



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

SAR EVALUATION REPORT

For

Cellular/AWS/PCS CDMA & AWS/PCS LTE Phone with Bluetooth and WLAN

**Base Model: MS770, LG-MS770, LGMS770, LW770, LG-LW770, LGLW770
FCC ID: ZNFMS770**

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Prepared for

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--	5/23/2012	Initial Issue	--
A	6/6/2012	Updated report based on reviewer's comments <ol style="list-style-type: none">1. Removed Sec. 7 and inserted the summary of highest 1-g SAR results into Sec. 12. Added Sec. 15.1. Scaled SAR Values to the Maximum tune-up Tolerances	Sunny Shih
B	6/18/2012	Made the following revisions in response to reviewer's comments: <ol style="list-style-type: none">1. Amended table in Sec. 15.1 to include more comprehensive scaled SAR data.2. Revised Section 16 to apply scaled SAR considerations to Simultaneous Transmission Analyses.	Ray Su

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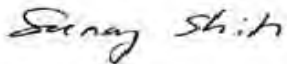

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1. Attestation of Test Results

Applicant	LG ELECTRONICS MOBILECOMM U.S.A., INC.		
DUT description	Cellular/AWS/PCS CDMA & AWS/PCS LTE Phone with Bluetooth and WLAN		
Model	MS770, LG-MS770, LGMS770, LW770, LG-LW770, LGLW770		
Test device is	An identical prototype		
Device category	Portable		
Exposure category	General Population/Uncontrolled Exposure		
Date tested	4/23/2012 – 5/10/2012		
FCC Rule Parts	Freq. Range	Highest 1-g SAR	Limit
22	824-849MHz	Head: 0.603 W/kg (Left Touch) (1xRTT) Body & Hotspot: 1.06 W/kg (Rear w/ 10mm distance) (1xRTT)	1.6 W/kg
24	1850-1910MHz	Head: 1.01 W/kg (Left Touch) (1xEV-DO) Body: 0.999 W/kg (Front w/ 10 mm distance) (1xRTT) Hotspot: 1.24 W/kg (Edge 3 w/ 10mm distance) (1xRTT)	
24 (LTE Band 2)	1850-1910MHz	Head: 1.03 W/kg (Left Touch) Body & Hotspot: 0.763 W/kg (Rear w/ 10 mm distance)	
27 (CDMA BC15)	1711.25-1753.75MHz	Head: 0.662 W/kg (Right Touch) (1xRTT) Body & Hotspot: 0.736 W/kg (Rear w/ 10mm distance) (1xRTT)	
27 (LTE Band 4)	1710-1755MHz	Head: 0.661 W/kg (Left Touch) Body & Hotspot: 0.748 W/kg (Rear w/ 10 mm distance)	
15.247	2412-2462MHz	Head: 0.142 W/kg (Right Touch) Body & Hotspot: 0.119 W/kg (Rear w/ 10 mm distance)	
Simultaneous Transmission Condition:		1.551 W/kg	
Applicable Standards			Test Results
FCC OET Bulletin 65 Supplement C 01-01 and IEEE Std 1528-2003			Pass
<p>Compliance Certification Services, Inc. (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.</p> <p>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.</p>			
Approved & Released For UL CCS By:		Tested By:	
			
Sunny Shih Engineering Leader Compliance Certification Services (UL CCS)		Elijah Garcia Laboratory Technician I Compliance Certification Services (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 and the following KDB Procedures:

- 648474 D01 SAR Handsets Multi Xmitter and Ant, v01r05
- 248227 D01 SAR meas for 802 11abg v01r02
- 941225 D01 SAR test for 3G devices v02
- 941225 D05 SAR for LTE Devices v01
- 941225 D06 Hot Spot SAR v01

KDB Inquiry #: 760669

Test Reduction for 1x Advanced

KDB Inquiry #: 181634

As this device, MS770 (FCC ID ZNFMS770) is similar to the model LG-VS920 (FCC ID BEJVS920), KDB Inquiry # 181634 was used in the testing of this filing.

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	R & S	CMU200	106291	6	24	2012
Base Station Simulator	R & S	CMW500	10-300233773	12	14	2012
ESA Series Network Analyzer	Agilent	E5071B	MY42100131	2	11	2013
Synthesized Signal Generator	HP	83732B	US34490599	7	14	2012
E-Field Probe	SPEAG	EX3DV4	3772	2	16	2013
E-Field Probe	SPEAG	EX3DV3	3531	12	19	2012
Thermometer	ERTCO	639-1S	1718	7	19	2012
Data Acquisition Electronics	SPEAG	DAE4	1258	3	8	2013
Data Acquisition Electronics	SPEAG	DAE4	1259	2	13	2013
System Validation Dipole	SPEAG	D1750V2	1053	5	27	2012
System Validation Dipole	SPEAG	D835V2	4d002	3	6	2013
System Validation Dipole	SPEAG	D1900V2	5d043	11	10	2012
System Validation Dipole	SPEAG	D2450V2	748	2	7	2013
Power Meter	HP	437B	3125U16345	5	13	2012
Power Sensor	HP	8481A	2702A60780	5	13	2012
Amplifier	MITEQ	4D00400600-50-30P	1620606	N/A		
Directional coupler	Werlatone	C8060-102	2141	N/A		

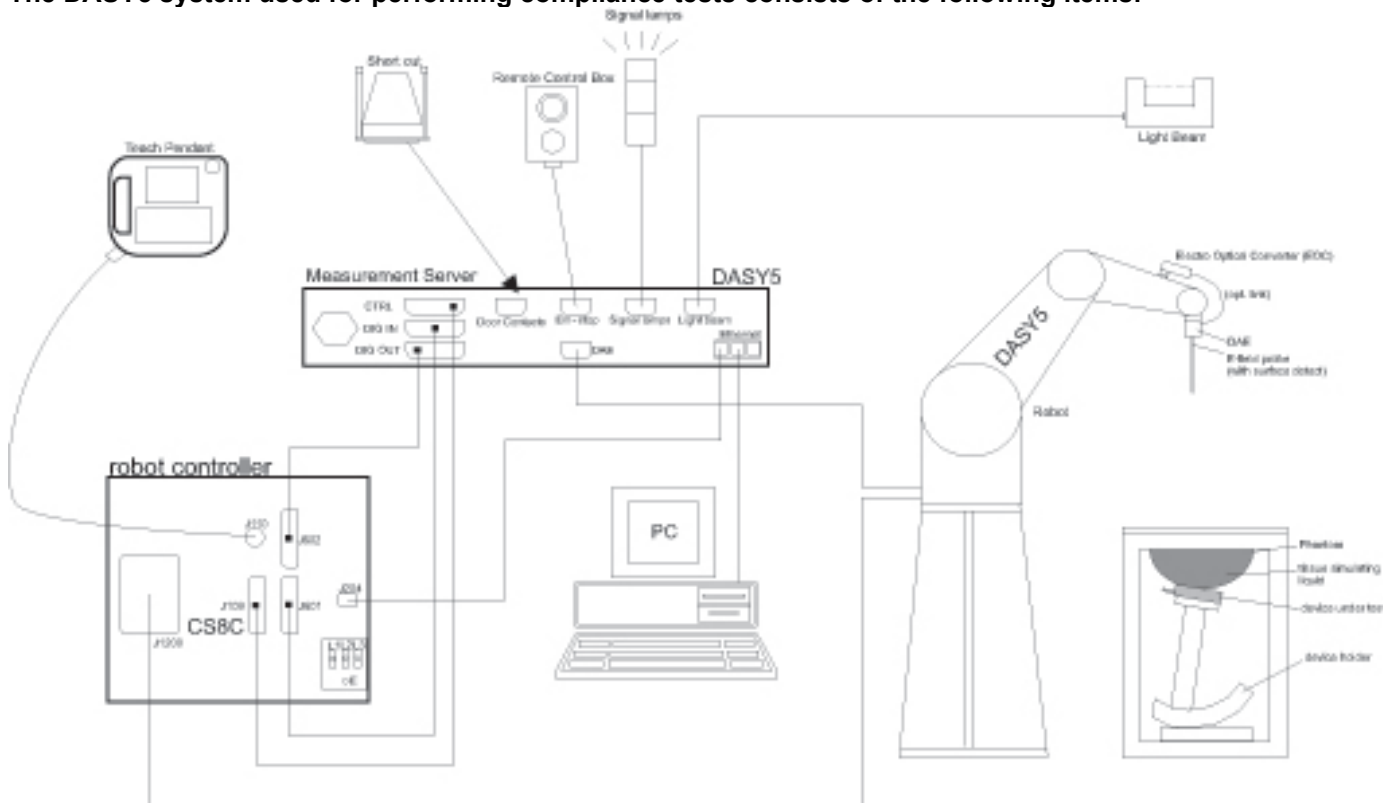
4.2. Measurement Uncertainty

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	-4.92	Normal	1	0.64	-3.15
Liquid Permittivity - deviation from target	5.00	Rectangular	1.732	0.6	1.73
Liquid Permittivity - measurement uncertainty	4.97	Normal	1	0.6	2.98
Combined Standard Uncertainty $U_c(y)$ =					10.66
Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =					21.32 %
Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =					1.68 dB

5. Measurement System Description and Setup

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



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP or Win7 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

6. SAR Measurement Procedure

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

Cellular/AWS/PCS CDMA & AWS/PCS LTE Phone with Bluetooth and WLAN Base Model: MS770, LG-MS770, LGMS770, LW770, LG-LW770, LGLW770	
Normal operation	<ul style="list-style-type: none"> - Held to head, - Body (Rear and Front sides) with 10 mm separation distance. - Hotspot (wireless router) with 10 mm separation distance to all sides and edges.
Accessory	<ol style="list-style-type: none"> 1. Headset 2. Battery Cover <ul style="list-style-type: none"> o Standard Battery Cove

7.1. Band and Air Interfaces

Tx Frequency Bands	<ul style="list-style-type: none"> - CDMA BC 0: 824 - 849 MHz - CDMA BC 1: 1850 - 1910 MHz - CDMA BC 15: 1711.25-1753.75 MHz - LTE Band 2: 1850 – 1910 MHz - LTE Band 4: 1710 - 1755 MHz - 802.11b/g/n: 2412 - 2462 MHz, b / g / HT20 - Bluetooth: 2402 - 2480 MHz
GPRS Multi-Slot Class:	Not supported
GPRS Class:	Not supported
DTM Class:	Not supported

7.2. Hotspot (Wireless router) Exposure Condition

The device is capable of personal hotspot mode. The hotspot mode can be enabled by the user.

7.3. Simultaneous Transmission

***MS770 All Usage Scenarios**

No.	Capable TX Configuration	Head SAR	Body SAR	Hotspot SAR	Power Reduction (CDMA EVDO)	Power Reduction (LTE)	Note
1	CDMA BC0 Voice	0	0	X	X	X	Standalone CDMA BC0 Voice
2	CDMA BC1 Voice	0	0	X	X	X	Standalone CDMA BC1 Voice
3	CDMA BC15 Voice	0	0	X	X	X	Standalone CDMA BC15 Voice
4	CDMA BC1 EVDO	0	0	X	X	X	Standalone CDMA BC1 EVDO
5	CDMA BC15 EVDO	0	0	X	X	X	Standalone CDMA BC15 EVDO
6	LTE B2	0	0	X	X	X	Standalone LTE B2
7	LTE B4	0	0	X	X	X	Standalone LTE B4
8	WiFi	0	0	X	X	X	Standalone WiFi
9	CDMA BC0 Voice + WiFi data	0	0	X	X	X	-
10	CDMA BC1 Voice + WiFi data	0	0	X	X	X	-
11	CDMA BC15 Voice + WiFi data	0	0	X	X	X	-
12	CDMA BC0 1x Data + WiFi data	X	X	0	X	X	CDMA Hotspot
13	CDMA BC1 1x Data/EVDO + WiFi data	X	X	0	X	X	CDMA Hotspot
14	CDMA BC15 1xData/EVDO + WiFi data	X	X	0	X	X	CDMA Hotspot
15	LTE B2 + WiFi data	X	X	0	X	X	LTE Hotspot
16	LTE B4 + WiFi data	X	X	0	X	X	LTE Hotspot
17	CDMA BC0 Voice + CDMA BC1 EVDO	0	0	X	0	X	SVDO
18	CDMA BC0 Voice + CDMA BC15 EVDO	0	0	X	0	X	SVDO
19	CDMA BC0 Voice + LTE B2	0	0	X	X	0	SVLTE
20	CDMA BC0 Voice + LTE B4	0	0	X	X	0	SVLTE
21	CDMA BC1 Voice + CDMA BC1 EVDO	0	0	X	0	X	SVDO
22	CDMA BC1 Voice + CDMA BC15 EVDO	0	0	X	0	X	SVDO
23	CDMA BC1 Voice + LTE B2	0	0	X	X	0	SVLTE
24	CDMA BC1 Voice + LTE B4	0	0	X	X	0	SVLTE
25	CDMA BC15 Voice + CDMA BC1 EVDO	0	0	X	0	X	SVDO
26	CDMA BC15 Voice + CDMA BC15 EVDO	0	0	X	0	X	SVDO
27	CDMA BC15 Voice + LTE B2	0	0	X	X	0	SVLTE
28	CDMA BC15 Voice + LTE B4	0	0	X	X	0	SVLTE
29	CDMA BC0 Voice + CDMA BC1 EVDO + WiFi	0	X	0	0	X	WiFi Hotspot (SVDO)
30	CDMA BC0 Voice + CDMA BC15 EVDO + WiFi	0	X	0	0	X	WiFi Hotspot (SVDO)
31	CDMA BC0 Voice + LTE B2 + WiFi	0	X	0	X	0	WiFi Hotspot (SVLTE)
32	CDMA BC0 Voice + LTE B4+ WiFi	0	X	0	X	0	WiFi Hotspot (SVLTE)
33	CDMA BC1 Voice + CDMA BC1 EVDO+ WiFi	0	X	0	0	X	WiFi Hotspot (SVDO)
34	CDMA BC1 Voice + CDMA BC15 EVDO+ WiFi	0	X	0	0	X	WiFi Hotspot (SVDO)
35	CDMA BC1 Voice + LTE B2+ WiFi	0	X	0	X	0	WiFi Hotspot (SVLTE)
36	CDMA BC1 Voice + LTE B4 + WiFi	0	X	0	X	0	WiFi Hotspot (SVLTE)
37	CDMA BC15 Voice + CDMA BC1 EVDO+ WiFi	0	X	0	0	X	WiFi Hotspot (SVDO)
38	CDMA BC15 Voice + CDMA BC15 EVDO+ WiFi	0	X	0	0	X	WiFi Hotspot (SVDO)
39	CDMA BC15 Voice + LTE B2 + WiFi	0	X	0	X	0	WiFi Hotspot (SVLTE)
40	CDMA BC15 Voice + LTE B4 + WiFi	0	X	0	X	0	WiFi Hotspot (SVLTE)

* The simultaneous transmission between BT and WiFi is not supported.
 * The simultaneous transmission between CDMA EVDO and LTE data is not supported.
 * CDMA BC0 EVDO is not supported.
 * SVLTE & SVDO are supported
 *Power Reduction for SVDO & SVLTE modes is applied
 *1x Advanced capability for CDMA BC0/BC1/BC15 is supported

7.4. KDB 941225 D05 SAR for LTE Devices v01

#	Description	Information
1	Identify the operating frequency range of each LTE transmission band used by the device	Band 2: 1850.7 – 1909.3 MHz Band 4: 1710.7 - 1750 MHz
2	Identify the channel bandwidths used in each frequency band; 1.4, 3, 5, 10, 15, 20 MHz etc	Band 2: 1.4, 3, 5, 10 MHz Band 4: 1.4, 3, 5, 10 MHz
3	Identify the high, middle and low (H, M, L) channel numbers and frequencies in each LTE frequency band	<p>LTE Band 2</p> <ul style="list-style-type: none"> - Bandwidth: 1.4MHz Ch No.: 18607 Frequency: 1850.7 MHz <li style="padding-left: 100px;">18900 Frequency: 1880 MHz <li style="padding-left: 100px;">19193 Frequency: 1909.3 MHz - Bandwidth: 3MHz Ch No.: 18615 Frequency: 1851.5 MHz <li style="padding-left: 100px;">18900 Frequency: 1880 MHz <li style="padding-left: 100px;">19185 Frequency: 1908.5 MHz - Bandwidth: 5MHz Ch No.: 18625 Frequency: 1852.5 MHz <li style="padding-left: 100px;">18900 Frequency: 1880 MHz <li style="padding-left: 100px;">19175 Frequency: 1907.5 MHz - Bandwidth: 10MHz Ch No.: 18650 Frequency: 1855 MHz <li style="padding-left: 100px;">18900 Frequency: 1880 MHz <li style="padding-left: 100px;">19150 Frequency: 1905 MHz <p>LTE Band 4</p> <ul style="list-style-type: none"> - Bandwidth: 1.4MHz Ch No.: 19957 Frequency: 1710.7 MHz <li style="padding-left: 100px;">20175 Frequency: 1732.5 MHz <li style="padding-left: 100px;">20393 Frequency: 1754.3 MHz - Bandwidth: 3MHz Ch No.: 19965 Frequency: 1711.5 MHz <li style="padding-left: 100px;">20175 Frequency: 1732.5 MHz <li style="padding-left: 100px;">20385 Frequency: 1753.5 MHz - Bandwidth: 5MHz Ch No.: 19975 Frequency: 1712.5 MHz <li style="padding-left: 100px;">20175 Frequency: 1732.5 MHz <li style="padding-left: 100px;">20375 Frequency: 1752.5 MHz - Bandwidth: 10MHz Ch No.: 20000 Frequency: 1715 MHz <li style="padding-left: 100px;">20175 Frequency: 1732.5 MHz <li style="padding-left: 100px;">20350 Frequency: 1750 MHz
4	Specify the UE category and uplink modulations used	The UE Category is 3 Uplink modulations: QPSK, 16QAM
5	Descriptions of the LTE transmitter and antenna implementation & identify whether it is a standalone transmitter operating independently of other wireless transmitters in the device or sharing hardware components and/or antenna(s) with other transmitters etc.	The LTE and EVDO BC1 and BC15 share the same hardware. For details, please refer to the antenna distance document.
6	Identify the LTE voice/data requirements in each operating mode and exposure condition with respect to head and body test configurations, antenna locations, handset flip-cover or slide positions, antenna diversity conditions, etc.	Exposure conditions 1) Body SAR is required. 2) Hotspot SAR: Front/Back/Edge 1/Edge 2 is required because LTE hotspot is supported.

KDB 941225 D05 SAR for LTE Devices v01 (continued)

7	Identify if Maximum Power Reduction (MPR) is optional or mandatory, i.e. built-in by design: a) only mandatory MPR may be considered during SAR testing, when the maximum output power is permanently limited by the MPR implemented within the UE; and only for the applicable RB (resource block) configurations specified in LTE standards b) A-MPR (additional MPR) must be disabled.	As per 3GPP TS 36.101: Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3 <table border="1" data-bbox="634 260 1477 506"> <thead> <tr> <th rowspan="2">Modulation</th> <th colspan="6">Channel bandwidth/Transmission bandwidth (RB)</th> <th rowspan="2">MPR (dB)</th> </tr> <tr> <th>1.4 MHz</th> <th>3.0 MHz</th> <th>5 MHz</th> <th>10 MHz</th> <th>15 MHz</th> <th>20 MHz</th> </tr> </thead> <tbody> <tr> <td>QPSK</td> <td>>5</td> <td>>4</td> <td>>8</td> <td>>12</td> <td>>16</td> <td>>18</td> <td>≤1</td> </tr> <tr> <td>16 QAM</td> <td>≤5</td> <td>≤4</td> <td>≤8</td> <td>≤12</td> <td>≤16</td> <td>≤18</td> <td>≤1</td> </tr> <tr> <td>16 QAM</td> <td>>5</td> <td>>4</td> <td>>8</td> <td>>12</td> <td>>16</td> <td>>18</td> <td>≤2</td> </tr> </tbody> </table> MPR is permanently built-in by design. A-MPR was disabled.	Modulation	Channel bandwidth/Transmission bandwidth (RB)						MPR (dB)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	QPSK	>5	>4	>8	>12	>16	>18	≤1	16 QAM	≤5	≤4	≤8	≤12	≤16	≤18	≤1	16 QAM	>5	>4	>8	>12	>16	>18	≤2
Modulation	Channel bandwidth/Transmission bandwidth (RB)						MPR (dB)																																	
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz																																		
QPSK	>5	>4	>8	>12	>16	>18	≤1																																	
16 QAM	≤5	≤4	≤8	≤12	≤16	≤18	≤1																																	
16 QAM	>5	>4	>8	>12	>16	>18	≤2																																	
8	Include the maximum average conducted output power measured on the required test channels for each channel bandwidth and UL modulation used in each frequency band: a) with 1 RB allocated at the upper edge of a channel b) with 1 RB allocated at the lower edge of a channel c) using 50% RB allocation centered within a channel d) using 100% RB allocation	Refer to the RF Output Power Table																																						
9	Identify all other U.S. wireless operating modes (3G, Wi-Fi, WiMax, Bluetooth etc), device/exposure configurations (head and body, antenna and handset flip-cover or slide positions, antenna diversity conditions etc.) and frequency bands used for these modes	* Supported band & Exposure conditions 1) Bluetooth 2.4GHz - Exposure Conditions: BT SAR is not required due to its low power and antenna separation distance. 2) WiFi 2.4GHz - Exposure Conditions: Head/Body SAR required * WiFi Hotspot is supported. 3) Supported WWAN bands: CDMA BC0/BC1/BC15 -Exposure Conditions: Head and Body SAR required; Hotspot SAR required on select modes.																																						
10	Include the maximum average conducted output power measured for the other wireless mode and frequency bands	See the section of RF output power measurements																																						
11	Identify the simultaneous transmission conditions for the voice and data configurations supported by all wireless modes, device configurations and frequency bands, for the head and body exposure conditions and device operating configurations (handset flip or cover positions, antenna diversity conditions etc.)	Refer to the table titled "MS770 All Usage Scenarios" under Section 8.3.																																						

KDB 941225 D05 SAR for LTE Devices v01 (continued)

12	When power reduction is applied to certain wireless modes to satisfy SAR compliance for simultaneous transmission conditions, other equipment certification or operating requirements, include the maximum average conducted output power measured in each power reduction mode applicable to the simultaneous voice/data transmission configurations for such wireless configurations and frequency bands; and also include details of the power reduction implementation and measurement setup	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3" style="text-align: center;">Power Reduction Operation Table for SVDO Mode</th> </tr> <tr> <th style="text-align: center;">Mode</th> <th style="text-align: center;">CDMA Current Voice Power for BC0, BC1, BC15</th> <th style="text-align: center;">CDMA EVDO Max. Power for BC1 & BC15</th> </tr> </thead> <tbody> <tr> <td rowspan="2" style="text-align: center;">SVDO</td> <td style="text-align: center;">P < 15.5 dBm</td> <td style="text-align: center;">23.5dBm (Limited)</td> </tr> <tr> <td style="text-align: center;">P ≥ 15.5 dBm</td> <td style="text-align: center;">18.5dBm (Limited)</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3" style="text-align: center;">Power Reduction Operation Table for SVLTE Mode</th> </tr> <tr> <th style="text-align: center;">Mode</th> <th style="text-align: center;">CDMA Current Voice Power for BC0, BC1, BC15</th> <th style="text-align: center;">LTE Max. Power for B2 & B4</th> </tr> </thead> <tbody> <tr> <td rowspan="2" style="text-align: center;">SVLTE</td> <td style="text-align: center;">P < 18.5 dBm</td> <td style="text-align: center;">22.8dBm (Limited)</td> </tr> <tr> <td style="text-align: center;">P ≥ 18.5 dBm</td> <td style="text-align: center;">18.8dBm (Limited)</td> </tr> </tbody> </table>	Power Reduction Operation Table for SVDO Mode			Mode	CDMA Current Voice Power for BC0, BC1, BC15	CDMA EVDO Max. Power for BC1 & BC15	SVDO	P < 15.5 dBm	23.5dBm (Limited)	P ≥ 15.5 dBm	18.5dBm (Limited)	Power Reduction Operation Table for SVLTE Mode			Mode	CDMA Current Voice Power for BC0, BC1, BC15	LTE Max. Power for B2 & B4	SVLTE	P < 18.5 dBm	22.8dBm (Limited)	P ≥ 18.5 dBm	18.8dBm (Limited)
Power Reduction Operation Table for SVDO Mode																								
Mode	CDMA Current Voice Power for BC0, BC1, BC15	CDMA EVDO Max. Power for BC1 & BC15																						
SVDO	P < 15.5 dBm	23.5dBm (Limited)																						
	P ≥ 15.5 dBm	18.5dBm (Limited)																						
Power Reduction Operation Table for SVLTE Mode																								
Mode	CDMA Current Voice Power for BC0, BC1, BC15	LTE Max. Power for B2 & B4																						
SVLTE	P < 18.5 dBm	22.8dBm (Limited)																						
	P ≥ 18.5 dBm	18.8dBm (Limited)																						
13	Include descriptions of the test equipment, test software, built-in test firmware etc. required to support testing the device when power reduction is applied to one or more transmitters/antennas for simultaneous voice/data transmission	Not Applicable																						
14	When appropriate, include a SAR test plan proposal with respect to the above	Not Applicable																						
15	If applicable, include preliminary SAR test data and/or supporting information in laboratory testing inquiries to address specific issues and concerns or for requesting further test reduction considerations appropriate for the device; for example, simultaneous transmission configurations	Not Applicable																						

8. Summary of Test Configurations

Refer to Section 19. "Antenna Location and Separation Distances" for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

8.1. Head Exposure Conditions for WWAN and WiFi

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

8.2. Body Exposure Conditions

For CDMA BC0/BC1/BC15, 1xRTT Mode

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	< 25 mm	Yes	
Front	< 25 mm	Yes	
Edge 1	93.1 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	2 mm	Yes	
Edge 3	2 mm	Yes	
Edge 4	15.1 mm	Yes	

For CDMA BC1/BC15, 1xEVDO Mode and LTE Band 2 & 4

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	< 25 mm	Yes	
Front	< 25 mm	Yes	
Edge 1	6.3 mm	Yes	
Edge 2	3.1 mm	Yes	
Edge 3	64.5 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 4	50.8 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

For WiFi

Test Configuration	Antenna-to-edge/surface	SAR Required	Note
Rear	< 25 mm	Yes	
Front	< 25 mm	Yes	
Edge 1	6.3 mm	Yes	
Edge 2	46.2 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	86.1 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	3.1 mm	Yes	

9. RF Output Power Measurement

9.1. CDMA BC0

1xRTT

Target Power: 24.5 dBm

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

CDMA			Avg Pwr (dBm)		
			RC1 - SO55	RC3 - SO55	RC3 - SO32
Band	Ch	Freq. (MHz)	(Loopback)	(Loopback)	(+F-SCH)
BC 0	1013	824.7	25.0	25.0	25.0
	384	836.52	25.2	25.1	25.1
	777	848.31	25.2	25.2	25.2

1x Advanced

Target Power: 24.5 dBm

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

CDMA			Avg Pwr (dBm)
			RC Fwd11, Rvs8 - SO75
Band	Ch	Freq. (MHz)	(Loopback)
BC 0	1013	824.7	25.0
	384	836.52	25.1
	777	848.31	25.2

9.2. CDMA BC1

1xRTT

Target Power: 23.8 dBm

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

CDMA			Avg Pwr (dBm)		
			RC1 - SO55	RC3 - SO55	RC3 - SO32
Band	Ch	Freq. (MHz)	(Loopback)	(Loopback)	(+F-SCH)
BC 1	25	1851.25	24.2	24.3	24.3
	600	1880	24.2	24.3	24.3
	1175	1908.75	24.2	24.2	24.3

1x Advanced

Target Power: 23.8 dBm

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

CDMA			Avg Pwr (dBm)
			RC Fwd11, Rvs8 - SO75
Band	Ch	Freq. (MHz)	(Loopback)
BC 1	25	1851.25	24.3
	600	1880	24.3
	1175	1908.75	24.3

1xEv-Do Rel. 0

Target Power: 23.5 dBm

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

Band	FTAP Rate	RTAP Rate	Channel	f (MHz)	Avg Pwr (dBm)
BC1	307.2 kbps (2 slot, QPSK)	153.6 kbps	25	1851.25	24.1
			600	1880	24.1
			1175	1908.75	24.0

1xEv-Do Rev. A

Target Power: 23.5 dBm

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

Band	FETAP Traffic Format	RETAP Data Payload Size	Channel	f (MHz)	Avg Pwr (dBm)
BC1	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	25	1851.25	24.0
			600	1880	24.1
			1175	1908.75	24.0

9.3. CDMA BC15

1xRTT

Target Power: 23.8 dBm

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

CDMA			Avg Pwr (dBm)		
			RC1 - SO55	RC3 - SO55	RC3 - SO32
Band	Ch	Freq. (MHz)	(Loopback)	(Loopback)	(+F-SCH)
BC 15	25	1711.25	24.2	24.3	24.3
	450	1732.5	24.3	24.2	24.2
	875	1754.75	24.3	24.3	24.3

1x Advanced

Target Power: 23.8 dBm

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

CDMA			Avg Pwr (dBm)
			RC Fwd11, Rvs8 - SO75
Band	Ch	Freq. (MHz)	(Loopback)
BC 15	25	1711.25	24.3
	450	1732.5	24.2
	875	754.75	24.3

1xEv-Do Rel. 0

Target Power: 23.5 dBm

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

Band	FTAP Rate	RTAP Rate	Channel	f (MHz)	Avg Pwr (dBm)
BC15	307.2 kbps (2 slot, QPSK)	153.6 kbps	25	1711.25	23.8
			450	1732.5	23.8
			875	1754.75	23.9

1xEv-Do Rev. A

Target Power: 23.5 dBm

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

Band	FETAP Traffic Format	RETAP Data Payload Size	Channel	f (MHz)	Avg Pwr (dBm)
BC15	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	25	1711.25	23.8
			450	1732.5	23.9
			875	1754.75	24.0

9.4. LTE Band 2

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

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

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

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4, 10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10, 15, 20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3	13	10	Table 6.2.4-2	Table 6.2.4-2
	6.6.3.3.2				
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23 ¹	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

Target Power: 22.8 dBm
 Tune-up Tolerance: -1.5 dB / +0.7 dB

Conducted Output Power for LTE Band 2

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
1.4	18607	1850.7	QPSK	1	0	0.0	0.1	23.4
				1	5	0.0	0.0	23.5
				3	2	0.0	0.1	23.4
				6	0	1.0	1.2	22.3
			16QAM	1	0	1.0	1.2	22.2
				1	5	1.0	1.1	22.4
	3	2		1.0	1.1	22.4		
	18900	1880.0	QPSK	6	0	1.5	1.6	21.9
				1	0	0.0	0.1	23.2
				1	5	0.0	0.0	23.3
				3	2	0.0	0.0	23.3
				6	0	1.0	0.9	22.4
				1	0	1.0	0.9	22.4
			16QAM	1	5	1.0	0.8	22.5
				3	2	1.0	0.9	22.4
				6	0	1.5	1.7	21.6
				1	0	0.0	0.2	23.2
				1	5	0.0	0.0	23.4
				3	2	0.0	0.2	23.2
	19193	1909.3	QPSK	6	0	1.0	1.1	22.3
				1	0	1.0	1.1	22.3
				1	5	1.0	1.2	22.2
			16QAM	3	2	1.0	1.0	22.3
				6	0	1.5	1.6	21.8
6				0	1.5	1.6	21.8	

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
3	18615	1851.5	QPSK	1	0	0.0	0.0	23.4
				1	14	0.0	0.1	23.3
				8	4	1.0	1.1	22.3
				15	0	1.0	0.9	22.4
			16QAM	1	0	1.0	0.8	22.6
				1	14	1.0	1.1	22.3
	8	4		1.5	1.4	22.0		
	18900	1880.0	QPSK	15	0	1.5	1.6	21.8
				1	0	0.0	0.0	23.5
				1	14	0.0	0.1	23.3
				8	4	1.0	1.2	22.3
				15	0	1.0	1.2	22.3
				1	0	1.0	0.8	22.6
			16QAM	1	14	1.0	1.0	22.5
				8	4	1.5	1.7	21.8
				15	0	1.5	1.7	21.8
				1	0	0.0	0.0	23.5
				1	14	0.0	0.2	23.3
				8	4	1.0	1.2	22.3
	19185	1908.5	QPSK	15	0	1.0	1.2	22.3
				1	0	1.0	0.9	22.6
				1	14	1.0	0.8	22.7
			16QAM	8	4	1.5	1.6	21.8
				15	0	1.5	1.7	21.8
15				0	1.5	1.7	21.8	

Conducted Output Power for LTE Band 2 continued

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
5	18625	1852.5	QPSK	1	0	0.0	0.0	23.4
				1	24	0.0	0.0	23.3
				12	6	0.5	0.6	22.8
				25	0	0.5	0.6	22.8
			16QAM	1	0	0.5	0.6	22.7
				1	24	0.5	0.6	22.8
				12	6	1.5	1.5	21.9
				25	0	1.0	0.9	22.5
	18900	1880.0	QPSK	1	0	0.0	0.0	23.3
				1	24	0.0	0.0	23.3
				12	6	0.5	0.6	22.8
				25	0	0.5	0.5	22.8
			16QAM	1	0	0.5	0.7	22.6
				1	24	0.5	0.6	22.7
				12	6	1.5	1.6	21.8
				25	0	1.0	1.0	22.3
	19175	1907.5	QPSK	1	0	0.0	0.0	23.5
				1	24	0.0	0.2	23.3
				12	6	0.5	0.7	22.8
				25	0	0.5	0.7	22.8
			16QAM	1	0	0.5	0.7	22.8
				1	24	0.5	0.6	22.9
				12	6	1.5	1.7	21.8
				25	0	1.0	1.0	22.5

