	w/	-	50	0	15.0	14.18	1.21	-0.15	0.573	0.69
	LTE 7	QPSK20M	Left Side	0	20850	w/o	-	1	99	24.0	23.31	1.17	-0.08	0.986	1.16
	LTE 7	QPSK20M	Left Side	0	21100	w/o	-	1	99	24.0	23.18	1.21	0.04	0.971	1.17
	LTE 7	QPSK20M	Top Side	1.6	20850	w/o	-	1	99	24.0	23.31	1.17	0.12	0.801	0.94
	LTE 7	QPSK20M	Top Side	1.6	21100	w/o	-	1	99	24.0	23.18	1.21	0.11	0.775	0.94
	LTE 7	QPSK20M	Left Side	0	21350	w/o	-	100	0	23.0	22.16	1.21	0.09	0.345	0.42
	LTE 7	QPSK20M	Left Side	0	21350	w/o	w/	1	99	24.0	23.34	1.16	-0.15	0.982	1.14
	LTE 7	QPSK20M	Left Side	0	21350	w/o	-	1	99	24.0	23.34	1.16	0.02	0.964	1.12

Plot No.	Band	Mode	Test Position	Separation Distance (mm)	Ch.	Mobile Dock	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
08	2.4G WLAN	802.11b	Rear Face	0	11	-	14.5	14.41	1.02	-0.12	0.589	**0.60**
	2.4G WLAN	802.11b	Top Side	0	11	-	14.5	14.41	1.02	-0.05	0.379	0.39
	2.4G WLAN	802.11b	Rear Face	0	11	w/	14.5	14.41	1.02	0.07	0.156	0.16
	5.3G WLAN	802.11ac VH80	Rear Face	0	58	-	9.5	9.15	1.08	-0.09	0.266	0.29
09	5.3G WLAN	802.11ac VH80	Top Side	0	58	-	9.5	9.15	1.08	-0.05	0.594	**0.64**
	5.3G WLAN	802.11ac VH80	Top Side	0	58	w/	9.5	9.15	1.08	0.05	0.496	0.54
	5.6G WLAN	802.11ac VH80	Rear Face	0	106	-	9.5	9.41	1.02	-0.14	0.121	0.12
10	5.6G WLAN	802.11ac VH80	Top Side	0	106	-	9.5	9.41	1.02	-0.08	0.413	**0.42**
	5.6G WLAN	802.11ac VH80	Top Side	0	106	w/	9.5	9.41	1.02	0.07	0.304	0.31
	5.8G WLAN	802.11ac VH80	Rear Face	0	155	-	9.5	9.24	1.06	-0.08	0.156	0.17
11	5.8G WLAN	802.11ac VH80	Top Side	0	155	-	9.5	9.24	1.06	-0.13	0.446	**0.47**
	5.8G WLAN	802.11ac VH80	Top Side	0	155	w/	9.5	9.24	1.06	0.03	0.338	0.36

4.7.3 SAR Measurement Variability

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

SAR repeated measurement procedure:

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

Band	Mode	Test Position	Ch.	Original Measured SAR-1g (W/kg)	1st Repeated SAR-1g (W/kg)	L/S Ratio	2nd Repeated SAR-1g (W/kg)	L/S Ratio	3rd Repeated SAR-1g (W/kg)	L/S Ratio
WCDMA II	RMC12.2K	Top Side	9400	0.967	0.962	1.01	N/A	N/A	N/A	N/A
LTE 2	QPSK20M	Rear Face	18700	0.815	0.812	1.00	N/A	N/A	N/A	N/A
LTE 7	QPSK20M	Left Side	21350	1.01	0.964	1.05	N/A	N/A	N/A	N/A

4.7.4 Simultaneous Multi-band Transmission Evaluation

<Possibilities of Simultaneous Transmission>

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

Simultaneous TX Combination	Capable Transmit Configurations	Body Exposure Condition
1	GSM + WLAN 2.4G	Yes
2	GSM + WLAN 5G	Yes
3	GSM + BT (Data)	Yes
4	WCDMA + WLAN 2.4G	Yes
5	WCDMA + WLAN 5G	Yes
6	WCDMA + BT	Yes
7	LTE + WLAN 2.4G	Yes
8	LTE + WLAN 5G	Yes
9	LTE + BT	Yes

Note :

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

<Estimated SAR Calculation>

According to KDB 447498 D01, when standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR was estimated according to following formula to result in substantially conservative SAR values of <= 0.4 W/kg to determine simultaneous transmission SAR test exclusion.

$$\text{Estimated SAR} = \frac{\text{Max. Tune up Power}_{(\text{mW})}}{\text{Min. Test Separation Distance}_{(\text{mm})}} \times \frac{\sqrt{f_{(\text{GHz})}}}{7.5}$$

If the minimum test separation distance is < 5 mm, a distance of 5 mm is used for estimated SAR calculation. When the test separation distance is > 50 mm, the 0.4 W/kg is used for SAR-1g.

Mode / Band	Frequency (GHz)	Max. Tune-up Power (dBm)	Test Position	Separation Distance (mm)	Estimated SAR (W/kg)
GSM850	0.849	25.7 (Max Frame-Averaged Power)	Body	5	0.40
GSM1900	1.910	23.7 (Max Frame-Averaged Power)	Body	5	0.40
WCDMA II	1.908	24.5	Body	5	0.40
WCDMA V	0.847	24.5	Body	5	0.40
LTE 2	1.909	24.0	Body	5	0.40
LTE 5	0.848	24.0	Body	5	0.40
LTE 7	2.568	24.0	Body	5	0.40
WLAN (DTS)	2.462	14.5	Body	5	0.40
WLAN (NII)	5.3	9.5	Body	5	0.40
WLAN (NII)	5.6	9.5	Body	5	0.40
WLAN (NII)	5.8	9.5	Body	5	0.40
BT (DSS)	2.48	4.0	Body	5	0.11

Note:

1. The separation distance is determined from the outer housing of the EUT to the user.
2. When standalone SAR testing is not required, an estimated SAR can be applied to determine simultaneous transmission SAR test exclusion.

<SAR Summation Analysis>

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

<For Tablet PC Mode>

No.	Conditions (SAR1 + SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
1	GSM850 + WLAN (DTS)	Body	Rear Face	0.84	0.60	1.44	Σ SAR < 1.6, Not required
			Left Side	0.08	0.40	0.48	Σ SAR < 1.6, Not required
			Right Side	0.40	0.40	0.80	Σ SAR < 1.6, Not required
			Top Side	0.79	0.39	1.18	Σ SAR < 1.6, Not required
			Bottom Side	0.40	0.40	0.80	Σ SAR < 1.6, Not required
2	GSM850 + WLAN (NII)	Body	Rear Face	0.84	0.29	1.13	Σ SAR < 1.6, Not required
			Left Side	0.08	0.40	0.48	Σ SAR < 1.6, Not required
			Right Side	0.40	0.40	0.80	Σ SAR < 1.6, Not required
			Top Side	0.79	0.64	1.43	Σ SAR < 1.6, Not required
			Bottom Side	0.40	0.40	0.80	Σ SAR < 1.6, Not required
3	GSM850 + BT (DSS)	Body	Rear Face	0.84	0.11	0.95	Σ SAR < 1.6, Not required
			Left Side	0.08	0.11	0.19	Σ SAR < 1.6, Not required
			Right Side	0.40	0.11	0.51	Σ SAR < 1.6, Not required
			Top Side	0.79	0.11	0.90	Σ SAR < 1.6, Not required
			Bottom Side	0.40	0.11	0.51	Σ SAR < 1.6, Not required

No.	Conditions (SAR1 + SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
4	GSM1900 + WLAN (DTS)	Body	Rear Face	0.79	0.6	1.39	Σ SAR < 1.6, Not required
			Left Side	0.66	0.4	1.06	Σ SAR < 1.6, Not required
			Right Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
			Top Side	0.76	0.39	1.15	Σ SAR < 1.6, Not required
			Bottom Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
5	GSM1900 + WLAN (NII)	Body	Rear Face	0.79	0.29	1.08	Σ SAR < 1.6, Not required
			Left Side	0.66	0.4	1.06	Σ SAR < 1.6, Not required
			Right Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
			Top Side	0.76	0.64	1.40	Σ SAR < 1.6, Not required
			Bottom Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
6	GSM1900 + BT (DSS)	Body	Rear Face	0.79	0.11	0.90	Σ SAR < 1.6, Not required
			Left Side	0.66	0.11	0.77	Σ SAR < 1.6, Not required
			Right Side	0.4	0.11	0.51	Σ SAR < 1.6, Not required
			Top Side	0.76	0.11	0.87	Σ SAR < 1.6, Not required
			Bottom Side	0.4	0.11	0.51	Σ SAR < 1.6, Not required

No.	Conditions (SAR1 + SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
7	WCDMA II + WLAN (DTS)	Body	Rear Face	0.97	0.6	1.57	Σ SAR < 1.6, Not required
			Left Side	0.77	0.4	1.17	Σ SAR < 1.6, Not required
			Right Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
			Top Side	1.06	0.39	1.45	Σ SAR < 1.6, Not required
			Bottom Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
8	WCDMA II + WLAN (NII)	Body	Rear Face	0.97	0.29	1.26	Σ SAR < 1.6, Not required
			Left Side	0.77	0.4	1.17	Σ SAR < 1.6, Not required
			Right Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
			Top Side	1.06	0.64	1.70	**Analyzed as below**
			Bottom Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
9	WCDMA II + BT (DSS)	Body	Rear Face	0.97	0.11	1.08	Σ SAR < 1.6, Not required
			Left Side	0.77	0.11	0.88	Σ SAR < 1.6, Not required
			Right Side	0.4	0.11	0.51	Σ SAR < 1.6, Not required
			Top Side	1.06	0.11	1.17	Σ SAR < 1.6, Not required
			Bottom Side	0.4	0.11	0.51	Σ SAR < 1.6, Not required

