



MOTOROLA

Portable Cellular Phone SAR Test Report

Tests Requested By: Motorola Mobility, Inc.
600 N. US Highway 45
Libertyville, IL 60048

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Test Laboratory: Motorola Mobility, Inc. - ADR Test Services Laboratory
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This laboratory is accredited to ISO/IEC 17025-2005 to perform the following tests:

Accreditation:



2404

Tests:

Electromagnetic Specific Absorption Rate

Procedures:

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)

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:

(none)

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Revision History

Revision Version	Date	Notes
Rev. 0	May-29-2012	Initial report release
Rev. A	Jul-09-2012	Revised per TCB inquiry

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. For ANSI / IEEE C95.1 (1 g), the final simultaneous-transmission SAR readings (by summation) for this phone are 1.59 W/kg for head-adjacent use, 0.88 W/kg for body-worn accessory use, and 1.15 W/kg for mobile hotspot operation. These measurements were performed using a DASy4™ v4.7 or DASy52™ 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	0.49	0.30	0.42
1x CDMA 800	0.43	0.29	0.78
EVDO 800	0.37	0.40	0.77
1x CDMA 1900	0.97	0.46	0.78
EVDO 1900	0.72	0.44	0.85
Wi-Fi 2.45 GHz	1.53	0.01	0.12
Wi-Fi 5.2 GHz	1.36	0.12	N/A
Wi-Fi 5.3 GHz	1.41	0.12	N/A
Wi-Fi 5.6 GHz	1.56	0.04	N/A
Wi-Fi 5.8 GHz	1.07	0.03	0.04

2. Description of the Device Under Test

2.1 Antenna description

Main Antenna [800/1900 MHz]

Type	Internal	
Location	Bottom of Transceiver	
Dimensions	Width	4.6 mm
	Length	50.2 mm

LTE Antenna [782 MHz]

Type	Internal	
Location	Left-Side Rear of Transceiver	
Dimensions	Width	10.5 mm
	Length	30.0 mm

Wi-Fi/Bluetooth Antenna [2.4 / 5 GHz]

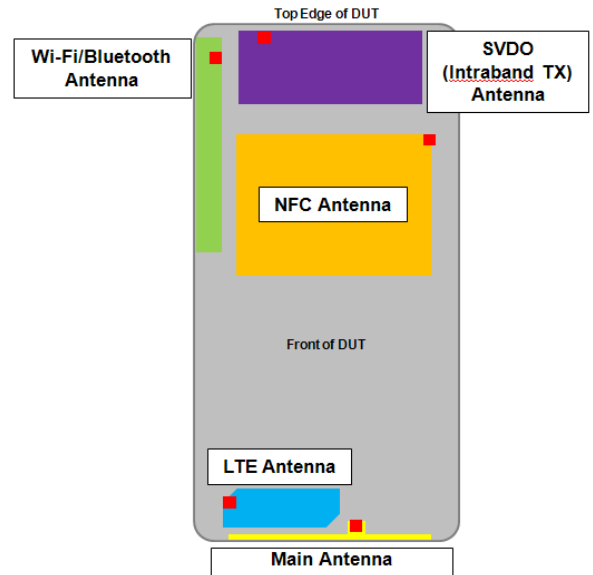
Type	Internal	
Location	Left Edge of Transceiver	
Dimensions	Width	5.5 mm
	Length	55.2 mm

SVDO (Intraband TX) Antenna [800/1900 MHz]

Type	Internal	
Location	Top Edge of Transceiver	
Dimensions	Width	18.8 mm
	Length	46.5 mm

NFC Antenna [13.56 MHz]

Type	Internal	
Location	of Transceiver	
Dimensions	Width	18.8 mm
	Length	46.5 mm



2.2 Device Signaling^{1,2}

Serial Number(s) (Functional Use)	LVQV2L0031 (CDMA/EVDO/LTE conducted power measurements, CDMA/EVDO/LTE SAR testing, Wi-Fi SAR testing) LVQV2L0035 (CDMA/EVDO SAR testing) LVQV2G0014 (EVDO conducted power, EVDO SVDO Intraband Antenna SAR testing) LVQV2X0062 (Bluetooth conducted power measurements) LVQV2L0005 (Wi-Fi conducted power measurements)
Production Unit or Identical Prototype (47 CFR §2.908)	Identical Prototype
Device Category	Portable
RF Exposure Limits	General Population / Uncontrolled

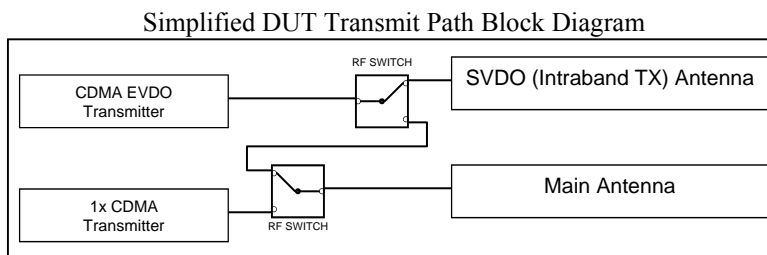
Mode(s) of Operation	Modulation Mode(s)	Maximum Output Power Setting	Duty Cycle	Transmitting Frequency Range(s)
LTE Band 13	QPSK, 16QAM	24.0 dBm	1:1	782 MHz (1 Channel, 10 MHz wide)
1x CDMA 800	QPSK	25.0 dBm	1:1	824.70 – 848.31 MHz
EVDO 800	QPSK	25.0 dBm	1:1	824.70 – 848.31 MHz
1x CDMA 1900	QPSK	25.0 dBm	1:1	1851.20 – 1908.75 MHz
EVDO 1900	QPSK	25.0 dBm	1:1	1851.20 – 1908.75 MHz
Wi-Fi 802.11b/g/n	BPSK	19 dBm	1:1	2412.0 - 2462.0 MHz
Wi-Fi 802.11a/n	BPSK	16 dBm	1:1	5180.0 - 5240.0 MHz, 5260.0 - 5320.0 MHz, 5500.0 - 5700.0 MHz, 5745.0 - 5825.0 MHz
Bluetooth	GFSK	7.9 dBm	1:1	2402.0 – 2480.0 MHz

¹ This device supports voice call functionality over GSM and WCDMA on non-US cellular networks. The GSM/WCDMA network functions have been disabled by firmware and are SIM locked for all US operators. Further information regarding this functionality is contained within Exhibit 12.

² This device contains an integrated Near Field Communications (NFC) module. Evaluation of SAR test requirements for the NFC transmitter was performed per the guidance in FCC KDB 447498, FCC KDB 865664 and FCC KDB 648474. FCC KDB 865664 specifies that the FCC SAR test requirements are applicable to 100 MHz - 6 GHz only, but states that numerical SAR simulation may be appropriate for transmit frequencies below 100 MHz. Additionally, KDB 447498 provides guidance on test exclusion based on maximum transmit power capabilities, which this NFC transmitter falls into. Finally, KDB 648474 states that "phones with built-in NFC, wireless charging or similar functions that do not require separate SAR testing for these specific capabilities can generally be tested according to the normally required SAR measurement procedures. The SAR influence of the additional accessory hardware and functionality to the transmitters and antennas that require SAR Testing are considered during the required SAR testing; therefore, it is transparent to the testing process." Therefore, no SAR measurements of the NFC transmitter are required.

2.2.1 CDMA, EVDO, and SVDO Operational Description

In addition to typical 1x CDMA and EVDO network functions, the DUT has an interleaved pair of transmit paths capable of supporting Simultaneous Voice and Data (SVDO) as shown in the following simplified block diagram.



The basic functionality of these two transmit paths is as follows:

- When ONLY transmitting 1x CDMA (voice or data), signaling is routed to the Main Antenna
- When ONLY transmitting EVDO data, signaling is routed to the Main Antenna
- When transmitting using *interband* signals for SVDO operation (1x CDMA 800 voice with EVDO 1900 data, or 1x CDMA 1900 voice with EVDO 800 data), both 1x and EVDO signals are routed to the Main Antenna
- When transmitting using *inband* signals for SVDO operation (1x CDMA and EVDO both on 800, or both on 1900) 1x CDMA is routed to the Main Antenna while EVDO is routed to the SVDO (Intraband TX) Antenna

To operate the DUT with EVDO routed to the SVDO (Intraband TX) Antenna with no other signaling active, a manufacturer's test mode is required. All SAR testing of EVDO transmissions from the SVDO (Intraband TX) Antenna utilized this test mode.

Per the manufacturer's factory process, verification of the CDMA EVDO transmitter's power is carried out at the RF port of the Main Antenna. To demonstrate the proper function of the manufacturer's test mode, conducted power measurements are provided in section 2.3.2 along with measurements of typical transmission using a base station simulator.

For further information on the operation of the SVDO functionality, see Exhibit 12.

2.2.2 LTE Device Description

LTE Summary Information per FCC KDB 941225

FCC ID			IHDP56NG1
Form Factor			Handset
Frequency Range			777 MHz - 787 MHz
Channel Bandwidths			10 MHz
L,M,H Channel Numbers and Frequencies			
Low	Mid	High	
N/A	23230 (782 MHz)	N/A	
UE Category			1
Modulations Supported			QPSK, 16QAM
Description of LTE Tx and Antenna Implementation			1 TX/RX Antenna; 1 RX Antenna
LTE Voice Available?			Yes (3 rd Party VOIP clients Only)
Hotspot with LTE + Wi-Fi?			Yes
Hotspot with LTE + Wi-Fi active with 1x Voice sessions?			Yes
LTE MPR Permanently Implemented per 3GPP TS 36.101?			Yes
A-MPR disabled (by setting NS=01 on the R&S CMW500)?			Yes
Conducted power table providing 1 RB (lower and upper edge), 50% RB (centered) and 100% RB			Yes
Table provided specifying other US wireless operating modes?			Yes
Table provided specifying maximum average conducted power for these other wireless modes			Yes
Table provided identifying simultaneous transmission conditions?			Yes (see section 6.4)
Power Reduction used for SAR compliance?			Yes (see section 2.2.3)
Power Reduction used for CDMA?			Yes
Power Reduction used for LTE?			Yes
Power Reduction used for svLTE?			Yes
Test Equipment used			CMW500 SW version 2.1.26.3

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 permanently implemented. 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 maximum power for the SAR test cases is 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

2.2.3 Transmitter power reduction conditions and modes

The DUT utilizes reduced limits for the maximum transmit power for its transmitters when operating under the following noted conditions. Tables of the reduced limits used for testing are given below. A complete description of this functionality is provided in the “Operational Description” contained within Exhibit 12. The implementation to trigger the reduction in power requires the device to be radiating, which prevents conducted power measurements of this functionality without modification to the unit.

For the Wi-Fi transmitter, reduced power limits are enforced under any condition where the Wi-Fi transmitter is operating simultaneously with any other transmitter(s). A table of the reduced limits used for testing is given below.

Mode(s) of Operation	Wi-Fi 2.4 GHz	Wi-Fi 5 GHz
Channel Ranges	1-11	36-165
Maximum Output Power Target (dBm)	19	16
Reduced Maximum Output Power Target (dBm)	15	9

The DUT supports Simultaneous Voice and LTE (SVLTE), allowing a 1x CDMA voice call while simultaneously providing an LTE link for data transport on the cellular network. While operating in SVLTE, *if the power on the 1x CDMA transmitter for voice is operating above 18 dBm*, a reduced maximum LTE transmit power limit is enforced to ensure SAR exposure compliance is maintained. When the power of the 1x CDMA transmitter is operating at or below 18 dBm or this combination of transmitters is not in use, the LTE transmitter operates up to its maximum power limit. Note that both conditions (1x CDMA above 18 dBm and LTE at reduced power, or 1x CDMA at or below 18 dBm with LTE at full power) are demonstrated for SAR compliance in section 6. A table of the reduced limits used for testing is 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)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Output Power Setting with MPR (dBm)	23.0	23.0	24.0	24.0	22.0	22.0	23.0	23.0
Reduced Maximum Output Power Setting (dBm)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0

The LTE transmitter may also operate as the data transport to the network during a mobile hotspot session. For operation in body-adjacent exposure configurations, the noted reduced power limit is strictly enforced regardless of other transmit conditions.

The DUT supports Simultaneous Voice and Data (SVDO), allowing a 1x CDMA voice call while simultaneously providing an EVDO link for data transport on the cellular network. While operating in SVDO, *if the power on the 1x CDMA transmitter for voice is operating above 18 dBm*, a reduced maximum EVDO 800 transmit power limit is enforced to ensure SAR exposure compliance is maintained. This reduced limit is enforced for both interband (1x CDMA 1900 voice) operation on the main antenna, or intraband (1x CDMA 800 voice) operation for 1x on the main antenna and EVDO on the SVDO antenna. When the power of the 1x CDMA transmitter is operating at or below 18 dBm or this combination of transmitters is not in use, the EVDO transmitter operates up to its maximum power limit. A table of the reduced limits used for testing is given below.

Mode(s) of Operation	EVDO 800
Channel Ranges	1013-777
Maximum Output Power Setting (dBm)	25.0
Reduced Maximum Output Power Setting (dBm)	18.0

While operating in SV conditions (SVDO or SVLTE) concurrent with a mobile hotspot session, in head-adjacent exposure configurations, a reduced maximum power limit is enforced on the 1x CDMA 1900 transmitter to ensure SAR exposure compliance is maintained. A table of the reduced limits used for testing is given below.

Mode(s) of Operation	1x CDMA 1900
Channel Ranges	25-1175
Maximum Output Power Setting (dBm)	25.0
Reduced Maximum Output Power Setting (dBm)	18.0

While operating in a mobile hotspot session (with or without SVDO), in body-adjacent exposure configurations, a reduced maximum power limit is enforced on the 1x CDMA 1900 transmitter to ensure SAR exposure compliance is maintained. A table of the reduced limits used for testing is given below.

Mode(s) of Operation	1x CDMA 1900
Channel Ranges	25-1175
Maximum Output Power Setting (dBm)	25.0
Reduced Maximum Output Power Setting (dBm)	16.0

While operating in SVDO in head-adjacent exposure configurations, *if the power on the 1x CDMA 800 transmitter for voice is operating above 18 dBm*, a reduced maximum power limit is enforced on the EVDO 1900 transmitter to ensure SAR exposure compliance is maintained. When the power of the 1x CDMA transmitter is operating at or below 18 dBm or this combination of transmitters is not in use, the EVDO transmitter operates up to its maximum power limit. A table of the reduced limits used for testing is given below.

Mode(s) of Operation	EVDO 1900
Channel Ranges	25-1175
Maximum Output Power Setting (dBm)	25.0
Reduced Maximum Output Power Setting (dBm)	18.0

While operating in SVDO in head-adjacent exposure configurations, with the 1x CDMA 1900 transmitter for voice, a reduced maximum power limit is enforced on the EVDO 1900 transmitter to ensure SAR exposure compliance is maintained. A table of the reduced limits used for testing is given below.

Mode(s) of Operation	EVDO 1900
Channel Ranges	25-1175
Maximum Output Power Setting (dBm)	25.0
Reduced Maximum Output Power Setting (dBm)	15.0

While operating in SVDO in body-worn accessory exposure configurations, *if the power on the 1x CDMA transmitter (800 or 1900 band) for voice is operating above 18 dBm*, a reduced maximum power limit is enforced on the EVDO 1900 transmitter to ensure SAR exposure compliance is maintained. When the power of the 1x CDMA transmitter is operating at or below 18 dBm or this combination of transmitters is not in use, the EVDO transmitter operates up to its maximum power limit. A table of the reduced limits used for testing is given below.

Mode(s) of Operation	EVDO 1900
Channel Ranges	25-1175
Maximum Output Power Setting (dBm)	25.0
Reduced Maximum Output Power Setting (dBm)	18.0

While operating in a mobile hotspot session, in body-adjacent exposure configurations, a reduced maximum power limit is enforced on the EVDO 1900 transmitter to ensure SAR exposure compliance is maintained. A table of the reduced limits used for testing is given below.

Mode(s) of Operation	EVDO 1900
Channel Ranges	25-1175
Maximum Output Power Setting (dBm)	25.0
Reduced Maximum Output Power Setting (dBm)	16.0

See section 6.4 for tables detailing the complete interoperation of these power limit reduction schema.

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 (dBm)	Power Limit with MPR (dBm)	MPR Target (dB)	Measured reduction from maximum limit	Notes
QPSK	10 MHz	1	0	23.71	24.0	0	0 dB	-
		1	49	24.07	24.0	0	0 dB	-
		50%	12	23.48	23.0	-1	-0.52 dB	MPR enabled
		100%	0	23.35	23.0	-1	-0.65 dB	MPR enabled
16QAM	10 MHz	1	0	23.25	23.0	-1	-0.75 dB	MPR enabled
		1	49	23.15	23.0	-1	-0.85 dB	MPR enabled
		50%	12	22.50	22.0	-2	-1.50 dB	MPR enabled
		100%	0	22.32	22.0	-2	-1.68 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 (for Interband Operation on Main Antenna)							
		Loopback		Data		EVDO Rev. O	EVDO Rev. A
Band	Channel	RC3 SO55	RC1 SO55	TDSO SO32 + FCH-SCH	TDSO SO32 + SCH	RTAP 153.6k	Subtype 2 RETAP
CDMA 800	1013	25.05	25.00	25.01	24.80	24.99	24.99
	384	24.99	24.95	24.86	24.89	24.80	24.85
	777	25.12	25.09	25.09	25.13	25.06	24.71
CDMA 1900	25	25.00	24.96	24.90	24.94	24.80	24.87
	600	24.94	24.99	24.96	24.99	24.91	24.98
	1175	24.80	24.85	24.84	24.85	24.80	24.88

Measured Conducted Power (dBm) for CDMA modes (for Inband Operation on SVDO Antenna)				
		EVDO Rev. O	EVDO Rev. A	Manufacturer's Test Mode
Band	Channel	RTAP 153.6k	Subtype 2 RETAP	
CDMA 800	1013	25.03	25.06	24.95
	384	24.87	24.85	24.87
	777	24.77	24.75	24.88
CDMA 1900	25	24.75	24.93	24.81
	600	25.20	25.20	24.66
	1175	24.63	24.52	24.78

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.

