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# SAR TEST REPORT

**Applicant** Shanghai SmartPeak Technology Co.,Ltd.  
**FCC ID** 2AJMSC6000  
**Brand** SMARTPEAK  
**Product** WCDMA Smart Handheld Terminal  
**Model** C6000  
**Report No.** RXA1606-0101SAR01R2  
**Issue Date** September 28, 2016

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **IEEE 1528-2013, ANSI/ IEEE C95.1-1992**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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## Table of Contents

1	Test Laboratory.....	4
1.1	Notes of the Test Report.....	4
1.2	Test facility.....	4
1.3	Testing Location.....	5
1.4	Laboratory Environment.....	5
2	Statement of Compliance.....	6
3	Description of Equipment under Test.....	7
4	Test Specification, Methods and Procedures.....	10
5	Operational Conditions during Test.....	11
5.1	Test Positions.....	11
5.1.1	Against Phantom Head.....	11
5.1.2	Body Worn Configuration.....	11
5.2	Measurement Variability.....	12
5.3	Test Configuration.....	13
5.3.1	GSM Test Configuration.....	13
5.3.2	3G Test Configuration.....	14
5.3.3	Wi-Fi Test Configuration.....	15
5.3.4	BT Test Configuration.....	16
6	SAR Measurements System Configuration.....	17
6.1	SAR Measurement Set-up.....	17
6.2	DASY5 E-field Probe System.....	18
6.3	SAR Measurement Procedure.....	20
7	Main Test Equipment.....	22
8	Tissue Dielectric Parameter Measurements & System Verification.....	23
8.1	Tissue Verification.....	23
8.2	System Performance Check.....	25
9	Normal and Maximum Output Power.....	28
9.1	GSM Mode.....	28
9.2	CDMA Mode.....	29
9.3	WLAN Mode.....	30
9.4	Bluetooth Mode.....	31
10	Measured and Reported (Scaled) SAR Results.....	32
10.1	EUT Antenna Locations.....	32
10.2	Standalone SAR test exclusion considerations.....	33
10.3	Measured SAR Results.....	34
10.4	Simultaneous Transmission Analysis.....	40
	ANNEX A: Test Layout.....	45
	ANNEX B: System Check Results.....	49
	ANNEX C: Highest Graph Results.....	57
	ANNEX D: Probe Calibration Certificate.....	69
	ANNEX E: D835V2 Dipole Calibration Certificate.....	80



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ANNEX F: D1900V2 Dipole Calibration Certificate.....	88
ANNEX G: D2450V2 Dipole Calibration Certificate .....	96
ANNEX H: DAE4 Calibration Certificate .....	104

# 1 Test Laboratory

## 1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above. This report must not be used by the client to claim product certification, approval, or endorsement by CNAS or any government agencies.

## 1.2 Test facility

### **CNAS (accreditation number:L2264)**

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

### **FCC (recognition number is 428261)**

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

### **IC (recognition number is 8510A)**

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

### **VCCI (recognition number is C-4595, T-2154, R-4113, G-766)**

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

### **A2LA (Certificate Number: 3857.01)**

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

### 1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.  
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### 1.4 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 $\Omega$
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

## 2 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for the EUT are as follows:

Table 2.1: Highest Reported SAR

Mode	Highest Reported SAR (W/kg)			
	1g SAR Head	1g SAR Body-worn (Separation 10mm)	1g SAR Hotspot (Separation 10mm)	Product Specific 10-g SAR (Separation 0mm)
GSM 850	0.440	0.539	0.505	NA
GSM 1900	0.313	0.281	0.574	NA
CDMA BC 0	0.237	0.927	0.484	NA
Wi-Fi (2.4G)	0.280	0.238	0.238	NA
Bluetooth	0.015	NA	NA	NA
Date of Testing:	July 21, 2016~ August 21, 2016			
Note: The device is in compliance with SAR for Uncontrolled Environment /General Population exposure limits (1.6 W/kg) specified in ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013.				

Table 2.2: Highest Simultaneous Transmission SAR

Exposure Configuration	1g SAR Head	1g SAR Body-worn (Separation 10mm)	1g SAR Hotspot (Separation 10mm)
Highest Simultaneous Transmission SAR (W/kg)	0.449	1.217	0.743
Note: 1. The detail for simultaneous transmission consideration is described in chapter 10.4.			

### 3 Description of Equipment under Test

#### Client Information

<b>Applicant</b>	Shanghai SmartPeak Technology Co.,Ltd.
<b>Applicant address</b>	Room 1,No.3 Building, NO.295, Qianqiao Road, Fengxian District, Shanghai, P.R.China
<b>Manufacturer</b>	Shanghai SmartPeak Technology Co.,Ltd.
<b>Manufacturer address</b>	Room 1,No.3 Building, NO.295, Qianqiao Road, Fengxian District, Shanghai, P.R.China

#### Accessory Equipment Details

<b>Name</b>	<b>Model</b>	<b>Manufacturer</b>	<b>Note</b>
Battery	BL-C60	Shenzhen MBELL ELECTRONICS CO., LTD.	/
Adapter 1	RCL-X055300C	SHENZHEN RICHLY TECHNOLOGIES CO.,LTD.	/
Adapter 2	YLJXC-055100	DONGGUAN YINLI ELECTRONICS CO.,LTD.	/
Charger pedestal holder	CRD-C60	Shanghai SmartPeak Technology Co.,Ltd.	/

**General Technologies**

Application Purpose:	Original Grant
EUT Stage:	Production Unit
Model:	C6000
IMEI:	868692020019704
Hardware Version:	P1
Software Version:	V1.41.4649
Antenna Type:	Internal Antenna
Device Class:	B
Wi-Fi Hotspot	Wi-Fi 2.4G
Power Class:	GSM 850:4 GSM 1900:1 CDMA BC 0:3
Power Level	GSM 850:level 5 GSM 1900:level 0 CDMA BC 0: all up bits



**Wireless Technology and Frequency Range**

Wireless Technology		Modulation	Operating mode	Tx (MHz)
GSM	850	Voice(GMSK) GPRS(GMSK)	<input type="checkbox"/> Multi-slot Class:8-1UP <input type="checkbox"/> Multi-slot Class:10-2UP	824 ~ 849
	1900	EGPRS(GMSK,8PSK)	<input checked="" type="checkbox"/> Multi-slot Class:12-4UP <input type="checkbox"/> Multi-slot Class:33-4UP	1850 ~ 1910
Does this device support DTM (Dual Transfer Mode)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
CDMA	BC 0	QPSK	1xRTT	824 ~ 849
BT	2.4G	Version 4.0 LE		2402 ~2480
Wi-Fi	2.4G	DSSS, OFDM	802.11b/g/n (HT20)	2402 ~2472
	Does this device support MIMO <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			



