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

SAR EVALUATION REPORT

For
Tablet with GSM/GPRS/EDGE/WCDMA, 802.11bgn, BT3.0

Model: GT-P3100
FCC ID: A3LGTP3100

Report number: 12I14206-5-A
Issue Date: February 23, 2012

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	February 23, 2012	Initial Issue	--
A	March 22, 2012	Removed GPRS Head SAR measurements as VoIP is not supported in GPRS	Dave Weaver

Table of Contents

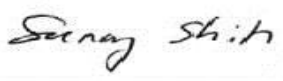
1. Attestation of Test Results

Applicant	Samsung Electronics Co., Ltd.		
DUT description	Tablet with GSM/GPRS/EDGE/WCDMA, 802.11bgn, BT3.0		
Model	GT-P3100 IMEI: 004999010640000		
Test device is	An identical prototype		
Device category	Portable devices		
Exposure category	General Population/Uncontrolled Exposure		
Date tested	January 30, 2012 – February 22, 2012		
FCC Rule Parts	Freq. Range [MHz]	Highest 1-g SAR	Limit (W/kg)
22	824-849	0.80 W/kg (Head: Right Touch) 0.62 W/kg (Body: Rear w/ 0 mm distance)	1.6
24	1850-1910	0.54 W/kg (Head: Right Touch) 1.11 W/kg (Body: Edge 1 @ 45 degrees 0 mm distance)	
15.247	2412-2462	0.08 W/kg (Head: SAR in flat phantom w/) 0.34 W/kg (Body: Rear w/ 0 mm distance)	
Simultaneous transmission condition:		1.24 W/kg (The highest SAR across exposure conditions)	
Applicable Standards			Test Results
FCC OET Bulletin 65 Supplement C 01-01, IEEE STD 1528:2003			Pass

Compliance Certification Services, Inc. (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 Team Leader
Compliance Certification Services (UL CCS)

Tested By:

Chakrit Thammanavarat
SAR Engineer
Compliance Certification Services (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 and the following KDBs Procedures.

- 447498 D01 Mobile Portable RF Exposure v04
- 648474 D01 SAR Handsets Multi Xmiter and Ant, v01r05
- 941225 D06 Hot Spot SAR v01
- 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
- 248227 D01 SAR meas for 802 11abg v01r02

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 utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's 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	HP	85070C	N/A	N/A		
Base Station Simulator	Agilent	8960	GB46160222	6	17	2012
Base Station Simulator	R & S	CMU 200	106291	6	24	2012
Base Station Simulator	Anritsu	MT8820C	6200985430	6	17	2012
ESA Series Network Analyzer	Agilent	E5071B	MY42100131	2	11	2013
Synthesized Signal Generator	HP	83732B	US34490599	7	14	2012
E-Field Probe	SPEAG	EX3DV3	3531	12	19	2012
Thermometer	ERTCO	639-1S	1718	7	19	2012
Data Acquisition Electronics	SPEAG	DAE4	1258	5	2	2012
Data Acquisition Electronics	SPEAG	DAE4	1259	2	13	2013
System Validation Dipole	SPEAG	D835V2	4d117	4	15	2012
System Validation Dipole	SPEAG	D1900V2	5d140	4	18	2012
System Validation Dipole	SPEAG	*D2450V2	706	4	19	2012
Power Meter	HP	437B	3125U16345	5	13	2012
Power Sensor	HP	8481A	2702A60780	5	13	2012
Amplifier	MITEQ	4D00400600-50-30P	1620606	N/A		
Directional coupler	Werlatone	C8060-102	2141	N/A		

Notes:

*Per KDB 450824 D02 requirements for dipole calibration, UL CCS has adopted two years calibration intervals. On annual basis, each measurement dipole has been evaluated and is in compliance with the following criteria:

1. There is no physical damage on the dipole
2. System validation with specific dipole is within 10% of calibrated value.
3. Return-loss is within 20% of calibrated measurement. (See Appendix 18.10_Calibration Certificate for D2450V2 SN 706 incl. extended cal. data)
4. Impedance is within 5Ω of calibrated measurement (See Appendix 18.10_Calibration Certificate for D2450V2 SN 706 incl. extended cal. data)

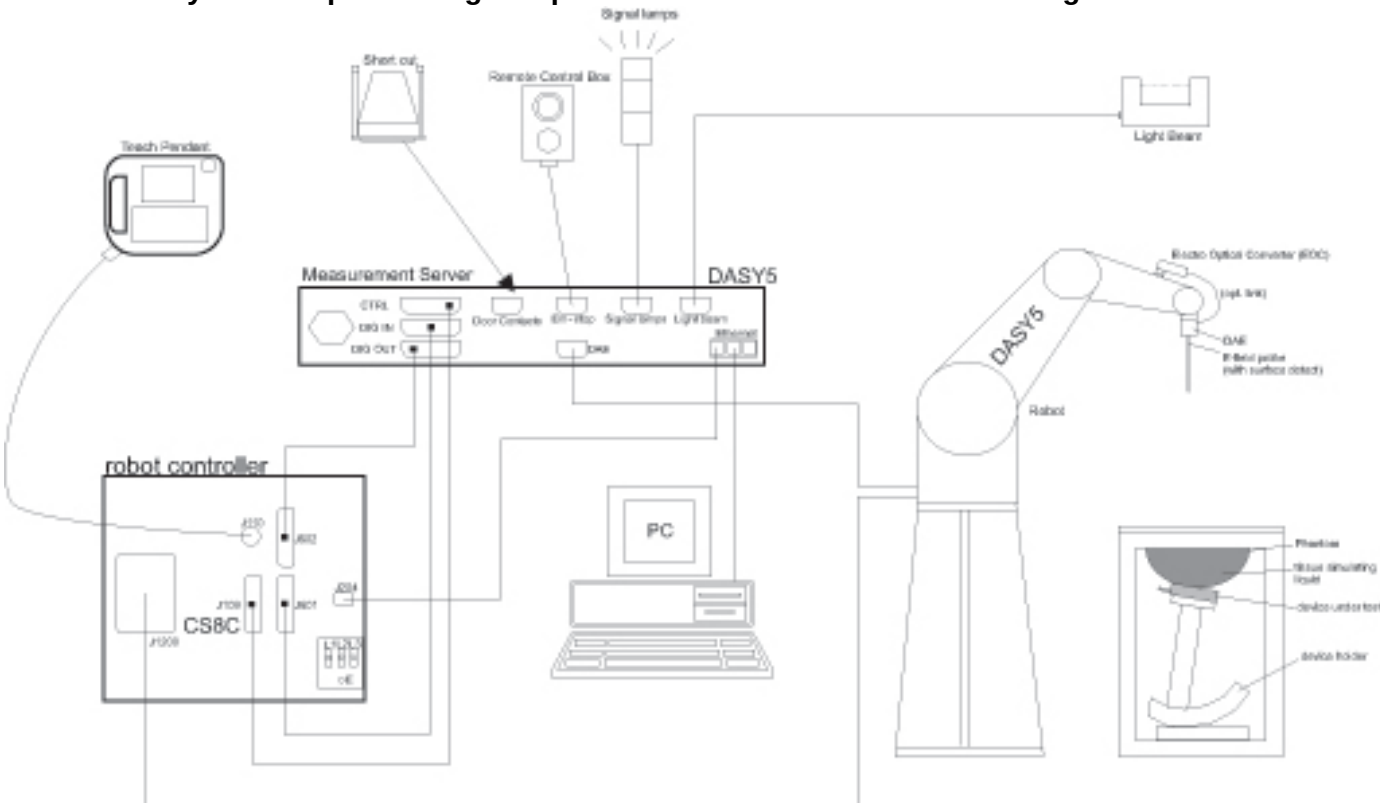
4.2. Measurement uncertainty

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

Component	error, %	Probe 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	9.20	Rectangular	1.732	0.7071	3.76
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	-4.88	Normal	1	0.64	-3.12
Liquid Permittivity - deviation from target	5.00	Rectangular	1.732	0.6	1.73
Liquid Permittivity - measurement	-3.93	Normal	1	0.6	-2.36
Combined Standard Uncertainty Uc(y) =					11.11
Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =				22.22	%
Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =				1.74	dB

5. Measurement System Description and Setup

The DASY5 system 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.
- Data acquisition electronics (DAE) which performs the signal amplification, 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. Device Under Test

Tablet with GSM/GPRS/EDGE/WCDMA, 802.11bgn, BT3.0 Model: GT-P3100	
Mode of operation:	Held to head Body and Wireless Router (Hotspot) Bottom face, and Edges (Edge 1, 2, 3, and 4): Multiple display orientations supporting both portrait and landscape configurations
Device dimensions (mm):	193.7 x 122.4 x 10.5 (length x width x height)

6.1. Band and air interlaces

Air Interfaces:	GSM, GPRS, EGPRS 850/1900 MHz WCDMA (Rel 99), HSDPA, HSPA, HSPA+ (DL: 64QAM, UL: QPSK) 850/1900 MHz WiFi: 802.11bgn: 2.4GHz Bluetooth: 2.4 GHz
Uplink Modulations:	GSM Modes: GMSK, 8PSK UMTS Modes: BPSK, QPSK WiFi: 802.11bgn: 2.4GHz, Bluetooth: Ver 3.0
GPRS Multi-Slot Class:	12
GPRS Class:	B
DTM Class:	Not supported

6.2. Personal Hotspot Mode

The device is capable of personal hotspot mode. The hotspot mode can be enabled by the users.

6.3. Simultaneous Transmission Conditions

No	Simultaneous Transmission	Head	Body	Hot-spot
1	GSM voice + WiFi 2.4 GHz	☒	☒	☐
2	WCDMA Voice + WiFi 2.4 GHz	☒	☒	☐
3	GSM voice + BT	☒	☒	☐
4	WCDMA Voice + BT	☒	☒	☐
5	GPRS/EGPRS + WiFi 2.4 GHz	☐	☒	☒
6	WCDMA/HSPA + WiFi 2.4 GHz	☐	☒	☒

Note(s):

As the tablet has a diagonal size of greater than 20 cm, and in accordance with FCC training provided in October 2011 (TCBC Workshop) hotspot SAR is not required for this device.

