FCC SAR Test Report

Report No.	:	**SA170320C18 R1**
Applicant	:	**Poynt Co.**
Address	:	**490 S. California Ave., Suite 200 Palo Alto, CA 94306**
Product	:	**Cellular module**
FCC ID	:	**2AFD7-P0502**
Brand	:	**Poynt**
Model No.	:	**PDS6**
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**
Sample Received Date	:	**Mar. 20, 2017**
Date of Testing	:	**Mar. 29, 2017 ~ Apr. 19, 2017**
Lab Address	:	**No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.**
Test Location	:	**No. 19, Hwa Ya 2nd Rd, Wen Hwa Vil, Kwei Shan Dist., Taoyuan City 33383, Taiwan (R.O.C)**

CERTIFICATION: The above equipment have been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch – Lin Kou Laboratories**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's SAR characteristics under the conditions specified in this report. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product certification, approval, or endorsement by TAF or any government agencies.

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Approved By : Eli Hsu / Project Engineer

Testing Laboratory
2021

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Release Control Record

Report No.	Reason for Change	Date Issued
SA170320C18	Initial release	May 12, 2017
SA170320C18 R1	Revise model no.	Jun. 19, 2017

1. Summary of Maximum SAR Value

Equipment Class	Mode	Highest Reported Body SAR_{1g} (0.5 cm Gap) (W/kg)
PCB	GSM850	0.26
	GSM1900	1.23
	WCDMA II	1.28
	WCDMA V	0.71
Equipment Class	Mode	Highest Reported Body SAR_{1g} (0.5 cm Gap) (W/kg)
DTS	2.4G WLAN	0.75
NII	5.3G WLAN	1.19
	5.6G WLAN	1.11
	5.8G WLAN	1.17
DSS	Bluetooth	N/A
Highest Simultaneous Transmission SAR		Body (W/kg)
PCB + DTS		1.46
PCB + NII		1.33
PCB + DSS		1.39

Note:

1. The SAR limit **(Head & Body: SAR_{1g} 1.6 W/kg, 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. SAR testing for WLAN Module is referring to BV CPS report no.: SA170320C17.

2. Description of Equipment Under Test

EUT Type	Cellular module
FCC ID	2AFD7-P0502
Brand Name	Poynt
Model Name	PDS6
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 WLAN : 2412 ~ 2462, 5180 ~ 5240, 5260 ~ 5320, 5500 ~ 5700, 5745 ~ 5825 Bluetooth : 2402 ~ 2480
Uplink Modulations	GSM & GPRS : GMSK EDGE : 8PSK WCDMA : QPSK 802.11b : DSSS 802.11a/g/n : OFDM Bluetooth : GFSK, π/4-DQPSK, 8-DPSK
Maximum Tune-up Conducted Power (Unit: dBm)	GSM850 : 33.5 GSM1900 : 30.5 WCDMA Band II : 21.5 WCDMA Band V : 24.5 WLAN 2.4G : 15.0 WLAN 5.2G : 13.0 WLAN 5.3G : 13.0 WLAN 5.6G : 13.0 WLAN 5.8G : 13.0 Bluetooth : 4.2
Antenna Type	PCB Antenna, Fixed Internal Antenna (Peak Antenna Gain : 1.63 dBi for 2.4GHz, 2.62 dBi for 5GHz)
EUT Stage	Identical Prototype

Note:

1. The EUT was installed in Smart Terminal (Brand: Poynt, Model: P0502, FCC ID: 2AFD7-P0501).
2. The above EUT information is declared by manufacturer and for more detailed features description please refers to the manufacturer's specifications or User's Manual.

List of Accessory:

Battery	**Brand Name**	Getac Technology corp.
	Model Name	CCQ60
	Power Rating	3.8Vdc, 1900mAh
	Type	Li-ion

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:

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

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

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

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

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

3.2 SPEAG DASY52 System

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

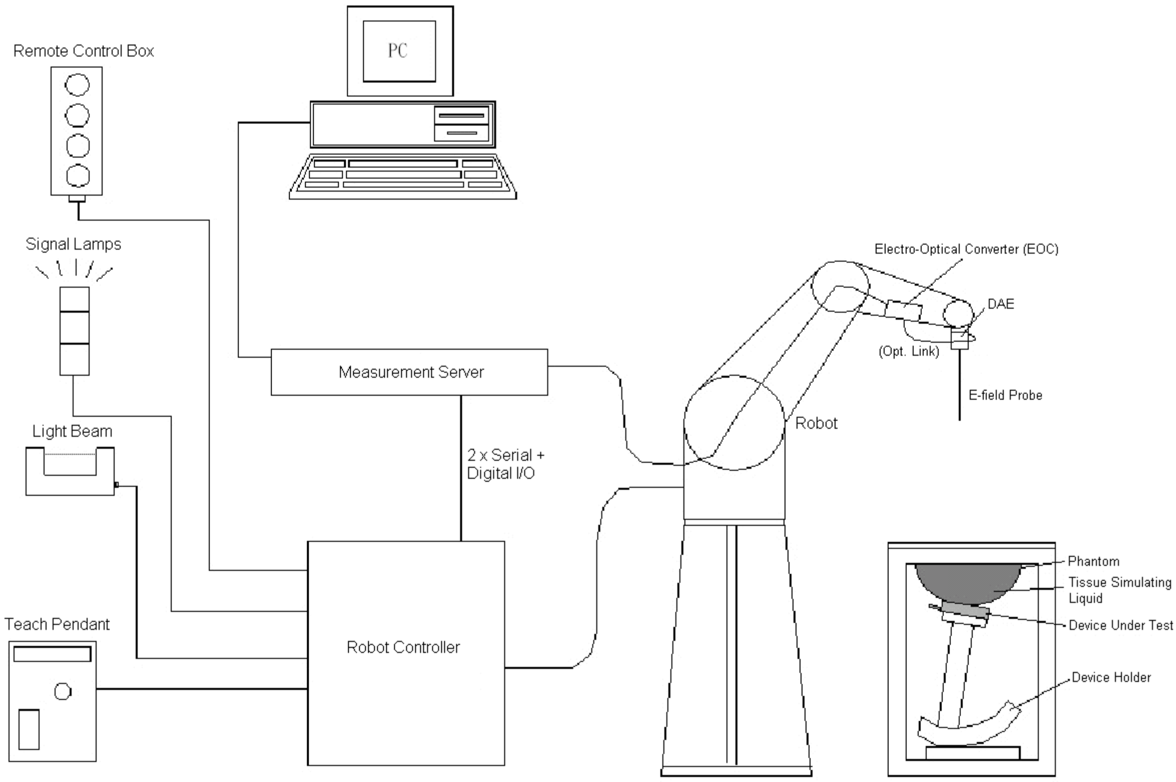


Fig-3.1 SPEAG DASY52 System Setup

3.2.1 Robot

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

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

Fig-3.2 SPEAG DASY52 System

3.2.2 Probes

The SAR measurement is conducted with the dosimetric probe. The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency.

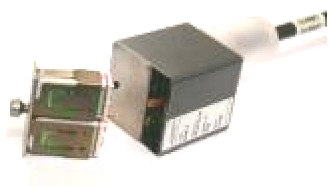
Model	EX3DV4
Construction	Symmetrical design with triangular core. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).
Frequency	10 MHz to 6 GHz Linearity: ± 0.2 dB
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 µW/g to 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 µW/g)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm

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

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

3.2.3 Data Acquisition Electronics (DAE)

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



3.2.4 Phantoms

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

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

3.2.5 Device Holder

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

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

3.2.6 System Validation Dipoles

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

3.2.7 Tissue Simulating Liquids

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

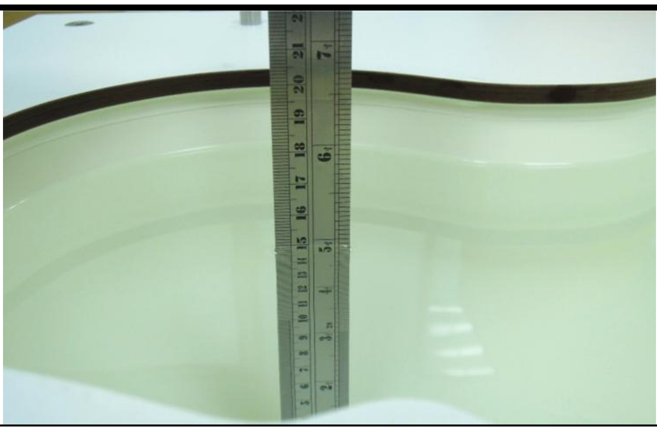
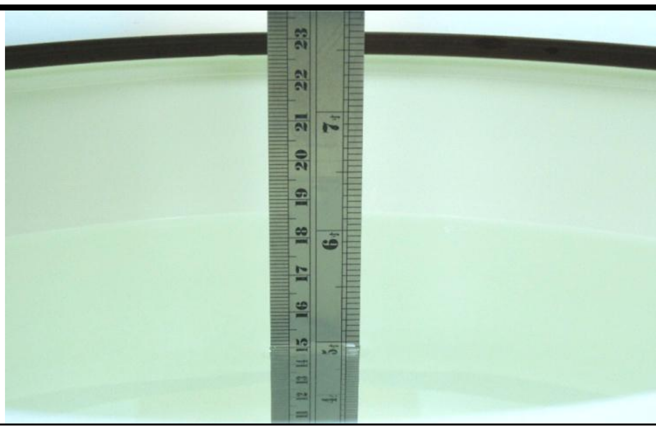
	

Photo of Liquid Height for Head Position	**Photo of Liquid Height for Body Position**

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

Table-3.1 Targets of Tissue Simulating Liquid

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

The following table gives the recipes for tissue simulating liquids.

Table-3.2 Recipes of Tissue Simulating Liquid

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

3.3 SAR System Verification

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

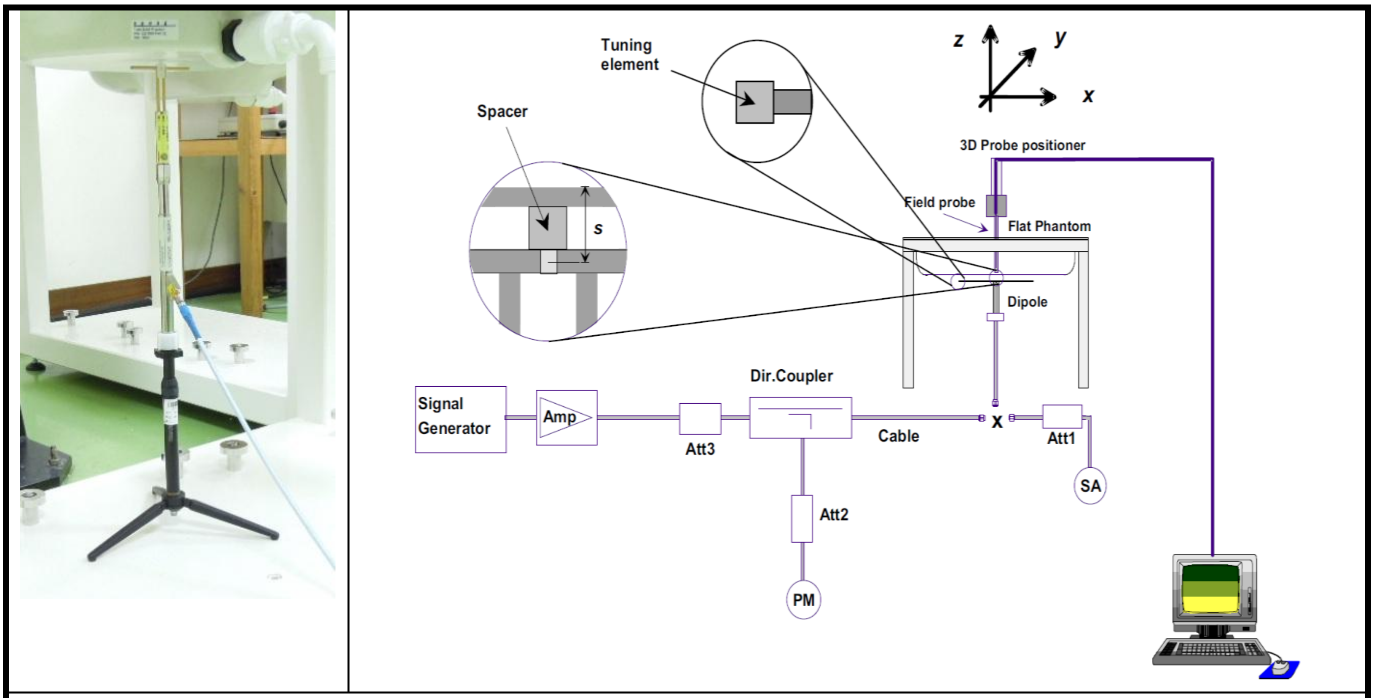


Fig-3.3 System Verification Setup

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

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

3.4 SAR Measurement Procedure

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

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

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

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

3.4.1 Area & Zoom Scan Procedure

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

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

Note:

When zoom scan is required and report SAR is <= 1.4 W/kg, the zoom scan resolution of Δx / Δy (2-3GHz: <= 8 mm, 3-4GHz: <= 7 mm, 4-6GHz: <= 5 mm) may be applied.

3.4.2 Volume Scan Procedure

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

3.4.3 Power Drift Monitoring

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

3.4.4 Spatial Peak SAR Evaluation

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

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

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

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

3.4.5 SAR Averaged Methods

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

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

4. SAR Measurement Evaluation

4.1 EUT Configuration and Setting

<Connections between EUT and System Simulator>

For WWAN SAR testing, the EUT was linked and controlled by base station emulator (Agilent E5515C is used for GSM/WCDMA/CDMA, and Anritsu MT8820C is used for LTE). 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 8 (max. uplink: 1, max. downlink: 4, total timeslots: 5)
3. This EUT supports GPRS multi-slot class 10 (max. uplink: 2, max. downlink: 4, total timeslots: 5)
4. This EUT supports GPRS multi-slot class 11 (max. uplink: 3, max. downlink: 4, total timeslots: 5)
5. This EUT supports GPRS multi-slot class 12 (max. uplink: 4, max. downlink: 4, total timeslots: 5)
6. This EUT supports EDGE multi-slot class 8 (max. uplink: 1, max. downlink: 4, total timeslots: 5)
7. This EUT supports EDGE multi-slot class 10 (max. uplink: 2, max. downlink: 4, total timeslots: 5)
8. This EUT supports EDGE multi-slot class 11 (max. uplink: 3, max. downlink: 4, total timeslots: 5)
9. This EUT supports EDGE multi-slot class 12 (max. uplink: 4, max. downlink: 4, total timeslots: 5)

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

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

<Considerations Related to WCDMA for Setup and Testing>

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)	CM (dB)(2)	MPR
1	2 / 15	15 / 15	64	2 / 15	4 / 15	0.0	0
2	12 / 15 (3)	15 / 15 (3)	64	12 / 15 (3)	24 / 15	1.0	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} = 8 $\Leftrightarrow A_{hs} = \beta_{hs} / \beta_c = 30 / 15 \Leftrightarrow \beta_{hs} = 30 / 15 * \beta_c$.
Note 2: CM = 1 for $\beta_c / \beta_d = 12 / 15$, $\beta_{hs} / \beta_c = 24 / 15$.
Note 3: 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 signaled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11 / 15$ and $\beta_d = 15 / 15$.

Release 6 HSUPA Data Devices

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

Sub-test	β_c	β_d	β_d (SF)	β_c / β_d	β_{hs} (1)	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM (2) (dB)	MPR (dB)	AG (4) Index	E-TFCI
1	11 / 15 (3)	15 / 15 (3)	64	11 / 15 (3)	22 / 15	209 / 225	1039 / 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_{ed1}: 47/15 β_{ed2}: 47/15	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 (4)	15 / 15 (4)	64	15 / 15 (4)	30 / 15	24 / 15	134 / 15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 8 $\Leftrightarrow$ $A_{hs} = \beta_{hs} / \beta_c = 30 / 15 \Leftrightarrow \beta_{hs} = 30 / 15 * \beta_c$.
Note 2: CM = 1 for $\beta_c / \beta_d = 12 / 15$, $\beta_{hs} / \beta_c = 24 / 15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c / β_d ratio of 11 / 15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10 / 15$ and $\beta_d = 15 / 15$.
Note 4: For subtest 5 the β_c / β_d ratio of 15 / 15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 14 / 15$ and $\beta_d = 15 / 15$.
Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.
Note 6: β_{ed} cannot be set directly; it is set by Absolute Grant Value.

