FCC SAR Test Report

Report No.	:	**SA120626C35**
Applicant	:	**HTC Corporation**
Address	:	**23,Xinghua Rd.,Taoyuan 330,Taiwan,R.O.C.**
Product	:	**Smart Phone**
FCC ID	:	**NM8PM63100**
Brand	:	**HTC**
Model No.	:	**PM63100**
Standards	:	**FCC 47 CFR Part 2 (2.1093) / IEEE C95.1:1991 / IEEE 1528:2003** **FCC OET Bulletin 65 Supplement C (Edition 01-01)** **KDB 248227 D01 v01r02 / KDB 648474 D01 v01r05 / KDB 941225 D01 v02** **KDB 941225 D03 v01 / KDB 941225 D05 v01 / KDB 941225 D06 v01**
Date of Testing	:	**Jul. 06, 2012 ~ Jul. 20, 2012**

CERTIFICATION: The above equipment have been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch - Taiwan HwaYa Lab**, 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

Issue No.	Reason for Change	Date Issued
R01	Original release	Jul. 25, 2012

1. Summary of Maximum SAR Value

Mode / Band	Test Position	SAR-1g (W/kg)
GSM850	Head	0.464
	Body Worn (1 cm Gap)	0.981
	Hotspot Mode (1 cm Gap)	1.18
GSM1900	Head	0.667
	Body Worn (1 cm Gap)	1.02
	Hotspot Mode (1 cm Gap)	1.03
WCDMA Band II	Head	0.835
	Body Worn (1 cm Gap)	1.04
	Hotspot Mode (1 cm Gap)	1.15
WCDMA Band V	Head	0.321
	Body Worn (1 cm Gap)	0.558
	Hotspot Mode (1 cm Gap)	0.665
LTE Band 2	Head	0.902
	Body Worn (1 cm Gap)	1
	Hotspot Mode (1 cm Gap)	1.04
LTE Band 4	Head	0.866
	Body Worn (1 cm Gap)	1.12
	Hotspot Mode (1 cm Gap)	1.13
LTE Band 5	Head	0.329
	Body Worn (1 cm Gap)	0.427
	Hotspot Mode (1 cm Gap)	0.504
LTE Band 17	Head	0.637
	Body Worn (1 cm Gap)	0.198
	Hotspot Mode (1 cm Gap)	0.249
WLAN 2.4GHz	Head	0.328
	Body Worn (1 cm Gap)	0.193
	Hotspot Mode (1 cm Gap)	0.203
WLAN 5GHz	Head	0.036
	Body Worn (1 cm Gap)	0.191
	Hotspot Mode (1 cm Gap)	0.179
Bluetooth	Head	N/A
	Body Worn (1 cm Gap)	N/A
	Hotspot Mode (1 cm Gap)	N/A

Note:

1. The SAR limit **(1.6 W/kg)** for general population/uncontrolled exposure is specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1991.
2. Since the maximum output power of Bluetooth is less than P_{Ref} (10.8 dBm) and the closest separation distance of WWAN and Bluetooth antennas is larger than 2.5 cm, SAR testing for Bluetooth is not required.

2. Description of Equipment Under Test

EUT Type	Smart Phone
FCC ID	NM8PM63100
Brand Name	HTC
Model Name	PM63100
Tx Frequency Bands (Unit: MHz)	GSM850 : 824 ~ 849 GSM1900 : 1850 ~ 1910 WCDMA Band II : 1850 ~ 1910 WCDMA Band V : 824 ~ 849 LTE Band 2 : 1850 ~ 1910 LTE Band 4 : 1710 ~ 1755 LTE Band 5 : 824 ~ 849 LTE Band 17 : 704 ~ 716 WLAN : 2400 ~ 2483.5, 5150 ~ 5350, 5470 ~ 5725, 5725 ~ 5850 Bluetooth : 2400 ~ 2483.5
Uplink Modulations	GSM & GPRS : GMSK EDGE : 8PSK WCDMA : QPSK LTE : QPSK, 16QAM 802.11b : DSSS 802.11a/g/n : OFDM Bluetooth : GFSK
Maximum AVG Conducted Power (Unit: dBm)	GSM850 : 33.70 GSM1900 : 30.53 WCDMA Band II : 23.89 WCDMA Band V : 23.80 LTE Band 2 : 23.42 LTE Band 4 : 23.61 LTE Band 5 : 22.43 LTE Band 17 : 23.26 802.11b : 17.53 802.11g : 12.60 802.11n HT20 (2.4GHz) : 11.51 802.11a : 13.45 802.11n HT20 (5GHz) : 13.87 802.11n HT40 (5GHz) : 13.10
Antenna Type	Fixed Internal Antenna
EUT Stage	Production Unit

Note:

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

The EUT is a voice/data transmitter device that contains one WWAN transmitter. The GSM, WCDMA and LTE cannot transmit simultaneously. Confirming the LTE transmitter follows 3GPP standards, is category 3, BW 5/10 MHz, band 2/4/5/17, supports QPSK / 16QAM modulations, and supports data transmission only. Tested per 3GPP 36.521 maximum transmit procedures for both QPSK / 16QAM.

LTE Maximum Power Reduction in accordance with 3GPP 36.101: Power Reduction in accordance to 3GPP is active all times during LTE operation.

Modulation	Channel bandwidth / Transmission bandwidth configuration (RB)		3GPP Requirement (dB)	LTE MPR Setting (dB)
	BW 5 MHz	BW 10 MHz		
QPSK	> 8	> 12	<= 1	1
16QAM	<= 8	<= 12	<= 1	1
16QAM	> 8	> 12	<= 2	2

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

In addition, the device is compliant with A-MPR requirements defined in 36.101 section 6.2.4 that may be required to meet 3GPP Adjacent Channel Leakage Ratio (“ACLR”) requirements. A-MPR was disabled for all FCC compliance testing.

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 DASY System

DASY 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 DASY4/5 software defined. The DASY 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.

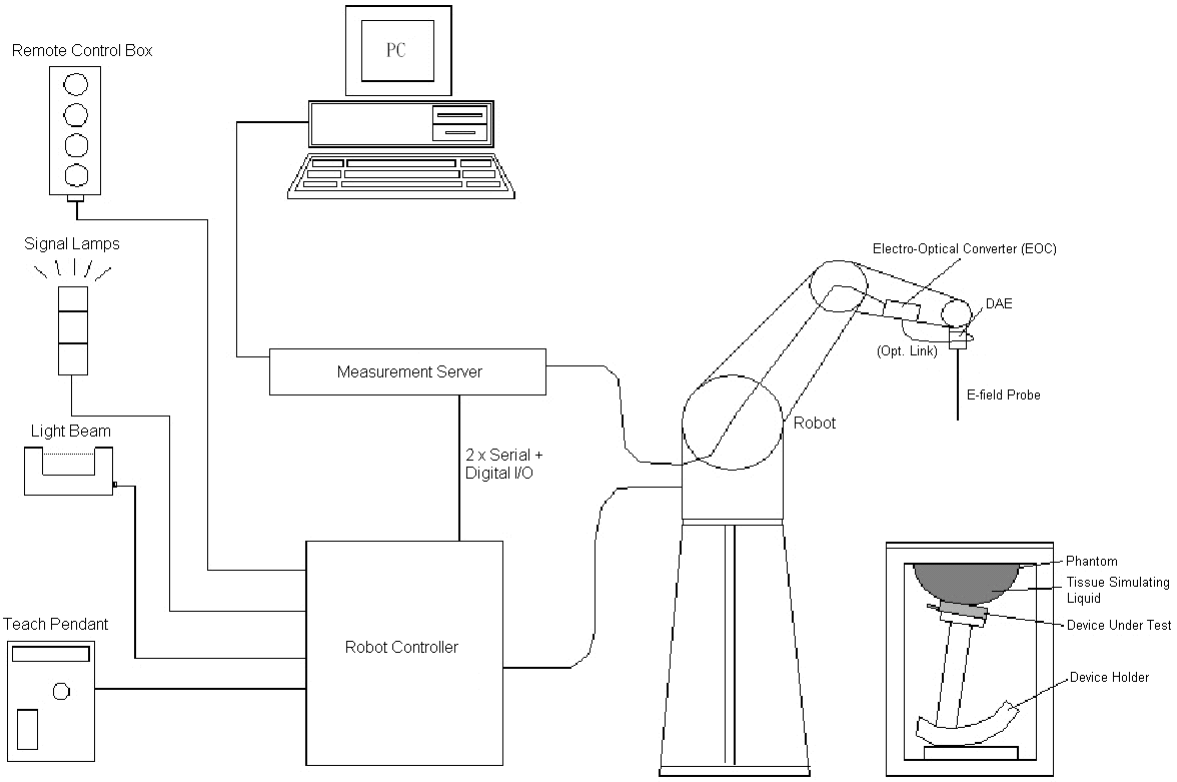


Fig-3.1 DASY System Setup

3.2.1 Robot

The DASY system uses the high precision robots from Stäubli SA (France). For the 6-axis controller system, the robot controller version (DASY4: CS7MB; DASY5: 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 DASY4

Fig-3.3 DASY5

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

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 DASY4/5 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.

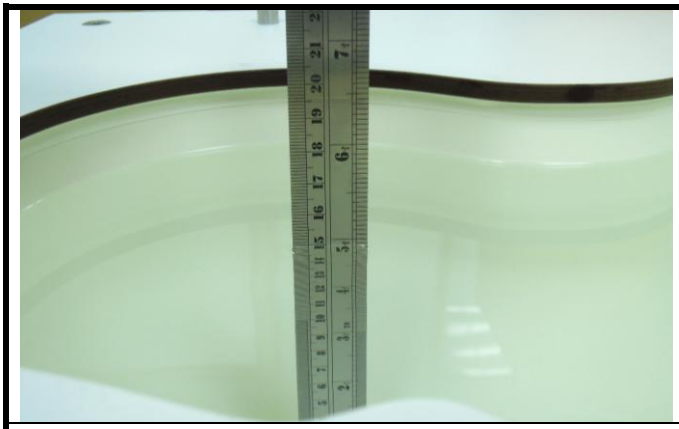


Photo of Liquid Height for Head Position

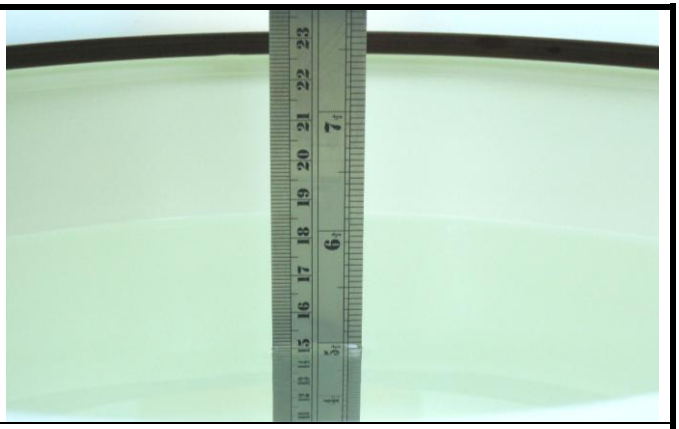


Photo of Liquid Height for Body Position

The dielectric properties of the head tissue simulating liquids are defined in IEEE 1528 and FCC OET 65 Supplement C Appendix C. For the body tissue simulating liquids, the dielectric properties are defined in FCC OET 65 Supplement C Appendix C. The dielectric properties of the tissue simulating liquids were verified prior to the SAR evaluation using an Agilent 85070D Dielectric Probe Kit and an Agilent 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
1750	40.1	38.1 ~ 42.1	1.37	1.30 ~ 1.44
1900	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
2450	39.2	37.2 ~ 41.2	1.80	1.71 ~ 1.89
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
1750	53.4	50.7 ~ 56.1	1.49	1.42 ~ 1.56
1900	53.3	50.6 ~ 56.0	1.52	1.44 ~ 1.60
2450	52.7	50.1 ~ 55.3	1.95	1.85 ~ 2.05
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	-
H1750	-	47.0	-	0.4	-	-	52.6	-
H1900	-	44.5	-	0.2	-	-	55.3	-
H2450	-	45.0	-	0.1	-	-	54.9	-
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	-
B1750	-	31.0	-	0.2	-	-	68.8	-
B1900	-	29.5	-	0.3	-	-	70.2	-
B2450	-	31.4	-	0.1	-	-	68.5	-
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.

