



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

**SAR EVALUATION REPORT**

*For*

**iPhone**

**MODEL: A1387  
FCC ID: BCG-E2430A  
IC: 579C-E2430A**

**REPORT NUMBER: 11U13896-5B**

**ISSUE DATE: OCT. 01, 2011**

*Prepared for*

**APPLE INC.  
1 INFINITE LOOP  
CUPERTINO, CA 95014-2084**

*Prepared by*

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**NVLAP LAB CODE 200065-0**

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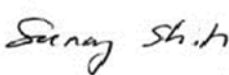
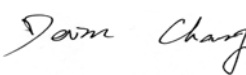
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### Revision History

<b>Version</b>	<b>Date</b>	<b>Revisions</b>	<b>By</b>
<b>A</b>	08/25/2011	Initial	Sunny Shih
<b>B</b>	10/01/2011	Additional Test Modes	Sunny Shih

# 1 Attestation of Test Results

Tested for:	Apple Inc. 1 Infinite Loop, Cupertino, CA 95014-2084			
EUT description:	The device is an internet and multimedia-capable phone that incorporates a number of wireless technologies, including cellular voice and data, Wi-Fi, Bluetooth, and GPS.			
Model number:	A1387			
Serial Number(s) and IMEI or MEID Numbers	Serial Number(s)	IMEI or MEID Number(s)		
	<ul style="list-style-type: none"> <li>• C39FX03HDR2T</li> <li>• C39FX02WDR2T</li> <li>• C39G101HDR2W</li> <li>• C39G1019DR2W</li> </ul>	<ul style="list-style-type: none"> <li>• 99 000085 005783 9</li> <li>• 99 000085 006116 1</li> <li>• 99 000085 000688 5</li> <li>• 99 000085 000535 8</li> </ul>		
Device category:	Portable	Exposure category:	General Population/Uncontrolled Exposure	
Date tested:	07/20/2011 – 09/30/2011			
Freq. Range [MHz]	Modulation	Test Position	Highest 1-g SAR (W/kg)	Limit (W/kg)
824 - 849	RC3/SO55	Head: LHS Touch	1.150	1.6
	GPRS 2 Slots	Body: Front Side, Distance: 1cm	1.150	
	GPRS 2 Slots	Hotspot mode: Front Side, Distance: 1cm	1.150	
1850 - 1910	RC3/SO55,	Head: LHS Touch	1.180	
	RMC 12.2kbps	Head: RHS Touch	1.180	
	GPRS 2 Slots	Body: Front Side, Distance: 1cm	0.990	
	GPRS 2 Slots	Hotspot mode: Front Side, Distance: 1cm	0.990	
2400 – 2483.5	DSS CCK	Head: RHS Touch	0.372	
	DSS CCK	Body: Back Side, Distance: 1cm	0.191	
	DSS CCK	Hotspot mode: Back Side, Distance: 1cm	0.191	
Applicable Standards				Test Results
FCC OET Bulletin 65 Supplement C 01-01, IEEE STD 1528: 2003 IC RSS 102 Issue 4				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><b>Note:</b> 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 Team Leader / UL CCS		Devin Chang EMC Engineer / UL CCS		

## 2 Test Methodology

These test plans were performed in accordance with FCC OET Bulletin 65 Supplement C 01-01, IEEE STD 1528: 2003, IC RSS 102 Issue 4 and the following specific FCC Test Procedures:

- KDB 648474 D01, D02 SAR Handsets Multi Transmitters and Ant, v01r05
- KDB 941225 D01 SAR test for 3G devices v02
- KDB 941225 D03 SAR Test Reduction GSM/GPRS/EDGE v01
- KDB 941225 D06 Hot Spot SAR v01
- KDB 248227 D01 SAR Measurement Procedure for 802 11abg v01r02
- KDB Inquiry 651190

## 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 Description of DUT

The device is an internet and multimedia-capable phone that incorporates a number of wireless technologies, including cellular voice and data, Wi-Fi, Bluetooth, and GPS.	
Model Number:	A1387
FCC ID:	BCG-E2430A
IC ID:	579C-E2430A
Test Configurations:	<ul style="list-style-type: none"> <li>• Held to head,</li> <li>• Worn on body (LCD facing up and LCD facing down) with 1cm separation distance,</li> <li>• Personal hot spot function with 1cm separation distance to all sides and edges.</li> </ul>

### 4.1 Description of Antennas

The device is capable of switching between the Primary/ANT1 and Secondary/ANT2 Antennas. The antenna switching is implemented with a physical, "break-before-make" switch such that only one antenna can be used for cellular transmission at a time. Since, both Primary and Secondary Antennas can be used for transmit and receive, the applicable transmission modes for both antennas are defined in the table below.

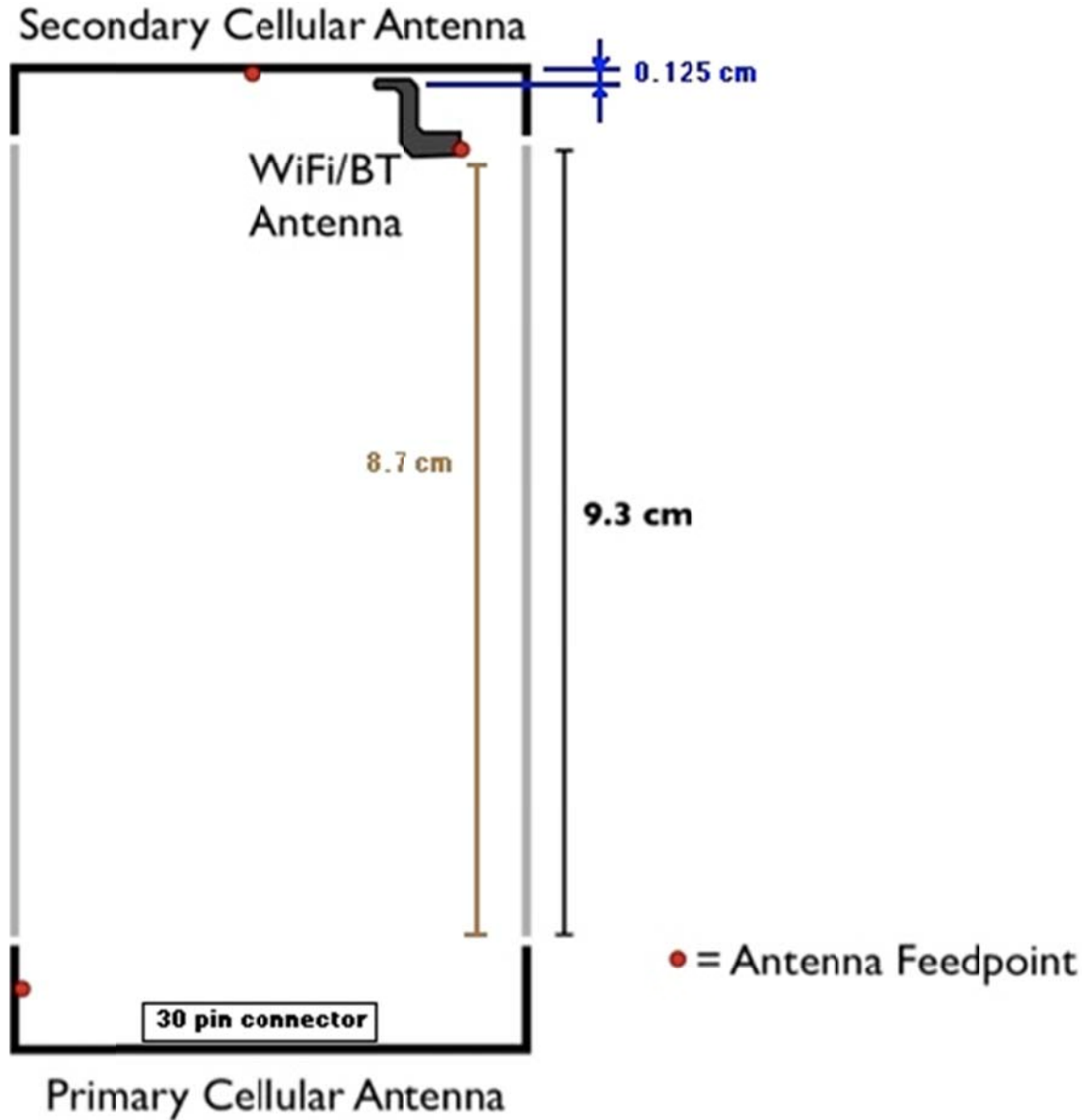
Antenna	Antenna Use	Antenna Type	Technologies	Tx Bands
1	Primary	Metal band/FPC	CDMA 1x (voice), 1xRTT (voice/data), EV-DO, GSM (voice), GPRS/EDGE (data), UMTS (voice), UMTS (data), UMTS (Voice + data mode)*, HSDPA, HSUPA	850/1900
2	Secondary	Metal band	CDMA 1x (voice), 1xRTT (voice/data), EV-DO, GSM (voice), GPRS/EDGE (data), UMTS (voice), UMTS (data), UMTS (Voice + data mode)*, HSDPA, HSUPA	850/1900
3	Wi-Fi/BT	PIFA	802.11b/g/n, Bluetooth. Wi-Fi and BT cannot transmit simultaneously.	2400MHz

Antennas	Physical Separation Distance
Antenna 1 and Antenna 2	9.3 cm
Antenna 1 and Antenna 3	8.7 cm
Antenna 2 and Antenna 3	0.125 cm

Notes:

\* In UMTS (voice + data) mode, the same antenna is used for both voice and data transmission. The data transmission can be in any one of these wireless modes: UMTS, HSDPA or HSUPA. Only one cellular antenna is used for voice + data transmission at any give time.

The antenna locations are defined in the sketch below. The view of the phone is from the back side, with Primary Antenna and the 30-pin connector at the bottom of the phone.



Note: The metal band on the top and bottom edge of the device is used for the antennas. There are defined separations in the metal band to isolate the primary and secondary antennas.

## 4.2 Bands and Air interfaces tested

Tx Frequency Bands:	Cellular: 824 – 849MHz PCS: 1850 – 1910MHz 802.11b/g/n: 2412 – 2462MHz, HT20 Bluetooth: 2402-2480MHz			
Air Interfaces:	CDMA 1xRTT, EV-DO Rev.0, EV-DO Rev.A. GSM, GPRS, EGPRS. WCDMA (Rel 99), HSDPA (Rel 6, CAT 10), HSUPA (Rel 6, CAT 6). 802.11b/g/n. Bluetooth 4.0 + LE.			
Uplink Modulations:	CDMA Modes: QPSK GSM Modes: GMSK, 8PSK WCDMA Modes: BPSK, QPSK 802.11b: DSSS CCK 802.11g: OFDM 802.11n: OFDM Bluetooth: DQPSK, 8DPSK, GFSK			
Multi-Slot Class:	10			
Capability Class:	B			
Notes:	DUT does not support DTM or SVDO			
Measured Maximum Average Conducted Power (of tested bands):	Mode	Modulation	850 MHz Power (dBm)	1900 MHz Power (dBm)
	CDMA 1xRTT	QPSK	24.5	23.5
	EV-DO	QPSK	24.4	23.3
	GSM	GMSK	33.5	31.5
	GPRS, 1 Slot	GMSK	33.5	31.5
	GPRS, 2 Slots	GMSK	31.5	31.4
	EGPRS, 1 Slot	GMSK	25.7	25.7
	EGPRS, 2 Slots	GMSK	25.5	25.6
	WCDMA	QPSK	24.0	23.6
	802.11b/g/n:	DSSS CCK/ OFDM	17.2/17.0/17.0	
	Bluetooth	GFSK/ $\pi/4$ DQPSK/ 8DPSK	13.7/11.8/12.0	
Bluetooth 4.0LE	GFSK	9.9		

## 4.3 Personal Hotspot Mode

The device is capable of personal hotspot mode. The hotspot mode can be enabled by the users by the following this sequence of soft-keys; **Settings > General > Network > Enable Personal Hotspot**. SAR measurements in the personal hot spot function are performed with 1cm separation distance to all sides and edges to the body phantom.



## 5 Simultaneous Transmission

This device is capable of transmitting simultaneously in certain allowed configurations. These configurations are defined in this section. The different transmission modes are sub-divided based on exposure conditions:

- Head
- Body-worn accessory
- Wireless Router (Hotspot)

Regardless of the state of Wi-Fi hotspot mode, the following is true:

- Voice call in CDMA 1x, GSM, or UMTS mode is allowed through primary antenna (ANT 1) or secondary antenna (ANT 2).
- Data call in CDMA 1xRTT/EV-DO, or GPRS/EGPRS or UMTS or HSDPA/HSUPA mode is allowed through primary antenna (ANT 1) or secondary antenna (ANT 2).
- Voice + Data call in UMTS mode is allowed through primary antenna (ANT 1) or secondary antenna (ANT 2).

When the device is in Wi-Fi hotspot mode, and cellular data connection (1xRTT/EV-DO/GPRS/EGPRS/UMTS) is active, then the following is true:

- Voice call in CDMA 1x is NOT possible, because SVDO is NOT a supported feature of this device.
- Voice call in GSM mode is NOT possible, because DTM is NOT a supported feature of this device.
- Voice call in UMTS mode is possible through primary antenna (ANT 1) or secondary antenna (ANT 2).

Notes:

- Bluetooth and Wi-Fi time-share the same antenna (ANT 3) and cannot transmit simultaneously.
- Only one cellular antenna is used for transmission at any given time. For example, in UMTS (voice + data) mode, the same antenna is used for both voice and data transmission.
- SVDO or DTM are NOT supported features on this device in any mode.

### 5.1 Head Exposure Condition

User usage	SAR Test distance	Mode	Mode of Operation	Band	CDMA Voice (1xRTT)	GSM Voice	WCDMA Voice	CDMA Data <sup>1</sup> 1xRTT, EV-DO	GPRS/EGPRS <sup>1</sup>	HSDPA <sup>1,3</sup>	HSPA <sup>1,3</sup> (HSDPA/HSUPA)	Wi-Fi 2.4GHz <sup>2</sup>	BT 2.4GHz <sup>1,2,4</sup>	
Head	0 cm	Voice	CDMA Voice (1xRTT)	835	TX1	No	No	No	No	No	No	TX3	No	
			CDMA Voice (1xRTT)	835	TX2	No	No	No	No	No	No		No	No
			CDMA Voice (1xRTT)	1900	TX1	No	No	No	No	No	No		No	No
			CDMA Voice (1xRTT)	1900	TX2	No	No	No	No	No	No		No	No
			GSM Voice	850	No	TX1	No	No	No	No	No		No	No
			GSM Voice	850	No	TX2	No	No	No	No	No		No	No
			GSM Voice	1900	No	TX1	No	No	No	No	No		No	No
			GSM Voice	1900	No	TX2	No	No	No	No	No		No	No
			WCDMA Voice <sup>3</sup>	835	No	No	TX1	No	No	No	No		No	No
			WCDMA Voice <sup>3</sup>	835	No	No	TX2	No	No	No	No		No	No
			WCDMA Voice <sup>3</sup>	1900	No	No	TX1	No	No	No	No		No	No
			WCDMA Voice <sup>3</sup>	1900	No	No	TX2	No	No	No	No		No	No
			Wi-Fi	2400	No	No	No	No	No	No	No		No	No

**Notes:**

- 1 – There is no use case for this configuration in head exposure condition.
- 2 – Bluetooth and Wi-Fi time-share the same antenna and cannot transmit simultaneously.
- 3 – Primary antenna/ANT1/TX1 or Secondary antenna/ANT2/TX2 supports both voice and data modes in WCDMA operation. Per KDB 941225 D01 SAR Test for 3G devices v02, SAR for head exposure configurations is measured in voice mode only using a 12.2 kbps RMC with TPC bits configured to all “1’s”. Also, see conducted power results in section 8.3.
- 4 – There is no use case for Cellular + BT configuration in head exposure condition.

### 5.2 Body-worn Accessory Exposure Condition

#### Cellular + Wi-Fi Simultaneous Transmission Configurations

User usage	SAR Test distance	Mode	Mode of Operation	Band	CDMA Voice (1xRTT)	GSM Voice	WCDMA Voice	CDMA Data 1xRTT, EV-DO	GPRS/ EGPRS	HSDPA	HSPA (HSDPA/HSUPA)	Wi-Fi 2.4GHz <sup>7</sup>	BT 2.4GHz <sup>7</sup>	
Body-worn accessory	1 cm	Voice	CDMA voice 1xRTT <sup>1</sup>	835	TX1	No	No	No	No	No	No	TX3	No	
			CDMA voice 1xRTT <sup>1</sup>	835	TX2	No	No	No	No	No	No		No	
			CDMA voice 1xRTT <sup>1</sup>	1900	TX1	No	No	No	No	No	No		No	
			CDMA voice 1xRTT <sup>1</sup>	1900	TX2	No	No	No	No	No	No		No	
			GSM Voice <sup>2</sup>	850	No	TX1	No	No	No	No	No		No	
			GSM Voice <sup>2</sup>	850	No	TX2	No	No	No	No	No		No	
			GSM Voice <sup>2</sup>	1900	No	TX1	No	No	No	No	No		No	
			GSM Voice <sup>2</sup>	1900	No	TX2	No	No	No	No	No		No	
			WCDMA Voice <sup>3,4</sup>	835	No	No	TX1	No	No	No	No		No	
			WCDMA Voice <sup>3,4</sup>	835	No	No	TX2	No	No	No	No		No	
			WCDMA Voice <sup>3,4</sup>	1900	No	No	TX1	No	No	No	No		No	
			WCDMA Voice <sup>3,4</sup>	1900	No	No	TX2	No	No	No	No		No	
		Data	CDMA 1xRTT, EV-DO <sup>1</sup>	835	No	No	No	TX1	No	No	No		No	No
			CDMA 1xRTT, EV-DO <sup>1</sup>	835	No	No	No	TX2	No	No	No		No	
			CDMA 1xRTT, EV-DO <sup>1</sup>	1900	No	No	No	TX1	No	No	No		No	
			CDMA 1xRTT, EV-DO <sup>1</sup>	1900	No	No	No	TX2	No	No	No		No	
			GPRS/ EGPRS <sup>2</sup>	850	No	No	No	No	TX1	No	No		No	
			GPRS/ EGPRS <sup>2</sup>	850	No	No	No	No	TX2	No	No		No	
			GPRS/ EGPRS <sup>2</sup>	1900	No	No	No	No	TX1	No	No		No	
			GPRS/ EGPRS <sup>2</sup>	1900	No	No	No	No	TX2	No	No		No	
			HSDPA <sup>4,5</sup>	835	No	No	TX1	No	No	TX1	No		No	
			HSDPA <sup>4,5</sup>	835	No	No	TX2	No	No	TX2	No		No	
			HSDPA <sup>4,5</sup>	1900	No	No	TX1	No	No	TX1	No		No	
			HSDPA <sup>4,5</sup>	1900	No	No	TX2	No	No	TX2	No		No	
			HSPA <sup>4,6</sup>	835	No	No	TX1	No	No	No	TX1		No	
			HSPA <sup>4,6</sup>	835	No	No	TX2	No	No	No	TX2		No	
			HSPA <sup>4,6</sup>	1900	No	No	TX1	No	No	No	TX1		No	
			HSPA <sup>4,6</sup>	1900	No	No	TX2	No	No	No	TX2		No	
Wi-Fi	2400	No	No	No	No	No	No	No	No	No				

**Notes:**

- 1 – Per KDB941225 D01 SAR test for 3G devices v02, Body-worn SAR evaluation for both Primary and Secondary antennas is performed in RC3/SO32 only.
  - Body-worn SAR for multiple code channel (FCH+SCH) is not required since the output power is not 1/4 dB higher than RC3/SO32. Also, see conducted power results in section 8.1.
  - Body-worn SAR for 1xEV-DO Rev. 0 and Rev. A is not required since the output power is not 1/4 dB higher than RC3. Also, see conducted power results in section 8.1.
- 2 – Per KDB941225 D01 SAR test for 3G devices v02, Body-worn SAR evaluation for both Primary and Secondary antennas is performed in GSM (GMSK), and GPRS (GMSK, CS1) modes. SAR evaluation in EGPRS mode is not performed because source-based time-averaged power is lower than GPRS mode. Also, see conducted power results in section 8.2.
- 3 – Per KDB 941225 D01 SAR Test for 3G devices v02, SAR for body exposure configurations in voice and data modes is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”. Also, see conducted power results in section 8.3.
- 4 – In UMTS VOICE + DATA mode, the same antenna is used for both voice and data transmission. Only one cellular antenna is used for transmission at any given time.
- 5 – Per KDB 941225 D01 Body SAR is not required for handsets with HSDPA capabilities when the maximum average output of each RF channel with HSDPA active is less than 1/4 dB higher than that measured without HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2 kbps RMC is  $\leq$  75% of the SAR limit. Also, see conducted power results in section 8.3.
- 6 – Per KDB 941225 D01 Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than 1/4 dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2 kbps RMC is  $\leq$  75% of the SAR limit. Also, see conducted power results in section 8.3.
- 7 – Bluetooth and Wi-Fi time-share the same antenna and cannot transmit simultaneously.

Cellular + BT Simultaneous Transmission Configurations

User usage	SAR Test distance	Mode	Mode of Operation	Band	CDMA Voice (1xRTT)	GSM Voice	WCDMA Voice	CDMA Data (1xRTT, EV-DO)	GPRS/EGPRS	HSDPA	HSPA (HSDPA/HSUPA)	Wi-Fi 2.4GHz <sup>7</sup>	BT 2.4GHz <sup>7</sup>		
Body-worn accessory	1 cm	Voice	CDMA voice 1xRTT <sup>1</sup>	835	TX1	No	No	No	No	No	No	No	TX3		
			CDMA voice 1xRTT <sup>1</sup>	835	TX2	No	No	No	No	No	No	No		No	
			CDMA voice 1xRTT <sup>1</sup>	1900	TX1	No	No	No	No	No	No	No		No	
			CDMA voice 1xRTT <sup>1</sup>	1900	TX2	No	No	No	No	No	No	No		No	
			GSM Voice <sup>2</sup>	850	No	TX1	No	No	No	No	No	No		No	
			GSM Voice <sup>2</sup>	850	No	TX2	No	No	No	No	No	No		No	
			GSM Voice <sup>2</sup>	1900	No	TX1	No	No	No	No	No	No		No	
			GSM Voice <sup>2</sup>	1900	No	TX2	No	No	No	No	No	No		No	
			WCDMA Voice <sup>3,4</sup>	835	No	No	TX1	No	No	No	No	No		No	
			WCDMA Voice <sup>3,4</sup>	835	No	No	TX2	No	No	No	No	No		No	
			WCDMA Voice <sup>3,4</sup>	1900	No	No	TX1	No	No	No	No	No		No	
			WCDMA Voice <sup>3,4</sup>	1900	No	No	TX2	No	No	No	No	No		No	
			Data	CDMA 1xRTT, EV-DO <sup>1</sup>	835	No	No	No	TX1	No	No	No		No	No
				CDMA 1xRTT, EV-DO <sup>1</sup>	835	No	No	No	TX2	No	No	No		No	No
		CDMA 1xRTT, EV-DO <sup>1</sup>		1900	No	No	No	TX1	No	No	No	No		No	
		CDMA 1xRTT, EV-DO <sup>1</sup>		1900	No	No	No	TX2	No	No	No	No		No	
		GPRS/EGPRS <sup>2</sup>		850	No	No	No	No	TX1	No	No	No		No	
		GPRS/EGPRS <sup>2</sup>		850	No	No	No	No	TX2	No	No	No		No	
		GPRS/EGPRS <sup>2</sup>		1900	No	No	No	No	TX1	No	No	No		No	
		GPRS/EGPRS <sup>2</sup>		1900	No	No	No	No	TX2	No	No	No		No	
		HSDPA <sup>3,4</sup>		835	No	No	TX1	No	No	TX1	No	No		No	
		HSDPA <sup>3,4</sup>		835	No	No	TX2	No	No	TX2	No	No		No	
		HSDPA <sup>3,4</sup>		1900	No	No	TX1	No	No	TX1	No	No		No	
		HSDPA <sup>3,4</sup>		1900	No	No	TX2	No	No	TX2	No	No		No	
		HSPA <sup>3,5</sup>		835	No	No	TX1	No	No	No	TX1	No		No	
		HSPA <sup>3,5</sup>		835	No	No	TX2	No	No	No	TX2	No		No	
		HSPA <sup>3,5</sup>	1900	No	No	TX1	No	No	No	TX1	No	No			
		HSPA <sup>3,5</sup>	1900	No	No	TX2	No	No	No	TX2	No	No			
BT	2400	No	No	No	No	No	No	No	No	No	No				

**5.3 Wireless Router (hotspot) Exposure Condition**

User usage	SAR Test distance	Mode	Mode of Operation	Band	CDMA Voice <sup>1</sup> (1xRTT)	GSM Voice <sup>1</sup>	WCDMA Voice <sup>3</sup>	CDMA Data (1xRTT, EV-DO)	GPRS/ EGPRS	HSDPA	HSPA (HSDPA/HSUPA)	Wi-Fi 2.4GHz	BT 2.4GHz <sup>7</sup>	
												Wi-Fi 2.4GHz	BT 2.4GHz <sup>7</sup>	
Wireless Router (Hotspot)	1 cm	Data	CDMA 1xRTT, EVDO <sup>2</sup>	835	No	No	No	TX1	No	No	No	TX3	No	
			CDMA 1xRTT, EVDO <sup>2</sup>	835	No	No	No	TX2	No	No	No		No	
			CDMA 1xRTT, EVDO <sup>2</sup>	1900	No	No	No	TX1	No	No	No		No	No
			CDMA 1xRTT, EVDO <sup>2</sup>	1900	No	No	No	TX2	No	No	No		No	No
			GPRS/ EGPRS	850	No	No	No	No	TX1	No	No		No	No
			GPRS/ EGPRS	850	No	No	No	No	TX2	No	No		No	No
			GPRS/ EGPRS	1900	No	No	No	No	TX1	No	No		No	No
			GPRS/ EGPRS	1900	No	No	No	No	TX2	No	No		No	No
			WCDMA <sup>3,4</sup>	835	No	No	TX1	No	No	No	No		No	No
			WCDMA <sup>3,4</sup>	835	No	No	TX2	No	No	No	No		No	No
			WCDMA <sup>3,4</sup>	1900	No	No	TX1	No	No	No	No		No	No
			WCDMA <sup>3,4</sup>	1900	No	No	TX2	No	No	No	No		No	No
			HSDPA <sup>4,5</sup>	835	No	No	TX1	No	No	TX1	No		No	No
			HSDPA <sup>4,5</sup>	835	No	No	TX2	No	No	TX2	No		No	No
			HSDPA <sup>4,5</sup>	1900	No	No	TX1	No	No	TX1	No		No	No
			HSDPA <sup>4,5</sup>	1900	No	No	TX2	No	No	TX2	No		No	No
			HSPA <sup>4,6</sup>	835	No	No	TX1	No	No	No	TX1		No	No
			HSPA <sup>4,6</sup>	835	No	No	TX2	No	No	No	TX2		No	No
			HSPA <sup>4,6</sup>	1900	No	No	TX1	No	No	No	TX1		No	No
			HSPA <sup>4,6</sup>	1900	No	No	TX2	No	No	No	TX2		No	No
Wi-Fi	2400	No	No	No	No	No	No	No	No	No	No			

**Notes:**

- 1 – CDMA and GSM voice calls are not supported in hotspot mode.
- 2 – Per KDB 941225 D06 Hotspot SAR, 1xEVDO Rev. 0 is used for wireless router (hotspot) SAR measurements. Wireless router (hotspot) SAR for 1xEVDO Rev. A is not required since the output is not 1/4 dB higher than Rev. 0. Also, see conducted power results in section 8.1. Wireless Router (hotspot) SAR evaluation in 1xRTT mode is not required.
- 3 – Per KDB 941225 D01 SAR Test for 3G devices v02, Per KDB 941225 D01 SAR Test for 3G devices v02, SAR for wireless router (hotspot) exposure configurations in voice and data modes is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”. Also, see conducted power results in section 8.3.
- 4 – In UMTS VOICE + DATA mode, the same antenna is used for both voice and data transmission. Only one cellular antenna is used for transmission at any given time.
- 5 – Per KDB 941225 D01 Body SAR is not required for handsets with HSDPA capabilities when the maximum average output of each RF channel with HSDPA active is less than ¼ dB higher than that measured without HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2 kbps RMC is ≤ 75% of the SAR limit. Also, see conducted power results in section 8.3.
- 6 – Per KDB 941225 D01 Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2 kbps RMC is ≤ 75% of the SAR limit. Also, see conducted power results in section 8.3.
- 7 – Bluetooth and Wi-Fi time-share the same antenna and cannot transmit simultaneously. Only Wi-Fi mode is evaluated in hotspot mode.

## 6 DUT Test Conditions

This DUT was tested in twelve different positions. These tests are sub-divided in three categories:

- Head: Right Cheek, Right Tilt, Left Check, Left Tilt.
- Body – worn accessory: Front surface and Back surface of the DUT has separation distance of 1cm to the flat phantom.
- Wireless Router (hotspot): Front surface, Back surface, Left-edge, Right-edge, Top-edge, and Bottom-edge of the DUT has separation distance of 1cm to the flat phantom.

## 7 Measurement Procedure

A summary of the procedure follows:

### 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 (for example, 1.2 mm for an EX3DV3 probe type).

### 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 hotspot. The sophisticated interpolation routines implemented in DASY4 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 7x7x9 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

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.

## 7.1 Head SAR Configurations

### 7.1.1 SAM Specifications

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region.

