



SAR EVALUATION REPORT

Applicant Name:
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Date of Testing:
 11/05/14 - 12/19/14
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 PCTEST Lab, Columbia, MD, USA
Document Serial No.:
 0Y1411052080-R1.A3L

FCC ID: A3LSMG360V

APPLICANT: SAMSUNG ELECTRONICS, CO. LTD.


DUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model(s): SM-G360V, SM-S820L

Equipment Class	Band & Mode	Tx Frequency	SAR		
			1 gm Head (W/kg)	1 gm Body-Worn (W/kg)	1 gm Hotspot (W/kg)
PCE	Cell. CDMA/EVDO	824.70 - 848.31 MHz	0.72	0.91	0.96
PCE	PCS CDMA/EVDO	1851.25 - 1908.75 MHz	1.09	0.83	0.87
PCE	LTE Band 13	779.5 - 784.5 MHz	0.52	0.94	0.94
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	1.03	0.91	0.91
PCE	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	1.06	0.94	0.95
DTS	2.4 GHz WLAN	2412 - 2462 MHz	0.20	0.11	0.11
DSS/DTS	Bluetooth	2402 - 2480 MHz	N/A		
Simultaneous SAR per KDB 690783 D01v01r03:			1.17	1.27	1.07

Note: This revised Test Report (S/N: 0Y1411052080-R1.A3L) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.



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 Section 1.7 of this report; 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.


 Randy Ortanez
 President





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FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 1 of 45

T A B L E O F C O N T E N T S

1	DEVICE UNDER TEST	3
2	LTE INFORMATION	7
3	INTRODUCTION	8
4	DOSIMETRIC ASSESSMENT	9
5	DEFINITION OF REFERENCE POINTS	10
6	TEST CONFIGURATION POSITIONS FOR HANDSETS	11
7	RF EXPOSURE LIMITS	14
8	FCC MEASUREMENT PROCEDURES.....	15
9	RF CONDUCTED POWERS.....	19
10	SYSTEM VERIFICATION.....	28
11	SAR DATA SUMMARY	30
12	FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS.....	37
13	SAR MEASUREMENT VARIABILITY	40
14	EQUIPMENT LIST.....	41
15	MEASUREMENT UNCERTAINTIES	42
16	CONCLUSION.....	43
17	REFERENCES	44
APPENDIX A:	SAR TEST PLOTS	
APPENDIX B:	SAR DIPOLE VERIFICATION PLOTS	
APPENDIX C:	PROBE AND DIPOLE CALIBRATION CERTIFICATES	
APPENDIX D:	SAR TISSUE SPECIFICATIONS	
APPENDIX E:	SAR SYSTEM VALIDATION	
APPENDIX F:	SAR TEST SETUP PHOTOGRAPHS	

FCC ID: A3LSMG360V	 PCTEST <small>ENGINEERING LABORATORY, INC.</small>	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset	Page 2 of 45	

1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
Cell. CDMA/EVDO	Voice/Data	824.70 - 848.31 MHz
PCS CDMA/EVDO	Voice/Data	1851.25 - 1908.75 MHz
LTE Band 13	Voice/Data	779.5 - 784.5 MHz
LTE Band 4 (AWS)	Voice/Data	1710.7 - 1754.3 MHz
LTE Band 2 (PCS)	Voice/Data	1850.7 - 1909.3 MHz
2.4 GHz WLAN	Data	2412 - 2462 MHz
Bluetooth	Data	2402 - 2480 MHz



1.2 Nominal and Maximum Output Power Specifications

This device operates using the following maximum and nominal output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D01v05.

Mode / Band		Modulated Average (dBm)
Cell. CDMA/EVDO	Maximum	25.0
	Nominal	24.5
PCS CDMA/EVDO	Maximum	25.0
	Nominal	24.5

Mode / Band		Modulated Average (dBm)
LTE Band 13	Maximum	24.0
	Nominal	23.5
LTE Band 4 (AWS)	Maximum	23.5
	Nominal	23.0
LTE Band 2 (PCS)	Maximum	22.7
	Nominal	22.2

Mode / Band		Modulated Average (dBm)
IEEE 802.11b (2.4 GHz)	Maximum	13.5
	Nominal	13.0
IEEE 802.11g (2.4 GHz)	Maximum	13.0
	Nominal	12.5
IEEE 802.11n (2.4 GHz)	Maximum	13.0
	Nominal	12.5
Bluetooth	Maximum	12.0
	Nominal	11.5
Bluetooth LE	Maximum	3.5
	Nominal	3.0

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 3 of 45

1.3 Sides for SAR Testing

The overall dimensions of this device are > 9 × 5 cm. The overall diagonal dimension of the device is < 160 mm and the diagonal display is < 150 mm. Exact antenna dimensions and separation distances are shown in the Technical Descriptions in the FCC filing.

**Table 1-1
Mobile Hotspot Sides for SAR Testing**

Mode	Back	Front	Top	Bottom	Right	Left
Cell. EVDO	Yes	Yes	No	Yes	Yes	Yes
PCS EVDO	Yes	Yes	No	Yes	Yes	Yes
LTE Band 13	Yes	Yes	No	Yes	Yes	Yes
LTE Band 4 (AWS)	Yes	Yes	No	Yes	Yes	Yes
LTE Band 2 (PCS)	Yes	Yes	No	Yes	Yes	Yes
2.4 GHz WLAN	Yes	Yes	No	No	No	Yes

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 D06v01 guidance, page 2. The distances between the transmit antennas and the edges of the device are included in the filing.

1.4 Simultaneous Transmission Capabilities



According to FCC KDB Publication 447498 D05v01, 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 1-1 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 1-1

Simultaneous Transmission Paths

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB Publication 447498 D01v05 3) procedures.

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 4 of 45

**Table 1-2
Simultaneous Transmission Scenarios**

No.	Capable Transmit Configuration	Head	Body-Worn Accessory	Wireless Router	Notes
1	1x CDMA voice + 2.4 GHz WI-FI	Yes	Yes	N/A	
2	1x CDMA voice + 2.4 GHz Bluetooth	N/A	Yes	N/A	
3	LTE + 2.4 GHz WI-FI	Yes	Yes	Yes	
4	LTE + 2.4 GHz Bluetooth	N/A	Yes	N/A	
5	CDMA/EVDO data + 2.4 GHz WI-FI	Yes*	Yes*	Yes	*-Pre-installed VOIP applications are considered.
6	CDMA/EVDO data + 2.4 GHz Bluetooth	N/A	Yes*	N/A	*-Pre-installed VOIP applications are considered.
7	1x CDMA voice + CDMA/EVDO data	N/A	N/A	N/A	Not supported by HW
8	CDMA/EVDO data + LTE	N/A	N/A	N/A	Not supported by HW
9	1x CDMA voice + LTE	N/A	N/A	N/A	Not supported by HW
10	1x CDMA voice + LTE + 2.4 GHz WI-FI	N/A	N/A	N/A	Not supported by HW

- 2.4 GHz WLAN, and 2.4 GHz Bluetooth share the same antenna path and cannot transmit simultaneously.
- All licensed modes share the same antenna path and cannot transmit simultaneously.
- Per the manufacturer, WIFI Direct is not expected to be used in conjunction with a held-to-ear or body-worn accessory voice call. Therefore, there are no simultaneous transmission scenarios involving WIFI direct beyond that listed in the above table.
- This device supports VoLTE.

1.5 SAR Test Exclusions Applied

(A) WIFI/BT

Per FCC KDB 447498 D01v05, the 1g SAR exclusion threshold for distances <50mm is defined by the following equation:

$$\frac{\text{Max Power of Channel (mW)}}{\text{Test Separation Dist (mm)}} * \sqrt{\text{Frequency(GHz)}} \leq 3.0$$

Based on the maximum conducted power of Bluetooth (rounded to the nearest mW) and the antenna to user separation distance, body-worn Bluetooth SAR was not required; $[(16/10) * \sqrt{2.480}] = 2.5 < 3.0$. Per KDB Publication 447498 D01v05, the maximum power of the channel was rounded to the nearest mW before calculation.

(B) Licensed Transmitter(s)

LTE SAR for the higher modulations and lower bandwidths were not tested since the maximum average output power of all required channels and configurations was not more than 0.5 dB higher than the highest bandwidth; and the reported LTE SAR for the highest bandwidth was less than 1.45 W/kg for all configurations according to FCC KDB 941225 D05v02.



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.

1.6 Power Reduction for SAR

There is no power reduction used for any band/mode implemented in this device for SAR purposes.

1.7 Guidance Applied

- IEEE 1528-2003
- FCC KDB Publication 941225 D01v03, D05v02r03, D06v01r01 (2G/3G/4G and Hotspot)
- FCC KDB Publication 248227 D01v01r02 (SAR Considerations for 802.11 Devices)



FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 5 of 45

- FCC KDB Publication 447498 D01v05r02 (General SAR Guidance)
- FCC KDB Publication 865664 D01v01r03, D02v01r01 (SAR Measurements up to 6 GHz)

1.8 Device Serial Numbers

Several samples were used with identical hardware to support SAR testing. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.



	Head Serial Number	Body-Worn Serial Number	Hotspot Serial Number
Cell. CDMA/EVDO	0511-4	0511-4	0511-4
PCS CDMA/EVDO	0511-4	0511-4	0511-4
LTE Band 13	0511-4	0511-4	0511-4
LTE Band 4 (AWS)	2811-7	2811-7	2811-7
LTE Band 2 (PCS)	2811-3	2811-3	2811-3
2.4 GHz WLAN	0511-4	0511-4	0511-4

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset	Page 6 of 45	

2

LTE INFORMATION

LTE Information			
FCC ID	A3LSMG360V		
Form Factor	Portable Handset		
Frequency Range of each LTE transmission band	LTE Band 13 (779.5 - 784.5 MHz)		
	LTE Band 4 (AWS) (1710.7 - 1754.3 MHz)		
	LTE Band 2 (PCS) (1850.7 - 1909.3 MHz)		
Channel Bandwidths	LTE Band 13: 5 MHz, 10 MHz		
	LTE Band 4 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz		
	LTE Band 2 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz		
Channel Numbers and Frequencies (MHz)	Low	Mid	High
LTE Band 13: 5 MHz	779.5 (23205)	782 (23230)	784.5 (23255)
LTE Band 13: 10 MHz	782 (23230)	782 (23230)	782 (23230)
LTE Band 4 (AWS): 1.4 MHz	1710.7 (19957)	1732.5 (20175)	1754.3 (20393)
LTE Band 4 (AWS): 3 MHz	1711.5 (19965)	1732.5 (20175)	1753.5 (20385)
LTE Band 4 (AWS): 5 MHz	1712.5 (19975)	1732.5 (20175)	1752.5 (20375)
LTE Band 4 (AWS): 10 MHz	1715 (20000)	1732.5 (20175)	1750 (20350)
LTE Band 4 (AWS): 15 MHz	1717.5 (20025)	1732.5 (20175)	1747.5 (20325)
LTE Band 4 (AWS): 20 MHz	1720 (20050)	1732.5 (20175)	1745 (20300)
LTE Band 2 (PCS): 1.4 MHz	1850.7 (18607)	1880 (18900)	1909.3 (19193)
LTE Band 2 (PCS): 3 MHz	1851.5 (18615)	1880 (18900)	1908.5 (19185)
LTE Band 2 (PCS): 5 MHz	1852.5 (18625)	1880 (18900)	1907.5 (19175)
LTE Band 2 (PCS): 10 MHz	1855 (18650)	1880 (18900)	1905 (19150)
LTE Band 2 (PCS): 15 MHz	1857.5 (18675)	1880 (18900)	1902.5 (19125)
LTE Band 2 (PCS): 20 MHz	1860 (18700)	1880 (18900)	1900 (19100)
UE Category	3		
Modulations Supported in UL	QPSK, 16QAM		
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		

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 7 of 45

3 INTRODUCTION

The FCC and Industry Canada have adopted the guidelines for evaluating the environmental effects of radio frequency (RF) radiation in ET Docket 93-62 on Aug. 6, 1996 and Health Canada Safety Code 6 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 [22]. The measurement procedure described in IEEE/ANSI C95.3-2002 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave [4] is used for guidance in measuring the Specific Absorption Rate (SAR) due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the International Committee for Non-Ionizing Radiation Protection (ICNIRP) in Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," Report No. Vol 74. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

3.1 SAR Definition

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

Equation 3-1
SAR Mathematical Equation

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



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

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

where:

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

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

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT	 SAMSUNG	Reviewed by: Quality Manager
Document S/N: 0Y1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 8 of 45

4 DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

The evaluation was performed using the following procedure compliant to FCC KDB Publication 865664 D01v01 and IEEE 1528-2013:

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 and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 D01v01 (See Table 4-1) and IEEE 1528-2013.
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 1g/10g cube evaluation. SAR at this fixed point was measured and used as a reference value.
3. Based on the area scan data, the peak of the region with maximum SAR was determined by spline interpolation. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB Publication 865664 D01v01 (See Table 4-1) and IEEE 1528-2013. On the 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. SAR values at the inner surface of the phantom are extrapolated from the measured values along the line away from the surface with spacing no greater than that in Table 4-1. 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.

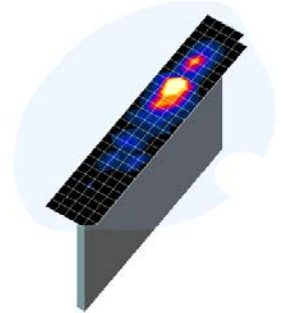




Figure 4-1
Sample SAR Area Scan

Table 4-1
Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01*

Frequency	Maximum Area Scan Resolution (mm) (Δx_{area} , Δy_{area})	Maximum Zoom Scan Resolution (mm) (Δx_{zoom} , Δy_{zoom})	Maximum Zoom Scan Spatial Resolution (mm)			Minimum Zoom Scan Volume (mm) (x,y,z)
			Uniform Grid	Graded Grid		
			$\Delta z_{zoom}(n)$	$\Delta z_{zoom}(1)^*$	$\Delta z_{zoom}(n>1)^*$	
≤ 2 GHz	≤ 15	≤ 8	≤ 5	≤ 4	≤ 1.5* $\Delta z_{zoom}(n-1)$	≥ 30
2-3 GHz	≤ 12	≤ 5	≤ 5	≤ 4	≤ 1.5* $\Delta z_{zoom}(n-1)$	≥ 30
3-4 GHz	≤ 12	≤ 5	≤ 4	≤ 3	≤ 1.5* $\Delta z_{zoom}(n-1)$	≥ 28
4-5 GHz	≤ 10	≤ 4	≤ 3	≤ 2.5	≤ 1.5* $\Delta z_{zoom}(n-1)$	≥ 25
5-6 GHz	≤ 10	≤ 4	≤ 2	≤ 2	≤ 1.5* $\Delta z_{zoom}(n-1)$	≥ 22

*Also compliant to IEEE 1528-2013 Table 6

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 9 of 45

5 DEFINITION OF REFERENCE POINTS

5.1 EAR REFERENCE POINT

Figure 5-2 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 5-1. The plane passing through the two ear canals and M is defined as the Reference Plane. The line N-F (Neck-Front), also called the Reference Pivoting Line, is not perpendicular to the reference plane (see Figure 5-1). 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].

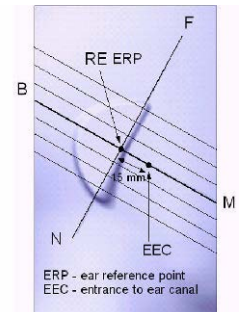


Figure 5-1
Close-Up Side view of ERP

5.2 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 acoustic output located along the “vertical centerline” on the front of the device aligned to the “ear reference point” (See Figure 5-3). The acoustic output 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 its 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 5-2
Front, back and side view of SAM Twin Phantom

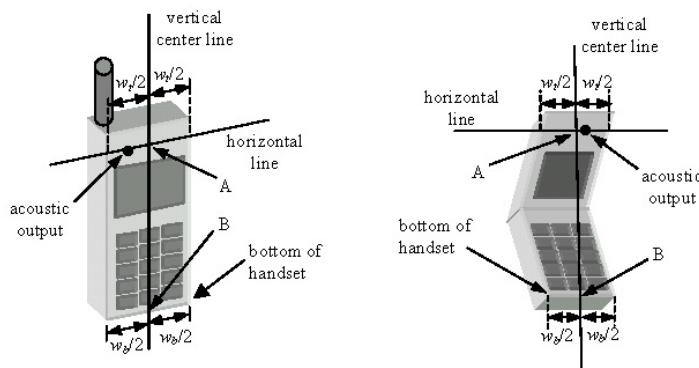


Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

FCC ID: A3LSMG360V	PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT	SAMSUNG	Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 10 of 45

6 TEST CONFIGURATION POSITIONS FOR HANDSETS

6.1 Device Holder

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

6.2 Positioning for Cheek

1. The test device was positioned with the device 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 6-1), 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.

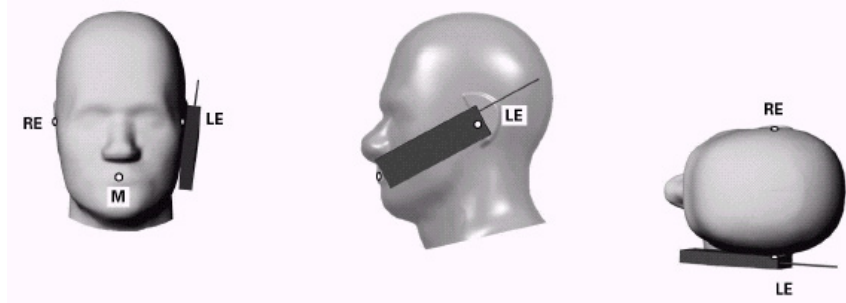




Figure 6-1 Front, Side and Top View of Cheek Position

2. The handset was translated towards the phantom along the line passing through RE & LE until the handset touches the pinna.
3. While maintaining the handset in this plane, the handset was rotated around the LE-RE line until the vertical centerline was in the 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 device contact with the ear, the device was rotated about the NF line until any point on the handset made contact with a phantom point below the ear (cheek) (See Figure 6-2).

6.3 Positioning for Ear / 15° Tilt

With the test device aligned in the “Cheek 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 degrees.
2. The phone was then rotated around the horizontal line by 15 degrees.
3. While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the handset touched 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. In this situation, 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 6-2).

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT	 SAMSUNG	Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 11 of 45

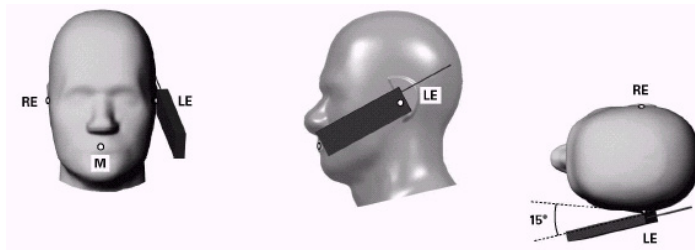


Figure 6-2 Front, Side and Top View of Ear/15° Tilt Position

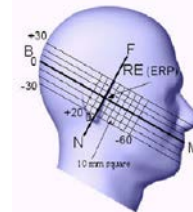


Figure 6-3 Side view w/ relevant markings

6.4 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. Per IEEE 1528-2013, a rotated SAM phantom is necessary to allow probe access to such regions. Both SAM heads of the TwinSAM-Chin20 are rotated 20 degrees around the NF line. Each head can be removed from the table for emptying and cleaning.

Under these circumstances, the following procedures apply, adopted from the FCC guidance on SAR handsets document FCC KDB Publication 648474 D04_v01. The SAR required in these regions of SAM should be measured using a flat phantom. The phone should be positioned with a separation distance of 4 mm between the ear reference point (ERP) and the outer surface of the flat phantom shell. While maintaining this distance at the ERP location, the low (bottom) edge of the phone should be lowered from the phantom to establish the same separation distance between the peak SAR location identified by the truncated partial SAR distribution measured with the SAM phantom. The distance from the peak SAR location to the phone is determined by the straight line passing perpendicularly through the phantom surface. When it is not feasible to maintain 4 mm separation at the ERP while also establishing the required separation at the peak SAR location, the top edge of the phone will be allowed to touch the phantom with a separation < 4 mm at the ERP. The phone should not be tilted to the left or right while placed in this inclined position to the flat phantom.

6.5 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 6-4). Per FCC KDB Publication 648474 D04v01, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D01v05 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

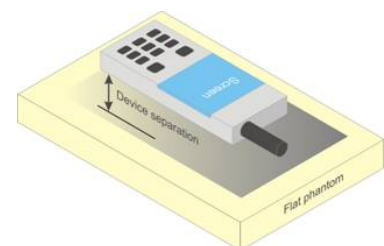




Figure 6-4 Sample Body-Worn Diagram

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

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 12 of 45

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 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.

6.6 Extremity Exposure Configurations



Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions; i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user's body, SAR compliance for the body is also required. The 1-g body and 10-g extremity SAR Exclusion Thresholds found in KDB Publication 44798 D01v05 should be applied to determine SAR test requirements.

Per KDB Publication 447498 D01v05, Cell phones (handsets) are not normally designed to be used on extremities or operated in extremity only exposure conditions. The maximum output power levels of handsets generally do not require extremity SAR testing to show compliance. Therefore, extremity SAR was not evaluated for this device.

6.7 Wireless Router Configurations

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 v01 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 containing transmitting antennas within 2.5 cm of their edges, 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.

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 due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v05 publication procedures. The "Portable Hotspot" feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset	Page 13 of 45	

7 RF EXPOSURE LIMITS

7.1 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.



7.2 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 7-1
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)
Peak Spatial Average SAR Head	1.6	8.0
Whole Body SAR	0.08	0.4
Peak Spatial Average SAR Hands, Feet, Ankle, Wrists, etc.	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.

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT	 SAMSUNG	Reviewed by: Quality Manager
Document S/N: 0Y1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 14 of 45

8 FCC MEASUREMENT PROCEDURES

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

8.1 Measured and Reported SAR

Per FCC KDB Publication 447498 D01v05, When SAR is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance. For simultaneous transmission, the measured aggregate SAR must be scaled according to the sum of the differences between the maximum tune-up tolerance and actual power used to test each transmitter. When SAR is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as *reported* SAR. The highest *reported* SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r02.

8.2 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.



8.3 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.

8.3.1 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 8-1 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 8-2 was applied.

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 15 of 45

**Table 8-1
Parameters for Max. Power for RC1**

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

**Table 8-2
Parameters for Max. Power for RC3**

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

5. FCHs were configured at full rate for maximum SAR with “All Up” power control bits.

8.3.2 CDMA2000 1x Advanced

This device additionally supports 1x Advanced. Conducted powers were measured using SO75 with RC8 on the uplink and RC11 on the downlink per KDB Publication 941225 D01v03. 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 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 is required for 1x advanced when the maximum output for 1x Advanced is more than 0.25 dB higher than the maximum measured for 1x. Also, 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.

8.3.3 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.

Head SAR was additionally evaluated using EVDO Rev. A to support compliance for VoIP operations. See Section 8.3.5 for EVDO Rev. A configuration parameters.

8.3.4 Body SAR Measurements

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.

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 16 of 45

8.3.5 Handsets with EVDO

For handsets with Ev-Do capabilities, when the maximum average output of each channel in Rev. 0 is less than ¼ dB higher than that measured in RC3 (1x RTT), body SAR for EV-DO is not required. Otherwise, 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 or less than ¼ dB higher than that measured in RC3. 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.

8.3.6 Body SAR Measurements for EVDO Hotspot

Hotspot Body SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0 per KDB Publication 941225 D01 procedures for “1x Ev-Do data Devices”. SAR for Subtype 2 Physical layer configurations is not required for Rev. A when the maximum average output of each RF channels is less than that measured in Subtype 0/1 Physical layer configurations. Otherwise, SAR is measured on the maximum output channel for Rev. A using the exposure configuration that results in the highest SAR for the RF channels in Rev. 0. The AT is tested with a Reverse Data Channel rate of 153.6 kbps in Subtype 0/1 Physical Layer configurations; and a Reverse Data Channel payload size of 4096 bits and Termination Target of 16 slots in Subtype 2 Physical Layer configurations.

SAR is not required for 1x RTT for Ev-Do devices that also support 1x RTT voice and/or data operations, when the maximum average output of each channel is less than 1/4 dB higher than that measured in Subtype 0/1 Physical Layer configurations for Rev. 0. Otherwise, CDMA “Body-SAR Measurement” procedures for “CDMA 2000 1x Handsets” were applied.

8.4 SAR Measurement Conditions for LTE

LTE modes were tested according to FCC KDB 941225 D05v02 publication. Please see notes after the tabulated 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. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

8.4.1 Spectrum Plots for RB Configurations



A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

8.4.2 MPR

MPR is permanently implemented for this device by the manufacturer. 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.

8.4.3 A-MPR

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

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 17 of 45

8.4.4 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05v02r01:

- a. Per Section 5.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
 - i. The required channel and offset combination with the highest maximum output power is required for SAR.
 - ii. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.
 - iii. When the reported SAR for a required test channel is > 1.45 W/kg, SAR is required for all RB offset configurations for that channel.
- b. Per Section 5.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Section 5.2.1.
- c. Per Section 5.2.3, QPSK SAR is not required for the 100% allocation when the highest maximum output power for the 100% allocation is less than the highest maximum output power of the 1 RB and 50% RB allocations and the reported SAR for the 1 RB and 50% RB allocations is < 0.8 W/kg.
- d. Per Section 5.2.4 and 5.3, SAR tests for higher order modulations and lower bandwidths configurations are not required when the conducted power of the required test configurations determined by Sections 5.2.1 through 5.2.3 is less than or equal to $\frac{1}{2}$ dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is < 1.45 W/kg.

8.5 SAR Testing with 802.11 Transmitters

Normal network operating configurations are not suitable for measuring the SAR of 802.11 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 D01v01r02 for more details.



8.5.1 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.

8.5.2 Frequency Channel Configurations [24]

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.

If the maximum extrapolated peak SAR of the zoom scan for the highest output channel was less than 1.6 W/kg and 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.

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 18 of 45

9 RF CONDUCTED POWERS

9.1 CDMA Conducted Powers

Band	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	1013	824.7	24.32	24.34	24.20	24.33	24.32	24.44	24.43
	384	836.52	24.26	24.28	24.17	24.31	24.36	24.41	24.39
	777	848.31	24.33	24.31	24.23	24.36	24.38	24.38	24.36
PCS	25	1851.25	24.16	24.18	23.93	24.27	24.28	24.14	24.09
	600	1880	24.42	24.38	24.10	24.33	24.42	24.39	24.38
	1175	1908.75	24.59	24.57	24.44	24.62	24.55	24.59	24.57

Note: RC1 is only applicable for IS-95 compatibility.

Per KDB Publication 941225 D01v03:

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 SAR was tested with 1x RTT with TDSO / SO32 FCH Only. Ev-Do and 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. Hotspot SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0. If the average output power of Subtype 2 for Rev. A is less than the Rev. 0 power levels, then Rev. A SAR is not required. Otherwise, SAR is measured on the maximum output channel for Rev. A using the exposure configuration that results in the highest SAR for that RF channel in Rev. 0. SAR is not required for 1x RTT for Ev-Do hotspot devices when the maximum average output of each channel is less than 1/4 dB higher than that measured in Subtype 0/1 Physical Layer configurations for Rev. 0.
4. Head SAR was additionally evaluated with EVDO Rev. A to determine compliance for held-to-ear VoIP operations.
5. 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 8.3.2 for 1x Advanced test set up.

