



SAR EVALUATION REPORT

Applicant Name:

Samsung Electronics, Co. Ltd.
416 Maetan 3-Dong, Yeongtong-Gu
Suwon City, Kyungki-Do
Korea 443-742

Date of Testing:

2/20/2012-2/21/2012 & 3/28/2012-4/09/2012

Test Site/Location:

PCTEST Lab, Columbia, MD, USA

Document Serial No.:

OY1203290373.A3L

FCC ID:

A3LSPHL710

APPLICANT:

SAMSUNG ELECTRONICS, CO. LTD.

DUT Type:

Portable Handset

Application Type:

Certification

FCC Rule Part(s):

CFR §2.1093

Model(s):

SPH-L710

Band & Mode	Tx Frequency	Conducted Power [dBm]	SAR		
			1 gm Head (W/kg)	1 gm Body-Worn (W/kg)	1 gm Hotspot (W/kg)
Cell. CDMA/EVDO - FCC Rule Part 90S	817.90 - 823.10 MHz	25.27	0.24	0.65	0.65
Cell. CDMA/EVDO - FCC Rule Part 22H	824.70 - 848.31 MHz	25.23	0.32	0.84	0.84
PCS CDMA/EVDO - FCC Rule Part 24E	1851.25 - 1908.75 MHz	24.95	0.42	1.10	1.10
LTE Band 25 - FCC Rule Part 24E	1852.5 - 1912.5 MHz	23.05	0.14	0.74	0.74
2.4 GHz WLAN - FCC Rule Part 15C	2412 - 2462 MHz	14.45	0.03	0.07	N/A
5.8 GHz WLAN - FCC Rule Part 15C	5745 - 5825 MHz	12.24	0.03	0.17	
5.2 GHz WLAN - FCC Rule Part 15E	5180 - 5240 MHz	11.70	0.03	0.22	
5.3 GHz WLAN - FCC Rule Part 15E	5260 - 5320 MHz	11.82	0.03	0.19	
5.5 GHz WLAN - FCC Rule Part 15E	5500 - 5700 MHz	12.40	0.07	0.27	
Bluetooth - FCC Rule Part 15C	2402 - 2480 MHz	9.19	N/A		
Simultaneous SAR per KDB 690783 D01:			0.53	1.44	1.44

Note: Powers in the above table represent output powers for the SAR test configurations and may not represent the highest output powers for all configurations for each mode.

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE C95.1-1992 and has been tested in accordance with the measurement procedures specified in FCC/OET Bulletin 65 Supplement C (2001), IEEE 1528-2003 and in applicable Industry Canada Radio Standards Specifications (RSS); for North American frequency bands only.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them. Test results reported herein relate only to the item(s) tested.

PCTEST certifies that no party to this application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.


Randy Ortanez
President



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1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Tx Frequency
Cell. CDMA/EVDO - FCC Rule Part 90S	817.90 - 823.10 MHz
Cell. CDMA/EVDO - FCC Rule Part 22H	824.70 - 848.31 MHz
PCS CDMA/EVDO - FCC Rule Part 24E	1851.25 - 1908.75 MHz
LTE Band 25 - FCC Rule Part 24E	1852.5 - 1912.5 MHz
2.4 GHz WLAN - FCC Rule Part 15C	2412 - 2462 MHz
5.8 GHz WLAN - FCC Rule Part 15C	5745 - 5825 MHz
5.2 GHz WLAN - FCC Rule Part 15E	5180 - 5240 MHz
5.3 GHz WLAN - FCC Rule Part 15E	5260 - 5320 MHz
5.5 GHz WLAN - FCC Rule Part 15E	5500 - 5700 MHz
Bluetooth - FCC Rule Part 15C	2402 - 2480 MHz
NFC - FCC Rule Part 15C	13.56 MHz

1.2 Near Field Communications (NFC) Antenna

This DUT has NFC operations. The NFC antenna is integrated into the standard battery and will be the only battery available from the manufacturer for this model. Therefore all SAR tests were performed with the standard battery which already integrates the NFC antenna. The device restricts the battery used to battery model: EB-L1G6LLA.

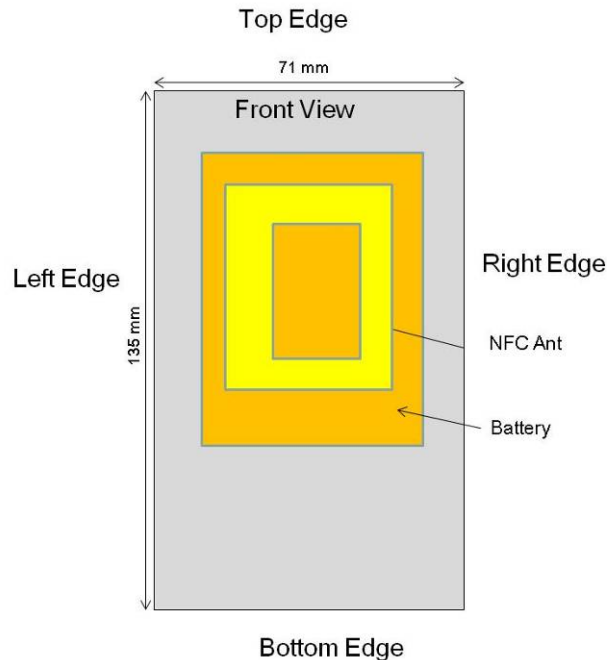


Figure 1-1
NFC Antenna Locations

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1.3 DUT Antenna Locations

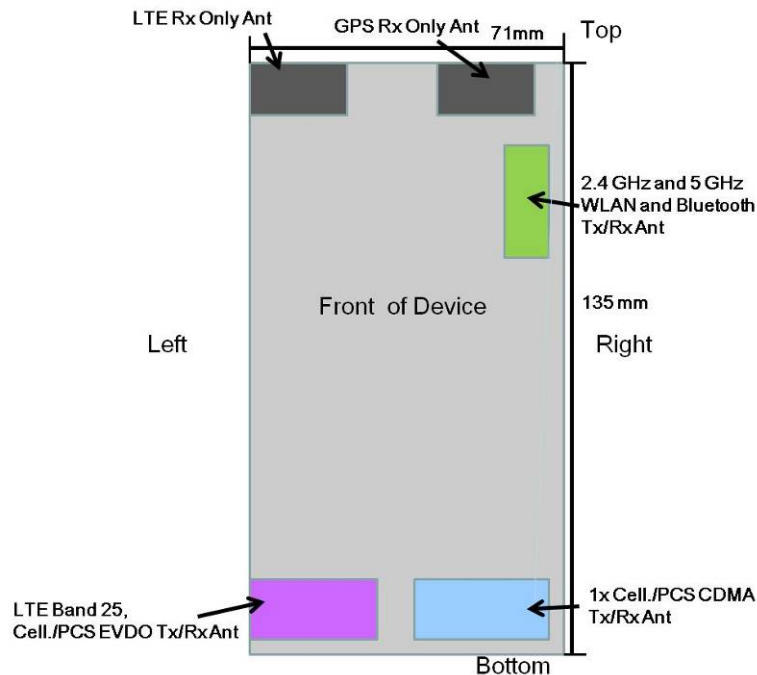


Figure 1-2
DUT Antenna Locations

Table1-1
Mobile Hotspot Sides for SAR Testing

Mobile Hotspot Sides for SAR Testing						
Mode	Back	Front	Top	Bottom	Right	Left
Cell. CDMA 1x - FCC Rule Part 90S	Yes	Yes	No	Yes	Yes	No
Cell CDMA 1x - FCC Rule Part 22H	Yes	Yes	No	Yes	Yes	No
PCS CDMA 1x - FCC Rule Part 24E	Yes	Yes	No	Yes	Yes	No
Cell. EVDO - FCC Rule Part 90S	Yes	Yes	No	Yes	No	Yes
Cell EVDO - FCC Rule Part 22H	Yes	Yes	No	Yes	No	Yes
PCS EVDO - FCC Rule Part 24E	Yes	Yes	No	Yes	No	Yes
LTE Band 25 - FCC Rule Part 24E	Yes	Yes	No	Yes	No	Yes
2.4 GHz WLAN - FCC Rule Part 15C	Yes	Yes	Yes	No	Yes	No

Note: Particular DUT edges were not required to be evaluated for Wireless Router SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 941225 D06 guidance, page 2. The antenna document shows the distances between the transmit antennas and the edges of the device. When the wireless router mode is enabled, all 5 GHz bands are disabled. Therefore 5 GHz WIFI is not considered in this section.

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1.4 Power Reduction for SAR

This device uses power reduction mechanisms for EVDO and LTE during SVLTE (voice + LTE data) and SVDO (voice + EVDO) operations for SAR compliance. See Section 11 and Section 12 for more details.

1.5 Simultaneous Transmission Capabilities

According to KDB 648474, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds. Possible transmission paths for the DUT are shown in Figure 1-3 and are color-coded to indicate communication modes which share the same path. Modes which share the same transmission path cannot transmit simultaneously with one another.

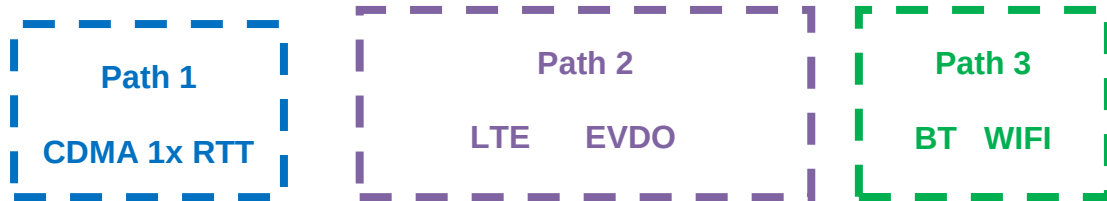


Figure 1-3
Simultaneous Transmission Paths

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to KDB 447498 3) procedures.

Table 1-2
Simultaneous Transmission Scenarios

Ref.	Simultaneous Transmit Configurations	Power Reduction	SAR Report Section	Head	Body-Worn Accessory	Hot Spot	Note
				IEEE 1528, Supp C	Supplement C	FCC KDB 941225 D06 edges/sides	
A	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + LTE B25 Data	LTE	Section 15.6	√	√	-	SVLTE
B	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + EVDO BC0 Data	EVDO	Section 15.7	√	√	-	SVDO
C	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + EVDO BC1 Data			√	√	-	SVDO
D	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + EVDO BC10 Data			√	√	-	SVDO
E	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + 2.4 GHz WIFI	None	Section 15.4	√	√	-	
F	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + 5 GHz WIFI			√	√	-	
G	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + LTE B25 Data + 2.4 GHz WIFI	LTE	Section 15.6	√	√	√	Voice + LTE + WIFI Hotspot
H	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + EVDO BC0 Data + 2.4 GHz WIFI	EVDO	Section 15.7	√	√	√	Voice + EVDO + WIFI Hotspot
I	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + EVDO BC1 Data + 2.4 GHz WIFI			√	√	√	Voice + EVDO + WIFI Hotspot
J	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + EVDO BC10 Data + 2.4 GHz WIFI			√	√	√	Voice + EVDO + WIFI Hotspot
K	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Data + 2.4 GHz WIFI			-	-	√	1X CDMA Data +WIFI Hotspot
L	BC0/BC1/BC10 850/1900 MHz EVDO Data + 2.4 GHz WIFI	None	Section 15.5	-	-	√	EVDO+WIFI Hotspot
M	LTE B25 Data + 2.4 GHz WIFI			-	-	√	LTE+WIFI Hotspot
N	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + LTE B25 Data + 5 GHz WIFI			-	-	-	Not Supported by S/W
O	LTE B25 Data + 5 GHz WIFI			-	-	-	Not Supported by S/W
P	1X BC0/BC1/BC10 Data + 5 GHz WIFI			-	-	-	Not Supported by S/W
Q	EVDO BC0/BC1/BC10 Data + 5 GHz WIFI			-	-	-	Not Supported by S/W
R	EVDO BC0/BC1/BC10 data + LTE B25 Data			-	-	-	Not supported by the HW

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1.6 SAR Test Exclusions Applied

(A) WIFI/BT

Since Wireless Router operations are not allowed by the chipset firmware using 5 GHz WIFI, only 2.4 GHz WIFI Hotspot SAR tests and combinations are considered for SAR with respect to Wireless Router configurations based on KDB 941225 D06.

The separation between the CDMA 1x-RTT Antenna and the Bluetooth/ WLAN antenna is 86.8.0 mm.

The separation between the EVDO/LTE Antenna and the Bluetooth/ WLAN antenna is 92.9 mm.

The maximum RF Conducted Power of Bluetooth Tx is 8.299 mW (See DSS Report for a full set of Bluetooth powers). The maximum RF Conducted Power of 2.4 GHz WLAN is 27.99 mW. The maximum RF Conducted Power of 5 GHz WLAN is 17.78 mW.

Per KDB Publication 648474, **Bluetooth SAR was not required** based on the maximum conducted power, the Bluetooth/WLAN to main antennas separation distance and Body-SAR of the main antennas.

This device supports 20MHz and 40MHz Bandwidths for IEEE 802.11n for 5 GHz WIFI only. 802.11n was not evaluated since the average output power of each bandwidth was not more than 0.25 dB higher than the average output power of 802.11a mode.

(B) Licensed Transmitter(s)

CDMA 1x-RTT and EVDO operate on separate transmission paths. Therefore, these modes were evaluated independently to determine compliance for different simultaneous transmission scenarios.

1.7 FCC Guidance Applied

- FCC OET Bulletin 65 Supplement C [June 2001]
- FCC KDB 941225 (2G/3G/4G and Hotspot)
- FCC KDB 248227 (802.11)
- FCC KDB 648474 (Simultaneous)
- FCC KDB 865664 (5 GHz)
- October 2011 TCB Workshop (1x Advanced)

1.8 Samples Used for SAR Testing

Several samples were used with identical hardware. Reduced power levels were configured by the manufacturer via software to support SAR test cases only.

Mode/Band:	CDMA 1x			EVDO		LTE		IEEE 802.11b	IEEE 802.11a
Target Maximum Power (dBm):	25	18	15	25	19	23	19	-	-
Serial Number:	PCT-011	PCT-004	PCT-008	PCT-005	PCT-012	PCT-003	PCT-007	PCT-006	D2-0445

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KDB 941225 Pub LTE Information			
KDB 941225 Section	FCC ID	A3LSPHL710	
	Form Factor	Handset	
1)	Frequency Range of each LTE transmission band	Band 25: 1852.5 - 1912.5 MHz	
2)	Channel Bandwidths	Band 25: 5 MHz	
3)	Channel Numbers and Frequencies (MHz)	Low	Mid
		1852.5 MHz (26065)	1882.5 MHz (26365)
4)(a)	UE Category	UE category 3	
(b)	Modulations Supported in UL	QPSK, 16QAM	
	LTE Transmitter and Antenna Implementation	CDMA 1x RTT and LTE/EVDO operate on separate transmission paths	
5)	Description of LTE Tx and Ant. Implementation	1 TX/RX Ant, 1 RX Ant	
6)	LTE Voice available?	No	
	Hotspot with LTE+WIFI	Yes	
	Hotspot with LTE+WIFI active with 1XVoice sessions?	Yes	
7)	LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3-6.2.5? (manufacturer attestation to be provided)	Yes	
	A-MPR (Additional MPR) disabled for SAR Testing?	Yes	
8)	Conducted power Table provided for 1RB (low and high offset), 50% RB (centered), 100% RB	Yes	
9-10)	Non-LTE US Wireless Operating Modes/Band	RF Output Power	RF Exposure Configurations
	Cell. CDMA/EVDO - FCC Rule Part 90S	See page 1	
	Cell. CDMA/EVDO - FCC Rule Part 22H		
	PCS CDMA/EVDO - FCC Rule Part 24E		
	Bluetooth - FCC Rule Part 15		
	2.4 GHz WLAN - FCC Rule Part 15		
	5 GHz WLAN - FCC Rule Part 15		
11)	Simultaneous Tx Conditions (Voice and Data Configurations)	See Section 1.5	
12)	Power Reduction used for SAR Compliance?	Yes	
13)	Describe Power Reduction (LTE Modes)	See Section 12	
14)	SAR Test Plan	See Section 12	
15)	SAR test data	See Section 14	

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3

INTRODUCTION

The FCF has adopted the guidelines for evaluating the environmental effects of radio frequency (RF) radiation in ET Docket 93-62 on Aug. 6, 1996 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices. [1]

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz [3] and Health Canada RF Exposure Guidelines Safety Code 6 [24]. The measurement procedure described in IEEE/ANSI C95.3-2002 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave [4] is used for guidance in measuring the Specific Absorption Rate (SAR) due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the International Committee for Non-Ionizing Radiation Protection (ICNIRP) in Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," Report No. Vol 74. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

3.1 SAR Definition

Specific Absorption Rate is defined as the time derivative (rate) of the incremental energy (dU) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Equation 3-1).

Equation 3-1
SAR Mathematical Equation

$$SAR = \frac{d}{dt} \left(\frac{dU}{dm} \right) = \frac{d}{dt} \left(\frac{dU}{\rho dv} \right)$$

SAR is expressed in units of Watts per Kilogram (W/kg).

$$SAR = \frac{\sigma \cdot E^2}{\rho}$$

where:

- σ = conductivity of the tissue-simulating material (S/m)
- ρ = mass density of the tissue-simulating material (kg/m³)
- E = Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relation to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.[6]

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4 SAR MEASUREMENT SETUP

4.1 Automated SAR Measurement System

Measurements are performed using the DASY automated dosimetric SAR assessment system. The DASY is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland and consists of a high precision robotics system (Staubli), robot controller, desktop computer, near-field probe, probe alignment sensor, and the SAM phantom containing the head or body equivalent material. The robot is a six-axis industrial robot, performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF). See WWW.SPEAG.COM for more information about the specification of the SAR assessment system.



Figure 4-1
SAR Measurement System



Figure 4-2
Near-Field Probe

Table 4-1
Composition of the Tissue Equivalent Matter

Frequency (MHz)	835	835	1900	1900	2450	2450	5200-5800	5200-5800
Tissue	Head	Body	Head	Body	Head	Body	Head	Body
Ingredients (% by weight)								
Bactericide	0.1	0.1						
DGBE			44.92	29.44	7.99	26.7		
HEC	1	1						
NaCl	1.45	0.94	0.18	0.39	0.16	0.1		
Sucrose	57	44.9						
Triton X-100					19.97		17.24	
Diethylenglycol monohexylether							17.24	
Polysorbate (Tween) 80								20
Water	40.45	53.06	54.9	70.17	71.88	73.2	65.52	80

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DOSIMETRIC ASSESSMENT

5.1 Measurement Procedure

The evaluation was performed using the following procedure:

1. The SAR distribution at the exposed side of the head or body was measured at a distance no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the device-head interface and the horizontal grid resolution was 15mm and 15mm for frequencies < 3 GHz in the x and y directions respectively. When applicable, for frequencies above 3 GHz, a 10 mm by 10 mm resolution was used.
2. The point SAR measurement was taken at the maximum SAR region determined from Step 1 to enable the monitoring of SAR fluctuations/drifts during the 1 gram cube evaluation. SAR at this fixed point was measured and used as a reference value.
3. Based on the area scan data, the peak area of the maximum absorption was determined by spline interpolation. Around this point, a volume of 32mm x 32mm x 30mm (fine resolution volume scan, zoom scan) was assessed by measuring at least 5 x 5 x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure (see references or the DASY manual online for more details):
 - a. The data was extrapolated to the surface of the outer-shell of the phantom. The combined distance extrapolated was the combined distance from the center of the dipoles 2.7mm away from the tip of the probe housing plus the 1.2 mm distance between the surface and the lowest measuring point. The extrapolation was based on a least-squares algorithm. A polynomial of the fourth order was calculated through the points in the z-axis (normal to the phantom shell).
 - b. After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot" condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were obtained through interpolation, in order to calculate the averaged SAR.
 - c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan was complete to calculate the SAR drift. If the drift deviated by more than 5%, the SAR test and drift measurements were repeated.
5. For testing 5 GHz devices, finer resolution zoom scans were performed as specified by FCC SAR Measurement Requirements for 3 – 6 GHz, KDB 865664 publication. The 5 GHz zoom scan requires a minimum volume of 24mm x 24mm x 20mm and 7 x 7 x 11 points.

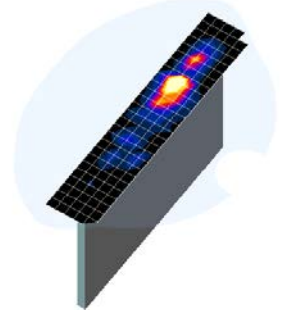


Figure 5-1
Sample SAR Area Scan

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6

DEFINITION OF REFERENCE POINTS

6.1 EAR REFERENCE POINT

Figure 8-1 shows the front, back and side views of the SAM Twin Phantom. The point “M” is the reference point for the center of the mouth, “LE” is the left ear reference point (ERP), and “RE” is the right ERP. The ERP is 15mm posterior to the entrance to the ear canal (EEC) along the B-M line (Back-Mouth), as shown in Figure 8-1. The plane passing through the two ear canals and M is defined as the Reference Plane. The line N-F (Neck-Front) is perpendicular to the reference plane and passing through the RE (or LE) is called the Reference Pivoting Line (see Figure 6-2). Line B-M is perpendicular to the N-F line. Both N-F and B-M lines are marked on the external phantom shell to facilitate handset positioning [5].

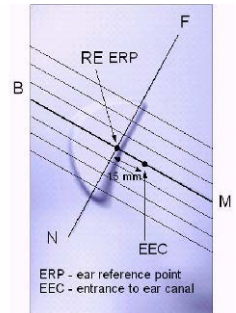


Figure 6-1
Close-Up Side view
of ERP

6.2 HANDSET REFERENCE POINTS

Two imaginary lines on the handset were established: the vertical centerline and the horizontal line. The test device was placed in a normal operating position with the “test device reference point” located along the “vertical centerline” on the front of the device aligned to the “ear reference point” (See Figure 6-3). The “test device reference point” was then located at the same level as the center of the ear reference point. The test device was positioned so that the “vertical centerline” was bisecting the front surface of the handset at it’s top and bottom edges, positioning the “ear reference point” on the outer surface of the both the left and right head phantoms on the ear reference point.



Figure 6-2
Front, back and side view of SAM Twin Phantom

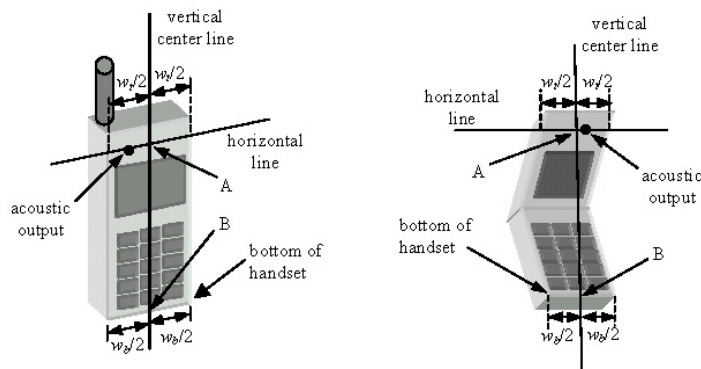


Figure 6-3
Handset Vertical Center & Horizontal Line Reference Points

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7 TEST CONFIGURATION POSITIONS FOR HANDSETS

7.1 Device Holder

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

7.2 Positioning for Cheek/Touch

1. The test device was positioned with the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 7-1), such that the plane defined by the vertical center line and the horizontal line of the phone is approximately parallel to the sagittal plane of the phantom.

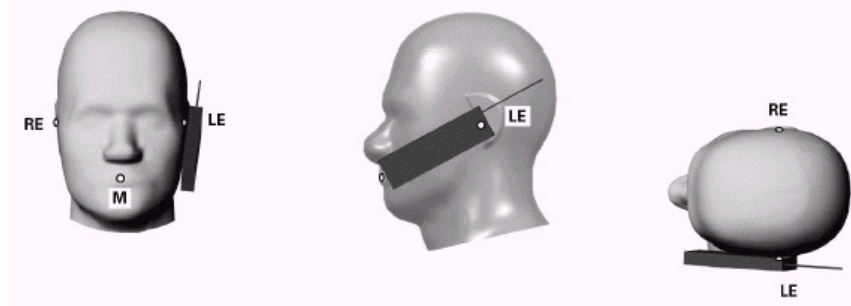


Figure 7-1 Front, Side and Top View of Cheek/Touch Position

2. The handset was translated towards the phantom along the line passing through RE & LE until the handset touches the ear.
3. While maintaining the handset in this plane, the handset was rotated around the LE-RE line until the vertical centerline was in the plane normal to MB-NF including the line MB (reference plane).
4. The phone was then rotated around the vertical centerline until the phone (horizontal line) was symmetrical with respect to the line NF.
5. While maintaining the vertical centerline in the reference plane, keeping point A on the line passing through RE and LE, and maintaining the phone contact with the ear, the handset was rotated about the line NF until any point on the handset made contact with a phantom point below the ear (cheek) (See Figure 7-2).

7.3 Positioning for Ear / 15° Tilt

With the test device aligned in the “Cheek/Touch Position”:

1. While maintaining the orientation of the phone, the phone was retracted parallel to the reference plane far enough to enable a rotation of the phone by 15 degree.
2. The phone was then rotated around the horizontal line by 15 degree.
3. While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the phone touches the head. (In this position, point A was located on the line RE-LE). The tilted position is obtained when the contact is on the pinna. If the contact was at any location other than the pinna, the angle of the phone would then be reduced. The tilted position was obtained when any part of the phone was in contact of the ear as well as a second part of the phone was in contact with the head (see Figure 7-2).

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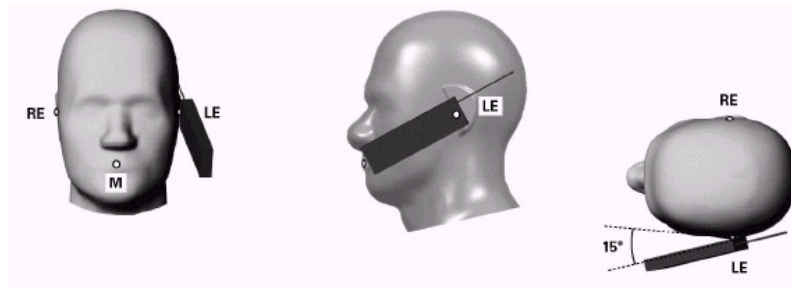


Figure 7-2 Front, Side and Top View of Ear/15° Tilt Position

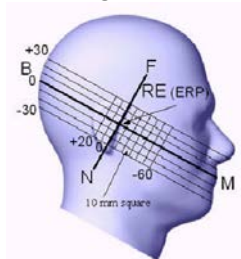


Figure 7-3
Side view w/ relevant markings



Figure 7-4 Body SAR Sample Photo
(Not Actual EUT)

7.4 SAR Evaluations near the Mouth/Jaw Regions of the SAM Phantom

Antennas located near the bottom of a phone may require SAR measurements around the mouth and jaw regions of the SAM head phantom. This typically applies to clam-shell style phones that are generally longer in the unfolded normal use positions or to certain older style long rectangular phones.

Under these circumstances, the following procedures apply, adopted from the FCC guidance on SAR handsets document publication 648474. The SAR required in these regions of SAM should be measured using a flat phantom. **Rectangular shaped phones** should be positioned with its bottom edge positioned from the flat phantom with the same distance provided by the cheek touching position using SAM. The ear reference point (ERP, as defined for SAM) of the phone should be positioned $\frac{1}{2}$ cm from the flat phantom shell. **Clam-shell phones** should be positioned with the hinge against a smooth edge of the flat phantom where the upper half of the phone is unfolded and extended beyond the phantom side wall. The lower half of the phone is secured in the test device holder at a fixed distance below the flat phantom determined by the minimum separation along the lower edge of the phone in the cheek touching position using SAM. Any case with substantial variation in separation distance along the lower edge of a clam shell is discussed with the FCC for best-to-use methodology.

The latest IEEE 1528 committee developments propose the usage of a tilted phantom when the antenna of the phone is mounted at the bottom or in all cases the peak absorption is in the chin region. Both SAM heads of the TwinSAM-Chin20 are rotated 20 degrees around the NF line. Each head can be removed individually from the table for emptying and cleaning.

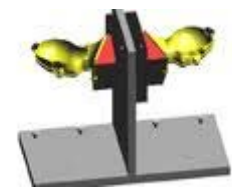


Figure 7-5 Twin SAM
Chin20

7.5 Body-Worn Accessory Configurations

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 7-4). A device with a headset output is tested with a headset connected to the device.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic

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components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented.

Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

7.6 Wireless Router Configurations

Some battery-operated handsets have the capability to transmit and receive internet connectivity through simultaneous transmission of WIFI in conjunction with a separate licensed transmitter. The FCC has provided guidance in KDB Publication 941225 D06 where SAR test considerations for handsets ($L \times W \geq 9 \text{ cm} \times 5 \text{ cm}$) are based on a composite test separation distance of 10 mm from the front, back and edges of the device with antennas 2.5 cm or closer to the edge of the device, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests. Since this device meets the minimum size requirements, procedures in KDB Publication 941225 D06 were used for SAR testing. See Figure 1-2 for device dimensions.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions. Therefore, SAR must be evaluated for each frequency transmission and mode separately and summed with the WIFI transmitter according to KDB 648474 publication procedures. The "Portable Hotspot" feature on the handset was NOT activated, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal.

