FCC SAR Test Report

FCC ID: QISSCL-L02

Project No.	:	1507C083
Equipment	:	Smart Phone
Model Name	:	HUAWEI SCL-L02, SCL-L02
Applicant	:	Huawei Technologies Co., Ltd.
Address	:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen,518129, P.R.C

Date of Receipt	:	Jul. 07, 2015
Date of Test	:	Jul. 07, 2015~ Jul. 22, 2015
Issued Date	:	Jul. 23, 2015
Tested by	:	BTL Inc.

Testing Engineer :

(Super Jiang)

Technical Manager :

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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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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-1507C083	Original Issue.	Jul. 23, 2015

1. GENERAL SUMMARY

Equipment	Smart Phone
Brand Name	HUAWEI
Model Name	HUAWEI SCL-L02, SCL-L02
Model difference	Only differ in model name.
Manufacturer	Huawei Technologies Co., Ltd.
Address	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen,518129, P.R.C
Standard(s)	**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) **KDB941225 D01** 3G SAR Procedures v03 **KDB941225 D05** SAR for LTE Devices v02r03 **KDB941225 D06** Hotspot Mode V02 **KDB447498 D01** General RF Exposure Guidance v05r02 **KDB648474 D04** SAR Handsets Multi Xmiter and Ant v01r02 **KDB248227 D01** 802. 11 Wi-Fi SAR v02r01 **KDB865664 D01** SAR measurement 100 MHrz 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-1507C083) 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 HUAWEI SCL-L02, SCL-L02 are as below Table.

Band	Max Reported SAR(W/kg)		
	1-g Head	1-g Body-worn (15mm) *	1-g Hotspot (10mm)
GSM850	0.42	0.58	0.67
GSM1900	0.35	0.21	0.45
UMTS Band 5	0.44	0.56	0.66
LTE Band 5	0.44	0.62	0.68
LTE Band 7	0.48	0.48	0.78
WiFi 2.4G	0.79	0.11	0.23
The highest simultaneous SAR value is 1.27 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 15mm 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, and had been tested in accordance with the measurement methods and procedures specified in IEEE Std 1528-2003 & IEEE Std 1528a-2005.

3.2 GENERAL DESCRIPTION OF EUT

Equipment	Smart Phone		
Model Name	HUAWEI SCL-L02, SCL-L02		
S/N No.	1#sample V2T0115521000374 2#sample V2T0115521000371		
IMEI Code	1#sample IMEI : 867537020003730 2#sample IMEI :867537020003706		
HW Version	HL3SCALEM		
SW Version	SCL-L02V100R001C900B026		
Tested Mode(s)	GSM850/1900, UMTS Band 5, LTE Band 5/7 2.4GWiFi (tested),BT		
Test Modulation	GSM(GMSK/8PSK),UMTS(QPSK),LTE(QPSK/16QAM), WiFi(DSSS/OFDM)		
Operation Frequency Range(s)	Band	TX (MHz)	RX (MHz)
	GSM850	824-849	869-894
	GSM1900	1850-1910	1930-1990
	UMTS Band 5	824-849	869-894
	LTE Band 5	824-849	869-894
	LTE Band 7	2500-2570	2620-2690
	Bluetooth	2400 ~2483.5	
	WIFI	2412 ~2462	
GPRS/EDGE (Downlink only)Multislot Class(12)	Max Number of Timeslots in Uplink:	4	
	Max Number of Timeslots in Downlink:	4	
	Max Total Timeslot:	5	
GSM Device class	Class B		
HSDPA UE Category	14		
HSUPA UE Category	6		
DC-HSDPA UE Category	24		
Power Class:	4,tested with power level 5(GSM850)		
	1,tested with power level 0(GSM1900)		
	3, tested with power control “all 1”(UMTS Band 5)		
	3, tested with power control “all Max”(LTE Band 5/7)		
Test Channels (low-mid-high):	128-190-251 (GSM850)		
	512-661-810 (GSM1900)		
	4132-4182-4233 (UMTS Band 5)		
	20407-20525-20643(LTE Band 5 BW=1.4MHz)		
	20415-20525-20635(LTE Band 5 BW=3MHz)		
	20425-20525-20625(LTE Band 5 BW=5MHz)		
	20450-20525-20600(LTE Band 5 BW=10MHz)		
	20775-21100-21425(LTE Band 7 BW=5MHz)		
	20800-21100-21400(LTE Band 7 BW=10MHz)		
	20825-21100-21375(LTE Band 7 BW=15MHz)		
	20850-21100-21350(LTE Band 7 BW=20MHz)		
	1-6-11(2.4G WIFI 802.11b/g/n HT20)		

Antenna Gain	BT/2.4GWiFi: -2 dBi
	GSM850: -1.6dBi
	GSM1900:0.1dBi
	UMTS850:-1.6dBi
	LTE Band5:-1.6dBi;
	LTE Band7:0.1dBi;

Other Information		
Battery	Brand	HUAWEI
	Model	HB4342A1RBC
	Capacitance	2200mAh
	Rated Voltage	3.8V
	Manufacturer	SCUD (FUJIAN) Electronics Co., Ltd.
		Sunwoda Eletronic Co., LTD.
Earphone	Brand	HUAWEI
	Model	1.HA1-3 2.1293#+3283# 3.5MM-150 3.MEMD1532B528000 4.EMC323-011-01 5.HG-04A
	Manufacturer	1.GoerTek Inc 2.BOLUO COUNTY QUANCHENG ELECTRONIC CO., LTD. 3.Jiangxi Lianchuang Hongsheng Electronic Co., LTD. 4.MERRY ELECTRONICS CO., LTD. 5.GoerTek Inc

3.3 HOTSPOT POWER REDUCTION SPECIFICATION FOR SAR

This device uses a single fixed level of power reduction through static table look-up for SAR compliance and it is triggered by a single event or operation. A fixed level power reduction is applied when hotspot mode becomes active. When the hotspot is disabled, the power value will be recovered.

Item	Description
Supporting power reduction or not	Yes
Frequency Band(s) using power reduction	LTE Band 7
Power reduction feature	A fixed power reduction is applied when hotspot mode becomes active. When the hotspot is disabled, the power value will be recovered.
Triggering conditions	Only hotspot mode (wireless routing) and nothing else is used to trigger this power reduction.
Full power and reduced power specifications	See Section 8.1
All simultaneous voice and data transmissions combinations and considerations	See Section 8.3

3.4 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.	

3.5 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	Power Amplifier	Mini-circuits	ZHL-42W	N/A	N/A
6	Power Amplifier	Mini-circuits	ZVE-8G	N/A	N/A
7	ENA Network Analyzer	Agilent	E5071C	MY46102965	Mar. 29, 2016
8	Dielectric Probe Kit	Agilent	85070E	2593	N/A
9	P-series power meter	Agilent	N1911A	MY45100473	Mar. 29, 2016
10	wideband power sensor	Agilent	N1921A	MY51100041	Mar. 29, 2016
11	Power Meter	Anritsu	ML2487A	6K00004714	Mar. 16, 2016
12	Power Meter Sensor	Anritsu	MA2491A	34138	Mar. 16, 2016
13	MXG Analog Signal Generator	Agilent	N5181A	MY49060710	Nov. 02, 2015
14	System Validation Dipole	Speag	D835V2	4d160	Sep. 23, 2015
15	System Validation Dipole	Speag	D1900V2	5d179	Sep. 18, 2015
16	System Validation Dipole	Speag	D2450V2	919	Sep. 17, 2015
17	System Validation Dipole	Speag	D2600V2	1067	Sep. 18, 2015
18	Low pass filter	Mini-Circuits	SLP-2950+	M108294	Mar. 29, 2016
19	Attenuator	Mini-Circuits	VAT-10+	31317-1	Mar. 29, 2016
20	Attenuator	Mini-Circuits	VAT-10+	31317-2	Mar. 29, 2016
21	Attenuator	MEB	300-affn-03	314	Mar. 29, 2016
22	Dual directional coupler	Agilent	777D	50208	Mar. 29, 2016
23	8960 Series wireless Communication Test SET	Agilent	E5515C	MY48364183	Mar. 28, 2016
24	Wideband radio communication tester	R&S	CMW500	12010002K50-1 22125-PJ	Mar. 29, 2016
25	Spectrum Analyzer	R&S	FSL 6	100423	Nov. 02, 2015
26	Directional Coupler	Telestone	TS-PCCOM-05	0107090019	Mar. 04, 2016
27	Coupler	Mini-Circuits	ZADC-10-63-S+	SF6631801334	Mar. 29, 2016

Remark: " N/A" denotes no model name, serial No. or calibration specified.
All calibration period of equipment list is one year.

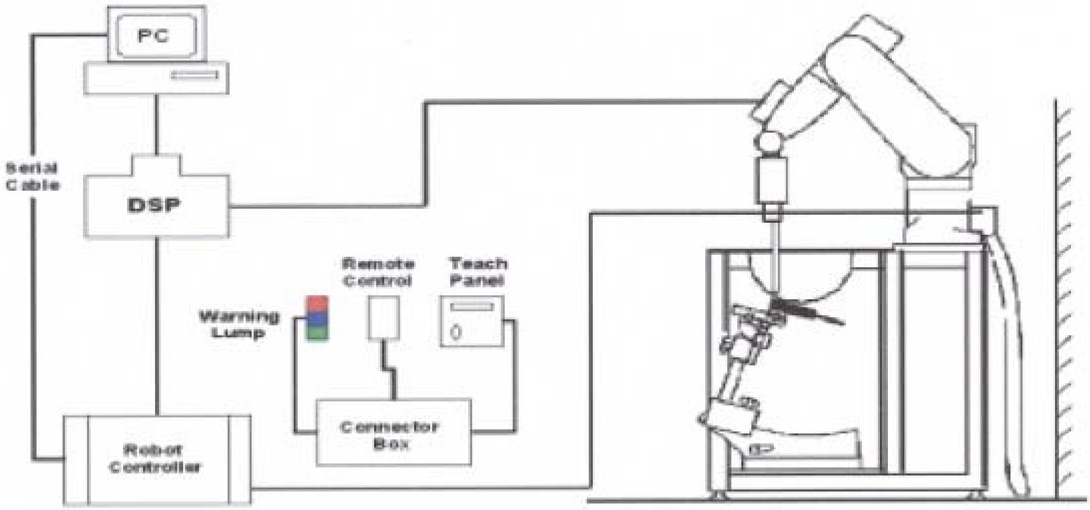
4.SAR MEASUREMENTS SYSTEM CONFIGURATION

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.

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

Where: Δt = Exposure time (30 seconds),
C = Heat capacity of tissue (brain or muscle),
ΔT = Temperature increase due to RF exposure.

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

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-worn) 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}, $\Delta y_{zoom} \leq$ 2GHz -≤8mm, 2-4GHz -≤5 mm and 4-6 GHz-≤4mm; $\Delta z_{zoom} \leq$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.

Ingredients (% of weight)	Head Tissue			
Frequency Band (MHz)	835	1900	2450	2600
Water	41.45	55.242	62.7	55.242
Salt(NaCl)	1.45	0.306	0.5	0.306
Sugar	56.0	0.0	0.0	0.0
HEC	1.0	0.0	0.0	0.0
Bactericide	0.1	0.0	0.0	0.0
TritonX-100	0.0	0.0	0.0	0.0
DGBE	0.0	44.542	36.8	44.452
Ingredients (% of weight)	Body Tissue			
Frequency Band (MHz)	835	1900	2450	2600
Water	52.4	69.91	73.2	64.493
Salt(NaCl)	1.40	0.13	0.04	0.024
Sugar	45.0	0.0	0.0	0.0
HEC	1.0	0.0	0.0	0.0
Bactericide	0.1	0.0	0.0	0.0
TritonX-100	0.0	0.0	0.0	0.0
DGBE	0.0	29.96	26.7	32.252

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)	0.96 (0.92~1.02)	56.407	0.993	21.9	2015/7/17
		55.2 (52.44~57.96)	0.96 (0.92~1.02)	56.706	0.984	22.5	2015/7/18
	1900	53.3 (50.64~55.97)	1.52 (1.44~1.60)	52.993	1.553	22.1	2015/7/19
	2450	52.7 (50.07~55.35)	1.95 (1.85~2.05)	51.714	1.979	22.3	2015/7/19
	2600	52.51 (49.88~55.14)	2.16 (2.05~2.27)	52.309	2.126	22.4	2015/7/19
Head	835	41.5 (39.43~43.58)	0.9 (0.86~0.95)	41.706	0.913	22.5	2015/7/15
				41.696	0.921	22.1	2015/7/16
	1900	40 (38.00~42.00)	1.4 (1.33~1.47)	39.720	1.443	22.2	2015/7/15
	2450	39.2 (37.24~41.16)	1.8 (1.71~1.89)	38.396	1.803	22.4	2015/7/19
	2600	39.0 (37.05~40.95)	1.96 (1.86~2.06)	37.589	2.006	22.3	2015/7/15

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

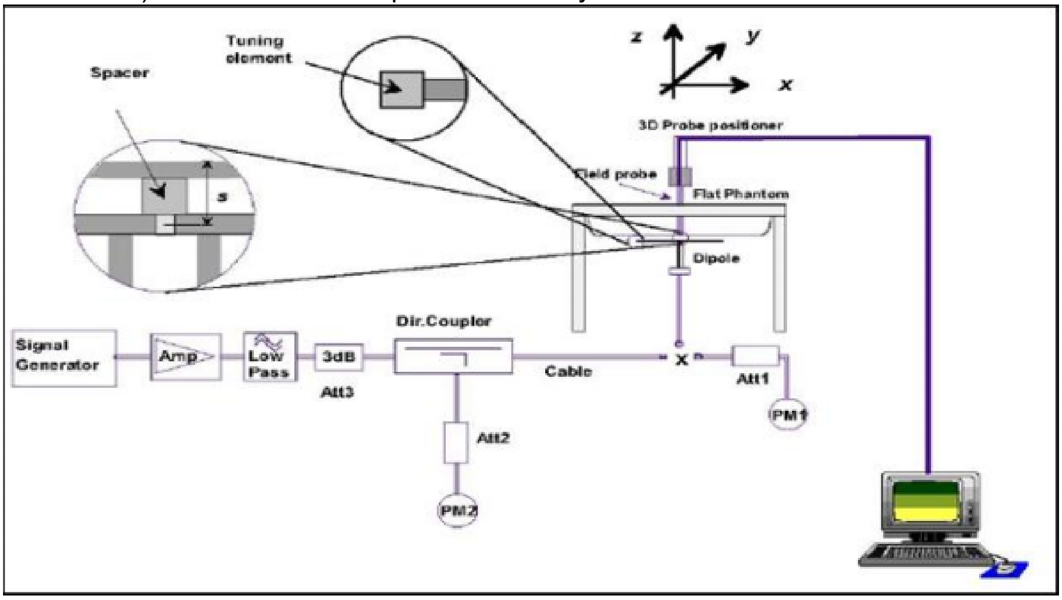
The system check is performed for verifying the accuracy of the complete measurement system and performance of the software. The system check is performed with tissue equivalent material according to IEEE P1528 (described above). The following table shows system check results for all frequency bands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

System Check	Measured Frequency (MHz)	250mW Measured SAR_{1g}	1W Normalized SAR_{1g}	1W Target SAR_{10g} (±10% deviation)	Liquid Temp. (℃)	Test Date
Head	835	2.33	9.32	9.43 (8.487~10.373)	22.5	2015/7/15
		2.42	9.68		22.1	2015/7/16
	1900	9.81	39.24	39.8 (35.82~43.78)	22.2	2015/7/15
	2450	13.10	52.40	51.5 (46.35~56.65)	22.4	2015/7/19
	2600	15.00	60.00	58.0 (52.20~63.80)	22.3	2015/7/15
Body	835	2.42	9.68	9.56 (8.604~10.516)	21.9	2015/7/17
		2.49	9.96		22.5	2015/7/18
	1900	9.82	39.28	39.5 (35.55~43.45)	22.1	2015/7/19
	2450	12.91	51.64	50.7 (45.63~55.77)	22.3	2015/7/19
	2600	14.20	56.80	57.4 (51.66~63.14)	22.4	2015/7/19

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 8960 Series 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 downlink.

