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SAR EVALUATION REPORT

Applicant Name:
Panasonic Corporation of North America
Two Riverfront Plaza, 9th Floor
Newark, NJ 07102-5490
United States

Date of Testing:
01/13/14 - 01/27/14
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Document Serial No.:
0Y1401030008.ACJ

FCC ID: **ACJ9TGWW13B**

APPLICANT: **PANASONIC CORPORATION OF NORTH AMERICA**

DUT Type: Portable Tablet
Application Type: Class II Permissive Change
FCC Rule Part(s): CFR §2.1093
Model(s): WW13B
Permissive Change(s) The wireless module FCC ID: ACJ9TGWW13B is integrated into the host tablet FZ-M1

Equipment Class	Band & Mode	Tx Frequency	Measured Conducted Power [dBm]	SAR 1 gm Body (W/kg)
PCB	GPRS/EDGE 850	824.20 - 848.80 MHz	31.94	1.37
PCB	GPRS/EDGE 1900	1850.20 - 1909.80 MHz	28.82	1.27
PCB	UMTS 850	826.40 - 846.60 MHz	22.56	1.19
PCB	UMTS 1750	1712.4 - 1752.5 MHz	22.76	1.20
PCB	UMTS 1900	1852.4 - 1907.6 MHz	22.66	1.17
PCB	CDMA/EVDO BC10 (§90S)	817.90 - 823.10 MHz	23.37	1.26
PCB	CDMA/EVDO BC0 (§22H)	824.70 - 848.31 MHz	23.50	1.31
PCB	PCS CDMA/EVDO	1851.25 - 1908.75 MHz	23.70	1.18
PCB	LTE Band 17	706.5 - 713.5 MHz	22.66	1.40
PCB	LTE Band 13	779.5 - 784.5 MHz	22.83	1.39
PCB	LTE Band 5 (Cell)	824.7 - 848.3 MHz	22.66	1.23
PCB	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	22.89	1.39
PCB	LTE Band 25 (PCS)	1850.7 - 1914.3 MHz	22.82	0.80
Simultaneous SAR per KDB 690783 D01v01r02:				1.43

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

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE C95.1-1992 and has been tested in accordance with the measurement procedures specified in 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

ACCREDITED
TESTING LABORATORY
CERTIFICATE #2041.01

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1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
GPRS/EDGE 850	Data	824.20 - 848.80 MHz
GPRS/EDGE 1900	Data	1850.20 - 1909.80 MHz
UMTS 850	Data	826.40 - 846.60 MHz
UMTS 1750	Data	1712.4 - 1752.5 MHz
UMTS 1900	Data	1852.4 - 1907.6 MHz
CDMA/EVDO BC10 (§90S)	Data	817.90 - 823.10 MHz
CDMA/EVDO BC0 (§22H)	Data	824.70 - 848.31 MHz
PCS CDMA/EVDO	Data	1851.25 - 1908.75 MHz
LTE Band 17	Data	706.5 - 713.5 MHz
LTE Band 13	Data	779.5 - 784.5 MHz
LTE Band 5 (Cell)	Data	824.7 - 848.3 MHz
LTE Band 4 (AWS)	Data	1710.7 - 1754.3 MHz
LTE Band 2 (PCS)	Data	1850.7 - 1909.3 MHz
LTE Band 25 (PCS)	Data	1850.7 - 1914.3 MHz

1.2 Power Reduction for SAR

This device uses a proximity sensor for SAR compliance. The proximity sensor is activated when used in close proximity to the user's body. The proximity sensor triggers power reduction for data modes and is only applicable for tablet operations.

Since the device is a full tablet size, the Body SAR was evaluated per FCC KDB Publication 616217 D04v01 for full sized tablets.

1.3 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.

Maximum Power:

Mode / Band		Burst Average GMSK (dBm)				Burst Average 8-PSK (dBm)			
		1 TX Slots	*2 TX Slots*	*3 TX Slots*	*4 TX Slots*	*1 TX Slots*	*2 TX Slots*	*3 TX Slots*	*4 TX Slots*
GPRS/EDGE 850	Maximum	**33.5**	**33.5**	**N/A**	**N/A**	**28.0**	**28.0**	**28.0**	**28.0**
	Nominal	**32.5**	**32.5**	**N/A**	**N/A**	**27.0**	**27.0**	**27.0**	**27.0**
GPRS/EDGE 1900	Maximum	**30.5**	**30.5**	**N/A**	**N/A**	**27.0**	**27.0**	**27.0**	**27.0**
	Nominal	**29.5**	**29.5**	**N/A**	**N/A**	**26.0**	**26.0**	**26.0**	**26.0**

Mode / Band		Modulated Average (dBm)			
		3GPP RMC Rel 99	*3GPP HSDPA Rel 5*	*3GPP HSUPA Rel 6*	*3GPP DC-HSDPA Rel 8*
UMTS Band 5 (850 MHz)	Maximum	**24.0**	**23.0**	**23.0**	**23.0**
	Nominal	**23.0**	**22.0**	**22.0**	**22.0**
UMTS Band 4 (1750 MHz)	Maximum	**24.0**	**23.0**	**23.0**	**23.0**
	Nominal	**23.0**	**22.0**	**22.0**	**22.0**
UMTS Band 2 (1900 MHz)	Maximum	**24.0**	**23.0**	**23.0**	**23.0**
	Nominal	**23.0**	**22.0**	**22.0**	**22.0**

Mode / Band		Modulated Average (dBm)
CDMA BC10 (§90S)	Maximum	**25.0**
	Nominal	**24.0**
CDMA BC0 (§22H)	Maximum	**25.0**
	Nominal	**24.0**
PCS CDMA	Maximum	**25.0**
	Nominal	**24.0**

Mode / Band		Modulated Average (dBm)
LTE Band 17	Maximum	**24.0**
	Nominal	**23.0**
LTE Band 13	Maximum	**24.0**
	Nominal	**23.0**
LTE Band 5 (Cell)	Maximum	**24.0**
	Nominal	**23.0**
LTE Band 4 (AWS)	Maximum	**24.0**
	Nominal	**23.0**
LTE Band 25 (PCS)	Maximum	**24.0**
	Nominal	**23.0**

With power backoff:

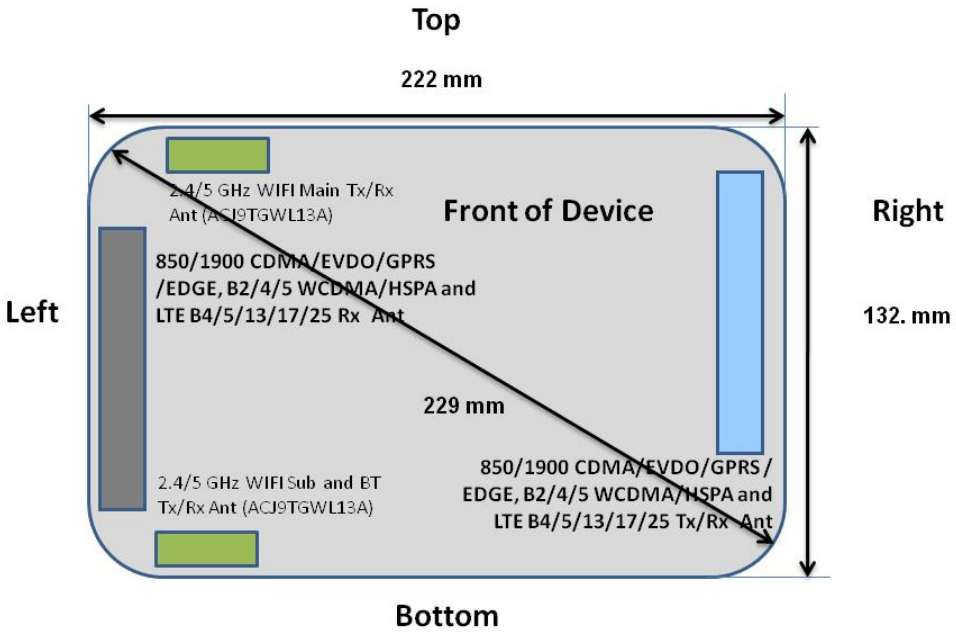
Mode / Band		Burst Average GMSK (dBm)				Burst Average 8-PSK (dBm)			
		1 TX Slots	*2 TX Slots*	*3 TX Slots*	*4 TX Slots*	*1 TX Slots*	*2 TX Slots*	*3 TX Slots*	*4 TX Slots*
GPRS/EDGE 850	Maximum	**30.0**	**26.5**	**N/A**	**N/A**	**27.5**	**26.5**	**24.5**	**23.5**
	Nominal	**29.0**	**25.5**	**N/A**	**N/A**	**26.5**	**25.5**	**23.5**	**22.5**
GPRS/EDGE 1900	Maximum	**24.5**	**20.5**	**N/A**	**N/A**	**24.0**	**21.0**	**18.5**	**18.0**
	Nominal	**23.5**	**19.5**	**N/A**	**N/A**	**23.0**	**20.0**	**17.5**	**17.0**

Mode / Band		Modulated Average (dBm)			
		3GPP RMC Rel 99	*3GPP HSDPA Rel 5*	*3GPP HSUPA Rel 6*	*3GPP DC-HSDPA Rel 8*
UMTS Band 5 (850 MHz)	Maximum	**19.5**	**19.0**	**19.0**	**19.0**
	Nominal	**18.5**	**18.0**	**18.0**	**18.0**
UMTS Band 4 (1750 MHz)	Maximum	**17.0**	**17.0**	**17.0**	**17.0**
	Nominal	**16.0**	**16.0**	**16.0**	**16.0**
UMTS Band 2 (1900 MHz)	Maximum	**15.5**	**15.5**	**15.5**	**15.5**
	Nominal	**14.5**	**14.5**	**14.5**	**14.5**

Mode / Band		Modulated Average (dBm)
CDMA BC10 (§90S)	Maximum	**19.5**
	Nominal	**18.5**
CDMA BC0 (§22H)	Maximum	**19.5**
	Nominal	**18.5**
PCS CDMA	Maximum	**16.0**
	Nominal	**15.0**

Mode / Band		Modulated Average (dBm)
LTE Band 17	Maximum	**21.5**
	Nominal	**20.5**
LTE Band 13	Maximum	**21.0**
	Nominal	**20.0**
LTE Band 5 (Cell)	Maximum	**19.5**
	Nominal	**18.5**
LTE Band 4 (AWS)	Maximum	**18.0**
	Nominal	**17.0**
LTE Band 25 (PCS)	Maximum	**15.5**
	Nominal	**14.5**

1.4 DUT Antenna Locations



Note: Exact antenna dimensions and separation distances are shown in the Technical Descriptions in the FCC Filing.

Figure 1-1
DUT Antenna Locations

Table 1-1
Sides for SAR Testing

Sides for SAR Testing					
Mode	Back	Top	Bottom	Right	Left
GPRS 850	Yes	Yes	No	Yes	No
GPRS 1900	Yes	Yes	No	Yes	No
UMTS 850	Yes	Yes	No	Yes	No
UMTS 1750	Yes	Yes	No	Yes	No
UMTS 1900	Yes	Yes	No	Yes	No
EVDO BC10 (§90S)	Yes	Yes	No	Yes	No
EVDO BC0 (§22H)	Yes	Yes	No	Yes	No
PCS EVDO	Yes	Yes	No	Yes	No
LTE Band 17	Yes	Yes	No	Yes	No
LTE Band 13	Yes	Yes	No	Yes	No
LTE Band 5 (Cell)	Yes	Yes	No	Yes	No
LTE Band 4 (AWS)	Yes	Yes	No	Yes	No
LTE Band 25 (PCS)	Yes	Yes	No	Yes	No

Note: Per KDB 616217 D04v01r01 and based on the SAR exclusion threshold in KDB 447498 D01v05R01, particular DUT edges were not required to be evaluated for SAR

1.5 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 1-2 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 1-2
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.

Table 1-2
Simultaneous Transmission Scenarios

Ref.	Simultaneous Transmit Configurations	Body FCC KDB 616217	Note
1	1X CDMA/EVDO BC0 Data + 2.4/5 GHz WIFI	Yes	
2	1X CDMA/EVDO BC1 Data + 2.4/5 GHz WIFI	Yes	
3	1X CDMA/EVDO BC10 Data + 2.4/5 GHz WIFI	Yes	
4	1X CDMA/EVDO BC0 Data + 2.4 GHz Bluetooth	Yes	
5	1X CDMA/EVDO BC1 Data + 2.4 GHz Bluetooth	Yes	
6	1X CDMA/EVDO BC10 Data + 2.4 GHz Bluetooth	Yes	
7	GPRS/EDGE 850 Data + 2.4/5 GHz WIFI	Yes	
8	GPRS/EDGE 1900 Data + 2.4/5 GHz WIFI	Yes	
9	GPRS/EDGE 850 Data + 2.4 GHz Bluetooth	Yes	
10	GPRS/EDGE 1900 Data + 2.4 GHz Bluetooth	Yes	
11	UMTS B2 Data + 2.4/5 GHz WIFI	Yes	
12	UMTS B4 Data + 2.4/5 GHz WIFI	Yes	
13	UMTS B5 Data + 2.4/5 GHz WIFI	Yes	
14	UMTS B2 Data + 2.4 GHz Bluetooth	Yes	
15	UMTS B4 Data + 2.4 GHz Bluetooth	Yes	
16	UMTS B5 Data + 2.4 GHz Bluetooth	Yes	
17	LTE B4 Data + 2.4/5 GHz WIFI	Yes	
18	LTE B5 Data + 2.4/5 GHz WIFI	Yes	
19	LTE B13 Data + 2.4/5 GHz WIFI	Yes	
20	LTE B17 Data + 2.4/5 GHz WIFI	Yes	
21	LTE B25 Data + 2.4/5 GHz WIFI	Yes	
22	LTE B4 Data + 2.4 GHz Bluetooth	Yes	
23	LTE B5 Data + 2.4 GHz Bluetooth	Yes	
24	LTE B13 Data + 2.4 GHz Bluetooth	Yes	
25	LTE B17 Data + 2.4 GHz Bluetooth	Yes	
26	LTE B25 Data + 2.4 GHz Bluetooth	Yes	
27	LTE + CDMA	N/A	Not Supported by HW
28	LTE + GPRS/EDGE	N/A	Not Supported by HW
29	LTE + UMTS	N/A	Not Supported by HW
30	2.4/5 GHz WIFI + 2.4 GHz Bluetooth	N/A	Not Supported by HW

Notes:

1. LTE, CDMA, GPRS/EDGE, and UMTS share the sampe antenna path and cannot transmit simultaneously

2. Bluetooth and 2.4/5 GHz WLAN share the same antenna path and cannot transmit simultaneously.

1.6 SAR Test Exclusions Applied

(A) Licensed Transmitter(s)

This device is only capable of QPSK HSUPA in the uplink. Therefore, no additional SAR tests are required beyond that described for devices with HSUPA in KDB 941225 D01v02.

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.

This Device additionally supports LTE B2. LTE Band 25 and LTE Band 2 share the same transmission path. LTE Band 2 was not evaluated for SAR since the supported frequency range falls within the LTE Band 25 supported frequency range.

1.7 Guidance Applied

- FCC KDB Publication 941225 D01-D06 (2G/3G/4G)
- FCC KDB Publication 447498 D01v05 (General SAR Guidance)
- FCC KDB Publication 865664 D01-D02 (SAR Measurements up to 6 GHz)
- FCC KDB Publication 616217 D04v01 (Tablet SAR Consideration)

1.8 Device Serial Numbers

Several samples were used with identical hardware to support SAR testing. Power level was configured for testing via software only available to the manufacturer (end user cannot control power level). The manufacturer has confirmed that the device(s) tested have the same mechanical and thermal characteristics and are within operational tolerances expected for production units.

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Mode	Max Power Serial Number	Reduced Power Serial Number
GSM/GPRS/EDGE 850	20	22
GSM/GPRS/EDGE 1900	20	20
UMTS 850	20	22
UMTS 1750	20	35
UMTS 1900	104	22
CDMA/EVDO BC10 (§90S)	35	35
CDMA/EVDO BC0 (§22H)	35	35
PCS CDMA/EVDO	35	35
LTE Band 17	21	21
LTE Band 13	22	22
LTE Band 5 (Cell)	104	22
LTE Band 4 (AWS)	35	35
LTE Band 25 (PCS)	22	20

2 LTE INFORMATION

LTE Information			
FCC ID	**ACJ9TGWW13B**		
Form Factor	Portable Tablet		
Frequency Range of each LTE transmission band	LTE Band 17 (706.5 - 713.5 MHz)		
	LTE Band 13 (779.5 - 784.5 MHz)		
	LTE Band 5 (Cell) (824.7 - 848.3 MHz)		
	LTE Band 4 (AWS) (1710.7 - 1754.3 MHz)		
	LTE Band 2 (PCS) (1850.7 - 1909.3 MHz)		
	LTE Band 25 (PCS) (1850.7 - 1914.3 MHz)		
Channel Bandwidths	LTE Band 17: 5 MHz, 10 MHz		
	LTE Band 13: 5 MHz, 10 MHz		
	LTE Band 5 (Cell): 1.4 MHz, 3 MHz, 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		
	LTE Band 25 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz		
Channel Numbers and Frequencies (MHz)	Low	Mid	High
LTE Band 17: 5 MHz	706.5 (23755)	710 (23790)	713.5 (23825)
LTE Band 17: 10 MHz	709 (23780)	710 (23790)	711 (23800)
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 5 (Cell): 1.4 MHz	824.7 (20407)	836.5 (20525)	848.3 (20643)
LTE Band 5 (Cell): 3 MHz	825.5 (20415)	836.5 (20525)	847.5 (20635)
LTE Band 5 (Cell): 5 MHz	826.5 (20425)	836.5 (20525)	846.5 (20625)
LTE Band 5 (Cell): 10 MHz	829 (20450)	836.5 (20525)	844 (20600)
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)
LTE Band 25 (PCS): 1.4 MHz	1850.7 (26047)	1882.5 (26365)	1914.3 (26683)
LTE Band 25 (PCS): 3 MHz	1851.5 (26055)	1882.5 (26365)	1913.5 (26675)
LTE Band 25 (PCS): 5 MHz	1852.5 (26065)	1882.5 (26365)	1912.5 (26665)
LTE Band 25 (PCS): 10 MHz	1855 (26090)	1882.5 (26365)	1910 (26640)
LTE Band 25 (PCS): 15 MHz	1857.5 (26115)	1882.5 (26365)	1907.5 (26615)
LTE Band 25 (PCS): 20 MHz	1860 (26140)	1882.5 (26365)	1905 (26590)
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		

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/m^3)
E = Total RMS electric field strength (V/m)

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

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:

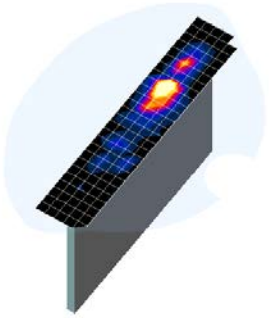

Figure 4-1
Sample SAR Area Scan

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.

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

5 SAR TESTING PROCEDURES

5.1 SAR Testing for Tablet per KDB Publication 616217 D04v01

This device can be used also in full sized tablet exposure conditions, due to its size. Per FCC KDB 616217, the back surface and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom. The SAR Exclusion Threshold in KDB 447498 D01v05 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom.

5.2 Additional Test Positions due to Proximity Sensor Considerations

This device uses a proximity sensor to reduce powers in tablet-device use conditions.

While the device is touching the user on the antenna, the proximity sensor activates and reduces the maximum output power allowed. However, the sensor is not active when the device is moved beyond the sensor triggering distance and the maximum output power is no longer limited. Therefore, an additional exposure condition is needed in the vicinity of the triggering distance to ensure SAR is compliant when the device is allowed to operate at a non-reduced output power level.

FCC KDB 616217 D04 Section 6 was used as a guideline for selecting SAR test distances for this device at these additional exposure conditions. Since the proximity sensor activation distance for the back side of the device is 20 mm, a conservative distance of 19 mm was tested for SAR on the back side at maximum power. Since the proximity sensor activation distance for the right edge of the device is 15 mm, a conservative distance of 14 mm was tested for SAR on the right edge at maximum power. Sensor triggering distance summary data is included in Appendix G. The proximity sensor does not trigger power reduction from the front of the device.

The sensor is designed to support sufficient detection range and sensitivity to cover regions of the sensors in all applicable directions since the sensor entirely covers the antenna.

6 RF EXPOSURE LIMITS

6.1 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.

6.2 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 6-1
SAR Human Exposure Specified in ANSI/IEEE C95.1-1992 and Health Canada Safety Code 6

HUMAN EXPOSURE LIMITS		
	UNCONTROLLED ENVIRONMENT *General Population* (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT *Occupational* (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.

7 FCC MEASUREMENT PROCEDURES

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

7.1 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.

7.2 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.

7.3 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.

7.3.1 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 7-1 parameters were applied.
3. If the MS supports the RC 3 Reverse FCH, RC3 Reverse SCH_0 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 7-2 was applied.

Table 7-1
Parameters for Max. Power for RC1

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

Table 7-2
Parameters for Max. Power for RC3

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

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

7.3.2 Body SAR Measurements for EVDO

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. 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.

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 ¼ 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.

7.4 SAR Measurement Conditions for UMTS

7.4.1 Output Power Verification

Maximum output power is measured on the High, Middle and Low channels for each applicable transmission band according to the general descriptions in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all "1s".

Maximum output power is verified on the High, Middle and Low channels according to the general descriptions in section 5.2 of 3GPP TS 34.121 (release 5), using the appropriate RMC with TPC (transmit power control) set to all "1s" or applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HS-DPCCH etc) are tabulated in this test report. All configurations that are not supported by the DUT or cannot be measured due to technical or equipment limitations are identified.

7.4.2 Body SAR Measurements

SAR for body exposure configurations is measured using the 12.2 kbps RMC with the TPC bits all "1s".

7.4.3 Procedures Used to Establish RF Signal for SAR HSDPA Data Devices

The following procedures are applicable to HSDPA data devices operating under 3GPP Release 5. Body exposure conditions are typically applicable to these devices, including handsets and data modems operating in various electronic devices. HSDPA operates in conjunction with UMTS and

requires an active DPCCH. The default test configuration is to measure SAR in UMTS without HSDPA, with an established radio link between the DUT and a communication test set with 12.2 kbps RMC mode configured in Test Loop Mode 1; and tested with HSDPA with FRC and a 12.2 kbps RMC using the highest SAR configuration in UMTS. SAR is selectively confirmed for other physical channel configurations according to output power, exposure conditions and device operating capabilities. Maximum output power is verified according to 3GPP TS 23.121 (Release 5) and SAR must be measured according to these maximum output conditions.

Sub-Test	β_c	β_d	β_d *(SF)*	β_c/β_d	β_{HS} *(Note1, Note 2)*	CM (dB) *(Note 3)*	MPR (dB) *(Note 3)*
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 *(Note 4)*	15/15 *(Note 4)*	64	12/15 *(Note 4)*	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$.
Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and $\Delta_{NACK} = 8$ ($A_{hs} = 30/15$) with $\beta_{hs} = 30/15 * \beta_c$, and $\Delta_{CQI} = 7$ ($A_{hs} = 24/15$) with $\beta_{hs} = 24/15 * \beta_c$.
Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

7.4.1 SAR Measurement Conditions for HSUPA Data Devices

SAR for body exposure configurations are measured according to the 'Body SAR Measurements' procedures in the 'WCDMA Handsets' section of the KDB 941225 D01 FCC 3G document. In addition, Body SAR is also measured for HSPA when the maximum average output of each RF channel with HSPA active is at least ¼ dB higher of that measured without HSPA in 12.2 kbps RMC mode or the maximum SAR for 12.2 kbps RMC is above 75% of the SAR limit. Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 with power control algorithm 2, according to the highest body SAR configuration in 12.2 kbps RMC without HSPA. When VOIP is applicable for head exposure, SAR is not required when the maximum output of each RF channel with HSPA is less than ¼ dB higher than that measured using 12.2 kbps RMC; otherwise, the same HSPA configuration used for body measurements should be used to test for head exposure.

Due to inner loop power control requirements in HSPA, a commercial communication test set should be used for the output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and EDCH configurations for HSPA should be configured according to the β values indicated below as well as other applicable procedures described in the 'WCDMA Handset' and 'Release 5 HSDPA Data Devices' sections of the FCC 3G document.

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs}(1)	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM(2) (dB)	MPR (dB)	AG(4) Index	E-TFCI
1	11/15(3)	15/15(3)	64	11/15(3)	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}: 47/15 β_{ed2}: 47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15(4)	15/15(4)	64	15/15(4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$.
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 14/15$ and $\beta_d = 15/15$.
Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.
Note 6: β_{ed} can not be set directly; it is set by Absolute Grant Value.

7.4.2 SAR Measurement Conditions for DC-HSDPA

SAR test exclusion for DC-HSDPA devices is determined by power measurements according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1. A primary and a secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to qualify for SAR test exclusion. DC-HSDPA uplink maximum output power measurements using the four Rel. 5 HSDPA subtests in Table C.10.1.4 of TS 234.121-1 is required.

When the maximum average output power of each RF channel with DC-HSDPA active is ≤ ¼ dB higher than that measured using 12.2 kbps RMC, or the maximum reported SAR for 12.2 kbps RMC is ≤ 75% of the SAR limit, SAR evaluation for DC-HSDPA is not required.

7.5 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).

7.5.1 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.

7.5.2 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.

7.5.3 A-MPR

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

7.5.4 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 ½ dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is <1.45 W/kg.

8 RF CONDUCTED POWERS

8.1 GPRS/EDGE Conducted Powers

Table 8-1
Maximum GPRS/EDGE Average RF Conducted Powers

		Maximum Burst-Averaged Output Power					
		GPRS Data (GMSK)		*EDGE Data (8-PSK)*			
Band	**Channel**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 850	128	32.08	**31.93**	26.62	26.45	26.32	26.11
	190	32.07	**31.94**	26.55	26.29	26.27	26.18
	251	31.96	**31.85**	26.44	26.28	26.13	26.04
GSM 1900	512	28.89	**28.82**	25.15	25.00	25.10	25.00
	661	28.99	**28.81**	25.04	25.04	25.01	25.03
	810	28.83	**28.78**	25.09	25.02	25.00	25.08
		Calculated Maximum Frame-Averaged Output Power					
		GPRS Data (GMSK)		*EDGE Data (8-PSK)*			
Band	**Channel**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 850	128	23.05	**25.91**	17.59	20.43	22.06	23.10
	190	23.04	**25.92**	17.52	20.27	22.01	23.17
	251	22.93	**25.83**	17.41	20.26	21.87	23.03
GSM 1900	512	19.86	**22.80**	16.12	18.98	20.84	21.99
	661	19.96	**22.79**	16.01	19.02	20.75	22.02
	810	19.80	**22.76**	16.06	19.00	20.74	22.07
GSM 850	**Frame Avg. Targets:**	23.47	**26.48**	17.97	20.98	22.74	23.99
GSM 1900		20.47	**23.48**	16.97	19.98	21.74	22.99

Table 8-2
Reduced GPRS/EDGE Average RF Conducted Powers

		Maximum Burst-Averaged Output Power					
		GPRS Data (GMSK)		*EDGE Data (8-PSK)*			
Band	**Channel**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 850	128	**29.99**	26.44	27.12	26.44	24.44	23.50
	190	**30.00**	26.50	27.00	26.46	24.43	23.24
	251	**29.90**	26.48	27.21	26.46	24.42	23.50
GSM 1900	512	**23.86**	20.00	24.00	20.76	18.15	17.12
	661	**23.75**	20.14	23.93	20.71	18.00	16.88
	810	**23.90**	20.12	24.00	20.69	18.13	16.94

		Calculated Maximum Frame-Averaged Output Power					
		GPRS Data (GMSK)		*EDGE Data (8-PSK)*			
Band	**Channel**	**GPRS [dBm] 1 Tx Slot**	**GPRS [dBm] 2 Tx Slot**	**EDGE [dBm] 1 Tx Slot**	**EDGE [dBm] 2 Tx Slot**	**EDGE [dBm] 3 Tx Slot**	**EDGE [dBm] 4 Tx Slot**
GSM 850	128	**20.96**	20.42	18.09	20.42	20.18	20.49
	190	**20.97**	20.48	17.97	20.44	20.17	20.23
	251	**20.87**	20.46	18.18	20.44	20.16	20.49
GSM 1900	512	**14.83**	13.98	14.97	14.74	13.89	14.11
	661	**14.72**	14.12	14.90	14.69	13.74	13.87
	810	**14.87**	14.10	14.97	14.67	13.87	13.93
GSM 850	**Frame Avg. Targets:**	**19.97**	19.48	17.47	19.48	19.24	19.49
GSM 1900		**14.47**	13.48	13.97	13.98	13.24	13.99

Note:

1. Both burst-averaged and calculated frame-averaged powers are included. Frame-averaged power was calculated from the measured burst-averaged power by converting the slot powers into linear units and calculating the energy over 8 timeslots.
2. The source-based frame-averaged output power was evaluated for all GPRS/EDGE slot configurations. The configuration with the highest target frame averaged output power was evaluated for SAR. When the maximum frame-averaged powers are equivalent across two or more slots (within 0.25 dB), the configuration with the most number of time slots was tested.
3. GPRS (GMSK) output powers were measured with coding scheme setting of 1 (CS1) on the base station simulator. CS1 was configured to measure GPRS output power measurements and SAR to ensure GMSK modulation in the signal. Our Investigation has shown that CS1 - CS4 settings do not have any impact on the output levels or modulation in the GPRS modes.
4. EDGE (8-PSK) output powers were measured with MCS7 on the base station simulator. MCS7 coding scheme was used to measure the output powers for EDGE since investigation has shown that choosing MCS7 coding scheme will ensure 8-PSK modulation. It has been shown that MCS levels that produce 8PSK modulation do not have an impact on output power.

GSM Class: C
GPRS Multislot class: 10
EDGE Multislot class: 12
DTM Multislot Class: N/A

Figure 8-1
Power Measurement Setup

8.2 UMTS Conducted Powers

Table 8-3
Maximum UMTS Average RF Conducted Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	1312	1412	1862	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	22.56	22.56	22.53	22.66	22.76	22.70	22.66	22.62	22.63	-
6	HSDPA	Subtest 1	22.08	22.04	22.00	21.68	21.81	21.74	21.73	21.91	21.93	0
6		Subtest 2	21.87	21.97	22.08	21.87	21.93	21.93	21.74	21.96	21.91	0
6		Subtest 3	21.45	21.62	21.56	21.29	21.39	21.35	21.39	21.41	21.46	0.5
6		Subtest 4	21.42	21.50	21.75	21.31	21.41	21.44	21.20	21.39	21.51	0.5
6	HSUPA	Subtest 1	22.30	22.17	22.05	21.73	21.81	21.31	21.30	21.37	21.65	0
6		Subtest 2	20.72	20.45	20.50	20.40	20.44	20.48	20.17	20.34	20.40	2
6		Subtest 3	21.00	20.64	20.62	20.56	20.66	20.65	20.43	20.71	20.63	1
6		Subtest 4	21.00	20.97	20.75	20.67	20.77	20.13	20.93	21.00	20.74	2
6		Subtest 5	21.95	22.09	22.12	21.78	21.83	21.95	21.64	21.93	21.89	0
8	DC-HSDPA	Subtest 1	22.03	21.96	22.04	21.70	21.76	21.95	21.68	21.93	22.07	0
8		Subtest 2	21.99	22.08	21.97	21.75	21.86	22.07	21.80	22.00	21.93	0
8		Subtest 3	21.39	21.87	21.70	21.41	21.40	21.51	21.31	21.49	21.51	0.5
8		Subtest 4	21.50	21.58	21.67	21.23	21.32	21.54	21.42	21.56	21.50	0.5

Table 8-4
Reduced UMTS Average RF Conducted Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	1312	1412	1862	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	18.99	18.96	18.90	16.71	16.91	16.93	15.42	15.05	15.49	-
6	HSDPA	Subtest 1	18.55	18.52	18.46	16.26	16.36	16.30	14.90	14.64	15.00	0
6		Subtest 2	18.45	18.51	18.47	16.23	16.36	16.46	14.76	14.50	15.00	0
6		Subtest 3	17.94	18.00	17.85	15.79	15.82	15.78	14.22	13.95	14.60	0.5
6		Subtest 4	17.93	17.86	17.83	15.76	15.92	15.88	14.25	14.00	14.69	0.5
6	HSUPA	Subtest 1	18.37	17.67	17.87	16.19	16.29	15.80	14.74	14.00	15.00	0
6		Subtest 2	17.00	16.88	16.83	14.50	14.58	14.95	13.36	13.00	13.50	2
6		Subtest 3	17.60	17.00	17.09	15.33	15.45	15.47	13.61	13.20	14.00	1
6		Subtest 4	17.00	16.90	16.88	14.85	15.00	14.89	13.50	12.98	13.50	2
6		Subtest 5	18.50	18.43	18.34	16.25	16.36	16.47	14.95	14.70	15.36	0
8	DC-HSDPA	Subtest 1	18.49	18.38	18.44	16.27	16.36	16.41	14.85	14.43	15.17	0
8		Subtest 2	18.44	18.36	18.34	16.27	16.35	16.47	14.80	14.71	15.30	0
8		Subtest 3	18.03	18.00	18.02	15.79	15.88	15.81	14.23	14.00	14.67	0.5
8		Subtest 4	17.96	17.88	17.90	15.71	15.86	15.87	14.24	14.04	14.79	0.5

UMTS SAR was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v02. HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg.

DC-HSDPA considerations

- 3GPP Specification 34.121-1 Release 8 Ver 8.10.0 was used for DC-HSDPA guidance
- H-Set 12 (QPSK) was confirmed to be used during DC-HSDPA measurements
- Measured maximum output powers for DC-HSDPA were not greater than 1/4 dB higher than the WCDMA 12.2 kbps RMC maximum output, as a result, SAR is not required for DC-HSDPA
- The DUT supports UE category 24 for HSDPA

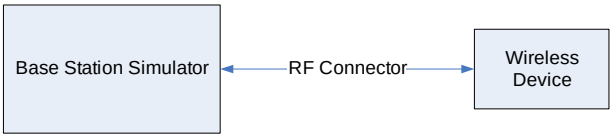

Figure 8-2
Power Measurement Setup

8.3 CDMA Conducted Powers

Table 8-5
Maximum CDMA Conducted Powers

Band	Channel	Rule Part	Frequency	TDSO SO32 [dBm]	TDSO SO32 [dBm]	1x EvDO Rev. 0 [dBm]	1x EvDO Rev. A [dBm]
	F-RC		MHz	FCH+SCH	FCH	(RTAP)	(RETAP)
Cellular	564	90S	820.1	23.41	23.38	23.37	23.36
Cellular	1013	22H	824.7	23.59	23.70	23.47	23.46
	384	22H	836.52	23.57	23.56	23.50	23.49
	777	22H	848.31	23.17	23.19	23.21	23.20
PCS	25	24E	1851.25	23.67	23.70	23.70	23.69
	600	24E	1880	23.36	23.47	23.43	23.41
	1175	24E	1908.75	23.53	23.51	23.51	23.50

Table 8-6
Reduced CDMA Conducted Powers

Band	Channel	Rule Part	Frequency	TDSO SO32 [dBm]	TDSO SO32 [dBm]	1x EvDO Rev. 0 [dBm]	1x EvDO Rev. A [dBm]
	F-RC		MHz	FCH+SCH	FCH	(RTAP)	(RETAP)
Cellular	564	90S	820.1	19.49	19.46	19.50	19.45
Cellular	1013	22H	824.7	19.46	19.50	19.48	19.47
	384	22H	836.52	19.30	19.29	19.25	19.23
	777	22H	848.31	19.17	19.19	19.22	19.20
PCS	25	24E	1851.25	15.81	15.84	15.85	15.83
	600	24E	1880	15.83	15.94	15.90	15.88
	1175	24E	1908.75	15.93	15.91	15.91	15.90

Note:

1. For FCC Rule Part 90S, Per FCC KDB Publication 447498 D01v05 4.1.6, only one channel is required since the device operates within the transmission range of 817.90 – 823.10 MHz**.**
2. Per KDB Publication 941225 D01v02: Body 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 data devices when the maximum average output of each channel is less than ¼ dB higher than that measured in Subtype 0/1 Physical Layer configurations for Rev. 0

Figure 8-3
Power Measurement Setup

8.4 LTE Conducted Powers

Table 8-7
Maximum LTE Band 17 Conducted Powers - 10 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
710.0	23790	10	QPSK	1	0	**22.66**	0	0
710.0	23790	10	QPSK	1	25	22.53	0	0
710.0	23790	10	QPSK	1	49	22.52	0	0
710.0	23790	10	QPSK	25	0	21.63	1	0-1
710.0	23790	10	QPSK	25	12	21.94	1	0-1
710.0	23790	10	QPSK	25	25	**21.95**	1	0-1
710.0	23790	10	QPSK	50	0	21.73	1	0-1
710.0	23790	10	16QAM	1	0	21.95	1	0-1
710.0	23790	10	16QAM	1	25	22.04	1	0-1
710.0	23790	10	16QAM	1	49	22.02	1	0-1
710.0	23790	10	16QAM	25	0	20.90	2	0-2
710.0	23790	10	16QAM	25	12	20.88	2	0-2
710.0	23790	10	16QAM	25	25	20.69	2	0-2
710.0	23790	10	16QAM	50	0	20.67	2	0-2

Note: LTE Band 17 at 10 MHz Bandwidth does not support three non-overlapping channels. Per KDB 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the mid channel of the group of overlapping channels should be selected for testing

Table 8-8
Maximum LTE Band 17 Conducted Powers - 5 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
710.0	23790	5	QPSK	1	0	22.80	0	0
710.0	23790	5	QPSK	1	12	22.94	0	0
710.0	23790	5	QPSK	1	24	22.82	0	0
710.0	23790	5	QPSK	12	0	21.71	1	0-1
710.0	23790	5	QPSK	12	6	22.04	1	0-1
710.0	23790	5	QPSK	12	13	22.03	1	0-1
710.0	23790	5	QPSK	25	0	21.87	1	0-1
710.0	23790	5	16-QAM	1	0	21.87	1	0-1
710.0	23790	5	16-QAM	1	12	21.62	1	0-1
710.0	23790	5	16-QAM	1	24	21.54	1	0-1
710.0	23790	5	16-QAM	12	0	20.75	2	0-2
710.0	23790	5	16-QAM	12	6	21.12	2	0-2
710.0	23790	5	16-QAM	12	13	21.15	2	0-2
710.0	23790	5	16-QAM	25	0	20.84	2	0-2

Note: LTE Band 17 at 5 MHz Bandwidth does not support three non-overlapping channels. Per KDB 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the mid channel of the group of overlapping channels should be selected for testing

Table 8-9
Reduced LTE Band 17 Conducted Powers - 10 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
710.0	23790	10	QPSK	1	0	**20.88**	0	0
710.0	23790	10	QPSK	1	25	20.65	0	0
710.0	23790	10	QPSK	1	49	20.67	0	0
710.0	23790	10	QPSK	25	0	20.76	0	0-1
710.0	23790	10	QPSK	25	12	20.79	0	0-1
710.0	23790	10	QPSK	25	25	**20.90**	0	0-1
710.0	23790	10	QPSK	50	0	20.83	0	0-1
710.0	23790	10	16QAM	1	0	20.87	0	0-1
710.0	23790	10	16QAM	1	25	21.00	0	0-1
710.0	23790	10	16QAM	1	49	20.89	0	0-1
710.0	23790	10	16QAM	25	0	20.88	0	0-2
710.0	23790	10	16QAM	25	12	20.93	0	0-2
710.0	23790	10	16QAM	25	25	20.89	0	0-2
710.0	23790	10	16QAM	50	0	20.83	0	0-2

Note: LTE Band 17 at 10 MHz Bandwidth does not support three non-overlapping channels. Per KDB 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the mid channel of the group of overlapping channels should be selected for testing

Table 8-10
Reduced LTE Band 17 Conducted Powers - 5 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
710.0	23790	5	QPSK	1	0	20.81	0	0
710.0	23790	5	QPSK	1	12	20.94	0	0
710.0	23790	5	QPSK	1	24	20.97	0	0
710.0	23790	5	QPSK	12	0	21.00	0	0-1
710.0	23790	5	QPSK	12	6	20.98	0	0-1
710.0	23790	5	QPSK	12	13	20.96	0	0-1
710.0	23790	5	QPSK	25	0	20.89	0	0-1
710.0	23790	5	16-QAM	1	0	20.54	0	0-1
710.0	23790	5	16-QAM	1	12	20.61	0	0-1
710.0	23790	5	16-QAM	1	24	20.77	0	0-1
710.0	23790	5	16-QAM	12	0	21.00	0	0-2
710.0	23790	5	16-QAM	12	6	20.98	0	0-2
710.0	23790	5	16-QAM	12	13	20.96	0	0-2
710.0	23790	5	16-QAM	25	0	20.90	0	0-2

Note: LTE Band 17 at 5 MHz Bandwidth does not support three non-overlapping channels. Per KDB 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the mid channel of the group of overlapping channels should be selected for testing

Table 8-11
Maximum LTE Band 13 Conducted Powers - 10 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
782.0	23230	10	QPSK	1	0	22.50	0	0
782.0	23230	10	QPSK	1	25	22.80	0	0
782.0	23230	10	QPSK	1	49	**22.83**	0	0
782.0	23230	10	QPSK	25	0	**22.00**	1	0-1
782.0	23230	10	QPSK	25	12	21.81	1	0-1
782.0	23230	10	QPSK	25	25	21.61	1	0-1
782.0	23230	10	QPSK	50	0	21.67	1	0-1
782.0	23230	10	16QAM	1	0	21.57	1	0-1
782.0	23230	10	16QAM	1	25	21.94	1	0-1
782.0	23230	10	16QAM	1	49	21.88	1	0-1
782.0	23230	10	16QAM	25	0	20.67	2	0-2
782.0	23230	10	16QAM	25	12	20.73	2	0-2
782.0	23230	10	16QAM	25	25	20.71	2	0-2
782.0	23230	10	16QAM	50	0	20.51	2	0-2

Note: LTE Band 13 at 10 MHz Bandwidth does not support three non-overlapping channels. Per KDB 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the mid channel of the group of overlapping channels should be selected for testing

Table 8-12
Maximum LTE Band 13 Conducted Powers - 5 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
782.0	23230	5	QPSK	1	0	22.61	0	0
782.0	23230	5	QPSK	1	12	22.66	0	0
782.0	23230	5	QPSK	1	24	22.72	0	0
782.0	23230	5	QPSK	12	0	21.66	1	0-1
782.0	23230	5	QPSK	12	6	21.87	1	0-1
782.0	23230	5	QPSK	12	13	21.92	1	0-1
782.0	23230	5	QPSK	25	0	21.75	1	0-1
782.0	23230	5	16-QAM	1	0	21.54	1	0-1
782.0	23230	5	16-QAM	1	12	21.55	1	0-1
782.0	23230	5	16-QAM	1	24	21.56	1	0-1
782.0	23230	5	16-QAM	12	0	20.78	2	0-2
782.0	23230	5	16-QAM	12	6	20.93	2	0-2
782.0	23230	5	16-QAM	12	13	20.98	2	0-2
782.0	23230	5	16-QAM	25	0	20.59	2	0-2

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

Table 8-13
Reduced LTE Band 13 Conducted Powers - 10 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
782.0	23230	10	QPSK	1	0	20.56	0	0
782.0	23230	10	QPSK	1	25	20.64	0	0
782.0	23230	10	QPSK	1	49	**20.80**	0	0
782.0	23230	10	QPSK	25	0	**20.50**	0	0-1
782.0	23230	10	QPSK	25	12	20.47	0	0-1
782.0	23230	10	QPSK	25	25	20.48	0	0-1
782.0	23230	10	QPSK	50	0	20.49	0	0-1
782.0	23230	10	16QAM	1	0	20.47	0	0-1
782.0	23230	10	16QAM	1	25	20.50	0	0-1
782.0	23230	10	16QAM	1	49	20.45	0	0-1
782.0	23230	10	16QAM	25	0	19.50	0	0-2
782.0	23230	10	16QAM	25	12	19.43	0	0-2
782.0	23230	10	16QAM	25	25	19.46	0	0-2
782.0	23230	10	16QAM	50	0	19.49	0	0-2

Note: LTE Band 13 at 10 MHz Bandwidth does not support three non-overlapping channels. Per KDB 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the mid channel of the group of overlapping channels should be selected for testing

Table 8-14
Reduced LTE Band 13 Conducted Powers - 5 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
782.0	23230	5	QPSK	1	0	20.56	0	0
782.0	23230	5	QPSK	1	12	20.63	0	0
782.0	23230	5	QPSK	1	24	20.76	0	0
782.0	23230	5	QPSK	12	0	20.50	0	0-1
782.0	23230	5	QPSK	12	6	20.48	0	0-1
782.0	23230	5	QPSK	12	13	20.47	0	0-1
782.0	23230	5	QPSK	25	0	20.50	0	0-1
782.0	23230	5	16-QAM	1	0	20.49	0	0-1
782.0	23230	5	16-QAM	1	12	20.50	0	0-1
782.0	23230	5	16-QAM	1	24	20.44	0	0-1
782.0	23230	5	16-QAM	12	0	19.50	0	0-2
782.0	23230	5	16-QAM	12	6	19.48	0	0-2
782.0	23230	5	16-QAM	12	13	19.47	0	0-2
782.0	23230	5	16-QAM	25	0	19.50	0	0-2

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

Table 8-15
Maximum LTE Band 5 (Cell) Conducted Powers - 10 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
836.5	20525	10	QPSK	1	0	22.57	0	0
836.5	20525	10	QPSK	1	25	22.58	0	0
836.5	20525	10	QPSK	1	49	**22.66**	0	0
836.5	20525	10	QPSK	25	0	21.56	1	0-1
836.5	20525	10	QPSK	25	12	**21.70**	1	0-1
836.5	20525	10	QPSK	25	25	21.54	1	0-1
836.5	20525	10	QPSK	50	0	21.54	1	0-1
836.5	20525	10	16QAM	1	0	21.76	1	0-1
836.5	20525	10	16QAM	1	25	21.91	1	0-1
836.5	20525	10	16QAM	1	49	21.78	1	0-1
836.5	20525	10	16QAM	25	0	20.59	2	0-2
836.5	20525	10	16QAM	25	12	20.63	2	0-2
836.5	20525	10	16QAM	25	25	20.57	2	0-2
836.5	20525	10	16QAM	50	0	20.55	2	0-2

Note: LTE Band 5 at 10 MHz Bandwidth does not support three non-overlapping channels. Per KDB 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the mid channel of the group of overlapping channels should be selected for testing

Table 8-16
Maximum LTE Band 5 (Cell) Conducted Powers - 5 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
826.5	20425	5	QPSK	1	0	22.62	0	0
826.5	20425	5	QPSK	1	12	22.64	0	0
826.5	20425	5	QPSK	1	24	22.58	0	0
826.5	20425	5	QPSK	12	0	21.86	1	0-1
826.5	20425	5	QPSK	12	6	21.62	1	0-1
826.5	20425	5	QPSK	12	13	21.53	1	0-1
826.5	20425	5	QPSK	25	0	21.54	1	0-1
826.5	20425	5	16-QAM	1	0	21.54	1	0-1
826.5	20425	5	16-QAM	1	12	21.56	1	0-1
826.5	20425	5	16-QAM	1	24	21.50	1	0-1
826.5	20425	5	16-QAM	12	0	20.91	2	0-2
826.5	20425	5	16-QAM	12	6	20.85	2	0-2
826.5	20425	5	16-QAM	12	13	20.66	2	0-2
826.5	20425	5	16-QAM	25	0	20.50	2	0-2
836.5	20525	5	QPSK	1	0	22.51	0	0
836.5	20525	5	QPSK	1	12	22.76	0	0
836.5	20525	5	QPSK	1	24	22.61	0	0
836.5	20525	5	QPSK	12	0	21.76	1	0-1
836.5	20525	5	QPSK	12	6	21.86	1	0-1
836.5	20525	5	QPSK	12	13	21.62	1	0-1
836.5	20525	5	QPSK	25	0	21.72	1	0-1
836.5	20525	5	16-QAM	1	0	21.58	1	0-1
836.5	20525	5	16-QAM	1	12	21.68	1	0-1
836.5	20525	5	16-QAM	1	24	21.69	1	0-1
836.5	20525	5	16-QAM	12	0	20.84	2	0-2
836.5	20525	5	16-QAM	12	6	20.75	2	0-2
836.5	20525	5	16-QAM	12	13	20.70	2	0-2
836.5	20525	5	16-QAM	25	0	20.62	2	0-2
846.5	20625	5	QPSK	1	0	22.68	0	0
846.5	20625	5	QPSK	1	12	22.70	0	0
846.5	20625	5	QPSK	1	24	22.69	0	0
846.5	20625	5	QPSK	12	0	21.55	1	0-1
846.5	20625	5	QPSK	12	6	21.63	1	0-1
846.5	20625	5	QPSK	12	13	21.56	1	0-1
846.5	20625	5	QPSK	25	0	21.54	1	0-1
846.5	20625	5	16-QAM	1	0	21.71	1	0-1
846.5	20625	5	16-QAM	1	12	21.62	1	0-1
846.5	20625	5	16-QAM	1	24	21.59	1	0-1
846.5	20625	5	16-QAM	12	0	20.58	2	0-2
846.5	20625	5	16-QAM	12	6	20.60	2	0-2
846.5	20625	5	16-QAM	12	13	20.52	2	0-2
846.5	20625	5	16-QAM	25	0	20.56	2	0-2

Table 8-17
Maximum LTE Band 5 (Cell) Conducted Powers - 3 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
825.5	20415	3	QPSK	1	0	22.62	0	0
825.5	20415	3	QPSK	1	7	22.58	0	0
825.5	20415	3	QPSK	1	14	22.57	0	0
825.5	20415	3	QPSK	8	0	21.88	1	0-1
825.5	20415	3	QPSK	8	4	21.73	1	0-1
825.5	20415	3	QPSK	8	7	21.54	1	0-1
825.5	20415	3	QPSK	15	0	21.83	1	0-1
825.5	20415	3	16-QAM	1	0	21.78	1	0-1
825.5	20415	3	16-QAM	1	7	21.89	1	0-1
825.5	20415	3	16-QAM	1	14	21.91	1	0-1
825.5	20415	3	16-QAM	8	0	20.73	2	0-2
825.5	20415	3	16-QAM	8	4	20.52	2	0-2
825.5	20415	3	16-QAM	8	7	20.68	2	0-2
825.5	20415	3	16-QAM	15	0	20.74	2	0-2
836.5	20525	3	QPSK	1	0	22.64	0	0
836.5	20525	3	QPSK	1	7	22.77	0	0
836.5	20525	3	QPSK	1	14	22.62	0	0
836.5	20525	3	QPSK	8	0	21.85	1	0-1
836.5	20525	3	QPSK	8	4	21.91	1	0-1
836.5	20525	3	QPSK	8	7	21.70	1	0-1
836.5	20525	3	QPSK	15	0	21.71	1	0-1
836.5	20525	3	16-QAM	1	0	21.55	1	0-1
836.5	20525	3	16-QAM	1	7	21.55	1	0-1
836.5	20525	3	16-QAM	1	14	21.50	1	0-1
836.5	20525	3	16-QAM	8	0	20.60	2	0-2
836.5	20525	3	16-QAM	8	4	20.64	2	0-2
836.5	20525	3	16-QAM	8	7	20.50	2	0-2
836.5	20525	3	16-QAM	15	0	20.65	2	0-2
847.5	20635	3	QPSK	1	0	22.52	0	0
847.5	20635	3	QPSK	1	7	22.54	0	0
847.5	20635	3	QPSK	1	14	22.53	0	0
847.5	20635	3	QPSK	8	0	21.53	1	0-1
847.5	20635	3	QPSK	8	4	21.62	1	0-1
847.5	20635	3	QPSK	8	7	21.58	1	0-1
847.5	20635	3	QPSK	15	0	21.63	1	0-1
847.5	20635	3	16-QAM	1	0	21.50	1	0-1
847.5	20635	3	16-QAM	1	7	21.52	1	0-1
847.5	20635	3	16-QAM	1	14	21.50	1	0-1
847.5	20635	3	16-QAM	8	0	20.53	2	0-2
847.5	20635	3	16-QAM	8	4	20.51	2	0-2
847.5	20635	3	16-QAM	8	7	20.54	2	0-2
847.5	20635	3	16-QAM	15	0	20.58	2	0-2