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8

EXPOSURE LIMITS

8.1 Uncontrolled Environment

UNCONTROLLED ENVIRONMENTS are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

8.2 Controlled Environment

CONTROLLED ENVIRONMENTS are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Table 8-1
SAR Human Exposure Specified in ANSI/IEEE C95.1-1992 and Health Canada Safety Code 6

HUMAN EXPOSURE LIMITS		
	UNCONTROLLED ENVIRONMENT <i>General Population</i> (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT <i>Occupational</i> (W/kg) or (mW/g)
SPATIAL PEAK SAR Brain	1.6	8.0
SPATIAL AVERAGE SAR Whole Body	0.08	0.4
SPATIAL PEAK SAR Hands, Feet, Ankles, Wrists	4.0	20

1. The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
2. The Spatial Average value of the SAR averaged over the whole body.
3. The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

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Power measurements were performed using a base station simulator under digital average power.

9.1 Procedures Used to Establish RF Signal for SAR

The following procedures are according to FCC KDB Publication 941225 D01 "SAR Measurement Procedures for 3G Devices" v02, October 2007.

The device was placed into a simulated call using a base station simulator in a RF shielded chamber. Establishing connections in this manner ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. Devices under test were evaluated prior to testing, with a fully charged battery and were configured to operate at maximum output power. In order to verify that the device was tested throughout the SAR test at maximum output power, the SAR measurement system measures a "point SAR" at an arbitrary reference point at the start and end of the 1 gram SAR evaluation, to assess for any power drifts during the evaluation. If the power drift deviated by more than 5%, the SAR test and drift measurements were repeated.

9.2 SAR Measurement Conditions for CDMA2000

The following procedures were performed according to FCC KDB Publication 941225 D01 "SAR Measurement Procedures for 3G Devices" v02, October 2007.

9.2.1 Output Power Verification

See 3GPP2 C.S0011/TIA-98-E as recommended by "SAR Measurement Procedures for 3G Devices" v02, October 2007. Maximum output power is verified on the High, Middle and Low channels according to procedures in section 4.4.5.2 of 3GPP2 C.S0011/TIA-98-E. SO55 tests were measured with power control bits in the "All Up" condition.

1. If the mobile station (MS) supports Reverse TCH RC 1 and Forward TCH RC 1, set up a call using Fundamental Channel Test Mode 1 (RC=1/1) with 9600 bps data rate only.
2. Under RC1, C.S0011 Table 4.4.5.2-1, Table 9-1 parameters were applied.
3. If the MS supports the RC 3 Reverse FCH, RC3 Reverse SCH₀ and demodulation of RC 3,4, or 5, set up a call using Supplemental Channel Test Mode 3 (RC 3/3) with 9600 bps Fundamental Channel and 9600 bps SCH₀ data rate.
4. Under RC3, C.S0011 Table 4.4.5.2-2, Table 9-2 was applied.
5. FCHs were configured at full rate for maximum SAR with "All Up" power control bits.

Table 9-1
Parameters for Max. Power for RC1

Parameter	Units	Value
I_{or}	dBm/1.23 MHz	-104
$\frac{Pilot E_c}{I_{or}}$	dB	-7
$\frac{Traffic E_c}{I_{or}}$	dB	-7.4

Table 9-2
Parameters for Max. Power for RC3

Parameter	Units	Value
I_{or}	dBm/1.23 MHz	-86
$\frac{Pilot E_c}{I_{or}}$	dB	-7
$\frac{Traffic E_c}{I_{or}}$	dB	-7.4

9.2.2 CDMA2000 1x Advanced

This device additionally supports 1x Advanced. Conducted powers were measured according to October 2011 TCB Workshop notes using SO75 with RC8 on the uplink and RC11 on the downlink. Smart blanking was disabled for all measurements. The EUT was configured with forward power control Mode 000 and reverse power control at 400 bps. Conducted powers were

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measured on an Agilent 8960 Series 10 Wireless Communications Test Set, O E5515C using the CDMA2000 1x Advanced application, option E1962B-410.

Based on the maximum output power measured for 1x Advanced, SAR would have to be evaluated for 1x advanced if the maximum output for 1x Advanced is more than 0.25 dB higher than the maximum measured for 1x. If the measured SAR in any 1x mode exposure conditions (head, body etc.) is larger than 1.2 W/kg, the highest of those configurations above 1.2 W/kg for each exposure condition in 1x Advanced has to be repeated. All measured SAR in 1x mode higher than 1.5 W/kg must be repeated for 1x Advanced.

9.2.3 Head SAR Measurements

SAR for head exposure configurations is measured in RC3 with the DUT configured to transmit at full rate using Loopback Service Option SO55. SAR for RC1 is not required when the maximum average output of each channel is less than $\frac{1}{4}$ dB higher than that measured in RC3. Otherwise, SAR is measured on the maximum output channel in RC1 using the exposure configuration that results in the highest SAR for that channel in RC3.

SAR was additionally measured with EVDO Rev.0 to support simultaneous transmission scenarios operating with a CDMA voice call. SAR for Rev. 0 is measured on the maximum output channel at 153.6 kbps using the body exposure configuration that results in the highest SAR for that channel in RC3. SAR for Rev. A is not required when the maximum average output of each channel is less than that measured in Rev. 0. Otherwise, SAR is measured on the maximum output channel for Rev. A using a Reverse Data Channel payload size of 4096 bits and a Termination Target of 16 slots defined for Subtype 2 Physical Layer configurations. A Forward Traffic Channel data rate corresponding to the 2-slot version of 307.2 kbps with the ACK Channel transmitting in all slots would be configured in the downlink for both Rev. 0 and Rev. A.

9.2.4 Body-Worn and Hotspot SAR Measurements

CDMA 1x SAR for body exposure configurations is measured in RC3 with the DUT configured to transmit at full rate on FCH with all other code channels disabled using TDSO / SO32. SAR for multiple code channels (FCH + SCH_n) is not required when the maximum average output of each RF channel is less than $\frac{1}{4}$ dB higher than that measured with FCH only. Otherwise, SAR is measured on the maximum output channel (FCH + SCH_n) with FCH at full rate and SCH₀ enabled at 9600 bps using the exposure configuration that results in the highest SAR for that channel with FCH only. When multiple code channels are enabled, the DUT output may shift by more than 0.5 dB and lead to higher SAR drifts and SCH dropouts. Body SAR was measured using TDSO / SO32 with power control bits in the "All Up." Body SAR in RC1 is not required when the maximum average output of each channel is less than $\frac{1}{4}$ dB higher than that measured in RC3. Otherwise, SAR is measured on the maximum output channel in RC1; with Loopback Service Option SO55, at full rate, using the body exposure configuration that results in the highest SAR for that channel in RC3.

EVDO Rev. 0 SAR was also tested in the body-worn and hotspot configurations. SAR for Rev. A is not required when the maximum average output of each channel is less than that measured in Rev. 0. Otherwise, SAR is measured on the maximum output channel for Rev. A for the configuration that produced the highest SAR with Rev. 0.

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9.3 SAR Measurement Conditions for LTE

LTE modes were tested according to FCC KDB 941225 D05 publication. Please see notes following SAR data for required test configurations. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The R&S CMW500 was used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing.

9.3.1 MPR

MPR is implemented for this device by the manufacturer when the transmit power is not limited by the power reduction mechanism. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1. See Section 10.2 and Section 12.3.1 for MPR targets.

9.3.2 A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator.

9.3.3 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05:

- a. Per Page 4, 3) A), QPSK with 50% RB is required.
- b. Per Page 4, footnote 2, when the maximum output power across high, mid., and low channels is < 0.5 dB, mid channel is tested. Low and high channel SAR tests are not required for QPSK, 50% RB allocation when the SAR is < 0.8 W/kg.
- c. Per Page 4, 3) B), QPSK with 1 RB for both channel edges are required.
- d. Per Page 4, footnote 6, QPSK 1 RB allocation SAR tests were performed on the highest output power channel for the RB allocation when the average output power of the 1 RB allocation was > 0.5 dB higher than the 50% RB allocation for QPSK. Otherwise, SAR tests are performed on the channel that produced the highest SAR for QPSK with 50% RB. 1 RB low and high offset configurations are considered together for a single channel selection.
- e. Per Page 4, 3) B), I), when the SAR for QPSK 1 RB allocation tests is <1.45 W/kg, testing on the other channels is not required.
- f. Per Page 4, 4) A), 16QAM with 50% RB is required on the channel with the highest measured SAR for QPSK with 50% RB allocation.
- g. Per Page 4, 4) A), I), when the SAR for 16 QAM, 50 % allocation tests is <1.45 W/kg, testing on the other channels is not required.
- h. Per Page 4, 4) B) and Page 5 footnote 9, 16QAM with 1RB for both channel edges are required on the highest output power channel for the 1 RB allocation when the average output power of the 1 RB allocation is >0.5 dB higher than the 50% allocation for 16 QAM. Otherwise, SAR tests are performed on the channel that produced the highest SAR for 16 QAM with 50% RB. 1 RB low and high offset configurations are considered together for a single channel selection.
- i. Per Page 5, 4) B), I), when the SAR for 16 QAM 1 RB allocation tests is <1.45 W/kg, testing on the other channels is not required.
- j. Per Page 4, 4), A) I) and Page 5, 4), A)I, 100% RB Allocation is not required to be tested when the 50% RB SAR is not > 1.45 W/kg.

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9.4 SAR Testing with 802.11 Transmitters

Normal network operating configurations are not suitable for measuring the SAR of 802.11 a/b/g/n transmitters. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable. See KDB Publication 248227 for more details.

9.4.1 General Device Setup

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters. The test frequencies should correspond to actual channel frequencies defined for domestic use. SAR for devices with switched diversity should be measured with only one antenna transmitting at a time during each SAR measurement, according to a fixed modulation and data rate. The same data pattern should be used for all measurements.

9.4.2 Frequency Channel Configurations [27]

For 2.4 GHz, the highest average RF output power channel between the low, mid and high channel at the lowest data rate was selected for SAR evaluation in 802.11b mode. 802.11g/n modes and higher data rates for 802.11b were additionally evaluated for SAR if the output power of the respective mode was 0.25 dB or higher than the powers of the SAR configurations tested in the 802.11b mode.

For 5 GHz, the highest average RF output power channel across the default test channels at the lowest data rate was selected for SAR evaluation in 802.11a. When the adjacent channels are higher in power than the default channels, these “required channels” were considered instead of the default channels for SAR testing. 802.11n modes and higher data rates for 802.11a/n were evaluated only if the respective mode was 0.25 dB or higher than the 802.11a mode.

If the maximum extrapolated peak SAR of the zoom scan for the highest output channel was less than 1.6 W/kg or if the 1g averaged SAR was less than 0.8 W/kg, SAR testing was not required for the other test channels in the band.

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10 STANDALONE RF CONDUCTED POWERS

10.1 Standalone CDMA Conducted Powers

Band	FCC Rule Part	Channel	Frequency	SO55 [dBm]	SO55 [dBm]	SO75 [dBm]	TDSO SO32 [dBm]	TDSO SO32 [dBm]	1x EvDO Rev. 0 [dBm]	1x EvDO Rev. A [dBm]
		F-RC	MHz	RC1	RC3	RC8	FCH+SCH	FCH	(RTAP)	(RETAP)
Cellular	90S	564	820.1	24.90	24.85	24.85	24.86	24.84	25.27	25.18
	22H	1013	824.7	24.74	24.71	24.69	24.70	24.68	24.98	25.04
		384	836.52	24.97	24.90	25.05	24.94	24.93	25.12	25.23
		777	848.31	24.78	24.72	24.76	24.73	24.72	24.78	24.81
PCS	24E	25	1851.25	25.11	24.98	24.94	24.95	24.95	24.72	24.82
		600	1880	24.93	24.82	24.70	24.82	24.82	24.84	24.91
		1175	1908.75	24.91	24.79	24.62	24.79	24.80	24.73	24.78

Note: RC1 is only applicable for IS-95 compatibility. For FCC Rule Part 90S, Per FCC KDB Publication 447498 6)c), only one channel is required since the device operates within the transmission range of 817.90 – 823.10 MHz.

Per KDB Publication 941225 D01:

1. CDMA 1x Head SAR was tested with SO55 RC3. SO55 RC1 was not required since the average output power was not more than 0.25 dB than the SO55 RC3 powers.
2. CDMA 1x Body-Worn and Hotspot SAR was tested with 1x RTT with TDSO / SO32 FCH Only. TDSO / SO32 FCH+SCH SAR tests were not required since the average output power was not more than 0.25 dB higher than the TDSO / SO32 FCH only powers.
3. According to FCC KDB 941225 D01 publication, EVDO SAR (Head, Body-Worn and Hotspot) is measured using Subtype 0/1 Physical Layer configurations for Rev. 0. When the maximum output power of Rev. A for each channel is greater than the Rev.0 power, Rev. A must additionally be tested using the highest output channel for the configuration that resulted in the highest SAR for Rev.0.

1x Advanced Considerations:

1. CDMA 1X Advanced technology was not required for SAR since the maximum output powers for 1x Advanced was not more than 0.25 dB higher than the maximum measured powers for 1x and the measured SAR in any 1x mode exposure conditions was not greater than 1.2 W/kg. See Section 9.2.2 for 1x Advanced test set up.

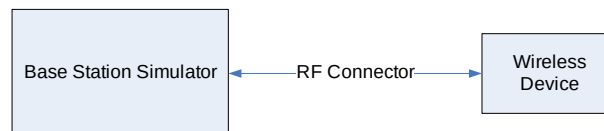


Figure 10-1
Power Measurement Setup

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10.2 Standalone LTE Conducted Powers

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	1852.5	26065	5	QPSK	1	0	23.05	0	0
	1852.5	26065	5	QPSK	1	24	23.02	0	0
	1852.5	26065	5	QPSK	12	6	22.09	1	0-1
	1852.5	26065	5	QPSK	25	0	22.25	1	0-1
	1852.5	26065	5	16-QAM	1	0	22.17	1	0-1
	1852.5	26065	5	16-QAM	1	24	22.10	1	0-1
	1852.5	26065	5	16-QAM	12	6	21.02	2	0-2
Mid	1852.5	26065	5	16-QAM	25	0	21.32	2	0-2
	1882.5	26365	5	QPSK	1	0	22.95	0	0
	1882.5	26365	5	QPSK	1	24	22.88	0	0
	1882.5	26365	5	QPSK	12	6	22.01	1	0-1
	1882.5	26365	5	QPSK	25	0	22.11	1	0-1
	1882.5	26365	5	16-QAM	1	0	22.00	1	0-1
	1882.5	26365	5	16-QAM	1	24	22.00	1	0-1
High	1882.5	26365	5	16-QAM	12	6	20.90	2	0-2
	1882.5	26365	5	16-QAM	25	0	21.25	2	0-2
	1912.5	26665	5	QPSK	1	0	22.98	0	0
	1912.5	26665	5	QPSK	1	24	22.88	0	0
	1912.5	26665	5	QPSK	12	6	22.05	1	0-1
	1912.5	26665	5	QPSK	25	0	22.18	1	0-1
	1912.5	26665	5	16-QAM	1	0	22.08	1	0-1
	1912.5	26665	5	16-QAM	1	24	22.15	1	0-1
	1912.5	26665	5	16-QAM	12	6	21.00	2	0-2
	1912.5	26665	5	16-QAM	25	0	21.37	2	0-2

General test procedures for LTE can be found in Section 9.3.3. According to FCC KDB Publication 941225 D05:

- 1) The output power across low, mid, and high channel was less than 0.5 dB for QPSK 50% RB, therefore **mid channel was tested for QPSK 50% RB**. Low and high channel SAR tests were not required since the SAR values for all configurations were less than 0.8 W/kg.
- 2) The average output power of QPSK 1 RB configurations was more than 0.5 dB higher than QPSK with 50% RB, therefore **low channel (highest output power) was tested for QPSK 1 RB configurations**. Mid and High channel SAR tests were not required since the SAR was <1.45 W/kg for all configurations.
- 3) The average output power of 16 QAM 50% RB is not more than 0.5 dB higher than QPSK, therefore the **mid channel (highest SAR measured with QPSK 50% RB) was tested for 16 QAM 50 % RB**. Low and High channel SAR tests were not required since the SAR was <1.45 W/kg for all configurations.
- 4) The average output power of 16 QAM 1 RB configurations was more than 0.5 dB higher than 16 QAM with 50% RB, therefore **low channel (highest output power) was tested for 16 QAM 1 RB configurations**. Mid and High channel SAR tests were not required since the SAR was <1.45 W/kg for all configurations.
- 5) 100% RB Allocation SAR was not required to be tested since the 50% RB SAR was not > 1.45 W/kg.



Figure 10-2
Power Measurement Setup

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10.3 Measured WLAN Conducted Powers

Table 10-1
IEEE 802.11b Average RF Power

Mode	Freq [MHz]	Channel	802.11b Conducted Power [dBm]			
			Data Rate [Mbps]			
			1	2	5.5	11
802.11b	2412	1	13.72	13.70	13.69	13.68
802.11b	2437	6	14.01	14.04	14.08	14.04
802.11b	2462	11	14.45	14.47	14.37	14.43

Table 10-2
IEEE 802.11g Average RF Power

Mode	Freq [MHz]	Channel	802.11g Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11g	2412	1	12.26	12.24	12.22	12.21	12.21	12.23	12.19	12.28
802.11g	2437	6	12.60	12.63	12.68	12.63	12.58	12.67	12.62	12.67
802.11g	2462	11	13.02	13.05	12.95	12.91	12.95	12.99	12.97	12.97

Table 10-3
IEEE 802.11n Average RF Power

Mode	Freq [MHz]	Channel	802.11n (2.4GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5/7.2	13/14.4	19.5/21.7	26/28.9	39/43.3	52/57.8	58.5/65	65/72.2
802.11n	2412	1	12.11	12.16	12.08	12.11	12.03	12.14	12.11	12.08
802.11n	2437	6	12.53	12.54	12.50	12.55	12.56	12.57	12.56	12.45
802.11n	2462	11	12.79	12.82	12.82	12.77	12.80	12.85	12.82	12.87

Table 10-4
IEEE 802.11a Average RF Power

Mode	Freq [MHz]	Channel	802.11a Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11a	5180	36*	11.44	11.41	11.40	11.43	11.35	11.37	11.32	11.41
802.11a	5200	40	11.49	11.31	11.40	11.42	11.44	11.45	11.49	11.42
802.11a	5220	44	11.63	11.59	11.67	11.61	11.65	11.58	11.67	11.62
802.11a	5240	48*	11.70	11.69	11.65	11.68	11.72	11.64	11.67	11.69
802.11a	5260	52*	11.51	11.54	11.49	11.58	11.53	11.58	11.61	11.52
802.11a	5280	56	11.64	11.62	11.65	11.69	11.71	11.61	11.60	11.65
802.11a	5300	60	11.71	11.69	11.75	11.76	11.72	11.67	11.73	11.73
802.11a	5320	64*	11.82	11.89	11.86	11.81	11.94	11.90	11.87	11.92
802.11a	5500	100	12.40	12.47	12.41	12.44	12.45	12.37	12.48	12.46
802.11a	5520	104*	12.39	12.41	12.42	12.36	12.39	12.34	12.49	12.39
802.11a	5540	108	12.21	12.30	12.32	12.35	12.36	12.38	12.41	12.38
802.11a	5560	112	12.22	12.28	12.36	12.35	12.27	12.33	12.27	12.39
802.11a	5580	116*	12.27	12.25	12.24	12.25	12.20	12.33	12.37	12.34
802.11a	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5660	132	11.86	11.93	11.97	11.94	11.92	11.95	11.99	11.98
802.11a	5680	136*	11.84	11.89	11.89	11.88	11.92	11.89	11.95	11.93
802.11a	5700	140	11.79	11.75	11.76	11.78	11.75	11.83	11.80	11.79
802.11a	5745	149*	12.24	12.18	12.12	12.22	12.23	12.25	12.20	12.19
802.11a	5765	153	12.03	11.99	12.01	12.04	12.01	12.06	12.05	12.07
802.11a	5785	157*	11.85	11.87	11.91	11.86	11.93	11.88	11.91	11.87
802.11a	5805	161*	11.75	11.76	11.74	11.75	11.78	11.81	11.84	11.82
802.11a	5825	165	11.79	11.80	11.80	11.87	11.87	11.89	11.93	11.91

Per FCC KDB Publication 443999, transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Band. (*) – indicates default channels per KDB Publication 248227. When the adjacent channels are higher in power then the default channels, these “required channels” are considered instead of the default channels for SAR testing.

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Table 10-5
IEEE 802.11n (20 MHz) Average RF Power

Mode	Freq [MHz]	Channel	802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	20	26	39	52	58	65
802.11n	5180	36*	11.21	11.11	11.13	11.18	11.23	11.19	11.17	11.22
802.11n	5200	40	11.26	11.31	11.27	11.25	11.32	11.30	11.29	11.26
802.11n	5220	44	11.37	11.41	11.33	11.32	11.43	11.38	11.41	11.42
802.11n	5240	48*	11.49	11.45	11.44	11.47	11.43	11.48	11.51	11.47
802.11n	5260	52*	11.56	11.47	11.58	11.59	11.60	11.63	11.64	11.62
802.11n	5280	56	11.67	11.70	11.56	11.68	11.71	11.67	11.64	11.75
802.11n	5300	60	11.76	11.70	11.69	11.68	11.72	11.74	11.73	11.75
802.11n	5320	64*	11.75	11.78	11.84	11.81	11.80	11.88	11.89	11.84
802.11n	5500	100	12.42	12.37	12.41	12.41	12.42	12.44	12.49	12.44
802.11n	5520	104*	12.33	12.43	12.44	12.35	12.32	12.30	12.50	12.42
802.11n	5540	108	12.16	12.26	12.32	12.37	12.33	12.32	12.34	12.34
802.11n	5560	112	12.22	12.27	12.37	12.35	12.20	12.34	12.27	12.38
802.11n	5580	116*	12.24	12.22	12.26	12.28	12.16	12.26	12.40	12.36
802.11n	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5660	132	11.89	11.92	11.94	11.90	11.94	11.96	11.94	11.96
802.11n	5680	136*	11.82	11.89	11.89	11.85	11.95	11.88	11.88	11.91
802.11n	5700	140	11.80	11.75	11.79	11.71	11.74	11.85	11.80	11.72
802.11n	5745	149*	12.28	12.30	12.31	12.34	12.36	12.38	12.37	12.38
802.11n	5765	153	12.24	12.22	12.23	12.24	12.26	12.24	12.29	12.31
802.11n	5785	157*	12.00	12.05	12.08	12.07	12.11	12.13	12.12	12.09
802.11n	5805	161*	11.88	11.90	11.91	11.96	12.01	12.03	12.00	11.99
802.11n	5825	165	11.86	11.87	11.86	11.91	11.89	11.92	11.92	11.93

Per FCC KDB Publication 443999, transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Bands.

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Table 10-6
IEEE 802.11n (40 MHz) Average RF Power

Mode	Freq [MHz]	Channel	802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			13.5/15	27/30	40.5/45	54/60	81/90	108/120	121.5/135	135/150
802.11n	5190	38*	10.89	10.94	10.82	10.93	10.97	10.93	10.89	10.98
802.11n	5230	46	11.01	11.08	11.09	11.12	11.14	11.03	11.19	11.16
802.11n	5270	54	11.23	11.31	11.32	11.28	11.35	11.34	11.39	11.41
802.11n	5310	62*	11.46	11.49	11.42	11.57	11.58	11.51	11.49	11.49
802.11n	5510	102*	12.12	12.19	12.18	12.24	12.23	12.28	12.25	12.29
802.11n	5550	110	12.09	12.16	12.19	12.17	12.23	12.21	12.13	12.25
802.11n	5590	118	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5630	126	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5670	134	11.87	11.83	11.79	11.86	11.92	11.89	11.87	11.81
802.11n	5755	151*	11.38	11.43	11.52	11.43	11.36	11.45	11.53	11.39
802.11n	5795	159	11.13	11.12	11.21	11.18	11.13	11.25	11.28	11.25

Per FCC KDB Publication 443999 and RSS-210 A9.2(3), transmission on channels which overlap the 5600-5650 MHz is prohibited as a client. This device does not transmit any beacons or initiate any transmissions in 5.3 and 5.5 GHz Bands. (*) – indicates default channels per KDB Publication 248227. When the adjacent channels are higher in power then the default channels, these “required channels” are considered instead of the default channels for SAR testing.

Justification for reduced test configurations for WIFI channels per KDB Publication 248227 and April 2010 FCC/TCB Meeting Workshop:

- For 2.4 GHz WIFI, highest average RF output power channel for the lowest data rate for IEEE 802.11b were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11g/n) and data rates were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11b mode.
- For 5 GHz WIFI, highest average RF output power channel for the lowest data rate for IEEE 802.11a were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11n for 20 MHz and 40 MHz bandwidths) and data rates were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11a mode.
- Because the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is <1.6 W/kg and the 1g averaged SAR is <0.8 W/kg for all bands and configurations, SAR testing on other channels was not required.
- SAR was evaluated on the channels and data rates indicated in bold.

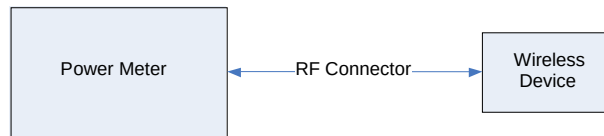


Figure 10-3
Power Measurement Setup

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11 EVDO POWER REDUCTION

11.1 Introduction to EVDO Power Reduction

This device is capable of Simultaneous Voice and EVDO Data (SVDO) calls, with the voice call supported by a CDMA 1xRTT transmitter and the data connection supported by a separate EVDO transmitter. An EVDO power reduction scheme is applied during an EVDO connection operating simultaneously with the 1xRTT voice calls. The maximum transmit power of EVDO is limited depending on the CDMA 1x voice transmit power level. When CDMA 1x Voice is operating at a certain range of high power levels, maximum EVDO transmit power is limited. When CDMA 1x Voice transmit power is below a certain threshold transmit power level, EVDO can transmit at the maximum power. Target levels of power reduction and CDMA voice threshold levels are provided in Table 11-1.

Table 11-1
SVDO Power Reduction Scheme

Mode	Voice Avg Power(P) 1x 850/1900 MHz (dBm)	Max. EVDO Data Avg Power (dBm)
SVDO	$P \geq 15$	19
	$P < 15$	25

11.2 Output Power Verification

Output powers were measured in SVDO mode to determine that the power reduction mechanism was operating reliably and consistently. The power reduction was investigated by simultaneously connecting the device to two CDMA base station simulators. EVDO output powers were measured through conducted RF connections by first connecting the device in an EVDO data call and subsequently a CDMA 1xRTT call. CDMA powers were controlled by configuring the CDMA base station simulator to active bits. The EVDO output power was monitored while changing the CDMA cell output power level.