Mode	Freq [MHz]	Channel	Detector	802.11b Conducted Power [dBm]			
				Data Rate [Mbps]			
				1	2	5.5	11
802.11b	2412	1	AVG	18.01	17.98	18.01	18.16
			PEAK	20.34	20.35	20.33	20.45
802.11b	2437	6	AVG	19.05	18.95	19.07	19.07
			PEAK	21.29	21.24	21.30	21.31
802.11b	2462	11	AVG	18.30	18.28	18.25	18.28
			PEAK	20.85	20.82	20.81	20.84

Mode	Freq [MHz]	Channel	Detector	802.11g Conducted Power [dBm]							
				Data Rate [Mbps]							
				6	9	12	18	24	36	48	54
802.11g	2412	1	AVG	12.92	12.91	12.90	12.93	13.08	12.87	12.94	12.88
			PEAK	18.65	19.00	19.01	19.19	19.23	19.13	19.40	18.86
802.11g	2437	6	AVG	16.11	16.15	16.15	16.10	15.37	15.18	15.16	14.42
			PEAK	21.56	21.63	21.71	21.58	21.29	21.36	21.21	20.70
802.11g	2462	11	AVG	12.84	12.84	12.79	12.80	12.76	12.73	12.69	12.63
			PEAK	19.21	19.97	19.50	19.65	19.79	19.42	19.58	19.01

Mode	Freq [MHz]	Channel	Detector	802.11n (2.4GHz - 400ns GI) Conducted Power [dBm]							
				Data Rate [Mbps]							
				7.2	14.4	21.7	28.9	43.4	57.8	65.0	72.2
802.11n	2412	1	AVG	13.01	13.30	13.29	13.22	13.25	13.24	12.97	13.52
			PEAK	19.60	19.72	19.78	19.76	19.72	19.83	19.30	19.86
802.11n	2437	6	AVG	16.15	15.29	15.26	15.18	14.31	14.32	12.87	11.86
			PEAK	21.64	21.11	21.39	21.25	20.83	20.78	20.06	18.98
802.11n	2462	11	AVG	12.76	13.22	12.72	12.69	13.02	12.76	12.84	13.11
			PEAK	19.91	20.27	19.97	19.92	19.96	20.05	19.67	20.01

Mode	Freq [MHz]	Channel	Detector	802.11n (2.4GHz - 800ns GI) Conducted Power [dBm]							
				Data Rate [Mbps]							
				6.5	13.0	19.5	26.0	39.0	52.0	58.5	65.0
802.11n	2412	1	AVG	13.26	12.94	13.24	12.71	13.04	13.31	12.74	13.34
			PEAK	19.91	19.41	19.84	19.58	19.79	19.84	19.46	20.02
802.11n	2437	6	AVG	16.24	15.31	15.31	15.17	14.11	14.36	12.86	11.77
			PEAK	21.64	21.23	21.43	21.29	20.79	20.66	20.07	19.20
802.11n	2462	11	AVG	12.81	12.86	12.81	12.64	12.68	13.02	12.73	12.83
			PEAK	20.06	19.85	20.20	19.83	19.92	20.23	20.06	20.22

20 MHz Channel Bandwidth

Mode	Freq [MHz]	Channel	Detector	802.11a Conducted Power [dBm]							
				Data Rate [Mbps]							
				6	9	12	18	24	36	48	54
802.11a	5180	36	AVG	14.16	14.13	14.19	14.06	12.98	12.81	11.71	11.75
802.11a	5200	40	AVG	15.40	15.47	14.55	14.41	13.38	13.23	12.31	12.46
802.11a	5220	44	AVG	16.05	15.96	15.04	14.95	14.00	13.83	12.90	12.69
802.11a	5240	48	AVG	15.93	16.00	14.89	14.78	13.83	13.79	12.81	12.86
802.11a	5260	52	AVG	15.08	15.13	14.22	14.22	13.19	13.04	12.11	12.14
802.11a	5280	56	AVG	15.19	15.25	14.16	14.10	13.16	13.05	12.12	12.23
802.11a	5300	60	AVG	15.31	15.32	14.14	14.13	13.30	13.16	12.10	12.19
802.11a	5320	64	AVG	13.67	13.66	13.64	13.61	13.58	13.59	12.54	12.66
802.11a	5500	100	AVG	14.11	14.05	14.15	14.02	12.81	12.69	11.76	11.63
802.11a	5520	104	AVG	14.92	15.07	13.92	13.91	12.98	12.81	11.82	11.90
802.11a	5540	108	AVG	14.74	14.73	13.84	13.82	12.70	12.55	11.64	11.72
802.11a	5560	112	AVG	14.81	14.83	13.85	13.69	12.92	12.81	11.72	11.84
802.11a	5580	116	AVG	14.88	14.92	13.92	13.85	12.76	12.77	11.71	11.85
802.11a	5660	132	AVG	15.01	15.02	13.92	13.85	13.06	12.92	11.95	11.99
802.11a	5680	136	AVG	15.07	15.08	14.01	14.02	12.96	12.82	11.98	12.07
802.11a	5700	140	AVG	11.37	11.33	11.38	11.33	11.36	11.34	11.28	11.29

Mode	Freq [MHz]	Channel	Detector	802.11n (5GHz - 400ns GI) Conducted Power [dBm]							
				Data Rate [Mbps]							
				7.2	14.4	22	29	43	58	65	72
802.11n	5180	36	AVG	13.78	13.81	12.93	12.83	11.91	10.68	9.71	8.86
802.11n	5200	40	AVG	14.49	14.58	13.42	13.21	12.38	11.33	10.26	9.48
802.11n	5220	44	AVG	15.01	15.03	13.84	13.91	12.82	11.88	10.92	9.94
802.11n	5240	48	AVG	14.77	14.77	13.74	13.79	12.81	11.81	10.87	9.84
802.11n	5260	52	AVG	14.19	14.32	13.04	13.07	12.18	11.01	10.14	9.16
802.11n	5280	56	AVG	14.01	14.24	13.15	13.07	12.18	11.21	10.22	9.36
802.11n	5300	60	AVG	14.14	14.22	13.11	13.19	12.16	11.13	10.19	9.25
802.11n	5320	64	AVG	13.71	13.76	13.64	13.71	12.48	11.48	10.58	9.67
802.11n	5500	100	AVG	13.68	13.83	12.81	12.71	11.69	10.71	9.83	8.86
802.11n	5520	104	AVG	13.99	14.02	12.82	12.89	11.83	10.88	9.73	8.93
802.11n	5540	108	AVG	13.47	13.91	12.66	12.54	11.74	10.51	9.61	8.56
802.11n	5560	112	AVG	13.70	13.77	12.85	12.83	11.82	10.84	9.81	8.89
802.11n	5580	116	AVG	13.87	13.97	12.75	12.80	11.88	10.93	10.02	9.10
802.11n	5660	132	AVG	13.90	14.24	13.04	12.94	11.98	10.92	10.06	9.16
802.11n	5680	136	AVG	14.13	14.12	13.12	13.01	12.06	10.97	9.91	9.33
802.11n	5700	140	AVG	11.55	11.50	11.53	11.44	11.46	11.08	10.15	9.26

Mode	Freq [MHz]	Channel	Detector	802.11n (5GHz - 800ns GI) Conducted Power [dBm]							
				Data Rate [Mbps]							
				6.5	13	20	16	39	52	59	65
802.11n	5180	36	AVG	14.10	14.03	12.92	12.59	11.87	10.76	9.79	8.94
802.11n	5200	40	AVG	14.41	14.43	13.38	13.17	12.32	11.37	10.42	9.22
802.11n	5220	44	AVG	15.10	14.97	13.93	13.78	12.89	11.99	10.93	9.70
802.11n	5240	48	AVG	14.92	14.94	13.73	13.60	12.82	11.82	10.90	9.81
802.11n	5260	52	AVG	14.11	14.14	13.15	13.00	12.10	11.19	10.23	9.18
802.11n	5280	56	AVG	14.19	14.16	13.29	13.06	12.07	11.21	10.23	9.41
802.11n	5300	60	AVG	14.29	14.28	13.25	13.12	12.23	11.24	10.17	9.12
802.11n	5320	64	AVG	14.63	14.54	13.53	13.38	12.54	11.51	10.50	9.62
802.11n	5500	100	AVG	13.80	13.75	12.86	12.56	11.61	10.80	9.86	8.87
802.11n	5520	104	AVG	14.10	14.09	12.86	12.71	11.86	10.86	9.81	8.83
802.11n	5540	108	AVG	13.73	13.74	12.68	12.37	11.53	10.58	9.55	8.53
802.11n	5560	112	AVG	13.82	13.77	12.98	12.68	11.77	10.74	10.06	8.89
802.11n	5580	116	AVG	13.96	13.97	12.79	12.69	11.86	11.02	10.07	9.09
802.11n	5660	132	AVG	13.94	13.87	13.03	12.82	11.94	11.01	10.08	8.96
802.11n	5680	136	AVG	14.11	14.13	12.96	12.79	12.00	11.04	10.21	8.99
802.11n	5700	140	AVG	14.34	14.31	13.28	13.11	12.21	11.13	10.19	9.17

40 MHz Channel Bandwidth

Mode	Freq [MHz]	Channel	Detector	40MHz BW 802.11n (5GHz - 400ns GI) Conducted Power [dBm]							
				Data Rate [Mbps]							
				7.2	14.4	21.7	28.9	43.3	57.8	65.0	72.2
802.11n	5190	38	AVG	11.39	11.38	11.38	11.39	11.35	11.18	10.20	9.31
802.11n	5230	46	AVG	14.28	14.31	13.20	13.18	12.23	11.06	10.20	9.33
802.11n	5270	54	AVG	14.32	14.26	13.21	13.22	12.32	11.06	10.23	9.24
802.11n	5310	62	AVG	11.40	11.38	11.36	11.39	11.35	11.10	10.12	9.36
802.11n	5510	102	AVG	14.28	14.29	13.21	13.19	12.30	11.05	10.24	9.38
802.11n	5550	110	AVG	14.25	14.31	13.15	13.17	12.29	11.06	10.18	9.26
802.11n	5690	138	AVG	10.43	10.57	10.48	10.45	10.47	10.47	9.75	9.09

Mode	Freq [MHz]	Channel	Detector	40MHz BW 802.11n (5GHz - 800ns GI) Conducted Power [dBm]							
				Data Rate [Mbps]							
				6.5	13	20	26	39	52	59	65
802.11n	5190	38	AVG	11.36	11.33	11.36	11.35	11.33	10.80	9.71	8.97
802.11n	5230	46	AVG	13.97	13.95	12.85	12.92	11.79	10.94	9.84	9.00
802.11n	5270	54	AVG	13.81	13.98	12.79	12.80	11.72	10.85	9.72	8.97
802.11n	5310	62	AVG	11.35	11.52	11.51	11.41	11.54	10.98	9.92	9.05
802.11n	5510	102	AVG	12.48	12.50	12.52	12.43	11.82	10.98	9.69	9.02
802.11n	5550	110	AVG	14.06	13.76	12.88	12.80	11.72	10.90	9.83	9.05
802.11n	5690	138	AVG	10.43	10.60	10.54	10.47	10.49	10.56	9.73	9.03

20 MHz Channel Bandwidth

Mode	Freq [MHz]	Channel	Detector	802.11a Conducted Power [dBm]							
				Data Rate [Mbps]							
				6	9	12	18	24	36	48	54
802.11a	5745	149	AVG	15.20	15.19	14.16	14.13	13.02	12.94	12.06	12.16
			PEAK	19.71	19.86	19.52	19.43	18.92	18.96	18.44	18.25
802.11a	5765	153	AVG	15.14	15.15	14.01	14.02	13.15	13.11	11.99	12.07
			PEAK	19.68	19.80	19.42	19.40	18.97	19.02	18.31	18.27
802.11a	5785	157	AVG	15.04	15.06	13.98	13.95	13.20	13.04	12.05	12.12
			PEAK	19.61	19.76	19.36	19.32	18.97	18.99	18.40	18.27
802.11a	5805	161	AVG	14.90	14.95	13.97	13.80	13.02	12.87	11.91	12.01
			PEAK	19.49	19.63	19.32	19.23	18.80	18.87	18.27	18.16
802.11a	5825	165	AVG	14.78	14.82	13.66	13.66	12.72	12.63	11.58	11.67
			PEAK	19.43	19.55	19.17	19.10	18.67	18.64	18.06	17.88

Mode	Freq [MHz]	Channel	Detector	20MHz BW 802.11n (5GHz - 400ns GI) Conducted Power [dBm]							
				Data Rate [Mbps]							
				7.2	14.4	21.7	28.9	43.4	57.8	65.0	72.2
802.11n	5745	149	AVG	14.08	14.15	13.01	13.00	12.10	11.15	10.25	9.37
			PEAK	19.38	19.29	19.11	18.87	18.50	17.99	17.43	16.43
802.11n	5765	153	AVG	14.01	14.08	13.04	13.14	11.93	11.10	10.19	9.30
			PEAK	19.33	19.21	19.03	18.97	18.38	17.82	17.39	16.33
802.11n	5785	157	AVG	13.94	13.96	13.00	13.06	12.11	11.06	10.13	9.23
			PEAK	19.27	19.16	19.02	18.88	18.45	17.77	17.27	16.33
802.11n	5805	161	AVG	13.80	13.90	12.91	12.91	12.02	10.91	9.99	9.02
			PEAK	19.17	19.06	18.94	18.76	18.34	17.66	17.16	16.22
802.11n	5825	165	AVG	13.61	13.64	12.70	12.73	11.67	10.70	9.84	8.86
			PEAK	19.01	18.9	18.80	18.62	18.10	17.58	16.96	15.92

Mode	Freq [MHz]	Channel	Detector	20MHz BW 802.11n (5GHz - 800ns GI) Conducted Power [dBm]							
				Data Rate [Mbps]							
				6.5	13.0	19.5	26.0	39.0	52.0	58.5	65.0
802.11n	5745	149	AVG	14.18	14.18	13.10	12.94	12.09	11.23	10.29	9.32
			PEAK	19.44	19.36	19.11	18.97	18.49	17.88	17.42	16.63
802.11n	5765	153	AVG	14.10	14.08	13.05	12.97	12.03	11.12	10.26	9.25
			PEAK	19.35	19.31	19.07	18.92	18.47	17.72	17.47	16.60
802.11n	5785	157	AVG	14.03	14.05	12.93	12.79	11.96	11.14	10.26	9.18
			PEAK	19.30	19.28	19.01	18.84	18.47	17.68	17.45	16.53
802.11n	5805	161	AVG	13.99	13.91	12.91	12.73	11.95	10.99	10.03	9.06
			PEAK	19.23	19.12	19.01	18.73	18.33	17.71	17.28	16.40
802.11n	5825	165	AVG	13.76	13.76	12.65	12.46	11.60	10.61	9.67	8.67
			PEAK	19.09	19.03	18.81	18.55	18.17	17.35	16.93	16.14

40 MHz Channel Bandwidth

Mode	Freq [MHz]	Channel	Detector	40MHz BW 802.11n (5GHz - 400ns GI) Conducted Power [dBm]							
				Data Rate [Mbps]							
				15.0	30.0	45.0	60.0	90.0	120.0	135.0	150.0
802.11n	5755	151	AVG	13.93	13.96	12.84	12.83	11.76	10.86	9.75	9.06
			PEAK	19.45	19.45	18.92	18.92	18.34	17.47	16.68	16.03
802.11n	5775	155	AVG	13.95	13.98	12.51	12.80	11.74	10.81	9.69	8.96
			PEAK	19.49	19.45	18.61	18.84	18.27	17.57	16.72	15.99
802.11n	5795	159	AVG	13.91	13.94	12.90	12.81	11.78	10.76	9.74	9.01
			PEAK	19.52	19.48	18.74	18.89	18.30	17.54	16.69	16.01
802.11n	5815	163	AVG	13.90	13.93	12.88	12.78	11.85	10.77	9.76	9.02
			PEAK	19.42	19.49	18.93	18.87	18.29	17.51	16.67	16.06

Mode	Freq [MHz]	Channel	Detector	40MHz BW 802.11n (5GHz - 800ns GI) Conducted Power [dBm]							
				Data Rate [Mbps]							
				13.5	27.0	40.5	54.0	81.0	108.0	121.5	135.0
802.11n	5755	151	AVG	13.97	13.92	12.86	12.91	11.74	10.84	9.73	8.94
			PEAK	19.45	19.49	18.91	18.91	18.19	17.54	16.69	15.91
802.11n	5775	155	AVG	13.98	13.94	12.79	12.83	11.77	10.85	9.80	9.08
			PEAK	19.49	19.41	18.90	18.91	18.28	17.53	16.74	16.10
802.11n	5795	159	AVG	13.90	13.92	12.86	12.84	11.80	10.72	9.59	8.97
			PEAK	19.46	19.55	18.81	18.78	18.07	17.51	16.58	16.02
802.11n	5815	163	AVG	13.96	13.96	12.79	12.75	11.81	10.92	9.71	8.96
			PEAK	19.49	19.5	18.88	18.80	17.89	17.64	16.62	15.91

2.3.4 Bluetooth modes and test exclusion

Frequency [MHz]	Data Rate [Mbps]	Channel Number	Average Conducted Power [mW]
2402	1.0	0	5.534
2441	1.0	39	5.585
2480	1.0	78	6.012
2402	2.0	0	3.999
2441	2.0	39	4.036
2480	2.0	78	4.315
2402	3.0	0	3.990
2441	3.0	39	4.027
2480	3.0	78	4.315

Frequency [MHz]	Mode	Channel Number	Peak Conducted Power [mW]
2402	LE	0	5.984
2441	LE	39	5.957
2480	LE	78	6.180

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 D01, as follows:

Vs. Main (Cellular) Antenna

- The highest output conducted power measured for Bluetooth on the device under test is 6.180 mW [≤ 24 mW]
- The distance between the Bluetooth antenna and the Main (Cellular) antenna is 6.75 cm [≥ 5 cm]

Vs. LTE Antenna

- The highest output conducted power measured for Bluetooth on the device under test is 6.180 mW [≤ 24 mW]
- The distance between the Bluetooth antenna and the LTE antenna is 6.29 cm [≥ 5 cm]

Vs. SVDO (Intraband TX) Antenna

- The highest output conducted power measured for Bluetooth on the device under test is 6.180 mW [≤ 12 mW]
- The distance between the Bluetooth antenna and the SVDO (Intraband TX) antenna is 0.50 cm [< 2.5 cm]
- The highest 1-g SAR values for the SVDO (Intraband TX) antenna are: [< 1.2 W/kg]
 EVDO 800 (0.21 W/kg); EVDO 1900 (0.23 W/kg)

Note that Bluetooth mode is not intended for use in configurations against the head, and this evaluation considers only body-adjacent (Body-Worn Accessory or Mobile Hotspot) position configurations. Pictorial representation of the antenna locations and separation distances are given in Exhibit 7d and in section 6.4 below.

3. Test Equipment Used

3.1 Dosimetric System

The Motorola Mobility ADR Test Services Laboratory utilizes a Dosimetric Assessment System (DASY4™ v4.7 or DASY52™) 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 $\pm 10.8\%$ (K=1) with an expanded uncertainty of $\pm 21.6\%$ (K=2). The overall 1 g RSS uncertainty of the measurement system is $\pm 11.1\%$ (K=1) with an expanded uncertainty of $\pm 22.2\%$ (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 measurements is shown in the following tables. All equipment was brought into service and used only during its noted calibration period, except where indicated. Equipment without a calibration period was in service for the entirety of the test period.