## 4 Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with FCC 47 CFR § 2.1093, IEEE 1528- 2013, ANSI/IEEE C95.1-1992, the following FCC Published RF exposure KDB procedures:

248227 D01 802.11 Wi-Fi SAR v02r02  
447498 D01 General RF Exposure Guidance v06  
648474 D04 Handset SAR v01r03  
865664 D01 SAR measurement 100 MHz to 6 GHz v01r04  
865664 D02 RF Exposure Reporting v01r02  
941225 D01 3G SAR Procedures v03r01  
941225 D06 Hotspot Mode v02r01

## 5 Operational Conditions during Test

### 5.1 Test Positions

#### 5.1.1 Against Phantom Head

Measurements were made in “cheek” and “tilt” positions on both the left hand and right hand sides of the phantom.

The positions used in the measurements were according to IEEE 1528 - 2013 "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques".

#### 5.1.2 Body Worn Configuration

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations.

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration. Per FCC KDB Publication 648474 D04, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is  $> 1.2$  W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented. Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

## 5.2 Measurement Variability

Per FCC KDB Publication 865664 D01, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR Measurement Variability was assessed using the following procedures for each frequency band:

- 1) When the original highest measured SAR is  $\geq 0.80$  W/kg, the measurement was repeated once.
- 2) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was  $> 1.20$  or when the original or repeated measurement was  $\geq 1.45$  W/kg (~ 10% from the 1-g SAR limit).
- 3) A third repeated measurement was performed only if the original, first or second repeated measurement was  $\geq 1.5$  W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is  $> 1.20$ .
- 4) Repeated measurements are not required when the original highest measured SAR is  $< 0.80$  W/kg

## 5.3 Test Configuration

### 5.3.1 GSM Test Configuration

According to specification 3GPP TS 51.010, the maximum power of the GSM can do the power reduction for the multi-slot. The allowed power reduction in the multi-slot configuration is as following:

Output power of reductions:

**Table 5.1: The allowed power reduction in the multi-slot configuration**

<b>Number of time slots in uplink assignment</b>	<b>Permissible nominal reduction of maximum output power,(dB)</b>
1	0
2	0 to 3,0
3	1,8 to 4,8
4	3,0 to 6,0

### 5.3.2 3G Test Configuration

#### 3G SAR Test Reduction Procedure

In the following procedures, the mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is  $\leq \frac{1}{4}$  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  $\leq 1.2$  W/kg, SAR measurement is not required for the secondary mode.<sup>3</sup> This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as “otherwise” in the applicable procedures; SAR measurement is required for the secondary mode.

### 5.3.3 Wi-Fi Test Configuration

SAR test reduction for 802.11 Wi-Fi transmission mode configurations are considered separately for DSSS and OFDM. An initial test position is determined to reduce the number of tests required for certain exposure configurations with multiple test positions. An initial test configuration is determined for each frequency band and aggregated band according to maximum output power, channel bandwidth, wireless mode configurations and other operating parameters to streamline the measurement requirements. For 2.4 GHz DSSS, either the initial test position or DSSS procedure is applied to reduce the number of SAR tests; these are mutually exclusive. For OFDM, an initial test position is only applicable to next to the ear, UMPC mini-tablet and hotspot mode configurations, which is tested using the initial test configuration to facilitate test reduction. For other exposure conditions with a fixed test position, SAR test reduction is determined using only the initial test configuration.

The multiple test positions require SAR measurements in head, hotspot mode or UMPC mini-tablet configurations may be reduced according to the highest reported SAR determined using the *initial test position(s)* by applying the DSSS or OFDM SAR measurement procedures in the required wireless mode test configuration(s). The *initial test position(s)* is measured using the highest measured maximum output power channel in the required wireless mode test configuration(s). When the *reported SAR* for the *initial test position* is:

- $\leq 0.4$  W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and wireless mode combination within the frequency band or aggregated band. DSSS and OFDM configurations are considered separately according to the required SAR procedures.
- 0.4 W/kg, SAR is repeated using the same wireless mode test configuration tested in the *initial test position* to measure the subsequent next closet/smallest test separation distance and maximum coupling test position, on the highest maximum output power channel, until the *reported SAR* is  $\leq 0.8$  W/kg or all required test positions are tested.
  - ✧ For subsequent test positions with equivalent test separation distance or when exposure is dominated by coupling conditions, the position for maximum coupling condition should be tested.
  - ✧ When it is unclear, all equivalent conditions must be tested.
- For all positions/configurations tested using the *initial test position* and subsequent test positions, when the *reported SAR* is  $> 0.8$  W/kg, measure the SAR for these positions/configurations on the subsequent next highest measured output power channel(s) until the *reported SAR* is  $\leq 1.2$  W/kg or all required test channels are considered.
  - ✧ The additional power measurements required for this step should be limited to those necessary for identifying subsequent highest output power channels to apply the test reduction.

To determine the initial test position, Area Scans were performed to determine the position with the Maximum Value of SAR (measured). The position that produced the highest Maximum Value of SAR is considered the worst case position; thus used as the initial test position.



A Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement. This RF signal utilized in SAR measurement has almost 100% duty cycle and its crest factor is 1.

