



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

SAR SUPPLEMENTAL EVALUATION REPORT

For

iPhone / RoW SKU

MODEL: A1387

FCC ID: BCG-E2430A

IC: 579C-E2430A

REPORT NUMBER: 11U13896-5ARoW

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

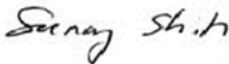
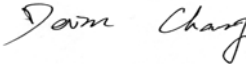
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Revision History

Version	Date	Revisions	By
	08/27/2011	Initial	Sunny Shih
A	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 (RoW SKU)			
Serial Number(s) and IMEI or MEID Numbers	Serial Number(s)	IMEI or MEID Number(s)		
	<ul style="list-style-type: none"> C39FX06PDR33 C39FX055DR33 	<ul style="list-style-type: none"> 99 000085 002068 8 99 000085 001811 2 		
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	R99, 12.2kbps, RMC	Head: LHS Touch	0.987	1.6
	RC3/SO32	Body: Front Side, Distance: 1cm	0.350	
	R99, 12.2kbps, RMC	Hotspot mode: Right-Edge, Distance: 1cm	0.399	
1850 - 1910	RMC 12.2kbps	Head: RHS Touch	1.090	
	GPRS 2 Slots (GMSK, CS1)	Body: Front Side, Distance: 1cm	0.491	
	GPRS 2 Slots (GMSK, CS1)	Hotspot mode: Front Side, Distance: 1cm	0.491	
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>Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government (NIST Handbook 150, Annex A). This report is written to support regulatory compliance of the applicable standards stated above.</p>				
Approved & Released For UL CCS By:		Tested By:		
				
Sunny Shih Engineering 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 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"> • Held to head, • Worn on body (LCD facing up and LCD facing down) with 1cm separation distance, • Personal hot spot function with 1cm separation distance to all sides and edges.
RoW SKU	<p>This device has two SKU versions; North America SKU, and Rest-of-the-World SKU. The only difference between the North America and Rest-of-the-World SKU is re-tuning of the secondary antenna matching network. The antenna matching network for the secondary antenna in North America SKU is optimized for FCC bands only. The primary antenna is same on both SKUs.</p> <p>In compliance with FCC's response to KDB 651190, the test results of secondary antenna in U.S. bands of the Rest-of-the-World SKU are reported in this report.</p>

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.

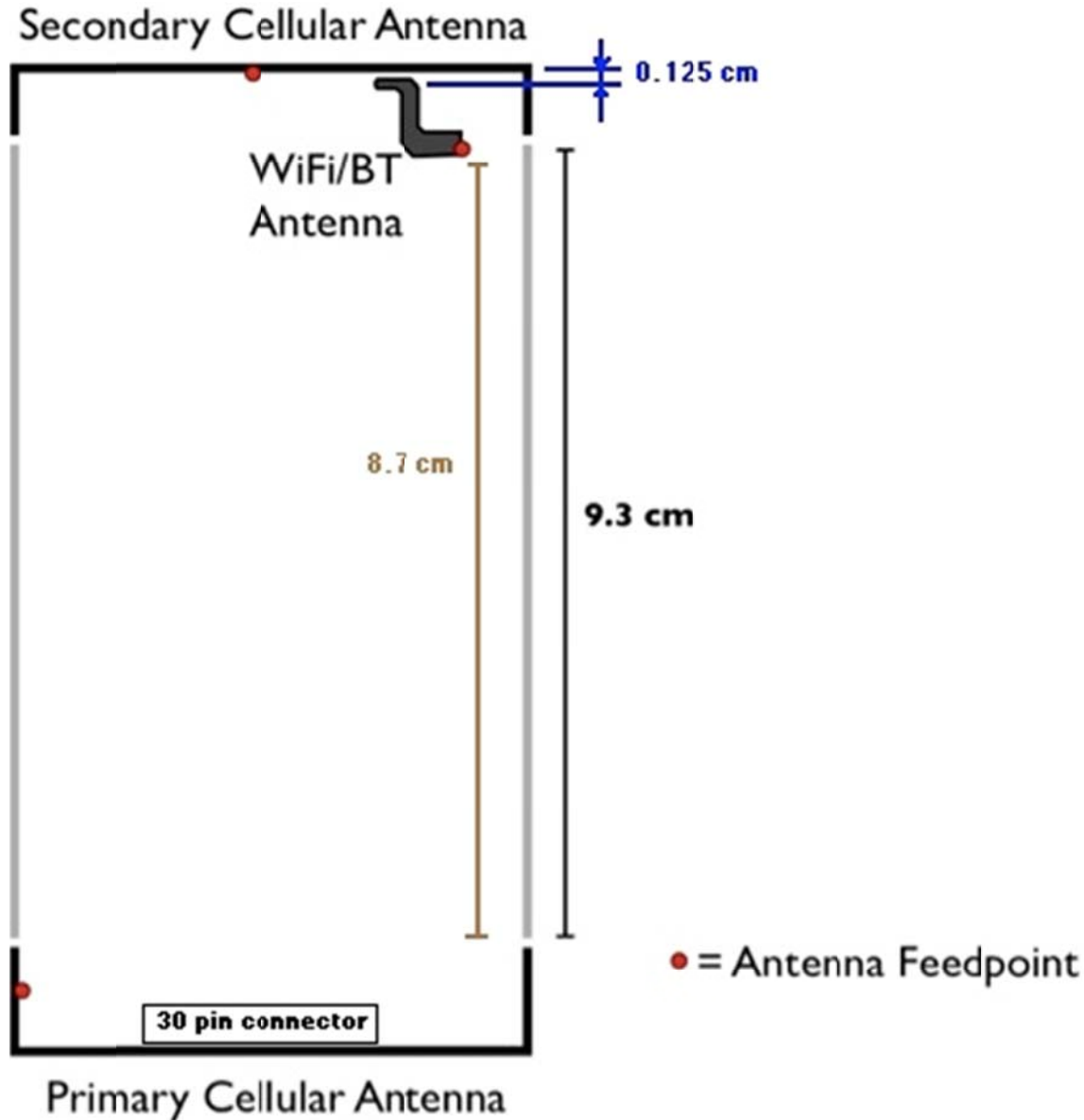
Antenna	Antenna Use	Antenna Type	Technologies	Tx Bands
1	Primary	Metal band/FPC	CDMA 1x (voice), 1xRTT (voice/data), EV-DO, GSM (voice), GPRS/EDGE (data), UMTS (voice), UMTS (data), UMTS (Voice + data mode)*, HSDPA, HSUPA	850/1900
2	Secondary	Metal band	CDMA 1x (voice), 1xRTT (voice/data), EV-DO, GSM (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 given 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: DSS 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

