MOTOROLA

Portable Cellular Phone SAR Test Report

Tests Requested By:	Motorola Mobility, Inc. 600 N. US Highway 45 Libertyville, IL 60048
Test Report #:	24564-1F Rev. B
Date of Report:	Jul-06-2011
Date of Test:	Apr-24-2011 to Jun-21-2011
FCC ID #:	IHDT56MX1
Generic Name:	MMQCX10-3335511A11
Test Laboratory:	Motorola Mobility, Inc. - ADR Test Services Laboratory 600 N. US Highway 45 Libertyville, IL 60048
Report Author:	Thomas Knipple Senior RF Engineer

Accreditation:

This laboratory is accredited to ISO/IEC 17025-2005 to perform the following tests:

Tests:	Procedures:
Electromagnetic Specific Absorption Rate	IEC 62209-1 RSS-102 IEEE 1528 - 2003 FCC OET Bulletin 65 (*including Supplement C*) Australian Communications Authority Radio Communications (Electromagnetic Radiation – Human Exposure) Standard 2003 CENELEC EN 50360 ARIB Std. T-56 (2002)

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On the following products or types of products:
Wireless Communications Devices (Examples): Two Way Radios; Portable Phones (including Cellular, Licensed Non-Broadcast and PCS); Low Frequency Readers; and Pagers

Statement of Compliance:

Motorola declares under its sole responsibility that the portable cellular telephone model to which this declaration relates, is in conformity with the appropriate General Population/Uncontrolled RF exposure standards, recommendations and guidelines (FCC 47 CFR §2.1093) as well as with CENELEC en50360:2001 and ANSI / IEEE C95.1. It also declares that the product was tested in accordance with IEEE 1528 / CENELEC EN62209-1 (2006), as well as other appropriate measurement standards, guidelines and recommended practices. Any deviations from these standards, guidelines and recommended practices are noted below:

Motorola's ISO 17025 accreditation scope does not currently include SAR testing in the 5 GHz band. Therefore, SAR testing performed in this band was performed outside of our ISO 17025 accreditation. The general procedures and guidelines provided within; FCC KDB 248227 D01, FCC KDB 648474 D01, FCC KDB 865664 D01 and IEC 62209-2 were utilized for testing.

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1. Introduction

The Motorola Mobility ADR Test Services Laboratory has performed measurements of the maximum potential exposure to the user of the portable cellular phone covered by this test report. The Specific Absorption Rate (SAR) of this product was measured. The portable cellular phone was tested in accordance with [1], [4] and [5]. The SAR values measured for the portable cellular phone are below the maximum recommended levels of 1.6 W/kg in a 1 g average set in [3] and 2.0 W/kg in a 10 g average set in [2].

For ANSI / IEEE C95.1 (1 g), the final stand-alone SAR readings for this phone are given in the table below. These measurements were performed using a Dasy4™ v4.7 system manufactured by Schmid & Partner Engineering AG (SPEAG), of Zurich Switzerland.

Transmit Band	Head SAR (1 g $^{W}/_{kg}$)	Body-Worn Accessory SAR (1 g $^{W}/_{kg}$)	Mobile Hotspot SAR (1 g $^{W}/_{kg}$)
LTE Band 13	**0.72**	**0.50**	**1.25**
CDMA 800	**0.88**	**0.41**	**1.38**
CDMA 1900	**0.77**	**0.94**	**1.48**
Wi-Fi 2.45 GHz	**0.17**	**0.01**	**0.13**

2. Description of the Device Under Test

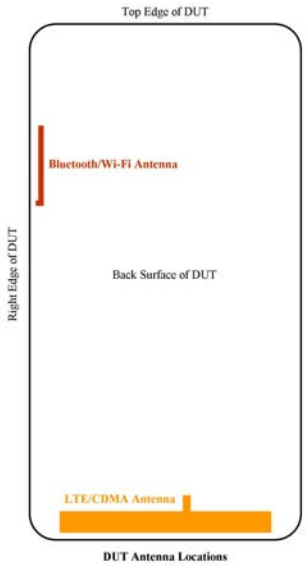
2.1 Antenna description

LTE/CDMA (782/850/1900 MHz) Antenna

Type	Internal	
Location	Bottom of Transceiver	
Dimensions	Width	9.53 mm
	Length	52.35 mm

Bluetooth/Wi-Fi 2 GHz Antenna

Type	Internal	
Location	Right-Side Rear of Transceiver	
Dimensions	Width	3.67 mm
	Length	20.42 mm



DUT Antenna Locations

2.2 Device Signaling

Serial Number(s) (Functional Use)	LTGV260027	(CDMA conducted power measurements, Wi-Fi 2.4 GHz SAR testing)
	TA0470499P	(CDMA head/body/mobile hotspot SAR testing, Wi-Fi 2.4 GHz SAR testing)
	LTGV260247	(Wi-Fi 2.4 GHz conducted power measurements)
	LTGV430034	(LTE conducted power measurements, LTE head/body/mobile hotspot SAR testing)
	TA0470498N	(LTE head/body/mobile hotspot SAR testing)
	TA0470499F	(LTE head/body svLTE SAR testing)
	LTGV530046	(LTE mobile hotspot with svLTE SAR testing)
Production Unit or Identical Prototype (47 CFR §2..908)	Identical Prototype	
Device Category	Portable	
RF Exposure Limits	General Population / Uncontrolled	

Mode(s) of Operation	Modulation Mode(s)	Maximum Output Power Setting	Duty Cycle	Transmitting Frequency Range(s)
LTE Band 13	QPSK, 16QAM	24.0 dBm	1:1	777 - 787 MHz (1 Channel, 10 MHz wide)
CDMA 800	QPSK	25.0 dBm	1:1	824.70 - 848.31 MHz
CDMA 1900	QPSK	25.0 dBm	1:1	1851.20 - 1908.75 MHz
Wi-Fi 802.11b/g/n	BPSK	18.4 dBm	1:1	2412.0 - 2462.5 MHz
Bluetooth	GFSK	8.2 dBm	1:1	2402.0 - 2483.5 MHz

2.2.1 LTE Device Description

LTE Summary Information per FCC KDB 941225

	FCC ID			IHDT56MX1
	Form Factor			Handset
1	**Frequency Range**			777 MHz - 787 MHz
2	**Channel Bandwidths**			10 MHz
3	**L,M,H Channel Numbers and Frequencies**			
	Low	**Mid**	**High**	
	N/A	23230 (782 MHz)	N/A	
4	**UE Category**			1
	Modulations Supported			QPSK, 16QAM
5	**Description of LTE Tx and Antenna Implementation**			1 TX/RX Antenna; 1 RX Antenna
6	**LTE Voice Available?**			No
	Hotspot with LTE + Wi-Fi?			Yes
	Hotspot with LTE + Wi-Fi active with 1x Voice sessions?			Yes
7 (a)	**LTE MPR Permanently Implemented per 3GPP TS 36.101?**			Yes
7 (b)	**A-MPR disabled (by setting NS=01 on the R&S CMW500)?**			Yes
8	**Conducted power table providing 1 RB (lower and upper edge), 50% RB (centered) and 100% RB**			Yes
9	**Table provided specifying other US wireless operating modes?**			Yes
10	**Table provided specifying maximum average conducted power for these other wireless modes**			Yes
11	**Table provided identifying simultaneous transmission conditions?**			Yes
12	**Power Reduction used for SAR compliance?**			Yes
	Power Reduction used for CDMA?			Yes, for Hotspot
	Power Reduction used for LTE?			No
	Power Reduction used for svLTE?			Yes
13	**Test Equipment used**			CMW500 SW version 2.0.20.10

LTE Maximum Power Reduction (MPR) conditions are defined in 3GPP 36-521, section 6.2.3.3:

> **6.2.3.3 Minimum conformance requirements**
> For UE Power Class 3, the allowed Maximum Power Reduction (MPR) for the maximum output power in Table 6.2.2.3-1 due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3.3-1.

Table 6.2.3.3-1: Maximum Power Reduction (MPR) for Power Class 3

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

> For the UE maximum output power modified by MPR, the power limits specified in subclause 6.2.5.3 apply. The normative reference for this requirement is TS 36.101 clause 6.2.3.

For the DUT architecture, MPR is employed whenever allowed. Per the chart above, for a 10 MHz bandwidth the following MPR is used:

Modulation	# of RBs	MPR (dB)
QPSK	>12	1
16 QAM	<= 12	1
16 QAM	> 12	2

The table applies for any RB start value. RBs are assigned contiguously.

Thus, given a maximum power of 24 dBm and the MPR described above, the power for the SAR test cases are as follows:

Test Case	Max Power (dBm)
QPSK, Start RB: 12, RB Alloc 50%	23
QPSK, Start RB: 0, RB Alloc 100%	23
QPSK, Start RB: 49, RB Alloc: 1 RB @ high channel edge	24
QPSK, Start RB: 0, RB Alloc: 1 RB @ low channel edge	24
16QAM, Start RB: 12, RB Alloc 50%	22
16QAM, Start RB: 0, RB Alloc 100%	22
16QAM, Start RB: 49, RB Alloc: 1 RB @ high channel edge	23
16QAM, Start RB: 0, RB Alloc: 1 RB @ low channel edge	23

2.2.2 Power limit reduction schemes

For specified modes of operation, the DUT utilizes reduced maximum power limits to maintain compliance to SAR exposure limits. Complete descriptions of the following functionalities are provided in the Operational Description contained within Exhibit 12. The implementations to trigger the reductions in power require the device to be radiating, which prevents conducted power measurements of these functionalities without modification of the DUT.

The DUT supports Simultaneous Voice and LTE (svLTE), allowing a CDMA voice call while simultaneously providing an LTE link for data transport on the cellular network. When operating during svLTE, a reduction in the maximum LTE transmit power limit is triggered to ensure SAR exposure compliance is maintained. A table of the reduced limits used for testing are given below. When this combination of functionalities is not in use, the LTE transmitter operates at full maximum power.

Mode(s) of Operation	LTE Band 13							
Test Channel	23230							
Modulation	QPSK				16QAM			
RB Allocation	50%	100%	1 RB @HIGH EDGE	1 RB @LOW EDGE	50%	100%	1 RB @HIGH EDGE	1 RB @LOW EDGE
Maximum Output Power Setting (dBm)	23.0	23.0	24.0	24.0	22.0	22.0	23.0	23.0
Power Reduction (dB)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Reduced Maximum Output Power Setting (dBm)	19.0	19.0	20.0	20.0	18.0	18.0	19.0	19.0

When operating as a mobile hotspot during svLTE, an alternate reduction in the maximum LTE transmit power limit is triggered to ensure SAR exposure compliance is maintained. A table of the alternate reduced limits used for testing are given below.

Mode(s) of Operation	LTE Band 13							
Test Channel	23230							
Modulation	QPSK				16QAM			
RB Allocation	50%	100%	1 RB @HIGH EDGE	1 RB @LOW EDGE	50%	100%	1 RB @HIGH EDGE	1 RB @LOW EDGE
Maximum Output Power Setting (dBm)	23.0	23.0	24.0	24.0	22.0	22.0	23.0	23.0
Power Reduction (dB)	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
Reduced Maximum Output Power Setting (dBm)	13.5	13.5	14.5	14.5	12.5	12.5	13.5	13.5

The DUT utilizes reduced limits for the maximum CDMA 1900 band transmit power when the mobile hotspot functionality is enabled. These limits are utilized when in a data connection during a mobile hotspot session, and also when in a voice connection for svLTE during a mobile hotspot session. A table of the reduced limits used for testing are given below.