Table 8-18
Maximum LTE Band 5 (Cell) Conducted Powers - 1.4 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
824.7	20407	1.4	QPSK	1	0	22.88	0	0
824.7	20407	1.4	QPSK	1	2	22.82	0	0
824.7	20407	1.4	QPSK	1	5	22.88	0	0
824.7	20407	1.4	QPSK	3	0	22.78	0	0
824.7	20407	1.4	QPSK	3	2	22.66	0	0
824.7	20407	1.4	QPSK	3	3	22.73	0	0
824.7	20407	1.4	QPSK	6	0	21.91	1	0-1
824.7	20407	1.4	16-QAM	1	0	21.54	1	0-1
824.7	20407	1.4	16-QAM	1	2	21.55	1	0-1
824.7	20407	1.4	16-QAM	1	5	21.57	1	0-1
824.7	20407	1.4	16-QAM	3	0	21.76	1	0-1
824.7	20407	1.4	16-QAM	3	2	21.53	1	0-1
824.7	20407	1.4	16-QAM	3	3	21.79	1	0-1
824.7	20407	1.4	16-QAM	6	0	20.84	2	0-2
836.5	20525	1.4	QPSK	1	0	22.85	0	0
836.5	20525	1.4	QPSK	1	2	22.73	0	0
836.5	20525	1.4	QPSK	1	5	22.73	0	0
836.5	20525	1.4	QPSK	3	0	22.79	0	0
836.5	20525	1.4	QPSK	3	2	22.67	0	0
836.5	20525	1.4	QPSK	3	3	22.67	0	0
836.5	20525	1.4	QPSK	6	0	21.94	1	0-1
836.5	20525	1.4	16-QAM	1	0	21.64	1	0-1
836.5	20525	1.4	16-QAM	1	2	21.53	1	0-1
836.5	20525	1.4	16-QAM	1	5	21.56	1	0-1
836.5	20525	1.4	16-QAM	3	0	21.92	1	0-1
836.5	20525	1.4	16-QAM	3	2	21.80	1	0-1
836.5	20525	1.4	16-QAM	3	3	21.70	1	0-1
836.5	20525	1.4	16-QAM	6	0	20.84	2	0-2
848.3	20643	1.4	QPSK	1	0	22.60	0	0
848.3	20643	1.4	QPSK	1	2	22.57	0	0
848.3	20643	1.4	QPSK	1	5	22.53	0	0
848.3	20643	1.4	QPSK	3	0	22.57	0	0
848.3	20643	1.4	QPSK	3	2	22.56	0	0
848.3	20643	1.4	QPSK	3	3	22.56	0	0
848.3	20643	1.4	QPSK	6	0	21.64	1	0-1
848.3	20643	1.4	16-QAM	1	0	21.50	1	0-1
848.3	20643	1.4	16-QAM	1	2	21.52	1	0-1
848.3	20643	1.4	16-QAM	1	5	21.55	1	0-1
848.3	20643	1.4	16-QAM	3	0	21.51	1	0-1
848.3	20643	1.4	16-QAM	3	2	21.57	1	0-1
848.3	20643	1.4	16-QAM	3	3	21.58	1	0-1
848.3	20643	1.4	16-QAM	6	0	20.66	2	0-2

Table 8-19
Reduced LTE Band 5 (Cell) Conducted Powers - 10 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
836.5	20525	10	QPSK	1	0	**18.85**	0	0
836.5	20525	10	QPSK	1	25	18.83	0	0
836.5	20525	10	QPSK	1	49	18.84	0	0
836.5	20525	10	QPSK	25	0	**19.02**	0	0-1
836.5	20525	10	QPSK	25	12	18.95	0	0-1
836.5	20525	10	QPSK	25	25	18.99	0	0-1
836.5	20525	10	QPSK	50	0	18.84	0	0-1
836.5	20525	10	16QAM	1	0	19.00	0	0-1
836.5	20525	10	16QAM	1	25	19.27	0	0-1
836.5	20525	10	16QAM	1	49	19.28	0	0-1
836.5	20525	10	16QAM	25	0	18.94	0	0-2
836.5	20525	10	16QAM	25	12	18.97	0	0-2
836.5	20525	10	16QAM	25	25	19.00	0	0-2
836.5	20525	10	16QAM	50	0	18.78	0	0-2

Note: LTE Band 5 at 10 MHz Bandwidth does not support three non-overlapping channels. Per KDB 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the mid channel of the group of overlapping channels should be selected for testing

Table 8-20
Reduced LTE Band 5 (Cell) Conducted Powers - 5 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
826.5	20425	5	QPSK	1	0	18.87	0	0
826.5	20425	5	QPSK	1	12	18.86	0	0
826.5	20425	5	QPSK	1	24	18.94	0	0
826.5	20425	5	QPSK	12	0	18.98	0	0-1
826.5	20425	5	QPSK	12	6	18.95	0	0-1
826.5	20425	5	QPSK	12	13	18.98	0	0-1
826.5	20425	5	QPSK	25	0	18.64	0	0-1
826.5	20425	5	16-QAM	1	0	18.61	0	0-1
826.5	20425	5	16-QAM	1	12	18.66	0	0-1
826.5	20425	5	16-QAM	1	24	18.71	0	0-1
826.5	20425	5	16-QAM	12	0	18.71	0	0-2
826.5	20425	5	16-QAM	12	6	18.82	0	0-2
826.5	20425	5	16-QAM	12	13	19.04	0	0-2
826.5	20425	5	16-QAM	25	0	18.92	0	0-2
836.5	20525	5	QPSK	1	0	19.07	0	0
836.5	20525	5	QPSK	1	12	19.02	0	0
836.5	20525	5	QPSK	1	24	18.95	0	0
836.5	20525	5	QPSK	12	0	19.04	0	0-1
836.5	20525	5	QPSK	12	6	18.86	0	0-1
836.5	20525	5	QPSK	12	13	18.81	0	0-1
836.5	20525	5	QPSK	25	0	18.82	0	0-1
836.5	20525	5	16-QAM	1	0	18.90	0	0-1
836.5	20525	5	16-QAM	1	12	18.87	0	0-1
836.5	20525	5	16-QAM	1	24	18.95	0	0-1
836.5	20525	5	16-QAM	12	0	18.85	0	0-2
836.5	20525	5	16-QAM	12	6	18.90	0	0-2
836.5	20525	5	16-QAM	12	13	18.86	0	0-2
836.5	20525	5	16-QAM	25	0	18.93	0	0-2
846.5	20625	5	QPSK	1	0	18.89	0	0
846.5	20625	5	QPSK	1	12	18.89	0	0
846.5	20625	5	QPSK	1	24	18.94	0	0
846.5	20625	5	QPSK	12	0	19.04	0	0-1
846.5	20625	5	QPSK	12	6	18.76	0	0-1
846.5	20625	5	QPSK	12	13	18.66	0	0-1
846.5	20625	5	QPSK	25	0	18.84	0	0-1
846.5	20625	5	16-QAM	1	0	19.01	0	0-1
846.5	20625	5	16-QAM	1	12	18.62	0	0-1
846.5	20625	5	16-QAM	1	24	18.98	0	0-1
846.5	20625	5	16-QAM	12	0	18.88	0	0-2
846.5	20625	5	16-QAM	12	6	18.86	0	0-2
846.5	20625	5	16-QAM	12	13	18.62	0	0-2
846.5	20625	5	16-QAM	25	0	18.55	0	0-2

Table 8-21
Reduced LTE Band 5 (Cell) Conducted Powers - 3 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
825.5	20415	3	QPSK	1	0	18.62	0	0
825.5	20415	3	QPSK	1	7	18.69	0	0
825.5	20415	3	QPSK	1	14	18.64	0	0
825.5	20415	3	QPSK	8	0	18.74	0	0-1
825.5	20415	3	QPSK	8	4	18.82	0	0-1
825.5	20415	3	QPSK	8	7	18.81	0	0-1
825.5	20415	3	QPSK	15	0	18.77	0	0-1
825.5	20415	3	16-QAM	1	0	18.92	0	0-1
825.5	20415	3	16-QAM	1	7	19.01	0	0-1
825.5	20415	3	16-QAM	1	14	18.99	0	0-1
825.5	20415	3	16-QAM	8	0	18.61	0	0-2
825.5	20415	3	16-QAM	8	4	18.63	0	0-2
825.5	20415	3	16-QAM	8	7	18.62	0	0-2
825.5	20415	3	16-QAM	15	0	18.95	0	0-2
836.5	20525	3	QPSK	1	0	18.82	0	0
836.5	20525	3	QPSK	1	7	18.84	0	0
836.5	20525	3	QPSK	1	14	18.88	0	0
836.5	20525	3	QPSK	8	0	18.86	0	0-1
836.5	20525	3	QPSK	8	4	18.88	0	0-1
836.5	20525	3	QPSK	8	7	18.84	0	0-1
836.5	20525	3	QPSK	15	0	19.16	0	0-1
836.5	20525	3	16-QAM	1	0	18.87	0	0-1
836.5	20525	3	16-QAM	1	7	18.52	0	0-1
836.5	20525	3	16-QAM	1	14	18.55	0	0-1
836.5	20525	3	16-QAM	8	0	18.71	0	0-2
836.5	20525	3	16-QAM	8	4	18.62	0	0-2
836.5	20525	3	16-QAM	8	7	18.59	0	0-2
836.5	20525	3	16-QAM	15	0	18.83	0	0-2
847.5	20635	3	QPSK	1	0	18.97	0	0
847.5	20635	3	QPSK	1	7	18.73	0	0
847.5	20635	3	QPSK	1	14	18.68	0	0
847.5	20635	3	QPSK	8	0	18.65	0	0-1
847.5	20635	3	QPSK	8	4	18.73	0	0-1
847.5	20635	3	QPSK	8	7	18.81	0	0-1
847.5	20635	3	QPSK	15	0	18.68	0	0-1
847.5	20635	3	16-QAM	1	0	18.52	0	0-1
847.5	20635	3	16-QAM	1	7	18.50	0	0-1
847.5	20635	3	16-QAM	1	14	18.53	0	0-1
847.5	20635	3	16-QAM	8	0	18.65	0	0-2
847.5	20635	3	16-QAM	8	4	18.68	0	0-2
847.5	20635	3	16-QAM	8	7	19.07	0	0-2
847.5	20635	3	16-QAM	15	0	18.72	0	0-2

Table 8-22
Reduced LTE Band 5 (Cell) Conducted Powers - 1.4 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
824.7	20407	1.4	QPSK	1	0	18.78	0	0
824.7	20407	1.4	QPSK	1	2	18.81	0	0
824.7	20407	1.4	QPSK	1	5	18.81	0	0
824.7	20407	1.4	QPSK	3	0	18.71	0	0
824.7	20407	1.4	QPSK	3	2	18.70	0	0
824.7	20407	1.4	QPSK	3	3	18.71	0	0
824.7	20407	1.4	QPSK	6	0	18.78	0	0-1
824.7	20407	1.4	16-QAM	1	0	18.59	0	0-1
824.7	20407	1.4	16-QAM	1	2	18.58	0	0-1
824.7	20407	1.4	16-QAM	1	5	18.59	0	0-1
824.7	20407	1.4	16-QAM	3	0	18.89	0	0-1
824.7	20407	1.4	16-QAM	3	2	18.70	0	0-1
824.7	20407	1.4	16-QAM	3	3	18.69	0	0-1
824.7	20407	1.4	16-QAM	6	0	18.79	0	0-2
836.5	20525	1.4	QPSK	1	0	18.96	0	0
836.5	20525	1.4	QPSK	1	2	18.80	0	0
836.5	20525	1.4	QPSK	1	5	18.80	0	0
836.5	20525	1.4	QPSK	3	0	18.85	0	0
836.5	20525	1.4	QPSK	3	2	18.83	0	0
836.5	20525	1.4	QPSK	3	3	18.88	0	0
836.5	20525	1.4	QPSK	6	0	19.22	0	0-1
836.5	20525	1.4	16-QAM	1	0	18.81	0	0-1
836.5	20525	1.4	16-QAM	1	2	18.83	0	0-1
836.5	20525	1.4	16-QAM	1	5	18.85	0	0-1
836.5	20525	1.4	16-QAM	3	0	18.82	0	0-1
836.5	20525	1.4	16-QAM	3	2	18.88	0	0-1
836.5	20525	1.4	16-QAM	3	3	18.85	0	0-1
836.5	20525	1.4	16-QAM	6	0	18.92	0	0-2
848.3	20643	1.4	QPSK	1	0	18.60	0	0
848.3	20643	1.4	QPSK	1	2	18.93	0	0
848.3	20643	1.4	QPSK	1	5	18.95	0	0
848.3	20643	1.4	QPSK	3	0	18.75	0	0
848.3	20643	1.4	QPSK	3	2	18.73	0	0
848.3	20643	1.4	QPSK	3	3	18.73	0	0
848.3	20643	1.4	QPSK	6	0	18.68	0	0-1
848.3	20643	1.4	16-QAM	1	0	18.53	0	0-1
848.3	20643	1.4	16-QAM	1	2	18.51	0	0-1
848.3	20643	1.4	16-QAM	1	5	18.54	0	0-1
848.3	20643	1.4	16-QAM	3	0	18.75	0	0-1
848.3	20643	1.4	16-QAM	3	2	19.01	0	0-1
848.3	20643	1.4	16-QAM	3	3	19.09	0	0-1
848.3	20643	1.4	16-QAM	6	0	18.62	0	0-2

Table 8-23
Maximum LTE Band 4 (AWS) Conducted Powers - 20 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1732.5	20175	20	QPSK	1	0	22.81	0	0
1732.5	20175	20	QPSK	1	50	22.73	0	0
1732.5	20175	20	QPSK	1	99	**22.89**	0	0
1732.5	20175	20	QPSK	50	0	**21.97**	1	0-1
1732.5	20175	20	QPSK	50	25	21.63	1	0-1
1732.5	20175	20	QPSK	50	50	21.63	1	0-1
1732.5	20175	20	QPSK	100	0	21.70	1	0-1
1732.5	20175	20	16QAM	1	0	22.04	1	0-1
1732.5	20175	20	16QAM	1	50	21.90	1	0-1
1732.5	20175	20	16QAM	1	99	21.96	1	0-1
1732.5	20175	20	16QAM	50	0	20.74	2	0-2
1732.5	20175	20	16QAM	50	25	20.67	2	0-2
1732.5	20175	20	16QAM	50	50	20.68	2	0-2
1732.5	20175	20	16QAM	100	0	20.64	2	0-2

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

Table 8-24
Maximum LTE Band 4 (AWS) Conducted Powers - 15 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1717.5	20025	15	QPSK	1	0	22.76	0	0
1717.5	20025	15	QPSK	1	36	22.72	0	0
1717.5	20025	15	QPSK	1	74	22.68	0	0
1717.5	20025	15	QPSK	36	0	21.74	1	0-1
1717.5	20025	15	QPSK	36	18	21.52	1	0-1
1717.5	20025	15	QPSK	36	37	21.50	1	0-1
1717.5	20025	15	QPSK	75	0	21.55	1	0-1
1717.5	20025	15	16QAM	1	0	22.07	1	0-1
1717.5	20025	15	16QAM	1	36	22.11	1	0-1
1717.5	20025	15	16QAM	1	74	22.08	1	0-1
1717.5	20025	15	16QAM	36	0	20.65	2	0-2
1717.5	20025	15	16QAM	36	18	20.58	2	0-2
1717.5	20025	15	16QAM	36	37	20.58	2	0-2
1717.5	20025	15	16QAM	75	0	20.56	2	0-2
1732.5	20175	15	QPSK	1	0	22.84	0	0
1732.5	20175	15	QPSK	1	36	22.89	0	0
1732.5	20175	15	QPSK	1	74	22.90	0	0
1732.5	20175	15	QPSK	36	0	22.01	1	0-1
1732.5	20175	15	QPSK	36	18	21.65	1	0-1
1732.5	20175	15	QPSK	36	37	21.70	1	0-1
1732.5	20175	15	QPSK	75	0	21.65	1	0-1
1732.5	20175	15	16QAM	1	0	21.78	1	0-1
1732.5	20175	15	16QAM	1	36	21.63	1	0-1
1732.5	20175	15	16QAM	1	74	21.73	1	0-1
1732.5	20175	15	16QAM	36	0	21.00	2	0-2
1732.5	20175	15	16QAM	36	18	20.62	2	0-2
1732.5	20175	15	16QAM	36	37	20.57	2	0-2
1732.5	20175	15	16QAM	75	0	20.62	2	0-2
1747.5	20325	15	QPSK	1	0	22.92	0	0
1747.5	20325	15	QPSK	1	36	22.95	0	0
1747.5	20325	15	QPSK	1	74	22.77	0	0
1747.5	20325	15	QPSK	36	0	21.74	1	0-1
1747.5	20325	15	QPSK	36	18	21.64	1	0-1
1747.5	20325	15	QPSK	36	37	21.74	1	0-1
1747.5	20325	15	QPSK	75	0	21.55	1	0-1
1747.5	20325	15	16QAM	1	0	21.93	1	0-1
1747.5	20325	15	16QAM	1	36	21.87	1	0-1
1747.5	20325	15	16QAM	1	74	21.79	1	0-1
1747.5	20325	15	16QAM	36	0	21.00	2	0-2
1747.5	20325	15	16QAM	36	18	20.74	2	0-2
1747.5	20325	15	16QAM	36	37	20.69	2	0-2
1747.5	20325	15	16QAM	75	0	20.70	2	0-2

Table 8-25
Maximum LTE Band 4 (AWS) Conducted Powers - 10 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1715	20000	10	QPSK	1	0	22.73	0	0
1715	20000	10	QPSK	1	25	22.67	0	0
1715	20000	10	QPSK	1	49	22.58	0	0
1715	20000	10	QPSK	25	0	21.62	1	0-1
1715	20000	10	QPSK	25	12	21.57	1	0-1
1715	20000	10	QPSK	25	25	21.63	1	0-1
1715	20000	10	QPSK	50	0	21.59	1	0-1
1715	20000	10	16QAM	1	0	22.10	1	0-1
1715	20000	10	16QAM	1	25	22.02	1	0-1
1715	20000	10	16QAM	1	49	21.88	1	0-1
1715	20000	10	16QAM	25	0	20.67	2	0-2
1715	20000	10	16QAM	25	12	20.62	2	0-2
1715	20000	10	16QAM	25	25	20.61	2	0-2
1715	20000	10	16QAM	50	0	20.58	2	0-2
1732.5	20175	10	QPSK	1	0	22.87	0	0
1732.5	20175	10	QPSK	1	25	22.87	0	0
1732.5	20175	10	QPSK	1	49	22.91	0	0
1732.5	20175	10	QPSK	25	0	21.79	1	0-1
1732.5	20175	10	QPSK	25	12	21.71	1	0-1
1732.5	20175	10	QPSK	25	25	21.69	1	0-1
1732.5	20175	10	QPSK	50	0	21.63	1	0-1
1732.5	20175	10	16QAM	1	0	21.82	1	0-1
1732.5	20175	10	16QAM	1	25	21.64	1	0-1
1732.5	20175	10	16QAM	1	49	21.67	1	0-1
1732.5	20175	10	16QAM	25	0	20.82	2	0-2
1732.5	20175	10	16QAM	25	12	20.75	2	0-2
1732.5	20175	10	16QAM	25	25	20.71	2	0-2
1732.5	20175	10	16QAM	50	0	20.66	2	0-2
1750	20350	10	QPSK	1	0	22.70	0	0
1750	20350	10	QPSK	1	25	22.83	0	0
1750	20350	10	QPSK	1	49	22.80	0	0
1750	20350	10	QPSK	25	0	21.86	1	0-1
1750	20350	10	QPSK	25	12	21.83	1	0-1
1750	20350	10	QPSK	25	25	21.78	1	0-1
1750	20350	10	QPSK	50	0	21.74	1	0-1
1750	20350	10	16QAM	1	0	21.59	1	0-1
1750	20350	10	16QAM	1	25	21.63	1	0-1
1750	20350	10	16QAM	1	49	21.53	1	0-1
1750	20350	10	16QAM	25	0	20.77	2	0-2
1750	20350	10	16QAM	25	12	20.88	2	0-2
1750	20350	10	16QAM	25	25	20.77	2	0-2
1750	20350	10	16QAM	50	0	20.76	2	0-2

Table 8-26
Maximum LTE Band 4 (AWS) Conducted Powers - 5 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1712.5	19975	5	QPSK	1	0	22.85	0	0
1712.5	19975	5	QPSK	1	12	22.68	0	0
1712.5	19975	5	QPSK	1	24	22.62	0	0
1712.5	19975	5	QPSK	12	0	21.81	1	0-1
1712.5	19975	5	QPSK	12	6	21.70	1	0-1
1712.5	19975	5	QPSK	12	13	21.71	1	0-1
1712.5	19975	5	QPSK	25	0	21.70	1	0-1
1712.5	19975	5	16-QAM	1	0	21.55	1	0-1
1712.5	19975	5	16-QAM	1	12	21.48	1	0-1
1712.5	19975	5	16-QAM	1	24	21.47	1	0-1
1712.5	19975	5	16-QAM	12	0	21.00	2	0-2
1712.5	19975	5	16-QAM	12	6	20.84	2	0-2
1712.5	19975	5	16-QAM	12	13	20.80	2	0-2
1712.5	19975	5	16-QAM	25	0	20.74	2	0-2
1732.5	20175	5	QPSK	1	0	22.89	0	0
1732.5	20175	5	QPSK	1	12	22.77	0	0
1732.5	20175	5	QPSK	1	24	22.75	0	0
1732.5	20175	5	QPSK	12	0	22.01	1	0-1
1732.5	20175	5	QPSK	12	6	21.77	1	0-1
1732.5	20175	5	QPSK	12	13	21.83	1	0-1
1732.5	20175	5	QPSK	25	0	21.75	1	0-1
1732.5	20175	5	16-QAM	1	0	21.88	1	0-1
1732.5	20175	5	16-QAM	1	12	21.71	1	0-1
1732.5	20175	5	16-QAM	1	24	21.74	1	0-1
1732.5	20175	5	16-QAM	12	0	21.04	2	0-2
1732.5	20175	5	16-QAM	12	6	20.87	2	0-2
1732.5	20175	5	16-QAM	12	13	20.83	2	0-2
1732.5	20175	5	16-QAM	25	0	20.74	2	0-2
1752.5	20375	5	QPSK	1	0	22.88	0	0
1752.5	20375	5	QPSK	1	12	22.98	0	0
1752.5	20375	5	QPSK	1	24	22.85	0	0
1752.5	20375	5	QPSK	12	0	21.90	1	0-1
1752.5	20375	5	QPSK	12	6	21.83	1	0-1
1752.5	20375	5	QPSK	12	13	21.82	1	0-1
1752.5	20375	5	QPSK	25	0	21.77	1	0-1
1752.5	20375	5	16-QAM	1	0	22.02	1	0-1
1752.5	20375	5	16-QAM	1	12	21.96	1	0-1
1752.5	20375	5	16-QAM	1	24	21.97	1	0-1
1752.5	20375	5	16-QAM	12	0	20.93	2	0-2
1752.5	20375	5	16-QAM	12	6	20.95	2	0-2
1752.5	20375	5	16-QAM	12	13	20.81	2	0-2
1752.5	20375	5	16-QAM	25	0	20.66	2	0-2

Table 8-27
Maximum LTE Band 4 (AWS) Conducted Powers - 3 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1711.5	19965	3	QPSK	1	0	22.72	0	0
1711.5	19965	3	QPSK	1	7	22.65	0	0
1711.5	19965	3	QPSK	1	14	22.59	0	0
1711.5	19965	3	QPSK	8	0	21.83	1	0-1
1711.5	19965	3	QPSK	8	4	21.83	1	0-1
1711.5	19965	3	QPSK	8	7	21.71	1	0-1
1711.5	19965	3	QPSK	15	0	21.80	1	0-1
1711.5	19965	3	16-QAM	1	0	22.01	1	0-1
1711.5	19965	3	16-QAM	1	7	21.95	1	0-1
1711.5	19965	3	16-QAM	1	14	21.93	1	0-1
1711.5	19965	3	16-QAM	8	0	20.74	2	0-2
1711.5	19965	3	16-QAM	8	4	20.68	2	0-2
1711.5	19965	3	16-QAM	8	7	20.67	2	0-2
1711.5	19965	3	16-QAM	15	0	20.81	2	0-2
1732.5	20175	3	QPSK	1	0	22.96	0	0
1732.5	20175	3	QPSK	1	7	22.84	0	0
1732.5	20175	3	QPSK	1	14	22.79	0	0
1732.5	20175	3	QPSK	8	0	21.73	1	0-1
1732.5	20175	3	QPSK	8	4	21.76	1	0-1
1732.5	20175	3	QPSK	8	7	21.77	1	0-1
1732.5	20175	3	QPSK	15	0	21.74	1	0-1
1732.5	20175	3	16-QAM	1	0	21.81	1	0-1
1732.5	20175	3	16-QAM	1	7	21.61	1	0-1
1732.5	20175	3	16-QAM	1	14	21.67	1	0-1
1732.5	20175	3	16-QAM	8	0	20.57	2	0-2
1732.5	20175	3	16-QAM	8	4	20.57	2	0-2
1732.5	20175	3	16-QAM	8	7	20.61	2	0-2
1732.5	20175	3	16-QAM	15	0	20.72	2	0-2
1753.5	20385	3	QPSK	1	0	22.88	0	0
1753.5	20385	3	QPSK	1	7	22.71	0	0
1753.5	20385	3	QPSK	1	14	22.66	0	0
1753.5	20385	3	QPSK	8	0	21.99	1	0-1
1753.5	20385	3	QPSK	8	4	21.87	1	0-1
1753.5	20385	3	QPSK	8	7	21.89	1	0-1
1753.5	20385	3	QPSK	15	0	21.80	1	0-1
1753.5	20385	3	16-QAM	1	0	21.65	1	0-1
1753.5	20385	3	16-QAM	1	7	21.54	1	0-1
1753.5	20385	3	16-QAM	1	14	21.54	1	0-1
1753.5	20385	3	16-QAM	8	0	21.05	2	0-2
1753.5	20385	3	16-QAM	8	4	20.94	2	0-2
1753.5	20385	3	16-QAM	8	7	20.96	2	0-2
1753.5	20385	3	16-QAM	15	0	20.85	2	0-2

Table 8-28
Maximum LTE Band 4 (AWS) Conducted Powers - 1.4 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1710.7	19957	1.4	QPSK	1	0	22.80	0	0
1710.7	19957	1.4	QPSK	1	2	22.72	0	0
1710.7	19957	1.4	QPSK	1	5	22.80	0	0
1710.7	19957	1.4	QPSK	3	0	22.79	0	0
1710.7	19957	1.4	QPSK	3	2	22.81	0	0
1710.7	19957	1.4	QPSK	3	3	22.85	0	0
1710.7	19957	1.4	QPSK	6	0	21.86	1	0-1
1710.7	19957	1.4	16-QAM	1	0	21.57	1	0-1
1710.7	19957	1.4	16-QAM	1	2	21.53	1	0-1
1710.7	19957	1.4	16-QAM	1	5	21.50	1	0-1
1710.7	19957	1.4	16-QAM	3	0	21.79	1	0-1
1710.7	19957	1.4	16-QAM	3	2	21.76	1	0-1
1710.7	19957	1.4	16-QAM	3	3	21.75	1	0-1
1710.7	19957	1.4	16-QAM	6	0	20.87	2	0-2
1732.5	20175	1.4	QPSK	1	0	22.84	0	0
1732.5	20175	1.4	QPSK	1	2	22.76	0	0
1732.5	20175	1.4	QPSK	1	5	22.76	0	0
1732.5	20175	1.4	QPSK	3	0	22.76	0	0
1732.5	20175	1.4	QPSK	3	2	22.73	0	0
1732.5	20175	1.4	QPSK	3	3	22.79	0	0
1732.5	20175	1.4	QPSK	6	0	21.82	1	0-1
1732.5	20175	1.4	16-QAM	1	0	21.70	1	0-1
1732.5	20175	1.4	16-QAM	1	2	21.77	1	0-1
1732.5	20175	1.4	16-QAM	1	5	21.60	1	0-1
1732.5	20175	1.4	16-QAM	3	0	21.78	1	0-1
1732.5	20175	1.4	16-QAM	3	2	21.83	1	0-1
1732.5	20175	1.4	16-QAM	3	3	21.87	1	0-1
1732.5	20175	1.4	16-QAM	6	0	20.70	2	0-2
1754.3	20393	1.4	QPSK	1	0	22.75	0	0
1754.3	20393	1.4	QPSK	1	2	22.74	0	0
1754.3	20393	1.4	QPSK	1	5	22.75	0	0
1754.3	20393	1.4	QPSK	3	0	22.83	0	0
1754.3	20393	1.4	QPSK	3	2	22.81	0	0
1754.3	20393	1.4	QPSK	3	3	22.74	0	0
1754.3	20393	1.4	QPSK	6	0	21.83	1	0-1
1754.3	20393	1.4	16-QAM	1	0	21.53	1	0-1
1754.3	20393	1.4	16-QAM	1	2	21.51	1	0-1
1754.3	20393	1.4	16-QAM	1	5	21.50	1	0-1
1754.3	20393	1.4	16-QAM	3	0	21.82	1	0-1
1754.3	20393	1.4	16-QAM	3	2	21.85	1	0-1
1754.3	20393	1.4	16-QAM	3	3	21.83	1	0-1
1754.3	20393	1.4	16-QAM	6	0	20.77	2	0-2

Table 8-29
Reduced LTE Band 4 (AWS) Conducted Powers - 20 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1732.5	20175	20	QPSK	1	0	17.63	0	0
1732.5	20175	20	QPSK	1	50	17.51	0	0
1732.5	20175	20	QPSK	1	99	**17.76**	0	0
1732.5	20175	20	QPSK	50	0	**17.58**	0	0-1
1732.5	20175	20	QPSK	50	25	17.50	0	0-1
1732.5	20175	20	QPSK	50	50	17.56	0	0-1
1732.5	20175	20	QPSK	100	0	17.50	0	0-1
1732.5	20175	20	16QAM	1	0	17.56	0	0-1
1732.5	20175	20	16QAM	1	50	17.58	0	0-1
1732.5	20175	20	16QAM	1	99	17.70	0	0-1
1732.5	20175	20	16QAM	50	0	17.52	0	0-2
1732.5	20175	20	16QAM	50	25	17.58	0	0-2
1732.5	20175	20	16QAM	50	50	17.52	0	0-2
1732.5	20175	20	16QAM	100	0	17.51	0	0-2

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

Table 8-30
Reduced LTE Band 4 (AWS) Conducted Powers - 15 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1717.5	20025	15	QPSK	1	0	17.50	0	0
1717.5	20025	15	QPSK	1	36	17.53	0	0
1717.5	20025	15	QPSK	1	74	17.54	0	0
1717.5	20025	15	QPSK	36	0	17.52	0	0-1
1717.5	20025	15	QPSK	36	18	17.51	0	0-1
1717.5	20025	15	QPSK	36	37	17.50	0	0-1
1717.5	20025	15	QPSK	75	0	17.38	0	0-1
1717.5	20025	15	16QAM	1	0	17.80	0	0-1
1717.5	20025	15	16QAM	1	36	17.76	0	0-1
1717.5	20025	15	16QAM	1	74	17.83	0	0-1
1717.5	20025	15	16QAM	36	0	17.36	0	0-2
1717.5	20025	15	16QAM	36	18	17.45	0	0-2
1717.5	20025	15	16QAM	36	37	17.41	0	0-2
1717.5	20025	15	16QAM	75	0	17.37	0	0-2
1732.5	20175	15	QPSK	1	0	17.57	0	0
1732.5	20175	15	QPSK	1	36	17.59	0	0
1732.5	20175	15	QPSK	1	74	17.72	0	0
1732.5	20175	15	QPSK	36	0	17.61	0	0-1
1732.5	20175	15	QPSK	36	18	17.54	0	0-1
1732.5	20175	15	QPSK	36	37	17.41	0	0-1
1732.5	20175	15	QPSK	75	0	17.53	0	0-1
1732.5	20175	15	16QAM	1	0	17.42	0	0-1
1732.5	20175	15	16QAM	1	36	17.30	0	0-1
1732.5	20175	15	16QAM	1	74	17.43	0	0-1
1732.5	20175	15	16QAM	36	0	17.50	0	0-2
1732.5	20175	15	16QAM	36	18	17.47	0	0-2
1732.5	20175	15	16QAM	36	37	17.44	0	0-2
1732.5	20175	15	16QAM	75	0	17.50	0	0-2
1747.5	20325	15	QPSK	1	0	17.77	0	0
1747.5	20325	15	QPSK	1	36	17.77	0	0
1747.5	20325	15	QPSK	1	74	17.75	0	0
1747.5	20325	15	QPSK	36	0	17.60	0	0-1
1747.5	20325	15	QPSK	36	18	17.57	0	0-1
1747.5	20325	15	QPSK	36	37	17.61	0	0-1
1747.5	20325	15	QPSK	75	0	17.57	0	0-1
1747.5	20325	15	16QAM	1	0	17.62	0	0-1
1747.5	20325	15	16QAM	1	36	17.60	0	0-1
1747.5	20325	15	16QAM	1	74	17.57	0	0-1
1747.5	20325	15	16QAM	36	0	17.61	0	0-2
1747.5	20325	15	16QAM	36	18	17.59	0	0-2
1747.5	20325	15	16QAM	36	37	17.63	0	0-2
1747.5	20325	15	16QAM	75	0	17.46	0	0-2

Table 8-31
Reduced LTE Band 4 (AWS) Conducted Powers - 10 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1715	20000	10	QPSK	1	0	17.52	0	0
1715	20000	10	QPSK	1	25	17.47	0	0
1715	20000	10	QPSK	1	49	17.38	0	0
1715	20000	10	QPSK	25	0	17.51	0	0-1
1715	20000	10	QPSK	25	12	17.51	0	0-1
1715	20000	10	QPSK	25	25	17.55	0	0-1
1715	20000	10	QPSK	50	0	17.39	0	0-1
1715	20000	10	16QAM	1	0	17.91	0	0-1
1715	20000	10	16QAM	1	25	17.81	0	0-1
1715	20000	10	16QAM	1	49	17.72	0	0-1
1715	20000	10	16QAM	25	0	17.26	0	0-2
1715	20000	10	16QAM	25	12	17.31	0	0-2
1715	20000	10	16QAM	25	25	17.22	0	0-2
1715	20000	10	16QAM	50	0	17.30	0	0-2
1732.5	20175	10	QPSK	1	0	17.64	0	0
1732.5	20175	10	QPSK	1	25	17.60	0	0
1732.5	20175	10	QPSK	1	49	17.69	0	0
1732.5	20175	10	QPSK	25	0	17.70	0	0-1
1732.5	20175	10	QPSK	25	12	17.63	0	0-1
1732.5	20175	10	QPSK	25	25	17.29	0	0-1
1732.5	20175	10	QPSK	50	0	17.55	0	0-1
1732.5	20175	10	16QAM	1	0	17.45	0	0-1
1732.5	20175	10	16QAM	1	25	17.37	0	0-1
1732.5	20175	10	16QAM	1	49	17.45	0	0-1
1732.5	20175	10	16QAM	25	0	17.67	0	0-2
1732.5	20175	10	16QAM	25	12	17.60	0	0-2
1732.5	20175	10	16QAM	25	25	17.54	0	0-2
1732.5	20175	10	16QAM	50	0	17.55	0	0-2
1750	20350	10	QPSK	1	0	17.56	0	0
1750	20350	10	QPSK	1	25	17.64	0	0
1750	20350	10	QPSK	1	49	17.57	0	0
1750	20350	10	QPSK	25	0	17.46	0	0-1
1750	20350	10	QPSK	25	12	17.64	0	0-1
1750	20350	10	QPSK	25	25	17.63	0	0-1
1750	20350	10	QPSK	50	0	17.65	0	0-1
1750	20350	10	16QAM	1	0	17.32	0	0-1
1750	20350	10	16QAM	1	25	17.40	0	0-1
1750	20350	10	16QAM	1	49	17.35	0	0-1
1750	20350	10	16QAM	25	0	17.44	0	0-2
1750	20350	10	16QAM	25	12	17.49	0	0-2
1750	20350	10	16QAM	25	25	17.64	0	0-2
1750	20350	10	16QAM	50	0	17.60	0	0-2

Table 8-32
Reduced LTE Band 4 (AWS) Conducted Powers - 5 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1712.5	19975	5	QPSK	1	0	17.55	0	0
1712.5	19975	5	QPSK	1	12	17.52	0	0
1712.5	19975	5	QPSK	1	24	17.33	0	0
1712.5	19975	5	QPSK	12	0	17.73	0	0-1
1712.5	19975	5	QPSK	12	6	17.57	0	0-1
1712.5	19975	5	QPSK	12	13	17.62	0	0-1
1712.5	19975	5	QPSK	25	0	17.49	0	0-1
1712.5	19975	5	16-QAM	1	0	17.33	0	0-1
1712.5	19975	5	16-QAM	1	12	17.29	0	0-1
1712.5	19975	5	16-QAM	1	24	17.31	0	0-1
1712.5	19975	5	16-QAM	12	0	17.65	0	0-2
1712.5	19975	5	16-QAM	12	6	17.59	0	0-2
1712.5	19975	5	16-QAM	12	13	17.68	0	0-2
1712.5	19975	5	16-QAM	25	0	17.58	0	0-2
1732.5	20175	5	QPSK	1	0	17.75	0	0
1732.5	20175	5	QPSK	1	12	17.50	0	0
1732.5	20175	5	QPSK	1	24	17.75	0	0
1732.5	20175	5	QPSK	12	0	17.59	0	0-1
1732.5	20175	5	QPSK	12	6	17.62	0	0-1
1732.5	20175	5	QPSK	12	13	17.60	0	0-1
1732.5	20175	5	QPSK	25	0	17.51	0	0-1
1732.5	20175	5	16-QAM	1	0	17.67	0	0-1
1732.5	20175	5	16-QAM	1	12	17.56	0	0-1
1732.5	20175	5	16-QAM	1	24	17.59	0	0-1
1732.5	20175	5	16-QAM	12	0	17.78	0	0-2
1732.5	20175	5	16-QAM	12	6	17.63	0	0-2
1732.5	20175	5	16-QAM	12	13	17.64	0	0-2
1732.5	20175	5	16-QAM	25	0	17.45	0	0-2
1752.5	20375	5	QPSK	1	0	17.84	0	0
1752.5	20375	5	QPSK	1	12	17.89	0	0
1752.5	20375	5	QPSK	1	24	17.83	0	0
1752.5	20375	5	QPSK	12	0	17.71	0	0-1
1752.5	20375	5	QPSK	12	6	17.73	0	0-1
1752.5	20375	5	QPSK	12	13	17.64	0	0-1
1752.5	20375	5	QPSK	25	0	17.62	0	0-1
1752.5	20375	5	16-QAM	1	0	17.76	0	0-1
1752.5	20375	5	16-QAM	1	12	17.75	0	0-1
1752.5	20375	5	16-QAM	1	24	17.71	0	0-1
1752.5	20375	5	16-QAM	12	0	17.58	0	0-2
1752.5	20375	5	16-QAM	12	6	17.73	0	0-2
1752.5	20375	5	16-QAM	12	13	17.61	0	0-2
1752.5	20375	5	16-QAM	25	0	17.54	0	0-2

Table 8-33
Reduced LTE Band 4 (AWS) Conducted Powers - 3 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1711.5	19965	3	QPSK	1	0	17.51	0	0
1711.5	19965	3	QPSK	1	7	17.43	0	0
1711.5	19965	3	QPSK	1	14	17.40	0	0
1711.5	19965	3	QPSK	8	0	17.67	0	0-1
1711.5	19965	3	QPSK	8	4	17.70	0	0-1
1711.5	19965	3	QPSK	8	7	17.60	0	0-1
1711.5	19965	3	QPSK	15	0	17.68	0	0-1
1711.5	19965	3	16-QAM	1	0	17.85	0	0-1
1711.5	19965	3	16-QAM	1	7	17.80	0	0-1
1711.5	19965	3	16-QAM	1	14	17.78	0	0-1
1711.5	19965	3	16-QAM	8	0	17.58	0	0-2
1711.5	19965	3	16-QAM	8	4	17.56	0	0-2
1711.5	19965	3	16-QAM	8	7	17.45	0	0-2
1711.5	19965	3	16-QAM	15	0	17.71	0	0-2
1732.5	20175	3	QPSK	1	0	17.79	0	0
1732.5	20175	3	QPSK	1	7	17.63	0	0
1732.5	20175	3	QPSK	1	14	17.71	0	0
1732.5	20175	3	QPSK	8	0	17.61	0	0-1
1732.5	20175	3	QPSK	8	4	17.56	0	0-1
1732.5	20175	3	QPSK	8	7	17.59	0	0-1
1732.5	20175	3	QPSK	15	0	17.63	0	0-1
1732.5	20175	3	16-QAM	1	0	17.58	0	0-1
1732.5	20175	3	16-QAM	1	7	17.39	0	0-1
1732.5	20175	3	16-QAM	1	14	17.40	0	0-1
1732.5	20175	3	16-QAM	8	0	17.37	0	0-2
1732.5	20175	3	16-QAM	8	4	17.38	0	0-2
1732.5	20175	3	16-QAM	8	7	17.40	0	0-2
1732.5	20175	3	16-QAM	15	0	17.32	0	0-2
1753.5	20385	3	QPSK	1	0	17.72	0	0
1753.5	20385	3	QPSK	1	7	17.64	0	0
1753.5	20385	3	QPSK	1	14	17.65	0	0
1753.5	20385	3	QPSK	8	0	17.84	0	0-1
1753.5	20385	3	QPSK	8	4	17.75	0	0-1
1753.5	20385	3	QPSK	8	7	17.73	0	0-1
1753.5	20385	3	QPSK	15	0	17.70	0	0-1
1753.5	20385	3	16-QAM	1	0	17.51	0	0-1
1753.5	20385	3	16-QAM	1	7	17.45	0	0-1
1753.5	20385	3	16-QAM	1	14	17.13	0	0-1
1753.5	20385	3	16-QAM	8	0	17.86	0	0-2
1753.5	20385	3	16-QAM	8	4	17.78	0	0-2
1753.5	20385	3	16-QAM	8	7	17.78	0	0-2
1753.5	20385	3	16-QAM	15	0	17.70	0	0-2

Table 8-34
Reduced LTE Band 4 (AWS) Conducted Powers - 1.4 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1710.7	19957	1.4	QPSK	1	0	17.63	0	0
1710.7	19957	1.4	QPSK	1	2	17.69	0	0
1710.7	19957	1.4	QPSK	1	5	17.91	0	0
1710.7	19957	1.4	QPSK	3	0	17.75	0	0
1710.7	19957	1.4	QPSK	3	2	17.52	0	0
1710.7	19957	1.4	QPSK	3	3	17.51	0	0
1710.7	19957	1.4	QPSK	6	0	17.72	0	0-1
1710.7	19957	1.4	16-QAM	1	0	17.38	0	0-1
1710.7	19957	1.4	16-QAM	1	2	17.39	0	0-1
1710.7	19957	1.4	16-QAM	1	5	17.44	0	0-1
1710.7	19957	1.4	16-QAM	3	0	17.75	0	0-1
1710.7	19957	1.4	16-QAM	3	2	17.75	0	0-1
1710.7	19957	1.4	16-QAM	3	3	17.59	0	0-1
1710.7	19957	1.4	16-QAM	6	0	17.82	0	0-2
1732.5	20175	1.4	QPSK	1	0	17.57	0	0
1732.5	20175	1.4	QPSK	1	2	17.72	0	0
1732.5	20175	1.4	QPSK	1	5	17.51	0	0
1732.5	20175	1.4	QPSK	3	0	17.70	0	0
1732.5	20175	1.4	QPSK	3	2	17.73	0	0
1732.5	20175	1.4	QPSK	3	3	17.74	0	0
1732.5	20175	1.4	QPSK	6	0	17.72	0	0-1
1732.5	20175	1.4	16-QAM	1	0	17.28	0	0-1
1732.5	20175	1.4	16-QAM	1	2	17.46	0	0-1
1732.5	20175	1.4	16-QAM	1	5	17.50	0	0-1
1732.5	20175	1.4	16-QAM	3	0	17.76	0	0-1
1732.5	20175	1.4	16-QAM	3	2	17.75	0	0-1
1732.5	20175	1.4	16-QAM	3	3	17.47	0	0-1
1732.5	20175	1.4	16-QAM	6	0	17.59	0	0-2
1754.3	20393	1.4	QPSK	1	0	17.69	0	0
1754.3	20393	1.4	QPSK	1	2	17.60	0	0
1754.3	20393	1.4	QPSK	1	5	17.48	0	0
1754.3	20393	1.4	QPSK	3	0	17.82	0	0
1754.3	20393	1.4	QPSK	3	2	17.83	0	0
1754.3	20393	1.4	QPSK	3	3	17.55	0	0
1754.3	20393	1.4	QPSK	6	0	17.70	0	0-1
1754.3	20393	1.4	16-QAM	1	0	17.22	0	0-1
1754.3	20393	1.4	16-QAM	1	2	17.21	0	0-1
1754.3	20393	1.4	16-QAM	1	5	17.45	0	0-1
1754.3	20393	1.4	16-QAM	3	0	17.80	0	0-1
1754.3	20393	1.4	16-QAM	3	2	17.86	0	0-1
1754.3	20393	1.4	16-QAM	3	3	17.90	0	0-1
1754.3	20393	1.4	16-QAM	6	0	17.48	0	0-2

Table 8-35
Maximum LTE Band 25 (PCS) Conducted Powers - 20 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1860	26140	20	QPSK	1	0	22.51	0	0
1860	26140	20	QPSK	1	59	22.53	0	0
1860	26140	20	QPSK	1	99	22.54	0	0
1860	26140	20	QPSK	50	0	21.50	1	0-1
1860	26140	20	QPSK	50	25	21.51	1	0-1
1860	26140	20	QPSK	50	50	**21.54**	1	0-1
1860	26140	20	QPSK	100	0	21.50	1	0-1
1860	26140	20	16QAM	1	0	21.53	1	0-1
1860	26140	20	16QAM	1	59	21.64	1	0-1
1860	26140	20	16QAM	1	99	21.56	1	0-1
1860	26140	20	16QAM	50	0	20.53	2	0-2
1860	26140	20	16QAM	50	25	20.54	2	0-2
1860	26140	20	16QAM	50	50	20.51	2	0-2
1860	26140	20	16QAM	100	0	20.50	2	0-2
1882.5	26365	20	QPSK	1	0	22.53	0	0
1882.5	26365	20	QPSK	1	59	22.68	0	0
1882.5	26365	20	QPSK	1	99	**22.82**	0	0
1882.5	26365	20	QPSK	50	0	21.52	1	0-1
1882.5	26365	20	QPSK	50	25	21.53	1	0-1
1882.5	26365	20	QPSK	50	50	21.50	1	0-1
1882.5	26365	20	QPSK	100	0	21.50	1	0-1
1882.5	26365	20	16QAM	1	0	21.53	1	0-1
1882.5	26365	20	16QAM	1	59	21.63	1	0-1
1882.5	26365	20	16QAM	1	99	21.58	1	0-1
1882.5	26365	20	16QAM	50	0	21.00	2	0-2
1882.5	26365	20	16QAM	50	25	20.50	2	0-2
1882.5	26365	20	16QAM	50	50	20.50	2	0-2
1882.5	26365	20	16QAM	100	0	20.51	2	0-2
1905	26590	20	QPSK	1	0	22.52	0	0
1905	26590	20	QPSK	1	59	22.54	0	0
1905	26590	20	QPSK	1	99	22.53	0	0
1905	26590	20	QPSK	50	0	21.52	1	0-1
1905	26590	20	QPSK	50	25	21.50	1	0-1
1905	26590	20	QPSK	50	50	21.52	1	0-1
1905	26590	20	QPSK	100	0	21.53	1	0-1
1905	26590	20	16QAM	1	0	21.70	1	0-1
1905	26590	20	16QAM	1	59	21.87	1	0-1
1905	26590	20	16QAM	1	99	21.63	1	0-1
1905	26590	20	16QAM	50	0	20.50	2	0-2
1905	26590	20	16QAM	50	25	20.50	2	0-2
1905	26590	20	16QAM	50	50	20.53	2	0-2
1905	26590	20	16QAM	100	0	20.51	2	0-2

