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SAR EVALUATION REPORT

Applicant Name:

Samsung Electronics, Co. Ltd.
416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si
Gyeonggi-Do, 443-742
Republic of Korea

Date of Testing:

04/23/2012–05/05/2012 & 06/14/2012–06/18/2012

Test Site/Location:

PCTEST Lab, Columbia, MD, USA

Document Serial No.:

0Y1206120801.A3L

FCC ID:**A3LSPHL300****APPLICANT:****SAMSUNG ELECTRONICS, CO. LTD.****DUT Type:**

Portable Handset

Application Type:

Certification

FCC Rule Part(s):

CFR §2.1093

Model(s):

SPH-L300

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	24.74	0.49	0.59	0.76
Cell. CDMA/EVDO - FCC Rule Part 22H	824.70 - 848.31 MHz	24.77	0.71	0.81	0.81
PCS CDMA/EVDO - FCC Rule Part 24E	1851.25 - 1908.75 MHz	24.74	0.77	1.02	1.02
LTE Band 25 - FCC Rule Part 24E	1852.5 - 1912.5 MHz	23.42	0.91	0.97	0.97
2.4 GHz WLAN - FCC Rule Part 15C	2412 - 2462 MHz	16.27	0.01	0.00	0.00
5.8 GHz WLAN - FCC Rule Part 15C	5745 - 5825 MHz	11.61	0.18	0.22	
5.2 GHz WLAN - FCC Rule Part 15E	5180 - 5240 MHz	12.13	0.04	0.05	
5.3 GHz WLAN - FCC Rule Part 15E	5260 - 5320 MHz	12.64	0.03	0.02	
5.5 GHz WLAN - FCC Rule Part 15E	5500 - 5700 MHz	11.86	0.13	0.18	
Bluetooth - FCC Rule Part 15C	2402 - 2480 MHz	9.65	N/A		
Simultaneous SAR per KDB 690783 D01:			0.98	1.35	1.35

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-L1H7LLA.

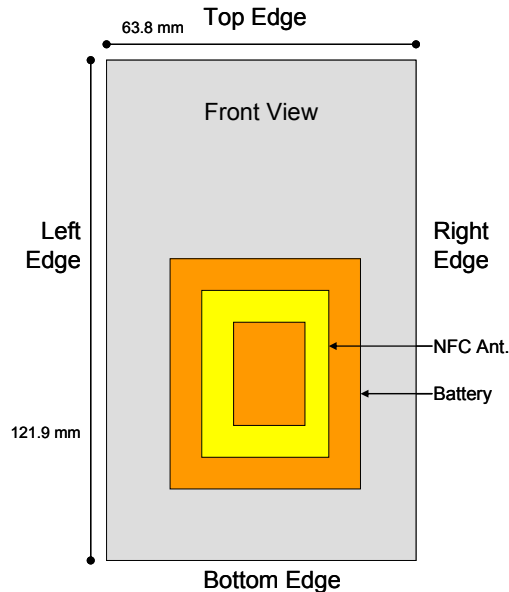




Figure 1-1
NFC Antenna Locations

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1.3 DUT Antenna Locations

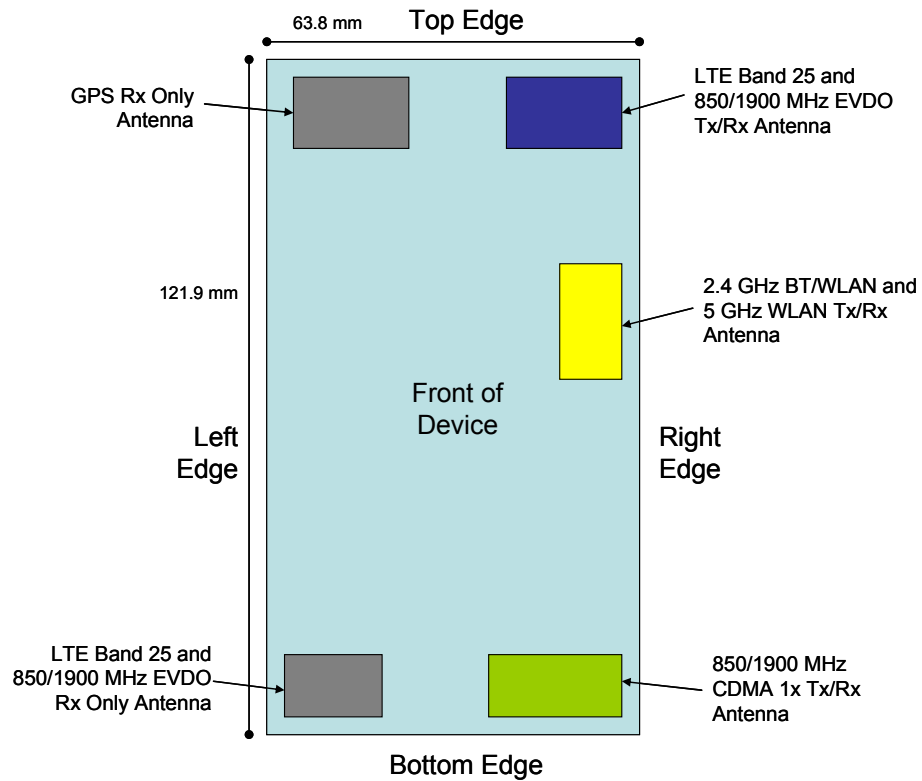




Figure 1-2
DUT Antenna Locations

Table1-1
Mobile Hotspot Sides for SAR Testing

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	Yes	No	Yes	No
Cell EVDO – FCC Rule Part 22H	Yes	Yes	Yes	No	Yes	No
PCS EVDO – FCC Rule Part 24E	Yes	Yes	Yes	No	Yes	No
LTE Band 25 – FCC Rule Part 24E	Yes	Yes	Yes	No	Yes	No
2.4 GHz WLAN – FCC Rule Part 15C	Yes	Yes	No	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.

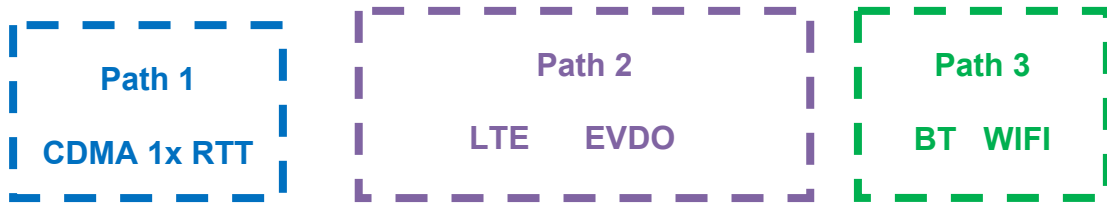


Figure 1-3
Simultaneous Transmission Paths

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 distance between the CDMA 1x-RTT Antenna and the Bluetooth/WLAN antenna is 63 mm.

The separation distance between the EVDO/LTE Antenna and the Bluetooth/WLAN antenna is 14 mm.

The maximum RF Conducted Power of Bluetooth Tx is 9.226 mW (See DSS Report for a full set of Bluetooth powers). The maximum RF Conducted Power of 2.4 GHz WLAN is 42.364 mW. The maximum RF Conducted Power of 5 GHz WLAN is 19.143 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)	24.5	18	15	24.5	19	23	19	-	-
Serial Number	51	54	63	52, 1206-13	56, 1206-12	1206-7	1206-6	66, 51	68

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LTE CHECKLIST PER KDB 941225 D05

KDB 941225 Pub LTE Information			
KDB 941225 Section	FCC ID	A3LSPHL300	
	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	
	Modulations Supported in UL	QPSK, 16QAM	
(b)	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 FCC 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/m^3)
- 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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5 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.

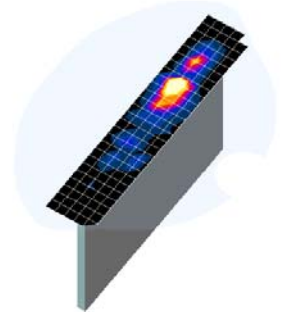




Figure 5-1
Sample SAR Area Scan

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6

DEFINITION OF REFERENCE POINTS

6.1 EAR REFERENCE POINT

Figure 6-2 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 6-1. 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].

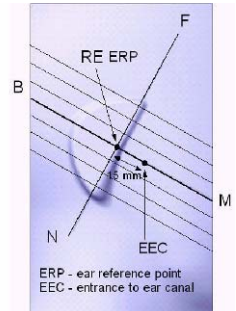


Figure 6-1
Close-Up Side view
of ERP

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

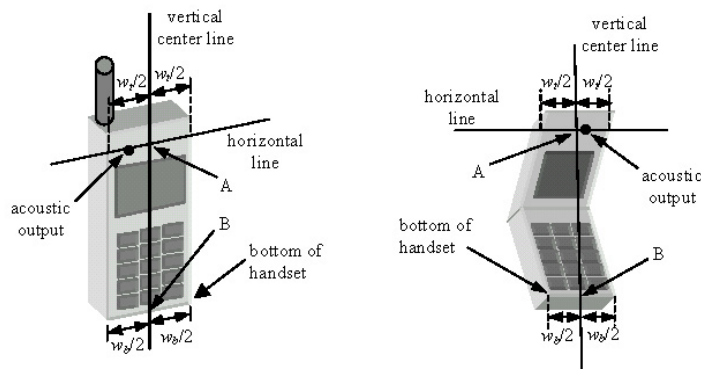




Figure 6-3
Handset Vertical Center & Horizontal Line Reference Points

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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.

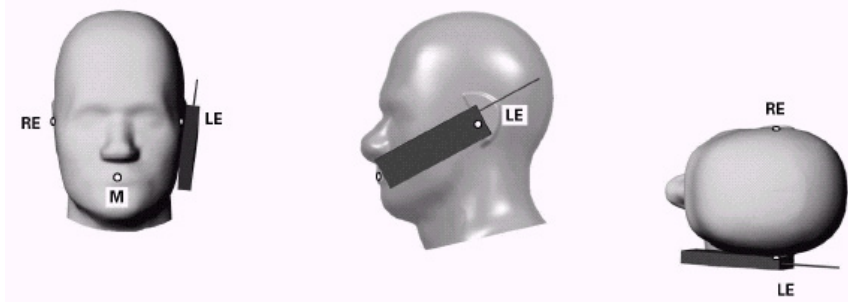




Figure 7-1 Front, Side and Top View of Cheek/Touch Position

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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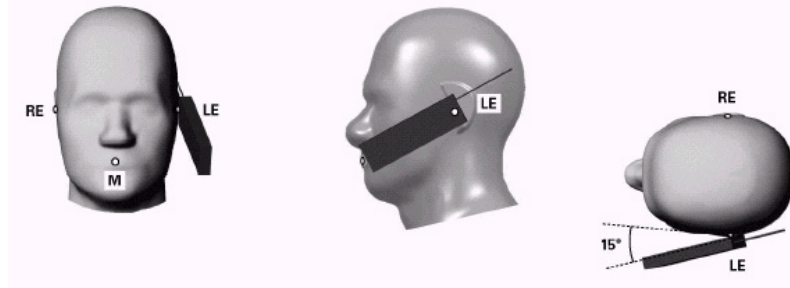


Figure 7-2 Front, Side and Top View of Ear/15° Tilt Position

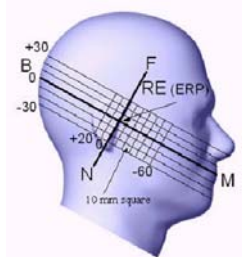


Figure 7-3 Side view w/ relevant markings



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 ½ 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.

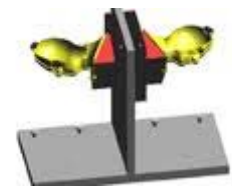


Figure 7-5 Twin SAM Chin20

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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9 FCC MEASUREMENT PROCEDURES

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
$\frac{I_{or}}{I_{or}}$	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
$\frac{I_{or}}{I_{or}}$	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, Model 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 ¼ 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 ¼ 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 ¼ 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	RC11	FCH+SCH	FCH	(RTAP)	(RETAP)
Cellular	90S	564	820.1	24.68	24.67	24.73	24.71	24.74	24.67	24.65
	22H	1013	824.7	24.66	24.67	24.73	24.66	24.66	24.56	24.54
		384	836.52	24.76	24.77	24.80	24.74	24.77	24.65	24.62
		777	848.31	24.63	24.66	24.74	24.65	24.68	24.48	24.47
PCS	24E	25	1851.25	24.76	24.73	24.75	24.72	24.73	24.65	24.64
		600	1880	24.69	24.70	24.76	24.71	24.74	24.47	24.46
		1175	1908.75	24.72	24.70	24.75	24.65	24.70	24.45	24.44

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.

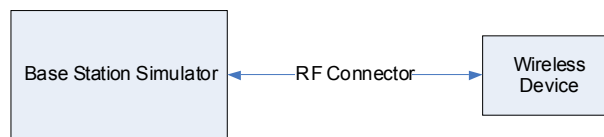


Figure 10-1
Power Measurement Setup

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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	22.92	0	0
	1852.5	26065	5	QPSK	1	24	22.85	0	0
	1852.5	26065	5	QPSK	12	6	22.14	1	0-1
	1852.5	26065	5	QPSK	25	0	22.15	1	0-1
	1852.5	26065	5	16-QAM	1	0	22.35	1	0-1
	1852.5	26065	5	16-QAM	1	24	22.27	1	0-1
	1852.5	26065	5	16-QAM	12	6	21.24	2	0-2
Mid	1882.5	26365	5	16-QAM	25	0	21.36	2	0-2
	1882.5	26365	5	QPSK	1	0	23.13	0	0
	1882.5	26365	5	QPSK	1	24	23.10	0	0
	1882.5	26365	5	QPSK	12	6	22.29	1	0-1
	1882.5	26365	5	QPSK	25	0	22.37	1	0-1
	1882.5	26365	5	16-QAM	1	0	22.30	1	0-1
	1882.5	26365	5	16-QAM	1	24	22.27	1	0-1
High	1882.5	26365	5	16-QAM	12	6	21.17	2	0-2
	1882.5	26365	5	16-QAM	25	0	21.41	2	0-2
	1912.5	26665	5	QPSK	1	0	23.42	0	0
	1912.5	26665	5	QPSK	1	24	22.71	0	0
	1912.5	26665	5	QPSK	12	6	22.47	1	0-1
	1912.5	26665	5	QPSK	25	0	22.44	1	0-1
	1912.5	26665	5	16-QAM	1	0	22.42	1	0-1
1912.5	26665	5	16-QAM	1	24	21.93	1	0-1	
1912.5	26665	5	16-QAM	12	6	21.45	2	0-2	
1912.5	26665	5	16-QAM	25	0	21.50	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 **high channel (highest output power) was tested for QPSK 1 RB configurations**. Mid and Low 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 **high channel (highest output power) was tested for 16 QAM 1 RB configurations**. Mid and Low 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.