6.4. Power Sensor

The following sensors (functioning as proximity sensor) are used for power reduction.

- Grip sensor 1: Covers the Rear and Top-edge (Edge 1) of the DUT.
- Grip sensor 2: Covers the Rear of the DUT
- 1 IR sensor: Covers the front, located adjacent to receiver at the front of the DUT.

6.5. Power Reduction Implementation

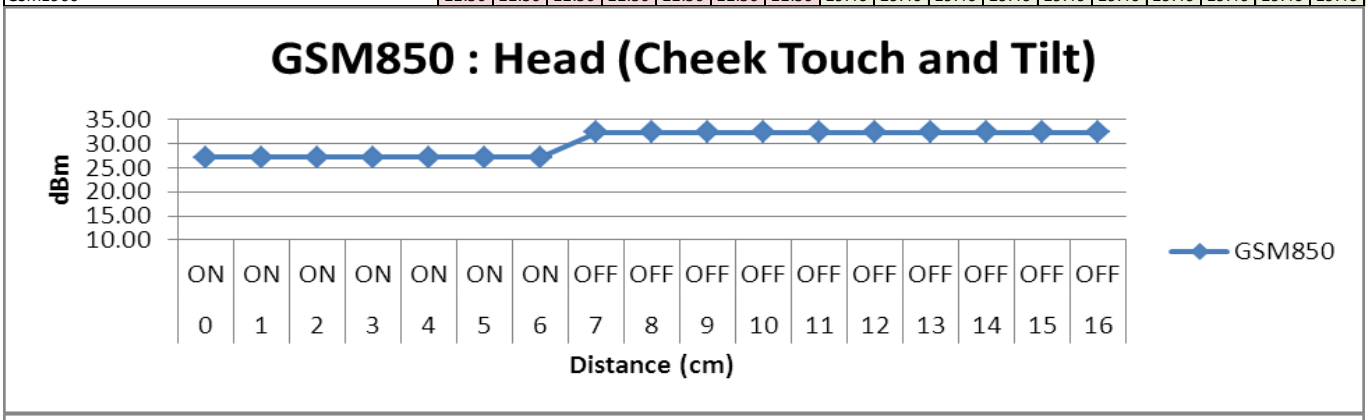
Trigger distances are:

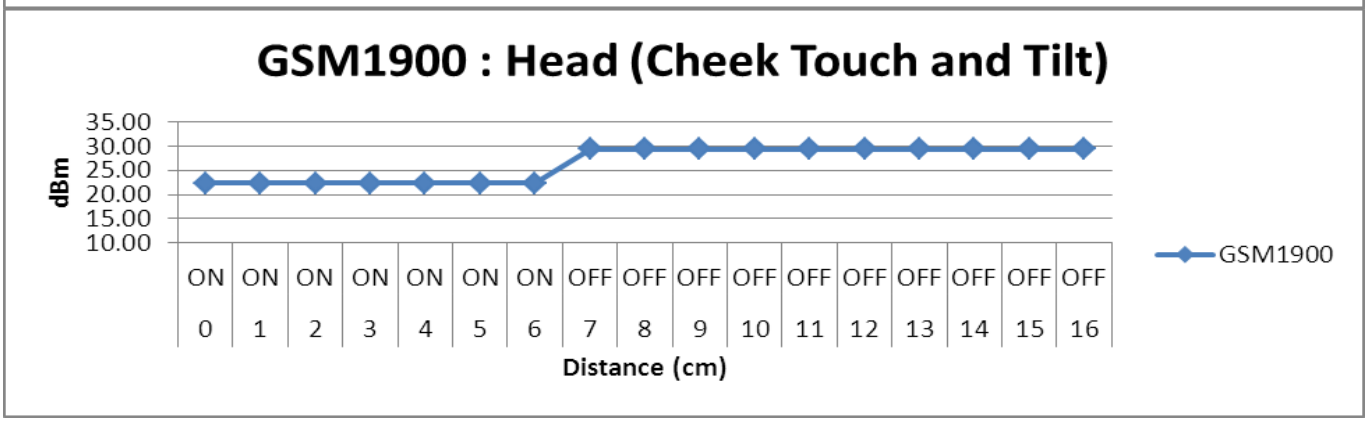
- Grip sensor 1: 8 mm from Rear and 5 mm from Top-edge (Edge 1) of the DUT
- Grip sensor 2: 8 mm from Rear of the DUT
- IR sensor: 60 mm from front of the DUT

Both Grip and IR sensors have the same levels of power reduction.

6.6. Summary Table of Power Reduction dB Levels per Mode & Band

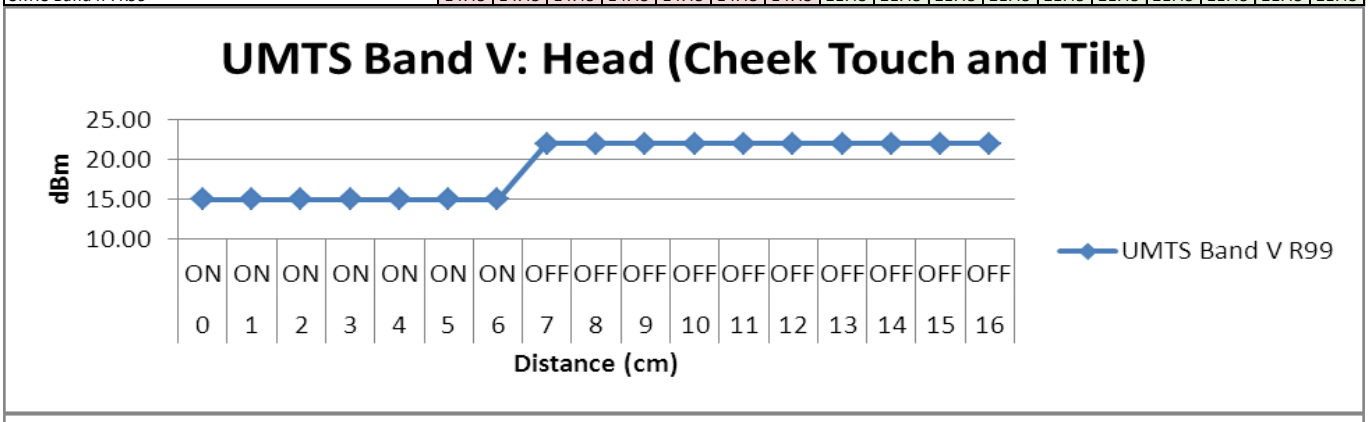
Head (Cheek Touch and Tilt)																	
Distance (cm):	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IR Sensor with reduced power activation:	ON	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
GSM850	27.21	27.21	27.21	27.21	27.21	27.21	27.21	32.33	32.33	32.33	32.33	32.33	32.33	32.33	32.33	32.33	32.33
GSM1900	22.36	22.36	22.36	22.36	22.36	22.36	22.36	29.46	29.46	29.46	29.46	29.46	29.46	29.46	29.46	29.46	29.46

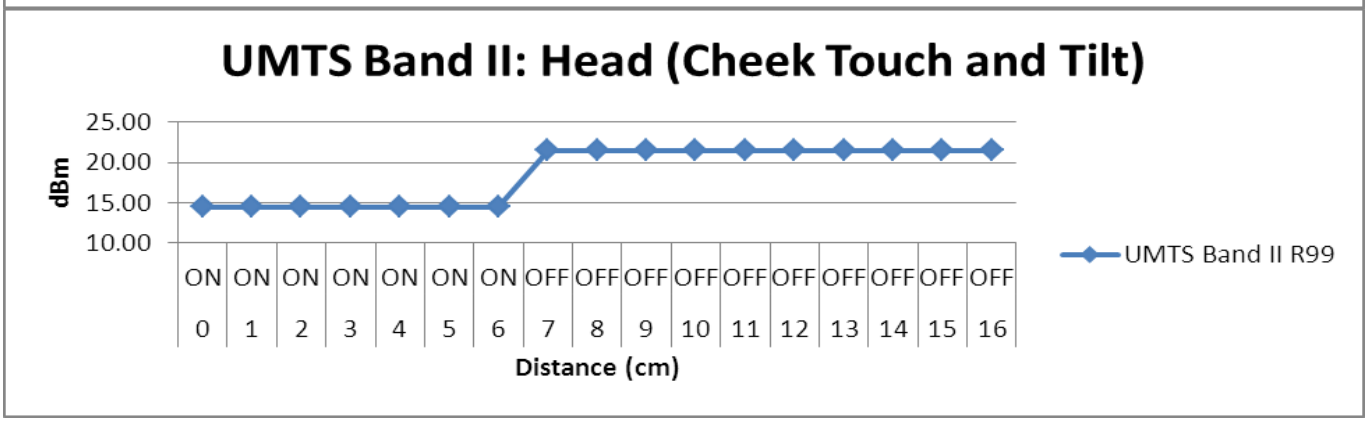




Summary Table of Power Reduction dB Levels per Mode & Band (continued)