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
10	18650	1855.0	QPSK	1	0	0.0	0.0	23.4
				1	49	0.0	0.1	23.3
				25	12	1.0	1.2	22.2
				50	0	1.0	1.0	22.3
			16QAM	1	0	1.0	0.9	22.4
				1	49	1.0	0.9	22.4
				25	12	1.5	1.5	21.9
				50	0	1.5	1.4	22.0
	18900	1880.0	QPSK	1	0	0.0	0.0	23.4
				1	49	0.0	0.0	23.4
				25	12	1.0	1.2	22.2
				50	0	1.0	1.0	22.3
			16QAM	1	0	1.0	1.0	22.4
				1	49	1.0	0.9	22.5
				25	12	1.5	1.6	21.8
				50	0	1.5	1.5	21.8
	19150	1905.0	QPSK	1	0	0.0	0.0	23.4
				1	49	0.0	0.0	23.4
				25	12	1.0	1.2	22.3
				50	0	1.0	1.2	22.3
			16QAM	1	0	1.0	1.1	22.4
				1	49	1.0	1.1	22.4
				25	12	1.5	1.7	21.8
				50	0	1.5	1.5	21.9

9.5. LTE Band 4

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

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

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

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4, 10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
NS_04	6.6.2.2.2	41	20	>10	≤ 1
			5	>6	≤ 1
NS_05	6.6.3.3.1	1	10, 15, 20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3	13	10	Table 6.2.4-2	Table 6.2.4-2
	6.6.3.3.2				
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23 ¹	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

Target Power: 22.8 dBm
 Tune-up Tolerance: -1.5 dB / +0.7 dB

Conducted Output Power for LTE Band 4

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
1.4	19957	1710.7	QPSK	1	0	0.0	0.1	23.4
				1	5	0.0	0.0	23.5
				3	2	0.0	0.1	23.4
				6	0	1.0	1.2	22.3
			16QAM	1	0	1.0	1.2	22.2
				1	5	1.0	1.1	22.4
				3	2	1.0	1.1	22.4
				6	0	1.5	1.6	21.9
	20175	1732.5	QPSK	1	0	0.0	0.0	23.4
				1	5	0.0	0.1	23.4
				3	2	0.0	0.1	23.3
				6	0	1.0	1.1	22.3
			16QAM	1	0	1.0	1.2	22.2
				1	5	1.0	1.2	22.3
				3	2	1.0	0.9	22.6
				6	0	1.5	1.5	21.9
	20393	1754.3	QPSK	1	0	0.0	0.0	23.4
				1	5	0.0	0.0	23.4
				3	2	0.0	0.1	23.3
				6	0	1.0	1.1	22.4
			16QAM	1	0	1.0	1.0	22.4
				1	5	1.0	0.8	22.6
				3	2	1.0	1.1	22.3
				6	0	1.5	1.4	22.0

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
3	19965	1711.5	QPSK	1	0	0.0	0.0	23.4
				1	14	0.0	0.1	23.3
				8	4	1.0	1.1	22.3
				15	0	1.0	0.9	22.4
			16QAM	1	0	1.0	0.8	22.6
				1	14	1.0	1.1	22.3
				8	4	1.5	1.4	22.0
				15	0	1.5	1.6	21.8
	20175	1732.5	QPSK	1	0	0.0	0.0	23.4
				1	14	0.0	0.1	23.4
				8	4	1.0	1.2	22.3
				15	0	1.0	1.2	22.3
			16QAM	1	0	1.0	1.2	22.2
				1	14	1.0	1.2	22.3
				8	4	1.5	1.5	21.9
				15	0	1.5	1.7	21.8
	20385	1753.5	QPSK	1	0	0.0	0.1	23.3
				1	14	0.0	0.0	23.4
				8	4	1.0	1.2	22.3
				15	0	1.0	1.2	22.3
			16QAM	1	0	1.0	1.2	22.2
				1	14	1.0	0.9	22.5
				8	4	1.5	1.7	21.8
				15	0	1.5	1.6	21.8

Conducted Output Power for LTE Band 4 continued

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
5	19975	1712.5	QPSK	1	0	0.0	0.0	23.4
				1	24	0.0	0.0	23.3
				12	6	0.5	0.6	22.8
				25	0	0.5	0.6	22.8
			16QAM	1	0	0.5	0.6	22.7
				1	24	0.5	0.6	22.8
				12	6	1.5	1.5	21.9
				25	0	1.0	0.9	22.5
	20175	1732.5	QPSK	1	0	0.0	0.0	23.4
				1	24	0.0	0.0	23.4
				12	6	0.5	0.7	22.8
				25	0	0.5	0.7	22.8
			16QAM	1	0	0.5	0.7	22.7
				1	24	0.5	0.7	22.8
				12	6	1.5	1.5	22.0
				25	0	1.0	0.9	22.6
	20375	1752.5	QPSK	1	0	0.0	0.0	23.4
				1	24	0.0	0.0	23.4
				12	6	0.5	0.6	22.8
				25	0	0.5	0.6	22.8
			16QAM	1	0	0.5	0.7	22.7
				1	24	0.5	0.6	22.8
				12	6	1.5	1.6	21.9
				25	0	1.0	0.9	22.5

BW	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	Target MPR	Meas. MPR	Avg Pwr (dBm)
10	20000	1715.0	QPSK	1	0	0.0	0.0	23.4
				1	49	0.0	0.1	23.3
				25	12	1.0	1.2	22.2
				50	0	1.0	1.0	22.3
			16QAM	1	0	1.0	0.9	22.5
				1	49	1.0	0.9	22.4
				25	12	1.5	1.5	21.9
				50	0	1.5	1.4	22.0
	20175	1732.5	QPSK	1	0	0.0	0.0	23.5
				1	49	0.0	0.1	23.4
				25	12	1.0	1.2	22.3
				50	0	1.0	1.2	22.3
			16QAM	1	0	1.0	1.0	22.5
				1	49	1.0	0.8	22.7
				25	12	1.5	1.5	22.0
				50	0	1.5	1.3	22.2
	20350	1750.0	QPSK	1	0	0.0	0.0	23.4
				1	49	0.0	0.0	23.3
				25	12	1.0	1.1	22.2
				50	0	1.0	1.0	22.3
			16QAM	1	0	1.0	1.1	22.3
				1	49	1.0	1.2	22.2
				25	12	1.5	1.7	21.7
				50	0	1.5	1.5	21.8

9.6. Power Reduction for SV-DO

Power Reduction Operation Table for SVDO Mode		
Mode	CDMA Current Voice Power for BC0, BC1, BC15	CDMA EVDO Max. Power for BC1 & BC15
SVDO	P < 15.5 dBm	23.5dBm (Limited)
	P ≥ 15.5 dBm	18.5dBm (Limited)

CDMA 1xRTT (BC0) to 1xEVDO (BC1 & BC15)

Agilent 8960		Agilent 8960					
CDMA BC0 1xRTT		BC1 1xEVDO			BC15 1xEVDO		
		Output Power [dBm]			Output Power [dBm]		
Ch#	Output Power [dBm]	25	600	1175	25	450	875
1013	15	24.02	24.01	23.89	23.95	24.12	23.96
	16	18.97	18.96	19.02	19.03	19.14	18.96
384	15	23.98	23.98	23.87	23.93	24.02	23.75
	16	19.04	19.01	19.03	19.01	19.12	18.97
777	15	23.98	23.99	23.88	23.94	24.03	23.83
	16	18.97	19.04	19.02	19.02	19.14	18.95

CDMA 1xRTT (BC1) to 1xEVDO (BC1 & BC15)

Agilent 8960		Agilent 8960					
CDMA BC1 1xRTT		BC1 1xEVDO			BC15 1xEVDO		
		Output Power [dBm]			Output Power [dBm]		
Ch. #	Output Power [dBm]	25	600	1175	25	450	875
25	15	24.03	23.97	23.87	23.94	24.00	23.96
	16	18.99	18.97	18.75	18.98	19.15	18.95
600	15	23.97	23.97	23.77	23.98	24.02	23.94
	16	18.95	18.97	18.75	19.02	19.16	18.93
1175	15	23.98	23.99	23.79	23.95	24.00	23.93
	16	18.95	19.04	18.82	18.98	19.14	18.95

CDMA 1xRTT (BC15) to 1xEVDO (BC1 & BC15)

Agilent 8960		Agilent 8960					
CDMA BC15 1xRTT		BC1 1xEVDO			BC15 1xEVDO		
		Output Power [dBm]			Output Power [dBm]		
Ch. #	Output Power [dBm]	25	600	1175	25	450	875
25	15	23.97	23.98	23.78	23.96	23.98	23.93
	16	18.86	18.97	18.85	18.81	19.04	18.95
450	15	23.97	23.98	23.79	23.95	23.97	23.85
	16	18.87	18.98	18.85	18.80	19.02	18.94
875	15	23.98	23.97	23.78	23.94	24.01	23.96
	16	18.87	18.99	18.87	18.83	18.99	18.95

9.7. Power Reduction for SV-LTE Band 2

Power Reduction Operation Table for SVLTE Mode		
Mode	CDMA Current Voice Power for BC0, BC1, BC15	LTE Max. Power for B2 & B4
SVLTE	P < 18.5 dBm	22.8dBm (Limited)
	P ≥ 18.5 dBm	18.8dBm (Limited)

CDMA 1xRTT (BC0) to SV-LTE Band 2 (QPSK, 16QAM)

LTE Band 2, 10 Mhz BW, CH 18900									
Agilent 8960		Anritsu MT8820C							
CDMA BC0 1xRTT		QPSK				16QAM			
		Output Power [dBm]				Output Power [dBm]			
Ch. #	Output Power [dBm]	1RB 0 offset	1RB 49 offset	25RB 12 offset	50RB 0 offset	1RB 0 offset	1RB 49 offset	25RB 12 offset	50RB 0 offset
1013	18	23.3	23.0	22.2	22.3	22.4	22.4	21.9	22.0
	19	19.1	19.1	19.1	19.3	19.1	19.1	19.1	19.3
384	18	23.1	23.2	22.3	22.3	22.4	22.4	21.8	21.9
	19	19.1	19.3	19.1	19.3	19.1	19.3	19.1	19.3
777	18	23.2	23.1	22.4	22.3	22.4	22.4	21.8	22.0
	19	19.0	19.1	19.4	19.3	19.2	19.3	19.4	19.3

CDMA 1xRTT (BC1) to SV-LTE Band 2 (QPSK, 16QAM)

LTE Band 2, 10 Mhz BW, CH 18900									
Agilent 8960		Anritsu MT8820C							
CDMA BC1 1xRTT		QPSK				16QAM			
		Output Power [dBm]				Output Power [dBm]			
Ch. #	Output Power [dBm]	1RB 0 offset	1RB 49 offset	25RB 12 offset	50RB 0 offset	1RB 0 offset	1RB 49 offset	25RB 12 offset	50RB 0 offset
25	18	23.0	23.2	22.2	22.3	22.5	22.3	22.0	21.9
	19	19.1	19.3	19.1	19.3	19.1	19.3	19.1	19.3
600	18	23.1	23.2	22.3	22.2	22.4	22.4	21.8	21.9
	19	19.1	19.3	19.1	19.3	19.1	19.3	19.1	19.4
1175	18	23.2	23.1	22.4	22.3	22.5	22.3	22.0	22.0
	19	19.1	19.3	19.1	19.3	19.1	19.3	19.1	19.3

CDMA 1xRTT (BC15) to SV-LTE Band 2 (QPSK, 16QAM)

LTE Band 2, 10 Mhz BW, CH 18900									
Agilent 8960		Anritsu MT8820C							
CDMA BC15 1xRTT		QPSK				16QAM			
		Output Power [dBm]				Output Power [dBm]			
Ch. #	Output Power [dBm]	1RB 0 offset	1RB 49 offset	25RB 12 offset	50RB 0 offset	1RB 0 offset	1RB 49 offset	25RB 12 offset	50RB 0 offset
25	18	23.3	23.3	22.2	22.2	22.4	22.4	21.9	22.0
	19	19.0	19.1	19.1	19.3	19.2	19.2	19.4	19.3
450	18	23.1	23.2	22.3	22.2	22.4	22.4	21.8	21.9
	19	19.1	19.3	19.3	19.3	19.1	19.3	19.1	19.3
875	18	23.2	23.1	22.4	22.2	22.4	22.4	21.8	22.0
	19	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.3

9.8. Power Reduction for SV-LTE Band 4

Power Reduction Operation Table for SVLTE Mode		
Mode	CDMA Current Voice Power for BC0, BC1, BC15	LTE Max. Power for B2 & B4
SVLTE	P < 18.5 dBm	22.8dBm (Limited)
	P ≥ 18.5 dBm	18.8dBm (Limited)

CDMA 1xRTT (BC0) to SV-LTE Band 4 (QPSK, 16QAM)

LTE Band 4, 10 Mhz BW, CH 20175									
Agilent 8960		Anritsu MT8820C							
CDMA BC0 1xRTT		QPSK				16QAM			
		Output Power [dBm]				Output Power [dBm]			
Ch. #	Output Power [dBm]	1RB 0 offset	1RB 49 offset	25RB 12 offset	50RB 0 offset	1RB 0 offset	1RB 49 offset	25RB 12 offset	50RB 0 offset
1013	18	23.1	23.3	22.2	22.2	22.3	22.4	21.8	22.0
	19	19.1	19.3	19.3	19.1	19.1	19.3	19.1	19.1
384	18	23.3	23.3	22.1	22.2	22.5	22.4	21.9	22.0
	19	19.3	19.2	19.3	19.1	19.1	19.3	19.1	19.1
777	18	23.3	23.2	22.1	22.2	22.5	22.4	21.9	22.0
	19	19.1	19.2	19.3	19.1	19.1	19.3	19.1	19.1

CDMA 1xRTT (BC1) to SV-LTE Band 4 (QPSK, 16QAM)

LTE Band 4, 10 Mhz BW, CH 20175									
Agilent 8960		Anritsu MT8820C							
CDMA BC1 1xRTT		QPSK				16QAM			
		Output Power [dBm]				Output Power [dBm]			
Ch. #	Output Power [dBm]	1RB 0 offset	1RB 49 offset	25RB 12 offset	50RB 0 offset	1RB 0 offset	1RB 49 offset	25RB 12 offset	50RB 0 offset
25	18	23.3	23.1	22.1	22.3	22.3	22.4	21.8	22.0
	19	19.30	19.30	19.20	19.20	19.20	19.30	19.30	19.20
600	18	23.3	23.3	22.1	22.2	22.4	22.4	21.9	22.0
	19	19.3	19.2	19.3	19.3	19.1	19.3	19.1	19.1
1175	18	23.1	23.2	22.2	22.3	22.3	22.4	21.9	22.0
	19	19.3	19.2	19.3	19.1	19.1	19.3	19.1	19.1

CDMA 1xRTT (BC15) to SV-LTE Band 4 (QPSK, 16QAM)

LTE Band 4, 10 Mhz BW, CH 20175									
Agilent 8960		Anritsu MT8820C							
CDMA BC5 1xRTT		QPSK				16QAM			
		Output Power [dBm]				Output Power [dBm]			
Ch. #	Output Power [dBm]	1RB 0 offset	1RB 49 offset	25RB 12 offset	50RB 0 offset	1RB 0 offset	1RB 49 offset	25RB 12 offset	50RB 0 offset
25	18	23.4	23.2	22.1	22.3	22.5	22.4	21.8	21.9
	19	19.3	19.2	19.3	19.1	19.1	19.3	19.1	19.1
450	18	23.3	23.3	22.1	22.2	22.4	22.4	21.9	22.0
	19	19.3	19.2	19.3	19.1	19.1	19.3	19.1	19.1
875	18	23.1	23.2	22.2	22.2	22.5	22.4	21.9	22.0
	19	19.1	19.3	19.3	19.1	19.3	19.3	19.1	19.2

9.9. Wi-Fi (11bgn)

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 $\frac{1}{4}$ dB \geq 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.

Output power table

Band (MHz)	Mode	Ch #	Freq. (MHz)	Target Power	Measured Avg Pwr(dBm)
2.4	802.11b	1	2412	16	15.6
		6	2437		15.5
		11	2462		15.4
	802.11g	1	2412	13	11.5
		6	2437		11.5
		11	2462		11.5
	802.11n (HT20)	1	2412	11	9.1
		6	2437		9.3
		11	2462		9.2

Note(s):

- SAR is not required for 802.11g/HT20 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a/b channels. As per KDB 248227

9.10. Bluetooth

Mode	Channel #	Freq. (MHz)	Conducted Avg Power	
			(dBm)	(mW)
V2.1 + EDR, GFSK	0	2402	7.7	5.89
	39	2441	8.2	6.61
	78	2480	8.7	7.41
V2.1 + EDR, 8-DPSK	0	2402	6.8	4.79
	39	2441	7.3	5.37
	78	2480	7.7	5.89
V4.0 LE, GFSK	0	2402	5.8	3.76
	39	2441	6.0	3.99
	78	2480	6.5	4.45

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) and antenna is ≥ 2.5 cm from other antennas
- Output $\leq P_{Ref}$ (10.79dBm / 12 mW) and antenna is < 2.5 cm from other antennas

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

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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

10.1. Composition of Ingredients for the Tissue Material Used in the SAR Tests

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

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

MSL/HSL750 (Body and Head liquids for 700 – 800 MHz)

Item	Head Tissue Simulation Liquids HSL750 Muscle (body) Tissue Simulation Liquids MSL750
Type No	SL AAH 075
Manufacturer	SPEAG
The item is composed of the following ingredients:	
H ² O	Water, 35 – 58%
Sucrose	Sugar, white, refined, 40-60%
NaCl	Sodium Chloride, 0-6%
Hydroxyethyl-cellulose	Medium Viscosity (CAS# 9004-62-0), <0.3%
Preventol-D7	Preservative: aqueous preparation, (CAS# 55965-84-9), containing 5-chloro-2-methyl-3(2H)-isothiazolone and 2-methyl-3(2H)-isothiazolone, 0.1-0.7%

Simulating Liquids for 5 GHz, Manufactured by SPEAG

Ingredients	(% by weight)
Water	78
Mineral oil	11
Emulsifiers	9
Additives and Salt	2

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.

Tissue Dielectric Parameter Check Results

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit \pm (%)	
04/23/2012	Body 2450	e'	51.1487	Relative Permittivity (ϵ_r):	51.15	52.70	-2.94	5
		e"	14.4028	Conductivity (σ):	1.96	1.95	0.62	5
	Body 2410	e'	51.2599	Relative Permittivity (ϵ_r):	51.26	52.76	-2.84	5
		e"	14.2387	Conductivity (σ):	1.91	1.91	0.03	5
	Body 2435	e'	51.1956	Relative Permittivity (ϵ_r):	51.20	52.73	-2.90	5
		e"	14.4028	Conductivity (σ):	1.95	1.93	0.98	5
Body 2475	e'	51.0647	Relative Permittivity (ϵ_r):	51.06	52.67	-3.05	5	
	e"	14.4028	Conductivity (σ):	1.98	1.99	-0.15	5	
04/24/2012	Head 2450	e'	38.8752	Relative Permittivity (ϵ_r):	38.88	39.20	-0.83	5
		e"	13.6692	Conductivity (σ):	1.86	1.80	3.45	5
	Head 2410	e'	38.9999	Relative Permittivity (ϵ_r):	39.00	39.28	-0.71	5
		e"	13.5333	Conductivity (σ):	1.81	1.76	3.01	5
	Head 2435	e'	38.9202	Relative Permittivity (ϵ_r):	38.92	39.24	-0.80	5
		e"	13.6213	Conductivity (σ):	1.84	1.78	3.47	5
Head 2475	e'	38.7800	Relative Permittivity (ϵ_r):	38.78	39.17	-0.99	5	
	e"	13.7461	Conductivity (σ):	1.89	1.83	3.54	5	
04/24/2012	Head 835	e'	41.7003	Relative Permittivity (ϵ_r):	41.70	41.50	0.48	5
		e"	18.9758	Conductivity (σ):	0.88	0.90	-2.11	5
	Head 825	e'	41.8221	Relative Permittivity (ϵ_r):	41.82	41.58	0.59	5
		e"	19.0073	Conductivity (σ):	0.87	0.90	-3.00	5
	Head 850	e'	41.5247	Relative Permittivity (ϵ_r):	41.52	41.50	0.06	5
		e"	18.9389	Conductivity (σ):	0.90	0.92	-2.17	5
04/24/2012	Body 835	e'	55.0374	Relative Permittivity (ϵ_r):	55.04	55.20	-0.29	5
		e"	21.2857	Conductivity (σ):	0.99	0.97	1.88	5
	Body 820	e'	55.1155	Relative Permittivity (ϵ_r):	55.12	55.28	-0.29	5
		e"	21.3359	Conductivity (σ):	0.97	0.97	0.45	5
	Body 850	e'	54.9265	Relative Permittivity (ϵ_r):	54.93	55.16	-0.42	5
		e"	21.2207	Conductivity (σ):	1.00	0.99	1.60	5
04/25/2012	Head 1900	e'	41.7685	Relative Permittivity (ϵ_r):	41.77	40.00	4.42	5
		e"	13.0613	Conductivity (σ):	1.38	1.40	-1.44	5
	Head 1850	e'	41.9879	Relative Permittivity (ϵ_r):	41.99	40.00	4.97	5
		e"	12.9400	Conductivity (σ):	1.33	1.40	-4.92	5
	Head 1880	e'	41.8477	Relative Permittivity (ϵ_r):	41.85	40.00	4.62	5
		e"	13.0138	Conductivity (σ):	1.36	1.40	-2.83	5
Head 1910	e'	41.7346	Relative Permittivity (ϵ_r):	41.73	40.00	4.34	5	
	e"	13.0861	Conductivity (σ):	1.39	1.40	-0.73	5	

Tissue Dielectric Parameter Check Results (continued)

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
4/25/2012	Head 1750	e'	38.9849	Relative Permittivity (ϵ_r):	38.98	40.08	-2.74	5
		e"	13.5855	Conductivity (σ):	1.32	1.37	-3.44	5
	Head 1720	e'	39.1048	Relative Permittivity (ϵ_r):	39.10	40.13	-2.56	5
		e"	13.5314	Conductivity (σ):	1.29	1.35	-4.29	5
	Head 1735	e'	39.0461	Relative Permittivity (ϵ_r):	39.05	40.11	-2.65	5
		e"	13.5554	Conductivity (σ):	1.31	1.36	-3.88	5
4/26/2012	Body 1900	e'	54.5381	Relative Permittivity (ϵ_r):	54.54	53.30	2.32	5
		e"	14.9815	Conductivity (σ):	1.58	1.52	4.13	5
	Body 1850	e'	54.6971	Relative Permittivity (ϵ_r):	54.70	53.30	2.62	5
		e"	14.8189	Conductivity (σ):	1.52	1.52	0.29	5
	Body 1880	e'	54.6114	Relative Permittivity (ϵ_r):	54.61	53.30	2.46	5
		e"	14.9331	Conductivity (σ):	1.56	1.52	2.70	5
	Body 1910	e'	54.4958	Relative Permittivity (ϵ_r):	54.50	53.30	2.24	5
		e"	15.0065	Conductivity (σ):	1.59	1.52	4.85	5
4/26/2012	Body 1720	e'	54.8209	Relative Permittivity (ϵ_r):	54.82	53.52	2.43	5
		e"	15.0306	Conductivity (σ):	1.44	1.47	-2.06	5
	Body 1735	e'	54.7928	Relative Permittivity (ϵ_r):	54.79	53.48	2.46	5
		e"	15.0546	Conductivity (σ):	1.45	1.48	-1.66	5
	Body 1750	e'	54.7503	Relative Permittivity (ϵ_r):	54.75	53.44	2.45	5
		e"	15.0839	Conductivity (σ):	1.47	1.49	-1.24	5
4/27/2012	Body 1900	e'	52.1027	Relative Permittivity (ϵ_r):	52.10	53.30	-2.25	5
		e"	14.5060	Conductivity (σ):	1.53	1.52	0.82	5
	Body 1850	e'	52.2712	Relative Permittivity (ϵ_r):	52.27	53.30	-1.93	5
		e"	14.3816	Conductivity (σ):	1.48	1.52	-2.67	5
	Body 1880	e'	52.1901	Relative Permittivity (ϵ_r):	52.19	53.30	-2.08	5
		e"	14.4566	Conductivity (σ):	1.51	1.52	-0.58	5
	Body 1910	e'	52.0654	Relative Permittivity (ϵ_r):	52.07	53.30	-2.32	5
		e"	14.5363	Conductivity (σ):	1.54	1.52	1.56	5
4/27/2012	Body 835	e'	55.3079	Relative Permittivity (ϵ_r):	55.31	55.20	0.20	5
		e"	21.6214	Conductivity (σ):	1.00	0.97	3.49	5
	Body 820	e'	55.4422	Relative Permittivity (ϵ_r):	55.44	55.28	0.30	5
		e"	21.6926	Conductivity (σ):	0.99	0.97	2.13	5
	Body 850	e'	55.1731	Relative Permittivity (ϵ_r):	55.17	55.16	0.03	5
		e"	21.5557	Conductivity (σ):	1.02	0.99	3.20	5

Tissue Dielectric Parameter Check Results (continued)

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
4/27/2012	Head 1900	e'	41.2939	Relative Permittivity (ϵ_r):	41.29	40.00	3.23	5
		e''	13.1347	Conductivity (σ):	1.39	1.40	-0.88	5
	Head 1850	e'	41.4704	Relative Permittivity (ϵ_r):	41.47	40.00	3.68	5
		e''	13.0114	Conductivity (σ):	1.34	1.40	-4.40	5
	Head 1880	e'	41.3631	Relative Permittivity (ϵ_r):	41.36	40.00	3.41	5
		e''	13.0855	Conductivity (σ):	1.37	1.40	-2.29	5
Head 1910	e'	41.2630	Relative Permittivity (ϵ_r):	41.26	40.00	3.16	5	
	e''	13.1622	Conductivity (σ):	1.40	1.40	-0.15	5	
4/28/2012	Head 1750	e'	38.9785	Relative Permittivity (ϵ_r):	38.98	40.08	-2.76	5
		e''	13.7468	Conductivity (σ):	1.34	1.37	-2.29	5
	Head 1720	e'	39.1085	Relative Permittivity (ϵ_r):	39.11	40.13	-2.55	5
		e''	13.6739	Conductivity (σ):	1.31	1.35	-3.28	5
	Head 1735	e'	39.0430	Relative Permittivity (ϵ_r):	39.04	40.11	-2.65	5
		e''	13.7125	Conductivity (σ):	1.32	1.36	-2.77	5
4/28/2012	Body 1720	e'	53.9353	Relative Permittivity (ϵ_r):	53.94	53.52	0.78	5
		e''	15.1844	Conductivity (σ):	1.45	1.47	-1.06	5
	Body 1735	e'	53.8887	Relative Permittivity (ϵ_r):	53.89	53.48	0.77	5
		e''	15.2319	Conductivity (σ):	1.47	1.48	-0.51	5
	Body 1750	e'	53.8384	Relative Permittivity (ϵ_r):	53.84	53.44	0.74	5
		e''	15.2703	Conductivity (σ):	1.49	1.49	-0.02	5
4/30/2012	Body 1900	e'	52.8631	Relative Permittivity (ϵ_r):	52.86	53.30	-0.82	5
		e''	14.8885	Conductivity (σ):	1.57	1.52	3.48	5
	Body 1850	e'	53.0559	Relative Permittivity (ϵ_r):	53.06	53.30	-0.46	5
		e''	14.7274	Conductivity (σ):	1.51	1.52	-0.33	5
	Body 1880	e'	52.9392	Relative Permittivity (ϵ_r):	52.94	53.30	-0.68	5
		e''	14.8225	Conductivity (σ):	1.55	1.52	1.94	5
Body 1910	e'	52.8276	Relative Permittivity (ϵ_r):	52.83	53.30	-0.89	5	
	e''	14.9205	Conductivity (σ):	1.58	1.52	4.25	5	
4/30/2012	Body 1720	e'	54.2358	Relative Permittivity (ϵ_r):	54.24	53.52	1.34	5
		e''	15.5066	Conductivity (σ):	1.48	1.47	1.04	5
	Body 1735	e'	54.1973	Relative Permittivity (ϵ_r):	54.20	53.48	1.34	5
		e''	15.5347	Conductivity (σ):	1.50	1.48	1.47	5
	Body 1750	e'	54.1609	Relative Permittivity (ϵ_r):	54.16	53.44	1.35	5
		e''	15.5735	Conductivity (σ):	1.52	1.49	1.97	5

Tissue Dielectric Parameter Check Results (continued)

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
4/30/2012	Body 2450	e'	53.3402	Relative Permittivity (ϵ_r):	53.34	52.70	1.21	5
		e"	14.7854	Conductivity (σ):	2.01	1.95	3.29	5
	Body 2410	e'	53.4924	Relative Permittivity (ϵ_r):	53.49	52.76	1.39	5
		e"	14.6009	Conductivity (σ):	1.96	1.91	2.57	5
	Body 2435	e'	53.4058	Relative Permittivity (ϵ_r):	53.41	52.73	1.29	5
		e"	14.7198	Conductivity (σ):	1.99	1.93	3.20	5
Body 2475	e'	53.2340	Relative Permittivity (ϵ_r):	53.23	52.67	1.07	5	
	e"	14.8946	Conductivity (σ):	2.05	1.99	3.26	5	
4/30/2012	Head 1900	e'	41.5444	Relative Permittivity (ϵ_r):	41.54	40.00	3.86	5
		e"	13.6141	Conductivity (σ):	1.44	1.40	2.73	5
	Head 1850	e'	41.7358	Relative Permittivity (ϵ_r):	41.74	40.00	4.34	5
		e"	13.4630	Conductivity (σ):	1.38	1.40	-1.08	5
	Head 1880	e'	41.6214	Relative Permittivity (ϵ_r):	41.62	40.00	4.05	5
		e"	13.5565	Conductivity (σ):	1.42	1.40	1.22	5
Head 1910	e'	41.5069	Relative Permittivity (ϵ_r):	41.51	40.00	3.77	5	
	e"	13.6400	Conductivity (σ):	1.45	1.40	3.47	5	
5/1/2012	Body 1720	e'	53.2069	Relative Permittivity (ϵ_r):	53.21	53.52	-0.58	5
		e"	15.0413	Conductivity (σ):	1.44	1.47	-1.99	5
	Body 1735	e'	53.1635	Relative Permittivity (ϵ_r):	53.16	53.48	-0.59	5
		e"	15.0741	Conductivity (σ):	1.45	1.48	-1.54	5
	Body 1750	e'	53.1214	Relative Permittivity (ϵ_r):	53.12	53.44	-0.60	5
		e"	15.1135	Conductivity (σ):	1.47	1.49	-1.04	5
5/3/2012	Head 835	e'	41.5480	Relative Permittivity (ϵ_r):	41.55	41.50	0.12	5
		e"	18.9159	Conductivity (σ):	0.88	0.90	-2.42	5
	Head 825	e'	41.6742	Relative Permittivity (ϵ_r):	41.67	41.58	0.23	5
		e"	18.9342	Conductivity (σ):	0.87	0.90	-3.37	5
	Head 850	e'	41.3663	Relative Permittivity (ϵ_r):	41.37	41.50	-0.32	5
		e"	18.8758	Conductivity (σ):	0.89	0.92	-2.50	5
5/3/2012	Head 1900	e'	40.6120	Relative Permittivity (ϵ_r):	40.61	40.00	1.53	5
		e"	13.4104	Conductivity (σ):	1.42	1.40	1.20	5
	Head 1850	e'	40.8219	Relative Permittivity (ϵ_r):	40.82	40.00	2.05	5
		e"	13.2826	Conductivity (σ):	1.37	1.40	-2.41	5
	Head 1880	e'	40.6876	Relative Permittivity (ϵ_r):	40.69	40.00	1.72	5
		e"	13.3537	Conductivity (σ):	1.40	1.40	-0.29	5
Head 1910	e'	40.5747	Relative Permittivity (ϵ_r):	40.57	40.00	1.44	5	
	e"	13.4410	Conductivity (σ):	1.43	1.40	1.96	5	

Tissue Dielectric Parameter Check Results (continued)