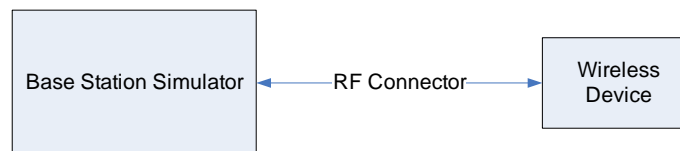


Figure 9-1
Power Measurement Setup

FCC ID: A3LSMG360V	PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT	SAMSUNG	Reviewed by: Quality Manager
Document S/N: 0Y1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 19 of 45

9.2 LTE Conducted Powers

9.2.1 LTE Band 13



Table 9-1
LTE Band 13 Conducted Powers - 10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Mid	782.0	23230	10	QPSK	1	0	23.91	0	0
	782.0	23230	10	QPSK	1	25	23.23	0	0
	782.0	23230	10	QPSK	1	49	23.24	0	0
	782.0	23230	10	QPSK	25	0	22.49	0-1	1
	782.0	23230	10	QPSK	25	12	22.20	0-1	1
	782.0	23230	10	QPSK	25	25	22.12	0-1	1
	782.0	23230	10	QPSK	50	0	22.35	0-1	1
	782.0	23230	10	16QAM	1	0	23.00	0-1	1
	782.0	23230	10	16QAM	1	25	22.61	0-1	1
	782.0	23230	10	16QAM	1	49	22.60	0-1	1
	782.0	23230	10	16QAM	25	0	21.61	0-2	2
	782.0	23230	10	16QAM	25	12	21.31	0-2	2
	782.0	23230	10	16QAM	25	25	21.20	0-2	2
	782.0	23230	10	16QAM	50	0	21.44	0-2	2

Table 9-2
LTE Band 13 Conducted Powers - 5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Mid	782.0	23230	5	QPSK	1	0	23.72	0	0
	782.0	23230	5	QPSK	1	12	23.20	0	0
	782.0	23230	5	QPSK	1	24	23.25	0	0
	782.0	23230	5	QPSK	12	0	22.42	0-1	1
	782.0	23230	5	QPSK	12	6	22.25	0-1	1
	782.0	23230	5	QPSK	12	13	22.15	0-1	1
	782.0	23230	5	QPSK	25	0	22.24	0-1	1
	782.0	23230	5	16-QAM	1	0	23.00	0-1	1
	782.0	23230	5	16-QAM	1	12	22.57	0-1	1
	782.0	23230	5	16-QAM	1	24	22.58	0-1	1
	782.0	23230	5	16-QAM	12	0	21.53	0-2	2
	782.0	23230	5	16-QAM	12	6	21.36	0-2	2
	782.0	23230	5	16-QAM	12	13	21.25	0-2	2
	782.0	23230	5	16-QAM	25	0	21.34	0-2	2

Note: LTE Band 13 at 5 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 20 of 45

9.2.2 LTE Band 4 (AWS)

Table 9-3

LTE Band 4 (AWS) Conducted Powers - 20 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Mid	1732.5	20175	20	QPSK	1	0	23.16	0	0
	1732.5	20175	20	QPSK	1	50	23.47	0	0
	1732.5	20175	20	QPSK	1	99	23.24	0	0
	1732.5	20175	20	QPSK	50	0	21.97	0-1	1
	1732.5	20175	20	QPSK	50	25	22.09	0-1	1
	1732.5	20175	20	QPSK	50	50	21.63	0-1	1
	1732.5	20175	20	QPSK	100	0	21.89	0-1	1
	1732.5	20175	20	16QAM	1	0	21.54	0-1	1
	1732.5	20175	20	16QAM	1	50	21.93	0-1	1
	1732.5	20175	20	16QAM	1	99	21.50	0-1	1
	1732.5	20175	20	16QAM	50	0	21.11	0-2	2
	1732.5	20175	20	16QAM	50	25	21.17	0-2	2
	1732.5	20175	20	16QAM	50	50	20.78	0-2	2
	1732.5	20175	20	16QAM	100	0	21.05	0-2	2

Note: LTE Band 4 (AWS) at 20 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

Table 9-4

LTE Band 4 (AWS) Conducted Powers - 15 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1717.5	20025	15	QPSK	1	0	22.51	0	0
	1717.5	20025	15	QPSK	1	36	22.62	0	0
	1717.5	20025	15	QPSK	1	74	22.55	0	0
	1717.5	20025	15	QPSK	36	0	21.71	0-1	1
	1717.5	20025	15	QPSK	36	18	21.57	0-1	1
	1717.5	20025	15	QPSK	36	37	21.76	0-1	1
	1717.5	20025	15	QPSK	75	0	21.68	0-1	1
	1717.5	20025	15	16QAM	1	0	21.87	0-1	1
	1717.5	20025	15	16QAM	1	36	21.83	0-1	1
	1717.5	20025	15	16QAM	1	74	21.55	0-1	1
	1717.5	20025	15	16QAM	36	0	20.70	0-2	2
	1717.5	20025	15	16QAM	36	18	20.57	0-2	2
	1717.5	20025	15	16QAM	36	37	20.65	0-2	2
	1717.5	20025	15	16QAM	75	0	20.58	0-2	2
	1732.5	20175	15	QPSK	1	0	22.93	0	0
	1732.5	20175	15	QPSK	1	36	23.16	0	0
	1732.5	20175	15	QPSK	1	74	22.74	0	0
	1732.5	20175	15	QPSK	36	0	22.11	0-1	1
1732.5	20175	15	QPSK	36	18	22.16	0-1	1	
1732.5	20175	15	QPSK	36	37	21.84	0-1	1	
1732.5	20175	15	QPSK	75	0	21.99	0-1	1	
1732.5	20175	15	16QAM	1	0	22.14	0-1	1	
1732.5	20175	15	16QAM	1	36	22.42	0-1	1	
1732.5	20175	15	16QAM	1	74	21.93	0-1	1	
1732.5	20175	15	16QAM	36	0	21.16	0-2	2	
1732.5	20175	15	16QAM	36	18	21.22	0-2	2	
1732.5	20175	15	16QAM	36	37	20.89	0-2	2	
1732.5	20175	15	16QAM	75	0	20.96	0-2	2	
High	1747.5	20325	15	QPSK	1	0	23.35	0	0
	1747.5	20325	15	QPSK	1	36	23.07	0	0
	1747.5	20325	15	QPSK	1	74	22.97	0	0
	1747.5	20325	15	QPSK	36	0	22.02	0-1	1
	1747.5	20325	15	QPSK	36	18	21.75	0-1	1
	1747.5	20325	15	QPSK	36	37	21.97	0-1	1
	1747.5	20325	15	QPSK	75	0	21.89	0-1	1
	1747.5	20325	15	16QAM	1	0	22.27	0-1	1
	1747.5	20325	15	16QAM	1	36	21.62	0-1	1
	1747.5	20325	15	16QAM	1	74	21.86	0-1	1
	1747.5	20325	15	16QAM	36	0	21.12	0-2	2
	1747.5	20325	15	16QAM	36	18	20.75	0-2	2
	1747.5	20325	15	16QAM	36	37	20.69	0-2	2
	1747.5	20325	15	16QAM	75	0	20.87	0-2	2



FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 21 of 45

Table 9-5
LTE Band 4 (AWS) Conducted Powers - 10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1715	20000	10	QPSK	1	0	22.50	0	0
	1715	20000	10	QPSK	1	25	22.71	0	0
	1715	20000	10	QPSK	1	49	22.76	0	0
	1715	20000	10	QPSK	25	0	21.65	0-1	1
	1715	20000	10	QPSK	25	12	21.57	0-1	1
	1715	20000	10	QPSK	25	25	21.58	0-1	1
	1715	20000	10	QPSK	50	0	21.51	0-1	1
	1715	20000	10	16QAM	1	0	21.56	0-1	1
	1715	20000	10	16QAM	1	25	21.89	0-1	1
	1715	20000	10	16QAM	1	49	21.50	0-1	1
	1715	20000	10	16QAM	25	0	20.66	0-2	2
	1715	20000	10	16QAM	25	12	20.73	0-2	2
	1715	20000	10	16QAM	25	25	20.75	0-2	2
	1715	20000	10	16QAM	50	0	20.57	0-2	2
	Mid	1732.5	20175	10	QPSK	1	0	22.86	0
1732.5		20175	10	QPSK	1	25	23.44	0	0
1732.5		20175	10	QPSK	1	49	22.82	0	0
1732.5		20175	10	QPSK	25	0	22.25	0-1	1
1732.5		20175	10	QPSK	25	12	22.09	0-1	1
1732.5		20175	10	QPSK	25	25	21.88	0-1	1
1732.5		20175	10	QPSK	50	0	22.07	0-1	1
1732.5		20175	10	16QAM	1	0	21.97	0-1	1
1732.5		20175	10	16QAM	1	25	22.00	0-1	1
1732.5		20175	10	16QAM	1	49	21.69	0-1	1
1732.5		20175	10	16QAM	25	0	21.28	0-2	2
1732.5		20175	10	16QAM	25	12	21.12	0-2	2
1732.5		20175	10	16QAM	25	25	21.01	0-2	2
1732.5		20175	10	16QAM	50	0	20.87	0-2	2
High		1750	20350	10	QPSK	1	0	23.15	0
	1750	20350	10	QPSK	1	25	23.12	0	0
	1750	20350	10	QPSK	1	49	23.08	0	0
	1750	20350	10	QPSK	25	0	21.76	0-1	1
	1750	20350	10	QPSK	25	12	21.79	0-1	1
	1750	20350	10	QPSK	25	25	21.73	0-1	1
	1750	20350	10	QPSK	50	0	21.66	0-1	1
	1750	20350	10	16QAM	1	0	21.77	0-1	1
	1750	20350	10	16QAM	1	25	21.92	0-1	1
	1750	20350	10	16QAM	1	49	21.95	0-1	1
	1750	20350	10	16QAM	25	0	20.99	0-2	2
	1750	20350	10	16QAM	25	12	20.71	0-2	2
	1750	20350	10	16QAM	25	25	20.77	0-2	2
	1750	20350	10	16QAM	50	0	20.55	0-2	2

Table 9-6
LTE Band 4 (AWS) Conducted Powers - 5 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1712.5	19975	5	QPSK	1	0	22.69	0	0
	1712.5	19975	5	QPSK	1	12	23.25	0	0
	1712.5	19975	5	QPSK	1	24	23.07	0	0
	1712.5	19975	5	QPSK	12	0	21.62	0-1	1
	1712.5	19975	5	QPSK	12	6	21.69	0-1	1
	1712.5	19975	5	QPSK	12	13	22.03	0-1	1
	1712.5	19975	5	QPSK	25	0	21.70	0-1	1
	1712.5	19975	5	16-QAM	1	0	21.81	0-1	1
	1712.5	19975	5	16-QAM	1	12	22.36	0-1	1
	1712.5	19975	5	16-QAM	1	24	22.20	0-1	1
	1712.5	19975	5	16-QAM	12	0	20.58	0-2	2
	1712.5	19975	5	16-QAM	12	6	20.68	0-2	2
	1712.5	19975	5	16-QAM	12	13	20.82	0-2	2
	1712.5	19975	5	16-QAM	25	0	20.54	0-2	2
	Mid	1732.5	20175	5	QPSK	1	0	23.42	0
1732.5		20175	5	QPSK	1	12	23.41	0	0
1732.5		20175	5	QPSK	1	24	23.00	0	0
1732.5		20175	5	QPSK	12	0	22.35	0-1	1
1732.5		20175	5	QPSK	12	6	22.20	0-1	1
1732.5		20175	5	QPSK	12	13	22.02	0-1	1
1732.5		20175	5	QPSK	25	0	22.21	0-1	1
1732.5		20175	5	16-QAM	1	0	21.96	0-1	1
1732.5		20175	5	16-QAM	1	12	22.27	0-1	1
1732.5		20175	5	16-QAM	1	24	22.41	0-1	1
1732.5		20175	5	16-QAM	12	0	21.20	0-2	2
1732.5		20175	5	16-QAM	12	6	21.11	0-2	2
1732.5		20175	5	16-QAM	12	13	20.90	0-2	2
1732.5		20175	5	16-QAM	25	0	21.14	0-2	2
High		1752.5	20375	5	QPSK	1	0	22.93	0
	1752.5	20375	5	QPSK	1	12	23.42	0	0
	1752.5	20375	5	QPSK	1	24	23.42	0	0
	1752.5	20375	5	QPSK	12	0	22.19	0-1	1
	1752.5	20375	5	QPSK	12	6	22.16	0-1	1
	1752.5	20375	5	QPSK	12	13	22.28	0-1	1
	1752.5	20375	5	QPSK	25	0	22.13	0-1	1
	1752.5	20375	5	16-QAM	1	0	22.31	0-1	1
	1752.5	20375	5	16-QAM	1	12	22.47	0-1	1
	1752.5	20375	5	16-QAM	1	24	22.46	0-1	1
	1752.5	20375	5	16-QAM	12	0	21.34	0-2	2
	1752.5	20375	5	16-QAM	12	6	21.49	0-2	2
	1752.5	20375	5	16-QAM	12	13	21.47	0-2	2
	1752.5	20375	5	16-QAM	25	0	21.20	0-2	2





FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 22 of 45

Table 9-7
LTE Band 4 (AWS) Conducted Powers - 3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1711.5	19965	3	QPSK	1	0	22.69	0	0
	1711.5	19965	3	QPSK	1	7	22.87	0	0
	1711.5	19965	3	QPSK	1	14	22.84	0	0
	1711.5	19965	3	QPSK	8	0	21.53	0-1	1
	1711.5	19965	3	QPSK	8	4	21.65	0-1	1
	1711.5	19965	3	QPSK	8	7	21.71	0-1	1
	1711.5	19965	3	QPSK	15	0	21.64	0-1	1
	1711.5	19965	3	16-QAM	1	0	21.97	0-1	1
	1711.5	19965	3	16-QAM	1	7	21.78	0-1	1
	1711.5	19965	3	16-QAM	1	14	22.12	0-1	1
	1711.5	19965	3	16-QAM	8	0	20.72	0-2	2
	1711.5	19965	3	16-QAM	8	4	20.68	0-2	2
	1711.5	19965	3	16-QAM	8	7	20.61	0-2	2
	1711.5	19965	3	16-QAM	15	0	20.59	0-2	2
	Mid	1732.5	20175	3	QPSK	1	0	23.48	0
1732.5		20175	3	QPSK	1	7	23.34	0	0
1732.5		20175	3	QPSK	1	14	23.20	0	0
1732.5		20175	3	QPSK	8	0	22.29	0-1	1
1732.5		20175	3	QPSK	8	4	22.25	0-1	1
1732.5		20175	3	QPSK	8	7	22.12	0-1	1
1732.5		20175	3	QPSK	15	0	22.13	0-1	1
1732.5		20175	3	16-QAM	1	0	22.41	0-1	1
1732.5		20175	3	16-QAM	1	7	22.15	0-1	1
1732.5		20175	3	16-QAM	1	14	22.49	0-1	1
1732.5		20175	3	16-QAM	8	0	21.24	0-2	2
1732.5		20175	3	16-QAM	8	4	21.05	0-2	2
1732.5		20175	3	16-QAM	8	7	21.30	0-2	2
1732.5		20175	3	16-QAM	15	0	21.33	0-2	2
High		1753.5	20385	3	QPSK	1	0	23.47	0
	1753.5	20385	3	QPSK	1	7	23.42	0	0
	1753.5	20385	3	QPSK	1	14	22.97	0	0
	1753.5	20385	3	QPSK	8	0	21.86	0-1	1
	1753.5	20385	3	QPSK	8	4	21.87	0-1	1
	1753.5	20385	3	QPSK	8	7	21.80	0-1	1
	1753.5	20385	3	QPSK	15	0	21.79	0-1	1
	1753.5	20385	3	16-QAM	1	0	22.24	0-1	1
	1753.5	20385	3	16-QAM	1	7	22.43	0-1	1
	1753.5	20385	3	16-QAM	1	14	22.14	0-1	1
	1753.5	20385	3	16-QAM	8	0	20.78	0-2	2
	1753.5	20385	3	16-QAM	8	4	20.73	0-2	2
	1753.5	20385	3	16-QAM	8	7	20.73	0-2	2
	1753.5	20385	3	16-QAM	15	0	20.95	0-2	2

Table 9-8
LTE Band 4 (AWS) Conducted Powers -1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1710.7	19957	1.4	QPSK	1	0	22.63	0	0
	1710.7	19957	1.4	QPSK	1	2	22.93	0	0
	1710.7	19957	1.4	QPSK	1	5	22.94	0	0
	1710.7	19957	1.4	QPSK	3	0	22.55	0	0
	1710.7	19957	1.4	QPSK	3	2	22.63	0	0
	1710.7	19957	1.4	QPSK	3	3	22.61	0	0
	1710.7	19957	1.4	QPSK	6	0	21.58	0-1	1
	1710.7	19957	1.4	16-QAM	1	0	21.86	0-1	1
	1710.7	19957	1.4	16-QAM	1	2	21.95	0-1	1
	1710.7	19957	1.4	16-QAM	1	5	22.17	0-1	1
	1710.7	19957	1.4	16-QAM	3	0	21.59	0-1	1
	1710.7	19957	1.4	16-QAM	3	2	21.61	0-1	1
	1710.7	19957	1.4	16-QAM	3	3	21.64	0-1	1
	1710.7	19957	1.4	16-QAM	6	0	20.62	0-2	2
	Mid	1732.5	20175	1.4	QPSK	1	0	23.39	0
1732.5		20175	1.4	QPSK	1	2	23.35	0	0
1732.5		20175	1.4	QPSK	1	5	23.45	0	0
1732.5		20175	1.4	QPSK	3	0	23.07	0	0
1732.5		20175	1.4	QPSK	3	2	23.07	0	0
1732.5		20175	1.4	QPSK	3	3	22.99	0	0
1732.5		20175	1.4	QPSK	6	0	22.32	0-1	1
1732.5		20175	1.4	16-QAM	1	0	21.62	0-1	1
1732.5		20175	1.4	16-QAM	1	2	22.37	0-1	1
1732.5		20175	1.4	16-QAM	1	5	22.28	0-1	1
1732.5		20175	1.4	16-QAM	3	0	21.99	0-1	1
1732.5		20175	1.4	16-QAM	3	2	22.29	0-1	1
1732.5		20175	1.4	16-QAM	3	3	22.23	0-1	1
1732.5		20175	1.4	16-QAM	6	0	20.87	0-2	2
High		1754.3	20393	1.4	QPSK	1	0	23.28	0
	1754.3	20393	1.4	QPSK	1	2	23.46	0	0
	1754.3	20393	1.4	QPSK	1	5	23.22	0	0
	1754.3	20393	1.4	QPSK	3	0	23.22	0	0
	1754.3	20393	1.4	QPSK	3	2	23.10	0	0
	1754.3	20393	1.4	QPSK	3	3	23.08	0	0
	1754.3	20393	1.4	QPSK	6	0	22.22	0-1	1
	1754.3	20393	1.4	16-QAM	1	0	22.38	0-1	1
	1754.3	20393	1.4	16-QAM	1	2	22.42	0-1	1
	1754.3	20393	1.4	16-QAM	1	5	22.35	0-1	1
	1754.3	20393	1.4	16-QAM	3	0	22.07	0-1	1
	1754.3	20393	1.4	16-QAM	3	2	22.22	0-1	1
	1754.3	20393	1.4	16-QAM	3	3	22.21	0-1	1
	1754.3	20393	1.4	16-QAM	6	0	21.42	0-2	2

FCC ID: A3LSMG360V		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 23 of 45

9.2.3 LTE Band 2 (PCS)

Table 9-9
LTE Band 2 (PCS) Conducted Powers - 20 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1860	18700	20	QPSK	1	0	22.45	0	0
	1860	18700	20	QPSK	1	50	21.98	0	0
	1860	18700	20	QPSK	1	99	22.06	0	0
	1860	18700	20	QPSK	50	0	20.81	0-1	1
	1860	18700	20	QPSK	50	25	20.70	0-1	1
	1860	18700	20	QPSK	50	50	20.50	0-1	1
	1860	18700	20	QPSK	100	0	20.50	0-1	1
	1860	18700	20	16QAM	1	0	21.36	0-1	1
	1860	18700	20	16QAM	1	50	20.99	0-1	1
	1860	18700	20	16QAM	1	99	20.83	0-1	1
	1860	18700	20	16QAM	50	0	19.84	0-2	2
	1860	18700	20	16QAM	50	25	19.50	0-2	2
	1860	18700	20	16QAM	50	50	19.53	0-2	2
	1860	18700	20	16QAM	100	0	19.59	0-2	2
	1880.0	18900	20	QPSK	1	0	22.25	0	0
	1880.0	18900	20	QPSK	1	50	22.13	0	0
	1880.0	18900	20	QPSK	1	99	21.79	0	0
	1880.0	18900	20	QPSK	50	0	21.27	0-1	1
1880.0	18900	20	QPSK	50	25	21.02	0-1	1	
1880.0	18900	20	QPSK	50	50	20.50	0-1	1	
1880.0	18900	20	QPSK	100	0	20.86	0-1	1	
1880.0	18900	20	16QAM	1	0	20.71	0-1	1	
1880.0	18900	20	16QAM	1	50	20.81	0-1	1	
1880.0	18900	20	16QAM	1	99	20.82	0-1	1	
1880.0	18900	20	16QAM	50	0	20.07	0-2	2	
1880.0	18900	20	16QAM	50	25	19.81	0-2	2	
1880.0	18900	20	16QAM	50	50	19.54	0-2	2	
1880.0	18900	20	16QAM	100	0	19.73	0-2	2	
High	1900	19100	20	QPSK	1	0	21.50	0	0
	1900	19100	20	QPSK	1	50	22.14	0	0
	1900	19100	20	QPSK	1	99	21.52	0	0
	1900	19100	20	QPSK	50	0	20.52	0-1	1
	1900	19100	20	QPSK	50	25	20.90	0-1	1
	1900	19100	20	QPSK	50	50	20.78	0-1	1
	1900	19100	20	QPSK	100	0	20.59	0-1	1
	1900	19100	20	16QAM	1	0	20.64	0-1	1
	1900	19100	20	16QAM	1	50	21.50	0-1	1
	1900	19100	20	16QAM	1	99	20.88	0-1	1
	1900	19100	20	16QAM	50	0	19.56	0-2	2
	1900	19100	20	16QAM	50	25	19.81	0-2	2
	1900	19100	20	16QAM	50	50	19.67	0-2	2
	1900	19100	20	16QAM	100	0	19.57	0-2	2

Table 9-10
LTE Band 2 (PCS) Conducted Powers - 15 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]	
Low	1857.5	18675	15	QPSK	1	0	22.41	0	0	
	1857.5	18675	15	QPSK	1	36	21.94	0	0	
	1857.5	18675	15	QPSK	1	74	22.40	0	0	
	1857.5	18675	15	QPSK	36	0	20.64	0-1	1	
	1857.5	18675	15	QPSK	36	18	20.63	0-1	1	
	1857.5	18675	15	QPSK	36	37	20.60	0-1	1	
	1857.5	18675	15	QPSK	75	0	20.53	0-1	1	
	1857.5	18675	15	16QAM	1	0	21.49	0-1	1	
	1857.5	18675	15	16QAM	1	36	21.05	0-1	1	
	1857.5	18675	15	16QAM	1	74	21.04	0-1	1	
	1857.5	18675	15	16QAM	36	0	19.55	0-2	2	
	1857.5	18675	15	16QAM	36	18	19.54	0-2	2	
	1857.5	18675	15	16QAM	36	37	19.55	0-2	2	
	1857.5	18675	15	16QAM	75	0	19.51	0-2	2	
	Mid	1880.0	18900	15	QPSK	1	0	22.23	0	0
		1880.0	18900	15	QPSK	1	36	21.86	0	0
		1880.0	18900	15	QPSK	1	74	21.55	0	0
		1880.0	18900	15	QPSK	36	0	21.14	0-1	1
1880.0		18900	15	QPSK	36	18	20.74	0-1	1	
1880.0		18900	15	QPSK	36	37	20.55	0-1	1	
1880.0		18900	15	QPSK	75	0	20.58	0-1	1	
1880.0		18900	15	16QAM	1	0	21.50	0-1	1	
1880.0		18900	15	16QAM	1	36	21.45	0-1	1	
1880.0		18900	15	16QAM	1	74	20.83	0-1	1	
1880.0		18900	15	16QAM	36	0	19.96	0-2	2	
1880.0		18900	15	16QAM	36	18	19.68	0-2	2	
1880.0		18900	15	16QAM	36	37	19.51	0-2	2	
1880.0		18900	15	16QAM	75	0	19.67	0-2	2	
High		1902.5	19125	15	QPSK	1	0	21.55	0	0
		1902.5	19125	15	QPSK	1	36	21.56	0	0
		1902.5	19125	15	QPSK	1	74	21.50	0	0
		1902.5	19125	15	QPSK	36	0	20.66	0-1	1
	1902.5	19125	15	QPSK	36	18	20.76	0-1	1	
	1902.5	19125	15	QPSK	36	37	20.52	0-1	1	
	1902.5	19125	15	QPSK	75	0	20.51	0-1	1	
	1902.5	19125	15	16QAM	1	0	20.53	0-1	1	
	1902.5	19125	15	16QAM	1	36	20.93	0-1	1	
	1902.5	19125	15	16QAM	1	74	20.50	0-1	1	
	1902.5	19125	15	16QAM	36	0	19.83	0-2	2	
	1902.5	19125	15	16QAM	36	18	19.70	0-2	2	
	1902.5	19125	15	16QAM	36	37	19.52	0-2	2	
	1902.5	19125	15	16QAM	75	0	19.57	0-2	2	



FCC ID: A3LSMG360V		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 24 of 45

Table 9-11
LTE Band 2 (PCS) Conducted Powers - 10 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1855	18650	10	QPSK	1	0	22.46	0	0
	1855	18650	10	QPSK	1	25	22.00	0	0
	1855	18650	10	QPSK	1	49	22.09	0	0
	1855	18650	10	QPSK	25	0	20.81	0-1	1
	1855	18650	10	QPSK	25	12	20.55	0-1	1
	1855	18650	10	QPSK	25	25	20.51	0-1	1
	1855	18650	10	QPSK	50	0	20.53	0-1	1
	1855	18650	10	16QAM	1	0	21.45	0-1	1
	1855	18650	10	16QAM	1	25	20.78	0-1	1
	1855	18650	10	16QAM	1	49	20.56	0-1	1
	1855	18650	10	16QAM	25	0	20.03	0-2	2
	1855	18650	10	16QAM	25	12	19.63	0-2	2
	1855	18650	10	16QAM	25	25	19.56	0-2	2
	1855	18650	10	16QAM	50	0	19.50	0-2	2
	Mid	1880.0	18900	10	QPSK	1	0	22.10	0
1880.0		18900	10	QPSK	1	25	21.72	0	0
1880.0		18900	10	QPSK	1	49	21.55	0	0
1880.0		18900	10	QPSK	25	0	20.93	0-1	1
1880.0		18900	10	QPSK	25	12	20.68	0-1	1
1880.0		18900	10	QPSK	25	25	20.56	0-1	1
1880.0		18900	10	QPSK	50	0	20.66	0-1	1
1880.0		18900	10	16QAM	1	0	21.16	0-1	1
1880.0		18900	10	16QAM	1	25	20.89	0-1	1
1880.0		18900	10	16QAM	1	49	21.19	0-1	1
1880.0		18900	10	16QAM	25	0	20.08	0-2	2
1880.0		18900	10	16QAM	25	12	19.82	0-2	2
1880.0		18900	10	16QAM	25	25	19.67	0-2	2
1880.0		18900	10	16QAM	50	0	19.63	0-2	2
High		1905	19150	10	QPSK	1	0	21.87	0
	1905	19150	10	QPSK	1	25	21.75	0	0
	1905	19150	10	QPSK	1	49	21.50	0	0
	1905	19150	10	QPSK	25	0	20.74	0-1	1
	1905	19150	10	QPSK	25	12	20.57	0-1	1
	1905	19150	10	QPSK	25	25	20.53	0-1	1
	1905	19150	10	QPSK	50	0	20.54	0-1	1
	1905	19150	10	16QAM	1	0	21.05	0-1	1
	1905	19150	10	16QAM	1	25	20.85	0-1	1
	1905	19150	10	16QAM	1	49	20.53	0-1	1
	1905	19150	10	16QAM	25	0	19.85	0-2	2
	1905	19150	10	16QAM	25	12	19.56	0-2	2
	1905	19150	10	16QAM	25	25	19.57	0-2	2
	1905	19150	10	16QAM	50	0	19.73	0-2	2