No.	Conditions (SAR1 + SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
10	WCDMA V + WLAN (DTS)	Body	Rear Face	0.64	0.6	1.24	Σ SAR < 1.6, Not required
			Left Side	0.13	0.4	0.53	Σ SAR < 1.6, Not required
			Right Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
			Top Side	0.46	0.39	0.85	Σ SAR < 1.6, Not required
			Bottom Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
11	WCDMA V + WLAN (NII)	Body	Rear Face	0.64	0.29	0.93	Σ SAR < 1.6, Not required
			Left Side	0.13	0.4	0.53	Σ SAR < 1.6, Not required
			Right Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
			Top Side	0.46	0.64	1.10	Σ SAR < 1.6, Not required
			Bottom Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
12	WCDMA V + BT (DSS)	Body	Rear Face	0.64	0.11	0.75	Σ SAR < 1.6, Not required
			Left Side	0.13	0.11	0.24	Σ SAR < 1.6, Not required
			Right Side	0.4	0.11	0.51	Σ SAR < 1.6, Not required
			Top Side	0.46	0.11	0.57	Σ SAR < 1.6, Not required
			Bottom Side	0.4	0.11	0.51	Σ SAR < 1.6, Not required

No.	Conditions (SAR1 + SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
13	LTE 2 + WLAN (DTS)	Body	Rear Face	0.89	0.6	1.49	Σ SAR < 1.6, Not required
			Left Side	0.71	0.4	1.11	Σ SAR < 1.6, Not required
			Right Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
			Top Side	0.75	0.39	1.14	Σ SAR < 1.6, Not required
			Bottom Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
14	LTE 2 + WLAN (NII)	Body	Rear Face	0.89	0.29	1.18	Σ SAR < 1.6, Not required
			Left Side	0.71	0.4	1.11	Σ SAR < 1.6, Not required
			Right Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
			Top Side	0.75	0.64	1.39	Σ SAR < 1.6, Not required
			Bottom Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
15	LTE 2 + BT (DSS)	Body	Rear Face	0.89	0.11	1.00	Σ SAR < 1.6, Not required
			Left Side	0.71	0.11	0.82	Σ SAR < 1.6, Not required
			Right Side	0.4	0.11	0.51	Σ SAR < 1.6, Not required
			Top Side	0.75	0.11	0.86	Σ SAR < 1.6, Not required
			Bottom Side	0.4	0.11	0.51	Σ SAR < 1.6, Not required

No.	Conditions (SAR1 + SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
16	LTE 5 + WLAN (DTS)	Body	Rear Face	0.77	0.6	1.37	Σ SAR < 1.6, Not required
			Left Side	0.53	0.4	0.93	Σ SAR < 1.6, Not required
			Right Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
			Top Side	0.72	0.39	1.11	Σ SAR < 1.6, Not required
			Bottom Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
17	LTE 5 + WLAN (NII)	Body	Rear Face	0.77	0.29	1.06	Σ SAR < 1.6, Not required
			Left Side	0.53	0.4	0.93	Σ SAR < 1.6, Not required
			Right Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
			Top Side	0.72	0.64	1.36	Σ SAR < 1.6, Not required
			Bottom Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
18	LTE 5 + BT (DSS)	Body	Rear Face	0.77	0.11	0.88	Σ SAR < 1.6, Not required
			Left Side	0.53	0.11	0.64	Σ SAR < 1.6, Not required
			Right Side	0.4	0.11	0.51	Σ SAR < 1.6, Not required
			Top Side	0.72	0.11	0.83	Σ SAR < 1.6, Not required
			Bottom Side	0.4	0.11	0.51	Σ SAR < 1.6, Not required

No.	Conditions (SAR1 + SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
19	LTE 7 + WLAN (DTS)	Body	Rear Face	0.78	0.6	1.38	Σ SAR < 1.6, Not required
			Left Side	1.18	0.4	1.58	Σ SAR < 1.6, Not required
			Right Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
			Top Side	0.94	0.39	1.33	Σ SAR < 1.6, Not required
			Bottom Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
20	LTE 7 + WLAN (NII)	Body	Rear Face	0.78	0.29	1.07	Σ SAR < 1.6, Not required
			Left Side	1.18	0.4	1.58	Σ SAR < 1.6, Not required
			Right Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
			Top Side	0.94	0.64	1.58	Σ SAR < 1.6, Not required
			Bottom Side	0.4	0.4	0.80	Σ SAR < 1.6, Not required
21	LTE 7 + BT (DSS)	Body	Rear Face	0.78	0.11	0.89	Σ SAR < 1.6, Not required
			Left Side	1.18	0.11	1.29	Σ SAR < 1.6, Not required
			Right Side	0.4	0.11	0.51	Σ SAR < 1.6, Not required
			Top Side	0.94	0.11	1.05	Σ SAR < 1.6, Not required
			Bottom Side	0.4	0.11	0.51	Σ SAR < 1.6, Not required

<SAR to Peak Location Separation Ratio Analysis>

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

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

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

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

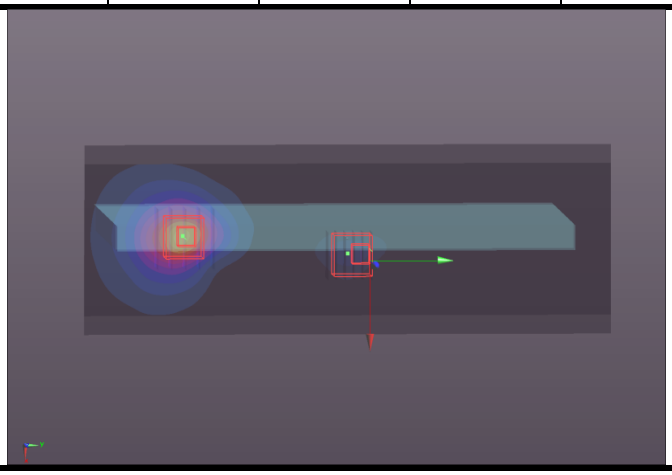
The SPLSR is determined by the following formula.

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

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

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

Conditions	Exposure Condition	Test Position	SAR Value (W/kg)	Coordinates			Peak Location Separation Distance (R_i, mm)	SPLSR
				x	y	z		
WCDMA II Ch9400	Body	Top Side	1.06	-2	-90.8	1.25	103.8	0.02
802.11ac Ch58			0.64	7	12.5	-2.26		



Test Engineer： Kevin Yao, and Willy Chang

5. Calibration of Test Equipment

Equipment	Manufacturer	Model	SN	Cal. Date	Cal. Interval
System Validation Dipole	SPEAG	D835V2	4d121	Aug. 25, 2016	1 Year
System Validation Dipole	SPEAG	D1900V2	5d036	Jan. 23, 2017	1 Year
System Validation Dipole	SPEAG	D2450V2	737	Aug. 26, 2016	1 Year
System Validation Dipole	SPEAG	D2600V2	1020	Aug. 26, 2016	1 Year
System Validation Dipole	SPEAG	D5GHzV2	1019	Aug. 23, 2016	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	3971	Mar. 24, 2017	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	3753	May. 05, 2017	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	7351	Dec. 20, 2016	1 Year
Data Acquisition Electronics	SPEAG	DAE3	579	Sep. 05, 2016	1 Year
Data Acquisition Electronics	SPEAG	DAE4	1431	Mar. 20, 2017	1 Year
Data Acquisition Electronics	SPEAG	DAE4	916	Dec. 15, 2016	1 Year
Wireless Communication Test Set	Agilent	E5515C	MY50266628	Dec. 12, 2016	1 Year
Radio Communication Analyzer	Anritsu	MT8820C	6201381727	May. 26, 2017	1 Year
Spectrum Analyzer	R&S	FSL6	102006	Mar. 27, 2017	1 Year
EXA Spectrum Analyzer	Agilent	N9010A	MY52100136	Jun. 26, 2013	N/A
EXA Spectrum Analyzer	Agilent	N9010A	MY53470455	May. 19, 2017	N/A
Vector Signal Generator	Anritsu	MG3710A	6201599977	Mar. 27, 2017	1 Year
Thermometer	YFE	YF-160A	130504591	Mar. 24, 2017	1 Year
Power Amplifier	AR	5S1G4	0339656	Sep. 21, 2016	1 Year
Attenuator	MTJ	MTJ6011-03	N/A	Sep. 21, 2016	1 Year
Attenuator	Woken	00800A1G01L-10	N/A	Sep. 21, 2016	1 Year
Directional Coupler	Woken	0110A05602O-10	11122702	Sep. 21, 2016	1 Year
Dielectric Assessment Kit	SPEAG	DAK-3.5	1151	Aug. 25, 2016	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	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:
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Web Site: www.adt.com.tw

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

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Appendix A. SAR Plots of System Verification

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

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2017/07/06

System Check_B835_170706

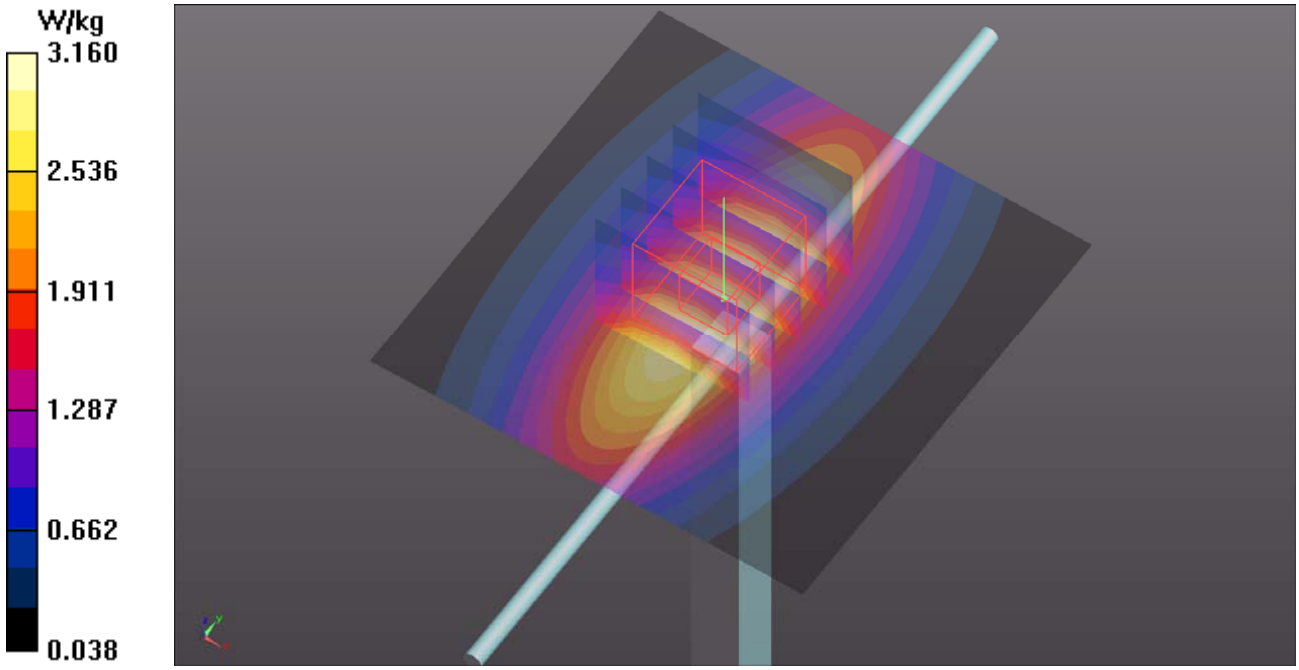
DUT: Dipole 835 MHz; Type: D835V2; SN: 4d121