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	3.5
	3 TX slots	5.5
	4 TX slots	6.5
GSM1900	1 TX slot	0
	2 TX slots	2.5
	3 TX slots	4.5
	4 TX slots	5.5

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 ∆ACK, ∆NACK, ∆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: ∆ACK, ∆NACK and ∆CQI = 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, $\beta_{hs}/\beta_c = 24/15$. 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 $\beta_c = 11/15$ and $\beta_d = 15/15$

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: ΔACK, ΔNACK and ΔCQI = 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).

5. DC-HSDPA

In DC-HSDPA implementation of this device, the uplink parameters are the same as HSDPA. No additional channels and modulations (16 QAM, and 64 QAM) are supported in uplink. The difference is only in the downlink parameters, where two carriers are supported. HSDPA settings were used on uplink.

For Rel. 8 DC-HSDPA apply the four subtests from HSDPA Release 5 except use fixed reference channel H-Set 12 for DC-HSDPA. And we can apply the same SAR test exclusion criteria used for Rel. 6 HSPA for Rel. 7 HSPA+ and Rel. 8 DC-HSDPA. That is, if the HSPA, HSPA+, or the DC-HSDPA maximum output is not more than 0.25 dB higher than WCDMA, SAR measurement for those modes is not required.
The following tests were completed according to procedures in section 7.3.13 of 3GPP TS 34.108 v9.5.0. A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0
Levels for HSDPA connection setup

Parameter During Connection setup	**Unit**	**Value**
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH _Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-3.1

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13
The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.
The measurements were performed with a Fixed Reference Channel (FRC) H-Set 12 with QPSK

Parameter	Value
Nominal average inf. bit rate	60 kbit/s
Inter-TTI Distance	1 TTI"s
Number of HARQ Processes	6 Processes
Information Bit Payload	120 Bits
Number Code Blocks	1 Block
Binary Channel Bits Per TTI	960 Bits
Total Available SMLs in UE	19200 SMLs
Number of SMLs per HARQ Process	3200 SMLs
Coding Rate	0.15
Number of Physical Channel Codes	1

Note:
1.The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table above.
2.Maximum number of transmission is limited to 1,i.e.,retransmission is not allowed. The redundancy and constellation version 0 shall be used.

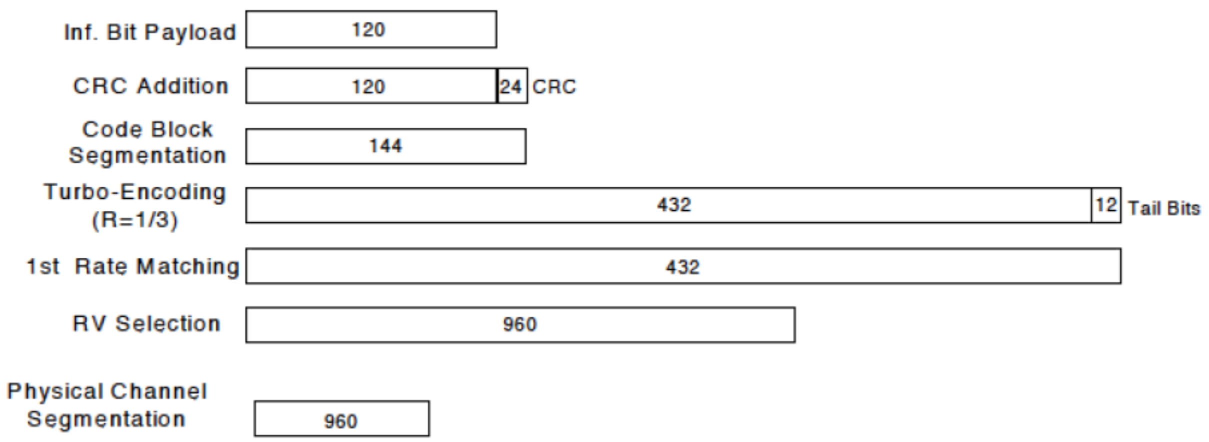


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

The following 4 Sub-tests for HSDPA were completed according to Release 5 procedures. A summary of subtest settings are illustrated below:

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: 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 β_c/β_d= 12/15, $\beta_{hs}/\beta_c = 24/15$. 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 $\beta_c = 11/15$ and $\beta_d = 15/15$

Up commands are set continuously to set the UE to Max power.

Note:
1.The Dual Carriers transmission only applies to HSDPA physical channels
2.The Dual Carriers belong to the same Node and are on adjacent carriers.
3.The Dual Carriers do not support MIMO to serve UEs configured for dual cell operation
4.The Dual Carriers operate in the same frequency band .
5.The device doesn't support the modulation of 16QAM in uplink but 64QAM in downlink for DC-HSDPA mode.
6.The device doesn"t support carrier aggregation for it just can operate in Release 8.

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 2.4G WIFI TEST CONFIGURATION

For WLAN SAR testing, WLAN engineering testing software installed on the DUT can provide continuous transmitting RF signal.

Mode	b	g	N20
Duty cycle	100%		
Crest factor	1		

For the 802.11b SAR tests, a communication link is set up with the test mode software for WiFi mode test. The Absolute Radio Frequency Channel Number(ARFCN) is allocated to 1 ,6 and 11 respectively in the case of 2450 MHz. 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.

✧ **802.11b DSSS SAR Test Requirements**

SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

1) When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
2) When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

✧ **2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements**

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied. SAR is not required for the following 2.4 GHz OFDM conditions.

1) When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.
2) When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

7.2 TEST POSITION

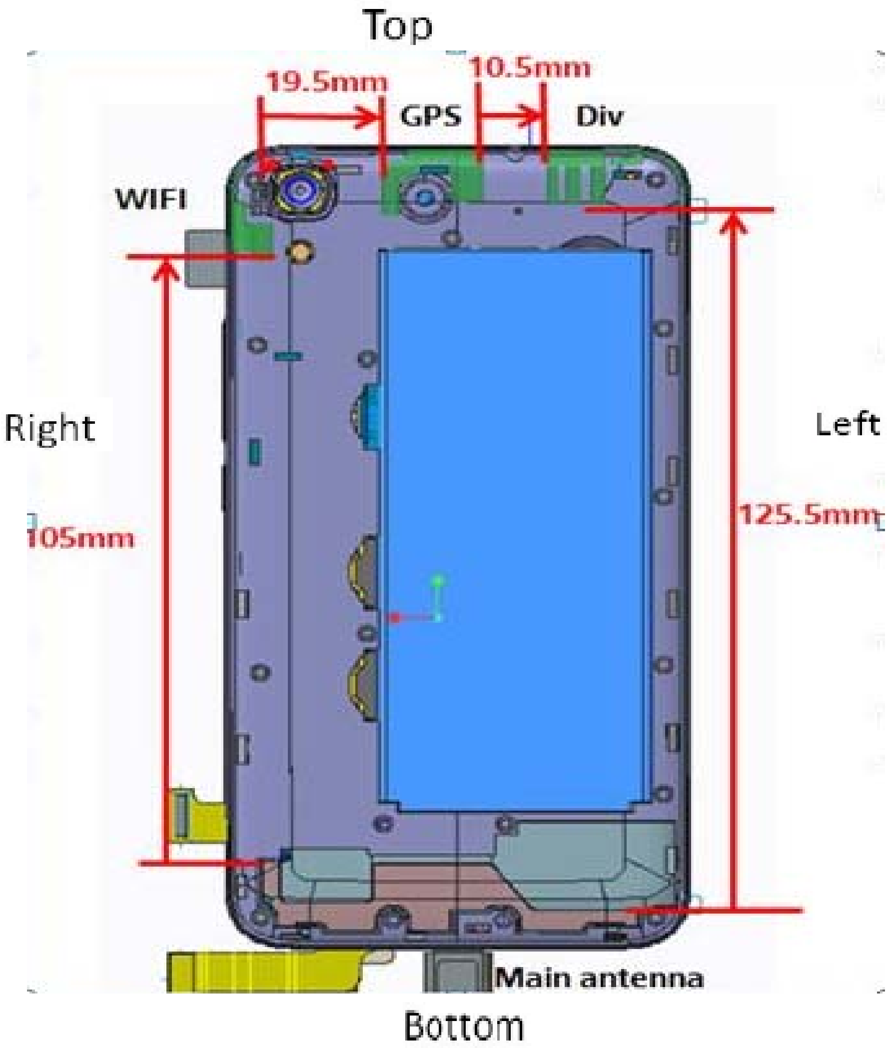
7.2.1 Head

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

7.2.2 Body

The size of the mobile phone is 143.5mm(length)X72.1mm (width), the length of the diagonal is144.5mm .

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



Note:

1) The diversity antenna that is used to improve the acceptance of performance of the main antenna, it does not have a transmitter function.

Table 7.2.2 Hotspot Side For SAR Testing

Mode	Exposure Condition	Front Side	Rear Side	Left Side	Right Side	Top Side	Bottom Side
GSM850/1900	Hotspot	YES	YES	YES	YES	NO	YES
UMTS Band 5	Hotspot	YES	YES	YES	YES	NO	YES
LTE Band 5/7	Hotspot	YES	YES	YES	YES	NO	YES
2.4GWiFi	Hotspot	YES	YES	NO	YES	YES	NO

Note: Per KDB 941225 D06, particular DUT edges were not required to be evaluated for Hotspot SAR if the antenna-to-edge distance is greater than 2.5cm.

8.TEST RESULT

8.1CONDUCTED POWER RESULTS

8.1.1CONDUCTED POWER MEASUREMENTS OF GSM850

1) Conducted power measurement results 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)		34.00	33.46	33.25	33.32	-9.19	24.27	24.06	24.13
GPRS (GMSK)	1 Tx Slot	**34.00**	33.43	**33.31**	33.87	-9.19	24.24	**24.12**	24.68
	2 Tx Slots	30.50	30.03	30.03	29.85	-6.13	23.90	23.90	23.72
	3 Tx Slots	28.50	27.98	28.17	27.82	-4.42	23.56	23.75	23.40
	4 Tx Slots	27.50	26.66	26.75	27.04	-3.18	23.48	23.57	23.86

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 GPRS1Tx mode was selected for SAR testing according to the highest frame –averaged output power table.

8.1.2CONDUCTED POWER MEASUREMENTS OF GSM1900

1) Conducted power measurement results 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)		31.00	30.67	30.72	30.75	-9.19	21.48	21.53	21.56
GPRS (GMSK)	1 Tx Slot	31.00	30.64	30.59	30.49	-9.19	21.45	21.40	21.30
	2 Tx Slots	**28.50**	27.99	**27.95**	27.66	-6.13	21.86	**21.82**	21.53
	3 Tx Slots	26.50	26.18	26.07	25.72	-4.42	21.76	21.65	21.30
	4 Tx Slots	25.50	24.76	24.63	24.43	-3.18	21.58	21.45	21.25

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 tabl

8.1.3CONDUCTED POWER MEASUREMENTS OF UMTS850 Band 5

UMTS850 (Band 5)		Tune-up	SAR Conducted Power (dBm)		
			4132CH	4182CH	4233CH
WCDMA	12.2kbps RMC	**24.30**	23.82	23.71	23.66
	64kbps RMC	**24.30**	23.73	23.60	23.64
	144kbps RMC	**24.30**	23.80	23.60	23.72
	384kbps RMC	**24.30**	23.76	23.70	23.72
HSDPA	Subtest 1	**23.50**	22.54	22.36	22.27
	Subtest 2	**23.50**	22.45	22.34	22.19
	Subtest 3	**22.50**	22.01	21.86	21.80
	Subtest 4	**22.50**	22.03	21.89	21.73
HSUPA	Subtest 1	**23.50**	22.35	22.32	22.24
	Subtest 2	**22.50**	21.67	21.60	21.17
	Subtest 3	**21.50**	21.01	21.03	20.82
	Subtest 4	**22.50**	21.94	22.03	21.93
	Subtest 5	**23.00**	22.13	21.99	21.91
DC-HSDPA	Subtest 1	**23.50**	22.54	22.36	22.27
	Subtest 2	**23.50**	22.45	22.34	22.19
	Subtest 3	**22.50**	22.01	21.86	21.80
	Subtest 4	**22.50**	22.03	21.89	21.73

8.1.4CONDUCTED POWER MEASUREMENTS OF LTE Band 5

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20407	20525	20643
1.4MHz	QPSK	1	0	**24.00**	22.28	22.63	22.74
		1	2	**24.00**	22.49	22.50	22.88
		1	5	**24.00**	22.62	22.53	22.68
		3	0	**24.00**	22.33	22.37	22.53
		3	1	**24.00**	22.47	22.40	22.56
		3	3	**24.00**	22.53	22.36	22.58
		6	0	**23.00**	21.50	21.35	21.53
	16QAM	1	0	**23.00**	21.62	21.60	21.78
		1	2	**23.00**	21.84	21.73	21.88
		1	5	**23.00**	21.86	21.53	21.89
		3	0	**23.00**	21.51	21.63	21.63
		3	1	**23.00**	21.65	21.65	21.72
		3	3	**23.00**	21.70	21.65	21.77
		6	0	**22.00**	20.40	20.58	20.70
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20415	20525	20635
3MHz	QPSK	1	0	**24.00**	22.42	22.60	22.56
		1	7	**24.00**	22.67	22.45	22.48
		1	14	**24.00**	22.80	22.59	22.59
		8	0	**23.00**	21.41	21.44	21.50
		8	3	**23.00**	21.44	21.45	21.60
		8	7	**23.00**	21.50	21.40	21.53
		15	0	**23.00**	21.40	21.44	21.55
	16QAM	1	0	**23.00**	21.76	21.60	21.60
		1	7	**23.00**	21.85	21.60	21.58
		1	14	**23.00**	22.14	21.59	21.70
		8	0	**22.00**	20.58	20.40	20.55
		8	3	**22.00**	20.56	20.45	20.73
		8	7	**22.00**	20.62	20.41	20.72
		15	0	**22.00**	20.52	20.39	20.60