The power reduction targets and threshold level described in Table 11-1 were confirmed. Please see the results in Table 11-2

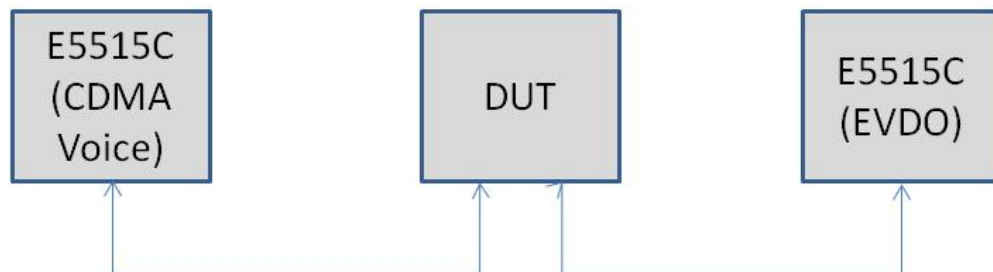


Figure 11-1
SVDO Conducted Test Setup Diagram

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Table 11-2
EVDO Power Reduction Verification

Note: EVDO Base station simulator was configured using "All Up Bits"

1x-RTT CDMA Voice Band	BC10 1x-RTT CDMA Voice Channel	BC10 1x-RTT CDMA Voice Tx (dBm)	EVDO Data Conducted Power (dBm)														
			BC10			BC0						BC1					
			Rev. 0		Rev. A	Rev. 0			Rev. A			Rev. 0			Rev. A		
			Mid	Mid	Mid	Low	Mid	High	Low	Mid	High	Low	Mid	High	Low	Mid	High
835 MHz	564	25	18.88	18.83	18.92	18.99	18.86	18.92	19.03	18.88	19.02	19.11	19.02	19.01	19.11	19.04	
	564	24	18.92	18.92	18.89	19.01	18.88	18.89	18.98	18.91	18.98	19.07	18.98	19.09	19.10	19.01	
	564	23	18.91	18.87	18.95	18.98	18.89	18.92	18.99	18.91	19.05	19.08	18.96	19.01	19.19	18.99	
	564	22	18.94	18.82	18.92	19.03	18.85	18.92	19.01	18.85	18.98	19.04	19.02	18.98	19.11	19.01	
	564	21	18.87	18.78	18.89	19.05	18.92	18.89	19.02	18.92	19.08	19.10	18.84	19.05	19.07	18.97	
	564	20	18.92	18.85	18.88	18.95	18.84	18.85	19.01	18.87	19.01	19.05	19.01	19.04	19.05	19.03	
	564	19	18.78	18.91	18.87	19.02	18.85	18.87	19.03	18.94	19.09	19.13	18.95	19.01	19.17	19.01	
	564	18	18.85	18.92	18.89	18.98	18.86	18.92	18.98	18.92	18.98	19.05	19.02	18.98	19.15	18.98	
	564	17	18.89	18.91	18.95	19.02	18.84	18.88	19.02	18.94	19.04	19.09	18.98	18.97	19.04	19.10	
	564	16	18.92	18.85	18.89	19.03	18.88	18.92	19.01	19.96	18.98	19.06	19.01	19.02	19.11	19.01	
	564	15	18.88	18.83	18.85	18.98	18.87	18.89	19.03	18.92	19.05	19.07	18.97	19.04	19.08	18.95	
	564	14	24.98	25.01	24.98	25.01	24.96	24.79	25.14	24.95	25.01	25.13	24.98	24.98	25.11	25.19	
	564	13	24.89	25.04	24.97	25.03	24.89	24.92	25.09	24.87	24.95	25.11	25.01	25.07	24.98	25.04	
	564	12	25.01	25.01	25.05	24.97	24.91	24.85	25.18	25.15	25.02	25.12	25.12	25.11	24.99	24.99	
	564	11	24.96	24.99	25.02	25.01	24.96	24.92	25.20	25.04	25.02	25.07	25.03	25.04	25.08	25.19	

1x-RTT CDMA Voice Band	BC0 1x-RTT CDMA Voice Channel	BC0 1x-RTT CDMA Voice Tx (dBm)	EVDO Data Conducted Power (dBm)														
			BC10			BC0						BC1					
			Rev. 0		Rev. A	Rev. 0			Rev. A			Rev. 0			Rev. A		
			Mid	Mid	Mid	Low	Mid	High	Low	Mid	High	Low	Mid	High	Low	Mid	High
835 MHz	1013	25	18.91	18.84	18.87	18.99	18.86	18.92	19.03	18.92	19.02	19.11	19.03	19.06	19.12	19.05	
	1013	24	18.86	18.92	18.92	18.95	18.88	18.89	19.05	19.01	18.98	19.08	19.05	19.01	19.09	18.96	
	1013	23	18.91	18.90	18.95	19.01	18.91	18.92	18.99	18.94	19.05	19.12	18.96	19.02	19.20	18.99	
	1013	22	18.94	18.82	18.87	19.03	18.85	18.88	18.95	18.87	19.06	19.04	18.97	18.98	19.11	19.01	
	1013	21	18.87	18.85	18.89	19.05	18.92	18.89	19.02	18.92	19.08	19.10	18.84	19.01	19.07	18.97	
	1013	20	18.92	18.85	18.88	18.95	18.86	18.85	18.95	18.87	19.01	19.05	19.01	19.04	19.05	19.03	
	1013	19	18.88	18.78	18.87	18.98	18.85	18.87	19.03	18.94	19.09	19.07	18.95	19.02	19.17	19.01	
	1013	18	18.92	18.92	18.87	18.98	18.86	18.92	18.98	19.91	18.97	19.05	19.02	18.98	19.15	19.12	
	1013	17	18.89	18.91	18.95	19.02	18.86	18.89	19.02	18.93	19.04	19.09	18.97	18.97	19.11	19.10	
	1013	16	18.86	18.92	18.88	19.03	18.87	18.95	18.98	18.97	19.05	19.07	19.01	19.09	19.11	19.01	
	1013	15	18.90	19.01	18.92	18.98	18.89	18.92	19.02	19.94	19.04	19.05	18.97	19.02	19.08	18.95	
	1013	14	24.91	25.02	24.98	25.03	25.02	24.91	25.19	25.11	24.82	25.09	25.01	25.02	25.09	25.02	
	1013	13	24.86	25.05	25.03	25.05	24.95	24.85	25.21	24.96	24.96	24.99	24.98	25.03	25.08	24.99	
	1013	12	24.99	25.01	24.97	24.98	24.89	24.78	25.18	25.08	25.03	25.13	25.11	24.99	24.99	25.07	
	1013	11	24.97	24.99	25.01	25.04	25.01	24.92	25.16	25.09	25.07	25.08	25.13	25.05	25.15	25.18	

1x-RTT CDMA Voice Band	BC0 1x-RTT CDMA Voice Channel	BC0 1x-RTT CDMA Voice Tx (dBm)	EVDO Data Conducted Power (dBm)														
			BC10			BC0						BC1					
			Rev. 0		Rev. A	Rev. 0			Rev. A			Rev. 0			Rev. A		
			Mid	Mid	Mid	Low	Mid	High	Low	Mid	High	Low	Mid	High	Low	Mid	High
835 MHz	384	25	18.91	18.87	18.91	19.03	18.87	18.89	19.02	18.91	18.98	19.15	18.99	19.06	19.09	19.03	
	384	24	18.90	18.92	18.92	18.98	18.97	18.88	18.98	18.89	19.05	19.08	19.03	19.08	19.14	19.07	
	384	23	18.91	18.90	18.91	19.01	18.89	18.92	18.99	18.87	18.97	19.12	18.96	19.02	19.09	18.99	
	384	22	18.94	18.87	18.92	19.03	18.85	18.92	18.95	18.94	19.06	19.04	18.91	18.98	19.13	19.01	
	384	21	18.87	18.78	18.89	19.01	18.92	18.89	19.02	18.92	19.08	19.10	18.87	19.02	19.07	18.97	
	384	20	18.92	18.85	18.88	18.95	18.84	18.91	19.01	18.87	19.01	19.07	19.01	19.04	19.05	19.03	
	384	19	18.88	18.83	18.89	19.02	18.92	18.87	19.03	18.97	19.09	19.13	18.95	19.02	19.17	19.05	
	384	18	18.92	18.92	18.87	18.98	18.86	18.92	18.98	18.92	19.02	19.05	19.02	18.98	19.15	19.12	
	384	17	18.89	18.87	18.91	19.02	18.84	18.92	19.01	18.91	19.04	19.05	18.97	18.97	19.11	19.10	
	384	16	18.90	18.92	18.87	18.95	18.87	18.92	19.01	18.88	19.02	19.09	18.98	19.09	19.11	19.01	
	384	15	18.89	18.88	18.96	19.02	18.94	18.89	19.03	18.92	18.98	19.11	19.03	19.02	19.08	18.98	
	384	14	24.91	25.02	25.01	25.03	25.02	24.79	25.12	24.97	24.81	25.11	25.05	24.99	25.11	25.02	
	384	13	24.89	25.04	24.99	24.99	24.97	24.78	25.11	25.08	25.01	24.99	25.09	25.02	24.99	25.19	
	384	12	24.93	25.01	25.02	25.02	24.95	24.92	25.17	25.08	24.87	25.09	24.99	25.07	24.98	24.99	
	384	11	24.91	24.98	24.98	25.01	24.89	24.89	25.19	24.99	25.02	25.11	25.07	25.11	25.07	25.17	

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1x-RTT CDMA Voice Band	BC0 1x-RTT CDMA Voice Channel	BC0 1x-RTT CDMA Voice Tx (dBm)	EVDO Data Conducted Power (dBm)														
			BC10			BC0						BC1					
			Rev. 0		Rev. A	Rev. 0			Rev. A			Rev. 0			Rev. A		
			Mid	Mid		Low	Mid	High	Low	Mid	High	Low	Mid	High	Low	Mid	High
835 MHz	777	25	18.90	18.87		18.92	19.03	18.89	18.87	19.03	18.84	19.02	19.07	19.04	19.08	19.13	19.02
	777	24	18.82	18.92		18.89	18.98	18.87	18.95	19.05	18.92	19.10	19.05	19.01	19.01	19.05	19.05
	777	23	18.91	18.90		18.95	19.01	18.89	18.92	18.99	18.87	19.05	19.08	18.96	19.02	19.09	18.99
	777	22	18.83	18.92		18.92	19.03	18.85	18.92	19.05	18.94	19.06	19.04	18.97	18.98	19.06	19.01
	777	21	18.87	18.81		18.89	19.05	18.92	18.89	19.02	18.92	19.08	19.10	18.84	19.05	19.07	18.97
	777	20	18.92	18.85		18.88	18.95	18.84	18.85	19.01	18.85	19.01	19.05	19.01	19.04	19.05	19.03
	777	19	18.88	18.83		18.87	19.02	18.85	18.87	19.03	18.94	19.09	19.13	18.95	19.02	19.17	19.03
	777	18	18.92	18.92		18.87	19.03	18.86	18.89	19.02	18.92	19.02	19.05	19.02	18.98	19.15	19.12
	777	17	18.83	18.92		18.92	19.02	18.84	18.89	19.02	18.91	19.04	19.09	18.98	18.97	19.11	19.10
	777	16	18.92	18.89		18.92	18.95	18.92	18.92	19.02	18.88	19.01	19.12	18.96	19.01	19.04	19.01
	777	15	18.91	18.92		18.89	19.02	18.91	18.89	18.99	18.89	19.04	19.11	18.99	19.09	19.10	18.99
	777	14	24.97	25.03		24.97	25.04	25.03	24.78	25.15	25.08	24.95	25.09	24.01	25.01	25.07	25.09
	777	13	24.95	24.98		25.01	25.05	24.97	24.91	25.14	25.02	24.97	24.98	25.01	25.02	25.11	25.20
	777	12	24.91	25.02		24.96	24.98	24.87	24.89	25.20	24.98	25.03	25.01	24.99	25.11	25.08	25.14
	777	11	24.87	24.99		24.97	25.04	24.92	24.95	24.16	25.08	25.04	25.04	25.12	25.07	24.99	25.19

1x-RTT CDMA Voice Band	BC1 1x-RTT CDMA Voice Channel	BC1 1x-RTT CDMA Voice Tx (dBm)	EVDO Data Conducted Power (dBm)														
			BC10			BC0						BC1					
			Rev. 0		Rev. A	Rev. 0			Rev. A			Rev. 0			Rev. A		
			Mid	Mid		Low	Mid	High	Low	Mid	High	Low	Mid	High	Low	Mid	High
1900 MHz	25	25	18.88	18.92		18.89	19.01	18.85	18.97	19.02	18.92	19.05	19.11	19.01	19.06	19.09	19.08
	25	24	18.89	18.91		18.92	19.05	18.86	18.88	19.03	18.89	19.02	19.12	18.97	19.04	19.11	19.05
	25	23	18.91	18.90		18.95	19.01	18.89	18.92	19.01	18.87	19.05	19.10	18.96	19.03	19.20	19.01
	25	22	18.94	18.82		18.92	19.03	18.85	19.94	18.95	18.94	19.06	19.08	18.97	18.98	19.11	19.02
	25	21	18.87	18.78		18.89	19.05	18.92	18.89	19.02	18.92	19.07	19.11	18.85	19.05	19.07	18.98
	25	20	18.92	18.85		18.88	18.95	18.84	18.85	19.01	18.87	19.01	19.04	19.01	19.03	19.05	19.03
	25	19	18.88	18.83		18.87	19.02	18.85	18.87	19.03	18.94	19.09	19.13	18.95	19.02	19.17	19.05
	25	18	18.92	18.92		18.87	18.98	18.86	18.92	18.98	18.84	19.02	19.05	19.02	18.98	19.17	19.11
	25	17	18.94	18.91		18.95	19.02	18.84	18.89	18.95	18.85	19.04	19.08	18.99	18.97	19.11	18.99
	25	16	18.87	18.86		18.88	18.99	18.92	18.89	19.02	18.94	19.04	19.06	18.96	19.08	19.11	18.95
	25	15	18.92	18.82		18.92	18.95	18.89	18.88	18.98	18.97	19.08	19.05	18.95	19.01	19.07	19.98
	25	14	24.98	25.01		25.01	24.92	24.99	24.88	25.16	25.08	24.81	25.12	25.01	25.06	25.12	25.01
	25	13	24.89	25.02		25.03	25.05	25.03	24.78	25.13	24.96	25.06	25.15	24.98	25.01	25.09	25.09
	25	12	24.95	24.98		24.99	25.01	24.98	24.91	25.18	25.05	24.98	25.12	25.04	25.11	25.01	25.21
	25	11	24.89	25.01		24.99	25.02	24.93	24.92	25.18	25.11	25.04	24.99	25.11	24.99	25.19	25.18

1x-RTT CDMA Voice Band	BC1 1x-RTT CDMA Voice Channel	BC1 1x-RTT CDMA Voice Tx (dBm)	EVDO Data Conducted Power (dBm)														
			BC10			BC0						BC1					
			Rev. 0		Rev. A	Rev. 0			Rev. A			Rev. 0			Rev. A		
			Mid	Mid		low	mid	high	low	mid	high	low	mid	high	low	mid	high
1900 MHz	600	25	18.87	18.80		18.91	18.98	18.86	18.91	19.04	18.92	19.01	19.13	19.04	19.05	19.12	19.06
	600	24	18.88	18.86		18.92	19.02	18.88	18.88	19.02	18.89	19.03	19.11	19.01	19.07	19.11	19.02
	600	23	18.91	18.90		18.95	19.01	18.89	18.92	18.99	18.87	19.05	19.08	18.96	19.02	19.20	18.99
	600	22	18.94	18.82		18.92	19.03	18.85	18.92	18.95	18.94	19.06	19.04	18.97	18.98	19.11	19.01
	600	21	18.87	18.78		18.89	19.05	18.92	18.89	19.02	18.92	19.08	19.10	18.84	19.05	19.07	18.97
	600	20	18.92	18.85		18.88	18.95	18.84	18.85	19.01	18.87	19.01	19.05	19.01	19.04	19.05	19.03
	600	19	18.88	18.83		18.87	19.02	18.85	18.87	19.03	18.94	19.09	19.13	18.95	19.02	19.17	19.05
	600	18	18.92	18.92		18.87	18.98	18.86	18.92	18.98	18.92	19.02	19.05	19.02	18.98	19.15	19.12
	600	17	18.89	18.91		18.95	19.02	18.84	18.89	19.02	18.91	19.04	19.09	18.98	18.97	19.11	19.10
	600	16	18.99	18.86		18.87	18.99	18.88	18.98	19.05	18.94	19.06	19.06	18.96	19.02	19.13	18.95
	600	15	18.91	18.89		18.96	18.97	18.87	18.95	19.01	18.97	19.02	19.07	18.96	19.10	19.05	19.02
	600	14	24.99	25.03		24.97	24.98	24.98	24.85	25.17	25.10	24.79	25.12	25.02	25.05	25.12	24.99
	600	13	24.97	25.03		25.01	25.05	25.05	24.79	25.14	24.95	25.10	25.15	24.95	24.98	25.10	25.08
	600	12	24.89	24.99		24.96	25.01	24.87	24.89	25.20	24.98	24.99	25.12	25.05	25.12	24.98	25.22
	600	11	24.88	24.97		24.97	25.04	24.92	24.93	25.18	25.13	25.05	24.98	25.12	25.07	25.12	25.21

1x-RTT CDMA Voice Band	BC1 1x-RTT CDMA Voice Channel	BC1 1x-RTT CDMA Voice Tx (dBm)	EVDO Data Conducted Power (dBm)														
			BC10		BC0						BC1						
			Rev. 0	Rev. A	Rev. 0			Rev. A			Rev. 0			Rev. A			
			Mid	Mid	low	mid	high	low	mid	high	low	mid	high	low	mid	high	
1900 MHz	1175	25	18.91	18.90	18.92	18.95	18.85	18.89	19.02	18.88	19.08	19.11	19.03	19.06	19.05	19.02	
	1175	24	19.82	18.82	18.89	19.02	18.92	18.95	18.99	18.94	19.02	19.04	19.01	19.08	19.13	18.98	
	1175	23	18.87	18.90	18.95	19.01	18.89	18.92	18.98	18.87	19.05	19.08	18.96	19.02	19.20	18.99	
	1175	22	18.94	18.85	18.92	19.03	18.84	18.89	18.95	18.94	19.06	19.04	18.97	18.98	19.08	18.95	
	1175	21	18.87	18.78	18.89	19.05	18.94	18.89	18.98	18.92	19.08	19.11	19.05	19.05	19.07	18.97	
	1175	20	18.92	18.85	18.92	18.95	18.84	18.85	19.01	18.87	19.04	19.05	19.01	19.04	19.08	19.03	
	1175	19	18.87	18.83	18.87	19.02	18.85	18.89	19.03	18.94	19.09	19.11	18.95	19.02	19.17	19.05	
	1175	18	18.92	18.92	18.89	18.98	18.94	18.92	18.98	18.87	19.02	19.05	19.02	18.98	19.15	19.12	
	1175	17	18.89	18.91	18.95	19.03	18.87	18.89	19.02	18.91	19.02	19.09	18.98	19.02	19.11	19.10	
	1175	16	18.98	18.85	18.89	19.02	18.85	18.89	19.03	18.84	18.98	19.07	18.97	19.04	19.04	18.96	
	1175	15	18.97	18.83	18.98	19.01	18.88	18.95	19.05	18.94	19.05	19.05	18.99	19.06	19.10	18.97	
	1175	14	24.89	24.99	25.03	25.02	24.87	24.79	25.16	24.96	24.83	25.11	24.98	25.07	25.09	25.09	
	1175	13	24.92	25.01	24.97	24.97	24.91	24.92	25.19	25.08	24.98	25.09	25.03	25.11	24.99	25.20	
	1175	12	24.88	25.02	24.99	25.02	24.93	24.85	25.17	25.01	25.02	25.16	25.13	25.09	25.12	25.17	
	1175	11	24.92	25.02	25.01	25.03	25.01	24.94	25.14	24.99	25.10	25.07	25.04	24.97	25.09	25.21	

11.3 SVDO SAR Testing Procedures

SAR testing was additionally performed on the devices at the standalone threshold 1x-RTT CDMA and standalone reduced EVDO power levels with respect to the various SVDO simultaneous transmission scenarios. Additional samples were tuned to fixed reduced power levels for the purpose of evaluating simultaneous SAR based on the sum SAR of standalone 1x-RTT CDMA and standalone EVDO combinations. While the power reduction mechanism is activated at the CDMA Voice power level of 15dBm, simultaneous SAR summations were evaluated at maximum power EVDO. SAR was additionally evaluated at reduced power EVDO levels to perform simultaneous SAR analysis when CDMA voice is at maximum output power.

11.3.1 Reduced EVDO Conducted Powers

Table 11-3
Reduced EVDO Conducted Powers

Band	FCC Rule Part	Channel	Frequency	1x EvDO Rev. 0 [dBm] (RTAP)	1x EvDO Rev. A [dBm] (RETAP)
		F-RC	MHz		
Cellular	90S	564	820.1	19.25	19.33
	22H	1013	824.7	19.17	19.27
	22H	384	836.52	19.34	19.40
	22H	777	848.31	19.24	19.35
PCS	24E	25	1851.25	18.81	18.89
	24E	600	1880	19.09	19.14
	24E	1175	1908.75	19.05	19.16

For FCC Rule Part 90S, Per FCC KDB Publication 447498 6)c), only one channel is required since the device operates within the transmission range of 817.90 – 823.10 MHz.

According to FCC KDB 941225 D01 publication, EVDO SAR (Head, Body-Worn and Hotspot) is measured using Subtype 0/1 Physical Layer configurations for Rev. 0. When the maximum output power of Rev. A for each channel is greater than the Rev.0 power, Rev. A must additionally be tested using the highest output channel for the configuration that resulted in the highest SAR for Rev.0.

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11.3.2 Fixed CDMA Conducted Powers

Table 11-4
Fixed CDMA Conducted Powers

Band	FCC Rule Part	Channel	Frequency	SO55 [dBm]	SO55 [dBm]	SO75 [dBm]	TDSO SO32 [dBm]	TDSO SO32 [dBm]
		F-RC	MHz	RC1	RC3	RC8	FCH+SCH	FCH
Cellular	90S	564	820.1	15.23	15.25	15.12	15.28	15.22
	22H	1013	824.7	14.75	14.85	14.90	14.87	14.82
		384	836.52	15.25	15.27	15.30	15.20	15.24
		777	848.31	15.19	15.31	15.34	15.29	15.27
PCS	24E	25	1851.25	15.21	15.12	15.10	15.18	15.11
		600	1880	14.95	14.90	14.85	14.96	14.90
		1175	1908.75	15.04	15.12	14.90	15.19	15.12

Note: There is no power reduction applied to the CDMA Voice modes, however the device with output powers represented in the table above was tuned down (for SAR Test purposes only) to analyze simultaneous SAR scenarios in the SVDO condition where EVDO is operating at maximum output power in conjunction with a lower CDMA voice level (See Table 11-1). For FCC Rule Part 90S, Per FCC KDB Publication 447498 6)c), only one channel is required since the device operates within the transmission range of 817.90 – 823.10 MHz.

Per KDB Publication 941225 D01:

1. Head SAR was tested with SO55 RC3. SO55 RC1 was not required since the average output power was not more than 0.25 dB than the SO55 RC3 powers.
2. Body-Worn and Hotspot SAR was tested with 1x RTT with TDSO / SO32 FCH Only. TDSO / SO32 FCH+SCH SAR tests were not required since the average output power was not more than 0.25 dB higher than the TDSO / SO32 FCH only powers.

1x Advanced Considerations

1. CDMA 1X Advanced technology was not required for SAR since the maximum output powers for 1x Advanced was not more than 0.25 dB higher than the maximum measured powers for 1x and the measured SAR in any 1x mode exposure conditions was not greater than 1.2 W/kg. See Section 9.2.2 for 1x Advanced test set up.

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12 LTE POWER REDUCTION

12.1 Introduction to LTE Power Reduction

This device is capable of Simultaneous Voice and LTE (SVLTE) calls, with the voice call supported by a CDMA 1xRTT transmitter and the data connection supported by a separate LTE transmitter. A LTE power reduction scheme is applied during a LTE connection operating simultaneously with 1xRTT voice calls. The maximum transmit power of LTE is limited depending on the CDMA 1x voice transmit power level. When CDMA 1x Voice is operating at a certain range of high power levels, the maximum LTE transmit power is limited. When CDMA 1x Voice transmit power is below a certain threshold transmit power level, LTE can transmit at the maximum power. Target levels of power reduction and CDMA voice threshold levels are provided in Table 12-1.

Table 12-1
SVLTE Power Reduction Scheme

Mode	Voice Avg Power(P) 1x 850/1900 MHz (dBm)	Max. B25 LTE Data Avg Power (dBm)
SVLTE	$P \geq 18$	19
	$P < 18$	23

12.2 Output Power Verification

Per KDB Publication 941225 D05, 5) B), output powers were measured in SVLTE mode to determine that the power reduction mechanism was operating reliably and consistently. The power reduction was investigated by simultaneously connecting the device to both LTE and CDMA base station simulators. LTE output powers were measured through conducted RF connections by first connecting the device in a LTE data call and subsequently a CDMA 1xRTT call. CDMA powers were controlled by configuring the CDMA base station simulator to active bits. The LTE output power was monitored while changing the cell output power level.

The power reduction targets and threshold level described in Table 12-1 were confirmed. Please see results in Table 12-2.

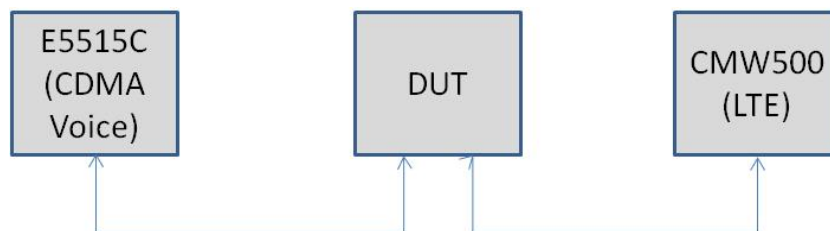


Figure 12-1
SVLTE Conducted Test Setup Diagram

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Table 12-2
SVLTE Power Reduction Verification Results

1x-RTT CDMA Voice Band	BC10 1x-RTT CDMA Voice Channel	BC10 1x-RTT CDMA Voice Tx (dBm)	LTE Band 25 Conducted Power (dBm)							
			Low Channel							
			QPSK 12 RB (6 RB Offset)	QPSK 1 RB (0 RB Offset)	QPSK 1 RB (24 RB Offset)	QPSK 25 RB (0 RB Offset)	16QAM 12 RB (6 RB Offset)	16QAM 1 RB (0 RB Offset)	16QAM 1 RB (24 RB Offset)	16QAM 25 RB (0 RB Offset)
835 MHz	564	25	19.17	19.08	19.15	19.18	19.05	18.90	19.02	19.10
		24	19.17	19.10	19.11	19.18	19.02	19.05	18.98	19.11
		23	19.15	19.05	19.15	19.20	19.10	19.16	18.87	19.10
		22	19.18	19.03	19.15	19.21	19.10	18.88	18.98	19.11
		21	19.15	19.08	19.15	19.18	19.05	18.92	19.02	19.09
		20	19.17	19.05	19.15	19.20	19.10	18.90	18.98	19.10
		19	19.16	19.08	19.10	19.15	19.02	18.87	18.85	19.10
		18	19.15	19.10	19.14	19.15	19.05	18.90	19.05	19.09
		17	22.16	23.02	23.20	22.15	21.13	21.98	22.08	21.13
		16	22.16	23.00	23.21	22.21	21.17	22.01	22.05	21.09
		15	22.16	22.97	23.24	22.22	21.13	21.98	22.08	21.15
		14	22.18	23.05	23.18	22.20	21.16	21.97	22.10	21.10
		13	22.16	23.05	23.18	22.21	21.11	21.99	22.05	21.08
		12	22.18	23.01	23.19	22.21	21.13	21.97	22.08	21.09
		11	22.19	22.98	23.19	22.20	21.13	21.98	22.10	21.13

1x-RTT CDMA Voice Band	BC10 1x-RTT CDMA Voice Channel	BC10 1x-RTT CDMA Voice Tx (dBm)	LTE Band 25 Conducted Power (dBm)							
			Mid. Channel							
			QPSK 12 RB (6 RB Offset)	QPSK 1 RB (0 RB Offset)	QPSK 1 RB (24 RB Offset)	QPSK 25 RB (0 RB Offset)	16QAM 12 RB (6 RB Offset)	16QAM 1 RB (0 RB Offset)	16QAM 1 RB (24 RB Offset)	16QAM 25 RB (0 RB Offset)
835 MHz	564	25	19.01	18.70	18.83	18.99	18.92	18.98	19.12	18.86
		24	18.97	18.70	18.82	19.01	18.87	18.98	19.05	18.85
		23	18.97	18.74	18.84	18.97	18.88	18.95	19.15	18.78
		22	19.03	18.70	18.81	18.97	18.95	18.98	19.15	18.78
		21	18.99	18.69	18.82	19.00	18.85	18.97	19.12	18.82
		20	18.99	18.69	18.84	19.00	18.97	19.00	19.17	18.84
		19	19.02	18.71	18.82	18.98	18.99	18.82	19.17	18.88
		18	18.97	18.72	18.83	19.01	19.01	18.79	19.12	18.91
		17	22.10	22.90	23.01	22.02	20.91	22.08	22.24	20.89
		16	22.05	22.90	22.97	22.07	20.92	21.98	22.23	20.89
		15	22.14	22.92	22.98	22.05	20.93	21.99	22.26	20.90
		14	22.03	22.91	23.02	22.00	20.92	22.08	22.23	20.75
		13	22.08	22.92	23.01	22.05	20.91	22.05	22.26	20.74
		12	22.03	22.91	23.02	22.07	20.92	21.98	22.25	20.88
		11	22.08	22.92	22.97	21.95	20.93	22.05	22.25	20.85

1x-RTT CDMA Voice Band	BC10 1x-RTT CDMA Voice Channel	BC10 1x-RTT CDMA Voice Tx (dBm)	LTE Band 25 Conducted Power (dBm)							
			High Channel							
			QPSK 12 RB (6 RB Offset)	QPSK 1 RB (0 RB Offset)	QPSK 1 RB (24 RB Offset)	QPSK 25 RB (0 RB Offset)	16QAM 12 RB (6 RB Offset)	16QAM 1 RB (0 RB Offset)	16QAM 1 RB (24 RB Offset)	16QAM 25 RB (0 RB Offset)
835 MHz	564	25	19.11	19.10	18.95	18.98	19.02	18.99	18.85	18.88
		24	19.10	19.08	18.91	18.95	18.99	19.10	18.95	18.80
		23	18.98	19.08	18.85	19.05	19.02	18.85	18.78	18.95
		22	19.09	19.10	19.95	19.00	19.05	19.09	18.91	18.87
		21	19.10	19.08	18.85	19.05	19.12	19.10	18.79	18.95
		20	19.11	19.07	19.10	18.99	19.10	19.10	18.84	18.88
		19	19.09	19.10	19.16	19.00	19.05	18.98	18.92	18.95
		18	19.09	19.08	19.10	19.00	19.02	19.10	18.92	18.88
		17	22.08	23.05	22.81	22.03	21.10	21.89	21.89	21.02
		16	22.11	23.01	22.81	22.03	21.11	22.21	21.88	20.99
		15	22.05	23.12	22.78	22.03	21.15	22.15	21.92	20.98
		14	22.12	23.12	22.81	22.05	21.10	21.99	21.90	21.04
		13	22.04	23.05	22.80	21.97	21.10	22.08	21.89	21.02
		12	22.06	23.02	22.78	21.98	21.08	22.15	21.92	20.97
		11	22.10	23.10	22.79	21.99	21.08	22.20	21.88	21.02

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1x-RTT CDMA Voice Band	BC0 1x-RTT CDMA Voice Channel	BC0 1x-RTT CDMA Voice Tx (dBm)	LTE Band 25 Conducted Power (dBm)							
			Low Channel							
			QPSK 12 RB (6 RB Offset)	QPSK 1 RB (0 RB Offset)	QPSK 1 RB (24 RB Offset)	QPSK 25 RB (0 RB Offset)	16QAM 12 RB (6 RB Offset)	16QAM 1 RB (0 RB Offset)	16QAM 1 RB (24 RB Offset)	16QAM 25 RB (0 RB Offset)
835 MHz	1013	25	19.16	19.08	19.10	19.20	19.09	19.01	19.02	19.10
		24	19.18	19.06	19.10	19.18	19.09	18.88	19.02	19.09
		23	19.18	19.06	19.10	19.21	19.10	19.16	18.87	19.10
		22	19.18	19.05	19.12	19.21	19.10	18.88	19.02	19.10
		21	19.17	19.08	19.14	19.20	19.02	18.94	18.98	19.11
		20	19.18	19.10	19.13	19.18	19.09	18.94	18.98	19.10
		19	19.18	19.09	19.11	19.10	19.02	19.89	18.85	19.11
		18	19.19	19.09	19.11	19.09	19.08	19.88	19.02	19.11
		17	22.19	23.03	23.19	22.19	21.13	21.99	22.08	21.15
		16	22.17	23.02	23.24	22.19	21.15	21.98	22.08	21.11
		15	22.17	23.04	23.19	22.19	21.11	21.99	22.09	21.14
		14	22.17	23.04	23.24	22.22	21.11	22.00	22.09	21.15
		13	22.18	23.03	23.25	22.19	21.14	22.00	22.11	21.16
		12	22.19	23.03	23.22	22.22	21.14	21.98	22.09	21.17
		11	22.18	23.04	23.23	22.21	21.15	22.01	22.07	21.16