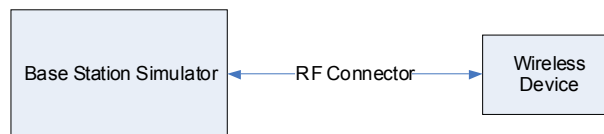


Figure 10-2
Power Measurement Setup

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10.3 Measured WLAN Conducted Powers

**Table 10-1
IEEE 802.11b Average RF Power**

Mode	Freq [MHz]	Channel	Conducted Power [dBm]			
			Data Rate [Mbps]			
			1	2	5.5	11
802.11b	2412	1	16.27	16.03	16.20	15.93
802.11b	2437	6	15.95	15.44	15.54	15.56
802.11b	2462	11	15.28	15.33	14.89	14.87

**Table 10-2
IEEE 802.11g Average RF Power**

Mode	Freq [MHz]	Channel	Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11g	2412	1	13.46	14.14	13.35	11.25	12.47	11.56	13.12	14.29
802.11g	2437	6	13.03	14.58	13.22	11.12	12.25	11.46	12.91	13.66
802.11g	2462	11	12.72	13.59	12.29	10.21	11.49	10.53	11.93	13.21

**Table 10-3
IEEE 802.11n Average RF Power**

Mode	Freq [MHz]	Channel	Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	20	26	39	52	58	65
802.11n	2412	1	12.33	11.85	9.16	10.73	11.57	11.24	11.83	11.43
802.11n	2437	6	11.57	11.85	9.19	10.34	10.35	10.91	11.15	11.18
802.11n	2462	11	10.24	10.85	8.49	9.48	9.54	10.08	10.52	10.37

**Table 10-4
IEEE 802.11a Average RF Power**

Mode	Freq [MHz]	Channel	Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11a	5180	36*	12.07	12.29	12.05	12.23	12.21	11.30	10.42	11.28
802.11a	5200	40	11.95	11.42	12.20	12.18	11.84	11.64	12.14	12.19
802.11a	5220	44	12.13	10.69	11.58	10.83	11.26	11.37	11.59	12.02
802.11a	5240	48*	11.42	11.87	12.28	11.66	11.58	10.86	11.14	11.84
802.11a	5260	52*	12.64	11.41	12.82	11.17	11.33	12.68	12.35	11.40
802.11a	5280	56	12.42	12.64	12.52	12.67	12.66	11.62	12.08	11.91
802.11a	5300	60	11.98	11.53	12.17	12.13	11.28	11.91	12.11	12.11
802.11a	5320	64*	11.35	10.74	11.76	10.82	11.18	11.81	12.01	11.01
802.11a	5500	100	11.86	11.74	12.11	12.08	12.09	11.64	11.71	11.75
802.11a	5520	104*	11.66	11.75	11.59	11.73	11.66	11.68	11.54	11.56
802.11a	5540	108	11.74	11.03	11.33	10.79	10.87	10.58	11.36	11.36
802.11a	5560	112	11.11	10.94	11.20	10.78	11.34	10.48	10.79	10.86
802.11a	5580	116*	11.09	10.95	10.77	9.99	10.39	10.89	10.43	10.40
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	9.98	10.15	9.95	9.47	9.49	9.91	9.57	9.80
802.11a	5680	136*	9.60	9.35	9.27	9.07	9.35	9.26	9.15	9.75
802.11a	5700	140	9.86	9.52	9.46	10.06	9.71	9.53	8.97	9.08
802.11a	5745	149*	10.97	10.89	10.66	10.94	10.75	10.75	10.76	10.90
802.11a	5765	153	11.25	11.12	11.49	10.96	10.91	10.80	10.99	10.92
802.11a	5785	157*	11.61	10.81	11.32	11.13	11.32	10.88	11.00	11.55
802.11a	5805	161*	11.30	11.03	11.53	11.33	10.91	11.08	10.88	10.95
802.11a	5825	165	11.31	11.10	11.02	11.33	11.07	11.31	10.85	11.01

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	Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	20	26	39	52	58	65
802.11n	5180	36*	11.54	12.04	11.96	11.25	11.89	11.70	12.01	11.75
802.11n	5200	40	11.08	12.21	12.11	10.85	11.00	11.24	11.75	11.47
802.11n	5220	44	12.38	12.38	11.94	10.78	11.64	11.63	12.31	12.37
802.11n	5240	48*	11.07	12.22	11.23	11.39	11.90	12.33	11.58	11.52
802.11n	5260	52*	12.02	12.64	11.76	11.74	11.23	12.44	11.41	11.91
802.11n	5280	56	12.49	11.72	12.79	12.20	12.01	12.08	12.03	12.02
802.11n	5300	60	11.44	12.24	12.22	12.30	12.54	11.48	11.28	12.37
802.11n	5320	64*	11.66	11.55	11.94	11.72	11.83	12.25	11.05	11.39
802.11n	5500	100	11.99	12.10	11.47	11.41	11.51	11.29	11.23	11.56
802.11n	5520	104*	11.43	11.71	11.25	11.25	11.33	10.89	11.78	11.53
802.11n	5540	108	11.10	11.50	11.05	10.95	10.63	10.76	11.07	11.00
802.11n	5560	112	10.63	11.09	11.11	10.61	10.51	10.50	10.81	10.64
802.11n	5580	116*	10.67	10.57	10.38	10.79	10.15	10.39	10.23	10.32
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	9.98	10.16	9.74	9.48	9.22	9.49	9.52	9.53
802.11n	5680	136*	9.76	9.53	9.95	9.76	9.13	9.18	9.22	9.13
802.11n	5700	140	9.68	9.98	9.55	9.66	9.16	9.52	9.25	9.07
802.11n	5745	149*	11.48	11.12	11.09	10.92	10.92	11.04	10.67	11.07
802.11n	5765	153	11.26	11.28	11.86	11.25	10.77	11.05	10.76	10.86
802.11n	5785	157*	11.14	11.70	11.51	11.45	10.99	11.42	10.93	11.06
802.11n	5805	161*	11.35	11.28	11.67	11.25	10.80	10.90	11.15	11.04
802.11n	5825	165	11.50	11.67	11.51	10.91	11.25	11.02	11.45	11.28

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 40MHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5/7.2	13/14.4	19.5/21.7	26/28.9	39/43.4	52/57.8	58.5/65	65/72.2
802.11n	5190	38	12.01	12.07	12.20	12.19	12.26	12.18	12.17	12.27
802.11n	5230	46	12.13	12.20	12.31	12.27	12.36	12.29	12.28	12.37
802.11n	5270	54	12.21	12.29	12.39	12.35	12.47	12.37	12.35	12.44
802.11n	5310	62	12.39	12.47	12.48	12.46	12.49	12.53	12.47	12.49
802.11n	5510	102	11.88	10.35	8.72	10.18	8.44	11.23	11.88	7.84
802.11n	5550	110	11.93	11.04	10.03	10.38	9.38	11.62	12.04	9.26
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	11.44	10.05	8.96	9.47	8.96	10.80	11.50	8.18
802.11n	5755	151	11.84	10.90	9.27	10.28	10.59	11.17	11.84	9.22
802.11n	5795	159	11.84	10.60	9.14	10.05	10.39	10.41	11.18	8.76



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.

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.

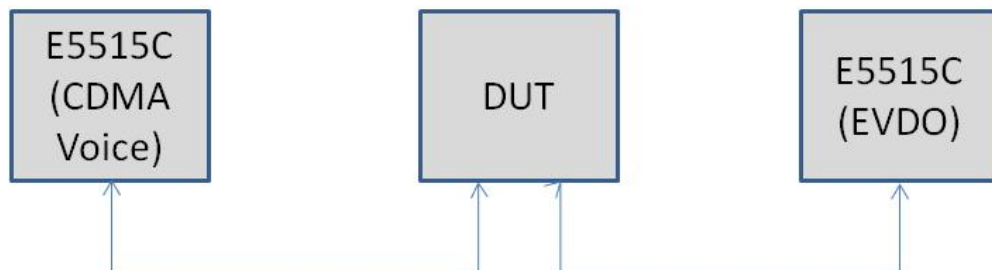
**Table 11-1
SVDO Power Reduction Scheme**

Mode	Voice Avg Power(P) 1x 850/1900 MHz (dBm)	Max. EVDO Data Avg Power (dBm)
SVDO	$P \geq 15$	19
	$P < 15$	24.5

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	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	24.58	24.48	24.48	24.49	24.55	24.48	24.46	24.49	24.48	24.49	24.55	24.48	24.49	24.55	
	564	13	24.60	24.49	24.46	24.49	24.49	24.50	24.57	24.49	24.46	24.49	24.49	24.46	24.49	24.49	
	564	12	24.58	24.52	24.51	24.51	24.53	24.55	24.55	24.54	24.51	24.51	24.53	24.51	24.51	24.53	
	564	11	24.53	24.53	24.49	24.50	24.51	24.53	24.53	24.53	24.49	24.50	24.51	24.49	24.50	24.51	

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	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	24.52	24.52	24.48	24.54	24.53	24.48	24.49	24.44	24.48	24.49	24.55	24.48	24.46	24.49	
	1013	13	24.46	24.52	24.54	24.49	24.47	24.55	24.51	24.43	24.46	24.49	24.49	24.50	24.57	24.49	
	1013	12	24.49	24.51	24.48	24.47	24.51	24.53	24.53	24.49	24.51	24.51	24.53	24.55	24.55	24.54	
	1013	11	24.51	24.49	24.51	24.50	24.49	24.50	24.51	24.47	24.49	24.50	24.51	24.53	24.53	24.53	



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	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	24.49	24.55	24.51	24.49	24.44	24.53	24.54	24.53	24.48	24.46	24.49	24.48	24.49	24.55	
	384	13	24.55	24.53	24.55	24.51	24.43	24.54	24.49	24.47	24.50	24.57	24.49	24.46	24.49	24.49	
	384	12	24.53	24.54	24.53	24.53	24.49	24.48	24.47	24.51	24.55	24.55	24.54	24.51	24.51	24.53	
	384	11	24.51	24.51	24.50	24.51	24.47	24.51	24.50	24.49	24.53	24.53	24.53	24.49	24.50	24.51	

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	24.49	24.51	24.52	24.46	24.49	24.48	24.49	24.55	24.48	24.49	24.44	24.48	24.54	24.53	
	777	13	24.51	24.50	24.50	24.57	24.49	24.46	24.49	24.49	24.55	24.48	24.51	24.43	24.54	24.49	
	777	12	24.49	24.55	24.55	24.55	24.54	24.51	24.51	24.53	24.53	24.53	24.49	24.48	24.47	24.51	
	777	11	24.47	24.53	24.53	24.53	24.53	24.49	24.50	24.51	24.50	24.51	24.47	24.51	24.50	24.49	

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	24.58	24.48	24.45	24.49	24.55	24.48	24.49	24.44	24.48	24.46	24.49	24.48	24.49	24.55	
	25	13	24.49	24.55	24.46	24.49	24.49	24.55	24.51	24.43	24.50	24.57	24.49	24.46	24.49	24.49	
	25	12	24.58	24.53	24.49	24.51	24.53	24.53	24.49	24.55	24.55	24.54	24.54	24.51	24.51	24.53	
	25	11	24.49	24.48	24.45	24.50	24.51	24.50	24.51	24.47	24.53	24.53	24.53	24.49	24.50	24.51	

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	24.45	24.55	24.48	24.46	24.49	24.51	24.49	24.55	24.48	24.49	24.55	24.48	24.49	24.44	
	600	13	24.55	24.50	24.50	24.57	24.49	24.46	24.49	24.49	24.46	24.49	24.49	24.55	24.51	24.43	
	600	12	24.48	24.41	24.55	24.55	24.54	24.51	24.51	24.53	24.51	24.51	24.53	24.53	24.53	24.49	
	600	11	24.43	24.46	24.53	24.53	24.53	24.49	24.50	24.51	24.49	24.50	24.51	24.50	24.51	24.47	

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	24.43	24.49	24.48	24.49	24.55	24.48	24.49	24.55	24.48	24.46	24.49	24.48	24.49	24.55	
	1175	13	24.49	24.55	24.46	24.49	24.49	24.46	24.49	24.49	24.50	24.57	24.49	24.46	24.49	24.49	
	1175	12	24.51	24.56	24.51	24.51	24.53	24.51	24.51	24.53	24.55	24.55	24.54	24.51	24.51	24.53	
	1175	11	24.49	24.49	24.49	24.50	24.51	24.49	24.50	24.51	24.53	24.53	24.53	24.49	24.50	24.51	

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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]	1x EvDO Rev. A [dBm]
		F-RC	MHz	(RTAP)	(RETAP)
Cellular	90S	564	820.1	18.92	18.91
	22H	1013	824.7	18.88	18.87
		384	836.52	18.97	18.94
		777	848.31	19.02	18.98
PCS	24E	25	1851.25	18.85	18.79
		600	1880	18.90	18.89
		1175	1908.75	18.77	18.76

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	Channel	Frequency	SO55 [dBm]	SO55 [dBm]	SO75 [dBm]	TDSO SO32 [dBm]	TDSO SO32 [dBm]
	F-RC	MHz	RC1	RC3	RC8	FCH+SCH	FCH
Cellular	564	820.1	14.82	14.87	14.81	15.02	15.34
	1013	824.7	15.24	15.26	15.22	15.47	15.43
	384	836.52	14.86	14.83	14.82	14.97	15.37
	777	848.31	14.89	14.85	14.88	14.97	15.38
PCS	25	1851.25	15.14	15.01	15.10	15.24	15.50
	600	1880	14.92	14.99	14.95	15.33	15.38
	1175	1908.75	14.86	14.93	14.92	15.23	15.32



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.