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
5/4/2012	Body 835	e'	54.9874	Relative Permittivity (ϵ_r):	54.99	55.20	-0.39	5
		e"	21.4655	Conductivity (σ):	1.00	0.97	2.74	5
	Body 820	e'	55.1524	Relative Permittivity (ϵ_r):	55.15	55.28	-0.23	5
		e"	21.5258	Conductivity (σ):	0.98	0.97	1.34	5
	Body 850	e'	54.8330	Relative Permittivity (ϵ_r):	54.83	55.16	-0.59	5
		e"	21.3907	Conductivity (σ):	1.01	0.99	2.41	5
5/4/2012	Body 1900	e'	51.8974	Relative Permittivity (ϵ_r):	51.90	53.30	-2.63	5
		e"	14.2951	Conductivity (σ):	1.51	1.52	-0.64	5
	Body 1850	e'	52.0117	Relative Permittivity (ϵ_r):	52.01	53.30	-2.42	5
		e"	14.1263	Conductivity (σ):	1.45	1.52	-4.40	5
	Body 1880	e'	51.9549	Relative Permittivity (ϵ_r):	51.95	53.30	-2.52	5
		e"	14.2468	Conductivity (σ):	1.49	1.52	-2.02	5
Body 1910	e'	51.8574	Relative Permittivity (ϵ_r):	51.86	53.30	-2.71	5	
	e"	14.3108	Conductivity (σ):	1.52	1.52	-0.01	5	
5/7/2012	Head 1750	e'	39.0290	Relative Permittivity (ϵ_r):	39.03	40.08	-2.63	5
		e"	13.5572	Conductivity (σ):	1.32	1.37	-3.64	5
	Head 1720	e'	39.1665	Relative Permittivity (ϵ_r):	39.17	40.13	-2.40	5
		e"	13.4849	Conductivity (σ):	1.29	1.35	-4.61	5
	Head 1735	e'	39.1028	Relative Permittivity (ϵ_r):	39.10	40.11	-2.51	5
		e"	13.5237	Conductivity (σ):	1.30	1.36	-4.11	5
5/7/2012	Body 1720	e'	53.4365	Relative Permittivity (ϵ_r):	53.44	53.52	-0.15	5
		e"	14.8492	Conductivity (σ):	1.42	1.47	-3.24	5
	Body 1735	e'	53.3810	Relative Permittivity (ϵ_r):	53.38	53.48	-0.18	5
		e"	14.8804	Conductivity (σ):	1.44	1.48	-2.80	5
	Body 1750	e'	53.3199	Relative Permittivity (ϵ_r):	53.32	53.44	-0.23	5
		e"	14.9130	Conductivity (σ):	1.45	1.49	-2.36	5
5/10/2012	Body 1720	e'	52.5668	Relative Permittivity (ϵ_r):	52.57	53.52	-1.78	5
		e"	14.6875	Conductivity (σ):	1.40	1.47	-4.29	5
	Body 1735	e'	52.5316	Relative Permittivity (ϵ_r):	52.53	53.48	-1.77	5
		e"	14.7428	Conductivity (σ):	1.42	1.48	-3.70	5
	Body 1750	e'	52.4862	Relative Permittivity (ϵ_r):	52.49	53.44	-1.79	5
		e"	14.7964	Conductivity (σ):	1.44	1.49	-3.12	5
5/10/2012	Body 835	e'	55.1817	Relative Permittivity (ϵ_r):	55.18	55.20	-0.03	5
		e"	21.3675	Conductivity (σ):	0.99	0.97	2.27	5
	Body 820	e'	55.3307	Relative Permittivity (ϵ_r):	55.33	55.28	0.10	5
		e"	21.4453	Conductivity (σ):	0.98	0.97	0.96	5
	Body 850	e'	55.0448	Relative Permittivity (ϵ_r):	55.04	55.16	-0.20	5
		e"	21.2966	Conductivity (σ):	1.01	0.99	1.96	5

Tissue Dielectric Parameter Check Results (continued)

Date	Freq. (MHz)	Liquid Parameters		Measured	Target	Delta (%)	Limit ±(%)	
5/10/2012	Body 1900	e'	51.9913	Relative Permittivity (ϵ_r):	51.99	53.30	-2.46	5
		e"	14.5174	Conductivity (σ):	1.53	1.52	0.90	5
	Body 1850	e'	52.1717	Relative Permittivity (ϵ_r):	52.17	53.30	-2.12	5
		e"	14.3563	Conductivity (σ):	1.48	1.52	-2.84	5
	Body 1880	e'	52.0619	Relative Permittivity (ϵ_r):	52.06	53.30	-2.32	5
		e"	14.4549	Conductivity (σ):	1.51	1.52	-0.59	5
Body 1910	e'	51.9579	Relative Permittivity (ϵ_r):	51.96	53.30	-2.52	5	
	e"	14.5473	Conductivity (σ):	1.54	1.52	1.64	5	
5/21/2012	Body 2450	e'	53.4222	Relative Permittivity (ϵ_r):	53.42	52.70	1.37	5
		e"	14.3406	Conductivity (σ):	1.95	1.95	0.18	5
	Body 2410	e'	53.5512	Relative Permittivity (ϵ_r):	53.55	52.76	1.50	5
		e"	14.1649	Conductivity (σ):	1.90	1.91	-0.49	5
	Body 2435	e'	53.4720	Relative Permittivity (ϵ_r):	53.47	52.73	1.41	5
		e"	14.2742	Conductivity (σ):	1.93	1.93	0.08	5
Body 2475	e'	53.3418	Relative Permittivity (ϵ_r):	53.34	52.67	1.28	5	
	e"	14.4463	Conductivity (σ):	1.99	1.99	0.15	5	
5/21/2012	Body 1900	e'	52.0482	Relative Permittivity (ϵ_r):	52.05	53.30	-2.35	5
		e"	14.6066	Conductivity (σ):	1.54	1.52	1.52	5
	Body 1850	e'	52.2332	Relative Permittivity (ϵ_r):	52.23	53.30	-2.00	5
		e"	14.4624	Conductivity (σ):	1.49	1.52	-2.13	5
	Body 1880	e'	52.1246	Relative Permittivity (ϵ_r):	52.12	53.30	-2.21	5
		e"	14.5327	Conductivity (σ):	1.52	1.52	-0.06	5
Body 1910	e'	52.0089	Relative Permittivity (ϵ_r):	52.01	53.30	-2.42	5	
	e"	14.6462	Conductivity (σ):	1.56	1.52	2.33	5	
5/22/2012	Body 835	e'	54.7781	Relative Permittivity (ϵ_r):	54.78	55.20	-0.76	5
		e"	21.3722	Conductivity (σ):	0.99	0.97	2.30	5
	Body 820	e'	54.9789	Relative Permittivity (ϵ_r):	54.98	55.28	-0.54	5
		e"	21.4315	Conductivity (σ):	0.98	0.97	0.90	5
	Body 830	e'	54.8420	Relative Permittivity (ϵ_r):	54.84	55.24	-0.72	5
		e"	21.4001	Conductivity (σ):	0.99	0.97	1.90	5
Body 850	e'	54.5947	Relative Permittivity (ϵ_r):	54.59	55.16	-1.02	5	
	e"	21.3168	Conductivity (σ):	1.01	0.99	2.06	5	
5/23/2012	Body 1900	e'	51.9569	Relative Permittivity (ϵ_r):	51.96	53.30	-2.52	5
		e"	14.9355	Conductivity (σ):	1.58	1.52	3.81	5
	Body 1850	e'	52.1332	Relative Permittivity (ϵ_r):	52.13	53.30	-2.19	5
		e"	14.7599	Conductivity (σ):	1.52	1.52	-0.11	5
	Body 1880	e'	52.0271	Relative Permittivity (ϵ_r):	52.03	53.30	-2.39	5
		e"	14.8612	Conductivity (σ):	1.55	1.52	2.20	5
Body 1910	e'	51.9174	Relative Permittivity (ϵ_r):	51.92	53.30	-2.59	5	
	e"	14.9727	Conductivity (σ):	1.59	1.52	4.61	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)	SAR Measured (mW/g)		
				1g/10g	Head	Body
D835V2	4d002	3/6/12	835	1g	9.36	10.2
				10g	6.12	6.68
D1900V2	5d043	11/10/11	1900	1g	40.8	42.0
				10g	21.2	22.0
D2450V2	748	2/7/12	2450	1g	53.6	50.8
				10g	24.8	23.6
D1750V2	1053	5/27/11	1750	1g	36.08	36.88
				10g	19.16	19.72

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.						
4/23/2012	D2450	748	Body	1g	50.5	50.8	-0.59	±10
				10g	23.6	23.6	0.00	
4/24/2012	D2450	748	Head	1g	56.7	53.6	5.78	±10
				10g	26.1	24.8	5.24	
4/24/2012	D835V2	4d002	Head	1g	9.42	9.36	0.64	±10
				10g	6.21	6.12	1.47	
4/25/2012	D835V2	4d002	Body	1g	10.10	10.2	-0.98	±10
				10g	6.67	6.68	-0.15	
4/25/2012	D1750V2	1053	Head	1g	33.90	36.08	-6.04	±10
				10g	17.9	19.16	-6.58	
4/25/2012	D1900V2	5d043	Head	1g	40.20	40.8	-1.47	±10
				10g	21.4	21.2	0.94	
4/26/2012	D1750V2	1053	Body	1g	36.80	36.88	-0.22	±10
				10g	19.7	19.72	-0.10	
4/26/2012	D1900V2	5d043	Body	1g	40.10	42	-4.52	±10
				10g	21.4	22	-2.73	
4/27/2012	D1900V2	5d043	Body	1g	41.20	42	-1.90	±10
				10g	21.9	22	-0.45	
4/27/2012	D1900V2	5d043	Head	1g	39.60	40.8	-2.94	±10
				10g	20.6	21.2	-2.83	
4/27/2012	D835V2	4d002	Body	1g	9.65	10.2	-5.39	±10
				10g	6.38	6.68	-4.49	
4/28/2012	D1750V2	1053	Head	1g	36.00	36.08	-0.22	±10
				10g	19.2	19.16	0.21	
4/28/2012	D1750V2	1053	Body	1g	37.50	36.88	1.68	±10
				10g	20.2	19.72	2.43	
4/30/2012	D1900V2	5d043	Body	1g	41.60	42	-0.95	±10
				10g	22.2	22	0.91	
4/30/2012	D1750V2	1053	Body	1g	35.70	36.88	-3.20	±10
				10g	19.2	19.72	-2.64	
4/30/2012	D2450	748	Body	1g	53.7	50.8	5.71	±10
				10g	25.1	23.6	6.36	
4/30/2012	D1900V2	5d043	Head	1g	38.20	40.8	-6.37	±10
				10g	20.0	21.2	-5.66	
5/1/2012	D1750V2	1053	Body	1g	38.20	36.88	3.58	±10
				10g	20.5	19.72	3.96	
5/3/2012	D835V2	4d002	Head	1g	9.20	9.36	-1.71	±10
				10g	6.02	6.12	-1.63	
5/3/2012	D1900V2	5d043	Head	1g	37.70	40.8	-7.60	±10
				10g	19.7	21.2	-7.08	
5/4/2012	D835V2	4d002	Body	1g	9.40	10.2	-7.84	±10
				10g	6.2	6.68	-6.59	
5/4/2012	D1900V2	5d043	Body	1g	40.10	42	-4.52	±10
				10g	21.0	22	-4.55	
5/7/2012	D1750V2	1053	Head	1g	33.10	36.08	-8.26	±10
				10g	17.6	19.16	-8.14	
5/7/2012	D1750V2	1053	Body	1g	37.90	36.88	2.77	±10
				10g	20.3	19.72	2.94	

System Performance Check Results (continued)

Date Tested	System Dipole		T.S. Liquid	SAR Measured (Normalized to 1 W)		Target (Ref. Value)	Delta (%)	Tolerance (%)
	Type	Serial No.						
5/10/2012	D835V2	4d002	Body	1g	9.76	10.2	-4.31	±10
				10g	6.45	6.68	-3.44	
5/10/2012	D1750V2	1053	Body	1g	37.20	36.88	0.87	±10
				10g	20.0	19.72	1.42	
5/10/2012	D1900V2	5d043	Body	1g	42.80	42	1.90	±10
				10g	22.5	22	2.27	
5/21/2012	D2450	748	Body	1g	49.5	50.8	-2.56	±10
				10g	22.9	23.6	-2.97	
5/21/2012	D1900V2	5d043	Body	1g	41.20	42	-1.90	±10
				10g	21.5	22	-2.27	
5/22/2012	D835V2	4d002	Body	1g	10.60	10.2	3.92	±10
				10g	6.95	6.68	4.04	
5/23/2012	D1900V2	5d043	Body	1g	42.30	42	0.71	±10
				10g	22.1	22	0.45	

12. SAR Test Results with all Transmitter at Maximum Power

12.1. CDMA BC0

Test Reduction Consideration for 1x Advanced per KDB Inquiry 760669

Even though this device supports 1x Advanced, SAR is not required for it because its maximum output power is no more than 0.25 dB higher than the maximum output power measured for 1xRTT and the measured SAR under all exposure conditions in 1xRTT voice mode were below 1.2 W/kg. Furthermore, Body and Hotspot SAR are not required for 1x Advanced because it is strictly a voice-only mode and therefore does not support Body and Hotspot usage.

12.1.1. Head SAR

Test Position	Mode	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
					1-g	10-g	
Left Touch	1xRTT (RC3 SO55)	1013	824.7	25.0			1
		384	836.5	25.1	0.603	0.453	
		777	848.3	25.2			1
Left Tilt (15°)	1xRTT (RC3 SO55)	1013	824.7	25.0			1
		384	836.5	25.1	0.317	0.241	
		777	848.3	25.2			1
Right Touch	1xRTT (RC3 SO55)	1013	824.7	25.0			1
		384	836.5	25.1	0.585	0.432	
		777	848.3	25.2			1
Right Tilt (15°)	1xRTT (RC3 SO55)	1013	824.7	25.0			1
		384	836.5	25.1	0.350	0.267	
		777	848.3	25.2			1

- EVDO is not supported in BC0

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.

12.1.2. Body & Hotspot SAR

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
						1-g	10-g	
Rear	1xRTT (RC3 SO32)	10	1013	824.7	25.0	1.060	0.738	
			384	836.5	25.1	0.940	0.652	
			777	848.3	25.2	0.683	0.444	
			1013	824.7	25.0	0.835	0.519	2
Front	1xRTT (RC3 SO32)	10	1013	824.7	25.0			1
			384	836.5	25.1	0.650	0.477	
			777	848.3	25.2			1
Edge 1	1xRTT (RC3 SO32)	10	1013	824.7	25.0			3
			384	836.5	25.1			3
			777	848.3	25.2			3
Edge 2	1xRTT (RC3 SO32)	10	1013	824.7	25.0			1
			384	836.5	25.1	0.477	0.355	
			777	848.3	25.2			1
Edge 3	1xRTT (RC3 SO32)	10	1013	824.7	25.0			1
			384	836.5	25.1	0.177	0.100	
			777	848.3	25.2			1
Edge 4	1xRTT (RC3 SO32)	10	1013	824.7	25.0			1
			384	836.5	25.1	0.339	0.262	
			777	848.3	25.2			1

- **EVDO is not supported in BC0**

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.
2. With headset attached.
3. SAR is not required because the distance from the tested antenna to this edge is greater than 2.5 cm.

12.2. CDMA BC1

Test Reduction Consideration for 1x Advanced per KDB Inquiry 760669

Even though this device supports 1x Advanced, SAR is not required for it because its maximum output power is no more than 0.25 dB higher than the maximum output power measured for 1xRTT and the measured SAR under all exposure conditions in 1xRTT voice mode were below 1.2 W/kg. Furthermore, Body and Hotspot SAR are not required for 1x Advanced because it is strictly a voice-only mode and therefore does not support Body and Hotspot usage.

12.2.1. Head SAR

Test Position	Mode	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
					1-g	10-g	
Left Touch	1xRTT (RC3 SO55)	25	1851.25	24.3			1
		600	1880.00	24.3	0.527	0.333	
		1175	1908.75	24.2			1
Left Tilt (15°)	1xRTT (RC3 SO55)	25	1851.25	24.3			1
		600	1880.00	24.3	0.276	0.161	
		1175	1908.75	24.2			1
Right Touch	1xRTT (RC3 SO55)	25	1851.25	24.3	0.812	0.480	
		600	1880.00	24.3	0.836	0.501	
		1175	1908.75	24.2	0.986	0.585	
Right Tilt (15°)	1xRTT (RC3 SO55)	25	1851.25	24.3			1
		600	1880.00	24.3	0.213	0.125	
		1175	1908.75	24.2			1
Test Position	Mode	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
					1-g	10-g	
Left Touch	1xEVDO (Rel. 0)	25	1851.25	24.1	1.010	0.597	
		600	1880.00	24.1	0.980	0.581	
		1175	1908.75	24.0	0.763	0.448	
Left Tilt (15°)	1xEVDO (Rel. 0)	25	1851.25	24.1	0.866	0.506	
		600	1880.00	24.1	0.851	0.498	
		1175	1908.75	24.0	0.668	0.389	
Right Touch	1xEVDO (Rel. 0)	25	1851.25	24.1	0.786	0.479	
		600	1880.00	24.1	0.833	0.503	
		1175	1908.75	24.0	0.585	0.351	
Right Tilt (15°)	1xEVDO (Rel. 0)	25	1851.25	24.1			1
		600	1880.00	24.1	0.788	0.461	
		1175	1908.75	24.0			1

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.

12.2.2. Body & Hotspot SAR

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
						1-g	10-g	
Rear	1xRTT (RC3 SO32)	10	25	1851.25	24.3	0.723	0.425	
			600	1880.00	24.3	0.881	0.517	
			1175	1908.75	24.3	0.804	0.474	
			600	1880.00	24.3	0.746	0.436	2
Front	1xRTT (RC3 SO32)	10	25	1851.25	24.3	0.837	0.495	
			600	1880.00	24.3	0.840	0.499	
			1175	1908.75	24.3	0.999	0.602	
Edge 1	1xRTT (RC3 SO32)	10	25	1851.25	24.3			3
			600	1880.00	24.3			3
			1175	1908.75	24.3			3
Edge 2	1xRTT (RC3 SO32)	10	25	1851.25	24.3			1
			600	1880.00	24.3	0.190	0.110	
			1175	1908.75	24.3			1
Edge 3	1xRTT (RC3 SO32)	10	25	1851.25	24.3	1.170	0.635	
			600	1880.00	24.3	1.240	0.664	
			1175	1908.75	24.3	1.080	0.565	
Edge 4	1xRTT (RC3 SO32)	10	25	1851.25	24.3			1
			600	1880.00	24.3	0.146	0.088	
			1175	1908.75	24.3			1
Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
Rear	1xEVDO (Rel. 0)	10	25	1851.25	24.1	0.776	0.466	
			600	1880.00	24.1	0.857	0.535	
			1175	1908.75	24.0	0.798	0.491	
			600	1880.00	24.1	0.786	0.478	2
Front	1xEVDO (Rel. 0)	10	25	1851.25	24.1			1
			600	1880.00	24.1	0.465	0.275	
			1175	1908.75	24.0			1
Edge 1	1xEVDO (Rel. 0)	10	25	1851.25	24.1			1
			600	1880.00	24.1	0.291	0.173	
			1175	1908.75	24.0			1
Edge 2	1xEVDO (Rel. 0)	10	25	1851.25	24.1			1
			600	1880.00	24.1	0.554	0.297	
			1175	1908.75	24.0			1
Edge 3	1xEVDO (Rel. 0)	10	25	1851.25	24.1			3
			600	1880.00	24.1			3
			1175	1908.75	24.0			3
Edge 4	1xEVDO (Rel. 0)	10	25	1851.25	24.1			3
			600	1880.00	24.1			3
			1175	1908.75	24.0			3

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.
2. With headset attached.
3. SAR is not required because the distance from the tested antenna to this edge is greater than 2.5 cm.

12.3. CDMA BC15

Test Reduction Consideration for 1x Advanced per KDB Inquiry 760669

Even though this device supports 1x Advanced, SAR is not required for it because its maximum output power is no more than 0.25 dB higher than the maximum output power measured for 1xRTT and the measured SAR under all exposure conditions in 1xRTT voice mode were below 1.2 W/kg. Furthermore, Body and Hotspot SAR are not required for 1x Advanced because it is strictly a voice-only mode and therefore does not support Body and Hotspot usage.

12.3.1. Head SAR (Maximum Power)

Test Position	Mode	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
					1-g	10-g	
Left Touch	1xRTT (RC3 SO55)	25	1711.25	24.3			1
		450	1732.50	24.2	0.505	0.329	
		875	1753.75	24.3			1
Left Tilt (15°)	1xRTT (RC3 SO55)	25	1711.25	24.3			1
		450	1732.50	24.2	0.246	0.159	
		875	1753.75	24.3			1
Right Touch	1xRTT (RC3 SO55)	25	1711.25	24.3			1
		450	1732.50	24.2	0.662	0.387	
		875	1753.75	24.3			1
Right Tilt (15°)	1xRTT (RC3 SO55)	25	1711.25	24.3			1
		450	1732.50	24.2	0.313	0.165	
		875	1753.75	24.3			1
Test Position	Mode	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
Left Touch	1xEVDO (Rel. 0)	25	1711.25	23.8			1
		450	1732.50	23.8	0.571	0.331	
		875	1753.75	23.9			1
Left Tilt (15°)	1xEVDO (Rel. 0)	25	1711.25	23.8			1
		450	1732.50	23.8	0.511	0.303	
		875	1753.75	23.9			1
Right Touch	1xEVDO (Rel. 0)	25	1711.25	23.8			1
		450	1732.50	23.8	0.452	0.279	
		875	1753.75	23.9			1
Right Tilt (15°)	1xEVDO (Rel. 0)	25	1711.25	23.8			1
		450	1732.50	23.8	0.462	0.277	
		875	1753.75	23.9			1

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.

12.3.2. Body & Hotspot SAR (Maximum Power)

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
						1-g	10-g	
Rear	1xRTT (RC3 SO32)	10	25	1711.25	24.3			1
			450	1732.50	24.2	0.736	0.433	
			875	1753.75	24.3			1
			450	1732.50	24.2	0.639	0.392	2
Front	1xRTT (RC3 SO32)	10	25	1711.25	24.3			1
			450	1732.50	24.2	0.539	0.312	
			875	1753.75	24.3			1
Edge 1	1xRTT (RC3 SO32)	10	25	1711.25	24.3			3
			450	1732.50	24.2			3
			875	1753.75	24.3			3
Edge 2	1xRTT (RC3 SO32)	10	25	1711.25	24.3			1
			450	1732.50	24.2	0.173	0.101	
			875	1753.75	24.3			1
Edge 3	1xRTT (RC3 SO32)	10	25	1711.25	24.3			1
			450	1732.50	24.2	0.565	0.298	
			875	1753.75	24.3			1
Edge 4	1xRTT (RC3 SO32)	10	25	1711.25	24.3			1
			450	1732.50	24.2	0.183	0.112	
			875	1753.75	24.3			1
Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
Rear	1xEVDO (Rel. 0)	10	25	1711.25	23.8			1
			450	1732.50	23.8	0.679	0.407	
			875	1753.75	23.9			1
			450	1732.50	23.8	0.436	0.269	2
Front	1xEVDO (Rel. 0)	10	25	1711.25	23.8			1
			450	1732.50	23.8	0.269	0.167	
			875	1753.75	23.9			1
Edge 1	1xEVDO (Rel. 0)	10	25	1711.25	23.8			1
			450	1732.50	23.8	0.145	0.087	
			875	1753.75	23.9			1
Edge 2	1xEVDO (Rel. 0)	10	25	1711.25	23.8			1
			450	1732.50	23.8	0.192	0.106	
			875	1753.75	23.9			1
Edge 3	1xEVDO (Rel. 0)	10	25	1711.25	23.8			3
			450	1732.50	23.8			3
			875	1753.75	23.9			3
Edge 4	1xEVDO (Rel. 0)	10	25	1711.25	23.8			3
			450	1732.50	23.8			3
			875	1753.75	23.9			3

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.
2. With headset attached.
3. SAR is not required because the distance from the tested antenna to this edge is greater than 2.5 cm.

12.4. LTE SAR Band 4

12.4.1. Head SAR (Maximum Power)

10 MHz Bandwidth

Test Position	Mode	UL Ch #.	Freq. (MHz)	UL RB Allocatio	UL RB Start	MPR	Avg Pwr (dBm)	SAR (mW/g)		Note
								1-g	10-g	
Left Touch	QPSK	20175	1732.5	1	0	0	23.48	0.446	0.256	
				1	49	0	23.42	0.661	0.379	
				25	12	1	22.32	0.452	0.259	
				50	0	1	22.29			1
	16QAM	20175	1732.5	1	0	1	22.45	0.387	0.222	
				1	49	1	22.70	0.567	0.326	
				25	12	1.5	21.97	0.390	0.224	
				50	0	1.5	22.22			1
Left Tilt (15°)	QPSK	20175	1732.5	1	0	0	23.48	0.344	0.205	
				1	49	0	23.42	0.478	0.286	
				25	12	1	22.32	0.334	0.199	
				50	0	1	22.29			1
	16QAM	20175	1732.5	1	0	1	22.45	0.326	0.192	
				1	49	1	22.70	0.398	0.237	
				25	12	1.5	21.97	0.310	0.182	
				50	0	1.5	22.22			1
Right Touch	QPSK	20175	1732.5	1	0	0	23.48	0.364	0.221	
				1	49	0	23.42	0.501	0.307	
				25	12	1	22.32	0.375	0.228	
				50	0	1	22.29			1
	16QAM	20175	1732.5	1	0	1	22.45	0.274	0.168	
				1	49	1	22.70	0.419	0.255	
				25	12	1.5	21.97	0.343	0.210	
				50	0	1.5	22.22			1
Right Tilt (15°)	QPSK	20175	1732.5	1	0	0	23.48	0.340	0.203	
				1	49	0	23.42	0.479	0.287	
				25	12	1	22.32	0.346	0.206	
				50	0	1	22.29			1
	16QAM	20175	1732.5	1	0	1	22.45	0.308	0.183	
				1	49	1	22.70	0.415	0.247	
				25	12	1.5	21.97	0.332	0.196	
				50	0	1.5	22.22			1

Note(s):

- Testing for 100% RB allocation is not required because the SAR value for 50% RB allocation is $\leq 1.45W/Kg$, as per KDB 941225 D05 SAR for LTE Devices v01

12.4.2. Body & Hotspot SAR (Maximum Power)

10 MHz Bandwidth

Test Position	Mode	Dist. (mm)	UL Ch #.	Freq. (MHz)	UL RB Allocatio	UL RB Start	MPR	Avg Pwr (dBm)	SAR (mW/g)		Note
									1-g	10-g	
Rear	QPSK	10	20175	1732.5	1	0	0	23.48	0.363	0.224	
					1	49	0	23.42	0.748	0.458	
					1	49	0	23.42	0.582	0.354	2
					25	12	1	22.32	0.345	0.208	
					50	0	1	22.29			1
	16QAM	10	20175	1732.5	1	0	1	22.45	0.313	0.193	
					1	49	1	22.70	0.461	0.280	
					25	12	1.5	21.97	0.316	0.190	
					50	0	1.5	22.22			1
					1	0	0	23.48	0.141	0.088	
Front	QPSK	10	20175	1732.5	1	49	0	23.42	0.277	0.172	
					1	49	0	23.42	0.221	0.138	2
					25	12	1	22.32	0.145	0.091	
					50	0	1	22.29			1
					1	0	1	22.45	0.130	0.082	
	16QAM	10	20175	1732.5	1	49	1	22.70	0.181	0.112	
					25	12	1.5	21.97	0.134	0.084	
					50	0	1.5	22.22			1
					1	0	0	23.48	0.108	0.065	
					1	49	0	23.42	0.175	0.103	
Edge 1	QPSK	10	20175	1732.5	25	12	1	22.32	0.122	0.072	
					50	0	1	22.29			1
					1	0	1	22.45	0.079	0.047	
					1	49	1	22.70	0.130	0.077	
					25	12	1.5	21.97	0.105	0.062	
	16QAM	10	20175	1732.5	50	0	1.5	22.22			1
					1	0	0	23.48	0.155	0.086	
					1	49	0	23.42	0.236	0.129	
					25	12	1	22.32	0.163	0.089	
					50	0	1	22.29			1
Edge 2	QPSK	10	20175	1732.5	1	0	1	22.45	0.129	0.070	
					1	49	1	22.70	0.203	0.110	
					25	12	1.5	21.97	0.147	0.080	
	16QAM	10	20175	1732.5	50	0	1.5	22.22			1
					1	0	0	23.48	0.155	0.086	
					1	49	0	23.42	0.236	0.129	
					25	12	1	22.32	0.163	0.089	
50	0	1	22.29			1					

Note(s):

- Testing for 100% RB allocation is not required because the SAR value for 50% RB allocation is $\leq 1.45W/Kg$, as per KDB 941225 D05 SAR for LTE Devices v01
- With headset attached.

12.5. LTE SAR Band 2

12.5.1. Head SAR (Maximum Power)

10 MHz Bandwidth

Test Position	Mode	UL Ch #.	Freq. (MHz)	UL RB Allocatio	UL RB Start	MPR	Avg Pwr (dBm)	SAR (mW/g)		Note
								1-g	10-g	
Left Touch	QPSK	18650	1855	1	0	0	23.4	1.030	0.595	
				1	49	0	23.3	0.978	0.565	
				25	12	1	22.2	0.784	0.453	
				50	0	1	22.3			1
Left Touch	QPSK	18900	1880	1	0	0	23.4	0.864	0.501	
				1	49	0	23.4	0.860	0.501	
				25	12	1	22.2	0.667	0.385	
				50	0	1	22.3			1
	16QAM	18900	1880	1	0	1	22.4	0.761	0.440	
				1	49	1	22.5	0.776	0.448	
				25	12	1.5	21.8	0.605	0.350	
				50	0	1.5	21.8			1
Left Touch	QPSK	19150	1905	1	0	0	23.4	0.989	0.567	
				1	49	0	23.4	0.765	0.435	
				25	12	1	22.3	0.735	0.415	
				50	0	1	22.3			1
Left Tilt (15°)	QPSK	18900	1880	1	0	0	23.4	0.724	0.422	
				1	49	0	23.4	0.719	0.419	
				25	12	1	22.2	0.579	0.336	
				50	0	1	22.3			1
	16QAM	18900	1880	1	0	1	22.4	0.624	0.364	
				1	49	1	22.5	0.623	0.365	
				25	12	1.5	21.8	0.501	0.291	
				50	0	1.5	21.8			1
Right Touch	QPSK	18900	1880	1	0	0	23.4	0.673	0.401	
				1	49	0	23.4	0.695	0.413	
				25	12	1	22.2	0.541	0.323	
				50	0	1	22.3			1
	16QAM	18900	1880	1	0	1	22.4	0.578	0.344	
				1	49	1	22.5	0.596	0.357	
				25	12	1.5	21.8	0.463	0.278	
				50	0	1.5	21.8			1
Right Tilt (15°)	QPSK	18900	1880	1	0	0	23.4	0.738	0.431	
				1	49	0	23.4	0.746	0.434	
				25	12	1	22.2	0.590	0.343	
				50	0	1	22.3			1
	16QAM	18900	1880	1	0	1	22.4	0.632	0.368	
				1	49	1	22.5	0.653	0.381	
				25	12	1.5	21.8	0.515	0.299	
				50	0	1.5	21.8			1

Note(s):

- Testing for 100% RB allocation is not required because the SAR value for 50% RB allocation is $\leq 1.45W/Kg$, as per KDB 941225 D05 SAR for LTE Devices v01

12.5.2. Body & Hotspot SAR (Maximum Power)

10 MHz Bandwidth

Test Position	Mode	Dist. (mm)	UL Ch #.	Freq. (MHz)	UL RB Allocatio	UL RB Start	MPR	Avg Pwr (dBm)	SAR (mW/g)		Note
									1-g	10-g	
Rear	QPSK	10	18900	1880	1	0	0	23.4	0.751	0.476	
					1	49	0	23.4	0.763	0.481	
					1	49	0	23.4	0.752	0.445	2
					25	12	1	22.2	0.605	0.381	
	50	0	1	22.3			1				
	16QAM	10	18900	1880	1	0	1	22.4	0.612	0.388	
					1	49	1	22.5	0.641	0.400	
					25	12	1.5	21.8	0.508	0.320	
50					0	1.5	21.8			1	
Front	QPSK	10	18900	1880	1	0	0	23.4	0.355	0.215	
					1	49	0	23.4	0.370	0.225	
					1	49	0	23.4	0.316	0.193	2
					25	12	1	22.2	0.289	0.176	
	50	0	1	22.3			1				
	16QAM	10	18900	1880	1	0	1	22.4	0.287	0.175	
					1	49	1	22.5	0.300	0.182	
					25	12	1.5	21.8	0.253	0.154	
50					0	1.5	21.8			1	
Edge 1	QPSK	10	18900	1880	1	0	0	23.4	0.276	0.171	
					1	49	0	23.4	0.282	0.177	
					25	12	1	22.2	0.198	0.122	
					50	0	1	22.3			1
	16QAM	10	18900	1880	1	0	1	22.4	0.215	0.132	
					1	49	1	22.5	0.239	0.145	
					25	12	1.5	21.8	0.170	0.105	
					50	0	1.5	21.8			1
Edge 2	QPSK	10	18900	1880	1	0	0	23.4	0.361	0.193	
					1	49	0	23.4	0.436	0.231	
					25	12	1	22.2	0.319	0.169	
					50	0	1	22.3			1
	16QAM	10	18900	1880	1	0	1	22.4	0.299	0.159	
					1	49	1	22.5	0.352	0.187	
					25	12	1.5	21.8	0.282	0.148	
					50	0	1.5	21.8			1

Note(s):

- Testing for 100% RB allocation is not required because the SAR value for 50% RB allocation is $\leq 1.45W/Kg$, as per KDB 941225 D05 SAR for LTE Devices v01

12.6. Wi-Fi (2.4 GHz Band)

12.6.1. Head SAR

Test Position	Mode	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
					1-g	10-g	
Left Touch	802.11b	1	2412	15.6	0.069	0.033	
		6	2437	15.5			1
		11	2462	15.4			1
Left Tilt (15°)	802.11b	1	2412	15.6	0.067	0.030	
		6	2437	15.5			1
		11	2462	15.4			1
Right Touch	802.11b	1	2412	15.6	0.142	0.042	
		6	2437	15.5			1
		11	2462	15.4			1
Right Tilt (15°)	802.11b	1	2412	15.6	0.077	0.036	
		6	2437	15.5			1
		11	2462	15.4			1

12.6.2. Body & Hotspot SAR

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
						1-g	10-g	
Rear	802.11b	10	1	2412	15.6	0.119	0.058	
			6	2437	15.5			1
			11	2462	15.4			1
			1	2412	15.6	0.080	0.041	2
Front	802.11b	10	1	2412	15.6	0.035	0.019	
			6	2437	15.5			1
			11	2462	15.4			1
Edge 1	802.11b	10	1	2412	15.6	0.036	0.019	
			6	2437	15.5			1
			11	2462	15.4			1
Edge 2	802.11b	10	1	2412	15.6			3
			6	2437	15.5			3
			11	2462	15.4			3
Edge 3	802.11b	10	1	2412	15.6			3
			6	2437	15.5			3
			11	2462	15.4			3
Edge 4	802.11b	10	1	2412	15.6	0.106	0.051	
			6	2437	15.5			1
			11	2462	15.4			1

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.
- SAR is not required because the distance from the tested antenna to this edge is greater than 2.5 cm.