1x-RTT CDMA Voice Band	BC0 1x-RTT CDMA Voice Channel	BC0 1x-RTT CDMA Voice Tx (dBm)	LTE Band 25 Conducted Power (dBm)							
			Mid. Channel							
			QPSK 12 RB (6 RB Offset)	QPSK 1 RB (0 RB Offset)	QPSK 1 RB (24 RB Offset)	QPSK 25 RB (0 RB Offset)	16QAM 12 RB (6 RB Offset)	16QAM 1 RB (0 RB Offset)	16QAM 1 RB (24 RB Offset)	16QAM 25 RB (0 RB Offset)
835 MHz	1013	25	18.99	18.69	18.84	18.99	18.94	18.98	19.12	18.92
		24	18.99	18.69	18.82	18.99	18.87	18.98	19.12	18.85
		23	18.97	18.71	18.83	19.00	18.87	19.04	19.12	18.79
		22	19.03	18.70	18.84	18.97	18.87	19.04	19.17	18.85
		21	18.98	18.69	18.82	19.00	18.85	18.97	19.12	18.78
		20	19.01	18.69	18.84	19.00	18.97	18.79	19.20	18.92
		19	19.03	18.71	18.82	19.00	19.00	18.95	19.19	18.88
		18	19.01	18.69	18.83	18.99	19.00	18.95	19.19	18.88
		17	22.13	22.90	22.98	22.04	20.94	22.10	22.25	20.91
		16	22.09	22.94	22.98	22.06	20.94	21.98	22.25	20.78
		15	22.09	22.93	23.00	22.06	20.93	22.00	22.26	20.90
		14	22.08	22.93	23.01	22.04	20.93	22.15	22.25	20.90
		13	22.10	22.93	23.01	22.07	20.92	22.05	22.26	20.89
		12	22.08	22.92	22.98	22.08	20.91	22.01	22.27	20.90
		11	22.12	22.93	22.97	22.07	20.93	21.99	22.25	20.90

1x-RTT CDMA Voice Band	BC0 1x-RTT CDMA Voice Channel	BC0 1x-RTT CDMA Voice Tx (dBm)	LTE Band 25 Conducted Power (dBm)							
			High Channel							
			QPSK 12 RB (6 RB Offset)	QPSK 1 RB (0 RB Offset)	QPSK 1 RB (24 RB Offset)	QPSK 25 RB (0 RB Offset)	16QAM 12 RB (6 RB Offset)	16QAM 1 RB (0 RB Offset)	16QAM 1 RB (24 RB Offset)	16QAM 25 RB (0 RB Offset)
835 MHz	1013	25	19.09	19.08	18.94	19.05	19.05	18.97	18.84	18.87
		24	19.09	19.08	18.91	18.95	19.02	19.11	18.91	18.82
		23	18.98	19.07	18.85	18.99	19.10	18.87	18.84	18.95
		22	19.11	19.07	19.02	18.99	19.05	19.12	18.91	18.87
		21	19.09	19.08	19.02	19.05	19.12	19.12	18.84	18.95
		20	19.09	19.07	18.85	18.99	19.02	19.11	18.78	18.87
		19	19.07	19.08	19.16	18.99	19.05	19.11	18.94	18.95
		18	19.11	19.07	19.02	19.05	19.02	18.98	18.95	18.85
		17	22.09	23.01	22.78	22.05	21.07	22.02	21.89	21.02
		16	22.05	23.13	22.81	22.05	21.15	22.18	21.89	20.98
		15	22.12	23.13	22.78	22.07	21.15	22.17	21.90	20.98
		14	22.12	23.08	22.78	21.98	21.11	22.09	21.89	21.10
		13	22.12	23.05	22.81	22.07	21.15	21.98	21.90	21.10
		12	22.09	22.97	22.78	22.01	21.09	22.00	21.91	20.99
		11	22.14	22.97	22.79	22.06	21.09	22.17	21.91	20.98

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1x-RTT CDMA Voice Band	BC0 1x-RTT CDMA Voice Channel	BC0 1x-RTT CDMA Voice Tx (dBm)	LTE Band 25 Conducted Power (dBm)							
			Low Channel							
			QPSK 12 RB (6 RB Offset)	QPSK 1 RB (0 RB Offset)	QPSK 1 RB (24 RB Offset)	QPSK 25 RB (0 RB Offset)	16QAM 12 RB (6 RB Offset)	16QAM 1 RB (0 RB Offset)	16QAM 1 RB (24 RB Offset)	16QAM 25 RB (0 RB Offset)
835 MHz	384	25	19.17	19.07	19.10	19.18	19.05	18.92	19.02	19.10
		24	19.18	19.07	19.15	19.18	19.07	18.90	18.97	19.10
		23	19.18	19.05	19.10	19.19	19.11	18.95	18.87	19.11
		22	19.18	19.03	19.15	19.21	19.10	18.88	18.98	19.11
		21	19.17	19.07	19.15	19.18	19.02	19.07	19.02	19.10
		20	19.18	19.03	19.20	19.20	19.11	18.89	19.02	19.10
		19	19.17	19.12	19.12	19.12	19.02	18.87	19.02	19.10
		18	19.16	19.10	19.15	19.21	19.05	18.89	18.97	19.09
		17	22.18	23.00	23.20	22.13	21.15	21.97	22.08	21.17
		16	22.18	23.02	23.25	22.20	21.17	21.97	22.10	21.09
		15	22.17	23.01	23.25	22.22	21.15	22.00	22.08	21.15
		14	22.18	23.00	23.18	22.20	21.16	22.00	22.10	21.10
		13	22.16	23.02	23.25	22.21	21.16	21.99	22.07	21.17
		12	22.17	23.03	23.20	22.21	21.15	22.00	22.10	21.10
		11	22.17	23.02	23.20	22.20	21.15	21.97	22.10	21.17

1x-RTT CDMA Voice Band	BC0 1x-RTT CDMA Voice Channel	BC0 1x-RTT CDMA Voice Tx (dBm)	LTE Band 25 Conducted Power (dBm)							
			Mid. Channel							
			QPSK 12 RB (6 RB Offset)	QPSK 1 RB (0 RB Offset)	QPSK 1 RB (24 RB Offset)	QPSK 25 RB (0 RB Offset)	16QAM 12 RB (6 RB Offset)	16QAM 1 RB (0 RB Offset)	16QAM 1 RB (24 RB Offset)	16QAM 25 RB (0 RB Offset)
835 MHz	384	25	18.97	18.70	18.84	18.99	18.90	19.00	19.11	18.89
		24	18.97	18.71	18.82	18.98	19.01	18.95	19.20	18.85
		23	18.99	18.69	18.83	19.00	18.87	19.02	19.15	18.89
		22	18.99	18.70	18.84	18.97	19.00	19.04	19.13	18.85
		21	19.02	18.70	18.84	19.02	18.85	18.85	19.12	18.92
		20	18.97	18.69	18.82	19.00	18.97	19.00	19.20	18.95
		19	19.03	18.71	18.84	18.97	18.99	18.80	19.13	18.88
		18	19.02	18.70	18.84	19.00	18.97	18.97	18.20	18.88
		17	22.11	22.90	23.00	22.05	20.95	21.98	22.25	20.89
		16	22.11	22.92	22.98	22.07	20.91	21.98	22.25	20.90
		15	22.03	22.92	22.98	22.05	20.91	21.99	22.26	20.90
		14	22.03	22.92	23.00	22.00	20.92	22.15	22.25	20.90
		13	22.14	22.91	22.98	22.05	20.91	21.98	22.26	20.74
		12	22.11	22.91	23.04	22.07	20.92	22.03	22.27	20.89
		11	22.05	22.91	23.00	22.05	20.91	22.00	22.25	20.91

1x-RTT CDMA Voice Band	BC0 1x-RTT CDMA Voice Channel	BC0 1x-RTT CDMA Voice Tx (dBm)	LTE Band 25 Conducted Power (dBm)							
			High Channel							
			QPSK 12 RB (6 RB Offset)	QPSK 1 RB (0 RB Offset)	QPSK 1 RB (24 RB Offset)	QPSK 25 RB (0 RB Offset)	16QAM 12 RB (6 RB Offset)	16QAM 1 RB (0 RB Offset)	16QAM 1 RB (24 RB Offset)	16QAM 25 RB (0 RB Offset)
835 MHz	384	25	19.09	19.07	19.05	19.05	19.01	19.12	18.87	18.87
		24	19.11	19.07	18.91	18.97	19.10	19.10	18.90	18.95
		23	19.10	19.10	19.87	19.05	19.10	18.85	18.91	18.95
		22	19.08	19.07	19.02	18.97	19.02	18.98	18.91	18.87
		21	18.98	19.08	18.87	19.05	18.99	19.12	18.86	18.95
		20	19.08	19.10	18.87	19.02	19.02	19.12	18.85	18.85
		19	19.11	19.08	19.11	19.02	19.05	19.10	18.89	18.94
		18	19.11	19.10	19.05	18.99	19.02	18.98	18.79	18.87
		17	22.10	23.10	22.81	22.06	21.10	22.20	21.90	20.98
		16	22.07	23.00	22.78	22.06	21.15	22.20	21.89	20.98
		15	22.07	23.15	22.81	21.99	21.15	22.18	21.89	20.98
		14	22.15	23.15	22.80	22.05	21.10	22.15	21.90	21.05
		13	22.04	23.10	22.80	22.07	21.14	22.20	21.89	20.98
		12	22.07	23.00	22.80	21.98	21.14	22.18	21.90	21.05
		11	22.07	22.99	22.79	22.06	21.09	22.18	21.89	21.05

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1x-RTT CDMA Voice Band	BC0 1x-RTT CDMA Voice Channel	BC0 1x-RTT CDMA Voice Tx (dBm)	LTE Band 25 Conducted Power (dBm)							
			Low Channel							
			QPSK 12 RB (6 RB Offset)	QPSK 1 RB (0 RB Offset)	QPSK 1 RB (24 RB Offset)	QPSK 25 RB (0 RB Offset)	16QAM 12 RB (6 RB Offset)	16QAM 1 RB (0 RB Offset)	16QAM 1 RB (24 RB Offset)	16QAM 25 RB (0 RB Offset)
835 MHz	777	25	19.18	19.05	19.15	19.19	19.10	18.87	19.02	19.10
		24	19.18	19.03	19.10	19.21	19.02	18.89	19.02	19.09
		23	19.17	19.05	19.15	19.20	19.10	19.16	18.87	19.10
		22	19.15	19.03	19.15	19.21	19.02	18.88	18.98	19.09
		21	19.16	19.05	19.15	19.18	19.02	18.87	18.98	19.10
		20	19.18	19.05	19.20	19.20	19.10	18.89	18.98	19.11
		19	19.17	19.03	19.15	19.08	19.11	18.88	18.98	19.10
		18	19.17	19.07	19.20	19.20	19.02	19.07	19.02	19.10
		17	22.17	23.00	23.20	22.20	21.15	21.97	22.09	21.18
		16	22.18	23.02	23.25	22.21	21.17	21.97	22.09	21.15
		15	22.18	23.02	23.15	22.22	21.05	22.00	22.10	21.15
		14	22.16	23.05	23.20	22.15	21.16	21.97	22.10	21.10
		13	22.19	23.00	23.15	22.21	21.11	21.99	22.10	21.18
		12	22.16	23.01	23.20	22.21	21.15	22.00	22.10	21.18
		11	22.16	23.00	23.20	22.20	21.05	21.97	22.10	21.15

1x-RTT CDMA Voice Band	BC0 1x-RTT CDMA Voice Channel	BC0 1x-RTT CDMA Voice Tx (dBm)	LTE Band 25 Conducted Power (dBm)							
			Mid. Channel							
			QPSK 12 RB (6 RB Offset)	QPSK 1 RB (0 RB Offset)	QPSK 1 RB (24 RB Offset)	QPSK 25 RB (0 RB Offset)	16QAM 12 RB (6 RB Offset)	16QAM 1 RB (0 RB Offset)	16QAM 1 RB (24 RB Offset)	16QAM 25 RB (0 RB Offset)
835 MHz	777	25	18.97	18.71	18.84	18.98	18.87	18.85	19.13	18.85
		24	18.99	18.71	18.82	19.00	19.00	19.00	19.12	18.92
		23	18.97	18.70	18.84	19.00	18.99	18.95	19.20	18.79
		22	19.03	18.70	18.84	18.97	18.95	19.04	19.15	18.85
		21	18.97	18.71	18.82	18.97	18.85	18.97	19.12	18.95
		20	18.97	18.69	18.84	19.00	18.85	18.80	19.12	18.88
		19	19.02	18.70	18.82	19.02	18.97	19.00	19.12	18.92
		18	19.02	18.71	18.84	19.00	18.99	18.80	19.20	18.95
		17	22.10	22.90	23.00	21.98	20.92	22.05	22.23	20.89
		16	22.05	22.92	22.98	22.05	20.92	21.98	22.25	20.89
		15	22.10	22.92	22.98	22.05	20.92	21.99	22.26	20.90
		14	22.00	22.90	23.04	22.05	20.92	22.15	22.25	20.90
		13	22.10	22.90	22.98	22.05	20.91	22.05	22.26	20.78
		12	22.03	22.92	23.00	22.07	20.92	22.00	22.27	20.89
		11	22.14	22.90	23.00	22.05	20.91	22.05	22.25	20.89

1x-RTT CDMA Voice Band	BC0 1x-RTT CDMA Voice Channel	BC0 1x-RTT CDMA Voice Tx (dBm)	LTE Band 25 Conducted Power (dBm)							
			High Channel							
			QPSK 12 RB (6 RB Offset)	QPSK 1 RB (0 RB Offset)	QPSK 1 RB (24 RB Offset)	QPSK 25 RB (0 RB Offset)	16QAM 12 RB (6 RB Offset)	16QAM 1 RB (0 RB Offset)	16QAM 1 RB (24 RB Offset)	16QAM 25 RB (0 RB Offset)
835 MHz	777	25	19.11	19.07	19.02	18.97	19.10	19.10	18.85	18.85
		24	19.10	19.07	18.87	19.05	19.02	18.85	18.89	18.95
		23	18.98	19.08	18.85	19.05	19.10	18.85	18.78	18.95
		22	19.11	19.07	19.02	18.97	19.05	19.12	18.91	18.87
		21	19.08	19.10	19.87	19.05	19.12	18.98	18.87	18.95
		20	18.98	19.07	18.85	19.02	19.02	19.12	18.90	18.94
		19	19.10	19.08	18.87	19.05	18.99	19.12	18.91	18.87
		18	19.08	19.10	19.11	19.02	19.02	19.10	18.86	18.95
		17	22.15	23.03	22.78	22.05	21.10	22.20	21.90	21.10
		16	22.05	23.01	22.80	21.98	21.15	22.21	21.89	20.98
		15	22.00	23.10	22.80	21.98	21.12	22.20	21.88	21.10
		14	22.15	23.15	22.78	22.07	21.10	21.95	21.90	20.98
		13	22.05	23.10	22.80	22.07	21.10	21.90	21.89	21.08
		12	22.05	23.00	22.78	21.98	21.08	22.17	21.90	21.08
		11	22.15	23.10	22.80	22.05	21.08	22.15	21.88	21.05

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1x-RTT CDMA Voice Band	BC1 1x-RTT CDMA Voice Channel	BC1 1x-RTT CDMA Voice Tx (dBm)	LTE Band 25 Conducted Power (dBm)							
			Low Channel							
			QPSK 12 RB (6 RB Offset)	QPSK 1 RB (0 RB Offset)	QPSK 1 RB (24 RB Offset)	QPSK 25 RB (0 RB Offset)	16QAM 12 RB (6 RB Offset)	16QAM 1 RB (0 RB Offset)	16QAM 1 RB (24 RB Offset)	16QAM 25 RB (0 RB Offset)
1900 MHz	25	25	19.16	19.05	19.11	19.18	19.05	18.88	19.01	19.10
		24	19.16	19.04	19.11	19.18	19.02	19.00	19.05	19.10
		23	19.18	19.05	19.10	19.20	19.10	19.10	18.89	19.10
		22	19.16	19.03	19.15	19.21	19.05	18.88	18.98	19.11
		21	19.16	19.07	19.15	19.18	19.02	18.92	19.02	19.10
		20	19.18	19.03	19.18	19.20	19.10	18.89	18.98	19.10
		19	19.16	19.12	19.10	19.08	19.02	18.87	19.00	19.11
		18	19.16	19.07	19.15	19.12	19.10	18.92	19.00	19.10
		17	22.17	23.00	23.20	22.18	21.13	21.97	22.08	21.11
		16	22.16	23.05	23.21	22.21	21.17	21.97	22.09	21.11
		15	22.18	23.02	23.25	22.22	21.16	22.00	22.10	21.15
		14	22.18	23.05	23.18	22.18	21.15	22.00	22.10	21.15
		13	22.19	23.05	23.19	22.21	21.11	21.99	22.05	21.10
		12	22.16	23.04	23.20	22.21	21.15	21.97	22.10	21.18
		11	22.19	23.00	23.17	22.18	21.15	21.98	22.05	21.15

1x-RTT CDMA Voice Band	BC1 1x-RTT CDMA Voice Channel	BC1 1x-RTT CDMA Voice Tx (dBm)	LTE Band 25 Conducted Power (dBm)							
			Mid. Channel							
			QPSK 12 RB (6 RB Offset)	QPSK 1 RB (0 RB Offset)	QPSK 1 RB (24 RB Offset)	QPSK 25 RB (0 RB Offset)	16QAM 12 RB (6 RB Offset)	16QAM 1 RB (0 RB Offset)	16QAM 1 RB (24 RB Offset)	16QAM 25 RB (0 RB Offset)
1900 MHz	25	25	19.02	18.70	18.84	19.00	18.89	18.98	19.10	18.92
		24	18.97	18.69	18.82	18.99	19.00	18.98	19.12	18.85
		23	18.97	18.70	18.84	18.97	18.87	18.95	19.15	18.79
		22	19.02	18.70	18.84	18.97	18.95	19.04	19.10	18.85
		21	18.97	18.69	18.82	19.01	19.00	18.97	19.12	18.92
		20	18.97	18.69	18.82	19.00	18.97	18.98	19.20	18.95
		19	19.03	18.71	18.84	18.98	19.00	18.79	19.20	18.88
		18	18.97	18.71	18.83	19.01	18.97	19.02	19.10	18.88
		17	22.05	22.91	23.01	22.00	20.92	21.98	22.20	20.91
		16	22.03	22.92	23.00	22.07	20.92	21.98	22.25	20.89
		15	22.10	22.92	22.98	22.05	20.90	21.99	22.26	20.90
		14	22.03	22.90	23.01	22.07	20.92	22.13	22.26	20.90
		13	22.14	22.91	22.98	22.05	20.91	22.05	22.25	20.94
		12	22.03	22.92	23.04	22.07	20.92	21.98	22.27	20.94
		11	22.03	22.90	22.99	22.07	20.90	22.01	22.24	20.89

1x-RTT CDMA Voice Band	BC1 1x-RTT CDMA Voice Channel	BC1 1x-RTT CDMA Voice Tx (dBm)	LTE Band 25 Conducted Power (dBm)							
			High Channel							
			QPSK 12 RB (6 RB Offset)	QPSK 1 RB (0 RB Offset)	QPSK 1 RB (24 RB Offset)	QPSK 25 RB (0 RB Offset)	16QAM 12 RB (6 RB Offset)	16QAM 1 RB (0 RB Offset)	16QAM 1 RB (24 RB Offset)	16QAM 25 RB (0 RB Offset)
1900 MHz	25	25	19.07	19.08	18.92	19.00	19.10	19.05	18.95	18.87
		24	19.09	19.05	18.91	18.95	18.99	19.12	18.91	18.80
		23	18.99	19.08	18.85	19.05	19.10	18.85	18.78	18.95
		22	19.10	19.07	19.02	18.97	19.05	19.12	18.95	18.87
		21	19.08	19.08	18.85	19.05	19.12	19.05	18.86	18.95
		20	19.11	19.05	19.10	19.00	19.02	19.12	18.78	18.85
		19	19.10	19.08	19.16	18.99	19.05	18.98	18.87	18.90
		18	19.07	19.07	18.92	18.99	19.00	19.05	18.89	18.95
		17	22.14	23.02	22.80	22.01	21.11	21.89	21.90	21.00
		16	22.05	22.99	22.81	21.99	21.15	22.21	21.90	21.03
		15	22.10	23.15	22.78	22.07	21.15	22.10	21.89	20.98
		14	22.15	23.10	22.78	22.05	21.10	21.96	21.90	21.08
		13	22.04	23.05	22.78	22.07	21.12	22.20	21.89	20.98
		12	22.05	22.98	22.78	21.98	21.08	22.18	21.90	21.05
		11	22.11	22.98	22.80	22.05	21.11	22.15	21.88	21.99

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1x-RTT CDMA Voice Band	BC1 1x-RTT CDMA Voice Channel	BC1 1x-RTT CDMA Voice Tx (dBm)	LTE Band 25 Conducted Power (dBm)							
			Low Channel							
			QPSK 12 RB (6 RB Offset)	QPSK 1 RB (0 RB Offset)	QPSK 1 RB (24 RB Offset)	QPSK 25 RB (0 RB Offset)	16QAM 12 RB (6 RB Offset)	16QAM 1 RB (0 RB Offset)	16QAM 1 RB (24 RB Offset)	16QAM 25 RB (0 RB Offset)
1900 MHz	600	25	19.18	19.12	19.11	19.20	19.10	18.88	19.05	19.11
		24	19.18	19.04	19.10	19.18	19.02	18.88	19.05	19.10
		23	19.18	19.05	19.10	19.20	19.10	19.16	18.87	19.10
		22	19.18	19.03	19.15	19.21	19.10	18.88	18.98	19.11
		21	19.16	19.05	19.15	19.18	19.02	18.92	19.02	19.11
		20	19.18	19.03	19.20	19.20	19.10	18.89	18.98	19.10
		19	19.18	19.12	19.10	19.08	19.02	18.87	18.85	19.11
		18	19.16	19.12	19.10	19.18	19.02	18.89	19.01	19.10
		17	22.18	23.00	23.17	22.13	21.16	22.00	22.11	21.18
		16	22.16	23.00	23.25	22.21	21.17	21.97	22.09	21.09
		15	22.18	23.02	23.25	22.22	21.16	22.00	22.08	21.15
		14	22.16	23.05	23.18	22.22	21.16	21.97	22.10	21.10
		13	22.19	23.05	23.20	22.21	21.11	21.99	22.10	21.18
		12	22.16	23.01	23.23	22.21	21.15	21.97	22.10	21.18
		11	22.18	23.05	23.25	22.23	21.11	22.00	22.06	21.09

1x-RTT CDMA Voice Band	BC1 1x-RTT CDMA Voice Channel	BC1 1x-RTT CDMA Voice Tx (dBm)	LTE Band 25 Conducted Power (dBm)							
			Mid. Channel							
			QPSK 12 RB (6 RB Offset)	QPSK 1 RB (0 RB Offset)	QPSK 1 RB (24 RB Offset)	QPSK 25 RB (0 RB Offset)	16QAM 12 RB (6 RB Offset)	16QAM 1 RB (0 RB Offset)	16QAM 1 RB (24 RB Offset)	16QAM 25 RB (0 RB Offset)
1900 MHz	600	25	18.99	18.69	18.83	19.00	18.90	19.02	19.12	18.88
		24	18.97	18.69	18.82	18.99	18.87	18.98	19.12	18.85
		23	18.97	18.70	18.84	19.00	18.87	18.95	19.20	18.79
		22	19.03	18.70	18.84	18.97	18.95	19.04	19.15	18.85
		21	18.97	18.70	18.82	19.00	18.85	18.97	19.12	18.78
		20	18.97	18.69	18.84	19.00	18.97	18.85	19.20	18.95
		19	19.03	18.71	18.84	18.98	19.00	18.79	19.20	18.88
		18	19.03	18.69	18.82	18.98	18.88	18.98	19.15	18.92
		17	22.14	22.92	23.01	21.98	20.95	22.12	22.24	20.91
		16	22.03	22.92	22.98	22.07	20.92	21.98	22.25	20.89
		15	22.14	22.92	22.98	22.05	20.91	21.99	22.26	20.90
		14	22.03	22.93	23.04	22.07	20.92	22.15	22.26	20.90
		13	22.14	22.91	22.98	22.05	20.91	22.05	22.26	20.74
		12	22.03	22.92	23.04	22.07	20.92	21.98	22.27	20.89
		11	22.14	22.92	22.98	22.05	20.92	22.03	22.26	20.90

1x-RTT CDMA Voice Band	BC1 1x-RTT CDMA Voice Channel	BC1 1x-RTT CDMA Voice Tx (dBm)	LTE Band 25 Conducted Power (dBm)							
			High Channel							
			QPSK 12 RB (6 RB Offset)	QPSK 1 RB (0 RB Offset)	QPSK 1 RB (24 RB Offset)	QPSK 25 RB (0 RB Offset)	16QAM 12 RB (6 RB Offset)	16QAM 1 RB (0 RB Offset)	16QAM 1 RB (24 RB Offset)	16QAM 25 RB (0 RB Offset)
1900 MHz	600	25	19.11	19.07	18.90	19.05	19.05	18.97	18.81	18.85
		24	19.09	19.08	18.91	18.95	18.99	19.12	18.91	18.80
		23	18.98	19.08	18.85	19.05	19.10	18.85	18.78	18.95
		22	19.11	19.07	19.02	18.97	19.05	19.12	18.91	18.87
		21	19.08	19.08	18.85	19.05	19.12	19.12	18.86	18.95
		20	19.11	19.07	18.85	18.99	19.02	19.12	18.78	18.85
		19	19.07	19.08	19.16	18.99	19.05	18.98	18.89	18.95
		18	19.11	19.08	18.85	19.02	18.99	19.12	18.95	18.87
		17	22.05	23.03	22.80	22.07	21.08	21.88	21.91	21.05
		16	22.05	23.01	22.80	21.98	21.15	22.21	21.89	20.98
		15	22.05	23.15	22.78	22.07	21.15	22.21	21.89	20.98
		14	22.15	23.15	22.78	22.05	21.10	21.95	21.90	21.10
		13	22.04	23.05	22.80	22.07	21.15	22.20	21.89	20.98
		12	22.05	22.98	22.78	21.98	21.08	22.18	21.90	21.05
		11	22.15	23.10	22.82	22.07	21.15	22.15	21.90	20.98

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1x-RTT CDMA Voice Band	BC1 1x-RTT CDMA Voice Channel	BC1 1x-RTT CDMA Voice Tx (dBm)	LTE Band 25 Conducted Power (dBm)							
			Low Channel							
			QPSK 12 RB (6 RB Offset)	QPSK 1 RB (0 RB Offset)	QPSK 1 RB (24 RB Offset)	QPSK 25 RB (0 RB Offset)	16QAM 12 RB (6 RB Offset)	16QAM 1 RB (0 RB Offset)	16QAM 1 RB (24 RB Offset)	16QAM 25 RB (0 RB Offset)
1900 MHz	1175	25	19.15	19.05	19.09	19.11	19.05	19.10	19.01	19.10
		24	19.16	19.04	19.10	19.18	19.10	18.88	19.05	19.10
		23	19.15	19.05	19.11	19.20	19.10	19.05	18.87	19.10
		22	19.16	19.03	19.15	19.18	19.02	18.88	19.02	19.09
		21	19.15	19.00	19.13	19.18	19.02	18.92	18.89	19.11
		20	19.15	19.00	19.13	19.21	19.10	18.89	18.98	19.10
		19	19.17	19.03	19.10	19.15	19.02	18.87	19.00	19.09
		18	19.17	19.03	19.10	19.20	19.05	18.88	18.88	19.10
		17	22.15	23.00	23.20	22.19	21.10	21.99	22.10	21.15
		16	22.15	23.02	23.21	22.21	21.15	21.97	22.10	21.09
		15	22.18	23.02	23.22	22.20	21.16	21.99	22.08	21.13
		14	22.16	23.05	23.18	22.22	21.10	22.00	22.09	21.10
		13	22.15	22.98	23.25	22.21	21.11	21.99	22.10	21.13
		12	22.16	23.01	23.17	22.20	21.16	21.97	22.08	21.18
		11	22.15	23.01	23.19	22.20	21.10	21.97	22.08	21.11

1x-RTT CDMA Voice Band	BC1 1x-RTT CDMA Voice Channel	BC1 1x-RTT CDMA Voice Tx (dBm)	LTE Band 25 Conducted Power (dBm)							
			Mid. Channel							
			QPSK 12 RB (6 RB Offset)	QPSK 1 RB (0 RB Offset)	QPSK 1 RB (24 RB Offset)	QPSK 25 RB (0 RB Offset)	16QAM 12 RB (6 RB Offset)	16QAM 1 RB (0 RB Offset)	16QAM 1 RB (24 RB Offset)	16QAM 25 RB (0 RB Offset)
1900 MHz	1175	25	18.99	18.68	18.85	18.98	18.95	19.01	19.11	18.79
		24	19.03	18.69	18.82	18.99	18.87	18.98	19.12	18.85
		23	18.97	18.70	18.82	19.00	18.87	19.00	19.20	18.82
		22	19.03	18.70	18.84	18.97	19.00	19.04	19.15	18.85
		21	19.00	18.68	18.82	19.00	18.85	18.97	19.12	18.78
		20	18.97	18.69	18.80	19.00	18.97	18.85	19.15	18.95
		19	18.97	18.70	18.84	18.98	19.00	18.81	19.20	18.88
		18	19.01	18.70	18.80	19.00	19.02	18.79	19.10	18.89
		17	22.11	22.90	22.99	22.01	20.92	21.99	22.23	20.90
		16	22.03	22.92	22.98	22.07	20.92	21.98	22.23	20.89
		15	22.15	22.92	22.98	22.05	20.91	22.00	22.26	20.90
		14	22.03	22.90	23.02	22.02	20.92	22.15	22.26	20.90
		13	22.14	22.93	22.98	22.04	20.92	22.05	22.26	20.82
		12	22.10	22.92	23.02	22.05	20.91	21.98	22.25	20.89
		11	22.11	22.93	23.00	22.04	20.90	22.00	22.25	20.89

1x-RTT CDMA Voice Band	BC1 1x-RTT CDMA Voice Channel	BC1 1x-RTT CDMA Voice Tx (dBm)	LTE Band 25 Conducted Power (dBm)							
			High Channel							
			QPSK 12 RB (6 RB Offset)	QPSK 1 RB (0 RB Offset)	QPSK 1 RB (24 RB Offset)	QPSK 25 RB (0 RB Offset)	16QAM 12 RB (6 RB Offset)	16QAM 1 RB (0 RB Offset)	16QAM 1 RB (24 RB Offset)	16QAM 25 RB (0 RB Offset)
1900 MHz	1175	25	19.05	19.06	18.91	19.02	19.08	18.97	18.84	18.90
		24	19.09	19.08	18.91	18.95	18.99	19.12	18.91	18.80
		23	19.05	19.08	18.87	19.02	19.08	18.87	18.78	18.95
		22	19.11	19.07	19.02	18.97	19.05	19.12	18.78	18.87
		21	19.08	19.05	18.85	19.05	19.11	19.12	18.86	18.95
		20	19.11	19.07	18.85	18.99	19.02	19.09	18.92	18.85
		19	19.07	19.08	19.16	19.02	19.05	18.98	18.89	18.87
		18	19.09	19.06	18.87	19.02	18.02	19.08	18.92	18.90
		17	22.04	23.03	22.82	22.04	21.05	21.92	21.89	21.02
		16	22.04	23.03	22.80	21.98	21.12	22.21	21.89	20.98
		15	22.05	23.10	22.80	22.04	21.12	22.21	21.92	20.98
		14	22.10	23.10	22.78	22.05	21.10	21.98	21.89	21.02
		13	22.04	23.05	22.82	22.05	21.15	22.20	21.89	20.98
		12	22.05	22.98	22.78	21.98	21.08	22.18	21.92	21.05
		11	22.01	23.04	22.82	22.07	21.12	22.05	21.92	21.02

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12.3 SVLTE SAR Testing Procedures

SAR testing was additionally performed on the devices at the standalone threshold 1x-RTT CDMA and LTE power levels with respect to the simultaneous transmission scenarios. Additional samples were tuned to fixed reduced power levels for the purpose of evaluating simultaneous SAR based on the sum SAR of the standalone 1x-RTT CDMA and standalone EVDO combinations. While the power reduction mechanism is activated at the CDMA Voice power level of 18 dBm, simultaneous SAR summations of were evaluated at maximum power LTE. SAR was additionally evaluated at reduced power LTE levels to perform simultaneous SAR analysis when CDMA voice is at maximum output power.