Mode(s) of Operation	CDMA 1900		
Test Channel	25	600	1175
Channel Ranges	25 - 338	339 - 788	789 - 1175
Maximum Output Power Setting (dBm)	25.0	25.0	25.0
Power Reduction (dB)	5.9	6.9	7.3
Reduced Maximum Output Power Setting (dBm)	19.1	18.1	17.7

2.3 Device Conducted Power Measurements

2.3.1 LTE modes

Measured Conducted Power (dBm) for LTE modes							
Modulation	Channel Bandwidth	RB Allocation Size	RB Offset	Measured Power (dB)	MPR Target (dB)	Measured reduction from 24 dBm target	Notes
QPSK	10 MHz	1	0	24.0	0	0 dB	-
		1	49	24.2	0	0 dB	-
		50%	12	23.2	1	0.8 dB	MPR enabled
		100%	0	23.2	1	0.8 dB	MPR enabled
16QAM	10 MHz	1	0	22.9	1	1.1 dB	MPR enabled
		1	49	22.9	1	1.1 dB	MPR enabled
		50%	12	21.9	2	2.1 dB	MPR enabled
		100%	0	22.0	2	2.0 dB	MPR enabled

2.3.2 CDMA modes

Per the "SAR Measurement Procedures for 3G Devices" released in October, 2007, RC1, RC3 and RC3 (FCH + SCH) CDMA modes, EVDO Rev O, EVDO Rev A were considered. The conducted power measurements (per steps 3, 4 & 10 of section 4.4.5.2 of 3GPP2 C.5.011 / TIA -98-E) for each mode are shown in the table below.

Measured Conducted Power (dBm) for CDMA modes							
		Loopback		Data[1]		EVDO Rev. O	EVDO Rev. B
Band	Channel	RC1 SO55	RC3 SO55	TDSO SO32 + FCH-SCH	TDSO SO32 + SCH	RTAP 153.6k	Subtype 2 RETAP
CDMA 800	1013	24.99	25.01	24.87	24.84	24.46	24.53
	384	24.96	24.97	24.74	24.81	24.49	24.55
	777	24.87	24.88	24.92	24.96	24.30	24.57
CDMA 1900	25	25.12	25.00	24.92	25.00	24.45	24.58
	600	25.07	25.01	24.84	24.87	24.57	24.78
	1175	24.94	24.93	25.01	25.05	24.50	24.65

[1] The DUT system architecture does not support simultaneous voice and data during a single CDMA session to the cellular network. Operation in this mode is for data transmission only.

2.3.3 Wi-Fi 802.11 modes

Per "SAR Measurement Procedures for 802.11 a/b/g Transmitters" (FCC KDB 248227), power measurements were performed for 802.11 operational modes. The average conducted power measurements for each mode are shown in the tables below. SAR testing for 802.11 was performed with the transmitter set to the lowest data rate on the default test channels **highlighted in bold** in the tables below. The head and body positions that resulted in the highest SAR values were further tested on the additional channels and higher data rates **highlighted in pink** in the tables below.

Band	Channel	Measured Average Conducted Power (dBm) for 802.11b Mode Data Rates			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
Wi-Fi 2450 MHz	1	**18.38**	18.34	18.08	18.28
	6	**17.85**	17.88	17.6	17.78
	11	**17.54**	17.55	17.45	17.46

Band	Channel	Measured Average Conducted Power (dBm) for 802.11g Mode Data Rates							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
Wi-Fi 2450 MHz	1	17.60	17.42	16.93	16.69	14.51	14.57	12.78	12.72
	6	17.43	17.02	16.59	16.35	14.29	14.18	12.52	12.33
	11	16.69	16.80	16.19	15.89	13.70	13.65	11.92	11.86

Band	Channel	Measured Average Conducted Power (dBm) for 802.11n Mode Data Rates (20 MHz Channel, 800 ns Guard Interval)							
		6.5 Mbps	13 Mbps	19.5 Mbps	26 Mbps	39 Mbps	52 Mbps	58.5 Mbps	65 Mbps
Wi-Fi 2450 MHz	1	16.38	16.85	16.53	14.73	14.41	12.89	12.79	11.80
	6	16.11	16.56	16.42	14.40	14.08	12.59	12.46	11.55
	11	15.56	16.08	15.73	13.91	13.64	11.95	11.93	10.97

Band	Channel	Measured Average Conducted Power (dBm) for 802.11n Mode Data Rates (20 MHz Channel, 400 ns Guard Interval)							
		7.2 Mbps	14.4 Mbps	21.6 Mbps	28.8 Mbps	43.3 Mbps	57.7 Mbps	65 Mbps	72.2 Mbps
Wi-Fi 2450 MHz	1	16.30	16.75	16.35	14.52	14.35	12.53	12.59	11.72
	6	16.02	16.47	15.97	14.21	14.00	12.19	12.22	11.27
	11	15.41	15.88	15.61	13.73	13.60	13.67	11.94	10.89

3. Test Equipment Used

3.1 Dosimetric System

The Motorola Mobility ADR Test Services Laboratory utilizes a Dosimetric Assessment System (Dasy4™ v4.7) manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. All the SAR measurements are taken within a shielded enclosure. The overall 10 g RSS uncertainty of the measurement system is ±10.8% (K=1) with an expanded uncertainty of ±21.6% (K=2). The overall 1 g RSS uncertainty of the measurement system is ±11.1% (K=1) with an expanded uncertainty of ±22.2% (K=2). The measurement uncertainty budget is given in Appendix 6. Per IEEE 1528, this uncertainty budget is applicable to the SAR range of 0.4 W/kg to 10 W/kg.

The list of calibrated equipment used for the measurements is shown in the following table.

Description	Serial Number	Cal Date	Cal Due Date
DASY4™ DAE V1	434	Jan-13-2011	Jan-13-2012
E-Field Probe ES3DV3	3124	Aug-11-2010	Aug-11-2011
DASY4™ DAE V1	702	Apr-14-2011	Apr-14-2012
E-Field Probe ES3DV3	3183	Jul-14-2010	Jul-14-2011
DASY4™ DAE V1	699	Sep-20-2010	Sep-20-2011
E-Field Probe ES3DV3	3184	Mar-11-2011	Mar-11-2012
S.A.M. Phantom used for 800/900 MHz	TP-1131		
S.A.M. Phantom used for 800/900 MHz	TP-1136		
S.A.M. Phantom used for 800/900 MHz	TP-1156		
S.A.M. Phantom used for 1800/1900/2450 MHz	TP-1250		
S.A.M. Phantom used for 1800/1900/2450 MHz	TP-1136		
Dipole Validation Kit, DV835V2	422TR	Mar-18-2011	Mar-18-2012
Dipole Validation Kit, DV835V2	434TR	Mar-09-2011	Mar-09-2012
Dipole Validation Kit, DV835V2	436TR	Mar-18-2011	Mar-18-2012
Dipole Validation Kit, DV1800V2	250TR	Mar-17-2011	Mar-17-2012
Dipole Validation Kit, DV1800V2	259TR	Mar-17-2011	Mar-17-2012
Dipole Validation Kit, DV2450V2	740	Mar-17-2011	Mar-17-2012
Dipole Validation Kit, DV2450V2	863	Mar-17-2011	Mar-17-2012

3.2 Additional Equipment

Description	Serial Number	Cal Date	Cal Due Date
Rohde & Schwarz CMW500 SW version 2.0.20.10 Used for LTE testing	103402	Dec-01-2010	Dec-01-2012
Signal Generator HP8648C	3847A04982	Nov-18-2009	Nov-18-2011
Power Meter E4419B	GB39510900	Mar-28-2011	Mar-28-2013
Power Sensor #1 - E9301A	US39210918	Oct-25-2010	Oct-25-2011
Power Sensor #2 - E9301A	US39210917	Oct-25-2010	Oct-25-2011
Signal Generator HP8648C	3847A04810	Oct-30-2009	Oct-30-2011
Power Meter E4419B	GB39511087	Dec-22-2009	Dec-22-2011
Power Sensor #1 - E9301A	US39211006	Oct-25-2010	Oct-25-2011
Power Sensor #2 - E9301A	US39210934	Oct-25-2010	Oct-25-2011
Signal Generator HP8648C	3847A04843	Mar-28-2011	Mar-28-2013
Power Meter E4419B	GB39511084	Mar-28-2011	Mar-28-2013
Power Sensor #1 - E9301A	US39210929	Mar-31-2011	Mar-31-2012
Power Sensor #2 - E9301A	US39210930	Mar-31-2011	Mar-31-2012
Network Analyzer HP8753ES	US39172529	Jun-04-2010	Jun-04-2011
Network Analyzer HP8753ES	US39171846	May-19-2011	May-19-2012
Dielectric Probe Kit HP85070C	US99360070		

4. Electrical parameters of the tissue simulating liquid

Prior to conducting SAR measurements, the relative permittivity, ε_r, and the conductivity, σ, of the tissue simulating liquids were measured with a HP85070 Dielectric Probe Kit These values, along with the temperature of the simulated tissue are shown in the table below. The recommended limits for permittivity and conductivity are also shown. A mass density of $\rho = 1\ ^{g}/_{cm^3}$ was entered into the system in all the cases. It can be seen that the measured parameters are within tolerance of the recommended limits specified in [1] and [5].

E-field probes calibrated at 1810 MHz were used for "1900 MHz" band (1850 MHz - 1910 MHz) SAR measurements. FCC KDB 450824 provides additional requirements on page 3 of 6 for SAR testing that is performed with probe calibration points that are more than 50 MHz removed from the measured bands. The KDB requires; "(2) When nominal tissue dielectric parameters are specified in the probe calibration data, the tissue dielectric parameters measured for routine measurements should be less than the target Er and higher than the target Sigma values to minimize SAR underestimations". The 1900 MHz simulated tissues listed below meet this criteria.

The probe calibration frequency and the system accuracy verification were performed at 835 MHz. The center of the LTE Band 13 transmit band is 782 MHz. The difference exceeds the ± 50 MHz window specified in FCC KDB 450824 D01. Therefore calculations are given to perform a SAR correction for deviations of the complex permittivity and conductivity from simulated tissue targets if the deviation is in the direction that does not result in a "conservative" SAR result. The sensitivity coefficients for frequencies within "Attachment 1: Tissue Parameter Variations" of FCC KDB 450824 were used.

This attachment provides:

450 MHz tissue has sensitivity coefficients for ε_r of -0.46 and for σ of +0.43
800 MHz tissue has sensitivity coefficients for ε_r of -0.57 and for σ of +0.59

A linear approximation to get the values for 782 MHz (the frequency of the center of the transmit band) were performed. The sensitivity coefficients used for 782 MHz were: ε_r of -0.56434 and σ of +0.581771.

These coefficients were then applied to the delta between the measured conductivity and the target conductivity using the formula:

$$\Delta SAR = S_\varepsilon\, \Delta\varepsilon + S_\sigma\, \Delta\sigma$$

Here, $S_\varepsilon = \partial SAR/\partial\varepsilon$ and $S_\sigma = \partial SAR/\partial\sigma$ are sensitivity coefficients, representing the sensitivity of SAR to permittivity and conductivity, respectively.

