FCC SAR Test Report

FCC ID: 2AEEX-GEMINI

Project No.	:	1504C059
Equipment	:	Smart Phone
Model Name	:	Gemini
Applicant	:	SACO LLC
Address	:	2170 NW 87th Ave, Doral Florida, 33172, Doral, Florida, United States 33172

Date of Receipt	:	Apr. 13, 2015
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Issued Date	:	Jun. 06, 2015
Tested by	:	BTL Inc.

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Testing Laboratory
2640

Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**), or National Institute of Standards and Technology (**NIST**) .

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BTL's laboratory quality assurance procedures are in compliance with the **ISO Guide17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

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REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FCC-SAR-1504C059	Original Issue.	Jun. 06, 2015

1. GENERAL SUMMARY

Equipment	Smart Phone
Model Name	GEMINI
Brand Name	AFFIX
Manufacturer	shanghai YIXI technology co., LTD
Address	8F modernmodern logistics plaza 102 rd qinjiang,caohejing,hi-tech park shang city 200233pr china
Factory	Skycom Telecommunications Co., Limited
Address	4 Floor,Building A,Zhi Yang Technology Park.No.014 Tang Qian Zhang Qi Road,Zhang Ge Community,Guan Lan Street,Long Hua New Dictrict,Shen Zhen.
Standard(s)	**FCC 47CFR §2.1093** Radio frequency Radiation Exposure Evaluation: Portable Devices **ANSI Std C95.1-1992**Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.(IEEE Std C95.1-1991) **IEEE Std 1528-2003** Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques **IEEE Std 1528a-2005** IEEE Recommended Practice for Determining the Peak Spatial-AvSpecific Absorption Rate (SAR) in the Human Head from WirelessCommunications Devices: Measurement Techniques Amendment 1: CAD File for Human Head Model (SAM Phantom) **KDB616217 D04** SAR for laptop and tablets v01r01 **KDB941225 D01** 3G SAR Procedures v03 **KDB941225 D02** HSPA and 1x Advanced v02r02 **KDB941225 D03** SAR Test Reduction GSM/GPRS/EDGE v01 **KDB941225 D06** Hotspot Mode V02 **KDB447498 D01** General RF Exposure Guidance v05r02 **KDB248227 D01** D01 802.11 Wi-Fi SAR v02 **KDB865664 D01** SAR measurement 100 MHz to 6 GHz v01r03 **KDB865664 D02** SAR Reporting v01r01 **KDB690783 D01** SAR Listings on Grants v01r03

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCC-SAR-1504C059) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. RF EMISSIONS MEASUREMENT

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **SAR room** at the location of No.3,Jinshagang 1st Road, ShiXia, Dalang Town,Dong Guan, China.523792

2.2 MEASUREMENT UNCERTAINTY

Note: Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz v01r03,when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2003 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.

3. GENERAL INFORMATION

3.1 STATEMENT OF COMPLIANCE

The maximum results of Specific Absorption Rate (SAR) found during testing for Smart Phone are as below Table.

Band	Max Reported SAR(W/kg)		
	1-g Head	1-g Body-worn (10mm) *	1-g Hotspot (10mm)
GSM850	0.25	0.79	0.79
GSM1900	0.02	0.26	0.66
UMTS Band 2	0.46	0.70	0.77
UMTS Band 4	0.79	1.06	1.10
UMTS Band 5	0.27	0.47	0.47
LTE Band 4	0.34	0.79	0.79
LTE Band 7	0.16	0.79	0.79
WiFi 2.4G	0.10	0.02	0.02
The highest simultaneous SAR value is 1.50 W/kg per KDB690783 D01			

Note:

1)* For body-worn operation, this device has been tested and meets FCC RF exposure guidelines when used with any accessory that contains no metal and that positions the handset a minimum of 10mm from the body. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

The device is in compliance with Specific Absorption Rate（SAR）for general population uncontrolled exposure limits according to the FCC rule §2.1093, the ANSI/IEEE C95.1:1992, the NCRP Report Number 86 for uncontrolled environment, according to the Industry Canada Radio Standards Specification RSS-102 for General Population/Uncontrolled exposure, and had been tested in accordance with the measurement methods and procedures specified in IEEE Std 1528-2003 & IEEE Std 1528a-2005

3.1.1 GENERAL DESCRIPTION OF EUT

Equipment	Smart Phone		
Model Name	GEMINI		
Brand Name	AFFIX		
IMEI Code	860975019974395		
HW Version	GEMINIF-MB-V12		
SW Version	X531F_4.4.4_1.0_1.0_0326		
Operation Frequency Range(s)	Band	TX (MHz)	
	GSM850	824-849	
	GSM1900	1850-1910	
	UMTS Band 2	1850-1910	
	UMTS Band 4	1710-1755	
	UMTS Band 5	824-849	
	LTE Band 4	1710-1755	
	LTE Band 7	2500-2570	
	Bluetooth	2400 ~2483.5	
	WIFI	2412 ~2462	
Modulation	GSM/GPRS:	GMSK	Class 12
	EDGE:	8PSK	Class 12
	WCDMA:	QPSK	HSDPA Cat 14 / HSUPA Cat 6
	LTE	QPSK, 16QAM	
	802.11b	DSSS	
	802.11g/n	OFDM	
	Bluetooth	GFSK(1Mbps), π/4-DQPSK(2Mbps), 8-DPSK(3Mbps)	

Anttena and Accessory

Antenna Gain	BT/2.4GWiFi: 0.52dBi	
	GSM850:1.44dBi	
	GSM1900:1.02dBi	
	UMTS850:1.31dBi	
	UMTS1700:1.71dBi	
	UMTS1900:1.68dBi	
	LTE Band4:1.64dBi Band7:1.39dBi	
Battery	Brand Name: AFFIX	Model Name: ROCKET
	Power Rating:3.8Vdc, 3000mAh	
	Manufacturer: Shenzhen Nalon Battery co., Ltd.	
Earphone	Brand Name: AFFIX	Model Name: TC-ROCKET
	Manufacturer: Shen Zhen futaixin Electronic CO.,LTD.	
	Signal Line Type: 1.2 meter non-shielded cable without ferrite core	

3.2 LABORATORY ENVIRONMENT

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

3.3 MAIN TEST INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Data Acquisition Electronics	Speag	DAE4	1390	Sep. 15, 2015
2	E-field Probe	Speag	EX3DV4	3932	Jan. 30, 2016
3	Electro Optical Converter	Speag	ECO90	1151	N/A
4	SAM Twin Phantom	Speag	SAM	1784	N/A
5	System Validation Dipole	Speag	D835V2	4d160	Sep. 22, 2015
6	System Validation Dipole	Speag	D1750V2	1101	Sep. 19, 2015
7	System Validation Dipole	Speag	D1900V2	5d179	Sep. 18, 2015
8	System Validation Dipole	Speag	D2450V2	919	Sep. 17, 2015
9	System Validation Dipole	Speag	D2600V2	1067	Sep. 18, 2015
10	Power Amplifier	Mini-Circuits	ZHL-42W	N/A	N/A
11	Power Amplifier	Mini-Circuits	ZVE-8G	N/A	N/A
12	ENA Network Analyzer	Agilent	E5071C	MY46102965	Mar. 29, 2016
13	Dielectric Probe Kit	Agilent	85070E	2593	N/A
14	P-series power meter	Agilent	N1911A	MY45100473	Mar. 29, 2016
15	wideband power sensor	Agilent	N1921A	MY51100041	Mar. 29, 2016
16	Power Meter	Anritsu	ML2487A	6K00004714	Mar. 16, 2016
17	Power Meter Sensor	Anritsu	MA2491A	34138	Mar. 16, 2016
18	MXG Analog Signal Generator	Agilent	N5181A	MY49060710	Nov. 02, 2015
19	Low pass filter	Mini-Circuits	SLP-2950+	M108294	Mar. 29, 2016
20	Attenuator	Mini-Circuits	VAT-10+	31317-1	Mar. 29, 2016
21	Attenuator	Mini-Circuits	VAT-10+	31317-2	Mar. 29, 2016
22	Attenuator	MEB	300-affn-03	314	Mar. 29, 2016
23	Dual directional coupler	Agilent	777D	50208	Mar. 29, 2016
24	8960 Series 10 Wireless Com Test set	Agilent	E5515E	MY53211053	Jun. 13, 2016

Remark: ” N/A” denotes no model name, serial No. or calibration specified.

Only the 8960 Series 10 Wireless Com Test set is calibrated biennially, other instruments are calibrated once a year.

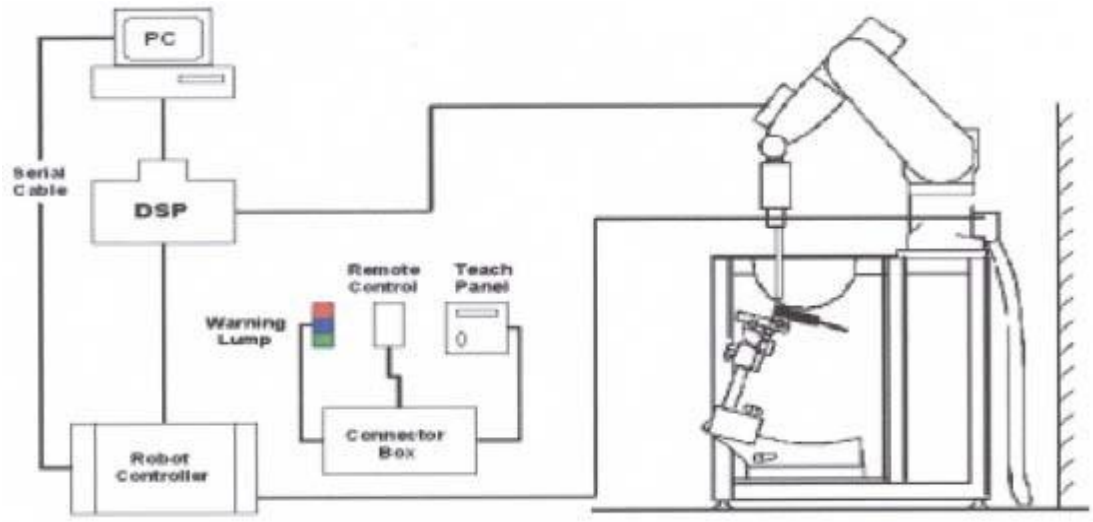
4.SAR MEASUREMENTS SYSTEM CONFIGURATION

4.1SAR MEASUREMENT SET-UP

The DASY5 system for performing compliance tests consists of the following items:

1. A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
2. A dosimetric probe, i.e. an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
3. A data acquisition electronic (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
4. A unit to operate the optical surface detector which is connected to the EOC.
5. The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.
6. TheDASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 7
7. DASY5 software and SEMCAD data evaluation software.
8. Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
9. The generic twin phantom enabling the testing of left-hand and right-hand usage.
10. The device holder for handheld mobile phones.
11. Tissue simulating liquid mixed according to the given recipes.
12. System validation dipoles allowing to validate the proper functioning of the system.

4.1.1Test Setup Layout



4.2DASY5E-FIELDPROBESYSTEM

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

4.2.1EX3DV4 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	ISO/IEC 17025 calibration service available
Frequency	10 MHz to 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 µW/g to > 100 mW/g Linearity:± 0.2dB
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Distance from probe tip to dipole centers: 1.0 mm

EX3DV4 E-field Probe

4.2.2E-FIELD PROBE CALIBRATION

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

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

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

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

Where: Δt = Exposure time (30 seconds),

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

ΔT = Temperature increase due to RF exposure.

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

Where: σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m3).

4.2.3OTHER TEST EQUIPMENT

4.2.3.1. Device Holder for Transmitters

Construction: Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices (e.g., laptops, cameras, etc.) It is light weight and fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin SAM, ELI4and SAM v6.0Phantoms.
Material: POM, Acrylic glass, Foam

4.2.3.2 Phantom

The SAM twin phantom is a berglass shell phantom with2mm shell thickness (except the ear region, where shell thickness increases to 6 mm). The phantom has three measurement areas:

_ Left hand
_ Right hand
_ Flat phantom

The bottom plate contains three pairs of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to cover the phantom during o-periods to prevent water evaporation and changes in the liquid parameters. Free space scans of devices on top of this phantom cover are possible.

SAM twin Phantom

4.2.4SCANNING PROCEDURE

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or Body) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the DUT’s output power and should vary max. ± 5 %.

The “surface check” measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ± 0.1mm). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe. (It does not depend on the surface reflectivity or the probe angle to the surface within ± 30°.)

- Area Scan

The “area scan” measures the SAR above the DUT or verification dipole on a parallel plane to the surface. It is used to locate the approximate location of the peak SAR with 2D spline interpolation. The robot performs a stepped movement along one grid axis while the local electrical field strength is measured by the probe. The probe is touching the surface of the SAM during acquisition of measurement values. The standard scan uses large grid spacing for faster measurement.

Standard grid spacing for head measurements is 15 mm in x- and y- dimension(≤2GHz) , 12 mm in x- and y- dimension(2-4 GHz) and 10mm in x- and y- dimension(4-6GHz). If a finer resolution is needed, the grid spacing can be reduced. Grid spacing and orientation have no influence on the SAR result. For special applications where the standard scan method does not find the peak SAR within the grid, e.g. mobile phones with flip cover, the grid can be adapted in orientation.

- Zoom Scan

A “zoom scan” measures the field in a volume around the 2D peak SAR value acquired in the previous “coarse” scan. This is a fine grid with maximum scan spatial resolution: Δx_{zoom}, Δy_{zoom}≤ 2GHz -≤8mm, 2-4GHz -≤5 mm and 4-6 GHz-≤4mm; Δz_{zoom}≤3GHz -≤5 mm, 3-4 GHz-≤4mm and 4-6GHz-≤2mm where the robot additionally moves the probe along the z-axis away from the bottom of the Phantom. DASY is also able to perform repeated zoom scans if more than 1 peak is found during area scan. In this document, the evaluated peak 1g and 10g averaged SAR values are shown in the 2D-graphics in Appendix B. Test results relevant for the specified standard (see chapter 1.4.)are shown in table form form in chapter 7.2.

A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 2 mm steps. This measurement shows the continuity of the liquid and can - depending in the field strength – also show the liquid depth.

The following table summarizes the area scan and zoom scan resolutions per FCC KDB 865664D01:

Frequency	Maximun Area Scan resolution (Δx_{area}, Δy_{area})	Maximun Zoom Scan spatial resolution (Δx_{Zoom}, Δy_{Zoom})	Maximun Zoom Scan spatial resolution			Minimum zoom scan volume (x,y,z)
			Uniform Grid	Graded Grad		
			$\Delta z_{Zoom}(n)$	$\Delta z_{Zoom}(1)$*	$\Delta z_{Zoom}(n>1)$*	
≤2GHz	≤15mm	≤8mm	≤5mm	≤4mm	≤1.5*Δz_{Zoom}(n-1)	≥30mm
2-3GHz	≤12mm	≤5mm	≤5mm	≤4mm	≤1.5*Δz_{Zoom}(n-1)	≥30mm
3-4GHz	≤12mm	≤5mm	≤4mm	≤3mm	≤1.5*Δz_{Zoom}(n-1)	≥28mm
4-5GHz	≤10mm	≤4mm	≤3mm	≤2.5mm	≤1.5*Δz_{Zoom}(n-1)	≥25mm
5-6GHz	≤10mm	≤4mm	≤2mm	≤2mm	≤1.5*Δz_{Zoom}(n-1)	≥22mm

4.2.5SPATIAL PEAK SAR EVALUATION

The spatial peak SAR - value for 1 and 10 g is evaluated after the Cube measurements have been done. The basis of the evaluation are the SAR values measured at the points of the fine cube grid consisting of 5 x 5 x 7 points(with 8mm horizontal resolution) or 7 x 7 x 7 points(with 5mm horizontal resolution) or 8 x 8 x 7 points(with 4mm horizontal resolution). The algorithm that finds the maximal averaged volume is separated into three different stages.

- The data between the dipole center of the probe and the surface of the phantom are extrapolated. This data cannot be measured since the center of the dipole is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is about 1 mm (see probe calibration sheet). The extrapolated data from a cube measurement can be visualized by selecting “Graph Evaluated”.
- The maximum interpolated value is searched with a straight-forward algorithm. Around this maximum the SAR - values averaged over the spatial volumes (1g or 10 g) are computed using the 3d-spline interpolation algorithm. If the volume cannot be evaluated (i.e., if a part of the grid was cut off by the boundary of the measurement area) the evaluation will be started on the corners of the bottom plane of the cube.
- All neighboring volumes are evaluated until no neighboring volume with a higher average value is found.

Extrapolation

The extrapolation is based on a least square algorithm [W. Gander, Computermathematik, p.168-180]. Through the points in the first 3 cm along the z-axis, polynomials of order four are calculated. These polynomials are then used to evaluate the points between the surface and the probe tip. The points, calculated from the surface, have a distance of 1 mm from each other.

Interpolation

The interpolation of the points is done with a 3d-Spline. The 3d-Spline is composed of three one-dimensional splines with the "Not a knot"-condition [W. Gander, Computermathematik, p.141-150] (x, y and z -direction) [Numerical Recipes in C, Second Edition, p.123ff].

Volume Averaging

At First the size of the cube is calculated. Then the volume is integrated with the trapezoidal algorithm. 8000 points (20x20x20) are interpolated to calculate the average.

Advanced Extrapolation

DASY5 uses the advanced extrapolation option which is able to compansate boundary effects on E-field probes.

4.2.6DATA STORAGE AND EVALUATION

4.2.5.1Data Storage

The DASY5 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DAE4". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

4.4.2 Data Evaluation by SEMCAD

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:	Sensitivity	Normi, a_{i0}, a_{i1}, a_{i2}
	Conversion factor	$ConvF_i$
	Diode compression point	Dcp_i
Device parameters:	Frequency	f
	Crest factor	cf
Media parameters:	Conductivity	
	Density	

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY5 components. In the direct measuring mode of the multi meter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

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 as:

$$V_i = U_i + U_i^2 \cdot cf / dcp_i$$

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: $E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$

H-field probes: $H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1} f + a_{i2} f^2) / f$

With V_i = compensated signal of channel i (i = x, y, z)

$Norm_i$ = sensor sensitivity of channel i (i = x, y, z)
[mV/(V/m)^2] for E-field Probes

ConvF = sensitivity enhancement in solution

aij = sensor sensitivity factors for H-field probes

f = carrier frequency [GHz]

E_i = electric field strength of channel i in V/m

H_i = magnetic field strength of channel i in A/m

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

$$E_{tot} = (E_X^2 + E_Y^2 + E_Z^2)^{1/2}$$

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

$$SAR = (E_{tot})^2 \cdot \sigma / (\rho \cdot 1000)$$

With SAR = local specific absorption rate in mW/g

E_{tot} = total field strength in V/m
= conductivity in [mho/m] or [Siemens/m]
= equivalent tissue density in g/cm^3

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = E_{tot}^2 / 3770 \text{ or } P_{pwe} = H_{tot}^2 \cdot 37.7$$

With P_{pwe} = equivalent power density of a plane wave in mW/cm^2

E_{tot} = total field strength in V/m

H_{tot} = total magnetic field strength in A/m

5. SYSTEM VERIFICATION PROCEDURE

5.1 TISSUE VERIFICATION

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine of the dielectic parameter are within the tolerances of the specified target values. The measured conductivity and relative permittivity should be within ± 5% of the target values.

The following materials are used for producing the tissue-equivalent materials.

Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
Head 835	0.2	-	0.2	1.5	57.0	-	41.1	-
Head 1750	-	47.0	-	0.4	-	-	52.6	-
Head 1900	-	44.5	-	0.2	-	-	55.3	-
Head 2450	-	45.0	-	0.1	-	-	54.9	-
Head 2600	-	45.1	-	0.1	-	-	54.8	-

Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
Body 835	0.2	-	0.2	0.9	48.5	-	50.2	-
Body 1750	-	31.0	-	0.2	-	-	68.8	-
Body 1900	-	29.5	-	0.3	-	-	70.2	-
Body 2450	-	31.4	-	0.1	-	-	68.5	-
Body 2600	-	31.8	-	0.1	-	-	68.1	-

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

Tissue Type	Measured Frequency (MHz)	Target Tissue		Measured Tissue		Liquid Temp. (℃)	Test Date
		εr (+/-5%)	σ (S/m) (+/-5%)	εr	σ (S/m)		
Body	835	55.2 (52.44~57.96)	0.97 (0.92~1.02)	54.87	0.965	20.7	2015/5/13
	1750	53.44 (50.64~56.11)	1.49 (1.42~1.56)	53.37	1.486	20.8	2015/4/20
				53.36	1.488	20.8	2015/4/24
	1900	53.3 (50.64~55.97)	1.52 (1.44~1.60)	53.28	1.517	20.8	2015/4/28
	2450	52.7 (50.07~55.35)	1.95 (1.85~2.05)	52.64	1.948	20.7	2015/5/23
	2600	52.51 (49.88~55.14)	2.16 (2.05~2.27)	52.508	2.15	20.8	2015/5/20
Head	835	41.5 (39.43~43.58)	0.9 (0.86~0.95)	41.46	0.876	20.7	2015/5/12
	1750	40.08 (38.08~42.08)	1.37 (1.30~1.44)	40.05	1.368	20.8	2015/5/14
				40.04	1.366	20.8	2015/5/23
	1900	40 (38.00~42.00)	1.4 (1.33~1.47)	39.54	1.386	20.8	2015/5/14
	2450	39.2 (37.24~41.16)	1.8 (1.71~1.89)	39.17	1.767	20.7	2015/5/23
	2600	39.01 (37.06~40.96)	1.96 (1.86~2.06)	38.934	1.954	20.8	2015/5/23

Note:
1)The dielectric parameters of the tissue-equivalent liquid should be measured under similar ambient conditions and within 2 °C of the conditions expected during the SAR evaluation to satisfy protocol requirements.
2)KDB 865664 was ensured to be applied for probe calibration frequencies greater than or equal to 50MHz of the EUT frequencies.
3)The above measured tissue parameters were used in the DASY software to perform interpolation via the DASY software to determine actual dielectric parameters at the test frequencies. The SAR test plots may slightly differ from the table above since the DASY rounds to three significant digits.