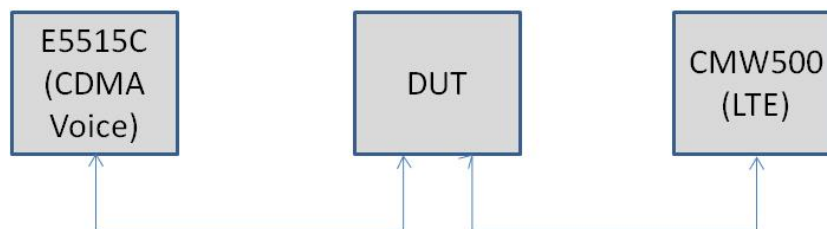
**Table 12-1
SVLTE Power Reduction Scheme**

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 (6RB 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 (6RB 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 (6RB 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 (6RB 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 (6RB 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 (6RB 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 (6RB 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 (6RB 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	18.76	0	0
	1852.5	26065	5	QPSK	1	24	18.64	0	0
	1852.5	26065	5	QPSK	12	6	18.78	0	0-1
	1852.5	26065	5	QPSK	25	0	18.81	0	0-1
	1852.5	26065	5	16-QAM	1	0	18.72	0	0-1
	1852.5	26065	5	16-QAM	1	24	18.63	0	0-1
	1852.5	26065	5	16-QAM	12	6	18.62	0	0-2
	1852.5	26065	5	16-QAM	25	0	18.83	0	0-2
Mid	1882.5	26365	5	QPSK	1	0	18.61	0	0
	1882.5	26365	5	QPSK	1	24	18.69	0	0
	1882.5	26365	5	QPSK	12	6	18.90	0	0-1
	1882.5	26365	5	QPSK	25	0	18.94	0	0-1
	1882.5	26365	5	16-QAM	1	0	18.60	0	0-1
	1882.5	26365	5	16-QAM	1	24	18.76	0	0-1
	1882.5	26365	5	16-QAM	12	6	18.85	0	0-2
	1882.5	26365	5	16-QAM	25	0	19.00	0	0-2
High	1912.5	26665	5	QPSK	1	0	18.71	0	0
	1912.5	26665	5	QPSK	1	24	18.61	0	0
	1912.5	26665	5	QPSK	12	6	19.10	0	0-1
	1912.5	26665	5	QPSK	25	0	19.11	0	0-1
	1912.5	26665	5	16-QAM	1	0	18.80	0	0-1
	1912.5	26665	5	16-QAM	1	24	18.74	0	0-1
	1912.5	26665	5	16-QAM	12	6	18.89	0	0-2
	1912.5	26665	5	16-QAM	25	0	19.14	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 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**

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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	18.05	18.05	18.06	18.06	18.03
	22H	1013	824.7	18.06	18.06	18.11	18.10	18.09
		384	836.52	18.17	18.16	18.23	18.19	18.17
		777	848.31	18.11	18.11	18.16	18.15	18.13
PCS	24E	25	1851.25	18.45	18.45	18.48	18.44	18.43
		600	1880	18.35	18.36	18.40	18.32	18.34
		1175	1908.75	18.39	18.37	18.42	18.37	18.37



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
4/23/2012	835H	22.7	820	0.896	40.83	0.898	41.571	-0.22%	-1.78%
			835	0.910	40.64	0.900	41.500	1.11%	-2.07%
			850	0.925	40.45	0.916	41.500	0.98%	-2.53%
5/5/2012	835H	22.8	820	0.901	39.76	0.898	41.571	0.33%	-4.36%
			835	0.916	39.69	0.900	41.500	1.78%	-4.36%
			850	0.929	39.50	0.916	41.500	1.42%	-4.82%
4/27/2012	1900H	22.6	1850	1.338	39.70	1.400	40.000	-4.43%	-0.75%
			1880	1.369	39.56	1.400	40.000	-2.21%	-1.10%
			1910	1.397	39.46	1.400	40.000	-0.21%	-1.35%
6/14/2012	1900H	22.1	1850	1.357	38.41	1.400	40.000	-3.07%	-3.98%
			1880	1.390	38.26	1.400	40.000	-0.71%	-4.35%
			1910	1.425	38.14	1.400	40.000	1.79%	-4.65%
			1920	1.433	38.10	1.400	40.000	2.36%	-4.75%
4/26/2012	2450H	22.1	2401	1.763	38.12	1.758	39.298	0.28%	-3.00%
			2450	1.722	37.56	1.800	39.200	-4.33%	-4.18%
			2499	1.874	37.37	1.852	39.135	1.19%	-4.51%
04/30/2012	5200H-5800H	22.8	5200	4.501	35.27	4.660	36.000	-3.41%	-2.03%
			5220	4.523	35.18	4.680	35.980	-3.35%	-2.22%
			5260	4.567	35.19	4.720	35.940	-3.24%	-2.09%
			5500	4.788	34.89	4.965	35.650	-3.56%	-2.13%
			5785	5.052	34.41	5.255	35.315	-3.86%	-2.56%
			5800	5.068	34.40	5.270	35.300	-3.83%	-2.55%
4/25/2012	835B	22.7	820	0.971	52.71	0.969	55.284	0.21%	-4.66%
			835	0.987	52.58	0.970	55.200	1.75%	-4.75%
			850	1.000	52.44	0.988	55.154	1.21%	-4.92%
5/3/2012	835B	22.7	820	0.997	53.72	0.969	55.284	2.89%	-2.83%
			835	1.012	53.61	0.970	55.200	4.33%	-2.88%
			850	1.027	53.40	0.988	55.154	3.95%	-3.18%
4/23/2012	1900B	21.7	1850	1.475	52.22	1.520	53.300	-2.96%	-2.03%
			1880	1.510	52.12	1.520	53.300	-0.66%	-2.21%
			1910	1.536	52.05	1.520	53.300	1.05%	-2.35%
6/18/2012	1900B	22.8	1850	1.464	51.60	1.520	53.300	-3.68%	-3.19%
			1880	1.496	51.48	1.520	53.300	-1.58%	-3.41%
			1910	1.529	51.34	1.520	53.300	0.59%	-3.68%
			1920	1.545	51.35	1.520	53.300	1.64%	-3.66%
4/30/2012	2450B	22.8	2401	1.937	51.01	1.903	52.765	1.79%	-3.33%
			2450	1.893	50.32	1.950	52.700	-2.92%	-4.52%
			2499	2.072	50.33	2.019	52.638	2.63%	-4.38%
5/1/2012	5200B-5800B	24.1	5200	5.212	47.24	5.299	49.014	-1.64%	-3.62%
			5220	5.253	47.24	5.323	48.987	-1.32%	-3.57%
			5260	5.299	46.98	5.369	48.906	-1.30%	-3.94%
			5500	5.711	46.37	5.650	48.580	1.08%	-4.55%
			5785	6.165	45.85	5.982	48.242	3.06%	-4.96%
			5800	6.179	45.91	6.000	48.200	2.98%	-4.75%

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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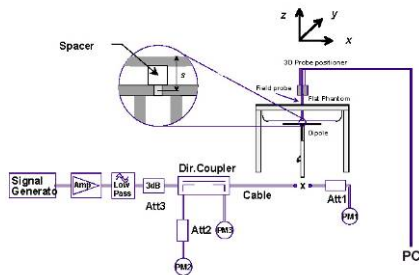
13.3 Test System Verification

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	04/23/2012	21.7	21.6	0.100	4d133	3561	0.942	9.450	9.420	-0.32%
835	Head	05/05/2012	23.0	22.8	0.100	4d026	3258	1.01	9.460	10.100	6.77%
1900	Head	04/27/2012	23.8	22.4	0.100	5d149	3288	3.88	39.300	38.800	-1.27%
1900	Head	06/14/2012	22.6	22.2	0.100	5d149	3288	3.93	39.300	39.300	0.00%
2450	Head	04/26/2012	23.1	21.4	0.010	719	3022	0.508	53.800	50.800	-5.58%
5200	Head	04/30/2012	21.8	20.9	0.017	1057	3589	1.35	79.100	79.882	0.99%
5500	Head	04/30/2012	21.9	21.0	0.016	1057	3589	1.36	84.900	83.436	-1.72%
5800	Head	04/30/2012	22.1	20.8	0.016	1057	3589	1.31	79.500	81.875	2.99%
835	Body	04/25/2012	23.7	22.2	0.100	4d026	3258	1.02	9.660	10.200	5.59%
835	Body	05/03/2012	23.0	22.1	0.100	4d047	3561	0.927	9.410	9.270	-1.49%
1900	Body	04/23/2012	21.8	20.8	0.100	5d149	3288	3.92	39.300	39.200	-0.25%
1900	Body	06/18/2012	23.3	22.8	0.100	5d148	3288	3.89	39.100	38.900	-0.51%
2450	Body	04/30/2012	23.1	21.3	0.100	719	3022	4.88	51.300	48.800	-4.87%
5200	Body	05/01/2012	24.2	22.6	0.017	1057	3589	1.26	73.400	74.556	1.58%
5500	Body	05/01/2012	24.5	22.8	0.017	1057	3589	1.29	78.900	77.246	-2.10%
5800	Body	05/01/2012	24.6	22.9	0.017	1057	3589	1.26	74.300	74.118	-0.24%

