FCC OET BULLETIN 65 SUPPLEMENT C 01-01
IEEE Std 1528-2003 & IEEE 1528a-2005

SAR EVALUATION REPORT

For

Tablet with cellular GSM/GPRS/EGPRS/WCDMA/HSPA+/DC-HSDPA/CDMA1xRTT/ EV-DO Rev 0, A, B / LTE radio, IEEE 802.11a/b/g/n radio and Bluetooth radio

Model: A1460
FCC ID: BCGA1460

Report Number: 12U14507-9A
Issue Date: 10/8/2012

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	10/3/2012	Initial Issue	--
A	10/8/2012	1. Section 7: Updated Table Title. 2. Sections 8.5.4 and 8.6: Revised Statement. 3. Section 10.11: Revised Statement. 4. Section 13.11, 13.12, and 13.13: Updated Table Title.	Bobby Bayani

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1. Attestation of Test Results

Applicant	Apple Inc.
DUT description	Tablet with cellular GSM/GPRS/EGPRS/WCDMA/HSPA+/DC-HSDPA/CDMA1xRTT/ EV-DO Rev 0, A, B / LTE radio, IEEE 802.11a/b/g/n radio and Bluetooth radio
Model	A1460
Test device is	An identical prototype
Device category	Portable
Exposure category	General Population/Uncontrolled Exposure
Highest 1g SAR	Refer to Sec. 7.
Date tested	8/3/2012 - 9/25/2012

Applicable Standards	Test Results
FCC OET Bulletin 65 Supplement C 01-01, IEEE Std 1528-2003 & IEEE 1528a-2005	Pass

UL CCS tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government (NIST Handbook 150, Annex A). This report is written to support regulatory compliance of the applicable standards stated above.

Approved & Released For UL CCS By:

Sunny Shih
Engineering Leader
UL CCS

Tested By:

Bobby Bayani
SAR Engineer
UL CCS

2. Test Methodology

The tests documented in this report were performed in accordance with FCC OET Bulletin 65 Supplement C Edition 01-01, IEEE Std 1528-2003 & IEEE 1528a-2005 and the following KDB Procedures:

- 447498 D01 Mobile Portable RF Exposure v04
- 941225 D01 SAR test for 3G devices v02
- 941225 D02 Guidance for 3GPP R6 and R7 HSPA v02v01
- 941225 D03 SAR Test Reduction GSM GPRS EDGE v01
- 941225 D05 SAR for LTE Devices v02 **(Draft)**
- 248227 D01 SAR Meas for 802 11abg v01r02
- 616217 D04 SAR for laptop and tablets v01 **(Daft)**
- KDB Inquiry: Tracking Number 958182 for Proximity Sensor discussion
- KDB Inquiry: Tracking Number 583922 for EVDO Rev.B discussion

3. Facilities and Accreditation

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

4. Calibration and Uncertainty

4.1. Measuring Instrument Calibration

The measuring equipment used to perform the tests documented in this report has been calibrated in accordance with the manufacturers' recommendations, and is traceable to recognized national standards.

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due date		
				MM	DD	Year
Dielectronic Probe kit	SPEAG	DAK-3.5	1054	N/A		
Vector Signal Generator	R & S	SMU200A	104592	7	27	2014
Vector Signal Generator	R & S	SMU200A	104591	7	26	2014
Power Meter	R & S	NRP2	101663	9	4	2013
Power Meter	R & S	NRP2	101664	9	7	2013
Power Sensor	R & S	NRP - Z81	101298	9	7	2013
Power Sensor	R & S	NRP - Z81	101302	9	4	2013
Amplifier	Amplifier Research	15S1G4M41, 0.7-4.2 GHz	335565	N/A		
Amplifier	Amplifier Research	35S4G8A, 4-8 GHz	336934	N/A		
Directional coupler	KRYTAR	158010	92552	N/A		
Directional coupler	KRYTAR	158010	142253	N/A		
S-Parameter Network Analyzer	Agilent	N5230C	MY49001783	8	31	2013
Base Station Simulator	Agilent	8960	GB42361452	4	4	2013
Base Station Simulator	R & S	CMU200	118706	8	29	2013
Base Station Simulator	R & S	CMU200	108982	5	16	2013
Base Station Simulator	R & S	CMU200	112899	5	16	2013
Base Station Simulator	R & S	CMW500	112266	8	8	2013
Base Station Simulator	R & S	CMW500	112267	8	23	2013
Base Station Simulator	R & S	CMW500	112268	8	27	2013
Base Station Simulator	R & S	CMW500	112269	8	16	2013
Thermometer	Control Company	4353	122102412	2	24	2014
E-Field Probe	SPEAG	EX3DV4	3676	3	23	2013
E-Field Probe	SPEAG	EX3DV4	3720	3	23	2013
E-Field Probe	SPEAG	EX3DV4	3757	3	23	2013
E-Field Probe	SPEAG	EX3DV4	3778	3	23	2013
E-Field Probe	SPEAG	EX3DV4	3751	11	19	2012
Data Acquisition Electronics	SPEAG	DAE4	1261	3	8	2013
Data Acquisition Electronics	SPEAG	DAE4	1263	3	7	2013
Data Acquisition Electronics	SPEAG	DAE4	1264	3	4	2013
Data Acquisition Electronics	SPEAG	DAE4	1278	3	8	2013
System Validation Dipole	SPEAG	D2450V2	826	4	11	2013
System Validation Dipole	SPEAG	D5GHzV2	1072	4	17	2013
System Validation Dipole	SPEAG	D750V3	1025	4	13	2013
System Validation Dipole	SPEAG	D835V2	4d076	4	10	2013
System Validation Dipole	SPEAG	D1900V2	5d108	4	3	2013

4.2. Measurement Uncertainty

Measurement uncertainty for 300 MHz to 3 GHz averaged over 1 gram

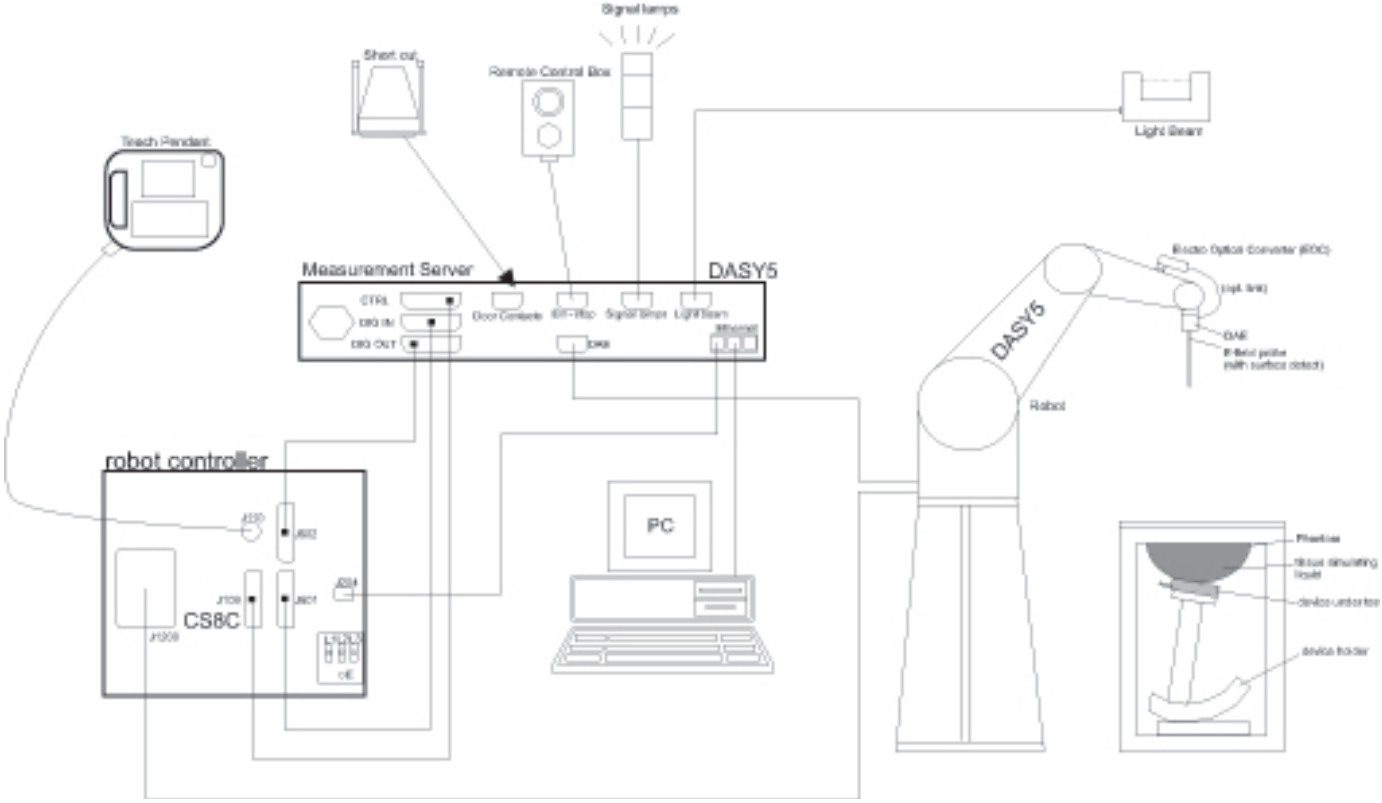
Component	Error, %	Distribution	Divisor	Sensitivity	U (Xi), %
Measurement System					
Probe Calibration (k=1)	**6.00**	Normal	1	1	**6.00**
Axial Isotropy	1.15	Rectangular	1.732	0.7071	**0.47**
Hemispherical Isotropy	2.30	Rectangular	1.732	0.7071	**0.94**
Boundary Effect	0.90	Rectangular	1.732	1	**0.52**
Probe Linearity	3.45	Rectangular	1.732	1	**1.99**
System Detection Limits	1.00	Rectangular	1.732	1	**0.58**
Readout Electronics	0.30	Normal	1	1	**0.30**
Response Time	0.80	Rectangular	1.732	1	**0.46**
Integration Time	2.60	Rectangular	1.732	1	**1.50**
RF Ambient Conditions - Noise	3.00	Rectangular	1.732	1	**1.73**
RF Ambient Conditions - Reflections	3.00	Rectangular	1.732	1	**1.73**
Probe Positioner Mechanical Tolerance	0.40	Rectangular	1.732	1	**0.23**
Probe Positioning with respect to Phantom	2.90	Rectangular	1.732	1	**1.67**
Extrapolation, Interpolation and Integration	1.00	Rectangular	1.732	1	**0.58**
Test Sample Related					
Test Sample Positioning	2.90	Normal	1	1	**2.90**
Device Holder Uncertainty	3.60	Normal	1	1	**3.60**
Output Power Variation - SAR Drift	5.00	Rectangular	1.732	1	**2.89**
Phantom and Tissue Parameters					
Phantom Uncertainty (shape and thickness)	4.00	Rectangular	1.732	1	**2.31**
Liquid Conductivity - deviation from target	5.00	Rectangular	1.732	0.64	**1.85**
Liquid Conductivity - measurement	**4.73**	Normal	1	0.64	**3.03**
Liquid Permittivity - deviation from target	5.00	Rectangular	1.732	0.6	**1.73**
Liquid Permittivity - measurement uncertainty	**-4.67**	Normal	1	0.6	**-2.80**
				Combined Standard Uncertainty Uc(y) =	**10.58**
				Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =	**21.16 %**
				Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =	**1.67 dB**

Measurement uncertainty for 3 to 6 GHz averaged over 1 gram

Component	Error, %	Distribution	Divisor	Sensitivity	U (Xi), %
Measurement System					
Probe Calibration (k=1)	**6.55**	**Normal**	**1**	**1**	**6.55**
Axial Isotropy	1.15	**Rectangular**	**1.732**	**0.7071**	**0.47**
Hemispherical Isotropy	2.30	**Rectangular**	**1.732**	**0.7071**	**0.94**
Boundary Effect	0.90	**Rectangular**	**1.732**	**1**	**0.52**
Probe Linearity	3.45	**Rectangular**	**1.732**	**1**	**1.99**
System Detection Limits	1.00	**Rectangular**	**1.732**	**1**	**0.58**
Readout Electronics	1.00	**Normal**	**1**	**1**	**1.00**
Response Time	0.80	**Rectangular**	**1.732**	**1**	**0.46**
Integration Time	2.60	**Rectangular**	**1.732**	**1**	**1.50**
RF Ambient Conditions - Noise	3.00	**Rectangular**	**1.732**	**1**	**1.73**
RF Ambient Conditions - Reflections	3.00	**Rectangular**	**1.732**	**1**	**1.73**
Probe Positioner Mechanical Tolerance	0.40	**Rectangular**	**1.732**	**1**	**0.23**
Probe Positioning with respect to Phantom	2.90	**Rectangular**	**1.732**	**1**	**1.67**
Extrapolation, Interpolation and Integration	3.90	**Rectangular**	**1.732**	**1**	**2.25**
Test Sample Related					
Test Sample Positioning	1.10	**Normal**	**1**	**1**	**1.10**
Device Holder Uncertainty	3.60	**Normal**	**1**	**1**	**3.60**
Output Power Variation - SAR Drift	5.00	**Rectangular**	**1.732**	**1**	**2.89**
Phantom and Tissue Parameters					
Phantom Uncertainty (shape and thickness)	4.00	**Rectangular**	**1.732**	**1**	**2.31**
Liquid Conductivity - deviation from target	5.00	**Rectangular**	**1.732**	**0.64**	**1.85**
Liquid Conductivity - measurement	**-3.78**	**Normal**	**1**	**0.64**	**-2.42**
Liquid Permittivity - deviation from target	10.00	**Rectangular**	**1.732**	**0.6**	**3.46**
Liquid Permittivity - measurement uncertainty	**-3.34**	**Normal**	**1**	**0.6**	**-2.00**
				Combined Standard Uncertainty Uc(y), %:	**10.91**
				Expanded Uncertainty U, Coverage Factor = 1.96, > 95 % Confidence =	**21.39 %**
				Expanded Uncertainty U, Coverage Factor = 1.96, > 95 % Confidence =	**1.68 dB**

5. Measurement System Description and Setup

The DASY5 system used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP or Win7 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

6. SAR Measurement Procedure

6.1. Normal SAR Measurement Procedure

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE Standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Area Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01 (Draft)

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

Step 3: Zoom Scan

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

Zoom Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01 (Draft)

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5·$\Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the area scan based *1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

Step 5: Z-Scan (FCC only)

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation the extrapolated distance should not be larger than the step size in Z-direction.

6.2. Volume Scan Procedures

Step 1: Repeat Step 1-4 in Section 6.1

Step 2: Volume Scan
Volume Scans are used to assess peak SAR and averaged SAR measurements in largely extended 3-dimensional volumes within any phantom. This measurement does not need any previous area scan. The grid can be anchored to a user specific point or to the current probe location.

Step 3: Power drift measurement
The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

7. Summary of Highest 1g SAR Results

Results for Highest SAR Values for each Frequency Band

FCC Rule Parts	Freq. Range	Highest 1-g SAR	Limit
22	824-849 MHz	Body: 1.19 W/kg (Rear w/ 0 mm distance)	1.6 W/kg
24	1850-1910 MHz	Body: 1.19 W/kg (Rear w/ 0 mm distance)	
90	817.9-823.1 MHz	Body: 1.18 W/kg (Rear w/ 0 mm distance)	
27 (LTE Band 5)	824-849 MHz	Body: 1.14 W/kg (Rear w/ 0 mm distance)	
27 (LTE Band 13)	777-787 MHz	Body: 1.19 W/kg (Rear w/ 0 mm distance)	
27 (LTE Band 25)	1850-1915 MHz	Body: 1.16 W/kg (Rear w/ 0 mm distance)	
15.247 (WiFi)	2412-2462 MHz	Body: 1.12 W/kg (Edge 3 w/ 0 mm distance)	
15.247 (BT)	2402-2480 MHz	Body: 0.356 W/kg (Edge 3 w/ 0 mm distance)	
15.407	5150-5250 MHz	Body: 0.585 W/kg (Edge 3 w/ 0 mm distance)	
	5250-5350 MHz	Body: 0.877 W/kg (Edge 3 w/ 0 mm distance)	
	5500-5700 MHz	Body: 1.08 W/kg (Edge 3 w/ 0 mm distance)	
15.247	5725-5850 MHz	Body: 0.958 W/kg (Edge 3 w/ 0 mm distance)	
Simultaneous transmission condition		1.436 W/kg (Sec. 15.7) (The highest SAR across exposure conditions)	

Notes:

- Edge 1 = Top Edge
- Edge 2 = Right Edge
- Edge 3 = Bottom Edge
- Edge 4 = Left Edge
- Edge 1 (41° Rear Tilt) = Top Edge/Right Corner Tilt 41°
- Rear (27° Tilt @ Edge 1) = Right Edge Tilt 27°

8. Device Under Test

Model A1460, is a tablet with multimedia functions (music, application support, and video), cellular GSM/GPRS/EGPRS/WCDMA/HSPA+/DC-HSDPA/CDMA1xRTT/ EV-DO Rev 0, A, B / LTE radio, IEEE 802.11a/b/g/n radio and Bluetooth radio.	
Exposure conditions	Body Exposure with all surfaces and edges. Refer to Section 9 for detailed.

8.1. Band and Air Interfaces

Tx Frequency Bands	• GSM850: 824 - 849 MHz • GSM1900: 1850 - 1910 MHz • W-CDMA Band II: 1850 - 1910 MHz • W-CDMA Band V: 824 - 849 MHz • CDMA BC 0: 824 - 849 MHz • CDMA BC 1: 1850 - 1910 MHz • CDMA BC 10: 817.9 – 823.1 MHz • LTE Band 5: 824 - 849 MHz • LTE Band 13: 777 - 787 MHz • LTE Band 25: 1850 - 1915 MHz • 802.11a/b/g/n: 2412 - 2462 MHz 5180 – 5825 MHz • Bluetooth: 2402 - 2480 MHz
Mode	▪ GSM/GPRS/EGPRS ▪ UMTS Rel 99 ▪ HSDPA (Rel 7, CAT 14) ▪ HSUPA (Rel 6, CAT 6) ▪ DC-HSDPA (Rel 8, CAT 24) ▪ HSPA+ (Rel 6, CAT 6) ▪ CDMA 1xRTT ▪ EVDO Rev. 0, Rev. A, Rev. B (Rev B in BC0 for 16QAM only) ▪ 802.11a/b/g/n HT20/HT40 (a mode only) • Bluetooth 4.0 LE

8.2. Hotspot (Wireless router) Function

The device is capable of personal hotspot mode. The hotspot mode can be enabled by the users by the following this sequence of soft-keys; Settings > General > Network > Enable Personal Hotspot.

WiFi Hotspot mode permits the device to share its cellular data connection with other 2.4 GHz WiFi-enabled devices (channels 1 - 11). WiFi Hotspot mode is not supported in 5.0 GHz WiFi band.

8.3. Simultaneous Transmission

8.3.1. Body Exposure Condition

A1460 Cellular + Wi-Fi, Cellular+ BT Simultaneous Transmission Configurations

User usage	SAR Test distance	Mode	Mode of Operation	Band	LTE	CDMA Data 1xRTT, EV-DO	GPRS/ EGPRS	WCDMA	DC-HSDPA / HSPA+	Wi-Fi 5GHz	Wi-Fi 2.4GHz	BT 2.4GHz
Body SAR	0 cm	Cellular + 2.4GHz WiFi	CDMA 1xRTT, EV-DO	820	No	Yes	No	No	No	No	Yes	No
			CDMA 1xRTT, EV-DO	835	No	Yes	No	No	No	No		No
			CDMA 1xRTT, EV-DO	1900	No	Yes	No	No	No	No		No
			GPRS/ EGPRS	850	No	No	Yes	No	No	No		No
			GPRS/ EGPRS	1900	No	No	Yes	No	No	No		No
			WCDMA	850	No	No	No	Yes	No	No		No
			WCDMA	1900	No	No	No	Yes	No	No		No
			DC-HSDPA	835	No	No	No	No	Yes	No		No
			DC-HSDPA	1900	No	No	No	No	Yes	No		No
			HSPA+	835	No	No	No	No	Yes	No		No
			HSPA+	1900	No	No	No	No	Yes	No		No
			LTE data	782	Yes	No	No	No	No	No		No
			LTE data	850	Yes	No	No	No	No	No		No
			LTE data	1915	Yes	No	No	No	No	No		No
		Cellular+5GHz Wifi / Cellular+BT / 5GHz Wifi+BT	CDMA 1xRTT, EV-DO	820	No	Yes	No	No	No	Yes	No	Yes
			CDMA 1xRTT, EV-DO	835	No	Yes	No	No	No		No	
			CDMA 1xRTT, EV-DO	1900	No	Yes	No	No	No		No	
			GPRS/ EGPRS	850	No	No	Yes	No	No		No	
			GPRS/ EGPRS	1900	No	No	Yes	No	No		No	
			WCDMA	850	No	No	No	Yes	No		No	
			WCDMA	1900	No	No	No	Yes	No		No	
			DC-HSDPA	835	No	No	No	No	Yes		No	
			DC-HSDPA	1900	No	No	No	No	Yes		No	
			HSPA+	835	No	No	No	No	Yes		No	
			HSPA+	1900	No	No	No	No	Yes		No	
			LTE data	782	Yes	No	No	No	No		No	
			LTE data	850	Yes	No	No	No	No		No	
			LTE data	1915	Yes	No	No	No	No		No	

8.3.2. Wireless Router (hotspot) Exposure Condition

A1460 Hotspot simultaneous transmission

User usage	SAR Test distance	Mode	Mode of Operation	Band	LTE	CDMA Data 1xRTT, EV-DO	GPRS/ EGPRS	WCDMA	DC-HSDPA / HSPA+	Wi-Fi HOTSPOT 2.4GHz Only)	BT 2.4GHz
Hotspot	0 cm	Cellular + 2.4GHz Wifi	CDMA 1xRTT, EV-DO	820	No	Yes	No	No	No	Yes	No
			CDMA 1xRTT, EV-DO	835	No	Yes	No	No	No		No
			CDMA 1xRTT, EV-DO	1900	No	Yes	No	No	No		No
			GPRS/ EGPRS	850	No	No	Yes	No	No		No
			GPRS/ EGPRS	1900	No	No	Yes	No	No		No
			WCDMA	850	No	No	No	Yes	No		No
			WCDMA	1900	No	No	No	Yes	No		No
			DC-HSDPA	835	No	No	No	No	Yes		No
			DC-HSDPA	1900	No	No	No	No	Yes		No
			HSPA+	835	No	No	No	No	Yes		No
			HSPA+	1900	No	No	No	No	Yes		No
			LTE data	782	Yes	No	No	No	No		No
			LTE data	850	Yes	No	No	No	No		No
			LTE data	1915	Yes	No	No	No	No		No

8.4. 941225 D05 SAR for LTE Devices v02 (Draft)

<table>
<tr><th>#</th><th>Description</th><th>Information</th></tr>
<tr><td>A</td><td>List the frequency range and channel bandwidths used in each LTE band; 1.4, 3, 5, 10, 15, 20 MHz, etc.</td><td>
<table>
<tr><td colspan="2">Band 5</td></tr>
<tr><td>Tx: 824 - 849 MHz</td><td>Rx: 869 - 894 MHz</td></tr>
<tr><td colspan="2">Band 13</td></tr>
<tr><td>Tx: 777 – 787 MHz</td><td>Rx: 746 – 756 MHz</td></tr>
<tr><td colspan="2">Band 25</td></tr>
<tr><td>Tx: 1850 - 1915 MHz</td><td>Rx: 1930 - 1995 MHz</td></tr>
<tr><td colspan="2">Channel Bandwidths: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz</td></tr>
</table>
</td></tr>
<tr><td>B</td><td>Identify the high, middle and low (H, M, L) channel numbers and channel frequencies for each LTE bandwidth and frequency band</td><td>
<table>
<tr><td rowspan="2">Band 5</td><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td></td><td></td><td>20450/ 829</td><td>20425/ 826.5</td><td>20415/ 825.5</td><td>20407/ 824.7</td></tr>
<tr><td>Mid</td><td></td><td></td><td>20525/ 836.5</td><td>20525/ 836.5</td><td>20525/ 836.5</td><td>20525/ 836.5</td></tr>
<tr><td>High</td><td></td><td></td><td>20600/ 844</td><td>20625/ 846.5</td><td>20634/ 847.4</td><td>20642/ 848.2</td></tr>
<tr><td rowspan="2">Band 13</td><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td></td><td></td><td></td><td>23205/ 779.5</td><td></td><td></td></tr>
<tr><td>Mid</td><td></td><td></td><td>23230/ 782</td><td>23230/ 782</td><td></td><td></td></tr>
<tr><td>High</td><td></td><td></td><td></td><td>23255/ 784.5</td><td></td><td></td></tr>
<tr><td rowspan="2">Band 25</td><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td>26140 /1860</td><td>26115/ 1857.5</td><td>26090/ 1855</td><td>26065/ 1852.5</td><td>26055/ 1851.5</td><td>26047/ 1850.7</td></tr>
<tr><td>Mid</td><td>26365/ 1882.5</td><td>26365/ 1882.5</td><td>26365/ 1882.5</td><td>26365/ 1882.5</td><td>26365/ 1882.5</td><td>26365/ 1882.5</td></tr>
<tr><td>High</td><td>26590/ 1905</td><td>26615/ 1907.5</td><td>26640/ 1910</td><td>26665/ 1912.5</td><td>26674/ 1913.4</td><td>26682/ 1914.2</td></tr>
</table>
</td></tr>
<tr><td>C</td><td>Descriptions of the LTE transmitter and antenna implementation, and identify if the transmitter operates independently of the other wireless transmitters in the device; i.e., whether the LTE hardware, components and/or antenna(s) are shared with other transmitters.</td><td>A single antenna is used for LTE and other wireless modes (CDMA/GPRS/EGPRS/UMTS) for both Transmit and Receive.
A Secondary antenna is used for LTE and other wireless modes (CDMA/GPRS/EGPRS/UMTS) for Receive Only. This device does not support DTM, SVDO, SVLTE.</td></tr>
</table>

941225 D05 SAR for LTE Devices v02 (Continued)

<table>
<tr><th>#</th><th>Description</th><th>Information</th></tr>
<tr><td>D</td><td>Identify the voice and data transmission requirements for all LTE operating modes and exposure conditions, for standalone and simultaneous transmission, with respect to the required head and body test configurations, antenna locations, handset flip or slide cover positions, antenna diversity requirements, etc.</td><td>Data Device Only.
Exposure Conditions:
• Body-Rear, Edge 3, Edge 4, Edge 1, Edge 2 of the DUT at a separation distance of 0 mm from the flat phantom.
• With Proximity Sensor Power back-off disabled
○ Rear Surface of the DUT at the separation distance of 12 mm to the flat phantom.
○ Edge 1 of the DUT at the separation distance of 14 mm to the flat phantom
○ Edge 1/Edge 2 Corner of the DUT with separation distance of 0 mm and 27° angle to the flat body phantom.</td></tr>
<tr><td>E</td><td>Identify if Maximum Power Reduction (MPR) is implemented as an optional or permanent feature, i.e., built-in by design:
1. MPR may be considered during SAR testing only when the maximum output power is permanently limited by the MPR implemented within the device, according to the RB (resource block) configurations specified in 3GPP/LTE standards.
2. Regardless of network requirements, only those RB configurations allowed (see 3GPP standards) for the channel bandwidth and modulation combinations may be tested with MPR active. Configurations with RB allocations less than the RB thresholds required by 3GPP must be tested without MPR.
3. A-MPR (additional MPR) must be disabled during SAR testing.</td><td>As per 3GPP TS 36.101 v11.0.0 (2012-03)
Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3
<table><tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (RB)</th><th rowspan="2">MPR (dB)</th></tr><tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr><tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr><tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr></table>
A-MPR is supported by design, but is disabled for SAR testing.
A-MPR is disabled, by using Network Setting value of NS_01.</td></tr>
<tr><td>F</td><td>When power reduction is required for one or more LTE modes to satisfy SAR compliance for simultaneous transmission or other equipment certification and operating requirements, maximum average conducted output power measurement results for each power reduction mode applicable to the simultaneous voice/data transmission configurations for such wireless configurations and frequency bands are required.</td><td>Yes. A Proximity sensor for cellular power reduction is implemented in the device to address RF exposure compliance when the cellular antenna is positioned close to the user’s body or other objects.</td></tr>
</table>

941225 D05 SAR for LTE Devices v02 (Continued)

#	Description	Information
G	Based on the design specifications and other information available to the manufacturer, through measurement and analysis during product development, when the maximum output power for different RB allocations and RB offset conditions within a channel bandwidth, modulation, or across the channels in a frequency band varies by more than 1 dB, a KDB inquiry is required to confirm if the required test channels are appropriate for SAR testing or if a different set of required test channels is necessary.	Refer to Section 10.
H	The maximum average conducted output power should be measured for the required test channels, for each channel bandwidth and uplink modulation, in each frequency band, using the following configurations to support the SAR test reduction and exclusion applied in the evaluation: 1. 100% RB allocation 2. 1 RB and also 50% RB allocation, offset to the upper and lower edges of each required test channel and also to the middle of the channel bandwidth	Refer to Section 10.
I	Spectrum plots should be included in SAR reports to demonstrate the tested RB allocations have been established correctly at the maximum output power conditions.	N/A.

8.5. Power Reduction by Proximity Sensing

A proximity sensor for power reduction is implemented in this device to address RF exposure compliance when the cellular antenna is positioned close to the user's body. The sensor's mechanical structure is designed to fit within the enclosure design used in this device and also extended around the edge and top of the antenna element in order to optimize sensitivity in these orientations. This design combines the antenna and proximity sensor into a single FPC (Flexible Printed Circuit).

8.5.1. Proximity Sensor Detection Area

The proximity sensor is combined with the primary antenna in a single FPC (Flexible Printed Circuit), therefore, the proximity sensor occupies the same area as the primary antenna.

A two-step power back-off mechanism is implemented in this device. For design and testing purposes Top-Edge, Front Surface, and Rear Surface are chosen as the dimensions of interest.

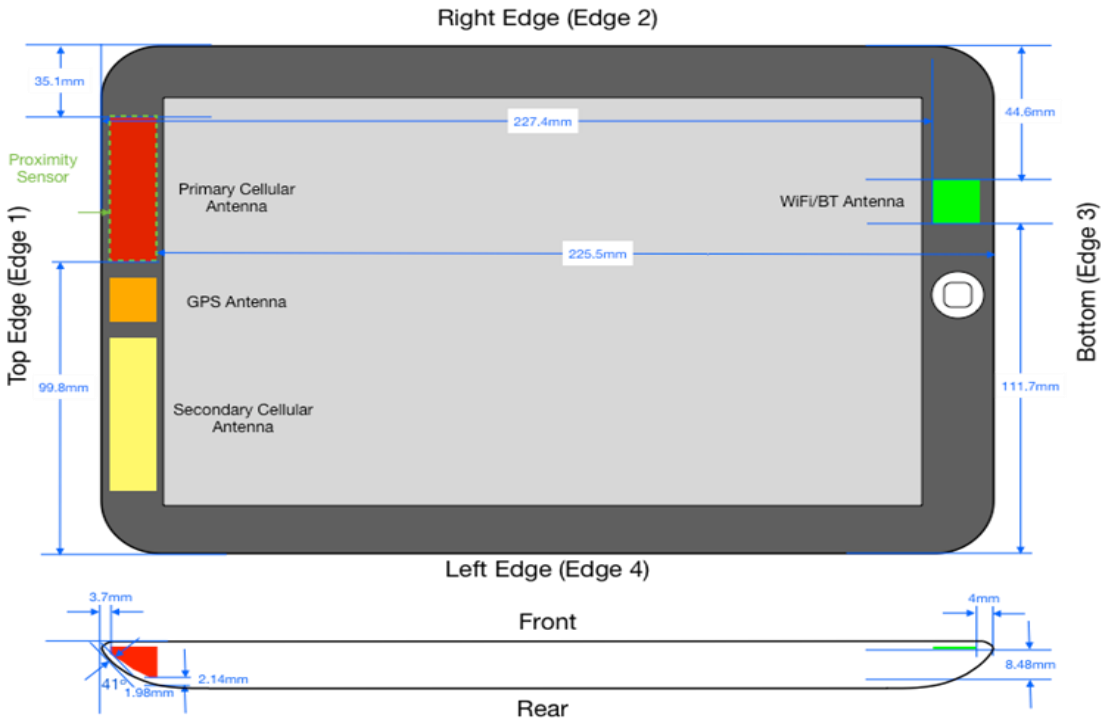
The proximity sensor is triggered at the following conservative distances when:

- the Top-edge of the device is 20 mm for the first-stage trigger, and 14mm for the second-stage trigger, from the phantom.
- the Rear Surface of the device is 20 mm for the first-stage trigger, and 12mm for the second-stage trigger, from the phantom.

The expected capacitance trigger values are programmed in each device for each power back-off stage. Capacitance trigger value for first stage (t1) is C1, and for second stage (t2) is C2. C1 is always smaller than C2.

When a certain object or human body approaches the DUT, if the measured capacitance is lower than C1, proximity sensor is not triggered. If the measured capacitance is higher than C1, but lower than C2, first power back-off (P1) is triggered. If the measured capacitance is higher than C2, second power back-off (P2) is triggered.

SAR evaluation is performed with power back-off disabled (at full power) at the conservative distance of the second stage. Therefore, additional SAR testing for different stages of power back-off will not be performed.



Separation Distances (mm)	Cellular (Primary)	Cellular (Secondary)	Wi-Fi / BT
Cellular (Primary)		18.24	211.0
Cellular (Secondary)			217.2
Wi-Fi / BT			
Top-Edge (Edge 1)	3.7	3.74	227.4
Right-Edge (Edge 2)	35.1	104.14	44.6
Bottom-Edge (Edge 3)	225.5	225.5	4.0
Left-Edge (Edge 4)	99.8	35.14	111.7
Rear Surface	2.14	2.14	8.48

As per the 616217 D04 SAR for laptop and tablets v01, section 6.1, 6.2, following procedure is used to determine the triggering distances.

First, the DUT is moved towards the flat phantom.

Proximity Sensor Status Table when DUT is moving towards the phantom

Distance to the DUT (mm)	Proximity Sensor Status – Rear Surface	Proximity Sensor Status – Top-Edge
30	OFF	OFF
27	OFF	OFF
25	OFF	OFF
24	OFF	OFF
23	OFF	OFF
22	OFF	OFF
21	OFF	OFF
20	ON (C1, t1, P1)	ON (C1, t1, P1)
19	ON (C1, t1, P1)	ON (C1, t1, P1)
18	ON (C1, t1, P1)	ON (C1, t1, P1)
17	ON (C1, t1, P1)	ON (C1, t1, P1)
16	ON (C1, t1, P1)	ON (C1, t1, P1)
15	ON (C1, t1, P1)	ON (C1, t1, P1)
14	ON (C1, t1, P1)	ON (C2, t2, P2)
13	ON (C1, t1, P1)	ON (C2, t2, P2)
12	ON (C2, t2, P2)	ON (C2, t2, P2)
11	ON (C2, t2, P2)	ON (C2, t2, P2)
10	ON (C2, t2, P2)	ON (C2, t2, P2)
9	ON (C2, t2, P2)	ON (C2, t2, P2)
6	ON (C2, t2, P2)	ON (C2, t2, P2)
3	ON (C2, t2, P2)	ON (C2, t2, P2)
0	ON (C2, t2, P2)	ON (C2, t2, P2)

Notes:

C1: Capacitance value triggered First Stage (t1) power back-off
C2: Capacitance value triggered Second Stage (t2) power back-off
t1: 1st Stage triggered
t2: 2nd Stage triggered
P1: Power back-off at 1st Stage
P2: Power back-off at 2nd Stage
The distance at which the proximity sensor triggers is same for all cellular test frequencies.

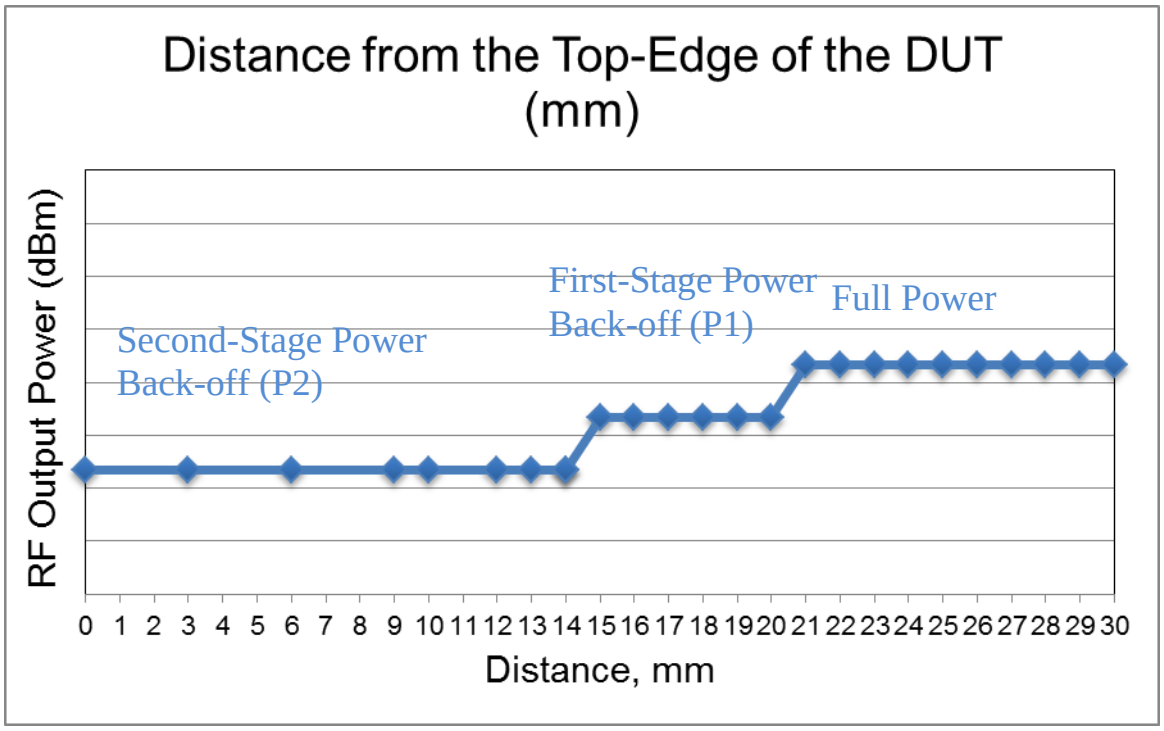
Now, the DUT is moved away from flat phantom

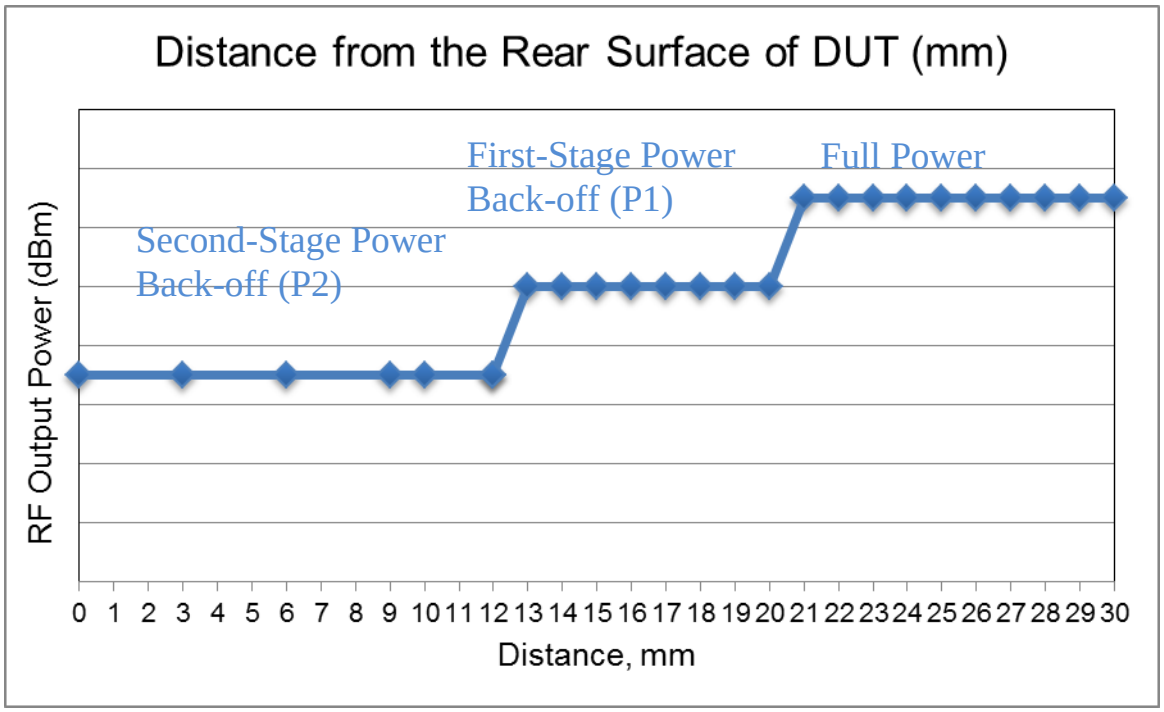
Proximity Sensor Status Table when DUT is moving away from the phantom

Distance to DUT (mm)	Proximity Sensor Status – Rear Surface	Proximity Sensor Status – Top-Edge
0	ON (C2, t2, P2)	ON (C2, t2, P2)
3	ON (C2, t2, P2)	ON (C2, t2, P2)
6	ON (C2, t2, P2)	ON (C2, t2, P2)
9	ON (C2, t2, P2)	ON (C2, t2, P2)
10	ON (C2, t2, P2)	ON (C2, t2, P2)
11	ON (C2, t2, P2)	ON (C2, t2, P2)
12	ON (C2, t2, P2)	ON (C2, t2, P2)
13	ON (C1, t1, P1)	ON (C2, t2, P2)
14	ON (C1, t1, P1)	ON (C2, t2, P2)
15	ON (C1, t1, P1)	ON (C1, t1, P1)
16	ON (C1, t1, P1)	ON (C1, t1, P1)
17	ON (C1, t1, P1)	ON (C1, t1, P1)
18	ON (C1, t1, P1)	ON (C1, t1, P1)
19	ON (C1, t1, P1)	ON (C1, t1, P1)
20	ON (C1, t1, P1)	ON (C1, t1, P1)
21	OFF	OFF
22	OFF	OFF
23	OFF	OFF
24	OFF	OFF
25	OFF	OFF
27	OFF	OFF
30	OFF	OFF

Notes:

C1: Capacitance value triggered First Stage (t1) power back-off
C2: Capacitance value triggered Second Stage (t2) power back-off
t1: 1st Stage triggered
t2: 2nd Stage triggered
P1: Power back-off at 1st Stage
P2: Power back-off at 2nd Stage
The distance at which the proximity sensor triggers is same for all cellular test frequencies.



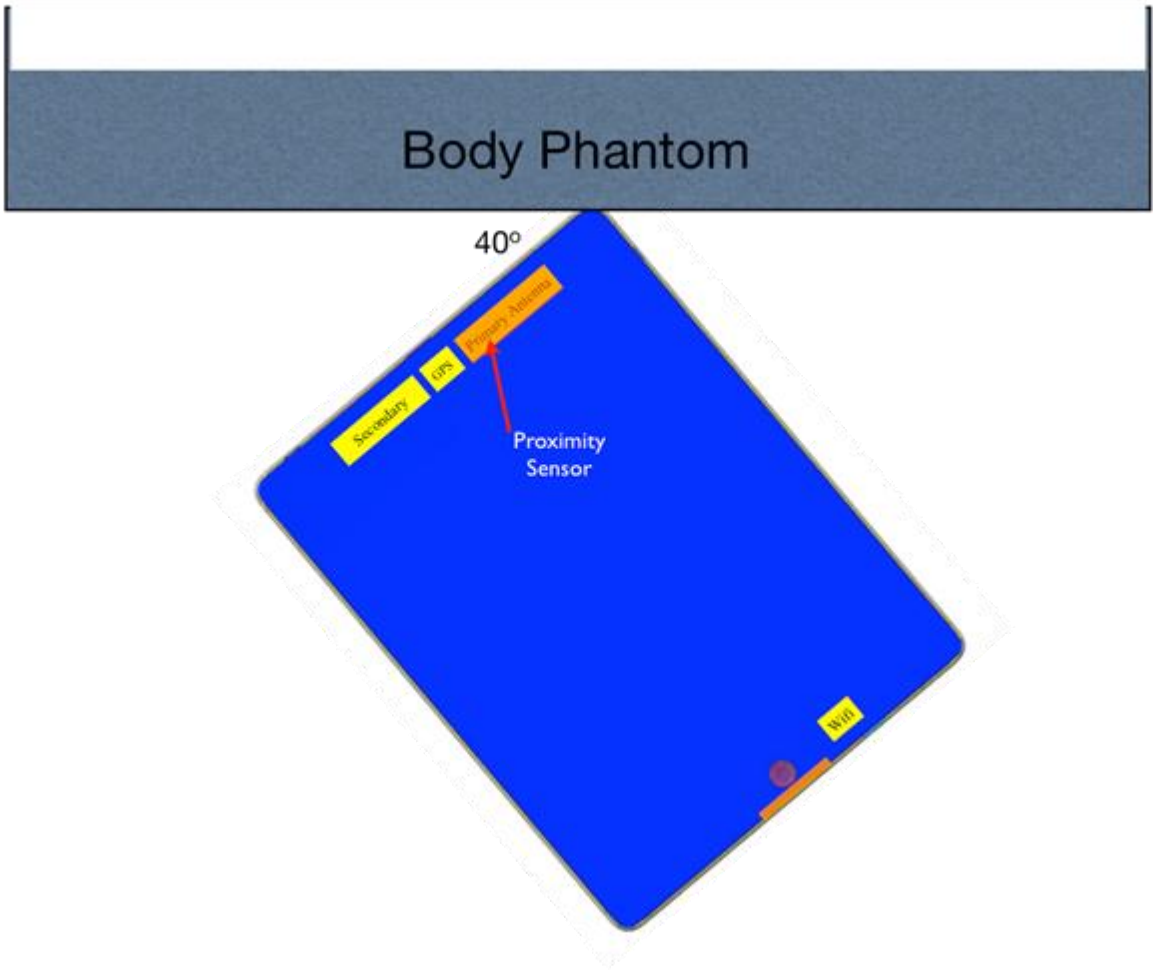


Since, the antenna and proximity sensor are not spatially offset in this implementation, the procedure in KDB 616217, section V.)B.) doesn't apply to device. However, the primary antenna is 35.1 mm from the edge of the device, additional testing is performed to evaluate the coverage of the proximity sensor detection area in the corner of the DUT.

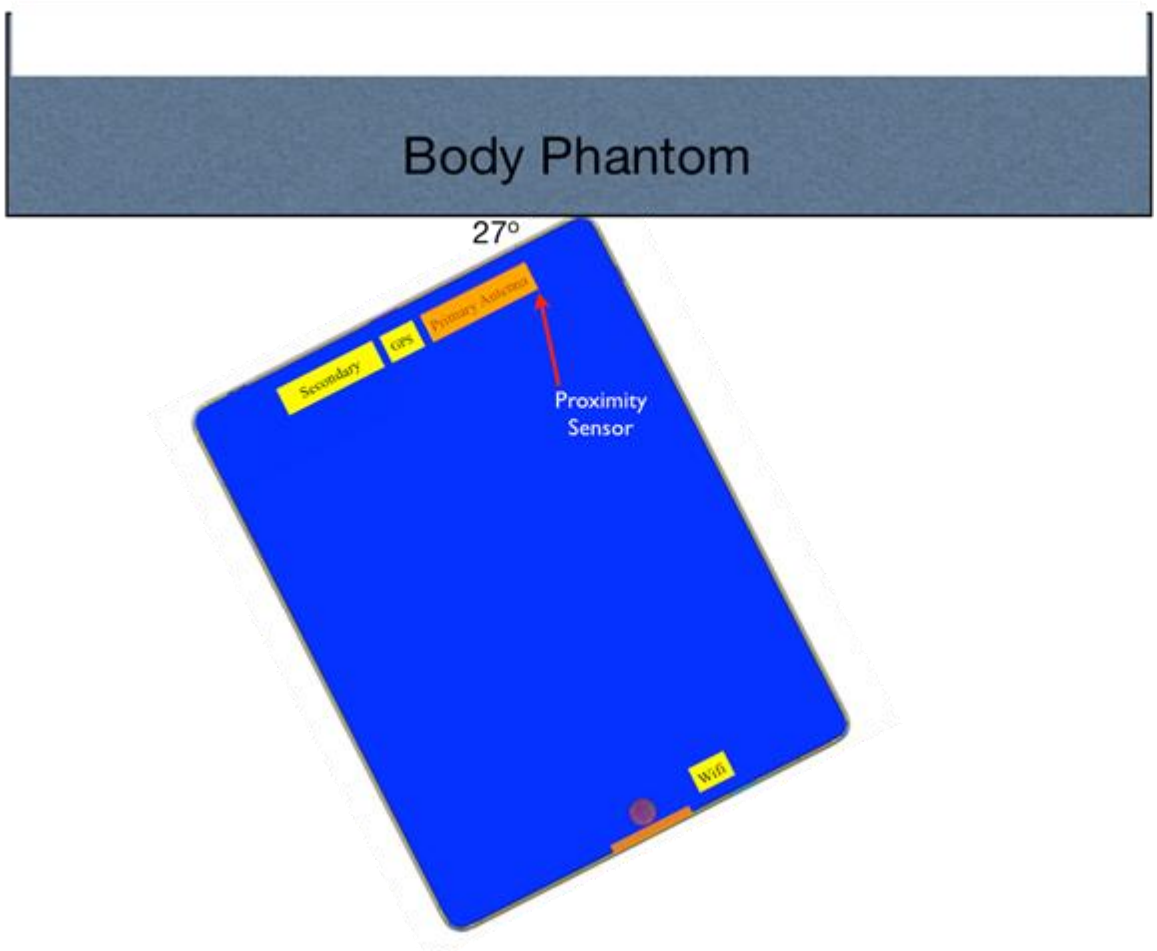
8.5.2. Coverage at the Corner of the DUT

The proximity sensor coverage at the Top-Edge/Right-corner of the device is determined by changing the angle of the device relative to the phantom, and observe the angle at which the proximity sensor is triggered.

In this case, the conservative angles at which the proximity sensor is triggered are: 40° for the first-stage, and 27° for the second-stage, from the phantom.



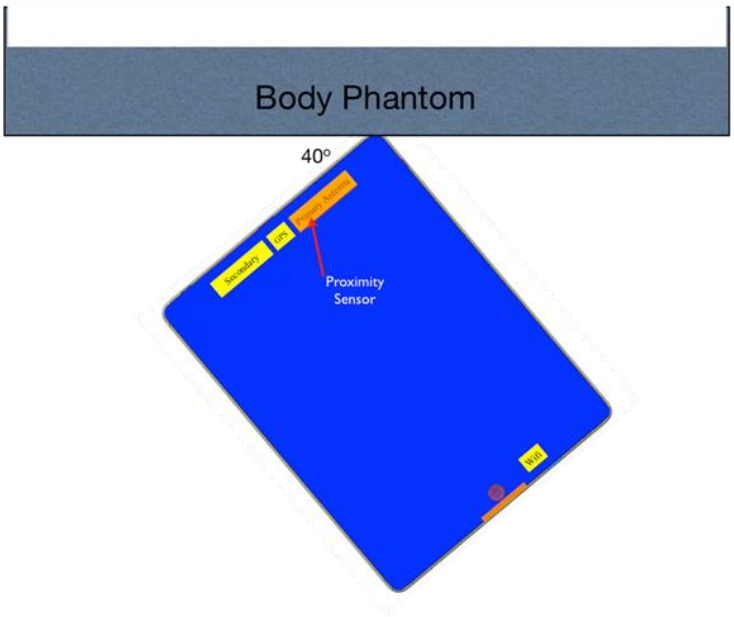
DUT angle at which first–stage is activated



DUT angle at which second–stage is activated

Proximity Sensor Status Table when DUT is moving towards the phantom

Angle to the DUT (Degrees)	Proximity Sensor Status – Top-Edge/Right Corner
90	OFF
85	OFF
80	OFF
75	OFF
70	OFF
65	OFF
60	OFF
55	OFF
50	OFF
45	OFF
44	OFF
43	OFF
42	OFF
41	OFF
40	ON (C1, t1, P1)
39	ON (C1, t1, P1)
38	ON (C1, t1, P1)
35	ON (C1, t1, P1)
30	ON (C1, t1, P1)
29	ON (C1, t1, P1)
28	ON (C1, t1, P1)
27	ON (C2, t2, P2)
26	ON (C2, t2, P2)
25	ON (C2, t2, P2)
20	ON (C2, t2, P2)
15	ON (C2, t2, P2)
10	ON (C2, t2, P2)
5	ON (C2, t2, P2)
0	ON (C2, t2, P2)

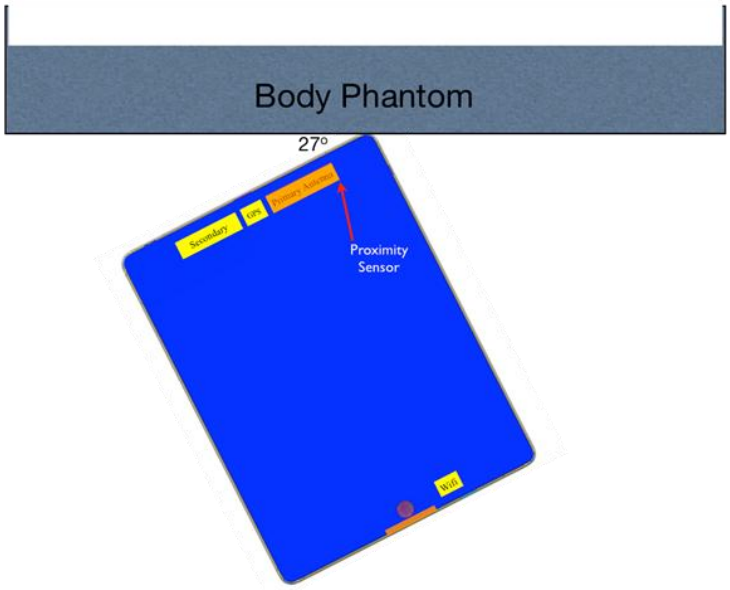


Notes:

C1: Capacitance value triggered First Stage (t1) power back-off
C2: Capacitance value triggered Second Stage (t2) power back-off
t1: 1st Stage triggered
t2: 2nd Stage triggered
P1: Power back-off at 1st Stage
P2: Power back-off at 2nd Stage
The distance at which the proximity sensor triggers is same for all cellular test frequencies.