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 DUT Test Conditions

This DUT was tested with configuration and mode when the secondary antenna is used. Test procedure and test setup were following the same procedure as documented in 11U13896-5B SAR test report.

- 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.

6 RF Output Power Verification

The Output power verification is performed on the secondary antenna port only. The output power at the primary antenna port is same for both North America SKU and Rest-of-the-World SKU. Please refer to the FCC SAR report of North America SKU for output power results for the primary antenna.

6.1 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.

6.1.1 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)	Ave Tx Power (dBm)	
					Secondary Antenna	
Cellular	RC1	55 (Loopback)	1013	824.7	23.9	
			384	836.52	23.9	
			777	848.31	23.7	
	RC3	55 (Loopback)	55 (Loopback)	1013	824.7	24.0
				384	836.52	24.0
				777	848.31	23.9
		32 (+ F-SCH)	32 (+ F-SCH)	1013	824.7	23.75
				384	836.52	23.80
				777	848.31	23.70
		32 (+ SCH)	32 (+ SCH)	1013	824.7	23.89
				384	836.52	23.90
				777	848.31	23.70
US PCS	RC1	55 (Loopback)	25	1851.25	20.8	
			600	1880	21.0	
			1175	1908.75	20.8	
	RC3	55 (Loopback)	55 (Loopback)	25	1851.25	20.9
				600	1880	21.0
				1175	1908.75	20.8
		32 (+ F-SCH)	32 (+ F-SCH)	25	1851.25	21.05
				600	1880	21.00
				1175	1908.75	20.70
		32 (+ SCH)	32 (+ SCH)	25	1851.25	20.93
				600	1880	21.10
				1175	1908.75	20.80

6.1.2 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)
					Secondary Antenna
Cellular	307.2 kbps (2 slot, QPSK)	153.6 kbps	1013	824.7	23.95
			384	836.52	23.80
			777	848.31	23.72
US PCS	307.2 kbps (2 slot, QPSK)	153.6 kbps	25	1851.25	20.95
			600	1880	21.00
			1175	1908.75	20.92

6.1.3 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)
					Secondary Antenna
Cellular	307.2 kbps, QPSK/ ACK Channel is transmitted at all the slots	4096	1013	824.7	23.98
			384	836.52	23.90
			777	848.31	23.65
US PCS	307.2 kbps, QPSK/ ACK Channel is transmitted at all the slots	4096	25	1851.25	21.03
			600	1880	21.10
			1175	1908.75	20.70

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.
- **Thus, for 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.**

6.2 GSM Mode

6.2.1 GSM (GMSK)

Band	Ch#	Frequency (MHz)	Avg. TX Power (dBm)
			Secondary Antenna
GSM850	128	824.2	32.3
	190	836.6	32.3
	251	848.8	32.3
GSM1900	512	1850.2	29.3
	661	1880	29.3
	810	1909.8	29.3

6.2.2 GPRS (GMSK) - Coding Scheme: CS1

Band	Ch #	Frequency (MHz)	Avg Tx Power (dBm)			
			Secondary Antenna			
			1 Slot	Frame Avg Power	2 Slots	Frame Avg Power
GPRS 850	128	824.2	32.3	23.3	29.5	23.5
	190	836.6	32.9	23.9	30.0	24
	251	848.8	32.7	23.7	30.0	24
GPRS 1900	512	1850.2	29	20	29.0	23
	661	1880	29.2	20.2	29.0	23
	810	1909.8	29.2	20.2	29.1	23.1

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

6.2.3 EGPRS (8PSK) - Coding Scheme: MCS5

Band	Ch #	Frequency (MHz)	Avg Tx Power (dBm)			
			Secondary Antenna			
			1 Slot	Frame Avg Power	2 Slots	Frame Avg Power
EGPRS 850	128	824.2	25.5	16.5	25.4	19.4
	190	836.6	25.7	16.7	25.6	19.6
	251	848.8	25.8	16.8	25.7	19.7
EGPRS 1900	512	1850.2	22.9	13.9	22.8	16.8
	661	1880	23	14	22.8	16.8
	810	1909.8	22.8	13.8	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 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 secondary antenna,**
 - **GPRS850 2 time slots**
 - **GPRS1900 2 time slots**

6.3 WCDMA Mode

6.3.1 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
	β_c/β_d	8/15

Test Results

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

6.3.2 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			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	β_d (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
	β_{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)
					Secondary Antenna
UMTS850 (Band V)	Subtest 1	4132	4357	826.4	23.21
		4183	4408	836.6	23.15
		4233	4458	846.6	22.9
	Subtest 2	4132	4357	826.4	23.28
		4183	4408	836.6	23.16
		4233	4458	846.6	22.94
	Subtest 3	4132	4357	826.4	22.83
		4183	4408	836.6	22.62
		4233	4458	846.6	22.41
	Subtest 4	4132	4357	826.4	22.87
		4183	4408	836.6	22.67
		4233	4458	846.6	22.37
UMTS1900 (Band II)	Subtest 1	9262	9662	1852.4	20.39
		9400	9800	1880	20.46
		9538	9938	1907.6	20.53
	Subtest 2	9262	9662	1852.4	20.36
		9400	9800	1880	20.5
		9538	9938	1907.6	20.45
	Subtest 3	9262	9662	1852.4	19.95
		9400	9800	1880	19.98
		9538	9938	1907.6	19.92
	Subtest 4	9262	9662	1852.4	19.92
		9400	9800	1880	19.95
		9538	9938	1907.6	20.06

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.

