



**FCC OET BULLETIN 65 SUPPLEMENT C 01-01
IEEE Std 1528-2003 and 1528a-2005**

SAR EVALUATION REPORT

For
GSM&WCDMA with Bluetooth and WLAN

**Model: LG-P769
FCC ID: ZNFP769**

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1. Attestation of Test Results

Applicant	LG ELECTRONICS MOBILECOMM U.S.A., INC.			
DUT description	GSM&WCDMA with Bluetooth and WLAN			
Model	LG-P769			
Test device is	An identical prototype			
Device category	Portable			
Exposure category	General Population/Uncontrolled Exposure			
Date tested	7/16/2012 – 8/2/2012			
FCC Rule Parts	Freq. Range	Highest 1-g SAR	Limit	
22	824-849 MHz	Head: 0.162 W/kg (Right Touch) Body: 0.485 W/kg (Rear w/ 10mm distance) Hotspot: 0.485 W/kg (Rear w/ 10mm distance)	1.6 W/kg	
27	1710–1755 MHz	Head: 0.284 W/kg (Left Touch) Body: 0.907 W/kg (Rear with Headset w/ 10 mm distance) Hotspot: 0.869 W/kg (Rear w/ 10 mm distance)		
24	1850-1910 MHz	Head: 0.255 W/kg (Right Touch) Body: 1.250 W/kg (Rear w/ 10 mm distance) Hotspot: 1.250 W/kg (Rear w/ 10 mm distance)		
15.247	2412-2462 MHz	Head: 0.569 W/kg (Right Touch) Body: 0.240 W/kg (Rear w/ 10 mm distance) Hotspot: 0.240 W/kg (Rear w/ 10 mm distance)		
	5725-5850 MHz	Head: 0.067 W/kg (Right Touch) Body: 0.249 W/kg (Rear w/ 10 mm distance)		
15.407	5150-5250 MHz	Head: 0.092 W/kg (Right Touch) Body: 0.113 W/kg (Rear w/ 10 mm distance)		
	5250-5350 MHz	Head: 0.108 W/kg (Right Touch) Body: 0.138 W/kg (Rear w/ 10 mm distance)		
	5500-5700 MHz	Head: 0.161 W/kg (Right Touch) Body: 0.236 W/kg (Rear w/ 10 mm distance)		
Simultaneous Transmission Use Condition		1.578 W/kg		
Applicable Standards				Test Results
FCC OET Bulletin 65 Supplement C 01-01, IEEE Std 1528-2003 and 1528a-2005			Pass	

UL CCS tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government (NIST Handbook 150, Annex A). This report is written to support regulatory compliance of the applicable standards stated above.

Approved & Released For UL CCS By:

Tested By:



Dave Weaver
Program Manager
UL CCS

Kent Huang
SAR Engineer
UL CCS

2. Test Methodology

The tests documented in this report were performed in accordance with FCC OET Bulletin 65 Supplement C Edition 01-01, IEEE STD 1528-2003 & 1528a-2005 and the following KDB Procedures:

- 648474 D01 SAR Handsets Multi Xmitter and Ant, v01r05
- 941225 D01 SAR test for 3G devices v02
- 941225 D03 SAR Test Reduction GSM GPRS EDGE v01
- 248227 D01 SAR meas for 802 11abg v01r02
- 941225 D06 Hot Spot SAR v01

3. Facilities and Accreditation

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

4. Calibration and Uncertainty

4.1. Measuring Instrument Calibration

The measuring equipment used to perform the tests documented in this report has been calibrated in accordance with the manufacturers' recommendations, and is traceable to recognized national standards.

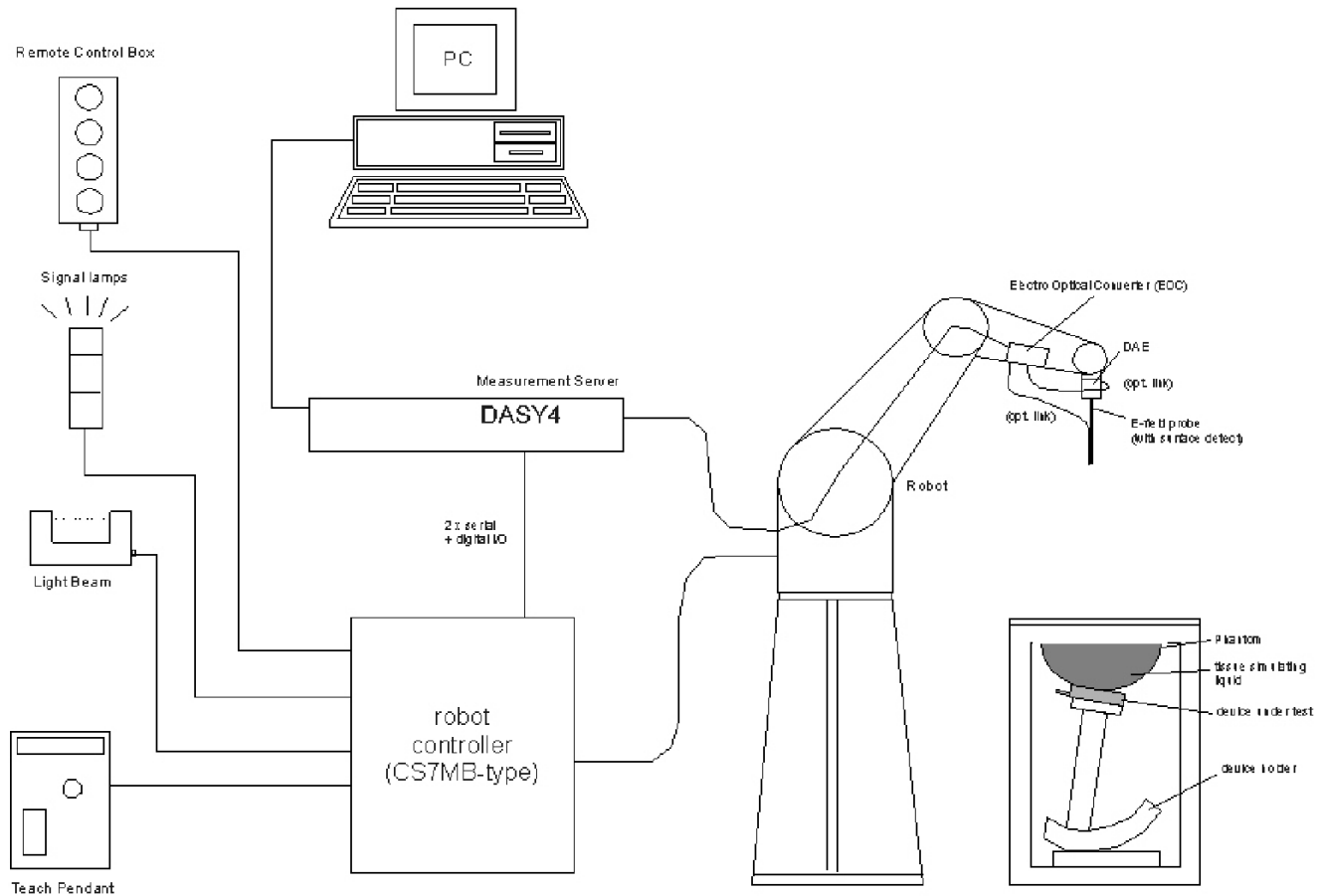
Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due date		
				MM	DD	Year
Dielectronic Probe kit	HP	85070C	N/A	N/A		
Base Station Simulator	Agilent	8960	MY48360228	11	28	2012
ESA Series Network Analyzer	Agilent	E5071B	MY42100131	2	11	2013
Synthesized Signal Generator	HP	8665B	3438A00633	2	22	2013
E-Field Probe	SPEAG	EX3DV4	3749	1	27	2013
Thermometer	ERTCO	639-1S	8350	7	30	2013
Data Acquisition Electronics	SPEAG	DAE3	427	1	17	2013
Data Acquisition Electronics	SPEAG	DAE3	500	6	13	2013
System Validation Dipole	SPEAG	D835V2	4d002	3	6	2013
System Validation Dipole	SPEAG	D1750V2	1050	4	19	2013
System Validation Dipole	SPEAG	D1900V2	5d140	4	12	2013
System Validation Dipole	SPEAG	D1900V2	5d043	11	10	2012
System Validation Dipole	SPEAG	D2450V2	706	4	11	2013
System Validation Dipole	SPEAG	D5GHzV2	1075	2	14	2013
Power Meter	HP	438A	3513U04320	9	17	2013
Power Sensor A	HP	8481A	2237A31744	8	17	2013
Power Sensor B	HP	8481A	3318A95392	8	17	2013
Amplifier	MITEQ	4D00400600-50-30P	1622052	N/A		
Directional coupler	Werlatone	C8060-102	2149	N/A		
Synthesized Signal Generator	HP	8665B	3744A01084	5	3	2013
Power Meter	HP	438A	2822A05684	10	7	2013
Power Sensor A	HP	8481A	2702A66876	8	1	2013
Power Sensor B	HP	8482A	2349A08568	4	14	2013
Amplifier	MITEQ	4D00400600-50-30P	1620606	N/A		
Directional coupler	Werlatone	C8060-102	2141	N/A		

4.2. Measurement Uncertainty

Measurement uncertainty for 300 MHz to 3 GHz averaged over 1 gram					
Component	Error, %	Distribution	Divisor	Sensitivity	U (X), %
Measurement System					
Probe Calibration (k=1)	6.00	Normal	1	1	6.00
Axial Isotropy	1.15	Rectangular	1.732	0.7071	0.47
Hemispherical Isotropy	2.30	Rectangular	1.732	0.7071	0.94
Boundary Effect	0.90	Rectangular	1.732	1	0.52
Probe Linearity	3.45	Rectangular	1.732	1	1.99
System Detection Limits	1.00	Rectangular	1.732	1	0.58
Readout Electronics	0.30	Normal	1	1	0.30
Response Time	0.80	Rectangular	1.732	1	0.46
Integration Time	2.60	Rectangular	1.732	1	1.50
RF Ambient Conditions - Noise	3.00	Rectangular	1.732	1	1.73
RF Ambient Conditions - Reflections	3.00	Rectangular	1.732	1	1.73
Probe Positioner Mechanical Tolerance	0.40	Rectangular	1.732	1	0.23
Probe Positioning with respect to Phantom	2.90	Rectangular	1.732	1	1.67
Extrapolation, Interpolation and Integration	1.00	Rectangular	1.732	1	0.58
Test Sample Related					
Test Sample Positioning	2.90	Normal	1	1	2.90
Device Holder Uncertainty	3.60	Normal	1	1	3.60
Output Power Variation - SAR Drift	5.00	Rectangular	1.732	1	2.89
Phantom and Tissue Parameters					
Phantom Uncertainty (shape and thickness)	4.00	Rectangular	1.732	1	2.31
Liquid Conductivity - deviation from target	5.00	Rectangular	1.732	0.64	1.85
Liquid Conductivity - measurement	4.26	Normal	1	0.64	2.73
Liquid Permittivity - deviation from target	5.00	Rectangular	1.732	0.6	1.73
Liquid Permittivity - measurement uncertainty	-4.41	Normal	1	0.6	-2.65
Combined Standard Uncertainty Uc(y) =					10.45
Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =					20.91 %
Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =					1.65 dB
Measurement uncertainty for 3 to 6 GHz averaged over 1 gram					
Component	Error, %	Distribution	Divisor	Sensitivity	U (X), %
Measurement System					
Probe Calibration (k=1)	6.55	Normal	1	1	6.55
Axial Isotropy	1.15	Rectangular	1.732	0.7071	0.47
Hemispherical Isotropy	2.30	Rectangular	1.732	0.7071	0.94
Boundary Effect	0.90	Rectangular	1.732	1	0.52
Probe Linearity	3.45	Rectangular	1.732	1	1.99
System Detection Limits	1.00	Rectangular	1.732	1	0.58
Readout Electronics	1.00	Normal	1	1	1.00
Response Time	0.80	Rectangular	1.732	1	0.46
Integration Time	2.60	Rectangular	1.732	1	1.50
RF Ambient Conditions - Noise	3.00	Rectangular	1.732	1	1.73
RF Ambient Conditions - Reflections	3.00	Rectangular	1.732	1	1.73
Probe Positioner Mechanical Tolerance	0.40	Rectangular	1.732	1	0.23
Probe Positioning with respect to Phantom	2.90	Rectangular	1.732	1	1.67
Extrapolation, Interpolation and Integration	3.90	Rectangular	1.732	1	2.25
Test Sample Related					
Test Sample Positioning	1.10	Normal	1	1	1.10
Device Holder Uncertainty	3.60	Normal	1	1	3.60
Output Power Variation - SAR Drift	5.00	Rectangular	1.732	1	2.89
Phantom and Tissue Parameters					
Phantom Uncertainty (shape and thickness)	4.00	Rectangular	1.732	1	2.31
Liquid Conductivity - deviation from target	5.00	Rectangular	1.732	0.64	1.85
Liquid Conductivity - measurement uncertainty	3.33	Normal	1	0.64	2.13
Liquid Permittivity - deviation from target	10.00	Rectangular	1.732	0.6	3.46
Liquid Permittivity - measurement uncertainty	3.44	Normal	1	0.6	2.06
Combined Standard Uncertainty Uc(y), %:					10.86
Expanded Uncertainty U, Coverage Factor = 1.96, > 95 % Confidence =					21.29 %
Expanded Uncertainty U, Coverage Factor = 1.96, > 95 % Confidence =					1.68 dB

5. Measurement System Description and Setup

The DASY4 system used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot (Stäubli RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows XP.
- DASY software.
- Remote controls with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing validating the proper functioning of the system.

6. SAR Measurement Procedures

6.1. Normal SAR Measurement Procedure

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE Standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Step 3: Zoom Scan

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures $\geq 7 \times 7 \times 9$ (above 4.5 GHz) or $5 \times 5 \times 7$ (below 3 GHz) points within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

Step 5: Z-Scan (FCC only)

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation the extrapolated distance should not be larger than the step size in Z-direction.

6.2. Volume Scan Procedures

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE Standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Step 3: Zoom Scan

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures $\geq 7 \times 7 \times 9$ (above 4.5 GHz) or $5 \times 5 \times 7$ (below 3 GHz) points within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

Step 4: Volume Scan

Volume Scans are used to assess peak SAR and averaged SAR measurements in largely extended 3-dimensional volumes within any phantom. This measurement does not need any previous area scan. The grid can be anchored to a user specific point or to the current probe location.

Step 5: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

7. Device Under Test

GSM & W-CDMA Phone with Bluetooth & WLAN Model: LG-P769, LGP769, P769	
Normal operation	<ul style="list-style-type: none"> - Held to head, - Body (Rear and Front sides) with 10 mm separation distance.
Accessory	<ol style="list-style-type: none"> 1. Headset 2. Battery Cover <ul style="list-style-type: none"> o Normal Battery Cover

7.1. Air Interfaces and Frequency Ranges

Air Interfaces	<ul style="list-style-type: none"> - GSM, GPRS and EGPRS Class 12 - W-CDMA Rel 99, HSDPA (Rel 6, CAT 6), HSUPA (Rel. 6, CAT10) - Bluetooth Ver 2.1 with EDR
Tx Frequency Ranges	<ul style="list-style-type: none"> - GSM850: 824 - 849 MHz - GSM1900: 1850 - 1910 MHz - W-CDMA Band V: 824 - 849 MHz - W-CDMA Band IV: 1710 – 1755 MHz - W-CDMA Band II: 1850 - 1910 MHz - 802.11abgn - Bluetooth: 2402 - 2480 MHz

7.2. Simultaneous Transmission

No.	Conditions
1	GSM850 Voice + WiFi
2	GSM1900 Voice + WiFi
3	GSM850 GPRS + WiFi
4	GSM1900 GPRS + WiFi
5	W-CDMA Band V+ WiFi
6	W-CDMA Band II+ WiFi
7	W-CDMA Band IV+ WiFi
1	GSM850 Voice + BT
2	GSM1900 Voice + BT
3	GSM850 GPRS + BT
4	GSM1900 GPRS + BT
5	W-CDMA Band V+ BT
6	W-CDMA Band II+ BT
7	W-CDMA Band IV+ BT

Notes:

1. EGPRS is Rx only

7.3. Hotspot (Wireless router) Exposure Condition

The hotspot mode for this device is supported. The hotspot mode is only applied for WiFi 2.4GHz Band.

8. Summary of Test Configurations

Refer to Section 17 “Antenna Location and Separation Distances” for the specific details of the antenna-to-antenna distances and Section 18 “Setup Photos” for the details of the test positions.

8.1. Head Test Configurations for WWAN and WLAN

Test Configurations	SAR Required	Note
Left Touch	Yes	
Left Tilt (15°)	Yes	
Right Touch	Yes	
Right Tilt (15°)	Yes	

8.2. Body-worn Accessory Test Configurations for WWAN and WLAN

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	< 25 mm	Yes	
Front	< 25 mm	Yes	

8.3. Personal Router/Hotspot Test Configurations

WWAN Test Configurations

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	< 25 mm	Yes	
Front	< 25 mm	Yes	
Edge 1	113.5 mm	No	SAR is not required because the distance from the antenna to this edge is > 2.5 cm as per KDB 941225 D06 Hot Spot SAR v01
Edge 2	1.1 mm	Yes	
Edge 3	2.1 mm	Yes	
Edge 4	20.2 mm	Yes	

WLAN 2.4GHz Band Test Configurations

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	< 25 mm	Yes	
Front	< 25 mm	Yes	
Edge 1	2.1 mm	Yes	
Edge 2	54.8 mm	No	SAR is not required because the distance from the antenna to this edge is > 2.5 cm as per KDB 941225 D06 Hot Spot SAR v01
Edge 3	108.4 mm	No	SAR is not required because the distance from the antenna to this edge is > 2.5 cm as per KDB 941225 D06 Hot Spot SAR v01
Edge 4	1.1 mm	Yes	

9. RF Output Power Measurement

9.1. GSM850

Target Power: 32.5 dBm

Tune-up Tolerance: -1.5 dB / +0.7 dB

GMSK (Voice) Mode

Band	Ch No.	Freq. (MHz)	Avg burst Pwr (dBm)
850	128	824.2	32.8
	190	836.6	32.8
	251	848.8	32.8

Target Power:

GPRS 1 slot 32.5 dBm

GPRS 2 slot 30.5 dBm

GPRS 3 slot 28.5 dBm

GPRS 4 slot 27.0 dBm

Tune-up Tolerance: -1.5 dB / +0.7 dB

GMSK (GPRS) Mode - Coding Scheme: CS1

Band	Ch No.	Freq. (MHz)	Avg burst Pwr (dBm)				Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr	3 slots	Frame Avg Pwr	4 slots	Frame Avg Pwr
850	128	824.2	32.8	23.8	30.8	24.8	28.8	24.6	27.3	24.3
	190	836.6	32.8	23.8	30.8	24.8	28.8	24.6	27.3	24.3
	251	848.8	32.8	23.8	30.8	24.8	28.9	24.6	27.3	24.3

Notes:

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

- Head: GMSK Voice Mode
- Body: GMSK (GPRS) mode with 2 time slots, based on the output power measurements above

Target Power:

EGPRS 1 slot 27.0 dBm

EGPRS 2 slot 25.0 dBm

EGPRS 3 slot 23.0 dBm

EGPRS 4 slot 22.0 dBm

Tune-up Tolerance: -1.5 dB / +0.7 dB

8PSK (EGPRS) Mode - Coding Scheme: MCS5

Band	Ch No.	Freq. (MHz)	Avg burst Pwr (dBm)				Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr	3 slots	Frame Avg Pwr	4 slots	Frame Avg Pwr
850	128	824.2	27.3	18.2	25.2	19.2	23.2	18.9	22.2	19.2
	190	836.6	27.2	18.2	25.2	19.2	23.1	18.9	22.2	19.2
	251	848.8	27.2	18.2	25.2	19.2	23.1	18.9	22.2	19.2

9.2. GSM1900

Target Power: 30.7 dBm

Tune-up Tolerance: -1.5 dB / +0.7 dB

GMSK (Voice) Mode

Band	Ch No.	Freq. (MHz)	Avg burst Pwr (dBm)
1900	512	1850.2	31.2
	661	1880.0	31.2
	810	1909.8	31.1

Target Power:

GPRS 1 slot 30.7 dBm

GPRS 2 slot 28.7 dBm

GPRS 3 slot 26.7 dBm

GPRS 4 slot 25.2 dBm

Tune-up Tolerance: -1.5 dB / +0.7 dB

GMSK (GPRS) Mode - Coding Scheme: CS1

Band	Ch No.	Freq. (MHz)	Avg burst Pwr (dBm)				Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr	3 slots	Frame Avg Pwr	4 slots	Frame Avg Pwr
1900	512	1850.2	31.2	22.2	29.2	23.2	27.3	23.0	25.8	22.7
	661	1880.0	31.2	22.1	29.2	23.2	27.3	23.0	25.7	22.7
	810	1909.8	31.0	22.0	29.2	23.2	27.2	23.0	25.7	22.7

Notes:

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

- Head: GMSK Voice Mode
- Body: GMSK (GPRS) mode with 2 time slots, based on the output power measurements above

Target Power:

EGPRS 1 slot 25.3 dBm

EGPRS 2 slot 23.3 dBm

EGPRS 3 slot 21.3 dBm

EGPRS 4 slot 20.3 dBm

Tune-up Tolerance: -1.5 dB / +0.7 dB

8PSK (EGPRS) Mode - Coding Scheme: MCS5

Band	Ch No.	Freq. (MHz)	Avg burst Pwr (dBm)				Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr	3 slots	Frame Avg Pwr	4 slots	Frame Avg Pwr
1900	512	1850.2	26.0	17.0	23.9	17.9	22.0	17.7	21.0	17.9
	661	1880.0	26.0	16.9	23.9	17.9	22.0	17.7	20.9	17.9
	810	1909.8	25.9	16.9	23.9	17.8	21.9	17.7	20.9	17.9

9.3. W-CDMA (UMTS) Band V

Target Power: 23.0 dBm

Tune-up Tolerance: -1.5 dB / +0.7 dB

Release 99 (RMC, 12.2kbps)

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	β_c/β_d	8/15

Output power table

Band	Ch No.	Freq. (MHz)	Avg Pwr (dBm)
850 (Band V)	4132	826.4	23.5
	4183	836.6	23.4
	4233	846.6	23.4

HSDPA

The following 4 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

Mode	HSDPA	HSDPA	HSDPA	HSDPA	
Subtest	1	2	3	4	
WCDMA General Settings	Loopback Mode				Test Mode 1
	Rel99 RMC				12.2kbps RMC
	HSDPA FRC				H-Set1
	Power Control Algorithm				Algorithm 2
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
CM (dB)	0	1	1.5	1.5	
HSDPA Specific Settings	D _{ACK}				8
	D _{NAK}				8
	DCQI				8
	Ack-Nack repetition factor				3
	CQI Feedback (Table 5.2B.4)				4ms
	CQI Repetition Factor (Table 5.2B.4)				2
A _{hs} = β_{hs}/β_c				30/15	

Output power table

Band	Subtest	Ch No.	Freq. (MHz)	Avg Pwr (dBm)
850 (Band V)	1	4132	826.4	23.6
		4183	836.6	23.5
		4233	846.6	23.5
	2	4132	826.4	23.6
		4183	836.6	23.5
		4233	846.6	23.5
	3	4132	826.4	23.0
		4183	836.6	23.0
		4233	846.6	23.0
	4	4132	826.4	22.8
		4183	836.6	22.8
		4233	846.6	22.8

HSPA (HSDPA & HSUPA)

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

Mode	HSPA	HSPA	HSPA	HSPA	HSPA	
Subtest	1	2	3	4	5	
WCDMA General Settings	Loopback Mode					Test Mode 1
	Rel99 RMC					12.2kbps RMC
	HSDPA FRC					H-Set1
	HSUPA Test					HSUPA Loopback
	Power Control Algorithm					Algorithm2
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	15/15
	β_{ec}	209/225	12/15	30/15	2/15	24/15
	β_c/β_d	11/15	6/15	15/9	2/15	15/15
	β_{hs}	22/15	12/15	30/15	4/15	30/15
	β_{ed}	1309/225	94/75	47/15 47/15	56/75	134/15
	CM (dB)	1.0	3.0	2.0	3.0	1.0
MPR (dB)	0	2	1	2	0	
HSDPA Specific Settings	DACK					8
	DNAK					8
	DCQI					8
	Ack-Nack repetition factor					3
	CQI Feedback (Table 5.2B.4)					4ms
	CQI Repetition Factor (Table 5.2B.4)					2
A _{hs} = β_{hs}/β_c					30/15	
HSUPA Specific Settings	D E-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	81
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_TFCIs	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 92 E-TFCI PO 18	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27	

Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)
850 (Band V)	Subtest 1	4132	826.4	23.5
		4183	836.6	23.5
		4233	846.6	23.5
	Subtest 2	4132	826.4	23.5
		4183	836.6	23.5
		4233	846.6	23.5
	Subtest 3	4132	826.4	23.1
		4183	836.6	23.0
		4233	846.6	23.0
	Subtest 4	4132	826.4	23.6
		4183	836.6	23.5
		4233	846.6	23.5
	Subtest 5	4132	826.4	23.5
		4183	836.6	23.5
		4233	846.6	23.5

Note(s):

- KDB 941225 D01 – Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit.
- *: Please refer to the separately attached document *MPR HSUPA Issue_* for a detailed explanation/justification from the manufacturer on why MPR was not implemented for this particular mode on this device.

9.4. W-CDMA (UMTS) Band II

Target Power: 24.0 dBm

Tune-up Tolerance: -1.5 dB / +0.7 dB

Release 99 (RMC, 12.2kbps)

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	β_c/β_d	8/15

Output power table

Band	Ch No.	Freq. (MHz)	Avg Pwr (dBm)
1900 (Band II)	9262	1852.4	24.5
	9400	1880.0	24.3
	9538	1907.6	24.3

HSDPA

The following 4 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

Mode	HSDPA	HSDPA	HSDPA	HSDPA	
Subtest	1	2	3	4	
WCDMA General Settings	Loopback Mode				Test Mode 1
	Rel99 RMC				12.2kbps RMC
	HSDPA FRC				H-Set1
	Power Control Algorithm				Algorithm 2
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
CM (dB)	0	1	1.5	1.5	
HSDPA Specific Settings	D _{ACK}				8
	D _{NAK}				8
	DCQI				8
	Ack-Nack repetition factor				3
	CQI Feedback (Table 5.2B.4)				4ms
	CQI Repetition Factor (Table 5.2B.4)				2
A _{hs} = β_{hs}/β_c				30/15	

Output power table

Band	Subtest	Ch No.	Freq. (MHz)	Avg Pwr (dBm)
1900 (Band II)	1	9262	1852.4	24.5
		9400	1880.0	24.3
		9538	1907.6	24.3
	2	9262	1852.4	24.5
		9400	1880.0	24.3
		9538	1907.6	24.3
	3	9262	1852.4	23.9
		9400	1880.0	23.7
		9538	1907.6	23.5
	4	9262	1852.4	23.7
		9400	1880.0	23.4
		9538	1907.6	23.3

HSPA (HSDPA & HSUPA)

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

Mode	HSPA	HSPA	HSPA	HSPA	HSPA	
Subtest	1	2	3	4	5	
WCDMA General Settings	Loopback Mode					Test Mode 1
	Rel99 RMC					12.2kbps RMC
	HSDPA FRC					H-Set1
	HSUPA Test					HSUPA Loopback
	Power Control Algorithm					Algorithm2
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	15/15
	β_{ec}	209/225	12/15	30/15	2/15	24/15
	β_c/β_d	11/15	6/15	15/9	2/15	15/15
	β_{hs}	22/15	12/15	30/15	4/15	30/15
	β_{ed}	1309/225	94/75	47/15 47/15	56/75	134/15
	CM (dB)	1.0	3.0	2.0	3.0	1.0
MPR (dB)	0	2	1	2	0	
HSDPA Specific Settings	DACK					8
	DNAK					8
	DCQI					8
	Ack-Nack repetition factor					3
	CQI Feedback (Table 5.2B.4)					4ms
	CQI Repetition Factor (Table 5.2B.4)					2
A _{hs} = β_{hs}/β_c					30/15	
HSUPA Specific Settings	D E-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	81
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_TFCIs	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 92 E-TFCI PO 18	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27	

Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)
1900 (Band II)	Subtest 1	9262	1852.4	24.5
		9400	1880.0	24.3
		9538	1907.6	24.3
	Subtest 2	9262	1852.4	24.4
		9400	1880.0	24.3
		9538	1907.6	24.3
	Subtest 3	9262	1852.4	23.4
		9400	1880.0	23.9
		9538	1907.6	22.8
	Subtest 4	9262	1852.4	24.4
		9400	1880.0	24.3
		9538	1907.6	24.2
	Subtest 5	9262	1852.4	24.5
		9400	1880.0	24.3
		9538	1907.6	24.2

Note(s):

- KDB 941225 D01 – Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit.
- *: Please refer to the separately attached document *MPR HSUPA Issue_* for a detailed explanation/justification from the manufacturer on why MPR was not implemented for this particular mode on this device.