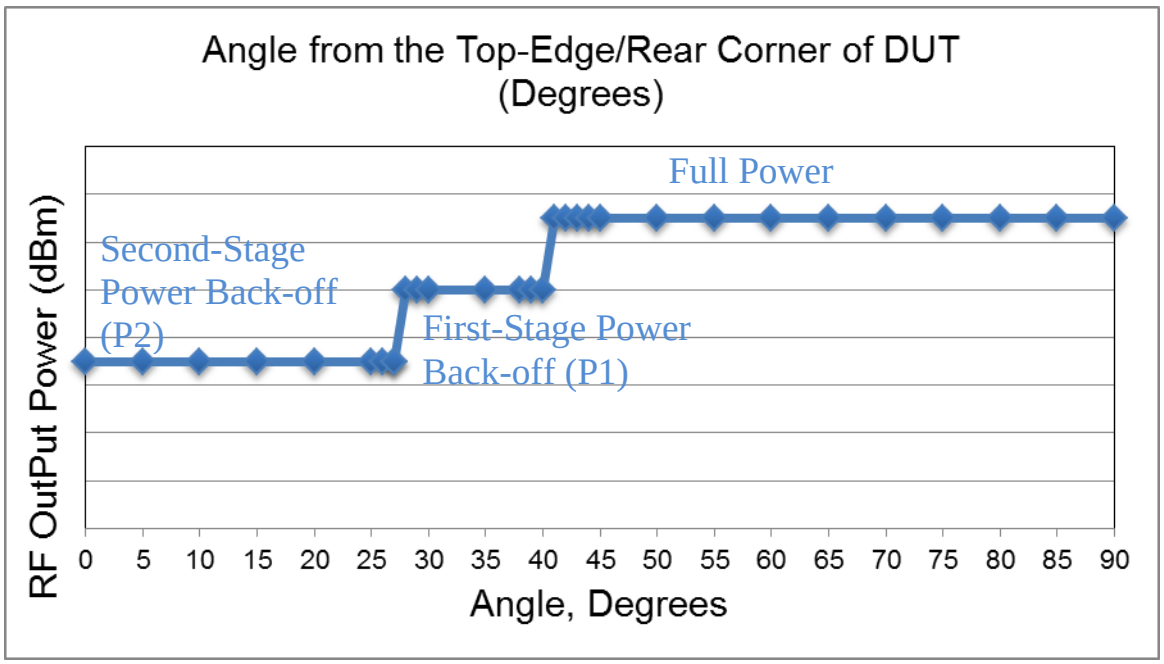
Proximity Sensor Status Table when DUT is moving away from the phantom

Angle to the DUT (Degrees)	Proximity Sensor Status – Top-Edge/Right Corner
0	ON (C2, t2, P2)
5	ON (C2, t2, P2)
10	ON (C2, t2, P2)
15	ON (C2, t2, P2)
20	ON (C2, t2, P2)
25	ON (C2, t2, P2)
26	ON (C2, t2, P2)
27	ON (C2, t2, P2)
28	ON (C1, t1, P1)
29	ON (C1, t1, P1)
30	ON (C1, t1, P1)
35	ON (C1, t1, P1)
38	ON (C1, t1, P1)
39	ON (C1, t1, P1)
40	ON (C1, t1, P1)
41	OFF
42	OFF
43	OFF
44	OFF
45	OFF
50	OFF
55	OFF
60	OFF
65	OFF
70	OFF
75	OFF
80	OFF
85	OFF
90	OFF



Notes:

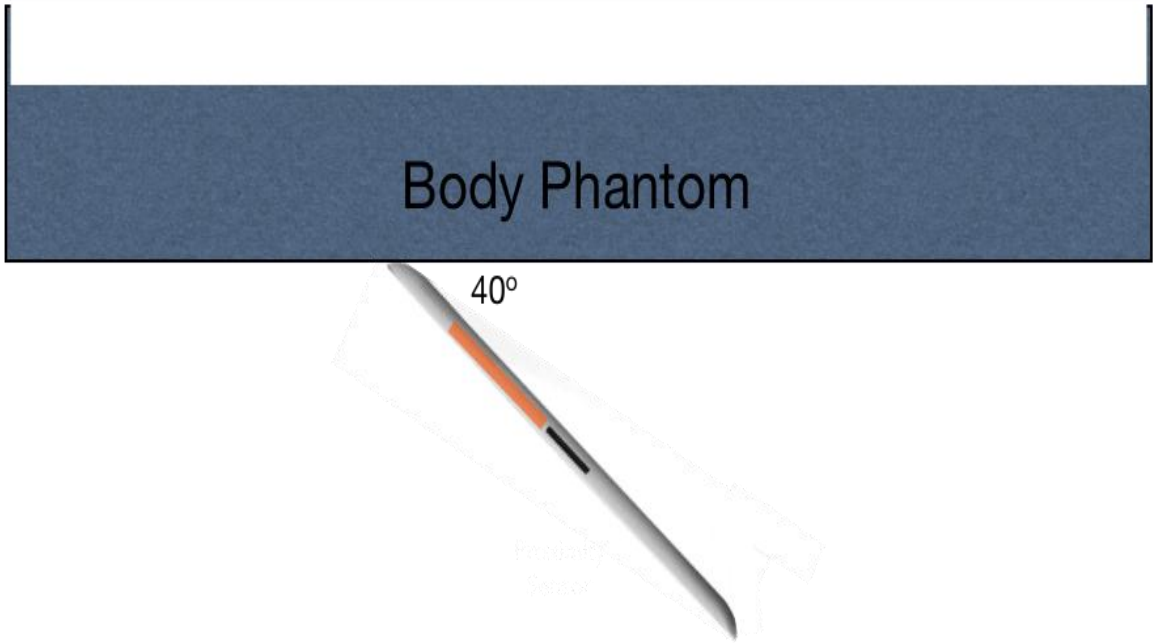
C1: Capacitance value triggered First Stage (t1) power back-off
C2: Capacitance value triggered Second Stage (t2) power back-off
t1: 1st Stage triggered
t2: 2nd Stage triggered
P1: Power back-off at 1st Stage
P2: Power back-off at 2nd Stage
The distance at which the proximity sensor triggers is same for all cellular test frequencies.



The proximity sensor coverage at the Rear Surface/Right-corner of the device is determined by changing the angle of the device relative to the phantom, and observe the angle at which the proximity sensor is triggered.

In this case, the conservative angles at which the proximity sensor is triggered are: 40° for the first-stage, and 25° for the second-stage, from the phantom.

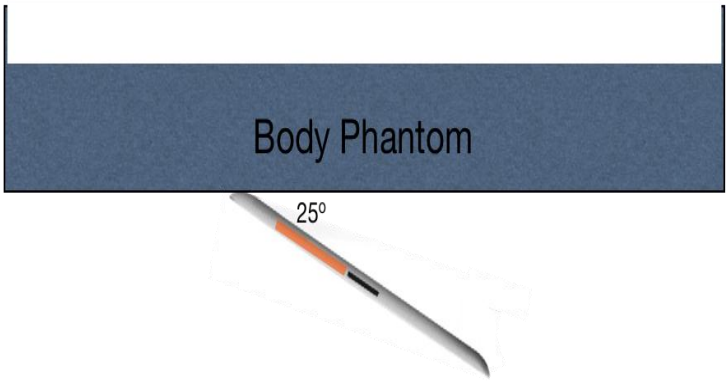
DUT angle at which first-stage is activated



DUT angle at which second-stage is activated

Proximity Sensor Status Table when DUT is moving towards the phantom

Angle to the DUT (Degrees)	Proximity Sensor Status – Rear Surface/Right Corner
90	OFF
85	OFF
80	OFF
75	OFF
70	OFF
65	OFF
60	OFF
55	OFF
50	OFF
45	OFF
43	OFF
42	OFF
41	OFF
40	ON (C1, t1, P1)
39	ON (C1, t1, P1)
38	ON (C1, t1, P1)
35	ON (C1, t1, P1)
30	ON (C1, t1, P1)
28	ON (C1, t1, P1)
27	ON (C1, t1, P1)
26	ON (C1, t1, P1)
25	ON (C2, t2, P2)
24	ON (C2, t2, P2)
23	ON (C2, t2, P2)
20	ON (C2, t2, P2)
15	ON (C2, t2, P2)
10	ON (C2, t2, P2)
5	ON (C2, t2, P2)
0	ON (C2, t2, P2)

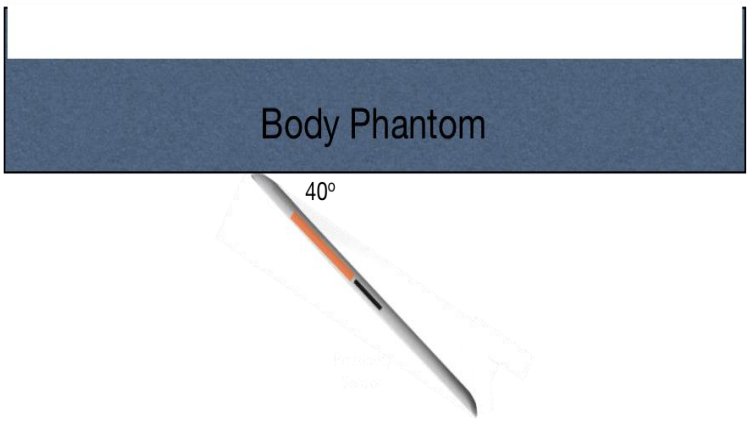


Notes:

C1: Capacitance value triggered First Stage (t1) power back-off
C2: Capacitance value triggered Second Stage (t2) power back-off
t1: 1st Stage triggered
t2: 2nd Stage triggered
P1: Power back-off at 1st Stage
P2: Power back-off at 2nd Stage
The distance at which the proximity sensor triggers is same for all cellular test frequencies.

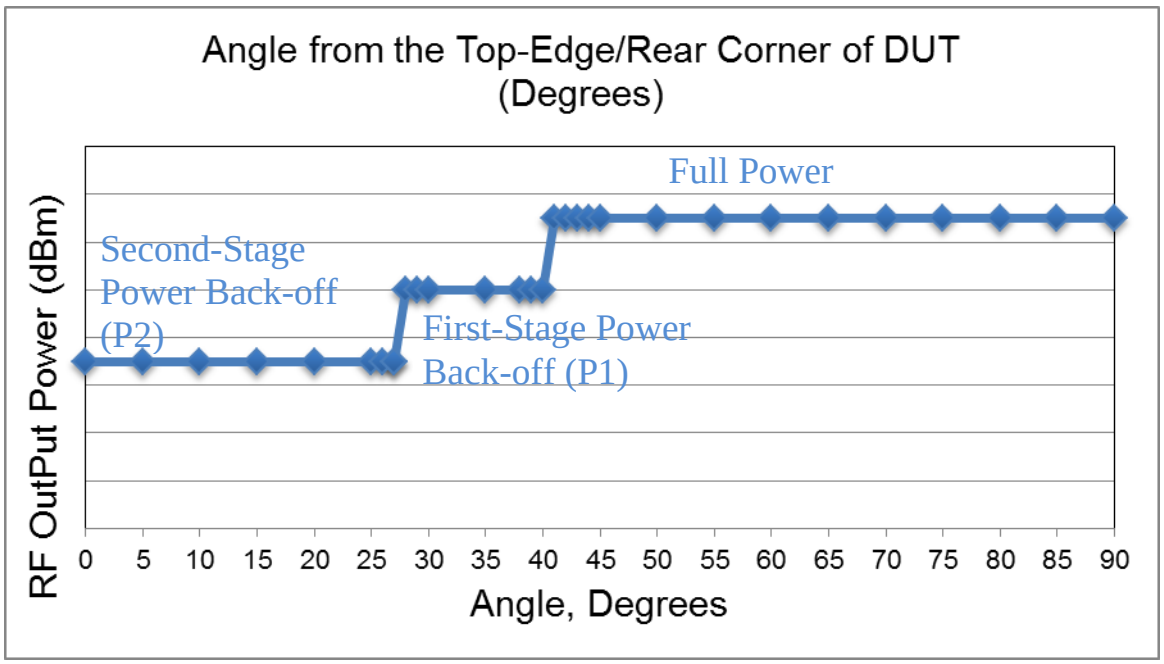
Proximity Sensor Status Table when DUT is moving away from the phantom

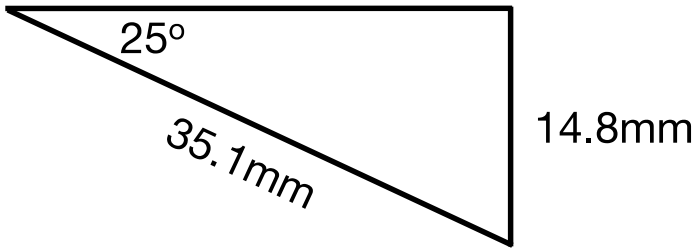
Angle to the DUT (Degrees)	Proximity Sensor Status – Top-Edge
0	ON (C2, t2, P2)
5	ON (C2, t2, P2)
10	ON (C2, t2, P2)
15	ON (C2, t2, P2)
20	ON (C2, t2, P2)
23	ON (C2, t2, P2)
24	ON (C2, t2, P2)
25	ON (C2, t2, P2)
26	ON (C1, t1, P1)
27	ON (C1, t1, P1)
28	ON (C1, t1, P1)
30	ON (C1, t1, P1)
35	ON (C1, t1, P1)
38	ON (C1, t1, P1)
39	ON (C1, t1, P1)
40	ON (C1, t1, P1)
41	OFF
42	OFF
43	OFF
45	OFF
46	OFF
47	OFF
50	OFF
55	OFF
60	OFF
65	OFF
70	OFF
75	OFF
80	OFF
85	OFF
90	OFF



Notes:

C1: Capacitance value triggered First Stage (t1) power back-off
C2: Capacitance value triggered Second Stage (t2) power back-off
t1: 1st Stage triggered
t2: 2nd Stage triggered
P1: Power back-off at 1st Stage
P2: Power back-off at 2nd Stage
The distance at which the proximity sensor triggers is same for all cellular test frequencies.





SAR evaluation for Rear Surface/Right Corner is not performed because, the Antenna-to-flat phantom distance, in this case, is 14.8 mm, which is more the 12 mm for the Rear Surface (at which SAR evaluation will be performed at full power).

With the Top-Edge of the device against the phantom, when the front of the device (LCD side) is tilted toward the phantom, the proximity sensor will remain triggered all the time.

The proximity sensor is not triggered, when approaching from any other corner; therefore, the proximity sensor coverage is only evaluated when approaching from the Top/Right Corner

8.5.3. SAR test configurations

SAR evaluation will be performed with power back-off disabled (at full power) at the conservative distance of the second stage. Therefore, additional SAR testing for different stages of power back-off will not be performed.

For body exposure condition, the DUT is evaluated in the following configurations:

- Rear surface of the DUT with separation distance of 0 mm to the flat phantom. The proximity sensor is active and triggered in this configuration, therefore, the conducted power is backed-off.

- Top-Edge of the DUT with separation distance of 0 mm to the flat phantom. The proximity sensor is active and triggered in this configuration, therefore, the conducted power is backed-off.

- Bottom-Edge of the DUT with separation distance of 0 mm to the flat phantom. The proximity sensor is active, but not triggered in this configuration. Therefore, the conducted power is NOT backed-off.

- Right-Edge of the DUT with separation distance of 0 mm to the flat phantom. The proximity sensor is active, but not triggered in this configuration. Therefore, the conducted power is NOT backed-off.

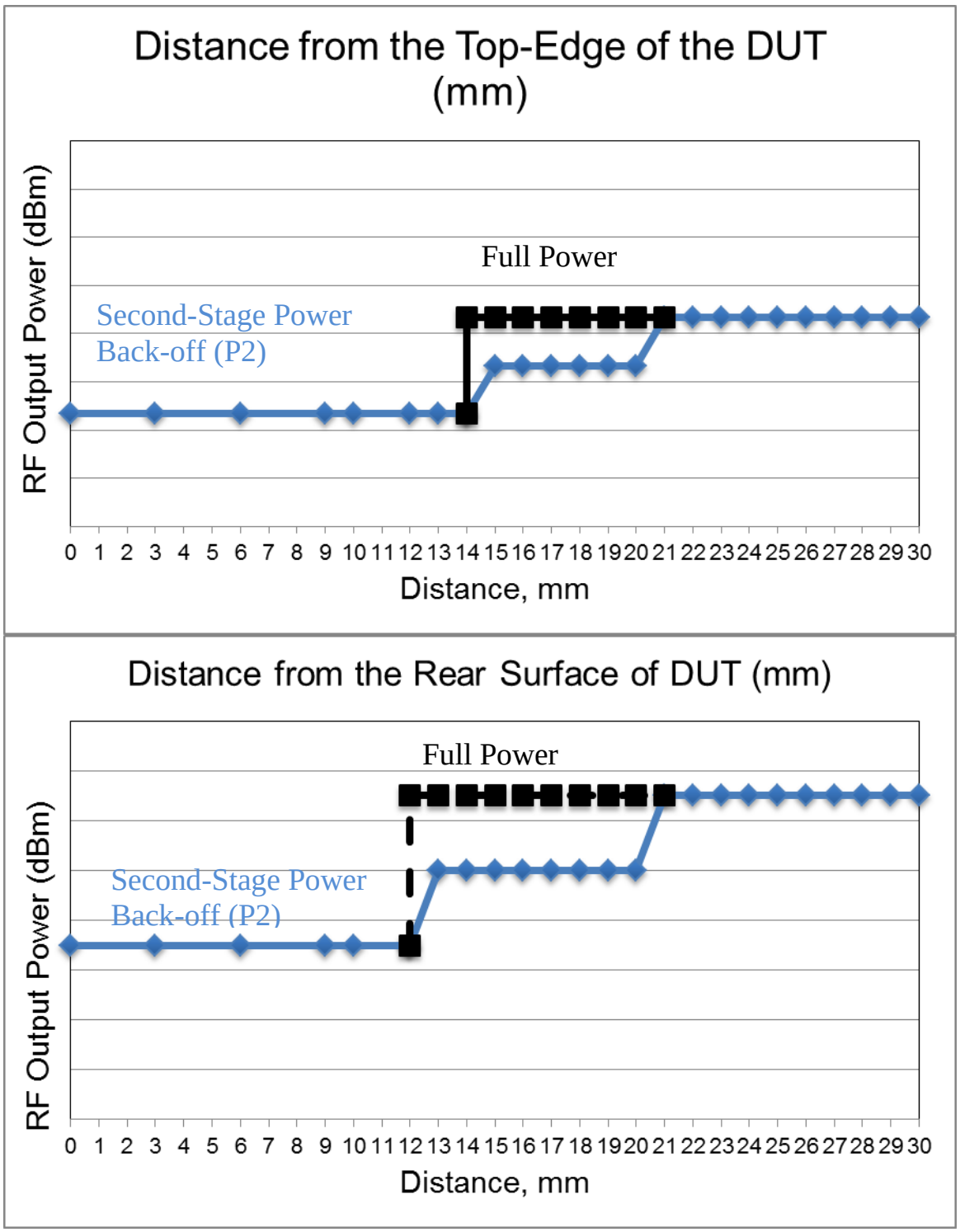
- Rear surface of the DUT with conservative distance of 12 mm to the flat phantom. The proximity sensor is disabled, by special development software, in this configuration. Therefore, the conducted power has NO backed-off.

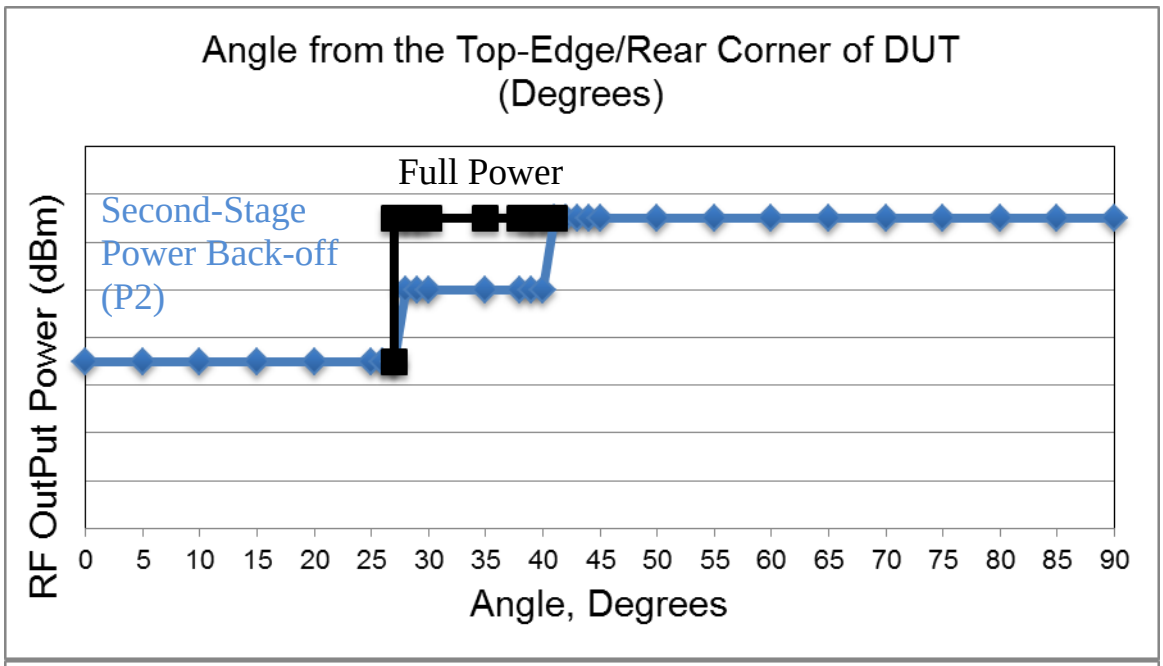
- Top-Edge of the DUT with conservative distance of 14 mm to the flat phantom. The proximity sensor is disabled, by special development software, in this configuration. Therefore, the conducted power has NO backed-off.

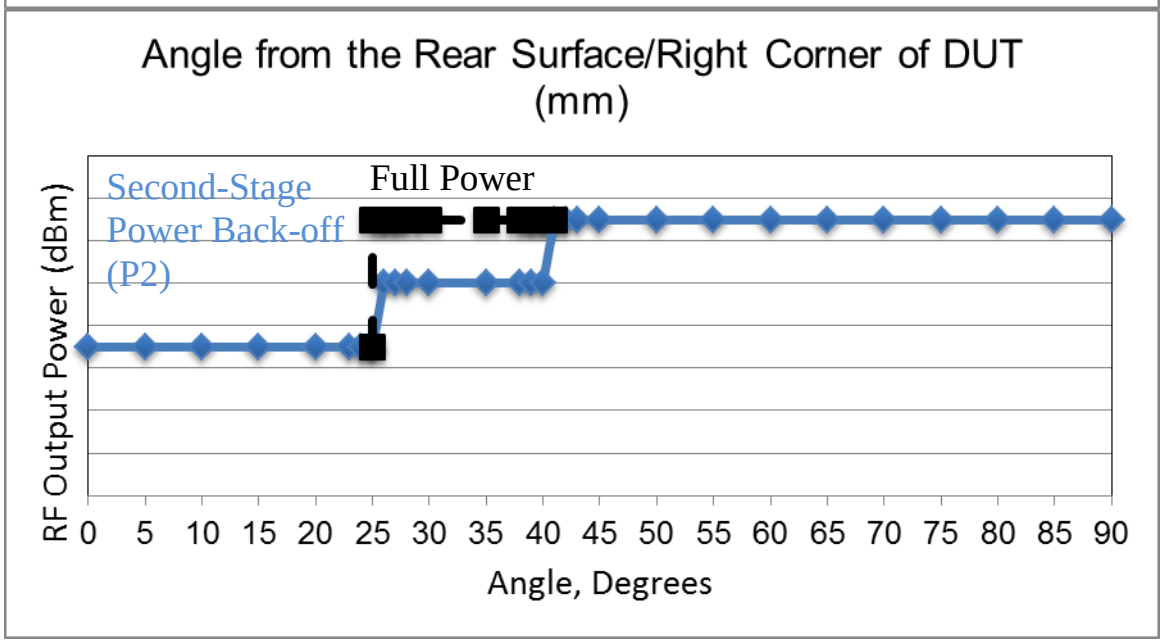
- Top-Edge of the DUT with separation distance of 0 mm and 27° angle to the flat body phantom. The proximity sensor is disabled, by special development software, in this configuration. Therefore, the conducted power has NO backed-off.

SAR evaluation of the DUT on the Front Surface with separation distance of 0 mm to the flat phantom is NOT performed because there is no use case for this configuration.

The graphs below (BLACK LINE) show the distance or angle at which SAR evaluation will be performed.







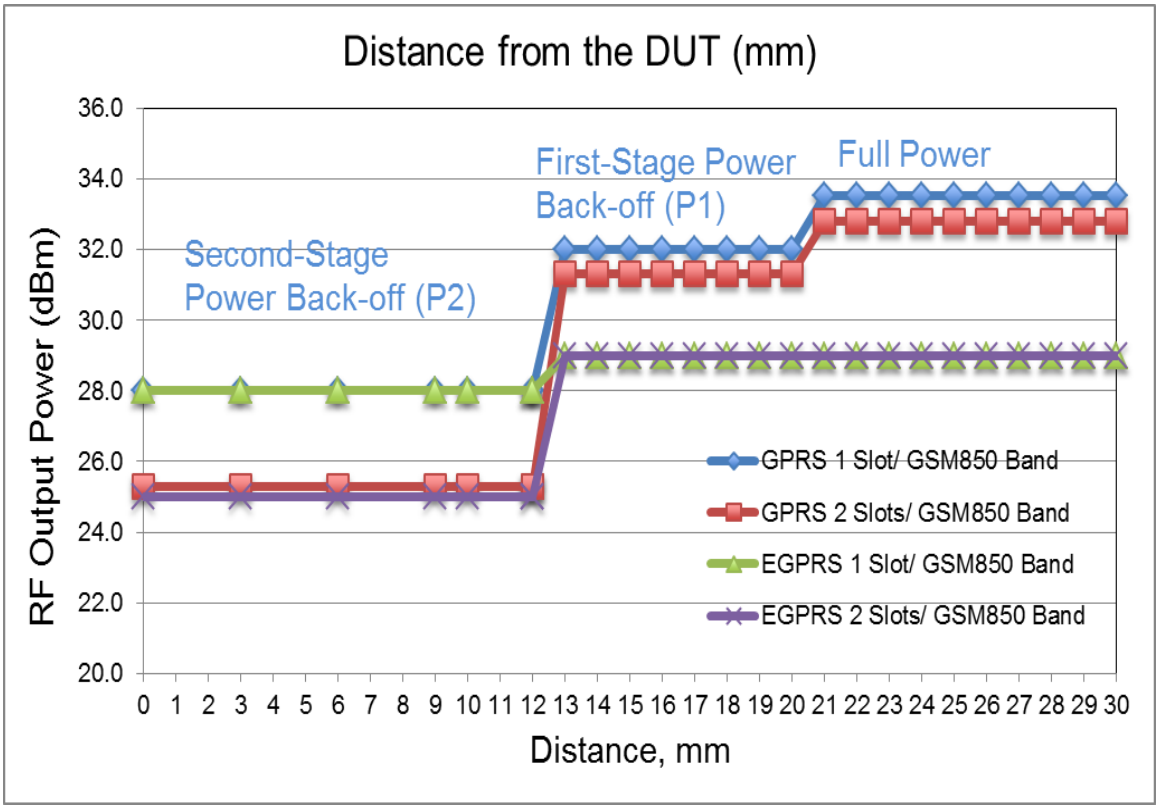
8.5.4. Special Development Software

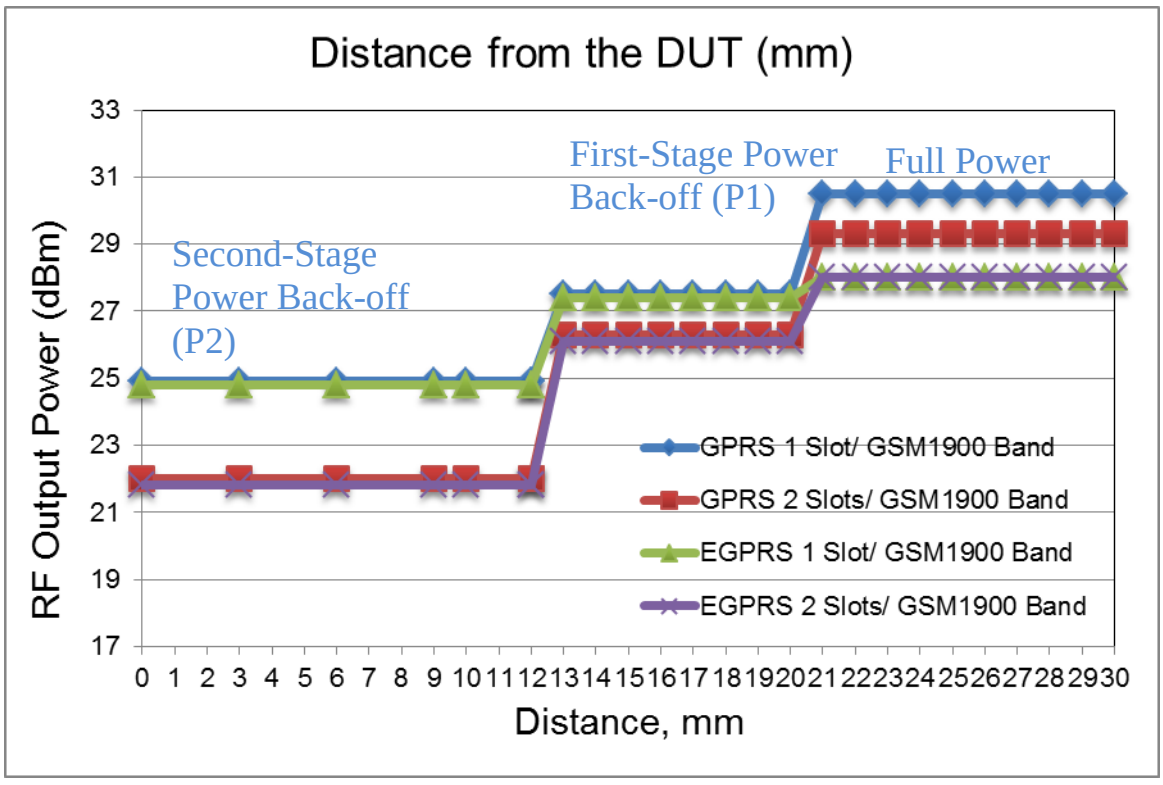
During the Top-Edge (14mm), Rear (12mm), and 27° angle from the Top-Edge/Right Corner (0mm) SAR Evaluation, the power reduction due to proximity sensor was disabled using a series of test commands which are only available in development software. The proximity sensor or the power reduction cannot be intentionally or unintentionally turned-off by the user. The software provided on production units will not allow the proximity sensor or the power cap to be disabled.

8.6. Power Reduction per Air-interface

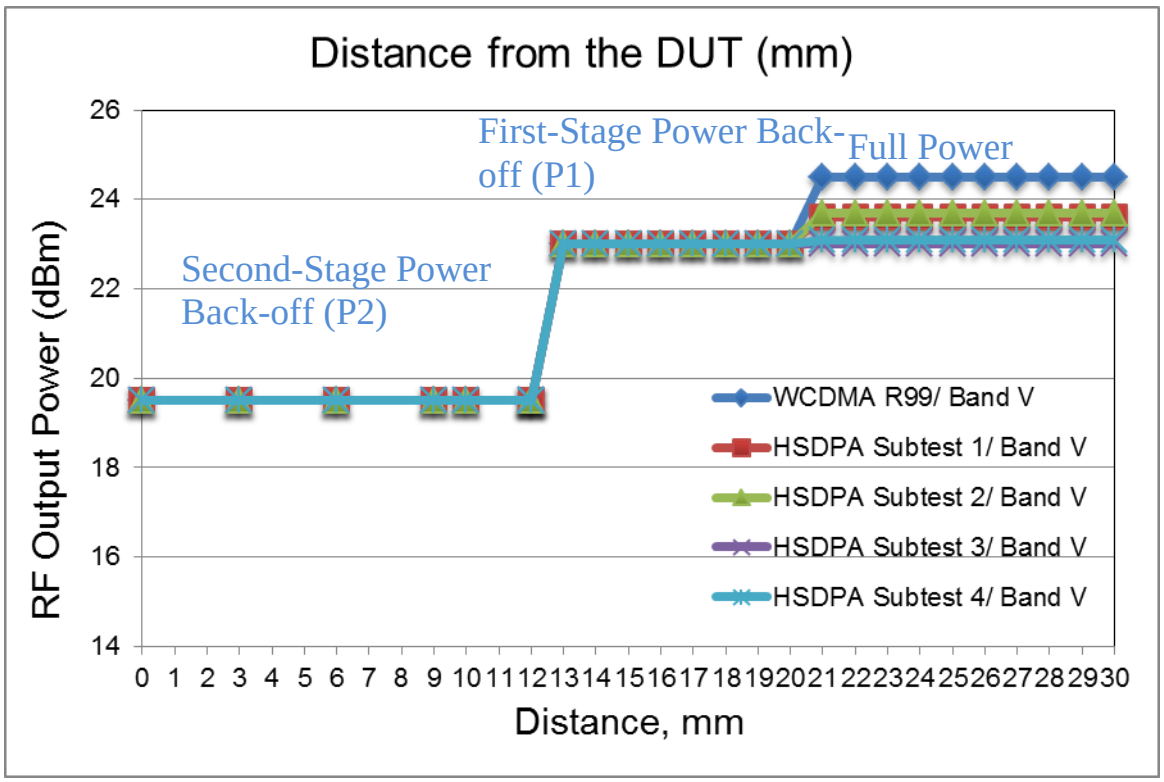
The following graphs show the power level vs the distance from the DUT to the flat phantom for the Rear Surface only.