HSPA+ SAR Guidance

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

DC-HSDPA SAR Guidance

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

4.2 EUT Testing Position

The EUT was tested on Front Face, Rear Face, Right Side, Left Side, Bottom Side and Top Side of EUT with phantom 0.5 cm gap

4.2.1 Simultaneous Transmission Possibilities

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

Simultaneous TX Combination	Capable Transmit Configurations	Body Exposure Condition
1	GSM850 (Voice / Data) + WLAN (Data)	Yes
2	GSM1900 (Voice / Data) + WLAN (Data)	Yes
3	WCDMA II (Voice / Data) + WLAN (Data)	Yes
4	WCDMA V (Voice / Data) + WLAN (Data)	Yes
5	GSM850 (Voice / Data) + BT (Data)	Yes
6	GSM1900 (Voice / Data) + BT (Data)	Yes
7	WCDMA II (Voice / Data) + BT (Data)	Yes
8	WCDMA V (Voice / Data) + BT (Data)	Yes

Note :

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

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 (%)
Mar. 29, 2017	Body	835	23.1	0.982	55.096	0.97	55.2	1.24	-0.19
Apr. 19, 2017	Body	835	23.3	1.015	56.103	0.97	55.2	4.64	1.64
Mar. 29, 2017	Body	1900	23.1	1.584	51.781	1.52	53.3	4.21	-2.85
Apr. 18, 2017	Body	1900	23.3	1.567	51.018	1.52	53.3	3.09	-4.28
Apr. 18, 2017	Body	1900	23.3	1.567	51.018	1.52	53.3	3.09	-4.28

Note:

1. 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 ℃.
2. Since the maximum deviation of dielectric properties of the tissue simulating liquid is within 5%, SAR correction is evaluated in the measurement uncertainty shown on section 6 of this report.

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
Mar. 29, 2017	3820	Body	835	0.982	55.096	Pass	Pass	Pass	N/A	N/A	N/A
Apr. 19, 2017	1790	Body	835	1.015	56.103	Pass	Pass	Pass	N/A	N/A	N/A
Mar. 29, 2017	3820	Body	1900	1.584	51.781	Pass	Pass	Pass	N/A	N/A	N/A
Apr. 18, 2017	3820	Body	1900	1.567	51.018	Pass	Pass	Pass	N/A	N/A	N/A
Apr. 18, 2017	1790	Body	1900	1.567	51.018	Pass	Pass	Pass	N/A	N/A	N/A

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
Mar. 29, 2017	Body	835	9.57	2.47	9.88	3.24	4d121	3820	913
Apr. 19, 2017	Body	835	9.57	2.50	10.00	4.49	4d121	1790	861
Mar. 29, 2017	Body	1900	40.10	9.92	39.68	-1.05	5d036	3820	913
Apr. 18, 2017	Body	1900	40.10	10.20	40.80	1.75	5d036	3820	862
Apr. 18, 2017	Body	1900	40.10	10.10	40.40	0.75	5d036	1790	861

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 Conducted Power

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

Mode	Maximum Burst-Averaged Output Power		Maximum Frame-Averaged Output Power	
	GSM850	GSM1900	GSM850	GSM1900
GPRS (GMSK, 1Tx-slot)	33.5	30.5	24.5	21.5
GPRS (GMSK, 2Tx-slot)	30.5	27.5	24.5	21.5
GPRS (GMSK, 3Tx-slot)	28.5	25.5	24.2	21.2
GPRS (GMSK, 4Tx-slot)	27.5	24.5	24.5	21.5
EDGE (8PSK, 1Tx-slot)	27.5	26.5	18.5	17.5
EDGE (8PSK, 2Tx-slot)	24.5	23.5	18.5	17.5
EDGE (8PSK, 3Tx-slot)	22.5	21.5	18.2	17.2
EDGE (8PSK, 4Tx-slot)	21.5	20.5	18.5	17.5

Note:

1. SAR testing was performed on the maximum frame-averaged power mode.
2. The frame-averaged power is linearly proportion to the slot number configured and it is linearly scaled the maximum burst-averaged power based on time slots. The calculated method is shown as below:
   Frame-averaged power = 10 x log (Burst-averaged power mW x Slot used / 8)

Mode	WCDMA Band II	WCDMA Band V
RMC 12.2K	21.5	24.5
HSDPA	21.0	23.0
HSUPA	21.0	23.0

4.6.2 Measured Conducted Power Result

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

Band	GSM850			GSM1900		
Channel	128	189	251	512	661	810
Frequency (MHz)	824.2	836.4	848.8	1850.2	1880.0	1909.8
Maximum Burst-Averaged Output Power						
GPRS (GMSK, 1Tx-slot)	32.08	**32.14**	32.09	29.03	29.38	**29.49**
GPRS (GMSK, 2Tx-slot)	29.26	29.33	29.29	26.12	26.52	26.67
GPRS (GMSK, 3Tx-slot)	27.45	27.54	27.49	24.34	24.74	24.88
GPRS (GMSK, 4Tx-slot)	26.29	26.40	26.36	23.46	23.69	23.89
EDGE (8PSK, 1Tx-slot)	26.19	26.29	26.24	24.96	25.32	25.43
EDGE (8PSK, 2Tx-slot)	23.33	23.45	23.41	22.10	22.51	22.63
EDGE (8PSK, 3Tx-slot)	21.53	21.63	21.60	20.39	20.70	20.81
EDGE (8PSK, 4Tx-slot)	20.28	20.41	20.36	19.10	19.54	19.66

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	
RMC 12.2K	**20.98**	20.38	20.12	**22.85**	22.56	22.69	-
HSDPA Subtest-1	20.88	20.28	20.02	22.74	22.53	22.67	0
HSDPA Subtest-2	20.87	20.27	20.01	22.16	21.82	21.97	0
HSDPA Subtest-3	20.88	20.28	20.02	21.80	21.59	21.74	0.5
HSDPA Subtest-4	20.89	20.29	20.03	21.60	21.33	21.42	0.5
HSUPA Subtest-1	20.26	19.66	19.52	21.42	21.04	21.24	0
HSUPA Subtest-2	20.09	19.49	19.60	20.11	19.82	19.90	2
HSUPA Subtest-3	20.39	19.79	19.53	21.09	20.82	20.98	1
HSUPA Subtest-4	20.38	19.78	19.52	20.28	19.99	20.13	2
HSUPA Subtest-5	20.94	20.34	20.08	22.16	21.97	22.16	0

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.

4.7.2 SAR Results for Body Exposure Condition (Separation Distance is 0.5 cm Gap)

Plot No.	Band	Mode	Test Position	Ch.	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	GSM850	GPRS12	Front Face	189	27.5	26.40	1.29	-0.01	0.268	0.35
01	GSM850	GPRS12	Rear Face	189	27.5	26.40	1.29	0.03	0.485	0.62
	GSM850	GPRS12	Right Side	189	27.5	26.40	1.29	-0.04	0.279	0.36
	GSM850	GPRS12	Left Side	189	27.5	26.40	1.29	-0.11	0.228	0.29
	GSM850	GPRS12	Top Side	189	27.5	26.40	1.29	-0.04	0.00894	0.01
	GSM850	GPRS12	Bottom Side	189	27.5	26.40	1.29	0.12	0.146	0.19
	GSM1900	GPRS12	Front Face	810	24.5	23.89	1.15	-0.09	0.954	1.10
	GSM1900	GPRS12	Front Face	512	24.5	23.46	1.27	-0.01	0.81	1.03
	GSM1900	GPRS12	Front Face	661	24.5	23.69	1.21	-0.08	0.891	1.07
02	GSM1900	GPRS12	Rear Face	810	24.5	23.89	1.15	-0.07	1.07	1.23
	GSM1900	GPRS12	Rear Face	810	24.5	23.89	1.15	0.03	1.04	1.20
	GSM1900	GPRS12	Rear Face	512	24.5	23.46	1.27	0.15	0.866	1.10
	GSM1900	GPRS12	Rear Face	661	24.5	23.69	1.21	-0.02	0.968	1.17
	GSM1900	EDGE12	Rear Face	810	20.5	19.66	1.21	0.05	0.357	0.43
	GSM1900	GPRS12	Right Side	810	24.5	23.89	1.15	0.07	0.131	0.15
	GSM1900	GPRS12	Left Side	810	24.5	23.89	1.15	-0.01	0.596	0.69
	GSM1900	GPRS12	Top Side	810	24.5	23.89	1.15	-0.03	0.027	0.03
	GSM1900	GPRS12	Bottom Side	810	24.5	23.89	1.15	-0.12	0.695	0.80
	GSM1900	GPRS12	Bottom Side	512	24.5	23.46	1.27	-0.12	0.674	0.86
	GSM1900	GPRS12	Bottom Side	661	24.5	23.69	1.21	-0.14	0.698	0.84

