SAR TEST REPORT

HCT CO., LTD

EUT Type:	Cellular/PCS GSM/ GPRS/EDGE, Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC
FCC ID:	ZNFKS1301
Model:	KS1301
Date of Issue:	Nov. 19, 2013
Test report No.:	HCTA1310FS04
Test Laboratory:	**HCT CO., LTD.** 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea TEL: +82 31 645 6300 FAX: +82 31 645 6401
Applicant :	**LG Electronics, MobileComm U.S.A., Inc.** 1000 Sylvan Avenue, Englewood Cliffs NJ 07632
Testing has been carried out in accordance with:	RSS-102 Issue 4; Health Canada Safety Code 6 47CFR §2.1093 ANSI/ IEEE C95.1 – 1992 IEEE 1528-2003
Test result:	The tested device complies with the requirements in respect of all parameters subject to the test. The test results and statements relate only to the items tested. The test report shall not be reproduced except in full, without written approval of the laboratory.
Signature	Report prepared by : Young –Soo Jang Test Engineer of SAR Part Approved by : Jae-Sang So Manager of SAR Part

Table of Contents

Revision History

Rev.	Issue DATE	DESCRIPTION
-	Oct. 28, 2013	Initial Issue
1	Nov. 12, 2013	Page 18, 19, 26, 61, 62 and 63 was revised.
2	Nov. 15, 2013	Page 26, 48, 49, 55, 56, 57, 58, 59, 60, 62, 65, 66, 68, 69 and 70 was revised.
3	Nov. 16, 2013	Page 71 was revised.
4	Nov. 19, 2013	Page 48 was revised. (802.11 n 40MHz Table)

1. INTRODUCTION

The FCC has adopted the guidelines for evaluating the environmental effects of radio frequency radiation in ET Docket 93-62 on Aug. 6, 1996 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices.

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz. 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017. The measurement procedure described in IEEE/ANSI C95.3-1992 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave is used for guidance in measuring SAR due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86 NCRP, 1986, Bethesda, MD 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

SAR Definition

Specific Absorption Rate (SAR) is defined as the time derivative of the incremental electromagnetic energy (d*W*) absorbed by (dissipated in) an incremental mass (d*m*) contained in a volume element (d*V*) of a given density (*r*). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body.

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

Figure 1. SAR Mathematical Equation

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

$$SAR = \sigma E^2 / \rho$$

Where:
σ = conductivity of the tissue-simulant material (S/m)
ρ = mass density of the tissue-simulant material (kg/㎥)
E = Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relations to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC KDB Procedure, IEEE Standard 1528-2003 & IEEE 1528a-2005 and the following published KDB procedures.

- FCC KDB Publication 941225 D01 SAR test for 3G devices v02
- FCC KDB Publication 941225 D02 HSPA and 1x Advanced v02r02
- FCC KDB Publication 941225 D03 SAR Test Reduction GSM GPRS EDGE v01
- FCC KDB Publication 941225 D06 Hot Spot SAR v01r01
- FCC KDB Publication 248227 D01v01r02(SAR Considerationa for 802.11 Devices)
- FCC KDB Publication 447498 D01v05r01 (General SAR Guidance)
- FCC KDB Publication 648474 D04 Handset SAR v01r01
- FCC KDB Publication 865664 D01 SAR measurement 100 MHz to 6 GHz v01r01
- FCC KDB Publication 865664 D02 SAR Reporting v01r01
- April 2013 TCB Workshop Notes (IEEE 802.11ac)

3. DESCRIPTION OF DEVICE

Environmental evaluation measurements of specific absorption rate (SAR) distributions in emulated human head and body tissues exposed to radio frequency (RF) radiation from wireless portable devices for compliance with the rules and regulations of the U.S. Federal Communications Commission (FCC).

<table>
<tr><td>EUT Type</td><td colspan="6">Cellular/PCS GSM/ GPRS/EDGE, Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC</td></tr>
<tr><td>FCC ID:</td><td colspan="6">ZNFKS1301</td></tr>
<tr><td>Model:</td><td colspan="6">KS1301</td></tr>
<tr><td>Trade Name</td><td colspan="6">LG Electronics, MobileComm U.S.A., Inc.</td></tr>
<tr><td>Application Type</td><td colspan="6">Certification</td></tr>
<tr><td>Mode(s) of Operation</td><td colspan="6">GSM850 / GSM1900 / WCDMA850 / 802.11a/b/g/n/ac</td></tr>
<tr><td>Tx Frequency</td><td colspan="6">824.20 - 848.80 MHz (GSM850) / 1 850.20 – 1 909.80 MHz (GSM1900)
826.4 - 846.6 MHz (WCDMA850) / 2 412- 2 462 MHz (802.11b/g/n/ac) / 5 180-5 825MHz(802.a/n/ac)</td></tr>
<tr><td>Production Unit or Identical Prototype</td><td colspan="6">Prototype</td></tr>
<tr><td rowspan="15">Max SAR</td><td rowspan="2">Band</td><td rowspan="2">Tx Frequency (MHz)</td><td rowspan="2">Equipment Class</td><td colspan="3">Reported 1g SAR (W/Kg)</td></tr>
<tr><td>Head</td><td>Body-worn</td><td>Hotspot</td></tr>
<tr><td>GSM850</td><td>824.2 - 848.8</td><td>PCE</td><td>0.63</td><td>0.65</td><td>1.02</td></tr>
<tr><td>GSM1900</td><td>1 850.2 -1 909.8</td><td>PCE</td><td>0.28</td><td>0.75</td><td>0.88</td></tr>
<tr><td>WCDMA 850</td><td>826.4 - 846.6</td><td>PCE</td><td>0.40</td><td>0.42</td><td>0.58</td></tr>
<tr><td>802.11b</td><td>2 412.0 - 2 462.0</td><td>DTS</td><td>0.28</td><td>0.08</td><td>0.08</td></tr>
<tr><td>802.11a</td><td>5 745 - 5 825</td><td>DTS</td><td>0.09</td><td>0.06</td><td>0.08</td></tr>
<tr><td>802.11a</td><td>5 180 - 5 240</td><td>UNII</td><td>0.07</td><td>0.06</td><td></td></tr>
<tr><td>802.11a</td><td>5 260 - 5 320</td><td>UNII</td><td>0.07</td><td>0.05</td><td></td></tr>
<tr><td>802.11a</td><td>5 500 - 5 700</td><td>UNII</td><td>0.06</td><td>0.05</td><td></td></tr>
<tr><td>Bluetooth</td><td>2 402 – 2 480</td><td>DSS/DTS</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td colspan="3">Simultaneous SAR per KDB 690783 D01</td><td>0.79</td><td>0.83</td><td>1.06</td></tr>
<tr><td colspan="6">Hand SAR for Phablet</td></tr>
<tr><td colspan="2">Band</td><td>Tx Frequency (MHz)</td><td>Equipment Class</td><td colspan="2">Reported 10g SAR (W/Kg)</td></tr>
<tr><td colspan="2">802.11a</td><td>5 180 - 5 240</td><td>UNII</td><td colspan="2">0.11</td></tr>
<tr><td colspan="2">802.11a</td><td>5 260 - 5 320</td><td>UNII</td><td colspan="2">0.11</td></tr>
<tr><td colspan="2">802.11a</td><td>5 500 - 5 700</td><td>UNII</td><td colspan="2">0.09</td></tr>
<tr><td>Date(s) of Tests</td><td colspan="6">Oct.07, 2013 ~ Oct.15, 2013</td></tr>
<tr><td>Antenna Type</td><td colspan="6">Integral Antenna</td></tr>
<tr><td>GPRS</td><td colspan="6">Multislot Class: 12</td></tr>
<tr><td>Key Feature(s)</td><td colspan="6">This device supports Mobile Hotspot.</td></tr>
</table>

Note : Separation distance of 0.8 mm was considered because this is the closest distance between the outer of the device and user. Please see the Operational description for further information.

4. DESCRIPTION OF TEST EQUIPMENT

4.1 SAR MEASUREMENT SETUP

These measurements are performed using the DASY4 automated dosimetric assessment system. It is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland. It consists of high precision robotics system (Staubli), robot controller, Pentium III computer, near-field probe, probe alignment sensor, and the generic twin phantom containing the brain equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF) (see Figure.4.1).

A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and remote control, is used to drive the robot motors. The PC consists of the HP Pentium IV 3.0 GHz computer with Windows XP system and SAR Measurement Software DASY4, A/D interface card, monitor, mouse, and keyboard. The Staubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.

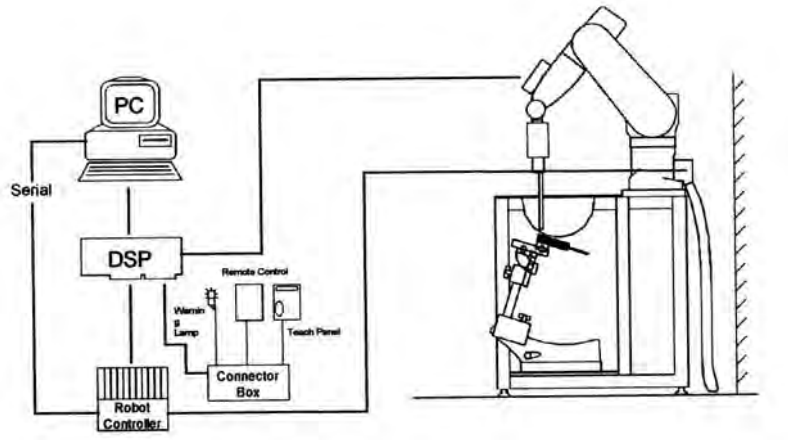


Figure 2. HCT SAR Lab. Test Measurement Set-up

The DAE4 consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer. The system is described in detail in.

4.2 DASY4 E-FIELD PROBE SYSTEM

4.1 ET3DV6 Probe Specification

Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection System Built-in shielding against static charges
Calibration	In air from 10 MHz to 2.5 GHz In brain and muscle simulating tissue at Frequencies of 450 MHz, 900 MHz and 1.8 GHz (accuracy: 8 %)
Frequency	10 MHz to > 3 GHz; Linearity: ± 0.2 dB (30 MHz to 3 GHz)
Directivity	± 0.2 dB in brain tissue (rotation around probe axis) ± 0.4 dB in brain tissue (rotation normal probe axis)
Dynamic	5 μW/g to > 100 mW/g;
Range Linearity:	± 0.2 dB
Surface Detection	± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces.
Dimensions	Overall length: 330 mm Tip length: 16 mm Body diameter: 12 mm Tip diameter: 6.8 mm Distance from probe tip to dipole centers: 2.7 mm
Application	General dissymmetry up to 3 GHz Compliance tests of WCDMA/LTE Phones Fast automatic scanning in arbitrary phantoms

Figure 3. Photograph of the probe and the Phantom

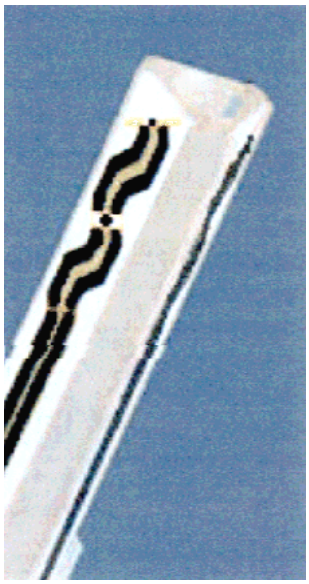


Figure 4. ET3DV6 E-field Probe

The SAR measurements were conducted with the dosimetric probe ET3DV6, designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multifiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches a maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY4 software reads the reflection during a software approach and looks for the maximum using a 2nd order fitting. The approach is stopped at reaching the maximum.

4.2.1 EX3DV4 Probe Specification

Construction	Symmetrical design with triangular core Interleaved sensors
	Built-in shielding against static charges
	PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Basic Broad Band Calibration in air
	Conversion Factors (CF) for HSL 900 and HSL 1810
	Additional CF for other liquids and frequencies upon request
Frequency	10 MHz to 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GHz)
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: 330 mm (Tip: 20 mm)
	Tip diameter: 3.9 mm (Body: 12 mm)
	Distance from probe tip to dipole centers: 2.0 mm
Application	General dosimetry up to 4 GHz
	Dosimetry in strong gradient fields
	Compliance tests of mobile phones

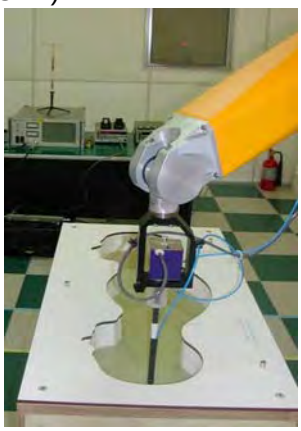


Figure 5. Photograph of the probe and the Phantom

Figure 6. EX3DV4 E-field Probe

The SAR measurements were conducted with the dosimetric probe EX3DV4, designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multifiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches a maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY4 software reads the reflection during a software approach and looks for the maximum using a 2nd order fitting. The approach is stopped at reaching the maximum.

4.3 PROBE CALIBRATION PROCESS

4.3.1 E-Probe Calibration

Each probe is calibrated according to a dosimetric assessment procedure with an accuracy better than ± 10 %. The spherical isotropy was evaluated with the proper procedure and found to be better than ± 0.25 dB. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe is 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 bellow 1 GHz, and in a waveguide 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.

$$SAR = C\frac{\Delta T}{\Delta t}$$

where:
Δt = exposure time (30 seconds),
C = heat capacity of tissue (brain or muscle),
ΔT = temperature increase due to RF exposure.
SAR is proportional to $\Delta T/\Delta t$, the initial rate of tissue heating, before thermal diffusion takes place.
Now it's possible to quantify the electric field in the simulated tissue by equating the thermally derived SAR to the E-field;

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

where:
σ = simulated tissue conductivity,
ρ = Tissue density (1.25 g/㎤ for brain tissue)

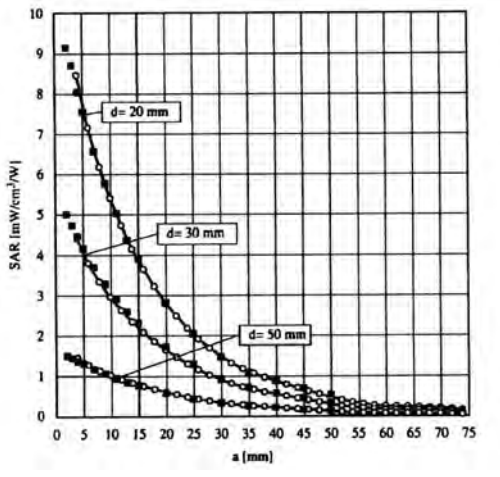


Figure 7. E-Field and Temperature measurements at 900 MHz

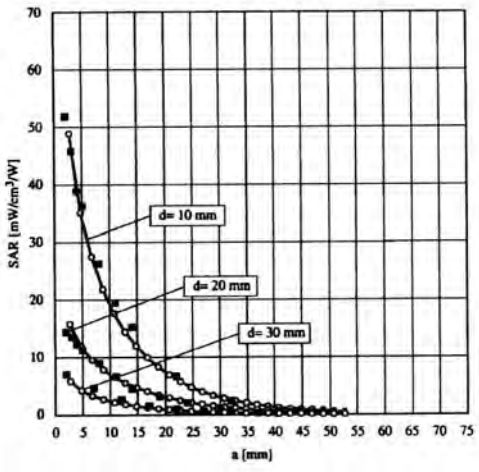


Figure 8. E-Field and temperature measurements at 1.8 GHz

4.3.2 Data Extrapolation

The DASY4 software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given like below;

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

with V_i = compensated signal of channel i (i=x,y,z)
U_i = input signal of channel i (i=x,y,z)
cf = crest factor of exciting field (DASY parameter)
dcp_i = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

E-field probes:

$$E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

with V_i = compensated signal of channel i (i = x,y,z)
$Norm_i$ = sensor sensitivity of channel i (i = x,y,z)
$\mu V/(V/m)^2$ for E-field probes
ConvF = sensitivity of enhancement in solution
E_i = electric field strength of channel i in V/m

The RSS value of the field components gives the total field strength (Hermetian magnitude):

$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

The primary field data are used to calculate the derived field units.

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1000}$$

with SAR = local specific absorption rate in W/g
E_{tot} = total field strength in V/m
σ = conductivity in [mho/m] or [Siemens/m]
ρ = equivalent tissue density in g/cm^3

The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = \frac{E_{tot}^2}{3770}$$

with P_{pwe} = equivalent power density of a plane wave in W/cm^2
E_{tot} = total electric field strength in V/m

4.4 SAM Phantom

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.

Shell Thickness	2.0 mm ± 0.2 mm (6 ± 0.2 mm at ear point)
Filling Volume	about 25 L
Dimensions	810 mm x 1 000 mm x 500 mm (H x L x W)

Figure 9. SAM Phantom

Triple Modular Phantom consists of tree identical modules which can be installed and removed separately without emptying the liquid. It includes three reference points for phantom installation. Covers prevent evaporation of the liquid. Phantom material is resistant to DGBE based tissue simulating liquids. The MFP V5.1 will be delivered including wooden support only (**non**-standard SPEAG support).
Applicable for system performance check from 700 MHz to 6 GHz (MFP V5.1C) or 800 MHz - 6 GHz (MFP V5.1A) as well as dosimetric evaluations for body-worn operation.

Shell Thickness	2.0 mm ± 0.2 mm
Filling Volume	approx. 9.2 L
Dimensions	830 mm x 500 mm (L x W)

Figure 10. Triple Modular Phantom

4.5 Device Holder for Transmitters

In combination with the SAM Phantom V 4.0, the Mounting Device (POM) enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is the ear opening. The devices can be easily, accurately, and repeatable positioned according to the FCC and CENELEC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

Note: A simulating human hand is not used due to the complex anatomical and geometrical structure of the hand that may produced infinite number of configurations. To produce the Worst-case condition (the hand absorbs antenna output power), the hand is omitted during the tests.

Figure 11. Device Holder

4.6 Tissue Simulating Mixture Characterization

The mixture is characterized to obtain proper dielectric constant (permittivity) and conductivity of the tissue of interest. The tissue dielectric parameters recommended in IEEE 1528 and IEC 62209 have been used as targets for the compositions, and are to mach within 5%, per the FCC recommendations .

Ingredients (% by weight)	Frequency (MHz)							
	835		1 900		2 450		5200-5800	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body
Water	40.45	53.06	54.9	70.17	71.88	73.2	65.52	78.66
Salt (NaCl)	1.45	0.94	0.18	0.39	0.16	0.1	0.0	0.0
Sugar	57.0	44.9	0.0	0	0.0	0.0	0.0	0.0
HEC	1.0	1.0	0.0	0	0.0	0.0	0.0	0.0
Bactericide	0.1	0.1	0.0	0	0.0	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	19.97	0.0	17.24	10.67
DGBE	0.0	0.0	44.92	29.44	7.99	26.7	0.0	0.0
Diethylene glycol hexyl ether	-	-	-	-	-	-	17.24	10.67

Salt:	99 % Pure Sodium Chloride	Sugar:	98 % Pure Sucrose
Water:	De-ionized, 16M resistivity	HEC:	Hydroxyethyl Cellulose
DGBE:	99 % Di(ethylene glycol) butyl ether,[2-(2-butoxyethoxy) ethanol]		
Triton X-100(ultra pure):	Polyethylene glycol mono[4-(1,1,3,3-tetramethylbutyl)phenyl] ether		

Table 4.1 Composition of the Tissue Equivalent Matter

4.7 SAR TEST EQUIPMENT

Manufacturer	Type / Model	S/N	Calib. Date	Calib.Interval	Calib.Due
SPEAG	SAM Phantom	-	N/A	N/A	N/A
Staubli	Robot RX90L	F01/5K09A1/A/01	N/A	N/A	N/A
Staubli	Robot ControllerCS7MB	F99/5A82A1/C/01	N/A	N/A	N/A
HP	Pavilion t000_puffer	KRJ51201TV	N/A	N/A	N/A
SPEAG	Light Alignment Sensor	265	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	D221340.01	N/A	N/A	N/A
SPEAG	DAE4	648	Apr. 24, 2013	Annual	Apr. 24, 2014
SPEAG	E-Field Probe EX3DV4	3903	Mar. 18, 2013	Annual	Mar. 18, 2014
SPEAG	Dipole D835V2	441	Apr. 25, 2013	Annual	Apr. 25, 2014
SPEAG	Dipole D1900V2	5d032	Jul. 29, 2013	Annual	Jul. 29, 2014
SPEAG	Dipole D2450V2	743	Aug. 23, 2013	Annual	Aug. 23, 2014
SPEAG	Dipole D5GHzV2	1107	Feb. 21, 2013	Annual	Feb. 21, 2014
Agilent	Power Meter(F) E4419B	MY41291386	Nov. 02, 2012	Annual	Nov. 02, 2013
Agilent	Power Sensor(G) 8481	MY41090870	Nov. 02, 2012	Annual	Nov. 02, 2013
HP	Dielectric Probe Kit 85070C	00721521	CBT		
HP	Dual Directional Coupler 778D	16072	Nov. 02, 2012	Annual	Nov. 02, 2013
R&S	Base Station CMW500	1201.0002K50_116858	Jan. 17,2013	Annual	Jan. 17,2014
HP	Base Station E5515C	GB44400269	Feb. 14, 2013	Annual	Feb. 14, 2014
HP	Signal Generator 8664A	3744A02069	Nov. 02, 2012	Annual	Nov. 02, 2013
Hewlett Packard	11636B/Power Divider	11377	Nov. 11. 2012	Annual	Nov. 11. 2013
Agilent	N9020A/ SIGNAL ANALYZER	MY51110020	Apr. 25, 2013	Annual	Apr. 25, 2014
TESCOM	TC-3000C / BLUETOOTH TESTER	3000C000276	Apr. 24, 2013	Annual	Apr. 24, 2014

NOTE:
1. The E-field probe was calibrated by SPEAG, by the waveguide technique procedure. Dipole Verification measurement is performed by HCT Lab. before each test. The brain/body simulating material is calibrated by HCT using the dielectric probe system and network analyzer to determine the conductivity and permittivity
(dielectric constant) of the brain/body-equivalent material.
2. CBT(Calibrating Before Testing). Prior to testing, the dielectric probe kit was calibrated via the network analyzer, with the specified procedure(calibrated in pure water) and calibration kit(standard) short circuit, before the dielectric measurement. The specific procedure and calibration kit are provided by Agilent

5. SAR MEASUREMENT PROCEDURE

The evaluation was performed with the following procedure:

1. The SAR value at a fixed location above the ear point was measured and was used as a reference value for assessing the power drop.