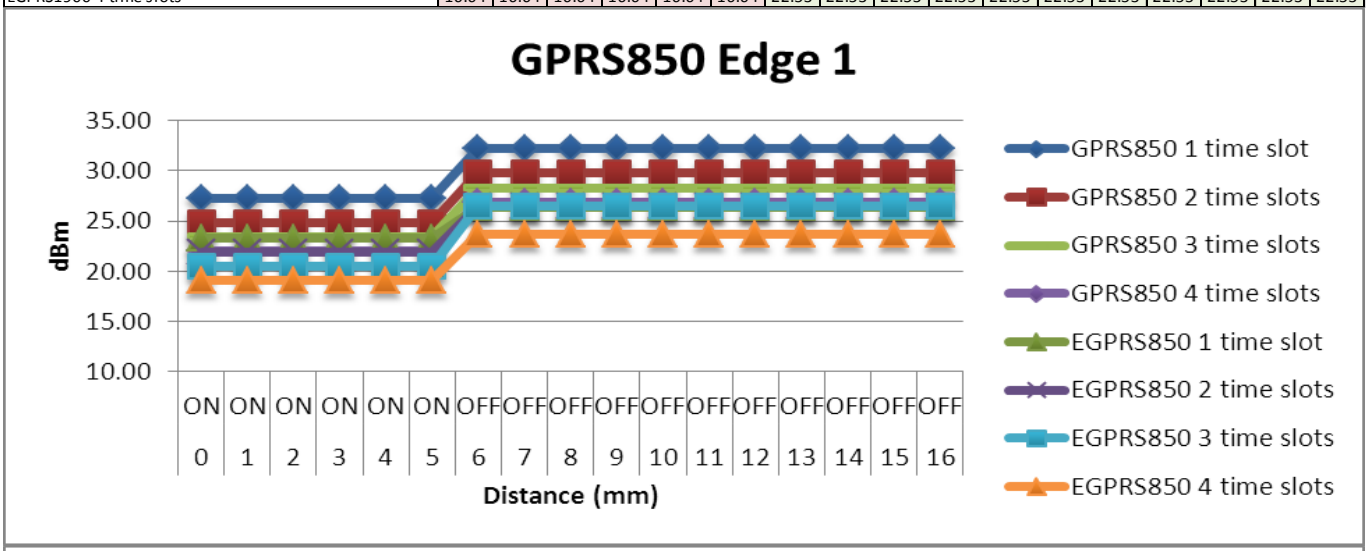
Head (Cheek Touch and Tilt)																	
Distance (cm):	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IR Sensor with reduced power activation:	ON	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
UMTS Band V : R99	14.99	14.99	14.99	14.99	14.99	14.99	14.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99
UMTS Band II : R99	14.45	14.45	14.45	14.45	14.45	14.45	14.45	21.45	21.45	21.45	21.45	21.45	21.45	21.45	21.45	21.45	21.45

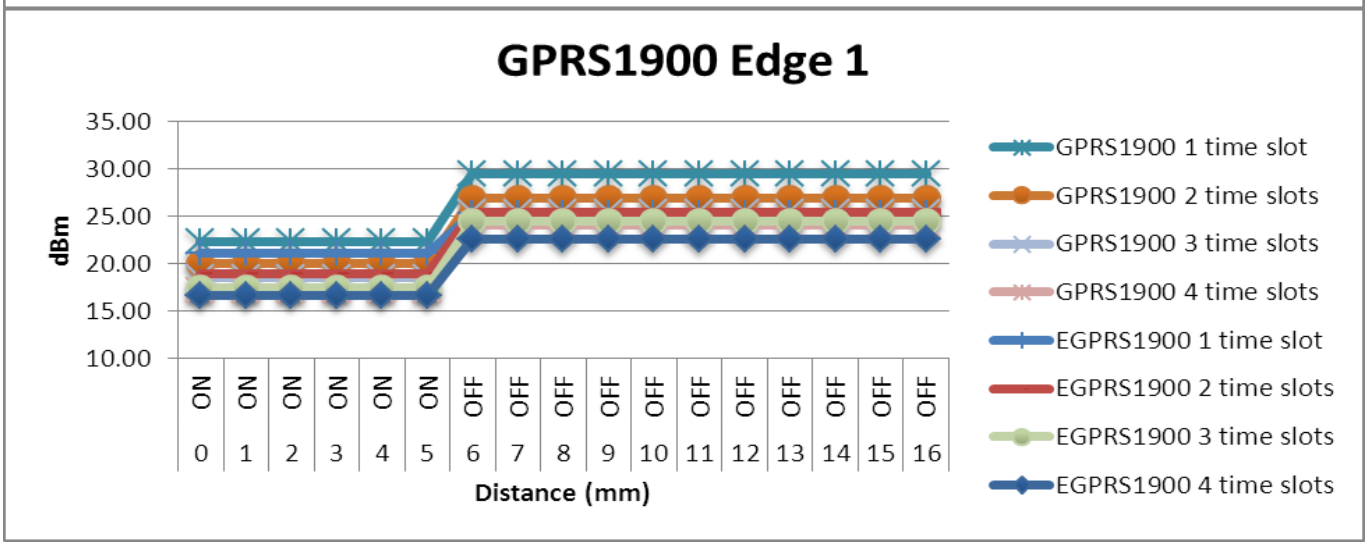




Summary Table of Power Reduction dB Levels per Mode & Band (continued)

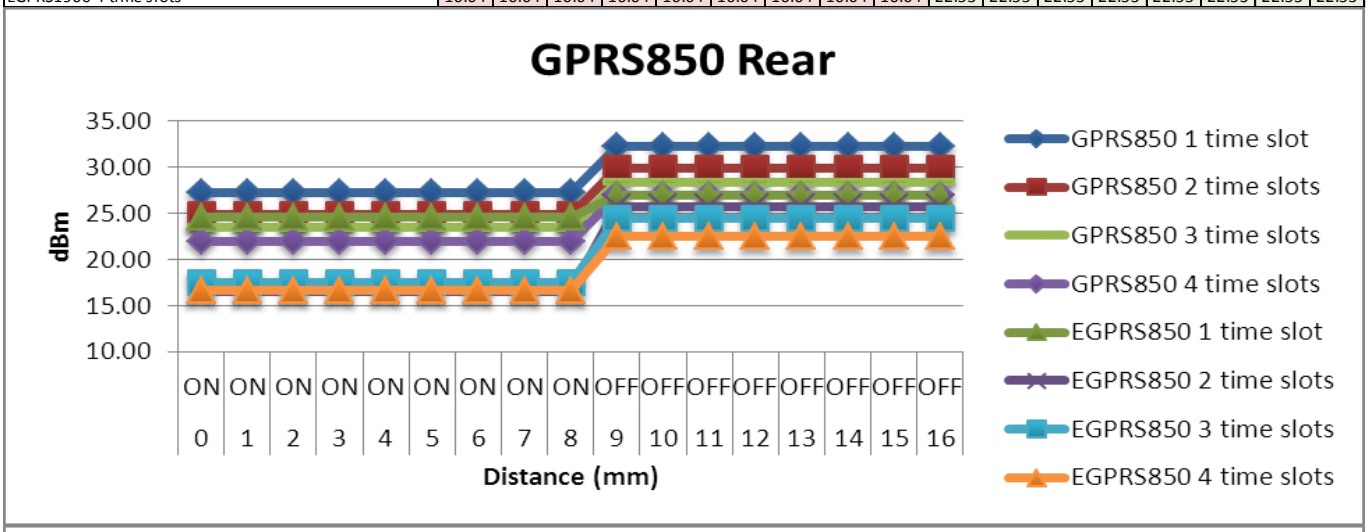
Edge 1																	
Distance (mm):	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Proximity sensor with reduced power activation:	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
GPRS850 1 time slot	27.21	27.21	27.21	27.21	27.21	27.21	32.17	32.17	32.17	32.17	32.17	32.17	32.17	32.17	32.17	32.17	32.17
GPRS850 2 time slots	24.88	24.88	24.88	24.88	24.88	24.88	29.81	29.81	29.81	29.81	29.81	29.81	29.81	29.81	29.81	29.81	29.81
GPRS850 3 time slots	23.46	23.46	23.46	23.46	23.46	23.46	28.32	28.32	28.32	28.32	28.32	28.32	28.32	28.32	28.32	28.32	28.32
GPRS850 4 time slots	21.97	21.97	21.97	21.97	21.97	21.97	26.91	26.91	26.91	26.91	26.91	26.91	26.91	26.91	26.91	26.91	26.91
EGPRS850 1 time slot	23.30	23.30	23.30	23.30	23.30	23.30	26.35	26.35	26.35	26.35	26.35	26.35	26.35	26.35	26.35	26.35	26.35
EGPRS850 2 time slots	21.93	21.93	21.93	21.93	21.93	21.93	26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44	26.44
EGPRS850 3 time slot	20.43	20.43	20.43	20.43	20.43	20.43	26.46	26.46	26.46	26.46	26.46	26.46	26.46	26.46	26.46	26.46	26.46
EGPRS850 4 time slots	19.06	19.06	19.06	19.06	19.06	19.06	23.63	23.63	23.63	23.63	23.63	23.63	23.63	23.63	23.63	23.63	23.63
GPRS1900 1 time slot	22.31	22.31	22.31	22.31	22.31	22.31	29.43	29.43	29.43	29.43	29.43	29.43	29.43	29.43	29.43	29.43	29.43
GPRS1900 2 time slots	19.94	19.94	19.94	19.94	19.94	19.94	26.95	26.95	26.95	26.95	26.95	26.95	26.95	26.95	26.95	26.95	26.95
GPRS1900 3 time slots	18.54	18.54	18.54	18.54	18.54	18.54	25.48	25.48	25.48	25.48	25.48	25.48	25.48	25.48	25.48	25.48	25.48
GPRS1900 4 time slots	17.21	17.21	17.21	17.21	17.21	17.21	24.02	24.02	24.02	24.02	24.02	24.02	24.02	24.02	24.02	24.02	24.02
EGPRS1900 1 time slot	21.35	21.35	21.35	21.35	21.35	21.35	25.34	25.34	25.34	25.34	25.34	25.34	25.34	25.34	25.34	25.34	25.34
EGPRS1900 2 time slots	18.86	18.86	18.86	18.86	18.86	18.86	25.47	25.47	25.47	25.47	25.47	25.47	25.47	25.47	25.47	25.47	25.47
EGPRS1900 3 time slots	17.46	17.46	17.46	17.46	17.46	17.46	24.50	24.50	24.50	24.50	24.50	24.50	24.50	24.50	24.50	24.50	24.50
EGPRS1900 4 time slots	16.64	16.64	16.64	16.64	16.64	16.64	22.53	22.53	22.53	22.53	22.53	22.53	22.53	22.53	22.53	22.53	22.53