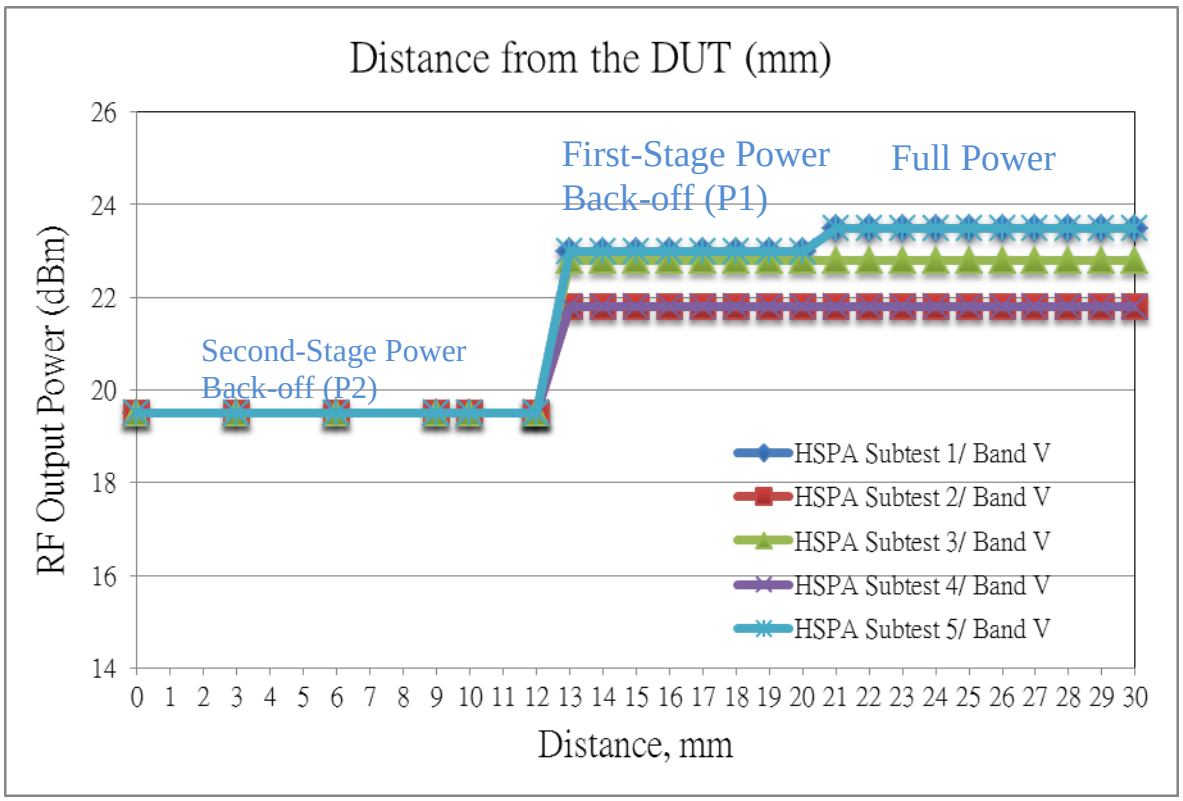
8.6.1. GSM Bands

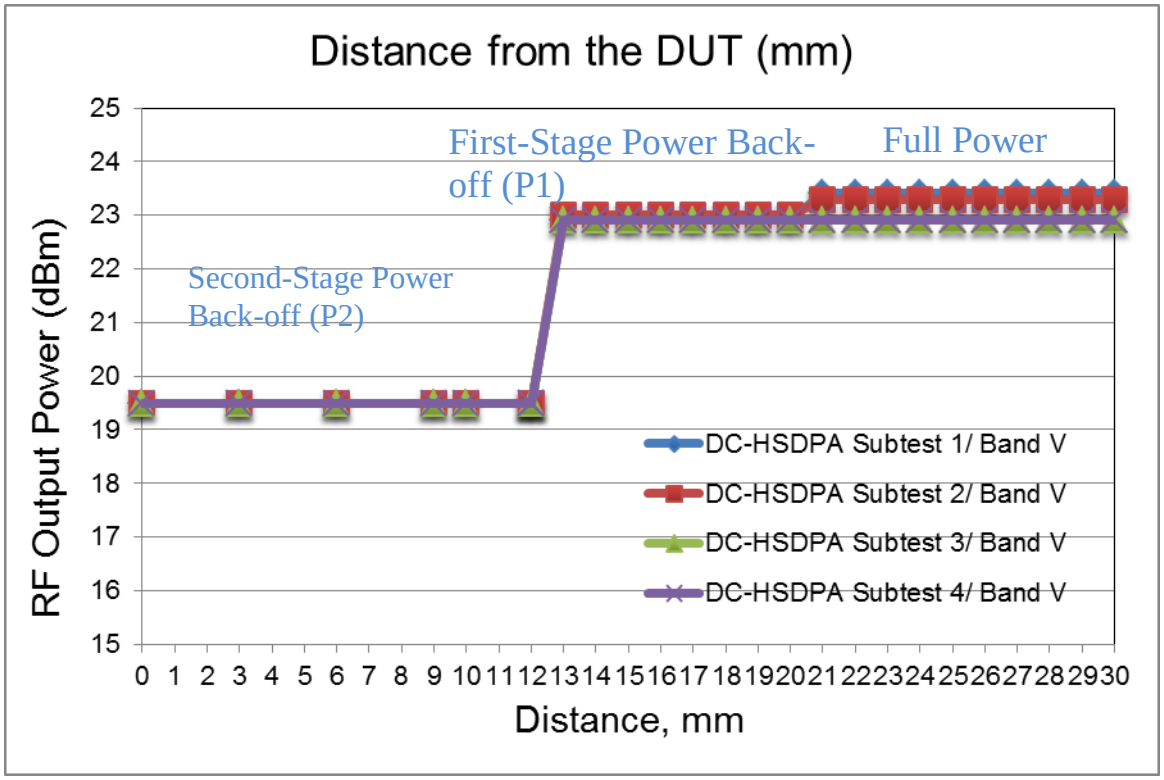


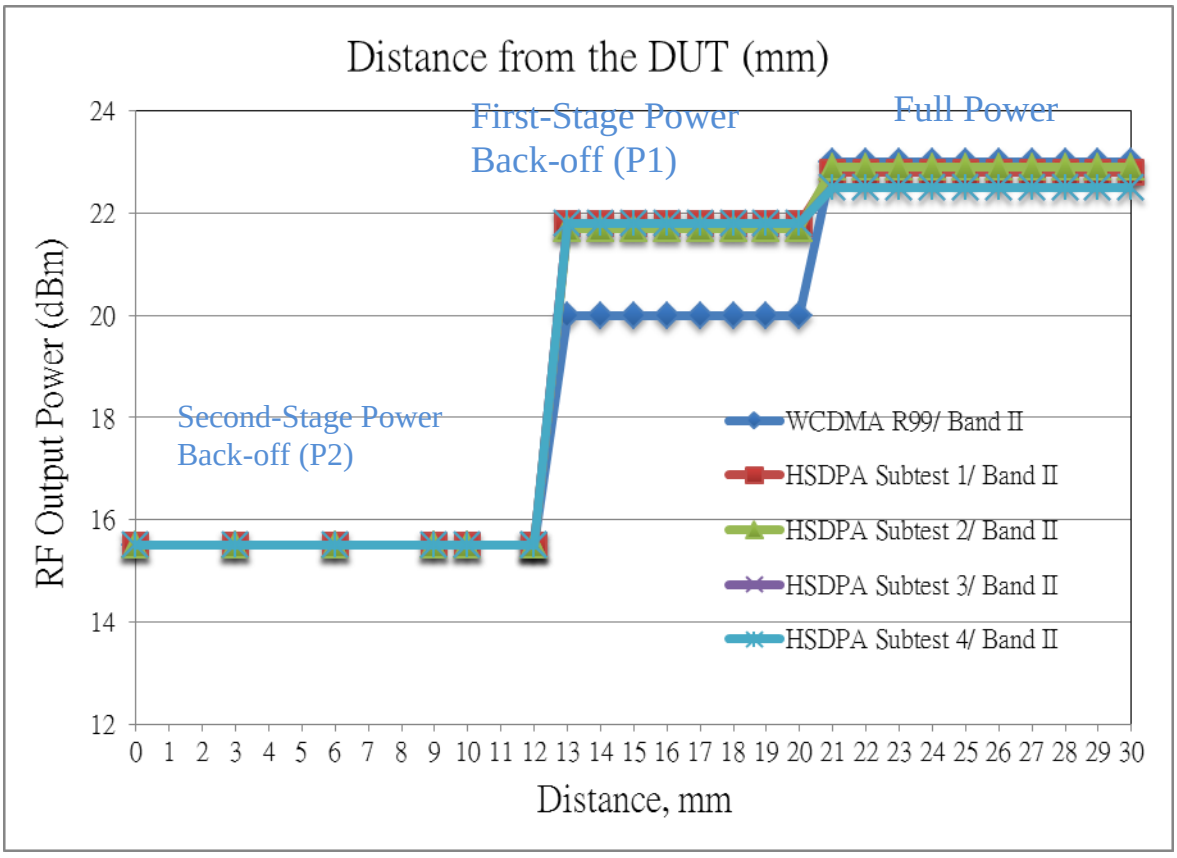


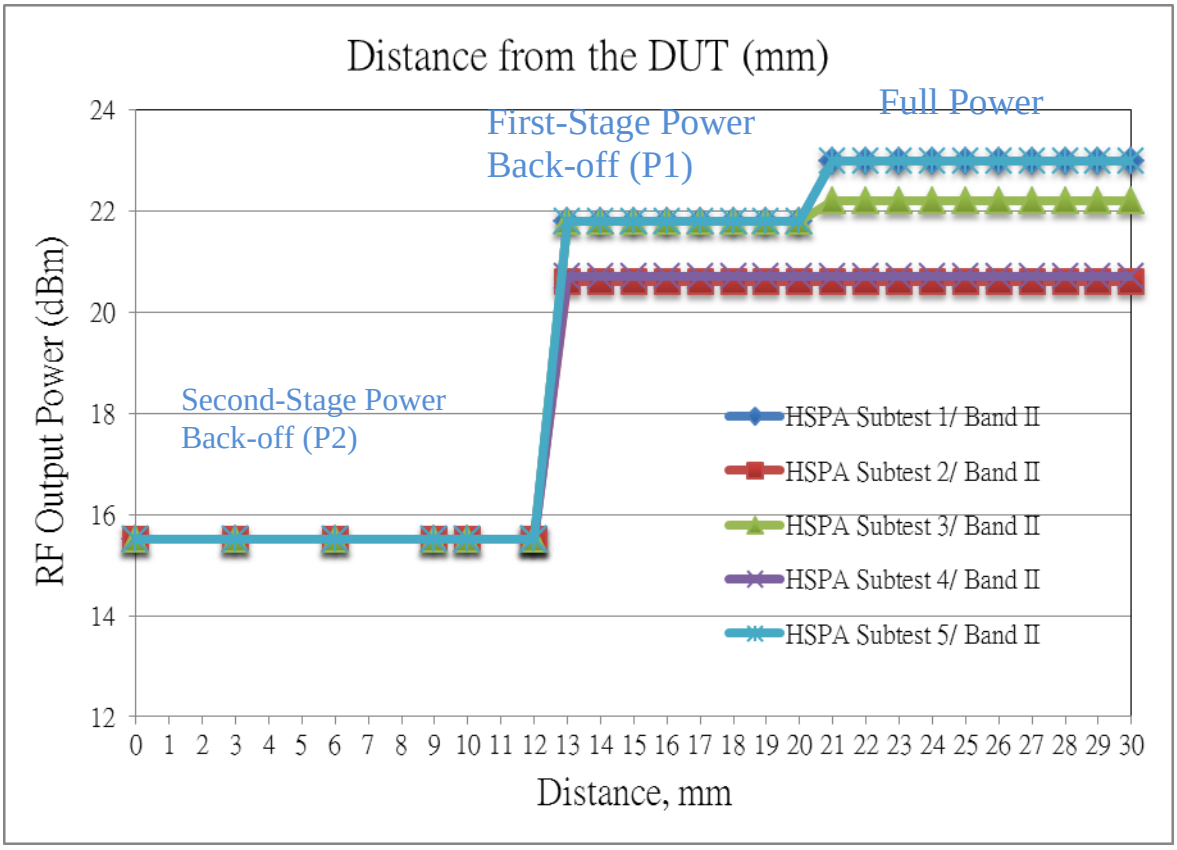
8.6.2. WCDMA Bands

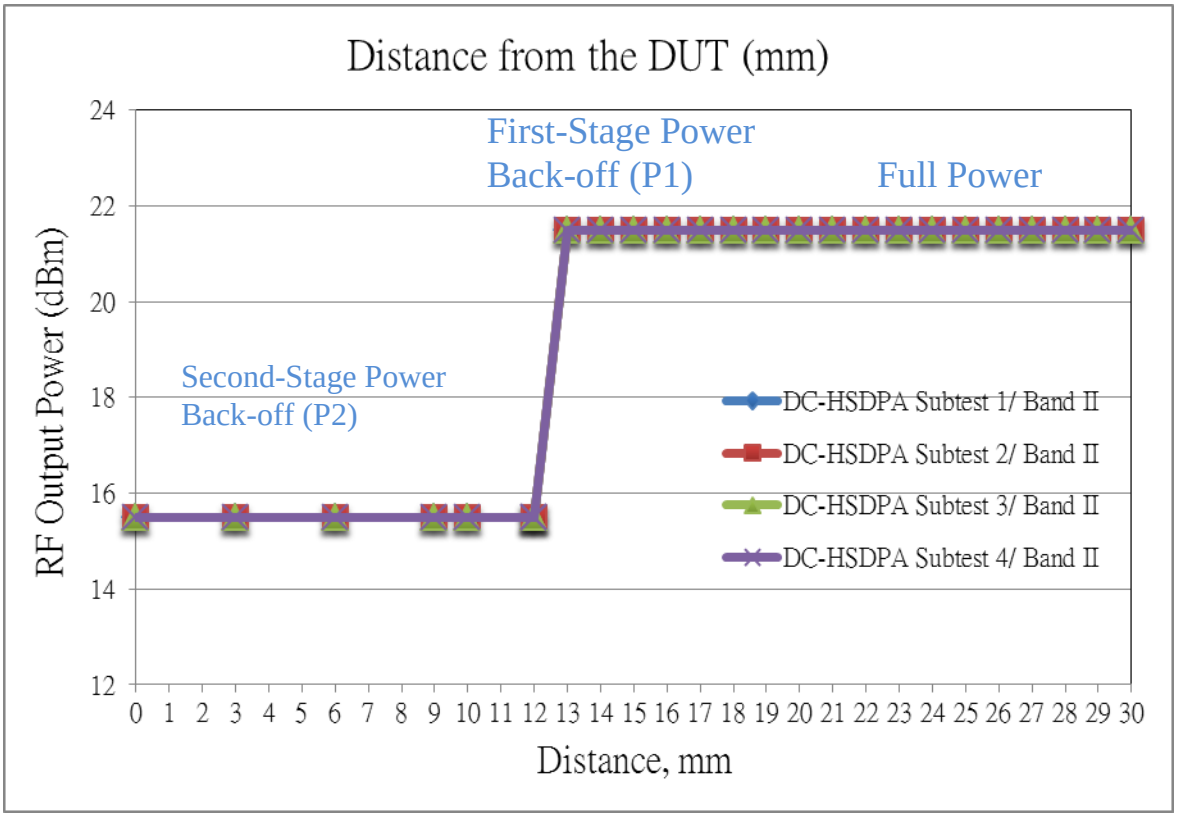




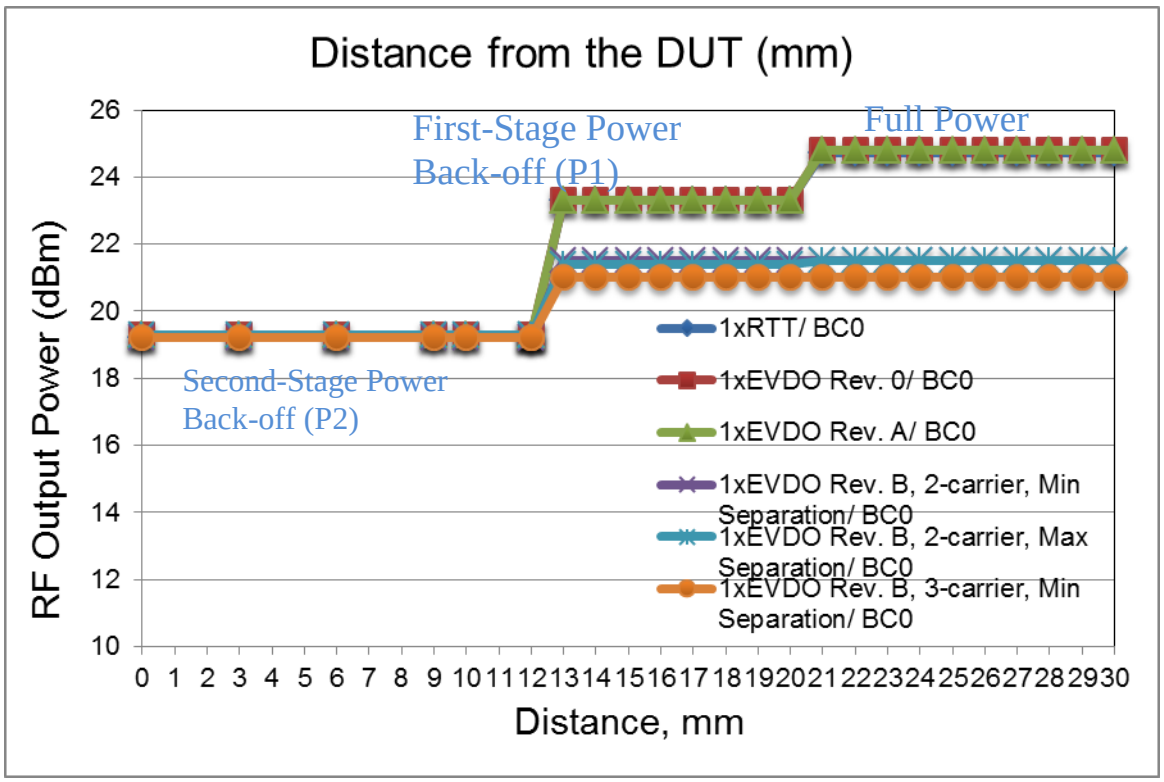


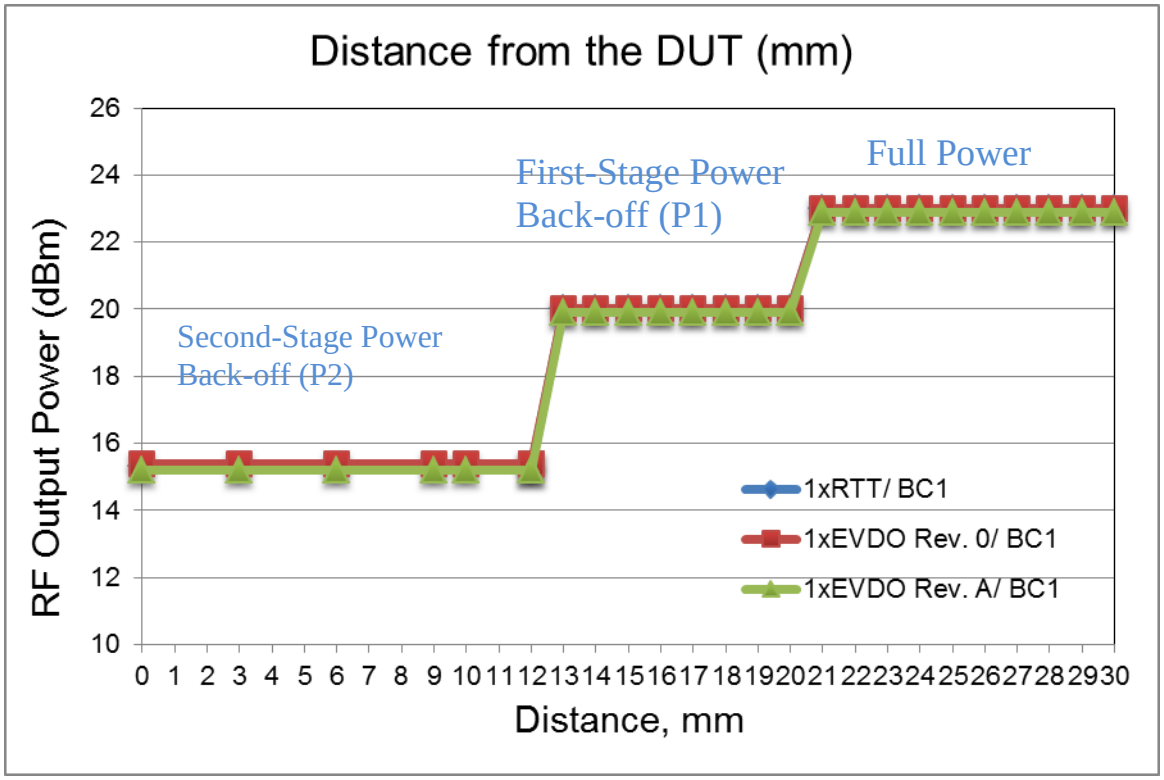


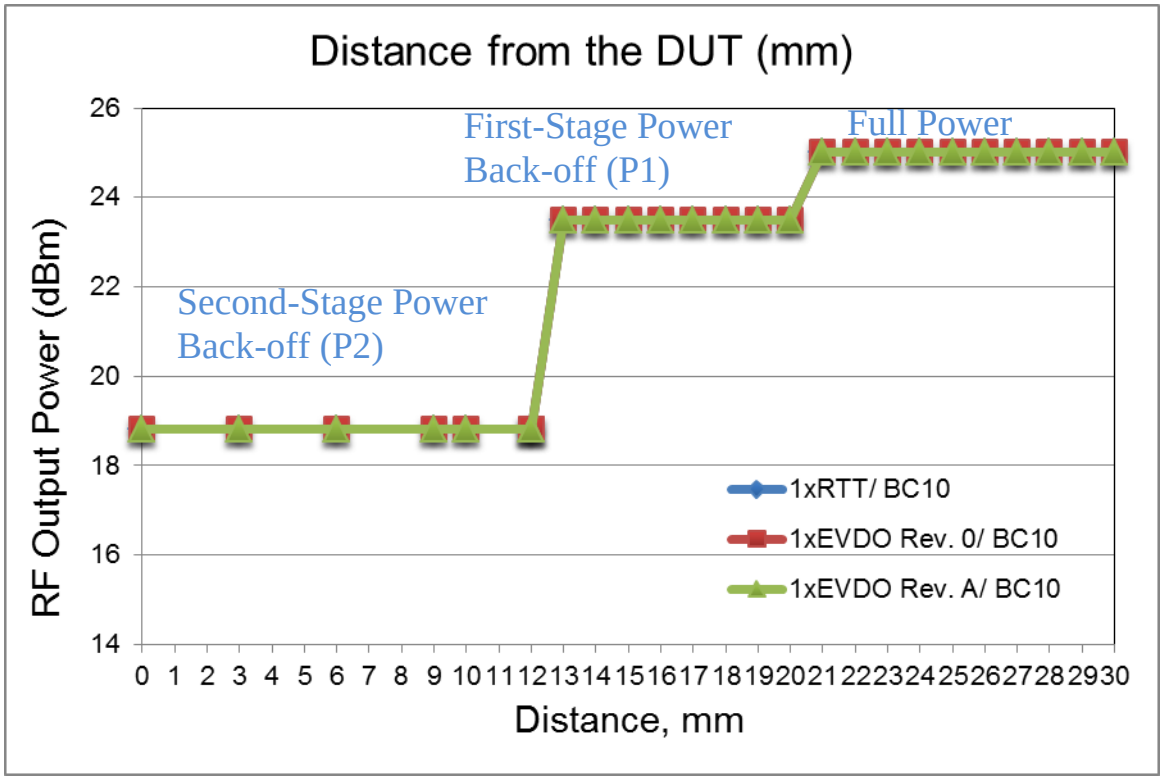




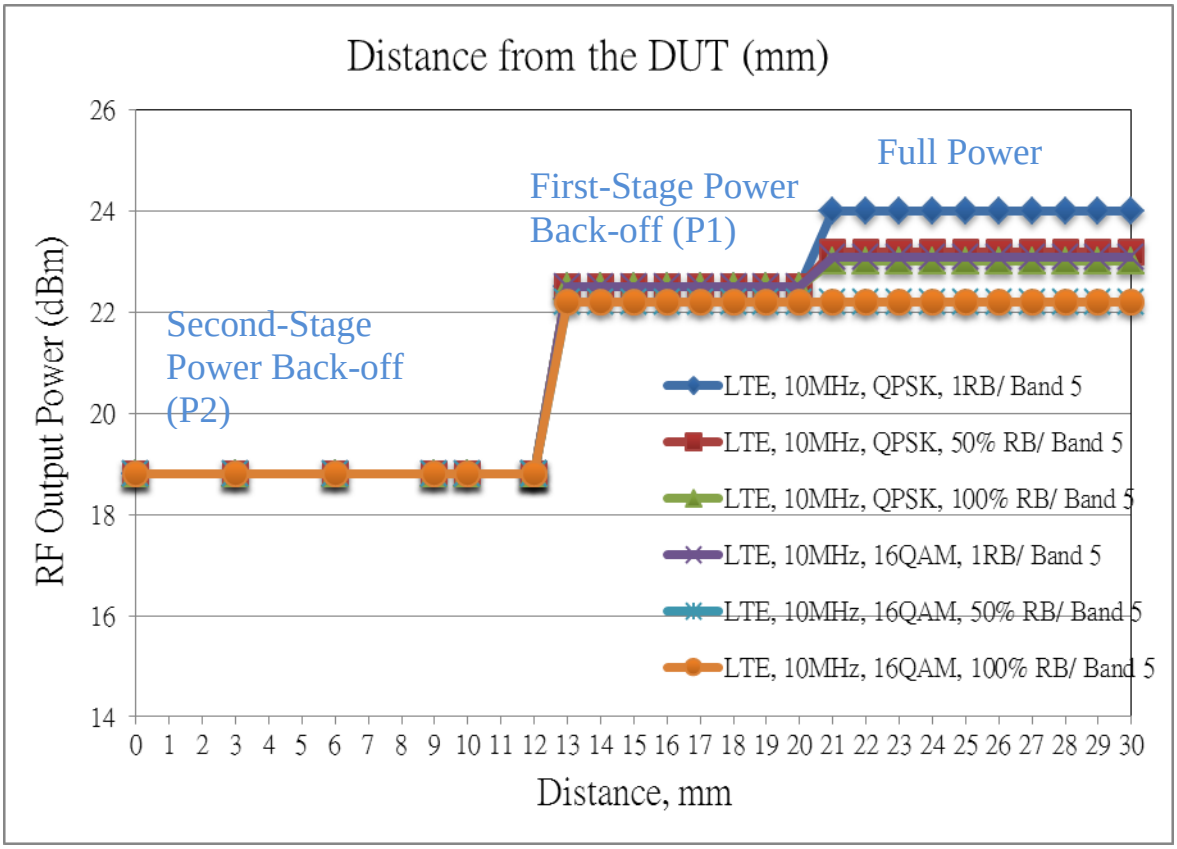
8.6.3. CDMA Bands

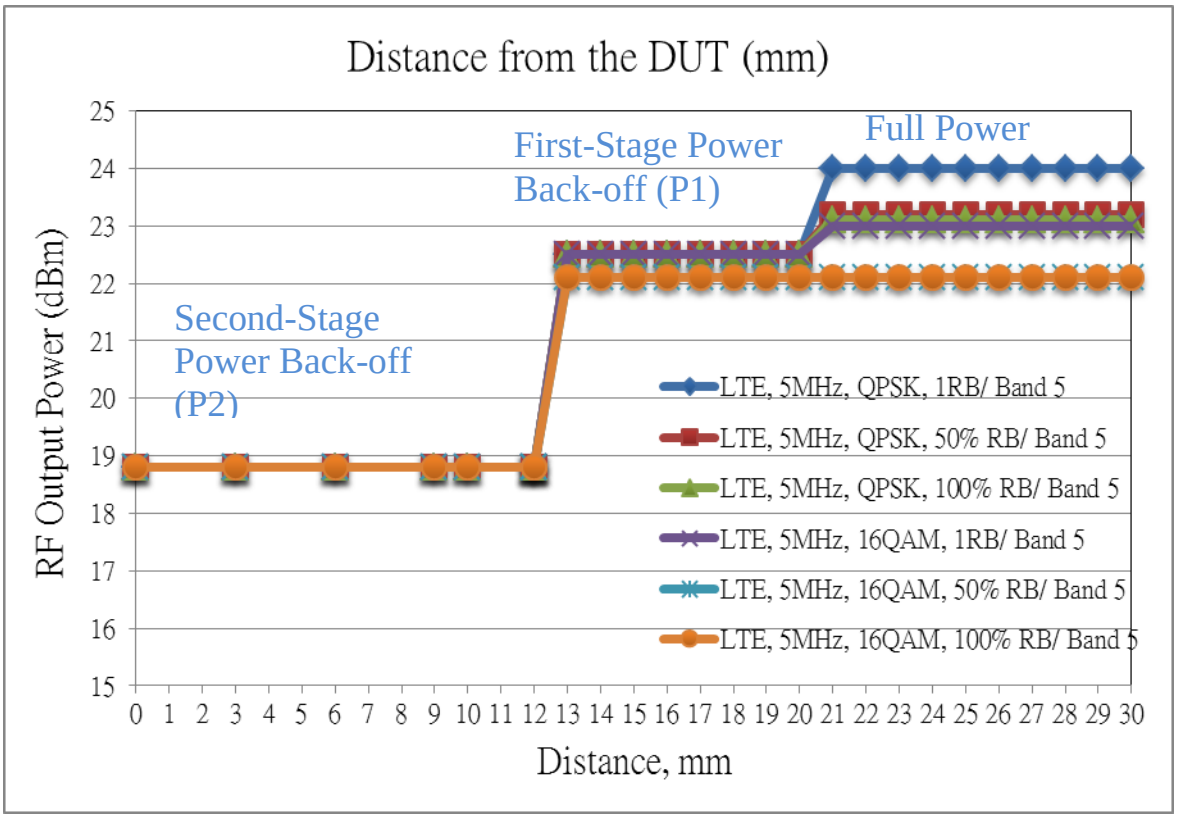


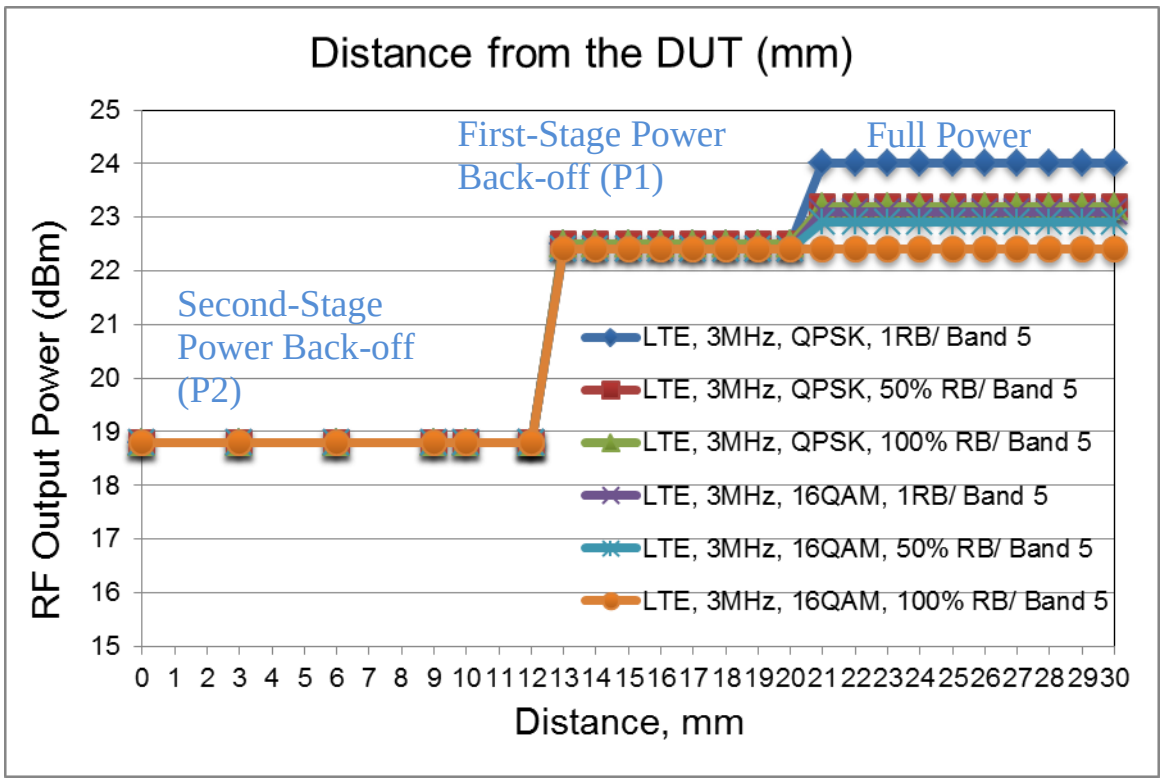


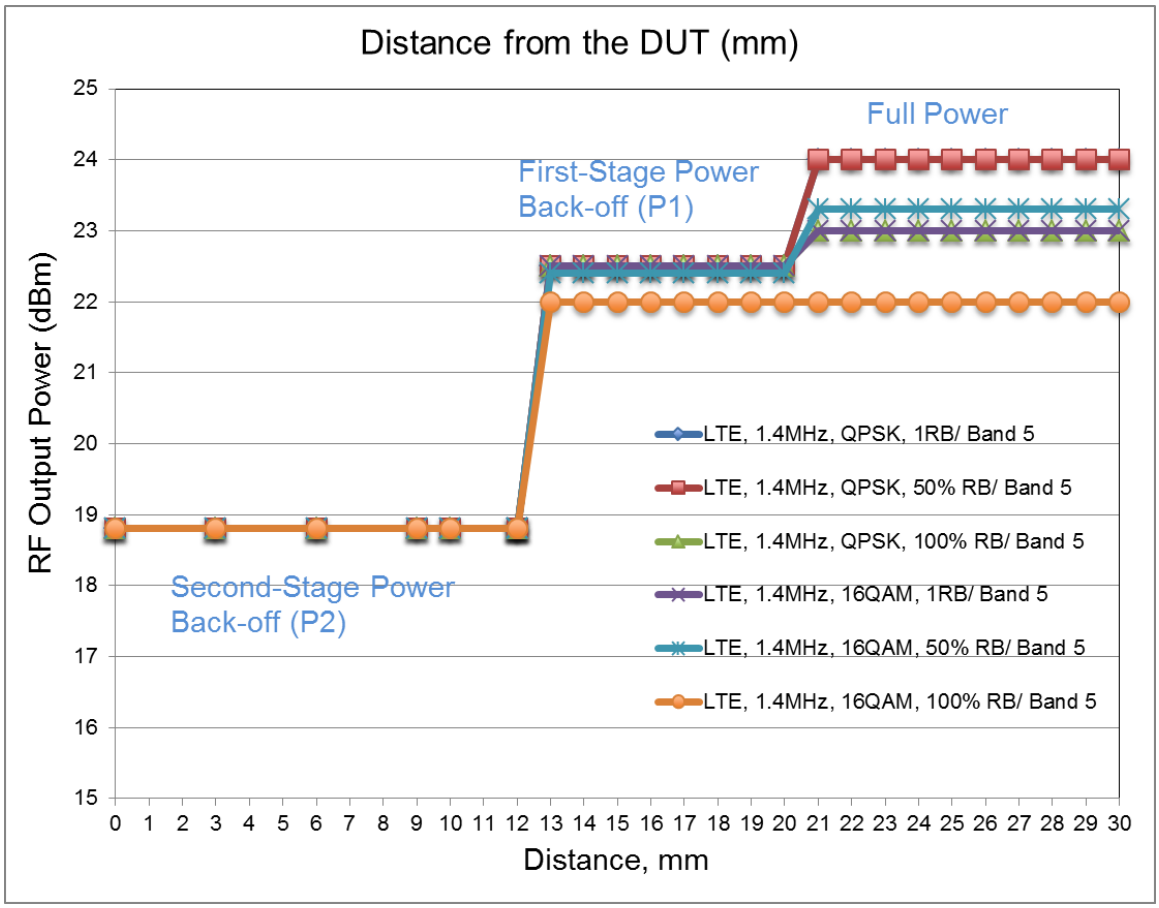


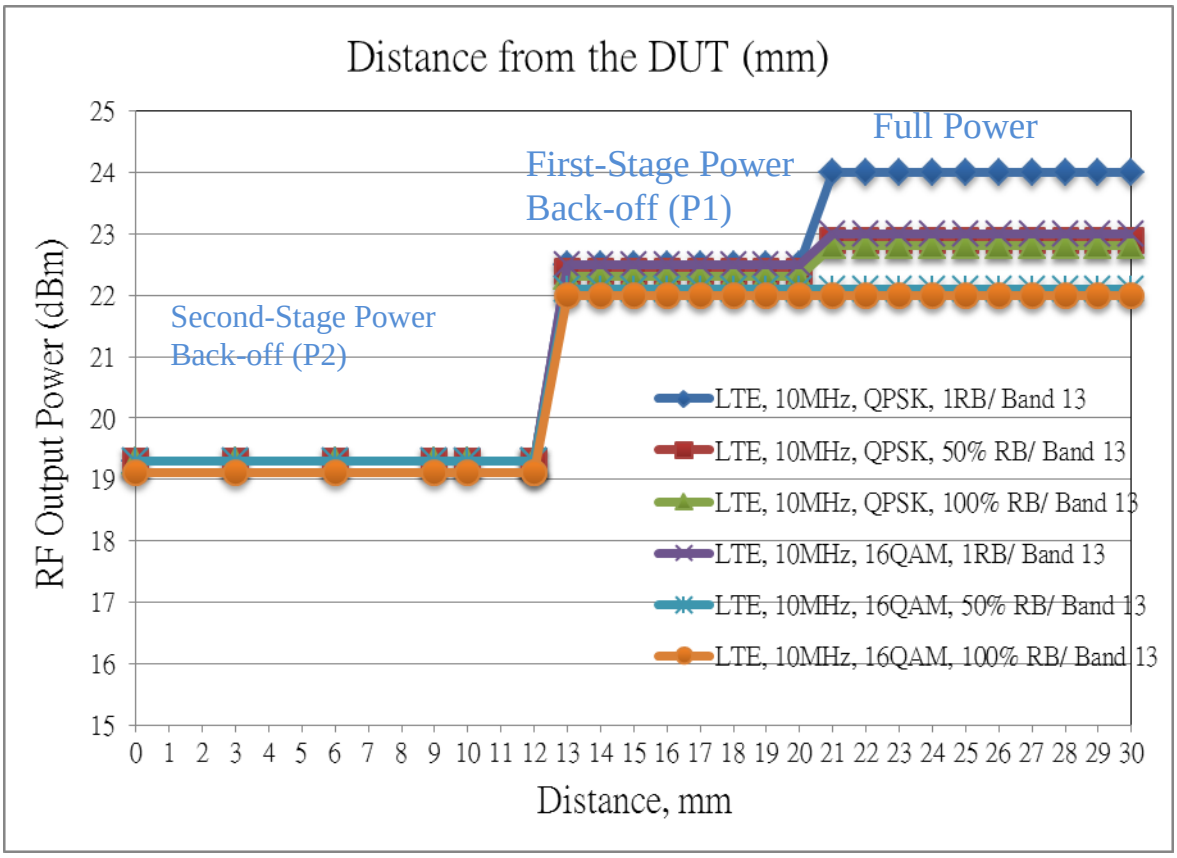
8.6.4. LTE Bands

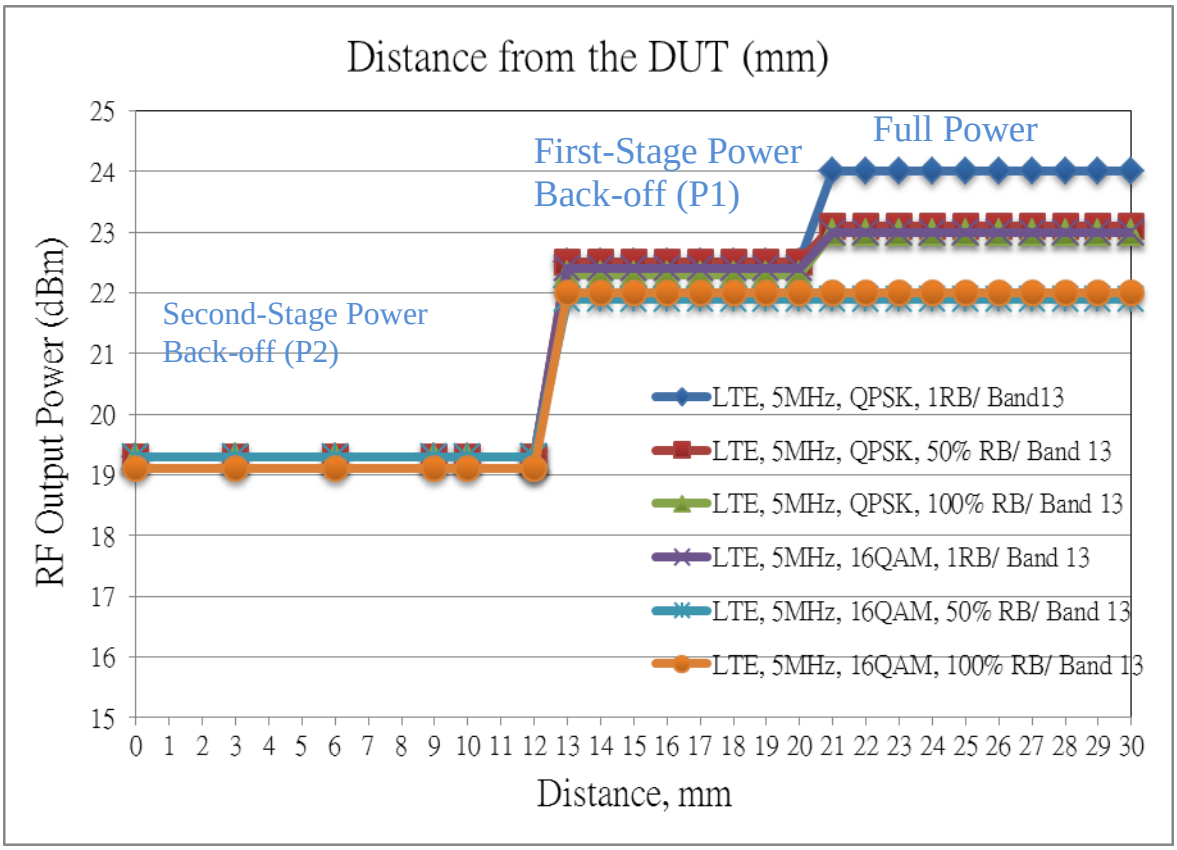


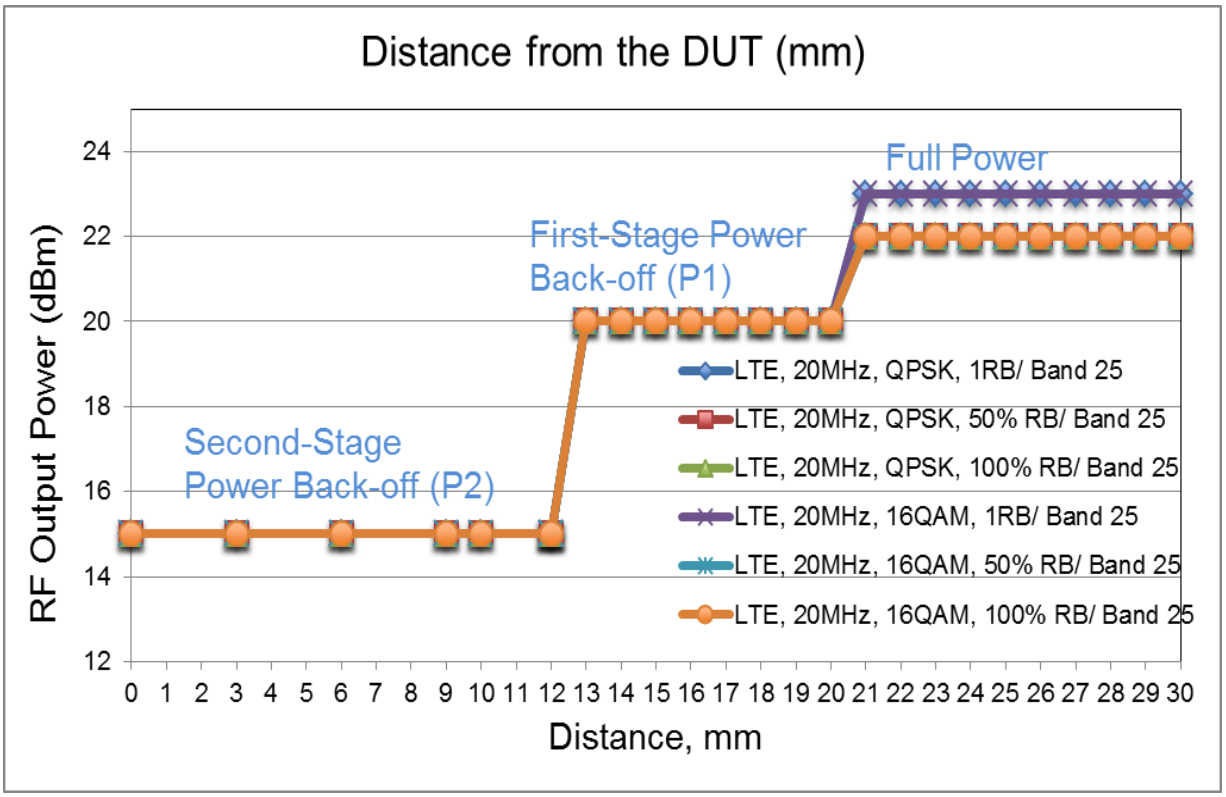


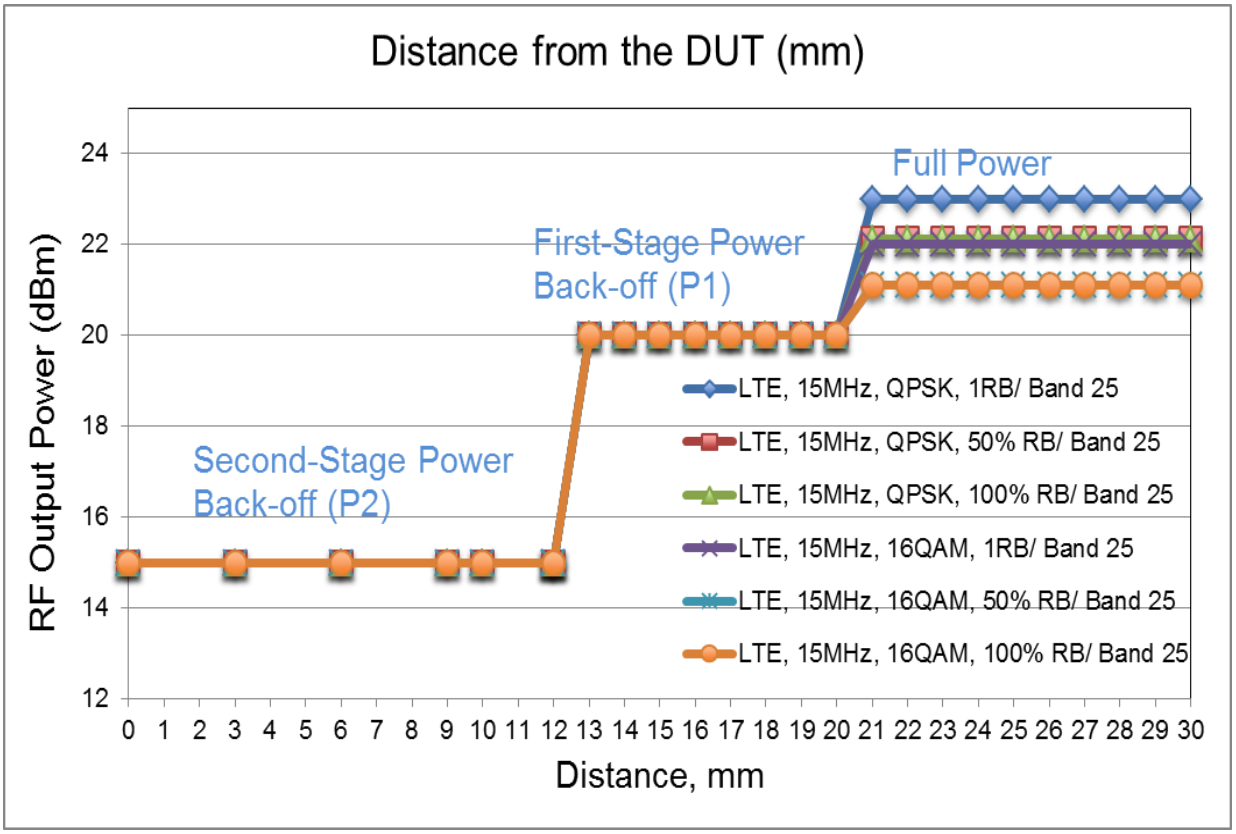


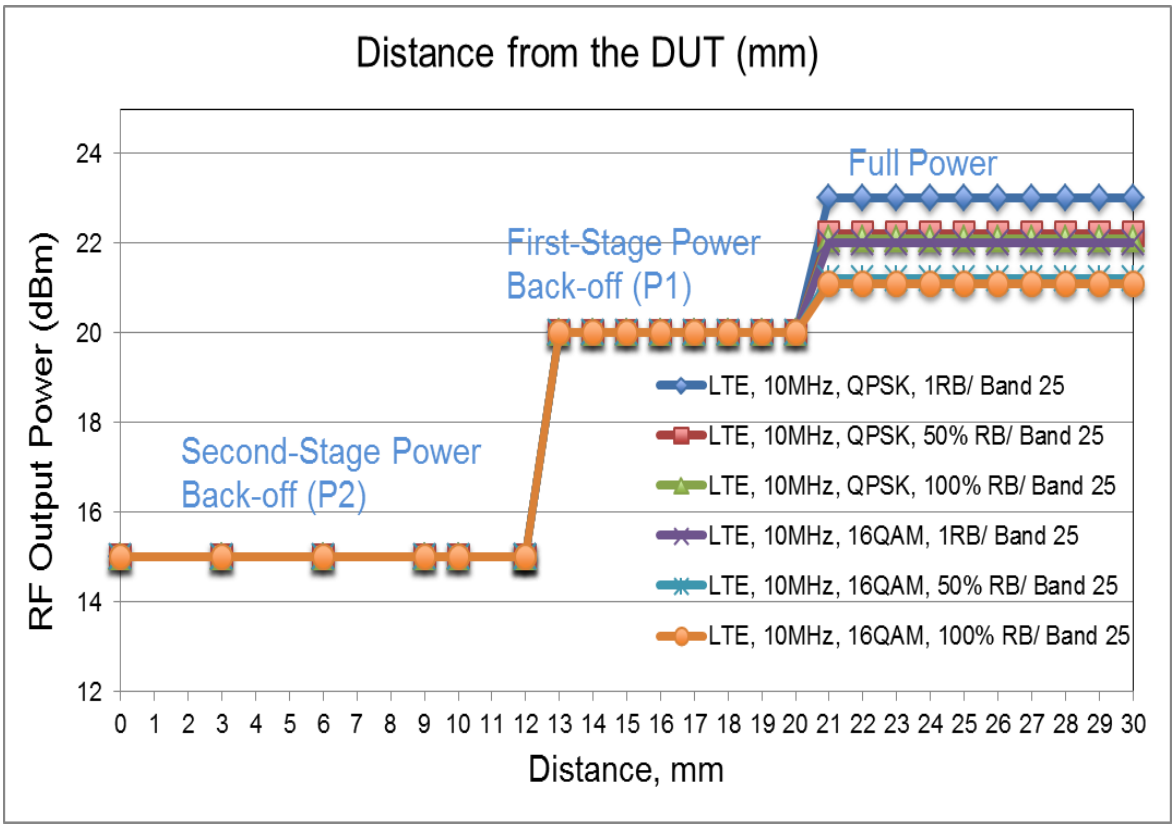


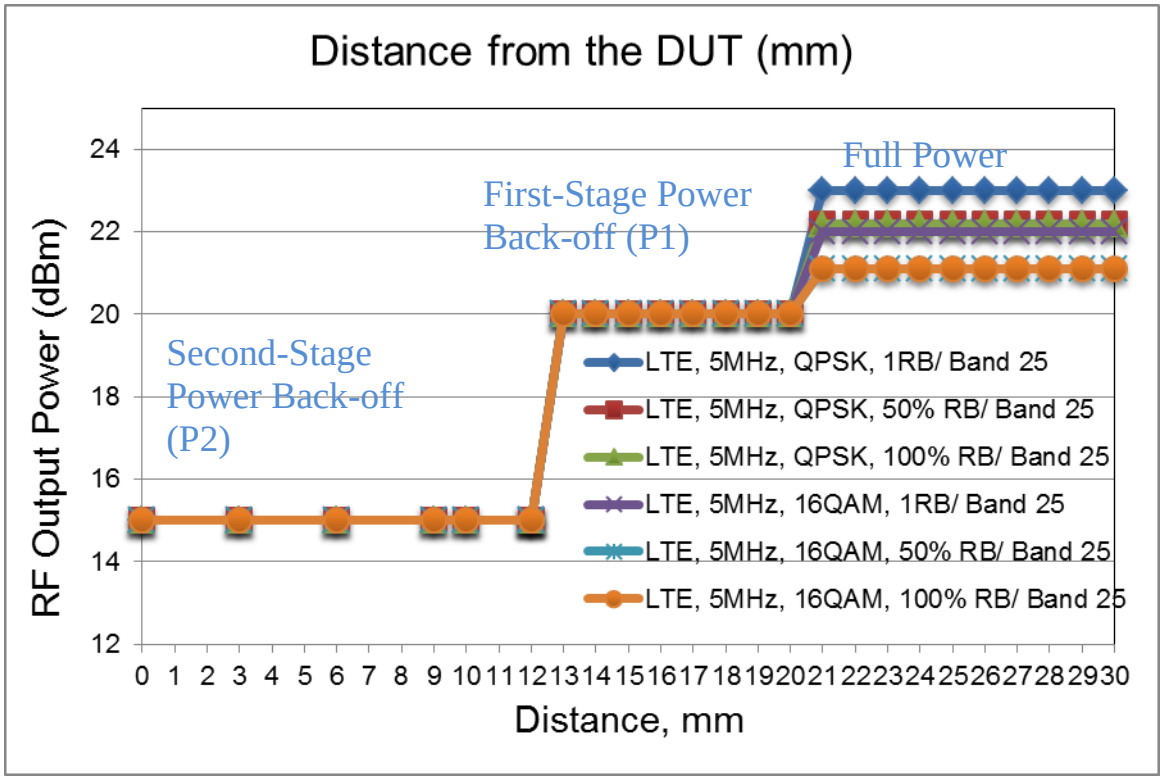


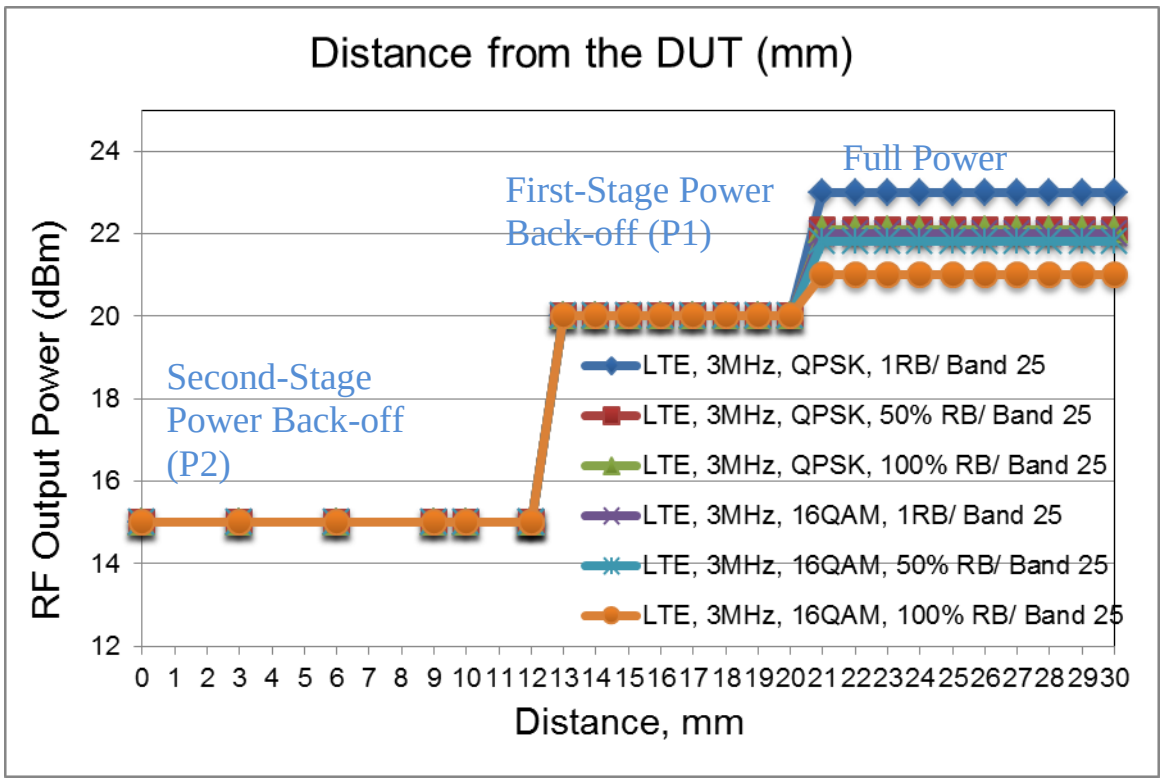


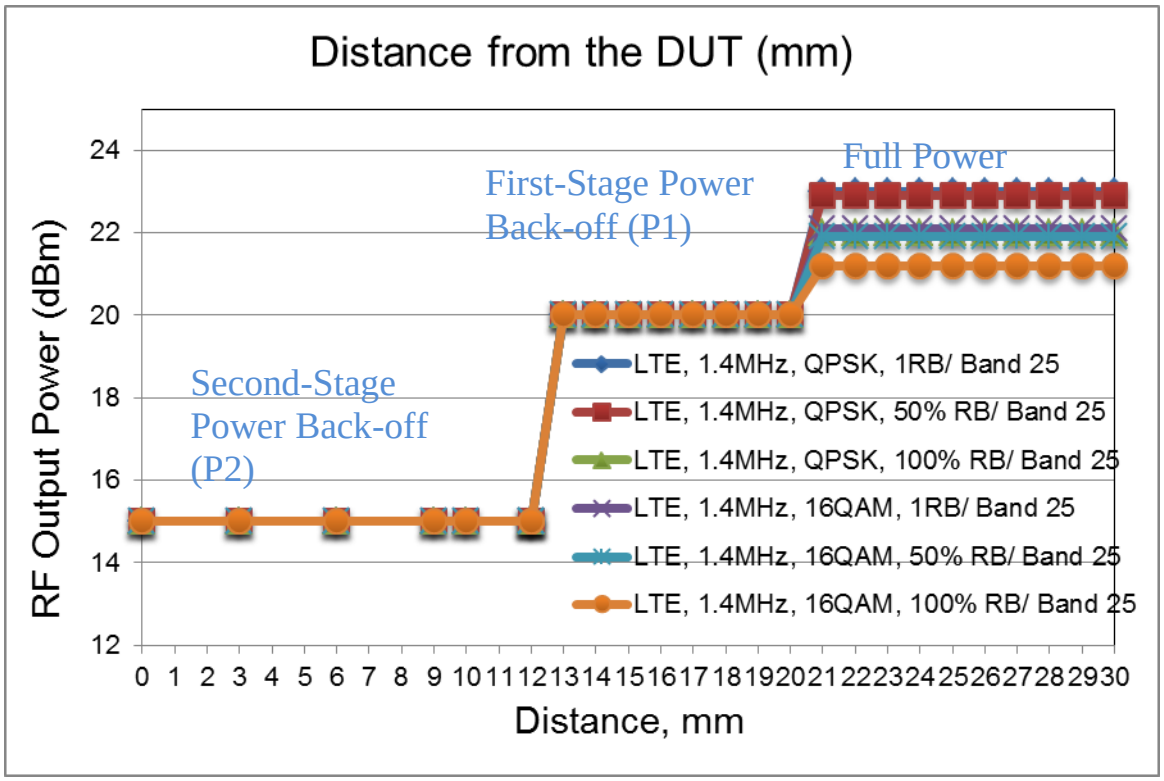












9. Exposure Conditions

Refer to Section 18 “Antenna Location and Separation Distances” for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

9.1. Body

For WiFi

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	8.48mm	Yes	
Edge 1	227.4mm	No	This is not the most conservative antenna-to-user distance at edge mode. According to KDB 447498 4) b) ii) (2)
Edge 2	44.6mm	Yes	
Edge 3	3.75mm	Yes	
Edge 4	111.7mm	No	This is not the most conservative antenna-to-user distance at edge mode. According to KDB 447498 4) b) ii) (2)

For WWAN and LTE

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	2.14mm	Yes	
Edge 1	3.7mm	Yes	
Edge 1 (41° Rear Tilt)	1.98mm	Yes	
Rear (27° Tilt @ Edge 1)	>3.7mm	Yes	
Edge 2	35.1mm	Yes	
Edge 3	99.8mm	No	This is not the most conservative antenna-to-user distance at edge mode. According to KDB 447498 4) b) ii) (2)
Edge 4	225.5mm	No	This is not the most conservative antenna-to-user distance at edge mode. According to KDB 447498 4) b) ii) (2)

Notes:

- Edge 1 = Top Edge
- Edge 2 = Right Edge
- Edge 3 = Bottom Edge
- Edge 4 = Left Edge
- Edge 1 (41° Rear Tilt) = Top Edge/Right Corner Tilt 41°
- Rear (27° Tilt @ Edge 1) = Right Edge Tilt 27°

10. RF Output Power Measurement

10.1. GSM850

Without Power Back-off

GPRS (GMSK) - Coding Scheme: CS1

Band	Ch No.	Freq. (MHz)	Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr
850	128	824.2	33.5	24.5	**32.8**	26.8
	190	836.6	33.3	24.3	**32.7**	26.7
	251	848.8	33.3	24.3	**32.7**	26.7

EGPRS (8PSK) - Coding Scheme: MCS5

Band	Ch No.	Freq. (MHz)	Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr
850	128	824.2	28.8	19.7	28.9	22.8
	190	836.6	28.9	19.9	28.9	22.9
	251	848.8	28.8	19.8	28.8	22.8

With Power Back-off

GPRS (GMSK) - Coding Scheme: CS1

Band	Ch No.	Freq. (MHz)	Avg burst Pwr (dBm)				Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr	1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr
			Second-stage Power Back-off				First-Stage Power Back-off			
850	128	824.2	28.2	19.2	**25.2**	19.2	32.0	23.0	**31.3**	25.2
	190	836.6	28.3	19.3	**25.3**	19.3	32.0	23.0	**31.2**	25.2
	251	848.8	28.3	19.3	**25.3**	19.3	32.0	23.0	**31.2**	25.2

EGPRS (8PSK) - Coding Scheme: MCS5

Band	Ch No.	Freq. (MHz)	Avg burst Pwr (dBm)				Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr	1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr
			Second-stage Power Back-off				First-Stage Power Back-off			
850	128	824.2	28.2	19.2	25.0	19.0	29.0	20.0	29.0	23.0
	190	836.6	28.2	19.2	25.0	19.0	29.0	20.0	29.0	23.0
	251	848.8	28.2	19.2	25.0	19.0	29.0	20.0	29.0	23.0

Notes:

The worst-case configuration and mode for SAR testing is determined to be as follows:

- GMSK (GPRS) mode with 2 time slots, based on the output power measurements above
- SAR is not required for EGPRS (8PSK) Mode because its output power is less than that of GPRS Mode

10.2. GSM1900

Without Power Back-off

GPRS (GMSK) - Coding Scheme: CS1

Band	Ch No.	Freq. (MHz)	Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr
1900	512	1850.2	30.5	21.5	**29.3**	23.3
	661	1880.0	30.4	21.4	**29.3**	23.3
	810	1909.8	30.4	21.4	**29.3**	23.3

EGPRS (8PSK) - Coding Scheme: MCS5

Band	Ch No.	Freq. (MHz)	Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr
1900	512	1850.2	28.0	19.0	28.0	22.0
	661	1880.0	28.0	19.0	28.0	22.0
	810	1909.8	28.0	19.0	28.0	22.0

With Power Back-off

GPRS (GMSK) - Coding Scheme: CS1

Band	Ch No.	Freq. (MHz)	Avg burst Pwr (dBm)				Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr	1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr
			Second-stage Power Back-off				First-Stage Power Back-off			
1900	512	1850.2	24.9	15.9	**22.0**	16.0	27.5	18.5	**26.3**	20.3
	661	1880.0	24.8	15.8	**22.0**	16.0	27.4	18.4	**26.3**	20.3
	810	1909.8	24.8	15.8	**22.0**	16.0	27.5	18.5	**26.2**	20.2

EGPRS (8PSK) - Coding Scheme: MCS5

Band	Ch No.	Freq. (MHz)	Avg burst Pwr (dBm)				Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr	1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr
			Second-stage Power Back-off				First-Stage Power Back-off			
1900	512	1850.2	24.8	15.8	21.8	15.8	27.4	18.4	26.1	20.1
	661	1880.0	24.8	15.8	21.8	15.8	27.4	18.4	26.1	20.1
	810	1909.8	24.8	15.8	21.8	15.8	27.4	18.4	26.0	20.0

Notes:

The worst-case configuration and mode for SAR testing is determined to be as follows:

- GMSK (GPRS) mode with 2 time slots, based on the output power measurements above
- SAR is not required for EGPRS (8PSK) Mode because its output power is less than that of GPRS Mode

10.3. W-CDMA Band V

Release 99

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	βc/βd	8/15

Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)		
				Without Pwr Back-off	With Pwr Back-off	
					Second-stage	First-Stage
W-CDMA Band V	Rel 99 (RMC, 12.2 kbps)	4132	826.4	24.5	19.5	23.0
		4183	836.6	24.4	19.4	22.9
		4233	846.6	24.4	19.4	22.9

HSDPA

The following 4 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
W-CDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm 2			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	βc/βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	CM (dB)	0	1	1.5	1.5
HSDPA Specific Settings	D_{ACK}	8			
	D_{NAK}	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	Ahs =βhs/βc	30/15			

Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)		
				Without Pwr Back-off	With Pwr Back-off	
					Second-stage	First-Stage
W-CDMA Band V	Subtest 1	4132	826.4	23.6	19.5	23.0
		4183	836.6	23.5	19.4	22.9
		4233	846.6	23.4	19.5	22.9
	Subtest 2	4132	826.4	23.7	19.4	23.0
		4183	836.6	23.5	19.4	22.9
		4233	846.6	23.5	19.5	22.9
	Subtest 3	4132	826.4	23.0	19.4	23.0
		4183	836.6	23.0	19.5	22.9
		4233	846.6	23.0	19.4	22.9
	Subtest 4	4132	826.4	23.1	19.4	23.0
		4183	836.6	23.0	19.4	22.9
		4233	846.6	22.9	19.5	22.9

Maximum output power levels that are possible for all subtests reported.

Note(s):

KDB 941225 D01 – Body SAR is not required for HSDPA when the maximum average output of each RF channel with HSDPA active is less than ¼ dB higher than that measured without HSDPA using 12.2 kbps RMC or the maximum SAR for 12.2 kbps RMC is < 75% of the SAR limit.

HSPA (HSDPA & HSUPA)

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSPA	HSPA	HSPA	HSPA	HSPA
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm2				
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	15/15
	βec	209/225	12/15	30/15	2/15	24/15
	βc/βd	11/15	6/15	15/9	2/15	15/15
	βhs	22/15	12/15	30/15	4/15	30/15
	βed	1309/225	94/75	47/15 47/15	56/75	134/15
	CM (dB)	1.0	3.0	2.0	3.0	1.0
	MPR (dB)	0	2	1	2	0
HSDPA Specific Settings	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	Ahs = βhs/βc	30/15				
HSUPA Specific Settings	D E-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	81
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_TFCIs	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 92 E-TFCI PO 18	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27	

Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)		
				Without Pwr Back-off	With Pwr Back-off	
					Second-stage	First-Stage
W-CDMA Band V	Subtest 1	4132	826.4	23.5	19.5	22.9
		4183	836.6	23.6	19.4	22.9
		4233	846.6	23.5	19.5	23.0
	Subtest 2	4132	826.4	23.6	19.4	22.9
		4183	836.6	23.8	19.4	22.9
		4233	846.6	23.7	19.5	23.0
	Subtest 3	4132	826.4	23.7	19.4	23.0
		4183	836.6	23.8	19.5	22.9
		4233	846.6	23.7	19.4	22.9
	Subtest 4	4132	826.4	22.7	19.5	22.7
		4183	836.6	22.8	19.5	22.7
		4233	846.6	22.8	19.4	22.7
	Subtest 5	4132	826.4	23.4	19.4	22.9
		4183	836.6	23.5	19.5	23.0
		4233	846.6	23.5	19.4	22.9

Note(s):

KDB 941225 D01 – Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit.

DC-HSDPA (Rel 8, CAT 24)

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS34.108 v9.5.0. A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0

Table E.5.0: Levels for HSDPA connection setup

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH _Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-3.1

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table. Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

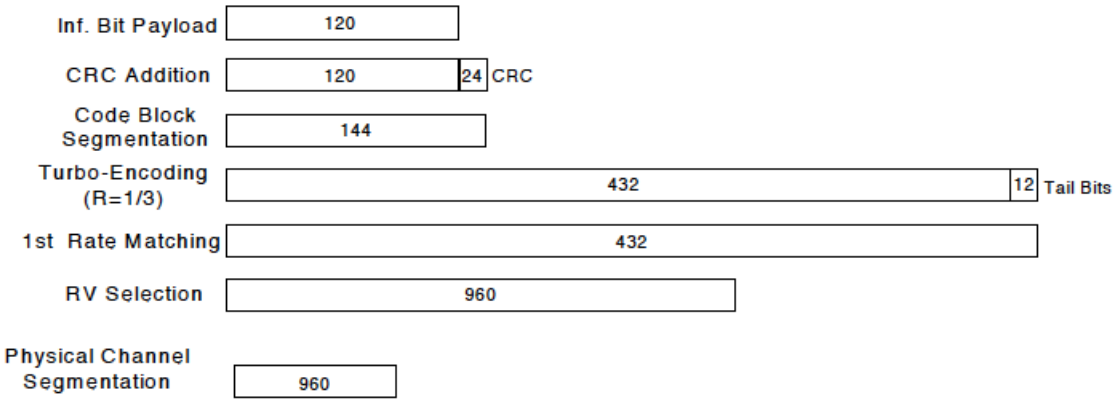


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

The following 5 Sub-tests for HSDPA were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of subtest settings are illustrated below:

	Mode	Rel6 HSDPA	Rel6 HSDPA	Rel6 HSDPA	Rel6 HSDPA
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm2			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	βd (SF)	64			
	βc/βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	MPR	0	0	0.5	0.5
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack Repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	Ahs = βhs/ βc	30/15			

Up commands are set continuously to set the UE to Max power.

Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)		
				Without Pwr Back-off	With Pwr Back-off	
					Second-stage	First-Stage
W-CDMA Band V	Subtest 1	4132	826.4	23.5	19.4	22.9
		4183	836.6	23.4	19.4	22.9
		4233	846.6	23.4	19.5	22.9
	Subtest 2	4132	826.4	23.3	19.4	23.0
		4183	836.6	23.4	19.5	22.9
		4233	846.6	23.4	19.4	22.9
	Subtest 3	4132	826.4	22.8	19.5	22.8
		4183	836.6	22.9	19.5	22.8
		4233	846.6	22.8	19.4	22.8
	Subtest 4	4132	826.4	22.8	19.4	22.8
		4183	836.6	22.9	19.4	22.8
		4233	846.6	22.8	19.4	22.8

HSPA+

Since 16QAM is not used for uplink, the uplink Category and release is same as HSUPA, i.e., CAT 6 Rel 6. Therefore, the RF conducted power is not measured.

10.4. W-CDMA Band II

Release 99

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	βc/βd	8/15

Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)		
				Without Pwr Back-off	With Pwr Back-off	
					Second-stage	First-Stage
W-CDMA (UMTS) Band II	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	23.0	15.3	20.0
		9400	1880.0	22.9	15.2	19.8
		9538	1907.6	23.0	15.5	20.0

HSDPA

The following 4 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
W-CDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm 2			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	βc/βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	CM (dB)	0	1	1.5	1.5
HSDPA Specific Settings	D_{ACK}	8			
	D_{NAK}	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	Ahs =βhs/βc	30/15			

Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)		
				Without Pwr Back-off	With Pwr Back-off	
					Second-stage	First-Stage
W-CDMA Band II	Subtest 1	9262	1852.4	22.8	15.5	19.9
		9400	1880.0	22.7	15.4	19.8
		9538	1907.6	22.8	15.5	20.0
	Subtest 2	9262	1852.4	22.8	15.4	19.8
		9400	1880.0	22.8	15.5	19.9
		9538	1907.6	22.9	15.5	19.8
	Subtest 3	9262	1852.4	22.5	15.4	19.8
		9400	1880.0	22.5	15.5	20.0
		9538	1907.6	22.5	15.4	19.8
	Subtest 4	9262	1852.4	22.5	15.5	19.9
		9400	1880.0	22.5	15.4	20.0
		9538	1907.6	22.5	15.5	19.9

Maximum output power levels that are possible for all subtests reported.

Note(s):

KDB 941225 D01 – Body SAR is not required for HSDPA when the maximum average output of each RF channel with HSDPA active is less than ¼ dB higher than that measured without HSDPA using 12.2 kbps RMC or the maximum SAR for 12.2 kbps RMC is < 75% of the SAR limit.

HSPA (HSDPA & HSUPA)

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSPA	HSPA	HSPA	HSPA	HSPA
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm2				
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	15/15
	βec	209/225	12/15	30/15	2/15	24/15
	βc/βd	11/15	6/15	15/9	2/15	15/15
	βhs	22/15	12/15	30/15	4/15	30/15
	βed	1309/225	94/75	47/15 47/15	56/75	134/15
	CM (dB)	1.0	3.0	2.0	3.0	1.0
	MPR (dB)	0	2	1	2	0
HSDPA Specific Settings	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	Ahs = βhs/βc	30/15				
HSUPA Specific Settings	D E-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	81
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_TFCIs	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 92 E-TFCI PO 18	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27	

Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)		
				Without Pwr Back-off	With Pwr Back-off	
					Second-stage	First-Stage
W-CDMA Band II	Subtest 1	9262	1852.4	22.8	15.4	20.0
		9400	1880.0	23.0	15.5	19.8
		9538	1907.6	22.9	15.4	20.0
	Subtest 2	9262	1852.4	20.6	15.5	19.8
		9400	1880.0	20.6	15.4	19.8
		9538	1907.6	20.6	15.4	20.0
	Subtest 3	9262	1852.4	22.1	15.5	20.0
		9400	1880.0	22.2	15.4	19.8
		9538	1907.6	22.2	15.5	19.7
	Subtest 4	9262	1852.4	20.6	15.4	19.8
		9400	1880.0	20.6	15.5	20.0
		9538	1907.6	20.7	15.4	20.0
	Subtest 5	9262	1852.4	23.0	15.4	19.8
		9400	1880.0	23.0	15.5	19.7
		9538	1907.6	22.9	15.4	19.8

Note(s):

KDB 941225 D01 – Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit.

DC-HSDPA (Rel 8, CAT 24)

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS34.108 v9.5.0. A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0

Table E.5.0: Levels for HSDPA connection setup

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH _Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-3.1

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Proces ses	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table. Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

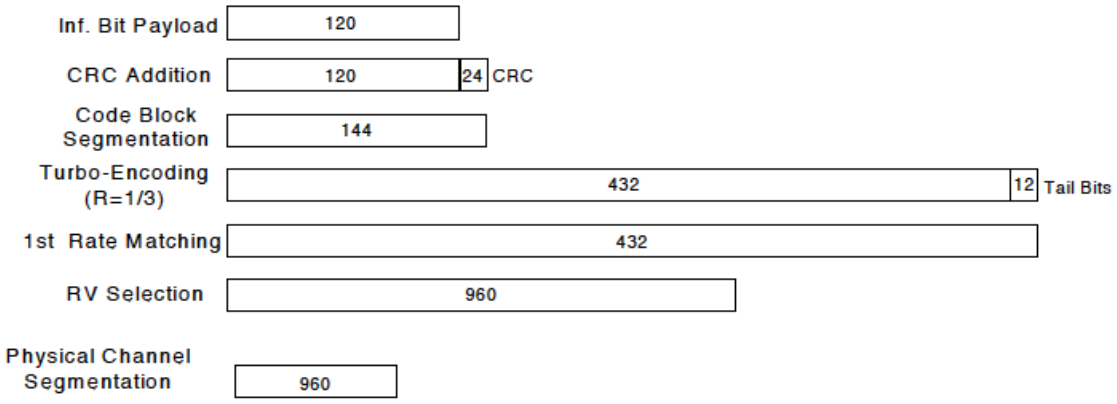


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

The following 5 Sub-tests for HSDPA were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of subtest settings are illustrated below:

	Mode	Rel6 HSDPA	Rel6 HSDPA	Rel6 HSDPA	Rel6 HSDPA
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm2			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	βd (SF)	64			
	βc/βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	MPR	0	0	0.5	0.5
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack Repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	Ahs = βhs/ βc	30/15			

Up commands are set continuously to set the UE to Max power.

Results

Band	Mode	UL Ch No.	Freq. (MHz)	Avg Pwr (dBm)		
				Without Pwr Back-off	With Pwr Back-off	
					Second-stage	First-Stage
W-CDMA Band II	Subtest 1	9262	1852.4	23.0	15.5	20.0
		9400	1880.0	23.0	15.4	19.8
		9538	1907.6	22.9	15.5	20.0
	Subtest 2	9262	1852.4	23.0	15.5	19.8
		9400	1880.0	22.9	15.4	20.0
		9538	1907.6	22.9	15.5	19.8
	Subtest 3	9262	1852.4	22.7	15.4	19.9
		9400	1880.0	22.6	15.5	19.8
		9538	1907.6	22.6	15.4	19.9
	Subtest 4	9262	1852.4	22.7	15.5	20.0
		9400	1880.0	22.6	15.4	19.8
		9538	1907.6	22.7	15.4	19.9

HSPA+

Since 16QAM is not used for uplink, the uplink Category and release is same as HSUPA, i.e., CAT 6 Rel 6. Therefore, the RF conducted power is not measured.