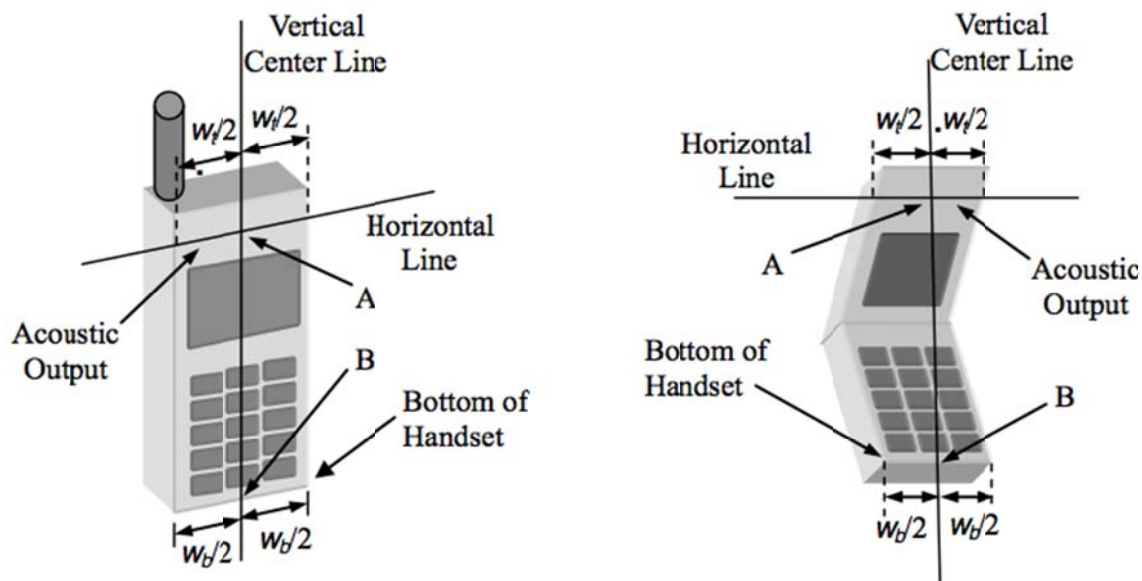
Material: Vinylester, glass fiber reinforced (VE-GF)

Shell Thickness: 2 +/- 0.2 mm (6 +/- 0.2 mm at ear point)

### 7.1.2 Handset Reference Points

In order to identify reference points on the handset, define two imaginary lines on the handset

- The vertical centerline passes through two points on the front side of the handset - the midpoint of the width  $w_t$  of the handset at the level of the acoustic output, and the midpoint of the width  $w_b$  of the bottom of the handset.
- The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.
- The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.

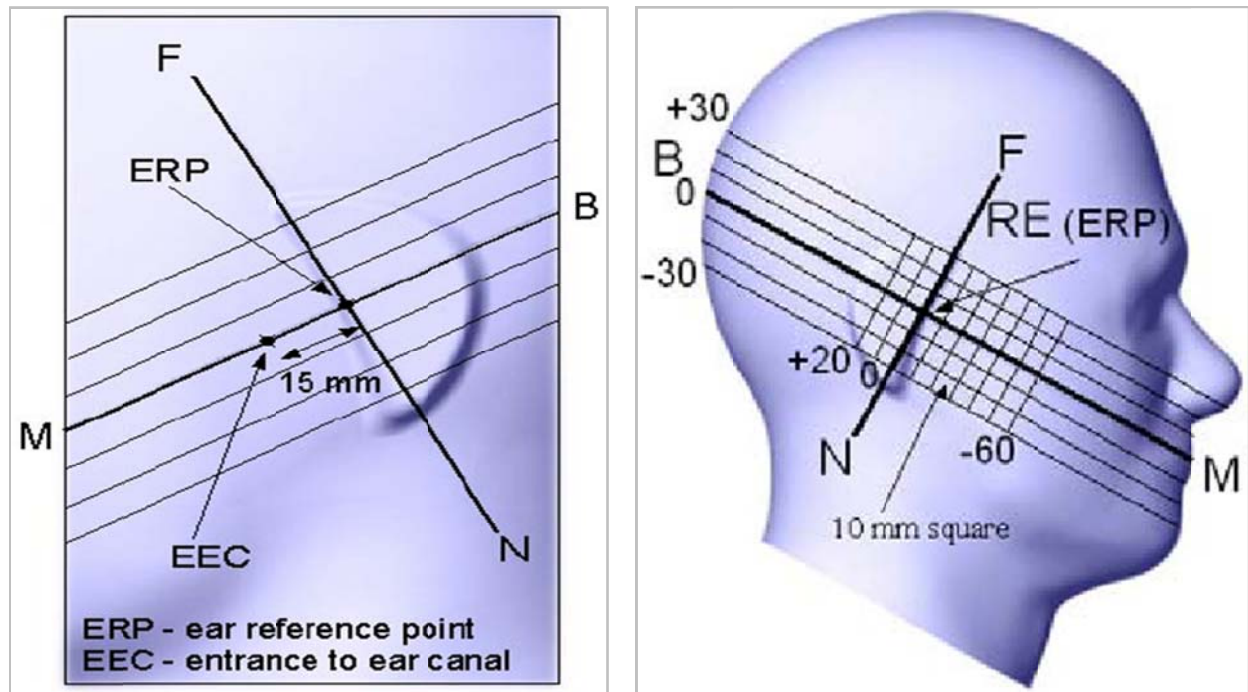




**7.1.3 Ear Reference Point**

This category includes most wireless handsets with fixed, retractable or internal antennas located toward the top half of the device, with or without a foldout, sliding or similar keypad cover. The handset should have its earpiece located within the upper ¼ of the device, either along the centerline or off-centered, as perceived by its users. This type of handset should be positioned in a normal operating position with the “test device reference point” located along the “vertical centerline” on the front of the device aligned to the “ear reference point”. The “test device reference point” should be located at the same level as the center of the earpiece region. The “vertical centerline” should bisect the front surface of the handset at its top and bottom edges. A “ear reference point” is located on the outer surface of the head phantom on each ear spacer. It is located 1.5 cm above the center of the ear canal entrance in the “phantom reference plane” defined by the three lines joining the center of each “ear reference point” (left and right) and the tip of the mouth.

A handset should be initially positioned with the earpiece region pressed against the ear spacer of a head phantom. For the SCC-34/SC-2 head phantom, the device should be positioned parallel to the “N-F” line defined along the base of the ear spacer that contains the “ear reference point”. For interim head phantoms, the device should be positioned parallel to the cheek for maximum RF energy coupling. The “test device reference point” is aligned to the “ear reference point” on the head phantom and the “vertical centerline” is aligned to the “phantom reference plane”. This is called the “initial ear position”. While maintaining these three alignments, the body of the handset is gradually adjusted to each of the following positions for evaluating SAR:



### 7.1.4 Holder

The DASY device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity  $\epsilon = 3$  and loss tangent  $\delta = 0.02$ .

Since this device has antennas around the edges of a phone, the phone is attached to a piece of lossless foam to raise the phone above the clamps of the test device holder instead of clamping the holder directly to the phone. See test-set-up photos in section 12-1.

### 7.1.5 Check Positions

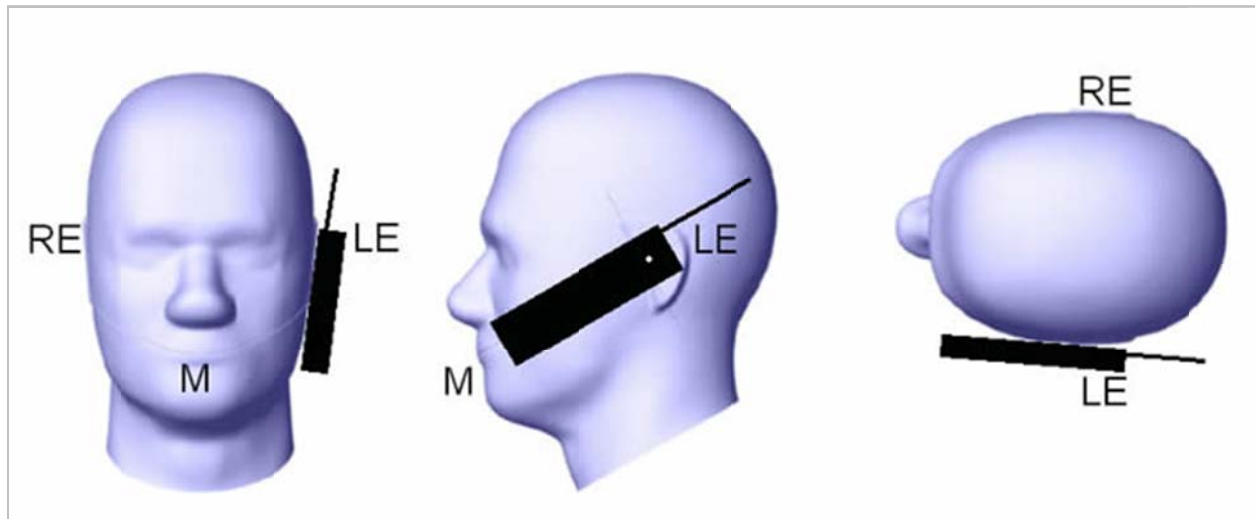
The device is brought toward the mouth of the head phantom by pivoting against the “ear reference point” or along the “N-F” line for the SCC-34/SC-2 head phantom.

This test position is established:

- a) When any point on the display, keypad or mouthpiece portions of the handset is in contact with the phantom.
- b) (or) When any portion of a foldout, sliding or similar keypad cover opened to its intended self-adjusting normal use position is in contact with the cheek or mouth of the phantom.

For existing head phantoms – when the handset loses contact with the phantom at the pivoting point, rotation should continue until the device touches the cheek of the phantom or breaks its last contact from the ear spacer.

Cheek / Touch Position



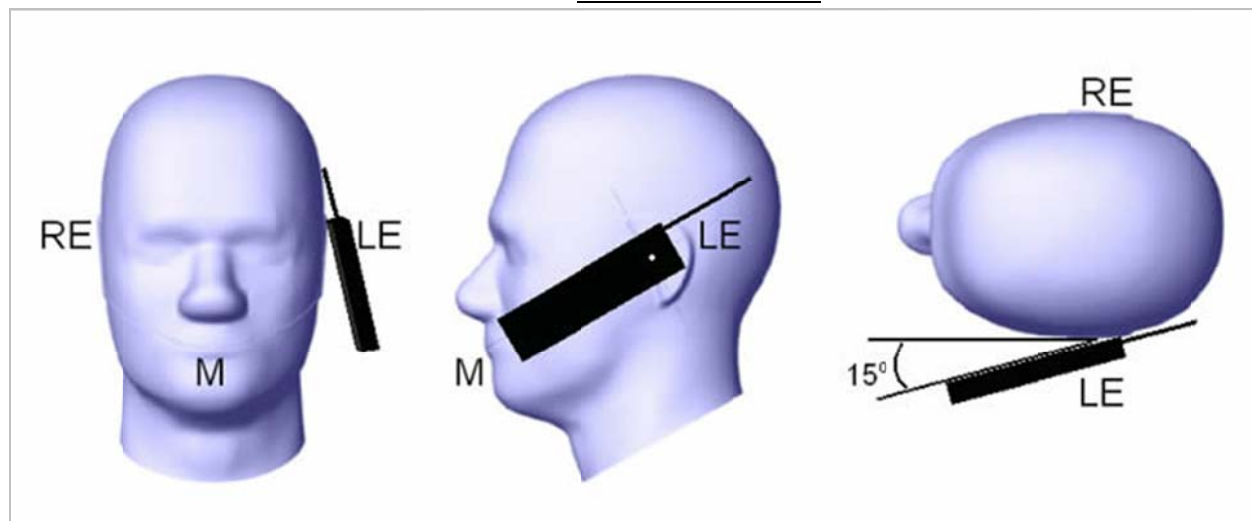
## 7.2 Tilt Positions

With the handset aligned in the “Cheek/Touch Position”:

- a) If the earpiece of the handset is not in full contact with the phantom’s ear spacer (in the “Cheek/Touch position”) and the peak SAR location for the “Cheek/Touch” position is located at the ear spacer region or corresponds to the earpiece region of the handset, the device should be returned to the “initial ear position” by rotating it away from the mouth until the earpiece is in full contact with the ear spacer.
- b) (otherwise) The handset should be moved (translated) away from the cheek perpendicular to the line passes through both “ear reference points” (note: one of these ear reference points may not physically exist on a split head model) for approximate 2-3 cm. While it is in this position, the device handset is tilted away from the mouth with respect to the “test device reference point” until the inside angle between the vertical centerline on the front surface of the phone and the horizontal line passing through the ear reference point is by  $15^\circ$ . After the tilt, it is then moved (translated) back toward the head perpendicular to the line passes through both “ear reference points” until the device touches the phantom or the ear spacer. If the antenna touches the head first, the positioning process should be repeated with a tilt angle less than  $15^\circ$  so that the device and its antenna would touch the phantom simultaneously. This test position may require a device holder or positioner to achieve the translation and tilting with acceptable positioning repeatability.

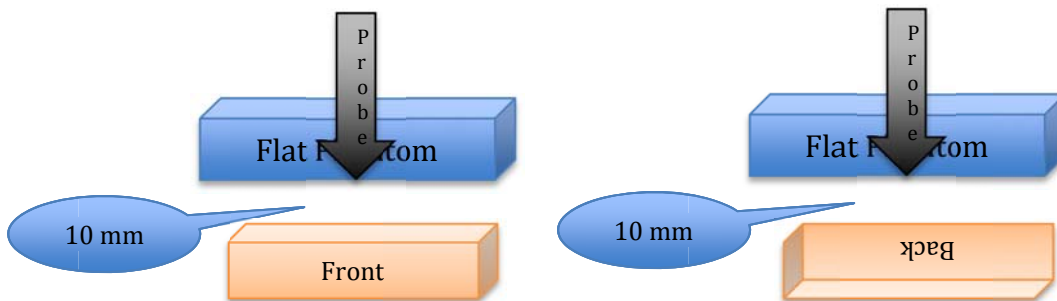
If a device is also designed to transmit with its keypad cover closed for operating in the head position, such positions should also be considered in the SAR evaluation. The device should be tested on the left and right side of the head phantom in the “Cheek/Touch” and “Ear/Tilt” positions. When applicable, each configuration should be tested with the antenna in its fully extended and fully retracted positions. These test configurations should be tested at the high, middle and low frequency channels of each operating mode; for example, AMPS, CDMA, and TDMA. If the SAR measured at the middle channel for each test configuration (left, right, Cheek/Touch, Tilt/Ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s). If the transmission band of the test device is less than 10 MHz, testing at the high and low frequency channels is optional.

Ear/Tilt  $15^\circ$  Position



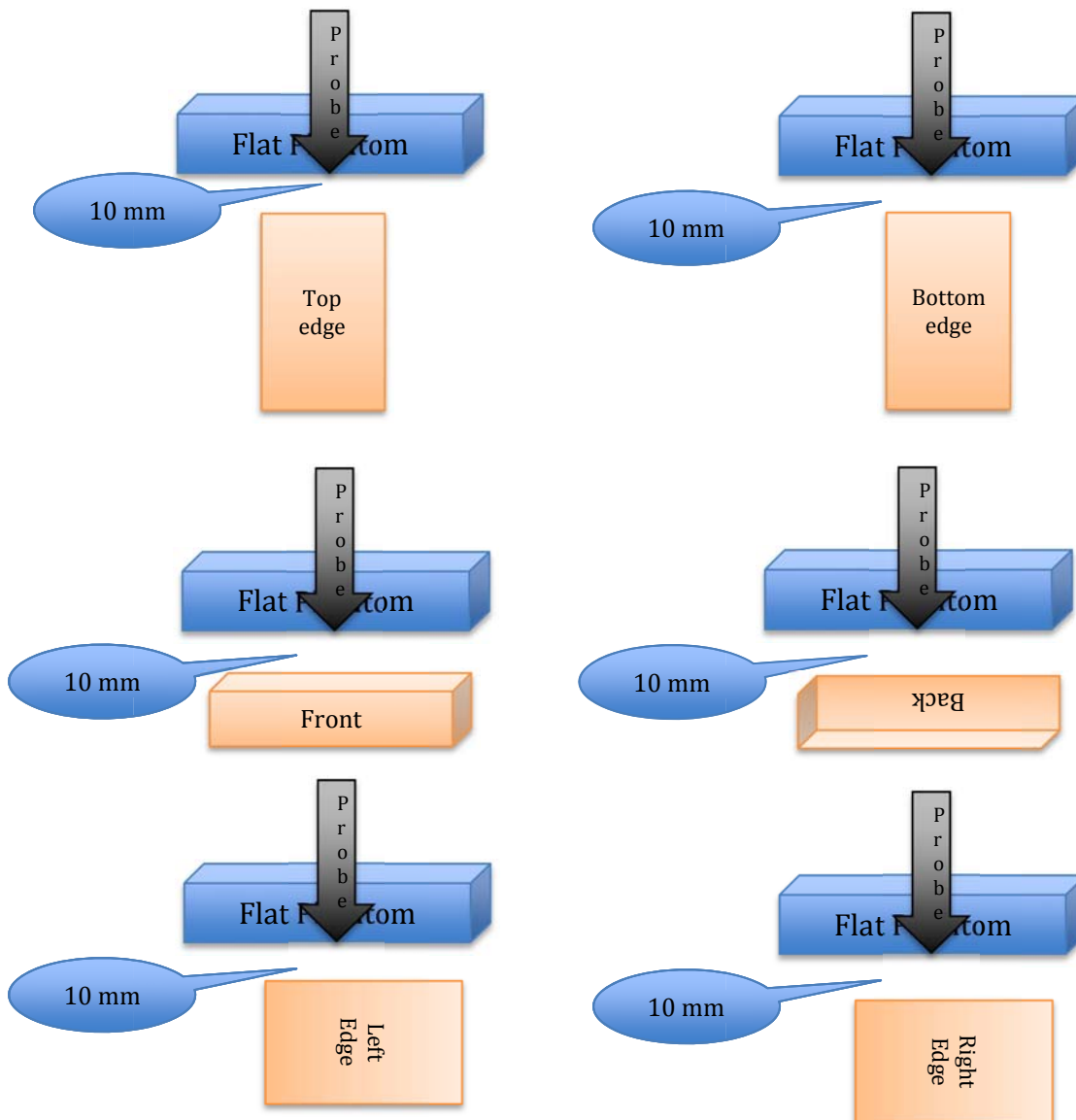
### 7.3 Body-worn Accessory SAR Configurations

This device is not supplied with any specific body-worn accessories, but the device is tested at a minimum distance of 1.0cm to demonstrate body-worn accessory SAR compliance.



### 7.4 Wireless Router (Hotspot) SAR Configurations

In addition to body-worn, this device is tested for wireless router (hotspot) configuration. A separation distance of 1.0cm from the device to the flat phantom is used for both measurements.



## 8 RF Output Power Verification

### 8.1 CDMA Mode

Maximum average output power is verified on the Low, Middle and High channels according to procedures in section 4.4.5.2 of 3GPP2 C.S0011/TIA-98-E for 1xRTT, section 3.1.2.3.4 of 3GPP2 C.S0033-0/TIA-866 for Rel. 0 and section 4.3.4 of 3GPP2 C.S0033-A for Rev. A.

#### 8.1.1 CDMA2000 1xRTT

This procedure assumes the Agilent 8960 base station emulator has the following applications installed and with valid license.

##### Application

##### Rev. License

CDMA2000 Mobile Test

B.13.08, L

- Protocol Rev > 6 (IS2000-0); System ID: 28 (Cell) & 18 (PCS); NID 65535 (Cell & PCS);
- Registration Channel: 384 (Cell) & 600 (PCS)
- Radio Configuration (RC) > Please see following table for details
- Traffic Data Rate > Full
- TDSO SCH Info > F-SCH Parameters > F-SCH Data Rate > 153.6kbps  
> R-SCH Parameters > R-SCH Data Rate > 153.6kbps
- Rvs Power Ctrl > All Up Bits (Maximum TxPout)

#### Test Results

Band	Radio Configuration (RC)	Service Option (SO)	Ch#	Frequency (MHz)	Avg Tx Power (dBm)	
					Primary Antenna	Secondary Antenna
Cellular	RC1	55 (Loopback)	1013	824.7	24.4	24.2
			384	836.52	24.3	24.0
			777	848.31	24.5	23.9
	RC3	55 (Loopback)	1013	824.7	24.5	24.3
			384	836.52	24.3	24.1
			777	848.31	24.5	24.0
		32 (+ F-SCH)	1013	824.7	24.5	23.87
			384	836.52	24.3	23.70
			777	848.31	24.5	23.70
		32 (+ SCH)	1013	824.7	24.4	24
			384	836.52	24.3	23.84
			777	848.31	24.4	23.77
US PCS	RC1	55 (Loopback)	25	1851.25	23.4	20.7
			600	1880	23.2	21.0
			1175	1908.75	23.3	20.8
	RC3	55 (Loopback)	25	1851.25	23.5	20.8
			600	1880	23.3	21.1
			1175	1908.75	23.4	20.8
		32 (+ F-SCH)	25	1851.25	23.4	21.00
			600	1880	23.3	21.00
			1175	1908.75	23.3	20.75
		32 (+ SCH)	25	1851.25	23.3	20.93
			600	1880	23.3	21.00
			1175	1908.75	23.3	20.80

### 8.1.2 CDMA2000 1xEV-DO Rev. 0

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

#### EVDO Release 0 - RTAP

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00000000 : 00000000 : 00000000 : 00000000 > Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Params:
  - Cell Power > -105.5 dBm/1.23 MHz
  - Cell Band > (Select US Cellular or US PCS)
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > RTAP
  - RTAP Rate > 153.6 kbps
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

#### EVDO Release 0 - FTAP

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00000000 : 00000000 : 00000000 : 00000000 > Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Params:
  - Cell Power > -105.5 dBm/1.23 MHz
  - Cell Band > (Select US Cellular or US PCS)
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > FTAP (default)
  - FTAP Rate > 307.2 kbps (2 Slot, QPSK)
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

#### **Test Results**

Band	FTAP Rate	RTAP Rate	Ch#	Frequency (MHz)	Avg Tx Power (dBm)	
					Primary Antenna	Secondary Antenna
Cellular	307.2 kbps (2 slot, QPSK)	153.6 kbps	1013	824.7	24.4	24.00
			384	836.52	24.3	23.80
			777	848.31	24.3	23.75
US PCS	307.2 kbps (2 slot, QPSK)	153.6 kbps	25	1851.25	23.3	20.97
			600	1880	23.3	21.00
			1175	1908.75	23.2	20.83

**8.1.3 CDMA2000 1xEV-DO Rev. A**

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

<u>Application</u>	<u>Rev. License</u>
1xEV-DO Terminal Test	A.09.13

**EVDO Rev. A – RETAP**

- Call Setup > Shift & Preset
- Cell Power > -60 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > RETAP
- R-Data Pkt Size > 4096
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2 > PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Access Network Info > Cell Parameters > Sector ID > 00000000: 00000000: 00000000: 00000000 > Subnet Mask > 0
- Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots > ACK R-Data After > Subpacket 0 (All ACK)
- Rvs Power Ctrl > All Up bits (to get the maximum power)

**EVDO Rev. A - FETAP**

- Call Setup > Shift & Preset
- Cell Power > -60 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > FETAP
- F-Traffic Format > 4 (1024, 2,128) Canonical (307.2k, QPSK)
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2 > PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Access Network Info > Cell Parameters > Sector ID > 00000000: 00000000: 00000000: 00000000 > Subnet Mask > 0
- Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots > ACK R-Data After > Subpacket 0 (All ACK)
- Rvs Power Ctrl > All Up bits (to get the maximum power)

**Test Results**

Band	FETAP Traffic Format	RETAP Data Payload Size	Ch#	Frequency (MHz)	Avg Tx Power (dBm)	
					Primary Antenna	Secondary Antenna
Cellular	307.2 kbps, QPSK/ ACK Channel is transmitted at all the slots	4096	1013	824.7	24.2	23.98
			384	836.52	24.2	23.90
			777	848.31	24.1	23.70
US PCS	307.2 kbps, QPSK/ ACK Channel is transmitted at all the slots	4096	25	1851.25	23.2	21.0
			600	1880	23.3	21.0
			1175	1908.75	23.1	20.73

**Test mode reduction considerations per KDB 941225****Note # 1:**

Per KDB941225 D01 SAR test for 3G devices v02, and based on the above power measurements,

- **Head SAR is measured for RC3 with the DUT configured to transmit at full rate using Loopback Service Option SO55.**
- Head SAR for RC1 is not required when the maximum average output of each channel is less than 0.25 dB higher than as measured in RC3.

**Note # 2:**

Per KDB941225 D01 SAR test for 3G devices v02, and based on the above power measurements,

- Body-worn accessory SAR for multiple code channel (FCH+SCH) is not required since the output power is not 1/4 dB higher than RC3/SO32.
- Body-worn accessory SAR for 1xEVDO Rev. 0 and Rev. A is not required since the output power is not 1/4 dB higher than RC3.
- **Thus, for both primary and secondary antenna, RC3/SO32 is used for Body-worn accessory SAR measurements.**
- **For Wireless Router (hotspot) exposure condition, 1xEVDO Rev. 0 is used for SAR measurements. Wireless Router (hotspot) SAR for 1xEVDO Rev. A is not required due to the output is not 1/4 dB higher than Rev. 0.**



## 8.2 GSM Mode

### 8.2.1 GSM (GMSK)

Band	Ch#	Frequency (MHz)	Avg Tx Power (dBm)	
			Primary Antenna	Secondary Antenna
GSM850	128	824.2	33.5	32.4
	190	836.6	33.4	32.5
	251	848.8	33.4	32.4
GSM1900	512	1850.2	31.5	29.4
	661	1880	31.5	29.4
	810	1909.8	31.4	29.3

### 8.2.2 GPRS (GMSK) - Coding Scheme: CS1

Band	Ch #	Frequency (MHz)	Avg Tx Power (dBm)							
			Primary Antenna				Secondary Antenna			
			1 Slot	Frame Avg Power	2 Slots	Frame Avg Power	1 Slot	Frame Avg Power	2 Slots	Frame Avg Power
GPRS 850	128	824.2	33.5	24.5	31.5	<b>25.5</b>	32.4	23.4	29.5	<b>23.5</b>
	190	836.6	33.4	24.4	31.4	<b>25.4</b>	32.4	23.4	30.1	<b>24.1</b>
	251	848.8	33.2	24.2	31.3	<b>25.3</b>	32.3	23.3	30.0	<b>24.0</b>
GPRS 1900	512	1850.2	31.4	22.4	31.3	<b>25.3</b>	29	20	29	<b>23</b>
	661	1880	31.5	22.5	31.4	<b>25.4</b>	29	20	29	<b>23</b>
	810	1909.8	31.4	22.4	31.4	<b>25.4</b>	29.2	20.2	29.1	<b>23.1</b>

**Note:** The modulation for CS1 to CS4 is GMSK, so the above table reflects the conducted power in the GMSK modulation.

### 8.2.3 EGPRS (8PSK) - Coding Scheme: MCS5

Band	Ch #	Frequency (MHz)	Avg Tx Power (dBm)							
			Primary Antenna				Secondary Antenna			
			1 Slot	Frame Avg Power	2 Slots	Frame Avg Power	1 Slot	Frame Avg Power	2 Slots	Frame Avg Power
EGPRS 850	128	824.2	26.3	17.3	26.1	20.1	25.5	16.5	25.3	19.3
	190	836.6	26.4	17.4	26.2	20.2	25.7	16.7	25.5	19.5
	251	848.8	26.5	17.5	26.3	20.3	25.5	16.5	25.5	19.5
EGPRS 1900	512	1850.2	24.8	15.8	24.7	18.7	23	14	22.8	16.8
	661	1880	24.6	15.6	24.5	18.5	23	14	22.8	16.8
	810	1909.8	24.6	15.6	24.4	18.4	23	14	22.8	16.8

**Note:** The modulation for MCS5 to MCS9 is 8PSK, so the above table reflects the conducted power in the 8PSK modulation.

**Test mode reduction considerations per KDB 941225**

Per KDB 941225 D03 SAR Test Reduction GSM/GPRS/EDGE v01, SAR test reductions are applied for devices operating in GSM/GPRS/EDGE modes to demonstrate RF exposure compliance.

- Since the source-based time-averaged output power for EGPRS mode is lower than that in the GPRS mode, therefore Body-worn accessory SAR test reduction is applicable for this device.
- **Based on output power above and time slots, the following worst-case configurations were chosen for Body-worn accessory SAR testing for both primary and secondary antenna,**
  - GPRS850 2 time slots
  - GPRS1900 2 time slots
  - GSM850 GMSK
  - GSM1900 GMSK
- **For Wireless Router (hotspot) exposure condition, the following worst-case configurations were chosen for SAR testing for both primary and secondary antenna,**
  - GPRS850 2 time slots
  - GPRS1900 2 time slots

### 8.3 WCDMA Mode

#### 8.3.1 Release 99

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

WCDMA General Settings	Mode	Rel99
	Subtest	-
	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps
	Power Control Algorithm	Algorithm2
	$\beta_c/\beta_d$	8/15

#### Test Results

Band	Mode	UL Ch#	DL Ch#	Frequency (MHz)	Avg Tx Power (dBm)	
					Primary Antenna	Secondary Antenna
UMTS850 (Band V)	Rel 99 12.2kbps RMC	4132	4357	826.4	24.0	23.9
		4183	4408	836.6	24.0	24.0
		4233	4458	846.6	24.0	24.0
UMTS1900 (Band II)	Rel 99 12.2kbps RMC	9262	9662	1852.4	23.6	21.0
		9400	9800	1880.0	23.5	21.1
		9538	9938	1907.6	23.6	21.1

#### 8.3.2 HSDPA

The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP TS34.121 specification. A summary of these settings are illustrated below:

	Mode	Rel6 HSDPA	Rel6 HSDPA	Rel6 HSDPA	Rel6 HSDPA
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm2			
	$\beta_c$	2/15	12/15	15/15	15/15
	$\beta_d$	15/15	15/15	8/15	4/15
	$\beta_d$ (SF)	64			
	$\beta_c/\beta_d$	2/15	12/15	15/8	15/4
	$\beta_{hs}$	4/15	24/15	30/15	30/15
MPR	0	0	0.5	0.5	
HSDPA Specific Settings	$D_{ACK}$	8			
	$D_{NAK}$	8			
	DCQI	8			
	Ack-Nack Repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	$A_{hs} = \beta_{hs}/\beta_c$	30/15			

**Test Results**

Band	Mode	UL Ch#	DL Ch#	Frequency (MHz)	Avg Tx Power (dBm)	
					Primary Antenna	Secondary Antenna
UMTS850 (Band V)	Subtest 1	4132	4357	826.4	23.48	23.22
		4183	4408	836.6	23.37	23.17
		4233	4458	846.6	23.46	23.28
	Subtest 2	4132	4357	826.4	23.51	23.31
		4183	4408	836.6	23.45	23.29
		4233	4458	846.6	23.43	23.24
	Subtest 3	4132	4357	826.4	23.05	22.89
		4183	4408	836.6	23.03	22.75
		4233	4458	846.6	23.01	22.71
	Subtest 4	4132	4357	826.4	23.1	22.86
		4183	4408	836.6	22.99	22.8
		4233	4458	846.6	22.97	22.75
UMTS1900 (Band II)	Subtest 1	9262	9662	1852.4	22.63	20.48
		9400	9800	1880	22.34	20.33
		9538	9938	1907.6	22.54	20.46
	Subtest 2	9262	9662	1852.4	22.62	20.47
		9400	9800	1880	22.35	20.4
		9538	9938	1907.6	22.5	20.44
	Subtest 3	9262	9662	1852.4	22.05	19.91
		9400	9800	1880	21.95	19.98
		9538	9938	1907.6	21.99	20.02
	Subtest 4	9262	9662	1852.4	22.1	19.88
		9400	9800	1880	21.91	19.96
		9538	9938	1907.6	21.96	20.12

**Test mode reduction consideration per KDB 941225**

Per KDB 941225 D01 – Body SAR is not required for HSDPA when the maximum average output of each RF channel with HSDPA active is less than ¼ dB higher than that measured without HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2 kbps RMC is < 75% of the SAR limit.