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: B07T10N3_0706 Medium parameters used: f = 835 MHz; σ = 1.001 S/m; ε_r = 55.454; ρ = 1000 kg/m^3
Ambient Temperature：23.9 ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7351; ConvF(10.31, 10.31, 10.31); Calibrated: 2016/12/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: ELI Phantom_1204; Type: QDOVA;
- 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) = 3.16 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 54.50 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 3.63 W/kg
SAR(1 g) = 2.51 W/kg; SAR(10 g) = 1.67 W/kg
Maximum value of SAR (measured) = 3.15 W/kg



System Check_B1900_170706

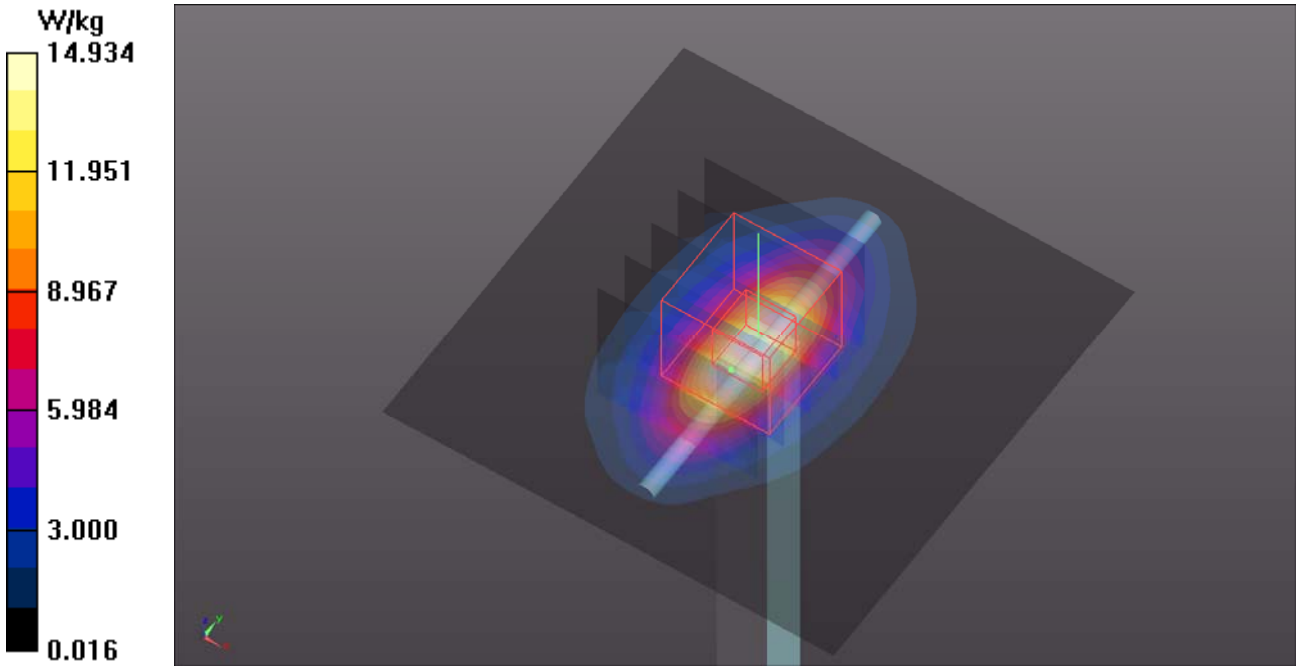
DUT: Dipole 1900 MHz; Type: D1900V2; SN: 5d036

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: B16T20N1_0706 Medium parameters used: f = 1900 MHz; σ = 1.575 S/m; ε_r = 51.251; ρ = 1000 kg/m^3
Ambient Temperature：24.3 ℃ ； Liquid Temperature：23.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7351; ConvF(8.14, 8.14, 8.14); Calibrated: 2016/12/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: ELI Phantom_1204; Type: QDOVA;
- 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) = 14.9 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 98.00 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 18.3 W/kg
SAR(1 g) = 10.2 W/kg; SAR(10 g) = 5.27 W/kg
Maximum value of SAR (measured) = 14.3 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2017/07/08

System Check_B2450_170708

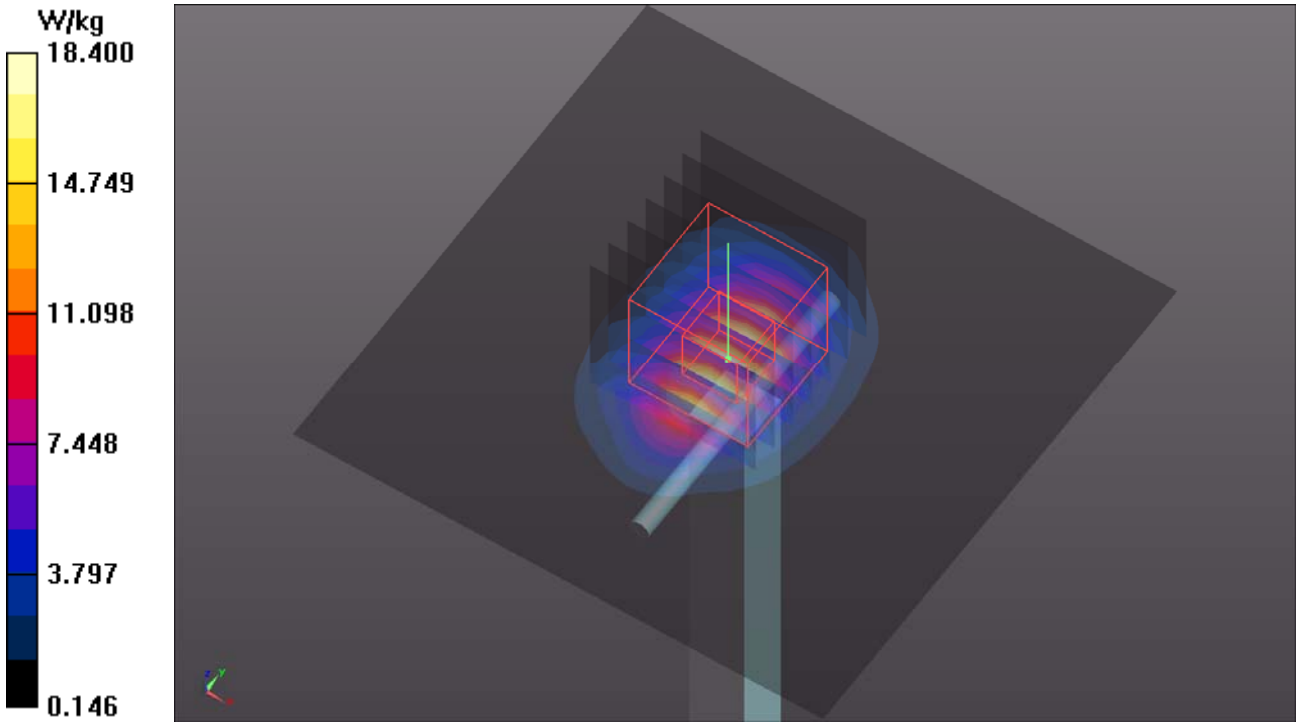
DUT: Dipole 2450 MHz; Type: D2450V2; SN: 737

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: B19T27N4_0708 Medium parameters used: f = 2450 MHz; σ = 2.02 S/m; ε_r = 50.572; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3753; ConvF(7.27, 7.27, 7.27); Calibrated: 2017/05/05;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn916; Calibrated: 2016/12/15
- Phantom: ELI Phantom_1245; Type: QDOVA;
- 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) = 18.5 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.58 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 24.4 W/kg
SAR(1 g) = 12.1 W/kg; SAR(10 g) = 5.62 W/kg
Maximum value of SAR (measured) = 18.4 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2017/07/07