12.3.1 Reduced LTE Conducted Powers

Table 12-3
Reduced LTE Conducted Powers

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
Low	1852.5	26065	5	QPSK	1	0	19.20	0	0
	1852.5	26065	5	QPSK	1	24	19.17	0	0
	1852.5	26065	5	QPSK	12	6	19.42	0	0-1
	1852.5	26065	5	QPSK	25	0	19.45	0	0-1
	1852.5	26065	5	16-QAM	1	0	19.25	0	0-1
	1852.5	26065	5	16-QAM	1	24	19.20	0	0-1
	1852.5	26065	5	16-QAM	12	6	19.50	0	0-2
	1852.5	26065	5	16-QAM	25	0	19.48	0	0-2
Mid	1882.5	26365	5	QPSK	1	0	19.18	0	0
	1882.5	26365	5	QPSK	1	24	19.10	0	0
	1882.5	26365	5	QPSK	12	6	19.15	0	0-1
	1882.5	26365	5	QPSK	25	0	19.22	0	0-1
	1882.5	26365	5	16-QAM	1	0	19.10	0	0-1
	1882.5	26365	5	16-QAM	1	24	19.00	0	0-1
	1882.5	26365	5	16-QAM	12	6	19.00	0	0-2
	1882.5	26365	5	16-QAM	25	0	19.27	0	0-2
High	1912.5	26665	5	QPSK	1	0	18.88	0	0
	1912.5	26665	5	QPSK	1	24	18.92	0	0
	1912.5	26665	5	QPSK	12	6	19.18	0	0-1
	1912.5	26665	5	QPSK	25	0	19.30	0	0-1
	1912.5	26665	5	16-QAM	1	0	19.15	0	0-1
	1912.5	26665	5	16-QAM	1	24	19.10	0	0-1
	1912.5	26665	5	16-QAM	12	6	19.32	0	0-2
	1912.5	26665	5	16-QAM	25	0	19.27	0	0-2

General test procedures for LTE can be found in Section 9.3.3. According to FCC KDB 941225 D05:

- 1) The output power across low, mid. and high channel was less than 0.5 dB for QPSK 50% RB, therefore **mid channel was tested for QPSK 50% RB**. Low and high channel SAR tests were not required since the SAR values for all configurations were less than 0.8 W/kg.
- 2) The average output power of QPSK 1 RB configurations was not more than 0.5 dB higher than QPSK with 50% RB, therefore **mid channel (highest SAR measured with QPSK**

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50% RB) was tested for QPSK 1 RB configurations. Low and High channel SAR tests were not required since the SAR was <1.45 W/kg for all configurations.

- 3) The average output power of 16 QAM 50% RB was not more than 0.5 dB higher than QPSK, therefore the **mid channel (highest SAR measured with QPSK 50% RB) was tested for 16 QAM 50 % RB.** Low and High channel SAR tests were not required since the SAR was <1.45 W/kg for all configurations.
- 4) The average output power of 16 QAM 1 RB configurations was not more than 0.5 dB higher than 16 QAM with 50% RB, therefore **mid channel (highest SAR measured with 16 QAM 50% RB) was tested for 16 QAM 1 RB configurations.** Low and High channel SAR tests were not required since the SAR was <1.45 W/kg for all configurations.
- 5) 100% RB Allocation SAR was not required to be tested since the 50% RB SAR was not > 1.45 W/kg.

12.3.2 Fixed CDMA Conducted Powers

Table 12-4
Fixed CDMA Conducted Powers

Band	FCC Rule Part	Channel	Frequency	SO55 [dBm]	SO55 [dBm]	SO75 [dBm]	TDSO SO32 [dBm]	TDSO SO32 [dBm]
		F-RC	MHz	RC1	RC3	RC8	FCH+SCH	FCH
Cellular	90S	564	820.1	18.16	18.10	18.10	18.15	18.12
	22H	1013	824.7	18.23	18.27	18.19	18.24	18.24
		384	836.52	18.39	18.35	18.34	18.35	18.35
		777	848.31	18.23	18.23	18.22	18.20	18.22
PCS	24E	25	1851.25	18.08	18.05	17.97	18.03	18.10
		600	1880	18.11	18.10	17.85	18.04	18.07
		1175	1908.75	18.00	18.00	17.79	17.96	17.97

Note: There is no power reduction applied to the CDMA Voice modes, however the device with output powers represented in the table above was tuned down (for SAR Test purposes only) to analyze simultaneous SAR scenarios in the SVLTE condition where LTE is operating at maximum output power in conjunction with a lower CDMA voice level (See Table 12-1). For FCC Rule Part 90S, Per FCC KDB Publication 447498 6)c), only one channel is required since the device operates within the transmission range of 817.90 – 823.10 MHz.

CDMA 1x Test Notes per KDB Publication 941225 D01:

1. Head SAR was tested with SO55 RC3. SO55 RC1 was not required since the average output power was not more than 0.25 dB than the SO55 RC3 powers.
2. Body-Worn and Hotspot SAR was tested with 1x RTT with TDSO / SO32 FCH Only. TDSO / SO32 FCH+SCH SAR tests were not required since the average output power was not more than 0.25 dB higher than the TDSO / SO32 FCH only powers.

1x Advanced Considerations

1. CDMA 1X Advanced technology was not required for SAR since the maximum output powers for 1x Advanced was not more than 0.25 dB higher than the maximum measured powers for 1x and the measured SAR in any 1x mode exposure conditions was not greater than 1.2 W/kg. See Section 9.2.2 for 1x Advanced test set up.

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13 SYSTEM VERIFICATION

13.1 Tissue Verification

Table 13-1
Measured Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (C°)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ϵ	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ϵ	% dev σ	% dev ϵ
4/6/2012	835H	22.8	820	0.902	42.68	0.898	41.571	0.45%	2.67%
			835	0.916	42.57	0.900	41.500	1.78%	2.58%
			850	0.932	42.46	0.916	41.500	1.75%	2.31%
3/30/2012	1900H	23.2	1850	1.376	41.19	1.400	40.000	-1.71%	2.97%
			1880	1.410	41.16	1.400	40.000	0.71%	2.90%
			1910	1.428	41.01	1.400	40.000	2.00%	2.52%
4/7/2012	1900H	23.3	1850	1.355	40.69	1.400	40.000	-3.21%	1.72%
			1880	1.379	40.66	1.400	40.000	-1.50%	1.65%
			1910	1.402	40.52	1.400	40.000	0.14%	1.30%
4/2/2012	2450H	21.9	2401	1.808	38.25	1.758	39.298	2.84%	-2.67%
			2450	1.868	38.08	1.800	39.200	3.78%	-2.86%
			2499	1.922	37.87	1.852	39.135	3.78%	-3.23%
2/21/2012	5200H-5800H	20.7	5200	4.780	35.30	4.660	36.000	2.58%	-1.94%
			5240	4.828	35.22	4.700	35.960	2.72%	-2.06%
			5320	4.901	35.10	4.780	35.880	2.53%	-2.17%
			5500	5.102	34.84	4.965	35.650	2.76%	-2.27%
			5745	5.379	34.30	5.215	35.355	3.14%	-2.98%
			5800	5.468	34.16	5.270	35.300	3.76%	-3.23%
3/28/2012	835B	22.8	820	0.972	55.64	0.969	55.284	0.31%	0.64%
			835	0.983	55.38	0.970	55.200	1.34%	0.33%
			850	0.997	55.22	0.988	55.154	0.91%	0.12%
4/9/2012	835B	22.8	820	0.970	55.28	0.969	55.284	0.10%	-0.01%
			835	0.989	55.12	0.970	55.200	1.96%	-0.14%
			850	1.004	55.01	0.988	55.154	1.62%	-0.26%
4/2/2012	1900B	22.4	1850	1.451	55.02	1.520	53.300	-4.54%	3.23%
			1880	1.492	54.85	1.520	53.300	-1.84%	2.91%
			1910	1.529	54.90	1.520	53.300	0.59%	3.00%
4/7/2012	1900B	23.3	1850	1.447	54.93	1.520	53.300	-4.80%	3.06%
			1880	1.473	54.84	1.520	53.300	-3.09%	2.89%
			1910	1.503	54.74	1.520	53.300	-1.12%	2.70%
4/3/2012	2450B	23.0	2401	1.865	51.31	1.903	52.765	-2.00%	-2.76%
			2450	1.929	51.17	1.950	52.700	-1.08%	-2.90%
			2499	2.003	50.99	2.019	52.638	-0.79%	-3.13%
2/20/2012	5200B-5800B	22.1	5200	5.357	47.67	5.299	49.014	1.09%	-2.74%
			5240	5.409	47.59	5.346	48.933	1.18%	-2.74%
			5320	5.537	47.40	5.439	48.607	1.80%	-2.48%
			5500	5.805	46.89	5.650	48.580	2.74%	-3.48%
			5745	6.185	46.28	5.936	48.248	4.19%	-4.08%
			5800	6.262	46.21	6.000	48.200	4.37%	-4.13%

The above measured tissue parameters were used in the DASY software to perform interpolation via the DASY software to determine actual dielectric parameters at the test frequencies (per IEEE 1528 6.6.1.2). The SAR test plots may slightly differ from the table due to rounding.

Probe calibration used within ± 100 MHz of the test frequency in either 5.725 - 5.85 or 5.47-5.725 GHz is acceptable per KDB Publication 865664 since the design of the SAR probe supports the extended frequency, provided the DASY software version recommended is used for the tests, and the expanded calibration uncertainty ($k=2$) is less than or equal to 15% (See SAR probe calibration certificate for this information).

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13.2 Measurement Procedure for Tissue verification

- 1) The network analyzer and probe system was configured and calibrated.
- 2) The probe was immersed in the sample which was placed in a nonmetallic container. Trapped air bubbles beneath the flange were minimized by placing the probe at a slight angle.
- 3) The complex admittance with respect to the probe aperture was measured
- 4) The complex relative permittivity ϵ' can be calculated from the below equation (Pournaropoulos and Misra):

$$Y = \frac{j2\omega\epsilon_r\epsilon_0}{[\ln(b/a)]^2} \int_a^b \int_a^b \int_0^\pi \cos\phi' \frac{\exp[-j\omega r(\mu_0\epsilon_r'\epsilon_0)^{1/2}]}{r} d\phi' d\rho' d\rho$$

where Y is the admittance of the probe in contact with the sample, the primed and unprimed coordinates refer to source and observation points, respectively, $r^2 = \rho^2 + \rho'^2 - 2\rho\rho'\cos\phi'$, ω is the angular frequency, and $j = \sqrt{-1}$.

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13.3 Test System Verification

Prior to assessment, the system is verified to $\pm 10\%$ of the manufacturer SAR measurement on the reference dipole at the time of calibration.

Table 13-2
System Verification Results

System Verification TARGET & MEASURED											
Tissue Frequency (MHz)	Tissue Type	Date:	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Dipole SN	Probe SN	Measured SAR _{1g} (W/kg)	1 W Target SAR _{1g} (W/kg)	1 W Normalized SAR _{1g} (W/kg)	Deviation (%)
835	Head	04/06/2012	23.1	22.8	0.100	4d047	3263	0.977	9.410	9.770	3.83%
1900	Head	03/30/2012	23.9	22.1	0.100	5d080	3561	4.17	39.900	41.700	4.51%
1900	Head	04/07/2012	24.0	22.1	0.100	5d080	3561	3.78	39.900	37.800	-5.26%
2450	Head	04/02/2012	22.3	20.7	0.100	797	3263	5.36	52.100	53.600	2.88%
5200	Head	02/21/2012	23.8	22.4	0.100	1007	3589	7.68	79.800	76.800	-3.76%
5500	Head	02/21/2012	23.2	21.9	0.025	1007	3589	2.08	86.300	83.200	-3.59%
5800	Head	02/21/2012	21.8	20.9	0.100	1007	3589	7.94	79.400	79.400	0.00%
835	Body	03/28/2012	23.5	21.8	0.100	4d047	3263	0.992	9.410	9.920	5.42%
835	Body	04/09/2012	23.8	23.1	0.100	4d047	3263	1.00	9.410	10.000	6.27%
1900	Body	04/02/2012	24.5	23.2	0.100	5d149	3561	4.20	39.300	42.000	6.87%
1900	Body	04/07/2012	23.7	23.2	0.100	5d149	3561	4.00	39.300	40.000	1.78%
2450	Body	04/03/2012	23.3	22.1	0.100	797	3263	5.18	50.800	51.800	1.97%
5200	Body	02/20/2012	22.0	20.8	0.100	1007	3589	7.17	75.500	71.700	-5.03%
5500	Body	02/20/2012	21.9	20.7	0.100	1007	3589	7.44	81.300	74.400	-8.49%
5800	Body	02/20/2012	21.8	20.5	0.100	1007	3589	7.06	75.300	70.600	-6.24%

Note: Per KDB Publication 865664, when a reference dipole is not defined within $\pm 100\text{MHz}$ of the test frequency, the system verification may be conducted within $\pm 200\text{ MHz}$ of the center frequency of the measurement frequencies if the SAR probe calibration is valid and the same tissue-equivalent matter is used for verification and test measurements.

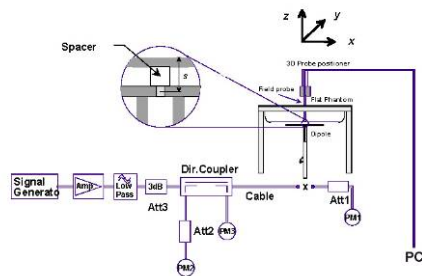


Figure 13-1
System Verification Setup Diagram



Figure 13-2
System Verification Setup Photo

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14 SAR DATA SUMMARY

14.1 Standalone Head SAR Data

Table 14-1
Cell. CDMA – FCC Rule Part 90S Head SAR Results

MEASUREMENT RESULTS											
FREQUENCY		Mode/Band	FCC Rule Part	Service	Target Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	SAR (1g)
MHz	Ch.										(W/kg)
820.10	564	Cell. CDMA	90S	SO55	25	24.85	0.06	Right	Touch	PCT-011	0.114
820.10	564	Cell. CDMA	90S	SO55	25	24.85	0.01	Right	Tilt	PCT-011	0.088
820.10	564	Cell. CDMA	90S	SO55	25	24.85	0.07	Left	Touch	PCT-011	0.101
820.10	564	Cell. CDMA	90S	SO55	25	24.85	0.01	Left	Tilt	PCT-011	0.074
820.10	564	Cell. CDMA	90S	SO55	18	18.10	0.18	Right	Touch	PCT-004	0.026
820.10	564	Cell. CDMA	90S	SO55	18	18.10	0.06	Right	Tilt	PCT-004	0.017
820.10	564	Cell. CDMA	90S	SO55	18	18.10	0.19	Left	Touch	PCT-004	0.020
820.10	564	Cell. CDMA	90S	SO55	18	18.10	0.20	Left	Tilt	PCT-004	0.015
820.10	564	Cell. CDMA	90S	SO55	15	15.25	0.19	Right	Touch	PCT-008	0.015
820.10	564	Cell. CDMA	90S	SO55	15	15.25	0.13	Right	Tilt	PCT-008	0.011
820.10	564	Cell. CDMA	90S	SO55	15	15.25	0.04	Left	Touch	PCT-008	0.013
820.10	564	Cell. CDMA	90S	SO55	15	15.25	0.14	Left	Tilt	PCT-008	0.009
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram			

Table 14-2
Cell. CDMA – FCC Rule Part 22H Head SAR Results

MEASUREMENT RESULTS											
FREQUENCY		Mode/Band	FCC Rule Part	Service	Target Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	SAR (1g)
MHz	Ch.										(W/kg)
836.52	384	Cell. CDMA	22H	SO55	25	24.90	0.15	Right	Touch	PCT-011	0.100
836.52	384	Cell. CDMA	22H	SO55	25	24.90	0.18	Right	Tilt	PCT-011	0.068
836.52	384	Cell. CDMA	22H	SO55	25	24.90	0.02	Left	Touch	PCT-011	0.100
836.52	384	Cell. CDMA	22H	SO55	25	24.90	0.08	Left	Tilt	PCT-011	0.070
836.52	384	Cell. CDMA	22H	SO55	18	18.35	0.05	Right	Touch	PCT-004	0.025
836.52	384	Cell. CDMA	22H	SO55	18	18.35	0.02	Right	Tilt	PCT-004	0.016
836.52	384	Cell. CDMA	22H	SO55	18	18.35	0.04	Left	Touch	PCT-004	0.020
836.52	384	Cell. CDMA	22H	SO55	18	18.35	0.20	Left	Tilt	PCT-004	0.014
836.52	384	Cell. CDMA	22H	SO55	15	15.27	0.10	Right	Touch	PCT-008	0.016
836.52	384	Cell. CDMA	22H	SO55	15	15.27	0.07	Right	Tilt	PCT-008	0.010
836.52	384	Cell. CDMA	22H	SO55	15	15.27	0.05	Left	Touch	PCT-008	0.012
836.52	384	Cell. CDMA	22H	SO55	15	15.27	0.15	Left	Tilt	PCT-008	0.009
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram			

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Table 14-3
PCS CDMA-FCC Rule Part 24E Head SAR Results

MEASUREMENT RESULTS											
FREQUENCY		Mode/Band	FCC Rule Part	Service	Target Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	SAR (1g)
MHz	Ch.										(W/kg)
1880.00	600	PCS CDMA	24E	SO55	25	24.82	0.00	Right	Touch	PCT-011	0.305
1880.00	600	PCS CDMA	24E	SO55	25	24.82	0.04	Right	Tilt	PCT-011	0.095
1880.00	600	PCS CDMA	24E	SO55	25	24.82	0.04	Left	Touch	PCT-011	0.422
1880.00	600	PCS CDMA	24E	SO55	25	24.82	-0.10	Left	Tilt	PCT-011	0.115
1880.00	600	PCS CDMA	24E	SO55	18	18.10	0.13	Right	Touch	PCT-004	0.061
1880.00	600	PCS CDMA	24E	SO55	18	18.10	0.14	Right	Tilt	PCT-004	0.017
1880.00	600	PCS CDMA	24E	SO55	18	18.10	0.04	Left	Touch	PCT-004	0.072
1880.00	600	PCS CDMA	24E	SO55	18	18.10	0.05	Left	Tilt	PCT-004	0.019
1880.00	600	PCS CDMA	24E	SO55	15	14.90	0.11	Right	Touch	PCT-008	0.028
1880.00	600	PCS CDMA	24E	SO55	15	14.90	-0.13	Right	Tilt	PCT-008	0.007
1880.00	600	PCS CDMA	24E	SO55	15	14.90	-0.01	Left	Touch	PCT-008	0.048
1880.00	600	PCS CDMA	24E	SO55	15	14.90	0.04	Left	Tilt	PCT-008	0.011
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram			

Table 14-4
Cell. EVDO – FCC Rule Part 90S Head SAR Results

MEASUREMENT RESULTS											
FREQUENCY		Mode	FCC Rule Part	Service	Target Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	SAR (1g)
MHz	Ch.										(W/kg)
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	25	25.27	0.03	Right	Touch	PCT-005	0.219
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	25	25.27	0.16	Right	Tilt	PCT-005	0.163
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	25	25.27	0.04	Left	Touch	PCT-005	0.241
820.10	564	Cell. EVDO	90S	EVDO Rev. A	25	25.18	-0.02	Left	Touch	PCT-005	0.239
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	25	25.27	0.02	Left	Tilt	PCT-005	0.165
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	19	19.25	0.16	Right	Touch	PCT-012	0.049
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	19	19.25	0.06	Right	Tilt	PCT-012	0.039
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	19	19.25	0.09	Left	Touch	PCT-012	0.058
820.10	564	Cell. EVDO	90S	EVDO Rev. A	19	19.33	-0.03	Left	Touch	PCT-012	0.058
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	19	19.25	0.11	Left	Tilt	PCT-012	0.042
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram			

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Table 14-5
Cell. EVDO – FCC Rule Part 22H Head SAR Results

MEASUREMENT RESULTS											
FREQUENCY		Mode	FCC Rule Part	Service	Target Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	SAR (1g)
MHz	Ch.										(W/kg)
836.52	384	Cell.EVDO	22H	EVDO Rev. 0	25	25.12	-0.12	Right	Touch	PCT-005	0.307
836.52	384	Cell.EVDO	22H	EVDO Rev. 0	25	25.12	0.02	Right	Tilt	PCT-005	0.218
836.52	384	Cell.EVDO	22H	EVDO Rev. 0	25	25.12	-0.13	Left	Touch	PCT-005	0.322
836.52	384	Cell.EVDO	22H	EVDO Rev. A	25	25.23	-0.02	Left	Touch	PCT-005	0.314
836.52	384	Cell.EVDO	22H	EVDO Rev. 0	25	25.12	-0.05	Left	Tilt	PCT-005	0.191
836.52	384	Cell.EVDO	22H	EVDO Rev. 0	19	19.34	0.14	Right	Touch	PCT-012	0.067
836.52	384	Cell.EVDO	22H	EVDO Rev. 0	19	19.34	-0.01	Right	Tilt	PCT-012	0.047
836.52	384	Cell.EVDO	22H	EVDO Rev. 0	19	19.34	0.07	Left	Touch	PCT-012	0.079
836.52	384	Cell.EVDO	22H	EVDO Rev. A	19	19.40	0.06	Left	Touch	PCT-012	0.080
836.52	384	Cell.EVDO	22H	EVDO Rev. 0	19	19.34	0.06	Left	Tilt	PCT-012	0.050
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram			

Table 14-6
PCS EVDO – FCC Rule Part 24E Head SAR Results

MEASUREMENT RESULTS											
FREQUENCY		Mode	FCC Rule Part	Service	Target Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	SAR (1g)
MHz	Ch.										(W/kg)
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	25	24.84	0.09	Right	Touch	PCT-005	0.182
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	25	24.84	0.07	Right	Tilt	PCT-005	0.079
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	25	24.84	-0.01	Left	Touch	PCT-005	0.230
1880.00	600	PCS EVDO	24E	EVDO Rev. A	25	24.91	0.01	Left	Touch	PCT-005	0.234
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	25	24.84	-0.03	Left	Tilt	PCT-005	0.043
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	19	19.09	0.03	Right	Touch	PCT-012	0.042
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	19	19.09	0.04	Right	Tilt	PCT-012	0.013
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	19	19.09	0.15	Left	Touch	PCT-012	0.053
1908.75	1175	PCS EVDO	24E	EVDO Rev. A	19	19.16	-0.05	Left	Touch	PCT-012	0.055
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	19	19.09	0.10	Left	Tilt	PCT-012	0.009
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram			

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Table 14-7
LTE Head SAR Results – Maximum Power

MEASUREMENT RESULTS																
FREQUENCY			Mode	FCC Rule Part	Bandwidth [MHz]	Target Power [dBm]	MPR [dB]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Modulation	# of RB	RB Offset	Device Serial Number	SAR (1g)
MHz	Ch.															(W/kg)
1882.5	26365	Mid	LTE Band 25	24E	5	22	1	22.01	0.07	Right	Touch	QPSK	12	6	PCT-003	0.112
1852.5	26065	Low	LTE Band 25	24E	5	23	0	23.05	-0.16	Right	Touch	QPSK	1	0	PCT-003	0.114
1852.5	26065	Low	LTE Band 25	24E	5	23	0	23.02	0.06	Right	Touch	QPSK	1	24	PCT-003	0.116
1882.5	26365	Mid	LTE Band 25	24E	5	21	2	20.90	0.07	Right	Touch	16 QAM	12	6	PCT-003	0.085
1852.5	26065	Low	LTE Band 25	24E	5	22	1	22.17	0.11	Right	Touch	16 QAM	1	0	PCT-003	0.099
1852.5	26065	Low	LTE Band 25	24E	5	22	1	22.10	0.14	Right	Touch	16 QAM	1	24	PCT-003	0.093
1882.5	26365	Mid	LTE Band 25	24E	5	22	1	22.01	0.18	Right	Tilt	QPSK	12	6	PCT-003	0.034
1852.5	26065	Low	LTE Band 25	24E	5	23	0	23.05	0.01	Right	Tilt	QPSK	1	0	PCT-003	0.041
1852.5	26065	Low	LTE Band 25	24E	5	23	0	23.02	-0.19	Right	Tilt	QPSK	1	24	PCT-003	0.041
1882.5	26365	Mid	LTE Band 25	24E	5	21	2	20.90	0.01	Right	Tilt	16 QAM	12	6	PCT-003	0.024
1852.5	26065	Low	LTE Band 25	24E	5	22	1	22.17	0.04	Right	Tilt	16 QAM	1	0	PCT-003	0.027
1852.5	26065	Low	LTE Band 25	24E	5	22	1	22.10	-0.01	Right	Tilt	16 QAM	1	24	PCT-003	0.032
1882.5	26365	Mid	LTE Band 25	24E	5	22	1	22.01	0.01	Left	Touch	QPSK	12	6	PCT-003	0.136
1852.5	26065	Low	LTE Band 25	24E	5	23	0	23.05	-0.12	Left	Touch	QPSK	1	0	PCT-003	0.138
1852.5	26065	Low	LTE Band 25	24E	5	23	0	23.02	-0.05	Left	Touch	QPSK	1	24	PCT-003	0.136
1882.5	26365	Mid	LTE Band 25	24E	5	21	2	20.90	0.18	Left	Touch	16 QAM	12	6	PCT-003	0.104
1852.5	26065	Low	LTE Band 25	24E	5	22	1	22.17	0.08	Left	Touch	16 QAM	1	0	PCT-003	0.108
1852.5	26065	Low	LTE Band 25	24E	5	22	1	22.10	0.11	Left	Touch	16 QAM	1	24	PCT-003	0.109
1882.5	26365	Mid	LTE Band 25	24E	5	22	1	22.01	0.03	Left	Tilt	QPSK	12	6	PCT-003	0.021
1852.5	26065	Low	LTE Band 25	24E	5	23	0	23.05	0.16	Left	Tilt	QPSK	1	0	PCT-003	0.023
1852.5	26065	Low	LTE Band 25	24E	5	23	0	23.02	0.20	Left	Tilt	QPSK	1	24	PCT-003	0.029
1882.5	26365	Mid	LTE Band 25	24E	5	21	2	20.90	0.19	Left	Tilt	16 QAM	12	6	PCT-003	0.016
1852.5	26065	Low	LTE Band 25	24E	5	22	1	22.17	0.03	Left	Tilt	16 QAM	1	0	PCT-003	0.022
1852.5	26065	Low	LTE Band 25	24E	5	22	1	22.10	0.22	Left	Tilt	16 QAM	1	24	PCT-003	0.021
ANSI / IEEE C95.1 1992 - SAFETY LIMIT										Head 1.6 W/kg (mW/g) averaged over 1 gram						
Spatial Peak Uncontrolled Exposure/General Population																

Note: Per KDB 941225 D05, when the maximum average output power of 1 RB allocation is more than 0.5 dB higher than the 50% RB allocation, the highest output power for the 1 RB allocations is tested.