**8.3.3 HSPA (Rel 6 HSDPA & HSUPA)**

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

Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{HS}$ (Note 1)	$\beta_{ec}$	$\beta_{ed}$ (Note 4) (Note 5)	$\beta_{ed}$ (SF)	$\beta_{ed}$ (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/25	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}$ : 47/15 $\beta_{ed2}$ : 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4,  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$ . For sub-test 5,  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 5/15$  with  $\beta_{hs} = 5/15 * \beta_c$ .

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

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

Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5:  $\beta_{ed}$  can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

**Test Results**

Band	Mode	UL Ch#	DL Ch#	Frequency (MHz)	Avg Tx Power (dBm)	
					Primary Antenna	Secondary Antenna
UMTS850 (Band V)	Subtest 1	4132	4357	826.4	23.2	22.63
		4183	4408	836.6	23.1	22.65
		4233	4458	846.6	23.25	23.07
	Subtest 2	4132	4357	826.4	22.07	21.93
		4183	4408	836.6	22.23	21.83
		4233	4458	846.6	21.91	21.71
	Subtest 3	4132	4357	826.4	22.12	21.81
		4183	4408	836.6	21.88	21.63
		4233	4458	846.6	22.12	22
	Subtest 4	4132	4357	826.4	22.38	22.29
		4183	4408	836.6	22.37	22.12
		4233	4458	846.6	22.48	22.08
	Subtest 5	4132	4357	826.4	23.36	23.22
		4183	4408	836.6	23.37	23.16
		4233	4458	846.6	23.56	23.26
UMTS1900 (Band II)	Subtest 1	9262	9662	1852.4	22.51	19.68
		9400	9800	1880	21.8	19.87
		9538	9938	1907.6	22.61	20.16
	Subtest 2	9262	9662	1852.4	21.37	18.86
		9400	9800	1880	20.86	18.75
		9538	9938	1907.6	21.34	18.89
	Subtest 3	9262	9662	1852.4	20.98	18.94
		9400	9800	1880	21.24	19.12
		9538	9938	1907.6	21.01	19.11
	Subtest 4	9262	9662	1852.4	21.44	19.52
		9400	9800	1880	21.04	18.93
		9538	9938	1907.6	21.49	19.33
	Subtest 5	9262	9662	1852.4	22.51	20.37
		9400	9800	1880	22.22	20.33
		9538	9938	1907.6	22.54	20.35

**Test mode reduction consideration per KDB 941225**

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

## 8.4 Wi-Fi Mode

The measured maximum average conducted power for all supported modulations in Wi-Fi mode is below.

### Test Results

Band	Mode	Channel	Frequency (MHz)	Avg Tx Pwr (dBm)
2.4GHz	802.11b	1	2412	17.2
		6	2437	17.1
		11	2462	17.1
	802.11g	1	2412	14.0
		6	2437	17.0
		11	2462	14.0
	802.11n (HT20)	1	2412	13.5
		6	2437	17.0
		11	2462	13.5

### Test mode reduction consideration per KDB 248227

**Note:** Per KDB 248227, SAR is not required for 802.11g /n (HT20) channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11b channels.

## 8.5 Bluetooth Mode

The measured maximum average conducted power for all supported modulations in BT mode is below.

### Test Results

Band	Mode	Channel	Frequency (MHz)	Avg Tx Pwr (dBm)
2.4GHz	V2.1 + EDR, GFSK	0	2402	13.5
		39	2441	13.7
		78	2480	13.7
	V2.1 + EDR, $\pi/4$ DQPSK	0	2402	11.7
		39	2441	11.8
		78	2480	11.7
	V2.1 + EDR, 8-DPSK	0	2402	12.0
		39	2441	12.0
		78	2480	11.7
	V4.0 LE, GFSK	0	2402	9.4
		39	2441	9.9
		78	2480	9.9

## 9 Standalone SAR Test Results

The test configuration for each body exposure condition (head, body-worn accessory, and wireless router) is dependent on the applicable voice or data modes, and antenna selected, as mentioned in section 5.0.

Both primary and secondary antenna can be used in both voice and data modes for all supported cellular technologies.

### 9.1 Head Exposure Condition

#### Highest Standalone SAR Test Result

Mode	Mode of Operation	Band	CDMA Voice (1xRTT)	GSM Voice	WCDMA Voice	CDMA Data <sup>1</sup> (1xRTT, EV-DO)	GPRS/EGPRS	HSDPA	HSPA	Wi-Fi 2.4GHz	BT 2.4GHz	Test Positions	Highest 1-g SAR (W/Kg)	Test Results	
Voice	CDMA (1xRTT)	835	TX1	No	No	No	No	No	No	No	No	RHS/LHS Tilt, RHS/LHS Touch	<b>1.150</b>	See Section 9.1.1	
	CDMA (1xRTT)	835	TX2	No	No	No	No	No	No	No	No	RHS/LHS Tilt, RHS/LHS Touch	1.120	See Section 9.1.1	
	CDMA (1xRTT)	1900	TX1	No	No	No	No	No	No	No	No	RHS/LHS Tilt, RHS/LHS Touch	<b>1.180</b>	See Section 9.1.2	
	CDMA (1xRTT)	1900	TX2	No	No	No	No	No	No	No	No	RHS/LHS Tilt, RHS/LHS Touch	1.150	See Section 9.1.2	
	GSM	850	No	TX1	No	No	No	No	No	No	No	RHS/LHS Tilt, RHS/LHS Touch	<b>1.040</b>	See Section 9.1.3	
	GSM	850	No	TX2	No	No	No	No	No	No	No	RHS/LHS Tilt, RHS/LHS Touch	0.869	See Section 9.1.3	
	GSM	1900	No	TX1	No	No	No	No	No	No	No	RHS/LHS Tilt, RHS/LHS Touch	<b>1.080</b>	See Section 9.1.4	
	GSM	1900	No	TX2	No	No	No	No	No	No	No	RHS/LHS Tilt, RHS/LHS Touch	0.968	See Section 9.1.4	
	UMTS	835	No	No	TX1	No	No	No	No	No	No	No	RHS/LHS Tilt, RHS/LHS Touch	1.040	See Section 9.1.5
	UMTS	835	No	No	TX2	No	No	No	No	No	No	No	RHS/LHS Tilt, RHS/LHS Touch	<b>1.130</b>	See Section 9.1.5
	UMTS	1900	No	No	TX1	No	No	No	No	No	No	No	RHS/LHS Tilt, RHS/LHS Touch	1.130	See Section 9.1.6
	UMTS	1900	No	No	TX2	No	No	No	No	No	No	No	RHS/LHS Tilt, RHS/LHS Touch	<b>1.180</b>	See Section 9.1.6
Wi-Fi	2400	No	No	No	No	No	No	No	No	TX3	No	RHS/LHS Tilt, RHS/LHS Touch	<b>0.372</b>	See Section 9.1.7	



**9.1.1 CDMA2000 1x – CDMA 835 Band**

Mode	Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
Voice	CDMA2000 Cell	Primary	1xRTT (RC3, SO55)	LHS Touch	1013	824.70	24.5	1.140 <sup>1</sup>
	<b>CDMA2000 Cell</b>	<b>Primary</b>	<b>1xRTT (RC3, SO55)</b>	<b>LHS Touch</b>	<b>384</b>	<b>836.52</b>	<b>24.3</b>	<b>1.150<sup>1</sup></b>
	CDMA2000 Cell	Primary	1xRTT (RC3, SO55)	LHS Touch	777	848.31	24.5	1.120 <sup>1</sup>
	CDMA2000 Cell	Primary	1xRTT (RC3, SO55)	LHS Tilt	384	836.52	24.3	0.472 <sup>1,2</sup>
	CDMA2000 Cell	Primary	1xRTT (RC3, SO55)	RHS Touch	1013	824.70	24.5	0.886 <sup>1</sup>
	CDMA2000 Cell	Primary	1xRTT (RC3, SO55)	RHS Touch	384	836.52	24.3	0.924 <sup>1</sup>
	CDMA2000 Cell	Primary	1xRTT (RC3, SO55)	RHS Touch	777	848.31	24.5	0.985 <sup>1</sup>
Voice	CDMA2000 Cell	Primary	1xRTT (RC3, SO55)	RHS Tilt	384	836.52	24.3	0.523 <sup>1,2</sup>
	CDMA2000 Cell	Secondary	1xRTT (RC3, SO55)	LHS Touch	1013	824.70	24.3	1.060 <sup>1</sup>
	CDMA2000 Cell	Secondary	1xRTT (RC3, SO55)	LHS Touch	384	836.52	24.1	1.120 <sup>1</sup>
	CDMA2000 Cell	Secondary	1xRTT (RC3, SO55)	LHS Touch	777	848.31	24.0	1.090 <sup>1</sup>
	CDMA2000 Cell	Secondary	1xRTT (RC3, SO55)	LHS Tilt	1013	824.70	24.3	0.729 <sup>1</sup>
	CDMA2000 Cell	Secondary	1xRTT (RC3, SO55)	LHS Tilt	384	836.52	24.1	0.860 <sup>1</sup>
	CDMA2000 Cell	Secondary	1xRTT (RC3, SO55)	LHS Tilt	777	848.31	24.0	0.721 <sup>1</sup>
Voice	CDMA2000 Cell	Secondary	1xRTT (RC3, SO55)	RHS Touch	384	836.52	24.1	0.755 <sup>1,2</sup>
	CDMA2000 Cell	Secondary	1xRTT (RC3, SO55)	RHS Tilt	384	836.52	24.1	0.600 <sup>1,2</sup>

**9.1.2 CDMA2000 1x – PCS 1900 Band**

Mode	Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
Voice	CDMA2000 PCS	Primary	1xRTT (RC3, SO55)	LHS Touch	25	1851.25	23.5	1.150 <sup>1</sup>
	CDMA2000 PCS	Primary	1xRTT (RC3, SO55)	LHS Touch	600	1880.00	23.3	1.140 <sup>1</sup>
	<b>CDMA2000 PCS</b>	<b>Primary</b>	<b>1xRTT (RC3, SO55)</b>	<b>LHS Touch</b>	<b>1175</b>	<b>1908.75</b>	<b>23.4</b>	<b>1.180<sup>1</sup></b>
	CDMA2000 PCS	Primary	1xRTT (RC3, SO55)	LHS Tilt	600	1880.00	23.3	0.530 <sup>1,2</sup>
	CDMA2000 PCS	Primary	1xRTT (RC3, SO55)	RHS Touch	25	1851.25	23.5	1.120 <sup>1</sup>
	CDMA2000 PCS	Primary	1xRTT (RC3, SO55)	RHS Touch	600	1880.00	23.3	1.010 <sup>1</sup>
	CDMA2000 PCS	Primary	1xRTT (RC3, SO55)	RHS Touch	1175	1908.75	23.4	1.060 <sup>1</sup>
Voice	CDMA2000 PCS	Primary	1xRTT (RC3, SO55)	RHS Tilt	600	1880.00	23.3	0.558 <sup>1,2</sup>
	CDMA2000 PCS	Secondary	1xRTT (RC3, SO55)	LHS Touch	600	1880.00	21.1	0.641 <sup>1,2</sup>
	CDMA2000 PCS	Secondary	1xRTT (RC3, SO55)	LHS Tilt	600	1880.00	21.1	0.643 <sup>1,2</sup>
	CDMA2000 PCS	Secondary	1xRTT (RC3, SO55)	RHS Touch	25	1851.25	20.8	1.040 <sup>1</sup>
	CDMA2000 PCS	Secondary	1xRTT (RC3, SO55)	RHS Touch	600	1880.00	21.1	1.100 <sup>1</sup>
	CDMA2000 PCS	Secondary	1xRTT (RC3, SO55)	RHS Touch	1175	1908.75	20.8	1.150 <sup>1</sup>
	CDMA2000 PCS	Secondary	1xRTT (RC3, SO55)	RHS Tilt	25	1851.25	20.8	1.040 <sup>1</sup>
Voice	CDMA2000 PCS	Secondary	1xRTT (RC3, SO55)	RHS Tilt	600	1880.00	21.1	1.020 <sup>1</sup>
	CDMA2000 PCS	Secondary	1xRTT (RC3, SO55)	RHS Tilt	1175	1908.75	20.8	1.080 <sup>1</sup>

**Test mode reduction considerations**

**Note # 1:** Per KDB941225 D01 SAR test for 3G devices v02, and based on the power measurements in section 8.1,

- Head SAR is measured for RC3 with the DUT configured to transmit at full rate using Loopback Service Option SO55.
- Head SAR for RC1 is not required when the maximum average output of each channel is less than 0.25 dB higher than as measured in RC3. Refer to conducted power results in section 8.1.

**Note # 2:** Per FCC/OET Bulletin 65 Supplement C (June 2001) and Public Notice DA-02-1438, if the SAR measured at the middle channel for each test configuration is at least 3.0dB lower than the SAR limit, testing at the low and high channels is optional for such test configuration(s).

**9.1.3 GSM850**

Mode	Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
Voice	GSM850	Primary	GMSK	LHS Touch	128	824.20	33.5	0.921
	<b>GSM850</b>	<b>Primary</b>	<b>GMSK</b>	<b>LHS Touch</b>	<b>190</b>	<b>836.6</b>	<b>33.4</b>	<b>1.040</b>
	GSM850	Primary	GMSK	LHS Touch	251	848.8	33.4	1.020
	GSM850	Primary	GMSK	LHS Tilt	190	836.6	33.4	0.229 <sup>1</sup>
	GSM850	Primary	GMSK	RHS Touch	128	824.20	33.5	0.676
	GSM850	Primary	GMSK	RHS Touch	190	836.6	33.4	0.814
	GSM850	Primary	GMSK	RHS Touch	251	848.8	33.4	0.876
	GSM850	Primary	GMSK	RHS Tilt	190	836.6	33.4	0.282 <sup>1</sup>
Voice	GSM850	Secondary	GMSK	LHS Touch	128	824.20	32.4	0.751
	GSM850	Secondary	GMSK	LHS Touch	190	836.6	32.5	0.810
	GSM850	Secondary	GMSK	LHS Touch	251	848.8	32.4	0.869
	GSM850	Secondary	GMSK	LHS Tilt	190	836.6	32.5	0.515 <sup>1</sup>
	GSM850	Secondary	GMSK	RHS Touch	190	836.6	32.5	0.569 <sup>1</sup>
	GSM850	Secondary	GMSK	RHS Tilt	190	836.6	32.5	0.460 <sup>1</sup>

**9.1.4 GSM1900**

Mode	Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
Voice	GSM1900	Primary	GMSK	LHS Touch	512	1850.2	31.5	1.010
	GSM1900	Primary	GMSK	LHS Touch	661	1880.0	31.5	1.070
	<b>GSM1900</b>	<b>Primary</b>	<b>GMSK</b>	<b>LHS Touch</b>	<b>810</b>	<b>1909.8</b>	<b>31.4</b>	<b>1.080</b>
	GSM1900	Primary	GMSK	LHS Tilt	661	1880.0	31.5	0.438 <sup>1</sup>
	GSM1900	Primary	GMSK	RHS Touch	512	1850.2	31.5	0.927
	GSM1900	Primary	GMSK	RHS Touch	661	1880.0	31.5	0.839
	GSM1900	Primary	GMSK	RHS Touch	810	1909.8	31.4	0.874
	GSM1900	Primary	GMSK	RHS Tilt	661	1880.0	31.5	0.446 <sup>1</sup>
Voice	GSM1900	Secondary	GMSK	LHS Touch	661	1880.00	29.4	0.513 <sup>1</sup>
	GSM1900	Secondary	GMSK	LHS Tilt	661	1880.00	29.4	0.563 <sup>1</sup>
	GSM1900	Secondary	GMSK	RHS Touch	512	1850.2	29.4	0.748
	GSM1900	Secondary	GMSK	RHS Touch	661	1880.00	29.4	0.839
	GSM1900	Secondary	GMSK	RHS Touch	810	1909.8	29.3	0.916
	GSM1900	Secondary	GMSK	RHS Tilt	512	1850.2	29.4	0.710
	GSM1900	Secondary	GMSK	RHS Tilt	661	1880.0	29.4	0.836
	GSM1900	Secondary	GMSK	RHS Tilt	810	1909.8	29.3	0.968

**Test mode reduction consideration**

**Note # 1:** Per FCC/OET Bulletin 65 Supplement C (June 2001) and Public Notice DA-02-1438, if the SAR measured at the middle channel for each test configuration is at least 3.0dB lower than the SAR limit, testing at the low and high channels is optional for such test configuration(s).

### 9.1.5 UMTS Band V

Mode	Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
Voice	UMTS Band V	Primary	R99, 12.2kbps, RMC	LHS Touch	4132	826.4	24.0	1.040
	UMTS Band V	Primary	R99, 12.2kbps, RMC	LHS Touch	4183	836.6	24.0	1.020
	UMTS Band V	Primary	R99, 12.2kbps, RMC	LHS Touch	4233	846.6	24.0	1.040
	UMTS Band V	Primary	R99, 12.2kbps, RMC	LHS Tilt	4183	836.6	24.0	0.248 <sup>1</sup>
	UMTS Band V	Primary	R99, 12.2kbps, RMC	RHS Touch	4132	826.4	24.0	0.812
	UMTS Band V	Primary	R99, 12.2kbps, RMC	RHS Touch	4183	836.6	24.0	0.795
	UMTS Band V	Primary	R99, 12.2kbps, RMC	RHS Touch	4233	846.6	24.0	0.868
	UMTS Band V	Primary	R99, 12.2kbps, RMC	RHS Tilt	4183	836.6	24.0	0.276 <sup>1</sup>
Voice	UMTS Band V	Secondary	R99, 12.2kbps, RMC	LHS Touch	4132	826.4	23.9	1.040
	<b>UMTS Band V</b>	<b>Secondary</b>	<b>R99, 12.2kbps, RMC</b>	<b>LHS Touch</b>	<b>4183</b>	<b>836.6</b>	<b>24.0</b>	<b>1.130</b>
	UMTS Band V	Secondary	R99, 12.2kbps, RMC	LHS Touch	4233	846.6	24.0	0.966
	UMTS Band V	Secondary	R99, 12.2kbps, RMC	LHS Tilt	4132	826.4	23.9	0.753
	UMTS Band V	Secondary	R99, 12.2kbps, RMC	LHS Tilt	4183	836.6	24.0	0.861
	UMTS Band V	Secondary	R99, 12.2kbps, RMC	LHS Tilt	4233	846.6	24.0	0.671
	UMTS Band V	Secondary	R99, 12.2kbps, RMC	RHS Touch	4132	826.4	23.9	0.785
	UMTS Band V	Secondary	R99, 12.2kbps, RMC	RHS Touch	4183	836.6	24.0	0.824
	UMTS Band V	Secondary	R99, 12.2kbps, RMC	RHS Touch	4233	846.6	24.0	0.697
UMTS Band V	Secondary	R99, 12.2kbps, RMC	RHS Tilt	4183	836.6	24.0	0.614 <sup>1</sup>	

### 9.1.6 UMTS Band II

Mode	Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
Voice	UMTS Band II	Primary	R99, 12.2kbps, RMC	LHS Touch	9262	1852.4	23.6	1.090
	UMTS Band II	Primary	R99, 12.2kbps, RMC	LHS Touch	9400	1880.00	23.5	1.130
	UMTS Band II	Primary	R99, 12.2kbps, RMC	LHS Touch	9538	1907.6	23.6	1.080
	UMTS Band II	Primary	R99, 12.2kbps, RMC	LHS Tilt	9400	1880.00	23.5	0.547 <sup>1</sup>
	UMTS Band II	Primary	R99, 12.2kbps, RMC	RHS Touch	9262	1852.4	23.6	1.090
	UMTS Band II	Primary	R99, 12.2kbps, RMC	RHS Touch	9400	1880.00	23.5	1.090
	UMTS Band II	Primary	R99, 12.2kbps, RMC	RHS Touch	9538	1907.6	23.6	1.040
	UMTS Band II	Primary	R99, 12.2kbps, RMC	RHS Tilt	9400	1880.00	23.5	0.611 <sup>1</sup>
Voice	UMTS Band II	Secondary	R99, 12.2kbps, RMC	LHS Touch	9400	1880.00	21.1	0.758 <sup>1</sup>
	UMTS Band II	Secondary	R99, 12.2kbps, RMC	LHS Tilt	9262	1852.4	21.0	0.769
	UMTS Band II	Secondary	R99, 12.2kbps, RMC	LHS Tilt	9400	1880.00	21.1	0.847
	UMTS Band II	Secondary	R99, 12.2kbps, RMC	LHS Tilt	9538	1907.6	21.1	0.823
	UMTS Band II	Secondary	R99, 12.2kbps, RMC	RHS Touch	9262	1852.4	21.0	1.080
	UMTS Band II	Secondary	R99, 12.2kbps, RMC	RHS Touch	9400	1880.00	21.1	1.160
	<b>UMTS Band II</b>	<b>Secondary</b>	<b>R99, 12.2kbps, RMC</b>	<b>RHS Touch</b>	<b>9538</b>	<b>1907.6</b>	<b>21.1</b>	<b>1.180</b>
	UMTS Band II	Secondary	R99, 12.2kbps, RMC	RHS Tilt	9262	1852.4	21.0	1.120
	UMTS Band II	Secondary	R99, 12.2kbps, RMC	RHS Tilt	9400	1880.00	21.1	1.140
UMTS Band II	Secondary	R99, 12.2kbps, RMC	RHS Tilt	9538	1907.6	21.1	1.120	

#### **Test mode reduction consideration**

**Note # 1:** Per FCC/OET Bulletin 65 Supplement C (June 2001) and Public Notice DA-02-1438, if the SAR measured at the middle channel for each test configuration is at least 3.0dB lower than the SAR limit, testing at the low and high channels is optional for such test configuration(s).

**9.1.7 Wi-Fi**

Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
2.4GHz	Wi-Fi/BT	802.11b	LHS Touch	6	2437	17.1	0.133 <sup>1,2</sup>
2.4GHz	Wi-Fi/BT	802.11b	LHS Tilt	6	2437	17.1	0.105 <sup>1,2</sup>
<b>2.4GHz</b>	<b>Wi-Fi/BT</b>	<b>802.11b</b>	<b>RHS Touch</b>	<b>6</b>	<b>2437</b>	17.1	<b>0.372</b> <sup>1,2</sup>
2.4GHz	Wi-Fi/BT	802.11b	RHS Tilt	6	2437	17.1	0.272 <sup>1,2</sup>

**Test mode reduction considerations**

**Note # 1:** Per KDB 248227, SAR is not required for 802.11g /n (HT20) channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11b channels. Refer to conducted power results in section 8.4.

**Note # 2:** Per FCC/OET Bulletin 65 Supplement C (June 2001) and Public Notice DA-02-1438, if the SAR measured at the middle channel for each test configuration is at least 3.0dB lower than the SAR limit, testing at the low and high channels is optional for such test configuration(s).

## 9.2 Body-worn Accessory Exposure Condition

This device is not supplied with any specific body-worn accessories, but the device is tested at a minimum separation distance of 1.0cm from the flat phantom to demonstrate body-worn accessory SAR compliance. The device is tested with both front surface and back surface facing the flat phantom.

### Highest Standalone SAR Test Result

Mode	Mode of Operation	Band	CDMA Voice (1xRTT)	GSM Voice	WCDMA Voice	CDMA Data (1xRTT, EV-DO)	GPRS	HSDPA	HSPA	WiFi 2.4GHz	BT 2.4GHz	Test Positions	Highest 1-g SAR (W/Kg)	Test Results
Voice	CDMA 1xRTT	835	TX1	No	No	No	No	No	No	No	No	Front, <b>Back</b>	<b>1.110</b>	See Section 9.2.1
	CDMA 1xRTT	835	TX2	No	No	No	No	No	No	No	No	Front, <b>Back</b>	0.467	See Section 9.2.1
	CDMA 1xRTT	1900	TX1	No	No	No	No	No	No	No	No	Front, <b>Back</b>	<b>0.561</b>	See Section 9.2.2
	CDMA 1xRTT	1900	TX2	No	No	No	No	No	No	No	No	Front, <b>Back</b>	0.360	See Section 9.2.2
	GSM	850	No	TX1	No	No	No	No	No	No	No	Front, <b>Back</b>	<b>0.875</b>	See Section 9.2.3
	GSM	850	No	TX2	No	No	No	No	No	No	No	Front, <b>Back</b>	0.271	See Section 9.2.3
	GSM	1900	No	TX1	No	No	No	No	No	No	No	Front, <b>Back</b>	<b>0.451</b>	See Section 9.2.4
	GSM	1900	No	TX2	No	No	No	No	No	No	No	Front, <b>Back</b>	0.375	See Section 9.2.4
	UMTS	835	No	No	TX1	No	No	No	No	No	No	Front, <b>Back</b>	<b>0.981</b>	See Section 9.2.5
	UMTS	835	No	No	TX2	No	No	No	No	No	No	Front, <b>Back</b>	0.463	See Section 9.2.5
	UMTS	1900	No	No	TX1	No	No	No	No	No	No	Front, <b>Back</b>	<b>0.578</b>	See Section 9.2.6
	UMTS	1900	No	No	TX2	No	No	No	No	No	No	Front, <b>Back</b>	0.504	See Section 9.2.6
Data	GPRS	850	No	No	No	No	TX1	No	No	No	No	Front, <b>Back</b>	<b>1.150</b>	See Section 9.2.3
	GPRS	850	No	No	No	No	TX2	No	No	No	No	Front, <b>Back</b>	0.315	See Section 9.2.3
	GPRS	1900	No	No	No	No	TX1	No	No	No	No	Front, <b>Back</b>	<b>0.990</b>	See Section 9.2.4
	GPRS	1900	No	No	No	No	TX2	No	No	No	No	Front, <b>Back</b>	0.633	See Section 9.2.4
	Wi-Fi	2400	No	No	No	No	No	No	No	TX3	No	Front, <b>Back</b>	<b>0.191</b>	See Section 9.2.7
	BT	2400	No	No	No	No	No	No	No	No	TX3	Front, <b>Back</b>	<b>0.055</b>	See Section 9.2.8

**9.2.1 CDMA2000 1xRTT – Cell Band**

Mode	Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
Voice	CDMA2000 Cell	Primary	1xRTT (RC3, SO32)	Front side	1013	824.70	24.5	1.070 <sup>1</sup>
	CDMA2000 Cell	Primary	1xRTT (RC3, SO32)	Front side	384	836.52	24.3	1.040 <sup>1</sup>
	CDMA2000 Cell	Primary	1xRTT (RC3, SO32)	Front side	777	848.31	24.5	1.050 <sup>1</sup>
	<b>CDMA2000 Cell</b>	<b>Primary</b>	<b>1xRTT (RC3, SO32)</b>	<b>Back Side</b>	<b>1013</b>	<b>824.70</b>	<b>24.5</b>	<b>1.110<sup>1</sup></b>
	CDMA2000 Cell	Primary	1xRTT (RC3, SO32)	Back Side	384	836.52	24.3	1.040 <sup>1</sup>
	CDMA2000 Cell	Primary	1xRTT (RC3, SO32)	Back Side	777	848.31	24.5	1.030 <sup>1</sup>
	CDMA2000 Cell	Primary	1xRTT (RC3, SO32)	Back Side w/Headset	1013	824.70	24.5	0.921 <sup>1,3</sup>
Voice	CDMA2000 Cell	Secondary	1xRTT (RC3, SO32)	Front side	384	836.52	23.70	0.467 <sup>1,2</sup>
	CDMA2000 Cell	Secondary	1xRTT (RC3, SO32)	Back Side	384	836.52	23.70	0.397 <sup>1,2</sup>
	CDMA2000 Cell	Secondary	1xRTT (RC3, SO32)	Front Side w/Headset	384	836.52	23.70	0.368 <sup>1,3</sup>

**9.2.2 CDMA2000 1xRTT – PCS Band**

Mode	Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
Voice	<b>CDMA2000 PCS</b>	<b>Primary</b>	<b>1xRTT (RC3, SO32)</b>	<b>Front side</b>	<b>600</b>	<b>1880.00</b>	<b>23.3</b>	<b>0.561<sup>1,2</sup></b>
	CDMA2000 PCS	Primary	1xRTT (RC3, SO32)	Back Side	600	1880.00	23.3	0.485 <sup>1,2</sup>
	CDMA2000 PCS	Primary	1xRTT (RC3, SO32)	Front Side w/Headset	600	1880.00	23.3	0.549 <sup>1,3</sup>
Voice	CDMA2000 PCS	Secondary	1xRTT (RC3, SO32)	Front side	600	1880.00	21.0	0.254 <sup>1,2</sup>
	CDMA2000 PCS	Secondary	1xRTT (RC3, SO32)	Back Side	600	1880.00	21.0	0.360 <sup>1,2</sup>
	CDMA2000 PCS	Secondary	1xRTT (RC3, SO32)	Back Side w/Headset	600	1880.00	21.0	0.355 <sup>1,3</sup>

**Test mode reduction considerations**

**Note # 1:** Per KDB941225 D01 SAR test for 3G devices v02, and based on the power measurements,

- Body-worn accessory SAR for multiple code channel (FCH+SCH) is not required since the output power is not 1/4 dB higher than RC3/SO32. Refer to conducted power results in section 8.1.
- Body-worn accessory SAR for 1xEVDO Rev. 0 and Rev. A is not required since the output power is not 1/4 dB higher than RC3. Refer to conducted power results in section 8.1.
- **Thus, for both primary and secondary antenna, RC3/SO32 is used for Body-worn accessory SAR measurements.**

**Note # 2:** Per FCC/OET Bulletin 65 Supplement C (June 2001) and Public Notice DA-02-1438, if the SAR measured at the middle channel for each test configuration is at least 3.0dB lower than the SAR limit, testing at the low and high channels is optional for such test configuration(s).