System Check_B2600_170707

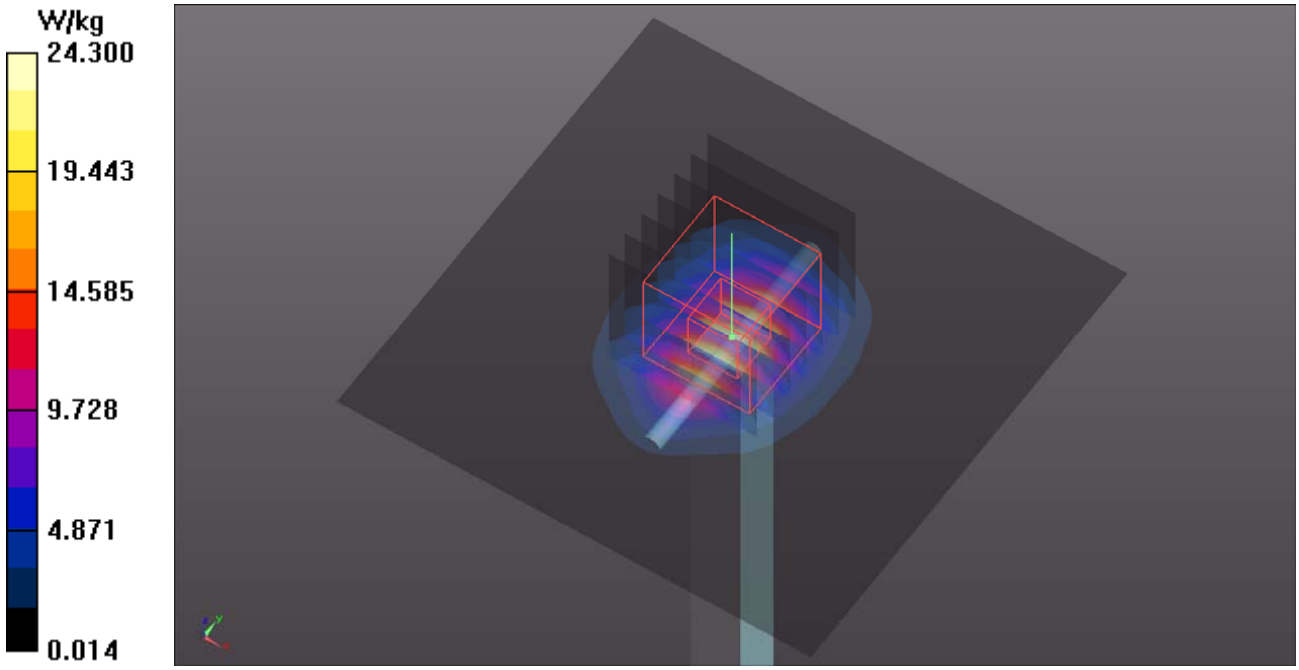
DUT: Dipole 2600 MHz; Type: D2600V2; SN: 1020

Communication System: CW; Frequency: 2600 MHz;Duty Cycle: 1:1
Medium: B19T27N4_0707 Medium parameters used: f = 2600 MHz; σ = 2.157 S/m; ε_r = 50.91; ρ = 1000 kg/m^3
Ambient Temperature：23.9 ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3753; ConvF(7.14, 7.14, 7.14); Calibrated: 2017/05/05;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn916; Calibrated: 2016/12/15
- Phantom: ELI Phantom_1204; Type: QDOVA
- 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) = 24.3 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 109.4 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 30.5 W/kg
SAR(1 g) = 14 W/kg; SAR(10 g) = 6.19 W/kg
Maximum value of SAR (measured) = 24.2 W/kg



System Check_B5250_170708

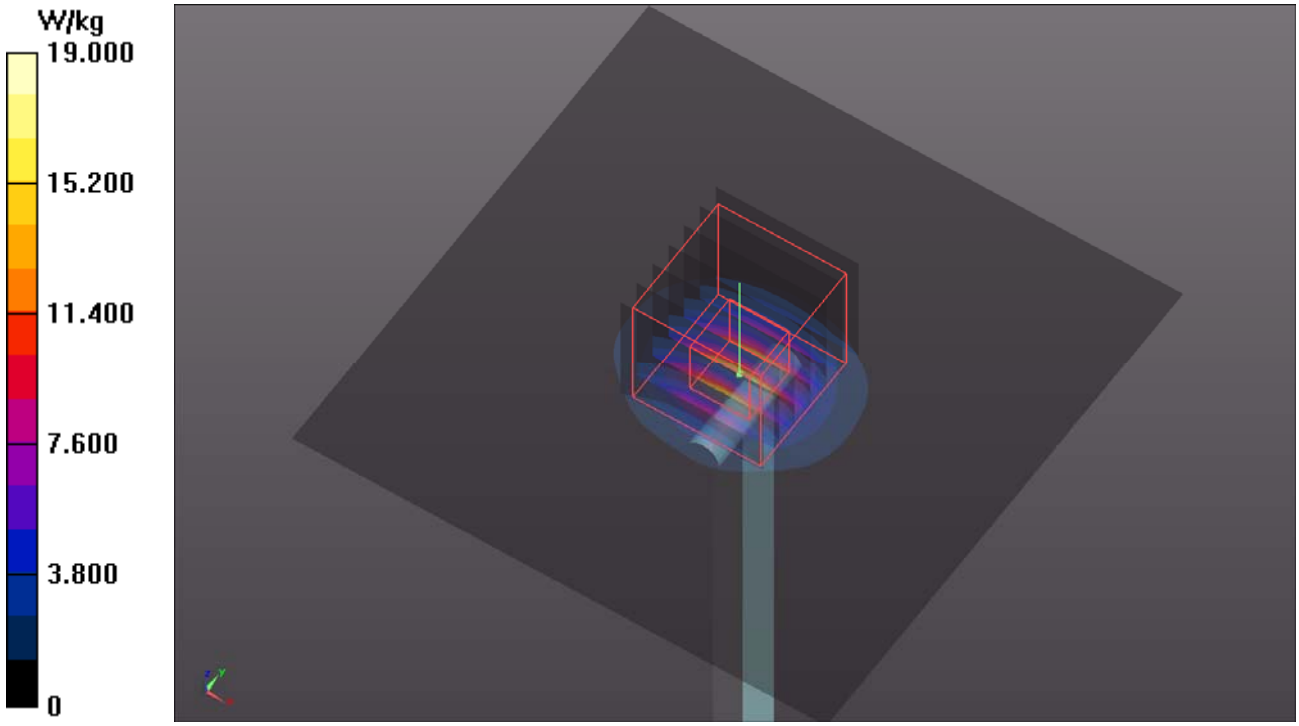
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5250 MHz;Duty Cycle: 1:1
Medium: B34T60N2_0708 Medium parameters used: f = 5250 MHz; σ = 5.408 S/m; ε_r = 47.3; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3753; ConvF(4.87, 4.87, 4.87); Calibrated: 2017/05/05;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn916; Calibrated: 2016/12/15
- Phantom: ELI Phantom_1245; Type: QDOVA;
- 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) = 17.3 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 59.03 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 29.6 W/kg
SAR(1 g) = 7.71 W/kg; SAR(10 g) = 2.19 W/kg
Maximum value of SAR (measured) = 19.0 W/kg



System Check_B5600_170708

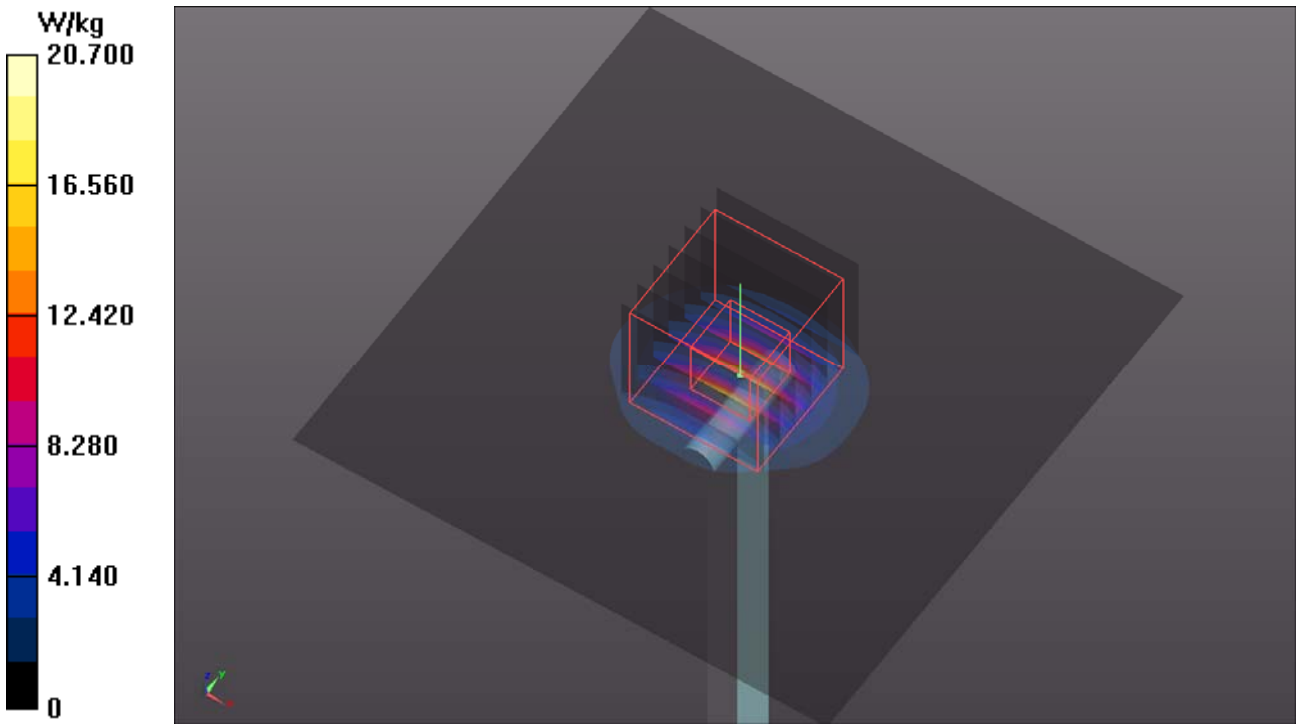
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5600 MHz;Duty Cycle: 1:1
Medium: B34T60N2_0708 Medium parameters used: f = 5600 MHz; σ = 5.889 S/m; ε_r = 46.629; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3753; ConvF(4.27, 4.27, 4.27); Calibrated: 2017/05/05;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn916; Calibrated: 2016/12/15
- Phantom: ELI Phantom_1245; Type: QDOVA;
- 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) = 18.5 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 67.95 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 34.0 W/kg
SAR(1 g) = 8.02 W/kg; SAR(10 g) = 2.24 W/kg
Maximum value of SAR (measured) = 20.7 W/kg