2. The SAR distribution at the exposed side of the head was measured at a distance of 3.9 mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 15 mm x 15 mm. Based on this data, the area of the maximum absorption was determined by spline interpolation.

3. Around this point, a volume of 32 mm x 32 mm x 30 mm was assessed by measuring 5 x 5 x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

   a. The data at the surface were extrapolated, since the center of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.
   b. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed using the 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the “Not a knot” condition (in x, y, and z directions. The volume was integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.
   c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

4. The SAR value, at the same location as procedure #1, was re-measured. If the value changed by more than 5 %, the evaluation is repeated.

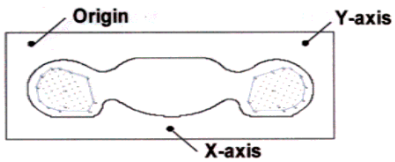


Figure 12. SAR Measurement Point in Area Scan

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 extend, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the hightest E-field value to determine the averaged SASR-distribution over 10g.

Area scan and zoom scan resolution setting follow KDB 865664 D01v01 quoted below

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 ± 1 mm	½·δ·ln(2) ± 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: Δx_{Area}, Δy_{Area}			≤ 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.	
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5·$\Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the area scan based *1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

6. DESCRIPTION OF TEST POSITION

6.1 HEAD POSITION

The device was placed in a normal operating position with the Point A on the device, as illustrated in following drawing, aligned with the location of the RE(ERP) on the phantom. With the ear-piece pressed against the head, the vertical center line of the body of the handset was aligned with an imaginary plane consisting of the RE, LE and M. While maintaining these alignments, the body of the handset was gradually moved towards the cheek until any point on the mouth-piece or keypad contacted the cheek. This is a cheek/touch position. For ear/tilt position, while maintain the device aligned with the BM and FN lines, the device was pivot against ERP back for 15º or until the device antenna touch the phantom. Please refer to IEEE 1528-2003 illustration below.

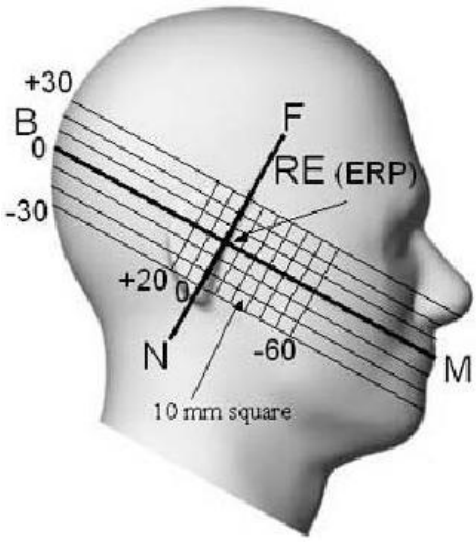


Figure 13. Side view of the phantom

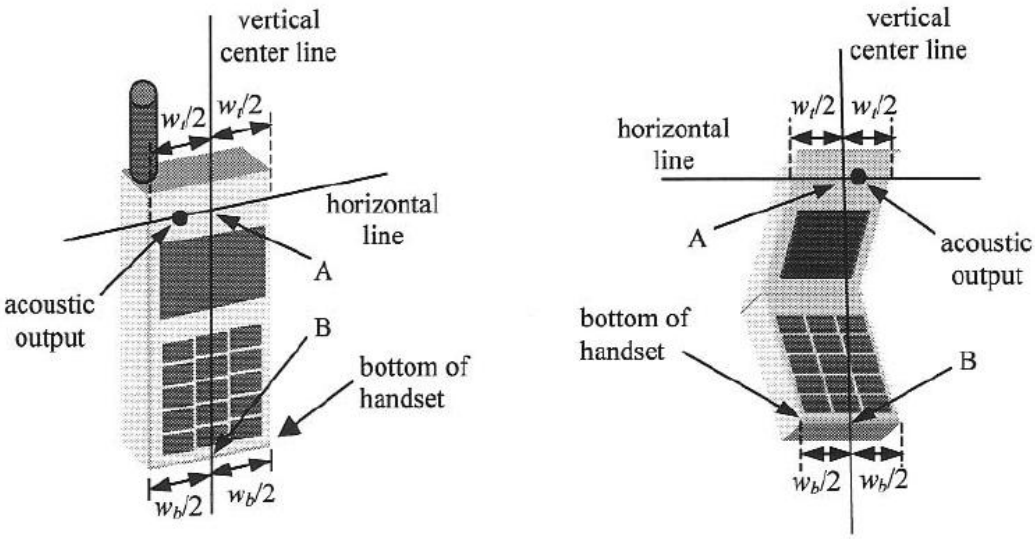


Figure 14. Handset vertical and horizontal reference lines

6.2 Body Holster/Belt Clip 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. A device with a headset output is tested with a headset connected to the device. Body dielectric parameters are used.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that 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 each accessory. If multiple accessory 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.

Since this EUT does not supply any body worn accessory to the end user a distance of 0.8 cm and 1.0 cm from the EUT back surface to the liquid interface is configured for the generic test.

"See the Test SET-UP Photo"

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. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessory(ies), Including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

In all cases SAR measurements are performed to investigate the worst-case positioning. Worstcase positioning is then documented and used to perform Body SAR testing.

6.3 Extremity Exposure Configurations

Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions; i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user's body, SAR compliance for the body is also required. The 1-g body and 10-g extremity SAR Exclusion Thresholds found in KDB Publication 447498 D01v05 should be applied to determine SAR test requirements.

For smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC minitablets that support voice calls next to the ear, the phablets procedures outlined in KDB Publication 6484474 D04 v01r01DR04 should be applied to evaluate SAR compliance. A device marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance. In addition to the normally required head and body-worn accessory SAR test procedures required for handsets, the UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna ≥ 25 mm from that surface or edge, in direct contact with the phantom, for 10-g SAR. The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g SAR > 1.2W/kg.

7. MEASUREMENT UNCERTAINTY

Error Description	Tol (± %)	Prob. dist.	Div.	c_i	Standard Uncertainty (± %)	v_{eff}
1. Measurement System						
Probe Calibration	6.00	N	1	1	6.00	∞
Axial Isotropy	4.70	R	1.73	0.7	1.90	∞
Hemispherical Isotropy	9.60	R	1.73	0.7	3.88	∞
Boundary Effects	1.00	R	1.73	1	0.58	∞
Linearity	4.70	R	1.73	1	2.71	∞
System Detection Limits	1.00	R	1.73	1	0.58	∞
Readout Electronics	0.30	N	1.00	1	0.30	∞
Response Time	0.8	R	1.73	1	0.46	∞
Integration Time	2.6	R	1.73	1	1.50	∞
RF Ambient Conditions	3.00	R	1.73	1	1.73	∞
Probe Positioner	0.40	R	1.73	1	0.23	∞
Probe Positioning	2.90	R	1.73	1	1.67	∞
Max SAR Eval	1.00	R	1.73	1	0.58	∞
2.Test Sample Related						
Device Positioning	2.90	N	1.00	1	2.90	145
Device Holder	3.60	N	1.00	1	3.60	5
Power Drift	5.00	R	1.73	1	2.89	∞
3.Phantom and Setup						
Phantom Uncertainty	4.00	R	1.73	1	2.31	∞
Liquid Conductivity(target)	5.00	R	1.73	0.64	1.85	∞
Liquid Conductivity(meas.)	2.07	N	1	0.64	1.32	9
Liquid Permitivity(target)	5.00	R	1.73	0.6	1.73	∞
Liquid Permitivity(meas.)	5.02	N	1	0.6	3.01	9
Combind Standard Uncertainty					11.13	
Coverage Factor for 95 %					$k=2$	
Expanded STD Uncertainty					22.25	

Table 7.1 Uncertainty (800 MHz- 2450 MHz)

Error Description	Tol (± %)	Prob. dist.	Div.	c_i	Standard Uncertainty (± %)	v_{eff}
1. Measurement System						
Probe Calibration	6.55	N	1	1	6.00	∞
Axial Isotropy	4.70	R	1.73	0.7	1.90	∞
Hemispherical Isotropy	9.60	R	1.73	0.7	3.88	∞
Boundary Effects	1.00	R	1.73	1	0.58	∞
Linearity	4.70	R	1.73	1	2.71	∞
System Detection Limits	1.00	R	1.73	1	0.58	∞
Readout Electronics	0.30	N	1.00	1	0.30	∞
Response Time	0.8	R	1.73	1	0.46	∞
Integration Time	2.6	R	1.73	1	1.50	∞
RF Ambient Conditions	3.00	R	1.73	1	1.73	∞
Probe Positioner	0.40	R	1.73	1	0.23	∞
Probe Positioning	2.90	R	1.73	1	1.67	∞
Max SAR Eval	1.00	R	1.73	1	0.58	∞
2.Test Sample Related						
Device Positioning	2.90	N	1.00	1	2.90	145
Device Holder	3.60	N	1.00	1	3.60	5
Power Drift	5.00	R	1.73	1	2.89	∞
3.Phantom and Setup						
Phantom Uncertainty	4.00	R	1.73	1	2.31	∞
Liquid Conductivity(target)	5.00	R	1.73	0.64	1.85	∞
Liquid Conductivity(meas.)	2.07	N	1	0.64	1.32	9
Liquid Permitivity(target)	5.00	R	1.73	0.6	1.73	∞
Liquid Permitivity(meas.)	5.02	N	1	0.6	3.01	9
Combind Standard Uncertainty					11.43	
Coverage Factor for 95 %					*k*=2	
Expanded STD Uncertainty					22.86	

Table 7.2 Uncertainty (5000-5900 MHz)

8. ANSI/ IEEE C95.1 - 1992 RF EXPOSURE LIMITS

HUMAN EXPOSURE	UNCONTROLLED ENVIRONMENT General Population (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT Occupational (W/kg) or (mW/g)
SPATIAL PEAK SAR * (Brain)	1.60	8.00
SPATIAL AVERAGE SAR ** (Whole Body)	0.08	0.40
SPATIAL PEAK SAR *** (Hands / Feet / Ankle / Wrist)	4.00	20.00

Table 8.1 Safety Limits for Partial Body Exposure

NOTES:

* The Spatial Peak value of the SAR averaged over any 1 g of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

** The Spatial Average value of the SAR averaged over the whole-body.

*** The Spatial Peak value of the SAR averaged over any 10 g of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e.as a result of employment or occupation).

9. SAR SYSTEM VALIDATION

Per FCC KCB 865664 D02v01, SAR system validation status should be document to confirm measurement accuracy. The SAR systems (including SAR probes, system components and software versions) used for this device were validated against its performance specifications prior to the SAR measurements. Reference dipoles were used with the required tissue- equivalent media for system validation, according to the procedures outlined in IEEE 1528-2003 and FCC KDB 865664 D01 v01. Since SAR probe calibrations are frequency dependent, each probe calibration point was validated at a frequency within the valid frequency range of the probe calibration point, using the system that normally operates with the probe for routine SAR measurements and according to the required tissue-equivalent media.

A tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probes and tissue dielectric parameters has been included.

SAR System #	Probe	probe Type	Probe Calibration Point		Dipole	Date	Dielectric Parameters		CW Validation			Modulation Validation		
							Measured Permittivity	Measured Conductivity	Sensitivity	Probe Linearity	Probe Isortopy	MOD. Type	Duty Factor	PAR
5	3903	EX3DV4	Head	835	441	May.06,2013	42.01	0.92	PASS	PASS	PASS	GMSK	PASS	N/A
5	3903	EX3DV4	Head	1900	5d032	Aug.07,2013	39.8	1.4	PASS	PASS	PASS	GMSK	PASS	N/A
5	3903	EX3DV4	Head	2450	743	Sep.2,2013	38.91	1.81	PASS	PASS	PASS	OFDM	N/A	PASS
5	3903	EX3DV4	Head	5200	1107	Apr.4,2013	36.68	4.71	PASS	PASS	PASS	OFDM	N/A	PASS
5	3903	EX3DV4	Head	5300	1107	Apr.4,2013	36.41	4.83	PASS	PASS	PASS	OFDM	N/A	PASS
5	3903	EX3DV4	Head	5500	1107	Apr.4,2013	35.81	5.09	PASS	PASS	PASS	OFDM	N/A	PASS
5	3903	EX3DV4	Head	5600	1107	Apr.4,2013	35.63	5.14	PASS	PASS	PASS	OFDM	N/A	PASS
5	3903	EX3DV4	Head	5800	1107	Apr.4,2013	35.17	5.31	PASS	PASS	PASS	OFDM	N/A	PASS
5	3903	EX3DV4	Body	835	441	May.06,2013	55.88	0.99	PASS	PASS	PASS	GMSK	PASS	N/A
5	3903	EX3DV4	Body	1900	5d032	Aug.08,2013	51.8	1.54	PASS	PASS	PASS	GMSK	PASS	N/A
5	3903	EX3DV4	Body	2450	743	Sep.03,2013	52.32	1.96	PASS	PASS	PASS	OFDM	N/A	PASS
5	3903	EX3DV4	Body	5200	1107	Apr.5,2013	50.14	5.44	PASS	PASS	PASS	OFDM	N/A	PASS
5	3903	EX3DV4	Body	5300	1107	Apr.5,2013	49.52	5.51	PASS	PASS	PASS	OFDM	N/A	PASS
5	3903	EX3DV4	Body	5500	1107	Apr.5,2013	49.15	5.65	PASS	PASS	PASS	OFDM	N/A	PASS
5	3903	EX3DV4	Body	5600	1107	Apr.5,2013	48.84	5.93	PASS	PASS	PASS	OFDM	N/A	PASS
5	3903	EX3DV4	Body	5800	1107	Apr.5,2013	48.26	6.21	PASS	PASS	PASS	OFDM	N/A	PASS

SAR System Validation Summary 1g

SAR System #	Probe	probe Type	Probe Calibration Point		Dipole	Date	Dielectric Parameters		CW Validation			Modulation Validation		
							Measured Permittivity	Measured Conductivity	Sensitivity	Probe Linearity	Probe Isortopy	MOD. Type	Duty Factor	PAR
5	3903	EX3DV4	Body	5200	1107	Oct.01,2013	49.87	5.38	PASS	PASS	PASS	OFDM	N/A	PASS
5	3903	EX3DV4	Body	5300	1107	Oct.01,2013	49.42	5.49	PASS	PASS	PASS	OFDM	N/A	PASS
5	3903	EX3DV4	Body	5500	1107	Oct.01,2013	49.1	5.63	PASS	PASS	PASS	OFDM	N/A	PASS
5	3903	EX3DV4	Body	5600	1107	Oct.01,2013	48.88	5.77	PASS	PASS	PASS	OFDM	N/A	PASS
5	3903	EX3DV4	Body	5800	1107	Oct.01,2013	48.31	6.12	PASS	PASS	PASS	OFDM	N/A	PASS

SAR System Validation Summary – Extremity SAR Considerations

Note;

All measurement were performed using probes calibrated for CW signal only. Modulations in the table bove represent test configurations for which the measurement system has been validated per FCC KDB Publication 865664 D01v01r01. SAR system were validated for modulated signals with a periodic duty cycle, such as GMSK, or with a high peak to average ratio (>5 dB), such as OFDM according to KDB 865664.

10. SYSTEM VERIFICATION

10.1 Tissue Verification

Freq. [MHz]	Date	Probe	Dipole	Liquid	Liquid Temp. [°C]	Parameters	Target Value	Measured Value	Deviation [%]	Limit [%]
835	Oct. 07, 2013	3903	441	Head	20.2	ε r	41.5	41.4	- 0.24	± 5
						σ	0.90	0.862	- 4.22	± 5
835	Oct. 08, 2013	3903		Body	20.3	ε r	55.2	55.9	+ 1.27	± 5
						σ	0.97	0.95	- 2.06	± 5
1 900	Oct. 09, 2013	3903	5d032	Head	20.7	ε r	40.0	40.8	+ 2.00	± 5
						σ	1.40	1.37	- 2.14	± 5
1 900	Oct. 09, 2013	3903		Body	20.7	ε r	53.3	53.5	+ 0.38	± 5
						σ	1.52	1.51	- 0.66	± 5
2 450	Oct. 10, 2013	3903	743	Head	20.5	ε r	39.2	39	- 0.51	± 5
						σ	1.80	1.79	- 0.56	± 5
2 450	Oct. 10, 2013	3903		Body	20.5	ε r	52.7	53.5	+ 1.52	± 5
						σ	1.95	1.99	+ 2.05	± 5
5 200	Oct. 14, 2013	3903	1107	Head	20.6	ε_r	36	36.1	+ 0.28	± 5
						σ	4.66	4.52	- 3.00	± 5
5 300	Oct. 14, 2013	3903		Head	20.6	ε_r	35.9	35.8	- 0.28	± 5
						σ	4.76	4.68	- 1.68	± 5
5 500	Oct. 14, 2013	3903		Head	20.6	ε_r	35.6	35.3	- 0.84	± 5
						σ	4.96	4.84	- 2.42	± 5
5 600	Oct. 14, 2013	3903		Head	20.6	ε_r	35.5	35.2	- 0.85	± 5
						σ	5.07	4.94	- 2.56	± 5
5 800	Oct. 14, 2013	3903		Head	20.6	ε_r	35.3	34.6	- 1.98	± 5
						σ	5.27	5.23	- 0.76	± 5
5 200	Oct. 15, 2013	3903		Body	20.3	ε_r	49.01	48	- 2.06	± 5
						σ	5.3	5.29	- 0.19	± 5
5 300	Oct. 15, 2013	3903		Body	20.3	ε_r	48.85	47.5	- 2.76	± 5
						σ	5.42	5.43	+ 0.18	± 5
5 500	Oct. 15, 2013	3903		Body	20.3	ε_r	48.6	47	- 3.29	± 5
						σ	5.65	5.67	+ 0.35	± 5
5 600	Oct. 15, 2013	3903		Body	20.3	ε_r	48.44	46.9	- 3.18	± 5
						σ	5.77	5.82	+ 0.87	± 5
5 800	Oct. 15, 2013	3903		Body	20.3	ε_r	48.2	46.6	- 3.32	± 5
						σ	6.00	6.21	+ 3.50	± 5

The Tissue dielectronic parameters were measured prior to the SAR evaluation using an Agilent 85070C Dielectronic Probe Kit and Agilent Network Analyzer.

10.2 System Verification

Prior to assessment, the system is verified to the ± 10 % of the specifications at 835 MHz /1 900 MHz/ 2 450 MHz / 5 200 MHz/ 5 300 MHz/ 5 500 MHz/ 5 600 MHz/ 5 800 MHz by using the system Verification kit. (Graphic Plots Attached)

System Verification Results

Freq. [MHz]	Date	Probe (SN)	Dipole (SN)	Liquid	Amb. Temp. [°C]	Liquid Temp. [°C]	1 W Target SAR_{1g} (SPEAG) (mW/g)	Measured SAR_{1g} (mW/g)	1 W Normalized SAR_{1g} (mW/g)	Deviation [%]	Limit [%]
835	Oct. 07, 2013	3903	441	Head	20.4	20.2	9.68	1.01	10.1	+ 4.34	± 10
835	Oct. 08, 2013			Body	20.5	20.3	9.69	0.928	9.28	- 4.23	± 10
1 900	Oct. 09, 2013		5d032	Head	20.9	20.7	40.1	3.87	38.7	- 3.49	± 10
1 900	Oct. 09, 2013			Body	20.9	20.7	40.5	4.08	40.8	+ 0.74	± 10
2 450	Oct. 10, 2013		743	Head	20.7	20.5	52.8	5.11	51.1	- 3.22	± 10
2 450	Oct. 10, 2013			Body	20.7	20.5	50.5	5.28	52.8	+ 4.55	± 10
5 200	Oct. 14, 2013		1107	Head	20.8	20.6	80.1	7.66	76.6	- 4.37	± 10
5 300	Oct. 14, 2013			Head	20.8	20.6	81.0	8.17	81.7	+ 0.86	± 10
5 500	Oct. 14, 2013			Head	20.8	20.6	80.0	8.36	83.6	+ 4.50	± 10
5 600	Oct. 14, 2013			Head	20.8	20.6	84.4	8.18	81.8	- 3.08	± 10
5 800	Oct. 14, 2013			Head	20.8	20.6	78.3	7.59	75.9	- 3.07	± 10
5 200	Oct. 15, 2013			Body	20.5	20.3	74.3	7.31	73.1	- 1.62	± 10
5 300	Oct. 15, 2013			Body	20.5	20.3	76.0	7.66	76.6	+ 0.79	± 10
5 500	Oct. 15, 2013			Body	20.5	20.3	78.4	8.06	80.6	+ 2.81	± 10
5 600	Oct. 15, 2013			Body	20.5	20.3	81.0	8.33	83.3	+ 2.84	± 10
5 800	Oct. 15, 2013			Body	20.5	20.3	74.3	7.75	77.5	+ 4.31	± 10

System Verification Results – Extremity SAR

Freq. [MHz]	Date	Probe (SN)	Dipole (SN)	Liquid	Amb. Temp. [°C]	Liquid Temp. [°C]	1 W Target SAR_{10g} (SPEAG) (mW/g)	Measured SAR_{10g} (mW/g)	1 W Normalized SAR_{10g} (mW/g)	Deviation [%]	Limit [%]
5 200	Oct. 15, 2013	3903	1107	Body	20.5	20.3	20.8	2.09	20.9	+ 0.48	± 10
5 300	Oct. 15, 2013			Body	20.5	20.3	21.3	2.16	21.6	+ 1.41	± 10
5 500	Oct. 15, 2013			Body	20.5	20.3	21.7	2.28	22.8	+ 5.07	± 10
5 600	Oct. 15, 2013			Body	20.5	20.3	22.3	2.32	23.2	+ 4.04	± 10
5 800	Oct. 15, 2013			Body	20.5	20.3	20.4	2.17	21.7	+ 6.37	± 10

10.3 System Verification Procedure

SAR measurement was prior to assessment, the system is verified to the ± 10 % of the specifications at each frequency band by using the system Verification kit. (Graphic Plots Attached)

- Cabling the system, using the Verification kit equipments.
- Generate about 100 mW Input Level from the Signal generator to the Dipole Antenna.
- Dipole Antenna was placed below the Flat phantom.
- The measured one-gram SAR at the surface of the phantom above the dipole feed-point should be within 10 % of the target reference value.
- The results are normalized to 1 W input power.