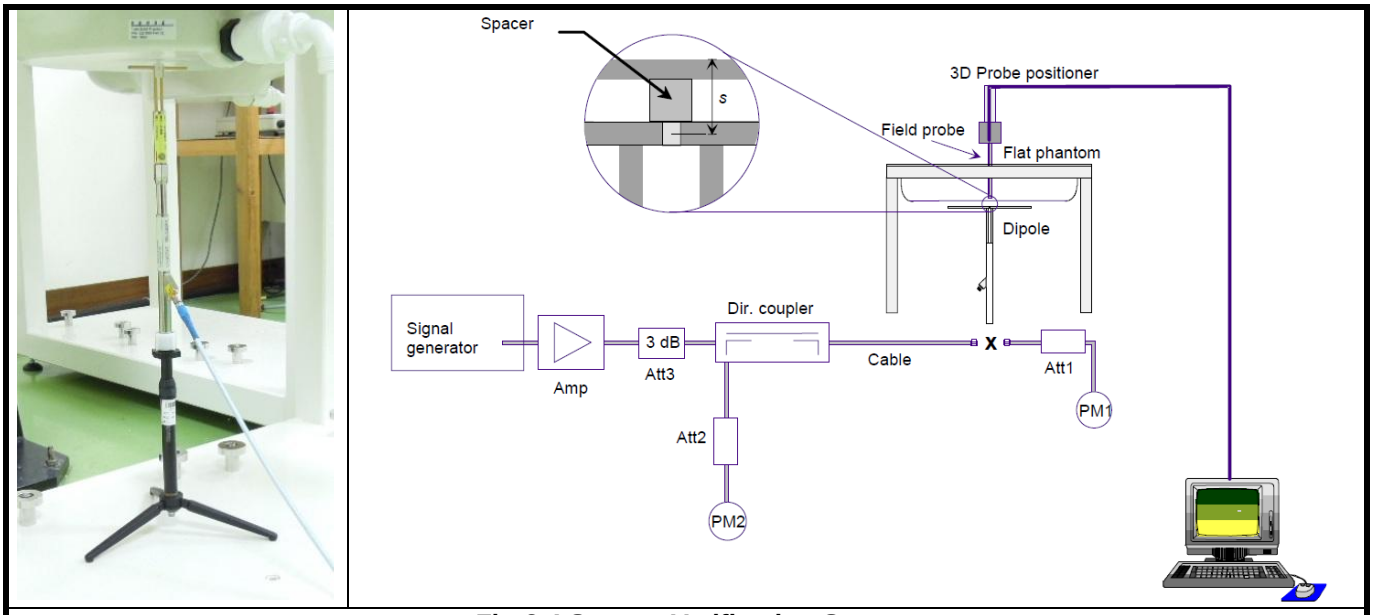


Fig-3.4 System Verification Setup

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 power meter PM1 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 PM2 is read at that level. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter PM2.

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 measures 5x5x7 points with step size 8, 8 and 5 mm for below 3 GHz, and 7x7x9 points with step size 4, 4 and 2.5 mm for above 5 GHz. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g.

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

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.

For GSM850, the power control level is set to 5. For GPRS850 (GMSK, CS1), the power control level is set to 5. For EDGE850 (GMSK: MCS1, 8PSK:MCS9), the power control level is set to 8. For GSM1900, the power control level is set to 0. For GPRS1900 (GMSK, CS1), the power control level is set to 0. For EDGE1900 (GMSK: MCS1, 8PSK:MCS9), the power control level is set to 2. Head SAR is tested under GSM link mode. Body SAR is tested under maximum source-based time-average power mode of GPRS/EDGE.

For WCDMA, head and body SAR is tested under 12.2k RMC mode with power control set all up bits. SAR for AMR is not required since its power is less than 1/4 dB higher than RMC. SAR for HSDPA/HSUPA is not required since its power is less than 1/4 dB higher than RMC without HSDPA/HSUPA.

For LTE, set the related parameters of operating band, channel bandwidth, uplink channel number, modulation type, and RB in base station simulator. When the EUT has registered and communicated to base station simulator, set the simulator to make EUT transmitting the maximum radiated power. The steps for system simulator (Anritsu MT8820C) setup are as below.

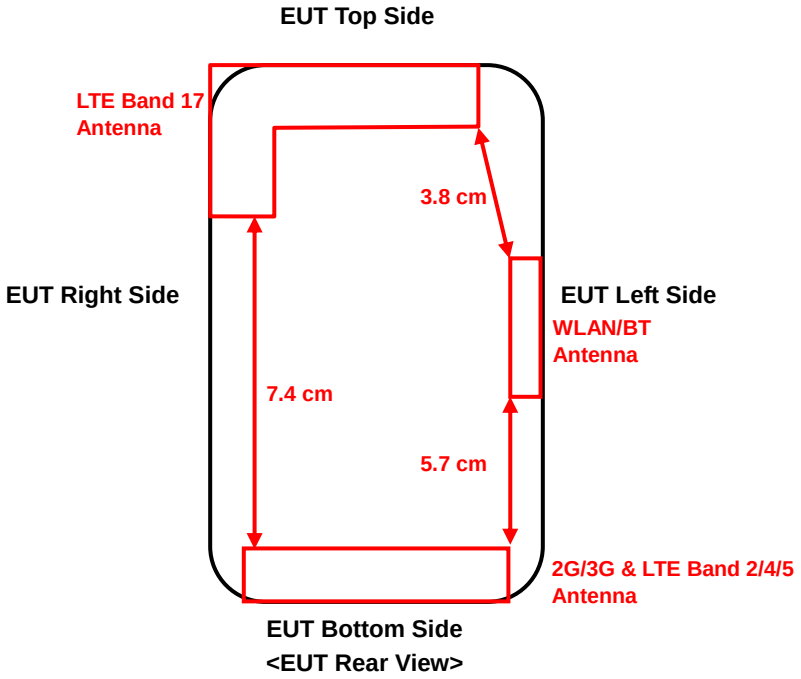
1. Press the “Std” button to select “LTE 22.20S” function
2. Choose the “Screen Select” item to “Fundamental Measurement”
3. Enter the “Common” item
4. Set the Operating Band
5. Set the Channel Bandwidth
6. Set the UL Channel & Frequency
7. Set the Modulation
8. Set the RB number and RB shift
9. Press “Start Call” button when EUT register to the system simulator
10. Set the TX-1 Max. Power to make the EUT transmit maximum output power

For WLAN SAR testing, the EUT has installed WLAN engineering testing software which can provide continuous transmitting RF signal. This RF signal utilized in SAR measurement has almost 100% duty cycle. The data rates for WLAN SAR testing were set in 1 Mbps for 802.11b, 6 Mbps for 802.11a, and MCS0 for 802.11n HT20 due to the highest RF output power.

This EUT has one WWAN transmitter with two WWAN antenna antennas, and one WLAN/BT transmitter and one WLAN/BT antenna. The possible configuration for simultaneous transmission is shown as below.

Simultaneous Tx Combination	Configuration	Head (Voice / VoIP)	Body Worn (Voice / VoIP)	Hotspot (Data)
1	GSM850 (Voice / Data) + WLAN/BT (Data)	V	V	V
2	GSM1900 (Voice / Data) + WLAN/BT (Data)	V	V	V
3	WCDMA Band II (Voice / Data) + WLAN/BT (Data)	V	V	V
4	WCDMA Band V (Voice / Data) + WLAN/BT (Data)	V	V	V
5	LTE Band 2 (Data) + WLAN/BT (Data)	V	V	V
6	LTE Band 4 (Data) + WLAN/BT (Data)	V	V	V
7	LTE Band 5 (Data) + WLAN/BT (Data)	V	V	V
8	LTE Band 17 (Data) + WLAN/BT (Data)	V	V	V

<Antenna Location>



This device supports WiFi hotspot function, so body SAR was tested under 1 cm for the surfaces / slide edges where a transmitting antenna is within 2.5 cm from the edge. Since the SAR is required for antenna located within 2.5 cm from edge, SAR testing for each antenna is listed as below.

2G/3G & LTE 2/4/5 Antenna : Front Face, Rear Face, Left Side, Right Side, Bottom Side
WLAN/Bluetooth Antenna : Front Face, Rear Face, Left Side
LTE Band 17 Antenna : Front Face, Rear Face, Left Side, Right Side, Top Side

4.2 EUT Testing Position

This EUT was tested in **Right Cheek**, **Right Tilted**, **Left Cheek**, **Left Tilted**, **Front Face**, **Rear Face**, **Right Side**, **Left Side**, **Top Side** and **Bottom Side** positions as illustrated below:

1. Define two imaginary lines on the handset

(a) The vertical centerline passes through two points on the front side of the handset - the midpoint of the width w_t of the handset at the level of the acoustic output, and the midpoint of the width w_b of the bottom of the handset.

(b) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.

(c) The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.

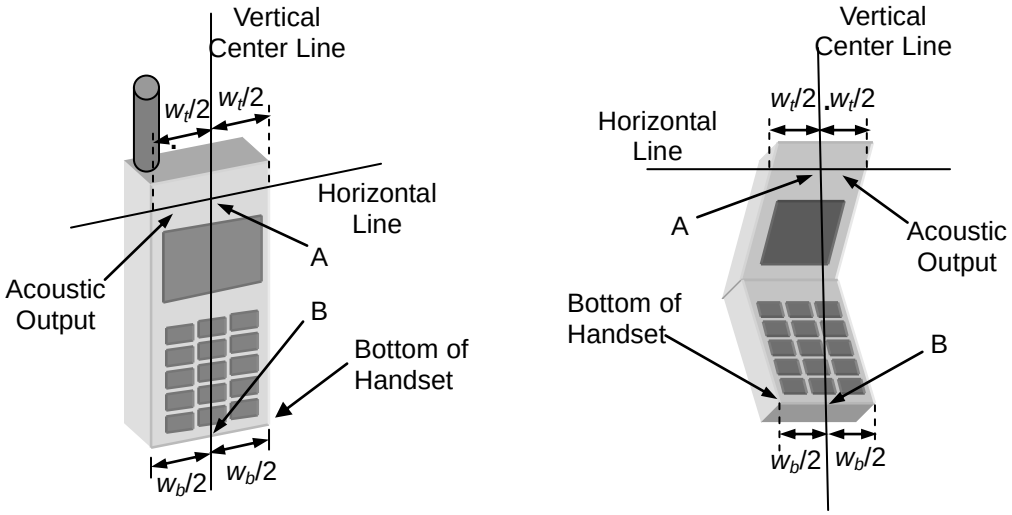


Fig-4.1 Illustration for Handset Vertical and Horizontal Reference Lines

2. Cheek Position

(a) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.

(b) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost (see Fig-4.2).

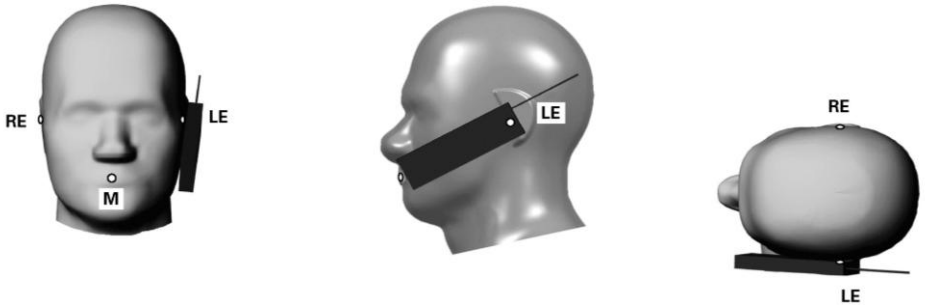


Fig-4.2 Illustration for Cheek Position

3. Tilted Position

(a) To position the device in the “cheek” position described above.