5.2 SYSTEM CHECK

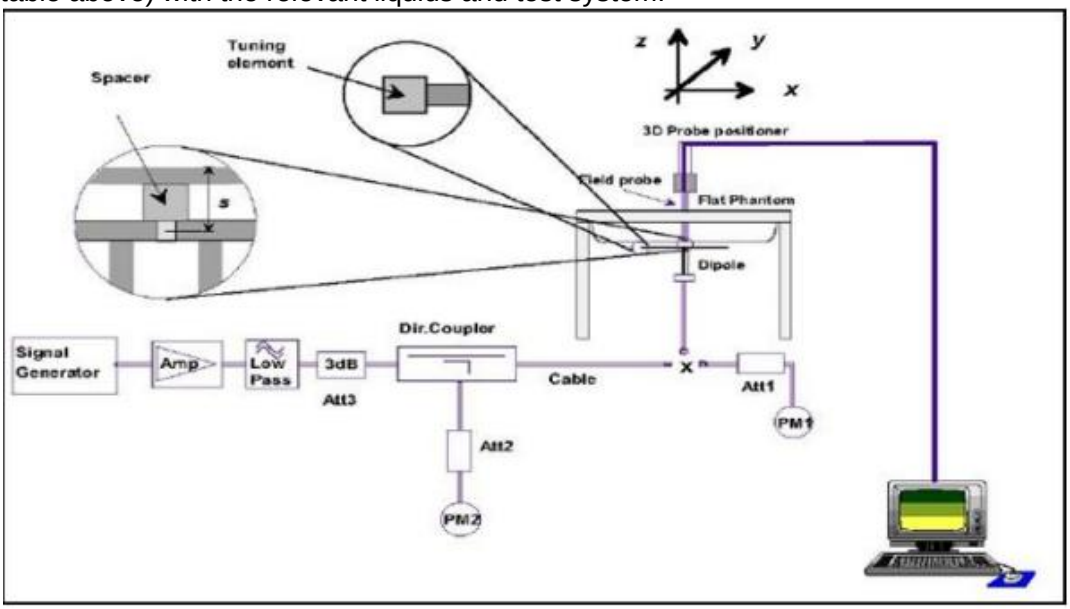
The system check is performed for verifying the accuracy of the complete measurement system and performance of the software. The system check is performed with tissue equivalent material according to IEEE P1528 (described above). The following table shows system check results for all frequency bands and tissue liquids used during the tests.

Frequency (MHz)	Test Date	Temp	250mW Measured SAR_{1g}	1W Normalized SAR_{1g}	1W Target SAR_{10g} (±10% deviation)
		(℃)	(W/kg)		
835B	2015/5/13	20.7	2.52	10.08	9.56 (8.604~10.516)
1750B	2015/4/20	20.8	8.95	35.8	37.90 (34.11~41.69)
1750B	2015/4/24	20.8	8.89	35.56	37.90 (34.11~41.69)
1900B	2015/4/28	20.8	9.98	39.92	39.5 (35.55~43.45)
2450B	2015/5/23	20.7	12.77	51.08	50.7 (45.63~55.77)
2600B	2015/5/20	20.8	14.32	57.28	57.40 (51.66~63.14)
835H	2015/5/12	20.7	2.34	9.36	9.43 (8.487~10.373)
1750H	2015/5/14	20.8	8.85	35.40	36.1 (32.49~39.71)
1750H	2015/5/23	20.8	8.83	35.32	36.1 (32.49~39.71)
1900H	2015/5/14	20.8	9.85	39.40	39.8 (35.82~43.78)
2450H	2015/5/23	20.7	12.56	50.24	51.5 (46.35~56.65)
2600H	2015/5/23	20.8	14.55	58.20	58 (52.2~63.8)

5.3 SYSTEM CHECK PROCEDURE

The system check is performed by using a system check dipole which is positioned parallel to the planar part of the SAM phantom at the reference point. The distance of the dipole to the SAM phantom is determined by a plexiglass spacer. The dipole is connected to the signal source consisting of signal generator and amplifier via a directional coupler, N-connector cable and adaption to SMA. It is fed with a power of 250 mW(below 5GHz) or 100mW(above 5GHz). To adjust this power a power meter is used. The power sensor is connected to the cable before the system check to measure the power at this point and do adjustments at the signal generator. At the outputs of the directional coupler both return loss as well as forward power are controlled during the system check to make sure that emitted power at the dipole is kept constant. This can also be checked by the power drift measurement after the test.

System check results have to be equal or near the values determined during dipole calibration (target SAR in table above) with the relevant liquids and test system.



6.SAR MEASUREMENT VARIABILITY AND UNCERTAINTY

6.1SAR MEASUREMENT VARIABILITY

Per KDB865664 D01 SAR measurement 100 MHz to 6 GHz v01r03, SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. The 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.

The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.

The detailed repeated measurement results are shown in Section 8.2.

6.2SAR MEASUREMENT UNCERTAINTY

Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz v01r03,when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis.

7. OPERATIONAL CONDITIONS DURING TEST

7.1 SAR TEST CONFIGURATION

7.1.1 GSM TEST CONFIGURATION

SAR tests for GSM850 and GSM1900, a communication link is set up with a base station by air link. Using CMU200 the power lever is set to “5”and “0” in SAR of GSM850 and GSM1900. The tests in the band of GSM850 and GSM1900 are performed in the mode of GPRS/EGPRS function. Since the GPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslot is 5. The EGPRS class is 12 for this EUT, it has at most 4 timeslots in uplink, and at most 4 timeslots in downlink, the maximum total timeslot is 5.

When SAR tests for EGPRS mode is necessary, GMSK modulation should be used to minimize SAR measurement error due to higher peak-to-average power (PAR) ratios inherent in 8-PSK.

According to specification 3GPP TS 51.010, the maximum power of the GSM can do the power reduction for the multi-slot.

The allowed power reduction in the multi-slot configuration is as following:

Number of timeslots in uplink assignment		Reduction of maximum output power (dB)
Band	Time Slots	GPRS (GMSK)
GSM850	1 TX slot	0
	2 TX slots	0
	3 TX slots	2
	4 TX slots	4
GSM1900	1 TX slot	0
	2 TX slots	1.5
	3 TX slots	3
	4 TX slots	4.5

7.1.2 UMTS TEST CONFIGURATION

1. Output Power Verification

Maximum output power is verified on the High, Middle and Low channels according to the procedures description in section 5.2 of 3GPP TS 34.121,using the appropriate RMC or AMR with TPC(transmit power control) set to all “1s” for WCDMA/HSDPA or applying the required inner loop power control procedure to maintain maximum output power while HSUPA is active. Result for all applicable physical channel configurations(DPCCH,DPDCHn and spreading codes, HSDPA, HSPA)
Should be tabulated in the SAR report .All configuration that are not supported by the DUT or cannot be measured due to technical or equipment limitation should be clearly identified.

2. WCDMA

(1).Head SAR Measurements
SAR for Head exposure configurations in voice mode is measured using a 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 kbps AMR with 3.4kbps SRB(signalling radio bearer) using the exposure configuration that results in the highest SAR in12.2kbps RMC for that RF channel.

(2).Body SAR Measurements
SAR for body exposure configurations is measured using the 12.2 kbps RMC with the TPC bits configured to all “1s”. SAR for other spreading codes and multiple DPDCHn, when supported by the EUT, are not required when the maximum average outputs of each RF channel, for each spreading code and DPDCHn configuration, are less than ¼ dB higher than those measured in 12.2 kbps RMC.

3. HSDPA

SAR for body exposure configurations is measured according to the “Body SAR Measurements”” procedures of 3G device. In addition, body SAR is also measured for HSDPA when the maximum average outputs of each RF channel with HSDPA active is at ¼ dB higher than that measured without HSDPA using 12.2kbps RMC or the maximum SAR 12.2kbps RMC is above 75% of the SAR limit. Body SAR for HSDPA is measured using an FRC with H-Set 1 in Sub-test 1 and a 12.2kbps RMC configured in Test Loop Mode 1, using the highest body SAR configuration in 12.2 kbps RMC without HSDPA.
HSDPA should be configured according to UE category of a test device. The number of HS-DSCH/HS-PDSCHs, HAPRQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission condition, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4ms with a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. The β_c and β_d gain factors for DPCCH and DPDCH were set according to the values in the below table, β_{hs} for HS-DPCCH is set automatically to the correct value when Δ ACK, Δ NACK, Δ CQI = 8. The variation of the β_c /β_d ratio causes a power reduction at sub-tests 2 - 4.

Sub-test	β_c	β_d	β_d (SF)	β_c /β_d	β_{hs} (1)	CM(dB)(2)	MPR (dB)
1	2/15	15/15	64	2/15	4/15	0.0	0
2	12/15(3)	15/15(3)	64	12/15(3)	24/15	1.0	0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: ΔACK, ΔNACK and ΔCQI = 8 $A_{hs} = \beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$
Note 2 : CM=1 for β_c/β_d= 12/15, β_{hs}/β_c = 24/15. For all other combinations of DPDCH,DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.
Note 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 signalled gain factors for the reference TFC (TF1,TF1) to β_c = 11/15 and β_d = 15/15

The measurements were performed with a Fixed Reference Channel (FRC) and H-Set 1 QPSK.

Settings of required H-Set 1 QPSK acc. to 3GPP 34.121

Parameter	Value
Nominal average inf. bit rate	534 kbit/s
Inter-TTI Distance	3 TTI"s
Number of HARQ Processes	2 Processes
Information Bit Payload	3202 Bits
MAC-d PDU size	336 Bits
Number Code Blocks	1 Block
Binary Channel Bits Per TTI	4800 Bits
Total Available SMLs in UE	19200 SMLs
Number of SMLs per HARQ Process	9600 SMLs
Coding Rate	0.67
Number of Physical Channel Codes	5

HSDPA UE category

HS-DSCH Category	Maximum HS-DSCH Codes Received	Minimum Inter-TTI Interval	Maximum HS-DSCH Transport Block Bits/HS-DSCH TTI	Total Soft Channel Bits
1	5	3	7298	19200
2	5	3	7298	28800
3	5	2	7298	28800
4	5	2	7298	38400
5	5	1	7298	57600
6	5	1	7298	67200
7	10	1	14411	115200
8	10	1	14411	134400
9	15	1	25251	172800
10	15	1	27952	172800
11	5	2	3630	14400
12	5	1	3630	28800
13	15	1	34800	259200
14	15	1	42196	259200
15	15	1	23370	345600
16	15	1	27952	345600

4. HSUPA

SAR for Body exposure configurations is measured according to the “Body SAR Measurements” procedures of 3G device. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the primary mode and the adjusted SAR is ≤ 1.2W/kg, SAR measurement is not required for the secondary mode.

Per KDB941225 D01v03, the 3G SAR test reduction procedures is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSPA using the HSPA body SAR procedures for the highest reported body exposure SAR configuration in 12.2 kbps RMC.

Due to inner loop power control requirements in HSUPA, a commercial communication test set should be used for the output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSDPA should be configured according to the values indicated below as well as other applicable procedures described in the “WCDMA Handset“ and „Release 5 HSDPA Data Device” sections of 3G device.

Subtests for UMTS Release 6 HSUPA

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

Note 1: Δ ACK, Δ NACK and Δ CQI = 8 $A_{hs} = \beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference

Note 3 : For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1,TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$

Note 4 : For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1,TF1) to $\beta_c = 14/15$ and $\beta_d = 15/15$

Note 5 : Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g

Note 6: β_{ed} can not be set directly; it is set by Absolute Grant Value.

HSUPA UE category

UE E-DCH Category	Maximum E-DCH Codes Transmitted	Number of HARQ Processes	E-DCH TTI(ms)	Minimum Speading Factor	Maximum E-DCH Transport Block Bits	Max Rate (Mbps)
1	1	4	10	4	7110	0.7296
2	2	8	2	4	2798	1.4592
	2	4	10	4	14484	
3	2	4	10	4	14484	1.4592
4	2	8	2	2	5772	2.9185
	2	4	10	2	20000	2.00
5	2	4	10	2	20000	2.00
6 (No DPDCH)	4	8	10	2SF2&2SF4	11484	5.76
	4	4	2		20000	2.00
7 (No DPDCH)	4	8	2	2SF2&2SF4	22996	?
	4	4	10		20000	?

NOTE: When 4 codes are transmitted in parallel, two codes shall be transmitted with SF2 and two with SF4.UE categories 1 to 6 support QPSK only. UE category 7 supports QPSK and 16QAM.(TS25.306-7.3.0).

7.1.3 LTE TEST CONFIGURATION

SAR for LTE band exposure configurations is measured according to the procedures of KDB 941225 D05 SAR for LTE Devices v02r03. The CMW500 Wide Band Radio Communication Tester was used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR test were performed with the same number of RB and RB offsets transmitting on all TTI frames(Maximum TTI)

1. Spectrum Plots for RB configurations

A properly configured base station simulator was used for LTE output power measurements and SAR testing. Therefore, spectrum plots for RB configurations were not required to be included in this report.

2. MPR

When MPR is implemented permanently within the UE, regardless of network requirements, only those RB configurations allowed by 3GPP for the channel bandwidth and modulation combinations may be tested with MPR active. Configurations with RB allocations less than the RB thresholds required by 3GPP must be tested without MPR.
The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101:

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

3. A-MPR

A-MPR(Additional MPR) has been disabled for all SAR tests by using Network Signalling Value of “NS_01”on the base station simulator.

4. LTE procedures for SAR testing

A) Largest channel bandwidth standalone SAR test requirements

i) QPSK with 1 RB allocation

Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

ii) QPSK with 50% RB allocation

The procedures required for 1 RB allocation in i) are applied to measure the SAR for QPSK with 50% RB allocation.

iii) QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in i) and ii) are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

iv) Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in above sections to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

B) Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section A) to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

7.1.4 WIFI TEST CONFIGURATION

For WLAN SAR testing, WLAN engineering testing software installed on the DUT can provide continuous transmitting RF signal. This RF signal utilized in SAR measurement has almost 100% duty cycle and its crest factor is 1.

For WLAN SAR tests, a communication link is set up with the test mode software for WIFI mode test. During the test, at the each test frequency channel, the EUT is operated at the RF continuous emission mode. Each channel should be tested at the lowest data rate. Testing at higher data rates is not required when the maximum average output power is less than 0.25dB higher than those measured at the lowest data rate.

For 2.4GHz,802.11b/g operating modes are tested independently according to the service requirements in each frequency band. 802.11b/g modes are tested on channel 1, 6, 11; however, if output power reduction is necessary for channels 1 and/or 11 to meet restricted band requirements the highest output channel closest to each of these channels must be tested instead.

SAR is not required for 802.11g/n channels when the maximum average output power is less than 0.25dB higher than that measured on the corresponding 802.11b channels.

Mode	Band	GHz	Channel	"Default Test Channels"	
				802.11b	802.11g
802.11b/g	2.4 GHz	2.412	1#	√	△
		2.437	6#	√	△
		2.462	11#	√	△

Notes:

√ = "default test channels"

△= possible 802.11g channels with maximum average output ¼ dB the "default test channels"

= when output power is reduced for channel 1 and /or 11 to meet restricted band requirements the highest output channels closest to each of these channels should be tested.

According to FCC KDB 248227,when the maximum output channel(maximum tune-up tolerance limit power)in each 802.11a frequency band is not included in the "default test channels", the maximum output channel should be tested instead of an adjacent "default test channel". These are referred to as the "required test channels".

7.2 TEST POSITION

7.2.1 Head

Measurements were made in “cheek” and “tilt” positions on both the left hand and right hand sides of the phantom. (APPENDIX 7)

7.2.2 Body

The location of the antennas inside mobile phone is shown as below picture:

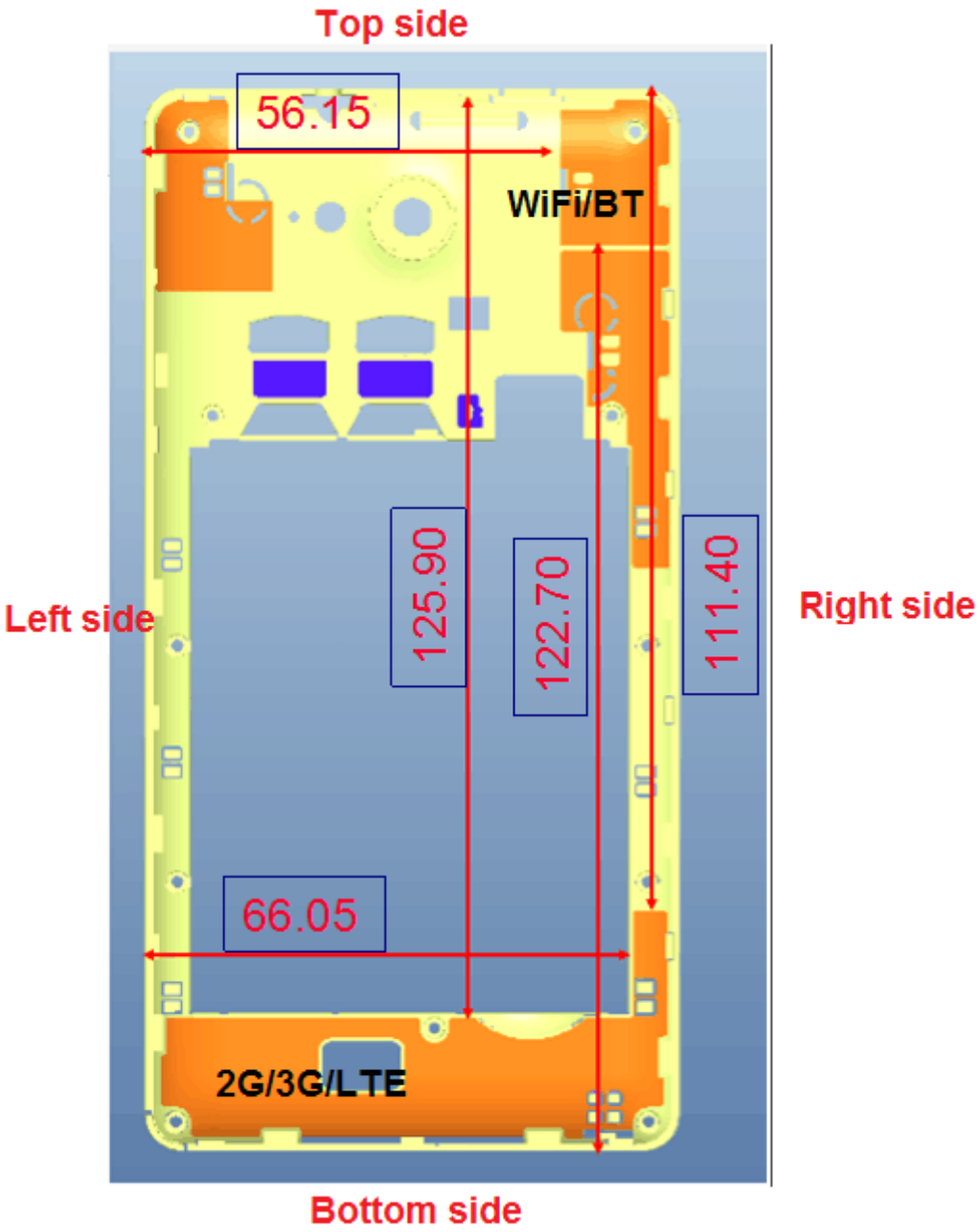


Table 7.2.2 Hotspot Side For SAR Testing

Band	Front Face	Rear Face	Top Side	Bottom Side	Right Side	Left Side
GSM850	YES	YES	NO	YES	YES	YES
GSM1900	YES	YES	NO	YES	YES	YES
UMTS Band2	YES	YES	NO	YES	YES	YES
UMTS Band4	YES	YES	NO	YES	YES	YES
UMTS Band5	YES	YES	NO	YES	YES	YES
LTE Band4	YES	YES	NO	YES	YES	YES
LTE Band7	YES	YES	NO	YES	YES	YES
WiFi	YES	YES	YES	NO	YES	NO

Note: Particular EUT edges were not required to be evaluated for Wireless Rputer SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 941225 D06 guidance, page 2. The distances between the transmit antennas and the edges of the device are included in the filing. When wireless router mode is enabled.