Description	Serial Number	Cal Date	Cal Due Date
DASY4™ DAE V1	376	Aug-31-2011	Aug-31-2012
E-Field Probe ES3DV3	3124	Aug-23-2011	Aug-23-2012
DASY4™ DAE V1	1310	Jan-11-2012	Jan-11-2013
E-Field Probe ES3DV3	3284	Jan-10-2012	Jan-10-2013
DASY4™ DAE V1	699	Sep-22-2011	Sep-22-2012
E-Field Probe ES3DV3	3115	Sep-22-2011	Sep-22-2012
DASY4™ DAE V1	702	Apr-17-2012	Apr-17-2013
E-Field Probe EX3DV4	3728	Apr-24-2012	Apr-24-2013
S.A.M. Phantom used for 782/800/900 MHz	TP-1132		
S.A.M. Phantom used for 782/800/900 MHz	TP-1156		
S.A.M. Phantom used for 1800/1900/2450 MHz	TP-1162		
S.A.M. Phantom used for 1800/1900/2450 MHz	TP-1319		
S.A.M. Phantom used for 2.4/5 GHz	TP-1106		
Dipole Validation Kit, DV835V2	4D128	Jan-11-2012	Jan-11-2013
Dipole Validation Kit, DV835V2	4D129	Jan-11-2012	Jan-11-2013
Dipole Validation Kit, DV835V2	436TR	Mar-18-2011	Mar-18-2012 ³
Dipole Validation Kit, DV1800V2	2D190	Jan-05-2012	Jan-05-2013
Dipole Validation Kit, DV1800V2	2D191	Jan-05-2012	Jan-05-2013
Dipole Validation Kit, DV1800V2	259	Oct-20-2011	Oct-20-2012
Dipole Validation Kit, DV2450V2	863	Mar-17-2011	Mar-17-2012 ³
Dipole Validation Kit, DV2450V2	766	Jul-15-2011	Jul-15-2012
Dipole Validation Kit, D5GHzV2	1088	May-20-2011	May-20-2012

3.2 Additional Equipment

Description	Serial Number	Cal Date	Cal Due Date
Signal Generator HP8648C	3847A04810	Sep-26-2011	Sep-26-2013
Power Meter E4419B	GB39511090	Aug-12-2011	Aug-12-2013
Power Sensor #1 - E9301A	US39210917	Nov-16-2011	Nov-16-2012
Power Sensor #2 - E9301A	US39210918	Nov-16-2011	Nov-16-2012
Signal Generator HP8648C	3847M01245	Aug-23-2011	Aug-23-2013
Power Meter E4419B	GB39511084	Mar-28-2011	Mar-28-2013
Power Sensor #1 - E9301A	US39210931	Jan-19-2012	Jan-19-2013
Power Sensor #2 - E9301A	US39210932	Jan-19-2012	Jan-19-2013
Signal Generator HP8648C	3847A04632	Aug-13-2011	Aug-13-2013
Power Meter E4419B	GB39511086	Nov-04-2011	Nov-04-2013
Power Sensor #1 - E9301A	US39210915	Sep-09-2011	Sep-09-2012
Power Sensor #2 - E9301A	US39210916	Sep-09-2011	Sep-09-2012
Signal Generator N5181A	MY50143026	Oct-27-2011	Oct-27-2014
Power Meter E4419A	GB41293246	Nov-05-2011	Nov-05-2013
Power Sensor #1 - E9301A	US39211009	Aug-16-2011	Aug-16-2012
Power Sensor #2 - E9301A	US39211013	Aug-16-2011	Aug-16-2012
Network Analyzer HP8753ES ⁴	US39171846	May-19-2011	May-19-2012
Network Analyzer E5071C ⁵	MY46212851	May-10-2012	May-10-2013
Dielectric Probe Kit DAK-3.5	1030		

³ Per FCC KDB 450824 D02, evaluation for the extension of the dipole calibration was carried out. Results are provided in Appendix 7 in addition to the original calibration certificate.

⁴ Network Analyzer removed from service on May-15-2012.

⁵ Network Analyzer placed into service on May-15-2012.

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 $\rho = 1 \text{ g/cm}^3$ 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 these criteria.

f (MHz)	Tissue type	Limits / Measured	Dielectric Parameters				
			ϵ_r	σ (S/m)	Temp (°C)		
782	Head	Measured, Apr-06-2012	42.7	0.89	20.4		
		Recommended Limits	41.78 ±5%	0.896 ±5%	18-25		
	Body	Measured, Apr-07-2012	55.5	0.93	19.0		
		Measured, May-19-2012	54.3	0.93	19.0		
		Recommended Limits	55.4 ±5%	0.966 ±5%	18-25		
		Measured, Mar-27-2012	40.8	0.92	19.1		
835	Head	Measured, Apr-13-2012	40.5	0.94	19.1		
		Measured, Apr-17-2012	40.5	0.93	19.0		
		Measured, May-01-2012	41.4	0.94	19.7		
		Recommended Limits	41.5 ±5%	0.90 ±5%	18-25		
		Body	Measured, Mar-28-2012	53.5	1.00	18.8	
			Measured, Apr-05-2012	54.7	0.99	19.2	
	Measured, Apr-06-2012		55.1	1.00	18.8		
	Measured, Jun-27-2012		55.8	0.99	20.0		
	Recommended Limits		55.2 ±5%	0.97 ±5%	18-25		
	1880		Head	Measured, Apr-17-2012	38.1	1.47	18.6
		Measured, Apr-25-2012		38.1	1.47	19.6	
		Measured, Mar-28-2012		38.4	1.45	19.2	
Measured, May-11-2012		38.8		1.44	19.2		
Recommended Limits		40.0 ±5%		1.40 ±5%	18-25		
Body		Measured, Mar-28-2012	52.7	1.57	19.0		
		Measured, Apr-06-2012	52.0	1.59	18.6		
		Measured, May-06-2012	53.2	1.58	18.8		
		Measured, May-18-2012	51.6	1.59	18.6		
		Measured, May-21-2012	51.3	1.58	19.2		
		Measured, May-23-2012	51.2	1.59	18.8		
		Recommended Limits	53.3 ±5%	1.52 ±5%	18-25		
		2450	Head	Measured, Jun-26-2012	37.6	1.86	21.4
				Recommended Limits	39.2 ±5%	1.80 ±5%	18-25
Body	Measured, Jun-26-2012		50.5	2.0	18.8		
	Measured, Jul-06-2012		50.5	2.04	19.1		
	Recommended Limits		52.7 ±5%	1.95 ±5%	18-25		
5210	Head	Measured, Jun-27-2012	35.4	4.59	19.6		
		Recommended Limits	36.0 ±10%	4.66 ±5%	18-25		
	Body	Measured, Jun-27-2012	48.1	5.26	21.1		
		Recommended Limits	49.0 ±10%	5.31 ±5%	18-25		
5290	Head	Measured, Jun-28-2012	35.2	4.66	19.6		
		Recommended Limits	35.9 ±10%	4.74 ±5%	18-25		
	Body	Measured, Jun-27-2012	47.9	5.37	21.1		
		Recommended Limits	48.9 ±10%	5.41 ±5%	18-25		
5600	Head	Measured, Jun-28-2012	34.6	5.09	19.7		
		Recommended Limits	35.5 ±10%	5.06 ±5%	18-25		
	Body	Measured, Jul-06-2012	44.3	5.82	19.1		
		Recommended Limits	48.5 ±10%	5.77 ±5%	18-25		
5785	Head	Measured, Jun-28-2012	34.3	5.29	19.7		
		Measured, Jul-06-2012	33.9	5.12	19.0		
		Recommended Limits	35.4 ±10%	5.25 ±5%	18-25		
	Body	Measured, Jul-04-2012	43.5	5.90	19.0		
		Recommended Limits	48.2 ±10%	5.98 ±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	5 GHz Body
Sugar	57	44.9	--	--	--	--	--
DGBE	--	--	47	30.8	--	8	--
Diacetin	--	--	--	--	51	--	--
Water	40.45	53.06	52.62	68.8	48.75	71.8	78.66
Salt	1.45	0.94	0.38	0.4	0.15	0.2	--
HEC	1	1	--	--	--	--	--
Bact.	0.1	0.1	--	--	0.1	--	--
Triton X-100	--	--	--	--	--	20	10.67
Di(ethylene glycol) Hexyl Ether	--	--	--	--	--	--	10.67

All 5 GHz Head SAR testing was performed using HBBL3500-5800V5 tissue simulating liquids from Schmid & Partner Engineering AG. Prior to conducting SAR measurements, the relative permittivity, ϵ_r , and the conductivity, σ , of the liquids were measured as shown above.

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 $\pm 10\%$ from the target SAR indicated in Appendix 7. These frequencies are within $\pm 10\%$ of the compliance test mid-band frequency as required in [1] and [5]^{6,7}. 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). For frequencies below 3 GHz, the simulated tissue depth was verified to be 15.0 cm \pm 0.5 cm. For frequencies above 3 GHz, the simulated tissue depth was verified to be 10 cm \pm 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	Dipole	Measured SAR (W/kg), 1 gram	Normalized SAR (W/kg), 1 gram	Dielectric Parameters		Ambient Temp (°C)	Tissue Temp (°C)
					ϵ_r	σ (S/m)		
835	Measured, Mar-27-2012	4D128	2.02	10.1	40.8	0.92	20.8	19.5
	Measured, Apr-06-2012	4D128	2.04	10.2	42	0.94	21.4	19.8
	Measured, May-07-2012	4D128	2.02	10.1	41.4	0.92	20.8	19.3
	Recommended Limits	4D128		9.45	41.5 \pm 5%	0.90 \pm 5%	18-25	18-25
	Measured, Apr-13-2012	4D129	2.05	10.25	40.5	0.94	21.2	19.2
	Measured, Apr-17-2012	4D129	2.01	10.05	40.5	0.93	21.0	19.0
	Measured, May-01-2012	4D129	2.06	10.3	41.4	0.94	21.7	19.7
Recommended Limits	4D129		9.41	41.5 \pm 5%	0.90 \pm 5%	18-25	18-25	
1800	Measured, Mar-28-2012	259	7.59	37.95	38.7	1.37	20.6	19.5
	Recommended Limits	259		38.1	40.0 \pm 5%	1.40 \pm 5%	18-25	18-25
	Measured, Apr-17-2012	2D191	7.56	37.8	38.6	1.39	20.8	18.9
	Measured, Apr-25-2012	2D191	7.80	39.0	38.5	1.38	20.7	20.1
	Measured, May-11-2012	2D191	7.63	38.15	39.1	1.36	21.5	19.2
	Measured, May-18-2012	2D191	7.15	35.75	38.7	1.38	21.4	19.6
	Recommended Limits	2D191		39.2	40.0 \pm 5%	1.40 \pm 5%	18-25	18-25
2450	Measured, Jun-26-2012	863	11.0	55.0	37.6	1.86	20.8	20.0
	Recommended Limits	863		54.2	39.2 \pm 5%	1.80 \pm 5%	18-25	18-25
5200	Measured, Jun-27-2012	1088	7.46	74.6	35.4	4.58	20.5	19.7
	Recommended Limits	1088		80.2	36.0 \pm 10%	4.65 \pm 5%	18-25	18-25
5800	Measured, Jun-28-2012	1088	7.25	72.5	34.5	5.20	21.1	19.8
	Measured, Jul-06-2012	1088	7.11	71.1	33.9	5.13	20.8	19.0
	Recommended Limits	1088		79.0	35.4 \pm 10%	5.27 \pm 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	6.08	5 of 11
		1810	5.03	5 of 11
		2450	4.40	5 of 11
E-Field Probe ES3DV3	3284	835	6.18	5 of 11
		1810	5.33	5 of 11
		2450	4.56	5 of 11
E-Field Probe ES3DV3	3115	835	5.83	5 of 11
		1810	5.17	5 of 11
		2450	4.35	5 of 11
E-Field Probe EX3DV4	3728	2450	6.86	5 of 11
		5200	4.74	5 of 11
		5800	4.23	5 of 11

⁶ Device testing for LTE Band 13 utilized the same system setup (phantom/probe/tissue) as used for 835 MHz system accuracy verification measurements, and as such those verification measurements are applicable for testing in that transmit band.

⁷ Device testing for U-NII II (5290 MHz) and U-NII III (5600 MHz) bands utilized the same system setup (phantom/probe/tissue) as used for 5200 MHz and 5800 MHz system accuracy verification measurements, respectively, and as such those verification measurements are applicable for testing in those transmit bands.

System Accuracy Verification Measurements for Body SAR Measurements								
f (MHz)	Description	Dipole	Measured SAR (W/kg), 1 gram	Normalized SAR (W/kg), 1 gram	Dielectric Parameters		Ambient Temp (°C)	Tissue Temp (°C)
					ϵ_r	σ (S/m)		
835	Measured, Mar-28-2012	4D128	2.07	10.35	53.5	1	20.2	18.6
	Measured, Apr-05-2012	4D128	2.04	10.2	54.6	0.99	21.1	18.8
	Measured, Apr-06-2012	4D128	2.07	10.35	55.1	1	21.1	18.8
	Measured, Apr-07-2012	4D128	2.02	10.1	55	0.98	20.9	19
	Recommended Limits	4D128		9.45	55.2 ±5%	0.97 ±5%	18-25	18-25
	Measured, May-19-2012	4D129	2.07	10.35	53.8	0.99	21.7	19.0
	Recommended Limits	4D129		9.41	55.2 ±5%	0.97 ±5%	18-25	18-25
	Measured, Jun-27-2012	436TR	2.02	10.1	55.8	0.99	20.5	19.7
Recommended Limits	436TR		10.1	55.2 ±5%	0.97 ±5%	18-25	18-25	
1800	Measured, Mar-28-2012	259	7.94	39.7	53	1.48	20.7	19.2
	Measured, Apr-06-2012	259	7.88	39.4	52.3	1.5	21.4	19.3
	Measured, May-06-2012	259	7.78	38.9	53.5	1.49	20.9	19.9
	Recommended Limits	259		39.1	53.3 ±5%	1.52 ±5%	18-25	18-25
	Measured, May-21-2012	2D190	7.56	37.8	51.7	1.49	21.3	18.9
	Measured, May-23-2012	2D190	7.58	37.9	51.5	1.49	20.9	18.7
	Recommended Limits	2D190		37.8	53.3 ±5%	1.52 ±5%	18-25	18-25
	Measured, May-17-2012	2D191	6.92	34.6	51.9	1.49	21.3	19.7
Measured, May-18-2012	2D191	6.91	34.55	51.7	1.5	21.9	19.7	
Recommended Limits	2D191		37.8	53.3 ±5%	1.52 ±5%	18-25	18-25	
2450	Measured, Jun-26-2012	863	10.9	54.5	50.5	2.00	20.8	19.4
	Recommended Limits	863		52.8	52.7 ±5%	1.95 ±5%	18-25	18-25
	Measured, Jul-05-2012	766	10.9	54.5	50.5	2.04	20.8	18.9
	Recommended Limits	766		50.4	52.7 ±5%	1.95 ±5%	18-25	18-25
5200	Measured, Jun-27-2012	1088	7.3	73.0	48.1	5.24	20.7	21.3
	Recommended Limits	1088		75.5	49.03 ±10%	5.30 ±5%	18-25	18-25
5800	Measured, Jul-04-2012	1088	6.82	68.2	43.5	5.93	21.0	19.0
	Measured, Jul-06-2012	1088	7.13	71.3	43.9	6.11	20.5	19.0
	Recommended Limits	1088		75.4	48.2 ±10%	6.00 ±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	6.04	6 of 11
		1810	4.69	6 of 11
		2450	4.21	6 of 11
E-Field Probe ES3DV3	3284	835	6.28	6 of 11
		1810	5.28	6 of 11
		2450	4.56	6 of 11
E-Field Probe ES3DV3	3115	835	5.89	6 of 11
		1810	4.72	6 of 11
		2450	4.12	6 of 11
E-Field Probe EX3DV4	3728	2450	6.84	6 of 11
		5200	4.22	6 of 11
		5800	3.71	6 of 11

6. Test Results

For 1x CDMA, interband EVDO, and LTE modes, the test sample was operated using an actual transmission through a base station simulator. Intraband EVDO operation using the SVDO antenna is accomplished through manufacturer test mode software as described in section 2.2.1. 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 Cellular Phone model covered by this report has the following battery options:

Model SNN5915A - 2530 mAH battery

The Model SNN5915A battery is an internally-sealed battery contained within the DUT, and may not be removed by the end-user. This battery was used to do all of the SAR testing. The phone was placed in the SAR measurement system with a fully charged battery.

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 the [6]. Also shown are the temperatures of the simulated tissue after the test, the measured drift and the extrapolated SAR. The exact method of extrapolation is:

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

The SAR reported at the end of the measurement process by the DASY™ 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	750	6.26	5 of 11
		835	6.08	5 of 11
		1810	5.03	5 of 11
		2450	4.40	5 of 11
E-Field Probe ES3DV3	3284	835	6.18	5 of 11
		1810	5.33	5 of 11
		2450	4.56	5 of 11
E-Field Probe ES3DV3	3115	835	5.83	5 of 11
		1810	5.17	5 of 11
		2450	4.35	5 of 11
E-Field Probe EX3DV4	3728	2450	6.86	5 of 11
		5200	4.74	5 of 11
		5300	4.43	5 of 11
		5600	4.14	5 of 11
		5800	4.23	5 of 11

Left Head Cheek Position																
Band Center Frequency (MHz)	Mode	Battery/Accessory	Channel	DUT Power		Temp (°C)	Drift (dB)	10 g SAR value			1 g SAR value			Test Plot		
				Measured (dBm)	Power Reduction (dB)			Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Grid	Plot Page	
782	LTE Band 13, QPSK (50% RB)	SNN5915A	23230	23.48	-1	19.0	-0.05	0.294	0.30	X	0.392	0.40	X			
	LTE Band 13, QPSK (100% RB)	SNN5915A	23230							X			X			
	LTE Band 13, QPSK (1 RB @ Low)	SNN5915A	23230	23.71	0	19.0	-0.04	0.362	0.37	X	0.481	0.49	X	5x5x7	A43	
	LTE Band 13, QPSK (1 RB @ High)	SNN5915A	23230	24.07	0	19.1	0.01	0.334	0.33	X	0.447	0.45	X			
	LTE Band 13, 16QAM (50% RB)	SNN5915A	23230	22.50	-2	19.1	0.01	0.236	0.24	X	0.317	0.32	X			
	LTE Band 13, 16QAM (100% RB)	SNN5915A	23230							X			X			
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5915A	23230	23.25	-1	19.0	-0.27	0.272	0.29	X	0.356	0.38	X			
	LTE Band 13, 16QAM (1 RB @ High)	SNN5915A	23230	23.15	-1	19.0	-0.03	0.239	0.24	X	0.319	0.32	X			
835	1x CDMA 800, RC3 SO55	SNN5915A	1013							X			X			
		SNN5915A	384	24.99	X	19.7	-0.01	0.323	0.32	X	0.430	0.43	X	5x5x7	A44	
		SNN5915A	777							X			X			
	EVDO 800, Rev. O	SNN5915A	1013								X			X		
		SNN5915A	384	24.80	X	20.3	0.05	0.262	0.26	X	0.341	0.34	X			
		SNN5915A	777							X			X			
	EVDO 800, Rev. O, (SVDO Antenna)	SNN5915A	1013								X			X		
		SNN5915A	384	24.87	X	19.7	-0.02	0.075	0.08	X	0.113	0.11	X			
SNN5915A		777							X			X				
1880	1x CDMA 1900, RC3 SO55	SNN5915A	25							X			X			
		SNN5915A	600	24.94	X	18.7	0.06	0.283	0.28	X	0.469	0.47	X			
		SNN5915A	1175							X			X			
	EVDO 1900, Rev. O	SNN5915A	25								X			X		
		SNN5915A	600	24.91	X	18.6	0.30	0.188	0.19	X	0.305	0.31	X			
		SNN5915A	1175							X			X			
2437	802.11b, 1 Mbps	SNN5915A	1							X			X			
		SNN5915A	6	19.05	X	20.0	0.05	0.143	0.14	X	0.288	0.29	X			
		SNN5915A	11							X			X			
5210	802.11a, 6 Mbps	SNN5915A	44	16.05	X	19.1	-0.04	0.151	0.15	X	0.437	0.44	X			
5290	802.11a, 6 Mbps	SNN5915A	60	15.31	X	20.2	-0.09	0.154	0.16	X	0.462	0.47	X			
5600	802.11a, 6 Mbps	SNN5915A	136	15.07	X	19.8	-0.25	0.195	0.21	X	0.604	0.64	X			
5785	802.11a, 6 Mbps	SNN5915A	149	15.20	X	19.8	-0.10	0.187	0.19	X	0.585	0.60	X			