System Check_B5800_170708

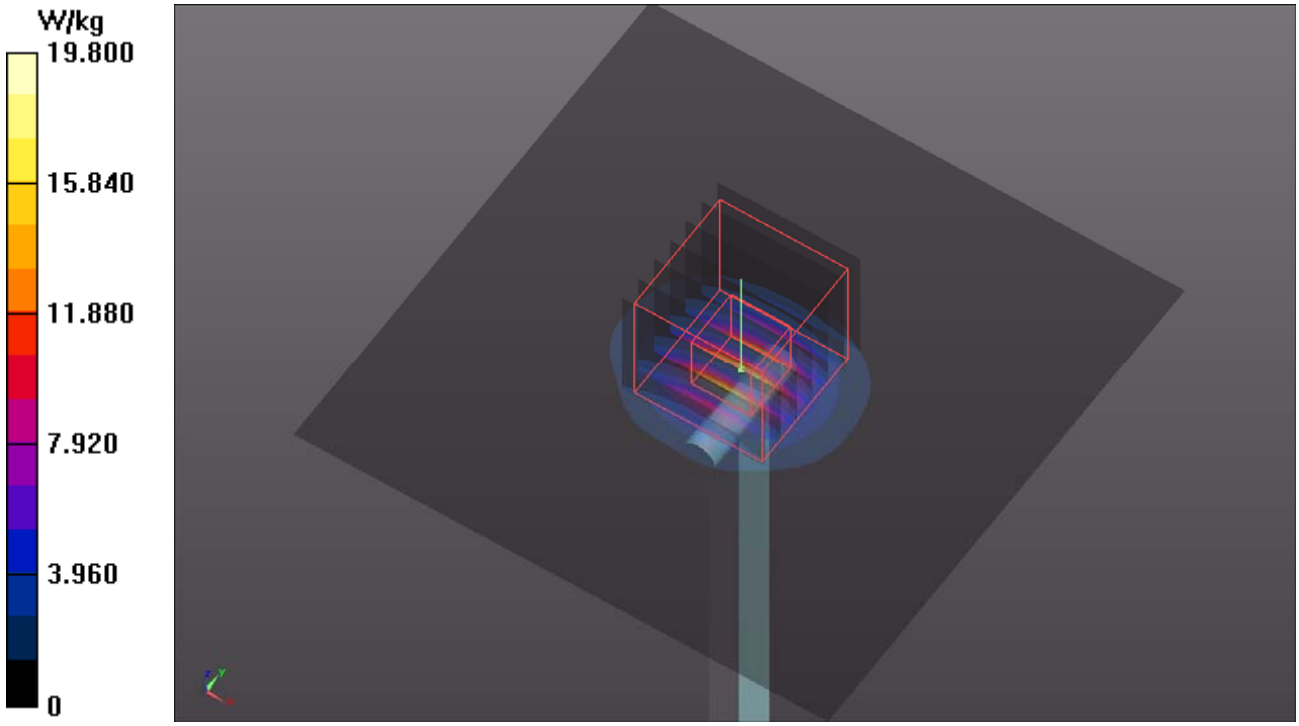
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: B34T60N2_0708 Medium parameters used: f = 5800 MHz; σ = 6.176 S/m; ε_r = 46.237; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3753; ConvF(4.52, 4.52, 4.52); Calibrated: 2017/05/05;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn916; Calibrated: 2016/12/15
- Phantom: ELI Phantom_1245; Type: QDOVA;
- 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) = 18.1 W/kg

Pin=100mW/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 65.10 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 33.5 W/kg
SAR(1 g) = 7.6 W/kg; SAR(10 g) = 2.13 W/kg
Maximum value of SAR (measured) = 19.8 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_Rear Face_0cm_Ch251_P_Sensor_w

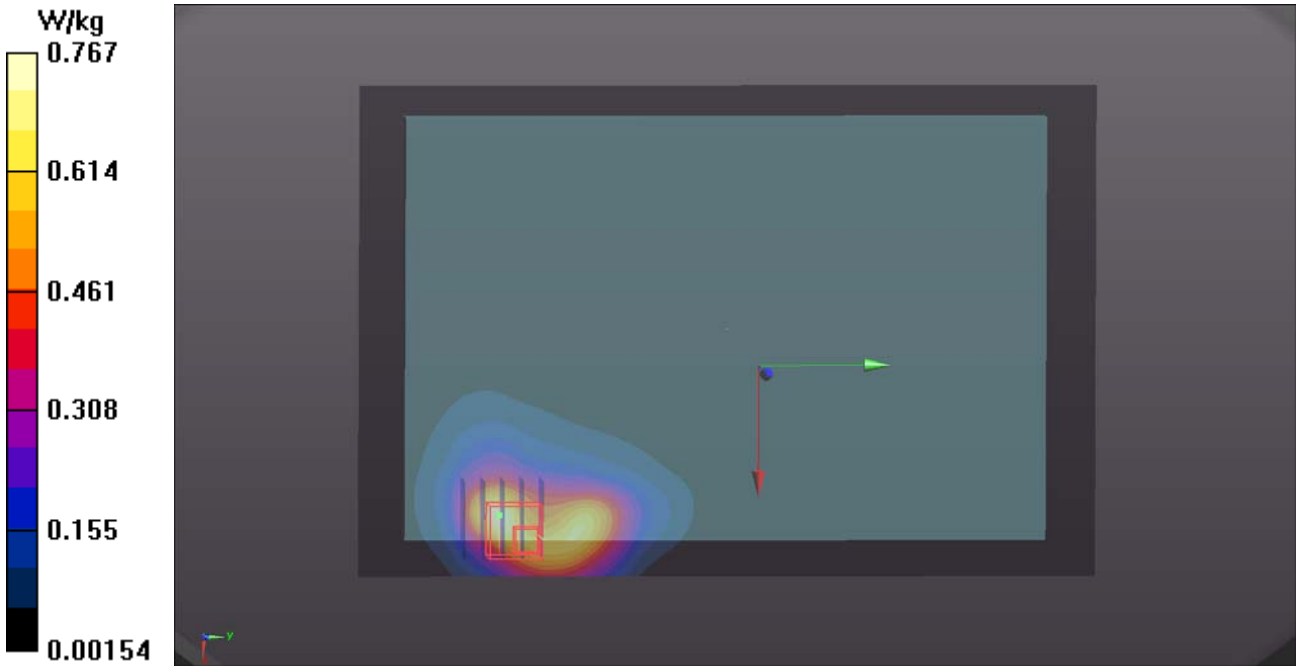
DUT: 170616C12

Communication System: GPRS11; Frequency: 848.8 MHz;Duty Cycle: 1:2.67
Medium: B07T10N3_0706 Medium parameters used: f = 849 MHz; σ = 1.014 S/m; ε_r = 55.371; ρ = 1000 kg/m^3
Ambient Temperature：23.9 ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7351; ConvF(10.31, 10.31, 10.31); Calibrated: 2016/12/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: ELI Phantom_1204; Type: QDOVA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (131x251x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.767 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.88 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 1.70 W/kg
SAR(1 g) = 0.740 W/kg; SAR(10 g) = 0.377 W/kg
Maximum value of SAR (measured) = 1.32 W/kg



P02 GSM1900_GPRS11_Rear Face_0cm_Ch661_P_Sensor_w

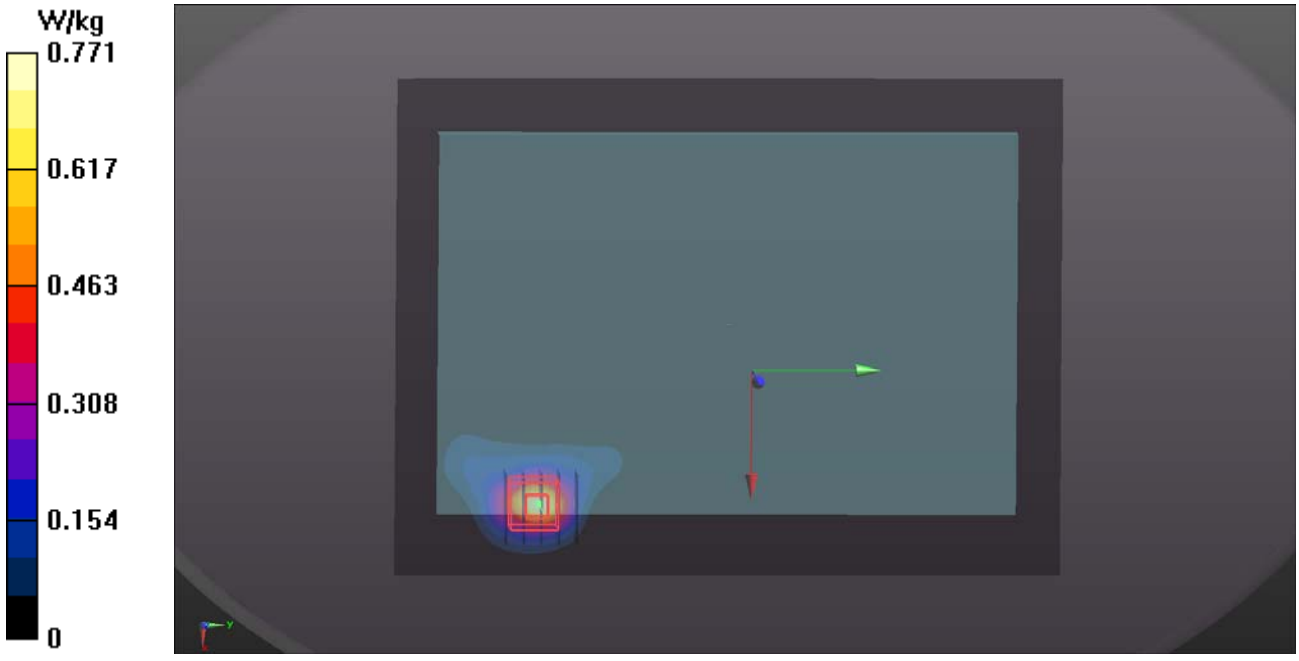
DUT: 170616C12

Communication System: GPRS11; Frequency: 1880 MHz;Duty Cycle: 1:2.67
Medium: B16T20N1_0705 Medium parameters used: f = 1880 MHz; σ = 1.55 S/m; ε_r = 51.444; ρ = 1000 kg/m^3
Ambient Temperature：23.9 ℃ ； Liquid Temperature：23.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3971; ConvF(8.26, 8.26, 8.26); Calibrated: 2017/03/24;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2016/09/05
- Phantom: ELI Phantom_1043; Type: QDOVA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (151x201x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.771 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.10 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 1.56 W/kg
SAR(1 g) = 0.640 W/kg; SAR(10 g) = 0.296 W/kg
Maximum value of SAR (measured) = 1.27 W/kg