#### **5.3.4 BT Test Configuration**

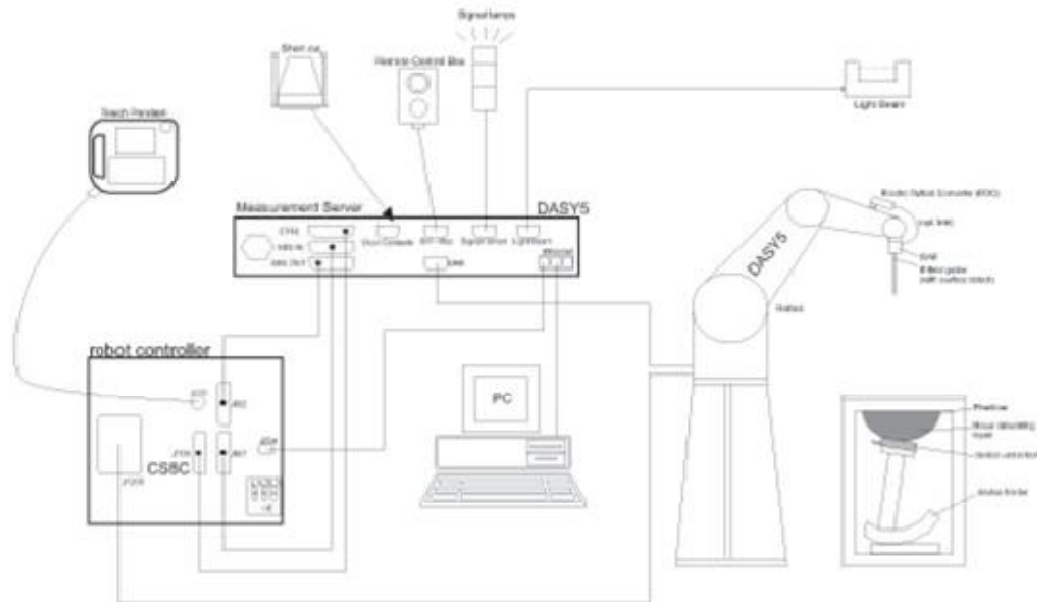
For BT SAR testing, BT engineering testing software installed on the EUT can provide continuous transmitting RF signal with maximum output power. And the CBT control the EUT operating with hopping off and data rate set for 3DH5. This RF signal utilized in SAR measurement has almost 100% duty cycle and its crest factor is 1.



## 6 SAR Measurements System Configuration

### 6.1 SAR Measurement Set-up

The DASY system for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP or Win7 and the DASY software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

## 6.2 DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

### EX3DV4 Probe Specification

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available
Frequency	10 MHz to > 6 GHz Linearity: $\pm 0.2$ dB (30 MHz to 6 GHz)
Directivity	$\pm 0.3$ dB in HSL (rotation around probe axis) $\pm 0.5$ dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 $\mu$ W/g to > 100 mW/g Linearity: $\pm 0.2$ dB (noise: typically < 1 $\mu$ W/g)
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure Scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.



### E-field Probe Calibration

Each probe is calibrated according to a dosimetric assessment procedure with accuracy better than  $\pm 10\%$ . The spherical isotropy was evaluated and found to be better than  $\pm 0.25$ dB. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested.

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies below 1 GHz, and in a wave guide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermistor-based



temperature probe is used in conjunction with the E-field probe.

$$\mathbf{SAR=C\Delta T/\Delta t}$$

Where:  $\Delta t$  = Exposure time (30 seconds),

$C$  = Heat capacity of tissue (brain or muscle),

$\Delta T$  = Temperature increase due to RF exposure.

Or

$$\mathbf{SAR=IEI^2\sigma/\rho}$$

Where:  $\sigma$  = Simulated tissue conductivity,

$\rho$  = Tissue density ( $\text{kg/m}^3$ ).

### 6.3 SAR Measurement Procedure

#### Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

#### Area Scan

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan), if only one zoom scan follows the area scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of zoom scans has to be increased accordingly.

Area scan parameters extracted from FCC KDB 865664 D01 SAR measurement 100 MHz to 6 GHz.

	≤3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: ΔxArea, ΔyArea	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

### Zoom Scan

Zoom scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The zoom scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the zoom scan evaluates the averaged SAR for 1 gram and 10 gram and displays these values next to the job's label.

Zoom scan parameters extracted from FCC KDB 865664 D01 SAR measurement 100 MHz to 6 GHz.

			≤3GHz	> 3 GHz
Maximum zoom scan spatial resolution: $\Delta x_{zoom}$ $\Delta y_{zoom}$			≤2GHz: ≤8mm 2 – 3GHz: ≤5mm*	3 – 4GHz: ≤5mm* 4 – 6GHz: ≤4mm*
Maximum zoom scan spatial resolution, normal to phantom surface	Uniform grid: $\Delta z_{zoom}(n)$		≤5mm	3 – 4GHz: ≤4mm 4 – 5GHz: ≤3mm 5 – 6GHz: ≤2mm
	Graded grid	$\Delta z_{zoom}(1)$ : between 1 <sup>st</sup> two points closest to phantom surface	≤4mm	3 – 4GHz: ≤3mm 4 – 5GHz: ≤2.5mm 5 – 6GHz: ≤2mm
		$\Delta z_{zoom}(n > 1)$ : between subsequent points	≤1.5• $\Delta z_{zoom}(n-1)$	
Minimum zoom scan volume	X, y, z		≥30mm	3 – 4GHz: ≥28mm 4 – 5GHz: ≥25mm 5 – 6GHz: ≥22mm
<p>Note: <math>\delta</math> is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.</p> <p>* When zoom scan is required and the <u>reported</u> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB 447498 is ≤ 1.4W/kg, ≤8mm, ≤7mm and ≤5mm zoom scan resolution may be applied, respectively, for 2GHz to 3GHz, 3GHz to 4GHz and 4GHz to 6GHz.</p>				

### Volume Scan Procedures

The volume scan is used to 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.

### Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASYS 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 drifts more than 5%, the SAR will be retested.

## 7 Main Test Equipment

Name of Equipment	Manufacturer	Type/Model	Serial Number	Last Cal.	Cal. Due Date
Network analyzer	Agilent	E5071B	MY42404014	2016-05-21	2017-05-20
Dielectric Probe Kit	HP	85070E	US44020115	2016-05-21	2017-05-20
Power meter	Agilent	E4417A	GB41291714	2016-05-21	2017-05-20
Power sensor	Agilent	N8481H	MY50350004	2016-05-21	2017-05-20
Power sensor	Agilent	E9327A	US40441622	2016-05-21	2017-05-20
Dual directional coupler	Agilent	778D-012	50519	2016-05-21	2017-05-20
Dual directional coupler	Agilent	777D	50146	2016-05-21	2017-05-20
Amplifier	INDEXSAR	IXA-020	0401	2016-05-21	2017-05-20
Wideband radio communication tester	R&S	CMW 500	113645	2016-05-21	2017-05-20
BT Base Station Simulator	R&S	CBT	100271	2016-05-21	2017-05-20
E-field Probe	SPEAG	EX3DV4	3677	2015-12-10	2016-12-09
DAE	SPEAG	DAE4	871	2015-11-17	2016-11-16
Validation Kit 835MHz	SPEAG	D835V2	4d020	2014-08-28	2017-08-27
Validation Kit 1900MHz	SPEAG	D1900V2	5d060	2014-09-01	2017-08-31
Validation Kit 2450MHz	SPEAG	D2450V2	786	2014-09-01	2017-08-31
Temperature Probe	Tianjin jinming	JM222	AA1009129	2016-05-21	2017-05-20
Hygrothermograph	Tianjin jinming	WS-1	64591	2016-07-16	2017-07-15