Plot No.	Band	Mode	Test Position	Ch.	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 II	RMC12.2K	Front Face	9262	21.5	20.98	1.13	0	1.02	1.15
	WCDMA II	RMC12.2K	Front Face	9400	21.5	20.38	1.29	0.03	0.911	1.18
	WCDMA II	RMC12.2K	Front Face	9538	21.5	20.12	1.37	0	0.916	1.26
	WCDMA II	HSDPA Subtest-4	Front Face	9262	21.0	20.89	1.03	0.02	0.926	0.95
	WCDMA II	HSDPA Subtest-4	Front Face	9400	21.0	20.29	1.18	0.06	0.806	0.95
	WCDMA II	HSDPA Subtest-4	Front Face	9538	21.0	20.03	1.25	0.04	0.758	0.95
	WCDMA II	HSUPA Subtest-5	Front Face	9262	21.0	20.94	1.01	-0.1	0.969	0.98
	WCDMA II	HSUPA Subtest-5	Front Face	9400	21.0	20.34	1.16	0.09	0.843	0.98
	WCDMA II	HSUPA Subtest-5	Front Face	9538	21.0	20.08	1.24	-0.11	0.793	0.98
	WCDMA II	RMC12.2K	Rear Face	9262	21.5	20.98	1.13	-0.04	1.04	1.17
	WCDMA II	RMC12.2K	Rear Face	9262	21.5	20.98	1.13	0.03	1.01	1.14
	WCDMA II	RMC12.2K	Rear Face	9400	21.5	20.38	1.29	-0.02	0.894	1.16
03	WCDMA II	RMC12.2K	Rear Face	9538	21.5	20.12	1.37	-0.01	0.928	**1.28**
	WCDMA II	HSDPA Subtest-4	Rear Face	9262	21.0	20.89	1.03	0.08	0.943	0.97
	WCDMA II	HSDPA Subtest-4	Rear Face	9400	21.0	20.29	1.18	0.13	0.821	0.97
	WCDMA II	HSDPA Subtest-4	Rear Face	9538	21.0	20.03	1.25	0.09	0.773	0.97
	WCDMA II	HSUPA Subtest-5	Rear Face	9262	21.0	20.94	1.01	0.04	1.01	1.02
	WCDMA II	HSUPA Subtest-5	Rear Face	9400	21.0	20.34	1.16	-0.03	0.877	1.02
	WCDMA II	HSUPA Subtest-5	Rear Face	9538	21.0	20.08	1.24	0.01	0.828	1.02
	WCDMA II	RMC12.2K	Right Side	9262	21.5	20.98	1.13	-0.03	0.129	0.15
	WCDMA II	RMC12.2K	Left Side	9262	21.5	20.98	1.13	0.1	0.539	0.61
	WCDMA II	RMC12.2K	Top Side	9262	21.5	20.98	1.13	0.04	0.025	0.03
	WCDMA II	RMC12.2K	Bottom Side	9262	21.5	20.98	1.13	-0.12	0.817	0.92
	WCDMA II	RMC12.2K	Bottom Side	9400	21.5	20.38	1.29	-0.14	0.681	0.88
	WCDMA II	RMC12.2K	Bottom Side	9538	21.5	20.12	1.37	-0.07	0.655	0.90
	WCDMA V	RMC12.2K	Front Face	4132	24.5	22.85	1.46	-0.02	0.287	0.42
04	WCDMA V	RMC12.2K	Rear Face	4132	24.5	22.85	1.46	0.07	0.486	**0.71**
	WCDMA V	RMC12.2K	Right Side	4132	24.5	22.85	1.46	-0.14	0.342	0.50
	WCDMA V	RMC12.2K	Left Side	4132	24.5	22.85	1.46	-0.06	0.271	0.40
	WCDMA V	RMC12.2K	Top Side	4132	24.5	22.85	1.46	-0.17	0.00928	0.01
	WCDMA V	RMC12.2K	Bottom Side	4132	24.5	22.85	1.46	-0.08	0.153	0.22

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
GSM1900	GPRS12	Rear Face	810	1.07	1.04	1.03	N/A	N/A	N/A	N/A
WCDMA II	RMC12.2K	Rear Face	9262	1.04	1.01	1.03	N/A	N/A	N/A	N/A

4.7.4 Simultaneous Multi-band Transmission Evaluation

<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)
BT (DSS)	2.48	4.2	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.