8.TEST RESULT

8.1CONDUCTED POWER RESULTS

8.1.1CONDUCTED POWER MEASUREMENTS OF GSM850

GSM850		Tune Up	Burst-Averaged output Power (dBm)			Division Factors	Frame-Averaged output Power (dBm)		
			128CH	190CH	251CH		128CH	190CH	251CH
GSM (CS)		**32.50**	31.41	31.53	31.54	-9.19	22.22	22.34	22.35
GPRS (GMSK)	1 Tx Slot	**32.50**	31.27	31.52	31.50	-9.19	22.08	22.33	22.31
	2 Tx Slots	**32.50**	31.31	31.42	31.44	-6.13	25.18	25.29	25.31
	3 Tx Slots	**30.50**	29.39	29.53	29.65	-4.42	24.97	25.11	25.23
	4 Tx Slots	**28.50**	27.31	27.52	27.55	-3.18	24.13	24.34	24.37
EDGE (GMSK)	1 Tx Slot	**32.50**	31.40	31.49	31.48	-9.19	22.21	22.30	22.29
	2 Tx Slots	**32.50**	31.38	31.40	31.43	-6.13	25.25	25.27	25.30
	3 Tx Slots	**30.50**	29.39	29.58	29.62	-4.42	24.97	25.16	25.20
	4 Tx Slots	**28.50**	27.28	27.54	27.56	-3.18	24.10	24.36	24.38
EDGE (8PSK)	1 Tx Slot	**29.00**	27.84	27.84	28.04	-9.19	18.65	18.65	18.85
	2 Tx Slots	**27.00**	26.52	26.36	26.75	-6.13	20.39	20.23	20.62
	3 Tx Slots	**25.00**	24.51	24.42	24.63	-4.42	20.09	20.00	20.21
	4 Tx Slots	**23.00**	22.09	22.05	22.41	-3.18	18.91	18.87	19.23

Note:
1) The conducted power of GSM850 is measured with RMS detector.
2) Frame-averaged output power was calculated from the measured burst-averaged output power by converting the slot powers into linear units and calculating the energy over 8 time slots.
3) Per KDB941225 D01v03, the bolded GPRS 2Tx mode was selected for SAR testing according to the highest frame –averaged output power table.

8.1.2CONDUCTED POWER MEASUREMENTS OF GSM1900

GSM1900		Tune Up	Burst-Averaged output Power (dBm)			Division Factors	Frame-Averaged output Power (dBm)		
			512CH	661CH	810CH		512CH	661CH	810CH
GSM (CS)		**30.50**	29.86	29.64	29.65	-9.19	20.67	20.45	20.46
GPRS (GMSK)	1 Tx Slot	**30.50**	29.77	29.60	29.63	-9.19	20.58	20.41	20.44
	2 Tx Slots	**29.00**	28.86	28.75	28.78	-6.13	22.73	22.62	22.65
	3 Tx Slots	**27.50**	27.08	26.84	26.91	-4.42	22.66	22.42	22.49
	4 Tx Slots	**26.00**	25.03	24.80	25.02	-3.18	21.85	21.62	21.84
EDGE (GMSK)	1 Tx Slot	**30.50**	29.80	29.61	29.66	-9.19	20.61	20.42	20.47
	2 Tx Slots	**29.00**	28.90	28.73	28.81	-6.13	22.77	22.60	22.68
	3 Tx Slots	**27.50**	27.01	26.80	27.00	-4.42	22.59	22.38	22.58
	4 Tx Slots	**26.00**	25.01	24.83	24.91	-3.18	21.83	21.65	21.73
EDGE (8PSK)	1 Tx Slot	**28.00**	27.15	27.01	27.00	-9.19	17.96	17.82	17.81
	2 Tx Slots	**26.50**	26.01	25.68	25.87	-6.13	19.88	19.55	19.74
	3 Tx Slots	**25.00**	24.03	23.84	24.01	-4.42	19.61	19.42	19.59
	4 Tx Slots	**22.50**	21.88	21.75	21.78	-3.18	18.70	18.57	18.60

Note:
1) The conducted power of GSM1900 is measured with RMS detector.
2) Frame-averaged output power was calculated from the measured burst-averaged output power by converting the slot powers into linear units and calculating the energy over 8 time slots.
3) Per KDB941225 D01v03, the bolded GPRS 2Tx mode was selected for SAR testing according to the highest frame –averaged output power table.

8.1.3 CONDUCTED POWER MEASUREMENTS OF UMTS 850 Band 5

UMTS850 (Band 5)		Tune-up	SAR Conducted Power (dBm)		
			4132CH	4182CH	4233CH
WCDMA	12.2kbps RMC	**23.50**	22.44	22.50	22.44
	64kbps RMC	**23.50**	22.41	22.47	22.46
	144kbps RMC	**23.50**	22.39	22.44	22.45
	384kbps RMC	**23.50**	22.38	22.53	22.46
HSDPA	Subtest 1	**22.00**	21.05	21.00	20.99
	Subtest 2	**22.00**	20.95	21.01	20.90
	Subtest 3	**22.00**	20.89	20.95	20.93
	Subtest 4	**22.00**	20.87	20.95	20.94
HSUPA	Subtest 1	**22.50**	21.50	21.47	21.31
	Subtest 2	**22.50**	21.45	21.51	21.33
	Subtest 3	**22.50**	21.41	21.49	21.32
	Subtest 4	**22.00**	21.01	20.96	20.94
	Subtest 5	**22.00**	20.96	21.10	20.87
HSPA+	Subtest 1	**21.50**	20.56	20.60	20.55
	Subtest 2	**21.50**	20.51	20.66	20.57
	Subtest 3	**21.50**	20.45	20.59	20.49
	Subtest 4	**21.50**	20.45	20.48	20.48

Note:
1) The conducted power of UMTS Band 5 is measured with RMS detector.
2)Note: Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.

8.1.4 CONDUCTED POWER MEASUREMENTS OF UMTS 1700 Band 4

UMTS1700 (Band 4)		Tune-up	SAR Conducted Power (dBm)		
			1312CH	1413CH	1513CH
WCDMA	12.2kbps RMC	**24.50**	23.35	23.08	23.12
	64kbps RMC	**24.50**	23.37	23.10	23.10
	144kbps RMC	**24.50**	23.40	23.11	23.09
	384kbps RMC	**24.50**	23.41	23.11	23.16
HSDPA	Subtest 1	**23.00**	21.85	21.53	21.55
	Subtest 2	**23.00**	21.95	21.52	21.64
	Subtest 3	**23.00**	21.74	21.53	21.57
	Subtest 4	**23.00**	21.81	21.53	21.54
HSUPA	Subtest 1	**23.00**	22.37	22.12	22.03
	Subtest 2	**23.00**	22.30	22.11	22.05
	Subtest 3	**23.00**	22.30	22.12	22.05
	Subtest 4	**22.50**	21.87	21.58	21.59
	Subtest 5	**22.50**	21.70	21.56	21.59
HSPA+	Subtest 1	**22.50**	21.43	21.10	21.10
	Subtest 2	**22.50**	21.38	21.10	20.98
	Subtest 3	**22.50**	21.37	21.09	21.01
	Subtest 4	**22.50**	21.35	21.08	21.03

Note:
1) The conducted power of UMTS Band 4 is measured with RMS detector.
2)Note: Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.

8.1.5CONDUCTED POWER MEASUREMENTS OFUMTS1900 Band 2

UMTS1900 (Band 2)		Tune-up	SAR Conducted Power (dBm)		
			9262CH	9400CH	9538CH
WCDMA	12.2kbps RMC	**24.00**	23.06	22.98	22.95
	64kbps RMC	**24.00**	23.07	22.89	22.94
	144kbps RMC	**24.00**	23.07	22.98	22.95
	384kbps RMC	**24.00**	23.07	22.99	22.94
HSDPA	Subtest 1	**22.50**	21.69	21.58	21.60
	Subtest 2	**22.50**	21.65	21.54	21.56
	Subtest 3	**22.50**	21.60	21.61	21.55
	Subtest 4	**22.50**	21.55	21.55	21.50
HSUPA	Subtest 1	**23.00**	22.08	22.06	21.90
	Subtest 2	**23.00**	22.15	22.13	21.95
	Subtest 3	**23.00**	22.19	22.08	21.98
	Subtest 4	**22.50**	21.72	21.50	21.62
	Subtest 5	**22.50**	21.68	21.45	21.57
HSPA+	Subtest 1	**22.50**	21.28	21.20	21.02
	Subtest 2	**22.50**	21.27	21.11	21.14
	Subtest 3	**22.50**	21.24	21.10	21.13
	Subtest 4	**22.50**	21.23	21.08	21.12

Note:
1) The conducted power of UMTS Band 2 is measured with RMS detector.
2)Note: Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.

8.1.6CONDUCTED POWER MEASUREMENTS OF LTE Band 4

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					19957	20175	20393
1.4MHz	QPSK	1	0	**24.00**	23.30	22.76	22.92
		1	2	**24.00**	23.31	22.72	22.84
		1	5	**24.00**	23.29	22.81	22.83
		3	0	**24.00**	23.31	22.75	22.80
		3	1	**24.00**	23.30	22.76	22.86
		3	2	**24.00**	23.24	22.78	22.92
		6	0	**23.00**	22.31	21.83	21.88
	16QAM	1	0	**23.00**	22.46	21.35	21.80
		1	2	**23.00**	22.47	21.33	21.80
		1	5	**23.00**	22.44	21.45	21.88
		3	0	**23.00**	22.30	22.05	21.92
		3	1	**23.00**	22.29	22.01	21.81
		3	2	**23.00**	22.28	22.02	21.80
		6	0	**22.50**	21.20	21.17	21.01
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					19965	20175	20385
3MHz	QPSK	1	0	**24.00**	23.06	22.87	22.77
		1	7	**24.00**	23.03	22.93	22.78
		1	14	**24.00**	23.06	22.87	22.72
		8	0	**23.00**	22.29	21.81	21.77
		8	4	**23.00**	22.21	21.71	21.75
		8	7	**23.00**	22.15	21.87	21.76
		15	0	**23.00**	22.24	21.87	21.77
	16QAM	1	0	**22.50**	21.96	21.92	21.42
		1	7	**22.50**	21.79	22.01	21.47
		1	14	**22.50**	21.82	21.97	21.35
		8	0	**22.00**	21.34	20.81	20.94
		8	4	**22.00**	21.37	20.83	20.85
		8	7	**22.00**	21.35	20.96	20.98
		15	0	**22.00**	21.33	20.84	20.85

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					19975	20175	20375
5MHz	QPSK	1	0	**24.00**	23.26	22.85	22.90
		1	13	**24.00**	23.22	22.84	22.91
		1	24	**24.00**	23.07	22.84	22.90
		12	0	**23.00**	22.25	21.86	21.75
		12	6	**23.00**	22.16	21.76	21.78
		12	11	**23.00**	22.13	21.86	21.77
		25	0	**23.00**	22.14	21.77	21.74
	16QAM	1	0	**23.00**	22.18	22.01	21.71
		1	13	**23.00**	22.18	22.03	21.67
		1	24	**23.00**	22.13	21.95	21.74
		12	0	**22.00**	21.40	21.01	20.86
		12	6	**22.00**	21.21	20.95	20.81
		12	11	**22.00**	21.22	21.01	20.82
		25	0	**22.00**	21.16	20.92	20.84
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20000	20175	20350
10MHz	QPSK	1	0	**24.00**	23.28	22.89	22.60
		1	25	**24.00**	23.11	22.75	22.67
		1	49	**24.00**	22.97	22.76	22.71
		25	0	**23.00**	22.18	21.83	21.73
		25	13	**23.00**	22.12	21.81	21.70
		25	25	**23.00**	21.94	21.80	21.71
		50	0	**23.00**	21.97	21.68	21.69
	16QAM	1	0	**23.00**	22.36	21.60	21.37
		1	25	**23.00**	22.23	21.39	21.26
		1	49	**23.00**	22.10	21.45	21.42
		25	0	**22.00**	21.22	21.01	20.83
		25	13	**22.00**	21.19	20.89	20.82
		25	25	**22.00**	21.02	20.96	20.83
		50	0	**22.00**	21.06	20.84	20.72

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20025	20175	20325
15MHz	QPSK	1	0	**24.00**	23.29	23.02	22.78
		1	38	**24.00**	23.04	22.91	22.75
		1	74	**24.00**	22.92	22.73	22.81
		36	0	**23.00**	22.13	21.88	22.85
		36	18	**23.00**	21.90	21.80	21.74
		36	39	**23.00**	21.83	21.79	21.77
		75	0	**23.00**	21.92	21.80	21.72
	16QAM	1	0	**23.00**	22.43	22.19	22.03
		1	38	**23.00**	22.20	22.02	22.05
		1	74	**23.00**	22.00	21.84	21.83
		36	0	**22.00**	21.24	21.03	20.82
		36	18	**22.00**	21.02	20.93	20.79
		36	39	**22.00**	21.91	20.86	20.83
		75	0	**22.00**	21.00	20.89	20.78
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20050	20175	20300
20MHz	QPSK	1	0	**24.00**	23.17	22.76	22.76
		1	50	**24.00**	22.75	22.78	22.63
		1	99	**24.00**	22.71	22.66	22.70
		50	0	**23.00**	21.90	21.70	21.67
		50	25	**23.00**	21.75	21.67	21.65
		50	50	**23.00**	21.72	21.62	21.66
		100	0	**23.00**	21.82	21.62	21.69
	16QAM	1	0	**23.00**	22.25	21.95	21.91
		1	50	**23.00**	21.81	21.96	21.75
		1	99	**23.00**	21.87	21.80	21.85
		50	0	**22.00**	20.93	20.76	20.72
		50	25	**22.00**	20.84	20.75	20.74
		50	50	**22.00**	20.76	20.68	20.66
		100	0	**22.00**	20.89	20.65	20.78

8.1.7CONDUCTED POWER MEASUREMENTS OF LTE Band 7

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20775	21100	21425
5MHz	QPSK	1	0	**23.00**	22.32	22.49	22.39
		1	13	**23.00**	22.30	22.58	22.35
		1	24	**23.00**	22.28	22.61	22.36
		12	0	**22.50**	21.39	21.53	21.31
		12	6	**22.50**	21.39	21.47	21.30
		12	11	**22.50**	21.40	21.52	21.32
		25	0	**22.50**	21.36	21.47	21.26
	16QAM	1	0	**22.50**	21.48	21.26	21.26
		1	13	**22.50**	21.42	21.39	21.21
		1	24	**22.50**	21.47	21.40	21.14
		12	0	**21.50**	20.50	20.55	20.42
		12	6	**21.50**	20.53	20.52	20.43
		12	11	**21.50**	20.51	20.48	20.46
		25	0	**21.50**	20.50	20.48	20.41
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20800	21100	21400
10MHz	QPSK	1	0	**23.00**	22.39	22.32	22.08
		1	25	**23.00**	22.40	22.36	22.26
		1	49	**23.00**	22.34	22.36	22.21
		25	0	**22.50**	21.38	21.45	21.19
		25	13	**22.50**	21.37	21.47	21.28
		25	25	**22.50**	21.46	21.46	21.29
		50	0	**22.50**	21.35	21.48	21.24
	16QAM	1	0	**22.50**	21.62	21.02	20.94
		1	25	**22.50**	21.56	21.01	20.93
		1	49	**22.50**	21.60	21.05	20.97
		25	0	**21.50**	21.40	20.63	20.51
		25	13	**21.50**	21.41	20.55	20.49
		25	25	**21.50**	21.44	20.56	20.50
		50	0	**21.50**	21.32	20.56	20.46

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20825	21100	21375
15MHz	QPSK	1	0	**23.00**	22.48	22.53	22.27
		1	38	**23.00**	22.45	22.50	22.14
		1	74	**23.00**	22.42	22.50	22.26
		36	0	**22.50**	21.35	21.48	21.36
		36	18	**22.50**	21.43	21.55	21.14
		36	39	**22.50**	21.40	21.49	21.25
		75	0	**22.50**	21.39	21.42	21.20
	16QAM	1	0	**22.50**	21.72	21.53	21.11
		1	38	**22.50**	21.71	21.50	20.88
		1	74	**22.50**	21.60	21.53	20.97
		36	0	**21.50**	20.64	20.54	20.52
		36	18	**21.50**	20.59	20.49	20.49
		36	39	**21.50**	20.58	20.50	20.47
		75	0	**21.50**	20.53	20.48	20.45
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20850	21100	21350
20MHz	QPSK	1	0	**23.00**	22.45	22.49	22.35
		1	50	**23.00**	22.42	22.46	22.17
		1	99	**23.00**	22.45	22.45	22.30
		50	0	**22.50**	21.43	21.42	21.28
		50	25	**22.50**	21.41	21.52	21.30
		50	50	**22.50**	21.50	21.57	21.21
		100	0	**22.50**	21.48	21.55	21.29
	16QAM	1	0	**22.50**	21.91	21.75	21.37
		1	50	**22.50**	21.86	21.60	21.31
		1	99	**22.50**	21.76	21.60	21.35
		50	0	**21.50**	20.60	20.57	20.51
		50	25	**21.50**	20.47	20.53	20.49
		50	50	**21.50**	20.50	20.57	20.48
		100	0	**21.50**	20.48	20.50	20.43

8.1.8 CONDUCTED POWER MEASUREMENTS OF WiFi 2.4G

WiFi 2.4G	Frequency (MHz)	Tune-up	Average Power (dBm) for Data Rates (Mbps)			
			1	2	5.5	11
802.11b	2412	16.00	14.89	14.88	14.86	14.42
	2437	16.00	14.42	14.26	14.15	13.72
	2462	16.00	14.31	14.09	13.91	13.52

WiFi 2.4G	Frequency (MHz)	Tune-up	Average Power (dBm) for Data Rates (Mbps)							
			6	9	12	18	24	36	48	54
802.11g	2412	13.00	11.34	10.97	10.75	10.36	10.00	9.37	8.78	8.69
	2437	13.00	11.56	11.20	10.98	10.59	10.20	9.63	9.08	8.96
	2462	12.00	11.23	11.09	10.86	10.45	10.10	9.50	8.89	8.79

WiFi 2.4G	Frequency (MHz)	Tune-up	Average Power (dBm) for Data Rates (Mbps)							
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n HT20	2412	10.00	8.65	8.5	7.98	7.9	7.13	6.57	6.42	6.16
	2437	10.00	8.72	8.14	7.64	7.35	6.77	6.28	6.18	5.83
	2462	10.00	8.48	8.38	7.85	7.55	6.97	6.45	6.28	6.02

Note:

1) The Average conducted power of WiFi is measured with RMS detector.

2) Per KDB248227, for WiFi 2.4GHz, highest average RF output power channel for the lowest data rate of 802.11b mode was selected for SAR evaluation. SAR test at higher data rates and higher order modulations (including 802.11g/n) were not required since the maximum average output power for each of these configurations is not more than 1/4dB higher than the tested channel for the lowest data rate of 802.11b mode.

8.1.9 CONDUCTED POWER MEASUREMENTS OF BT

BT 2450 MHz	Average Conducted Power (dBm)			Tune Up
	CH0	CH39	CH78	
DH5	2.29	2.04	0.54	3
2DH5	0.34	0.1	-1.41	2
3DH5	0.38	0.11	-1.37	1

Note: The conducted power of BT is measured with RMS detector.

8.2SAR TEST RESULTS

General Notes:

1) Per KDB447498 D01v05r02, all measurement SAR results are scaled to the maximum tune-up tolerance limit to demonstrate compliant.

2) Per KDB447498 D01v05r02, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:≤0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is≤100 MHz. When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel must be used.

3) Per KDB865664 D01v01r03,for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/Kg; if the deviation among the repeated measurement is ≤20%,and the measured SAR <1.45W/Kg, only one repeated measurement is required.

4) Per KDB648474 D04v01r02, SAR is evaluated without a headset connected to the device. When the standalone reported Body SAR is ≤1.2 W/kg, no additional SAR evaluations using a headset are required.

5) Per KDB865664 D02v01r01, SAR plot is only required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination; Plots are also required when the measured SAR is > 1.5 W/kg, or > 7.0 W/kg for occupational exposure. The published RF exposure KDB procedures may require additional plots; for example, to support SAR to peak location separation ratio test exclusion and/or volume scan post-processing.

GSM Notes:

1) Per KDB648474 D04v01r02, Body accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for Body SAR.