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

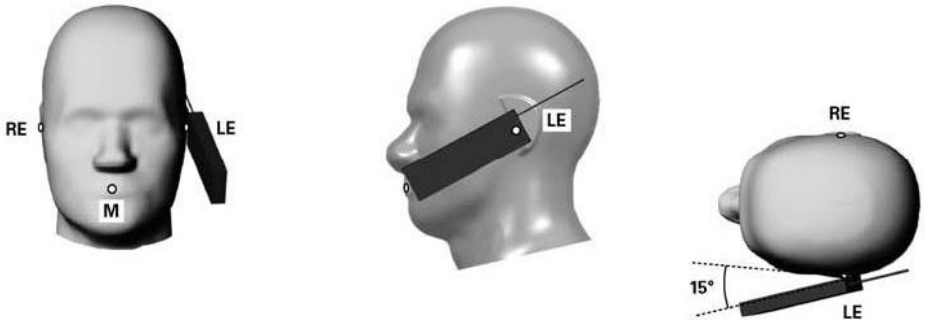


Fig-4.3 Illustration for Tilted Position

4. Body Worn Position

(a) To position the EUT parallel to the phantom surface.

(b) To adjust the EUT parallel to the flat phantom.

(c) To adjust the distance between the EUT surface and the flat phantom to 1 cm.

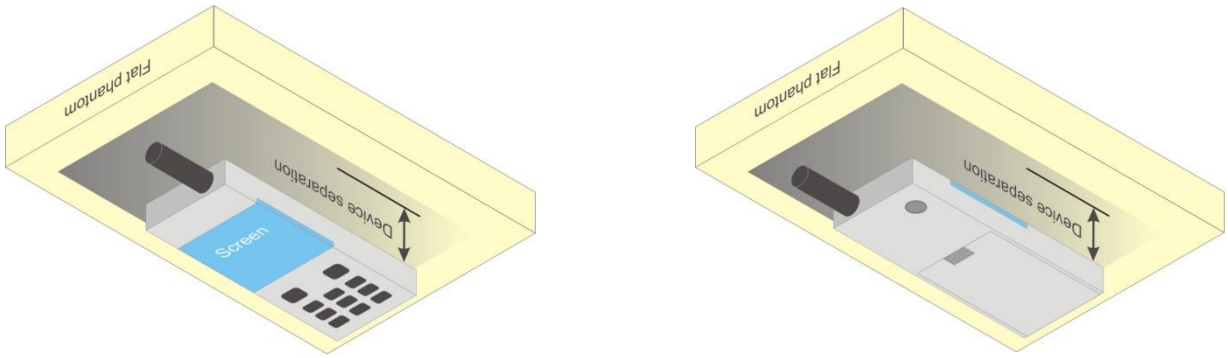


Fig-4.4 Illustration for Body Worn Position

4.3 Tissue Verification

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

Tissue Type	Frequency (MHz)	Liquid Temp. (℃)	Measured Conductivity (σ)	Measured Permittivity (ε_r)	Target Conductivity (σ)	Target Permittivity (ε_r)	Conductivity Deviation (%)	Permittivity Deviation (%)	Test Date
H750	750	20.5	0.89	41.109	0.89	41.9	0.00	-1.89	Jul. 11, 2012
H835	835	20.7	0.916	42.727	0.90	41.5	1.78	2.96	Jul. 08, 2012
H835	835	20.4	0.898	42.034	0.90	41.5	-0.22	1.29	Jul. 11, 2012
H1750	1750	20.2	1.341	41.381	1.37	40.1	-2.12	3.19	Jul. 11, 2012
H1900	1900	20.7	1.436	39.743	1.40	40.0	2.57	-0.64	Jul. 09, 2012
H1900	1900	20.5	1.436	39.743	1.40	40.0	2.57	-0.64	Jul. 11, 2012
H1900	1900	20.5	1.43	39.76	1.40	40.0	2.14	-0.60	Jul. 20, 2012
H2450	2450	21.0	1.77	40.30	1.80	39.2	-1.67	2.81	Jul. 06, 2012
H5G	5200	20.6	4.70	37.081	4.66	36.0	0.86	3.00	Jul. 12, 2012
H5G	5500	20.6	5.082	36.452	4.96	35.6	2.46	2.39	Jul. 12, 2012
H5G	5800	20.6	5.44	35.757	5.27	35.3	3.23	1.29	Jul. 12, 2012
B750	750	20.7	0.967	55.252	0.96	55.5	0.73	-0.45	Jul. 10, 2012
B835	835	21.1	0.978	55.60	0.97	55.2	0.82	0.72	Jul. 06, 2012
B835	835	20.3	0.979	55.898	0.97	55.2	0.93	1.26	Jul. 10, 2012
B1750	1750	20.6	1.468	53.671	1.49	53.4	-1.48	0.51	Jul. 06, 2012
B1750	1750	20.5	1.477	52.379	1.49	53.4	-0.87	-1.91	Jul. 07, 2012
B1900	1900	21.3	1.55	52.80	1.52	53.3	1.97	-0.94	Jul. 06, 2012
B1900	1900	20.5	1.554	53.967	1.52	53.3	2.24	1.25	Jul. 09, 2012
B2450	2450	21.2	1.99	54.30	1.95	52.7	2.05	3.04	Jul. 06, 2012
B5G	5200	20.4	5.27	49.057	5.30	49.0	-0.57	0.12	Jul. 12, 2012
B5G	5500	20.6	5.717	48.431	5.65	48.6	1.19	-0.35	Jul. 13, 2012
B5G	5800	20.6	6.123	47.668	6.00	48.2	2.05	-1.10	Jul. 13, 2012

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 Verification

The measuring results for system check are shown as below.

Test Date	Type	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. 11, 2012	Head	750	8.44	2.19	8.76	3.79	1013	3590	861
Jul. 08, 2012	Head	835	9.46	2.32	9.28	-1.90	4d021	3820	579
Jul. 11, 2012	Head	835	9.46	2.42	9.68	2.33	4d021	3590	861
Jul. 11, 2012	Head	1750	38.00	9.16	36.64	-3.58	1055	3590	861
Jul. 09, 2012	Head	1900	38.90	10.30	41.20	5.91	5d036	3820	579
Jul. 11, 2012	Head	1900	38.90	9.90	39.60	1.80	5d036	3590	861
Jul. 20, 2012	Head	1900	38.90	9.90	39.60	1.80	5d036	3650	910
Jul. 06, 2012	Head	2450	52.90	12.40	49.60	-6.24	737	3590	861
Jul. 12, 2012	Head	5200	79.60	7.47	74.70	-6.16	1018	3590	861
Jul. 12, 2012	Head	5500	84.70	8.57	85.70	1.18	1018	3590	861
Jul. 12, 2012	Head	5800	78.60	8.24	82.40	4.83	1018	3590	861
Jul. 10, 2012	Body	750	8.76	2.36	9.44	7.76	1013	3590	861
Jul. 06, 2012	Body	835	9.60	2.39	9.56	-0.42	4d021	3590	861
Jul. 10, 2012	Body	835	9.60	2.39	9.56	-0.42	4d021	3590	861
Jul. 06, 2012	Body	1750	38.00	9.14	36.56	-3.79	1055	3820	579
Jul. 07, 2012	Body	1750	38.00	9.24	36.96	-2.74	1055	3820	579
Jul. 06, 2012	Body	1900	38.90	9.39	37.56	-3.44	5d036	3590	861
Jul. 09, 2012	Body	1900	38.90	9.98	39.92	2.62	5d036	3820	579
Jul. 06, 2012	Body	2450	50.00	13.30	53.20	6.40	737	3590	861
Jul. 12, 2012	Body	5200	72.70	7.60	76.00	4.54	1018	3590	861
Jul. 13, 2012	Body	5500	78.30	8.13	81.30	3.83	1018	3650	910
Jul. 13, 2012	Body	5800	73.40	6.92	69.20	-5.72	1018	3650	910

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.

4.5 Conducted Power Results

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

Band	GSM850			GSM1900		
Channel	128	189	251	512	661	810
Frequency (MHz)	824.2	836.4	848.8	1850.2	1880.0	1909.8
Maximum Burst-Averaged Output Power						
GSM (GMSK, 1 Uplink)	33.32	**33.70**	33.65	30.29	30.33	**30.53**
GPRS 8 (GMSK, 1 Uplink)	33.25	33.62	33.56	30.34	30.40	30.52
GPRS 10 (GMSK, 2 Uplink)	31.53	31.58	31.45	28.93	28.98	29.15
EDGE 8 (GMSK, 1 Uplink)	33.30	33.67	33.61	30.24	30.29	30.44
EDGE 10 (GMSK, 2 Uplink)	31.55	31.54	31.40	28.84	28.89	29.07
EDGE 8 (8PSK, 1 Uplink)	26.70	26.75	26.81	26.35	26.36	26.48
EDGE 10 (8PSK, 2 Uplink)	26.52	26.53	26.50	26.16	26.11	26.18
Maximum Frame-Averaged Output Power						
GSM (GMSK, 1 Uplink)	24.32	24.70	24.65	21.29	21.33	21.53
GPRS 8 (GMSK, 1 Uplink)	24.25	24.62	24.56	21.34	21.40	21.52
GPRS 10 (GMSK, 2 Uplink)	25.53	**25.58**	25.45	22.93	22.98	**23.15**
EDGE 8 (GMSK, 1 Uplink)	24.30	24.67	24.61	21.24	21.29	21.44
EDGE 10 (GMSK, 2 Uplink)	25.55	25.54	25.40	22.84	22.89	23.07
EDGE 8 (8PSK, 1 Uplink)	17.70	17.75	17.81	17.35	17.36	17.48
EDGE 10 (8PSK, 2 Uplink)	20.52	20.53	20.50	20.16	20.11	20.18

Note:

1. SAR testing for GSM/GPRS/EDGE was performed on the maximum frame-averaged power mode.
2. The frame-averaged power is linearly scaled the maximum burst-averaged power based on time slots. The calculated methods are shown as below:
   Frame-averaged power = Burst-averaged power (1 Uplink) - 9 dBm
   Frame-averaged power = Burst averaged power (2 Uplink) - 6 dBm

Band	WCDMA Band II			WCDMA Band V		
Channel	9262	9400	9538	4132	4182	4233
Frequency (MHz)	1852.4	1880.0	1907.6	826.4	836.4	846.6
RMC 12.2K	23.67	**23.89**	23.46	23.78	**23.80**	23.61
HSDPA Subtest-1	23.68	23.82	23.59	22.64	22.84	22.68
HSDPA Subtest-2	23.66	23.85	23.48	22.68	22.86	22.66
HSDPA Subtest-3	22.32	22.38	22.05	22.15	22.37	22.19
HSDPA Subtest-4	22.28	22.32	21.95	22.13	22.24	22.11
HSUPA Subtest-1	22.76	23.54	23.20	21.98	22.08	22.69
HSUPA Subtest-2	21.63	21.78	21.51	21.55	21.70	21.53
HSUPA Subtest-3	21.92	22.21	21.68	21.28	21.57	21.70
HSUPA Subtest-4	22.14	21.83	21.66	21.78	21.92	21.66
HSUPA Subtest-5	23.75	23.65	23.56	22.79	22.96	22.83