Therefore, low channel was tested for the QPSK, 1 RB allocation and 16 QAM, 1 RB allocation configurations.

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Table 14-8
LTE Head SAR Results – Reduced Power

MEASUREMENT RESULTS																
FREQUENCY			Mode	FCC Rule Part	Bandwidth [MHz]	Target Power [dBm]	MPR [dB]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Modulation	# of RB	RB Offset	Device Serial Number	SAR (1g)
MHz	Ch.															(W/kg)
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.15	0.04	Right	Touch	QPSK	12	6	PCT-007	0.055
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.18	-0.08	Right	Touch	QPSK	1	0	PCT-007	0.052
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.10	0.04	Right	Touch	QPSK	1	24	PCT-007	0.055
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.00	0.03	Right	Touch	16 QAM	12	6	PCT-007	0.055
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.10	-0.02	Right	Touch	16 QAM	1	0	PCT-007	0.056
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.00	0.12	Right	Touch	16 QAM	1	24	PCT-007	0.060
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.15	0.14	Right	Tilt	QPSK	12	6	PCT-007	0.020
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.18	0.12	Right	Tilt	QPSK	1	0	PCT-007	0.017
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.10	0.13	Right	Tilt	QPSK	1	24	PCT-007	0.017
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.00	0.19	Right	Tilt	16 QAM	12	6	PCT-007	0.020
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.10	0.01	Right	Tilt	16 QAM	1	0	PCT-007	0.020
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.00	0.13	Right	Tilt	16 QAM	1	24	PCT-007	0.020
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.15	0.16	Left	Touch	QPSK	12	6	PCT-007	0.052
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.18	0.11	Left	Touch	QPSK	1	0	PCT-007	0.042
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.10	0.19	Left	Touch	QPSK	1	24	PCT-007	0.049
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.00	0.14	Left	Touch	16 QAM	12	6	PCT-007	0.051
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.10	0.08	Left	Touch	16 QAM	1	0	PCT-007	0.044
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.00	0.10	Left	Touch	16 QAM	1	24	PCT-007	0.050
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.15	0.04	Left	Tilt	QPSK	12	6	PCT-007	0.012
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.18	0.04	Left	Tilt	QPSK	1	0	PCT-007	0.010
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.10	0.04	Left	Tilt	QPSK	1	24	PCT-007	0.012
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.00	0.03	Left	Tilt	16 QAM	12	6	PCT-007	0.011
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.10	-0.12	Left	Tilt	16 QAM	1	0	PCT-007	0.010
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.00	0.01	Left	Tilt	16 QAM	1	24	PCT-007	0.012
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram						

Table 14-9
2.4 GHz WIFI Head SAR Results

MEASUREMENT RESULTS											
FREQUENCY		Mode	FCC Rule Part	Service	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	SAR (1g)
MHz	Ch.										(W/kg)
2462	11	IEEE 802.11b	15C	DSSS	14.45	0.03	Right	Touch	PCT-006	1	0.013
2462	11	IEEE 802.11b	15C	DSSS	14.45	0.06	Right	Tilt	PCT-006	1	0.009
2462	11	IEEE 802.11b	15C	DSSS	14.45	0.10	Left	Touch	PCT-006	1	0.027
2462	11	IEEE 802.11b	15C	DSSS	14.45	0.18	Left	Tilt	PCT-006	1	0.013
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram				

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Table 14-10
5 GHz WIFI Head SAR Results

MEASUREMENT RESULTS											
FREQUENCY		Mode	FCC Rule Part	Service	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	SAR (1g)
MHz	Ch.										(W/kg)
5745	149	IEEE 802.11a	15C	OFDM	12.24	0.01	Right	Touch	D2-0445	6	0.032
5745	149	IEEE 802.11a	15C	OFDM	12.24	0.03	Right	Tilt	D2-0445	6	0.027
5745	149	IEEE 802.11a	15C	OFDM	12.24	0.13	Left	Touch	D2-0445	6	0.033
5745	149	IEEE 802.11a	15C	OFDM	12.24	0.20	Left	Tilt	D2-0445	6	0.016
5240	48	IEEE 802.11a	15E	OFDM	11.70	0.05	Right	Touch	D2-0445	6	0.012
5240	48	IEEE 802.11a	15E	OFDM	11.70	0.16	Right	Tilt	D2-0445	6	0.014
5240	48	IEEE 802.11a	15E	OFDM	11.70	0.03	Left	Touch	D2-0445	6	0.027
5240	48	IEEE 802.11a	15E	OFDM	11.70	0.05	Left	Tilt	D2-0445	6	0.022
5320	64	IEEE 802.11a	15E	OFDM	11.82	0.06	Right	Touch	D2-0445	6	0.024
5320	64	IEEE 802.11a	15E	OFDM	11.82	0.12	Right	Tilt	D2-0445	6	0.029
5320	64	IEEE 802.11a	15E	OFDM	11.82	0.09	Left	Touch	D2-0445	6	0.034
5320	64	IEEE 802.11a	15E	OFDM	11.82	0.05	Left	Tilt	D2-0445	6	0.022
5500	100	IEEE 802.11a	15E	OFDM	12.40	0.03	Right	Touch	D2-0445	6	0.062
5500	100	IEEE 802.11a	15E	OFDM	12.40	0.08	Right	Tilt	D2-0445	6	0.063
5500	100	IEEE 802.11a	15E	OFDM	12.40	0.01	Left	Touch	D2-0445	6	0.062
5500	100	IEEE 802.11a	15E	OFDM	12.40	0.01	Left	Tilt	D2-0445	6	0.072
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram				

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14.2 Standalone Body-Worn SAR Data

Table 14-11
CDMA Body-Worn SAR Results

MEASUREMENT RESULTS											
FREQUENCY		Mode	FCC Rule Part	Service	Target Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Side	SAR (1g)
MHz	Ch.										(W/kg)
820.10	564	Cell. CDMA	90S	TDSO / SO32	25	24.84	0.07	1.0 cm	PCT-011	back	0.489
820.10	564	Cell. CDMA	90S	TDSO / SO32	18	18.12	0.05	1.0 cm	PCT-004	back	0.072
820.10	564	Cell. CDMA	90S	TDSO / SO32	15	15.22	0.15	1.0 cm	PCT-008	back	0.034
836.52	384	Cell. CDMA	22H	TDSO / SO32	25	24.93	-0.14	1.0 cm	PCT-011	back	0.495
836.52	384	Cell. CDMA	22H	TDSO / SO32	18	18.35	0.06	1.0 cm	PCT-004	back	0.084
836.52	384	Cell. CDMA	22H	TDSO / SO32	15	15.24	0.18	1.0 cm	PCT-008	back	0.040
1851.25	25	PCS CDMA	24E	TDSO / SO32	25	24.95	-0.02	1.0 cm	PCT-011	back	1.010
1880.00	600	PCS CDMA	24E	TDSO / SO32	25	24.82	-0.01	1.0 cm	PCT-011	back	1.030
1908.75	1175	PCS CDMA	24E	TDSO / SO32	25	24.80	0.05	1.0 cm	PCT-011	back	1.020
1880.00	600	PCS CDMA	24E	TDSO / SO32	18	18.07	0.00	1.0 cm	PCT-004	back	0.245
1880.00	600	PCS CDMA	24E	TDSO / SO32	15	14.90	-0.15	1.0 cm	PCT-008	back	0.107
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram			

Note: For CDMA mode, hotspot back side SAR Data was considered as body-worn SAR data per FCC KDB Publication 941225 D06. CDMA 1x-RTT SAR was required to be evaluated for hotspot exposure configurations since there are simultaneous combinations **Table 1-2** that allow hotspot transmissions using CDMA 1x-RTT.

Table 14-12
EVDO Body-Worn SAR Results

MEASUREMENT RESULTS											
FREQUENCY		Mode	FCC Rule Part	Service	Target Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Side	SAR (1g)
MHz	Ch.										(W/kg)
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	25	25.27	0.08	1.0 cm	PCT-005	back	0.645
820.10	564	Cell. EVDO	90S	EVDO Rev. A	25	25.18	-0.05	1.0 cm	PCT-005	back	0.645
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	19	19.25	0.04	1.0 cm	PCT-012	back	0.151
820.10	564	Cell. EVDO	90S	EVDO Rev. A	19	19.33	-0.02	1.0 cm	PCT-012	back	0.140
824.70	1013	Cell. EVDO	22H	EVDO Rev. 0	25	24.98	-0.01	1.0 cm	PCT-005	back	0.509
836.52	384	Cell. EVDO	22H	EVDO Rev. 0	25	25.12	0.04	1.0 cm	PCT-005	back	0.825
836.52	384	Cell. EVDO	22H	EVDO Rev. A	25	25.23	-0.15	1.0 cm	PCT-005	back	0.835
848.31	777	Cell. EVDO	22H	EVDO Rev. 0	25	24.78	-0.04	1.0 cm	PCT-005	back	0.617
836.52	384	Cell. EVDO	22H	EVDO Rev. 0	19	19.34	0.09	1.0 cm	PCT-012	back	0.194
836.52	384	Cell. EVDO	22H	EVDO Rev. A	19	19.40	-0.06	1.0 cm	PCT-012	back	0.186
1851.25	25	PCS EVDO	24E	EVDO Rev. 0	25	24.72	0.01	1.0 cm	PCT-005	back	0.920
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	25	24.84	0.05	1.0 cm	PCT-005	back	0.979
1880.00	600	PCS EVDO	24E	EVDO Rev. A	25	24.91	0.05	1.0 cm	PCT-005	back	1.100
1908.75	1175	PCS EVDO	24E	EVDO Rev. 0	25	24.73	0.04	1.0 cm	PCT-005	back	1.080
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	19	19.09	-0.01	1.0 cm	PCT-012	back	0.258
1908.75	1175	PCS EVDO	24E	EVDO Rev. 0	19	19.16	-0.03	1.0 cm	PCT-012	back	0.339
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram			

Note: For EVDO mode, hotspot back side SAR Data was considered as body-worn SAR data per FCC KDB Publication 941225 D06. EVDO SAR was required to be evaluated for body-worn exposure configurations since there are simultaneous combinations per **Table 1-2** that allow body-worn transmissions using EVDO.

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Table 14-13
LTE Body-Worn SAR Results

MEASUREMENT RESULTS																
FREQUENCY			Mode	FCC Rule Part	Bandwidth [MHz]	Target Power [dBm]	MPR [dB]	Conducted Power [dBm]	Power Drift [dB]	Device Serial Number	Modulation	# of RB	RB Offset	Spacing	Side	SAR (1g)
MHz	Ch.															(W/kg)
1882.5	26365	Mid	LTE Band 25	24E	5	22	1	22.01	-0.02	PCT-003	QPSK	12	6	1.0 cm	back	0.584
1852.5	26065	Low	LTE Band 25	24E	5	23	0	23.05	0.02	PCT-003	QPSK	1	0	1.0 cm	back	0.705
1852.5	26065	Low	LTE Band 25	24E	5	23	0	23.02	0.00	PCT-003	QPSK	1	24	1.0 cm	back	0.744
1882.5	26365	Mid	LTE Band 25	24E	5	21	2	20.90	0.10	PCT-003	16 QAM	12	6	1.0 cm	back	0.467
1852.5	26065	Low	LTE Band 25	24E	5	22	1	22.17	-0.02	PCT-003	16 QAM	1	0	1.0 cm	back	0.567
1852.5	26065	Low	LTE Band 25	24E	5	22	1	22.10	-0.17	PCT-003	16 QAM	1	24	1.0 cm	back	0.573
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.15	-0.05	PCT-007	QPSK	12	6	1.0 cm	back	0.295
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.18	0.10	PCT-007	QPSK	1	0	1.0 cm	back	0.292
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.10	-0.02	PCT-007	QPSK	1	24	1.0 cm	back	0.302
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.00	-0.02	PCT-007	16 QAM	12	6	1.0 cm	back	0.286
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.10	0.01	PCT-007	16 QAM	1	0	1.0 cm	back	0.290
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.00	0.09	PCT-007	16 QAM	1	24	1.0 cm	back	0.301
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram						

Note: For LTE mode, hotspot back side SAR Data was considered as body-worn SAR data per FCC KDB Publication 941225 D06. Per KDB 941225 D05, when the maximum average output power of 1 RB allocation is more than 0.5 dB higher than the 50% RB allocation, the highest output power for the 1 RB allocations is tested. Therefore, low channel for was tested for the QPSK, 1 RB allocation and 16 QAM, 1 RB allocation configurations at 23 dBm.

Table 14-14
WIFI Body-Worn SAR Results

MEASUREMENT RESULTS											
FREQUENCY		Mode	FCC Rule Part	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	SAR (1g)
MHz	Ch.										(W/kg)
2462	11	IEEE 802.11b	15C	DSSS	14.45	-0.09	1.0 cm	PCT-006	1	back	0.066
5745	149	IEEE 802.11a	15C	OFDM	12.24	-0.08	1.0 cm	D2-0445	6	back	0.172
5240	48	IEEE 802.11a	15E	OFDM	11.70	-0.11	1.0 cm	D2-0445	6	back	0.216
5320	64	IEEE 802.11a	15E	OFDM	11.82	0.11	1.0 cm	D2-0445	6	back	0.190
5500	100	IEEE 802.11a	15E	OFDM	12.40	-0.17	1.0 cm	D2-0445	6	back	0.267
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram			

Note: For 802.11b mode, hotspot back side SAR Data was considered as body-worn SAR data per FCC KDB Publication 941225 D06.

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14.3 Standalone Wireless Router SAR Data

Table 14-15
Cell. CDMA Hotspot SAR Results

MEASUREMENT RESULTS											
FREQUENCY		Mode	FCC Rule Part	Service	Target Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Side	SAR (1g)
MHz	Ch.										(W/kg)
820.10	564	Cell. CDMA	90S	TDSO / SO32	25	24.84	0.07	1.0 cm	PCT-011	back	0.489
820.10	564	Cell. CDMA	90S	TDSO / SO32	25	24.84	-0.04	1.0 cm	PCT-011	front	0.251
820.10	564	Cell. CDMA	90S	TDSO / SO32	25	24.84	0.07	1.0 cm	PCT-011	bottom	0.180
820.10	564	Cell. CDMA	90S	TDSO / SO32	25	24.84	0.09	1.0 cm	PCT-011	right	0.336
820.10	564	Cell. CDMA	90S	TDSO / SO32	18	18.12	0.05	1.0 cm	PCT-004	back	0.072
820.10	564	Cell. CDMA	90S	TDSO / SO32	18	18.12	0.06	1.0 cm	PCT-004	front	0.039
820.10	564	Cell. CDMA	90S	TDSO / SO32	18	18.12	0.19	1.0 cm	PCT-004	bottom	0.026
820.10	564	Cell. CDMA	90S	TDSO / SO32	18	18.12	0.10	1.0 cm	PCT-004	right	0.049
820.10	564	Cell. CDMA	90S	TDSO / SO32	15	15.22	0.15	1.0 cm	PCT-008	back	0.034
820.10	564	Cell. CDMA	90S	TDSO / SO32	15	15.22	0.13	1.0 cm	PCT-008	front	0.023
820.10	564	Cell. CDMA	90S	TDSO / SO32	15	15.22	0.18	1.0 cm	PCT-008	bottom	0.013
820.10	564	Cell. CDMA	90S	TDSO / SO32	15	15.22	0.11	1.0 cm	PCT-008	right	0.025
836.52	384	Cell. CDMA	22H	TDSO / SO32	25	24.93	-0.14	1.0 cm	PCT-011	back	0.495
836.52	384	Cell. CDMA	22H	TDSO / SO32	25	24.93	-0.01	1.0 cm	PCT-011	front	0.251
836.52	384	Cell. CDMA	22H	TDSO / SO32	25	24.93	-0.12	1.0 cm	PCT-011	bottom	0.218
836.52	384	Cell. CDMA	22H	TDSO / SO32	25	24.93	0.07	1.0 cm	PCT-011	right	0.308
836.52	384	Cell. CDMA	22H	TDSO / SO32	18	18.35	0.06	1.0 cm	PCT-004	back	0.084
836.52	384	Cell. CDMA	22H	TDSO / SO32	18	18.35	0.16	1.0 cm	PCT-004	front	0.036
836.52	384	Cell. CDMA	22H	TDSO / SO32	18	18.35	0.07	1.0 cm	PCT-004	bottom	0.032
836.52	384	Cell. CDMA	22H	TDSO / SO32	18	18.35	0.04	1.0 cm	PCT-004	right	0.042
836.52	384	Cell. CDMA	22H	TDSO / SO32	15	15.24	0.18	1.0 cm	PCT-008	back	0.040
836.52	384	Cell. CDMA	22H	TDSO / SO32	15	15.24	0.09	1.0 cm	PCT-008	front	0.024
836.52	384	Cell. CDMA	22H	TDSO / SO32	15	15.24	0.03	1.0 cm	PCT-008	bottom	0.017
836.52	384	Cell. CDMA	22H	TDSO / SO32	15	15.24	0.02	1.0 cm	PCT-008	right	0.028
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram			

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Table 14-16
PCS CDMA Hotspot SAR Results

MEASUREMENT RESULTS											
FREQUENCY		Mode	FCC Rule Part	Service	Target Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Side	SAR (1g)
MHz	Ch.										(W/kg)
1851.25	25	PCS CDMA	24E	TDSO / SO32	25	24.95	-0.02	1.0 cm	PCT-011	back	1.010
1880.00	600	PCS CDMA	24E	TDSO / SO32	25	24.82	-0.01	1.0 cm	PCT-011	back	1.030
1908.75	1175	PCS CDMA	24E	TDSO / SO32	25	24.80	0.05	1.0 cm	PCT-011	back	1.020
1880.00	600	PCS CDMA	24E	TDSO / SO32	25	24.82	-0.01	1.0 cm	PCT-011	front	0.598
1880.00	600	PCS CDMA	24E	TDSO / SO32	25	24.82	0.03	1.0 cm	PCT-011	bottom	0.624
1880.00	600	PCS CDMA	24E	TDSO / SO32	25	24.82	0.00	1.0 cm	PCT-011	right	0.297
1880.00	600	PCS CDMA	24E	TDSO / SO32	18	18.07	0.00	1.0 cm	PCT-004	back	0.245
1880.00	600	PCS CDMA	24E	TDSO / SO32	18	18.07	0.03	1.0 cm	PCT-004	front	0.172
1880.00	600	PCS CDMA	24E	TDSO / SO32	18	18.07	-0.03	1.0 cm	PCT-004	bottom	0.184
1880.00	600	PCS CDMA	24E	TDSO / SO32	18	18.07	0.05	1.0 cm	PCT-004	right	0.059
1880.00	600	PCS CDMA	24E	TDSO / SO32	15	14.90	-0.15	1.0 cm	PCT-008	back	0.107
1880.00	600	PCS CDMA	24E	TDSO / SO32	15	14.90	0.05	1.0 cm	PCT-008	front	0.071
1880.00	600	PCS CDMA	24E	TDSO / SO32	15	14.90	0.05	1.0 cm	PCT-008	bottom	0.069
1880.00	600	PCS CDMA	24E	TDSO / SO32	15	14.90	0.18	1.0 cm	PCT-008	right	0.022
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram			

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Table 14-17
Cell. EVDO Hotspot SAR Results

MEASUREMENT RESULTS											
FREQUENCY		Mode	FCC Rule Part	Service	Target Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Side	SAR (1g)
MHz	Ch.										(W/kg)
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	25	25.27	0.08	1.0 cm	PCT-005	back	0.645
820.10	564	Cell. EVDO	90S	EVDO Rev. A	25	25.18	-0.05	1.0 cm	PCT-005	back	0.645
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	25	25.27	-0.04	1.0 cm	PCT-005	front	0.354
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	25	25.27	0.01	1.0 cm	PCT-005	bottom	0.249
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	25	25.27	-0.03	1.0 cm	PCT-005	left	0.445
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	19	19.25	0.04	1.0 cm	PCT-012	back	0.151
820.10	564	Cell. EVDO	90S	EVDO Rev. A	19	19.33	-0.02	1.0 cm	PCT-012	back	0.140
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	19	19.25	0.01	1.0 cm	PCT-012	front	0.081
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	19	19.25	0.01	1.0 cm	PCT-012	bottom	0.067
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	19	19.25	-0.04	1.0 cm	PCT-012	left	0.111
824.70	1013	Cell. EVDO	22H	EVDO Rev. 0	25	24.98	-0.01	1.0 cm	PCT-005	back	0.509
836.52	384	Cell. EVDO	22H	EVDO Rev. 0	25	25.12	0.04	1.0 cm	PCT-005	back	0.825
836.52	384	Cell. EVDO	22H	EVDO Rev. A	25	25.23	-0.15	1.0 cm	PCT-005	back	0.835
848.31	777	Cell. EVDO	22H	EVDO Rev. 0	25	24.78	-0.04	1.0 cm	PCT-005	back	0.617
836.52	384	Cell. EVDO	22H	EVDO Rev. 0	25	25.12	-0.06	1.0 cm	PCT-005	front	0.510
836.52	384	Cell. EVDO	22H	EVDO Rev. 0	25	25.12	0.07	1.0 cm	PCT-005	bottom	0.440
836.52	384	Cell. EVDO	22H	EVDO Rev. 0	25	25.12	-0.02	1.0 cm	PCT-005	left	0.672
836.52	384	Cell. EVDO	22H	EVDO Rev. 0	19	19.34	0.09	1.0 cm	PCT-012	back	0.194
836.52	384	Cell. EVDO	22H	EVDO Rev. A	19	19.40	-0.06	1.0 cm	PCT-012	back	0.186
836.52	384	Cell. EVDO	22H	EVDO Rev. 0	19	19.34	-0.06	1.0 cm	PCT-012	front	0.124
836.52	384	Cell. EVDO	22H	EVDO Rev. 0	19	19.34	0.01	1.0 cm	PCT-012	bottom	0.116
836.52	384	Cell. EVDO	22H	EVDO Rev. 0	19	19.34	-0.02	1.0 cm	PCT-012	left	0.163
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram			

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Table 14-18
PCS EVDO Hotspot SAR Results

MEASUREMENT RESULTS											
FREQUENCY		Mode	FCC Rule Part	Service	Target Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Side	SAR (1g)
MHz	Ch.										(W/kg)
1851.25	25	PCS EVDO	24E	EVDO Rev. 0	25	24.72	0.01	1.0 cm	PCT-005	back	0.920
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	25	24.84	0.05	1.0 cm	PCT-005	back	0.979
1880.00	600	PCS EVDO	24E	EVDO Rev. A	25	24.91	0.05	1.0 cm	PCT-005	back	1.100
1908.75	1175	PCS EVDO	24E	EVDO Rev. 0	25	24.73	0.04	1.0 cm	PCT-005	back	1.080
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	25	24.84	0.00	1.0 cm	PCT-005	front	0.567
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	25	24.84	0.04	1.0 cm	PCT-005	bottom	0.773
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	25	24.84	0.00	1.0 cm	PCT-005	left	0.162
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	19	19.09	-0.01	1.0 cm	PCT-012	back	0.258
1908.75	1175	PCS EVDO	24E	EVDO Rev. 0	19	19.16	-0.03	1.0 cm	PCT-012	back	0.339
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	19	19.09	0.15	1.0 cm	PCT-012	front	0.155
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	19	19.09	0.11	1.0 cm	PCT-012	bottom	0.190
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	19	19.09	0.03	1.0 cm	PCT-012	left	0.035
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram			

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Table 14-19
LTE Hotspot SAR Results – Maximum Power

MEASUREMENT RESULTS																
FREQUENCY			Mode	FCC Rule Part	Bandwidth [MHz]	Target Power [dBm]	MPR [dB]	Conducted Power [dBm]	Power Drift [dB]	Device Serial Number	Modulation	# of RB	RB Offset	Spacing	Side	SAR (1g) (W/kg)
MHz	Ch.	High														
1882.5	26365	Mid	LTE Band 25	24E	5	22	1	22.01	-0.02	PCT-003	QPSK	12	6	1.0 cm	back	0.584
1852.5	26065	Low	LTE Band 25	24E	5	23	0	23.05	0.02	PCT-003	QPSK	1	0	1.0 cm	back	0.705
1852.5	26065	Low	LTE Band 25	24E	5	23	0	23.02	0.00	PCT-003	QPSK	1	24	1.0 cm	back	0.744
1882.5	26365	Mid	LTE Band 25	24E	5	21	2	20.90	0.10	PCT-003	16 QAM	12	6	1.0 cm	back	0.467
1852.5	26065	Low	LTE Band 25	24E	5	22	1	22.17	-0.02	PCT-003	16 QAM	1	0	1.0 cm	back	0.567
1852.5	26065	Low	LTE Band 25	24E	5	22	1	22.10	-0.17	PCT-003	16 QAM	1	24	1.0 cm	back	0.573
1882.5	26365	Mid	LTE Band 25	24E	5	22	1	22.01	0.09	PCT-003	QPSK	12	6	1.0 cm	front	0.298
1852.5	26065	Low	LTE Band 25	24E	5	23	0	23.05	0.06	PCT-003	QPSK	1	0	1.0 cm	front	0.339
1852.5	26065	Low	LTE Band 25	24E	5	23	0	23.02	-0.17	PCT-003	QPSK	1	24	1.0 cm	front	0.368
1882.5	26365	Mid	LTE Band 25	24E	5	21	2	20.90	0.02	PCT-003	16 QAM	12	6	1.0 cm	front	0.233
1852.5	26065	Low	LTE Band 25	24E	5	22	1	22.17	-0.04	PCT-003	16 QAM	1	0	1.0 cm	front	0.275
1852.5	26065	Low	LTE Band 25	24E	5	22	1	22.10	0.08	PCT-003	16 QAM	1	24	1.0 cm	front	0.290
1882.5	26365	Mid	LTE Band 25	24E	5	22	1	22.01	0.10	PCT-003	QPSK	12	6	1.0 cm	bottom	0.411
1852.5	26065	Low	LTE Band 25	24E	5	23	0	23.05	0.17	PCT-003	QPSK	1	0	1.0 cm	bottom	0.497
1852.5	26065	Low	LTE Band 25	24E	5	23	0	23.02	-0.06	PCT-003	QPSK	1	24	1.0 cm	bottom	0.536
1882.5	26365	Mid	LTE Band 25	24E	5	21	2	20.90	0.05	PCT-003	16 QAM	12	6	1.0 cm	bottom	0.321
1852.5	26065	Low	LTE Band 25	24E	5	22	1	22.17	0.08	PCT-003	16 QAM	1	0	1.0 cm	bottom	0.408
1852.5	26065	Low	LTE Band 25	24E	5	22	1	22.10	0.05	PCT-003	16 QAM	1	24	1.0 cm	bottom	0.400
1882.5	26365	Mid	LTE Band 25	24E	5	22	1	22.01	0.06	PCT-003	QPSK	12	6	1.0 cm	left	0.084
1852.5	26065	Low	LTE Band 25	24E	5	23	0	23.05	0.06	PCT-003	QPSK	1	0	1.0 cm	left	0.098
1852.5	26065	Low	LTE Band 25	24E	5	23	0	23.02	0.14	PCT-003	QPSK	1	24	1.0 cm	left	0.102
1882.5	26365	Mid	LTE Band 25	24E	5	21	2	20.90	0.10	PCT-003	16 QAM	12	6	1.0 cm	left	0.058
1852.5	26065	Low	LTE Band 25	24E	5	22	1	22.17	0.14	PCT-003	16 QAM	1	0	1.0 cm	left	0.076
1852.5	26065	Low	LTE Band 25	24E	5	22	1	22.10	0.04	PCT-003	16 QAM	1	24	1.0 cm	left	0.083
ANSI / IEEE C95.1 1992 - SAFETY LIMIT										Body						
Spatial Peak										1.6 W/kg (mW/g)						
Uncontrolled Exposure/General Population										averaged over 1 gram						

Note: Per KDB 941225 D05, when the maximum average output power of 1 RB allocation is more than 0.5 dB higher than the 50% RB allocation, the highest output power for the 1 RB allocations is tested. Therefore, low channel was tested for the QPSK, 1 RB allocation and 16 QAM, 1 RB allocation configurations.