Note: Per KDB Publication 865664, when a reference dipole is not defined within ± 100 MHz of the test frequency, the system verification may be conducted within ± 200 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	24.5	24.67	-0.02	Right	Touch	51	0.488
820.10	564	Cell. CDMA	90S	SO55	24.5	24.67	-0.05	Right	Tilt	51	0.313
820.10	564	Cell. CDMA	90S	SO55	24.5	24.67	0.04	Left	Touch	51	0.419
820.10	564	Cell. CDMA	90S	SO55	24.5	24.67	0.00	Left	Tilt	51	0.297
820.10	564	Cell. CDMA	90S	SO55	18	18.05	0.14	Right	Touch	54	0.086
820.10	564	Cell. CDMA	90S	SO55	18	18.05	0.08	Right	Tilt	54	0.061
820.10	564	Cell. CDMA	90S	SO55	18	18.05	0.13	Left	Touch	54	0.081
820.10	564	Cell. CDMA	90S	SO55	18	18.05	0.10	Left	Tilt	54	0.058
820.10	564	Cell. CDMA	90S	SO55	15	14.87	0.02	Right	Touch	63	0.045
820.10	564	Cell. CDMA	90S	SO55	15	14.87	-0.02	Right	Tilt	63	0.029
820.10	564	Cell. CDMA	90S	SO55	15	14.87	0.17	Left	Touch	63	0.047
820.10	564	Cell. CDMA	90S	SO55	15	14.87	0.00	Left	Tilt	63	0.026
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	24.5	24.77	0.00	Right	Touch	51	0.708
836.52	384	Cell. CDMA	22H	SO55	24.5	24.77	0.04	Right	Tilt	51	0.444
836.52	384	Cell. CDMA	22H	SO55	24.5	24.77	0.01	Left	Touch	51	0.555
836.52	384	Cell. CDMA	22H	SO55	24.5	24.77	0.04	Left	Tilt	51	0.353
836.52	384	Cell. CDMA	22H	SO55	18	18.16	0.01	Right	Touch	54	0.119
836.52	384	Cell. CDMA	22H	SO55	18	18.16	0.02	Right	Tilt	54	0.078
836.52	384	Cell. CDMA	22H	SO55	18	18.16	0.01	Left	Touch	54	0.105
836.52	384	Cell. CDMA	22H	SO55	18	18.16	0.10	Left	Tilt	54	0.064
836.52	1013	Cell. CDMA	22H	SO55	15	14.83	0.09	Right	Touch	63	0.055
836.52	1013	Cell. CDMA	22H	SO55	15	14.83	0.16	Right	Tilt	63	0.035
836.52	1013	Cell. CDMA	22H	SO55	15	14.83	0.02	Left	Touch	63	0.047
836.52	1013	Cell. CDMA	22H	SO55	15	14.83	0.08	Left	Tilt	63	0.030
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	24.5	24.70	-0.07	Right	Touch	51	0.611
1880.00	600	PCS CDMA	24E	SO55	24.5	24.70	-0.07	Right	Tilt	51	0.154
1880.00	600	PCS CDMA	24E	SO55	24.5	24.70	0.04	Left	Touch	51	0.490
1880.00	600	PCS CDMA	24E	SO55	24.5	24.70	-0.09	Left	Tilt	51	0.141
1880.00	600	PCS CDMA	24E	SO55	18	18.36	-0.03	Right	Touch	54	0.114
1880.00	600	PCS CDMA	24E	SO55	18	18.36	0.14	Right	Tilt	54	0.042
1880.00	600	PCS CDMA	24E	SO55	18	18.36	0.06	Left	Touch	54	0.134
1880.00	600	PCS CDMA	24E	SO55	18	18.36	0.09	Left	Tilt	54	0.041
1880.00	600	PCS CDMA	24E	SO55	15	14.99	0.12	Right	Touch	63	0.021
1880.00	600	PCS CDMA	24E	SO55	15	14.99	-0.10	Right	Tilt	63	0.006
1880.00	600	PCS CDMA	24E	SO55	15	14.99	0.20	Left	Touch	63	0.027
1880.00	600	PCS CDMA	24E	SO55	15	14.99	0.05	Left	Tilt	63	0.006
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	24.5	24.67	-0.02	Right	Touch	52	0.126
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	24.5	24.67	-0.05	Right	Tilt	52	0.109
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	24.5	24.67	-0.08	Left	Touch	52	0.147
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	24.5	24.67	-0.03	Left	Tilt	52	0.142
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	19	18.92	0.12	Right	Touch	56	0.015
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	19	18.92	0.14	Right	Tilt	56	0.014
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	19	18.92	0.02	Left	Touch	56	0.019
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	19	18.92	0.17	Left	Tilt	56	0.017
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	24.5	24.65	0.01	Right	Touch	52	0.183
836.52	384	Cell.EVDO	22H	EVDO Rev. 0	24.5	24.65	0.09	Right	Tilt	52	0.165
836.52	384	Cell.EVDO	22H	EVDO Rev. 0	24.5	24.65	-0.07	Left	Touch	52	0.230
836.52	384	Cell.EVDO	22H	EVDO Rev. 0	24.5	24.65	0.04	Left	Tilt	52	0.205
836.52	384	Cell.EVDO	22H	EVDO Rev. 0	19	18.97	0.17	Right	Touch	56	0.023
836.52	384	Cell.EVDO	22H	EVDO Rev. 0	19	18.97	0.19	Right	Tilt	56	0.020
836.52	384	Cell.EVDO	22H	EVDO Rev. 0	19	18.97	0.04	Left	Touch	56	0.028
836.52	384	Cell.EVDO	22H	EVDO Rev. 0	19	18.97	0.11	Left	Tilt	56	0.024
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	24.5	24.47	-0.05	Right	Touch	1206-13	0.468
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	24.5	24.47	0.00	Right	Tilt	1206-13	0.639
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	24.5	24.47	-0.04	Left	Touch	1206-13	0.663
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	24.5	24.47	0.04	Left	Tilt	1206-13	0.773
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	19	18.90	-0.08	Right	Touch	1206-12	0.128
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	19	18.90	-0.01	Right	Tilt	1206-12	0.166
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	19	18.90	0.02	Left	Touch	1206-12	0.129
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	19	18.90	-0.02	Left	Tilt	1206-12	0.147
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	22.29	-0.02	Right	Touch	QPSK	12	6	1206-7	0.462
1912.5	26665	High	LTE Band 25	24E	5	23	0	23.42	0.04	Right	Touch	QPSK	1	0	1206-7	0.623
1912.5	26665	High	LTE Band 25	24E	5	23	0	22.71	-0.03	Right	Touch	QPSK	1	24	1206-7	0.389
1882.5	26365	Mid	LTE Band 25	24E	5	21	2	21.17	0.01	Right	Touch	16 QAM	12	6	1206-7	0.382
1912.5	26665	High	LTE Band 25	24E	5	22	1	22.42	0.02	Right	Touch	16 QAM	1	0	1206-7	0.519
1912.5	26665	High	LTE Band 25	24E	5	22	1	21.93	-0.05	Right	Touch	16 QAM	1	24	1206-7	0.330
1882.5	26365	Mid	LTE Band 25	24E	5	22	1	22.29	0.03	Right	Tilt	QPSK	12	6	1206-7	0.652
1912.5	26665	High	LTE Band 25	24E	5	23	0	23.42	0.09	Right	Tilt	QPSK	1	0	1206-7	0.828
1912.5	26665	High	LTE Band 25	24E	5	23	0	22.71	-0.11	Right	Tilt	QPSK	1	24	1206-7	0.457
1882.5	26365	Mid	LTE Band 25	24E	5	21	2	21.17	0.02	Right	Tilt	16 QAM	12	6	1206-7	0.508
1912.5	26665	High	LTE Band 25	24E	5	22	1	22.42	0.15	Right	Tilt	16 QAM	1	0	1206-7	0.682
1912.5	26665	High	LTE Band 25	24E	5	22	1	21.93	-0.06	Right	Tilt	16 QAM	1	24	1206-7	0.387
1882.5	26365	Mid	LTE Band 25	24E	5	22	1	22.29	0.05	Left	Touch	QPSK	12	6	1206-7	0.613
1912.5	26665	High	LTE Band 25	24E	5	23	0	23.42	0.00	Left	Touch	QPSK	1	0	1206-7	0.831
1912.5	26665	High	LTE Band 25	24E	5	23	0	22.71	0.01	Left	Touch	QPSK	1	24	1206-7	0.525
1882.5	26365	Mid	LTE Band 25	24E	5	21	2	21.17	0.01	Left	Touch	16 QAM	12	6	1206-7	0.499
1912.5	26665	High	LTE Band 25	24E	5	22	1	22.42	-0.16	Left	Touch	16 QAM	1	0	1206-7	0.703
1912.5	26665	High	LTE Band 25	24E	5	22	1	21.93	0.14	Left	Touch	16 QAM	1	24	1206-7	0.436
1882.5	26365	Mid	LTE Band 25	24E	5	22	1	22.29	-0.02	Left	Tilt	QPSK	12	6	1206-7	0.550
1912.5	26665	High	LTE Band 25	24E	5	23	0	23.42	0.11	Left	Tilt	QPSK	1	0	1206-7	0.911
1912.5	26665	High	LTE Band 25	24E	5	23	0	22.71	-0.12	Left	Tilt	QPSK	1	24	1206-7	0.568
1882.5	26365	Mid	LTE Band 25	24E	5	21	2	21.17	-0.12	Left	Tilt	16 QAM	12	6	1206-7	0.514
1912.5	26665	High	LTE Band 25	24E	5	22	1	22.42	-0.06	Left	Tilt	16 QAM	1	0	1206-7	0.714
1912.5	26665	High	LTE Band 25	24E	5	22	1	21.93	0.14	Left	Tilt	16 QAM	1	24	1206-7	0.489
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) 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, high 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	18.90	-0.14	Right	Touch	QPSK	12	6	1206-6	0.154
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.61	0.01	Right	Touch	QPSK	1	0	1206-6	0.132
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.69	-0.01	Right	Touch	QPSK	1	24	1206-6	0.156
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.85	-0.11	Right	Touch	16 QAM	12	6	1206-6	0.150
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.60	-0.04	Right	Touch	16 QAM	1	0	1206-6	0.135
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.76	0.00	Right	Touch	16 QAM	1	24	1206-6	0.162
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.90	-0.09	Right	Tilt	QPSK	12	6	1206-6	0.217
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.61	-0.02	Right	Tilt	QPSK	1	0	1206-6	0.228
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.69	-0.08	Right	Tilt	QPSK	1	24	1206-6	0.247
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.85	-0.14	Right	Tilt	16 QAM	12	6	1206-6	0.214
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.60	-0.12	Right	Tilt	16 QAM	1	0	1206-6	0.235
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.76	-0.19	Right	Tilt	16 QAM	1	24	1206-6	0.267
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.90	-0.14	Left	Touch	QPSK	12	6	1206-6	0.198
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.61	0.10	Left	Touch	QPSK	1	0	1206-6	0.223
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.69	0.07	Left	Touch	QPSK	1	24	1206-6	0.294
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.85	0.11	Left	Touch	16 QAM	12	6	1206-6	0.199
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.60	-0.02	Left	Touch	16 QAM	1	0	1206-6	0.241
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.76	-0.06	Left	Touch	16 QAM	1	24	1206-6	0.300
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.90	0.07	Left	Tilt	QPSK	12	6	1206-6	0.207
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.61	-0.20	Left	Tilt	QPSK	1	0	1206-6	0.243
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.69	-0.12	Left	Tilt	QPSK	1	24	1206-6	0.293
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.85	-0.01	Left	Tilt	16 QAM	12	6	1206-6	0.213
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.60	-0.03	Left	Tilt	16 QAM	1	0	1206-6	0.259
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.76	-0.02	Left	Tilt	16 QAM	1	24	1206-6	0.313
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)	
2412	1	IEEE 802.11b	15C	DSSS	16.27	-0.13	Right	Touch	51	1	0.004	
2412	1	IEEE 802.11b	15C	DSSS	16.27	0.10	Right	Tilt	51	1	0.000	
2412	1	IEEE 802.11b	15C	DSSS	16.27	0.05	Left	Touch	51	1	0.011	
2412	1	IEEE 802.11b	15C	DSSS	16.27	-0.03	Left	Tilt	51	1	0.003	
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)	
5785	157	IEEE 802.11a	15C	OFDM	11.61	0.03	Right	Touch	68	6	0.070	
5785	157	IEEE 802.11a	15C	OFDM	11.61	0.17	Right	Tilt	68	6	0.049	
5785	157	IEEE 802.11a	15C	OFDM	11.61	-0.07	Left	Touch	68	6	0.184	
5785	157	IEEE 802.11a	15C	OFDM	11.61	0.12	Left	Tilt	68	6	0.033	
5220	44	IEEE 802.11a	15E	OFDM	12.13	0.07	Right	Touch	68	6	0.002	
5220	44	IEEE 802.11a	15E	OFDM	12.13	0.00	Right	Tilt	68	6	0.000	
5220	44	IEEE 802.11a	15E	OFDM	12.13	0.19	Left	Touch	68	6	0.037	
5220	44	IEEE 802.11a	15E	OFDM	12.13	-0.09	Left	Tilt	68	6	0.006	
5260	52	IEEE 802.11a	15E	OFDM	12.64	0.07	Right	Touch	68	6	0.000	
5260	52	IEEE 802.11a	15E	OFDM	12.64	0.00	Right	Tilt	68	6	0.000	
5260	52	IEEE 802.11a	15E	OFDM	12.64	0.14	Left	Touch	68	6	0.033	
5260	52	IEEE 802.11a	15E	OFDM	12.64	0.14	Left	Tilt	68	6	0.007	
5500	100	IEEE 802.11a	15E	OFDM	11.86	-0.06	Right	Touch	68	6	0.039	
5500	100	IEEE 802.11a	15E	OFDM	11.86	0.08	Right	Tilt	68	6	0.002	
5500	100	IEEE 802.11a	15E	OFDM	11.86	0.20	Left	Touch	68	6	0.129	
5500	100	IEEE 802.11a	15E	OFDM	11.86	0.17	Left	Tilt	68	6	0.030	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT							Head					
Spatial Peak							1.6 W/kg (mW/g)					
Uncontrolled Exposure/General Population							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	24.5	24.74	-0.05	1.0 cm	51	back	0.587
820.10	564	Cell. CDMA	90S	TDSO / SO32	18	18.03	-0.01	1.0 cm	54	back	0.118
820.10	564	Cell. CDMA	90S	TDSO / SO32	15	15.34	-0.01	1.0 cm	63	back	0.073
824.70	1013	Cell. CDMA	22H	TDSO / SO32	24.5	24.66	0.01	1.0 cm	51	back	0.657
836.52	384	Cell. CDMA	22H	TDSO / SO32	24.5	24.77	0.01	1.0 cm	51	back	0.810
848.31	777	Cell. CDMA	22H	TDSO / SO32	24.5	24.68	-0.03	1.0 cm	51	back	0.545
836.52	384	Cell. CDMA	22H	TDSO / SO32	18	18.17	0.00	1.0 cm	54	back	0.163
836.52	384	Cell. CDMA	22H	TDSO / SO32	15	15.37	-0.10	1.0 cm	63	back	0.095
1851.25	25	PCS CDMA	24E	TDSO / SO32	24.5	24.73	0.05	1.0 cm	51	back	1.020
1880.00	600	PCS CDMA	24E	TDSO / SO32	24.5	24.74	0.00	1.0 cm	51	back	0.929
1908.75	1175	PCS CDMA	24E	TDSO / SO32	24.5	24.70	0.02	1.0 cm	51	back	0.818
1880.00	600	PCS CDMA	24E	TDSO / SO32	18	18.34	-0.06	1.0 cm	54	back	0.121
1880.00	600	PCS CDMA	24E	TDSO / SO32	15	15.38	0.03	1.0 cm	63	back	0.040
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: For CDMA mode, hotspot SAR Data was used for supporting body-worn accessory compliance 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	24.5	24.67	0.01	1.0 cm	52	back	0.314
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	19	18.92	0.03	1.0 cm	56	back	0.032
836.52	384	Cell. EVDO	22H	EVDO Rev. 0	24.5	24.65	-0.05	1.0 cm	52	back	0.438
836.52	384	Cell. EVDO	22H	EVDO Rev. 0	19	18.97	0.08	1.0 cm	56	back	0.049
1851.25	25	PCS EVDO	24E	EVDO Rev. 0	24.5	24.65	-0.06	1.0 cm	1206-13	back	0.755
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	24.5	24.47	0.04	1.0 cm	1206-13	back	0.910
1908.75	1175	PCS EVDO	24E	EVDO Rev. 0	24.5	24.45	-0.16	1.0 cm	1206-13	back	0.856
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	19	18.90	-0.07	1.0 cm	1206-12	back	0.246
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: For EVDO mode, hotspot SAR Data was used for supporting body-worn accessory compliance 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) (W/kg)	
MHz	Ch.															
1882.5	26365	Mid	LTE Band 25	24E	5	22	1	22.29	-0.14	1206-7	QPSK	12	6	1.0 cm	back	0.616
1912.5	26665	High	LTE Band 25	24E	5	23	0	23.42	-0.09	1206-7	QPSK	1	0	1.0 cm	back	0.968
1912.5	26665	High	LTE Band 25	24E	5	23	0	22.71	0.10	1206-7	QPSK	1	24	1.0 cm	back	0.617
1882.5	26365	Mid	LTE Band 25	24E	5	21	2	21.17	0.03	1206-7	16 QAM	12	6	1.0 cm	back	0.453
1912.5	26665	High	LTE Band 25	24E	5	22	1	22.42	0.19	1206-7	16 QAM	1	0	1.0 cm	back	0.775
1912.5	26665	High	LTE Band 25	24E	5	22	1	21.93	-0.15	1206-7	16 QAM	1	24	1.0 cm	back	0.540
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.90	0.02	1206-6	QPSK	12	6	1.0 cm	back	0.242
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.61	-0.06	1206-6	QPSK	1	0	1.0 cm	back	0.287
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.69	-0.20	1206-6	QPSK	1	24	1.0 cm	back	0.307
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.85	0.05	1206-6	16 QAM	12	6	1.0 cm	back	0.238
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.60	0.01	1206-6	16 QAM	1	0	1.0 cm	back	0.298
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.76	-0.08	1206-6	16 QAM	1	24	1.0 cm	back	0.323
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 SAR Data was used for supporting body-worn accessory compliance 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, high 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) (W/kg)
MHz	Ch.										
2412	1	IEEE 802.11b	15C	DSSS	16.27	0.07	1.0 cm	66	1	back	0.004
5785	157	IEEE 802.11a	15C	OFDM	11.61	-0.03	1.0 cm	68	6	back	0.218
5220	44	IEEE 802.11a	15E	OFDM	12.13	-0.04	1.0 cm	68	6	back	0.046
5260	52	IEEE 802.11a	15E	OFDM	12.64	0.08	1.0 cm	68	6	back	0.018
5500	100	IEEE 802.11a	15E	OFDM	11.86	0.10	1.0 cm	68	6	back	0.176
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 SAR Data was used for supporting body-worn accessory compliance 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	24.5	24.74	-0.05	1.0 cm	51	back	0.587
820.10	564	Cell. CDMA	90S	TDSO / SO32	24.5	24.74	-0.01	1.0 cm	51	front	0.677
820.10	564	Cell. CDMA	90S	TDSO / SO32	24.5	24.74	0.00	1.0 cm	51	bottom	0.132
820.10	564	Cell. CDMA	90S	TDSO / SO32	24.5	24.74	-0.01	1.0 cm	51	right	0.756
820.10	564	Cell. CDMA	90S	TDSO / SO32	18	18.03	-0.01	1.0 cm	54	back	0.118
820.10	564	Cell. CDMA	90S	TDSO / SO32	18	18.03	0.01	1.0 cm	54	front	0.124
820.10	564	Cell. CDMA	90S	TDSO / SO32	18	18.03	0.01	1.0 cm	54	bottom	0.022
820.10	564	Cell. CDMA	90S	TDSO / SO32	18	18.03	0.04	1.0 cm	54	right	0.135
820.10	564	Cell. CDMA	90S	TDSO / SO32	15	15.34	-0.01	1.0 cm	63	back	0.073
820.10	564	Cell. CDMA	90S	TDSO / SO32	15	15.34	0.08	1.0 cm	63	front	0.060
820.10	564	Cell. CDMA	90S	TDSO / SO32	15	15.34	0.19	1.0 cm	63	bottom	0.008
820.10	564	Cell. CDMA	90S	TDSO / SO32	15	15.34	0.01	1.0 cm	63	right	0.057
824.70	1013	Cell. CDMA	22H	TDSO / SO32	24.5	24.66	0.01	1.0 cm	51	back	0.657
836.52	384	Cell. CDMA	22H	TDSO / SO32	24.5	24.77	0.01	1.0 cm	51	back	0.810
848.31	777	Cell. CDMA	22H	TDSO / SO32	24.5	24.68	-0.03	1.0 cm	51	back	0.545
836.52	384	Cell. CDMA	22H	TDSO / SO32	24.5	24.77	0.06	1.0 cm	51	front	0.790
836.52	384	Cell. CDMA	22H	TDSO / SO32	24.5	24.77	-0.03	1.0 cm	51	bottom	0.216
836.52	384	Cell. CDMA	22H	TDSO / SO32	24.5	24.77	0.03	1.0 cm	51	right	0.774
836.52	384	Cell. CDMA	22H	TDSO / SO32	18	18.17	0.00	1.0 cm	54	back	0.163
836.52	384	Cell. CDMA	22H	TDSO / SO32	18	18.17	0.02	1.0 cm	54	front	0.159
836.52	384	Cell. CDMA	22H	TDSO / SO32	18	18.17	0.03	1.0 cm	54	bottom	0.033
836.52	384	Cell. CDMA	22H	TDSO / SO32	18	18.17	0.04	1.0 cm	54	right	0.166
836.52	384	Cell. CDMA	22H	TDSO / SO32	15	15.37	-0.10	1.0 cm	63	back	0.095
836.52	384	Cell. CDMA	22H	TDSO / SO32	15	15.37	0.02	1.0 cm	63	front	0.078
836.52	384	Cell. CDMA	22H	TDSO / SO32	15	15.37	0.03	1.0 cm	63	bottom	0.013
836.52	384	Cell. CDMA	22H	TDSO / SO32	15	15.37	0.03	1.0 cm	63	right	0.086
ANSI / IEEE C95.1 1992 - SAFETY LIMIT								Body			
Spatial Peak								1.6 W/kg (mW/g)			
Uncontrolled Exposure/General Population								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	24.5	24.73	0.05	1.0 cm	51	back	1.020
1880.00	600	PCS CDMA	24E	TDSO / SO32	24.5	24.74	0.00	1.0 cm	51	back	0.929
1908.75	1175	PCS CDMA	24E	TDSO / SO32	24.5	24.70	0.02	1.0 cm	51	back	0.818
1851.25	25	PCS CDMA	24E	TDSO / SO32	24.5	24.73	-0.03	1.0 cm	51	front	1.010
1880.00	600	PCS CDMA	24E	TDSO / SO32	24.5	24.74	-0.03	1.0 cm	51	front	0.857
1908.75	1175	PCS CDMA	24E	TDSO / SO32	24.5	24.70	-0.02	1.0 cm	51	front	0.831
1880.00	600	PCS CDMA	24E	TDSO / SO32	24.5	24.74	0.09	1.0 cm	51	bottom	0.798
1880.00	600	PCS CDMA	24E	TDSO / SO32	24.5	24.74	-0.05	1.0 cm	51	right	0.393
1880.00	600	PCS CDMA	24E	TDSO / SO32	18	18.34	-0.06	1.0 cm	54	back	0.121
1880.00	600	PCS CDMA	24E	TDSO / SO32	18	18.34	0.01	1.0 cm	54	front	0.127
1880.00	600	PCS CDMA	24E	TDSO / SO32	18	18.34	0.01	1.0 cm	54	bottom	0.023
1880.00	600	PCS CDMA	24E	TDSO / SO32	18	18.34	0.04	1.0 cm	54	right	0.138
1880.00	600	PCS CDMA	24E	TDSO / SO32	15	15.38	0.03	1.0 cm	63	back	0.040
1880.00	600	PCS CDMA	24E	TDSO / SO32	15	15.38	-0.01	1.0 cm	63	front	0.038
1880.00	600	PCS CDMA	24E	TDSO / SO32	15	15.38	-0.07	1.0 cm	63	bottom	0.027
1880.00	600	PCS CDMA	24E	TDSO / SO32	15	15.38	0.10	1.0 cm	63	right	0.012
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	24.5	24.67	0.01	1.0 cm	52	back	0.314
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	24.5	24.67	-0.02	1.0 cm	52	front	0.080
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	24.5	24.67	-0.10	1.0 cm	52	top	0.053
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	24.5	24.67	-0.19	1.0 cm	52	right	0.134
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	19	18.92	0.03	1.0 cm	56	back	0.032
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	19	18.92	0.03	1.0 cm	56	front	0.009
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	19	18.92	-0.04	1.0 cm	56	top	0.003
820.10	564	Cell. EVDO	90S	EVDO Rev. 0	19	18.92	0.11	1.0 cm	56	right	0.014
836.52	384	Cell. EVDO	22H	EVDO Rev. 0	24.5	24.65	-0.05	1.0 cm	52	back	0.438
836.52	384	Cell. EVDO	22H	EVDO Rev. 0	24.5	24.65	0.02	1.0 cm	52	front	0.129
836.52	384	Cell. EVDO	22H	EVDO Rev. 0	24.5	24.65	-0.19	1.0 cm	52	top	0.080
836.52	384	Cell. EVDO	22H	EVDO Rev. 0	24.5	24.65	-0.03	1.0 cm	52	right	0.217
836.52	384	Cell. EVDO	22H	EVDO Rev. 0	19	18.97	0.08	1.0 cm	56	back	0.049
836.52	384	Cell. EVDO	22H	EVDO Rev. 0	19	18.97	0.04	1.0 cm	56	front	0.014
836.52	384	Cell. EVDO	22H	EVDO Rev. 0	19	18.97	0.13	1.0 cm	56	top	0.006
836.52	384	Cell. EVDO	22H	EVDO Rev. 0	19	18.97	0.07	1.0 cm	56	right	0.025
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	24.5	24.65	-0.06	1.0 cm	1206-13	back	0.755
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	24.5	24.47	0.04	1.0 cm	1206-13	back	0.910
1908.75	1175	PCS EVDO	24E	EVDO Rev. 0	24.5	24.45	-0.16	1.0 cm	1206-13	back	0.856
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	24.5	24.47	0.04	1.0 cm	1206-13	front	0.243
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	24.5	24.47	-0.04	1.0 cm	1206-13	top	0.459
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	24.5	24.47	0.10	1.0 cm	1206-13	right	0.150
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	19	18.90	-0.07	1.0 cm	1206-12	back	0.246
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	19	18.90	0.01	1.0 cm	1206-12	front	0.070
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	19	18.90	-0.08	1.0 cm	1206-12	top	0.085
1880.00	600	PCS EVDO	24E	EVDO Rev. 0	19	18.90	-0.09	1.0 cm	1206-12	right	0.029
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram			