9.5. W-CDMA (UMTS) Band IV

Target Power: 24.0 dBm

Tune-up Tolerance: -1.5 dB / +0.7 dB

Release 99 (RMC, 12.2kbps)

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	β_c/β_d	8/15

Output power table

Band	Ch No.	Freq. (MHz)	Avg Pwr (dBm)
1700 (Band IV)	1312	1712.4	24.7
	1412	1732.4	24.7
	1862	1752.5	24.7

HSDPA

The following 4 Sub-tests were completed according to Release 5 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

Mode	HSDPA	HSDPA	HSDPA	HSDPA	
Subtest	1	2	3	4	
WCDMA General Settings	Loopback Mode				Test Mode 1
	Rel99 RMC				12.2kbps RMC
	HSDPA FRC				H-Set1
	Power Control Algorithm				Algorithm 2
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
CM (dB)	0	1	1.5	1.5	
HSDPA Specific Settings	D _{ACK}				8
	D _{NAK}				8
	DCQI				8
	Ack-Nack repetition factor				3
	CQI Feedback (Table 5.2B.4)				4ms
	CQI Repetition Factor (Table 5.2B.4)				2
A _{hs} = β_{hs}/β_c				30/15	

Output power table

Band	Subtest	Ch No.	Freq. (MHz)	Avg Pwr (dBm)
1700 (Band IV)	1	1312	1712.4	24.7
		1412	1732.4	24.6
		1862	1752.5	24.7
	2	1312	1712.4	24.1
		1412	1732.4	23.9
		1862	1752.5	24.0
	3	1312	1712.4	23.6
		1412	1732.4	23.5
		1862	1752.5	23.6
	4	1312	1712.4	23.4
		1412	1732.4	23.2
		1862	1752.5	23.3

HSPA (HSDPA & HSUPA)

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

Mode	HSPA	HSPA	HSPA	HSPA	HSPA	
Subtest	1	2	3	4	5	
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm2				
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	15/15
	β_{ec}	209/225	12/15	30/15	2/15	24/15
	β_c/β_d	11/15	6/15	15/9	2/15	15/15
	β_{hs}	22/15	12/15	30/15	4/15	30/15
	β_{ed}	1309/225	94/75	47/15 47/15	56/75	134/15
	CM (dB)	1.0	3.0	2.0	3.0	1.0
MPR (dB)	0	2	1	2	0	
HSDPA Specific Settings	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
A _{hs} = β_{hs}/β_c	30/15					
HSUPA Specific Settings	D E-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	81
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_TFCIs	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 92 E-TFCI PO 18		E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27

Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)
1700 (Band IV)	Subtest 1	1312	1712.4	24.6
		1412	1732.4	24.4
		1862	1752.5	24.5
	Subtest 2	1312	1712.4	24.7
		1412	1732.4	24.5
		1862	1752.5	24.7
	Subtest 3	1312	1712.4	23.5
		1412	1732.4	23.4
		1862	1752.5	23.5
	Subtest 4	1312	1712.4	24.7
		1412	1732.4	24.5
		1862	1752.5	24.6
	Subtest 5	1312	1712.4	24.7
		1412	1732.4	24.6
		1862	1752.5	24.7

Note(s):

- KDB 941225 D01 – Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit.
- *: Please refer to the separately attached document *MPR HSUPA Issue_* for a detailed explanation/justification from the manufacturer on why MPR was not implemented for this particular mode on this device.

9.6. Wi-Fi (2.4 GHz Band)

Required Test Channels per KDB 248227 D01

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

Notes:

√ = "default test channels"

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

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

Band (MHz)	Mode	Ch #	Freq. (MHz)	Target Pwr (dBm)	Avg Pwr (dBm)	Note
2.4	802.11b	1	2412	17.9	16.6	
		6	2437	17.9	17.2	
		11	2462	17.9	17.7	
	802.11g	1	2412	15.7	14.5	
		6	2437	15.7	15.4	
		11	2462	15.7	15.9	
	802.11n (HT20)	1	2412	14.0	12.7	
		6	2437	14.0	13.4	
		11	2462	14.0	13.9	

9.7. Wi-Fi (5 GHz Bands)

Mode		Band	GHz	Channel	"Default Test Channels"	
					802.11a	
802.11a	UNII (15.407)	5.2 GHz	5.180	36	√	
			5.200	40		*
			5.220	44		*
			5.240	48	√	
		5.3 GHz	5.260	52	√	
			5.280	56		*
			5.300	60		*
			5.320	64	√	
		5.5 GHz	5.500	100		
			5.520	104	√	
			5.540	108		*
			5.560	112		*
			5.580	116	√	
			5.600	120		*
	5.620		124	√		
	5.640		128		*	
	DTS (15.247)	5.8 GHz	5.745	149	√	
			5.765	153		*
			5.785	157	√	
			5.805	161		*
5.825			165	√		

√ = "default test channels"

* = possible 802.11a channels with maximum average output > the "default test channels"

WiFi (5 GHz Bands) (Continued)

Band (MHz)	Mode	Ch #	Freq. (MHz)	Target Pwr (dBm)	Avg Pwr (dBm)	Note
5.2	802.11a	36	5180	14.5	13.5	
		40	5200	14.5	13.4	
		44	5220	14.5	13.4	
		48	5240	14.5	13.4	
	802.11n (HT20)	36	5180	12.8	12.0	
		40	5200	12.8	12.3	
48		5240	12.8	12.4		
5.3	802.11a	52	5260	14.5	13.4	
		56	5280	14.5	13.4	
		60	5300	14.5	13.4	
		64	5320	14.5	13.4	
	802.11n (HT20)	52	5260	12.8	12.4	
		60	5300	12.8	12.3	
64		5320	12.8	12.2		
5.5	802.11a	100	5500	14.5	14.0	
		104	5520	14.5	14.0	
		108	5540	14.5	14.0	
		112	5560	14.5	14.0	
		116	5580	14.5	13.9	
		120	5600	14.5		1
		124	5620	14.5		1
		128	5640	14.5		1
		132	5660	14.5	13.8	
		136	5680	14.5	13.8	
	140	5700	14.5	13.7		
	802.11n (HT20)	100	5500	12.8	12.9	
		120	5600	12.8		1
		140	5700	12.8	12.6	
149		5745	14.5	14.0		
5.8	802.11a	153	5765	14.5	14.0	
		157	5785	14.5	13.9	
		161	5805	14.5	13.8	
		165	5825	14.5	13.8	
	802.11n (HT20)	149	5745	12.8	13.0	
		157	5785	12.8	12.9	
161		5805	12.8	12.8		

Note(s):

1. Channel 120, 124, and 128 are not supported

9.8. Bluetooth

Version 2.1+EDR, Power class: 1 (100 mW/20 dBm)

Mode	Channel #	Freq. (MHz)	Conducted Avg Power	
			(dBm)	(mW)
V2.1 + EDR, GFSK	0	2402	8.46	7.01
	39	2441	9.73	9.40
	78	2480	10.12	10.28
V2.1 + EDR, $\pi/4$ DQPSK	0	2402	6.34	4.31
	39	2441	7.65	5.82
	78	2480	8.00	6.31
V2.1 + EDR, 8-DPSK	0	2402	6.54	4.51
	39	2441	7.82	6.05
	78	2480	8.17	6.56

Note(s):

According to KDB 648474, Table 2, Unlicensed transmitters

When there is simultaneous transmission, Stand-alone SAR not required due to

- Output $\leq 2 \cdot P_{Ref}$ (13.8dBm / 24 mW) and antenna is ≥ 5.0 cm from other antennas
- Output $\leq P_{Ref}$ (10.79dBm / 12 mW)

10. Tissue Dielectric Properties

IEEE Std 1528-2003 Table 2

Target Frequency (MHz)	Head	
	ϵ_r	σ (S/m)
300	45.3	0.87
450	43.5	0.87
835	41.5	0.90
900	41.5	0.97
1450	40.5	1.20
1800 – 2000	40.0	1.40
2450	39.2	1.80
2600	39.0	1.96
3000	38.5	2.40

FCC OET Bulletin 65 Supplement C 01-01

Target Frequency (MHz)	Head		Body	
	ϵ_r	σ (S/m)	ϵ_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 – 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5000	36.2	4.45	49.3	5.07
5100	36.1	4.55	49.1	5.18
5200	36.0	4.66	49.0	5.30
5300	35.9	4.76	48.9	5.42
5400	35.8	4.86	48.7	5.53
5500	35.6	4.96	48.6	5.65
5600	35.5	5.07	48.5	5.77
5700	35.4	5.17	48.3	5.88
5800	35.3	5.27	48.2	6.00

10.2. Tissue Dielectric Parameter Check Results

Tissue dielectric parameters were measured at the low, middle and high frequency of each operating frequency range of the test device.

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
7/16/2012	Body 1900	e'	52.7996	Relative Permittivity (ϵ_r):	52.80	53.30	-0.94	5
		e''	14.5277	Conductivity (σ):	1.53	1.52	0.97	5
	Body 1850	e'	52.9502	Relative Permittivity (ϵ_r):	52.95	53.30	-0.66	5
		e''	14.3462	Conductivity (σ):	1.48	1.52	-2.91	5
	Body 1880	e'	52.8951	Relative Permittivity (ϵ_r):	52.90	53.30	-0.76	5
		e''	14.3676	Conductivity (σ):	1.50	1.52	-1.19	5
Body 1910	e'	52.7697	Relative Permittivity (ϵ_r):	52.77	53.30	-0.99	5	
	e''	14.4817	Conductivity (σ):	1.54	1.52	1.18	5	
7/16/2012	Head 1900	e'	41.3349	Relative Permittivity (ϵ_r):	41.33	40.00	3.34	5
		e''	13.2618	Conductivity (σ):	1.40	1.40	0.08	5
	Head 1850	e'	41.4474	Relative Permittivity (ϵ_r):	41.45	40.00	3.62	5
		e''	13.0987	Conductivity (σ):	1.35	1.40	-3.76	5
	Head 1880	e'	41.4241	Relative Permittivity (ϵ_r):	41.42	40.00	3.56	5
		e''	13.1665	Conductivity (σ):	1.38	1.40	-1.69	5
Head 1910	e'	41.2166	Relative Permittivity (ϵ_r):	41.22	40.00	3.04	5	
	e''	13.2553	Conductivity (σ):	1.41	1.40	0.82	5	
7/17/2012	Body 835	e'	53.3319	Relative Permittivity (ϵ_r):	53.33	55.20	-3.38	5
		e''	21.1346	Conductivity (σ):	0.98	0.97	1.16	5
	Body 825	e'	53.3921	Relative Permittivity (ϵ_r):	53.39	55.28	-3.41	5
		e''	21.3476	Conductivity (σ):	0.97	0.97	0.50	5
	Body 850	e'	53.0989	Relative Permittivity (ϵ_r):	53.10	55.16	-3.73	5
		e''	21.2846	Conductivity (σ):	1.01	0.99	1.91	5
7/17/2012	Head 835	e'	42.4532	Relative Permittivity (ϵ_r):	42.45	41.50	2.30	5
		e''	19.1805	Conductivity (σ):	0.89	0.90	-1.05	5
	Head 820	e'	42.3980	Relative Permittivity (ϵ_r):	42.40	41.58	1.97	5
		e''	19.2309	Conductivity (σ):	0.88	0.90	-1.86	5
	Head 850	e'	42.1580	Relative Permittivity (ϵ_r):	42.16	41.50	1.59	5
		e''	19.1946	Conductivity (σ):	0.91	0.92	-0.85	5
7/18/2012	Body 1750	e'	55.2758	Relative Permittivity (ϵ_r):	55.28	53.44	3.43	5
		e''	14.9426	Conductivity (σ):	1.45	1.49	-2.16	5
	Body 1710	e'	55.1686	Relative Permittivity (ϵ_r):	55.17	53.54	3.03	5
		e''	14.7874	Conductivity (σ):	1.41	1.46	-3.80	5
	Body 1715	e'	55.1711	Relative Permittivity (ϵ_r):	55.17	53.53	3.06	5
		e''	14.834	Conductivity (σ):	1.41	1.46	-3.42	5
Body 1730	e'	55.2295	Relative Permittivity (ϵ_r):	55.23	53.49	3.25	5	
	e''	14.849	Conductivity (σ):	1.43	1.47	-3.09	5	
7/18/2012	Head 1750	e'	40.1006	Relative Permittivity (ϵ_r):	40.10	40.08	0.04	5
		e''	13.7476	Conductivity (σ):	1.34	1.37	-2.28	5
	Head 1720	e'	40.1656	Relative Permittivity (ϵ_r):	40.17	40.13	0.09	5
		e''	13.6420	Conductivity (σ):	1.30	1.35	-3.50	5
	Head 1735	e'	40.0804	Relative Permittivity (ϵ_r):	40.08	40.11	-0.07	5
		e''	13.7119	Conductivity (σ):	1.32	1.36	-2.77	5

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
7/20/2012	Body 1750	e'	55.0432	Relative Permittivity (εr):	55.04	53.44	3.00	5
		e"	15.0514	Conductivity (σ):	1.46	1.49	-1.45	5
	Body 1710	e'	55.2414	Relative Permittivity (εr):	55.24	53.54	3.17	5
		e"	14.9689	Conductivity (σ):	1.42	1.46	-2.62	5
	Body 1715	e'	55.2151	Relative Permittivity (εr):	55.22	53.53	3.15	5
		e"	14.9727	Conductivity (σ):	1.43	1.46	-2.51	5
	Body 1730	e'	55.1265	Relative Permittivity (εr):	55.13	53.49	3.06	5
		e"	14.9968	Conductivity (σ):	1.44	1.47	-2.12	5
7/24/2012	Head 5180	e'	35.7829	Relative Permittivity (εr):	35.78	36.01	-0.64	10
		e"	16.3859	Conductivity (σ):	4.72	4.63	1.92	5
	Head 5200	e'	35.7470	Relative Permittivity (εr):	35.75	35.99	-0.68	10
		e"	16.4044	Conductivity (σ):	4.74	4.65	1.98	5
	Head 5500	e'	35.2483	Relative Permittivity (εr):	35.25	35.65	-1.12	10
		e"	16.5227	Conductivity (σ):	5.05	4.96	1.92	5
	Head 5800	e'	34.7861	Relative Permittivity (εr):	34.79	35.30	-1.46	10
		e"	16.7089	Conductivity (σ):	5.39	5.27	2.25	5
7/25/2012	Head 5180	e'	36.1386	Relative Permittivity (εr):	36.14	36.01	0.35	10
		e"	15.8834	Conductivity (σ):	4.57	4.63	-1.20	5
	Head 5200	e'	36.1112	Relative Permittivity (εr):	36.11	35.99	0.34	10
		e"	15.9050	Conductivity (σ):	4.60	4.65	-1.12	5
	Head 5500	e'	35.6224	Relative Permittivity (εr):	35.62	35.65	-0.07	10
		e"	16.0176	Conductivity (σ):	4.90	4.96	-1.20	5
	Head 5800	e'	35.1978	Relative Permittivity (εr):	35.20	35.30	-0.29	10
		e"	16.2820	Conductivity (σ):	5.25	5.27	-0.36	5
7/26/2012	Head 5180	e'	35.9328	Relative Permittivity (εr):	35.93	36.01	-0.22	10
		e"	16.2033	Conductivity (σ):	4.67	4.63	0.79	5
	Head 5200	e'	35.9030	Relative Permittivity (εr):	35.90	35.99	-0.24	10
		e"	16.2263	Conductivity (σ):	4.69	4.65	0.87	5
	Head 5500	e'	35.3916	Relative Permittivity (εr):	35.39	35.65	-0.72	10
		e"	16.3126	Conductivity (σ):	4.99	4.96	0.62	5
	Head 5800	e'	34.9526	Relative Permittivity (εr):	34.95	35.30	-0.98	10
		e"	16.5845	Conductivity (σ):	5.35	5.27	1.49	5
7/28/2012	Body 5180	e'	47.7213	Relative Permittivity (εr):	47.72	49.05	-2.70	10
		e"	18.2510	Conductivity (σ):	5.26	5.27	-0.28	5
	Body 5200	e'	47.8242	Relative Permittivity (εr):	47.82	49.02	-2.44	10
		e"	18.3007	Conductivity (σ):	5.29	5.29	-0.06	5
	Body 5500	e'	47.2274	Relative Permittivity (εr):	47.23	48.61	-2.85	10
		e"	18.8372	Conductivity (σ):	5.76	5.64	2.06	5
	Body 5800	e'	46.6398	Relative Permittivity (εr):	46.64	48.20	-3.24	10
		e"	18.9703	Conductivity (σ):	6.12	6.00	1.96	5
Body 5825	e'	46.6965	Relative Permittivity (εr):	46.70	48.20	-3.12	10	
	e"	19.1338	Conductivity (σ):	6.20	6.00	3.29	5	

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
7/30/2012	Body 5180	e'	50.7359	Relative Permittivity (ϵ_r):	50.74	49.05	3.44	10
		e"	18.2244	Conductivity (σ):	5.25	5.27	-0.42	5
	Body 5200	e'	50.5115	Relative Permittivity (ϵ_r):	50.51	49.02	3.04	10
		e"	18.2717	Conductivity (σ):	5.28	5.29	-0.22	5
	Body 5500	e'	50.1555	Relative Permittivity (ϵ_r):	50.16	48.61	3.17	10
		e"	18.6575	Conductivity (σ):	5.71	5.64	1.09	5
	Body 5800	e'	49.6659	Relative Permittivity (ϵ_r):	49.67	48.20	3.04	10
		e"	18.9803	Conductivity (σ):	6.12	6.00	2.02	5
	Body 5825	e'	49.4183	Relative Permittivity (ϵ_r):	49.42	48.20	2.53	10
		e"	19.1417	Conductivity (σ):	6.20	6.00	3.33	5
7/31/2012	Head 2450	e'	37.5178	Relative Permittivity (ϵ_r):	37.52	39.20	-4.29	5
		e"	13.4919	Conductivity (σ):	1.84	1.80	2.11	5
	Head 2410	e'	37.6745	Relative Permittivity (ϵ_r):	37.67	39.28	-4.09	5
		e"	13.3794	Conductivity (σ):	1.79	1.76	1.84	5
	Head 2435	e'	37.5739	Relative Permittivity (ϵ_r):	37.57	39.24	-4.23	5
		e"	13.4492	Conductivity (σ):	1.82	1.78	2.16	5
	Head 2475	e'	37.4402	Relative Permittivity (ϵ_r):	37.44	39.17	-4.41	5
		e"	13.5713	Conductivity (σ):	1.87	1.83	2.22	5
7/31/2012	Body 2450	e'	50.4399	Relative Permittivity (ϵ_r):	50.44	52.70	-4.29	5
		e"	14.924	Conductivity (σ):	2.03	1.95	4.26	5
	Body 2410	e'	50.5755	Relative Permittivity (ϵ_r):	50.58	52.76	-4.14	5
		e"	14.7688	Conductivity (σ):	1.98	1.91	3.75	5
	Body 2435	e'	50.4879	Relative Permittivity (ϵ_r):	50.49	52.73	-4.25	5
		e"	14.8695	Conductivity (σ):	2.01	1.93	4.25	5
	Body 2460	e'	50.4059	Relative Permittivity (ϵ_r):	50.41	52.69	-4.33	5
		e"	14.9639	Conductivity (σ):	2.05	1.96	4.21	5
8/2/2012	Body 1900	e'	52.9237	Relative Permittivity (ϵ_r):	52.92	53.30	-0.71	5
		e"	14.4036	Conductivity (σ):	1.52	1.52	0.11	5
	Body 1850	e'	53.1006	Relative Permittivity (ϵ_r):	53.10	53.30	-0.37	5
		e"	14.2006	Conductivity (σ):	1.46	1.52	-3.90	5
	Body 1880	e'	53.1241	Relative Permittivity (ϵ_r):	53.12	53.30	-0.33	5
		e"	14.3417	Conductivity (σ):	1.50	1.52	-1.37	5
	Body 1910	e'	53.0125	Relative Permittivity (ϵ_r):	53.01	53.30	-0.54	5
		e"	14.4472	Conductivity (σ):	1.53	1.52	0.94	5

11. System Performance Check

The system performance check is performed prior to any usage of the system in order to verify SAR system measurement accuracy. The system performance check verifies that the system operates within its specifications of $\pm 10\%$.

11.1. System Performance Check Measurement Conditions

- The measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness: 2.0 ± 0.2 mm (bottom plate) filled with Body or Head simulating liquid of the following parameters.
- The DASY system with an E-Field Probe was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10 mm (above 1 GHz) and 15 mm (below 1 GHz) from dipole center to the simulating liquid surface.
- The coarse grid with a grid spacing of 15 mm was aligned with the dipole.
 For 5 GHz band - The coarse grid with a grid spacing of 10 mm was aligned with the dipole.
- Special 7x7x7 (below 3 GHz) and/or 8x8x7 (above 3 GHz) fine cube was chosen for the cube.
- Distance between probe sensors and phantom surface was set to 3 mm.
 For 5 GHz band - Distance between probe sensors and phantom surface was set to 2.5 mm
- The dipole input power (forward power) was 100 mW.
- The results are normalized to 1 W input power.

11.2. Reference SAR Values for System Performance Check

The reference SAR values can be obtained from the calibration certificate of system validation dipoles

System Dipole	Serial No.	Cal. Date	Freq. (MHz)	Target SAR Values (mW/g)		
				1g/10g	Head	Body
D835V2	4d002	3/6/12	835	1g	9.32	9.41
				10g	6.08	6.20
D1750V2	1050	4/19/12	1750	1g	35.9	36.9
				10g	19.1	19.9
D1900V2	5d140	4/12/12	1900	1g	39.8	40.2
				10g	20.8	21.3
D1900V2	5d043	11/10/11	1900	1g	40.3	41.1
				10g	21.0	21.7
D2450V2	706	4/11/12	2450	1g	51.2	49.6
				10g	23.9	23.4
D5GHzV2	1075	2/14/12	5200	1g	79.4	72.7
				10g	22.8	20.5
			5500	1g	85.7	77.7
				10g	24.3	21.7
			5800	1g	78.9	72.5
				10g	22.5	20.2

11.3. System Performance Check Results

Date Tested	System Dipole		T.S. Liquid	SAR Measured (Normalized to 1 W)		Target (Ref. Value)	Delta (%)	Tolerance (%)
	Type	Serial No.		1g	10g			
7/16/2012	D1900V2	5d140	Body	1g	40.9	40.2	1.74	±10
				10g	21.6			
7/16/2012	D1900V2	5d140	Head	1g	41.0	39.8	3.02	±10
				10g	21.4			
7/17/2012	D835V2	4d002	Body	1g	9.72	9.41	3.29	±10
				10g	6.39			
7/17/2012	D835V2	4d002	Head	1g	9.73	9.32	4.40	±10
				10g	6.39			
7/18/2012	D1750V2	1050	Body	1g	38.5	36.9	4.34	±10
				10g	20.7			
7/18/2012	D1750V2	1050	Head	1g	34.8	35.9	-3.06	±10
				10g	18.5			
7/20/2012	D1750V2	1050	Body	1g	38.4	36.9	4.07	±10
				10g	20.7			
7/24/2012	D5GHzV2 (5.2 GHz)	1075	Head	1g	82.4	79.4	3.78	±10
				10g	23.8			
7/25/2012	D5GHzV2 (5.2 GHz)	1075	Head	1g	75.9	79.4	-4.41	±10
				10g	21.7			
7/25/2012	D5GHzV2 (5.8 GHz)	1075	Head	1g	81.3	78.9	3.04	±10
				10g	23.1			
7/26/2012	D5GHzV2 (5.5 GHz)	1075	Head	1g	85.6	85.7	-0.12	±10
				10g	24.5			
7/28/2012	D5GHzV2 (5.2 GHz)	1075	Body	1g	73.2	72.7	0.69	±10
				10g	21.1			
7/30/2012	D5GHzV2 (5.5 GHz)	1075	Body	1g	76.8	77.7	-1.16	±10
				10g	21.9			
7/30/2012	D5GHzV2 (5.8 GHz)	1075	Body	1g	72.5	72.5	0.00	±10
				10g	20.8			
7/31/2012	D2450V2	706	Body	1g	51.2	49.6	3.23	±10
				10g	24.0			
7/31/2012	D2450V2	706	Head	1g	52.6	51.2	2.73	±10
				10g	24.1			
8/2/2012	D1900V2	5d043	Body	1g	41.40	41.10	0.73	±10
				10g	21.80			

12. SAR Test Results

12.1. GSM850

12.1.1. Head SAR

Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Note
				Tune-up limit	Measured	Measured	Scaled	
Left Touch	Voice	128	824.20	33.2	32.8			1
		190	836.60	33.2	32.8	0.118	0.129	
		251	848.80	33.2	32.8			1
Left Tilt (15°)	Voice	128	824.20	33.2	32.8			1
		190	836.60	33.2	32.8	0.074	0.081	
		251	848.80	33.2	32.8			1
Right Touch	Voice	128	824.20	33.2	32.8			1
		190	836.60	33.2	32.8	0.101	0.111	
		251	848.80	33.2	32.8			1
Right Tilt (15°)	Voice	128	824.20	33.2	32.8			1
		190	836.60	33.2	32.8	0.073	0.080	
		251	848.80	33.2	32.8			1

12.1.2. Body-Worn SAR

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Note
					Tune-up limit	Measured	Measured	Scaled	
Rear	Voice	10	128	824.20	33.2	32.8			1
			190	836.60	33.2	32.8	0.391	0.429	
			190	836.60	33.2	32.8	0.281	0.308	2
			251	848.80	33.2	32.8			1
Front	Voice	10	128	824.20	33.2	32.8			1
			190	836.60	33.2	32.8	0.164	0.180	
			251	848.80	33.2	32.8			1

Note(s):

- SAR test was performed in the middle channel only as the measured level was < 50% of the SAR limit as stated in FCC "Public Notice DA 02-1438" by the SCC-34/SC-2. Testing in the low and high channel is optional.
- With headset attached.

12.1.3. Hotspot SAR

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Note
					Tune-up limit	Measured	Measured	Scaled	
Rear	GPRS 2 slots	10	128	824.20	25.4	24.8			1
			190	836.60	25.4	24.8	0.472	0.542	
			251	848.80	25.4	24.8			1
Front	GPRS 2 slots	10	128	824.20	25.4	24.8			1
			190	836.60	25.4	24.8	0.203	0.233	
			251	848.80	25.4	24.8			1
Edge 2	GPRS 2 slots	10	128	824.20	25.4	24.8			1
			190	836.60	25.4	24.8	0.175	0.201	
			251	848.80	25.4	24.8			1
Edge 3	GPRS 2 slots	10	128	824.20	25.4	24.8			1
			190	836.60	25.4	24.8	0.065	0.075	
			251	848.80	25.4	24.8			1
Edge 4	GPRS 2 slots	10	128	824.20	25.4	24.8			1
			190	836.60	25.4	24.8	0.207	0.238	
			251	848.80	25.4	24.8			1

Note(s):

- SAR test was performed in the middle channel only as the measured level was < 50% of the SAR limit as stated in FCC "Public Notice DA 02-1438" by the SCC-34/SC-2. Testing in the low and high channel is optional.

12.2. GSM1900

12.2.1. Head SAR

Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Note
				Tune-up limit	Measured	Measured	Scaled	
Left Touch	Voice	512	1850.2	31.4	31.2			1
		661	1880.0	31.4	31.2	0.144	0.151	
		810	1909.8	31.4	31.1			1
Left Tilt (15°)	Voice	512	1850.2	31.4	31.2			1
		661	1880.0	31.4	31.2	0.045	0.047	
		810	1909.8	31.4	31.1			1
Right Touch	Voice	512	1850.2	31.4	31.2			1
		661	1880.0	31.4	31.2	0.160	0.168	
		810	1909.8	31.4	31.1			1
Right Tilt (15°)	Voice	512	1850.2	31.4	31.2			1
		661	1880.0	31.4	31.2	0.033	0.035	
		810	1909.8	31.4	31.1			1

12.2.2. Body-Worn SAR

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Note
					Tune-up limit	Measured	Measured	Scaled	
Rear	Voice	10	512	1850.2	31.4	31.2			1
			661	1880.0	31.4	31.2	0.692	0.725	
			661	1880.0	31.4	31.1	0.659	0.706	2
			810	1909.8	31.4	21.1			1
Front	Voice	10	512	1850.2	31.4	31.2			1
			661	1880.0	31.4	31.2	0.236	0.247	
			810	1909.8	31.4	31.1			1

Note(s):

- SAR test was performed in the middle channel only as the measured level was < 50% of the SAR limit as stated in FCC "Public Notice DA 02-1438" by the SCC-34/SC-2. Testing in the low and high channel is optional.
- With headset attached.

12.2.3. Hotspot SAR

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Note
					Tune-up limit	Measured	Measured	Scaled	
Rear	GPRS 2 slots	10	512	1850.2	23.4	23.2	0.874	0.915	
			661	1880.0	23.4	23.2	0.849	0.889	
			810	1909.8	23.4	23.2	0.931	0.975	
Front	GPRS 2 slots	10	512	1850.2	23.4	23.2			1
			661	1880.0	23.4	23.2	0.285	0.298	
			810	1909.8	23.4	23.2			1
Edge 2	GPRS 2 slots	10	512	1850.2	23.4	23.2			1
			661	1880.0	23.4	23.2	0.067	0.070	
			810	1909.8	23.4	23.2			1
Edge 3	GPRS 2 slots	10	512	1850.2	23.4	23.2			1
			661	1880.0	23.4	23.2	0.724	0.758	
			810	1909.8	23.4	23.2			1
Edge 4	GPRS 2 slots	10	512	1850.2	23.4	23.2			
			661	1880.0	23.4	23.2	0.074	0.077	
			810	1909.8	23.4	23.2			

Note(s):

1. According to FCC "Public Notice DA 02-1438" by the SCC-34/SC-2, when the SAR measured for the middle channel is < 50% of the SAR limit, testing for the low and high channel is optional.