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20425	20525	20625
5MHz	QPSK	1	0	**24.00**	22.36	22.68	22.69
		1	12	**24.00**	22.68	22.72	22.74
		1	24	**24.00**	22.61	22.71	22.72
		12	0	**23.00**	21.60	21.60	21.53
		12	6	**23.00**	21.52	21.50	21.54
		12	13	**23.00**	21.52	21.47	21.58
		25	0	**23.00**	21.51	21.50	21.54
	16QAM	1	0	**23.00**	21.93	21.72	21.80
		1	12	**23.00**	22.17	21.73	21.88
		1	24	**23.00**	22.18	21.68	21.90
		12	0	**22.00**	20.60	20.60	20.60
		12	6	**22.00**	20.64	20.55	20.58
		12	13	**22.00**	20.66	20.46	20.58
		25	0	**22.00**	20.59	20.43	20.51
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20450	20525	20600
10MHz	QPSK	1	0	**24.00**	22.47	22.60	22.53
		1	24	**24.00**	22.52	22.50	22.54
		1	49	**24.00**	22.50	22.40	22.58
		25	0	**23.00**	21.60	21.60	21.60
		25	12	**23.00**	21.41	21.56	21.59
		25	25	**23.00**	21.40	21.51	21.50
		50	0	**23.00**	21.39	21.47	21.51
	16QAM	1	0	**23.00**	21.84	21.96	21.99
		1	24	**23.00**	21.80	21.60	21.61
		1	49	**23.00**	21.70	21.70	21.63
		25	0	**22.00**	20.60	20.65	20.61
		25	12	**22.00**	20.50	20.63	20.61
		25	25	**22.00**	20.40	20.60	20.53
		50	0	**22.00**	20.41	20.50	20.52

8.1.7CONDUCTED POWER MEASUREMENTS OF LTE Band 7

1) Conducted power measurement results of LTE Band 7 (Hotspot disabled)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20775	21100	21425
5MHz	QPSK	1	0	**23.40**	22.84	22.88	22.90
		1	13	**23.40**	22.75	22.68	22.50
		1	24	**23.40**	23.06	21.80	22.34
		12	0	**22.40**	21.72	21.46	21.38
		12	6	**22.40**	21.46	21.47	21.68
		12	11	**22.40**	21.82	22.06	21.69
		25	0	**22.40**	21.56	21.65	21.61
	16QAM	1	0	**22.40**	21.07	21.47	21.67
		1	13	**22.40**	21.94	21.51	21.39
		1	24	**22.40**	21.80	21.44	21.14
		12	0	**21.40**	20.47	20.50	20.69
		12	6	**21.40**	20.68	20.42	20.80
		12	11	**21.40**	20.48	20.46	20.79
		25	0	**21.40**	20.65	20.78	20.75
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20800	21100	21400
10MHz	QPSK	1	0	**23.40**	22.88	22.93	22.95
		1	25	**23.40**	22.88	22.58	22.51
		1	49	**23.40**	23.18	22.07	22.34
		25	0	**22.40**	21.56	21.44	21.38
		25	13	**22.40**	21.51	21.44	21.59
		25	25	**22.40**	21.82	21.78	21.77
		50	0	**22.40**	21.56	21.73	21.74
	16QAM	1	0	**22.40**	21.89	22.07	22.27
		1	25	**22.40**	22.33	21.53	21.52
		1	49	**22.40**	21.81	21.51	21.35
		25	0	**21.40**	20.40	20.55	20.63
		25	13	**21.40**	20.73	20.54	21.14
		25	25	**21.40**	21.01	20.80	20.80
		50	0	**21.40**	20.65	20.88	20.67

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20825	21100	21375
15MHz	QPSK	1	0	**23.40**	23.04	22.87	22.80
		1	38	**23.40**	22.82	22.56	22.38
		1	74	**23.40**	23.17	21.98	22.31
		36	0	**22.40**	21.82	21.49	21.38
		36	18	**22.40**	21.46	21.47	21.71
		36	39	**22.40**	21.60	21.86	21.76
		75	0	**22.40**	21.58	21.64	21.58
	16QAM	1	0	**22.40**	22.27	21.94	21.52
		1	38	**22.40**	22.23	21.48	21.47
		1	74	**22.40**	21.80	21.70	21.43
		36	0	**21.40**	21.14	20.70	20.55
		36	18	**21.40**	20.78	20.59	20.73
		36	39	**21.40**	21.25	20.62	20.69
		75	0	**21.40**	20.59	20.80	20.54
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20850	21100	21350
20MHz	QPSK	1	0	**23.40**	22.82	22.54	22.60
		1	50	**23.40**	22.62	22.50	22.27
		1	99	**23.40**	22.92	21.85	22.37
		50	0	**22.40**	21.59	21.50	21.28
		50	25	**22.40**	21.45	21.47	21.72
		50	50	**22.40**	21.63	21.67	21.87
		100	0	**22.40**	21.70	21.77	21.59
	16QAM	1	0	**22.40**	21.73	21.88	21.54
		1	50	**22.40**	22.10	21.37	21.30
		1	99	**22.40**	21.70	21.16	21.18
		50	0	**21.40**	20.41	20.75	20.62
		50	25	**21.40**	20.73	20.35	21.06
		50	50	**21.40**	20.69	20.90	20.81
		100	0	**21.40**	20.74	20.90	20.61

2) Conducted power measurement results of LTE Band 7 (Hotspot activated)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20775	21100	21425
5MHz	QPSK	1	0	**20.50**	19.65	19.59	19.84
		1	12	**20.50**	19.71	19.58	19.58
		1	24	**20.50**	19.71	19.59	19.42
		12	0	**20.50**	19.37	19.48	19.52
		12	6	**20.50**	19.52	19.56	19.99
		12	13	**20.50**	19.53	19.90	19.59
		25	0	**20.50**	19.48	19.49	19.61
	16QAM	1	0	**20.50**	19.58	19.47	19.48
		1	12	**20.50**	19.47	19.50	19.59
		1	24	**20.50**	19.63	19.35	19.41
		12	0	**20.50**	19.32	19.28	19.31
		12	6	**20.50**	19.47	19.46	19.08
		12	13	**20.50**	19.78	19.91	19.49
		25	0	**20.50**	19.45	19.45	19.60
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20800	21100	21400
10MHz	QPSK	1	0	**20.50**	19.99	19.80	19.74
		1	24	**20.50**	19.70	19.50	19.60
		1	49	**20.50**	19.56	19.64	19.47
		25	0	**20.50**	19.49	19.53	19.45
		25	12	**20.50**	19.49	19.39	19.58
		25	25	**20.50**	19.67	19.49	19.59
		50	0	**20.50**	19.48	19.53	19.56
	16QAM	1	0	**20.50**	19.89	19.64	19.55
		1	24	**20.50**	19.76	19.53	19.64
		1	49	**20.50**	19.75	20.22	19.73
		25	0	**20.50**	19.72	19.47	19.38
		25	12	**20.50**	19.42	19.43	19.93
		25	25	**20.50**	19.75	19.73	19.73
		50	0	**20.50**	19.61	19.66	19.55

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20825	21100	21375
15MHz	QPSK	1	0	**20.50**	19.97	19.60	19.71
		1	38	**20.50**	19.73	19.57	19.49
		1	74	**20.50**	19.59	19.60	19.44
		36	0	**20.50**	19.71	19.46	19.45
		36	18	**20.50**	19.44	19.44	19.72
		36	39	**20.50**	19.77	19.91	19.76
		75	0	**20.50**	19.60	19.52	19.63
	16QAM	1	0	**20.50**	20.04	19.51	20.11
		1	38	**20.50**	19.89	19.63	19.59
		1	74	**20.50**	19.61	20.38	19.65
		36	0	**20.50**	20.27	19.68	19.43
		36	18	**20.50**	19.44	19.52	19.63
		36	39	**20.50**	19.61	20.13	19.66
		75	0	**20.50**	19.64	19.61	19.60
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20850	21100	21350
20MHz	QPSK	1	0	**20.50**	19.70	19.42	19.52
		1	50	**20.50**	19.63	19.45	19.43
		1	99	**20.50**	19.53	19.66	19.39
		50	0	**20.50**	19.58	19.55	19.45
		50	25	**20.50**	19.45	19.53	19.75
		50	50	**20.50**	19.44	19.88	19.76
		100	0	**20.50**	19.59	19.69	19.60
	16QAM	1	0	**20.50**	20.15	20.06	19.83
		1	50	**20.50**	19.71	19.54	19.42
		1	99	**20.50**	19.54	19.94	19.32
		50	0	**20.50**	19.54	19.61	19.43
		50	25	**20.50**	19.45	19.46	19.57
		50	50	**20.50**	19.76	19.77	19.76
		100	0	**20.50**	19.68	19.68	19.60

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	17	16.44	16.32	16.25	16.13
	2437	17	16.34	16.28	16.24	16.06
	2462	17	15.29	15.17	15.08	14.82

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	14	13.49	13.44	12.27	12.48	12.31	12.09	11.52	11.42
	2437	14	13.36	13.41	13.22	12.87	12.56	12.07	11.51	11.44
	2462	14	11.64	11.65	11.32	10.97	10.56	10.43	10.15	10.08

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	13	12.47	12.29	11.67	11.42	10.97	10.45	10.33	10.12
	2437	13	12.42	12.23	11.69	11.57	11.05	10.57	10.23	10.15
	2462	13	11.74	11.49	11.06	10.76	10.30	9.79	9.51	9.43

Note:

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

2) Per KDB248227, for WiFi 2.4GHz, the highest measured maximum output power Channel for DSSS modes(802.11b)was selected for SAR measurement.SAR for OFDM modes(2.4GHz 802.11g/n) was not required When the highest reported SAR for DSSS is adjusted by the ratio of OFDM modes(802.11g/n)to DSSS modes(802.11b)specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

8.1.9 CONDUCTED POWER MEASUREMENTS OF BT

BT MHz	Average Conducted Power (dBm)			Tune Up
	CH0	CH39	CH78	
DH5	10.53	11.87	9.75	12
2DH5	9.09	10.82	7.35	12
3DH5	9.07	10.48	7.28	12

BT MHz	Average Conducted Power (dBm)			Tune Up
	CH0	CH19	CH39	
BT (4.0)	-0.82	1.78	1.22	3

Note:
1) 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 KDB941225 **D06**v02, the DUT Dimension is bigger than 9 cm x 5 cm, so 10mm is chosen as the test separation distance for Hotspot mode. When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.
5) Per KDB648474 D04v01r02, SAR is evaluated without a headset connected to the device. When the standalone reported body-worn SAR is ≤1.2 W/kg, no additional SAR evaluations using a headset are required.
6) 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-worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn 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.

LTE notes:

1) The LTE test configurations are determined according to KDB941225 D05 SAR for LTE Devices v02r03.The general test procedures used for SAR testing can be found in Section 7.1.3.
2) A-MPR was disabled for all SAR test by setting NS_01 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames(maximum TTI)

WLAN Notes:

1. For exposure conditions with multiple test positions, such as handset operating next to the ear, devices with hotspot mode, procedures for initial test position can be applied. Using the transmission mode determined by the DSSS procedure or initial test configuration, area scans are measured for all positions in an exposure condition. The test position with the highest extrapolated(peak)SAR is used as the initial test position. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other (remaining) test positions. Otherwise, SAR is evaluated at the subsequent highest peak SAR position until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.

2. Justification for test configurations for WLAN per KDB Publication 248227 for 2.4GHZ WIFI single transmission chain operations, the highest measured maximum output power Channel for DSSS was selected for SAR measurement.SAR for OFDM modes(2.4GHz 802.11g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR. See Section 7.1.4 for more information.

8.2.1SAR MEASUREMENT RESULT OF GSM850 1#SAMPLE

1. Head SAR test results of GSM850

Test data with the battery 1#									
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	-0.09	34	33.25	0.351	0.417	
GSM	Right Tilted	190	836.6	-0.03	34	33.25	0.247	0.294	
GSM	Left Cheek	190	836.6	-0.01	34	33.25	0.356	0.423	1
GSM	Left Tilted	190	836.6	-0.02	34	33.25	0.241	0.286	
Test at worst position with the battery 2#									
GSM	Left Cheek	190	836.6	-0.09	34	33.25	0.354	0.421	

1.

2. Body-Worn SAR test results of GSM850

Test data with the battery 1# (distance=15mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
GSM	Front Face	190	836.6	0.04	34	33.25	0.392	0.466	
GSM	Rear Face	190	836.6	0.08	34	33.25	0.457	0.543	
Test at worst position with the battery 2#(distance=15mm)									
GSM	Rear Face	190	836.6	-0.04	34	33.25	0.485	**0.576**	2

3. Hotspot SAR test results of GSM850

Test data with the battery 1#(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 1TX	Front Face	190	836.6	-0.02	34	33.31	0.436	0.511	
GPRS 1TX	Rear Face	190	836.6	-0.04	34	33.31	0.567	**0.665**	3
GPRS 1TX	Left Side	190	836.6	-0.09	34	33.31	0.421	0.493	
GPRS 1TX	Right Side	190	836.6	-0.08	34	33.31	0.459	0.538	
GPRS 1TX	Bottom Side	190	836.6	-0.01	34	33.31	0.039	0.046	
Test at worst position with the battery 2#(distance=10mm)									
GPRS 1TX	Rear Face	190	836.6	-0.01	34	33.31	0.562	0.659	

8.2.2SAR MEASUREMENT RESULT OF GSM1900 1#SAMPLE

1. Head SAR test results of GSM1900

Test data with the battery 1#									
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	-0.01	31	30.72	0.195	0.208	
GSM	Right Tilted	661	1880	-0.08	31	30.72	0.172	0.183	
GSM	Left Cheek	661	1880	0.06	31	30.72	0.324	**0.346**	4
GSM	Left Tilted	661	1880	-0.02	31	30.72	0.126	0.134	
Test at worst position with the battery 2#									
GSM	Left Cheek	661	1880	0.08	31	30.72	0.289	0.308	

2. Body-Worn SAR test results of GSM1900

Test data with the battery 1#(distance=15mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
GSM	Front Face	661	1880	-0.07	31	30.72	0.181	0.193	
GSM	Rear Face	661	1880	-0.08	31	30.72	0.198	**0.211**	5
Test at worst position with the battery 2#(distance=15mm)									
GSM	Rear Face	661	1880	-0.05	31	30.72	0.186	0.198	

3. Hotspot SAR test results of GSM1900

Test data with the battery 1#(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 Face	661	1880	-0.03	28.5	27.95	0.351	0.398	
GPRS 2TX	Rear Face	661	1880	-0.05	28.5	27.95	0.398	**0.452**	6
GPRS 2TX	Left Side	661	1880	-0.04	28.5	27.95	0.105	0.119	
GPRS 2TX	Right Side	661	1880	-0.19	28.5	27.95	0.11	0.125	
GPRS 2TX	Bottom Side	661	1880	-0.37	28.5	27.95	0.33	0.375	
Test at worst position with the battery 2#(distance=10mm)									
GPRS 2TX	Rear Face	661	1880	-0.05	28.5	27.95	0.306	0.347	

8.2.3SAR MEASUREMENT RESULT OF UMTS Band 5 1#SAMPLE

1. Head SAR test results of UMTS Band 5

Test data with the battery 1#									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
RMC 12.2Kbps	Right Cheek	4182	836.6	-0.01	24.3	23.71	0.369	0.423	
RMC 12.2Kbps	Right Tilted	4182	836.6	-0.08	24.3	23.71	0.253	0.290	
RMC 12.2Kbps	Left Cheek	4182	836.6	0.03	24.3	23.71	0.380	**0.435**	7
RMC 12.2Kbps	Left Tilted	4182	836.6	-0.03	24.3	23.71	0.271	0.310	
Test at worst position with the battery 2#									
RMC 12.2Kbps	Left Cheek	4182	836.6	-0.02	24.3	23.71	0.374	0.428	

2. Body-Worn SAR test results of UMTS Band 5

Test data with the battery 1#(distance=15mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
RMC 12.2Kbps	Front Face	4182	836.6	-0.03	24.3	23.71	0.397	0.455	
RMC 12.2Kbps	Rear Face	4182	836.6	-0.04	24.3	23.71	0.492	**0.564**	8
Test at worst position with the battery 2#(distance=15mm)									
RMC 12.2Kbps	Rear Face	4182	836.6	-0.05	24.3	23.71	0.457	0.523	