10.5. CDMA BC0

1xRTT

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

Application	Rev, License
CDMA2000 Mobile Test	B.13.08, L

- Call Setup > Shift & Preset
- Cell Info > Cell Parameters > System ID (SID) > 387 for BC0
  > Network ID (NID) > 65535
- Protocol Rev > 6 (IS-2000-0)
- Radio Config (RC) > Please see following table or details
- FCH Service Option (SO) Setup > Please see following table or details
- Traffic Data Rate > Full
- TDSO SCH Info > F-SCH Parameters > F-SCH Data Rate > 153.6 kbps
  > R-SCH Parameters > R-SCH Data Rate > 153.6 kbps
- Rvs Power Ctrl > Active bits
  - Rvs Power Ctrl > All Up bits (Maximum TxPout)

RESULTS

Band	Mode	Ch	Freq. (MHz)	Avg Pwr (dBm)		
				Without Pwr Back-off	With Pwr Back-off	
					Second-stage	First-Stage
BC 0	RC1 SO55 (Loopback)	1013	824.7	24.6	19.2	23.3
		384	836.52	24.6	19.1	23.2
		777	848.31	24.5	19.2	23.3
	RC3 SO55 (Loopback)	1013	824.7	24.6	19.2	23.3
		384	836.52	24.6	19.1	23.2
		777	848.31	24.3	19.1	23.3
	RC3 SO32 ((+F-SCH))	1013	824.7	24.7	19.2	23.2
		384	836.52	24.7	19.3	23.3
		777	848.31	24.6	19.1	23.2

1xEv-Do Rel. 0

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

Application	Rev, License
1xEV-DO Terminal Test	B.13.10, L

EVDO Release 0 - RTAPS

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00000000 : 00000000 : 00000000 : 00000000 >
  - Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Parms:
  - Cell Power > -93 dBm/1.23 MHz
  - System ID: 331; NID: 65535, Reg. Ch. #.: 610 for BC0, 600 for BC1 & 500 for BC10
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > RTAP
  - RTAP Rate > 153.6 kbps
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

EVDO Release 0 - FTAP

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00000000 : 00000000 : 00000000 : 00000000 >
  - Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Parms:
  - Cell Power > -93 dBm/1.23 MHz
  - Cell Band > (Select US Cellular or US PCS)
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > FTAP (default)
  - FTAP Rate > 307.2 kbps (2 Slot, QPSK)
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

RESULTS

Band	FETAP Traffic Format	RETAP Data Payload Size	Channel	f (MHz)	Avg Pwr (dBm)		
					Without Pwr Back-	With Pwr Back-off	
						Second-stage	First-Stage
BC0	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	1013	824.70	24.8	19.3	23.3
			384	836.52	24.7	19.2	23.2
			777	848.31	24.6	19.1	23.1

1xEv-Do Rev. A

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

Application	Rev, License
1xEV-DO Terminal Test	B.13.10, L

EVDO Rev. A – RETAP

- Call Setup > Shift & Preset
- Cell Power > --93 and -96 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > RETAP
- R-Data Pkt Size > 4096
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots
- Rvs Power Ctrl > All Up bits (to get the maximum power)

EVDO Rev. A - FETAP

- Call Setup > Shift & Preset
- Cell Power > -93, and -96 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > FETAP
- F-Traffic Format > 4 (1024, 2,128) Canonical (307.2k, QPSK)
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
- PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots
- Rvs Power Ctrl > All Up bits (to get the maximum power)

RESULTS

Band	FETAP Traffic Format	RETAP Data Payload Size	Channel	f (MHz)	Avg Pwr (dBm)		
					Without Pwr Back-	With Pwr Back-off	
						Second-stage	First-Stage
BC0	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	1013	824.70	24.8	19.3	23.3
			384	836.52	24.6	19.2	23.2
			777	848.31	24.7	19.1	23.1

1xEv-Do Rev. B

This procedure assumes the Rohde & Schwarz CMW 500 CDMA Rev. B Test Set has the following applications installed and with valid license.

Application	Rev, License
1xEV-DO Terminal Test	V.2.1.25

1xEV-DO Release B –

- CMW 500 Signal Generator > 1xEV-DO Taskbar Enable
- CMW 500 1xEV-DO Signaling Configuration Window >
- 1xEV-DO Signaling On Window:
  Under Access Network Control:
  Band Class: BC0: US Cellular
  RF Channel: 31
  1xEV-DO Power: -70 dBm
  Release B

- 1xEV-DO Signaling Configuration Window

  Under RF Frequency Band / Channel: Enter Ch. Frequency
  - Under Carrier Configuration: RF Frequency
    For Two Carriers: Low Channel (1013)

	RF Channel	RF Channel Offset
Carrier [0]	31	0
Carrier [1]	1013	982

  - Under Carrier Configuration: RF Pilot

	Carrier Sector	Active on AN	Assigned to AT
Pilot [0]	C0/S0	✓	✓
	CA/S1	✓	✓

    For Three Carriers: Low Channel (1013)

	RF Channel	RF Channel Offset
Carrier [0]	72	0
Carrier [1]	31	-41
Carrier [2]	1013	941

  - Under Carrier Configuration: RF Pilot

	Carrier Sector	Active on AN	Assigned to AT
Pilot [0]	C0/S0	✓	✓
Pilot [1]	C1/S1	✓	✓
Pilot [2]	C2/S2	✓	✓

- Rvs Power Ctrl > All Up bits (to get the maximum power)

RESULTS

Two Carrier Mini Separation

Band	Test Set #	Channel	f (MHz)	Avg Pwr (dBm)		
				Without Pwr Back-off	With Pwr Back-off	
					Second-stage	First-Stage
BC0	1	1013+31	824.70+825.93	21.5	19.2	21.5
		384+425	836.52+837.75	21.5	19.2	21.4
		736+777	847.08+848.31	21.5	19.1	21.4

Two Carrier Max Separation

Band	Test Set #	Channel	f (MHz)	Avg Pwr (dBm)		
				Without Pwr Back-off	With Pwr Back-off	
					Second-stage	First-Stage
BC0	2	1013+156	824.70+829.68	21.5	19.1	21.4
		384+550	836.52+841.50	21.5	19.3	21.3
		611+777	843.33+848.31	21.5	19.2	21.3

Three Carrier Min Separation

Band	Test Set #	Channel	f (MHz)	Avg Pwr (dBm)		
				Without Pwr Back-off	With Pwr Back-off	
					Second-stage	First-Stage
BC0	3	1013+31+72	824.70+825.93+827.16	21.0	19.2	21.0
		384+425+466	836.52+837.75+838.98	21.0	19.2	21.0
		695+736+777	845.85+847.08+848.31	21.0	19.1	21.0

10.6. CDMA BC1

Only Model A1460 supports EVDO Rev B in BC0 for 16QAM only. Device does not support simultaneous EV-DO Rev.B and voice. Device will use carriers as assigned by network. All channels are tested at max power without independent power control.

1xRTT

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

Application	Rev, License
CDMA2000 Mobile Test	B.13.08, L

- Call Setup > Shift & Preset
- Cell Info > Cell Parameters > System ID (SID) > 600 for BC1
  > Network ID (NID) > 65535
- Protocol Rev > 6 (IS-2000-0)
- Radio Config (RC) > Please see following table or details
- FCH Service Option (SO) Setup > Please see following table or details
- Traffic Data Rate > Full
- TDSO SCH Info > F-SCH Parameters > F-SCH Data Rate > 153.6 kbps
  > R-SCH Parameters > R-SCH Data Rate > 153.6 kbps
- Rvs Power Ctrl > Active bits
  - Rvs Power Ctrl > All Up bits (Maximum TxPout)

RESULTS

Band	Mode	Ch	Freq. (MHz)	Avg Pwr (dBm)		
				Without Pwr Back-off	With Pwr Back-off	
					Second-stage	First-Stage
BC 1	RC1 SO55 (Loopback)	25	1851.25	22.9	15.3	19.9
		600	1880.00	22.9	15.3	19.9
		1175	1908.75	22.8	15.3	20.0
	RC3 SO55 (Loopback)	25	1851.25	22.8	15.3	20.0
		600	1880.00	22.9	15.3	19.9
		1175	1908.75	22.8	15.2	19.9
	RC3 SO32 ((+F-SCH))	25	1851.25	23.0	15.3	20.0
		600	1880.00	22.9	15.3	19.9
		1175	1908.75	22.9	15.2	20.0

1xEv-Do Rel. 0

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

Application	Rev, License
1xEV-DO Terminal Test	B.13.10, L

EVDO Release 0 - RTAPS

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00000000 : 00000000 : 00000000 : 00000000 >
  - Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Parms:
  - Cell Power > -93 dBm/1.23 MHz
  - System ID: 331; NID: 65535, Reg. Ch. #.: 610 for BC0, 600 for BC1 & 500 for BC10
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > RTAP
  - RTAP Rate > 153.6 kbps
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

EVDO Release 0 - FTAP

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00000000 : 00000000 : 00000000 : 00000000 >
  - Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Parms:
  - Cell Power > -93 dBm/1.23 MHz
  - Cell Band > (Select US Cellular or US PCS)
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > FTAP (default)
  - FTAP Rate > 307.2 kbps (2 Slot, QPSK)
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

RESULTS

Band	FTAP Rate	RTAP Rate	Channel	f (MHz)	Avg Pwr (dBm)		
					Without Pwr Back-	With Pwr Back-off	
						Second-stage	First-Stage
BC1	307.2 kbps (2 slot, QPSK)	153.6 kbps	25	1851.25	23.0	15.3	20
			600	1880.00	22.8	15.3	20
			1175	1908.75	22.8	15.3	20

1xEv-Do Rev. A

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

Application	Rev, License
1xEV-DO Terminal Test	B.13.10, L

EVDO Rev. A – RETAP

- Call Setup > Shift & Preset
- Cell Power > --93 and -96 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > RETAP
- R-Data Pkt Size > 4096
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots
- Rvs Power Ctrl > All Up bits (to get the maximum power)

EVDO Rev. A - FETAP

- Call Setup > Shift & Preset
- Cell Power > -93, and -96 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > FETAP
- F-Traffic Format > 4 (1024, 2,128) Canonical (307.2k, QPSK)
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
- PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots
- Rvs Power Ctrl > All Up bits (to get the maximum power)

RESULTS

Band	FETAP Traffic Format	RETAP Data Payload Size	Channel	f (MHz)	Avg Pwr (dBm)		
					Without Pwr Back-	With Pwr Back-off	
						Second-stage	First-Stage
BC1	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	25	1851.25	22.8	15.2	19.9
			600	1880.00	22.9	15.2	19.9
			1175	1908.75	22.9	15.1	19.9

10.7. CDMA BC10

Only Model A1460 supports EVDO Rev B in BC0 for 16QAM only. Device does not support simultaneous EV-DO Rev.B and voice. Device will use carriers as assigned by network. All channels are tested at max power without independent power control.

1xRTT

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

Application	Rev, License
CDMA2000 Mobile Test	B.13.08, L

- Call Setup > Shift & Preset
- Cell Info > Cell Parameters > System ID (SID) > 580 (BC10)
  > Network ID (NID) > 65535
- Protocol Rev > 6 (IS-2000-0)
- Radio Config (RC) > Please see following table or details
- FCH Service Option (SO) Setup > Please see following table or details
- Traffic Data Rate > Full
- TDSO SCH Info > F-SCH Parameters > F-SCH Data Rate > 153.6 kbps
  > R-SCH Parameters > R-SCH Data Rate > 153.6 kbps
- Rvs Power Ctrl > Active bits
  - Rvs Power Ctrl > All Up bits (Maximum TxPout)

RESULTS

Band	Mode	Ch	Freq. (MHz)	Avg Pwr (dBm)		
				Without Pwr Back-off	With Pwr Back-off	
					Second-stage	First-Stage
BC 10	RC1 SO55 (Loopback)	476	817.9	24.9	18.7	23.3
		580	820.5	25.0	18.8	23.5
		684	823.1	25.0	18.7	23.3
	RC3 SO55 (Loopback)	476	817.9	24.9	18.7	23.3
		580	820.5	24.9	18.8	23.5
		684	823.1	24.9	18.7	23.4
	RC3 SO32 ((+F-SCH))	476	817.9	24.9	18.7	23.3
		580	820.5	25.0	18.8	23.5
		684	823.1	25.0	18.8	23.4

1xEv-Do Rel. 0

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

Application	Rev, License
1xEV-DO Terminal Test	B.13.10, L

EVDO Release 0 - RTAPS

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00000000 : 00000000 : 00000000 : 00000000 >
  - Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Parms:
  - Cell Power > -93 dBm/1.23 MHz
  - System ID: 331; NID: 65535, Reg. Ch. #.: 610 for BC0, 600 for BC1 & 500 for BC10
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > RTAP
  - RTAP Rate > 153.6 kbps
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

EVDO Release 0 - FTAP

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00000000 : 00000000 : 00000000 : 00000000 >
  - Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Parms:
  - Cell Power > -93 dBm/1.23 MHz
  - Cell Band > (Select US Cellular or US PCS)
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > FTAP (default)
  - FTAP Rate > 307.2 kbps (2 Slot, QPSK)
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

RESULTS

Band	FTAP Rate	RTAP Rate	Channel	f (MHz)	Avg Pwr (dBm)		
					Without Pwr Back-	With Pwr Back-off	
						Second-stage	First-Stage
BC10	307.2 kbps (2 slot, QPSK)	153.6 kbps	476	817.9	24.9	18.8	23.4
			580	820.5	25.0	18.8	23.5
			684	823.1	25.0	18.8	23.5

1xEv-Do Rev. A

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

Application	Rev, License
1xEV-DO Terminal Test	B.13.10, L

EVDO Rev. A – RETAP

- Call Setup > Shift & Preset
- Cell Power > --93 and -96 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > RETAP
- R-Data Pkt Size > 4096
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots
- Rvs Power Ctrl > All Up bits (to get the maximum power)

EVDO Rev. A - FETAP

- Call Setup > Shift & Preset
- Cell Power > -93, and -96 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > FETAP
- F-Traffic Format > 4 (1024, 2,128) Canonical (307.2k, QPSK)
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
- PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots
- Rvs Power Ctrl > All Up bits (to get the maximum power)

RESULTS.

Band	FETAP Traffic Format	RETAP Data Payload Size	Channel	f (MHz)	Avg Pwr (dBm)		
					Without Pwr Back-	With Pwr Back-off	
						Second-stage	First-Stage
BC10	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	476	817.9	25.0	18.8	23.4
			580	820.5	25.0	18.8	23.5
			684	823.1	24.9	18.8	23.5

10.8. LTE Band 5

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of “NS_01”.

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4,10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23[1]	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

Results

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)		
							Without Pwr Back-off	With Pwr Back-off	
								Second-stage	First-Stage
10	20450	829.0	QPSK	1	0	0	24.0	18.7	22.5
				1	24	0	24.0	18.8	22.5
				1	49	0	24.0	18.7	22.4
				25	0	1	23.2	18.7	22.5
				25	12	1	23.0	18.8	22.5
				25	24	1	23.0	18.7	22.5
				50	0	1	23.0	18.7	22.5
			16QAM	1	0	1	22.8	18.7	22.2
				1	24	1	23.1	18.7	22.2
				1	49	1	22.7	18.7	22.1
				25	0	2	22.2	18.7	22.2
				25	12	2	22.0	18.8	22.2
				25	24	2	22.2	18.8	22.2
				50	0	2	22.0	18.8	22.2
	20525	836.5	QPSK	1	0	0	24.0	18.8	22.5
				1	24	0	24.0	18.8	22.5
				1	49	0	24.0	18.8	22.5
				25	0	1	22.9	18.8	22.4
				25	12	1	23.1	18.8	22.4
				25	24	1	22.9	18.8	22.4
				50	0	1	23.0	18.8	22.4
			16QAM	1	0	1	23.0	18.8	22.0
				1	24	1	23.0	18.8	22.0
				1	49	1	22.7	18.8	22.0
				25	0	2	22.2	18.8	22.1
				25	12	2	21.9	18.8	22.2
				25	24	2	22.2	18.8	22.2
				50	0	2	22.1	18.8	22.1
	20600	844.0	QPSK	1	0	0	24.0	18.6	22.5
				1	24	0	23.8	18.8	22.3
				1	49	0	24.0	18.7	22.5
				25	0	1	22.8	18.7	22.5
				25	12	1	23.1	18.8	22.4
				25	24	1	22.9	18.7	22.5
				50	0	1	23.0	18.7	22.5
			16QAM	1	0	1	23.0	18.7	22.0
				1	24	1	22.8	18.7	22.0
				1	49	1	22.7	18.4	22.0
				25	0	2	22.3	18.8	22.1
				25	12	2	22.0	18.8	22.1
				25	24	2	22.0	18.8	22.0
				50	0	2	22.0	18.8	22.0

LTE Band 5 Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)		
							Without Pwr Back-off	With Pwr Back-off	
								Second-stage	First-Stage
5	20425	826.5	QPSK	1	0	0	24.0	18.7	22.5
				1	12	0	24.0	18.8	22.5
				1	24	0	23.9	18.7	22.5
				12	0	1	23.2	18.7	22.5
				12	6	1	22.9	18.8	22.4
				12	11	1	23.1	18.7	22.4
				25	0	1	22.9	18.8	22.4
			16QAM	1	0	1	22.9	18.7	22.2
				1	12	1	23.0	18.7	22.0
				1	24	1	22.9	18.7	22.1
				12	0	2	22.1	18.8	22.0
				12	6	2	21.7	18.8	22.0
				12	11	2	22.1	18.8	22.0
				25	0	2	21.9	18.8	22.0
	20525	836.5	QPSK	1	0	0	24.0	18.7	22.5
				1	12	0	24.0	18.8	22.5
				1	24	0	24.0	18.8	22.5
				12	0	1	23.2	18.7	22.4
				12	6	1	22.9	18.8	22.4
				12	11	1	23.1	18.7	22.4
				25	0	1	22.9	18.8	22.4
			16QAM	1	0	1	22.9	18.8	22.0
				1	12	1	22.8	18.8	21.8
				1	24	1	22.9	18.7	22.0
				12	0	2	22.0	18.8	22.0
				12	6	2	21.8	18.8	22.0
				12	11	2	22.0	18.7	22.0
				25	0	2	21.8	18.8	22.0
	20625	846.5	QPSK	1	0	0	24.0	18.8	22.5
				1	12	0	24.0	18.8	22.3
				1	24	0	23.9	18.4	22.5
				12	0	1	23.2	18.8	22.4
				12	6	1	22.9	18.8	22.4
				12	11	1	23.2	18.8	22.4
				25	0	1	22.9	18.7	22.4
			16QAM	1	0	1	22.9	18.8	22.1
				1	12	1	23.0	18.7	22.0
				1	24	1	22.9	18.4	22.0
				12	0	2	22.1	18.8	22.0
				12	6	2	21.8	18.8	22.0
				12	11	2	22.1	18.8	22.0
				25	0	2	21.9	18.8	22.0

LTE Band 5 Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)		
							Without Pwr Back-off	With Pwr Back-off	
								Second-stage	First-Stage
3	20415	825.5	QPSK	1	0	0	23.8	18.7	22.4
				1	7	0	24.0	18.8	22.4
				1	14	0	23.8	18.8	22.4
				8	0	1	23.2	18.7	22.4
				8	4	1	22.9	18.8	22.4
				8	7	1	23.2	18.8	22.4
				15	0	1	22.9	18.8	22.4
			16QAM	1	0	1	22.9	18.7	22.1
				1	7	1	23.1	18.7	22.1
				1	14	1	22.8	18.8	22.0
				8	0	2	22.3	18.8	22.0
				8	4	2	22.3	18.8	22.0
				8	7	2	22.3	18.8	22.1
				15	0	2	22.0	18.8	22.0
	20525	836.5	QPSK	1	0	0	23.8	18.7	22.4
				1	7	0	24.0	18.8	22.5
				1	14	0	23.7	18.8	22.4
				8	0	1	23.2	18.7	22.4
				8	4	1	22.8	18.8	22.4
				8	7	1	23.1	18.8	22.4
				15	0	1	22.8	18.8	22.4
			16QAM	1	0	1	22.8	18.8	22.0
				1	7	1	23.0	18.7	22.0
				1	14	1	22.6	18.8	22.0
				8	0	2	22.2	18.8	21.9
				8	4	2	22.2	18.7	22.0
				8	7	2	22.2	18.8	21.9
				15	0	2	22.1	18.8	21.9
	20634	847.4	QPSK	1	0	0	23.8	18.8	22.4
				1	7	0	23.8	18.8	22.4
				1	14	0	23.8	18.4	22.4
				8	0	1	23.1	18.8	22.3
				8	4	1	22.9	18.8	22.4
				8	7	1	23.1	18.7	22.4
				15	0	1	22.9	18.8	22.4
			16QAM	1	0	1	22.8	18.8	21.9
				1	7	1	22.7	18.7	22.0
				1	14	1	22.7	18.4	21.9
				8	0	2	22.2	18.8	22.0
				8	4	2	22.2	18.8	22.0
				8	7	2	22.1	18.8	21.8
				15	0	2	22.2	18.8	21.9

LTE Band 5 Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)		
							Without Pwr Back-off	With Pwr Back-off	
								Second-stage	First-Stage
1.4	20407	824.7	QPSK	1	0	0	24.0	18.7	22.4
				1	2	0	24.0	18.8	22.4
				1	5	0	23.9	18.8	22.4
				3	0	1	23.9	18.7	22.3
				3	1	1	23.8	18.8	22.4
				3	2	1	23.8	18.8	22.4
				6	0	1	22.7	18.7	22.4
			16QAM	1	0	1	22.7	18.8	22.0
				1	2	1	23.0	18.8	22.0
				1	5	1	22.7	18.7	22.0
				3	0	1	22.8	18.8	22.0
				3	1	1	22.8	18.8	22.0
				3	2	1	22.8	18.8	22.0
				6	0	2	22.1	18.8	21.9
	20525	836.5	QPSK	1	0	0	23.9	18.7	22.4
				1	2	0	24.0	18.8	22.4
				1	5	0	23.9	18.8	22.3
				3	0	1	23.8	18.7	22.3
				3	1	1	23.8	18.8	22.4
				3	2	1	23.8	18.8	22.4
				6	0	1	22.8	18.8	22.3
			16QAM	1	0	1	23.1	18.8	21.8
				1	2	1	23.0	18.8	21.9
				1	5	1	22.9	18.7	21.8
				3	0	1	22.9	18.8	21.9
				3	1	1	22.9	18.8	21.9
				3	2	1	22.8	18.7	21.9
				6	0	2	22.0	18.8	21.8
	20642	848.2	QPSK	1	0	0	23.9	18.8	22.4
				1	2	0	24.0	18.8	22.3
				1	5	0	23.9	18.4	22.4
				3	0	1	23.7	18.8	22.3
				3	1	1	23.7	18.8	22.4
				3	2	1	23.7	18.8	22.3
				6	0	1	22.7	18.7	22.4
			16QAM	1	0	1	22.8	18.8	22.0
				1	2	1	22.8	18.8	21.8
				1	5	1	22.7	18.4	21.8
				3	0	1	22.9	18.8	21.8
				3	1	1	22.9	18.8	21.9
				3	2	1	22.9	18.8	21.8
				6	0	2	22.0	18.8	21.8

10.9. LTE Band 13

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of “NS_01”.

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4,10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23[1]	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-
Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.					

Band 13

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)		
							Without Pwr Back-off	With Pwr Back-off	
								Second-stage	First-Stage
10	23230	782.0	QPSK	1	0	0	24.0	19.3	22.5
				1	24	0	23.9	19.2	22.5
				1	49	0	23.8	19.3	22.3
				25	0	1	22.8	19.3	22.3
				25	12	1	22.9	19.3	22.4
				25	24	1	22.9	19.3	22.3
				50	0	1	22.8	19.3	22.3
			16QAM	1	0	1	22.9	19.3	22.3
				1	24	1	23.0	19.1	22.3
				1	49	1	22.6	19.2	22.1
				25	0	2	22.1	19.2	22.1
				25	12	2	22.1	19.3	22.1
				25	24	2	22.1	19.1	22.1
				50	0	2	22.0	19.1	22.0

LTE Band 13 Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)		
							Without Pwr Back-off	With Pwr Back-off	
								Second-stage	First-Stage
5	23205	779.5	QPSK	1	0	0	24.0	19.3	22.4
				1	12	0	24.0	19.2	22.4
				1	24	0	24.0	19.3	22.3
				12	0	1	23.1	19.3	22.3
				12	6	1	23.0	19.3	22.4
				12	11	1	23.1	19.2	22.3
				25	0	1	23.0	19.3	22.3
			16QAM	1	0	1	22.9	19.2	22.0
				1	12	1	23.0	19.2	22.0
				1	24	1	22.8	19.2	22.0
				12	0	2	21.9	19.3	21.9
				12	6	2	22.0	19.3	21.9
				12	11	2	21.9	19.1	21.9
				25	0	2	22.0	19.1	21.9
	23230	782.0	QPSK	1	0	0	24.0	19.3	22.4
				1	12	0	23.7	19.3	22.4
				1	24	0	23.7	19.2	22.4
				12	0	1	22.9	19.2	22.3
				12	6	1	23.0	19.3	22.4
				12	11	1	22.9	19.3	22.4
				25	0	1	22.9	19.3	22.3
			16QAM	1	0	1	23.0	19.2	22.0
				1	12	1	23.0	19.2	22.0
				1	24	1	22.5	19.2	21.9
				12	0	2	21.9	19.3	21.9
				12	6	2	22.0	19.3	21.9
				12	11	2	21.9	19.1	21.9
				25	0	2	21.9	19.1	21.9
	23255	784.5	QPSK	1	0	0	24.0	19.3	22.4
				1	12	0	24.0	19.3	22.4
				1	24	0	23.8	19.3	22.3
				12	0	1	22.9	19.2	22.3
				12	6	1	22.8	19.3	22.4
				12	11	1	22.9	19.2	22.4
				25	0	1	22.8	19.3	22.3
			16QAM	1	0	1	22.9	19.2	21.8
				1	12	1	23.0	19.2	21.8
				1	24	1	22.8	19.3	21.8
				12	0	2	21.7	19.3	21.7
				12	6	2	21.7	19.1	21.7
				12	11	2	21.7	19.1	21.7
				25	0	2	21.9	19.3	21.8

10.10. LTE Band 25

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signalling Value of "NS_01".

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4,10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23[1]	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

Results

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)		
							Without Pwr Back-off	With Pwr Back-off	
								Second-stage	First-Stage
20	26140	1860.0	QPSK	1	0	0	23.0	15.0	20.0
				1	49	0	22.9	14.8	20.0
				1	99	0	22.8	14.8	20.0
				50	0	1	21.9	14.9	20.0
				50	24	1	22.0	15.0	19.9
				50	49	1	21.8	14.9	20.0
				100	0	1	22.0	15.0	20.0
			16QAM	1	0	1	21.9	14.9	20.0
				1	49	1	21.9	14.8	20.0
				1	99	1	21.9	14.8	20.0
				50	0	2	21.0	14.9	20.0
				50	24	2	21.0	15.0	19.9
				50	49	2	21.0	14.8	20.0
				100	0	2	21.0	14.9	20.0
	26365	1882.5	QPSK	1	0	0	22.9	15.0	20.0
				1	49	0	22.9	15.0	20.0
				1	99	0	22.9	15.0	20.0
				50	0	1	22.0	15.0	20.0
				50	24	1	22.0	15.0	20.0
				50	49	1	22.0	15.0	20.0
				100	0	1	22.0	15.0	20.0
			16QAM	1	0	1	22.1	14.9	19.9
				1	49	1	22.0	14.8	19.9
				1	99	1	21.7	14.8	20.0
				50	0	2	21.0	14.9	20.0
				50	24	2	20.9	15.0	20.0
				50	49	2	21.0	14.9	19.9
				100	0	2	21.0	15.0	20.0
	26590	1905.0	QPSK	1	0	0	22.9	14.8	20.0
				1	49	0	23.0	15.0	20.0
				1	99	0	22.9	15.0	20.0
				50	0	1	21.8	14.9	20.0
				50	24	1	22.0	15.0	20.0
				50	49	1	21.9	15.0	19.9
				100	0	1	22.0	15.0	20.0
			16QAM	1	0	1	22.1	14.8	19.9
				1	49	1	22.0	15.0	19.9
				1	99	1	21.9	15.0	19.9
				50	0	2	20.7	14.9	19.9
				50	24	2	21.0	14.9	19.8
				50	49	2	21.1	14.9	19.9
				100	0	2	21.3	14.9	19.9

LTE Band 25 Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)		
							Without Pwr Back-off	With Pwr Back-off	
								Second-stage	First-Stage
15	26115	1857.5	QPSK	1	0	0	23.0	15.0	20.0
				1	37	0	22.9	14.8	19.9
				1	74	0	22.9	14.8	19.8
				38	0	1	22.1	14.9	19.9
				38	18	1	22.1	15.0	20.0
				38	37	1	22.1	14.9	19.9
				75	0	1	22.1	15.0	20.0
			16QAM	1	0	1	22.0	14.8	19.9
				1	37	1	22.0	14.8	19.8
				1	74	1	22.0	14.9	19.9
				38	0	2	21.1	15.0	19.9
				38	18	2	21.1	14.9	19.9
				38	37	2	21.0	15.0	20.0
				75	0	2	21.0	14.8	19.8
	26365	1882.5	QPSK	1	0	0	23.0	14.9	19.9
				1	37	0	23.0	15.0	20.0
				1	74	0	22.9	15.0	20.0
				38	0	1	22.0	14.8	19.9
				38	18	1	22.1	14.8	19.8
				38	37	1	22.0	14.9	19.9
				75	0	1	22.0	15.0	20.0
			16QAM	1	0	1	22.0	15.0	19.9
				1	37	1	22.1	14.8	19.9
				1	74	1	21.9	14.8	19.8
				38	0	2	21.1	14.9	19.9
				38	18	2	21.1	15.0	19.8
				38	37	2	21.1	14.9	19.9
				75	0	2	21.0	15.0	19.9
	26615	1907.5	QPSK	1	0	0	23.0	14.8	19.9
				1	37	0	22.9	14.8	19.9
				1	74	0	23.0	14.9	19.9
				38	0	1	21.9	15.0	20.0
				38	18	1	22.1	14.8	19.9
				38	37	1	21.9	14.8	19.9
				75	0	1	22.1	14.9	19.9
			16QAM	1	0	1	22.0	15.0	19.9
				1	37	1	22.0	15.0	19.9
				1	74	1	22.0	14.8	19.9
				38	0	2	21.0	14.8	19.8
				38	18	2	21.0	14.9	19.8
				38	37	2	21.0	15.0	19.8
				75	0	2	21.1	14.9	19.9

LTE Band 25 Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)		
							Without Pwr Back-off	With Pwr Back-off	
								Second-stage	First-Stage
10	26090	1855.0	QPSK	1	0	0	22.9	15.0	19.9
				1	24	0	23.0	14.8	19.9
				1	49	0	22.9	14.8	19.8
				25	0	1	22.2	15.0	20.0
				25	12	1	22.1	14.8	19.9
				25	24	1	22.2	14.8	19.8
				50	0	1	22.1	15.0	19.9
			16QAM	1	0	1	21.8	14.8	19.9
				1	24	1	22.0	14.8	19.8
				1	49	1	21.9	14.9	19.9
				25	0	2	21.2	15.0	19.8
				25	12	2	21.2	15.0	19.9
				25	24	2	21.1	14.8	19.9
				50	0	2	21.2	14.8	19.8
	26365	1882.5	QPSK	1	0	0	23.0	15.0	19.9
				1	24	0	23.0	14.8	19.9
				1	49	0	22.8	14.8	19.9
				25	0	1	22.0	14.9	19.9
				25	12	1	22.1	15.0	20.0
				25	24	1	22.0	14.8	19.9
				50	0	1	22.0	14.8	19.8
			16QAM	1	0	1	21.9	14.9	19.9
				1	24	1	22.0	15.0	19.8
				1	49	1	21.8	14.8	19.8
				25	0	2	21.0	15.0	19.8
				25	12	2	21.1	14.8	19.9
				25	24	2	21.0	14.8	19.8
				50	0	2	21.0	14.9	19.8
	26640	1910.0	QPSK	1	0	0	23.0	15.0	19.9
				1	24	0	23.0	15.0	19.8
				1	49	0	23.0	14.8	19.8
				25	0	1	21.9	14.9	20.0
				25	12	1	22.1	15.0	19.9
				25	24	1	21.8	14.8	19.9
				50	0	1	22.1	14.8	19.8
			16QAM	1	0	1	22.0	14.9	19.9
				1	24	1	22.0	14.8	19.9
				1	49	1	21.9	14.8	19.8
				25	0	2	20.9	14.9	19.9
				25	12	2	21.2	14.8	19.8
				25	24	2	21.0	14.9	19.8
				50	0	2	21.1	15.0	19.8

LTE Band 25 Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)		
							Without Pwr Back-off	With Pwr Back-off	
								Second-stage	First-Stage
5	26065	1852.5	QPSK	1	0	0	23.0	15.0	19.8
				1	12	0	23.0	14.8	19.9
				1	24	0	23.0	14.8	19.8
				12	0	1	22.2	14.9	19.9
				12	6	1	22.2	15.0	19.9
				12	11	1	22.2	14.8	19.9
				25	0	1	22.2	14.8	19.8
			16QAM	1	0	1	22.0	14.9	19.9
				1	12	1	22.0	15.0	19.8
				1	24	1	22.0	14.8	19.8
				12	0	2	21.1	15.0	19.8
				12	6	2	21.1	14.8	19.9
				12	11	2	21.1	14.8	19.8
				25	0	2	21.1	14.9	19.8
	26365	1882.5	QPSK	1	0	0	23.0	15.0	19.9
				1	12	0	23.0	14.8	19.9
				1	24	0	22.9	14.8	19.8
				12	0	1	21.9	14.9	19.9
				12	6	1	21.9	15.0	19.9
				12	11	1	21.9	14.8	19.9
				25	0	1	21.9	14.8	19.8
			16QAM	1	0	1	22.0	14.9	19.9
				1	12	1	22.0	15.0	19.9
				1	24	1	21.9	14.8	19.8
				12	0	2	20.8	15.0	19.9
				12	6	2	20.8	14.8	19.9
				12	11	2	20.8	14.8	19.8
				25	0	2	21.0	15.0	19.8
	26665	1912.5	QPSK	1	0	0	23.0	14.8	19.9
				1	12	0	23.0	14.8	19.8
				1	24	0	22.9	14.9	19.9
				12	0	1	21.8	15.0	19.9
				12	6	1	21.8	14.8	19.9
				12	11	1	21.9	14.8	19.8
				25	0	1	21.9	14.9	19.9
			16QAM	1	0	1	21.8	15.0	19.8
				1	12	1	21.8	14.8	19.8
				1	24	1	21.7	15.0	19.8
				12	0	2	20.7	14.8	19.9
				12	6	2	20.7	14.8	19.8
				12	11	2	20.7	14.9	19.8
				25	0	2	21.0	14.9	19.8

LTE Band 25 Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)		
							Without Pwr Back-off	With Pwr Back-off	
								Second-stage	First-Stage
3	26055	1851.5	QPSK	1	0	0	23.0	15.0	19.8
				1	7	0	23.0	15.0	19.9
				1	14	0	22.9	14.8	19.8
				8	0	1	22.1	14.8	19.8
				8	4	1	22.0	14.9	19.9
				8	7	1	22.1	15.0	19.8
				15	0	1	22.0	14.8	19.8
			16QAM	1	0	1	21.8	14.8	19.8
				1	7	1	22.0	14.9	19.9
				1	14	1	21.8	15.0	19.8
				8	0	2	21.2	14.8	19.8
				8	4	2	21.2	15.0	19.8
				8	7	2	21.2	14.8	19.9
				15	0	2	21.0	14.8	19.8
	26365	1882.5	QPSK	1	0	0	23.0	14.9	19.9
				1	7	0	22.9	14.8	19.9
				1	14	0	22.8	14.8	19.8
				8	0	1	21.8	14.9	19.9
				8	4	1	22.1	15.0	19.8
				8	7	1	21.8	14.8	19.9
				15	0	1	22.0	14.8	19.8
			16QAM	1	0	1	21.8	14.9	19.9
				1	7	1	21.8	15.0	19.8
				1	14	1	21.8	14.8	19.8
				8	0	2	21.2	15.0	19.8
				8	4	2	21.3	14.8	19.9
				8	7	2	21.2	14.8	19.8
				15	0	2	21.1	14.9	19.8
	26675	1913.4	QPSK	1	0	0	22.9	15.0	19.9
				1	7	0	22.7	14.8	19.8
				1	14	0	22.9	15.0	19.9
				8	0	1	21.9	14.8	19.9
				8	4	1	22.1	14.8	19.8
				8	7	1	21.9	15.0	19.8
				15	0	1	22.2	14.8	19.9
			16QAM	1	0	1	22.0	14.8	19.8
				1	7	1	22.0	14.9	19.8
				1	14	1	22.0	15.0	19.8
				8	0	2	21.0	14.8	19.9
				8	4	2	21.5	14.8	19.8
				8	7	2	21.0	14.9	19.8
				15	0	2	21.3	14.9	19.8

LTE Band 25 Results (continued)

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Start	MPR	Avg Pwr (dBm)		
							Without Pwr Back-off	With Pwr Back-off	
								Second-stage	First-Stage
1.4	26047	1850.7	QPSK	1	0	0	23.0	15.0	19.8
				1	2	0	23.0	14.8	19.9
				1	5	0	23.0	14.8	19.8
				3	0	1	22.9	15.0	19.8
				3	1	1	22.9	14.8	19.9
				3	2	1	22.8	14.8	19.8
				6	0	1	22.1	14.9	19.8
			16QAM	1	0	1	21.8	15.0	19.8
				1	2	1	22.3	14.8	19.8
				1	5	1	21.7	14.8	19.8
				3	0	1	21.8	14.8	19.8
				3	1	1	21.9	15.0	19.8
				3	2	1	22.0	14.8	19.8
				6	0	2	21.4	14.8	19.8
	26365	1882.5	QPSK	1	0	0	23.0	15.0	19.8
				1	2	0	23.0	14.8	19.8
				1	5	0	23.0	14.8	19.8
				3	0	1	22.7	15.0	19.8
				3	1	1	22.8	14.8	19.7
				3	2	1	22.9	14.8	19.8
				6	0	1	22.0	15.0	19.8
			16QAM	1	0	1	22.0	14.8	19.8
				1	2	1	21.8	14.8	19.8
				1	5	1	21.9	14.8	19.8
				3	0	1	22.0	14.8	19.8
				3	1	1	22.1	15.0	19.8
				3	2	1	22.0	14.8	19.8
				6	0	2	21.4	14.8	19.8
	16682	1914.2	QPSK	1	0	0	23.0	15.0	19.8
				1	2	0	22.6	14.8	19.8
				1	5	0	23.0	14.8	19.8
				3	0	1	22.6	15.0	19.8
				3	1	1	22.6	14.8	19.7
				3	2	1	23.0	14.8	19.8
				6	0	1	22.1	14.9	19.8
			16QAM	1	0	1	21.9	15.0	19.8
				1	2	1	22.0	14.8	19.8
				1	5	1	21.9	14.8	19.8
				3	0	1	22.0	14.8	19.8
				3	1	1	22.0	15.0	19.8
				3	2	1	22.3	14.8	19.8
				6	0	2	21.5	14.8	19.8

10.11. WiFi (2.4 GHz Band)

There are two Bill of Material variations of the Wi-Fi/Bluetooth Radio to support the production volumes of the device. The two BOM variants are:

- BOM # 1
- BOM # 2

The A1460 share the same Wi-Fi/Bluetooth chipset, have the same mechanical outline (e.g., the same dimension package and pin-out layout), use the same on-board antenna matching circuit, have an identical antenna structure, and are built and tested to conform the same specifications and to operate within the same tolerances.

Complete SAR evaluation is performed on the BOM # 1 that has the highest SAR, and then, the test is repeated for the other BOM variant at the highest peak SAR value.

Required Test Channels per KDB 248227 D01

Mode	Band	GHz	Channel	"Default Test Channels"	
				802.11b	802.11g
802.11b/g	2.4 GHz	**2.412**	1#	√	∇
		2.437	6	√	∇
		2.462	11#	√	∇

Notes:
√ = "default test channels"
∇ = possible 802.11g channels with maximum average output ¼ dB ≥ the "default test channels"
= when output power is reduced for channel 1 and /or 11 to meet restricted band requirements the highest output channels closest to each of these channels should be tested.

Band (MHz)	Mode	Ch #	Freq. (MHz)	Avg Pwr (dBm)	Note
2.4	802.11b	1	2412	16.5	
		6	2437	16.5	
		11	2462	16.5	
	802.11g	1	2412	16.0	
		6	2437	16.5	
		11	2462	15.5	
	802.11n (HT20)	1	2412	15.5	
		6	2437	16.5	
		11	2462	15.0	

Note(s):
Per KDB 248227, SAR is not required for 802.11g/HT20 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a/b channels.

10.12. WiFi (5 GHz Bands)

Required Test Channels per KDB 248227 D01

Mode		Band	GHz	Channel	"Default Test Channels" 802.11a	
802.11a	UNII (15.407)	5.2 GHz	5.180	36	√	
			5.200	40		*
			2.220	44		*
			5.240	48	√	
		5.3 GHz	5.260	52	√	
			5.280	56		*
			5.300	60		*
			5.320	64	√	
		5.5 GHz	5.500	100		
			5.520	104	√	
			5.540	108		*
			5.560	112		*
			5.580	116	√	
			5.600	120		*
			5.620	124	√	
			5.640	128		*
			5.660	132		*
			5.680	136	√	
			5.700	140		*
	DTS (15.247)	5.8 GHz	5.745	149	√	
			5.765	153		*
			5.785	157	√	
			5.805	161		*
			5.825	165	√	

√ = "default test channels"

* = possible 802.11a channels with maximum average output > the "default test channels"

= when output power is reduced for channel 1 and /or 11 to meet restricted band requirements the highest output channels closest to each of these channels should be tested.

Band (MHz)	Mode	Ch #	Freq. (MHz)	Avg Pwr (dBm)	Note
5.2	802.11a	36	5180	14.0	
		40	5200	14.0	
		44	5220	14.0	
		48	5240	14.0	
	802.11n (HT20)	36	5180	14.0	
		40	5200	14.0	
		48	5240	14.0	
	802.11n (HT40)	38	5190	12.0	
		46	5230	15.5	
5.3	802.11a	52	5260	17.5	
		56	5280	17.5	
		60	5300	17.5	
		64	5320	16.0	
	802.11n (HT20)	52	5260	17.5	
		60	5300	17.5	
		64	5320	16.0	
	802.11n (HT40)	54	5270	17.5	
		62	5310	14.0	
5.5	802.11a	100	5500	15.5	
		104	5520	18.0	
		108	5540	18.0	
		112	5560	18.0	
		116	5580	18.0	
		120	5600	18.0	
		124	5620	18.0	
		128	5640	18.0	
		132	5660	18.0	
		136	5680	18.0	
		140	5700	15.0	
	802.11n (HT20)	100	5500	15.0	
		120	5600	18.0	
		140	5700	15.0	
	802.11n (HT40)	102	5510	13.0	
		110	5550	18.0	
		134	5670	16.0	
5.8	802.11a	149	5745	18.5	
		153	5765	18.5	
		157	5785	18.5	
		161	5805	18.5	
		165	5825	18.5	
	802.11n (HT20)	149	5745	18.5	
		157	5785	18.5	
		161	5805	18.5	
	802.11n (HT40)	151	5755	18.5	
		159	5795	18.5	

Note(s):

Per KDB 248227, SAR is not required for 802.11n HT20/HT40 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a/b channels.

10.13. Bluetooth

Mode	Channel #	Freq. (MHz)	Conducted Avg Power	
			(dBm)	(mW)
V2.1 + EDR, GFSK	0	2402	13.00	19.95
	39	2441	13.00	19.95
	78	2480	13.00	19.95
V2.1 + EDR, π/4 DQPSK	0	2402	10.50	11.22
	39	2441	10.50	11.22
	78	2480	10.50	11.22
V2.1 + EDR, 8-DPSK	0	2402	10.50	11.22
	39	2441	10.50	11.22
	78	2480	10.50	11.22
V4.0 LE, GFSK	0	2402	10.00	10.00
	19	2440	10.00	10.00
	39	2480	10.00	10.00

11. Tissue Dielectric Properties

IEEE Std 1528-2003 Table 2

Target Frequency (MHz)	Head	
	ε_r	σ (S/m)
300	45.3	0.87
450	43.5	0.87
835	41.5	0.90
900	41.5	0.97
1450	40.5	1.20
1800 – 2000	40.0	1.40
2450	39.2	1.80
2600	39.0	1.96
3000	38.5	2.40

FCC OET Bulletin 65 Supplement C 01-01

Target Frequency (MHz)	Head		Body	
	ε_r	σ (S/m)	ε_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 – 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5000	36.2	4.45	49.3	5.07
5100	36.1	4.55	49.1	5.18
5200	36.0	4.66	49.0	5.30
5300	35.9	4.76	48.9	5.42
5400	35.8	4.86	48.7	5.53
5500	35.6	4.96	48.6	5.65
5600	35.5	5.07	48.5	5.77
5700	35.4	5.17	48.3	5.88
5800	35.3	5.27	48.2	6.00

11.1. Composition of Ingredients for the Tissue Material Used in the SAR Tests

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

Salt: 99+% Pure Sodium Chloride Sugar: 98+% Pure Sucrose
Water: De-ionized, 16 MΩ+ resistivity HEC: Hydroxyethyl Cellulose
DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]
Triton X-100 (ultra pure): Polyethylene glycol mono [4-(1,1, 3, 3-tetramethylbutyl)phenyl]ether

MSL/HSL750 (Body and Head liquids for 700 – 800 MHz)

Item	Head Tissue Simulation Liquids HSL750 Muscle (body) Tissue Simulation Liquids MSL750
Type No	SL AAH 075
Manufacturer	SPEAG
The item is composed of the following ingredients:	
H^2O	Water, 35 – 58%
Sucrese	Sugar, white, refined, 40-60%
NaCl	Sodium Chloride, 0-6%
Hydroxyethel-cellulsoe	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%

MSL/HSL1750 (Body and Head liquids for 1700 – 1800 MHz)

Item	Head Tissue Simulation Liquids HSL1750 Muscle (body) Tissue Simulation Liquids MSL1750
Type No	SL AAM 175
Manufacturer	SPEAG
-The item is composed of the following ingredients:	
H^2O	Water, 52 – 75%
C8H18O3	Diethylene glycol monobutyl ether (DGBE), 25-48%
NaCl	Sodium Chloride, <1.0%

Simulating Liquids for 5 GHz, Manufactured by SPEAG

Ingredients	(% by weight)
Water	78
Mineral oil	11
Emulsifiers	9
Additives and Salt	2

11.2. Tissue Dielectric Parameter Check Results

Tissue dielectric parameters were measured at the low, middle and high frequency of each operating frequency range of the test device.

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
8/1/2012	Body 2450	e'	50.9584	Relative Permittivity (ε_r):	50.96	52.70	-3.30	5
		e"	14.0249	Conductivity (σ):	1.91	1.95	-2.02	5
	Body 2410	e'	51.0770	Relative Permittivity (ε_r):	51.08	52.76	-3.19	5
		e"	13.8144	Conductivity (σ):	1.85	1.91	-2.95	5
	Body 2435	e'	51.0177	Relative Permittivity (ε_r):	51.02	52.73	-3.24	5
		e"	13.9463	Conductivity (σ):	1.89	1.93	-2.22	5
	Body 2475	e'	50.8313	Relative Permittivity (ε_r):	50.83	52.67	-3.49	5
		e"	14.1536	Conductivity (σ):	1.95	1.99	-1.88	5
8/1/2012	Body 2450	e'	50.7236	Relative Permittivity (ε_r):	50.72	52.70	-3.75	5
		e"	14.0709	Conductivity (σ):	1.92	1.95	-1.70	5
	Body 2410	e'	50.8538	Relative Permittivity (ε_r):	50.85	52.76	-3.61	5
		e"	13.8638	Conductivity (σ):	1.86	1.91	-2.60	5
	Body 2435	e'	50.7868	Relative Permittivity (ε_r):	50.79	52.73	-3.68	5
		e"	13.9938	Conductivity (σ):	1.89	1.93	-1.89	5
	Body 2475	e'	50.6027	Relative Permittivity (ε_r):	50.60	52.67	-3.92	5
		e"	14.2020	Conductivity (σ):	1.95	1.99	-1.55	5
8/2/2012	Body 5180	e'	50.0100	Relative Permittivity (ε_r):	50.01	49.05	1.96	10
		e"	18.1600	Conductivity (σ):	5.23	5.27	-0.78	5
	Body 5200	e'	49.9600	Relative Permittivity (ε_r):	49.96	49.02	1.92	10
		e"	18.1500	Conductivity (σ):	5.25	5.29	-0.89	5
	Body 5500	e'	49.4900	Relative Permittivity (ε_r):	49.49	48.61	1.80	10
		e"	18.4500	Conductivity (σ):	5.64	5.64	-0.04	5
	Body 5800	e'	49.1500	Relative Permittivity (ε_r):	49.15	48.20	1.97	10
		e"	18.8100	Conductivity (σ):	6.07	6.00	1.10	5
	Body 5825	e'	49.1300	Relative Permittivity (ε_r):	49.13	48.20	1.93	10
		e"	18.8300	Conductivity (σ):	6.10	6.00	1.65	5
8/3/2012	Body 2450	e'	50.6311	Relative Permittivity (ε_r):	50.63	52.70	-3.93	5
		e"	14.2874	Conductivity (σ):	1.95	1.95	-0.19	5
	Body 2410	e'	50.8186	Relative Permittivity (ε_r):	50.82	52.76	-3.68	5
		e"	14.1037	Conductivity (σ):	1.89	1.91	-0.92	5
	Body 2435	e'	50.7039	Relative Permittivity (ε_r):	50.70	52.73	-3.84	5
		e"	14.2138	Conductivity (σ):	1.92	1.93	-0.34	5
	Body 2475	e'	50.5183	Relative Permittivity (ε_r):	50.52	52.67	-4.08	5
		e"	14.3998	Conductivity (σ):	1.98	1.99	-0.17	5
8/3/2012	Body 5180	e'	49.6900	Relative Permittivity (ε_r):	49.69	49.05	1.31	10
		e"	18.0400	Conductivity (σ):	5.20	5.27	-1.43	5
	Body 5200	e'	49.6500	Relative Permittivity (ε_r):	49.65	49.02	1.29	10
		e"	18.0500	Conductivity (σ):	5.22	5.29	-1.43	5
	Body 5500	e'	49.1800	Relative Permittivity (ε_r):	49.18	48.61	1.17	10
		e"	18.3200	Conductivity (σ):	5.60	5.64	-0.74	5
	Body 5800	e'	48.7700	Relative Permittivity (ε_r):	48.77	48.20	1.18	10
		e"	18.6600	Conductivity (σ):	6.02	6.00	0.30	5
	Body 5825	e'	48.7400	Relative Permittivity (ε_r):	48.74	48.20	1.12	10
		e"	18.6900	Conductivity (σ):	6.05	6.00	0.89	5

Tissue Dielectric Parameter Check Results (continued)

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
8/3/2012	Body 5180	e'	48.1546	Relative Permittivity (ϵ_r):	48.15	49.05	-1.82	10
		e"	17.7978	Conductivity (σ):	5.13	5.27	-2.75	5
	Body 5200	e'	48.1147	Relative Permittivity (ϵ_r):	48.11	49.02	-1.85	10
		e"	17.8025	Conductivity (σ):	5.15	5.29	-2.78	5
	Body 5500	e'	47.6584	Relative Permittivity (ϵ_r):	47.66	48.61	-1.96	10
		e"	18.0100	Conductivity (σ):	5.51	5.64	-2.42	5
	Body 5800	e'	47.2684	Relative Permittivity (ϵ_r):	47.27	48.20	-1.93	10
		e"	18.2788	Conductivity (σ):	5.89	6.00	-1.75	5
	Body 5825	e'	47.2401	Relative Permittivity (ϵ_r):	47.24	48.20	-1.99	10
		e"	18.2900	Conductivity (σ):	5.92	6.00	-1.27	5
8/8/2012	Body 5180	e'	48.7255	Relative Permittivity (ϵ_r):	48.73	49.05	-0.65	10
		e"	18.1064	Conductivity (σ):	5.22	5.27	-1.07	5
	Body 5200	e'	48.6845	Relative Permittivity (ϵ_r):	48.68	49.02	-0.68	10
		e"	18.1261	Conductivity (σ):	5.24	5.29	-1.02	5
	Body 5500	e'	48.2284	Relative Permittivity (ϵ_r):	48.23	48.61	-0.79	10
		e"	18.3599	Conductivity (σ):	5.61	5.64	-0.53	5
	Body 5800	e'	47.4574	Relative Permittivity (ϵ_r):	47.46	48.20	-1.54	10
		e"	18.1514	Conductivity (σ):	5.85	6.00	-2.44	5
	Body 5825	e'	47.4028	Relative Permittivity (ϵ_r):	47.40	48.20	-1.65	10
		e"	18.1668	Conductivity (σ):	5.88	6.00	-1.93	5
8/9/2012	Body 2450	e'	50.7116	Relative Permittivity (ϵ_r):	50.71	52.70	-3.77	5
		e"	14.1721	Conductivity (σ):	1.93	1.95	-0.99	5
	Body 2410	e'	50.8285	Relative Permittivity (ϵ_r):	50.83	52.76	-3.66	5
		e"	14.0263	Conductivity (σ):	1.88	1.91	-1.46	5
	Body 2435	e'	50.7539	Relative Permittivity (ϵ_r):	50.75	52.73	-3.74	5
		e"	14.1296	Conductivity (σ):	1.91	1.93	-0.93	5
	Body 2475	e'	50.6088	Relative Permittivity (ϵ_r):	50.61	52.67	-3.91	5
		e"	14.2108	Conductivity (σ):	1.96	1.99	-1.48	5
8/9/2012	Body 5180	e'	48.5476	Relative Permittivity (ϵ_r):	48.55	49.05	-1.02	10
		e"	17.7943	Conductivity (σ):	5.13	5.27	-2.77	5
	Body 5200	e'	48.5254	Relative Permittivity (ϵ_r):	48.53	49.02	-1.01	10
		e"	17.7991	Conductivity (σ):	5.15	5.29	-2.80	5
	Body 5500	e'	48.0577	Relative Permittivity (ϵ_r):	48.06	48.61	-1.14	10
		e"	18.0177	Conductivity (σ):	5.51	5.64	-2.38	5
	Body 5800	e'	47.6435	Relative Permittivity (ϵ_r):	47.64	48.20	-1.15	10
		e"	18.2966	Conductivity (σ):	5.90	6.00	-1.66	5
	Body 5825	e'	47.5995	Relative Permittivity (ϵ_r):	47.60	48.20	-1.25	10
		e"	18.3121	Conductivity (σ):	5.93	6.00	-1.15	5
8/9/2012	Body 5180	e'	47.5532	Relative Permittivity (ϵ_r):	47.55	49.05	-3.05	10
		e"	17.8564	Conductivity (σ):	5.14	5.27	-2.43	5
	Body 5200	e'	47.5353	Relative Permittivity (ϵ_r):	47.54	49.02	-3.03	10
		e"	17.8587	Conductivity (σ):	5.16	5.29	-2.48	5
	Body 5500	e'	47.0531	Relative Permittivity (ϵ_r):	47.05	48.61	-3.21	10
		e"	18.0550	Conductivity (σ):	5.52	5.64	-2.18	5
	Body 5800	e'	46.6394	Relative Permittivity (ϵ_r):	46.64	48.20	-3.24	10
		e"	18.3188	Conductivity (σ):	5.91	6.00	-1.54	5
	Body 5825	e'	46.5918	Relative Permittivity (ϵ_r):	46.59	48.20	-3.34	10
		e"	18.3318	Conductivity (σ):	5.94	6.00	-1.04	5

Tissue Dielectric Parameter Check Results (continued)