LTE Band 2									
BW	Modulation	CH	Frequency (MHz)	RB	RB Offset	Target Power	MPR	Expected Power	Measured Power
5 MHz	QPSK	18625	1852.5	1	0	23.5	0	23.5	23.01
		18900	1880.0	1	0	23.5	0	23.5	23.11
		19175	1907.5	1	0	23.5	0	23.5	22.78
		18625	1852.5	1	24	23.5	0	23.5	23.02
		18900	1880.0	1	24	23.5	0	23.5	**23.21**
		19175	1907.5	1	24	23.5	0	23.5	22.89
		18625	1852.5	12	6	23.5	1	22.5	22.13
		18900	1880.0	12	6	23.5	1	22.5	22.26
		19175	1907.5	12	6	23.5	1	22.5	21.79
		18625	1852.5	25	0	23.5	1	22.5	22.03
		18900	1880.0	25	0	23.5	1	22.5	22.13
		19175	1907.5	25	0	23.5	1	22.5	21.57
	16QAM	18625	1852.5	1	0	23.5	1	22.5	21.98
		18900	1880.0	1	0	23.5	1	22.5	22.11
		19175	1907.5	1	0	23.5	1	22.5	21.82
		18625	1852.5	1	24	23.5	1	22.5	22.05
		18900	1880.0	1	24	23.5	1	22.5	**22.25**
		19175	1907.5	1	24	23.5	1	22.5	21.89
		18625	1852.5	12	6	23.5	2	21.5	21.20
		18900	1880.0	12	6	23.5	2	21.5	21.30
		19175	1907.5	12	6	23.5	2	21.5	20.94
		18625	1852.5	25	0	23.5	2	21.5	21.02
		18900	1880.0	25	0	23.5	2	21.5	21.10
		19175	1907.5	25	0	23.5	2	21.5	20.67
10 MHz	QPSK	18650	1855	1	0	23.5	0	23.5	23.28
		18900	1880	1	0	23.5	0	23.5	23.37
		19150	1905	1	0	23.5	0	23.5	23.13
		18650	1855	1	49	23.5	0	23.5	23.21
		18900	1880	1	49	23.5	0	23.5	**23.42**
		19150	1905	1	49	23.5	0	23.5	22.80
		18650	1855	25	12	23.5	1	22.5	22.35
		18900	1880	25	12	23.5	1	22.5	22.41
		19150	1905	25	12	23.5	1	22.5	22.03
		18650	1855	50	0	23.5	1	22.5	22.17
		18900	1880	50	0	23.5	1	22.5	22.19
		19150	1905	50	0	23.5	1	22.5	21.98
	16QAM	18650	1855	1	0	23.5	1	22.5	22.30
		18900	1880	1	0	23.5	1	22.5	22.43
		19150	1905	1	0	23.5	1	22.5	22.20
		18650	1855	1	49	23.5	1	22.5	22.19
		18900	1880	1	49	23.5	1	22.5	**22.49**
		19150	1905	1	49	23.5	1	22.5	21.80
		18650	1855	25	12	23.5	2	21.5	21.34
		18900	1880	25	12	23.5	2	21.5	21.44
		19150	1905	25	12	23.5	2	21.5	21.10
		18650	1855	50	0	23.5	2	21.5	21.22
		18900	1880	50	0	23.5	2	21.5	21.27
		19150	1905	50	0	23.5	2	21.5	21.00

LTE Band 4									
BW	Modulation	CH	Frequency (MHz)	RB	RB Offset	Target Power	MPR	Expected Power	Measured Power
5 MHz	QPSK	19975	1712.5	1	0	23.7	0	23.7	23.50
		20175	1732.5	1	0	23.7	0	23.7	23.07
		20375	1752.5	1	0	23.7	0	23.7	23.56
		19975	1712.5	1	24	23.7	0	23.7	23.39
		20175	1732.5	1	24	23.7	0	23.7	23.12
		20375	1752.5	1	24	23.7	0	23.7	**23.60**
		19975	1712.5	12	6	23.7	1	22.7	22.41
		20175	1732.5	12	6	23.7	1	22.7	22.14
		20375	1752.5	12	6	23.7	1	22.7	22.62
		19975	1712.5	25	0	23.7	1	22.7	22.47
		20175	1732.5	25	0	23.7	1	22.7	21.99
		20375	1752.5	25	0	23.7	1	22.7	22.44
	16QAM	19975	1712.5	1	0	23.7	1	22.7	22.41
		20175	1732.5	1	0	23.7	1	22.7	22.03
		20375	1752.5	1	0	23.7	1	22.7	22.53
		19975	1712.5	1	24	23.7	1	22.7	22.38
		20175	1732.5	1	24	23.7	1	22.7	22.05
		20375	1752.5	1	24	23.7	1	22.7	**22.57**
		19975	1712.5	12	6	23.7	2	21.7	21.50
		20175	1732.5	12	6	23.7	2	21.7	21.15
		20375	1752.5	12	6	23.7	2	21.7	21.67
		19975	1712.5	25	0	23.7	2	21.7	21.36
		20175	1732.5	25	0	23.7	2	21.7	20.99
		20375	1752.5	25	0	23.7	2	21.7	21.47
10 MHz	QPSK	20000	1715	1	0	23.7	0	23.7	23.49
		20175	1732.5	1	0	23.7	0	23.7	23.20
		20350	1750	1	0	23.7	0	23.7	**23.61**
		20000	1715	1	49	23.7	0	23.7	23.33
		20175	1732.5	1	49	23.7	0	23.7	23.10
		20350	1750	1	49	23.7	0	23.7	23.59
		20000	1715	25	12	23.7	1	22.7	22.34
		20175	1732.5	25	12	23.7	1	22.7	22.03
		20350	1750	25	12	23.7	1	22.7	22.54
		20000	1715	50	0	23.7	1	22.7	22.15
		20175	1732.5	50	0	23.7	1	22.7	21.87
		20350	1750	50	0	23.7	1	22.7	22.27
	16QAM	20000	1715	1	0	23.7	1	22.7	22.44
		20175	1732.5	1	0	23.7	1	22.7	22.20
		20350	1750	1	0	23.7	1	22.7	**22.56**
		20000	1715	1	49	23.7	1	22.7	22.31
		20175	1732.5	1	49	23.7	1	22.7	22.09
		20350	1750	1	49	23.7	1	22.7	22.48
		20000	1715	25	12	23.7	2	21.7	21.30
		20175	1732.5	25	12	23.7	2	21.7	20.99
		20350	1750	25	12	23.7	2	21.7	21.53
		20000	1715	50	0	23.7	2	21.7	21.13
		20175	1732.5	50	0	23.7	2	21.7	20.86
		20350	1750	50	0	23.7	2	21.7	21.32

LTE Band 5									
BW	Modulation	CH	Frequency (MHz)	RB	RB Offset	Target Power	MPR	Expected Power	Measured Power
5 MHz	QPSK	20425	826.5	1	0	22.5	0	22.5	**22.38**
		20525	836.5	1	0	22.5	0	22.5	22.17
		20625	846.5	1	0	22.5	0	22.5	22.29
		20425	826.5	1	24	22.5	0	22.5	22.33
		20525	836.5	1	24	22.5	0	22.5	22.32
		20625	846.5	1	24	22.5	0	22.5	22.17
		20425	826.5	12	6	22.5	1	21.5	21.34
		20525	836.5	12	6	22.5	1	21.5	21.34
		20625	846.5	12	6	22.5	1	21.5	21.48
		20425	826.5	25	0	22.5	1	21.5	21.25
		20525	836.5	25	0	22.5	1	21.5	21.26
		20625	846.5	25	0	22.5	1	21.5	21.28
	16QAM	20425	826.5	1	0	22.5	1	21.5	21.25
		20525	836.5	1	0	22.5	1	21.5	21.20
		20625	846.5	1	0	22.5	1	21.5	21.28
		20425	826.5	1	24	22.5	1	21.5	21.27
		20525	836.5	1	24	22.5	1	21.5	**21.29**
		20625	846.5	1	24	22.5	1	21.5	21.19
		20425	826.5	12	6	22.5	2	20.5	20.45
		20525	836.5	12	6	22.5	2	20.5	20.37
		20625	846.5	12	6	22.5	2	20.5	20.54
		20425	826.5	25	0	22.5	2	20.5	20.34
		20525	836.5	25	0	22.5	2	20.5	20.23
		20625	846.5	25	0	22.5	2	20.5	20.32
10 MHz	QPSK	20450	829	1	0	22.5	0	22.5	22.32
		20525	836.5	1	0	22.5	0	22.5	22.16
		20600	844	1	0	22.5	0	22.5	**22.43**
		20450	829	1	49	22.5	0	22.5	22.19
		20525	836.5	1	49	22.5	0	22.5	22.40
		20600	844	1	49	22.5	0	22.5	22.22
		20450	829	25	12	22.5	1	21.5	21.31
		20525	836.5	25	12	22.5	1	21.5	21.25
		20600	844	25	12	22.5	1	21.5	21.42
		20450	829	50	0	22.5	1	21.5	21.18
		20525	836.5	50	0	22.5	1	21.5	21.17
		20600	844	50	0	22.5	1	21.5	21.22
	16QAM	20450	829	1	0	22.5	1	21.5	21.30
		20525	836.5	1	0	22.5	1	21.5	21.20
		20600	844	1	0	22.5	1	21.5	**21.38**
		20450	829	1	49	22.5	1	21.5	21.25
		20525	836.5	1	49	22.5	1	21.5	21.37
		20600	844	1	49	22.5	1	21.5	21.22
		20450	829	25	12	22.5	2	20.5	20.35
		20525	836.5	25	12	22.5	2	20.5	20.24
		20600	844	25	12	22.5	2	20.5	20.42
		20450	829	50	0	22.5	2	20.5	20.26
		20525	836.5	50	0	22.5	2	20.5	20.25
		20600	844	50	0	22.5	2	20.5	20.28

LTE Band 17									
BW	Modulation	CH	Frequency (MHz)	RB	RB Offset	Target Power	MPR	Expected Power	Measured Power
5 MHz	QPSK	23755	706.5	1	0	23.3	0	23.3	22.69
		23790	710	1	0	23.3	0	23.3	22.97
		23825	713.5	1	0	23.3	0	23.3	**23.23**
		23755	706.5	1	24	23.3	0	23.3	23.05
		23790	710	1	24	23.3	0	23.3	23.11
		23825	713.5	1	24	23.3	0	23.3	22.73
		23755	706.5	12	6	23.3	1	22.3	21.87
		23790	710	12	6	23.3	1	22.3	22.14
		23825	713.5	12	6	23.3	1	22.3	22.21
		23755	706.5	25	0	23.3	1	22.3	21.73
		23790	710	25	0	23.3	1	22.3	22.00
		23825	713.5	25	0	23.3	1	22.3	22.08
	16QAM	23755	706.5	1	0	23.3	1	22.3	21.62
		23790	710	1	0	23.3	1	22.3	21.91
		23825	713.5	1	0	23.3	1	22.3	**22.21**
		23755	706.5	1	24	23.3	1	22.3	22.03
		23790	710	1	24	23.3	1	22.3	22.05
		23825	713.5	1	24	23.3	1	22.3	21.83
		23755	706.5	12	6	23.3	2	21.3	20.92
		23790	710	12	6	23.3	2	21.3	21.21
		23825	713.5	12	6	23.3	2	21.3	21.24
		23755	706.5	25	0	23.3	2	21.3	20.68
		23790	710	25	0	23.3	2	21.3	20.99
		23825	713.5	25	0	23.3	2	21.3	21.06
10 MHz	QPSK	23780	709	1	0	23.3	0	23.3	22.57
		23790	710	1	0	23.3	0	23.3	22.65
		23800	711	1	0	23.3	0	23.3	22.88
		23780	709	1	49	23.3	0	23.3	23.15
		23790	710	1	49	23.3	0	23.3	**23.26**
		23800	711	1	49	23.3	0	23.3	22.81
		23780	709	25	12	23.3	1	22.3	21.94
		23790	710	25	12	23.3	1	22.3	22.04
		23800	711	25	12	23.3	1	22.3	22.04
		23780	709	50	0	23.3	1	22.3	21.73
		23790	710	50	0	23.3	1	22.3	21.81
		23800	711	50	0	23.3	1	22.3	21.84
	16QAM	23780	709	1	0	23.3	1	22.3	21.65
		23790	710	1	0	23.3	1	22.3	21.74
		23800	711	1	0	23.3	1	22.3	21.91
		23780	709	1	49	23.3	1	22.3	22.19
		23790	710	1	49	23.3	1	22.3	**22.20**
		23800	711	1	49	23.3	1	22.3	21.92
		23780	709	25	12	23.3	2	21.3	20.94
		23790	710	25	12	23.3	2	21.3	21.00
		23800	711	25	12	23.3	2	21.3	21.06
		23780	709	50	0	23.3	2	21.3	20.76
		23790	710	50	0	23.3	2	21.3	20.75
		23800	711	50	0	23.3	2	21.3	20.81