**Note # 3:** The device is tested with the headset for the same channel and test position that has the highest SAR for body-worn accessory conditions.

**9.2.3 GSM850/GPRS850**

Mode	Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
Voice	GSM850	Primary	GMSK	Front side	128	824.2	33.5	0.824 <sup>1</sup>
	GSM850	Primary	GMSK	Front side	190	836.6	33.4	0.871 <sup>1</sup>
	<b>GSM850</b>	<b>Primary</b>	<b>GMSK</b>	<b>Front side</b>	<b>251</b>	<b>848.8</b>	<b>33.4</b>	<b>0.875<sup>1</sup></b>
	GSM850	Primary	GMSK	Back Side	190	836.6	33.4	0.706 <sup>1,2</sup>
	GSM850	Primary	GMSK	Front Side w/Headset	190	836.6	33.4	0.833 <sup>1,3</sup>
Voice	GSM850	Secondary	GMSK	Front side	190	836.6	32.5	0.260 <sup>1,2</sup>
	GSM850	Secondary	GMSK	Back Side	190	836.6	32.5	0.271 <sup>1,2</sup>
	GSM850	Secondary	GMSK	Back Side w/Headset	190	836.6	32.5	0.195 <sup>1,3</sup>

Mode	Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
Data	GPRS850	Primary	GPRS 2 Slots (GMSK, CS1)	Front side	128	824.2	31.5	0.916 <sup>1</sup>
	GPRS850	Primary	GPRS 2 Slots (GMSK, CS1)	Front side	190	836.6	31.4	0.874 <sup>1</sup>
	<b>GPRS850</b>	<b>Primary</b>	<b>GPRS 2 Slots (GMSK, CS1)</b>	<b>Front side</b>	<b>251</b>	<b>848.8</b>	<b>31.3</b>	<b>1.150<sup>1</sup></b>
	GPRS850	Primary	GPRS 2 Slots (GMSK, CS1)	Back Side	128	824.20	31.5	1.050 <sup>1</sup>
	GPRS850	Primary	GPRS 2 Slots (GMSK, CS1)	Back Side	190	836.6	31.4	0.887 <sup>1</sup>
	GPRS850	Primary	GPRS 2 Slots (GMSK, CS1)	Back Side	251	848.8	31.3	1.010 <sup>1</sup>
	GPRS850	Primary	GPRS 2 Slots (GMSK, CS1)	Front Side w/Headset	251	848.8	<b>31.3</b>	1.060 <sup>1,3</sup>
	GPRS850	Primary	GPRS 1 Slot (GMSK, CS1)	Front Side	251	848.8	33.2	0.699 <sup>1,4</sup>
	GPRS850	Secondary	GPRS 2 Slots (GMSK, CS1)	Front side	190	836.6	30.1	0.315 <sup>1,2</sup>
	GPRS850	Secondary	GPRS 2 Slots (GMSK, CS1)	Back Side	190	836.6	30.1	0.287 <sup>1,2</sup>
	GPRS850	Secondary	GPRS 2 Slots (GMSK, CS1)	Front Side w/Headset	190	836.6	30.1	0.306 <sup>1,3</sup>
	GPRS850	Secondary	GPRS 1 Slot (GMSK, CS1)	Front Side	190	836.6	30.1	0.313 <sup>1,4</sup>

**Test mode reduction considerations**

**Note # 1:** Per KDB 941225 D03 SAR Test Reduction GSM/GPRS/EDGE v01, SAR test reductions are applied for devices operating in GSM/GPRS/EDGE modes to demonstrate RF exposure compliance.

- **Since the source-based time-averaged output power for EGPRS mode is lower than that in the GPRS mode, therefore Body-worn accessory SAR test reduction is applicable. Refer to conducted power results in section 8.2.**
- **Based on output power and time slots (refer to conducted power results in section 8.2), the following worst-case configurations were chosen for Body-worn accessory SAR testing for both primary and secondary antenna,**
  - **GPRS850 2 time slots**
  - **GSM850 GMSK, CS1**

**Note # 2:** Per FCC/OET Bulletin 65 Supplement C (June 2001) and Public Notice DA-02-1438, if the SAR measured at the middle channel for each test configuration is at least 3.0dB lower than the SAR limit, testing at the low and high channels is optional for such test configuration(s).

**Note # 3:** The device is tested with the headset for the same channel and test position that has the highest SAR for body-worn accessory conditions.

**Note # 4:** The device is tested in the GPRS 1 Slot mode for the same channel and test position that has the highest SAR for body-worn accessory conditions in the GPRS 2 Slots mode.

**9.2.4 GSM1900/GPRS1900**

Mode	Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
Voice	<b>GSM1900</b>	<b>Primary</b>	<b>GMSK</b>	<b>Front side</b>	<b>661</b>	<b>1880.00</b>	<b>31.5</b>	<b>0.451<sup>1,2</sup></b>
	GSM1900	Primary	GMSK	Back Side	661	1880.00	31.5	0.401 <sup>1,2</sup>
	GSM1900	Primary	GMSK	Front Side w/Headset	661	1880.00	31.5	0.448 <sup>1,3</sup>
Voice	GSM1900	Secondary	GMSK	Front side	661	1880.00	29.4	0.279 <sup>1,2</sup>
	GSM1900	Secondary	GMSK	Back Side	661	1880.00	29.4	0.375 <sup>1,2</sup>
	GSM1900	Secondary	GMSK	Back Side w/Headset	661	1880.00	29.4	0.291 <sup>1,3</sup>

Mode	Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
Data	<b>GPRS1900</b>	<b>Primary</b>	<b>GPRS 2 Slots (GMSK, CS1)</b>	<b>Front side</b>	<b>512</b>	<b>1850.2</b>	<b>31.3</b>	<b>0.990<sup>1</sup></b>
	GPRS1900	Primary	GPRS 2 Slots (GMSK, CS1)	Front side	661	1880.0	31.4	0.856 <sup>1</sup>
	GPRS1900	Primary	GPRS 2 Slots (GMSK, CS1)	Front side	810	1909.8	31.4	0.816 <sup>1</sup>
	GPRS1900	Primary	GPRS 2 Slots (GMSK, CS1)	Back Side	661	1880.0	31.4	0.670 <sup>1,2</sup>
	GPRS1900	Primary	GPRS 2 Slots (GMSK, CS1)	Front side w/Headset	512	1850.2	31.3	0.923 <sup>1,4</sup>
	GPRS1900	Primary	GPRS 1 Slot (GMSK, CS1)	Front side	512	1850.2	31.4	0.375 <sup>1,4</sup>
	GPRS1900	Secondary	GPRS 2 Slots (GMSK, CS1)	Front side	661	1880.0	29.0	0.633 <sup>1,2</sup>
	GPRS1900	Secondary	GPRS 2 Slots (GMSK, CS1)	Back Side	661	1880.0	29.0	0.509 <sup>1,2</sup>
	GPRS1900	Secondary	GPRS 2 Slots (GMSK, CS1)	Front side w/Headset	661	1880.0	29.0	0.506 <sup>1,4</sup>
	GPRS1900	Secondary	GPRS 1 Slot (GMSK, CS1)	Front side	661	1880.0	29.0	0.327 <sup>1,4</sup>

**Test mode reduction considerations**

**Note #1:** Per KDB 941225 D03 SAR Test Reduction GSM/GPRS/EDGE v01, SAR test reductions are applied for devices operating in GSM/GPRS/EDGE modes to demonstrate RF exposure compliance.

- **Since the source-based time-averaged output power for EGPRS mode is lower than that in the GPRS mode, therefore Body-worn accessory SAR test reduction is applicable for this device. Refer to conducted power results in section 8.2.**
- **Based on output power above and time slots (refer to conducted power results in section 8.2), the following worst-case configurations were chosen for Body-worn accessory SAR testing for both primary and secondary antenna,**
  - **GPRS1900 2 time slots**
  - **GSM1900 GMSK, CS1**

**Note # 2:** Per FCC/OET Bulletin 65 Supplement C (June 2001) and Public Notice DA-02-1438, if the SAR measured at the middle channel for each test configuration is a least 3.0dB lower than the SAR limit, testing at the low and high channels is optional for such test configuration(s).

**Note # 3:** The device is tested with the headset for the same channel and test position that has the highest SAR for body-worn accessory conditions.

**Note # 4:** The device is tested in the GPRS 1 Slot mode for the same channel and test position that has the highest SAR for body-worn accessory conditions in the GPRS 2 Slots mode.



**9.2.5 UMTS Band V**

Mode	Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
Voice	<b>UMTS Band V</b>	<b>Primary</b>	<b>R99, 12.2kbps, RMC</b>	<b>Front side</b>	<b>4132</b>	<b>826.40</b>	<b>24.0</b>	<b>0.981<sup>1,2</sup></b>
	UMTS Band V	Primary	R99, 12.2kbps, RMC	Front side	4183	836.6	24.0	0.974 <sup>1,2</sup>
	UMTS Band V	Primary	R99, 12.2kbps, RMC	Front side	4233	848.6	24.0	0.952 <sup>1,2</sup>
	UMTS Band V	Primary	R99, 12.2kbps, RMC	Front side w/Headset	4132	824.40	24.0	0.762 <sup>1,2,4</sup>
	UMTS Band V	Primary	R99, 12.2kbps, RMC	Back Side	4183	836.6	24.0	0.760 <sup>1,2,3</sup>
Voice	UMTS Band V	Secondary	R99, 12.2kbps, RMC	Front side	4183	836.6	24.0	0.368 <sup>1,2,3</sup>
	UMTS Band V	Secondary	R99, 12.2kbps, RMC	Back Side	4183	836.6	24.0	0.463 <sup>1,2,3</sup>
	UMTS Band V	Secondary	R99, 12.2kbps, RMC	Back Side w/Headset	4183	836.6	24.0	0.165 <sup>1,2,4</sup>

**9.2.6 UMTS Band II**

Mode	Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
Voice	<b>UMTS Band II</b>	<b>Primary</b>	<b>R99, 12.2kbps, RMC</b>	<b>Front side</b>	<b>9400</b>	<b>1880.00</b>	<b>23.5</b>	<b>0.578<sup>1,2,3</sup></b>
	UMTS Band II	Primary	R99, 12.2kbps, RMC	Back Side	9400	1880.00	23.5	0.522 <sup>1,2,3</sup>
	UMTS Band II	Primary	R99, 12.2kbps, RMC	Front Side w/Headset	9400	1880.00	23.5	0.576 <sup>1,2,4</sup>
Voice	UMTS Band II	Secondary	R99, 12.2kbps, RMC	Front side	9400	1880.00	21.1	0.385 <sup>1,2,3</sup>
	UMTS Band II	Secondary	R99, 12.2kbps, RMC	Back Side	9400	1880.00	21.1	0.504 <sup>1,2,3</sup>
	UMTS Band II	Secondary	R99, 12.2kbps, RMC	Back Side w/Headset	9400	1880.00	21.1	0.399 <sup>1,2,4</sup>

**Test mode reduction considerations**

**Note # 1:** Per KDB 941225 D01 – Body SAR is not required for HSDPA when the maximum average output of each RF channel with HSDPA active is less than ¼ dB higher than that measured without HSDPA using 12.2 kbps RMC or the maximum SAR for 12.2 kbps RMC is < 75% of the SAR limit. Refer to conducted power results in section 8.3.

**Note # 2:** KDB 941225 D01 – Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit. Refer to conducted power results in section 8.3.

**Note # 3:** Per FCC/OET Bulletin 65 Supplement C (June 2001) and Public Notice DA-02-1438, if the SAR measured at the middle channel for each test configuration is at least 3.0dB lower than the SAR limit, testing at the low and high channels is optional for such test configuration(s).

**Note # 4:** The device is tested with the headset for the same channel and test position that has the highest SAR for body-worn accessory conditions.

**9.2.7 Wi-Fi**

Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
2.4GHz	Wi-Fi/BT	802.11b	Front side	6	2437	17.1	0.076 <sup>1,2</sup>
<b>2.4GHz</b>	<b>Wi-Fi/BT</b>	<b>802.11b</b>	<b>Back side</b>	<b>6</b>	<b>2437</b>	17.1	<b>0.191</b> <sup>1,2</sup>
2.4GHz	Wi-Fi/BT	802.11b	Back side w/headset	6	2437	17.1	0.038 <sup>1,3</sup>

**9.2.8 Bluetooth**

Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
2.4GHz	WiFi/BT	Bluetooth	Front side	39	2441	13.7	0.024 <sup>2</sup>
2.4GHz	WiFi/BT	Bluetooth	Back side	39	2441	13.7	0.055 <sup>2</sup>

**Test mode reduction considerations**

**Note # 1:** Per KDB 248227, SAR is not required for 802.11g/n (HT20) channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11b channels. Refer to conducted power results in section 8.4.

**Note # 2:** Per FCC/OET Bulletin 65 Supplement C (June 2001) and Public Notice DA-02-1438, if the SAR measured at the middle channel for each test configuration is atleast 3.0dB lower than the SAR limit, testing at the low and high channels is optional for such test configuration(s).

**Note # 3:** The device is tested with the headset for the same channel and test position that has the highest SAR for body-worn accessory conditions.

**9.3 Wireless Router (Hotspot) Exposure Condition**

In addition to body-worn, this device is tested for wireless router (hotspot) exposure condition. A separation distance of 1.0cm from the device to the flat phantom is used for both measurements. Some test mode reductions are applied for some configurations.

Since Bluetooth and Wi-Fi time-share same antenna and cannot transmit simultaneously, SAR evaluation is not performed on Wi-Fi/BT antenna (Antenna 3) in the Bluetooth mode.

Since, the Primary Antenna (Antenna 1) is located at the bottom-edge, Antenna-to-top edge distance is more than 2.5cm. Per KDB 941225 D06 Hotspot SAR, when the Antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested. Top-edge with 1cm separation distance is excluded from SAR evaluation in hotspot mode.

Also, since the secondary antenna (Antenna 2) is located at the Top-edge, Antenna-to-bottom edge distance is more than 2.5cm. Per KDB 941225 D06 Hotspot SAR, when the Antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested. Bottom-edge with 1cm separation distance is excluded from SAR evaluation in hotspot mode.

**Highest Standalone SAR result**

Mode	Mode of Operation	Band	CDMA Voice (1xRTT)	GSM Voice	WCDMA Voice	EV-DO	GPRS	HSDPA	HSPA	WiFi 2.4GHz	Test Positions	Highest 1-g SAR (W/Kg)	Test Results
Data	EVDO	835	No	No	No	TX1	No	No	No	No	<b>Front</b> , Back, Left-edge, Right-edge, Bottom-edge	<b>1.020</b>	See Section 9.3.1
	EVDO	835	No	No	No	TX2	No	No	No	No	<b>Front</b> , Back, Left-edge, Right-edge, Top-edge	0.461	See Section 9.3.1
	EVDO	1900	No	No	No	TX1	No	No	No	No	<b>Front</b> , Back, Left-edge, Right-edge, Bottom-edge	<b>0.649</b>	See Section 9.3.2
	EVDO	1900	No	No	No	TX2	No	No	No	No	Front, <b>Back</b> , Left-edge, Right-edge, Top-edge	0.355	See Section 9.3.2
	GPRS	850	No	No	No	No	TX1	No	No	No	<b>Front</b> , Back, Left-edge, Right-edge, Bottom-edge	<b>1.150</b>	See Section 9.3.3
	GPRS	850	No	No	No	No	TX2	No	No	No	Front, Back, Left-edge, <b>Right-edge</b> , Top-edge	0.390	See Section 9.3.3
	GPRS	1900	No	No	No	No	TX1	No	No	No	<b>Front</b> , Back, Left-edge, Right-edge, Bottom-edge	<b>0.990</b>	See Section 9.3.4
	GPRS	1900	No	No	No	No	TX2	No	No	No	<b>Front</b> , Back, Left-edge, Right-edge, Top-edge	0.633	See Section 9.3.4
	WCDMA	835	No	No	TX1	No	No	No	No	No	<b>Front</b> , Back, Left-edge, Right-edge, Bottom-edge	<b>0.981</b>	See Section 9.3.5
	WCDMA	835	No	No	TX2	No	No	No	No	No	Front, Back, Left-edge, <b>Right-edge</b> , Top-edge	0.499	See Section 9.3.5
	WCDMA	1900	No	No	TX1	No	No	No	No	No	<b>Front</b> , Back, Left-edge, Right-edge, Bottom-edge	<b>0.578</b>	See Section 9.3.6
	WCDMA	1900	No	No	TX2	No	No	No	No	No	Front, <b>Back</b> , Left-edge, Right-edge, Top-edge	0.504	See Section 9.3.6
	Wi-Fi	2400	No	No	No	No	No	No	No	TX3	Front, <b>Back</b> , Left-edge, Right-edge, Top-edge	<b>0.191</b>	See Section 9.3.7

**9.3.1 1xEVDO – Cell Band**

Mode	Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
Data	<b>CDMA2000 Cell</b>	<b>Primary</b>	<b>1xEVDO Rev. 0</b>	<b>Front side</b>	<b>1013</b>	<b>824.70</b>	<b>24.4</b>	<b>1.020</b> <sup>1,3</sup>
	CDMA2000 Cell	Primary	1xEVDO Rev. 0	Front side	384	836.52	24.3	0.986 <sup>1,3</sup>
	CDMA2000 Cell	Primary	1xEVDO Rev. 0	Front side	777	848.31	24.3	0.926 <sup>1,3</sup>
	CDMA2000 Cell	Primary	1xEVDO Rev. 0	Back Side	1013	824.70	24.4	0.887 <sup>1,3</sup>
	CDMA2000 Cell	Primary	1xEVDO Rev. 0	Back Side	384	836.52	24.3	0.837 <sup>1,3</sup>
	CDMA2000 Cell	Primary	1xEVDO Rev. 0	Back Side	777	848.31	24.3	0.874 <sup>1,3</sup>
	CDMA2000 Cell	Primary	1xEVDO Rev. 0	Right edge	384	836.52	24.3	0.260 <sup>1,2,3</sup>
	CDMA2000 Cell	Primary	1xEVDO Rev. 0	Left edge	1013	824.70	24.4	0.805 <sup>1,3</sup>
	CDMA2000 Cell	Primary	1xEVDO Rev. 0	Left edge	384	836.52	24.3	0.771 <sup>1,3</sup>
	CDMA2000 Cell	Primary	1xEVDO Rev. 0	Left edge	777	848.31	24.3	0.726 <sup>1,3</sup>
	CDMA2000 Cell	Primary	1xEVDO Rev. 0	Bottom edge	384	836.52	24.3	0.319 <sup>1,2,3</sup>
	CDMA2000 Cell	Secondary	1xEVDO Rev. 0	Front side	384	836.52	23.80	0.461 <sup>1,2,3</sup>
	CDMA2000 Cell	Secondary	1xEVDO Rev. 0	Back Side	384	836.52	23.80	0.424 <sup>1,2,3</sup>
	CDMA2000 Cell	Secondary	1xEVDO Rev. 0	Right edge	384	836.52	23.80	0.400 <sup>1,2,3</sup>
	CDMA2000 Cell	Secondary	1xEVDO Rev. 0	Left edge	384	836.52	23.80	0.216 <sup>1,2,3</sup>
CDMA2000 Cell	Secondary	1xEVDO Rev. 0	Top edge	384	836.52	23.80	0.162 <sup>1,2,3</sup>	

**9.3.2 1xEVDO – PCS Band**

Mode	Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
Data	<b>CDMA2000 PCS</b>	<b>Primary</b>	<b>1xEVDO Rev. 0</b>	<b>Front side</b>	<b>600</b>	<b>1880.00</b>	<b>23.3</b>	<b>0.649</b> <sup>1,2,3</sup>
	CDMA2000 PCS	Primary	1xEVDO Rev. 0	Back Side	600	1880.00	23.3	0.627 <sup>1,2,3</sup>
	CDMA2000 PCS	Primary	1xEVDO Rev. 0	Right edge	600	1880.00	23.3	0.175 <sup>1,2,3</sup>
	CDMA2000 PCS	Primary	1xEVDO Rev. 0	Left edge	600	1880.00	23.3	0.487 <sup>1,2,3</sup>
	CDMA2000 PCS	Primary	1xEVDO Rev. 0	Bottom edge	600	1880.00	23.3	0.322 <sup>1,2,3</sup>
	CDMA2000 PCS	Secondary	1xEVDO Rev. 0	Front side	600	1880.00	21.0	0.258 <sup>1,2,3</sup>
	CDMA2000 PCS	Secondary	1xEVDO Rev. 0	Back Side	600	1880.00	21.0	0.355 <sup>1,2,3</sup>
	CDMA2000 PCS	Secondary	1xEVDO Rev. 0	Right edge	600	1880.00	21.0	0.118 <sup>1,2,3</sup>
	CDMA2000 PCS	Secondary	1xEVDO Rev. 0	Left edge	600	1880.00	21.0	0.304 <sup>1,2,3</sup>
	CDMA2000 PCS	Secondary	1xEVDO Rev. 0	Top edge	600	1880.00	21.0	0.216 <sup>1,2,3</sup>

**Test mode reduction considerations****Note # 1:**

Per KDB941225 D01 SAR test for 3G devices v02, and based on the power measurements,

- **For wireless router (hotspot) mode, 1xEVDO Rev. 0 is used for SAR measurements for both primary and secondary antenna. Wireless router (hotspot) SAR for 1xEVDO Rev. A is not required due to the output is not 1/4 dB higher than Rev. 0. Refer to conducted power results in section 8.1.**

**Note # 2:** Per FCC/OET Bulletin 65 Supplement C (June 2001) and Public Notice DA-02-1438, if the SAR measured at the middle channel for each test configuration is at least 3.0dB lower than the SAR limit, testing at the low and high channels is optional for such test configuration(s).

**Note # 3:** Primary Antenna is located at the bottom-edge; Antenna-to-top edge distance is more than 2.5cm. Per KDB 941225 D06 Hotspot SAR, when the Antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested. Top-edge with 1cm separation distance is excluded from SAR evaluation.

### 9.3.3 GPRS850

Mode	Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
Data	GPRS850	Primary	GPRS 2 Slots (GMSK, CS1)	Front side	128	824.20	31.5	0.916 <sup>1,3</sup>
	GPRS850	Primary	GPRS 2 Slots (GMSK, CS1)	Front side	190	836.6	31.4	0.874 <sup>1,3</sup>
	<b>GPRS850</b>	<b>Primary</b>	<b>GPRS 2 Slots (GMSK, CS1)</b>	<b>Front side</b>	<b>251</b>	<b>848.8</b>	<b>31.3</b>	<b>1.150</b> <sup>1,3</sup>
	GPRS850	Primary	GPRS 2 Slots (GMSK, CS1)	Back Side	128	824.20	31.5	1.050 <sup>1,3</sup>
	GPRS850	Primary	GPRS 2 Slots (GMSK, CS1)	Back Side	190	836.6	31.4	0.887 <sup>1,3</sup>
	GPRS850	Primary	GPRS 2 Slots (GMSK, CS1)	Back Side	251	848.8	<b>31.3</b>	1.010 <sup>1,3</sup>
	GPRS850	Primary	GPRS 2 Slots (GMSK, CS1)	Right edge	190	836.6	31.4	0.355 <sup>1,2,3</sup>
	GPRS850	Primary	GPRS 2 Slots (GMSK, CS1)	Left edge	128	824.20	31.5	1.080 <sup>1,3</sup>
	GPRS850	Primary	GPRS 2 Slots (GMSK, CS1)	Left edge	190	836.6	31.4	1.060 <sup>1,3</sup>
	GPRS850	Primary	GPRS 2 Slots (GMSK, CS1)	Left edge	251	848.8	<b>31.3</b>	0.928 <sup>1,3</sup>
	GPRS850	Primary	GPRS 2 Slots (GMSK, CS1)	Bottom edge	190	836.6	31.4	0.339 <sup>1,2,3</sup>
	GPRS850	Secondary	GPRS 2 Slots (GMSK, CS1)	Front side	190	836.6	30.1	0.315 <sup>1,2,3</sup>
	GPRS850	Secondary	GPRS 2 Slots (GMSK, CS1)	Back Side	190	836.6	30.1	0.287 <sup>1,2,3</sup>
	GPRS850	Secondary	GPRS 2 Slots (GMSK, CS1)	Right edge	190	836.6	30.1	0.390 <sup>1,2,3</sup>
	GPRS850	Secondary	GPRS 2 Slots (GMSK, CS1)	Left edge	190	836.6	30.1	0.076 <sup>1,2,3</sup>
	GPRS850	Secondary	GPRS 2 Slots (GMSK, CS1)	Top edge	190	836.6	30.1	0.155 <sup>1,2,3</sup>

### 9.3.4 GPRS1900

Mode	Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
Data	<b>GPRS1900</b>	<b>Primary</b>	<b>GPRS 2 Slots (GMSK, CS1)</b>	<b>Front side</b>	<b>512</b>	<b>1850.2</b>	<b>31.3</b>	<b>0.990</b> <sup>1,3</sup>
	GPRS1900	Primary	GPRS 2 Slots (GMSK, CS1)	Front side	661	1880.0	31.4	0.856 <sup>1,3</sup>
	GPRS1900	Primary	GPRS 2 Slots (GMSK, CS1)	Front side	810	1909.8	31.4	0.816 <sup>1,3</sup>
	GPRS1900	Primary	GPRS 2 Slots (GMSK, CS1)	Back Side	661	1880.00	31.4	0.670 <sup>1,2,3</sup>
	GPRS1900	Primary	GPRS 2 Slots (GMSK, CS1)	Right edge	661	1880.00	31.4	0.253 <sup>1,2,3</sup>
	GPRS1900	Primary	GPRS 2 Slots (GMSK, CS1)	Left edge	661	1880.00	31.4	0.644 <sup>1,2,3</sup>
	GPRS1900	Primary	GPRS 2 Slots (GMSK, CS1)	Bottom edge	661	1880.00	31.4	0.425 <sup>1,2,3</sup>
	GPRS1900	Secondary	GPRS 2 Slots (GMSK, CS1)	Front side	661	1880.0	29.0	0.633 <sup>1,2,3</sup>
	GPRS1900	Secondary	GPRS 2 Slots (GMSK, CS1)	Back Side	661	1880.00	29.0	0.509 <sup>1,2,3</sup>
	GPRS1900	Secondary	GPRS 2 Slots (GMSK, CS1)	Right edge	661	1880.00	29.0	0.150 <sup>1,2,3</sup>
	GPRS1900	Secondary	GPRS 2 Slots (GMSK, CS1)	Left edge	661	1880.00	29.0	0.445 <sup>1,2,3</sup>
	GPRS1900	Secondary	GPRS 2 Slots (GMSK, CS1)	Top edge	661	1880.00	29.0	0.519 <sup>1,2,3</sup>

#### Test mode reduction considerations

**Note # 1:** Per KDB 941225 D03 SAR Test Reduction GSM/GPRS/EDGE v01, SAR test reductions are applied for devices operating in GSM/GPRS/EDGE modes to demonstrate RF exposure compliance.

- **For wireless router (hotspot) mode, the following worst-case configurations were chosen for SAR testing for both primary and secondary antenna,**
  - **GPRS850 2 time slots**
  - **GPRS1900 2 time slots**

**Refer to conducted power results in section 8.2.**

**Note # 2:** Per FCC/OET Bulletin 65 Supplement C (June 2001) and Public Notice DA-02-1438, if the SAR measured at the middle channel for each test configuration is at least 3.0dB lower than the SAR limit, testing at the low and high channels is optional for such test configuration(s).

**Note # 3:** Primary Antenna is located at the bottom-edge; Antenna-to-top edge distance is more than 2.5cm. Per KDB 941225 D06 Hotspot SAR, when the Antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested. Top-edge with 1cm separation distance is excluded from SAR evaluation.

**9.3.5 UMTS Band V**

Mode	Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
Data	<b>UMTS Band V</b>	<b>Primary</b>	<b>R99, 12.2kbps, RMC</b>	<b>Front side</b>	<b>4132</b>	<b>826.4</b>	<b>24.0</b>	<b>0.981<sup>1,2,4</sup></b>
	UMTS Band V	Primary	R99, 12.2kbps, RMC	Front side	4183	836.6	24.0	0.974 <sup>1,2,4</sup>
	UMTS Band V	Primary	R99, 12.2kbps, RMC	Front side	4233	848.6	24.0	0.952 <sup>1,2,4</sup>
	UMTS Band V	Primary	R99, 12.2kbps, RMC	Back Side	4183	836.6	24.0	0.760 <sup>1,2,4</sup>
	UMTS Band V	Primary	R99, 12.2kbps, RMC	Right edge	4183	836.6	24.0	0.288 <sup>1,2,3,4</sup>
	UMTS Band V	Primary	R99, 12.2kbps, RMC	Left edge	4183	836.6	24.0	0.751 <sup>1,2,3,4</sup>
	UMTS Band V	Primary	R99, 12.2kbps, RMC	Bottom edge	4183	836.6	24.0	0.308 <sup>1,2,3,4</sup>
Data	UMTS Band V	Secondary	R99, 12.2kbps, RMC	Front side	4183	836.6	24.0	0.368 <sup>1,2,3,5</sup>
	UMTS Band V	Secondary	R99, 12.2kbps, RMC	Back Side	4183	836.6	24.0	0.463 <sup>1,2,3,5</sup>
	UMTS Band V	Secondary	R99, 12.2kbps, RMC	Right edge	4183	836.6	24.0	0.499 <sup>1,2,3,5</sup>
	UMTS Band V	Secondary	R99, 12.2kbps, RMC	Left edge	4183	836.6	24.0	0.211 <sup>1,2,3,5</sup>
	UMTS Band V	Secondary	R99, 12.2kbps, RMC	Top edge	4183	836.6	24.0	0.247 <sup>1,2,3,5</sup>

**9.3.6 UMTS Band II**

Mode	Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
Data	<b>UMTS Band II</b>	<b>Primary</b>	<b>R99, 12.2kbps, RMC</b>	<b>Front side</b>	<b>9400</b>	<b>1880.00</b>	<b>23.5</b>	<b>0.578<sup>1,2,3,4</sup></b>
	UMTS Band II	Primary	R99, 12.2kbps, RMC	Back Side	9400	1880.00	23.5	0.522 <sup>1,2,3,4</sup>
	UMTS Band II	Primary	R99, 12.2kbps, RMC	Right edge	9400	1880.00	23.5	0.173 <sup>1,2,3,4</sup>
	UMTS Band II	Primary	R99, 12.2kbps, RMC	Left edge	9400	1880.00	23.5	0.488 <sup>1,2,3,4</sup>
	UMTS Band II	Primary	R99, 12.2kbps, RMC	Bottom edge	9400	1880.00	23.5	0.271 <sup>1,2,3,4</sup>
Data	UMTS Band II	Secondary	R99, 12.2kbps, RMC	Front side	9400	1880.00	21.1	0.385 <sup>1,2,3,5</sup>
	UMTS Band II	Secondary	R99, 12.2kbps, RMC	Back Side	9400	1880.00	21.1	0.504 <sup>1,2,3,5</sup>
	UMTS Band II	Secondary	R99, 12.2kbps, RMC	Right edge	9400	1880.00	21.1	0.128 <sup>1,2,3,5</sup>
	UMTS Band II	Secondary	R99, 12.2kbps, RMC	Left edge	9400	1880.00	21.1	0.334 <sup>1,2,3,5</sup>
	UMTS Band II	Secondary	R99, 12.2kbps, RMC	Top edge	9400	1880.00	21.1	0.300 <sup>1,2,3,5</sup>

**Test mode reduction considerations**

**Note # 1:** Per KDB 941225 D01 – Body SAR is not required for HSDPA when the maximum average output of each RF channel with HSDPA active is less than ¼ dB higher than that measured without HSDPA using 12.2 kbps RMC or the maximum SAR for 12.2 kbps RMC is < 75% of the SAR limit. Refer to conducted power results in section 8.3.