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
8/9/2012	Body 5180	e'	47.5532	Relative Permittivity (ϵ_r):	47.55	49.05	-3.05	10
		e''	17.8564	Conductivity (σ):	5.14	5.27	-2.43	5
	Body 5200	e'	47.5353	Relative Permittivity (ϵ_r):	47.54	49.02	-3.03	10
		e''	17.8587	Conductivity (σ):	5.16	5.29	-2.48	5
	Body 5500	e'	47.0531	Relative Permittivity (ϵ_r):	47.05	48.61	-3.21	10
		e''	18.0550	Conductivity (σ):	5.52	5.64	-2.18	5
	Body 5800	e'	46.6394	Relative Permittivity (ϵ_r):	46.64	48.20	-3.24	10
		e''	18.3188	Conductivity (σ):	5.91	6.00	-1.54	5
	Body 5825	e'	46.5918	Relative Permittivity (ϵ_r):	46.59	48.20	-3.34	10
		e''	18.3318	Conductivity (σ):	5.94	6.00	-1.04	5
8/10/2012	Body 5180	e'	47.6472	Relative Permittivity (ϵ_r):	47.65	49.05	-2.85	10
		e''	17.6116	Conductivity (σ):	5.07	5.27	-3.77	5
	Body 5200	e'	47.6267	Relative Permittivity (ϵ_r):	47.63	49.02	-2.84	10
		e''	17.6192	Conductivity (σ):	5.09	5.29	-3.78	5
	Body 5500	e'	47.1681	Relative Permittivity (ϵ_r):	47.17	48.61	-2.97	10
		e''	17.7950	Conductivity (σ):	5.44	5.64	-3.59	5
	Body 5800	e'	46.7702	Relative Permittivity (ϵ_r):	46.77	48.20	-2.97	10
		e''	18.0332	Conductivity (σ):	5.82	6.00	-3.07	5
	Body 5825	e'	46.7252	Relative Permittivity (ϵ_r):	46.73	48.20	-3.06	10
		e''	18.0537	Conductivity (σ):	5.85	6.00	-2.54	5
8/14/2012	Body 5180	e'	48.1071	Relative Permittivity (ϵ_r):	48.11	49.05	-1.92	10
		e''	17.9627	Conductivity (σ):	5.17	5.27	-1.85	5
	Body 5200	e'	48.0705	Relative Permittivity (ϵ_r):	48.07	49.02	-1.94	10
		e''	17.9881	Conductivity (σ):	5.20	5.29	-1.77	5
	Body 5500	e'	47.6171	Relative Permittivity (ϵ_r):	47.62	48.61	-2.05	10
		e''	18.2070	Conductivity (σ):	5.57	5.64	-1.35	5
	Body 5800	e'	47.1569	Relative Permittivity (ϵ_r):	47.16	48.20	-2.16	10
		e''	18.4908	Conductivity (σ):	5.96	6.00	-0.61	5
	Body 5825	e'	47.1244	Relative Permittivity (ϵ_r):	47.12	48.20	-2.23	10
		e''	18.5181	Conductivity (σ):	6.00	6.00	-0.04	5
8/15/2012	Body 5180	e'	48.2354	Relative Permittivity (ϵ_r):	48.24	49.05	-1.65	10
		e''	18.4456	Conductivity (σ):	5.31	5.27	0.79	5
	Body 5200	e'	48.2057	Relative Permittivity (ϵ_r):	48.21	49.02	-1.66	10
		e''	18.4660	Conductivity (σ):	5.34	5.29	0.84	5
	Body 5500	e'	47.7139	Relative Permittivity (ϵ_r):	47.71	48.61	-1.85	10
		e''	18.6741	Conductivity (σ):	5.71	5.64	1.18	5
	Body 5800	e'	47.2511	Relative Permittivity (ϵ_r):	47.25	48.20	-1.97	10
		e''	18.9609	Conductivity (σ):	6.11	6.00	1.91	5
	Body 5825	e'	47.2144	Relative Permittivity (ϵ_r):	47.21	48.20	-2.04	10
		e''	18.9790	Conductivity (σ):	6.15	6.00	2.45	5
8/16/2012	Body 5180	e'	48.4250	Relative Permittivity (ϵ_r):	48.43	49.05	-1.27	10
		e''	18.1890	Conductivity (σ):	5.24	5.27	-0.62	5
	Body 5200	e'	48.3930	Relative Permittivity (ϵ_r):	48.39	49.02	-1.28	10
		e''	18.2063	Conductivity (σ):	5.26	5.29	-0.58	5
	Body 5500	e'	47.9126	Relative Permittivity (ϵ_r):	47.91	48.61	-1.44	10
		e''	18.4182	Conductivity (σ):	5.63	5.64	-0.21	5
	Body 5800	e'	47.4756	Relative Permittivity (ϵ_r):	47.48	48.20	-1.50	10
		e''	18.6984	Conductivity (σ):	6.03	6.00	0.50	5
	Body 5825	e'	47.4360	Relative Permittivity (ϵ_r):	47.44	48.20	-1.59	10
		e''	18.7191	Conductivity (σ):	6.06	6.00	1.05	5

Tissue Dielectric Parameter Check Results (continued)

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
8/21/2012	Body 1900	e'	52.1814	Relative Permittivity (ϵ_r):	52.18	53.30	-2.10	5
		e"	14.7817	Conductivity (σ):	1.56	1.52	2.74	5
	Body 1850	e'	52.3048	Relative Permittivity (ϵ_r):	52.30	53.30	-1.87	5
		e"	14.5722	Conductivity (σ):	1.50	1.52	-1.38	5
	Body 1880	e'	52.2531	Relative Permittivity (ϵ_r):	52.25	53.30	-1.96	5
		e"	14.6980	Conductivity (σ):	1.54	1.52	1.08	5
	Body 1910	e'	52.1351	Relative Permittivity (ϵ_r):	52.14	53.30	-2.19	5
		e"	14.8266	Conductivity (σ):	1.57	1.52	3.59	5
8/22/2012	Body 835	e'	52.8481	Relative Permittivity (ϵ_r):	52.85	55.20	-4.26	5
		e"	21.8798	Conductivity (σ):	1.02	0.97	4.73	5
	Body 820	e'	53.0083	Relative Permittivity (ϵ_r):	53.01	55.28	-4.10	5
		e"	21.9620	Conductivity (σ):	1.00	0.97	3.40	5
	Body 850	e'	52.6945	Relative Permittivity (ϵ_r):	52.69	55.16	-4.46	5
		e"	21.8107	Conductivity (σ):	1.03	0.99	4.43	5
8/22/2012	Body 1900	e'	52.5995	Relative Permittivity (ϵ_r):	52.60	53.30	-1.31	5
		e"	14.5704	Conductivity (σ):	1.54	1.52	1.27	5
	Body 1850	e'	52.7183	Relative Permittivity (ϵ_r):	52.72	53.30	-1.09	5
		e"	14.3084	Conductivity (σ):	1.47	1.52	-3.17	5
	Body 1880	e'	52.6731	Relative Permittivity (ϵ_r):	52.67	53.30	-1.18	5
		e"	14.4648	Conductivity (σ):	1.51	1.52	-0.52	5
	Body 1910	e'	52.5570	Relative Permittivity (ϵ_r):	52.56	53.30	-1.39	5
		e"	14.6157	Conductivity (σ):	1.55	1.52	2.12	5
8/22/2012	Body 1900	e'	51.8924	Relative Permittivity (ϵ_r):	51.89	53.30	-2.64	5
		e"	14.6061	Conductivity (σ):	1.54	1.52	1.52	5
	Body 1850	e'	52.0148	Relative Permittivity (ϵ_r):	52.01	53.30	-2.41	5
		e"	14.3414	Conductivity (σ):	1.48	1.52	-2.94	5
	Body 1880	e'	51.9664	Relative Permittivity (ϵ_r):	51.97	53.30	-2.50	5
		e"	14.5029	Conductivity (σ):	1.52	1.52	-0.26	5
	Body 1910	e'	51.8492	Relative Permittivity (ϵ_r):	51.85	53.30	-2.72	5
		e"	14.6565	Conductivity (σ):	1.56	1.52	2.40	5
8/22/2012	Body 835	e'	53.1297	Relative Permittivity (ϵ_r):	53.13	55.20	-3.75	5
		e"	21.8700	Conductivity (σ):	1.02	0.97	4.68	5
	Body 820	e'	53.2870	Relative Permittivity (ϵ_r):	53.29	55.28	-3.60	5
		e"	21.9472	Conductivity (σ):	1.00	0.97	3.33	5
	Body 850	e'	52.9774	Relative Permittivity (ϵ_r):	52.98	55.16	-3.95	5
		e"	21.7990	Conductivity (σ):	1.03	0.99	4.37	5
8/23/2012	Body 1900	e'	52.4798	Relative Permittivity (ϵ_r):	52.48	53.30	-1.54	5
		e"	14.3249	Conductivity (σ):	1.51	1.52	-0.44	5
	Body 1850	e'	52.5689	Relative Permittivity (ϵ_r):	52.57	53.30	-1.37	5
		e"	14.1191	Conductivity (σ):	1.45	1.52	-4.45	5
	Body 1880	e'	52.5345	Relative Permittivity (ϵ_r):	52.53	53.30	-1.44	5
		e"	14.2371	Conductivity (σ):	1.49	1.52	-2.09	5
	Body 1910	e'	52.4422	Relative Permittivity (ϵ_r):	52.44	53.30	-1.61	5
		e"	14.3711	Conductivity (σ):	1.53	1.52	0.41	5
8/23/2012	Body 835	e'	52.9630	Relative Permittivity (ϵ_r):	52.96	55.20	-4.05	5
		e"	21.7592	Conductivity (σ):	1.01	0.97	4.15	5
	Body 820	e'	53.1157	Relative Permittivity (ϵ_r):	53.12	55.28	-3.91	5
		e"	21.8092	Conductivity (σ):	0.99	0.97	2.68	5
	Body 850	e'	52.8221	Relative Permittivity (ϵ_r):	52.82	55.16	-4.23	5
		e"	21.6524	Conductivity (σ):	1.02	0.99	3.67	5

Tissue Dielectric Parameter Check Results (continued)

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
8/23/2012	Body 835	e'	53.1235	Relative Permittivity (ϵ_r):	53.12	55.20	-3.76	5
		e''	21.7603	Conductivity (σ):	1.01	0.97	4.15	5
	Body 820	e'	53.2762	Relative Permittivity (ϵ_r):	53.28	55.28	-3.62	5
		e''	21.8366	Conductivity (σ):	1.00	0.97	2.81	5
	Body 850	e'	52.9811	Relative Permittivity (ϵ_r):	52.98	55.16	-3.95	5
		e''	21.6843	Conductivity (σ):	1.02	0.99	3.82	5
8/23/2012	Body 1900	e'	51.9157	Relative Permittivity (ϵ_r):	51.92	53.30	-2.60	5
		e''	14.4324	Conductivity (σ):	1.52	1.52	0.31	5
	Body 1850	e'	52.0150	Relative Permittivity (ϵ_r):	52.02	53.30	-2.41	5
		e''	14.2216	Conductivity (σ):	1.46	1.52	-3.76	5
	Body 1880	e'	51.9721	Relative Permittivity (ϵ_r):	51.97	53.30	-2.49	5
		e''	14.3409	Conductivity (σ):	1.50	1.52	-1.37	5
	Body 1910	e'	51.8818	Relative Permittivity (ϵ_r):	51.88	53.30	-2.66	5
		e''	14.4789	Conductivity (σ):	1.54	1.52	1.16	5
8/242012	Body 1900	e'	52.4622	Relative Permittivity (ϵ_r):	52.46	53.30	-1.57	5
		e''	14.7636	Conductivity (σ):	1.56	1.52	2.61	5
	Body 1850	e'	52.6699	Relative Permittivity (ϵ_r):	52.67	53.30	-1.18	5
		e''	14.5669	Conductivity (σ):	1.50	1.52	-1.42	5
	Body 1880	e'	52.5462	Relative Permittivity (ϵ_r):	52.55	53.30	-1.41	5
		e''	14.7017	Conductivity (σ):	1.54	1.52	1.11	5
	Body 1910	e'	52.4215	Relative Permittivity (ϵ_r):	52.42	53.30	-1.65	5
		e''	14.7971	Conductivity (σ):	1.57	1.52	3.39	5
8/24/2012	Body 750	e'	54.3451	Relative Permittivity (ϵ_r):	54.35	55.55	-2.16	5
		e''	23.2211	Conductivity (σ):	0.97	0.96	0.55	5
	Body 775	e'	54.0712	Relative Permittivity (ϵ_r):	54.07	55.45	-2.49	5
		e''	23.0851	Conductivity (σ):	0.99	0.97	3.09	5
	Body 790	e'	53.9098	Relative Permittivity (ϵ_r):	53.91	55.39	-2.68	5
		e''	22.9843	Conductivity (σ):	1.01	0.97	4.50	5
8/242012	Body 835	e'	53.4068	Relative Permittivity (ϵ_r):	53.41	55.20	-3.25	5
		e''	21.8555	Conductivity (σ):	1.01	0.97	4.61	5
	Body 820	e'	53.5685	Relative Permittivity (ϵ_r):	53.57	55.28	-3.09	5
		e''	21.9414	Conductivity (σ):	1.00	0.97	3.30	5
	Body 850	e'	53.2537	Relative Permittivity (ϵ_r):	53.25	55.16	-3.45	5
		e''	21.7708	Conductivity (σ):	1.03	0.99	4.23	5
8/27/2012	Body 1900	e'	52.1001	Relative Permittivity (ϵ_r):	52.10	53.30	-2.25	5
		e''	14.3652	Conductivity (σ):	1.52	1.52	-0.16	5
	Body 1850	e'	52.1988	Relative Permittivity (ϵ_r):	52.20	53.30	-2.07	5
		e''	14.1739	Conductivity (σ):	1.46	1.52	-4.08	5
	Body 1880	e'	52.1495	Relative Permittivity (ϵ_r):	52.15	53.30	-2.16	5
		e''	14.2800	Conductivity (σ):	1.49	1.52	-1.79	5
	Body 1910	e'	52.0699	Relative Permittivity (ϵ_r):	52.07	53.30	-2.31	5
		e''	14.4104	Conductivity (σ):	1.53	1.52	0.69	5
8/27/2012	Body 750	e'	53.6457	Relative Permittivity (ϵ_r):	53.65	55.55	-3.42	5
		e''	23.2166	Conductivity (σ):	0.97	0.96	0.53	5
	Body 775	e'	53.3847	Relative Permittivity (ϵ_r):	53.38	55.45	-3.72	5
		e''	23.0515	Conductivity (σ):	0.99	0.97	2.94	5
	Body 790	e'	53.1902	Relative Permittivity (ϵ_r):	53.19	55.39	-3.98	5
		e''	22.9520	Conductivity (σ):	1.01	0.97	4.35	5

Tissue Dielectric Parameter Check Results (continued)

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
8/28/2012	Body 1900	e'	52.2690	Relative Permittivity (ϵ_r):	52.27	53.30	-1.93	5
		e''	14.5286	Conductivity (σ):	1.53	1.52	0.98	5
	Body 1850	e'	52.4696	Relative Permittivity (ϵ_r):	52.47	53.30	-1.56	5
		e''	14.3092	Conductivity (σ):	1.47	1.52	-3.16	5
	Body 1880	e'	52.3693	Relative Permittivity (ϵ_r):	52.37	53.30	-1.75	5
		e''	14.4625	Conductivity (σ):	1.51	1.52	-0.54	5
	Body 1910	e'	52.2127	Relative Permittivity (ϵ_r):	52.21	53.30	-2.04	5
		e''	14.5600	Conductivity (σ):	1.55	1.52	1.73	5
9/7/2012	Body 1900	e'	51.5132	Relative Permittivity (ϵ_r):	51.51	53.30	-3.35	5
		e''	14.6451	Conductivity (σ):	1.55	1.52	1.79	5
	Body 1850	e'	51.6773	Relative Permittivity (ϵ_r):	51.68	53.30	-3.04	5
		e''	14.3771	Conductivity (σ):	1.48	1.52	-2.70	5
	Body 1880	e'	51.5800	Relative Permittivity (ϵ_r):	51.58	53.30	-3.23	5
		e''	14.5247	Conductivity (σ):	1.52	1.52	-0.11	5
	Body 1910	e'	51.4810	Relative Permittivity (ϵ_r):	51.48	53.30	-3.41	5
		e''	14.7045	Conductivity (σ):	1.56	1.52	2.74	5
9/7/2012	Body 750	e'	53.3572	Relative Permittivity (ϵ_r):	53.36	55.55	-3.94	5
		e''	23.2587	Conductivity (σ):	0.97	0.96	0.71	5
	Body 775	e'	53.1138	Relative Permittivity (ϵ_r):	53.11	55.45	-4.21	5
		e''	23.0595	Conductivity (σ):	0.99	0.97	2.97	5
	Body 790	e'	52.9079	Relative Permittivity (ϵ_r):	52.91	55.39	-4.49	5
		e''	22.9632	Conductivity (σ):	1.01	0.97	4.40	5
9/7/2012	Body 835	e'	52.7639	Relative Permittivity (ϵ_r):	52.76	55.20	-4.41	5
		e''	21.8103	Conductivity (σ):	1.01	0.97	4.39	5
	Body 820	e'	52.9212	Relative Permittivity (ϵ_r):	52.92	55.28	-4.26	5
		e''	21.8594	Conductivity (σ):	1.00	0.97	2.91	5
	Body 850	e'	52.6288	Relative Permittivity (ϵ_r):	52.63	55.16	-4.58	5
		e''	21.7577	Conductivity (σ):	1.03	0.99	4.17	5
9/7/2012	Body 1900	e'	51.6466	Relative Permittivity (ϵ_r):	51.65	53.30	-3.10	5
		e''	14.3373	Conductivity (σ):	1.51	1.52	-0.35	5
	Body 1850	e'	51.7241	Relative Permittivity (ϵ_r):	51.72	53.30	-2.96	5
		e''	14.1611	Conductivity (σ):	1.46	1.52	-4.16	5
	Body 1880	e'	51.7149	Relative Permittivity (ϵ_r):	51.71	53.30	-2.97	5
		e''	14.2774	Conductivity (σ):	1.49	1.52	-1.81	5
	Body 1910	e'	51.5933	Relative Permittivity (ϵ_r):	51.59	53.30	-3.20	5
		e''	14.3732	Conductivity (σ):	1.53	1.52	0.43	5
9/10/2012	Body 1900	e'	51.4150	Relative Permittivity (ϵ_r):	51.42	53.30	-3.54	5
		e''	14.5726	Conductivity (σ):	1.54	1.52	1.29	5
	Body 1850	e'	51.5455	Relative Permittivity (ϵ_r):	51.55	53.30	-3.29	5
		e''	14.3452	Conductivity (σ):	1.48	1.52	-2.92	5
	Body 1880	e'	51.4905	Relative Permittivity (ϵ_r):	51.49	53.30	-3.39	5
		e''	14.4805	Conductivity (σ):	1.51	1.52	-0.41	5
	Body 1910	e'	51.3704	Relative Permittivity (ϵ_r):	51.37	53.30	-3.62	5
		e''	14.6200	Conductivity (σ):	1.55	1.52	2.15	5
9/10/2012	Body 835	e'	52.9255	Relative Permittivity (ϵ_r):	52.93	55.20	-4.12	5
		e''	21.7453	Conductivity (σ):	1.01	0.97	4.08	5
	Body 820	e'	53.0876	Relative Permittivity (ϵ_r):	53.09	55.28	-3.96	5
		e''	21.8214	Conductivity (σ):	0.99	0.97	2.73	5
	Body 850	e'	52.7808	Relative Permittivity (ϵ_r):	52.78	55.16	-4.31	5
		e''	21.6767	Conductivity (σ):	1.02	0.99	3.78	5

Tissue Dielectric Parameter Check Results (continued)

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
9/10/2012	Body 835	e'	52.9168	Relative Permittivity (ϵ_r):	52.92	55.20	-4.14	5
		e''	21.7599	Conductivity (σ):	1.01	0.97	4.15	5
	Body 820	e'	53.0780	Relative Permittivity (ϵ_r):	53.08	55.28	-3.98	5
		e''	21.8386	Conductivity (σ):	1.00	0.97	2.81	5
	Body 850	e'	52.7746	Relative Permittivity (ϵ_r):	52.77	55.16	-4.32	5
		e''	21.6832	Conductivity (σ):	1.02	0.99	3.82	5
9/10/2012	Body 1900	e'	51.2237	Relative Permittivity (ϵ_r):	51.22	53.30	-3.90	5
		e''	14.4671	Conductivity (σ):	1.53	1.52	0.55	5
	Body 1850	e'	51.3133	Relative Permittivity (ϵ_r):	51.31	53.30	-3.73	5
		e''	14.2645	Conductivity (σ):	1.47	1.52	-3.47	5
	Body 1880	e'	51.2966	Relative Permittivity (ϵ_r):	51.30	53.30	-3.76	5
		e''	14.3932	Conductivity (σ):	1.50	1.52	-1.01	5
	Body 1910	e'	51.1691	Relative Permittivity (ϵ_r):	51.17	53.30	-4.00	5
		e''	14.5083	Conductivity (σ):	1.54	1.52	1.37	5
9/11/2012	Body 1900	e'	51.5779	Relative Permittivity (ϵ_r):	51.58	53.30	-3.23	5
		e''	14.3180	Conductivity (σ):	1.51	1.52	-0.48	5
	Body 1850	e'	51.6618	Relative Permittivity (ϵ_r):	51.66	53.30	-3.07	5
		e''	14.1381	Conductivity (σ):	1.45	1.52	-4.32	5
	Body 1880	e'	51.6444	Relative Permittivity (ϵ_r):	51.64	53.30	-3.11	5
		e''	14.2539	Conductivity (σ):	1.49	1.52	-1.97	5
	Body 1910	e'	51.5273	Relative Permittivity (ϵ_r):	51.53	53.30	-3.33	5
		e''	14.3546	Conductivity (σ):	1.52	1.52	0.30	5
9/11/2012	Body 835	e'	53.0330	Relative Permittivity (ϵ_r):	53.03	55.20	-3.93	5
		e''	21.8170	Conductivity (σ):	1.01	0.97	4.43	5
	Body 820	e'	53.1955	Relative Permittivity (ϵ_r):	53.20	55.28	-3.77	5
		e''	21.8939	Conductivity (σ):	1.00	0.97	3.08	5
	Body 850	e'	52.9016	Relative Permittivity (ϵ_r):	52.90	55.16	-4.09	5
		e''	21.7339	Conductivity (σ):	1.03	0.99	4.06	5
9/11/2012	Body 835	e'	52.7814	Relative Permittivity (ϵ_r):	52.78	55.20	-4.38	5
		e''	21.7712	Conductivity (σ):	1.01	0.97	4.21	5
	Body 820	e'	52.9476	Relative Permittivity (ϵ_r):	52.95	55.28	-4.21	5
		e''	21.8518	Conductivity (σ):	1.00	0.97	2.88	5
	Body 850	e'	52.6472	Relative Permittivity (ϵ_r):	52.65	55.16	-4.55	5
		e''	21.6943	Conductivity (σ):	1.03	0.99	3.87	5
9/12/2012	Body 750	e'	53.4990	Relative Permittivity (ϵ_r):	53.50	55.55	-3.69	5
		e''	23.2878	Conductivity (σ):	0.97	0.96	0.84	5
	Body 775	e'	53.2238	Relative Permittivity (ϵ_r):	53.22	55.45	-4.01	5
		e''	23.1444	Conductivity (σ):	1.00	0.97	3.35	5
	Body 790	e'	53.0542	Relative Permittivity (ϵ_r):	53.05	55.39	-4.22	5
		e''	23.0348	Conductivity (σ):	1.01	0.97	4.73	5
9/12/2012	Body 835	e'	52.9887	Relative Permittivity (ϵ_r):	52.99	55.20	-4.01	5
		e''	21.8364	Conductivity (σ):	1.01	0.97	4.52	5
	Body 820	e'	53.1489	Relative Permittivity (ϵ_r):	53.15	55.28	-3.85	5
		e''	21.9142	Conductivity (σ):	1.00	0.97	3.17	5
	Body 850	e'	52.8382	Relative Permittivity (ϵ_r):	52.84	55.16	-4.20	5
		e''	21.7608	Conductivity (σ):	1.03	0.99	4.19	5

Tissue Dielectric Parameter Check Results (continued)

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
9/13/2012	Body 5180	e'	49.0982	Relative Permittivity (ϵ_r):	49.10	49.05	0.10	10
		e''	18.3566	Conductivity (σ):	5.29	5.27	0.30	5
	Body 5200	e'	49.0635	Relative Permittivity (ϵ_r):	49.06	49.02	0.09	10
		e''	18.3781	Conductivity (σ):	5.31	5.29	0.36	5
	Body 5500	e'	48.5836	Relative Permittivity (ϵ_r):	48.58	48.61	-0.06	10
		e''	18.6206	Conductivity (σ):	5.69	5.64	0.89	5
	Body 5800	e'	48.1190	Relative Permittivity (ϵ_r):	48.12	48.20	-0.17	10
		e''	18.9293	Conductivity (σ):	6.10	6.00	1.74	5
	Body 5825	e'	48.0824	Relative Permittivity (ϵ_r):	48.08	48.20	-0.24	10
		e''	18.9590	Conductivity (σ):	6.14	6.00	2.34	5
9/13/2012	Body 5180	e'	49.0229	Relative Permittivity (ϵ_r):	49.02	49.05	-0.05	10
		e''	18.3655	Conductivity (σ):	5.29	5.27	0.35	5
	Body 5200	e'	48.9950	Relative Permittivity (ϵ_r):	49.00	49.02	-0.05	10
		e''	18.3815	Conductivity (σ):	5.31	5.29	0.38	5
	Body 5500	e'	48.4902	Relative Permittivity (ϵ_r):	48.49	48.61	-0.25	10
		e''	18.6164	Conductivity (σ):	5.69	5.64	0.86	5
	Body 5800	e'	48.0470	Relative Permittivity (ϵ_r):	48.05	48.20	-0.32	10
		e''	18.9143	Conductivity (σ):	6.10	6.00	1.66	5
	Body 5825	e'	48.0006	Relative Permittivity (ϵ_r):	48.00	48.20	-0.41	10
		e''	18.9404	Conductivity (σ):	6.13	6.00	2.24	5
9/13/2012	Body 835	e'	53.2492	Relative Permittivity (ϵ_r):	53.25	55.20	-3.53	5
		e''	21.8167	Conductivity (σ):	1.01	0.97	4.42	5
	Body 820	e'	53.4051	Relative Permittivity (ϵ_r):	53.41	55.28	-3.39	5
		e''	21.8785	Conductivity (σ):	1.00	0.97	3.00	5
	Body 850	e'	53.1183	Relative Permittivity (ϵ_r):	53.12	55.16	-3.70	5
		e''	21.7415	Conductivity (σ):	1.03	0.99	4.09	5
9/14/2012	Body 1900	e'	52.4471	Relative Permittivity (ϵ_r):	52.45	53.30	-1.60	5
		e''	14.7287	Conductivity (σ):	1.56	1.52	2.37	5
	Body 1850	e'	52.5523	Relative Permittivity (ϵ_r):	52.55	53.30	-1.40	5
		e''	14.5112	Conductivity (σ):	1.49	1.52	-1.80	5
	Body 1880	e'	52.5120	Relative Permittivity (ϵ_r):	52.51	53.30	-1.48	5
		e''	14.6422	Conductivity (σ):	1.53	1.52	0.70	5
	Body 1910	e'	52.4055	Relative Permittivity (ϵ_r):	52.41	53.30	-1.68	5
		e''	14.7727	Conductivity (σ):	1.57	1.52	3.22	5
9/14/2012	Body 835	e'	52.7225	Relative Permittivity (ϵ_r):	52.72	55.20	-4.49	5
		e''	21.8038	Conductivity (σ):	1.01	0.97	4.36	5
	Body 820	e'	52.8906	Relative Permittivity (ϵ_r):	52.89	55.28	-4.32	5
		e''	21.8603	Conductivity (σ):	1.00	0.97	2.92	5
	Body 850	e'	52.5803	Relative Permittivity (ϵ_r):	52.58	55.16	-4.67	5
		e''	21.7390	Conductivity (σ):	1.03	0.99	4.08	5
9/17/2012	Body 1900	e'	52.2605	Relative Permittivity (ϵ_r):	52.26	53.30	-1.95	5
		e''	14.8582	Conductivity (σ):	1.57	1.52	3.27	5
	Body 1850	e'	52.3964	Relative Permittivity (ϵ_r):	52.40	53.30	-1.70	5
		e''	14.6080	Conductivity (σ):	1.50	1.52	-1.14	5
	Body 1880	e'	52.3187	Relative Permittivity (ϵ_r):	52.32	53.30	-1.84	5
		e''	14.7487	Conductivity (σ):	1.54	1.52	1.43	5
	Body 1910	e'	52.2298	Relative Permittivity (ϵ_r):	52.23	53.30	-2.01	5
		e''	14.9104	Conductivity (σ):	1.58	1.52	4.18	5

Tissue Dielectric Parameter Check Results (continued)

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
9/17/2012	Body 835	e'	52.8669	Relative Permittivity (ϵ_r):	52.87	55.20	-4.23	5
		e''	21.8533	Conductivity (σ):	1.01	0.97	4.60	5
	Body 820	e'	53.0474	Relative Permittivity (ϵ_r):	53.05	55.28	-4.03	5
		e''	21.9212	Conductivity (σ):	1.00	0.97	3.20	5
	Body 850	e'	52.7042	Relative Permittivity (ϵ_r):	52.70	55.16	-4.45	5
		e''	21.7915	Conductivity (σ):	1.03	0.99	4.33	5
9/25/2012	Body 2450	e'	51.7030	Relative Permittivity (ϵ_r):	51.70	52.70	-1.89	5
		e''	14.2759	Conductivity (σ):	1.94	1.95	-0.27	5
	Body 2410	e'	51.8384	Relative Permittivity (ϵ_r):	51.84	52.76	-1.75	5
		e''	14.0571	Conductivity (σ):	1.88	1.91	-1.25	5
	Body 2435	e'	51.7550	Relative Permittivity (ϵ_r):	51.76	52.73	-1.84	5
		e''	14.1958	Conductivity (σ):	1.92	1.93	-0.47	5
	Body 2475	e'	51.6017	Relative Permittivity (ϵ_r):	51.60	52.67	-2.03	5
		e''	14.4002	Conductivity (σ):	1.98	1.99	-0.17	5
9/25/2012	Body 2450	e'	52.5033	Relative Permittivity (ϵ_r):	52.50	52.70	-0.37	5
		e''	14.3063	Conductivity (σ):	1.95	1.95	-0.06	5
	Body 2410	e'	52.6419	Relative Permittivity (ϵ_r):	52.64	52.76	-0.22	5
		e''	14.0849	Conductivity (σ):	1.89	1.91	-1.05	5
	Body 2435	e'	52.5582	Relative Permittivity (ϵ_r):	52.56	52.73	-0.32	5
		e''	14.2243	Conductivity (σ):	1.93	1.93	-0.27	5
	Body 2475	e'	52.4016	Relative Permittivity (ϵ_r):	52.40	52.67	-0.51	5
		e''	14.4330	Conductivity (σ):	1.99	1.99	0.06	5

12. System Performance Check

The system performance check is performed prior to any usage of the system in order to verify SAR system measurement accuracy. The system performance check verifies that the system operates within its specifications of ±10%.

12.1. System Performance Check Measurement Conditions

- The measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness: 2.0 ±0.2 mm (bottom plate) filled with Body or Head simulating liquid of the following parameters.
- The DASY system with an E-Field Probe was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10 mm (above 1 GHz) and 15 mm (below 1 GHz) from dipole center to the simulating liquid surface.
- The coarse grid with a grid spacing of 15 mm was aligned with the dipole.
  For 5 GHz band - The coarse grid with a grid spacing of 10 mm was aligned with the dipole.
- Special 7x7x7 (below 3 GHz) and/or 8x8x7 (above 3 GHz) fine cube was chosen for the cube.
- Distance between probe sensors and phantom surface was set to 3 mm.
  For 5 GHz band - Distance between probe sensors and phantom surface was set to 2.5 mm
- The dipole input power (forward power) was 100 mW.
- The results are normalized to 1 W input power.

12.2. Reference SAR Values for System Performance Check

The reference SAR values can be obtained from the calibration certificate of system validation dipoles

System Dipole	Serial No.	Cal. Date	Freq. (MHz)	Target SAR Values (mW/g)		
				1g/10g	Head	Body
D750V3	1025	4/13/12	750	1g	8.44	8.76
				10g	5.53	5.80
D835V2	4d076	4/10/12	835	1g	9.40	9.49
				10g	6.16	6.28
D1900V2	5d108	4/3/12	1900	1g	39.9	40.6
				10g	21.0	21.5
D2450V2	826	4/11/12	2450	1g	52.4	50.6
				10g	24.5	23.7
D5GHzV2	1072	4/18/12	5200	1g	80.3	73.8
				10g	23.0	20.7
			5500	1g	85.0	78.7
				10g	24.3	21.9
			5800	1g	79.6	72.8
				10g	22.6	20.2

12.3. System Performance Check Results

Date Tested	System Dipole		T.S.	SAR Measured (Normalized to 1 W)		Target (Ref. Value)	Delta (%)	Tolerance (%)
	Type	Serial No.	Liquid					
8/1/2012	D2450V2	826	Body	1g	53.1	50.6	4.94	±10
				10g	24.9	23.7	5.06	
8/1/2012	D2450V2	826	Body	1g	50.1	50.6	-0.99	±10
				10g	23.0	23.7	-2.95	
8/2/2012	D5GHzV2 (5.8GHz)	1072	Body	1g	69.5	72.8	-4.53	±10
				10g	19.5	20.2	-3.47	
8/3/2012	D2450V2	826	Body	1g	54.7	50.6	8.10	±10
				10g	25.5	23.7	7.59	
8/3/2012	D5GHzV2 (5.8GHz)	1072	Body	1g	68.1	72.8	-6.46	±10
				10g	19.1	20.2	-5.45	
8/3/2012	D5GHzV2 (5.8GHz)	1072	Body	1g	67.8	72.8	-6.87	±10
				10g	19.1	20.2	-5.45	
8/8/2012	D5GHzV2 (5.2GHz)	1072	Body	1g	69.3	73.8	-6.10	±10
				10g	19.5	20.7	-5.80	
8/9/2012	D2450V2	826	Body	1g	53.2	50.6	5.14	±10
				10g	25.0	23.7	5.49	
8/9/2012	D5GHzV2 (5.2GHz)	1072	Body	1g	69.8	73.8	-5.42	±10
				10g	19.7	20.7	-4.83	
8/9/2012	D5GHzV2 (5.2GHz)	1072	Body	1g	69.7	73.8	-5.56	±10
				10g	19.6	20.7	-5.31	
8/10/2012	D5GHzV2 (5.2GHz)	1072	Body	1g	70.8	73.8	-4.07	±10
				10g	19.9	20.7	-3.86	
8/14/2012	D5GHzV2 (5.5GHz)	1072	Body	1g	75.4	78.7	-4.19	±10
				10g	21.1	21.9	-3.65	
8/14/2012	D5GHzV2 (5.6GHz)	1072	Body	1g	79.2	78.7	0.64	±10
				10g	22.2	21.9	1.37	
8/15/2012	D5GHzV2 (5.2GHz)	1072	Body	1g	73.4	73.8	-0.54	±10
				10g	20.7	20.7	0.00	
8/15/2012	D5GHzV2 (5.5GHz)	1072	Body	1g	77.0	78.7	-2.16	±10
				10g	21.4	21.9	-2.28	
8/15/2012	D5GHzV2 (5.6GHz)	1072	Body	1g	80.9	78.7	2.80	±10
				10g	22.7	21.9	3.65	
8/15/2012	D5GHzV2 (5.8GHz)	1072	Body	1g	68.7	72.8	-5.63	±10
				10g	19.3	20.2	-4.46	
8/16/2012	D5GHzV2 (5.5GHz)	1072	Body	1g	75.1	78.7	-4.57	±10
				10g	21.0	21.9	-4.11	
8/16/2012	D5GHzV2 (5.6GHz)	1072	Body	1g	78.8	78.7	0.13	±10
				10g	22.1	21.9	0.91	
8/21/2012	D1900V2	5d108	Body	1g	42.4	40.6	4.43	±10
				10g	22.0	21.5	2.33	
8/22/2012	D835V2	4d076	Body	1g	9.87	9.49	4.00	±10
				10g	6.50	6.28	3.50	

System Performance Check Results (continued)

Date Tested	System Dipole		T.S. Liquid	SAR Measured (Normalized to 1 W)		Target (Ref. Value)	Delta (%)	Tolerance (%)
	Type	Serial No.						
8/22/2012	D1900V2	5d108	Body	1g	39.4	40.6	-2.96	±10
				10g	20.6	21.5	-4.19	
8/22/2012	D1900V2	5d108	Body	1g	39.9	40.6	-1.72	±10
				10g	20.8	21.5	-3.26	
8/22/2012	D835V2	4d076	Body	1g	10.3	9.49	8.54	±10
				10g	6.79	6.28	8.12	
8/23/2012	D1900V2	5d108	Body	1g	39.1	40.6	-3.69	±10
				10g	20.4	21.5	-5.12	
8/23/2012	D835V2	4d076	Body	1g	9.86	9.49	3.90	±10
				10g	6.49	6.28	3.34	
8/23/2012	D835V2	4d076	Body	1g	9.88	9.49	4.11	±10
				10g	6.51	6.28	3.66	
8/23/2012	D1900V2	5d108	Body	1g	40.3	40.6	-0.74	±10
				10g	21.1	21.5	-1.86	
8/24/2012	D1900V2	5d108	Body	1g	40.6	40.6	0.00	±10
				10g	21.2	21.5	-1.40	
8/24/2012	D750V3	1025	Body	1g	8.38	8.76	-4.34	±10
				10g	5.56	5.80	-4.14	
8/24/2012	D835V2	4d076	Body	1g	10.4	9.49	9.59	±10
				10g	6.85	6.28	9.08	
8/27/2012	D1900V2	5d108	Body	1g	37.9	40.6	-6.65	±10
				10g	19.7	21.5	-8.37	
8/27/2012	D750V3	1025	Body	1g	8.45	8.76	-3.54	±10
				10g	5.62	5.80	-3.10	
8/28/2012	D1900V2	5d108	Body	1g	39.7	40.6	-2.22	±10
				10g	20.7	21.5	-3.72	
9/7/2012	D1900V2	5d108	Body	1g	40.7	40.6	0.25	±10
				10g	21.7	21.5	0.93	
9/7/2012	D750V3	1025	Body	1g	8.37	8.76	-4.45	±10
				10g	5.53	5.80	-4.66	
9/7/2012	D835V2	4d076	Body	1g	9.27	9.49	-2.32	±10
				10g	6.11	6.28	-2.71	
9/7/2012	D1900V2	5d108	Body	1g	38.7	40.6	-4.68	±10
				10g	20.1	21.5	-6.51	
9/10/2012	D1900V2	5d108	Body	1g	39.8	40.6	-1.97	±10
				10g	20.7	21.5	-3.72	
9/10/2012	D835V2	4d076	Body	1g	9.57	9.49	0.84	±10
				10g	6.30	6.28	0.32	
9/10/2012	D835V2	4d076	Body	1g	10.1	9.49	6.43	±10
				10g	6.68	6.28	6.37	
9/10/2012	D1900V2	5d108	Body	1g	40.6	40.6	0.00	±10
				10g	21.2	21.5	-1.40	
9/11/2012	D1900V2	5d108	Body	1g	38.8	40.6	-4.43	±10
				10g	20.3	21.5	-5.58	
9/11/2012	D835V2	4d076	Body	1g	9.24	9.49	-2.63	±10
				10g	6.07	6.28	-3.34	

System Performance Check Results (continued)

Date Tested	System Dipole		T.S. Liquid	SAR Measured (Normalized to 1 W)		Target (Ref. Value)	Delta (%)	Tolerance (%)
	Type	Serial No.						
9/11/2012	D835V2	4d076	Body	1g	9.71	9.49	2.32	±10
				10g	6.39	6.28	1.75	
9/12/2012	D750V3	1025	Body	1g	8.74	8.76	-0.23	±10
				10g	5.79	5.80	-0.17	
9/12/2012	D835V2	4d076	Body	1g	9.80	9.49	3.27	±10
				10g	6.45	6.28	2.71	
9/13/2012	D5GHzV2 (5.2GHz)	1072	Body	1g	68.8	73.8	-6.78	±10
				10g	19.3	20.7	-6.76	
9/13/2012	D5GHzV2 (5.2GHz)	1072	Body	1g	71.8	73.8	-2.71	±10
				10g	20.1	20.7	-2.90	
9/13/2012	D835V2	4d076	Body	1g	9.84	9.49	3.69	±10
				10g	6.47	6.28	3.03	
9/14/2012	D1900V2	5d108	Body	1g	38.7	40.6	-4.68	±10
				10g	20.3	21.5	-5.58	
9/14/2012	D835V2	4d076	Body	1g	9.92	9.49	4.53	±10
				10g	6.53	6.28	3.98	
9/17/2012	D1900V2	5d108	Body	1g	39.5	40.6	-2.71	±10
				10g	20.6	21.5	-4.19	
9/17/2012	D835V2	4d076	Body	1g	9.45	9.49	-0.42	±10
				10g	6.23	6.28	-0.80	
9/25/2012	D2450V2	826	Body	1g	52.4	50.6	3.56	±10
				10g	24.3	23.7	2.53	
9/25/2012	D2450V2	826	Body	1g	51.4	50.6	1.58	±10
				10g	23.7	23.7	0.00	

13. SAR Test Results

13.1. GSM850

Test Position	Power back-off	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)	1g SAR (W/kg)	Note
Rear	on (Second-stage)	0	GPRS 2 slots	128	824.2	25.2	1.120	
				190	836.6	25.3	**1.190**	
				251	848.8	25.3	1.140	
Edge 1	on (Second-stage)	0	GPRS 2 slots	128	824.2	25.2		1
				190	836.6	25.3	0.705	
				251	848.8	25.3		1
Edge 1 (41° Rear Tilt)	on (Second-stage)	0	GPRS 2 slots	128	824.2	25.2	1.040	
				190	836.6	25.3	1.020	
				251	848.8	25.3	0.958	
Rear	off	12	GPRS 2 slots	128	824.2	32.8		1
				190	836.6	32.7	0.682	2
				251	848.8	32.7		1
Edge 1	off	14	GPRS 2 slots	128	824.2	32.8		1
				190	836.6	32.7	0.477	2
				251	848.8	32.7		1
Rear (27° Tilt @ Edge 1)	off	0	GPRS 2 slots	128	824.2	32.8		1
				190	836.6	32.7	0.399	
				251	848.8	32.7		1
Edge 2	off	0	GPRS 2 slots	128	824.2	32.8		1
				190	836.6	32.7	0.413	
				251	848.8	32.7		1

Note(s):

1. SAR test was performed in the middle channel only as the measured level was < 50% of the SAR limit as stated in FCC "Public Notice DA 02-1438" by the SCC-34/SC-2. Testing in the low and high channel is optional.
2. SAR evaluation is performed with power back-off disabled (at full power) at the conservative distance of the second stage trigger. Therefore, additional SAR testing for different stages of power back-off is not performed.

13.2. GSM1900

Test Position	Power back-off	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)	1g SAR (W/kg)	Note
Rear	on (Second-stage)	0	GPRS 2 slots	512	1850.2	22.0	0.798	
				661	1880.0	22.0	0.951	
				810	1909.8	22.0	**1.190**	
Edge 1	on (Second-stage)	0	GPRS 2 slots	512	1850.2	22.0		1
				661	1880.0	22.0	0.634	
				810	1909.8	22.0		1
Edge 1 (41° Rear Tilt)	on (Second-stage)	0	GPRS 2 slots	512	1850.2	22.0	0.816	
				661	1880.0	22.0	0.832	
				810	1909.8	22.0	0.899	
Rear	off	12	GPRS 2 slots	512	1850.2	29.3	0.710	2
				661	1880.0	29.3	0.822	2
				810	1909.8	29.3	0.939	2
Edge 1	off	14	GPRS 2 slots	512	1850.2	29.3		1
				661	1880.0	29.3	0.751	2
				810	1909.8	29.3		1
Rear (27° Tilt @ Edge 1)	off	0	GPRS 2 slots	512	1850.2	29.3		1
				661	1880.0	29.3	0.561	
				810	1909.8	29.3		1
Edge 2	off	0	GPRS 2 slots	512	1850.2	29.3		1
				661	1880.0	29.3	0.492	
				810	1909.8	29.3		1

Note(s):

1. According to FCC “Public Notice DA 02-1438” by the SCC-34/SC-2, when the SAR measured for the middle channel is < 50% of the SAR limit, testing for the low and high channel is optional.
2. SAR evaluation is performed with power back-off disabled (at full power) at the conservative distance of the second stage trigger. Therefore, additional SAR testing for different stages of power back-off is not performed.

13.3. W-CDMA Band V

Test reduction considerations

Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit as per KDB 941225 D01

Test Position	Power back-off	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)	1g SAR (W/kg)	Note
Rear	on (Second-stage)	0	Rel 99 RMC 12.2kbps	4132	826.4	19.5	1.040	
				4183	836.6	19.4	**1.150**	
				4233	846.6	19.4	1.110	
Edge 1	on (Second-stage)	0	Rel 99 RMC 12.2kbps	4132	826.4	19.5	0.721	
				4183	836.6	19.4	0.851	
				4233	846.6	19.4	0.698	
Edge 1 (41 deg Tilt)	on (Second-stage)	0	Rel 99 RMC 12.2kbps	4132	826.4	19.5	0.918	
				4183	836.6	19.4	1.050	
				4233	846.6	19.4	1.030	
Rear	off	12	Rel 99 RMC 12.2kbps	4132	826.4	24.5		1
				4183	836.6	24.4	0.646	2
				4233	846.6	24.4		1
Edge 1	off	14	Rel 99 RMC 12.2kbps	4132	826.4	24.5		1
				4183	836.6	24.4	0.441	2
				4233	846.6	24.4		1
Rear (27 deg Tilt @ Edge 1)	off	0	Rel 99 RMC 12.2kbps	4132	826.4	24.5		1
				4183	836.6	24.4	0.436	
				4233	846.6	24.4		1
Edge 2	off	0	Rel 99 RMC 12.2kbps	4132	826.4	24.5		1
				4183	836.6	24.4	0.431	
				4233	846.6	24.4		1

Note(s):

1. According to FCC "Public Notice DA 02-1438" by the SCC-34/SC-2, when the SAR measured for the middle channel is < 50% of the SAR limit, testing for the low and high channel is optional.
2. SAR evaluation is performed with power back-off disabled (at full power) at the conservative distance of the second stage trigger. Therefore, additional SAR testing for different stages of power back-off is not performed.

13.4. W-CDMA Band II

Test reduction considerations

Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2kbps RMC is ≤ 75% of the SAR limit as per KDB 941225 D01

Test Position	Power back-off	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)	1g SAR (W/kg)	Note
Rear	on (Second-stage)	0	Rel 99 RMC 12.2kbps	9262	1852.4	15.3	0.938	
				9400	1880.0	15.2	0.921	
				9538	1907.6	15.5	**1.180**	
Edge 1	on (Second-stage)	0	Rel 99 RMC 12.2kbps	9262	1852.4	15.3		1
				9400	1880.0	15.2	0.643	
				9538	1907.6	15.5		1
Edge 1 (41° Rear Tilt)	on (Second-stage)	0	Rel 99 RMC 12.2kbps	9262	1852.4	15.3	0.948	
				9400	1880.0	15.2	0.866	
				9538	1907.6	15.5	1.000	
Rear	off	12	Rel 99 RMC 12.2kbps	9262	1852.4	23.0	0.697	2
				9400	1880.0	22.9	0.843	2
				9538	1907.6	23.0	0.868	2
Edge 1	off	14	Rel 99 RMC 12.2kbps	9262	1852.4	23.0	0.699	2
				9400	1880.0	22.9	0.915	2
				9538	1907.6	23.0	1.030	2
Rear (27° Tilt @ Edge 1)	off	0	Rel 99 RMC 12.2kbps	9262	1852.4	23.0		1
				9400	1880.0	22.9	0.659	
				9538	1907.6	23.0		1
Edge 2	off	0	Rel 99 RMC 12.2kbps	9262	1852.4	23.0		1
				9400	1880.0	22.9	0.437	
				9538	1907.6	23.0		1

Note(s):

1. According to FCC “Public Notice DA 02-1438” by the SCC-34/SC-2, when the SAR measured for the middle channel is < 50% of the SAR limit, testing for the low and high channel is optional.
2. SAR evaluation is performed with power back-off disabled (at full power) at the conservative distance of the second stage trigger. Therefore, additional SAR testing for different stages of power back-off is not performed.

13.5. CDMA BC0

Test Position	Pwr Back-off	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)	1g SAR (W/kg)	Note
Rear	on (Second-stage)	0	1xRTT (RC3 SO32)	1013	824.7	19.2	0.946	
				384	836.5	19.3	**1.170**	
				777	848.3	19.1	1.070	
Edge 1	on (Second-stage)	0	1xRTT (RC3 SO32)	1013	824.7	19.2	0.657	
				384	836.5	19.3	0.819	
				777	848.3	19.1	0.624	
Edge 1 (41° Rear Tilt)	on (Second-stage)	0	1xRTT (RC3 SO32)	1013	824.7	19.2	0.823	
				384	836.5	19.3	1.050	
				777	848.3	19.1	0.973	
Rear	off	12	1xRTT (RC3 SO32)	1013	824.7	24.7	0.636	
				384	836.5	24.7	0.809	2
				777	848.3	24.6	0.680	2
Edge 1	off	14	1xRTT (RC3 SO32)	1013	824.7	24.7		1
				384	836.5	24.7	0.538	2
				777	848.3	24.6		1
Rear (27° Tilt @ Edge 1)	off	0	1xRTT (RC3 SO32)	1013	824.7	24.7		1
				384	836.5	24.7	0.510	
				777	848.3	24.6		1
Edge 2	off	0	1xRTT (RC3 SO32)	1013	824.7	24.7		1
				384	836.5	24.7	0.492	
				777	848.3	24.6		1
Test Position	Pwr Back-off	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)	1g SAR (W/kg)	Note
Rear	on (Second-stage)	0	1xEVDO (Rel. 0)	1013	824.7	19.3	0.907	
				384	836.5	19.2	**1.140**	
				777	848.3	19.1	1.030	
Edge 1	on (Second-stage)	0	1xEVDO (Rel. 0)	1013	824.7	19.3	0.692	
				384	836.5	19.2	0.869	
				777	848.3	19.1	0.649	
Edge 1 (41° Rear Tilt)	on (Second-stage)	0	1xEVDO (Rel. 0)	1013	824.7	19.3	0.814	
				384	836.5	19.2	1.050	
				777	848.3	19.1	0.972	
Rear	off	12	1xEVDO (Rel. 0)	1013	824.7	24.8	0.694	
				384	836.5	24.7	0.823	2
				777	848.3	24.6	0.700	2
Edge 1	off	14	1xEVDO (Rel. 0)	1013	824.7	24.8		1
				384	836.5	24.7	0.534	2
				777	848.3	24.6		1
Rear (27° Tilt @ Edge 1)	off	0	1xEVDO (Rel. 0)	1013	824.7	24.8		1
				384	836.5	24.7	0.539	
				777	848.3	24.6		1
Edge 2	off	0	1xEVDO (Rel. 0)	1013	824.7	24.8		1
				384	836.5	24.7	0.460	
				777	848.3	24.6		1

CDMA BC0 continued

Test Position	Pwr Back-off	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)	1g SAR (W/kg)	Note
Rear	on (Second-stage)	0	1xEVDO (Rev. B) Two Carrier Mini.	1013+31	824.70+825.93	19.2	0.845	
				384+425	836.52+837.75	19.2	**1.150**	
				736+777	847.08+848.31	19.1	0.934	
Edge 1	on (Second-stage)	0	1xEVDO (Rev. B) Two Carrier Mini.	1013+31	824.70+825.93	19.2	0.688	
				384+425	836.52+837.75	19.2	0.814	
				736+777	847.08+848.31	19.1	0.641	
Edge 1 (41° Tilt)	on (Second-stage)	0	1xEVDO (Rev. B) Two Carrier Mini.	1013+31	824.70+825.93	19.2	0.802	
				384+425	836.52+837.75	19.2	0.952	
				736+777	847.08+848.31	19.1	0.910	
Rear	off	12	1xEVDO (Rev. B) Two Carrier Mini.	1013+31	824.70+825.93	21.5		1
				384+425	836.52+837.75	21.5	0.427	2
				736+777	847.08+848.31	21.5		1
Edge 1	off	14	1xEVDO (Rev. B) Two Carrier Mini.	1013+31	824.70+825.93	21.5		1
				384+425	836.52+837.75	21.5	0.247	2
				736+777	847.08+848.31	21.5		1
Rear (27° Tilt @ Edge 1)	off	0	1xEVDO (Rev. B) Two Carrier Mini.	1013+31	824.70+825.93	21.5		1
				384+425	836.52+837.75	21.5	0.222	
				736+777	847.08+848.31	21.5		1
Edge 2	off	0	1xEVDO (Rev. B) Two Carrier Mini.	1013+31	824.70+825.93	21.5		1
				384+425	836.52+837.75	21.5	0.053	
				736+777	847.08+848.31	21.5		1

Test Position	Pwr Back-off	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)	1g SAR (W/kg)	Note
Rear	on (Second-stage)	0	1xEVDO (Rev. B) Three carrier	1013+31+72	824.70+825.93+827.16	19.2	0.916	
				384+425+466	836.52+837.75+838.98	19.2	**1.100**	
				695+736+777	845.85+847.08+848.31	19.1	1.030	
Edge 1	on (Second-stage)	0	1xEVDO (Rev. B) Three carrier	1013+31+72	824.70+825.93+827.16	19.2		1
				384+425+466	836.52+837.75+838.98	19.2	0.778	
				695+736+777	845.85+847.08+848.31	19.1		1
Edge 1 (41° Tilt)	on (Second-stage)	0	1xEVDO (Rev. B) Three carrier	1013+31+72	824.70+825.93+827.16	19.2		1
				384+425+466	836.52+837.75+838.98	19.2	0.740	
				695+736+777	845.85+847.08+848.31	19.1		1
Rear	off	12	1xEVDO (Rev. B) Three carrier	1013+31+72	824.70+825.93+827.16	21.0		1
				384+425+466	836.52+837.75+838.98	21.0	0.349	2
				695+736+777	845.85+847.08+848.31	21.0		1
Edge 1	off	14	1xEVDO (Rev. B) Three carrier	1013+31+72	824.70+825.93+827.16	21.0		1
				384+425+466	836.52+837.75+838.98	21.0	0.254	2
				695+736+777	845.85+847.08+848.31	21.0		1
Rear (27° Tilt @ Edge 1)	off	0	1xEVDO (Rev. B) Three carrier	1013+31+72	824.70+825.93+827.16	21.0		1
				384+425+466	836.52+837.75+838.98	21.0	0.070	
				695+736+777	845.85+847.08+848.31	21.0		1
Edge 2	off	0	1xEVDO (Rev. B) Three carrier	1013+31+72	824.70+825.93+827.16	21.0		1
				384+425+466	836.52+837.75+838.98	21.0	0.052	
				695+736+777	845.85+847.08+848.31	21.0		1

Note(s):

1. According to FCC "Public Notice DA 02-1438" by the SCC-34/SC-2, when the SAR measured for the middle channel is < 50% of the SAR limit, testing for the low and high channel is optional.
2. SAR evaluation is performed with power back-off disabled (at full power) at the conservative distance of the second stage trigger. Therefore, additional SAR testing for different stages of power back-off is not performed.