2) Per KDB941225 D01v03, SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.

UMTS Notes:

Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.

WLAN Notes:

Per KDB248227D01v01r02 and October 2012/April 2013 FCC/TCB workshop meeting notes:

1) For WiFi 2.4GHz, highest average RF output power channel for the lowest data rate of 802.11b mode was selected for SAR evaluation. SAR test at higher data rates and higher order modulations (including 802.11g/n) were not required since the maximum average output power for each of these configurations is not more than 1/4dB higher than the tested channel for the lowest data rate of 802.11b mode.

8.2.1SAR MEASUREMENT RESULT OF GSM850

Head SAR test results of GSM850									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
GSM	Right Cheek	190	836.6	0.08	32.5	31.53	0.194	0.243	
GSM	Right Tilt	190	836.6	-0.04	32.5	31.53	0.123	0.154	
GSM	Left Cheek	190	836.6	-0.07	32.5	31.53	0.200	0.250	1
GSM	Left Tilt	190	836.6	0.03	32.5	31.53	0.151	0.189	

Body-Worn SAR test results of GSM850 (Distance=10mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
GPRS 2TX	Front	190	836.6	-0.06	32.5	31.42	0.418	0.536	
GPRS 2TX	Back	190	836.6	-0.09	32.5	31.42	0.613	0.786	

Hotspot SAR test results of GSM850 (Distance=10mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
GPRS 2TX	Front	190	836.6	-0.06	32.5	31.42	0.418	0.536	
GPRS 2TX	Back	190	836.6	-0.09	32.5	31.42	0.613	0.786	2
GPRS 2TX	Left	190	836.6	-0.01	32.5	31.42	0.348	0.446	
GPRS 2TX	Right	190	836.6	0.07	32.5	31.42	0.312	0.400	
GPRS 2TX	Bottom	190	836.6	-0.07	32.5	31.42	0.082	0.105	

8.2.2SAR MEASUREMENT RESULT OF GSM1900

Head SAR test results of GSM1900									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
GSM	Right Cheek	661	1880	-0.07	30.5	29.64	0.013	0.016	
GSM	Right Tilt	661	1880	0.06	30.5	29.64	0.00422	0.005	
GSM	Left Cheek	661	1880	-0.03	30.5	29.64	0.019	0.023	3
GSM	Left Tilt	661	1880	-0.06	30.5	29.64	0.00701	0.009	

Body-Worn SAR test results of GSM1900 (Distance=10mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
GPRS 2TX	Front	661	1880	0.08	29	28.75	0.247	0.262	4
GPRS 2TX	Back	661	1880	0.08	29	28.75	0.215	0.228	

Hotspot SAR test results of GSM1900 (Distance=10mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
GPRS 2TX	Front	661	1880	0.08	29	28.75	0.247	0.262	
GPRS 2TX	Back	661	1880	0.08	29	28.75	0.215	0.228	
GPRS 2TX	Left	661	1880	-0.02	29	28.75	0.13	0.138	
GPRS 2TX	Right	661	1880	0.08	29	28.75	0.055	0.058	
GPRS 2TX	Bottom	661	1880	-0.03	29	28.75	0.627	0.664	5

Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg， the measurement was repeat once.

2) A second measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurement was >1.20 or when the original or repeated measurement was ≥ 1.45 W/kg.

3) 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.

8.2.3SAR MEASUREMENT RESULT OF UMTS Band 2

Head SAR test results of UMTS Band 2									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
RMC	Right Cheek	9400	1880	-0.07	24	22.98	0.285	0.360	
RMC	Right Tilt	9400	1880	-0.09	24	22.98	0.097	0.123	
RMC	Left Cheek	9400	1880	0.04	24	22.98	0.363	0.459	6
RMC	Left Tilt	9400	1880	0.04	24	22.98	0.119	0.151	

Body-Worn SAR test results of UMTS Band 2(Distance=10mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
RMC	Front	9400	1880	-0.08	24	22.98	0.554	0.701	7
RMC	Back	9400	1880	-0.02	24	22.98	0.544	0.688	

Hotspot SAR test results of UMTS Band 2 (Distance=10mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
RMC	Front	9400	1880	-0.08	24	22.98	0.554	0.701	
RMC	Back	9400	1880	-0.02	24	22.98	0.544	0.688	
RMC	Left	9400	1880	-0.01	24	22.98	0.206	0.261	
RMC	Right	9400	1880	-0.08	24	22.98	0.075	0.095	
RMC	Bottom	9400	1880	-0.04	24	22.98	0.605	0.765	8

Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg， the measurement was repeat once.

2) A second measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurement was >1.20 or when the original or repeated measurement was ≥ 1.45 W/kg.

3) 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.

8.2.4SAR MEASUREMENT RESULT OF UMTS Band 4

Head SAR test results of UMTS Band 4									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
RMC	Right Cheek	1413	1732.6	-0.07	24.5	23.08	0.567	0.786	9
RMC	Right Tilt	1413	1732.6	-0.08	24.5	23.08	0.174	0.241	
RMC	Left Cheek	1413	1732.6	0.06	24.5	23.08	0.555	0.770	
RMC	Left Tilt	1413	1732.6	0.04	24.5	23.08	0.349	0.484	

Body-Worn SAR test results of UMTS Band 4(Distance=10mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
RMC	Front	1413	1732.6	-0.03	24.5	23.08	0.765	1.061	10
RMC	Front High	1512	1752.6	-0.04	24.5	23.12	0.601	0.826	
RMC	Front Low	1312	1712.4	-0.04	24.5	23.35	0.476	0.620	
RMC	Back	1413	1732.6	-0.07	24.5	23.08	0.761	1.055	
RMC	Back High	1512	1752.6	-0.03	24.5	23.12	0.691	0.949	
RMC	Back Low	1312	1712.4	-0.01	24.5	23.35	0.582	0.758	

Hotspot SAR test results of UMTS Band 4 (Distance=10mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
RMC	Front	1413	1732.6	-0.03	24.5	23.08	0.765	1.061	
RMC	Front High	1512	1752.6	-0.04	24.5	23.12	0.601	0.826	
RMC	Front Low	1312	1712.4	-0.04	24.5	23.35	0.476	0.620	
RMC	Back	1413	1732.6	-0.07	24.5	23.08	0.761	1.055	
RMC	Back High	1512	1752.6	-0.03	24.5	23.12	0.691	0.949	
RMC	Back Low	1312	1712.4	-0.01	24.5	23.35	0.582	0.758	
RMC	Left	1413	1732.6	0.04	24.5	23.08	0.57	0.790	
RMC	Right	1413	1732.6	0.09	24.5	23.08	0.317	0.440	
RMC	Bottom	1413	1732.6	0.07	24.5	23.08	0.795	1.102	11
RMC	Bottom High	1512	1752.6	0.06	24.5	23.12	0.702	0.965	
RMC	Bottom Low	1312	1712.4	0.02	24.5	23.35	0.571	0.744	

Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg， the measurement was repeat once.

2) A second measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurement was >1.20 or when the original or repeated measurement was ≥ 1.45 W/kg.

3) 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.

8.2.5SAR MEASUREMENT RESULT OF UMTS Band 5

Head SAR test results of UMTS Band 5									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
RMC	Right Cheek	4182	836.6	0.07	23.5	22.5	0.215	0.271	12
RMC	Right Tilt	4182	836.6	0.04	23.5	22.5	0.15	0.189	
RMC	Left Cheek	4182	836.6	0.03	23.5	22.5	0.205	0.258	
RMC	Left Tilt	4182	836.6	0.05	23.5	22.5	0.124	0.156	

Body-Worn SAR test results of UMTS Band 5(Distance=10mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
RMC	Front	4182	836.6	-0.08	23.5	22.5	0.265	0.334	
RMC	Back	4182	836.6	-0.05	23.5	22.5	0.377	0.475	

Hotspot SAR test results of UMTS Band 5 (Distance=10mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
RMC	Front	4182	836.6	-0.08	23.5	22.5	0.265	0.334	
RMC	Back	4182	836.6	-0.05	23.5	22.5	0.377	0.475	13
RMC	Left	4182	836.6	-0.09	23.5	22.5	0.15	0.189	
RMC	Right	4182	836.6	-0.05	23.5	22.5	0.172	0.217	
RMC	Bottom	4182	836.6	-0.02	23.5	22.5	0.055	0.069	

Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg， the measurement was repeat once.

2) A second measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurement was >1.20 or when the original or repeated measurement was ≥ 1.45 W/kg.

3) 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.

8.2.6SAR MEASUREMENT RESULT OF LTE Band 4

Head SAR test results of LTE Band 4									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
20M 1RB/0#	Right Cheek	20050	1720	0.02	24	23.17	0.221	0.268	
	Right Tilt	20050	1720	-0.03	24	23.17	0.093	0.113	
	Left Cheek	20050	1720	0.05	24	23.17	0.268	0.324	
	Left Tilt	20050	1720	0.06	24	23.17	0.083	0.100	
20M 50%RB/ 0#	Right Cheek	20050	1720	0.07	23	21.9	0.22	0.283	
	Right Tilt	20050	1720	0.06	23	21.9	0.084	0.108	
	Left Cheek	20050	1720	0.06	23	21.9	0.264	0.340	14
	Left Tilt	20050	1720	0.09	23	21.9	0.065	0.084	

Body-Worn SAR test results of LTE Band 4(Distance=10mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
20M 1RB/0#	Front	20050	1720	-0.03	24	23.13	0.378	0.462	
	Back	20050	1720	0.03	24	23.13	0.634	0.775	
20M 50%RB/ 0#	Front	20050	1720	-0.05	23	21.9	0.373	0.481	
	Back	20050	1720	0.01	23	21.9	0.612	0.788	

Hotspot SAR test results of LTE Band 4(Distance=10mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
20M 1RB/0#	Front	20050	1720	-0.03	24	23.13	0.378	0.462	
	Back	20050	1720	0.03	24	23.13	0.634	0.775	
	Left	20050	1720	0.03	24	23.13	0.26	0.318	
	Right	20050	1720	0.06	24	23.13	0.107	0.131	
	Bottom	20050	1720	0.04	24	23.13	0.476	0.582	
20M 50%RB/ 0#	Front	20050	1720	-0.05	23	21.9	0.373	0.481	
	Back	20050	1720	0.01	23	21.9	0.612	0.788	15
	Left	20050	1720	-0.01	23	21.9	0.204	0.263	
	Right	20050	1720	0.02	23	21.9	0.085	0.110	
	Bottom	20050	1720	-0.07	23	21.9	0.37	0.477	

Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg， the measurement was repeat once.

2) A second measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurement was >1.20 or when the original or repeated measurement was ≥ 1.45 W/kg.

3) 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

8.2.7SAR MEASUREMENT RESULT OF LTE Band 7

Head SAR test results of LTE Band 7									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
20M 1RB/0#	Right Cheek	21100	2535	0.01	23	22.49	0.143	0.161	16
	Right Tilt	21100	2535	0.03	23	22.49	0.089	0.100	
	Left Cheek	21100	2535	0.01	23	22.49	0.121	0.136	
	Left Tilt	21100	2535	0.09	23	22.49	0.04	0.045	
20M 50%RB/ 50#	Right Cheek	21100	2535	-0.01	22.5	21.57	0.053	0.066	
	Right Tilt	21100	2535	0.04	22.5	21.57	0.077	0.095	
	Left Cheek	21100	2535	0.03	22.5	21.57	0.126	0.156	
	Left Tilt	21100	2535	0.05	22.5	21.57	0.0335	0.041	

Body-Worn SAR test results of LTE Band 7(Distance=10mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
20M 1RB/0#	Front	21100	2535	-0.07	23	22.49	0.621	0.698	
	Back	21100	2535	0.09	23	22.49	0.685	0.770	
20M 50%RB/ 50#	Front	21100	2535	-0.07	22.5	21.57	0.53	0.657	
	Back	21100	2535	-0.01	22.5	21.57	0.637	0.789	

Hotspot SAR test results of LTE Band 7(Distance=10mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
20M 1RB/0#	Front	21100	2535	-0.07	23	22.49	0.621	0.698	
	Back	21100	2535	0.09	23	22.49	0.685	0.770	
	Left	21100	2535	0.04	23	22.49	0.261	0.294	
	Right	21100	2535	0.07	23	22.49	0.068	0.076	
	Bottom	21100	2535	-0.04	23	22.49	0.698	0.785	
20M 50%RB/ 50#	Front	21100	2535	-0.07	22.5	21.57	0.53	0.657	
	Back	21100	2535	-0.01	22.5	21.57	0.637	0.789	17
	Left	21100	2535	-0.02	22.5	21.57	0.185	0.229	
	Right	21100	2535	-0.04	22.5	21.57	0.041	0.051	
	Bottom	21100	2535	0.04	22.5	21.57	0.614	0.761	

Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg， the measurement was repeat once.

2) A second measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurement was >1.20 or when the original or repeated measurement was ≥ 1.45 W/kg.

3) 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.

8.2.8 SAR MEASUREMENT RESULT OF WiFi 2.4G

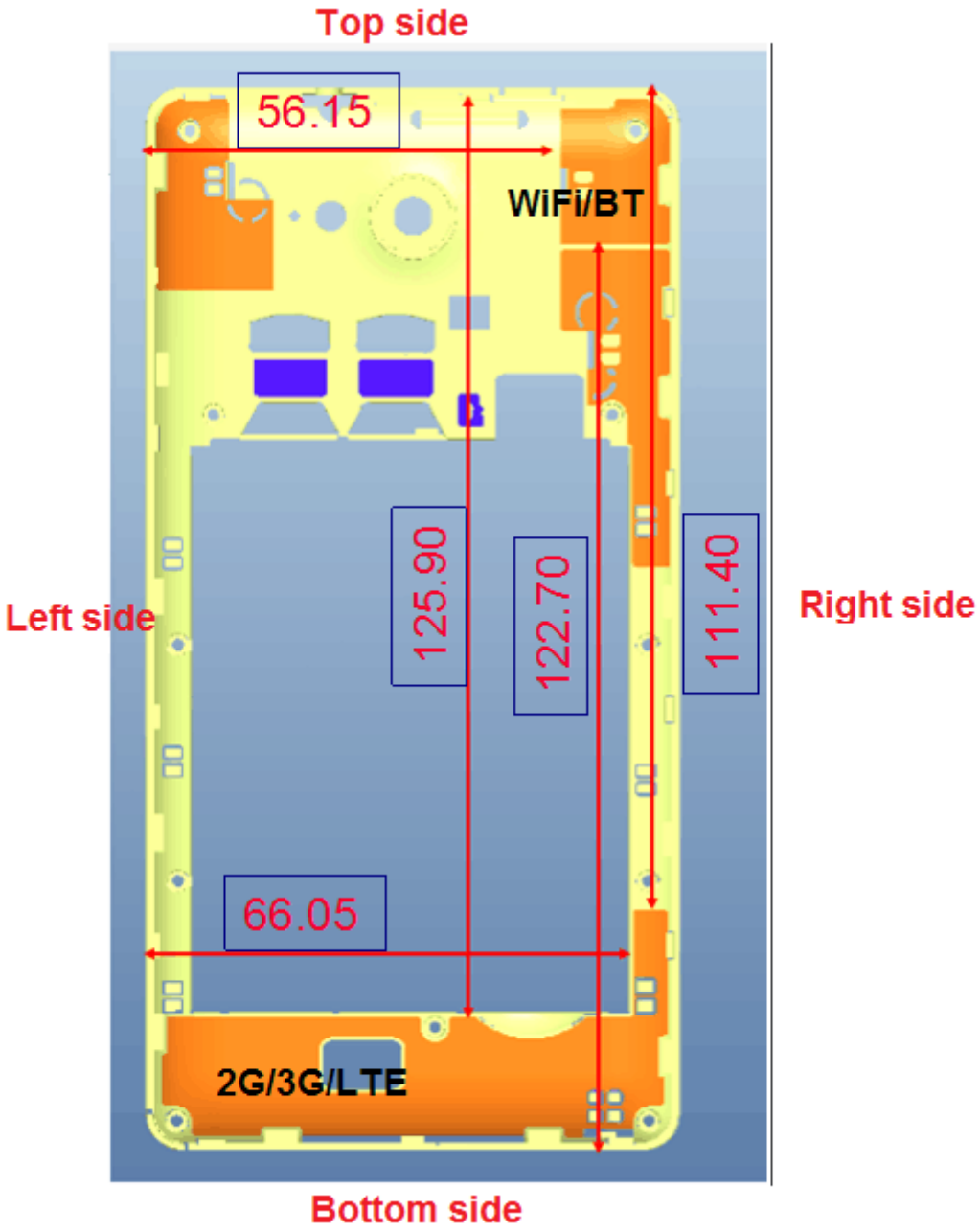
Head SAR test results of WiFi 2.4G									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
802.11b	Right Cheek	1	2412	-0.03	16	14.89	0.023	0.030	
	Right Tilt	1	2412	0.07	16	14.89	0.021	0.027	
	Left Cheek	1	2412	0.02	16	14.89	0.076	0.098	18
	Left Tilt	1	2412	0.08	16	14.89	0.058	0.075	

Body-Worn SAR test results of WiFi 2.4G (Distance=10mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
802.11b	Front	1	2412	-0.01	16	14.89	0.014	0.018	
	Back	1	2412	0.04	16	14.89	0.013	0.017	

Hotspot SAR test results of WiFi 2.4G (Distance=10mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
802.11b	Front	1	2412	-0.01	16	14.89	0.014	0.018	19
	Back	1	2412	0.04	16	14.89	0.013	0.017	
	Right	1	2412	0.07	16	14.89	0.0074	0.010	
	Top	1	2412	0.05	16	14.89	0.00369	0.005	

8.3 MULTIPLE TRANSMITTER EVALUATION

The following tables list information which is relevant for the decision if a simultaneous transmit evaluation is necessary according to FCC KDB 447498D01 General RF Exposure Guidance v05r02
The location of the antennas is shown as below picture:



8.3.1STAND-ALONE SAR TEST EXCLUSION

Per FCC KDB 447498D01v05, the 1-g SAR and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance,mm)][√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where:

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

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

Standalone SAR test exclusion for BT

Mode	Position	P_{max} (dBm)*	P_{max} (mW)	Distance (mm)	f (GHz)	Calculation Result	SAR Exclusion threshold	SAR test exclusion
BT	Body-Worn	3	1.995	5	2.480	0.628	3	Yes

Note:

1)* - maximum possible output power declared by manufacturer

2) Held to ear configurations are not applicable to Bluetooth for this device.

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] • [√f(GHz)/x] W/kg for test separation distances≤50 mm,where x = 7.5 for 1-g SAR and x = 18.75 for 10-g SAR.
When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

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

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

If the minimum test separation distance is < 5 mm, a distance of 5 mm is used for estimated SAR calculation. When the separation distance is › 50 mm, the 0.4W/Kg is used for SAR_{1g}

Estimated SAR calculation

Mode	Position	P_{max} (dBm)*	P_{max} (mW)	Distance (mm)	f (GHz)	X	Estimated SAR (W/Kg)*
BT	Front	3	1.995	5	2.480	7.5	0.084
	Back	3	1.995	5	2.480	7.5	0.084
GSM 850	Top	-	-	125.90	-	-	0.4
GSM 1900	Top	-	-	125.90	-	-	0.4
UMTS Band 2/4/5	Top	-	-	125.90	-	-	0.4
LTE Band 4/7	Top	-	-	125.90	-	-	0.4
WiFi 2.4G	Left	-	-	56.15	-	-	0.4
	Bottom	-	-	122.70	-	-	0.4

Note: * - maximum possible output power declared by manufacturer

8.3.2STAND-ALONE SAR TEST EXCLUSION

Per FCC KDB 447498D01v05 r02, SAR compliance for simultaneous transmission must be considered when the maximum duration of overlapping transmissions, including network hand-offs, is greater than 30 seconds. This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis.

The Simultaneous Transmission Possibilities of this device are as below:

No.	Configuration	Head	Body-worn	Hotspot
1	GSM (Voice) + WiFi 2.4G	Yes	Yes	N/A
2	GPRS/EDGE (DATA) + WiFi 2.4G	N/A	N/A	Yes
3	GSM(Voice) +BT	N/A	Yes	N/A
4	GPRS/EDGE(DATA)+BT	N/A	Yes	N/A
5	UMTS(Voice)+WiFi 2.4G	Yes	Yes	N/A
6	UMTS(DATA)+WiFi 2.4G	N/A	Yes	Yes
7	UMTS(Voice)+BT	N/A	N/A	N/A
8	UMTS(DATA)+BT	N/A	Yes	N/A
9	LTE(DATA)+WiFi 2.4G	Yes*	Yes*	Yes
10	LTE(DATA)+BT	N/A	Yes*	N/A

Note:
i)* VOIP 3rd party applications may possibly be installed and used by the end user.
ii) Wi-Fi 2.4G and Bluetooth share the same antenna and can't transmit simultaneously.
iii) 2G&3G&4G share the same antenna and can't transmit simultaneously.
iv) The device does not support DTM function.
v) Held to ear configurations are not applicable to Bluetooth and therefore were not considered for simultaneous transmission.