3. Hotspot SAR test results of UMTS Band 5

Test data with the battery 1#(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 12.2Kbps	Front Face	4182	836.6	-0.02	24.3	23.71	0.408	0.467	
RMC 12.2Kbps	Rear Face	4182	836.6	-0.01	24.3	23.71	0.576	**0.660**	9
RMC 12.2Kbps	Left Side	4182	836.6	-0.02	24.3	23.71	0.437	0.501	
RMC 12.2Kbps	Right Side	4182	836.6	-0.02	24.3	23.71	0.491	0.562	
RMC 12.2Kbps	Bottom Side	4182	836.6	0.02	24.3	23.71	0.053	0.061	
Test at worst position with the battery 2#(distance=10mm)									
RMC 12.2Kbps	Rear Face	4182	836.6	-0.08	24.3	23.71	0.556	0.637	

8.2.4SAR MEASUREMENT RESULT OF LTE Band 5 2#SAMPLE

1. Head SAR test results of LTE Band 5

Test data with the battery 1#									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
10M 1RB/0#	Right Cheek	20525	836.5	0	24	22.6	0.321	**0.443**	10
	Right Tilted	20525	836.5	-0.03	24	22.6	0.259	0.358	
	Left Cheek	20525	836.5	-0.02	24	22.6	0.317	0.438	
	Left Tilted	20525	836.5	-0.01	24	22.6	0.252	0.348	
10M 25%RB/ 0#	Right Cheek	20525	836.5	0.03	23	21.6	0.220	0.304	
	Right Tilted	20525	836.5	-0.02	23	21.6	0.211	0.291	
	Left Cheek	20525	836.5	-0.02	23	21.6	0.230	0.317	
	Left Tilted	20525	836.5	-0.04	23	21.6	0.200	0.276	
Test at worst position with the battery 2#									
10M 1RB/0#	Right Cheek	20525	836.5	0	24	22.6	0.320	0.385	

2. Body-Worn SAR test results of LTE Band 5

Test data with the battery 1#(distance=15mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
10M 1RB/0#	Front Face	20525	836.5	-0.01	24	22.6	0.286	0.395	
	Rear Face	20525	836.5	-0.01	24	22.6	0.446	**0.616**	11
10M 25%RB/ 0#	Front Face	20525	836.5	-0.03	23	21.6	0.283	0.391	
	Rear Face	20525	836.5	-0.08	23	21.6	0.343	0.473	
Test at worst position with the battery 2#(distance=15mm)									
10M 1RB/0#	Rear Face	20525	836.5	-0.02	24	22.6	0.434	0.599	

3. Hotspot SAR test results of LTE Band 5

Test data with the battery 1#(distance=10mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
10M 1RB/0#	Front Face	20525	836.5	0.07	24	22.6	0.393	0.542	
	Rear Face	20525	836.5	0.08	24	22.6	0.491	**0.678**	12
	Left Side	20525	836.5	0.02	24	22.6	0.413	0.570	
	Right Side	20525	836.5	-0.04	24	22.6	0.458	0.632	
	Bottom Side	20525	836.5	-0.04	24	22.6	0.052	0.072	
10M 25%RB/ 0#	Front Face	20525	836.5	0.03	23	21.6	0.301	0.415	
	Rear Face	20525	836.5	-0.03	23	21.6	0.358	0.494	
	Left Side	20525	836.5	0.05	23	21.6	0.396	0.547	
	Right Side	20525	836.5	-0.09	23	21.6	0.356	0.491	
	Bottom Side	20525	836.5	0.01	23	21.6	0.041	0.057	
Test at worst position with the battery 2#(distance=10mm)									
10M 1RB/0#	Rear Face	20525	836.5	-0.06	24	22.6	0.482	0.665	

8.2.5SAR MEASUREMENT RESULT OF LTE Band 7 2#SAMPLE

1. Head SAR test results of LTE Band 7

Test data with the battery 1#									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
20M 1RB/99#	Right Cheek	20850	2510	-0.09	23.4	22.92	0.230	0.257	
	Right Tilted	20850	2510	-0.01	23.4	22.92	0.117	0.131	
	Left Cheek	20850	2510	-0.05	23.4	22.92	0.431	0.481	
	Left Tilted	20850	2510	-0.05	23.4	22.92	0.070	0.078	
20M 50%RB/ 50#	Right Cheek	21350	2560	0.02	22.4	21.87	0.212	0.240	
	Right Tilted	21350	2560	-0.01	22.4	21.87	0.104	0.117	
	Left Cheek	21350	2560	0.01	22.4	21.87	0.428	**0.484**	13
	Left Tilted	21350	2560	0.04	22.4	21.87	0.068	0.077	
Test at worst position with the battery 2#									
20M 1RB/99#	Left Cheek	20850	2510	0.07	23.4	22.92	0.427	0.477	

2. Body-Worn SAR test results of LTE Band 7

Test data with the battery 1#(distance=15mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm)		SAR Value (W/kg)1-g	Reported SAR	Graph Results
					Tune up	Conducted			
20M 1RB/99#	Front Face	20850	2510	0.02	23.4	22.92	0.423	0.472	
	Rear Face	20850	2510	0.04	23.4	22.92	0.430	**0.480**	14
20M 50%RB/ 50#	Front Face	21350	2560	0.04	22.4	21.87	0.337	0.381	
	Rear Face	21350	2560	0.09	22.4	21.87	0.372	0.420	
Test at worst position with the battery 2#(distance=15mm)									
20M 1RB/99#	Rear Face	20850	2510	0.05	23.4	22.92	0.428	0.478	

3. Hotspot SAR test results of LTE Band 7

Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm) Tune up	Power(dBm) Conducted	SAR Value (W/kg)1-g	Reported SAR	Graph Results
Test data with the battery 1#(distance=10mm)									
20M 1RB/0#	Front Face	20850	2510	-0.16	20.5	19.7	0.346	0.416	
	Rear Face	20850	2510	-0.19	20.5	19.7	0.423	0.509	
	Left Side	20850	2510	-0.72	20.5	19.7	0.281	0.338	
	Right Side	20850	2510	0.02	20.5	19.7	0.042	0.050	
	Bottom Side	20850	2510	-0.03	20.5	19.7	0.652	**0.784**	15
20M 50%RB/ 50#	Front Face	21100	2535	0.07	20.5	19.88	0.623	0.719	
	Rear Face	21100	2535	-0.02	20.5	19.88	0.644	0.743	
	Left Side	21100	2535	-0.04	20.5	19.88	0.197	0.227	
	Right Side	21100	2535	0.08	20.5	19.88	0.029	0.033	
	Bottom Side	21100	2535	-0.06	20.5	19.88	0.649	0.749	
Test at worst position with the battery 2#(distance=10mm)									
20M 1RB/0#	Bottom Side	20850	2510	0.06	20.5	19.7	0.645	0.775	

8.2.6 SAR MEASUREMENT RESULT OF WiFi 2.4G 1#SAMPLE

1. Head SAR test results of WiFi 2.4G

Test data with the battery 1#									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm) Tune up	Power(dBm) Conducted	SAR Value (W/kg)1-g	Reported SAR	Graph Results
802.11b	Right Cheek	1	2412	-0.04	17	16.44	0.316	0.359	
	Right Tilted	1	2412	-0.04	17	16.44	0.290	0.330	
	Left Cheek	1	2412	0.02	17	16.44	0.691	**0.786**	16
	Left Tilted	1	2412	0.09	17	16.44	0.667	0.759	
Test at worst position with the battery 2#									
802.11b	Left Cheek	1	2412	0.09	17	16.44	0.664	0.755	

2. Body-Worn SAR test results of WiFi 2.4G

Test data with the battery 1#(distance=15mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm) Tune up	Power(dBm) Conducted	SAR Value (W/kg)1-g	Reported SAR	Graph Results
802.11b	Front Face	1	2412	0.06	17	16.44	0.083	0.094	
	Rear Face	1	2412	0.05	17	16.44	0.096	**0.109**	17
Test at worst position with the battery 2#(distance=15mm)									
802.11b	Rear Face	1	2412	-0.06	17	16.44	0.095	0.108	

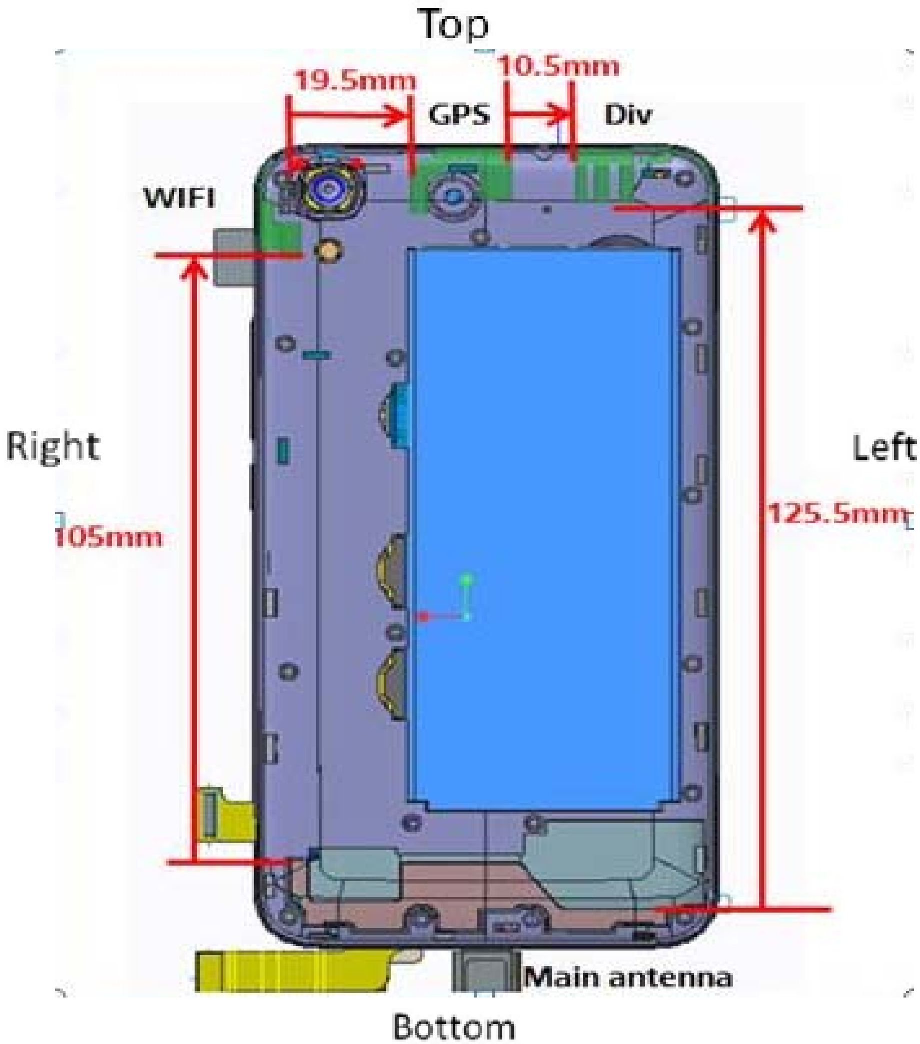
3. Hotspot SAR test results of WiFi 2.4G

Test data with the battery 1#(distance=10mm)									
Mode	Test Position	CH	Freq.	Drift (dB)	Power(dBm) Tune up	Power(dBm) Conducted	SAR Value (W/kg)1-g	Reported SAR	Graph Results
802.11b	Front Face	1	2412	0.02	17	16.44	0.165	0.188	
	Rear Face	1	2412	0.01	17	16.44	0.201	**0.229**	18
	Right Side	1	2412	0	17	16.44	0.102	0.116	
	Top Side	1	2412	-0.02	17	16.44	0.118	0.134	
Test at worst position with the battery 2#(distance=10mm)									
802.11b	Rear Face	1	2412	0.01	17	16.44	0.197	0.224	

Note: Per KDB248227D01, the highest SAR measured for the initial test position or initial test configuration should be used to determine SAR test exclusion according to the sum of 1-g SAR and SAR peak to location ratio provisions in KDB 447498. In addition, a test lab may also choose to perform standalone SAR measurements for test positions and 802.11 configurations that are not required by the initial test position or initial test configuration procedures and apply the results to determine simultaneous transmission SAR test exclusion, according to sum of 1-g and SAR peak to location ratio requirements to reduce the number of simultaneous transmission SAR measurements.

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 size of the mobile phone is 143.5mm(length)X72.1mm (width), the length of the diagonal is144.5mm .
The location of the antennas inside mobile phone is shown as below picture:



Note:
1) The diversity antenna that is used to improve the acceptance of performance of the main antenna, it does not have a transmitter function.

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	12	15.85	15	2.48	1.664	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	12	15.85	15	2.48	7.5	0.222
	Rear	12	15.85	15	2.48	7.5	0.222
GSM850/ 1900	Top Side			> 50			0.4
UMTS Band 5	Top Side			> 50			0.4
LTE Band 5/7	Top Side			> 50			0.4
2.4GWiFi	Left Side			> 50			0.4
	Bottom Side			> 50			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	N/A	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	Yes	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 850	GSM 1900	UMTS Band 5	LTE Band5	LTE Band7	2.4G WiFi	MAX ∑SAR1g
Head	Right Cheek	0.417	0.208	0.423	0.443	0.257	0.359	0.802
	Right Tilted	0.294	0.183	0.290	0.358	0.131	0.330	0.688
	Left Cheek	0.423	0.346	0.435	0.438	0.484	0.786	1.270
	Left Tilted	0.286	0.134	0.310	0.348	0.078	0.759	1.107
Body-Worn	Front	0.466	0.193	0.455	0.395	0.472	0.094	0.566
	Rear	0.576	0.211	0.564	0.616	0.480	0.109	0.725
Hots-pot	Front	0.511	0.398	0.467	0.542	0.719	0.188	0.907
	Rear	0.665	0.452	0.660	0.678	0.743	0.229	0.972
	Left	0.493	0.119	0.501	0.570	0.338	0.400	0.970
	Right	0.538	0.125	0.562	0.632	0.050	0.116	0.748
	Top	0.400	0.400	0.400	0.400	0.400	0.134	0.534
	Bottom	0.046	0.375	0.061	0.072	0.784	0.400	1.184

MAX. $\sum SAR_{1g}$=1.270W/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 5	LTE Band5	LTE Band7	BT	MAX $\sum SAR_{1g}$
Body-Worn	Front	0.466	0.193	0.455	0.395	0.472	0.222	0.694
	Rear	0.576	0.211	0.564	0.616	0.480	0.222	0.838

MAX. $\sum SAR_{1g}$=0.838W/Kg<1.6 W/Kg,so the SAR to peak location separation ratio should not be considered.