13. Sum of the 1g SAR for Voice and Data Mode

The following sum of the 1g SAR calculations with all transmitters operating at maximum power are used to determine the worst-case test configurations in SV-DO and SV-LTE, for which additional SAR will be performed with power reduction.

13.1. Head Exposure Conditions

Sum of the 1g SAR for Voice (1xRTT), 1xEVDO and WiFi

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	CDMA BC1 1xEVDO	CDMA BC15 1xEVDO	WiFi 2.4 GHz	
Left Touch	0.603			1.01		0.069	1.682
	0.603				0.571	0.069	1.243
		0.527		1.01		0.069	1.606
		0.527			0.571	0.069	1.167
			0.505	1.01		0.069	1.584
Left Tilt			0.505		0.571	0.069	1.145
	0.317			0.866		0.067	1.250
	0.317				0.511	0.067	0.895
		0.276		0.866		0.067	1.209
		0.276			0.511	0.067	0.854
Right Touch			0.286	0.866		0.067	1.219
			0.286		0.511	0.067	0.864
	0.585			0.833		0.142	1.560
	0.585				0.452	0.142	1.179
		0.986		0.833		0.142	1.961
Right Tilt		0.986			0.452	0.142	1.580
			0.662	0.833		0.142	1.637
			0.662		0.452	0.142	1.256
	0.35			0.788		0.077	1.215
	0.35				0.426	0.077	0.853
Right Tilt		0.213		0.788		0.077	1.078
		0.213			0.426	0.077	0.716
			0.363	0.788		0.077	1.228
			0.363		0.426	0.077	0.866
					0.426	0.077	0.866

Sum of the 1g SAR for Voice (1xRTT), LTE and WiFi

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	LTE Band 2	LTE Band 4	WiFi 2.4 GHz	
Left Touch	0.603			1.03		0.069	1.702
	0.603				0.661	0.069	1.333
		0.527		1.03		0.069	1.626
		0.527			0.661	0.069	1.257
			0.505	1.03		0.069	1.604
Left Tilt			0.505		0.661	0.069	1.235
	0.317			0.724		0.067	1.108
	0.317				0.478	0.067	0.862
		0.276		0.724		0.067	1.067
		0.276			0.478	0.067	0.821
Right Touch			0.246	0.724		0.067	1.037
			0.246		0.478	0.067	0.791
	0.585			0.695		0.142	1.422
	0.585				0.501	0.142	1.228
		0.986		0.695		0.142	1.823
Right Tilt		0.986			0.501	0.142	1.629
			0.662	0.695		0.142	1.499
			0.662		0.501	0.142	1.305
	0.35			0.746		0.077	1.173
	0.35				0.479	0.077	0.906
Right Tilt		0.213		0.746		0.077	1.036
		0.213			0.479	0.077	0.769
			0.313	0.746		0.077	1.136
			0.313		0.479	0.077	0.869
					0.479	0.077	0.869

13.2. Body Exposure Conditions

Sum of the 1g SAR for Voice (1xRTT), 1xEVDO and WiFi

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	CDMA BC1 1xEVDO	CDMA BC15 1xEVDO	WiFi 2.4 GHz	
Rear	1.06			0.857		0.119	2.036
	1.06				0.694	0.119	1.873
		0.881		0.857		0.119	1.857
		0.881			0.694	0.119	1.694
			0.736	0.857		0.119	1.712
			0.736		0.694	0.119	1.549
Front	0.65			0.465		0.035	1.150
	0.65				0.316	0.035	1.001
		0.999		0.465		0.035	1.499
		0.999			0.316	0.035	1.350
			0.539	0.465		0.035	1.039
			0.539		0.316	0.035	0.890
Edge 1	0.00			0.291		0.036	0.327
	0.00				0.145	0.036	0.181
		0.00		0.291		0.036	0.327
		0.00			0.145	0.036	0.181
			0.00	0.291		0.036	0.327
			0.00		0.145	0.036	0.181
Edge 2	0.467			0.554		0.00	1.021
	0.467				0.249	0.00	0.716
		0.185		0.554		0.00	0.739
		0.185			0.249	0.00	0.434
			0.207	0.554		0.00	0.761
			0.207		0.249	0.00	0.456
Edge 3	0.177			0.00		0.00	0.177
	0.177				0.00	0.00	0.177
		1.24		0.00		0.00	1.240
		1.24			0.00	0.00	1.240
			0.608	0.00		0.00	0.608
			0.608		0.00	0.00	0.608
Edge 4	0.00			0.00		0.106	0.106
	0.00				0.00	0.106	0.106
		0.00		0.00		0.106	0.106
		0.00			0.00	0.106	0.106
			0.00	0.00		0.106	0.106
			0.00		0.00	0.106	0.106

Body Exposure Conditions (continued)

Sum of the 1g SAR for Voice (1xRTT), LTE and WiFi

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	LTE Band 4	LTE Band 2	WiFi 2.4 GHz	
Rear	1.06			0.748		0.119	1.927
	1.06				0.763	0.119	1.942
		0.881		0.748		0.119	1.748
		0.881			0.763	0.119	1.763
			0.736	0.748		0.119	1.603
			0.736		0.763	0.119	1.618
Front	0.65			0.277		0.035	0.962
	0.65				0.370	0.035	1.055
		0.999		0.277		0.035	1.311
		0.999			0.370	0.035	1.404
			0.539	0.277		0.035	0.851
			0.539		0.370	0.035	0.944
Edge 1	0.00			0.175		0.036	0.211
	0.00				0.282	0.036	0.318
		0.00		0.175		0.036	0.211
		0.00			0.282	0.036	0.318
			0.00	0.175		0.036	0.211
			0.00		0.282	0.036	0.318
Edge 2	0.467			0.236		0.00	0.703
	0.467				0.436	0.00	0.903
		0.185		0.236		0.00	0.421
		0.185			0.436	0.00	0.621
			0.207	0.236		0.00	0.443
			0.207		0.436	0.00	0.643
Edge 3	0.177			0.00		0.00	0.177
	0.177				0.00	0.00	0.177
		1.24		0.00		0.00	1.240
		1.24			0.00	0.00	1.240
			0.608	0.00		0.00	0.608
			0.608		0.00	0.00	0.608
Edge 4	0.00			0.00		0.106	0.106
	0.00				0.00	0.106	0.106
		0.00		0.00		0.106	0.106
		0.00			0.00	0.106	0.106
			0.00	0.00		0.106	0.106
			0.00		0.00	0.106	0.106

14. SAR Test Results with Power Reduction for SV-DO & SV-LTE

Based on the calculations found in Section 14, the test configurations with sum of the 1g SAR > 1.6 W/kg were chosen for additional SAR testing with power reduction:

- Head Exposure Condition – Left Touch and Right Touch
- Body Exposure Condition – Rear

14.1. CDMA BC0

14.1.1. Head SAR with Voice Power Reduction for SV-DO

Test Position	Mode	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
					1-g	10-g	
Left Touch	1xRTT (RC3 SO55)	1013	824.7	16.1			1
		384	836.5	16.1	0.069	0.050	
		777	848.3	16.2			1
Right Touch	1xRTT (RC3 SO55)	1013	824.7	16.1			1
		384	836.5	16.1	0.064	0.045	
		777	848.3	16.2			1

14.1.2. Body & Hotspot SAR with Voice Power Reduction for SV-DO

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
						1-g	10-g	
Rear	1xRTT (RC3 SO32)	10	1013	824.7	16.1			1
			384	836.5	16.1	0.128	0.089	
			777	848.3	16.2			1

14.1.3. Head SAR with Voice Power Reduction for SV-LTE

Test Position	Mode	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
					1-g	10-g	
Left Touch	1xRTT (RC3 SO55)	1013	824.7	19.0			1
		384	836.5	19.2	0.110	0.0803	
		777	848.3	19.2			1
Right Touch	1xRTT (RC3 SO55)	1013	824.7	19.0			1
		384	836.5	19.2	0.111	0.081	
		777	848.3	19.2			1

14.1.4. Body & Hotspot SAR with Voice Power Reduction for SV-LTE

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
						1-g	10-g	
Rear	1xRTT (RC3 SO32)	10	1013	824.7	19.0			1
			384	836.5	19.2	0.259	0.179	
			777	848.3	19.2			1

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.

14.2. CDMA BC1

14.2.1. Head SAR with Voice Power Reduction for SV-DO

Test Position	Mode	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
					1-g	10-g	
Left Touch	1xRTT (RC3 SO55)	25	1851.25	16.1			1
		600	1880.00	16.2	0.075	0.047	
		1175	1908.75	16.1			1
Right Touch	1xRTT (RC3 SO55)	25	1851.25	16.1			1
		600	1880.00	16.2	0.067	0.039	
		1175	1908.75	16.1			1

14.2.2. Body & Hotspot SAR with Voice Power Reduction for SV-DO

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
						1-g	10-g	
Rear	1xRTT (RC3 SO32)	10	25	1851.25	16.1			1
			600	1880.00	16.2	0.108	0.063	
			1175	1908.75	16.1			1

14.2.3. Head SAR with Voice Power Reduction for SV-LTE

Test Position	Mode	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
					1-g	10-g	
Left Touch	1xRTT (RC3 SO55)	25	1851.25	19.2			1
		600	1880.00	19.2	0.134	0.085	
		1175	1908.75	19.2			1
Right Touch	1xRTT (RC3 SO55)	25	1851.25	19.2			1
		600	1880.00	19.2	0.167	0.096	
		1175	1908.75	19.2			1

14.2.4. Body & Hotspot SAR with Voice Power Reduction for SV-LTE

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
						1-g	10-g	
Rear	1xRTT (RC3 SO32)	10	25	1851.25	19.2			1
			600	1880.00	19.2	0.225	0.133	
			1175	1908.75	19.2			1

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.

14.2.5. Head SAR with Data Power Reduction for SV-DO

Test Position	Mode	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
					1-g	10-g	
Left Touch	1xEVDO (Rel. 0)	25	1851.25	18.90			1
		600	1880.00	18.95	0.297	0.173	
		1175	1908.75	18.97			1
Right Touch	1xEVDO (Rel. 0)	25	1851.25	18.90			1
		600	1880.00	18.95	0.263	0.160	
		1175	1908.75	18.97			1

14.2.6. Body & Hotspot SAR with Data Power Reduction for SV-DO

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
						1-g	10-g	
Rear	1xEVDO (Rel. 0)	10	25	1851.25	18.90			1
			600	1880.00	18.95	0.372	0.236	
			1175	1908.75	18.97			1

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.

14.3. CDMA BC15

14.3.1. Head SAR with Voice Power Reduction for SV-DO

Test Position	Mode	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
					1-g	10-g	
Left Touch	1xRTT (RC3 SO55)	25	1711.25	16.19			1
		450	1732.50	16.15	0.096	0.060	
		875	1753.75	16.20			1
Right Touch	1xRTT (RC3 SO55)	25	1711.25	16.19			1
		450	1732.50	16.15	0.081	0.047	
		875	1753.75	16.20			1

14.3.2. Body & Hotspot SAR with Voice Power Reduction for SV-DO

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
						1-g	10-g	
Rear	1xRTT (RC3 SO32)	10	25	1711.25	16.19			1
			450	1732.50	16.15	0.103	0.061	
			875	1753.75	16.20			1

14.3.3. Head SAR with Voice Power Reduction for SV-LTE

Test Position	Mode	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
					1-g	10-g	
Left Touch	1xRTT (RC3 SO55)	25	1711.25	19.11			1
		450	1732.50	19.16	0.173	0.110	
		875	1753.75	19.17			1
Right Touch	1xRTT (RC3 SO55)	25	1711.25	19.11			1
		450	1732.50	19.16	0.172	0.100	
		875	1753.75	19.17			1

14.3.4. Body & Hotspot SAR with Voice Power Reduction for SV-LTE

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
						1-g	10-g	
Rear	1xRTT (RC3 SO32)	10	25	1711.25	19.11			1
			450	1732.50	19.16	0.233	0.139	
			875	1753.75	19.17			1

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.

14.3.5. Head SAR with Data Power Reduction for SV-DO

Test Position	Mode	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
					1-g	10-g	
Left Touch	1xEVDO (Rel. 0)	25	1711.25	18.95			1
		450	1732.50	19.03	0.179	0.103	
		875	1753.75	18.95			1
Right Touch	1xEVDO (Rel. 0)	25	1711.25	18.95			1
		450	1732.50	19.03	0.147	0.090	
		875	1753.75	18.95			1

14.3.6. Body & Hotspot SAR with Data Power Reduction for SV-DO

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
						1-g	10-g	
Rear	1xEVDO (Rel. 0)	10	25	1711.25	18.95			1
			450	1732.50	19.03	0.224	0.134	
			875	1753.75	18.95			1

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.

14.4. LTE SAR Band 4

14.4.1. Head SAR with Power Reduction for SV-LTE

10 MHz Bandwidth

Test Position	Mode	UL Ch #.	Freq. (MHz)	UL RB Allocatio	UL RB Start	Avg Pwr (dBm)	SAR (mW/g)		Note
							1-g	10-g	
Left Touch	QPSK	20175	1732.5	1	0	19.4	0.234	0.137	
				1	49	19.4	0.130	0.076	
				25	12	19.4	0.143	0.083	
				50	0	19.4			1
	16QAM	20175	1732.5	1	0	19.4	0.196	0.115	
				1	49	19.4	0.112	0.066	
				25	12	19.4	0.118	0.069	
				50	0	19.4			1
Right Touch	QPSK	20175	1732.5	1	0	19.4	0.189	0.116	
				1	49	19.4	0.105	0.064	
				25	12	19.4	0.114	0.069	
				50	0	19.4			1
	16QAM	20175	1732.5	1	0	19.4	0.158	0.096	
				1	49	19.4	0.094	0.058	
				25	12	19.4	0.101	0.061	
				50	0	19.4			1

14.4.2. Body & Hotspot SAR with Power Reduction for SV-LTE

10 MHz Bandwidth

Test Position	Mode	Dist. (mm)	UL Ch #.	Freq. (MHz)	UL RB Allocatio	UL RB Start	Avg Pwr (dBm)	SAR (mW/g)		Note
								1-g	10-g	
Rear	QPSK	10	20175	1732.5	1	0	19.4	0.272	0.162	
					1	49	19.4	0.159	0.095	
					25	12	19.4	0.169	0.100	
					50	0	19.4			1
	16QAM	10	20175	1732.5	1	0	19.4	0.241	0.143	
					1	49	19.4	0.139	0.082	
					25	12	19.4	0.149	0.088	
					50	0	19.4			1

Note(s):

- Testing for 100% RB allocation is not required because the SAR value for 50% RB allocation is $\leq 1.45W/Kg$, as per KDB 941225 D05 SAR for LTE Devices v01

14.5. LTE SAR Band 2

14.5.1. Head SAR with Power Reduction for SV-LTE

10 MHz Bandwidth

Test Position	Mode	UL Ch #.	Freq. (MHz)	UL RB Allocatio	UL RB Start	Avg Pwr (dBm)	SAR (mW/g)		Note
							1-g	10-g	
Left Touch	QPSK	18900	1880	1	0	19.5	0.276	0.159	
				1	49	19.5	0.177	0.102	
				25	12	19.5	0.164	0.095	
				50	0	19.5			1
	16QAM	18900	1880	1	0	19.5	0.266	0.156	
				1	49	19.5	0.166	0.096	
				25	12	19.5	0.151	0.088	
				50	0	19.5			1
Right Touch	QPSK	18900	1880	1	0	19.5	0.275	0.164	
				1	49	19.5	0.171	0.102	
				25	12	19.5	0.159	0.095	
				50	0	19.5			1
	16QAM	18900	1880	1	0	19.5	0.247	0.149	
				1	49	19.5	0.157	0.094	
				25	12	19.5	0.137	0.083	
				50	0	19.5			1

14.5.2. Body & Hotspot SAR with Power Reduction for SV-LTE

10 MHz Bandwidth

Test Position	Mode	Dist. (mm)	UL Ch #.	Freq. (MHz)	UL RB Allocatio	UL RB Start	Avg Pwr (dBm)	SAR (mW/g)		Note
								1-g	10-g	
Rear	QPSK	10	18900	1880	1	0	19.5	0.350	0.222	
					1	49	19.5	0.247	0.152	
					25	12	19.5	0.218	0.133	
					50	0	19.5			1
	16QAM	10	18900	1880	1	0	19.5	0.316	0.201	
					1	49	19.5	0.210	0.133	
					25	12	19.5	0.183	0.116	
					50	0	19.5			1

Note(s):

- Testing for 100% RB allocation is not required because the SAR value for 50% RB allocation is $\leq 1.45W/Kg$, as per KDB 941225 D05 SAR for LTE Devices v01

15. 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)
CDMA BC0	Head	Left Touch	1xRTT (RC3, SO55)	0.603
	Body & Hotspot	Rear	1xRTT (RC3, SO32)	1.060
CDMA BC1	Head	Right Touch	1xRTT (RC3, SO55)	0.986
	Head	Left Touch	1xEVDO (Rel. 0)	1.010
	Body	Front	1xRTT (RC3, SO32)	0.999
	Hotspot	Edge 3	1xRTT (RC3, SO32)	1.240
	Body & Hotspot	Rear	1xEVDO (Rel. 0)	0.857
CDMA BC15	Head	Right Touch	1xRTT (RC3, SO55)	0.662
	Head	Left touch	1xEVDO (Rel. 0)	0.571
	Body & Hotspot	Rear	1xRTT (RC3, SO32)	0.736
	Body & Hotspot	Rear	1xEVDO (Rel. 0)	0.679
LTE Band 4	Head	Left Touch	10 MHz (QPSK) RB 1/49	0.661
	Body & Hotspot	Rear	10 MHz (QPSK) RB 1/49	0.748
LTE Band 2	Head	Left Touch	10 MHz (QPSK) RB 1/0	1.030
	Body & Hotspot	Rear	10 MHz (QPSK) RB 1/49	0.763
WiFi 2.4 GHz	Head	Right Touch	802.11b 1Mbps	0.142
	Body & Hotspot	Rear	802.11b 1Mbps	0.119

15.1. Scaled SAR Values to the Maximum tune-up Tolerances

The following measured results were scaled to the maximum tune-up tolerance, according to the output power of the channel tested for the highest measured results in each frequency band.

Test Configuration		Mode	Ch #.	Freq. (MHz)	Power (dBm)		SAR (W/kg)	
					Max. tune-up limit	Measured	Measured	Scaled
Head	Left Touch	1xRTT (RC3 SO55)	384	836.52	25.2	25.10	0.603	0.617
Body&Hotspot	Rear	1xRTT (RC3 SO32)	1013	824.70	25.2	25.00	1.060	1.110
Head	Right Touch	1xRTT (RC3 SO55)	1715	1908.75	24.5	24.20	0.986	1.057
Head	Left Touch	1xEVDO (Rel. 0)	25	1851.25	24.2	24.10	1.010	1.034
Body	Rear	1xRTT (RC3 SO32)	600	1880.00	24.5	24.30	0.881	0.923
Body	Front	1xRTT (RC3 SO32)	1175	1908.75	24.5	24.30	0.999	1.046
Hotspot	Edge 3	1xRTT (RC3 SO32)	600	1880.00	24.5	24.30	1.240	1.298
Body&Hotspot	Rear	1xEVDO (Rel. 0)	600	1880.00	24.2	24.10	0.857	0.877
Body&Hotspot	Front	1xEVDO (Rel. 0)	600	1880.00	24.2	24.10	0.465	0.476
Head	Right Touch	1xRTT (RC3 SO55)	450	1732.50	24.5	24.20	0.662	0.709
Head	Left Touch	1xEVDO (Rel. 0)	450	1732.50	24.2	23.80	0.571	0.626
Body&Hotspot	Rear	1xRTT (RC3 SO32)	450	1732.50	24.5	24.20	0.736	0.789
Body&Hotspot	Rear	1xEVDO (Rel. 0)	450	1732.50	24.2	23.80	0.679	0.745
Body&Hotspot	Front	1xEVDO (Rel. 0)	450	1732.50	24.2	23.80	0.269	0.295
Head	Left Touch	10M (QPSK) RB1/49	20175	1732.50	23.5	23.42	0.661	0.673
Body&Hotspot	Rear	10M (QPSK) RB1/49	20175	1732.50	23.5	23.42	0.748	0.762
Body&Hotspot	Front	10M (QPSK) RB1/49	20175	1732.50	23.5	23.42	0.277	0.282
Head	Left Touch	10M (QPSK) RB1/0	18650	1855.00	23.5	23.40	1.030	1.054
Body&Hotspot	Rear	10M (QPSK) RB1/49	18900	1880.00	23.5	23.40	0.763	0.781
Body&Hotspot	Front	10M (QPSK) RB1/49	18900	1880.00	23.5	23.40	0.370	0.379
Head	Right Touch	802.11b	1	2412.00	16.0	15.60	0.142	0.156
Body&Hotspot	Rear	802.11b	1	2412.00	16.0	15.60	0.119	0.130
Body&Hotspot	Front	802.11b	1	2412.00	16.0	15.60	0.035	0.038

Note:

SAR scaling was applied to certain configurations beyond what was required for the purpose of applying scaled SAR considerations to Simultaneous Transmission cases with high Sum of the (measured) SAR values

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

Test Laboratory: UL CCS SAR Lab B Date: 4/24/2012

CDMA 2000

Frequency: 836.52 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 0.883$ mho/m; $\epsilon_r = 41.682$; $\rho = 1000$ kg/m³
DASY5 Configuration:

- Electronics: DAE4 Sn1259; Calibrated: 2/13/2012
- Probe: EX3DV3 - SN3531; ConvF(9.81, 9.81, 9.81); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM; Type: QD000P40CD; Serial: 1629

Left/Touch_1xRTT_ch 384/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (measured) = 0.568 mW/g

Left/Touch_1xRTT_ch 384/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

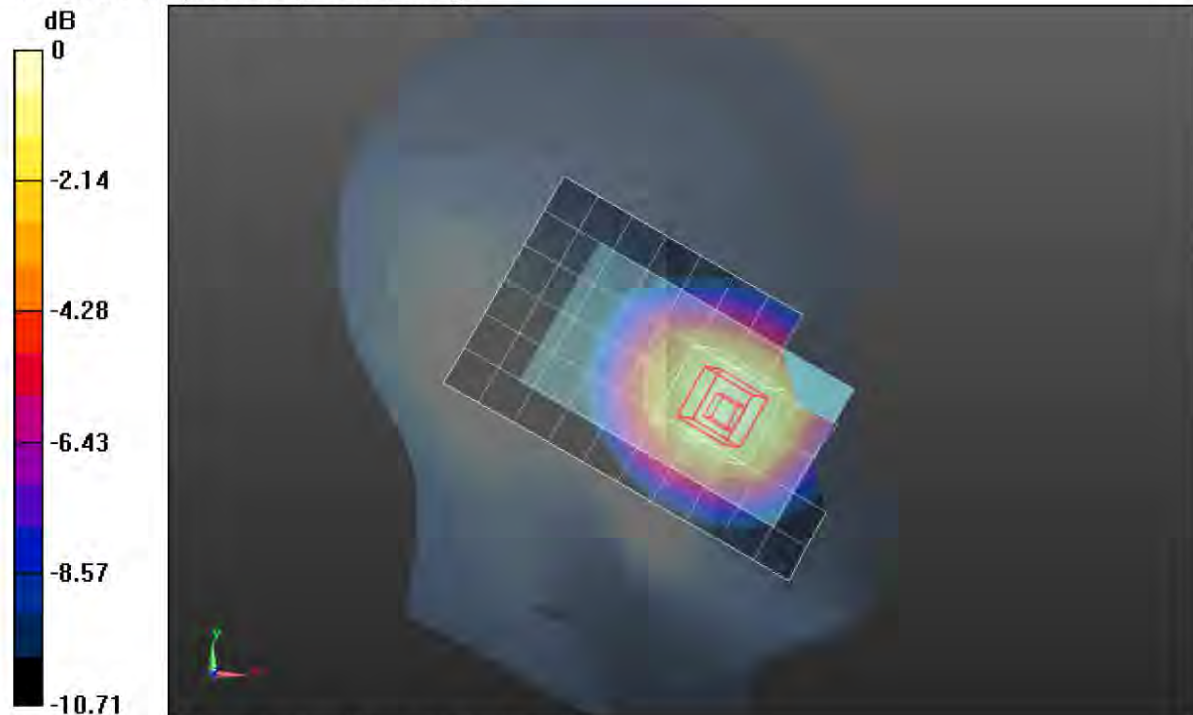
Reference Value = 25.644 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.7350

SAR(1 g) = 0.603 mW/g; SAR(10 g) = 0.453 mW/g

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

Maximum value of SAR (measured) = 0.666 mW/g



0 dB = 0.670mW/g = -3.48 dB mW/g

Test Laboratory: UL CCS SAR Lab B Date: 4/24/2012

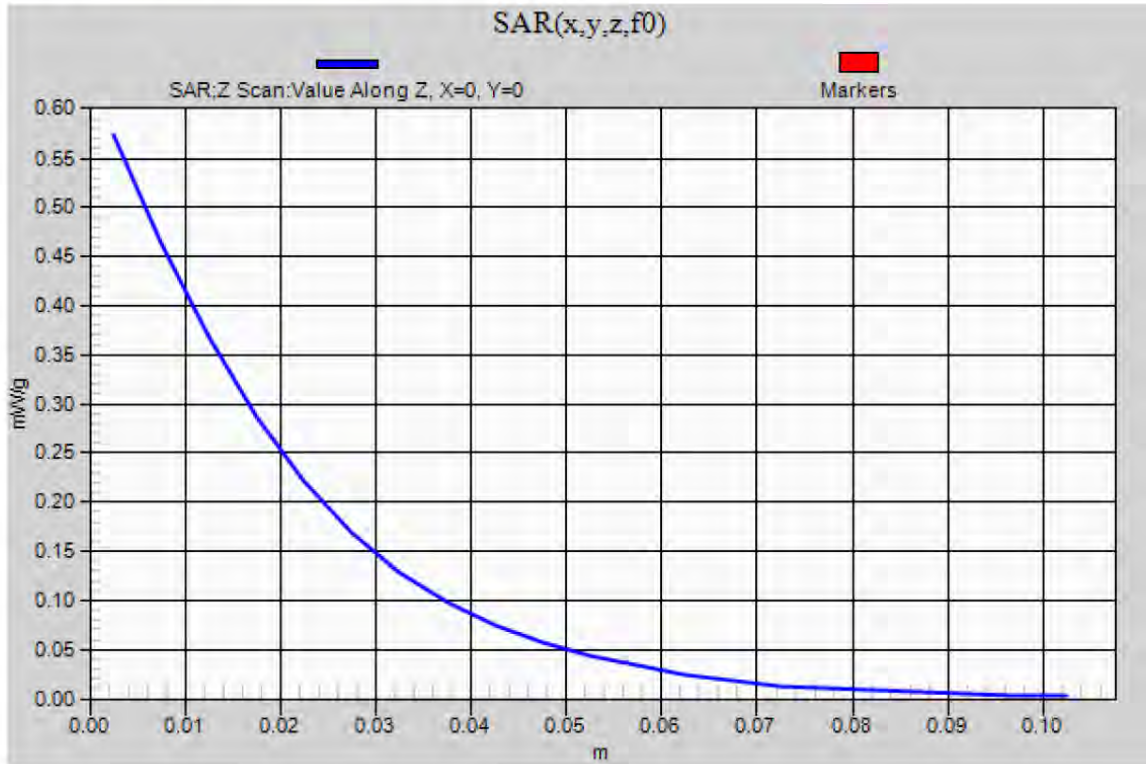
CDMA 2000

Frequency: 836.52 MHz; Duty Cycle: 1:1

Left/Touch_1xRTT_ch 384/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

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

Maximum value of SAR (measured) = 0.574 mW/g



Test Laboratory: UL CCS SAR Lab B Date: 4/27/2012

CDMA2000

Frequency: 824.7 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used: $f = 825$ MHz; $\sigma = 0.994$ mho/m; $\epsilon_r = 55.398$; $\rho = 1000$ kg/m³

DASY5 Configuration:

- Electronics: DAE4 Sn1259; Calibrated: 2/13/2012
- Probe: EX3DV3 - SN3531; ConvF(10, 10, 10); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: ELI v5.0 (A); Type: QDOVA001BB; Serial: 1120

Rear/1xRTT_SO32_Ch 1013/Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.259 mW/g

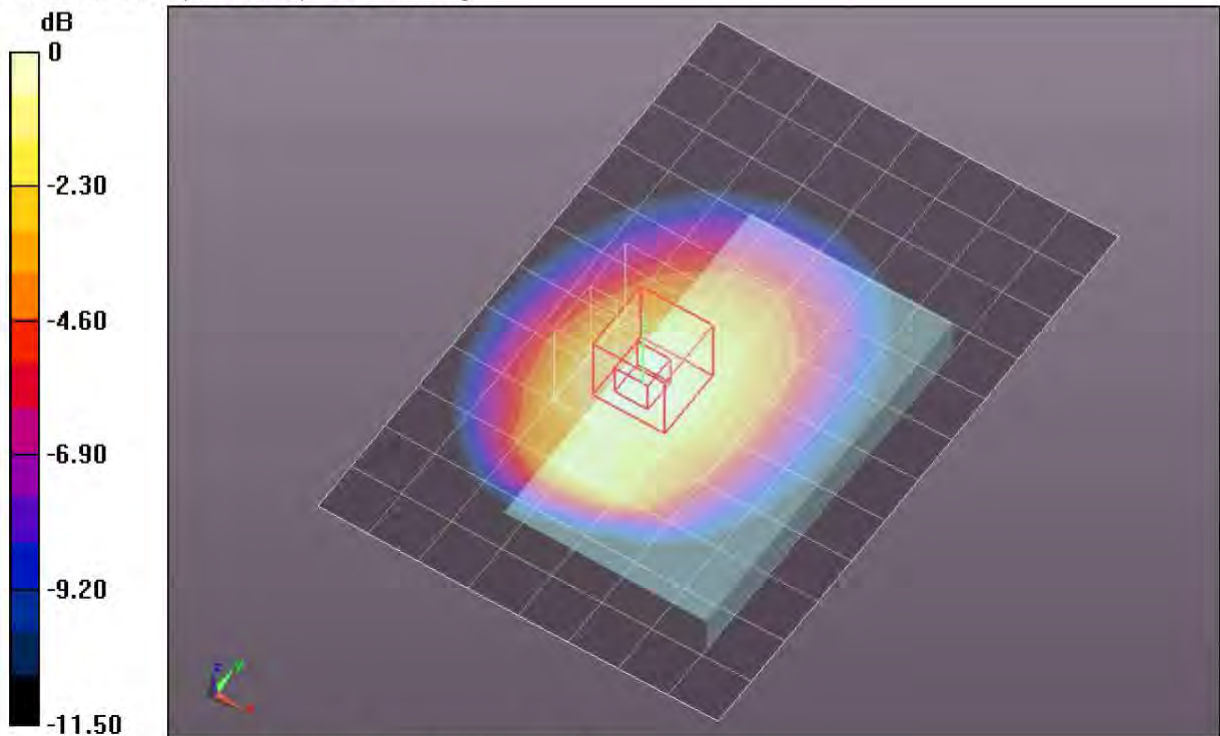
Rear/1xRTT_SO32_Ch 1013/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 35.908 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 1.4810