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																
Band Center Frequency (MHz)	Mode	Battery/Accessory	Channel	DUT Power		Temp (°C)	Drift (dB)	10 g SAR value			1 g SAR value			Test Plot		
				Measured (dBm)	Power Reduction (dB)			Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Grid	Plot Page	
782	LTE Band 13, QPSK (50% RB)	SNN5915A	23230	23.48	-1	18.3	-0.03	0.173	0.17		0.248	0.25				
	LTE Band 13, QPSK (100% RB)	SNN5915A	23230													
	LTE Band 13, QPSK (1 RB @ Low)	SNN5915A	23230	23.71	0	18.3	-0.06	0.216	0.22		0.307	0.31				
	LTE Band 13, QPSK (1 RB @ High)	SNN5915A	23230	24.07	0	18.3	0.03	0.176	0.18		0.251	0.25				
	LTE Band 13, 16QAM (50% RB)	SNN5915A	23230	22.50	-2	18.3	0.03	0.137	0.14		0.196	0.20				
	LTE Band 13, 16QAM (100% RB)	SNN5915A	23230													
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5915A	23230	23.25	-1	18.3	0.11	0.171	0.17		0.246	0.25				
	LTE Band 13, 16QAM (1 RB @ High)	SNN5915A	23230	23.15	-1	18.3	0.06	0.139	0.14		0.196	0.20				
835	1x CDMA 800, RC3 SO55	SNN5915A	1013													
		SNN5915A	384	24.99		19.7	-0.34	0.292	0.32		0.385	0.42				
		SNN5915A	777													
	EVDO 800, Rev. O	SNN5915A	1013													
		SNN5915A	384	24.80		19.0	-0.06	0.273	0.28		0.361	0.37		5x5x7	A45	
		SNN5915A	777													
	EVDO 800, Rev. O, (SVDO Antenna)	SNN5915A	1013													
		SNN5915A	384	24.87		19.5	-0.04	0.082	0.08		0.150	0.15		5x5x7	A46	
SNN5915A		777														
1880	1x CDMA 1900, RC3 SO55	SNN5915A	25	25.00		19.1	0.33	0.591	0.59		0.971	0.97		5x5x7	A47	
		SNN5915A	600	24.94		19.7	0.06	0.543	0.54		0.903	0.90				
		SNN5915A	1175	24.80		19.1	0.31	0.402	0.40		0.678	0.68				
	EVDO 1900, Rev. O	SNN5915A	25	24.80		19.2	-0.13	0.350	0.36		0.567	0.58				
		SNN5915A	600	24.91		18.6	0.27	0.326	0.33		0.547	0.55				
		SNN5915A	1175	24.80		19.6	0.19	0.427	0.43		0.724	0.72		5x5x7	A48	
2437	802.11b, 1 Mbps	SNN5915A	1	18.01		20.0	-0.08	0.539	0.55		1.50	1.53		5x5x7	A50	
		SNN5915A	6	19.05		20.0	-0.37	0.463	0.50		1.30	1.42				
		SNN5915A	11	18.30		20.0	-0.18	0.437	0.46		1.21	1.26				
5210	802.11a, 6 Mbps	SNN5915A	44	16.05		19.1	-0.53	0.379	0.43		1.20	1.36		7x7x12	A51	
5290	802.11a, 6 Mbps	SNN5915A	60	15.31		20.0	-0.39	0.331	0.36		1.29	1.41		7x7x12	A52	
5600	802.11a, 6 Mbps	SNN5915A	136	15.07		19.8	-0.82	0.351	0.42		1.29	1.56		7x7x12	A53	
5785	802.11a, 6 Mbps	SNN5915A	149	15.20		18.9	0.05	0.296	0.30		1.07	1.07		7x7x12	A54	

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																
Band Center Frequency (MHz)	Mode	Battery/Accessory	Channel	DUT Power		Temp (°C)	Drift (dB)	10 g SAR value			1 g SAR value			Test Plot		
				Measured (dBm)	Power Reduction (dB)			Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Grid	Plot Page	
782	LTE Band 13, QPSK (50% RB)	SNN5915A	23230	23.48	-1	19.2	-0.01	0.144	0.14	X	0.177	0.18	X			
	LTE Band 13, QPSK (100% RB)	SNN5915A	23230							X			X			
	LTE Band 13, QPSK (1 RB @ Low)	SNN5915A	23230	23.71	0	19.2	-0.04	0.183	0.18	X	0.225	0.23	X	5x5x7	A55	
	LTE Band 13, QPSK (1 RB @ High)	SNN5915A	23230	24.07	0	19.2	-0.01	0.160	0.16	X	0.197	0.20	X			
	LTE Band 13, 16QAM (50% RB)	SNN5915A	23230	22.50	-2	18.9	-0.16	0.116	0.12	X	0.142	0.15	X			
	LTE Band 13, 16QAM (100% RB)	SNN5915A	23230							X			X			
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5915A	23230	23.25	-1	18.9	-0.07	0.131	0.13	X	0.161	0.16	X			
	LTE Band 13, 16QAM (1 RB @ High)	SNN5915A	23230	23.15	-1	18.9	0.025	0.117	0.12	X	0.145	0.15	X			
835	1x CDMA 800, RC3 S055	SNN5915A	1013							X			X			
		SNN5915A	384	24.99	X	19.7	-0.03	0.167	0.17	X	0.215	0.22	X			
		SNN5915A	777							X			X			
	EVDO 800, Rev. O	SNN5915A	1013								X			X		
		SNN5915A	384	24.80	X	18.8	0.03	0.181	0.18	X	0.235	0.24	X	5x5x7	A57	
		SNN5915A	777							X			X			
	EVDO 800, Rev. O, (SVDO Antenna)	SNN5915A	1013								X			X		
		SNN5915A	384	24.87	X	19.5	-0.01	0.052	0.05	X	0.082	0.08	X			
SNN5915A		777							X			X				
1880	1x CDMA 1900, RC3 S055	SNN5915A	25							X			X			
		SNN5915A	600	24.94	X	18.7	0.09	0.171	0.17	X	0.293	0.29	X	5x5x7	A59	
		SNN5915A	1175							X			X			
	EVDO 1900, Rev. O	SNN5915A	25								X			X		
		SNN5915A	600	24.91	X	18.6	0.09	0.113	0.11	X	0.196	0.20	X	5x5x7	A60	
		SNN5915A	1175							X			X			
2437	802.11b, 1 Mbps	SNN5915A	1							X			X			
		SNN5915A	6	19.05	X	20.0	0.26	0.053	0.05	X	0.120	0.12	X			
		SNN5915A	11							X			X			
5210	802.11a, 6 Mbps	SNN5915A	44	16.05	X	19.1	-0.16	0.153	0.16	X	0.459	0.48	X			
5290	802.11a, 6 Mbps	SNN5915A	60	15.31	X	20.1	-0.04	0.143	0.14	X	0.455	0.46	X			
5600	802.11a, 6 Mbps	SNN5915A	136	15.07	X	19.8	-0.31	0.186	0.20	X	0.573	0.62	X			
5785	802.11a, 6 Mbps	SNN5915A	149	15.20	X	19.8	-0.37	0.186	0.20	X	0.587	0.64	X			

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																
Band Center Frequency (MHz)	Mode	Battery/Accessory	Channel	DUT Power		Temp (°C)	Drift (dB)	10 g SAR value			1 g SAR value			Test Plot		
				Measured (dBm)	Power Reduction (dB)			Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Grid	Plot Page	
782	LTE Band 13, QPSK (50% RB)	SNN5915A	23230	23.48	-1	18.3	0.07	0.095	0.10	X	0.122	0.12	X			
	LTE Band 13, QPSK (100% RB)	SNN5915A	23230							X			X			
	LTE Band 13, QPSK (1 RB @ Low)	SNN5915A	23230	23.71	0	18.3	-0.11	0.120	0.12	X	0.152	0.16	X			
	LTE Band 13, QPSK (1 RB @ High)	SNN5915A	23230	24.07	0	18.0	0.13	0.105	0.11	X	0.131	0.13	X			
	LTE Band 13, 16QAM (50% RB)	SNN5915A	23230	22.50	-2	18.0	-0.05	0.078	0.08	X	0.099	0.10	X			
	LTE Band 13, 16QAM (100% RB)	SNN5915A	23230							X			X			
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5915A	23230	23.25	-1	18.0	-0.08	0.091	0.09	X	0.115	0.12	X			
	LTE Band 13, 16QAM (1 RB @ High)	SNN5915A	23230	23.15	-1	18.0	0.03	0.074	0.07	X	0.093	0.09	X			
835	1x CDMA 800, RC3 S055	SNN5915A	1013							X			X			
		SNN5915A	384	24.99	X	19.5	-0.04	0.174	0.18	X	0.225	0.23	X	5x5x7	A56	
		SNN5915A	777							X			X			
	EVDO 800, Rev. O	SNN5915A	1013								X			X		
		SNN5915A	384	24.80	X	19.0	0.04	0.159	0.16	X	0.204	0.20	X			
		SNN5915A	777							X			X			
	EVDO 800, Rev. O, (SVDO Antenna)	SNN5915A	1013								X			X		
		SNN5915A	384	24.87	X	19.5	-0.01	0.059	0.06	X	0.110	0.11	X	5x5x7	A58	
SNN5915A		777							X			X				
1880	1x CDMA 1900, RC3 S055	SNN5915A	25							X			X			
		SNN5915A	600	24.94	X	18.7	0.03	0.150	0.15	X	0.263	0.26	X			
		SNN5915A	1175							X			X			
	EVDO 1900, Rev. O	SNN5915A	25								X			X		
		SNN5915A	600	24.91	X	18.6	-0.25	0.084	0.09	X	0.150	0.16	X			
		SNN5915A	1175							X			X			
2437	802.11b, 1 Mbps	SNN5915A	1							X			X			
		SNN5915A	6	19.05	X	20.0	-0.17	0.182	0.19	X	0.484	0.50	X	5x5x7	A62	
		SNN5915A	11							X			X			
5210	802.11a, 6 Mbps	SNN5915A	44	16.05	X	19.1	0.44	0.290	0.29	X	0.918	0.92	X	7x7x12	A63	
5290	802.11a, 6 Mbps	SNN5915A	60	15.31	X	19.9	-0.34	0.241	0.26	X	0.916	0.99	X	7x7x12	A64	
5600	802.11a, 6 Mbps	SNN5915A	136	15.07	X	19.8	0.11	0.252	0.25	X	0.925	0.93	X	7x7x12	A65	
5785	802.11a, 6 Mbps	SNN5915A	149	15.20	X	19.8	0.34	0.258	0.26	X	0.941	0.94	X	7x7x12	A66	

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 measurement data in the following tables is provided to demonstrate SAR performance for the various transmitters operating at reduced power limits, for the purpose of evaluating simultaneous SAR cases. See sections 2.2.3 and 6.4 for further information.

Left Head Cheek Position																
Band Center Frequency (MHz)	Mode	Battery/Accessory	Channel	DUT Power		Temp (°C)	Drift (dB)	10 g SAR value			1 g SAR value			Test Plot		
				Reduced Limit (dBm)	Power Reduction (dB)			Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Grid	Plot Page	
782	LTE Band 13, QPSK (50% RB)	SNN5915A	23230	20	-4	19.5	-0.31	0.120	0.13	X	0.163	0.18	X			
	LTE Band 13, QPSK (100% RB)	SNN5915A	23230													
	LTE Band 13, QPSK (1 RB @ Low)	SNN5915A	23230	20	-4	19.5	-0.06	0.150	0.15	X	0.202	0.20	X			
	LTE Band 13, QPSK (1 RB @ High)	SNN5915A	23230	20	-4	19.5	0.07	0.130	0.13	X	0.175	0.18	X			
	LTE Band 13, 16QAM (50% RB)	SNN5915A	23230	20	-4	19.6	0.03	0.098	0.10	X	0.134	0.13	X			
	LTE Band 13, 16QAM (100% RB)	SNN5915A	23230													
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5915A	23230	20	-4	19.6	-0.04	0.112	0.11	X	0.151	0.15	X			
	LTE Band 13, 16QAM (1 RB @ High)	SNN5915A	23230	20	-4	19.6	-0.02	0.100	0.10	X	0.136	0.14	X			
835	1x CDMA 800, RC3 SO55	SNN5915A	1013													
		SNN5915A	384	18	X	19.2	0.05	0.055	0.06	X	0.073	0.07	X			
		SNN5915A	777													
	EVDO 800, Rev. O	SNN5915A	1013													
		SNN5915A	384	18	-7	20.3	-0.22	0.078	0.08	X	0.103	0.11	X			
		SNN5915A	777													
	EVDO 800, Rev. O, (SVDO Antenna)	SNN5915A	1013													
		SNN5915A	384	18	-7	19.0	-0.27	0.022	0.02	X	0.034	0.04	X			
SNN5915A		777														
1880	1x CDMA 1900, RC3 SO55	SNN5915A	25													
		SNN5915A	600	18	-7	19.2	0.16	0.046	0.05	X	0.076	0.08	X			
		SNN5915A	1175													
	EVDO 1900, Rev. O	SNN5915A	25													
		SNN5915A	600	18	-7	19.3	0.03	0.048	0.05	X	0.079	0.08	X			
		SNN5915A	1175													
	EVDO 1900, Rev. O (SVDO Antenna)	SNN5915A	25													
		SNN5915A	600	15	-10	18.5	0.21	0.268	0.27	X	0.597	0.60	X			
SNN5915A		1175														
2437	802.11b, 1 Mbps	SNN5915A	1													
		SNN5915A	6	15	-4	19.6	0.09	0.092	0.09	X	0.189	0.19	X			
		SNN5915A	11													
5210	802.11a, 6 Mbps	SNN5915A	44	9	-7	18.6	0.00	0.044	0.04	X	0.127	0.13	X			
5290	802.11a, 6 Mbps	SNN5915A	60	9	-7	18.5	-0.16	0.037	0.04	X	0.107	0.11	X			
5600	802.11a, 6 Mbps	SNN5915A	136	9	-7	18.6	0.20	0.045	0.05	X	0.142	0.14	X			
5785	802.11a, 6 Mbps	SNN5915A	149	9	-7	19.9	-0.33	0.048	0.05	X	0.148	0.16	X			

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 Check Position																
Band Center Frequency (MHz)	Mode	Battery/Accessory	Channel	DUT Power		Temp (°C)	Drift (dB)	10 g SAR value			1 g SAR value			Test Plot		
				Reduced Limit (dBm)	Power Reduction (dB)			Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Grid	Plot Page	
782	LTE Band 13, QPSK (50% RB)	SNN5915A	23230	20	-4	19.2	-0.07	0.065	0.07	X	0.092	0.09	X			
	LTE Band 13, QPSK (100% RB)	SNN5915A	23230													
	LTE Band 13, QPSK (1 RB @ Low)	SNN5915A	23230	20	-4	19.2	0.05	0.084	0.08	X	0.119	0.12	X			
	LTE Band 13, QPSK (1 RB @ High)	SNN5915A	23230	20	-4	19.1	0.00	0.072	0.07	X	0.101	0.10	X			
	LTE Band 13, 16QAM (50% RB)	SNN5915A	23230	20	-4	19.3	0.06	0.054	0.05	X	0.076	0.08	X			
	LTE Band 13, 16QAM (100% RB)	SNN5915A	23230													
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5915A	23230	20	-4	19.3	0.03	0.063	0.06	X	0.089	0.09	X			
LTE Band 13, 16QAM (1 RB @ High)	SNN5915A	23230	20	-4	19.1	-0.11	0.053	0.05	X	0.075	0.08	X				
835	1x CDMA 800, RC3 SO55	SNN5915A	1013													
		SNN5915A	384	18	X	20.2	-0.09	0.057	0.06	X	0.076	0.08	X			
		SNN5915A	777													
	EVDO 800, Rev. O	SNN5915A	1013													
		SNN5915A	384	18	-7	20.4	-0.07	0.068	0.07	X	0.091	0.09	X			
		SNN5915A	777													
	EVDO 800, Rev. O (SVDO Antenna)	SNN5915A	1013													
SNN5915A		384	18	-7	18.9	0.04	0.022	0.02	X	0.041	0.04	X				
SNN5915A		777														
1880	1x CDMA 1900, RC3 SO55	SNN5915A	25													
		SNN5915A	600	18	-7	19.1	0.61	0.072	0.07	X	0.119	0.12	X			
		SNN5915A	1175													
	EVDO 1900, Rev. O	SNN5915A	25													
		SNN5915A	600	18	-7	19.4	0.11	0.093	0.09	X	0.154	0.15	X			
		SNN5915A	1175													
	EVDO 1900, Rev. O (SVDO Antenna)	SNN5915A	25													
SNN5915A		600	15	-10	19.5	-0.09	0.267	0.27	X	0.605	0.62	X	5x5x7	A49		
SNN5915A		1175														
2437	802.11b, 1 Mbps	SNN5915A	1	15	-4	19.6	0.14	0.178	0.18	X	0.476	0.48	X			
		SNN5915A	6	15	-4	19.6	-0.06	0.173	0.18	X	0.469	0.48	X			
		SNN5915A	11	15	-4	19.6	-0.08	0.177	0.18	X	0.473	0.48	X			
5210	802.11a, 6 Mbps	SNN5915A	44	9	-7	18.6	-0.63	0.085	0.10	X	0.292	0.34	X			
5290	802.11a, 6 Mbps	SNN5915A	60	9	-7	18.5	0.19	0.077	0.08	X	0.292	0.29	X			
5600	802.11a, 6 Mbps	SNN5915A	136	9	-7	18.6	0.00	0.083	0.08	X	0.311	0.31	X			
5785	802.11a, 6 Mbps	SNN5915A	149	9	-7	19.9	-0.42	0.075	0.08	X	0.288	0.32	X			