Table 8-36
Maximum LTE Band 25 (PCS) Conducted Powers - 15 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1857.5	26115	15	QPSK	1	0	22.54	0	0
1857.5	26115	15	QPSK	1	36	22.56	0	0
1857.5	26115	15	QPSK	1	74	22.57	0	0
1857.5	26115	15	QPSK	36	0	21.50	1	0-1
1857.5	26115	15	QPSK	36	18	21.53	1	0-1
1857.5	26115	15	QPSK	36	37	21.54	1	0-1
1857.5	26115	15	QPSK	75	0	21.51	1	0-1
1857.5	26115	15	16QAM	1	0	21.51	1	0-1
1857.5	26115	15	16QAM	1	36	21.54	1	0-1
1857.5	26115	15	16QAM	1	74	21.66	1	0-1
1857.5	26115	15	16QAM	36	0	20.53	2	0-2
1857.5	26115	15	16QAM	36	18	20.57	2	0-2
1857.5	26115	15	16QAM	36	37	20.56	2	0-2
1857.5	26115	15	16QAM	75	0	20.50	2	0-2
1882.5	26365	15	QPSK	1	0	22.52	0	0
1882.5	26365	15	QPSK	1	36	22.57	0	0
1882.5	26365	15	QPSK	1	74	22.50	0	0
1882.5	26365	15	QPSK	36	0	21.59	1	0-1
1882.5	26365	15	QPSK	36	18	21.51	1	0-1
1882.5	26365	15	QPSK	36	37	21.57	1	0-1
1882.5	26365	15	QPSK	75	0	21.57	1	0-1
1882.5	26365	15	16QAM	1	0	21.59	1	0-1
1882.5	26365	15	16QAM	1	36	21.52	1	0-1
1882.5	26365	15	16QAM	1	74	21.53	1	0-1
1882.5	26365	15	16QAM	36	0	20.55	2	0-2
1882.5	26365	15	16QAM	36	18	20.51	2	0-2
1882.5	26365	15	16QAM	36	37	20.52	2	0-2
1882.5	26365	15	16QAM	75	0	20.53	2	0-2
1907.5	26615	15	QPSK	1	0	22.63	0	0
1907.5	26615	15	QPSK	1	36	22.55	0	0
1907.5	26615	15	QPSK	1	74	22.59	0	0
1907.5	26615	15	QPSK	36	0	21.50	1	0-1
1907.5	26615	15	QPSK	36	18	21.51	1	0-1
1907.5	26615	15	QPSK	36	37	21.52	1	0-1
1907.5	26615	15	QPSK	75	0	21.53	1	0-1
1907.5	26615	15	16QAM	1	0	21.54	1	0-1
1907.5	26615	15	16QAM	1	36	21.66	1	0-1
1907.5	26615	15	16QAM	1	74	21.76	1	0-1
1907.5	26615	15	16QAM	36	0	20.51	2	0-2
1907.5	26615	15	16QAM	36	18	20.54	2	0-2
1907.5	26615	15	16QAM	36	37	20.59	2	0-2
1907.5	26615	15	16QAM	75	0	20.50	2	0-2

Table 8-37
Maximum LTE Band 25 (PCS) Conducted Powers - 10 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1855	26090	10	QPSK	1	0	22.57	0	0
1855	26090	10	QPSK	1	25	22.51	0	0
1855	26090	10	QPSK	1	49	22.52	0	0
1855	26090	10	QPSK	25	0	21.57	1	0-1
1855	26090	10	QPSK	25	12	21.53	1	0-1
1855	26090	10	QPSK	25	25	21.52	1	0-1
1855	26090	10	QPSK	50	0	21.53	1	0-1
1855	26090	10	16QAM	1	0	21.72	1	0-1
1855	26090	10	16QAM	1	25	21.77	1	0-1
1855	26090	10	16QAM	1	49	21.87	1	0-1
1855	26090	10	16QAM	25	0	20.67	2	0-2
1855	26090	10	16QAM	25	12	20.58	2	0-2
1855	26090	10	16QAM	25	25	20.55	2	0-2
1855	26090	10	16QAM	50	0	20.51	2	0-2
1882.5	26365	10	QPSK	1	0	22.58	0	0
1882.5	26365	10	QPSK	1	25	22.52	0	0
1882.5	26365	10	QPSK	1	49	22.53	0	0
1882.5	26365	10	QPSK	25	0	21.57	1	0-1
1882.5	26365	10	QPSK	25	12	21.54	1	0-1
1882.5	26365	10	QPSK	25	25	21.57	1	0-1
1882.5	26365	10	QPSK	50	0	21.50	1	0-1
1882.5	26365	10	16QAM	1	0	21.61	1	0-1
1882.5	26365	10	16QAM	1	25	21.79	1	0-1
1882.5	26365	10	16QAM	1	49	21.86	1	0-1
1882.5	26365	10	16QAM	25	0	20.58	2	0-2
1882.5	26365	10	16QAM	25	12	20.56	2	0-2
1882.5	26365	10	16QAM	25	25	20.51	2	0-2
1882.5	26365	10	16QAM	50	0	20.63	2	0-2
1910	26640	10	QPSK	1	0	22.54	0	0
1910	26640	10	QPSK	1	25	22.60	0	0
1910	26640	10	QPSK	1	49	22.74	0	0
1910	26640	10	QPSK	25	0	21.75	1	0-1
1910	26640	10	QPSK	25	12	21.57	1	0-1
1910	26640	10	QPSK	25	25	21.55	1	0-1
1910	26640	10	QPSK	50	0	21.51	1	0-1
1910	26640	10	16QAM	1	0	21.53	1	0-1
1910	26640	10	16QAM	1	25	21.52	1	0-1
1910	26640	10	16QAM	1	49	21.58	1	0-1
1910	26640	10	16QAM	25	0	20.71	2	0-2
1910	26640	10	16QAM	25	12	20.58	2	0-2
1910	26640	10	16QAM	25	25	20.61	2	0-2
1910	26640	10	16QAM	50	0	20.50	2	0-2

Table 8-38
Maximum LTE Band 25 (PCS) Conducted Powers - 5 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1852.5	26065	5	QPSK	1	0	22.50	0	0
1852.5	26065	5	QPSK	1	12	22.55	0	0
1852.5	26065	5	QPSK	1	24	22.53	0	0
1852.5	26065	5	QPSK	12	0	21.58	1	0-1
1852.5	26065	5	QPSK	12	6	21.52	1	0-1
1852.5	26065	5	QPSK	12	13	21.53	1	0-1
1852.5	26065	5	QPSK	25	0	21.50	1	0-1
1852.5	26065	5	16-QAM	1	0	21.90	1	0-1
1852.5	26065	5	16-QAM	1	12	22.00	1	0-1
1852.5	26065	5	16-QAM	1	24	21.98	1	0-1
1852.5	26065	5	16-QAM	12	0	20.53	2	0-2
1852.5	26065	5	16-QAM	12	6	20.51	2	0-2
1852.5	26065	5	16-QAM	12	13	20.55	2	0-2
1852.5	26065	5	16-QAM	25	0	20.51	2	0-2
1882.5	26365	5	QPSK	1	0	22.50	0	0
1882.5	26365	5	QPSK	1	12	22.53	0	0
1882.5	26365	5	QPSK	1	24	22.51	0	0
1882.5	26365	5	QPSK	12	0	21.54	1	0-1
1882.5	26365	5	QPSK	12	6	21.55	1	0-1
1882.5	26365	5	QPSK	12	13	21.54	1	0-1
1882.5	26365	5	QPSK	25	0	21.50	1	0-1
1882.5	26365	5	16-QAM	1	0	21.59	1	0-1
1882.5	26365	5	16-QAM	1	12	21.66	1	0-1
1882.5	26365	5	16-QAM	1	24	21.55	1	0-1
1882.5	26365	5	16-QAM	12	0	20.62	2	0-2
1882.5	26365	5	16-QAM	12	6	20.60	2	0-2
1882.5	26365	5	16-QAM	12	13	20.64	2	0-2
1882.5	26365	5	16-QAM	25	0	20.50	2	0-2
1912.5	26665	5	QPSK	1	0	22.50	0	0
1912.5	26665	5	QPSK	1	12	22.56	0	0
1912.5	26665	5	QPSK	1	24	22.69	0	0
1912.5	26665	5	QPSK	12	0	21.65	1	0-1
1912.5	26665	5	QPSK	12	6	21.60	1	0-1
1912.5	26665	5	QPSK	12	13	21.63	1	0-1
1912.5	26665	5	QPSK	25	0	21.54	1	0-1
1912.5	26665	5	16-QAM	1	0	21.65	1	0-1
1912.5	26665	5	16-QAM	1	12	21.71	1	0-1
1912.5	26665	5	16-QAM	1	24	21.71	1	0-1
1912.5	26665	5	16-QAM	12	0	20.58	2	0-2
1912.5	26665	5	16-QAM	12	6	20.54	2	0-2
1912.5	26665	5	16-QAM	12	13	20.61	2	0-2
1912.5	26665	5	16-QAM	25	0	20.52	2	0-2

Table 8-39
Maximum LTE Band 25 (PCS) Conducted Powers - 3 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1851.5	26055	3	QPSK	1	0	22.51	0	0
1851.5	26055	3	QPSK	1	7	22.55	0	0
1851.5	26055	3	QPSK	1	14	22.56	0	0
1851.5	26055	3	QPSK	8	0	21.58	1	0-1
1851.5	26055	3	QPSK	8	4	21.51	1	0-1
1851.5	26055	3	QPSK	8	7	21.55	1	0-1
1851.5	26055	3	QPSK	15	0	21.52	1	0-1
1851.5	26055	3	16-QAM	1	0	21.70	1	0-1
1851.5	26055	3	16-QAM	1	7	21.79	1	0-1
1851.5	26055	3	16-QAM	1	14	21.74	1	0-1
1851.5	26055	3	16-QAM	8	0	20.51	2	0-2
1851.5	26055	3	16-QAM	8	4	20.50	2	0-2
1851.5	26055	3	16-QAM	8	7	20.50	2	0-2
1851.5	26055	3	16-QAM	15	0	20.58	2	0-2
1882.5	26365	3	QPSK	1	0	22.53	0	0
1882.5	26365	3	QPSK	1	7	22.51	0	0
1882.5	26365	3	QPSK	1	14	22.53	0	0
1882.5	26365	3	QPSK	8	0	21.59	1	0-1
1882.5	26365	3	QPSK	8	4	21.56	1	0-1
1882.5	26365	3	QPSK	8	7	21.61	1	0-1
1882.5	26365	3	QPSK	15	0	21.50	1	0-1
1882.5	26365	3	16-QAM	1	0	21.54	1	0-1
1882.5	26365	3	16-QAM	1	7	21.53	1	0-1
1882.5	26365	3	16-QAM	1	14	21.52	1	0-1
1882.5	26365	3	16-QAM	8	0	20.50	2	0-2
1882.5	26365	3	16-QAM	8	4	20.50	2	0-2
1882.5	26365	3	16-QAM	8	7	20.51	2	0-2
1882.5	26365	3	16-QAM	15	0	20.55	2	0-2
1913.5	26675	3	QPSK	1	0	22.57	0	0
1913.5	26675	3	QPSK	1	7	22.53	0	0
1913.5	26675	3	QPSK	1	14	22.53	0	0
1913.5	26675	3	QPSK	8	0	21.66	1	0-1
1913.5	26675	3	QPSK	8	4	21.68	1	0-1
1913.5	26675	3	QPSK	8	7	21.76	1	0-1
1913.5	26675	3	QPSK	15	0	21.59	1	0-1
1913.5	26675	3	16-QAM	1	0	21.57	1	0-1
1913.5	26675	3	16-QAM	1	7	21.51	1	0-1
1913.5	26675	3	16-QAM	1	14	21.60	1	0-1
1913.5	26675	3	16-QAM	8	0	20.65	2	0-2
1913.5	26675	3	16-QAM	8	4	20.69	2	0-2
1913.5	26675	3	16-QAM	8	7	20.72	2	0-2
1913.5	26675	3	16-QAM	15	0	20.58	2	0-2

Table 8-40
Maximum LTE Band 25 (PCS) Conducted Powers - 1.4 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1850.7	26047	1.4	QPSK	1	0	22.69	0	0
1850.7	26047	1.4	QPSK	1	2	22.53	0	0
1850.7	26047	1.4	QPSK	1	5	22.67	0	0
1850.7	26047	1.4	QPSK	3	0	22.53	0	0
1850.7	26047	1.4	QPSK	3	2	22.52	0	0
1850.7	26047	1.4	QPSK	3	3	22.54	0	0
1850.7	26047	1.4	QPSK	6	0	21.52	1	0-1
1850.7	26047	1.4	16-QAM	1	0	21.50	1	0-1
1850.7	26047	1.4	16-QAM	1	2	21.52	1	0-1
1850.7	26047	1.4	16-QAM	1	5	21.51	1	0-1
1850.7	26047	1.4	16-QAM	3	0	21.50	1	0-1
1850.7	26047	1.4	16-QAM	3	2	21.60	1	0-1
1850.7	26047	1.4	16-QAM	3	3	21.63	1	0-1
1850.7	26047	1.4	16-QAM	6	0	20.58	2	0-2
1882.5	26365	1.4	QPSK	1	0	22.57	0	0
1882.5	26365	1.4	QPSK	1	2	22.62	0	0
1882.5	26365	1.4	QPSK	1	5	22.67	0	0
1882.5	26365	1.4	QPSK	3	0	22.53	0	0
1882.5	26365	1.4	QPSK	3	2	22.55	0	0
1882.5	26365	1.4	QPSK	3	3	22.54	0	0
1882.5	26365	1.4	QPSK	6	0	21.64	1	0-1
1882.5	26365	1.4	16-QAM	1	0	21.53	1	0-1
1882.5	26365	1.4	16-QAM	1	2	21.57	1	0-1
1882.5	26365	1.4	16-QAM	1	5	21.54	1	0-1
1882.5	26365	1.4	16-QAM	3	0	21.60	1	0-1
1882.5	26365	1.4	16-QAM	3	2	21.62	1	0-1
1882.5	26365	1.4	16-QAM	3	3	21.64	1	0-1
1882.5	26365	1.4	16-QAM	6	0	20.60	2	0-2
1914.3	26683	1.4	QPSK	1	0	22.70	0	0
1914.3	26683	1.4	QPSK	1	2	22.63	0	0
1914.3	26683	1.4	QPSK	1	5	22.75	0	0
1914.3	26683	1.4	QPSK	3	0	22.63	0	0
1914.3	26683	1.4	QPSK	3	2	22.62	0	0
1914.3	26683	1.4	QPSK	3	3	22.70	0	0
1914.3	26683	1.4	QPSK	6	0	21.70	1	0-1
1914.3	26683	1.4	16-QAM	1	0	21.66	1	0-1
1914.3	26683	1.4	16-QAM	1	2	21.61	1	0-1
1914.3	26683	1.4	16-QAM	1	5	21.59	1	0-1
1914.3	26683	1.4	16-QAM	3	0	21.75	1	0-1
1914.3	26683	1.4	16-QAM	3	2	21.77	1	0-1
1914.3	26683	1.4	16-QAM	3	3	21.70	1	0-1
1914.3	26683	1.4	16-QAM	6	0	20.56	2	0-2

Table 8-41
Reduced LTE Band 25 (PCS) Conducted Powers - 20 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1860	26140	20	QPSK	1	0	14.49	0	0
1860	26140	20	QPSK	1	59	14.70	0	0
1860	26140	20	QPSK	1	99	14.73	0	0
1860	26140	20	QPSK	50	0	14.61	0	0-1
1860	26140	20	QPSK	50	25	14.72	0	0-1
1860	26140	20	QPSK	50	50	14.77	0	0-1
1860	26140	20	QPSK	100	0	14.76	0	0-1
1860	26140	20	16QAM	1	0	14.88	0	0-1
1860	26140	20	16QAM	1	59	14.61	0	0-1
1860	26140	20	16QAM	1	99	14.68	0	0-1
1860	26140	20	16QAM	50	0	14.71	0	0-2
1860	26140	20	16QAM	50	25	14.67	0	0-2
1860	26140	20	16QAM	50	50	14.76	0	0-2
1860	26140	20	16QAM	100	0	14.36	0	0-2
1882.5	26365	20	QPSK	1	0	**14.99**	0	0
1882.5	26365	20	QPSK	1	59	14.84	0	0
1882.5	26365	20	QPSK	1	99	14.94	0	0
1882.5	26365	20	QPSK	50	0	**14.90**	0	0-1
1882.5	26365	20	QPSK	50	25	14.88	0	0-1
1882.5	26365	20	QPSK	50	50	14.76	0	0-1
1882.5	26365	20	QPSK	100	0	14.84	0	0-1
1882.5	26365	20	16QAM	1	0	14.76	0	0-1
1882.5	26365	20	16QAM	1	59	14.37	0	0-1
1882.5	26365	20	16QAM	1	99	14.07	0	0-1
1882.5	26365	20	16QAM	50	0	14.00	0	0-2
1882.5	26365	20	16QAM	50	25	14.18	0	0-2
1882.5	26365	20	16QAM	50	50	14.21	0	0-2
1882.5	26365	20	16QAM	100	0	14.00	0	0-2
1905	26590	20	QPSK	1	0	14.79	0	0
1905	26590	20	QPSK	1	59	14.61	0	0
1905	26590	20	QPSK	1	99	14.84	0	0
1905	26590	20	QPSK	50	0	14.73	0	0-1
1905	26590	20	QPSK	50	25	14.67	0	0-1
1905	26590	20	QPSK	50	50	14.81	0	0-1
1905	26590	20	QPSK	100	0	14.77	0	0-1
1905	26590	20	16QAM	1	0	14.86	0	0-1
1905	26590	20	16QAM	1	59	14.98	0	0-1
1905	26590	20	16QAM	1	99	15.00	0	0-1
1905	26590	20	16QAM	50	0	14.72	0	0-2
1905	26590	20	16QAM	50	25	14.71	0	0-2
1905	26590	20	16QAM	50	50	14.63	0	0-2
1905	26590	20	16QAM	100	0	14.75	0	0-2

Table 8-42
Reduced LTE Band 25 (PCS) Conducted Powers - 15 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1857.5	26115	15	QPSK	1	0	14.54	0	0
1857.5	26115	15	QPSK	1	36	14.66	0	0
1857.5	26115	15	QPSK	1	74	14.77	0	0
1857.5	26115	15	QPSK	36	0	14.76	0	0-1
1857.5	26115	15	QPSK	36	18	14.48	0	0-1
1857.5	26115	15	QPSK	36	37	14.82	0	0-1
1857.5	26115	15	QPSK	75	0	14.60	0	0-1
1857.5	26115	15	16QAM	1	0	14.90	0	0-1
1857.5	26115	15	16QAM	1	36	14.35	0	0-1
1857.5	26115	15	16QAM	1	74	14.00	0	0-1
1857.5	26115	15	16QAM	36	0	14.55	0	0-2
1857.5	26115	15	16QAM	36	18	14.39	0	0-2
1857.5	26115	15	16QAM	36	37	14.66	0	0-2
1857.5	26115	15	16QAM	75	0	14.62	0	0-2
1882.5	26365	15	QPSK	1	0	14.89	0	0
1882.5	26365	15	QPSK	1	36	14.94	0	0
1882.5	26365	15	QPSK	1	74	14.87	0	0
1882.5	26365	15	QPSK	36	0	14.82	0	0-1
1882.5	26365	15	QPSK	36	18	14.88	0	0-1
1882.5	26365	15	QPSK	36	37	14.78	0	0-1
1882.5	26365	15	QPSK	75	0	14.77	0	0-1
1882.5	26365	15	16QAM	1	0	14.57	0	0-1
1882.5	26365	15	16QAM	1	36	14.63	0	0-1
1882.5	26365	15	16QAM	1	74	14.48	0	0-1
1882.5	26365	15	16QAM	36	0	14.80	0	0-2
1882.5	26365	15	16QAM	36	18	14.82	0	0-2
1882.5	26365	15	16QAM	36	37	14.86	0	0-2
1882.5	26365	15	16QAM	75	0	14.81	0	0-2
1907.5	26615	15	QPSK	1	0	14.66	0	0
1907.5	26615	15	QPSK	1	36	14.89	0	0
1907.5	26615	15	QPSK	1	74	14.93	0	0
1907.5	26615	15	QPSK	36	0	14.72	0	0-1
1907.5	26615	15	QPSK	36	18	14.53	0	0-1
1907.5	26615	15	QPSK	36	37	14.85	0	0-1
1907.5	26615	15	QPSK	75	0	14.84	0	0-1
1907.5	26615	15	16QAM	1	0	14.65	0	0-1
1907.5	26615	15	16QAM	1	36	14.71	0	0-1
1907.5	26615	15	16QAM	1	74	14.66	0	0-1
1907.5	26615	15	16QAM	36	0	14.82	0	0-2
1907.5	26615	15	16QAM	36	18	14.82	0	0-2
1907.5	26615	15	16QAM	36	37	14.70	0	0-2
1907.5	26615	15	16QAM	75	0	14.66	0	0-2

Table 8-43
Reduced LTE Band 25 (PCS) Conducted Powers - 10 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1855	26090	10	QPSK	1	0	14.60	0	0
1855	26090	10	QPSK	1	25	14.74	0	0
1855	26090	10	QPSK	1	49	14.87	0	0
1855	26090	10	QPSK	25	0	14.86	0	0-1
1855	26090	10	QPSK	25	12	14.75	0	0-1
1855	26090	10	QPSK	25	25	14.84	0	0-1
1855	26090	10	QPSK	50	0	14.81	0	0-1
1855	26090	10	16QAM	1	0	14.47	0	0-1
1855	26090	10	16QAM	1	25	14.32	0	0-1
1855	26090	10	16QAM	1	49	14.67	0	0-1
1855	26090	10	16QAM	25	0	14.00	0	0-2
1855	26090	10	16QAM	25	12	14.07	0	0-2
1855	26090	10	16QAM	25	25	14.04	0	0-2
1855	26090	10	16QAM	50	0	14.00	0	0-2
1882.5	26365	10	QPSK	1	0	14.77	0	0
1882.5	26365	10	QPSK	1	25	14.76	0	0
1882.5	26365	10	QPSK	1	49	14.64	0	0
1882.5	26365	10	QPSK	25	0	14.81	0	0-1
1882.5	26365	10	QPSK	25	12	14.50	0	0-1
1882.5	26365	10	QPSK	25	25	14.90	0	0-1
1882.5	26365	10	QPSK	50	0	14.86	0	0-1
1882.5	26365	10	16QAM	1	0	14.98	0	0-1
1882.5	26365	10	16QAM	1	25	15.00	0	0-1
1882.5	26365	10	16QAM	1	49	14.77	0	0-1
1882.5	26365	10	16QAM	25	0	14.78	0	0-2
1882.5	26365	10	16QAM	25	12	14.73	0	0-2
1882.5	26365	10	16QAM	25	25	14.86	0	0-2
1882.5	26365	10	16QAM	50	0	14.51	0	0-2
1910	26640	10	QPSK	1	0	14.69	0	0
1910	26640	10	QPSK	1	25	14.78	0	0
1910	26640	10	QPSK	1	49	14.88	0	0
1910	26640	10	QPSK	25	0	14.92	0	0-1
1910	26640	10	QPSK	25	12	15.00	0	0-1
1910	26640	10	QPSK	25	25	14.93	0	0-1
1910	26640	10	QPSK	50	0	14.89	0	0-1
1910	26640	10	16QAM	1	0	14.38	0	0-1
1910	26640	10	16QAM	1	25	14.57	0	0-1
1910	26640	10	16QAM	1	49	14.65	0	0-1
1910	26640	10	16QAM	25	0	14.94	0	0-2
1910	26640	10	16QAM	25	12	14.98	0	0-2
1910	26640	10	16QAM	25	25	14.89	0	0-2
1910	26640	10	16QAM	50	0	14.89	0	0-2

Table 8-44
Reduced LTE Band 25 (PCS) Conducted Powers - 5 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1852.5	26065	5	QPSK	1	0	14.67	0	0
1852.5	26065	5	QPSK	1	12	14.69	0	0
1852.5	26065	5	QPSK	1	24	14.77	0	0
1852.5	26065	5	QPSK	12	0	14.83	0	0-1
1852.5	26065	5	QPSK	12	6	14.89	0	0-1
1852.5	26065	5	QPSK	12	13	14.85	0	0-1
1852.5	26065	5	QPSK	25	0	14.79	0	0-1
1852.5	26065	5	16-QAM	1	0	14.38	0	0-1
1852.5	26065	5	16-QAM	1	12	14.02	0	0-1
1852.5	26065	5	16-QAM	1	24	14.00	0	0-1
1852.5	26065	5	16-QAM	12	0	14.04	0	0-2
1852.5	26065	5	16-QAM	12	6	14.13	0	0-2
1852.5	26065	5	16-QAM	12	13	14.01	0	0-2
1852.5	26065	5	16-QAM	25	0	14.00	0	0-2
1882.5	26365	5	QPSK	1	0	15.00	0	0
1882.5	26365	5	QPSK	1	12	15.00	0	0
1882.5	26365	5	QPSK	1	24	14.92	0	0
1882.5	26365	5	QPSK	12	0	15.00	0	0-1
1882.5	26365	5	QPSK	12	6	14.47	0	0-1
1882.5	26365	5	QPSK	12	13	14.84	0	0-1
1882.5	26365	5	QPSK	25	0	14.85	0	0-1
1882.5	26365	5	16-QAM	1	0	14.87	0	0-1
1882.5	26365	5	16-QAM	1	12	14.88	0	0-1
1882.5	26365	5	16-QAM	1	24	14.91	0	0-1
1882.5	26365	5	16-QAM	12	0	14.63	0	0-2
1882.5	26365	5	16-QAM	12	6	14.96	0	0-2
1882.5	26365	5	16-QAM	12	13	14.98	0	0-2
1882.5	26365	5	16-QAM	25	0	14.91	0	0-2
1912.5	26665	5	QPSK	1	0	15.00	0	0
1912.5	26665	5	QPSK	1	12	14.75	0	0
1912.5	26665	5	QPSK	1	24	14.99	0	0
1912.5	26665	5	QPSK	12	0	14.10	0	0-1
1912.5	26665	5	QPSK	12	6	14.42	0	0-1
1912.5	26665	5	QPSK	12	13	14.76	0	0-1
1912.5	26665	5	QPSK	25	0	14.44	0	0-1
1912.5	26665	5	16-QAM	1	0	14.07	0	0-1
1912.5	26665	5	16-QAM	1	12	14.65	0	0-1
1912.5	26665	5	16-QAM	1	24	15.00	0	0-1
1912.5	26665	5	16-QAM	12	0	14.04	0	0-2
1912.5	26665	5	16-QAM	12	6	14.33	0	0-2
1912.5	26665	5	16-QAM	12	13	14.63	0	0-2
1912.5	26665	5	16-QAM	25	0	14.29	0	0-2

Table 8-45
Reduced LTE Band 25 (PCS) Conducted Powers - 3 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1851.5	26055	3	QPSK	1	0	14.27	0	0
1851.5	26055	3	QPSK	1	7	14.69	0	0
1851.5	26055	3	QPSK	1	14	14.71	0	0
1851.5	26055	3	QPSK	8	0	14.18	0	0-1
1851.5	26055	3	QPSK	8	4	14.43	0	0-1
1851.5	26055	3	QPSK	8	7	14.46	0	0-1
1851.5	26055	3	QPSK	15	0	14.29	0	0-1
1851.5	26055	3	16-QAM	1	0	14.12	0	0-1
1851.5	26055	3	16-QAM	1	7	14.58	0	0-1
1851.5	26055	3	16-QAM	1	14	14.46	0	0-1
1851.5	26055	3	16-QAM	8	0	14.00	2	0-2
1851.5	26055	3	16-QAM	8	4	14.18	0	0-2
1851.5	26055	3	16-QAM	8	7	14.25	0	0-2
1851.5	26055	3	16-QAM	15	0	14.20	0	0-2
1882.5	26365	3	QPSK	1	0	14.80	0	0
1882.5	26365	3	QPSK	1	7	15.00	0	0
1882.5	26365	3	QPSK	1	14	14.94	0	0
1882.5	26365	3	QPSK	8	0	14.95	0	0-1
1882.5	26365	3	QPSK	8	4	14.99	0	0-1
1882.5	26365	3	QPSK	8	7	14.94	0	0-1
1882.5	26365	3	QPSK	15	0	14.63	0	0-1
1882.5	26365	3	16-QAM	1	0	14.73	0	0-1
1882.5	26365	3	16-QAM	1	7	14.24	0	0-1
1882.5	26365	3	16-QAM	1	14	14.08	0	0-1
1882.5	26365	3	16-QAM	8	0	14.58	0	0-2
1882.5	26365	3	16-QAM	8	4	14.77	0	0-2
1882.5	26365	3	16-QAM	8	7	14.80	0	0-2
1882.5	26365	3	16-QAM	15	0	14.38	0	0-2
1913.5	26675	3	QPSK	1	0	14.17	0	0
1913.5	26675	3	QPSK	1	7	14.74	0	0
1913.5	26675	3	QPSK	1	14	14.97	0	0
1913.5	26675	3	QPSK	8	0	14.53	0	0-1
1913.5	26675	3	QPSK	8	4	14.87	0	0-1
1913.5	26675	3	QPSK	8	7	14.99	0	0-1
1913.5	26675	3	QPSK	15	0	14.77	0	0-1
1913.5	26675	3	16-QAM	1	0	14.13	0	0-1
1913.5	26675	3	16-QAM	1	7	14.83	0	0-1
1913.5	26675	3	16-QAM	1	14	15.00	0	0-1
1913.5	26675	3	16-QAM	8	0	14.51	0	0-2
1913.5	26675	3	16-QAM	8	4	14.83	0	0-2
1913.5	26675	3	16-QAM	8	7	14.97	0	0-2
1913.5	26675	3	16-QAM	15	0	14.65	0	0-2

Table 8-46
Reduced LTE Band 25 (PCS) Conducted Powers - 1.4 MHz Bandwidth

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]	Target MPR [dB]	MPR Allowed per 3GPP [dB]
1850.7	26047	1.4	QPSK	1	0	14.17	0	0
1850.7	26047	1.4	QPSK	1	2	14.20	0	0
1850.7	26047	1.4	QPSK	1	5	14.38	0	0
1850.7	26047	1.4	QPSK	3	0	14.08	0	0
1850.7	26047	1.4	QPSK	3	2	14.15	0	0
1850.7	26047	1.4	QPSK	3	3	14.18	0	0
1850.7	26047	1.4	QPSK	6	0	14.19	0	0-1
1850.7	26047	1.4	16-QAM	1	0	14.12	0	0-1
1850.7	26047	1.4	16-QAM	1	2	14.16	0	0-1
1850.7	26047	1.4	16-QAM	1	5	14.07	0	0-1
1850.7	26047	1.4	16-QAM	3	0	14.16	0	0-1
1850.7	26047	1.4	16-QAM	3	2	14.10	0	0-1
1850.7	26047	1.4	16-QAM	3	3	14.13	0	0-1
1850.7	26047	1.4	16-QAM	6	0	14.17	0	0-2
1882.5	26365	1.4	QPSK	1	0	14.14	0	0
1882.5	26365	1.4	QPSK	1	2	14.11	0	0
1882.5	26365	1.4	QPSK	1	5	14.21	0	0
1882.5	26365	1.4	QPSK	3	0	14.16	0	0
1882.5	26365	1.4	QPSK	3	2	14.24	0	0
1882.5	26365	1.4	QPSK	3	3	14.24	0	0
1882.5	26365	1.4	QPSK	6	0	14.20	0	0-1
1882.5	26365	1.4	16-QAM	1	0	14.07	0	0-1
1882.5	26365	1.4	16-QAM	1	2	14.09	0	0-1
1882.5	26365	1.4	16-QAM	1	5	14.21	0	0-1
1882.5	26365	1.4	16-QAM	3	0	14.16	0	0-1
1882.5	26365	1.4	16-QAM	3	2	14.20	0	0-1
1882.5	26365	1.4	16-QAM	3	3	14.19	0	0-1
1882.5	26365	1.4	16-QAM	6	0	14.02	0	0-2
1914.3	26683	1.4	QPSK	1	0	14.94	0	0
1914.3	26683	1.4	QPSK	1	2	15.00	0	0
1914.3	26683	1.4	QPSK	1	5	15.00	0	0
1914.3	26683	1.4	QPSK	3	0	14.99	0	0
1914.3	26683	1.4	QPSK	3	2	14.97	0	0
1914.3	26683	1.4	QPSK	3	3	15.00	0	0
1914.3	26683	1.4	QPSK	6	0	15.00	0	0-1
1914.3	26683	1.4	16-QAM	1	0	14.96	0	0-1
1914.3	26683	1.4	16-QAM	1	2	14.94	0	0-1
1914.3	26683	1.4	16-QAM	1	5	15.00	0	0-1
1914.3	26683	1.4	16-QAM	3	0	14.84	0	0-1
1914.3	26683	1.4	16-QAM	3	2	14.92	0	0-1
1914.3	26683	1.4	16-QAM	3	3	14.98	0	0-1
1914.3	26683	1.4	16-QAM	6	0	14.99	0	0-2

9 SYSTEM VERIFICATION

9.1 Tissue Verification

Table 9-1
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
1/13/2014	750B	22.4	740	0.917	55.655	0.963	55.570	-4.78%	0.15%
			755	0.929	56.037	0.964	55.512	-3.63%	0.95%
			770	0.963	55.772	0.965	55.453	-0.21%	0.58%
			785	0.963	55.383	0.966	55.395	-0.31%	-0.02%
1/16/2014	750B	23.6	710	0.952	55.688	0.960	55.687	-0.83%	0.00%
			725	0.964	55.682	0.961	55.629	0.31%	0.10%
			740	0.984	55.575	0.963	55.570	2.18%	0.01%
			755	0.997	55.284	0.964	55.512	3.42%	-0.41%
1/18/2014	750B	23.1	740	0.955	56.167	0.963	55.570	-0.83%	1.07%
			755	0.969	56.052	0.964	55.512	0.52%	0.97%
			770	0.984	55.880	0.965	55.453	1.97%	0.77%
			785	0.997	55.702	0.966	55.395	3.21%	0.55%
1/16/2014	835B	22.1	820	0.996	53.751	0.969	55.258	2.79%	-2.73%
			835	1.011	53.529	0.970	55.200	4.23%	-3.03%
			850	1.027	53.399	0.988	55.154	3.95%	-3.18%
1/19/2014	835B	21.0	820	0.994	53.334	0.969	55.258	2.58%	-3.48%
			835	1.009	53.166	0.970	55.200	4.02%	-3.68%
			850	1.023	52.989	0.988	55.154	3.54%	-3.93%
1/18/2014	1750B	23.2	1710	1.473	51.391	1.463	53.537	0.68%	-4.01%
			1750	1.513	51.222	1.488	53.432	1.68%	-4.14%
			1790	1.555	51.106	1.514	53.326	2.71%	-4.16%
1/21/2014	1750B	23.8	1710	1.413	52.168	1.463	53.537	-3.42%	-2.56%
			1750	1.456	51.984	1.488	53.432	-2.15%	-2.71%
			1790	1.497	51.846	1.514	53.326	-1.12%	-2.78%
1/16/2014	1900B	22.0	1850	1.508	52.840	1.520	53.300	-0.79%	-0.86%
			1880	1.545	52.763	1.520	53.300	1.64%	-1.01%
			1910	1.578	52.623	1.520	53.300	3.82%	-1.27%
1/19/2014	1900B	22.6	1850	1.514	53.868	1.520	53.300	-0.39%	1.07%
			1880	1.551	53.757	1.520	53.300	2.04%	0.86%
			1910	1.587	53.638	1.520	53.300	4.41%	0.63%
1/22/2014	1900B	22.6	1850	1.481	52.516	1.520	53.300	-2.57%	-1.47%
			1880	1.514	52.435	1.520	53.300	-0.39%	-1.62%
			1910	1.552	52.332	1.520	53.300	2.11%	-1.82%
1/27/2014	1900B	22.8	1850	1.518	52.812	1.520	53.300	-0.13%	-0.92%
			1880	1.555	52.735	1.520	53.300	2.30%	-1.06%
			1910	1.589	52.642	1.520	53.300	4.54%	-1.23%

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 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.

9.2 Test System Verification

Prior to SAR assessment, the system is verified to ±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 9-2
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)	$Deviation_{1g}$ (%)
B	750	BODY	01/13/2014	24.5	22.4	0.100	1054	3288	0.874	8.720	8.740	0.23%
B	750	BODY	01/16/2014	23.5	23.4	0.100	1054	3288	0.887	8.720	8.870	1.72%
B	750	BODY	01/18/2014	23.5	23.1	0.100	1054	3288	0.911	8.720	9.110	4.47%
H	835	BODY	01/16/2014	23.4	22.0	0.100	4d119	3318	1.030	9.540	10.300	7.97%
H	835	BODY	01/19/2014	23.4	22.1	0.100	4d119	3318	0.939	9.540	9.390	-1.57%
B	1750	BODY	01/18/2014	23.9	23.2	0.100	1008	3288	3.700	38.200	37.000	-3.14%
K	1750	BODY	01/21/2014	24.5	23.8	0.100	1051	3333	3.550	37.800	35.500	-6.08%
I	1900	BODY	01/16/2014	23.1	22.2	0.100	5d148	3319	4.000	40.800	40.000	-1.96%
I	1900	BODY	01/19/2014	23.4	22.8	0.100	5d148	3319	3.840	40.800	38.400	-5.88%
I	1900	BODY	01/22/2014	23.5	22.4	0.100	5d148	3319	3.820	40.800	38.200	-6.37%
I	1900	BODY	01/27/2014	23.6	22.9	0.100	5d148	3319	3.840	40.800	38.400	-5.88%

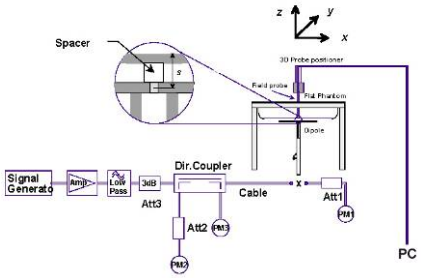

Figure 9-1
System Verification Setup Diagram

Figure 9-2
System Verification Setup Photo

10 SAR DATA SUMMARY

10.1 Standalone Body SAR Data

Table 10-1
GPRS/UMTS Body SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of GPRS Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Scaled SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	190	GSM 850	GPRS	33.5	31.94	0.11	19 mm	20	2	1:4.15	back	0.272	1.432	0.390	
824.20	128	GSM 850	GPRS	33.5	31.93	-0.12	14 mm	20	2	1:4.15	right	0.760	1.435	1.091	
836.60	190	GSM 850	GPRS	33.5	31.94	-0.06	14 mm	20	2	1:4.15	right	0.828	1.432	1.186	
848.80	251	GSM 850	GPRS	33.5	31.85	-0.12	14 mm	20	2	1:4.15	right	0.900	1.462	1.316	
836.60	190	GSM 850	GPRS	30.0	30.00	-0.08	0 mm	22	1	1:8.3	back	0.718	1.000	0.718	
836.60	190	GSM 850	GPRS	33.5	31.94	-0.19	0 mm	20	2	1:4.15	top	0.449	1.432	0.643	
824.20	128	GSM 850	GPRS	30.0	29.99	0.01	0 mm	22	1	1:8.3	right	1.370	1.002	1.373	A1
836.60	190	GSM 850	GPRS	30.0	30.00	0.05	0 mm	22	1	1:8.3	right	1.290	1.000	1.290	
848.80	251	GSM 850	GPRS	30.0	29.90	0.02	0 mm	22	1	1:8.3	right	1.340	1.023	1.371	
824.20	128	GSM 850	GPRS	30.0	29.99	0.14	0 mm	22	1	1:8.3	right	1.330	1.002	1.333	
1880.00	661	GSM 1900	GPRS	30.5	28.81	0.00	19 mm	20	2	1:4.15	back	0.052	1.476	0.077	
1850.20	512	GSM 1900	GPRS	30.5	28.82	-0.09	14 mm	20	2	1:4.15	right	0.730	1.472	1.075	
1880.00	661	GSM 1900	GPRS	30.5	28.81	-0.07	14 mm	20	2	1:4.15	right	0.682	1.476	1.007	
1909.80	810	GSM 1900	GPRS	30.5	28.78	-0.05	14 mm	20	2	1:4.15	right	0.687	1.486	1.021	
1880.00	661	GSM 1900	GPRS	24.5	23.75	0.18	0 mm	20	1	1:8.3	back	0.106	1.189	0.126	
1880.00	661	GSM 1900	GPRS	30.5	28.81	0.01	0 mm	20	2	1:4.15	top	0.295	1.476	0.435	
1850.20	512	GSM 1900	GPRS	24.5	23.86	-0.09	0 mm	20	1	1:8.3	right	0.951	1.159	1.102	
1880.00	661	GSM 1900	GPRS	24.5	23.75	-0.06	0 mm	20	1	1:8.3	right	1.070	1.189	1.272	
1909.80	810	GSM 1900	GPRS	24.5	23.90	-0.03	0 mm	20	1	1:8.3	right	1.090	1.148	1.251	A2
836.60	4183	UMTS 850	RMC	24.0	22.56	-0.01	19 mm	20	N/A	1:1	back	0.189	1.393	0.263	
836.60	4183	UMTS 850	RMC	24.0	22.56	0.02	14 mm	20	N/A	1:1	right	0.477	1.393	0.664	
836.60	4183	UMTS 850	RMC	19.5	18.96	0.02	0 mm	22	N/A	1:1	back	0.578	1.132	0.654	
836.60	4183	UMTS 850	RMC	24.0	22.56	0.01	0 mm	20	N/A	1:1	top	0.281	1.393	0.391	
826.40	4132	UMTS 850	RMC	19.5	18.99	-0.01	0 mm	22	N/A	1:1	right	0.974	1.125	1.096	
836.60	4183	UMTS 850	RMC	19.5	18.96	0.02	0 mm	22	N/A	1:1	right	1.030	1.132	1.166	
846.60	4233	UMTS 850	RMC	19.5	18.90	-0.04	0 mm	22	N/A	1:1	right	1.040	1.148	1.194	A3
1732.40	1412	UMTS 1750	RMC	24.0	22.76	-0.03	19 mm	20	N/A	1:1	back	0.113	1.330	0.150	
1732.40	1412	UMTS 1750	RMC	24.0	22.76	0.03	14 mm	20	N/A	1:1	right	0.327	1.330	0.435	
1732.40	1412	UMTS 1750	RMC	17.0	16.91	0.01	0 mm	35	N/A	1:1	back	0.422	1.021	0.431	
1732.40	1412	UMTS 1750	RMC	24.0	22.76	0.11	0 mm	20	N/A	1:1	top	0.598	1.330	0.795	
1712.40	1312	UMTS 1750	RMC	17.0	16.71	0.08	0 mm	35	N/A	1:1	right	0.867	1.069	0.927	
1732.40	1412	UMTS 1750	RMC	17.0	16.91	-0.10	0 mm	35	N/A	1:1	right	1.030	1.021	1.052	
1752.50	1862	UMTS 1750	RMC	17.0	16.93	-0.10	0 mm	35	N/A	1:1	right	1.180	1.016	1.199	A4
1880.00	9400	UMTS 1900	RMC	24.0	22.62	-0.04	19 mm	104	N/A	1:1	back	0.052	1.374	0.071	
1852.40	9262	UMTS 1900	RMC	24.0	22.66	0.00	14 mm	104	N/A	1:1	right	0.574	1.361	0.781	
1880.00	9400	UMTS 1900	RMC	24.0	22.62	-0.01	14 mm	104	N/A	1:1	right	0.646	1.374	0.888	
1907.60	9538	UMTS 1900	RMC	24.0	22.63	0.01	14 mm	104	N/A	1:1	right	0.648	1.371	0.888	
1880.00	9400	UMTS 1900	RMC	15.5	15.05	0.10	0 mm	22	N/A	1:1	back	0.083	1.109	0.092	
1880.00	9400	UMTS 1900	RMC	24.0	22.62	0.05	0 mm	104	N/A	1:1	top	0.233	1.374	0.320	
1852.40	9262	UMTS 1900	RMC	15.5	15.42	-0.08	0 mm	22	N/A	1:1	right	0.981	1.019	1.000	
1880.00	9400	UMTS 1900	RMC	15.5	15.05	-0.12	0 mm	22	N/A	1:1	right	0.843	1.109	0.935	
1907.60	9538	UMTS 1900	RMC	15.5	15.49	-0.02	0 mm	22	N/A	1:1	right	1.170	1.002	1.172	A5
1907.60	9538	UMTS 1900	RMC	15.5	15.49	-0.16	0 mm	22	N/A	1:1	right	1.110	1.002	1.112	
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: Blue entries indicate variability measurements.

Table 10-2
EVDO Body 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)	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. 0	25.0	23.37	-0.04	19 mm	35	1:1	back	0.195	1.455	0.284	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. 0	25.0	23.37	0.01	14 mm	35	1:1	right	0.481	1.455	0.700	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. 0	19.5	19.50	0.00	0 mm	35	1:1	back	0.699	1.000	0.699	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. 0	25.0	23.37	0.05	0 mm	35	1:1	top	0.460	1.455	0.669	
820.10	564	CDMA BC10 (§90S)	EVDO Rev. 0	19.5	19.50	-0.14	0 mm	35	1:1	right	1.260	1.000	1.260	A6
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	25.0	23.50	0.00	19 mm	35	1:1	back	0.208	1.413	0.294	
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	25.0	23.50	-0.07	14 mm	35	1:1	right	0.562	1.413	0.794	
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	19.5	19.25	-0.02	0 mm	35	1:1	back	0.620	1.059	0.657	
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	25.0	23.50	-0.12	0 mm	35	1:1	top	0.393	1.413	0.555	
824.70	1013	CDMA BC0 (§22H)	EVDO Rev. 0	19.5	19.48	0.12	0 mm	35	1:1	right	1.220	1.005	1.226	
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	19.5	19.25	-0.04	0 mm	35	1:1	right	1.240	1.059	1.313	A7
848.31	777	CDMA BC0 (§22H)	EVDO Rev. 0	19.5	19.22	-0.01	0 mm	35	1:1	right	1.140	1.067	1.216	
1880.00	600	PCS CDMA	EVDO Rev. 0	25.0	23.43	0.09	19 mm	35	1:1	back	0.075	1.435	0.108	
1851.25	25	PCS CDMA	EVDO Rev. 0	25.0	23.70	-0.07	14 mm	35	1:1	right	0.781	1.349	1.054	
1880.00	600	PCS CDMA	EVDO Rev. 0	25.0	23.43	-0.10	14 mm	35	1:1	right	0.820	1.435	1.177	
1908.75	1175	PCS CDMA	EVDO Rev. 0	25.0	23.51	-0.01	14 mm	35	1:1	right	0.809	1.409	1.140	
1880.00	600	PCS CDMA	EVDO Rev. 0	16.0	15.90	0.07	0 mm	35	1:1	back	0.109	1.023	0.112	
1880.00	600	PCS CDMA	EVDO Rev. 0	25.0	23.43	0.16	0 mm	35	1:1	top	0.381	1.435	0.547	
1851.25	25	PCS CDMA	EVDO Rev. 0	16.0	15.85	-0.04	0 mm	35	1:1	right	0.849	1.035	0.879	
1880.00	600	PCS CDMA	EVDO Rev. 0	16.0	15.90	0.02	0 mm	35	1:1	right	1.020	1.023	1.043	A8
1908.75	1175	PCS CDMA	EVDO Rev. 0	16.0	15.91	0.02	0 mm	35	1:1	right	0.815	1.021	0.832	
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 10-3
LTE Band 17 Body SAR Data

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)	
710.00	23790	Mid	LTE Band 17	10	21.5	20.88	0.04	0	21	QPSK	1	0	0 mm	back	1:1	0.678	1.153	0.782	
710.00	23790	Mid	LTE Band 17	10	21.5	20.90	-0.17	0	21	QPSK	25	25	0 mm	back	1:1	0.656	1.148	0.753	
710.00	23790	Mid	LTE Band 17	10	24.0	22.66	-0.06	0	21	QPSK	1	0	0 mm	top	1:1	0.253	1.361	0.344	
710.00	23790	Mid	LTE Band 17	10	23.0	21.95	0.13	1	21	QPSK	25	25	0 mm	top	1:1	0.195	1.274	0.248	
710.00	23790	Mid	LTE Band 17	10	21.5	20.88	0.10	0	21	QPSK	1	0	0 mm	right	1:1	1.210	1.153	1.395	A9
710.00	23790	Mid	LTE Band 17	10	21.5	20.90	-0.04	0	21	QPSK	25	25	0 mm	right	1:1	1.060	1.148	1.217	
710.00	23790	Mid	LTE Band 17	10	21.5	20.83	-0.07	0	21	QPSK	50	0	0 mm	right	1:1	0.964	1.167	1.125	
710.00	23790	Mid	LTE Band 17	10	24.0	22.66	0.01	0	21	QPSK	1	0	19 mm	back	1:1	0.109	1.361	0.148	
710.00	23790	Mid	LTE Band 17	10	23.0	21.95	-0.06	1	21	QPSK	25	25	19 mm	back	1:1	0.077	1.274	0.098	
710.00	23790	Mid	LTE Band 17	10	24.0	22.66	0.14	0	21	QPSK	1	0	14 mm	right	1:1	0.310	1.361	0.422	
710.00	23790	Mid	LTE Band 17	10	23.0	21.95	0.09	1	21	QPSK	25	25	14 mm	right	1:1	0.255	1.274	0.325	
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 10-4
LTE Band 13 Body SAR Data

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	21.0	20.80	-0.03	0	22	QPSK	1	49	0 mm	back	1:1	0.789	1.047	0.826	
782.00	23230	Mid	LTE Band 13	10	21.0	20.50	-0.15	0	22	QPSK	25	0	0 mm	back	1:1	0.788	1.122	0.884	
782.00	23230	Mid	LTE Band 13	10	21.0	20.49	0.02	0	22	QPSK	50	0	0 mm	back	1:1	0.776	1.125	0.873	
782.00	23230	Mid	LTE Band 13	10	24.0	22.83	-0.06	0	22	QPSK	1	49	0 mm	top	1:1	0.319	1.309	0.418	
782.00	23230	Mid	LTE Band 13	10	23.0	22.00	0.02	1	22	QPSK	25	0	0 mm	top	1:1	0.280	1.259	0.353	
782.00	23230	Mid	LTE Band 13	10	21.0	20.80	0.14	0	22	QPSK	1	49	0 mm	right	1:1	1.190	1.047	1.246	
782.00	23230	Mid	LTE Band 13	10	21.0	20.50	-0.04	0	22	QPSK	25	0	0 mm	right	1:1	1.240	1.122	1.391	A10
782.00	23230	Mid	LTE Band 13	10	21.0	20.49	-0.18	0	22	QPSK	50	0	0 mm	right	1:1	1.230	1.125	1.384	
782.00	23230	Mid	LTE Band 13	10	24.0	22.83	0.07	0	22	QPSK	1	49	19 mm	back	1:1	0.124	1.309	0.162	
782.00	23230	Mid	LTE Band 13	10	23.0	22.00	0.07	1	22	QPSK	25	0	19 mm	back	1:1	0.110	1.259	0.138	
782.00	23230	Mid	LTE Band 13	10	24.0	22.83	0.08	0	22	QPSK	1	49	14 mm	right	1:1	0.268	1.309	0.351	
782.00	23230	Mid	LTE Band 13	10	23.0	22.00	0.19	1	22	QPSK	25	0	14 mm	right	1:1	0.203	1.259	0.256	
782.00	23230	Mid	LTE Band 13	10	21.0	20.50	0.10	0	22	QPSK	25	0	0 mm	right	1:1	1.230	1.122	1.380	
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: Blue entries indicate variability measurements.