No.	Conditions (SAR1 + SAR2)	Exposure Condition	Test Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR Analysis
1	GSM850 + WLAN (DTS)	Body	Front Face	0.35	0.07	0.42	Σ SAR < 1.6, Not required
			Rear Face	0.62	0.75	1.37	Σ SAR < 1.6, Not required
			Left Side	0.29	0.05	0.34	Σ SAR < 1.6, Not required
			Right Side	0.36	0	0.36	Σ SAR < 1.6, Not required
			Top Side	0.01	0.45	0.46	Σ SAR < 1.6, Not required
			Bottom Side	0.19	0	0.19	Σ SAR < 1.6, Not required
2	GSM850 + WLAN (NII)	Body	Front Face	0.35	0.07	0.42	Σ SAR < 1.6, Not required
			Rear Face	0.62	1.19	1.81	**Analyzed as below**
			Left Side	0.29	0.1	0.39	Σ SAR < 1.6, Not required
			Right Side	0.36	0.04	0.4	Σ SAR < 1.6, Not required
			Top Side	0.01	0.11	0.12	Σ SAR < 1.6, Not required
			Bottom Side	0.19	0.01	0.2	Σ SAR < 1.6, Not required
3	GSM850 + BT (DSS)	Body	Front Face	0.35	0.11	0.46	Σ SAR < 1.6, Not required
			Rear Face	0.62	0.11	0.73	Σ SAR < 1.6, Not required
			Left Side	0.29	0.11	0.4	Σ SAR < 1.6, Not required
			Right Side	0.36	0.11	0.47	Σ SAR < 1.6, Not required
			Top Side	0.01	0.11	0.12	Σ SAR < 1.6, Not required
			Bottom Side	0.19	0.11	0.3	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	Front Face	1.1	0.07	1.17	Σ SAR < 1.6, Not required
			Rear Face	1.23	0.75	1.98	**Analyzed as below**
			Left Side	0.69	0.05	0.74	Σ SAR < 1.6, Not required
			Right Side	0.15	0	0.15	Σ SAR < 1.6, Not required
			Top Side	0.03	0.45	0.48	Σ SAR < 1.6, Not required
			Bottom Side	0.86	0	0.86	Σ SAR < 1.6, Not required
5	GSM1900 + WLAN (NII)	Body	Front Face	1.1	0.07	1.17	Σ SAR < 1.6, Not required
			Rear Face	1.23	1.19	2.42	**Analyzed as below**
			Left Side	0.69	0.1	0.79	Σ SAR < 1.6, Not required
			Right Side	0.15	0.04	0.19	Σ SAR < 1.6, Not required
			Top Side	0.03	0.11	0.14	Σ SAR < 1.6, Not required
			Bottom Side	0.86	0.01	0.87	Σ SAR < 1.6, Not required
6	GSM1900 + BT (DSS)	Body	Front Face	1.1	0.11	1.21	Σ SAR < 1.6, Not required
			Rear Face	1.23	0.11	1.34	Σ SAR < 1.6, Not required
			Left Side	0.69	0.11	0.8	Σ SAR < 1.6, Not required
			Right Side	0.15	0.11	0.26	Σ SAR < 1.6, Not required
			Top Side	0.03	0.11	0.14	Σ SAR < 1.6, Not required
			Bottom Side	0.86	0.11	0.97	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	Front Face	1.26	0.07	1.33	Σ SAR < 1.6, Not required
			Rear Face	1.28	0.75	2.03	**Analyzed as below**
			Left Side	0.61	0.05	0.66	Σ SAR < 1.6, Not required
			Right Side	0.15	0	0.15	Σ SAR < 1.6, Not required
			Top Side	0.03	0.45	0.48	Σ SAR < 1.6, Not required
			Bottom Side	0.92	0	0.92	Σ SAR < 1.6, Not required
8	**WCDMA II + WLAN (NII)**	Body	Front Face	1.26	0.07	1.33	Σ SAR < 1.6, Not required
			Rear Face	1.28	1.19	2.47	**Analyzed as below**
			Left Side	0.61	0.1	0.71	Σ SAR < 1.6, Not required
			Right Side	0.15	0.04	0.19	Σ SAR < 1.6, Not required
			Top Side	0.03	0.11	0.14	Σ SAR < 1.6, Not required
			Bottom Side	0.92	0.01	0.93	Σ SAR < 1.6, Not required
9	**WCDMA II + BT (DSS)**	Body	Front Face	1.26	0.11	1.37	Σ SAR < 1.6, Not required
			Rear Face	1.28	0.11	1.39	Σ SAR < 1.6, Not required
			Left Side	0.61	0.11	0.72	Σ SAR < 1.6, Not required
			Right Side	0.15	0.11	0.26	Σ SAR < 1.6, Not required
			Top Side	0.03	0.11	0.14	Σ SAR < 1.6, Not required
			Bottom Side	0.92	0.11	1.03	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	Front Face	0.42	0.07	0.49	Σ SAR < 1.6, Not required
			Rear Face	0.71	0.75	1.46	Σ SAR < 1.6, Not required
			Left Side	0.4	0.05	0.45	Σ SAR < 1.6, Not required
			Right Side	0.5	0	0.50	Σ SAR < 1.6, Not required
			Top Side	0.01	0.45	0.46	Σ SAR < 1.6, Not required
			Bottom Side	0.22	0	0.22	Σ SAR < 1.6, Not required
11	WCDMA V + WLAN (NII)	Body	Front Face	0.42	0.07	0.49	Σ SAR < 1.6, Not required
			Rear Face	0.71	1.19	1.90	**Analyzed as below**
			Left Side	0.4	0.1	0.50	Σ SAR < 1.6, Not required
			Right Side	0.5	0.04	0.54	Σ SAR < 1.6, Not required
			Top Side	0.01	0.11	0.12	Σ SAR < 1.6, Not required
			Bottom Side	0.22	0.01	0.23	Σ SAR < 1.6, Not required
12	WCDMA V + BT (DSS)	Body	Front Face	0.42	0.11	0.53	Σ SAR < 1.6, Not required
			Rear Face	0.71	0.11	0.82	Σ SAR < 1.6, Not required
			Left Side	0.4	0.11	0.51	Σ SAR < 1.6, Not required
			Right Side	0.5	0.11	0.61	Σ SAR < 1.6, Not required
			Top Side	0.01	0.11	0.12	Σ SAR < 1.6, Not required
			Bottom Side	0.22	0.11	0.33	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.

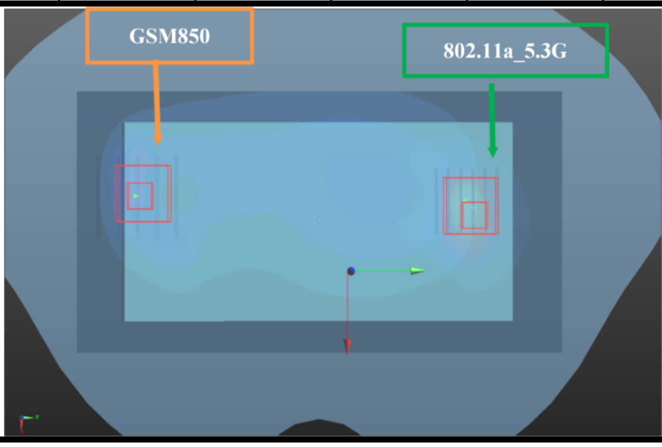
The SPLSR is determined by the following formula.

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

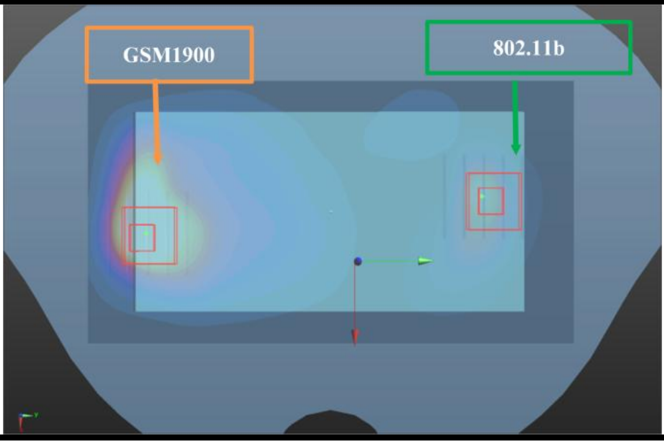
Where SAR_1 and SAR_2 are the highest reported or estimated SAR for each antenna in the pair, and R_i is the separation distance between the peak SAR locations for the antenna pair in mm.

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.

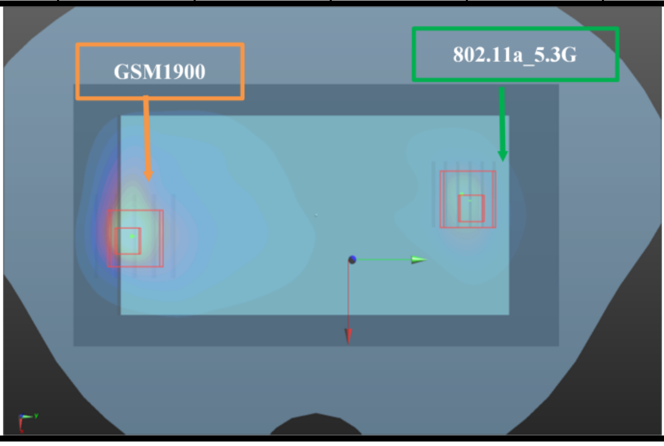
Conditions	Exposure Condition	Test Position	SAR Value (W/kg)	Coordinates			Peak Location Separation Distance (R_i, mm)	SPLSR	Simultaneous Transmission SAR Test
				x	y	z			
GSM850_GPRS12_Ch189	Body	Rear Face	0.62	-8.4	-72.8	-1.2	136.4	0.02	SPLSR ≤ 0.04, Not required
802.11a Ch64			1.19	-2.5	63.5	-0.71			



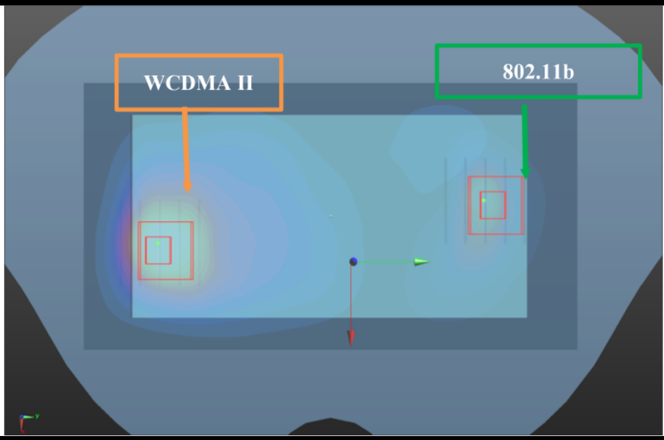
Conditions	Exposure Condition	Test Position	SAR Value (W/kg)	Coordinates			Peak Location Separation Distance (R_i, mm)	SPLSR	Simultaneous Transmission SAR Test
				x	y	z			
GSM1900_GPRS12_Ch810	Body	Rear Face	1.23	9.6	-77.6	-0.26	143.5	0.02	SPLSR ≤ 0.04, Not required
802.11b Ch11			0.75	-4.4	65.2	-0.75			