Table 9-12
LTE Band 2 (PCS) Conducted Powers - 5 MHz Bandwidth



	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1852.5	18625	5	QPSK	1	0	22.23	0	0
	1852.5	18625	5	QPSK	1	12	21.97	0	0
	1852.5	18625	5	QPSK	1	24	22.14	0	0
	1852.5	18625	5	QPSK	12	0	20.82	0-1	1
	1852.5	18625	5	QPSK	12	6	20.82	0-1	1
	1852.5	18625	5	QPSK	12	13	20.55	0-1	1
	1852.5	18625	5	QPSK	25	0	20.74	0-1	1
	1852.5	18625	5	16-QAM	1	0	21.40	0-1	1
	1852.5	18625	5	16-QAM	1	12	20.81	0-1	1
	1852.5	18625	5	16-QAM	1	24	20.57	0-1	1
	1852.5	18625	5	16-QAM	12	0	19.85	0-2	2
	1852.5	18625	5	16-QAM	12	6	19.61	0-2	2
	1852.5	18625	5	16-QAM	12	13	19.54	0-2	2
	1852.5	18625	5	16-QAM	25	0	19.76	0-2	2
	Mid	1880.0	18900	5	QPSK	1	0	21.60	0
1880.0		18900	5	QPSK	1	12	21.62	0	0
1880.0		18900	5	QPSK	1	24	21.56	0	0
1880.0		18900	5	QPSK	12	0	20.76	0-1	1
1880.0		18900	5	QPSK	12	6	20.66	0-1	1
1880.0		18900	5	QPSK	12	13	20.53	0-1	1
1880.0		18900	5	QPSK	25	0	20.69	0-1	1
1880.0		18900	5	16-QAM	1	0	20.82	0-1	1
1880.0		18900	5	16-QAM	1	12	20.70	0-1	1
1880.0		18900	5	16-QAM	1	24	21.07	0-1	1
1880.0		18900	5	16-QAM	12	0	19.54	0-2	2
1880.0		18900	5	16-QAM	12	6	19.81	0-2	2
1880.0		18900	5	16-QAM	12	13	19.52	0-2	2
1880.0		18900	5	16-QAM	25	0	19.56	0-2	2
High		1907.5	19175	5	QPSK	1	0	21.95	0
	1907.5	19175	5	QPSK	1	12	22.00	0	0
	1907.5	19175	5	QPSK	1	24	21.50	0	0
	1907.5	19175	5	QPSK	12	0	20.80	0-1	1
	1907.5	19175	5	QPSK	12	6	20.60	0-1	1
	1907.5	19175	5	QPSK	12	13	20.50	0-1	1
	1907.5	19175	5	QPSK	25	0	20.65	0-1	1
	1907.5	19175	5	16-QAM	1	0	20.70	0-1	1
	1907.5	19175	5	16-QAM	1	12	21.06	0-1	1
	1907.5	19175	5	16-QAM	1	24	20.95	0-1	1
	1907.5	19175	5	16-QAM	12	0	19.72	0-2	2
	1907.5	19175	5	16-QAM	12	6	19.56	0-2	2
	1907.5	19175	5	16-QAM	12	13	19.50	0-2	2
	1907.5	19175	5	16-QAM	25	0	19.83	0-2	2

Table 9-13
LTE Band 2 (PCS) Conducted Powers - 3 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1851.5	18615	3	QPSK	1	0	22.42	0	0
	1851.5	18615	3	QPSK	1	7	22.44	0	0
	1851.5	18615	3	QPSK	1	14	22.06	0	0
	1851.5	18615	3	QPSK	8	0	20.87	0-1	1
	1851.5	18615	3	QPSK	8	4	20.85	0-1	1
	1851.5	18615	3	QPSK	8	7	20.83	0-1	1
	1851.5	18615	3	QPSK	15	0	20.81	0-1	1
	1851.5	18615	3	16-QAM	1	0	20.53	0-1	1
	1851.5	18615	3	16-QAM	1	7	20.90	0-1	1
	1851.5	18615	3	16-QAM	1	14	20.83	0-1	1
	1851.5	18615	3	16-QAM	8	0	19.85	0-2	2
	1851.5	18615	3	16-QAM	8	4	19.85	0-2	2
	1851.5	18615	3	16-QAM	8	7	19.88	0-2	2
	1851.5	18615	3	16-QAM	15	0	19.89	0-2	2
	1851.5	18615	3	16-QAM	15	0	19.89	0-2	2
Mid	1880.0	18900	3	QPSK	1	0	21.96	0	0
	1880.0	18900	3	QPSK	1	7	21.80	0	0
	1880.0	18900	3	QPSK	1	14	21.51	0	0
	1880.0	18900	3	QPSK	8	0	20.70	0-1	1
	1880.0	18900	3	QPSK	8	4	20.57	0-1	1
	1880.0	18900	3	QPSK	8	7	20.61	0-1	1
	1880.0	18900	3	QPSK	15	0	20.61	0-1	1
	1880.0	18900	3	16-QAM	1	0	20.51	0-1	1
	1880.0	18900	3	16-QAM	1	7	20.99	0-1	1
	1880.0	18900	3	16-QAM	1	14	20.71	0-1	1
	1880.0	18900	3	16-QAM	8	0	19.95	0-2	2
	1880.0	18900	3	16-QAM	8	4	19.89	0-2	2
	1880.0	18900	3	16-QAM	8	7	19.56	0-2	2
	1880.0	18900	3	16-QAM	15	0	19.55	0-2	2
	1880.0	18900	3	16-QAM	15	0	19.55	0-2	2
High	1908.5	19185	3	QPSK	1	0	21.55	0	0
	1908.5	19185	3	QPSK	1	7	21.50	0	0
	1908.5	19185	3	QPSK	1	14	21.62	0	0
	1908.5	19185	3	QPSK	8	0	20.52	0-1	1
	1908.5	19185	3	QPSK	8	4	20.56	0-1	1
	1908.5	19185	3	QPSK	8	7	20.54	0-1	1
	1908.5	19185	3	QPSK	15	0	20.58	0-1	1
	1908.5	19185	3	16-QAM	1	0	20.66	0-1	1
	1908.5	19185	3	16-QAM	1	7	20.51	0-1	1
	1908.5	19185	3	16-QAM	1	14	20.63	0-1	1
	1908.5	19185	3	16-QAM	8	0	19.75	0-2	2
	1908.5	19185	3	16-QAM	8	4	19.57	0-2	2
	1908.5	19185	3	16-QAM	8	7	19.50	0-2	2
	1908.5	19185	3	16-QAM	15	0	19.51	0-2	2
	1908.5	19185	3	16-QAM	15	0	19.51	0-2	2

Table 9-14
LTE Band 2 (PCS) Conducted Powers -1.4 MHz Bandwidth

	Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	MPR Allowed per 3GPP [dB]	MPR [dB]
Low	1850.7	18607	1.4	QPSK	1	0	22.48	0	0
	1850.7	18607	1.4	QPSK	1	2	22.00	0	0
	1850.7	18607	1.4	QPSK	1	5	22.50	0	0
	1850.7	18607	1.4	QPSK	3	0	21.78	0	0
	1850.7	18607	1.4	QPSK	3	2	21.94	0	0
	1850.7	18607	1.4	QPSK	3	3	21.91	0	0
	1850.7	18607	1.4	QPSK	6	0	20.91	0-1	1
	1850.7	18607	1.4	16-QAM	1	0	21.09	0-1	1
	1850.7	18607	1.4	16-QAM	1	2	20.51	0-1	1
	1850.7	18607	1.4	16-QAM	1	5	20.60	0-1	1
	1850.7	18607	1.4	16-QAM	3	0	20.67	0-1	1
	1850.7	18607	1.4	16-QAM	3	2	20.52	0-1	1
	1850.7	18607	1.4	16-QAM	3	3	20.54	0-1	1
	1850.7	18607	1.4	16-QAM	6	0	19.69	0-2	2
	1850.7	18607	1.4	16-QAM	6	0	19.69	0-2	2
Mid	1880.0	18900	1.4	QPSK	1	0	21.71	0	0
	1880.0	18900	1.4	QPSK	1	2	21.66	0	0
	1880.0	18900	1.4	QPSK	1	5	21.54	0	0
	1880.0	18900	1.4	QPSK	3	0	21.58	0	0
	1880.0	18900	1.4	QPSK	3	2	21.60	0	0
	1880.0	18900	1.4	QPSK	3	3	21.53	0	0
	1880.0	18900	1.4	QPSK	6	0	20.63	0-1	1
	1880.0	18900	1.4	16-QAM	1	0	20.57	0-1	1
	1880.0	18900	1.4	16-QAM	1	2	20.58	0-1	1
	1880.0	18900	1.4	16-QAM	1	5	20.55	0-1	1
	1880.0	18900	1.4	16-QAM	3	0	20.73	0-1	1
	1880.0	18900	1.4	16-QAM	3	2	21.00	0-1	1
	1880.0	18900	1.4	16-QAM	3	3	20.81	0-1	1
	1880.0	18900	1.4	16-QAM	6	0	20.23	0-2	2
	1880.0	18900	1.4	16-QAM	6	0	20.23	0-2	2
High	1909.3	19193	1.4	QPSK	1	0	21.61	0	0
	1909.3	19193	1.4	QPSK	1	2	21.85	0	0
	1909.3	19193	1.4	QPSK	1	5	21.93	0	0
	1909.3	19193	1.4	QPSK	3	0	21.53	0	0
	1909.3	19193	1.4	QPSK	3	2	21.57	0	0
	1909.3	19193	1.4	QPSK	3	3	21.50	0	0
	1909.3	19193	1.4	QPSK	6	0	20.50	0-1	1
	1909.3	19193	1.4	16-QAM	1	0	20.52	0-1	1
	1909.3	19193	1.4	16-QAM	1	2	21.33	0-1	1
	1909.3	19193	1.4	16-QAM	1	5	20.98	0-1	1
	1909.3	19193	1.4	16-QAM	3	0	20.73	0-1	1
	1909.3	19193	1.4	16-QAM	3	2	20.50	0-1	1
	1909.3	19193	1.4	16-QAM	3	3	21.06	0-1	1
	1909.3	19193	1.4	16-QAM	6	0	19.60	0-2	2
	1909.3	19193	1.4	16-QAM	6	0	19.60	0-2	2

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 26 of 45

9.3 WLAN Conducted Powers

Table 9-15
IEEE 802.11b Average RF Power

Mode	Freq [MHz]	Channel	802.11b Conducted Power [dBm]			
			Data Rate [Mbps]			
			1	2	5.5	11
802.11b	2412	1*	12.41	12.44	12.51	12.52
802.11b	2437	6*	13.32	13.35	13.38	13.44
802.11b	2462	11*	13.36	13.37	13.36	13.42

(*) – indicates default channels per KDB Publication 248227 D01v01r02.

Table 9-16
IEEE 802.11g Average RF Power

Mode	Freq [MHz]	Channel	802.11g Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11g	2412	1	11.55	11.46	11.53	11.49	11.51	11.46	11.53	11.49
802.11g	2437	6	12.81	12.80	12.87	12.87	12.85	12.85	12.89	12.88
802.11g	2462	11	12.85	12.85	12.89	12.89	12.89	12.90	12.86	12.93

Table 9-17
IEEE 802.11n Average RF Power

Mode	Freq [MHz]	Channel	802.11n (2.4GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	19.5	26	39	52	58.5	65
802.11n	2412	1	11.52	11.60	11.58	11.55	11.59	11.60	11.68	11.60
802.11n	2437	6	12.79	12.82	12.82	12.82	12.75	12.79	12.79	12.84
802.11n	2462	11	12.78	12.83	12.83	12.76	12.80	12.86	12.79	12.80

Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v01r02 and October 2012/April 2013 FCC/TCB Meeting Notes:

- For 2.4 GHz operations, 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) 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.
- When the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is <1.6 W/kg and the reported 1g averaged SAR is <0.8 W/kg, SAR testing on other channels is not required. Otherwise, the other default (or corresponding required) test channels were additionally tested using the lowest data rate.
- The bolded data rate and channel above were tested for SAR.

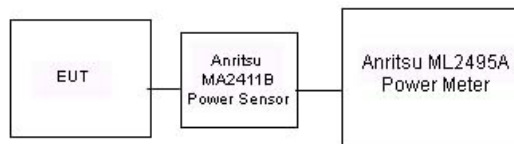


Figure 9-2
Power Measurement Setup

FCC ID: A3LSMG360V	PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT	SAMSUNG	Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 27 of 45



10 SYSTEM VERIFICATION

10.1 Tissue Verification

**Table 10-1
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
11/10/2014	750H	21.6	740	0.881	40.436	0.893	41.994	-1.34%	-3.71%
			755	0.894	40.265	0.894	41.916	0.00%	-3.94%
			770	0.914	40.132	0.895	41.838	2.12%	-4.08%
			785	0.938	40.066	0.896	41.760	4.69%	-4.06%
11/10/2014	835H	21.3	820	0.914	41.768	0.899	41.578	1.67%	0.46%
			835	0.929	41.568	0.900	41.500	3.22%	0.16%
			850	0.943	41.375	0.916	41.500	2.95%	-0.30%
12/8/2014	1750H	21.0	1710	1.362	39.606	1.348	40.142	1.04%	-1.34%
			1750	1.398	39.405	1.371	40.079	1.97%	-1.68%
			1790	1.439	39.176	1.394	40.016	3.23%	-2.10%
11/13/2014	1900H	21.3	1850	1.397	38.835	1.400	40.000	-0.21%	-2.91%
			1880	1.427	38.686	1.400	40.000	1.93%	-3.29%
			1910	1.460	38.554	1.400	40.000	4.29%	-3.61%
11/24/2014	1900H	22.5	1850	1.356	40.002	1.400	40.000	-3.14%	0.01%
			1880	1.386	39.902	1.400	40.000	-1.00%	-0.24%
			1910	1.415	39.815	1.400	40.000	1.07%	-0.46%
12/19/2014	2450H	21.9	2401	1.704	39.184	1.756	39.287	-2.96%	-0.26%
			2450	1.756	38.948	1.800	39.200	-2.44%	-0.64%
			2499	1.812	38.819	1.853	39.138	-2.21%	-0.82%
11/12/2014	750B	22.9	740	0.974	56.099	0.963	55.570	1.14%	0.95%
			755	0.988	56.011	0.964	55.512	2.49%	0.90%
			770	1.001	55.757	0.965	55.453	3.73%	0.55%
			785	1.012	55.456	0.966	55.395	4.76%	0.11%
11/5/2014	835B	21.6	820	0.944	53.755	0.969	55.258	-2.58%	-2.72%
			835	0.960	53.584	0.970	55.200	-1.03%	-2.93%
			850	0.973	53.444	0.988	55.154	-1.52%	-3.10%
11/11/2014	835B	21.7	820	0.935	53.196	0.969	55.258	-3.51%	-3.73%
			835	0.948	53.049	0.970	55.200	-2.27%	-3.90%
			850	0.964	52.901	0.988	55.154	-2.43%	-4.08%
12/8/2014	1750B	20.9	1710	1.464	52.207	1.463	53.537	0.07%	-2.48%
			1750	1.508	52.023	1.488	53.432	1.34%	-2.64%
			1790	1.555	51.886	1.514	53.326	2.71%	-2.70%
11/10/2014	1900B	21.0	1850	1.512	52.968	1.520	53.300	-0.53%	-0.62%
			1880	1.547	52.866	1.520	53.300	1.78%	-0.81%
			1910	1.583	52.818	1.520	53.300	4.14%	-0.90%
11/24/2014	1900B	22.5	1850	1.528	52.798	1.520	53.300	0.53%	-0.94%
			1880	1.553	52.706	1.520	53.300	2.17%	-1.11%
			1910	1.582	52.551	1.520	53.300	4.08%	-1.41%
12/17/2014	2450B	24.3	2401	1.856	50.927	1.903	52.765	-2.47%	-3.48%
			2450	1.922	50.754	1.950	52.700	-1.44%	-3.69%
			2499	1.984	50.582	2.019	52.638	-1.73%	-3.91%

The above measured tissue parameters were used in the DASY software. The DASY software was used to perform interpolation to determine the dielectric parameters at the SAR test device frequencies (per KDB Publication 865664 and IEEE 1528-2013 6.6.1.2). The tissue parameters listed in the SAR test plots may slightly differ from the table above due to significant digit rounding in the software.

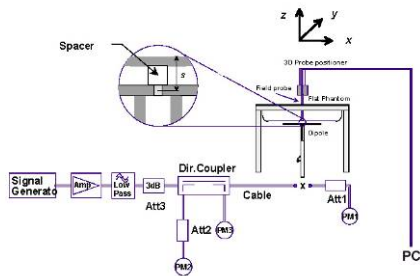
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Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 28 of 45

10.2 Test System Verification

Prior to SAR assessment, the system is verified to $\pm 10\%$ of the SAR measurement on the reference dipole at the time of calibration by the calibration facility. Full system validation status and result summary can be found in Appendix E.

**Table 10-2
System Verification Results**

System Verification TARGET & MEASURED												
SAR System #	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 _{1g} (%)
J	750	HEAD	11/10/2014	22.7	21.6	0.100	1003	3022	0.772	8.370	7.720	-7.77%
C	835	HEAD	11/10/2014	22.4	21.3	0.100	4d132	3333	0.969	9.270	9.690	4.53%
J	1750	HEAD	12/08/2014	21.6	21.0	0.100	1008	3022	3.550	36.900	35.500	-3.79%
C	1900	HEAD	11/13/2014	22.9	21.3	0.100	5d148	3333	4.000	40.700	40.000	-1.72%
H	1900	HEAD	11/24/2014	23.2	22.5	0.100	5d141	3319	4.270	40.100	42.700	6.48%
G	2450	HEAD	12/19/2014	24.4	21.9	0.100	797	3258	4.920	51.800	49.200	-5.02%
J	750	BODY	11/12/2014	23.3	22.3	0.100	1003	3022	0.917	8.770	9.170	4.56%
C	835	BODY	11/05/2014	22.5	21.6	0.100	4d132	3213	0.990	9.580	9.900	3.34%
C	835	BODY	11/11/2014	22.8	21.7	0.100	4d132	3333	1.030	9.580	10.300	7.52%
J	1750	BODY	12/08/2014	21.0	20.9	0.100	1008	3022	3.950	37.600	39.500	5.05%
B	1900	BODY	11/10/2014	22.1	21.0	0.100	5d148	3318	4.030	39.300	40.300	2.54%
H	1900	BODY	11/24/2014	20.6	22.0	0.100	5d141	3319	3.760	40.600	37.600	-7.39%
E	2450	BODY	12/17/2014	24.5	24.3	0.100	797	3332	4.940	49.400	49.400	0.00%



**Figure 10-1
System Verification Setup Diagram**



**Figure 10-2
System Verification Setup Photo**

FCC ID: A3LSMG360V	PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT	SAMSUNG	Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 29 of 45

11 SAR DATA SUMMARY



11.1 Standalone Head SAR Data

**Table 11-1
Cell. CDMA Head SAR**

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.52	384	Cell. CDMA	RC3 / SO55	25.0	24.28	0.00	Right	Cheek	0511-4	1:1	0.481	1.180	0.568	
836.52	384	Cell. CDMA	RC3 / SO55	25.0	24.28	0.01	Right	Tilt	0511-4	1:1	0.380	1.180	0.448	
836.52	384	Cell. CDMA	RC3 / SO55	25.0	24.28	-0.01	Left	Cheek	0511-4	1:1	0.550	1.180	0.649	
836.52	384	Cell. CDMA	RC3 / SO55	25.0	24.28	0.01	Left	Tilt	0511-4	1:1	0.410	1.180	0.484	
836.52	384	Cell. CDMA	EVDO Rev. A	25.0	24.39	-0.04	Right	Cheek	0511-4	1:1	0.527	1.151	0.607	
836.52	384	Cell. CDMA	EVDO Rev. A	25.0	24.39	0.09	Right	Tilt	0511-4	1:1	0.394	1.151	0.453	
836.52	384	Cell. CDMA	EVDO Rev. A	25.0	24.39	0.01	Left	Cheek	0511-4	1:1	0.623	1.151	0.717	A1
836.52	384	Cell. CDMA	EVDO Rev. A	25.0	24.39	-0.05	Left	Tilt	0511-4	1:1	0.406	1.151	0.467	
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 11-2
PCS CDMA Head SAR**

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	600	PCS CDMA	RC3 / SO55	25.0	24.38	0.05	Right	Cheek	0511-4	1:1	0.414	1.153	0.477	
1880.00	600	PCS CDMA	RC3 / SO55	25.0	24.38	-0.03	Right	Tilt	0511-4	1:1	0.309	1.153	0.356	
1851.25	25	PCS CDMA	RC3 / SO55	25.0	24.18	-0.03	Left	Cheek	0511-4	1:1	0.616	1.208	0.744	
1880.00	600	PCS CDMA	RC3 / SO55	25.0	24.38	-0.01	Left	Cheek	0511-4	1:1	0.757	1.153	0.873	
1908.75	1175	PCS CDMA	RC3 / SO55	25.0	24.57	0.02	Left	Cheek	0511-4	1:1	0.711	1.104	0.785	
1880.00	600	PCS CDMA	RC3 / SO55	25.0	24.38	-0.01	Left	Tilt	0511-4	1:1	0.308	1.153	0.355	
1880.00	600	PCS CDMA	EVDO Rev. A	25.0	24.38	-0.05	Right	Cheek	0511-4	1:1	0.610	1.153	0.703	
1880.00	600	PCS CDMA	EVDO Rev. A	25.0	24.38	0.03	Right	Tilt	0511-4	1:1	0.417	1.153	0.481	
1851.25	25	PCS CDMA	EVDO Rev. A	25.0	24.09	0.16	Left	Cheek	0511-4	1:1	0.763	1.233	0.941	
1880.00	600	PCS CDMA	EVDO Rev. A	25.0	24.38	0.10	Left	Cheek	0511-4	1:1	0.942	1.153	1.086	A2
1908.75	1175	PCS CDMA	EVDO Rev. A	25.0	24.57	0.12	Left	Cheek	0511-4	1:1	0.868	1.104	0.958	
1880.00	600	PCS CDMA	EVDO Rev. A	25.0	24.38	0.19	Left	Tilt	0511-4	1:1	0.360	1.153	0.415	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 30 of 45

**Table 11-3
LTE Band 13 Head SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
782.00	23230	Mid	LTE Band 13	10	24.0	23.91	-0.07	0	Right	Cheek	QPSK	1	0	0511-4	1:1	0.424	1.021	0.433	
782.00	23230	Mid	LTE Band 13	10	23.0	22.49	0.05	1	Right	Cheek	QPSK	25	0	0511-4	1:1	0.283	1.125	0.318	
782.00	23230	Mid	LTE Band 13	10	24.0	23.91	-0.05	0	Right	Tilt	QPSK	1	0	0511-4	1:1	0.285	1.021	0.291	
782.00	23230	Mid	LTE Band 13	10	23.0	22.49	0.07	1	Right	Tilt	QPSK	25	0	0511-4	1:1	0.187	1.125	0.210	
782.00	23230	Mid	LTE Band 13	10	24.0	23.91	-0.04	0	Left	Cheek	QPSK	1	0	0511-4	1:1	0.509	1.021	0.520	A3
782.00	23230	Mid	LTE Band 13	10	23.0	22.49	0.17	1	Left	Cheek	QPSK	25	0	0511-4	1:1	0.338	1.125	0.380	
782.00	23230	Mid	LTE Band 13	10	24.0	23.91	-0.15	0	Left	Tilt	QPSK	1	0	0511-4	1:1	0.275	1.021	0.281	
782.00	23230	Mid	LTE Band 13	10	23.0	22.49	0.06	1	Left	Tilt	QPSK	25	0	0511-4	1:1	0.178	1.125	0.200	
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 11-4
LTE Band 4 (AWS) Head SAR**



MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	23.47	0.11	0	Right	Cheek	QPSK	1	50	2811-7	1:1	0.434	1.007	0.437	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	22.09	-0.05	1	Right	Cheek	QPSK	50	25	2811-7	1:1	0.330	1.099	0.363	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	23.47	0.05	0	Right	Tilt	QPSK	1	50	2811-7	1:1	0.418	1.007	0.421	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	22.09	0.01	1	Right	Tilt	QPSK	50	25	2811-7	1:1	0.308	1.099	0.338	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	23.47	-0.16	0	Left	Cheek	QPSK	1	50	2811-7	1:1	1.020	1.007	1.027	A4
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	22.09	0.07	1	Left	Cheek	QPSK	50	25	2811-7	1:1	0.713	1.099	0.784	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	21.89	0.09	1	Left	Cheek	QPSK	100	0	2811-7	1:1	0.662	1.151	0.762	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	23.47	0.13	0	Left	Tilt	QPSK	1	50	2811-7	1:1	0.417	1.007	0.420	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	22.09	-0.09	1	Left	Tilt	QPSK	50	25	2811-7	1:1	0.312	1.099	0.343	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	23.47	0.15	0	Left	Cheek	QPSK	1	50	2811-7	1:1	1.020	1.007	1.027	
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: Variability data is highlighted blue in the table above.

**Table 11-5
LTE Band 2 (PCS) Head SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.7	22.45	0.00	0	Right	Cheek	QPSK	1	0	2811-3	1:1	0.528	1.059	0.559	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.7	21.27	0.05	1	Right	Cheek	QPSK	50	0	2811-3	1:1	0.363	1.104	0.401	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.7	22.45	0.09	0	Right	Tilt	QPSK	1	0	2811-3	1:1	0.311	1.059	0.329	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.7	21.27	-0.02	1	Right	Tilt	QPSK	50	0	2811-3	1:1	0.241	1.104	0.266	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.7	22.45	0.08	0	Left	Cheek	QPSK	1	0	2811-3	1:1	0.996	1.059	1.055	A5
1880.00	18900	Mid	LTE Band 2 (PCS)	20	22.7	22.25	0.15	0	Left	Cheek	QPSK	1	0	2811-3	1:1	0.860	1.109	0.954	
1900.00	19100	High	LTE Band 2 (PCS)	20	22.7	22.14	-0.02	0	Left	Cheek	QPSK	1	50	2811-3	1:1	0.862	1.138	0.981	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.7	21.27	0.02	1	Left	Cheek	QPSK	50	0	2811-3	1:1	0.673	1.104	0.743	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.7	20.86	0.04	1	Left	Cheek	QPSK	100	0	2811-3	1:1	0.689	1.213	0.836	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.7	22.45	0.06	0	Left	Tilt	QPSK	1	0	2811-3	1:1	0.259	1.059	0.274	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.7	21.27	0.05	1	Left	Tilt	QPSK	50	0	2811-3	1:1	0.213	1.104	0.235	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.7	22.45	0.15	0	Left	Cheek	QPSK	1	0	2811-3	1:1	0.979	1.059	1.037	
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: Variability data is highlighted blue in the table above.