12.3. WCDMA (UMTS) Band V

Test mode reduction considerations

Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit as per KDB 941225 D01

12.3.1. Head SAR

Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Note
				Tune-up limit	Measured	Measured	Scaled	
Left Touch	Rel 99 RMC 12.2kbps	4132	826.4	23.7	23.5			1
		4183	836.6	23.7	23.4	0.162	0.174	
		4233	846.6	23.7	23.4			1
Left Tilt (15°)	Rel 99 RMC 12.2kbps	4132	826.4	23.7	23.5			1
		4183	836.6	23.7	23.4	0.102	0.109	
		4233	846.6	23.7	23.4			1
Right Touch	Rel 99 RMC 12.2kbps	4132	826.4	23.7	23.5			1
		4183	836.6	23.7	23.4	0.143	0.153	
		4233	846.6	23.7	23.4			1
Right Tilt (15°)	Rel 99 RMC 12.2kbps	4132	826.4	23.7	23.5			1
		4183	836.6	23.7	23.4	0.097	0.104	
		4233	846.6	23.7	23.4			1

12.3.2. Body-Worn SAR

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Note
					Tune-up limit	Measured	Measured	Scaled	
Rear	Rel 99 RMC 12.2kbps	10	4132	826.4	23.7	23.5			1
			4183	836.6	23.7	23.4	0.485	0.520	
			4183	836.6	23.7	23.4	0.376	0.403	2
			4233	846.6	23.7	23.4			1
Front	Rel 99 RMC 12.2kbps	10	4132	826.4	23.7	23.5			1
			4183	836.6	23.7	23.4	0.198	0.212	
			4233	846.6	23.7	23.4			1

Note(s):

- SAR test was performed in the middle channel only as the measured level was < 50% of the SAR limit as stated in FCC "Public Notice DA 02-1438" by the SCC-34/SC-2. Testing in the low and high channel is optional.
- With headset attached.

12.3.3. Hotspot SAR

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Note
					Tune-up limit	Measured	Measured	Scaled	
Rear	Rel 99 RMC 12.2kbps	10	4132	826.4	23.7	23.5			1
			4183	836.6	23.7	23.4	0.485	0.520	
			4233	846.6	23.7	23.4			1
Front	Rel 99 RMC 12.2kbps	10	4132	826.4	23.7	23.5			1
			4183	836.6	23.7	23.4	0.198	0.212	
			4233	846.6	23.7	23.4			1
Edge 2	Rel 99 RMC 12.2kbps	10	4132	826.4	23.7	23.5			1
			4183	836.6	23.7	23.4	0.194	0.208	
			4233	846.6	23.7	23.4			1
Edge 3	Rel 99 RMC 12.2kbps	10	4132	826.4	23.7	23.5			1
			4183	836.6	23.7	23.4	0.074	0.079	
			4233	846.6	23.7	23.4			1
Edge 4	Rel 99 RMC 12.2kbps	10	4132	826.4	23.7	23.5			1
			4183	836.6	23.7	23.4	0.253	0.271	
			4233	846.6	23.7	23.4			1

Note(s):

- SAR test was performed in the middle channel only as the measured level was < 50% of the SAR limit as stated in FCC "Public Notice DA 02-1438" by the SCC-34/SC-2. Testing in the low and high channel is optional.

12.4. WCDMA (UMTS) Band II

Test mode reduction considerations

Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit as per KDB 941225 D01

12.4.1. Head SAR

Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Note
				Tune-up limit	Measured	Measured	Scaled	
Left Touch	Rel 99 RMC 12.2kbps	9262	1852.4	24.7	24.5			1
		9400	1880.0	24.7	24.3	0.195	0.214	
		9538	1907.6	24.7	24.3			1
Left Tilt (15°)	Rel 99 RMC 12.2kbps	9262	1852.4	24.7	24.5			1
		9400	1880.0	24.7	24.3	0.070	0.077	
		9538	1907.6	24.7	24.3			1
Right Touch	Rel 99 RMC 12.2kbps	9262	1852.4	24.7	24.5			1
		9400	1880.0	24.7	24.3	0.255	0.280	
		9538	1907.6	24.7	24.3			1
Right Tilt (15°)	Rel 99 RMC 12.2kbps	9262	1852.4	24.7	24.5			1
		9400	1880.0	24.7	24.3	0.049	0.054	
		9538	1907.6	24.7	24.3			1

12.4.2. Body-Worn SAR

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Note
					Tune-up limit	Measured	Measured	Scaled	
Rear	Rel 99 RMC 12.2kbps	10	9262	1852.4	24.7	24.5	1.230	1.288	
			9262	1852.4	24.7	24.5	1.180	1.236	2
			9400	1880.0	24.7	24.3	1.100	1.206	
			9538	1907.6	24.7	24.3	1.050	1.151	
	HSPA (Sub-test 5)	10	9262	1852.4	24.7	24.5	1.250	1.309	3
Front	Rel 99 RMC 12.2kbps	10	9262	1852.4	24.7	24.5			1
			9400	1880.0	24.7	24.3	0.454	0.498	
			9538	1907.6	24.7	24.3			1

Note(s):

- SAR test was performed in the middle channel only as the measured level was < 50% of the SAR limit as stated in FCC "Public Notice DA 02-1438" by the SCC-34/SC-2. Testing in the low and high channel is optional.
- With headset attached
- Based on KDB941225 D01, body SAR is also measured for HSPA when the maximum average output of each RF channel with HSPA active is at least ¼ dB higher than that measured without HSPA using 12.2 kbps RMC or the maximum SAR for 12.2 kbps RMC is above 75% of the SAR limit. Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 with power control algorithm 2

12.4.3. Hotspot SAR

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Note
					Tune-up limit	Measured	Measured	Scaled	
Rear	Rel 99 RMC 12.2kbps	10	9262	1852.4	24.7	24.5	1.230	1.288	
			9400	1880.0	24.7	24.3	1.100	1.206	
			9538	1907.6	24.7	24.3	1.050	1.151	
	HSPA		9262	1852.4	24.7	24.5	1.250	1.309	2
Front	Rel 99 RMC 12.2kbps	10	9262	1852.4	24.7	24.5			1
			9400	1880.0	24.7	24.3	0.454	0.498	
			9538	1907.6	24.7	24.3			1
Edge 2	Rel 99 RMC 12.2kbps	10	9262	1852.4	24.7	24.5			1
			9400	1880.0	24.7	24.3	0.089	0.098	
			9538	1907.6	24.7	24.3			1
Edge 3	Rel 99 RMC 12.2kbps	10	9262	1852.4	24.7	24.5	1.070	1.120	
			9400	1880.0	24.7	24.3	0.937	1.027	
			9538	1907.6	24.7	24.3	0.920	1.009	
Edge 4	Rel 99 RMC 12.2kbps	10	9262	1852.4	24.7	24.5			1
			9400	1880.0	24.7	24.3	0.092	0.101	
			9538	1907.6	24.7	24.3			1

Note(s):

- SAR test was performed in the middle channel only as the measured level was < 50% of the SAR limit as stated in FCC "Public Notice DA 02-1438" by the SCC-34/SC-2. Testing in the low and high channel is optional.
- Based on KDB941225 D01, body SAR is also measured for HSPA when the maximum average output of each RF channel with HSPA active is at least ¼ dB higher than that measured without HSPA using 12.2 kbps RMC or the maximum SAR for 12.2 kbps RMC is above 75% of the SAR limit. Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 with power control algorithm 2

12.5. WCDMA (UMTS) Band IV

Test mode reduction considerations

Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit as per KDB 941225 D01

12.5.1. Head SAR

Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Note
				Tune-up limit	Measured	Measured	Scaled	
Left Touch	Rel 99 RMC 12.2kbps	1312	1712.4	24.7	24.7			1
		1412	1732.4	24.7	24.7	0.284	0.284	
		1862	1752.5	24.7	24.7			1
Left Tilt (15°)	Rel 99 RMC 12.2kbps	1312	1712.4	24.7	24.7			1
		1412	1732.4	24.7	24.7	0.077	0.077	
		1862	1752.5	24.7	24.7			1
Right Touch	Rel 99 RMC 12.2kbps	1312	1712.4	24.7	24.7			1
		1412	1732.4	24.7	24.7	0.235	0.235	
		1862	1752.5	24.7	24.7			1
Right Tilt (15°)	Rel 99 RMC 12.2kbps	1312	1712.4	24.7	24.7			1
		1412	1732.4	24.7	24.7	0.083	0.083	
		1862	1752.5	24.7	24.7			1

12.5.2. Body-Worn SAR

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Note
					Tune-up limit	Measured	Measured	Scaled	
Rear	Rel 99 RMC 12.2kbps	10	1312	1712.4	24.7	24.7	0.818	0.818	
			1412	1732.4	24.7	24.7	0.791	0.791	
			1862	1752.5	24.7	24.7	0.869	0.869	
			1862	1752.5	24.7	24.7	0.907	0.907	2
Front	Rel 99 RMC 12.2kbps	10	1312	1712.4	24.7	24.7			1
			1412	1732.4	24.7	24.7	0.461	0.461	
			1862	1752.5	24.7	24.7			1

Note(s):

- SAR test was performed in the middle channel only as the measured level was < 50% of the SAR limit as stated in FCC "Public Notice DA 02-1438" by the SCC-34/SC-2. Testing in the low and high channel is optional.
- With headset attached.

12.5.3. Hotspot SAR

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Note
					Tune-up limit	Measured	Measured	Scaled	
Rear	Rel 99 RMC 12.2kbps	10	1312	1712.4	24.7	24.7	0.818	0.818	
			1412	1732.4	24.7	24.7	0.791	0.791	
			1862	1752.5	24.7	24.7	0.869	0.869	
Front	Rel 99 RMC 12.2kbps	10	1312	1712.4	24.7	24.7			1
			1412	1732.4	24.7	24.7	0.461	0.461	
			1862	1752.5	24.7	24.7			1
Edge 2	Rel 99 RMC 12.2kbps	10	1312	1712.4	24.7	24.7			1
			1412	1732.4	24.7	24.7	0.109	0.109	
			1862	1752.5	24.7	24.7			1
Edge 3	Rel 99 RMC 12.2kbps	10	1312	1712.4	24.7	24.7			1
			1412	1732.4	24.7	24.7	0.777	0.777	
			1862	1752.5	24.7	24.7			1
Edge 4	Rel 99 RMC 12.2kbps	10	1312	1712.4	24.7	24.7			1
			1412	1732.4	24.7	24.7	0.156	0.156	
			1513	1752.5	24.7	24.7			1

Note(s):

- SAR test was performed in the middle channel only as the measured level was < 50% of the SAR limit as stated in FCC "Public Notice DA 02-1438" by the SCC-34/SC-2. Testing in the low and high channel is optional.

12.6. Wi-Fi (2.4 GHz Band)

12.6.1. Head SAR

Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Note
				Tune-up limit	Measured	Measured	Scaled	
Left Touch	802.11b	1	2412	17.9	16.6			1
		6	2437	17.9	17.2			1
		11	2462	17.9	17.9	0.243	0.243	
Left Tilt (15°)	802.11b	1	2412	17.9	16.6			1
		6	2437	17.9	17.2			1
		11	2462	17.9	17.9	0.216	0.216	
Right Touch	802.11b	1	2412	17.9	16.6			1
		6	2437	17.9	17.2			1
		11	2462	17.9	17.9	0.569	0.569	
Right Tilt (15°)	802.11b	1	2412	17.9	16.6			1
		6	2437	17.9	17.2			1
		11	2462	17.9	17.9	0.367	0.367	1

12.6.2. Body & Hotspot SAR

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Note
					Tune-up limit	Measured	Measured	Scaled	
Rear	802.11b	10	1	2412	17.9	16.6			1
			6	2437	17.9	17.2			
			11	2462	17.9	17.9	0.240	0.240	
			11	2462	17.9	17.9	0.226	0.226	2
Front	802.11b	10	1	2412	17.9	16.6			1
			6	2437	17.9	17.2			1
			11	2462	17.9	17.9	0.137	0.137	
Edge 1	802.11b	10	1	2412	17.9	16.6			1
			6	2437	17.9	17.2			1
			11	2462	17.9	17.9	0.132	0.132	
Edge 4	802.11b	10	1	2412	17.9	16.6			1
			6	2437	17.9	17.2			1
			11	2462	17.9	17.9	0.127	0.127	

Note(s):

- For frequency bands with an operating range of < 100 MHz, when the SAR measured for the highest output power channel within is ≤ 0.8 W/kg, SAR for the remaining channels is not required. Per KDB 447498 1) e) i)
- With headset attached.

12.7. Wi-Fi (5 GHz Bands)

12.7.1. Head SAR

Band (GHz)	Test Position	Mode	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Note
					Tune-up limit	Measured	Measured	Scaled	
5.2	Left Touch	802.11a	36	5180	14.5	13.5	0.028	0.035	
			44	5220	14.5	13.4	0.029	0.037	
	Left Tilt (15°)	802.11a	36	5180	14.5	13.5	0.024	0.030	
			44	5220	14.5	13.4	0.030	0.039	
	Right Touch	802.11a	36	5180	14.5	13.5	0.088	0.110	
			44	5220	14.5	13.4	0.092	0.119	
Right Tilt (15°)	802.11a	36	5180	14.5	13.5	0.078	0.098		
		44	5220	14.5	13.4	0.068	0.088		
5.3	Left Touch	802.11a	52	5260	14.5	13.4	0.028	0.037	
			64	5320	14.5	13.4	0.026	0.034	
	Left Tilt (15°)	802.11a	52	5260	14.5	13.4	0.027	0.035	
			64	5320	14.5	13.4	0.031	0.040	
	Right Touch	802.11a	52	5260	14.5	13.4	0.085	0.110	
			64	5320	14.5	13.4	0.108	0.139	
Right Tilt (15°)	802.11a	52	5260	14.5	13.4	0.072	0.092		
		64	5320	14.5	13.4	0.077	0.099		
5.5	Left Touch	802.11a	104	5520	14.5	14.0	0.064	0.071	
			116	5580	14.5	13.9	0.066	0.075	
			124	5620					1
			136	5680	14.5	13.8	0.063	0.074	
	Left Tilt (15°)	802.11a	104	5520	14.5	14.0	0.071	0.079	
			116	5580	14.5	13.9	0.074	0.085	
			124	5620					1
			136	5680	14.5	13.8	0.062	0.073	
	Right Touch	802.11a	104	5520	14.5	14.0	0.161	0.181	
			116	5580	14.5	13.9	0.141	0.162	
			124	5620					1
			136	5680	14.5	13.8	0.112	0.132	
Right Tilt (15°)	802.11a	104	5520	14.5	14.0	0.107	0.120		
		116	5580	14.5	13.9	0.087	0.100		
		124	5620					1	
		136	5680	14.5	13.8	0.073	0.086		
5.8	Left Touch	802.11a	149	5745	14.5	14.0	0.032	0.035	
			157	5785	14.5	13.9	0.023	0.026	
			165	5825	14.5	13.8	0.011	0.013	
	Left Tilt (15°)	802.11a	149	5745	14.5	14.0	0.050	0.056	
			157	5785	14.5	13.9	0.029	0.033	
			165	5825	14.5	13.8	0.022	0.026	
	Right Touch	802.11a	149	5745	14.5	14.0	0.067	0.075	
			157	5785	14.5	13.9	0.050	0.057	
			165	5825	14.5	13.8	0.044	0.051	
	Right Tilt (15°)	802.11a	149	5745	14.5	14.0	0.041	0.046	
			157	5785	14.5	13.9	0.019	0.021	
			165	5825	14.5	13.8	0.024	0.028	

Note(s):

1. Channel is not supported for this device

12.7.2. Body-Worn SAR

Band (GHz)	Test Position	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)		SAR (W/kg)		Note
						Tune-up limit	Measured	Measured	Scaled	
5.2	Rear	10	802.11a	36	5180	14.5	13.5	0.096	0.120	
				44	5220	14.5	13.4	0.109	0.140	
				44	5220	14.5	13.4	0.113	0.146	1
	Front	10	802.11a	36	5180	14.5	13.5	0.013	0.017	
				44	5220	14.5	13.4	0.019	0.025	
5.3	Rear	10	802.11a	52	5260	14.5	13.4	0.138	0.178	
				52	5260	14.5	13.4	0.117	0.151	1
				64	5320	14.5	13.4	0.123	0.158	
	Front	10	802.11a	52	5260	14.5	13.4	0.021	0.027	
				64	5320	14.5	13.4	0.025	0.032	
5.5	Rear	10	802.11a	104	5520	14.5	14.0	0.236	0.265	
				104	5520	14.5	14.0	0.203	0.228	1
				116	5580	14.5	13.9	0.234	0.269	
				124	5620	14.5				2
				136	5680	14.5	13.8	0.226	0.266	
	Front	10	802.11a	104	5520	14.5	14.0	0.036	0.041	
				116	5580	14.5	13.9	0.034	0.039	
				124	5620					2
				136	5680	14.5	13.8	0.036	0.042	
5.8	Rear	10	802.11a	149	5745	14.5	14.0	0.223	0.250	
				149	5745	14.5	14.0	0.249	0.279	1
				157	5785	14.5	13.9	0.137	0.157	
				165	5825	14.5	13.8	0.126	0.148	
	Front	10	802.11a	149	5745	14.5	14.0	0.023	0.026	
				157	5785	14.5	13.9	0.011	0.013	
				165	5825	14.5	13.8	0.00572	0.007	

Note(s):

1. With headset attached.
2. Channel is not supported for this device

13. Summary of Highest SAR Values

Results for highest SAR values for each frequency band and mode

Technology/Band	Test configuration		Mode	Highest 1g SAR (W/kg)
GSM850	Head	Left Touch	GMSK (Voice)	0.118
	Body	Rear	GMSK (Voice)	0.391
	Hotspot	Rear	GPRS 2 slots	0.472
GSM1900	Head	Right Touch	GMSK (Voice)	0.160
	Body	Rear	GMSK (Voice)	0.692
	Hotspot	Rear	GPRS 2 slots	0.931
W-CDMA Band V	Head	Right Touch	Rel99 (RMC, 12.2 kbps)	0.162
	Body	Rear	Rel99 (RMC, 12.2 kbps)	0.485
	Hotspot	Rear	Rel99 (RMC, 12.2 kbps)	0.485
W-CDMA Band II	Head	Right Touch	Rel99 (RMC, 12.2 kbps)	0.255
	Body	Rear	Rel6 (HSPA Sub-test5)	1.250
	Hotspot	Rear	Rel6 (HSPA Sub-test5)	1.250
W-CDMA Band IV	Head	Left Touch	Rel99 (RMC, 12.2 kbps)	0.284
	Body	Rear with Headset	Rel99 (RMC, 12.2 kbps)	0.907
	Hotspot	Rear	Rel99 (RMC, 12.2 kbps)	0.869
WiFi 2.4GHz	Head	Right Touch	802.11b	0.569
	Body	Rear	802.11b	0.240
	Hotspot	Rear	802.11b	0.240
WiFi 5.2GHz	Head	Right Touch	802.11a	0.092
	Body	Rear with Headset	802.11a	0.113
WiFi 5.3GHz	Head	Right Touch	802.11a	0.108
	Body	Rear	802.11a	0.138
WiFi 5.5GHz	Head	Right Touch	802.11a	0.161
	Body	Rear	802.11a	0.236
WiFi 5.8GHz	Head	Right Touch	802.11a	0.067
	Body	Rear with Headset	802.11a	0.249

13.1. SAR Plots (from Summary of Highest SAR Values)

Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/17/2012 PM

GSM850

Frequency: 836.6 MHz; Duty Cycle: 1:8; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.892$ mho/m; $\epsilon_r = 42.4$; $\rho = 1000$ kg/m³ ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(8.68, 8.68, 8.68); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM A (Twin); Type: SAM A; Serial: 1050

Left Touch/Voice/Ch190/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.125 mW/g

Left Touch/Voice/Ch190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

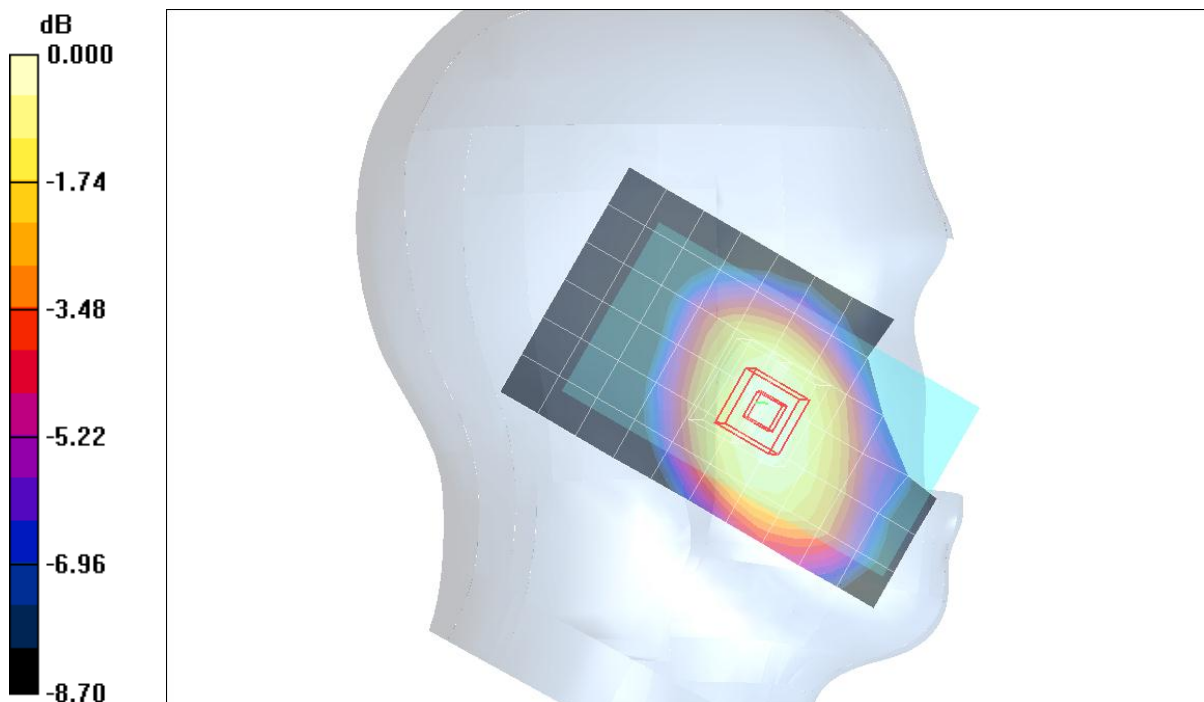
Reference Value = 12.1 V/m; Power Drift = -0.015 dB

Peak SAR (extrapolated) = 0.142 W/kg

SAR(1 g) = 0.118 mW/g; SAR(10 g) = 0.092 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.130 mW/g



0 dB = 0.130mW/g

Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/17/2012 PM

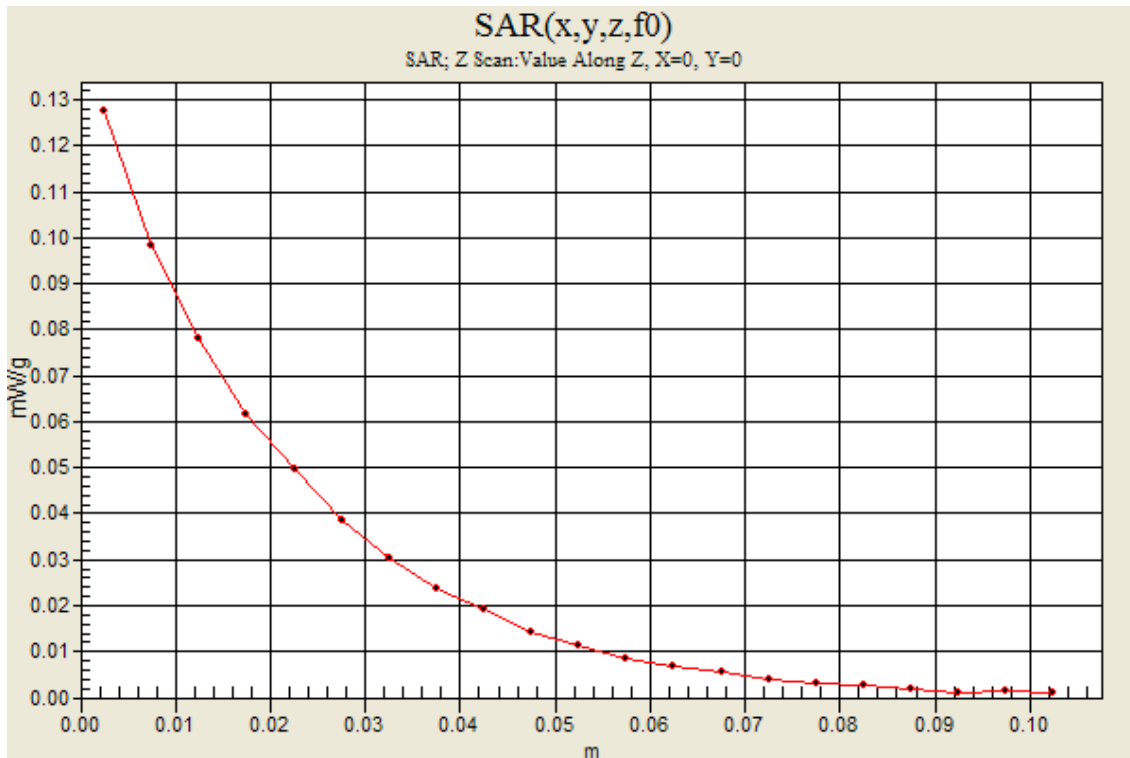
GSM850

Frequency: 836.6 MHz; Duty Cycle: 1:8

Left Touch/Voice/Ch190/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.128 mW/g



Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/17/2012

GSM850

Frequency: 836.6 MHz; Duty Cycle: 1:8; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.984$ mho/m; $\epsilon_r = 53.3$; $\rho = 1000$ kg/m³ ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(8.84, 8.84, 8.84); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM B (Twin); Type: SAM B; Serial: TP-105

Rear/Voice/Ch190/Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.436 mW/g

Rear/Voice/Ch190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

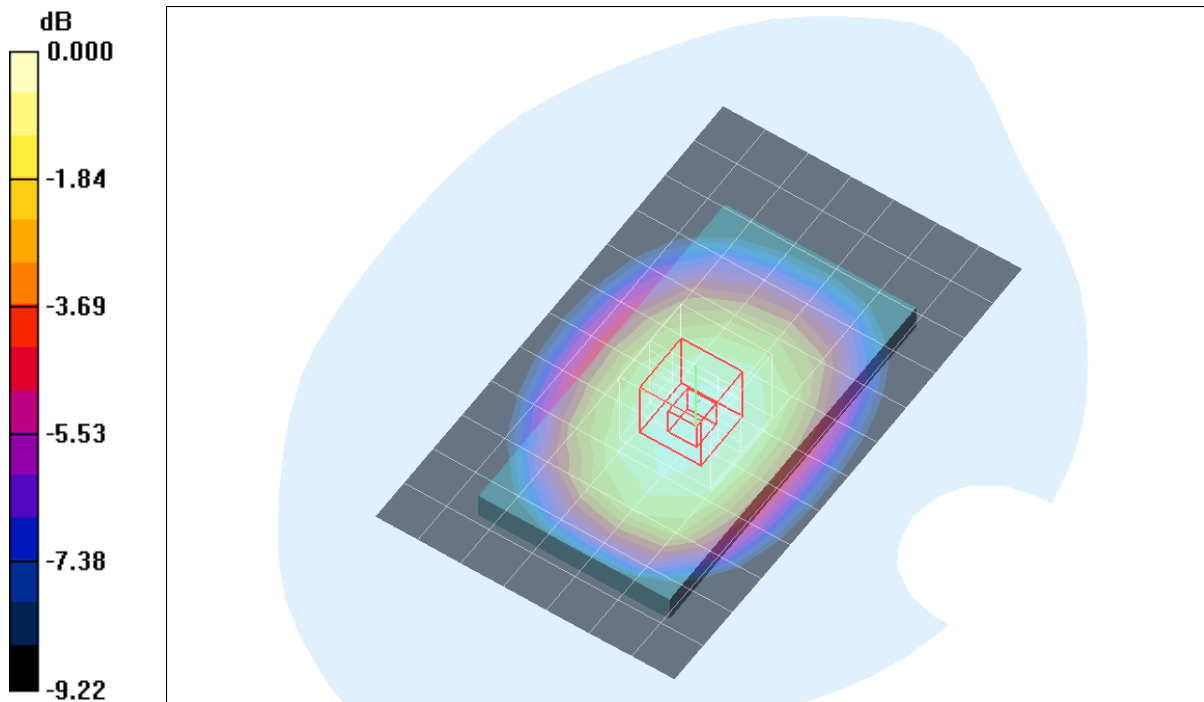
Reference Value = 21.4 V/m; Power Drift = 0.001 dB

Peak SAR (extrapolated) = 0.497 W/kg

SAR(1 g) = 0.391 mW/g; SAR(10 g) = 0.295 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.442 mW/g