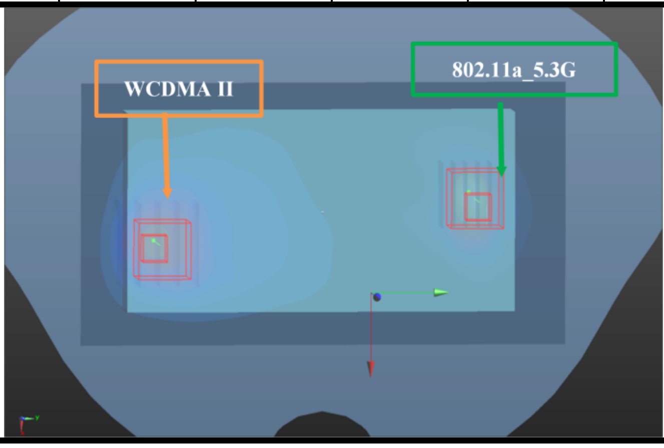
Conditions	Exposure Condition	Test Position	SAR Value (W/kg)	Coordinates			Peak Location Separation Distance (R_i, mm)	SPLSR	Simultaneous Transmission SAR Test
				x	y	z			
GSM1900_GPRS12_Ch810	Body	Rear Face	1.23	9.6	-77.6	-0.26	141.6	0.03	SPLSR ≤ 0.04, Not required
802.11a Ch64			1.19	-2.5	63.5	-0.71			



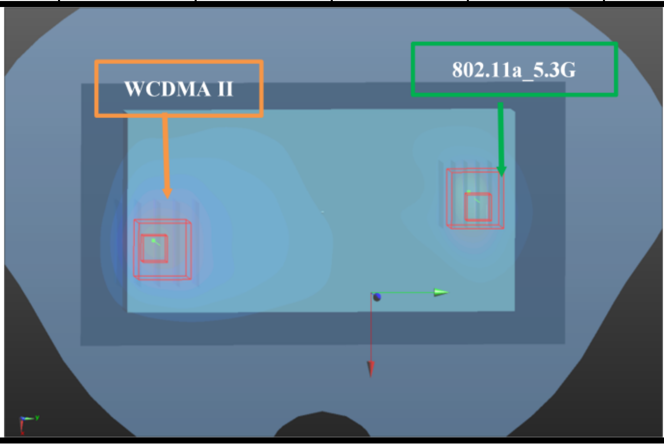
Conditions	Exposure Condition	Test Position	SAR Value (W/kg)	Coordinates			Peak Location Separation Distance (R_i, mm)	SPLSR	Simultaneous Transmission SAR Test
				x	y	z			
WCDMA II RMC12.2K Ch9538	Body	Rear Face	1.28	13.2	-70	-0.58	136.3	0.02	SPLSR ≤ 0.04, Not required
802.11b Ch11			0.75	-4.4	65.2	-0.75			



Conditions	Exposure Condition	Test Position	SAR Value (W/kg)	Coordinates			Peak Location Separation Distance (R_i, mm)	SPLSR	Simultaneous Transmission SAR Test
				x	y	z			
WCDMA II RMC12.2K Ch9538	Body	Rear Face	1.28	13.2	-70	-0.58	134.4	0.03	SPLSR ≤ 0.04, Not required
802.11a Ch64			1.19	-2.5	63.5	-0.71			



Conditions	Exposure Condition	Test Position	SAR Value (W/kg)	Coordinates			Peak Location Separation Distance (R_i, mm)	SPLSR	Simultaneous Transmission SAR Test
				x	y	z			
WCDMA V RMC12.2K Ch4132	Body	Rear Face	0.71	-10	-74.4	0.49	138.1	0.02	SPLSR ≤ 0.04, Not required
802.11a Ch64			1.19	-2.5	63.5	-0.71			



Test Engineer： Stanley Chuang, and Vic Wu

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
Dosimetric E-Field Probe	SPEAG	EX3DV4	3820	Jun. 27, 2016	1 Year
Dosimetric E-Field Probe	SPEAG	ET3DV6	1790	Jun. 24, 2016	1 Year
Data Acquisition Electronics	SPEAG	DAE4	913	Mar. 31, 2016	1 Year
Data Acquisition Electronics	SPEAG	DAE4	861	Jun. 16, 2016	1 Year
Data Acquisition Electronics	SPEAG	DAE4	862	Mar. 10, 2017	1 Year
Wireless Communication Test Set	Agilent	E5515C	MY50266628	Dec. 12, 2016	1 Year
Spectrum Analyzer	Agilent	N9030A	MY53120770	Jan. 10, 2017	1 Year
ENA Series Network Analyzer	Agilent	E5071C	MY46214281	Jun. 13, 2016	1 Year
MXG Analong Signal Generator	Agilent	N5181A	MY50143868	Jul. 07, 2016	1 Year
Power Meter	Anritsu	ML2495A	1218009	Jul. 06, 2016	1 Year
Power Sensor	Anritsu	MA2411B	1207252	Jul. 06, 2016	1 Year
Thermometer	YFE	YF-160A	150601220	May. 04, 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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Fax: 886-2-2605-1924

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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.

System Check_B835_170419

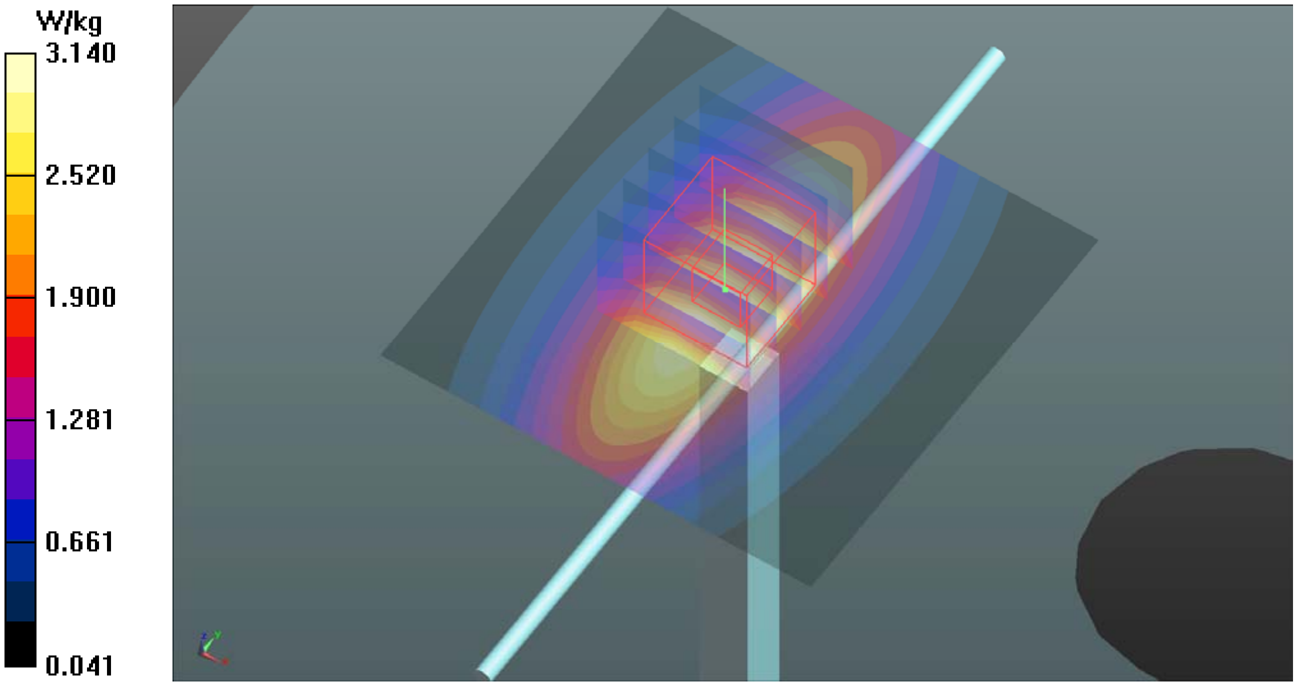
DUT: Dipole 835 MHz; Type: D835V2; SN: 4d121