6.3.3 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	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1)	β_{ec}	β_{ed} (Note 4) (Note 5)	β_{ed} (SF)	β_{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	β_{ed1} : 47/15 β_{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, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$. For sub-test 5, Δ_{ACK} , Δ_{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 β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$.

Note 4: 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: β_{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)
					Secondary Antenna
UMTS850 (Band V)	Subtest 1	4132	4357	826.4	23.14
		4183	4408	836.6	22.41
		4233	4458	846.6	22.92
	Subtest 2	4132	4357	826.4	21.83
		4183	4408	836.6	21.87
		4233	4458	846.6	21.66
	Subtest 3	4132	4357	826.4	22.05
		4183	4408	836.6	21.72
		4233	4458	846.6	21.33
	Subtest 4	4132	4357	826.4	22.31
		4183	4408	836.6	22.2
		4233	4458	846.6	21.8
	Subtest 5	4132	4357	826.4	23.16
		4183	4408	836.6	23.07
		4233	4458	846.6	22.85
UMTS1900 (Band II)	Subtest 1	9262	9662	1852.4	19.68
		9400	9800	1880	19.96
		9538	9938	1907.6	20.2
	Subtest 2	9262	9662	1852.4	18.84
		9400	9800	1880	19.22
		9538	9938	1907.6	18.85
	Subtest 3	9262	9662	1852.4	18.88
		9400	9800	1880	18.92
		9538	9938	1907.6	19.02
	Subtest 4	9262	9662	1852.4	19.41
		9400	9800	1880	19.37
		9538	9938	1907.6	19.26
	Subtest 5	9262	9662	1852.4	20.37
		9400	9800	1880	20.39
		9538	9938	1907.6	20.39

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.

7 Standalone SAR Test Results

The Standalone SAR for secondary antenna of Rest-of-the-World SKU is tested

- o For each wireless mode,
- o For each exposure condition (head, body-worn accessory, wireless router mode), and
- o For each frequency band

at the highest SAR configuration of the North American SKU.

7.1 Head Exposure Condition

Highest Standalone SAR Test Results based upon SAR report 11U13896-5B North America SKU for each wireless mode are below:

Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
CDMA2000 Cell	Secondary	1xRTT Voice (RC3, SO55)	LHS Touch	384	836.52	24.1	1.120
CDMA2000 PCS	Secondary	1xRTT Voice (RC3, SO55)	RHS Touch	1175	1908.75	20.8	1.150
GSM850	Secondary	GMSK, Voice	LHS Touch	251	848.8	32.4	0.869
GSM1900	Secondary	GMSK, Voice	RHS Tilt	810	1909.8	29.3	0.968
UMTS Band V	Secondary	R99, 12.2kbps, RMC	LHS Touch	4183	836.6	24.0	1.130
UMTS Band II	Secondary	R99, 12.2kbps, RMC	RHS Touch	9538	1907.6	21.1	1.180

The SAR values for the Rest-of-the-World SKU for the above wireless mode are below.

Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
CDMA2000 Cell	Secondary	1xRTT Voice (RC3, SO55)	LHS Touch	384	836.52	24.0	0.947
CDMA2000 PCS	Secondary	1xRTT Voice (RC3, SO55)	RHS Touch	1175	1908.75	20.8	1.020
GSM850	Secondary	GMSK, Voice	LHS Touch	251	848.8	32.3	0.650
GSM1900	Secondary	GMSK, Voice	RHS Tilt	810	1909.8	29.3	0.724
UMTS Band V	Secondary	R99, 12.2kbps, RMC	LHS Touch	4183	836.6	24.0	0.987
UMTS Band II	Secondary	R99, 12.2kbps, RMC	RHS Touch	9538	1907.6	21.0	1.020

Secondary Antenna Head Evaluation and Test Mode

Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
CDMA2000 Cell	Secondary	1xRTT Voice (RC3, SO55)	LHS Touch	1013	824.7	24.0	0.926
CDMA2000 Cell	Secondary	1xRTT Voice (RC3, SO55)	LHS Touch	384	836.52	24.0	0.947
CDMA2000 Cell	Secondary	1xRTT Voice (RC3, SO55)	LHS Touch	777	848.31	23.9	0.947

Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
CDMA2000 PCS	Secondary	1xRTT Voice (RC3, SO55)	RHS Touch	25	1851.25	20.9	0.997
CDMA2000 PCS	Secondary	1xRTT Voice (RC3, SO55)	RHS Touch	600	1880	21.0	0.923
CDMA2000 PCS	Secondary	1xRTT Voice (RC3, SO55)	RHS Touch	1175	1908.75	20.8	1.020
CDMA2000 PCS	Secondary	1xRTT Voice (RC3, SO55)	RHS Tilt	25	1851.25	20.9	0.989
CDMA2000 PCS	Secondary	1xRTT Voice (RC3, SO55)	RHS Tilt	600	1880	21.0	1.020
CDMA2000 PCS	Secondary	1xRTT Voice (RC3, SO55)	RHS Tilt	1175	1908.75	20.8	0.916

Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
PCS 1900	Secondary	1xRTT Voice (RC3, SO55)	RHS Touch	512	1850.2	29.3	0.712
PCS 1900	Secondary	1xRTT Voice (RC3, SO55)	RHS Touch	661	1880	29.3	0.826
PCS 1900	Secondary	1xRTT Voice (RC3, SO55)	RHS Touch	810	1909.8	29.3	0.724
PCS 1900	Secondary	1xRTT Voice (RC3, SO55)	RHS Tilt	512	1850.2	29.3	0.824
PCS 1900	Secondary	1xRTT Voice (RC3, SO55)	RHS Tilt	661	1880	29.3	0.766
PCS 1900	Secondary	1xRTT Voice (RC3, SO55)	RHS Tilt	810	1909.8	29.3	0.766

Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
UMTS Band V	Secondary	R99 12.2kbps RMC	LHS Touch	4132	826.4	24.0	0.809
UMTS Band V	Secondary	R99 12.2kbps RMC	LHS Touch	4183	836.6	24.0	0.987
UMTS Band V	Secondary	R99 12.2kbps	LHS Touch	4233	846.6	24.0	0.869

		RMC					
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Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
UMTS Band II	Secondary	R99 12.2kbps RMC	RHS Touch	9262	1852.4	21.0	1.090
UMTS Band II	Secondary	R99 12.2kbps RMC	RHS Touch	9400	1880.00	21.1	1.090
UMTS Band II	Secondary	R99 12.2kbps RMC	RHS Touch	9538	1907.6	21.0	1.020
UMTS Band II	Secondary	R99 12.2kbps RMC	RHS Tilt	9262	1852.4	21.0	0.880
UMTS Band II	Secondary	R99 12.2kbps RMC	RHS Tilt	9400	1880.00	21.1	1.010
UMTS Band II	Secondary	R99 12.2kbps RMC	RHS Tilt	9538	1907.6	21.0	1.040

7.2 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.

The highest SAR values for the North American SKU for each wireless mode are below.

Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
CDMA2000 Cell	Secondary	1xRTT Voice (RC3, SO32)	Front	384	836.52	23.70	0.467
CDMA2000 PCS	Secondary	1xRTT Voice (RC3, SO32)	Back	600	1880.0	21.0	0.360
GSM850	Secondary	GMSK, Voice	Back	190	836.6	32.5	0.271
GPRS850	Secondary	GPRS 2 Slots (GMSK, CS1)	Front	190	836.6	30.1	0.315
GSM1900	Secondary	GMSK, Voice	Back	661	1880.0	29.4	0.375
GPRS1900	Secondary	GPRS 2 Slots (GMSK, CS1)	Front	661	1880.0	29.0	0.633
UMTS Band V	Secondary	R99, 12.2kbps, RMC	Back	4183	836.6	24.0	0.463
UMTS Band II	Secondary	R99, 12.2kbps, RMC	Back	9400	1880.0	21.1	0.504

The SAR values for the Rest-of-the-World SKU for the above wireless mode are below.

Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
CDMA2000 Cell	Secondary	1xRTT Voice (RC3, SO32)	Front	384	836.52	23.80	0.35
CDMA2000 PCS	Secondary	1xRTT Voice (RC3, SO32)	Back	600	1880.0	21.0	0.235
GSM850	Secondary	GMSK, Voice	Back	190	836.6	32.3	0.186
GPRS850	Secondary	GPRS 2 Slots (GMSK, CS1)	Front	190	836.6	30.0	0.308
GSM1900	Secondary	GMSK, Voice	Back	661	1880.0	29.2	0.319
GPRS1900	Secondary	GPRS 2 Slots (GMSK, CS1)	Front	661	1880.0	29.0	0.491
UMTS Band V	Secondary	R99, 12.2kbps, RMC	Back	4183	836.6	24.0	0.333
UMTS Band II	Secondary	R99, 12.2kbps, RMC	Back	9400	1880.0	21.1	0.424

Secondary ANT Body-worn Evaluation and Test Mode

Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
CDMA2000 Cell	Secondary	1xRTT Voice (RC3, SO32)	Front	384	836.52	23.80	0.35
CDMA2000 Cell	Secondary	1xRTT Voice (RC3, SO32)	Back	384	836.52	23.80	0.349

Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
CDMA2000 PCS	Secondary	1xRTT Voice (RC3, SO32)	Front	600	1880.0	21.0	0.181
CDMA2000 PCS	Secondary	1xRTT Voice (RC3, SO32)	Back	600	1880.0	21.0	0.235

Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
UMTS Band V	Secondary	R99, 12.2kbps, RMC	Front	4183	836.6	24.0	0.339
UMTS Band V	Secondary	R99, 12.2kbps, RMC	Back	4183	836.6	24.0	0.333

Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
UMTS Band II	Secondary	R99, 12.2kbps, RMC	Front	9400	1880.0	21.1	0.329
UMTS Band II	Secondary	R99, 12.2kbps, RMC	Back	9400	1880.0	21.1	0.424

7.3 Wireless Router (Hotspot) Exposure Condition

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. Some test time reductions are applied for some configurations.

The highest SAR values for the North American SKU for each wireless mode are below.

Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
CDMA2000 Cell	Secondary	1xEVDO Rev. 0	Front	384	836.52	23.8	0.461
CDMA2000 PCS	Secondary	1xEVDO Rev. 0	Back	600	1880.0	21.0	0.355
GPRS850	Secondary	GPRS 2 Slots (GMSK, CS1)	Right Edge	190	836.6	30.1	0.390
GPRS1900	Secondary	GPRS 2 Slots (GMSK, CS1)	Front	661	1880.0	29.0	0.633
UMTS Band V	Secondary	R99, 12.2kbps, RMC	Right Edge	4183	836.6	24.0	0.499
UMTS Band II	Secondary	R99, 12.2kbps, RMC	Back	9400	1880.0	21.1	0.504

The SAR values for the Rest-of-the-World SKU for the above wireless mode are below.

Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
CDMA2000 Cell	Secondary	1xEVDO Rev. 0	Front	384	836.52	23.80	0.327
CDMA2000 PCS	Secondary	1xEVDO Rev. 0	Back	600	1880.0	21.0	0.248
GPRS850	Secondary	GPRS 2 Slots (GMSK, CS1)	Right Edge	190	836.6	30.0	0.366
GPRS1900	Secondary	GPRS 2 Slots (GMSK, CS1)	Front	661	1880.0	29.0	0.491
UMTS Band V	Secondary	R99, 12.2kbps, RMC	Right Edge	4183	836.6	23.9	0.399
UMTS Band II	Secondary	R99, 12.2kbps, RMC	Back	9400	1880.0	21.1	0.424

Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
UMTS Band V	Secondary	R99, 12.2kbps, RMC	Front	4183	836.6	24.0	0.339
UMTS Band V	Secondary	R99, 12.2kbps, RMC	Back	4183	836.6	24.0	0.333
UMTS Band V	Secondary	R99, 12.2kbps, RMC	Right Edge	4183	836.6	24.0	0.399
UMTS Band V	Secondary	R99, 12.2kbps, RMC	Left Edge	4183	836.6	24.0	0.072
UMTS Band V	Secondary	R99, 12.2kbps, RMC	Top Edge	4183	836.6	24.0	0.141

Band	Antenna	Mode	Test Position	Ch #	Freq. (MHz)	Power (dBm)	SAR (W/Kg) 1-g
UMTS Band II	Secondary	R99, 12.2kbps, RMC	Front	9400	1880.0	21.1	0.329
UMTS Band II	Secondary	R99, 12.2kbps, RMC	Back	9400	1880.0	21.1	0.424
UMTS Band II	Secondary	R99, 12.2kbps, RMC	Right Edge	9400	1880.0	21.1	0.076
UMTS Band II	Secondary	R99, 12.2kbps, RMC	Left Edge	9400	1880.0	21.1	0.141
UMTS Band II	Secondary	R99, 12.2kbps, RMC	Top Edge	9400	1880.0	21.1	0.239

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.

8 Highest SAR Test Plots

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

Date: 8/9/2011

Test Laboratory: UL CCS SAR Lab C

EU UMTS band V_Left Hand Side_Ant Secondary

Communication System: UMTS-FDD (WCDMA); Frequency: 836.6 MHz; Duty Cycle: 1:2.18776
 Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.863$ mho/m; $\epsilon_r = 43.347$; $\rho = 1000$ kg/m³
 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)
- 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=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (interpolated) = 1.136 mW/g

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

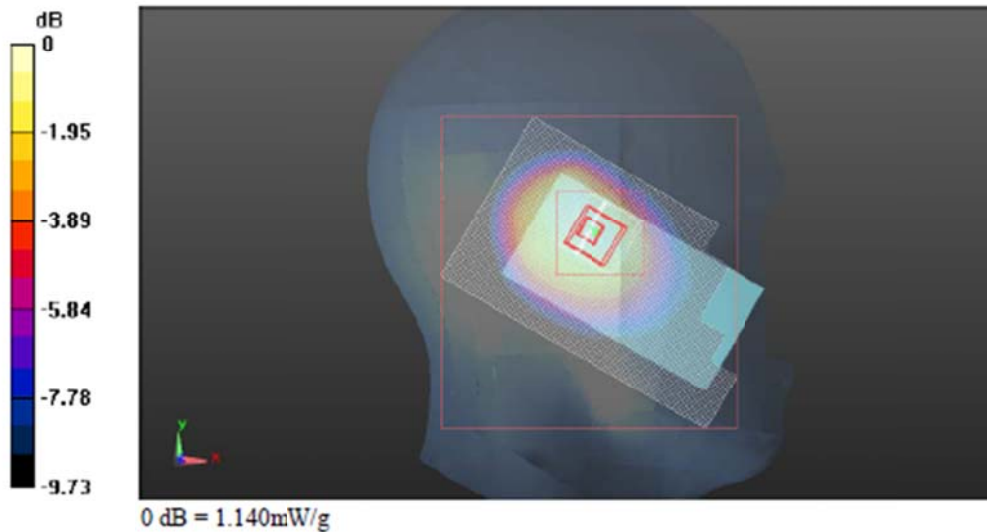
Reference Value = 35.860 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 1.303 W/kg

SAR(1 g) = 0.987 mW/g; SAR(10 g) = 0.701 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

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



Date: 8/9/2011

Test Laboratory: UL CCS SAR Lab C

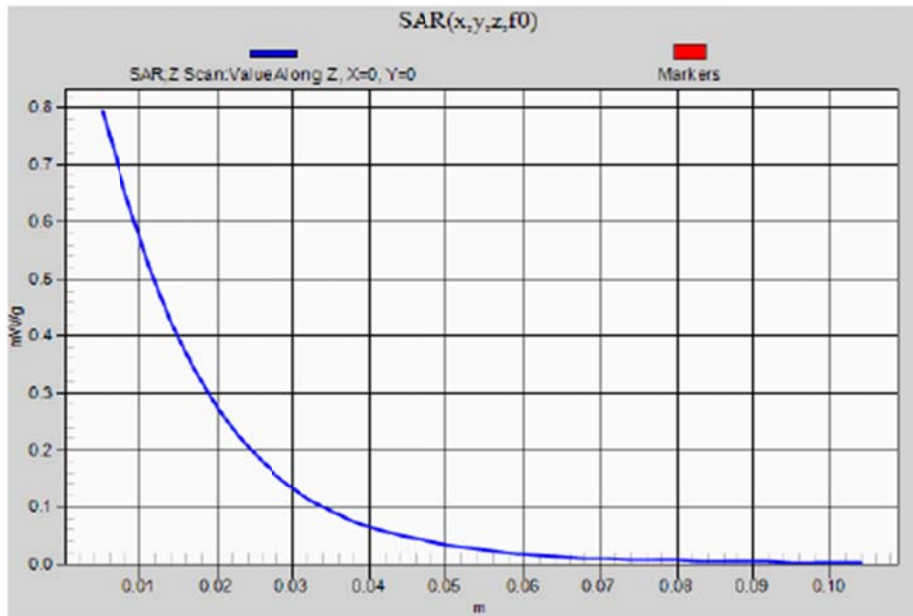
EU UMTS band V_Left Hand Side_Ant Secondary

Communication System: UMTS-FDD (WCDMA); Frequency: 836.8 MHz; Duty Cycle: 1:2.18776