## 8 Tissue Dielectric Parameter Measurements & System Verification

### 8.1 Tissue Verification

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within  $\pm 2^\circ\text{C}$  of the temperature when the tissue parameters are characterized. The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 – 4 days of use; or earlier if the dielectric parameters can become out of tolerance.

#### Target values

Frequency (MHz)	Water (%)	Salt (%)	Sugar (%)	Glycol (%)	Preventol (%)	Cellulose (%)	$\epsilon_r$	$\sigma(\text{s/m})$	
Head	835	41.45	1.45	56	0	0.1	1.0	41.5	0.90
	1900	55.242	0.306	0	44.452	0	0	40.0	1.40
	2450	62.7	0.5	0	36.8	0	0	39.2	1.80
Body	835	52.5	1.4	45	0	0.1	1.0	55.2	0.97
	1900	69.91	0.13	0	29.96	0	0	53.3	1.52
	2450	73.2	0.1	0	26.7	0	0	52.7	1.95

**Measurements results**

Frequency (MHz)		Test Date	Temp °C	Measured Dielectric Parameters		Target Dielectric Parameters		Limit (Within ±5%)	
				$\epsilon_r$	$\sigma$ (s/m)	$\epsilon_r$	$\sigma$ (s/m)	Dev $\epsilon_r$ (%)	Dev $\sigma$ (%)
835	Head	7/21/2016	21.5	41.4	0.88	41.5	0.90	-0.24	-2.22
	Body	7/25/2016	21.5	54.2	0.96	55.2	0.97	-1.81	-1.03
		8/12/2016	21.5	54.2	0.96	55.2	0.97	-1.81	-1.03
1900	Head	7/24/2016	21.5	40.1	1.41	40.0	1.40	0.25	0.71
	Body	7/25/2016	21.5	52.6	1.51	53.3	1.52	-1.31	-0.66
		8/12/2016	21.5	52.6	1.51	53.3	1.52	-1.31	-0.66
2450	Head	8/20/2016	21.5	38.6	1.81	39.2	1.80	-1.53	0.56
	Body	8/21/2016	21.5	52.5	1.98	52.7	1.95	-0.38	1.54

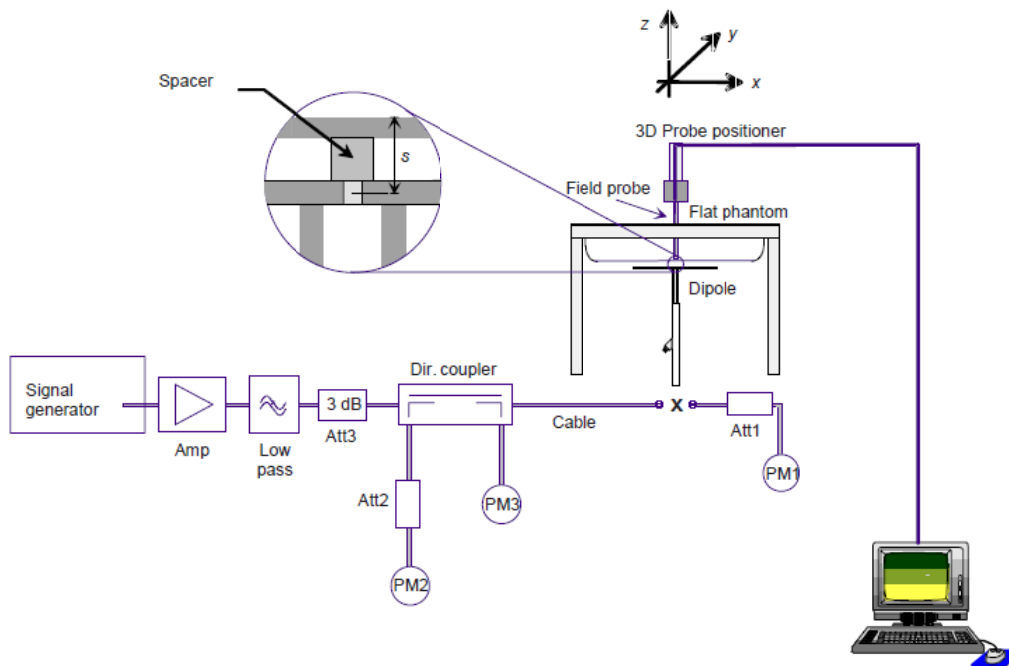
Note: The depth of tissue-equivalent liquid in a phantom must be  $\geq 15.0$  cm for SAR measurements  $\leq 3$  GHz and  $\geq 10.0$  cm for measurements  $> 3$  GHz.



## 8.2 System Performance Check

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulates were measured using the dielectric probe kit and the network analyzer. A system check measurement for every day was made following the determination of the dielectric parameters of the Tissue simulates, using the dipole validation kit. The dipole antenna was placed under the flat section of the twin SAM phantom.

System check is performed regularly on all frequency bands where tests are performed with the DASYS system.