SAR(1 g) = 1.06 mW/g; SAR(10 g) = 0.738 mW/g

Maximum value of SAR (measured) = 1.251 mW/g



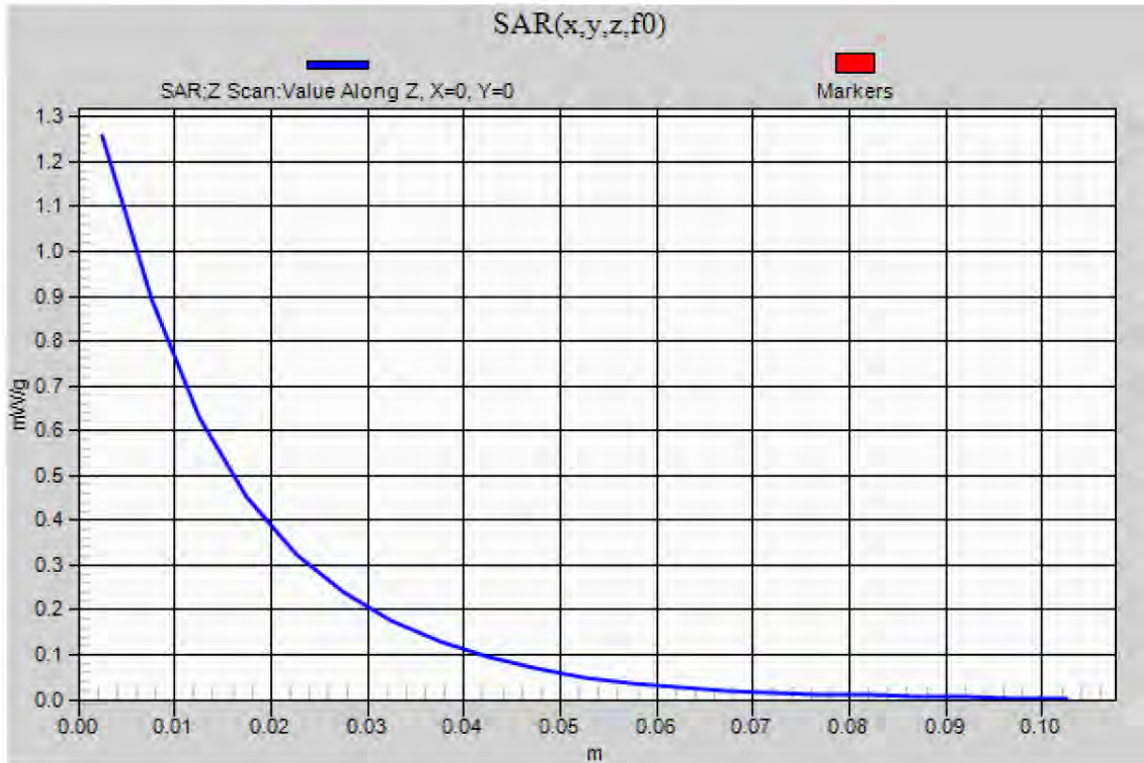
0 dB = 1.250mW/g = 1.94 dB mW/g

Test Laboratory: UL CCS SAR Lab B Date: 4/27/2012

CDMA2000

Frequency: 824.7 MHz; Duty Cycle: 1:1

Rear/1xRTT_SO32_Ch 1013/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 1.258 mW/g



Test Laboratory: UL CCS SAR Lab B Date: 4/25/2012

CDMA 2000 - BC1

Frequency: 1908.75 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 1908.75 \text{ MHz}$; $\sigma = 1.389 \text{ mho/m}$; $\epsilon_r = 41.739$; $\rho = 1000 \text{ kg/m}^3$

DASY5 Configuration:

- Electronics: DAE4 Sn1259; Calibrated: 2/13/2012
- Probe: EX3DV3 - SN3531; ConvF(8.53, 8.53, 8.53); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM; Type: QD000P40CD; Serial: 1629

Right/Touch_1xRTT_ch 1175/Area Scan (7x11x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Maximum value of SAR (measured) = 1.080 mW/g

Right/Touch_1xRTT_ch 1175/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

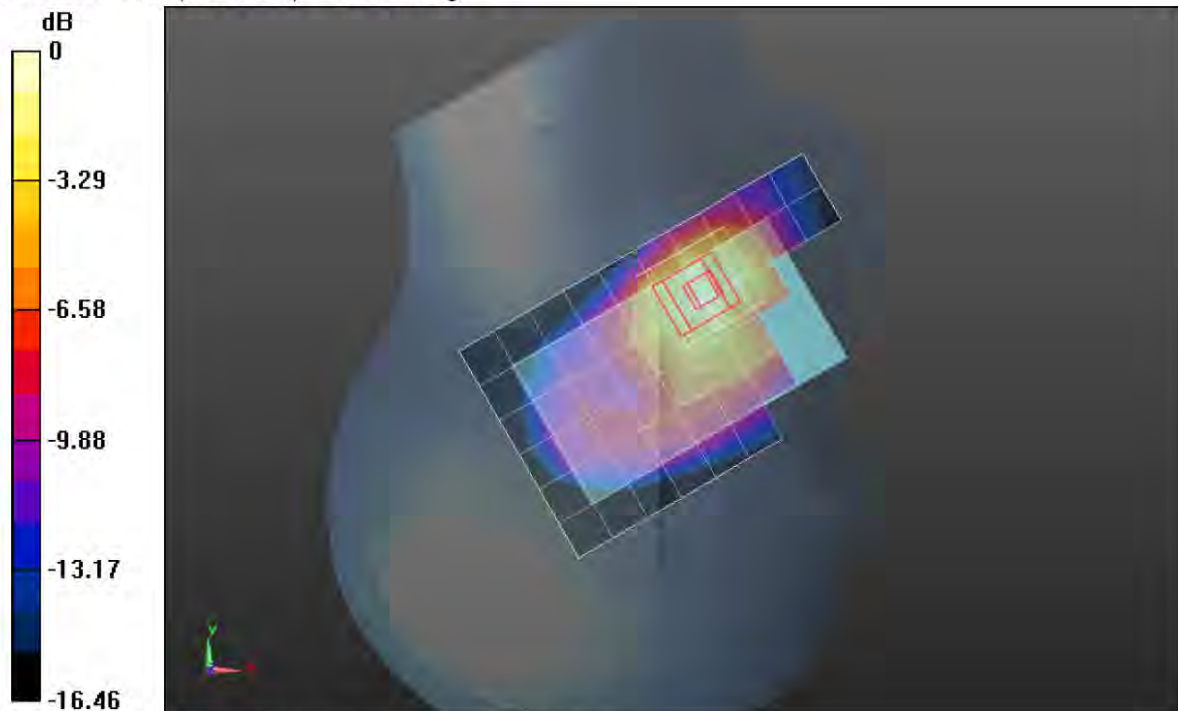
Reference Value = 27.924 V/m; Power Drift = 0.0034 dB

Peak SAR (extrapolated) = 1.5170

SAR(1 g) = 0.986 mW/g; SAR(10 g) = 0.585 mW/g

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

Maximum value of SAR (measured) = 1.228 mW/g



0 dB = 1.230mW/g = 1.80 dB mW/g

Test Laboratory: UL CCS SAR Lab B Date: 4/25/2012

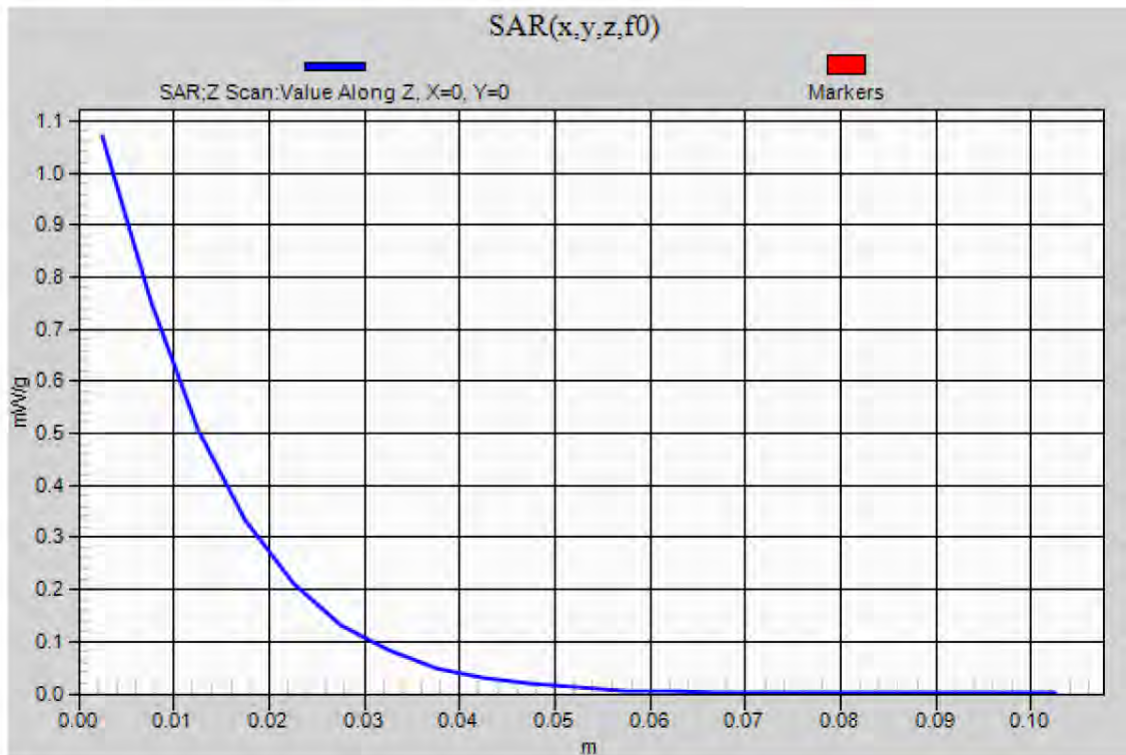
CDMA 2000 - BC1

Frequency: 1908.75 MHz; Duty Cycle: 1:1

Right/Touch_1xRTT_ch 1175/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

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

Maximum value of SAR (measured) = 1.069 mW/g



Test Laboratory: UL CCS SAR Lab B Date: 4/30/2012

CDMA 2000 - BC1

Frequency: 1851.25 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.387$ mho/m; $\epsilon_r = 41.731$; $\rho = 1000$ kg/m³

DASY5 Configuration:

- Electronics: DAE4 Sn1259; Calibrated: 2/13/2012
- Probe: EX3DV3 - SN3531; ConvF(8.53, 8.53, 8.53); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM; Type: QD000P40CD; Serial: 1629

Left/Touch_1xEVDO_ch 25/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (measured) = 1.270 mW/g

Left/Touch_1xEVDO_ch 25/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

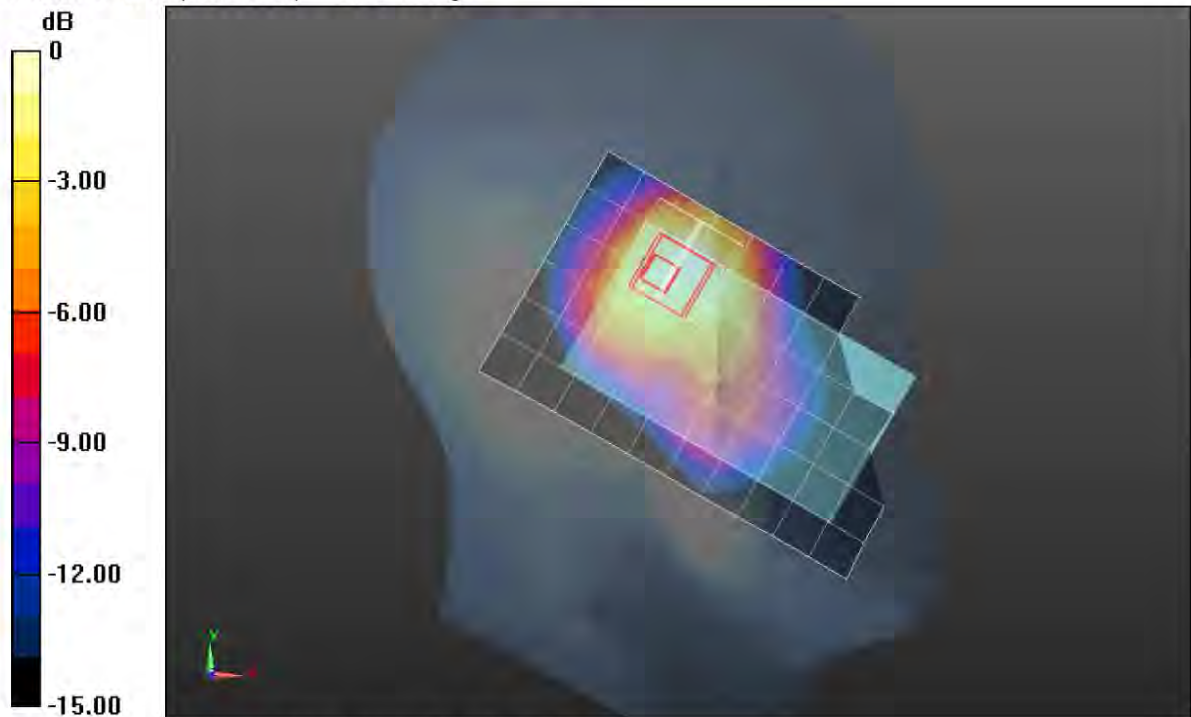
Reference Value = 30.659 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 1.8760

SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.597 mW/g

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

Maximum value of SAR (measured) = 1.300 mW/g



0 dB = 1.300mW/g = 2.28 dB mW/g

Test Laboratory: UL CCS SAR Lab B Date: 4/30/2012

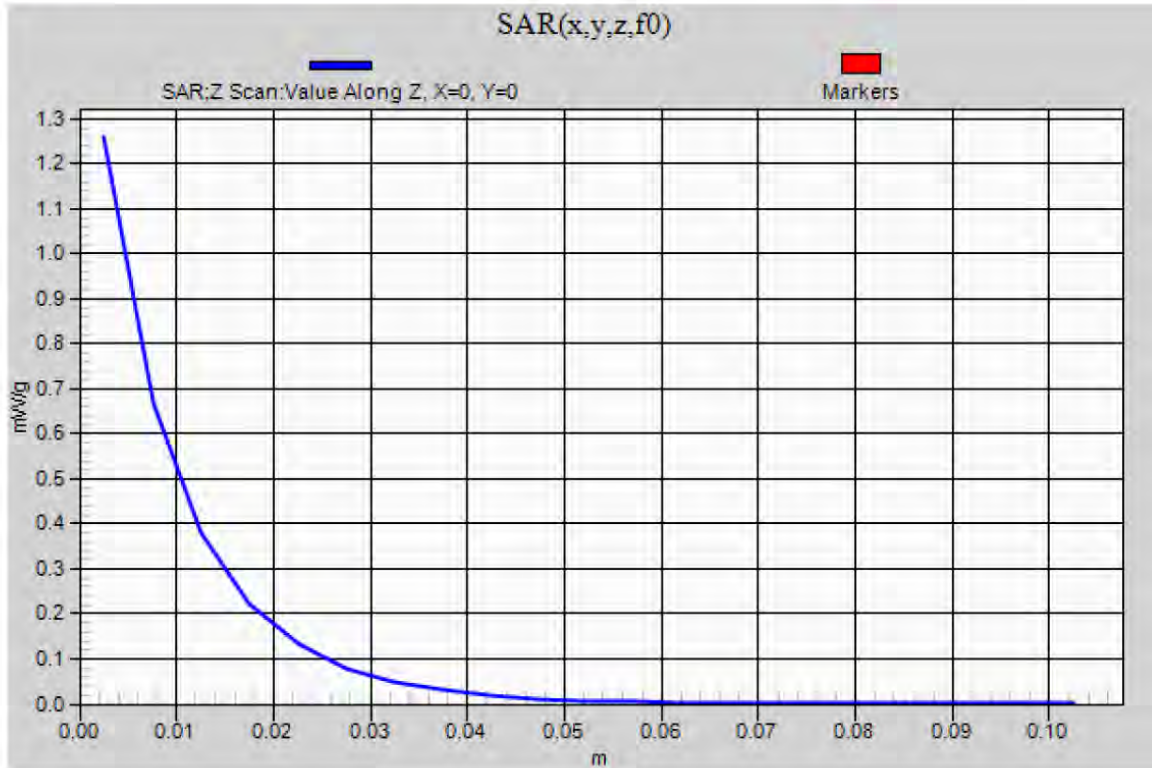
CDMA 2000 - BC1

Frequency: 1851.25 MHz; Duty Cycle: 1:1

Left/Touch_1xEVDO_ch 25/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

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

Maximum value of SAR (measured) = 1.260 mW/g



Test Laboratory: UL CCS SAR Lab B Date: 4/26/2012

CDMA 2000-BC1

Frequency: 1908.75 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 1908.75$ MHz; $\sigma = 1.593$ mho/m; $\epsilon_r = 54.501$; $\rho = 1000$ kg/m³

DASY5 Configuration:

- Electronics: DAE4 Sn1259; Calibrated: 2/13/2012
- Probe: EX3DV3 - SN3531; ConvF(7.91, 7.91, 7.91); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: ELI v5.0 (B); Type: QDOVA001BB; Serial: 1118

Front/1xRTT_SO32_Ch 1175/Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (measured) = 1.140 mW/g

Front/1xRTT_SO32_Ch 1175/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

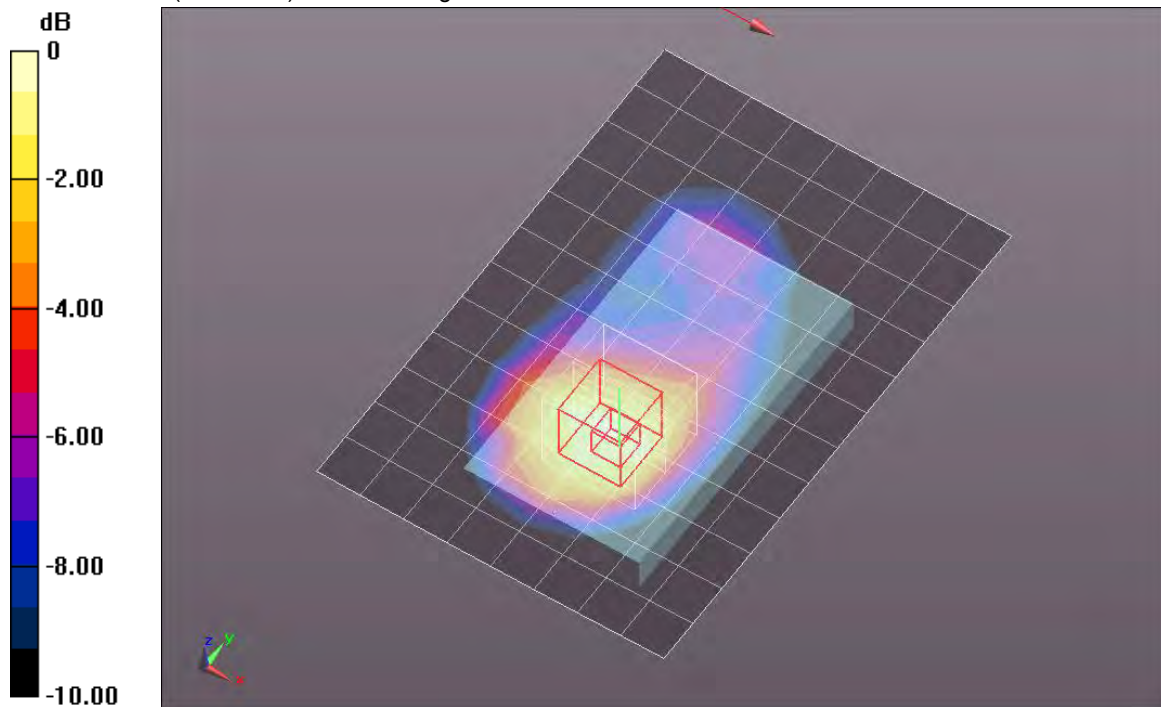
Reference Value = 27.086 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 1.6280

SAR(1 g) = 0.999 mW/g; SAR(10 g) = 0.602 mW/g

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

Maximum value of SAR (measured) = 1.264 mW/g



0 dB = 1.260mW/g = 2.01 dB mW/g

Test Laboratory: UL CCS SAR Lab B Date: 4/26/2012

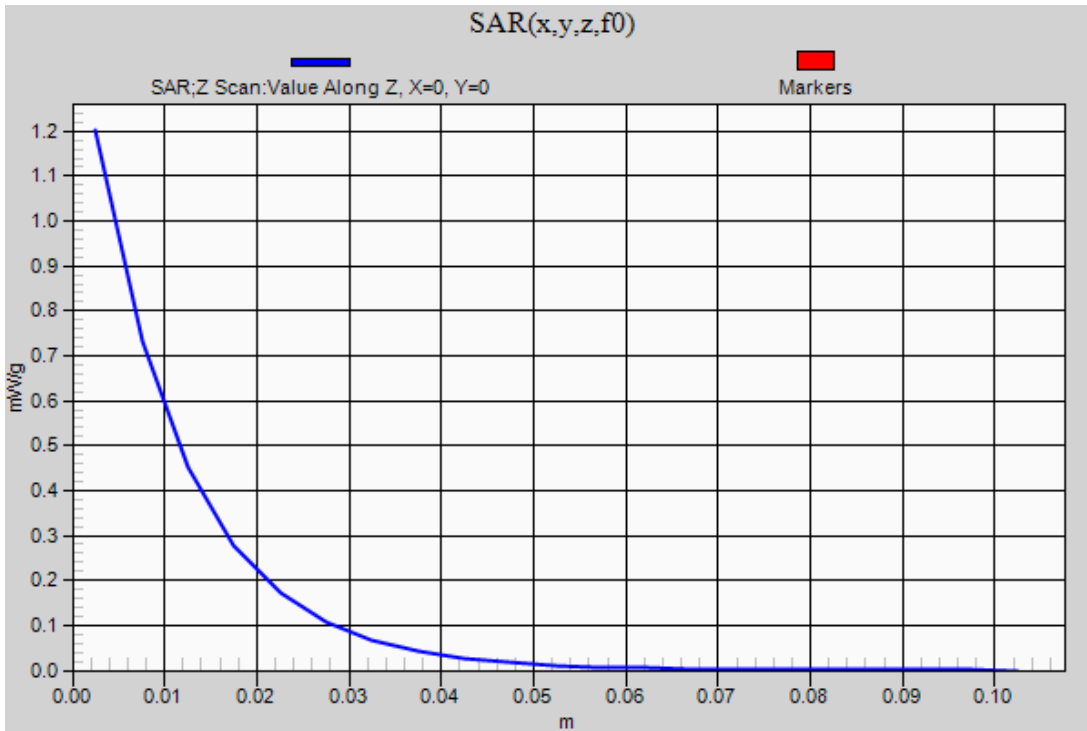
CDMA 2000-BC1

Frequency: 1908.75 MHz; Duty Cycle: 1:1

Front/1xRTT_SO32_Ch 1175/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

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

Maximum value of SAR (measured) = 1.202 mW/g



Test Laboratory: UL CCS SAR Lab B Date: 4/27/2012

CDMA2000-BC1

Frequency: 1880 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.512$ mho/m; $\epsilon_r = 52.19$; $\rho = 1000$ kg/m³
DASY5 Configuration:

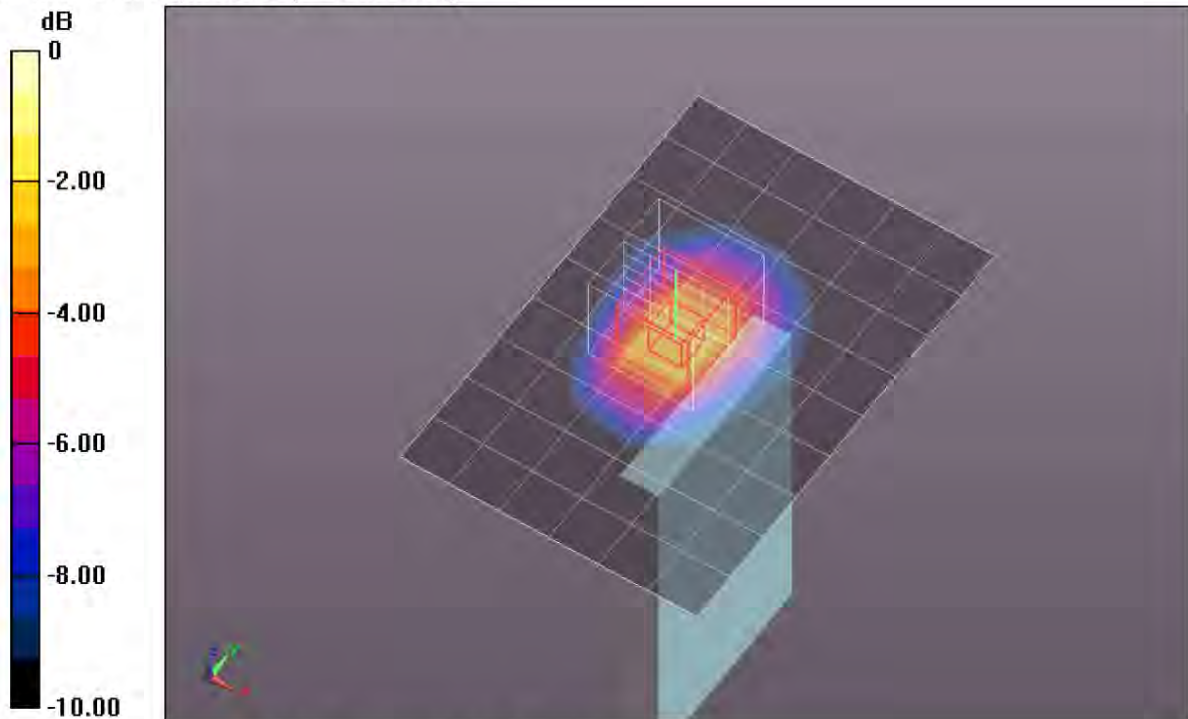
- Electronics: DAE4 Sn1259; Calibrated: 2/13/2012
- Probe: EX3DV3 - SN3531; ConvF(7.91, 7.91, 7.91); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: ELI v5.0 (B); Type: QDOVA001BB; Serial: 1118

Edge 3/1xRTT_SO32_Ch 600/Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.090 mW/g

Edge 3/1xRTT_SO32_Ch 600/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.159 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 2.0610

SAR(1 g) = 1.24 mW/g; SAR(10 g) = 0.664 mW/g
Maximum value of SAR (measured) = 1.655 mW/g



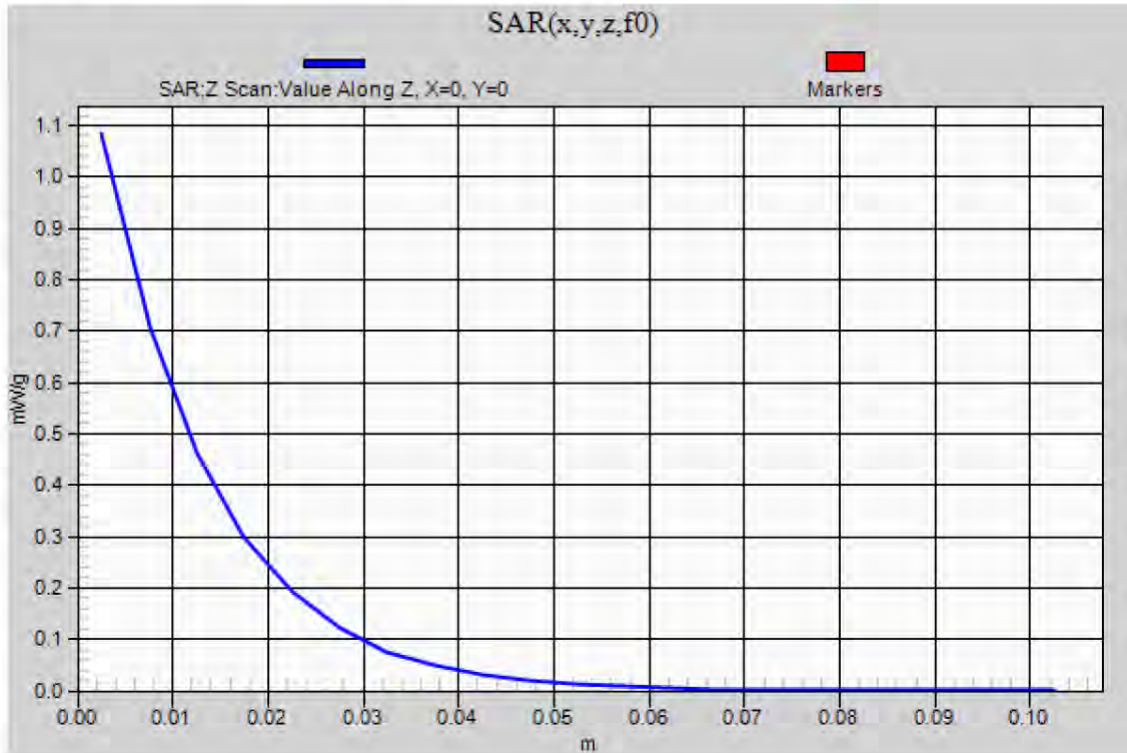
0 dB = 1.650mW/g = 4.35 dB mW/g

Test Laboratory: UL CCS SAR Lab B Date: 4/27/2012

CDMA2000-BC1

Frequency: 1880 MHz; Duty Cycle: 1:1

Edge 3/1xRTT_SO32_Ch 600/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 1.084 mW/g



Test Laboratory: UL CCS SAR Lab B Date: 4/27/2012

CDMA2000-BC1

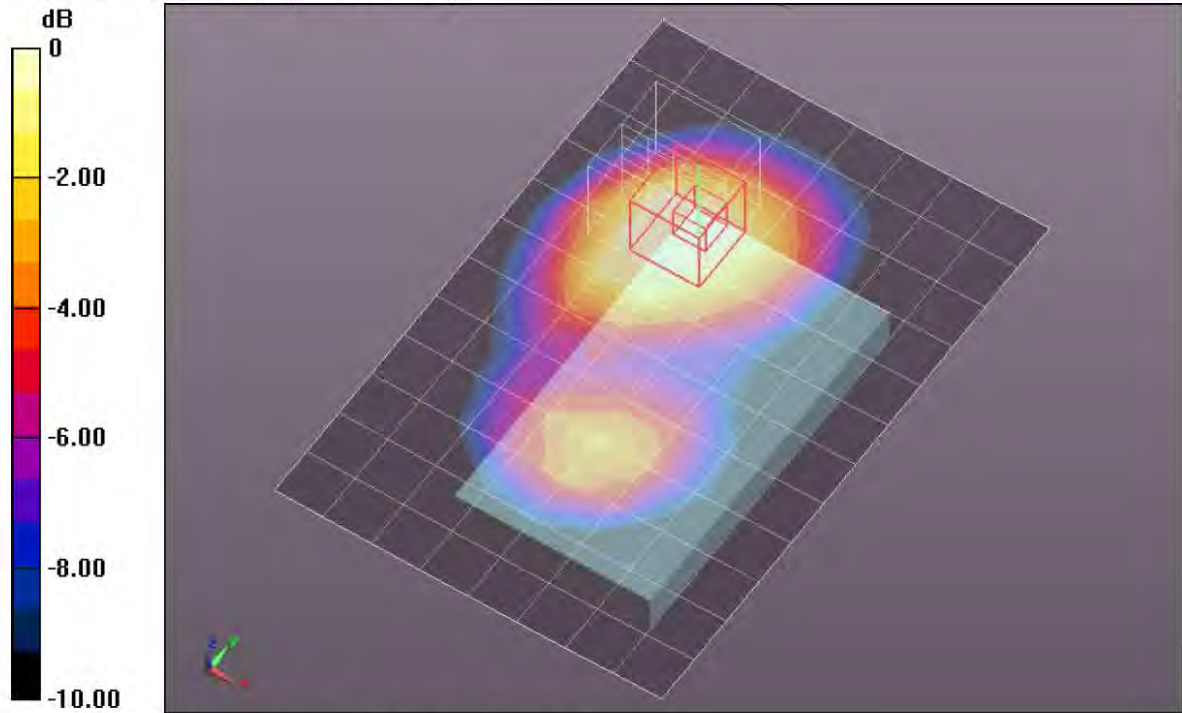
Frequency: 1880 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.512$ mho/m; $\epsilon_r = 52.19$; $\rho = 1000$ kg/m³

DASY5 Configuration:

- Electronics: DAE4 Sn1259; Calibrated: 2/13/2012
- Probe: EX3DV3 - SN3531; ConvF(7.91, 7.91, 7.91); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: ELI v5.0 (B); Type: QDOVA001BB; Serial: 1118

Rear/1xEVDO_Rel.0_Ch 600/Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.078 mW/g

Rear/1xEVDO_Rel.0_Ch 600/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.070 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 1.4140
SAR(1 g) = 0.857 mW/g; SAR(10 g) = 0.535 mW/g
Maximum value of SAR (measured) = 1.064 mW/g



0 dB = 1.060mW/g = 0.51 dB mW/g

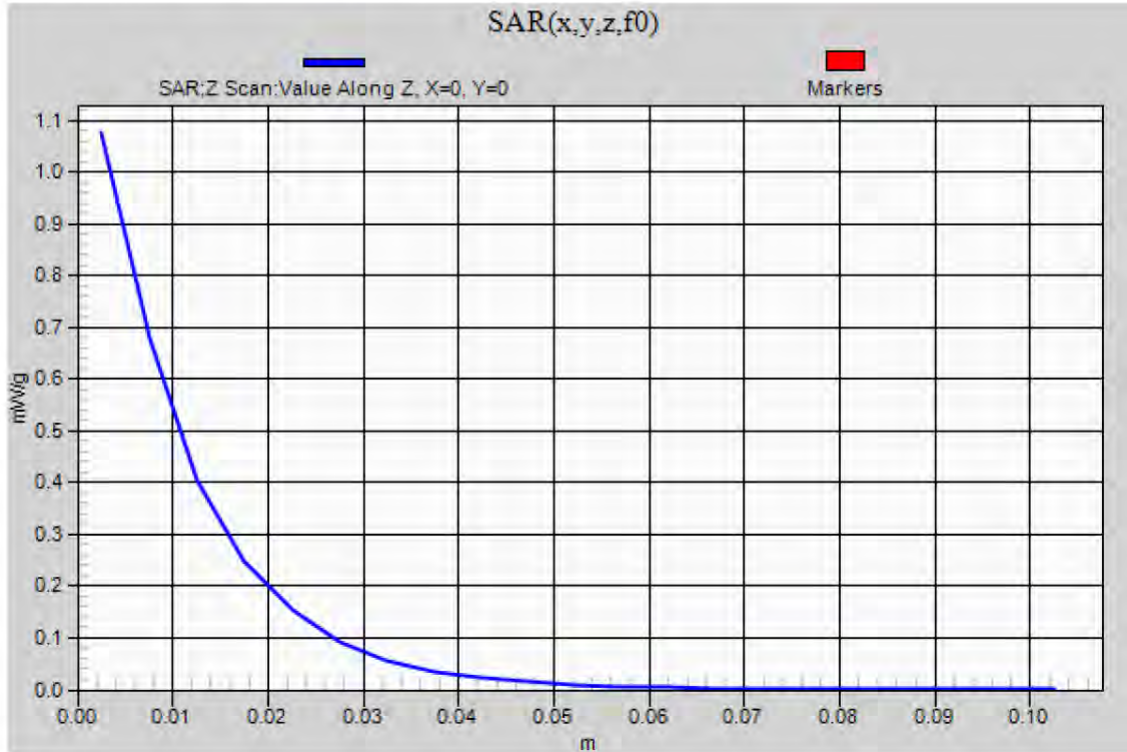
Test Laboratory: UL CCS SAR Lab B Date: 4/27/2012