APPENDIX

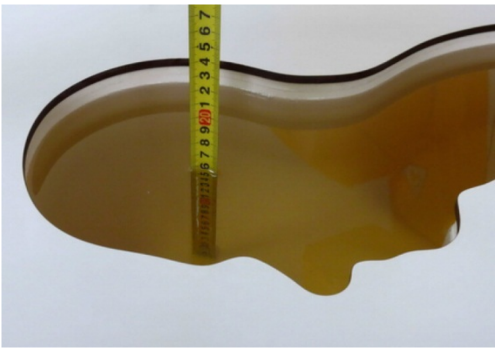
1. Test Layout

Specific Absorption Rate Test Layout

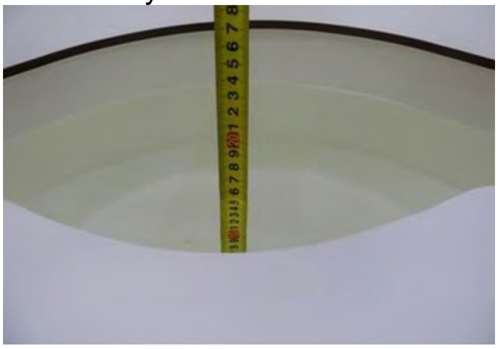
Liquid depth in the flat Phantom (≥15cm depth)

Body 835MHz 15.5cm

Head 835MHz 15.5cm

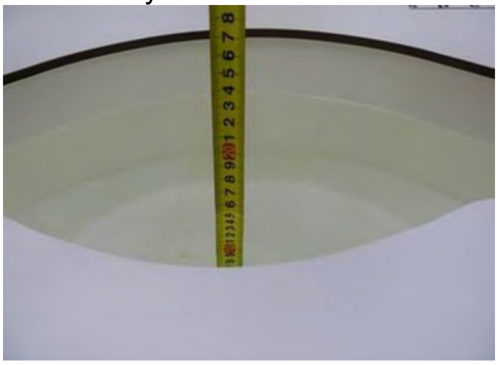


Body 1900 MHz 15.1cm



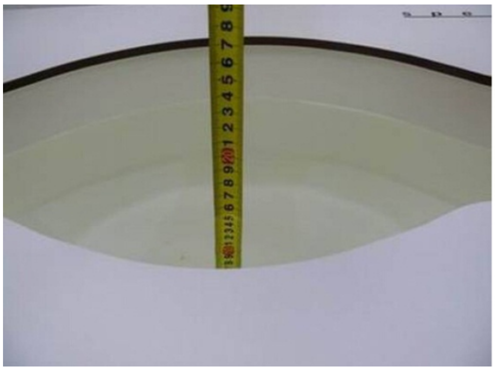
Head 1900M Hz 15.4cm

Body 2450 MHz 15.4cm



Head 2450MHz 15.3cm

Body 2600MHz 15.2cm



Head 2600MHz 15.2cm

2. System Check Plots

Date: 07/15/2015

Test Laboratory: BTL Inc.

System Check_H835

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

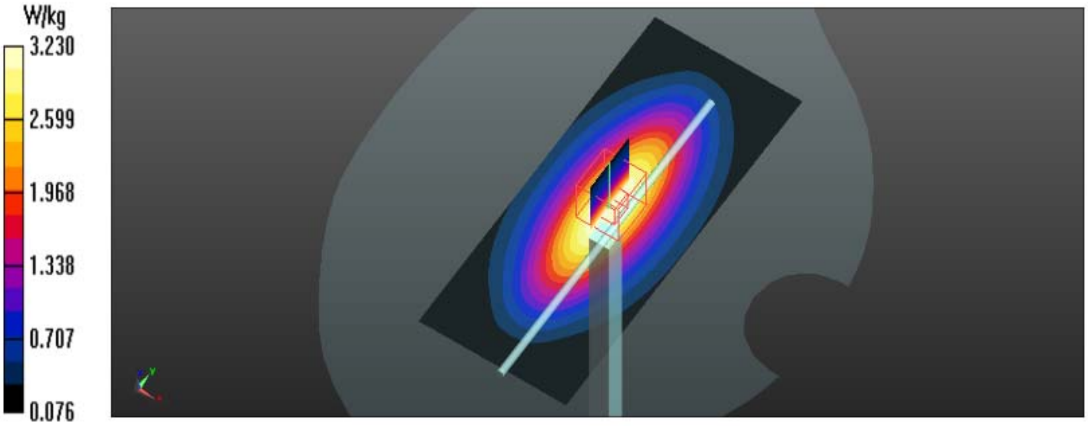
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.913 S/m; ε_r = 41.706; ρ = 1000 kg/m^3
Ambient Temperature : 23.2 ℃; Liquid Temperature : 22.5 ℃

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)

Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.23 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 54.532 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 3.88 W/kg
SAR(1 g) = 2.33 W/kg; SAR(10 g) = 1.56 W/kg
Maximum value of SAR (measured) = 3.25 W/kg



Date: 07/16/2015

Test Laboratory: BTL Inc.

System Check_H835

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

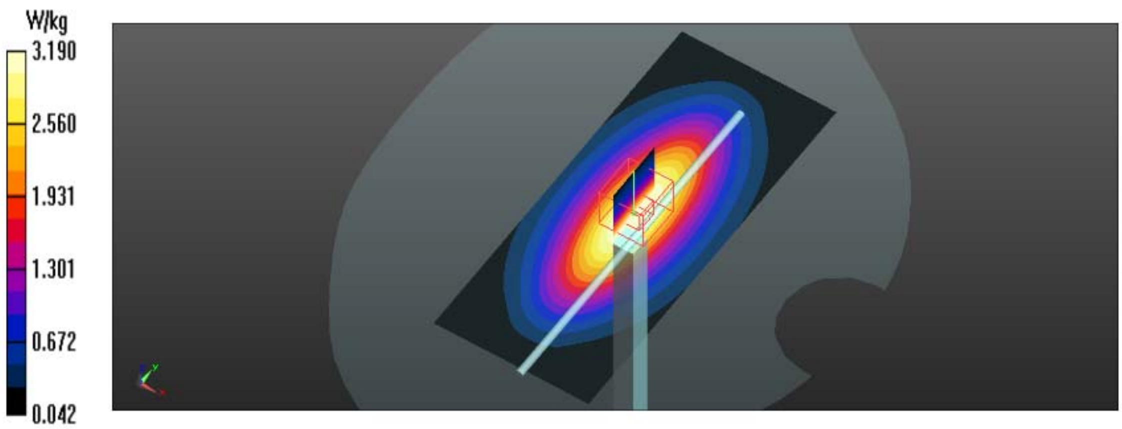
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.921 S/m; ε_r = 41.696; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：22.1 ℃

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)

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.19 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 58.341 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.75 W/kg
SAR(1 g) = 2.42 W/kg; SAR(10 g) = 1.61 W/kg
Maximum value of SAR (measured) = 3.20 W/kg



Date: 07/17/2015

Test Laboratory: BTL Inc.

System Check_B835

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

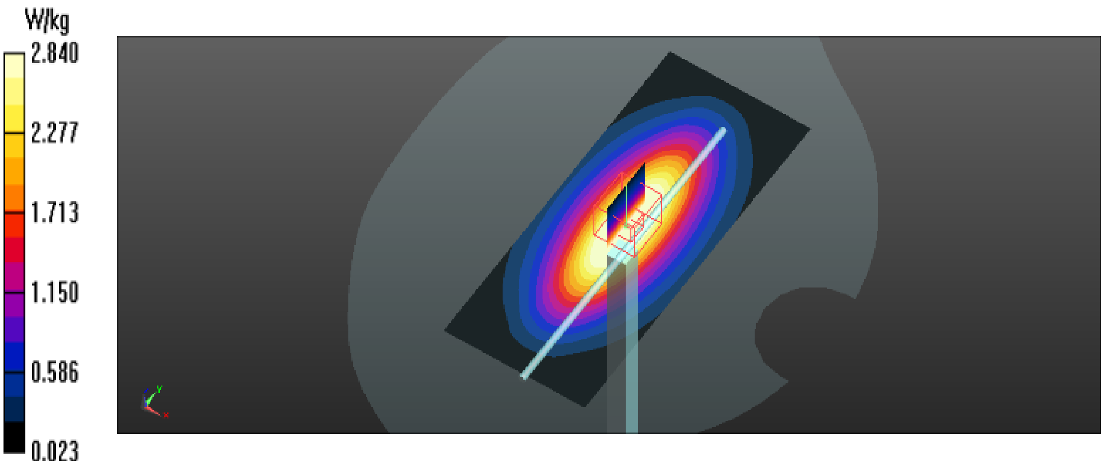
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.993 S/m; ε_r = 56.407; ρ = 1000 kg/m^3
Ambient Temperature : 23.2 ℃; Liquid Temperature : 21.9 ℃

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)

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.84 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 54.335 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 3.38 W/kg
SAR(1 g) = 2.42 W/kg; SAR(10 g) = 1.53 W/kg
Maximum value of SAR (measured) = 2.87 W/kg



Date: 07/18/2015

Test Laboratory: BTL Inc.

System Check_B835

DUT: Dipole 835 MHz D835V2 SN: 4d160;

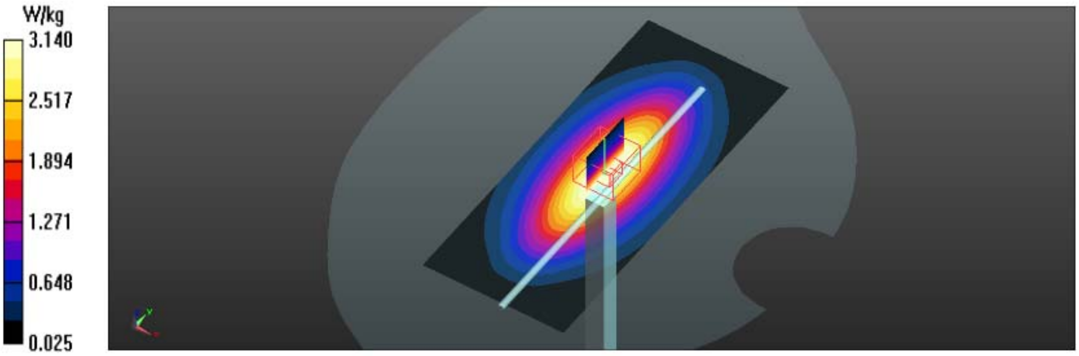
Communication System: UID 0, CW (0); Frequency: 835 MHz; Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.984 S/m; ε_r = 56.706; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.5 ℃

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)

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.14 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 57.172 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 3.72 W/kg
SAR(1 g) = 2.49 W/kg; SAR(10 g) = 1.64 W/kg
Maximum value of SAR (measured) = 3.15 W/kg



Date: 07/19/2015

Test Laboratory: BTL Inc.

System Check_B1900

DUT: Dipole 1900 MHz; Type: D1900V2; SN: 5d175;

Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.553 S/m; ε_r = 52.993; ρ = 1000 kg/m^3
Ambient Temperature : 23.1 ℃; Liquid Temperature : 22.1 ℃

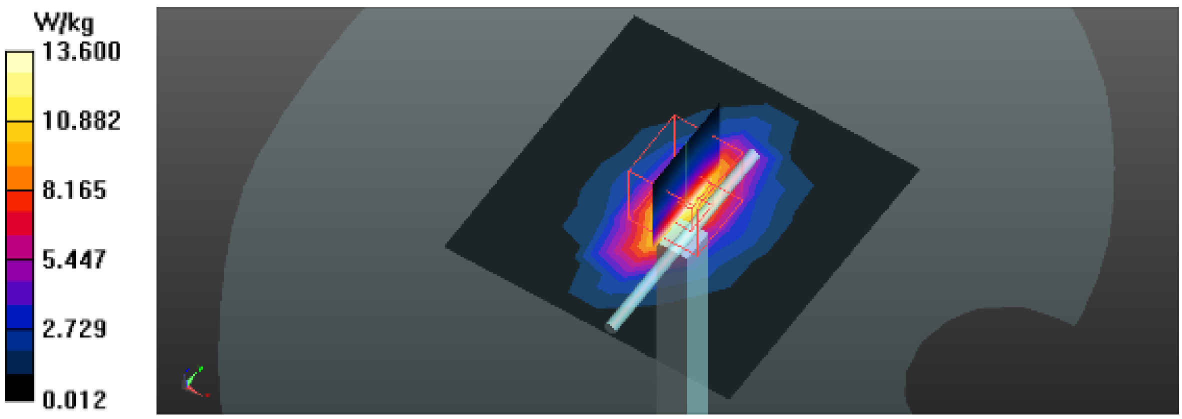
DASY Configuration:

- 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)

Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 13.6 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 95.370 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 17.1 W/kg
SAR(1 g) = 9.82 W/kg; SAR(10 g) = 4.97 W/kg

Maximum value of SAR (measured) = 13.65 W/kg



Date: 07/15/2015

Test Laboratory: BTL Inc.

System Check_H1900

DUT: Dipole 1900 MHz; Type: D1900V2; SN: 5d175;

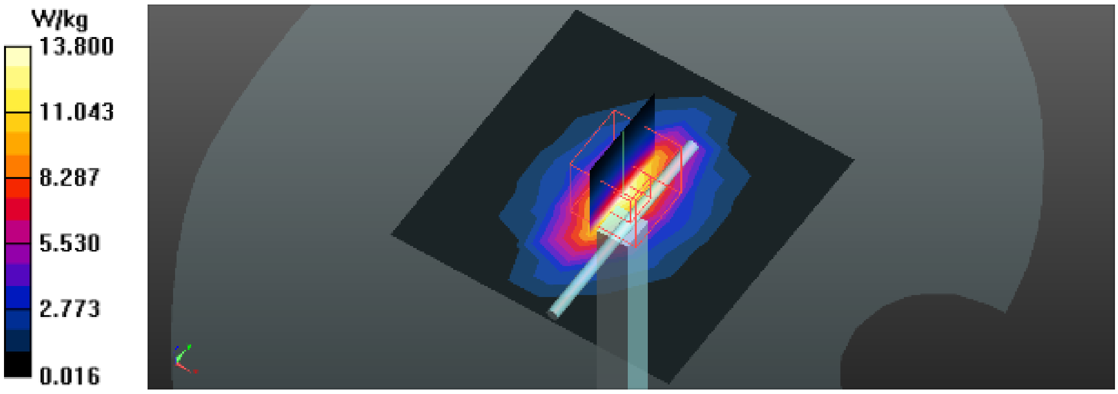
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.443 S/m; ε_r = 39.72; ρ = 1000 kg/m^3
Ambient Temperature : 23.0 ℃; Liquid Temperature : 22.2 ℃

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)

Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 13.8 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 99.547 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 19.0 W/kg
SAR(1 g) = 9.81 W/kg; SAR(10 g) = 4.93 W/kg
Maximum value of SAR (measured) = 14.5 W/kg



Date: 07/19/2015

Test Laboratory: BTL Inc.

System Check_B2450

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

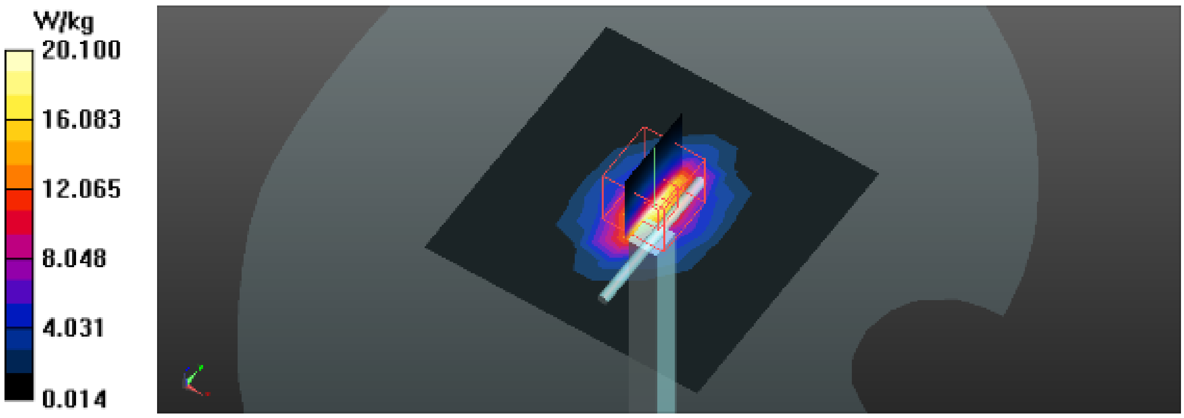
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.979 S/m; ε_r = 51.714; ρ = 1000 kg/m^3
Ambient Temperature : 23.2 ℃; Liquid Temperature : 22.3 ℃

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)

Area Scan (9x9x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 20.1 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 101.0 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 27.8 W/kg
SAR(1 g) = 12.91 W/kg; SAR(10 g) = 5.86 W/kg
Maximum value of SAR (measured) = 20.3 W/kg



Date: 07/19/2015

Test Laboratory: BTL Inc.