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

Left Head 15° Tilt Position																
Band Center Frequency (MHz)	Mode	Battery/Accessory	Channel	DUT Power		Temp (°C)	Drift (dB)	10 g SAR value			1 g SAR value			Test Plot		
				Reduced Limit (dBm)	Power Reduction (dB)			Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Grid	Plot Page	
782	LTE Band 13, QPSK (50% RB)	SNN5915A	23230	20	-4	19.0	0.01	0.044	0.04	X	0.056	0.06	X			
	LTE Band 13, QPSK (100% RB)	SNN5915A	23230													
	LTE Band 13, QPSK (1 RB @ Low)	SNN5915A	23230	20	-4	19.0	0.03	0.059	0.06	X	0.074	0.07	X			
	LTE Band 13, QPSK (1 RB @ High)	SNN5915A	23230	20	-4	19.0	-0.03	0.051	0.05	X	0.064	0.06	X			
	LTE Band 13, 16QAM (50% RB)	SNN5915A	23230	20	-4	19.0	-0.18	0.037	0.04	X	0.046	0.05	X			
	LTE Band 13, 16QAM (100% RB)	SNN5915A	23230													
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5915A	23230	20	-4	19.6	-0.03	0.045	0.05	X	0.056	0.06	X			
LTE Band 13, 16QAM (1 RB @ High)	SNN5915A	23230	20	-4	19.5	0.19	0.039	0.04	X	0.050	0.05	X				
835	1x CDMA 800, RC3 SO55	SNN5915A	1013													
		SNN5915A	384	18	X	19.3	0.06	0.031	0.03	X	0.041	0.04	X			
		SNN5915A	777													
	EVDO 800, Rev. O	SNN5915A	1013													
		SNN5915A	384	18	-7	20.3	-0.02	0.044	0.04	X	0.057	0.06	X			
		SNN5915A	777													
	EVDO 800, Rev. O (SVDO Antenna)	SNN5915A	1013													
SNN5915A		384	18	-7	19.0	0.04	0.014	0.01	X	0.023	0.02	X				
SNN5915A		777														
1880	1x CDMA 1900, RC3 SO55	SNN5915A	25													
		SNN5915A	600	18	-7	19.2	0.08	0.035	0.04	X	0.061	0.06	X			
		SNN5915A	1175													
	EVDO 1900, Rev. O	SNN5915A	25													
		SNN5915A	600	18	-7	19.3	0.10	0.035	0.04	X	0.060	0.06	X			
		SNN5915A	1175													
	EVDO 1900, Rev. O (SVDO Antenna)	SNN5915A	25													
SNN5915A		600	15	-10	18.6	-0.36	0.286	0.31	X	0.637	0.69	X	5x5x7	A61		
SNN5915A		1175														
2437	802.11b, 1 Mbps	SNN5915A	1													
		SNN5915A	6	15	-4	19.6	-0.020	0.019	0.02	X	0.036	0.04	X			
		SNN5915A	11													
5210	802.11a, 6 Mbps	SNN5915A	44	9	-7	18.5	-0.29	0.037	0.04	X	0.120	0.13	X			
5290	802.11a, 6 Mbps	SNN5915A	60	9	-7	18.5	-0.12	0.040	0.04	X	0.118	0.12	X			
5600	802.11a, 6 Mbps	SNN5915A	136	9	-7	19.9	-0.35	0.042	0.05	X	0.142	0.15	X			
5785	802.11a, 6 Mbps	SNN5915A	149	9	-7	19.9	-0.29	0.045	0.05	X	0.144	0.15	X			

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																
Band Center Frequency (MHz)	Mode	Battery/Accessory	Channel	DUT Power		Temp (°C)	Drift (dB)	10 g SAR value			1 g SAR value			Test Plot		
				Reduced Limit (dBm)	Power Reduction (dB)			Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Grid	Plot Page	
782	LTE Band 13, QPSK (50% RB)	SNN5915A	23230	20	-4	19.2	0.18	0.038	0.04	X	0.049	0.05	X			
	LTE Band 13, QPSK (100% RB)	SNN5915A	23230													
	LTE Band 13, QPSK (1 RB @ Low)	SNN5915A	23230	20	-4	19.2	-0.04	0.053	0.05	X	0.066	0.07	X			
	LTE Band 13, QPSK (1 RB @ High)	SNN5915A	23230	20	-4	19.2	-0.07	0.042	0.04	X	0.052	0.05	X			
	LTE Band 13, 16QAM (50% RB)	SNN5915A	23230	20	-4	19.2	-0.04	0.031	0.03	X	0.039	0.04	X			
	LTE Band 13, 16QAM (100% RB)	SNN5915A	23230													
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5915A	23230	20	-4	19.2	0.06	0.036	0.04	X	0.045	0.05	X			
LTE Band 13, 16QAM (1 RB @ High)	SNN5915A	23230	20	-4	19.1	0.01	0.030	0.03	X	0.038	0.04	X				
835	1x CDMA 800, RC3 SO55	SNN5915A	1013													
		SNN5915A	384	18	X	20.0	0.14	0.032	0.03	X	0.041	0.04	X			
		SNN5915A	777													
	EVDO 800, Rev. O	SNN5915A	1013													
		SNN5915A	384	18	-7	20.4	0.06	0.044	0.04	X	0.057	0.06	X			
		SNN5915A	777													
	EVDO 800, Rev. O (SVDO Antenna)	SNN5915A	1013													
SNN5915A		384	18	-7	18.9	-0.03	0.016	0.02	X	0.031	0.03	X				
SNN5915A		777														
1880	1x CDMA 1900, RC3 SO55	SNN5915A	25													
		SNN5915A	600	18	-7	19.1	0.27	0.024	0.02	X	0.042	0.04	X			
		SNN5915A	1175													
	EVDO 1900, Rev. O	SNN5915A	25													
		SNN5915A	600	18	-7	19.5	0.00	0.032	0.03	X	0.055	0.06	X			
		SNN5915A	1175													
	EVDO 1900, Rev. O (SVDO Antenna)	SNN5915A	25													
SNN5915A		600	15	-10	19.5	-0.09	0.298	0.30	X	0.676	0.69	X				
SNN5915A		1175														
2437	802.11b, 1 Mbps	SNN5915A	1													
		SNN5915A	6	15	-4	19.7	-0.10	0.060	0.06	X	0.155	0.16	X			
		SNN5915A	11													
5210	802.11a, 6 Mbps	SNN5915A	44	9	-7	18.6	0.37	0.068	0.07	X	0.227	0.23	X			
5290	802.11a, 6 Mbps	SNN5915A	60	9	-7	18.5	-0.23	0.049	0.05	X	0.183	0.19	X			
5600	802.11a, 6 Mbps	SNN5915A	136	9	-7	18.6	0.09	0.060	0.06	X	0.230	0.23	X			
5785	802.11a, 6 Mbps	SNN5915A	149	9	-7	19.9	-0.22	0.056	0.06	X	0.216	0.23	X			

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 Accessory Test Results

The SAR results shown in tables 9 through 10 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 is the temperature of the simulated tissue after the test, the measured drift and the extrapolated SAR. The exact method of extrapolation is:

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

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 SPEAG™ MFP V5.1 C Triple Modular Phantom was used for the body-worn tests. The triple modular phantom consists of three identical modules that can be installed and removed separately without emptying the liquid. Each module of the triple phantom is constructed of glass-fiber reinforced vinylester (VG-GF) with a thickness at the bottom of 2.0 mm. It measures 29.2 cm(long) by 17.8 cm(wide) by 17.8 cm(tall).

The simulated tissue depth was verified to be 15.0 cm ± 0.5 cm for frequencies less than 3 GHz, or 10.0 cm ± 0.5 cm for frequencies greater than 3 GHz. The same device holder described in section 6 was used for positioning the phone. The cellular phone was tested with a headset connected to the device for all body-worn accessory 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 the purpose of including the SAR evaluation for body-worn accessories that support the device with the front side facing the user.

The cellular phone was also tested in data mode operations. For these tests, a separation distance of 25 mm between the device and the flat phantom was used. The device was tested in the worst-case SAR position and channel configuration from the voice-mode body-worn testing.

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	750	6.09	6 of 11
		835	6.04	6 of 11
		1810	4.69	6 of 11
		2450	4.21	6 of 11
E-Field Probe ES3DV3	3284	750	6.36	6 of 11
		835	6.28	6 of 11
		1810	5.28	6 of 11
		2450	4.56	6 of 11
E-Field Probe ES3DV3	3115	835	5.89	6 of 11
		1810	4.72	6 of 11
		2450	4.12	6 of 11
E-Field Probe EX3DV4	3728	2450	6.84	6 of 11
		5200	4.22	6 of 11
		5300	4.11	6 of 11
		5600	3.37	6 of 11
		5800	3.71	6 of 11

Body-Worn, Front of Phone 25 mm from Phantom																
Band Center Frequency (MHz)	Mode	Battery/Accessory	Channel	DUT Power		Temp (°C)	Drift (dB)	10 g SAR value			1 g SAR value			Test Plot		
				Measured (dBm)	Power Reduction (dB)			Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Grid	Plot Page	
782	LTE Band 13, QPSK (50% RB)	SNN5915A	23230	23.48	-1	18.0	-0.44	0.174	0.19	X	0.234	0.26	X			
	LTE Band 13, QPSK (100% RB)	SNN5915A	23230							X			X			
	LTE Band 13, QPSK (1 RB @ Low)	SNN5915A	23230	23.71	0	18.1	-0.00	0.221	0.22	X	0.298	0.30	X	5x5x7	A68	
	LTE Band 13, QPSK (1 RB @ High)	SNN5915A	23230	24.07	0	18.0	0.03	0.201	0.20	X	0.270	0.27	X			
	LTE Band 13, 16QAM (50% RB)	SNN5915A	23230	22.50	-2	18.7	-0.13	0.144	0.15	X	0.194	0.20	X			
	LTE Band 13, 16QAM (100% RB)	SNN5915A	23230							X			X			
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5915A	23230	23.25	-1	18.7	-0.05	0.180	0.18	X	0.241	0.24	X			
	LTE Band 13, 16QAM (1 RB @ High)	SNN5915A	23230	23.15	-1	18.6	-0.09	0.160	0.16	X	0.215	0.22	X			
835	1x CDMA 800, RC3 SO55	SNN5915A	1013							X			X			
		SNN5915A	384	24.99	X	18.2	0.04	0.186	0.19	X	0.247	0.25	X			
		SNN5915A	777							X			X			
	EVDO 800, Rev. O	SNN5915A	1013								X			X		
		SNN5915A	384	24.80	X	20.3	-0.03	0.141	0.14	X	0.188	0.19	X			
		SNN5915A	777							X			X			
	EVDO 800, Rev. O (SVDO Antenna)	SNN5915A	1013								X			X		
		SNN5915A	384	24.87	X	19.9	-0.22	0.023	0.02	X	0.031	0.03	X			
SNN5915A		777							X			X				
1880	1x CDMA 1900, RC3 SO55	SNN5915A	25							X			X			
		SNN5915A	600	24.94	X	18.8	-0.01	0.238	0.24	X	0.383	0.38	X			
		SNN5915A	1175							X			X			
	EVDO 1900, Rev. O	SNN5915A	25								X			X		
		SNN5915A	600	24.91	X	19.5	0.01	0.254	0.25	X	0.413	0.41	X			
		SNN5915A	1175							X			X			
	EVDO 1900, Rev. O (SVDO Antenna)	SNN5915A	25								X			X		
		SNN5915A	600	25.20	X	18.9	-0.72	0.120	0.14	X	0.198	0.23	X	5x5x7	A74	
SNN5915A		1175							X			X				
2437	802.11b, 1 Mbps	SNN5915A	1							X			X			
		SNN5915A	6	19.05	X	19.7	-0.12	0.008	0.01	X	0.014	0.01	X	5x5x7	A75	
		SNN5915A	11							X			X			
5210	802.11a, 6 Mbps	SNN5915A	44	16.05	X	20.6	-0.34	0.016	0.02	X	0.048	0.05	X			
5290	802.11a, 6 Mbps	SNN5915A	60	15.31	X	20.6	-0.40	0.016	0.02	X	0.046	0.05	X			
5600	802.11a, 6 Mbps	SNN5915A	136	15.07	X	19.0	-0.17	0.017	0.02	X	0.040	0.04	X	7x7x12	A78	
5785	802.11a, 6 Mbps	SNN5915A	149	15.20	X	18.8	-0.23	0.013	0.01	X	0.033	0.03	X	7x7x12	A79	

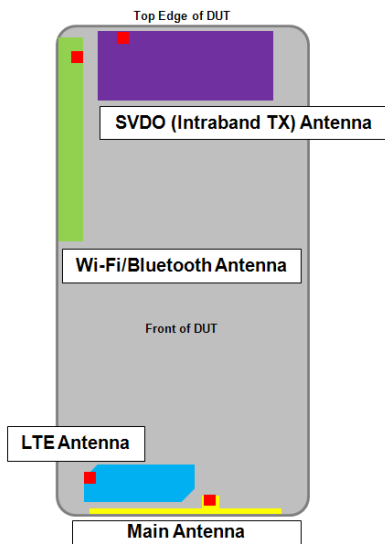
Table 9: SAR measurement results at the highest possible output power, measured in a body-worn accessory position against the ICNIRP and ANSI SAR Limit.

Body-Worn, Back of Phone 25 mm from Phantom																
Band Center Frequency (MHz)	Mode	Battery/Accessory	Channel	DUT Power		Temp (°C)	Drift (dB)	10 g SAR value			1 g SAR value			Test Plot		
				Measured (dBm)	Power Reduction (dB)			Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Grid	Plot Page	
782	LTE Band 13, QPSK (50% RB)	SNN5915A	23230	23.48	-1	18.1	-0.06	0.152	0.15	X	0.204	0.21	X			
	LTE Band 13, QPSK (100% RB)	SNN5915A	23230													
	LTE Band 13, QPSK (1 RB @ Low)	SNN5915A	23230	23.71	0	18.1	0.01	0.192	0.19	X	0.260	0.26	X			
	LTE Band 13, QPSK (1 RB @ High)	SNN5915A	23230	24.07	0	18.0	0.02	0.172	0.17	X	0.232	0.23	X			
	LTE Band 13, 16QAM (50% RB)	SNN5915A	23230	22.50	-2	18.6	-0.02	0.116	0.12	X	0.154	0.15	X			
	LTE Band 13, 16QAM (100% RB)	SNN5915A	23230													
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5915A	23230	23.25	-1	18.6	0.09	0.149	0.15	X	0.203	0.20	X			
LTE Band 13, 16QAM (1 RB @ High)	SNN5915A	23230	23.15	-1	18.5	-0.27	0.124	0.13	X	0.165	0.18	X				
835	1x CDMA 800, RC3 S055	SNN5915A	1013													
		SNN5915A	384	24.99	X	18.2	0.05	0.216	0.22	X	0.287	0.29	X	5x5x7	A69	
		SNN5915A	777													
	EVDO 800, Rev. O	SNN5915A	1013													
		SNN5915A	384	24.80	X	19.0	0.05	0.301	0.30	X	0.398	0.40	X	5x5x7	A70	
		SNN5915A	777													
EVDO 800, Rev. O (SVDO Antenna)	SNN5915A	1013														
	SNN5915A	384	24.87	X	19.9	-0.02	0.045	0.04	X	0.060	0.06	X	5x5x7	A71		
	SNN5915A	777														
1880	1x CDMA 1900, RC3 S055	SNN5915A	25													
		SNN5915A	600	24.94	X	18.8	0.03	0.283	0.28	X	0.456	0.46	X	5x5x7	A72	
		SNN5915A	1175													
	EVDO 1900, Rev. O	SNN5915A	25													
		SNN5915A	600	24.91	X	19.1	-0.02	0.274	0.28	X	0.440	0.44	X	5x5x7	A73	
		SNN5915A	1175													
EVDO 1900, Rev. O (SVDO Antenna)	SNN5915A	25														
	SNN5915A	600	25.20	X	19.2	-0.09	0.054	0.06	X	0.086	0.09	X				
	SNN5915A	1175														
2437	802.11b, 1 Mbps	SNN5915A	1													
		SNN5915A	6	19.05	X	19.7	-0.05	0.007	0.01	X	0.014	0.01	X			
		SNN5915A	11													
5210	802.11a, 6 Mbps	SNN5915A	44	16.05	X	20.6	0.09	0.048	0.05	X	0.123	0.12	X	7x7x12	A76	
5290	802.11a, 6 Mbps	SNN5915A	60	15.31	X	20.6	-0.24	0.045	0.05	X	0.116	0.12	X	7x7x12	A77	
5600	802.11a, 6 Mbps	SNN5915A	136	15.07	X	20.3	-0.16	0.004	0.00	X	0.014	0.01	X			
5785	802.11a, 6 Mbps	SNN5915A	149	15.20	X	20.3	-0.22	0.006	0.01	X	0.020	0.02	X			

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

6.3 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 less than 2.5 cm from the edge.



Mobile Hotspot Surfaces for SAR testing						
Mode	Front	Back	Left	Right	Top	Bottom
1x CDMA or EVDO on Main Antenna	Yes	Yes	Yes	Yes	No	Yes
EVDO on SVDO Antenna	Yes	Yes	Yes	Yes	Yes	No
LTE	Yes	Yes	Yes	No	No	Yes
Wi-Fi	Yes	Yes	Yes	No	Yes	No

The SAR results shown in tables 11 through 16 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 and the extrapolated SAR. The exact method of extrapolation is:

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

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 the maximum transmit power on several transmitters when the mobile hotspot functionality is enabled, as described above in 2.2.3. A complete description of this functionality is provided in the “Operational Description” contained within Exhibit 12.

When operating as a mobile hotspot, transmission utilizing the 5.2, 5.3 and 5.6 GHz Wi-Fi bands is disabled. The DUT may only operate as a mobile hotspot utilizing the 2.4 GHz or 5.785 GHz Wi-Fi bands.

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. All other test conditions measured lower SAR values than those included in Appendix 4.

A SPEAG™ MFP V5.1 C Triple Modular Phantom was used for the body-worn tests. The triple modular phantom consists of three identical modules that can be installed and removed separately without emptying the liquid. Each module of the triple phantom is constructed of glass-fiber reinforced vinylester (VG-GF) with a thickness at the bottom of 2.0 mm. It measures 29.2 cm(long) by 17.8 cm(wide) by 17.8 cm(tall).