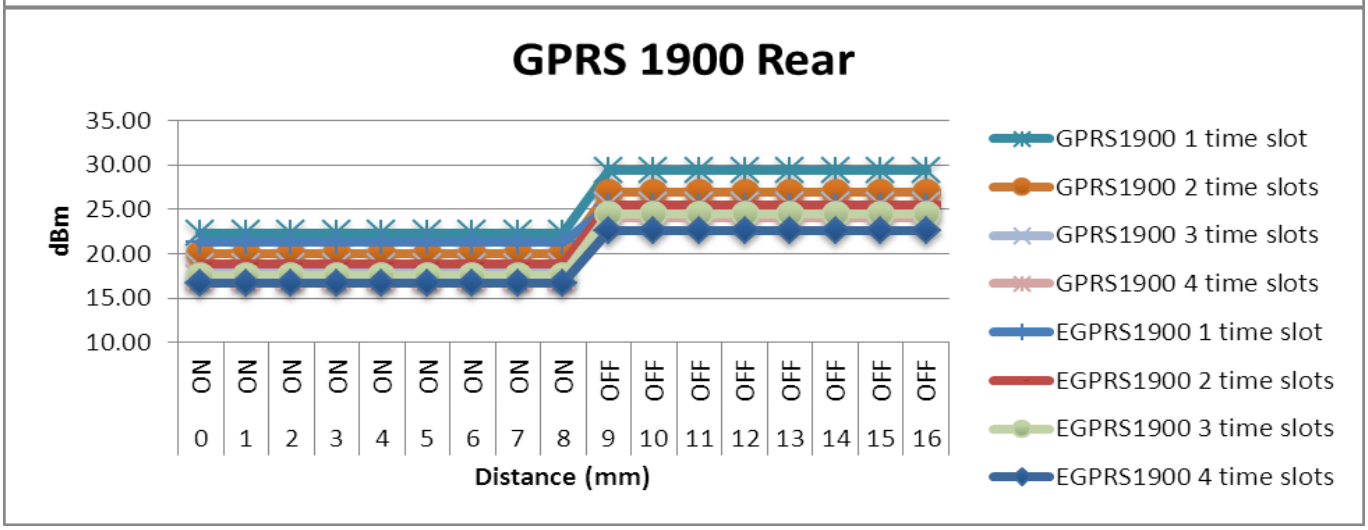




Summary Table of Power Reduction dB Levels per Mode & Band (continued)

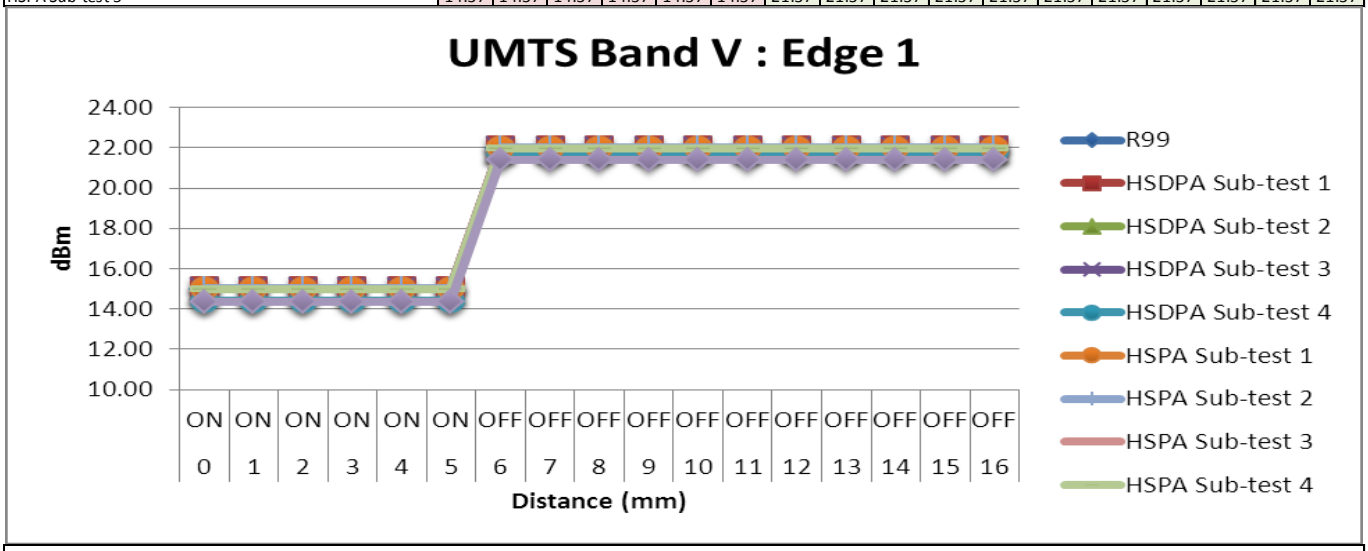
Rear/Base																	
Distance (mm):	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Proximity sensor with reduced power activation:	ON	ON	ON	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
GPRS850 1 time slot	27.21	27.21	27.21	27.21	27.21	27.21	27.21	27.21	27.21	32.17	32.17	32.17	32.17	32.17	32.17	32.17	32.17
GPRS850 2 time slots	24.88	24.88	24.88	24.88	24.88	24.88	24.88	24.88	24.88	29.81	29.81	29.81	29.81	29.81	29.81	29.81	29.81
GPRS850 3 time slots	23.46	23.46	23.46	23.46	23.46	23.46	23.46	23.46	23.46	28.32	28.32	28.32	28.32	28.32	28.32	28.32	28.32
GPRS850 4 time slots	21.97	21.97	21.97	21.97	21.97	21.97	21.97	21.97	21.97	26.91	26.91	26.91	26.91	26.91	26.91	26.91	26.91
EGPRS850 1 time slot	24.60	24.60	24.60	24.60	24.60	24.60	24.60	24.60	24.60	27.00	27.00	27.00	27.00	27.00	27.00	27.00	27.00
EGPRS850 2 time slots	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	25.73	25.73	25.73	25.73	25.73	25.73	25.73	25.73
EGPRS850 3 time slot	20.43	20.43	20.43	20.43	20.43	20.43	20.43	20.43	20.43	26.46	26.46	26.46	26.46	26.46	26.46	26.46	26.46
EGPRS850 4 time slots	19.06	19.06	19.06	19.06	19.06	19.06	19.06	19.06	19.06	23.63	23.63	23.63	23.63	23.63	23.63	23.63	23.63
GPRS1900 1 time slot	22.31	22.31	22.31	22.31	22.31	22.31	22.31	22.31	22.31	29.43	29.43	29.43	29.43	29.43	29.43	29.43	29.43
GPRS1900 2 time slots	19.94	19.94	19.94	19.94	19.94	19.94	19.94	19.94	19.94	26.95	26.95	26.95	26.95	26.95	26.95	26.95	26.95
GPRS1900 3 time slots	18.54	18.54	18.54	18.54	18.54	18.54	18.54	18.54	18.54	25.48	25.48	25.48	25.48	25.48	25.48	25.48	25.48
GPRS1900 4 time slots	17.21	17.21	17.21	17.21	17.21	17.21	17.21	17.21	17.21	24.02	24.02	24.02	24.02	24.02	24.02	24.02	24.02
EGPRS1900 1 time slot	21.35	21.35	21.35	21.35	21.35	21.35	21.35	21.35	21.35	25.34	25.34	25.34	25.34	25.34	25.34	25.34	25.34
EGPRS1900 2 time slots	18.86	18.86	18.86	18.86	18.86	18.86	18.86	18.86	18.86	25.47	25.47	25.47	25.47	25.47	25.47	25.47	25.47
EGPRS1900 3 time slots	17.46	17.46	17.46	17.46	17.46	17.46	17.46	17.46	17.46	24.50	24.50	24.50	24.50	24.50	24.50	24.50	24.50
EGPRS1900 4 time slots	16.64	16.64	16.64	16.64	16.64	16.64	16.64	16.64	16.64	22.53	22.53	22.53	22.53	22.53	22.53	22.53	22.53



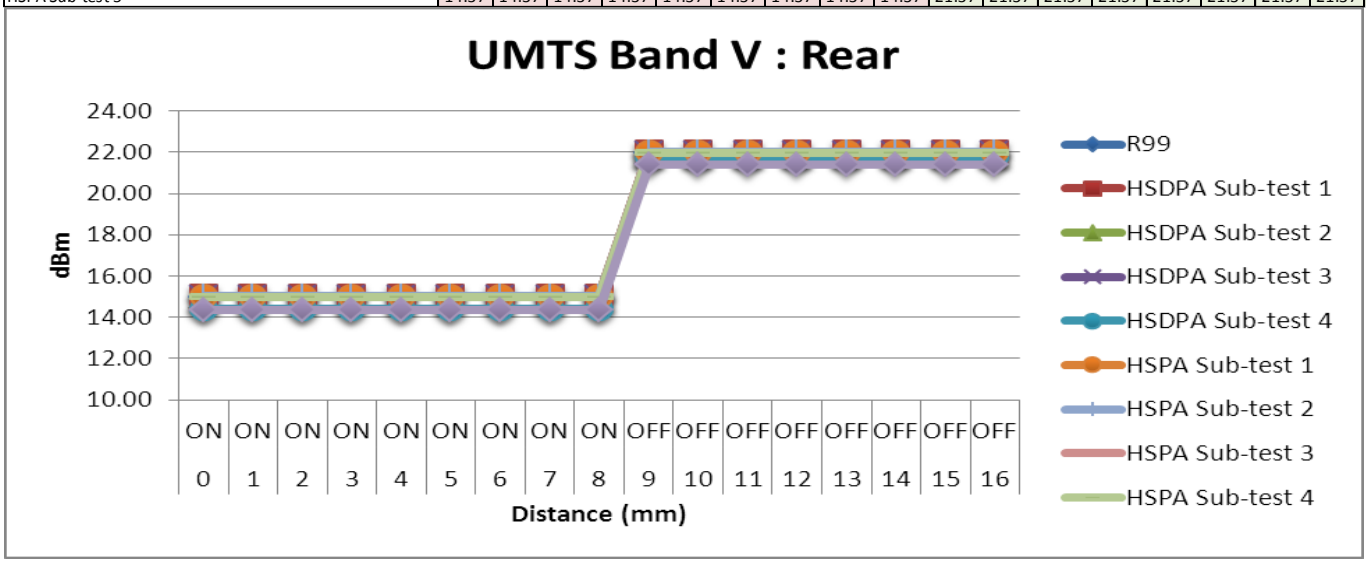


Summary Table of Power Reduction dB Levels per Mode & Band (continued)