Table 10-5
LTE Band 5 (Cell) Body SAR Data

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)	
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.5	18.85	0.16	0	22	QPSK	1	0	0 mm	back	1:1	0.822	1.161	0.954	
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.5	19.02	-0.03	0	22	QPSK	25	0	0 mm	back	1:1	0.803	1.117	0.897	
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.5	18.84	0.13	0	22	QPSK	50	0	0 mm	back	1:1	0.812	1.164	0.945	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.66	0.13	0	104	QPSK	1	49	0 mm	top	1:1	0.344	1.361	0.468	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	21.70	0.02	1	104	QPSK	25	12	0 mm	top	1:1	0.289	1.349	0.390	
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.5	18.85	0.00	0	22	QPSK	1	0	0 mm	right	1:1	1.060	1.161	1.231	A11
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.5	19.02	-0.19	0	22	QPSK	25	0	0 mm	right	1:1	1.000	1.117	1.117	
836.50	20525	Mid	LTE Band 5 (Cell)	10	19.5	18.84	0.05	0	22	QPSK	50	0	0 mm	right	1:1	0.984	1.164	1.145	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.66	0.15	0	104	QPSK	1	49	19 mm	back	1:1	0.140	1.361	0.191	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	21.70	0.01	1	104	QPSK	25	12	19 mm	back	1:1	0.114	1.349	0.154	
836.50	20525	Mid	LTE Band 5 (Cell)	10	24.0	22.66	-0.03	0	104	QPSK	1	49	14 mm	right	1:1	0.449	1.361	0.611	
836.50	20525	Mid	LTE Band 5 (Cell)	10	23.0	21.70	0.02	1	104	QPSK	25	12	14 mm	right	1:1	0.346	1.349	0.467	
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 10-6
LTE Band 4 (AWS) Body SAR Data

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	Mid	LTE Band 4 (AWS)	20	18.0	17.76	-0.08	0	35	QPSK	1	99	0 mm	back	1:1	0.589	1.057	0.623	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	18.0	17.58	-0.13	0	35	QPSK	50	0	0 mm	back	1:1	0.568	1.102	0.626	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	22.89	0.02	0	35	QPSK	1	99	0 mm	top	1:1	0.603	1.291	0.778	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.97	-0.11	1	35	QPSK	50	0	0 mm	top	1:1	0.470	1.268	0.596	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	18.0	17.76	-0.19	0	35	QPSK	1	99	0 mm	right	1:1	1.310	1.057	1.385	A12
1732.50	20175	Mid	LTE Band 4 (AWS)	20	18.0	17.58	0.03	0	35	QPSK	50	0	0 mm	right	1:1	1.160	1.102	1.278	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	18.0	17.50	0.02	0	35	QPSK	100	0	0 mm	right	1:1	1.150	1.122	1.290	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	22.89	0.11	0	35	QPSK	1	99	19 mm	back	1:1	0.116	1.291	0.150	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.97	-0.03	1	35	QPSK	50	0	19 mm	back	1:1	0.082	1.268	0.104	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.0	22.89	0.00	0	35	QPSK	1	99	14 mm	right	1:1	0.472	1.291	0.609	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.0	21.97	-0.06	1	35	QPSK	50	0	14 mm	right	1:1	0.307	1.268	0.389	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	18.0	17.76	-0.19	0	35	QPSK	1	99	0 mm	right	1:1	1.300	1.057	1.374	
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: Blue entries indicate variability measurements.

Table 10-7
LTE Band 25 (PCS) Body SAR Data

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)	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	15.5	14.99	0.14	0	20	QPSK	1	0	0 mm	back	1:1	0.103	1.125	0.116	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	15.5	14.90	0.09	0	20	QPSK	50	0	0 mm	back	1:1	0.095	1.148	0.109	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	22.82	0.04	0	22	QPSK	1	99	0 mm	top	1:1	0.284	1.312	0.373	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.0	21.54	0.03	1	22	QPSK	50	50	0 mm	top	1:1	0.255	1.400	0.357	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	15.5	14.99	-0.01	0	20	QPSK	1	0	0 mm	right	1:1	0.438	1.125	0.493	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	15.5	14.90	-0.08	0	20	QPSK	50	0	0 mm	right	1:1	0.502	1.148	0.576	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	22.82	0.00	0	22	QPSK	1	99	19 mm	back	1:1	0.054	1.312	0.071	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.0	21.54	0.10	1	22	QPSK	50	50	19 mm	back	1:1	0.045	1.400	0.063	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.0	22.82	0.17	0	22	QPSK	1	99	14 mm	right	1:1	0.608	1.312	0.798	A13
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.0	21.54	0.03	1	22	QPSK	50	50	14 mm	right	1:1	0.499	1.400	0.699	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population														Body 1.6 W/kg (mW/g) averaged over 1 gram						

10.2 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in FCC KDB 616217 and FCC KDB Publication 447498 D01v05..
2. Batteries are fully charged at the beginning of the SAR measurements. A standard battery was used for all 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. 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 12 for variability analysis.
7. Per FCC KDB 616217 D04 Section 4.3, SAR tests are required for the back surface and edges of the tablet with the tablet touching the phantom. The SAR Exclusion Threshold in FCC KDB 447498 D01v05 was applied to determine SAR test exclusion for adjacent edge configurations. Top and Right edge SAR tests were required for the main antenna.

GSM Test Notes:

1. Justification for reduced test configurations per KDB Publication 941225 D03v01 and October 2013 TCB Workshop Notes: The source-based frame-averaged output power was evaluated for all GPRS/EDGE slot configurations. The configuration with the highest target frame averaged output power was evaluated for SAR. When the maximum frame-averaged powers are equivalent across two or more slots (within 0.25 dB), the configuration with the most number of time slots was tested.
2. 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 > ½ dB, instead of the middle channel, the highest output power channel was used.

CDMA Notes:

1. Body 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 data devices when the maximum average output of each channel is less than ¼ dB higher than that measured in Subtype 0/1 Physical Layer configurations for Rev. 0..
2. 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 > ½ dB, instead of the middle channel, the highest output power channel was used.

UMTS Notes:

1. UMTS mode in was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v02. HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg.
2. 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 > ½ 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 7.5.4.
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).

11 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

11.1 Introduction

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

The FZ-M1 additionally contains WIFI transmitter ACJ9TGWL13A. Please reference the corresponding SAR report (0Y1401030009.ACJ) for WIFI test data.

11.2 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 a 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.

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

Table 11-1
Estimated SAR

Mode	Frequency	Maximum Allowed Power	Separation Distance (Body)	Estimated SAR (Body)
	[MHz]	[dBm]	[mm]	[W/kg]
2.4 GHz WLAN Left Edge Antenna 1	2437	14.00	17.6	**0.296**
2.4 GHz WLAN Left Edge Antenna 2	2437	14.00	17.3	**0.301**
2.4 GHz WLAN Left Edge MIMO	2437	12.00	17.3	**0.193**
5 GHz WLAN Left Edge MIMO	5785	9.00	17.3	**0.148**

11.3 Body SAR Simultaneous Transmission Analysis

Table 11-2
WLAN Antenna 1 Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body at 0 mm)

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.718	0.104	0.822
	Top	0.643	0.387	1.030
	Bottom	0.400	0.400	0.800
	Right	1.373	0.006	1.379
	Left	0.400	0.296	0.696

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.126	0.104	0.230
	Top	0.435	0.387	0.822
	Bottom	0.400	0.400	0.800
	Right	1.272	0.006	1.278
	Left	0.400	0.296	0.696

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.654	0.104	0.758
	Top	0.391	0.387	0.778
	Bottom	0.400	0.400	0.800
	Right	1.194	0.006	1.200
	Left	0.400	0.296	0.696

Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.431	0.104	0.535
	Top	0.795	0.387	1.182
	Bottom	0.400	0.400	0.800
	Right	1.199	0.006	1.205
	Left	0.400	0.296	0.696

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.092	0.104	0.196
	Top	0.320	0.387	0.707
	Bottom	0.400	0.400	0.800
	Right	1.172	0.006	1.178
	Left	0.400	0.296	0.696

Simult Tx	Configuration	EVDO BC10 (§90S) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.699	0.104	0.803
	Top	0.669	0.387	1.056
	Bottom	0.400	0.400	0.800
	Right	1.260	0.006	1.266
	Left	0.400	0.296	0.696

Simult Tx	Configuration	EVDO BC0 (§22H) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.657	0.104	0.761
	Top	0.555	0.387	0.942
	Bottom	0.400	0.400	0.800
	Right	1.313	0.006	1.319
	Left	0.400	0.296	0.696

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.112	0.104	0.216
	Top	0.547	0.387	0.934
	Bottom	0.400	0.400	0.800
	Right	1.043	0.006	1.049
	Left	0.400	0.296	0.696

Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.782	0.104	0.886
	Top	0.344	0.387	0.731
	Bottom	0.400	0.400	0.800
	Right	1.395	0.006	1.401
	Left	0.400	0.296	0.696

Simult Tx	Configuration	LTE Band 13 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.884	0.104	0.988
	Top	0.418	0.387	0.805
	Bottom	0.400	0.400	0.800
	Right	1.391	0.006	1.397
	Left	0.400	0.296	0.696

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.954	0.104	1.058
	Top	0.468	0.387	0.855
	Bottom	0.400	0.400	0.800
	Right	1.231	0.006	1.237
	Left	0.400	0.296	0.696

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.626	0.104	0.730
	Top	0.778	0.387	1.165
	Bottom	0.400	0.400	0.800
	Right	1.385	0.006	1.391
	Left	0.400	0.296	0.696

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.116	0.104	0.220
	Top	0.373	0.387	0.760
	Bottom	0.400	0.400	0.800
	Right	0.576	0.006	0.582
	Left	0.400	0.296	0.696

Table 11-3
WLAN Antenna 1 Simultaneous Transmission Scenario with 5 GHz WLAN (Body at 0 mm)

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.718	0.048	0.766
	Top	0.643	0.180	0.823
	Bottom	0.400	0.400	0.800
	Right	1.373	0.001	1.374
	Left	0.400	0.000	0.400

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.126	0.048	0.174
	Top	0.435	0.180	0.615
	Bottom	0.400	0.400	0.800
	Right	1.272	0.001	1.273
	Left	0.400	0.000	0.400

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.654	0.048	0.702
	Top	0.391	0.180	0.571
	Bottom	0.400	0.400	0.800
	Right	1.194	0.001	1.195
	Left	0.400	0.000	0.400

Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.431	0.048	0.479
	Top	0.795	0.180	0.975
	Bottom	0.400	0.400	0.800
	Right	1.199	0.001	1.200
	Left	0.400	0.000	0.400

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.092	0.048	0.140
	Top	0.320	0.180	0.500
	Bottom	0.400	0.400	0.800
	Right	1.172	0.001	1.173
	Left	0.400	0.000	0.400

Simult Tx	Configuration	EVDO BC10 (§90S) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.699	0.048	0.747
	Top	0.669	0.180	0.849
	Bottom	0.400	0.400	0.800
	Right	1.260	0.001	1.261
	Left	0.400	0.000	0.400

Simult Tx	Configuration	EVDO BC0 (§22H) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.657	0.048	0.705
	Top	0.555	0.180	0.735
	Bottom	0.400	0.400	0.800
	Right	1.313	0.001	1.314
	Left	0.400	0.000	0.400

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.112	0.048	0.160
	Top	0.547	0.180	0.727
	Bottom	0.400	0.400	0.800
	Right	1.043	0.001	1.044
	Left	0.400	0.000	0.400

Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.782	0.048	0.830
	Top	0.344	0.180	0.524
	Bottom	0.400	0.400	0.800
	Right	1.395	0.001	1.396
	Left	0.400	0.000	0.400

Simult Tx	Configuration	LTE Band 13 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.884	0.048	0.932
	Top	0.418	0.180	0.598
	Bottom	0.400	0.400	0.800
	Right	1.391	0.001	1.392
	Left	0.400	0.000	0.400

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.954	0.048	1.002
	Top	0.468	0.180	0.648
	Bottom	0.400	0.400	0.800
	Right	1.231	0.001	1.232
	Left	0.400	0.000	0.400

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.626	0.048	0.674
	Top	0.778	0.180	0.958
	Bottom	0.400	0.400	0.800
	Right	1.385	0.001	1.386
	Left	0.400	0.000	0.400

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.116	0.048	0.164
	Top	0.373	0.180	0.553
	Bottom	0.400	0.400	0.800
	Right	0.576	0.001	0.577
	Left	0.400	0.000	0.400

Table 11-4
WLAN Antenna 1 Simultaneous Transmission Scenario with 2.4 GHz WLAN (Back at 19 mm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.390	< 0.104	< 0.494
Back Side	GSM 1900	0.077	< 0.104	< 0.181
Back Side	UMTS 850	0.263	< 0.104	< 0.367
Back Side	UMTS 1750	0.150	< 0.104	< 0.254
Back Side	UMTS 1900	0.071	< 0.104	< 0.175
Back Side	CDMA BC10 (§90S)	0.284	< 0.104	< 0.388
Back Side	CDMA BC0 (§22H)	0.294	< 0.104	< 0.398
Back Side	PCS CDMA	0.108	< 0.104	< 0.212
Back Side	LTE Band 17	0.148	< 0.104	< 0.252
Back Side	LTE Band 13	0.162	< 0.104	< 0.266
Back Side	LTE Band 5 (Cell)	0.191	< 0.104	< 0.295
Back Side	LTE Band 4 (AWS)	0.150	< 0.104	< 0.254
Back Side	LTE Band 25 (PCS)	0.071	< 0.104	< 0.175

Table 11-5
WLAN Antenna 1 Simultaneous Transmission Scenario with 5 GHz WLAN (Back at 19 mm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.390	< 0.048	< 0.438
Back Side	GSM 1900	0.077	< 0.048	< 0.125
Back Side	UMTS 850	0.263	< 0.048	< 0.311
Back Side	UMTS 1750	0.150	< 0.048	< 0.198
Back Side	UMTS 1900	0.071	< 0.048	< 0.119
Back Side	CDMA BC10 (§90S)	0.284	< 0.048	< 0.332
Back Side	CDMA BC0 (§22H)	0.294	< 0.048	< 0.342
Back Side	PCS CDMA	0.108	< 0.048	< 0.156
Back Side	LTE Band 17	0.148	< 0.048	< 0.196
Back Side	LTE Band 13	0.162	< 0.048	< 0.21
Back Side	LTE Band 5 (Cell)	0.191	< 0.048	< 0.239
Back Side	LTE Band 4 (AWS)	0.150	< 0.048	< 0.198
Back Side	LTE Band 25 (PCS)	0.071	< 0.048	< 0.119

Table 11-6
WLAN Antenna 1 Simultaneous Transmission Scenario with 2.4 GHz WLAN (Right at 14 mm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Right Edge	GSM 850	1.316	< 0.006	< 1.322
Right Edge	GSM 1900	1.075	< 0.006	< 1.081
Right Edge	UMTS 850	0.664	< 0.006	< 0.67
Right Edge	UMTS 1750	0.435	< 0.006	< 0.441
Right Edge	UMTS 1900	0.888	< 0.006	< 0.894
Right Edge	CDMA BC10 (§90S)	0.700	< 0.006	< 0.706
Right Edge	CDMA BC0 (§22H)	0.794	< 0.006	< 0.8
Right Edge	PCS CDMA	1.177	< 0.006	< 1.183
Right Edge	LTE Band 17	0.422	< 0.006	< 0.428
Right Edge	LTE Band 13	0.351	< 0.006	< 0.357
Right Edge	LTE Band 5 (Cell)	0.611	< 0.006	< 0.617
Right Edge	LTE Band 4 (AWS)	0.609	< 0.006	< 0.615
Right Edge	LTE Band 25 (PCS)	0.798	< 0.006	< 0.804

Table 11-7
WLAN Antenna 1 Simultaneous Transmission Scenario with 5 GHz WLAN (Right at 14 mm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Right Edge	GSM 850	1.316	< 0.001	< 1.317
Right Edge	GSM 1900	1.075	< 0.001	< 1.076
Right Edge	UMTS 850	0.664	< 0.001	< 0.665
Right Edge	UMTS 1750	0.435	< 0.001	< 0.436
Right Edge	UMTS 1900	0.888	< 0.001	< 0.889
Right Edge	CDMA BC10 (§90S)	0.700	< 0.001	< 0.701
Right Edge	CDMA BC0 (§22H)	0.794	< 0.001	< 0.795
Right Edge	PCS CDMA	1.177	< 0.001	< 1.178
Right Edge	LTE Band 17	0.422	< 0.001	< 0.423
Right Edge	LTE Band 13	0.351	< 0.001	< 0.352
Right Edge	LTE Band 5 (Cell)	0.611	< 0.001	< 0.612
Right Edge	LTE Band 4 (AWS)	0.609	< 0.001	< 0.61
Right Edge	LTE Band 25 (PCS)	0.798	< 0.001	< 0.799

Table 11-8
WLAN Antenna 2 Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body at 0 mm)

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.718	0.075	0.793
	Top	0.643	0.400	1.043
	Bottom	0.400	0.210	0.610
	Right	1.373	0.032	1.405
	Left	0.400	0.301	0.701

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.126	0.075	0.201
	Top	0.435	0.400	0.835
	Bottom	0.400	0.210	0.610
	Right	1.272	0.032	1.304
	Left	0.400	0.301	0.701

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.654	0.075	0.729
	Top	0.391	0.400	0.791
	Bottom	0.400	0.210	0.610
	Right	1.194	0.032	1.226
	Left	0.400	0.301	0.701

Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.431	0.075	0.506
	Top	0.795	0.400	1.195
	Bottom	0.400	0.210	0.610
	Right	1.199	0.032	1.231
	Left	0.400	0.301	0.701

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.092	0.075	0.167
	Top	0.320	0.400	0.720
	Bottom	0.400	0.210	0.610
	Right	1.172	0.032	1.204
	Left	0.400	0.301	0.701

Simult Tx	Configuration	EVDO BC10 (§90S) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.699	0.075	0.774
	Top	0.669	0.400	1.069
	Bottom	0.400	0.210	0.610
	Right	1.260	0.032	1.292
	Left	0.400	0.301	0.701

Simult Tx	Configuration	EVDO BC0 (§22H) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.657	0.075	0.732
	Top	0.555	0.400	0.955
	Bottom	0.400	0.210	0.610
	Right	1.313	0.032	1.345
	Left	0.400	0.301	0.701

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.112	0.075	0.187
	Top	0.547	0.400	0.947
	Bottom	0.400	0.210	0.610
	Right	1.043	0.032	1.075
	Left	0.400	0.301	0.701

Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.782	0.075	0.857
	Top	0.344	0.400	0.744
	Bottom	0.400	0.210	0.610
	Right	1.395	0.032	**1.427**
	Left	0.400	0.301	0.701

Simult Tx	Configuration	LTE Band 13 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.884	0.075	0.959
	Top	0.418	0.400	0.818
	Bottom	0.400	0.210	0.610
	Right	1.391	0.032	1.423
	Left	0.400	0.301	0.701

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.954	0.075	1.029
	Top	0.468	0.400	0.868
	Bottom	0.400	0.210	0.610
	Right	1.231	0.032	1.263
	Left	0.400	0.301	0.701

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.626	0.075	0.701
	Top	0.778	0.400	1.178
	Bottom	0.400	0.210	0.610
	Right	1.385	0.032	1.417
	Left	0.400	0.301	0.701

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.116	0.075	0.191
	Top	0.373	0.400	0.773
	Bottom	0.400	0.210	0.610
	Right	0.576	0.032	0.608
	Left	0.400	0.301	0.701

Table 11-9
WLAN Antenna 2 Simultaneous Transmission Scenario with 5 GHz WLAN (Body at 0 mm)

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.718	0.084	0.802
	Top	0.643	0.400	1.043
	Bottom	0.400	0.289	0.689
	Right	1.373	0.001	1.374
	Left	0.400	0.000	0.400

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.126	0.084	0.210
	Top	0.435	0.400	0.835
	Bottom	0.400	0.289	0.689
	Right	1.272	0.001	1.273
	Left	0.400	0.000	0.400

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.654	0.084	0.738
	Top	0.391	0.400	0.791
	Bottom	0.400	0.289	0.689
	Right	1.194	0.001	1.195
	Left	0.400	0.000	0.400

Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.431	0.084	0.515
	Top	0.795	0.400	1.195
	Bottom	0.400	0.289	0.689
	Right	1.199	0.001	1.200
	Left	0.400	0.000	0.400

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.092	0.084	0.176
	Top	0.320	0.400	0.720
	Bottom	0.400	0.289	0.689
	Right	1.172	0.001	1.173
	Left	0.400	0.000	0.400

Simult Tx	Configuration	EVDO BC10 (§90S) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.699	0.084	0.783
	Top	0.669	0.400	1.069
	Bottom	0.400	0.289	0.689
	Right	1.260	0.001	1.261
	Left	0.400	0.000	0.400

Simult Tx	Configuration	EVDO BC0 (§22H) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.657	0.084	0.741
	Top	0.555	0.400	0.955
	Bottom	0.400	0.289	0.689
	Right	1.313	0.001	1.314
	Left	0.400	0.000	0.400

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.112	0.084	0.196
	Top	0.547	0.400	0.947
	Bottom	0.400	0.289	0.689
	Right	1.043	0.001	1.044
	Left	0.400	0.000	0.400

Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.782	0.084	0.866
	Top	0.344	0.400	0.744
	Bottom	0.400	0.289	0.689
	Right	1.395	0.001	1.396
	Left	0.400	0.000	0.400

Simult Tx	Configuration	LTE Band 13 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.884	0.084	0.968
	Top	0.418	0.400	0.818
	Bottom	0.400	0.289	0.689
	Right	1.391	0.001	1.392
	Left	0.400	0.000	0.400

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.954	0.084	1.038
	Top	0.468	0.400	0.868
	Bottom	0.400	0.289	0.689
	Right	1.231	0.001	1.232
	Left	0.400	0.000	0.400

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.626	0.084	0.710
	Top	0.778	0.400	1.178
	Bottom	0.400	0.289	0.689
	Right	1.385	0.001	1.386
	Left	0.400	0.000	0.400

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.116	0.084	0.200
	Top	0.373	0.400	0.773
	Bottom	0.400	0.289	0.689
	Right	0.576	0.001	0.577
	Left	0.400	0.000	0.400

Table 11-10
WLAN Antenna 2 Simultaneous Transmission Scenario with 2.4 GHz WLAN (Back at 19 mm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.390	< 0.075	< 0.465
Back Side	GSM 1900	0.077	< 0.075	< 0.152
Back Side	UMTS 850	0.263	< 0.075	< 0.338
Back Side	UMTS 1750	0.150	< 0.075	< 0.225
Back Side	UMTS 1900	0.071	< 0.075	< 0.146
Back Side	CDMA BC10 (§90S)	0.284	< 0.075	< 0.359
Back Side	CDMA BC0 (§22H)	0.294	< 0.075	< 0.369
Back Side	PCS CDMA	0.108	< 0.075	< 0.183
Back Side	LTE Band 17	0.148	< 0.075	< 0.223
Back Side	LTE Band 13	0.162	< 0.075	< 0.237
Back Side	LTE Band 5 (Cell)	0.191	< 0.075	< 0.266
Back Side	LTE Band 4 (AWS)	0.150	< 0.075	< 0.225
Back Side	LTE Band 25 (PCS)	0.071	< 0.075	< 0.146

Table 11-11
WLAN Antenna 2 Simultaneous Transmission Scenario with 5 GHz WLAN (Back at 19 mm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.390	< 0.084	< 0.474
Back Side	GSM 1900	0.077	< 0.084	< 0.161
Back Side	UMTS 850	0.263	< 0.084	< 0.347
Back Side	UMTS 1750	0.150	< 0.084	< 0.234
Back Side	UMTS 1900	0.071	< 0.084	< 0.155
Back Side	CDMA BC10 (§90S)	0.284	< 0.084	< 0.368
Back Side	CDMA BC0 (§22H)	0.294	< 0.084	< 0.378
Back Side	PCS CDMA	0.108	< 0.084	< 0.192
Back Side	LTE Band 17	0.148	< 0.084	< 0.232
Back Side	LTE Band 13	0.162	< 0.084	< 0.246
Back Side	LTE Band 5 (Cell)	0.191	< 0.084	< 0.275
Back Side	LTE Band 4 (AWS)	0.150	< 0.084	< 0.234
Back Side	LTE Band 25 (PCS)	0.071	< 0.084	< 0.155

Table 11-12
WLAN Antenna 2 Simultaneous Transmission Scenario with 2.4 GHz WLAN (Right at 14 mm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Right Edge	GSM 850	1.316	< 0.032	< 1.348
Right Edge	GSM 1900	1.075	< 0.032	< 1.107
Right Edge	UMTS 850	0.664	< 0.032	< 0.696
Right Edge	UMTS 1750	0.435	< 0.032	< 0.467
Right Edge	UMTS 1900	0.888	< 0.032	< 0.92
Right Edge	CDMA BC10 (§90S)	0.700	< 0.032	< 0.732
Right Edge	CDMA BC0 (§22H)	0.794	< 0.032	< 0.826
Right Edge	PCS CDMA	1.177	< 0.032	< 1.209
Right Edge	LTE Band 17	0.422	< 0.032	< 0.454
Right Edge	LTE Band 13	0.351	< 0.032	< 0.383
Right Edge	LTE Band 5 (Cell)	0.611	< 0.032	< 0.643
Right Edge	LTE Band 4 (AWS)	0.609	< 0.032	< 0.641
Right Edge	LTE Band 25 (PCS)	0.798	< 0.032	< 0.83

Table 11-13
WLAN Antenna 2 Simultaneous Transmission Scenario with 5 GHz WLAN (Right at 14 mm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Right Edge	GSM 850	1.316	< 0.001	< 1.317
Right Edge	GSM 1900	1.075	< 0.001	< 1.076
Right Edge	UMTS 850	0.664	< 0.001	< 0.665
Right Edge	UMTS 1750	0.435	< 0.001	< 0.436
Right Edge	UMTS 1900	0.888	< 0.001	< 0.889
Right Edge	CDMA BC10 (§90S)	0.700	< 0.001	< 0.701
Right Edge	CDMA BC0 (§22H)	0.794	< 0.001	< 0.795
Right Edge	PCS CDMA	1.177	< 0.001	< 1.178
Right Edge	LTE Band 17	0.422	< 0.001	< 0.423
Right Edge	LTE Band 13	0.351	< 0.001	< 0.352
Right Edge	LTE Band 5 (Cell)	0.611	< 0.001	< 0.612
Right Edge	LTE Band 4 (AWS)	0.609	< 0.001	< 0.61
Right Edge	LTE Band 25 (PCS)	0.798	< 0.001	< 0.799

Table 11-14
WLAN MIMO Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body at 0 mm)

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.718	0.042	0.760
	Top	0.643	0.096	0.739
	Bottom	0.400	0.132	0.532
	Right	1.373	0.003	1.376
	Left	0.400	0.193	0.593

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.126	0.042	0.168
	Top	0.435	0.096	0.531
	Bottom	0.400	0.132	0.532
	Right	1.272	0.003	1.275
	Left	0.400	0.193	0.593

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.654	0.042	0.696
	Top	0.391	0.096	0.487
	Bottom	0.400	0.132	0.532
	Right	1.194	0.003	1.197
	Left	0.400	0.193	0.593

Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.431	0.042	0.473
	Top	0.795	0.096	0.891
	Bottom	0.400	0.132	0.532
	Right	1.199	0.003	1.202
	Left	0.400	0.193	0.593

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.092	0.042	0.134
	Top	0.320	0.096	0.416
	Bottom	0.400	0.132	0.532
	Right	1.172	0.003	1.175
	Left	0.400	0.193	0.593

Simult Tx	Configuration	EVDO BC10 (§90S) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.699	0.042	0.741
	Top	0.669	0.096	0.765
	Bottom	0.400	0.132	0.532
	Right	1.260	0.003	1.263
	Left	0.400	0.193	0.593

Simult Tx	Configuration	EVDO BC0 (§22H) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.657	0.042	0.699
	Top	0.555	0.096	0.651
	Bottom	0.400	0.132	0.532
	Right	1.313	0.003	1.316
	Left	0.400	0.193	0.593

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.112	0.042	0.154
	Top	0.547	0.096	0.643
	Bottom	0.400	0.132	0.532
	Right	1.043	0.003	1.046
	Left	0.400	0.193	0.593

Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.782	0.042	0.824
	Top	0.344	0.096	0.440
	Bottom	0.400	0.132	0.532
	Right	1.395	0.003	1.398
	Left	0.400	0.193	0.593

Simult Tx	Configuration	LTE Band 13 SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.884	0.042	0.926
	Top	0.418	0.096	0.514
	Bottom	0.400	0.132	0.532
	Right	1.391	0.003	1.394
	Left	0.400	0.193	0.593

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.954	0.042	0.996
	Top	0.468	0.096	0.564
	Bottom	0.400	0.132	0.532
	Right	1.231	0.003	1.234
	Left	0.400	0.193	0.593

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.626	0.042	0.668
	Top	0.778	0.096	0.874
	Bottom	0.400	0.132	0.532
	Right	1.385	0.003	1.388
	Left	0.400	0.193	0.593

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.116	0.042	0.158
	Top	0.373	0.096	0.469
	Bottom	0.400	0.132	0.532
	Right	0.576	0.003	0.579
	Left	0.400	0.193	0.593

Table 11-15
WLAN MIMO Simultaneous Transmission Scenario with 5 GHz WLAN (Body at 0 mm)

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.718	0.000	0.718
	Top	0.643	0.000	0.643
	Bottom	0.400	0.000	0.400
	Right	1.373	0.000	1.373
	Left	0.400	0.148	0.548

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.126	0.000	0.126
	Top	0.435	0.000	0.435
	Bottom	0.400	0.000	0.400
	Right	1.272	0.000	1.272
	Left	0.400	0.148	0.548

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.654	0.000	0.654
	Top	0.391	0.000	0.391
	Bottom	0.400	0.000	0.400
	Right	1.194	0.000	1.194
	Left	0.400	0.148	0.548

Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.431	0.000	0.431
	Top	0.795	0.000	0.795
	Bottom	0.400	0.000	0.400
	Right	1.199	0.000	1.199
	Left	0.400	0.148	0.548

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.092	0.000	0.092
	Top	0.320	0.000	0.320
	Bottom	0.400	0.000	0.400
	Right	1.172	0.000	1.172
	Left	0.400	0.148	0.548

Simult Tx	Configuration	EVDO BC10 (§90S) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.699	0.000	0.699
	Top	0.669	0.000	0.669
	Bottom	0.400	0.000	0.400
	Right	1.260	0.000	1.260
	Left	0.400	0.148	0.548

Simult Tx	Configuration	EVDO BC0 (§22H) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.657	0.000	0.657
	Top	0.555	0.000	0.555
	Bottom	0.400	0.000	0.400
	Right	1.313	0.000	1.313
	Left	0.400	0.148	0.548

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.112	0.000	0.112
	Top	0.547	0.000	0.547
	Bottom	0.400	0.000	0.400
	Right	1.043	0.000	1.043
	Left	0.400	0.148	0.548

Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.782	0.000	0.782
	Top	0.344	0.000	0.344
	Bottom	0.400	0.000	0.400
	Right	1.395	0.000	1.395
	Left	0.400	0.148	0.548

Simult Tx	Configuration	LTE Band 13 SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.884	0.000	0.884
	Top	0.418	0.000	0.418
	Bottom	0.400	0.000	0.400
	Right	1.391	0.000	1.391
	Left	0.400	0.148	0.548

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.954	0.000	0.954
	Top	0.468	0.000	0.468
	Bottom	0.400	0.000	0.400
	Right	1.231	0.000	1.231
	Left	0.400	0.148	0.548

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.626	0.000	0.626
	Top	0.778	0.000	0.778
	Bottom	0.400	0.000	0.400
	Right	1.385	0.000	1.385
	Left	0.400	0.148	0.548

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.116	0.000	0.116
	Top	0.373	0.000	0.373
	Bottom	0.400	0.000	0.400
	Right	0.576	0.000	0.576
	Left	0.400	0.148	0.548

Table 11-16
WLAN MIMO Simultaneous Transmission Scenario with 2.4 GHz WLAN (Back at 19 mm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.390	< 0.042	< 0.432
Back Side	GSM 1900	0.077	< 0.042	< 0.119
Back Side	UMTS 850	0.263	< 0.042	< 0.305
Back Side	UMTS 1750	0.150	< 0.042	< 0.192
Back Side	UMTS 1900	0.071	< 0.042	< 0.113
Back Side	CDMA BC10 (§90S)	0.284	< 0.042	< 0.326
Back Side	CDMA BC0 (§22H)	0.294	< 0.042	< 0.336
Back Side	PCS CDMA	0.108	< 0.042	< 0.15
Back Side	LTE Band 17	0.148	< 0.042	< 0.19
Back Side	LTE Band 13	0.162	< 0.042	< 0.204
Back Side	LTE Band 5 (Cell)	0.191	< 0.042	< 0.233
Back Side	LTE Band 4 (AWS)	0.150	< 0.042	< 0.192
Back Side	LTE Band 25 (PCS)	0.071	< 0.042	< 0.113

Table 11-17
WLAN MIMO Simultaneous Transmission Scenario with 5 GHz WLAN (Back at 19 mm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.390	0.000	0.390
Back Side	GSM 1900	0.077	0.000	0.077
Back Side	UMTS 850	0.263	0.000	0.263
Back Side	UMTS 1750	0.150	0.000	0.150
Back Side	UMTS 1900	0.071	0.000	0.071
Back Side	CDMA BC10 (§90S)	0.284	0.000	0.284
Back Side	CDMA BC0 (§22H)	0.294	0.000	0.294
Back Side	PCS CDMA	0.108	0.000	0.108
Back Side	LTE Band 17	0.148	0.000	0.148
Back Side	LTE Band 13	0.162	0.000	0.162
Back Side	LTE Band 5 (Cell)	0.191	0.000	0.191
Back Side	LTE Band 4 (AWS)	0.150	0.000	0.150
Back Side	LTE Band 25 (PCS)	0.071	0.000	0.071

Table 11-18
WLAN MIMO Simultaneous Transmission Scenario with 2.4 GHz WLAN (Right at 14 mm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Right Edge	GSM 850	1.316	< 0.003	1.319
Right Edge	GSM 1900	1.075	< 0.003	1.078
Right Edge	UMTS 850	0.664	< 0.003	0.667
Right Edge	UMTS 1750	0.435	< 0.003	0.438
Right Edge	UMTS 1900	0.888	< 0.003	0.891
Right Edge	CDMA BC10 (§90S)	0.700	< 0.003	0.703
Right Edge	CDMA BC0 (§22H)	0.794	< 0.003	0.797
Right Edge	PCS CDMA	1.177	< 0.003	1.180
Right Edge	LTE Band 17	0.422	< 0.003	0.425
Right Edge	LTE Band 13	0.351	< 0.003	0.354
Right Edge	LTE Band 5 (Cell)	0.611	< 0.003	0.614
Right Edge	LTE Band 4 (AWS)	0.609	< 0.003	0.612
Right Edge	LTE Band 25 (PCS)	0.798	< 0.003	0.801

Table 11-19
WLAN MIMO Simultaneous Transmission Scenario with 5 GHz WLAN (Right at 14 mm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
Right Edge	GSM 850	1.316	0.000	1.316
Right Edge	GSM 1900	1.075	0.000	1.075
Right Edge	UMTS 850	0.664	0.000	0.664
Right Edge	UMTS 1750	0.435	0.000	0.435
Right Edge	UMTS 1900	0.888	0.000	0.888
Right Edge	CDMA BC10 (§90S)	0.700	0.000	0.700
Right Edge	CDMA BC0 (§22H)	0.794	0.000	0.794
Right Edge	PCS CDMA	1.177	0.000	1.177
Right Edge	LTE Band 17	0.422	0.000	0.422
Right Edge	LTE Band 13	0.351	0.000	0.351
Right Edge	LTE Band 5 (Cell)	0.611	0.000	0.611
Right Edge	LTE Band 4 (AWS)	0.609	0.000	0.609
Right Edge	LTE Band 25 (PCS)	0.798	0.000	0.798

Table 11-20
Simultaneous Transmission Scenario with Bluetooth (Body at 0 mm)

Simult Tx	Configuration	GPRS 850 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.718	0.059	0.777
	Top	0.643	0.400	1.043
	Bottom	0.400	0.125	0.525
	Right	1.373	0.006	1.379
	Left	0.400	0.010	0.410

Simult Tx	Configuration	GPRS 1900 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.126	0.059	0.185
	Top	0.435	0.400	0.835
	Bottom	0.400	0.125	0.525
	Right	1.272	0.006	1.278
	Left	0.400	0.010	0.410

Simult Tx	Configuration	UMTS 850 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.654	0.059	0.713
	Top	0.391	0.400	0.791
	Bottom	0.400	0.125	0.525
	Right	1.194	0.006	1.200
	Left	0.400	0.010	0.410

Simult Tx	Configuration	UMTS 1750 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.431	0.059	0.490
	Top	0.795	0.400	1.195
	Bottom	0.400	0.125	0.525
	Right	1.199	0.006	1.205
	Left	0.400	0.010	0.410

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.092	0.059	0.151
	Top	0.320	0.400	0.720
	Bottom	0.400	0.125	0.525
	Right	1.172	0.006	1.178
	Left	0.400	0.010	0.410

Simult Tx	Configuration	EVDO BC10 (§90S) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.699	0.059	0.758
	Top	0.669	0.400	1.069
	Bottom	0.400	0.125	0.525
	Right	1.260	0.006	1.266
	Left	0.400	0.010	0.410

Simult Tx	Configuration	EVDO BC0 (§22H) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.657	0.059	0.716
	Top	0.555	0.400	0.955
	Bottom	0.400	0.125	0.525
	Right	1.313	0.006	1.319
	Left	0.400	0.010	0.410

Simult Tx	Configuration	PCS EVDO SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.112	0.059	0.171
	Top	0.547	0.400	0.947
	Bottom	0.400	0.125	0.525
	Right	1.043	0.006	1.049
	Left	0.400	0.010	0.410

Simult Tx	Configuration	LTE Band 17 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.782	0.059	0.841
	Top	0.344	0.400	0.744
	Bottom	0.400	0.125	0.525
	Right	1.395	0.006	1.401
	Left	0.400	0.010	0.410

Simult Tx	Configuration	LTE Band 13 SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.884	0.059	0.943
	Top	0.418	0.400	0.818
	Bottom	0.400	0.125	0.525
	Right	1.391	0.006	1.397
	Left	0.400	0.010	0.410

Simult Tx	Configuration	LTE Band 5 (Cell) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.954	0.059	1.013
	Top	0.468	0.400	0.868
	Bottom	0.400	0.125	0.525
	Right	1.231	0.006	1.237
	Left	0.400	0.010	0.410

Simult Tx	Configuration	LTE Band 4 (AWS) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.626	0.059	0.685
	Top	0.778	0.400	1.178
	Bottom	0.400	0.125	0.525
	Right	1.385	0.006	1.391
	Left	0.400	0.010	0.410

Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.116	0.059	0.175
	Top	0.373	0.400	0.773
	Bottom	0.400	0.125	0.525
	Right	0.576	0.006	0.582
	Left	0.400	0.010	0.410

Table 11-21
Simultaneous Transmission Scenario with Bluetooth (Back at 19 mm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Back Side	GSM 850	0.390	< 0.059	< 0.449
Back Side	GSM 1900	0.077	< 0.059	< 0.136
Back Side	UMTS 850	0.263	< 0.059	< 0.322
Back Side	UMTS 1750	0.150	< 0.059	< 0.209
Back Side	UMTS 1900	0.071	< 0.059	< 0.13
Back Side	CDMA BC10 (§90S)	0.284	< 0.059	< 0.343
Back Side	CDMA BC0 (§22H)	0.294	< 0.059	< 0.353
Back Side	PCS CDMA	0.108	< 0.059	< 0.167
Back Side	LTE Band 17	0.148	< 0.059	< 0.207
Back Side	LTE Band 13	0.162	< 0.059	< 0.221
Back Side	LTE Band 5 (Cell)	0.191	< 0.059	< 0.25
Back Side	LTE Band 4 (AWS)	0.150	< 0.059	< 0.209
Back Side	LTE Band 25 (PCS)	0.071	< 0.059	< 0.13

Table 11-22
Simultaneous Transmission Scenario with Bluetooth (Right at 14 mm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Right Edge	GSM 850	1.316	< 0.006	< 1.322
Right Edge	GSM 1900	1.075	< 0.006	< 1.081
Right Edge	UMTS 850	0.664	< 0.006	< 0.67
Right Edge	UMTS 1750	0.435	< 0.006	< 0.441
Right Edge	UMTS 1900	0.888	< 0.006	< 0.894
Right Edge	CDMA BC10 (§90S)	0.700	< 0.006	< 0.706
Right Edge	CDMA BC0 (§22H)	0.794	< 0.006	< 0.8
Right Edge	PCS CDMA	1.177	< 0.006	< 1.183
Right Edge	LTE Band 17	0.422	< 0.006	< 0.428
Right Edge	LTE Band 13	0.351	< 0.006	< 0.357
Right Edge	LTE Band 5 (Cell)	0.611	< 0.006	< 0.617
Right Edge	LTE Band 4 (AWS)	0.609	< 0.006	< 0.615
Right Edge	LTE Band 25 (PCS)	0.798	< 0.006	< 0.804

1. For configurations excluded per 447498 D01v05, an estimated SAR of 0.4 W/kg was used to determine simultaneous transmission SAR exclusion since the test separation distance was >50 mm.
2. For SAR summations for body back at 19 mm, WLAN and Bluetooth SAR values for 0.0 cm were used since the 0.0 cm test distance for WLAN and Bluetooth was more conservative. "<" denotes that the 0.0 cm WLAN or Bluetooth SAR values were used for summation purposes.

3. For SAR summations for body right at 14 mm, WLAN and Bluetooth SAR values for 0.0 cm were used since the 0.0 cm test distance for WLAN and Bluetooth was more conservative. "<" denotes that the 0.0 cm WLAN or Bluetooth SAR values were used for summation purposes.
4. Only WLAN antenna 2 is capable of transmitting Bluetooth.
5. The worst case 5 GHz WLAN reported SAR for each configuration was used for SAR summation, regardless of whether the WLAN channel has WIFI Hotspot capability. Therefore, the summations above represent the absolute worst cases for simultaneous transmission with 5 GHz WLAN

11.4 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.

12 SAR MEASUREMENT VARIABILITY

12.1 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 12-1
Body SAR Measurement Variability Results

BODY VARIABILITY RESULTS														
Band	FREQUENCY		Mode	Service	# of Time Slots	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	824.20	128	GSM 850	GPRS	1	right	0 mm	1.370	1.330	1.03	N/A	N/A	N/A	N/A
1900	1907.60	9538	UMTS 1900	RMC	N/A	right	0 mm	1.170	1.110	1.05	N/A	N/A	N/A	N/A
750	782.00	23230	LTE Band 13	QPSK, 25 RB, 0 RB Offset	N/A	right	0 mm	1.240	1.230	1.01	N/A	N/A	N/A	N/A
1750	1732.50	20175	LTE Band 4 (AWS)	QPSK, 1 RB, 99 RB Offset	N/A	right	0 mm	1.310	1.300	1.01	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						

12.2 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.

13 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	85070C	Dielectric Probe Kit	2/14/2013	Annual	2/14/2014	MY44300633
Agilent	8648D	(9kHz-4GHz) Signal Generator	4/17/2013	Annual	4/17/2014	3629U00687
Agilent	8753E	(30kHz-6GHz) Network Analyzer	4/16/2013	Annual	4/16/2014	JP38020182
Agilent	8753E	(30kHz-6GHz) Network Analyzer	7/23/2013	Annual	7/23/2014	US37390350
Agilent	8753ES	S-Parameter Network Analyzer	10/29/2013	Annual	10/29/2014	US39170122
Agilent	E5515C	Wireless Communications Test Set	10/18/2012	Biennial	10/18/2014	GB43193563
Agilent	E5515C	Wireless Communications Test Set	5/9/2013	Biennial	5/9/2015	GB43304447
Agilent	E8257D	(250kHz-20GHz) Signal Generator	4/16/2013	Annual	4/16/2014	MY45470194
Agilent	N5182A	MXG Vector Signal Generator	10/28/2013	Annual	10/28/2014	US46240505
Amplifier Research	5S1G4	5W, 800MHz-4.2GHz	CBT	N/A	CBT	21910
Anritsu	MA24106A	USB Power Sensor	1/3/2014	Annual	1/3/2015	1349509
Anritsu	MA24106A	USB Power Sensor	1/3/2014	Annual	1/3/2015	1349511
Anritsu	MA24106A	USB Power Sensor	1/3/2014	Annual	1/3/2015	1349513
Anritsu	MA24106A	USB Power Sensor	1/3/2014	Annual	1/3/2015	1349514
Anritsu	MT8820C	Radio Communication Analyzer	12/12/2013	Annual	12/12/2014	6200901190
Anritsu	MT8820C	Radio Communication Analyzer	6/28/2013	Annual	6/28/2014	6201240328
Anritsu	MT8820C	Radio Communication Analyzer	12/12/2013	Annual	12/12/2014	6201300731
COMTech	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M1S5A00-009
COMTECH	AR85729-5/5759B	Solid State Amplifier	CBT	N/A	CBT	M3W1A00-1002
Control Company	4052	Long Stem Thermometer	9/27/2013	Biennial	9/27/2015	130567447
Fisher Scientific	15-077-960	Thermometer	11/6/2012	Biennial	11/6/2014	122640025
Fisher Scientific	15-078J	Long Stem Thermometer	10/30/2012	Biennial	10/30/2014	122626059
Gigatronics	80701A	(0.05-18GHz) Power Sensor	10/30/2013	Annual	10/30/2014	1833460
Gigatronics	8651A	Universal Power Meter	10/30/2013	Annual	10/30/2014	8650319
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
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
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	9/23/2013	Annual	9/23/2014	109892
Rohde & Schwarz	CMU200	Base Station Simulator	5/3/2013	Annual	5/3/2014	836371/0079
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	10/16/2013	Annual	10/16/2014	100976
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	2/8/2013	Annual	2/8/2014	101699
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	10/4/2013	Annual	10/4/2014	108798
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	12/9/2013	Annual	12/9/2014	109366
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	6/6/2013	Annual	6/6/2014	111427
Rohde & Schwarz	NRV-Z32	Peak Power Sensor	10/12/2012	Biennial	10/12/2014	836019/013
Rohde & Schwarz	SME06	Signal Generator	10/30/2013	Annual	10/30/2014	832026
Rohde & Schwarz	SMIQ03B	Signal Generator	4/17/2013	Annual	4/17/2014	DE27259
Seekonk	NC-100	Torque Wrench (8" lb)	11/29/2011	Triennial	11/29/2014	21053
Seekonk	NC-100	Torque Wrench (8" lb)	3/5/2012	Triennial	3/5/2015	N/A
SPEAG	D1750V2	1750 MHz SAR Dipole	4/30/2013	Annual	4/30/2014	1051
SPEAG	D1765V2	1765 MHz SAR Dipole	5/14/2013	Annual	5/14/2014	1008
SPEAG	D1900V2	1900 MHz SAR Dipole	2/6/2013	Annual	2/6/2014	5d148
SPEAG	D750V3	750 MHz Dipole	3/18/2013	Annual	3/18/2014	1054
SPEAG	D835V2	835 MHz SAR Dipole	4/25/2013	Annual	4/25/2014	4d119
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/17/2013	Annual	9/17/2014	1323
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/22/2013	Annual	4/22/2014	1364
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/22/2013	Annual	4/22/2014	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/19/2013	Annual	11/19/2014	1408
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/14/2013	Annual	5/14/2014	1070
SPEAG	DAKS-3.5	Portable Dielectric Assessment Kit	8/18/2013	Annual	8/18/2014	1008
SPEAG	ES3DV3	SAR Probe	9/23/2013	Annual	9/23/2014	3288
SPEAG	ES3DV3	SAR Probe	4/29/2013	Annual	4/29/2014	3318
SPEAG	ES3DV3	SAR Probe	4/29/2013	Annual	4/29/2014	3319
SPEAG	ES3DV3	SAR Probe	11/22/2013	Annual	11/22/2014	3333
VWR	23226-658	Long Stem Thermometer	3/30/2012	Biennial	3/30/2014	122179874
VWR	36934-158	Wall-Mounted Thermometer	8/8/2013	Annual	8/8/2014	130258636

Note: 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.

14 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

15 CONCLUSION

15.1 Measurement Conclusion

The SAR evaluation indicates that the EUT complies with the RF radiation exposure limits of the FCC and Industry Canada, with respect to all parameters subject to this test. These measurements were taken to simulate the RF effects of RF exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The results and statements relate only to the item(s) tested.