P03 WCDMA II_RMC12.2K_Top Side_1.6cm_Ch9400_P_Sensor_w_o

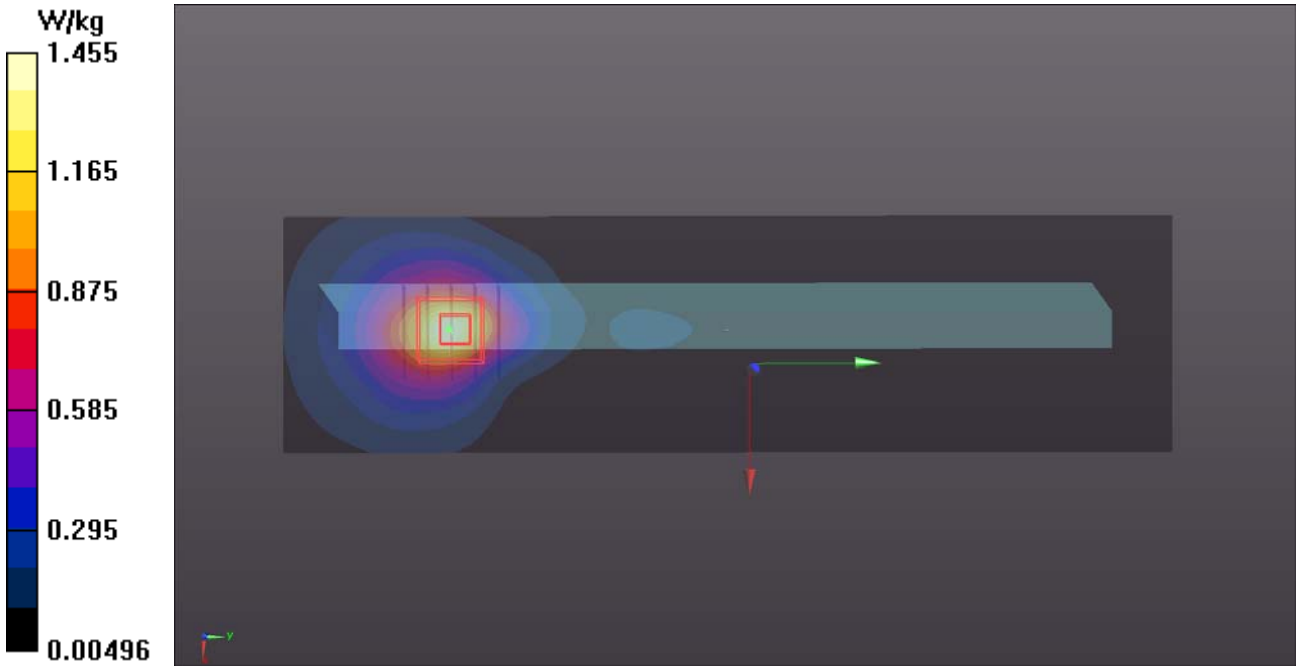
DUT: 170616C12

Communication System: WCDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: B16T20N1_0706 Medium parameters used: f = 1880 MHz; σ = 1.56 S/m; ε_r = 51.238; ρ = 1000 kg/m^3
Ambient Temperature：24.3 ℃ ； Liquid Temperature：23.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7351; ConvF(8.14, 8.14, 8.14); Calibrated: 2016/12/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: ELI Phantom_1204; Type: QDOVA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (61x201x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.46 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 30.41 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 1.61 W/kg
SAR(1 g) = 0.967 W/kg; SAR(10 g) = 0.570 W/kg
Maximum value of SAR (measured) = 1.37 W/kg



P04 WCDMA V_RMC12.2K_Rear Face_0cm_Ch4182_P_Sensor_w

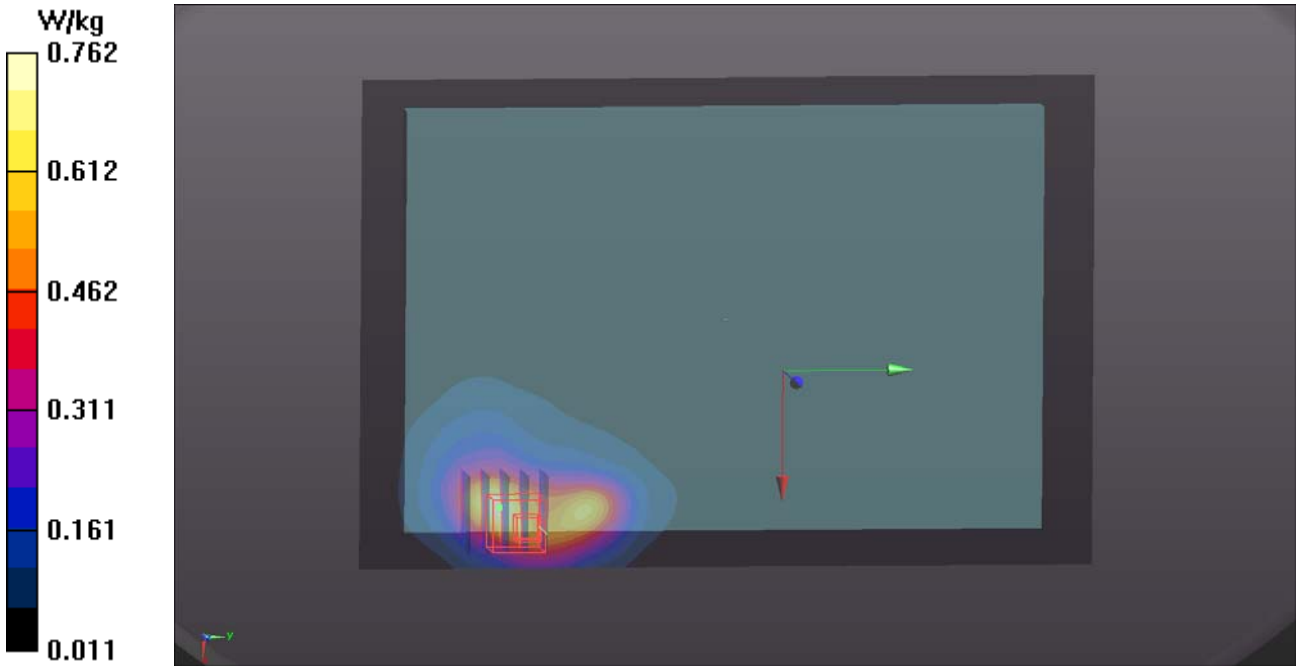
DUT: 170616C12

Communication System: WCDMA; Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: B07T10N3_0706 Medium parameters used: f = 836.4 MHz; σ = 1.002 S/m; ε_r = 55.446; ρ = 1000 kg/m^3
Ambient Temperature：23.9 ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7351; ConvF(10.31, 10.31, 10.31); Calibrated: 2016/12/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: ELI Phantom_1204; Type: QDOVA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (141x201x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.762 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.00 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.39 W/kg
SAR(1 g) = 0.636 W/kg; SAR(10 g) = 0.340 W/kg
Maximum value of SAR (measured) = 1.10 W/kg



P05 LTE 2_QPSK20M_Rear Face_1.7cm_Ch18700_P_Sensor_w_o_1RB_OS99

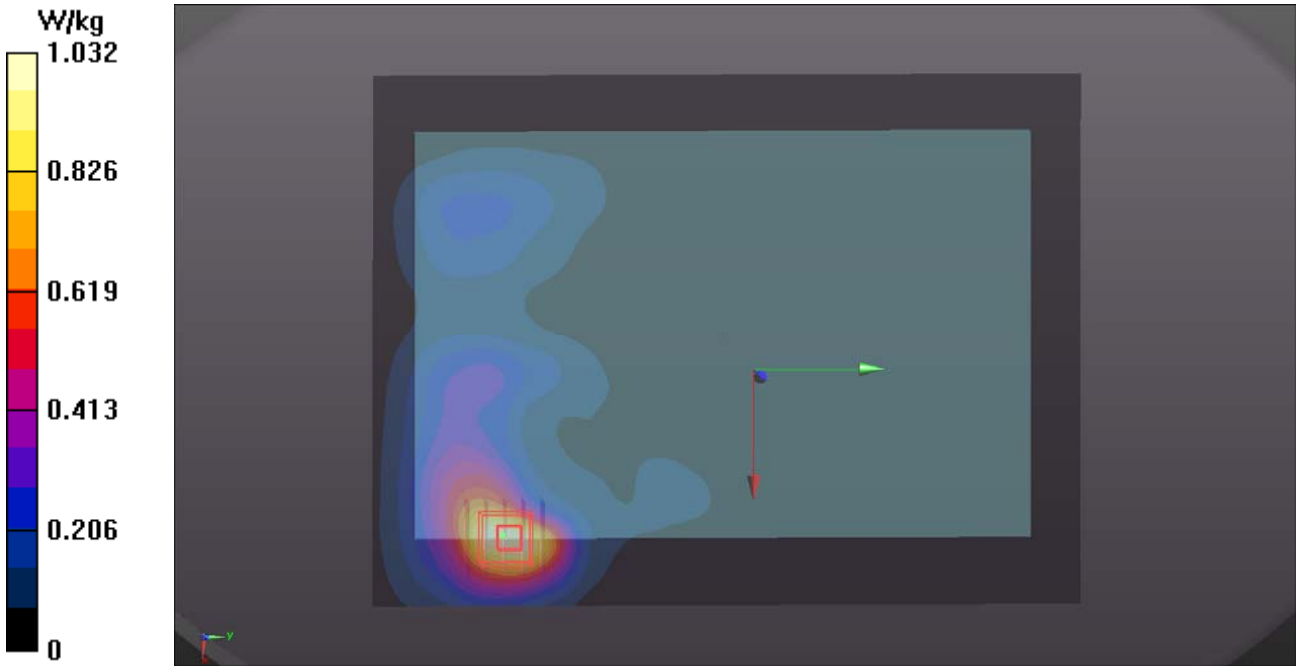
DUT: 170616C12

Communication System: LTE; Frequency: 1860 MHz;Duty Cycle: 1:1
Medium: B16T20N1_0706 Medium parameters used: f = 1860 MHz; σ = 1.548 S/m; ε_r = 51.222; ρ = 1000 kg/m^3
Ambient Temperature：24.3 ℃； Liquid Temperature：23.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7351; ConvF(8.14, 8.14, 8.14); Calibrated: 2016/12/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: ELI Phantom_1204; Type: QDOVA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (151x201x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.03 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.07 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 1.33 W/kg
SAR(1 g) = 0.815 W/kg; SAR(10 g) = 0.489 W/kg
Maximum value of SAR (measured) = 1.13 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2017/07/06