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) = 0.795 mW/g



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

Date: 10/1/2011

Test Laboratory: UL CCS SAR Lab C

EU CDMA2000 Cell band 1xRTT (RC3 S055)_Body_Ant Secondary

Communication System: CDMA2000; Frequency: 836.52 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 0.985$ mho/m; $\epsilon_r = 54.805$; $\rho = 1000$ kg/m³
 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 v4.0 (A); Type: QDOVA001BB; Serial: 1117
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Front side/M-ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (interpolated) = 0.367 mW/g

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

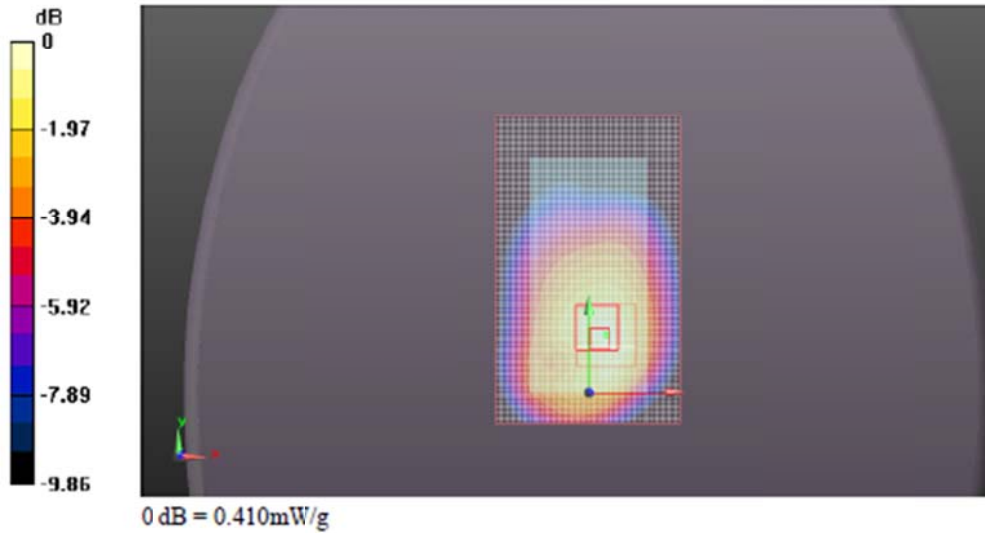
Reference Value = 19.630 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.495 W/kg

SAR(1 g) = 0.350 mW/g; SAR(10 g) = 0.249 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.412 mW/g



Date: 10/1/2011

Test Laboratory: UL CCS SAR Lab C

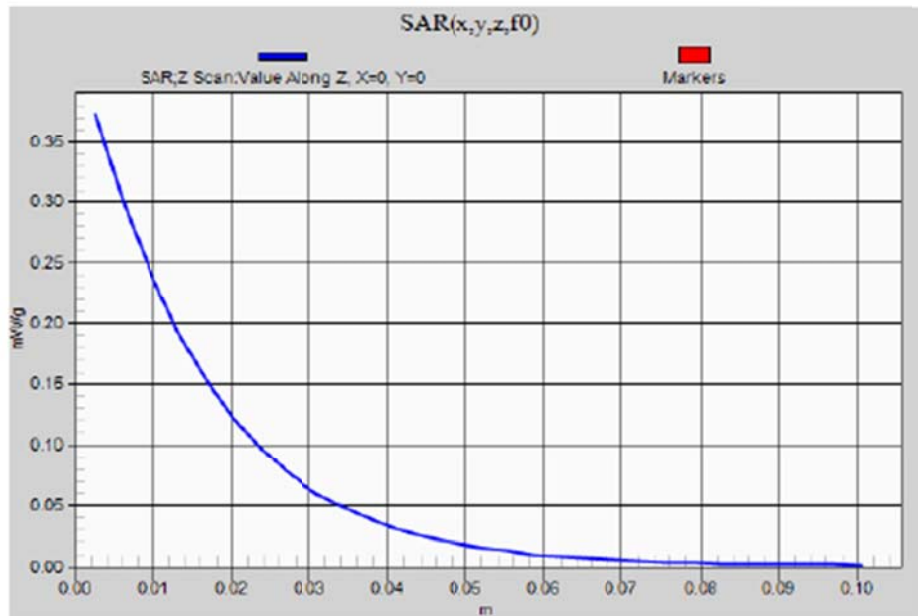
EU CDMA2000 Cell band 1xRTT (RC3 SO55)_Body_Ant Secondary

Communication System: CDMA2000; Frequency: 838.52 MHz; Duty Cycle: 1:1

Front 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) = 0.373 mW/g



Worst-case Hot Spot SAR Plot for Part 22 – 850MHz Band

Date: 8/3/2011

Test Laboratory: UL CCS SAR Lab C

EU_ UMTS band V_Body (Hotspot)_Ant Secondary

.333.333Communication System: UMTS-FDD (WCDMA); Frequency: 836.6 MHz;Duty Cycle: 1:2.18776
 Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.97$ mho/m; $\epsilon_r = 54.886$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

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

DASY5 Configuration:

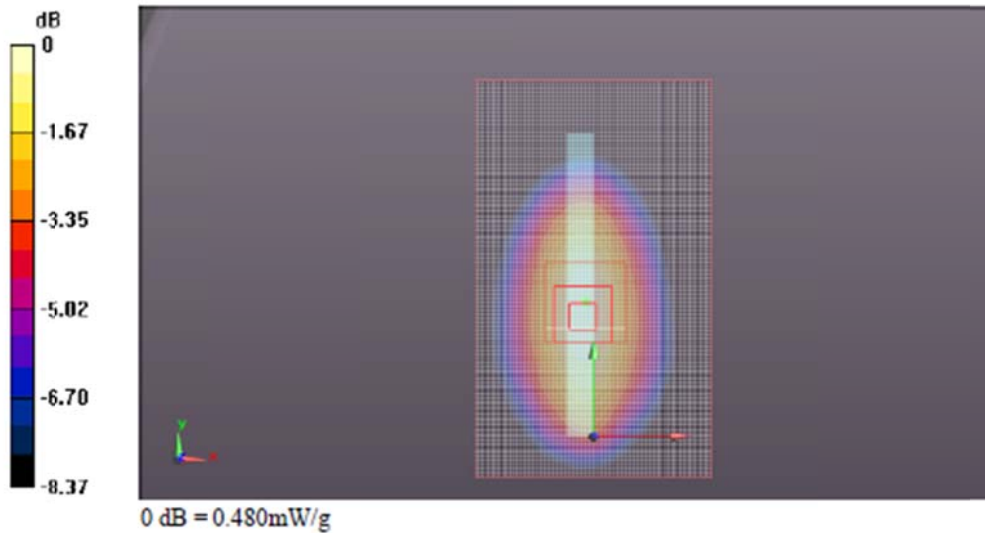
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3772; ConvF(8.57, 8.57, 8.57); Calibrated: 5/3/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1257; Calibrated: 5/3/2011
- Phantom: ELI v5.0 (B); Type: QDOVA001BB; Serial: 1121
- Measurement SW: DASY52, Version 52.6 (2);SEMCAD X Version 14.4.5 (3834)

Right edge/M-ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
 Maximum value of SAR (interpolated) = 0.474 mW/g

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

Reference Value = 22.099 V/m; Power Drift = -0.05 dB
 Peak SAR (extrapolated) = 0.600 W/kg
SAR(1 g) = 0.399 mW/g; SAR(10 g) = 0.273 mW/g
 Info: Interpolated medium parameters used for SAR evaluation.
 Maximum value of SAR (measured) = 0.480 mW/g



Test Laboratory: UL CCS SAR Lab C

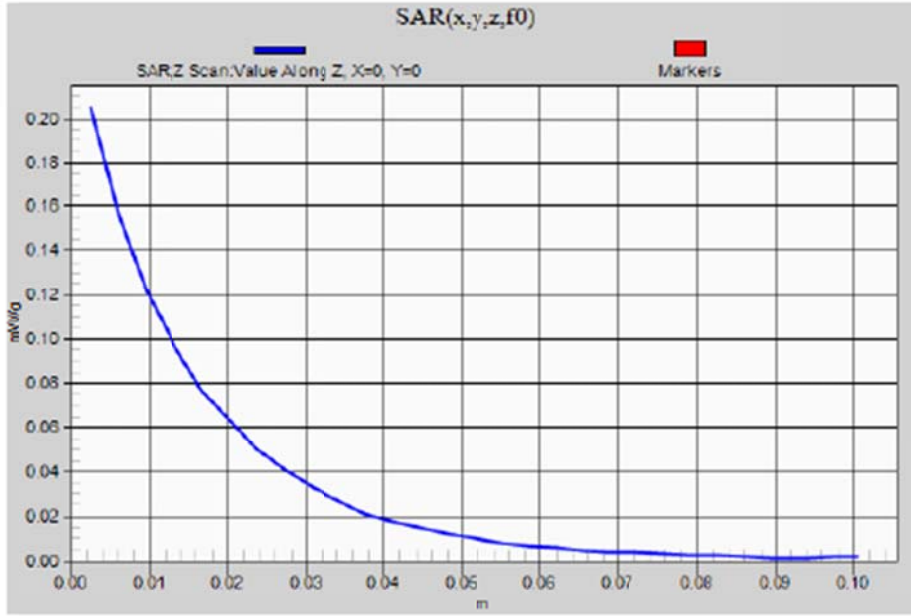
EU_ UMTS band V_Body (Hotspot)_Ant Secondary

Communication System: UMTS-FDD (WCDMA); Frequency: 836.8 MHz; Duty Cycle: 1:2.18776

Right edge/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) = 0.205 mW/g



Worst-case HEAD SAR Plot for Part 24 – 1900MHz Band

Date/Time: 8/2/2011 12:32:32 PM

Test Laboratory: UL CCS SAR Lab D

EU_UMTS band II_Right Hand Side_Ant Secondary

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

Communication System: UMTS Band II; Frequency: 1852.4 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1852.4$ MHz; $\sigma = 1.3$ mho/m; $\epsilon_r = 38.9$; $\rho = 1000$ kg/m³
 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 (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 188

Touch_L-ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (interpolated) = 1.31 mW/g

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

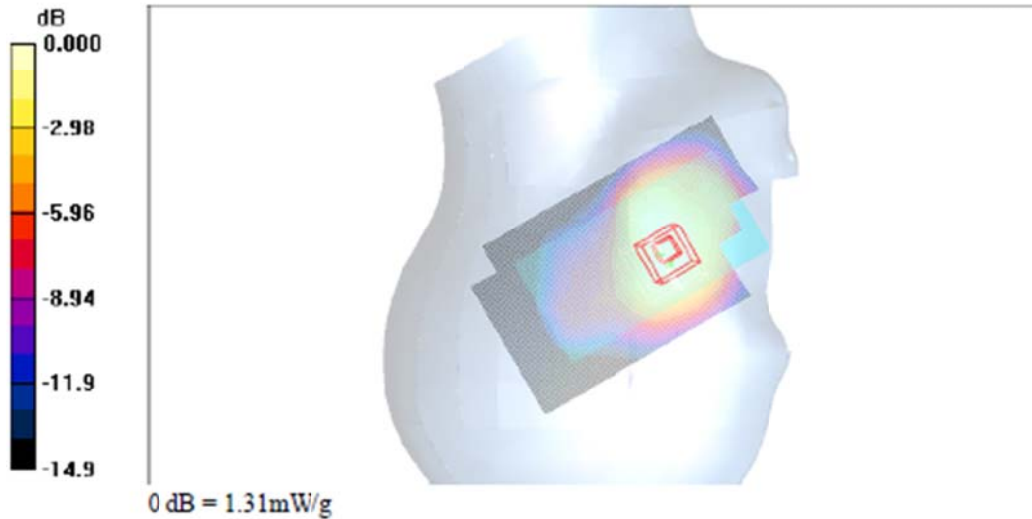
Reference Value = 29.9 V/m; Power Drift = -0.010 dB