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 31 of 45

**Table 11-6
DTS Head SAR**

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2462	11	IEEE 802.11b	DSSS	13.5	13.36	0.12	Right	Cheek	2811-7	1	1:1	0.190	1.033	0.196	A6
2462	11	IEEE 802.11b	DSSS	13.5	13.36	0.17	Right	Tilt	2811-7	1	1:1	0.048	1.033	0.050	
2462	11	IEEE 802.11b	DSSS	13.5	13.36	0.14	Left	Cheek	2811-7	1	1:1	0.081	1.033	0.084	
2462	11	IEEE 802.11b	DSSS	13.5	13.36	0.05	Left	Tilt	2811-7	1	1:1	0.043	1.033	0.044	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

11.2 Standalone Body-Worn SAR Data



**Table 11-7
CDMA Body-Worn SAR Data**

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Duty Cycle	Side	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
824.70	1013	Cell. CDMA	TDSO / SO32	25.0	24.32	0.02	10 mm	0511-4	1:1	back	0.653	1.169	0.763	
836.52	384	Cell. CDMA	TDSO / SO32	25.0	24.36	0.03	10 mm	0511-4	1:1	back	0.782	1.159	0.906	
848.31	777	Cell. CDMA	TDSO / SO32	25.0	24.38	0.00	10 mm	0511-4	1:1	back	0.784	1.153	0.904	A7
1851.25	25	PCS CDMA	TDSO / SO32	25.0	24.28	0.01	10 mm	0511-4	1:1	back	0.582	1.180	0.687	
1880.00	600	PCS CDMA	TDSO / SO32	25.0	24.42	-0.01	10 mm	0511-4	1:1	back	0.727	1.143	0.831	A9
1908.75	1175	PCS CDMA	TDSO / SO32	25.0	24.55	-0.09	10 mm	0511-4	1:1	back	0.720	1.109	0.798	
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 11-8
LTE Body-Worn SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
782.00	23230	Mid	LTE Band 13	10	24.0	23.91	-0.01	0	0511-4	QPSK	1	0	10 mm	back	1:1	0.881	1.021	0.900	
782.00	23230	Mid	LTE Band 13	10	23.0	22.49	0.06	1	0511-4	QPSK	25	0	10 mm	back	1:1	0.638	1.125	0.718	
782.00	23230	Mid	LTE Band 13	10	23.0	22.35	-0.02	1	0511-4	QPSK	50	0	10 mm	back	1:1	0.634	1.161	0.736	
782.00	23230	Mid	LTE Band 13	10	24.0	23.91	-0.08	0	0511-4	QPSK	1	0	10 mm	back	1:1	0.918	1.021	0.937	A11
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.5	23.47	-0.04	0	2811-7	QPSK	1	50	10 mm	back	1:1	0.905	1.007	0.911	A12
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	22.09	-0.06	1	2811-7	QPSK	50	25	10 mm	back	1:1	0.714	1.099	0.785	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	22.5	21.89	-0.05	1	2811-7	QPSK	100	0	10 mm	back	1:1	0.688	1.151	0.792	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.7	22.45	0.04	0	2811-3	QPSK	1	0	10 mm	back	1:1	0.885	1.059	0.937	A14
1880.00	18900	Mid	LTE Band 2 (PCS)	20	22.7	22.25	-0.06	0	2811-3	QPSK	1	0	10 mm	back	1:1	0.759	1.109	0.842	
1900.00	19100	High	LTE Band 2 (PCS)	20	22.7	22.14	0.10	0	2811-3	QPSK	1	50	10 mm	back	1:1	0.649	1.138	0.739	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.7	21.27	-0.07	1	2811-3	QPSK	50	0	10 mm	back	1:1	0.563	1.104	0.622	
1880.00	18900	Mid	LTE Band 2 (PCS)	20	21.7	20.86	-0.12	1	2811-3	QPSK	100	0	10 mm	back	1:1	0.555	1.213	0.673	
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: Variability data is highlighted blue in the table above.

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 32 of 45

**Table 11-9
DTS Body-Worn SAR**



MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2462	11	IEEE 802.11b	DSSS	13.5	13.36	-0.01	10 mm	2811-7	1	back	1:1	0.106	1.033	0.109	A16
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram								

11.3 Standalone Wireless Router SAR Data

**Table 11-10
CDMA Hotspot SAR Data**

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Duty Cycle	Side	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
824.70	1013	Cell. CDMA	EVDO Rev. 0	25.0	24.44	-0.07	10 mm	0511-4	1:1	back	0.669	1.138	0.761	
836.52	384	Cell. CDMA	EVDO Rev. 0	25.0	24.41	0.01	10 mm	0511-4	1:1	back	0.807	1.146	0.925	
848.31	777	Cell. CDMA	EVDO Rev. 0	25.0	24.38	-0.04	10 mm	0511-4	1:1	back	0.833	1.153	0.960	A8
836.52	384	Cell. CDMA	EVDO Rev. 0	25.0	24.41	0.02	10 mm	0511-4	1:1	front	0.681	1.146	0.780	
836.52	384	Cell. CDMA	EVDO Rev. 0	25.0	24.41	-0.20	10 mm	0511-4	1:1	bottom	0.122	1.146	0.140	
836.52	384	Cell. CDMA	EVDO Rev. 0	25.0	24.41	0.06	10 mm	0511-4	1:1	right	0.609	1.146	0.698	
824.70	1013	Cell. CDMA	EVDO Rev. 0	25.0	24.44	0.04	10 mm	0511-4	1:1	left	0.591	1.138	0.673	
836.52	384	Cell. CDMA	EVDO Rev. 0	25.0	24.41	0.02	10 mm	0511-4	1:1	left	0.713	1.146	0.817	
848.31	777	Cell. CDMA	EVDO Rev. 0	25.0	24.38	0.00	10 mm	0511-4	1:1	left	0.808	1.153	0.932	
848.31	777	Cell. CDMA	EVDO Rev. 0	25.0	24.38	0.09	10 mm	0511-4	1:1	back	0.825	1.153	0.951	
1880.00	600	PCS CDMA	EVDO Rev. 0	25.0	24.39	-0.04	10 mm	0511-4	1:1	back	0.651	1.151	0.749	
1851.25	25	PCS CDMA	EVDO Rev. 0	25.0	24.14	0.06	10 mm	0511-4	1:1	front	0.594	1.219	0.724	
1880.00	600	PCS CDMA	EVDO Rev. 0	25.0	24.39	0.08	10 mm	0511-4	1:1	front	0.758	1.151	0.872	A10
1908.75	1175	PCS CDMA	EVDO Rev. 0	25.0	24.59	0.04	10 mm	0511-4	1:1	front	0.679	1.099	0.746	
1880.00	600	PCS CDMA	EVDO Rev. 0	25.0	24.39	-0.03	10 mm	0511-4	1:1	bottom	0.631	1.151	0.726	
1880.00	600	PCS CDMA	EVDO Rev. 0	25.0	24.39	0.04	10 mm	0511-4	1:1	right	0.182	1.151	0.209	
1880.00	600	PCS CDMA	EVDO Rev. 0	25.0	24.39	-0.10	10 mm	0511-4	1:1	left	0.478	1.151	0.550	
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: Variability data is highlighted blue in the table above.

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 33 of 45



**Table 11-11
LTE Band 13 Hotspot SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
782.00	23230	Md	LTE Band 13	10	24.0	23.91	-0.01	0	0511-4	QPSK	1	0	10 mm	back	1:1	0.881	1.021	0.900	
782.00	23230	Md	LTE Band 13	10	23.0	22.49	0.06	1	0511-4	QPSK	25	0	10 mm	back	1:1	0.638	1.125	0.718	
782.00	23230	Md	LTE Band 13	10	23.0	22.35	-0.02	1	0511-4	QPSK	50	0	10 mm	back	1:1	0.634	1.161	0.736	
782.00	23230	Md	LTE Band 13	10	24.0	23.91	-0.02	0	0511-4	QPSK	1	0	10 mm	front	1:1	0.661	1.021	0.675	
782.00	23230	Md	LTE Band 13	10	23.0	22.49	0.07	1	0511-4	QPSK	25	0	10 mm	front	1:1	0.475	1.125	0.534	
782.00	23230	Md	LTE Band 13	10	24.0	23.91	-0.02	0	0511-4	QPSK	1	0	10 mm	bottom	1:1	0.101	1.021	0.103	
782.00	23230	Md	LTE Band 13	10	23.0	22.49	0.03	1	0511-4	QPSK	25	0	10 mm	bottom	1:1	0.063	1.125	0.071	
782.00	23230	Md	LTE Band 13	10	24.0	23.91	-0.03	0	0511-4	QPSK	1	0	10 mm	right	1:1	0.526	1.021	0.537	
782.00	23230	Md	LTE Band 13	10	23.0	22.49	0.03	1	0511-4	QPSK	25	0	10 mm	right	1:1	0.399	1.125	0.449	
782.00	23230	Md	LTE Band 13	10	24.0	23.91	-0.05	0	0511-4	QPSK	1	0	10 mm	left	1:1	0.674	1.021	0.688	
782.00	23230	Md	LTE Band 13	10	23.0	22.49	0.00	1	0511-4	QPSK	25	0	10 mm	left	1:1	0.608	1.125	0.684	
782.00	23230	Md	LTE Band 13	10	24.0	23.91	-0.08	0	0511-4	QPSK	1	0	10 mm	back	1:1	0.918	1.021	0.937	A11
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: Variability data is highlighted blue in the table above.

**Table 11-12
LTE Band 4 (AWS) Hotspot SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
1732.50	20175	Md	LTE Band 4 (AWS)	20	23.5	23.47	-0.04	0	2811-7	QPSK	1	50	10 mm	back	1:1	0.905	1.007	0.911	
1732.50	20175	Md	LTE Band 4 (AWS)	20	22.5	22.09	-0.06	1	2811-7	QPSK	50	25	10 mm	back	1:1	0.714	1.099	0.785	
1732.50	20175	Md	LTE Band 4 (AWS)	20	22.5	21.89	-0.05	1	2811-7	QPSK	100	0	10 mm	back	1:1	0.688	1.151	0.792	
1732.50	20175	Md	LTE Band 4 (AWS)	20	23.5	23.47	0.07	0	2811-7	QPSK	1	50	10 mm	front	1:1	0.906	1.007	0.912	A13
1732.50	20175	Md	LTE Band 4 (AWS)	20	22.5	22.09	0.04	1	2811-7	QPSK	50	25	10 mm	front	1:1	0.710	1.099	0.780	
1732.50	20175	Md	LTE Band 4 (AWS)	20	22.5	21.89	0.00	1	2811-7	QPSK	100	0	10 mm	front	1:1	0.690	1.151	0.794	
1732.50	20175	Md	LTE Band 4 (AWS)	20	23.5	23.47	-0.12	0	2811-7	QPSK	1	50	10 mm	bottom	1:1	0.536	1.007	0.540	
1732.50	20175	Md	LTE Band 4 (AWS)	20	22.5	22.09	0.00	1	2811-7	QPSK	50	25	10 mm	bottom	1:1	0.393	1.099	0.432	
1732.50	20175	Md	LTE Band 4 (AWS)	20	23.5	23.47	-0.05	0	2811-7	QPSK	1	50	10 mm	right	1:1	0.115	1.007	0.116	
1732.50	20175	Md	LTE Band 4 (AWS)	20	22.5	22.09	0.09	1	2811-7	QPSK	50	25	10 mm	right	1:1	0.087	1.099	0.096	
1732.50	20175	Md	LTE Band 4 (AWS)	20	23.5	23.47	-0.02	0	2811-7	QPSK	1	50	10 mm	left	1:1	0.533	1.007	0.537	
1732.50	20175	Md	LTE Band 4 (AWS)	20	22.5	22.09	-0.02	1	2811-7	QPSK	50	25	10 mm	left	1:1	0.376	1.099	0.413	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 34 of 45

**Table 11-13
LTE Band 2 (PCS) Hotspot SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.7	22.45	0.04	0	2811-3	QPSK	1	0	10 mm	back	1:1	0.885	1.059	0.937	
1880.00	18900	Md	LTE Band 2 (PCS)	20	22.7	22.25	-0.06	0	2811-3	QPSK	1	0	10 mm	back	1:1	0.759	1.109	0.842	
1900.00	19100	High	LTE Band 2 (PCS)	20	22.7	22.14	0.10	0	2811-3	QPSK	1	50	10 mm	back	1:1	0.649	1.138	0.739	
1880.00	18900	Md	LTE Band 2 (PCS)	20	21.7	21.27	-0.07	1	2811-3	QPSK	50	0	10 mm	back	1:1	0.563	1.104	0.622	
1880.00	18900	Md	LTE Band 2 (PCS)	20	21.7	20.86	-0.12	1	2811-3	QPSK	100	0	10 mm	back	1:1	0.555	1.213	0.673	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.7	22.45	-0.04	0	2811-3	QPSK	1	0	10 mm	front	1:1	0.895	1.059	0.948	A15
1880.00	18900	Md	LTE Band 2 (PCS)	20	22.7	22.25	0.14	0	2811-3	QPSK	1	0	10 mm	front	1:1	0.787	1.109	0.873	
1900.00	19100	High	LTE Band 2 (PCS)	20	22.7	22.14	0.13	0	2811-3	QPSK	1	50	10 mm	front	1:1	0.737	1.138	0.839	
1880.00	18900	Md	LTE Band 2 (PCS)	20	21.7	21.27	0.04	1	2811-3	QPSK	50	0	10 mm	front	1:1	0.594	1.104	0.656	
1880.00	18900	Md	LTE Band 2 (PCS)	20	21.7	20.86	-0.01	1	2811-3	QPSK	100	0	10 mm	front	1:1	0.587	1.213	0.712	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.7	22.45	0.03	0	2811-3	QPSK	1	0	10 mm	bottom	1:1	0.488	1.059	0.517	
1880.00	18900	Md	LTE Band 2 (PCS)	20	21.7	21.27	0.05	1	2811-3	QPSK	50	0	10 mm	bottom	1:1	0.291	1.104	0.321	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.7	22.45	-0.03	0	2811-3	QPSK	1	0	10 mm	right	1:1	0.097	1.059	0.103	
1880.00	18900	Md	LTE Band 2 (PCS)	20	21.7	21.27	0.00	1	2811-3	QPSK	50	0	10 mm	right	1:1	0.055	1.104	0.061	
1860.00	18700	Low	LTE Band 2 (PCS)	20	22.7	22.45	0.06	0	2811-3	QPSK	1	0	10 mm	left	1:1	0.388	1.059	0.411	
1880.00	18900	Md	LTE Band 2 (PCS)	20	21.7	21.27	-0.08	1	2811-3	QPSK	50	0	10 mm	left	1:1	0.270	1.104	0.298	
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 11-14
WLAN Hotspot SAR**

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2462	11	IEEE 802.11b	DSSS	13.5	13.36	-0.01	10 mm	2811-7	1	back	1:1	0.106	1.033	0.109	A16
2462	11	IEEE 802.11b	DSSS	13.5	13.36	0.05	10 mm	2811-7	1	front	1:1	0.066	1.033	0.068	
2462	11	IEEE 802.11b	DSSS	13.5	13.36	-0.01	10 mm	2811-7	1	left	1:1	0.106	1.033	0.109	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram							

11.4 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2003 and FCC KDB Publication 447498 D01v05.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v05.
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.
7. Per FCC KDB Publication 648474 D04v01, body-worn SAR was evaluated without a headset connected to the device. Since the standalone reported body-worn SAR was ≤ 1.2 W/kg, no additional body-worn SAR evaluations using a headset cable were required.

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 35 of 45

8. Per FCC KDB 865664 D01 v01, variability SAR tests were performed when the measured SAR results for a frequency band were greater than 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 13 for variability analysis.
9. During SAR Testing for the Wireless Router conditions per FCC KDB Publication 941225 D06v01, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 6.7 for more details).

CDMA Notes:



1. Head SAR for CDMA2000 mode was tested under RC3/SO55 per FCC KDB Publication 941225 D01v03.
2. Body-Worn SAR was tested with 1x RTT with TDSO / SO32 FCH Only. EVDO and 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, per FCC KDB Publication 941225 D01v03.
3. CDMA Wireless Router SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0 according to KDB 941225 D01 procedures for data devices. Since the average output power of Subtype 2 for Rev. A is less than the Rev. 0 power levels, EVDO Rev. A SAR is not required. SAR is not required for 1x RTT for Ev-Do hotspot devices when the maximum average output of each channel is less than 1/4 dB higher than that measured in Subtype 0/1 Physical Layer configurations for Rev. 0.
4. Head SAR was additionally evaluated using EVDO Rev. A to determine compliance for VoIP operations.
5. Per FCC KDB Publication 447498 D01v05, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is $> \frac{1}{2}$ dB, instead of the middle channel, the highest output power channel was used.

LTE Notes:

1. LTE Considerations: LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r01. The general test procedures used for testing can be found in Section 8.4.4.
2. MPR is permanently implemented for this device by the manufacturer. 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. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

WLAN Notes:

1. Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v01r02 and October 2012 FCC/TCB Meeting Notes for 2.4 GHz WIFI operations: 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. WIFI transmission was verified using an uncalibrated spectrum analyzer.
3. Since the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is < 1.6 W/kg and the reported 1g averaged SAR is < 0.8 W/kg, SAR testing on other default channels was not required.

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset	Page 36 of 45	

12 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

12.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v05 are applicable to handsets with built-in unlicensed transmitters such as 802.11b/g/n and Bluetooth devices which may simultaneously transmit with the licensed transmitter.

12.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB 447498 D01v05 IV.C.1.iii and IEEE 1528-2013 Section 6.3.4.1.2, simultaneous transmission SAR test exclusion may be applied when the sum of the 1-g SAR for all the simultaneous transmitting antennas in a specific physical test configuration is ≤ 1.6 W/kg. When standalone SAR is not required to be measured, per FCC KDB 447498 D01v05 4.3.2 2), the following equation must be used to estimate the standalone 1g SAR for simultaneous transmission assessment involving that transmitter.

$$\text{Estimated SAR} = \frac{\sqrt{f(\text{GHz})}}{7.5} * \frac{(\text{Max Power of channel, mW})}{\text{Min. Separation Distance, mm}}$$

**Table 12-1
Estimated SAR**

Mode	Frequency	Maximum Allowed Power	Separation Distance (Body)	Estimated SAR (Body)
	[MHz]	[dBm]	[mm]	[W/kg]
Bluetooth	2480	12.00	10	0.336

Note: Held-to ear configurations are not applicable to Bluetooth operations and therefore were not considered for simultaneous transmission. Per KDB Publication 447498 D01v05, the maximum power of the channel was rounded to the nearest mW before calculation.

12.3 Head SAR Simultaneous Transmission Analysis

**Table 12-2
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Held to Ear)**

Simult Tx	Configuration	Cell. CDMA SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	Cell. EVDO SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		Head SAR	Right Cheek	0.568			0.196	0.764	Head SAR
Right Tilt	0.448		0.050	0.498	Right Tilt	0.453	0.050	0.503	
Left Cheek	0.649		0.084	0.733	Left Cheek	0.717	0.084	0.801	
Left Tilt	0.484		0.044	0.528	Left Tilt	0.467	0.044	0.511	

FCC ID: A3LSMG360V	PCTEST <small>ENGINEERING LABORATORY, INC.</small>	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 37 of 45

Simult Tx	Configuration	PCS CDMA SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	PCS EVDO SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.477	0.196	0.673	Head SAR	Right Cheek	0.703	0.196	0.899
	Right Tilt	0.356	0.050	0.406		Right Tilt	0.481	0.050	0.531
	Left Cheek	0.873	0.084	0.957		Left Cheek	1.086	0.084	1.170
	Left Tilt	0.355	0.044	0.399		Left Tilt	0.415	0.044	0.459
Simult Tx	Configuration	LTE Band 13 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.433	0.196	0.629	Head SAR	Right Cheek	0.437	0.196	0.633
	Right Tilt	0.291	0.050	0.341		Right Tilt	0.421	0.050	0.471
	Left Cheek	0.520	0.084	0.604		Left Cheek	1.027	0.084	1.111
	Left Tilt	0.281	0.044	0.325		Left Tilt	0.420	0.044	0.464

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Right Cheek	0.559	0.196	0.755
	Right Tilt	0.329	0.050	0.379
	Left Cheek	1.055	0.084	1.139
	Left Tilt	0.274	0.044	0.318

12.4 Body-Worn Simultaneous Transmission Analysis



Table 12-3
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body-Worn at 1.0 cm)

Configuration	Mode	CDMA/LTE SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	Cell. CDMA	0.906	0.109	1.015
Back Side	PCS CDMA	0.831	0.109	0.940
Back Side	LTE Band 13	0.937	0.109	1.046
Back Side	LTE Band 4	0.911	0.109	1.020
Back Side	LTE Band 2	0.937	0.109	1.046

Table 12-4
Simultaneous Transmission Scenario with Bluetooth (Body-Worn at 1.0 cm)

Configuration	Mode	CDMA/LTE SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Back Side	Cell. CDMA	0.906	0.336	1.242
Back Side	PCS CDMA	0.831	0.336	1.167
Back Side	LTE Band 13	0.937	0.336	1.273
Back Side	LTE Band 4	0.911	0.336	1.247
Back Side	LTE Band 2	0.937	0.336	1.273

Note: Bluetooth SAR was not required to be measured per FCC KDB 447498. Estimated SAR results were used in the above table to determine simultaneous transmission SAR test exclusion.

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 38 of 45

12.5 Hotspot SAR Simultaneous Transmission Analysis

Per FCC KDB Publication 941225 D06v01, the devices edges with antennas more than 2.5 cm from edge are not required to be evaluated for SAR (“-”).



Table 12-5
Simultaneous Transmission Scenario (2.4 GHz Hotspot at 1.0 cm)

Simult Tx	Configuration	Cell. EVDO SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	PCS EVDO SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.960	0.109	1.069	Body SAR	Back	0.749	0.109	0.858
	Front	0.780	0.068	0.848		Front	0.872	0.068	0.940
	Top	-	-	0.000		Top	-	-	0.000
	Bottom	0.140	-	0.140		Bottom	0.726	-	0.726
	Right	0.698	-	0.698		Right	0.209	-	0.209
	Left	0.932	0.109	1.041		Left	0.550	0.109	0.659
Simult Tx	Configuration	LTE Band 13 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.937	0.109	1.046	Body SAR	Back	0.911	0.109	1.020
	Front	0.675	0.068	0.743		Front	0.912	0.068	0.980
	Top	-	-	0.000		Top	-	-	0.000
	Bottom	0.103	-	0.103		Bottom	0.540	-	0.540
	Right	0.537	-	0.537		Right	0.116	-	0.116
	Left	0.688	0.109	0.797		Left	0.537	0.109	0.646

Simult Tx	Configuration	LTE Band 2 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.937	0.109	1.046
	Front	0.948	0.068	1.016
	Top	-	-	0.000
	Bottom	0.517	-	0.517
	Right	0.103	-	0.103
	Left	0.411	0.109	0.520

12.6 Simultaneous Transmission Conclusion

The above numerical summed SAR results for all the worst-case simultaneous transmission conditions were below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D01v05 and IEEE 1528-2013 Section 6.3.4.1.2.

FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset	Page 39 of 45	

13 SAR MEASUREMENT VARIABILITY

13.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR Measurement Variability was assessed using the following procedures for each frequency band:

- 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
- 2) A second repeated measurement was preformed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
- 3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .
- 4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg

**Table 13-1
Head SAR Measurement Variability Results**



HEAD VARIABILITY RESULTS													
Band	FREQUENCY		Mode/Band	Service	Side	Test Position	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	Ratio	3rd Repeated SAR (1g)	Ratio
	MHz	Ch.					(W/kg)	(W/kg)		(W/kg)		(W/kg)	
1750	1732.50	20175	LTE Band 4 (AWS)	QPSK, 1 RB, 50 RB Offset	Left	Cheek	1.020	1.020	1.00	N/A	N/A	N/A	N/A
1900	1860.00	18700	LTE Band 2 (PCS)	QPSK, 1 RB, 0 RB Offset	Left	Cheek	0.996	0.979	1.02	N/A	N/A	N/A	N/A
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 13-2
Body SAR Measurement Variability Results**

BODY VARIABILITY RESULTS													
Band	FREQUENCY		Mode	Service	Side	Spacing	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	Ratio	3rd Repeated SAR (1g)	Ratio
	MHz	Ch.					(W/kg)	(W/kg)		(W/kg)		(W/kg)	
835	848.31	777	Cell. CDMA	EVDO Rev. 0	back	10 mm	0.833	0.825	1.01	N/A	N/A	N/A	N/A
750	782.00	23230	LTE Band 13	QPSK, 1 RB, 0 RB Offset	back	10 mm	0.881	0.918	1.04	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population						Body 1.6 W/kg (mW/g) averaged over 1 gram							

13.2 Measurement Uncertainty

The measured SAR was < 1.5 W/kg for all frequency bands. Therefore, per KDB Publication 865664 D01v01, the extended measurement uncertainty analysis per IEEE 1528-2003 was not required.



FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT	 SAMSUNG	Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset	Page 40 of 45	

14 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/6/2014	Annual	5/6/2015	1070
SPEAG	D750V3	750 MHz Dipole	1/20/2014	Annual	1/20/2015	1003
SPEAG	D835V2	835 MHz SAR Dipole	7/10/2014	Annual	7/10/2015	40132
SPEAG	D1765V2	1750 MHz SAR Dipole	5/7/2014	Annual	5/7/2015	1008
SPEAG	D1900V2	1900 MHz SAR Dipole	2/27/2014	Annual	2/27/2015	50148
SPEAG	D1900V2	1900 MHz SAR Dipole	4/9/2014	Annual	4/9/2015	50141
SPEAG	D2450V2	2450 MHz SAR Dipole	1/21/2014	Annual	1/21/2015	797
SPEAG	ES3DV2	SAR Probe	8/19/2014	Annual	8/19/2015	3022
SPEAG	ES3DV3	SAR Probe	10/24/2014	Annual	10/24/2015	3333
SPEAG	ES3DV3	SAR Probe	4/17/2014	Annual	4/17/2015	3319
SPEAG	ES3DV3	SAR Probe	2/25/2014	Annual	2/25/2015	3258
SPEAG	ES3DV3	SAR Probe	4/11/2014	Annual	4/11/2015	3213
SPEAG	ES3DV3	SAR Probe	3/19/2014	Annual	3/19/2015	3318
SPEAG	ES3DV3	SAR Probe	9/18/2014	Annual	9/18/2015	3332
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/12/2014	Annual	8/12/2015	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	10/23/2014	Annual	10/23/2015	1408
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/11/2014	Annual	4/11/2015	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/26/2014	Annual	2/26/2015	665
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/18/2013	Annual	11/18/2014	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/22/2014	Annual	1/22/2015	1272
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/17/2014	Annual	9/17/2015	1323
Agilent	E4438C	ESG Vector Signal Generator	4/1/2014	Annual	4/1/2015	MY47270002
Agilent	E4438C	ESG Vector Signal Generator	4/25/2014	Annual	4/25/2015	MY42082385
Agilent	E4438C	ESG Vector Signal Generator	4/15/2014	Annual	4/15/2015	MY45090700
Agilent	E5515C	Wireless Communications Test Set	5/9/2013	Biennial	5/9/2015	GB43004447
Agilent	8648D	(9kHz-4GHz) Signal Generator	4/15/2014	Annual	4/15/2015	362900687
Agilent	N5182A	MXG Vector Signal Generator	4/15/2014	Annual	4/15/2015	MY47420651
Agilent	E4438C	ESG Vector Signal Generator	3/31/2014	Annual	3/31/2015	MY42082659
Agilent	8753ES	S-Parameter Network Analyzer	5/22/2014	Annual	5/22/2015	US39170118
Agilent	N5182A	MXG Vector Signal Generator	4/15/2014	Annual	4/15/2015	MY47420800
Agilent	8594A	(9kHz-2.9GHz) Spectrum Analyzer	N/A	N/A	N/A	3051A00187
Agilent	N9020A	MXA Signal Analyzer	10/27/2014	Annual	10/27/2015	US46470561
Agilent	E8257D	(250kHz-20GHz) Signal Generator	4/15/2014	Annual	4/15/2015	MY45470194
Amplifier Research	1551G6	Amplifier	CBT	N/A	CBT	433976
Amplifier Research	1551G6	Amplifier	CBT	N/A	CBT	433977
Amplifier Research	1551G6	Amplifier	CBT	N/A	CBT	433975
Amplifier Research	1551G6	Amplifier	CBT	N/A	CBT	433978
Anritsu	MA24106A	USB Power Sensor	1/3/2014	Annual	1/3/2015	1349509
Anritsu	MT8820C	Radio Communication Analyzer	12/12/2013	Annual	12/12/2014	6200901190
Anritsu	MA24106A	USB Power Sensor	1/3/2014	Annual	1/3/2015	1344554
Anritsu	MA2411B	Pulse Power Sensor	3/25/2014	Annual	3/25/2015	1207470
Anritsu	MA24106A	USB Power Sensor	5/14/2014	Annual	5/14/2015	1231535
Anritsu	MA24106A	USB Power Sensor	5/14/2014	Annual	5/14/2015	1248508
Anritsu	MA2411B	Pulse Power Sensor	2/3/2014	Annual	2/3/2015	1339018
Anritsu	ML2469A	Power Meter	3/14/2014	Annual	3/14/2015	1306009
Anritsu	ML2495A	Power Meter	10/31/2013	Biennial	10/31/2015	0941001
COMTECH	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M155A00-009
COMTECH	AR85729-5/5759B	Solid State Amplifier	CBT	N/A	CBT	M3W1A00-1002
Control Company	36934-158	Wall-Mounted Thermometer	4/29/2014	Biennial	4/29/2016	122014488
Control Company	61220-416	Long-Stem Thermometer	4/29/2014	Biennial	4/29/2016	111331323
Fisher Scientific	15-077-960	Digital Thermometer	12/4/2013	Biennial	12/4/2015	130764558
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Mitutoyo	CD-6"CSX	Digital Caliper	5/8/2014	Biennial	5/8/2016	13264165
Mitutoyo	CD-6"CSX	Digital Caliper	5/8/2014	Biennial	5/8/2016	13264162
Narda	4014-C6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Narda	BW-53W2	Attenuator (3dB)	CBT	N/A	CBT	120
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMW500	Radio Communication Tester	4/23/2014	Annual	4/23/2015	112347
Rohde & Schwarz	CMW500	Radio Communication Tester	9/2/2014	Annual	9/2/2015	111427
Rohde & Schwarz	CMW500	Radio Communication Tester	10/4/2013	Biennial	10/4/2015	108798
Seekonk	NC-100	Torque Wrench	3/18/2014	Biennial	3/18/2016	22313
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	3/18/2014	Biennial	3/18/2016	N/A
Tektronix	RSA6114A	Real Time Spectrum Analyzer	4/16/2014	Annual	4/16/2015	8010177
VWR	36934-158	Wall-Mounted Thermometer	8/8/2013	Biennial	8/8/2015	130477877
VWR	36934-158	Wall-Mounted Thermometer	4/29/2014	Biennial	4/29/2016	111859323

Note:

1. CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, amplifier, 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.
2. Each equipment was used solely within its valid calibration period.



FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 41 of 45

15 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



FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 42 of 45

16 CONCLUSION

16.1 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]



FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset		Page 43 of 45

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FCC ID: A3LSMG360V	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset	Page 44 of 45	

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FCC ID: A3LSMG360V	 PCTEST <small>ENGINEERING LABORATORY, INC.</small>	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1411052080-R1.A3L	Test Dates: 11/05/14 - 12/19/14	DUT Type: Portable Handset	Page 45 of 45	

APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG360V; Type: Portable Handset; Serial: 0511-4

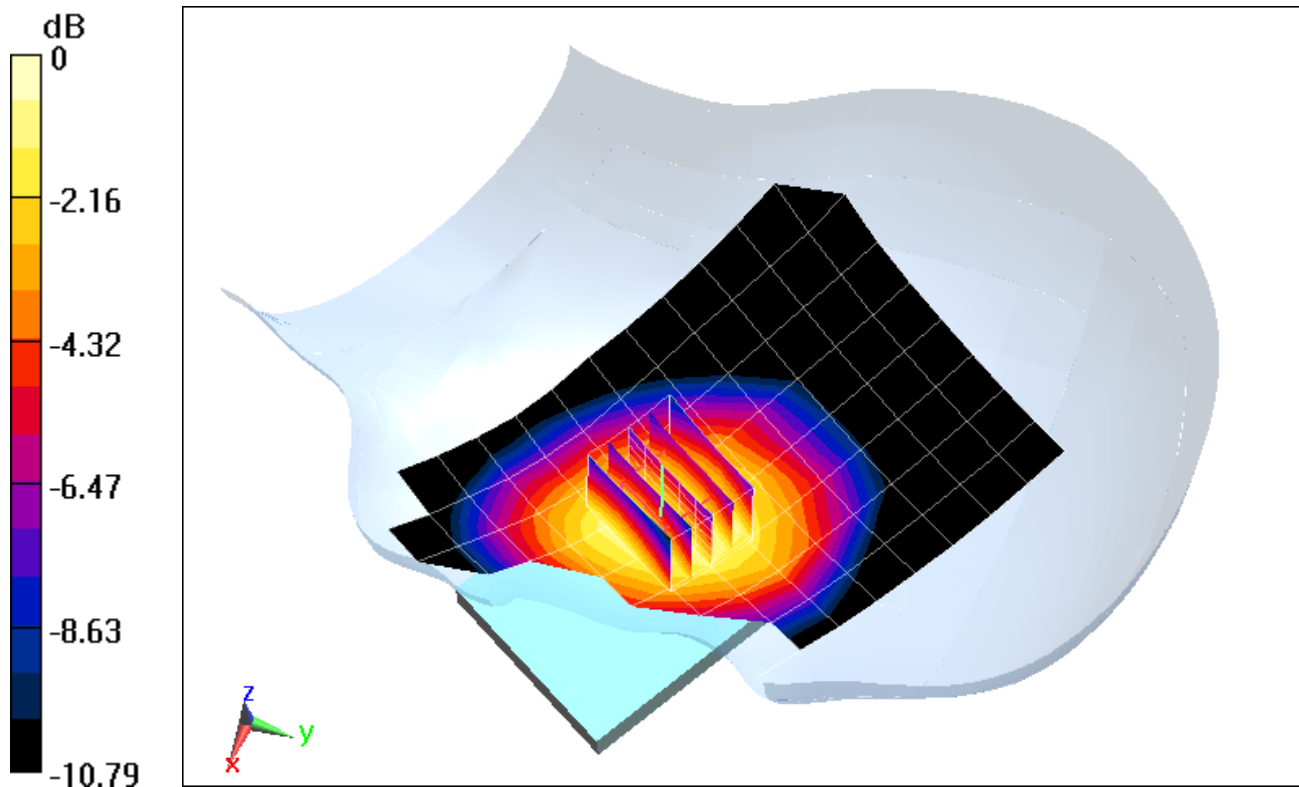
Communication System: UID 0, CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: 835 Head, Medium parameters used (interpolated):
 $f = 836.52 \text{ MHz}$; $\sigma = 0.93 \text{ S/m}$; $\epsilon_r = 41.548$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section

Test Date: 11-10-2014; Ambient Temp: 22.4°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3333; ConvF(6.33, 6.33, 6.33); Calibrated: 10/24/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 10/23/2014
Phantom: Sub TWIN SAM; Type: QD000P40CC; Serial: TP-1357
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

Mode: Cell. EVDO Rev. A, Left Head, Cheek, Mid.ch

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.220 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.791 W/kg
SAR(1 g) = 0.623 W/kg



0 dB = 0.694 W/kg = -1.59 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG360V; Type: Portable Handset; Serial: 0511-4

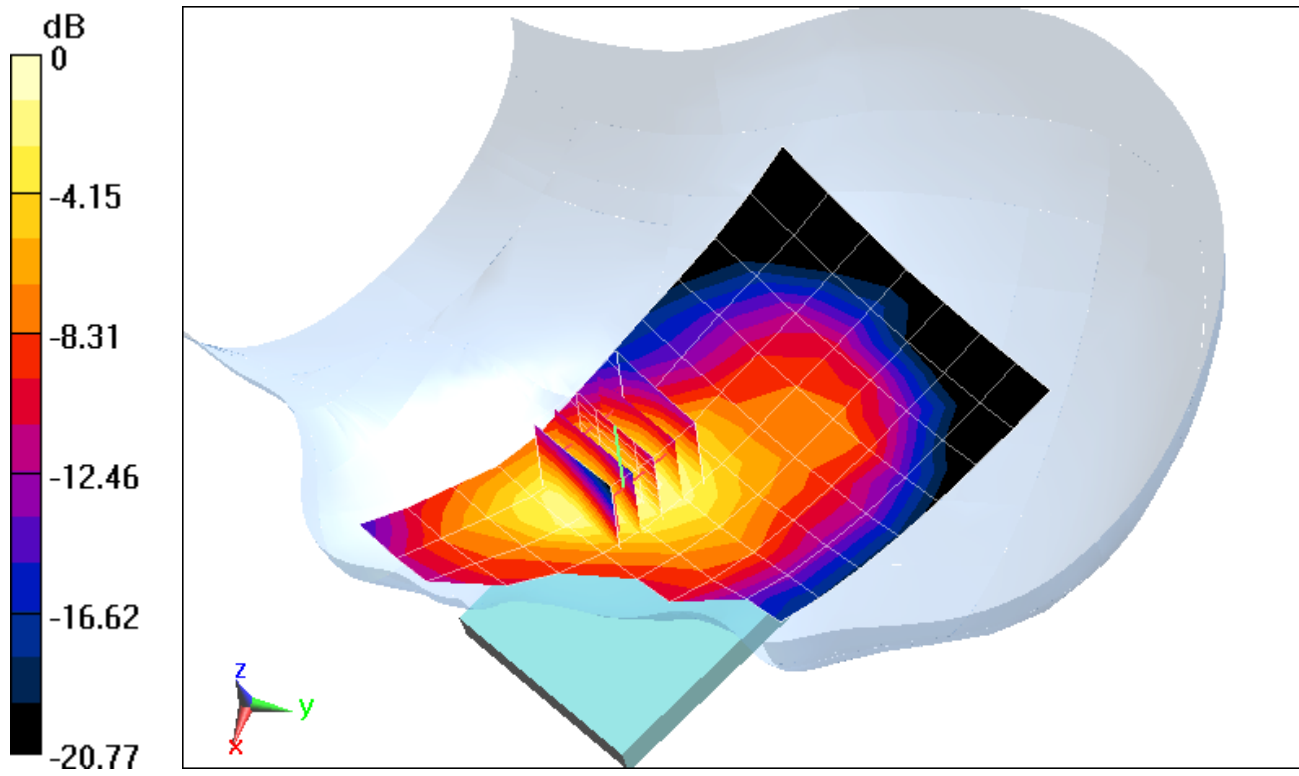
Communication System: UID 0, CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Head, Medium parameters used:
 $f = 1880 \text{ MHz}$; $\sigma = 1.427 \text{ S/m}$; $\epsilon_r = 38.686$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section

Test Date: 11-13-2014; Ambient Temp: 22.9°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3333; ConvF(5.11, 5.11, 5.11); Calibrated: 10/24/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 10/23/2014
Phantom: Main TWIN SAM; Type: QD000P40CC; Serial: TP-1406
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

Mode: PCS EVDO Rev. A, Left Head, Cheek, Mid.ch

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.790 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 1.43 W/kg
SAR(1 g) = 0.942 W/kg



0 dB = 1.12 W/kg = 0.49 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG360V; Type: Portable Handset; Serial: 0511-4

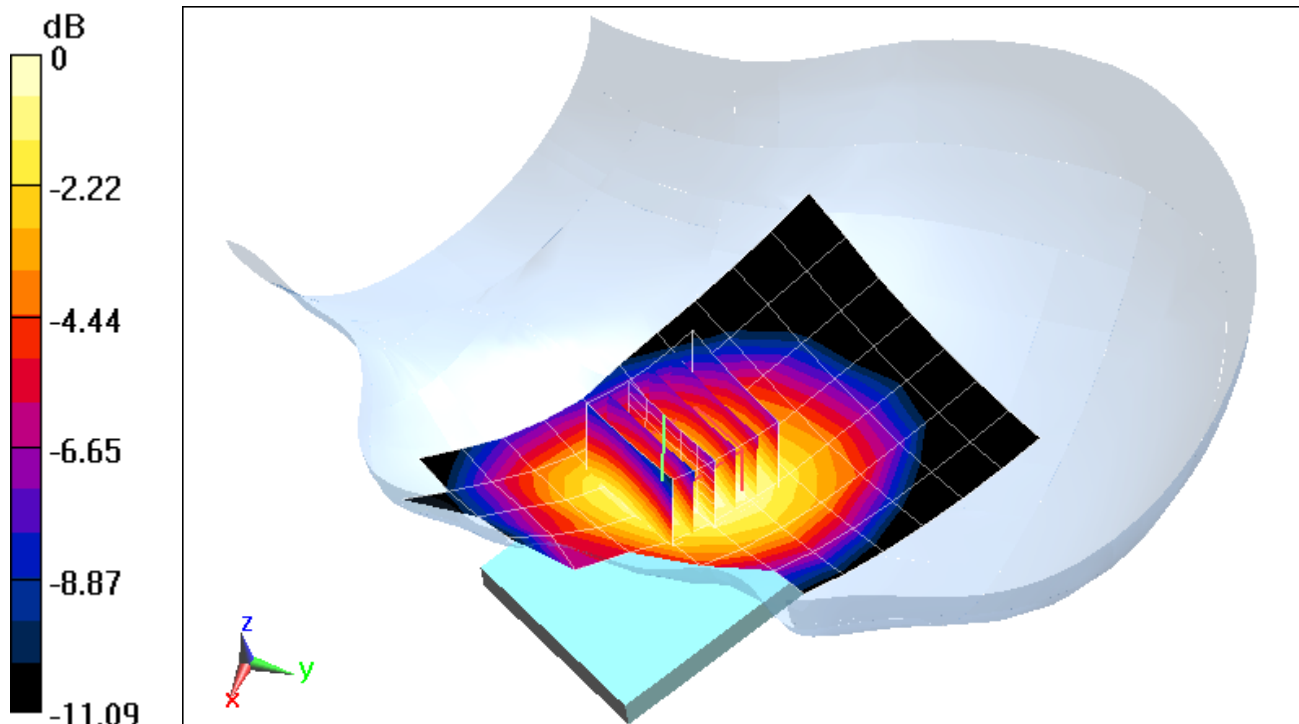
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Head, Medium parameters used (interpolated):
 $f = 782 \text{ MHz}$; $\sigma = 0.933 \text{ S/m}$; $\epsilon_r = 40.079$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section

Test Date: 11-10-2014; Ambient Temp: 22.7°C; Tissue Temp: 21.6°C

Probe: ES3DV2 - SN3022; ConvF(6.39, 6.39, 6.39); Calibrated: 8/19/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/12/2014
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**Mode: LTE Band 13, Left Head, Cheek, Mid.ch,
QPSK, 10 MHz Bandwidth, 1 RB, 0 RB Offset**

Area Scan (8x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Zoom Scan (6x6x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 25.057 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.648 W/kg
SAR(1 g) = 0.509 W/kg



0 dB = 0.555 W/kg = -2.56 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG360V; Type: Portable Handset; Serial: 2811-7

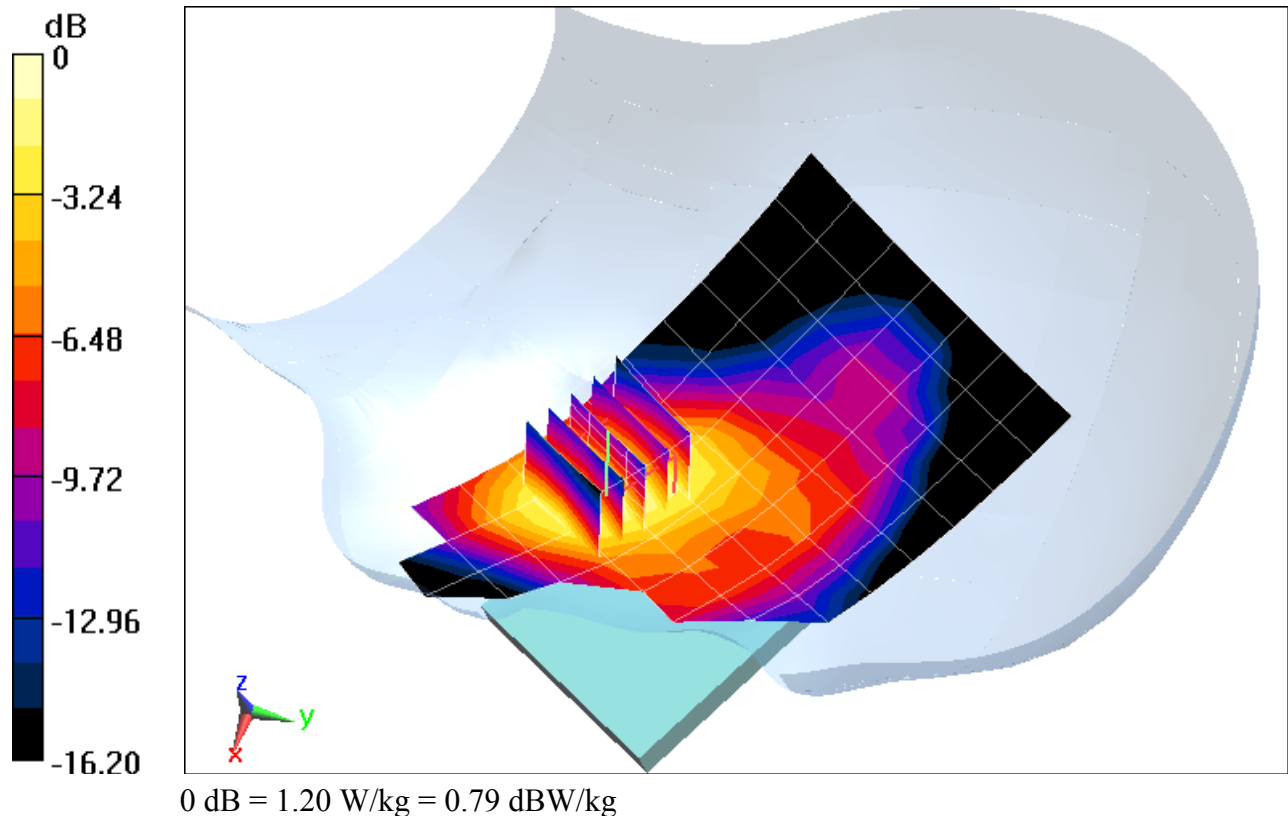
Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Head, Medium parameters used (interpolated):
 $f = 1732.5 \text{ MHz}$; $\sigma = 1.382 \text{ S/m}$; $\epsilon_r = 39.493$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section

Test Date: 12-08-2014; Ambient Temp: 21.6°C; Tissue Temp: 21.0°C

Probe: ES3DV2 - SN3022; ConvF(5.04, 5.04, 5.04); Calibrated: 8/19/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/12/2014
Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**Mode: LTE Band 4 (AWS), Left Head, Cheek, Mid.ch,
QPSK, 20 MHz Bandwidth, 1 RB, 50 RB Offset**

Area Scan (8x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 30.354 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 1.57 W/kg
SAR(1 g) = 1.02 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG360V; Type: Portable Handset; Serial: 2811-3

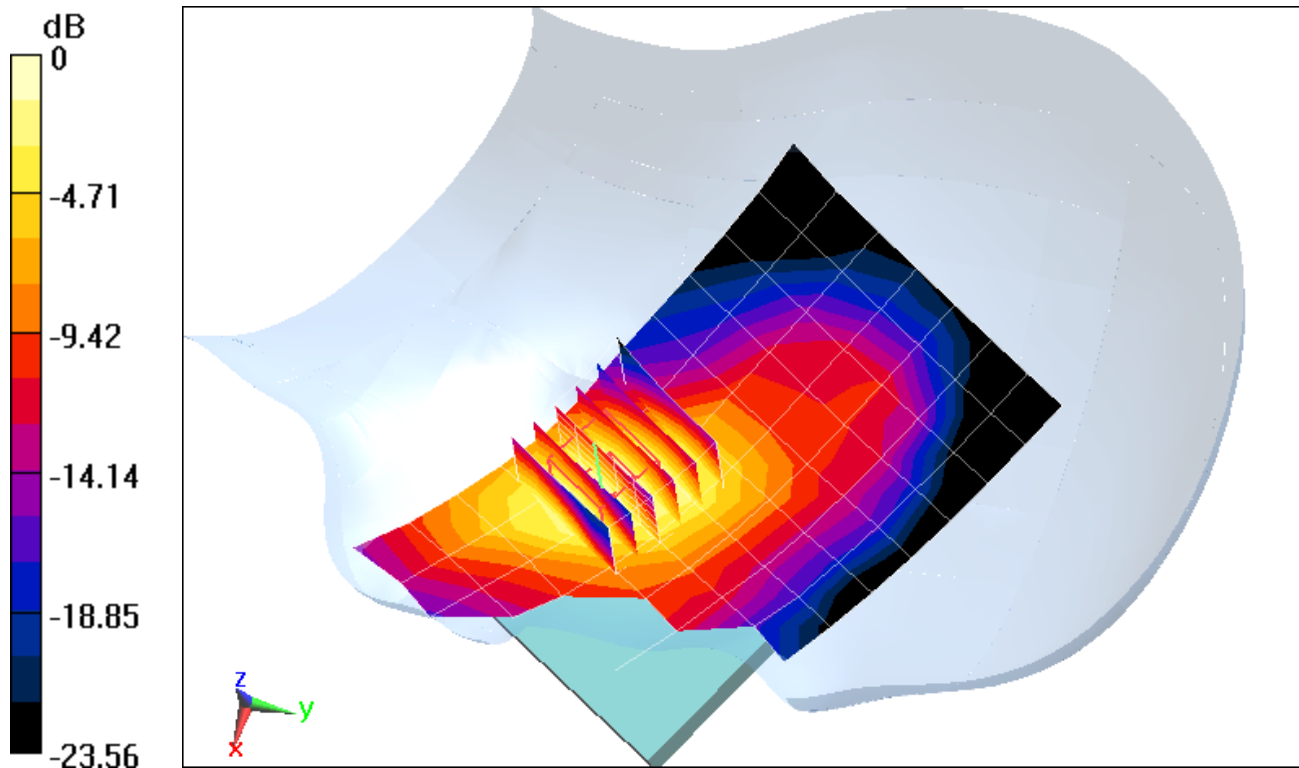
Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1
Medium: 1900 Head, Medium parameters used (interpolated):
 $f = 1860 \text{ MHz}$; $\sigma = 1.366 \text{ S/m}$; $\epsilon_r = 39.969$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section

Test Date: 11-24-2014; Ambient Temp: 23.2°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(5.05, 5.05, 5.05); Calibrated: 4/17/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 4/11/2014
Phantom: SAM; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**Mode: LTE Band 2 (PCS), Left Head, Cheek, Low.ch,
QPSK, 20 MHz Bandwidth, 1 RB, 0 RB Offset**

Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Zoom Scan (6x6x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 27.46 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1.55 W/kg
SAR(1 g) = 0.996 W/kg



0 dB = 1.22 W/kg = 0.86 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG360V; Type: Portable Handset; Serial: 2811-7

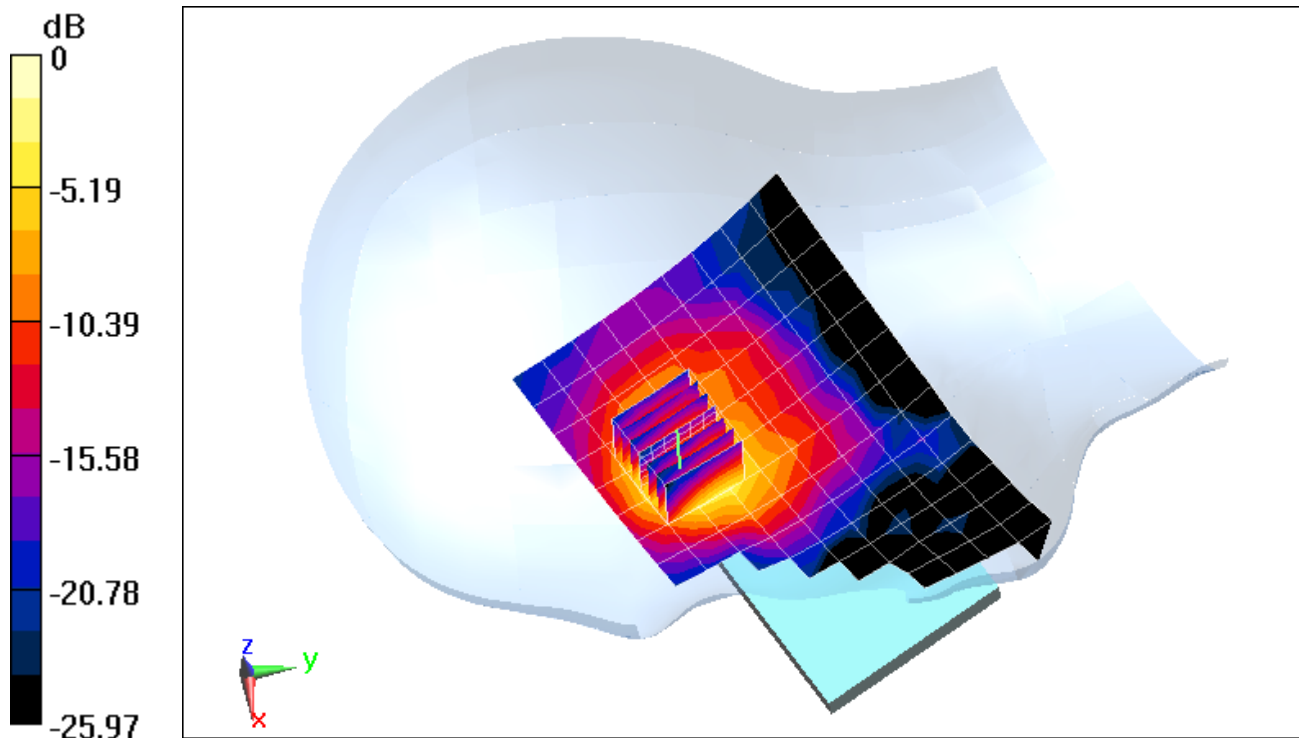
Communication System: UID 0, IEEE 802.11b; Frequency: 2462 MHz; Duty Cycle: 1:1
Medium: 2450 Head, Medium parameters used (interpolated):
 $f = 2462 \text{ MHz}$; $\sigma = 1.77 \text{ S/m}$; $\epsilon_r = 38.916$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section

Test Date: 12-19-2014; Ambient Temp: 24.4°C; Tissue Temp: 21.9°C

Probe: ES3DV3 - SN3258; ConvF(4.52, 4.52, 4.52); Calibrated: 2/25/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/26/2014
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11b, Right Head, Cheek, Ch 11, 1 Mbps

Area Scan (10x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.422 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.424 W/kg
SAR(1 g) = 0.190 W/kg



0 dB = 0.256 W/kg = -5.92 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG360V; Type: Portable Handset; Serial: 0511-4

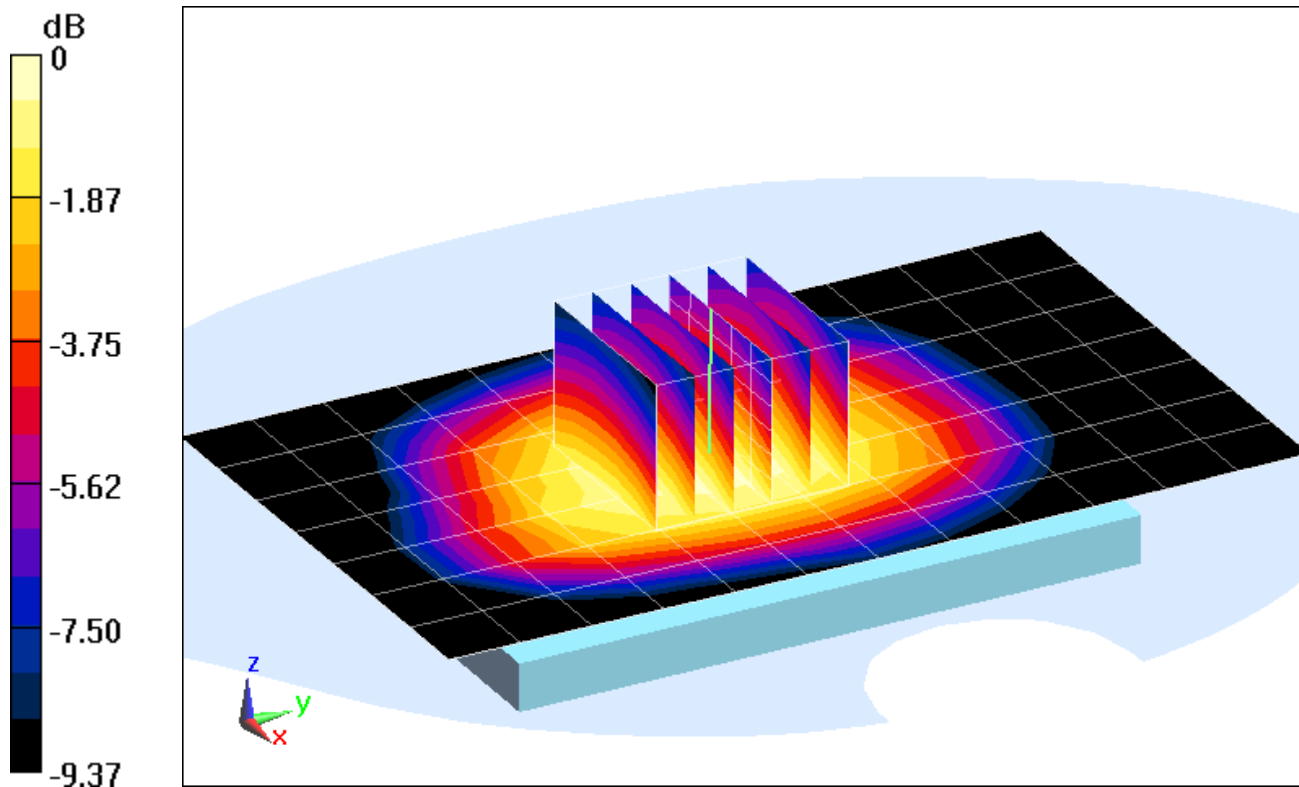
Communication System: UID 0, CDMA; Frequency: 848.31 MHz; Duty Cycle: 1:1
Medium: 835 Body, Medium parameters used (interpolated):
 $f = 848.31 \text{ MHz}$; $\sigma = 0.972 \text{ S/m}$; $\epsilon_r = 53.46$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-05-2014; Ambient Temp: 22.5°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3213; ConvF(6.18, 6.18, 6.18); Calibrated: 4/11/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 11/18/2013
Phantom: Main TWIN SAM; Type: QD000P40CC; Serial: TP-1406
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