**Note # 2:** KDB 941225 D01 – Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit. Refer to conducted power results in section 8.3.

**Note # 3:** Per FCC/OET Bulletin 65 Supplement C (June 2001) and Public Notice DA-02-1438, if the SAR measured at the middle channel for each test configuration is at least 3.0dB lower than the SAR limit, testing at the low and high channels is optional for such test configuration(s).

**Note # 4:** Primary Antenna is located at the bottom-edge; Antenna-to-top edge distance is more than 2.5cm. Per KDB 941225 D06 Hotspot SAR, when the Antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested. Top-edge with 1cm separation distance is excluded from SAR evaluation.

**Note # 5:** Secondary Antenna is located at the Top-edge; Antenna-to-bottom edge distance is more than 2.5cm. Per KDB 941225 D06 Hotspot SAR, when the Antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested. Bottom-edge with 1cm separation distance is excluded from SAR evaluation.

### 9.3.7 Wi-Fi

Wi-Fi/BT Antenna is located at the Top-edge; Antenna-to-bottom edge distance is more than 2.5cm. Per KDB 941225 D06 Hotspot SAR, when the Antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested. Bottom-edge with 1cm separation distance is excluded from SAR evaluation.

Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
2.4GHz	Wi-Fi/BT	802.11b	Front side	6	2437	17.1	0.076 <sup>1,2</sup>
<b>2.4GHz</b>	<b>Wi-Fi/BT</b>	<b>802.11b</b>	<b>Back side</b>	<b>6</b>	<b>2437</b>	17.1	<b>0.191</b> <sup>1,2</sup>
2.4GHz	W-Fi/BT	802.11b	Right edge	6	2437	17.1	0.015 <sup>1,2</sup>
2.4GHz	Wi-Fi/BT	802.11b	Left edge	6	2437	17.1	0.141 <sup>1,2</sup>
2.4GHz	Wi-Fi/BT	802.11b	Top edge	6	2437	17.1	0.058 <sup>1,2</sup>

#### **Test mode reduction considerations**

**Note # 1:** Per KDB 248227, SAR is not required for 802.11g /n (HT20) channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11b channels. Refer to conducted power results in section 8.4.

**Note # 2:** Per FCC/OET Bulletin 65 Supplement C (June 2001) and Public Notice DA-02-1438, if the SAR measured at the middle channel for each test configuration is at least 3.0dB lower than the SAR limit, testing at the low and high channels is optional for such test configuration(s).

## 10 Simultaneous Transmission SAR Analysis (KDB 648474)

This device is capable of transmitting simultaneously in certain allowed configurations. Please see section 5.0 for allowed simultaneous transmission configurations. The different transmission modes are sub-divided based of exposure conditions:

- Head
- Body-worn
- Wireless Router (Hotspot)

### 10.1 Head Exposure Condition

$\Sigma$  1-g SAR (W/kg) of all simultaneous transmitters

Mode	Mode of Operation	Band	CDMA Voice (1xRTT)	GSM Voice	WCDMA Voice	CDMA Data (1xRTT, EV-DO)	GPRS/EGPRS	HSDPA	HSPA	WiFi 2.4GHz	BT 2.4GHz	Test Positions	Highest $\Sigma$ 1-g SAR (W/Kg)	Test Analysis
Voice	CDMA 1xRTT	835	TX1	No	No	No	No	No	No	TX3	No	RHS/LHS Tilt, <b>RHS/LHS Touch</b>	1.357	See Section 10.1.1
	CDMA 1xRTT	835	TX2	No	No	No	No	No	No		No	RHS/LHS Tilt, <b>RHS/LHS Touch</b>	1.253	See Section 10.1.1
	CDMA 1xRTT	1900	TX1	No	No	No	No	No	No		No	RHS/LHS Tilt, <b>RHS/LHS Touch</b>	1.492	See Section 10.1.2
	CDMA 1xRTT	1900	TX2	No	No	No	No	No	No		No	RHS/LHS Tilt, <b>RHS/LHS Touch</b>	1.522	See Section 10.1.2
	GSM Voice	850	No	TX1	No	No	No	No	No		No	RHS/LHS Tilt, <b>RHS/LHS Touch</b>	1.248	See Section 10.1.3
	GSM Voice	850	No	TX2	No	No	No	No	No		No	RHS/LHS Tilt, <b>RHS/LHS Touch</b>	1.002	See Section 10.1.3
	GSM Voice	1900	No	TX1	No	No	No	No	No		No	RHS/LHS Tilt, <b>RHS/LHS Touch</b>	1.299	See Section 10.1.4
	GSM Voice	1900	No	TX2	No	No	No	No	No		No	RHS/LHS Tilt, <b>RHS/LHS Touch</b>	1.288	See Section 10.1.4
	WCDMA Voice	835	No	No	TX1	No	No	No	No		No	RHS/LHS Tilt, <b>RHS/LHS Touch</b>	1.240	See Section 10.1.5
	WCDMA Voice	835	No	No	TX2	No	No	No	No		No	RHS/LHS Tilt, <b>RHS/LHS Touch</b>	1.263	See Section 10.1.5
	WCDMA Voice	1900	No	No	TX1	No	No	No	No		No	RHS/LHS Tilt, <b>RHS/LHS Touch</b>	1.462	See Section 10.1.6
	WCDMA Voice	1900	No	No	TX2	No	No	No	No		No	RHS/LHS Tilt, <b>RHS/LHS Touch</b>	1.552	See Section 10.1.6

Simultaneous transmission analysis for cellular + Bluetooth configurations is not performed, because there is no use-case for this configuration.



**10.1.1 CDMA2000 1xRTT (Cell Band) + Wi-Fi**

Transmitter # 1				Transmitter # 2				Test Position	$\Sigma$ 1-g SAR (W/Kg)	Vol. Scan (Yes/No)
Ant	Operating mode	Ch#	SAR (W/Kg) 1-g	Ant	Operating mode	Ch#	SAR (W/Kg) 1-g			
1	1xRTT Voice (RC3, SO55)	384	1.150	3	802.11b	6	0.133	LHS Touch	1.283	No
1	1xRTT Voice (RC3, SO55)	384	0.472	3	802.11b	6	0.105	LHS Tilt	0.577	No
1	1xRTT Voice (RC3, SO55)	777	0.985	3	802.11b	6	0.372	RHS Touch	1.357	No
1	1xRTT Voice (RC3, SO55)	384	0.523	3	802.11b	6	0.272	RHS Tilt	0.795	No
2	1xRTT Voice (RC3, SO55)	384	1.120	3	802.11b	6	0.133	LHS Touch	1.253	No
2	1xRTT Voice (RC3, SO55)	384	0.860	3	802.11b	6	0.105	LHS Tilt	0.965	No
2	1xRTT Voice (RC3, SO55)	384	0.755	3	802.11b	6	0.372	RHS Touch	1.127	No
2	1xRTT Voice (RC3, SO55)	384	0.600	3	802.11b	6	0.272	RHS Tilt	0.872	No

$\Sigma$  1-g SAR (W/kg) of all simultaneous transmitters is < 1.6 W/kg. Based upon KDB 648474 D01, D02 SAR Handsets Multi Transmitters and Ant, v01r05, Simultaneous Tx SAR evaluation is not required.

**10.1.2 CDMA2000 1xRTT (PCS Band) + Wi-Fi**

Transmitter # 1				Transmitter # 2				Test Position	$\Sigma$ 1-g SAR (W/Kg)	Vol. Scan (Yes/No)
Ant	Operating mode	Ch#	SAR (W/Kg) 1-g	Ant	Operating mode	Ch#	SAR (W/Kg) 1-g			
1	1xRTT Voice (RC3, SO55)	1175	1.180	3	802.11b	6	0.133	LHS Touch	1.313	No
1	1xRTT Voice (RC3, SO55)	600	0.530	3	802.11b	6	0.105	LHS Tilt	0.635	No
1	1xRTT Voice (RC3, SO55)	25	1.120	3	802.11b	6	0.372	RHS Touch	1.492	No
1	1xRTT Voice (RC3, SO55)	600	0.558	3	802.11b	6	0.272	RHS Tilt	0.830	No
2	1xRTT Voice (RC3, SO55)	600	0.641	3	802.11b	6	0.133	LHS Touch	0.774	No
2	1xRTT Voice (RC3, SO55)	600	0.643	3	802.11b	6	0.105	LHS Tilt	0.748	No
2	1xRTT Voice (RC3, SO55)	1175	1.150	3	802.11b	6	0.372	RHS Touch	1.522	No
2	1xRTT Voice (RC3, SO55)	1175	1.080	3	802.11b	6	0.272	RHS Tilt	1.352	No

$\Sigma$  1-g SAR (W/kg) of all simultaneous transmitters is < 1.6 W/kg. Based upon KDB 648474 D01, D02 SAR Handsets Multi Transmitters and Ant, v01r05, Simultaneous Tx SAR evaluation is not required.

**10.1.3 GSM850 + WiFi**

Transmitter # 1				Transmitter # 2				Test Position	$\Sigma$ 1-g SAR (W/Kg)	Vol. Scan (Yes/No)
Ant	Operating mode	Ch#	SAR (W/Kg) 1-g	Ant	Operating mode	Ch#	SAR (W/Kg) 1-g			
1	GMSK, Voice	190	1.040	3	802.11b	6	0.133	LHS Touch	1.173	No
1	GMSK, Voice	190	0.229	3	802.11b	6	0.105	LHS Tilt	0.334	No
1	GMSK, Voice	251	0.876	3	802.11b	6	0.372	RHS Touch	1.248	No
1	GMSK, Voice	190	0.282	3	802.11b	6	0.272	RHS Tilt	0.554	No
2	GMSK, Voice	251	0.869	3	802.11b	6	0.133	LHS Touch	1.002	No
2	GMSK, Voice	190	0.515	3	802.11b	6	0.105	LHS Tilt	0.620	No
2	GMSK, Voice	190	0.569	3	802.11b	6	0.372	RHS Touch	0.941	No
2	GMSK, Voice	190	0.460	3	802.11b	6	0.272	RHS Tilt	0.732	No

$\Sigma$  1-g SAR (W/kg) of all simultaneous transmitters is < 1.6 W/kg. Based upon KDB 648474 D01, D02 SAR Handsets Multi Transmitters and Ant, v01r05, Simultaneous Tx SAR evaluation is not required.

**10.1.4 GSM1900 + WiFi**

Transmitter # 1				Transmitter # 2				Test Position	$\Sigma$ 1-g SAR (W/Kg)	Vol. Scan (Yes/No)
Ant	Operating mode	Ch#	SAR (W/Kg) 1-g	Ant	Operating mode	Ch#	SAR (W/Kg) 1-g			
1	GMSK, Voice	810	1.080	3	802.11b	6	0.133	LHS Touch	1.213	No
1	GMSK, Voice	661	0.438	3	802.11b	6	0.105	LHS Tilt	0.543	No
1	GMSK, Voice	512	0.927	3	802.11b	6	0.372	RHS Touch	1.299	No
1	GMSK, Voice	661	0.446	3	802.11b	6	0.272	RHS Tilt	0.718	No
2	GMSK, Voice	661	0.513	3	802.11b	6	0.133	LHS Touch	0.646	No
2	GMSK, Voice	661	0.563	3	802.11b	6	0.105	LHS Tilt	0.668	No
2	GMSK, Voice	810	0.916	3	802.11b	6	0.372	RHS Touch	1.288	No
2	GMSK, Voice	810	0.968	3	802.11b	6	0.272	RHS Tilt	1.240	No

$\Sigma$  1-g SAR (W/kg) of all simultaneous transmitters is < 1.6 W/kg. Based upon KDB 648474 D01, D02 SAR Handsets Multi Transmitters and Ant, v01r05, Simultaneous Tx SAR evaluation is not required.

**10.1.5 UMTS Band V + WiFi**

Transmitter # 1				Transmitter # 2				Test Position	$\Sigma$ 1-g SAR (W/Kg)	Vol. Scan (Yes/No)
Ant	Operating mode	Ch#	SAR (W/Kg) 1-g	Ant	Operating mode	Ch#	SAR (W/Kg) 1-g			
1	R99, 12.2kbps, RMC	4132	1.040	3	802.11b	6	0.133	LHS Touch	1.173	No
1	R99, 12.2kbps, RMC	4233	1.040	3	802.11b	6	0.133	LHS Touch	1.173	No
1	R99, 12.2kbps, RMC	4183	0.248	3	802.11b	6	0.105	LHS Tilt	0.353	No
1	R99, 12.2kbps, RMC	4233	0.868	3	802.11b	6	0.372	RHS Touch	1.240	No
1	R99, 12.2kbps, RMC	4183	0.276	3	802.11b	6	0.272	RHS Tilt	0.548	No
2	R99, 12.2kbps, RMC	4183	1.13	3	802.11b	6	0.133	LHS Touch	1.263	No
2	R99, 12.2kbps, RMC	4183	0.861	3	802.11b	6	0.105	LHS Tilt	0.966	No
2	R99, 12.2kbps, RMC	4183	0.824	3	802.11b	6	0.372	RHS Touch	1.196	No
2	R99, 12.2kbps, RMC	4183	0.614	3	802.11b	6	0.272	RHS Tilt	0.886	No

$\Sigma$  1-g SAR (W/kg) of all simultaneous transmitters is < 1.6 W/kg. Based upon KDB 648474 D01, D02 SAR Handsets Multi Transmitters and Ant, v01r05, Simultaneous Tx SAR evaluation is not required.

**10.1.6 UMTS Band II + WiFi**

Transmitter # 1				Transmitter # 2				Test Position	$\Sigma$ 1-g SAR (W/Kg)	Vol. Scan (Yes/No)
Ant	Operating mode	Ch#	SAR (W/Kg) 1-g	Ant	Operating mode	Ch#	SAR (W/Kg) 1-g			
1	R99, 12.2kbps, RMC	9400	1.130	3	802.11b	6	0.133	LHS Touch	1.263	No
1	R99, 12.2kbps, RMC	9400	0.547	3	802.11b	6	0.105	LHS Tilt	0.652	No
1	R99, 12.2kbps, RMC	9262	1.090	3	802.11b	6	0.372	RHS Touch	1.462	No
1	R99, 12.2kbps, RMC	9400	1.090	3	802.11b	6	0.372	RHS Touch	1.462	No
1	R99, 12.2kbps, RMC	9400	0.611	3	802.11b	6	0.272	RHS Tilt	0.883	No
2	R99, 12.2kbps, RMC	9400	0.758	3	802.11b	6	0.133	LHS Touch	0.891	No
2	R99, 12.2kbps, RMC	9400	0.847	3	802.11b	6	0.105	LHS Tilt	0.952	No
2	R99, 12.2kbps, RMC	9538	1.180	3	802.11b	6	0.372	RHS Touch	1.552	No
2	R99, 12.2kbps, RMC	9400	1.140	3	802.11b	6	0.272	RHS Tilt	1.412	No

$\Sigma$  1-g SAR (W/kg) of all simultaneous transmitters is < 1.6 W/kg. Based upon KDB 648474 D01, D02 SAR Handsets Multi Transmitters and Ant, v01r05, Simultaneous Tx SAR evaluation is not required.

### 10.2 Body-worn Exposure Condition

Σ 1-g SAR (W/kg) of all simultaneous transmitters

Mode	Mode of Operation	Band	CDMA Voice 1xRTT	GSM Voice	WCDMA Voice	CDMA Data 1xRTT, EV-DO	GPRS	HSDPA	HSPA	Wi-Fi 2.4GHz	BT 2.4GHz	Test Positions	Highest Σ 1-g SAR (W/Kg)	Test Analysis	
Voice	CDMA 1xRTT	835	TX1	No	No	No	No	No	No	TX3	No	Front, <b>Back</b>	1.301	See Section 10.2.1	
	CDMA 1xRTT	835	TX2	No	No	No	No	No	No		No	Front, <b>Back</b>	0.588	See Section 10.2.1	
	CDMA 1xRTT	1900	TX1	No	No	No	No	No	No		No	<b>Front, Back</b>	0.676	See Section 10.2.2	
	CDMA 1xRTT	1900	TX2	No	No	No	No	No	No		No	Front, <b>Back</b>	0.551	See Section 10.2.2	
	GSM Voice	850	No	TX1	No	No	No	No	No		No	No	<b>Front, Back</b>	0.951	See Section 10.2.3
	GSM Voice	850	No	TX2	No	No	No	No	No		No	No	Front, <b>Back</b>	0.462	See Section 10.2.3
	GSM Voice	1900	No	TX1	No	No	No	No	No		No	No	Front, <b>Back</b>	0.592	See Section 10.2.4
	GSM Voice	1900	No	TX2	No	No	No	No	No		No	No	Front, <b>Back</b>	0.566	See Section 10.2.4
	WCDMA Voice	835	No	No	TX1	No	No	No	No		No	No	<b>Front, Back</b>	1.057	See Section 10.2.5
	WCDMA Voice	835	No	No	TX2	No	No	No	No		No	No	Front, <b>Back</b>	0.654	See Section 10.2.5
	WCDMA Voice	1900	No	No	TX1	No	No	No	No		No	No	Front, <b>Back</b>	0.713	See Section 10.2.6
	WCDMA Voice	1900	No	No	TX2	No	No	No	No		No	No	Front, <b>Back</b>	0.695	See Section 10.2.6
Data	GPRS	850	No	No	No	No	TX1	No	No	No	No	Front, <b>Back</b>	1.241	See Section 10.2.3	
	GPRS	850	No	No	No	No	TX2	No	No	No	No	Front, <b>Back</b>	0.478	See Section 10.2.3	
	GPRS	1900	No	No	No	No	TX1	No	No	No	No	<b>Front, Back</b>	1.066	See Section 10.2.4	
	GPRS	1900	No	No	No	No	TX2	No	No	No	No	<b>Front, Back</b>	0.709	See Section 10.2.4	
Voice	CDMA 1xRTT	835	TX1	No	No	No	No	No	No	No	TX3	Front, <b>Back</b>	1.165	See Section 10.2.1	
	CDMA 1xRTT	835	TX2	No	No	No	No	No	No	No		<b>Front, Back</b>	0.491	See Section 10.2.1	
	CDMA 1xRTT	1900	TX1	No	No	No	No	No	No	No		<b>Front, Back</b>	0.585	See Section 10.2.2	
	CDMA 1xRTT	1900	TX2	No	No	No	No	No	No	No		Front, <b>Back</b>	0.415	See Section 10.2.2	
	GSM Voice	850	No	TX1	No	No	No	No	No	No		<b>Front, Back</b>	0.899	See Section 10.2.3	
	GSM Voice	850	No	TX2	No	No	No	No	No	No		Front, <b>Back</b>	0.326	See Section 10.2.3	
	GSM Voice	1900	No	TX1	No	No	No	No	No	No		<b>Front, Back</b>	0.475	See Section 10.2.4	
	GSM Voice	1900	No	TX2	No	No	No	No	No	No		Front, <b>Back</b>	0.430	See Section 10.2.4	
	WCDMA Voice	835	No	No	TX1	No	No	No	No	No		<b>Front, Back</b>	1.005	See Section 10.2.5	
	WCDMA Voice	835	No	No	TX2	No	No	No	No	No		Front, <b>Back</b>	0.518	See Section 10.2.5	
	WCDMA Voice	1900	No	No	TX1	No	No	No	No	No		<b>Front, Back</b>	0.602	See Section 10.2.6	
	WCDMA Voice	1900	No	No	TX2	No	No	No	No	No		Front, <b>Back</b>	0.559	See Section 10.2.6	
Data	GPRS	850	No	No	No	No	TX1	No	No	No	<b>Front, Back</b>	1.174	See Section 10.2.3		
	GPRS	850	No	No	No	No	TX2	No	No	No	Front, <b>Back</b>	0.342	See Section 10.2.3		
	GPRS	1900	No	No	No	No	TX1	No	No	No	<b>Front, Back</b>	1.014	See Section 10.2.4		
	GPRS	1900	No	No	No	No	TX2	No	No	No	<b>Front, Back</b>	0.657	See Section 10.2.4		

**10.2.1 CDMA2000 1xRTT (Cell Band) + WiFi or BT**

Transmitter # 1				Transmitter # 2				Test Position	$\Sigma$ 1-g SAR (W/Kg)	Vol. Scan (Yes/No)
Ant	Operating mode	Ch#	SAR (W/Kg) 1-g	Ant	Operating mode	Ch#	SAR (W/Kg) 1-g			
1	1xRTT Voice (RC3, SO32)	1013	1.070	3	802.11b	6	0.076	Front side	1.146	No
1	1xRTT Voice (RC3, SO32)	1013	1.110	3	802.11b	6	0.191	Back side	1.301	No
2	1xRTT Voice (RC3, SO32)	384	0.467	3	802.11b	6	0.076	Front side	0.543	No
2	1xRTT Voice (RC3, SO32)	384	0.397	3	802.11b	6	0.191	Back side	0.588	No
1	1xRTT Voice (RC3, SO32)	1013	1.070	3	Bluetooth	39	0.024	Front side	1.094	No
1	1xRTT Voice (RC3, SO32)	1013	1.110	3	Bluetooth	39	0.055	Back side	1.165	No
2	1xRTT Voice (RC3, SO32)	384	0.467	3	Bluetooth	39	0.024	Front side	0.491	No
2	1xRTT Voice (RC3, SO32)	384	0.397	3	Bluetooth	39	0.055	Back side	0.452	No

$\Sigma$  1-g SAR (W/kg) of all simultaneous transmitters is < 1.6 W/kg. Based upon KDB 648474 D01, D02 SAR Handsets Multi Transmitters and Ant, v01r05, Simultaneous Tx SAR evaluation is not required.

**10.2.2 CDMA2000 1xRTT (PCS Band) + WiFi or BT**

Transmitter # 1				Transmitter # 2				Test Position	$\Sigma$ 1-g SAR (W/Kg)	Vol. SAR (Yes/No)
Ant	Operating mode	Ch#	SAR (W/Kg) 1-g	Ant	Operating mode	Ch#	SAR (W/Kg) 1-g			
1	1xRTT Voice (RC3, SO32)	600	0.561	3	802.11b	6	0.076	Front side	0.637	No
1	1xRTT Voice (RC3, SO32)	600	0.485	3	802.11b	6	0.191	Back side	0.676	No
2	1xRTT Voice (RC3, SO32)	600	0.254	3	802.11b	6	0.076	Front side	0.330	No
2	1xRTT Voice (RC3, SO32)	600	0.360	3	802.11b	6	0.191	Back side	0.551	No
1	1xRTT Voice (RC3, SO32)	600	0.561	3	Bluetooth	39	0.024	Front side	0.585	No
1	1xRTT Voice (RC3, SO32)	600	0.485	3	Bluetooth	39	0.055	Back side	0.540	No
2	1xRTT Voice (RC3, SO32)	600	0.254	3	Bluetooth	39	0.024	Front side	0.278	No
2	1xRTT Voice (RC3, SO32)	600	0.360	3	Bluetooth	39	0.055	Back side	0.415	No

$\Sigma$  1-g SAR (W/kg) of all simultaneous transmitters is < 1.6 W/kg. Based upon KDB 648474 D01, D02 SAR Handsets Multi Transmitters and Ant, v01r05, Simultaneous Tx SAR evaluation is not required.

**10.2.3 GSM850/GPRS850 + WiFi or BT****GSM850 Voice + WiFi or BT**

Transmitter # 1				Transmitter # 2				Test Position	$\Sigma$ 1-g SAR (W/Kg)	Vol. SAR (Yes/No)
Ant	Operating mode	Ch#	SAR (W/Kg) 1-g	Ant	Operating mode	Ch#	SAR (W/Kg) 1-g			
1	GMSK, Voice	251	0.875	3	802.11b	6	0.076	Front side	0.951	No
1	GMSK, Voice	190	0.706	3	802.11b	6	0.191	Back side	0.897	No
2	GMSK, Voice	190	0.260	3	802.11b	6	0.076	Front side	0.336	No
2	GMSK, Voice	190	0.271	3	802.11b	6	0.191	Back side	0.462	No
1	GMSK, Voice	251	0.875	3	Bluetooth	39	0.024	Front side	0.899	No
1	GMSK, Voice	190	0.706	3	Bluetooth	39	0.055	Back side	0.761	No
2	GMSK, Voice	190	0.260	3	Bluetooth	39	0.024	Front side	0.284	No
2	GMSK, Voice	190	0.271	3	Bluetooth	39	0.055	Back side	0.326	No

**GPRS850 + WiFi or BT**

Transmitter # 1				Transmitter # 2				Test Position	$\Sigma$ 1-g SAR (W/Kg)	Vol. SAR (Yes/No)
Ant	Operating mode	Ch#	SAR (W/Kg) 1-g	Ant	Operating mode	Ch#	SAR (W/Kg) 1-g			
1	GPRS 2 Slots (GMSK, CS1)	251	1.150	3	802.11b	6	0.076	Front side	1.226	No
1	GPRS 2 Slots (GMSK, CS1)	128	1.050	3	802.11b	6	0.191	Back side	1.241	No
2	GPRS 2 Slots (GMSK, CS1)	190	0.315	3	802.11b	6	0.076	Front side	0.391	No
2	GPRS 2 Slots (GMSK, CS1)	190	0.287	3	802.11b	6	0.191	Back side	0.478	No
1	GPRS 2 Slots (GMSK, CS1)	251	1.150	3	Bluetooth	39	0.024	Front side	1.174	No
1	GPRS 2 Slots (GMSK, CS1)	128	1.050	3	Bluetooth	39	0.055	Back side	1.105	No
2	GPRS 2 Slots (GMSK, CS1)	190	0.315	3	Bluetooth	39	0.024	Front side	0.339	No
2	GPRS 2 Slots (GMSK, CS1)	190	0.287	3	Bluetooth	39	0.055	Back side	0.342	No

$\Sigma$  1-g SAR (W/kg) of all simultaneous transmitters is < 1.6 W/kg. Based upon KDB 648474 D01, D02 SAR Handsets Multi Transmitters and Ant, v01r05, Simultaneous Tx SAR evaluation is not required.

**10.2.4 GSM1900/GPRS1900 + WiFi or BT**

**GSM1900 Voice + Wi-Fi or BT**

Transmitter # 1				Transmitter # 2				Test Position	Σ 1-g SAR (W/Kg)	Vol. SAR (Yes/No)
Ant	Operating mode	Ch#	SAR (W/Kg) 1-g	Ant	Operating mode	Ch#	SAR (W/Kg) 1-g			
1	GMSK, Voice	661	0.451	3	802.11b	6	0.076	Front side	0.527	No
1	GMSK, Voice	661	0.401	3	802.11b	6	0.191	Back side	0.592	No
2	GMSK, Voice	661	0.279	3	802.11b	6	0.076	Front side	0.355	No
2	GMSK, Voice	661	0.375	3	802.11b	6	0.191	Back side	0.566	No
1	GMSK, Voice	661	0.451	3	Bluetooth	39	0.024	Front side	0.475	No
1	GMSK, Voice	661	0.401	3	Bluetooth	39	0.055	Back side	0.456	No
2	GMSK, Voice	661	0.279	3	Bluetooth	39	0.024	Front side	0.303	No
2	GMSK, Voice	661	0.375	3	Bluetooth	39	0.055	Back side	0.430	No

**GPRS1900 + Wi-Fi or BT**

Transmitter # 1				Transmitter # 2				Test Position	Σ 1-g SAR (W/Kg)	Vol. SAR (Yes/No)
Ant	Operating mode	Ch#	SAR (W/Kg) 1-g	Ant	Operating mode	Ch#	SAR (W/Kg) 1-g			
1	GPRS 2 Slots (GMSK, CS1)	512	0.990	3	802.11b	6	0.076	Front side	1.066	No
1	GPRS 2 Slots (GMSK, CS1)	661	0.670	3	802.11b	6	0.191	Back side	0.861	No
2	GPRS 2 Slots (GMSK, CS1)	661	0.633	3	802.11b	6	0.076	Front side	0.709	No
2	GPRS 2 Slots (GMSK, CS1)	661	0.509	3	802.11b	6	0.191	Back side	0.700	No
1	GPRS 2 Slots (GMSK, CS1)	512	0.990	3	Bluetooth	39	0.024	Front side	1.014	No
1	GPRS 2 Slots (GMSK, CS1)	661	0.670	3	Bluetooth	39	0.055	Back side	0.725	No
2	GPRS 2 Slots (GMSK, CS1)	661	0.633	3	Bluetooth	39	0.024	Front side	0.657	No
2	GPRS 2 Slots (GMSK, CS1)	661	0.509	3	Bluetooth	39	0.055	Back side	0.564	No

Σ 1-g SAR (W/kg) of all simultaneous transmitters is < 1.6 W/kg. Based upon KDB 648474 D01, D02 SAR Handsets Multi Transmitters and Ant, v01r05, Simultaneous Tx SAR evaluation is not required.