**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)
MHz	Ch.	High														(W/kg)
1882.5	26365	Mid	LTE Band 25	24E	5	22	1	22.29	-0.14	1206-7	QPSK	12	6	1.0 cm	back	0.616
1912.5	26665	High	LTE Band 25	24E	5	23	0	23.42	-0.09	1206-7	QPSK	1	0	1.0 cm	back	0.968
1912.5	26665	High	LTE Band 25	24E	5	23	0	22.71	0.10	1206-7	QPSK	1	24	1.0 cm	back	0.617
1882.5	26365	Mid	LTE Band 25	24E	5	21	2	21.17	0.03	1206-7	16 QAM	12	6	1.0 cm	back	0.453
1912.5	26665	High	LTE Band 25	24E	5	22	1	22.42	0.19	1206-7	16 QAM	1	0	1.0 cm	back	0.775
1912.5	26665	High	LTE Band 25	24E	5	22	1	21.93	-0.15	1206-7	16 QAM	1	24	1.0 cm	back	0.540
1882.5	26365	Mid	LTE Band 25	24E	5	22	1	22.29	-0.02	1206-7	QPSK	12	6	1.0 cm	front	0.226
1912.5	26665	High	LTE Band 25	24E	5	23	0	23.42	-0.03	1206-7	QPSK	1	0	1.0 cm	front	0.321
1912.5	26665	High	LTE Band 25	24E	5	23	0	22.71	-0.10	1206-7	QPSK	1	24	1.0 cm	front	0.175
1882.5	26365	Mid	LTE Band 25	24E	5	21	2	21.17	0.00	1206-7	16 QAM	12	6	1.0 cm	front	0.172
1912.5	26665	High	LTE Band 25	24E	5	22	1	22.42	0.12	1206-7	16 QAM	1	0	1.0 cm	front	0.273
1912.5	26665	High	LTE Band 25	24E	5	22	1	21.93	0.06	1206-7	16 QAM	1	24	1.0 cm	front	0.140
1882.5	26365	Mid	LTE Band 25	24E	5	22	1	22.29	0.00	1206-7	QPSK	12	6	1.0 cm	top	0.354
1912.5	26665	High	LTE Band 25	24E	5	23	0	23.42	-0.07	1206-7	QPSK	1	0	1.0 cm	top	0.537
1912.5	26665	High	LTE Band 25	24E	5	23	0	22.71	-0.10	1206-7	QPSK	1	24	1.0 cm	top	0.336
1882.5	26365	Mid	LTE Band 25	24E	5	21	2	21.17	0.03	1206-7	16 QAM	12	6	1.0 cm	top	0.284
1912.5	26665	High	LTE Band 25	24E	5	22	1	22.42	0.10	1206-7	16 QAM	1	0	1.0 cm	top	0.438
1912.5	26665	High	LTE Band 25	24E	5	22	1	21.93	0.03	1206-7	16 QAM	1	24	1.0 cm	top	0.281
1882.5	26365	Mid	LTE Band 25	24E	5	22	1	22.29	0.01	1206-7	QPSK	12	6	1.0 cm	right	0.135
1912.5	26665	High	LTE Band 25	24E	5	23	0	23.42	0.09	1206-7	QPSK	1	0	1.0 cm	right	0.174
1912.5	26665	High	LTE Band 25	24E	5	23	0	22.71	-0.01	1206-7	QPSK	1	24	1.0 cm	right	0.099
1882.5	26365	Mid	LTE Band 25	24E	5	21	2	21.17	-0.05	1206-7	16 QAM	12	6	1.0 cm	right	0.107
1912.5	26665	High	LTE Band 25	24E	5	22	1	22.42	-0.02	1206-7	16 QAM	1	0	1.0 cm	right	0.167
1912.5	26665	High	LTE Band 25	24E	5	22	1	21.93	0.07	1206-7	16 QAM	1	24	1.0 cm	right	0.098
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: 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, high 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	18.90	0.02	1206-6	QPSK	12	6	1.0 cm	back	0.242
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.61	-0.06	1206-6	QPSK	1	0	1.0 cm	back	0.287
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.69	-0.12	1206-6	QPSK	1	24	1.0 cm	back	0.307
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.85	0.05	1206-6	16 QAM	12	6	1.0 cm	back	0.238
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.60	0.01	1206-6	16 QAM	1	0	1.0 cm	back	0.298
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.76	-0.08	1206-6	16 QAM	1	24	1.0 cm	back	0.323
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.90	0.13	1206-6	QPSK	12	6	1.0 cm	front	0.068
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.61	0.08	1206-6	QPSK	1	0	1.0 cm	front	0.064
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.69	0.01	1206-6	QPSK	1	24	1.0 cm	front	0.072
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.85	-0.10	1206-6	16 QAM	12	6	1.0 cm	front	0.064
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.60	0.06	1206-6	16 QAM	1	0	1.0 cm	front	0.064
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.76	0.12	1206-6	16 QAM	1	24	1.0 cm	front	0.071
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.90	0.00	1206-6	QPSK	12	6	1.0 cm	top	0.130
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.61	-0.01	1206-6	QPSK	1	0	1.0 cm	top	0.120
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.69	0.03	1206-6	QPSK	1	24	1.0 cm	top	0.138
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.85	-0.05	1206-6	16 QAM	12	6	1.0 cm	top	0.130
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.60	0.07	1206-6	16 QAM	1	0	1.0 cm	top	0.125
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.76	0.04	1206-6	16 QAM	1	24	1.0 cm	top	0.142
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.90	0.01	1206-6	QPSK	12	6	1.0 cm	right	0.037
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.61	0.04	1206-6	QPSK	1	0	1.0 cm	right	0.035
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.69	0.13	1206-6	QPSK	1	24	1.0 cm	right	0.040
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.85	0.10	1206-6	16 QAM	12	6	1.0 cm	right	0.036
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.60	0.08	1206-6	16 QAM	1	0	1.0 cm	right	0.036
1882.5	26365	Mid	LTE Band 25	24E	5	19	0	18.76	0.10	1206-6	16 QAM	1	24	1.0 cm	right	0.040
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Body 1.6 W/kg (mW/g) 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)
2412	1	IEEE 802.11b	15C	DSSS	16.27	0.07	1.0 cm	66	1	back	0.004
2412	1	IEEE 802.11b	15C	DSSS	16.27	0.02	1.0 cm	66	1	front	0.001
2412	1	IEEE 802.11b	15C	DSSS	16.27	0.14	1.0 cm	66	1	right	0.002
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. The standard battery was used.
3. Tissue parameters and temperatures are listed on the SAR plots.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical, and thermal characteristics and are within operational tolerances.
5. 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.
6. 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