Please note that the absorption and distribution of electromagnetic energy in the body are very complex phenomena that depend on the mass, shape, and size of the body, the orientation of the body with respect to the field vectors, and the electrical properties of both the body and the environment. Other variables that may play a substantial role in possible biological effects are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease). Because various factors may interact with one another to vary the specific biological outcome of an exposure to electromagnetic fields, any protection guide should consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables. [3]

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APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: ACJ9TGWW13B; Type: Portable Tablet; Serial: 22

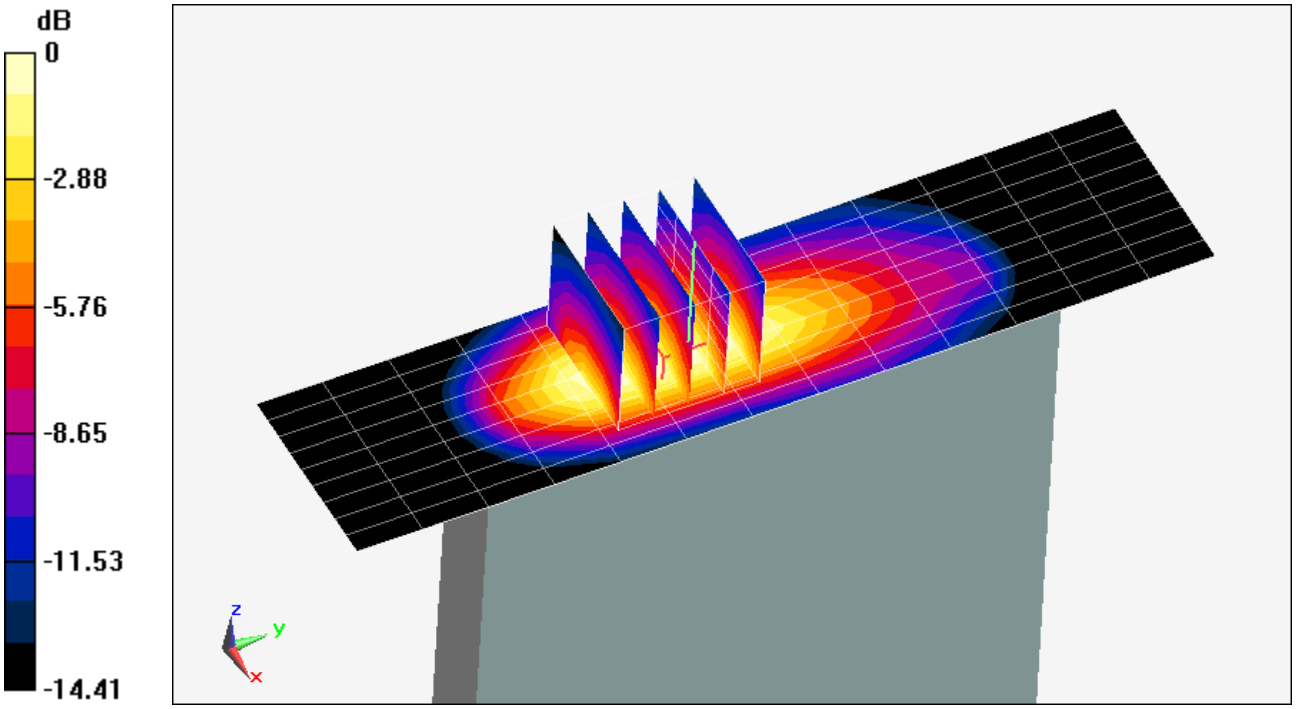
Communication System: UID 0, GSM GPRS; 1 Tx slot (0); Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium: 835 Body Medium parameters used (interpolated):
f = 824.2 MHz; σ = 0.998 S/m; ε_r = 53.287; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-19-2014; Ambient Temp: 23.4°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3318; ConvF(6.21, 6.21, 6.21); Calibrated: 4/29/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 4/22/2013
Phantom: ELI left; Type: QDOVA002AA; Serial: TP:1202
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: GPRS 850, Body SAR, Right Edge, Low.ch, 1 Tx Slots

Area Scan (10x14x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 36.647 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 2.40 W/kg
SAR(1 g) = 1.37 W/kg



0 dB = 1.49 W/kg = 1.73 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ACJ9TGWW13B; Type: Portable Tablet; Serial: 20

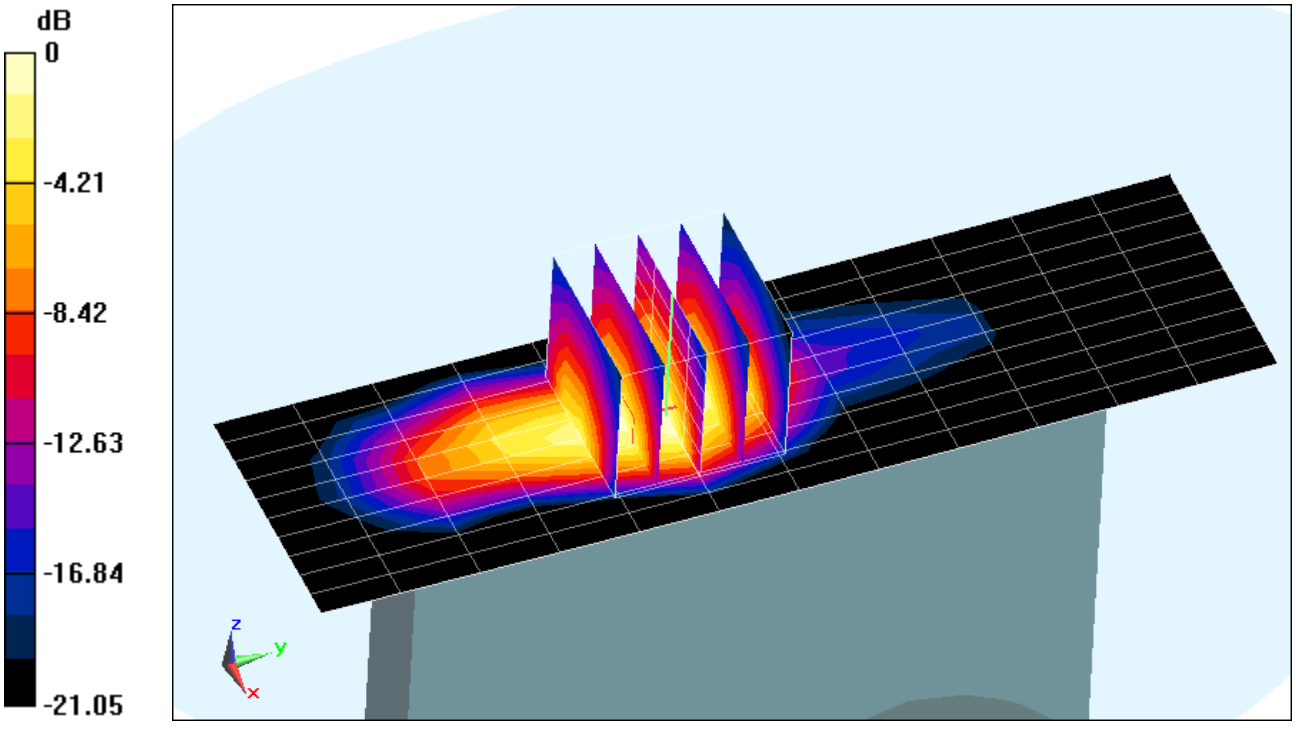
Communication System: UID 0, GSM GPRS; 1 Tx slot (0); Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium: 1900 Body Medium parameters used:
f = 1910 MHz; σ = 1.587 S/m; ε_r = 53.638; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-19-2014; Ambient Temp: 23.4°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3319; ConvF(4.85, 4.85, 4.85); Calibrated: 4/29/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 4/22/2013
Phantom: SAM front; Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: GPRS 1900, Body SAR, Right Edge, High.ch, 1 Tx Slot

Area Scan (11x13x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.953 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 2.25 W/kg
SAR(1 g) = 1.09 W/kg



0 dB = 1.19 W/kg = 0.76 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ACJ9TGWW13B; Type: Portable Tablet; Serial: 22

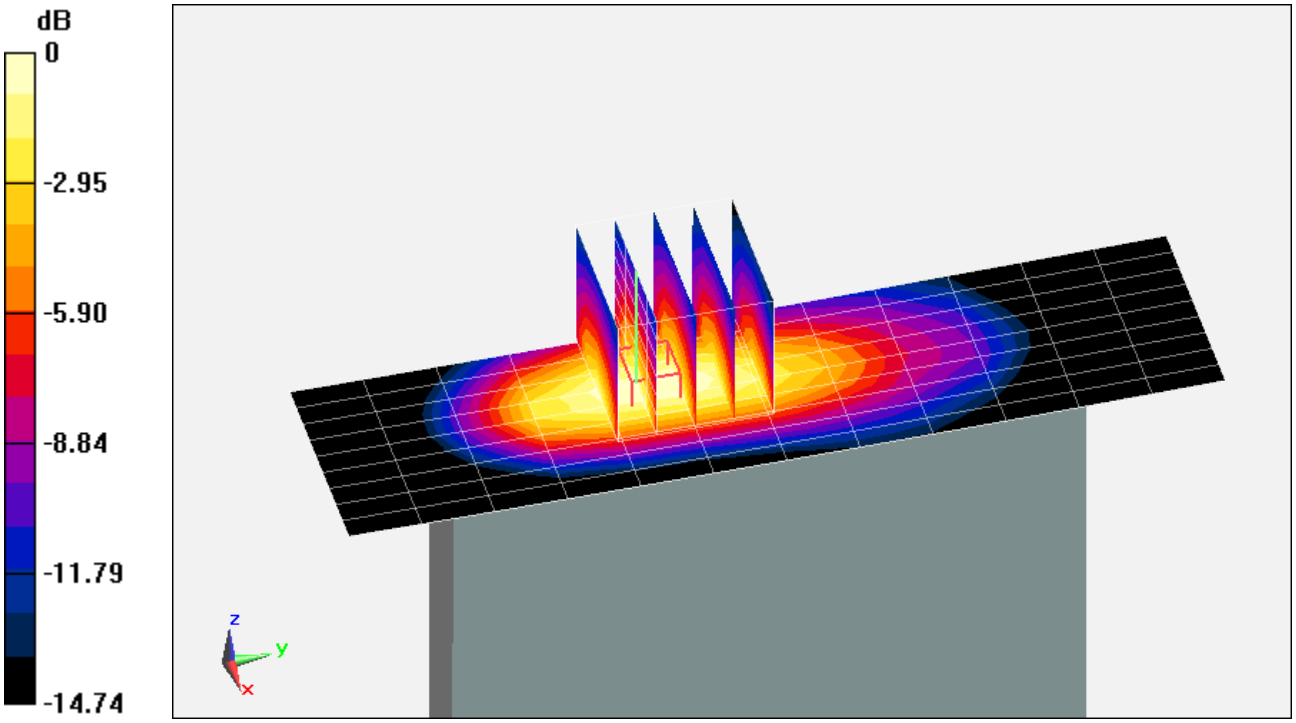
Communication System: UID 0, UMTS (0); Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
f = 846.6 MHz; σ = 1.02 S/m; ε_r = 53.029; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-19-2014; Ambient Temp: 23.4°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3318; ConvF(6.21, 6.21, 6.21); Calibrated: 4/29/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 4/22/2013
Phantom: ELI left; Type: QDOVA002AA; Serial: TP:1202
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: UMTS 850, Body SAR, Right Edge, High.ch

Area Scan (10x13x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 34.827 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.87 W/kg
SAR(1 g) = 1.04 W/kg



0 dB = 1.18 W/kg = 0.72 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ACJ9TGWW13B; Type: Portable Tablet; Serial: 35

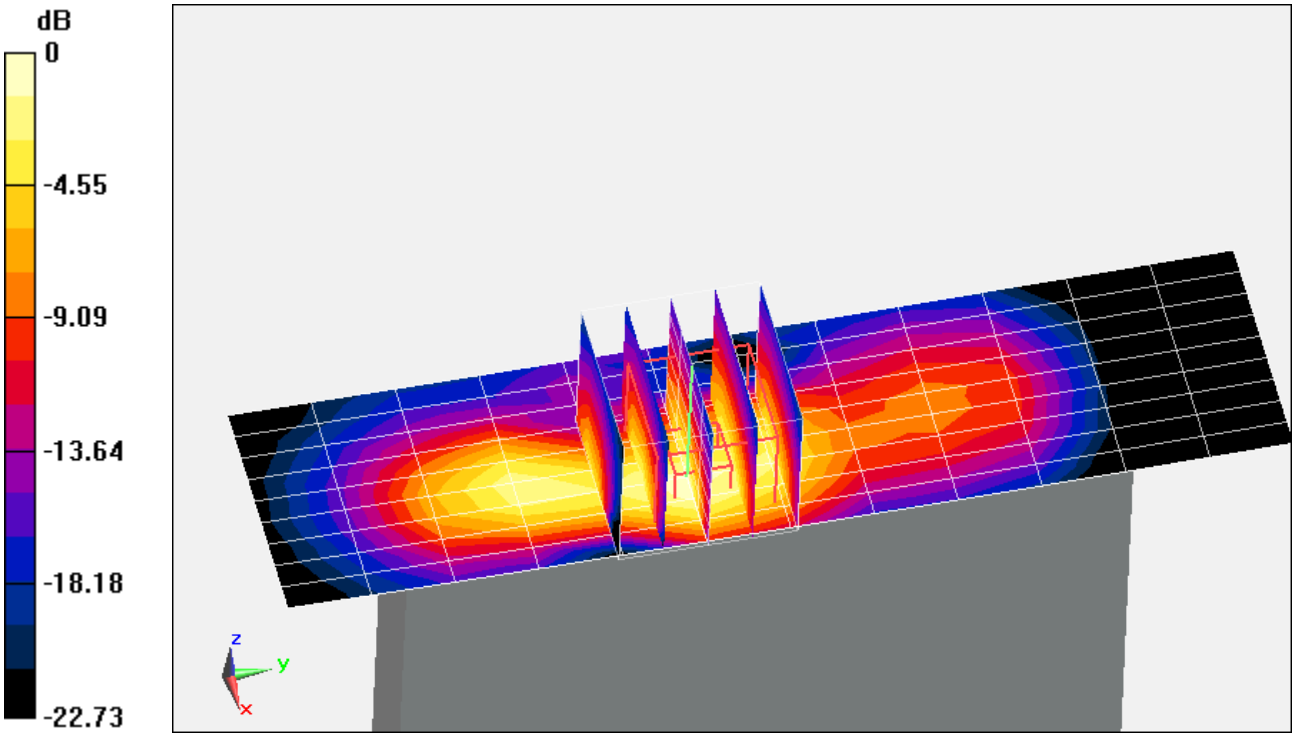
Communication System: UID 0, UMTS (0); Frequency: 1752.6 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1752.6 MHz; σ = 1.459 S/m; ε_r = 51.975; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-21-2014; Ambient Temp: 24.5°C; Tissue Temp: 23.8°C

Probe: ES3DV3 - SN3333; ConvF(4.95, 4.95, 4.95); Calibrated: 11/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: UMTS 1750, Body SAR, Right Edge, High.ch

Area Scan (10x13x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.968 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 2.74 W/kg
SAR(1 g) = 1.18 W/kg



0 dB = 1.43 W/kg = 1.55 dBW/kg

DUT: ACJ9TGWW13B; Type: Portable Tablet; Serial: 22

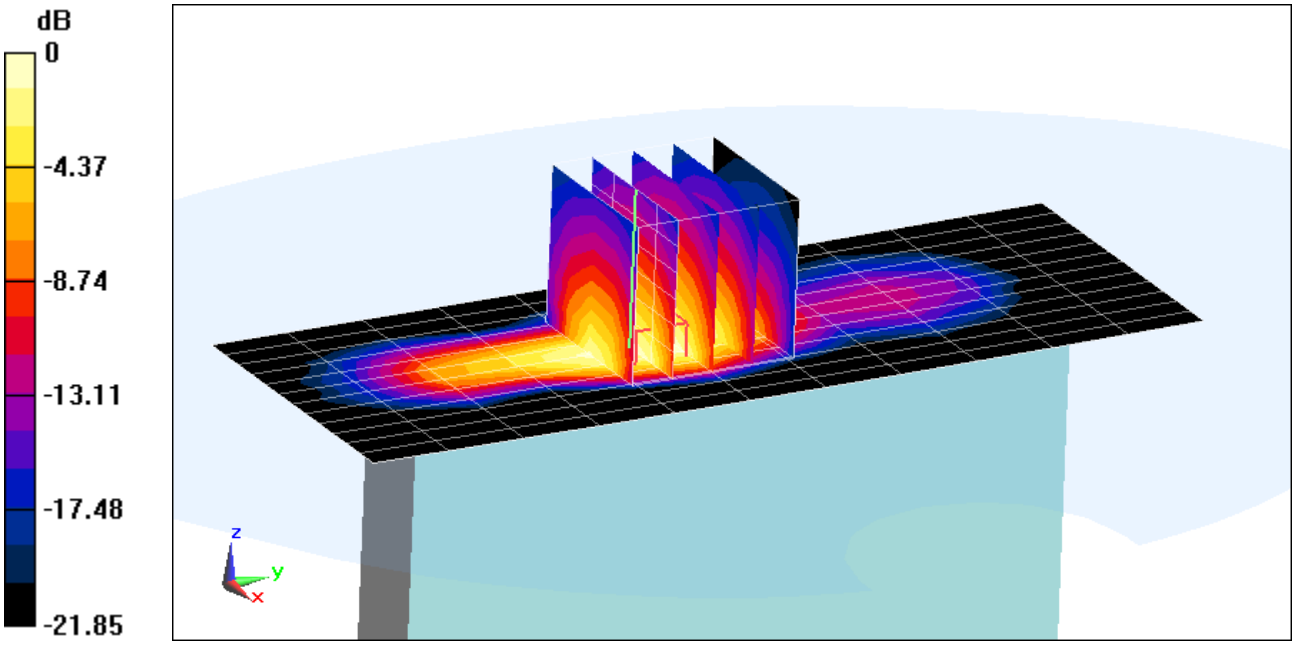
Communication System: UID 0, UMTS (0); Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1907.6 MHz; σ = 1.575 S/m; ε_r = 52.634; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-16-2014; Ambient Temp: 23.1°C; Tissue Temp: 22.2°C

Probe: ES3DV3 - SN3319; ConvF(4.85, 4.85, 4.85); Calibrated: 4/29/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 4/22/2013
Phantom: SAM front; Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: UMTS 1900, Body SAR, Right Edge, High.ch

Area Scan (13x12x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.102 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 2.50 W/kg
SAR(1 g) = 1.17 W/kg



0 dB = 1.27 W/kg = 1.04 dBW/kg

DUT: ACJ9TGWW13B; Type: Portable Tablet; Serial: 35

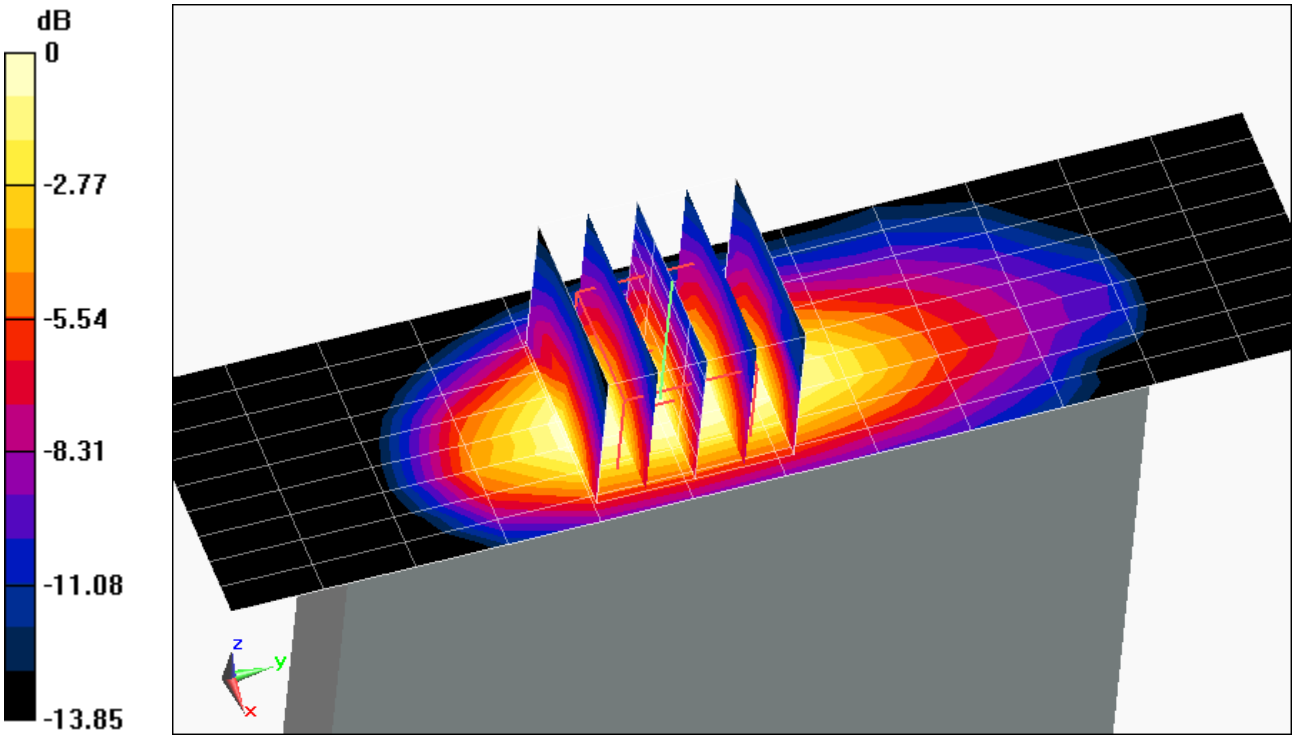
Communication System: UID 0, CDMA (0); Frequency: 820.1 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 820.1$ MHz; $\sigma = 0.996$ S/m; $\varepsilon_r = 53.75$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-16-2014; Ambient Temp: 23.4°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3318; ConvF(6.21, 6.21, 6.21); Calibrated: 4/29/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 4/22/2013
Phantom: ELI left; Type: QDOVA002AA; Serial: TP:1202
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: Cell. EVDO BC10, Body SAR, Right Edge, Mid.ch

Area Scan (10x13x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 38.531 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 2.47 W/kg
SAR(1 g) = 1.26 W/kg



0 dB = 1.44 W/kg = 1.58 dBW/kg

DUT: ACJ9TGWW13B; Type: Portable Tablet; Serial: 35

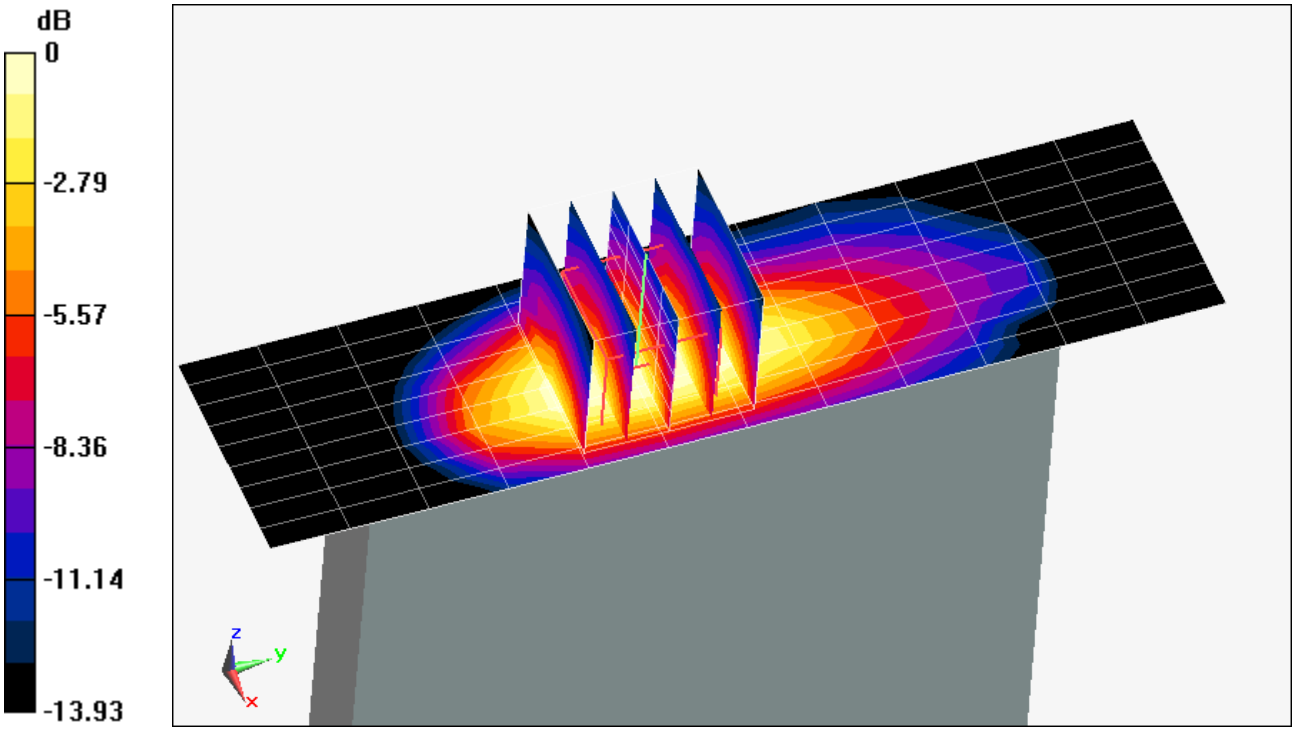
Communication System: UID 0, CDMA; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.52$ MHz; $\sigma = 1.013$ S/m; $\varepsilon_r = 53.516$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-16-2014; Ambient Temp: 23.4°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3318; ConvF(6.21, 6.21, 6.21); Calibrated: 4/29/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 4/22/2013
Phantom: ELI left; Type: QDOVA002AA; Serial: TP:1202
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: Cell. EVDO BC0, Body SAR, Right Edge, Mid.ch

Area Scan (10x13x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 38.021 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 2.18 W/kg
SAR(1 g) = 1.24 W/kg



0 dB = 1.43 W/kg = 1.55 dBW/kg

DUT: ACJ9TGWW13B; Type: Portable Tablet; Serial: 35

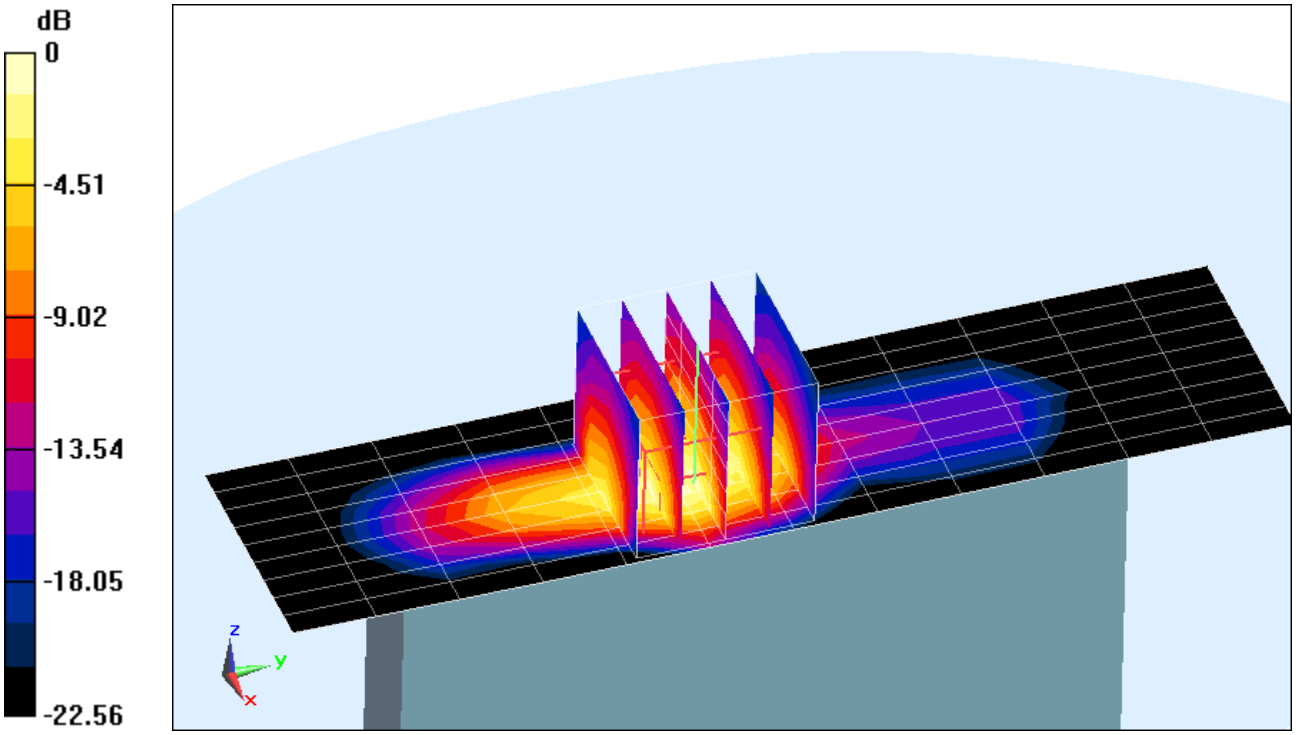
Communication System: UID 0, CDMA (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.555 S/m; ε_r = 52.735; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-27-2014; Ambient Temp: 23.6°C; Tissue Temp: 22.9°C

Probe: ES3DV3 - SN3319; ConvF(4.85, 4.85, 4.85); Calibrated: 4/29/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 4/22/2013
Phantom: SAM front; Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: PCS EVDO, Body SAR, Right Edge, Mid.ch

Area Scan (10x13x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.416 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 2.19 W/kg
SAR(1 g) = 1.02 W/kg



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

DUT: ACJ9TGWW13B; Type: Portable Tablet; Serial: 21

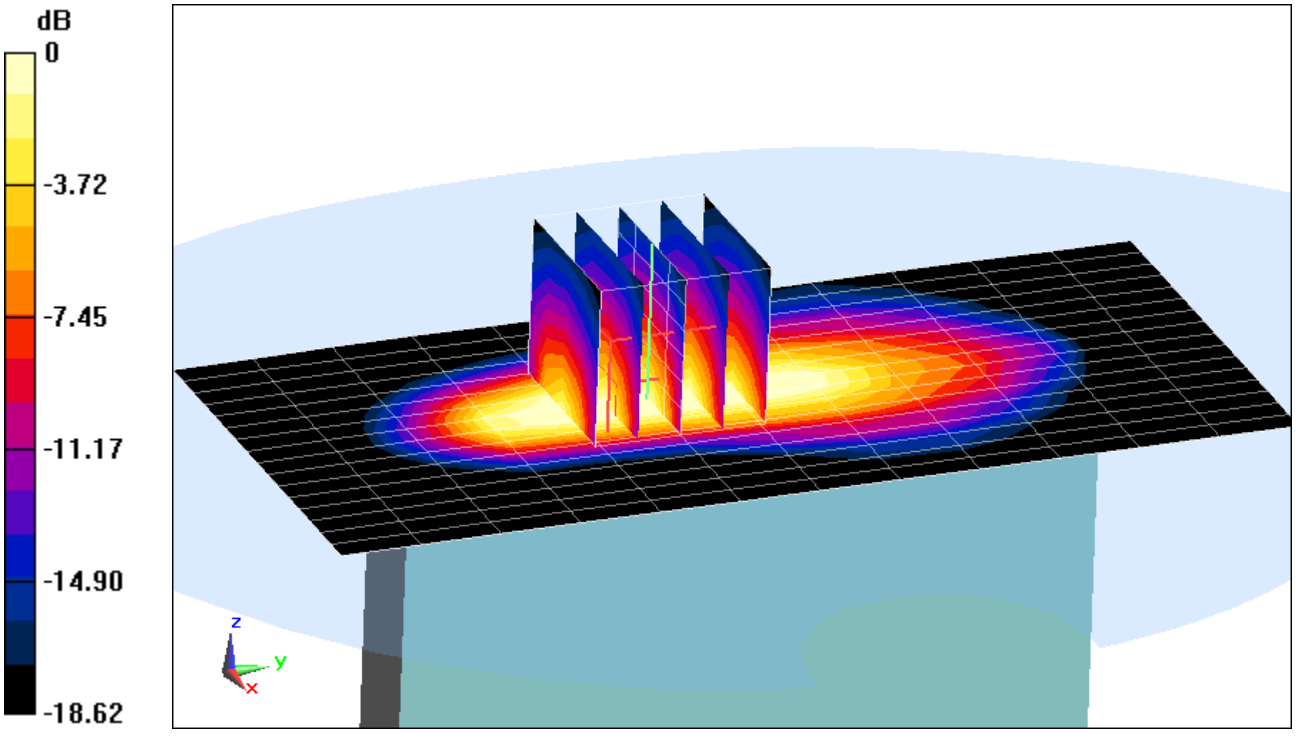
Communication System: UID 0, LTE BAND 17; Frequency: 710 MHz;Duty Cycle: 1:1
Medium: 750 Body Medium parameters used:
f = 710 MHz; σ = 0.952 S/m; ε_r = 55.688; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-16-2014; Ambient Temp: 23.5°C; Tissue Temp: 23.4°C

Probe: ES3DV3 - SN3288; ConvF(6.25, 6.25, 6.25); Calibrated: 9/23/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/17/2013
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: LTE Band 17, Body SAR, Right Edge, Mid.ch
10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (17x13x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 43.561 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 2.23 W/kg
SAR(1 g) = 1.21 W/kg



0 dB = 1.21 W/kg = 0.83 dBW/kg

DUT: ACJ9TGWW13B; Type: Portable Tablet; Serial: 22

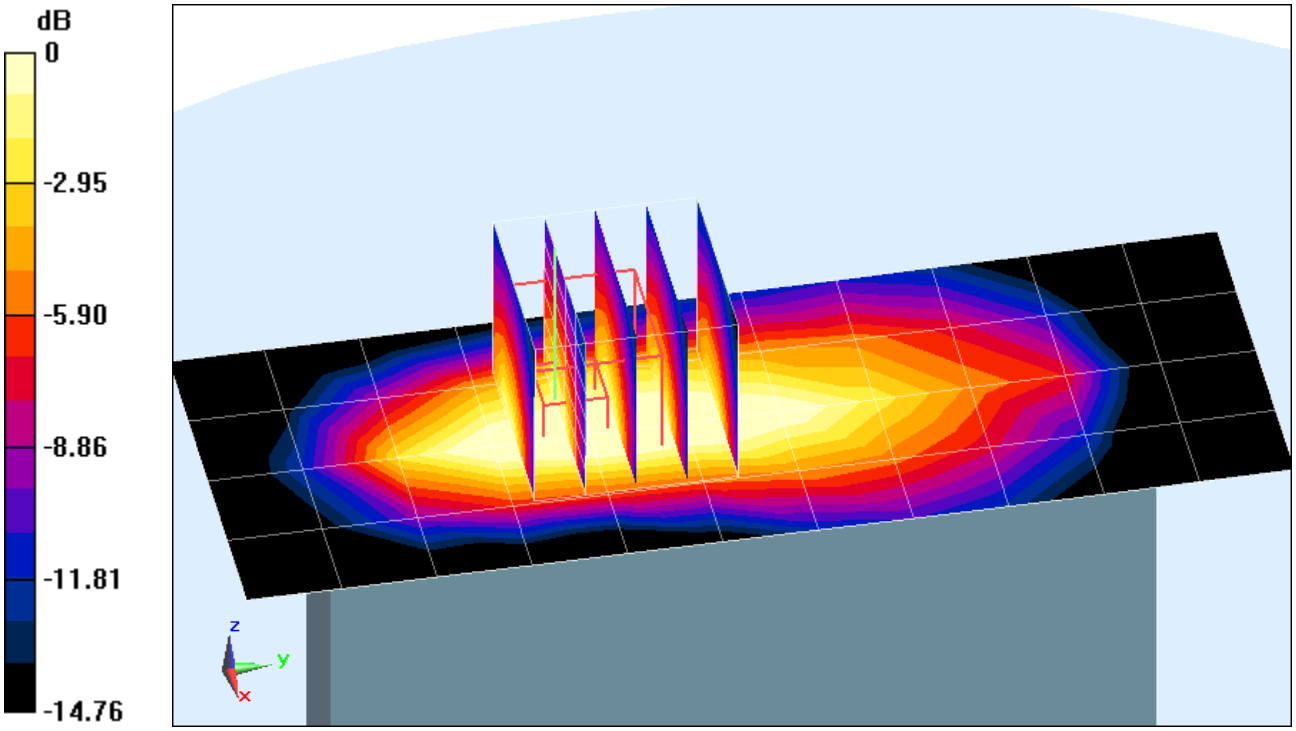
Communication System: UID 0, LTE RF; Frequency: 782 MHz;Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 782 MHz; σ = 0.963 S/m; ε_r = 55.461; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-13-2014; Ambient Temp: 24.5°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3288; ConvF(6.25, 6.25, 6.25); Calibrated: 9/23/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/17/2013
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: LTE Band 13, Body SAR, Right Edge, Mid.ch
10 MHz Bandwidth, QPSK, 25 RB, 0 RB Offset

Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.761 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 2.30 W/kg
SAR(1 g) = 1.24 W/kg



0 dB = 1.31 W/kg = 1.17 dBW/kg

DUT: ACJ9TGWW13B; Type: Portable Tablet; Serial: 22

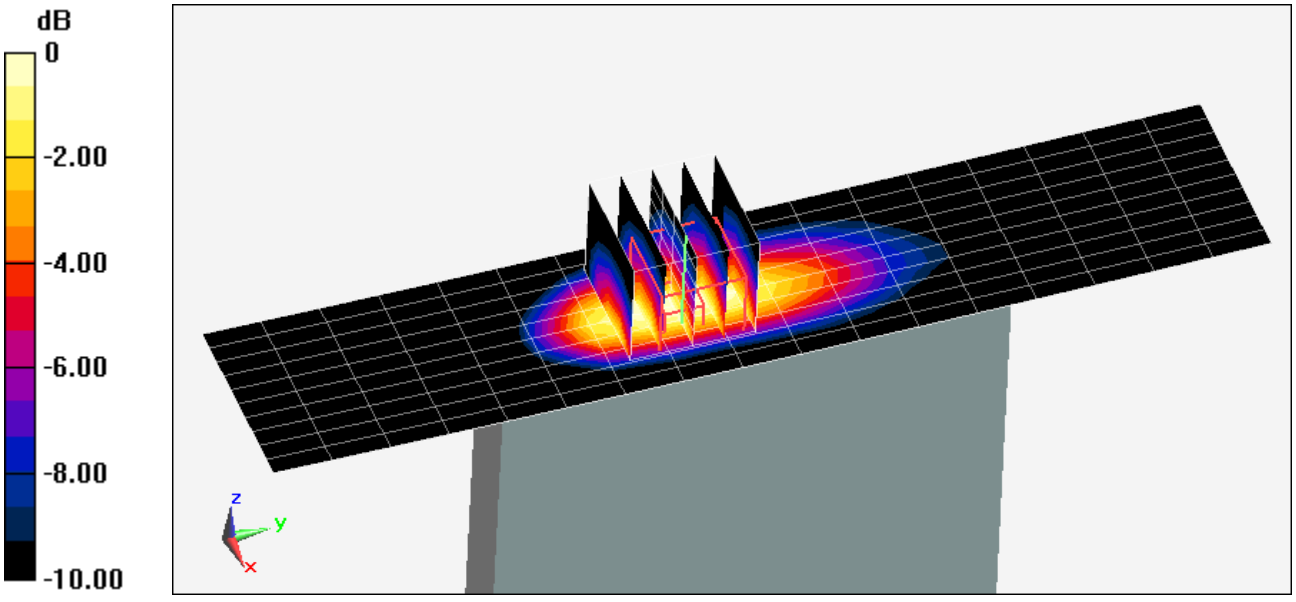
Communication System: UID 0, LTE Band 5 (Cell.); Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used (interpolated):
$f = 836.5$ MHz; $\sigma = 1.013$ S/m; $\varepsilon_r = 53.516$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-16-2014; Ambient Temp: 23.4°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3318; ConvF(6.21, 6.21, 6.21); Calibrated: 4/29/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 4/22/2013
Phantom: ELI left; Type: QDOVA002AA; Serial: TP:1202
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: LTE Band 5 (Cell.), Body SAR, Right Edge, Mid.ch
10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (11x18x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.731 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 1.85 W/kg
SAR(1 g) = 1.06 W/kg



0 dB = 2.50 W/kg = 3.98 dBW/kg

DUT: ACJ9TGWW13B; Type: Portable Tablet; Serial: 35

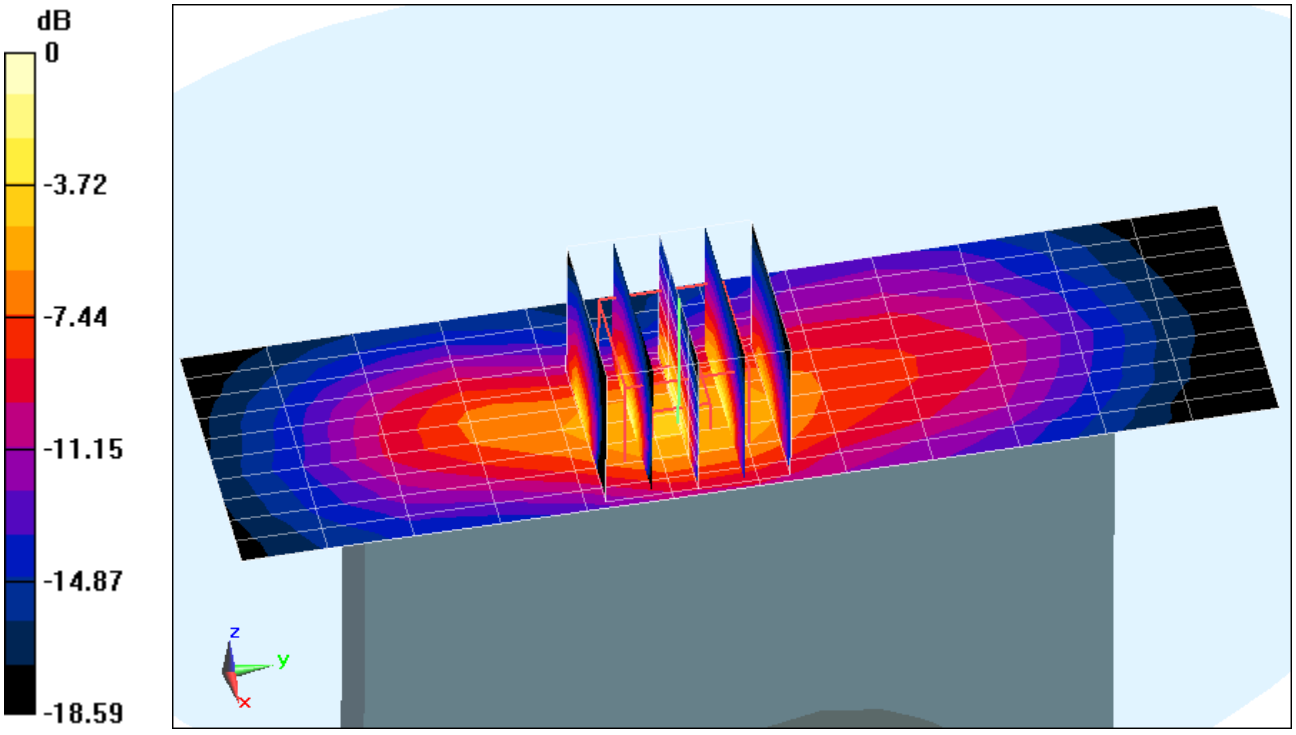
Communication System: UID 0, LTE RF; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
$f = 1732.5$ MHz; $\sigma = 1.495$ S/m; $\varepsilon_r = 51.296$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-18-2014; Ambient Temp: 23.9°C; Tissue Temp: 23.2°C

Probe: ES3DV3 - SN3288; ConvF(5.1, 5.1, 5.1); Calibrated: 9/23/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/17/2013
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

Mode: LTE Band 4 (AWS), Body SAR, Right Edge, Mid.ch
20 MHz Bandwidth, QPSK, 1 RB, 99 RB Offset

Area Scan (11x13x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.757 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 3.05 W/kg
SAR(1 g) = 1.31 W/kg



0 dB = 1.47 W/kg = 1.67 dBW/kg

DUT: ACJ9TGWW13B; Type: Portable Tablet; Serial: 22

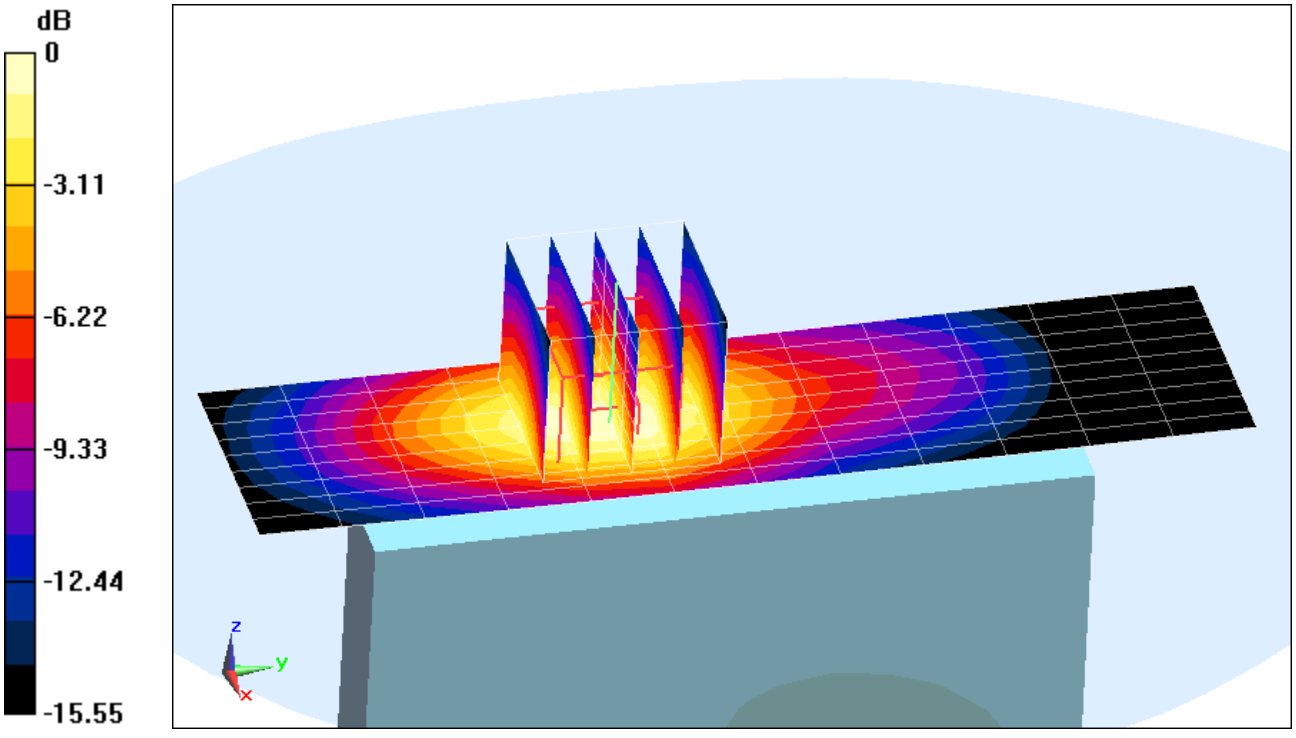
Communication System: UID 0, LTE Band 25; Frequency: 1882.5 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1882.5 MHz; σ = 1.517 S/m; ε_r = 52.426; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.4 cm

Test Date: 01-22-2014; Ambient Temp: 23.5°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3319; ConvF(4.85, 4.85, 4.85); Calibrated: 4/29/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 4/22/2013
Phantom: SAM front; Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 (7164)

Mode: LTE Band 25 (PCS), Body SAR, Right Edge, Mid.ch
20 MHz Bandwidth, QPSK, 1 RB, 99 RB Offset

Area Scan (10x13x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.180 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.944 W/kg
SAR(1 g) = 0.608 W/kg



0 dB = 0.674 W/kg = -1.71 dBW/kg

APPENDIX B: SYSTEM VERIFICATION

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1054

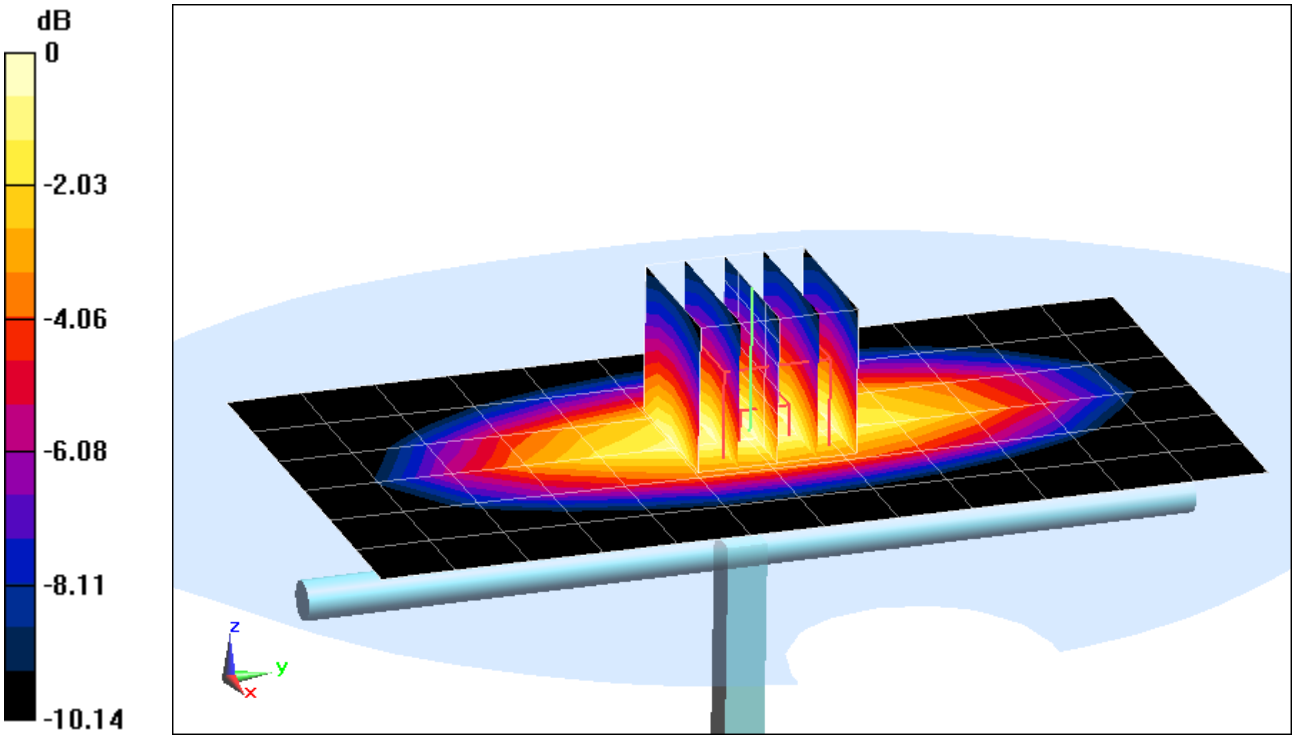
Communication System: UID 0, CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 0.964 S/m; ε_r = 56.09; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-18-2014; Ambient Temp: 23.5°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3288; ConvF(6.25, 6.25, 6.25); Calibrated: 9/23/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/17/2013
Phantom: SAM Sub Dasy B; Type: SAM 5.0; Serial: TP-1626
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

750MHz System Verification

Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20 dBm (100 mW)
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 0.911 W/kg
Deviation = 4.47%



0 dB = 0.978 W/kg = -0.10 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d119

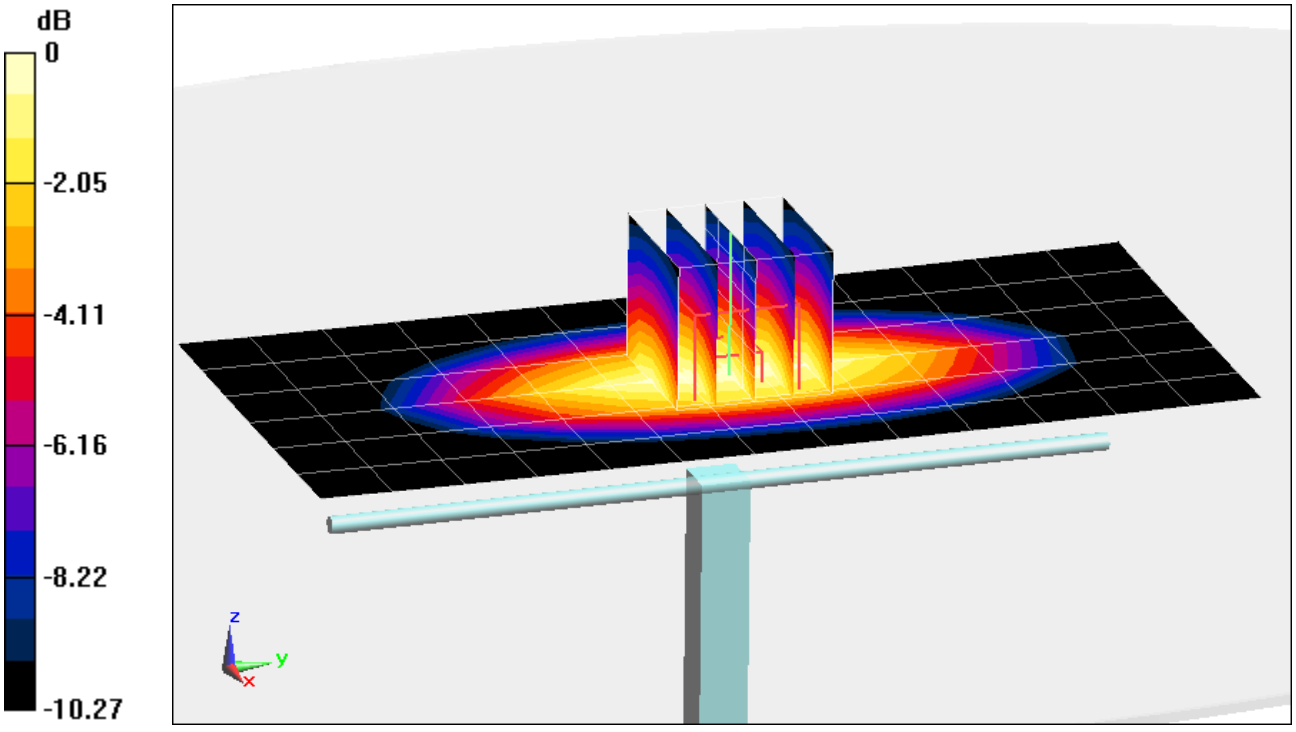
Communication System: UID 0, CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 1.011 S/m; ε_r = 53.529; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 01-16-2014; Ambient Temp: 23.4°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3318; ConvF(6.21, 6.21, 6.21); Calibrated: 4/29/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 4/22/2013
Phantom: ELI left; Type: QDOVA002AA; Serial: TP:1202
Measurement SW: DASY52, Version 52.8 (7); 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 dBm (100 mW)
Peak SAR (extrapolated) = 1.50 W/kg
SAR(1 g) = 1.03 W/kg
Deviation = 7.97%