CDMA2000-BC1

Frequency: 1880 MHz; Duty Cycle: 1:1

Rear/1xEVDO_Rel.0_Ch 600/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of SAR (measured) = 1.076 mW/g



Test Laboratory: UL CCS SAR Lab C

Date: 4/28/2012

CDMA 2000 - BC15

Frequency: 1732.5 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 1732.5$ MHz; $\sigma = 1.321$ mho/m; $\epsilon_r = 39.055$; $\rho = 1000$ kg/m³

DASY5 Configuration:

- Electronics: DAE4 Sn1259; Calibrated: 2/13/2012
- Probe: EX3DV3 - SN3531; ConvF(8.92, 8.92, 8.92); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM; Type: QD000P40CD; Serial: 1629

Right/Touch_1xRTT_ch 450/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (measured) = 0.746 mW/g

Right/Touch_1xRTT_ch 450/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

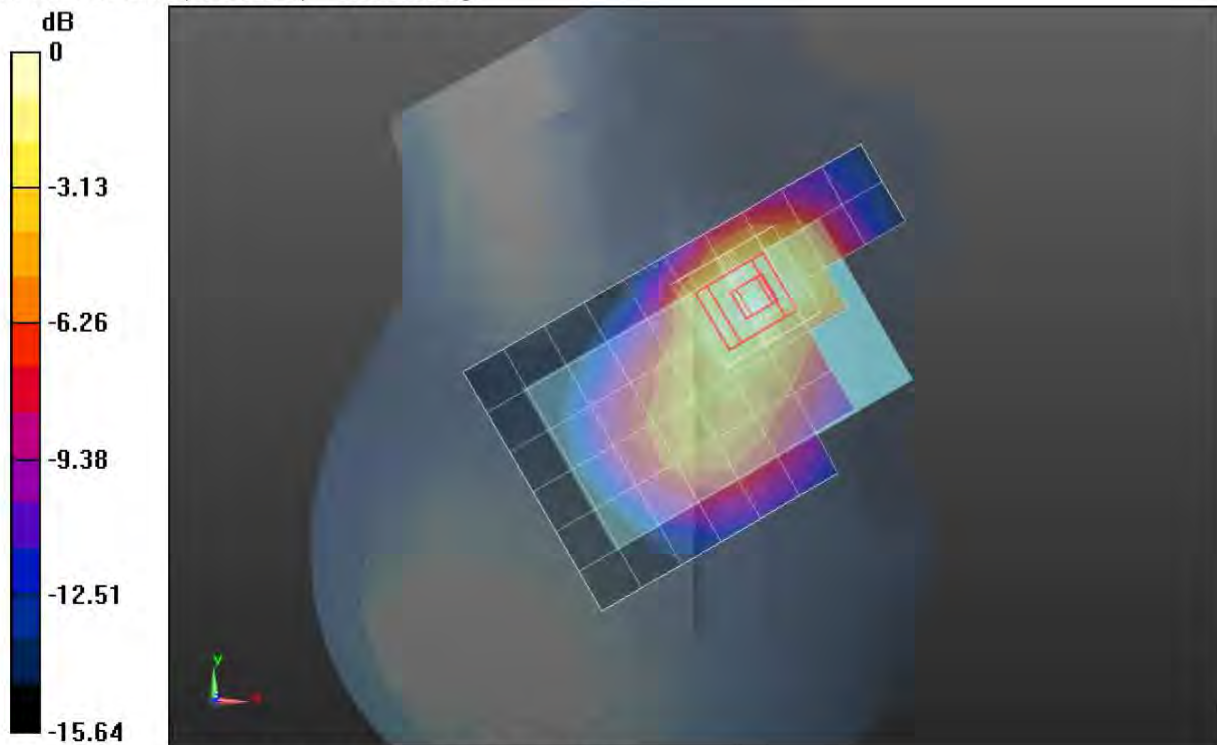
Reference Value = 23.931 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 1.0500

SAR(1 g) = 0.662 mW/g; SAR(10 g) = 0.387 mW/g

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

Maximum value of SAR (measured) = 0.835 mW/g



0 dB = 0.830mW/g = -1.62 dB mW/g

Test Laboratory: UL CCS SAR Lab C

Date: 4/28/2012

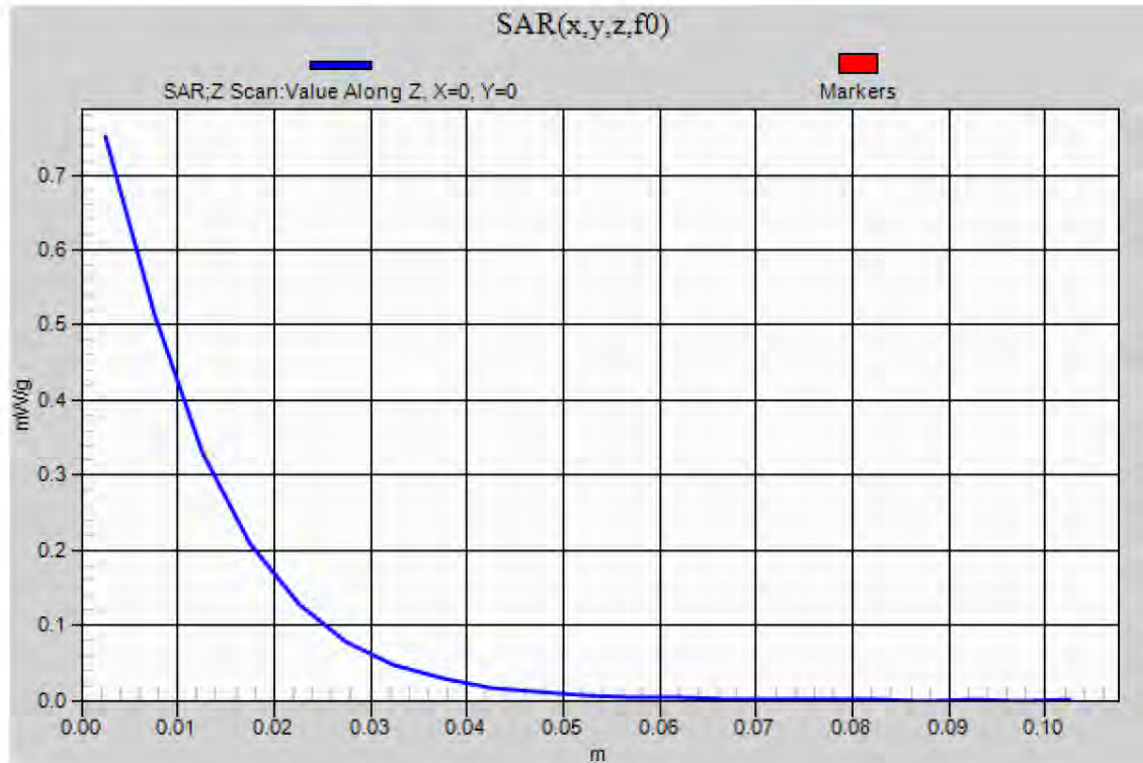
CDMA 2000 - BC15

Frequency: 1732.5 MHz; Duty Cycle: 1:1

Right/Touch_1xRTT_ch 450/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

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

Maximum value of SAR (measured) = 0.752 mW/g



Test Laboratory: UL CCS SAR Lab C

Date: 4/28/2012

CDMA 2000 - BC15

Frequency: 1732.5 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 1732.5$ MHz; $\sigma = 1.321$ mho/m; $\epsilon_r = 39.055$; $\rho = 1000$ kg/m³
DASY5 Configuration:

- Electronics: DAE4 Sn1259; Calibrated: 2/13/2012
- Probe: EX3DV3 - SN3531; ConvF(8.92, 8.92, 8.92); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM; Type: QD000P40CD; Serial: 1629

Left/Touch_1xEVDO_ch 450/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (measured) = 0.650 mW/g

Left/Touch_1xEVDO_ch 450/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

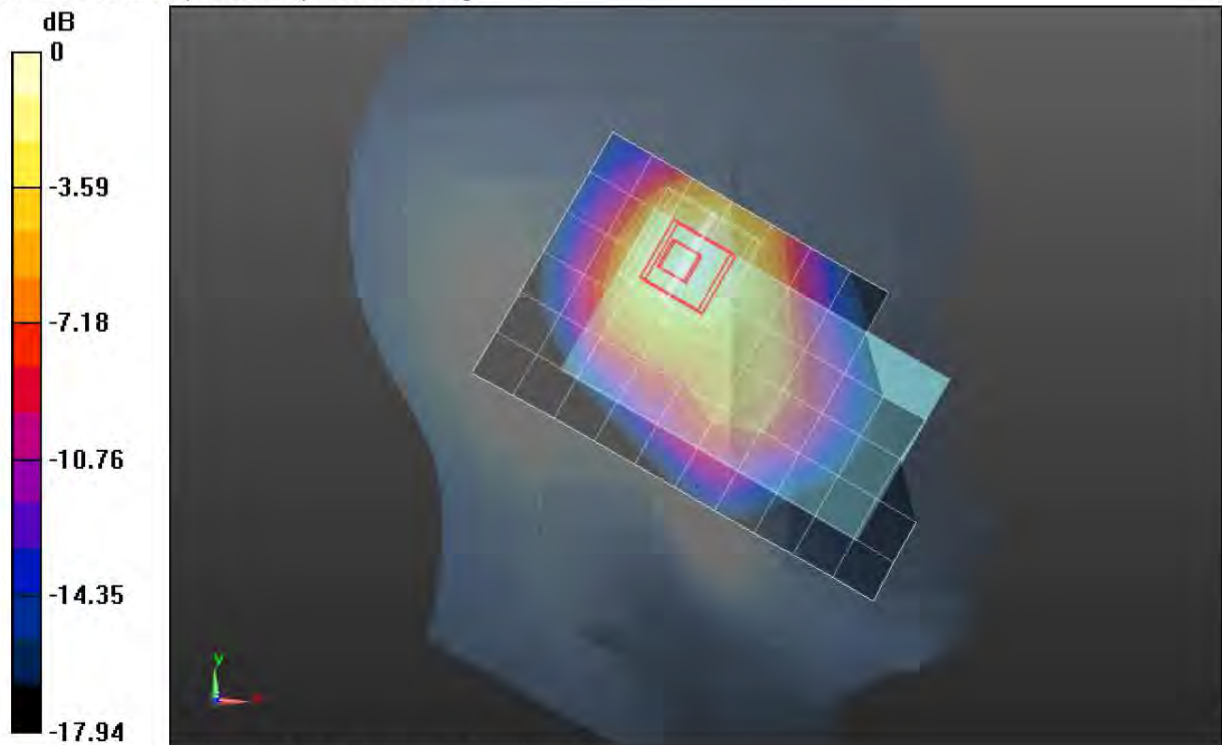
Reference Value = 22.340 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 1.0230

SAR(1 g) = 0.571 mW/g; SAR(10 g) = 0.331 mW/g

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

Maximum value of SAR (measured) = 0.731 mW/g



0 dB = 0.730mW/g = -2.73 dB mW/g

Test Laboratory: UL CCS SAR Lab C

Date: 4/28/2012

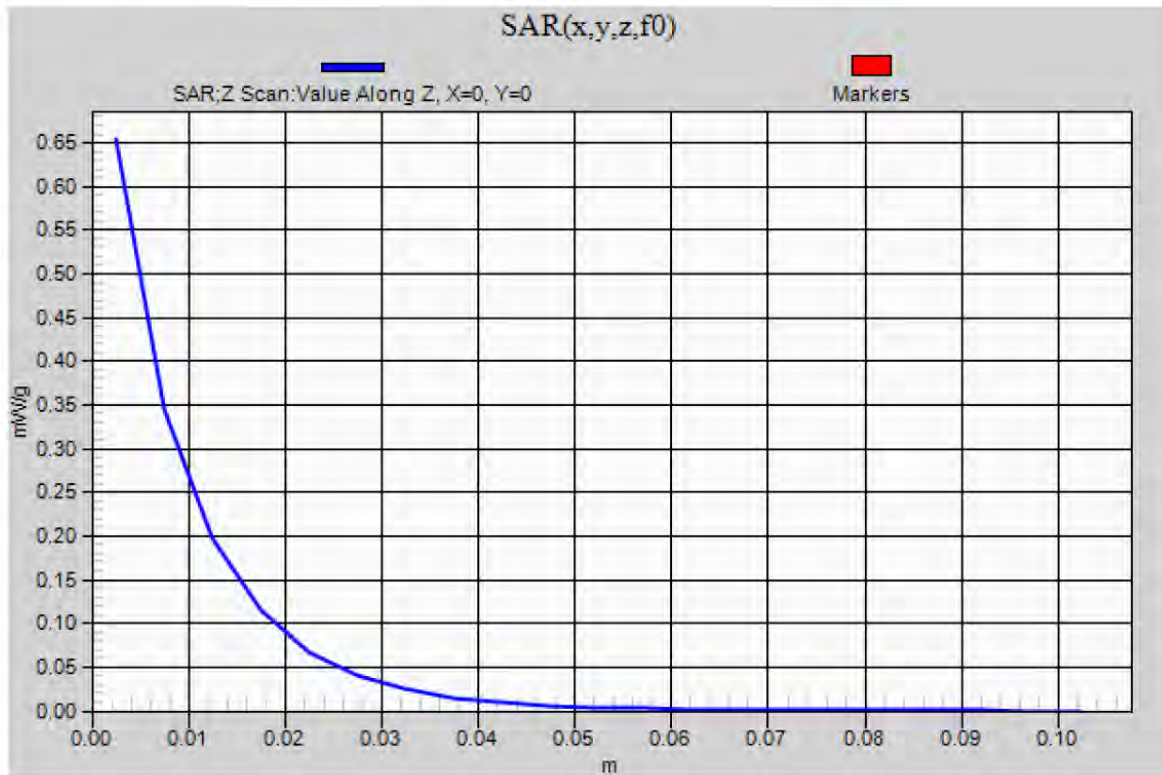
CDMA 2000 - BC15

Frequency: 1732.5 MHz; Duty Cycle: 1:1

Left/Touch_1xEVDO_ch 450/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

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

Maximum value of SAR (measured) = 0.654 mW/g



Test Laboratory: UL CCS SAR Lab C

Date: 4/29/2012

CDMA2000-BC15

Frequency: 1732.5 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 1732.5$ MHz; $\sigma = 1.467$ mho/m; $\epsilon_r = 53.897$; $\rho = 1000$ kg/m³

DASY5 Configuration:

- Electronics: DAE4 Sn1259; Calibrated: 2/13/2012
- Probe: EX3DV3 - SN3531; ConvF(8.34, 8.34, 8.34); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: ELL v5.0 (B); Type: QDOVA001BB; Serial: 1118

Rear/1xRTT_SO32_Ch 450/Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (measured) = 0.926 mW/g

Rear/1xRTT_SO32_Ch 450/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

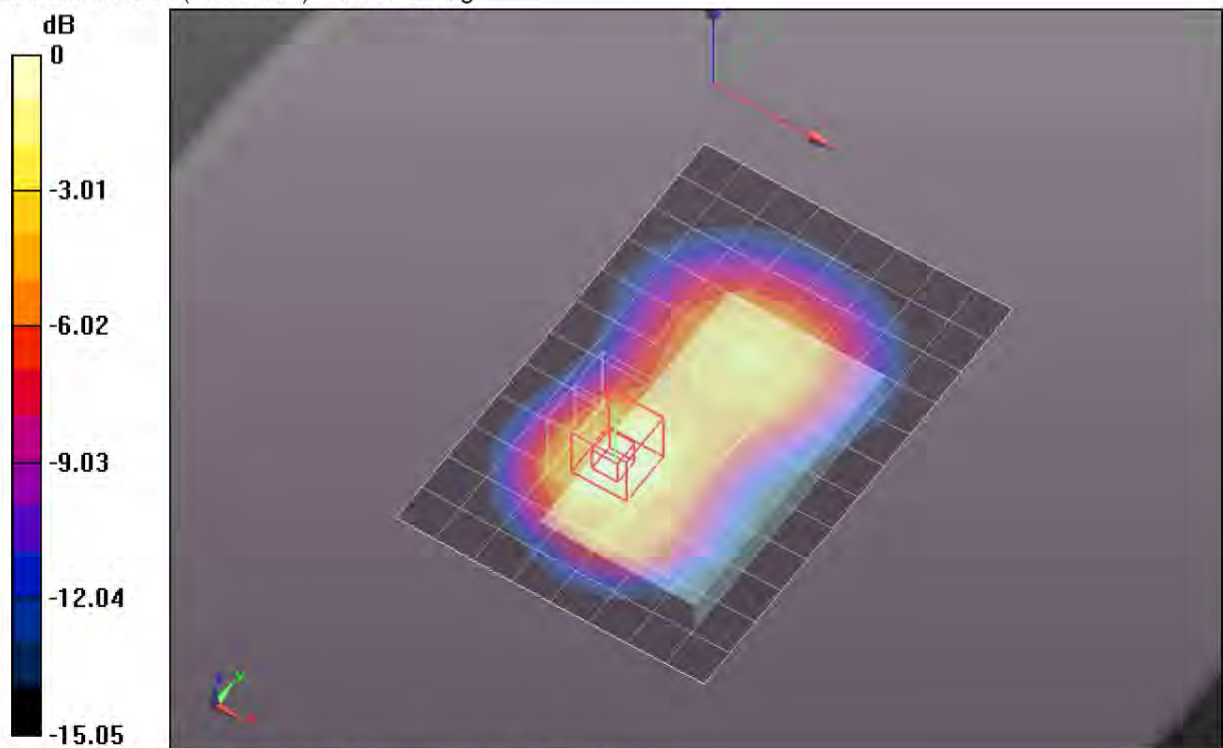
Reference Value = 25.120 V/m; Power Drift = 0.00093 dB

Peak SAR (extrapolated) = 1.1820

SAR(1 g) = 0.736 mW/g; SAR(10 g) = 0.433 mW/g

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

Maximum value of SAR (measured) = 0.925 mW/g



0 dB = 0.930mW/g = -0.63 dB mW/g

Test Laboratory: UL CCS SAR Lab C

Date: 4/29/2012

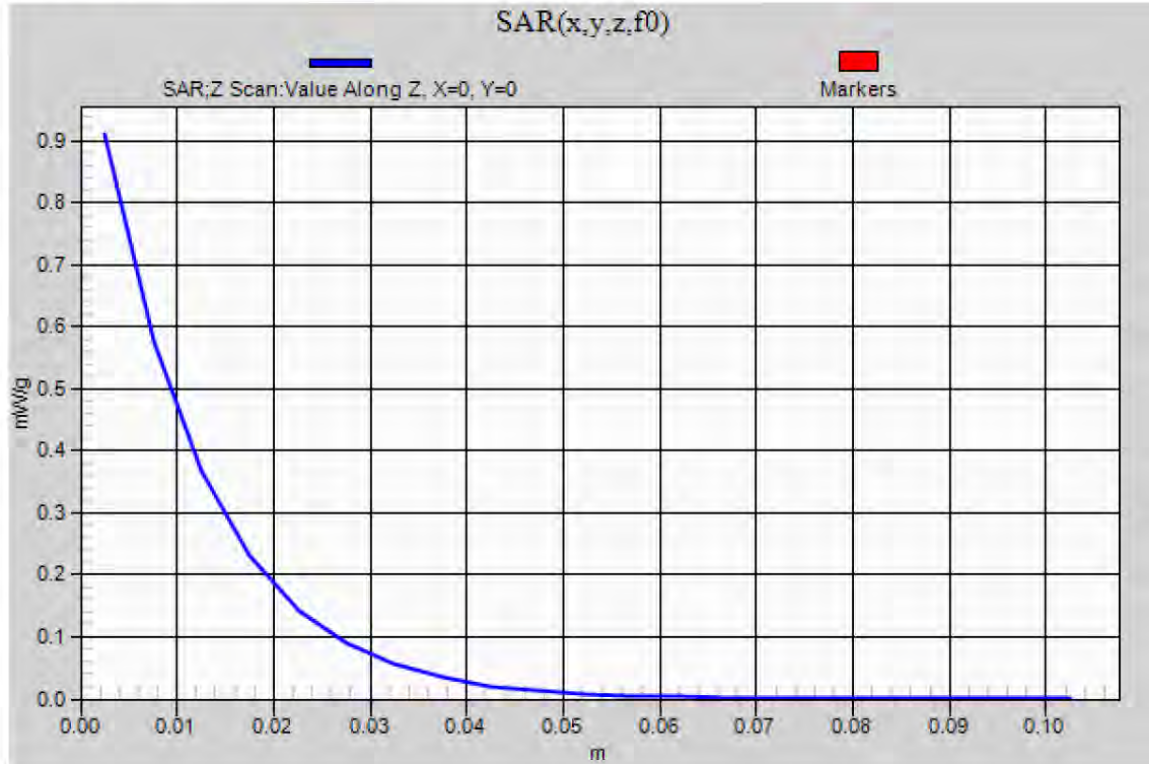
CDMA2000-BC15

Frequency: 1732.5 MHz; Duty Cycle: 1:1

Rear/1xRTT_SO32_Ch 450/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

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

Maximum value of SAR (measured) = 0.910 mW/g



Test Laboratory: UL CCS SAR Lab C

Date: 4/29/2012

CDMA2000-BC15

Frequency: 1732.5 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 1732.5$ MHz; $\sigma = 1.467$ mho/m; $\epsilon_r = 53.897$; $\rho = 1000$ kg/m³

DASY5 Configuration:

- Electronics: DAE4 Sn1259; Calibrated: 2/13/2012
- Probe: EX3DV3 - SN3531; ConvF(8.34, 8.34, 8.34); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: ELI v5.0 (B); Type: QDOVA001BB; Serial: 1118

Rear/1xEVDO_SO32_Ch 450/Area Scan (9x13x1):

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

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

Maximum value of SAR (measured) = 0.821 mW/g

Rear/1xEVDO_SO32_Ch 450/Zoom Scan (5x5x7)/Cube 0:

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

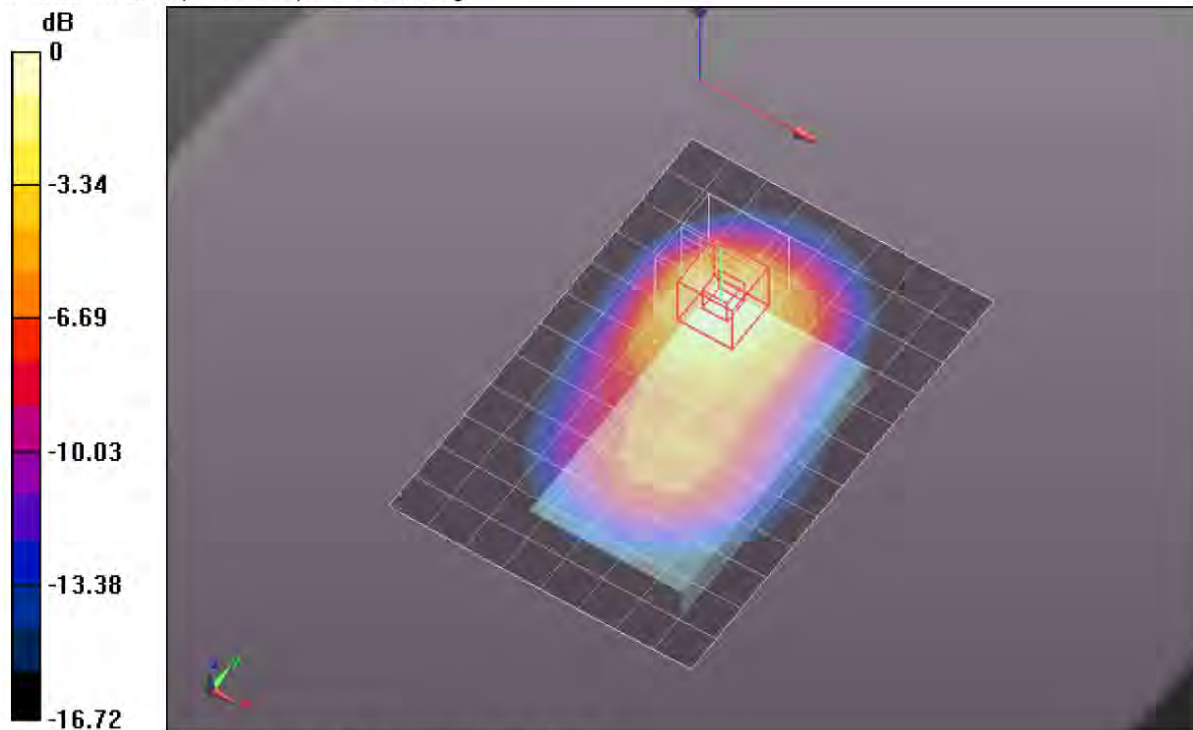
Reference Value = 24.015 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 1.1020

SAR(1 g) = 0.679 mW/g; SAR(10 g) = 0.407 mW/g

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

Maximum value of SAR (measured) = 0.856 mW/g



0 dB = 0.860mW/g = -1.31 dB mW/g

Test Laboratory: UL CCS SAR Lab C

Date: 4/29/2012

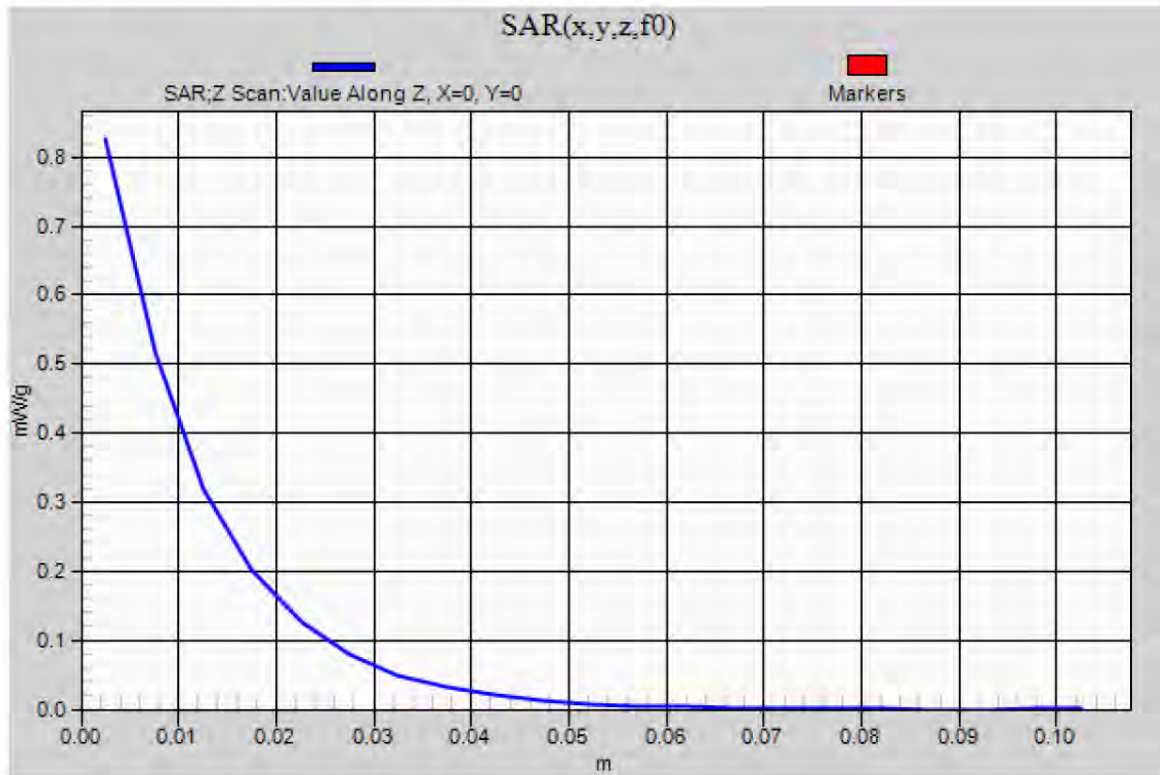
CDMA2000-BC15

Frequency: 1732.5 MHz; Duty Cycle: 1:1

Rear/1xEVDO_SO32_Ch 450/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

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

Maximum value of SAR (measured) = 0.827 mW/g



Test Laboratory: UL CCS SAR Lab A

Date: 4/25/2012

LTE Band4_Head

Frequency: 1732.5 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 1732.5 \text{ MHz}$; $\sigma = 1.306 \text{ mho/m}$; $\epsilon_r = 39.055$; $\rho = 1000 \text{ kg/m}^3$

DASY5 Configuration:

- Electronics: DAE4 Sn1239; Calibrated: 10/18/2011
- Probe: EX3DV4 - SN3772; ConvF(7.79, 7.79, 7.79); Calibrated: 2/16/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM v5.0 (A); Type: QD000P40CC; Serial: 1602

Left/Touch_QPSK_RB 1/49_M ch/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (measured) = 0.805 mW/g

Left/Touch_QPSK_RB 1/49_M ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

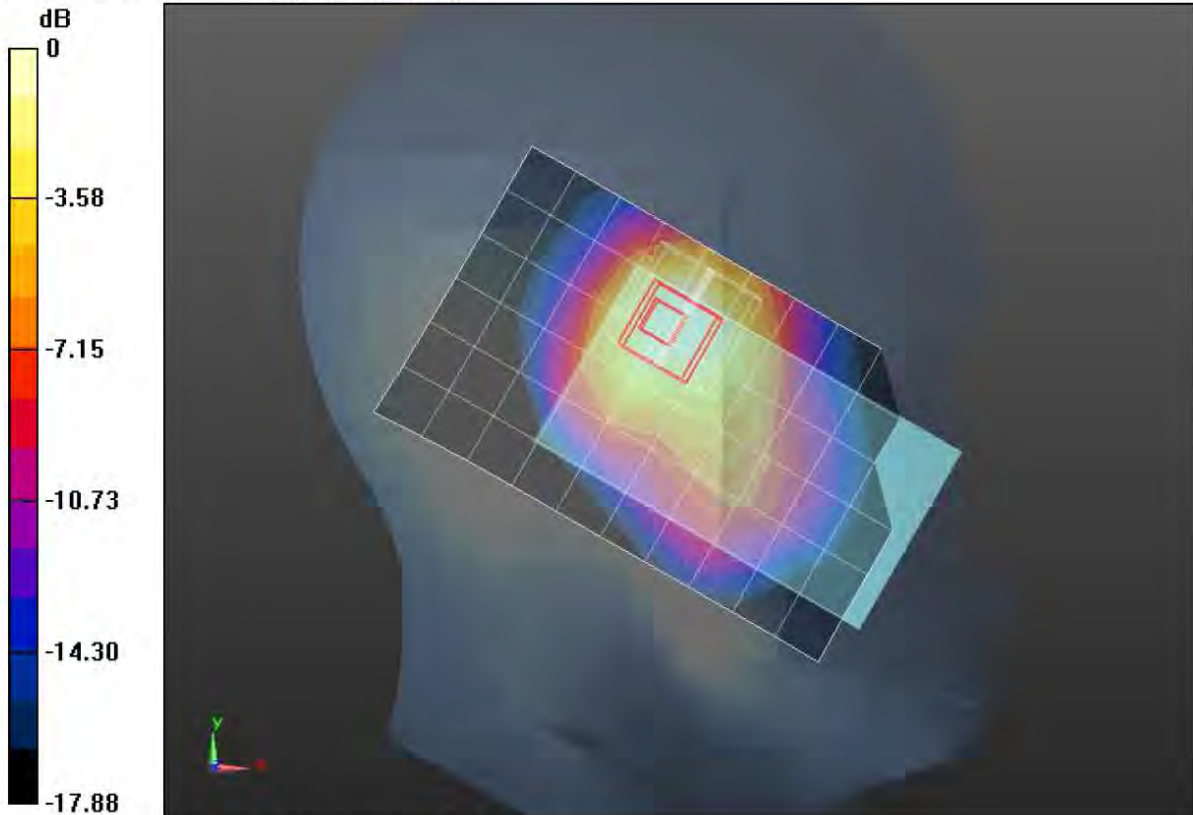
Reference Value = 25.042 V/m; Power Drift = 0.004 dB