Band	802.11b			802.11g		
Channel	1	6	11	1	6	11
Frequency (MHz)	2412	2437	2462	2412	2437	2462
Average Power	17.21	17.35	**17.53**	12.32	12.59	**12.60**

Band	802.11n (HT20)			-		
Channel	1	6	11	-	-	-
Frequency (MHz)	2412	2437	2462	-	-	-
Average Power	11.19	11.41	**11.51**	-	-	-

Band	802.11a							
Channel	36	40	44	48	52	56	60	64
Frequency (MHz)	5180	5200	5220	5240	5260	5280	5300	5320
Average Power	13.02	**13.08**	13.07	12.98	12.98	**13.02**	12.84	12.93

Band	802.11a							
Channel	100	104	108	112	116	132	136	140
Frequency (MHz)	5500	5520	5540	5560	5580	5660	5680	5700
Average Power	**13.45**	13.40	13.41	13.44	13.34	13.33	13.26	13.33

Band	802.11a							
Channel	149	153	157	161	-	-	-	-
Frequency (MHz)	5745	5765	5785	5805	-	-	-	-
Average Power	13.31	13.28	13.36	**13.38**	-	-	-	-

Band	802.11n (HT20)							
Channel	36	40	44	48	52	56	60	64
Frequency (MHz)	5180	5200	5220	5240	5260	5280	5300	5320
Average Power	13.57	13.86	13.75	**13.87**	**13.76**	13.52	13.53	13.53

Band	802.11n (HT20)							
Channel	100	104	108	112	116	132	136	140
Frequency (MHz)	5500	5520	5540	5560	5580	5660	5680	5700
Average Power	**12.81**	12.65	12.64	12.57	12.67	12.51	12.39	12.56

Band	802.11n (HT20)							
Channel	149	153	157	161	-	-	-	-
Frequency (MHz)	5745	5765	5785	5805	-	-	-	-
Average Power	12.46	12.61	12.65	**12.73**	-	-	-	-

Band	802.11n (HT40)							
Channel	38	46	54	62	102	134	151	159
Frequency (MHz)	5190	5230	5270	5310	5510	5670	5755	5795
Average Power	**12.95**	12.93	**12.94**	12.52	**13.10**	12.82	**12.92**	12.90

4.6 SAR Testing Results

4.6.1 SAR Results for Head

Plot No.	Band	Mode	Test Position	Channel	SAR-1g (W/kg)
1	GMS850	GPRS10	Right Cheek	189	**0.464**
2	GMS850	GPRS10	Right Tilted	189	0.249
3	GMS850	GPRS10	Left Cheek	189	0.411
4	GMS850	GPRS10	Left Tilted	189	0.261
5	GSM1900	GPRS10	Right Cheek	810	0.6
6	GSM1900	GPRS10	Right Tilted	810	0.275
7	GSM1900	GPRS10	Left Cheek	810	**0.667**
8	GSM1900	GPRS10	Left Tilted	810	0.389
13	WCDMA Band II	RMC12.2K	Right Cheek	9400	0.764
14	WCDMA Band II	RMC12.2K	Right Tilted	9400	0.352
15	WCDMA Band II	RMC12.2K	Left Cheek	9400	0.828
16	WCDMA Band II	RMC12.2K	Left Tilted	9400	0.431
17	WCDMA Band II	RMC12.2K	Left Cheek	9262	**0.835**
18	WCDMA Band II	RMC12.2K	Left Cheek	9538	0.83
9	WCDMA Band V	RMC12.2K	Right Cheek	4182	**0.321**
10	WCDMA Band V	RMC12.2K	Right Tilted	4182	0.19
11	WCDMA Band V	RMC12.2K	Left Cheek	4182	0.279
12	WCDMA Band V	RMC12.2K	Left Tilted	4182	0.199
101	802.11b	-	Right Cheek	11	0.273
102	802.11b	-	Right Tilted	11	0.064
103	802.11b	-	Left Cheek	11	**0.328**
104	802.11b	-	Left Tilted	11	0.041
650	802.11n	HT20	Right Cheek	48	0.013
651	802.11n	HT20	Right Tilted	48	0.00403
652	802.11n	HT20	Left Cheek	48	**0.036**
653	802.11n	HT20	Left Tilted	48	0.00366
654	802.11n	HT20	Right Cheek	52	0.031
655	802.11n	HT20	Right Tilted	52	0.00482
656	802.11n	HT20	Left Cheek	52	0.026
657	802.11n	HT20	Left Tilted	52	0.00271
658	802.11a	-	Right Cheek	100	0.016
659	802.11a	-	Right Tilted	100	0.00229
660	802.11a	-	Left Cheek	100	0.03
661	802.11a	-	Left Tilted	100	0.00774
662	802.11a	-	Right Cheek	161	0.0067
663	802.11a	-	Right Tilted	161	0.00484
664	802.11a	-	Left Cheek	161	0.00225
665	802.11a	-	Left Tilted	161	0.013

Plot No.	Band	Mode	Test Position	Channel	RB	Offset	SAR-1g (W/kg)
595	LTE Band 2	QPSK, BW 10M	Right Cheek	18900	25	12	0.649
599	LTE Band 2	QPSK, BW 10M	Right Cheek	18900	1	0	0.84
603	LTE Band 2	QPSK, BW 10M	Right Cheek	18900	1	49	0.817
596	LTE Band 2	QPSK, BW 10M	Right Tilted	18900	25	12	0.29
600	LTE Band 2	QPSK, BW 10M	Right Tilted	18900	1	0	0.371
604	LTE Band 2	QPSK, BW 10M	Right Tilted	18900	1	49	0.351
597	LTE Band 2	QPSK, BW 10M	Left Cheek	18900	25	12	0.694
601	LTE Band 2	QPSK, BW 10M	Left Cheek	18900	1	0	**0.902**
605	LTE Band 2	QPSK, BW 10M	Left Cheek	18900	1	49	0.893
598	LTE Band 2	QPSK, BW 10M	Left Tilted	18900	25	12	0.337
602	LTE Band 2	QPSK, BW 10M	Left Tilted	18900	1	0	0.43
606	LTE Band 2	QPSK, BW 10M	Left Tilted	18900	1	49	0.447
607	LTE Band 2	16QAM, BW 10M	Left Cheek	18900	25	12	0.567
608	LTE Band 2	16QAM, BW 10M	Left Cheek	18900	1	0	0.723
609	LTE Band 2	16QAM, BW 10M	Left Cheek	18900	1	49	0.719
580	LTE Band 4	QPSK, BW 10M	Right Cheek	20350	25	12	0.635
584	LTE Band 4	QPSK, BW 10M	Right Cheek	20350	1	0	0.819
588	LTE Band 4	QPSK, BW 10M	Right Cheek	20350	1	49	0.785
581	LTE Band 4	QPSK, BW 10M	Right Tilted	20350	25	12	0.219
585	LTE Band 4	QPSK, BW 10M	Right Tilted	20350	1	0	0.281
589	LTE Band 4	QPSK, BW 10M	Right Tilted	20350	1	49	0.274
582	LTE Band 4	QPSK, BW 10M	Left Cheek	20350	25	12	0.666
586	LTE Band 4	QPSK, BW 10M	Left Cheek	20350	1	0	**0.866**
590	LTE Band 4	QPSK, BW 10M	Left Cheek	20350	1	49	0.824
583	LTE Band 4	QPSK, BW 10M	Left Tilted	20350	25	12	0.306
587	LTE Band 4	QPSK, BW 10M	Left Tilted	20350	1	0	0.405
591	LTE Band 4	QPSK, BW 10M	Left Tilted	20350	1	49	0.383
592	LTE Band 4	16QAM, BW 10M	Left Cheek	20350	25	12	0.546
593	LTE Band 4	16QAM, BW 10M	Left Cheek	20350	1	0	0.702
594	LTE Band 4	16QAM, BW 10M	Left Cheek	20350	1	49	0.658
565	LTE Band 5	QPSK, BW 10M	Right Cheek	20600	25	12	0.256
569	LTE Band 5	QPSK, BW 10M	Right Cheek	20600	1	0	0.286
573	LTE Band 5	QPSK, BW 10M	Right Cheek	20600	1	49	**0.329**
566	LTE Band 5	QPSK, BW 10M	Right Tilted	20600	25	12	0.163
570	LTE Band 5	QPSK, BW 10M	Right Tilted	20600	1	0	0.182
574	LTE Band 5	QPSK, BW 10M	Right Tilted	20600	1	49	0.222
567	LTE Band 5	QPSK, BW 10M	Left Cheek	20600	25	12	0.225
571	LTE Band 5	QPSK, BW 10M	Left Cheek	20600	1	0	0.255
575	LTE Band 5	QPSK, BW 10M	Left Cheek	20600	1	49	0.289
568	LTE Band 5	QPSK, BW 10M	Left Tilted	20600	25	12	0.157
572	LTE Band 5	QPSK, BW 10M	Left Tilted	20600	1	0	0.184
576	LTE Band 5	QPSK, BW 10M	Left Tilted	20600	1	49	0.204
577	LTE Band 5	16QAM, BW 10M	Right Cheek	20600	25	12	0.21
578	LTE Band 5	16QAM, BW 10M	Right Cheek	20600	1	0	0.231
579	LTE Band 5	16QAM, BW 10M	Right Cheek	20600	1	49	0.228

Plot No.	Band	Mode	Test Position	Channel	RB	Offset	SAR-1g (W/kg)
550	LTE Band 17	QPSK, BW 10M	Right Cheek	23790	25	12	0.284
554	LTE Band 17	QPSK, BW 10M	Right Cheek	23790	1	0	0.327
558	LTE Band 17	QPSK, BW 10M	Right Cheek	23790	1	49	0.553
551	LTE Band 17	QPSK, BW 10M	Right Tilted	23790	25	12	0.282
555	LTE Band 17	QPSK, BW 10M	Right Tilted	23790	1	0	0.326
559	LTE Band 17	QPSK, BW 10M	Right Tilted	23790	1	49	0.526
552	LTE Band 17	QPSK, BW 10M	Left Cheek	23790	25	12	0.342
556	LTE Band 17	QPSK, BW 10M	Left Cheek	23790	1	0	0.407
560	LTE Band 17	QPSK, BW 10M	Left Cheek	23790	1	49	**0.637**
553	LTE Band 17	QPSK, BW 10M	Left Tilted	23790	25	12	0.326
557	LTE Band 17	QPSK, BW 10M	Left Tilted	23790	1	0	0.402
561	LTE Band 17	QPSK, BW 10M	Left Tilted	23790	1	49	0.593
562	LTE Band 17	16QAM, BW 10M	Left Cheek	23790	25	12	0.274
563	LTE Band 17	16QAM, BW 10M	Left Cheek	23790	1	0	0.335
564	LTE Band 17	16QAM, BW 10M	Left Cheek	23790	1	49	0.516

Note:

1. SAR is performed on the highest power channel. When the SAR value of highest power channel is less than 0.8 W/kg, SAR testing for optional channel is not required.
2. According to KDB 941225, the SAR testing for 100% RB is not required since the maximum SAR of 50% RB is less than 1.45 W/kg.
3. According to KDB 941225, the SAR testing was performed on largest channel bandwidth, and SAR for other channel bandwidths is not required since the maximum power of smaller channel bandwidth is within 1/2 dB higher or lower of measured for the largest channel bandwidth and maximum SAR of largest channel bandwidth is less than 1.45 W/kg.
4. Since GPRS/EDGE and WLAN of this device supports VOIP capability through 3rd party apps software, we have evaluated data mode for head SAR.
5. SAR testing for 802.11g/n is not required because its maximum power is less than 1/4 dB higher than 802.11b.
6. SAR testing for WLAN 5G is performed on the maximum power mode.