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

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1008

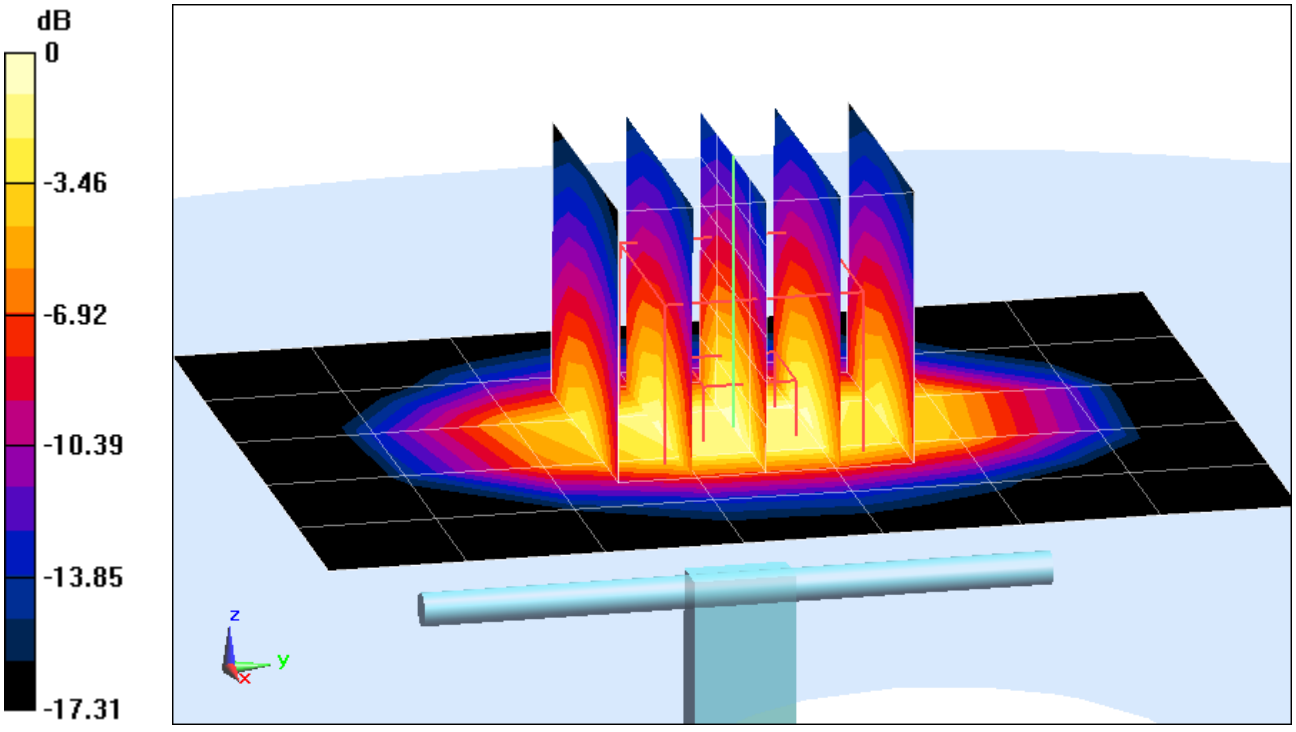
Communication System: UID 0, CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.513 S/m; ε_r = 51.222; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-18-2014; Ambient Temp: 23.9°C; Tissue Temp: 23.2°C

Probe: ES3DV3 - SN3288; ConvF(5.1, 5.1, 5.1); Calibrated: 9/23/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 9/17/2013
Phantom: SAM with CRP; Type: SAM; Serial: TP1375
Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.10 (7164)

1750 MHz System Verification

Area Scan (6x8x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Input Power = 20 dBm (100 mW)
Peak SAR (extrapolated) = 6.65 W/kg
SAR(1 g) = 3.7 W/kg
Deviation = -3.14%



0 dB = 4.16 W/kg = 6.19 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1051

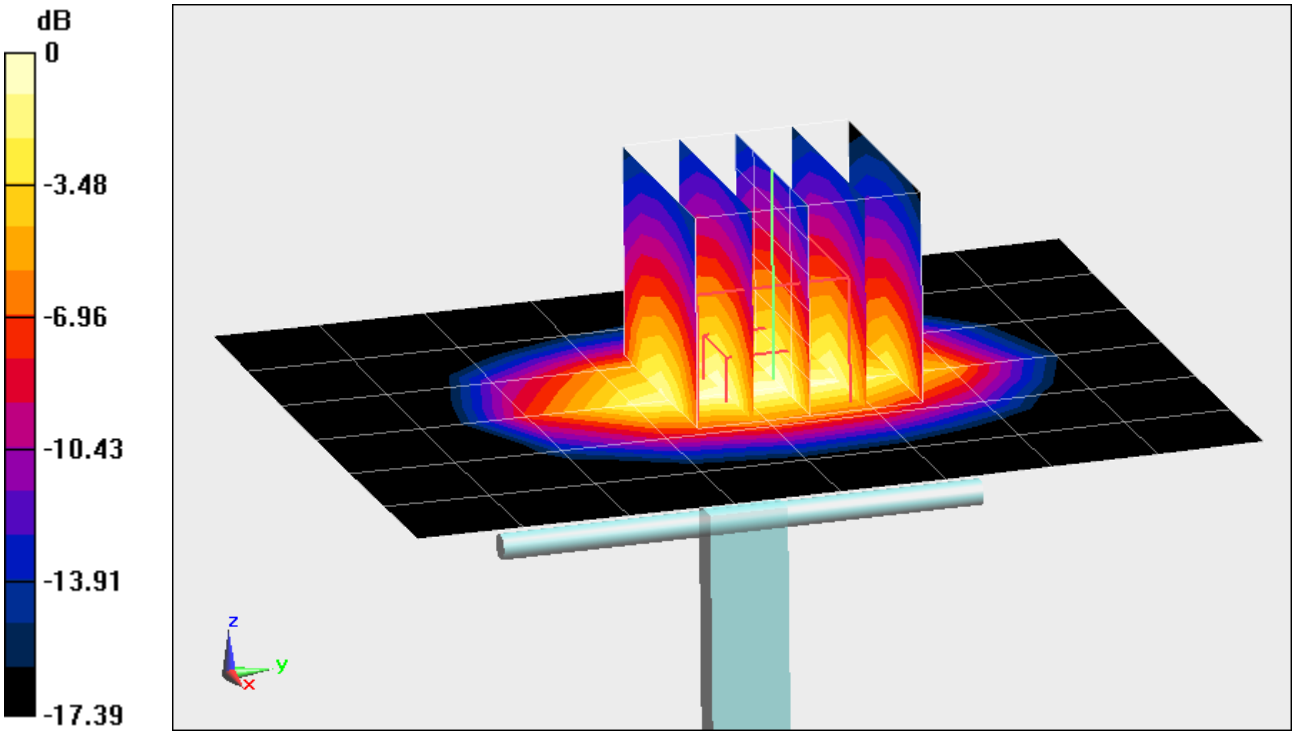
Communication System: UID 0, CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.456 S/m; ε_r = 51.984; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-21-2014; Ambient Temp: 24.5°C; Tissue Temp: 23.8°C

Probe: ES3DV3 - SN3333; ConvF(4.95, 4.95, 4.95); Calibrated: 11/22/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1408; Calibrated: 11/19/2013
Phantom: ELI v5.0; Type: QDOVA001BB; Serial: 1229
Measurement SW: DASY52, Version 52.8 (7); 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 dBm (100 mW)
Peak SAR (extrapolated) = 6.34 W/kg
SAR(1 g) = 3.55 W/kg
Deviation = -6.08%



0 dB = 3.89 W/kg = 5.90 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

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

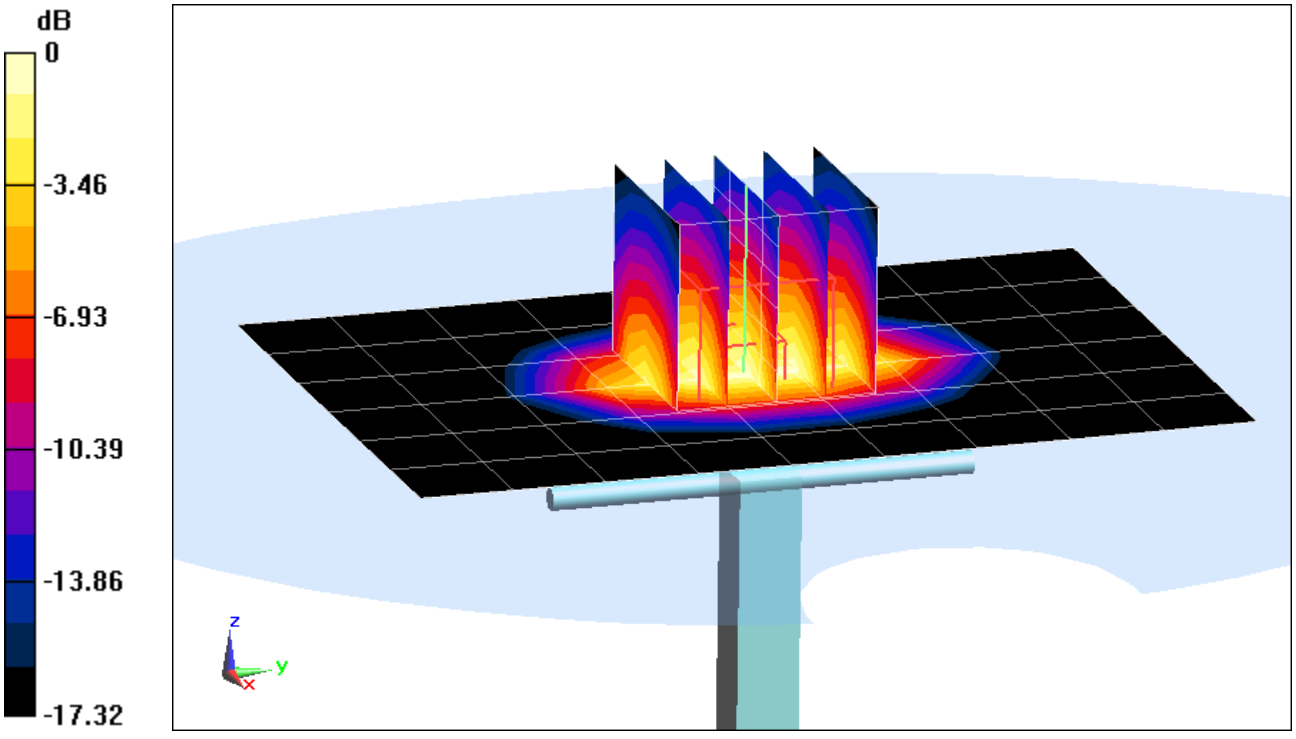
Communication System: UID 0, CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.539 S/m; ε_r = 52.366; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-22-2014; Ambient Temp: 23.5°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3319; ConvF(4.85, 4.85, 4.85); Calibrated: 4/29/2013;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1368; Calibrated: 4/22/2013
Phantom: SAM front; Type: QD000P40CD; Serial: TP:1759
Measurement SW: DASY52, Version 52.8 (7); 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 dBm (100 mW)
Peak SAR (extrapolated) = 6.89 W/kg
SAR(1 g) = 3.82 W/kg
Deviation = -6.37%



0 dB = 4.31 W/kg = 6.34 dBW/kg

APPENDIX C: PROBE CALIBRATION

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client PC Test

Certificate No: ES3-3288_Sep13/2

CALIBRATION CERTIFICATE (Replacement of No: ES3-3288_Sep13)

CCV 10/5/13

Object: ES3DV3 - SN:3288

Calibration procedure(s): QA CAL-01.v9, QA CAL-23.v5, QA CAL-25.v6
Calibration procedure for dosimetric E-field probes

Calibration date: September 23, 2013

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	04-Apr-13 (No. 217-01733)	Apr-14
Power sensor E4412A	MY41498087	04-Apr-13 (No. 217-01733)	Apr-14
Reference 3 dB Attenuator	SN: S5054 (3c)	04-Apr-13 (No. 217-01737)	Apr-14
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-13 (No. 217-01735)	Apr-14
Reference 30 dB Attenuator	SN: S5129 (30b)	04-Apr-13 (No. 217-01738)	Apr-14
Reference Probe ES3DV2	SN: 3013	28-Dec-12 (No. ES3-3013_Dec12)	Dec-13
DAE4	SN: 660	4-Sep-13 (No. DAE4-660_Sep13)	Apr-14
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-15
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-12)	In house check: Oct-13

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: October 4, 2013

PCT# 80828

Probe ES3DV3

SN:3288

Manufactured: July 6, 2010
Calibrated: September 23, 2013

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS) **Accreditation No.: SCS 108**
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3288

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.87	0.97	0.75	± 10.1 %
DCP (mV)[B]	103.3	103.2	100.2	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB$\sqrt{\mu V}$	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	171.1	±3.5 %
		Y	0.0	0.0	1.0		135.0	
		Z	0.0	0.0	1.0		154.3	

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3288

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	6.56	6.56	6.56	0.32	1.89	± 12.0 %
835	41.5	0.90	6.37	6.37	6.37	0.34	1.82	± 12.0 %
1750	40.1	1.37	5.67	5.67	5.67	0.56	1.51	± 12.0 %
1900	40.0	1.40	5.47	5.47	5.47	0.80	1.29	± 12.0 %
2450	39.2	1.80	4.63	4.63	4.63	0.80	1.34	± 12.0 %
2600	39.0	1.96	4.55	4.55	4.55	0.80	1.41	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

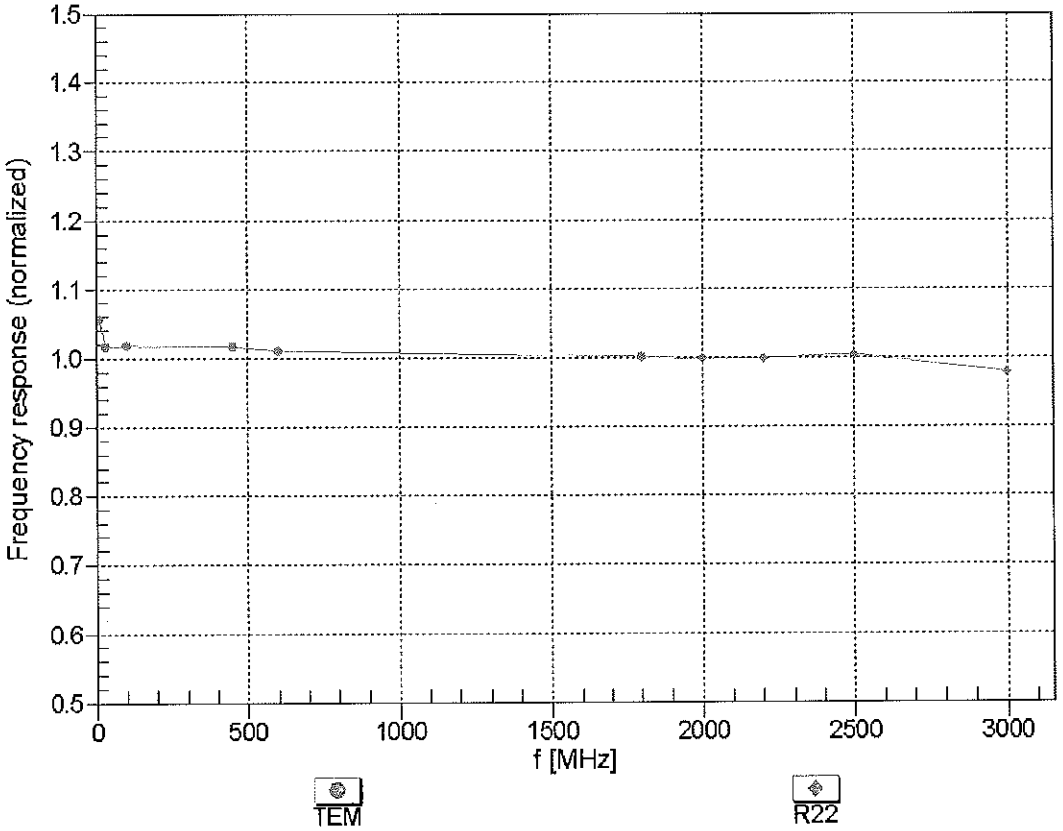
DASY/EASY - Parameters of Probe: ES3DV3 - SN:3288

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	6.25	6.25	6.25	0.70	1.27	± 12.0 %
835	55.2	0.97	6.27	6.27	6.27	0.75	1.22	± 12.0 %
1750	53.4	1.49	5.10	5.10	5.10	0.59	1.46	± 12.0 %
1900	53.3	1.52	4.82	4.82	4.82	0.53	1.54	± 12.0 %
2450	52.7	1.95	4.37	4.37	4.37	0.80	1.02	± 12.0 %
2600	52.5	2.16	4.14	4.14	4.14	0.64	0.94	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

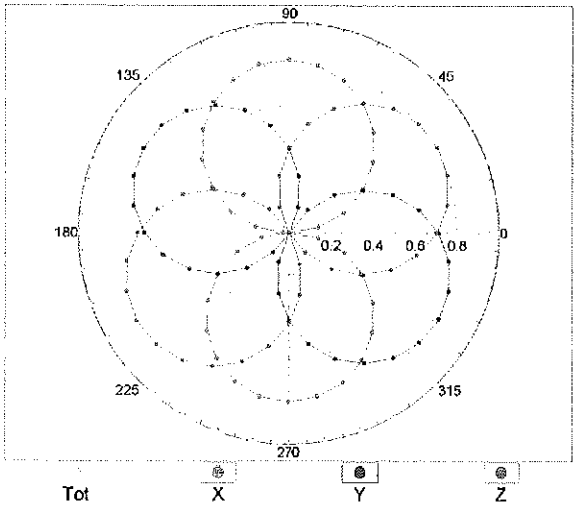
Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



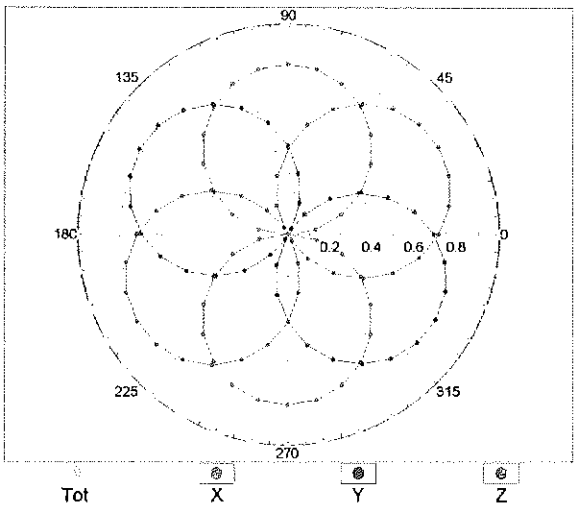
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

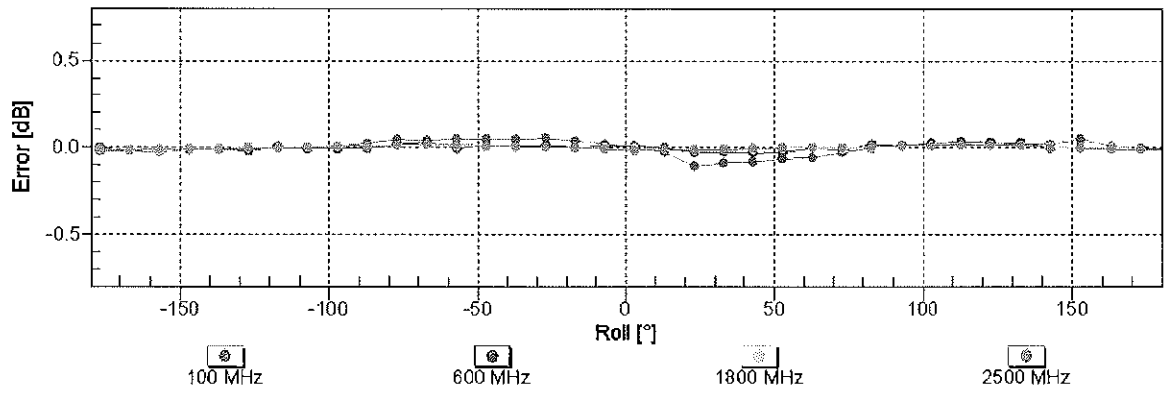
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



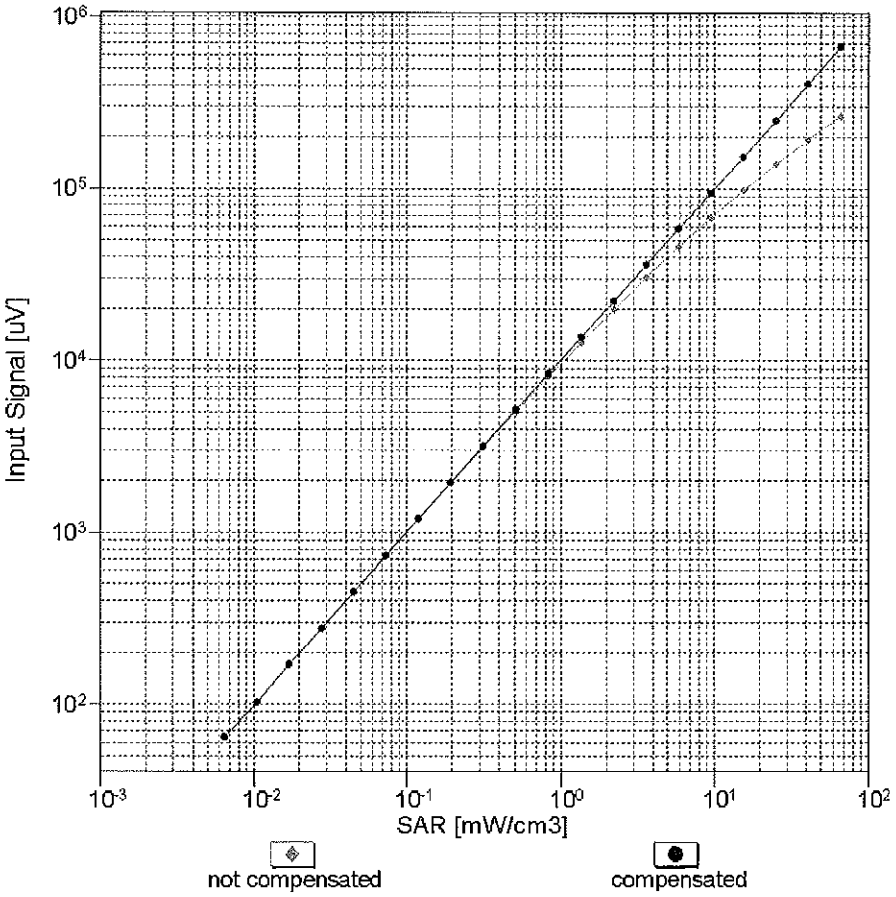
f=1800 MHz,R22

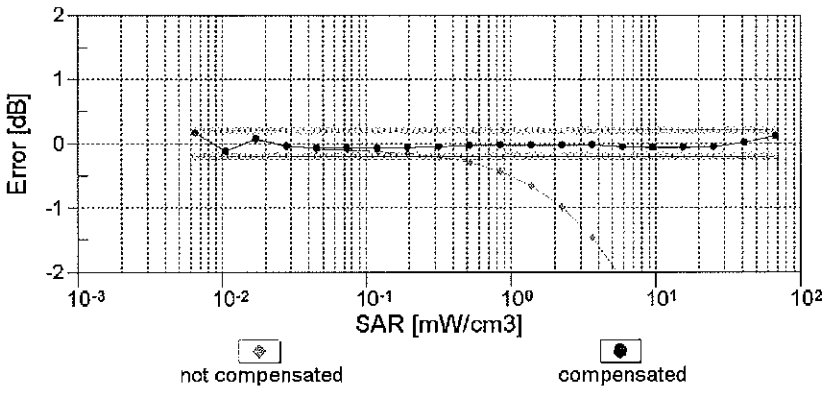




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})
(TEM cell , f = 900 MHz)

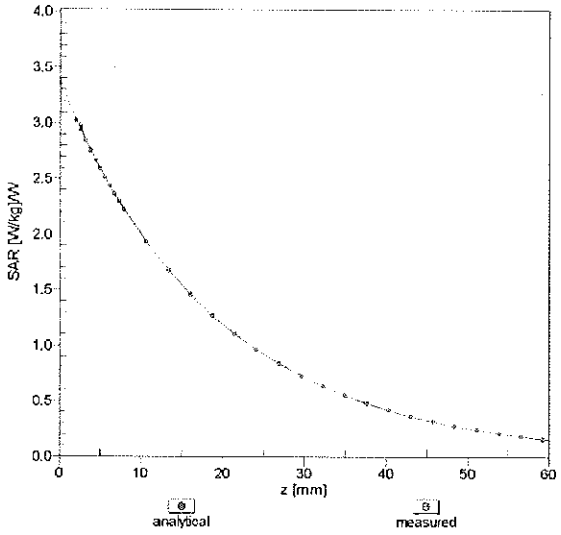




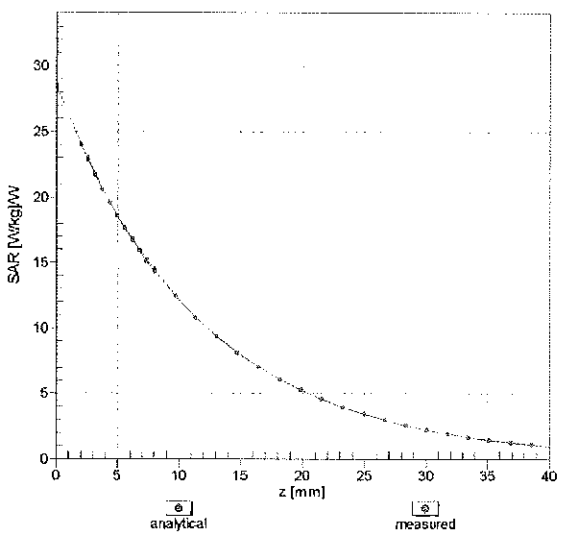
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

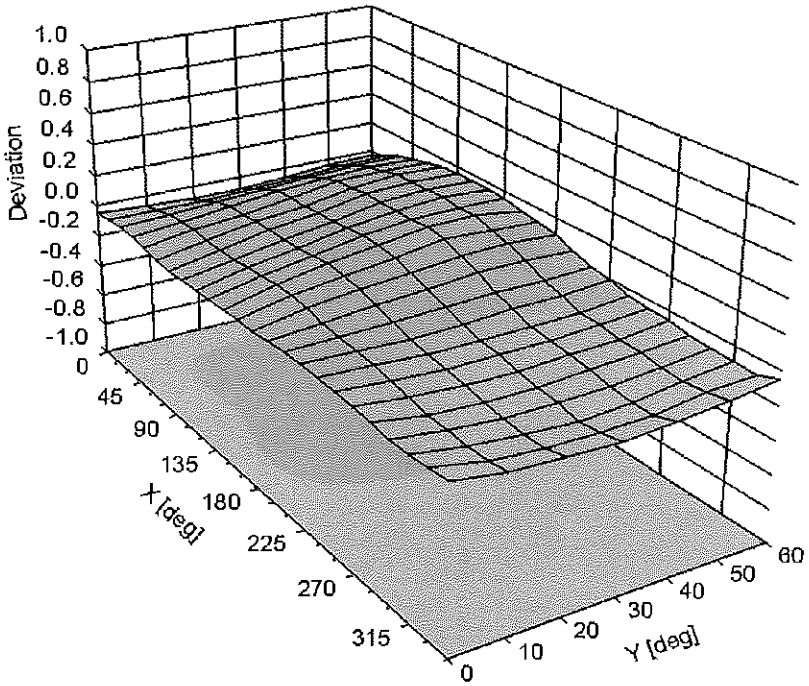


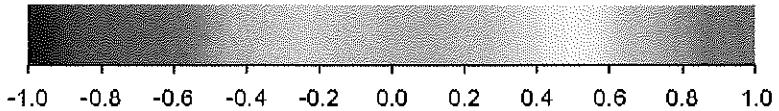
f = 1900 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz





Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3288

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	-127.1
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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Accreditation No.: SCS 108

Client PC Test

Certificate No: ES3-3318_Apr13

CALIBRATION CERTIFICATE

Object: ES3DV3 - SN:3318

Calibration procedure(s): QA CAL-01.v8, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes

VCC 6/4/13

Calibration date: April 29, 2013

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	04-Apr-13 (No. 217-01733)	Apr-14
Power sensor E4412A	MY41498087	04-Apr-13 (No. 217-01733)	Apr-14
Reference 3 dB Attenuator	SN: S5054 (3c)	04-Apr-13 (No. 217-01737)	Apr-14
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-13 (No. 217-01735)	Apr-14
Reference 30 dB Attenuator	SN: S5129 (30b)	04-Apr-13 (No. 217-01738)	Apr-14
Reference Probe ES3DV2	SN: 3013	28-Dec-12 (No. ES3-3013_Dec12)	Dec-13
DAE4	SN: 660	31-Jan-13 (No. DAE4-660_Jan13)	Jan-14
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-15
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-12)	In house check: Oct-13

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 29, 2013

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
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S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS) **Accreditation No.: SCS 108**
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe ES3DV3

SN:3318

Manufactured: January 10, 2012
Calibrated: April 29, 2013

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3318

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.15	0.92	1.29	± 10.1 %
DCP (mV)[B]	102.6	105.4	100.8	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	153.6	±3.5 %
		Y	0.0	0.0	1.0		133.8	
		Z	0.0	0.0	1.0		154.8	

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3318

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	6.59	6.59	6.59	0.25	2.12	± 12.0 %
850	41.5	0.92	6.33	6.33	6.33	0.57	1.25	± 12.0 %
1900	40.0	1.40	5.22	5.22	5.22	0.79	1.25	± 12.0 %
2450	39.2	1.80	4.59	4.59	4.59	0.80	1.30	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

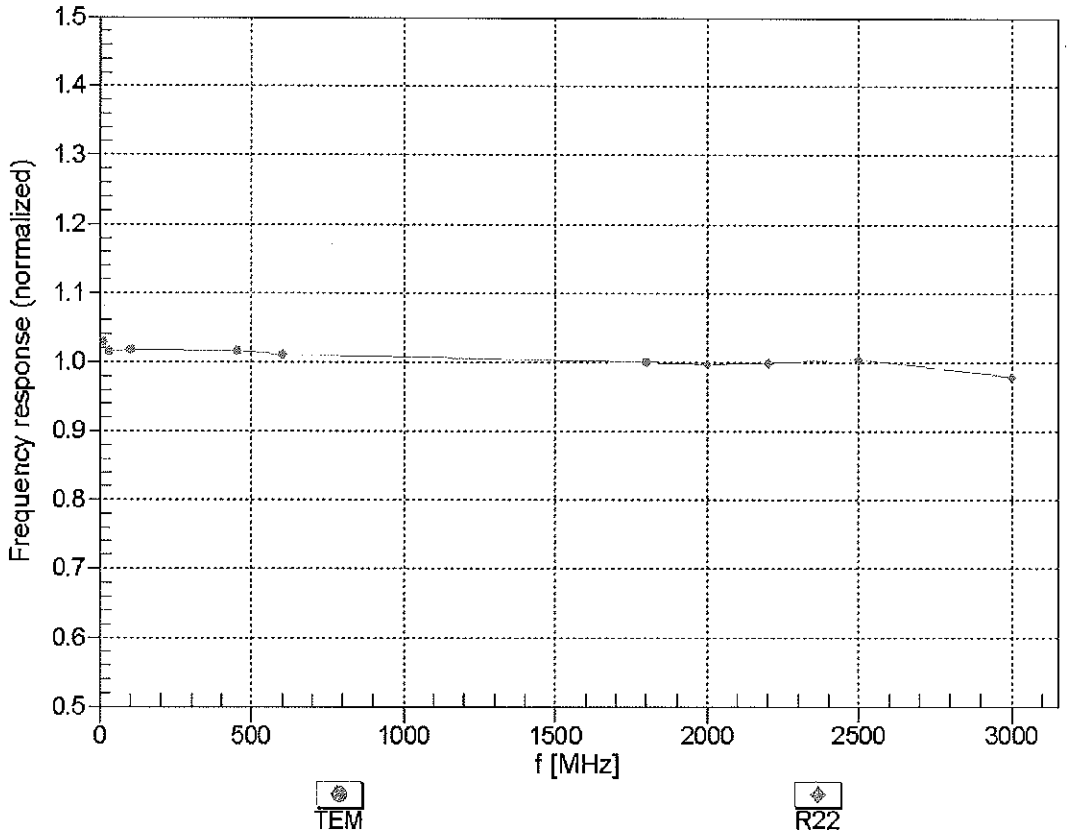
DASY/EASY - Parameters of Probe: ES3DV3 - SN:3318

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	6.35	6.35	6.35	0.53	1.42	± 12.0 %
850	55.2	0.99	6.21	6.21	6.21	0.57	1.38	± 12.0 %
1900	53.3	1.52	4.79	4.79	4.79	0.46	1.77	± 12.0 %
2450	52.7	1.95	4.31	4.31	4.31	0.80	1.09	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

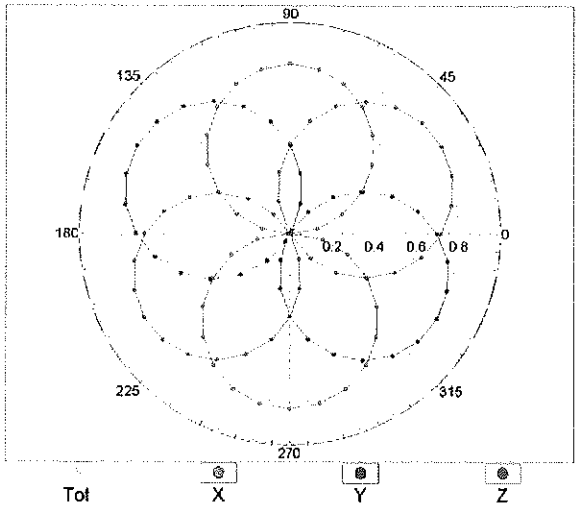
Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



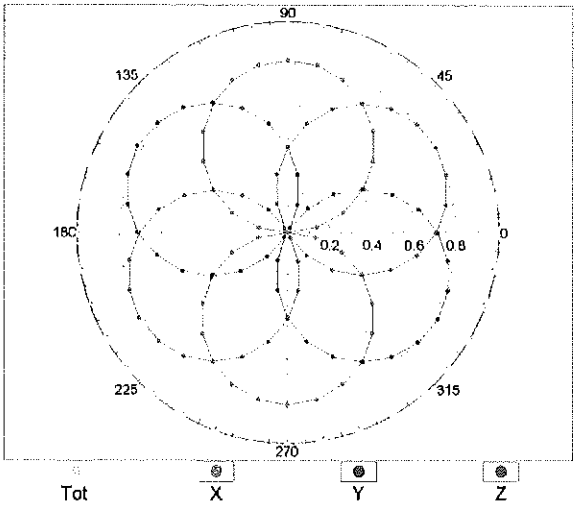
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

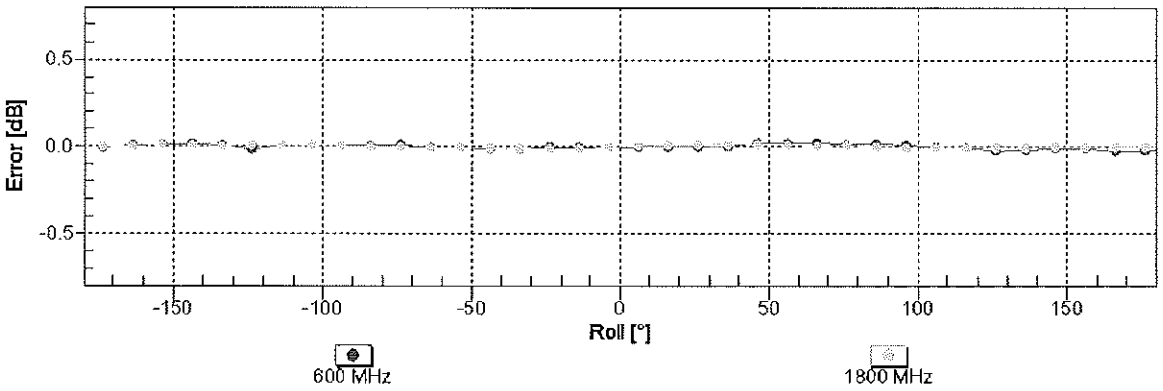
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



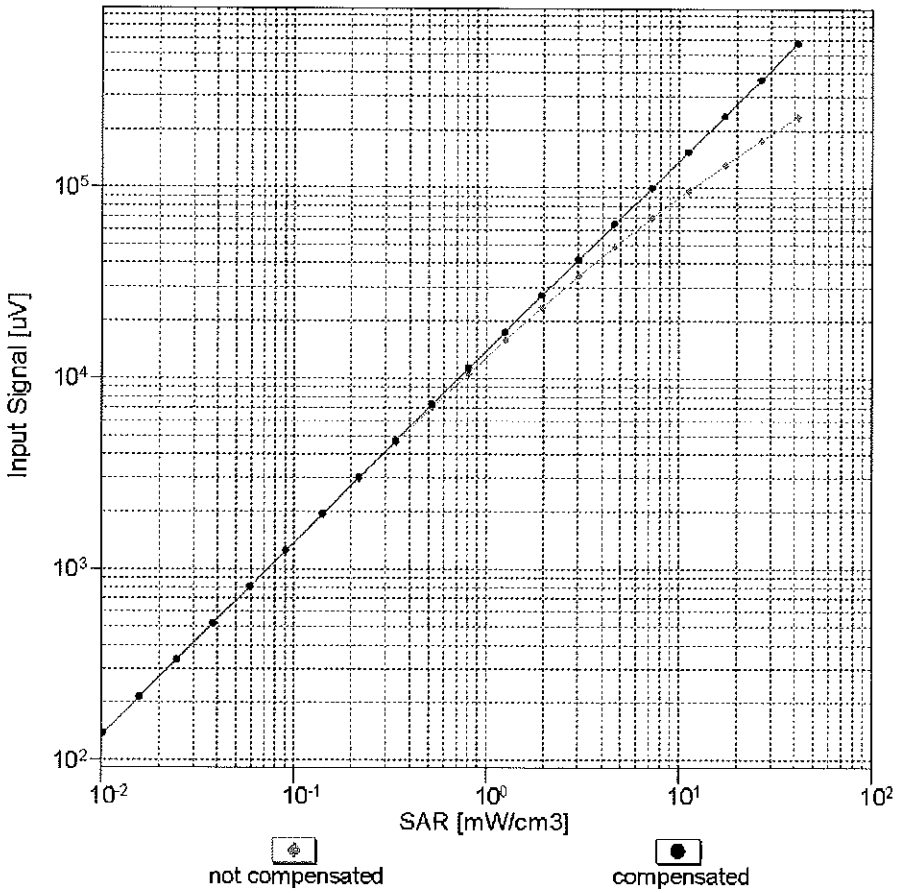
f=1800 MHz,R22

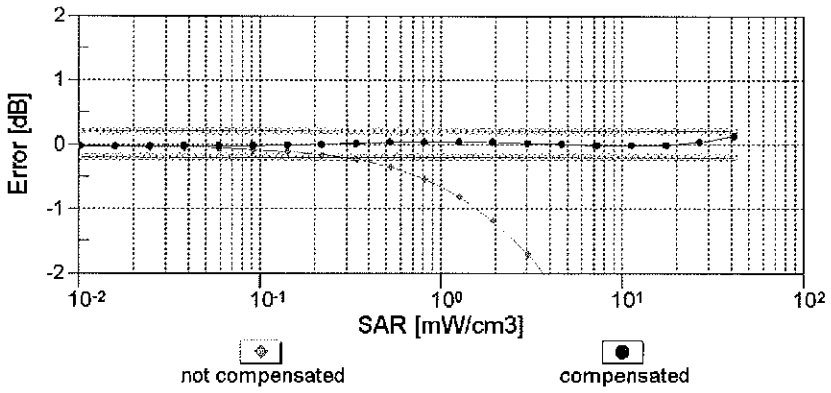




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})
(TEM cell , f = 900 MHz)

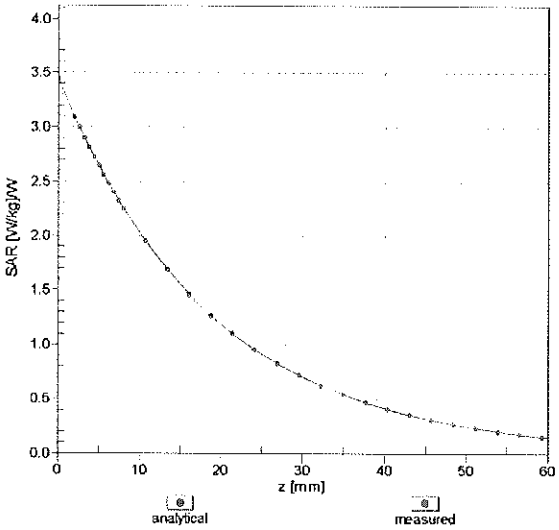




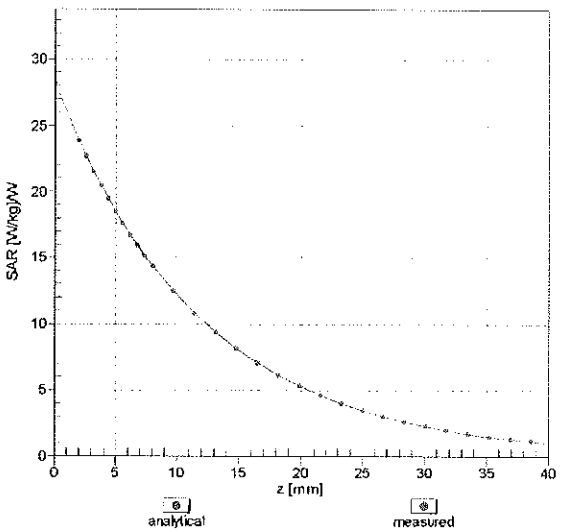
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment

f = 850 MHz,WGLS R9 (H_convF)

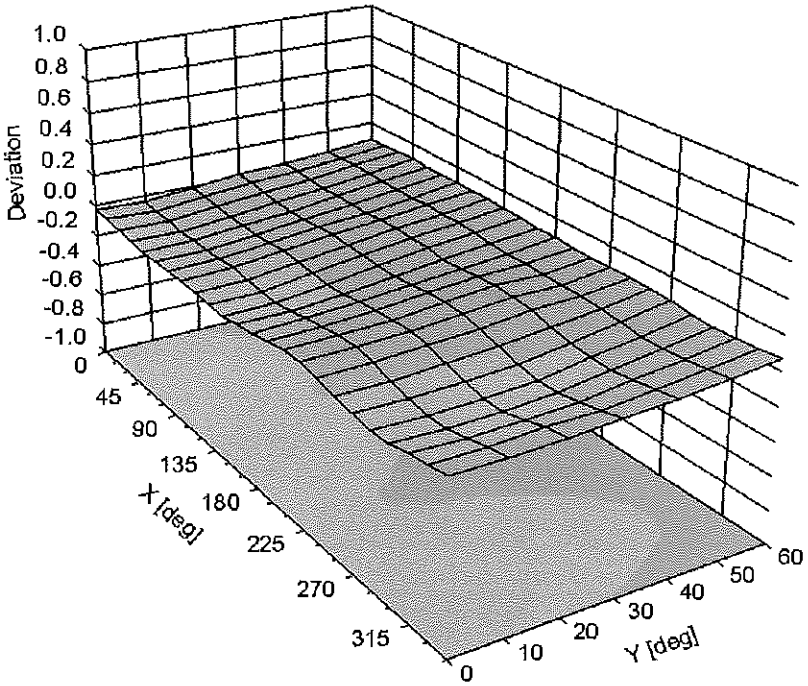


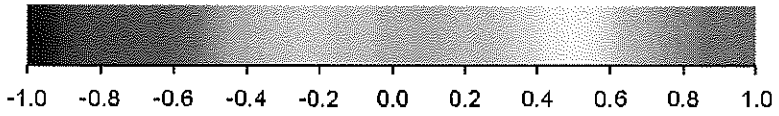
f = 1900 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz





Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3318

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	-103.8
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

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Additional Conversion Factors

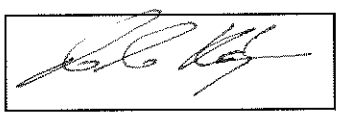
for Dosimetric E-Field Probe

Type:	**ES3DV3**
Serial Number:	**3318**
Place of Assessment:	**Zurich**
Date of Assessment:	**June 19, 2013**
Probe Calibration Date:	**April 29, 2013**

JF for 6/25/13

Schmid & Partner Engineering AG hereby certifies that conversion factor(s) of this probe have been evaluated on the date indicated above. The assessment was performed using the FDTD numerical code SEMCAD of Schmid & Partner Engineering AG. The evaluation is coupled with measured conversion factors (probe calibration date indicated above). The uncertainty of the numerical assessment is based on the extrapolation from measured value at 835 MHz or at 1900 MHz.

Assessed by:



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info@speag.com, http://www.speag.com

Dosimetric E-Field Probe ES3DV3 SN:3318

Conversion factor (± standard deviation)

1750 ± 50 MHz	*ConvF*	**5.59 ± 7%**	ε_r **= 40.1 ± 5%** σ **= 1.37 ± 5% mho/m** (head tissue)
1750 ± 50 MHz	*ConvF*	**5.22 ± 7%**	ε_r **= 53.4 ± 5%** σ **= 1.49 ± 5% mho/m** (body tissue)

Important Note:

For numerically assessed probe conversion factors, parameters Alpha and Delta in the DASY software must have the following entries: Alpha = 0 and Delta = 1.

Please see also DASY Manual.