8.3.3 SAR SUMMATION SCENARIO

About 2.4G WiFi and GSM/UMTS/LTE antenna

Reported SAR_{1g} / Test Position		GSM 900	GSM 1800	UMTS Band 2	UMTS Band 4	UMTS Band 5	LTE Band4	LTE Band7	2.4G WiFi	MAX $\sum SAR_{1g}$
Head	Right Cheek	0.243	0.016	0.360	0.786	0.271	0.283	0.161	0.161	0.947
	Right Tilt	0.154	0.005	0.123	0.241	0.189	0.113	0.100	0.100	0.341
	Left Cheek	0.250	0.023	0.459	0.770	0.258	0.340	0.156	0.136	0.906
	Left Tilt	0.189	0.009	0.151	0.484	0.156	0.100	0.045	0.045	0.529
Body-Worn	Front	0.536	0.262	0.701	1.061	0.334	0.481	0.698	0.018	1.079
	Back	0.786	0.228	0.688	1.055	0.475	0.788	0.789	0.017	1.072
Hotspot	Front	0.536	0.262	0.701	1.061	0.334	0.481	0.698	0.018	1.079
	Back	0.786	0.228	0.688	1.055	0.475	0.788	0.789	0.017	1.072
	Left	0.446	0.138	0.261	0.79	0.189	0.318	0.294	0.4	1.19
	Right	0.4	0.058	0.095	0.44	0.217	0.131	0.076	0.01	0.45
	Top	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.005	0.405
	Bottom	0.105	0.664	0.765	1.102	0.069	0.582	0.785	0.4	**1.502**

MAX. $\sum SAR_{1g}$=1.502W/Kg<1.6 W/Kg,so the SAR to peak location separation ratio should not be considered.

About BT and GSM/UMTS/LTE antenna

Reported SAR_{1g} / Test Position		GSM 900	GSM 1800	UMTS Band 2	UMTS Band 4	UMTS Band 5	LTE Band4	LTE Band7	BT	MAX $\sum SAR_{1g}$
Body-Worn	Front	0.536	0.262	0.701	1.061	0.334	0.481	0.698	0.084	**1.145**
	Back	0.786	0.228	0.688	1.055	0.475	0.788	0.789	0.084	1.139

MAX. $\sum SAR_{1g}$=1.145W/Kg<1.6 W/Kg,so the SAR to peak location separation ratio should not be considered.

APPENDIX

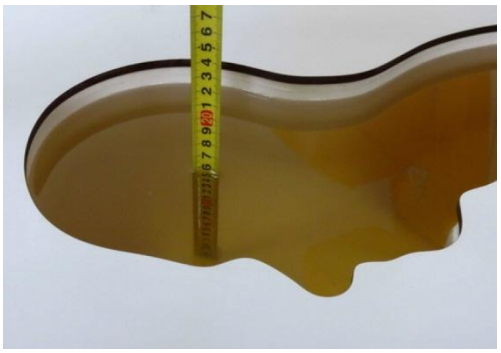
1. Test Layout

Specific Absorption Rate Test Layout

Liquid depth in the flat Phantom (≥15cm depth)

Body 835MHz 15.5cm

Head 835MHz 15.5cm



Body 1750MHz 15.3cm

Head 1750M Hz 15.3cm

Body 1900 MHz 15.1cm

Head 1900M Hz 15.4cm

Body 2450 MHz 15.4cm

Head 2450MHz 15.3cm

Body 2600 MHz 15.3cm

Head 2600MHz 15.3cm

2. System Check Plots

Date/Time: 05/13/2015 09:33:38

Test Laboratory: BTL Inc.

SystemPerformanceCheck-835 Body

DUT: Dipole 835 MHz D835V2; Type: D835V2; Serial: D835V2 - SN:4d160

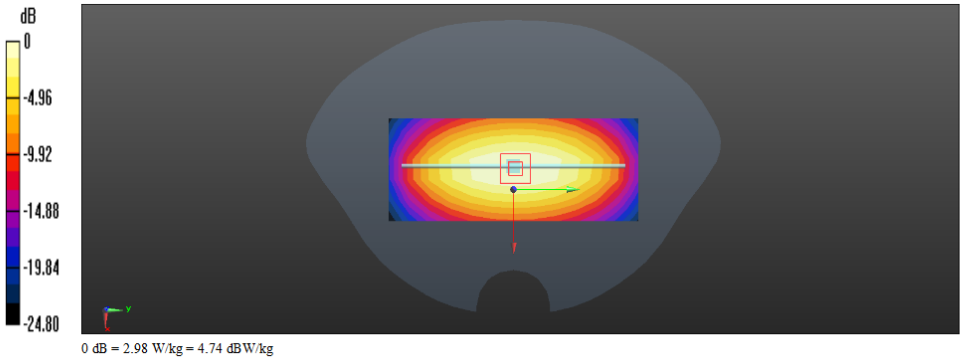
Communication System: UID 0, CW (0); Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.965 S/m; ε_r = 54.87; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(10.19, 10.19, 10.19); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -9.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

System Performance Check at Frequency at 835MHz/d=15mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Area Scan (6x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.98 W/kg

System Performance Check at Frequency at 835MHz/d=15mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 59.426 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 4.11 W/kg
SAR(1 g) = 2.52 W/kg; SAR(10 g) = 1.65 W/kg
Maximum value of SAR (measured) = 3.24 W/kg



0 dB = 2.98 W/kg = 4.74 dBW/kg

Date/Time: 05/12/2015 08:43:28

Test Laboratory: BTL Inc.

SystemPerformanceCheck-835 Head

DUT: Dipole 835 MHz D835V2; Type: D835V2; Serial: D835V2 - SN:4d160

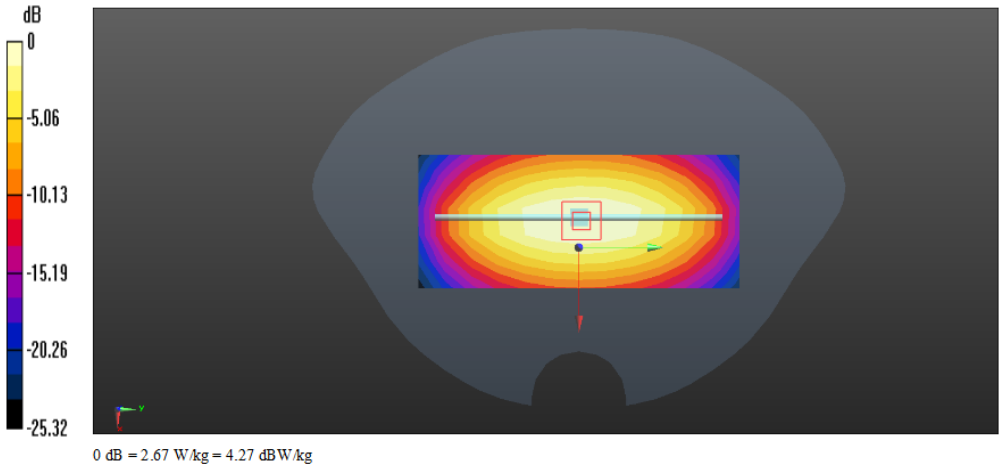
Communication System: UID 0, CW (0); Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.876 S/m; ε_r = 41.46; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(9.75, 9.75, 9.75); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -9.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

System Performance Check at Frequency at 835MHz/d=15mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Area Scan (6x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.67 W/kg

System Performance Check at Frequency at 835MHz/d=15mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.256 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.39 W/kg
SAR(1 g) = 2.34 W/kg; SAR(10 g) = 1.62 W/kg
Maximum value of SAR (measured) = 3.12 W/kg



0 dB = 2.67 W/kg = 4.27 dBW/kg

Date/Time: 04/20/2015 18:14:19

Test Laboratory: BTL Inc.

SystemPerformanceCheck-1750 Body

DUT: Dipole 1750 MHz D1750V2; Type: D1750V2; Serial: D1750V2 - SN:1101

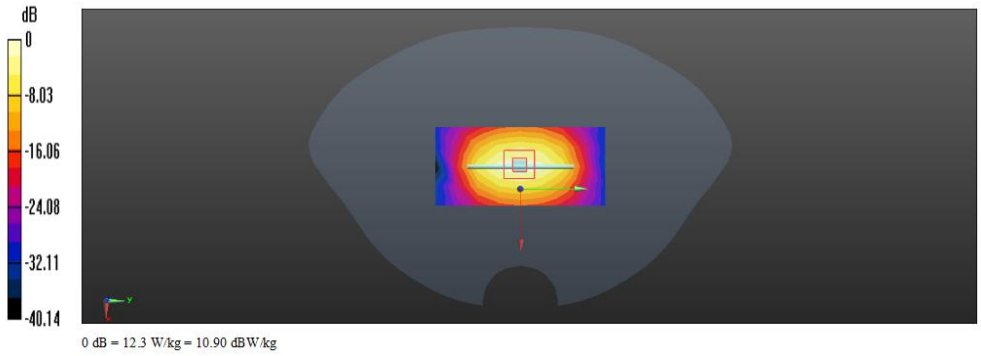
Communication System: UID 0, CW (0); Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.486 S/m; ε_r = 53.37; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(8.08, 8.08, 8.08); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

System Performance Check at 1750 MHz/d=15mm, Pin=250 mW, dist=2.0mm (EX-Probe) /Area Scan (5x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 12.3 W/kg

System Performance Check at 1750 MHz/d=15mm, Pin=250 mW, dist=2.0mm (EX-Probe) /Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.241 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 15.6 W/kg
SAR(1 g) = 8.95 W/kg; SAR(10 g) = 4.65 W/kg
Maximum value of SAR (measured) = 12.5 W/kg



Date/Time: 04/24/2015 01:35:19

Test Laboratory: BTL Inc.

SystemPerformanceCheck-1750 Body

DUT: Dipole 1750 MHz D1750V2; Type: D1750V2; Serial: D1750V2 - SN:1101

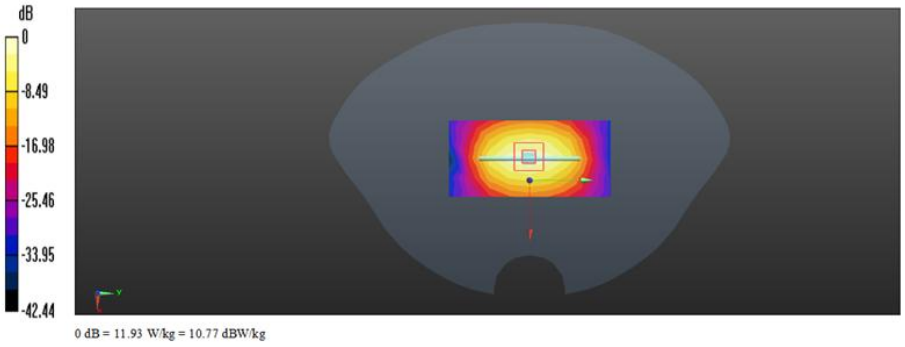
Communication System: UID 0, CW (0); Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.488 S/m; ε_r = 53.36; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(8.47, 8.47, 8.47); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

System Performance Check at 1750 MHz/d=15mm, Pin=250 mW, dist=2.0mm (EX-Probe) 2450MHz Body/Area Scan (5x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 11.93 W/kg

System Performance Check at 1750 MHz/d=15mm, Pin=250 mW, dist=2.0mm (EX-Probe) 2450MHz Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.253 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 12.26 W/kg
SAR(1 g) = 8.89 W/kg; SAR(10 g) = 4.56 W/kg
Maximum value of SAR (measured) = 12.15 W/kg



Date/Time: 05/14/2015 15:15:39

Test Laboratory: BTL Inc.

SystemPerformanceCheck-1750 Head

DUT: Dipole 1750 MHz D1750V2; Type: D1750V2; Serial: D1750V2 - SN:1101

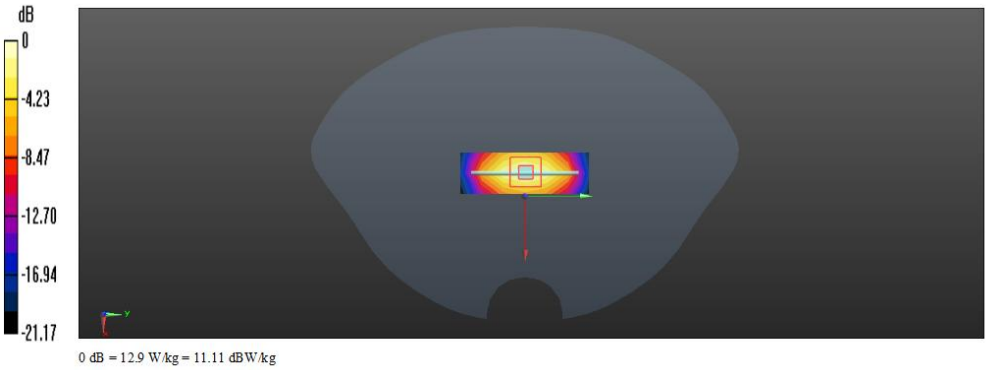
Communication System: UID 0, CW (0); Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.368 S/m; ε_r = 40.05; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(8.42, 8.42, 8.42); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

System Performance Check at 1750 MHz/d=15mm, Pin=250 mW, dist=2.0mm (EX-Probe) /Area Scan (3x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 12.9 W/kg

System Performance Check at 1750 MHz/d=15mm, Pin=250 mW, dist=2.0mm (EX-Probe) /Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 98.284 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 13.32 W/kg
SAR(1 g) = 8.85 W/kg; SAR(10 g) = 4.54 W/kg
Maximum value of SAR (measured) = 13.17 W/kg



Date/Time: 05/23/2015 18:40:29

Test Laboratory: BTL Inc.

SystemPerformanceCheck-1750 Head

DUT: Dipole 1750 MHz D1750V2; Type: D1750V2; Serial: D1750V2 - SN:1101

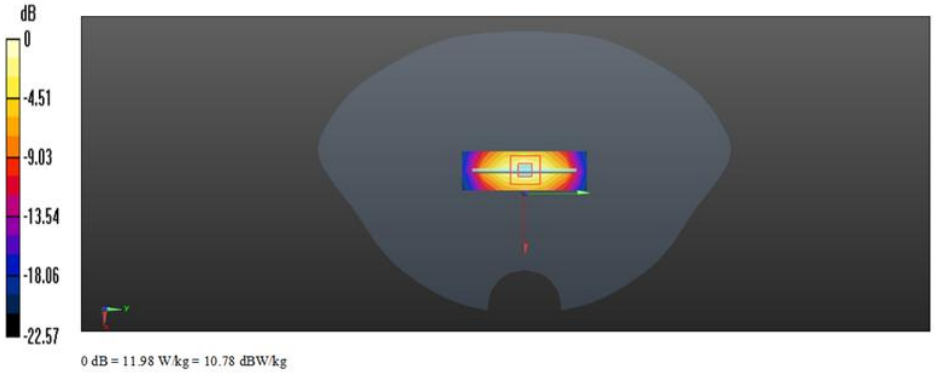
Communication System: UID 0, CW (0); Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.366 S/m; ε_r = 40.04; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(8.42, 8.42, 8.42); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

System Performance Check at 1750 MHz/d=15mm, Pin=250 mW, dist=2.0mm (EX-Probe) 1750MHz /Area Scan (3x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 11.89 W/kg

System Performance Check at 1750 MHz/d=15mm, Pin=250 mW, dist=2.0mm (EX-Probe) 1750MHz /Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.345 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 15.43 W/kg
SAR(1 g) = 8.83 W/kg; SAR(10 g) = 4.62 W/kg
Maximum value of SAR (measured) = 12.5 W/kg



Date/Time: 04/28/2015 08:32:14

Test Laboratory: BTL Inc.

SystemPerformanceCheck-1900 Body

DUT: Dipole 1900 MHz D1900V2; Type: D1900V2; Serial: D1900V2 - SN:5d179

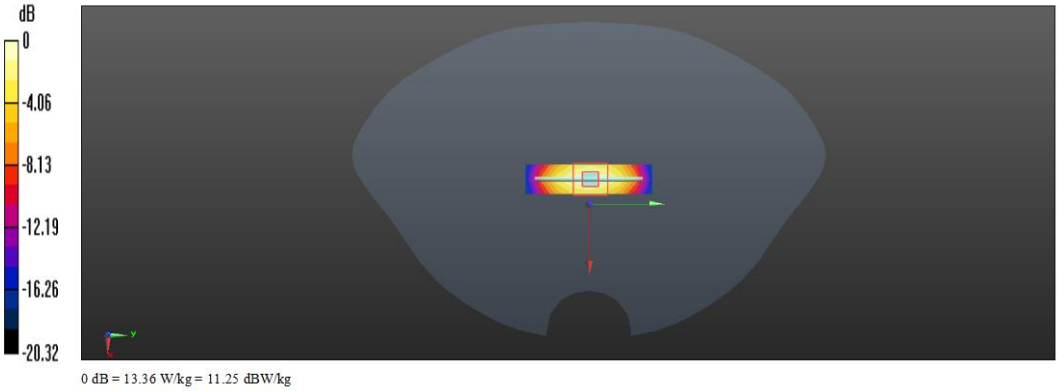
Communication System: UID 0, CW (0); Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.517 S/m; ε_r = 53.28; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(7.86, 7.86, 7.86); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

System Check/System Check at 1900MHz/Area Scan (3x9x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 13.36 W/kg

System Check/System Check at 1900MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 91.354 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 17.35 W/kg
SAR(1 g) = 9.98 W/kg; SAR(10 g) = 5.35 W/kg
Maximum value of SAR (measured) = 11.66 W/kg



Date/Time: 05/14/2015 08:01:50

Test Laboratory: BTL Inc.

SystemPerformanceCheck-1900 Head

DUT: Dipole 1900 MHz D1900V2; Type: D1900V2; Serial: D1900V2 - SN:5d179

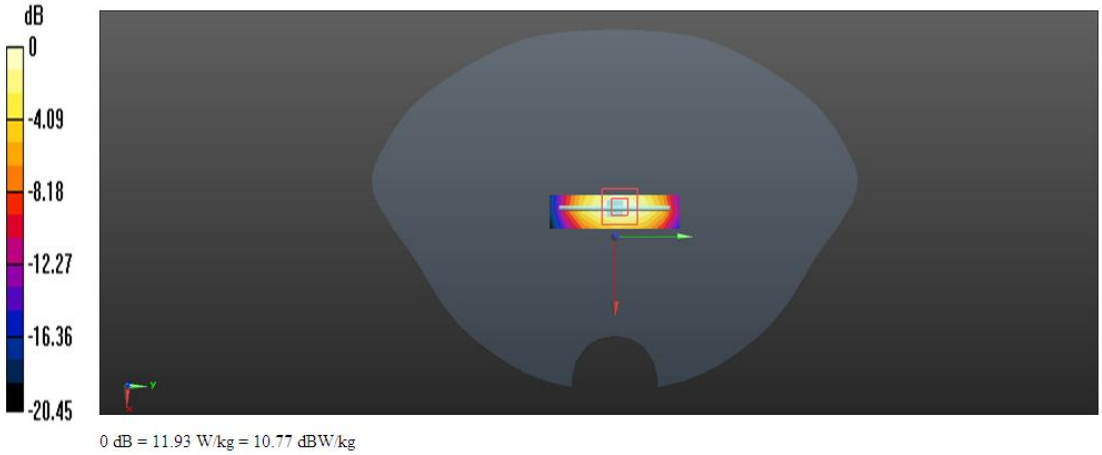
Communication System: UID 0, CW (0); Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.386 S/m; ε_r = 39.54; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(8.23, 8.23, 8.23); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/System Check HSL 1900 MHz/Area Scan (3x9x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 11.93 W/kg

Configuration/System Check HSL 1900 MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.021 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 16.83 W/kg
SAR(1 g) = 9.85 W/kg; SAR(10 g) = 5.32 W/kg
Maximum value of SAR (measured) = 11.56 W/kg



0 dB = 11.93 W/kg = 10.77 dBW/kg

Date/Time: 05/23/2015 15:36:31

Test Laboratory: BTL Inc.