Mode: Cell. CDMA, Body SAR, Back side, High.ch

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.905 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.979 W/kg
SAR(1 g) = 0.784 W/kg



0 dB = 0.859 W/kg = -0.66 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG360V; Type: Portable Handset; Serial: 0511-4

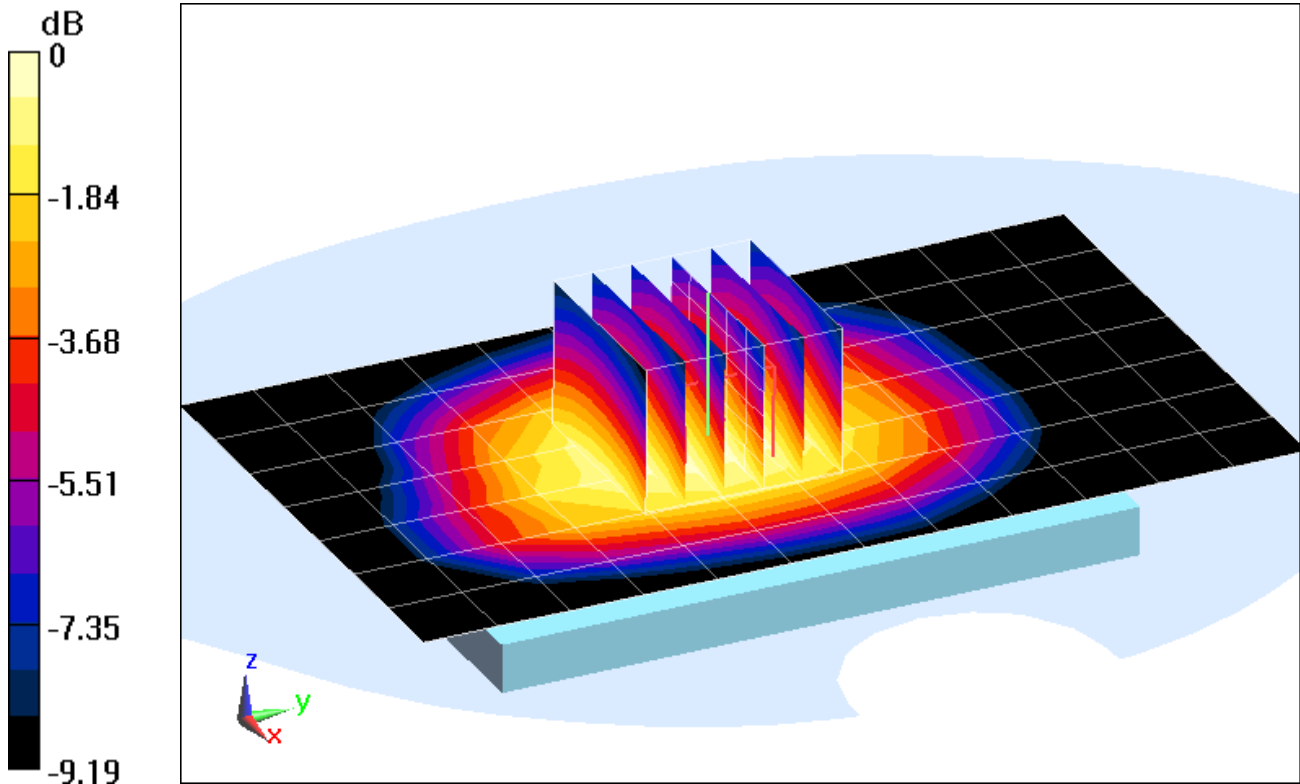
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Medium: 835 Body, Medium parameters used (interpolated):
 $f = 848.31 \text{ MHz}$; $\sigma = 0.962 \text{ S/m}$; $\epsilon_r = 52.918$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-11-2014; Ambient Temp: 22.8°C; Tissue Temp: 21.7°C

Probe: ES3DV3 - SN3333; ConvF(6.12, 6.12, 6.12); Calibrated: 10/24/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 10/23/2014
Phantom: Main TWIN SAM; Type: QD000P40CC; Serial: TP-1406
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

Mode: Cell. EVDO Rev. 0, Body SAR, Back side, High.ch

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 30.010 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.833 W/kg



0 dB = 0.916 W/kg = -0.38 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG360V; Type: Portable Handset; Serial: 0511-4

Communication System: UID 0, CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used:
 $f = 1880 \text{ MHz}$; $\sigma = 1.547 \text{ S/m}$; $\epsilon_r = 52.866$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-10-2014; Ambient Temp: 22.1°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3318; ConvF(4.6, 4.6, 4.6); Calibrated: 3/19/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 6/19/2014

Phantom: Sub Twin Sam v5.0; Type: QD000P40CD; Serial: TP:1626
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

Mode: PCS CDMA, Body SAR, Back side, Mid.ch

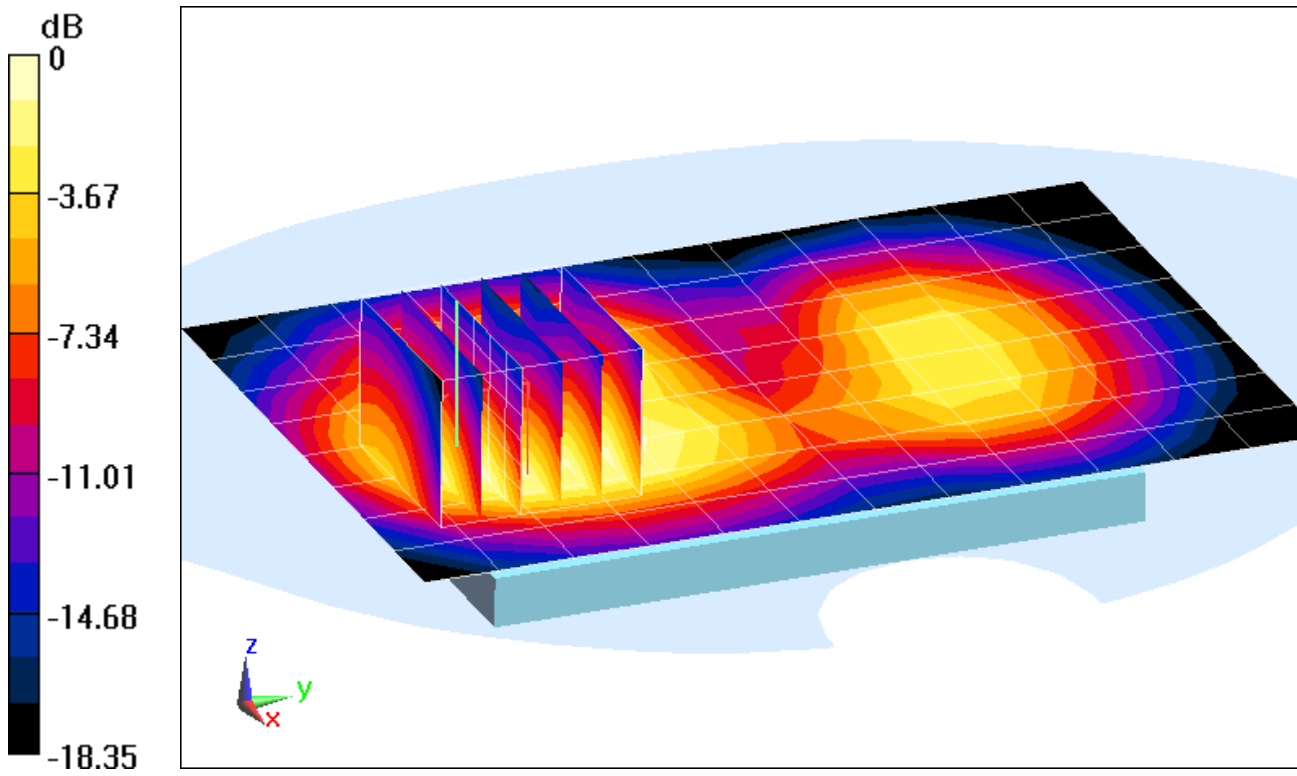
Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.339 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 1.30 W/kg

SAR(1 g) = 0.727 W/kg



0 dB = 0.869 W/kg = -0.61 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG360V; Type: Portable Handset; Serial: 0511-4

Communication System: UID 0, CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Body, Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.547 \text{ S/m}$; $\epsilon_r = 52.866$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-10-2014; Ambient Temp: 22.1°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3318; ConvF(4.6, 4.6, 4.6); Calibrated: 3/19/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 6/19/2014

Phantom: Sub Twin Sam v5.0; Type: QD000P40CD; Serial: TP:1626

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

Mode: PCS EVDO Rev. 0, Body SAR, Front side, Mid.ch

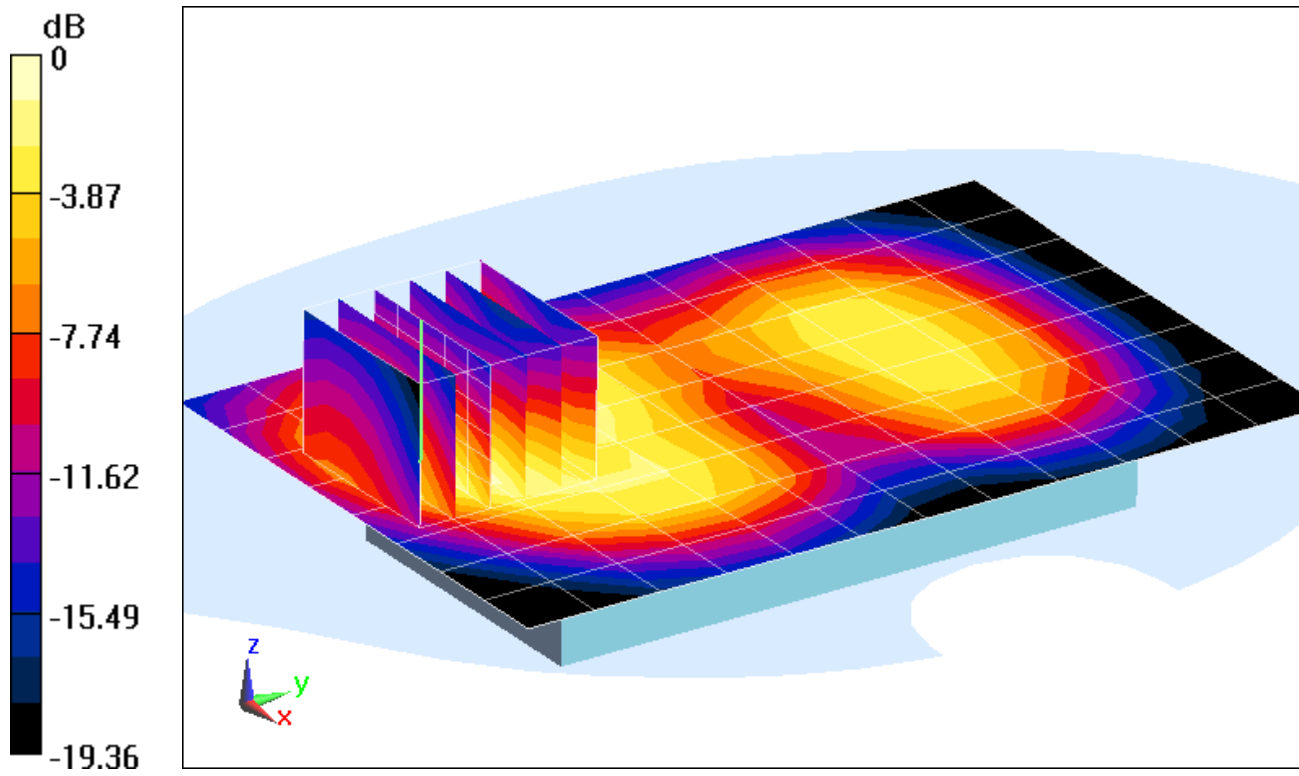
Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 22.202 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 1.36 W/kg

SAR(1 g) = 0.758 W/kg



0 dB = 0.928 W/kg = -0.32 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG360V; Type: Portable Handset; Serial: 0511-4

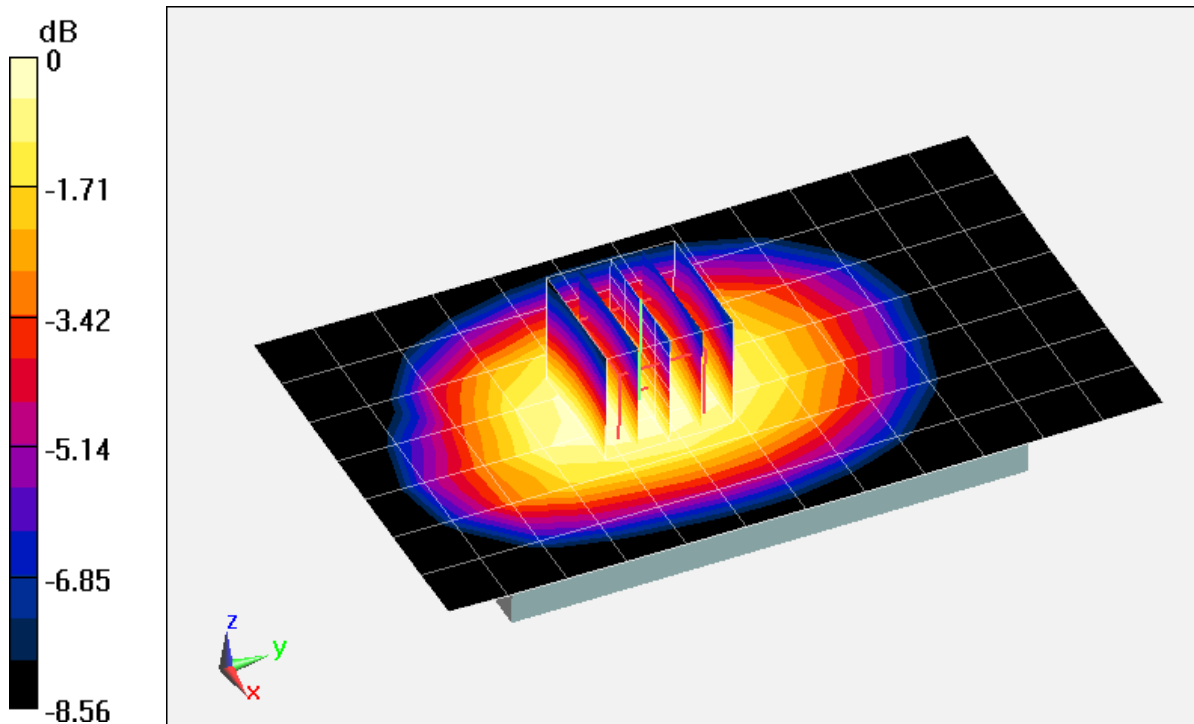
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 750 Body, Medium parameters used (interpolated):
 $f = 782 \text{ MHz}$; $\sigma = 1.01 \text{ S/m}$; $\epsilon_r = 55.516$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-12-2014; Ambient Temp: 23.3°C; Tissue Temp: 22.3°C

Probe: ES3DV2 - SN3022; ConvF(6.02, 6.02, 6.02); Calibrated: 8/19/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/12/2014
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1226
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**Mode: LTE Band 13, Body SAR, Back side, Mid.ch,
QPSK, 10 MHz Bandwidth, 1 RB, 0 RB Offset**

Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 31.388 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 1.14 W/kg
SAR(1 g) = 0.918 W/kg



0 dB = 1.00 W/kg = 0.00 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG360V; Type: Portable Handset; Serial: 2811-7

Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Body, Medium parameters used (interpolated):
 $f = 1732.5 \text{ MHz}$; $\sigma = 1.489 \text{ S/m}$; $\epsilon_r = 52.104$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-08-2014; Ambient Temp: 21.0°C; Tissue Temp: 20.9°C

Probe: ES3DV2 - SN3022; ConvF(4.7, 4.7, 4.7); Calibrated: 8/19/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/12/2014
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1226

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**Mode: LTE Band 4 (AWS), Body SAR, Back side, Mid.ch,
QPSK, 20 MHz Bandwidth, 1 RB, 50 RB Offset**

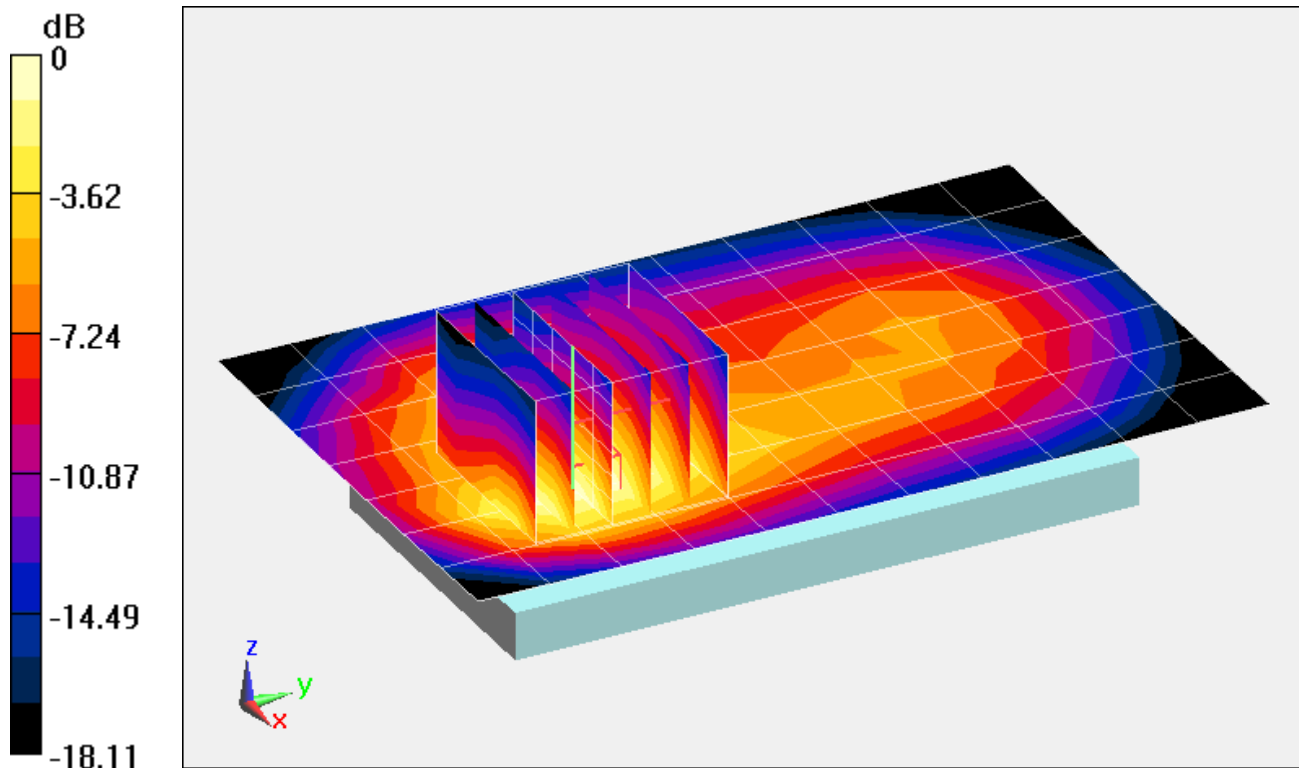
Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (6x6x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 24.691 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 1.52 W/kg

SAR(1 g) = 0.905 W/kg



0 dB = 1.09 W/kg = 0.37 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG360V; Type: Portable Handset; Serial: 2811-7

Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1
Medium: 1750 Body, Medium parameters used (interpolated):
 $f = 1732.5 \text{ MHz}$; $\sigma = 1.489 \text{ S/m}$; $\epsilon_r = 52.104$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-08-2014; Ambient Temp: 21.0°C; Tissue Temp: 20.9°C

Probe: ES3DV2 - SN3022; ConvF(4.7, 4.7, 4.7); Calibrated: 8/19/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 8/12/2014
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1226

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**Mode: LTE Band 4 (AWS), Body SAR, Front side, Mid.ch,
QPSK, 20 MHz Bandwidth, 1 RB, 50 RB Offset**

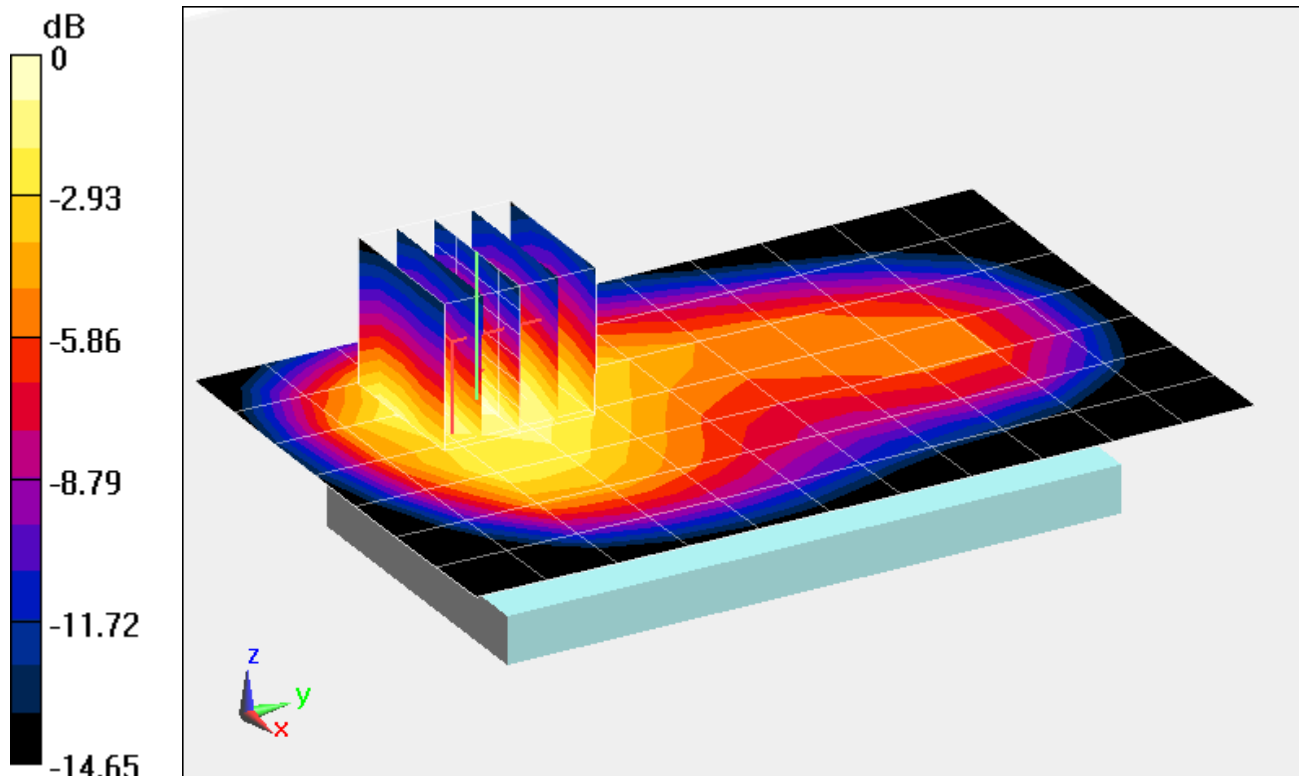
Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 25.680 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 1.49 W/kg

SAR(1 g) = 0.906 W/kg



0 dB = 1.07 W/kg = 0.29 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG360V; Type: Portable Handset; Serial: 2811-3

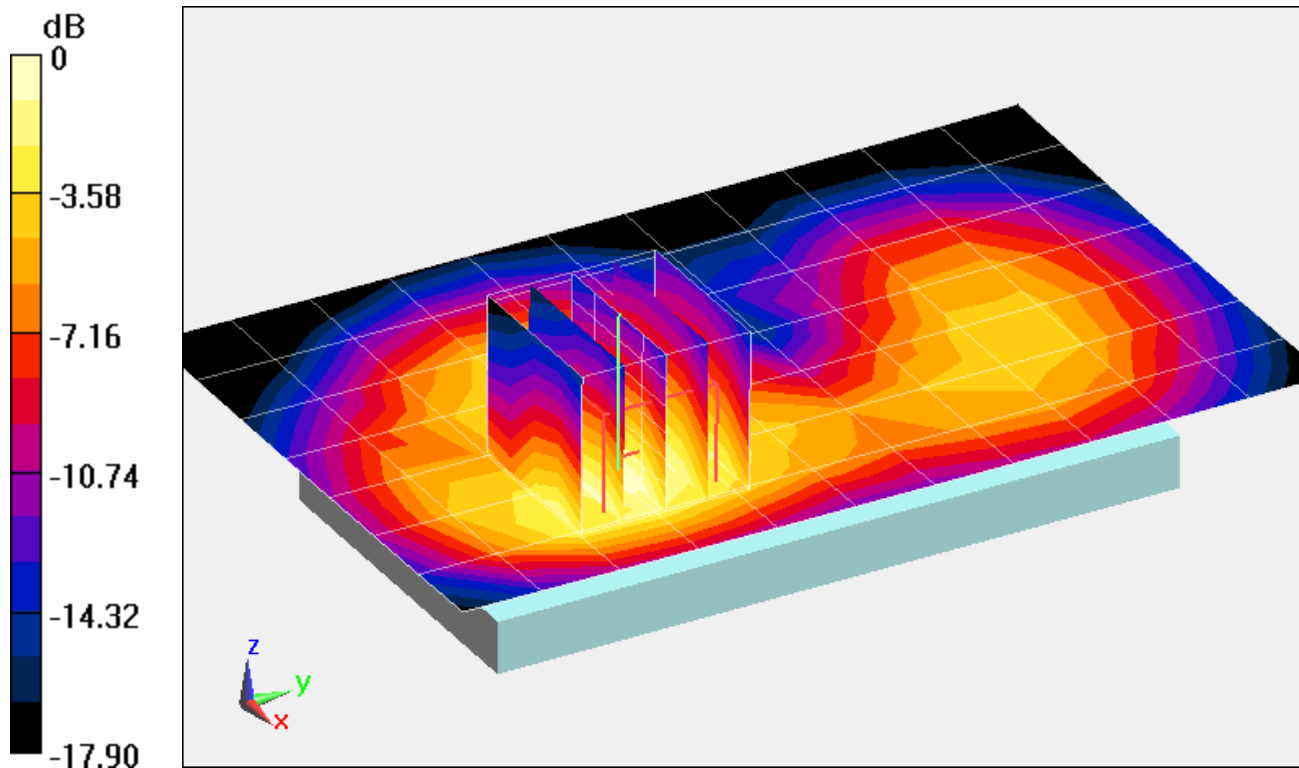
Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used (interpolated):
 $f = 1860 \text{ MHz}$; $\sigma = 1.536 \text{ S/m}$; $\epsilon_r = 52.767$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-24-2014; Ambient Temp: 20.6°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3319; ConvF(4.67, 4.67, 4.67); Calibrated: 4/17/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 4/11/2014
Phantom: ELI left; Type: QDOVA002AA; Serial: TP:1202
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**Mode: LTE Band 2 (PCS), Body SAR, Back side, Low.ch,
QPSK, 20 MHz Bandwidth, 1 RB, 0 RB Offset**

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.63 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.43 W/kg
SAR(1 g) = 0.885 W/kg



0 dB = 0.994 W/kg = -0.03 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG360V; Type: Portable Handset; Serial: 2811-3