11. RF CONDUCTED POWER MEASUREMENT

Power measurements were performed using a base station simulator under digital average power.
The handset was placed into a simulated call using a base station simulator in a shielded chamber.
Such test signals offer a consistent means for testing SAR and are recommended for evaluation SAR
SAR measurements were taken with a fully charged battery. In order to verify that the device was tested
and maintained at full power, this was configured with the base station simulator. The SAR measurement
Software calculates a reference point at the start and end of the test to check for power drifts. If conducted
Power deviations of more then 5 % occurred, the tests were repeated.

11.1 Output Power Specifications.

This device operates using the following maximum output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB publication 447498 D01v05.

GSM

GSM850	GSM1900
Target Power : 32.7 dBm	Target Power : 29.7 dBm
GPRS850	PCS1900
GPRS 1tx : 32.7 dBm/ EGPRS 1tx : 26.7 dBm	GPRS 1tx : 29.7 dBm/ EGPRS 1tx : 25.7 dBm
GPRS 2tx : 30.7 dBm/ EGPRS 2tx : 26.2 dBm	GPRS 2tx : 27.7 dBm/ EGPRS 2tx : 25.2 dBm
GPRS 3tx : 29.7 dBm/ EGPRS 3tx : 25.2 dBm	GPRS 3tx : 26.2 dBm/ EGPRS 3tx : 24.2 dBm
GPRS 4tx : 28.2 dBm/ EGPRS 4tx : 24.2 dBm	GPRS 4tx : 24.7 dBm/ EGPRS 4tx : 23.2 dBm
Tune-up Tolerance : -1.5 dB/ +0.5 dB	

WCDMA

WCDMA850	
Target Power : 23.2 dBm	
HSDPA Sub-test 1	23.2 dBm
HSDPA Sub-test 2	23.2 dBm
HSDPA Sub-test 3	23.2 dBm
HSDPA Sub-test 4	23.2 dBm
Tune-up Tolerance : -0.5 dB/ +0.5 dB	

Wifi

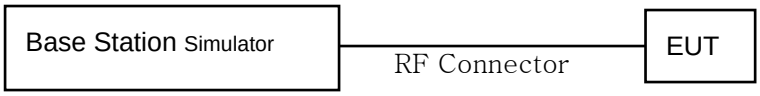
Wifi (Average Power)	Mode / Band									
	2.4 GHz				5 GHz					
	802.11 b	802.11 g	802.11 n	802.11ac	802.11 a	802.11 n (20MHz)	802.11 n (40MHz)	802.11ac (20MHz)	802.11ac (40MHz)	802.11ac (80MHz)
Maximum	16.5dBm	12.5dBm	11.5dBm	11 dBm	10dBm	10dBm	9.8dBm	9dBm	9dBm	9dBm
Nominal	15.5dBm	11.5dBm	10.5dBm	10 dBm	9dBm	9dBm	8.8dBm	8dBm	8dBm	8dBm

BT.

Bluetooth (Average Power)	Mode / Band			
	1 Mbps (GFSK)	2 Mbps (DPSK)	3 Mbos(8DPSK)	LE
Maximum	9 dBm	8 dBm	8 dBm	5 dBm
Nominal	7.5 dBm	6.5 dBm	6.5 dBm	3.5 dBm

11.2 GSM

Conducted output power measurements were performed using a base station simulator under digital average power.



SAR Test for WWAN were performed with a base station simulator Agilent E5515C. Communication between the device and the emulator was established by air link. Set base station emulator to allow DUT to radiate maximum output power during all tests. Please refer to the below worst case SAR operation setup.

- GSM voice: Head SAR
- GPRS Multi-slots : Body SAR with GPRS Multi-slot Class12 with CS 1 (GMSK)

Note;

CS1/MCS7 coding scheme was used in GPRS/EDGE output power measurements and SAR Testing, as a condition where GMSK/8PSK modulation was ensured. Investigation has shown that CS1 - CS4/ MCS5 – MCS9 settings do not have any impact on the output levels in the GPRS/EDGE modes.

GSM Conducted output powers (Burst-Average)

Band	Channel	Voice	GPRS(GMSK) Data – CS1				EDGE Data			
		GSM (dBm)	GPRS 1 TX Slot (dBm)	GPRS 2 TX Slot (dBm)	GPRS 3 TX Slot (dBm)	GPRS 4 TX Slot (dBm)	EDGE 1 TX Slot (dBm)	EDGE 2 TX Slot (dBm)	EDGE 3 TX Slot (dBm)	EDGE 4 TX Slot (dBm)
GSM 850	128	31.91	31.91	30.06	29.21	27.60	26.59	25.98	24.85	23.7
	190	31.88	31.89	30.08	29.29	27.58	26.55	25.91	24.81	23.74
	251	31.85	31.80	30.00	29.11	27.55	26.43	25.83	24.71	23.56
GSM 1900	512	29.09	29.11	27.12	25.58	24.11	25.62	25.01	23.95	22.89
	661	29.12	29.17	27.04	25.62	24.15	25.64	25.07	24	22.92
	810	29.17	29.15	27.15	25.60	24.27	25.63	25.02	23.96	22.9

GSM Conducted output powers (Frame-Average)

Band	Channel	Voice	GPRS(GMSK) Data – CS1				EDGE Data			
		GSM (dBm)	GPRS 1 TX Slot (dBm)	GPRS 2 TX Slot (dBm)	GPRS 3 TX Slot (dBm)	GPRS 4 TX Slot (dBm)	EDGE 1 TX Slot (dBm)	EDGE 2 TX Slot (dBm)	EDGE 3 TX Slot (dBm)	EDGE 4 TX Slot (dBm)
GSM 850	128	22.88	22.88	24.04	24.95	24.59	17.56	19.96	20.59	20.69
	190	22.85	22.86	24.06	25.03	24.57	17.52	19.89	20.55	20.73
	251	22.82	22.77	23.98	24.85	24.54	17.4	19.81	20.45	20.55
GSM 1900	512	20.06	20.08	21.1	21.32	21.1	16.59	18.99	19.69	19.88
	661	20.09	20.14	21.02	21.36	21.14	16.61	19.05	19.74	19.91
	810	20.14	20.12	21.13	21.34	21.26	16.60	19.00	19.7	19.89

Note:

Time slot average factor is as follows:

1 Tx slot = 9.03 dB, Frame-Average output power = Burst-Average output power – 9.03 dB

2 Tx slot = 6.02 dB, Frame-Average output power = Burst-Average output power – 6.02 dB

3 Tx slot = 4.26 dB, Frame-Average output power = Burst-Average output power – 4.26 dB

4 Tx slot = 3.01 dB, Frame-Average output power = Burst-Average output power – 3.01 dB

11.2 WCDMA

Body SAR is not required for handsets with HSDPA capabilities when the maximum average output of each RF channel with HSDPA active is less than ¼ dB higher than that measured without HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2 kbps RMC is ≤ 75 % of the SAR limit. Otherwise, SAR is Measured for HSDPA, using an FRC with H-Set 1 in Sub-test 1 and a 12.2 kbps RMC configured in Test Loop Mode 1, using the highest body SAR configuration in 12.2 kbps RMC without HSDPA, on the maximum output channel with the body exposure configuration that results in the highest SAR in 12.2 kbps RMC for that RF channel.

11.2.1 Output Power Verification

Maximum output power is verified on the High, Middle and Low channels according to the general descriptions in section 5.2 of 3 GPP TS 34.121, using the appropriate RMC or AMR with TPC(transmit power control) set to all “1s”.

11.2.2 Head SAR Measurements

SAR for head exposure configurations is measured using the 12.2 kbps RMC with TPC bits configured to all “1s”. SAR in AMR configurations is not required when the maximum average output of each RF channel for 12.2 kbps AMR is less than ¼ dB higher than that measured in 12.2 kbps RMC. Otherwise, SAR is measured on the maximum output channel in 12.2 AMR with a 3.4 kbps SRB (signaling radio bearer using the exposure configuration that results in the highest SAR for that RF channel in 12.2 RMC.

11.2.3 Body SAR Measurement

SAR for body exposure configurations is measured using the 12.2 kbps RMC with the TPC bits all “1s”.

11.2.4 Handsets with Release 5 HSDPA

Body SAR is not required for handsets with HSDPA capabilities when the maximum average output of each RF channel with HSDPA active is less than ¼ dB higher than that measured without HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2 kbps RMC is ≤ 75 % of the SAR limit. Otherwise, SAR is Measured for HSDPA, using an FRC with H-Set 1 in Sub-test 1 and a 12.2 kbps RMC configured in Test Loop Mode 1, using the highest body SAR configuration in 12.2 kbps RMC without HSDPA, on the maximum output channel with the body exposure configuration that results in the highest SAR in 12.2 kbps RMC for that RF channel.

Sub-Test 1 Setup for Release 5 HSDPA

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (1)	CM (dB) (2)
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15 (3)	15/15 (3)	64	12/15 (3)	24/15	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15.
Note 3: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

11.2.5 Handsets with Release 6 HSPA (HSDPA/HSUPA)

Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2 kbps RMC is ≤ 75 % of the SAR limit. Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 with power control algorithm 2, according to the highest body SAR configuration in 12.1 kbps RMC without HSPA. When VOIP is applicable for head exposure, SAR is not required when the maximum output of each RF channel with HSPA is less than ¼ dB higher than that measured using 12.2 kbps RMC; otherwise, the same HSPA configuration used for body measurement should be used to test for head exposure.

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs}[1]	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM[2] (dB)	MPR (dB)	AG[4] Index	E-TFCI
1	11/15[3]	15/15[3]	64	11/15[3]	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}: 47/15 β_{ed2}: 47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15[4]	15/15[4]	64	15/15[4]	30/15	24/15	134/15	4	1	1.0	0.0	21	81

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

WCDMA 850

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]						MPR Target
			UL 4132 DL 4357	Power reduction (dB)	UL 4183 DL 4408	Power reduction (dB)	UL 4233 DL 4458	Power reduction (dB)	
99	WCDMA	12.2 kbps RMC	22.87	-	22.83	-	22.85	-	-
99	WCDMA	12.2 kbps AMR	22.84	-	22.80	-	22.85	-	
5	HSDPA	Subtest 1	22.87	0.00	22.84	-0.01	22.84	0.01	0
5		Subtest 2	22.85	0.02	22.78	0.05	22.83	0.02	0
5		Subtest 3	22.36	0.51	22.32	0.51	22.30	0.55	-0.5
5		Subtest 4	22.37	0.50	22.30	0.53	22.36	0.49	-0.5
6	HSUPA	Subtest 1	22.20	0.00	22.19	**0.00**	22.06	**0.00**	0
6		Subtest 2	20.65	1.55	20.67	1.52	20.77	1.29	-2
6		Subtest 3	21.59	0.61	21.55	0.64	21.48	0.58	-1
6		Subtest 4	21.36	0.84	21.34	0.85	21.23	0.83	-2
6		Subtest 5	22.19	**0.01**	22.19	**0.00**	22.04	**0.02**	0

WCDMA Average Conducted output powers

11.3 WiFi

11.3.1 SAR Testing for 802.11b/g/n modes

General Device Setup

Normal Network operating configurations are not suitable for measuring the SAR of 802.11 a/b/g transmitters. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable.

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters. The test frequencies should correspond to actual channel frequencies defined for domestic use. SAR for devices with switched diversity should be measured with only one antenna transmitting at a time during each SAR measurement, according to a fixed modulation and data rate. The same data pattern should be used for all measurements.

Frequency Channel Configurations

802.11 a/b/g and 4.9 GHz operating modes are tested independently according to the service requirements in each frequency band. 802.11 b/g modes are tested on channels 1, 6 and 11.802.11a is tested for UNII operations on channels 36 and 48 in the 5.15-5.25 GHz band; channels 52 and 64 in the 5.25-5.35 GHz band; Channels 104, 116, 124 and 136 in the 5.470-5.725 GHz band; and channels 149 and 161 in the 5.8 GHz band. When 5.8 GHz § 15.247 is also available, channels 149, 157 and 165 should be tested instead of the UNII channels. 4.9 GHz is tested on channels 1, 10 and 5 or 6, whichever has the higher output power, for 5 MHz channels; channels 11,15 and 19 for 10 MHz channels; and channels 21 and 25 for 20 MHz channels.

These are referred to as the “default test channels”. 802.11g mode was evaluated only if the output power was 0.25 dB higher than the 802.11b mode.

Mode		GHz	Channel	Turbo Channel	“Default Test Channels”			
					§15.247		UNII	
					802.11b	802.11g		
802.11b/g		2.412	1#		√	▽		
		2.437	6	6	√	▽		
		2.462	11#		√	▽		
802.11a	UNII	5.18	36				√	
		5.20	40	42 (5.21 GHz)				*
		5.22	44					*
		5.24	48	50 (5.25 GHz)			√	
		5.26	52				√	
		5.28	56	58 (5.29 GHz)				*
		5.30	60					*
		5.32	64				√	
		5.500	100	Unknown				*
		5.520	104				√	
		5.540	108					*
		5.560	112					*
		5.580	116				√	
		5.600	120					*
		5.620	124				√	
		5.640	128					*
		5.660	132					*
		5.680	136				√	
		5.700	140					*
	UNII or §15.247	5.745	149		√		√	
		5.765	153	152 (5.76 GHz)		*		*
		5.785	157		√			*
		5.805	161	160 (5.80 GHz)		*	√	
	§15.247	5.825	165		√			

802.11 Test Channels per FCC Requirements

TEST RESULTS-Average

Conducted Output Power Measurements (802.11b Mode)

802.11b Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency[MHz]	Channel No.			
2412	1	1 Mbps	15.49	30
		2 Mbps	15.40	30
		5.5 Mbps	15.39	30
		11 Mbps	15.40	30
2437	6	1 Mbps	15.84	30
		2 Mbps	15.84	30
		5.5 Mbps	15.82	30
		11 Mbps	15.83	30
2462	11	1 Mbps	15.74	30
		2 Mbps	15.73	30
		5.5 Mbps	15.67	30
		11 Mbps	15.65	30

Conducted Output Power Measurements (802.11g Mode)

802.11g Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency[MHz]	Channel No.			
2412	1	6 Mbps	11.92	30
		9 Mbps	11.92	30
		12 Mbps	11.93	30
		18 Mbps	11.85	30
		24 Mbps	11.89	30
		36 Mbps	11.86	30
		48 Mbps	12.20	30
		54 Mbps	11.93	30
2437	6	6 Mbps	12.10	30
		9 Mbps	12.06	30
		12 Mbps	12.21	30
		18 Mbps	12.15	30
		24 Mbps	12.21	30
		36 Mbps	12.26	30
		48 Mbps	12.48	30
		54 Mbps	12.27	30
2462	11	6 Mbps	11.94	30
		9 Mbps	11.94	30
		12 Mbps	11.99	30
		18 Mbps	12.03	30
		24 Mbps	12.02	30
		36 Mbps	12.06	30
		48 Mbps	12.22	30
		54 Mbps	12.07	30

Conducted Output Power Measurements (802.11n Mode)

802.11n Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency[MHz]	Channel No.			
2412	1	6.5 Mbps	9.72	30
		13 Mbps	9.73	30
		19.5 Mbps	9.89	30
		26 Mbps	9.89	30
		39 Mbps	9.72	30
		52 Mbps	9.85	30
		58.5 Mbps	9.84	30
		65 Mbps	9.90	30
2437	6	6.5 Mbps	10.01	30
		13 Mbps	10.12	30
		19.5 Mbps	10.16	30
		26 Mbps	10.19	30
		39 Mbps	10.30	30
		52 Mbps	10.41	30
		58.5 Mbps	10.36	30
		65 Mbps	10.39	30
2462	11	6.5 Mbps	9.88	30
		13 Mbps	9.94	30
		19.5 Mbps	9.98	30
		26 Mbps	9.99	30
		39 Mbps	10.12	30
		52 Mbps	10.17	30
		58.5 Mbps	10.21	30
		65 Mbps	10.01	30

Note;
SAR testing was performed according to the FCC KDB 248227D01

Conducted Output Power Measurements (802.11ac Mode)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.			
2412	1	6.5 Mbps	9.91	30
		13 Mbps	10.09	30
		19.5 Mbps	9.71	30
		26 Mbps	9.91	30
		39 Mbps	9.97	30
		52 Mbps	9.89	30
		58.5 Mbps	10.08	30
		65 Mbps	10.09	30
		78 Mbps	10.04	30
2437	6	6.5 Mbps	10.24	30
		13 Mbps	10.28	30
		19.5 Mbps	10.33	30
		26 Mbps	10.38	30
		39 Mbps	10.49	30
		52 Mbps	10.56	30
		58.5 Mbps	10.27	30
		65 Mbps	10.52	30
		78 Mbps	10.58	30
2462	11	6.5 Mbps	10.00	30
		13 Mbps	10.10	30
		19.5 Mbps	10.14	30
		26 Mbps	10.22	30
		39 Mbps	9.94	30
		52 Mbps	10.02	30
		58.5 Mbps	10.12	30
		65 Mbps	10.17	30
		78 Mbps	10.15	30

Conducted Output Power Measurements (802.11a Mode: 5180~5240)

802.11a Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.			
5180	36	6 Mbps	9.25	16.86
		9 Mbps	9.06	16.86
		12 Mbps	9.17	16.86
		18 Mbps	9.11	16.86
		24 Mbps	9.08	16.86
		36 Mbps	8.96	16.86
		48 Mbps	9.29	16.86
		54 Mbps	9.12	16.86
5200	40	6 Mbps	9.21	16.86
		9 Mbps	9.10	16.86
		12 Mbps	9.19	16.86
		18 Mbps	9.22	16.86
		24 Mbps	9.07	16.86
		36 Mbps	9.06	16.86
		48 Mbps	9.08	16.86
		54 Mbps	9.01	16.86
5220	44	6 Mbps	9.18	16.86
		9 Mbps	9.05	16.86
		12 Mbps	9.10	16.86
		18 Mbps	8.98	16.86
		24 Mbps	8.99	16.86
		36 Mbps	8.85	16.86
		48 Mbps	9.09	16.86
		54 Mbps	9.01	16.86
5240	48	6 Mbps	9.08	16.86
		9 Mbps	8.94	16.86
		12 Mbps	9.08	16.86
		18 Mbps	8.94	16.86
		24 Mbps	8.98	16.86
		36 Mbps	8.79	16.86
		48 Mbps	9.13	16.86
		54 Mbps	8.97	16.86

Conducted Output Power Measurements (802.11a Mode: 5260~5320)

802.11a Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.			
5260	52	6 Mbps	9.41	23.84
		9 Mbps	9.47	23.84
		12 Mbps	9.28	23.84
		18 Mbps	9.40	23.84
		24 Mbps	9.34	23.84
		36 Mbps	9.45	23.84
		48 Mbps	9.40	23.84
		54 Mbps	9.28	23.84
5280	56	6 Mbps	9.38	23.84
		9 Mbps	9.29	23.84
		12 Mbps	9.25	23.84
		18 Mbps	9.21	23.84
		24 Mbps	9.20	23.84
		36 Mbps	9.19	23.84
		48 Mbps	9.29	23.84
		54 Mbps	9.24	23.84
5300	60	6 Mbps	9.45	23.84
		9 Mbps	9.29	23.84
		12 Mbps	9.25	23.84
		18 Mbps	9.21	23.84
		24 Mbps	9.20	23.84
		36 Mbps	9.19	23.84
		48 Mbps	9.29	23.84
		54 Mbps	9.24	23.84
5320	64	6 Mbps	9.18	23.84
		9 Mbps	9.28	23.84
		12 Mbps	9.33	23.84
		18 Mbps	9.25	23.84
		24 Mbps	9.23	23.84
		36 Mbps	9.20	23.84
		48 Mbps	9.31	23.84
		54 Mbps	9.27	23.84

Conducted Output Power Measurements (802.11a Mode: 5500~5720)

802.11a Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.			
5500	100	6 Mbps	9.17	23.84
		9 Mbps	9.23	23.84
		12 Mbps	9.13	23.84
		18 Mbps	9.10	23.84
		24 Mbps	9.12	23.84
		36 Mbps	9.15	23.84
		48 Mbps	9.33	23.84
		54 Mbps	9.23	23.84
5520	104	6 Mbps	9.07	23.84
		9 Mbps	9.01	23.84
		12 Mbps	9.01	23.84
		18 Mbps	9.02	23.84
		24 Mbps	9.01	23.84
		36 Mbps	8.7	23.84
		48 Mbps	8.48	23.84
		54 Mbps	8.3	23.84
5540	108	6 Mbps	9.04	23.84
		9 Mbps	9.04	23.84
		12 Mbps	9.03	23.84
		18 Mbps	9.03	23.84
		24 Mbps	8.97	23.84
		36 Mbps	8.68	23.84
		48 Mbps	8.42	23.84
		54 Mbps	8.28	23.84
5560	112	6 Mbps	9.02	23.84
		9 Mbps	9.06	23.84
		12 Mbps	9.03	23.84
		18 Mbps	9.06	23.84
		24 Mbps	8.94	23.84
		36 Mbps	8.52	23.84
		48 Mbps	8.4	23.84
		54 Mbps	8.17	23.84
5580	116	6 Mbps	8.90	23.84
		9 Mbps	8.98	23.84
		12 Mbps	9.09	23.84
		18 Mbps	8.97	23.84
		24 Mbps	9.04	23.84
		36 Mbps	9.05	23.84
		48 Mbps	9.08	23.84
		54 Mbps	8.95	23.84