The simulated tissue depth was verified to be 15.0 cm ± 0.5 cm for frequencies below 3 GHz, or 10.0 cm ± 0.5 cm for frequencies greater than 3 GHz. 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 body-worn mobile hotspot measurements:

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ES3DV3	3124	750	6.09	6 of 11
		835	6.04	6 of 11
		1810	4.69	6 of 11
		2450	4.21	6 of 11
E-Field Probe ES3DV3	3284	750	6.36	6 of 11
		835	6.28	6 of 11
		1810	5.28	6 of 11
		2450	4.56	6 of 11
E-Field Probe ES3DV3	3115	835	5.89	6 of 11
		1810	4.72	6 of 11
		2450	4.12	6 of 11
E-Field Probe EX3DV4	3728	2450	6.84	6 of 11
		5200	4.22	6 of 11
		5300	4.11	6 of 11
		5600	3.37	6 of 11
		5800	3.71	6 of 11

Mobile Hotspot, Front of Phone 10 mm from Phantom

Band Center Frequency (MHz)	Mode	Battery/Accessory	Channel	DUT Power		Temp (°C)	Drift (dB)	10 g SAR value			1 g SAR value			Test Plot		
				Limit or Measured (dBm)	Power Reduction (dB)			Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Grid	Plot Page	
782	LTE Band 13, QPSK (50% RB)	SNN5915A	23230	20	-4	18.8	-0.03	0.195	0.20	✗	0.340	0.34	✗			
	LTE Band 13, QPSK (100% RB)	SNN5915A	23230													
	LTE Band 13, QPSK (1 RB @ Low)	SNN5915A	23230	20	-4	19.0	-0.04	0.240	0.24	✗	0.416	0.42	✗	6x6x7	A81	
	LTE Band 13, QPSK (1 RB @ High)	SNN5915A	23230	20	-4	19.0	-0.04	0.217	0.22	✗	0.381	0.39	✗			
	LTE Band 13, 16QAM (50% RB)	SNN5915A	23230	20	-4	18.8	-0.08	0.161	0.16	✗	0.281	0.29	✗			
	LTE Band 13, 16QAM (100% RB)	SNN5915A	23230													
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5915A	23230	20	-4	18.9	-0.13	0.183	0.19	✗	0.319	0.33	✗			
	LTE Band 13, 16QAM (1 RB @ High)	SNN5915A	23230	20	-4	19.0	-0.07	0.166	0.17	✗	0.292	0.30	✗			
835	1x CDMA 800, RC3 SO55	SNN5915A	1013													
		SNN5915A	384	24.99	✗	18.6	0.01	0.555	0.56	✗	0.719	0.72	✗			
		SNN5915A	777													
	1x CDMA 800, RC3 SO55	SNN5915A	1013													
		SNN5915A	384	18	✗	19.1	-0.02	0.084	0.08	✗	0.11	0.11	✗			
		SNN5915A	777													
	EVDO 800, Rev. O	SNN5915A	1013													
		SNN5915A	384	24.80	✗	19.2	-0.02	0.548	0.55	✗	0.710	0.71	✗			
		SNN5915A	777													
	EVDO 800, Rev. O, (SVDO Antenna)	SNN5915A	1013													
		SNN5915A	384	24.87	✗	19.7	-0.22	0.041	0.04	✗	0.056	0.06	✗			
		SNN5915A	777													
EVDO 800, Rev. O, (SVDO Antenna)	SNN5915A	1013														
	SNN5915A	384	18	-7	19.2	-0.16	0.009	0.01	✗	0.014	0.02	✗				
	SNN5915A	777														
1880	1x CDMA 1900, RC3 SO55	SNN5915A	25													
		SNN5915A	600	16	-9	19.0	0.04	0.216	0.22	✗	0.396	0.40	✗			
		SNN5915A	1175													
	EVDO 1900, Rev. O	SNN5915A	25													
		SNN5915A	600	16	-9	18.7	-0.03	0.163	0.16	✗	0.295	0.30	✗			
		SNN5915A	1175													
EVDO 1900, Rev. O (SVDO Antenna)	SNN5915A	25														
	SNN5915A	600	16	-9	18.7	-0.02	0.085	0.09	✗	0.159	0.16	✗				
	SNN5915A	1175														
2437	802.11b, 1 Mbps	SNN5915A	1													
		SNN5915A	6	15	-4	19.0	0.14	0.021	0.02	✗	0.044	0.04	✗			
		SNN5915A	11													
5785	802.11a, 6 Mbps	SNN5915A	149	9	-7	19.7	-0.40	0.005	0.01	✗	0.019	0.02	✗			

Table 11: 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

Band Center Frequency (MHz)	Mode	Battery/Accessory	Channel	DUT Power		Temp (°C)	Drift (dB)	10 g SAR value			1 g SAR value			Test Plot		
				Limit or Measured (dBm)	Power Reduction (dB)			Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Grid	Plot Page	
782	LTE Band 13, QPSK (50% RB)	SNN5915A	23230	20	-4	18.6	-0.05	0.184	0.19	X	0.322	0.33	X			
	LTE Band 13, QPSK (100% RB)	SNN5915A	23230													
	LTE Band 13, QPSK (1 RB @ Low)	SNN5915A	23230	20	-4	18.6	-0.04	0.228	0.23	X	0.397	0.40	X			
	LTE Band 13, QPSK (1 RB @ High)	SNN5915A	23230	20	-4	18.6	0.01	0.204	0.20	X	0.353	0.35	X			
	LTE Band 13, 16QAM (50% RB)	SNN5915A	23230	20	-4	18.8	-0.22	0.158	0.17	X	0.274	0.29	X			
	LTE Band 13, 16QAM (100% RB)	SNN5915A	23230													
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5915A	23230	20	-4	18.8	-0.04	0.166	0.17	X	0.291	0.29	X			
	LTE Band 13, 16QAM (1 RB @ High)	SNN5915A	23230	20	-4	18.7	-0.04	0.147	0.15	X	0.252	0.25	X			
835	1x CDMA 800, RC3 SO55	SNN5915A	1013													
		SNN5915A	384	24.99	X	18.6	-0.01	0.483	0.48	X	0.632	0.63	X			
		SNN5915A	777													
	1x CDMA 800, RC3 SO55	SNN5915A	1013													
		SNN5915A	384	18	X	18.3	0.06	0.079	0.08	X	0.104	0.10	X			
		SNN5915A	777													
	EVDO 800, Rev. O	SNN5915A	1013													
		SNN5915A	384	24.80	X	19.2	0.02	0.478	0.48	X	0.625	0.63	X			
		SNN5915A	777													
	EVDO 800, Rev. O, (SVDO Antenna)	SNN5915A	1013													
		SNN5915A	384	24.87	X	19.7	-0.06	0.149	0.15	X	0.201	0.20	X	5x5x7	A84	
		SNN5915A	777													
EVDO 800, Rev. O, (SVDO Antenna)	SNN5915A	1013														
	SNN5915A	384	18	-7	19.3	-0.07	0.037	0.04	X	0.051	0.05	X				
	SNN5915A	777														
1880	1x CDMA 1900, RC3 SO55	SNN5915A	25													
		SNN5915A	600	16	-9	19.0	0.03	0.193	0.19	X	0.350	0.35	X			
		SNN5915A	1175													
	EVDO 1900, Rev. O	SNN5915A	25													
		SNN5915A	600	16	-9	18.7	-0.04	0.154	0.16	X	0.271	0.27	X			
		SNN5915A	1175													
EVDO 1900, Rev. O (SVDO Antenna)	SNN5915A	25														
	SNN5915A	600	16	-9	18.8	0.04	0.055	0.06	X	0.097	0.10	X				
	SNN5915A	1175														
2437	802.11b, 1 Mbps	SNN5915A	1													
		SNN5915A	6	15	-4	19.0	-0.05	0.014	0.01	X	0.031	0.03	X			
		SNN5915A	11													
5785	802.11a, 6 Mbps	SNN5915A	149	9	-7	19.7	-0.06	0.002	0.00	X	0.008	0.01	X			

Table 12: 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																
Band Center Frequency (MHz)	Mode	Battery/Accessory	Channel	DUT Power		Temp (°C)	Drift (dB)	10 g SAR value			1 g SAR value			Test Plot		
				Limit or Measured (dBm)	Power Reduction (dB)			Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Grid	Plot Page	
782	LTE Band 13, QPSK (50% RB)	SNN5915A	23230	20	-4	19.1	-0.07	0.130	0.13		0.187	0.19				
	LTE Band 13, QPSK (100% RB)	SNN5915A	23230													
	LTE Band 13, QPSK (1 RB @ Low)	SNN5915A	23230	20	-4	19.0	-0.03	0.171	0.17		0.245	0.25				
	LTE Band 13, QPSK (1 RB @ High)	SNN5915A	23230	20	-4	19.2	-0.02	0.146	0.15		0.210	0.21				
	LTE Band 13, 16QAM (50% RB)	SNN5915A	23230	20	-4	19.2	0.02	0.108	0.11		0.156	0.16				
	LTE Band 13, 16QAM (100% RB)	SNN5915A	23230													
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5915A	23230	20	-4	19.0	-0.02	0.129	0.13		0.185	0.19				
	LTE Band 13, 16QAM (1 RB @ High)	SNN5915A	23230	20	-4	19.1	-0.06	0.112	0.11		0.162	0.16				
835	1x CDMA 800, RC3 SO55	SNN5915A	1013													
		SNN5915A	384	24.99		18.2	0.02	0.530	0.53		0.778	0.78		5x5x7	A82	
		SNN5915A	777													
	1x CDMA 800, RC3 SO55	SNN5915A	1013													
		SNN5915A	384	18		18.5	0.01	0.099	0.10		0.147	0.15				
		SNN5915A	777													
	EVDO 800, Rev. O	SNN5915A	1013													
		SNN5915A	384	24.80		19.1	0.03	0.527	0.53		0.771	0.77		5x5x7	A83	
		SNN5915A	777													
	EVDO 800, Rev. O, (SVDO Antenna)	SNN5915A	1013													
		SNN5915A	384	24.87		19.7	0.06	0.026	0.03		0.038	0.04				
		SNN5915A	777													
EVDO 800, Rev. O, (SVDO Antenna)	SNN5915A	1013														
	SNN5915A	384	18	-7	18.8	-0.59	0.007	0.01		0.012	0.01					
	SNN5915A	777														
1880	1x CDMA 1900, RC3 SO55	SNN5915A	25													
		SNN5915A	600	16	-9	19.0	0.07	0.012	0.01		0.018	0.02				
		SNN5915A	1175													
	EVDO 1900, Rev. O	SNN5915A	25													
		SNN5915A	600	16	-9	18.7	0.00	0.018	0.02		0.027	0.03				
		SNN5915A	1175													
EVDO 1900, Rev. O (SVDO Antenna)	SNN5915A	25														
	SNN5915A	600	16	-9	18.8	-0.10	0.014	0.01		0.027	0.03					
	SNN5915A	1175														
2437	802.11b, 1 Mbps	SNN5915A	1													
		SNN5915A	6	15	-4	19.0	0.06	0.043	0.04		0.117	0.12		5x5x7	A88	
		SNN5915A	11													
5785	802.11a, 6 Mbps	SNN5915A	149	9	-7	19.7	-0.10	0.012	0.01		0.042	0.04		7x7x12	A89	

Table 13: 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															
Band Center Frequency (MHz)	Mode	Battery/Accessory	Channel	DUT Power		Temp (°C)	Drift (dB)	10 g SAR value			1 g SAR value			Test Plot	
				Limit or Measured (dBm)	Power Reduction (dB)			Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Grid	Plot Page
835	1x CDMA 800, RC3 SO55	SNN5915A	1013												
		SNN5915A	384	24.99		18.1	0.01	0.460	0.46		0.678	0.68			
		SNN5915A	777												
	1x CDMA 800, RC3 SO55	SNN5915A	1013												
		SNN5915A	384	18		18.4	0.31	0.063	0.06		0.094	0.09			
		SNN5915A	777												
	EVDO 800, Rev. O	SNN5915A	1013												
		SNN5915A	384	24.80		19.1	0.041	0.412	0.41		0.605	0.61			
		SNN5915A	777												
	EVDO 800, Rev. O, (SVDO Antenna)	SNN5915A	1013												
		SNN5915A	384	24.87		19.8	-0.17	0.049	0.05		0.073	0.08			
		SNN5915A	777												
EVDO 800, Rev. O, (SVDO Antenna)	SNN5915A	1013													
	SNN5915A	384	18	-7	18.8	-0.02	0.014	0.01		0.021	0.02				
	SNN5915A	777													
1880	1x CDMA 1900, RC3 SO55	SNN5915A	25												
		SNN5915A	600	16	-9	19.0	0.15	0.039	0.04		0.068	0.07			
		SNN5915A	1175												
	EVDO 1900, Rev. O	SNN5915A	25												
		SNN5915A	600	16	-9	18.7	-0.15	0.044	0.05		0.076	0.08			
		SNN5915A	1175												
	EVDO 1900, Rev. O (SVDO Antenna)	SNN5915A	25												
		SNN5915A	600	16	-9	18.7	0.11	0.012	0.01		0.021	0.02			
		SNN5915A	1175												

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															
Band Center Frequency (MHz)	Mode	Battery/Accessory	Channel	DUT Power		Temp (°C)	Drift (dB)	10 g SAR value			1 g SAR value			Test Plot	
				Limit or Measured (dBm)	Power Reduction (dB)			Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Grid	Plot Page
835	EVDO 800, Rev. O, (SVDO Antenna)	SNN5915A	1013												
		SNN5915A	384	24.87		19.8	-0.15	0.020	0.02		0.036	0.04			
		SNN5915A	777												
	EVDO 800, Rev. O, (SVDO Antenna)	SNN5915A	1013												
		SNN5915A	384	18	-7	19.2	-0.34	0.005	0.01		0.010	0.01			
		SNN5915A	777												
1880	EVDO 1900, Rev. O (SVDO Antenna)	SNN5915A	25												
		SNN5915A	600	16	-9	18.8	0.04	0.103	0.10		0.209	0.21		5x5x7 A87	
		SNN5915A	1175												
2437	802.11b, 1 Mbps	SNN5915A	1												
		SNN5915A	6	15	-4	19.0	-0.12	0.005	0.01		0.011	0.01			
		SNN5915A	11												
5785	802.11a, 6 Mbps	SNN5915A	149	9	-7	19.7	-0.18	0.009	0.01		0.025	0.03			

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

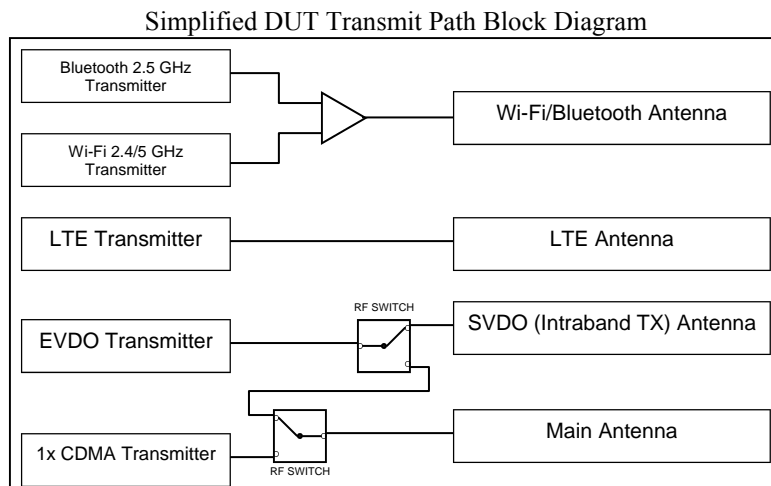
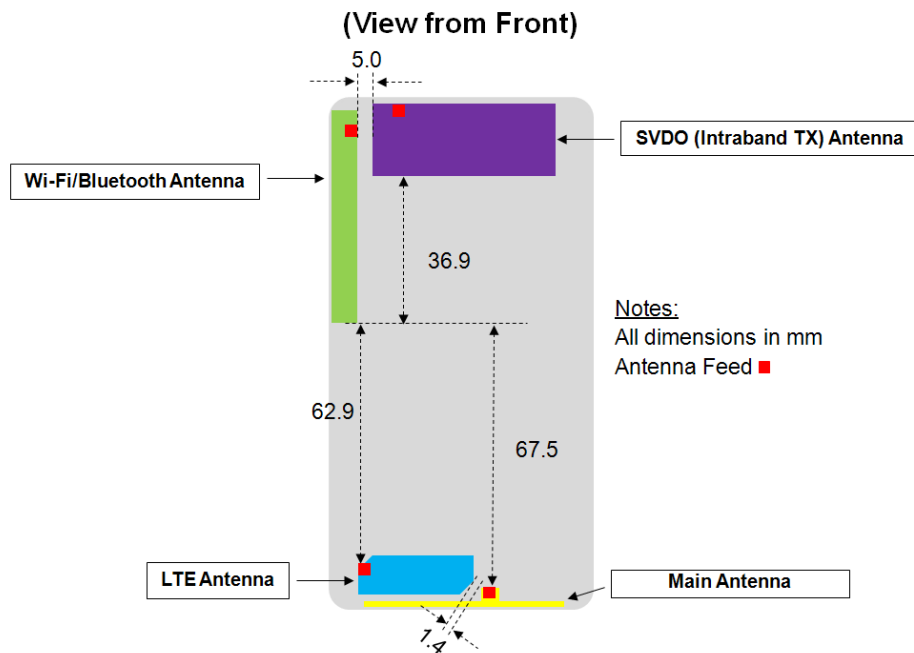
Mobile Hotspot, Bottom Edge of Phone 10 mm from Phantom															
Band Center Frequency (MHz)	Mode	Battery/Accessory	Channel	DUT Power		Temp (°C)	Drift (dB)	10 g SAR value			1 g SAR value			Test Plot	
				Limit or Measured (dBm)	Power Reduction (dB)			Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Measured (W/kg)	Extrapolated (W/kg)	Corrected (W/kg)	Grid	Plot Page
782	LTE Band 13, QPSK (50% RB)	SNN5915A	23230	20	-4	18.6	0.00	0.110	0.11		0.223	0.22			
	LTE Band 13, QPSK (100% RB)	SNN5915A	23230												
	LTE Band 13, QPSK (1 RB @ Low)	SNN5915A	23230	20	-4	18.6	0.00	0.135	0.14		0.271	0.27			
	LTE Band 13, QPSK (1 RB @ High)	SNN5915A	23230	20	-4	18.7	-0.05	0.123	0.12		0.247	0.25			
	LTE Band 13, 16QAM (50% RB)	SNN5915A	23230	20	-4	19.1	-0.15	0.093	0.10		0.190	0.20			
	LTE Band 13, 16QAM (100% RB)	SNN5915A	23230												
	LTE Band 13, 16QAM (1 RB @ Low)	SNN5915A	23230	20	-4	19.1	-0.02	0.105	0.11		0.212	0.21			
835	1x CDMA 800, RC3 SO55	SNN5915A	1013												
		SNN5915A	384	24.99		18.0	-0.03	0.046	0.05		0.085	0.09			
		SNN5915A	777												
	1x CDMA 800, RC3 SO55	SNN5915A	1013												
		SNN5915A	384	18		18.5	-0.03	0.007	0.01		0.014	0.01			
		SNN5915A	777												
	EVDO 800, Rev. O	SNN5915A	1013												
		SNN5915A	384	24.80		19.1	-0.05	0.048	0.05		0.088	0.09			
		SNN5915A	777												
1880	1x CDMA 1900, RC3 SO55	SNN5915A	25												
		SNN5915A	600	16	-9	19.0	-0.01	0.396	0.40		0.783	0.78		5x5x7 A85	
		SNN5915A	1175												
	EVDO 1900, Rev. O	SNN5915A	25	16	-9	18.8	-0.01	0.420	0.42		0.827	0.83			
		SNN5915A	600	16	-9	18.8	-0.15	0.399	0.41		0.794	0.82			
		SNN5915A	1175	16	-9	18.8	0.02	0.422	0.42		0.848	0.85		5x5x7 A86	

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

6.4 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 (1x and EVDO), LTE, and Wi-Fi transmitters may operate simultaneously as described in the tables on the following pages. CDMA supports both voice and data transmission. LTE and Wi-Fi support data transmission only. Bluetooth may also operate simultaneously with these modes, but is omitted from evaluation as described in section 2.3.4 above. The separation distances between the antennas are depicted in the layout diagram below, and a simplified model of the transmit paths is provided in the block diagram below.



For the transmitters requiring stand-alone SAR testing (CDMA (1x and EVDO), LTE, and Wi-Fi), 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. Simultaneous SAR summations for the head, body-worn accessory, and mobile hotspot exposure conditions with the worst-case SAR transmitter configurations are presented in tables 17 to 32 below⁸.