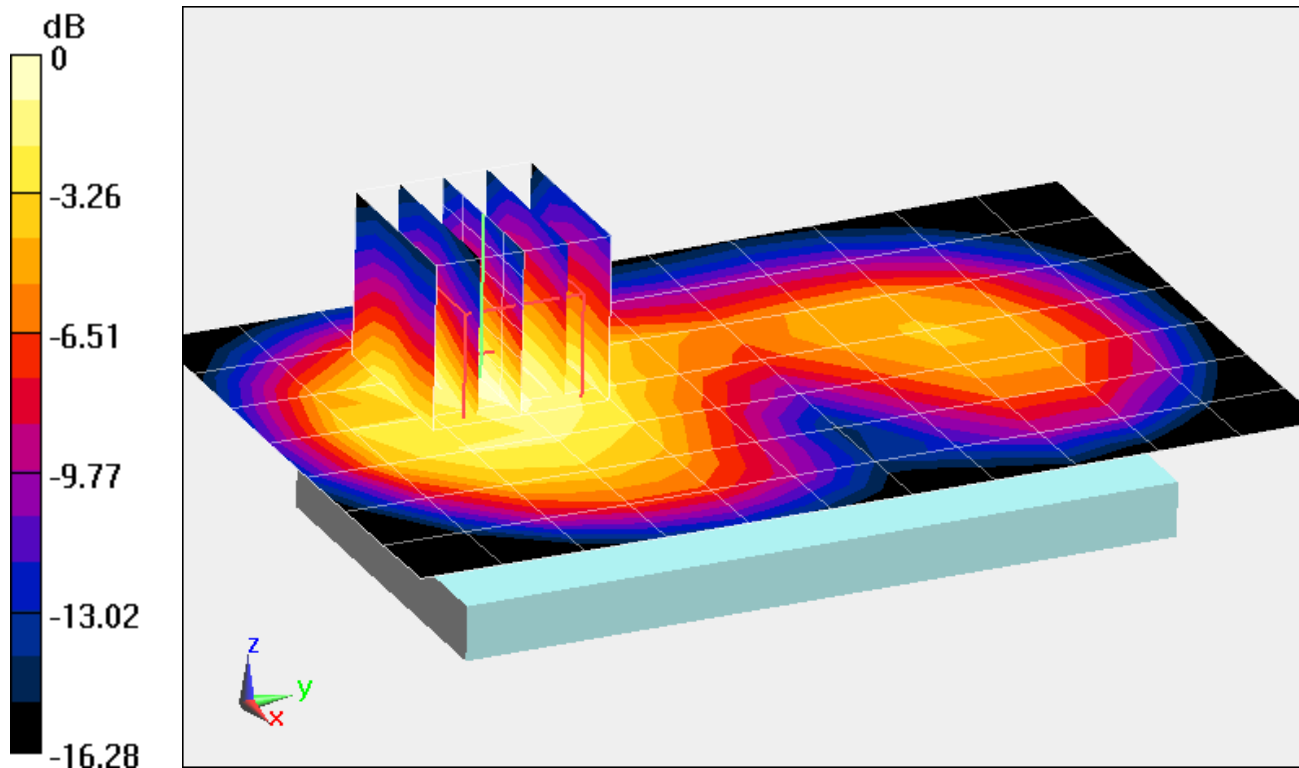
Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1
Medium: 1900 Body, Medium parameters used (interpolated):
 $f = 1860 \text{ MHz}$; $\sigma = 1.536 \text{ S/m}$; $\epsilon_r = 52.767$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-24-2014; Ambient Temp: 20.6°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3319; ConvF(4.67, 4.67, 4.67); Calibrated: 4/17/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 4/11/2014
Phantom: ELI left; Type: QDOVA002AA; Serial: TP:1202
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

**Mode: LTE Band 2 (PCS), Body SAR, Front side, Low.ch,
QPSK, 20 MHz Bandwidth, 1 RB, 0 RB Offset**

Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.68 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 0.895 W/kg



0 dB = 1.03 W/kg = 0.13 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: A3LSMG360V; Type: Portable Handset; Serial: 2811-7

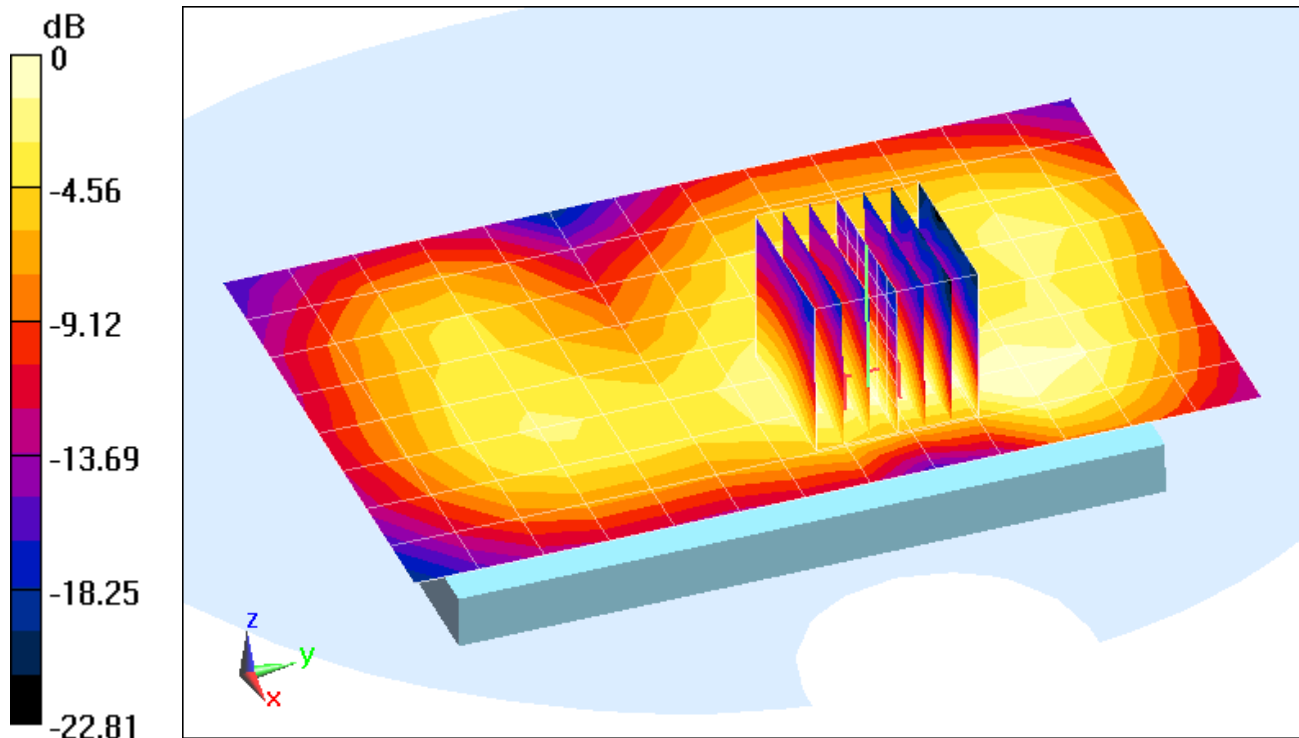
Communication System: UID 0, IEEE 802.11b; Frequency: 2462 MHz; Duty Cycle: 1:1
Medium: 2450 Body, Medium parameters used (interpolated):
 $f = 2462 \text{ MHz}$; $\sigma = 1.937 \text{ S/m}$; $\epsilon_r = 50.712$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-17-2014; Ambient Temp: 24.5°C; Tissue Temp: 24.3°C

Probe: ES3DV3 - SN3332; ConvF(4.31, 4.31, 4.31); Calibrated: 9/18/2014;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/17/2014
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

Mode: IEEE 802.11b, Body SAR, Ch 11, 1 Mbps, Back Side

Area Scan (9x14x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.929 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.208 W/kg
SAR(1 g) = 0.106 W/kg



0 dB = 0.134 W/kg = -8.73 dBW/kg

APPENDIX B: SYSTEM VERIFICATION

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 750 MHz; Type: D750V3; Serial: 1003

Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium: 750 Head, Medium parameters used (interpolated):

$f = 750 \text{ MHz}$; $\sigma = 0.89 \text{ S/m}$; $\epsilon_r = 40.322$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-10-2014; Ambient Temp: 22.7°C; Tissue Temp: 21.6°C

Probe: ES3DV2 - SN3022; ConvF(6.39, 6.39, 6.39); Calibrated: 8/19/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 8/12/2014

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

750 MHz System Verification

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm

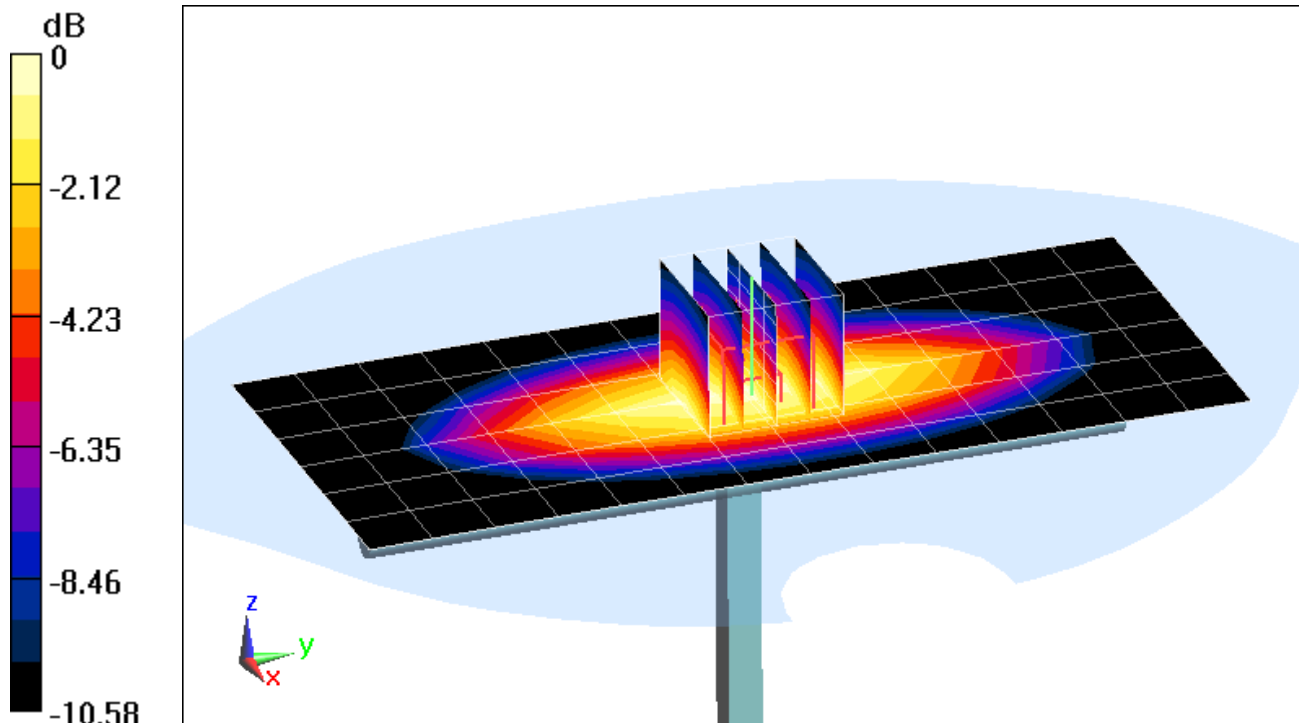
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 1.15 W/kg

SAR(1 g) = 0.772 W/kg

Deviation(1 g): -7.77%



0 dB = 0.901 W/kg = -0.45 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 835 MHz; Type: D835V2; Serial: 4d132

Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: 835 Head, Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.929 \text{ S/m}$; $\epsilon_r = 41.568$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-10-2014; Ambient Temp: 22.4°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3333; ConvF(6.33, 6.33, 6.33); Calibrated: 10/24/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1408; Calibrated: 10/23/2014

Phantom: Sub TWIN SAM; Type: QD000P40CC; Serial: TP-1357

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm

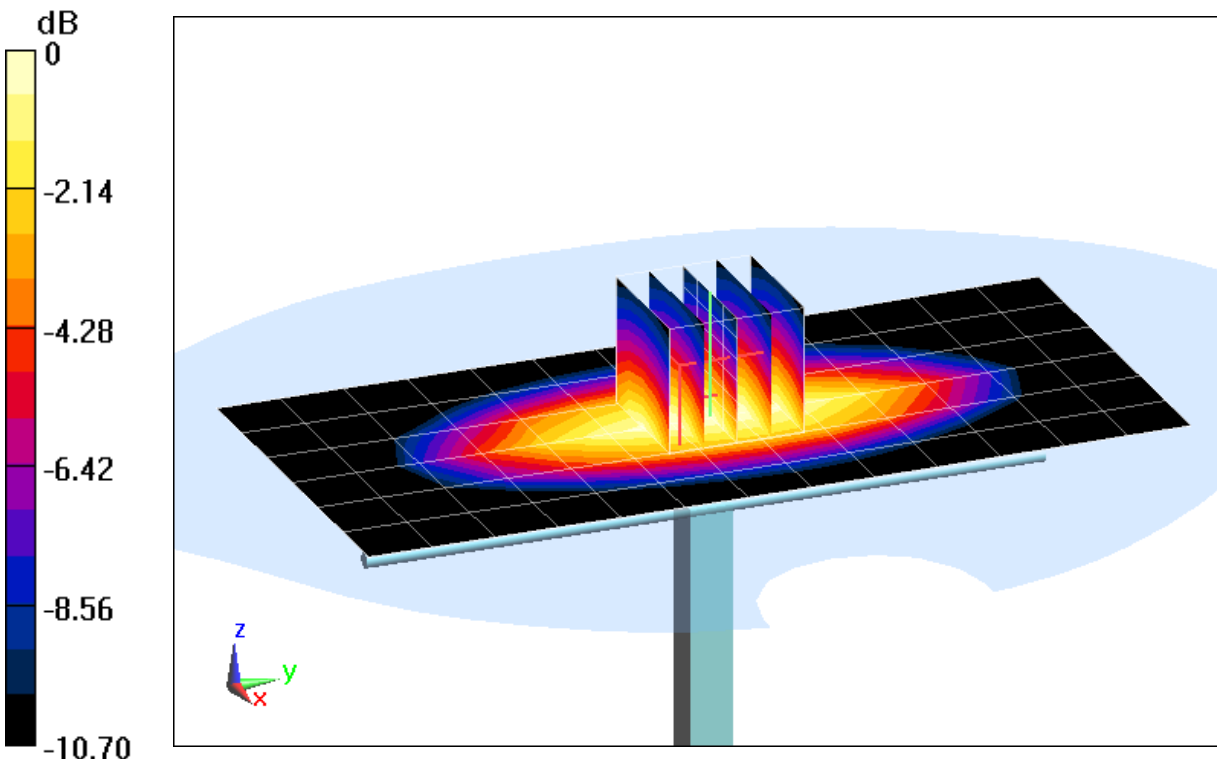
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 1.44 W/kg

SAR(1 g) = 0.969 W/kg

Deviation(1 g): 4.53%



0 dB = 1.13 W/kg = 0.53 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 1750 MHz; Type: D1765V2; Serial: 1008

Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: 1750 Head, Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.398 \text{ S/m}$; $\epsilon_r = 39.405$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-08-2014; Ambient Temp: 21.6°C; Tissue Temp: 21.0°C

Probe: ES3DV2 - SN3022; ConvF(5.04, 5.04, 5.04); Calibrated: 8/19/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 8/12/2014

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

1750 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm

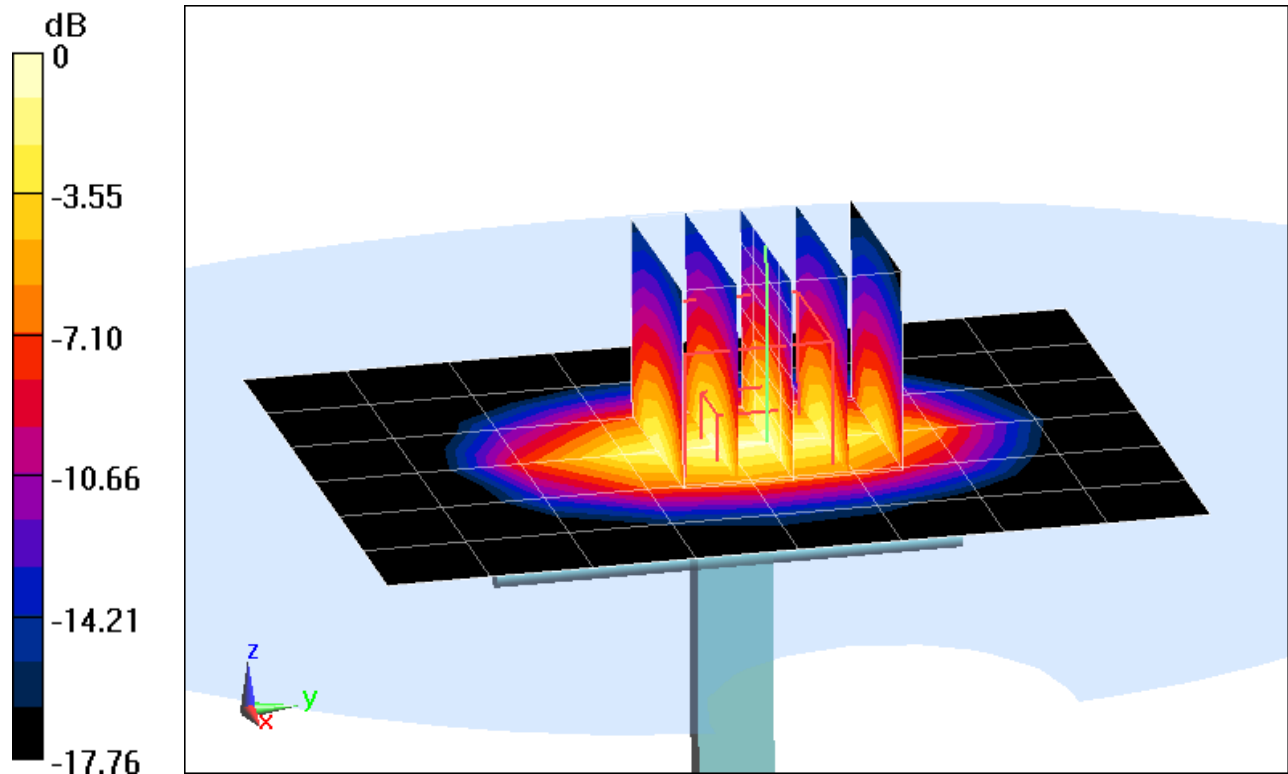
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 6.36 W/kg

SAR(1 g) = 3.55 W/kg

Deviation(1 g): -3.79%



0 dB = 4.38 W/kg = 6.41 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 1900 MHz; Type: D1900V2; Serial: 5d148

Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: 1900 Head, Medium parameters used (interpolated):

$f = 1900 \text{ MHz}$; $\sigma = 1.449 \text{ S/m}$; $\epsilon_r = 38.598$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-13-2014; Ambient Temp: 22.9°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3333; ConvF(5.11, 5.11, 5.11); Calibrated: 10/24/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1408; Calibrated: 10/23/2014

Phantom: Main TWIN SAM; Type: QD000P40CC; Serial: TP-1406

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

1900 MHz System Verification

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm

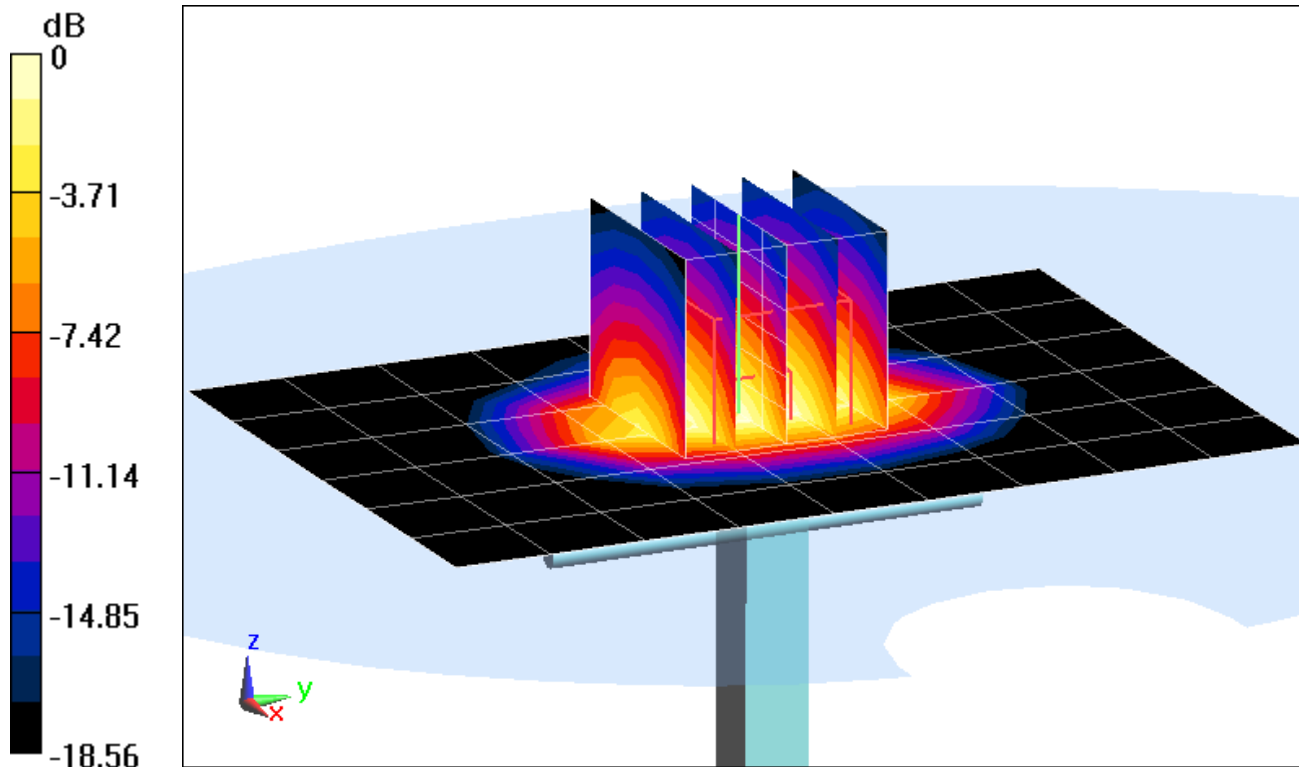
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 7.23 W/kg

SAR(1 g) = 4 W/kg

Deviation(1 g): -1.72%



0 dB = 5.11 W/kg = 7.08 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 1900 MHz; Type: D1900V2; Serial: 5d141

Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: 1900 Head, Medium parameters used (interpolated):

$f = 1900 \text{ MHz}$; $\sigma = 1.405 \text{ S/m}$; $\epsilon_r = 39.844$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-24-2014; Ambient Temp: 23.2°C; Tissue Temp: 22.5°C

Probe: ES3DV3 - SN3319; ConvF(5.05, 5.05, 5.05); Calibrated: 4/17/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 4/11/2014

Phantom: SAM; Type: QD000P40CD; Serial: TP:1758

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

1900 MHz System Verification

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm

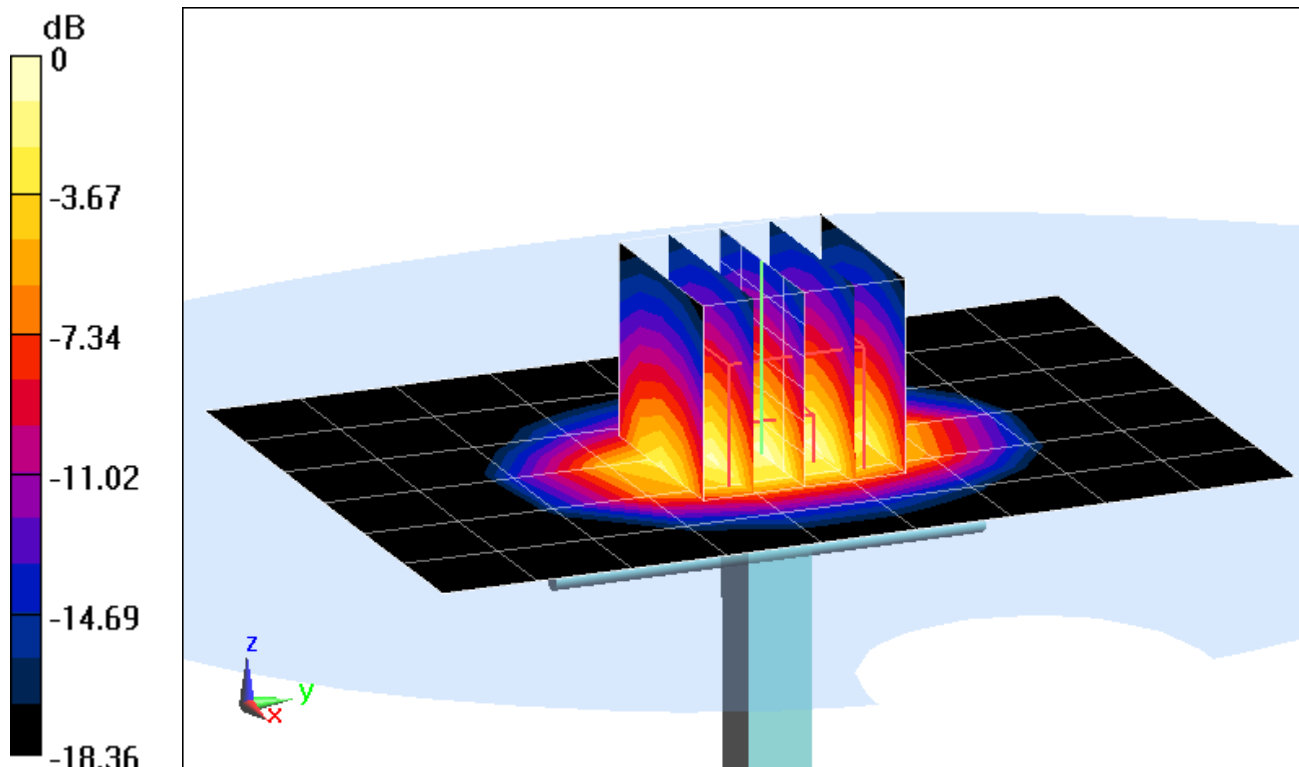
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 7.81 W/kg

SAR(1 g) = 4.27 W/kg

Deviation(1 g) = 6.48%



0 dB = 5.50 W/kg = 7.40 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 2450 MHz; Type: D2450V2; Serial: 797

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Head, Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 1.756 \text{ S/m}$; $\epsilon_r = 38.948$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-19-2014; Ambient Temp: 24.4°C; Tissue Temp: 21.9°C

Probe: ES3DV3 - SN3258; ConvF(4.52, 4.52, 4.52); Calibrated: 2/25/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/26/2014