SystemPerformanceCheck-2450 Body

DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:919

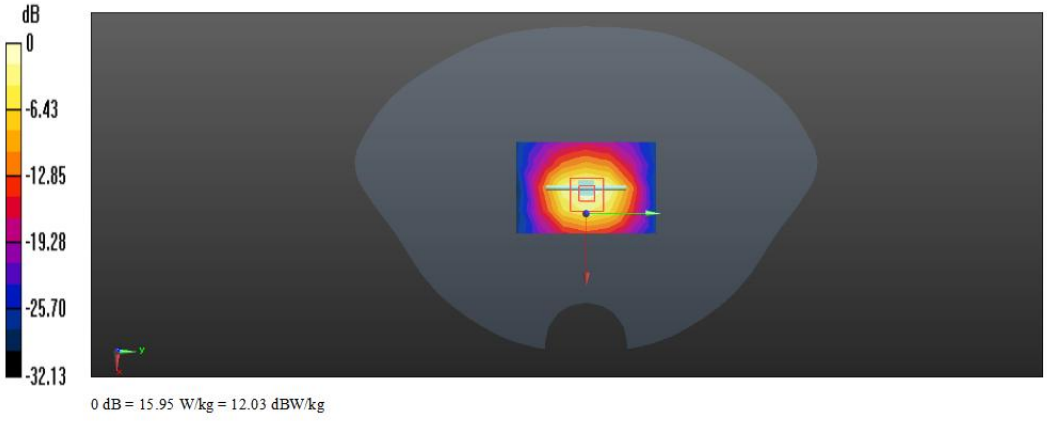
Communication System: UID 0, CW (0); Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.948 S/m; ε_r = 52.64; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(7.60, 7.60, 7.60); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

System Performance Check at 2450MHz/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Area Scan (5x7x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 15.95 W/kg

System Performance Check at 2450MHz/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 92.521 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 22.52 W/kg
SAR(1 g) = 12.77 W/kg; SAR(10 g) = 5.86 W/kg
Maximum value of SAR (measured) = 16.57 W/kg



Date/Time: 05/23/2015 13:21:26

Test Laboratory: BTL Inc.

SystemPerformanceCheck-2450 Head

DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:919

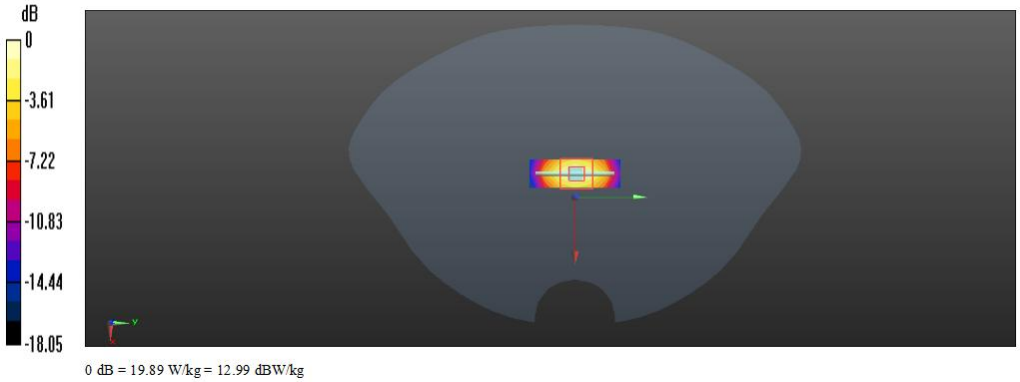
Communication System: UID 0, CW (0); Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.767 S/m; ε_r = 39.17; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(7.38, 7.38, 7.38); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

System Performance Check at 2450MHz/d=10mm, Pin=xx mW, dist=2.0mm (EX-Probe)/Area Scan (3x7x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 19.89 W/kg

System Performance Check at 2450MHz/d=10mm, Pin=xx mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 101.32 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 25.38 W/kg
SAR(1 g) = 12.56 W/kg; SAR(10 g) = 6.67 W/kg
Maximum value of SAR (measured) = 20.05 W/kg



0 dB = 19.89 W/kg = 12.99 dBW/kg

Date/Time: 05/20/2015 15:32:22

Test Laboratory: BTL Inc.

System Performance Check Body 2600MHz

DUT: Dipole 2600 MHz D2600V2; Type: D2600V2; Serial: D2600V2 - SN1067

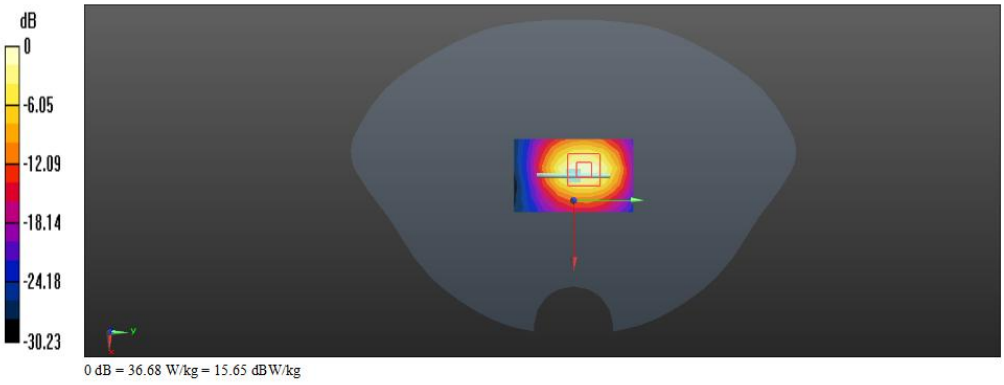
Communication System: UID 0, CW (0); Frequency: 2600 MHz
Medium parameters used: f = 2600 MHz; σ = 2.15 S/m; ε_r = 52.508; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(7.48, 7.48, 7.48); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

System Check/System Check Body 2600MHz/Area Scan (6x9x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 36.68 W/kg

System Check/System Check Body 2600MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 98.524 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 55.6 W/kg
SAR(1 g) = 14.32 W/kg; SAR(10 g) = 6.46 W/kg
Maximum value of SAR (measured) = 27.85 W/kg



Date/Time: 05/23/2015 07:28:32

Test Laboratory: BTL Inc.

System Performance Check Head 2600MHz

DUT: Dipole 2600 MHz D2600V2; Type: D2600V2; Serial: D2600V2 - SN1067

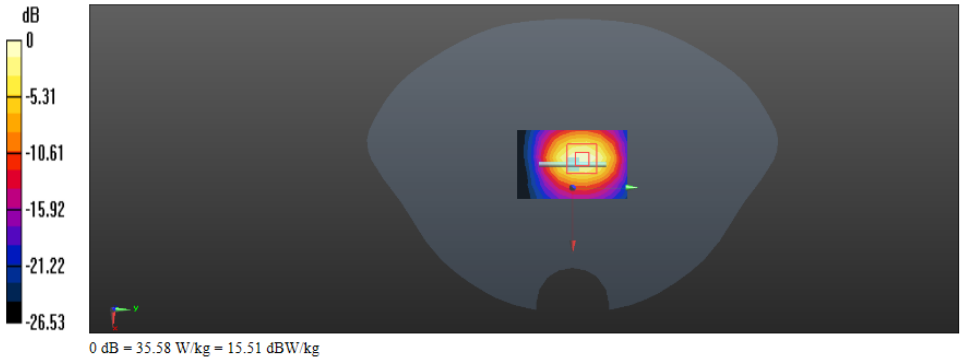
Communication System: UID 0, CW (0); Frequency: 2600 MHz
Medium parameters used: f = 2600 MHz; σ = 1.954 S/m; ε_r = 38.934; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(7.20, 7.20, 7.20); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

System Check/System Check Head 2600MHz/Area Scan (6x9x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 35.58 W/kg

System Check/System Check Head 2600MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.897 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 36.6 W/kg
SAR(1 g) = 14.55 W/kg; SAR(10 g) = 6.54 W/kg
Maximum value of SAR (measured) = 29.13 W/kg



0 dB = 35.58 W/kg = 15.51 dBW/kg

3.SAR Measurement Plots

Date/Time: 05/12/2015 15:06:39

Test Laboratory: BTL Inc.

Smart phone GEMINI GSM 850 GSM Left Hand touch cheek

DUT: Smart phone ; Type: GEMINI; Serial: NA

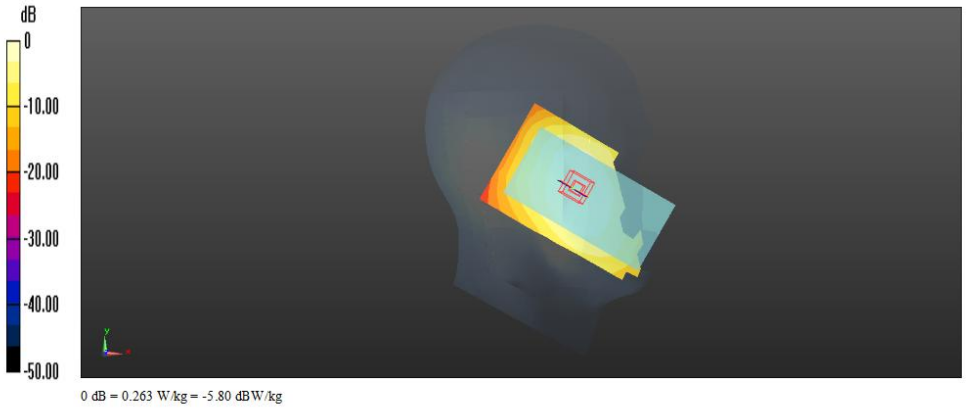
Communication System: UID 0, Generic GSM (0); Frequency: 836.6 MHz
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.89 S/m; εr = 41.478; ρ = 1000 kg/m3
Phantom section: Left Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(9.75, 9.75, 9.75); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Left Hand touch cheek/ GEMINI/Area Scan (11x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.263 W/kg

Left Hand touch cheek/ GEMINI/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.011 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.242 W/kg
SAR(1 g) = 0.200 W/kg; SAR(10 g) = 0.155 W/kg
Maximum value of SAR (measured) = 0.211 W/kg



Date/Time: 05/13/2015 14:03:10

Test Laboratory: BTL Inc.

Smart phone GEMINI GPRS 2TX 850 Body Back

DUT: Smart phone ; Type: GEMINI; Serial: NA

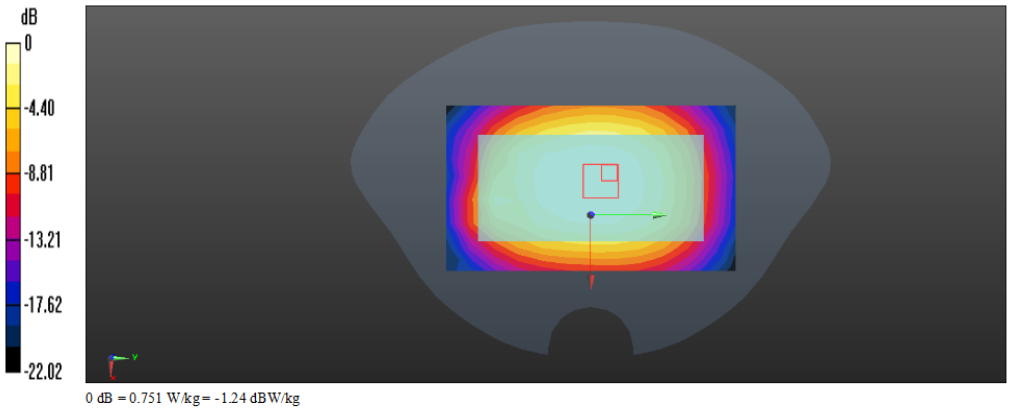
Communication System: UID 0, Generic GSM (0); Frequency: 836.6 MHz
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.98 S/m; εr = 55.868; ρ = 1000 kg/m3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(10.19, 10.19, 10.19); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection),z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Back Side/ GEMINI/Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.751 W/kg

Back Side/ GEMINI/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 26.521 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 0.613 W/kg; SAR(10 g) = 0.522 W/kg
Maximum value of SAR (measured) = 0.815 W/kg



Date/Time: 04/28/2015 10:36:46

Test Laboratory: BTL Inc.

Smart phone GEMINI GSM 1900 GSM Left Hand touch cheek

DUT: Smart phone ; Type: GEMINI; Serial: NA

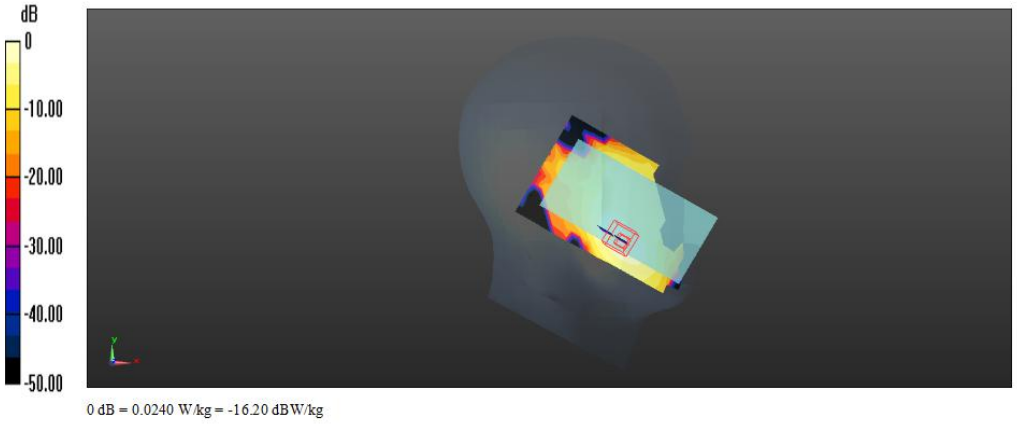
Communication System: UID 0, Generic GSM (0); Frequency: 1880 MHz
Medium parameters used: f = 1880 MHz; σ = 1.45 S/m; εr = 39.74; ρ = 1000 kg/m3
Phantom section: Left Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(8.23, 8.23, 8.23); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Left Hand touch cheek/ GEMINI/Area Scan (11x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.0240 W/kg

Left Hand touch cheek/ GEMINI/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.982 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.0310 W/kg
SAR(1 g) = 0.019 W/kg; SAR(10 g) = 0.010 W/kg
Maximum value of SAR (measured) = 0.0205 W/kg



Date/Time: 05/14/2015 08:33:05

Test Laboratory: BTL Inc.

Smart phone GEMINI GPRS 2TX 1900 Body Front

DUT: Smart phone ; Type: GEMINI; Serial: NA

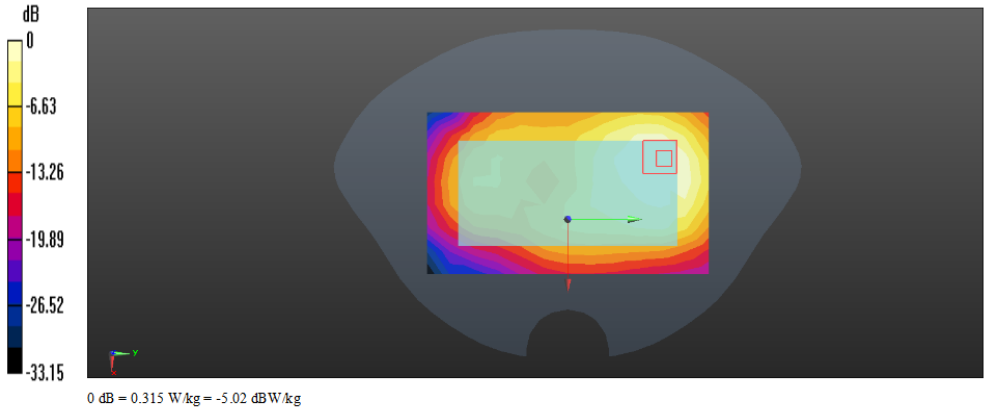
Communication System: UID 0, GPRS-FDD(TDMA,GMSK) (0); Frequency: 1880 MHz
Medium parameters used: f = 1880 MHz; σ = 1.57 S/m; εr = 51.14; ρ = 1000 kg/m3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(7.86, 7.86, 7.86); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Front Side/ GEMINI/Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.315 W/kg

Front Side/ GEMINI/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.613 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.488 W/kg
SAR(1 g) = 0.247 W/kg; SAR(10 g) = 0.149 W/kg
Maximum value of SAR (measured) = 0.342 W/kg



0 dB = 0.315 W/kg = -5.02 dBW/kg

Date/Time: 05/14/2015 10:23:25

Test Laboratory: BTL Inc.

Smart phone GEMINI GPRS 2TX 1900 Body Bottom

DUT: Smart phone ; Type: GEMINI; Serial: NA

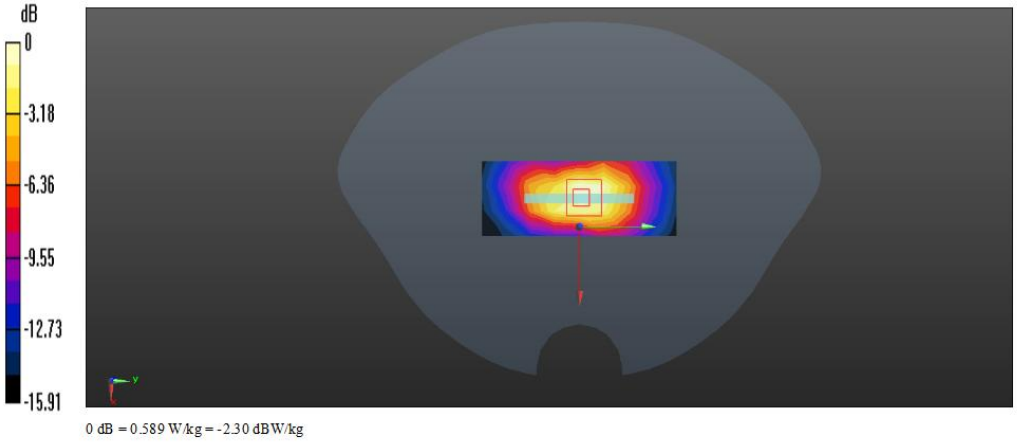
Communication System: UID 0, GPRS-FDD(TDMA,GMSK) (0); Frequency: 1880 MHz
Medium parameters used: f = 1880 MHz; σ = 1.57 S/m; εr = 51.14; ρ = 1000 kg/m3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(7.86, 7.86, 7.86); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Bottom Side/ GEMINI/Area Scan (4x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.589 W/kg

Bottom Side/ GEMINI/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.606 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.627 W/kg; SAR(10 g) = 0.312 W/kg
Maximum value of SAR (measured) = 0.998 W/kg



Date/Time: 04/28/2015 11:52:29

Test Laboratory: BTL Inc.

Smart phone GEMINI UMTS Band 2 Left Hand touch cheek

DUT: Smart phone ; Type: GEMINI; Serial: NA

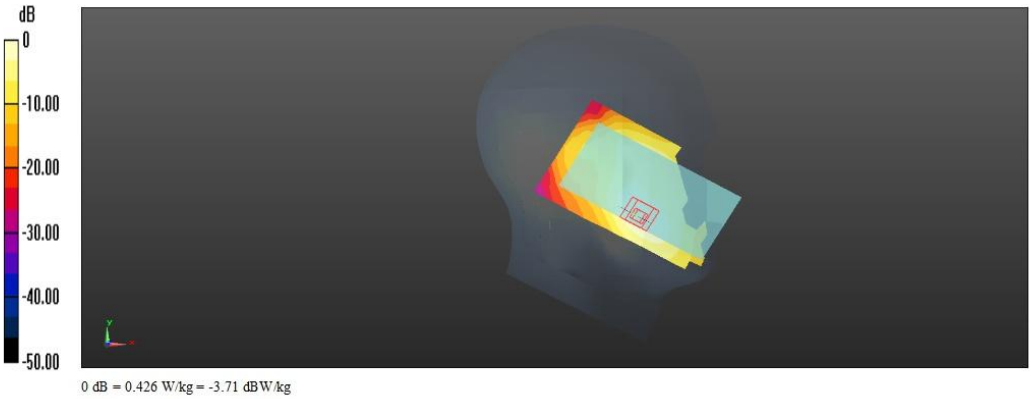
Communication System: UID 0, UMTS-FDD(WCDMA) (0); Frequency: 1880 MHz
Medium parameters used: f = 1880 MHz; σ = 1.45 S/m; εr = 39.74; ρ = 1000 kg/m3
Phantom section: Left Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(8.23, 8.23, 8.23); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Left Hand touch cheek/ GEMINI/Area Scan (11x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.426 W/kg

Left Hand touch cheek/ GEMINI/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.340 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.562 W/kg
SAR(1 g) = 0.363 W/kg; SAR(10 g) = 0.223 W/kg
Maximum value of SAR (measured) = 0.397 W/kg



Date/Time: 05/14/2015 10:58:50

Test Laboratory: BTL Inc.