**10.2.5 UMTS Band V + Wi-Fi or BT**

Transmitter # 1				Transmitter # 2				Test Position	$\Sigma$ 1-g SAR (W/Kg)	Vol. SAR (Yes/No)
Ant	Operating mode	Ch#	SAR (W/Kg) 1-g	Ant	Operating mode	Ch#	SAR (W/Kg) 1-g			
1	R99, 12.2kbps, RMC	4132	0.981	3	802.11b	6	0.076	Front side	1.057	No
1	R99, 12.2kbps, RMC	4183	0.760	3	802.11b	6	0.191	Back side	0.951	No
2	R99, 12.2kbps, RMC	4183	0.368	3	802.11b	6	0.076	Front side	0.444	No
2	R99, 12.2kbps, RMC	4183	0.463	3	802.11b	6	0.191	Back side	0.654	No
1	R99, 12.2kbps, RMC	4132	0.981	3	Bluetooth	39	0.024	Front side	1.005	No
1	R99, 12.2kbps, RMC	4183	0.760	3	Bluetooth	39	0.055	Back side	0.815	No
2	R99, 12.2kbps, RMC	4183	0.368	3	Bluetooth	39	0.024	Front side	0.392	No
2	R99, 12.2kbps, RMC	4183	0.463	3	Bluetooth	39	0.055	Back side	0.518	No

$\Sigma$  1-g SAR (W/kg) of all simultaneous transmitters is < 1.6 W/kg. Based upon KDB 648474 D01, D02 SAR Handsets Multi Transmitters and Ant, v01r05, Simultaneous Tx SAR evaluation is not required.

**10.2.6 UMTS Band II + WiFi or BT**

Transmitter # 1				Transmitter # 2				Test Position	$\Sigma$ 1-g SAR (W/Kg)	Vol. SAR (Yes/No)
Ant	Operating mode	Ch#	SAR (W/Kg) 1-g	Ant	Operating mode	Ch#	SAR (W/Kg) 1-g			
1	R99, 12.2kbps, RMC	9400	0.578	3	802.11b	6	0.076	Front side	0.654	No
1	R99, 12.2kbps, RMC	9400	0.522	3	802.11b	6	0.191	Back side	0.713	No
2	R99, 12.2kbps, RMC	9400	0.385	3	802.11b	6	0.076	Front side	0.461	No
2	R99, 12.2kbps, RMC	9400	0.504	3	802.11b	6	0.191	Back side	0.695	No
1	R99, 12.2kbps, RMC	9400	0.578	3	Bluetooth	39	0.024	Front side	0.602	No
1	R99, 12.2kbps, RMC	9400	0.522	3	Bluetooth	39	0.055	Back side	0.577	No
2	R99, 12.2kbps, RMC	9400	0.385	3	Bluetooth	39	0.024	Front side	0.409	No
2	R99, 12.2kbps, RMC	9400	0.504	3	Bluetooth	39	0.055	Back side	0.559	No

$\Sigma$  1-g SAR (W/kg) of all simultaneous transmitters is < 1.6 W/kg. Based upon KDB 648474 D01, D02 SAR Handsets Multi Transmitters and Ant, v01r05, Simultaneous Tx SAR evaluation is not required.

### 10.3 Wireless Router (Hotspot) Exposure Condition

#### Simultaneous Transmission

Mode	Mode of Operation	Band	CDMA Voice (1x/RTT)	GSM Voice	WCDMA Voice	EV-DO	GPRS	HSDPA	HSPA	WiFi 2.4GHz	Test Positions	Highest $\Sigma$ 1-g SAR (W/Kg)	Test Results
Data	EV-DO	835	No	No	No	TX1	No	No	No	TX3	Front, Back, Left-edge, Right-edge, Top edge, Bottom edge	1.096	See Section 10.3.1
	EV-DO	835	No	No	No	TX2	No	No	No		Front, Back, Left-edge, Right-edge, Top edge, Bottom edge	0.615	See Section 10.3.1
	EV-DO	1900	No	No	No	TX1	No	No	No		Front, Back, Left-edge, Right-edge, Top edge, Bottom edge	0.818	See Section 10.3.2
	EV-DO	1900	No	No	No	TX2	No	No	No		Front, Back, Left-edge, Right-edge, Top edge, Bottom edge	0.546	See Section 10.3.2
	GPRS	850	No	No	No	No	TX1	No	No		Front, Back, Left-edge, Right-edge, Top edge, Bottom edge	1.241	See Section 10.3.3
	GPRS	850	No	No	No	No	TX2	No	No		Front, Back, Left-edge, Right-edge, Top edge, Bottom edge	0.478	See Section 10.3.3
	GPRS	1900	No	No	No	No	TX1	No	No		Front, Back, Left-edge, Right-edge, Top edge, Bottom edge	1.066	See Section 10.3.4
	GPRS	1900	No	No	No	No	TX2	No	No		Front, Back, Left-edge, Right-edge, Top edge, Bottom edge	0.709	See Section 10.3.4
	WCDMA	835	No	No	TX1	No	No	No	No		Front, Back, Left-edge, Right-edge, Top edge, Bottom edge	1.057	See Section 10.3.5
	WCDMA	835	No	No	TX2	No	No	No	No		Front, Back, Left-edge, Right-edge, Top edge, Bottom edge	0.654	See Section 10.3.6
	WCDMA	1900	No	No	TX1	No	No	No	No		Front, Back, Left-edge, Right-edge, Top edge, Bottom edge	0.713	See Section 10.3.5
	WCDMA	1900	No	No	TX2	No	No	No	No		Front, Back, Left-edge, Right-edge, Top edge, Bottom edge	0.695	See Section 10.3.6

**10.3.1 1xEVDO Rev. 0 (Cell Band) + WiFi**

Transmitter # 1				Transmitter # 2				Test Position	$\Sigma$ 1-g SAR (W/Kg)	Vol. SAR (Yes/No)
Ant	Operating mode	Ch#	SAR (W/Kg) 1-g	Ant	Operating mode	Ch#	SAR (W/Kg) 1-g			
1	1xEVDO Rev. 0	1013	1.020	3	802.11b	6	0.076	Front side	1.096	No
1	1xEVDO Rev. 0	1013	0.887	3	802.11b	6	0.191	Back side	1.078	No
1	1xEVDO Rev. 0	1013	0.805	3	802.11b	6	0.141	Left edge	0.946	No
1	1xEVDO Rev. 0	384	0.260	3	802.11b	6	0.015	Right edge	0.275	No
1	1xEVDO Rev. 0	384	0	3	802.11b	6	0.058	Top edge	0.058	No
1	1xEVDO Rev. 0	384	0.319	3	802.11b	6	0	Bottom edge	0.319	No
2	1xEVDO Rev. 0	384	0.461	3	802.11b	6	0.076	Front side	0.437	No
2	1xEVDO Rev. 0	384	0.424	3	802.11b	6	0.191	Back side	0.615	No
2	1xEVDO Rev. 0	384	0.216	3	802.11b	6	0.141	Left edge	0.357	No
2	1xEVDO Rev. 0	384	0.400	3	802.11b	6	0.015	Right edge	0.415	No
2	1xEVDO Rev. 0	384	0.162	3	802.11b	6	0.058	Top edge	0.220	No
2	1xEVDO Rev. 0	384	0	3	802.11b	6	0	Bottom edge	0	No

$\Sigma$  1-g SAR (W/kg) of all simultaneous transmitters is < 1.6 W/kg. Based upon KDB 648474 D01, D02 SAR Handsets Multi Transmitters and Ant, v01r05, Simultaneous Tx SAR evaluation is not required.

**10.3.2 1xEVDO Rev. 0 (PCS Band) + Wi-Fi**

Transmitter # 1				Transmitter # 2				Test Position	$\Sigma$ 1-g SAR (W/Kg)	Vol. SAR (Yes/No)
Ant	Operating mode	Ch#	SAR (W/Kg) 1-g	Ant	Operating mode	Ch#	SAR (W/Kg) 1-g			
1	1xEVDO Rev. 0	600	0.649	3	802.11b	6	0.076	Front side	0.725	No
1	1xEVDO Rev. 0	600	0.627	3	802.11b	6	0.191	Back side	0.818	No
1	1xEVDO Rev. 0	600	0.487	3	802.11b	6	0.141	Left edge	0.628	No
1	1xEVDO Rev. 0	600	0.175	3	802.11b	6	0.015	Right edge	0.190	No
1	1xEVDO Rev. 0	600	0	3	802.11b	6	0.058	Top edge	0.058	No
1	1xEVDO Rev. 0	600	0.322	3	802.11b	6	0	Bottom edge	0.322	No
2	1xEVDO Rev. 0	600	0.258	3	802.11b	6	0.076	Front side	0.334	No
2	1xEVDO Rev. 0	600	0.355	3	802.11b	6	0.191	Back side	0.546	No
2	1xEVDO Rev. 0	600	0.304	3	802.11b	6	0.141	Left edge	0.445	No
2	1xEVDO Rev. 0	600	0.118	3	802.11b	6	0.015	Right edge	0.133	No
2	1xEVDO Rev. 0	600	0.216	3	802.11b	6	0.058	Top edge	0.274	No
2	1xEVDO Rev. 0	600	0	3	802.11b	6	0	Bottom edge	0	No

$\Sigma$  1-g SAR (W/kg) of all simultaneous transmitters is < 1.6 W/kg. Based upon KDB 648474 D01, D02 SAR Handsets Multi Transmitters and Ant, v01r05, Simultaneous Tx SAR evaluation is not required.

**10.3.3 GPRS850 + WiFi**

Transmitter # 1				Transmitter # 2				Test Position	$\Sigma$ 1-g SAR (W/Kg)	Vol. SAR (Yes/No)
Ant	Operating mode	Ch#	SAR (W/Kg) 1-g	Ant	Operating mode	Ch#	SAR (W/Kg) 1-g			
1	GPRS 2 Slots (GMSK, CS1)	251	1.150	3	802.11b	6	0.076	Front side	1.226	No
1	GPRS 2 Slots (GMSK, CS1)	128	1.050	3	802.11b	6	0.191	Back side	1.241	No
1	GPRS 2 Slots (GMSK, CS1)	128	1.080	3	802.11b	6	0.141	Left edge	1.221	No
1	GPRS 2 Slots (GMSK, CS1)	190	0.355	3	802.11b	6	0.015	Right edge	0.370	No
1	GPRS 2 Slots (GMSK, CS1)	190	0	3	802.11b	6	0.058	Top edge	0.058	No
1	GPRS 2 Slots (GMSK, CS1)	190	0.339	3	802.11b	6	0	Bottom edge	0.339	No
2	GPRS 2 Slots (GMSK, CS1)	190	0.315	3	802.11b	6	0.076	Front side	0.391	No
2	GPRS 2 Slots (GMSK, CS1)	190	0.287	3	802.11b	6	0.191	Back side	0.478	No
2	GPRS 2 Slots (GMSK, CS1)	190	0.076	3	802.11b	6	0.141	Left edge	0.217	No
2	GPRS 2 Slots (GMSK, CS1)	190	0.390	3	802.11b	6	0.015	Right edge	0.405	No
2	GPRS 2 Slots (GMSK, CS1)	190	0.155	3	802.11b	6	0.058	Top edge	0.213	No
2	GPRS 2 Slots (GMSK, CS1)	190	0	3	802.11b	6	0	Bottom edge	0	No

$\Sigma$  1-g SAR (W/kg) of all simultaneous transmitters is < 1.6 W/kg. Based upon KDB 648474 D01, D02 SAR Handsets Multi Transmitters and Ant, v01r05, Simultaneous Tx SAR evaluation is not required.

**10.3.4 GPRS1900 + WiFi**

Transmitter # 1				Transmitter # 2				Test Position	$\Sigma$ 1-g SAR (W/Kg)	Vol. SAR (Yes/No)
Ant	Operating mode	Ch#	SAR (W/Kg) 1-g	Ant	Operating mode	Ch#	SAR (W/Kg) 1-g			
1	GPRS 2 Slots (GMSK, CS1)	512	0.990	3	802.11b	6	0.076	Front side	1.066	No
1	GPRS 2 Slots (GMSK, CS1)	661	0.670	3	802.11b	6	0.191	Back side	0.861	No
1	GPRS 2 Slots (GMSK, CS1)	661	0.644	3	802.11b	6	0.141	Left edge	0.785	No
1	GPRS 2 Slots (GMSK, CS1)	661	0.253	3	802.11b	6	0.015	Right edge	0.268	No
1	GPRS 2 Slots (GMSK, CS1)	661	0	3	802.11b	6	0.058	Top edge	0.058	No
1	GPRS 2 Slots (GMSK, CS1)	661	0.425	3	802.11b	6	0	Bottom edge	0.425	No
2	GPRS 2 Slots (GMSK, CS1)	661	0.633	3	802.11b	6	0.076	Front side	0.709	No
2	GPRS 2 Slots (GMSK, CS1)	661	0.509	3	802.11b	6	0.191	Back side	0.700	No
2	GPRS 2 Slots (GMSK, CS1)	661	0.445	3	802.11b	6	0.141	Left edge	0.586	No
2	GPRS 2 Slots (GMSK, CS1)	661	0.150	3	802.11b	6	0.015	Right edge	0.165	No
2	GPRS 2 Slots (GMSK, CS1)	661	0.519	3	802.11b	6	0.058	Top edge	0.577	No
2	GPRS 2 Slots (GMSK, CS1)	661	0	3	802.11b	6	0	Bottom edge	0	No

$\Sigma$  1-g SAR (W/kg) of all simultaneous transmitters is < 1.6 W/kg. Based upon KDB 648474 D01, D02 SAR Handsets Multi Transmitters and Ant, v01r05, Simultaneous Tx SAR evaluation is not required.

**10.3.5 UMTS Band V + WiFi**

Transmitter # 1				Transmitter # 2				Test Position	$\Sigma$ 1-g SAR (W/Kg)	Vol. SAR (Yes/No)
Ant	Operating mode	Ch#	SAR (W/Kg) 1-g	Ant	Operating mode	Ch#	SAR (W/Kg) 1-g			
1	R99, 12.2kbps, RMC	4132	0.981	3	802.11b	6	0.076	Front side	1.057	No
1	R99, 12.2kbps, RMC	4183	0.760	3	802.11b	6	0.191	Back side	0.951	No
1	R99, 12.2kbps, RMC	4183	0.751	3	802.11b	6	0.141	Left edge	0.892	No
1	R99, 12.2kbps, RMC	4183	0.288	3	802.11b	6	0.015	Right edge	0.303	No
1	R99, 12.2kbps, RMC	4183	0	3	802.11b	6	0.058	Top edge	0.058	No
1	R99, 12.2kbps, RMC	4183	0.308	3	802.11b	6	0	Bottom edge	0.308	No
2	R99, 12.2kbps, RMC	4183	0.368	3	802.11b	6	0.076	Front side	0.444	No
2	R99, 12.2kbps, RMC	4183	0.463	3	802.11b	6	0.191	Back side	0.654	No
2	R99, 12.2kbps, RMC	4183	0.211	3	802.11b	6	0.141	Left edge	0.352	No
2	R99, 12.2kbps, RMC	4183	0.499	3	802.11b	6	0.015	Right edge	0.514	No
2	R99, 12.2kbps, RMC	4183	0.247	3	802.11b	6	0.058	Top edge	0.305	No
2	R99, 12.2kbps, RMC	4183	0	3	802.11b	6	0	Bottom edge	0	No

$\Sigma$  1-g SAR (W/kg) of all simultaneous transmitters is < 1.6 W/kg. Based upon KDB 648474 D01, D02 SAR Handsets Multi Transmitters and Ant, v01r05, Simultaneous Tx SAR evaluation is not required.

**10.3.6 UMTS Band II + WiFi**

Transmitter # 1				Transmitter # 2				Test Position	$\Sigma$ 1-g SAR (W/Kg)	Vol. SAR (Yes/No)
Ant	Operating mode	Ch#	SAR (W/Kg) 1-g	Ant	Operating mode	Ch#	SAR (W/Kg) 1-g			
1	R99, 12.2kbps, RMC	9400	0.578	3	802.11b	6	0.076	Front side	0.654	No
1	R99, 12.2kbps, RMC	9400	0.522	3	802.11b	6	0.191	Back side	0.713	No
1	R99, 12.2kbps, RMC	9400	0.488	3	802.11b	6	0.141	Left edge	0.629	No
1	R99, 12.2kbps, RMC	9400	0.173	3	802.11b	6	0.015	Right edge	0.188	No
1	R99, 12.2kbps, RMC	9400	0	3	802.11b	6	0.058	Top edge	0.058	No
1	R99, 12.2kbps, RMC	9400	0.271	3	802.11b	6	0	Bottom edge	0.271	No
2	R99, 12.2kbps, RMC	9400	0.385	3	802.11b	6	0.076	Front side	0.461	No
2	R99, 12.2kbps, RMC	9400	0.504	3	802.11b	6	0.191	Back side	0.695	No
2	R99, 12.2kbps, RMC	9400	0.334	3	802.11b	6	0.141	Left edge	0.475	No
2	R99, 12.2kbps, RMC	9400	0.128	3	802.11b	6	0.015	Right edge	0.143	No
2	R99, 12.2kbps, RMC	9400	0.300	3	802.11b	6	0.058	Top edge	0.358	No
2	R99, 12.2kbps, RMC	9400	0	3	802.11b	6	0	Bottom edge	0	No

$\Sigma$  1-g SAR (W/kg) of all simultaneous transmitters is < 1.6 W/kg. Based upon KDB 648474 D01, D02 SAR Handsets Multi Transmitters and Ant, v01r05, Simultaneous Tx SAR evaluation is not required.



## 11 Highest SAR Test Plots

### Worst-case HEAD SAR Plot for Part 22 – 850MHz Band

Date: 7/22/2011

Test Laboratory: UL CCS SAR Lab C

#### CDMA2000 Cell band Left Hand Side Ant Primary

Communication System: CDMA2000; Frequency: 836.52 MHz; Duty Cycle: 1:1  
Medium parameters used (interpolated):  $f = 836.52$  MHz;  $\sigma = 0.87$  mho/m;  $\epsilon_r = 43.336$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Left Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3772; ConvF(8.52, 8.52, 8.52); Calibrated: 5/3/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1257; Calibrated: 5/3/2011
- Phantom: SAM with CRP v5.0; Type: QD000P40CD; Serial: TP1632
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Touch/M-ch/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mmInfo: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.279 mW/g

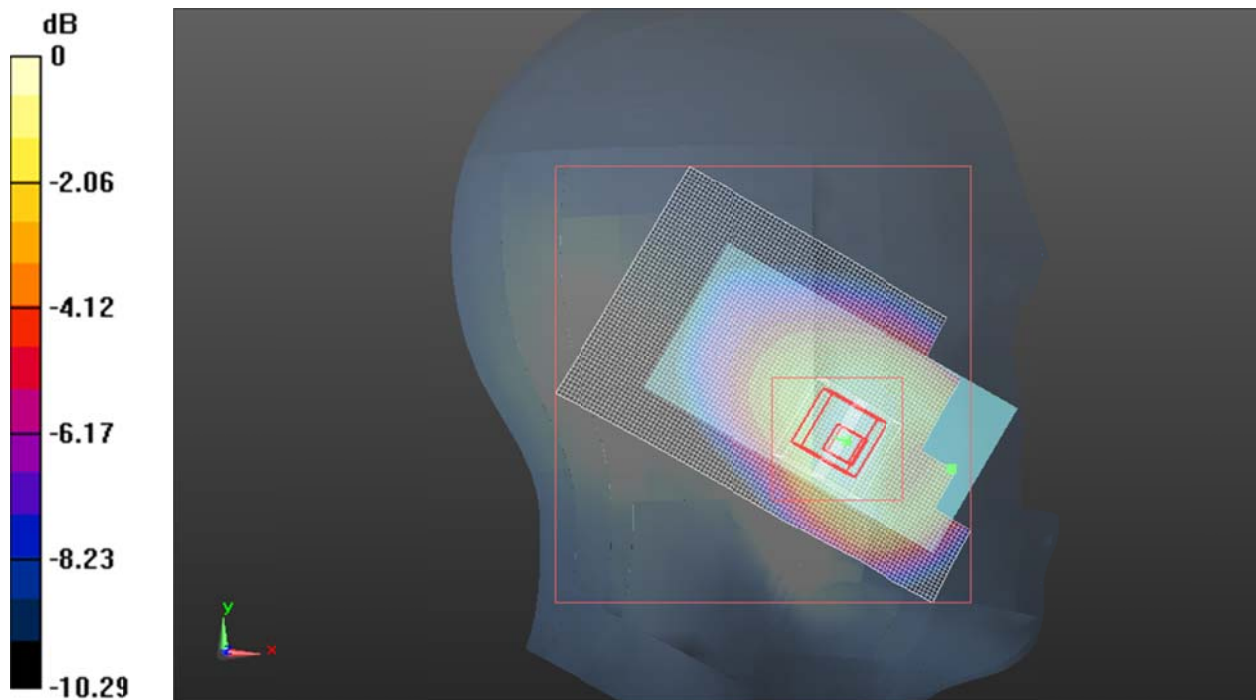
**Touch/M-ch/Zoom Scan (7x7x9)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 36.778 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 1.473 W/kg

**SAR(1 g) = 1.15 mW/g; SAR(10 g) = 0.825 mW/g**Info: [Interpolated medium parameters used for SAR evaluation.](#)

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



0 dB = 1.300mW/g

Date: 7/22/2011

Test Laboratory: UL CCS SAR Lab C

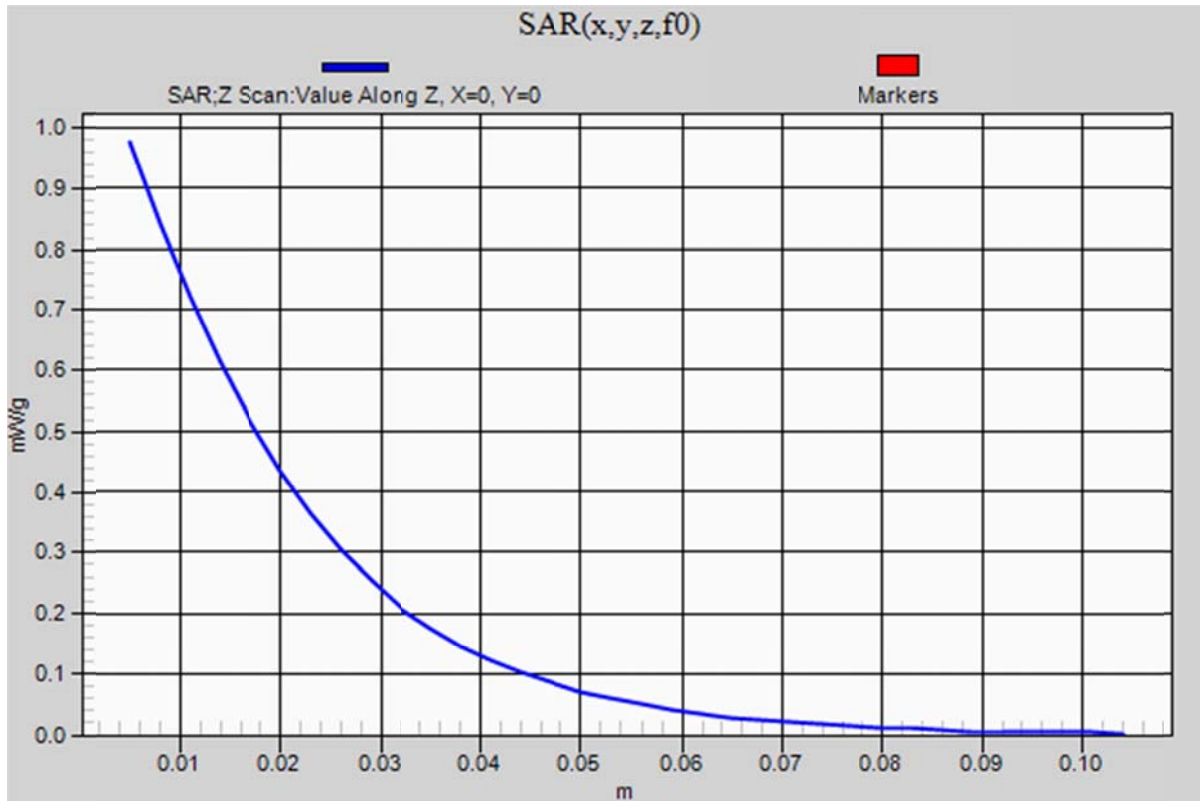
CDMA2000 Cell band\_Left Hand Side\_Ant Primary

Communication System: CDMA2000; Frequency: 836.52 MHz;Duty Cycle: 1:1

**Touch/M-ch/Z Scan (1x1x34):** Measurement grid: dx=20mm, dy=20mm, dz=3mm

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

Maximum value of SAR (measured) = 0.976 mW/g



Worst-case Body-worn accessory SAR Plot for Part 22 – 850MHz Band

Date: 7/28/2011

Test Laboratory: UL CCS SAR Lab C

## GPRS850\_Body\_Ant Primary

Communication System: GPRS-FDD (TDMA, GMSK, 2 slot); Frequency: 848.8 MHz; Duty Cycle: 1:4.00037

Medium parameters used (interpolated):  $f = 848.8$  MHz;  $\sigma = 0.99$  mho/m;  $\epsilon_r = 55.308$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

## DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3772; ConvF(8.57, 8.57, 8.57); Calibrated: 5/3/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1257; Calibrated: 5/3/2011
- Phantom: ELI v5.0 (B); Type: QDOVA001BB; Serial: 1121
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Front side/H-ch\_2 slot/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm[Info: Interpolated medium parameters used for SAR evaluation.](#)

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

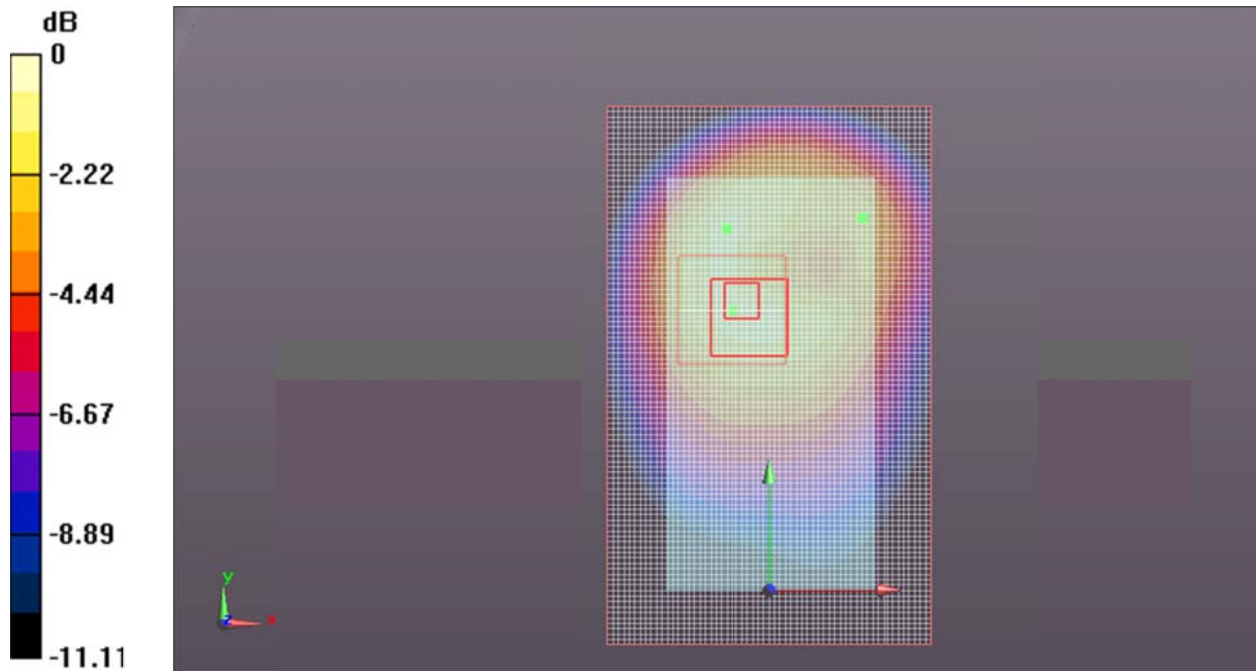
**Front side/H-ch\_2 slot/Zoom Scan (7x7x9)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 32.861 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 1.774 W/kg

**SAR(1 g) = 1.15 mW/g; SAR(10 g) = 0.702 mW/g**[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.395 mW/g



0 dB = 1.390mW/g

Date: 7/28/2011

Test Laboratory: UL CCS SAR Lab C

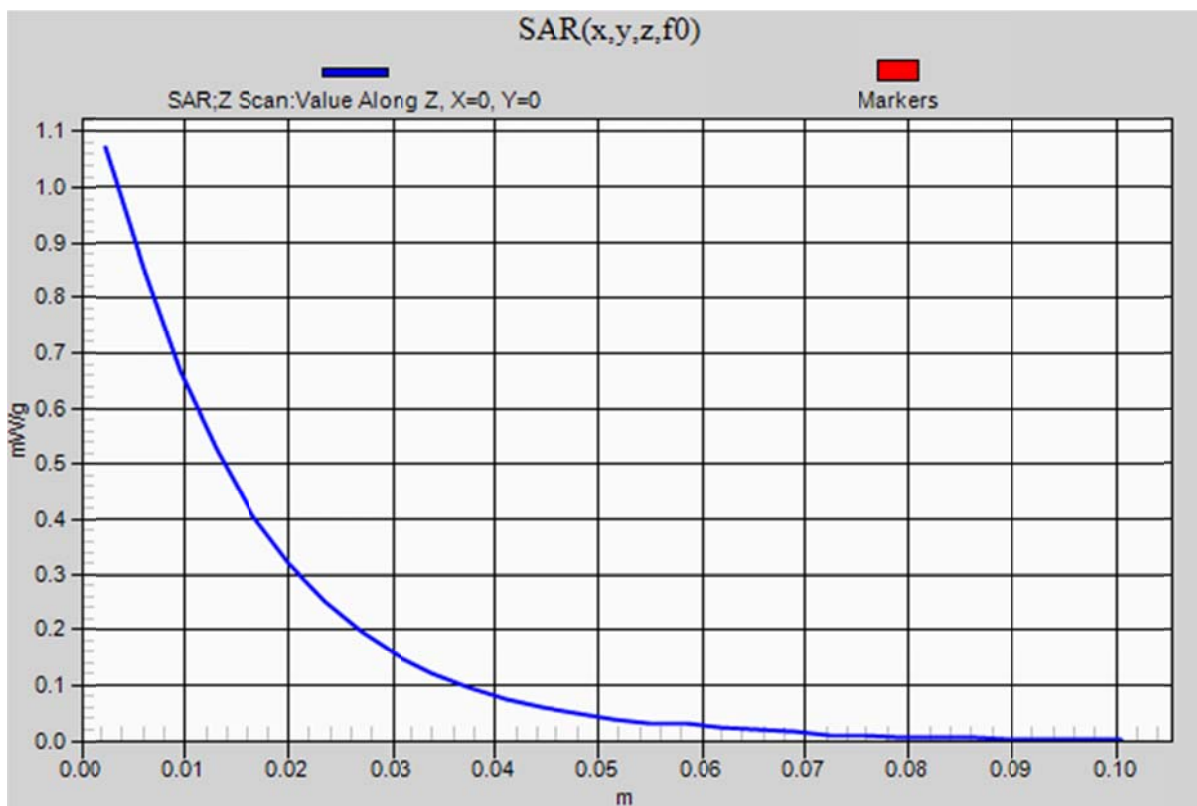
GPRS850\_Body\_Ant Primary

Communication System: GPRS-FDD (TDMA, GMSK, 2 slot); Frequency: 848.8 MHz; Duty Cycle: 1:4.00037