Calibration Laboratory of
Schmid & Partner
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Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS) **Accreditation No.: SCS 108**
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Client PC Test **Certificate No:** ES3-3319_Apr13

CALIBRATION CERTIFICATE

Object ES3DV3 - SN:3319

Calibration procedure(s) QA CAL-01.v8, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes

VCC 6/14/13

Calibration date: April 29, 2013

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	04-Apr-13 (No. 217-01733)	Apr-14
Power sensor E4412A	MY41498087	04-Apr-13 (No. 217-01733)	Apr-14
Reference 3 dB Attenuator	SN: S5054 (3c)	04-Apr-13 (No. 217-01737)	Apr-14
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-13 (No. 217-01735)	Apr-14
Reference 30 dB Attenuator	SN: S5129 (30b)	04-Apr-13 (No. 217-01738)	Apr-14
Reference Probe ES3DV2	SN: 3013	28-Dec-12 (No. ES3-3013_Dec12)	Dec-13
DAE4	SN: 660	31-Jan-13 (No. DAE4-660_Jan13)	Jan-14
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-15
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-12)	In house check: Oct-13

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 29, 2013

Calibration Laboratory of
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Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS) **Accreditation No.: SCS 108**
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Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe ES3DV3

SN:3319

Manufactured: January 10, 2012
Calibrated: April 29, 2013

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3319

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.12	1.20	1.22	± 10.1 %
DCP (mV)[B]	100.7	102.6	102.4	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	152.0	±3.8 %
		Y	0.0	0.0	1.0		159.0	
		Z	0.0	0.0	1.0		149.8	

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3319

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	6.49	6.49	6.49	0.28	1.97	± 12.0 %
850	41.5	0.92	6.23	6.23	6.23	0.42	1.57	± 12.0 %
1900	40.0	1.40	5.22	5.22	5.22	0.80	1.24	± 12.0 %
2450	39.2	1.80	4.57	4.57	4.57	0.80	1.32	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

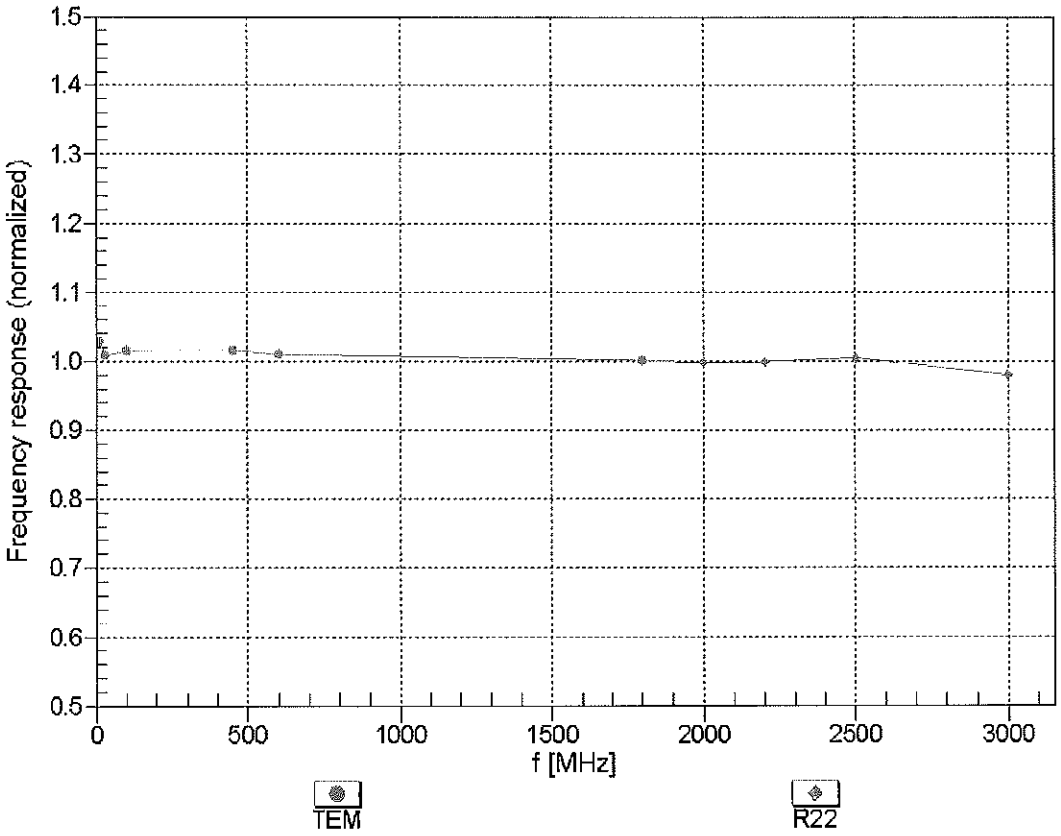
DASY/EASY - Parameters of Probe: ES3DV3 - SN:3319

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	6.30	6.30	6.30	0.45	1.53	± 12.0 %
850	55.2	0.99	6.15	6.15	6.15	0.42	1.65	± 12.0 %
1900	53.3	1.52	4.85	4.85	4.85	0.63	1.49	± 12.0 %
2450	52.7	1.95	4.32	4.32	4.32	0.69	1.20	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

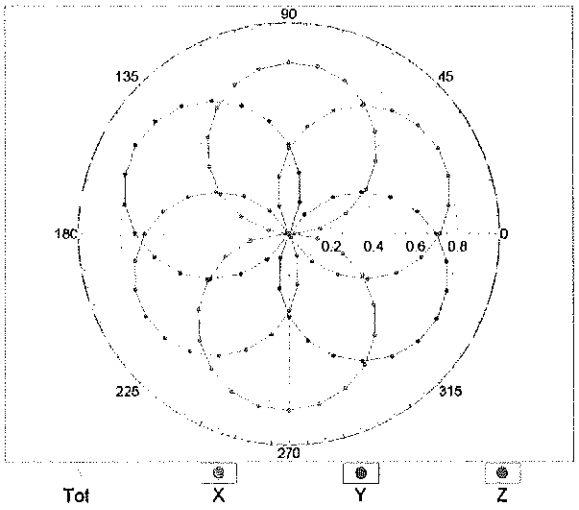
Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



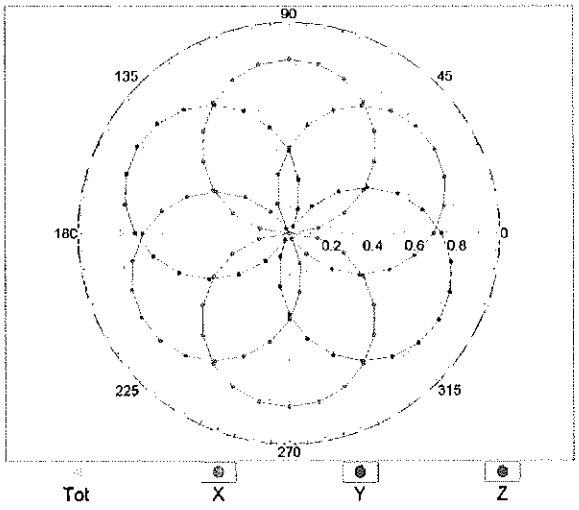
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

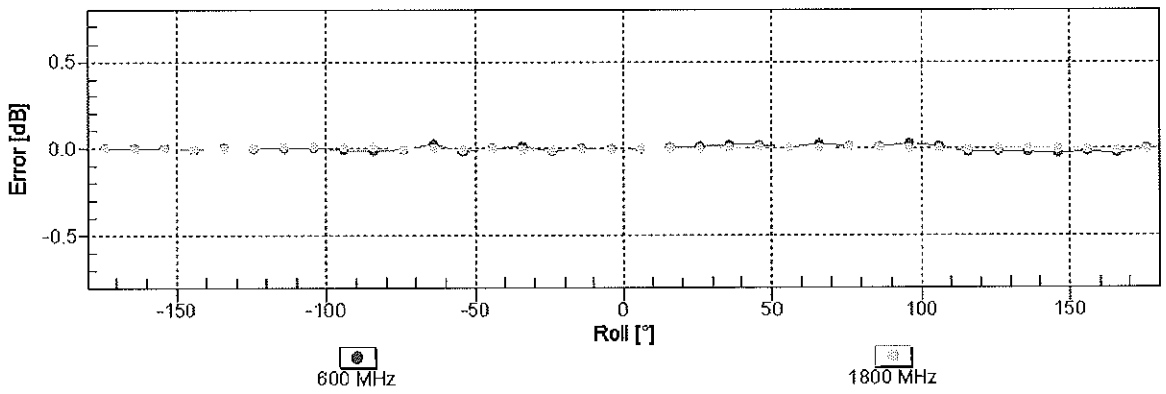
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



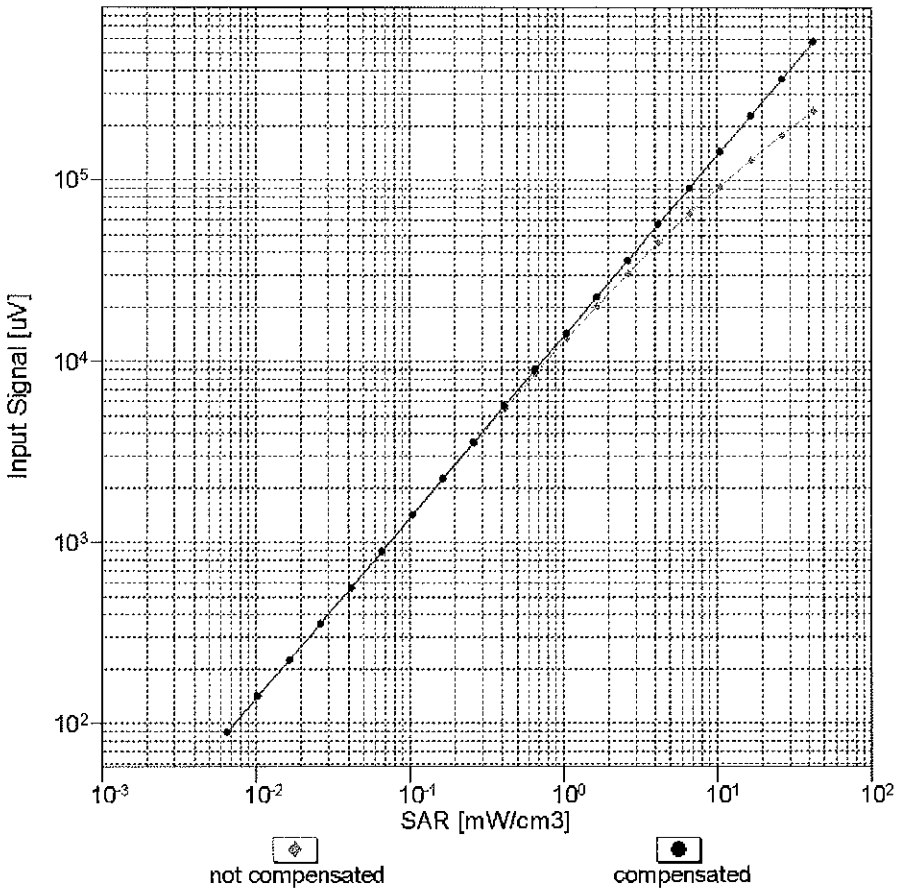
f=1800 MHz,R22

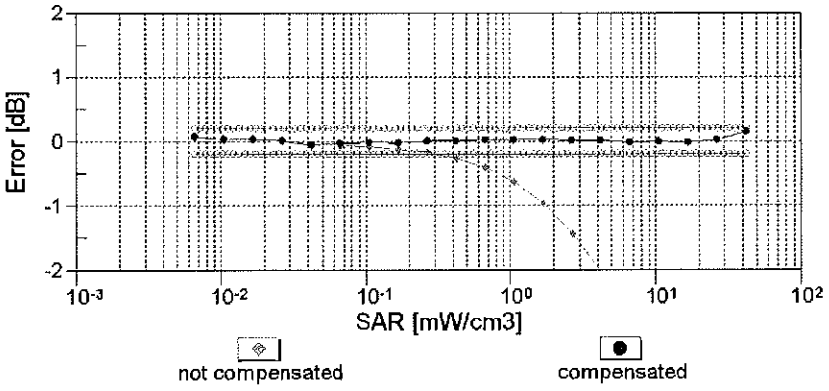




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})
(TEM cell , f = 900 MHz)

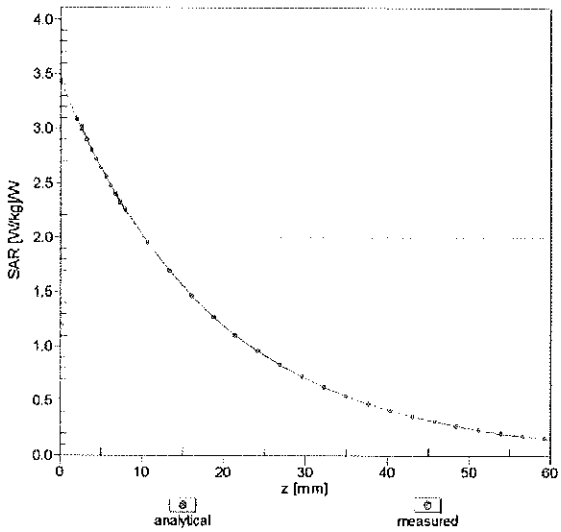




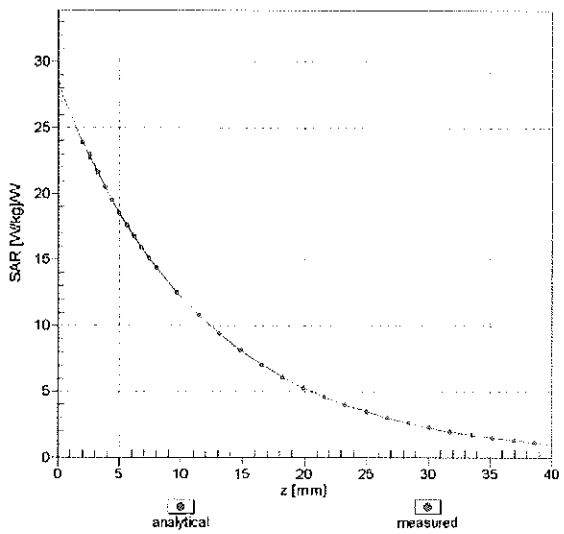
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment

f = 850 MHz,WGLS R9 (H_convF)

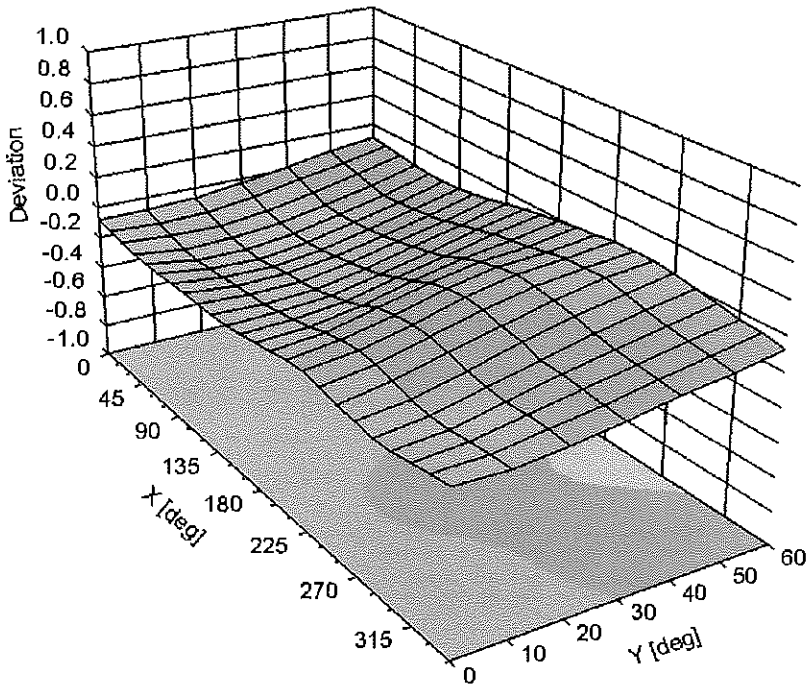


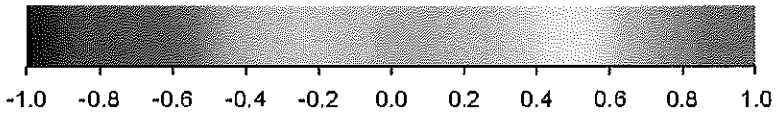
f = 1900 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz





Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3319

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	-104.1
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

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Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ES3DV3**
Serial Number:	**3319**
Place of Assessment:	**Zurich**
Date of Assessment:	**June 19, 2013**
Probe Calibration Date:	**April 29, 2013**

Schmid & Partner Engineering AG hereby certifies that conversion factor(s) of this probe have been evaluated on the date indicated above. The assessment was performed using the FDTD numerical code SEMCAD of Schmid & Partner Engineering AG. The evaluation is coupled with measured conversion factors (probe calibration date indicated above). The uncertainty of the numerical assessment is based on the extrapolation from measured value at 835 MHz or at 1900 MHz.

✓ KOK 6/25/13

Assessed by:

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info@speag.com, http://www.speag.com

Dosimetric E-Field Probe ES3DV3 SN:3319

Conversion factor (± standard deviation)

1750 ± 50 MHz	*ConvF*	**5.59 ± 7%**	ε_r = **40.1 ± 5%** σ = **1.37 ± 5% mho/m** (head tissue)
1750 ± 50 MHz	*ConvF*	**5.22 ± 7%**	ε_r = **53.4 ± 5%** σ = **1.49 ± 5% mho/m** (body tissue)

Important Note:

For numerically assessed probe conversion factors, parameters Alpha and Delta in the DASY software must have the following entries: Alpha = 0 and Delta = 1.

Please see also DASY Manual.

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Client PC Test **Certificate No: ES3-3333_Nov13**

CALIBRATION CERTIFICATE

Object ES3DV3 - SN:3333

Calibration procedure(s) QA CAL-01.v9, QA CAL-23.v5, QA CAL-25.v5
Calibration procedure for dosimetric E-field probes

Calibration date: November 22, 2013

1/7/14

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	04-Apr-13 (No. 217-01733)	Apr-14
Power sensor E4412A	MY41498087	04-Apr-13 (No. 217-01733)	Apr-14
Reference 3 dB Attenuator	SN: S5054 (3c)	04-Apr-13 (No. 217-01737)	Apr-14
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-13 (No. 217-01735)	Apr-14
Reference 30 dB Attenuator	SN: S5129 (30b)	04-Apr-13 (No. 217-01738)	Apr-14
Reference Probe ES3DV2	SN: 3013	28-Dec-12 (No. ES3-3013_Dec12)	Dec-13
DAE4	SN: 660	4-Sep-13 (No. DAE4-660_Sep13)	Sep-14
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-15
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: November 25, 2013

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Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z*: *A, B, C, D* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle*: The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

Probe ES3DV3

SN:3333

Manufactured: January 24, 2012
Calibrated: November 22, 2013

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3333

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.08	0.90	0.88	± 10.1 %
DCP (mV)[B]	104.9	103.3	101.7	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	140.9	±2.2 %
		Y	0.0	0.0	1.0		132.0	
		Z	0.0	0.0	1.0		170.3	

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3333

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unct. (k=2)
750	41.9	0.89	6.56	6.56	6.56	0.44	1.54	± 12.0 %
850	41.5	0.92	6.30	6.30	6.30	0.46	1.48	± 12.0 %
1750	40.1	1.37	5.23	5.23	5.23	0.77	1.17	± 12.0 %
1900	40.0	1.40	5.05	5.05	5.05	0.80	1.19	± 12.0 %
2450	39.2	1.80	4.42	4.42	4.42	0.74	1.31	± 12.0 %
2600	39.0	1.96	4.28	4.28	4.28	0.80	1.30	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.
[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3333

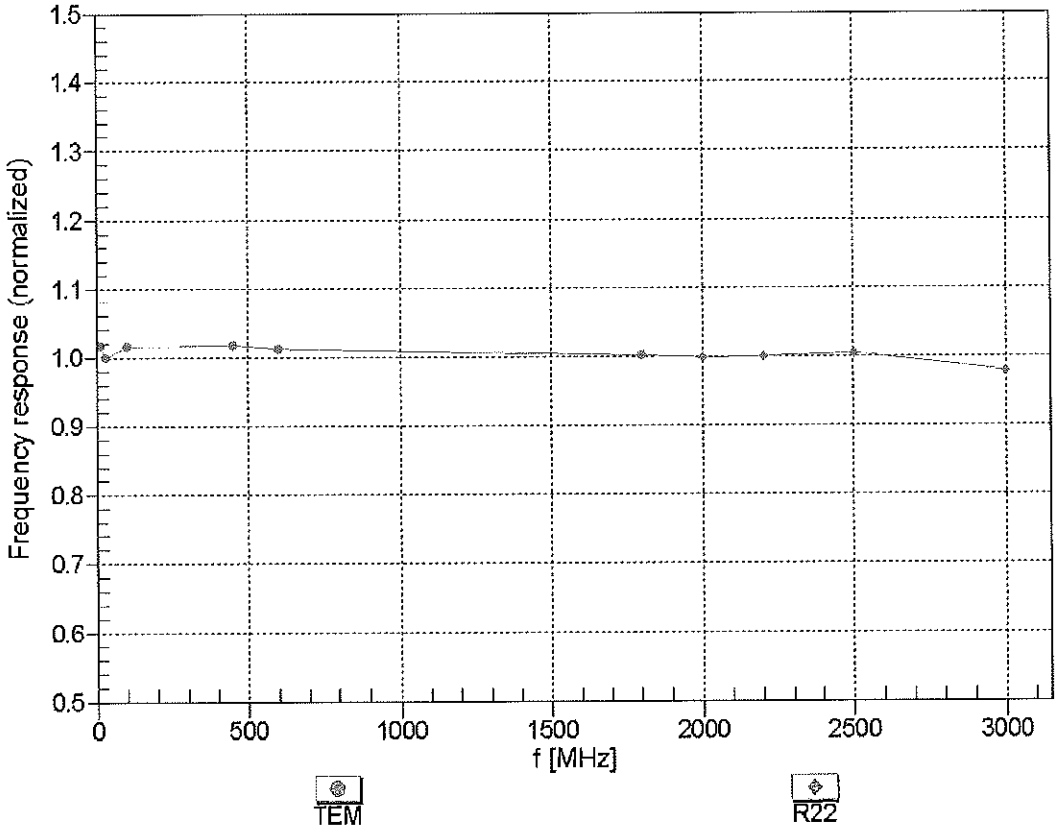
Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unct. (k=2)
750	55.5	0.96	6.11	6.11	6.11	0.33	1.90	± 12.0 %
850	55.2	0.99	6.07	6.07	6.07	0.80	1.19	± 12.0 %
1750	53.4	1.49	4.95	4.95	4.95	0.80	1.26	± 12.0 %
1900	53.3	1.52	4.71	4.71	4.71	0.49	1.54	± 12.0 %
2450	52.7	1.95	4.22	4.22	4.22	0.80	0.95	± 12.0 %
2600	52.5	2.16	4.16	4.16	4.16	0.80	1.07	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.
[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

Frequency Response of E-Field

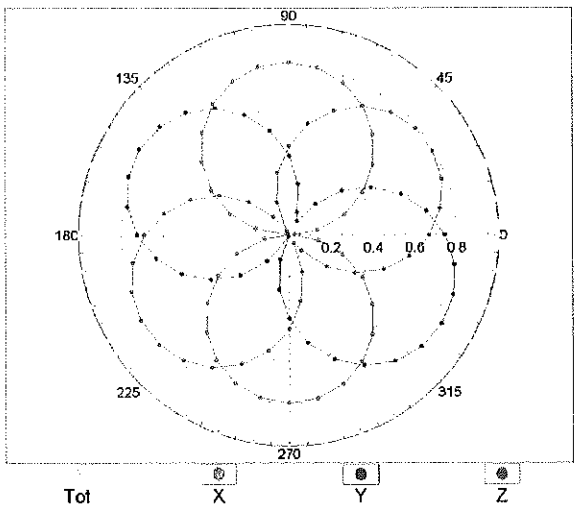
(TEM-Cell:ifi110 EXX, Waveguide: R22)



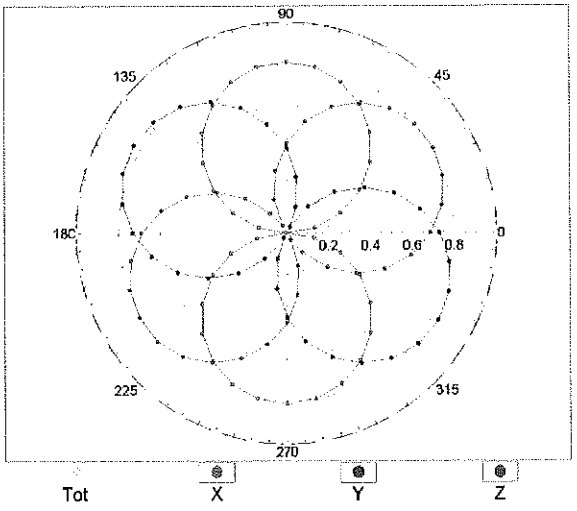
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

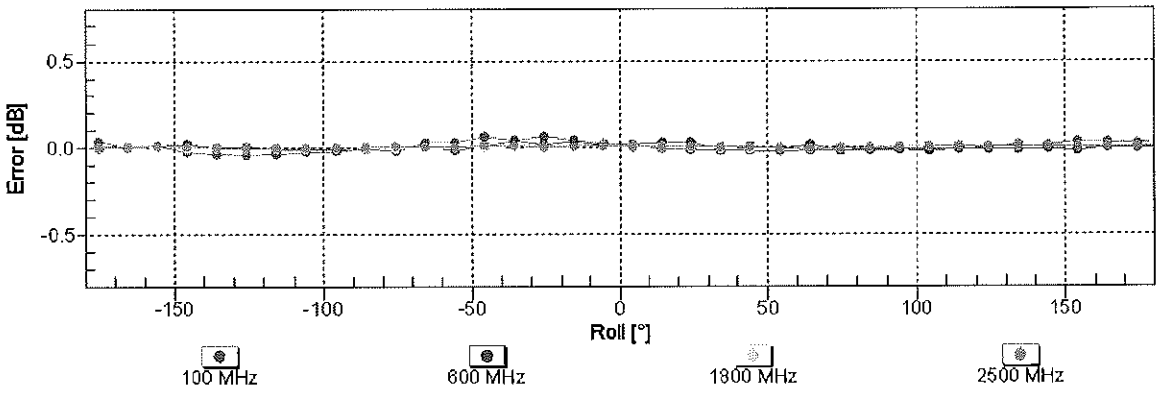
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



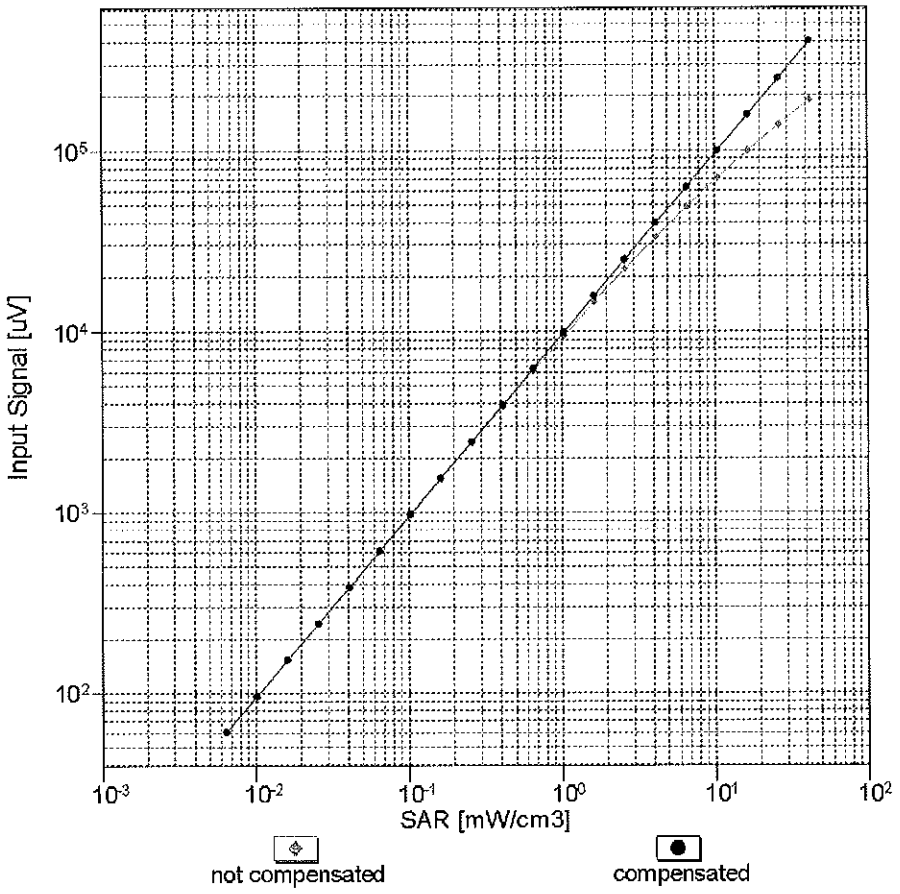
f=1800 MHz,R22

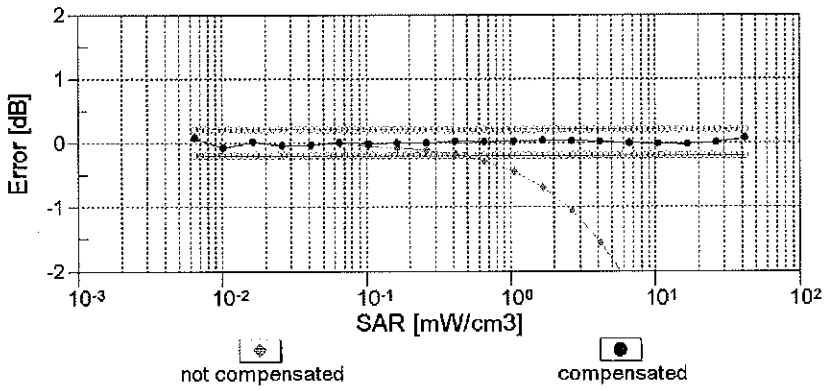




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})
(TEM cell , f = 900 MHz)

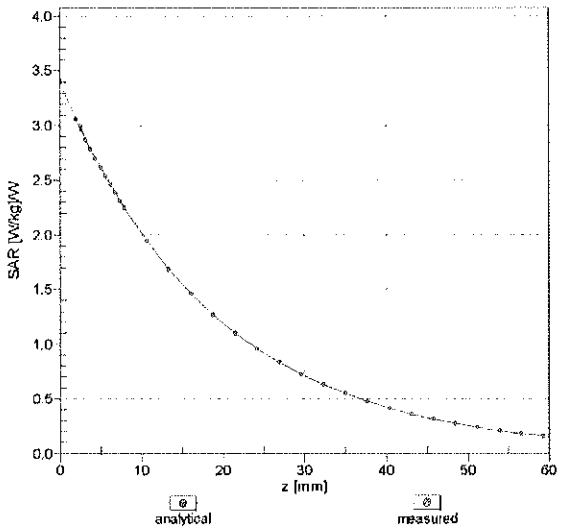




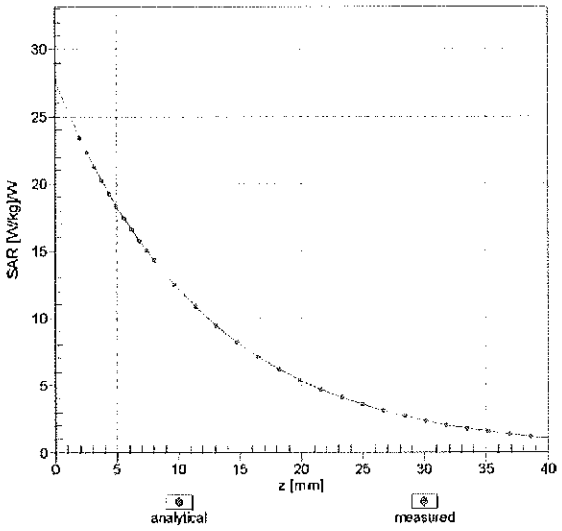
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment

f = 850 MHz,WGLS R9 (H_convF)

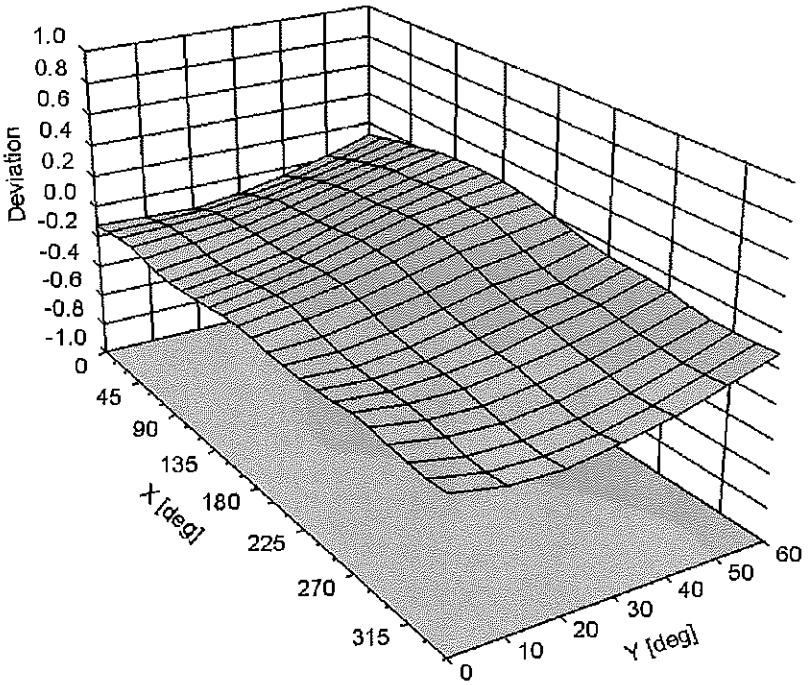


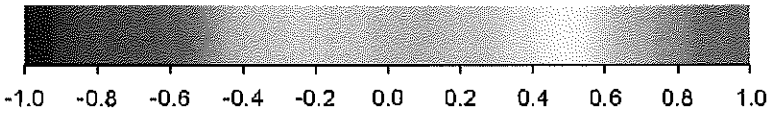
f = 1900 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz





Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3333

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	-35.7
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

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Accreditation No.: SCS 108

Client **PC Test**

Certificate No: D750V3-1054_Mar13

CALIBRATION CERTIFICATE

Object D750V3 - SN: 1054

Calibration procedure(s) QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: March 18, 2013

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	01-Nov-12 (No. 217-01640)	Oct-13
Power sensor HP 8481A	US37292783	01-Nov-12 (No. 217-01640)	Oct-13
Reference 20 dB Attenuator	SN: 5058 (20k)	27-Mar-12 (No. 217-01530)	Apr-13
Type-N mismatch combination	SN: 5047.3 / 06327	27-Mar-12 (No. 217-01533)	Apr-13
Reference Probe ES3DV3	SN: 3205	28-Dec-12 (No. ES3-3205_Dec12)	Dec-13
DAE4	SN: 601	27-Jun-12 (No. DAE4-601_Jun12)	Jun-13

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-11)	In house check: Oct-13
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-12)	In house check: Oct-13

	Name	Function	Signature
Calibrated by:	Israe El-Naouq	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: March 18, 2013

80880

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Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.5
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.1 ± 6 %	0.92 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.19 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.50 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.42 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.55 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.2 ± 6 %	1.00 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.26 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**8.72 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.48 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**5.75 W/kg ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.4 Ω - 0.9 jΩ
Return Loss	- 27.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.7 Ω - 2.7 jΩ
Return Loss	- 31.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.034 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	November 08, 2011

DASY5 Validation Report for Head TSL

Date: 18.03.2013

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1054

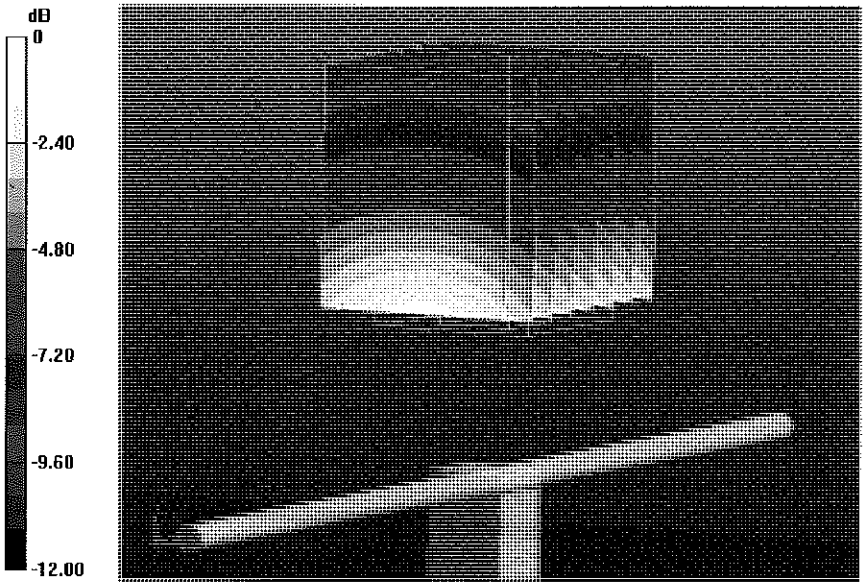
Communication System: CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.92 S/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.28, 6.28, 6.28); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.5(1059); SEMCAD X 14.6.8(7028)

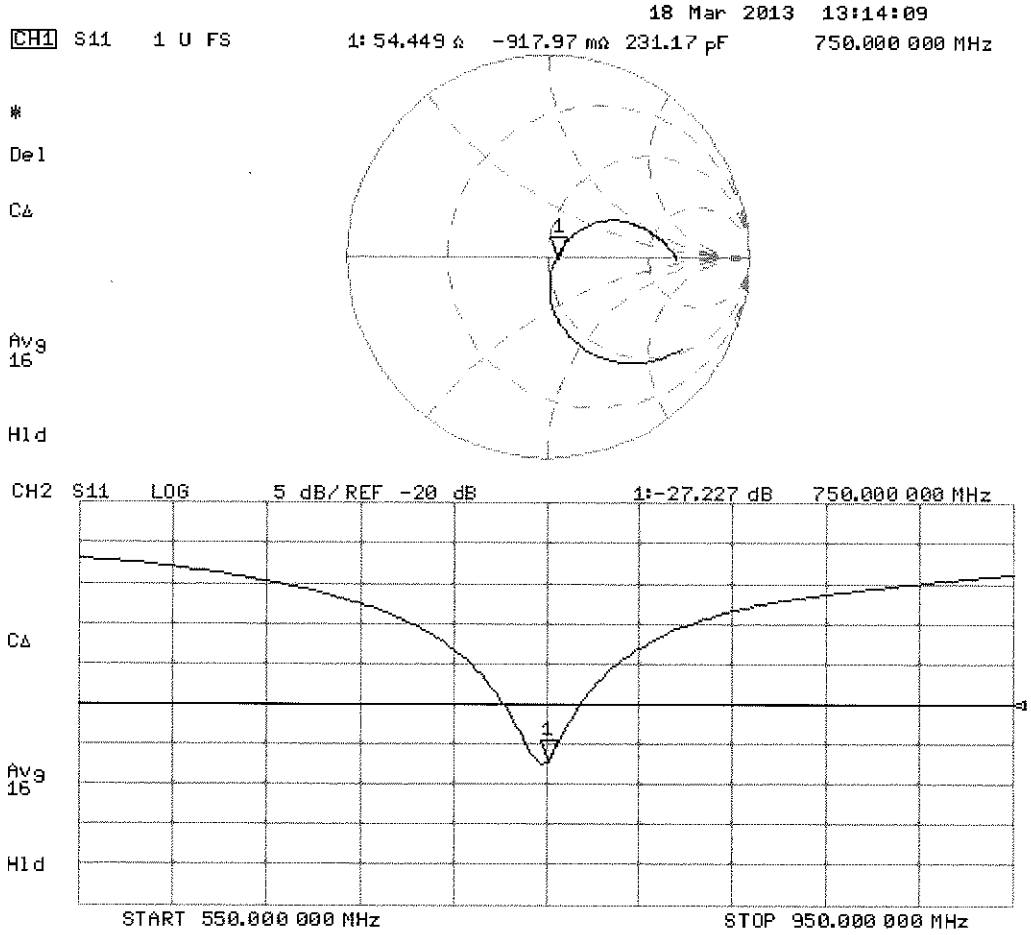
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.772 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.33 W/kg
SAR(1 g) = 2.19 W/kg; SAR(10 g) = 1.42 W/kg
Maximum value of SAR (measured) = 2.55 W/kg



0 dB = 2.55 W/kg = 4.07 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 18.03.2013

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1054

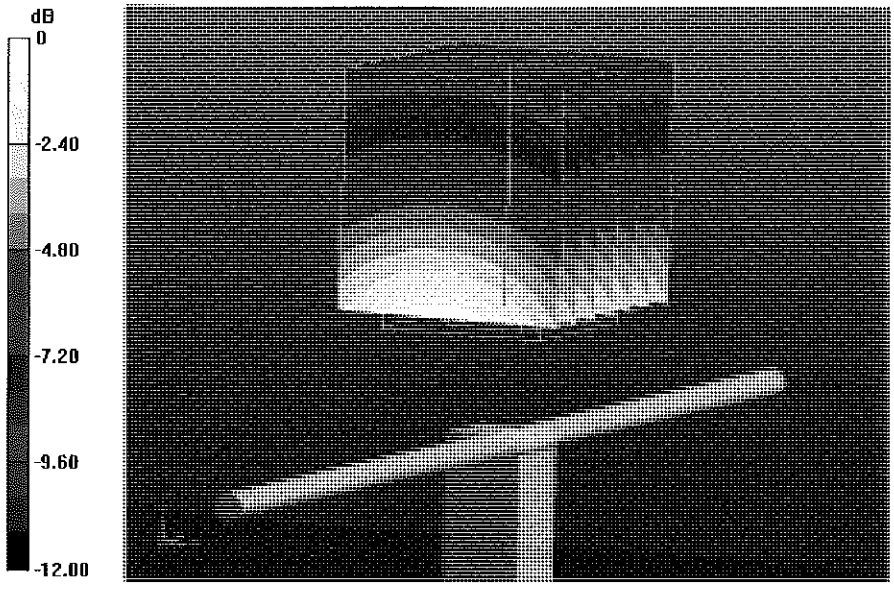
Communication System: CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 1 S/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.11, 6.11, 6.11); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.5(1059); SEMCAD X 14.6.8(7028)

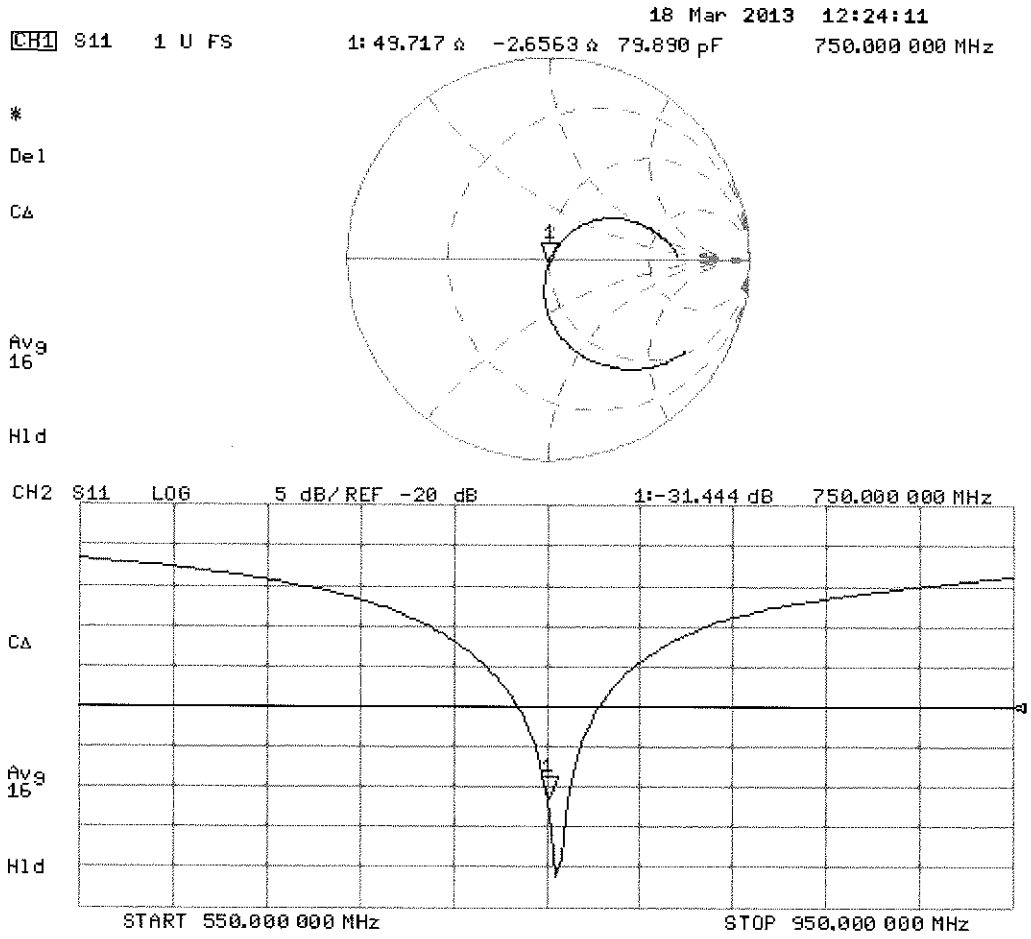
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.772 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.32 W/kg
SAR(1 g) = 2.26 W/kg; SAR(10 g) = 1.48 W/kg
Maximum value of SAR (measured) = 2.61 W/kg



0 dB = 2.61 W/kg = 4.17 dBW/kg

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 108

Client **PC Test**

Certificate No: D835V2-4d119_Apr13

CALIBRATION CERTIFICATE

Object	D835V2 - SN: 4d119
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	April 25, 2013

✓ KOK 5/8/13

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	01-Nov-12 (No. 217-01640)	Oct-13
Power sensor HP 8481A	US37292783	01-Nov-12 (No. 217-01640)	Oct-13
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-13 (No. 217-01736)	Apr-14
Type-N mismatch combination	SN: 5047.3 / 06327	04-Apr-13 (No. 217-01739)	Apr-14
Reference Probe ES3DV3	SN: 3205	28-Dec-12 (No. ES3-3205_Dec12)	Dec-13
DAE4	SN: 909	11-Sep-12 (No. DAE4-909_Sep12)	Sep-13

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-11)	In house check: Oct-13
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-12)	In house check: Oct-13

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 26, 2013

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
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S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.6
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.8 ± 6 %	0.94 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.51 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.68 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.62 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.30 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.0 ± 6 %	1.01 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.47 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.54 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.62 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.31 W/kg ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.1 Ω - 4.7 jΩ
Return Loss	- 26.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	45.8 Ω - 6.3 jΩ
Return Loss	- 22.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.385 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	June 29, 2010

DASY5 Validation Report for Head TSL

Date: 25.04.2013

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d119

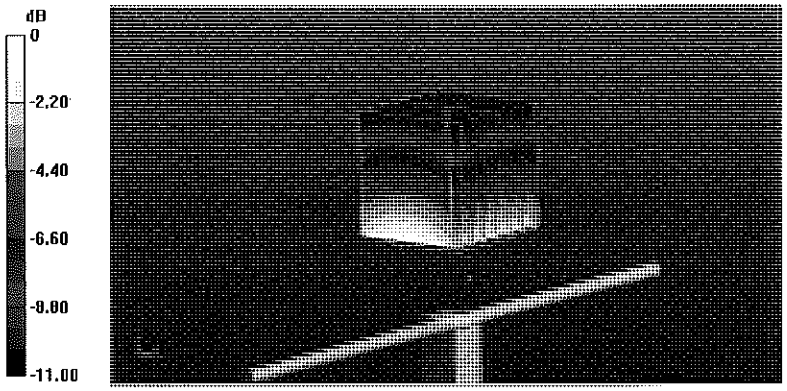
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.94 S/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.05, 6.05, 6.05); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn909; Calibrated: 11.09.2012
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.6(1115); SEMCAD X 14.6.9(7117)

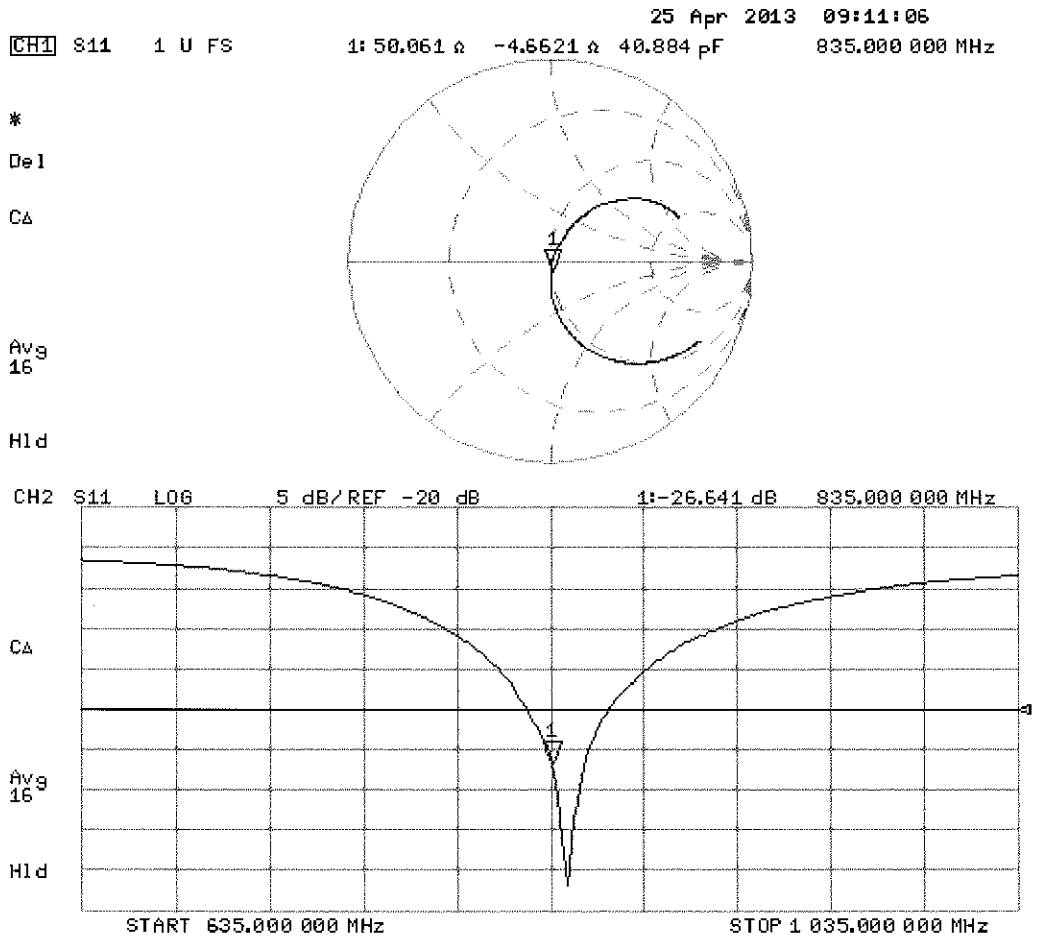
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.387 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.86 W/kg
SAR(1 g) = 2.51 W/kg; SAR(10 g) = 1.62 W/kg
Maximum value of SAR (measured) = 2.93 W/kg



0 dB = 2.93 W/kg = 4.67 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 24.04.2013

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d119

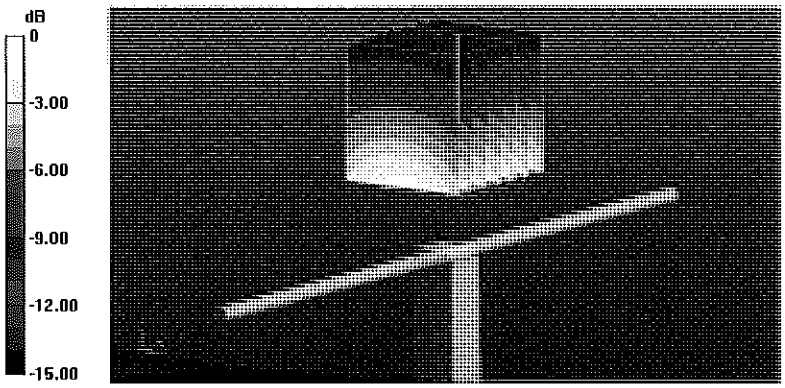
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1.01 S/m; ε_r = 54; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.04, 6.04, 6.04); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn909; Calibrated: 11.09.2012
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.6(1115); SEMCAD X 14.6.9(7117)

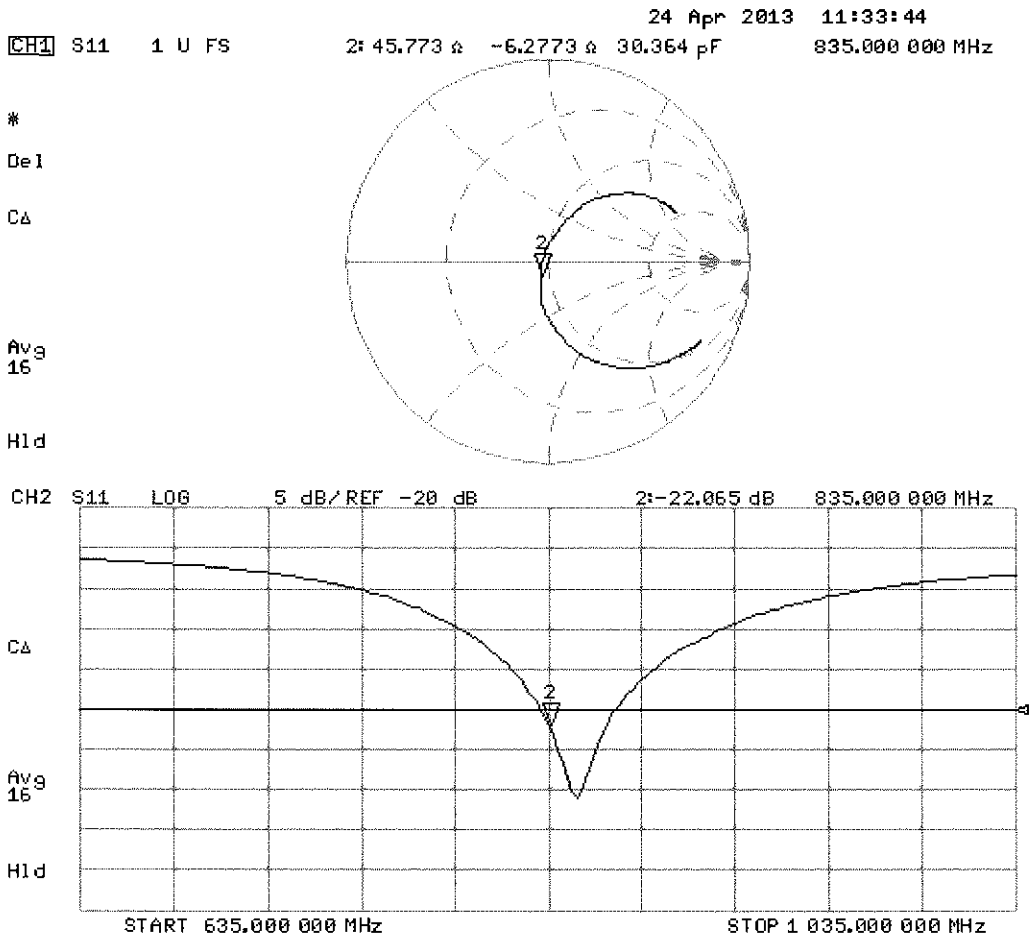
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.178 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.68 W/kg
SAR(1 g) = 2.47 W/kg; SAR(10 g) = 1.62 W/kg
Maximum value of SAR (measured) = 2.89 W/kg