Peak SAR (extrapolated) = 1.61 W/kg

SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.720 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.31 mW/g



Date/Time: 8/2/2011 12:52:38 PM

Test Laboratory: UL CCS SAR Lab D

EU_UMTS band II_Right Hand Side_Ant Secondary

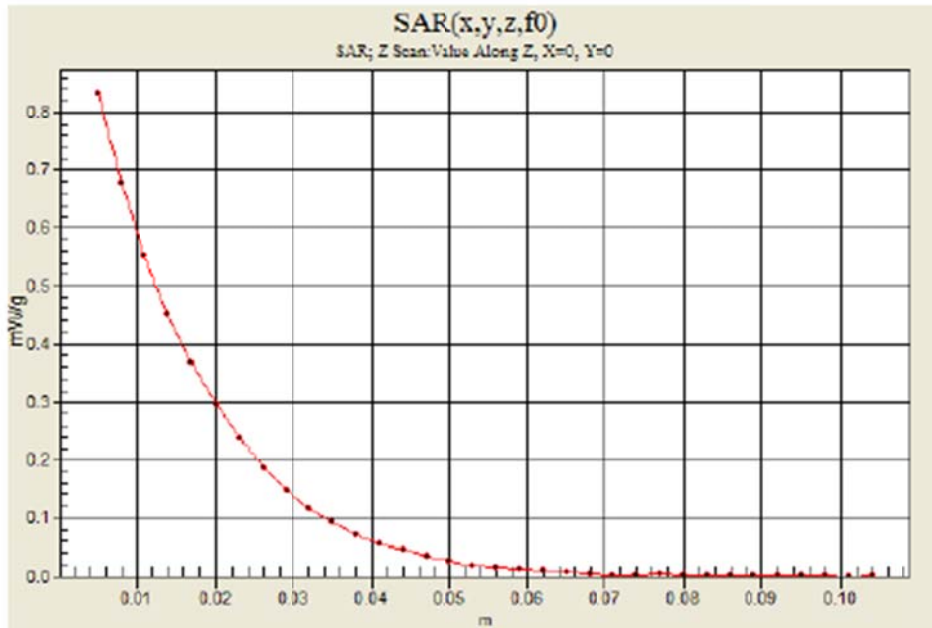
DUT: Apple; Type: N/A; Serial: N/A

Communication System: UMTS Band II; Frequency: 1852.4 MHz; Duty Cycle: 1:1

Touch_L-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) = 0.833 mW/g



Worst-case Body/ Hot Spot SAR Plot for Part 24 – 1900MHz Band

Date/Time: 9/30/2011 10:29:01 AM

Test Laboratory: UL CCS SAR Lab D

GSM1900

Communication System: PCS1900; Frequency: 1880 MHz; Duty Cycle: 1:4
 Medium parameters used: $f = 1880$ MHz; $\sigma = 1.48$ mho/m; $\epsilon_r = 52.9$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

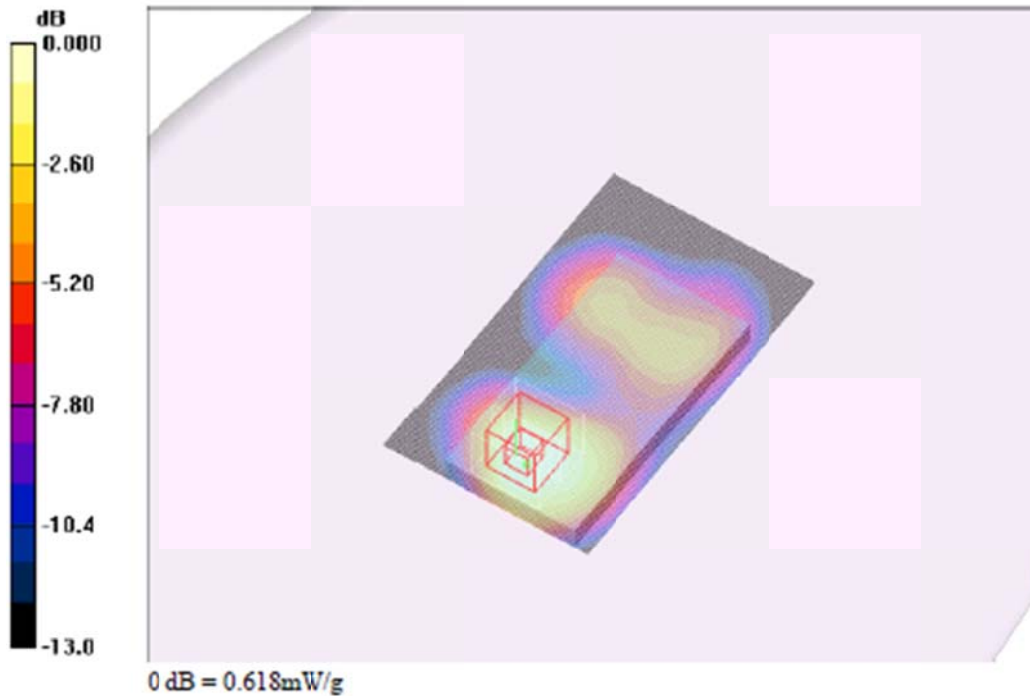
Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

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 188

Body Worn_Front_EU Spot Check/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (interpolated) = 0.745 mW/g

Body Worn_Front_EU Spot Check/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
 Reference Value = 20.6 V/m; Power Drift = -0.585 dB
 Peak SAR (extrapolated) = 0.805 W/kg
SAR(1 g) = 0.491 mW/g; SAR(10 g) = 0.285 mW/g
 Maximum value of SAR (measured) = 0.818 mW/g



9 Attachments

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