5660	132	6 Mbps	9.03	23.84
		9 Mbps	9.05	23.84
		12 Mbps	8.96	23.84
		18 Mbps	8.81	23.84
		24 Mbps	8.48	23.84
		36 Mbps	8.17	23.84
		48 Mbps	8.05	23.84
		54 Mbps	8.03	23.84
5680	136	6 Mbps	9.02	23.84
		9 Mbps	8.91	23.84
		12 Mbps	8.87	23.84
		18 Mbps	8.69	23.84
		24 Mbps	8.42	23.84
		36 Mbps	8.19	23.84
		48 Mbps	8.02	23.84
		54 Mbps	8.01	23.84
5700	140	6 Mbps	8.99	23.84
		9 Mbps	8.84	23.84
		12 Mbps	8.81	23.84
		18 Mbps	8.65	23.84
		24 Mbps	8.39	23.84
		36 Mbps	8.09	23.84
		48 Mbps	8.05	23.84
		54 Mbps	8.02	23.84
5720	144	6 Mbps	9.05	23.84
		9 Mbps	9.02	23.84
		12 Mbps	9.20	23.84
		18 Mbps	9.28	23.84
		24 Mbps	9.20	23.84
		36 Mbps	9.19	23.84
		48 Mbps	9.29	23.84
		54 Mbps	9.15	23.84

Conducted Output Power Measurements (802.11a Mode: 5745~5825)

802.11a Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.			
5745	149	6 Mbps	8.66	30
		9 Mbps	8.72	30
		12 Mbps	8.71	30
		18 Mbps	8.75	30
		24 Mbps	8.77	30
		36 Mbps	8.67	30
		48 Mbps	8.74	30
		54 Mbps	8.62	30
5765	153	6 Mbps	8.58	30
		9 Mbps	8.67	30
		12 Mbps	8.62	30
		18 Mbps	8.60	30
		24 Mbps	8.48	30
		36 Mbps	8.05	30
		48 Mbps	7.93	30
		54 Mbps	7.64	30
5785	157	6 Mbps	8.59	30
		9 Mbps	8.66	30
		12 Mbps	8.59	30
		18 Mbps	8.63	30
		24 Mbps	8.51	30
		36 Mbps	8.51	30
		48 Mbps	8.65	30
		54 Mbps	8.54	30
5805	161	6 Mbps	8.51	30
		9 Mbps	8.56	30
		12 Mbps	8.57	30
		18 Mbps	8.52	30
		24 Mbps	8.21	30
		36 Mbps	7.96	30
		48 Mbps	7.84	30
		54 Mbps	7.58	30
5825	165	6 Mbps	8.39	30
		9 Mbps	8.40	30
		12 Mbps	8.47	30
		18 Mbps	8.46	30
		24 Mbps	8.46	30
		36 Mbps	8.45	30
		48 Mbps	8.57	30
		54 Mbps	8.45	30

20 MHz BW

Conducted Output Power Measurements (802.11n 20MHz Mode: 5180~5240)

802.11n Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.			
5180	36	6.5 Mbps	9.15	16.92
		13 Mbps	9.19	16.92
		19.5 Mbps	9.18	16.92
		26 Mbps	9.25	16.92
		39 Mbps	9.23	16.92
		52 Mbps	9.18	16.92
		58.5 Mbps	9.36	16.92
		65 Mbps	9.12	16.92
5200	40	6.5 Mbps	9.17	16.92
		13 Mbps	9.27	16.92
		19.5 Mbps	9.07	16.92
		26 Mbps	9.16	16.92
		39 Mbps	9.16	16.92
		52 Mbps	9.27	16.92
		58.5 Mbps	9.12	16.92
		65 Mbps	9.17	16.92
5220	44	6.5 Mbps	9.17	16.92
		13 Mbps	9.18	16.92
		19.5 Mbps	9.06	16.92
		26 Mbps	9.15	16.92
		39 Mbps	9.14	16.92
		52 Mbps	9.19	16.92
		58.5 Mbps	9.13	16.92
		65 Mbps	9.12	16.92
5240	48	6.5 Mbps	9.16	16.92
		13 Mbps	9.00	16.92
		19.5 Mbps	8.99	16.92
		26 Mbps	9.06	16.92
		39 Mbps	9.06	16.92
		52 Mbps	9.08	16.92
		58.5 Mbps	9.15	16.92
		65 Mbps	9.13	16.92

Conducted Output Power Measurements (802.11n 20MHz Mode: 5260~5320)

802.11n Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.			
5260	52	6.5 Mbps	9.49	23.90
		13 Mbps	9.36	23.90
		19.5 Mbps	9.34	23.90
		26 Mbps	9.35	23.90
		39 Mbps	9.42	23.90
		52 Mbps	9.60	23.90
		58.5 Mbps	9.43	23.90
		65 Mbps	9.46	23.90
5280	56	6.5 Mbps	9.46	23.90
		13 Mbps	9.47	23.90
		19.5 Mbps	9.24	23.90
		26 Mbps	9.22	23.90
		39 Mbps	9.21	23.90
		52 Mbps	9.20	23.90
		58.5 Mbps	9.45	23.90
		65 Mbps	9.31	23.90
5300	60	6.5 Mbps	9.45	23.90
		13 Mbps	9.46	23.90
		19.5 Mbps	9.23	23.90
		26 Mbps	9.24	23.90
		39 Mbps	9.29	23.90
		52 Mbps	9.47	23.90
		58.5 Mbps	9.43	23.90
		65 Mbps	9.28	23.90
5320	64	6.5 Mbps	9.27	23.90
		13 Mbps	9.38	23.90
		19.5 Mbps	9.15	23.90
		26 Mbps	9.36	23.90
		39 Mbps	9.30	23.90
		52 Mbps	9.33	23.90
		58.5 Mbps	9.25	23.90
		65 Mbps	9.34	23.90

Conducted Output Power Measurements (802.11n 20MHz Mode: 5500~5700)

802.11a Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.			
5500	100	6.5 Mbps	9.08	23.91
		13 Mbps	9.26	23.91
		19.5 Mbps	9.13	23.91
		26 Mbps	9.42	23.91
		39 Mbps	9.34	23.91
		52 Mbps	9.28	23.91
		58.5 Mbps	9.26	23.91
		65 Mbps	9.13	23.91
5520	104	6.5 Mbps	9.06	23.91
		13 Mbps	9.06	23.91
		19.5 Mbps	9.09	23.91
		26 Mbps	9.02	23.91
		39 Mbps	8.72	23.91
		52 Mbps	8.42	23.91
		58.5 Mbps	8.36	23.91
		65 Mbps	8.2	23.91
5540	108	6.5 Mbps	9.02	23.91
		13 Mbps	9.09	23.91
		19.5 Mbps	9.02	23.91
		26 Mbps	8.97	23.91
		39 Mbps	8.64	23.91
		52 Mbps	8.3	23.91
		58.5 Mbps	8.25	23.91
		65 Mbps	8.09	23.91
5560	112	6.5 Mbps	9.02	23.91
		13 Mbps	9.04	23.91
		19.5 Mbps	8.98	23.91
		26 Mbps	8.89	23.91
		39 Mbps	8.62	23.91
		52 Mbps	8.28	23.91
		58.5 Mbps	8.25	23.91
		65 Mbps	8.1	23.91
5580	116	6.5 Mbps	8.99	23.91
		13 Mbps	8.89	23.91
		19.5 Mbps	8.91	23.91
		26 Mbps	9.06	23.91
		39 Mbps	9.03	23.91
		52 Mbps	8.92	23.91
		58.5 Mbps	8.90	23.91
		65 Mbps	8.97	23.91

5660	132	6.5 Mbps	8.98	23.91
		13 Mbps	8.92	23.91
		19.5 Mbps	8.71	23.91
		26 Mbps	8.58	23.91
		39 Mbps	8.26	23.91
		52 Mbps	8.01	23.91
		58.5 Mbps	7.91	23.91
		65 Mbps	7.73	23.91
5680	136	6.5 Mbps	8.94	23.91
		13 Mbps	8.87	23.91
		19.5 Mbps	8.64	23.91
		26 Mbps	8.51	23.91
		39 Mbps	8.21	23.91
		52 Mbps	7.91	23.91
		58.5 Mbps	7.78	23.91
		65 Mbps	7.62	23.91
5700	140	6.5 Mbps	8.94	23.91
		13 Mbps	8.76	23.91
		19.5 Mbps	8.56	23.91
		26 Mbps	8.46	23.91
		39 Mbps	8.09	23.91
		52 Mbps	7.86	23.91
		58.5 Mbps	7.76	23.91
		65 Mbps	7.63	23.91
5720	144	6.5 Mbps	9.09	23.91
		13 Mbps	9.05	23.91
		19.5 Mbps	9.19	23.91
		26 Mbps	9.08	23.91
		39 Mbps	9.18	23.91
		52 Mbps	9.19	23.91
		58.5 Mbps	9.32	23.91
		65 Mbps	9.18	23.91

Conducted Output Power Measurements (802.11n 20 MHz BW Mode: 5745~5825)

802.11n Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.			
5745	149	6.5 Mbps	8.66	30
		13 Mbps	8.67	30
		19.5 Mbps	8.74	30
		26 Mbps	8.73	30
		39 Mbps	8.65	30
		52 Mbps	8.68	30
		58.5 Mbps	8.71	30
		65 Mbps	8.72	30
5765	153	6.5 Mbps	8.56	30
		13 Mbps	8.55	30
		19.5 Mbps	8.51	30
		26 Mbps	8.41	30
		39 Mbps	8.14	30
		52 Mbps	7.85	30
		58.5 Mbps	7.79	30
		65 Mbps	7.64	30
5785	157	6.5 Mbps	8.52	30
		13 Mbps	8.60	30
		19.5 Mbps	8.64	30
		26 Mbps	8.54	30
		39 Mbps	8.58	30
		52 Mbps	8.63	30
		58.5 Mbps	8.61	30
		65 Mbps	8.50	30
5805	161	6.5 Mbps	8.78	30
		13 Mbps	8.63	30
		19.5 Mbps	8.46	30
		26 Mbps	8.33	30
		39 Mbps	7.98	30
		52 Mbps	7.69	30
		58.5 Mbps	7.58	30
		65 Mbps	7.51	30
5825	165	6.5 Mbps	8.39	30
		13 Mbps	8.46	30
		19.5 Mbps	8.49	30
		26 Mbps	8.50	30
		39 Mbps	8.57	30
		52 Mbps	8.43	30
		58.5 Mbps	8.43	30
		65 Mbps	8.52	30

40 MHz BW

Conducted Output Power Measurements (802.11n 40 MHz Mode: 5190~5230)

802.11a Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.			
5190	38	13.5 Mbps	9.14	16.99
		27 Mbps	9.25	16.99
		40.5 Mbps	9.40	16.99
		54 Mbps	9.26	16.99
		81 Mbps	8.89	16.99
		108 Mbps	9.31	16.99
		121.5 Mbps	9.39	16.99
		135 Mbps	8.95	16.99
5230	46	13.5 Mbps	8.65	16.99
		27 Mbps	8.57	16.99
		40.5 Mbps	9.09	16.99
		54 Mbps	8.79	16.99
		81 Mbps	8.62	16.99
		108 Mbps	8.71	16.99
		121.5 Mbps	8.89	16.99
		135 Mbps	8.55	16.99
5270	54	13.5 Mbps	9.63	23.98
		27 Mbps	9.58	23.98
		40.5 Mbps	9.69	23.98
		54 Mbps	9.63	23.98
		81 Mbps	9.59	23.98
		108 Mbps	9.41	23.98
		121.5 Mbps	9.43	23.98
		135 Mbps	9.42	23.98
5310	62	13.5 Mbps	9.55	23.98
		27 Mbps	9.42	23.98
		40.5 Mbps	9.25	23.98
		54 Mbps	9.57	23.98
		81 Mbps	9.58	23.98
		108 Mbps	9.06	23.98
		121.5 Mbps	9.39	23.98
		135 Mbps	9.46	23.98
5510	102	13.5 Mbps	7.85	23.98
		27 Mbps	7.85	23.98
		40.5 Mbps	7.85	23.98
		54 Mbps	7.93	23.98
		81 Mbps	7.88	23.98
		108 Mbps	7.86	23.98
		121.5 Mbps	7.79	23.98
		135 Mbps	7.70	23.98

5550	110	13.5 Mbps	7.96	23.98
		27 Mbps	8.02	23.98
		40.5 Mbps	8.00	23.98
		54 Mbps	8.02	23.98
		81 Mbps	7.84	23.98
		108 Mbps	7.77	23.98
		121.5 Mbps	8.07	23.98
		135 Mbps	8.04	23.98
5670	134	13.5 Mbps	7.89	23.98
		27 Mbps	7.96	23.98
		40.5 Mbps	7.92	23.98
		54 Mbps	7.88	23.98
		81 Mbps	7.79	23.98
		108 Mbps	7.85	23.98
		121.5 Mbps	7.93	23.98
		135 Mbps	7.95	23.98
5710	142	13.5 Mbps	7.74	23.98
		27 Mbps	7.74	23.98
		40.5 Mbps	7.80	23.98
		54 Mbps	7.93	23.98
		81 Mbps	8.13	23.98
		108 Mbps	8.29	23.98
		121.5 Mbps	8.00	23.98
		135 Mbps	7.94	23.98

Conducted Output Power Measurements (802.11n 40 MHz BW Mode: 5755~5795)

5755	151	13.5 Mbps	7.22	30
		27 Mbps	7.23	30
		40.5 Mbps	7.23	30
		54 Mbps	7.25	30
		81 Mbps	7.40	30
		108 Mbps	7.23	30
		121.5 Mbps	7.23	30
		135 Mbps	7.25	30
5795	159	13.5 Mbps	6.90	30
		27 Mbps	7.51	30
		40.5 Mbps	7.53	30
		54 Mbps	7.55	30
		81 Mbps	7.53	30
		108 Mbps	6.94	30
		121.5 Mbps	6.90	30
		135 Mbps	7.54	30

20 MHz BW

Conducted Output Power Measurements (802.11ac 20 MHz Mode: 5180~5240)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.			
5180	36	6.5	8.34	16.99
		13	8.38	16.99
		19.5	8.20	16.99
		26	8.37	16.99
		39	8.19	16.99
		52	8.46	16.99
		58.5	8.39	16.99
		65	8.24	16.99
		78	8.26	16.99
5200	40	6.5	8.48	16.99
		13	8.18	16.99
		19.5	8.27	16.99
		26	8.35	16.99
		39	8.43	16.99
		52	8.21	16.99
		58.5	8.22	16.99
		65	8.18	16.99
		78	8.19	16.99
5220	44	6.5	8.84	16.99
		13	8.44	16.99
		19.5	8.34	16.99
		26	8.13	16.99
		39	7.86	16.99
		52	7.63	16.99
		58.5	7.49	16.99
		65	7.40	16.99
		78	7.18	16.99
5240	48	6.5	8.34	16.99
		13	8.09	16.99
		19.5	8.06	16.99
		26	8.10	16.99
		39	8.15	16.99
		52	8.22	16.99
		58.5	8.02	16.99
		65	8.18	16.99
		78	8.28	16.99

Conducted Output Power Measurements (802.11ac 20 MHz Mode: 5260~5320)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.			
5260	52	6.5	8.42	23.98
		13	8.45	23.98
		19.5	8.35	23.98
		26	8.47	23.98
		39	8.40	23.98
		52	8.54	23.98
		58.5	8.32	23.98
		65	8.43	23.98
		78	8.45	23.98
5280	56	6.5	8.84	23.98
		13	8.66	23.98
		19.5	8.36	23.98
		26	8.27	23.98
		39	7.96	23.98
		52	8.15	23.98
		58.5	8.26	23.98
		65	8.28	23.98
		78	8.31	23.98
5300	60	6.5	8.23	23.98
		13	8.32	23.98
		19.5	8.23	23.98
		26	8.36	23.98
		39	8.35	23.98
		52	8.26	23.98
		58.5	8.36	23.98
		65	8.26	23.98
		78	8.33	23.98
5320	64	6.5	8.21	23.98
		13	8.22	23.98
		19.5	8.31	23.98
		26	8.28	23.98
		39	8.36	23.98
		52	8.22	23.98
		58.5	8.36	23.98
		65	8.36	23.98
		78	8.13	23.98

Conducted Output Power Measurements (802.11ac 20 MHz Mode: 5500~5720)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.			
5500	100	6.5	8.19	23.98
		13	8.12	23.98
		19.5	8.14	23.98
		26	8.09	23.98
		39	8.17	23.98
		52	8.09	23.98
		58.5	8.27	23.98
		65	8.07	23.98
		78	8.32	23.98
5520	104	6.5	8.61	23.98
		13	8.46	23.98
		19.5	8.19	23.98
		26	8.05	23.98
		39	7.73	23.98
		52	7.47	23.98
		58.5	7.38	23.98
		65	7.25	23.98
		78	7.05	23.98
5540	108	6.5	8.5	23.98
		13	8.33	23.98
		19.5	8.2	23.98
		26	8.05	23.98
		39	7.78	23.98
		52	7.45	23.98
		58.5	7.27	23.98
		65	7.18	23.98
		78	6.96	23.98
5560	112	6.5	8.43	23.98
		13	8.27	23.98
		19.5	8.05	23.98
		26	7.9	23.98
		39	7.62	23.98
		52	7.23	23.98
		58.5	7.28	23.98
		65	7.16	23.98
		78	6.87	23.98
5580	116	6.5	8.05	23.98
		13	7.93	23.98
		19.5	7.90	23.98
		26	7.94	23.98
		39	7.93	23.98
		52	7.83	23.98
		58.5	7.92	23.98
		65	7.95	23.98
		78	7.97	23.98

5660	132	6.5	8.19	23.98
		13	7.89	23.98
		19.5	7.74	23.98
		26	7.59	23.98
		39	7.29	23.98
		52	6.95	23.98
		58.5	6.83	23.98
		65	6.74	23.98
		78	6.52	23.98
5680	136	6.5	8.17	23.98
		13	7.96	23.98
		19.5	7.62	23.98
		26	7.49	23.98
		39	7.19	23.98
		52	6.92	23.98
		58.5	6.74	23.98
		65	6.8	23.98
		78	6.51	23.98
5700	140	6.5	7.84	23.98
		13	7.78	23.98
		19.5	7.50	23.98
		26	7.44	23.98
		39	7.13	23.98
		52	6.83	23.98
		58.5	6.72	23.98
		65	6.63	23.98
		78	6.42	23.98
5720	144	6.5	7.49	23.98
		13	7.55	23.98
		19.5	7.56	23.98
		26	7.59	23.98
		39	7.37	23.98
		52	7.43	23.98
		58.5	7.37	23.98
		65	7.35	23.98
		78	7.54	23.98

Conducted Output Power Measurements (802.11ac 20 MHz Mode: 5745~5825)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.			
5745	149	6.5	7.62	30
		13	7.72	30
		19.5	7.64	30
		26	7.71	30
		39	7.70	30
		52	7.64	30
		58.5	7.66	30
		65	7.67	30
		78	7.45	30
5765	153	6.5	7.50	30
		13	7.51	30
		19.5	7.56	30
		26	7.40	30
		39	7.14	30
		52	6.94	30
		58.5	6.81	30
		65	6.67	30
		78	6.5	30
5785	157	6.5	7.42	30
		13	7.48	30
		19.5	7.49	30
		26	7.55	30
		39	7.59	30
		52	7.42	30
		58.5	7.43	30
		65	7.42	30
		78	7.46	30
5805	161	6.5	7.48	30
		13	7.42	30
		19.5	7.30	30
		26	7.10	30
		39	7.28	30
		52	7.32	30
		58.5	7.32	30
		65	7.33	30
		78	7.32	30
5825	165	6.5	7.40	30
		13	7.40	30
		19.5	7.29	30
		26	7.36	30
		39	7.39	30
		52	7.31	30
		58.5	7.33	30
		65	7.35	30
		78	7.35	30

40 MHz BW

Conducted Output Power Measurements (802.11ac 40 MHz Mode: 5190~5230)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.			
5190	38	13.5	7.95	16.99
		27	8.43	16.99
		40.5	8.15	16.99
		54	8.19	16.99
		81	8.41	16.99
		108	7.91	16.99
		121.5	8.20	16.99
		135	7.80	16.99
		162	8.29	16.99
		180	7.91	16.99
5230	46	13.5	8.16	16.99
		27	8.00	16.99
		40.5	8.07	16.99
		54	7.71	16.99
		81	7.69	16.99
		108	7.81	16.99
		121.5	8.08	16.99
		135	8.10	16.99
		162	8.20	16.99
		180	7.52	16.99

Conducted Output Power Measurements (802.11ac 40MHz Mode: 5270~5310)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.			
5270	54	13.5	8.29	23.98
		27	8.34	23.98
		40.5	8.28	23.98
		54	8.70	23.98
		81	8.51	23.98
		108	8.66	23.98
		121.5	8.67	23.98
		135	8.66	23.98
		162	8.99	23.98
		180	8.72	23.98
5310	62	13.5	8.32	23.98
		27	8.37	23.98
		40.5	8.48	23.98
		54	8.42	23.98
		81	8.41	23.98
		108	8.13	23.98
		121.5	8.17	23.98
		135	8.43	23.98
		162	8.08	23.98
		180	8.40	23.98