The measured SAR is then corrected by the delta SAR to compensate for the change in conductivity using the formula:

$$SAR_{Corrected} = \frac{SAR_{Measured}}{(1 + \Delta SAR)}$$

f (MHz)	Tissue type	Limits / Measured	Dielectric Parameters		
			ε_r	σ (S/m)	Temp (°C)
782	Head	**Measured,** Apr-24-2011	41.9	0.86	20.2
		Measured, Jun-18-2011	42.0	0.87	20.5
		Measured, Jun-19-2011	42.0	0.86	20.5
		Measured, Jun-20-2011	43.1	0.93	21.9
		Recommended Limits	41.78 ±5%	0.896 ±5%	18-25
	Body	**Measured,** Apr-25-2011	54.1	0.92	20.7
		Measured, Apr-27-2011	54.8	0.92	20.7
		Measured, May-06-2011	54.8	0.98	20.0
		Measured, Jun-17-2011	56.5	0.93	20.5
		Measured, Jun-18-2011	56.2	0.93	20.0
		Measured, Jun-21-2011	56.4	0.94	21.2
		Recommended Limits	55.4 ±5%	0.966 ±5%	18-25
835	Head	**Measured,** Jun-10-2011	41.9	0.91	20.0
		Measured, Jun-13-2011	41.3	0.90	19.8
		Measured, Jun-15-2011	41.4	0.92	20.5
		Recommended Limits	41.5 ±5%	0.90 ±5%	18-25
	Body	**Measured,** Jun-13-2011	53.4	0.99	19.6
		Measured, Jun-15-2011	55.7	0.99	20.7
		Measured, Jun-17-2011	56.0	0.98	20.5
		Measured, Jun-21-2011	55.5	0.98	21.1
		Measured, Jun-21-2011	55.9	0.99	21.2
		Recommended Limits	55.2 ±5%	0.97 ±5%	18-25
1880	Head	**Measured,** Jun-14-2011	38.3	1.45	19.7
		Recommended Limits	40.0 ±5%	1.40 ±5%	18-25
	Body	**Measured,** Jun-14-2011	51.2	1.57	19.7
		Measured, Jun-16-2011	50.7	1.58	20.2
		Measured, Jun-21-2011	51.0	1.56	20.2
		Recommended Limits	53.3 ±5%	1.52 ±5%	18-25
2450	Head	**Measured,** Apr-27-2011	36.1	1.85	19.1
		Measured, Jun-15-2011	35.5	1.83	20.2
		Recommended Limits	39.2 ±10%	1.80 ±5%	18-25
	Body	**Measured,** Apr-27-2011	47.5	2.03	18.8
		Measured, Apr-28-2011	47.5	2.03	18.8
		Measured, Jun-16-2011	47.5	1.96	20.7
		Measured, Jun-20-2011	47.9	2.03	20.8
		Recommended Limits	52.7 ±10%	1.95 ±5%	18-25

The list of ingredients and the percent composition used for the simulated tissues are indicated in the table below.

Ingredient	782 / 835 / 900 MHz Head	782 / 835 / 900 MHz Body	1800 MHz / 1900 MHz Head	1800 MHz / 1900 MHz Body	2450 MHz Head	2450 MHz Body
Sugar	57	44.9	--	--	--	--
DGBE	--	--	47	30.8	--	30
Diacetin	--	--	--	--	51	--
Water	40.45	53.06	52.62	68.8	48.75	70
Salt	1.45	0.94	0.38	0.4	0.15	--
HEC	1	1	--	--	--	--
Bact.	0.1	0.1	--	--	0.1	--

5. System Accuracy Verifications

A system accuracy verification of the DASY4™ was performed using the measurement equipment listed in Section 3.1. The daily system accuracy verification occurs within the flat section of the SAM phantom.

A SAR measurement was performed to verify the measured SAR was within ±10% from the target SAR indicated in Appendix 7. These frequencies are within ±10% of the compliance test mid-band frequency as required in [1] and [5]. The test was conducted on the same days as the measurement of the DUT. Recommended limits for permittivity and conductivity, specified in [5], are shown in the table below. The obtained results from the system accuracy verification are also displayed in the table below. SAR values are normalized to 1 W forward power delivered to the dipole. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values. The distributions of SAR compare well with those of the reference measurements (see Appendix 1). The simulated tissue depth was verified to be 15.0 cm ± 0.5 cm. Z-axis scans showing the SAR penetration are also included in Appendix 1.

System Accuracy Verification Measurements for Head SAR Measurements						
f (MHz)	Description	SAR (W/kg), 1 gram	Dielectric Parameters		Ambient Temp (°C)	Tissue Temp (°C)
			ε_r	σ (S/m)		
835	**Measured,** Jun-10-2011	9.80	41.9	0.91	20.2	20.2
	Measured, Jun-13-2011	10.0	41.3	0.90	21.1	19.7
	Recommended Limits	9.69	41.5 ±5%	0.90 ±5%	18-25	18-25
	Measured, Apr-24-2011	9.85	41.3	0.91	20.3	20.2
	Measured, Jun-15-2011	10.0	41.4	0.92	21.1	20.5
	Measured, Jun-18-2011	9.80	41.5	0.92	21.0	20.3
	Measured, Jun-19-2011	9.90	41.3	0.92	21.7	20.5
	Measured, Jun-20-2011	9.95	43.1	0.93	21.5	21.9
	Recommended Limits	9.33	41.5 ±5%	0.90 ±5%	18-25	18-25
1800	**Measured,** Jun-14-2011	38.2	38.7	1.35	21.2	19.8
	Recommended Limits	38.6	40.0 ±5%	1.40 ±5%	18-25	18-25
2450	**Measured,** Apr-27-2011	57.5	36.1	1.85	20.2	18.9
	Recommended Limits	53.8	39.2 ±10%	1.80 ±5%	18-25	18-25
	Measured, Jun-15-2011	55.5	35.5	1.83	21.1	19.5
	Recommended Limits	54.2	39.2 ±10%	1.80 ±5%	18-25	18-25

The following probe conversion factors were used on the E-Field probe(s) used with the system accuracy verification measurements for head SAR measurements:

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ES3DV3	3124	835	5.89	5 of 11
		1810	4.89	5 of 11
		2450	4.35	5 of 11
E-Field Probe ES3DV3	3183	835	6.11	5 of 11
E-Field Probe ES3DV3	3184	2450	4.48	5 of 11

System Accuracy Verification Measurements for Body SAR Measurements						
f (MHz)	Description	SAR (W/kg), 1 gram	Dielectric Parameters		Ambient Temp (°C)	Tissue Temp (°C)
			ε_r	σ (S/m)		
835	**Measured,** Jun-13-2011	9.65	53.4	0.99	20.1	19.6
	Recommended Limits	10.0	55.2 ±5%	0.97 ±5%	18-25	18-25
	Measured, Jun-21-2011	10.05	53.8	0.98	21.0	20.7
	Recommended Limits	10.1	55.2 ±5%	0.97 ±5%	18-25	18-25
	Measured, Apr-25-2011	9.80	53.6	0.98	20.5	20.7
	Measured, Apr-27-2011	9.80	54.2	0.98	20.2	20.6
	Measured, May-06-2011	9.80	54.8	0.98	20.3	20.0
	Measured, Jun-15-2011	9.80	55.7	0.99	20.8	20.2
	Measured, Jun-17-2011	9.70	56.0	0.98	21.5	20.5
	Measured, Jun-18-2011	9.75	55.6	0.98	20.8	20.0
	Measured, Jun-21-2011	9.80	55.5	0.98	21.2	21.2
	Recommended Limits	9.77	55.2 ±5%	0.97 ±5%	18-25	18-25
1800	**Measured,** Jun-20-2011	36.6	51.0	1.45	21.2	20.4
	Recommended Limits	37.5	53.3 ±5%	1.52 ±5%	18-25	18-25
	Measured, Jun-14-2011	40.00	51.5	1.47	21.1	19.8
	Measured, Jun-16-2011	40.10	51.0	1.47	20.9	19.8
	Measured, Jun-21-2011	40.25	51.3	1.46	21.0	20.1
	Recommended Limits	37.2	53.3 ±5%	1.52 ±5%	18-25	18-25
2450	**Measured,** Apr-27-2011	55.0	47.5	2.03	20.2	18.8
	Recommended Limits	51.3	52.7 ±10%	1.95 ±5%	18-25	18-25
	Measured, Jun-16-2011	54.5	47.5	1.96	21.4	20.5
	Measured, Jun-20-2011	57.5	47.9	2.03	21.1	20.8
	Recommended Limits	52.8	52.7 ±10%	1.95 ±5%	18-25	18-25

The following probe conversion factors were used on the E-Field probe(s) used with the system accuracy verification measurements for body SAR measurements:

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ES3DV3	3124	835	5.86	6 of 11
		1810	4.76	6 of 11
		2450	4.19	6 of 11
E-Field Probe ES3DV3	3183	835	6.15	6 of 11
E-Field Probe ES3DV3	3184	835	6.10	6 of 11
		1810	4.90	6 of 11
		2450	4.33	6 of 11

6. Test Results

For LTE and CDMA modes, the test sample was operated using an actual transmission through a base station simulator. Wi-Fi testing was conducted using manufacturer test mode software, per guidance given in FCC KDB 248227. The base station simulator or test software was set up for the proper channels, transmitter power levels and transmit modes of operation.

The phone was tested in the configurations stipulated in [1], [4] and [5]. The phone was positioned into these configurations using the device holder supplied with the DASY4™ SAR measurement system The default settings for the "coarse" and "cube" scans were chosen and used for measurements. The grid spacing of the coarse scan was set to 15 mm or less as shown in the SAR plots included in Appendices 2 through 4. Please refer to the DASY4™ manual for additional information on SAR scanning procedures and algorithms used.

The DUT covered by this report has the following battery options:

Model SNN5892A - 1735 mAH battery

The DUT tested in this report has an optional battery door:

Inductive Charging Door: SJHN0701A

The inductive charging door serves as the Wireless Power Receiver in an Inductive Charging System. The receiver is a Wireless Power Consortium (WPC) compliant receiver and requires a WPC compliant transmitter to create the appropriate magnetic field in order to function. The receiver is designed to apply power to the phone when placed in the appropriate magnetic field. The inductive charging door was tested per guidance KDB inquiry 335470. Please see a more detailed description in the Operational Description given in Exhibit 12. Please see Exhibit 3 for external photos of the inductive charging door.

All tests will be performed with the plastic door shipped with the DUT. The configurations that result in the highest measured SAR for the cheek touch, 15 degree tilt, body worn and mobile hotspot tests will be repeated with the inductive charging battery door installed.

6.1 Head Adjacent Test Results

The SAR results shown in tables 1 through 8 are maximum SAR values averaged over 1 gram of phantom tissue, to demonstrate compliance to [3] and also over 10 grams of phantom tissue, to demonstrate compliance to [6]. Also shown are the temperature of the simulated tissue after the test, the measured drift, the measured conducted output power levels, power reduction amount (when applicable), the measured SAR corrected for probe calibration (when applicable), and the extrapolated SAR. The exact method of extrapolation is:

$$Extrapolated\ SAR = (Measured\ or\ Corrected\ SAR) * 10^{(-drift/10)}$$

The SAR reported at the end of the measurement process by the DASY4™ measurement system can be scaled up by the measured drift to determine the SAR at the beginning of the measurement process. This is the most conservative SAR because it corresponds to the average output power at the beginning of the SAR test. This extrapolation has been done because when the DUT is operating properly it may exhibit a slump in radiated power and SAR over time. This is verified by measuring the SAR drift after the test.

The left head and right head SAR contour distributions are similar. Because of this similarity, the cheek/touch and 15° tilt test conditions with the highest SAR values in each band are indicated as bold numbers in the following tables and are included in Appendix 2. All other test conditions measured lower SAR values than those included in Appendix 2.