4.6.2 SAR Results for Body

<Body Worn Mode>

Plot No.	Band	Mode	Test Position	Separation Distance (cm)	Channel	SAR-1g (W/kg)
56	GMS850	GPRS10	Front Face	1	189	0.563
57	GMS850	GPRS10	Rear Face	1	189	0.848
82	GMS850	GPRS10	Rear Face	1	128	0.677
83	GMS850	GPRS10	Rear Face	1	251	**0.981**
63	GSM1900	GPRS10	Front Face	1	810	**1.02**
64	GSM1900	GPRS10	Rear Face	1	810	0.953
89	GSM1900	GPRS10	Front Face	1	512	0.667
90	GSM1900	GPRS10	Front Face	1	661	0.82
91	GSM1900	GPRS10	Rear Face	1	512	0.701
92	GSM1900	GPRS10	Rear Face	1	661	0.829
77	WCDMA Band II	RMC12.2K	Front Face	1	9400	0.99
78	WCDMA Band II	RMC12.2K	Rear Face	1	9400	**1.04**
111	WCDMA Band II	RMC12.2K	Front Face	1	9262	0.87
112	WCDMA Band II	RMC12.2K	Front Face	1	9538	0.948
113	WCDMA Band II	RMC12.2K	Rear Face	1	9262	0.946
114	WCDMA Band II	RMC12.2K	Rear Face	1	9538	0.973
70	WCDMA Band V	RMC12.2K	Front Face	1	4182	0.367
71	WCDMA Band V	RMC12.2K	Rear Face	1	4182	**0.558**
109	802.11b	-	Front Face	1	11	0.107
110	802.11b	-	Rear Face	1	11	**0.193**
669	802.11n	HT20	Front Face	1	48	0.013
670	802.11n	HT20	Rear Face	1	48	0.083
674	802.11n	HT20	Front Face	1	52	0.024
675	802.11n	HT20	Rear Face	1	52	0.09
679	802.11a	-	Front Face	1	100	0.00927
680	802.11a	-	Rear Face	1	100	0.088
684	802.11a	-	Front Face	1	161	0.00792
685	802.11a	-	Rear Face	1	161	**0.191**

Plot No.	Band	Mode	Test Position	Separation Distance (cm)	Channel	RB	Offset	SAR-1g (W/kg)
312	LTE Band 2	QPSK, BW 10M	Front Face	1	18900	25	12	0.756
314	LTE Band 2	QPSK, BW 10M	Front Face	1	18900	1	0	0.96
316	LTE Band 2	QPSK, BW 10M	Front Face	1	18900	1	49	0.978
313	LTE Band 2	QPSK, BW 10M	Rear Face	1	18900	25	12	0.787
315	LTE Band 2	QPSK, BW 10M	Rear Face	1	18900	1	0	0.998
317	LTE Band 2	QPSK, BW 10M	Rear Face	1	18900	1	49	**1**
318	LTE Band 2	16QAM, BW 10M	Rear Face	1	18900	25	12	0.654
319	LTE Band 2	16QAM, BW 10M	Rear Face	1	18900	1	0	0.822
320	LTE Band 2	16QAM, BW 10M	Rear Face	1	18900	1	49	0.833
282	LTE Band 4	QPSK, BW 10M	Front Face	1	20350	25	12	0.758
284	LTE Band 4	QPSK, BW 10M	Front Face	1	20350	1	0	0.978
286	LTE Band 4	QPSK, BW 10M	Front Face	1	20350	1	49	0.958
283	LTE Band 4	QPSK, BW 10M	Rear Face	1	20350	25	12	0.856
324	LTE Band 4	QPSK, BW 10M	Rear Face	1	20000	25	12	0.69
325	LTE Band 4	QPSK, BW 10M	Rear Face	1	20175	25	12	0.645
285	LTE Band 4	QPSK, BW 10M	Rear Face	1	20350	1	0	**1.12**
287	LTE Band 4	QPSK, BW 10M	Rear Face	1	20350	1	49	1.08
288	LTE Band 4	16QAM, BW 10M	Rear Face	1	20350	25	12	0.694
289	LTE Band 4	16QAM, BW 10M	Rear Face	1	20350	1	0	0.892
290	LTE Band 4	16QAM, BW 10M	Rear Face	1	20350	1	49	0.844
252	LTE Band 5	QPSK, BW 10M	Front Face	1	20600	25	12	0.214
254	LTE Band 5	QPSK, BW 10M	Front Face	1	20600	1	0	0.249
256	LTE Band 5	QPSK, BW 10M	Front Face	1	20600	1	49	0.269
253	LTE Band 5	QPSK, BW 10M	Rear Face	1	20600	25	12	0.353
255	LTE Band 5	QPSK, BW 10M	Rear Face	1	20600	1	0	0.415
257	LTE Band 5	QPSK, BW 10M	Rear Face	1	20600	1	49	**0.427**
258	LTE Band 5	16QAM, BW 10M	Rear Face	1	20600	25	12	0.281
259	LTE Band 5	16QAM, BW 10M	Rear Face	1	20600	1	0	0.322
260	LTE Band 5	16QAM, BW 10M	Rear Face	1	20600	1	49	0.34
324	LTE Band 17	QPSK, BW 10M	Front Face	1	23790	25	12	0.075
224	LTE Band 17	QPSK, BW 10M	Front Face	1	23790	1	0	0.124
325	LTE Band 17	QPSK, BW 10M	Front Face	1	23790	1	49	0.146
223	LTE Band 17	QPSK, BW 10M	Rear Face	1	23790	25	12	0.075
225	LTE Band 17	QPSK, BW 10M	Rear Face	1	23790	1	0	0.123
227	LTE Band 17	QPSK, BW 10M	Rear Face	1	23790	1	49	**0.198**
228	LTE Band 17	16QAM, BW 10M	Front Face	1	23790	25	12	0.064
229	LTE Band 17	16QAM, BW 10M	Front Face	1	23790	1	0	0.077
230	LTE Band 17	16QAM, BW 10M	Front Face	1	23790	1	49	0.138

Note:

1. SAR is performed on the highest power channel. When the SAR value of highest power channel is less than 0.8 W/kg, SAR testing for optional channel is not required.
2. According to KDB 941225, the SAR testing for 100% RB is not required since the maximum SAR of 50% RB is less than 1.45 W/kg.
3. According to KDB 941225, the SAR testing was performed on largest channel bandwidth, and SAR for other channel bandwidths is not required since the maximum power of smaller channel bandwidth is within 1/2 dB higher or lower of measured for the largest channel bandwidth and maximum SAR of largest channel bandwidth is less than 1.45 W/kg.
4. Since GPRS/EDGE, WCDMA and WLAN of this device supports VOIP capability through 3rd party apps software, we have evaluated data mode for body worn mode.
5. SAR testing for 802.11g/n is not required because its maximum power is less than 1/4 dB higher than 802.11b.
6. SAR testing for WLAN 5G is performed on the maximum power mode.

<Hotspot Mode>

Plot No.	Band	Mode	Test Position	Separation Distance (cm)	Channel	SAR-1g (W/kg)
51	GMS850	GPRS10	Front Face	1	189	0.661
52	GMS850	GPRS10	Rear Face	1	189	0.963
53	GMS850	GPRS10	Left Side	1	189	0.54
54	GMS850	GPRS10	Right Side	1	189	0.675
55	GMS850	GPRS10	Bottom Side	1	189	0.15
80	GMS850	GPRS10	Rear Face	1	128	0.837
81	GMS850	GPRS10	Rear Face	1	251	**1.18**
58	GSM1900	GPRS10	Front Face	1	810	**1.03**
84	GSM1900	GPRS10	Rear Face	1	810	0.988
60	GSM1900	GPRS10	Left Side	1	810	0.368
61	GSM1900	GPRS10	Right Side	1	810	0.437
62	GSM1900	GPRS10	Bottom Side	1	810	0.982
87	GSM1900	GPRS10	Front Face	1	512	0.867
88	GSM1900	GPRS10	Front Face	1	661	0.66
85	GSM1900	GPRS10	Rear Face	1	512	0.67
86	GSM1900	GPRS10	Rear Face	1	661	0.816
93	GSM1900	GPRS10	Bottom Side	1	512	0.603
94	GSM1900	GPRS10	Bottom Side	1	661	0.75
72	WCDMA Band II	RMC12.2K	Front Face	1	9400	1.03
73	WCDMA Band II	RMC12.2K	Rear Face	1	9400	1.07
74	WCDMA Band II	RMC12.2K	Left Side	1	9400	0.42
75	WCDMA Band II	RMC12.2K	Right Side	1	9400	0.379
76	WCDMA Band II	RMC12.2K	Bottom Side	1	9400	**1.15**
95	WCDMA Band II	RMC12.2K	Front Face	1	9262	0.886
96	WCDMA Band II	RMC12.2K	Front Face	1	9538	1.01
97	WCDMA Band II	RMC12.2K	Rear Face	1	9262	0.99
98	WCDMA Band II	RMC12.2K	Rear Face	1	9538	1.05
99	WCDMA Band II	RMC12.2K	Bottom Side	1	9262	0.957
100	WCDMA Band II	RMC12.2K	Bottom Side	1	9538	1.13
65	WCDMA Band V	RMC12.2K	Front Face	1	4182	0.456
66	WCDMA Band V	RMC12.2K	Rear Face	1	4182	**0.665**
67	WCDMA Band V	RMC12.2K	Left Side	1	4182	0.345
68	WCDMA Band V	RMC12.2K	Right Side	1	4182	0.508
69	WCDMA Band V	RMC12.2K	Bottom Side	1	4182	0.104
105	802.11b	-	Front Face	1	11	0.11
106	802.11b	-	Rear Face	1	11	**0.203**
107	802.11b	-	Left Side	1	11	0.14
666	802.11n	HT20	Front Face	1	48	0.012
667	802.11n	HT20	Rear Face	1	48	0.059
668	802.11n	HT20	Left Side	1	48	0.077
681	802.11a	-	Front Face	1	161	0.012
682	802.11a	-	Rear Face	1	161	**0.179**
683	802.11a	-	Left Side	1	161	0.115

Plot No.	Band	Mode	Test Position	Separation Distance (cm)	Channel	RB	Offset	SAR-1g (W/kg)
291	LTE Band 2	QPSK, BW 10M	Front Face	1	18900	25	12	0.775
297	LTE Band 2	QPSK, BW 10M	Front Face	1	18900	1	0	0.969
303	LTE Band 2	QPSK, BW 10M	Front Face	1	18900	1	49	0.988
292	LTE Band 2	QPSK, BW 10M	Rear Face	1	18900	25	12	0.807
326	LTE Band 2	QPSK, BW 10M	Rear Face	1	18650	25	12	0.724
327	LTE Band 2	QPSK, BW 10M	Rear Face	1	19150	25	12	0.771
298	LTE Band 2	QPSK, BW 10M	Rear Face	1	18900	1	0	1.03
304	LTE Band 2	QPSK, BW 10M	Rear Face	1	18900	1	49	**1.04**
293	LTE Band 2	QPSK, BW 10M	Left Side	1	18900	25	12	0.27
299	LTE Band 2	QPSK, BW 10M	Left Side	1	18900	1	0	0.355
305	LTE Band 2	QPSK, BW 10M	Left Side	1	18900	1	49	0.346
294	LTE Band 2	QPSK, BW 10M	Right Side	1	18900	25	12	0.241
300	LTE Band 2	QPSK, BW 10M	Right Side	1	18900	1	0	0.316
306	LTE Band 2	QPSK, BW 10M	Right Side	1	18900	1	49	0.316
296	LTE Band 2	QPSK, BW 10M	Bottom Side	1	18900	25	12	0.666
302	LTE Band 2	QPSK, BW 10M	Bottom Side	1	18900	1	0	0.838
308	LTE Band 2	QPSK, BW 10M	Bottom Side	1	18900	1	49	0.849
309	LTE Band 2	16QAM, BW 10M	Rear Face	1	18900	25	12	0.429
310	LTE Band 2	16QAM, BW 10M	Rear Face	1	18900	1	0	0.549
311	LTE Band 2	16QAM, BW 10M	Rear Face	1	18900	1	49	0.546
261	LTE Band 4	QPSK, BW 10M	Front Face	1	20350	25	12	0.734
267	LTE Band 4	QPSK, BW 10M	Front Face	1	20350	1	0	0.955
273	LTE Band 4	QPSK, BW 10M	Front Face	1	20350	1	49	0.944
262	LTE Band 4	QPSK, BW 10M	Rear Face	1	20350	25	12	0.867
322	LTE Band 4	QPSK, BW 10M	Rear Face	1	20000	25	12	0.697
323	LTE Band 4	QPSK, BW 10M	Rear Face	1	20175	25	12	0.658
268	LTE Band 4	QPSK, BW 10M	Rear Face	1	20350	1	0	**1.13**
274	LTE Band 4	QPSK, BW 10M	Rear Face	1	20350	1	49	1.09
263	LTE Band 4	QPSK, BW 10M	Left Side	1	20350	25	12	0.262
269	LTE Band 4	QPSK, BW 10M	Left Side	1	20350	1	0	0.35
275	LTE Band 4	QPSK, BW 10M	Left Side	1	20350	1	49	0.302
264	LTE Band 4	QPSK, BW 10M	Right Side	1	20350	25	12	0.188
270	LTE Band 4	QPSK, BW 10M	Right Side	1	20350	1	0	0.246
276	LTE Band 4	QPSK, BW 10M	Right Side	1	20350	1	49	0.23
266	LTE Band 4	QPSK, BW 10M	Bottom Side	1	20350	25	12	0.503
272	LTE Band 4	QPSK, BW 10M	Bottom Side	1	20350	1	0	0.635
278	LTE Band 4	QPSK, BW 10M	Bottom Side	1	20350	1	49	0.643
279	LTE Band 4	16QAM, BW 10M	Rear Face	1	20350	25	12	0.585
280	LTE Band 4	16QAM, BW 10M	Rear Face	1	20350	1	0	0.756
281	LTE Band 4	16QAM, BW 10M	Rear Face	1	20350	1	49	0.715