Conducted Output Power Measurements (802.11ac 40 MHz Mode: 5510~5670)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.			
5510	102	13.5	7.75	23.98
		27	7.50	23.98
		40.5	7.56	23.98
		54	7.55	23.98
		81	7.66	23.98
		108	7.57	23.98
		121.5	7.53	23.98
		135	7.48	23.98
		162	7.51	23.98
		180	7.50	23.98
5550	110	13.5	7.61	23.98
		27	7.88	23.98
		40.5	7.59	23.98
		54	7.83	23.98
		81	7.70	23.98
		108	7.77	23.98
		121.5	7.54	23.98
		135	7.74	23.98
		162	7.80	23.98
		180	7.71	23.98
5670	134	13.5	7.34	23.98
		27	7.38	23.98
		40.5	7.46	23.98
		54	7.39	23.98
		81	7.31	23.98
		108	7.29	23.98
		121.5	7.36	23.98
		135	7.35	23.98
		162	7.31	23.98
		180	7.27	23.98
5710	142	13.5	6.97	23.98
		27	7.09	23.98
		40.5	6.95	23.98
		54	6.87	23.98
		81	6.97	23.98
		108	6.99	23.98
		121.5	7.13	23.98
		135	6.88	23.98
		162	6.87	23.98
		180	7.15	23.98

Conducted Output Power Measurements (802.11ac 40 MHz BW Mode: 5755~5795)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.			
5755	151	13.5	6.27	30
		27	6.30	30
		40.5	6.20	30
		54	6.37	30
		81	6.30	30
		108	6.29	30
		121.5	6.28	30
		135	6.18	30
		162	6.25	30
		180	6.26	30
5795	159	13.5	6.03	30
		27	5.98	30
		40.5	6.56	30
		54	5.98	30
		81	6.56	30
		108	5.92	30
		121.5	5.93	30
		135	5.90	30
		162	6.47	30
		180	6.46	30

80 MHz BW

Conducted Output Power Measurements (802.11ac 80MHz Mode: 5210)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.			
5210	42	29.3	7.56	16.99
		58.5	7.57	16.99
		87.8	7.58	16.99
		117	7.53	16.99
		175.5	7.45	16.99
		234	7.60	16.99
		263.3	7.65	16.99
		292.5	7.56	16.99
		351	7.60	16.99
		390	7.58	16.99

Conducted Output Power Measurements (802.11ac 80MHz Mode: 5290)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.			
5290	58	29.3	7.59	23.98
		58.5	7.60	23.98
		87.8	7.63	23.98
		117	7.61	23.98
		175.5	7.72	23.98
		234	7.67	23.98
		263.3	7.59	23.98
		292.5	7.62	23.98
		351	7.60	23.98
		390	7.56	23.98

Conducted Output Power Measurements (802.11ac 80MHz Mode: 5530~5690)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.			
5530	106	29.3	6.96	23.98
		58.5	6.96	23.98
		87.8	7.05	23.98
		117	7.08	23.98
		175.5	6.99	23.98
		234	7.03	23.98
		263.3	7.06	23.98
		292.5	7.00	23.98
		351	7.08	23.98
		390	7.05	23.98
5690	138	29.3	6.47	23.98
		58.5	6.50	23.98
		87.8	6.59	23.98
		117	6.46	23.98
		175.5	6.41	23.98
		234	6.39	23.98
		263.3	6.39	23.98
		292.5	6.42	23.98
		351	6.42	23.98
		390	6.54	23.98

Conducted Output Power Measurements (802.11ac 80 MHz BW Mode: 5775)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency[MHz]	Channel No.			
5775	155	29.3	6.72	30
		58.5	6.57	30
		87.8	6.54	30
		117	6.62	30
		175.5	6.48	30
		234	6.72	30
		263.3	6.50	30
		292.5	6.54	30
		351	6.64	30
		390	6.69	30

11.4 Test Exclusions Applied

11.4.1 Wi-Fi/BT

Per FCC KDB Publication 648474 D03-D04, this device is considered a “phablet” since its diagonal distance, 170.1 mm, is greater than 160 mm. Therefore hand SAR tests are required. Because wireless router operations are not supported for 5 GHz NII WIFI, hand SAR was evaluated for 5 GHz NII WIFI. However, hand SAR was not evaluated for 2.4 GHz WIFI and 5 GHz DTS WIFI since Hotspot SAR for 2.4 GHz WIFI and 5 GHz DTS WIFI were < 1.2 W/kg.”

Per FCC KDB 447498 D01v05, The SAR exclusion threshold for distance < 50mm is defined by the following equation:

$$\frac{Max\ Power\ of\ Channel(mW)}{Test\ \ Separation\ Distance\ (mm)} * \sqrt{Frequency(GHz)} \leq 3.0$$

. Mode	Frequency	Maximum Allowed Power	Separatuin Distance	≤ 3.0
	[MHz]	[mW]	[mm]	
Bluetooth	2441	8	10	1.24

Based on the maximum conducted power of Bluetooth and antenna to use separation distance, Bluetooth SAR was not required [(8/10)*√2.441] = 1.24 < 3.0.

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB 447498 D01v05 IV.C.1iii, simultaneous transmission SAR test exclusion may be applied when the sum of the 1-g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is ≤ 1.6W/kg. When standalone SAR is not required to be measured per FCC KDB 447498 D01v05 4.3.22, the following equation must be used to estimate the standalone 1-g SAR for simultaneous transmission assessment involving that transmitter

$$Estimated\ SAR = \frac{\sqrt{f(GHZ)}}{7.5} * \frac{(Max\ Power\ of\ channel\ mW)}{Min\ Seperation\ Distance}.$$

. Mode	Frequency	Maximum Allowed Power	Separatuin Distance (Body)	Estimated SAR (Body)
	[MHz]	[mW]	[mm]	[W/kg]
Bluetooth	2441	8	10	0.17

Note : Held-to ear configurations are not applicable to Bluetooth operations and therefore were not considered for simultaneous transmission. The Estimated SAR results were determined according to FCC KDB447498 D01v05

11.4.2 Licenced Transmitter(s)

GSM/GPRS/EDGE DTM is not supported for US bands. Therefore, the GMS Voice modes in this report do not transmit simultaneously with GPRS/EDGE Data.

Justification for reduced test configurations per KDB 941225 D03v01: The source-based time-averaged output power was evaluated for all multi-slot operations. The multi-slot configuration with the highest frame averaged output power was evaluated for SAR.

This device is only capable of QPSK HSUPA in the uplink. Therefore, no additional SAR tests are required beyond that descrived for device with HSUPA in KDB 941225 D01v02.

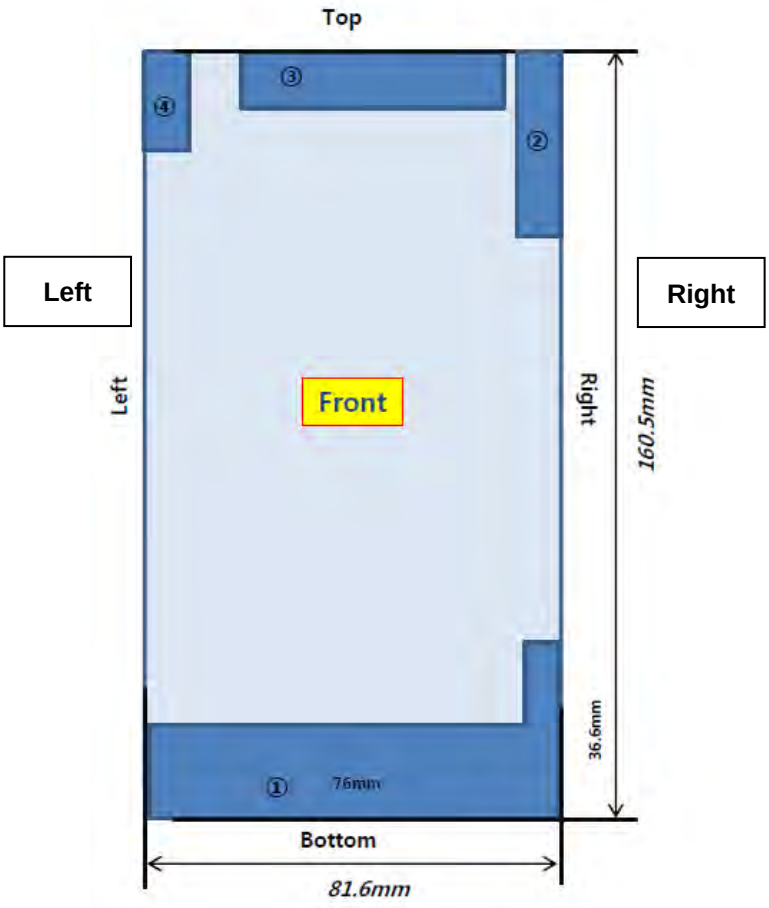
Per FCC KDB Publication 648474 D04 Handset SAR v01r01, since the device is a paablet and all hotspot SAR was < 1.2 W/kg, hand SAR was not required for licensed transmitters.

12. SAR Test configuration & Antenna Information

12.1 Mobile Hotspot sides for SAR Testing configurations

Mode	Rear	Front	Left	Right	Bottom	Top
GSM 850	Yes	Yes	Yes	Yes	Yes	No
GSM 1 900	Yes	Yes	Yes	Yes	Yes	No
WCDMA 850	Yes	Yes	Yes	Yes	Yes	No
2.4 GHz WLAN	Yes	Yes	Yes	No	No	Yes
5 GHz WLAN	Yes	Yes	Yes	No	No	Yes

12.2 Antenna and Device Information



Antenna	Mode	Band
①	GSM	G850 Tx, Rx
	GSM	EGSM Tx, Rx
	GSM	GSM1800 Tx, Rx
	GSM	GSM1900 Tx, Rx
	WCDMA	Band 1 Tx, Rx
	WCDMA	Band 5 Tx, Rx
	LTE	Band 1 Tx, Rx
	LTE	Band 3 Tx, Rx
	LTE	Band 11 Tx, Rx
	LTE	Band 1 2nd Rx
②	GNSS	1.574~1.6GHz
	LTE	Band 11 2nd Rx
③	LTE	Band 3 2nd Rx
④	Bluetooth	2.4GHz
	Wi-Fi	2.4GHz/5GHz

Note;

1. Per FCC KDB Publication 941225 D06v01, we performed the SAR testing at 0.8 cm and 1.0 cm from the top & bottom surfaces and also from side edges with a transmitting antenna ≤ 2.5 cm from an edge.
*Please see the KS1301_Antenna distance for futher information.
2. This EUT doesn't support LTE communication but the EUT have LTE device.

13. SAR TEST DATA SUMMARY

13.1-1 Measurement Results (GSM850 Head SAR)

Frequency		Mode	Power (dBm)		Power Drift (dB)	Battery	Phantom Position	Measured SAR(mW/g)	Scaling Facor	Scaled SAR(mW/g)	Plot No.
MHz	Ch.		Tune-Up Limit	Conducted Power							
836.6	190	GSM850	33.2	31.88	-0.118	Standard	Left Ear	0.344	1.355	0.466	-
836.6	190		33.2	31.88	-0.168	Standard	Left Tilt	0.149	1.355	0.202	-
836.6	190		33.2	31.88	0.013	Standard	Right Ear	0.276	1.355	0.374	-
836.6	190		33.2	31.88	-0.035	Standard	Right Tilt	0.141	1.355	0.191	-
836.6	190	GPRS 3Tx	30.2	29.29	0.193	Standard	Left Ear	0.510	1.233	0.629	1
836.6	190		30.2	29.29	-0.130	Standard	Left Tilt	0.261	1.233	0.322	-
836.6	190		30.2	29.29	0.051	Standard	Right Ear	0.413	1.233	0.509	-
836.6	190		30.2	29.29	-0.141	Standard	Right Tilt	0.206	1.233	0.254	-
ANSI/ IEEE C95.1 - 1992– Safety Limit **Spatial Peak** **Uncontrolled Exposure/ General Population**							**Head** **1.6 W/kg (mW/g)** Averaged over 1 gram				

13.1-2 Measurement Results (GSM1900 Head SAR)

Frequency		Mode	Power (dBm)		Power Drift (dB)	Battery	Phantom Position	Measured SAR(mW/g)	Scaling Facor	Scaled SAR(mW/g)	Plot No.
MHz	Ch.		Tune-Up Limit	Conducted Power							
1 880.0	661	GSM 1900	30.2	29.12	0.101	Standard	Left Ear	0.163	1.282	0.209	-
1 880.0	661		30.2	29.12	-0.134	Standard	Left Tilt	0.080	1.282	0.103	-
1 880.0	661		30.2	29.12	-0.113	Standard	Right Ear	0.174	1.282	0.223	-
1 880.0	661		30.2	29.12	-0.029	Standard	Right Tilt	0.084	1.282	0.108	-
1 880.0	661	GPRS 3Tx	26.7	25.62	-0.182	Standard	Left Ear	0.192	1.282	0.246	-
1 880.0	661		26.7	25.62	0.087	Standard	Left Tilt	0.096	1.282	0.123	-
1 880.0	661		26.7	25.62	-0.025	Standard	Right Ear	0.215	1.282	0.276	2
1 880.0	661		26.7	25.62	-0.055	Standard	Right Tilt	0.109	1.282	0.140	-
ANSI/ IEEE C95.1 - 1992– Safety Limit **Spatial Peak** **Uncontrolled Exposure/ General Population**							**Head** **1.6 W/kg (mW/g)** Averaged over 1 gram				

13.1-3 Measurement Results (WCDMA850 Head SAR)

Frequency		Mode	Power (dBm)		Power Drift (dB)	Battery	Phantom Position	Measured SAR(mW/g)	Scaling Facor	Scaled SAR(mW/g)	Plot No.
MHz	Ch.		Tune-Up Limit	Conducted Power							
836.6	4183	WCDMA850	23.7	22.83	-0.183	Standard	Left Ear	0.330	1.222	0.403	3
836.6	4183		23.7	22.83	-0.107	Standard	Left Tilt	0.164	1.222	0.200	-
836.6	4183		23.7	22.83	-0.184	Standard	Right Ear	0.273	1.222	0.334	-
836.6	4183		23.7	22.83	0.060	Standard	Right Tilt	0.146	1.222	0.178	-
ANSI/ IEEE C95.1 - 1992– Safety Limit **Spatial Peak** **Uncontrolled Exposure/ General Population**							**Head** **1.6 W/kg (mW/g)** Averaged over 1 gram				

13.1-4 Measurement Results (DTS Head SAR)

Frequency		Mode	Power (dBm)		Power Drift (dB)	Battery	Phantom Position	Data Rate	Measured SAR(mW/g)	Scaling Facor	Scaled SAR(mW/g)	Plot No.
MHz	Ch.		Tune-Up Limit	Conducted Power								
2 437	6	802.11b	16.5	15.84	-0.104	Standard	Left Ear	1Mbps	0.074	1.164	0.086	-
			16.5	15.84	0.120	Standard	Left Tilt	1Mbps	0.055	1.164	0.064	-
			16.5	15.84	-0.180	Standard	Right Ear	1Mbps	0.239	1.164	0.278	4
			16.5	15.84	-0.117	Standard	Right Tilt	1Mbps	0.096	1.164	0.112	-
5 745	149	802.11a	10.0	8.66	-0178	Standard	Left Ear	6Mbps	0.055	1.361	0.075	-
			10.0	8.66	-0.101	Standard	Left Tilt	6Mbps	0.043	1.361	0.059	-
			10.0	8.66	-0.191	Standard	Right Ear	6Mbps	0.068	1.361	0.093	5
			10.0	8.66	-0.190	Standard	Right Tilt	6Mbps	0.056	1.361	0.076	-
5 775	155	802.11ac	9.0	6.72	-0.158	Standard	Right Ear	29.3Mbps	0.024	1.690	0.041	-
ANSI/ IEEE C95.1 - 1992– Safety Limit **Spatial Peak** **Uncontrolled Exposure/ General Population**							**Head** **1.6 W/kg (mW/g)** Averaged over 1 gram					

13.1-5 Measurement Results (Nll Head SAR)

Frequency		Mode	Power (dBm)		Power Drift (dB)	Battery	Phantom Position	Data Rate	Measured SAR (mW/g)	Scaling Facor	Scaled SAR (mW/g)	Plot No.
MHz	Ch		Tune-Up Limit	Conducted Power								
5 180	36	802.11a	10.0	9.25	-0.169	Standard	Left Ear	6Mbps	0.047	1.189	0.056	-
5 180	36	802.11a	10.0	9.25	-0.154	Standard	Left Tilt	6Mbps	0.031	1.189	0.037	-
5 180	36	802.11a	10.0	9.25	-0.183	Standard	Right Ear	6Mbps	0.029	1.189	0.034	-
5 180	36	802.11a	10.0	9.25	-0.121	Standard	Right Tilt	6Mbps	0.056	1.189	0.067	-
5 210	42	802.11ac	9.0	7.56	-0.189	Standard	Right Tilt	29.3Mbps	0.028	1.393	0.039	-
5 300	60	802.11a	10.0	9.45	-0.108	Standard	Left Ear	6Mbps	0.056	1.135	0.064	-
5 300	60	802.11a	10.0	9.45	-0.118	Standard	Left Tilt	6Mbps	0.058	1.135	0.066	-
5 300	60	802.11a	10.0	9.45	-0.124	Standard	Right Ear	6Mbps	0.065	1.135	0.074	6
5 300	60	802.11a	10.0	9.45	-0.121	Standard	Right Tilt	6Mbps	0.057	1.135	0.065	-
5 290	58	802.11ac	9.0	7.59	-0.198	Standard	Right Ear	29.3Mbps	0.026	1.384	0.036	-
5 500	100	802.11a	10.0	9.17	-0.148	Standard	Left Ear	6Mbps	0.021	1.211	0.025	-
5 500	100	802.11a	10.0	9.17	-0.159	Standard	Left Tilt	6Mbps	0.015	1.211	0.018	-
5 500	100	802.11a	10.0	9.17	-0.145	Standard	Right Ear	6Mbps	0.051	1.211	0.062	-
5 500	100	802.11a	10.0	9.17	-0.164	Standard	Right Tilt	6Mbps	0.039	1.211	0.047	-
5 530	106	802.11ac	9.0	6.96	-0.149	Standard	Right Ear	29.3Mbps	0.022	1.291	0.028	-
5 690	138	802.11ac	9.0	6.47	-0.102	Standard	Right Ear	29.3Mbps	0.019	1.791	0.034	
ANSI/ IEEE C95.1 - 1992– Safety Limit **Spatial Peak** **Uncontrolled Exposure/ General Population**							**Head** **1.6 W/kg (mW/g)** Averaged over 1 gram					

13.2-1 Measurement Results (GSM850 Hotspot SAR)

Frequency		Mode	Power (dBm)		Power Drift (dB)	Configuration	Separation Distance	Measured SAR(mW/g)	Scaling Facor	Scaled SAR(mW/g)	Plot No.
MHz	Ch.		Tune-Up Limit	Conducted Power							
836.6	190	GPRS 3Tx	30.2	29.29	-0.074	Rear	0.8 cm	0.528	1.233	0.651	7
824.2	128		30.2	29.21	-0.028	Front	0.8 cm	0.489	1.256	0.614	-
836.6	190		30.2	29.29	-0.072	Front	0.8 cm	0.694	1.233	0.856	-
848.8	251		30.2	29.11	0.097	Front	0.8 cm	0.791	1.285	1.017	8
836.6	190		30.2	29.29	-0.090	Left	1.0 cm	0.368	1.233	0.454	-
836.6	190		30.2	29.29	0.100	Right	1.0 cm	0.238	1.233	0.293	-
836.6	190		30.2	29.29	-0.092	Bottom	1.0 cm	0.202	1.233	0.249	-
ANSI/ IEEE C95.1 - 1992– Safety Limit **Spatial Peak** **Uncontrolled Exposure/ General Population**							**Body** **1.6 W/kg (mW/g)** Averaged over 1 gram				

13. 2-2 Measurement Results (GSM1900 Hotspot SAR)

Frequency		Mode	Power (dBm)		Power Drift (dB)	Configuration	Separation Distance	Measured SAR (mW/g)	Scaling Facor	Scaled SAR (mW/g)	Plot No.
MHz	Ch.		Tune-Up Limit	Conducted Power							
1 880.0	661	GPRS 3Tx	26.7	25.62	0.074	Rear	0.8 cm	0.584	1.282	0.749	9
1850.2	512		26.7	25.58	0.020	Front	0.8 cm	0.564	1.294	0.730	
1 880.0	661		26.7	25.62	-0.019	Front	0.8 cm	0.624	1.282	0.800	
1909.8	810		26.7	25.60	0.023	Front	0.8 cm	0.686	1.288	0.884	10
1 880.0	661		26.7	25.62	-0.188	Left	1.0 cm	0.136	1.282	0.174	
1 880.0	661		26.7	25.62	-0.090	Right	1.0 cm	0.125	1.282	0.160	
1 880.0	661		26.7	25.62	-0.066	Bottom	1.0 cm	0.351	1.282	0.450	
ANSI/ IEEE C95.1 - 1992– Safety Limit **Spatial Peak** **Uncontrolled Exposure/ General Population**							**Body** **1.6 W/kg (mW/g)** Averaged over 1 gram				

13. 2-3 Measurement Results (WCDMA850 Hotspot SAR)

Frequency		Mode	Power (dBm)		Power Drift (dB)	Configuration	Separation Distance	Measured SAR(mW/g)	Scaling Facor	Scaled SAR(mW/g)	Plot No.
MHz	Ch.		Tune-Up Limit	Conducted Power							
836.6	4183	WCDMA850	23.7	22.83	-0.042	Rear	0.8 cm	0.341	1.222	0.417	11
836.6	4183		23.7	22.83	-0.038	Front	0.8 cm	0.471	1.222	0.575	12
836.6	4183		23.7	22.83	0.009	Left	1.0 cm	0.272	1.222	0.332	
836.6	4183		23.7	22.83	0.066	Right	1.0 cm	0.179	1.222	0.219	
836.6	4183		23.7	22.83	0.000	Bottom	1.0 cm	0.165	1.222	0.202	-
ANSI/ IEEE C95.1 - 1992– Safety Limit **Spatial Peak** **Uncontrolled Exposure/ General Population**							**0.093Body** **1.6 W/kg (mW/g)** Averaged over 1 gram				

13. 2-4 Measurement Results (WLAN Hotspot SAR)