Head Exposure Conditions; Simultaneous Transmit Configurations, including Power Conditions or Reduced Limits							
Case	Transmitter #1		Transmitter #2		Transmitter #3		Notes
	Transmitter Configuration	PWR	Transmitter Configuration	PWR	Transmitter Configuration	PWR	
1	1x CDMA 800 (Voice)	>18	EVDO 1900 (Data)	18			SVDO (Interband)
2	1x CDMA 800 (Voice)	≤18	EVDO 1900 (Data)	N/A			SVDO (Interband)
3	1x CDMA 800 (Voice)	>18	EVDO 800 (Data)	18			SVDO (Intraband)
4	1x CDMA 800 (Voice)	≤18	EVDO 800 (Data)	N/A			SVDO (Intraband)
5	1x CDMA 800 (Voice)	>18	LTE B13 (Data)	20			SVLTE
6	1x CDMA 800 (Voice)	≤18	LTE B13 (Data)	N/A			SVLTE
7	1x CDMA 800 (Voice)	N/A	Wi-Fi 2.4 GHz (Data)	15			1x Voice + Background Data
8	1x CDMA 800 (Voice)	N/A	Wi-Fi 5 GHz (Data)	9			1x Voice + Background Data
9	1x CDMA 1900 (Voice)	>18	EVDO 800 (Data)	18			SVDO (Interband)
10	1x CDMA 1900 (Voice)	≤18	EVDO 800 (Data)	N/A			SVDO (Interband)
11	1x CDMA 1900 (Voice)	N/A	EVDO 1900 (Data)	15			SVDO (Intraband)
12	1x CDMA 1900 (Voice)	>18	LTE B13 (Data)	20			SVLTE
13	1x CDMA 1900 (Voice)	≤18	LTE B13 (Data)	N/A			SVLTE
14	1x CDMA 1900 (Voice)	N/A	Wi-Fi 2.4 GHz (Data)	15			1x Voice + Background Data
15	1x CDMA 1900 (Voice)	N/A	Wi-Fi 5 GHz (Data)	9			1x Voice + Background Data
16	1x CDMA 800 (Voice)	>18	EVDO 1900 (Data)	18	Wi-Fi 2.4 GHz (Data)	15	SVDO (Interband) during Mobile Hotspot
17	1x CDMA 800 (Voice)	≤18	EVDO 1900 (Data)	N/A	Wi-Fi 2.4 GHz (Data)	15	SVDO (Interband) during Mobile Hotspot
18	1x CDMA 800 (Voice)	>18	EVDO 1900 (Data)	18	Wi-Fi 5.785 GHz (Data)	9	SVDO (Interband) during Mobile Hotspot
19	1x CDMA 800 (Voice)	≤18	EVDO 1900 (Data)	N/A	Wi-Fi 5.785 GHz (Data)	9	SVDO (Interband) during Mobile Hotspot
20	1x CDMA 800 (Voice)	>18	EVDO 800 (Data)	18	Wi-Fi 2.4 GHz (Data)	15	SVDO (Intraband) during Mobile Hotspot
21	1x CDMA 800 (Voice)	≤18	EVDO 800 (Data)	N/A	Wi-Fi 2.4 GHz (Data)	15	SVDO (Intraband) during Mobile Hotspot
22	1x CDMA 800 (Voice)	>18	EVDO 800 (Data)	18	Wi-Fi 5.785 GHz (Data)	9	SVDO (Intraband) during Mobile Hotspot
23	1x CDMA 800 (Voice)	≤18	EVDO 800 (Data)	N/A	Wi-Fi 5.785 GHz (Data)	9	SVDO (Intraband) during Mobile Hotspot
24	1x CDMA 800 (Voice)	>18	LTE B13 (Data)	20	Wi-Fi 2.4 GHz (Data)	15	SVLTE during Mobile Hotspot
25	1x CDMA 800 (Voice)	≤18	LTE B13 (Data)	N/A	Wi-Fi 2.4 GHz (Data)	15	SVLTE during Mobile Hotspot
26	1x CDMA 800 (Voice)	>18	LTE B13 (Data)	20	Wi-Fi 5.785 GHz (Data)	9	SVLTE during Mobile Hotspot
27	1x CDMA 800 (Voice)	≤18	LTE B13 (Data)	N/A	Wi-Fi 5.785 GHz (Data)	9	SVLTE during Mobile Hotspot
28	1x CDMA 1900 (Voice)	18	EVDO 800 (Data)	N/A	Wi-Fi 2.4 GHz (Data)	15	SVDO (Interband) during Mobile Hotspot
29	1x CDMA 1900 (Voice)	18	EVDO 800 (Data)	N/A	Wi-Fi 5.785 GHz (Data)	9	SVDO (Interband) during Mobile Hotspot
30	1x CDMA 1900 (Voice)	18	EVDO 1900 (Data)	15	Wi-Fi 2.4 GHz (Data)	15	SVDO (Intraband) during Mobile Hotspot
31	1x CDMA 1900 (Voice)	18	EVDO 1900 (Data)	15	Wi-Fi 5.785 GHz (Data)	9	SVDO (Intraband) during Mobile Hotspot
32	1x CDMA 1900 (Voice)	18	LTE B13 (Data)	N/A	Wi-Fi 2.4 GHz (Data)	15	SVLTE during Mobile Hotspot
33	1x CDMA 1900 (Voice)	18	LTE B13 (Data)	N/A	Wi-Fi 5.785 GHz (Data)	9	SVLTE during Mobile Hotspot

⁸ A description of the power conditions or reduced limits for simultaneous transmit modes is provided in section 2.2.3 and in expanded detail in Exhibit 12. The notation used in the “Exposure Condition” tables is as follows for the PWR column:

- N/A indicates the transmitter in this case has no reduced power limit enforced and may operate up to its maximum power, and no conditions are contingent on this transmitter’s operation.
- >18 and ≤18 indicate the transmitter’s power (in dBm) is monitored as a condition for enforcing the other power limit reductions in this case.
- 20, 18, 16, 15, and 9 indicate an enforced power limit, at the value stated in dBm, on the noted transmitter for this case.

For SVDO (Intraband) operation, transmitters listed in *italics* indicate operation using the SVDO (Intraband TX) Antenna located at the top of the DUT, as opposed to transmission using the Main antenna.

		Transmitter Stand-Alone 1 g SAR Values (W/kg)					1 g SAR Summations (W/kg)					
							Case 1	Case 3	Case 5	Case 7	Case 8	
Band		1x CDMA 800	EVDO 1900	EVDO 800	LTE Band 13	Wi-Fi 2.4 GHz	Wi-Fi 5 GHz	1x CDMA 800 + EVDO 1900	1x CDMA 800 + EVDO 800	1x CDMA 800 + LTE Band 13	1x CDMA 800 + Wi-Fi 2.4 GHz	1x CDMA 800 + Wi-Fi 5 GHz
Power Condition or Reduced Limit		>18 or N/A	18 dBm	18 dBm	20 dBm	15 dBm	9 dBm					
Position	Left Head Cheek	0.43	0.08	0.04	0.20	0.19	0.16	0.51	0.47	0.63	0.62	0.59
	Left Head 15° Tilt	0.22	0.06	0.02	0.07	0.04	0.15	0.28	0.24	0.29	0.26	0.37
	Right Head Cheek	0.42	0.15	0.04	0.12	0.48	0.34	0.57	0.46	0.54	0.90	0.76
	Right Head 15° Tilt	0.23	0.06	0.03	0.07	0.16	0.23	0.29	0.26	0.30	0.39	0.46

Table 17: SAR summations for simultaneous evaluation – 1x CDMA 800 (Voice) in Head Positions

		Transmitter Stand-Alone 1 g SAR Values (W/kg)				1 g SAR Summations (W/kg)		
						Case 2	Case 4	Case 6
Band		1x CDMA 800	EVDO 1900	EVDO 800	LTE Band 13	1x CDMA 800 + EVDO 1900	1x CDMA 800 + EVDO 800	1x CDMA 800 + LTE Band 13
Power Condition or Reduced Limit		≤18	N/A	N/A	N/A			
Position	Left Head Cheek	0.07	0.31	0.11	0.49	0.38	0.18	0.56
	Left Head 15° Tilt	0.04	0.20	0.08	0.23	0.24	0.12	0.27
	Right Head Cheek	0.08	0.72	0.15	0.31	0.76	0.23	0.39
	Right Head 15° Tilt	0.04	0.16	0.11	0.16	0.20	0.15	0.20

Table 18: SAR summations for simultaneous evaluation – 1x CDMA 800 (Voice) in Head Positions

		Transmitter Stand-Alone 1 g SAR Values (W/kg)					1 g SAR Summations (W/kg)					
							Case 9	Case 11	Case 12	Case 14	Case 15	
Band		1x CDMA 1900	EVDO 800	EVDO 1900	LTE Band 13	Wi-Fi 2.4 GHz	Wi-Fi 5 GHz	1x CDMA 1900 + EVDO 800	1x CDMA 1900 + EVDO 1900	1x CDMA 1900 + LTE Band 13	1x CDMA 1900 + Wi-Fi 2.4 GHz	1x CDMA 1900 + Wi-Fi 5 GHz
Power Condition or Reduced Limit		>18 or N/A	18 dBm	15 dBm	20 dBm	15 dBm	9 dBm					
Position	Left Head Cheek	0.47	0.11	0.60	0.20	0.19	0.16	0.58	1.07	0.67	0.66	0.63
	Left Head 15° Tilt	0.29	0.06	0.69	0.07	0.04	0.15	0.35	0.98	0.36	0.33	0.44
	Right Head Cheek	0.97	0.09	0.62	0.12	0.48	0.34	1.06	1.59	1.09	1.45	1.31
	Right Head 15° Tilt	0.26	0.06	0.69	0.07	0.16	0.23	0.32	0.95	0.33	0.42	0.49

Table 19: SAR summations for simultaneous evaluation – 1x CDMA 1900 (Voice) in Head Positions

		Transmitter Stand-Alone 1 g SAR Values (W/kg)			1 g SAR Summations (W/kg)	
					Case 10	Case 13
Band		1x CDMA 1900	EVDO 800	LTE Band 13	1x CDMA 1900 + EVDO 800	1x CDMA 1900 + LTE Band 13
Power Condition or Reduced Limit		≤18	N/A	N/A		
Position	Left Head Cheek	0.08	0.34	0.49	0.42	0.57
	Left Head 15° Tilt	0.06	0.24	0.23	0.30	0.29
	Right Head Cheek	0.12	0.37	0.31	0.49	0.43
	Right Head 15° Tilt	0.04	0.20	0.16	0.24	0.20

Table 20: SAR summations for simultaneous evaluation – 1x CDMA 1900 (Voice) in Head Positions

		Transmitter Stand-Alone 1 g SAR Values (W/kg)					1 g SAR Summations (W/kg)						
							Case 16	Case 18	Case 20	Case 22	Case 24	Case 26	
Band	1x CDMA 800	EVDO 1900	EVDO 800	LTE Band 13	Wi-Fi 2.4 GHz	Wi-Fi 5.785 GHz	1x CDMA 800 + EVDO 1900 + Wi-Fi 2.4 GHz	1x CDMA 800 + EVDO 1900 + Wi-Fi 5.785 GHz	1x CDMA 800 + EVDO 800 + Wi-Fi 2.4 GHz	1x CDMA 800 + EVDO 800 + Wi-Fi 5.785 GHz	1x CDMA 800 + LTE Band 13 + Wi-Fi 2.4 GHz	1x CDMA 800 + LTE Band 13 + Wi-Fi 5.785 GHz	
Power Condition or Reduced Limit	>18 or N/A	18 dBm	18 dBm	20 dBm	15 dBm	9 dBm							
Position	Left Head Cheek	0.43	0.08	0.04	0.20	0.19	0.16	0.70	0.67	0.66	0.63	0.72	0.69
	Left Head 15° Tilt	0.22	0.06	0.02	0.07	0.04	0.15	0.32	0.43	0.28	0.39	0.33	0.44
	Right Head Cheek	0.42	0.15	0.04	0.12	0.48	0.32	1.05	0.89	0.94	0.78	1.02	0.86
	Right Head 15° Tilt	0.23	0.06	0.03	0.07	0.16	0.23	0.45	0.52	0.42	0.49	0.46	0.53

Table 21: SAR summations for simultaneous evaluation – 1x CDMA 800 (Voice) in Head Positions during a Mobile Hotspot session

		Transmitter Stand-Alone 1 g SAR Values (W/kg)					1 g SAR Summations (W/kg)						
							Case 17	Case 19	Case 21	Case 23	Case 25	Case 27	
Band	1x CDMA 800	EVDO 1900	EVDO 800	LTE Band 13	Wi-Fi 2.4 GHz	Wi-Fi 5.785 GHz	1x CDMA 800 + EVDO 1900 + Wi-Fi 2.4 GHz	1x CDMA 800 + EVDO 1900 + Wi-Fi 5.785 GHz	1x CDMA 800 + EVDO 800 + Wi-Fi 2.4 GHz	1x CDMA 800 + EVDO 800 + Wi-Fi 5.785 GHz	1x CDMA 800 + LTE Band 13 + Wi-Fi 2.4 GHz	1x CDMA 800 + LTE Band 13 + Wi-Fi 5.785 GHz	
Power Condition or Reduced Limit	≤18	N/A	N/A	N/A	15 dBm	9 dBm							
Position	Left Head Cheek	0.07	0.31	0.11	0.49	0.19	0.16	0.57	0.54	0.37	0.34	0.75	0.72
	Left Head 15° Tilt	0.04	0.20	0.08	0.23	0.04	0.15	0.28	0.39	0.16	0.27	0.31	0.42
	Right Head Cheek	0.08	0.72	0.15	0.31	0.48	0.32	1.28	1.12	0.71	0.55	0.87	0.71
	Right Head 15° Tilt	0.04	0.16	0.11	0.16	0.16	0.23	0.36	0.43	0.31	0.38	0.36	0.43

Table 22: SAR summations for simultaneous evaluation – 1x CDMA 800 (Voice) in Head Positions during a Mobile Hotspot session

		Transmitter Stand-Alone 1 g SAR Values (W/kg)					1 g SAR Summations (W/kg)						
							Case 28	Case 29	Case 30	Case 31	Case 32	Case 33	
Band	1x CDMA 1900	EVDO 800	EVDO 1900	LTE Band 13	Wi-Fi 2.4 GHz	Wi-Fi 5.785 GHz	1x CDMA 1900 + EVDO 800 + Wi-Fi 2.4 GHz	1x CDMA 1900 + EVDO 800 + Wi-Fi 5.785 GHz	1x CDMA 1900 + EVDO 1900 + Wi-Fi 2.4 GHz	1x CDMA 1900 + EVDO 1900 + Wi-Fi 5.785 GHz	1x CDMA 1900 + LTE Band 13 + Wi-Fi 2.4 GHz	1x CDMA 1900 + LTE Band 13 + Wi-Fi 5.785 GHz	
Power Condition or Reduced Limit	18 dBm	N/A	15 dBm	20 dBm	15 dBm	9 dBm							
Position	Left Head Cheek	0.08	0.34	0.60	0.20	0.19	0.16	0.61	0.58	0.87	0.84	0.47	0.44
	Left Head 15° Tilt	0.06	0.24	0.69	0.07	0.04	0.15	0.34	0.45	0.79	0.90	0.17	0.28
	Right Head Cheek	0.12	0.37	0.62	0.12	0.48	0.32	0.97	0.81	1.22	1.06	0.72	0.56
	Right Head 15° Tilt	0.04	0.20	0.69	0.07	0.16	0.23	0.40	0.47	0.89	0.96	0.27	0.34

Table 23: SAR summations for simultaneous evaluation – 1x CDMA 1900 (Voice) in Head Positions during a Mobile Hotspot session

Body-Worn Accessory Exposure Conditions ⁹ ; Simultaneous Transmit Configurations, including Power Conditions or Reduced Limits							
Case	Transmitter #1		Transmitter #2		Transmitter #3		Notes
	Transmitter Configuration	PWR	Transmitter Configuration	PWR	Transmitter Configuration	PWR	
1	1x CDMA 800 (Voice)	>18	EVDO 1900 (Data)	18			SVDO (Interband)
2	1x CDMA 800 (Voice)	≤18	EVDO 1900 (Data)	N/A			SVDO (Interband)
3	1x CDMA 800 (Voice)	>18	EVDO 800 (Data)	18			SVDO (Intraband)
4	1x CDMA 800 (Voice)	≤18	EVDO 800 (Data)	N/A			SVDO (Intraband)
5	1x CDMA 800 (Voice)	>18	LTE B13 (Data)	20			SVLTE
6	1x CDMA 800 (Voice)	≤18	LTE B13 (Data)	N/A			SVLTE
7	1x CDMA 800 (Voice)	N/A	Wi-Fi 2.4 GHz (Data)	15			1x Voice + Background Data
8	1x CDMA 800 (Voice)	N/A	Wi-Fi 5 GHz (Data)	9			1x Voice + Background Data
9	1x CDMA 1900 (Voice)	>18	EVDO 800 (Data)	18			SVDO (Interband)
10	1x CDMA 1900 (Voice)	≤18	EVDO 800 (Data)	N/A			SVDO (Interband)
11	1x CDMA 1900 (Voice)	>18	EVDO 1900 (Data)	18			SVDO (Intraband)
12	1x CDMA 1900 (Voice)	≤18	EVDO 1900 (Data)	N/A			SVDO (Intraband)
13	1x CDMA 1900 (Voice)	>18	LTE B13 (Data)	20			SVLTE
14	1x CDMA 1900 (Voice)	≤18	LTE B13 (Data)	N/A			SVLTE
15	1x CDMA 1900 (Voice)	N/A	Wi-Fi 2.4 GHz (Data)	15			1x Voice + Background Data
16	1x CDMA 1900 (Voice)	N/A	Wi-Fi 5 GHz (Data)	9			1x Voice + Background Data
17	1x CDMA 800 (Voice)	N/A	EVDO 1900 (Data)	16	Wi-Fi 2.4 GHz (Data)	15	SVDO (Interband) during Mobile Hotspot
18	1x CDMA 800 (Voice)	N/A	EVDO 1900 (Data)	16	Wi-Fi 5.785 GHz (Data)	9	SVDO (Interband) during Mobile Hotspot
19	1x CDMA 800 (Voice)	>18	EVDO 800 (Data)	18	Wi-Fi 2.4 GHz (Data)	15	SVDO (Intraband) during Mobile Hotspot
20	1x CDMA 800 (Voice)	≤18	EVDO 800 (Data)	N/A	Wi-Fi 2.4 GHz (Data)	15	SVDO (Intraband) during Mobile Hotspot
21	1x CDMA 800 (Voice)	>18	EVDO 800 (Data)	18	Wi-Fi 5.785 GHz (Data)	9	SVDO (Intraband) during Mobile Hotspot
22	1x CDMA 800 (Voice)	≤18	EVDO 800 (Data)	N/A	Wi-Fi 5.785 GHz (Data)	9	SVDO (Intraband) during Mobile Hotspot
23	1x CDMA 800 (Voice)	N/A	LTE B13 (Data)	20	Wi-Fi 2.4 GHz (Data)	15	SVLTE during Mobile Hotspot
24	1x CDMA 800 (Voice)	N/A	LTE B13 (Data)	20	Wi-Fi 5.785 GHz (Data)	9	SVLTE during Mobile Hotspot
25	1x CDMA 1900 (Voice)	16	EVDO 800 (Data)	N/A	Wi-Fi 2.4 GHz (Data)	15	SVDO (Interband) during Mobile Hotspot
26	1x CDMA 1900 (Voice)	16	EVDO 800 (Data)	N/A	Wi-Fi 5.785 GHz (Data)	9	SVDO (Interband) during Mobile Hotspot
27	1x CDMA 1900 (Voice)	16	EVDO 1900 (Data)	16	Wi-Fi 2.4 GHz (Data)	15	SVDO (Intraband) during Mobile Hotspot
28	1x CDMA 1900 (Voice)	16	EVDO 1900 (Data)	16	Wi-Fi 5.785 GHz (Data)	9	SVDO (Intraband) during Mobile Hotspot
29	1x CDMA 1900 (Voice)	16	LTE B13 (Data)	20	Wi-Fi 2.4 GHz (Data)	15	SVLTE during Mobile Hotspot
30	1x CDMA 1900 (Voice)	16	LTE B13 (Data)	20	Wi-Fi 5.785 GHz (Data)	9	SVLTE during Mobile Hotspot

⁹ Note that during typical operation, the power of the transmitters is controlled in the manner described in this table. The summations given in the following tables for the Body-Worn Accessory exposure conditions are shown without power conditions or reduced limits enforced, e.g. all SAR values are for transmitters operating at their maximum power levels. As the SAR summations show results below the compliance limit using values from higher-power configurations than allowed during typical operation, compliance with those reductions employed is implied.