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: B07T10N1_0419 Medium parameters used: f = 835 MHz; σ = 1.015 S/m; ε_r = 56.103; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: ET3DV6 - SN1790; ConvF(6.37, 6.37, 6.37); Calibrated: 2016/06/24;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2016/06/16
- Phantom: Twin SAM Phantom_1485; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

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

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 53.88 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 3.61 W/kg
SAR(1 g) = 2.5 W/kg; SAR(10 g) = 1.66 W/kg
Maximum value of SAR (measured) = 3.12 W/kg



System Check_B1900_170418

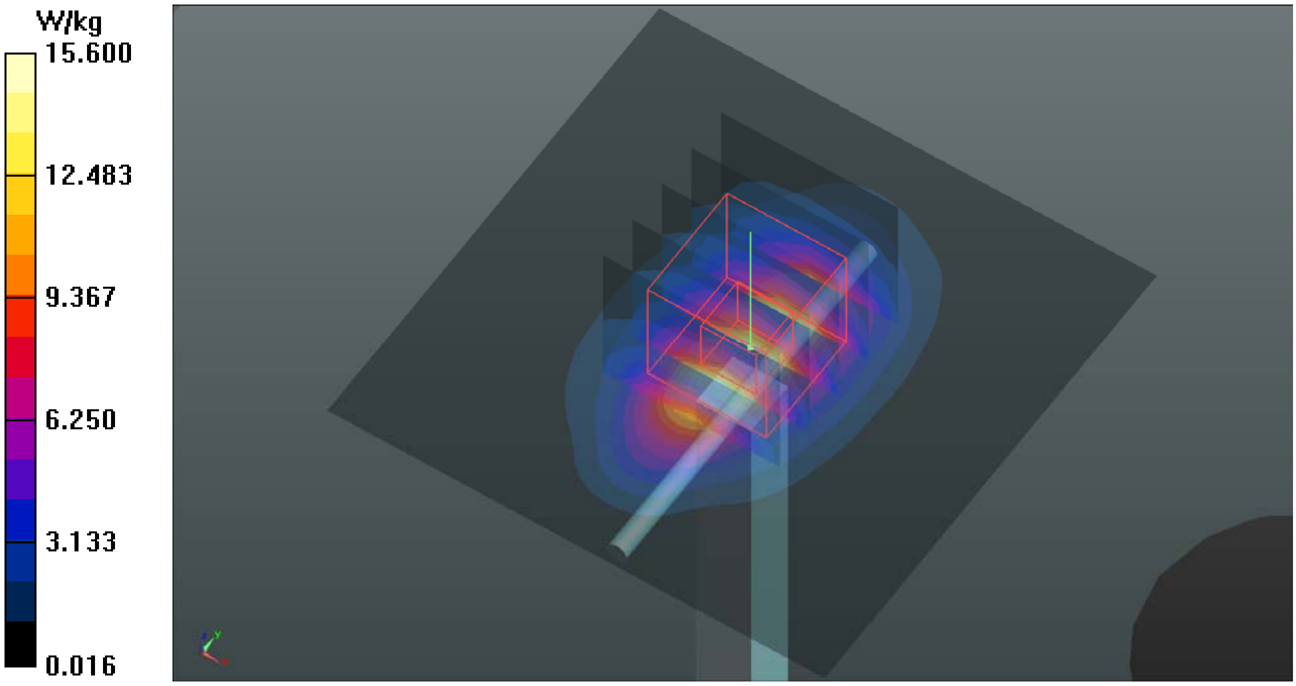
DUT: Dipole 1900 MHz; Type: D1900V2; SN: 5d036

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: B16T20N2_0418 Medium parameters used: f = 1900 MHz; σ = 1.567 S/m; ε_r = 51.018; ρ = 1000 kg/m^3
Ambient Temperature：23.7 ℃； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3820; ConvF(7.41, 7.41, 7.41); Calibrated: 2016/06/27;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn862; Calibrated: 2017/03/10
- Phantom: Twin SAM Phantom_1485; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 15.6 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 102.3 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 18.6 W/kg
SAR(1 g) = 10.2 W/kg; SAR(10 g) = 5.27 W/kg
Maximum value of SAR (measured) = 15.8 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_GPRS12_Rear Face_0.5cm_Ch189

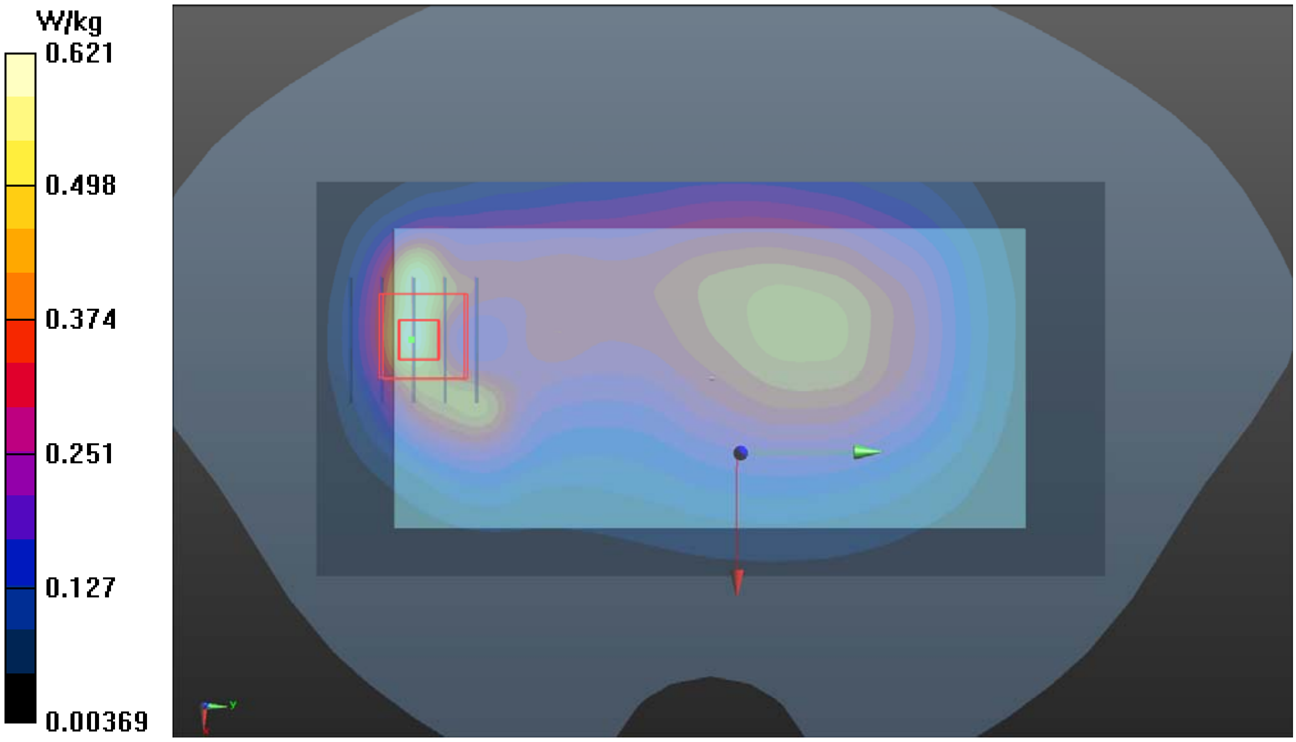
DUT: 170320C18

Communication System: GPRS12; Frequency: 836.4 MHz;Duty Cycle: 1:2
Medium: B07T10N1_0329 Medium parameters used: f = 836.4 MHz; σ = 0.984 S/m; ε_r = 55.084; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃； Liquid Temperature：23.1 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3820; ConvF(8.86, 8.86, 8.86); Calibrated: 2016/06/27;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2016/03/31
- Phantom: Twin SAM Phantom_1653; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.621 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.25 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.982 W/kg
SAR(1 g) = 0.485 W/kg; SAR(10 g) = 0.256 W/kg
Maximum value of SAR (measured) = 0.755 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2017/03/29