Edge 1 (UMTS Band V)																	
Distance (mm):	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Proximity sensor with reduced power activation:	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
R99	14.99	14.99	14.99	14.99	14.99	14.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99
HSDPA Sub-test 1	15.04	15.04	15.04	15.04	15.04	15.04	22.04	22.04	22.04	22.04	22.04	22.04	22.04	22.04	22.04	22.04	22.04
HSDPA Sub-test 2	14.99	14.99	14.99	14.99	14.99	14.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99
HSDPA Sub-test 3	14.98	14.98	14.98	14.98	14.98	14.98	21.98	21.98	21.98	21.98	21.98	21.98	21.98	21.98	21.98	21.98	21.98
HSDPA Sub-test 4	14.43	14.43	14.43	14.43	14.43	14.43	21.73	21.73	21.73	21.73	21.73	21.73	21.73	21.73	21.73	21.73	21.73
HSPA Sub-test 1	15.02	15.02	15.02	15.02	15.02	15.02	22.02	22.02	22.02	22.02	22.02	22.02	22.02	22.02	22.02	22.02	22.02
HSPA Sub-test 2	15.03	15.03	15.03	15.03	15.03	15.03	22.03	22.03	22.03	22.03	22.03	22.03	22.03	22.03	22.03	22.03	22.03
HSPA Sub-test 3	14.99	14.99	14.99	14.99	14.99	14.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99
HSPA Sub-test 4	14.99	14.99	14.99	14.99	14.99	14.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99
HSPA Sub-test 5	14.37	14.37	14.37	14.37	14.37	14.37	21.37	21.37	21.37	21.37	21.37	21.37	21.37	21.37	21.37	21.37	21.37

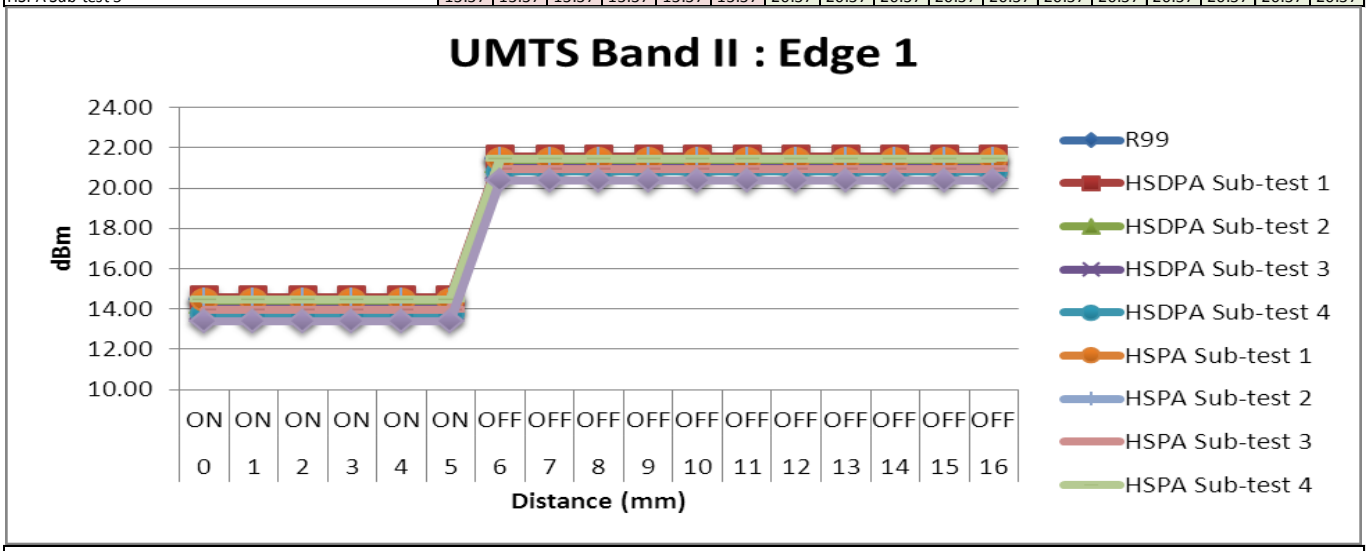


Rear/Base (UMTS Band V)																	
Distance (mm):	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Proximity sensor with reduced power activation:	ON	ON	ON	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
R99	14.99	14.99	14.99	14.99	14.99	14.99	14.99	14.99	14.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99
HSDPA Sub-test 1	15.04	15.04	15.04	15.04	15.04	15.04	15.04	15.04	15.04	22.04	22.04	22.04	22.04	22.04	22.04	22.04	22.04
HSDPA Sub-test 2	14.99	14.99	14.99	14.99	14.99	14.99	14.99	14.99	14.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99
HSDPA Sub-test 3	14.98	14.98	14.98	14.98	14.98	14.98	14.98	14.98	14.98	21.98	21.98	21.98	21.98	21.98	21.98	21.98	21.98
HSDPA Sub-test 4	14.43	14.43	14.43	14.43	14.43	14.43	14.43	14.43	14.43	21.73	21.73	21.73	21.73	21.73	21.73	21.73	21.73
HSPA Sub-test 1	15.02	15.02	15.02	15.02	15.02	15.02	15.02	15.02	15.02	22.02	22.02	22.02	22.02	22.02	22.02	22.02	22.02
HSPA Sub-test 2	15.03	15.03	15.03	15.03	15.03	15.03	15.03	15.03	15.03	22.03	22.03	22.03	22.03	22.03	22.03	22.03	22.03
HSPA Sub-test 3	14.99	14.99	14.99	14.99	14.99	14.99	14.99	14.99	14.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99
HSPA Sub-test 4	14.99	14.99	14.99	14.99	14.99	14.99	14.99	14.99	14.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99	21.99
HSPA Sub-test 5	14.37	14.37	14.37	14.37	14.37	14.37	14.37	14.37	14.37	21.37	21.37	21.37	21.37	21.37	21.37	21.37	21.37

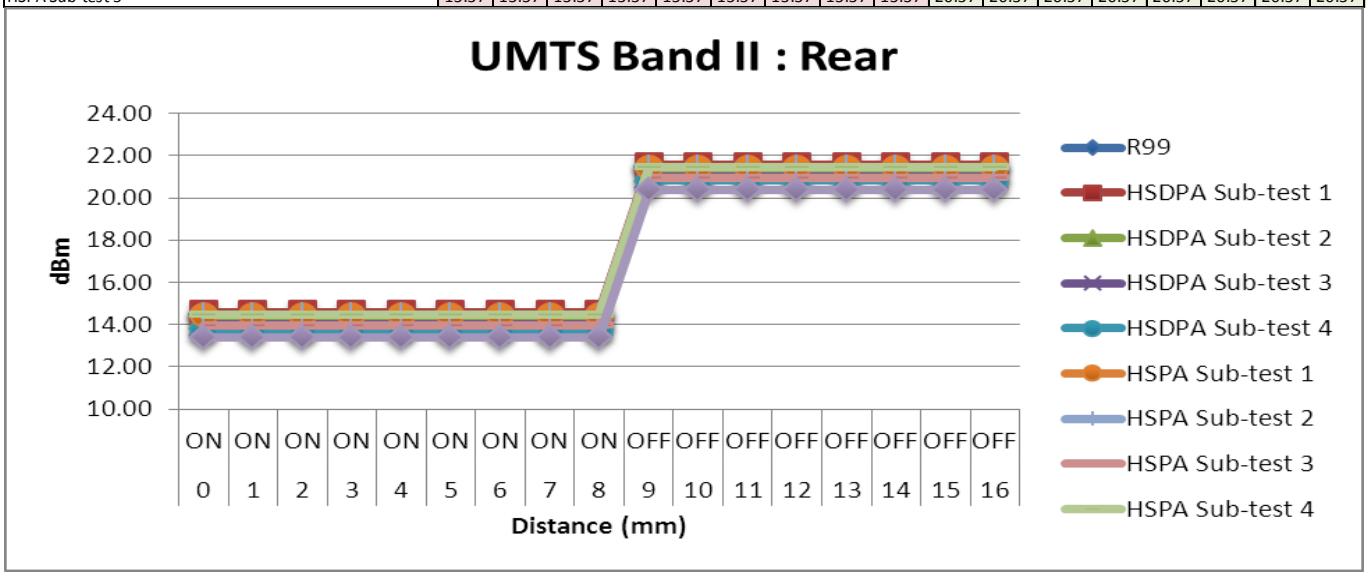


Summary Table of Power Reduction dB Levels per Mode & Band (continued)

Edge 1 (UMTS Band II)																	
Distance (mm):	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Proximity sensor with reduced power activation:	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
R99	14.45	14.45	14.45	14.45	14.45	14.45	21.45	21.45	21.45	21.45	21.45	21.45	21.45	21.45	21.45	21.45	21.45
HSDPA Sub-test 1	14.56	14.56	14.56	14.56	14.56	14.56	21.56	21.56	21.56	21.56	21.56	21.56	21.56	21.56	21.56	21.56	21.56
HSDPA Sub-test 2	14.33	14.33	14.33	14.33	14.33	14.33	21.33	21.33	21.33	21.33	21.33	21.33	21.33	21.33	21.33	21.33	21.33
HSDPA Sub-test 3	14.02	14.02	14.02	14.02	14.02	14.02	21.02	21.02	21.02	21.02	21.02	21.02	21.02	21.02	21.02	21.02	21.02
HSDPA Sub-test 4	13.81	13.81	13.81	13.81	13.81	13.81	20.81	20.81	20.81	20.81	20.81	20.81	20.81	20.81	20.81	20.81	20.81
HSPA Sub-test 1	14.47	14.47	14.47	14.47	14.47	14.47	21.47	21.47	21.47	21.47	21.47	21.47	21.47	21.47	21.47	21.47	21.47
HSPA Sub-test 2	14.48	14.48	14.48	14.48	14.48	14.48	21.48	21.48	21.48	21.48	21.48	21.48	21.48	21.48	21.48	21.48	21.48
HSPA Sub-test 3	13.95	13.95	13.95	13.95	13.95	13.95	20.95	20.95	20.95	20.95	20.95	20.95	20.95	20.95	20.95	20.95	20.95
HSPA Sub-test 4	14.48	14.48	14.48	14.48	14.48	14.48	21.48	21.48	21.48	21.48	21.48	21.48	21.48	21.48	21.48	21.48	21.48
HSPA Sub-test 5	13.37	13.37	13.37	13.37	13.37	13.37	20.37	20.37	20.37	20.37	20.37	20.37	20.37	20.37	20.37	20.37	20.37