Smart phone GEMINI UMTS Band 2 Body Front

DUT: Smart phone ; Type: GEMINI; Serial: NA

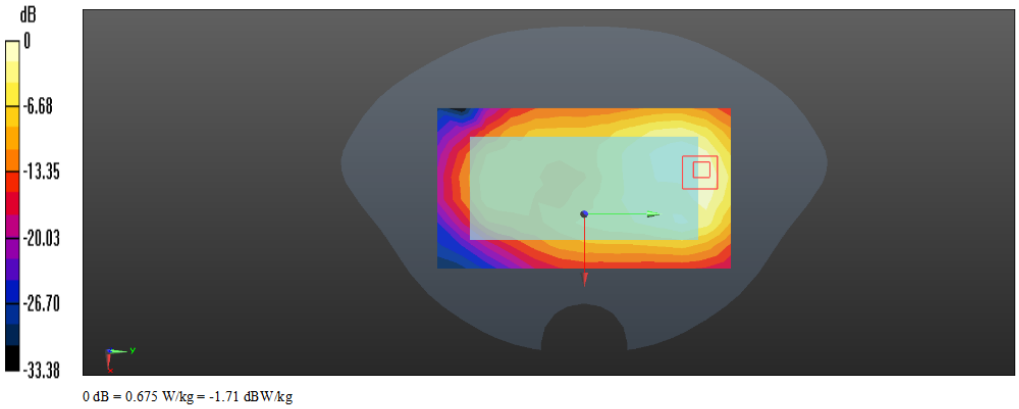
Communication System: UID 0, UMTS-FDD(WCDMA) (0); Frequency: 1880 MHz
Medium parameters used: f = 1880 MHz; σ = 1.57 S/m; εr = 51.14; ρ = 1000 kg/m3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(7.86, 7.86, 7.86); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection),z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Front Side/ GEMINI/Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.675 W/kg

Front Side/ GEMINI/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.687 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.923 W/kg
SAR(1 g) = 0.554 W/kg; SAR(10 g) = 0.312 W/kg
Maximum value of SAR (measured) = 0.796 W/kg



Date/Time: 05/14/2015 14:36:32

Test Laboratory: BTL Inc.

Smart phone GEMINI UMTS Band 2 Body Bottom

DUT: Smart phone ; Type: GEMINI; Serial: NA

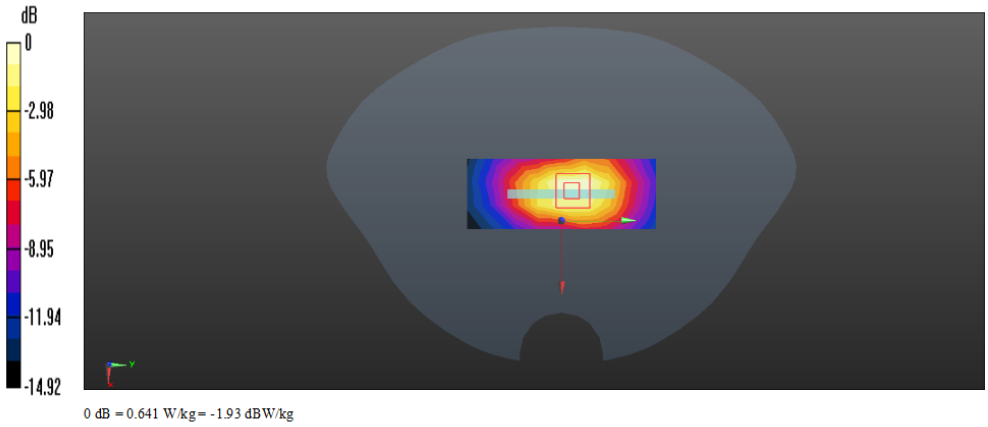
Communication System: UID 0, UMTS-FDD(WCDMA) (0); Frequency: 1880 MHz
Medium parameters used: f = 1880 MHz; σ = 1.57 S/m; εr = 51.14; ρ = 1000 kg/m3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(7.86, 7.86, 7.86); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Bottom Side/ GEMINI/Area Scan (4x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.641 W/kg

Bottom Side/ GEMINI/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.050 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.07 W/kg
SAR(1 g) = 0.605 W/kg; SAR(10 g) = 0.325 W/kg
Maximum value of SAR (measured) = 0.897 W/kg



Date/Time: 05/14/2015 15:46:25

Test Laboratory: BTL Inc.

Smart phone GEMINI UMTS Band 4 Right Hand touch cheek

DUT: Smart phone ; Type: GEMINI; Serial: NA

Communication System: UID 0, UMTS-FDD(WCDMA) (0); Frequency: 1732.6 MHz
Medium parameters used (interpolated): f = 1732.6 MHz; σ = 1.363 S/m; εr = 40.135; ρ = 1000 kg/m3
Phantom section: Right Section

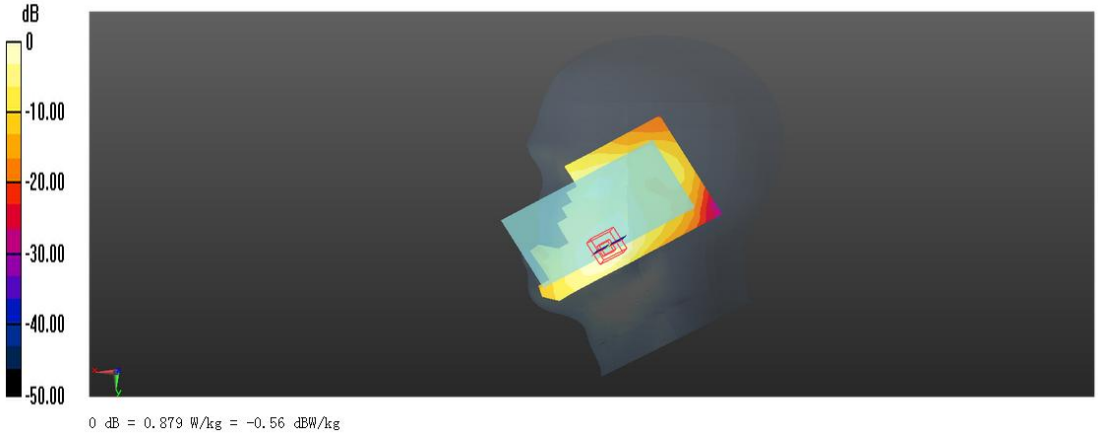
DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(8.42, 8.42, 8.42); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Right hand touch cheek/ GEMINI/Area Scan (11x18x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.879 W/kg

Right hand touch cheek/ GEMINI/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.679 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 1.03 W/kg
SAR(1 g) = 0.567 W/kg; SAR(10 g) = 0.350 W/kg
Maximum value of SAR (measured) = 0.756 W/kg



Date/Time: 04/20/2015 20:09:54

Test Laboratory: BTL Inc.

Smart phone GEMINI UMTS Band 4 Body Front

DUT: Smart phone ; Type: GEMINI; Serial: NA

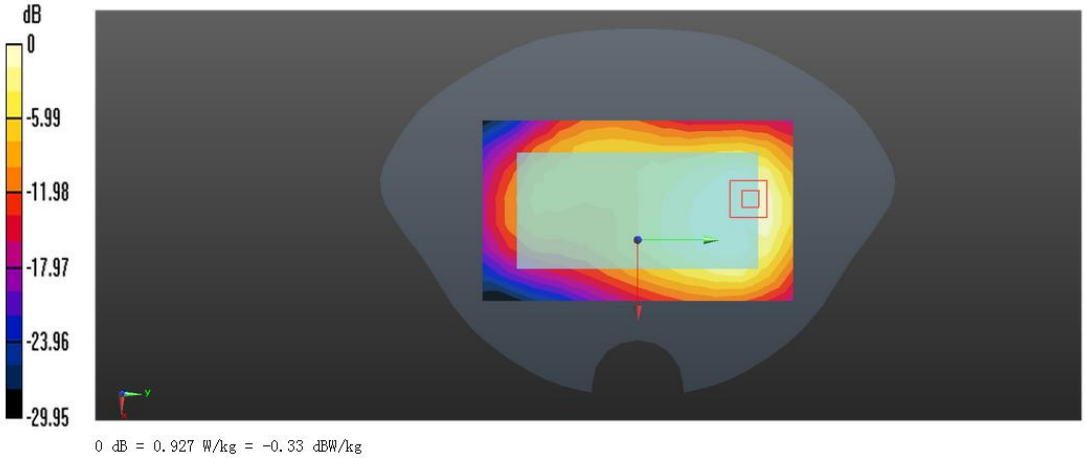
Communication System: UID 0, UMTS-FDD(WCDMA) (0); Frequency: 1732.6 MHz
Medium parameters used (interpolated): f = 1732.6 MHz; σ = 1.469 S/m; εr = 53.248; ρ = 1000 kg/m3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(8.08, 8.08, 8.08); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Front Side/ GEMINI/Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.927 W/kg

Front Side/ GEMINI/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.690 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.765 W/kg; SAR(10 g) = 0.460 W/kg
Maximum value of SAR (measured) = 1.04 W/kg



Date/Time: 04/20/2015 20:40:13

Test Laboratory: BTL Inc.

Smart phone GEMINI UMTS Band 4 Body Bottom

DUT: Smart phone ; Type: GEMINI; Serial: NA

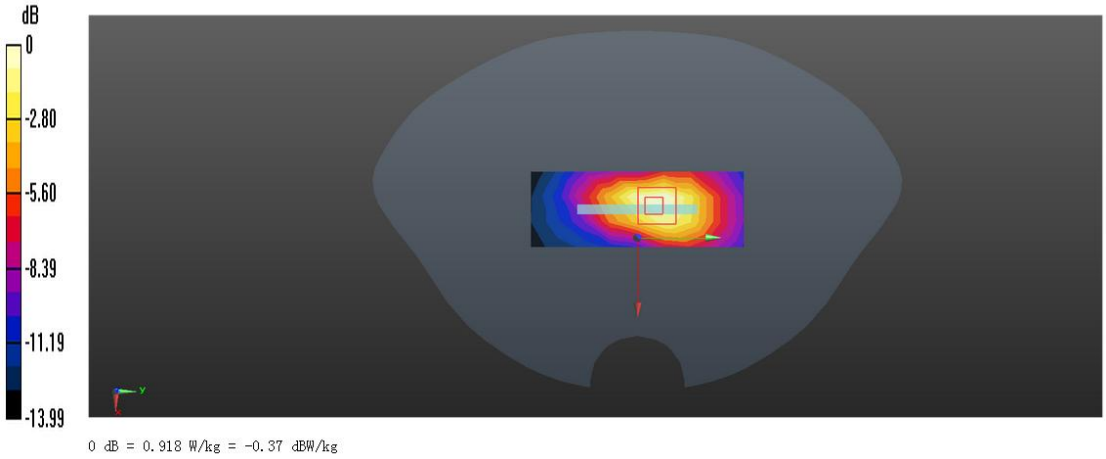
Communication System: UID 0, UMTS-FDD(WCDMA) (0); Frequency: 1732.6 MHz
Medium parameters used (interpolated): f = 1732.6 MHz; σ = 1.469 S/m; εr = 53.248; ρ = 1000 kg/m3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(8.08, 8.08, 8.08); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Bottom Side/ GEMINI/Area Scan (4x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.918 W/kg

Bottom Side/ GEMINI/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 26.712 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 1.09 W/kg
SAR(1 g) = 0.795 W/kg; SAR(10 g) = 0.407 W/kg
Maximum value of SAR (measured) = 0.976 W/kg



Date/Time: 05/12/2015 17:49:13

Test Laboratory: BTL Inc.

Smart phone GEMINI UMTS Band 5 Right Hand touch cheek

DUT: Smart phone ; Type: GEMINI; Serial: NA

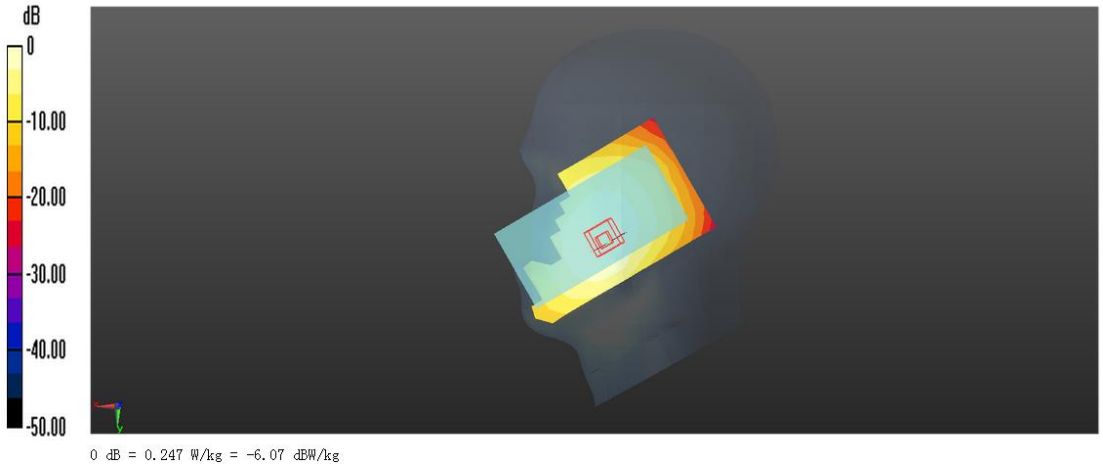
Communication System: UID 0, UMTS-FDD(WCDMA) (0); Frequency: 836.6 MHz
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.89 S/m; εr = 41.478; ρ = 1000 kg/m3
Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(9.75, 9.75, 9.75); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Right hand touch cheek/ GEMINI/Area Scan (11x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.247 W/kg

Right hand touch cheek/ GEMINI/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.808 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.263 W/kg
SAR(1 g) = 0.215 W/kg; SAR(10 g) = 0.165 W/kg
Maximum value of SAR (measured) = 0.224 W/kg



Date/Time: 05/13/2015 11:28:09

Test Laboratory: BTL Inc.

Smart phone GEMINI UMTS Band 5 Body Back

DUT: Smart phone ; Type: GEMINI; Serial: NA

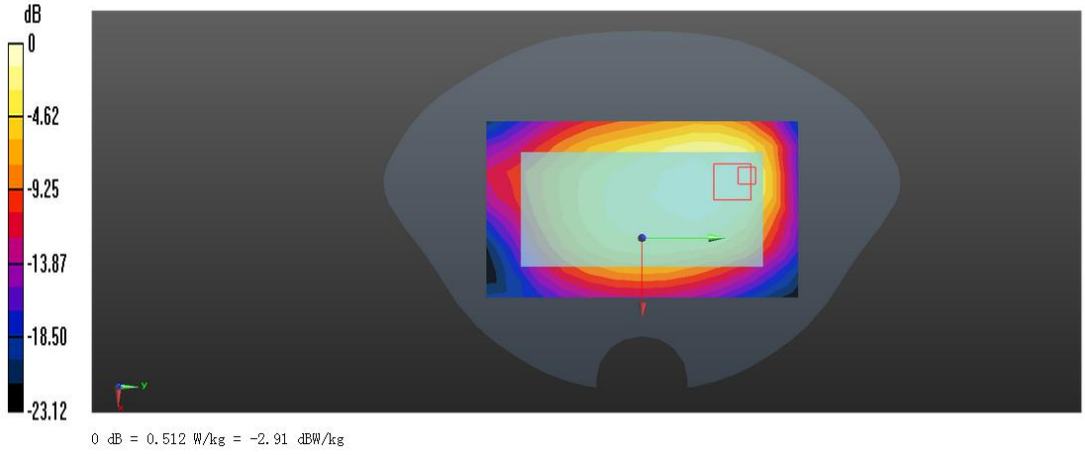
Communication System: UID 0, UMTS-FDD(WCDMA) (0); Frequency: 836.6 MHz
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.98 S/m; εr = 55.868; ρ = 1000 kg/m3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(10.19, 10.19, 10.19); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection),z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Back Side/ GEMINI/Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.512 W/kg

Back Side/ GEMINI/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.896 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.694 W/kg
SAR(1 g) = 0.377 W/kg; SAR(10 g) = 0.227 W/kg
Maximum value of SAR (measured) = 0.572 W/kg



Date/Time: 05/23/2015 23:21:16

Test Laboratory: BTL Inc.

Smart phone GEMINI LTE Band 4 50%RB Left Hand touch cheek

DUT: Smart phone ; Type: GEMINI; Serial: NA

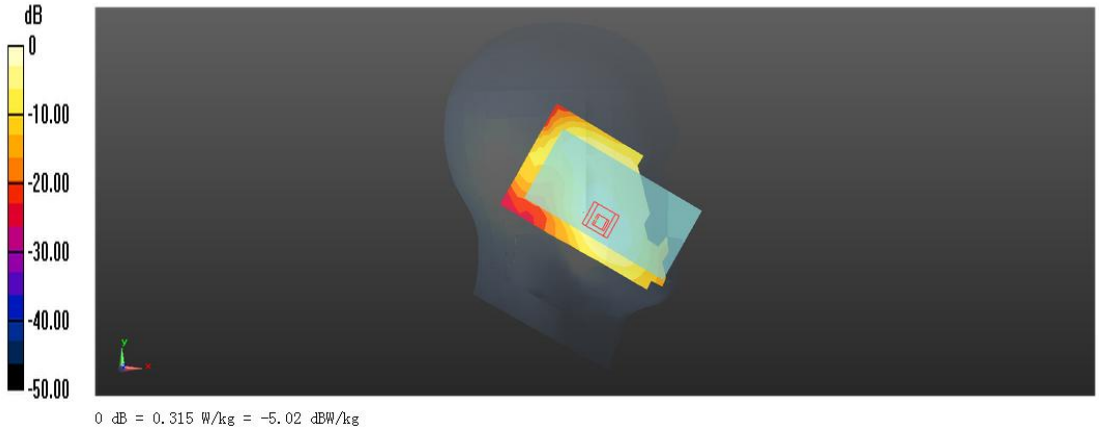
Communication System: UID 0, LTE-FDD(1RB,20MHz,QPSK) (0); Frequency: 1720 MHz
Medium parameters used (interpolated): f = 1720 MHz; σ = 1.35 S/m; εr = 40.218; ρ = 1000 kg/m3
Phantom section: Left Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(8.42, 8.42, 8.42); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Left Hand touch cheek/ GEMINI/Area Scan (11x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.315 W/kg

Left Hand touch cheek/ GEMINI/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.920 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.390 W/kg
SAR(1 g) = 0.264 W/kg; SAR(10 g) = 0.170 W/kg
Maximum value of SAR (measured) = 0.288 W/kg



Date/Time: 05/24/2015 06:13:32

Test Laboratory: BTL Inc.

Smart phone GEMINI LTE Band 4 50%RB Body Back

DUT: Smart phone ; Type: GEMINI; Serial: NA

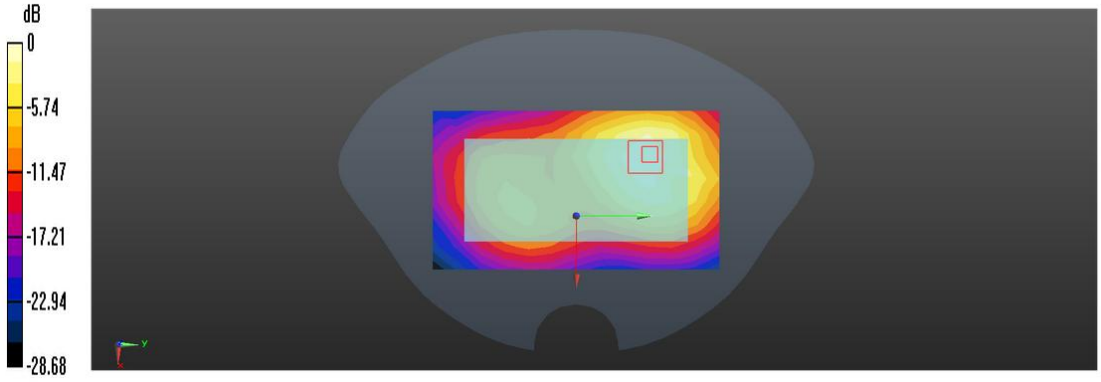
Communication System: UID 0, LTE-FDD(50%RB,20MHz,QPSK) (0); Frequency: 1720 MHz
Medium parameters used (interpolated): f = 1720 MHz; σ = 1.444 S/m; εr = 53.316; ρ = 1000 kg/m3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(8.08, 8.08, 8.08); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Back Side/ GEMINI/Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.788 W/kg

Back Side/ GEMINI/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.822 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.612 W/kg; SAR(10 g) = 0.374 W/kg
Maximum value of SAR (measured) = 0.724 W/kg



Date/Time: 05/23/2015 09:25:06

Test Laboratory: BTL Inc.