The SAR measurements were performed using the SAM phantoms listed in section 3.1. Since the same phantoms and simulated tissue were used for the system accuracy verification and the device SAR measurements, the Z-axis scans included in Appendix 1 are applicable for verification of simulated tissue depth.

The following probe conversion factors were used on the E-Field probe(s) used for head-adjacent measurements:

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ES3DV3	3124	835	5.89	5 of 11
		1810	4.89	5 of 11
		2450	4.35	5 of 11
E-Field Probe ES3DV3	3183	835	6.11	5 of 11
E-Field Probe ES3DV3	3184	2450	4.48	5 of 11

Left Head Cheek Position															
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Measured (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (50% RB)	SNN5892A	23230	19.7	-0.113	23.2		0.416	0.422	0.43	0.545	0.559	0.57		
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	20.0	-0.198	24.0		0.445	0.452	0.47	0.585	0.600	0.61		
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	**20.0**	**0.316**	**24.2**		**0.542**	**0.550**	**0.55**	**0.704**	**0.722**	**0.72**	**5x5x7**	**A57**
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	19.7	0.055	21.9		0.334	0.339	0.34	0.441	0.452	0.45		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	20.2	-0.389	22.9		0.395	0.401	0.44	0.506	0.519	0.57		
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	20.0	-0.059	22.9		0.404	0.410	0.55	0.528	0.541	0.42		
	LTE Band 13, QPSK (1 RB @ High)	*SNN5892A/ SJHN0701A*	*23230*	***20.1***	***-0.273***	***24.2***		***0.327***	***0.331***	***0.35***	***0.428***	***0.436***	***0.46***	**5x5x7**	**A58**
835	CDMA 800, RC3 SO55	SNN5892A	1013												
			384	19.6	-0.107	24.97		0.571		0.59	0.755		0.77		
			777												
1880	CDMA 1900, RC3 SO55	SNN5892A	25												
			600	**19.5**	**-0.005**	**25.01**		**0.472**		**0.47**	**0.767**		**0.77**	**5x5x7**	**A62**
			1175												
		SNN5892A/ SJHN0701A	*600*	***19.6***	***0.009***	***25.01***		***0.421***		***0.42***	***0.679***		***0.68***	**5x5x7**	**A63**
2450	802.11b, 1 Mbps	SNN5892A	1	18.8	-0.165	18.38		0.048		0.05	0.122		0.13		
			6	**18.6**	**-0.096**	**17.85**		**0.059**		**0.06**	**0.150**		**0.15**	**5x5x7**	**A64**
			11	18.6	0.065	17.54		0.055		0.06	0.143		0.14		
		SNN5892A/ SJHN0701A	*6*	***19.5***	***0.112***	***17.85***		***0.072***		***0.07***	***0.173***		***0.17***	**5x5x7**	**A65**

Table 1: SAR measurement results at the highest possible output power, measured in a head cheek position against the ICNIRP and ANSI SAR Limit.

Right Head Cheek Position															
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Measured (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (50% RB)	SNN5892A	23230	20.0	-0.206	23.2		0.409	0.415	0.44	0.530	0.543	0.57		
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	20.0	-0.173	24.0		0.459	0.466	0.48	0.593	0.608	0.63		
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	20.1	-0.039	24.2		0.515	0.523	0.53	0.672	0.689	0.70		
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	20.2	0.044	21.9		0.322	0.327	0.33	0.418	0.428	0.43		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	20.3	-0.485	22.9		0.406	0.412	0.46	0.527	0.540	0.60		
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	20.3	0.163	22.9		0.429	0.568	0.57	0.554	0.435	0.44		
835	CDMA 800, RC3 SO55	SNN5892A	1013	19.6	-0.206	25.01		0.566		0.59	0.745		0.78		
			384	**19.7**	**-0.012**	**24.97**		**0.619**		**0.62**	**0.823**		**0.83**	**5x5x7**	**A60**
			777	19.6	0.071	24.88		0.507		0.51	0.670		0.67		
		SNN5892A/ SJHN0701A	*384*	***20.5***	***-0.029***	***24.94***		***0.661***		***0.67***	***0.875***		***0.88***	**5x5x7**	**A61**
1880	CDMA 1900, RC3 SO55	SNN5892A	25												
			600	19.5	0.007	25.01		0.229		0.23	0.367		0.37		
			1175												
2450	802.11b, 1 Mbps	SNN5892A	1	18.8	0.138	18.38		0.028		0.03	0.063		0.06		
			6												
			11												

Table 2: SAR measurement results at the highest possible output power, measured in a head cheek position against the ICNIRP and ANSI SAR Limit.

Left Head 15° Tilt Position																
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Measured (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (50% RB)	SNN5892A	23230	19.7	-0.502	23.2		0.267	0.271	0.30	0.343	0.352	0.40		
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	20.0	-0.005	24.0		0.323	0.328	0.33	0.412	0.422	0.42		
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	20.0	0.108	24.2		0.354	0.359	0.36	0.457	0.468	0.47		
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	19.7	0.095	21.9		0.222	0.225	0.23	0.285	0.292	0.29		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	20.6	-0.103	22.9		0.288	0.292	0.30	0.366	0.375	0.38		
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	20.0	-0.683	22.9		0.318	0.323	0.38	0.409	0.419	0.49		
835	CDMA 800, RC3 SO55	SNN5892A	1013												
			384	19.8	-0.015	24.97		0.432		0.43	0.568		0.57		
			777												
1880	CDMA 1900, RC3 SO55	SNN5892A	25												
			600	**19.6**	**-0.012**	**25.01**		**0.149**		**0.15**	**0.259**		**0.26**	**5x5x7**	**A69**
			1175												
2450	802.11b, 1 Mbps	SNN5892A	1	**18.8**	**-0.020**	**18.38**		**0.00952**		**0.01**	**0.020**		**0.02**	**5x5x7**	**A70**
			6												
			11												

Table 3: SAR measurement results at the highest possible output power, measured in a head tilt position against the ICNIRP and ANSI SAR Limit.

Right Head 15° Tilt Position																
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Measured (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (50% RB)	SNN5892A	23230	20.0	-0.012	23.2		0.270	0.274	0.27	0.345	0.354	0.35		
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	20.1	-0.381	24.0		0.331	0.336	0.37	0.423	0.434	0.47		
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	**20.2**	**0.167**	**24.2**		**0.380**	**0.386**	**0.39**	**0.487**	**0.499**	**0.50**	**5x5x7**	**A66**
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	20.3	-0.767	21.9		0.201	0.204	0.24	0.260	0.266	0.32		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	20.3	-0.232	22.9		0.280	0.284	0.30	0.358	0.367	0.39		
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	20.3	0.094	22.9		0.310	0.315	0.32	0.399	0.409	0.41		
835	CDMA 800, RC3 SO55	SNN5892A	1013												
			384	**19.6**	**-0.091**	**24.97**		**0.432**		**0.44**	**0.565**		**0.58**	**5x5x7**	**A68**
			777												
1880	CDMA 1900, RC3 SO55	SNN5892A	25												
			600	19.6	-0.021	25.01		0.145		0.15	0.248		0.25		
			1175												
2450	802.11b, 1 Mbps	SNN5892A	1	18.8	0.112	18.38		0.005		0.01	0.011		0.01		
			6												
			11												

Table 4: SAR measurement results at the highest possible output power, measured in a head tilt position against the ICNIRP and ANSI SAR Limit.

The DUT supports Simultaneous Voice and LTE (svLTE), allowing a CDMA voice call while simultaneously providing an LTE link for data transport on the cellular network. When operating during svLTE, a reduction in the maximum LTE transmit power limit is triggered to ensure SAR exposure compliance is maintained. A table of the reduced limits used for testing is provided in section 2.2.2 above. The measurement data in the following tables is provided to demonstrate SAR performance for LTE when this functionality is enabled.

Left Head Cheek Position															
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Limit[2] (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (50% RB)	SNN5892A	23230	20.3	-0.320	19.0	-4.0	0.158	0.161	0.17	0.208	0.213	0.23		
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	20.2	-0.105	20.0	-4.0	0.133	0.137	0.14	0.172	0.175	0.18		
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	20.3	-0.324	20.0	-4.0	0.149	0.153	0.16	0.192	0.195	0.21		
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	20.3	-0.038	18.0	-4.0	0.126	0.129	0.13	0.164	0.167	0.17		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	20.3	-0.048	19.0	-4.0	0.113	0.116	0.12	0.146	0.148	0.15		
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	20.5	-0.110	19.0	-4.0	0.129	0.132	0.14	0.168	0.171	0.18		

Table 5: SAR measurement results at the highest possible output power, measured in a head cheek position against the ICNIRP and ANSI SAR Limit.

Right Head Cheek Position															
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Limit[2] (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (50% RB)	SNN5892A	23230	20.5	-0.091	19.0	-4.0	0.161	0.165	0.17	0.209	0.212	0.22		
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	20.5	0.009	20.0	-4.0	0.146	0.150	0.15	0.189	0.192	0.19		
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	**20.3**	**-0.124**	**20.0**	**-4.0**	**0.171**	**0.176**	**0.18**	**0.223**	**0.227**	**0.23**	**5x5x7**	**A59**
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	21.1	-0.071	18.0	-4.0	0.131	0.134	0.14	0.169	0.172	0.17		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	21.0	-0.361	19.0	-4.0	0.132	0.135	0.15	0.171	0.174	0.19		
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	21.0	-0.293	19.0	-4.0	0.138	0.142	0.15	0.180	0.183	0.20		

Table 6: SAR measurement results at the highest possible output power, measured in a head cheek position against the ICNIRP and ANSI SAR Limit.

[2] For tests with power limit reductions employed, measured conducted power is not available by device design. Per FCC direction, measured power is replaced with the reduced maximum power limit for the device mode under test.

Left Head 15° Tilt Position																
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Limit[2] (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	**LTE Band 13, QPSK (50% RB)**	SNN5892A	23230	**21.0**	**-0.032**	**19.0**	**-4.0**	**0.117**	**0.119**	**0.12**	**0.153**	**0.155**	**0.16**	**5x5x7**	**A67**
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	20.2	0.157	20.0	-4.0	0.100	0.102	0.10	0.127	0.129	0.13		
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	20.2	0.220	20.0	-4.0	0.112	0.114	0.11	0.143	0.145	0.15		
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	21.0	-0.039	18.0	-4.0	0.102	0.104	0.10	0.132	0.134	0.14		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	21.0	-0.031	19.0	-4.0	0.098	0.100	0.10	0.127	0.129	0.13		
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	21.0	0.064	19.0	-4.0	0.113	0.115	0.12	0.146	0.148	0.15		

Table 7: SAR measurement results at the highest possible output power, measured in a head tilt position against the ICNIRP and ANSI SAR Limit.

Right Head 15° Tilt Position																
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Limit[2] (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	**LTE Band 13, QPSK (50% RB)**	SNN5892A	23230	20.5	0.090	19.0	-4.0	0.107	0.109	0.11	0.137	0.139	0.14		
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	20.5	-0.133	20.0	-4.0	0.102	0.104	0.11	0.132	0.134	0.14		
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	20.3	0.114	20.0	-4.0	0.116	0.118	0.12	0.149	0.151	0.15		
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	21.0	0.016	18.0	-4.0	0.092	0.094	0.09	0.119	0.121	0.12		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	21.0	0.058	19.0	-4.0	0.095	0.097	0.10	0.122	0.124	0.12		
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	21.0	0.182	19.0	-4.0	0.105	0.107	0.11	0.135	0.137	0.14		

Table 8: SAR measurement results at the highest possible output power, measured in a head tilt position against the ICNIRP and ANSI SAR Limit.