13.6. CDMA BC1

Test Position	Pwr Back-off	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)	1g SAR (W/kg)	Note
Rear	on (Second-stage)	0	1xRTT (RC3 SO32)	25	1851.25	15.3	0.894	
				600	1880.00	15.3	**1.190**	
				1175	1908.75	15.2	1.160	
Edge 1	on (Second-stage)	0	1xRTT (RC3 SO32)	25	1851.25	15.5	0.738	
				600	1880.00	15.4	0.926	
				1175	1908.75	15.4	0.872	
Edge 1 (41° Rear Tilt)	on (Second-stage)	0	1xRTT (RC3 SO32)	25	1851.25	15.5	0.968	
				600	1880.00	15.4	1.180	
				1175	1908.75	15.4	1.090	
Rear	off	12	1xRTT (RC3 SO32)	25	1851.25	23.0	0.591	2
				600	1880.00	22.9	0.806	2
				1175	1908.75	22.9	0.821	2
Edge 1	off	14	1xRTT (RC3 SO32)	25	1851.25	23.0	0.639	2
				600	1880.00	22.9	0.883	2
				1175	1908.75	22.9	0.875	2
Rear (27° Tilt @ Edge 1)	off	0	1xRTT (RC3 SO32)	25	1851.25	23.0		1
				600	1880.00	22.9	0.613	
				1175	1908.75	22.9		1
Edge 2	off	0	1xRTT (RC3 SO32)	25	1851.25	23.0		1
				600	1880.00	22.9	0.408	
				1175	1908.75	22.9		1
Test Position	Pwr Back-off	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)	1g SAR (W/kg)	Note
Rear	on (Second-stage)	0	1xEVDO (Rel. 0)	25	1851.25	15.3	0.877	
				600	1880.00	15.3	**1.100**	
				1175	1908.75	15.3	1.090	
Edge 1	on (Second-stage)	0	1xEVDO (Rel. 0)	25	1851.25	15.3	0.672	
				600	1880.00	15.3	0.844	
				1175	1908.75	15.3	0.768	
Edge 1 (41° Rear Tilt)	on (Second-stage)	0	1xEVDO (Rel. 0)	25	1851.25	15.3	0.943	
				600	1880.00	15.3	1.100	
				1175	1908.75	15.3	0.891	
Rear	off	12	1xEVDO (Rel. 0)	25	1851.25	23.0	0.625	2
				600	1880.00	23.0	0.817	2
				1175	1908.75	23.0	0.825	2
Edge 1	off	14	1xEVDO (Rel. 0)	25	1851.25	23.0	0.628	2
				600	1880.00	23.0	0.843	2
				1175	1908.75	23.0	0.856	2
Rear (27° Tilt @ Edge 1)	off	0	1xEVDO (Rel. 0)	25	1851.25	23.0		1
				600	1880.00	23.0	0.554	
				1175	1908.75	23.0		1
Edge 2	off	0	1xEVDO (Rel. 0)	25	1851.25	23.0		1
				600	1880.00	23.0	0.445	
				1175	1908.75	23.0		1

Note(s):

1. According to FCC "Public Notice DA 02-1438" by the SCC-34/SC-2, when the SAR measured for the middle channel is < 50% of the SAR limit, testing for the low and high channel is optional.
2. SAR evaluation is performed with power back-off disabled (at full power) at the conservative distance of the second stage trigger. Therefore, additional SAR testing for different stages of power back-off is not performed.

13.7. CDMA BC10

Test Position	Pwr Back-off	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)	1g SAR (W/kg)	Note
Rear	on (Second-stage)	0	1xRTT (RC3 SO32)	476	817.9	18.7	1.170	
				580	820.5	18.8	**1.180**	
				684	823.1	18.8	1.010	
Edge 1	on (Second-stage)	0	1xRTT (RC3 SO32)	476	817.9	18.7	0.816	
				580	820.5	18.8	0.780	
				684	823.1	18.8	0.658	
Edge 1 (41° Rear Tilt)	on (Second-stage)	0	1xRTT (RC3 SO32)	476	817.9	18.7	1.010	
				580	820.5	18.8	0.906	
				684	823.1	18.8	0.792	
Rear	off	12	1xRTT (RC3 SO32)	476	817.9	24.9		1
				580	820.5	25.0	0.708	2
				684	823.1	25.0		1
Edge 1	off	14	1xRTT (RC3 SO32)	476	817.9	24.9		1
				580	820.5	25.0	0.527	2
				684	823.1	25.0		1
Rear (27° Tilt @ Edge 1)	off	0	1xRTT (RC3 SO32)	476	817.9	24.9		1
				580	820.5	25.0	0.538	
				684	823.1	25.0		1
Edge 2	off	0	1xRTT (RC3 SO32)	476	817.9	24.9		1
				580	820.5	25.0	0.468	
				684	823.1	25.0		1
Test Position	Pwr Back-off	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)	1g SAR (W/kg)	Note
Rear	on (Second-stage)	0	1xEVDO (Rel. 0)	476	817.9	18.8	1.080	
				580	820.5	18.8	**1.100**	
				684	823.1	18.8	0.912	
Edge 1	on (Second-stage)	0	1xEVDO (Rel. 0)	476	817.9	18.8	0.805	
				580	820.5	18.8	0.780	
				684	823.1	18.8	0.655	
Edge 1 (41° Rear Tilt)	on (Second-stage)	0	1xEVDO (Rel. 0)	476	817.9	18.8	0.889	
				580	820.5	18.8	0.811	
				684	823.1	18.8	0.702	
Rear	off	12	1xEVDO (Rel. 0)	476	817.9	24.9	0.762	2
				580	820.5	25.0	0.810	2
				684	823.1	25.0	0.728	2
Edge 1	off	14	1xEVDO (Rel. 0)	476	817.9	24.9		1
				580	820.5	25.0	0.590	2
				684	823.1	25.0		1
Rear (27° Tilt @ Edge 1)	off	0	1xEVDO (Rel. 0)	476	817.9	24.9		1
				580	820.5	25.0	0.652	
				684	823.1	25.0		1
Edge 2	off	0	1xEVDO (Rel. 0)	476	817.9	24.9		1
				580	820.5	25.0	0.520	
				684	823.1	25.0		1

Note(s):

1. According to FCC "Public Notice DA 02-1438" by the SCC-34/SC-2, when the SAR measured for the middle channel is < 50% of the SAR limit, testing for the low and high channel is optional.
2. SAR evaluation is performed with power back-off disabled (at full power) at the conservative distance of the second stage trigger. Therefore, additional SAR testing for different stages of power back-off is not performed.

13.8. LTE Band 5 (10MHz Bandwidth)

Test Position	Power back-off	Dist. (mm)	Mode	UL Ch #.	Freq. (MHz)	UL RB Allocation	UL RB Start	MPR	Power (dBm)	1g SAR (W/kg)	Note
Rear	on (Second-stage)	0	QPSK	20450	829.0	1	24	0	18.8	0.938	
						25	12	1	18.8	0.934	
				20525	836.5	1	0	0	18.8	1.070	
						1	24	0	18.8	1.110	
						1	49	0	18.8	0.889	
						25	0	1	18.8	**1.140**	
						25	12	1	18.8	1.120	
						25	24	1	18.8	1.030	
						50	0	1	18.8	1.120	
				20600	844.0	1	24	0	18.8	0.913	
						25	12	1	18.8	0.961	
Edge 1	on (Second-stage)	0	QPSK	20525	836.5	1	0	0	18.8	0.645	
						1	24	0	18.8	0.663	
						1	49	0	18.8	0.529	
						25	0	1	18.8	0.756	
						25	12	1	18.8	0.735	
						25	24	1	18.8	0.638	
						50	0	1	18.8	0.680	
Edge 1 (41° Tilt)	on (Second-stage)	0	QPSK	20450	829.0	1	24	0	18.8	0.807	
						25	12	1	18.8	0.839	
				20525	836.5	1	0	0	18.8	0.905	
						1	24	0	18.8	0.845	
						1	49	0	18.8	0.717	
						25	0	1	18.8	0.984	
						25	12	1	18.8	0.917	
						25	24	1	18.8	0.819	
						50	0	1	18.8	0.896	
				20600	844.0	1	24	0	18.8	0.809	
						25	12	1	18.8	0.829	

LTE Band 5 (10MHz Bandwidth) continued

Test Position	Power back-off	Dist. (mm)	Mode	UL Ch #.	Freq. (MHz)	UL RB Allocation	UL RB Start	MPR	Power (dBm)	1g SAR (W/kg)	Note
Rear	off	12	QPSK	20525	836.5	1	0	0	24.0	0.659	2
						1	24	0	24.0	0.739	2
						1	49	0	24.0	0.599	2
						25	0	1	22.9	0.574	2
						25	12	1	23.1	0.602	2
						25	24	1	22.9	0.563	2
						50	0	1	23.0	0.568	2
Edge 1	off	14	QPSK	20525	836.5	1	0	0	24.0	0.350	2
						1	24	0	24.0	0.404	2
						1	49	0	24.0	0.326	2
						25	0	1	22.9	0.319	2
						25	12	1	23.1	0.340	2
						25	24	1	22.9	0.328	2
						50	0	1	23.0	0.307	2
Rear (27° Tilt @ Edge 1)	off	0	QPSK	20525	836.5	1	0	0	24.0	0.315	
						1	24	0	24.0	0.369	
						1	49	0	24.0	0.317	
						25	0	1	22.9	0.329	
						25	12	1	23.1	0.348	
						25	24	1	22.9	0.331	
						50	0	1	23.0	0.298	
Edge 2	off	0	QPSK	20525	836.5	1	0	0	24.0	0.298	
						1	24	0	24.0	0.328	
						1	49	0	24.0	0.260	
						25	0	1	22.9	0.280	
						25	12	1	23.1	0.293	
						25	24	1	22.9	0.270	
						50	0	1	23.0	0.265	

Note(s):

1. Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction are applied using the following criteria:
   - Testing for Low and High Channel is performed at the highest output power level for 1RB, and 50% RB configuration for that channel
   - Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel
   - Testing for 16-QAM modulation is not required because the measured SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
   - Testing for the other channel bandwidths is not required because the measured SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.
2. SAR evaluation is performed with power back-off disabled (at full power) at the conservative distance of the second stage trigger. Therefore, additional SAR testing for different stages of power back-off is not performed.

13.9. LTE Band 13 (10MHz Bandwidth)

Test Position	Pwr Back-off	Dist. (mm)	Mode	UL Ch #.	Freq. (MHz)	UL RB Allocation	UL RB Start	MPR	Power (dBm)	1g SAR (W/kg)	Note
Rear	on (Second-stage)	0	QPSK	23230	782.0	1	0	0	19.3	0.978	
						1	24	0	19.2	0.990	
						1	49	0	19.3	1.080	
						25	0	1	19.3	1.080	
						25	12	1	19.3	1.160	
						25	24	1	19.3	**1.190**	
						50	0	1	19.3	1.060	
Edge 1	on (Second-stage)	0	QPSK	23230	782.0	1	0	0	19.3	0.671	
						1	24	0	19.2	0.697	
						1	49	0	19.3	0.722	
						25	0	1	19.3	0.707	
						25	12	1	19.3	0.763	
						25	24	1	19.3	0.790	
						50	0	1	19.3	0.728	
Edge 1 (41° Tilt @ Rear)	on (Second-stage)	0	QPSK	23230	782.0	1	0	0	19.3	0.893	
						1	24	0	19.2	1.010	
						1	49	0	19.3	1.000	
						25	0	1	19.3	0.982	
						25	12	1	19.3	1.090	
						25	24	1	19.3	1.120	
						50	0	1	19.3	1.040	
Rear	off	12	QPSK	23230	782.0	1	0	0	24.0	0.557	2
						1	24	0	23.9	0.554	2
						1	49	0	23.8	0.572	2
						25	0	1	22.8	0.468	2
						25	12	1	22.9	0.484	2
						25	24	1	22.9	0.498	2
						50	0	1	22.8	0.461	2
Edge 1	off	14	QPSK	23230	782.0	1	0	0	24.0	0.299	2
						1	24	0	23.9	0.272	2
						1	49	0	23.8	0.268	2
						25	0	1	22.8	0.229	2
						25	12	1	22.9	0.224	2
						25	24	1	22.9	0.230	2
						50	0	1	22.8	0.227	2
Rear (27° Tilt @ Edge 2)	off	0	QPSK	23230	782.0	1	0	0	24.0	0.342	
						1	24	0	23.9	0.317	
						1	49	0	23.8	0.314	
						25	0	1	22.8	0.286	
						25	12	1	22.9	0.280	
						25	24	1	22.9	0.277	
						50	0	1	22.8	0.260	
Edge 2	off	0	QPSK	23230	782.0	1	0	0	24.0	0.312	
						1	24	0	23.9	0.287	
						1	49	0	23.8	0.284	
						25	0	1	22.8	0.243	
						25	12	1	22.9	0.243	
						25	24	1	22.9	0.246	
						50	0	1	22.8	0.243	

Note(s):

1. Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction are applied using the following criteria:
   - Testing for Low and High Channel is performed at the highest output power level for 1RB, and 50% RB configuration for that channel
   - Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel
   - Testing for 16-QAM modulation is not required because the measured SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
   - Testing for the other channel bandwidths is not required because the measured SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.
2. SAR evaluation is performed with power back-off disabled (at full power) at the conservative distance of the second stage trigger. Therefore, additional SAR testing for different stages of power back-off is not performed.

13.10. LTE Band 25 (20MHz Bandwidth)

Test Position	Power back-off	Dist. (mm)	Mode	UL Ch #.	Freq. (MHz)	UL RB Allocation	UL RB Start	MPR	Power (dBm)	1g SAR (W/kg)	Note
Rear	on (Second-stage)	0	QPSK	26140	1860.0	1	0	0	15.0	0.783	
						50	24	1	15.0	0.671	
				26365	1882.5	1	0	0	15.0	**1.160**	
						1	49	0	15.0	1.020	
						1	99	0	15.0	0.847	
						50	0	1	15.0	0.912	
						50	24	1	15.0	0.810	
						50	49	1	15.0	0.740	
						100	0	1	15.0	1.060	
				26590	1905.0	1	49	0	15.0	1.080	
						50	24	1	15.0	0.952	
Edge 1	on (Second-stage)	0	QPSK	26140	1860.0	1	0	0	15.0	0.609	
						50	24	1	15.0	0.613	
				26365	1882.5	1	0	0	15.0	0.842	
						1	49	0	15.0	0.760	
						1	99	0	15.0	0.558	
						50	0	1	15.0	0.851	
						50	24	1	15.0	0.769	
						50	49	1	15.0	0.658	
						100	0	1	15.0	0.763	
				26590	1905.0	1	49	0	15.0	0.824	
						50	24	1	15.0	0.793	
Rear 41° Tilt @ Edge 1	on (Second-stage)	0	QPSK	26140	1860.0	1	0	0	15.0	0.853	
						50	24	1	15.0	0.850	
				26365	1882.5	1	0	0	15.0	1.080	
						1	49	0	15.0	1.030	
						1	99	0	15.0	0.747	
						50	0	1	15.0	1.130	
						50	24	1	15.0	1.070	
						50	49	1	15.0	0.921	
						100	0	1	15.0	1.030	
				26590	1905.0	1	49	0	15.0	1.050	
						50	24	1	15.0	1.040	

LTE Band 25 (20MHz Bandwidth) continued

Test Position	Power back-off	Dist. (mm)	Mode	UL Ch #.	Freq. (MHz)	UL RB Allocation	UL RB Start	MPR	Power (dBm)	1g SAR (W/kg)	Note
Rear	off	12	QPSK	26365	1882.5	1	0	0	22.9	0.695	2
						1	49	0	22.9	0.574	2
						1	99	0	22.9	0.521	2
						50	0	1	22.0	0.681	2
						50	24	1	22.0	0.627	2
						50	49	1	22.0	0.570	2
						100	0	1	22.0	0.619	2
Edge 1	off	14	QPSK	26140	1860.0	1	0	0	23.0	0.643	2
						50	24	1	22.0	0.618	2
				26365	1882.5	1	0	0	22.9	1.040	2
						1	49	0	22.9	0.834	2
						1	99	0	22.9	0.704	2
						50	0	1	22.0	0.730	2
						50	24	1	22.0	0.647	2
						50	49	1	22.0	0.578	2
						100	0	1	22.0	0.701	2
				26590	1905.0	1	49	0	22.8	1.150	2
						50	24	1	22.0	0.915	2
27° Tilt @ Edge 1	off	0	QPSK	26365	1882.5	1	0	0	22.9	0.691	
						1	49	0	22.9	0.629	
						1	99	0	22.9	0.558	
						50	0	1	22.0	0.543	
						50	24	1	22.0	0.502	
						50	49	1	22.0	0.459	
						100	0	1	22.0	0.532	
Edge 2	off	0	QPSK	26365	1882.5	1	0	0	22.9	0.625	
						1	49	0	22.9	0.565	
						1	99	0	22.9	0.485	
						50	0	1	22.0	0.499	
						50	24	1	22.0	0.448	
						50	49	1	22.0	0.420	
						100	0	1	22.0	0.460	

Note(s):

1. Per KDB 941225 D05 SAR for LTE Devices v02, SAR test reduction are applied using the following criteria:
   - Testing for Low and High Channel is performed at the highest output power level for 1RB, and 50% RB configuration for that channel
   - Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel
   - Testing for 16-QAM modulation is not required because the measured SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
   - Testing for the other channel bandwidths is not required because the measured SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.
2. SAR evaluation is performed with power back-off disabled (at full power) at the conservative distance of the second stage trigger. Therefore, additional SAR testing for different stages of power back-off is not performed

13.11. Wi-Fi (2.4 GHz Band)

(BOM #1)

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)	1g SAR (W/kg)	Note
Rear	802.11b	0	1	2412	16.5		1
			6	2437	16.5	0.083	
			11	2462	16.5		1
Edge 2	802.11b	0	1	2412	16.5		1
			6	2437	16.5	0.048	
			11	2462	16.5		1
Edge 3	802.11b	0	1	2412	16.5	0.963	
			6	2437	16.5	**1.120**	
			11	2462	16.5	1.020	

Highest SAR Configuration (BOM #2)

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)	1g SAR (W/kg)	Note
Edge 3	802.11b	0	6	2437	16.5	1.080	

Note(s):

1. When the 1-g SAR for the mid-band channel, or the channel with the highest output power satisfy the following conditions, testing of the other channels in the band is not required. (Per KDB 447498)
   ≤ 0.8 W/kg and transmission band ≤ 100 MHz
   ≤ 0.6 W/kg and, 100 MHz < transmission bandwidth ≤ 200 MHz
   ≤ 0.4 W/kg and transmission band > 200 MHz

13.12. Wi-Fi (5 GHz Bands)

(BOM #1)

Band (GHz)	Test Position	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)	1g SAR (W/kg)	Note
5.2	Rear	0	802.11a	36	5180	14.0	0.028	
				48	5240	14.0	0.033	
			802.11n HT40	46	5230	15.5	0.050	
	Edge 2	0	802.11a	36	5180	14.0	< .001	
				48	5240	14.0	< .001	
			802.11n HT40	46	5230	15.5	< .001	
	Edge 3	0	802.11a	36	5180	14.0	0.368	
				48	5240	14.0	0.400	
			802.11n HT40	46	5230	15.5	**0.585**	
5.3	Rear	0	802.11a	52	5260	17.5	0.054	
				60	5320	17.5	0.065	
	Edge 2	0	802.11a	52	5260	17.5	< .001	
				60	5320	17.5	< .001	
	Edge 3	0	802.11a	52	5260	17.5	**0.877**	
				60	5320	17.5	0.876	
5.5	Rear	0	802.11a	104	5520	18.0	0.051	
				116	5580	18.0	0.072	
				124	5620	18.0	0.051	
				136	5680	18.0	0.071	
	Edge 2	0	802.11a	104	5520	18.0	< .001	
				116	5580	18.0	0.020	
				124	5620	18.0	0.015	
				136	5680	18.0	0.015	
	Edge 3	0	802.11a	104	5520	18.0	0.941	
				116	5580	18.0	1.070	
				124	5620	18.0	1.050	
				136	5680	18.0	**1.080**	
5.8	Rear	0	802.11a	149	5745	18.5	0.057	
				157	5785	18.5	0.059	
				165	5825	18.5	0.051	
	Edge 2	0	802.11a	149	5745	18.5	0.011	
				157	5785	18.5	0.014	
				165	5825	18.5	0.00103	
	Edge 3	0	802.11a	149	5745	18.5	**0.958**	
				157	5785	18.5	0.934	
				165	5825	18.5	0.940	

Highest SAR Configuration (BOM #2)

Band (GHz)	Test Position	Dist. (mm)	Mode	Ch #.	Freq. (MHz)	Power (dBm)	1g SAR (W/kg)	Note
5.2	Edge 3	10	802.11n HT40	46	5230	15.5	0.548	
5.3	Edge 3	10	802.11a	52	5260	17.5	0.844	
5.5	Edge 3	10	802.11a	136	5680	18.0	1.060	
5.8	Edge 3	10	802.11a	149	5745	18.5	0.779	

13.13. Bluetooth

(BOM #1)

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)	1g SAR (W/kg)	Note
Rear	V2.1 + EDR, GFSK	0	0	2402	13.0		1
			39	2441	13.0	0.022	
			78	2480	13.0		1
Edge 2	V2.1 + EDR, GFSK	0	0	2402	13.0		1
			39	2441	13.0	0.010	
			78	2480	13.0		1
Edge 3	V2.1 + EDR, GFSK	0	0	2402	13.0		1
			39	2441	13.0	**0.356**	
			78	2480	13.0		1

Highest SAR Configuration (BOM #2)

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)	1g SAR (W/kg)	Note
Edge 3	V2.1 + EDR, GFSK	0	39	2441	13.0	0.317	

Note(s):

1. When the 1-g SAR for the mid-band channel, or the channel with the highest output power satisfy the following conditions, testing of the other channels in the band is not required. (Per KDB 447498)
   ≤ 0.8 W/kg and transmission band ≤ 100 MHz
   ≤ 0.6 W/kg and, 100 MHz < transmission bandwidth ≤ 200 MHz
   ≤ 0.4 W/kg and transmission band > 200 MHz

14. Summary of Highest SAR Values

Results for highest SAR values for each frequency band and mode

Technology/Band	Test configuration			Mode	Highest 1g SAR (W/kg)
	Exposure	Position	Pwr Back-off		
GSM850	Body	Rear	on (Second-stage)	GPRS 2 slots	1.190
GSM1900	Body	Rear	on (Second-stage)	GPRS 2 slots	1.190
W-CDMA Band V	Body	Rear	on (Second-stage)	Rel 99 RMC 12.2kbps	1.150
W-CDMA Band II	Body	Rear	on (Second-stage)	Rel 99 RMC 12.2kbps	1.180
CDMA BC0	Body	Rear	on (Second-stage)	1xRTT (RC3, SO32)	1.170
	Body	Rear	on (Second-stage)	1xEVDO (Rel.0)	1.140
	Body	Rear	on (Second-stage)	1xEVDO (Rev. B) 2 Carrier Mini	1.150
	Body	Rear	on (Second-stage)	1xEVDO (Rev. B) 3 Carrier Mini	1.100
CDMA BC1	Body	Rear	on (Second-stage)	1xRTT (RC3, SO32)	1.190
	Body	Rear	on (Second-stage)	1xEVDO (Rel.0)	1.100
CDMA BC10	Body	Rear	on (Second-stage)	1xRTT (RC3, SO32)	1.180
	Body	Rear	on (Second-stage)	1xEVDO (Rel.0)	1.100
LTE Band 5	Body	Rear	on (Second-stage)	10 MHz (QPSK) RB 1/24	1.140
LTE Band 13	Body	Rear	on (Second-stage)	10 MHz (QPSK) RB 25/12	1.190
LTE Band 25	Body	Rear	on (Second-stage)	20 MHz (QPSK) RB 100/0	1.160
WiFi 2.4 GHz	Body	Edge 3		802.11b 1Mbps	1.120
Bluetooth	Body	Edge 3		GFSK	0.359
WiFi 5.2 GHz	Body	Edge 3		802.11n HT40 MCS0	0.585
WiFi 5.3 GHz	Body	Edge 3		802.11a 6Mbps	0.877
WiFi 5.5 GHz	Body	Edge 3		802.11a 6Mbps	1.080
WiFi 5.8 GHz	Body	Edge 3		802.11a 6Mbps	0.958

14.1. Scaled SAR Values to the Maximum Target Output Power

The highest measured SAR results were scaled, in cases where measured output power is lower than the maximum Target output power level, in each frequency band.

Technology/Band	Test Configuration	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		SAR (W/kg)	
						Tune-up limit	Measured	Measured	Scaled
GSM850	Rear	GPRS 2 Slots	0	190	836.60	25.3	25.3	1.190	*
GSM1900	Rear	GPRS 2 Slots	0	810	1909.8	22.0	22.0	1.190	*
CDMA BC10	Rear	1xRTT (RC3 SO32)	0	580	820.5	18.8	18.8	1.180	*
LTE Band 13	Rear	10 MHz (QPSK) RB 25/24	0	23230	782.0	19.3	19.3	1.190	*
WiFi 2.4 GHz	Edge 3	802.11b 1Mbps	0	6	2437	16.5	16.5	1.120	*
WiFi 5.2 GHz	Edge 3	802.11n HT40 MCS0	0	46	5230	15.5	15.5	0.585	*
WiFi 5.3 GHz	Edge 3	802.11a 6Mbps	0	52	5260	17.5	17.5	0.877	*
WiFi 5.5 GHz	Edge 3	802.11a 6Mbps	0	136	5680	18.0	18.0	1.080	*
WiFi 5.8 GHz	Edge 3	802.11a 6Mbps	0	149	5785	18.5	18.5	0.958	*

Note(s):

*: SAR Scaling was not applied when the measured output power is equal or greater than the maximum target output power.

14.2. SAR Plots (from Summary of Highest SAR Values)

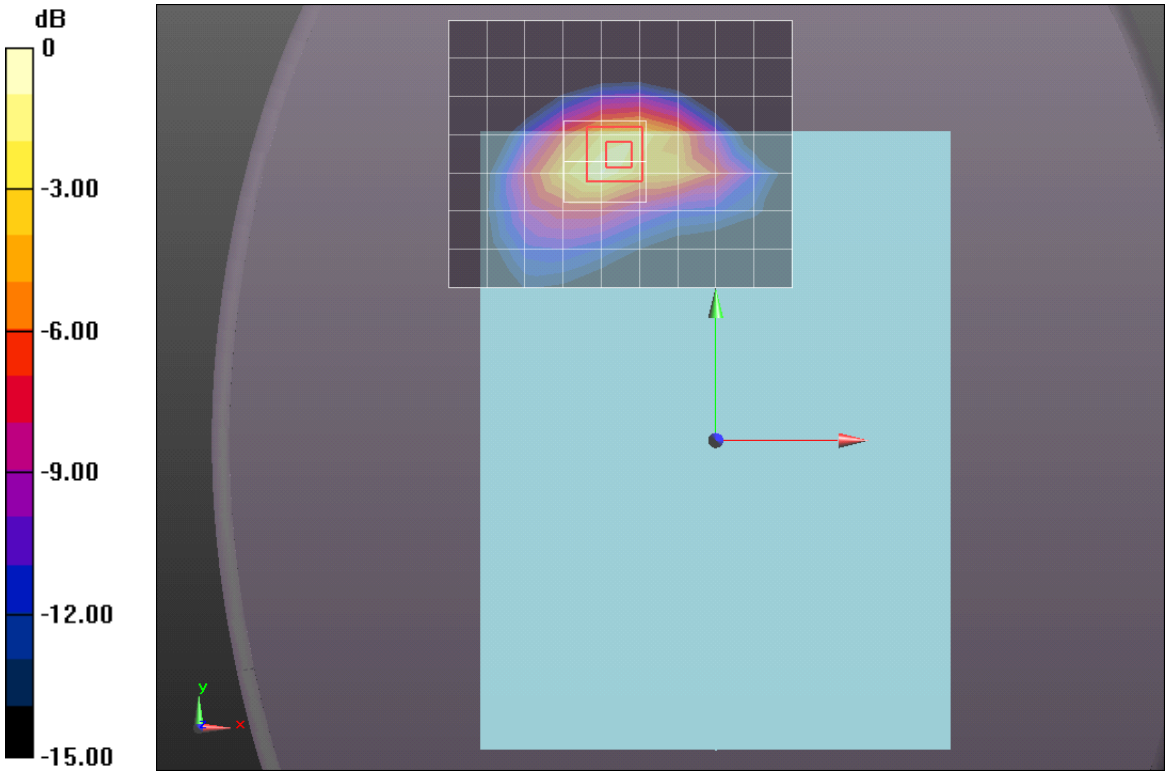
Test Laboratory: Lab C Date: 8/22/2012

GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): f = 836.6 MHz; σ = 1.017 mho/m; ε_r = 53.113; ρ = 1000 kg/m^3
DASY5 Configuration:
- Electronics: DAE4 Sn1261; Calibrated: 3/9/2012
- Probe: EX3DV4 - SN3757; ConvF(9, 9, 9); Calibrated: 3/24/2012
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1136

Rear/GPRS 2 Slots_ch 190/Area Scan (10x8x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.430 mW/g

Rear/GPRS 2 Slots_ch 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 40.047 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 2.4160
SAR(1 g) = 1.19 mW/g; SAR(10 g) = 0.618 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.725 mW/g



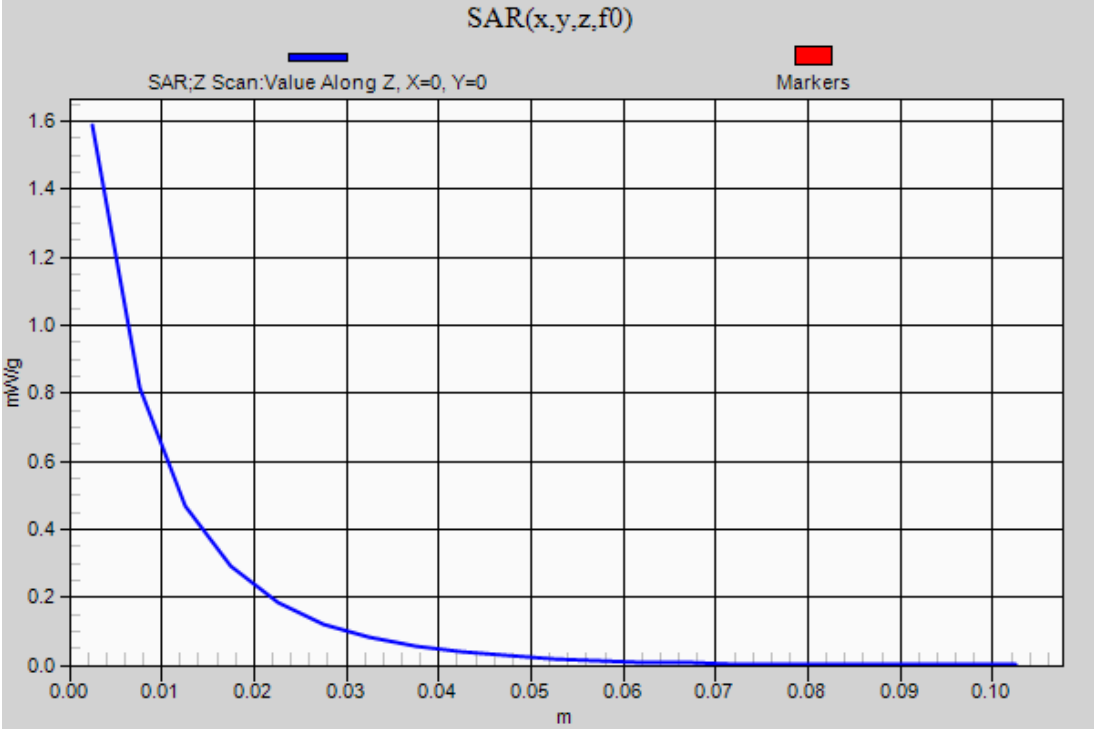
0 dB = 1.730mW/g = 4.76 dB mW/g

Test Laboratory: Lab C Date: 8/22/2012

GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4

Rear/GPRS 2 Slots_ch 190/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.587 mW/g



Test Laboratory: Lab A Date: 8/22/2012

GSM1900

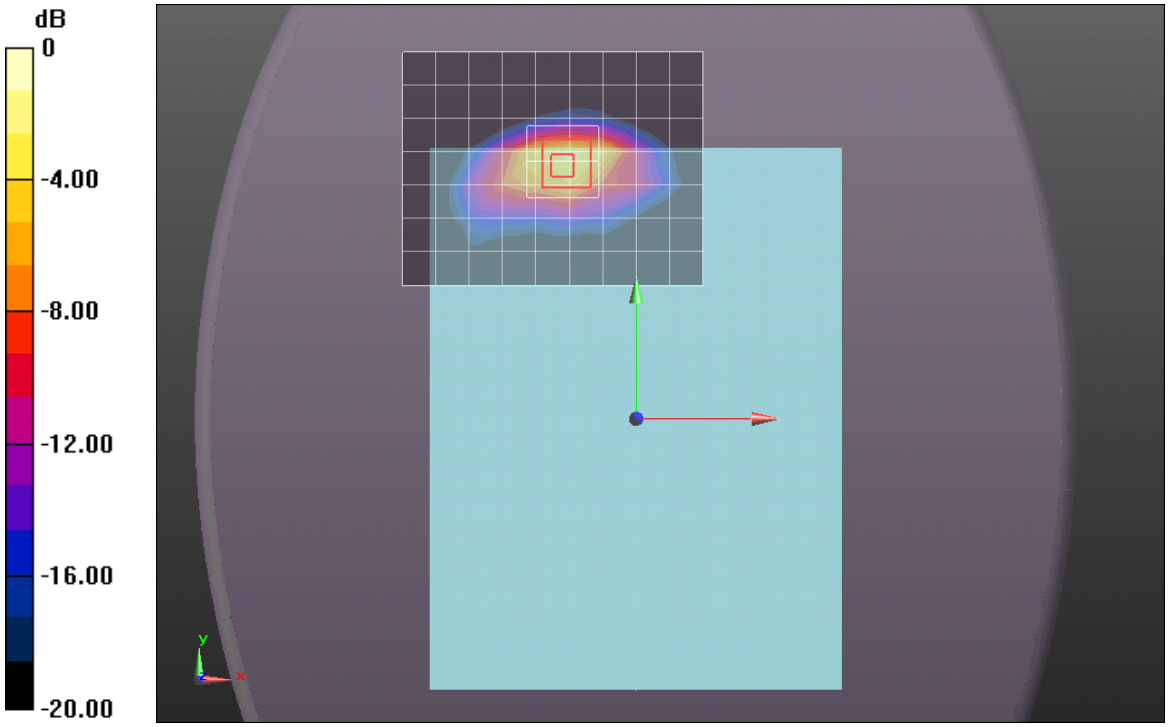
Frequency: 1909.8 MHz; Duty Cycle: 1:4; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used: f = 1910 MHz; σ = 1.553 mho/m; ε_r = 52.557; ρ = 1000 kg/m^3
DASY5 Configuration:
- Electronics: DAE4 Sn1263; Calibrated: 3/8/2012
- Probe: EX3DV4 - SN3778; ConvF(6.89, 6.89, 6.89); Calibrated: 3/24/2012
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1134

Rear/GPRS 2 Slots_ch 810/Area Scan (10x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.081 mW/g

Rear/GPRS 2 Slots_ch 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 33.076 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 2.2280
SAR(1 g) = 1.19 mW/g; SAR(10 g) = 0.566 mW/g
Maximum value of SAR (measured) = 1.702 mW/g



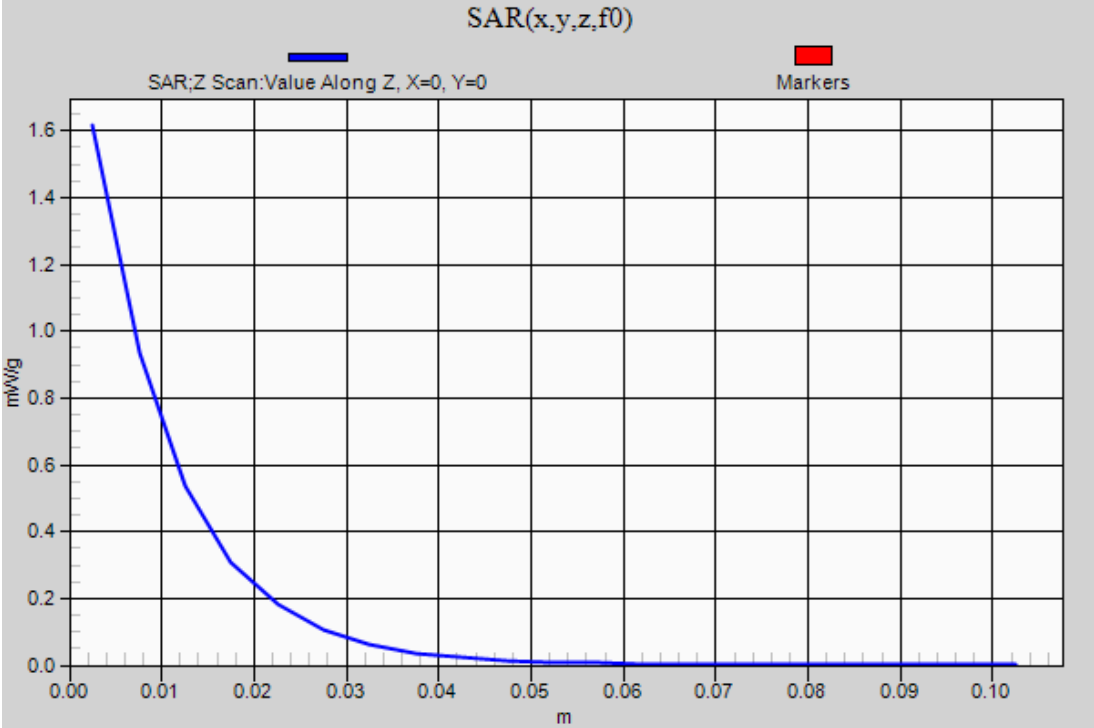
0 dB = 1.700mW/g = 4.61 dB mW/g

Test Laboratory: Lab A Date: 8/22/2012

GSM1900

Frequency: 1909.8 MHz; Duty Cycle: 1:4.00037

Rear/GPRS 2 Slots_ch 810/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 1.616 mW/g



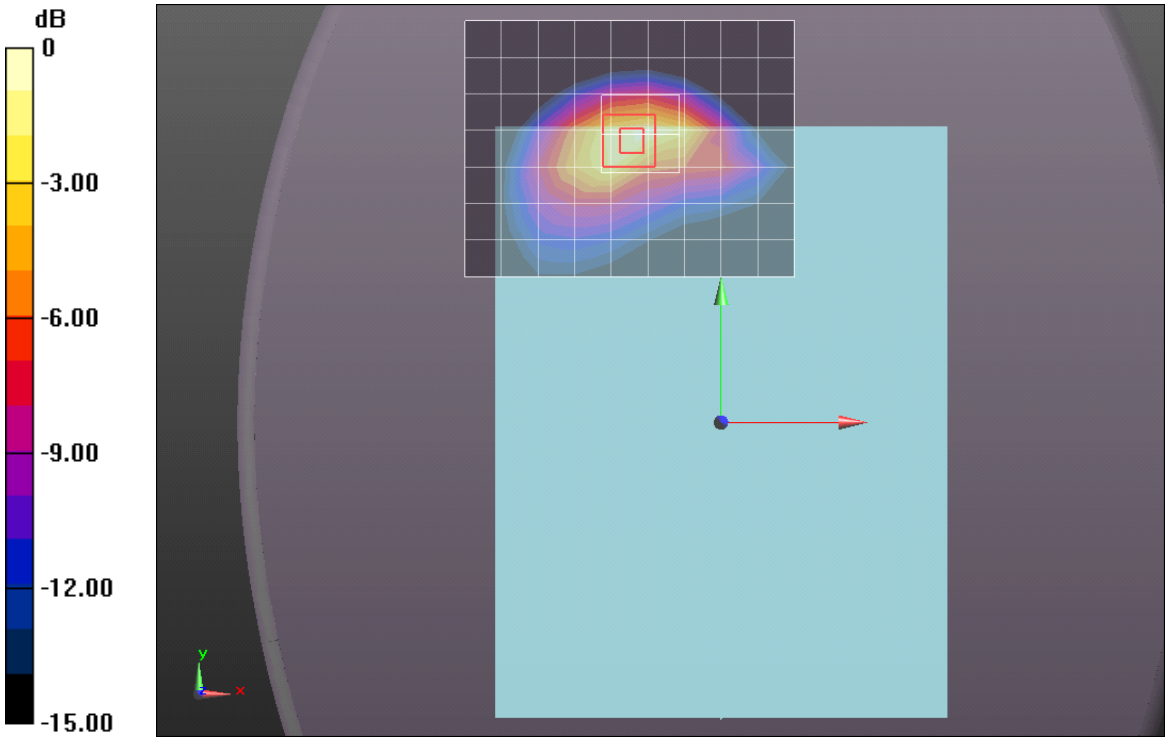
Test Laboratory: Lab C Date: 9/7/2012

W-CDMA Band V

Frequency: 836.6 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): f = 836.6 MHz; σ = 1.015 mho/m; ε_r = 52.749; ρ = 1000 kg/m^3
DASY5 Configuration:
- Electronics: DAE4 Sn1261; Calibrated: 3/9/2012
- Probe: EX3DV4 - SN3757; ConvF(9, 9, 9); Calibrated: 3/24/2012
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1136

Rear/Rel.99_RMC 12.2kbps_Ch 4183/Area Scan (10x8x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.426 mW/g

Rear/Rel.99_RMC 12.2kbps_Ch 4183/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 39.105 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 2.2820
SAR(1 g) = 1.15 mW/g; SAR(10 g) = 0.603 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.621 mW/g



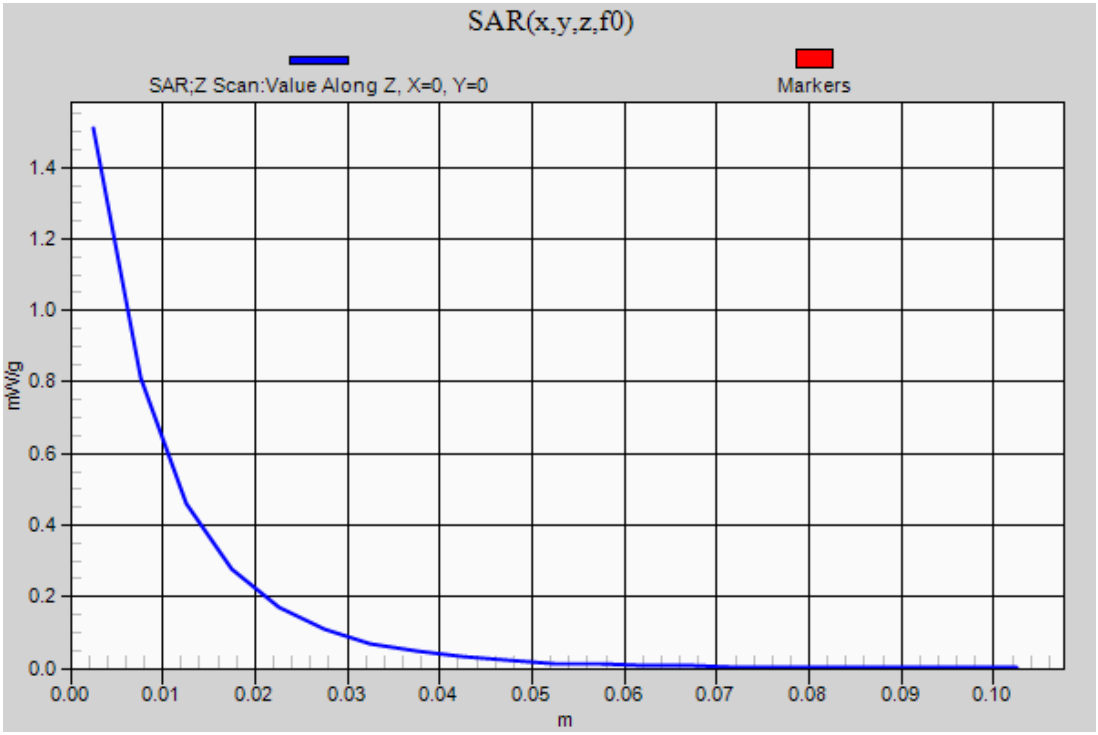
0 dB = 1.620mW/g = 4.19 dB mW/g

Test Laboratory: Lab C Date: 9/7/2012

W-CDMA Band V

Frequency: 836.6 MHz; Duty Cycle: 1:1

Rear/Rel.99_RMC 12.2kbps_Ch 4183/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.509 mW/g



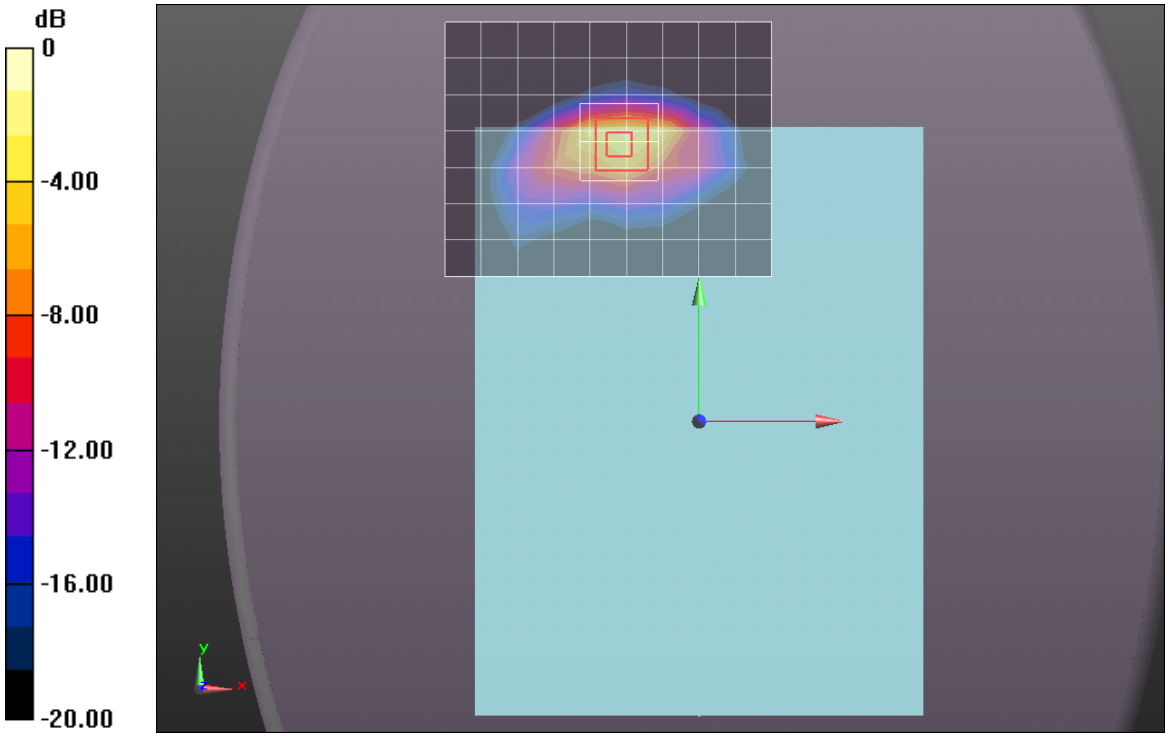
Test Laboratory: Lab A Date: 8/23/2012

W-CDMA Band II

Frequency: 1907.6 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): f = 1907.6 MHz; σ = 1.524 mho/m; ε_r = 52.452; ρ = 1000 kg/m^3
DASY5 Configuration:
- Electronics: DAE4 Sn1263; Calibrated: 3/8/2012
- Probe: EX3DV4 - SN3778; ConvF(6.89, 6.89, 6.89); Calibrated: 3/24/2012
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1134

Rear/Rel. 99 RMC 12.2kbps_Ch 9538/Area Scan (10x8x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.112 mW/g

Rear/Rel. 99 RMC 12.2kbps_Ch 9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.964 V/m; Power Drift = 0.0065 dB
Peak SAR (extrapolated) = 2.2080
SAR(1 g) = 1.18 mW/g; SAR(10 g) = 0.556 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.720 mW/g



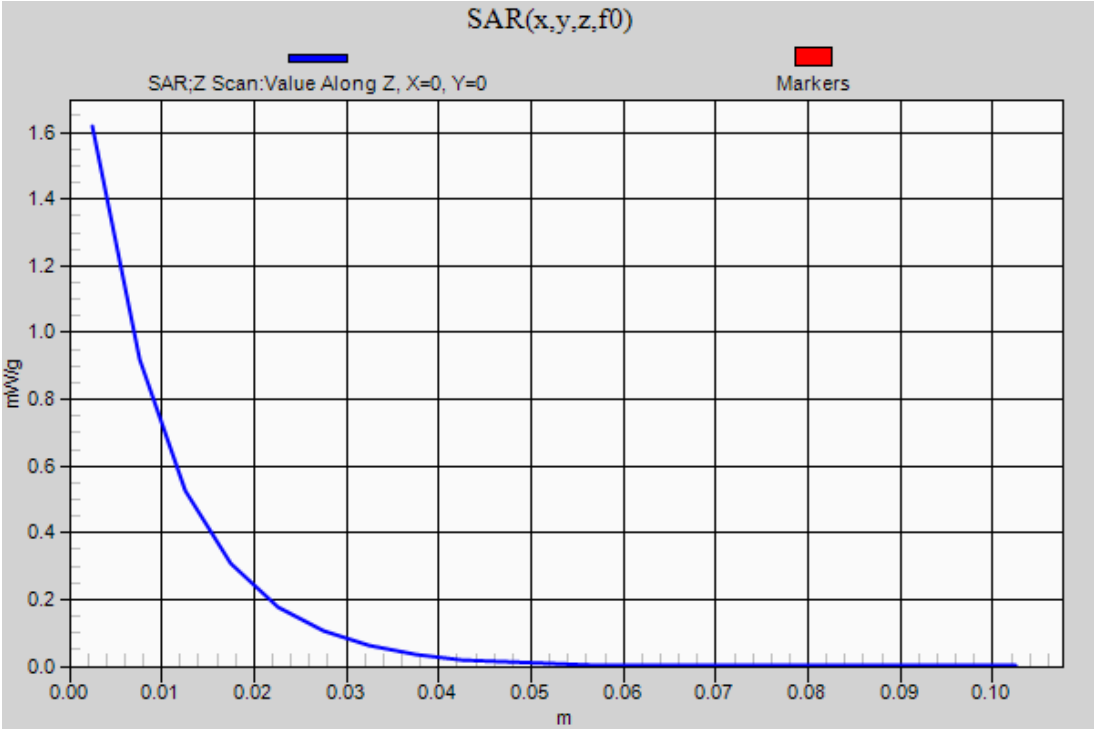
0 dB = 1.720mW/g = 4.71 dB mW/g

Test Laboratory: Lab A Date: 8/23/2012

W-CDMA Band II

Frequency: 1907.6 MHz; Duty Cycle: 1:1

Rear/Rel. 99 RMC 12.2kbps_Ch 9538/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.618 mW/g



Test Laboratory: Lab C Date: 8/23/2012

CDMA BC0

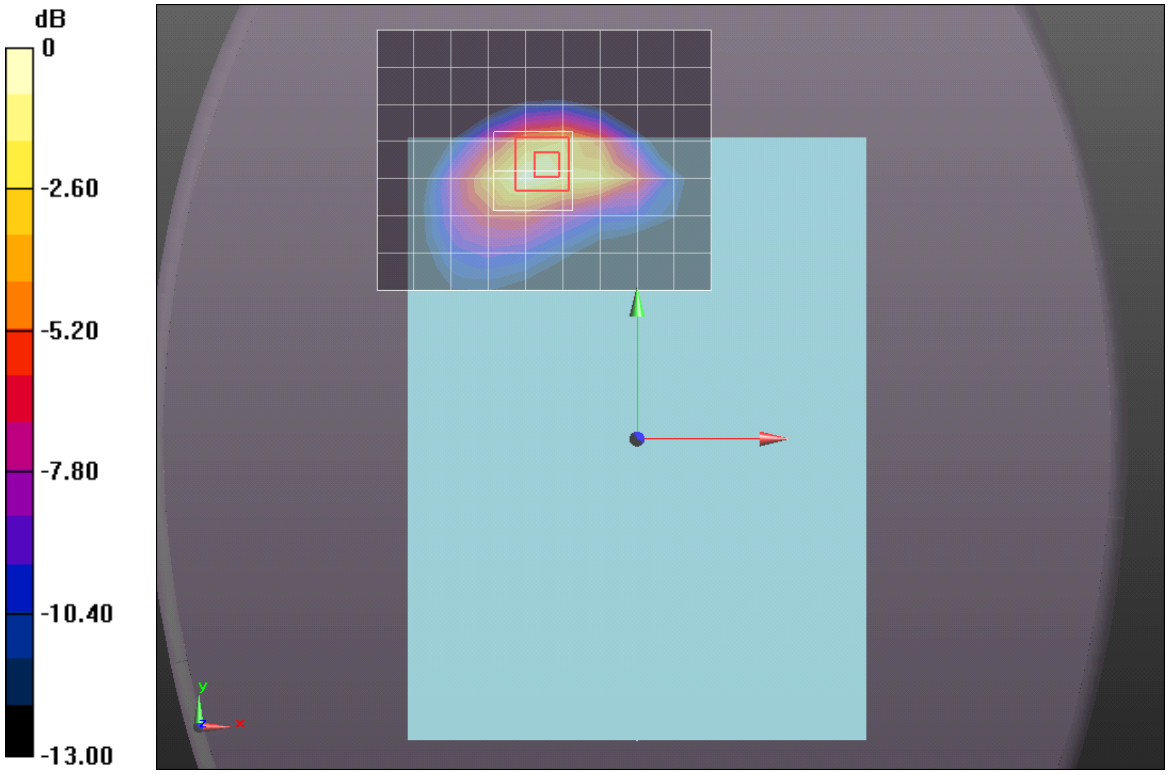
Frequency: 836.52 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): f = 836.52 MHz; σ = 1.017 mho/m; ε_r = 53.113; ρ = 1000 kg/m^3
DASY5 Configuration:
- Electronics: DAE4 Sn1261; Calibrated: 3/9/2012
- Probe: EX3DV4 - SN3757; ConvF(9, 9, 9); Calibrated: 3/24/2012
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1136

Rear/1xRTT_RC3_SO32_ch 384/Area Scan (10x8x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.577 mW/g

Rear/1xRTT_RC3_SO32_ch 384/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 40.872 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 2.3300
SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.617 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.682 mW/g