Plot No.	Band	Mode	Test Position	Separation Distance (cm)	Channel	RB	Offset	SAR-1g (W/kg)
231	LTE Band 5	QPSK, BW 10M	Front Face	1	20600	25	12	0.271
237	LTE Band 5	QPSK, BW 10M	Front Face	1	20600	1	0	0.323
243	LTE Band 5	QPSK, BW 10M	Front Face	1	20600	1	49	0.338
232	LTE Band 5	QPSK, BW 10M	Rear Face	1	20600	25	12	0.418
238	LTE Band 5	QPSK, BW 10M	Rear Face	1	20600	1	0	0.499
244	LTE Band 5	QPSK, BW 10M	Rear Face	1	20600	1	49	**0.504**
233	LTE Band 5	QPSK, BW 10M	Left Side	1	20600	25	12	0.266
239	LTE Band 5	QPSK, BW 10M	Left Side	1	20600	1	0	0.328
245	LTE Band 5	QPSK, BW 10M	Left Side	1	20600	1	49	0.311
234	LTE Band 5	QPSK, BW 10M	Right Side	1	20600	25	12	0.345
240	LTE Band 5	QPSK, BW 10M	Right Side	1	20600	1	0	0.426
246	LTE Band 5	QPSK, BW 10M	Right Side	1	20600	1	49	0.42
236	LTE Band 5	QPSK, BW 10M	Bottom Side	1	20600	25	12	0.088
242	LTE Band 5	QPSK, BW 10M	Bottom Side	1	20600	1	0	0.101
248	LTE Band 5	QPSK, BW 10M	Bottom Side	1	20600	1	49	0.118
249	LTE Band 5	16QAM, BW 10M	Rear Face	1	20600	25	12	0.339
250	LTE Band 5	16QAM, BW 10M	Rear Face	1	20600	1	0	0.404
251	LTE Band 5	16QAM, BW 10M	Rear Face	1	20600	1	49	0.411
321	LTE Band 17	QPSK, BW 10M	Front Face	1	23790	25	12	0.11
322	LTE Band 17	QPSK, BW 10M	Front Face	1	23790	1	0	0.122
323	LTE Band 17	QPSK, BW 10M	Front Face	1	23790	1	49	0.203
202	LTE Band 17	QPSK, BW 10M	Rear Face	1	23790	25	12	0.128
208	LTE Band 17	QPSK, BW 10M	Rear Face	1	23790	1	0	0.151
214	LTE Band 17	QPSK, BW 10M	Rear Face	1	23790	1	49	**0.249**
203	LTE Band 17	QPSK, BW 10M	Left Side	1	23790	25	12	0.054
209	LTE Band 17	QPSK, BW 10M	Left Side	1	23790	1	0	0.068
215	LTE Band 17	QPSK, BW 10M	Left Side	1	23790	1	49	0.124
204	LTE Band 17	QPSK, BW 10M	Right Side	1	23790	25	12	0.123
210	LTE Band 17	QPSK, BW 10M	Right Side	1	23790	1	0	0.141
216	LTE Band 17	QPSK, BW 10M	Right Side	1	23790	1	49	0.238
205	LTE Band 17	QPSK, BW 10M	Top Side	1	23790	25	12	0.063
211	LTE Band 17	QPSK, BW 10M	Top Side	1	23790	1	0	0.082
217	LTE Band 17	QPSK, BW 10M	Top Side	1	23790	1	49	0.127
219	LTE Band 17	16QAM, BW 10M	Rear Face	1	23790	25	12	0.112
220	LTE Band 17	16QAM, BW 10M	Rear Face	1	23790	1	0	0.139
221	LTE Band 17	16QAM, BW 10M	Rear Face	1	23790	1	49	0.222

Note:

1. SAR is performed on the highest power channel. When the SAR value of highest power channel is less than 0.8 W/kg, SAR testing for optional channel is not required.
2. According to KDB 941225, the SAR testing for 100% RB is not required since the maximum SAR of 50% RB is less than 1.45 W/kg.
3. According to KDB 941225, the SAR testing was performed on largest channel bandwidth, and SAR for other channel bandwidths is not required since the maximum power of smaller channel bandwidth is within 1/2 dB higher or lower of measured for the largest channel bandwidth and maximum SAR of largest channel bandwidth is less than 1.45 W/kg.
4. SAR testing for 802.11g/n is not required because its maximum power is less than 1/4 dB higher than 802.11b.
5. Only WLAN 5G band 1 and 4 (5.15~5.25 and 5.725~5.85 GHz) support wireless hotspot mode.
6. SAR testing for WLAN 5G is performed on the maximum power mode.

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4.6.3 Simultaneous Multi-band Transmission Evaluation

No.	Conditions (SAR1 + SAR2)	Mode	Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR
1	GSM850 + WLAN 2.4G	Head	Right Cheek	0.464	0.273	0.737	-
			Right Tilted	0.249	0.064	0.313	-
			Left Cheek	0.411	0.328	0.739	-
			Left Tilted	0.261	0.041	0.302	-
		Body-Worn	Front Face	0.563	0.107	0.67	-
			Rear Face	0.981	0.193	1.174	-
		Hotspot	Front Face	0.661	0.11	0.771	-
			Rear Face	1.18	0.203	1.383	-
			Left Side	0.54	0.14	0.68	-
			Right Side	0.675	0	0.675	-
			Top Side	0	0	0	-
			Bottom Side	0.15	0	0.15	-
	GSM850 + WLAN 5G	Head	Right Cheek	0.464	0.031	0.495	-
			Right Tilted	0.249	0.00484	0.25384	-
			Left Cheek	0.411	0.036	0.447	-
			Left Tilted	0.261	0.013	0.274	-
		Body-Worn	Front Face	0.563	0.024	0.587	-
			Rear Face	0.981	0.191	1.172	-
		Hotspot	Front Face	0.661	0.012	0.673	-
			Rear Face	1.18	0.179	1.359	-
			Left Side	0.54	0.115	0.655	-
			Right Side	0.675	0	0.675	-
			Top Side	0	0	0	-
			Bottom Side	0.15	0	0.15	-
2	GSM1900 + WLAN 2.4G	Head	Right Cheek	0.6	0.273	0.873	-
			Right Tilted	0.275	0.064	0.339	-
			Left Cheek	0.667	0.328	0.995	-
			Left Tilted	0.389	0.041	0.43	-
		Body-Worn	Front Face	1.02	0.107	1.127	-
			Rear Face	0.953	0.193	1.146	-
		Hotspot	Front Face	1.03	0.11	1.14	-
			Rear Face	0.988	0.203	1.191	-
			Left Side	0.368	0.14	0.508	-
			Right Side	0.437	0	0.437	-
			Top Side	0	0	0	-
			Bottom Side	0.982	0	0.982	-
	GSM1900 + WLAN 5G	Head	Right Cheek	0.6	0.031	0.631	-
			Right Tilted	0.275	0.00484	0.27984	-
			Left Cheek	0.667	0.036	0.703	-
			Left Tilted	0.389	0.013	0.402	-
		Body-Worn	Front Face	1.02	0.024	1.044	-
			Rear Face	0.953	0.191	1.144	-
		Hotspot	Front Face	1.03	0.012	1.042	-
			Rear Face	0.988	0.179	1.167	-
			Left Side	0.368	0.115	0.483	-
			Right Side	0.437	0	0.437	-
			Top Side	0	0	0	-
			Bottom Side	0.982	0	0.982	-

No.	Conditions (SAR1 + SAR2)	Mode	Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR
3	WCDMA II + WLAN 2.4G	Head	Right Cheek	0.764	0.273	1.037	-
			Right Tilted	0.352	0.064	0.416	-
			Left Cheek	0.835	0.328	1.163	-
			Left Tilted	0.431	0.041	0.472	-
		Body-Worn	Front Face	0.99	0.107	1.097	-
			Rear Face	1.04	0.193	1.233	-
		Hotspot	Front Face	1.03	0.11	1.14	-
			Rear Face	1.07	0.203	1.273	-
			Left Side	0.42	0.14	0.56	-
			Right Side	0.379	0	0.379	-
			Top Side	0	0	0	-
			Bottom Side	1.15	0	1.15	-
	WCDMA II + WLAN 5G	Head	Right Cheek	0.764	0.031	0.795	-
			Right Tilted	0.352	0.00484	0.35684	-
			Left Cheek	0.835	0.036	0.871	-
			Left Tilted	0.431	0.013	0.444	-
		Body-Worn	Front Face	0.99	0.024	1.014	-
			Rear Face	1.04	0.191	1.231	-
		Hotspot	Front Face	1.03	0.012	1.042	-
			Rear Face	1.07	0.179	1.249	-
			Left Side	0.42	0.115	0.535	-
			Right Side	0.379	0	0.379	-
			Top Side	0	0	0	-
			Bottom Side	1.15	0	1.15	-
4	WCDMA V + WLAN 2.4G	Head	Right Cheek	0.321	0.273	0.594	-
			Right Tilted	0.19	0.064	0.254	-
			Left Cheek	0.279	0.328	0.607	-
			Left Tilted	0.199	0.041	0.24	-
		Body-Worn	Front Face	0.367	0.107	0.474	-
			Rear Face	0.558	0.193	0.751	-
		Hotspot	Front Face	0.456	0.11	0.566	-
			Rear Face	0.665	0.203	0.868	-
			Left Side	0.345	0.14	0.485	-
			Right Side	0.508	0	0.508	-
			Top Side	0	0	0	-
			Bottom Side	0.104	0	0.104	-
	WCDMA V + WLAN 5G	Head	Right Cheek	0.321	0.031	0.352	-
			Right Tilted	0.19	0.00484	0.19484	-
			Left Cheek	0.279	0.036	0.315	-
			Left Tilted	0.199	0.013	0.212	-
		Body-Worn	Front Face	0.367	0.024	0.391	-
			Rear Face	0.558	0.191	0.749	-
		Hotspot	Front Face	0.456	0.012	0.468	-
			Rear Face	0.665	0.179	0.844	-
			Left Side	0.345	0.115	0.46	-
			Right Side	0.508	0	0.508	-
			Top Side	0	0	0	-
			Bottom Side	0.104	0	0.104	-