Frequency		Mode	Power (dBm)		Power Drift (dB)	Configuration	Data Rate	Separation Distance	Measured SAR (mW/g)	Scaling Facor	Scaled SAR (mW/g)	Plot No.
MHz	Ch		Tune-Up Limit	Conducted Power								
2 437	6	802.11b	16.5	15.84	0.114	Rear	1Mbps	0.8 cm	0.065	1.164	0.076	13
			16.5	15.84	-0.139	Front	1Mbps	0.8 cm	0.034	1.164	0.040	
			16.5	15.84	-0.122	Left	1Mbps	1.0 cm	0.054	1.164	0.063	
			16.5	15.84	-0.122	Top	1Mbps	1.0 cm	0.012	1.164	0.014	
5 745	149	802.11a	10.0	8.66	-0.120	Rear	6Mbps	0.8 cm	0.045	1.361	0.061	14
			10.0	8.66	-0.116	Front	6Mbps	0.8 cm	0.023	1.361	0.031	
			10.0	8.66	-0.152	Left	6Mbps	1.0 cm	0.056	1.361	0.076	15
			10.0	8.66	-0.169	Top	6Mbps	1.0 cm	0.037	1.361	0.050	
5 775	155	802.11ac	9.0	6.72	-0.196	Left	29.3Mbps	1.0 cm	0.031	1.690	0.052	
ANSI/ IEEE C95.1 - 1992– Safety Limit **Spatial Peak** **Uncontrolled Exposure/ General Population**							**Body** **1.6 W/kg (mW/g)** Averaged over 1 gram					

13.3-1 Measurement Results (WLAN Body-worn SAR)

Frequency		Mode	Power (dBm)		Power Drift (dB)	Configuration	Data Rate	Separation Distance	Measured SAR (mW/g)	Scaling Facor	Scaled SAR (mW/g)	Plot No.
MHz	Ch.		Tune-Up Limit	Conducted Power								
2 437	6	802.11b	16.5	15.84	0.114	Rear	1Mbps	0.8 cm	0.065	1.164	0.076	13
5 745	149	802.11a	10.0	8.66	-0.120	Rear	6Mbps	0.8 cm	0.045	1.361	0.061	14
5 775	155	802.11ac	9.0	6.72	-0.164	Rear	29.3Mbps	0.8 cm	0.031	1.690	0.052	
ANSI/ IEEE C95.1 - 1992– Safety Limit **Spatial Peak** **Uncontrolled Exposure/ General Population**							**Body** **1.6 W/kg (mW/g)** Averaged over 1 gram					

13.3-2 Measurement Results (Nll Body-worn SAR)

Frequency		Mode	Power (dBm)		Power Drift (dB)	Configuration	Data Rate	Separation Distance	Measured SAR (mW/g)	Scaling Facor	Scaled SAR (mW/g)	Plot No.
MHz	Ch		Tune-Up Limit	Conducted Power								
5 180	36	802.11a	10.0	9.25	-0.143	Rear	6Mbps	0.8 cm	0.054	1.189	0.064	16
5 210	42	802.11ac	9.0	7.56	-0.179	Rear	29.3Mbps	0.8 cm	0.027	1.393	0.038	
5 260	60	802.11a	10.0	9.45	-0.125	Rear	6Mbps	0.8 cm	0.042	1.135	0.048	
5 290	58	802.11ac	9.0	7.59	-0.128	Rear	29.3Mbps	0.8 cm	0.025	1.384	0.035	
5 500	100	802.11a	10.0	9.17	-0.113	Rear	6Mbps	0.8 cm	0.037	1.211	0.045	
5 530	106	802.11ac	9.0	6.96	-0.110	Rear	29.3Mbps	0.8 cm	0.010	1.600	0.016	
5 690	138	802.11ac	9.0	6.47	-0.191	Rear	29.3Mbps	0.8 cm	0.023	1.791	0.041	
ANSI/ IEEE C95.1 - 1992– Safety Limit **Spatial Peak** **Uncontrolled Exposure/ General Population**							**Body** **1.6 W/kg (mW/g)** Averaged over 1 gram					

13.3-3 Measurement Results (Body-worn SAR)

Frequency		Mode	Power (dBm)		Power Drift (dB)	Configuration	Separation Distance	Measured SAR (mW/g)	Scaling Facor	Scaled SAR (mW/g)	Plot No.
MHz	Ch.		Tune-Up Limit	Conducted Power							
836.6	190	GSM850	33.2	31.88	0.007	Rear	0.8 cm	0.368	1.355	0.499	
836.6	190	GPRS 3Tx	30.2	29.29	-0.074	Rear	0.8 cm	0.528	1.233	0.651	7
1 880.0	661	GSM1900	30.2	29.12	-0.193	Rear	0.8 cm	0.396	1.282	0.508	
1 880.0	661	GPRS 3Tx	26.7	25.62	0.074	Rear	0.8 cm	0.584	1.282	0.749	9
836.6	4183	WCDMA850	23.7	22.83	-0.042	Rear	0.8 cm	0.341	1.222	0.417	11
ANSI/ IEEE C95.1 - 1992– Safety Limit **Spatial Peak** **Uncontrolled Exposure/ General Population**							**Body** **1.6 W/kg (mW/g)** Averaged over 1 gram				

13.4-1 Measurement Results (Nll Hand SAR)

Frequency		Mode	Power (dBm)		Power Drift (dB)	Configuration	Data Rate	Separation Distance	Measured SAR (mW/g)	Scaling Facor	Scaled SAR (mW/g)	Plot No.
MHz	Ch.		Tune-Up Limit	Conducted Power								
5 180	36	802.11a	10.0	9.25	-0.117	Rear	6Mbps	0 cm	0.062	1.189	0.074	
5 180	36	802.11a	10.0	9.25	-0.156	Front	6Mbps	0 cm	0.047	1.189	0.056	
5 180	36	802.11a	10.0	9.25	-0.107	Left	6Mbps	0 cm	0.095	1.189	0.113	
5 180	36	802.11a	10.0	9.25	0.184	Top	6Mbps	0 cm	0.049	1.189	0.058	
5 210	42	802.11ac	9.0	7.56	-0.125	Left	29.3Mbps	0 cm	0.051	1.393	0.071	
5 260	60	802.11a	10.0	9.45	-0.107	Rear	6Mbps	0 cm	0.057	1.135	0.065	
5 260	60	802.11a	10.0	9.45	-0.131	Front	6Mbps	0 cm	0.051	1.135	0.058	
5 260	60	802.11a	10.0	9.45	-0.183	Left	6Mbps	0 cm	0.097	1.135	0.110	17
5 260	60	802.11a	10.0	9.45	-0.053	Top	6Mbps	0 cm	0.044	1.135	0.050	
5 290	58	802.11ac	9.0	7.59	-0.164	Left	29.3Mbps	0 cm	0.047	1.384	0.065	
5 500	100	802.11a	10.0	9.17	-0.144	Rear	6Mbps	0 cm	0.041	1.211	0.050	
5 500	100	802.11a	10.0	9.17	-0.114	Front	6Mbps	0 cm	0.036	1.211	0.044	
5 500	100	802.11a	10.0	9.17	-0.102	Left	6Mbps	0 cm	0.071	1.211	0.086	
5 500	100	802.11a	10.0	9.17	0.112	Top	6Mbps	0 cm	0.033	1.211	0.040	
5 530	106	802.11ac	9.0	6.96	0.124	Left	29.3Mbps	0 cm	0.043	1.600	0.069	
5690	138	802.11ac	9.0	6.47	-0.148	Left	29.3Mbps	0 cm	0.047	1.791	0.084	
ANSI/ IEEE C95.1 - 1992– Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							**Body 2.0 W/kg (mW/g) Averaged over 10 gram**					

13.5 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2003, FCC KDB Procedure.
2. Batteries are fully charged at the beginning of the SAR measurements. A standard battery was used for all SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB 447498 D01v05.
6. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 10 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
7. Per FCC KDB 648474 D04v01, SAR was evaluated without a headset connected to the device. Since the standalone reported SAR was ≤ 1.2 W/kg, no additional SAR evaluation using a headset cable were required.
8. Per FCC KDB 865664 D01v01, variability SAR tests were not performed since the measured SAR results for all frequency bands were less than 0.8 W/kg. Please see Section 14 for variability analysis information.
9. 1g SAR : For Back side, the device was tested at a distance of 8 mm at the center of the device. For Front side, the device was tested at a distance of 8mm from the outer ends of the device. The remaining surface or edges within 25 mm of Tx antenna were tested at a distance of 10 mm.

   10g SAR: For Back side, the device was test at a distance of 0 mm at the center. If the 10g SAR > 2.5 W/kg, the device was additionally tested bottom end touching the phantom as well as the top end touching the phantom. For Front side, the device was tested at a distance of 0 mm at the outer ends of the device. The remaining surface or edge within 25 mm of a Tx antenna were tested at a distance of 0mm.

GSM/GPRS Test Notes:

1. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
2. This device supports GSM VOIP in the head and body-worn configurations; therefore GPRS was additionally evaluated for head and body-worn compliance.
3. Justification for reduced test configurations per KDB 941225 D03v01: The source-based time-averaged output power was evaluated for all multi-slot operations. The multi-slot configuration with the highest frame averaged output power was evaluated for SAR.
4. Per FCC KDB 447498 D01v05, 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). When the maximum output power variation across the required test channels is 1/2 dB, instead of the middle channel, the highest output power channel must be used.

UMTS Notes:

1. UMTS mode in Body SAR was tested under RMC 12.2 kbps with HSPA inactive per KDB 941225 D01v02. HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg.
2. Per FCC KDB 447498 D01v05, 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). When the maximum output power variation across the channel highest output power channel was used.

WLAN Notes:

1. Justification for reduced test configurations for WIFI channels per KDB 248227 D01v01r02 and Oct. 2012 FCC/TCB Meeting Notes for 2.4 GHz WIFI: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11b. Other IEEE 802.11 modes (including 802.11 g/n) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11b mode.
2. Justification for reduced test configurations for WIFI channels per KDB 248227 D01v01r02 and Oct. 2012 FCC/TCB Meeting Notes for 5 GHz WIFI: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11a. Other IEEE 802.11 modes (including 802.11 n 20MHz and 40 MHz bandwidths) were not investigated since the average output power over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data of IEEE 802.11a mode.
3. Per Apr. 2013 TCB Workshop notes, full SAR test for all IEEE 802.11 ac configurations were not required because the average output power was not more than 0.25 dB higher than IEEE 802.11 a mode. IEEE 802.11 ac was evaluated for the highest IEEE 802.11 a configuration in each 5 GHz band and exposure condition.
4. When wireless router is enabled, 5.2, 5.3 and 5.5 GHz bands are disabled.
5. This device can operate in the 2.4 GHz and 5.8 GHz bands using WIFI Direct Go capability. Per FCC KDB 941225, 5.8 GHz WIFI Direct Go is evaluated for SAR using wireless router SAR evaluation procedures.
6. Since the maximum extrapolated peak SAR of the zoom scan for the maximum output channel was $\leq$ 1.6 W/kg and the reported 1g averaged SAR was $<$ 0.8 W/kg, SAR testing on other default channels was not required.
7. Per FCC KDB Publication 648474 D03-D04, this device is considered a “phablet” since its diagonal distance, 170.1 mm, is greater than 160 mm. Therefore hand SAR tests are required. Because wireless router operations are not supported for 5 GHz NII WIFI, hand SAR was evaluated for 5 GHz NII WIFI. However, hand SAR was not evaluated for 2.4 GHz WIFI and 5 GHz DTS WIFI since Hotspot SAR for 2.4 GHz WIFI and 5 GHz DTS WIFI were < 1.2 W/kg.”
8. 5GHz Wifi Direct GO is supported in the 5.8 Ghz band only. The manufacturer expects 5.8 GHz Wifi Direct GO may be used similar to wireless router usage. Therefore, 5.8 GHz Wifi Direct GO was evaluated for SAR similar to wireless router SAR procedures in FCC KDB Publication 941225.

14. SAR Measurement Variability and Uncertainty

In accordance with published RF Exposure KDB procedure 865664 D01 SAR measurement 100 MHz to 6 GHz v01. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.

2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.

3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

Note(s):

1. Second Repeated Measurement is not required since the ratio of the largest to smallest SAR for the original and first repeated measurement is not > 1.20.
2. Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg.

15. SAR Summation Scenario

	Position	Applicable Combination	Note
Simultaneous Transmission	Head	GSM 850 Voice/Data + 2.4 GHz WiFi	
		GSM 1900 Voice/Data + 2.4 GHz WiFi	
		WCDMA850 Voice + 2.4 GHz WiFi	
		GSM 850 Voice/Data + 5 GHz WiFi	
		GSM 1900 Voice/Data + 5 GHz WiFi	
		WCDMA850 Voice +5 GHz WiFi	
	Hotspot	GPRS 850 Data + 2.4 GHz WiFi	
		GPRS 1900 Data + 2.4 GHz WiFi	
		WCDMA850 Data + 2.4 GHz WiFi	
		GPRS 850 Data + 5 GHz WiFi	Wifi Direct GO
		GPRS 1900 Data + 5 GHz WiFi	
		WCDMA850 Data + 5 GHz WiFi	

	Position	Applicable Combination	Note
Simultaneous Transmission	Body-worn	GSM 850 Voice/Data + 2.4 GHz WiFi	
		GSM 1900 Voice/Data + 2.4 GHz WiFi	
		WCDMA850 Voice + 2.4 GHz WiFi	
		GSM 850 Voice/Data + 5 GHz WiFi	
		GSM 1900 Voice/Data + 5 GHz WiFi	
		WCDMA850 Voice + 5 GHz WiFi	
		GSM 850 Voice + 2.4 GHz Bluetooth	
		GSM 1900 Voice + 2.4 GHz Bluetooth	
		WCDMA850 Voice+ 2.4 GHz Bluetooth	
* BT and WLAN are not simultaneous transmission.			

15.1 Simultaneous Transmission Summation for Head

Simultaneous Transmission Summation with 2.4 GHz WIFI

Band	configuration	Scaled SAR (W/kg)	2.4 GHz WIFI Scaled SAR (W/kg)	∑ 1-g SAR (W/kg)
GSM 850	Left Cheek	0.466	0.086	0.552
	Left Tilt	0.202	0.064	0.266
	Right Cheek	0.374	0.278	0.652
	Right Tilt	0.191	0.112	0.303
GPRS 850	Left Cheek	0.629	0.086	0.715
	Left Tilt	0.322	0.064	0.386
	Right Cheek	0.509	0.278	0.787
	Right Tilt	0.254	0.112	0.366
GSM 1900	Left Cheek	0.209	0.086	0.295
	Left Tilt	0.103	0.064	0.167
	Right Cheek	0.223	0.278	0.501
	Right Tilt	0.108	0.112	0.220
GPRS 1900	Left Cheek	0.246	0.086	0.332
	Left Tilt	0.123	0.064	0.187
	Right Cheek	0.276	0.278	0.554
	Right Tilt	0.140	0.112	0.252
WCDMA 850	Left Cheek	0.403	0.086	0.489
	Left Tilt	0.200	0.064	0.264
	Right Cheek	0.334	0.278	0.612
	Right Tilt	0.178	0.112	0.290

Simultaneous Transmission Summation with 5 GHz WIFI

Band	configuration	Scaled SAR (W/kg)	5 GHz WIFI Scaled SAR (W/kg)	∑ 1-g SAR (W/kg)
GSM850	Left Cheek	0.466	0.075	0.541
	Left Tilt	0.202	0.066	0.268
	Right Cheek	0.374	0.093	0.467
	Right Tilt	0.191	0.076	0.267
GPRS 850	Left Cheek	0.629	0.075	0.704
	Left Tilt	0.322	0.066	0.388
	Right Cheek	0.509	0.093	0.602
	Right Tilt	0.254	0.076	0.330
GSM 1900	Left Cheek	0.209	0.075	0.284
	Left Tilt	0.103	0.066	0.169
	Right Cheek	0.223	0.093	0.316
	Right Tilt	0.108	0.076	0.184
GPRS 1900	Left Cheek	0.246	0.075	0.321
	Left Tilt	0.123	0.066	0.189
	Right Cheek	0.276	0.093	0.369
	Right Tilt	0.140	0.076	0.216
WCDMA 850	Left Cheek	0.403	0.075	0.478
	Left Tilt	0.200	0.066	0.266
	Right Cheek	0.334	0.093	0.427
	Right Tilt	0.178	0.076	0.254

15.2 Simultaneous Transmission Summation for Body-Worn

Simultaneous Transmission Summation with 2.4 GHz WIFI (1 cm)

Band	configuration	Scaled SAR (W/kg)	2.4 GHz WIFI Scaled SAR (W/kg)	∑ 1-g SAR (W/kg)
GSM 850	Rear	0.651	0.076	0.727
GSM 1900	Rear	0.749	0.076	0.825
WCDMA850	Rear	0.417	0.076	0.493

Simultaneous Transmission Summation with 5 GHz WIFI (1 cm)

Band	configuration	Scaled SAR (W/kg)	5 GHz WIFI Scaled SAR (W/kg)	∑ 1-g SAR (W/kg)
GSM 850	Rear	0.651	0.064	0.715
GSM 1900	Rear	0.749	0.064	0.813
WCDMA850	Rear	0.417	0.064	0.481

Simultaneous Transmission Summation with Bluetooth (1 cm)

Band	configuration	Scaled SAR (W/kg)	BT SAR (W/kg)	∑ 1-g SAR (W/kg)
GSM 850	Rear	0.651	0.17	0.821
GSM 1900	Rear	0.749	0.17	0.919
WCDMA850	Rear	0.417	0.17	0.587

15.3 Simultaneous Transmission Summation for Hotspot

Simultaneous Transmission Summation with 2.4 GHz WIFI (1 cm)

Band	configuration	Scaled SAR (W/kg)	2.4 GHz WIFI Scaled SAR (W/kg)	∑ 1-g SAR (W/kg)
GSM 850	Rear	0.651	0.076	0.727
	Front	1.017	0.040	1.057
	Left	0.454	0.063	0.517
	Right	0.293		0.307
	Bottom	0.249		0.249
	Top		0.014	0.014
GSM 1900	Rear	0.749	0.076	0.825
	Front	0.884	0.040	0.924
	Left	0.174	0.063	0.237
	Right	0.160		0.160
	Bottom	0.450		0.450
	Top		0.014	0.014
WCDMA 850	Rear	0.417	0.076	0.493
	Front	0.575	0.040	0.615
	Left	0.332	0.063	0.395
	Right	0.219		0.219
	Bottom	0.202		0.202
	Top		0.014	0.014

Simultaneous Transmission Summation with 5 GHz WIFI (1 cm)

Band	configuration	Scaled SAR (W/kg)	5 GHz WIFI Scaled SAR (W/kg)	∑ 1-g SAR (W/kg)
GSM 850	Rear	0.651	0.064	0.715
	Front	1.017	0.031	1.048
	Left	0.454	0.076	0.530
	Right	0.293		0.293
	Bottom	0.249		0.249
	Top		0.050	0.050
GSM 1900	Rear	0.749	0.064	0.813
	Front	0.884	0.031	0.915
	Left	0.174	0.076	0.250
	Right	0.160		0.160
	Bottom	0.450		0.450
	Top		0.050	0.050
WCDMA 850	Rear	0.417	0.064	0.481
	Front	0.575	0.031	0.606
	Left	0.332	0.076	0.408
	Right	0.219		0.219
	Bottom	0.202		0.202
	Top		0.050	0.050

15.4 Simultaneous Transmission Conclusion

The above numerical summed SAR results for all the worst-case simultaneous transmission conditions were below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit. And therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D01v05

16. CONCLUSION

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the ANSI/ IEEE C95.1 1992.

These measurements are taken to simulate the RF effects exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests.

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[21] SAR Evaluation of Handsets with Multiple Transmitters and Antennas #648474.

[22] SAR Measurement Procedure for 802.11 a/b/g Transmitters #KDB 248227.