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Table 14-20
LTE Hotspot SAR Results – Reduced Power

MEASUREMENT RESULTS																
FREQUENCY			Mode	FCC Rule Part	Bandwidth [MHz]	Target Power [dBm]	MPR [dB]	Conducted Power [dBm]	Power Drift [dB]	Device Serial Number	Modulation	# of RB	RB Offset	Spacing	Side	SAR (1g)
MHz	Ch.															(W/kg)
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.15	-0.05	PCT-007	QPSK	12	6	1.0 cm	back	0.295
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.18	0.10	PCT-007	QPSK	1	0	1.0 cm	back	0.292
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.10	-0.02	PCT-007	QPSK	1	24	1.0 cm	back	0.302
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.00	-0.02	PCT-007	16 QAM	12	6	1.0 cm	back	0.286
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.10	0.01	PCT-007	16 QAM	1	0	1.0 cm	back	0.290
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.00	0.09	PCT-007	16 QAM	1	24	1.0 cm	back	0.301
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.15	0.10	PCT-007	QPSK	12	6	1.0 cm	front	0.155
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.18	0.01	PCT-007	QPSK	1	0	1.0 cm	front	0.149
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.10	0.03	PCT-007	QPSK	1	24	1.0 cm	front	0.157
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.00	0.03	PCT-007	16 QAM	12	6	1.0 cm	front	0.142
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.10	0.06	PCT-007	16 QAM	1	0	1.0 cm	front	0.141
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.00	-0.01	PCT-007	16 QAM	1	24	1.0 cm	front	0.147
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.15	-0.02	PCT-007	QPSK	12	6	1.0 cm	bottom	0.214
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.18	0.03	PCT-007	QPSK	1	0	1.0 cm	bottom	0.208
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.10	0.02	PCT-007	QPSK	1	24	1.0 cm	bottom	0.213
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.00	0.02	PCT-007	16 QAM	12	6	1.0 cm	bottom	0.206
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.10	0.14	PCT-007	16 QAM	1	0	1.0 cm	bottom	0.205
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.00	0.13	PCT-007	16 QAM	1	24	1.0 cm	bottom	0.209
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.15	0.07	PCT-007	QPSK	12	6	1.0 cm	left	0.052
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.18	0.02	PCT-007	QPSK	1	0	1.0 cm	left	0.049
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.10	0.13	PCT-007	QPSK	1	24	1.0 cm	left	0.049
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.00	0.04	PCT-007	16 QAM	12	6	1.0 cm	left	0.052
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.10	0.20	PCT-007	16 QAM	1	0	1.0 cm	left	0.047
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	19.00	0.07	PCT-007	16 QAM	1	24	1.0 cm	left	0.051
ANSI / IEEE C95.1 1992 - SAFETY LIMIT										Body						
Spatial Peak										1.6 W/kg (mW/g)						
Uncontrolled Exposure/General Population										averaged over 1 gram						

Table 14-21
WIFI Hotspot SAR Results

MEASUREMENT RESULTS											
FREQUENCY		Mode	FCC Rule Part	Service	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	SAR (1g)
MHz	Ch.										(W/kg)
2462	11	IEEE 802.11b	15C	DSSS	14.45	-0.09	1.0 cm	PCT-006	1	back	0.066
2462	11	IEEE 802.11b	15C	DSSS	14.45	-0.13	1.0 cm	PCT-006	1	front	0.007
2462	11	IEEE 802.11b	15C	DSSS	14.45	-0.03	1.0 cm	PCT-006	1	top	0.004
2462	11	IEEE 802.11b	15C	DSSS	14.45	-0.14	1.0 cm	PCT-006	1	right	0.023
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram				

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14.4 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR value with the position set in a typical configuration. Test procedures used were according to FCC/OET Bulletin 65, Supplement C [June 2001], IEEE 1528-2003.
2. Batteries are fully charged for all readings.
3. Tissue parameters and temperatures are listed on the SAR plots.
4. Liquid tissue depth was at least 15.0 cm. To confirm the proper SAR liquid depth, the z-axis plots from the system verifications were included since the system verifications were performed using the same liquid, probe and DAE as the SAR tests in the same time period.
5. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 10 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.

CDMA/EVDO Notes:

1. Head SAR for CDMA2000 mode was tested under RC3/SO55 per KDB Publication 941225 D01.
2. Body-Worn and CDMA 1x RTT wireless router SAR was tested with 1x RTT with TDSO / SO32 FCH Only. TDSO / SO32 FCH+SCH SAR tests were not required since the average output power was not more than 0.25 dB higher than the TDSO / SO32 FCH only powers.
3. CDMA 1X Advanced technology was not required for SAR since the maximum output powers for 1x Advanced was not more than 0.25 dB higher than the maximum measured powers for 1x and the measured SAR in any 1x mode exposure conditions was not greater than 1.2 W/kg. See Section 9.2.2 for 1x Advanced test set up.
4. According to FCC KDB 941225 D01 publication, EVDO SAR (Head, Body-Worn and Hotspot) is measured using Subtype 0/1 Physical Layer configurations for Rev. 0. When the maximum output power of Rev. A for each channel is greater than the Rev.0 power, Rev. A must additionally be tested using the highest output channel for the configuration that resulted in the highest SAR for Rev.0.
5. Head and Body-worn SAR were additionally evaluated for EVDO to support simultaneous transmission scenarios with a CDMA Voice Call.
6. Per FCC KDB Publication 941225 D06, when the same wireless modes and device transmission configurations are required for body-worn accessories and hotspot mode, it is not necessary to additionally test body-worn accessory SAR for the same device orientation. Therefore, the hotspot data for the back side configuration additionally shows body-worn compliance at the same distance.
7. Justification for reduced test configurations: Per FCC/OET Bulletin 65 Supplement C (June 2001) and Public Notice DA-02-1438, if the SAR measured at the middle channel for each test configuration is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

LTE Notes:

1. LTE Considerations: LTE test configurations are determined according to SAR Test Considerations for LTE handsets and Data Modems KDB 941225 D05 Publication and were evaluated independently of position. General test procedures can be found in Section 9.3.3.
2. MPR is implemented for this device by the manufacturer when the transmit power is not limited by the power reduction mechanism. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.
3. A-MPR was disabled for all SAR tests by setting NS=01 on the base station simulator.
4. Per FCC KDB Publication 941225 D06, when the same wireless modes and device transmission configurations are required for body-worn accessories and hotspot mode, it is not necessary to additionally test body-worn accessory SAR for the same device orientation. Therefore, the hotspot data for the back side configuration additionally shows body-worn compliance at the same distance.

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WLAN Notes:

1. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 and April 2010 FCC/TCB Meeting Workshop for 2.4 GHz WIFI: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11b. Other IEEE 802.11 modes (including 802.11g/n) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11b mode.
2. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 and April 2010 FCC/TCB Meeting Workshop for 5 GHz WIFI: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11a. Other IEEE 802.11 modes (including 802.11n 20 MHz Bandwidth and 802.11n 40 MHz Bandwidth) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11a mode.
3. WLAN transmission was verified using an uncalibrated spectrum analyzer.
4. Because the maximum extrapolated peak SAR of the zoom scan for the maximum output channel of the lowest data rate is <1.6 W/kg and the 1g averaged SAR is <0.8 W/kg for all bands and configurations, SAR testing on other channels was not required.
5. Per FCC KDB Publication 941225 D06, when the same wireless modes and device transmission configurations are required for body-worn accessories and hotspot mode, it is not necessary to additionally test body-worn accessory SAR for the same device orientation. Therefore, the hotspot data for the back side configuration for IEEE 802.11b additionally shows body-worn compliance at the same distance.

Hotspot Notes:

1. Top edge for the CDMA 1x transmitter was not tested since the antenna distance from the edge was greater than 2.5 cm per FCC KDB Publication 941225 D06 guidance (see Section 1.3).
2. Top and right edges for the EVDO/LTE transmitter were not tested since the antenna distance from the edge was greater than 2.5 cm per FCC KDB Publication 941225 D06 guidance (see Section 1.3).
3. Bottom and left edges for the WLAN transmitter was not tested since the antenna distance from the edge was greater than 2.5 cm per FCC KDB Publication 941225 D06 (see Section 1.3).
4. During SAR Testing for the Wireless Router conditions per KDB 941225 D06, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 7.6.)

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15 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

15.1 Introduction

The following procedures adopted from “FCC SAR Considerations for Cell Phones with Multiple Transmitters” FCC KDB Publication 648474 are applicable to handsets with built-in unlicensed transmitters such as 802.11a/b/g/n and Bluetooth devices which may simultaneously transmit with the licensed transmitter.

15.2 FCC Power Tables & Conditions

	2.45	5.15 - 5.35	5.47 - 5.85	GHz
P_{Ref}	12	6	5	mW

Device output power should be rounded to the nearest mW to compare with values specified in this table.

Figure 15-1
Output Power Thresholds for Unlicensed Transmitters

	Individual Transmitter	Simultaneous Transmission
Licensed Transmitters	<u>Routine evaluation required</u>	SAR not required: Unlicensed only - when stand-alone 1-g SAR is not required and antenna is ≥ 5 cm from other antennas Licensed & Unlicensed - when the sum of the 1-g SAR is < 1.6 W/kg for all simultaneous transmitting antennas - when SAR to peak location separation ratio of simultaneous transmitting antenna pair is < 0.3
Unlicensed Transmitters	When there is no simultaneous transmission – - output ≤ 60/f: SAR not required - output > 60/f: stand-alone SAR required When there is simultaneous transmission – <u>Stand-alone SAR not required when</u> - output $\leq 2 \cdot P_{Ref}$ and antenna is ≥ 5.0 cm from other antennas - output $\leq P_{Ref}$ and antenna is ≥ 2.5 cm from other antennas - output $\leq P_{Ref}$ and antenna is < 2.5 cm from other antennas, each with either output power $\leq P_{Ref}$ or 1-g SAR < 1.2 W/kg <u>Otherwise stand-alone SAR is required</u> When stand-alone SAR is required - test SAR on highest output channel for each wireless mode and exposure condition - if SAR for highest output channel is $> 50\%$ of SAR limit, evaluate all channels according to normal procedures	SAR required: Licensed & Unlicensed antenna pairs with SAR to peak location separation ratio ≥ 0.3; test is only required for the configuration that results in the highest SAR in stand-alone configuration for each wireless mode and exposure condition Note: simultaneous transmission exposure conditions for head and body can be different for different style phones; therefore, different test requirements may apply

Figure 15-2
SAR Evaluation Requirements for Multiple Transmitter Handsets

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15.3 Simultaneous Transmission Capabilities

According to Figure 15-1 and Figure 15-2, simultaneous transmission analysis of SAR may be required for this device for the two licensed and unlicensed transmitters. Possible simultaneous transmissions (between the two licensed transmitters and the unlicensed transmitter) for this device indicated in **Table 15-1** were numerically summed using stand-alone SAR data and are shown in the following tables.

Per KDB Publication 648474, standalone Bluetooth SAR tests were not required. Standalone SAR tests for 2.4 GHz and 5 GHz WLAN were required. See Section 1.6(A) for more information.

Table 15-1
Possible Simultaneous Transmission Scenarios

Ref.	Simultaneous Transmit Configurations	Power Reduction	SAR Report Section	Head	Body-Worn Accessory	Hot Spot	Note
				IEEE 1528, Supp C	Supplement C	FCC KDB 941225 D06 edges/sides	
A	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + LTE B25 Data	LTE	Section 15.6	Table 15-7	Table 15-8	-	SVLTE
B	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + EVDO BC0 Data	EVDO	Section 15.7	Table 15-10	Table 15-11	-	SVDO
C	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + EVDO BC1 Data			Table 15-10	Table 15-11	-	SVDO
D	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + EVDO BC10 Data			Table 15-10	Table 15-11	-	SVDO
E	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + 2.4 GHz WIFI	None	Section 15.4	Table 15-2	Table 15-4	-	
F	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + 5 GHz WIFI			Table 15-3	Table 15-5	-	
G	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + LTE B25 Data + 2.4 GHz WIFI	LTE	Section 15.6	Table 15-7	Table 15-8	Table 15-9	Voice + LTE + WIFI Hotspot
H	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + EVDO BC0 Data + 2.4 GHz WIFI	EVDO	Section 15.7	Table 15-10	Table 15-11	Table 15-12	Voice + EVDO + WIFI Hotspot
I	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + EVDO BC1 Data + 2.4 GHz WIFI			Table 15-10	Table 15-11	Table 15-12	Voice + EVDO + WIFI Hotspot
J	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + EVDO BC10 Data + 2.4 GHz WIFI			Table 15-10	Table 15-11	Table 15-12	Voice + EVDO + WIFI Hotspot
K	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Data + 2.4 GHz WIFI	None	Section 15.5	-	-	Table 15-6	1X CDMA Data + WIFI Hotspot
L	BC0/BC1/BC10 850/1900 MHz EVDO Data + 2.4 GHz WIFI			-	-	Table 15-6	EVDO + WIFI Hotspot
M	LTE B25 Data + 2.4 GHz WIFI			-	-	Table 15-6	LTE + WIFI Hotspot

Note: The specific section report number and table number of the analysis of each condition is listed. The reference letters are included in the tables below.

15.4 Voice + WIFI Simultaneous Transmission Analysis

Table 15-2
Simultaneous Transmission Scenario (Held to Ear)

Simult Tx Ref.	Configuration	Cell. CDMA - FCC Rule Part 90S SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)	Simult Tx Ref.	Configuration	Cell. CDMA - FCC Rule Part 22H SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)
E	Right Cheek	0.114	0.013	0.127	E	Right Cheek	0.100	0.013	0.113
	Right Tilt	0.088	0.009	0.097		Right Tilt	0.068	0.009	0.077
	Left Cheek	0.101	0.027	0.128		Left Cheek	0.100	0.027	0.127
	Left Tilt	0.074	0.013	0.087		Left Tilt	0.070	0.013	0.083

Simult Tx Ref.	Configuration	PCS CDMA - FCC Rule Part 24E SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)
E	Right Cheek	0.305	0.013	0.318
	Right Tilt	0.095	0.009	0.104
	Left Cheek	0.422	0.027	0.449
	Left Tilt	0.115	0.013	0.128

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Table 15-3
Simultaneous Transmission Scenario (Held to Ear)

Simult Tx Ref.	Configuration	Cell. CDMA - FCC Rule Part 90S SAR (W/kg)	5 GHz WLAN - FCC Rule Part 15 SAR (W/kg)	Σ SAR (W/kg)	Simult Tx Ref.	Configuration	Cell. CDMA - FCC Rule Part 22H SAR (W/kg)	5 GHz WLAN - FCC Rule Part 15 SAR (W/kg)	Σ SAR (W/kg)
F	Right Cheek	0.114	0.062	0.176	F	Right Cheek	0.100	0.062	0.162
	Right Tilt	0.088	0.063	0.151		Right Tilt	0.068	0.063	0.131
	Left Cheek	0.101	0.062	0.163		Left Cheek	0.100	0.062	0.162
	Left Tilt	0.074	0.072	0.146		Left Tilt	0.070	0.072	0.142

Simult Tx Ref.	Configuration	PCS CDMA - FCC Rule Part 24E SAR (W/kg)	5 GHz WLAN - FCC Rule Part 15 SAR (W/kg)	Σ SAR (W/kg)
F	Right Cheek	0.305	0.062	0.367
	Right Tilt	0.095	0.063	0.158
	Left Cheek	0.422	0.062	0.484
	Left Tilt	0.115	0.072	0.187

Table 15-4
Simultaneous Transmission Scenario (Body-Worn at 1.0 cm)

Simult Tx Ref.	Mode	CDMA SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)
E	Cell. CDMA - FCC Rule Part 90S	0.489	0.066	0.555
	Cell. CDMA - FCC Rule Part 22H	0.495	0.066	0.561
	PCS CDMA - FCC Rule Part 24E	1.030	0.066	1.096

Table 15-5
Simultaneous Transmission Scenario (Body-Worn at 1.0 cm)

Simult Tx Ref.	Mode	CDMA SAR (W/kg)	5 GHz WLAN - FCC Rule Part 15 SAR (W/kg)	Σ SAR (W/kg)
F	Cell. CDMA - FCC Rule Part 90S	0.489	0.267	0.756
	Cell. CDMA - FCC Rule Part 22H	0.495	0.267	0.762
	PCS CDMA - FCC Rule Part 24E	1.030	0.267	1.297

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15.5 Hotspot Simultaneous Transmission Analysis

Table 15-6
Simultaneous Transmission Scenario (Hotspot at 1.0 cm)

Simult Tx Ref.	Configuration	Cell. CDMA - FCC Rule Part 90S SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)	Simult Tx Ref.	Configuration	Cell. CDMA - FCC Rule Part 22H SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)
K	Back	0.489	0.066	0.555	K	Back	0.495	0.066	0.561
	Front	0.251	0.007	0.258		Front	0.251	0.007	0.258
	Top	-	0.004	0.004		Top	-	0.004	0.004
	Bottom	0.180	-	0.180		Bottom	0.218	-	0.218
	Right	0.336	0.023	0.359		Right	0.308	0.023	0.331
	Left	-	-	0.000		Left	-	-	0.000

Simult Tx Ref.	Configuration	PCS CDMA - FCC Rule Part 24E SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)	Simult Tx Ref.	Configuration	Cell. EVDO - FCC Rule Part 90S SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)
K	Back	1.030	0.066	1.096	L	Back	0.645	0.066	0.711
	Front	0.598	0.007	0.605		Front	0.354	0.007	0.361
	Top	-	0.004	0.004		Top	-	0.004	0.004
	Bottom	0.624	-	0.624		Bottom	0.249	-	0.249
	Right	0.297	0.023	0.320		Right	-	0.023	0.023
	Left	-	-	0.000		Left	0.445	-	0.445

Simult Tx Ref.	Configuration	Cell. EVDO - FCC Rule Part 22H SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)	Simult Tx Ref.	Configuration	PCS EVDO - FCC Rule Part 24E SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)
L	Back	0.835	0.066	0.901	L	Back	1.100	0.066	1.166
	Front	0.510	0.007	0.517		Front	0.567	0.007	0.574
	Top	-	0.004	0.004		Top	-	0.004	0.004
	Bottom	0.440	-	0.440		Bottom	0.773	-	0.773
	Right	-	0.023	0.023		Right	-	0.023	0.023
	Left	0.672	-	0.672		Left	0.162	-	0.162

Simult Tx Ref.	Configuration	LTE Band 25 - FCC Rule Part 24E SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)
M	Back	0.744	0.066	0.810
	Front	0.368	0.007	0.375
	Top	-	0.004	0.004
	Bottom	0.536	-	0.536
	Right	-	0.023	0.023
	Left	0.102	-	0.102

Note: Per FCC KDB Publication 941225 D06, the edges with antennas more than 2.5 cm are not required to be evaluated for SAR ("-").

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15.6 SVLTE Simultaneous Transmission Scenario Analysis

Table 15-7
Simultaneous Transmission Scenario (Held to Ear)

Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	Cell. CDMA - FCC Rule Part 90S SAR (W/kg)	LTE Band 25 - FCC Rule Part 24E SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)	
		Tx Ant	1	2	3	1+2	1+2+3
A _G	P _{≥18}	Target Power (dBm)	25	19	-	1+2	1+2+3
		Reference	Table 14-1	Table 14-8	Table 14-9		
		Right Cheek	0.114	0.060	0.013	0.174	0.187
		Right Tilt	0.088	0.020	0.009	0.108	0.117
		Left Cheek	0.101	0.052	0.027	0.153	0.180
		Left Tilt	0.074	0.012	0.013	0.086	0.099
	P<18	Target Power (dBm)	18	23	-		
		Reference	Table 14-1	Table 14-7	Table 14-9		
		Right Cheek	0.026	0.116	0.013	0.142	0.155
		Right Tilt	0.017	0.041	0.009	0.058	0.067
		Left Cheek	0.020	0.138	0.027	0.158	0.185
		Left Tilt	0.015	0.029	0.013	0.044	0.057

Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	Cell. CDMA - FCC Rule Part 22H SAR (W/kg)	LTE Band 25 - FCC Rule Part 24E SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)	
		Tx Ant	1	2	3	1+2	1+2+3
A _G	P _{≥18}	Target Power (dBm)	25	19	-	1+2	1+2+3
		Reference	Table 14-2	Table 14-8	Table 14-9		
		Right Cheek	0.100	0.060	0.013	0.160	0.173
		Right Tilt	0.068	0.020	0.009	0.088	0.097
		Left Cheek	0.100	0.052	0.027	0.152	0.179
		Left Tilt	0.070	0.012	0.013	0.082	0.095
	P<18	Target Power (dBm)	18	23	-		
		Reference	Table 14-2	Table 14-7	Table 14-9		
		Right Cheek	0.025	0.116	0.013	0.141	0.154
		Right Tilt	0.016	0.041	0.009	0.057	0.066
		Left Cheek	0.020	0.138	0.027	0.158	0.185
		Left Tilt	0.014	0.029	0.013	0.043	0.056

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Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	PCS CDMA - FCC Rule Part 24E SAR (W/kg)	LTE Band 25 - FCC Rule Part 24E SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)	
		Tx Ant	1	2	3	1+2	1+2+3
A ₁ G	P _{≥18}	Target Power (dBm)	25	19	-	1+2	1+2+3
		Reference	Table 14-3	Table 14-8	Table 14-9		
		Right Cheek	0.305	0.060	0.013		
		Right Tilt	0.095	0.020	0.009	0.115	0.124
		Left Cheek	0.422	0.052	0.027	0.474	0.501
		Left Tilt	0.115	0.012	0.013	0.127	0.140
	P _{<18}	Target Power (dBm)	18	23	-		
		Reference	Table 14-3	Table 14-7	Table 14-9		
		Right Cheek	0.061	0.116	0.013	0.177	0.190
		Right Tilt	0.017	0.041	0.009	0.058	0.067
		Left Cheek	0.072	0.138	0.027	0.210	0.237
		Left Tilt	0.019	0.029	0.013	0.048	0.061

Table 15-8
Simultaneous Transmission Scenario (Body-Worn at 1.0 cm)

Simult Tx Ref.	Mode	CDMA SAR (W/kg)	LTE Band 25 - FCC Rule Part 24E SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
	Reference	Table 14-11	Table 14-13	Table 14-14	1+2	1+2+3
	Target Power (dBm)	25	19	-		
A ₁ G	Cell. CDMA - FCC Rule Part 90S	0.489	0.302	0.066	0.791	0.857
	Cell. CDMA - FCC Rule Part 22H	0.495	0.302	0.066	0.797	0.863
	PCS CDMA - FCC Rule Part 24E	1.030	0.302	0.066	1.332	1.398
	Reference	Table 14-11	Table 14-13	Table 14-14		
	Target Power (dBm)	18	23	-		
A ₁ G	Cell. CDMA - FCC Rule Part 90S	0.072	0.744	0.066	0.816	0.882
	Cell. CDMA - FCC Rule Part 22H	0.084	0.744	0.066	0.828	0.894
	PCS CDMA - FCC Rule Part 24E	0.245	0.744	0.066	0.989	1.055

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Table 15-9
Simultaneous Transmission Scenario (Hotspot at 1.0 cm)

Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	Cell. CDMA - FCC Rule Part 90S SAR (W/kg)	LTE Band 25 - FCC Rule Part 24E SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)
			1	2	3	1+2+3
G	P _≥ 18	Target Power (dBm)	25	19	-	1+2+3
		Reference	Table 14-15	Table 14-20	Table 14-21	
		Back	0.489	0.302	0.066	0.857
		Front	0.251	0.157	0.007	0.415
		Top	-	-	0.004	0.004
		Bottom	0.180	0.214	-	0.394
		Right	0.336	-	0.023	0.359
		Left	-	0.052	-	0.052
	P<18	Target Power (dBm)	18	23	-	
		Reference	Table 14-15	Table 14-19	Table 14-21	
		Back	0.072	0.744	0.066	0.882
		Front	0.039	0.368	0.007	0.414
		Top	-	-	0.004	0.004
		Bottom	0.026	0.536	-	0.562
		Right	0.049	-	0.023	0.072
		Left	-	0.102	-	0.102

Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	Cell. CDMA - FCC Rule Part 22H SAR (W/kg)	LTE Band 25 - FCC Rule Part 24E SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)
			1	2	3	1+2+3
G	P _≥ 18	Target Power (dBm)	25	19	-	1+2+3
		Reference	Table 14-15	Table 14-20	Table 14-21	
		Back	0.495	0.302	0.066	0.863
		Front	0.251	0.157	0.007	0.415
		Top	-	-	0.004	0.004
		Bottom	0.218	0.214	-	0.432
		Right	0.308	-	0.023	0.331
		Left	-	0.052	-	0.052
	P<18	Target Power (dBm)	18	23	-	
		Reference	Table 14-15	Table 14-19	Table 14-21	
		Back	0.084	0.744	0.066	0.894
		Front	0.036	0.368	0.007	0.411
		Top	-	-	0.004	0.004
		Bottom	0.032	0.536	-	0.568
		Right	0.042	-	0.023	0.065
		Left	-	0.102	-	0.102

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Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	PCS CDMA - FCC Rule Part 24E SAR (W/kg)	LTE Band 25 - FCC Rule Part 24E SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)
			1	2	3	1+2+3
G	P≥18	Target Power (dBm)	25	19	-	1+2+3
		Reference	Table 14-16	Table 14-20	Table 14-21	
		Back	1.030	0.302	0.066	1.398
		Front	0.598	0.157	0.007	0.762
		Top	-	-	0.004	0.004
		Bottom	0.624	0.214	-	0.838
		Right	0.297	-	0.023	0.320
		Left	-	0.052	-	0.052
	P<18	Target Power (dBm)	18	23	-	
		Reference	Table 14-16	Table 14-19	Table 14-21	
		Back	0.245	0.744	0.066	1.055
		Front	0.172	0.368	0.007	0.547
		Top	-	-	0.004	0.004
		Bottom	0.184	0.536	-	0.720
		Right	0.059	-	0.023	0.082
		Left	-	0.102	-	0.102

Note: Per FCC KDB Publication 941225 D06, the edges with antennas more than 2.5 cm are not required to be evaluated for SAR (“-”).

15.7 SVDO Simultaneous Transmission Scenario Analysis

Table 15-10
Simultaneous Transmission Scenario (Held to Ear)

Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	Cell. CDMA - FCC Rule Part 90S SAR (W/kg)	Cell. EVDO - FCC Rule Part 90S SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)	
			1	2	3	1+2	1+2+3
D,J	P≥15	Target Power (dBm)	25	19	-	1+2	1+2+3
		Reference	Table 14-1	Table 14-4	Table 14-9		
		Right Cheek	0.114	0.049	0.013	0.163	0.176
		Right Tilt	0.088	0.039	0.009	0.127	0.136
		Left Cheek	0.101	0.058	0.027	0.159	0.186
		Left Tilt	0.074	0.042	0.013	0.116	0.129
	P<15	Target Power (dBm)	15	25	-		
		Reference	Table 14-1	Table 14-4	Table 14-9		
		Right Cheek	0.015	0.219	0.013	0.234	0.247
		Right Tilt	0.011	0.163	0.009	0.174	0.183
		Left Cheek	0.013	0.241	0.027	0.254	0.281
		Left Tilt	0.009	0.165	0.013	0.174	0.187

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Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	Cell. CDMA - FCC Rule Part 22H SAR (W/kg)	Cell. EVDO - FCC Rule Part 90S SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)	
		Tx Ant	1	2	3	1+2	1+2+3
D,J	P $\geq$ 15	Target Power (dBm)	25	19	-	1+2	1+2+3
		Reference	Table 14-2	Table 14-4	Table 14-9		
		Right Cheek	0.100	0.049	0.013	0.149	0.162
		Right Tilt	0.068	0.039	0.009	0.107	0.116
		Left Cheek	0.100	0.058	0.027	0.158	0.185
		Left Tilt	0.070	0.042	0.013	0.112	0.125
	P<15	Target Power (dBm)	15	25	-		
		Reference	Table 14-2	Table 14-4	Table 14-9		
		Right Cheek	0.016	0.219	0.013	0.235	0.248
		Right Tilt	0.010	0.163	0.009	0.173	0.182
		Left Cheek	0.012	0.241	0.027	0.253	0.280
		Left Tilt	0.009	0.165	0.013	0.174	0.187

Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	PCS CDMA - FCC Rule Part 24E SAR (W/kg)	Cell. EVDO - FCC Rule Part 90S SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)	
		Tx Ant	1	2	3	1+2	1+2+3
D,J	P $\geq$ 15	Target Power (dBm)	25	19	-	1+2	1+2+3
		Reference	Table 14-3	Table 14-4	Table 14-9		
		Right Cheek	0.305	0.049	0.013	0.354	0.367
		Right Tilt	0.095	0.039	0.009	0.134	0.143
		Left Cheek	0.422	0.058	0.027	0.480	0.507
		Left Tilt	0.115	0.042	0.013	0.157	0.170
	P<15	Target Power (dBm)	15	25	-		
		Reference	Table 14-3	Table 14-4	Table 14-9		
		Right Cheek	0.028	0.219	0.013	0.247	0.260
		Right Tilt	0.007	0.163	0.009	0.170	0.179
		Left Cheek	0.048	0.241	0.027	0.289	0.316
		Left Tilt	0.011	0.165	0.013	0.176	0.189

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Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	Cell. CDMA - FCC Rule Part 90S SAR (W/kg)	Cell.EVDO - FCC Rule Part 22H SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)	
		Tx Ant	1	2	3	1+2	1+2+3
B,H	P $\geq$ 15	Target Power (dBm)	25	19	-	1+2	1+2+3
		Reference	Table 14-1	Table 14-5	Table 14-9		
		Right Cheek	0.114	0.067	0.013	0.181	0.194
		Right Tilt	0.088	0.047	0.009	0.135	0.144
		Left Cheek	0.101	0.080	0.027	0.181	0.208
		Left Tilt	0.074	0.050	0.013	0.124	0.137
	P<15	Target Power (dBm)	15	25	-		
		Reference	Table 14-1	Table 14-5	Table 14-9		
		Right Cheek	0.015	0.307	0.013	0.322	0.335
		Right Tilt	0.011	0.218	0.009	0.229	0.238
		Left Cheek	0.013	0.322	0.027	0.335	0.362
		Left Tilt	0.009	0.191	0.013	0.200	0.213

Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	Cell. CDMA - FCC Rule Part 22H SAR (W/kg)	Cell.EVDO - FCC Rule Part 22H SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)	
		Tx Ant	1	2	3	1+2	1+2+3
B,H	P $\geq$ 15	Target Power (dBm)	25	19	-	1+2	1+2+3
		Reference	Table 14-2	Table 14-5	Table 14-9		
		Right Cheek	0.100	0.067	0.013	0.167	0.180
		Right Tilt	0.068	0.047	0.009	0.115	0.124
		Left Cheek	0.100	0.080	0.027	0.180	0.207
		Left Tilt	0.070	0.050	0.013	0.120	0.133
	P<15	Target Power (dBm)	15	25	-		
		Reference	Table 14-2	Table 14-5	Table 14-9		
		Right Cheek	0.016	0.307	0.013	0.323	0.336
		Right Tilt	0.010	0.218	0.009	0.228	0.237
		Left Cheek	0.012	0.322	0.027	0.334	0.361
		Left Tilt	0.009	0.191	0.013	0.200	0.213

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Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	PCS CDMA - FCC Rule Part 24E SAR (W/kg)	Cell.EVDO - FCC Rule Part 22H SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)	
		Tx Ant	1	2	3	1+2	1+2+3
B,H	P $\geq$ 15	Target Power (dBm)	25	19	-	1+2	1+2+3
		Reference	Table 14-3	Table 14-5	Table 14-9		
		Right Cheek	0.305	0.067	0.013		
		Right Tilt	0.095	0.047	0.009	0.142	0.151
		Left Cheek	0.422	0.080	0.027	0.502	0.529
		Left Tilt	0.115	0.050	0.013	0.165	0.178
	P<15	Target Power (dBm)	15	25	-		
		Reference	Table 14-3	Table 14-5	Table 14-9		
		Right Cheek	0.028	0.307	0.013	0.335	0.348
		Right Tilt	0.007	0.218	0.009	0.225	0.234
		Left Cheek	0.048	0.322	0.027	0.370	0.397
		Left Tilt	0.011	0.191	0.013	0.202	0.215

Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	Cell. CDMA - FCC Rule Part 90S SAR (W/kg)	PCS EVDO - FCC Rule Part 24E SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)	
		Tx Ant	1	2	3	1+2	1+2+3
C,I	P $\geq$ 15	Target Power (dBm)	25	19	-	1+2	1+2+3
		Reference	Table 14-1	Table 14-6	Table 14-9		
		Right Cheek	0.114	0.042	0.013	0.156	0.169
		Right Tilt	0.088	0.013	0.009	0.101	0.110
		Left Cheek	0.101	0.055	0.027	0.156	0.183
		Left Tilt	0.074	0.009	0.013	0.083	0.096
	P<15	Target Power (dBm)	15	25	-		
		Reference	Table 14-1	Table 14-6	Table 14-9		
		Right Cheek	0.015	0.182	0.013	0.197	0.210
		Right Tilt	0.011	0.079	0.009	0.090	0.099
		Left Cheek	0.013	0.234	0.027	0.247	0.274
		Left Tilt	0.009	0.043	0.013	0.052	0.065

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Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	Cell. CDMA - FCC Rule Part 22H SAR (W/kg)	PCS EVDO - FCC Rule Part 24E SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)	
		Tx Ant	1	2	3	1+2	1+2+3
C,I	P $\geq$ 15	Target Power (dBm)	25	19	-	1+2	1+2+3
		Reference	Table 14-2	Table 14-6	Table 14-9		
		Right Cheek	0.100	0.042	0.013		
		Right Tilt	0.068	0.013	0.009	0.081	0.090
		Left Cheek	0.100	0.055	0.027	0.155	0.182
		Left Tilt	0.070	0.009	0.013	0.079	0.092
	P<15	Target Power (dBm)	15	25	-		
		Reference	Table 14-2	Table 14-6	Table 14-9		
		Right Cheek	0.016	0.182	0.013	0.198	0.211
		Right Tilt	0.010	0.079	0.009	0.089	0.098
		Left Cheek	0.012	0.234	0.027	0.246	0.273
		Left Tilt	0.009	0.043	0.013	0.052	0.065

Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	PCS CDMA - FCC Rule Part 24E SAR (W/kg)	PCS EVDO - FCC Rule Part 24E SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)	
		Tx Ant	1	2	3	1+2	1+2+3
C,I	P $\geq$ 15	Target Power (dBm)	25	19	-	1+2	1+2+3
		Reference	Table 14-3	Table 14-6	Table 14-9		
		Right Cheek	0.305	0.042	0.013	0.347	0.360
		Right Tilt	0.095	0.013	0.009	0.108	0.117
		Left Cheek	0.422	0.055	0.027	0.477	0.504
		Left Tilt	0.115	0.009	0.013	0.124	0.137
	P<15	Target Power (dBm)	15	25	-		
		Reference	Table 14-3	Table 14-6	Table 14-9		
		Right Cheek	0.028	0.182	0.013	0.210	0.223
		Right Tilt	0.007	0.079	0.009	0.086	0.095
		Left Cheek	0.048	0.234	0.027	0.282	0.309
		Left Tilt	0.011	0.043	0.013	0.054	0.067

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Table 15-11
Simultaneous Transmission Scenario (Body-Worn at 1.0 cm)

Simult Tx Ref.	Mode	CDMA SAR (W/kg)	Cell. EVDO - FCC Rule Part 90S SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
	Reference	Table 14-11	Table 14-12	Table 14-14		
	Target Power (dBm)	25	19	-		
D,J	Cell. CDMA - FCC Rule Part 90S	0.489	0.151	0.066	0.640	0.706
	Cell. CDMA - FCC Rule Part 22H	0.495	0.151	0.066	0.646	0.712
	PCS CDMA - FCC Rule Part 24E	1.030	0.151	0.066	1.181	1.247
	Reference	Table 14-11	Table 14-12	Table 14-14		
	Target Power (dBm)	15	25	-		
D,J	Cell. CDMA - FCC Rule Part 90S	0.034	0.645	0.066	0.679	0.745
	Cell. CDMA - FCC Rule Part 22H	0.040	0.645	0.066	0.685	0.751
	PCS CDMA - FCC Rule Part 24E	0.107	0.645	0.066	0.752	0.818

Simult Tx Ref.	Mode	CDMA SAR (W/kg)	Cell. EVDO - FCC Rule Part 22H SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
	Reference	Table 14-11	Table 14-12	Table 14-14		
	Target Power (dBm)	25	19	-		
B,H	Cell. CDMA - FCC Rule Part 90S	0.489	0.194	0.066	0.683	0.749
	Cell. CDMA - FCC Rule Part 22H	0.495	0.194	0.066	0.689	0.755
	PCS CDMA - FCC Rule Part 24E	1.030	0.194	0.066	1.224	1.290
	Reference	Table 14-11	Table 14-12	Table 14-14		
	Target Power (dBm)	15	25	-		
B,H	Cell. CDMA - FCC Rule Part 90S	0.034	0.835	0.066	0.869	0.935
	Cell. CDMA - FCC Rule Part 22H	0.040	0.835	0.066	0.875	0.941
	PCS CDMA - FCC Rule Part 24E	0.107	0.835	0.066	0.942	1.008

Simult Tx Ref.	Mode	CDMA SAR (W/kg)	PCS EVDO - FCC Rule Part 24E SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
	Reference	Table 14-11	Table 14-12	Table 14-14		
	Target Power (dBm)	25	19	-		
C,I	Cell. CDMA - FCC Rule Part 90S	0.489	0.339	0.066	0.828	0.894
	Cell. CDMA - FCC Rule Part 22H	0.495	0.339	0.066	0.834	0.900
	PCS CDMA - FCC Rule Part 24E	1.030	0.339	0.066	1.369	1.435
	Reference	Table 14-11	Table 14-12	Table 14-14		
	Target Power (dBm)	15	25	-		
C,I	Cell. CDMA - FCC Rule Part 90S	0.034	1.100	0.066	1.134	1.200
	Cell. CDMA - FCC Rule Part 22H	0.040	1.100	0.066	1.140	1.206
	PCS CDMA - FCC Rule Part 24E	0.107	1.100	0.066	1.207	1.273

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Table 15-12
Simultaneous Transmission Scenario (Hotspot at 1.0 cm)

Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	Cell. CDMA - FCC Rule Part 90S SAR (W/kg)	Cell. EVDO - FCC Rule Part 90S SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)
			1	2	3	1+2+3
J	P ≥ 15	Target Power (dBm)	25	19	-	1+2+3
		Reference	Table 14-15	Table 14-17	Table 14-21	
		Back	0.489	0.151	0.066	0.706
		Front	0.251	0.081	0.007	0.339
		Top	-	-	0.004	0.004
		Bottom	0.180	0.067	-	0.247
		Right	0.336	-	0.023	0.359
		Left	-	0.111	-	0.111
	P < 15	Target Power (dBm)	15	25	-	
		Reference	Table 14-15	Table 14-17	Table 14-21	
		Back	0.034	0.645	0.066	0.745
		Front	0.023	0.354	0.007	0.384
		Top	-	-	0.004	0.004
		Bottom	0.013	0.249	-	0.262
		Right	0.025	-	0.023	0.048
		Left	-	0.445	-	0.445

Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	Cell. CDMA - FCC Rule Part 22H SAR (W/kg)	Cell. EVDO - FCC Rule Part 90S SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)
			1	2	3	1+2+3
J	P ≥ 15	Target Power (dBm)	25	19	-	1+2+3
		Reference	Table 14-15	Table 14-17	Table 14-21	
		Back	0.495	0.151	0.066	0.712
		Front	0.251	0.081	0.007	0.339
		Top	-	-	0.004	0.004
		Bottom	0.218	0.067	-	0.285
		Right	0.308	-	0.023	0.331
		Left	-	0.111	-	0.111
	P < 15	Target Power (dBm)	15	25	-	
		Reference	Table 14-15	Table 14-17	Table 14-21	
		Back	0.040	0.645	0.066	0.751
		Front	0.024	0.354	0.007	0.385
		Top	-	-	0.004	0.004
		Bottom	0.017	0.249	-	0.266
		Right	0.028	-	0.023	0.051
		Left	-	0.445	-	0.445

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Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	PCS CDMA - FCC Rule Part 24E SAR (W/kg)	Cell. EVDO - FCC Rule Part 90S SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)
			1	2	3	1+2+3
J	P ≥ 15	Target Power (dBm)	25	19	-	1+2+3
		Reference	Table 14-16	Table 14-17	Table 14-21	
		Back	1.030	0.151	0.066	1.247
		Front	0.598	0.081	0.007	0.686
		Top	-	-	0.004	0.004
		Bottom	0.624	0.067	-	0.691
		Right	0.297	-	0.023	0.320
		Left	-	0.111	-	0.111
	P < 15	Target Power (dBm)	15	25	-	
		Reference	Table 14-16	Table 14-17	Table 14-21	
		Back	0.107	0.645	0.066	0.818
		Front	0.071	0.354	0.007	0.432
		Top	-	-	0.004	0.004
		Bottom	0.069	0.249	-	0.318
		Right	0.022	-	0.023	0.045
		Left	-	0.445	-	0.445

Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	Cell. CDMA - FCC Rule Part 90S SAR (W/kg)	Cell. EVDO - FCC Rule Part 22H SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)
			1	2	3	1+2+3
H	P ≥ 15	Target Power (dBm)	25	19	-	1+2+3
		Reference	Table 14-15	Table 14-17	Table 14-21	
		Back	0.489	0.194	0.066	0.749
		Front	0.251	0.124	0.007	0.382
		Top	-	-	0.004	0.004
		Bottom	0.180	0.116	-	0.296
		Right	0.336	-	0.023	0.359
		Left	-	0.163	-	0.163
	P < 15	Target Power (dBm)	15	25	-	
		Reference	Table 14-15	Table 14-17	Table 14-21	
		Back	0.034	0.835	0.066	0.935
		Front	0.023	0.510	0.007	0.540
		Top	-	-	0.004	0.004
		Bottom	0.013	0.440	-	0.453
		Right	0.025	-	0.023	0.048
		Left	-	0.672	-	0.672

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Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	Cell. CDMA - FCC Rule Part 22H SAR (W/kg)	Cell.EVDO - FCC Rule Part 22H SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)
			1	2	3	1+2+3
H	P ≥ 15	Target Power (dBm)	25	19	-	1+2+3
		Reference	Table 14-15	Table 14-17	Table 14-21	
		Back	0.495	0.194	0.066	0.755
		Front	0.251	0.124	0.007	0.382
		Top	-	-	0.004	0.004
		Bottom	0.218	0.116	-	0.334
		Right	0.308	-	0.023	0.331
		Left	-	0.163	-	0.163
	P < 15	Target Power (dBm)	15	25	-	
		Reference	Table 14-15	Table 14-17	Table 14-21	
		Back	0.040	0.835	0.066	0.941
		Front	0.024	0.510	0.007	0.541
		Top	-	-	0.004	0.004
		Bottom	0.017	0.440	-	0.457
		Right	0.028	-	0.023	0.051
		Left	-	0.672	-	0.672

Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	PCS CDMA - FCC Rule Part 24E SAR (W/kg)	Cell.EVDO - FCC Rule Part 22H SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)
			1	2	3	1+2+3
H	P ≥ 15	Target Power (dBm)	25	19	-	1+2+3
		Reference	Table 14-16	Table 14-17	Table 14-21	
		Back	1.030	0.194	0.066	1.290
		Front	0.598	0.124	0.007	0.729
		Top	-	-	0.004	0.004
		Bottom	0.624	0.116	-	0.740
		Right	0.297	-	0.023	0.320
		Left	-	0.163	-	0.163
	P < 15	Target Power (dBm)	15	25	-	
		Reference	Table 14-16	Table 14-17	Table 14-21	
		Back	0.107	0.835	0.066	1.008
		Front	0.071	0.510	0.007	0.588
		Top	-	-	0.004	0.004
		Bottom	0.069	0.440	-	0.509
		Right	0.022	-	0.023	0.045
		Left	-	0.672	-	0.672

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Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	Cell. CDMA - FCC Rule Part 90S SAR (W/kg)	PCS EVDO - FCC Rule Part 24E SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)
			1	2	3	1+2+3
I	P ≥ 15	Target Power (dBm)	25	19	-	1+2+3
		Reference	Table 14-15	Table 14-18	Table 14-21	
		Back	0.489	0.339	0.066	0.894
		Front	0.251	0.155	0.007	0.413
		Top	-	-	0.004	0.004
		Bottom	0.180	0.190	-	0.370
		Right	0.336	-	0.023	0.359
		Left	-	0.035	-	0.035
	P < 15	Target Power (dBm)	15	25	-	
		Reference	Table 14-15	Table 14-18	Table 14-21	
		Back	0.034	1.100	0.066	1.200
		Front	0.023	0.567	0.007	0.597
		Top	-	-	0.004	0.004
		Bottom	0.013	0.773	-	0.786
		Right	0.025	-	0.023	0.048
		Left	-	0.162	-	0.162

Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	Cell. CDMA - FCC Rule Part 22H SAR (W/kg)	PCS EVDO - FCC Rule Part 24E SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)
			1	2	3	1+2+3
I	P ≥ 15	Target Power (dBm)	25	19	-	1+2+3
		Reference	Table 14-15	Table 14-18	Table 14-21	
		Back	0.495	0.339	0.066	0.900
		Front	0.251	0.155	0.007	0.413
		Top	-	-	0.004	0.004
		Bottom	0.218	0.190	-	0.408
		Right	0.308	-	0.023	0.331
		Left	-	0.035	-	0.035
	P < 15	Target Power (dBm)	15	25	-	
		Reference	Table 14-15	Table 14-18	Table 14-21	
		Back	0.040	1.100	0.066	1.206
		Front	0.024	0.567	0.007	0.598
		Top	-	-	0.004	0.004
		Bottom	0.017	0.773	-	0.790
		Right	0.028	-	0.023	0.051
		Left	-	0.162	-	0.162

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Simult. Tx Ref.	CDMA Power Level (dBm)	Configuration	PCS CDMA - FCC Rule Part 24E SAR (W/kg)	PCS EVDO - FCC Rule Part 24E SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)
			1	2	3	1+2+3
I	P ≥ 15	Target Power (dBm)	25	19	-	1+2+3
		Reference	Table 14-16	Table 14-18	Table 14-21	
		Back	1.030	0.339	0.066	1.435
		Front	0.598	0.155	0.007	0.760
		Top	-	-	0.004	0.004
		Bottom	0.624	0.190	-	0.814
		Right	0.297	-	0.023	0.320
		Left	-	0.035	-	0.035
	P < 15	Target Power (dBm)	15	25	-	
		Reference	Table 14-16	Table 14-18	Table 14-21	
		Back	0.107	1.100	0.066	1.273
		Front	0.071	0.567	0.007	0.645
		Top	-	-	0.004	0.004
		Bottom	0.069	0.773	-	0.842
		Right	0.022	-	0.023	0.045
		Left	-	0.162	-	0.162

Note: Per FCC KDB Publication 941225 D06, the edges with antennas more than 2.5 cm are not required to be evaluated for SAR ("").

15.8 Simultaneous Transmission Conclusion

The above numerical summed SAR was below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit. No volumetric SAR summation is required per FCC KDB Publication 648474.

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Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Gigatronics	80701A	(0.05-18GHz) Power Sensor	10/12/2011	Annual	10/12/2012	1833460
Agilent	8753E	(30kHz-6GHz) Network Analyzer	4/21/2011	Annual	4/21/2012	JP38020182
Agilent	8594A	(9kHz-2.9GHz) Spectrum Analyzer	N/A		N/A	3051A00187
Agilent	8648D	(9kHz-4GHz) Signal Generator	10/10/2011	Annual	10/10/2012	3613A00315
SPEAG	D1900V2	1900 MHz SAR Dipole	7/22/2011	Annual	7/22/2012	5d080
SPEAG	D1900V2	1900 MHz SAR Dipole	2/22/2012	Annual	2/22/2013	5d149
SPEAG	D2450V2	2450 MHz SAR Dipole	1/24/2012	Annual	1/24/2013	797
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT			N/A
SPEAG	D5GHzV2	5 GHz SAR Dipole	7/26/2011	Annual	7/26/2012	1007
Amplifier Research	5S1G4	5W, 800MHz-4.2GHz	CBT		N/A	21910
MCL	BW-N6W5+	6dB Attenuator	CBT			1139
SPEAG	D835V2	835 MHz SAR Dipole	1/25/2012	Annual	1/25/2013	4d047
Narda	4772-3	Attenuator (3dB)	CBT		N/A	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT		N/A	120
Rohde & Schwarz	CMU200	Base Station Simulator	4/19/2011	Annual	4/19/2012	107826
Rohde & Schwarz	CMU200	Base Station Simulator	6/1/2011	Annual	6/1/2012	833855/0010
Pasternack	PE2208-6	Bidirectional Coupler	6/3/2011	Annual	6/3/2012	N/A
Pasternack	PE2209-10	Bidirectional Coupler	6/3/2011	Annual	6/3/2012	N/A
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/20/2011	Annual	4/20/2012	665
SPEAG	DAE3	Dasy Data Acquisition Electronics	11/9/2011	Annual	11/9/2012	455
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT		N/A	N/A
Speag	DAK-3.5	Dielectric Assessment Kit	12/1/2011	Annual	12/1/2012	1031
Agilent	85070E	Dielectric Probe Kit	3/8/2012	Annual	3/8/2013	MY44300633
Rohde & Schwarz	NRVD	Dual Channel Power Meter	4/8/2011	Biennial	4/8/2013	101695
Intelligent Weigh	PD-3000	Electronic Balance	3/27/2012	Annual	3/27/2013	11081534
Control Company	61220-416	Long-Stem Thermometer	2/15/2011	Biennial	2/15/2013	111331322
Control Company	61220-416	Long-Stem Thermometer	2/15/2011	Biennial	2/15/2013	111331323
Control Company	61220-416	Long-Stem Thermometer	2/15/2011	Biennial	2/15/2013	111331330
MiniCircuits	VLF-6000+	Low Pass Filter	CBT			N/A
MiniCircuits	VLF-6000+	Low Pass Filter	CBT			N/A
MiniCircuits	SLP-2400+	Low Pass Filter	CBT		N/A	R8979500903
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT		N/A	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT		N/A	N/A
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	8/5/2011	Annual	8/5/2012	112347
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	8/25/2011	Annual	8/25/2012	100976
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	10/7/2011	Annual	10/7/2012	103962
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	11/30/2011	Annual	11/30/2012	101699
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	3/5/2012	Annual	3/5/2013	102060
Anritsu	ML2438A	Power Meter	10/13/2011	Annual	10/13/2012	1070030
Anritsu	ML2495A	Power Meter	10/13/2011	Annual	10/13/2012	1039008
Anritsu	ML2438A	Power Meter	2/14/2012	Annual	2/14/2013	1190013
Anritsu	ML2438A	Power Meter	2/14/2012	Annual	2/14/2013	98150041
Anritsu	MA2481A	Power Sensor	2/14/2012	Annual	2/14/2013	5318
Anritsu	MA2481A	Power Sensor	2/14/2012	Annual	2/14/2013	5442
Anritsu	MA2481A	Power Sensor	2/14/2012	Annual	2/14/2013	5821
Anritsu	MA2481A	Power Sensor	2/14/2012	Annual	2/14/2013	8013
Anritsu	MA2481A	Power Sensor	2/14/2012	Annual	2/14/2013	2400
Anritsu	MA2411B	Pulse Sensor	10/13/2011	Annual	10/13/2012	1027293
Anritsu	MT8820C	Radio Communication Tester	11/11/2011	Annual	11/11/2012	6200901190
SPEAG	ES3DV4	SAR Probe	7/27/2011	Annual	7/27/2012	3561
SPEAG	ES3DV2	SAR Probe	8/25/2011	Annual	8/25/2012	3022
SPEAG	ES3DV3	SAR Probe	11/18/2011	Annual	11/18/2012	3263
SPEAG	ES3DV4	SAR Probe	1/27/2012	Annual	1/27/2013	3589
SPEAG	ES3DV3	SAR Probe	2/7/2012	Annual	2/7/2013	3288
SPEAG	ES3DV3	SAR Probe	2/21/2012	Annual	2/21/2013	3258
SPEAG	ES3DV3	SAR Probe	3/16/2012	Annual	3/16/2013	3209
Seekonk	NC-100	Torque Wrench (8" lb)	11/29/2011	Triennial	11/29/2014	21053
Gigatronics	8651A	Universal Power Meter	10/12/2011	Annual	10/12/2012	8650319
VWR	36934-158	Wall-Mounted Thermometer	5/26/2010	Biennial	5/26/2012	101718589
VWR	36934-158	Wall-Mounted Thermometer	1/21/2011	Biennial	1/21/2013	111286445
Agilent	E5515C	Wireless Communications Test Set	10/10/2011	Annual	10/10/2012	GB46110872
Agilent	E5515C	Wireless Communications Test Set	10/14/2011	Annual	10/14/2012	GB41450275
Agilent	E5515C	Wireless Communications Test Set	10/20/2011	Annual	10/20/2012	GB46310798
Agilent	E5515C	Wireless Communications Test Set	2/9/2012	Annual	2/9/2013	GB43460554
Agilent	E5515C	Wireless Communications Test Set	2/12/2012	Annual	2/12/2013	GB45360985
Agilent	E5515C	Wireless Communications Test Set	2/14/2012	Annual	2/14/2013	GB43304447
Agilent	E5515C	Wireless Communications Test Set	2/14/2012	Annual	2/14/2013	GB43163447
Agilent	E5515C	Wireless Communications Test Set	4/21/2011	Annual	4/21/2012	US41140256

Note: CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a amplifier, cable, attenuator, coupler or filter were connected to a calibrated source (i.e. a signal generator) to determine the losses of the measurement path. The power meter offset was then adjusted to compensate for the measurement system losses. This level offset is stored within the power meter before measurements are made. This calibration verification procedure applies to the system verification and output power measurements. The calibrated reading is then taken directly from the power meter after compensation of the losses for all final power measurements.

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17 MEASUREMENT UNCERTAINTIES

Applicable for frequencies less than 3000 MHz.

a	b	c	d	e= f(d,k)	f	g	h = c x f/e	i = c x g/e	k
Uncertainty Component	IEEE 1528 Sec.	Tol. (± %)	Prob. Dist.	Div.	c _f 1gm	c _g 10 gms	1gm u _i (± %)	10gms u _i (± %)	v _i
Measurement System									
Probe Calibration	E.2.1	6.0	N	1	1.0	1.0	6.0	6.0	∞
Axial Isotropy	E.2.2	0.25	N	1	0.7	0.7	0.2	0.2	∞
Hemishperical Isotropy	E.2.2	1.3	N	1	1.0	1.0	1.3	1.3	∞
Boundary Effect	E.2.3	0.4	N	1	1.0	1.0	0.4	0.4	∞
Linearity	E.2.4	0.3	N	1	1.0	1.0	0.3	0.3	∞
System Detection Limits	E.2.5	5.1	N	1	1.0	1.0	5.1	5.1	∞
Readout Electronics	E.2.6	1.0	N	1	1.0	1.0	1.0	1.0	∞
Response Time	E.2.7	0.8	R	1.73	1.0	1.0	0.5	0.5	∞
Integration Time	E.2.8	2.6	R	1.73	1.0	1.0	1.5	1.5	∞
RF Ambient Conditions	E.6.1	3.0	R	1.73	1.0	1.0	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.4	R	1.73	1.0	1.0	0.2	0.2	∞
Probe Positioning w/ respect to Phantom	E.6.3	2.9	R	1.73	1.0	1.0	1.7	1.7	∞
Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation	E.5	1.0	R	1.73	1.0	1.0	0.6	0.6	∞
Test Sample Related									
Test Sample Positioning	E.4.2	6.0	N	1	1.0	1.0	6.0	6.0	287
Device Holder Uncertainty	E.4.1	3.32	R	1.73	1.0	1.0	1.9	1.9	∞
Output Power Variation - SAR drift measurement	6.6.2	5.0	R	1.73	1.0	1.0	2.9	2.9	∞
Phantom & Tissue Parameters									
Phantom Uncertainty (Shape & Thickness tolerances)	E.3.1	4.0	R	1.73	1.0	1.0	2.3	2.3	∞
Liquid Conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity - measurement uncertainty	E.3.3	3.8	N	1	0.64	0.43	2.4	1.6	6
Liquid Permittivity - deviation from target values	E.3.2	5.0	R	1.73	0.60	0.49	1.7	1.4	∞
Liquid Permittivity - measurement uncertainty	E.3.3	4.5	N	1	0.60	0.49	2.7	2.2	6
Combined Standard Uncertainty (k=1)							RSS	12.1	11.7
Expanded Uncertainty (95% CONFIDENCE LEVEL)							k=2	24.2	23.5

The above measurement uncertainties are according to IEEE Std. 1528-2003

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Applicable for frequencies up to 6 GHz.

a	b	c	d	e= f(d,k)	f	g	h = c x f/e	i = c x g/e	k
Uncertainty Component	IEEE 1528 Sec.	Tol. (± %)	Prob. Dist.	Div.	c _i 1gm	c _i 10 gms	1gm u _i (± %)	10gms u _i (± %)	v _i
Measurement System									
Probe Calibration	E.2.1	6.55	N	1	1.0	1.0	6.6	6.6	∞
Axial Isotropy	E.2.2	0.25	N	1	0.7	0.7	0.2	0.2	∞
Hemishperical Isotropy	E.2.2	1.3	N	1	1.0	1.0	1.3	1.3	∞
Boundary Effect	E.2.3	0.4	N	1	1.0	1.0	0.4	0.4	∞
Linearity	E.2.4	0.3	N	1	1.0	1.0	0.3	0.3	∞
System Detection Limits	E.2.5	5.1	N	1	1.0	1.0	5.1	5.1	∞
Readout Electronics	E.2.6	1.0	N	1	1.0	1.0	1.0	1.0	∞
Response Time	E.2.7	0.8	R	1.73	1.0	1.0	0.5	0.5	∞
Integration Time	E.2.8	2.6	R	1.73	1.0	1.0	1.5	1.5	∞
RF Ambient Conditions	E.6.1	3.0	R	1.73	1.0	1.0	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.4	R	1.73	1.0	1.0	0.2	0.2	∞
Probe Positioning w/ respect to Phantom	E.6.3	2.9	R	1.73	1.0	1.0	1.7	1.7	∞
Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation	E.5	1.0	R	1.73	1.0	1.0	0.6	0.6	∞
Test Sample Related									
Test Sample Positioning	E.4.2	6.0	N	1	1.0	1.0	6.0	6.0	287
Device Holder Uncertainty	E.4.1	3.32	R	1.73	1.0	1.0	1.9	1.9	∞
Output Power Variation - SAR drift measurement	6.6.2	5.0	R	1.73	1.0	1.0	2.9	2.9	∞
Phantom & Tissue Parameters									
Phantom Uncertainty (Shape & Thickness tolerances)	E.3.1	4.0	R	1.73	1.0	1.0	2.3	2.3	∞
Liquid Conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity - measurement uncertainty	E.3.3	3.8	N	1	0.64	0.43	2.4	1.6	6
Liquid Permittivity - deviation from target values	E.3.2	5.0	R	1.73	0.60	0.49	1.7	1.4	∞
Liquid Permittivity - measurement uncertainty	E.3.3	4.5	N	1	0.60	0.49	2.7	2.2	6
Combined Standard Uncertainty (k=1)							RSS	12.4	12.0
Expanded Uncertainty (95% CONFIDENCE LEVEL)							k=2	24.7	24.0

The above measurement uncertainties are according to IEEE Std. 1528-2003

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18 CONCLUSION

18.1 Measurement Conclusion

The SAR evaluation indicates that the EUT complies with the RF radiation exposure limits of the FCC and Industry Canada, with respect to all parameters subject to this test. These measurements were taken to simulate the RF effects of RF exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The results and statements relate only to the item(s) tested. Please note that the absorption and distribution of electromagnetic energy in the body are very complex phenomena that depend on the mass, shape, and size of the body, the orientation of the body with respect to the field vectors, and the electrical properties of both the body and the environment. Other variables that may play a substantial role in possible biological effects are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease). Because various factors may interact with one another to vary the specific biological outcome of an exposure to electromagnetic fields, any protection guide should consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables. [3]

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