Peak SAR (extrapolated) = 1.1990

SAR(1 g) = 0.661 mW/g; SAR(10 g) = 0.379 mW/g

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

Maximum value of SAR (measured) = 0.816 mW/g



0 dB = 0.820mW/g = -1.72 dB mW/g

Test Laboratory: UL CCS SAR Lab A

Date: 4/25/2012

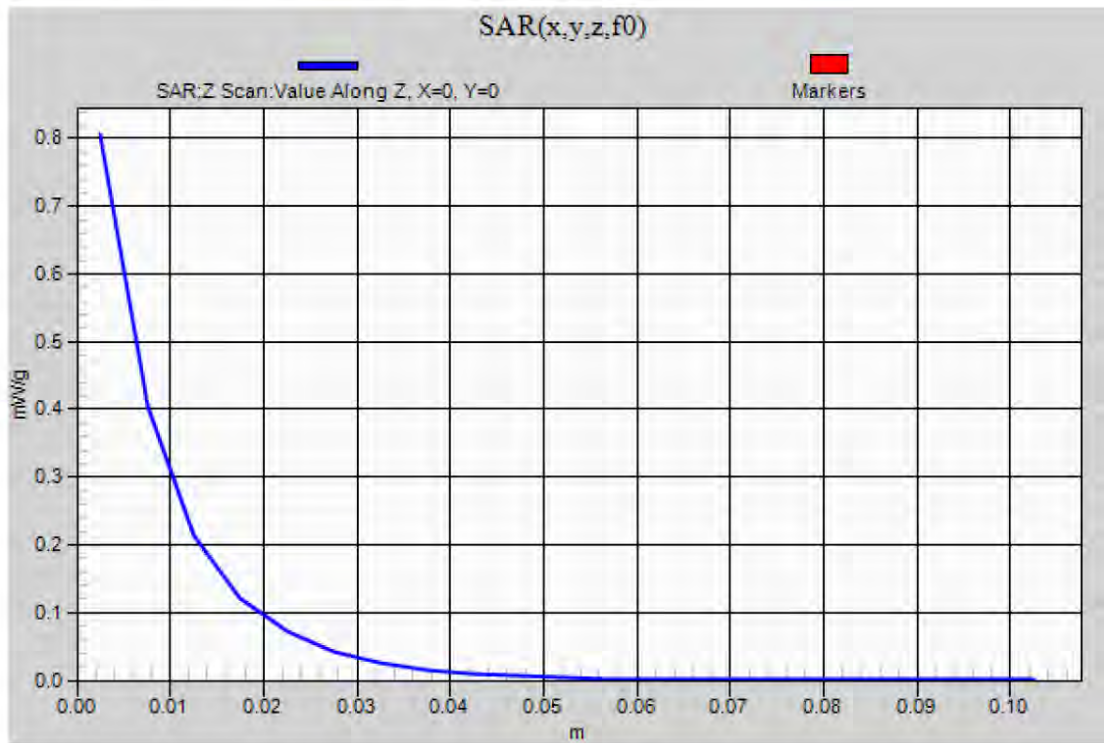
LTE Band4_Head

Frequency: 1732.5 MHz; Duty Cycle: 1:1

Left/Touch_QPSK_RB 1/49_M ch/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

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

Maximum value of SAR (measured) = 0.806 mW/g



Test Laboratory: UL CCS SAR Lab B Date: 4/26/2012

LTE Band4_ Body

Frequency: 1732.5 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 1732.5$ MHz; $\sigma = 1.451$ mho/m; $\epsilon_r = 54.798$; $\rho = 1000$ kg/m³

DASY5 Configuration:

- Electronics: DAE4 Sn1239; Calibrated: 10/18/2011
- Probe: EX3DV4 - SN3772; ConvF(7.55, 7.55, 7.55); Calibrated: 2/16/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: ELI v5.0 (A); Type: QDOVA001BB; Serial: 1119

Rear/Body 10mm_QPSK_RB 1/49_M ch/Area Scan (8x11x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (measured) = 0.904 mW/g

Rear/Body 10mm_QPSK_RB 1/49_M ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

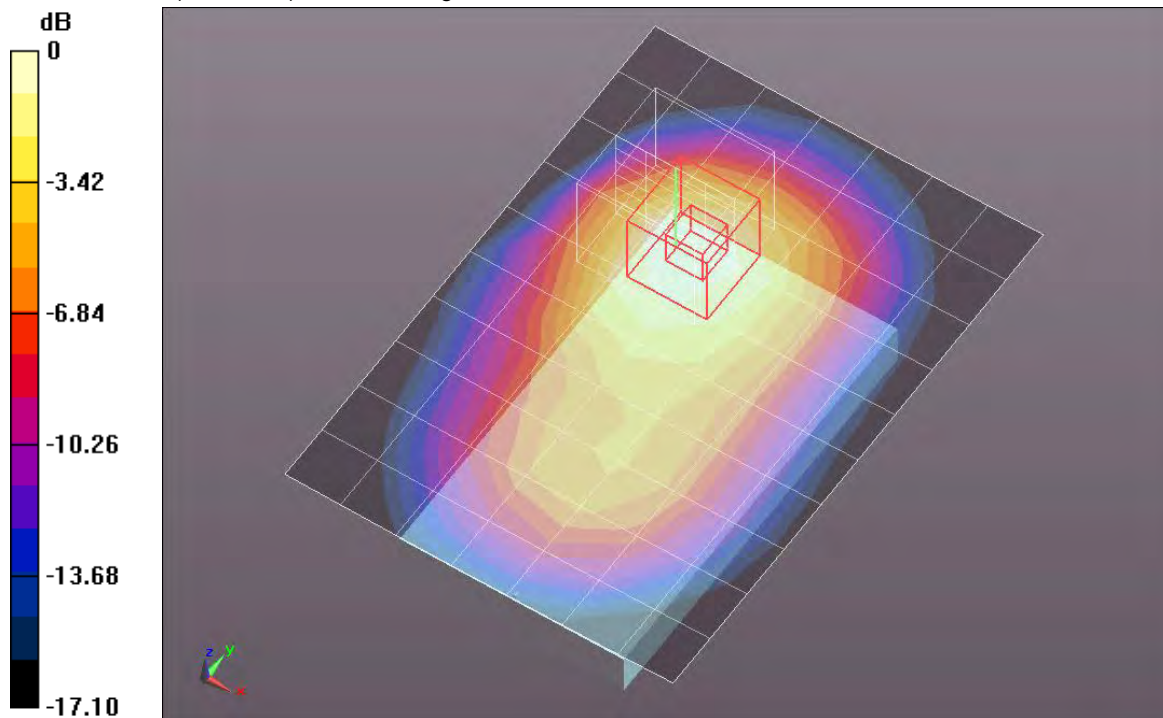
Reference Value = 25.328 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 1.2100

SAR(1 g) = 0.748 mW/g; SAR(10 g) = 0.458 mW/g

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

Maximum value of SAR (measured) = 0.914 mW/g



0 dB = 0.910mW/g = -0.82 dB mW/g

Test Laboratory: UL CCS SAR Lab A

Date: 4/26/2012

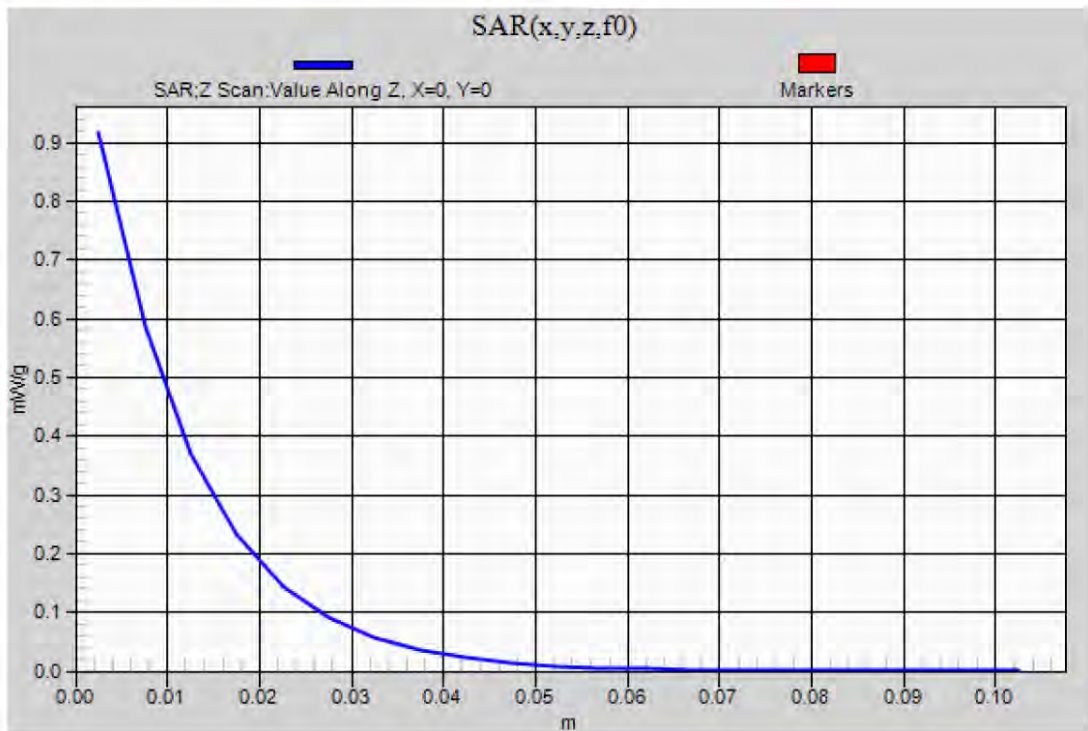
LTE Band4_ Body

Frequency: 1732.5 MHz; Duty Cycle: 1:1

Rear/Body 10mm_QPSK_RB 1/49_M ch/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

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

Maximum value of SAR (measured) = 0.917 mW/g



Test Laboratory: UL CCS SAR Lab A

Date: 4/27/2012

LTE Band2_Head

Frequency: 1855 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used: $f = 1855 \text{ MHz}$; $\sigma = 1.344 \text{ mho/m}$; $\epsilon_r = 41.453$; $\rho = 1000 \text{ kg/m}^3$

DASY5 Configuration:

- Electronics: DAE4 Sn1239; Calibrated: 10/18/2011
- Probe: EX3DV4 - SN3772; ConvF(7.59, 7.59, 7.59); Calibrated: 2/16/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM v5.0 (B); Type: QD000P40CD; Serial: 1628

Left/Touch_QPSK_RB 1/0_L ch/Area Scan (8x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.362 mW/g

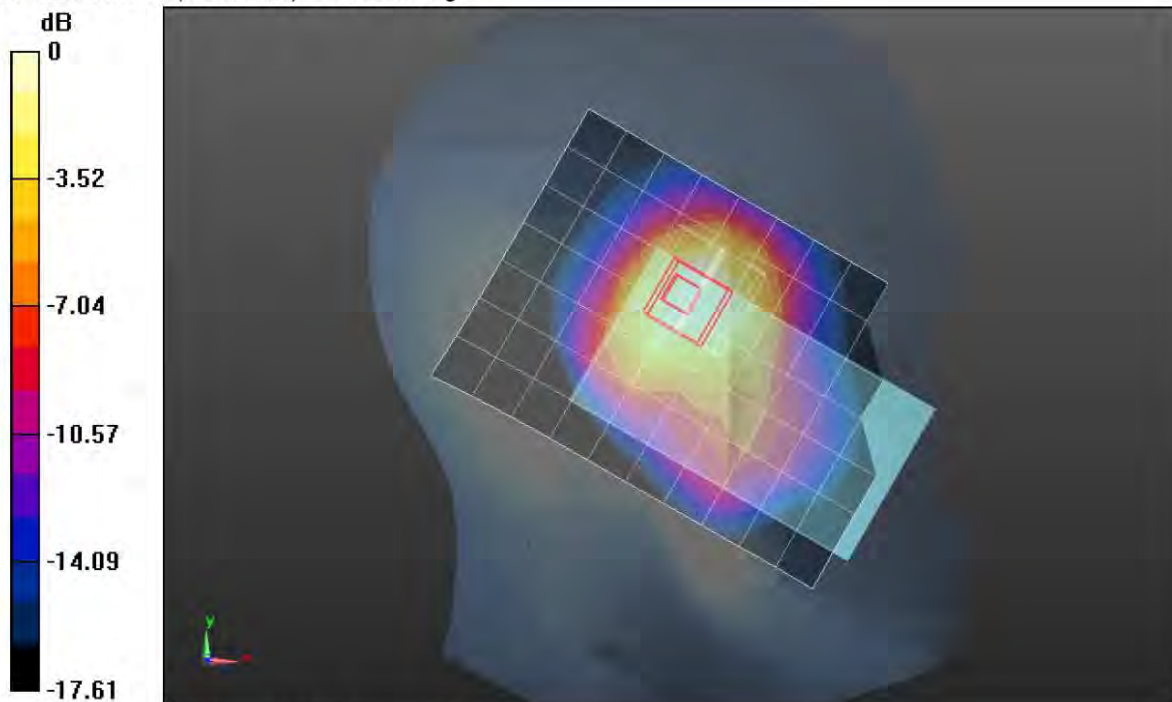
Left/Touch_QPSK_RB 1/0_L ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 32.083 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 1.9220

SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.595 mW/g

Maximum value of SAR (measured) = 1.302 mW/g



0 dB = 1.300mW/g = 2.28 dB mW/g

Test Laboratory: UL CCS SAR Lab A

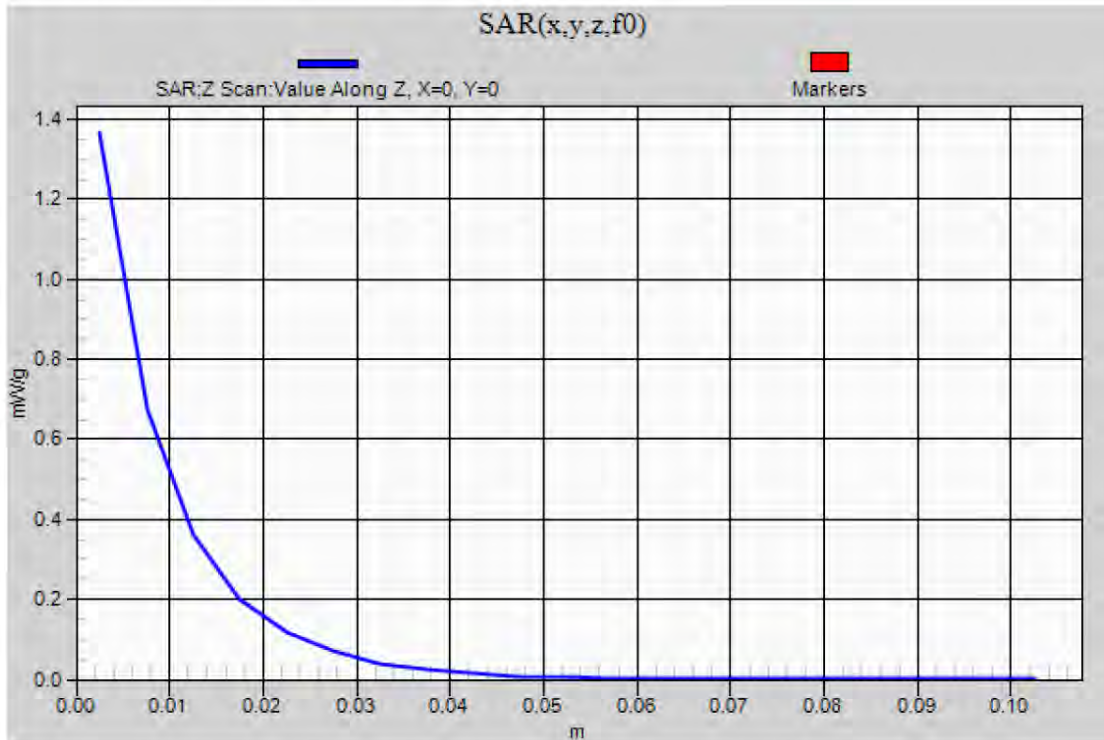
Date: 4/27/2012

LTE Band2_Head

Frequency: 1855 MHz; Duty Cycle: 1:1

Left/Touch_QPSK_RB 1/0_L ch/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of SAR (measured) = 1.367 mW/g



Test Laboratory: UL CCS SAR Lab B Date: 4/30/2012

LTE Band2_ Body

Frequency: 1880 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.55$ mho/m; $\epsilon_r = 52.939$; $\rho = 1000$ kg/m³

DASY5 Configuration:

- Electronics: DAE4 Sn1239; Calibrated: 10/18/2011
- Probe: EX3DV4 - SN3772; ConvF(7.23, 7.23, 7.23); Calibrated: 2/16/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: ELI v5.0 (B); Type: QDOVA001BB; Serial: 1099

Rear/Body 10mm_QPSK_RB 1/49_M ch/Area Scan (8x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.915 mW/g

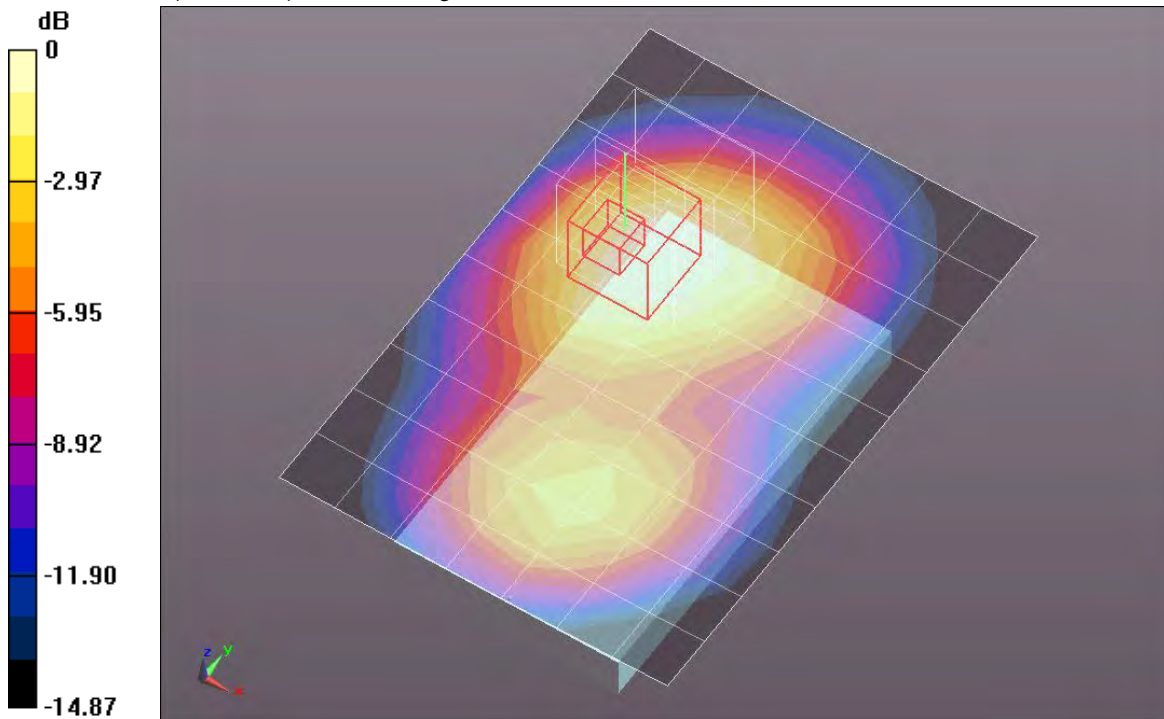
Rear/Body 10mm_QPSK_RB 1/49_M ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 24.621 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 1.2410

SAR(1 g) = 0.763 mW/g; SAR(10 g) = 0.481 mW/g

Maximum value of SAR (measured) = 0.956 mW/g



0 dB = 0.960mW/g = -0.35 dB mW/g

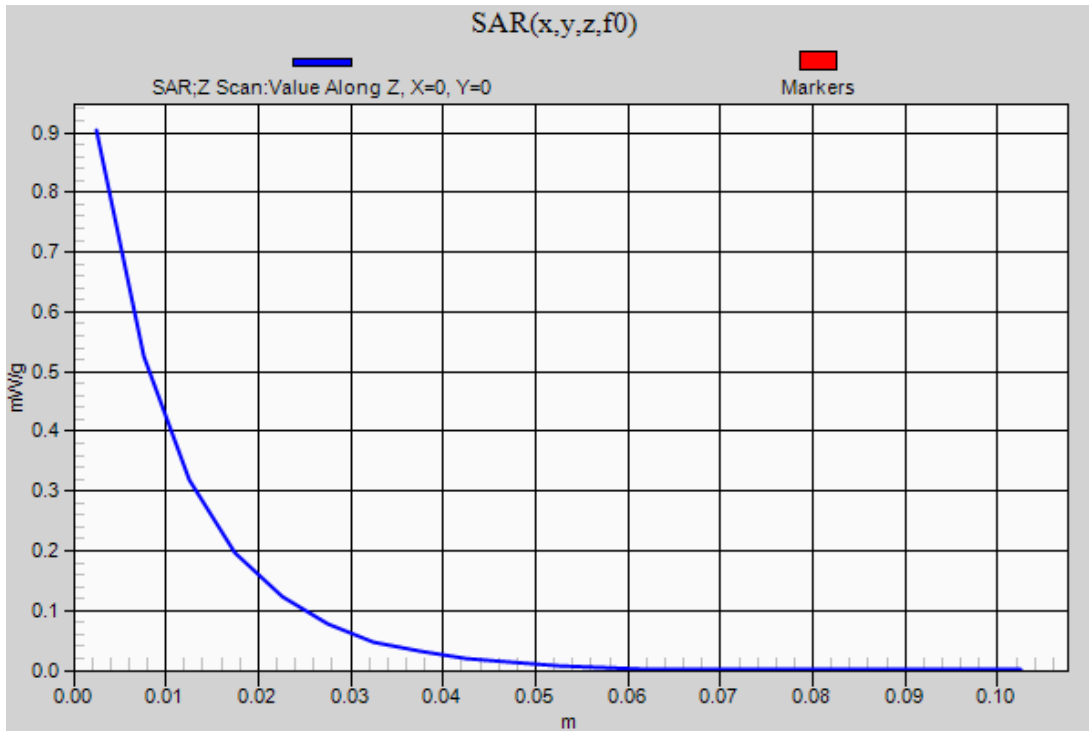
Test Laboratory: UL CCS SAR Lab B Date: 4/30/2012

LTE Band2_ Body

Frequency: 1880 MHz; Duty Cycle: 1:1

Rear/Body 10mm_QPSK_RB 1/49_M ch/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of SAR (measured) = 0.904 mW/g



Test Laboratory: UL CCS SAR Lab B Date: 4/24/2012

WiFi 2.4GHz_Head

Frequency: 2412 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.817$ mho/m; $\epsilon_r = 38.992$; $\rho = 1000$ kg/m³
DASY5 Configuration:

- Electronics: DAE4 Sn1259; Calibrated: 2/13/2012
- Probe: EX3DV3 - SN3531; ConvF(7.4, 7.4, 7.4); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: SAM; Type: QD000P40CD; Serial: 1629

Right/Touch_ch 1/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (measured) = 0.446 mW/g

Right /Touch_ch 1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.461 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 1.5780

SAR(1 g) = 0.093 mW/g; SAR(10 g) = 0.019 mW/g

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

Maximum value of SAR (measured) = 0.954 mW/g

Right /Touch_ch 1/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm

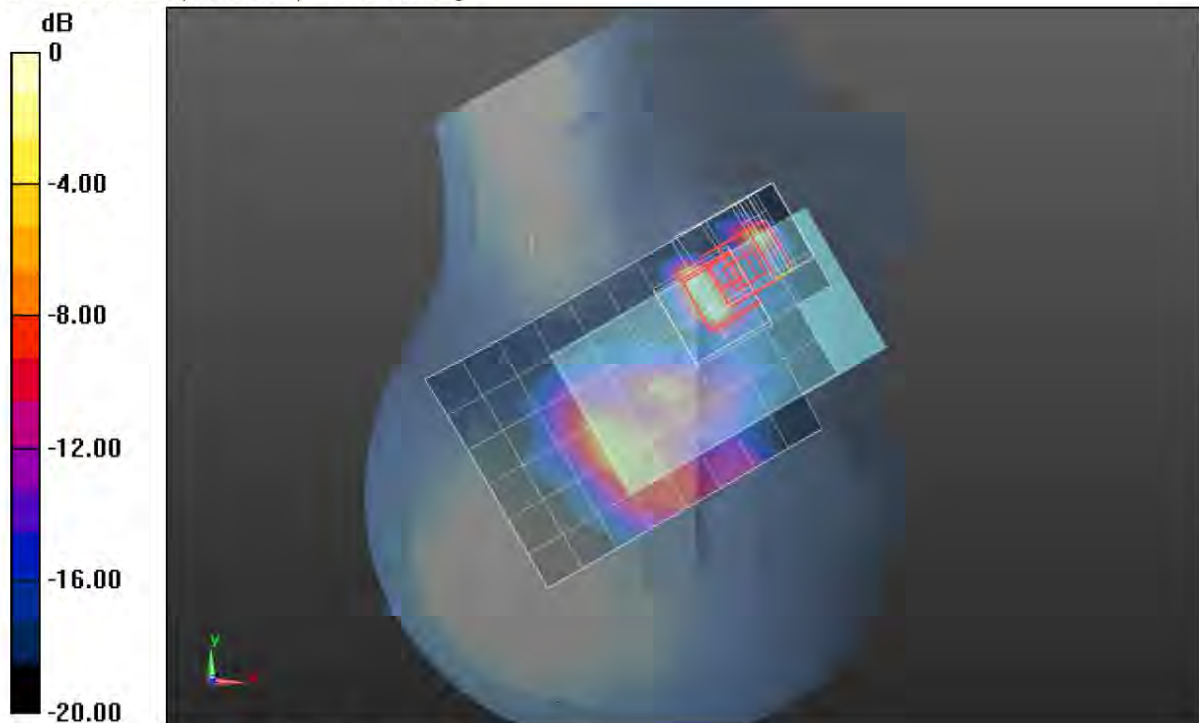
Reference Value = 2.461 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.7190

SAR(1 g) = 0.142 mW/g; SAR(10 g) = 0.042 mW/g

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

Maximum value of SAR (measured) = 0.460 mW/g



0 dB = 0.460mW/g = -6.74 dB mW/g

Test Laboratory: UL CCS SAR Lab B Date: 4/24/2012

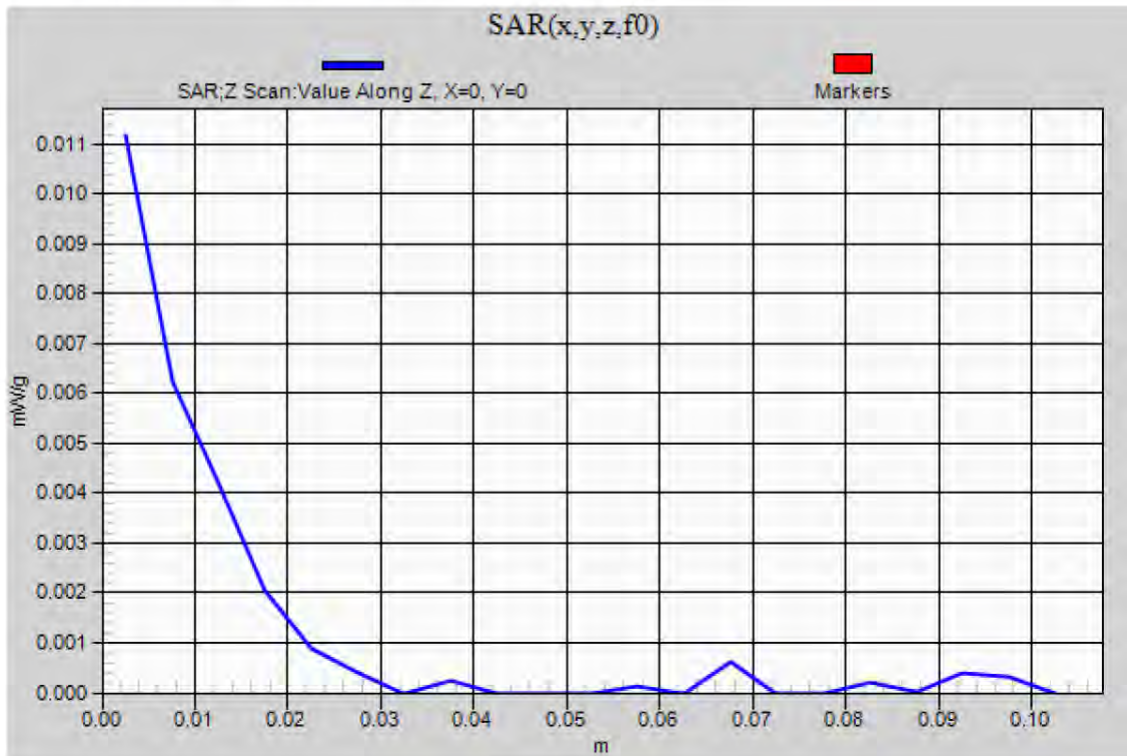
WiFi 2.4GHz

Frequency: 2412 MHz; Duty Cycle: 1:1

Right /Touch_ch 1/2 Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

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

Maximum value of SAR (measured) = 0.011 mW/g



Test Laboratory: UL CCS SAR Lab B Date: 4/23/2012

WiFi 2.4GHz

Frequency: 2412 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): $f = 2412 \text{ MHz}$; $\sigma = 1.912 \text{ mho/m}$; $\epsilon_r = 51.254$; $\rho = 1000 \text{ kg/m}^3$

DASY5 Configuration:

- Electronics: DAE4 Sn1259; Calibrated: 2/13/2012
- Probe: EX3DV3 - SN3531; ConvF(7.44, 7.44, 7.44); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: ELI v5.0 (A); Type: QDOVA001BB; Serial: 1120

Rear/802.11b_Ch 1/Area Scan (8x11x1):

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

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

Rear/802.11b_Ch 1/Zoom Scan (5x5x7)/Cube 0:

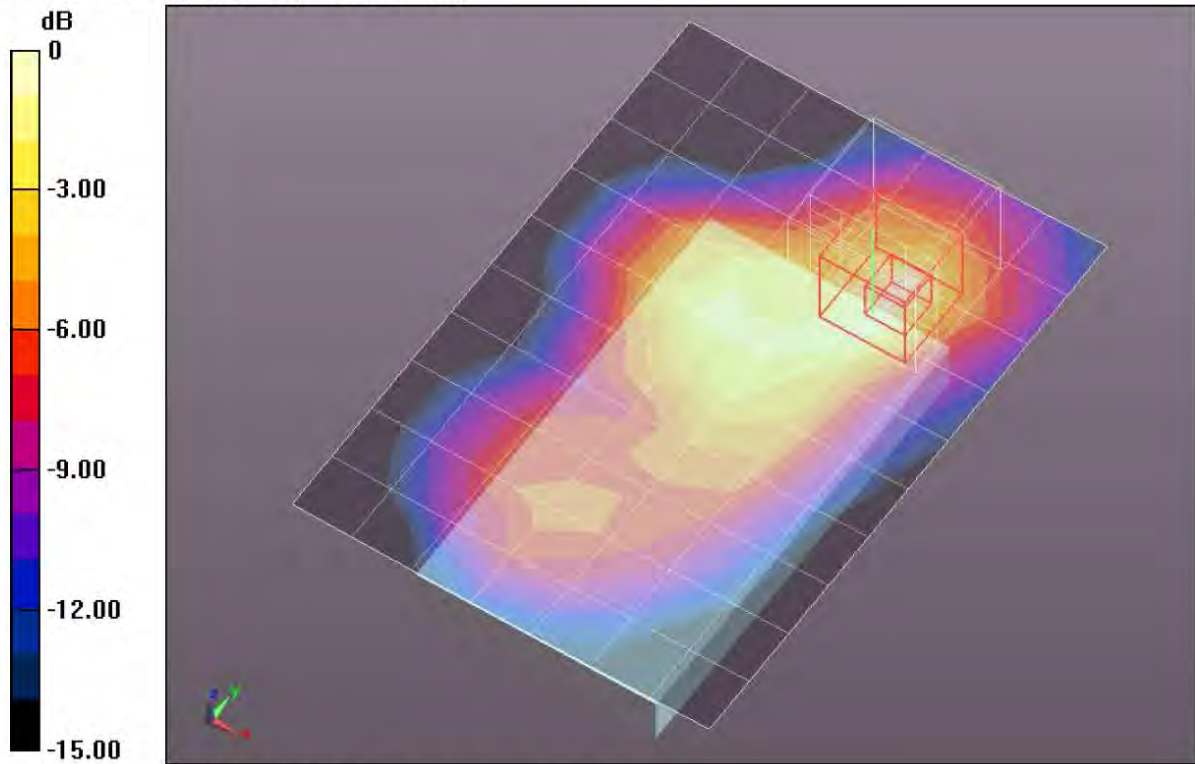
Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 8.746 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.2410

SAR(1 g) = 0.119 mW/g; SAR(10 g) = 0.058 mW/g

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

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



Test Laboratory: UL CCS SAR Lab B Date: 4/23/2012

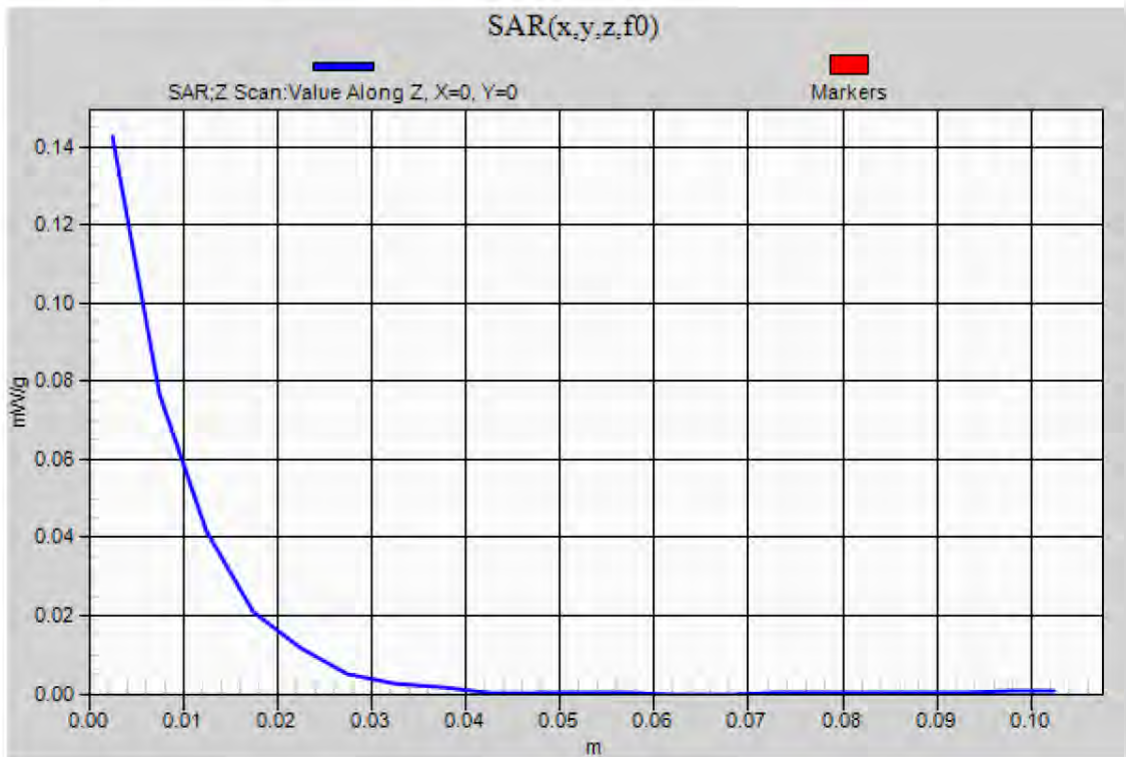
WiFi 2.4GHz

Frequency: 2412 MHz; Duty Cycle: 1:1

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

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

Maximum value of SAR (measured) = 0.143 mW/g



16. Simultaneous Transmission SAR Analysis

Simultaneous Transmission SAR Test Exclusion for Bluetooth

As its max average power is 7.41 mW [$<60/f(\text{GHz})$ mW], standalone SAR is not required for Bluetooth. Therefore, Bluetooth need not be considered in the simultaneous transmission SAR evaluation of other transmitters.