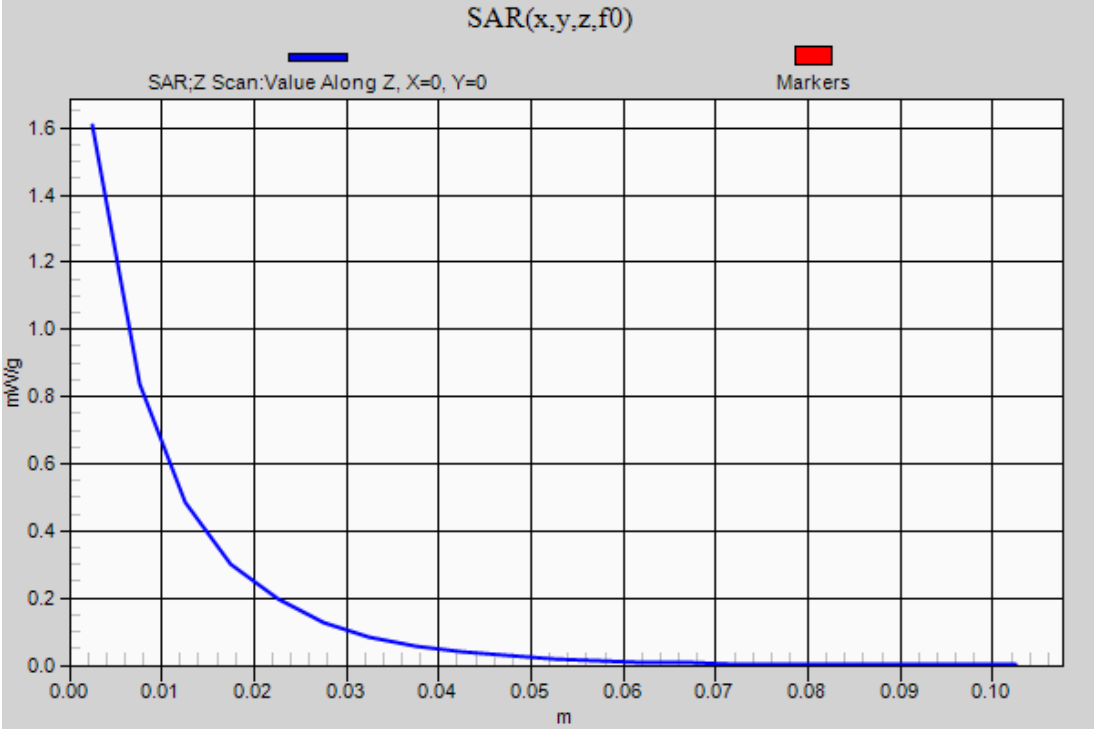
0 dB = 1.680mW/g = 4.51 dB mW/g

Test Laboratory: Lab C Date: 8/23/2012

CDMA BC0

Frequency: 836.52 MHz; Duty Cycle: 1:1

Rear/1xRTT_RC3_SO32_ch 384/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.607 mW/g



Test Laboratory: Lab C Date: 9/10/2012

CDMA BC0

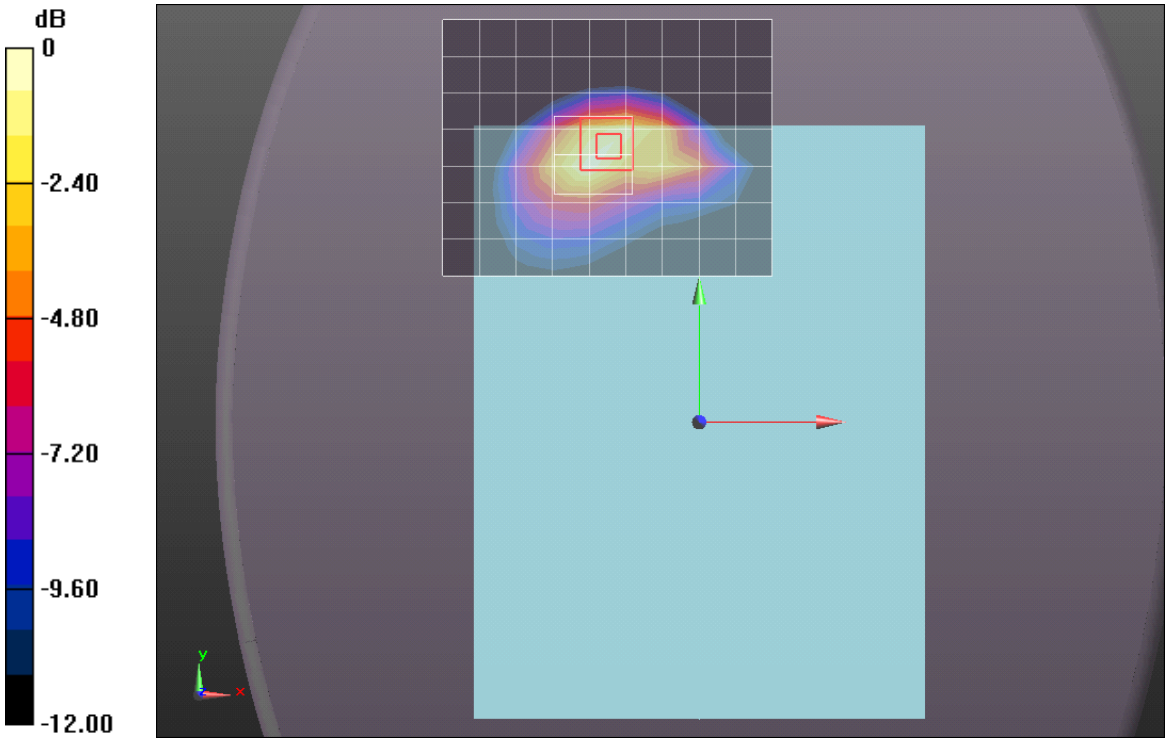
Frequency: 836.52 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): f = 836.52 MHz; σ = 1.012 mho/m; ε_r = 52.902; ρ = 1000 kg/m^3
DASY5 Configuration:
- Electronics: DAE4 Sn1261; Calibrated: 3/9/2012
- Probe: EX3DV4 - SN3757; ConvF(9, 9, 9); Calibrated: 3/24/2012
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1136

Rear/1xEVDO_Rel.0_ch 384/Area Scan (10x8x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.465 mW/g

Rear/1xEVDO_Rel.0_ch 384/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 38.291 V/m; Power Drift = 0.0051 dB
Peak SAR (extrapolated) = 2.2320
SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.607 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.545 mW/g



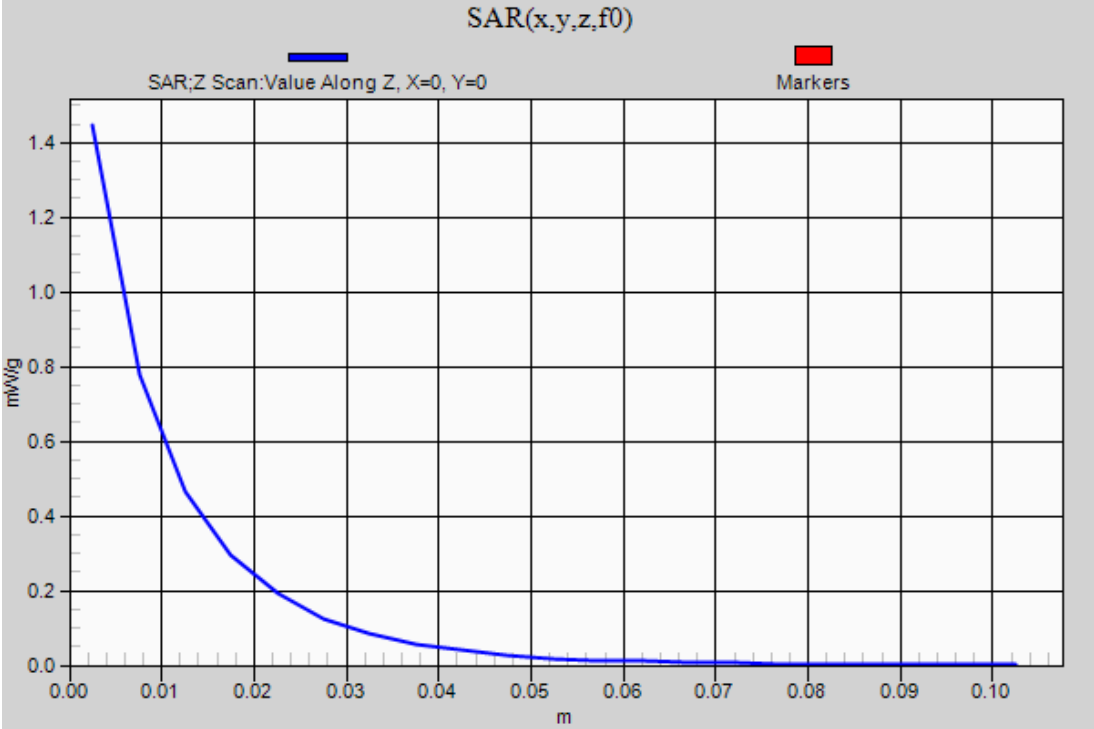
0 dB = 1.540mW/g = 3.75 dB mW/g

Test Laboratory: Lab C Date: 9/10/2012

CDMA BC0

Frequency: 836.52 MHz; Duty Cycle: 1:1

Rear/1xEVDO_Rel.0_ch 384/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.446 mW/g



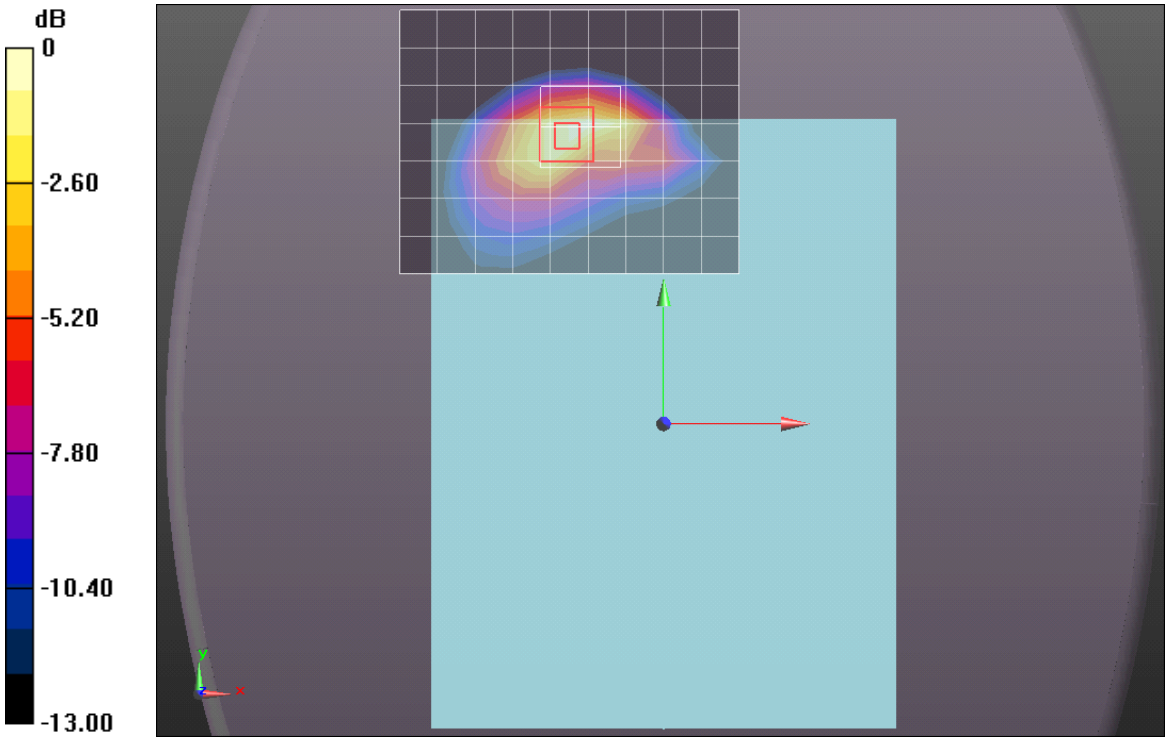
Test Laboratory: Lab C Date: 9/14/2012

CDMA BC0

Frequency: 836.52 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): f = 836.52 MHz; σ = 1.014 mho/m; ε_r = 52.708; ρ = 1000 kg/m^3
DASY5 Configuration:
- Electronics: DAE4 Sn1261; Calibrated: 3/9/2012
- Probe: EX3DV4 - SN3757; ConvF(9, 9, 9); Calibrated: 3/24/2012
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1136

Rear/1xEVDO_Rev. B_2 Carrier Mini_ch 384/Area Scan (10x8x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.482 mW/g

Rear/1xEVDO_Rev. B_2 Carrier Mini_ch 384/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 38.764 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 2.2460
SAR(1 g) = 1.15 mW/g; SAR(10 g) = 0.610 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.580 mW/g



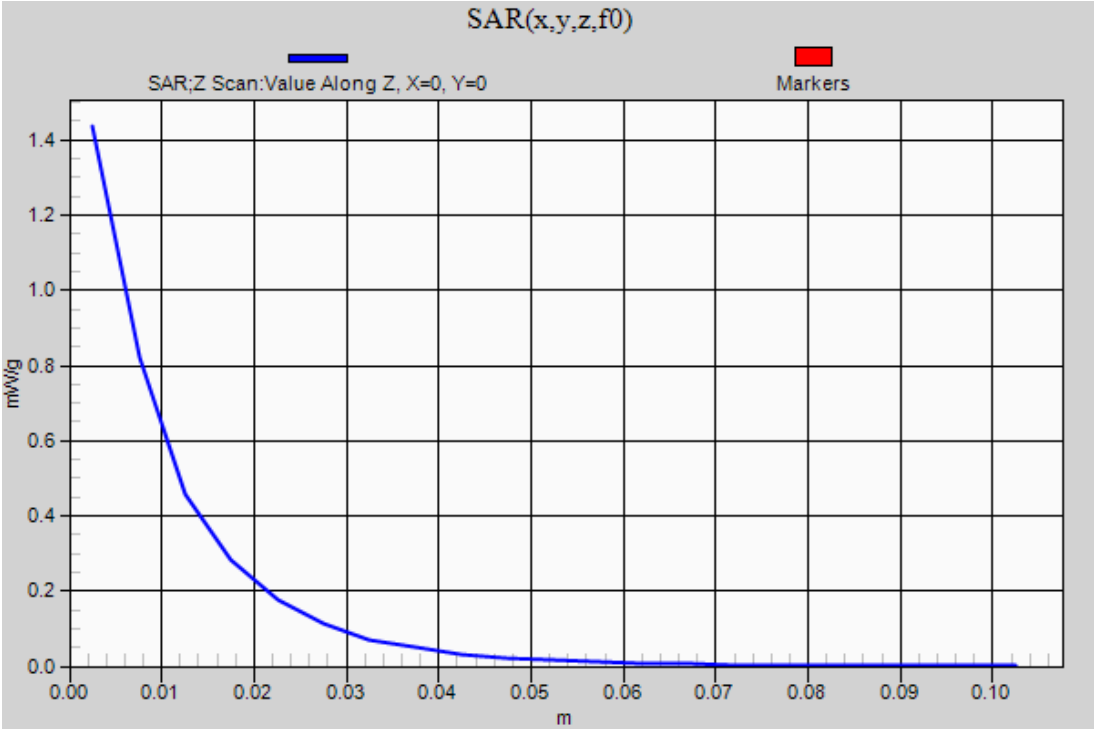
0 dB = 1.580mW/g = 3.97 dB mW/g

Test Laboratory: Lab C Date: 9/14/2012

CDMA BC0

Frequency: 836.52 MHz; Duty Cycle: 1:1

Rear/1xEVDO_Rev. B_2 Carrier Mini_ch 384/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.436 mW/g



Test Laboratory: Lab C Date: 9/14/2012

CDMA BC0

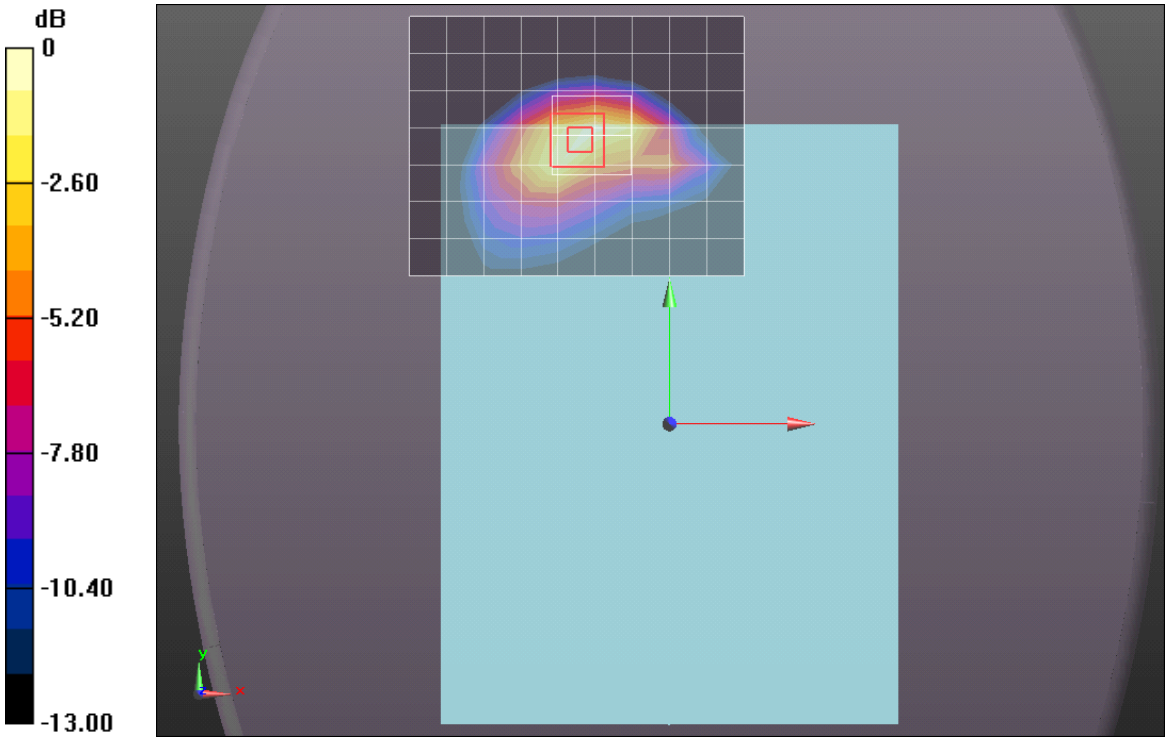
Frequency: 836.52 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): f = 836.52 MHz; σ = 1.014 mho/m; ε_r = 52.708; ρ = 1000 kg/m^3
DASY5 Configuration:
- Electronics: DAE4 Sn1261; Calibrated: 3/9/2012
- Probe: EX3DV4 - SN3757; ConvF(9, 9, 9); Calibrated: 3/24/2012
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1136

Rear/1xEVDO_Rev. B_3 Carrier Mini_ch 384/Area Scan (10x8x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.438 mW/g

Rear/1xEVDO_Rev. B_3 Carrier Mini_ch 384/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 38.756 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 2.0880
SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.588 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.557 mW/g



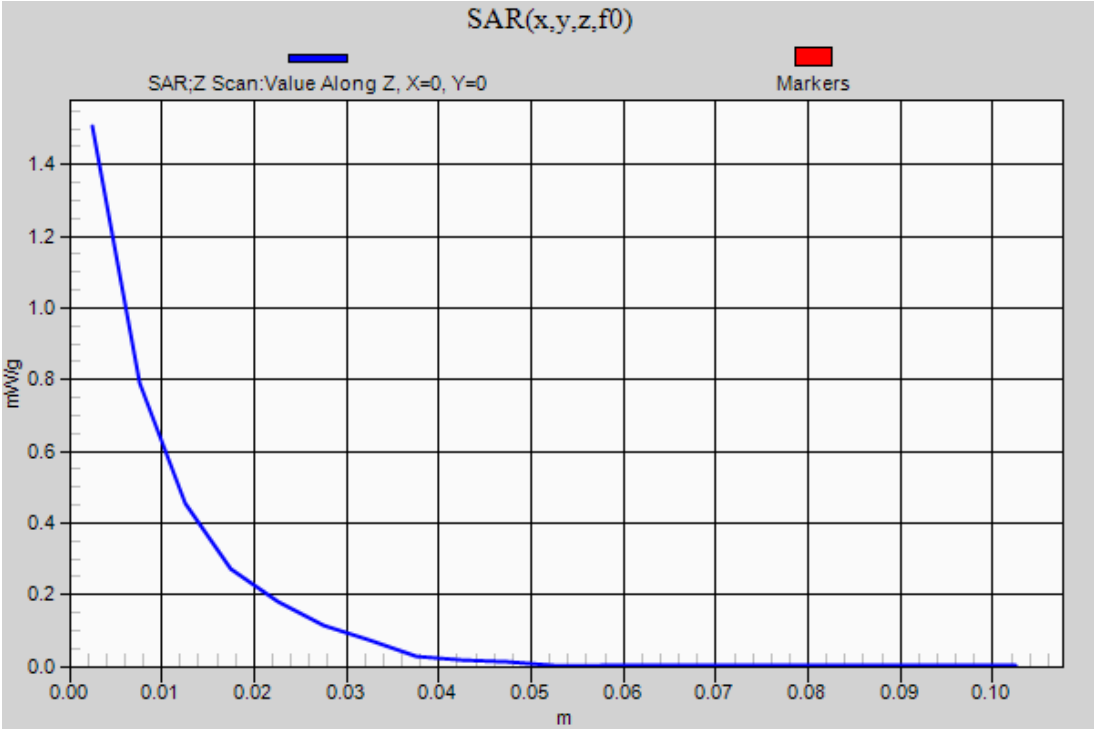
0 dB = 1.560mW/g = 3.86 dB mW/g

Test Laboratory: Lab C Date: 9/14/2012

CDMA BC0

Frequency: 836.52 MHz; Duty Cycle: 1:1

Rear/1xEVDO_Rev. B_3 Carrier Mini_ch 384/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.506 mW/g



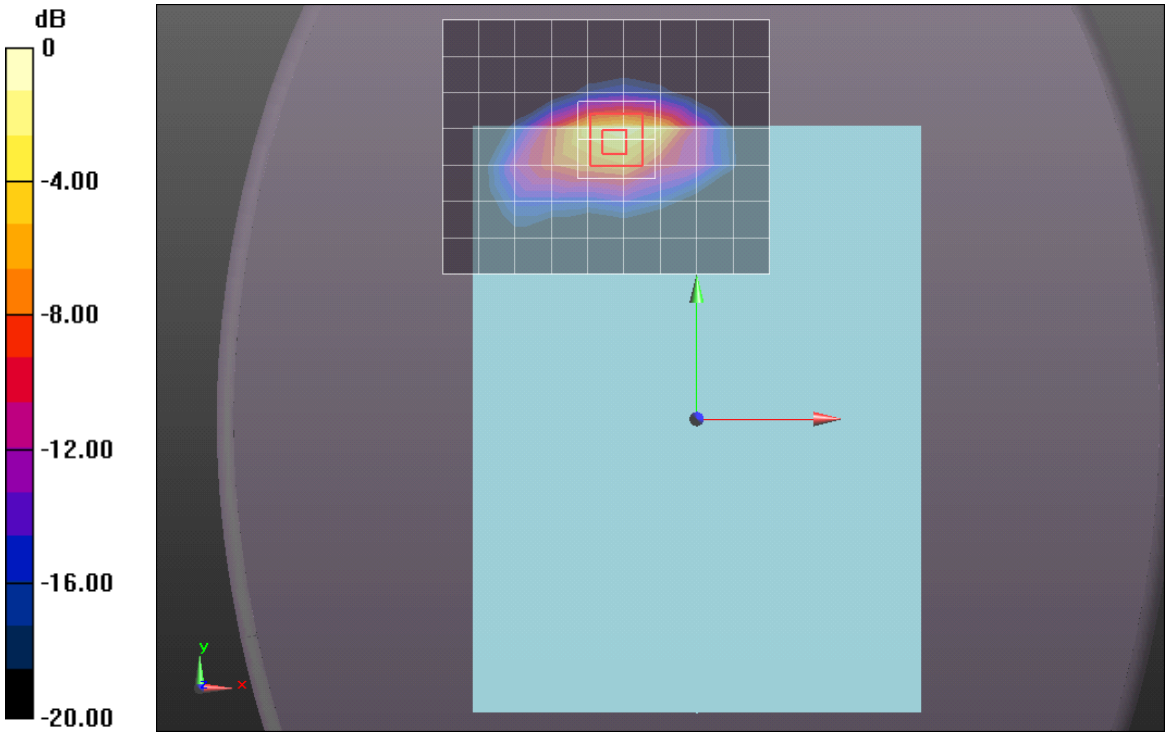
Test Laboratory: Lab A Date: 8/28/2012

CDMA BC1

Frequency: 1880 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used: f = 1880 MHz; σ = 1.513 mho/m; ε_r = 52.369; ρ = 1000 kg/m^3
DASY5 Configuration:
- Electronics: DAE4 Sn1263; Calibrated: 3/8/2012
- Probe: EX3DV4 - SN3778; ConvF(6.89, 6.89, 6.89); Calibrated: 3/24/2012
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1134

Rear/1xRTT_RC3_SO32_Ch 600/Area Scan (10x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.211 mW/g

Rear/1xRTT_RC3_SO32_Ch 600/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 34.123 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 2.2440
SAR(1 g) = 1.19 mW/g; SAR(10 g) = 0.560 mW/g
Maximum value of SAR (measured) = 1.782 mW/g



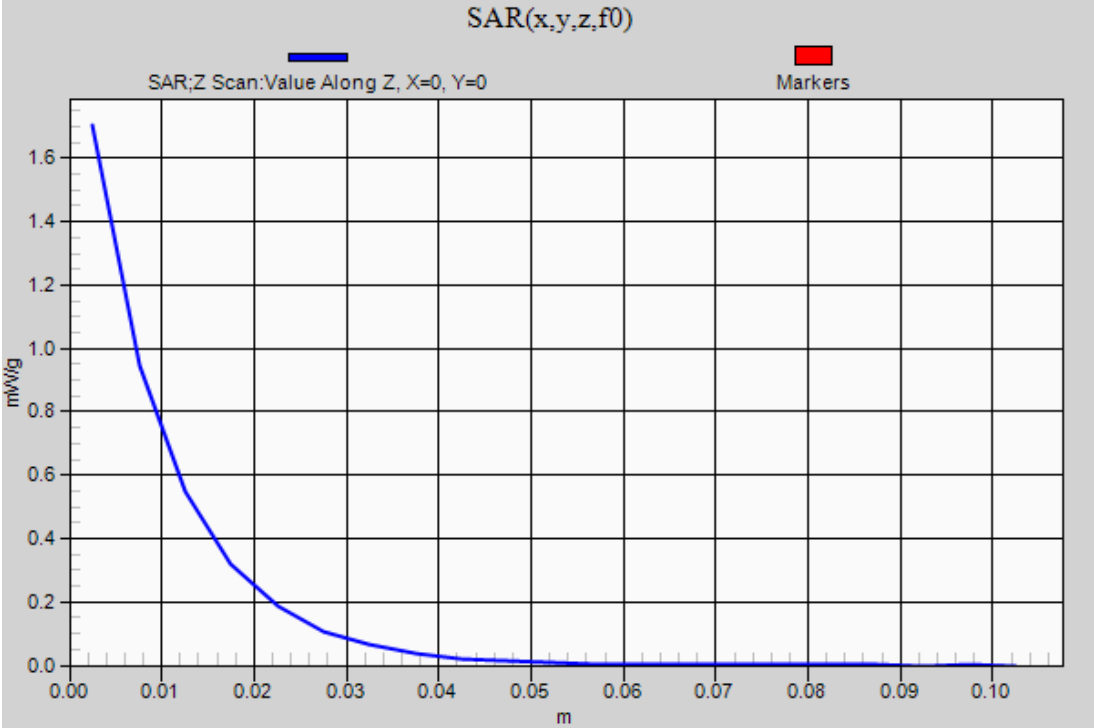
0 dB = 1.780mW/g = 5.01 dB mW/g

Test Laboratory: Lab A Date: 8/28/2012

CDMA BC1

Frequency: 1880 MHz; Duty Cycle: 1:1

Rear/1xRTT_RC3_SO32_Ch 600/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 1.704 mW/g



Test Laboratory: Lab C Date: 8/24/2012

CDMA BC10

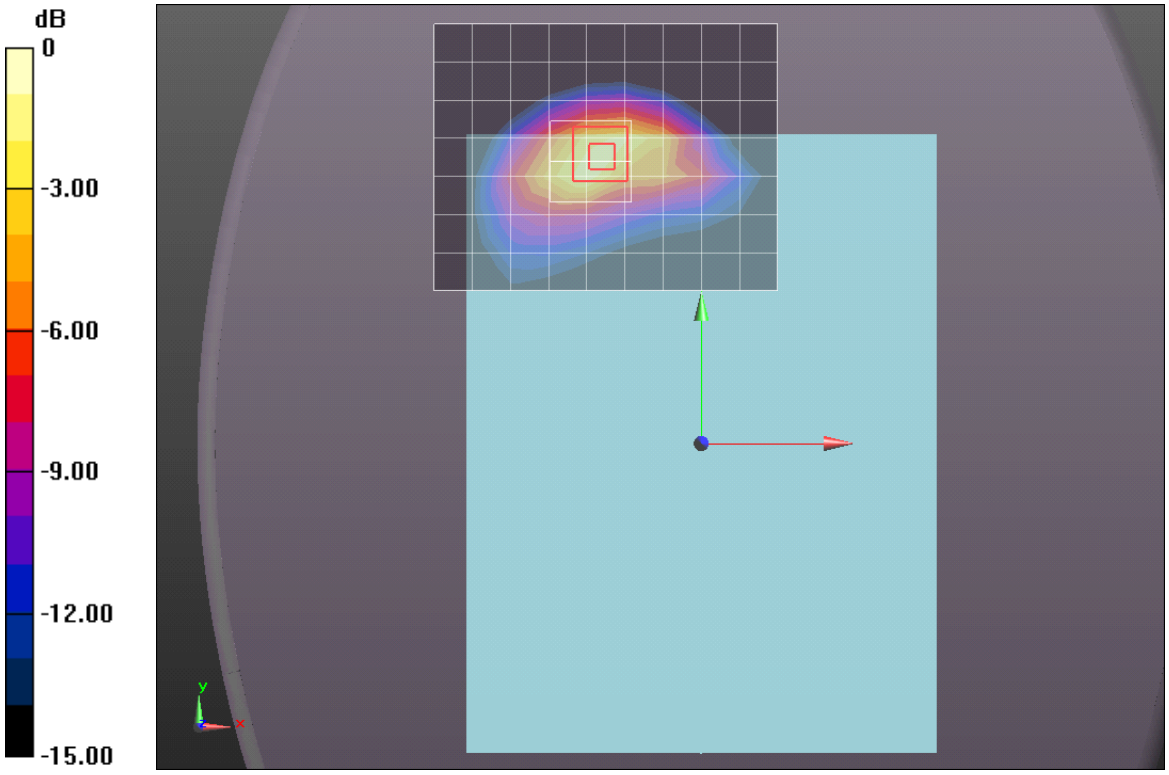
Frequency: 820.5 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): f = 820.5 MHz; σ = 1.001 mho/m; ε_r = 53.563; ρ = 1000 kg/m^3
DASY5 Configuration:
- Electronics: DAE4 Sn1261; Calibrated: 3/9/2012
- Probe: EX3DV4 - SN3757; ConvF(9, 9, 9); Calibrated: 3/24/2012
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1136

Rear/1xRTT_RC3_SO32_ch 580/Area Scan (10x8x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.351 mW/g

Rear/1xRTT_RC3_SO32_ch 580/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 40.522 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 2.4150
SAR(1 g) = 1.18 mW/g; SAR(10 g) = 0.610 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.721 mW/g



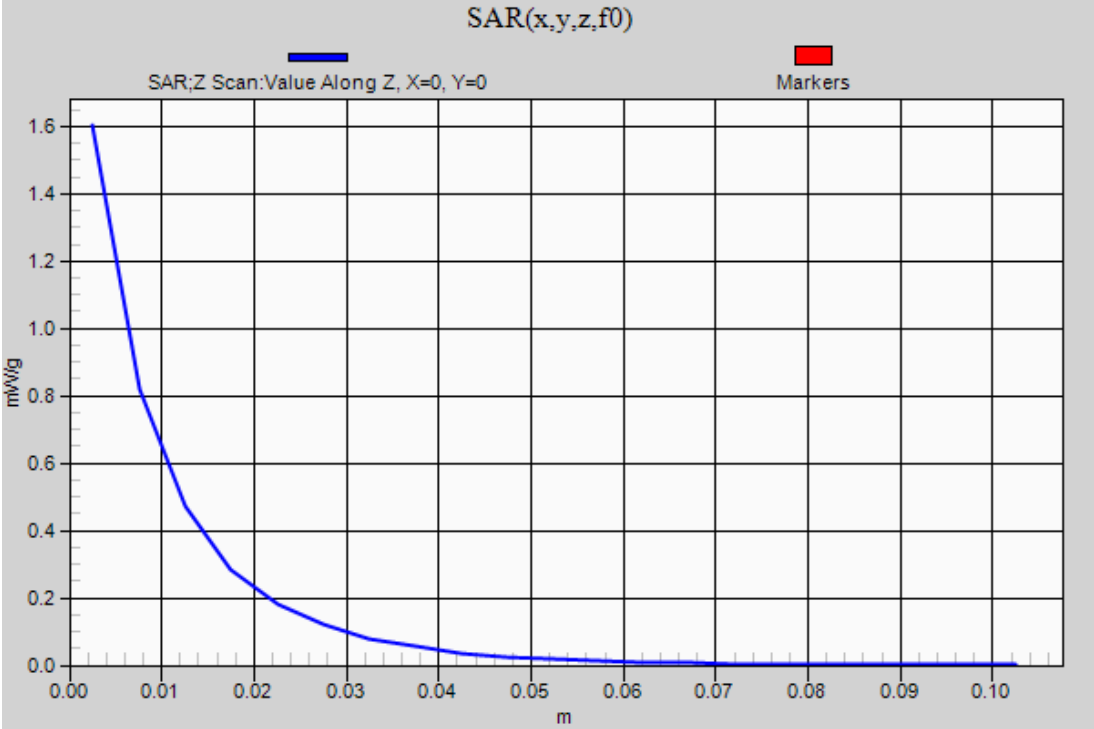
0 dB = 1.720mW/g = 4.71 dB mW/g

Test Laboratory: Lab C Date: 8/24/2012

CDMA BC10

Frequency: 820.5 MHz; Duty Cycle: 1:1

Rear/1xRTT_RC3_SO32_ch 580/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.603 mW/g



Test Laboratory: Lab C Date: 9/10/2012

CDMA BC10

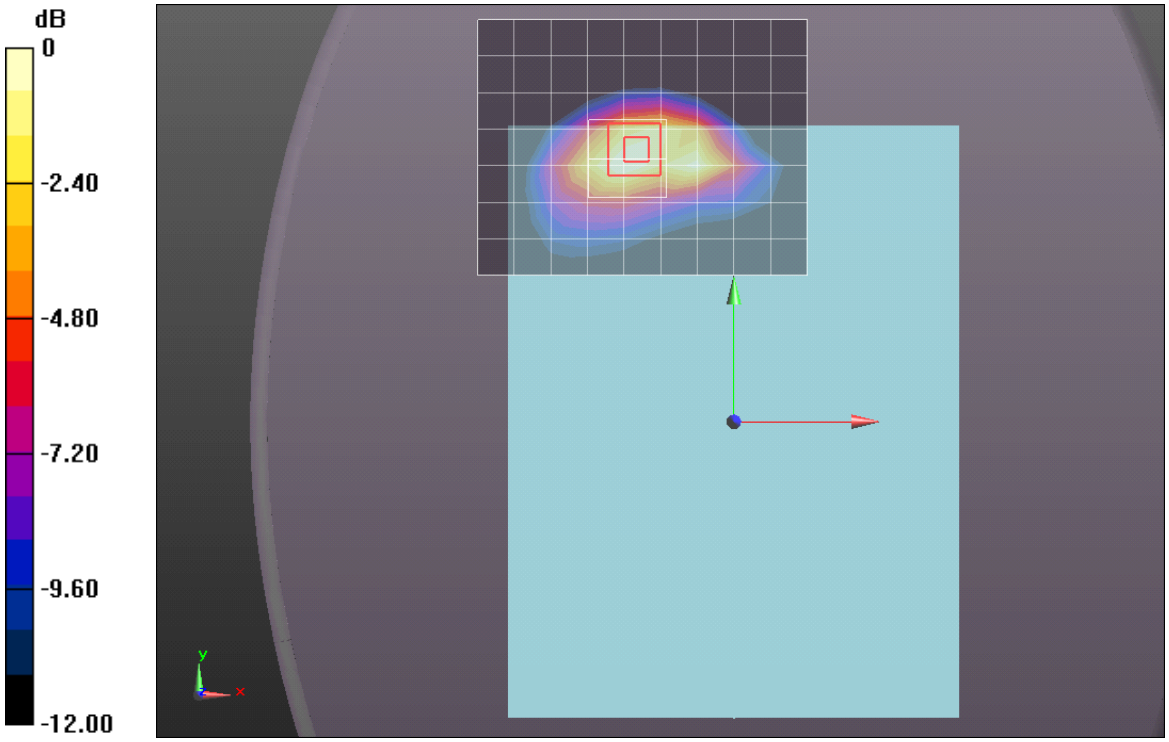
Frequency: 820.5 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): f = 820.5 MHz; σ = 0.997 mho/m; ε_r = 53.073; ρ = 1000 kg/m^3
DASY5 Configuration:
- Electronics: DAE4 Sn1261; Calibrated: 3/9/2012
- Probe: EX3DV4 - SN3757; ConvF(9, 9, 9); Calibrated: 3/24/2012
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1136

Rear/1xEVDO_Rel.0_ch 580/Area Scan (10x8x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.773 mW/g

Rear/1xEVDO_Rel.0_ch 580/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 39.326 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 2.2330
SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.571 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.564 mW/g



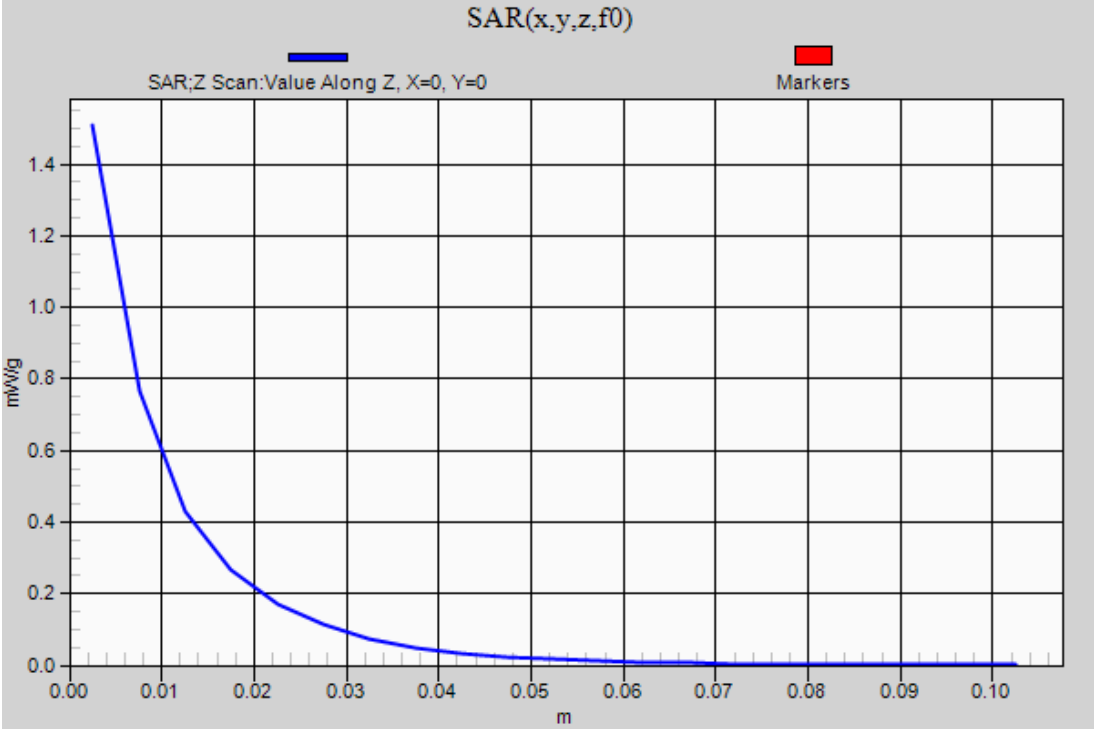
0 dB = 1.560mW/g = 3.86 dB mW/g

Test Laboratory: Lab C Date: 9/10/2012

CDMA BC10

Frequency: 820.5 MHz; Duty Cycle: 1:1

Rear/1xEVDO_Rel.0_ch 580/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.509 mW/g



Test Laboratory: Lab B Date: 9/10/2012

LTE Band 5

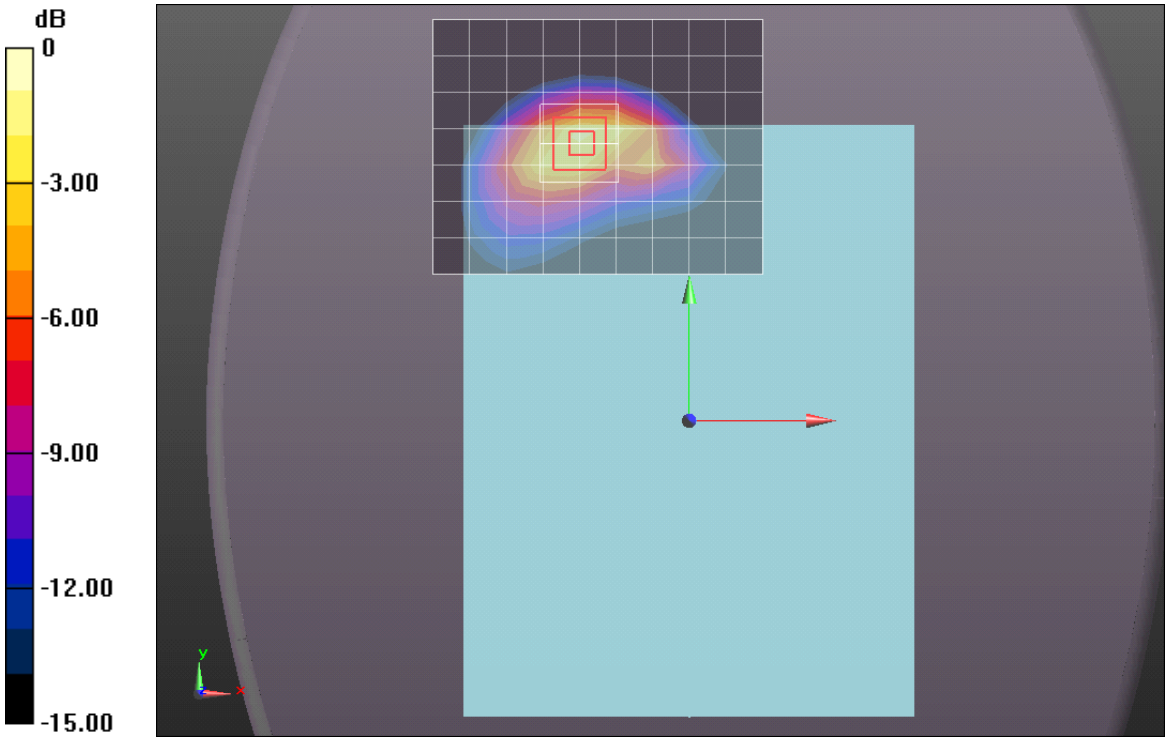
Frequency: 836.5 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): f = 836.5 MHz; σ = 1.012 mho/m; ε_r = 52.911; ρ = 1000 kg/m^3
DASY5 Configuration:
- Electronics: DAE4 Sn1264; Calibrated: 3/5/2012
- Probe: EX3DV4 - SN3720; ConvF(8.45, 8.45, 8.45); Calibrated: 3/24/2012
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1137

Rear/QPSK_RB#25,0_Ch 20525/Area Scan (10x8x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.155 mW/g

Rear/QPSK_RB#25,0_Ch 20525/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 40.321 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 2.3050
SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.592 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.744 mW/g



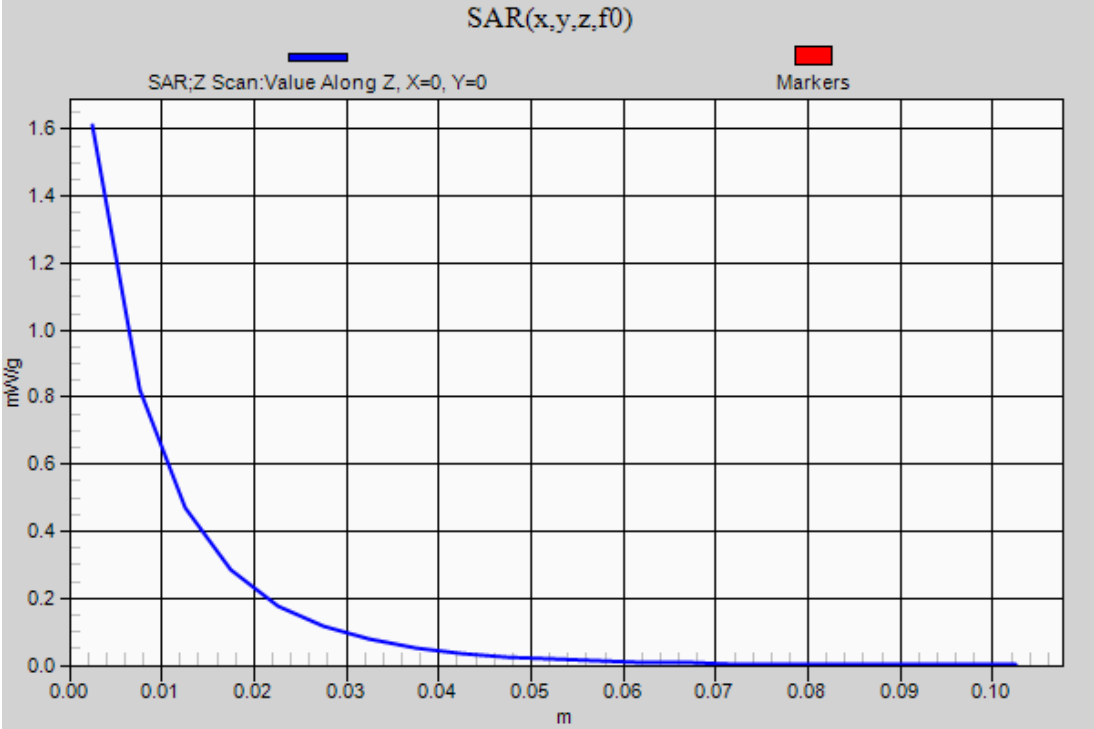
0 dB = 1.740mW/g = 4.81 dB mW/g

Test Laboratory: Lab B Date: 9/10/2012

LTE Band 5

Frequency: 836.5 MHz; Duty Cycle: 1:1

Rear/QPSK_RB#25,0_Ch 20525/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.612 mW/g



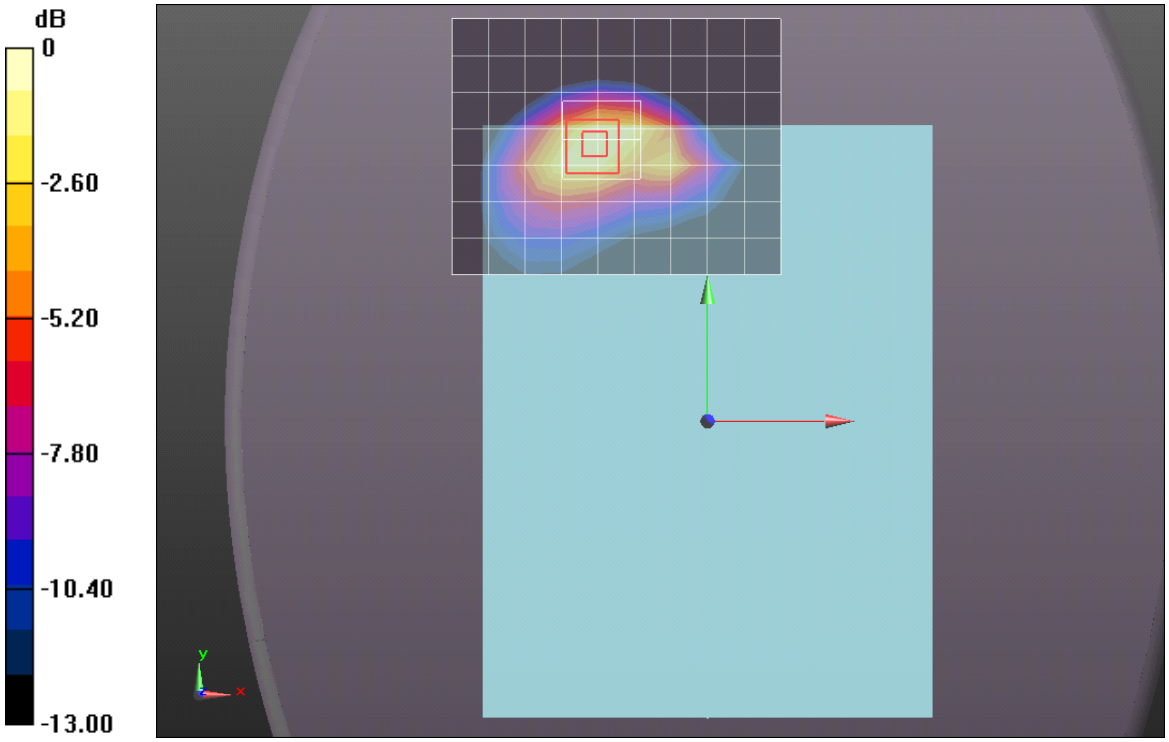
Test Laboratory: Lab B Date: 9/7/2012

LTE Band 13

Frequency: 782 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): f = 782 MHz; σ = 1.001 mho/m; ε_r = 53.02; ρ = 1000 kg/m^3
DASY5 Configuration:
- Electronics: DAE4 Sn1264; Calibrated: 3/5/2012
- Probe: EX3DV4 - SN3720; ConvF(8.64, 8.64, 8.64); Calibrated: 3/24/2012
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1137

Rear/QPSK_RB#25,24_Ch 23230/Area Scan (10x8x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.464 mW/g

Rear/QPSK_RB#25,24_Ch 23230/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 40.736 V/m; Power Drift = 0.0017 dB
Peak SAR (extrapolated) = 2.4290
SAR(1 g) = 1.19 mW/g; SAR(10 g) = 0.623 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.770 mW/g



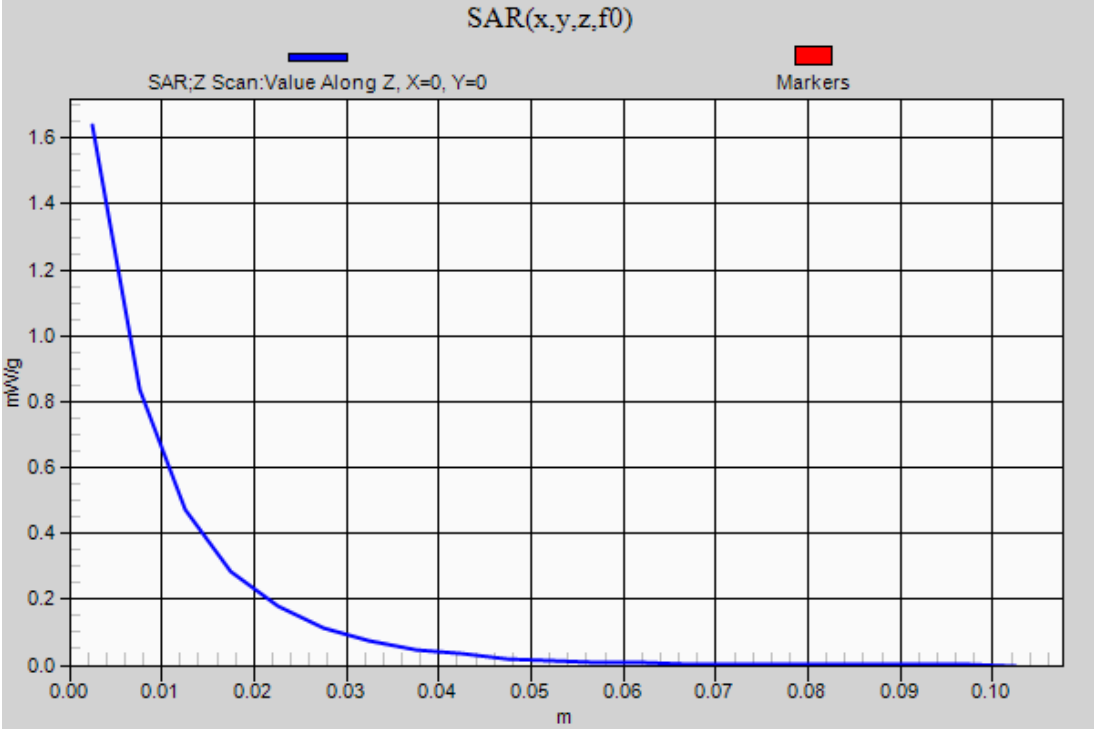
0 dB = 1.770mW/g = 4.96 dB mW/g

Test Laboratory: Lab B Date: 9/7/2012

LTE Band 13

Frequency: 782 MHz; Duty Cycle: 1:1

Rear/QPSK_RB#25,24_Ch 23230/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.639 mW/g



Test Laboratory: Lab D Date: 8/21/2012

LTE Band 25

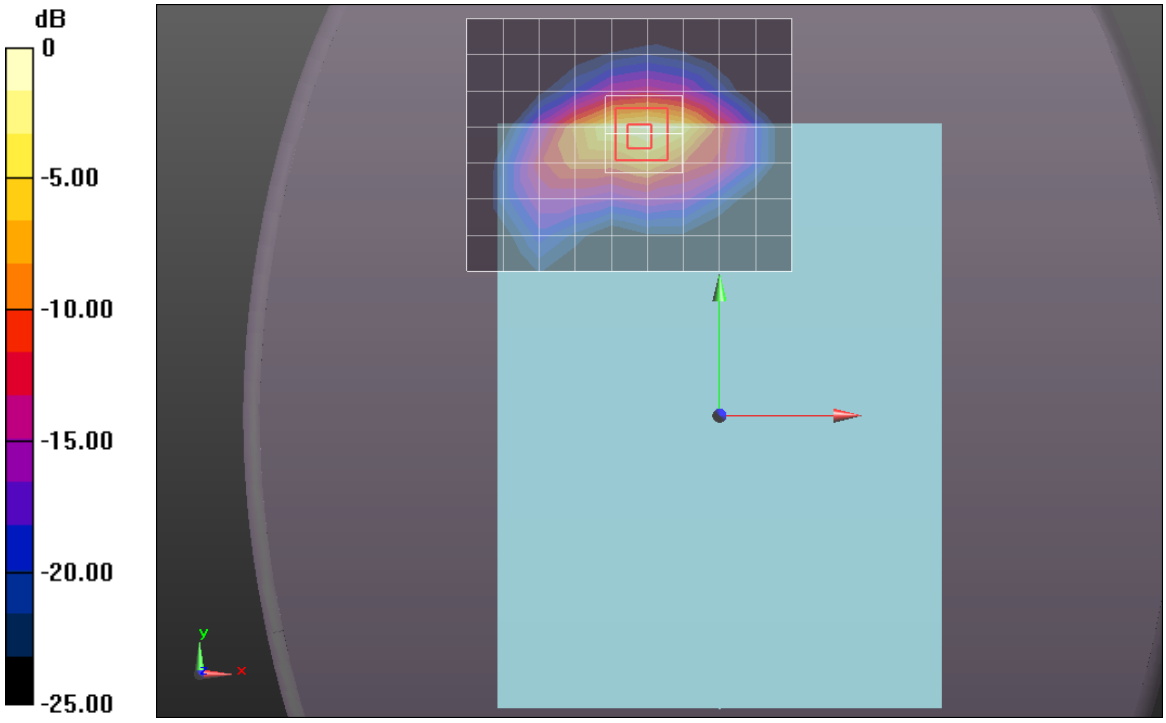
Frequency: 1882.5 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): f = 1882.5 MHz; σ = 1.541 mho/m; ε_r = 52.247; ρ = 1000 kg/m^3
DASY5 Configuration:
- Electronics: DAE4 Sn1278; Calibrated: 3/9/2012
- Probe: EX3DV4 - SN3676; ConvF(7.45, 7.45, 7.45); Calibrated: 3/24/2012
- Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1135

Rear/QPSK_RB#1,0_Ch 26365/Area Scan (10x8x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.332 mW/g

Rear/QPSK_RB#1,0_Ch 26365/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 33.088 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 2.1880
SAR(1 g) = 1.16 mW/g; SAR(10 g) = 0.544 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.730 mW/g