**Front side/H-ch\_2 slot/Z Scan (1x1x29):** Measurement grid: dx=20mm, dy=20mm, dz=3.5mm

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

Maximum value of SAR (measured) = 1.071 mW/g



Worst-case Wireless Router (hotspot) SAR Plot for Part 22 – 850MHz Band

Date: 7/28/2011

Test Laboratory: UL CCS SAR Lab C

## GPRS850\_Body\_Ant Primary

Communication System: GPRS-FDD (TDMA, GMSK, 2 slot); Frequency: 848.8 MHz; Duty Cycle: 1:4.00037

Medium parameters used (interpolated):  $f = 848.8$  MHz;  $\sigma = 0.99$  mho/m;  $\epsilon_r = 55.308$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY5 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3772; ConvF(8.57, 8.57, 8.57); Calibrated: 5/3/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1257; Calibrated: 5/3/2011
- Phantom: ELI v5.0 (B); Type: QDOVA001BB; Serial: 1121
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

**Front side/H-ch\_2 slot/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm[Info: Interpolated medium parameters used for SAR evaluation.](#)

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

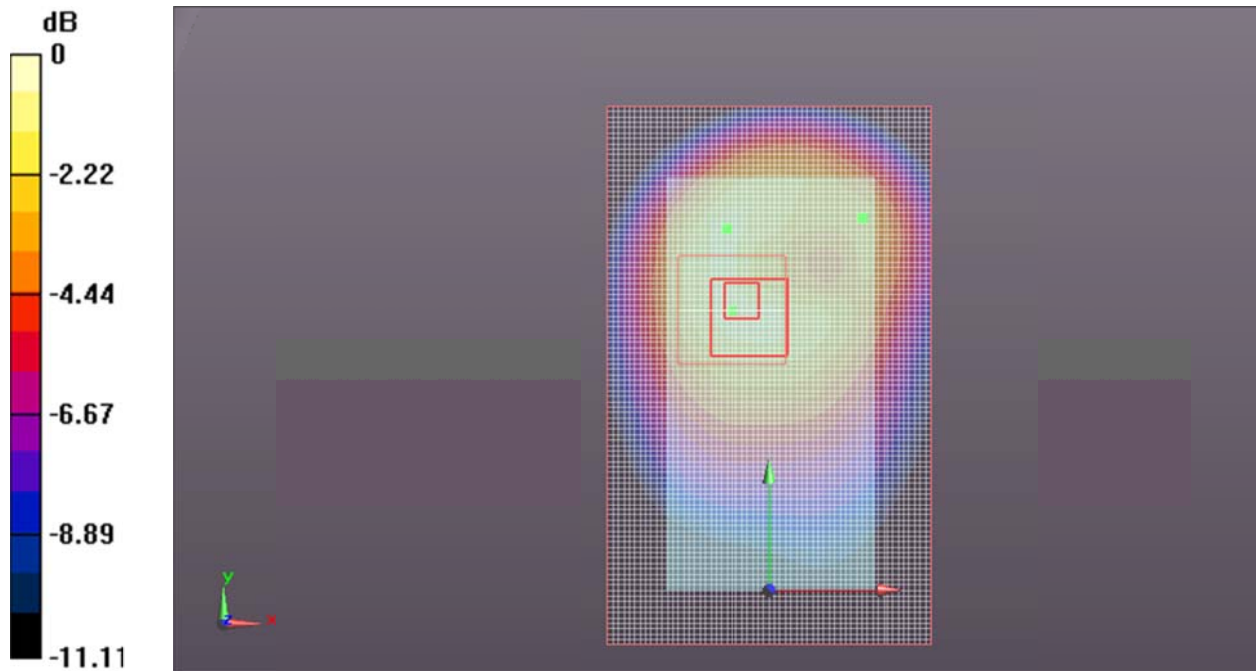
**Front side/H-ch\_2 slot/Zoom Scan (7x7x9)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 32.861 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 1.774 W/kg

**SAR(1 g) = 1.15 mW/g; SAR(10 g) = 0.702 mW/g**[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.395 mW/g



0 dB = 1.390mW/g



Date: 7/28/2011

Test Laboratory: UL CCS SAR Lab C

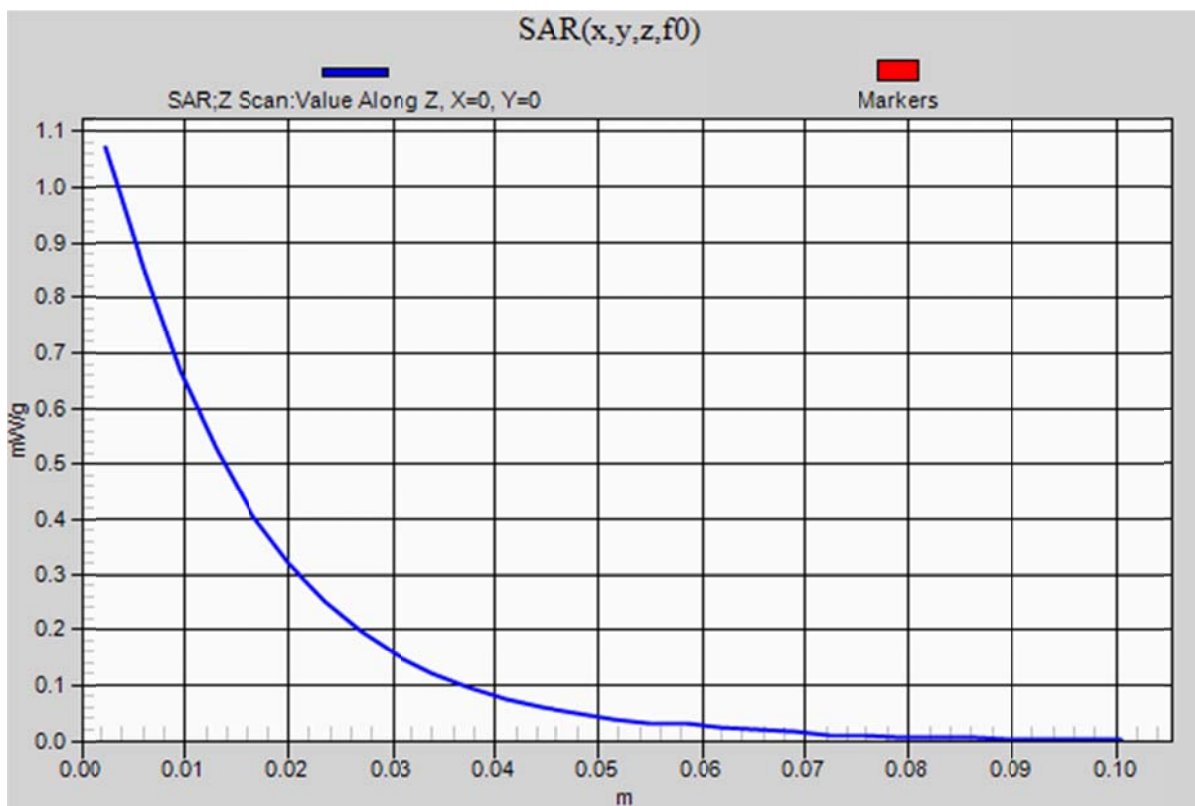
GPRS850\_Body\_Ant Primary

Communication System: GPRS-FDD (TDMA, GMSK, 2 slot); Frequency: 848.8 MHz;Duty Cycle: 1:4.00037

**Front side/H-ch\_2 slot/Z Scan (1x1x29):** Measurement grid: dx=20mm, dy=20mm, dz=3.5mm

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

Maximum value of SAR (measured) = 1.071 mW/g



Worst-case HEAD SAR Plot for Part 22 – 1900MHz Band

Date/Time: 7/22/2011 3:21:53 PM

Test Laboratory: UL CCS SAR Lab D

CDMA2000 PCS\_Left Hand Side\_Ant Primary

DUT: Apple; Type: N/A; Serial: N/A

Communication System: PCS1900; Frequency: 1908.75 MHz; Duty Cycle: 1:1  
Medium parameters used (interpolated):  $f = 1908.75$  MHz;  $\sigma = 1.37$  mho/m;  $\epsilon_r = 39.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Left Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3749; ConvF(7.36, 7.36, 7.36); Calibrated: 12/13/2010
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1259; Calibrated: 5/3/2011
- Phantom: SAM A (Twin); Type: SAM A; Serial: 1050
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Touch\_H-ch/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.45 mW/g

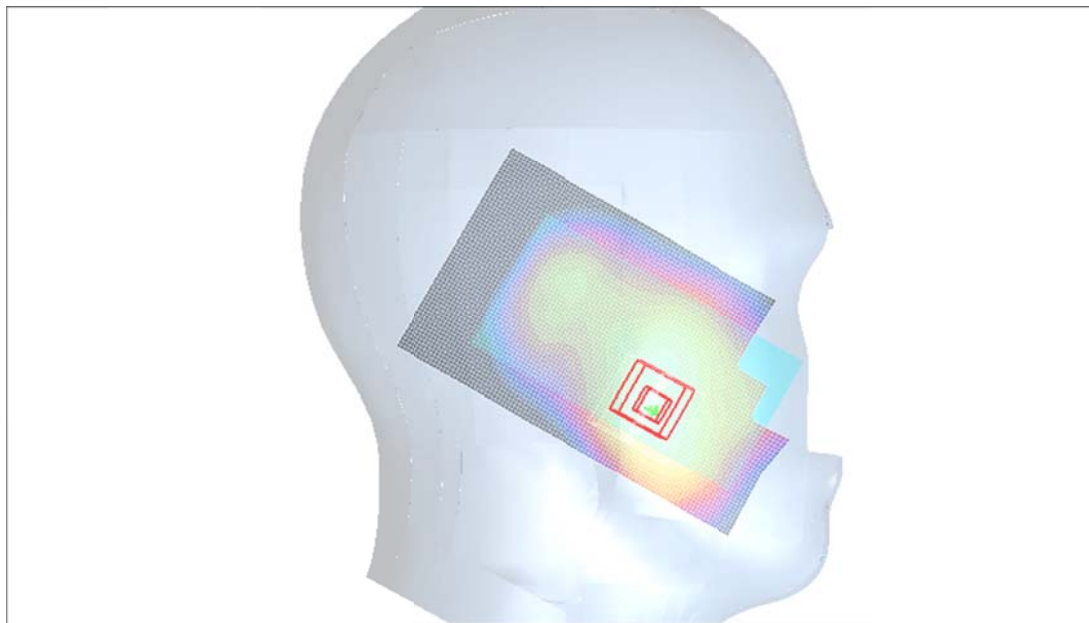
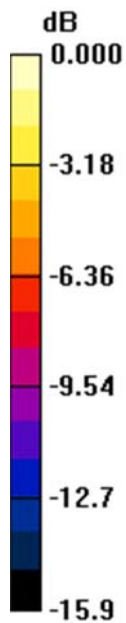
**Touch\_H-ch/Zoom Scan (7x7x9)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 31.4 V/m; Power Drift = -0.064 dB

Peak SAR (extrapolated) = 1.72 W/kg

**SAR(1 g) = 1.18 mW/g; SAR(10 g) = 0.759 mW/g**[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.42 mW/g



0 dB = 1.42mW/g

Date/Time: 7/22/2011 3:42:23 PM

Test Laboratory: UL CCS SAR Lab D

CDMA2000 PCS\_Left Hand Side\_Ant Primary

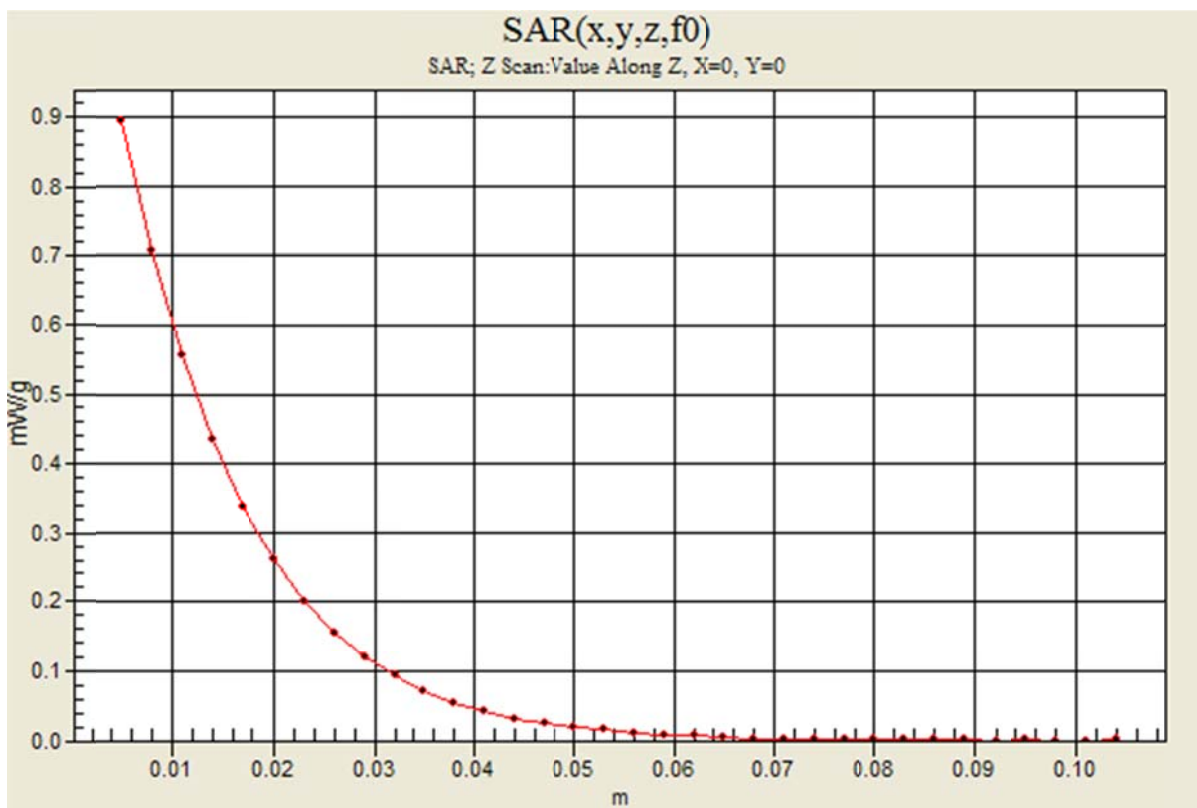
DUT: Apple; Type: N/A; Serial: N/A

Communication System: PCS1900; Frequency: 1908.75 MHz;Duty Cycle: 1:1

**Touch\_H-ch/Z Scan (1x1x34):** Measurement grid: dx=20mm, dy=20mm, dz=3mm

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

Maximum value of SAR (measured) = 0.895 mW/g



Date/Time: 7/21/2011 5:56:12 PM

Test Laboratory: UL CCS SAR Lab D

UMTS band II\_Right Hand Side\_Ant Secondary

DUT: Apple; Type: N/A; Serial: N/A

Communication System: UMTS Band II; Frequency: 1907.6 MHz; Duty Cycle: 1:1  
Medium parameters used (interpolated):  $f = 1907.6$  MHz;  $\sigma = 1.38$  mho/m;  $\epsilon_r = 39.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Right Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3749; ConvF(7.36, 7.36, 7.36); Calibrated: 12/13/2010
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1259; Calibrated: 5/3/2011
- Phantom: SAM A (Twin); Type: SAM A; Serial: 1050
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Touch\_H-ch/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.67 mW/g

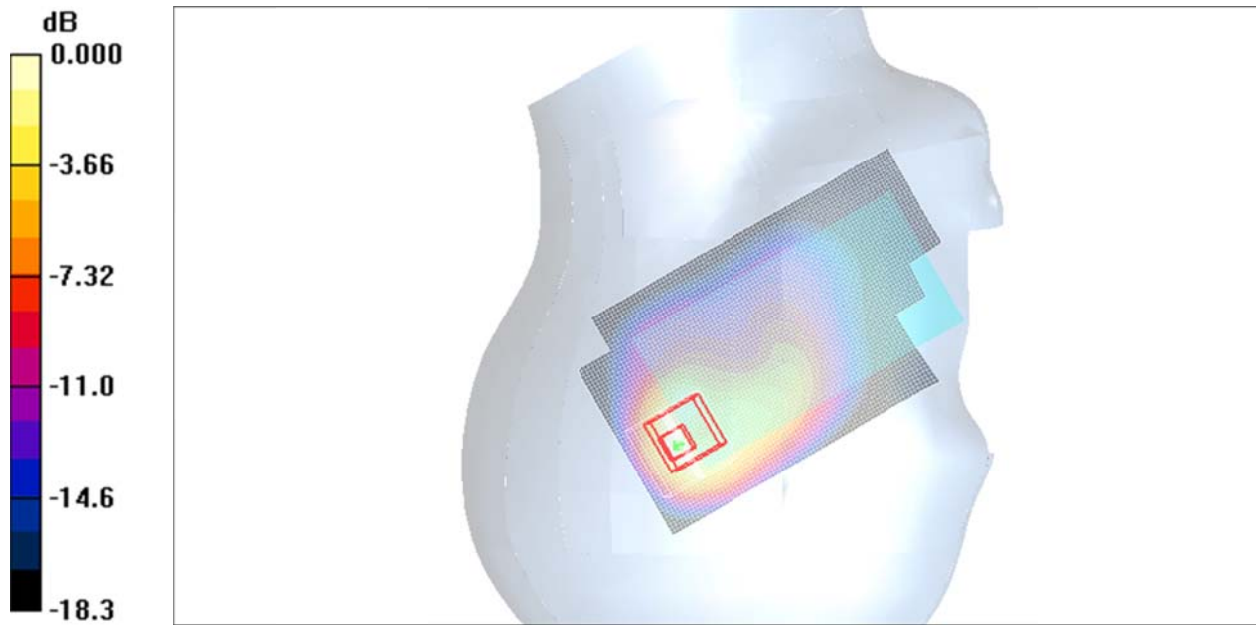
**Touch\_H-ch/Zoom Scan (7x7x9)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 31.2 V/m; Power Drift = 0.186 dB

Peak SAR (extrapolated) = 2.67 W/kg

**SAR(1 g) = 1.18 mW/g; SAR(10 g) = 0.571 mW/g**[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.75 mW/g



0 dB = 1.75mW/g

Date/Time: 7/21/2011 6:18:23 PM

Test Laboratory: UL CCS SAR Lab D

UMTS band II\_Right Hand Side\_Ant Secondary

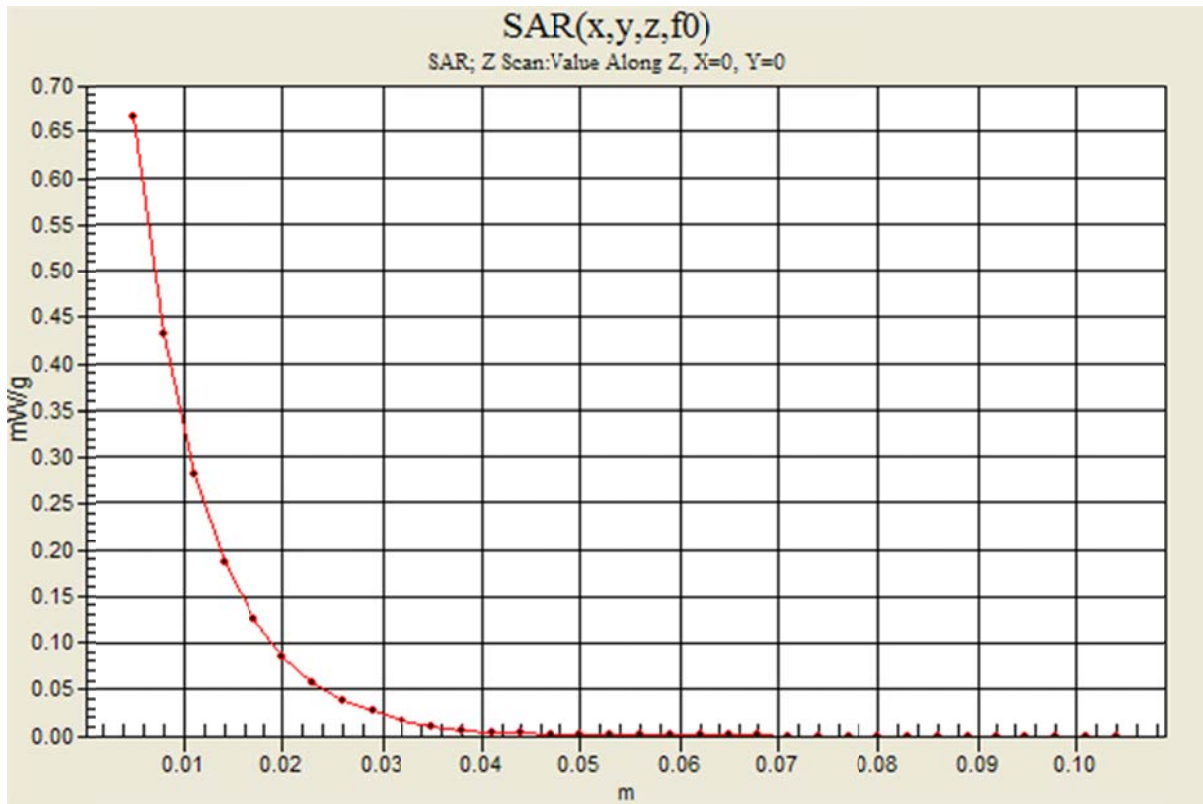
DUT: Apple; Type: N/A; Serial: N/A

Communication System: UMTS Band II; Frequency: 1907.6 MHz;Duty Cycle: 1:1

**Touch\_H-ch/Z Scan (1x1x34):** Measurement grid: dx=20mm, dy=20mm, dz=3mm

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

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



Worst-case Body-worn accessory SAR Plot for Part 22 – 1900MHz Band

Date/Time: 7/26/2011 9:33:47 PM

Test Laboratory: UL CCS SAR Lab D

GPRS1900\_Body\_Ant Primary

DUT: Apple; Type: NA; Serial: NA

Communication System: GPRS1900; Frequency: 1850.2 MHz; Duty Cycle: 1:4  
Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.44$  mho/m;  $\epsilon_r = 52.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3749; ConvF(7.33, 7.33, 7.33); Calibrated: 12/13/2010
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1259; Calibrated: 5/3/2011
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BB; Serial: 1017
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Front side\_L-ch\_2 slot/Area Scan (61x101x1):** Measurement grid: dx=15mm,  
dy=15mm

Maximum value of SAR (interpolated) = 1.39 mW/g

**Front side\_L-ch\_2 slot/Zoom Scan (7x7x9)/Cube 0:** Measurement grid: dx=5mm,  
dy=5mm, dz=3mm

Reference Value = 29.0 V/m; Power Drift = -0.077 dB

Peak SAR (extrapolated) = 1.63 W/kg

**SAR(1 g) = 0.990 mW/g; SAR(10 g) = 0.606 mW/g**

Maximum value of SAR (measured) = 1.26 mW/g

**Front side\_L-ch\_2 slot/Zoom Scan 2 (7x7x9)/Cube 0:** Measurement grid: dx=5mm,  
dy=5mm, dz=3mm

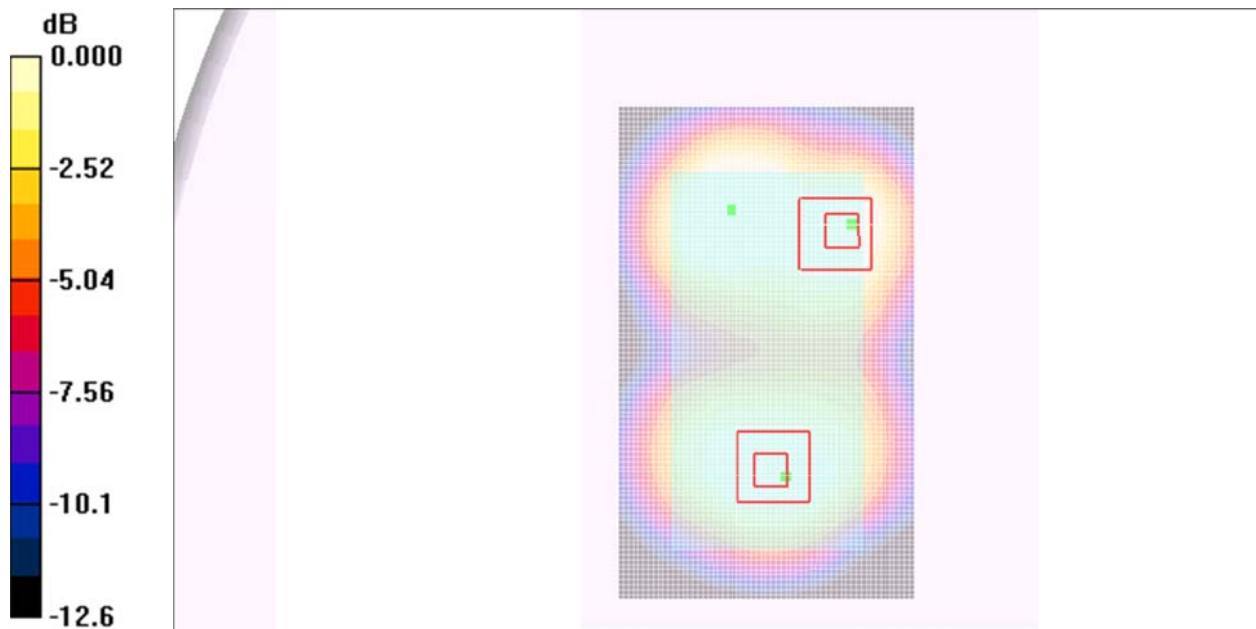
Reference Value = 29.0 V/m; Power Drift = -0.077 dB

Peak SAR (extrapolated) = 1.25 W/kg

**SAR(1 g) = 0.861 mW/g; SAR(10 g) = 0.575 mW/g**

Maximum value of SAR (measured) = 1.02 mW/g





0 dB = 1.02mW/g

Date/Time: 7/26/2011 10:06:46 PM

Test Laboratory: UL CCS SAR Lab D

GPRS1900\_Body\_Ant Primary

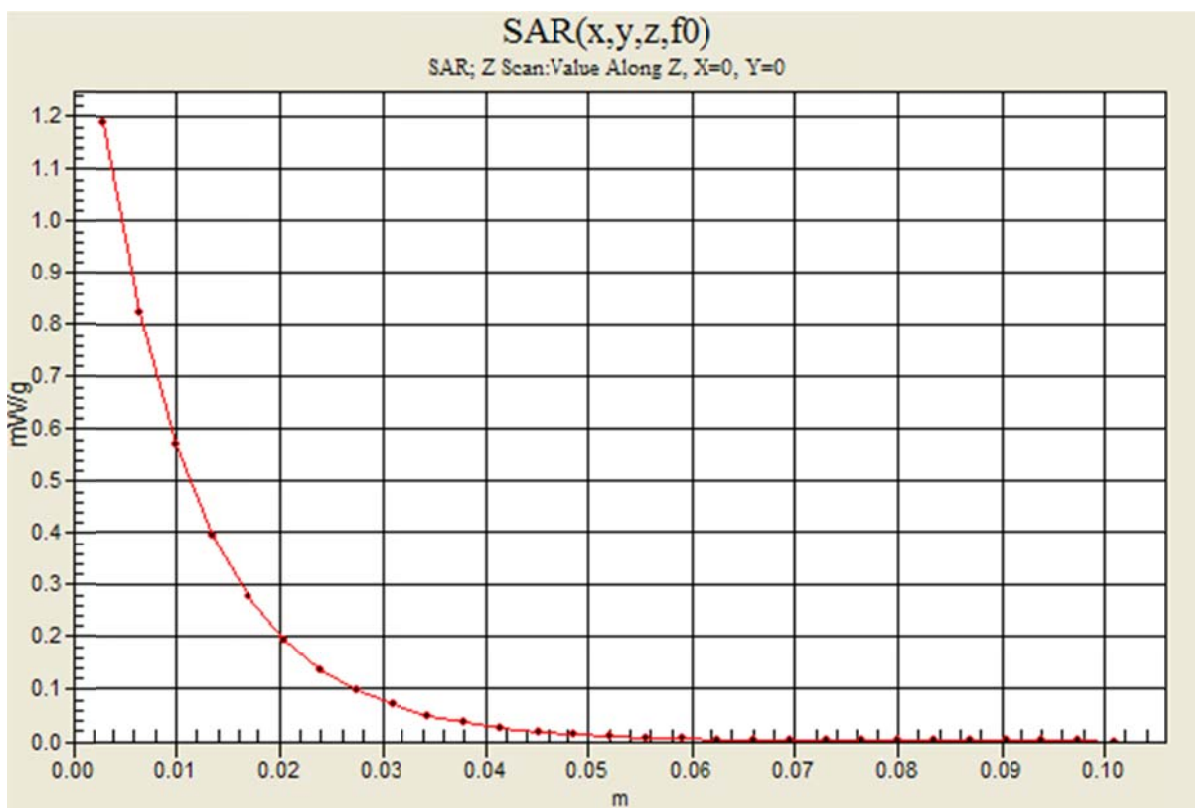
DUT: Apple; Type: NA; Serial: NA

Communication System: GPRS1900; Frequency: 1850.2 MHz;Duty Cycle: 1:4

**Front side\_L-ch\_2 slot/Z Scan (1x1x29):** Measurement grid: dx=20mm, dy=20mm, dz=3.5mm

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

Maximum value of SAR (measured) = 1.19 mW/g



Worst-case Wireless Router (hotspot) SAR Plot for Part 22 – 1900MHz Band

Date/Time: 7/26/2011 9:33:47 PM

Test Laboratory: UL CCS SAR Lab D

GPRS1900\_Body\_Ant Primary

DUT: Apple; Type: NA; Serial: NA

Communication System: GPRS1900; Frequency: 1850.2 MHz; Duty Cycle: 1:4  
Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.44$  mho/m;  $\epsilon_r = 52.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3749; ConvF(7.33, 7.33, 7.33); Calibrated: 12/13/2010
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1259; Calibrated: 5/3/2011
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BB; Serial: 1017
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Front side\_L-ch\_2 slot/Area Scan (61x101x1):** Measurement grid: dx=15mm,  
dy=15mm