		Transmitter Stand-Alone 1 g SAR Values (W/kg)					1 g SAR Summations (W/kg)					
							Cases 1, 2	Cases 3, 4	Cases 5, 6	Case 7	Case 8	
Band		1x CDMA 800	EVDO 1900	EVDO 800	LTE Band 13	Wi-Fi 2.4 GHz	Wi-Fi 5 GHz	1x CDMA 800 + EVDO 1900	1x CDMA 800 + EVDO 800	1x CDMA 800 + LTE Band 13	1x CDMA 800 + Wi-Fi 2.4 GHz	1x CDMA 800 + Wi-Fi 5 GHz
Position	Front of Phone 25 mm from Phantom	0.25	0.41	0.03	0.30	0.01	0.05	0.66	0.28	0.55	0.26	0.30
	Back of Phone 25 mm from Phantom	0.29	0.44	0.06	0.26	0.01	0.12	0.73	0.36	0.55	0.30	0.41

Table 24: SAR summations for simultaneous evaluation – 1x CDMA 800 (Voice) in Body-Worn Accessory Positions

		Transmitter Stand-Alone 1 g SAR Values (W/kg)					1 g SAR Summations (W/kg)					
							Cases 9, 10	Cases 11, 12	Cases 13, 14	Case 15	Case 16	
Band		1x CDMA 1900	EVDO 800	EVDO 1900	LTE Band 13	Wi-Fi 2.4 GHz	Wi-Fi 5 GHz	1x CDMA 1900 + EVDO 800	1x CDMA 1900 + EVDO 1900	1x CDMA 1900 + LTE Band 13	1x CDMA 1900 + Wi-Fi 2.4 GHz	1x CDMA 1900 + Wi-Fi 5 GHz
Position	Front of Phone 25 mm from Phantom	0.38	0.19	0.23	0.30	0.01	0.05	0.57	0.61	0.68	0.39	0.43
	Back of Phone 25 mm from Phantom	0.46	0.40	0.09	0.26	0.01	0.12	0.86	0.55	0.72	0.47	0.58

Table 25: SAR summations for simultaneous evaluation – 1x CDMA 1900 (Voice) in Body-Worn Accessory Positions

		Transmitter Stand-Alone 1 g SAR Values (W/kg)					1 g SAR Summations (W/kg)						
							Case 17	Case 18	Case 19, 20	Case 21, 22	Case 23	Case 24	
Band		1x CDMA 800	EVDO 1900	EVDO 800	LTE Band 13	Wi-Fi 2.4 GHz	Wi-Fi 5.785 GHz	1x CDMA 800 + EVDO 1900 + Wi-Fi 2.4 GHz	1x CDMA 800 + EVDO 1900 + Wi-Fi 5.785 GHz	1x CDMA 800 + EVDO 800 + Wi-Fi 2.4 GHz	1x CDMA 800 + EVDO 800 + Wi-Fi 5.785 GHz	1x CDMA 800 + LTE Band 13 + Wi-Fi 2.4 GHz	1x CDMA 800 + LTE Band 13 + Wi-Fi 5.785 GHz
Position	Front of Phone 25 mm from Phantom	0.25	0.41	0.03	0.30	0.01	0.05	0.67	0.41	0.29	0.33	0.56	0.60
	Back of Phone 25 mm from Phantom	0.29	0.44	0.06	0.26	0.01	0.12	0.74	0.85	0.36	0.47	0.56	0.67

Table 26: SAR summations for simultaneous evaluation – 1x CDMA 800 (Voice) in Body-Worn Accessory Positions during a Mobile Hotspot session

		Transmitter Stand-Alone 1 g SAR Values (W/kg)					1 g SAR Summations (W/kg)						
							Case 25	Case 26	Case 27	Case 28	Case 29	Case 30	
Band		1x CDMA 1900	EVDO 800	EVDO 1900	LTE Band 13	Wi-Fi 2.4 GHz	Wi-Fi 5.785 GHz	1x CDMA 1900 + EVDO 800 + Wi-Fi 2.4 GHz	1x CDMA 1900 + EVDO 800 + Wi-Fi 5.785 GHz	1x CDMA 1900 + EVDO 1900 + Wi-Fi 2.4 GHz	1x CDMA 1900 + EVDO 1900 + Wi-Fi 5.785 GHz	1x CDMA 1900 + LTE Band 13 + Wi-Fi 2.4 GHz	1x CDMA 1900 + LTE Band 13 + Wi-Fi 5.785 GHz
Position	Front of Phone 25 mm from Phantom	0.38	0.19	0.23	0.30	0.01	0.05	0.58	0.62	0.62	0.66	0.69	0.73
	Back of Phone 25 mm from Phantom	0.46	0.40	0.09	0.26	0.01	0.12	0.87	0.98	0.56	0.67	0.73	0.84

Table 27: SAR summations for simultaneous evaluation – 1x CDMA 1900 (Voice) in Body-Worn Accessory Positions during a Mobile Hotspot session

Mobile Hotspot Exposure Conditions; Simultaneous Transmit Configurations, including Power Conditions or Reduced Limits							
Case	Transmitter #1		Transmitter #2		Transmitter #3		Notes
	Transmitter Configuration	PWR	Transmitter Configuration	PWR	Transmitter Configuration	PWR	
1	1x CDMA 800 (TDSO32 Data)	N/A	Wi-Fi 2.4 GHz (Data)	15			Mobile Hotspot session
2	1x CDMA 800 (TDSO32 Data)	N/A	Wi-Fi 5.785 GHz (Data)	9			Mobile Hotspot session
3	EVDO 800 (Data)	N/A	Wi-Fi 2.4 GHz (Data)	15			Mobile Hotspot session
4	EVDO 800 (Data)	N/A	Wi-Fi 5.785 GHz (Data)	9			Mobile Hotspot session
5	1x CDMA 1900 (TDSO32 Data)	16	Wi-Fi 2.4 GHz (Data)	15			Mobile Hotspot session
6	1x CDMA 1900 (TDSO32 Data)	16	Wi-Fi 5.785 GHz (Data)	9			Mobile Hotspot session
7	EVDO 1900 (Data)	16	Wi-Fi 2.4 GHz (Data)	15			Mobile Hotspot session
8	EVDO 1900 (Data)	16	Wi-Fi 5.785 GHz (Data)	9			Mobile Hotspot session
9	LTE B13 (Data)	20	Wi-Fi 2.4 GHz (Data)	15			Mobile Hotspot session
10	LTE B13 (Data)	20	Wi-Fi 5.785 GHz (Data)	9			Mobile Hotspot session
11	1x CDMA 800 (Voice)	N/A	EVDO 1900 (Data)	16	Wi-Fi 2.4 GHz (Data)	15	SVDO (Interband) during Mobile Hotspot
12	1x CDMA 800 (Voice)	N/A	EVDO 1900 (Data)	16	Wi-Fi 5.785 GHz (Data)	9	SVDO (Interband) during Mobile Hotspot
13	1x CDMA 800 (Voice)	>18	EVDO 800 (Data)	18	Wi-Fi 2.4 GHz (Data)	15	SVDO (Intraband) during Mobile Hotspot
14	1x CDMA 800 (Voice)	≤18	EVDO 800 (Data)	N/A	Wi-Fi 2.4 GHz (Data)	15	SVDO (Intraband) during Mobile Hotspot
15	1x CDMA 800 (Voice)	>18	EVDO 800 (Data)	18	Wi-Fi 5.785 GHz (Data)	9	SVDO (Intraband) during Mobile Hotspot
16	1x CDMA 800 (Voice)	≤18	EVDO 800 (Data)	N/A	Wi-Fi 5.785 GHz (Data)	9	SVDO (Intraband) during Mobile Hotspot
17	1x CDMA 800 (Voice)	N/A	LTE B13 (Data)	20	Wi-Fi 2.4 GHz (Data)	15	SVLTE during Mobile Hotspot
18	1x CDMA 800 (Voice)	N/A	LTE B13 (Data)	20	Wi-Fi 5.785 GHz (Data)	9	SVLTE during Mobile Hotspot
19	1x CDMA 1900 (Voice)	16	EVDO 800 (Data)	N/A	Wi-Fi 2.4 GHz (Data)	15	SVDO (Interband) during Mobile Hotspot
20	1x CDMA 1900 (Voice)	16	EVDO 800 (Data)	N/A	Wi-Fi 5.785 GHz (Data)	9	SVDO (Interband) during Mobile Hotspot
21	1x CDMA 1900 (Voice)	16	EVDO 1900 (Data)	16	Wi-Fi 2.4 GHz (Data)	15	SVDO (Intraband) during Mobile Hotspot
22	1x CDMA 1900 (Voice)	16	EVDO 1900 (Data)	16	Wi-Fi 5.785 GHz (Data)	9	SVDO (Intraband) during Mobile Hotspot
23	1x CDMA 1900 (Voice)	16	LTE B13 (Data)	20	Wi-Fi 2.4 GHz (Data)	15	SVLTE during Mobile Hotspot
24	1x CDMA 1900 (Voice)	16	LTE B13 (Data)	20	Wi-Fi 5.785 GHz (Data)	9	SVLTE during Mobile Hotspot

		Transmitter Stand-Alone 1 g SAR Values (W/kg) ¹⁰					1 g SAR Summations (W/kg)					
							Case 1	Case 3	Case 5	Case 7	Case 9	
Band		1x CDMA 800	EVDO 800	1x CDMA 1900	EVDO 1900	LTE Band 13	Wi-Fi 2.4 GHz	1x CDMA 800 + Wi-Fi 2.4 GHz	EVDO 800 + Wi-Fi 2.4 GHz	1x CDMA 1900 + Wi-Fi 2.4 GHz	EVDO 1900 + Wi-Fi 2.4 GHz	LTE Band 13 + Wi-Fi 2.4 GHz
Power Condition or Reduced Limit		N/A	N/A	16 dBm	16 dBm	20 dB	15 dBm					
Position	Front of Phone 10 mm from Phantom	0.72	0.71	0.40	0.30	0.42	0.04	0.76	0.75	0.44	0.34	0.46
	Back of Phone 10 mm from Phantom	0.63	0.63	0.35	0.27	0.40	0.03	0.66	0.66	0.38	0.30	0.43
	Left Edge of Phone 10 mm from Phantom	0.78	0.77	0.02	0.03	0.25	0.12	0.90	0.89	0.14	0.15	0.37
	Right Edge of Phone 10 mm from Phantom	0.68	0.61	0.07	0.08	0	0	0.68	0.61	0.07	0.08	0
	Top Edge of Phone 10 mm from Phantom	0	0	0	0	0	0.01	0.01	0.01	0.01	0.01	0.01
	Bottom Edge of Phone 10 mm from Phantom	0.09	0.09	0.78	0.85	0.27	0	0.09	0.09	0.78	0.85	0.27

Table 28: SAR summations for simultaneous evaluation – Positions during a Mobile Hotspot session

		Transmitter Stand-Alone 1 g SAR Values (W/kg) ¹⁰					1 g SAR Summations (W/kg)					
							Case 2	Case 4	Case 6	Case 8	Case 10	
Band		1x CDMA 800	EVDO 800	1x CDMA 1900	EVDO 1900	LTE Band 13	Wi-Fi 5.785 GHz	1x CDMA 800 + Wi-Fi 5.785 GHz	EVDO 800 + Wi-Fi 5.785 GHz	1x CDMA 1900 + Wi-Fi 5.785 GHz	EVDO 1900 + Wi-Fi 5.785 GHz	LTE Band 13 + Wi-Fi 5.785 GHz
Power Condition or Reduced Limit		N/A	N/A	16 dBm	16 dBm	20 dBm	9 dBm					
Position	Front of Phone 10 mm from Phantom	0.72	0.71	0.40	0.30	0.42	0.02	0.74	0.73	0.42	0.32	0.44
	Back of Phone 10 mm from Phantom	0.63	0.63	0.35	0.27	0.40	0.01	0.64	0.64	0.36	0.28	0.41
	Left Edge of Phone 10 mm from Phantom	0.78	0.77	0.02	0.03	0.25	0.04	0.82	0.81	0.06	0.07	0.29
	Right Edge of Phone 10 mm from Phantom	0.68	0.61	0.07	0.08	0	0	0.68	0.61	0.07	0.08	0
	Top Edge of Phone 10 mm from Phantom	0	0	0	0	0	0.03	0.03	0.03	0.03	0.03	0.03
	Bottom Edge of Phone 10 mm from Phantom	0.09	0.09	0.78	0.85	0.27	0	0.09	0.09	0.78	0.85	0.27

Table 29: SAR summations for simultaneous evaluation – Positions during a Mobile Hotspot session

		Transmitter Stand-Alone 1 g SAR Values (W/kg)						1 g SAR Summations (W/kg)				
								Case 11	Case 13	Case 14	Case 17	
Band		1x CDMA 800	1x CDMA 800	EVDO 1900	EVDO 800	EVDO 800	LTE Band 13	Wi-Fi 2.4 GHz	1x CDMA 800 + EVDO 1900 + Wi-Fi 2.4 GHz	1x CDMA 800 + EVDO 800 + Wi-Fi 2.4 GHz	1x CDMA 800 + EVDO 800 + Wi-Fi 2.4 GHz	1x CDMA 800 + LTE Band 13 + Wi-Fi 2.4 GHz
Power Condition or Reduced Limit		>18 or N/A	≤18	16 dBm	18 dBm	N/A	20 dBm	15 dBm				
Position	Front of Phone 10 mm from Phantom	0.72	0.11	0.30	0.02	0.06	0.42	0.04	1.06	0.78	0.21	1.18
	Back of Phone 10 mm from Phantom	0.63	0.10	0.27	0.05	0.20	0.40	0.03	0.93	0.71	0.33	1.06
	Left Edge of Phone 10 mm from Phantom	0.78	0.15	0.03	0.01	0.04	0.25	0.12	0.87	0.85	0.31	1.09
	Right Edge of Phone 10 mm from Phantom	0.68	0.09	0.08	0.02	0.08	0	0	0.76	0.70	0.17	0.68
	Top Edge of Phone 10 mm from Phantom	0	0	0	0.01	0.04	0	0.01	0.01	0.02	0.05	0.01
	Bottom Edge of Phone 10 mm from Phantom	0.09	0.01	0.85	0	0	0.27	0	0.94	0.09	0.01	0.36

Table 30: SAR summations for simultaneous evaluation – Positions during a Mobile Hotspot session with a concurrent Voice session

¹⁰ The test results shown in these tables are for 1x CDMA with the DUT configured for RC3 SO55 Loopback, as opposed to TDSO SO32 mode. As the power measurements in section 2.3.2 demonstrate that there is no significant difference in power between the modes, compliance using TDSO SO32 is implied.

		Transmitter Stand-Alone 1 g SAR Values (W/kg)						1 g SAR Summations (W/kg)				
		1x CDMA 800	1x CDMA 800	EVDO 1900	EVDO 800	EVDO 800	LTE Band 13	Wi-Fi 5.785 GHz	Case 12	Case 15	Case 16	Case 18
Band												
Power Condition or Reduced Limit		>18 or N/A	≤18	16 dBm	18 dBm	N/A	15 dBm	9 dBm	1x CDMA 800 + EVDO 1900 + Wi-Fi 5.785 GHz	1x CDMA 800 + EVDO 800 + Wi-Fi 5.785 GHz	1x CDMA 800 + EVDO 800 + Wi-Fi 5.785 GHz	1x CDMA 800 + LTE Band 13 + Wi-Fi 5.785 GHz
Position	Front of Phone 10 mm from Phantom	0.72	0.11	0.30	0.02	0.06	0.42	0.02	1.04	0.76	0.19	1.16
	Back of Phone 10 mm from Phantom	0.63	0.10	0.27	0.05	0.20	0.40	0.01	0.69	0.31	0.91	1.04
	Left Edge of Phone 10 mm from Phantom	0.78	0.15	0.03	0.01	0.04	0.25	0.04	0.85	0.83	0.23	0.97
	Right Edge of Phone 10 mm from Phantom	0.68	0.09	0.08	0.02	0.08	0	0	0.76	0.70	0.17	0.68
	Top Edge of Phone 10 mm from Phantom	0	0	0	0.01	0.04	0	0.03	0.03	0.04	0.07	0.03
	Bottom Edge of Phone 10 mm from Phantom	0.09	0.01	0.85	0	0	0.27	0	1.11	0.36	0.28	0.36

Table 31: SAR summations for simultaneous evaluation – Positions during a Mobile Hotspot session with a concurrent Voice session

		Transmitter Stand-Alone 1 g SAR Values (W/kg)						1 g SAR Summations (W/kg)					
		1x CDMA 1900	EVDO 800	EVDO 1900	LTE Band 13	Wi-Fi 2.4 GHz	Wi-Fi 5.785 GHz	Case 19	Case 20	Case 21	Case 22	Case 23	Case 24
Band													
Power Condition or Reduced Limit		16 dBm	N/A	16 dBm	20 dBm	15 dBm	9 dBm	1x CDMA 1900 + EVDO 800 + Wi-Fi 2.4 GHz	1x CDMA 1900 + EVDO 800 + Wi-Fi 5.785 GHz	1x CDMA 1900 + EVDO 1900 + Wi-Fi 2.4 GHz	1x CDMA 1900 + EVDO 1900 + Wi-Fi 5.785 GHz	1x CDMA 1900 + LTE Band 13 + Wi-Fi 2.4 GHz	1x CDMA 1900 + LTE Band 13 + Wi-Fi 5.785 GHz
Position	Front of Phone 10 mm from Phantom	0.40	0.71	0.16	0.42	0.04	0.02	1.15	1.13	0.60	0.58	0.86	0.84
	Back of Phone 10 mm from Phantom	0.35	0.63	0.10	0.40	0.03	0.01	1.01	0.99	0.48	0.46	0.78	0.76
	Left Edge of Phone 10 mm from Phantom	0.02	0.77	0.03	0.25	0.12	0.04	0.91	0.83	0.17	0.09	0.39	0.31
	Right Edge of Phone 10 mm from Phantom	0.07	0.61	0.02	0	0	0	0.68	0.68	0.09	0.09	0.07	0.07
	Top Edge of Phone 10 mm from Phantom	0	0	0.21	0	0.01	0.03	0.01	0.03	0.22	0.24	0.01	0.03
	Bottom Edge of Phone 10 mm from Phantom	0.78	0.09	0	0.27	0	0	0.87	0.87	0.78	0.78	1.05	1.05

Table 32: SAR summations for simultaneous evaluation – Positions during a Mobile Hotspot session with a concurrent Voice session

Simultaneous Evaluation Conclusion

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)”