System Check_H2450

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

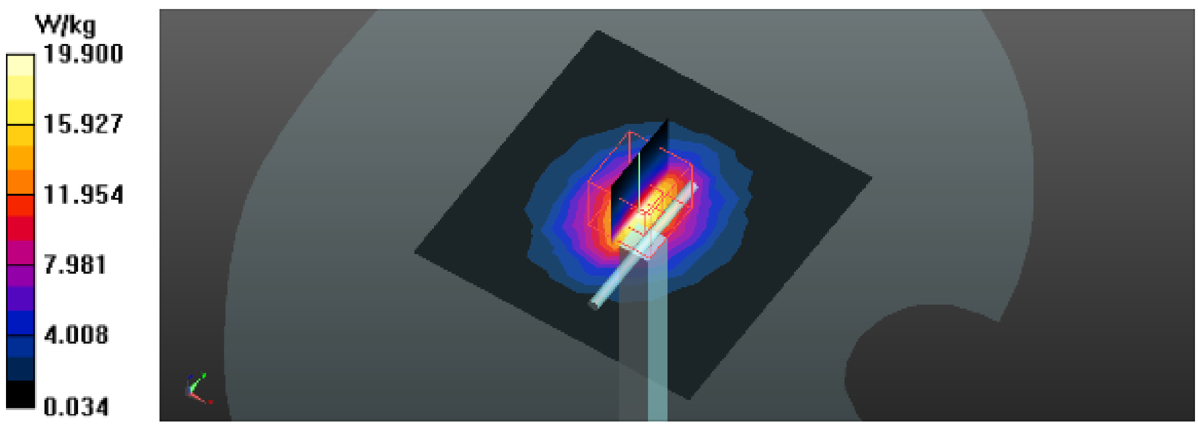
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.803 S/m; ε_r = 38.369; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.4 ℃

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)

Area Scan (9x9x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 19.9 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 104.7 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 26.7 W/kg
SAR(1 g) = 13.1 W/kg; SAR(10 g) = 6.51 W/kg
Maximum value of SAR (measured) = 20.1 W/kg



Date: 07/19/2015

Test Laboratory: BTL Inc.

System Check_B2600

DUT: Dipole 2600 MHz D2600V2 SN：1067;

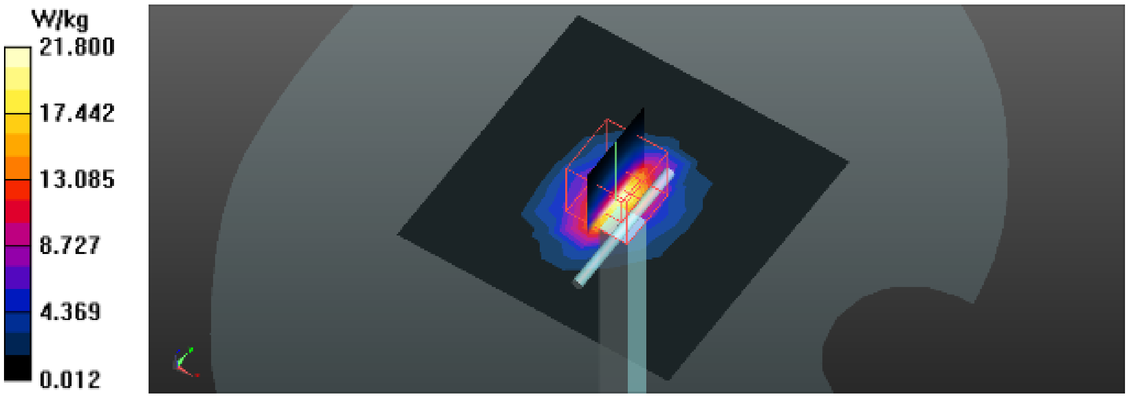
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 2.126 S/m; ε_r = 52.309; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：22.4 ℃

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)

Area Scan (9x9x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 21.8 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 99.496 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 31.3 W/kg
SAR(1 g) = 14.2 W/kg; SAR(10 g) = 6.3 W/kg
Maximum value of SAR (measured) = 22.5 W/kg



Date: 07/15/2015

Test Laboratory: BTL Inc.

System Check_H2600

DUT: Dipole 2600 MHz; Type: D2600V2; SN: 1067;

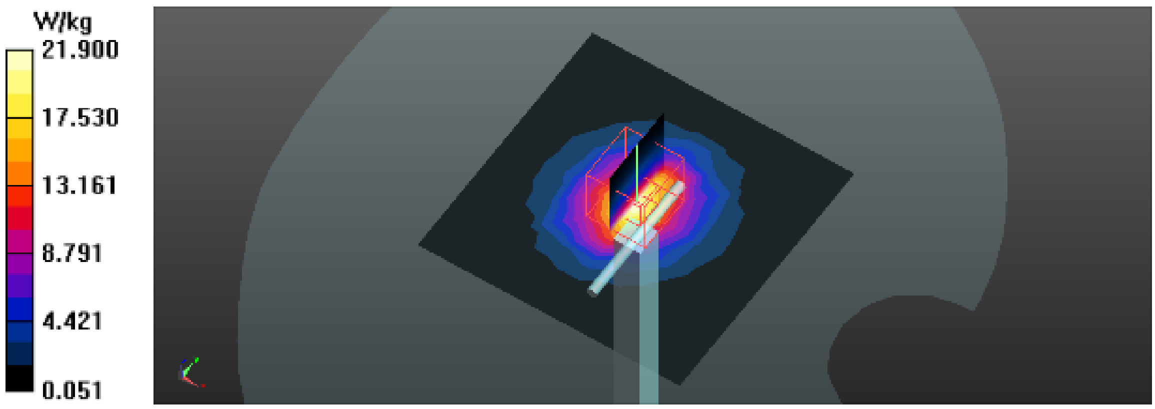
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 2.006 S/m; ε_r = 37.589; ρ = 1000 kg/m^3
Ambient Temperature : 23.3 ℃; Liquid Temperature : 22.3 ℃

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)

Area Scan (9x9x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 21.9 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 105.3 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 30.9 W/kg
SAR(1 g) = 15 W/kg; SAR(10 g) = 7.16 W/kg
Maximum value of SAR (measured) = 22.8 W/kg



3.SAR Measurement Plots

Date: 07/15/2015

Test Laboratory: BTL Inc.

1_GSM 850_GSM_CH190_Left Cheek_Smart phone

DUT: Smart Phone;

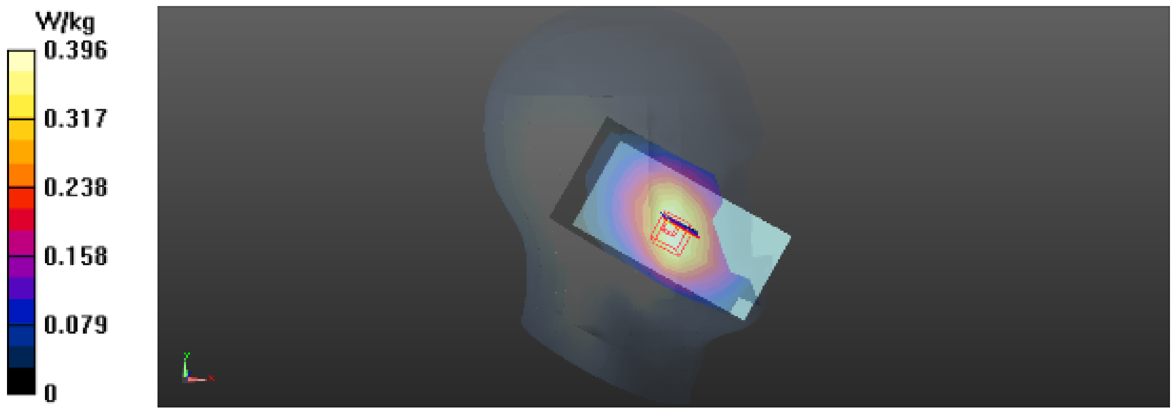
Communication System: UID 0, Generic GSM (0); Frequency: 836.6 MHz; Duty Cycle: 1:8.30042
Medium parameters used: f = 837 MHz; σ = 0.889 S/m; ε_r = 42.391; ρ = 1000 kg/m^3
Ambient Temperature : 23.2 ℃; Liquid Temperature : 22.5 ℃

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)

Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.396 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.690 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.444 W/kg
SAR(1 g) = 0.356 W/kg; SAR(10 g) = 0.269 W/kg
Maximum value of SAR (measured) = 0.378 W/kg



Date: 07/17/2015

Test Laboratory: BTL Inc.

2_GSM 850_GPRS_CH190_Rear Face_15mm_Smart phone

DUT: Smart Phone;

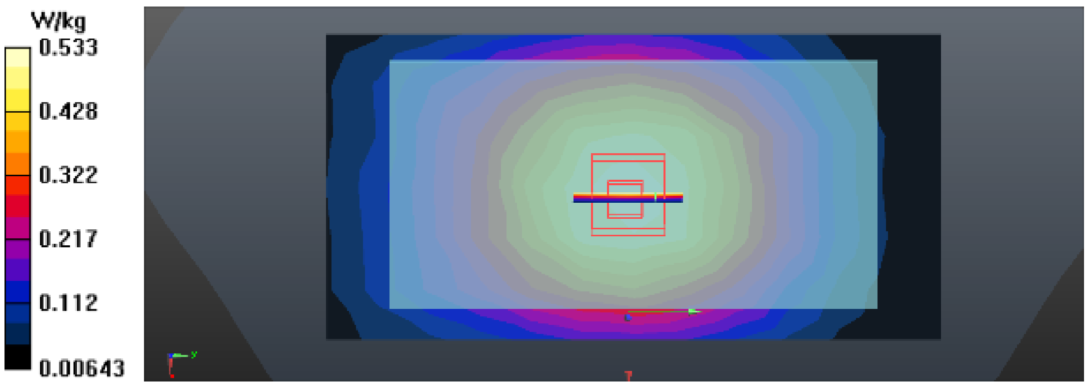
Communication System: UID 0, Generic GSM (0); Frequency: 836.6 MHz; Duty Cycle: 1:8.30042
Medium parameters used: f = 837 MHz; σ = 0.976 S/m; ε_r = 54.307; ρ = 1000 kg/m^3
Ambient Temperature : 23.2 ℃; Liquid Temperature : 21.9 ℃

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)

Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.533 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.287 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.558 W/kg
SAR(1 g) = 0.485 W/kg; SAR(10 g) = 0.363 W/kg
Maximum value of SAR (measured) = 0.479 W/kg



Date: 07/17/2015

Test Laboratory: BTL Inc.

3_GSM 850_GPRS_CH190_Rear Face_10mm_Smart phone

DUT: Smart Phone;

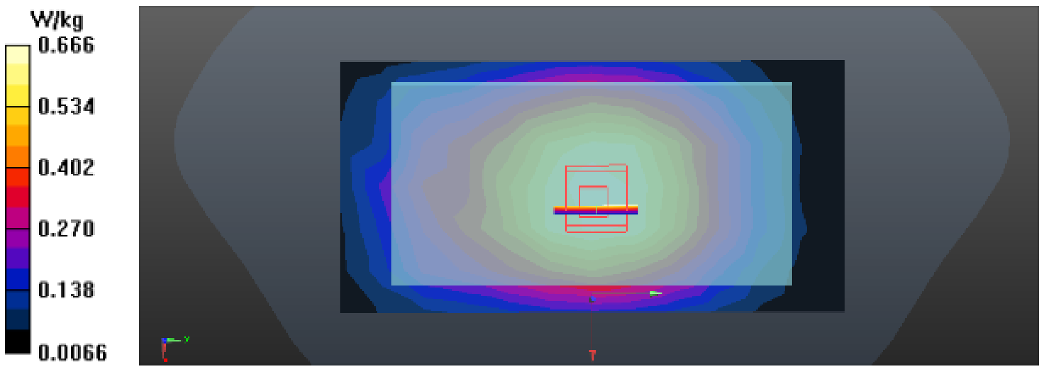
Communication System: UID 0, Generic GPRS (0); Frequency: 836.6 MHz; Duty Cycle: 1:8.30042
Medium parameters used: f = 837 MHz; σ = 0.976 S/m; ε_r = 54.307; ρ = 1000 kg/m^3
Ambient Temperature : 23.2 ℃; Liquid Temperature : 21.9 ℃

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)

Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.666 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.961 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.713 W/kg
SAR(1 g) = 0.567 W/kg; SAR(10 g) = 0.455 W/kg
Maximum value of SAR (measured) = 0.608 W/kg



Test Laboratory: BTL Inc.

4_GSM 1900_GSM_CH661_Left Cheek_Smart phone

DUT: Smart Phone;

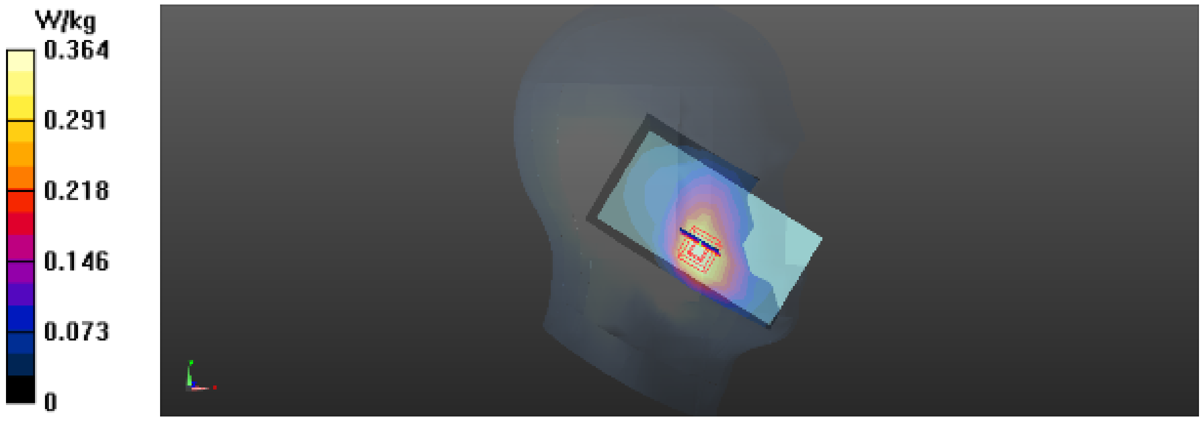
Communication System: UID 0, Generic GSM (0); Frequency: 1880 MHz; Duty Cycle: 1:8.30042
Medium parameters used: f = 1880 MHz; σ = 1.398 S/m; ε_r = 39.395; ρ = 1000 kg/m^3
Ambient Temperature : 23.0 ℃; Liquid Temperature : 22.2 ℃

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)

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.364 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.382 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.468 W/kg
SAR(1 g) = 0.324 W/kg; SAR(10 g) = 0.207 W/kg
Maximum value of SAR (measured) = 0.341 W/kg



Date: 07/19/2015

Test Laboratory: BTL Inc.