6.2 Body Worn Test Results

The SAR results shown in tables 9 through 12 are maximum SAR values averaged over 1 gram of phantom tissue, to demonstrate compliance to [3] and also over 10 grams of phantom tissue, to demonstrate compliance to [6]. Also shown are the temperature of the simulated tissue after the test, the measured drift, the measured conducted output power levels, power reduction amount (when applicable), the measured SAR corrected for probe calibration (when applicable), and the extrapolated SAR. The exact method of extrapolation is:

$$Extrapolated\ SAR = (Measured\ or\ Corrected\ SAR) * 10^{(-drift/10)}$$

The SAR reported at the end of the measurement process by the DASY4™ measurement system can be scaled up by the measured drift to determine the SAR at the beginning of the measurement process. This is the most conservative SAR because it corresponds to the average output power at the beginning of the SAR test. This extrapolation has been done because when the DUT is operating properly it may exhibit a slump in radiated power and SAR over time. This is verified by measuring the SAR drift after the test.

The test conditions that produced the highest SAR values in each band are indicated as bold numbers in the following tables and are included in Appendix 3. All other test conditions measured lower SAR values than those included in Appendix 3.

A "flat" phantom was for the body-worn tests. This "flat" phantom is made out of 1" thick natural High Density Polyethylene with a thickness at the bottom equal to 2.0 mm. It measures 52.7 cm(long) by 26.7 cm(wide) by 21.2 cm(tall).

The simulated tissue depth was verified to be 15.0 cm ± 0.5 cm. The same device holder described in section 6 was used for positioning the phone. Functional accessories were divided into two categories, the ones with metal components and the ones with non-metal components. For non-metallic component accessories, testing was performed on the accessory that displayed the closest proximity to the flat phantom. Each metallic component accessory, if any, was checked for uniqueness of metal component so that each is tested with the device. If multiple accessories shared an identical metal component, only the accessory that dictates the closest spacing to the body was tested. The cellular phone was tested with a headset connected to the device for all body-worn SAR measurements.

There are no body-worn accessories available for this phone at the time of testing thus the device was tested per the Supplement C testing guidelines for devices that do not have body-worn accessories. A separation distance of 25 mm between the device and the flat phantom was used for testing body-worn SAR. The chosen separation distance of 25 mm is utilized in order to support any case or holder accessories offered or to be offered by Motorola for this product. The device was tested with the front and back of the device facing the phantom. Both sides of the device were tested for Body SAR for the purpose of including the SAR evaluation for body-worn accessories that support the device with the front side facing the user.

The following probe conversion factors were used on the E-Field probe(s) used for the body-worn measurements:

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ES3DV3	3124	835	5.86	6 of 11
		1810	4.76	6 of 11
		2450	4.19	6 of 11
E-Field Probe ES3DV3	3183	835	6.15	6 of 11
E-Field Probe ES3DV3	3184	2450	4.33	6 of 11

Body-Worn, Front of Phone 25 mm from Phantom															
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Measured (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (50% RB)	SNN5892A	23230	20.7	-0.205	23.2		0.294	0.302	0.32	0.385	0.391	0.41		
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	20.7	0.145	24.0		0.324	0.333	0.33	0.424	0.431	0.43		
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	20.5	-0.262	24.2		0.321	0.330	0.35	0.422	0.429	0.46		
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	20.7	-0.008	21.9		0.214	0.220	0.22	0.280	0.285	0.29		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	20.5	-0.198	22.9		0.272	0.280	0.29	0.356	0.362	0.38		
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	20.5	0.178	22.9		0.276	0.284	0.28	0.363	0.369	0.37		
835	CDMA 800, RC3 SO55	SNN5892A	1013												
			384	19.5	-0.017	24.97		0.245		0.25	0.327		0.33		
			777												
1880	CDMA 1900, RC3 SO55	SNN5892A	25												
			600	19.7	-0.044	25.01		0.143		0.14	0.226		0.23		
			1175												
2450	802.11b, 1 Mbps	SNN5892A	1	18.5	-0.143	18.38		0.000406		0.00	0.00389		0.00		
			6												
			11												

Table 9: SAR measurement results at the highest possible output power, measured in a body-worn position against the ICNIRP and ANSI SAR Limit.

Body-Worn, Back of Phone 25 mm from Phantom															
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Measured (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (50% RB)	SNN5892A	23230	20.5	-0.236	23.2		0.287	0.295	0.31	0.379	0.385	0.41		
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	**20.5**	**-0.047**	**24.0**		**0.369**	**0.379**	**0.38**	**0.484**	**0.492**	**0.50**	**5x5x7**	**A72**
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	20.5	0.005	24.2		0.354	0.364	0.36	0.467	0.475	0.47		
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	20.3	-0.122	21.9		0.229	0.235	0.24	0.301	0.306	0.31		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	20.2	0.092	22.9		0.307	0.315	0.32	0.398	0.404	0.40		
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	20.2	-0.046	22.9		0.301	0.309	0.31	0.390	0.396	0.40		
	LTE Band 13, QPSK (1 RB @ Low)	*SNN5892A/ SJHN0701A*	*23230*	***19.6***	***-0.181***	***24.0***		***0.279***	***0.288***	***0.30***	***0.358***	***0.366***	***0.38***	**5x5x7**	**A73**
835	CDMA 800, RC3 SO55	SNN5892A	1013												
			384	**19.5**	**-0.181**	**24.97**		**0.296**		**0.31**	**0.395**		**0.41**	**5x5x7**	**A75**
			777												
		SNN5892A/ SJHN0701A	384	**20.0**	**-0.148**	**24.97**		**0.248**		**0.26**	**0.331**		**0.34**	**5x5x7**	**A76**
1880	CDMA 1900, RC3 SO55	SNN5892A	25	19.8	-0.291	25.00		0.415		0.44	0.672		0.72		
			600	19.8	-0.112	25.01		0.522		0.54	0.849		0.87		
			1175	**19.8**	**0.019**	**24.93**		**0.574**		**0.57**	**0.940**		**0.94**	**5x5x7**	**A77**
		SNN5892A/ SJHN0701A	*1175*	***19.8***	***-0.054***	***24.93***		***0.550***		***0.56***	***0.892***		***0.90***	**5x5x7**	**A78**
2450	802.11b, 1 Mbps	SNN5892A	1	18.9	-0.047	18.38		0.003		0.00	0.006		0.01		
			6	19.3	-0.041	17.85		0.005		0.01	0.00963		0.01		
			11	**19.0**	**0.048**	**17.54**		**0.0047**		**0.00**	**0.011**		**0.01**	**5x5x7**	**A79**
		SNN5892A/ SJHN0701A	***11***	***19.5***	***-0.122***	***17.54***		***0.00687***		***0.01***	***0.012***		***0.01***	**5x5x7**	**A80**

Table 10: SAR measurement results at the highest possible output power, measured in a body-worn position against the ICNIRP and ANSI SAR Limit.

The DUT supports Simultaneous Voice and LTE (svLTE), allowing a CDMA voice call while simultaneously providing an LTE link for data transport on the cellular network. When operating during svLTE, a reduction in the maximum LTE transmit power limit is triggered to ensure SAR exposure compliance is maintained. A table of the reduced limits used for testing is provided in section 2.2.2 above. The measurement data in the following tables is provided to demonstrate SAR performance for LTE when this functionality is enabled.

Body-Worn, Front of Phone 25 mm from Phantom															
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Limit[3] (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (50% RB)	SNN5892A	23230	20.0	-0.266	19.0	-4.0	0.096	0.099	0.11	0.125	0.127	0.14		
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	20.2	-0.172	20.0	-4.0	0.113	0.116	0.12	0.146	0.149	0.15		
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	21.5	-0.063	20.0	-4.0	0.110	0.113	0.11	0.144	0.147	0.15		
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	21.5	-0.213	18.0	-4.0	0.081	0.083	0.09	0.106	0.108	0.11		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	20.2	0.003	19.0	-4.0	0.091	0.094	0.09	0.119	0.121	0.12		
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	20.2	-0.031	19.0	-4.0	0.080	0.082	0.08	0.105	0.107	0.11		

Table 11: SAR measurement results at the highest possible output power, measured in a body-worn position against the ICNIRP and ANSI SAR Limit.

Body-Worn, Back of Phone 25 mm from Phantom															
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Limit[3] (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (50% RB)	SNN5892A	23230	20.2	-0.004	19.0	-4.0	0.106	0.109	0.11	0.138	0.141	0.14		
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	**20.1**	**-0.059**	**20.0**	**-4.0**	**0.116**	**0.119**	**0.12**	**0.152**	**0.155**	**0.16**	**5x5x7**	**A74**
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	20.1	-0.226	20.0	-4.0	0.109	0.112	0.12	0.143	0.146	0.15		
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	20.2	0.031	18.0	-4.0	0.088	0.091	0.09	0.115	0.117	0.12		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	20.2	-0.014	19.0	-4.0	0.097	0.100	0.10	0.127	0.129	0.13		
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	20.2	-0.047	19.0	-4.0	0.090	0.093	0.09	0.118	0.120	0.12		

Table 12: SAR measurement results at the highest possible output power, measured in a body-worn position against the ICNIRP and ANSI SAR Limit.

[3] For tests with power limit reductions employed, measured conducted power is not available by device design. Per FCC direction, measured power is replaced with the reduced maximum power limit for the device mode under test.

6.3 Lapdock Accessory Test Results

The DUT supports the use of the Motorola Lapdock™. The body-worn SAR results above were utilized to determine the channel that results in the highest measured SAR value when in proximity of the user's body. SAR testing was performed with the DUT placed into the Lapdock™ and the Lapdock™ placed for testing per FCC KDB 616217. For LTE and CDMA modes, the test sample was operated using an actual transmission through a base station simulator. Wi-Fi testing was conducted using manufacturer test mode software, per guidance given in FCC KDB 248227. The base station simulator or test software was set up for the proper channels, transmitter power levels and transmit modes of operation.

The SAR results shown in table 13 are maximum SAR values averaged over 1 gram of phantom tissue, to demonstrate compliance to [3] and also over 10 grams of phantom tissue, to demonstrate compliance to [6]. Also shown are the temperature of the simulated tissue after the test, the measured drift, the measured conducted output power levels, power reduction amount (when applicable), the measured SAR corrected for probe calibration (when applicable), and the extrapolated SAR. The exact method of extrapolation is:

$$Extrapolated\ SAR = (Measured\ or\ Corrected\ SAR) * 10^{(-drift/10)}$$

The SAR reported at the end of the measurement process by the DASY4™ measurement system can be scaled up by the measured drift to determine the SAR at the beginning of the measurement process. This is the most conservative SAR because it corresponds to the average output power at the beginning of the SAR test. This extrapolation has been done because when the DUT is operating properly it may exhibit a slump in radiated power and SAR over time. This is verified by measuring the SAR drift after the test.

The test conditions that produced the highest SAR values in each band are indicated as bold numbers in the following tables and are included in Appendix 4.

A "flat" phantom was for the Lapdock™ body tests. This "flat" phantom is made out of 1" thick natural High Density Polyethylene with a thickness at the bottom equal to 2.0 mm. It measures 52.7 cm(long) by 26.7 cm(wide) by 21.2 cm(tall).