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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.

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 and left edge for the CDMA 1x 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).
2. Bottom edge and left edge 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 edge, top edge, and left edge for the WLAN transmitter were 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: <u>Unlicensed only</u>
Unlicensed Transmitters	<p>When there is no simultaneous transmission –</p> <ul style="list-style-type: none"> output ≤ 60/f: SAR not required output > 60/f: stand-alone SAR required <p>When there is simultaneous transmission – <u>Stand-alone SAR not required when</u></p> <ul style="list-style-type: none"> 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 <p><u>Otherwise stand-alone SAR is required</u></p> <p>When stand-alone SAR is required</p> <ul style="list-style-type: none"> 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 	<p><u>Licensed & Unlicensed</u></p> <ul style="list-style-type: none"> 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 <p>SAR required: <u>Licensed & Unlicensed</u></p> <p>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</p> <p>Note: simultaneous transmission exposure conditions for head and body can be different for different style phones; therefore, different test requirements may apply</p>

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	None	Section 15.4	Table 15-2	Table 15-4	-	
E	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + 2.4 GHz WIFI			Table 15-3	Table 15-5	-	
F	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + 5 GHz WIFI	LTE	Section 15.6	Table 15-7	Table 15-8	Table 15-9	Voice + LTE + WIFI Hotspot
G	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + LTE B25 Data + 2.4 GHz WIFI			Table 15-10	Table 15-11	Table 15-12	Voice + EVDO + 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	None	Section 15.5	-	-	Table 15-6	1X CDMA Data + WIFI Hotspot
K	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Data + 2.4 GHz WIFI			Table 15-6	Table 15-6	Table 15-6	EVDO+WIFI Hotspot
L	BC0/BC1/BC10 850/1900 MHz EVDO Data + 2.4 GHz WIFI	None	Section 15.5	-	-	Table 15-6	LTE+WIFI Hotspot
M	LTE B25 Data + 2.4 GHz WIFI			-	-	Table 15-6	LTE+WIFI Hotspot

15.4 Voice + WIFI Simultaneous Transmission Analysis

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

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)	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)
Right Cheek	0.488	0.004	0.492	Right Cheek	0.708	0.004	0.712
Right Tilt	0.313	0.000	0.313	Right Tilt	0.444	0.000	0.444
Left Cheek	0.419	0.011	0.430	Left Cheek	0.555	0.011	0.566
Left Tilt	0.297	0.003	0.300	Left Tilt	0.353	0.003	0.356

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)
Right Cheek	0.611	0.004	0.615
Right Tilt	0.154	0.000	0.154
Left Cheek	0.490	0.011	0.501
Left Tilt	0.141	0.003	0.144



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

Configuration	Cell. CDMA - FCC Rule Part 90S SAR (W/kg)	5 GHz WLAN - FCC Rule Part 15 SAR (W/kg)	Σ SAR (W/kg)	Configuration	Cell. CDMA - FCC Rule Part 22H SAR (W/kg)	5 GHz WLAN - FCC Rule Part 15 SAR (W/kg)	Σ SAR (W/kg)
Right Cheek	0.488	0.070	0.558	Right Cheek	0.708	0.070	0.778
Right Tilt	0.313	0.049	0.362	Right Tilt	0.444	0.049	0.493
Left Cheek	0.419	0.184	0.603	Left Cheek	0.555	0.184	0.739
Left Tilt	0.297	0.033	0.330	Left Tilt	0.353	0.033	0.386

Configuration	PCS CDMA - FCC Rule Part 24E SAR (W/kg)	5 GHz WLAN - FCC Rule Part 15 SAR (W/kg)	Σ SAR (W/kg)
Right Cheek	0.611	0.070	0.681
Right Tilt	0.154	0.049	0.203
Left Cheek	0.490	0.184	0.674
Left Tilt	0.141	0.033	0.174

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

Mode	CDMA SAR (W/kg)	2.4 GHz WLAN - FCC Rule Part 15C SAR (W/kg)	Σ SAR (W/kg)
Cell. CDMA - FCC Rule Part 90S	0.587	0.004	0.591
Cell. CDMA - FCC Rule Part 22H	0.810	0.004	0.814
PCS CDMA - FCC Rule Part 24E	1.020	0.004	1.024

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

Mode	CDMA SAR (W/kg)	5 GHz WLAN - FCC Rule Part 15 SAR (W/kg)	Σ SAR (W/kg)
Cell. CDMA - FCC Rule Part 90S	0.587	0.218	0.805
Cell. CDMA - FCC Rule Part 22H	0.810	0.218	1.028
PCS CDMA - FCC Rule Part 24E	1.020	0.218	1.238

15.5 Hotspot Simultaneous Transmission Analysis

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



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)	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)
Back	0.587	0.004	0.591	Back	0.810	0.004	0.814
Front	0.677	0.001	0.678	Front	0.790	0.001	0.791
Top	-	-	0.000	Top	-	-	0.000
Bottom	0.132	-	0.132	Bottom	0.216	-	0.216
Right	0.756	0.002	0.758	Right	0.774	0.002	0.776
Left	-	-	0.000	Left	-	-	0.000

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)	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)
Back	1.020	0.004	1.024	Back	0.314	0.004	0.318
Front	1.010	0.001	1.011	Front	0.080	0.001	0.081
Top	-	-	0.000	Top	0.053	-	0.053
Bottom	0.798	-	0.798	Bottom	-	-	0.000
Right	0.393	0.002	0.395	Right	0.134	0.002	0.136
Left	-	-	0.000	Left	-	-	0.000

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)	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)
Back	0.438	0.004	0.442	Back	0.910	0.004	0.914
Front	0.129	0.001	0.130	Front	0.243	0.001	0.244
Top	0.080	-	0.080	Top	0.459	-	0.459
Bottom	-	-	0.000	Bottom	-	-	0.000
Right	0.217	0.002	0.219	Right	0.150	0.002	0.152
Left	-	-	0.000	Left	-	-	0.000

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)
Back	0.968	0.004	0.972
Front	0.321	0.001	0.322
Top	0.537	-	0.537
Bottom	-	-	0.000
Right	0.174	0.002	0.176
Left	-	-	0.000

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

The SVLTE simultaneous transmission was evaluated at the maximum output power allowed by the power reduction mechanisms for each applicable transmitter and antenna configurations.

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

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	1+2+3
P _≥ 18	Target Power (dBm)	24.5	19	-	1+2	1+2+3
	Reference	Table 14-1	Table 14-8	Table 14-9		
	Right Cheek	0.488	0.162	0.004	0.650	0.654
	Right Tilt	0.313	0.267	0.000	0.580	0.580
	Left Cheek	0.419	0.300	0.011	0.719	0.730
	Left Tilt	0.297	0.313	0.003	0.610	0.613
P<18	Target Power (dBm)	18	23	-		
	Reference	Table 14-1	Table 14-7	Table 14-9		
	Right Cheek	0.086	0.623	0.004	0.709	0.713
	Right Tilt	0.061	0.828	0.000	0.889	0.889
	Left Cheek	0.081	0.831	0.011	0.912	0.923
	Left Tilt	0.058	0.911	0.003	0.969	0.972

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	1+2+3
P _≥ 18	Target Power (dBm)	24.5	19	-	1+2	1+2+3
	Reference	Table 14-2	Table 14-8	Table 14-9		
	Right Cheek	0.708	0.162	0.004	0.870	0.874
	Right Tilt	0.444	0.267	0.000	0.711	0.711
	Left Cheek	0.555	0.300	0.011	0.855	0.866
	Left Tilt	0.353	0.313	0.003	0.666	0.669
P<18	Target Power (dBm)	18	23	-		
	Reference	Table 14-2	Table 14-7	Table 14-9		
	Right Cheek	0.119	0.623	0.004	0.742	0.746
	Right Tilt	0.078	0.828	0.000	0.906	0.906
	Left Cheek	0.105	0.831	0.011	0.936	0.947
	Left Tilt	0.064	0.911	0.003	0.975	0.978

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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	1+2+3
$P \geq 18$	Target Power (dBm)	24.5	19	-	1+2	1+2+3
	Reference	Table 14-3	Table 14-8	Table 14-9		
	Right Cheek	0.611	0.162	0.004	0.773	0.777
	Right Tilt	0.154	0.267	0.000	0.421	0.421
	Left Cheek	0.490	0.300	0.011	0.790	0.801
	Left Tilt	0.141	0.313	0.003	0.454	0.457
$P < 18$	Target Power (dBm)	18	23	-		
	Reference	Table 14-3	Table 14-7	Table 14-9		
	Right Cheek	0.114	0.623	0.004	0.737	0.741
	Right Tilt	0.042	0.828	0.000	0.870	0.870
	Left Cheek	0.134	0.831	0.011	0.965	0.976
	Left Tilt	0.041	0.911	0.003	0.952	0.955



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

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)	24.5	19	-		
Cell. CDMA - FCC Rule Part 90S	0.587	0.323	0.004	0.910	0.914
Cell. CDMA - FCC Rule Part 22H	0.810	0.323	0.004	1.133	1.137
PCS CDMA - FCC Rule Part 24E	1.020	0.323	0.004	1.343	1.347
Reference	Table 14-11	Table 14-13	Table 14-14		
Target Power (dBm)	18	23	-		
Cell. CDMA - FCC Rule Part 90S	0.118	0.968	0.004	1.086	1.090
Cell. CDMA - FCC Rule Part 22H	0.163	0.968	0.004	1.131	1.135
PCS CDMA - FCC Rule Part 24E	0.121	0.968	0.004	1.089	1.093

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



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	
P≥18	Target Power (dBm)	24.5	19	-	1+2+3
	Reference	Table 14-15	Table 14-20	Table 14-21	
	Back	0.587	0.323	0.004	0.914
	Front	0.677	0.072	0.001	0.750
	Top	-	0.142	-	0.142
	Bottom	0.132	-	-	0.132
	Right	0.756	0.040	0.002	0.798
	Left	-	-	-	0.000
P<18	Target Power (dBm)	18	23	-	
	Reference	Table 14-15	Table 14-19	Table 14-21	
	Back	0.118	0.968	0.004	1.090
	Front	0.124	0.321	0.001	0.446
	Top	-	0.537	-	0.537
	Bottom	0.022	-	-	0.022
	Right	0.135	0.174	0.002	0.311
	Left	-	-	-	0.000

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	
P≥18	Target Power (dBm)	24.5	19	-	1+2+3
	Reference	Table 14-15	Table 14-20	Table 14-21	
	Back	0.810	0.323	0.004	1.137
	Front	0.790	0.072	0.001	0.863
	Top	-	0.142	-	0.142
	Bottom	0.216	-	-	0.216
	Right	0.774	0.040	0.002	0.816
	Left	-	-	-	0.000
P<18	Target Power (dBm)	18	23	-	
	Reference	Table 14-15	Table 14-19	Table 14-21	
	Back	0.163	0.968	0.004	1.135
	Front	0.159	0.321	0.001	0.481
	Top	-	0.537	-	0.537
	Bottom	0.033	-	-	0.033
	Right	0.166	0.174	0.002	0.342
	Left	-	-	-	0.000

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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
P _≥ 18	Target Power (dBm)	24.5	19	-	1.347
	Reference	Table 14-16	Table 14-20	Table 14-21	
	Back	1.020	0.323	0.004	1.083
	Front	1.010	0.072	0.001	0.142
	Top	-	0.142	-	0.798
	Bottom	0.798	-	-	0.435
	Right	0.393	0.040	0.002	0.000
	Left	-	-	-	
P<18	Target Power (dBm)	18	23	-	
	Reference	Table 14-16	Table 14-19	Table 14-21	
	Back	0.121	0.968	0.004	1.093
	Front	0.127	0.321	0.001	0.449
	Top	-	0.537	-	0.537
	Bottom	0.023	-	-	0.023
	Right	0.138	0.174	0.002	0.314
	Left	-	-	-	0.000

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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15.7 SVDO Simultaneous Transmission Scenario Analysis

The SVDO simultaneous transmission was evaluated at the maximum output power allowed by the power reduction mechanisms for each applicable transmitter and antenna configurations.