16.1. Head Exposure Conditions

16.1.1. Sum of the SAR for SV-DO & WiFi, with all Transmitters at Maximum Power

Sum of the SAR with Measured Values

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	CDMA BC1 1xEVDO	CDMA BC15 1xEVDO	WiFi 2.4 GHz	
Left Tilt	0.317			0.866		0.067	1.250
	0.317				0.511	0.067	0.895
		0.276		0.866		0.067	1.209
		0.276			0.511	0.067	0.854
			0.246	0.866		0.067	1.179
			0.246		0.511	0.067	0.824
Right Tilt	0.35			0.788		0.077	1.215
	0.35				0.462	0.077	0.889
		0.213		0.788		0.077	1.078
		0.213			0.462	0.077	0.752
			0.313	0.788		0.077	1.178
			0.313		0.462	0.077	0.852

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.

16.1.2. Sum of the SAR for SV-DO & WiFi, with Voice Mode Power Reduction

This is equivalent to SAR_(Reduced Power 1xRTT) + SAR_(Max Power 1xEVDO) + SAR_(Max Power WiFi), which represents the following Power Reduction scenario operating concurrently with WiFi:

Power Reduction Operation Table for SVDO Mode		
Mode	CDMA Current Voice Power for BC0, BC1, BC15	CDMA EVDO Max. Power for BC1 & BC15
SVDO	P < 15.5 dBm	23.5dBm (Limited)
	P ≥ 15.5 dBm	18.5dBm (Limited)

Note that in this case, the SAR reflects Voice (1xRTT) at a slightly higher power level than the trigger point shown in the table.

Sum of the SAR with Measured Values

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	CDMA BC1 1xEVDO	CDMA BC15 1xEVDO	WiFi 2.4 GHz	
Left Touch	0.069			1.01		0.069	1.148
	0.069				0.571	0.069	0.709
		0.075		1.01		0.069	1.154
		0.075			0.571	0.069	0.715
			0.096	1.01		0.069	1.175
Right Touch			0.096		0.571	0.069	0.736
	0.064			0.833		0.142	1.039
	0.064				0.452	0.142	0.658
		0.067		0.833		0.142	1.042
		0.067			0.452	0.142	0.661
		0.081	0.833		0.142	1.056	
		0.081			0.452	0.142	0.675

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.

16.1.3. Sum of the SAR for SV-DO & WiFi, with Data Mode Power Reduction

This is equivalent to: SAR_(Max Power 1xRTT) + SAR_(Reduced Power 1xEVDO) + SAR_(Max Power WiFi), which represents the following Power Reduction scenario operating concurrently with WiFi:

Power Reduction Operation Table for SVDO Mode		
Mode	CDMA Current Voice Power for BC0, BC1, BC15	CDMA EVDO Max. Power for BC1 & BC15
SVDO	P < 15.5 dBm	23.5dBm (Limited)
	P ≥ 15.5 dBm	18.5dBm (Limited)

Note that in this case, the SAR reflects Voice (1xRTT) at the maximum target output power level.

Sum of the SAR with Measured Values

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	CDMA BC1 1xEVDO	CDMA BC15 1xEVDO	WiFi 2.4 GHz	
Left Touch	0.603			0.297		0.069	0.969
	0.603				0.179	0.069	0.851
		0.527		0.297		0.069	0.893
		0.527			0.179	0.069	0.775
			0.505	0.297		0.069	0.871
			0.505		0.179	0.069	0.753
Right Touch	0.585			0.263		0.142	0.990
	0.585				0.147	0.142	0.874
		0.986		0.263		0.142	1.391
		0.986			0.147	0.142	1.275
			0.662	0.263		0.142	1.067
			0.662		0.147	0.142	0.951

Note:

1.391 Denotes the select Simultaneous Transmission case(s) for which SAR scaling considerations are applied to

Sum of the SAR with Scaled Values for Select Case(s)

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	CDMA BC1 1xEVDO	CDMA BC15 1xEVDO	WiFi 2.4 GHz	
Right Touch		1.057		0.263		0.156	1.476

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.

16.1.4. Sum of the SAR for SV-LTE & WiFi, with all Transmitters at Maximum Power

Sum of the SAR with Measured Values

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	LTE Band 2	LTE Band 4	WiFi 2.4 GHz	
Left Tilt	0.317			0.724		0.067	1.108
	0.317				0.478	0.067	0.862
		0.276		0.724		0.067	1.067
		0.276			0.478	0.067	0.821
			0.246	0.724		0.067	1.037
			0.246		0.478	0.067	0.791
Right Tilt	0.35			0.746		0.077	1.173
	0.35				0.479	0.077	0.906
		0.213		0.746		0.077	1.036
		0.213			0.479	0.077	0.769
			0.313	0.746		0.077	1.136
			0.313		0.479	0.077	0.869

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.

16.1.5. Sum of the SAR for SV-LTE & WiFi, with Voice Mode Power Reduction

This is equivalent to SAR_(Reduced Power 1xRTT) + SAR_(Max Power LTE) + SAR_(Max Power WiFi), which represents the following Power Reduction scenario operating concurrently with WiFi:

Power Reduction Operation Table for SVLTE Mode		
Mode	CDMA Current Voice Power for BC0, BC1, BC15	LTE Max. Power for B2 & B4
SVLTE	P < 18.5 dBm	22.8dBm (Limited)
	P ≥ 18.5 dBm	18.8dBm (Limited)

Note that in this case, the SAR reflects Voice (1xRTT) at a slightly higher power level than the trigger point shown in the table.

Sum of the SAR with Measured Values

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	LTE Band 2	LTE Band 4	WiFi 2.4 GHz	
Left Touch	0.11			1.03		0.069	1.209
	0.11				0.661	0.069	0.840
		0.134		1.03		0.069	1.233
		0.134			0.661	0.069	0.864
			0.173	1.03		0.069	1.272
			0.173		0.661	0.069	0.903
Right Touch	0.111			0.695		0.142	0.948
	0.111				0.501	0.142	0.754
		0.167		0.695		0.142	1.004
		0.167			0.501	0.142	0.810
			0.172	0.695		0.142	1.009
			0.172		0.501	0.142	0.815

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.

16.1.6. Sum of the SAR for SV-LTE & WiFi, with Power Reduction for Data Mode

This is equivalent to: SAR_(Max Power 1xRTT) + SAR_(Reduced Power LTE) + SAR_(Max Power WiFi), which represents the following Power Reduction scenario operating concurrently with WiFi:

Power Reduction Operation Table for SVLTE Mode		
Mode	CDMA Current Voice Power for BC0, BC1, BC15	LTE Max. Power for B2 & B4
SVLTE	P < 18.5 dBm	22.8dBm (Limited)
	P ≥ 18.5 dBm	18.8dBm (Limited)

Note that in this case, the SAR reflects Voice (1xRTT) at the maximum target output power level.

Sum of the SAR with Measured Values

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	LTE Band 2	LTE Band 4	WiFi 2.4 GHz	
Left Touch	0.603			0.276		0.069	0.948
	0.603				0.234	0.069	0.906
		0.527		0.276		0.069	0.872
		0.527			0.234	0.069	0.830
			0.505	0.276		0.069	0.850
			0.505		0.234	0.069	0.808
Right Touch	0.585			0.275		0.142	1.002
	0.585				0.189	0.142	0.916
		0.986		0.275		0.142	1.403
		0.986			0.189	0.142	1.317
			0.662	0.275		0.142	1.079
			0.662		0.189	0.142	0.993

Note:

- 1.403 Denotes the select Simultaneous Transmission case(s) for which SAR scaling considerations are applied to
- 1.317

Sum of the SAR with Scaled Values for Select Case(s)

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	LTE Band 2	LTE Band 4	WiFi 2.4 GHz	
Right Touch		1.057		0.275		0.156	1.488
		1.057			0.189	0.156	1.402

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.

16.2. Body Exposure Conditions

16.2.1. Sum of the SAR for SV-DO & WiFi, with all Transmitters at Maximum Power

Sum of the SAR with Measured Values

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	CDMA BC1 1xEVDO	CDMA BC15 1xEVDO	WiFi 2.4 GHz	
Front	0.65			0.465		0.035	1.150
	0.65				0.269	0.035	0.954
		0.999		0.465		0.035	1.499
		0.999			0.269	0.035	1.303
			0.539	0.465		0.035	1.039
			0.539		0.269	0.035	0.843
Edge 1	0.00			0.291		0.036	0.327
	0.00				0.145	0.036	0.181
		0.00		0.291		0.036	0.327
		0.00			0.145	0.036	0.181
			0.00	0.291		0.036	0.327
			0.00		0.145	0.036	0.181
Edge 2	0.477			0.554		0.00	1.031
	0.477				0.192	0.00	0.669
		0.19		0.554		0.00	0.744
		0.19			0.192	0.00	0.382
			0.173	0.554		0.00	0.727
			0.173		0.192	0.00	0.365
Edge 3	0.177			0.00		0.00	0.177
	0.177				0.00	0.00	0.177
		1.24		0.00		0.00	1.240
		1.24			0.00	0.00	1.240
			0.565	0.00		0.00	0.565
			0.565		0.00	0.00	0.565
Edge 4	0.339			0.00		0.106	0.445
	0.339				0.00	0.106	0.445
		0.146		0.00		0.106	0.252
		0.146			0.00	0.106	0.252
			0.183	0.00		0.106	0.289
			0.183		0.00	0.106	0.289

Note:

1.499 Denotes the select Simultaneous Transmission case(s) for which SAR scaling considerations are applied to
 1.303

Sum of the SAR with Scaled Values for Select Case(s)

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	CDMA BC1 1xEVDO	CDMA BC15 1xEVDO	WiFi 2.4 GHz	
Front		1.046		0.476		0.038	1.560
		1.046			0.295	0.038	1.379

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.

16.2.2. Sum of the SAR for SV-DO & WiFi, with Voice Mode Power Reduction

This is equivalent to SAR_(Reduced Power 1xRTT) + SAR_(Max Power 1xEVDO) + SAR_(Max Power WiFi), which represents the following Power Reduction scenario operating concurrently with WiFi:

Power Reduction Operation Table for SVDO Mode		
Mode	CDMA Current Voice Power for BC0, BC1, BC15	CDMA EVDO Max. Power for BC1 & BC15
SVDO	P < 15.5 dBm	23.5dBm (Limited)
	P ≥ 15.5 dBm	18.5dBm (Limited)

Note that in this case, the SAR reflects Voice (1xRTT) at a slightly higher power level than the trigger point shown in the table.

Sum of the SAR with Measured Values

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	CDMA BC1 1xEVDO	CDMA BC15 1xEVDO	WiFi 2.4 GHz	
Rear	0.128			0.857		0.119	1.104
	0.128				0.679	0.119	0.926
		0.108		0.857		0.119	1.084
		0.108			0.679	0.119	0.906
			0.103	0.857		0.119	1.079
			0.103		0.679	0.119	0.901

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.

16.2.3. Sum of the SAR for SV-DO & WiFi, with Data Mode Power Reduction

This is equivalent to: SAR_(Max Power 1xRTT) + SAR_(Reduced Power 1xEVDO) + SAR_(Max Power WiFi), which represents the following Power Reduction scenario operating concurrently with WiFi:

Power Reduction Operation Table for SVDO Mode		
Mode	CDMA Current Voice Power for BC0, BC1, BC15	CDMA EVDO Max. Power for BC1 & BC15
SVDO	P < 15.5 dBm	23.5dBm (Limited)
	P ≥ 15.5 dBm	18.5dBm (Limited)

Note that in this case, the SAR reflects Voice (1xRTT) at the maximum target output power level.

Sum of the SAR with Measured Values

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	CDMA BC1 1xEVDO	CDMA BC15 1xEVDO	WiFi 2.4 GHz	
Rear	1.06			0.372		0.119	1.551
	1.06				0.224	0.119	1.403
		0.881		0.372		0.119	1.372
		0.881			0.224	0.119	1.224
			0.736	0.372		0.119	1.227
			0.736		0.224	0.119	1.079

Note:

- 1.551 Denotes the select Simultaneous Transmission case(s) for which SAR scaling considerations are applied to
- 1.403
- 1.372

Sum of the SAR with Scaled Values for Select Case(s)

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	CDMA BC1 1xEVDO	CDMA BC15 1xEVDO	WiFi 2.4 GHz	
Rear	1.11			0.372		0.130	1.612
	1.11				0.224	0.130	1.464
		0.923		0.372		0.130	1.425

SAR to Peak Location Separation Ratio (SPLSR)

Case #	Test Position	Worst-case combination				Σ 1-g SAR (mW/g)	Calculated distance (cm)	SPLSR	Figure
		CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC1 1xEVDO	WiFi 2.4 GHz				
1	Rear	1.110		0.372	0.130	1.612			
		1.110		0.372		1.482	6.12	0.242	1
		1.110			0.130	1.240	7.53	0.165	2
				0.372	0.130	0.502	3.76	0.134	3

Conclusion:

- Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg, or the SPLSR is under the 0.3 threshold under all circumstances.

16.2.4. Sum of the SAR for SV-LTE & WiFi, with all Transmitters at Max Power

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	LTE Band 4	LTE Band 2	WiFi 2.4 GHz	
Front	0.65			0.277		0.035	0.962
	0.65				0.370	0.035	1.055
		0.999		0.277		0.035	1.311
		0.999			0.370	0.035	1.404
			0.539	0.277		0.035	0.851
			0.539		0.370	0.035	0.944
Edge 1	0.00			0.175		0.036	0.211
	0.00				0.282	0.036	0.318
		0.00		0.175		0.036	0.211
		0.00			0.282	0.036	0.318
			0.00	0.175		0.036	0.211
			0.00		0.282	0.036	0.318
Edge 2	0.477			0.236		0.00	0.713
	0.477				0.436	0.00	0.913
		0.19		0.236		0.00	0.426
		0.19			0.436	0.00	0.626
			0.173	0.236		0.00	0.409
			0.173		0.436	0.00	0.609
Edge 3	0.177			0.00		0.00	0.177
	0.177				0.00	0.00	0.177
		1.24		0.00		0.00	1.240
		1.24			0.00	0.00	1.240
			0.565	0.00		0.00	0.565
			0.565		0.00	0.00	0.565
Edge 4	0.339			0.00		0.106	0.445
	0.339				0.00	0.106	0.445
		0.146		0.00		0.106	0.252
		0.146			0.00	0.106	0.252
			0.183	0.00		0.106	0.289
			0.183		0.00	0.106	0.289

Note:

1.311 Denotes the select Simultaneous Transmission case(s) for which SAR scaling considerations are applied to
 1.404

Sum of the SAR with Scaled Values for Select Case(s)

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	LTE Band 4	LTE Band 2	WiFi 2.4 GHz	
Front		1.046		0.282		0.038	1.366
		1.046			0.379	0.038	1.463

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.

16.2.5. Sum of the SAR for SV-LTE & WiFi, with Voice Mode Power Reduction

This is equivalent to SAR_(Reduced Power 1xRTT) + SAR_(Max Power LTE) + SAR_(Max Power WiFi), which represents the following Power Reduction scenario operating concurrently with WiFi:

Power Reduction Operation Table for SVLTE Mode		
Mode	CDMA Current Voice Power for BC0, BC1, BC15	LTE Max. Power for B2 & B4
SVLTE	P < 18.5 dBm	22.8dBm (Limited)
	P ≥ 18.5 dBm	18.8dBm (Limited)

Note that in this case, the SAR reflects Voice (1xRTT) at a slightly higher power level than the trigger point shown in the table.

Sum of the SAR with Measured Values

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	LTE Band 4	LTE Band 2	WiFi 2.4 GHz	
Rear	0.259			0.748		0.119	1.126
	0.259				0.763	0.119	1.141
		0.225		0.748		0.119	1.092
		0.225			0.763	0.119	1.107
			0.233	0.748		0.119	1.100
			0.233		0.763	0.119	1.115

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.

16.2.6. Sum of the SAR for SV-LTE & WiFi, with Data Mode Power Reduction

This is equivalent to: $SAR_{(Max\ Power\ 1xRTT)} + SAR_{(Reduced\ Power\ LTE)} + SAR_{(Max\ Power\ WiFi)}$, which represents the following Power Reduction scenario operating concurrently with WiFi:

Power Reduction Operation Table for SVLTE Mode		
Mode	CDMA Current Voice Power for BC0, BC1, BC15	LTE Max. Power for B2 & B4
SVLTE	P < 18.5 dBm	22.8dBm (Limited)
	P ≥ 18.5 dBm	18.8dBm (Limited)

Note that in this case, the SAR reflects Voice (1xRTT) at the maximum target output power level.

Sum of the SAR with Measured Values

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	LTE Band 4	LTE Band 2	WiFi 2.4 GHz	
Rear	1.06			0.272		0.119	1.451
	1.06				0.350	0.119	1.529
		0.881		0.272		0.119	1.272
		0.881			0.350	0.119	1.350
			0.736	0.272		0.119	1.127
			0.736		0.350	0.119	1.205

Note:

Denotes the select Simultaneous Transmission case(s) for which SAR scaling considerations are applied to

Sum of the SAR with Scaled Values for Select Case(s)

Test Position	Voice			Data			Σ 1-g SAR (mW/g)
	CDMA BC0 1xRTT	CDMA BC1 1xRTT	CDMA BC15 1xRTT	LTE Band 4	LTE Band 2	WiFi 2.4 GHz	
Rear	1.11			0.272		0.130	1.512
	1.11				0.350	0.130	1.590
		0.923			0.350	0.130	1.403

Note:

Denotes the configuration(s) with power below the maximum of tolerance and therefore require the application of scaling. For the full list of scaled SAR values, please refer to Section 15.1.

SAR to Peak Location Separation Ratio (SPLSR)

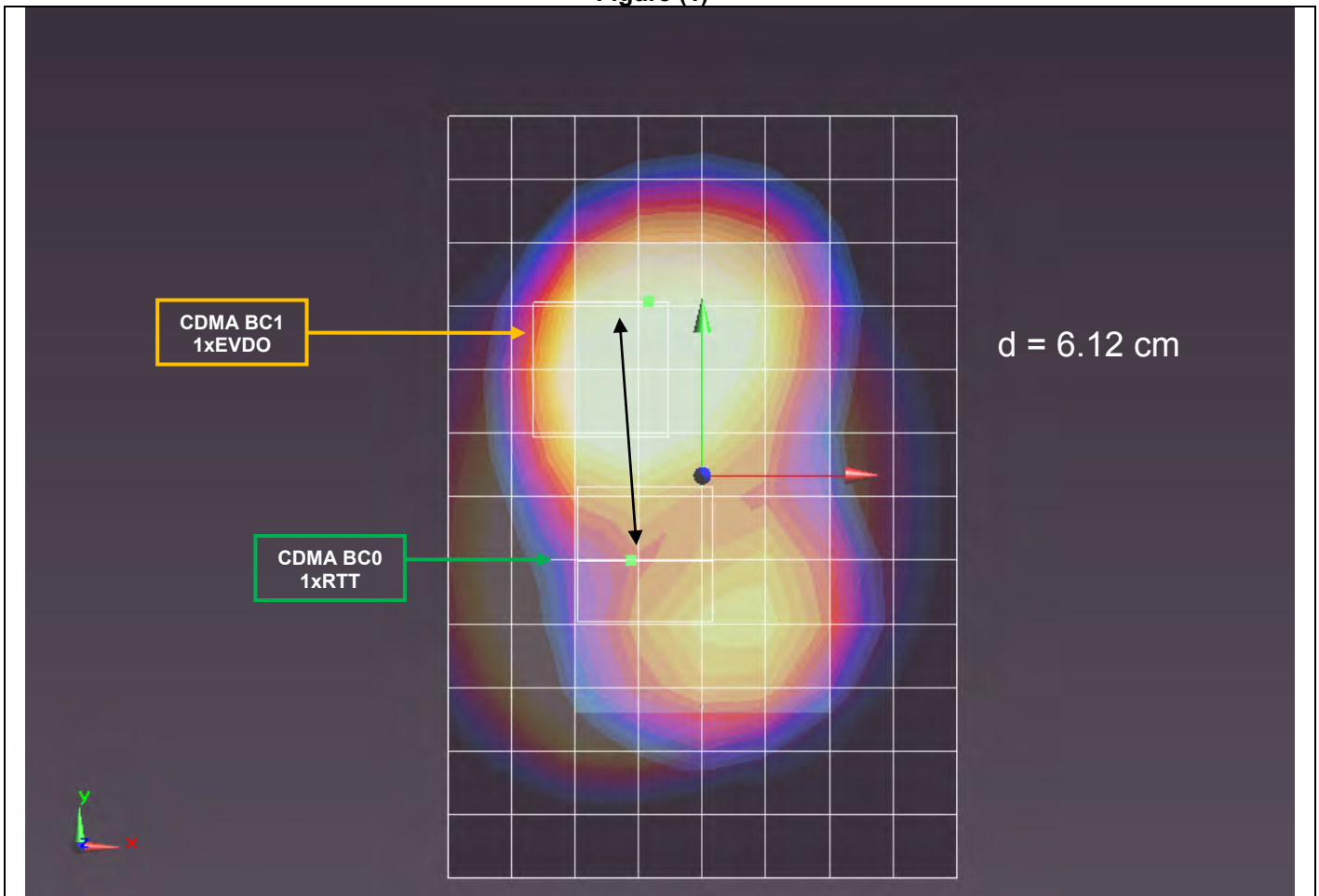
As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

Conclusion:

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

16.3. SAR Peak Location Separation Distance Calculations and Figures

Figure (1)

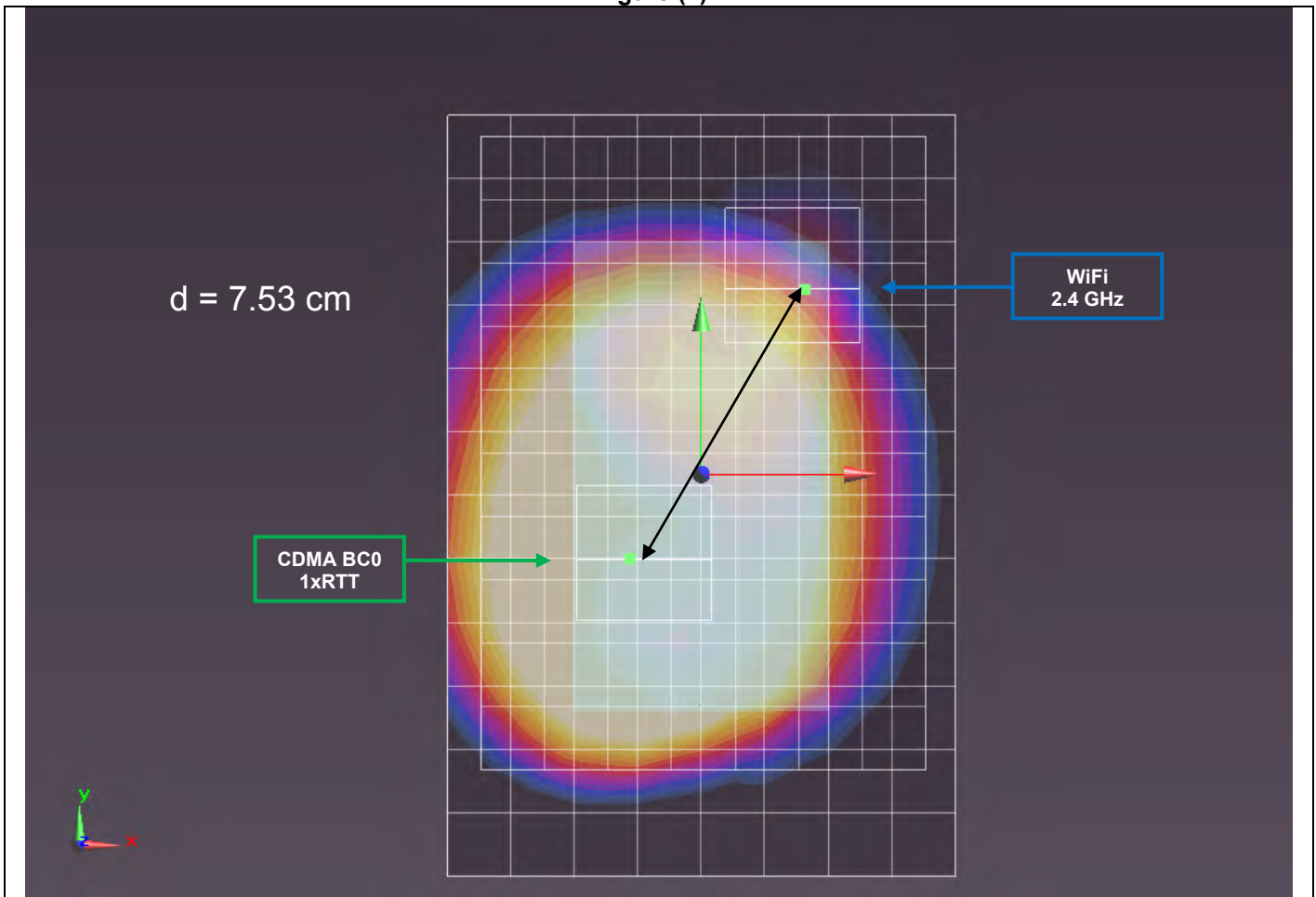


Mode	Peak SAR mW/g	X m	Y m	Z m
CDMA BC0, 1xRTT	1.48	-0.0151	-0.0201	-0.187
CDMA BC1, 1xEVDO	0.484	-0.0128	0.041	-0.186

d: Calculated distance (cm)
6.12

Note: $d = \text{SQRT}((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$

Figure (2)

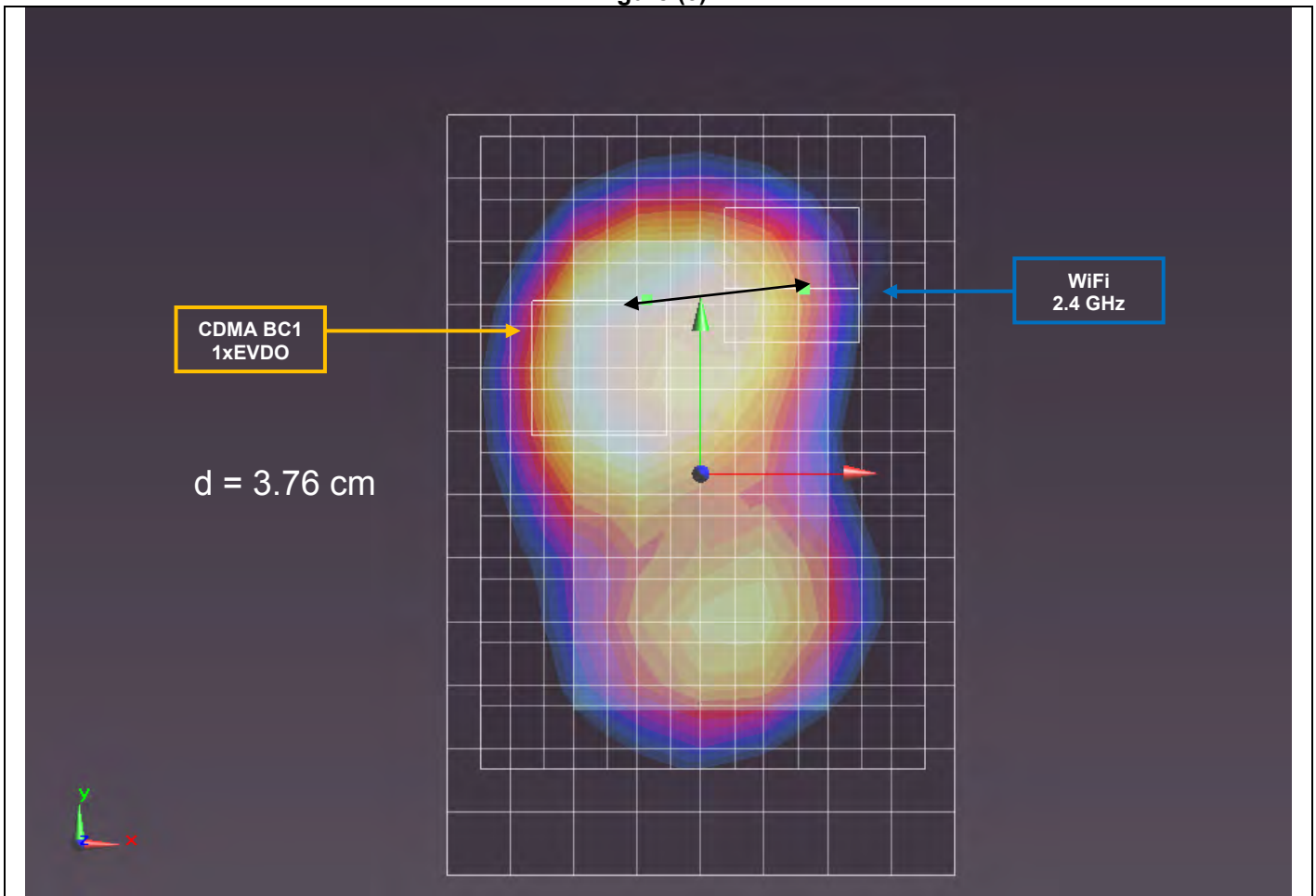


Mode	Peak SAR mW/g	X m	Y m	Z m
CDMA BC0, 1xRTT	1.48	-0.0151	-0.0201	-0.187
WiFi 2.4 GHz	0.241	0.0247	0.0438	-0.186

d: Calculated distance (cm)
7.53

Note: $d = \text{SQRT}((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$

Figure (3)



Mode	Peak SAR	X	Y	Z
	mW/g	m	m	m
CDMA BC1, 1xEVDO	0.484	-0.0128	0.041	-0.186
WiFi 2.4 GHz	0.241	0.0247	0.0438	-0.186
d: Calculated distance (cm)				
3.76				

Note: $d = \text{SQRT}((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)$

17. Appendixes

Refer to separated files for the following appendixes.

- 17.1. System Performance Check Plots**
- 17.2. SAR Test Plots for CDMA BC0**
- 17.3. SAR Test Plots for CDMA BC1**
- 17.4. SAR Test Plots for CDMA BC15**
- 17.5. SAR Test Plots for LTE Band 4**
- 17.6. SAR Test Plots for LTE Band 2**
- 17.7. SAR Test Plots for WiFi 2.4 GHz Band**
- 17.8. Calibration Certificate for E-Field Probe EX3DV4 - SN 3772**
- 17.9. Calibration Certificate for E-Field Probe EX3DV4 - SN 3751**
- 17.10. Calibration Certificate for D835V2 - SN 4d002**
- 17.11. Calibration Certificate for D1750V2 - SN 1053**
- 17.12. Calibration Certificate for D1900V2 - SN 5d043**
- 17.13. Calibration Certificate for D2450V2 - SN 748**