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

2450 MHz System Verification

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

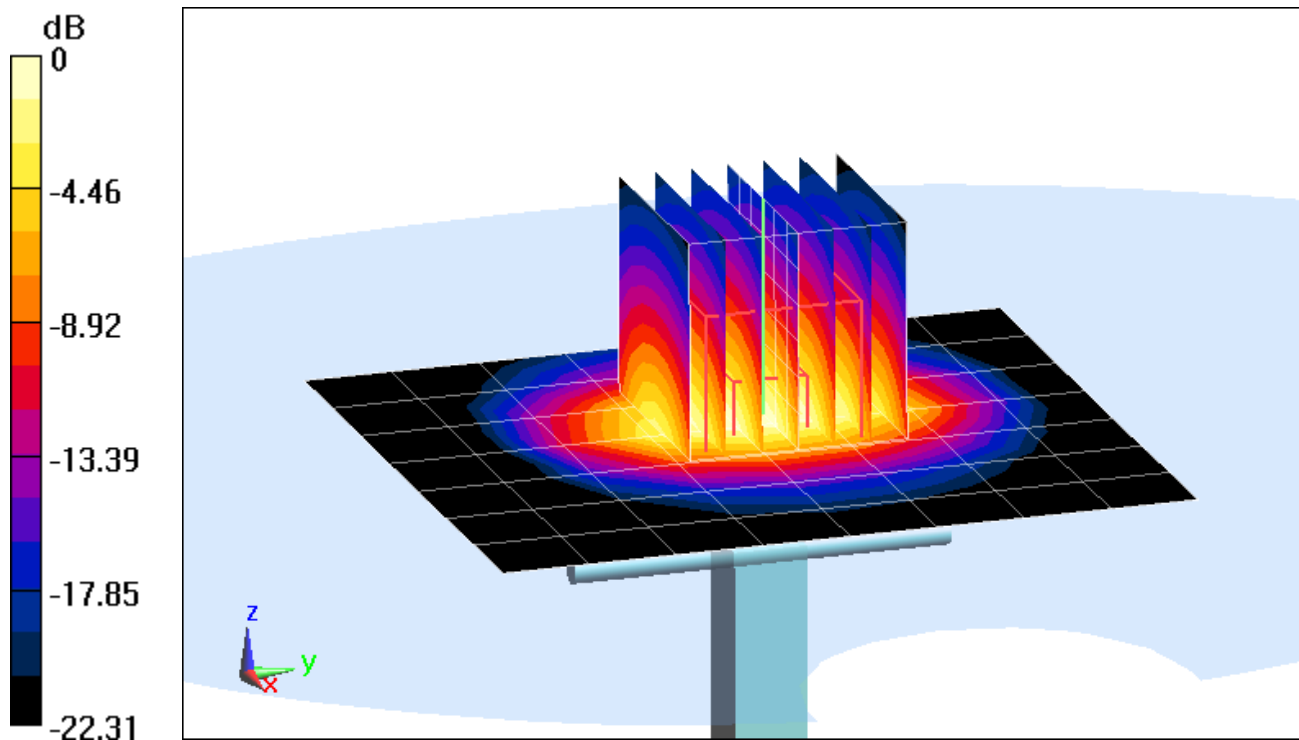
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Input Power: 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 10.2 W/kg

SAR(1 g) = 4.92 W/kg

Deviation(1 g): -5.02%



0 dB = 6.51 W/kg = 8.14 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 750 MHz; Type: D750V3; Serial: 1003

Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium: 750 Body, Medium parameters used (interpolated):

$f = 750 \text{ MHz}$; $\sigma = 0.983 \text{ S/m}$; $\epsilon_r = 56.04$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-12-2014; Ambient Temp: 23.3°C; Tissue Temp: 22.3°C

Probe: ES3DV2 - SN3022; ConvF(6.02, 6.02, 6.02); Calibrated: 8/19/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 8/12/2014

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1226

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

750 MHz System Verification

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm

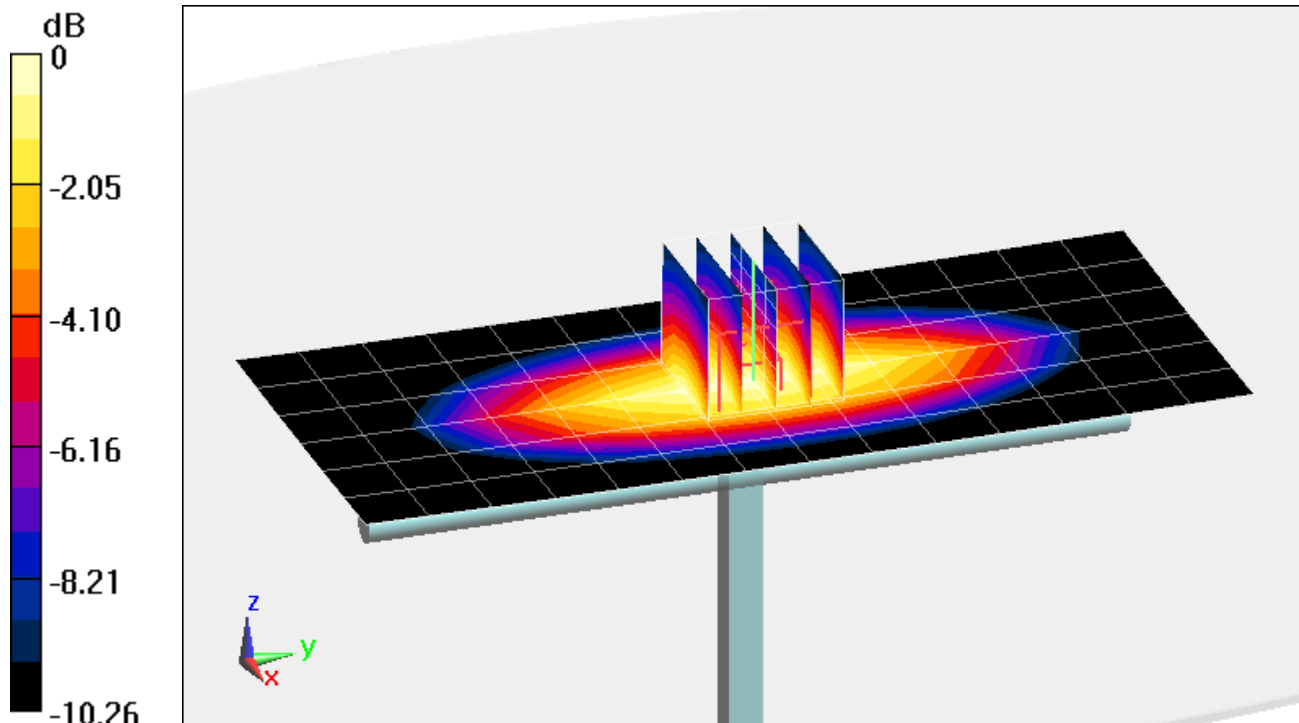
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 1.33 W/kg

SAR(1 g) = 0.917 W/kg

Deviation(1 g): 4.56%



0 dB = 1.07 W/kg = 0.29 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 835 MHz; Type: D835V2; Serial: 4d132

Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: 835 Body, Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.96 \text{ S/m}$; $\epsilon_r = 53.584$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-05-2014; Ambient Temp: 22.5°C; Tissue Temp: 21.6°C

Probe: ES3DV3 - SN3213; ConvF(6.18, 6.18, 6.18); Calibrated: 4/11/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 11/18/2013

Phantom: Main TWIN SAM; Type: QD000P40CC; Serial: TP-1406

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm

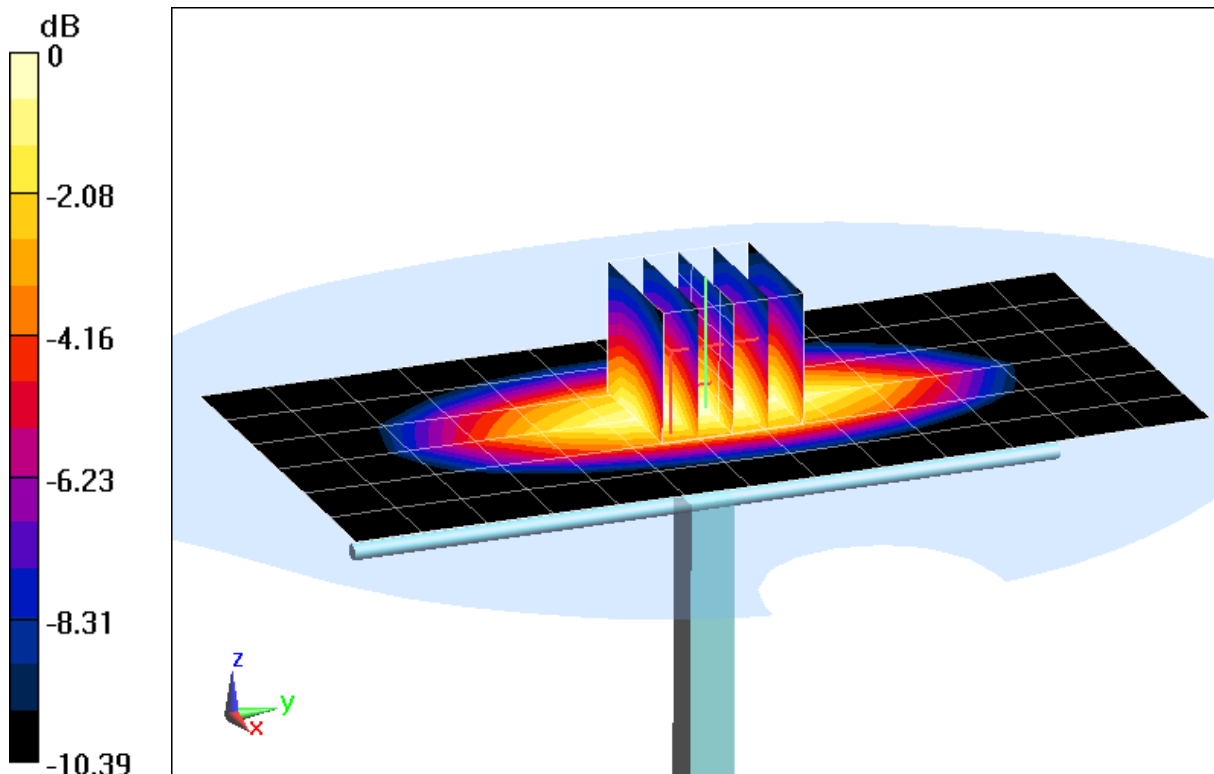
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 1.45 W/kg

SAR(1 g) = 0.990 W/kg

Deviation(1 g): 3.34%



0 dB = 1.15 W/kg = 0.61 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 835 MHz; Type: D835V2; Serial: 4d132

Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: 835 Body, Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.948 \text{ S/m}$; $\epsilon_r = 53.049$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11-11-2014; Ambient Temp: 22.8°C; Tissue Temp: 21.7°C

Probe: ES3DV3 - SN3333; ConvF(6.12, 6.12, 6.12); Calibrated: 10/24/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1408; Calibrated: 10/23/2014

Phantom: Main TWIN SAM; Type: QD000P40CC; Serial: TP-1406

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

835 MHz System Verification

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm

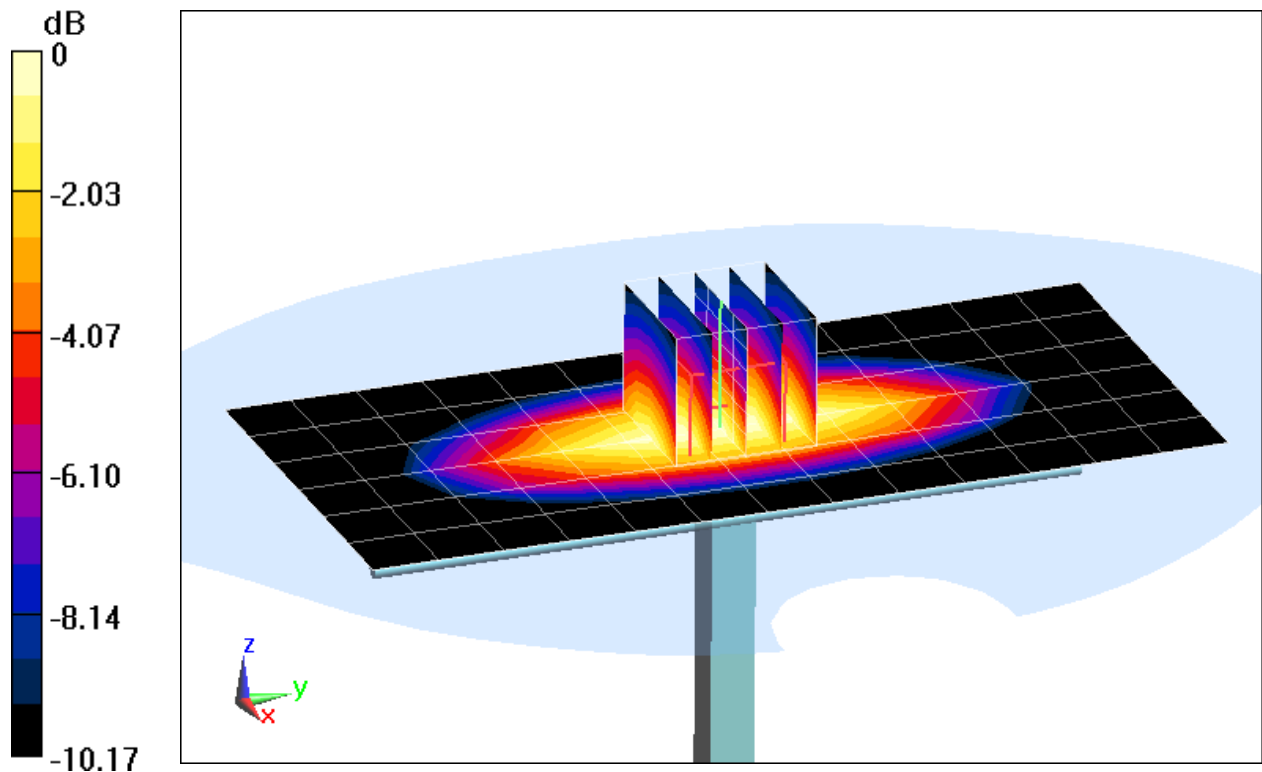
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 1.49 W/kg

SAR(1 g) = 1.03 W/kg

Deviation(1 g): 7.52%



0 dB = 1.20 W/kg = 0.79 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 1750 MHz; Type: D1765V2; Serial: 1008

Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: 1750 Body, Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.508 \text{ S/m}$; $\epsilon_r = 52.023$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-08-2014; Ambient Temp: 21.0°C; Tissue Temp: 20.9°C

Probe: ES3DV2 - SN3022; ConvF(4.7, 4.7, 4.7); Calibrated: 8/19/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 8/12/2014

Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1226

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

1750 MHz System Verification

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm

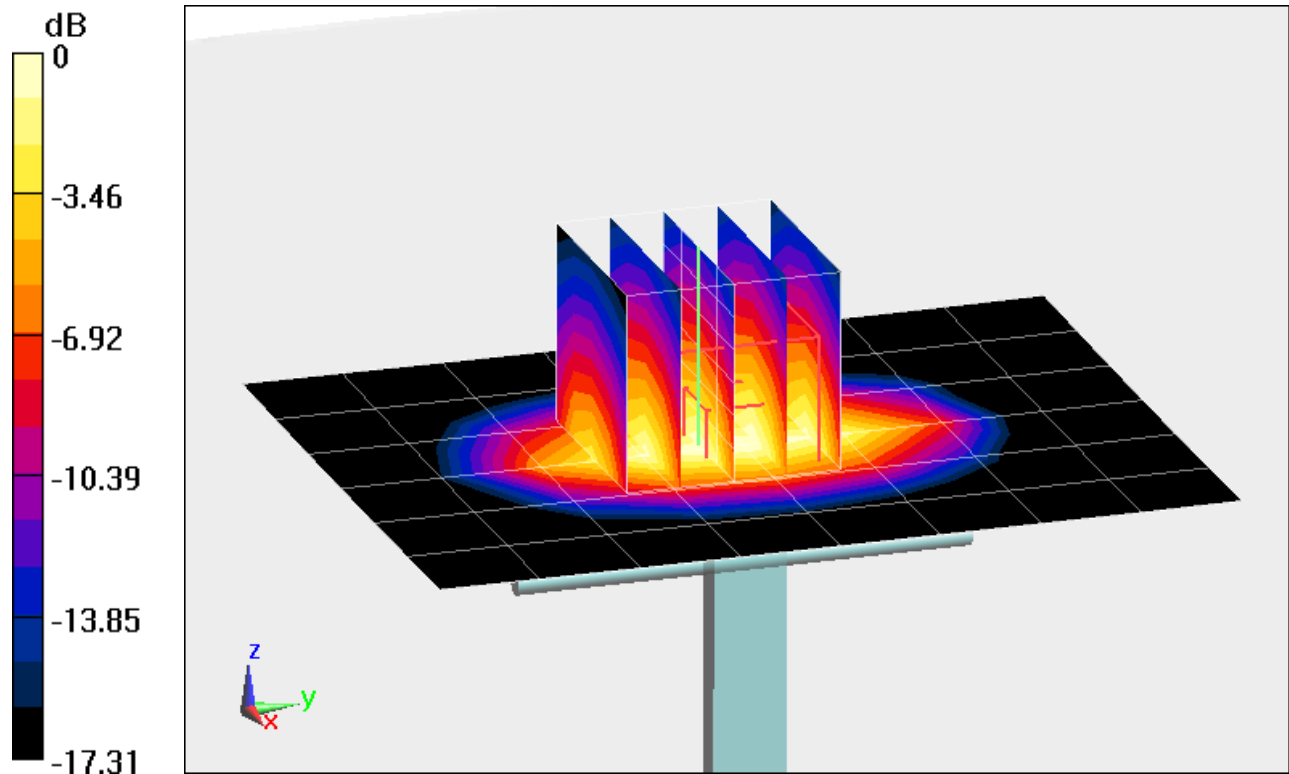
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 6.84 W/kg

SAR(1 g) = 3.95 W/kg

Deviation(1 g): 5.05%



0 dB = 4.86 W/kg = 6.87 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 1900 MHz; Type: D1900V2; Serial: 5d148

Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: 1900 Body, Medium parameters used (interpolated):

$f = 1900 \text{ MHz}$; $\sigma = 1.571 \text{ S/m}$; $\epsilon_r = 52.834$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-10-2014; Ambient Temp: 22.1°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3318; ConvF(4.6, 4.6, 4.6); Calibrated: 3/19/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 6/19/2014

Phantom: Sub Twin Sam v5.0; Type: QD000P40CD; Serial: TP:1626

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

1900 MHz System Verification

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm

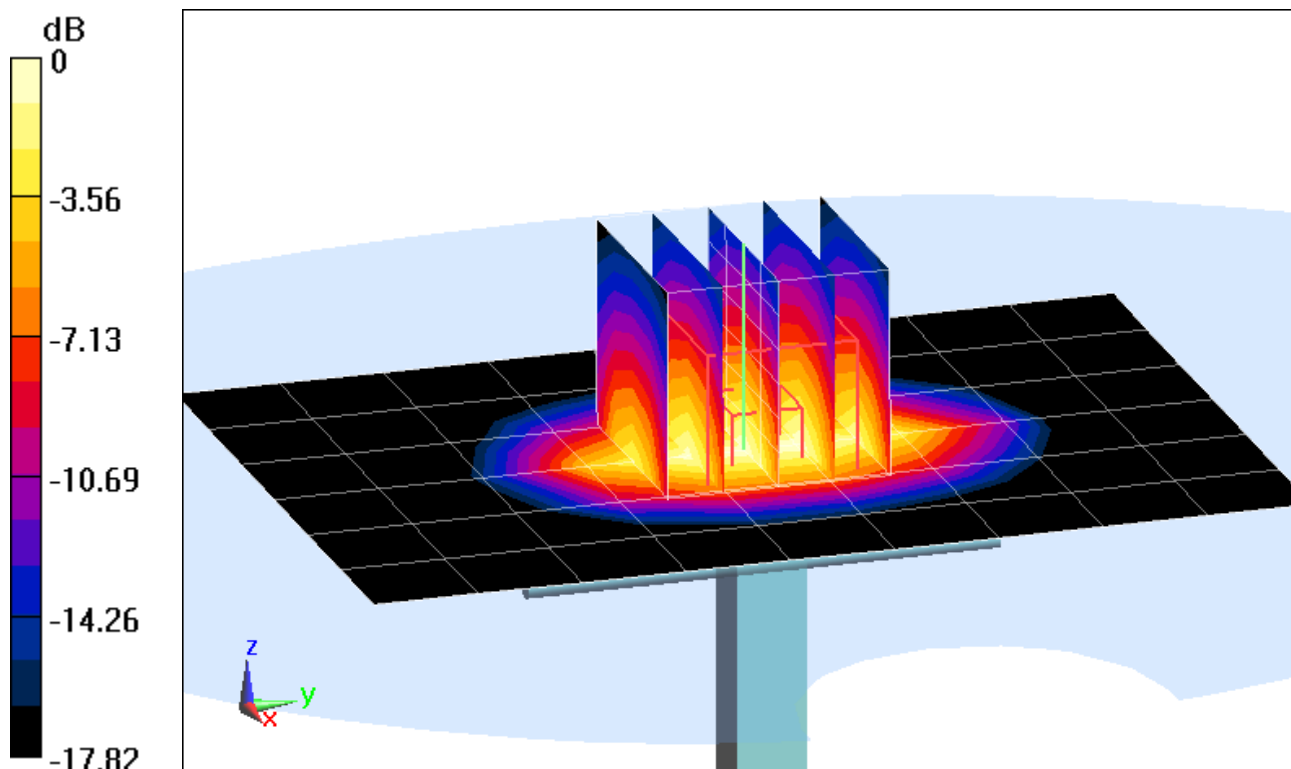
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 7.22 W/kg

SAR(1 g) = 4.03 W/kg

Deviation(1 g): 2.54%



0 dB = 5.08 W/kg = 7.06 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 1900 MHz; Type: D1900V2; Serial: 5d141

Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: 1900 Body, Medium parameters used (interpolated):

$f = 1900 \text{ MHz}$; $\sigma = 1.572 \text{ S/m}$; $\epsilon_r = 52.603$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11-24-2014; Ambient Temp: 20.6°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3319; ConvF(4.67, 4.67, 4.67); Calibrated: 4/17/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 4/11/2014

Phantom: ELI left; Type: QDOVA002AA; Serial: TP:1202

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

1900 MHz System Verification

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm

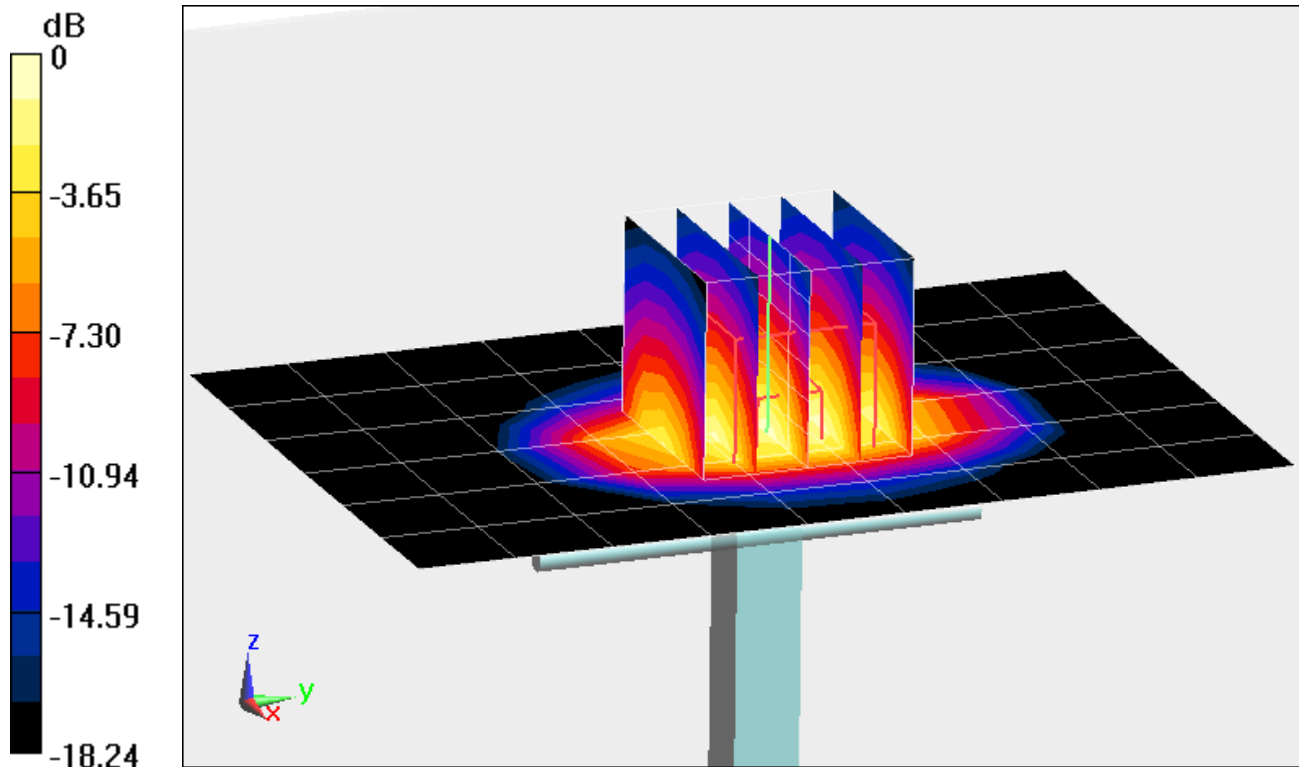
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power: 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 6.58 W/kg

SAR(1 g) = 3.76 W/kg

Deviation(1 g): -7.39%



0 dB = 4.76 W/kg = 6.78 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 2450 MHz; Type: D2450V2; Serial: 797

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Body, Medium parameters used:

$f = 2450$ MHz; $\sigma = 1.922$ S/m; $\epsilon_r = 50.754$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12-17-2014; Ambient Temp: 24.5°C; Tissue Temp: 24.3°C

Probe: ES3DV3 - SN3332; ConvF(4.31, 4.31, 4.31); Calibrated: 9/18/2014;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1323; Calibrated: 9/17/2014

Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7164)

2450 MHz System Verification

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

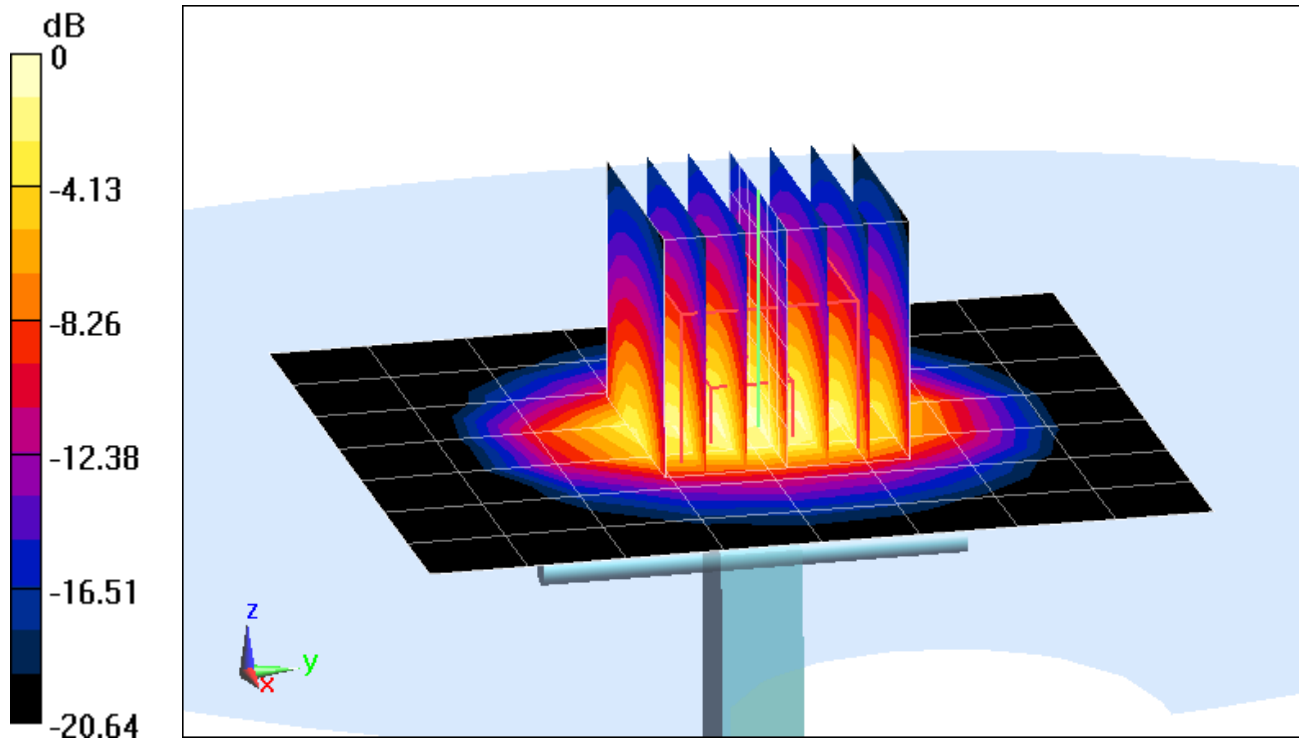
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Input Power: 20.0 dBm (100 mW)

Peak SAR (extrapolated) = 10.0 W/kg

SAR(1 g) = 4.94 W/kg

Deviation(1 g): 0.00%



0 dB = 6.45 W/kg = 8.10 dBW/kg