No.	Conditions (SAR1 + SAR2)	Mode	Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR
5	LTE 2 + WLAN 2.4G	Head	Right Cheek	0.84	0.273	1.113	-
			Right Tilted	0.371	0.064	0.435	-
			Left Cheek	0.902	0.328	1.23	-
			Left Tilted	0.447	0.041	0.488	-
		Body-Worn	Front Face	0.978	0.107	1.085	-
			Rear Face	1	0.193	1.193	-
		Hotspot	Front Face	0.988	0.11	1.098	-
			Rear Face	1.04	0.203	1.243	-
			Left Side	0.355	0.14	0.495	-
			Right Side	0.316	0	0.316	-
			Top Side	0	0	0	-
			Bottom Side	0.849	0	0.849	-
	LTE 2 + WLAN 5G	Head	Right Cheek	0.84	0.031	0.871	-
			Right Tilted	0.371	0.00484	0.37584	-
			Left Cheek	0.902	0.036	0.938	-
			Left Tilted	0.447	0.013	0.46	-
		Body-Worn	Front Face	0.978	0.024	1.002	-
			Rear Face	1	0.191	1.191	-
		Hotspot	Front Face	0.988	0.012	1	-
			Rear Face	1.04	0.179	1.219	-
			Left Side	0.355	0.115	0.47	-
			Right Side	0.316	0	0.316	-
			Top Side	0	0	0	-
			Bottom Side	0.849	0	0.849	-
6	LTE 4 + WLAN 2.4G	Head	Right Cheek	0.819	0.273	1.092	-
			Right Tilted	0.281	0.064	0.345	-
			Left Cheek	0.866	0.328	1.194	-
			Left Tilted	0.405	0.041	0.446	-
		Body-Worn	Front Face	0.978	0.107	1.085	-
			Rear Face	1.12	0.193	1.313	-
		Hotspot	Front Face	0.955	0.11	1.065	-
			Rear Face	1.13	0.203	1.333	-
			Left Side	0.35	0.14	0.49	-
			Right Side	0.246	0	0.246	-
			Top Side	0	0	0	-
			Bottom Side	0.643	0	0.643	-
	LTE 4 + WLAN 5G	Head	Right Cheek	0.819	0.031	0.85	-
			Right Tilted	0.281	0.00484	0.28584	-
			Left Cheek	0.866	0.036	0.902	-
			Left Tilted	0.405	0.013	0.418	-
		Body-Worn	Front Face	0.978	0.024	1.002	-
			Rear Face	1.12	0.191	1.311	-
		Hotspot	Front Face	0.955	0.012	0.967	-
			Rear Face	1.13	0.179	1.309	-
			Left Side	0.35	0.115	0.465	-
			Right Side	0.246	0	0.246	-
			Top Side	0	0	0	-
			Bottom Side	0.643	0	0.643	-

No.	Conditions (SAR1 + SAR2)	Mode	Position	Max. SAR1	Max. SAR2	SAR Summation	SPLSR
7	LTE 5 + WLAN 2.4G	Head	Right Cheek	0.329	0.273	0.602	-
			Right Tilted	0.222	0.064	0.286	-
			Left Cheek	0.289	0.328	0.617	-
			Left Tilted	0.204	0.041	0.245	-
		Body-Worn	Front Face	0.269	0.107	0.376	-
			Rear Face	0.427	0.193	0.62	-
		Hotspot	Front Face	0.338	0.11	0.448	-
			Rear Face	0.504	0.203	0.707	-
			Left Side	0.328	0.14	0.468	-
			Right Side	0.426	0	0.426	-
			Top Side	0	0	0	-
			Bottom Side	0.411	0	0.411	-
	LTE 5 + WLAN 5G	Head	Right Cheek	0.329	0.031	0.36	-
			Right Tilted	0.222	0.00484	0.22684	-
			Left Cheek	0.289	0.036	0.325	-
			Left Tilted	0.204	0.013	0.217	-
		Body-Worn	Front Face	0.269	0.024	0.293	-
			Rear Face	0.427	0.191	0.618	-
		Hotspot	Front Face	0.338	0.012	0.35	-
			Rear Face	0.504	0.179	0.683	-
			Left Side	0.328	0.115	0.443	-
			Right Side	0.426	0	0.426	-
			Top Side	0	0	0	-
			Bottom Side	0.411	0	0.411	-
8	LTE 17 + WLAN 2.4G	Head	Right Cheek	0.553	0.273	0.826	-
			Right Tilted	0.526	0.064	0.59	-
			Left Cheek	0.637	0.328	0.965	-
			Left Tilted	0.593	0.041	0.634	-
		Body-Worn	Front Face	0.146	0.107	0.253	-
			Rear Face	0.198	0.193	0.391	-
		Hotspot	Front Face	0.203	0.11	0.313	-
			Rear Face	0.249	0.203	0.452	-
			Left Side	0.124	0.14	0.264	-
			Right Side	0.238	0	0.238	-
			Top Side	0.127	0	0.127	-
			Bottom Side	0	0	0	-
	LTE 17 + WLAN 5G	Head	Right Cheek	0.553	0.031	0.584	-
			Right Tilted	0.526	0.00484	0.53084	-
			Left Cheek	0.637	0.036	0.673	-
			Left Tilted	0.593	0.013	0.606	-
		Body-Worn	Front Face	0.146	0.024	0.17	-
			Rear Face	0.198	0.191	0.389	-
		Hotspot	Front Face	0.203	0.012	0.215	-
			Rear Face	0.249	0.179	0.428	-
			Left Side	0.124	0.115	0.239	-
			Right Side	0.238	0	0.238	-
			Top Side	0.127	0	0.127	-
			Bottom Side	0	0	0	-

Note:

1. The maximum SAR summation is calculated based on the same configuration and test position.

Summary:

According to KDB 648474, the simultaneous transmission SAR for WWAN and WLAN was not required, because the SAR summation is less than 1.6 W/kg. The BT standalone SAR and WWAN/BT simultaneous transmission SAR were not required, because the maximum output power of Bluetooth is less than P_{Ref} (10.8 dBm) and the closest separation distance of these antennas is larger than 2.5 cm, and maximum WWAN SAR is less than 1.2 W/kg.

5. Calibration of Test Equipment

Equipment	Manufacturer	Model	SN	Cal. Date	Cal. Interval
System Validation Kit	SPEAG	D750V3	1013	Apr. 25, 2012	Annual
System Validation Kit	SPEAG	D835V2	4d021	Apr. 20, 2012	Annual
System Validation Kit	SPEAG	D1750V2	1055	Aug. 09, 2011	Annual
System Validation Kit	SPEAG	D1900V2	5d036	Jan. 26, 2012	Annual
System Validation Kit	SPEAG	D2450V2	737	Jan. 24, 2012	Annual
System Validation Kit	SPEAG	D5GHzV2	1018	Jan. 18, 2012	Annual
Dosimetric E-Field Probe	SPEAG	EX3DV4	3590	Feb. 23, 2012	Annual
Dosimetric E-Field Probe	SPEAG	EX3DV4	3650	Oct. 26, 2011	Annual
Dosimetric E-Field Probe	SPEAG	EX3DV4	3820	Dec. 16, 2011	Annual
Data Acquisition Electronics	SPEAG	DAE3	579	Apr. 27, 2012	Annual
Data Acquisition Electronics	SPEAG	DAE4	861	Aug. 29, 2011	Annual
Data Acquisition Electronics	SPEAG	DAE4	910	Dec. 07, 2011	Annual
SAM Phantom	SPEAG	QD000P40CD	TP-1652	N/A	N/A
SAM Phantom	SPEAG	QD000P40CD	TP-1654	N/A	N/A
Radio Communication Tester	Agilent	E5515C	MY50266628	Sep. 26, 2011	Biennial
Radio Communication Analyzer	Anritsu	MT8820C	6201010284	Aug. 01, 2011	Biennial
ENA Series Network Analyzer	Agilent	E5071C	MY46214281	May 14, 2012	Annual
MXG Analog Signal Generator	Agilent	N5181A	MY50143868	May 06, 2012	Annual
Power Meter	Anritsu	ML2495A	1218009	May 07, 2012	Annual
Power Sensor	Anritsu	MA2411B	1207252	May 07, 2012	Annual
EXA Spectrum Analyzer	Agilent	N9010A	MY52100136	Apr. 23, 2012	Annual
Dielectric Probe Kit	Agilent	85070D	E2-020018	May 14, 2012	Annual
Thermometer	YFE	YF-160A	110600361	Feb. 21, 2012	Annual
Directional Coupler	Woken	0110A05602O-10	11122702	Apr. 19, 2012	Annual
Power Amplifier	AR	5S1G4	0339656	Apr. 23, 2012	Annual
Power Amplifier	Mini-Circuit	ZVE-8G	001000422	Apr. 23, 2012	Annual
Attenuator	Woken	00800A1G01L-03	N/A	Apr. 19, 2012	Annual

6. Measurement Uncertainty

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Standard Uncertainty (1g)	Vi
Measurement System						
Probe Calibration	6.0	Normal	1	1	± 6.0 %	∞
Axial Isotropy	4.7	Rectangular	√3	0.7	± 1.9 %	∞
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	± 3.9 %	∞
Boundary Effects	1.0	Rectangular	√3	1	± 0.6 %	∞
Linearity	4.7	Rectangular	√3	1	± 2.7 %	∞
System Detection Limits	1.0	Rectangular	√3	1	± 0.6 %	∞
Readout Electronics	0.6	Normal	1	1	± 0.6 %	∞
Response Time	0.0	Rectangular	√3	1	± 0.0 %	∞
Integration Time	1.7	Rectangular	√3	1	± 1.0 %	∞
RF Ambient Noise	3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Reflections	3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	0.5	Rectangular	√3	1	± 0.3 %	∞
Probe Positioning	2.9	Rectangular	√3	1	± 1.7 %	∞
Max. SAR Eval.	2.3	Rectangular	√3	1	± 1.3 %	∞
Test Sample Related						
Device Positioning	3.9	Normal	1	1	± 3.9 %	31
Device Holder	2.7	Normal	1	1	± 2.7 %	19
Power Drift	5.0	Rectangular	√3	1	± 2.9 %	∞
Phantom and Setup						
Phantom Uncertainty	4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	± 1.8 %	∞
Liquid Conductivity (Meas.)	5.0	Normal	1	0.64	± 3.2 %	29
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	± 1.7 %	∞
Liquid Permittivity (Meas.)	5.0	Normal	1	0.6	± 3.0 %	29
Combined Standard Uncertainty					± 11.7 %	
Expanded Uncertainty (K=2)					**± 23.4 %**	

Uncertainty budget for frequency range 300 MHz to 3 GHz

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Standard Uncertainty (1g)	Vi
Measurement System						
Probe Calibration	6.55	Normal	1	1	± 6.55 %	∞
Axial Isotropy	4.7	Rectangular	√3	0.7	± 1.9 %	∞
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	± 3.9 %	∞
Boundary Effects	2.0	Rectangular	√3	1	± 1.2 %	∞
Linearity	4.7	Rectangular	√3	1	± 2.7 %	∞
System Detection Limits	1.0	Rectangular	√3	1	± 0.6 %	∞
Readout Electronics	0.3	Normal	1	1	± 0.3 %	∞
Response Time	0.8	Rectangular	√3	1	± 0.5 %	∞
Integration Time	2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Noise	3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Reflections	3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	0.8	Rectangular	√3	1	± 0.5 %	∞
Probe Positioning	9.9	Rectangular	√3	1	± 5.7 %	∞
Max. SAR Eval.	4.0	Rectangular	√3	1	± 2.3 %	∞
Test Sample Related						
Device Positioning	3.9	Normal	1	1	± 3.9 %	31
Device Holder	2.7	Normal	1	1	± 2.7 %	19
Power Drift	5.0	Rectangular	√3	1	± 2.9 %	∞
Phantom and Setup						
Phantom Uncertainty	4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	± 1.8 %	∞
Liquid Conductivity (Meas.)	5.0	Normal	1	0.64	± 3.2 %	30
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	± 1.7 %	∞
Liquid Permittivity (Meas.)	5.0	Normal	1	0.6	± 3.0 %	30
Combined Standard Uncertainty					± 13.4 %	
Expanded Uncertainty (K=2)					**± 26.8 %**	

Uncertainty budget for frequency range 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.

Copies of accreditation and authorization certificates of our laboratories obtained from approval agencies can be downloaded from our web site. If you have any comments, please feel free to contact us at the following:

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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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