The simulated tissue depth was verified to be 15.0 cm ± 0.5 cm. The DUT and Lapdock™ were placed using a Laptop Extension Kit available from SPEAG™ that facilitates the testing of larger devices according to IEC 62209-2 (e.g., laptops, cameras, etc.). The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin-SAM Phantoms

The following probe conversion factors were used on the E-Field probe(s) used for the Lapdock™ body measurements:

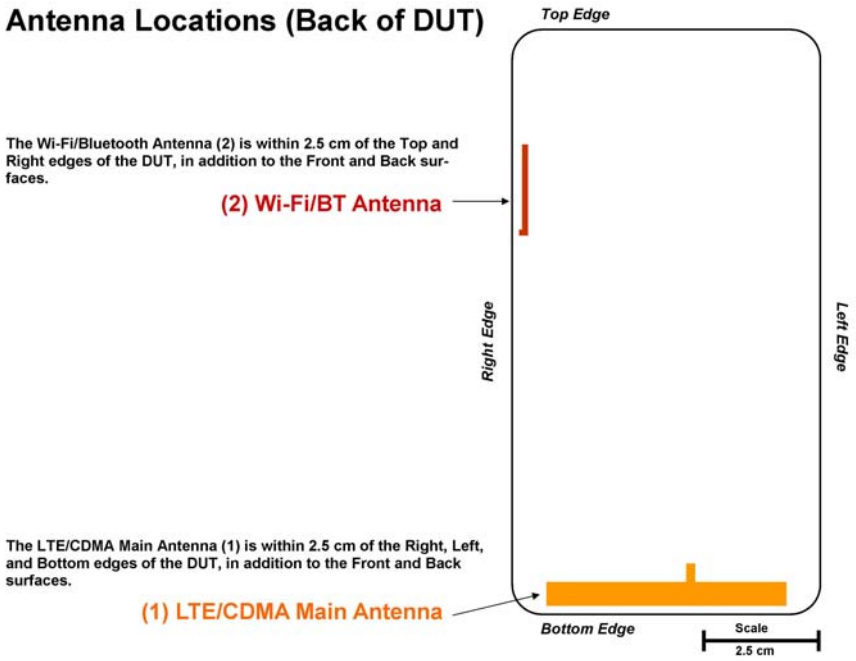
Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ES3DV3	3184	835	6.10	6 of 11
		1810	4.90	6 of 11
		2450	4.33	6 of 11

Lapdock against Body, Bottom Surface of Lapdock 0 mm from Phantom, Screen opened 90 degrees															
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Measured (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	20.8	-0.152	24.0		0.170	0.174	0.18	0.233	0.237	0.25	5x5x7	A82
835	CDMA 800, RC3 SO55	SNN5892A	1013												
			384	21.0	-0.023	24.97		0.270		0.27	0.380		0.38	5x5x7	A83
			777												
1880	CDMA 1900, RC3 SO55	SNN5892A	25												
			600												
			1175	20.0	0.084	24.93		0.318		0.32	0.528		0.53	5x5x7	A84
2450	802.11b, 1 Mbps	SNN5892A	1												
			6												
			11	20.4	0.049	17.54		0.00883		0.01	0.017		0.02	5x5x7	A85

Table 13: SAR measurement results at the highest possible output power, measured against the ICNIRP and ANSI SAR Limit.

6.4 Mobile Hotspot Test Results

The DUT is capable of functioning as a Wi-Fi to Cellular mobile hotspot. Additional SAR testing was performed according to the test guidelines provided per FCC KDB 941225 D06. Testing was performed with a separation of 1 cm between the DUT and the "flat" phantom. The DUT was positioned for SAR tests with the front and back surfaces facing the phantom, and also with the edges facing the phantom in which the transmitting antenna is < 2.5 cm from the edge.



Mobile Hotspot Surfaces for SAR testing						
Mode	Back	Front	Left	Right	Top	Bottom
CDMA	Yes	Yes	Yes	Yes	No	Yes
LTE	Yes	Yes	Yes	Yes	No	Yes
Wi-Fi	Yes	Yes	No	Yes	Yes	No

The SAR results shown in tables 14 through 24 are maximum SAR values averaged over 1 gram of phantom tissue, to demonstrate compliance to [3] and also over 10 grams of phantom tissue, to demonstrate compliance to [6]. Also shown are the temperature of the simulated tissue after the test, the measured drift, the measured conducted output power levels, power reduction amount (when applicable), the measured SAR corrected for probe calibration (when applicable), and the extrapolated SAR. The exact method of extrapolation is:

$$\textit{Extrapolated SAR} = (\textit{Measured or Corrected SAR}) * 10^{(-drift/10)}$$

The SAR reported at the end of the measurement process by the DASY4™ measurement system can be scaled up by the measured drift to determine the SAR at the beginning of the measurement process. This is the most conservative SAR because it corresponds to the average output power at the beginning of the SAR test. This extrapolation has been done because when the DUT is operating properly it may exhibit a slump in radiated power and SAR over time. This is verified by measuring the SAR drift after the test.

The DUT utilizes reduced limits for maximum transmit power when the mobile hotspot functionality is enabled, as described above in 2.2.2. A complete description of this functionality is provided in the Operational Description contained within Exhibit 12.

The test conditions that produced the highest SAR values in each band are indicated as bold numbers in the following tables and are included in Appendix 5. All other test conditions measured lower SAR values than those included in Appendix 5.

A "flat" phantom was for the mobile hotspot tests. This "flat" phantom is made out of 1" thick natural High Density Polyethylene with a thickness at the bottom equal to 2.0 mm. It measures 52.7 cm(long) by 26.7 cm(wide) by 21.2 cm(tall).

The simulated tissue depth was verified to be 15.0 cm ± 0.5 cm. The same device holder described in section 6 was used for positioning the phone.

The following probe conversion factors were used on the E-Field probe(s) used for the mobile hotspot measurements:

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ES3DV3	3124	835	5.86	6 of 11
		1810	4.76	6 of 11
		2450	4.19	6 of 11
E-Field Probe ES3DV3	3184	2450	4.33	6 of 11

Mobile Hotspot, Bottom Edge of Phone 10 mm from Phantom															
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Measured or Limit[4] (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (50% RB)	SNN5892A	23230	20.3	-0.164	23.2		0.008	0.008	0.01	0.014	0.014	0.01		
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	20.3	-0.086	24.0		0.056	0.058	0.06	0.094	0.096	0.10		
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	20.3	-0.039	24.2		0.058	0.060	0.06	0.098	0.100	0.10		
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	20.3	0.078	21.9		0.033	0.034	0.03	0.056	0.057	0.06		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	20.4	0.000	22.9		0.043	0.044	0.04	0.073	0.074	0.07		
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	20.2	-0.288	22.9		0.058	0.060	0.06	0.098	0.100	0.11		
835	CDMA 800, RC3 SO55	SNN5892A	1013												
			384	20.5	-0.092	24.97		0.069		0.07	0.118		0.12		
			777												
1880	CDMA 1900, RC3 SO55	SNN5892A	25	20.5	-0.062	19.1	-5.9	0.602		0.61	1.12		1.14		
			600	20.5	0.018	18.1	-6.9	0.629		0.63	1.19		1.19		
			1175	**20.2**	**-0.013**	**17.7**	**-7.3**	**0.843**		**0.85**	**1.48**		**1.48**	**5x5x7**	**A92**
	CDMA 1900, EVDO Rev. O[5]	SNN5892A	1175	19.0	0.183	17.7	-7.3	0.661		0.66	1.26		1.26		
	CDMA 1900, RC3 SO55	*SNN5892A/ SJHN0701A*	*1175*	***20.5***	***0.694***	***17.7***	***-7.3***	***0.674***		***0.67***	***1.34***		***1.34***	**5x5x7**	**A93**

Table 14: SAR measurement results at the highest possible output power, measured against the ICNIRP and ANSI SAR Limit.

Mobile Hotspot, Top Edge of Phone 10 mm from Phantom															
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Measured (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
2450	802.11b, 1 Mbps	SNN5892A	1	19.5	0.260	18.38		0.006		0.01	0.013		0.01		
			6												
			11												

Table 15: SAR measurement results at the highest possible output power, measured against the ICNIRP and ANSI SAR Limit.

[4] For tests with power limit reductions employed, measured conducted power is not available by device design. Per FCC direction, measured power is replaced with the reduced maximum power limit for the device mode under test.

[5] CDMA testing for Mobile Hotspot was conducted using 1x Data mode. Per discussion with the FCC, additional requested testing was conducted using EVDO Rev. O mode and is presented here.

Mobile Hotspot, Left Edge of Phone 10 mm from Phantom															
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Measured or Limit[4] (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (50% RB)	SNN5892A	23230	20.6	-0.210	23.2		0.586	0.602	0.63	0.837	0.851	0.89		
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	20.5	-0.306	24.0		0.697	0.716	0.77	0.995	1.011	1.09		
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	20.4	0.216	24.2		0.774	0.795	0.80	1.10	1.118	1.12		
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	20.4	-0.062	21.9		0.498	0.512	0.52	0.717	0.729	0.74		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	20.4	0.055	22.9		0.617	0.634	0.63	0.874	0.888	0.89		
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	20.5	-0.205	22.9		0.582	0.598	0.63	0.836	0.850	0.89		
835	CDMA 800, RC3 SO55	SNN5892A	1013	20.2	-0.388	25.01		0.649		0.71	0.941		1.03		
			384	20.2	-0.076	24.97		0.638		0.65	0.922		0.94		
			777	20.2	-0.009	24.88		0.536		0.54	0.94		0.78		
1880	CDMA 1900, RC3 SO55	SNN5892A	25												
			600	20.5	-0.051	18.1	-6.9	0.065		0.07	0.108		0.11		
			1175												

Table 16: SAR measurement results at the highest possible output power, measured against the ICNIRP and ANSI SAR Limit.

Mobile Hotspot, Right Edge of Phone 10 mm from Phantom															
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Measured or Limit[4] (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (50% RB)	SNN5892A	23230	20.3	-0.143	23.2		0.607	0.624	0.64	0.866	0.880	0.91		
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	20.5	-0.126	24.0		0.673	0.692	0.71	0.957	0.973	1.00		
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	20.3	-0.082	24.2		0.655	0.673	0.69	0.931	0.946	0.96		
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	20.3	-0.060	21.9		0.460	0.473	0.48	0.659	0.670	0.68		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	20.3	-0.598	22.9		0.538	0.553	0.63	0.769	0.782	0.90		
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	20.6	-0.611	22.9		0.628	0.645	0.74	0.893	0.908	1.04		
835	CDMA 800, RC3 SO55	SNN5892A	1013	20.5	-0.165	25.01		0.712		0.74	1.02		1.06		
			384	20.5	-0.192	24.97		0.688		0.72	0.988		1.03		
			777	20.5	-0.047	24.88		0.597		0.60	0.862		0.87		
1880	CDMA 1900, RC3 SO55	SNN5892A	25												
			600	20.5	-0.011	18.1	-6.9	0.065		0.07	0.108		0.11		
			1175												
2450	802.11b, 1 Mbps	SNN5892A	1	19.5	-0.147	18.38		0.027		0.03	0.083		0.09		
			6	19.5	0.006	17.85		0.044		0.04	0.101		0.10		
			11	**19.5**	**-0.149**	**17.54**		**0.047**		**0.05**	**0.129**		**0.13**	**5x5x7**	**A94**
		SNN5892A/ SJHN0701A	*11*	***19.5***	***-0.025***	***17.54***		***0.046***		***0.05***	***0.107***		***0.11***	**5x5x7**	**A95**

Table 17: SAR measurement results at the highest possible output power, measured against the ICNIRP and ANSI SAR Limit.