Smart phone GEMINI LTE Band 7 1RB Right Hand touch cheek

DUT: Smart phone ; Type: GEMINI; Serial: NA

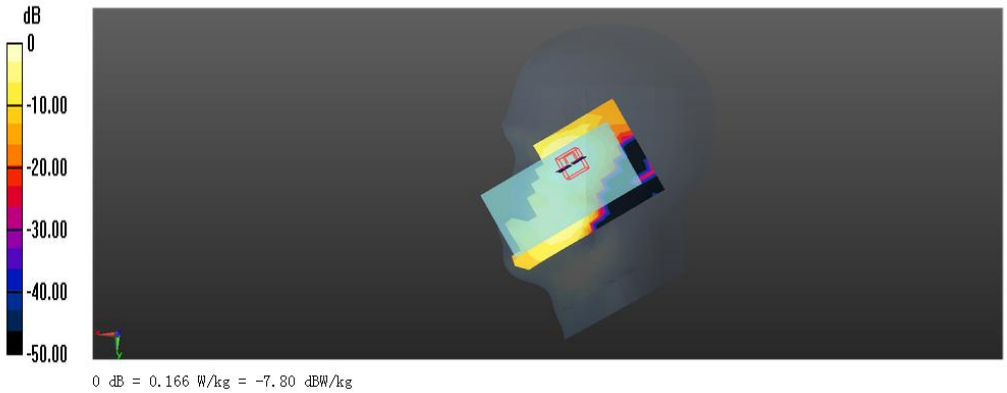
Communication System: UID 0, LTE-FDD(1RB,20MHz,QPSK) (0); Frequency: 2535 MHz
Medium parameters used (interpolated): f = 2535 MHz; σ = 1.9 S/m; εr = 38.96; ρ = 1000 kg/m3
Phantom section: Right Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(7.38, 7.38, 7.38); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Right hand touch cheek/ GEMINI/Area Scan (11x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.166 W/kg

Right hand touch cheek/ GEMINI/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.128 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.249 W/kg
SAR(1 g) = 0.143 W/kg; SAR(10 g) = 0.076 W/kg
Maximum value of SAR (measured) = 0.163 W/kg



Date/Time: 05/20/2015 20:23:08

Test Laboratory: BTL Inc.

Smart phone GEMINI LTE Band 7 50%RB Body Back

DUT: Smart phone ; Type: GEMINI; Serial: NA

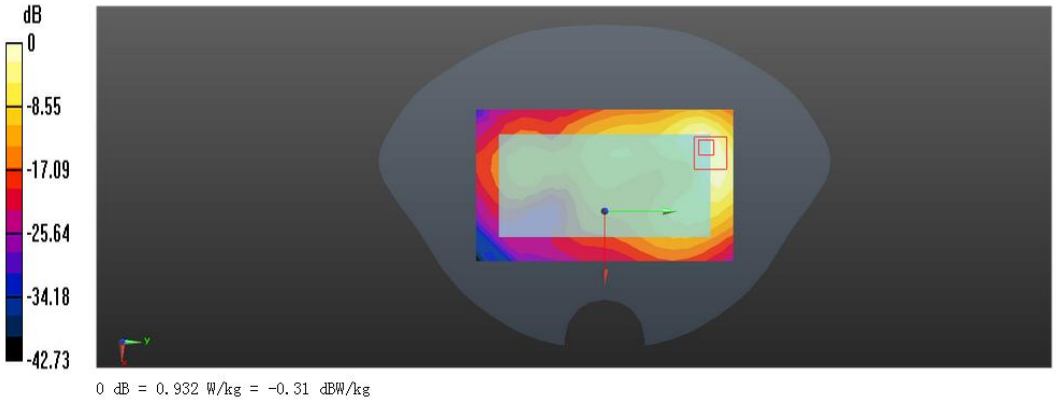
Communication System: UID 0, LTE-FDD(50% RB, 20MHz, QPSK) (0); Frequency: 2535 MHz
Medium parameters used (interpolated): f = 2535 MHz; σ = 2.111 S/m; εr = 52.392; ρ = 1000 kg/m3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(7.6, 7.6, 7.6); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection),z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Front Side/ GEMINI/Area Scan (11x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.932 W/kg

Front Side/ GEMINI/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.313 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.637 W/kg; SAR(10 g) = 0.283 W/kg
Maximum value of SAR (measured) = 1.01 W/kg



Date/Time: 05/23/2015 13:14:59

Test Laboratory: BTL Inc.

Smart phone GEMINI 802.11b 2412MHz CH 1 Left Hand touch cheek

DUT: Smart phone ; Type: GEMINI; Serial: NA

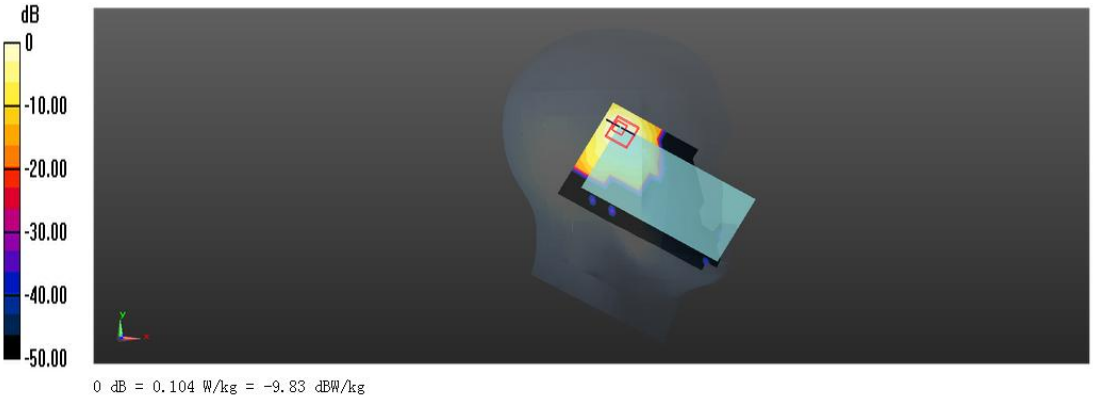
Communication System: UID 0, IEEE 802.11b WiFi 2.4GHz (DSSS,1Mbps) (0); Frequency: 2412 MHz
Medium parameters used (interpolated): f = 2412 MHz; σ = 1.8 S/m; εr = 39.376; ρ = 1000 kg/m3
Phantom section: Left Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(7.38, 7.38, 7.38); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Left Hand touch cheek/ GEMINI/Area Scan (11x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.104 W/kg

Left Hand touch cheek/ GEMINI/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.427 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.153 W/kg
SAR(1 g) = 0.076 W/kg; SAR(10 g) = 0.039 W/kg
Maximum value of SAR (measured) = 0.0856 W/kg



Date/Time: 05/23/2015 16:08:18

Test Laboratory: BTL Inc.

Smart phone GEMINI 802.11b 2412MHz CH 1 Body Front

DUT: Smart phone ; Type: GEMINI; Serial: NA

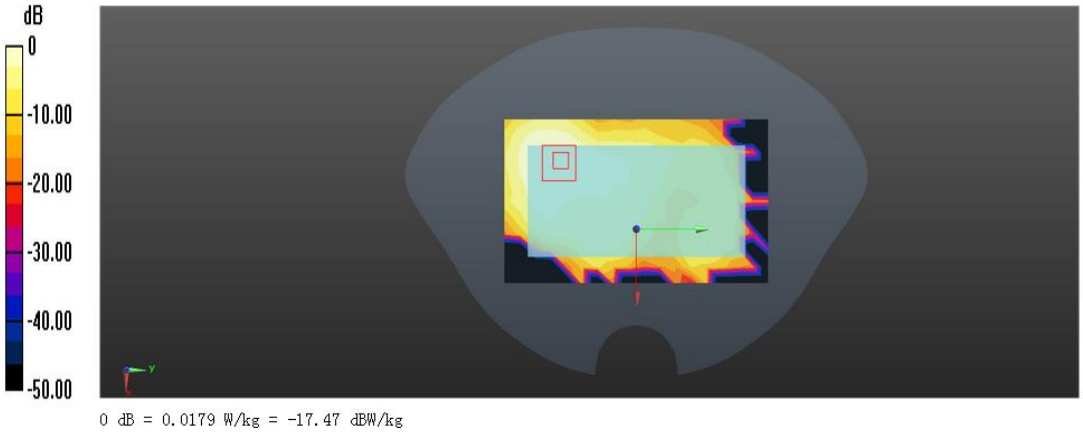
Communication System: UID 0, IEEE 802.11b WiFi 2.4GHz (DSSS,1Mbps) (0); Frequency: 2412 MHz
Medium parameters used (interpolated): f = 2412 MHz; σ = 1.968 S/m; εr = 50.861; ρ = 1000 kg/m3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN3932; ConvF(7.6, 7.6, 7.6); Calibrated: 01/30/2015;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1390; Calibrated: 09/15/2014
- Phantom: SAM 1; Type: SAM; Serial: 1784
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Front Side/ GEMINI/Area Scan (11x18x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.0179 W/kg

Front Side/ GEMINI/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.676 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.0240 W/kg
SAR(1 g) = 0.014 W/kg; SAR(10 g) = 0.00652 W/kg
Maximum value of SAR (measured) = 0.0199 W/kg



4. Calibration Certificate

(Pls See Appendix A.)

5. EUT Testing Position and Antenna Location

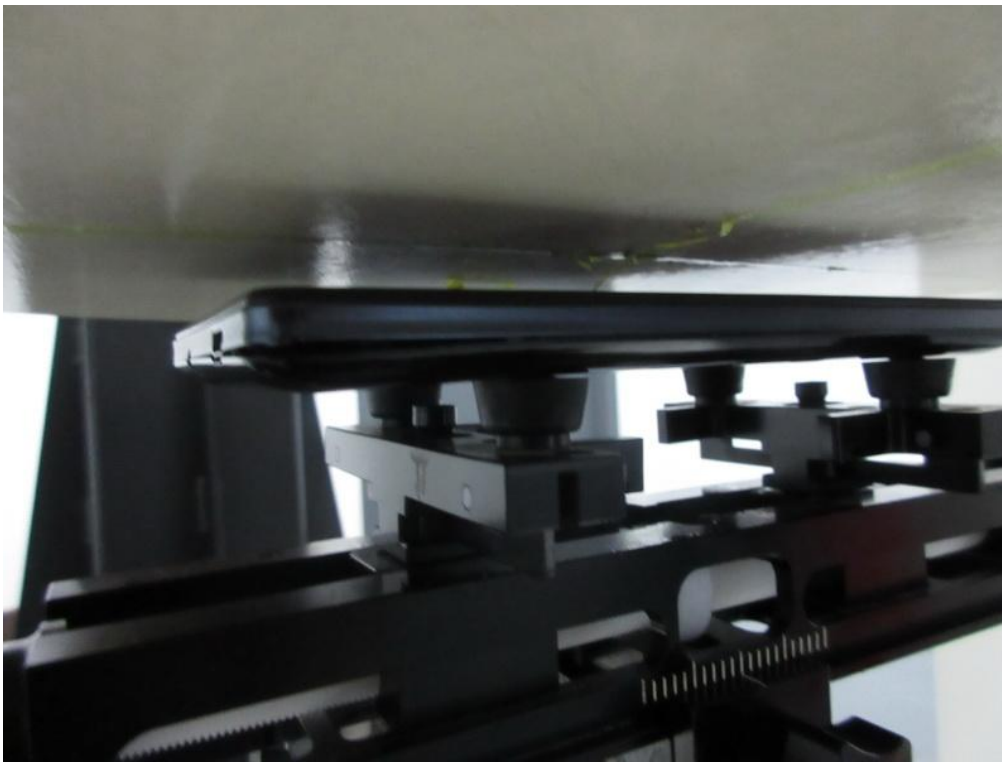
Top Side

Bottom Side

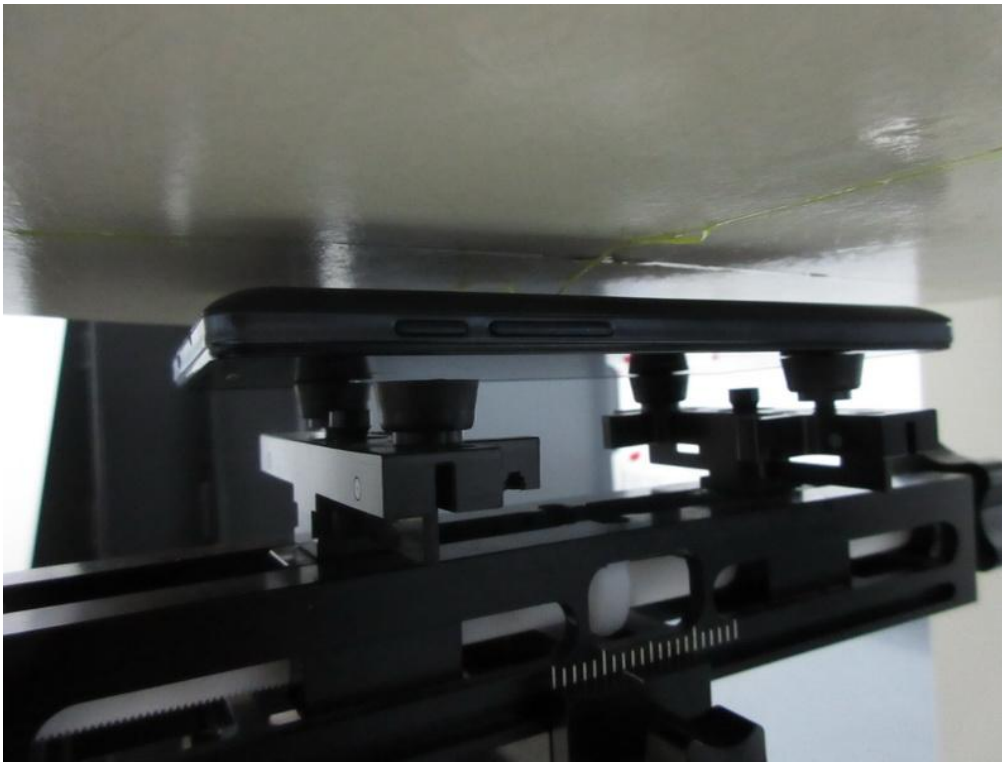
Left Side

Right Side

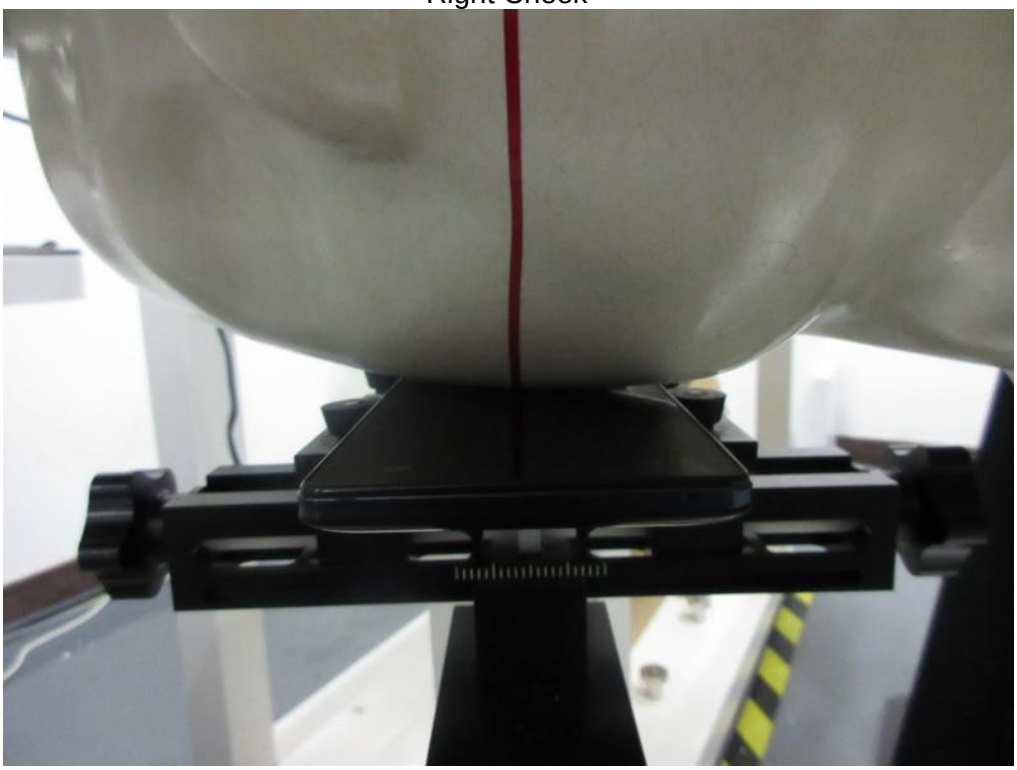
Front Side



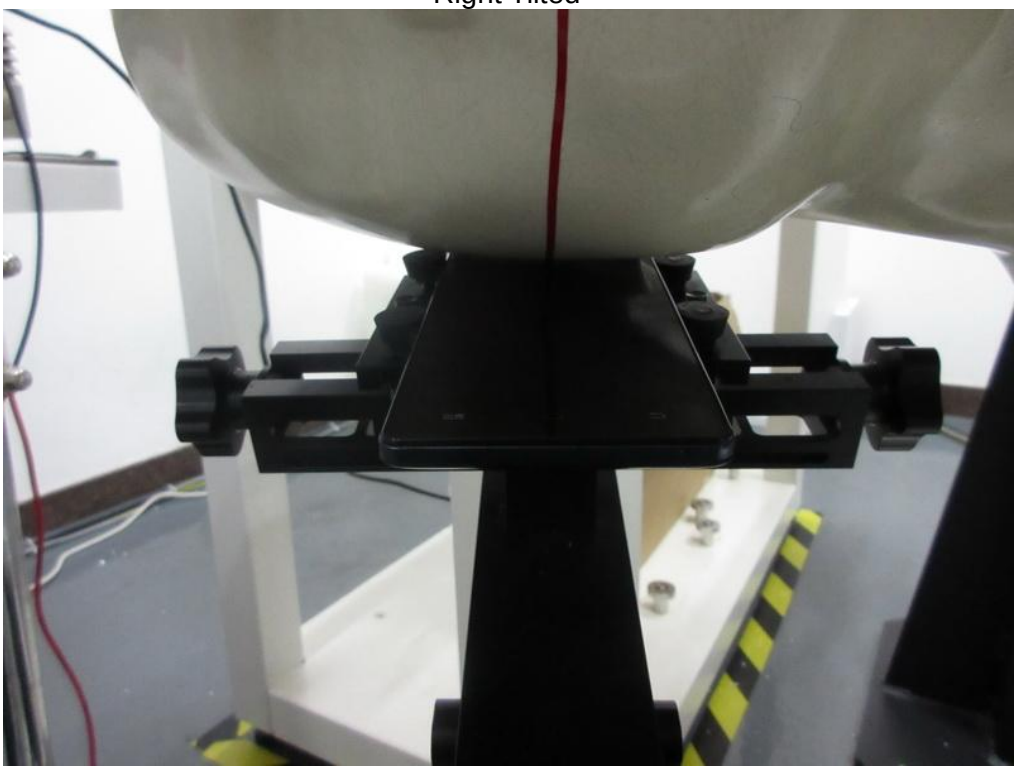
Back Side



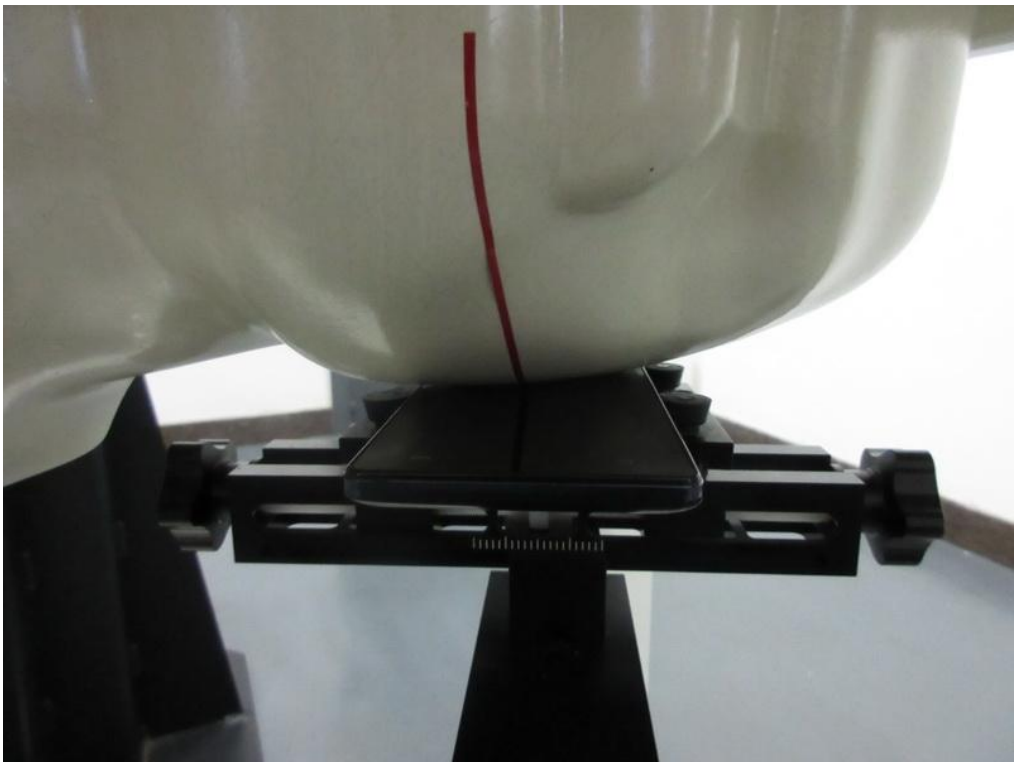
Right Cheek



Right Tilted



Left Cheek



Left Tilted