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



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
P _≥ 15	Target Power (dBm)	24.5	19	-	1+2	1+2+3
	Reference	Table 14-1	Table 14-4	Table 14-9		
	Right Cheek	0.488	0.015	0.004	0.503	0.507
	Right Tilt	0.313	0.014	0.000	0.327	0.327
	Left Cheek	0.419	0.019	0.011	0.438	0.449
	Left Tilt	0.297	0.017	0.003	0.314	0.317
P<15	Target Power (dBm)	15	24.5	-		
	Reference	Table 14-1	Table 14-4	Table 14-9		
	Right Cheek	0.045	0.126	0.004	0.171	0.175
	Right Tilt	0.029	0.109	0.000	0.138	0.138
	Left Cheek	0.047	0.147	0.011	0.194	0.205
	Left Tilt	0.026	0.142	0.003	0.168	0.171

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	1+2+3
P _≥ 15	Target Power (dBm)	24.5	19	-	1+2	1+2+3
	Reference	Table 14-2	Table 14-4	Table 14-9		
	Right Cheek	0.708	0.015	0.004	0.723	0.727
	Right Tilt	0.444	0.014	0.000	0.458	0.458
	Left Cheek	0.555	0.019	0.011	0.574	0.585
	Left Tilt	0.353	0.017	0.003	0.370	0.373
P<15	Target Power (dBm)	15	24.5	-		
	Reference	Table 14-2	Table 14-4	Table 14-9		
	Right Cheek	0.055	0.126	0.004	0.181	0.185
	Right Tilt	0.035	0.109	0.000	0.144	0.144
	Left Cheek	0.047	0.147	0.011	0.194	0.205
	Left Tilt	0.030	0.142	0.003	0.172	0.175

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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	1+2+3
P≥15	Target Power (dBm)	24.5	19	-	1+2	1+2+3
	Reference	Table 14-3	Table 14-4	Table 14-9		
	Right Cheek	0.611	0.015	0.004	0.626	0.630
	Right Tilt	0.154	0.014	0.000	0.168	0.168
	Left Cheek	0.490	0.019	0.011	0.509	0.520
	Left Tilt	0.141	0.017	0.003	0.158	0.161
P<15	Target Power (dBm)	15	24.5	-		
	Reference	Table 14-3	Table 14-4	Table 14-9		
	Right Cheek	0.021	0.126	0.004	0.147	0.151
	Right Tilt	0.006	0.109	0.000	0.115	0.115
	Left Cheek	0.027	0.147	0.011	0.174	0.185
	Left Tilt	0.006	0.142	0.003	0.148	0.151

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	1+2+3
P≥15	Target Power (dBm)	24.5	19	-	1+2	1+2+3
	Reference	Table 14-1	Table 14-5	Table 14-9		
	Right Cheek	0.488	0.023	0.004	0.511	0.515
	Right Tilt	0.313	0.020	0.000	0.333	0.333
	Left Cheek	0.419	0.028	0.011	0.447	0.458
	Left Tilt	0.297	0.024	0.003	0.321	0.324
P<15	Target Power (dBm)	15	24.5	-		
	Reference	Table 14-1	Table 14-5	Table 14-9		
	Right Cheek	0.045	0.183	0.004	0.228	0.232
	Right Tilt	0.029	0.165	0.000	0.194	0.194
	Left Cheek	0.047	0.230	0.011	0.277	0.288
	Left Tilt	0.026	0.205	0.003	0.231	0.234

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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	1+2+3
P≥15	Target Power (dBm)	24.5	19	-	1+2	1+2+3
	Reference	Table 14-2	Table 14-5	Table 14-9		
	Right Cheek	0.708	0.023	0.004	0.731	0.735
	Right Tilt	0.444	0.020	0.000	0.464	0.464
	Left Cheek	0.555	0.028	0.011	0.583	0.594
	Left Tilt	0.353	0.024	0.003	0.377	0.380
P<15	Target Power (dBm)	15	24.5	-		
	Reference	Table 14-2	Table 14-5	Table 14-9		
	Right Cheek	0.055	0.183	0.004	0.238	0.242
	Right Tilt	0.035	0.165	0.000	0.200	0.200
	Left Cheek	0.047	0.230	0.011	0.277	0.288
	Left Tilt	0.030	0.205	0.003	0.235	0.238

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	1+2+3
P≥15	Target Power (dBm)	24.5	19	-	1+2	1+2+3
	Reference	Table 14-3	Table 14-5	Table 14-9		
	Right Cheek	0.611	0.023	0.004	0.634	0.638
	Right Tilt	0.154	0.020	0.000	0.174	0.174
	Left Cheek	0.490	0.028	0.011	0.518	0.529
	Left Tilt	0.141	0.024	0.003	0.165	0.168
P<15	Target Power (dBm)	15	24.5	-		
	Reference	Table 14-3	Table 14-5	Table 14-9		
	Right Cheek	0.021	0.183	0.004	0.204	0.208
	Right Tilt	0.006	0.165	0.000	0.171	0.171
	Left Cheek	0.027	0.230	0.011	0.257	0.268
	Left Tilt	0.006	0.205	0.003	0.211	0.214

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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	1+2+3
P ≥ 15	Target Power (dBm)	24.5	19	-	1+2	1+2+3
	Reference	Table 14-1	Table 14-6	Table 14-9		
	Right Cheek	0.488	0.128	0.004	0.616	0.620
	Right Tilt	0.313	0.166	0.000	0.479	0.479
	Left Cheek	0.419	0.129	0.011	0.548	0.559
	Left Tilt	0.297	0.147	0.003	0.444	0.447
P < 15	Target Power (dBm)	15	24.5	-		
	Reference	Table 14-1	Table 14-6	Table 14-9		
	Right Cheek	0.045	0.468	0.004	0.513	0.517
	Right Tilt	0.029	0.639	0.000	0.668	0.668
	Left Cheek	0.047	0.663	0.011	0.710	0.721
	Left Tilt	0.026	0.773	0.003	0.799	0.802



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	1+2+3
P ≥ 15	Target Power (dBm)	24.5	19	-	1+2	1+2+3
	Reference	Table 14-2	Table 14-6	Table 14-9		
	Right Cheek	0.708	0.128	0.004	0.836	0.840
	Right Tilt	0.444	0.166	0.000	0.610	0.610
	Left Cheek	0.555	0.129	0.011	0.684	0.695
	Left Tilt	0.353	0.147	0.003	0.500	0.503
P < 15	Target Power (dBm)	15	24.5	-		
	Reference	Table 14-2	Table 14-6	Table 14-9		
	Right Cheek	0.055	0.468	0.004	0.523	0.527
	Right Tilt	0.035	0.639	0.000	0.674	0.674
	Left Cheek	0.047	0.663	0.011	0.710	0.721
	Left Tilt	0.030	0.773	0.003	0.803	0.806

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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	1+2+3
P \geq 15	Target Power (dBm)	24.5	19	-	1+2	1+2+3
	Reference	Table 14-3	Table 14-6	Table 14-9		
	Right Cheek	0.611	0.128	0.004	0.739	0.743
	Right Tilt	0.154	0.166	0.000	0.320	0.320
	Left Cheek	0.490	0.129	0.011	0.619	0.630
	Left Tilt	0.141	0.147	0.003	0.288	0.291
P<15	Target Power (dBm)	15	24.5	-		
	Reference	Table 14-3	Table 14-6	Table 14-9		
	Right Cheek	0.021	0.468	0.004	0.489	0.493
	Right Tilt	0.006	0.639	0.000	0.645	0.645
	Left Cheek	0.027	0.663	0.011	0.690	0.701
	Left Tilt	0.006	0.773	0.003	0.779	0.782

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

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	1+2	1+2+3
Target Power (dBm)	24.5	19	-		
Cell. CDMA - FCC Rule Part 90S	0.587	0.032	0.004	0.619	0.623
Cell. CDMA - FCC Rule Part 22H	0.810	0.032	0.004	0.842	0.846
PCS CDMA - FCC Rule Part 24E	1.020	0.032	0.004	1.052	1.056
Reference	Table 14-11	Table 14-12	Table 14-14		
Target Power (dBm)	15	24.5	-		
Cell. CDMA - FCC Rule Part 90S	0.073	0.314	0.004	0.387	0.391
Cell. CDMA - FCC Rule Part 22H	0.095	0.314	0.004	0.409	0.413
PCS CDMA - FCC Rule Part 24E	0.040	0.314	0.004	0.354	0.358

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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	1+2	1+2+3
Target Power (dBm)	24.5	19	-		
Cell. CDMA - FCC Rule Part 90S	0.587	0.049	0.004	0.636	0.640
Cell. CDMA - FCC Rule Part 22H	0.810	0.049	0.004	0.859	0.863
PCS CDMA - FCC Rule Part 24E	1.020	0.049	0.004	1.069	1.073
Reference	Table 14-11	Table 14-12	Table 14-14		
Target Power (dBm)	15	24.5	-		
Cell. CDMA - FCC Rule Part 90S	0.073	0.438	0.004	0.511	0.515
Cell. CDMA - FCC Rule Part 22H	0.095	0.438	0.004	0.533	0.537
PCS CDMA - FCC Rule Part 24E	0.040	0.438	0.004	0.478	0.482

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	1+2	1+2+3
Target Power (dBm)	24.5	19	-		
Cell. CDMA - FCC Rule Part 90S	0.587	0.246	0.004	0.833	0.837
Cell. CDMA - FCC Rule Part 22H	0.810	0.246	0.004	1.056	1.060
PCS CDMA - FCC Rule Part 24E	1.020	0.246	0.004	1.266	1.270
Reference	Table 14-11	Table 14-12	Table 14-14		
Target Power (dBm)	15	24.5	-		
Cell. CDMA - FCC Rule Part 90S	0.073	0.910	0.004	0.983	0.987
Cell. CDMA - FCC Rule Part 22H	0.095	0.910	0.004	1.005	1.009
PCS CDMA - FCC Rule Part 24E	0.040	0.910	0.004	0.950	0.954





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



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	
P ≥ 15	Target Power (dBm)	24.5	19	-	1+2+3
	Reference	Table 14-15	Table 14-17	Table 14-21	
	Back	0.587	0.032	0.004	0.623
	Front	0.677	0.009	0.001	0.687
	Top	-	0.003	-	0.003
	Bottom	0.132	-	-	0.132
	Right	0.756	0.014	0.002	0.772
	Left	-	-	-	0.000
P < 15	Target Power (dBm)	15	24.5	-	
	Reference	Table 14-15	Table 14-17	Table 14-21	
	Back	0.073	0.314	0.004	0.391
	Front	0.060	0.080	0.001	0.141
	Top	-	0.053	-	0.053
	Bottom	0.008	-	-	0.008
	Right	0.057	0.134	0.002	0.193
	Left	-	-	-	0.000

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	
P ≥ 15	Target Power (dBm)	24.5	19	-	1+2+3
	Reference	Table 14-15	Table 14-17	Table 14-21	
	Back	0.810	0.032	0.004	0.846
	Front	0.790	0.009	0.001	0.800
	Top	-	0.003	-	0.003
	Bottom	0.216	-	-	0.216
	Right	0.774	0.014	0.002	0.790
	Left	-	-	-	0.000
P < 15	Target Power (dBm)	15	24.5	-	
	Reference	Table 14-15	Table 14-17	Table 14-21	
	Back	0.095	0.314	0.004	0.413
	Front	0.078	0.080	0.001	0.159
	Top	-	0.053	-	0.053
	Bottom	0.013	-	-	0.013
	Right	0.086	0.134	0.002	0.222
	Left	-	-	-	0.000

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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	
P \geq 15	Target Power (dBm)	24.5	19	-	1+2+3
	Reference	Table 14-16	Table 14-17	Table 14-21	
	Back	1.020	0.032	0.004	1.056
	Front	1.010	0.009	0.001	1.020
	Top	-	0.003	-	0.003
	Bottom	0.798	-	-	0.798
	Right	0.393	0.014	0.002	0.409
	Left	-	-	-	0.000
P < 15	Target Power (dBm)	15	24.5	-	
	Reference	Table 14-16	Table 14-17	Table 14-21	
	Back	0.040	0.314	0.004	0.358
	Front	0.038	0.080	0.001	0.119
	Top	-	0.053	-	0.053
	Bottom	0.027	-	-	0.027
	Right	0.012	0.134	0.002	0.148
	Left	-	-	-	0.000

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	
P \geq 15	Target Power (dBm)	24.5	19	-	1+2+3
	Reference	Table 14-15	Table 14-17	Table 14-21	
	Back	0.587	0.049	0.004	0.640
	Front	0.677	0.014	0.001	0.692
	Top	-	0.006	-	0.006
	Bottom	0.132	-	-	0.132
	Right	0.756	0.025	0.002	0.783
	Left	-	-	-	0.000
P < 15	Target Power (dBm)	15	24.5	-	
	Reference	Table 14-15	Table 14-17	Table 14-21	
	Back	0.073	0.438	0.004	0.515
	Front	0.060	0.129	0.001	0.190
	Top	-	0.080	-	0.080
	Bottom	0.008	-	-	0.008
	Right	0.057	0.217	0.002	0.276
	Left	-	-	-	0.000

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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	
P \geq 15	Target Power (dBm)	24.5	19	-	1+2+3
	Reference	Table 14-15	Table 14-17	Table 14-21	
	Back	0.810	0.049	0.004	0.863
	Front	0.790	0.014	0.001	0.805
	Top	-	0.006	-	0.006
	Bottom	0.216	-	-	0.216
	Right	0.774	0.025	0.002	0.801
	Left	-	-	-	0.000
P < 15	Target Power (dBm)	15	24.5	-	
	Reference	Table 14-15	Table 14-17	Table 14-21	
	Back	0.095	0.438	0.004	0.537
	Front	0.078	0.129	0.001	0.208
	Top	-	0.080	-	0.080
	Bottom	0.013	-	-	0.013
	Right	0.086	0.217	0.002	0.305
	Left	-	-	-	0.000