5_GSM 1900_GPRS_CH661_Rear Face_15mm_Smart phone

DUT: Smart Phone;

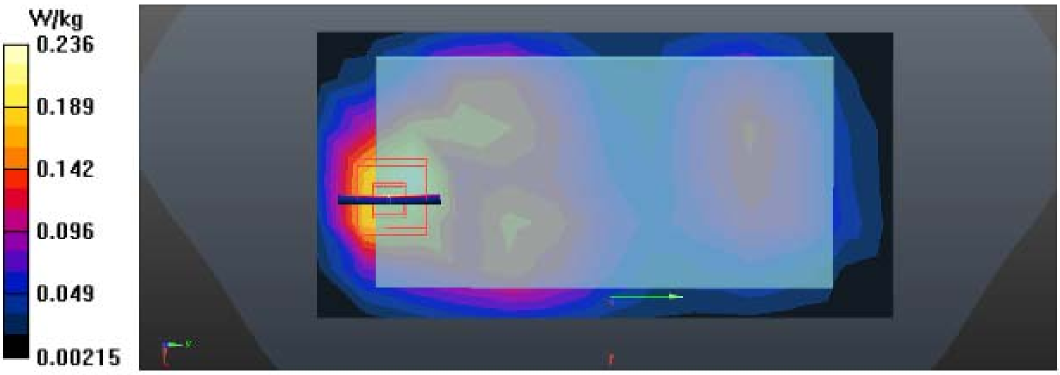
Communication System: UID 0, GPRS (0); Frequency: 1880 MHz; Duty Cycle: 1:8.30042
Medium parameters used: f = 1880 MHz; σ = 1.528 S/m; ε_r = 53.058; ρ = 1000 kg/m^3
Ambient Temperature：23.1 ℃; Liquid Temperature：22.1 ℃

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)

Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.236 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.976 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.339 W/kg
SAR(1 g) = 0.198 W/kg; SAR(10 g) = 0.108 W/kg
Maximum value of SAR (measured) = 0.219 W/kg



Date: 07/19/2015

Test Laboratory: BTL Inc.

6_GSM 1900_GPRS_CH661_Rear Face_10mm_Smart phone

DUT: Smart Phone;

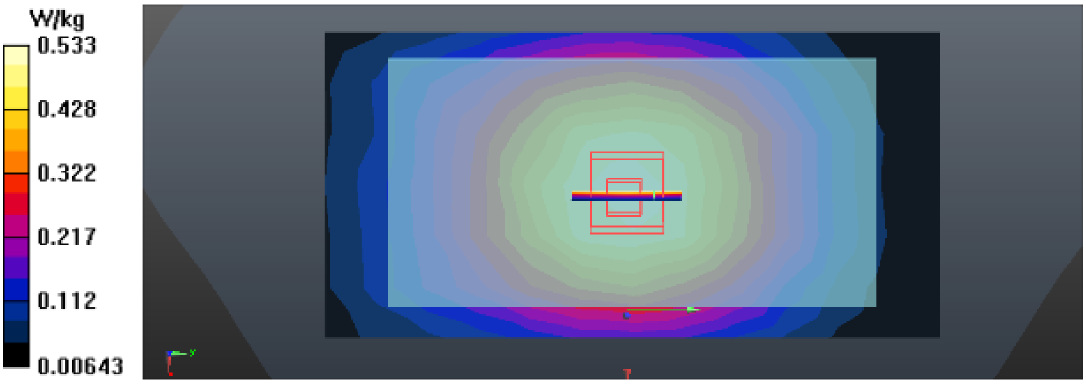
Communication System: UID 0, GPRS 8 (0); Frequency: 1880 MHz; Duty Cycle: 1:8.30042
Medium parameters used: f = 1880 MHz; σ = 1.528 S/m; ε_r = 53.058; ρ = 1000 kg/m^3
Ambient Temperature : 23.1 ℃; Liquid Temperature : 22.1 ℃

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)

Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.452 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.972 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.732 W/kg
SAR(1 g) = 0.398 W/kg; SAR(10 g) = 0.203 W/kg
Maximum value of SAR (measured) = 0.433 W/kg



Test Laboratory: BTL Inc.

7_WCDMA Band V_RMC12.2K_CH4182_Left Cheek _Smart phone

DUT: Smart Phone;

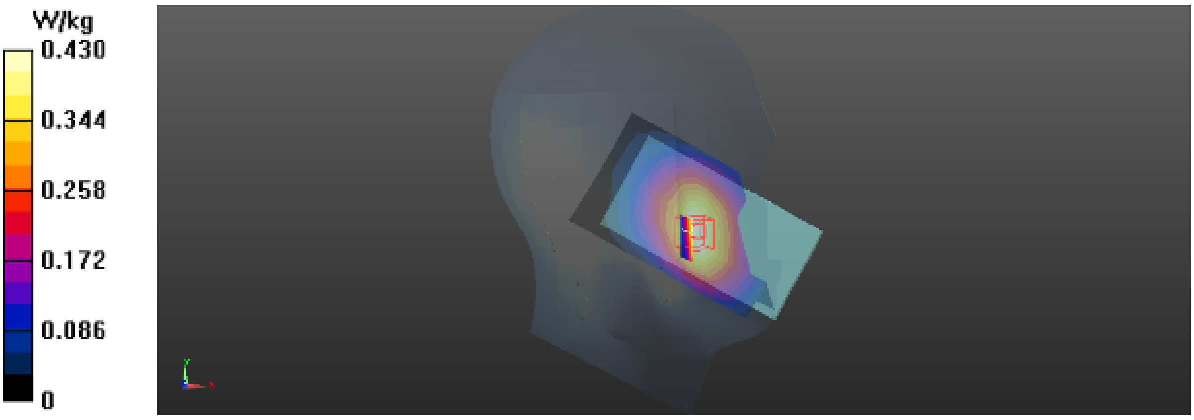
Communication System: UID 0, UMTS-FDD(WCDMA) (0); Frequency: 836.6 MHz; Duty Cycle: 1:1.95434
Medium parameters used: f = 837 MHz; σ = 0.892 S/m; ε_r = 42.361; ρ = 1000 kg/m^3
Ambient Temperature : 22.4 ℃; Liquid Temperature : 22.1 ℃

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)

Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.430 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.932 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.473 W/kg
SAR(1 g) = 0.380 W/kg; SAR(10 g) = 0.289 W/kg
Maximum value of SAR (measured) = 0.401 W/kg



Date: 07/18/2015

Test Laboratory: BTL Inc.

8_WCDMA Band V_RMC12.2K_CH4182_Rear Face_15mm_Smart phone

DUT: Smart Phone;

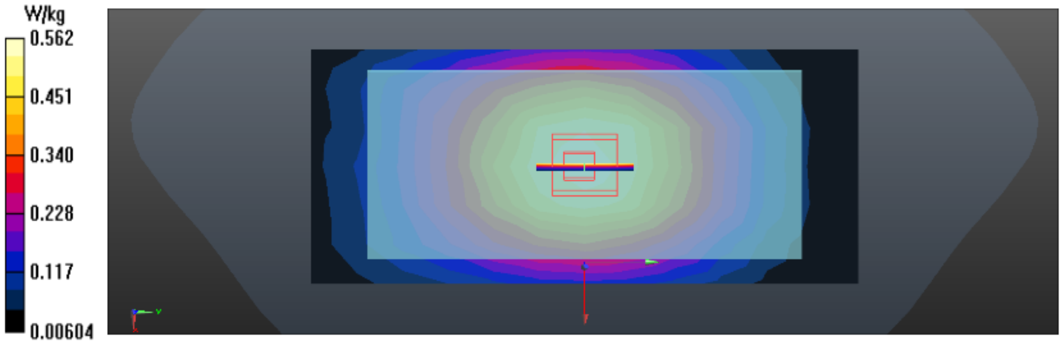
Communication System: UID 0, UMTS-FDD(WCDMA) (0); Frequency: 836.6 MHz; Duty Cycle: 1:1.25893
Medium parameters used: f = 837 MHz; σ = 0.976 S/m; ε_r = 54.307; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.5 ℃

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)

Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.562 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.811 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.601 W/kg
SAR(1 g) = 0.492 W/kg; SAR(10 g) = 0.384 W/kg
Maximum value of SAR (measured) = 0.514 W/kg



Date: 07/18/2015

Test Laboratory: BTL Inc.

9_WCDMA Band V_RMC12.2K_CH4182_Rear Face_10mm_Smart phone

DUT: Smart Phone;

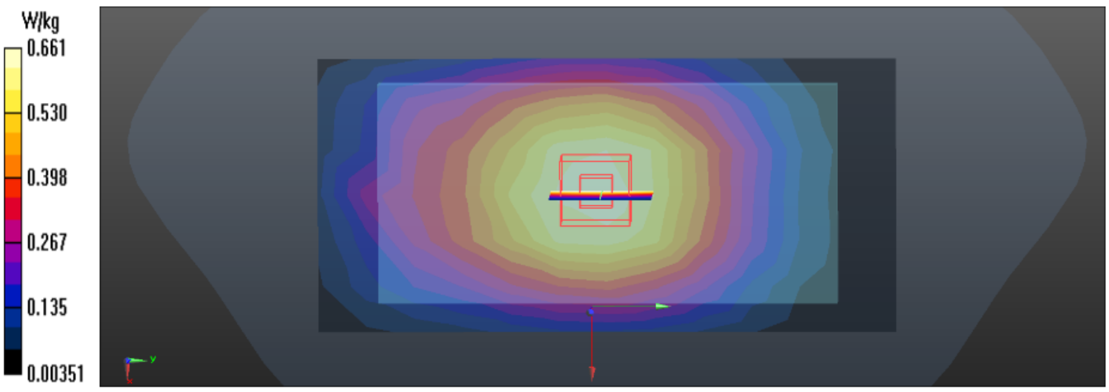
Communication System: UID 0, UMTS-FDD(WCDMA) (0); Frequency: 836.6 MHz; Duty Cycle: 1:1.25893
Medium parameters used: f = 837 MHz; σ = 0.976 S/m; ε_r = 54.307; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.5 ℃

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)

Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.661 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.856 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.698 W/kg
SAR(1 g) = 0.576 W/kg; SAR(10 g) = 0.456 W/kg
Maximum value of SAR (measured) = 0.605 W/kg



Date: 07/16/2015

Test Laboratory: BTL Inc.

10_LTE Band 5_QPSK10M_CH20525_1RB_Right Cheek_Smart phone

DUT: Smart Phone;

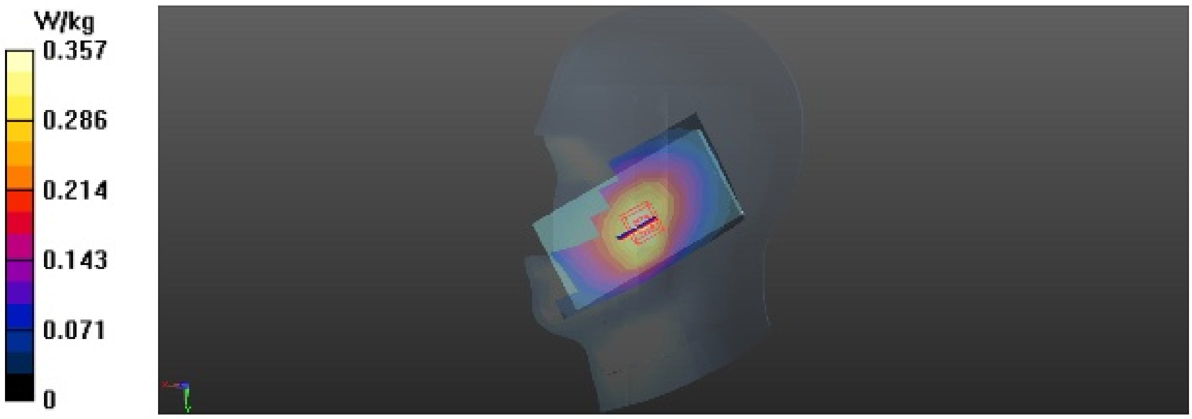
Communication System: UID 0, LTE-FDD(1RB,10MHz,QPSK) (0); Frequency: 836.5 MHz; Duty Cycle: 1:3.74111
Medium parameters used (interpolated): f = 836.5 MHz; σ = 0.892 S/m; ε_r = 42.366; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：22.1 ℃

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)

Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.357 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.649 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.399 W/kg
SAR(1 g) = 0.321 W/kg; SAR(10 g) = 0.244 W/kg
Maximum value of SAR (measured) = 0.337 W/kg



Test Laboratory: BTL Inc.

11_LTE Band 5_QPSK10M_CH20525_1RB_Rear Face_15mm_Smart phone

DUT: Smart Phone;

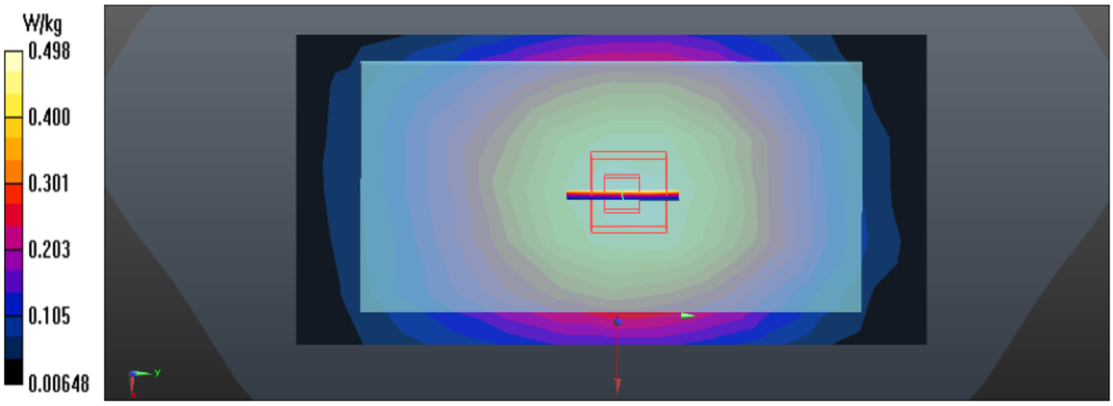
Communication System: UID 0, LTE-FDD(1RB,10MHz,QPSK) (0); Frequency: 836.5 MHz; Duty Cycle: 1:1.25893
Medium parameters used (interpolated): f = 836.5 MHz; σ = 0.975 S/m; ε_r = 54.311; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.5 ℃

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)

Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.498 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.782 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.538 W/kg
SAR(1 g) = 0.446 W/kg; SAR(10 g) = 0.351 W/kg
Maximum value of SAR (measured) = 0.468 W/kg



Date: 07/18/2015

Test Laboratory: BTL Inc.