Picture1 System Performance Check setup



Picture2 Setup Photo

**Justification for Extended SAR Dipole Calibrations**

Usage of SAR dipoles calibrated less than 3 years ago but more than 1 year ago were confirmed in maintaining return loss ( $< -20$  dB, within 20% of prior calibration) and impedance (within 5 ohm from prior calibration) requirements per extended calibrations in KDB 865664 D01:

Dipole		Date of Measurement	Return Loss(dB)	$\Delta$ %	Impedance ( $\Omega$ )	$\Delta\Omega$
Dipole D835V2 SN: 4d020	Head Liquid	8/28/2014	-30.1	/	48.6	/
		8/27/2015	-31.1	3.3%	49.7	1.1 $\Omega$
	Body Liquid	8/28/2014	-23.3	/	54.0	/
		8/27/2015	-23.9	2.6%	53.5	0.5 $\Omega$
Dipole D1900V2 SN: 5d060	Head Liquid	9/1/2014	-22.8	/	54.1	/
		8/31/2015	-23.7	3.9%	55.4	1.3 $\Omega$
	Body Liquid	9/1/2014	-21.6	/	57.6	/
		8/31/2015	-20.8	3.7%	57.3	0.3 $\Omega$
Dipole D2450V2 SN: 786	Head Liquid	9/1/2014	-23.6	/	57.1	/
		8/31/2015	-23.9	1.3%	57.4	0.3 $\Omega$
	Body Liquid	9/1/2014	-23.7	/	56.0	/
		8/31/2015	-24	1.3%	55.8	0.2 $\Omega$

**System Check results**

Frequency (MHz)	Test Date	Temp °C	250mW Measured SAR <sub>1g</sub> (W/kg)	1W Normalized SAR <sub>1g</sub> (W/kg)	1W Target SAR <sub>1g</sub> (W/kg)	Δ % (Limit ±10%)	Plot No.	
835	Head	7/21/2016	21.5	2.44	9.76	9.54	2.31	1
	Body	7/25/2016	21.5	2.41	9.64	9.54	1.05	2
		8/12/2016	21.5	2.46	9.48	9.54	-0.63	3
1900	Head	7/24/2016	21.5	9.84	39.36	39.20	0.41	4
	Body	7/25/2016	21.5	9.93	39.72	40.00	-0.70	5
		8/12/2016	21.5	9.82	39.28	40.00	-1.80	6
2450	Head	8/20/2016	21.5	13.70	54.80	52.50	4.38	7
	Body	8/21/2016	21.5	12.50	50.00	52.40	-4.58	8

Note: Target Values used derive from the calibration certificate Data Storage and Evaluation.

## 9 Normal and Maximum Output Power

KDB 447498 D01 at the maximum rated output power and within the tune-up tolerance range specified for the product, but not more than 2 dB lower than the maximum tune-up tolerance limit.

### 9.1 GSM Mode

GSM 850		Burst Average			Division Factors (dB)	Frame-Average			Burst Tune-up Limit(dBm)
		Power(dBm)				Power(dBm)			
Tx Channel		128	190	251		128	190	251	
Frequency(MHz)		824.2	836.6	848.8		824.2	836.6	848.8	
GSM(GMSK)		33.36	33.45	33.53	9.03	24.33	24.42	24.50	34.00
GPRS (GMSK)	1Txslot	33.37	33.40	33.51	9.03	<b>24.34</b>	<b>24.37</b>	<b>24.48</b>	34.00
	2Txslots	29.63	29.74	29.98	6.02	23.61	23.72	23.96	30.00
	3Txslots	27.05	27.31	27.42	4.26	22.79	23.05	23.16	27.50
	4Txslots	26.52	26.78	26.85	3.01	23.51	23.77	23.84	27.00
EGPRS (GMSK)	1Txslot	33.29	33.28	33.34	9.03	24.26	24.25	24.31	34.00
	2Txslots	29.48	29.52	29.78	6.02	23.46	23.50	23.76	30.00
	3Txslots	26.92	27.14	27.36	4.26	22.66	22.88	23.10	27.50
	4Txslots	26.61	26.51	26.73	3.01	23.60	23.50	23.72	27.00
EGPRS (8PSK)	1Txslot	25.72	25.78	25.78	9.03	16.69	16.75	16.75	26.00
	2Txslots	22.43	22.78	22.98	6.02	16.41	16.76	16.96	23.00
	3Txslots	21.69	21.61	21.12	4.26	17.43	17.35	16.86	22.00
	4Txslots	21.46	21.55	21.39	3.01	18.45	18.54	18.38	22.00
GSM 1900		Power(dBm)			Division Factors (dB)	Power(dBm)			Burst Tune-up Limit(dBm)
Tx Channel		512	661	810		512	661	810	
Frequency(MHz)		1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM(GMSK)		29.94	29.68	29.49	9.03	20.91	20.65	20.46	30.00
GPRS (GMSK)	1Txslot	29.91	29.60	29.45	9.03	20.88	20.57	20.42	30.00
	2Txslots	27.13	27.15	27.05	6.02	21.11	21.13	21.03	27.50
	3Txslots	25.25	25.32	25.23	4.26	20.99	21.06	20.97	25.50
	4Txslots	24.98	25.02	24.99	3.01	<b>21.97</b>	<b>22.01</b>	<b>21.98</b>	25.50
EGPRS (GMSK)	1Txslot	29.75	29.42	29.29	9.03	20.72	20.39	20.26	30.00
	2Txslots	27.00	26.92	26.85	6.02	20.98	20.90	20.83	27.50
	3Txslots	25.01	25.18	25.14	4.26	20.75	20.92	20.88	25.50
	4Txslots	24.74	24.82	24.88	3.01	21.73	21.81	21.87	25.00
EGPRS (8PSK)	1Txslot	26.12	25.92	25.79	9.03	17.09	16.89	16.76	26.50
	2Txslots	24.21	24.12	23.92	6.02	18.19	18.10	17.90	24.50
	3Txslots	23.24	23.04	22.90	4.26	18.98	18.78	18.64	23.50
	4Txslots	22.84	22.65	22.51	3.01	19.83	19.64	19.50	23.00

Notes: The worst-case configuration and mode for SAR testing is determined to be as follows:

1. Standalone: GSM 850 GMSK (GPRS) mode with 1 time slot for Max power, GSM 1900 GMSK (GPRS) mode with 4 time slots for Max power, based on the output power measurements above.