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	
P \geq 15	Target Power (dBm)	24.5	19	-	1+2+3
	Reference	Table 14-16	Table 14-17	Table 14-21	
	Back	1.020	0.049	0.004	1.073
	Front	1.010	0.014	0.001	1.025
	Top	-	0.006	-	0.006
	Bottom	0.798	-	-	0.798
	Right	0.393	0.025	0.002	0.420
	Left	-	-	-	0.000
P < 15	Target Power (dBm)	15	24.5	-	
	Reference	Table 14-16	Table 14-17	Table 14-21	
	Back	0.040	0.438	0.004	0.482
	Front	0.038	0.129	0.001	0.168
	Top	-	0.080	-	0.080
	Bottom	0.027	-	-	0.027
	Right	0.012	0.217	0.002	0.231
	Left	-	-	-	0.000

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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	
P \geq 15	Target Power (dBm)	24.5	19	-	1+2+3
	Reference	Table 14-15	Table 14-18	Table 14-21	
	Back	0.587	0.246	0.004	0.837
	Front	0.677	0.070	0.001	0.748
	Top	-	0.085	-	0.085
	Bottom	0.132	-	-	0.132
	Right	0.756	0.029	0.002	0.787
	Left	-	-	-	0.000
P < 15	Target Power (dBm)	15	24.5	-	
	Reference	Table 14-15	Table 14-18	Table 14-21	
	Back	0.073	0.910	0.004	0.987
	Front	0.060	0.243	0.001	0.304
	Top	-	0.459	-	0.459
	Bottom	0.008	-	-	0.008
	Right	0.057	0.150	0.002	0.209
	Left	-	-	-	0.000

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	
P \geq 15	Target Power (dBm)	24.5	19	-	1+2+3
	Reference	Table 14-15	Table 14-18	Table 14-21	
	Back	0.810	0.246	0.004	1.060
	Front	0.790	0.070	0.001	0.861
	Top	-	0.085	-	0.085
	Bottom	0.216	-	-	0.216
	Right	0.774	0.029	0.002	0.805
	Left	-	-	-	0.000
P < 15	Target Power (dBm)	15	24.5	-	
	Reference	Table 14-15	Table 14-18	Table 14-21	
	Back	0.095	0.910	0.004	1.009
	Front	0.078	0.243	0.001	0.322
	Top	-	0.459	-	0.459
	Bottom	0.013	-	-	0.013
	Right	0.086	0.150	0.002	0.238
	Left	-	-	-	0.000



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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		
P \geq 15	Target Power (dBm)	24.5	19	-	1+2+3	
	Reference	Table 14-16	Table 14-18	Table 14-21		
	Back	1.020	0.246	0.004		1.270
	Front	1.010	0.070	0.001		1.081
	Top	-	0.085	-		0.085
	Bottom	0.798	-	-		0.798
	Right	0.393	0.029	0.002		0.424
	Left	-	-	-		0.000
P < 15	Target Power (dBm)	15	24.5	-		
	Reference	Table 14-16	Table 14-18	Table 14-21		
	Back	0.040	0.910	0.004		0.954
	Front	0.038	0.243	0.001		0.282
	Top	-	0.459	-		0.459
	Bottom	0.027	-	-		0.027
	Right	0.012	0.150	0.002		0.164
	Left	-	-	-		0.000

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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16 EQUIPMENT LIST

Equipment List for 04/23/2012 – 05/05/2012

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
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
Agilent	8753E	(30kHz-6GHz) Network Analyzer	4/4/2012	Annual	4/4/2013	JP38020182
Agilent	E5515C	Wireless Communications Test Set	10/20/2011	Annual	10/20/2012	GB46310798
Agilent	E5515C	Wireless Communications Test Set	10/14/2011	Annual	10/14/2012	GB41450275
Gigatronics	80701A	(0.05-18GHz) Power Sensor	10/12/2011	Annual	10/12/2012	1833460
Gigatronics	8651A	Universal Power Meter	10/12/2011	Annual	10/12/2012	8650319
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
Rohde & Schwarz	CMU200	Base Station Simulator	6/1/2011	Annual	6/1/2012	833855/0010
Rohde & Schwarz	NRVD	Dual Channel Power Meter	4/8/2011	Biennial	4/8/2013	101695
SPEAG	D2450V2	2450 MHz SAR Dipole	8/19/2011	Annual	8/19/2012	719
SPEAG	D5GHzV2	5 GHz SAR Dipole	1/19/2012	Annual	1/19/2013	1057
SPEAG	D835V2	835 MHz SAR Dipole	1/25/2012	Annual	1/25/2013	4d047
SPEAG	D835V2	835 MHz SAR Dipole	8/15/2011	Annual	8/15/2012	4d026
SPEAG	DAE3	Dasy Data Acquisition Electronics	11/9/2011	Annual	11/9/2012	455
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/20/2012	Annual	2/20/2013	649
SPEAG	ES3DV2	SAR Probe	8/25/2011	Annual	8/25/2012	3022
SPEAG	EX3DV4	SAR Probe	1/27/2012	Annual	1/27/2013	3589
SPEAG	EX3DV4	SAR Probe	7/27/2011	Annual	7/27/2012	3561
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/19/2011	Annual	5/19/2012	859
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	8/25/2011	Annual	8/25/2012	100976
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	ML2438A	Power Meter	10/13/2011	Annual	10/13/2012	1070030
Anritsu	MA2481A	Power Sensor	2/14/2012	Annual	2/14/2013	2400
Agilent	E5515C	Wireless Communications Test Set	2/14/2012	Annual	2/14/2013	GB43304447
Anritsu	MA2411B	Pulse Sensor	10/13/2011	Annual	10/13/2012	1027293
Anritsu	ML2495A	Power Meter	10/13/2011	Annual	10/13/2012	1039008
Amplifier Research	5S1G4	5W, 800MHz-4.2GHz	CBT		CBT	21910
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT		CBT	N/A
Agilent	E5515C	Wireless Communications Test Set	2/12/2012	Annual	2/12/2013	GB45360985
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	10/7/2011	Annual	10/7/2012	103962
Control Company	61220-416	Long-Stem Thermometer	2/15/2011	Biennial	2/15/2013	111331322
VWR	36934-158	Wall-Mounted Thermometer	1/21/2011	Biennial	1/21/2013	111286454
SPEAG	ES3DV3	SAR Probe	2/21/2012	Annual	2/21/2013	3258
MiniCircuits	SLP-2400+	Low Pass Filter	CBT		CBT	R8979500903
Narda	4772-3	Attenuator (3dB)	CBT		CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT		CBT	120
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	8/5/2011	Annual	8/5/2012	112347
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT		CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT		CBT	N/A
Agilent	E5515C	Wireless Communications Test Set	2/14/2012	Annual	2/14/2013	GB43163447
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/18/2012	Annual	1/18/2013	1272
Agilent	85070E	Dielectric Probe Kit	3/8/2012	Annual	3/8/2013	MY44300633
Anritsu	MT8820C	Radio Communication Tester	11/11/2011	Annual	11/11/2012	6200901190
MiniCircuits	VLF-6000+	Low Pass Filter	CBT		CBT	N/A
MiniCircuits	VLF-6000+	Low Pass Filter	CBT		CBT	N/A
Control Company	61220-416	Long-Stem Thermometer	7/1/2011	Biennial	7/1/2013	111642834
VWR	36934-158	Wall-Mounted Thermometer	9/30/2011	Biennial	9/30/2013	111859332
Seekonk	NC-100	Torque Wrench (8" lb)	11/29/2011	Triennial	11/29/2014	21053
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	11/30/2011	Annual	11/30/2012	101699
Agilent	E5515C	Wireless Communications Test Set	2/9/2012	Annual	2/9/2013	GB43460554
Speag	DAK-3.5	Dielectric Assessment Kit	12/1/2011	Annual	12/1/2012	1031
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT		CBT	N/A
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	3/5/2012	Annual	3/5/2013	102060
MCL	BW-N6W5+	6dB Attenuator	CBT		CBT	1139
Intelligent Weigh	PD-3000	Electronic Balance	3/27/2012	Annual	3/27/2013	11081534
Control Company	36934-158	Wall-Mounted Thermometer	1/4/2012	Biennial	1/4/2014	122014497
Control Company	36934-158	Wall-Mounted Thermometer	1/4/2012	Biennial	1/4/2014	122014488
Control Company	61220-416	Long-Stem Thermometer	10/12/2011	Biennial	10/12/2013	111860820
Control Company	61220-416	Long-Stem Thermometer	10/12/2011	Biennial	10/12/2013	111860775
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/15/2012	Annual	2/15/2013	1323
Seekonk	NC-100	Torque Wrench (8" lb)	3/5/2012	Triennial	3/5/2015	N/A
Seekonk	NC-100	Torque Wrench (8" lb)	3/5/2012	Triennial	3/5/2015	N/A
SPEAG	ES3DV3	SAR Probe	2/7/2012	Annual	2/7/2013	3288
SPEAG	D1900V2	1900 MHz SAR Dipole	2/22/2012	Annual	2/22/2013	5d149
SPEAG	D835V2	835 MHz SAR Dipole	2/17/2012	Annual	2/17/2013	4d133
COMTECH	AR85729-5/5759B	Solid State Amplifier	CBT		CBT	M3W1A00-1002



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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Equipment List for 06/14/2012 – 06/18/2012

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
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
Agilent	8753E	(30kHz-6GHz) Network Analyzer	4/4/2012	Annual	4/4/2013	JP38020182
Agilent	E5515C	Wireless Communications Test Set	10/20/2011	Annual	10/20/2012	GB46310798
Agilent	E5515C	Wireless Communications Test Set	10/14/2011	Annual	10/14/2012	GB41450275
Gigatronics	80701A	(0.05-18GHz) Power Sensor	10/12/2011	Annual	10/12/2012	1833460
Gigatronics	8651A	Universal Power Meter	10/12/2011	Annual	10/12/2012	8650319
Rohde & Schwarz	NRVD	Dual Channel Power Meter	4/8/2011	Biennial	4/8/2013	101695
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/20/2012	Annual	2/20/2013	649
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	ML2438A	Power Meter	10/13/2011	Annual	10/13/2012	1070030
Anritsu	MA2481A	Power Sensor	2/14/2012	Annual	2/14/2013	2400
Agilent	E5515C	Wireless Communications Test Set	2/14/2012	Annual	2/14/2013	GB43304447
Anritsu	MA2411B	Pulse Sensor	10/13/2011	Annual	10/13/2012	1027293
Anritsu	ML2495A	Power Meter	10/13/2011	Annual	10/13/2012	1039008
Amplifier Research	5S1G4	5W, 800MHz-4.2GHz	CBT		CBT	21910
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT		CBT	N/A
Agilent	E5515C	Wireless Communications Test Set	2/12/2012	Annual	2/12/2013	GB45360985
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	10/7/2011	Annual	10/7/2012	103962
Control Company	61220-416	Long-Stem Thermometer	2/15/2011	Biennial	2/15/2013	111331322
VWR	36934-158	Wall-Mounted Thermometer	1/21/2011	Biennial	1/21/2013	111286454
MiniCircuits	SLP-2400+	Low Pass Filter	CBT		CBT	R8979500903
Narda	4772-3	Attenuator (3dB)	CBT		CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT		CBT	120
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	8/5/2011	Annual	8/5/2012	112347
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT		CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT		CBT	N/A
Agilent	E5515C	Wireless Communications Test Set	2/14/2012	Annual	2/14/2013	GB43163447
Agilent	85070E	Dielectric Probe Kit	3/8/2012	Annual	3/8/2013	MY44300633
Anritsu	MT8820C	Radio Communication Tester	11/11/2011	Annual	11/11/2012	6200901190
MiniCircuits	VLF-6000+	Low Pass Filter	CBT		CBT	N/A
MiniCircuits	VLF-6000+	Low Pass Filter	CBT		CBT	N/A
Control Company	61220-416	Long-Stem Thermometer	7/1/2011	Biennial	7/1/2013	111642834
VWR	36934-158	Wall-Mounted Thermometer	9/30/2011	Biennial	9/30/2013	111859332
Seekonk	NC-100	Torque Wrench (8" lb)	11/29/2011	Triennial	11/29/2014	21053
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	11/30/2011	Annual	11/30/2012	101699
Agilent	E5515C	Wireless Communications Test Set	2/9/2012	Annual	2/9/2013	GB43460554
Speag	DAK-3.5	Dielectric Assessment Kit	12/1/2011	Annual	12/1/2012	1031
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT		CBT	N/A
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	3/5/2012	Annual	3/5/2013	102060
MCL	BW-N6W5+	6dB Attenuator	CBT		CBT	1139
Intelligent Weigh	PD-3000	Electronic Balance	3/27/2012	Annual	3/27/2013	11081534
Control Company	36934-158	Wall-Mounted Thermometer	1/4/2012	Biennial	1/4/2014	122014497
Control Company	61220-416	Long-Stem Thermometer	10/12/2011	Biennial	10/12/2013	111860820
Seekonk	NC-100	Torque Wrench (8" lb)	3/5/2012	Triennial	3/5/2015	N/A
SPEAG	ES3DV3	SAR Probe	2/7/2012	Annual	2/7/2013	3288
SPEAG	D1900V2	1900 MHz SAR Dipole	2/8/2012	Annual	3/8/2012	5d148
SPEAG	D1900V2	1900 MHz SAR Dipole	2/22/2012	Annual	2/22/2013	5d149
COMTECH	AR85729-5/5759B	Solid State Amplifier	CBT		CBT	M3W1A00-1002

Note: CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing an 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 _i 1gm	c _i 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	299
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	299
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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