Attachment 1. – SAR Test Plots

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/ GPRS/EDGE, Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC
Liquid Temperature:	20.2 ℃
Ambient Temperature:	20.4 ℃
Test Date:	Oct.07, 2013
Plot No.	1

DUT: KS1301; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:2.77
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.864 mho/m; ε_r = 41.3; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

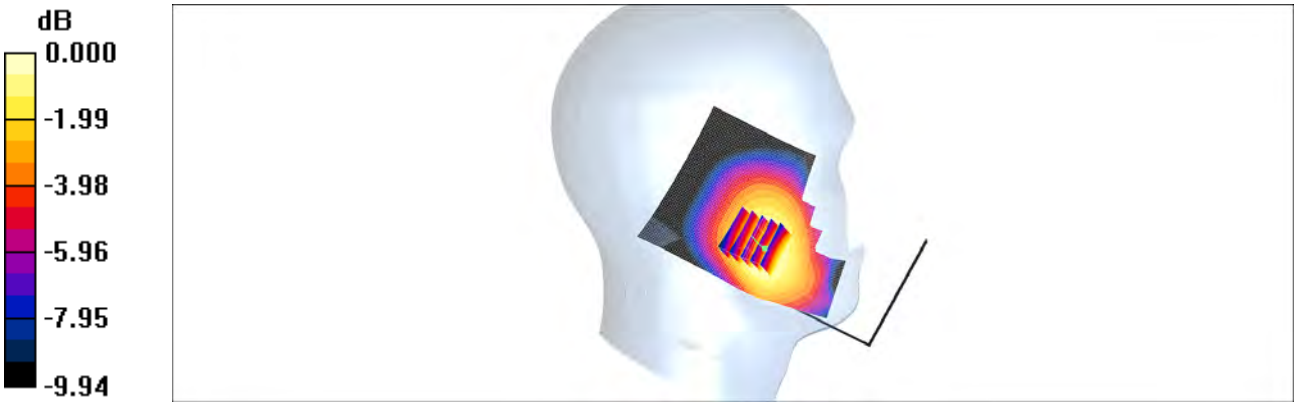
DASY4 Configuration:
- Probe: EX3DV4 - SN3903; ConvF(9.87, 9.87, 9.87); Calibrated: 2013-03-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn648; Calibrated: 2013-04-24
- Phantom: 800/900 Phantom; Type: SAM

GSM850 Left Touch GPRS 3Tx 190/Area Scan (71x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.542 mW/g

GSM850 Left Touch GPRS 3Tx 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.87 V/m; Power Drift = 0.193 dB
Peak SAR (extrapolated) = 0.678 W/kg
SAR(1 g) = 0.510 mW/g; SAR(10 g) = 0.376 mW/g

Maximum value of SAR (measured) = 0.538 mW/g



0 dB = 0.538mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/ GPRS/EDGE, Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC
Liquid Temperature:	20.7 ℃
Ambient Temperature:	20.9 ℃
Test Date:	Oct.09, 2013
Plot No.	2

DUT: KS1301; Type: Bar; Serial: #1

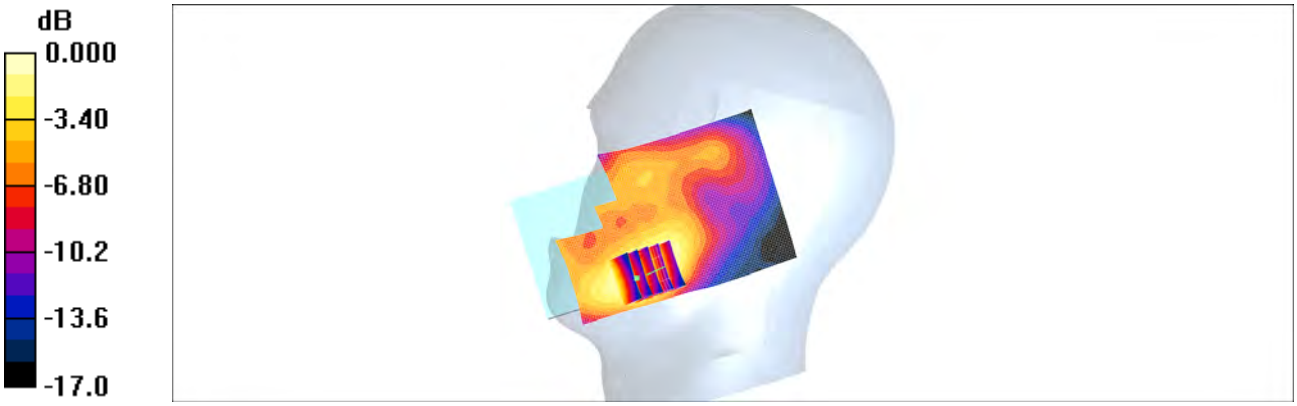
Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:2.77
Medium parameters used: f = 1880 MHz; σ = 1.35 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

DASY4 Configuration:
- Probe: EX3DV4 - SN3903; ConvF(8.3, 8.3, 8.3); Calibrated: 2013-03-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn648; Calibrated: 2013-04-24
- Phantom: SAM 835/900 MHz; Type: SAM

GSM1900 Right Touch 3Tx 661/Area Scan (71x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.247 mW/g

GSM1900 Right Touch 3Tx 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.10 V/m; Power Drift = -0.025 dB
Peak SAR (extrapolated) = 0.343 W/kg
SAR(1 g) = 0.215 mW/g; SAR(10 g) = 0.129 mW/g

Maximum value of SAR (measured) = 0.228 mW/g



0 dB = 0.228mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/ GPRS/EDGE, Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC
Liquid Temperature:	20.2 ℃
Ambient Temperature:	20.4 ℃
Test Date:	Oct.07, 2013
Plot No.	3

DUT: KS1301; Type: Bar; Serial: #1

Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.864 mho/m; ε_r = 41.3; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

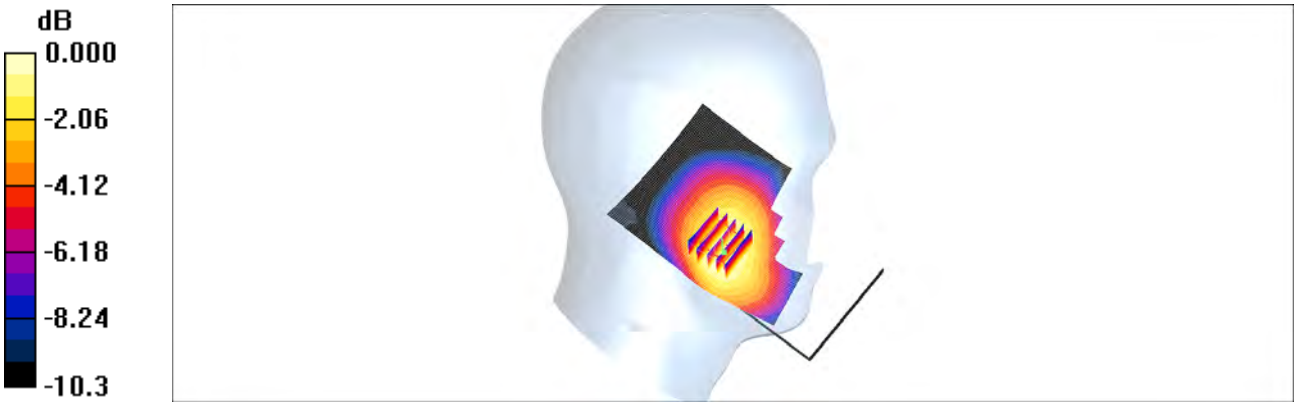
DASY4 Configuration:
- Probe: EX3DV4 - SN3903; ConvF(9.87, 9.87, 9.87); Calibrated: 2013-03-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn648; Calibrated: 2013-04-24
- Phantom: 800/900 Phantom; Type: SAM

WCDMA850 Left touch 4183/Area Scan (71x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.351 mW/g

WCDMA850 Left touch 4183/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.09 V/m; Power Drift = -0.183 dB
Peak SAR (extrapolated) = 0.438 W/kg
SAR(1 g) = 0.330 mW/g; SAR(10 g) = 0.240 mW/g

Maximum value of SAR (measured) = 0.356 mW/g



0 dB = 0.356mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/ GPRS/EDGE, Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC
Liquid Temperature:	20.5 ℃
Ambient Temperature:	20.7 ℃
Test Date:	Oct.10, 2013
Plot No.	4

DUT: KS1301; Type: Bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.78 mho/m; ε_r = 39.1; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

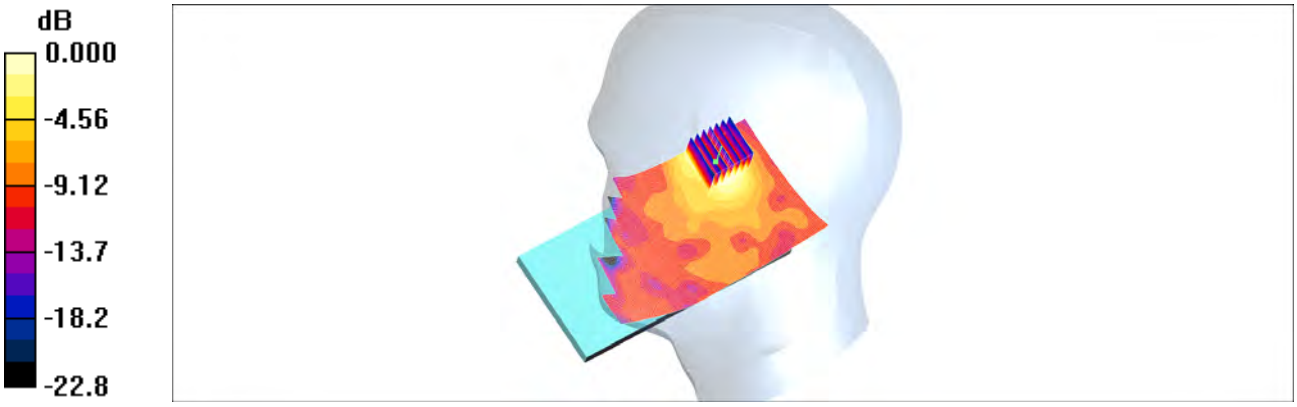
DASY4 Configuration:
- Probe: EX3DV4 - SN3903; ConvF(7.43, 7.43, 7.43); Calibrated: 2013-03-18
- Sensor-Surface: 2mm (Mechanical Surface Detection)Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn648; Calibrated: 2013-04-24
- Phantom: SAM 835/900 MHz; Type: SAM

802.11b Right Touch 1Mbps 6/Area Scan (81x151x1): Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (interpolated) = 0.371 mW/g

802.11b Right Touch 1Mbps 6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.03 V/m; Power Drift = -0.180 dB
Peak SAR (extrapolated) = 0.544 W/kg
SAR(1 g) = 0.239 mW/g; SAR(10 g) = 0.110 mW/g

Maximum value of SAR (measured) = 0.263 mW/g



0 dB = 0.263mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/ GPRS/EDGE, Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC
Liquid Temperature:	20.6 ℃
Ambient Temperature:	20.8 ℃
Test Date:	Oct.14, 2013
Plot No.	5

DUT: KS1301; Type: Bar; Serial: #1

Communication System: WIFI 5GHz; Frequency: 5745 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5745 MHz; σ = 5.18 mho/m; ε_r = 34.6; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

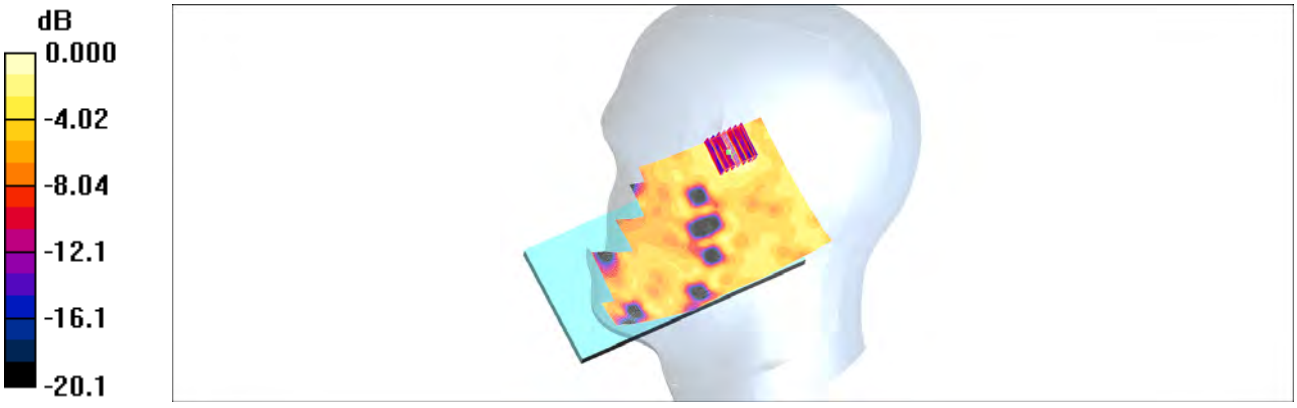
DASY4 Configuration:
- Probe: EX3DV4 - SN3903; ConvF(4.14, 4.14, 4.14); Calibrated: 2013-03-18
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn648; Calibrated: 2013-04-24
- Phantom: SAM 1800/1900 MHz; Type: SAM

802.11a Right Touch 149ch 6Mbps/Area Scan (101x161x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.122 mW/g

802.11a Right Touch 149ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.59 V/m; Power Drift = -0.191 dB
Peak SAR (extrapolated) = 0.320 W/kg
SAR(1 g) = 0.068 mW/g; SAR(10 g) = 0.028 mW/g

Maximum value of SAR (measured) = 0.136 mW/g



0 dB = 0.136mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/ GPRS/EDGE, Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC
Liquid Temperature:	20.6 ℃
Ambient Temperature:	20.8 ℃
Test Date:	Oct.14, 2013
Plot No.	6

DUT: KS1301; Type: Bar; Serial: #1

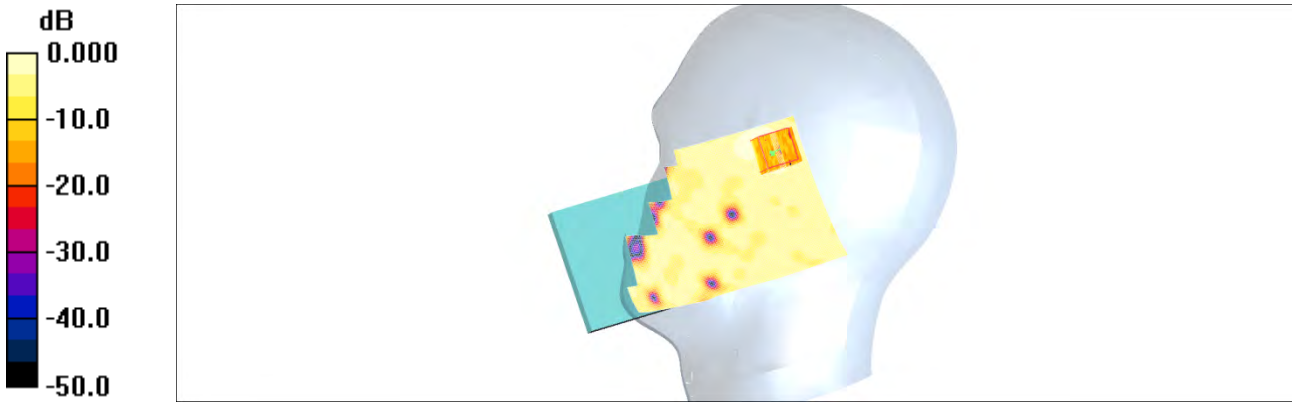
Communication System: WIFI 5GHz; Frequency: 5300 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5300 MHz; σ = 4.68 mho/m; ε_r = 35.8; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

DASY4 Configuration:
- Probe: EX3DV4 - SN3903; ConvF(4.6, 4.6, 4.6); Calibrated: 2013-03-18
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn648; Calibrated: 2013-04-24
- Phantom: SAM 1800/1900 MHz; Type: SAM

802.11a Right Touch 60ch 6Mbps/Area Scan (101x161x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.124 mW/g

802.11a Right Touch 60ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.62 V/m; Power Drift = -0.124 dB
Peak SAR (extrapolated) = 0.411 W/kg
SAR(1 g) = 0.065 mW/g; SAR(10 g) = 0.027 mW/g

Maximum value of SAR (measured) = 0.141 mW/g



0 dB = 0.141mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/ GPRS/EDGE, Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC
Liquid Temperature:	20.3 ℃
Ambient Temperature:	20.5 ℃
Test Date:	Oct.08, 2013
Plot No.	7

DUT: KS1301; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:2.77
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.951 mho/m; ε_r = 55.9; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

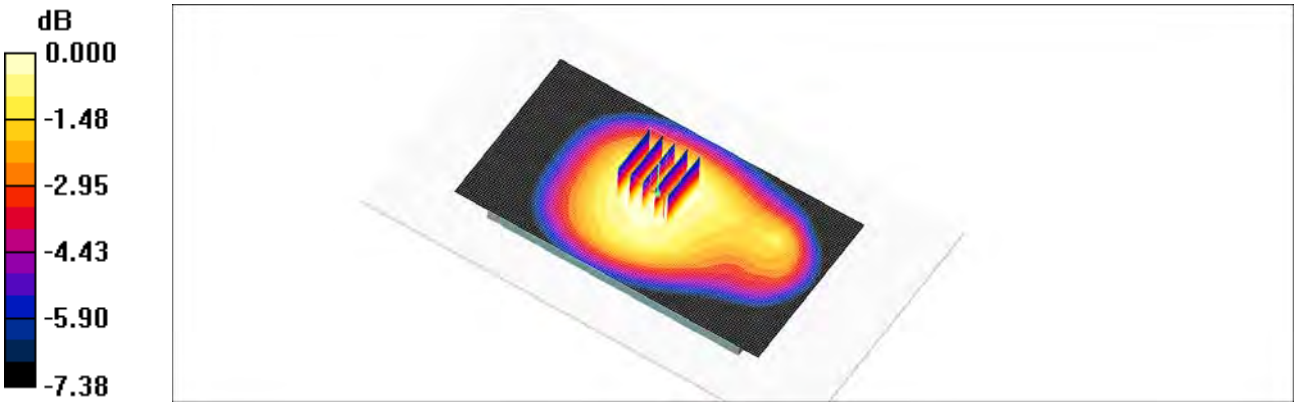
DASY4 Configuration:
- Probe: EX3DV4 - SN3903; ConvF(9.75, 9.75, 9.75); Calibrated: 2013-03-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn648; Calibrated: 2013-04-24
- Phantom: Triple Flat Phantom 5.1C_20120905; Type: QD 000 P51 CA

GSM850 Body Rear GPRS 3Tx 190/Area Scan (71x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.554 mW/g

GSM850 Body Rear GPRS 3Tx 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.5 V/m; Power Drift = -0.074 dB
Peak SAR (extrapolated) = 0.672 W/kg
SAR(1 g) = 0.528 mW/g; SAR(10 g) = 0.409 mW/g

Maximum value of SAR (measured) = 0.551 mW/g



0 dB = 0.551mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/ GPRS/EDGE, Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC
Liquid Temperature:	20.3 ℃
Ambient Temperature:	20.5 ℃
Test Date:	Oct.08, 2013
Plot No.	8

DUT: KS1301; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 848.8 MHz;Duty Cycle: 1:2.77
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.964 mho/m; ε_r = 55.8; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

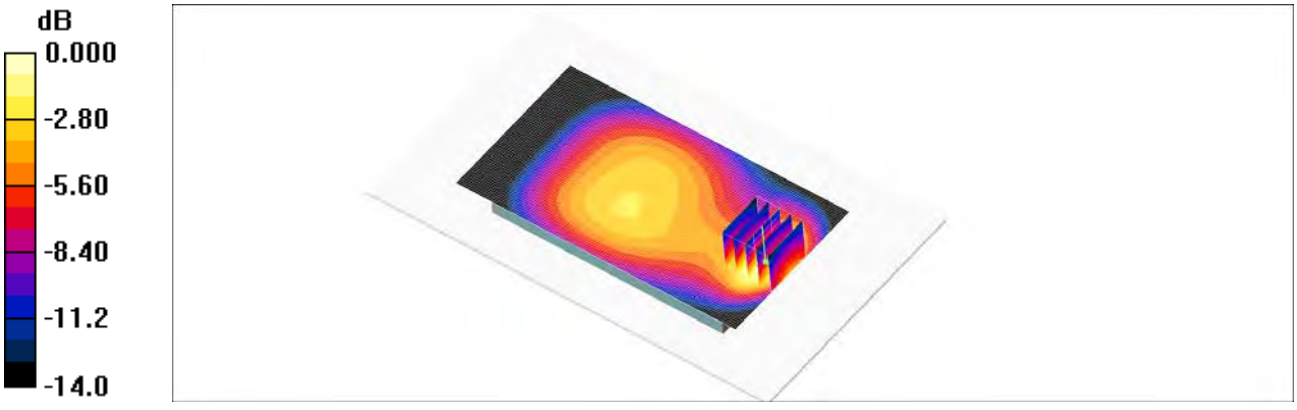
DASY4 Configuration:
- Probe: EX3DV4 - SN3903; ConvF(9.75, 9.75, 9.75); Calibrated: 2013-03-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn648; Calibrated: 2013-04-24
- Phantom: Triple Flat Phantom 5.1C_20120905; Type: QD 000 P51 CA

GSM850 Body Front GPRS 3Tx 251/Area Scan (71x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.868 mW/g

GSM850 Body Front GPRS 3Tx 251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.4 V/m; Power Drift = 0.097 dB
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 0.791 mW/g; SAR(10 g) = 0.454 mW/g

Maximum value of SAR (measured) = 0.890 mW/g



0 dB = 0.890mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/ GPRS/EDGE, Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC
Liquid Temperature:	20.7 ℃
Ambient Temperature:	20.9 ℃
Test Date:	Oct.09, 2013
Plot No.	9

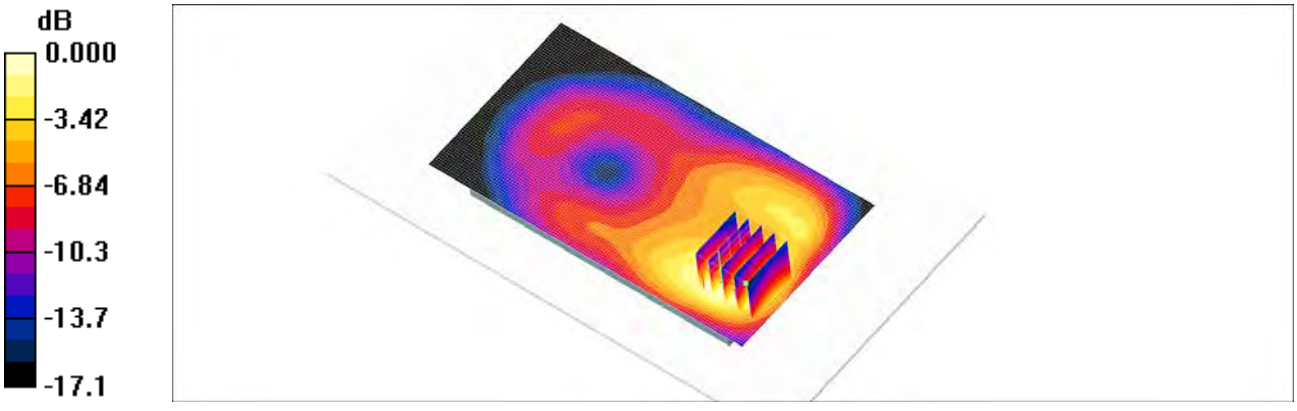
DUT: KS1301; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:2.77
Medium parameters used: f = 1880 MHz; σ = 1.48 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

DASY4 Configuration:
- Probe: EX3DV4 - SN3903; ConvF(7.53, 7.53, 7.53); Calibrated: 2013-03-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn648; Calibrated: 2013-04-24
- Phantom: Triple Flat Phantom 5.1C_20120905; Type: QD 000 P51 CA

GSM1900 Body Rear GPRS 3Tx 661/Area Scan (71x131x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.607 mW/g

GSM1900 Body Rear GPRS 3Tx 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.71 V/m; Power Drift = 0.074 dB
Peak SAR (extrapolated) = 0.957 W/kg
SAR(1 g) = 0.584 mW/g; SAR(10 g) = 0.344 mW/g
Maximum value of SAR (measured) = 0.623 mW/g