P06 LTE 5_QPSK10M_Rear Face_0cm_Ch20525_P_Sensor_w_1RB_OS24

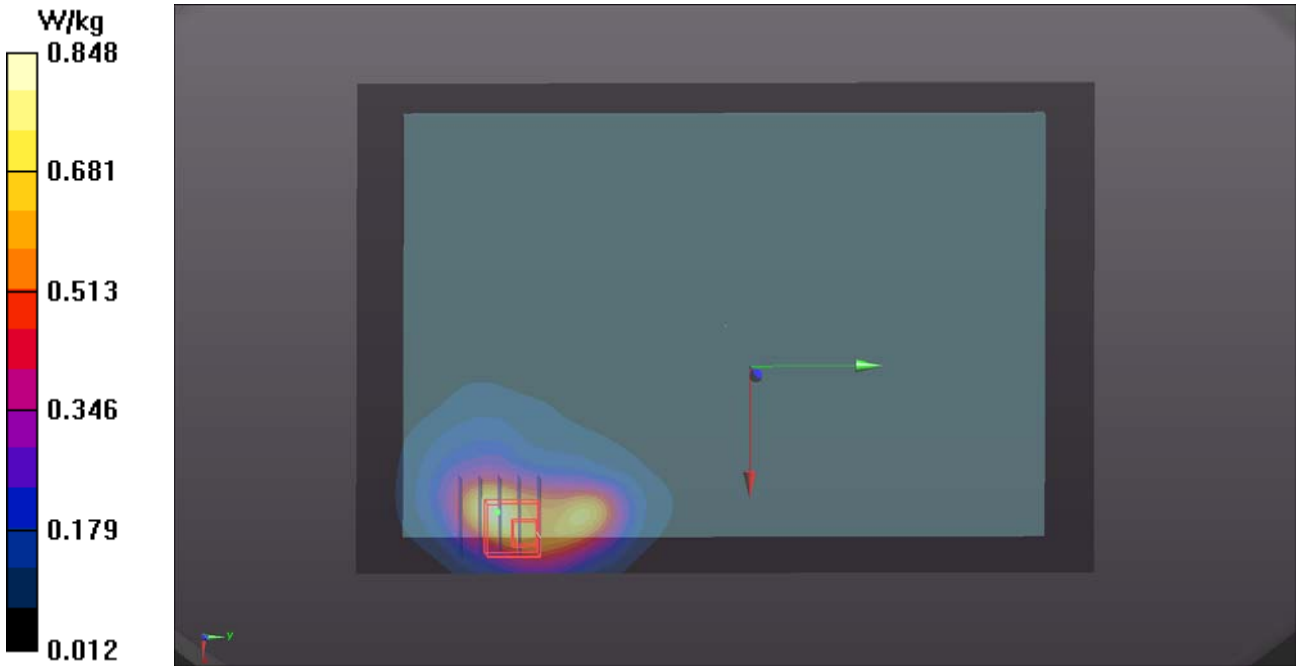
DUT: 170616C12

Communication System: LTE; Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium: B07T10N3_0706 Medium parameters used: f = 836.5 MHz; σ = 1.002 S/m; ε_r = 55.445; ρ = 1000 kg/m^3
Ambient Temperature：23.9 ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN7351; ConvF(10.31, 10.31, 10.31); Calibrated: 2016/12/20;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1431; Calibrated: 2017/03/20
- Phantom: ELI Phantom_1204; Type: QDOVA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (141x201x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.848 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.85 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.48 W/kg
SAR(1 g) = 0.686 W/kg; SAR(10 g) = 0.368 W/kg
Maximum value of SAR (measured) = 1.17 W/kg



P07 LTE 7_QPSK20M_Left Side_0cm_Ch21350_P_Sensor_w_o_1RB_OS99

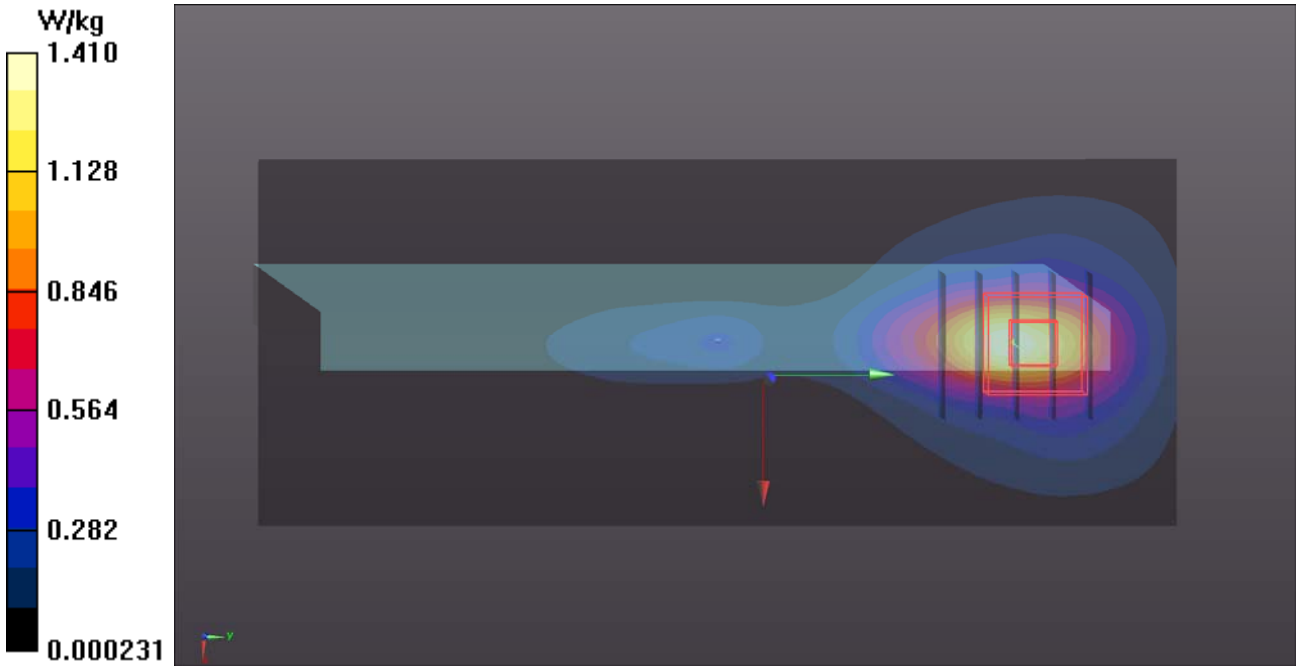
DUT: 170616C12

Communication System: LTE; Frequency: 2560 MHz;Duty Cycle: 1:1
Medium: B19T27N4_0707 Medium parameters used: f = 2560 MHz; σ = 2.109 S/m; ε_r = 51.001; ρ = 1000 kg/m^3
Ambient Temperature：23.9 ℃ ； Liquid Temperature：23.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3753; ConvF(7.14, 7.14, 7.14); Calibrated: 2017/05/05;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn916; Calibrated: 2016/12/15
- Phantom: ELI Phantom_1204; Type: QDOVA;
- 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) = 1.41 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.97 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 2.27 W/kg
SAR(1 g) = 1.01 W/kg; SAR(10 g) = 0.450 W/kg
Maximum value of SAR (measured) = 1.80 W/kg