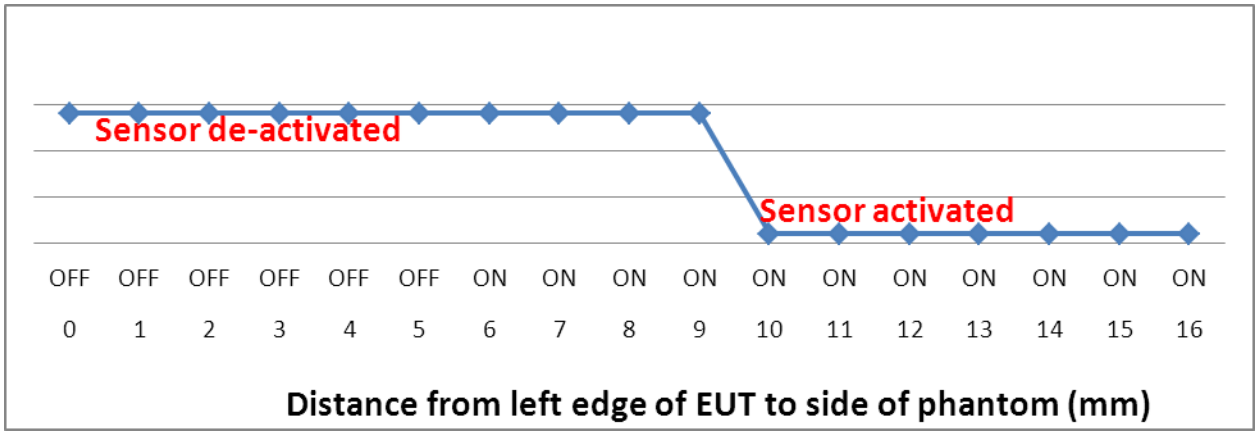
Rear/Base (UMTS Band II)																	
Distance (mm):	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Proximity sensor with reduced power activation:	ON	ON	ON	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
R99	14.45	14.45	14.45	14.45	14.45	14.45	14.45	14.45	14.45	21.45	21.45	21.45	21.45	21.45	21.45	21.45	21.45
HSDPA Sub-test 1	14.56	14.56	14.56	14.56	14.56	14.56	14.56	14.56	14.56	21.56	21.56	21.56	21.56	21.56	21.56	21.56	21.56
HSDPA Sub-test 2	14.33	14.33	14.33	14.33	14.33	14.33	14.33	14.33	14.33	21.33	21.33	21.33	21.33	21.33	21.33	21.33	21.33
HSDPA Sub-test 3	14.02	14.02	14.02	14.02	14.02	14.02	14.02	14.02	14.02	21.02	21.02	21.02	21.02	21.02	21.02	21.02	21.02
HSDPA Sub-test 4	13.81	13.81	13.81	13.81	13.81	13.81	13.81	13.81	13.81	20.81	20.81	20.81	20.81	20.81	20.81	20.81	20.81
HSPA Sub-test 1	14.47	14.47	14.47	14.47	14.47	14.47	14.47	14.47	14.47	21.47	21.47	21.47	21.47	21.47	21.47	21.47	21.47
HSPA Sub-test 2	14.48	14.48	14.48	14.48	14.48	14.48	14.48	14.48	14.48	21.48	21.48	21.48	21.48	21.48	21.48	21.48	21.48
HSPA Sub-test 3	13.95	13.95	13.95	13.95	13.95	13.95	13.95	13.95	13.95	20.95	20.95	20.95	20.95	20.95	20.95	20.95	20.95
HSPA Sub-test 4	14.48	14.48	14.48	14.48	14.48	14.48	14.48	14.48	14.48	21.48	21.48	21.48	21.48	21.48	21.48	21.48	21.48
HSPA Sub-test 5	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	20.37	20.37	20.37	20.37	20.37	20.37	20.37	20.37



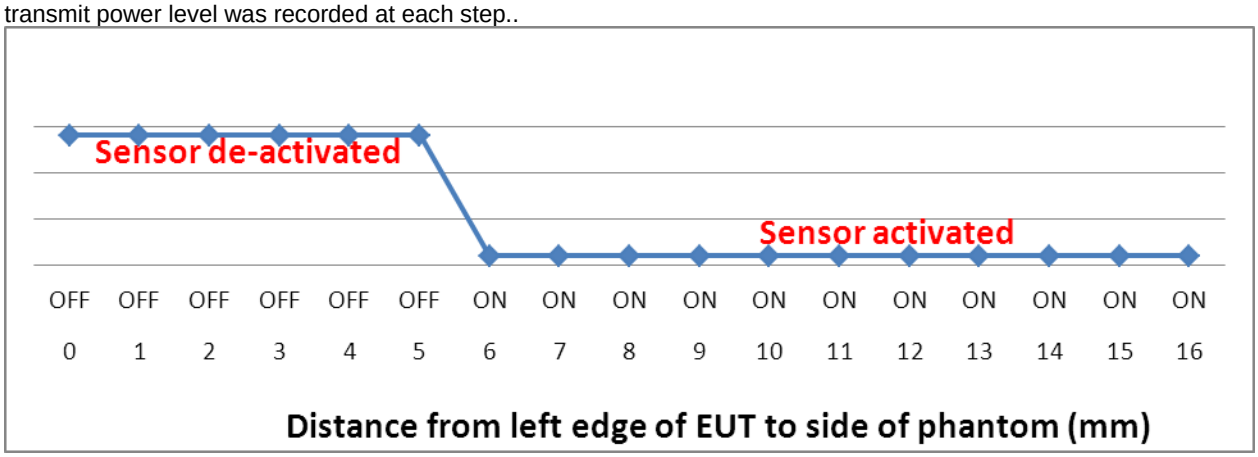
7. Sensor Coverage Area

Refer to Sensor Triggering distance of A3LGTP3100

7.1. Edge coverage



Note. The EUT was positioned parallel to the phantom, front facing down, off to one side with the left edge facing the phantom. The vertical separation distance was 8 mm. The EUT was then moved horizontally toward the phantom in 1 mm steps. The transmit power level was recorded at each step..

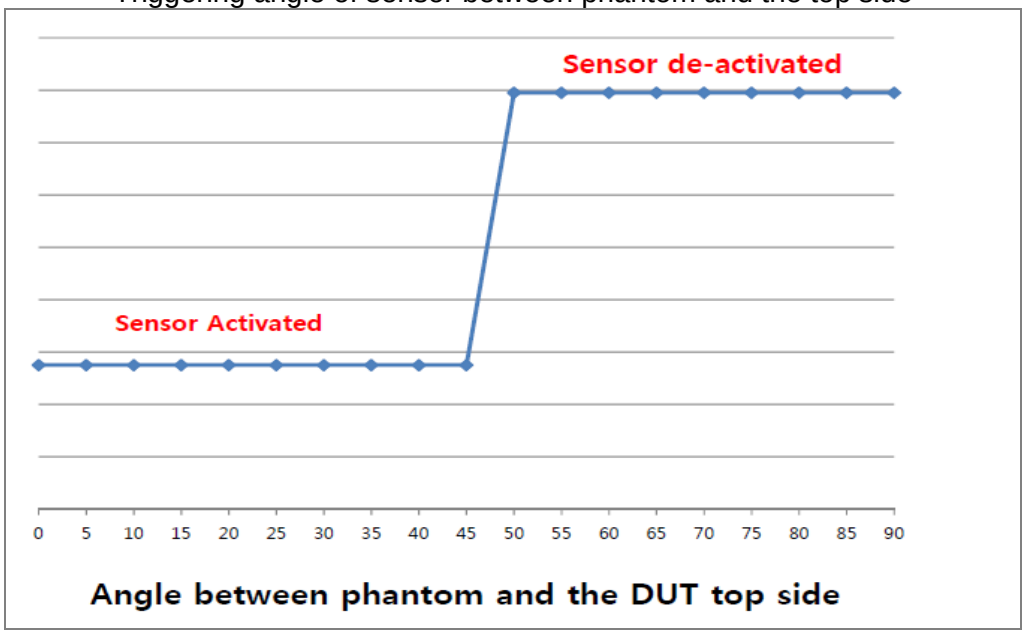


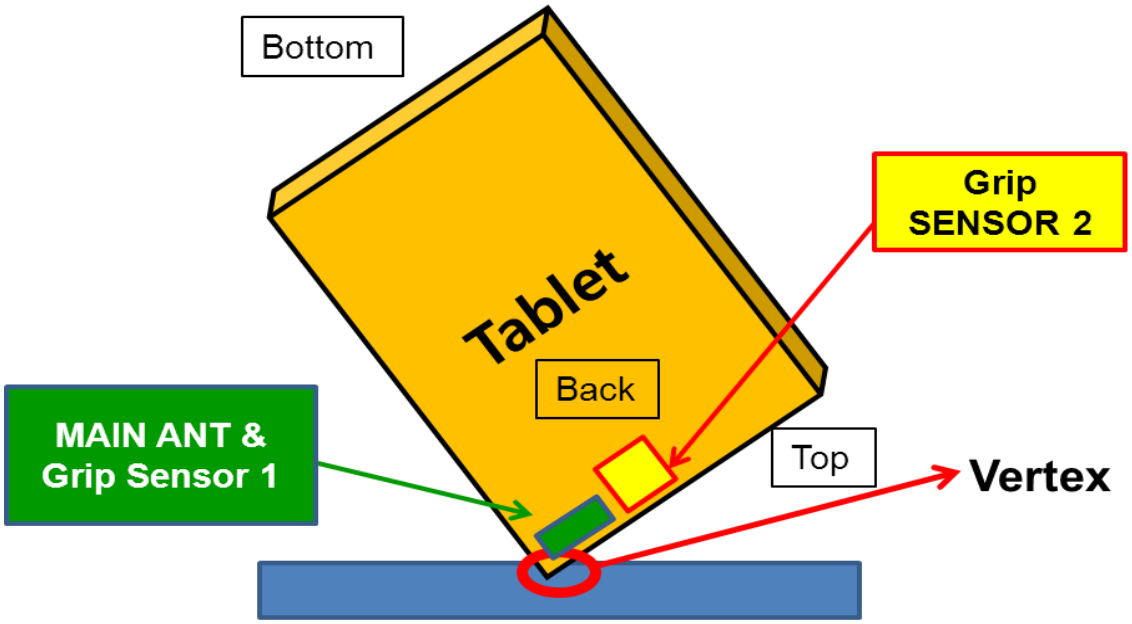
Note. The EUT was positioned perpendicular to the phantom, top edge facing up, off to one side with the left edge facing the phantom. The vertical separation distance was 5 mm. The EUT was then moved horizontally toward the phantom in 1 mm steps. The transmit power level was recorded at each step.