## 9.2 CDMA Mode

CDMA BC0(Cellular)		Average Power (dBm)			Tune-up Limit(dBm)
TX Channal		1013	384	777	
Frequency(MHz)		824.7	836.52	848.31	
RC1	SO55 (Loopback)	21.72	21.56	21.68	22.00
RC3	SO55 (Loopback)	21.73	21.54	21.69	22.00
	TDSO32 (FCH+SCH)	21.70	21.57	21.62	22.00
	TDSO32 (FCH)	21.71	21.60	21.65	22.00

Notes: The worst-case configuration and mode for SAR testing is determined to be as follows:

1. Standalone: CDMA BC0 (RC3) mode for Max power, based on the output power measurements above.

### 9.3 WLAN Mode

Wi-Fi 2.4G Mode	Channel	Frequency (MHz)	Average Conducted Power (dBm) for Data Rates (bps)								Tune-up Limit (dBm)
			1M	2M	5.5M	11M	/	/	/	/	
802.11b	1	2412	14.70	14.61	14.48	14.05	/	/	/	/	15.50
	6	2437	14.87	14.74	14.61	14.25	/	/	/	/	15.50
	11	2462	15.21	15.14	15.04	14.66	/	/	/	/	15.50
Mode	Channel	Frequency (MHz)	6M	9M	12M	18M	24M	36M	48M	54M	Tune-up
802.11g	1	2412	12.56	12.36	12.12	11.72	11.32	10.71	10.18	9.99	13.50
	6	2437	12.72	12.47	12.26	11.87	11.48	10.87	10.36	10.16	13.50
	11	2462	13.07	12.82	12.86	12.19	11.81	11.19	10.68	10.47	13.50
Mode	Channel	Frequency (MHz)	6.5M	13M	19.5M	26M	39M	52M	58.5M	65M	Tune-up
802.11n (HT20)	1	2412	12.53	12.07	11.65	11.29	10.70	10.24	10.04	9.84	13.50
	6	2437	12.66	12.18	11.78	11.41	10.84	10.37	10.18	9.98	13.50
	11	2462	12.96	12.48	12.08	11.71	11.14	10.68	10.48	10.27	13.50

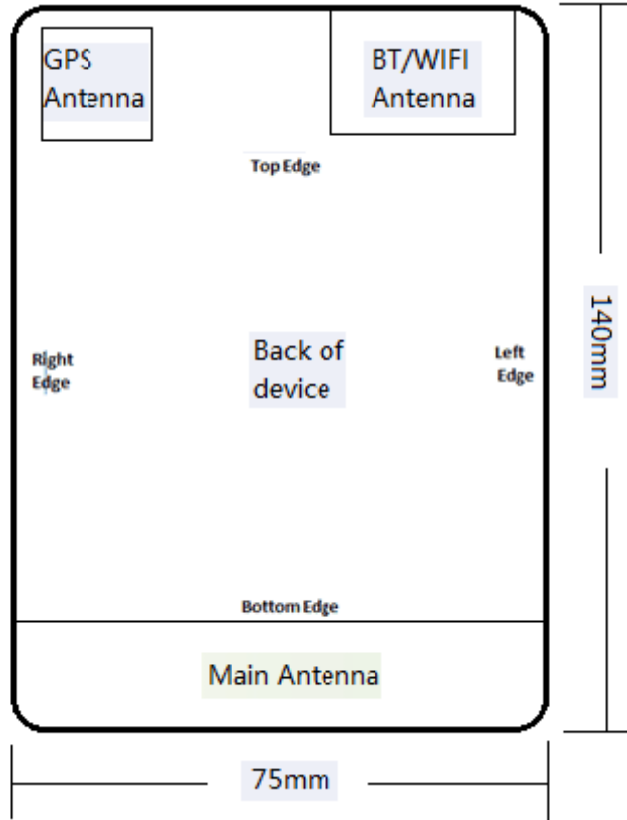
Note. 1. SAR is not required for OFDM when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is  $\leq 1.2$  W/kg.  
 2. The Tx power is set to 15 for 802.11 b/g /n HT20 mode by software.

### 9.4 Bluetooth Mode

BT	Average Conducted Power (dBm)			Tune-up Limit (dBm)
	Channel/Frequency(MHz)			
	Ch 0/2402 MHz	Ch 39/2441 MHz	Ch 78/2480 MHz	
GFSK	7.97	10.13	7.14	11.50
$\pi/4$ DQPSK	8.84	10.83	8.01	11.50
8DPSK	8.97	10.92	8.11	11.50
BT 4.0	Ch 0/2402 MHz	Ch 19/2440 MHz	Ch 39/2480 MHz	/
GFSK	0.09	0.99	-0.67	1.50

## 10 Measured and Reported (Scaled) SAR Results

### 10.1 EUT Antenna Locations



Overall (Length x Width): 140 mm x 75.0 mm						
Overall Diagonal: 147mm/Display Diagonal: 113mm						
Distance of the Antenna to the EUT surface/edge						
Antenna	Back Side	Front side	Left Edge	Right Edge	Top Edge	Bottom Edge
Main-Antenna	0	0	0	0	122	0
BT/Wi-Fi Antenna	0	0	6	50	0	114.5
Hotspot mode, Positions for SAR tests						
Mode	Back Side	Front side	Left Edge	Right Edge	Top Edge	Bottom Edge
GSM /CDMA	Yes	Yes	Yes	Yes	N/A	Yes
Wi-Fi	Yes	Yes	Yes	N/A	Yes	N/A
<p>Note: 1. Per KDB 941225 D06, when the overall device length and width are <math>\geq 9\text{cm} \times 5\text{cm}</math>, the test distance is 10mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge.</p> <p>2. For smart phones with an overall diagonal dimension is 147mm. Per KDB 648474 D04, for smart phones with a display diagonal dimension <math>&gt; 15.0\text{ cm}</math> or an overall diagonal dimension <math>&gt; 16.0\text{ cm}</math>, 10-g extremity SAR must be tested as a phablet to determine SAR compliance.</p>						



## 10.2 Standalone SAR test exclusion considerations

Per KDB 447498 D01, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$  for 1-g SAR and  $\leq 7.5$  for 10-g extremity SAR

- $f(\text{GHz})$  is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

Per KDB 447498 D01, when the minimum test separation distance is  $< 5$  mm, a distance of 5 mm is applied to determine SAR test exclusion.