0 dB = 0.442mW/g

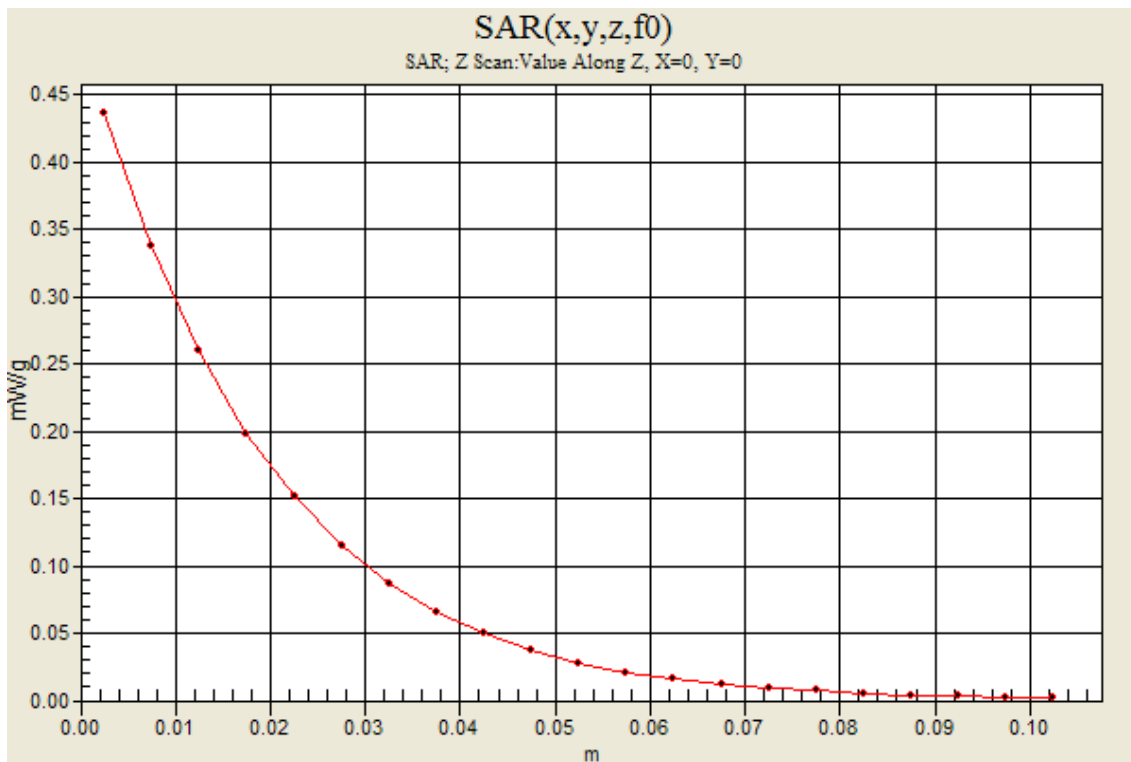
GSM850

Frequency: 836.6 MHz; Duty Cycle: 1:8

Rear/Voice/Ch190/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.436 mW/g



Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/17/2012

GSM850

Frequency: 836.6 MHz; Duty Cycle: 1:4; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.984$ mho/m; $\epsilon_r = 53.3$; $\rho = 1000$ kg/m³ ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(8.84, 8.84, 8.84); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM B (Twin); Type: SAM B; Serial: TP-105

Rear/GPRS 2 slots/Ch190/Area Scan (8x13x1):

 Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.523 mW/g

Rear/GPRS 2 slots/Ch190/Zoom Scan (5x5x7)/Cube 0:

 Measurement grid: dx=8mm, dy=8mm, dz=5mm

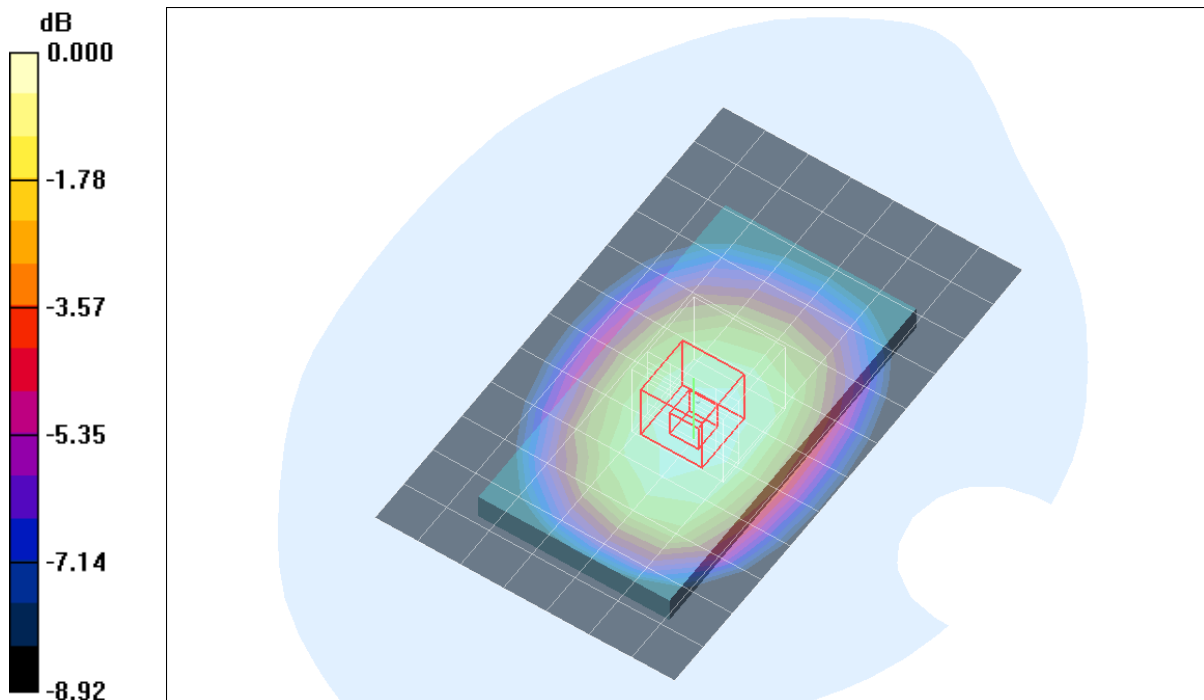
Reference Value = 23.6 V/m; Power Drift = -0.053 dB

Peak SAR (extrapolated) = 0.597 W/kg

SAR(1 g) = 0.472 mW/g; SAR(10 g) = 0.356 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.530 mW/g



0 dB = 0.530mW/g

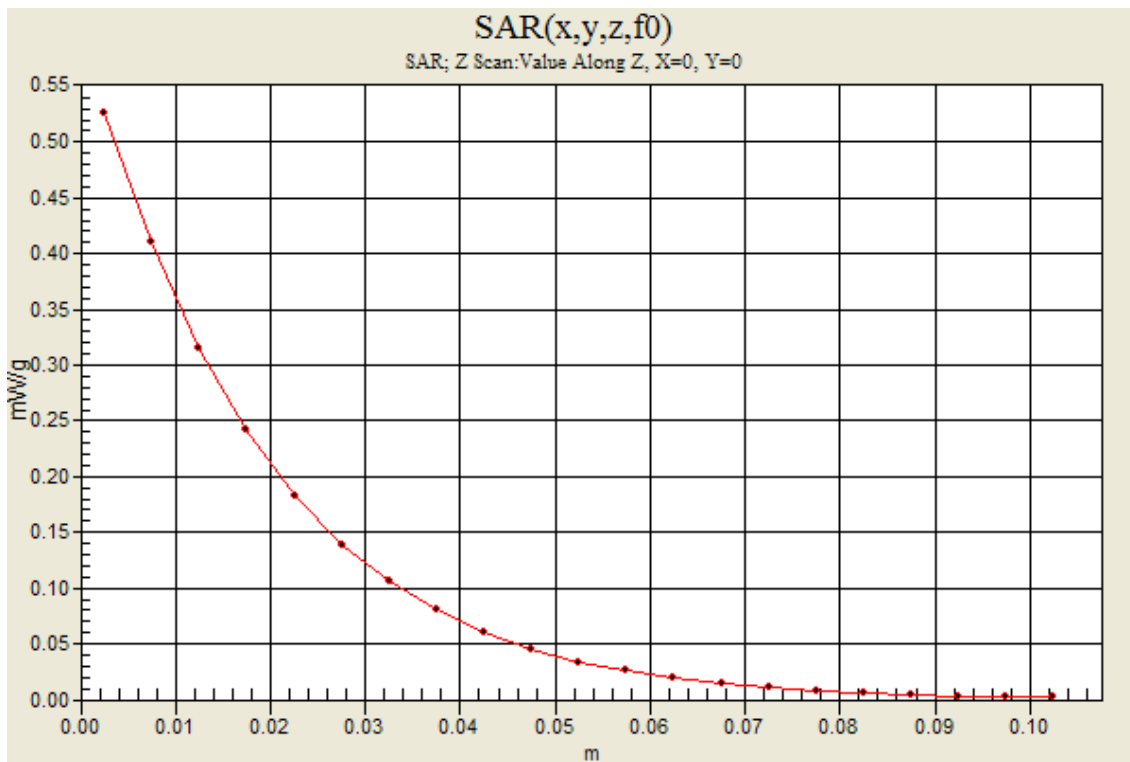
GSM850

Frequency: 836.6 MHz; Duty Cycle: 1:4

Rear/GPRS 2 slots/Ch190/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.526 mW/g



Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/16/2012

GSM1900

Frequency: 1880 MHz; Duty Cycle: 1:8; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 41.4$; $\rho = 1000$ kg/m³;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(7.67, 7.67, 7.67); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM A (Twin); Type: SAM A; Serial: 1050

Right Touch/Voice/Ch661/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.179 mW/g

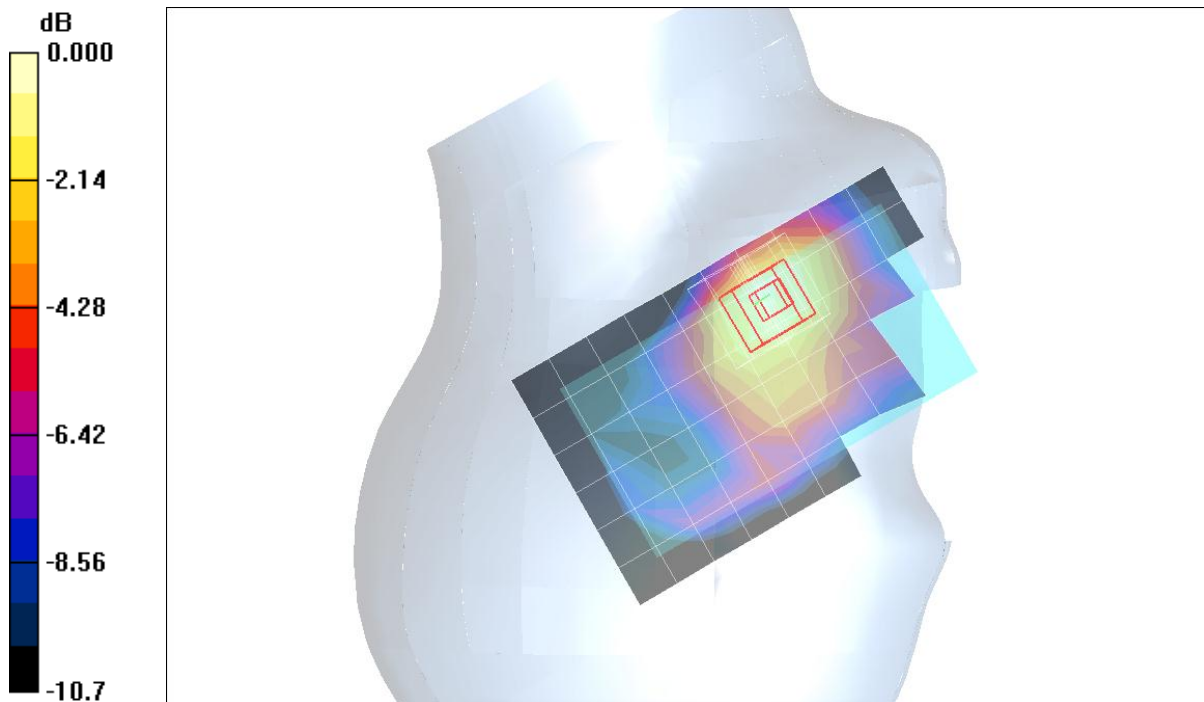
Right Touch/Voice/Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.6 V/m; Power Drift = 0.056 dB

Peak SAR (extrapolated) = 0.230 W/kg

SAR(1 g) = 0.160 mW/g; SAR(10 g) = 0.104 mW/g

Maximum value of SAR (measured) = 0.192 mW/g



0 dB = 0.192mW/g

Test Laboratory: UL CCS SAR Lab D

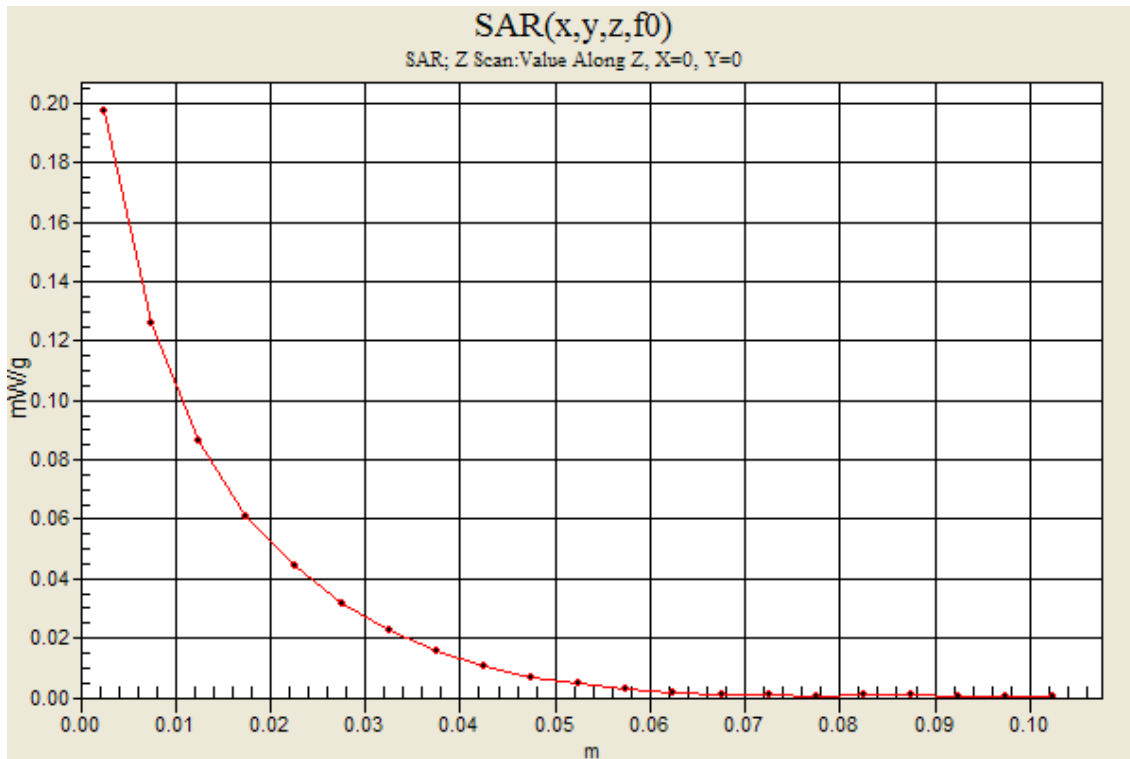
Date/Time: 7/16/2012

GSM1900

Frequency: 1880 MHz; Duty Cycle: 1:8

Right Touch/Voice/Ch661/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of SAR (measured) = 0.197 mW/g



Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/16/2012

GSM1900

Frequency: 1880 MHz; Duty Cycle: 1:8; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52.9$; $\rho = 1000$ kg/m³ ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(6.97, 6.97, 6.97); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM B (Twin); Type: SAM B; Serial: TP-105

Rear/Voice/Ch661/Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm

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

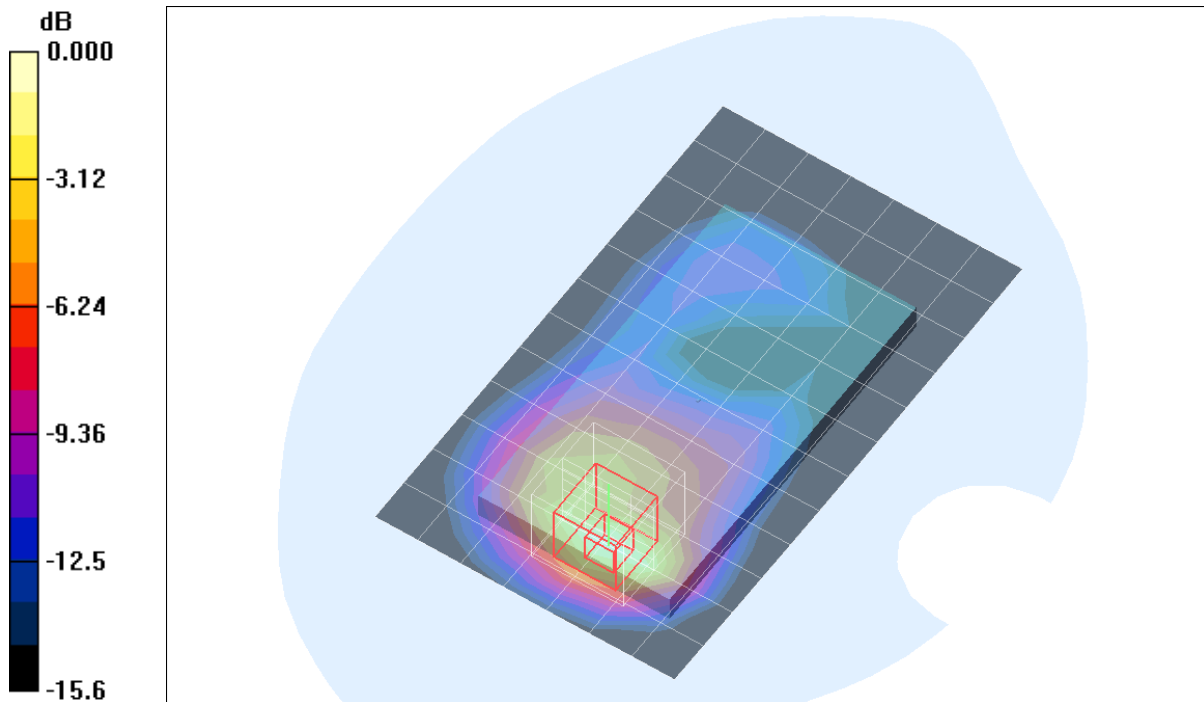
Rear/Voice/Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 24.8 V/m; Power Drift = -0.088 dB

Peak SAR (extrapolated) = 1.21 W/kg

SAR(1 g) = 0.692 mW/g; SAR(10 g) = 0.367 mW/g

Maximum value of SAR (measured) = 0.921 mW/g



0 dB = 0.921mW/g

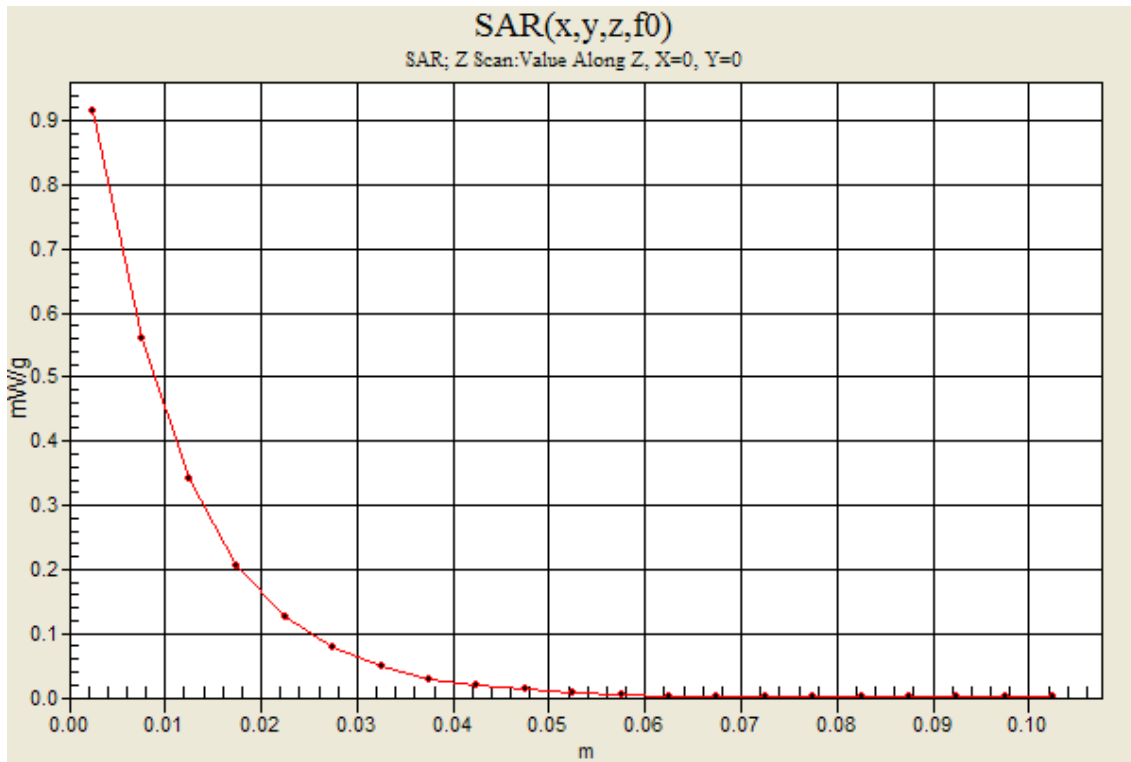
Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/16/2012

GSM1900

Frequency: 1880 MHz; Duty Cycle: 1:8

Rear/Voice/Ch661/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 0.915 mW/g



Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/18/2012

GSM1900

Frequency: 1909.8 MHz; Duty Cycle: 1:4; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used: $f = 1910$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 52.8$; $\rho = 1000$ kg/m³ ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(6.97, 6.97, 6.97); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM B (Twin); Type: SAM B; Serial: TP-105

Rear/GPRS 2 slots/Ch810/Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.23 mW/g

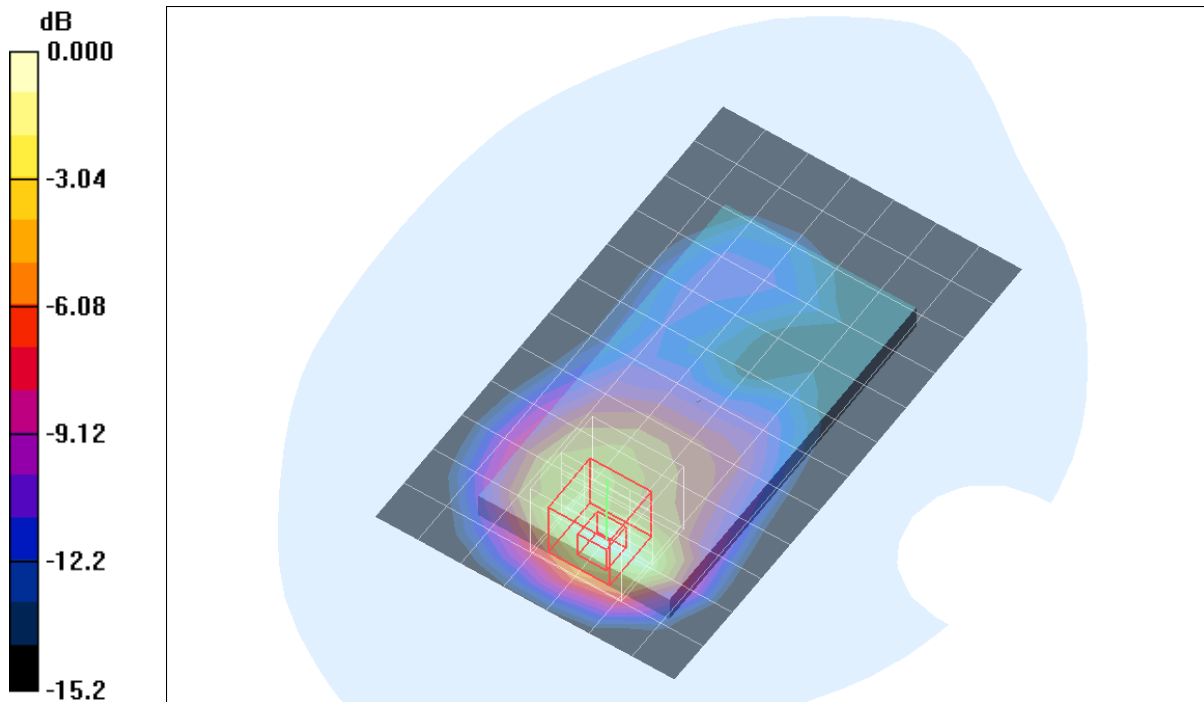
Rear/GPRS 2 slots/Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 28.7 V/m; Power Drift = -0.064 dB

Peak SAR (extrapolated) = 1.60 W/kg

SAR(1 g) = 0.931 mW/g; SAR(10 g) = 0.501 mW/g

Maximum value of SAR (measured) = 1.18 mW/g



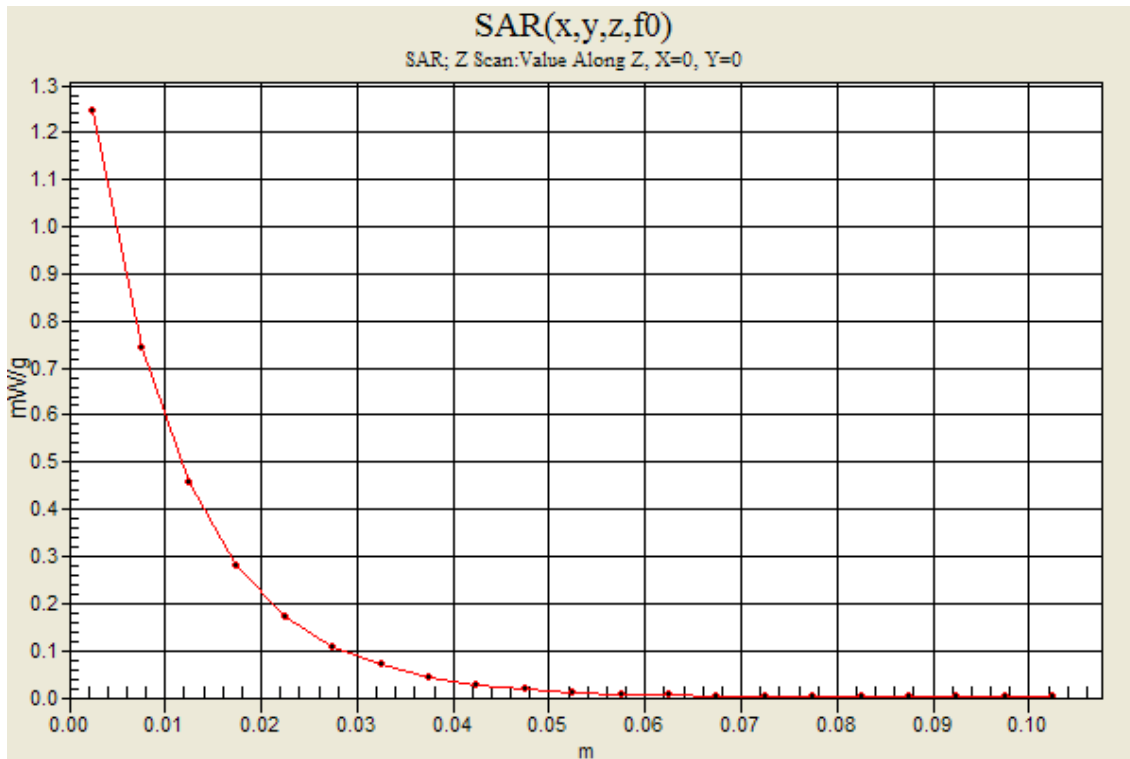
0 dB = 1.18mW/g

GSM1900

Frequency: 1909.8 MHz; Duty Cycle: 1:4

Rear/GPRS 2 slots/Ch810/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of SAR (measured) = 1.25 mW/g



Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/17/2012

W-CDMA Band V

Frequency: 836.6 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.892$ mho/m; $\epsilon_r = 42.4$; $\rho = 1000$ kg/m³ ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(8.68, 8.68, 8.68); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM A (Twin); Type: SAM A; Serial: 1050

Left Touch/Rel.99/Ch4183/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.174 mW/g