7.2. Vertex Coverage / Top Left Corner

At the top left corner, top edge and rear sensor are not activated. Taken into the account if the device could be easily be used in such a way that the antenna could be in close proximity to the user without the proximity sensor triggering power reduction; for example, held by the left corner or with the left corner resting on the left knee or leg of the user. Based upon the trigger angle for power reduction as illustrated below, additional Vertex at 45 degree SAR evaluation with full power (no power reduction was performed)

Triggering angle of sensor between phantom and the top side





8. Targeted Power Reduction Levels

Head (Implemented with IR Sensor) & Body (Implemented with Grip Sensors)

GSM/GPRS

Normal		Power Reduction (dB)				Back-Off Level
		1Tx	2Tx	3Tx	4Tx	
GSM850	128	0	2.5	4	5.5	5
	190	0	2.5	4	5.5	
	251	0	2.5	4	5.5	
GSM1900	512	0	2.5	4	5.5	7
	661	0	2.5	4	5.5	
	810	0	2.5	4	5.5	

UMTS Bands (WCDMA)

Normal		HSDPA				HSUPA					Back-Off Level (dB)
		Subtest1	Subtest2	Subtest3	Subtest4	Subtest1	Subtest2	Subtest3	Subtest4	Subtest5	
		MPR (dB)				MPR (dB)					
WCDMA 850	4357	0	0	0.5	0.5	0	2	1	2	0	7
	4407	0	0	0.5	0.5	0	2	1	2	0	
	4458	0	0	0.5	0.5	0	2	1	2	0	
WCDMA 1900	9662	0	0	0.5	0.5	0	2	1	2	0	7
	9799	0	0	0.5	0.5	0	2	1	2	0	
	9638	0	0	0.5	0.5	0	2	1	2	0	

9. RF Output Power Measurement

9.1. GSM850 & GSM1900

GSM (GMSK) Voice Mode

Band	Ch No.	Freq. (MHz)	Avg burst Pwr (dBm)
GSM850	128	824.2	32.32
	190	836.6	32.33
	251	848.8	32.33
GSM1900	512	1850.2	29.35
	661	1880.0	29.41
	810	1909.8	29.46

GSM (GMSK) Voice Mode with Power Back Off

Band	Ch No.	Freq. (MHz)	Avg burst Pwr (dBm)
GSM850	128	824.2	27.21
	190	836.6	27.20
	251	848.8	27.19
GSM1900	512	1850.2	22.30
	661	1880.0	22.32
	810	1909.8	22.36

GPRS (GMSK) - Coding Scheme: CS1

Band	Ch No.	f (MHz)	Avg burst Pwr (dBm)				Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr	3 slots	Frame Avg Pwr	4 slots	Frame Avg Pwr
GPRS 850	128.0	824.2	32.15	23.12	29.80	23.78	28.32	24.06	26.91	23.90
	190.0	836.6	32.17	23.14	29.81	23.79	28.31	24.05	26.91	23.90
	251.0	848.8	32.17	23.14	29.81	23.79	28.32	24.06	26.90	23.89
GPRS 1900	512.0	1850.2	29.39	20.36	26.92	20.90	25.47	21.21	24.01	21.00
	661.0	1880.0	29.37	20.34	26.89	20.87	25.43	21.17	23.97	20.96
	810.0	1909.8	29.43	20.40	26.95	20.93	25.48	21.22	24.02	21.01

EGPRS (8PSK) - Coding Scheme: MCS5

Band	Ch No.	f (MHz)	Avg burst Pwr (dBm)				Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr	3 slots	Frame Avg Pwr	4 slots	Frame Avg Pwr
GPRS 850	128.0	824.2	26.35	17.32	26.44	20.42	26.46	22.20	23.63	20.62
	190.0	836.6	26.34	17.31	26.44	20.42	26.44	22.18	23.60	20.59
	251.0	848.8	26.30	17.27	26.43	20.41	26.45	22.19	23.60	20.59
GPRS 1900	512.0	1850.2	25.31	16.28	25.47	19.45	24.50	20.24	22.51	19.50
	661.0	1880.0	25.34	16.31	25.44	19.42	24.49	20.23	22.49	19.48
	810.0	1909.8	25.33	16.30	25.42	19.40	24.50	20.24	22.53	19.52

GPRS (GMSK) - Coding Scheme: CS1 With Power Back Off

Band	Ch No.	f (MHz)	Avg burst Pwr (dBm)				Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr	3 slots	Frame Avg Pwr	4 slots	Frame Avg Pwr
GPRS 850	128	824.2	27.21	18.18	24.88	18.86	23.46	19.20	21.97	18.96
	190	836.6	27.20	18.17	24.88	18.86	23.44	19.18	21.95	18.94
	251	848.8	27.20	18.17	24.88	18.86	23.44	19.18	21.95	18.94
GPRS 1900	512	1850.2	22.30	13.27	19.90	13.88	18.50	14.24	17.18	14.17
	661	1880.0	22.31	13.28	19.93	13.91	18.54	14.28	17.20	14.19
	810	1909.8	22.30	13.27	19.94	13.92	18.54	14.28	17.21	14.20

EGPRS (8PSK) - Coding Scheme: MCS5 With Power Back Off

Band	Ch No.	f (MHz)	Avg burst Pwr (dBm)				Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr	3 slots	Frame Avg Pwr	4 slots	Frame Avg Pwr
GPRS 850	128	824.2	23.28	14.25	21.90	15.88	20.42	16.16	19.06	16.05
	190	836.6	23.30	14.27	21.90	15.88	20.43	16.17	19.01	16.00
	251	848.8	23.28	14.25	21.93	15.91	20.43	16.17	19.00	15.99
GPRS 1900	512	1850.2	21.32	12.29	18.84	12.82	17.44	13.18	16.61	13.60
	661	1880.0	21.35	12.32	18.86	12.84	17.45	13.19	16.59	13.58
	810	1909.8	21.33	12.30	18.86	12.84	17.46	13.20	16.64	13.63

Note(s):

According to KDB 941225 D03 SAR Test Reduction GSM/GPRS/EDGE vo1, noted in the following sections indicated below may be considered to determine SAR test reduction requirements for devices operating in GSM/GPRS/EDGE modes to demonstrate RF exposure compliance.

1. Since the source-based time-averaged output power for EGPRS mode is lower than that in the GPRS mode, therefore Body SAR test reduction is applicable for this device.
2. Based on output power measured above and time slots, the following worst-case configurations were chosen for Body SAR testing.
    a. GPRS850/GPRS1900 3 time slots(full power and power back-off)

9.2. UMTS (WCDMA) Band V & 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	Rel99
	Subtest	-
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)	Tx Conducted Pwr (dBm)	
				W/o Pwr back-off	W/ Pwr back-off
UMTS (WCDMA) Band V	Rel 99 (RMC, 12.2 kbps)	4132	826.4	22.00	15.00
		4183	836.6	21.90	14.90
		4233	846.6	21.86	14.86
UMTS (WCDMA) Band II	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	21.43	14.43
		9400	1880.0	21.37	14.37
		9538	1907.6	21.45	14.45

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
WCDMA 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)	MPR	Tx Conducted Pwr (dBm)	
					W/o Pwr back-off	W/ Pwr back-off
UMTS (WCDMA) Band V	Subtest 1	4132	826.4	0	22.04	15.04
		4183	836.6	0	21.92	14.92
		4233	846.6	0	21.90	14.90
	Subtest 2	4132	826.4	0	21.99	14.99
		4183	836.6	0	21.84	14.84
		4233	846.6	0	21.86	14.86
	Subtest 3	4132	826.4	0.5	21.98	14.98
		4183	836.6	0.5	21.81	14.81
		4233	846.6	0.5	21.83	14.83
	Subtest 4	4132	826.4	0.5	21.73	14.73
		4183	836.6	0.5	21.56	14.56
		4233	846.6	0.5	21.57	14.57
UMTS (WCDMA) Band II	Subtest 1	9262	1852.4	0	21.56	14.56
		9400	1880.0	0	21.50	14.50
		9538	1907.6	0	21.56	14.56
	Subtest 2	9262	1852.4	0	21.33	14.33
		9400	1880.0	0	21.21	14.21
		9538	1907.6	0	21.26	14.26
	Subtest 3	9262	1852.4	0.5	21.02	14.02
		9400	1880.0	0.5	20.97	13.97
		9538	1907.6	0.5	21.00	14.00
	Subtest 4	9262	1852.4	0.5	20.81	13.81
		9400	1880.0	0.5	20.69	13.69
		9538	1907.6	0.5	20.75	13.75

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)	MPR	Tx Conducted Pwr (dBm)	
					W/o Pwr back-off	W/ Pwr back-off
UMTS (WCDMA) Band V	Subtest 1	4132	826.4	0	22.02	15.02
		4183	836.6	0	21.86	14.86
		4233	846.6	0	21.86	14.86
	Subtest 2	4132	826.4	2	22.03	15.03
		4183	836.6	2	21.87	14.87
		4233	846.6	2	21.89	14.89
	Subtest 3	4132	826.4	1	21.99	14.99
		4183	836.6	1	21.83	14.83
		4233	846.6	1	21.82	14.82
	Subtest 4	4132	826.4	2	21.99	14.99
		4183	836.6	2	21.83	14.83
		4233	846.6	2	21.83	14.83
	Subtest 5	4132	826.4	0	21.37	14.37
		4183	836.6	0	21.23	14.23
		4233	846.6	0	21.24	14.24
UMTS (WCDMA) Band II	Subtest 1	9262	1852.4	0	21.47	14.47
		9400	1880.0	0	21.42	14.42
		9538	1907.6	0	21.47	14.47
	Subtest 2	9262	1852.4	2	21.48	14.48
		9400	1880.0	2	21.37	14.37
		9538	1907.6	2	21.43	14.43
	Subtest 3	9262	1852.4	1	20.93	13.93
		9400	1880.0	1	20.90	13.90
		9538	1907.6	1	20.95	13.95
	Subtest 4	9262	1852.4	2	21.48	14.48
		9400	1880.0	2	21.38	14.38
		9538	1907.6	2	21.46	14.46
	Subtest 5	9262	1852.4	0	20.37	13.37
		9400	1880.0	0	20.29	13.29
		9538	1907.6	0	20.34	13.34

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.