0 dB = 2.89 W/kg = 4.61 dBW/kg

Impedance Measurement Plot for Body TSL



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S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **PC Test**

Certificate No: D1750V2-1051_Apr13

CALIBRATION CERTIFICATE

Object D1750V2 - SN: 1051

Calibration procedure(s) QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: April 30, 2013

OK 5/8/13

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	01-Nov-12 (No. 217-01640)	Oct-13
Power sensor HP 8481A	US37292783	01-Nov-12 (No. 217-01640)	Oct-13
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-13 (No. 217-01736)	Apr-14
Type-N mismatch combination	SN: 5047.3 / 06327	04-Apr-13 (No. 217-01739)	Apr-14
Reference Probe ES3DV3	SN: 3205	28-Dec-12 (No. ES3-3205_Dec12)	Dec-13
DAE4	SN: 601	25-Apr-13 (No. DAE4-601_Apr13)	Apr-14

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-11)	In house check: Oct-13
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-12)	In house check: Oct-13

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 30, 2013

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.6
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.1 ± 6 %	1.33 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.01 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**36.5 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.83 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**19.5 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.4	1.49 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	51.8 ± 6 %	1.50 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.55 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**37.8 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.13 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**20.4 W/kg ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.9 Ω + 0.3 jΩ
Return Loss	- 40.7 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.0 Ω + 0.4 jΩ
Return Loss	- 30.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.222 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	February 19, 2010

DASY5 Validation Report for Head TSL

Date: 30.04.2013

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1051

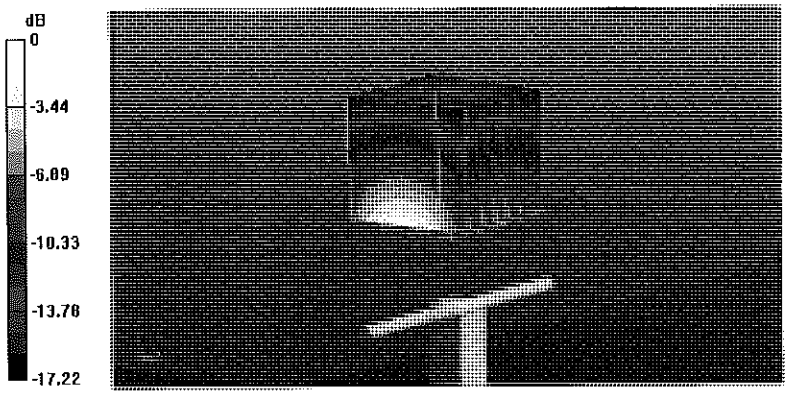
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.33 S/m; ε_r = 39.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.18, 5.18, 5.18); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.6(1115); SEMCAD X 14.6.9(7117)

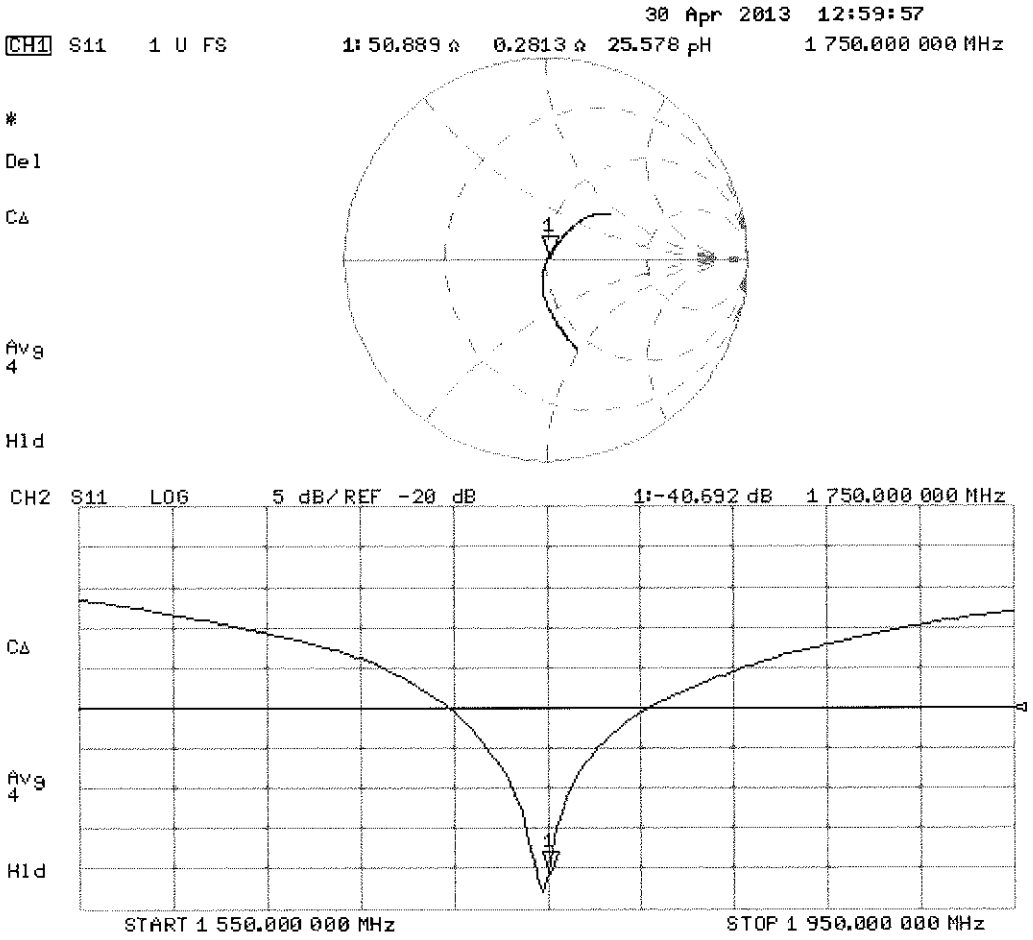
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (8x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 90.104 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 16.0 W/kg
SAR(1 g) = 9.01 W/kg; SAR(10 g) = 4.83 W/kg
Maximum value of SAR (measured) = 11.3 W/kg



0 dB = 11.3 W/kg = 10.53 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 30.04.2013

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1051

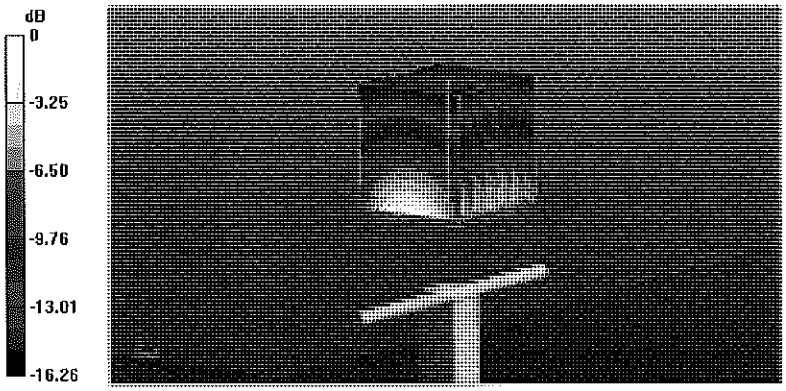
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.5 S/m; ε_r = 51.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.83, 4.83, 4.83); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.6(1115); SEMCAD X 14.6.9(7117)

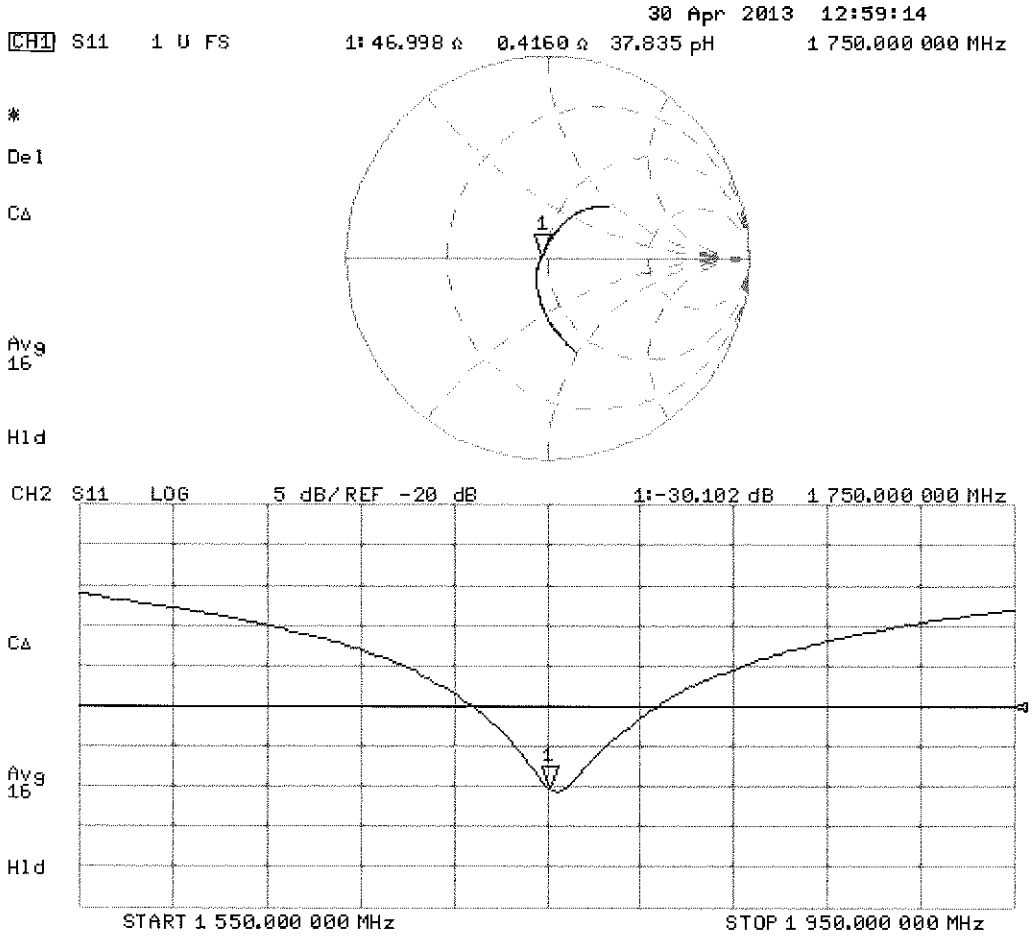
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.473 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 16.4 W/kg
SAR(1 g) = 9.55 W/kg; SAR(10 g) = 5.13 W/kg
Maximum value of SAR (measured) = 12.0 W/kg



0 dB = 12.0 W/kg = 10.79 dBW/kg

Impedance Measurement Plot for Body TSL



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S Schweizerischer Kalibrierdienst
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S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client PC Test

Certificate No: D1900V2-5d148_Feb13

CALIBRATION CERTIFICATE

Object: D1900V2 - SN: 5d148

Calibration procedure(s): QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: February 06, 2013

OK 2/21/13

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	01-Nov-12 (No. 217-01640)	Oct-13
Power sensor HP 8481A	US37292783	01-Nov-12 (No. 217-01640)	Oct-13
Reference 20 dB Attenuator	SN: 5058 (20k)	27-Mar-12 (No. 217-01530)	Apr-13
Type-N mismatch combination	SN: 5047.3 / 06327	27-Mar-12 (No. 217-01533)	Apr-13
Reference Probe ES3DV3	SN: 3205	28-Dec-12 (No. ES3-3205_Dec12)	Dec-13
DAE4	SN: 601	27-Jun-12 (No. DAE4-601_Jun12)	Jun-13

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-11)	In house check: Oct-13
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-12)	In house check: Oct-13

	Name	Function	Signature
Calibrated by:	Leif Klysner	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 6, 2013

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.5
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.4 ± 6 %	1.38 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.87 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**39.7 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.18 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**20.8 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	51.9 ± 6 %	1.53 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.3 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**40.8 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.45 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**21.7 W/kg ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.1 Ω + 5.9 jΩ
Return Loss	- 24.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.3 Ω + 6.3 jΩ
Return Loss	- 23.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.199 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	March 11, 2011

DASY5 Validation Report for Head TSL

Date: 06.02.2013

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d148

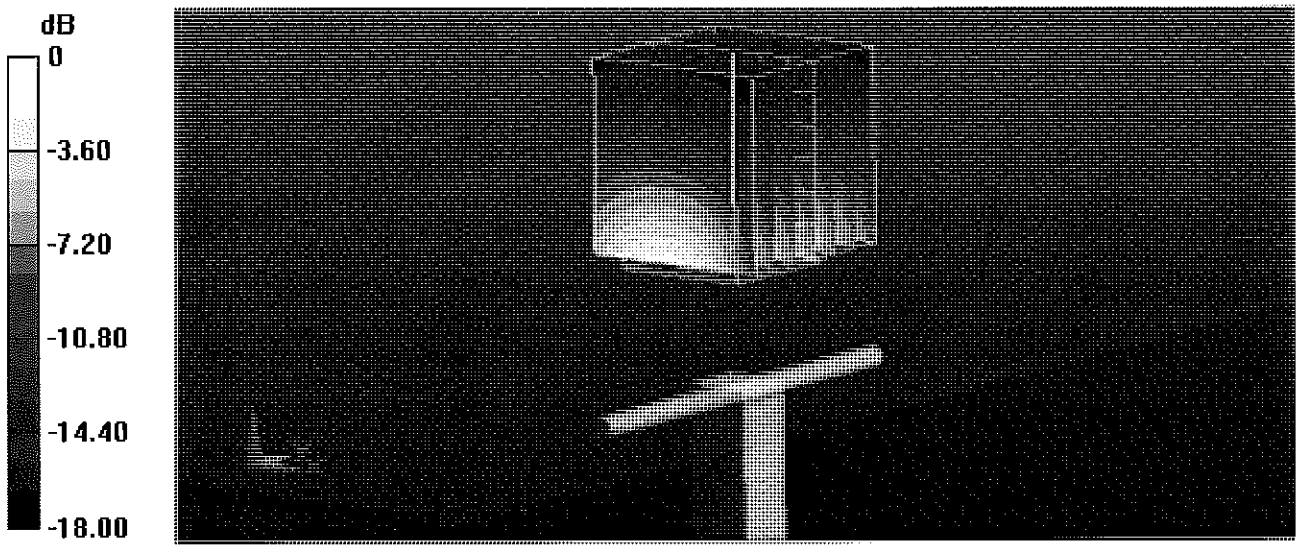
Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.38 S/m; ε_r = 39.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.98, 4.98, 4.98); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.5(1059); SEMCAD X 14.6.8(7028)

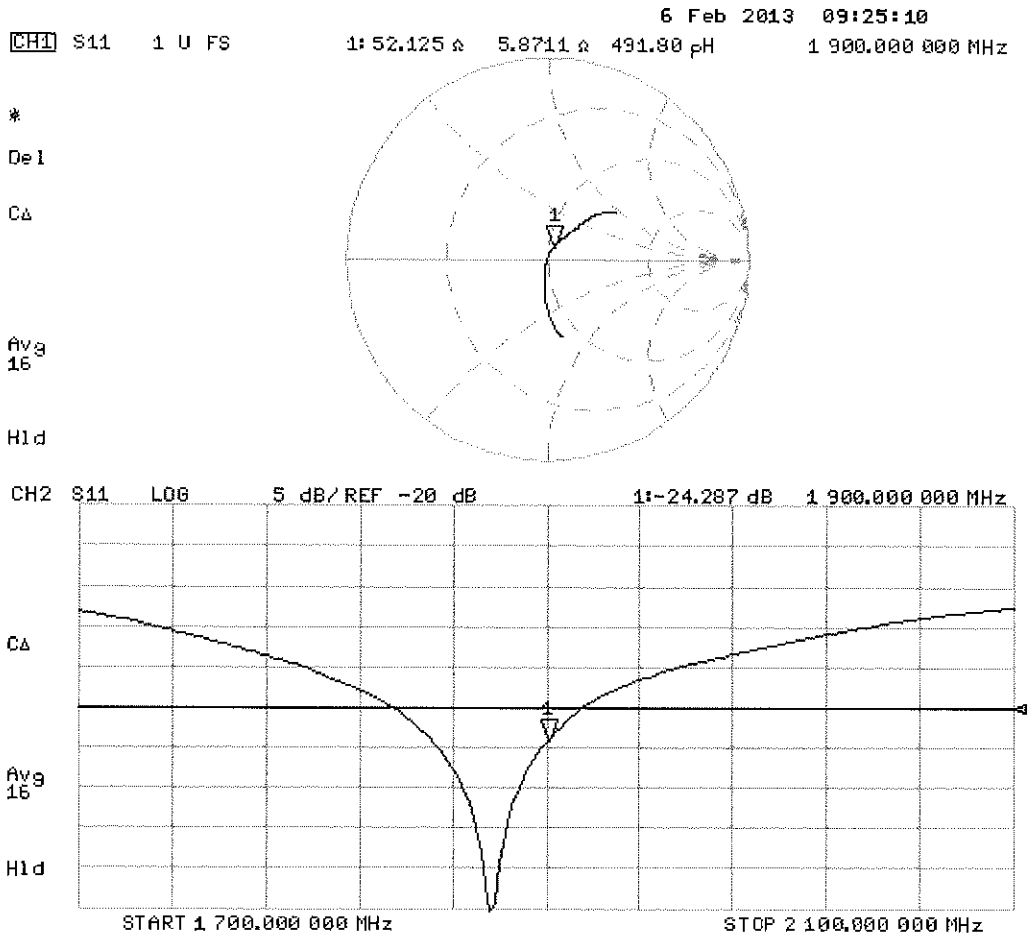
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.534 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 17.8 W/kg
SAR(1 g) = 9.87 W/kg; SAR(10 g) = 5.18 W/kg
Maximum value of SAR (measured) = 12.1 W/kg



0 dB = 12.1 W/kg = 10.83 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 06.02.2013

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d148

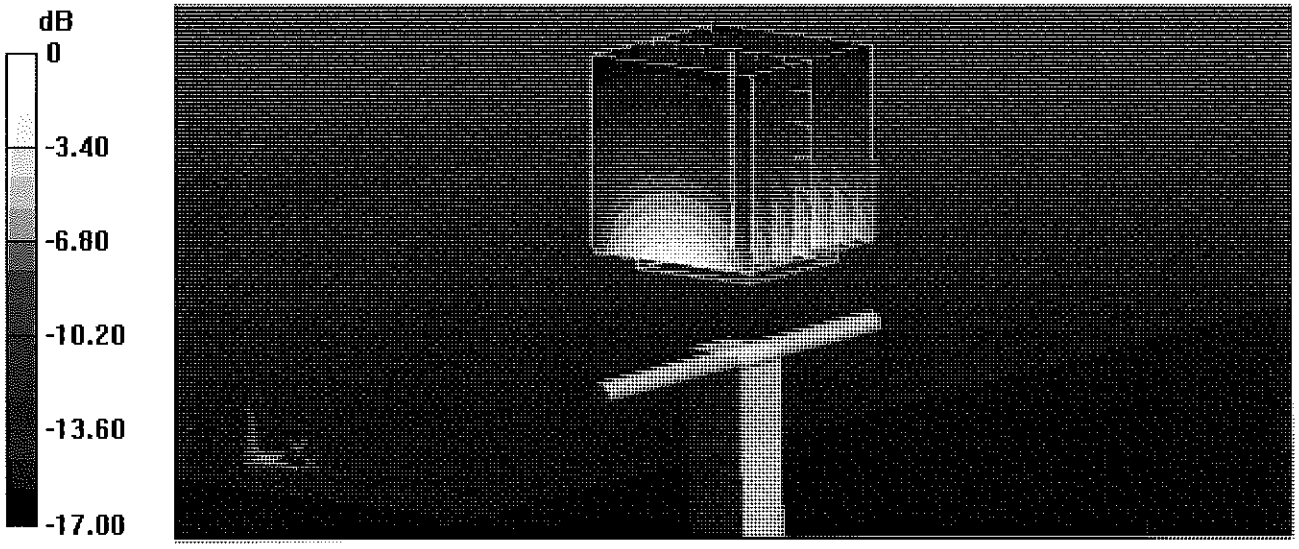
Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.53 S/m; ε_r = 51.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.6, 4.6, 4.6); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.5(1059); SEMCAD X 14.6.8(7028)

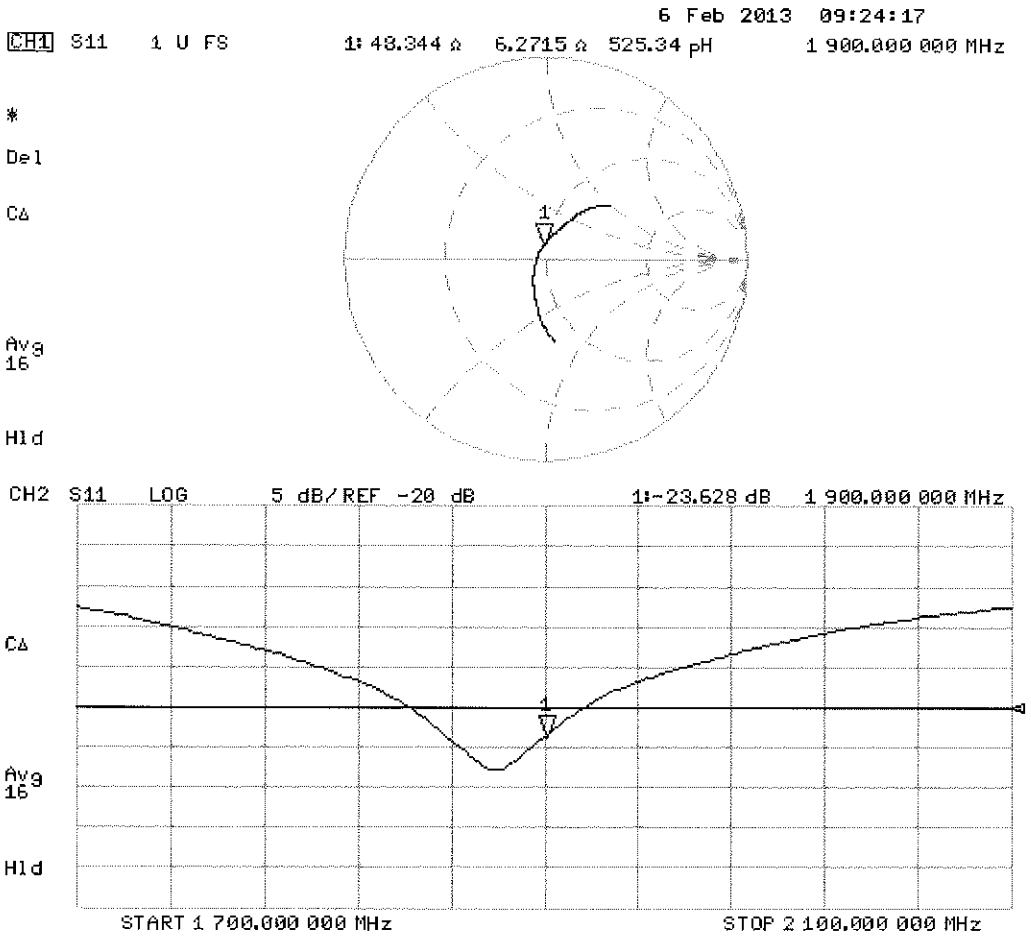
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.534 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 17.9 W/kg
SAR(1 g) = 10.3 W/kg; SAR(10 g) = 5.45 W/kg
Maximum value of SAR (measured) = 13.1 W/kg



0 dB = 13.1 W/kg = 11.17 dBW/kg

Impedance Measurement Plot for Body TSL



APPENDIX D: SAR TISSUE SPECIFICATIONS

Measurement Procedure for Tissue verification:

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

$$Y = \frac{j2\omega\varepsilon_r\varepsilon_0}{\left[\ln(b/a)\right]^2}\int_a^b\int_a^b\int_0^\pi \cos\phi' \frac{\exp\left[-j\omega r(\mu_0\varepsilon_r'\varepsilon_0)^{1/2}\right]}{r} d\phi' d\rho' d\rho$$

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

Table D-I
Composition of the Tissue Equivalent Matter

Frequency (MHz)	750	835	1750	1900
Tissue	Body	Body	Body	Body
Ingredients (% by weight)				
Bactericide	See Next Page	0.1		
DGBE			31	29.44
HEC		1		
NaCl		0.94	0.2	0.39
Sucrose		44.9		
Water		53.06	68.8	70.17

2 Composition / Information on ingredients

The Item is composed of the following ingredients:

H_2O	Water, 35 – 58%
Sucrose	Sugar, white, refined, 40 – 60%
NaCl	Sodium Chloride, 0 – 6%
Hydroxyethyl-cellulose	Medium Viscosity (CAS# 9004-62-0), <0.3%
Preventol-D7	Preservative: aqueous preparation, (CAS# 55965-84-9), containing 5-chloro-2-methyl-3(2H)-isothiazolone and 2-methyyl-3(2H)-isothiazolone, 0.1 – 0.7% Relevant for safety; Refer to the respective Safety Data Sheet*.

Figure D-1
Composition of 750 MHz Body Tissue Equivalent Matter

Note: 750MHz liquid recipes are proprietary SPEAG. Since the composition is approximate to the actual liquids utilized, the manufacturer tissue-equivalent liquid data sheets are provided below.

Measurement Certificate / Material Test

Item Name	**Body Tissue Simulating Liquid (MSL750)**
Product No.	SL AAM 075 AA (Charge: 111130-3)
Manufacturer	SPEAG

Measurement Method

TSL dielectric parameters measured using calibrated OCP probe (type DAK).

Target Parameters

Target parameters as defined in the IEEE 1528 and IEC 62209 compliance standards.

Test Condition

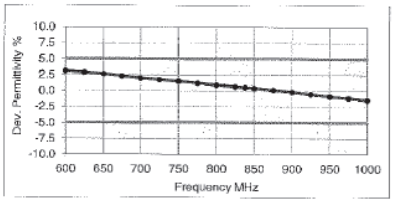
Ambient Condition	22°C ; 30% humidity
TSL Temperature	22°C
Test Date	7-Dec-11

Additional Information

TSL Density	1.212 g/cm^3
TSL Heat-capacity	3.006 kJ/(kg*K)

Results

	Measured			Target		Diff.to Target [%]	
f [MHz]	HP-e'	HP-e''	sigma	eps	sigma	Δ-eps	Δ-sigma
600	57.9	25.01	0.83	56.1	0.95	3.1	-12.3
625	57.6	24.66	0.86	56.0	0.95	2.9	-10.1
650	57.4	24.31	0.88	55.9	0.96	2.6	-8.0
675	57.1	24.02	0.90	55.8	0.96	2.3	-5.8
700	56.8	23.74	0.92	55.7	0.96	2.0	-3.7
725	56.6	23.50	0.95	55.6	0.96	1.7	-1.5
750	56.4	23.26	0.97	55.5	0.96	1.5	0.8
775	56.1	23.06	0.99	55.4	0.97	1.2	3.0
800	55.8	22.86	1.02	55.3	0.97	0.9	5.2
825	55.6	22.72	1.04	55.2	0.98	0.6	6.6
838	55.5	22.64	1.05	55.2	0.98	0.5	7.3
850	55.4	22.57	1.07	55.2	0.99	0.4	8.0
875	55.1	22.44	1.09	55.1	1.02	0.1	7.2
900	54.9	22.31	1.12	55.0	1.05	-0.2	6.4
925	54.7	22.20	1.14	55.0	1.06	-0.5	7.5
950	54.5	22.09	1.17	54.9	1.08	-0.9	8.5
975	54.3	21.99	1.19	54.9	1.09	-1.2	9.7
1000	54.1	21.89	1.22	54.8	1.10	-1.4	10.9



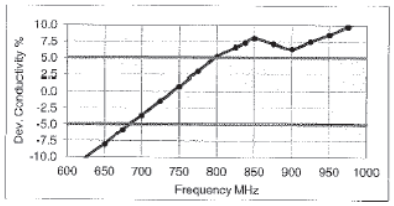


Figure D-2
750MHz Body Tissue Equivalent Matter

APPENDIX E: SAR SYSTEM VALIDATION

Per FCC KDB 865664 D02v01, SAR system validation status should be documented to confirm measurement accuracy. The SAR systems (including SAR probes, system components and software versions) used for this device were validated against its performance specifications prior to the SAR measurements. Reference dipoles were used with the required tissue- equivalent media for system validation, according to the procedures outlined in FCC KDB 865664 D01 v01 and IEEE 1528-2013. Since SAR probe calibrations are frequency dependent, each probe calibration point was validated at a frequency within the valid frequency range of the probe calibration point, using the system that normally operates with the probe for routine SAR measurements and according to the required tissue-equivalent media.

A tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probes and tissue dielectric parameters has been included.

Table E-I
SAR System Validation Summary

SAR SYSTEM #	FREQ. [MHz]	DATE	PROBE SN	PROBE TYPE	PROBE CAL. POINT		COND.	PERM.	CW VALIDATION			MOD. VALIDATION		
							(σ)	(ε_r)	SENSI-TIVITY	PROBE LINEARITY	PROBE ISOTROPY	MOD. TYPE	DUTY FACTOR	PAR
B	750	11/5/2013	3288	ES3DV3	750	Body	0.953	56.47	PASS	PASS	PASS	N/A	N/A	N/A
H	835	6/19/2013	3318	ES3DV3	835	Body	1.016	55.43	PASS	PASS	PASS	GMSK	PASS	N/A
B	1750	11/6/2013	3288	ES3DV3	1750	Body	1.534	51.18	PASS	PASS	PASS	N/A	N/A	N/A
K	1750	1/14/2014	3333	ES3DV3	1750	Body	1.510	52.07	PASS	PASS	PASS	N/A	N/A	N/A
I	1900	7/1/2013	3319	ES3DV3	1900	Body	1.502	52.10	PASS	PASS	PASS	GMSK	PASS	N/A

NOTE: While the probes have been calibrated for both a CW and modulated signals, all measurements were performed using communication systems calibrated for CW signals only. Modulations in the table above represent test configurations for which the measurement system has been validated per FCC KDB Publication 865664 D01v01 for scenarios when CW probe calibrations are used with other signal types. SAR systems were validated for modulated signals with a periodic duty cycle, such as GMSK, or with a high peak to average ratio (>5 dB), such as OFDM according to KDB 865664.

APPENDIX G: SENSOR TRIGGERING DATA SUMMARY

ACJ9TGWW13B Sensor Triggering Data Summary

Per FCC KDB Publication 616217 D04v01, this device was tested by the manufacturer to determine the proximity sensor triggering distances for the back and left edge of the device. The measured output power within ± 5 mm of the triggering points (or until touching the phantom) is included for back side and each applicable edge.

To ensure all production units are compliant it is necessary to test SAR at a distance 1 mm less than the smallest distance from the device and SAR phantom (determined from these triggering tests according to the KDB 616217 D04v01) with the device at maximum output power without power reduction. These SAR Tests are included in addition to the SAR tests for the device touching the SAR phantom, with reduced power.

The operational description contains information explaining how this device remains complaint in the event of a sensor malfunction.

Back Side

Moving device toward the phantom:

KDB 616217 §6.2.6 Measured Power [dBm]											
Distance [mm]	25	24	23	22	21	20	19	18	17	16	15
GSM 850 GMSK 1TX	33.45	33.30	33.26	33.40	33.40	29.94	29.76	29.75	29.91	29.71	29.61
GSM 850 GMSK 2TX	33.28	33.15	33.33	33.27	33.34	26.21	26.31	26.15	26.26	26.22	26.10
GSM 850 8PSK 1TX	27.77	27.60	27.60	27.93	27.70	27.36	27.33	27.17	27.22	27.37	27.30
GSM 850 8PSK 2TX	27.91	27.86	27.70	27.64	27.66	26.28	26.37	26.16	26.34	26.41	26.32
GSM 850 8PSK 3TX	27.65	27.66	27.64	27.89	27.92	24.26	24.18	24.32	24.21	24.10	24.23
GSM 850 8PSK 4TX	27.75	27.75	27.95	27.81	27.94	23.35	23.10	23.21	23.34	23.45	23.39
GSM 1900 GMSK 1TX	30.18	30.13	30.26	30.20	30.41	24.13	24.14	24.45	24.40	24.29	24.26
GSM 1900 GMSK 2TX	30.26	30.34	30.40	30.30	30.16	20.15	20.42	20.28	20.28	20.37	20.45
GSM 1900 8PSK 1TX	26.72	26.92	26.64	26.66	26.78	23.76	23.85	23.65	23.93	23.75	23.71
GSM 1900 8PSK 2TX	26.84	26.84	26.80	26.85	26.93	20.68	20.85	20.86	20.74	20.81	20.89
GSM 1900 8PSK 3TX	26.60	26.78	26.71	26.68	26.66	18.29	18.29	18.11	18.40	18.14	18.17
GSM 1900 8PSK 4TX	26.77	26.79	26.68	26.90	26.70	17.67	17.78	17.93	17.77	17.91	17.80
UMTS Band 5 Rel99	23.75	23.76	23.66	23.95	23.71	19.14	19.21	19.27	19.16	19.14	19.25
UMTS Band 5 HSDPA	22.76	22.94	22.76	22.87	22.87	18.93	18.82	18.66	18.69	18.89	18.89
UMTS Band 5 HSUPA	22.93	22.65	22.69	22.93	22.76	18.88	18.91	18.95	18.76	18.70	18.93
UMTS Band 5 DC-HSDPA	22.69	22.88	22.70	22.84	22.67	18.62	18.85	18.67	18.71	18.77	18.77
UMTS Band 4 Rel99	23.76	23.73	23.65	23.81	23.61	16.81	16.81	16.83	16.90	16.95	16.95
UMTS Band 4 HSDPA	22.66	22.87	22.73	22.64	22.92	16.88	16.65	16.64	16.77	16.93	16.95
UMTS Band 4 HSUPA	22.72	22.84	22.71	22.83	22.93	16.75	16.61	16.94	16.80	16.94	16.94
UMTS Band 4 DC-HSDPA	22.83	22.94	22.91	22.92	22.90	16.69	16.93	16.92	16.77	16.80	16.68
UMTS Band 2 Rel99	23.95	23.69	23.84	23.78	23.91	15.11	15.32	15.27	15.19	15.22	15.10
UMTS Band 2 HSDPA	22.82	22.62	22.64	22.64	22.90	15.12	15.38	15.18	15.20	15.38	15.20
UMTS Band 2 HSUPA	22.92	22.84	22.86	22.83	22.65	15.45	15.31	15.21	15.16	15.22	15.39
UMTS Band 2 DC-HSDPA	22.60	22.95	22.75	22.95	22.65	15.18	15.34	15.27	15.15	15.43	15.38
CDMA BC10	24.66	24.75	24.60	24.76	24.60	19.30	19.17	19.32	19.29	19.28	19.32
CDMA BC0	24.68	24.90	24.64	24.65	24.62	19.24	19.15	19.11	19.45	19.21	19.42
CDMA BC1	24.90	24.88	24.65	24.69	24.86	15.95	15.89	15.95	15.61	15.66	15.67
LTE Band 5	23.76	23.62	23.89	23.75	23.90	19.19	19.26	19.11	19.21	19.29	19.43
LTE Band 4	23.71	23.63	23.81	23.93	23.73	17.82	17.87	17.64	17.91	17.71	17.93
LTE Band 2	23.65	23.61	23.65	23.76	23.82	15.33	15.44	15.40	15.36	15.11	15.29
LTE Band 25	23.64	23.79	23.86	23.91	23.61	15.28	15.27	15.19	15.23	15.40	15.12
Distance [mm]	29	28	27	26	25	24	23	22	21	20	19
LTE Band 17	23.65	23.84	23.89	23.91	23.67	21.42	21.13	21.12	21.45	21.40	21.26
LTE Band 13	23.67	23.60	23.66	23.65	23.78	20.73	20.76	20.81	20.88	20.93	20.64

Moving device away from the phantom:

KDB 616217 §6.2.8 Measured Power [dBm]											
Distance [mm]	27	28	29	30	31	32	33	34	35	36	37
GSM 850 GMSK 1TX	29.75	29.71	29.79	29.86	29.75	29.80	33.14	33.20	33.16	33.20	33.36
GSM 850 GMSK 2TX	26.37	26.12	26.42	26.39	26.16	26.24	33.37	33.32	33.35	33.45	33.42
GSM 850 8PSK 1TX	27.37	27.30	27.28	27.28	27.15	27.19	27.63	27.66	27.69	27.82	27.92
GSM 850 8PSK 2TX	26.34	26.17	26.25	26.43	26.33	26.13	27.63	27.78	27.93	27.84	27.67
GSM 850 8PSK 3TX	24.39	24.11	24.20	24.26	24.41	24.35	27.89	27.64	27.67	27.78	27.64
GSM 850 8PSK 4TX	23.29	23.38	23.22	23.31	23.26	23.21	27.75	27.83	27.95	27.76	27.78
GSM 1900 GMSK 1TX	24.41	24.18	24.26	24.30	24.43	24.11	30.14	30.21	30.31	30.10	30.37
GSM 1900 GMSK 2TX	20.23	20.29	20.36	20.18	20.29	20.43	30.25	30.41	30.32	30.43	30.31
GSM 1900 8PSK 1TX	23.88	23.69	23.81	23.86	23.85	23.69	26.76	26.88	26.71	26.64	26.75
GSM 1900 8PSK 2TX	20.66	20.92	20.86	20.64	20.62	20.85	26.64	26.78	26.79	26.64	26.68
GSM 1900 8PSK 3TX	18.30	18.33	18.19	18.40	18.33	18.33	26.84	26.72	26.83	26.61	26.81
GSM 1900 8PSK 4TX	17.77	17.65	17.82	17.87	17.68	17.88	26.72	26.77	26.85	26.64	26.68
UMTS Band 5 Rel99	19.28	19.42	19.21	19.43	19.20	19.22	23.95	23.70	23.84	23.74	23.83
UMTS Band 5 HSDPA	18.86	18.81	18.65	18.61	18.90	18.73	22.94	22.60	22.76	22.95	22.84
UMTS Band 5 HSUPA	18.84	18.75	18.66	18.80	18.66	18.80	22.84	22.87	22.60	22.64	22.65
UMTS Band 5 DC-HSDPA	18.68	18.79	18.76	18.73	18.86	18.79	22.95	22.92	22.74	22.67	22.87
UMTS Band 4 Rel99	16.77	16.68	16.94	16.71	16.66	16.89	23.63	23.65	23.84	23.70	23.66
UMTS Band 4 HSDPA	16.88	16.78	16.63	16.83	16.74	16.69	22.83	22.92	22.73	22.84	22.84
UMTS Band 4 HSUPA	16.68	16.69	16.69	16.88	16.94	16.93	22.91	22.60	22.88	22.86	22.64
UMTS Band 4 DC-HSDPA	16.69	16.70	16.81	16.61	16.75	16.95	22.81	22.71	22.67	22.65	22.95
UMTS Band 2 Rel99	15.30	15.37	15.35	15.28	15.22	15.28	23.72	23.64	23.83	23.77	23.77
UMTS Band 2 HSDPA	15.35	15.32	15.10	15.18	15.43	15.19	22.87	22.80	22.84	22.91	22.83
UMTS Band 2 HSUPA	15.34	15.17	15.28	15.32	15.45	15.45	22.84	22.85	22.89	22.75	22.91
UMTS Band 2 DC-HSDPA	15.12	15.43	15.21	15.12	15.40	15.20	22.95	22.62	22.81	22.85	22.93
CDMA BC10	19.32	19.43	19.43	19.23	19.41	19.43	24.72	24.74	24.68	24.70	24.91
CDMA BC0	19.43	19.28	19.26	19.22	19.26	19.13	24.62	24.66	24.70	24.79	24.60
CDMA BC1	15.66	15.85	15.82	15.77	15.82	15.79	24.84	24.81	24.81	24.67	24.67
LTE Band 5	19.16	19.32	19.28	19.30	19.41	19.30	23.89	23.77	23.91	23.64	23.67
LTE Band 4	17.75	17.90	17.76	17.68	17.70	17.94	23.72	23.91	23.91	23.67	23.93
LTE Band 2	15.25	15.17	15.20	15.18	15.10	15.23	23.91	23.86	23.67	23.90	23.66
LTE Band 25	15.10	15.44	15.13	15.26	15.32	15.34	23.94	23.86	23.69	23.69	23.85
Distance [mm]	31	32	33	34	35	36	37	38	39	40	41
LTE Band 17	21.37	21.24	21.42	21.27	21.37	21.26	23.81	23.64	23.83	23.85	23.88
LTE Band 13	20.90	20.92	20.91	20.77	20.80	20.69	23.71	23.86	23.84	23.85	23.86

Based on the most conservative measured triggering distance of 20 mm for all modes, additional SAR measurements were required at 19 mm from the back side.

Right Edge

Moving device toward the phantom:

KDB 616217 §6.2.6 Measured Power [dBm]											
Distance [mm]	20	19	18	17	16	15	14	13	12	11	10
GSM 850 GMSK 1TX	33.34	33.35	33.14	33.15	33.30	29.65	29.63	29.79	29.71	29.72	29.61
GSM 850 GMSK 2TX	33.38	33.31	33.31	33.21	33.19	26.17	26.33	26.42	26.12	26.44	26.16
GSM 850 8PSK 1TX	27.79	27.79	27.82	27.67	27.85	27.45	27.15	27.43	27.42	27.11	27.38
GSM 850 8PSK 2TX	27.62	27.80	27.62	27.84	27.87	26.44	26.38	26.37	26.17	26.26	26.11
GSM 850 8PSK 3TX	27.86	27.67	27.66	27.65	27.78	24.38	24.13	24.33	24.43	24.10	24.41
GSM 850 8PSK 4TX	27.82	27.71	27.65	27.79	27.67	23.44	23.43	23.31	23.23	23.44	23.17
GSM 1900 GMSK 1TX	30.17	30.34	30.24	30.40	30.12	24.39	24.44	24.26	24.21	24.43	24.19
GSM 1900 GMSK 2TX	30.18	30.34	30.22	30.44	30.20	20.28	20.11	20.19	20.29	20.27	20.34
GSM 1900 8PSK 1TX	26.90	26.87	26.66	26.79	26.70	23.71	23.73	23.75	23.77	23.77	23.65
GSM 1900 8PSK 2TX	26.90	26.73	26.74	26.84	26.86	20.60	20.72	20.91	20.74	20.86	20.88
GSM 1900 8PSK 3TX	26.77	26.86	26.92	26.80	26.94	18.16	18.37	18.34	18.14	18.17	18.37
GSM 1900 8PSK 4TX	26.65	26.77	26.79	26.82	26.73	17.73	17.87	17.63	17.92	17.94	17.77
UMTS Band 5 Rel99	23.77	23.86	23.91	23.72	23.68	19.36	19.36	19.33	19.20	19.41	19.40
UMTS Band 5 HSDPA	22.62	22.94	22.88	22.66	22.63	18.72	18.83	18.89	18.73	18.94	18.80
UMTS Band 5 HSUPA	22.69	22.72	22.60	22.86	22.66	18.88	18.69	18.79	18.85	18.60	18.72
UMTS Band 5 DC-HSDPA	22.63	22.77	22.70	22.68	22.88	18.90	18.93	18.91	18.91	18.62	18.60
UMTS Band 4 Rel99	23.93	23.91	23.71	23.91	23.64	16.63	16.79	16.74	16.74	16.70	16.61
UMTS Band 4 HSDPA	22.91	22.82	22.93	22.85	22.65	16.64	16.88	16.63	16.73	16.70	16.83
UMTS Band 4 HSUPA	22.88	22.82	22.84	22.85	22.62	16.88	16.92	16.64	16.67	16.89	16.92
UMTS Band 4 DC-HSDPA	22.88	22.78	22.62	22.75	22.60	16.92	16.60	16.76	16.80	16.87	16.70
UMTS Band 2 Rel99	23.68	23.94	23.65	23.95	23.80	15.38	15.16	15.34	15.39	15.31	15.24
UMTS Band 2 HSDPA	22.78	22.95	22.79	22.60	22.72	15.24	15.13	15.14	15.18	15.11	15.20
UMTS Band 2 HSUPA	22.66	22.70	22.65	22.75	22.60	15.33	15.43	15.35	15.38	15.16	15.39
UMTS Band 2 DC-HSDPA	22.68	22.62	22.66	22.71	22.90	15.40	15.38	15.15	15.30	15.44	15.38
CDMA BC10	24.92	24.92	24.77	24.76	24.74	19.24	19.20	19.17	19.44	19.23	19.27
CDMA BC0	24.88	24.63	24.81	24.91	24.77	19.29	19.35	19.45	19.35	19.37	19.12
CDMA BC1	24.82	24.93	24.65	24.80	24.85	15.91	15.78	15.74	15.77	15.80	15.62
LTE Band 5	23.88	23.66	23.94	23.89	23.94	19.41	19.34	19.29	19.17	19.16	19.10
LTE Band 4	23.67	23.60	23.93	23.62	23.72	17.87	17.78	17.81	17.92	17.72	17.88
LTE Band 2	23.82	23.90	23.71	23.73	23.76	15.40	15.34	15.36	15.14	15.23	15.45
LTE Band 25	23.89	23.68	23.89	23.87	23.83	15.31	15.45	15.43	15.23	15.37	15.10
Distance [mm]	21	20	19	18	17	16	15	14	13	12	11
LTE Band 17	23.74	23.73	23.68	23.60	23.84	21.24	21.18	21.32	21.31	21.12	21.44
LTE Band 13	23.65	23.83	23.83	23.72	23.61	20.81	20.94	20.74	20.65	20.75	20.87

Moving device away from the phantom:

KDB 616217 §6.2.8 Measured Power [dBm]											
Distance [mm]	23	24	25	26	27	28	29	30	31	32	33
GSM 850 GMSK 1TX	29.80	29.95	29.64	29.87	29.63	29.69	33.36	33.18	33.34	33.29	33.18
GSM 850 GMSK 2TX	26.39	26.26	26.17	26.25	26.37	26.40	33.17	33.31	33.23	33.21	33.29
GSM 850 8PSK 1TX	27.34	27.35	27.18	27.20	27.10	27.27	27.85	27.89	27.75	27.61	27.75
GSM 850 8PSK 2TX	26.12	26.35	26.30	26.33	26.22	26.31	27.77	27.72	27.88	27.65	27.81
GSM 850 8PSK 3TX	24.39	24.23	24.19	24.20	24.13	24.24	27.85	27.89	27.64	27.64	27.95
GSM 850 8PSK 4TX	23.18	23.42	23.11	23.39	23.38	23.26	27.73	27.80	27.79	27.78	27.77
GSM 1900 GMSK 1TX	24.41	24.44	24.45	24.34	24.34	24.35	30.44	30.31	30.37	30.17	30.30
GSM 1900 GMSK 2TX	20.43	20.39	20.35	20.41	20.41	20.31	30.29	30.22	30.30	30.33	30.33
GSM 1900 8PSK 1TX	23.82	23.73	23.65	23.84	23.94	23.60	26.70	26.65	26.61	26.78	26.79
GSM 1900 8PSK 2TX	20.83	20.62	20.85	20.91	20.91	20.84	26.74	26.73	26.63	26.79	26.71
GSM 1900 8PSK 3TX	18.44	18.21	18.21	18.39	18.33	18.38	26.71	26.94	26.80	26.70	26.72
GSM 1900 8PSK 4TX	17.71	17.77	17.60	17.86	17.92	17.90	26.65	26.66	26.80	26.70	26.95
UMTS Band 5 Rel99	19.36	19.29	19.20	19.41	19.23	19.27	23.63	23.80	23.77	23.89	23.69
UMTS Band 5 HSDPA	18.65	18.94	18.76	18.90	18.64	18.83	22.84	22.95	22.87	22.84	22.63
UMTS Band 5 HSUPA	18.93	18.93	18.69	18.82	18.69	18.95	22.76	22.60	22.86	22.76	22.91
UMTS Band 5 DC-HSDPA	18.95	18.60	18.65	18.71	18.76	18.89	22.86	22.69	22.84	22.80	22.73
UMTS Band 4 Rel99	16.66	16.63	16.79	16.76	16.77	16.63	23.76	23.93	23.65	23.75	23.92
UMTS Band 4 HSDPA	16.77	16.65	16.75	16.74	16.88	16.80	22.86	22.60	22.91	22.68	22.67
UMTS Band 4 HSUPA	16.85	16.81	16.67	16.66	16.70	16.84	22.68	22.69	22.90	22.93	22.86
UMTS Band 4 DC-HSDPA	16.68	16.65	16.74	16.94	16.73	16.76	22.73	22.64	22.92	22.81	22.93
UMTS Band 2 Rel99	15.29	15.16	15.32	15.44	15.41	15.42	23.72	23.92	23.86	23.90	23.65
UMTS Band 2 HSDPA	15.29	15.17	15.30	15.32	15.38	15.36	22.83	22.82	22.71	22.67	22.74
UMTS Band 2 HSUPA	15.33	15.29	15.34	15.25	15.41	15.26	22.81	22.95	22.83	22.87	22.68
UMTS Band 2 DC-HSDPA	15.13	15.10	15.44	15.20	15.31	15.18	22.90	22.95	22.93	22.70	22.92
CDMA BC10	19.31	19.13	19.23	19.33	19.17	19.24	24.69	24.95	24.63	24.90	24.86
CDMA BC0	19.26	19.35	19.41	19.39	19.16	19.39	24.88	24.87	24.63	24.67	24.63
CDMA BC1	15.89	15.60	15.61	15.68	15.79	15.84	24.63	24.64	24.75	24.84	24.88
LTE Band 5	19.25	19.23	19.10	19.36	19.22	19.34	23.74	23.75	23.71	23.65	23.77
LTE Band 4	17.85	17.85	17.69	17.70	17.87	17.90	23.76	23.79	23.67	23.95	23.85
LTE Band 2	15.31	15.34	15.17	15.42	15.25	15.23	23.67	23.83	23.94	23.74	23.66
LTE Band 25	15.42	15.38	15.32	15.20	15.37	15.26	23.75	23.75	23.85	23.68	23.63
Distance [mm]	24	25	26	27	28	29	30	31	32	33	34
LTE Band 17	21.11	21.36	21.38	21.23	21.40	21.45	23.93	23.89	23.79	23.70	23.84
LTE Band 13	20.72	20.88	20.70	20.78	20.60	20.76	23.91	23.70	23.71	23.63	23.63

Based on the most conservative measured triggering distance of 15 mm for all modes, additional SAR measurements were required at 14 mm from the right edge.