Left Touch/Rel.99/Ch4183/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

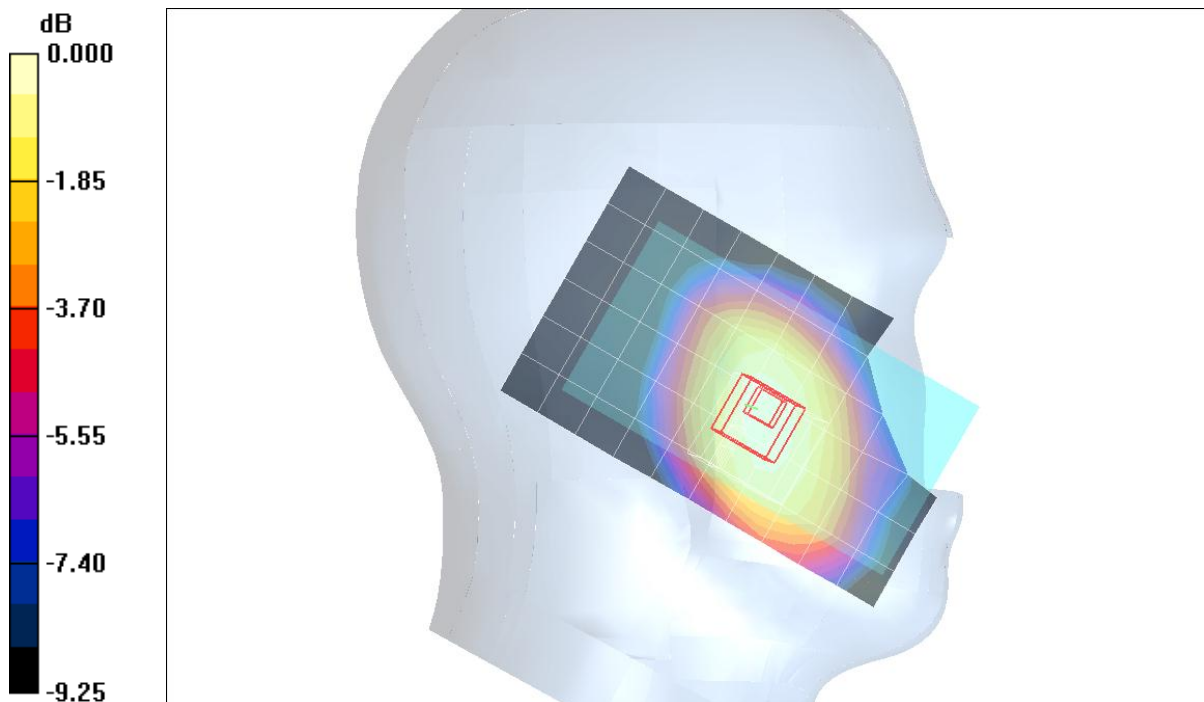
Reference Value = 14.2 V/m; Power Drift = -0.022 dB

Peak SAR (extrapolated) = 0.196 W/kg

SAR(1 g) = 0.162 mW/g; SAR(10 g) = 0.124 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.178 mW/g



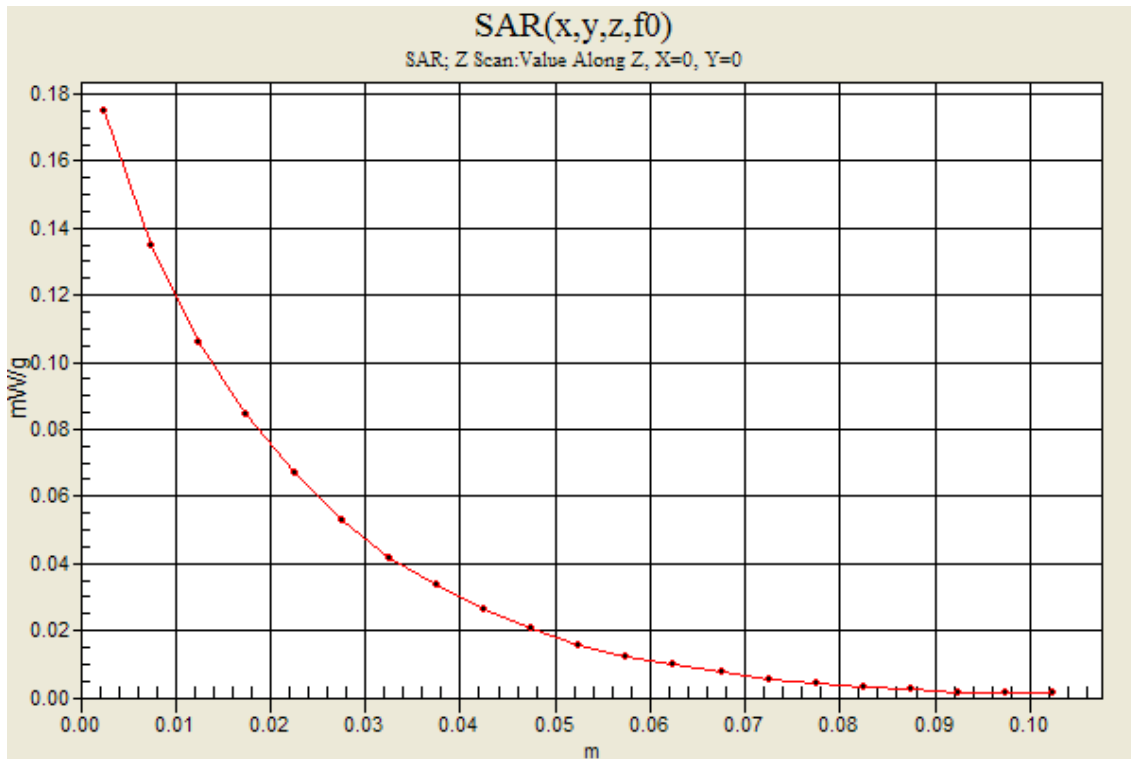
W-CDMA Band V

Frequency: 836.6 MHz; Duty Cycle: 1:1

Left Touch/Rel.99/Ch4183/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.175 mW/g



Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/17/2012

W-CDMA Band V

Frequency: 836.6 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.984$ mho/m; $\epsilon_r = 53.3$; $\rho = 1000$ kg/m³ ;
DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(8.84, 8.84, 8.84); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM B (Twin); Type: SAM B; Serial: TP-105

Rear/Rel.99/Ch4183/Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.545 mW/g

Rear/Rel.99/Ch4183/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

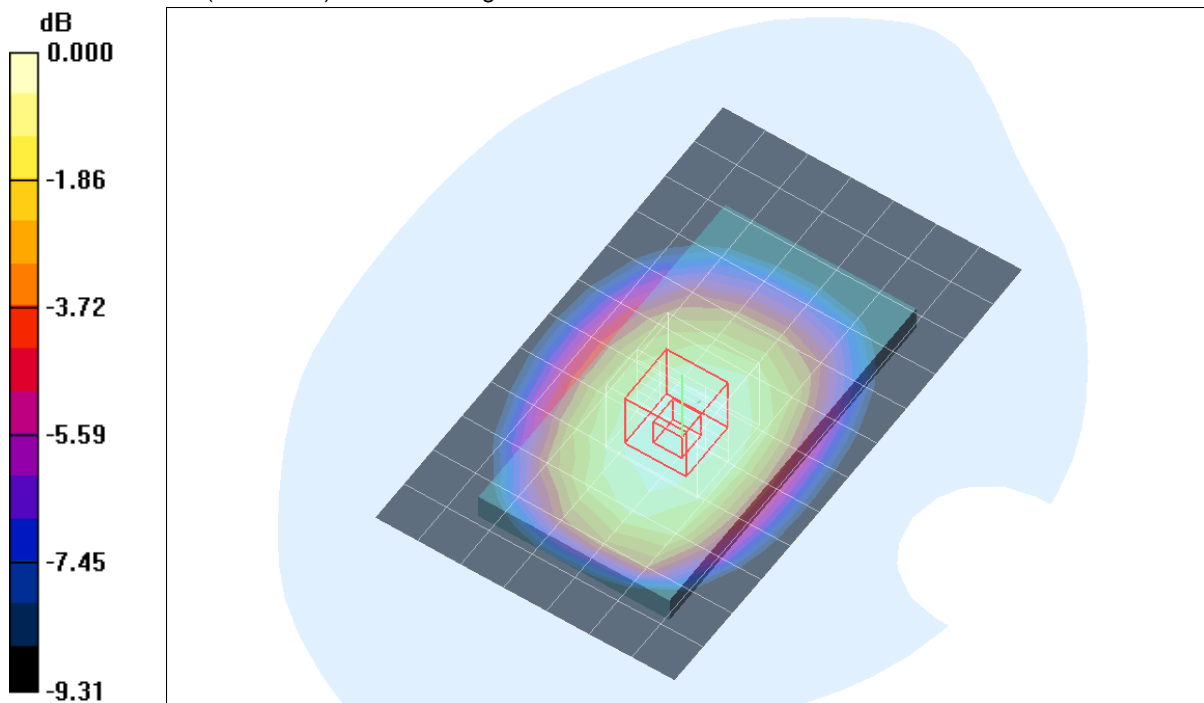
Reference Value = 24.0 V/m; Power Drift = 0.022 dB

Peak SAR (extrapolated) = 0.618 W/kg

SAR(1 g) = 0.485 mW/g; SAR(10 g) = 0.366 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.546 mW/g



0 dB = 0.546mW/g

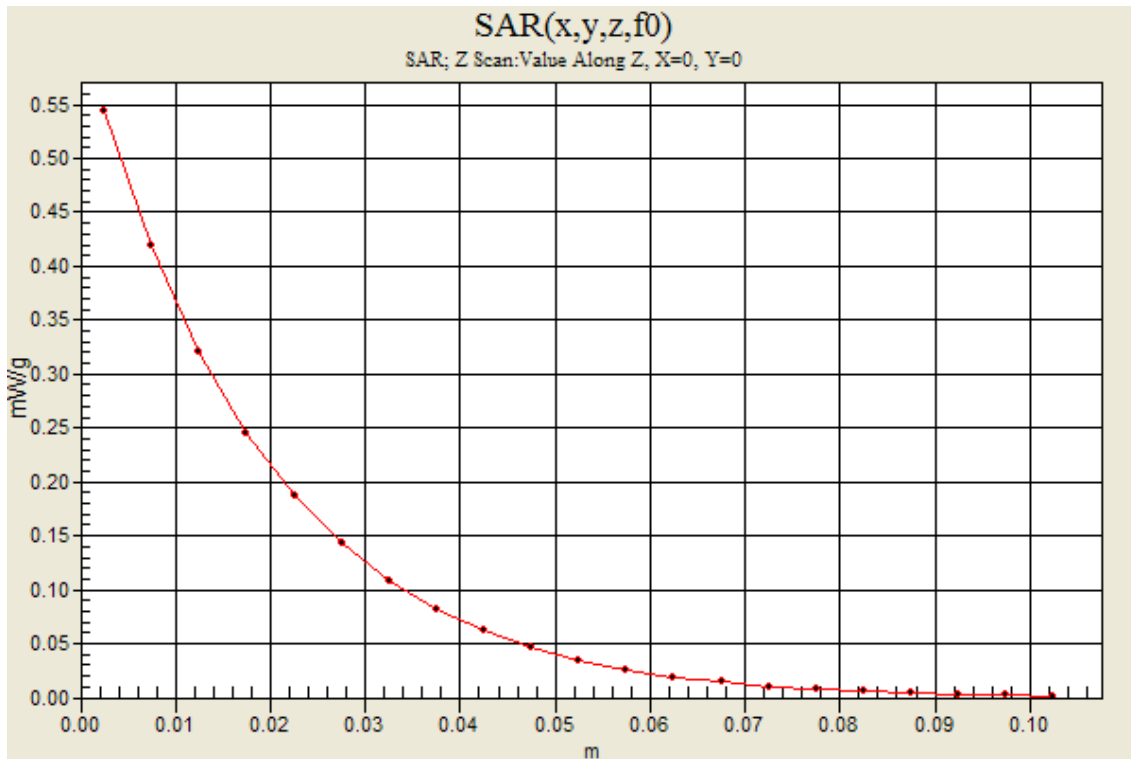
W-CDMA Band V

Frequency: 836.6 MHz; Duty Cycle: 1:1

Rear/Rel.99/Ch4183/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.544 mW/g



Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/16/2012

W-CDMA Band II

Frequency: 1880 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 41.4$; $\rho = 1000$ kg/m³;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(7.67, 7.67, 7.67); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM A (Twin); Type: SAM A; Serial: 1050

Right Touch/Rel.99/Ch9400/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.281 mW/g

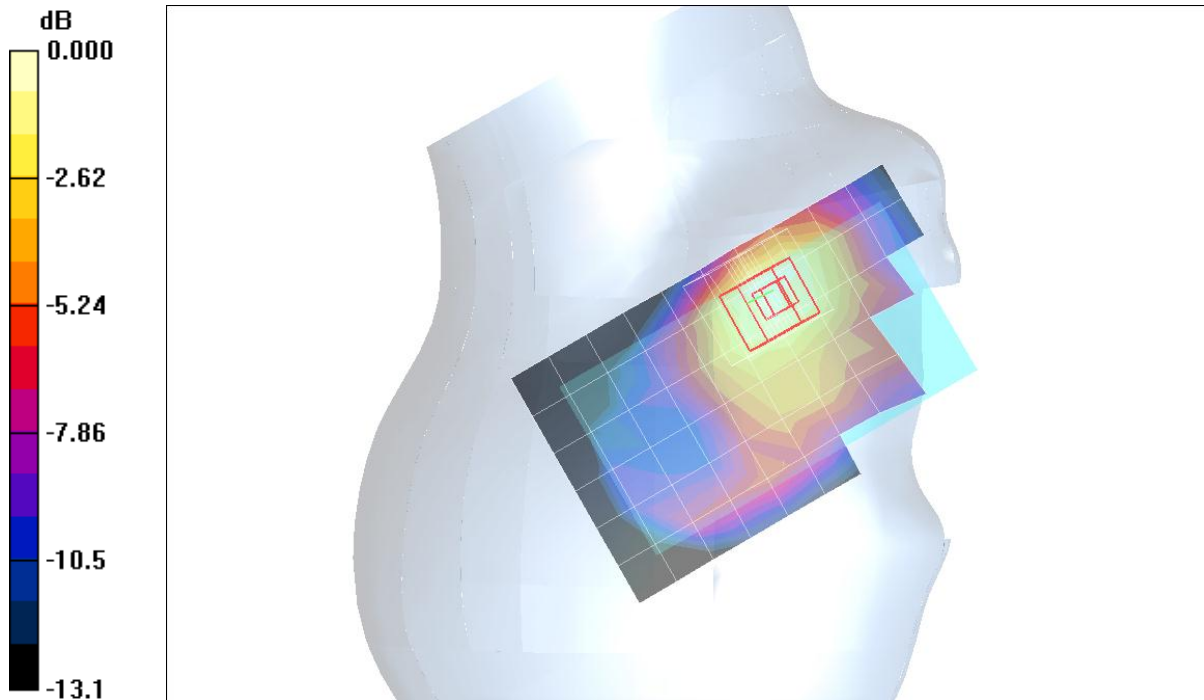
Right Touch/Rel.99/Ch9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.5 V/m; Power Drift = 0.068 dB

Peak SAR (extrapolated) = 0.371 W/kg

SAR(1 g) = 0.255 mW/g; SAR(10 g) = 0.165 mW/g

Maximum value of SAR (measured) = 0.304 mW/g



Test Laboratory: UL CCS SAR Lab D

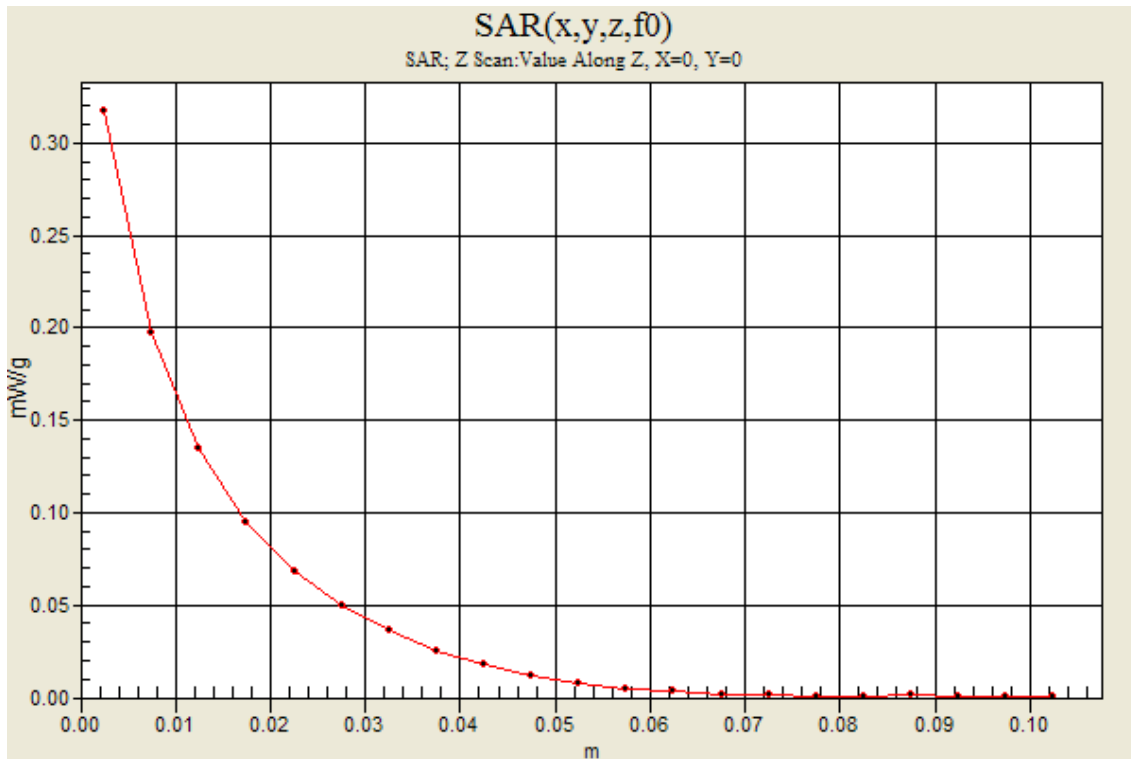
Date/Time: 7/16/2012

W-CDMA Band II

Frequency: 1880 MHz; Duty Cycle: 1:1

Right Touch/Rel.99/Ch9400/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of SAR (measured) = 0.317 mW/g



Test Laboratory: UL CCS SAR Lab D

Date/Time: 8/2/2012

W-CDMA Band II

Frequency: 1852.4 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 1852.4$ MHz; $\sigma = 1.46$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³ ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn500; Calibrated: 6/13/2012
- Probe: EX3DV4 - SN3749; ConvF(6.97, 6.97, 6.97); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BB; Serial: SN:1017

Rear/HSPA Sub-test5/Ch9262/Area Scan (8x13x1):

Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.61 mW/g

Rear/HSPA Sub-test5/Ch9262/Zoom Scan (5x5x7)/Cube 0:

Measurement grid: dx=8mm,

dy=8mm, dz=5mm

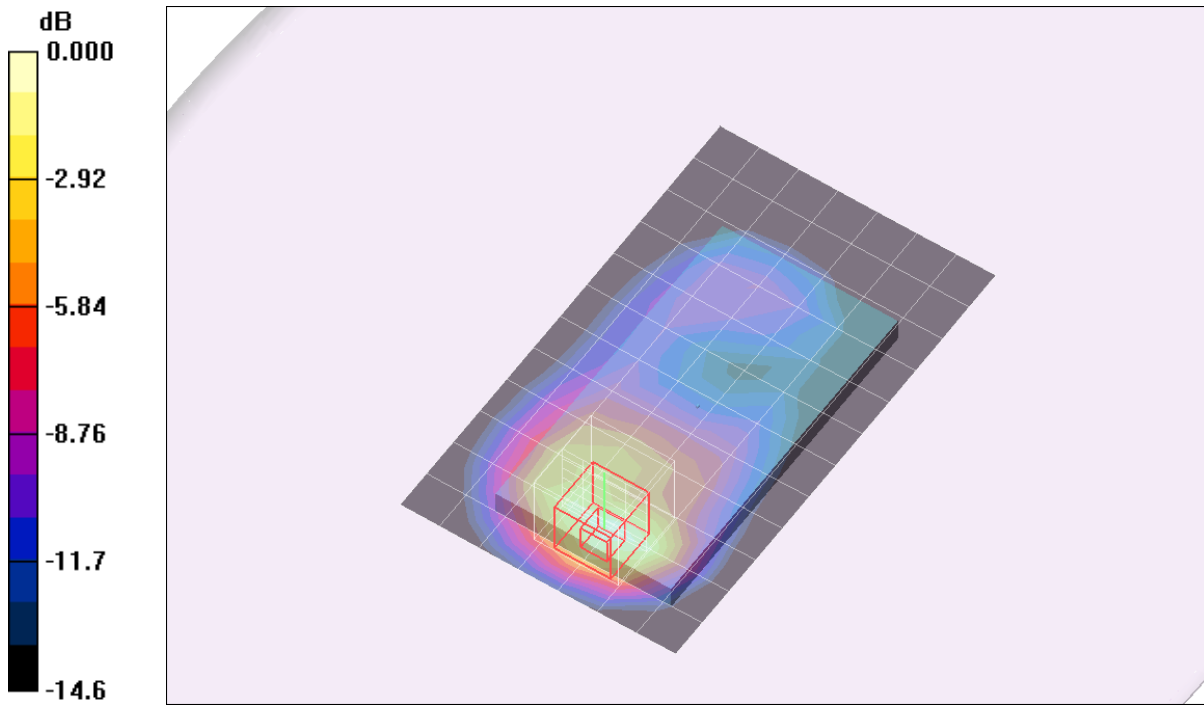
Reference Value = 31.0 V/m; Power Drift = -0.096 dB

Peak SAR (extrapolated) = 2.13 W/kg

SAR(1 g) = 1.25 mW/g; SAR(10 g) = 0.668 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.50 mW/g



0 dB = 1.50mW/g

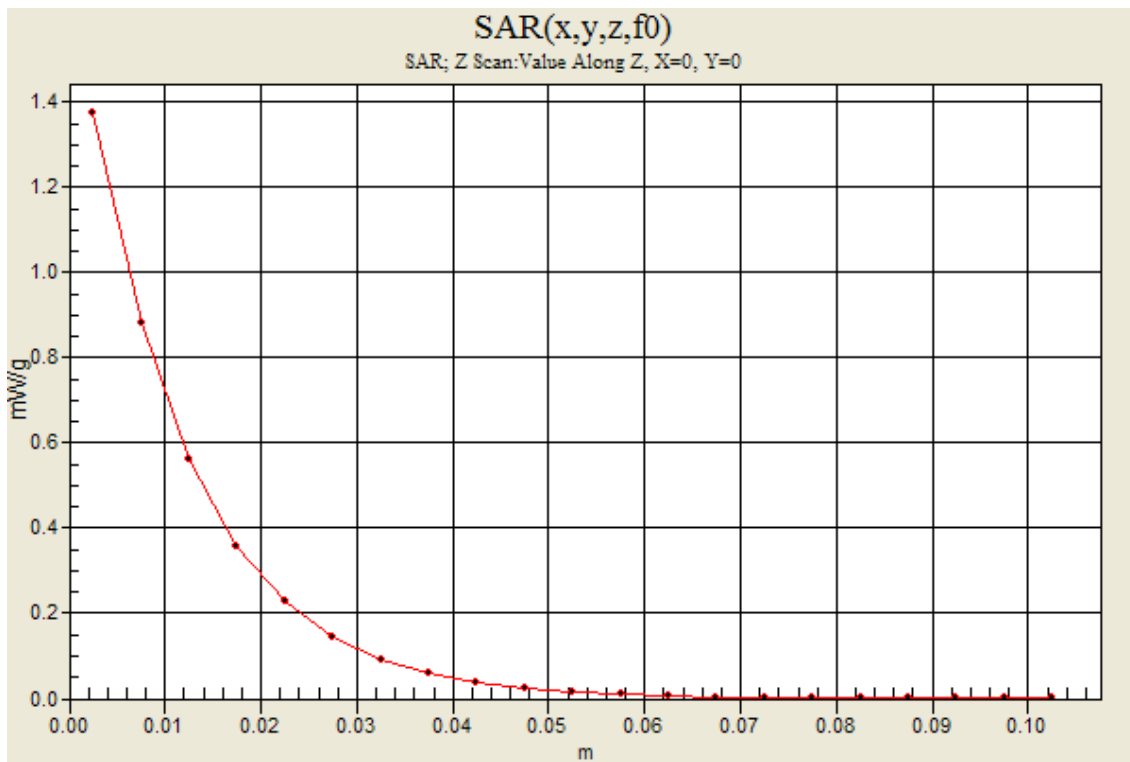
W-CDMA Band II

Frequency: 1852.4 MHz; Duty Cycle: 1:1

Rear/HSPA Sub-test5/Ch9262/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.37 mW/g



Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/18/2012

W-CDMA Band IV

Frequency: 1732.4 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 1732.4$ MHz; $\sigma = 1.32$ mho/m; $\epsilon_r = 40.1$; $\rho = 1000$ kg/m³;
DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(7.99, 7.99, 7.99); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM A (Twin); Type: SAM A; Serial: 1050

Left Touch/Rel.99/Ch1412/Area Scan (7x11x1):

Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.297 mW/g

Left Touch/Rel.99/Ch1412/Zoom Scan (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm,

dz=5mm

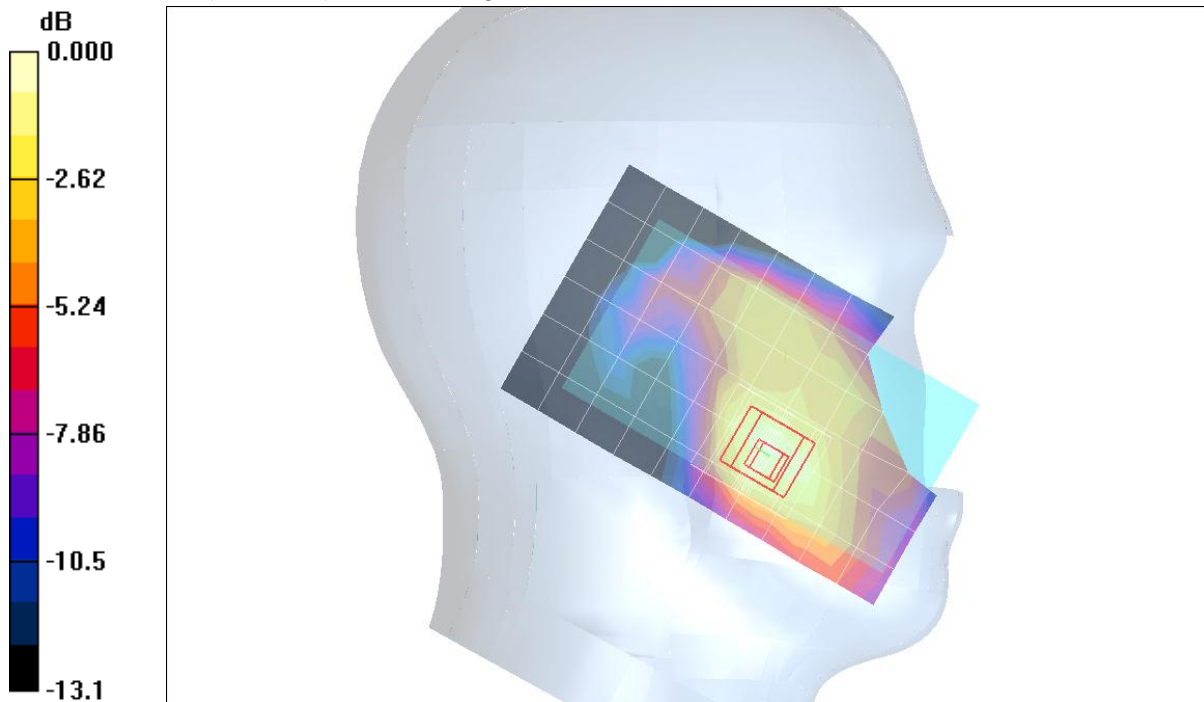
Reference Value = 15.1 V/m; Power Drift = 0.022 dB

Peak SAR (extrapolated) = 0.442 W/kg

SAR(1 g) = 0.284 mW/g; SAR(10 g) = 0.169 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.340 mW/g



0 dB = 0.340mW/g

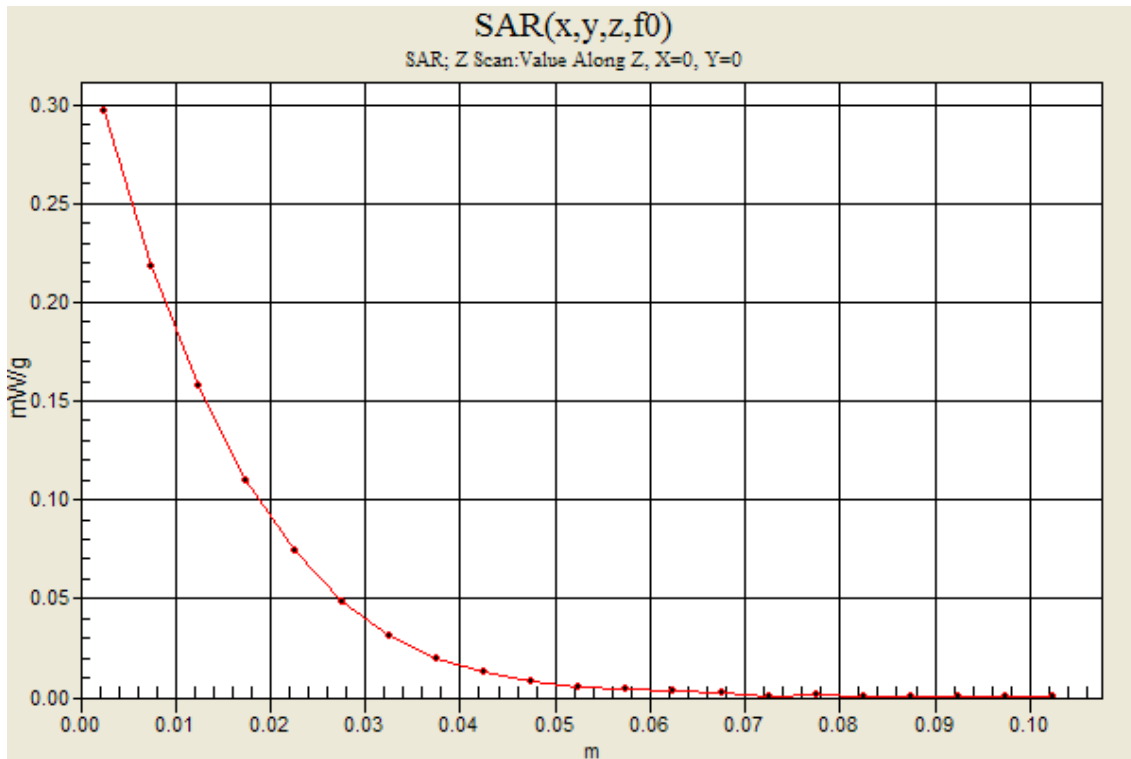
W-CDMA Band IV

Frequency: 1732.4 MHz; Duty Cycle: 1:1

Left Touch/Rel.99/Ch1412/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.297 mW/g



Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/20/2012

W-CDMA Band IV

Frequency: 1752.5 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 1752.5$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 55$; $\rho = 1000$ kg/m³;
DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(7.23, 7.23, 7.23); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM B (Twin); Type: SAM B; Serial: TP-105

Rear with Headset/Rel.99/Ch1862/Area Scan (8x13x1):

Measurement grid: dx=15mm, dy=15mm
[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.12 mW/g

Rear with Headset/Rel.99/Ch1862/Zoom Scan (5x5x7)/Cube 0:

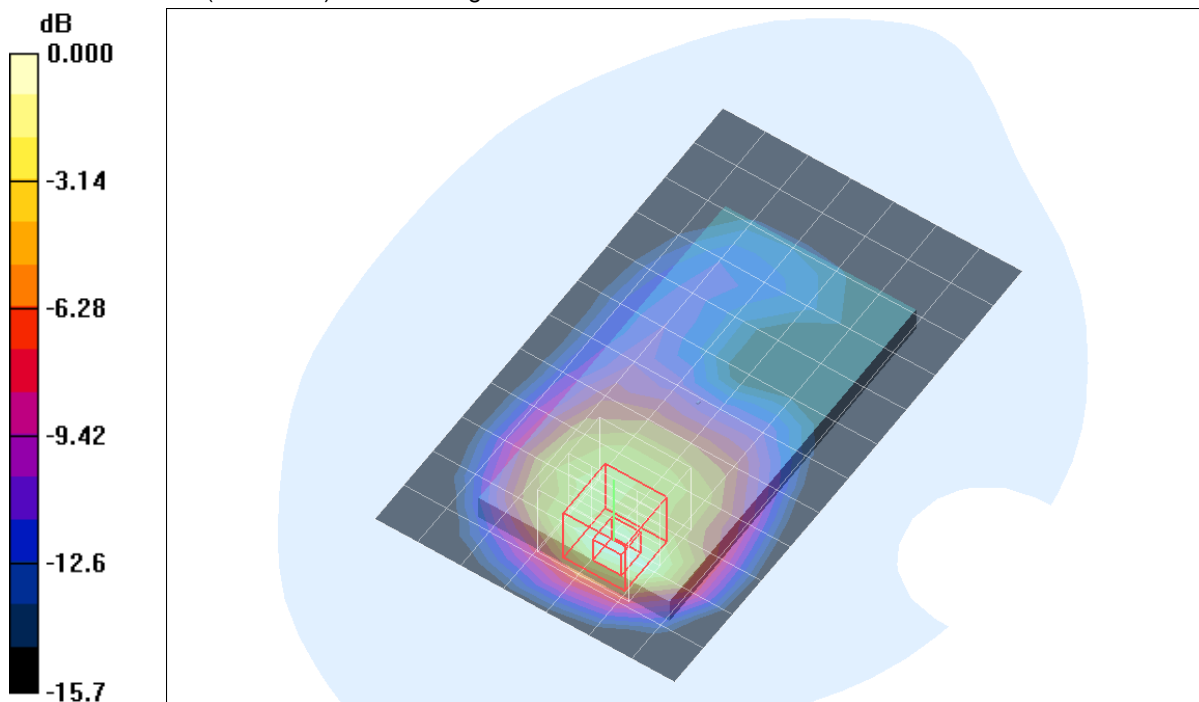
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.9 V/m; Power Drift = -0.191 dB

Peak SAR (extrapolated) = 1.52 W/kg

SAR(1 g) = 0.907 mW/g; SAR(10 g) = 0.494 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.11 mW/g



0 dB = 1.11mW/g

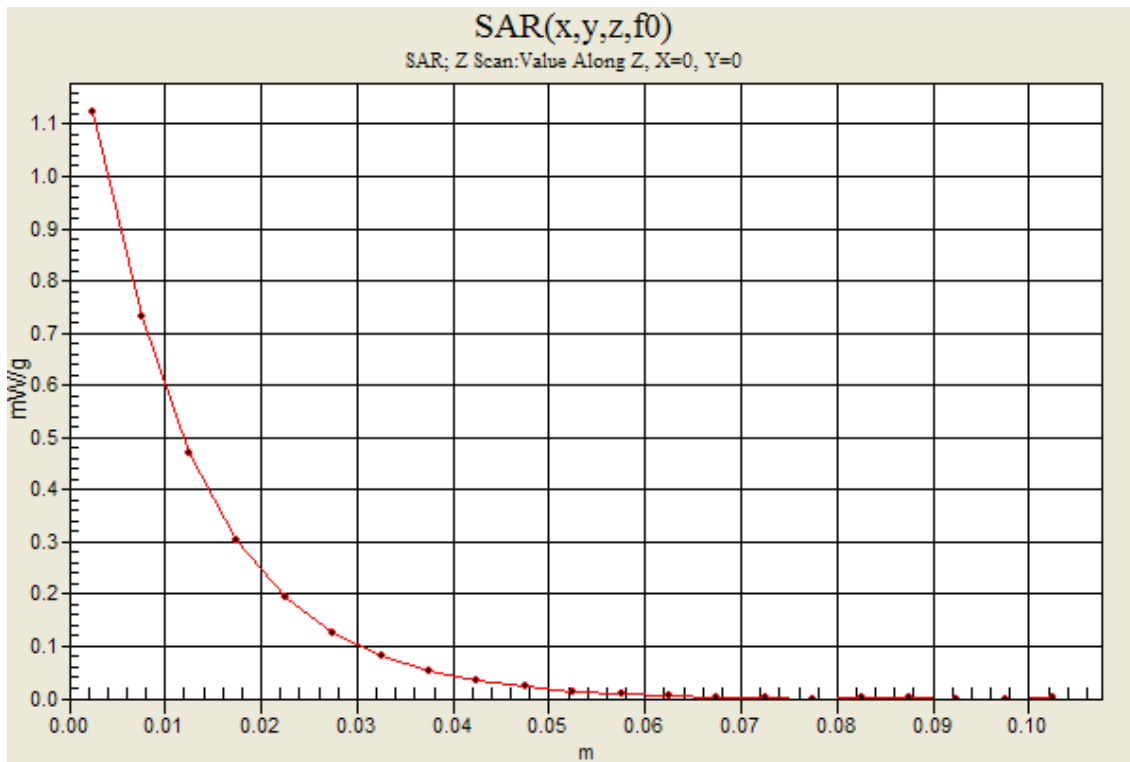
W-CDMA Band IV

Frequency: 1752.5 MHz; Duty Cycle: 1:1

Rear with Headset/Rel.99/Ch1862/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.12 mW/g



Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/20/2012

W-CDMA Band IV

Frequency: 1752.5 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C

Medium parameters used (interpolated): $f = 1752.5$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 55$; $\rho = 1000$ kg/m³ ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(7.23, 7.23, 7.23); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM B (Twin); Type: SAM B; Serial: TP-105

Rear/Rel.99/Ch1862/Area Scan (8x13x1):

Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.04 mW/g

Rear/Rel.99/Ch1862/Zoom Scan (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

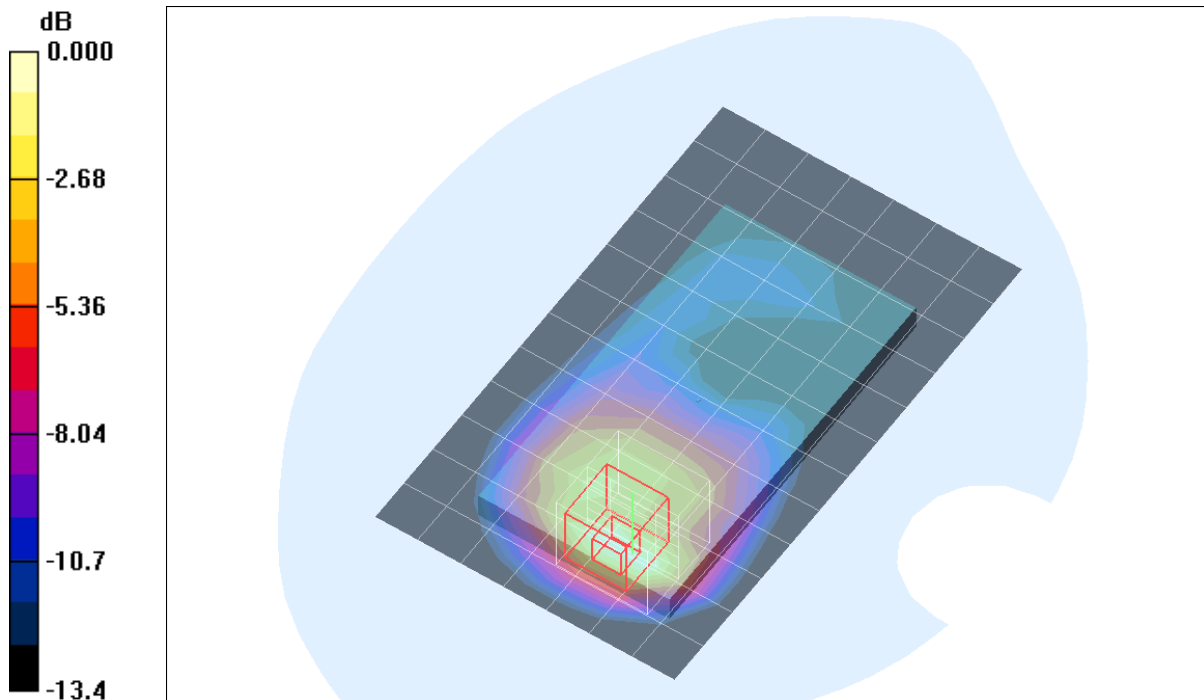
Reference Value = 27.5 V/m; Power Drift = -0.195 dB

Peak SAR (extrapolated) = 1.44 W/kg

SAR(1 g) = 0.869 mW/g; SAR(10 g) = 0.481 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.10 mW/g



0 dB = 1.10mW/g

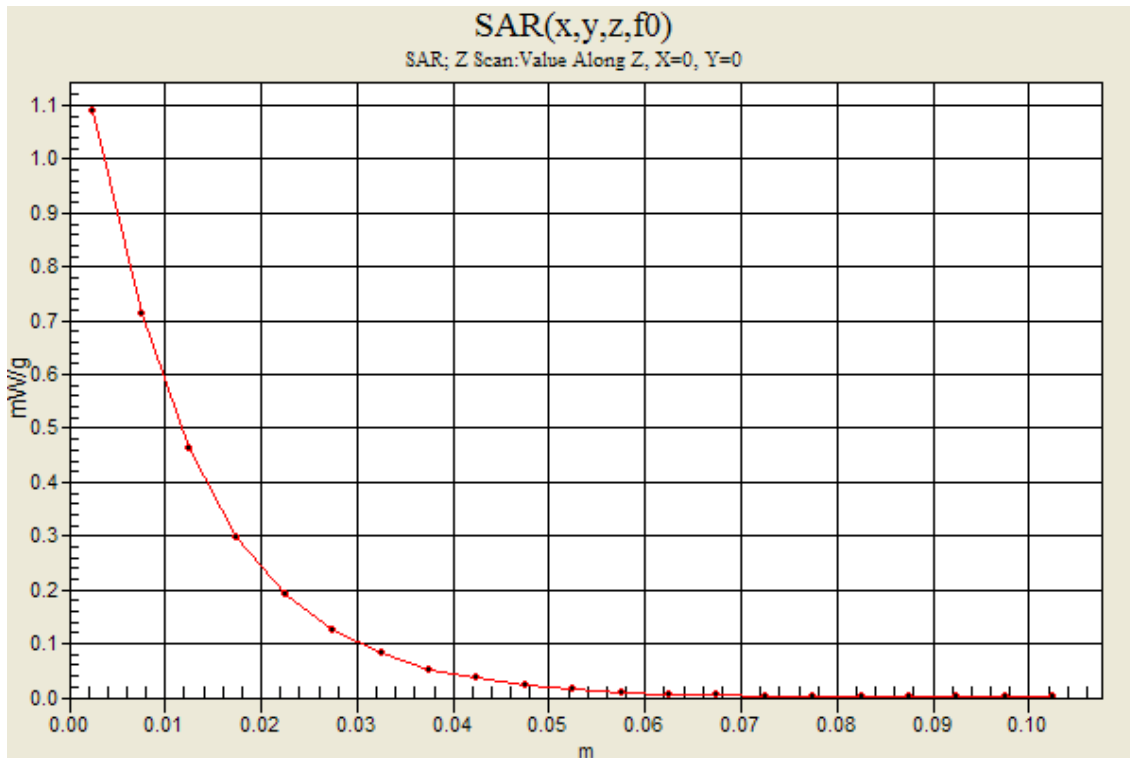
W-CDMA Band IV

Frequency: 1752.5 MHz; Duty Cycle: 1:1

Rear/Rel.99/Ch1862/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.09 mW/g



Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/31/2012

WiFi 2.4GHz Band

Frequency: 2462 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 2462$ MHz; $\sigma = 1.85$ mho/m; $\epsilon_r = 37.5$; $\rho = 1000$ kg/m³ ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(6.76, 6.76, 6.76); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM A (Twin); Type: SAM A; Serial: 1050

Right Touch/802.11b/Ch11/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.682 mW/g

Right Touch/802.11b/Ch11/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

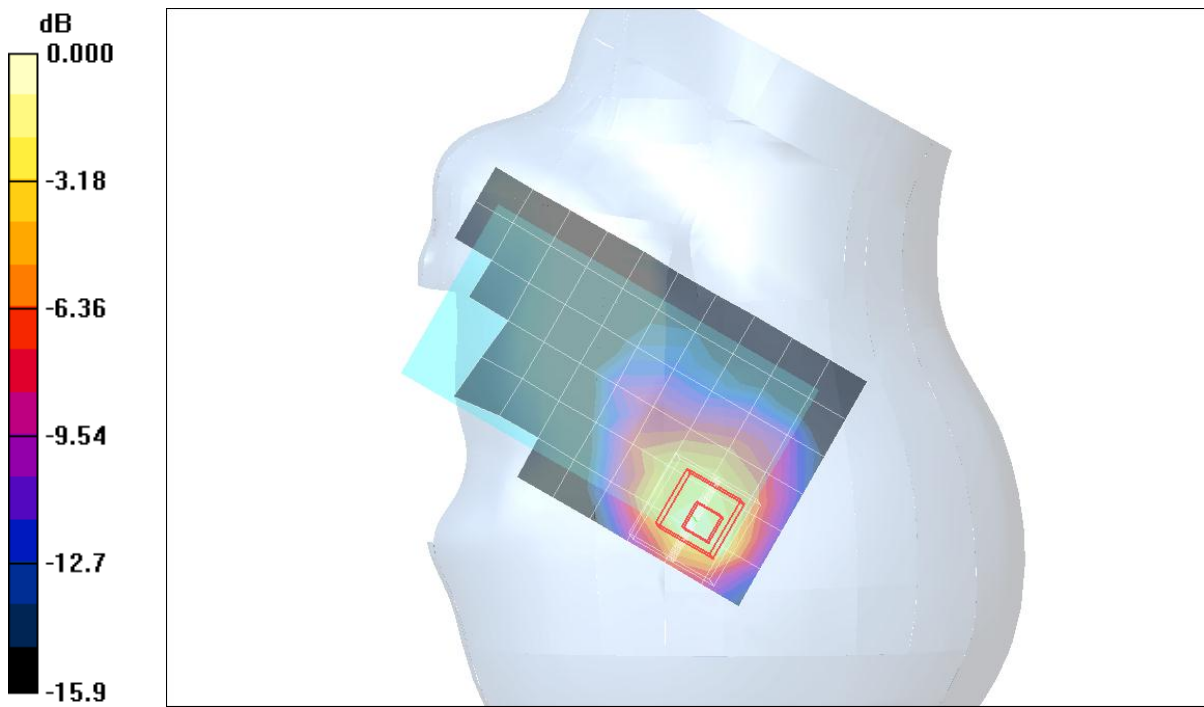
Reference Value = 19.2 V/m; Power Drift = 0.162 dB

Peak SAR (extrapolated) = 1.17 W/kg

SAR(1 g) = 0.569 mW/g; SAR(10 g) = 0.274 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.796 mW/g



0 dB = 0.796mW/g

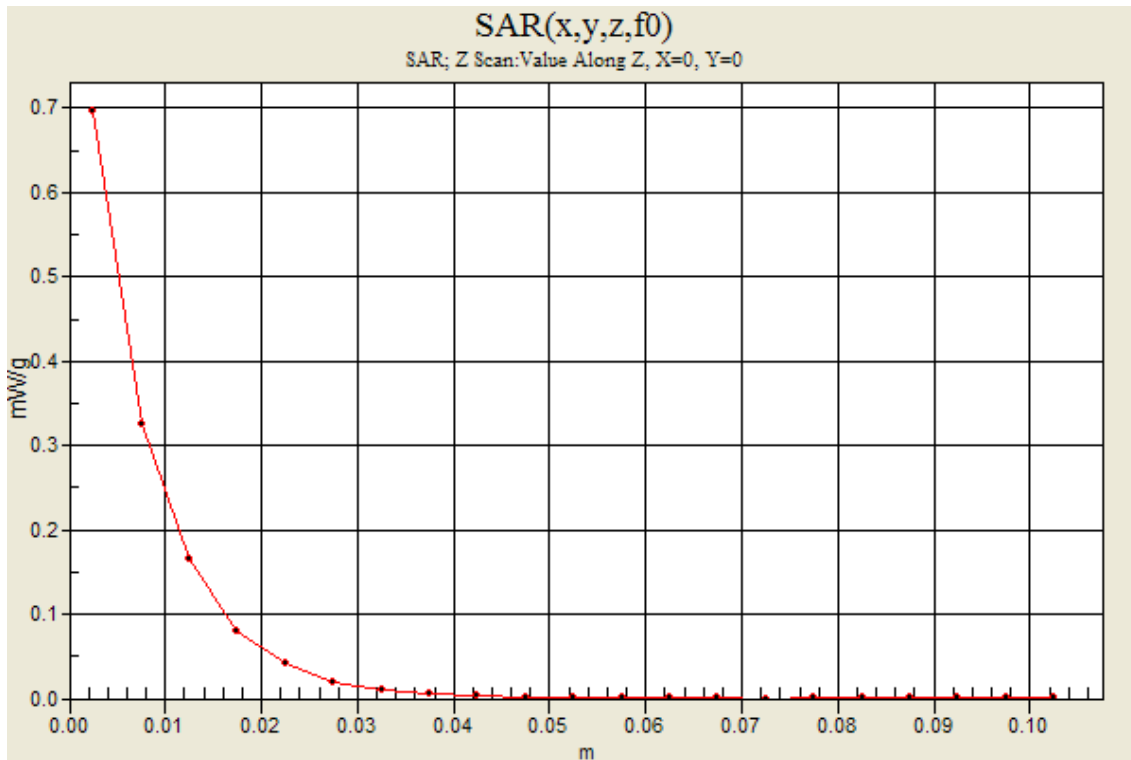
WiFi 2.4GHz Band

Frequency: 2462 MHz; Duty Cycle: 1:1

Right Touch/802.11b/Ch11/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.696 mW/g



Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/31/2012

WiFi 2.4GHz Band

Frequency: 2462 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 2462$ MHz; $\sigma = 2.05$ mho/m; $\epsilon_r = 50.4$; $\rho = 1000$ kg/m³ ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(6.66, 6.66, 6.66); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM B (Twin); Type: SAM B; Serial: TP-105

Rear/802.11b/Ch11/Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.309 mW/g

Rear/802.11b/Ch11/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

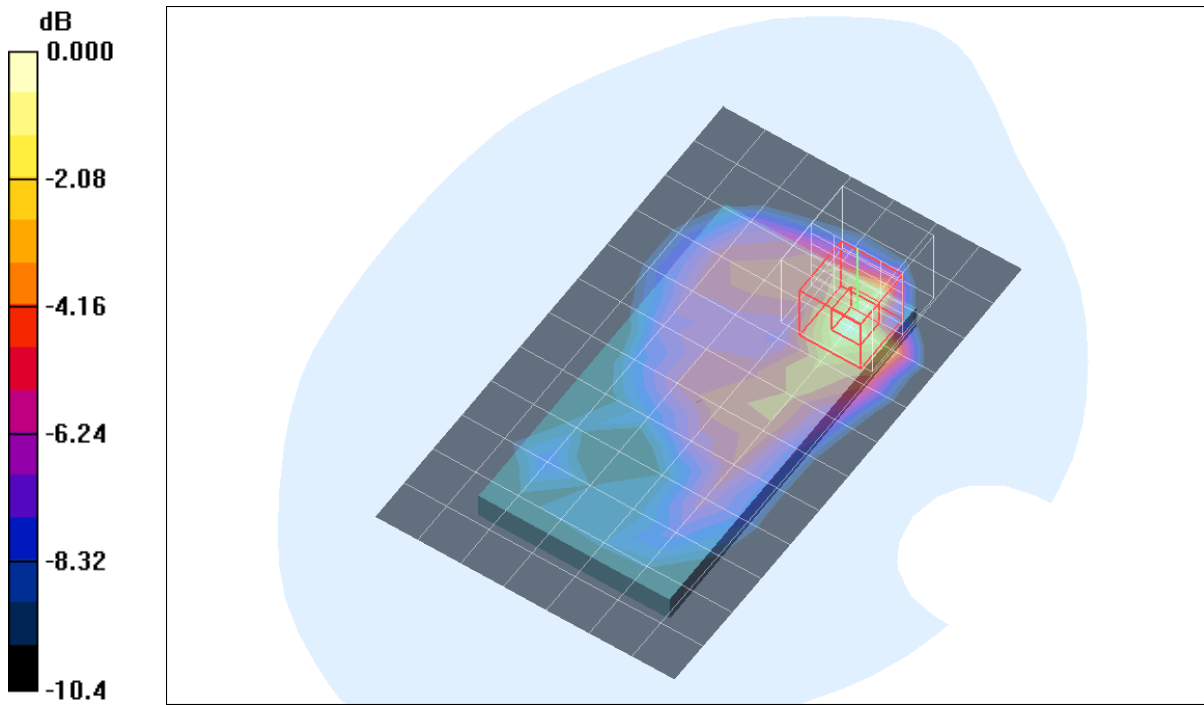
Reference Value = 12.7 V/m; Power Drift = -0.448 dB

Peak SAR (extrapolated) = 0.519 W/kg

SAR(1 g) = 0.240 mW/g; SAR(10 g) = 0.112 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.330 mW/g



0 dB = 0.330mW/g

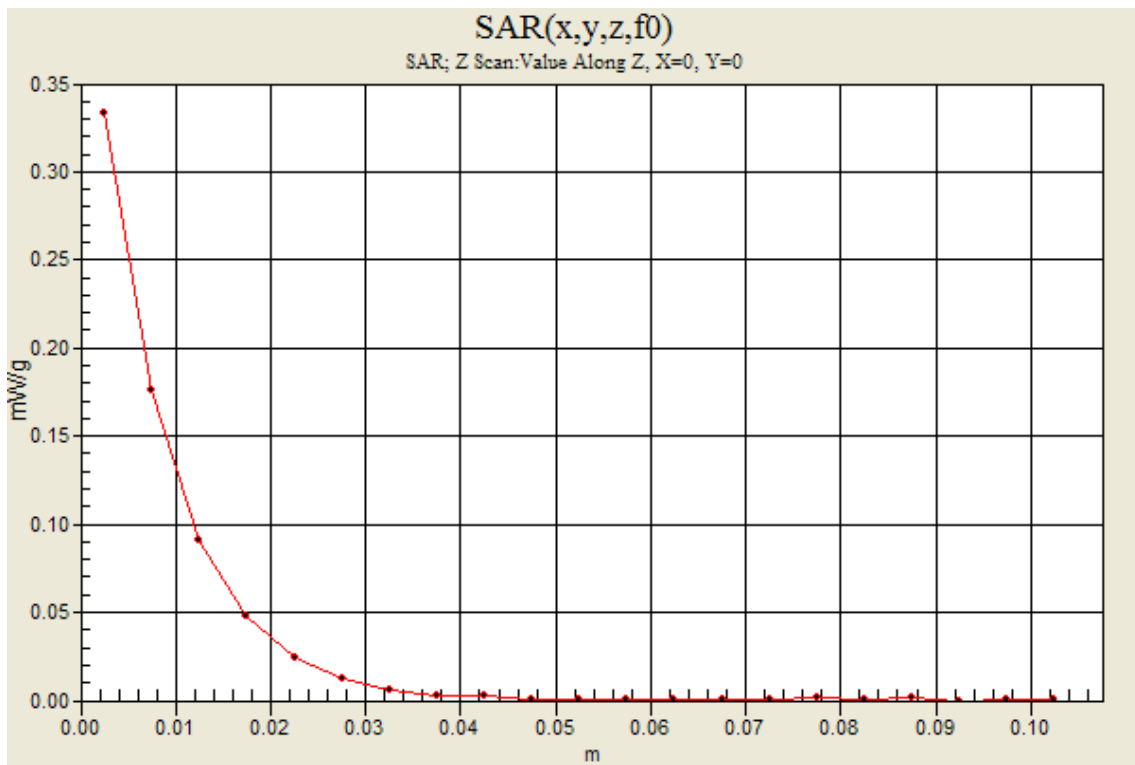
WiFi 2.4GHz Band

Frequency: 2462 MHz; Duty Cycle: 1:1

Rear/802.11b/Ch11/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.333 mW/g



Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/24/2012

WiFi 5.2GHz Band

Frequency: 5220 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used: $f = 5220 \text{ MHz}$; $\sigma = 4.76 \text{ mho/m}$; $\epsilon_r = 35.7$; $\rho = 1000 \text{ kg/m}^3$;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(4.68, 4.68, 4.68); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM A (Twin); Type: SAM A; Serial: 1050

Right Touch/802.11a/Ch44/Area Scan (11x18x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.161 mW/g

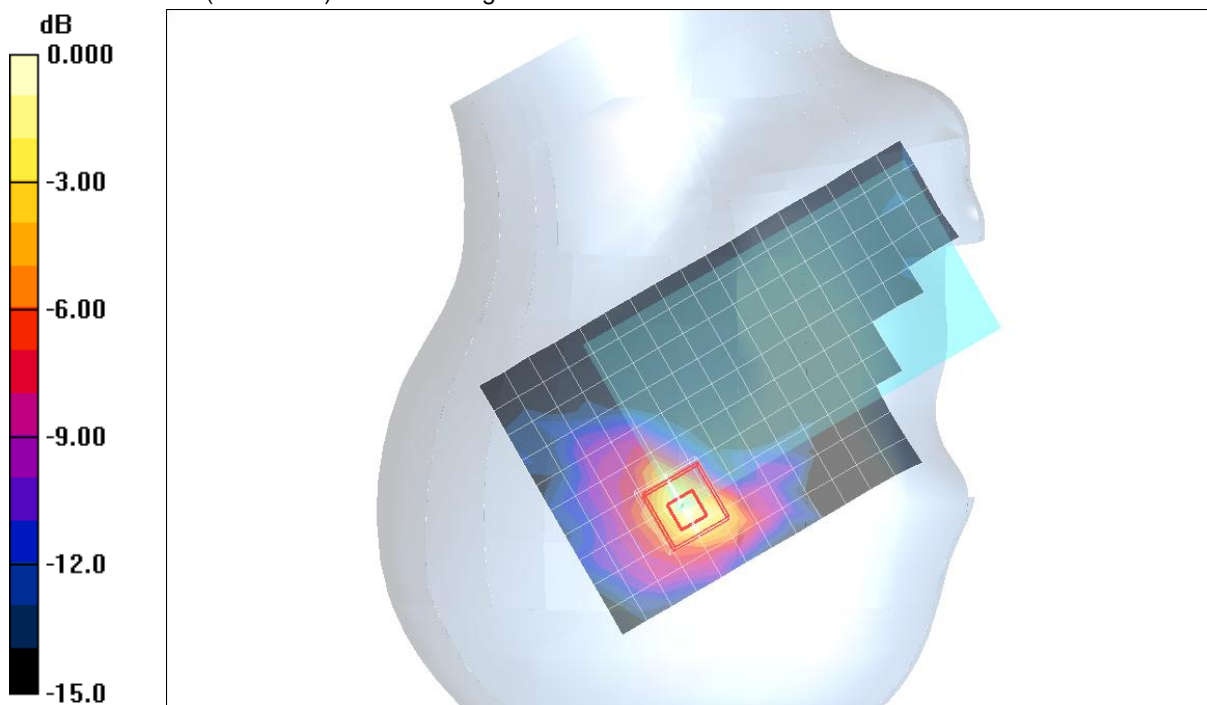
Right Touch/802.11a/Ch44/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 6.05 V/m; Power Drift = -0.174 dB