12_LTE Band 5_QPSK10M_CH20525_1RB_Rear Face_10mm_Smart phone

DUT: Smart Phone;

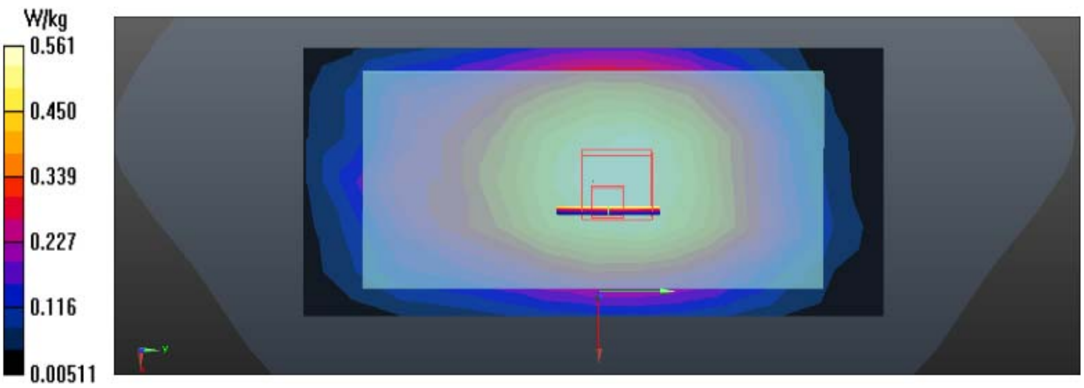
Communication System: UID 0, LTE-FDD(1RB,10MHz,QPSK) (0); Frequency: 836.5 MHz; Duty Cycle: 1:1.25893
Medium parameters used (interpolated): f = 836.5 MHz; σ = 0.975 S/m; ε_r = 54.311; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.5 ℃

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)

Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.561 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.093 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.610 W/kg
SAR(1 g) = 0.491 W/kg; SAR(10 g) = 0.389 W/kg
Maximum value of SAR (measured) = 0.517 W/kg



Date: 07/15/2015

Test Laboratory: BTL Inc.

13_LTE Band 7_QPSK20M_CH21350_50%RB_Left Cheek_Smart phone

DUT: Smart Phone;

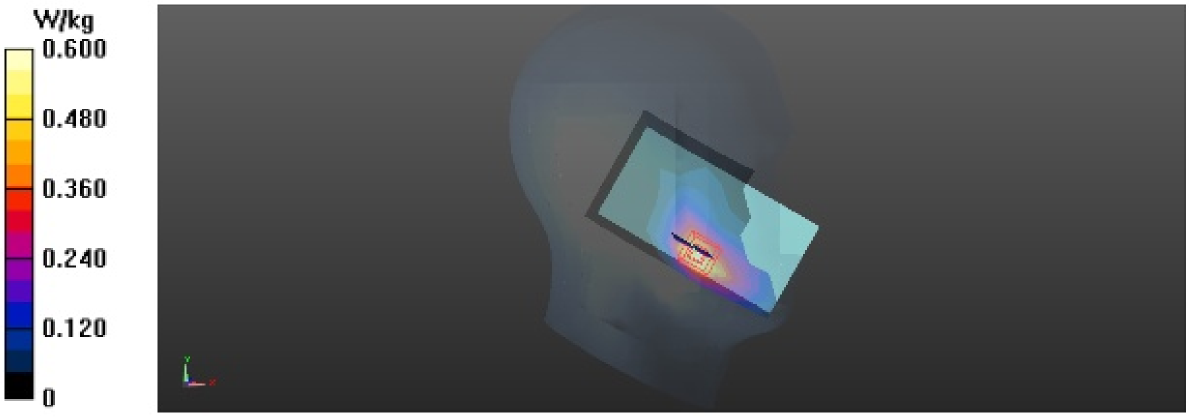
Communication System: UID 0, LTE-FDD(50% RB, 20MHz, QPSK) (0); Frequency: 2560 MHz; Duty Cycle: 1:3.82825
Medium parameters used: f = 2560 MHz; σ = 2.009 S/m; ε_r = 37.783; ρ = 1000 kg/m^3
Temperature：23.3 ℃; Liquid Temperature：22.3 ℃

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)

Area Scan (9x15x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.600 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.951 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.786 W/kg
SAR(1 g) = 0.428 W/kg; SAR(10 g) = 0.218 W/kg
Maximum value of SAR (measured) = 0.473 W/kg



Date: 07/19/2015

Test Laboratory: BTL Inc.

14_LTE Band 7_QPSK20M_CH20850_1RB_Rear Face_15mm_Smart phone

DUT: Smart Phone;

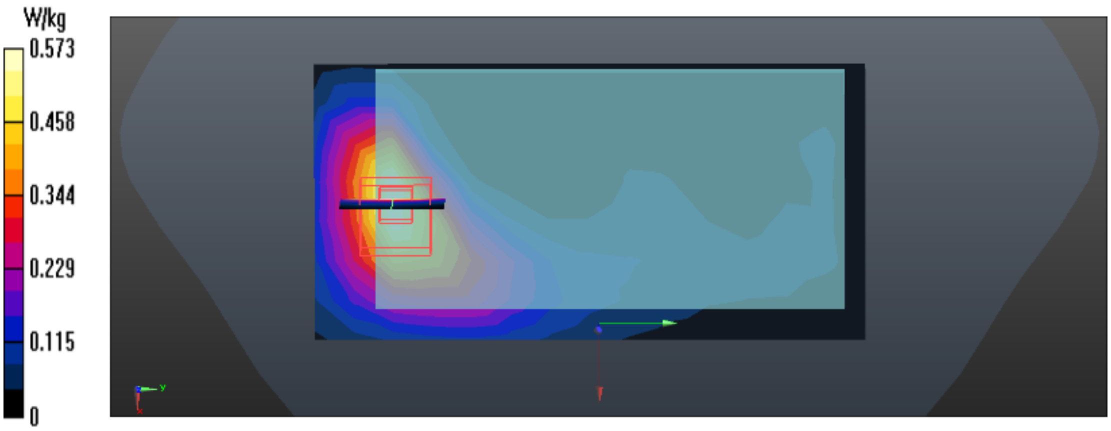
Communication System: UID 0, LTE-FDD(1RB,20MHz,QPSK) (0); Frequency: 2510 MHz; Duty Cycle: 1:1.25893
Medium parameters used: f = 2510 MHz; σ = 2.097 S/m; ε_r = 52.607; ρ = 1000 kg/m^3
Ambient Temperature : 23.2 ℃; Liquid Temperature : 22.4 ℃

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)

-/-/Area Scan (8x15x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.573 W/kg

-/-/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.574 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.869 W/kg
SAR(1 g) = 0.430 W/kg; SAR(10 g) = 0.221 W/kg
Maximum value of SAR (measured) = 0.474 W/kg



Date: 07/19/2015

Test Laboratory: BTL Inc.

15_LTE Band 7_QPSK20M_CH20850_1RB_Bottom Side_10mm_Smart phone

DUT: Smart Phone;

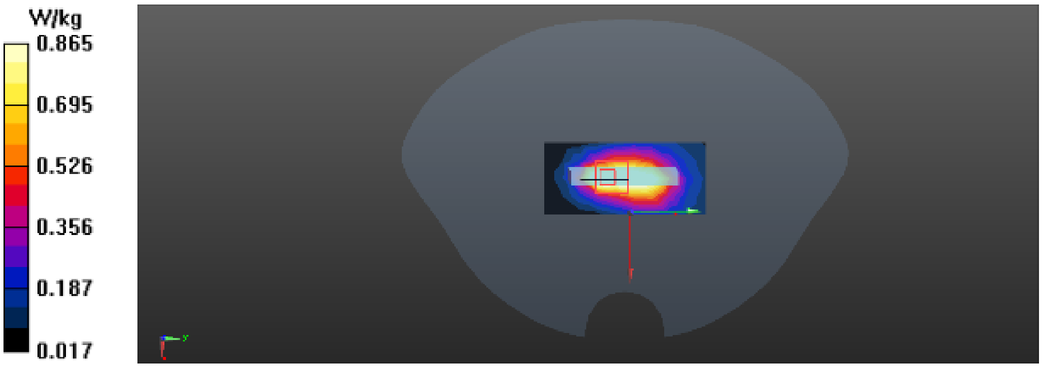
Communication System: UID 0, LTE-FDD(1RB,20MHz,QPSK) (0); Frequency: 2510 MHz; Duty Cycle: 1:1.25893
Medium parameters used: f = 2510 MHz; σ = 2.128 S/m; ε_r = 52.519; ρ = 1000 kg/m^3
Ambient Temperature : 23.2 ℃; Liquid Temperature : 22.4 ℃

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)

Area Scan (5x10x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.865 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.365 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.865 W/kg
SAR(1 g) = 0.652 W/kg; SAR(10 g) = 0.367 W/kg
Maximum value of SAR (measured) = 0.822 W/kg



Date: 07/19/2015

Test Laboratory: BTL Inc.

16_2.4G WIFI_802.11b_CH1_Left Cheek_Smart phone

DUT: Smart Phone;

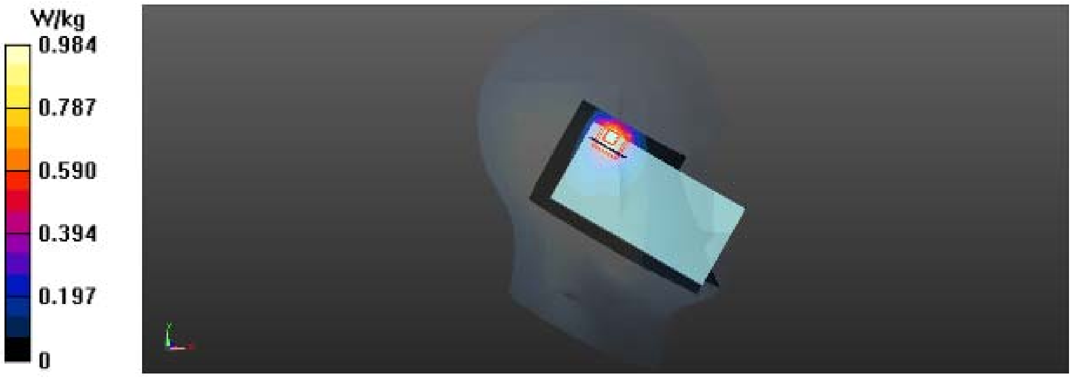
Communication System: UID 0, IEEE 802.11b WiFi 2.4GHz (DSSS,1Mbps) (0); Frequency: 2412 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; σ = 1.821 S/m; ε_r = 38.306; ρ = 1000 kg/m^3
Ambient Temperature : 23.5 ℃; Liquid Temperature : 22.4 ℃

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)

-/-/Area Scan (9x16x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.984 W/kg

-/-/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.181 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.67 W/kg
SAR(1 g) = 0.691 W/kg; SAR(10 g) = 0.352 W/kg
Maximum value of SAR (measured) = 0.695 W/kg



Date: 07/19/2015

Test Laboratory: BTL Inc.

T65_2.4G WIFI_802.11b_CH1_Rear Face_15mm_Smart phone

DUT: Smart Phone;

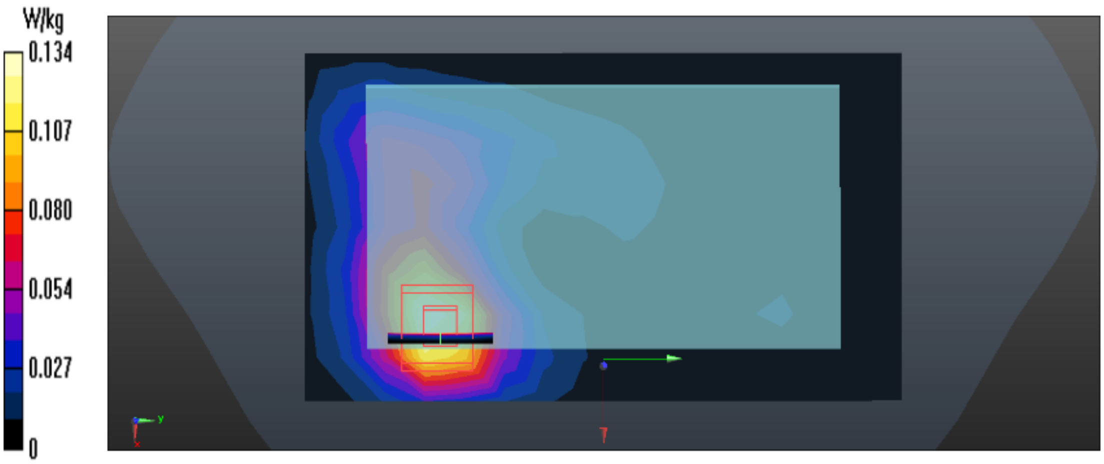
Communication System: UID 0, IEEE 802.11b WiFi 2.4GHz (DSSS,1Mbps) (0); Frequency: 2412 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; σ = 1.945 S/m; ε_r = 51.855; ρ = 1000 kg/m^3
Ambient Temperature : 23.2 ℃; Liquid Temperature : 22.3 ℃

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)

Area Scan (9x16x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.134 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.909 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.184 W/kg
SAR(1 g) = 0.096 W/kg; SAR(10 g) = 0.048 W/kg
Maximum value of SAR (measured) = 0.106 W/kg



Date: 07/19/2015

Test Laboratory: BTL Inc.

18_2.4G WIFI_802.11b_CH1_Rear Face_10mm_Smart phone

DUT: Smart Phone;

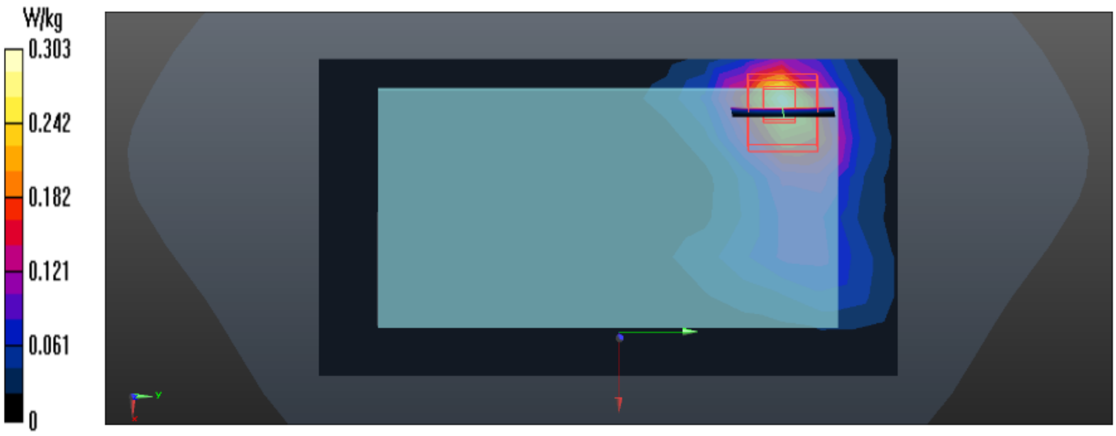
Communication System: UID 0, IEEE 802.11b WiFi 2.4GHz (DSSS,1Mbps) (0); Frequency: 2412 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; σ = 1.945 S/m; ε_r = 51.855; ρ = 1000 kg/m^3
Ambient Temperature : 23.2 ℃; Liquid Temperature : 22.3 ℃

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)

Area Scan (9x16x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.303 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.974 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.430 W/kg
SAR(1 g) = 0.201 W/kg; SAR(10 g) = 0.094 W/kg
Maximum value of SAR (measured) = 0.224 W/kg



4. Calibration Certificate

(Pls See Appendix A.)

5. EUT Testing Position

(Pls See Appendix B.)