Maximum value of SAR (interpolated) = 1.39 mW/g

**Front side\_L-ch\_2 slot/Zoom Scan (7x7x9)/Cube 0:** Measurement grid: dx=5mm,  
dy=5mm, dz=3mm

Reference Value = 29.0 V/m; Power Drift = -0.077 dB

Peak SAR (extrapolated) = 1.63 W/kg

**SAR(1 g) = 0.990 mW/g; SAR(10 g) = 0.606 mW/g**

Maximum value of SAR (measured) = 1.26 mW/g

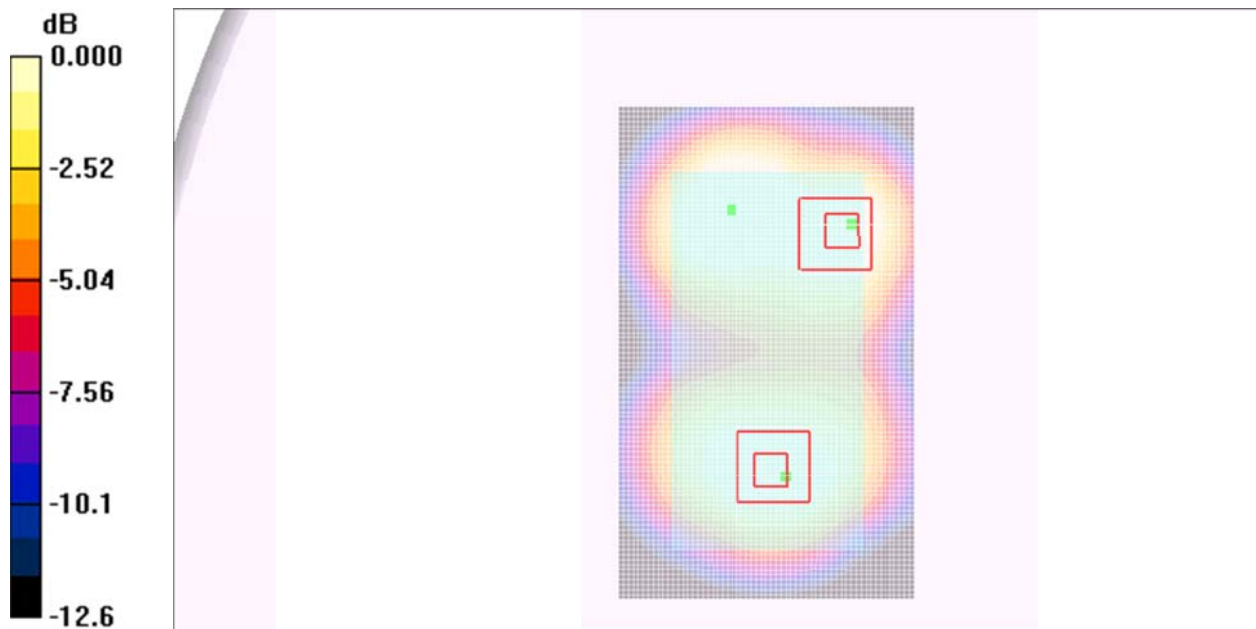
**Front side\_L-ch\_2 slot/Zoom Scan 2 (7x7x9)/Cube 0:** Measurement grid: dx=5mm,  
dy=5mm, dz=3mm

Reference Value = 29.0 V/m; Power Drift = -0.077 dB

Peak SAR (extrapolated) = 1.25 W/kg

**SAR(1 g) = 0.861 mW/g; SAR(10 g) = 0.575 mW/g**

Maximum value of SAR (measured) = 1.02 mW/g



0 dB = 1.02mW/g

Date/Time: 7/26/2011 10:06:46 PM

Test Laboratory: UL CCS SAR Lab D

GPRS1900\_Body\_Ant Primary

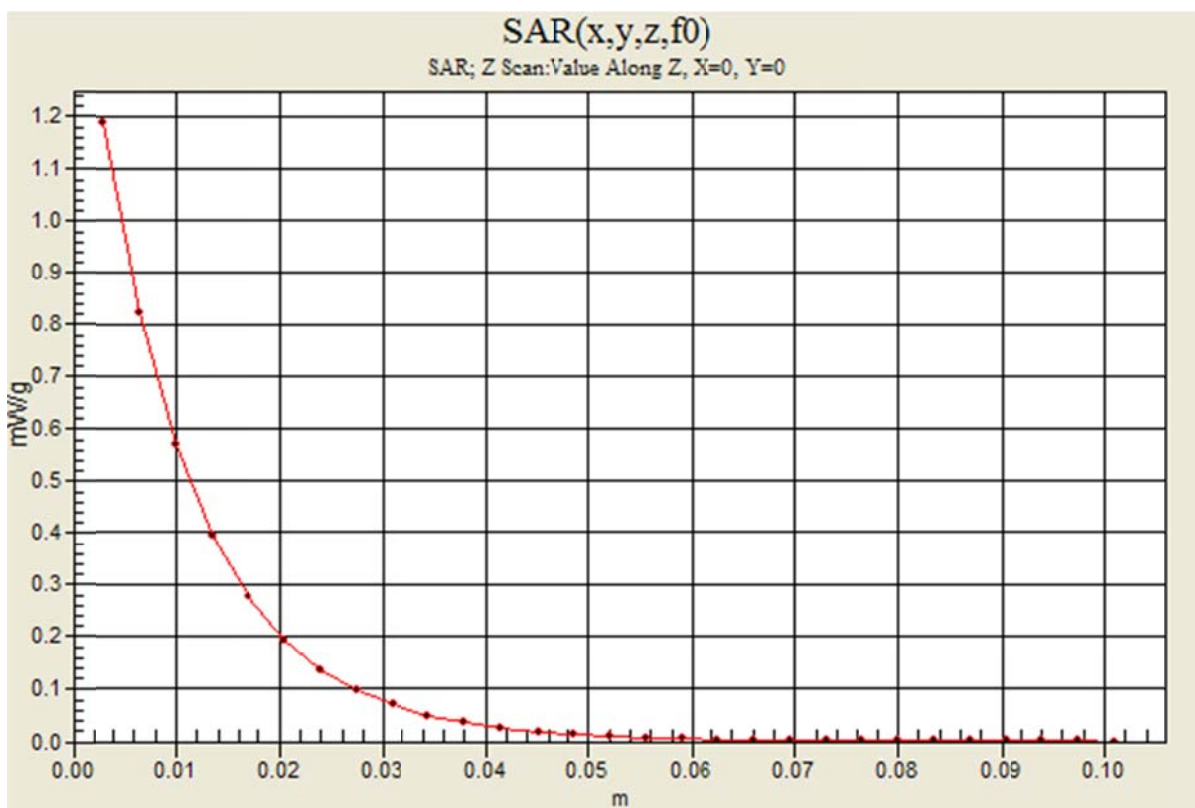
DUT: Apple; Type: NA; Serial: NA

Communication System: GPRS1900; Frequency: 1850.2 MHz;Duty Cycle: 1:4

**Front side\_L-ch\_2 slot/Z Scan (1x1x29):** Measurement grid: dx=20mm, dy=20mm, dz=3.5mm

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

Maximum value of SAR (measured) = 1.19 mW/g



Worst-case HEAD SAR Plot for Part 22 – 2400MHz Band

Date/Time: 7/25/2011 4:50:56 PM

Test Laboratory: UL CCS SAR Lab D

WiFi\_Right Hand Side\_WiFi

DUT: Apple; Type: N/A; Serial: N/A

Communication System: 802.11b/g 2.4GHz; Frequency: 2437 MHz; Duty Cycle: 1:1  
Medium parameters used (interpolated):  $f = 2437$  MHz;  $\sigma = 1.73$  mho/m;  $\epsilon_r = 39.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Right Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3749; ConvF(6.69, 6.69, 6.69); Calibrated: 12/13/2010
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)) Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1259; Calibrated: 5/3/2011
- Phantom: SAM B (Twin); Type: SAM B; Serial: TP-105
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Touch\_M-ch/Area Scan (61x101x1):** Measurement grid: dx=15mm, dy=15mm[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.577 mW/g

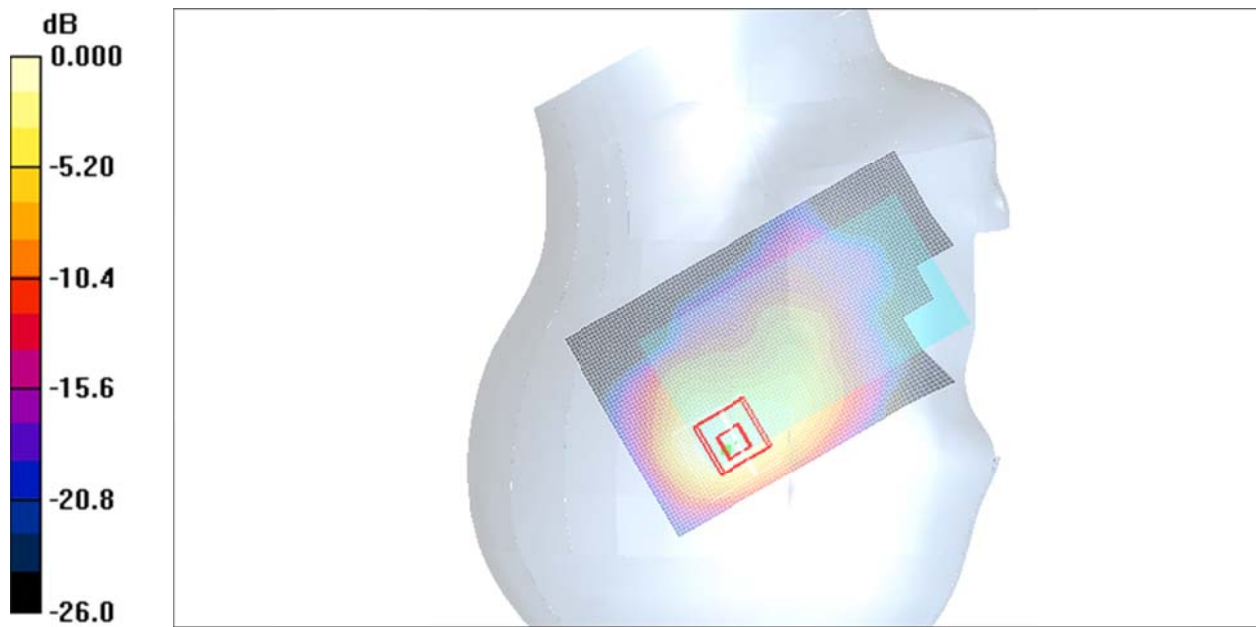
**Touch\_M-ch/Zoom Scan (7x7x9)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 15.3 V/m; Power Drift = 0.047 dB

Peak SAR (extrapolated) = 0.809 W/kg

**SAR(1 g) = 0.372 mW/g; SAR(10 g) = 0.176 mW/g**[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.525 mW/g



0 dB = 0.525mW/g

Date/Time: 7/25/2011 5:10:32 PM

Test Laboratory: UL CCS SAR Lab D

WiFi\_Right Hand Side\_WiFi

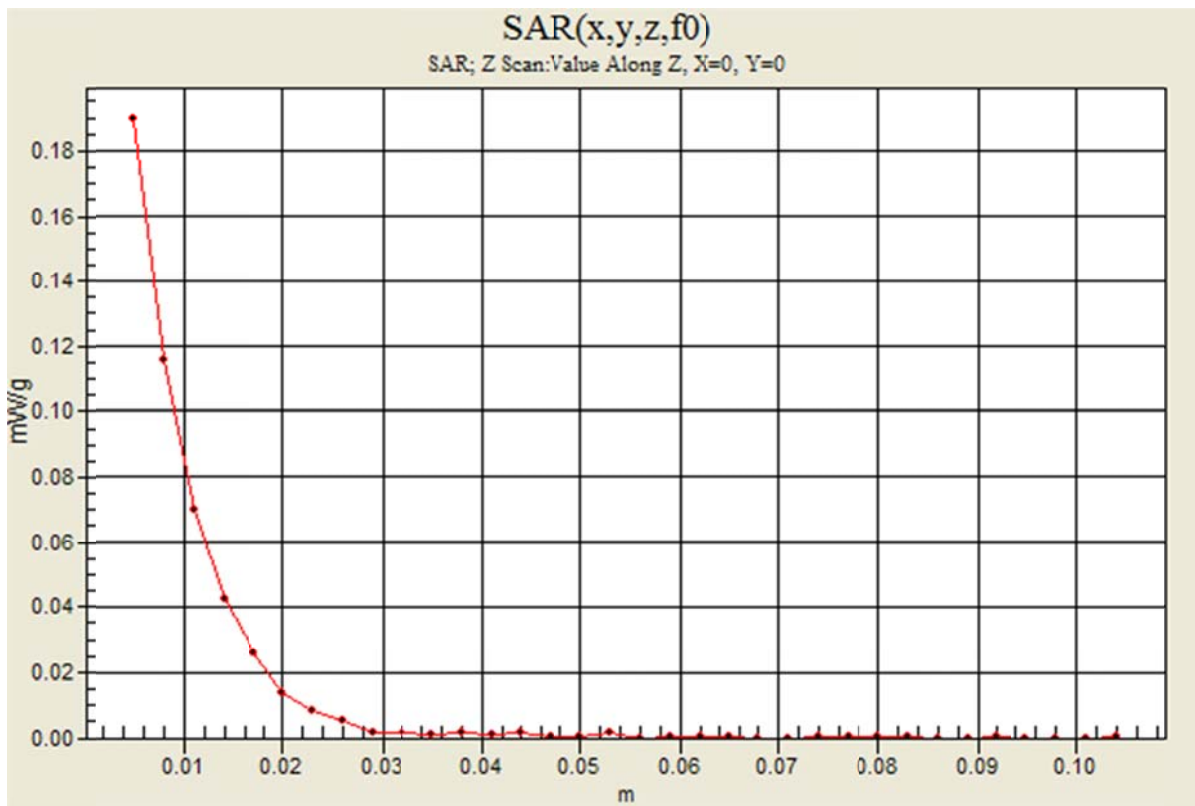
DUT: Apple; Type: N/A; Serial: N/A

Communication System: 802.11b/g 2.4GHz; Frequency: 2437 MHz;Duty Cycle: 1:1

**Touch\_M-ch/Z Scan (1x1x34):** Measurement grid: dx=20mm, dy=20mm, dz=3mm

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

Maximum value of SAR (measured) = 0.190 mW/g





Worst-case Body-worn accessory SAR Plot for Part 22 – 2400MHz Band

Date/Time: 7/28/2011 5:17:57 PM

Test Laboratory: UL CCS SAR Lab D

WiFi\_Body\_WiFi

DUT: Apple; Type: NA; Serial: NA

Communication System: 802.11b/g 2.4GHz; Frequency: 2437 MHz; Duty Cycle: 1:1  
Medium parameters used (interpolated):  $f = 2437$  MHz;  $\sigma = 2$  mho/m;  $\epsilon_r = 50.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3749; ConvF(6.9, 6.9, 6.9); Calibrated: 12/13/2010
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1259; Calibrated: 5/3/2011
- Phantom: SAM B (Twin); Type: SAM B; Serial: TP-105
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Back side\_M-ch/Area Scan (71x91x1):** Measurement grid: dx=15mm, dy=15mm[Info: Interpolated medium parameters used for SAR evaluation.](#)

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

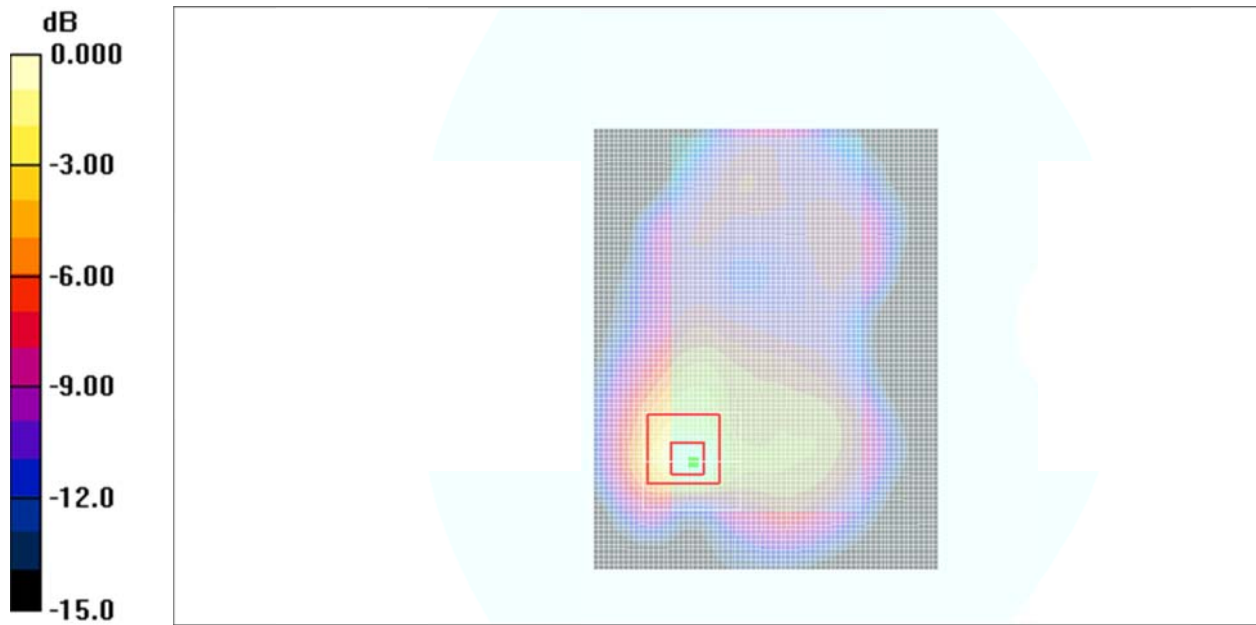
**Back side\_M-ch/Zoom Scan (7x7x9)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 11.5 V/m; Power Drift = -0.014 dB

Peak SAR (extrapolated) = 0.431 W/kg

**SAR(1 g) = 0.191 mW/g; SAR(10 g) = 0.085 mW/g**[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.273 mW/g



0 dB = 0.273mW/g

Date/Time: 7/28/2011 5:39:49 PM

Test Laboratory: UL CCS SAR Lab D

WiFi\_Body\_WiFi

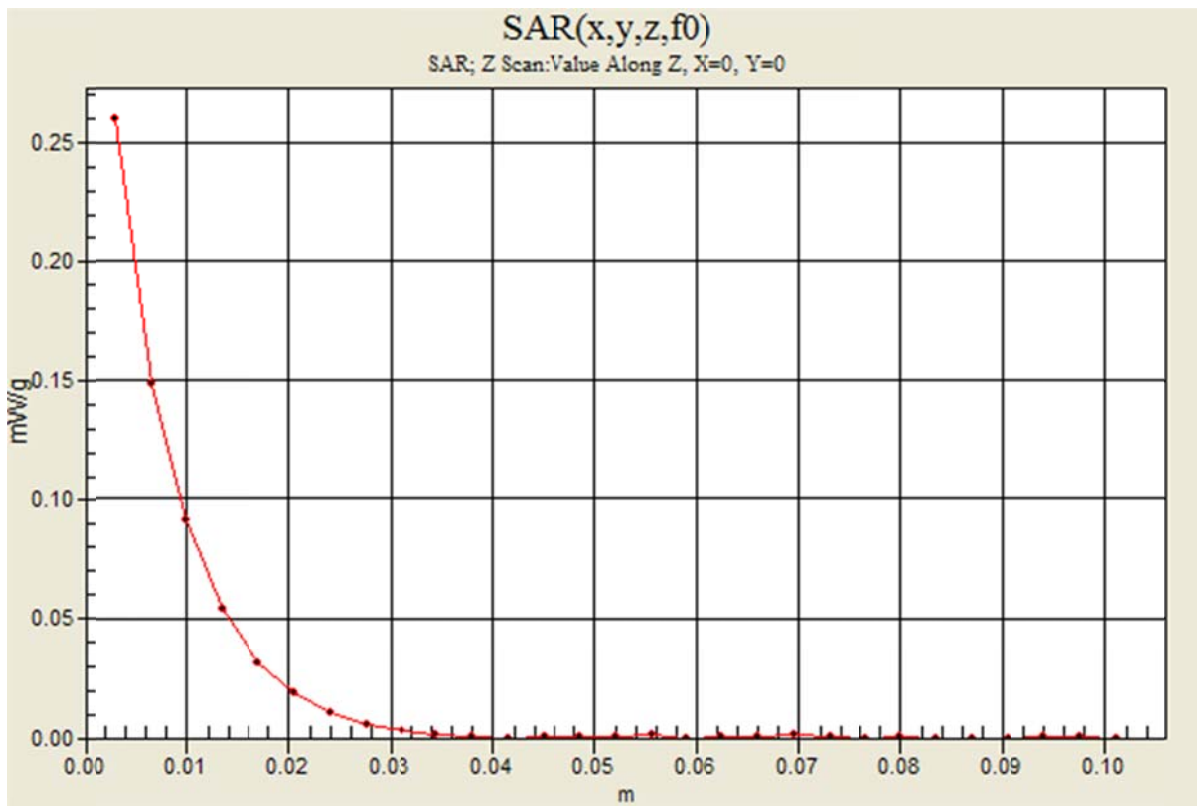
DUT: Apple; Type: NA; Serial: NA

Communication System: 802.11b/g 2.4GHz; Frequency: 2437 MHz; Duty Cycle: 1:1

**Back side\_M-ch/Z Scan (1x1x29):** Measurement grid: dx=20mm, dy=20mm, dz=3.5mm

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

Maximum value of SAR (measured) = 0.260 mW/g



Worst-case Wireless Router (hotspot) SAR Plot for Part 22 – 2400MHz Band

Date/Time: 7/28/2011 5:17:57 PM

Test Laboratory: UL CCS SAR Lab D

WiFi\_Body\_WiFi

DUT: Apple; Type: NA; Serial: NA

Communication System: 802.11b/g 2.4GHz; Frequency: 2437 MHz; Duty Cycle: 1:1  
Medium parameters used (interpolated):  $f = 2437$  MHz;  $\sigma = 2$  mho/m;  $\epsilon_r = 50.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3749; ConvF(6.9, 6.9, 6.9); Calibrated: 12/13/2010
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1259; Calibrated: 5/3/2011
- Phantom: SAM B (Twin); Type: SAM B; Serial: TP-105
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Back side\_M-ch/Area Scan (71x91x1):** Measurement grid: dx=15mm, dy=15mm[Info: Interpolated medium parameters used for SAR evaluation.](#)

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

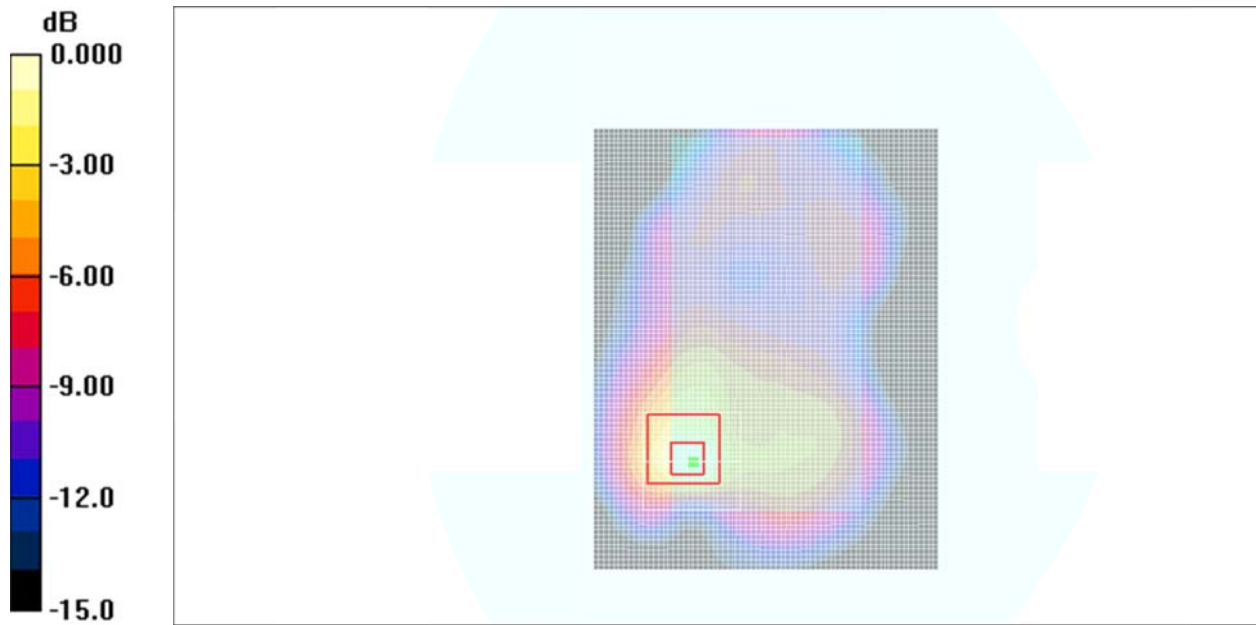
**Back side\_M-ch/Zoom Scan (7x7x9)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 11.5 V/m; Power Drift = -0.014 dB

Peak SAR (extrapolated) = 0.431 W/kg

**SAR(1 g) = 0.191 mW/g; SAR(10 g) = 0.085 mW/g**[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.273 mW/g



0 dB = 0.273mW/g

Date/Time: 7/28/2011 5:39:49 PM

Test Laboratory: UL CCS SAR Lab D

WiFi\_Body\_WiFi

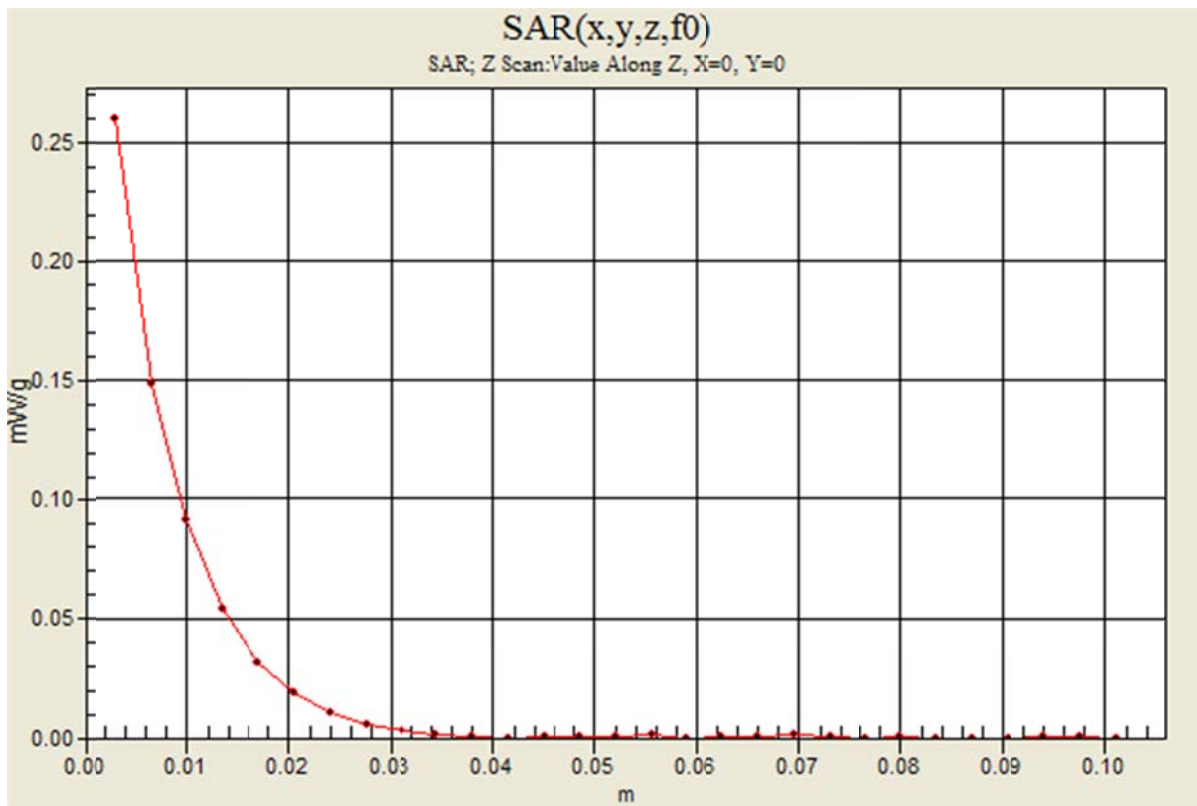
DUT: Apple; Type: NA; Serial: NA

Communication System: 802.11b/g 2.4GHz; Frequency: 2437 MHz; Duty Cycle: 1:1

**Back side\_M-ch/Z Scan (1x1x29):** Measurement grid: dx=20mm, dy=20mm, dz=3.5mm

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

Maximum value of SAR (measured) = 0.260 mW/g



## **12 Attachments**

- 12-1 SAR Test Setup Photos
- 12-2 Calibration and Uncertainty
- 12-3 Liquid Parameters
- 12-4 System Verification
- 12-5 SAR Test Plots for Head
- 12-6 SAR Test Plots for Body
- 12-7 SAR Test Plots for Hot Spot
- 12-8 Certificate of E-Field Probe
- 12-9 Certificate for System Validation Dipole