Bluetooth	Distance (mm)	MAX Power (dBm)	Frequency (MHz)	Ratio	Evaluation
Head	5	11.50	2441	4.41	Yes
Body worn	10	11.50	2441	2.21	No

### 10.3 Measured SAR Results

Table 1: GSM 850

Test Position	Cover Type	Channel/Frequency (MHz)	Time slot	Duty Cycle	Tune-up limit (dBm)	Conducted Power (dBm)	Drift (dB)	Measured SAR <sub>1g</sub> (W/kg)	Scaling Factor	Reported SAR <sub>1g</sub> (W/kg)	Plot No.
<b>Head SAR</b>											
Left Cheek	standard	190/836.6	GSM	1:8.3	34.00	33.45	0.040	0.388	1.14	0.440	9
Left Tilt	standard	190/836.6	GSM	1:8.3	34.00	33.45	0.040	0.208	1.14	0.236	/
Right Cheek	standard	190/836.6	GSM	1:8.3	34.00	33.45	-0.110	0.376	1.14	0.427	/
Right Tilt	standard	190/836.6	GSM	1:8.3	34.00	33.45	-0.050	0.254	1.14	0.288	/
<b>Body-worn (Distance 10mm)</b>											
Back Side	standard	190/836.6	GSM	1:8.3	34.00	33.45	0.080	0.475	1.14	0.539	10
Front Side	standard	190/836.6	GSM	1:8.3	34.00	33.45	0.080	0.258	1.14	0.293	/
<b>Hotspot (Distance 10mm)</b>											
Back Side	standard	190/836.6	1Txslot	1:8.3	34.00	33.40	-0.030	0.440	1.15	0.505	11
Front Side	standard	190/836.6	1Txslot	1:8.3	34.00	33.40	-0.040	0.098	1.15	0.112	/
Left Edge	standard	190/836.6	1Txslot	1:8.3	34.00	33.40	0.030	0.106	1.15	0.122	/
Right Edge	standard	190/836.6	1Txslot	1:8.3	34.00	33.40	-0.060	0.187	1.15	0.215	/
Top Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bottom Edge	standard	190/836.6	1Txslot	1:8.3	34.00	33.40	-0.060	0.095	1.15	0.109	/
<p>Note: 1. The value with blue color is the maximum SAR Value of each test band.</p> <p>2. Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).</p> <p>3. When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.</p>											



Table 2: GSM 1900

Test Position	Cover Type	Channel/Frequency (MHz)	Time slot	Duty Cycle	Tune-up limit (dBm)	Conducted Power (dBm)	Drift (dB)	Measured SAR <sub>1g</sub> (W/kg)	Scaling Factor	Reported SAR <sub>1g</sub> (W/kg)	Plot No.
<b>Head SAR</b>											
Left Cheek	standard	661/1880	GSM	1:8.3	30.00	29.68	0.040	0.291	1.08	0.313	12
Left Tilt	standard	661/1880	GSM	1:8.3	30.00	29.68	0.098	0.090	1.08	0.097	/
Right Cheek	standard	661/1880	GSM	1:8.3	30.00	29.68	0.082	0.201	1.08	0.216	/
Right Tilt	standard	661/1880	GSM	1:8.3	30.00	29.68	0.025	0.066	1.08	0.071	/
<b>Body-worn (Distance 10mm)</b>											
Back Side	standard	661/1880	GSM	1:8.3	30.00	29.68	-0.100	0.261	1.08	0.281	13
Front Side	standard	661/1880	GSM	1:8.3	30.00	29.68	0.039	0.134	1.08	0.144	/
<b>Hotspot (Distance 10mm)</b>											
Back Side	standard	661/1880	4Txslots	1:2.07	25.50	25.02	-0.033	0.246	1.12	0.275	/
Front Side	standard	661/1880	4Txslots	1:2.07	25.50	25.02	0.050	0.514	1.12	0.574	14
Left Edge	standard	661/1880	4Txslots	1:2.07	25.50	25.02	-0.038	0.395	1.12	0.441	/
Right Edge	standard	661/1880	4Txslots	1:2.07	25.50	25.02	-0.140	0.218	1.12	0.243	/
Top Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bottom Edge	standard	661/1880	4Txslots	1:2.07	25.50	25.02	0.070	0.364	1.12	0.407	/

Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is  $\leq 0.8$  W/kg then testing at the other channels is not required for such test configuration(s).

3. When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.



Table 3: CDMA BC 0

Test Position	Cover Type	Channel/Frequency (MHz)	Service	Duty Cycle	Tune-up limit (dBm)	Conducted Power (dBm)	Drift (dB)	Measured SAR <sub>1g</sub> (W/kg)	Scaling Factor	Reported SAR <sub>1g</sub> (W/kg)	Plot No.
<b>Head SAR</b>											
Left Cheek	standard	384/836.52	RC3-SO55 (Loopback)	1:1	22.00	21.54	-0.020	0.213	1.11	0.237	15
Left Tilt	standard	384/836.52	RC3-SO55 (Loopback)	1:1	22.00	21.54	-0.010	0.150	1.11	0.167	/
Right Cheek	standard	384/836.52	RC3-SO55 (Loopback)	1:1	22.00	21.54	-0.020	0.194	1.11	0.216	/
Right Tilt	standard	384/836.52	RC3-SO55 (Loopback)	1:1	22.00	21.54	-0.050	0.147	1.11	0.163	/
<b>Body-worn (Distance 10mm)</b>											
Back Side	standard	1013/824.7	RC3-SO55 (Loopback)	1:1	22.00	21.73	0.090	0.797	1.06	0.848	/
	standard	384/836.52	RC3-SO55 (Loopback)	1:1	22.00	21.54	0.030	0.834	1.11	0.927	16
	standard	777/848.31	RC3-SO55 (Loopback)	1:1	22.00	21.69	0.070	0.753	1.07	0.809	/
Front Side	standard	384/836.52	RC3-SO55 (Loopback)	1:1	22.00	21.54	0.050	0.417	1.11	0.464	/
<b>Hotspot (Distance 10mm)</b>											
Back Side	standard	384/836.52	RC3-TDSO32 (FCH)	1:1	22.00	21.60	0.050	0.441	1.10	0.484	17
Front Side	standard	384/836.52	RC3-TDSO32 (FCH)	1:1	22.00	21.60	-0.030	0.240	1.10	0.263	/
Left Edge	standard	384/836.52	RC3-TDSO32 (FCH)	1:1	22.00	21.60	0.050	0.156	1.10	0.171	/
Right Edge	standard	384/836.52	RC3-TDSO32 (FCH)	1:1	22.00	21.60	-0.080	0.234	1.10	0.257	/
Top Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bottom Edge	standard	384/836.52	RC3-TDSO32 (FCH)	1:1	22.00	21.60	-0.010	0.084	1.10	0.093	/
<b>Repeat Body-worn SAR (Distance 10mm)</b>											
Back Side	standard	384/836.52	RC3-SO55 (Loopback)	1:1	22.00	21.54	0.110	0.747	1.11	0.830	/

Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is  $\leq 0.8$  W/kg then testing at the other channels is not required for such test configuration(s).