P02 GSM1900_GPRS12_Rear Face_0.5cm_Ch810

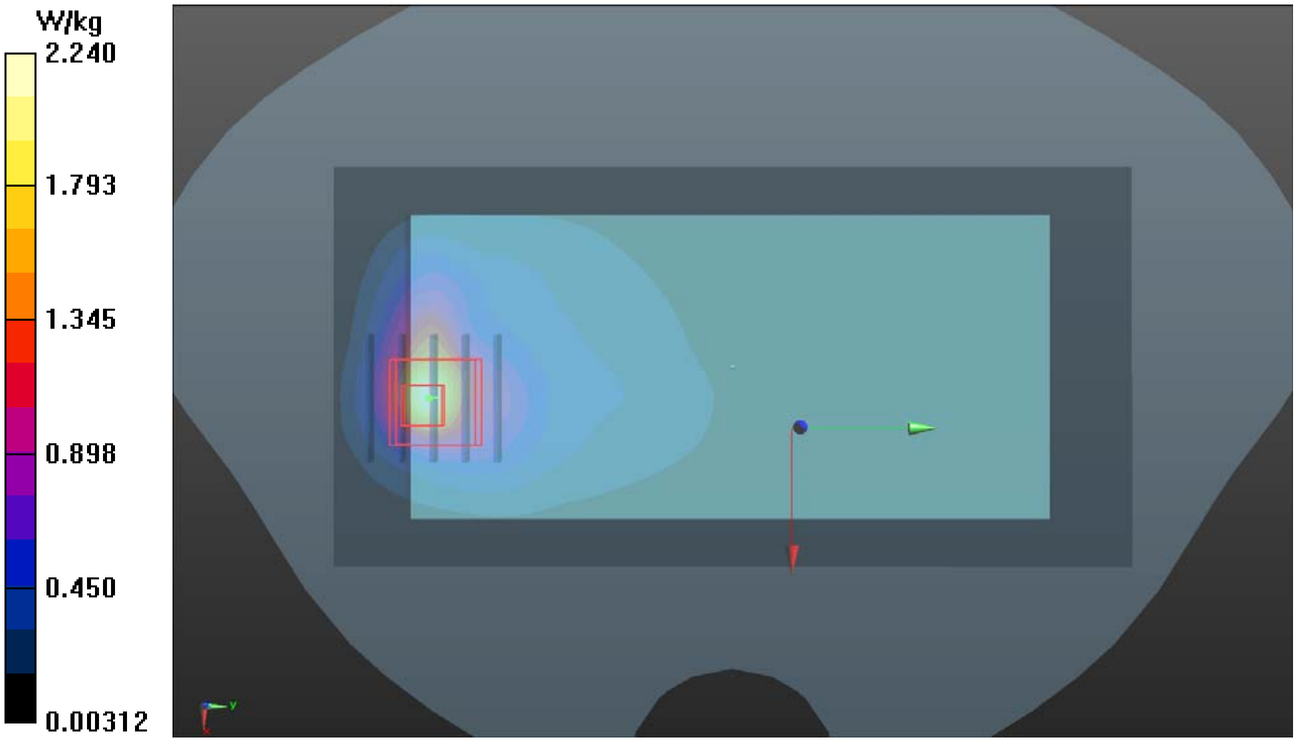
DUT: 170320C18

Communication System: GPRS12; Frequency: 1909.8 MHz;Duty Cycle: 1:2
Medium: B16T20N1_0329 Medium parameters used: f = 1910 MHz; σ = 1.596 S/m; ε_r = 51.749; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃； Liquid Temperature：23.1 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3820; ConvF(7.41, 7.41, 7.41); Calibrated: 2016/06/27;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2016/03/31
- Phantom: Twin SAM Phantom_1653; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.24 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.53 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 2.27 W/kg
SAR(1 g) = 1.07 W/kg; SAR(10 g) = 0.534 W/kg
Maximum value of SAR (measured) = 1.81 W/kg



P03 WCDMA II_RMC12.2K_Rear Face_0.5cm_Ch9538

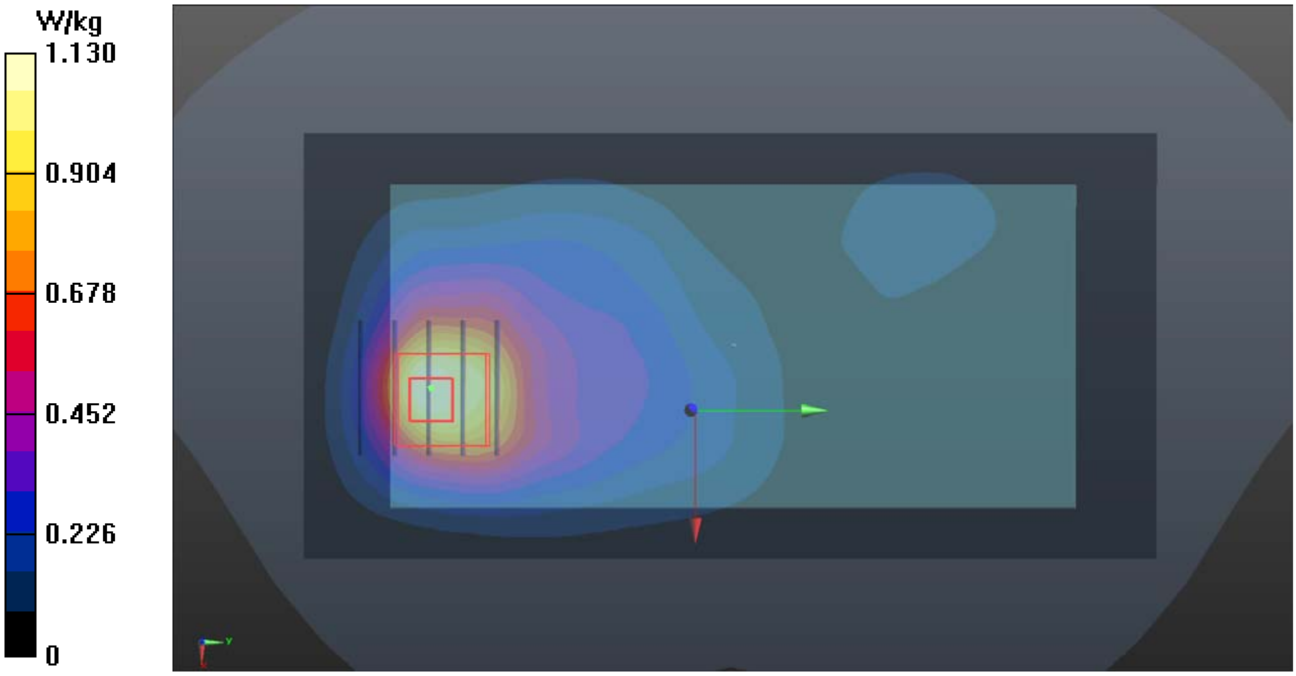
DUT: 170320C18

Communication System: WCDMA; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: B16T20N2_0329 Medium parameters used: f = 1908 MHz; σ = 1.592 S/m; ε_r = 51.641; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃； Liquid Temperature：23.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3820; ConvF(7.41, 7.41, 7.41); Calibrated: 2016/06/27;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2016/03/31
- Phantom: Twin SAM Phantom_1653; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.13 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.72 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.93 W/kg
SAR(1 g) = 0.928 W/kg; SAR(10 g) = 0.461 W/kg
Maximum value of SAR (measured) = 1.49 W/kg



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2017/03/29

P04 WCDMA V_RMC12.2K_Rear Face_0.5cm_Ch4132

DUT: 170320C18

Communication System: WCDMA; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium: B07T10N1_0329 Medium parameters used: f = 826.4 MHz; σ = 0.974 S/m; ε_r = 55.169; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃； Liquid Temperature：23.1 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3820; ConvF(8.86, 8.86, 8.86); Calibrated: 2016/06/27;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn913; Calibrated: 2016/03/31
- Phantom: Twin SAM Phantom_1653; Type: QD000P40;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7373)

- Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.730 W/kg

- Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.07 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 1.03 W/kg
SAR(1 g) = 0.486 W/kg; SAR(10 g) = 0.255 W/kg
Maximum value of SAR (measured) = 0.849 W/kg