Mobile Hotspot, Front of Phone 10 mm from Phantom															
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Measured or Limit[4] (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (50% RB)	SNN5892A	23230	20.6	-0.051	23.2		0.646	0.664	0.67	0.834	0.848	0.86		
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	20.5	-0.286	24.0		0.737	0.757	0.81	0.954	0.970	1.04		
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	20.3	-0.619	24.2		0.742	0.763	0.88	0.958	0.974	1.12		
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	20.3	-0.166	21.9		0.546	0.561	0.58	0.705	0.716	0.74		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	20.3	-0.121	22.9		0.609	0.626	0.64	0.787	0.800	0.82		
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	20.3	-0.075	22.9		0.595	0.611	0.62	0.770	0.783	0.80		
835	CDMA 800, RC3 SO55	SNN5892A	1013	20.2	-0.139	25.01		0.688		0.71	0.888		0.92		
			384	20.2	-0.095	24.97		0.838		0.86	1.09		1.11		
			777	20.2	0.113	24.88		0.693		0.69	0.903		0.90		
1880	CDMA 1900, RC3 SO55	SNN5892A	25												
			600	20.5	-0.064	18.1	-6.9	0.269		0.27	0.509		0.52		
			1175												
2450	802.11b, 1 Mbps	SNN5892A	1	19.5	0.207	18.38		0.004		0.00	0.009		0.01		
			6												
			11												

Table 18: SAR measurement results at the highest possible output power, measured against the ICNIRP and ANSI SAR Limit.

Mobile Hotspot, Back of Phone 10 mm from Phantom															
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Measured or Limit[4] (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (50% RB)	SNN5892A	23230	20.5	-0.203	23.2		0.711	0.731	0.77	0.941	0.956	1.00		
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	20.2	-0.049	24.0		0.780	0.802	0.81	1.02	1.037	1.05		
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	20.2	-0.099	24.2		0.756	0.777	0.79	0.993	1.009	1.03		
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	20.2	0.055	21.9		0.514	0.528	0.53	0.679	0.690	0.69		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	**20.6**	**-0.170**	**22.9**		**0.902**	**0.927**	**0.96**	**1.19**	**1.199**	**1.25**	**5x5x7**	**A87**
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	20.6	-0.276	22.9		0.826	0.849	0.90	1.10	1.118	1.19		
	LTE Band 13, 16QAM (1 RB @ Low)	*SNN5892A/ SJHN0701A*	*23230*	***19.6***	***-0.217***	***22.9***		***0.402***	***0.415***	***0.44***	***0.512***	***0.523***	***0.55***	**5x5x7**	**A88**
835	CDMA 800, RC3 SO55	SNN5892A	1013	20.2	-0.090	25.01		0.902		0.92	1.20		1.23		
			384	**21.2**	**-0.147**	**24.97**		**0.994**		**1.03**	**1.33**		**1.38**	**5x5x7**	**A90**
			777	20.2	0.103	24.88		0.949		0.95	1.25		1.25		
	CDMA 1900, EVDO Rev. O[6]	SNN5892A	384	19.0	-0.148	24.49		0.924		0.96	1.23		1.27		
	CDMA 800, RC3 SO55	*SNN5892A/ SJHN0701A*	*384*	***20.2***	***-0.144***	***24.97***		***0.726***		***0.75***	***0.970***		***1.00***	**5x5x7**	**A91**
1880	CDMA 1900, RC3 SO55	SNN5892A	25	20.5	0.059	19.1	-5.9	0.575		0.58	1.12		1.12		
			600	20.5	0.019	18.1	-6.9	0.567		0.57	1.11		1.11		
			1175	20.5	-0.013	17.7	-7.3	0.643		0.65	1.28		1.28		
2450	802.11b, 1 Mbps	SNN5892A	1	19.3	-0.028	18.38		0.021		0.02	0.037		0.04		
			6												
			11												

Table 19: SAR measurement results at the highest possible output power, measured against the ICNIRP and ANSI SAR Limit.

[6] CDMA testing for Mobile Hotspot was conducted using 1x Data mode. Per discussion with the FCC, additional requested testing was conducted using EVDO Rev. O mode and is presented here.

The DUT supports Simultaneous Voice and LTE (svLTE), allowing a CDMA voice call while simultaneously providing an LTE link for data transport on the cellular network. When operating as a mobile hotspot during svLTE, a reduction in the maximum LTE transmit power limit is triggered to ensure SAR exposure compliance is maintained. A table of the reduced limits used for testing is provided in section 2.2.2 above. The measurement data in the following tables is provided to demonstrate SAR performance for LTE when this combination of functionalities is enabled.

Mobile Hotspot, Bottom Edge of Phone 10 mm from Phantom															
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Limit[4] (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (50% RB)	SNN5892A	23230	20.6	-0.330	13.5	-9.5	0.005	0.005	0.01	0.008	0.008	0.01		
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	20.5	-0.078	14.5	-9.5	0.005	0.005	0.01	0.009	0.009	0.01		
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	20.5	-0.549	14.5	-9.5	0.006	0.006	0.01	0.010	0.010	0.01		
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	20.6	0.178	12.5	-9.5	0.005	0.005	0.01	0.008	0.008	0.01		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	20.5	0.253	13.5	-9.5	0.005	0.005	0.01	0.008	0.008	0.01		
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	20.5	-0.110	13.5	-9.5	0.005	0.005	0.01	0.009	0.009	0.01		

Table 20: SAR measurement results at the highest possible output power, measured against the ICNIRP and ANSI SAR Limit.

Mobile Hotspot, Left Edge of Phone 10 mm from Phantom															
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Limit[4] (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (50% RB)	SNN5892A	23230	20.0	-0.149	13.5	-9.5	0.056	0.056	0.06	0.081	0.081	0.08		
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	20.8	0.475	14.5	-9.5	0.072	0.072	0.07	0.106	0.106	0.11		
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	19.7	-0.185	14.5	-9.5	0.089	0.089	0.09	0.128	0.128	0.13		
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	19.6	-0.080	12.5	-9.5	0.061	0.061	0.06	0.088	0.088	0.09		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	19.4	0.053	13.5	-9.5	0.069	0.069	0.07	0.099	0.099	0.10		
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	19.4	-0.073	13.5	-9.5	0.067	0.067	0.07	0.097	0.097	0.10		

Table 21: SAR measurement results at the highest possible output power, measured against the ICNIRP and ANSI SAR Limit.

Mobile Hotspot, Right Edge of Phone 10 mm from Phantom															
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Limit[4] (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (50% RB)	SNN5892A	23230	20.5	-0.118	13.5	-9.5	0.065	0.065	0.07	0.093	0.093	0.10		
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	20.5	-0.042	14.5	-9.5	0.066	0.066	0.07	0.094	0.094	0.09		
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	20.6	0.033	14.5	-9.5	0.065	0.065	0.07	0.094	0.094	0.09		
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	20.6	-0.015	12.5	-9.5	0.054	0.054	0.05	0.076	0.076	0.08		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	20.0	-0.155	13.5	-9.5	0.068	0.068	0.07	0.097	0.07	0.10		
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	19.7	-0.125	13.5	-9.5	0.070	0.070	0.07	0.101	0.101	0.10		

Table 22: SAR measurement results at the highest possible output power, measured against the ICNIRP and ANSI SAR Limit.

Mobile Hotspot, Front of Phone 10 mm from Phantom															
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Limit[4] (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (50% RB)	SNN5892A	23230	20.8	0.253	13.5	-9.5	0.079	0.079	0.08	0.108	0.108	0.11		
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	20.3	-0.141	14.5	-9.5	0.075	0.075	0.08	0.096	0.096	0.10		
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	20.2	-0.169	14.5	-9.5	0.074	0.074	0.08	0.096	0.096	0.10		
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	20.5	-0.044	12.5	-9.5	0.065	0.065	0.07	0.084	0.084	0.08		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	20.2	0.030	13.5	-9.5	0.075	0.075	0.08	0.096	0.096	0.10		
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	20.2	-0.166	13.5	-9.5	0.071	0.071	0.07	0.093	0.093	0.10		

Table 23: SAR measurement results at the highest possible output power, measured against the ICNIRP and ANSI SAR Limit.

Mobile Hotspot, Back of Phone 10 mm from Phantom															
f (MHz)	Mode	Battery/ Accessory	Channel	Temp (°C)	Drift (dB)	DUT Power		10 g SAR value			1 g SAR value			Test Plot	
						Limit[4] (dBm)	Power Reduction (dB)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Measured (W/kg)	Corrected (W/kg)	Extrapolated (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (50% RB)	SNN5892A	23230	20.5	-0.145	13.5	-9.5	0.094	0.094	0.10	0.124	0.124	0.13		
	LTE Band 13, QPSK (100% RB)	SNN5892A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5892A	23230	20.5	-0.027	14.5	-9.5	0.099	0.099	0.10	0.131	0.131	0.13		
	LTE Band 13, QPSK (1 RB @ High)	SNN5892A	23230	20.3	-0.373	14.5	-9.5	0.080	0.080	0.09	0.108	0.108	0.12		
	LTE Band 13, 16QAM (50% RB)	SNN5892A	23230	20.3	-0.016	12.5	-9.5	0.076	0.076	0.08	0.101	0.101	0.10		
	LTE Band 13, 16QAM (100% RB)	SNN5892A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5892A	23230	**20.3**	**-0.063**	**13.5**	**-9.5**	**0.100**	**0.100**	**0.10**	**0.133**	**0.133**	**0.13**	**5x5x7**	**A89**
	LTE Band 13, 16QAM (1 RB @ High)	SNN5892A	23230	20.2	0.081	13.5	-9.5	0.088	0.088	0.09	0.116	0.116	0.12		

Table 24: SAR measurement results at the highest possible output power, measured against the ICNIRP and ANSI SAR Limit.

6.5 Description and Evaluation of Simultaneous Transmitters

Per "SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas" (FCC KDB 648474), the necessity of stand-alone and simultaneous SAR testing was evaluated for the licensed and unlicensed transmitters of the device under test.

By device design the CDMA and LTE transmitters may operate simultaneously with either the Wi-Fi 802.11 transmitter or the Bluetooth transmitter. The separation distance between the Wi-Fi 802.11/Bluetooth antenna and the main antenna is 7.497 cm. Pictorial representation of the antenna locations and separation distances are given in Exhibit 7d.

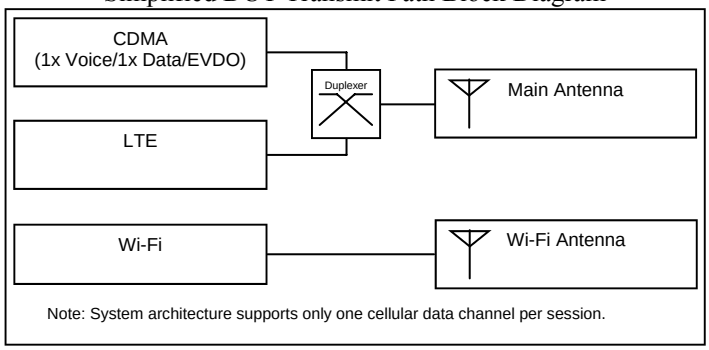
The Bluetooth transmitter of the device under test can be excluded from stand-alone and simultaneous SAR evaluation, per the highlighted requirements from FCC KDB 648474, as follows:

1. The highest output conducted power measured for Bluetooth on the device under test is 6.6 mW [≤ 24 mW]
2. The separation distance between the Bluetooth antenna and the main antenna is 7.497 cm [≥ 5.0 cm]

The Wi-Fi and the Bluetooth cannot transmit simultaneously, so there is no co-location test requirement for Wi-Fi and Bluetooth. CDMA supports both voice and data transmission, though not simultaneously. LTE and Wi-Fi support data transmission only.