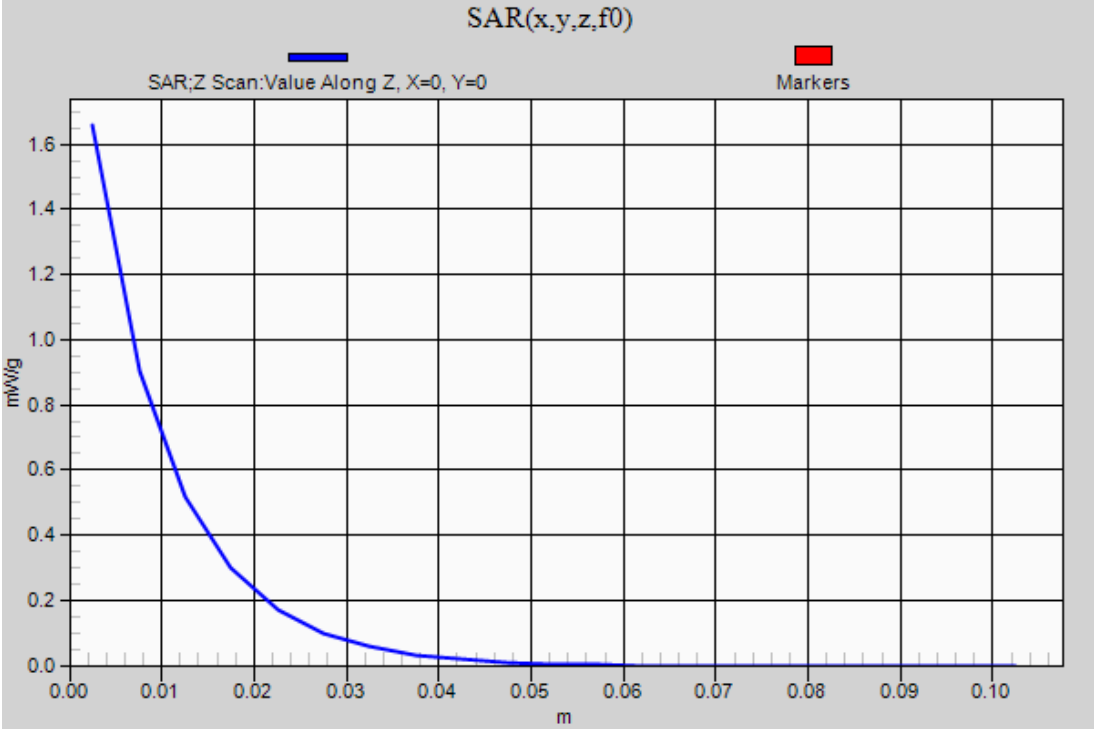
0 dB = 1.730mW/g = 4.76 dB mW/g

Test Laboratory: Lab D Date: 8/21/2012

LTE Band 25

Frequency: 1882.5 MHz; Duty Cycle: 1:1

Rear/QPSK_RB#1,0_Ch 26365/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.659 mW/g



Test Laboratory: Lab C Date: 8/1/2012

WiFi 2.4 GHz

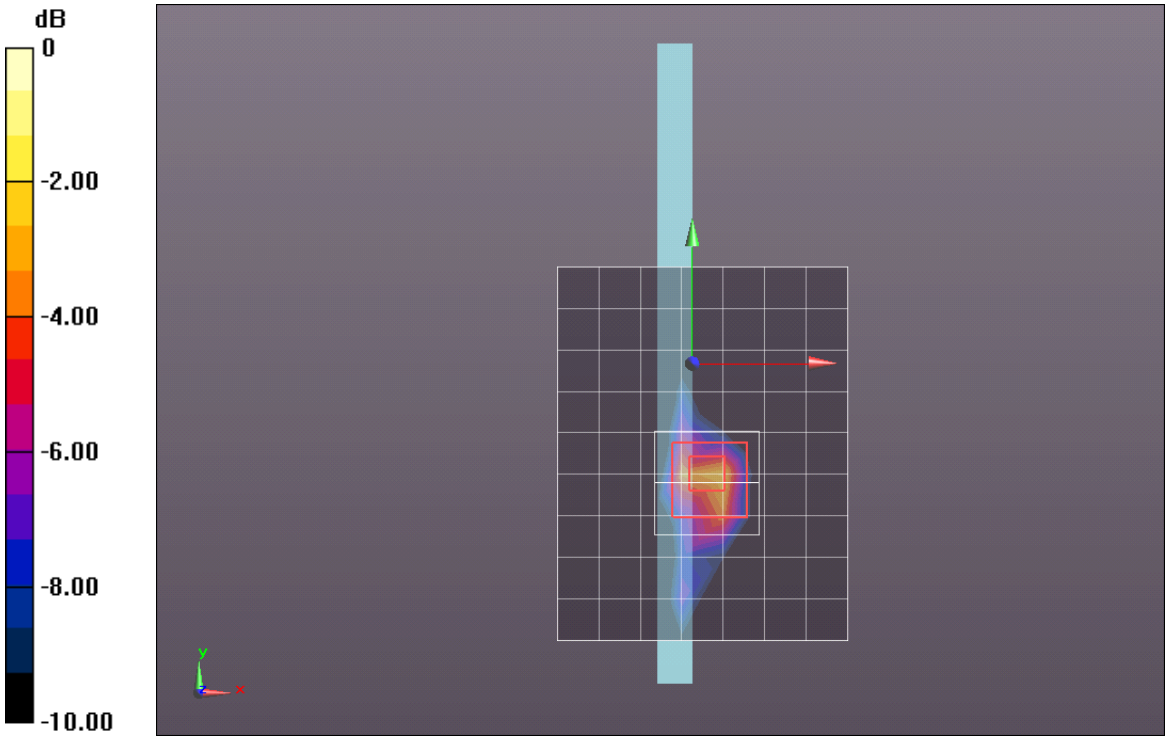
Frequency: 2437 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.892 mho/m; ε_r = 51.01; ρ = 1000 kg/m^3
DASY5 Configuration:
- Electronics: DAE4 Sn1261; Calibrated: 3/9/2012
- Probe: EX3DV4 - SN3757; ConvF(6.85, 6.85, 6.85); Calibrated: 3/24/2012
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1136

Edge 3/802.11b_ch 6/Area Scan (8x10x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.345 mW/g

Edge 3/802.11b_ch 6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 31.123 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.3510
SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.391 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 2.021 mW/g



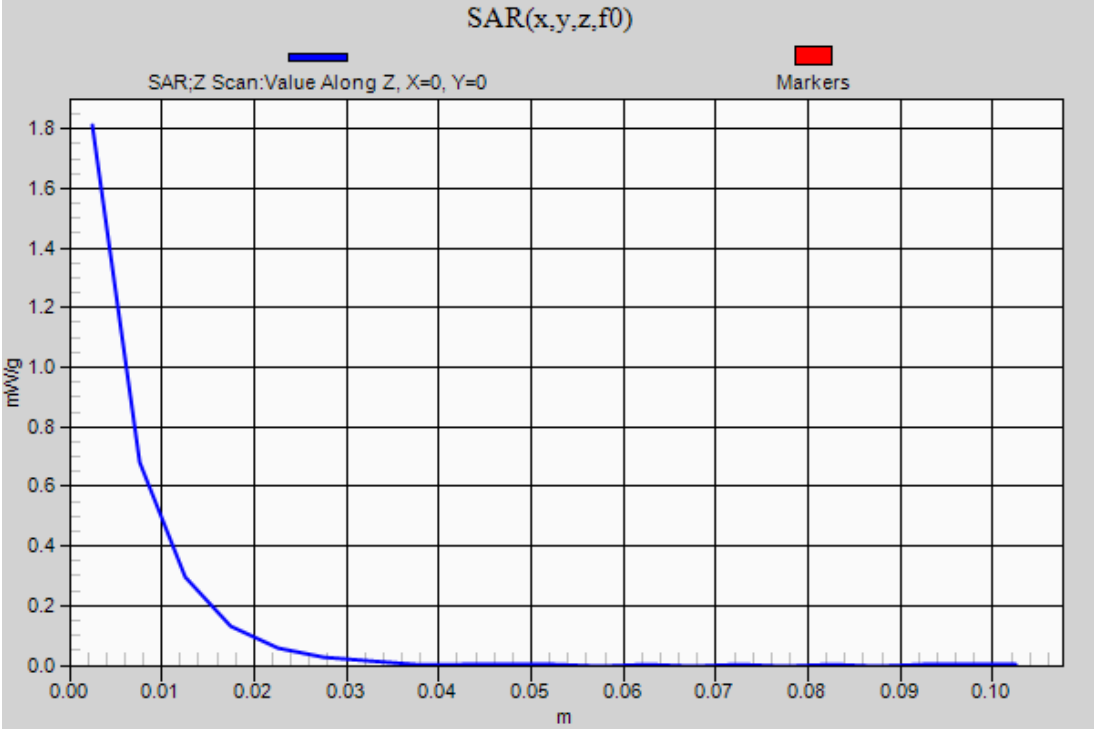
0 dB = 2.020mW/g = 6.11 dB mW/g

Test Laboratory: Lab C Date: 8/1/2012

WiFi 2.4 GHz

Frequency: 2437 MHz; Duty Cycle: 1:1

Edge 3/802.11b_ch 6/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.812 mW/g



Test Laboratory: Lab C Date: 9/25/2012

Bluetooth

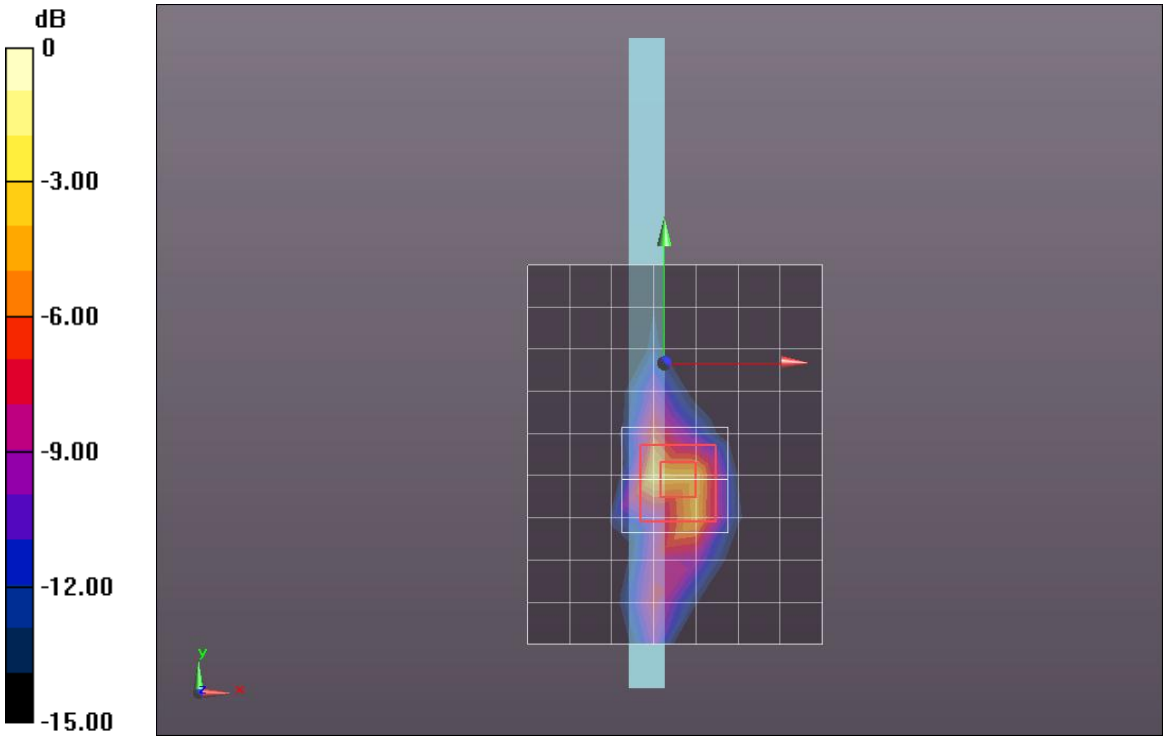
Frequency: 2441 MHz; Duty Cycle: 1:1.24165; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C
Medium parameters used (interpolated): f = 2441 MHz; σ = 1.932 mho/m; ε_r = 51.736; ρ = 1000 kg/m^3
DASY5 Configuration:
- Electronics: DAE4 Sn1261; Calibrated: 3/9/2012
- Probe: EX3DV4 - SN3757; ConvF(6.85, 6.85, 6.85); Calibrated: 3/24/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1136

Edge 3/802.15 GFSK_ch 39/Area Scan (8x10x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.344 mW/g

Edge 3/802.15 GFSK_ch 39/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 17.967 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.0450
SAR(1 g) = 0.356 mW/g; SAR(10 g) = 0.123 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.616 mW/g



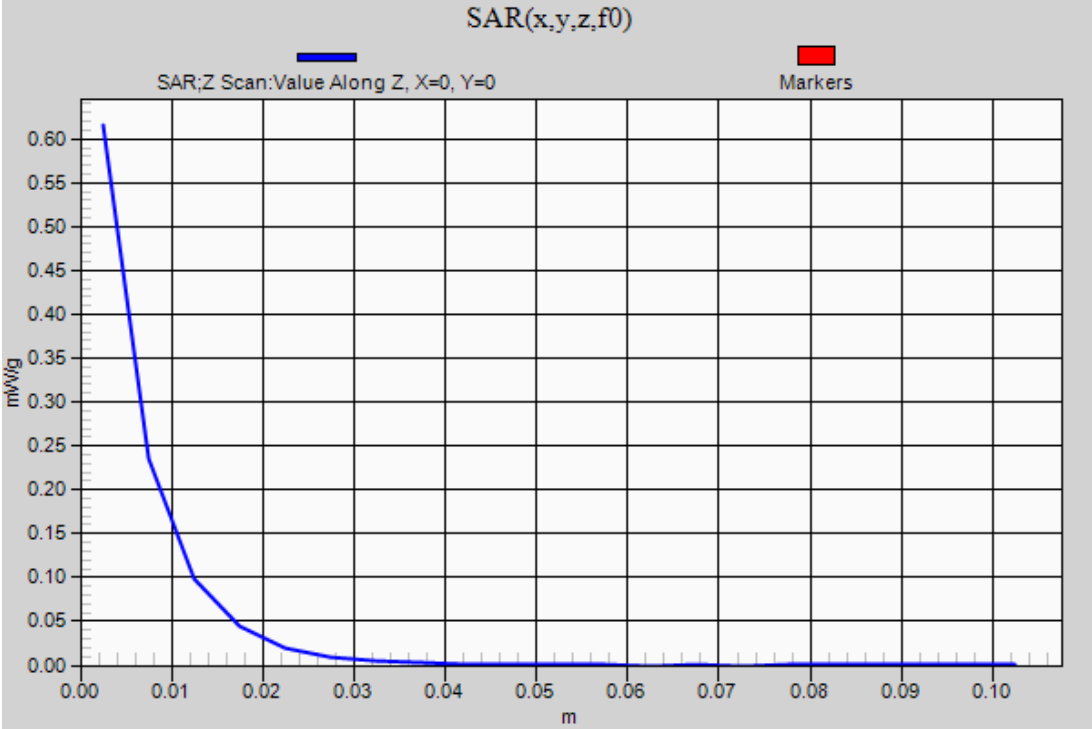
0 dB = 0.620mW/g = -4.15 dB mW/g

Test Laboratory: Lab C Date: 9/25/2012

Bluetooth

Frequency: 2441 MHz; Duty Cycle: 1:1.24165

Edge 3/802.15 GFSK_ch 39/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.615 mW/g



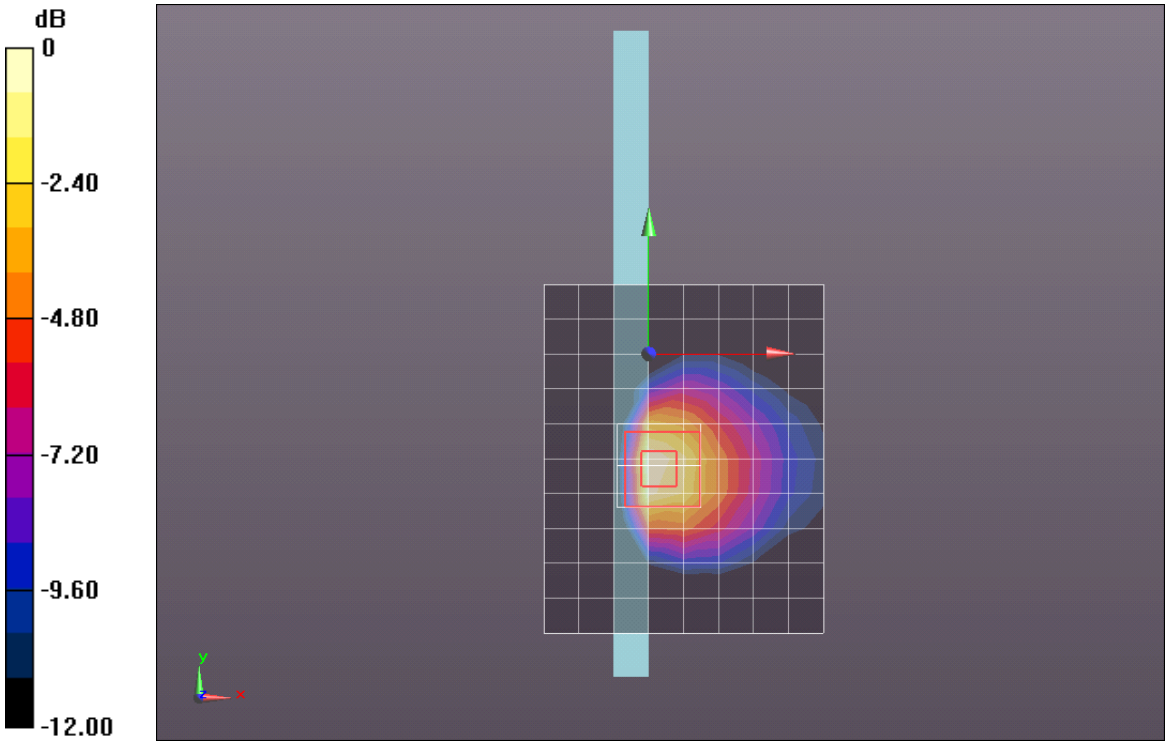
Test Laboratory: Lab B Date: 9/13/2012

WiFi 5.2 GHz

Frequency: 5230 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C
Medium parameters used: f = 5230 MHz; σ = 5.354 mho/m; ε_r = 49.013; ρ = 1000 kg/m^3
DASY5 Configuration:
- Electronics: DAE4 Sn1264; Calibrated: 3/5/2012
- Probe: EX3DV4 - SN3720; ConvF(4.09, 4.09, 4.09); Calibrated: 3/24/2012
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1137

Edge 3/802.11n HT40_Ch 46/Area Scan (9x11x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 1.144 mW/g

Edge 3/802.11n HT40_Ch 46/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 14.440 V/m; Power Drift = 0.0014 dB
Peak SAR (extrapolated) = 2.2240
SAR(1 g) = 0.585 mW/g; SAR(10 g) = 0.198 mW/g
Maximum value of SAR (measured) = 1.129 mW/g



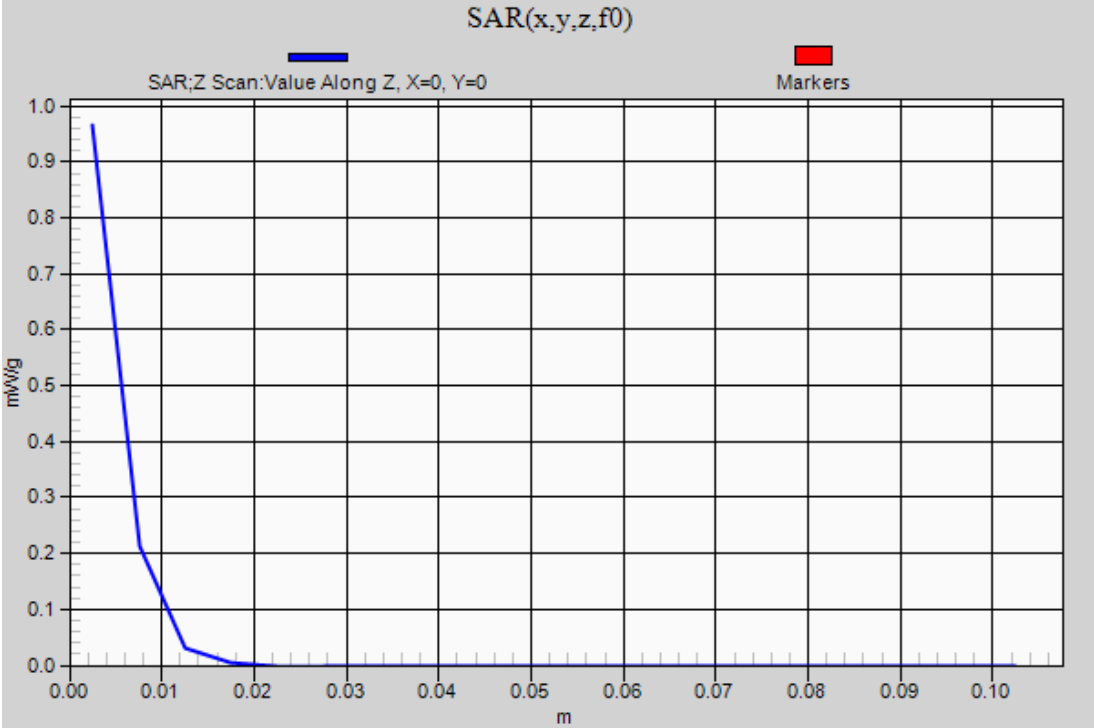
0 dB = 1.130mW/g = 1.06 dB mW/g

Test Laboratory: Lab B Date: 9/13/2012

WiFi 5.2 GHz

Frequency: 5230 MHz; Duty Cycle: 1:1

Edge 3/802.11n HT40_Ch 46/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 0.966 mW/g



Test Laboratory: Lab B Date: 8/9/2012

WiFi 5.3 GHz

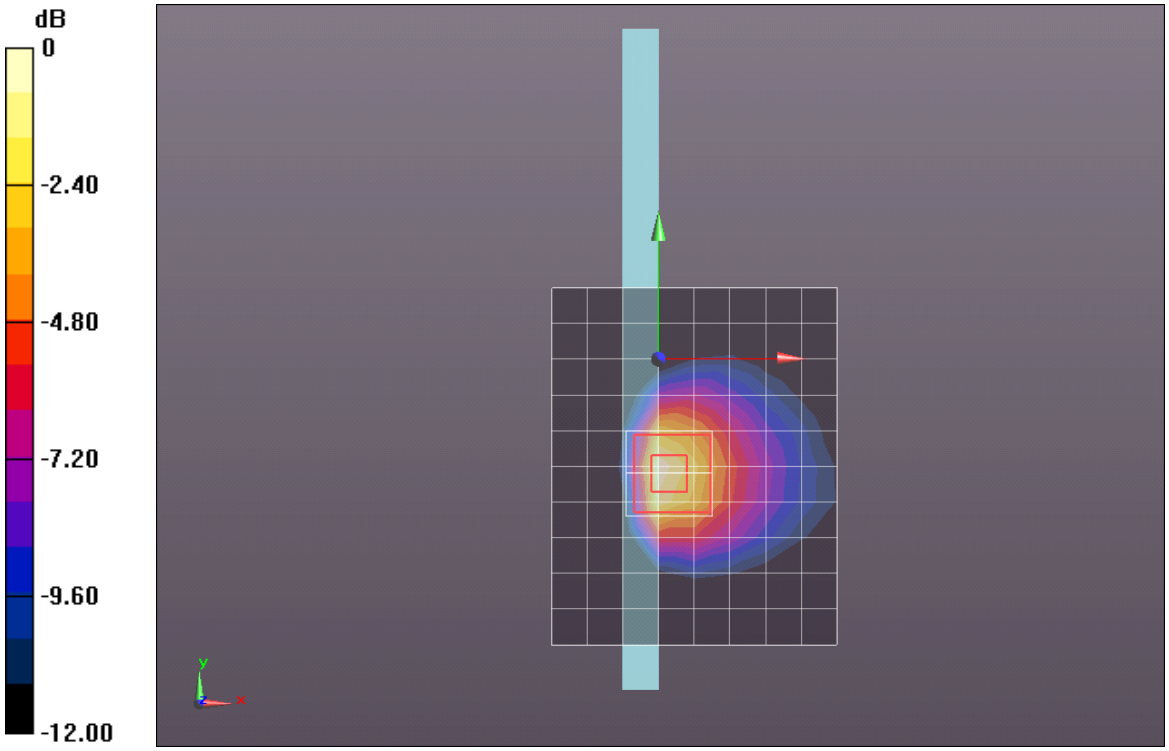
Frequency: 5260 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C
Medium parameters used: f = 5260 MHz; σ = 5.22 mho/m; ε_r = 48.413; ρ = 1000 kg/m^3
DASY5 Configuration:
- Electronics: DAE4 Sn1264; Calibrated: 3/5/2012
- Probe: EX3DV4 - SN3751; ConvF(3.86, 3.86, 3.86); Calibrated: 12/19/2011
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1137

Edge 3/802.11a_Ch 52/Area Scan (9x11x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 1.592 mW/g

Edge 3/802.11a_Ch 52/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 17.897 V/m; Power Drift = 0.003 dB
Peak SAR (extrapolated) = 3.2760
SAR(1 g) = 0.877 mW/g; SAR(10 g) = 0.304 mW/g
Maximum value of SAR (measured) = 1.662 mW/g



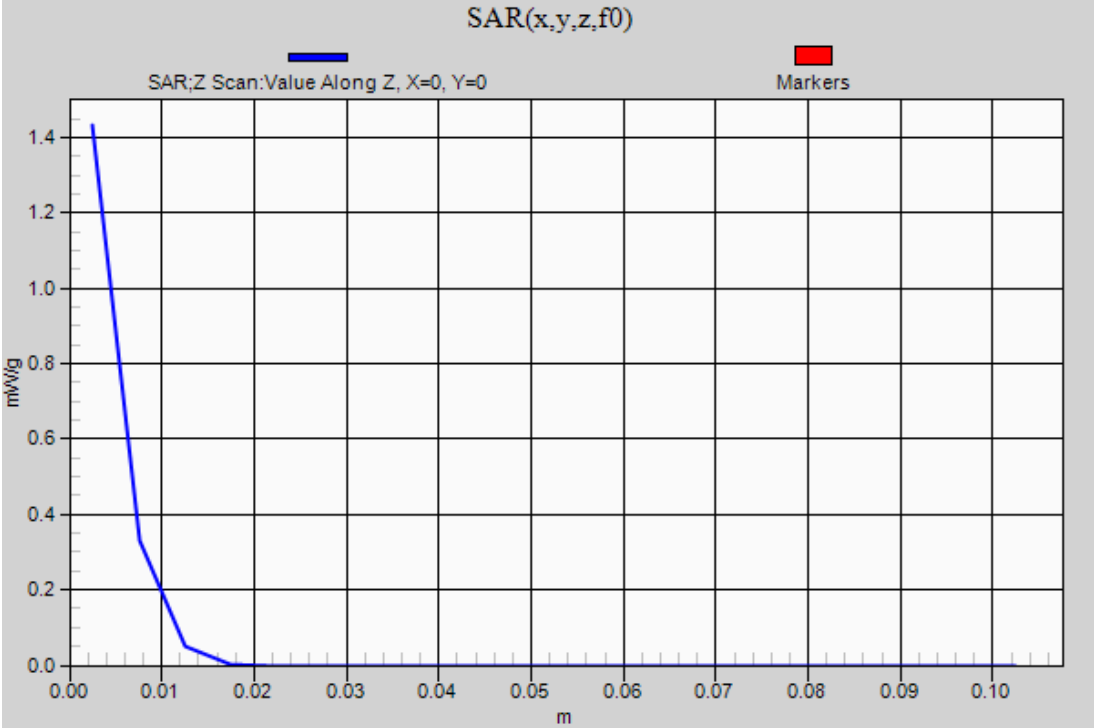
0 dB = 1.660mW/g = 4.40 dB mW/g

Test Laboratory: Lab B Date: 8/9/2012

WiFi 5.3 GHz

Frequency: 5260 MHz; Duty Cycle: 1:1

Edge 3/802.11a_Ch 52/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 1.433 mW/g



Test Laboratory: Lab B Date: 8/15/2012

WiFi 5.5 GHz

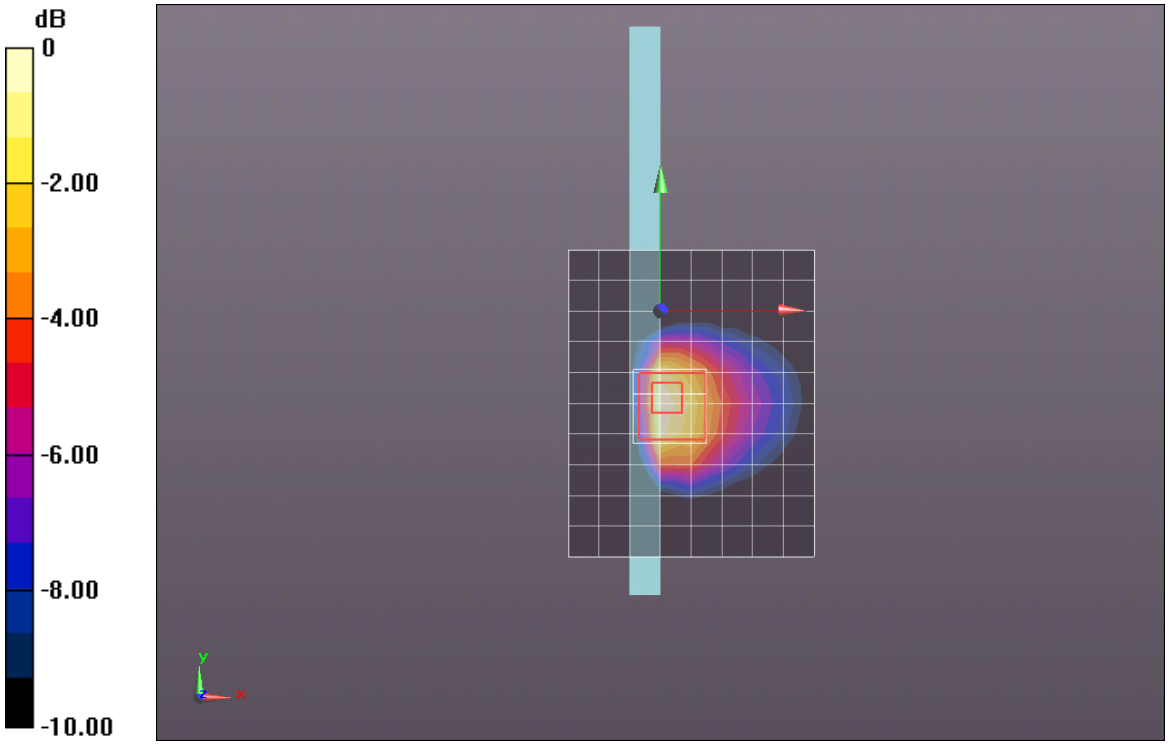
Frequency: 5680 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C
Medium parameters used: f = 5680 MHz; σ = 5.957 mho/m; ε_r = 47.433; ρ = 1000 kg/m^3
DASY5 Configuration:
- Electronics: DAE4 Sn1264; Calibrated: 3/5/2012
- Probe: EX3DV4 - SN3751; ConvF(3.29, 3.29, 3.29); Calibrated: 12/19/2011
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1137

Edge 3/802.11a_Ch 136/Area Scan (9x11x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 2.075 mW/g

Edge 3/802.11a_Ch 136/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 18.603 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 4.3390
SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.404 mW/g
Maximum value of SAR (measured) = 2.041 mW/g



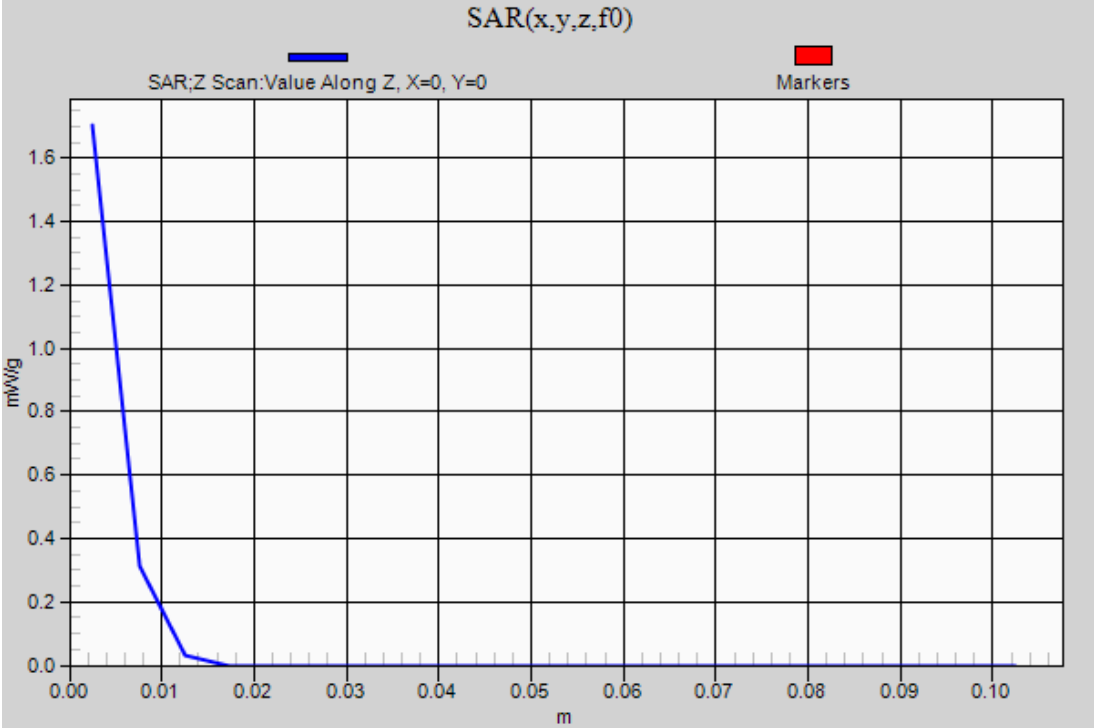
0 dB = 2.040mW/g = 6.19 dB mW/g

Test Laboratory: Lab B Date: 8/15/2012

WiFi 5.5 GHz

Frequency: 5680 MHz; Duty Cycle: 1:1

Edge 3/802.11a_Ch 136/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 1.703 mW/g



Test Laboratory: Lab B Date: 8/2/2012

WiFi 5.8 GHz

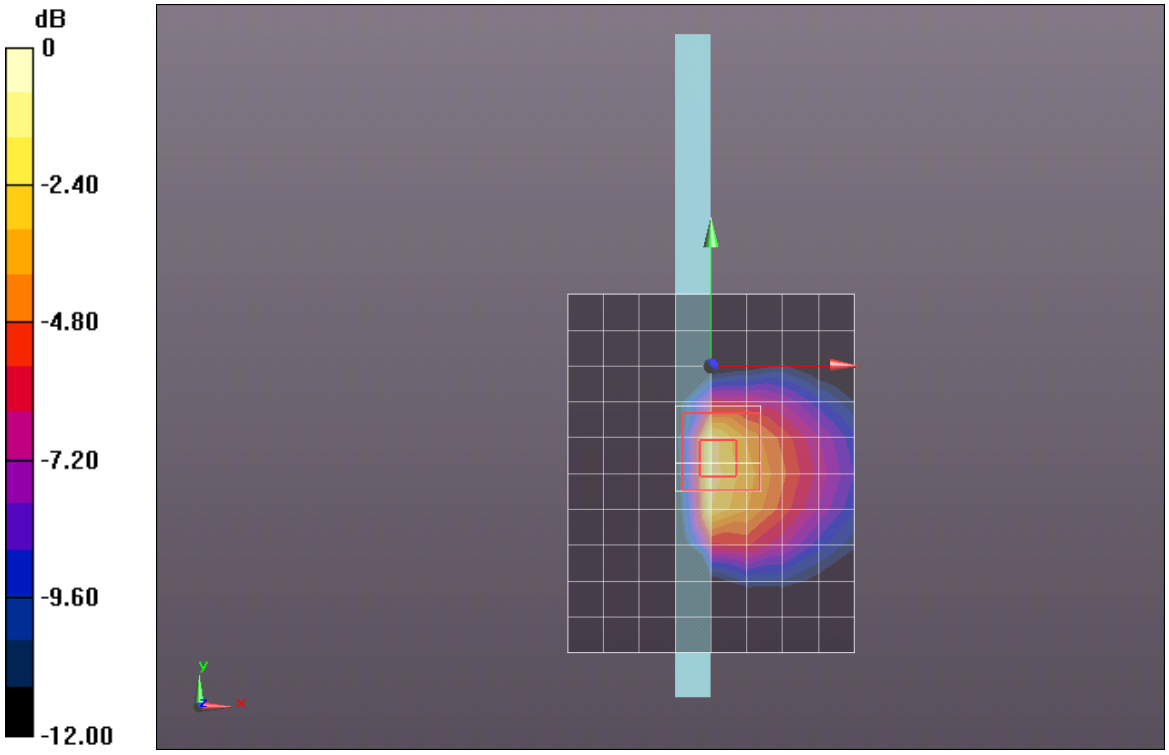
Frequency: 5745 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C
Medium parameters used: f = 5745 MHz; σ = 5.979 mho/m; ε_r = 49.181; ρ = 1000 kg/m^3
DASY5 Configuration:
- Electronics: DAE4 Sn1264; Calibrated: 3/5/2012
- Probe: EX3DV4 - SN3720; ConvF(3.69, 3.69, 3.69); Calibrated: 3/24/2012
- Sensor-Surface: 2.5mm (Mechanical Surface Detection), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Back ELI v5.0; Type: QDOVA002AA; Serial: 1137

Edge 3/802.11a_Ch 149/Area Scan (9x11x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 1.472 mW/g

Edge 3/802.11a_Ch 149/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 17.889 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 3.8440
SAR(1 g) = 0.958 mW/g; SAR(10 g) = 0.317 mW/g
Maximum value of SAR (measured) = 1.878 mW/g



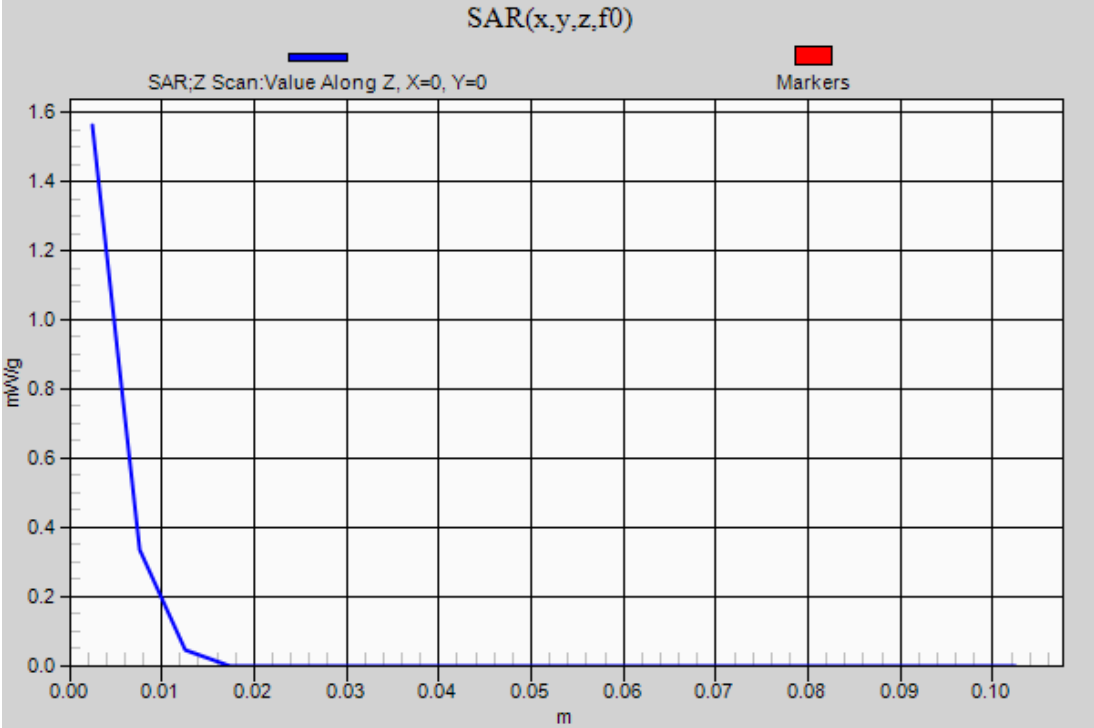
0 dB = 1.880mW/g = 5.48 dB mW/g

Test Laboratory: Lab B Date: 8/2/2012

WiFi 5.8 GHz

Frequency: 5745 MHz; Duty Cycle: 1:1

Edge 3/802.11a_Ch 149/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 1.563 mW/g



15. Simultaneous Transmission SAR Analysis

15.1. Sum of the SAR for GSM, W-CDMA, CDMA, LTE and WiFi 2.4 GHz

Sum of the SAR with Measured Values

Test Position	Data											Σ 1-g SAR (mW/g)
	GSM 850	GSM 1900	W-CDMA Band V	W-CDMA Band II	CDMA BC0	CDMA BC1	CDMA BC10	LTE Band 5	LTE Band 13	LTE Band 25	WiFi 2.4 GHz	
Rear	1.190										0.083	1.273
		1.190									0.083	1.273
			1.150								0.083	1.233
				1.180							0.083	1.263
					1.170						0.083	1.253
						1.190					0.083	1.273
							1.180				0.083	1.263
								1.140			0.083	1.223
									1.190		0.083	1.273
										1.160	0.083	1.243
Edge 1	0.705										0	0.705
		0.634									0	0.634
			0.851								0	0.851
				0.643							0	0.643
					0.869						0	0.869
						0.926					0	0.926
							0.816				0	0.816
								0.756			0	0.756
									0.790		0	0.790
										0.851	0	0.851
Edge 2	0.413										0.048	0.461
		0.492									0.048	0.540
			0.431								0.048	0.479
				0.437							0.048	0.485
					0.492						0.048	0.540
						0.445					0.048	0.493
							0.520				0.048	0.568
								0.328			0.048	0.376
									0.312		0.048	0.360
										0.625	0.048	0.673
Edge 3	0										1.120	1.120
		0									1.120	1.120
			0								1.120	1.120
				0							1.120	1.120
					0						1.120	1.120
						0					1.120	1.120
							0				1.120	1.120
								0			1.120	1.120
									0		1.120	1.120
										0	1.120	1.120
Edge 4	0										0	0
		0									0	0
			0								0	0
				0							0	0
					0						0	0
						0					0	0
							0				0	0
								0			0	0
									0		0	0
										0	0	0

Sum of the SAR with Scaled Values for the Worst-case Configuration

As the SAR for these configurations were measured at the maximum of tune-up tolerance limit, SAR scaling does not need to be applied.

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.3 for all circumstances that require SPLSR calculation.

15.2. Sum of the SAR for GSM, W-CDMA, CDMA, LTE and Bluetooth

Sum of the SAR with Measured Values

Test Position	Data											∑ 1-g SAR (mW/g)
	GSM 850	GSM 1900	W-CDMA Band V	W-CDMA Band II	CDMA BC0	CDMA BC1	CDMA BC10	LTE Band 5	LTE Band 13	LTE Band 25	Bluetooth	
Rear	1.190										0.022	1.212
		1.190									0.022	1.212
			1.150								0.022	1.172
				1.180							0.022	1.202
					1.170						0.022	1.192
						1.190					0.022	1.212
							1.180				0.022	1.202
								1.140			0.022	1.162
									1.190		0.022	1.212
										1.160	0.022	1.182
Edge 1	0.705										0	0.705
		0.634									0	0.634
			0.851								0	0.851
				0.643							0	0.643
					0.869						0	0.869
						0.926					0	0.926
							0.816				0	0.816
								0.756			0	0.756
									0.790		0	0.790
										0.851	0	0.851
Edge 2	0.413										0.010	0.423
		0.492									0.010	0.502
			0.431								0.010	0.441
				0.437							0.010	0.447
					0.492						0.010	0.502
						0.445					0.010	0.455
							0.520				0.010	0.530
								0.328			0.010	0.338
									0.312		0.010	0.322
										0.625	0.010	0.635
Edge 3	0										0.356	0.356
		0									0.356	0.356
			0								0.356	0.356
				0							0.356	0.356
					0						0.356	0.356
						0					0.356	0.356
							0				0.356	0.356
								0			0.356	0.356
									0		0.356	0.356
										0	0.356	0.356
Edge 4	0										0	0
		0									0	0
			0								0	0
				0							0	0
					0						0	0
						0					0	0
							0				0	0
								0			0	0
									0		0	0
										0	0	0

Sum of the SAR with Scaled Values for the Worst-case Configuration

As the SAR for these configurations were measured at the maximum of tune-up tolerance limit, SAR scaling does not need to be applied.

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.3 for all circumstances that require SPLSR calculation.

15.3. Sum of the SAR for GSM, W-CDMA, CDMA, LTE, WiFi 5.2 GHz

Sum of the SAR with Measured Values

Test Position	Data											Σ 1-g SAR (mW/g)
	GSM 850	GSM 1900	W-CDMA Band V	W-CDMA Band II	CDMA BC0	CDMA BC1	CDMA BC10	LTE Band 5	LTE Band 13	LTE Band 25	WiFi 5.2 GHz	
Rear	1.190										0.050	1.240
		1.190									0.050	1.240
			1.150								0.050	1.200
				1.180							0.050	1.230
					1.170						0.050	1.220
						1.190					0.050	1.240
							1.180				0.050	1.230
								1.140			0.050	1.190
									1.190		0.050	1.240
										1.160	0.050	1.210
Edge 1	0.705										0	0.705
		0.634									0	0.634
			0.851								0	0.851
				0.643							0	0.643
					0.869						0	0.869
						0.926					0	0.926
							0.816				0	0.816
								0.756			0	0.756
									0.790		0	0.790
										0.851	0	0.851
Edge 2	0.413										0	0.413
		0.492									0	0.492
			0.431								0	0.431
				0.437							0	0.437
					0.492						0	0.492
						0.445					0	0.445
							0.520				0	0.520
								0.328			0	0.328
									0.312		0	0.312
										0.625	0	0.625
Edge 3	0										0.585	0.585
		0									0.585	0.585
			0								0.585	0.585
				0							0.585	0.585
					0						0.585	0.585
						0					0.585	0.585
							0				0.585	0.585
								0			0.585	0.585
									0		0.585	0.585
										0	0.585	0.585
Edge 4	0										0	0
		0									0	0
			0								0	0
				0							0	0
					0						0	0
						0					0	0
							0				0	0
								0			0	0
									0		0	0
										0	0	0

Sum of the SAR with Scaled Values for the Worst-case Configuration

As the SAR for these configurations were measured at the maximum of tune-up tolerance limit, SAR scaling does not need to be applied.

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.3 for all circumstances that require SPLSR calculation.

15.4. Sum of the SAR for GSM, W-CDMA, CDMA, LTE, WiFi 5.3 GHz

Sum of the SAR with Measured Values

Test Position	Data											Σ 1-g SAR (mW/g)
	GSM 850	GSM 1900	W-CDMA Band V	W-CDMA Band II	CDMA BC0	CDMA BC1	CDMA BC10	LTE Band 5	LTE Band 13	LTE Band 25	WiFi 5.3 GHz	
Rear	1.190										0.065	1.255
		1.190									0.065	1.255
			1.150								0.065	1.215
				1.180							0.065	1.245
					1.170						0.065	1.235
						1.190					0.065	1.255
							1.180				0.065	1.245
								1.140			0.065	1.205
									1.190		0.065	1.255
										1.160	0.065	1.225
Edge 1	0.705										0	0.705
		0.634									0	0.634
			0.851								0	0.851
				0.643							0	0.643
					0.869						0	0.869
						0.926					0	0.926
							0.816				0	0.816
								0.756			0	0.756
									0.790		0	0.790
										0.851	0	0.851
Edge 2	0.413										0	0.413
		0.492									0	0.492
			0.431								0	0.431
				0.437							0	0.437
					0.492						0	0.492
						0.445					0	0.445
							0.520				0	0.520
								0.328			0	0.328
									0.312		0	0.312
										0.625	0	0.625
Edge 3	0										0.877	0.877
		0									0.877	0.877
			0								0.877	0.877
				0							0.877	0.877
					0						0.877	0.877
						0					0.877	0.877
							0				0.877	0.877
								0			0.877	0.877
									0		0.877	0.877
										0	0.877	0.877
Edge 4	0										0	0
		0									0	0
			0								0	0
				0							0	0
					0						0	0
						0					0	0
							0				0	0
								0			0	0
									0		0	0
										0	0	0

Sum of the SAR with Scaled Values for the Worst-case Configuration

As the SAR for these configurations were measured at the maximum of tune-up tolerance limit, SAR scaling does not need to be applied.

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.3 for all circumstances that require SPLSR calculation.

15.5. Sum of the SAR for GSM, W-CDMA, CDMA, LTE, WiFi 5.5 GHz

Sum of the SAR with Measured Values

Test Position	Data											Σ 1-g SAR (mW/g)
	GSM 850	GSM 1900	W-CDMA Band V	W-CDMA Band II	CDMA BC0	CDMA BC1	CDMA BC10	LTE Band 5	LTE Band 13	LTE Band 25	WiFi 5.5 GHz	
Rear	1.190										0.072	1.262
		1.190									0.072	1.262
			1.150								0.072	1.222
				1.180							0.072	1.252
					1.170						0.072	1.242
						1.190					0.072	1.262
							1.180				0.072	1.252
								1.140			0.072	1.212
									1.190		0.072	1.262
										1.160	0.072	1.232
Edge 1	0.705										0	0.705
		0.634									0	0.634
			0.851								0	0.851
				0.643							0	0.643
					0.869						0	0.869
						0.926					0	0.926
							0.816				0	0.816
								0.756			0	0.756
									0.790		0	0.790
										0.851	0	0.851
Edge 2	0.413										0.020	0.433
		0.492									0.020	0.512
			0.431								0.020	0.451
				0.437							0.020	0.457
					0.492						0.020	0.512
						0.445					0.020	0.465
							0.520				0.020	0.540
								0.328			0.020	0.348
									0.312		0.020	0.332
										0.625	0.020	0.645
Edge 3	0										1.080	1.080
		0									1.080	1.080
			0								1.080	1.080
				0							1.080	1.080
					0						1.080	1.080
						0					1.080	1.080
							0				1.080	1.080
								0			1.080	1.080
									0		1.080	1.080
										0	1.080	1.080
Edge 4	0										0	0
		0									0	0
			0								0	0
				0							0	0
					0						0	0
						0					0	0
							0				0	0
								0			0	0
									0		0	0
										0	0	0

Sum of the SAR with Scaled Values for the Worst-case Configuration

As the SAR for these configurations were measured at the maximum of tune-up tolerance limit, SAR scaling does not need to be applied.

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.3 for all circumstances that require SPLSR calculation.

15.6. Sum of the SAR for GSM, W-CDMA, CDMA, LTE, WiFi 5.8 GHz

Sum of the SAR with Measured Values

Test Position	Data											Σ 1-g SAR (mW/g)
	GSM 850	GSM 1900	W-CDMA Band V	W-CDMA Band II	CDMA BC0	CDMA BC1	CDMA BC10	LTE Band 5	LTE Band 13	LTE Band 25	WiFi 5.8 GHz	
Rear	1.190										0.059	1.249
		1.190									0.059	1.249
			1.150								0.059	1.209
				1.180							0.059	1.239
					1.170						0.059	1.229
						1.190					0.059	1.249
							1.180				0.059	1.239
								1.140			0.059	1.199
									1.190		0.059	1.249
										1.160	0.059	1.219
Edge 1	0.705										0	0.705
		0.634									0	0.634
			0.851								0	0.851
				0.643							0	0.643
					0.869						0	0.869
						0.926					0	0.926
							0.816				0	0.816
								0.756			0	0.756
									0.790		0	0.790
										0.851	0	0.851
Edge 2	0.413										0.014	0.427
		0.492									0.014	0.506
			0.431								0.014	0.445
				0.437							0.014	0.451
					0.492						0.014	0.506
						0.445					0.014	0.459
							0.520				0.014	0.534
								0.328			0.014	0.342
									0.312		0.014	0.326
										0.625	0.014	0.639
Edge 3	0										0.958	0.958
		0									0.958	0.958
			0								0.958	0.958
				0							0.958	0.958
					0						0.958	0.958
						0					0.958	0.958
							0				0.958	0.958
								0			0.958	0.958
									0		0.958	0.958
										0	0.958	0.958
Edge 4	0										0	0
		0									0	0
			0								0	0
				0							0	0
					0						0	0
						0					0	0
							0				0	0
								0			0	0
									0		0	0
										0	0	0

Sum of the SAR with Scaled Values for the Worst-case Configuration

As the SAR for these configurations were measured at the maximum of tune-up tolerance limit, SAR scaling does not need to be applied.

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.3 for all circumstances that require SPLSR calculation.

15.7. Sum of the SAR for WiFi 5 GHz and Bluetooth

Sum of the SAR with Measured Values

Test Position	Data					∑ 1-g SAR (mW/g)
	WiFi 5.2 GHz	WiFi 5.3 GHz	WiFi 5.5 GHz	WiFi 5.8 GHz	Bluetooth	
Rear	0.050				0.022	0.072
		0.065			0.022	0.087
			0.072		0.022	0.094
				0.059	0.022	0.081
Edge 1	0				0	0
		0			0	0
			0		0	0
				0	0	0
Edge 2	0				0.010	0
		0			0.010	0
			0.020		0.010	0
				0.014	0.010	0
Edge 3	0.585				0.356	0.941
		0.877			0.356	1.233
			1.080		0.356	**1.436**
				0.958	0.356	1.314
Edge 4	0				0	0
		0			0	0
			0		0	0
				0	0	0

Sum of the SAR with Scaled Values for the Worst-case Configuration

As the SAR for these configurations were measured at the maximum of tune-up tolerance limit, SAR scaling does not need to be applied.

SAR to Peak Location Separation Ratio (SPLSR)

As the Sum of the SAR is not greater than 1.6 W/kg SPLSR assessment is not required.

Conclusion:

Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.3 for all circumstances that require SPLSR calculation.

16. Appendixes

Refer to separated files for the following appendixes.

16.1. System Performance Check Plots

16.2. SAR Test Plots for GSM850

16.3. SAR Test Plots for GSM1900

16.4. SAR Test Plots for W-CDMA Band V

16.5. SAR Test Plots for W-CDMA Band II

16.6. SAR Test Plots for CDMA BC0

16.7. SAR Test Plots for CDMA BC1

16.8. SAR Test Plots for CDMA BC10

16.9. SAR Test Plots for LTE Band 5

16.10. SAR Test Plots for LTE Band 13

16.11. SAR Test Plots for LTE Band 25

16.12. SAR Test Plots for WiFi 2.4 GHz Band

16.13. SAR Test Plots for WiFi 5 GHz Bands

16.14. SAR Test Plots for Bluetooth

16.15. Calibration Certificate for E-Field Probe EX3DV4 - SN 3676

16.16. Calibration Certificate for E-Field Probe EX3DV4 - SN 3720

16.17. Calibration Certificate for E-Field Probe EX3DV4 - SN 3757

16.18. Calibration Certificate for E-Field Probe EX3DV4 - SN 3778

16.19. Calibration Certificate for E-Field Probe EX3DV4 - SN 3751

16.20. Calibration Certificate for D750V3 - SN 1025

16.21. Calibration Certificate for D835V2 - SN 4d076

16.22. Calibration Certificate for D1900V2 - SN 5d108

16.23. Calibration Certificate for D2450V2 - SN 826

16.24. Calibration Certificate for D5GHzV2 - SN 1072