Peak SAR (extrapolated) = 0.329 W/kg

SAR(1 g) = 0.092 mW/g; SAR(10 g) = 0.030 mW/g

Maximum value of SAR (measured) = 0.165 mW/g



0 dB = 0.165mW/g

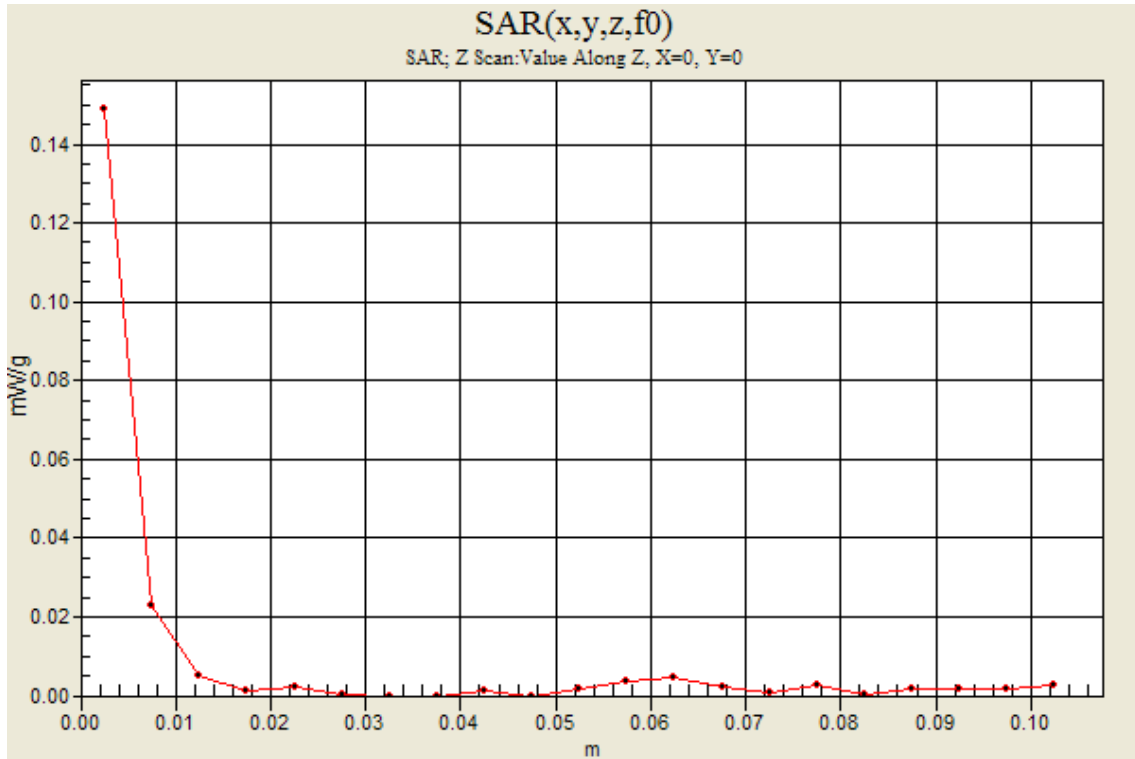
Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/24/2012

WiFi 5.2GHz Band

Frequency: 5220 MHz; Duty Cycle: 1:1

Right Touch/802.11a/Ch44/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 0.149 mW/g



Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/28/2012

WiFi 5.2GHz Band

Frequency: 5220 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used: $f = 5220 \text{ MHz}$; $\sigma = 5.29 \text{ mho/m}$; $\epsilon_r = 47.9$; $\rho = 1000 \text{ kg/m}^3$;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(4.23, 4.23, 4.23); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BB; Serial: SN:1017

Rear with Headset/802.11a/Ch44/Area Scan (11x17x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.158 mW/g

Rear with Headset/802.11a/Ch44/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm,

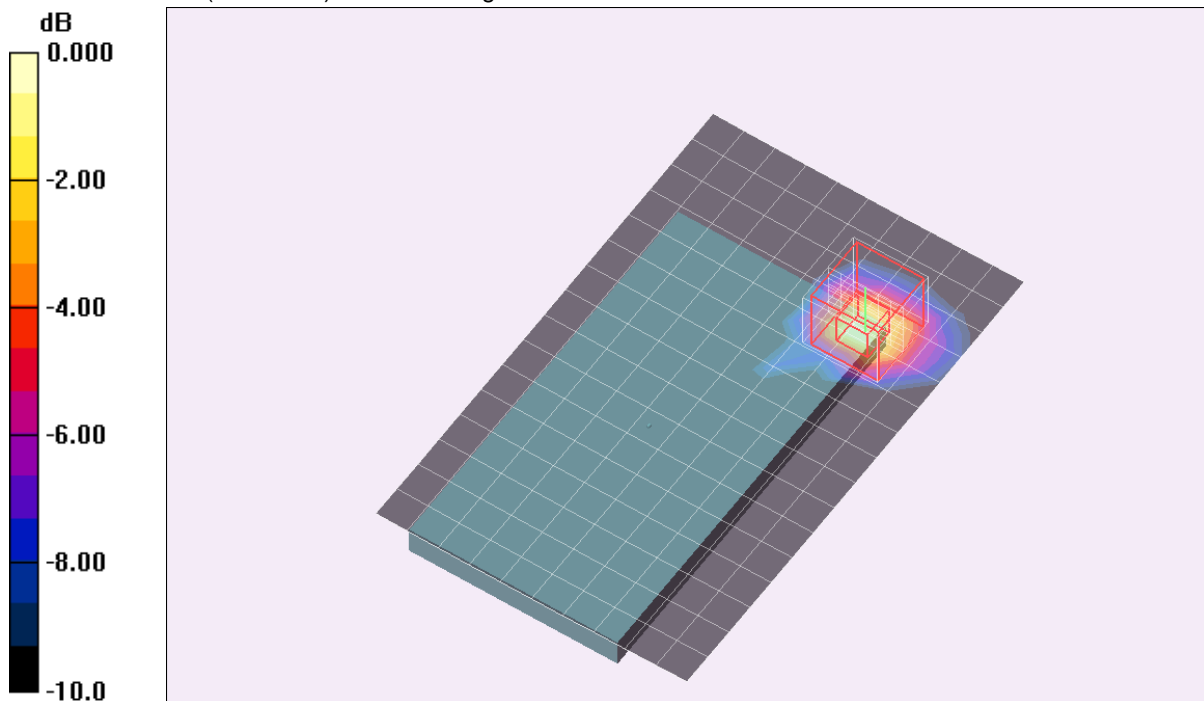
dy=4mm, dz=2.5mm

Reference Value = 6.15 V/m; Power Drift = -0.154 dB

Peak SAR (extrapolated) = 0.402 W/kg

SAR(1 g) = 0.113 mW/g; SAR(10 g) = 0.037 mW/g

Maximum value of SAR (measured) = 0.189 mW/g



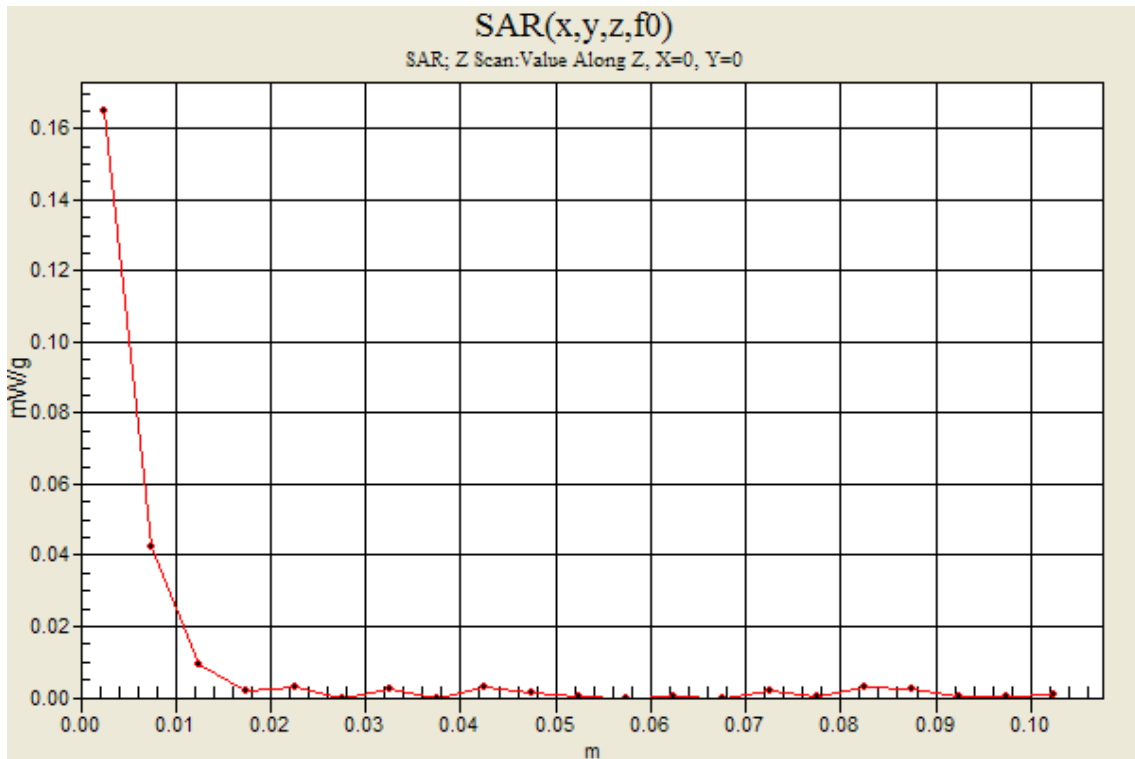
0 dB = 0.189mW/g

WiFi 5.2GHz Band

Frequency: 5220 MHz; Duty Cycle: 1:1

Rear with Headset/802.11a/Ch44/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of SAR (measured) = 0.165 mW/g



Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/25/2012

WiFi 5.3GHz Band

Frequency: 5320 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C
Medium parameters used: $f = 5320$ MHz; $\sigma = 4.73$ mho/m; $\epsilon_r = 35.9$; $\rho = 1000$ kg/m³ ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(4.41, 4.41, 4.41); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM A (Twin); Type: SAM A; Serial: 1050

Right Touch/802.11a/Ch64/Area Scan (11x18x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.164 mW/g

Right Touch/802.11a/Ch64/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm,

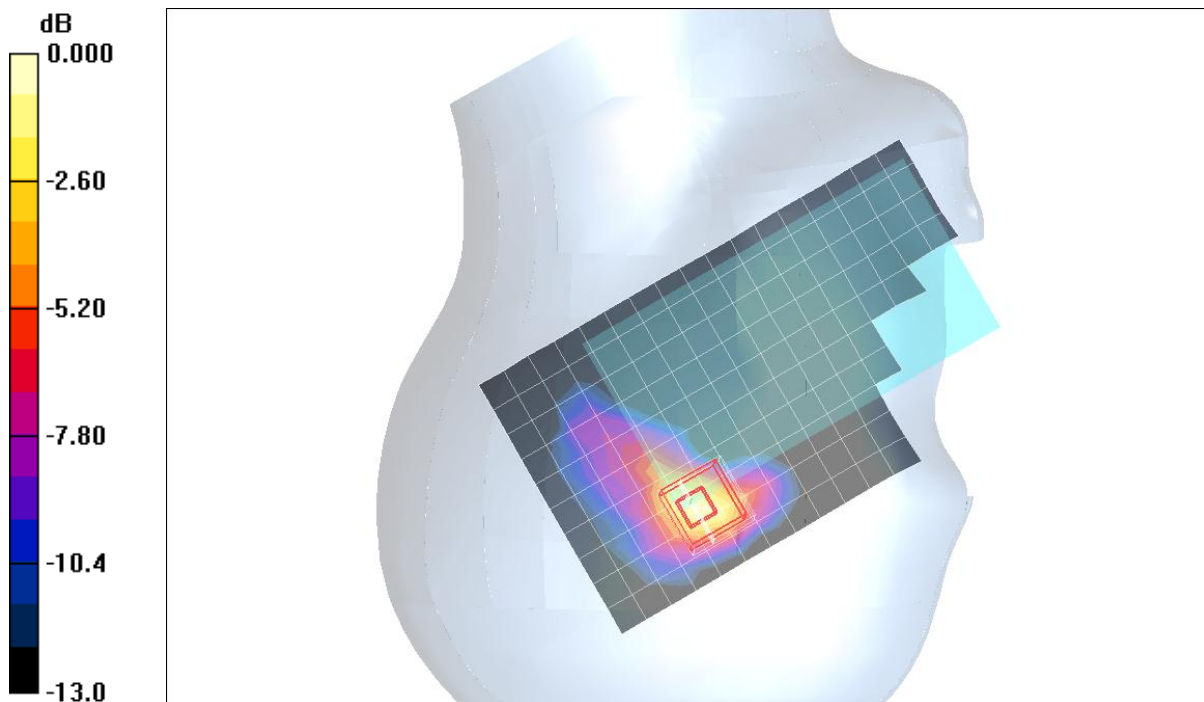
dz=2.5mm

Reference Value = 5.99 V/m; Power Drift = 0.055 dB

Peak SAR (extrapolated) = 0.372 W/kg

SAR(1 g) = 0.108 mW/g; SAR(10 g) = 0.034 mW/g

Maximum value of SAR (measured) = 0.192 mW/g



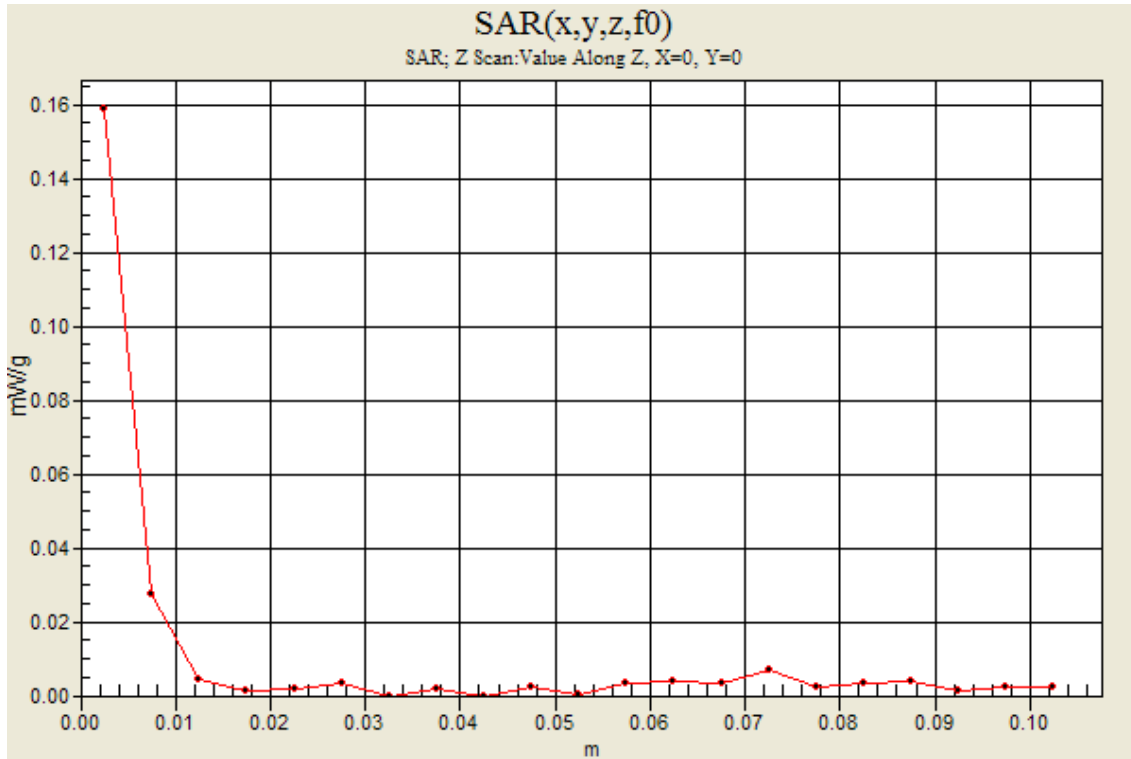
0 dB = 0.192mW/g

WiFi 5.3GHz Band

Frequency: 5320 MHz; Duty Cycle: 1:1

Right Touch/802.11a/Ch64/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of SAR (measured) = 0.159 mW/g



Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/28/2012

WiFi 5.3GHz Band

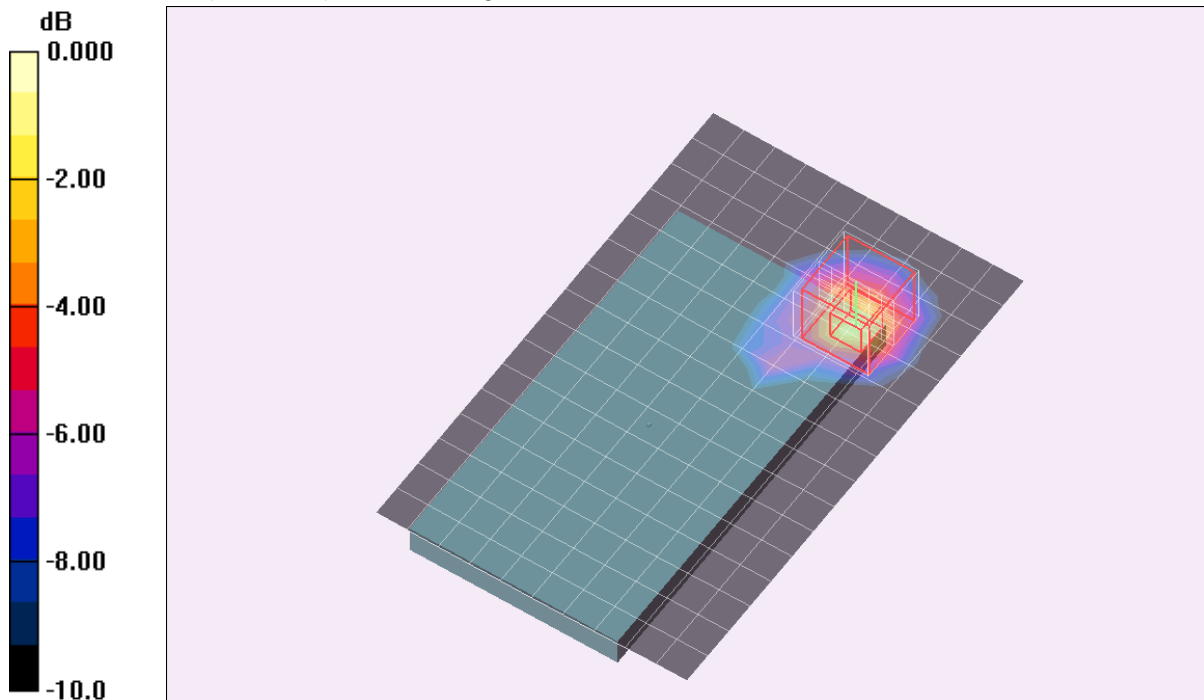
Frequency: 5260 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C
Medium parameters used: $f = 5260$ MHz; $\sigma = 5.38$ mho/m; $\epsilon_r = 47.7$; $\rho = 1000$ kg/m³;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(4.11, 4.11, 4.11); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BB; Serial: SN:1017

Rear/802.11a/Ch52/Area Scan (11x17x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.173 mW/g

Rear/802.11a/Ch52/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 6.72 V/m; Power Drift = -0.130 dB
Peak SAR (extrapolated) = 0.428 W/kg
SAR(1 g) = 0.138 mW/g; SAR(10 g) = 0.048 mW/g
Maximum value of SAR (measured) = 0.232 mW/g



0 dB = 0.232mW/g

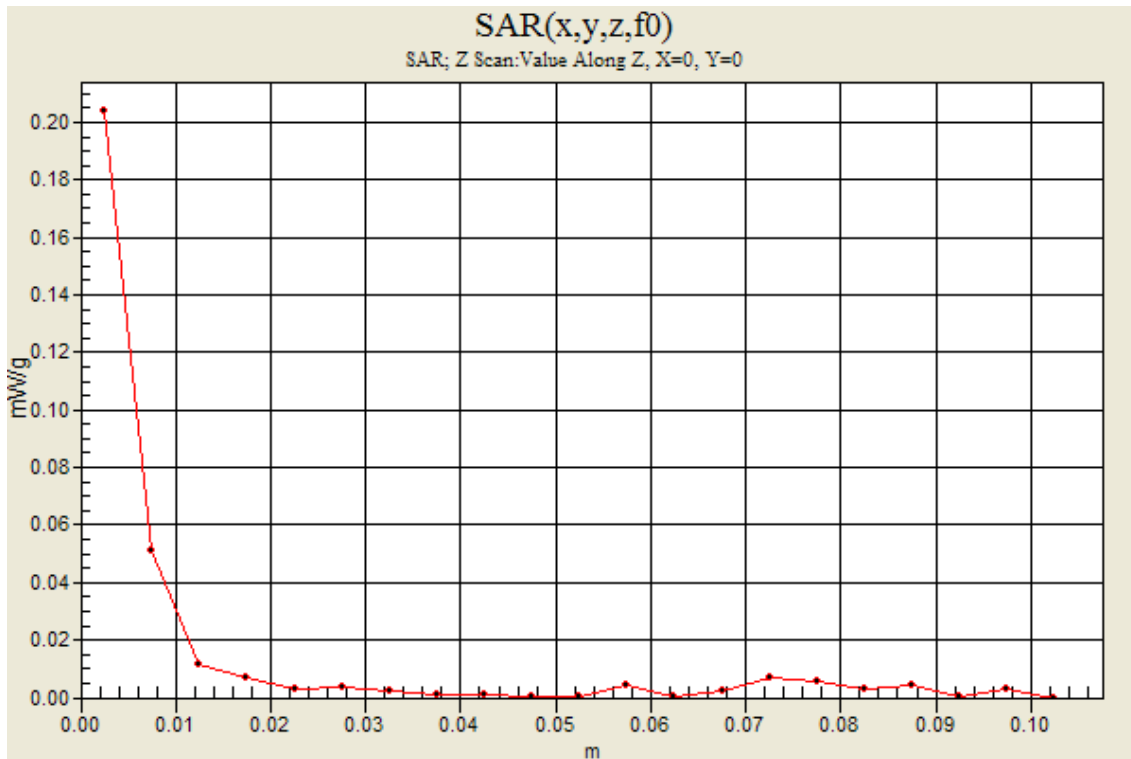
Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/28/2012

WiFi 5.3GHz Band

Frequency: 5260 MHz; Duty Cycle: 1:1

Rear/802.11a/Ch52/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 0.204 mW/g



Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/26/2012

WiFi 5.5GHz Band

Frequency: 5520 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C
Medium parameters used: $f = 5520 \text{ MHz}$; $\sigma = 5.02 \text{ mho/m}$; $\epsilon_r = 35.3$; $\rho = 1000 \text{ kg/m}^3$;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(4.19, 4.19, 4.19); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM A (Twin); Type: SAM A; Serial: 1050

Right Touch/802.11a/Ch104/Area Scan (11x18x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.232 mW/g

Right Touch/802.11a/Ch104/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm,

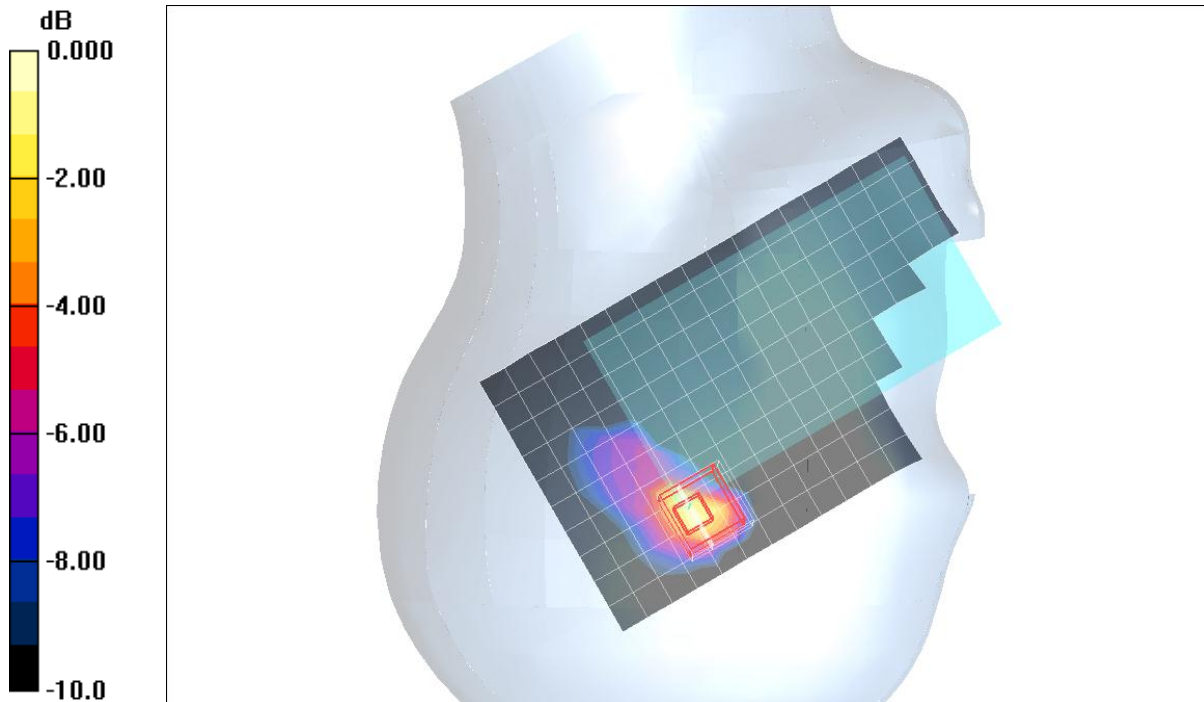
dz=2.5mm

Reference Value = 7.24 V/m; Power Drift = 0.170 dB

Peak SAR (extrapolated) = 0.650 W/kg

SAR(1 g) = 0.161 mW/g; SAR(10 g) = 0.049 mW/g

Maximum value of SAR (measured) = 0.276 mW/g

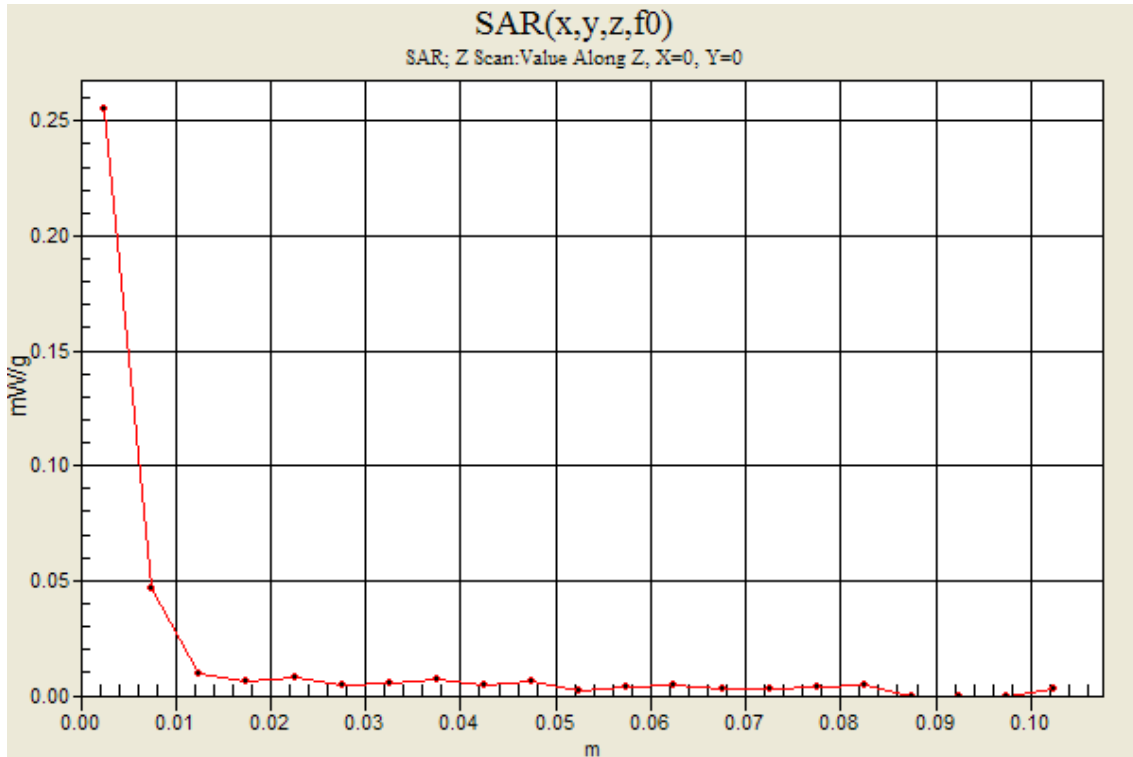


WiFi 5.5GHz Band

Frequency: 5520 MHz; Duty Cycle: 1:1

Right Touch/802.11a/Ch104/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of SAR (measured) = 0.255 mW/g



Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/30/2012

WiFi 5.5GHz Band

Frequency: 5520 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C
Medium parameters used: $f = 5520$ MHz; $\sigma = 5.75$ mho/m; $\epsilon_r = 50.1$; $\rho = 1000$ kg/m³;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(3.72, 3.72, 3.72); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BB; Serial: SN:1017

Rear/802.11a/Ch104/Area Scan (11x17x1): Measurement grid: dx=10mm, dy=10mm

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

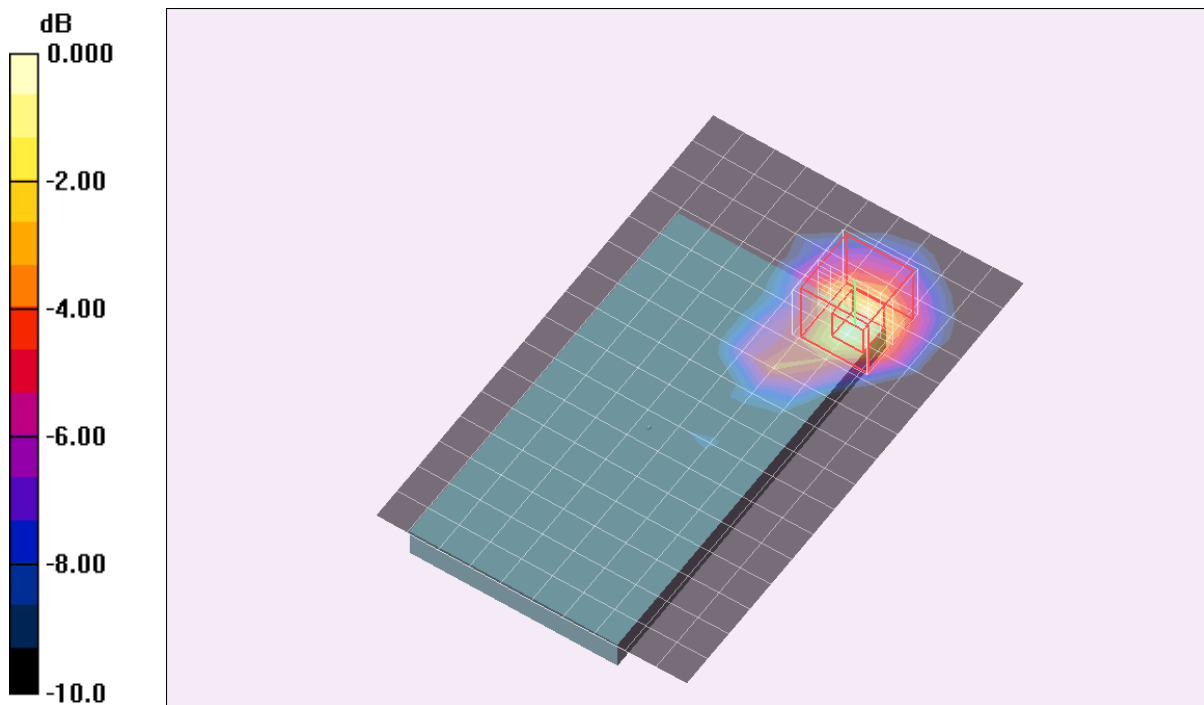
Rear/802.11a/Ch104/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 8.67 V/m; Power Drift = -0.131 dB

Peak SAR (extrapolated) = 0.786 W/kg

SAR(1 g) = 0.236 mW/g; SAR(10 g) = 0.085 mW/g

Maximum value of SAR (measured) = 0.403 mW/g



0 dB = 0.403mW/g

Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/25/2012

WiFi 5.8GHz Band

Frequency: 5745 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C
Medium parameters used: $f = 5745 \text{ MHz}$; $\sigma = 5.15 \text{ mho/m}$; $\epsilon_r = 35.2$; $\rho = 1000 \text{ kg/m}^3$;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(4.04, 4.04, 4.04); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM A (Twin); Type: SAM A; Serial: 1050

Right Touch/802.11a/Ch149/Area Scan (11x18x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
Maximum value of SAR (measured) = 0.120 mW/g

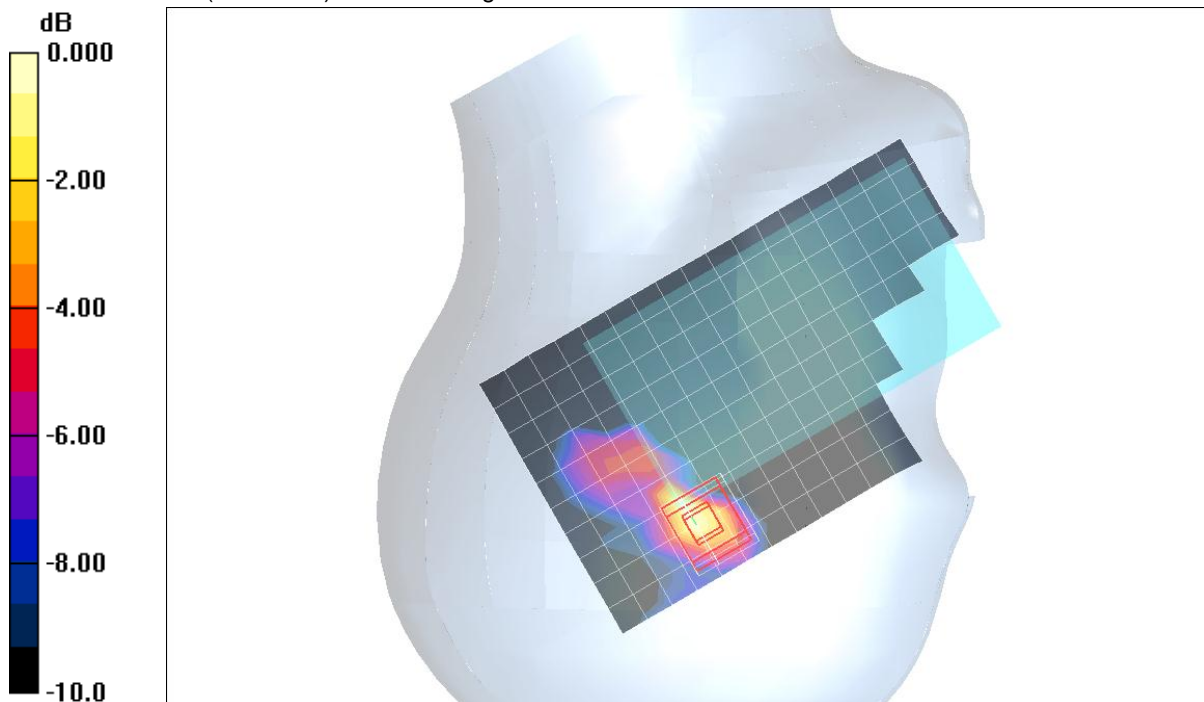
Right Touch/802.11a/Ch149/Zoom Scan (7x7x9)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 5.13 V/m; Power Drift = -0.049 dB

Peak SAR (extrapolated) = 0.258 W/kg

SAR(1 g) = 0.067 mW/g; SAR(10 g) = 0.019 mW/g

Maximum value of SAR (measured) = 0.127 mW/g

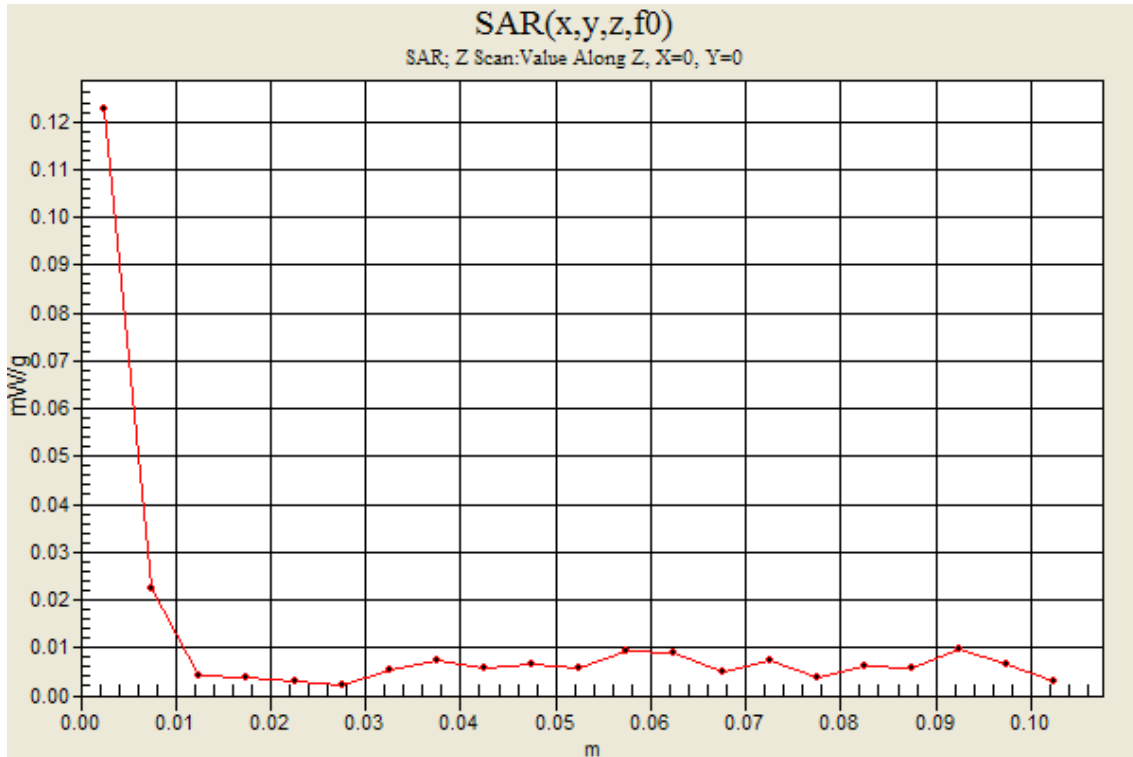


0 dB = 0.127mW/g

WiFi 5.8GHz Band

Frequency: 5745 MHz; Duty Cycle: 1:1

Right Touch/802.11a/Ch149/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 0.123 mW/g



Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/30/2012

WiFi 5.8GHz Band

Frequency: 5745 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C
Medium parameters used: $f = 5745 \text{ MHz}$; $\sigma = 6.01 \text{ mho/m}$; $\epsilon_r = 49.7$; $\rho = 1000 \text{ kg/m}^3$;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE3 Sn427; Calibrated: 1/17/2012
- Probe: EX3DV4 - SN3749; ConvF(3.81, 3.81, 3.81); Calibrated: 1/27/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BB; Serial: SN:1017

Rear with Headset/802.11a/Ch149/Area Scan (11x17x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (measured) = 0.399 mW/g

Rear with Headset/802.11a/Ch149/Zoom Scan (7x7x9)/Cube 0: Measurement grid: $dx=4\text{mm}$,

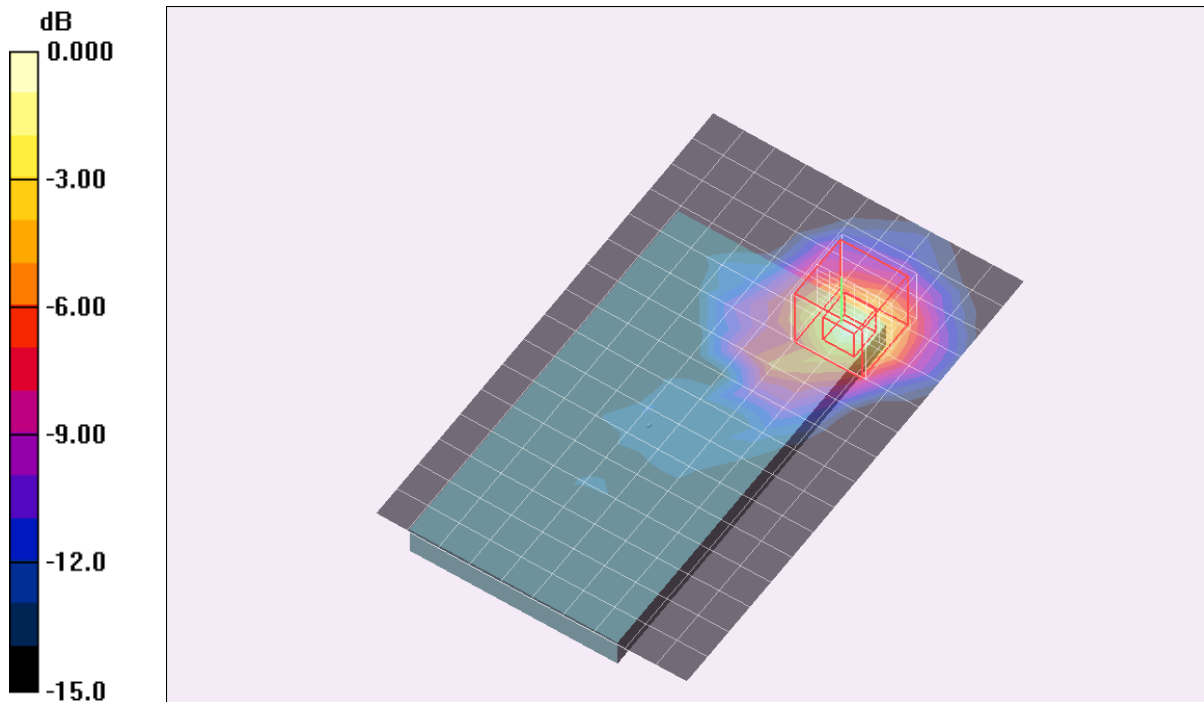
$dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 9.04 V/m; Power Drift = -0.032 dB

Peak SAR (extrapolated) = 0.934 W/kg

SAR(1 g) = 0.249 mW/g; SAR(10 g) = 0.081 mW/g

Maximum value of SAR (measured) = 0.428 mW/g



0 dB = 0.428mW/g

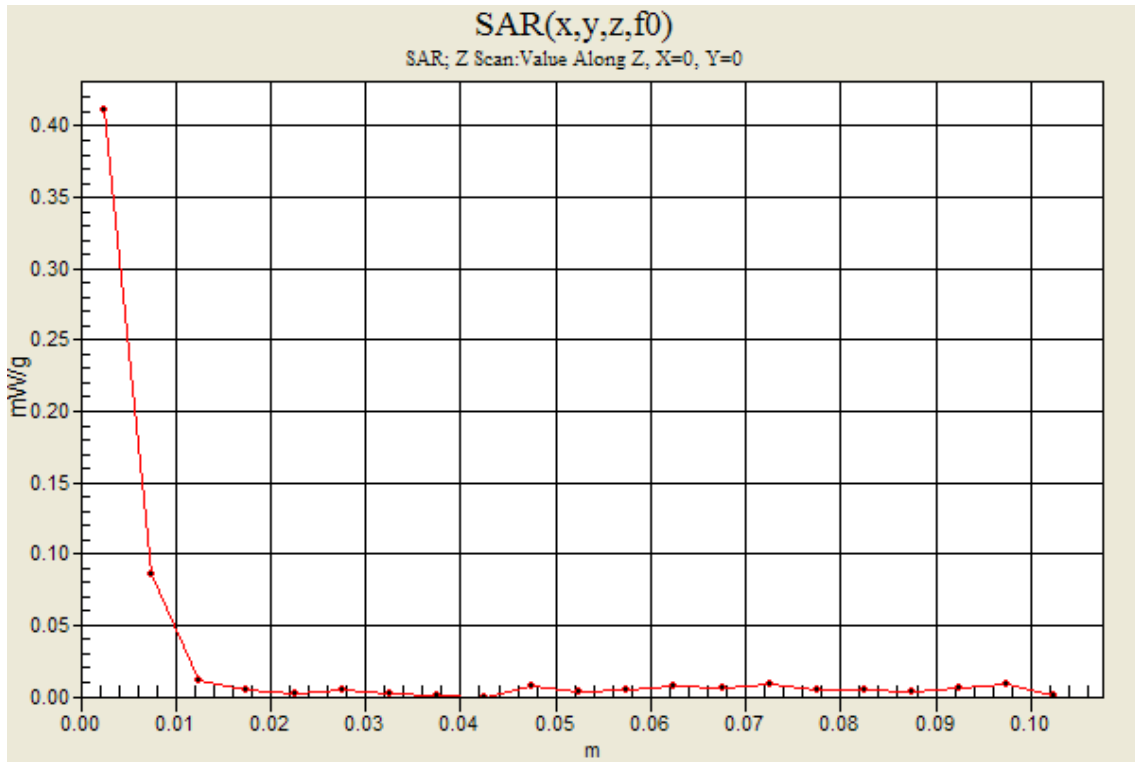
Test Laboratory: UL CCS SAR Lab D

Date/Time: 7/30/2012

WiFi 5.8GHz Band

Frequency: 5745 MHz; Duty Cycle: 1:1

Rear with Headset/802.11a/Ch149/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 0.411 mW/g



14. Simultaneous Transmission SAR Analysis

The Bluetooth's output power is $\leq 2 \cdot P_{Ref}$ (13.8 dBm / 24 mW), which stand-alone SAR evaluation is not required. Therefore, simultaneous transmission SAR evaluation is not required.

14.1. Sum of the 1-g Scaled SAR of Head Exposure Condition

Sum of the 1-g Scaled SAR for WWAN and WiFi 2.4GHz Band

Test Position	GSM850	GSM1900	W-CDMA (UMTS) Band V	W-CDMA (UMTS) Band II	W-CDMA (UMTS) Band IV	WiFi 2.4 GHz Band	Σ 1-g SAR (mW/g)
Left Touch	0.129					0.243	0.372
		0.151				0.243	0.394
			0.174			0.243	0.417
				0.214		0.243	0.457
					0.284	0.243	0.527
Left Tilt	0.081					0.216	0.297
		0.047				0.216	0.263
			0.109			0.216	0.325
				0.077		0.216	0.293
					0.077	0.216	0.293
Right Touch	0.111					0.569	0.680
		0.168				0.569	0.737
			0.153			0.569	0.722
				0.280		0.569	0.849
					0.235	0.569	0.804
Right Tilt	0.080					0.367	0.447
		0.035				0.367	0.402
			0.104			0.367	0.471
				0.054		0.367	0.421
					0.083	0.367	0.450

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

Conclusion:

- Simultaneous transmission SAR measurement (Volume Scan) is not required because the sum of the 1-g SAR is < 1.6 W/kg.

Sum of the 1-g Scaled SAR for WWAN and WiFi 5.2GHz Band

Test Position	GSM850	GSM1900	W-CDMA (UMTS) Band V	W-CDMA (UMTS) Band II	W-CDMA (UMTS) Band IV	WiFi 5.2 GHz Band	∑ 1-g SAR (mW/g)
Left Touch	0.129					0.037	0.166
		0.151				0.037	0.188
			0.174			0.037	0.211
				0.214		0.037	0.251
					0.284	0.037	0.321
Left Tilt	0.081					0.039	0.120
		0.047				0.039	0.086
			0.109			0.039	0.148
				0.077		0.039	0.116
					0.077	0.039	0.116
Right Touch	0.111					0.119	0.230
		0.168				0.119	0.287
			0.153			0.119	0.272
				0.280		0.119	0.399
					0.235	0.119	0.354
Right Tilt	0.080					0.098	0.178
		0.035				0.098	0.133
			0.104			0.098	0.202
				0.054		0.098	0.152
					0.083	0.098	0.181

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

Conclusion:

- Simultaneous transmission SAR measurement (Volume Scan) is not required because the sum of the 1-g SAR is < 1.6 W/kg.

Sum of the 1-g Scaled SAR for WWAN and WiFi 5.3GHz Band

Test Position	GSM850	GSM1900	W-CDMA (UMTS) Band V	W-CDMA (UMTS) Band II	W-CDMA (UMTS) Band IV	WiFi 5.3 GHz Band	∑ 1-g SAR (mW/g)
Left Touch	0.129					0.037	0.166
		0.151				0.037	0.188
			0.174			0.037	0.211
				0.214		0.037	0.251
					0.284	0.037	0.321
Left Tilt	0.081					0.040	0.121
		0.047				0.040	0.087
			0.109			0.040	0.149
				0.077		0.040	0.117
					0.077	0.040	0.117
Right Touch	0.111					0.139	0.250
		0.168				0.139	0.307
			0.153			0.139	0.292
				0.280		0.139	0.419
					0.235	0.139	0.374
Right Tilt	0.080					0.099	0.179
		0.035				0.099	0.134
			0.104			0.099	0.203
				0.054		0.099	0.153
					0.083	0.099	0.182

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

Conclusion:

- Simultaneous transmission SAR measurement (Volume Scan) is not required because the sum of the 1-g SAR is < 1.6 W/kg.

Sum of the 1-g Scaled SAR for WWAN and WiFi 5.5GHz Band

Test Position	GSM850	GSM1900	W-CDMA (UMTS) Band V	W-CDMA (UMTS) Band II	W-CDMA (UMTS) Band IV	WiFi 5.5 GHz Band	∑ 1-g SAR (mW/g)
Left Touch	0.129					0.075	0.204
		0.151				0.075	0.226
			0.174			0.075	0.249
				0.214		0.075	0.289
					0.284	0.075	0.359
Left Tilt	0.081					0.085	0.166
		0.047				0.085	0.132
			0.109			0.085	0.194
				0.077		0.085	0.162
					0.077	0.085	0.162
Right Touch	0.111					0.181	0.292
		0.168				0.181	0.349
			0.153			0.181	0.334
				0.280		0.181	0.461
					0.235	0.181	0.416
Right Tilt	0.080					0.120	0.200
		0.035				0.120	0.155
			0.104			0.120	0.224
				0.054		0.120	0.174
					0.083	0.120	0.203

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

Conclusion:

- Simultaneous transmission SAR measurement (Volume Scan) is not required because the sum of the 1-g SAR is < 1.6 W/kg.

Sum of the 1-g Scaled SAR for WWAN and WiFi 5.8GHz Band

Test Position	GSM850	GSM1900	W-CDMA (UMTS) Band V	W-CDMA (UMTS) Band II	W-CDMA (UMTS) Band IV	WiFi 5.8 GHz Band	∑ 1-g SAR (mW/g)
Left Touch	0.129					0.035	0.164
		0.151				0.035	0.186
			0.173			0.035	0.208
				0.214		0.035	0.249
					0.284	0.035	0.319
Left Tilt	0.081					0.056	0.137
		0.047				0.056	0.103
			0.109			0.056	0.165
				0.077		0.056	0.133
					0.077	0.056	0.133
Right Touch	0.111					0.075	0.186
		0.168				0.075	0.243
			0.153			0.075	0.228
				0.280		0.075	0.355
					0.235	0.075	0.310
Right Tilt	0.080					0.046	0.126
		0.035				0.046	0.081
			0.104			0.046	0.150
				0.054		0.046	0.100
					0.083	0.046	0.129

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

Conclusion:

- Simultaneous transmission SAR measurement (Volume Scan) is not required because the sum of the 1-g SAR is < 1.6 W/kg.

14.2. Sum of the 1-g Scaled SAR of Body Exposure Condition

Sum of the 1-g Scaled SAR for WWAN and WiFi 2.4GHz Band

Test Position	GSM850	GSM1900	W-CDMA (UMTS) Band V	W-CDMA (UMTS) Band II	W-CDMA (UMTS) Band IV	WiFi 2.4 GHz Band	∑ 1-g SAR (mW/g)
Rear	0.429					0.240	0.669
		0.725				0.240	0.965
			0.520			0.240	0.760
				1.309		0.240	1.549
					0.869	0.240	1.109
Front	0.180					0.137	0.317
		0.247				0.137	0.384
			0.212			0.137	0.349
				0.498		0.137	0.635
					0.461	0.137	0.598

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

Conclusion:

- Simultaneous transmission SAR measurement (Volume Scan) is not required because the sum of the 1-g SAR is < 1.6 W/kg.

Sum of the 1-g Scaled SAR for WWAN and WiFi 5.2GHz Band

Test Position	GSM850	GSM1900	W-CDMA (UMTS) Band V	W-CDMA (UMTS) Band II	W-CDMA (UMTS) Band IV	WiFi 5.2 GHz Band	∑ 1-g SAR (mW/g)
Rear	0.429					0.146	0.575
		0.725				0.146	0.871
			0.520			0.146	0.666
				1.309		0.146	1.455
					0.869	0.146	1.015
Front	0.180					0.025	0.205
		0.247				0.025	0.272
			0.212			0.025	0.237
				0.498		0.025	0.523
					0.461	0.025	0.486

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

Conclusion:

- Simultaneous transmission SAR measurement (Volume Scan) is not required because the sum of the 1-g SAR is < 1.6 W/kg.

Sum of the 1-g Scaled SAR for WWAN and WiFi 5.3GHz Band

Test Position	GSM850	GSM1900	W-CDMA (UMTS) Band V	W-CDMA (UMTS) Band II	W-CDMA (UMTS) Band IV	WiFi 5.3 GHz Band	∑ 1-g SAR (mW/g)
Rear	0.429					0.178	0.607
		0.725				0.178	0.903
			0.520			0.178	0.698
				1.309		0.178	1.487
					0.869	0.178	1.047
Front	0.180					0.032	0.212
		0.247				0.032	0.279
			0.212			0.032	0.244
				0.498		0.032	0.530
					0.461	0.032	0.493

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

Conclusion:

- Simultaneous transmission SAR measurement (Volume Scan) is not required because the sum of the 1-g SAR is < 1.6 W/kg.

Sum of the 1-g Scaled SAR for WWAN and WiFi 5.5GHz Band

Test Position	GSM850	GSM1900	W-CDMA (UMTS) Band V	W-CDMA (UMTS) Band II	W-CDMA (UMTS) Band IV	WiFi 5.5 GHz Band	∑ 1-g SAR (mW/g)
Rear	0.429					0.269	0.698
		0.725				0.269	0.994
			0.520			0.269	0.789
				1.309		0.269	1.578
					0.869	0.269	1.138
Front	0.180					0.042	0.222
		0.247				0.042	0.289
			0.212			0.042	0.254
				0.498		0.042	0.540
					0.461	0.042	0.503

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

Conclusion:

- Simultaneous transmission SAR measurement (Volume Scan) is not required because the sum of the 1-g SAR is < 1.6 W/kg.

Sum of the 1-g Scaled SAR for WWAN and WiFi 5.8GHz Band

Test Position	GSM850	GSM1900	W-CDMA (UMTS) Band V	W-CDMA (UMTS) Band II	W-CDMA (UMTS) Band IV	WiFi 5.8 GHz Band	Σ 1-g SAR (mW/g)
Rear	0.429					0.279	0.708
		0.725				0.279	1.004
			0.520			0.279	0.799
				1.309		0.279	1.588
					0.869	0.279	1.148
Front	0.180					0.026	0.206
		0.247				0.026	0.273
			0.212			0.026	0.238
				0.498		0.026	0.524
					0.461	0.026	0.487

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

Conclusion:

- Simultaneous transmission SAR measurement (Volume Scan) is not required because the sum of the 1-g SAR is < 1.6 W/kg.
-

14.3. Sum of the 1-g Scaled SAR of Hotspot Exposure Condition

Sum of the 1-g Scaled SAR for WWAN and WiFi 2.4GHz Band

Test Position	GSM850	GSM1900	W-CDMA (UMTS) Band V	W-CDMA (UMTS) Band II	W-CDMA (UMTS) Band IV	WiFi 2.4 GHz Band	∑ 1-g SAR (mW/g)
Rear	0.542					0.240	0.782
		0.975				0.240	1.215
			0.520			0.240	0.760
				1.309		0.240	1.549
					0.869	0.240	1.109
Front	0.233					0.137	0.370
		0.298				0.137	0.435
			0.212			0.137	0.349
				0.498		0.137	0.635
					0.461	0.137	0.598
Edge 4	0.238					0.127	0.365
		0.077				0.127	0.204
			0.271			0.127	0.398
				0.101		0.127	0.228
					0.156	0.127	0.283

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

Conclusion:

- Simultaneous transmission SAR measurement (Volume Scan) is not required because the sum of the 1-g SAR is < 1.6 W/kg.

15. Appendixes

Refer to separated files for the following appendixes.

- 15.1. System Performance Check Plots
- 15.2. SAR Test Plots for GSM850
- 15.3. SAR Test Plots for GSM1900
- 15.4. SAR Test Plots for W-CDMA Band V
- 15.5. SAR Test Plots for W-CDMA Band II
- 15.6. SAR Test Plots for W-CDMA Band IV
- 15.7. SAR Test Plots for WiFi 2.4GHz Band
- 15.8. SAR Test Plots for WiFi 5 GHz Bands
- 15.9. Calibration Certificate for E-Field Probe EX3DV4 - SN 3749
- 15.10. Calibration Certificate for D835V2 - SN 4d002
- 15.11. Calibration Certificate for D1750V2 - SN 1050
- 15.12. Calibration Certificate for D1900V2 - SN 5d140
- 15.13. Calibration Certificate for D2450V2 - SN 706
- 15.14. Calibration Certificate for D5GHzV2 - SN 1075
- 15.15. Calibration Certificate for D1900V2 - SN 5d043