Description of Simultaneous Transmit Capabilities				
Transmitter Combinations		Scenario Supported?	Supported for Mobile Hotspot?	Notes
#1	CDMA (1x Voice) + CDMA (1x Data)	No	No	DUT system architecture does not support simultaneous voice and data during a CDMA session on the cellular network
#2	CDMA (1x Voice) + CDMA (EVDO)	No	No	
#3	CDMA (1x Data) + CDMA (EVDO)	No	No	DUT system architecture supports only one data link per CDMA session
#4	CDMA (1x Voice) + LTE	Yes	No	*svLTE* – LTE operates at reduced power, See section 2.2.2
#5	CDMA (1x Data) + LTE	No	No	DUT system architecture supports only one data link per cellular session
	CDMA (EVDO) + LTE	No	No	DUT system architecture supports only one data link per cellular session
#6	CDMA (1x Voice) + Wi-Fi	Yes	No	Supported for voice plus background data
#7	CDMA (1x Data) + Wi-Fi	Yes	Yes	CDMA operates at reduced power during mobile hotspot operation, See section 2.2.2
	CDMA (EVDO) + Wi-Fi	Yes	Yes	
#8	LTE + Wi-Fi	Yes	Yes	Supported for mobile hotspot operation
#9	CDMA (1x Voice) + LTE + Wi-Fi	Yes	Yes	CDMA operates at reduced power during mobile hotspot operation; *svLTE during Mobile Hotspot* – LTE operates at reduced power See section 2.2.2

Simplified DUT Transmit Path Block Diagram



For the transmitters requiring stand-alone SAR testing (CDMA, LTE, and Wi-Fi 802.11), the KDB guidelines direct that if the sum of the 1 g SAR measured for the simultaneously transmitting antennas is less than the SAR limit, SAR measurement for simultaneous transmission is not required. Further, if the SAR-to-peak-location separation ratio for two simultaneously transmitting antennas is less than 0.3 then SAR measurement for simultaneous transmission is likewise not required. Evaluations of the head, body, and mobile hotspot simultaneous SAR summations for the worst-case SAR transmitter configurations are presented in the tables below.

The following Head position SAR summations for simultaneous evaluation are provided to demonstrate a CDMA voice link with a simultaneous data link on LTE or Wi-Fi.

Evaluations for Simultaneous SAR, Head positions								
	Transmitter Stand-Alone 1 g SAR Values (W/kg)				**1 g SAR Summations (W/kg)**			
Transmitter Combination					**#4**	**#4**	**#6**	**#6**
Band / Position	**CDMA 800**	**CDMA 1900**	***LTE Band 13* (svLTE)**	**Wi-Fi 2450**	**CDMA 800 + *LTE Band 13***	**CDMA 1900 + *LTE Band 13***	**CDMA 800 + Wi-Fi 2450**	**CDMA 1900 + Wi-Fi 2450**
Left Head Cheek	0.77	0.77	*0.23*	0.15	1.00	1.00	0.92	0.92
Left Head 15° Tilt	0.57	0.26	*0.16*	0.02	0.73	0.42	0.59	0.28
Right Head Cheek	0.83	0.37	*0.23*	0.06	1.06	0.60	0.89	0.43
Right Head 15° Tilt	0.58	0.25	*0.15*	0.01	0.73	0.40	0.59	0.26

The following Head position SAR summations for simultaneous evaluation are provided to demonstrate a CDMA voice link with simultaneous data links for LTE (to the cellular network) and Wi-Fi (to client devices), which can occur while the mobile hotspot functionality is enabled.[7]

Evaluations for Simultaneous SAR, Head positions Mobile Hotspot functionality enabled						
	Transmitter Stand-Alone 1 g SAR Values (W/kg)				**1 g SAR Summations (W/kg)**	
Transmitter Combination					**#9**	**#9**
Band / Position	**CDMA 800**	**CDMA 1900**	***LTE Band 13* (svLTE)**	**Wi-Fi 2450**	**CDMA 800 + *LTE Band 13* + Wi-Fi 2450**	**CDMA 1900 + *LTE Band 13* + Wi-Fi 2450**
Left Head Cheek	0.77	0.77	*0.23*	0.15	1.15	1.15
Left Head 15° Tilt	0.57	0.26	*0.16*	0.02	0.75	0.44
Right Head Cheek	0.83	0.37	*0.23*	0.06	1.12	0.66
Right Head 15° Tilt	0.58	0.25	*0.15*	0.01	0.74	0.41

[7] Note that during typical operation, the CDMA transmitter power is reduced for mobile hotspot operation and the LTE transmitter power is reduced as well for svLTE during mobile hotspot operation. The summations given are shown without CDMA power reduction enabled, and with a lesser power reduction than during this case for LTE enabled. As the SAR summations show results below the compliance limit using SAR values from higher-power configurations than used during typical operation, compliance with those reductions employed is implied.

The following Body-Worn position SAR summations for simultaneous evaluation are provided to demonstrate a CDMA voice link with a simultaneous data link on LTE or Wi-Fi.

Evaluations for Simultaneous SAR, Body-Worn positions								
	Transmitter Stand-Alone 1 g SAR Values (W/kg)				**1 g SAR Summations (W/kg)**			
Transmitter Combination					**#4**	**#4**	**#6**	**#6**
Band / Position	**CDMA 800**	**CDMA 1900**	***LTE Band 13* (svLTE)**	**Wi-Fi 2450**	**CDMA 800 + *LTE Band 13***	**CDMA 1900 + *LTE Band 13***	**CDMA 800 + Wi-Fi 2450**	**CDMA 1900 + Wi-Fi 2450**
Body Worn, Front of Phone 25 from Phantom	0.33	0.23	*0.15*	0.00	0.48	0.38	0.33	0.23
Body Worn, Back of Phone 25 from Phantom	0.41	0.94	*0.16*	0.01	0.57	1.10	0.42	0.95

The following Body-Worn position SAR summations for simultaneous evaluation are provided to demonstrate a CDMA voice link with simultaneous data links for LTE (to the cellular network) and Wi-Fi (to client devices), which can occur while the mobile hotspot functionality is enabled.[8]

Evaluations for Simultaneous SAR, Body-Worn positions Mobile Hotspot functionality enabled						
	Transmitter Stand-Alone 1 g SAR Values (W/kg)				**1 g SAR Summations (W/kg)**	
Transmitter Combination					**#9**	**#9**
Band / Position	**CDMA 800**	**CDMA 1900**	***LTE Band 13* (svLTE)**	**Wi-Fi 2450**	**CDMA 800 + *LTE Band 13* + Wi-Fi 2450**	**CDMA 1900 + *LTE Band 13* + Wi-Fi 2450**
Body Worn, Front of Phone 25 from Phantom	0.33	0.23	*0.15*	0.00	0.48	0.38
Body Worn, Back of Phone 25 from Phantom	0.41	0.94	*0.16*	0.01	0.58	1.11

[8] Note that during typical operation, the CDMA transmitter power is reduced for mobile hotspot operation and the LTE transmitter power is reduced as well for svLTE during mobile hotspot operation. The summations given are shown without CDMA power reduction enabled, and with a lesser power reduction than during this case for LTE enabled. As the SAR summations show results below the compliance limit using SAR values from higher-power configurations than used during typical operation, compliance with those reductions employed is implied.

The following Mobile Hotspot (10 mm separation) position SAR summations for simultaneous evaluation are provided to demonstrate a data link (over CDMA or LTE) with a simultaneous data link on Wi-Fi (to client devices).

Evaluations for Simultaneous SAR, Mobile Hotspot (10 mm separation) positions Mobile Hotspot fuctionality enabled							
	Transmitter Stand-Alone 1 g SAR Values (W/kg)				**1 g SAR Summations (W/kg)**		
Transmitter Combination					**#7**	**#7**	**#8**
Band / Position	***CDMA 800*** ***(Reduced Power)***	***CDMA 1900*** ***(Reduced Power)***	**LTE Band 13**	**Wi-Fi 2450**	***CDMA 800 +*** **Wi-Fi 2450**	***CDMA 1900 +*** **Wi-Fi 2450**	**LTE Band 13 + Wi-Fi 2450**
Bottom Edge of DUT 10 mm from Phantom	*0.12*	*1.48*	0.11	0.00	0.12	1.48	0.11
Top Edge of DUT 10 mm from Phantom	*0.00*	*0.00*	0.00	0.01	0.01	0.01	0.01
Left Edge of DUT 10 mm from Phantom	*1.03*	*0.11*	1.12	0.00	1.03	0.11	1.12
Right Edge of DUT 10 mm from Phantom	*1.06*	*0.11*	1.04	0.13	1.16	0.24	1.17
Front Surface of DUT 10 mm from Phantom	*1.11*	*0.52*	1.12	0.01	1.12	0.53	1.13
Back Surface of DUT 10 mm from Phantom	*1.38*	*1.28*	1.25	0.04	1.42	1.32	1.29

The following Mobile Hotspot (10 mm separation) position SAR summations for simultaneous evaluation are provided to demonstrate a CDMA voice link with simultaneous data links for LTE (to the cellular network) and Wi-Fi (to client devices), which can occur while the mobile hotspot functionality is enabled.

Evaluations for Simultaneous SAR, Mobile Hotspot (10 mm) position Mobile Hotspot functionality enabled						
	Transmitter Stand-Alone 1 g SAR Values (W/kg)				**1 g SAR Summations (W/kg)**	
Transmitter Combination					**#9**	**#9**
Band / Position	***CDMA 800*** ***(Reduced Power)***	***CDMA 1900*** ***(Reduced Power)***	***LTE Band 13*** ***(svLTE during Mobile Hotspot)***	**Wi-Fi 2450**	**CDMA 800 +** ***LTE Band 13 +*** **Wi-Fi 2450**	**CDMA 1900 +** ***LTE Band 13 +*** **Wi-Fi 2450**
Bottom Edge of DUT 10 mm from Phantom	*0.12*	*1.48*	*0.01*	0.00	0.13	1.49
Top Edge of DUT 10 mm from Phantom	*0.00*	*0.00*	*0.00*	0.01	0.01	0.01
Left Edge of DUT 10 mm from Phantom	*1.03*	*0.11*	*0.13*	0.00	1.16	0.24
Right Edge of DUT 10 mm from Phantom	*1.06*	*0.11*	*0.10*	0.13	1.29	0.35
Front Surface of DUT 10 mm from Phantom	*1.11*	*0.52*	*0.11*	0.01	0.23	0.64
Back Surface of DUT 10 mm from Phantom	*1.38*	*1.28*	*0.13*	0.04	1.55	1.45

As no summation of transmitter SAR values results in a value greater than the compliance limit, no measurements for simultaneous SAR are required.

References

[1] CENELEC, en62209-1:2006 “Human Exposure to Radio Frequency Fields From Hand - Held and Body - Mounted Wireless Communication Devices – Human Models, Instrumentation, and Procedures”

[2] CENELEC, en50360:2001 “Product standard to demonstrate the compliance of mobile phones with the basic restrictions related to human exposure to electromagnetic fields (300 MHz – 3 GHz)”.

[3] ANSI / IEEE, C95.1 1992 Edition “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”

[4] FCC OET Bulletin 65 Supplement C 01-01

[5] IEEE 1528 2003 Edition “IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”

[6] ICNIRP Guidelines “Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz)”