0 dB = 0.623mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/ GPRS/EDGE, Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC
Liquid Temperature:	20.7 ℃
Ambient Temperature:	20.9 ℃
Test Date:	Oct.09, 2013
Plot No.	10

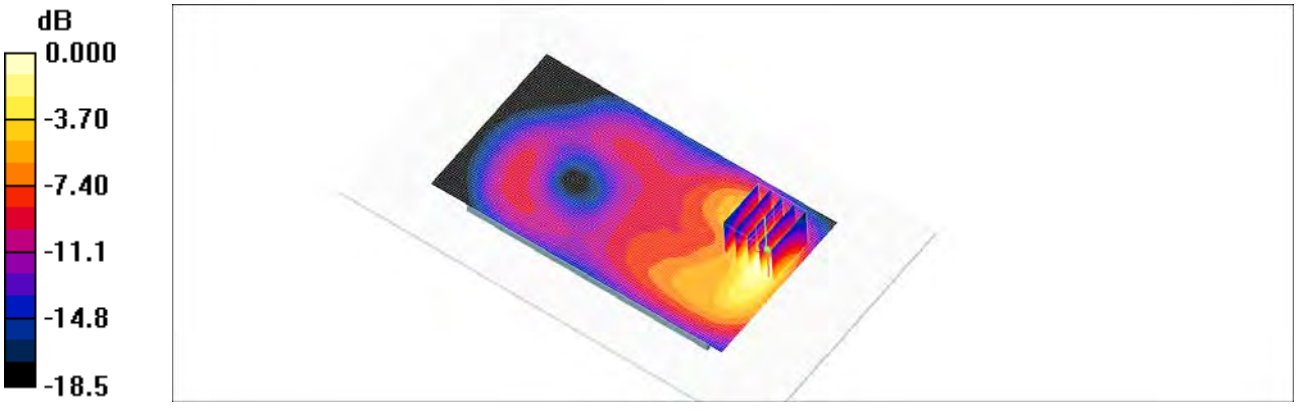
DUT: KS1301; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:2.77
Medium parameters used: f = 1910 MHz; σ = 1.52 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

DASY4 Configuration:
- Probe: EX3DV4 - SN3903; ConvF(7.53, 7.53, 7.53); Calibrated: 2013-03-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn648; Calibrated: 2013-04-24
- Phantom: Triple Flat Phantom 5.1C_20120905; Type: QD 000 P51 CA

GSM1900 Body Front GPRS 3Tx 810/Area Scan (71x131x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.742 mW/g

GSM1900 Body Front GPRS 3Tx 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.40 V/m; Power Drift = 0.023 dB
Peak SAR (extrapolated) = 1.26 W/kg
SAR(1 g) = 0.686 mW/g; SAR(10 g) = 0.366 mW/g
Maximum value of SAR (measured) = 0.781 mW/g



0 dB = 0.781mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/ GPRS/EDGE, Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC
Liquid Temperature:	20.3 ℃
Ambient Temperature:	20.5 ℃
Test Date:	Oct.08, 2013
Plot No.	11

DUT: KS1301; Type: Bar; Serial: #1

Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.951 mho/m; ε_r = 55.9; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

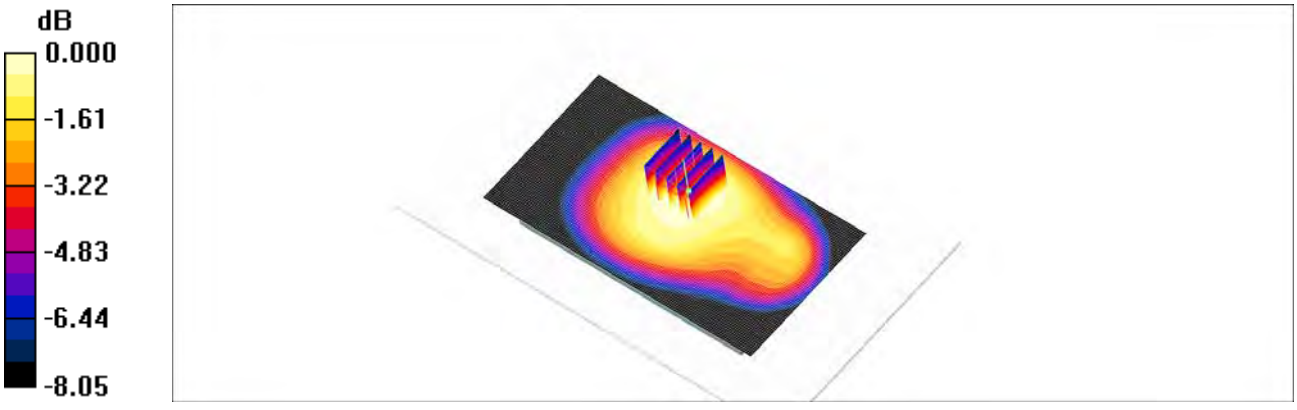
DASY4 Configuration:
- Probe: EX3DV4 - SN3903; ConvF(9.75, 9.75, 9.75); Calibrated: 2013-03-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn648; Calibrated: 2013-04-24
- Phantom: Triple Flat Phantom 5.1C_20120905; Type: QD 000 P51 CA

WCDMA850 Body Rear 4183/Area Scan (71x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.361 mW/g

WCDMA850 Body Rear 4183/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.6 V/m; Power Drift = -0.042 dB
Peak SAR (extrapolated) = 0.433 W/kg
SAR(1 g) = 0.341 mW/g; SAR(10 g) = 0.262 mW/g

Maximum value of SAR (measured) = 0.357 mW/g



0 dB = 0.357mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/ GPRS/EDGE, Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC
Liquid Temperature:	20.3 ℃
Ambient Temperature:	20.5 ℃
Test Date:	Oct.08, 2013
Plot No.	12

DUT: KS1301; Type: Bar; Serial: #1

Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.951 mho/m; ε_r = 55.9; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

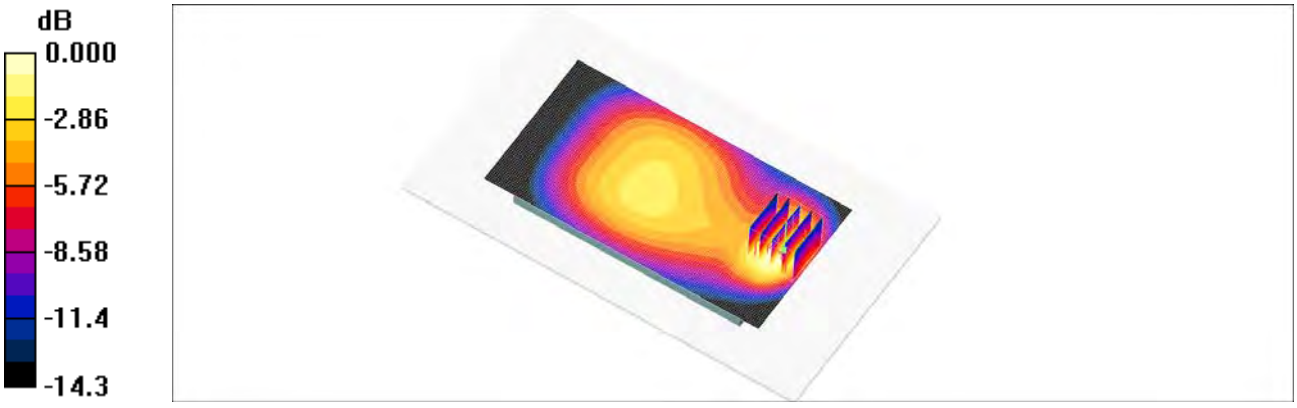
DASY4 Configuration:
- Probe: EX3DV4 - SN3903; ConvF(9.75, 9.75, 9.75); Calibrated: 2013-03-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn648; Calibrated: 2013-04-24
- Phantom: Triple Flat Phantom 5.1C_20120905; Type: QD 000 P51 CA

WCDMA850 Body Front 4183/Area Scan (71x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.494 mW/g

WCDMA850 Body Front 4183/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.9 V/m; Power Drift = -0.038 dB
Peak SAR (extrapolated) = 0.804 W/kg
SAR(1 g) = 0.471 mW/g; SAR(10 g) = 0.268 mW/g

Maximum value of SAR (measured) = 0.504 mW/g



0 dB = 0.504mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/ GPRS/EDGE, Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC
Liquid Temperature:	20.5 ℃
Ambient Temperature:	20.7 ℃
Test Date:	Oct.10, 2013
Plot No.	13

DUT: KS1301; Type: Bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2437 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.97 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

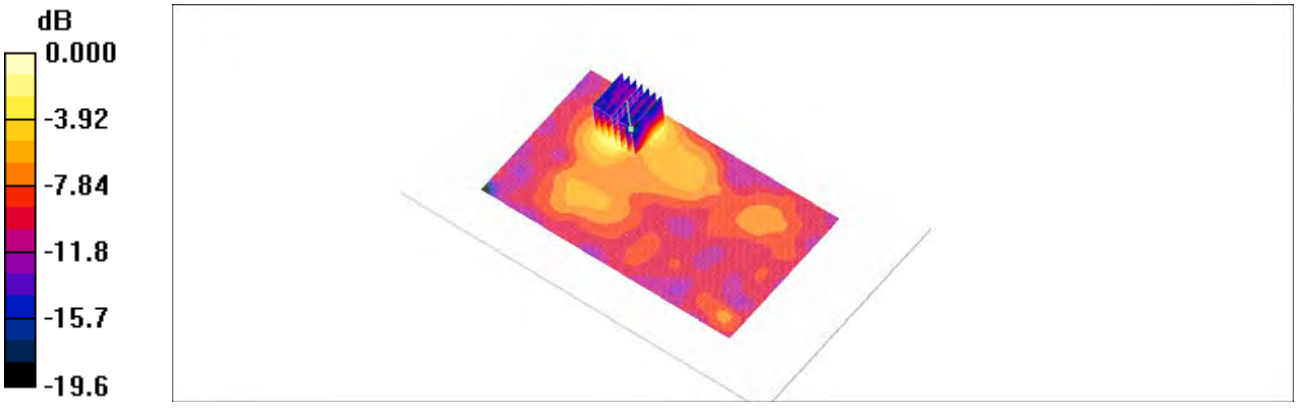
DASY4 Configuration:
- Probe: EX3DV4 - SN3903; ConvF(7.14, 7.14, 7.14); Calibrated: 2013-03-18
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn648; Calibrated: 2013-04-24
- Phantom: Triple Flat Phantom 5.1C_20120905; Type: QD 000 P51 CA

WIFI2450 Body rear 1Mbps 6ch/Area Scan (91x161x1): Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (interpolated) = 0.095 mW/g

WIFI2450 Body rear 1Mbps 6ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.88 V/m; Power Drift = 0.114 dB
Peak SAR (extrapolated) = 0.136 W/kg
SAR(1 g) = 0.065 mW/g; SAR(10 g) = 0.031 mW/g

Maximum value of SAR (measured) = 0.098 mW/g



0 dB = 0.098mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/ GPRS/EDGE, Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC
Liquid Temperature:	20.3 ℃
Ambient Temperature:	20.5 ℃
Test Date:	Oct.15, 2013
Plot No.	14

DUT: KS1301; Type: Bar; Serial: #1

Communication System: WIFI 5GHz; Frequency: 5745 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5745 MHz; σ = 6.25 mho/m; ε_r = 46.5; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

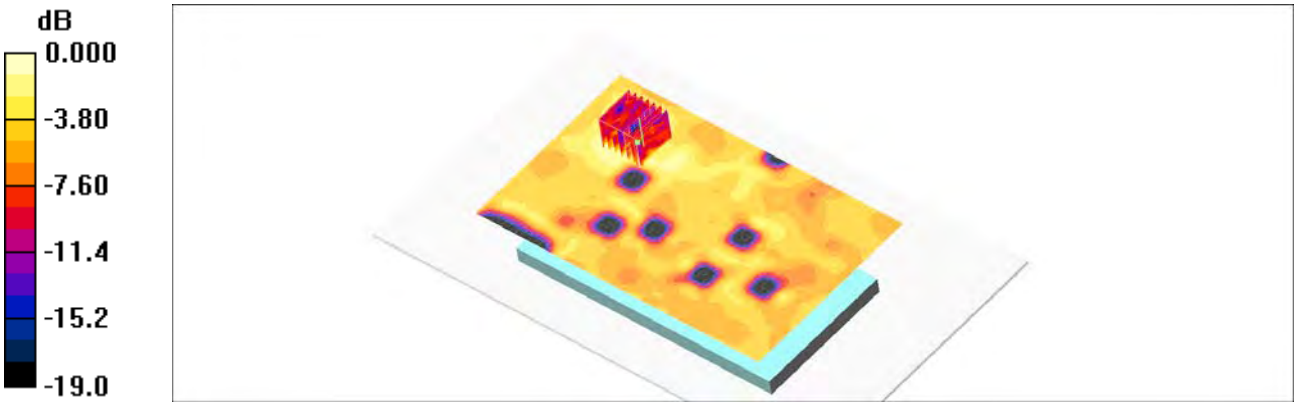
DASY4 Configuration:
- Probe: EX3DV4 - SN3903; ConvF(4.01, 4.01, 4.01); Calibrated: 2013-03-18
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn648; Calibrated: 2013-04-24
- Phantom: Triple Flat Phantom 5.1C_20120905; Type: QD 000 P51 CA

802.11a Body Rear 149ch 6Mbps/Area Scan (111x181x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.094 mW/g

802.11a Body Rear 149ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.65 V/m; Power Drift = -0.120 dB
Peak SAR (extrapolated) = 0.245 W/kg
SAR(1 g) = 0.045 mW/g; SAR(10 g) = 0.021 mW/g

Maximum value of SAR (measured) = 0.084 mW/g



0 dB = 0.084mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/ GPRS/EDGE, Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC
Liquid Temperature:	20.3 ℃
Ambient Temperature:	20.5 ℃
Test Date:	Oct.15, 2013
Plot No.	15

DUT: KS1301; Type: Bar; Serial: #1

Communication System: WIFI 5GHz; Frequency: 5745 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5745 MHz; σ = 6.12 mho/m; ε_r = 46.5; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

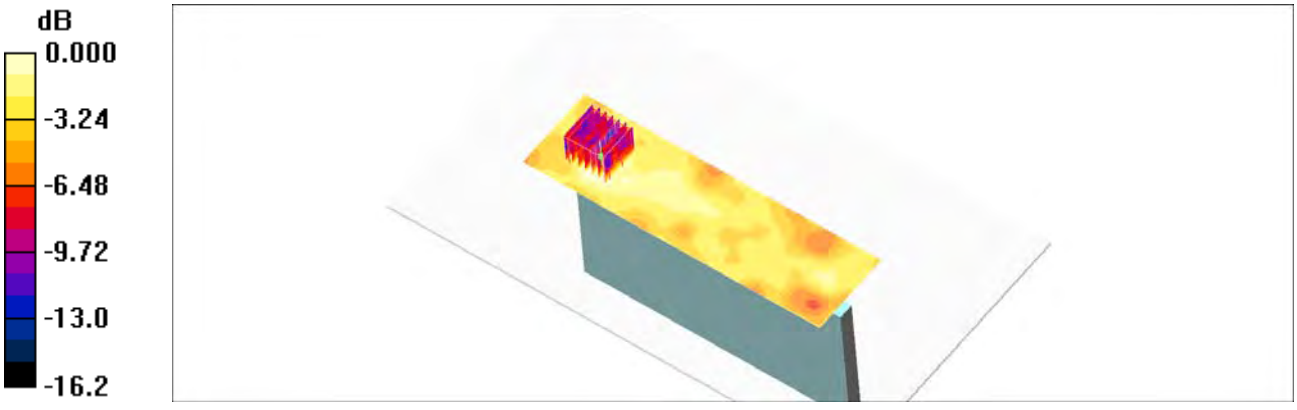
DASY4 Configuration:
- Probe: EX3DV4 - SN3903; ConvF(4.01, 4.01, 4.01); Calibrated: 2013-03-18
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn648; Calibrated: 2013-04-24
- Phantom: Triple Flat Phantom 5.1C_20120905; Type: QD 000 P51 CA

802.11a Body Left Side 149ch 6Mbps/Area Scan (51x181x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.094 mW/g

802.11a Body Left Side 149ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.49 V/m; Power Drift = -0.152 dB
Peak SAR (extrapolated) = 0.225 W/kg
SAR(1 g) = 0.056 mW/g; SAR(10 g) = 0.027 mW/g

Maximum value of SAR (measured) = 0.092 mW/g



0 dB = 0.092mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/ GPRS/EDGE, Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC
Liquid Temperature:	20.3 ℃
Ambient Temperature:	20.5 ℃
Test Date:	Oct.15, 2013
Plot No.	16

DUT: KS1301; Type: Bar; Serial: #1

Communication System: WIFI 5GHz; Frequency: 5180 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5180 MHz; σ = 5.27 mho/m; ε_r = 48.1; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

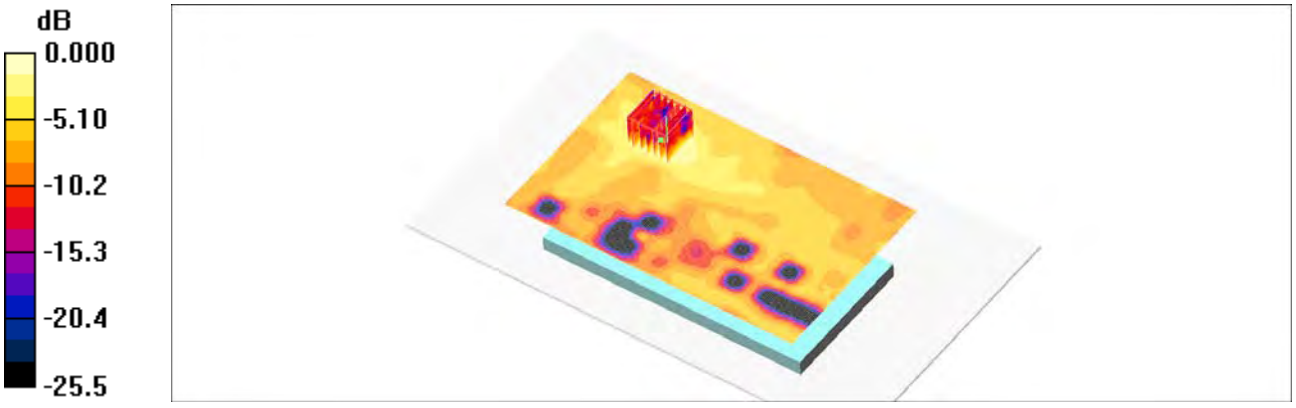
DASY4 Configuration:
- Probe: EX3DV4 - SN3903; ConvF(4.32, 4.32, 4.32); Calibrated: 2013-03-18
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn648; Calibrated: 2013-04-24
- Phantom: Triple Flat Phantom 5.1C_20120905; Type: QD 000 P51 CA

802.11a Body Rear 36ch 6Mbps/Area Scan (111x181x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.096 mW/g

802.11a Body Rear 36ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.89 V/m; Power Drift = -0.143 dB
Peak SAR (extrapolated) = 0.254 W/kg
SAR(1 g) = 0.054 mW/g; SAR(10 g) = 0.023 mW/g

Maximum value of SAR (measured) = 0.105 mW/g



Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/ GPRS/EDGE, Cellular WCDMA/HSDPA/HSUPA Phone with Bluetooth/WLAN/NFC
Liquid Temperature:	20.3 ℃
Ambient Temperature:	20.5 ℃
Test Date:	Oct.15, 2013
Plot No.	17

DUT: KS1301; Type: Bar; Serial: #1

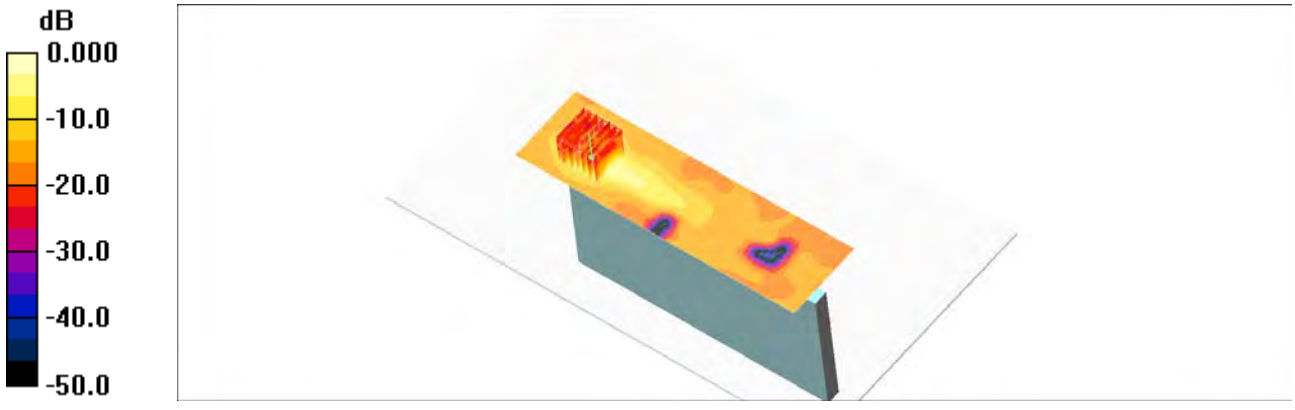
Communication System: WIFI 5GHz; Frequency: 5300 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5300 MHz; σ = 5.43 mho/m; ε_r = 47.5; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

DASY4 Configuration:
- Probe: EX3DV4 - SN3903; ConvF(4.24, 4.24, 4.24); Calibrated: 2013-03-18
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn648; Calibrated: 2013-04-24
- Phantom: Triple Flat Phantom 5.1C_20120905; Type: QD 000 P51 CA

802.11a Hand SAR Left Side 60ch 6Mbps/Area Scan (51x181x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.832 mW/g

802.11a Hand SAR Left Side 60ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.19 V/m; Power Drift = -0.183 dB
Peak SAR (extrapolated) = 2.49 W/kg
SAR(1 g) = 0.401 mW/g; SAR(10 g) = 0.097 mW/g

Maximum value of SAR (measured) = 0.907 mW/g



0 dB = 0.907mW/g