P08 2.4G WLAN_802.11b_Rear Face_0cm_Ch11

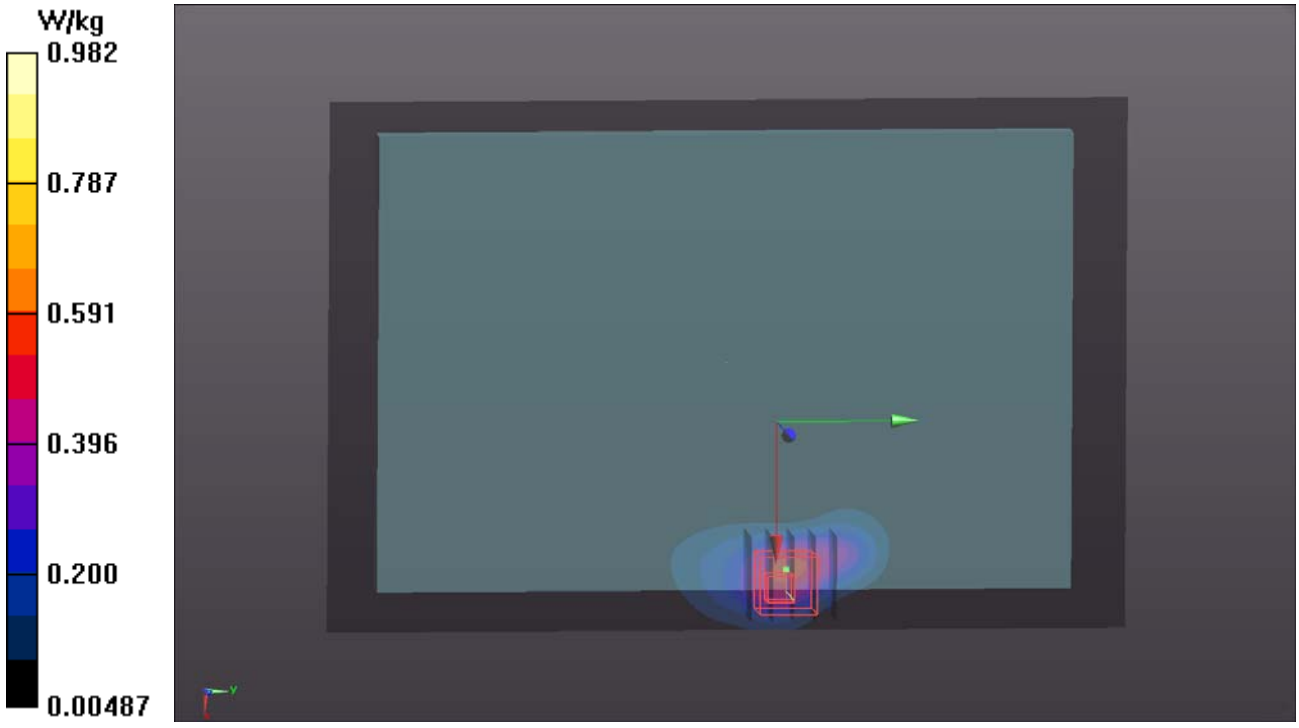
DUT: 170616C12

Communication System: WLAN_2.4G; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium: B19T27N4_0708 Medium parameters used: f = 2462 MHz; σ = 2.034 S/m; ε_r = 50.538; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3753; ConvF(7.27, 7.27, 7.27); Calibrated: 2017/05/05;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn916; Calibrated: 2016/12/15
- Phantom: ELI Phantom_1245; Type: QDOVA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (171x251x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.586 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.00 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 1.34 W/kg
SAR(1 g) = 0.589 W/kg; SAR(10 g) = 0.264 W/kg
Maximum value of SAR (measured) = 0.982 W/kg



P09 5.3G WLAN_802.11ac VH80_Top Side_0cm_Ch58

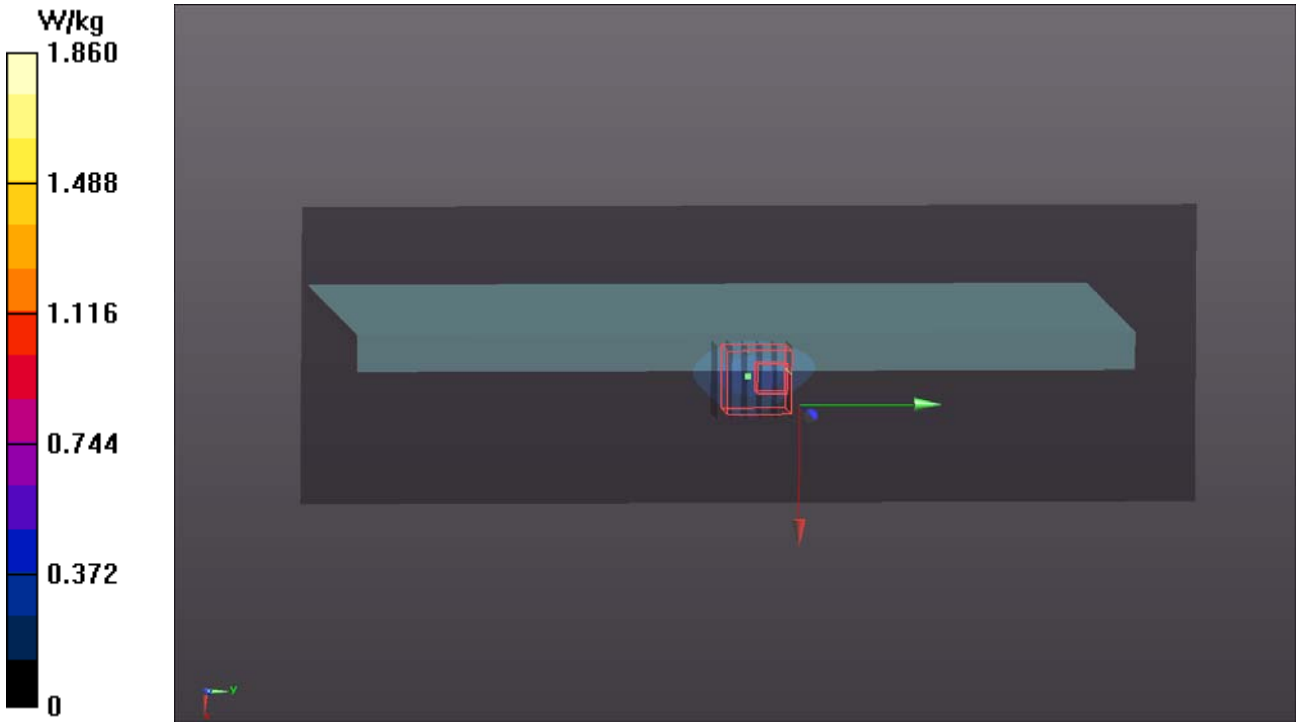
DUT: 170616C12

Communication System: WLAN_5G; Frequency: 5290 MHz;Duty Cycle: 1:1
Medium: B34T60N2_0708 Medium parameters used: f = 5290 MHz; σ = 5.443 S/m; ε_r = 47.225; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3753; ConvF(4.87, 4.87, 4.87); Calibrated: 2017/05/05;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn916; Calibrated: 2016/12/15
- Phantom: ELI Phantom_1245; Type: QDOVA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (101x301x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.381 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 7.287 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 3.65 W/kg
SAR(1 g) = 0.594 W/kg; SAR(10 g) = 0.118 W/kg
Maximum value of SAR (measured) = 1.86 W/kg



P10 5.6G WLAN_802.11ac VH80_Top Side_0cm_Ch106

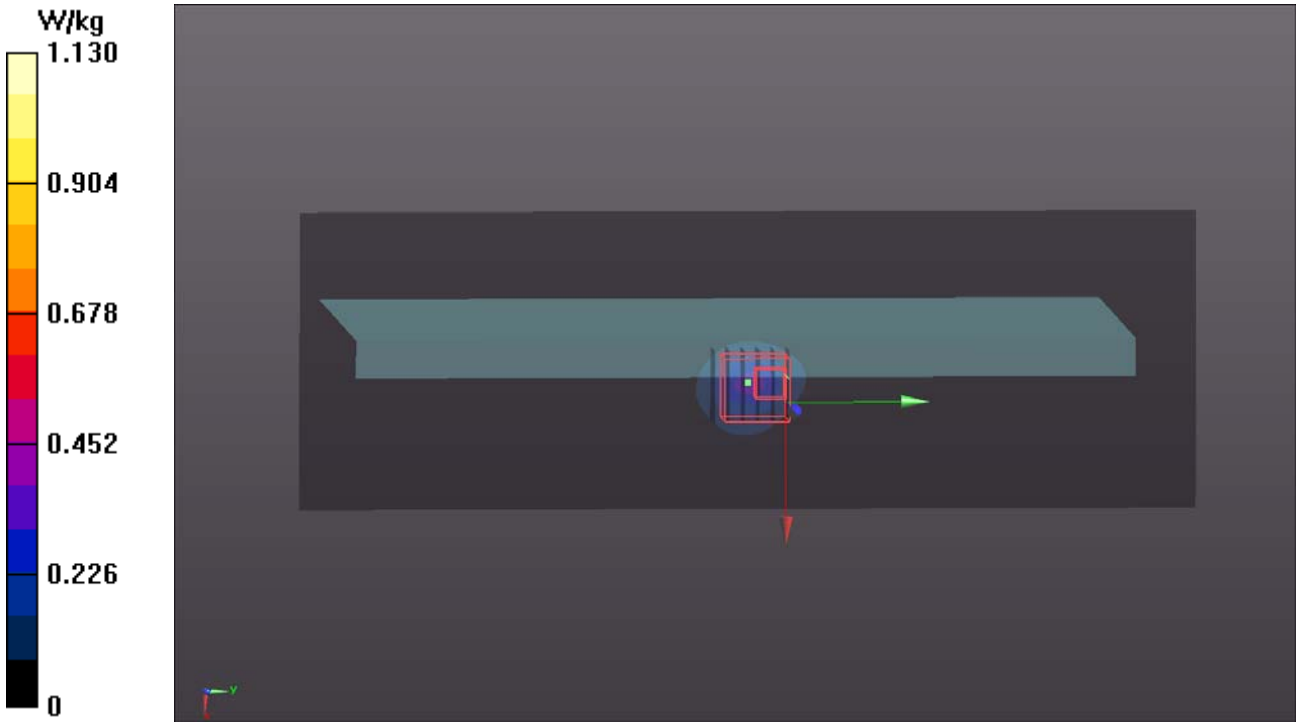
DUT: 170616C12

Communication System: WLAN_5G; Frequency: 5530 MHz;Duty Cycle: 1:1
Medium: B34T60N2_0708 Medium parameters used: f = 5530 MHz; σ = 5.778 S/m; ε_r = 46.691; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3753; ConvF(4.27, 4.27, 4.27); Calibrated: 2017/05/05;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn916; Calibrated: 2016/12/15
- Phantom: ELI Phantom_1245; Type: QDOVA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (101x301x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.345 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 6.713 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 2.36 W/kg
SAR(1 g) = 0.413 W/kg; SAR(10 g) = 0.098 W/kg
Maximum value of SAR (measured) = 1.13 W/kg



P11 5.8G WLAN_802.11ac VH80_Top Side_0cm_Ch155

DUT: 170616C12

Communication System: WLAN_5G; Frequency: 5775 MHz;Duty Cycle: 1:1
Medium: B34T60N2_0708 Medium parameters used: f = 5775 MHz; σ = 6.135 S/m; ε_r = 46.258; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃ ； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3753; ConvF(4.52, 4.52, 4.52); Calibrated: 2017/05/05;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn916; Calibrated: 2016/12/15
- Phantom: ELI Phantom_1245; Type: QDOVA;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (101x301x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.253 W/kg

- Zoom Scan (6x6x12)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm
Reference Value = 6.592 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 2.32 W/kg
SAR(1 g) = 0.446 W/kg; SAR(10 g) = 0.099 W/kg
Maximum value of SAR (measured) = 1.20 W/kg