Measurement Variability				
Test Position	Channel/ Frequency(MHz)	MAX Measured SAR <sub>1g</sub> (W/kg)	1 <sup>st</sup> Repeated SAR <sub>1g</sub> (W/kg)	Ratio
Back Side	384/836.52	0.834	0.747	1.12

Note: 1) When the original highest measured SAR is  $\geq 0.80$  W/kg, the measurement was repeated once.  
2) A second repeated measurement was preformed only if the ratio of largest to smallest SAR for the original and first repeated measurements was  $> 1.20$  or when the original or repeated measurement was  $\geq 1.45$  W/kg (~ 10% from the 1-g SAR limit).  
3) A third repeated measurement was performed only if the original, first or second repeated measurement was  $\geq 1.5$  W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is  $> 1.20$ .  
4) Repeated measurements are not required when the original highest measured SAR is  $< 0.80$  W/kg



Table 4: Wi-Fi (2.4G)

Test Position	Cover Type	Channel/Frequency (MHz)	Mode 802.11b	Duty Cycle	Area Scan Max.SAR (W/Kg)	Tune-up limit (dBm)	Conducted Power (dBm)	Drift (dB)	Measured SAR <sub>1g</sub> (W/kg)	Scaling Factor	Reported SAR <sub>1g</sub> (W/kg)	Plot No.
<b>Head SAR (Full Power)</b>												
Left Cheek	standard	11/2462	DSSS	1:1	0.119	15.50	15.21	-0.043	0.131	1.07	0.140	/
Left Tilt	standard	11/2462	DSSS	1:1	0.075	15.50	15.21	0.025	0.074	1.07	0.079	/
Right Cheek	standard	11/2462	DSSS	1:1	0.247	15.50	15.21	0.036	0.262	1.07	0.280	18
Right Tilt	standard	11/2462	DSSS	1:1	0.130	15.50	15.21	0.026	0.134	1.07	0.143	/
<b>Body-worn&amp;Hotspot (Distance 10mm)</b>												
Back Side	standard	11/2462	DSSS	1:1	0.210	15.50	15.21	0.037	0.223	1.07	0.238	19
Front Side	standard	11/2462	DSSS	1:1	0.048	15.50	15.21	0.027	0.050	1.07	0.054	/
Left Edge	standard	11/2462	DSSS	1:1	0.070	15.50	15.21	0.040	0.071	1.07	0.076	/
Top Edge	standard	11/2462	DSSS	1:1	0.052	15.50	15.21	0.027	0.052	1.07	0.056	/
<p>Note: 1. The value with blue color is the maximum SAR Value of each test band.</p> <p>2. According to 648474 D04 Handset SAR v01r03, For Phablet, Since hotspot mode 1-g reported SAR &lt; 1.2 W/kg, 10-g extremity SAR is no required.</p>												

<b>MAX Adjusted SAR</b>							
Mode	Test Position	Channel/Frequency(MHz)	MAX Measured SAR <sub>1g</sub> (W/kg)	802.11b Tune-up limit (dBm)	Tune-up limit (dBm)	Scaling Factor	Adjusted SAR <sub>1g</sub> (W/kg)
802.11g	Right Cheek	6/2462	0.262	15.50	13.50	0.87	0.230
802.11n HT20	Right Cheek	6/2462	0.262	15.50	13.50	0.87	0.230
<p>Note: SAR is not required for OFDM when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.</p>							



Table 5: BT

Test Position	Cover Type	Channel /Frequency (MHz)	Mode	Duty Cycle	Tune-up limit (dBm)	Conducted power (dBm)	Power Drift (dB)	SAR1g (W/kg)	Scaling Factor	Report SAR1g (W/kg)	Plot No.
<b>Head SAR</b>											
Left Cheek	Standard	39/2441	3DH5	1:1	11.50	10.92	0.036	0.007	1.14	0.009	/
Left Tilt	Standard	39/2441	3DH5	1:1	11.50	10.92	0.016	0.001	1.14	0.001	/
Right Cheek	Standard	39/2441	3DH5	1:1	11.50	10.92	0.003	0.013	1.14	0.015	20
Right Tilt	Standard	39/2441	3DH5	1:1	11.50	10.92	0.002	0.008	1.14	0.010	/

Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. According to 648474 D04 Handset SAR v01r03, For Phablet, Since hotspot mode 1-g reported SAR < 1.2 W/kg, 10-g extremity SAR is no required.

Band	Configuration	Frequency (MHz)	Maximum Power (dBm)	Separation Distance (mm)	Estimated SAR (W/kg)
Bluetooth	Body-worn	2441	11.50	10	0.29

For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01 based on the formula below.

$(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm}) \cdot [\sqrt{f(\text{GHz})} / x] \text{ W/kg}$   
for test separation distances  $\leq 50 \text{ mm}$ ; where  $x = 7.5$  for 1-g SAR, and  $x = 18.75$  for 10-g SAR.

## 10.4 Simultaneous Transmission Analysis

Simultaneous Transmission Configurations	Head	Body-worn	Hotspot
GSM + Bluetooth	Yes	Yes	N/A
CDMA+ Bluetooth	Yes	Yes	N/A
GSM + Wi-Fi-2.4GHz	Yes	Yes	Yes
CDMA+ Wi-Fi-2.4GHz	Yes	Yes	Yes
Wi-Fi-2.4GHz + Bluetooth	Yes	Yes	N/A

### General Note:

1. The Scaled SAR summation is calculated based on the same configuration and test position.
2. Per KDB 447498 D01, simultaneous transmission SAR is compliant if,
  - i) Scalar SAR summation  $< 1.6\text{W/kg}$ , simultaneously transmission SAR measurement is not necessary.
  - ii)  $\text{SPLSR} = (\text{SAR1} + \text{SAR2})^{1.5} / (\text{min. separation distance, mm})$ , and the peak separation distance is determined from the square root of  $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$ , where  $(x1, y1, z1)$  and  $(x2, y2, z2)$  are the coordinates of the extrapolated peak SAR locations in the zoom scan.
  - iii) If  $\text{SPLSR} \leq 0.04$ , simultaneously transmission SAR measurement is not necessary.