9.3. Wi-Fi 802.11bgn

Mode	Channel #	Freq. (MHz)	Conducted Avg Power	
			(dBm)	(mW)
802.11b	1	2412	11.68	14.72
	6	2437	11.69	14.76
	11	2462	11.66	14.66
802.11g	1	2412	11.52	14.19
	6	2437	11.67	14.69
	11	2462	11.74	14.93
802.11n (HT20)	1	2412	11.46	14.00
	6	2437	11.45	13.96
	11	2462	11.46	14.00

Note(s):
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 802.11b channels.

9.4. Bluetooth

Mode	Channel #	Freq. (MHz)	Average output power	
			(dBm)	(mW)
GFSK	0	2402	11.10	12.88
	39	2441	11.30	13.49
	78	2480	11.10	12.88
8PSK	0	2402	8.90	7.76
	39	2441	9.30	8.51
	78	2480	9.20	8.32

Note(s):
According to KDB 648474, Table 2, Unlicensed transmitters
When there is simultaneous transmission, Stand-alone SAR not required due to

- ☒ Output ≤ $2 \cdot P_{Ref}$ (24 mW) and antenna is ≥ 5.0 cm from other antennas
- ☒ Output ≤ P_{Ref} (12 mW) and antenna is ≥ 2.5 cm from other antennas
- ☒ Output ≤ P_{Ref} (12 mW) and antenna is < 2.5 cm from other antennas

10. Tissue Dielectric Property

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 & IC RSS-102

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

10.1. 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

10.2. Tissue dielectric parameters check results

Tissue dielectric parameters 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 ±(%)
01/30/2012	Body 835	e'	54.3365	Relative Permittivity (ϵ_r):	54.34	55.20	-1.56	5
		e''	21.4389	Conductivity (σ):	1.00	0.97	2.62	5
	Body 820	e'	54.5786	Relative Permittivity (ϵ_r):	54.58	55.28	-1.26	5
		e''	21.6759	Conductivity (σ):	0.99	0.97	2.05	5
	Body 850	e'	54.3797	Relative Permittivity (ϵ_r):	54.38	55.16	-1.41	5
		e''	21.4445	Conductivity (σ):	1.01	0.99	2.67	5
01/31/2012	Body 1900	e'	51.3301	Relative Permittivity (ϵ_r):	51.33	53.30	-3.70	5
		e''	14.5765	Conductivity (σ):	1.54	1.52	1.31	5
	Body 1850	e'	51.5185	Relative Permittivity (ϵ_r):	51.52	53.30	-3.34	5
		e''	14.4088	Conductivity (σ):	1.48	1.52	-2.49	5
	Body 1880	e'	51.3561	Relative Permittivity (ϵ_r):	51.36	53.30	-3.65	5
		e''	14.5170	Conductivity (σ):	1.52	1.52	-0.16	5
	Body 1910	e'	51.2075	Relative Permittivity (ϵ_r):	51.21	53.30	-3.93	5
		e''	14.7059	Conductivity (σ):	1.56	1.52	2.75	5
02/01/2012	Head 1900	e'	38.5433	Relative Permittivity (ϵ_r):	38.54	40.00	-3.64	5
		e''	13.7095	Conductivity (σ):	1.45	1.40	3.45	5
	Head 1850	e'	38.7951	Relative Permittivity (ϵ_r):	38.80	40.00	-3.01	5
		e''	13.6570	Conductivity (σ):	1.40	1.40	0.35	5
	Head 1880	e'	38.6074	Relative Permittivity (ϵ_r):	38.61	40.00	-3.48	5
		e''	13.6544	Conductivity (σ):	1.43	1.40	1.95	5
	Head 1910	e'	38.5193	Relative Permittivity (ϵ_r):	38.52	40.00	-3.70	5
		e''	13.6959	Conductivity (σ):	1.45	1.40	3.90	5
02/02/2012	Body 1900	e'	53.5334	Relative Permittivity (ϵ_r):	53.53	53.30	0.44	5
		e''	14.1787	Conductivity (σ):	1.50	1.52	-1.45	5
	Body 1850	e'	53.6390	Relative Permittivity (ϵ_r):	53.64	53.30	0.64	5
		e''	14.0702	Conductivity (σ):	1.45	1.52	-4.78	5
	Body 1880	e'	53.5974	Relative Permittivity (ϵ_r):	53.60	53.30	0.56	5
		e''	14.1244	Conductivity (σ):	1.48	1.52	-2.86	5
	Body 1910	e'	53.3766	Relative Permittivity (ϵ_r):	53.38	53.30	0.14	5
		e''	14.2264	Conductivity (σ):	1.51	1.52	-0.60	5

Tissue dielectric parameters check results (continued)

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
02/03/2012	Body 1900	e'	51.8384	Relative Permittivity (ϵ_r):	51.84	53.30	-2.74	5
		e''	14.4419	Conductivity (σ):	1.53	1.52	0.38	5
	Body 1850	e'	51.8236	Relative Permittivity (ϵ_r):	51.82	53.30	-2.77	5
		e''	14.1891	Conductivity (σ):	1.46	1.52	-3.98	5
	Body 1880	e'	51.8426	Relative Permittivity (ϵ_r):	51.84	53.30	-2.73	5
		e''	14.3654	Conductivity (σ):	1.50	1.52	-1.21	5
	Body 1910	e'	51.6703	Relative Permittivity (ϵ_r):	51.67	53.30	-3.06	5
		e''	14.4228	Conductivity (σ):	1.53	1.52	0.77	5
02/03/2012	Body 835	e'	53.3876	Relative Permittivity (ϵ_r):	53.39	55.20	-3.28	5
		e''	20.9684	Conductivity (σ):	0.97	0.97	0.36	5
	Body 820	e'	53.3474	Relative Permittivity (ϵ_r):	53.35	55.28	-3.49	5
		e''	21.0656	Conductivity (σ):	0.96	0.97	-0.82	5
	Body 850	e'	53.1808	Relative Permittivity (ϵ_r):	53.18	55.16	-3.58	5
		e''	20.9303	Conductivity (σ):	0.99	0.99	0.21	5
02/02/2012	Body 1900	e'	53.5334	Relative Permittivity (ϵ_r):	53.53	53.30	0.44	5
		e''	14.1787	Conductivity (σ):	1.50	1.52	-1.45	5
	Body 1850	e'	53.6390	Relative Permittivity (ϵ_r):	53.64	53.30	0.64	5
		e''	14.0702	Conductivity (σ):	1.45	1.52	-4.78	5
	Body 1880	e'	53.5974	Relative Permittivity (ϵ_r):	53.60	53.30	0.56	5
		e''	14.1244	Conductivity (σ):	1.48	1.52	-2.86	5
	Body 1910	e'	53.3766	Relative Permittivity (ϵ_r):	53.38	53.30	0.14	5
		e''	14.2264	Conductivity (σ):	1.51	1.52	-0.60	5
02/06/2012	Body 1900	e'	52.1593	Relative Permittivity (ϵ_r):	52.16	53.30	-2.14	5
		e''	14.2960	Conductivity (σ):	1.51	1.52	-0.64	5
	Body 1850	e'	52.2775	Relative Permittivity (ϵ_r):	52.28	53.30	-1.92	5
		e''	14.0683	Conductivity (σ):	1.45	1.52	-4.79	5
	Body 1880	e'	52.1975	Relative Permittivity (ϵ_r):	52.20	53.30	-2.07	5
		e''	14.1328	Conductivity (σ):	1.48	1.52	-2.81	5
	Body 1910	e'	52.0126	Relative Permittivity (ϵ_r):	52.01	53.30	-2.42	5
		e''	14.2130	Conductivity (σ):	1.51	1.52	-0.69	5
02/06/2012	Head 835	e'	41.2585	Relative Permittivity (ϵ_r):	41.26	41.50	-0.58	5
		e''	19.1879	Conductivity (σ):	0.89	0.90	-1.01	5
	Head 825	e'	41.2645	Relative Permittivity (ϵ_r):	41.26	41.58	-0.75	5
		e''	19.1345	Conductivity (σ):	0.88	0.90	-2.35	5
	Head 850	e'	41.1599	Relative Permittivity (ϵ_r):	41.16	41.50	-0.82	5
		e''	19.0619	Conductivity (σ):	0.90	0.92	-1.54	5

Tissue dielectric parameters check results (continued)

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
02/08/2012	Head 2450	e'	39.1366	Relative Permittivity (ϵ_r):	39.14	39.20	-0.16	5
		e''	13.4324	Conductivity (σ):	1.83	1.80	1.66	5
	Head 2410	e'	39.2952	Relative Permittivity (ϵ_r):	39.30	39.28	0.04	5
		e''	13.3529	Conductivity (σ):	1.79	1.76	1.64	5
	Head 2435	e'	39.1762	Relative Permittivity (ϵ_r):	39.18	39.24	-0.15	5
		e''	13.3517	Conductivity (σ):	1.81	1.78	1.42	5
02/08/2012	Body 1900	e'	51.7625	Relative Permittivity (ϵ_r):	51.76	53.30	-2.88	5
		e''	14.2992	Conductivity (σ):	1.51	1.52	-0.61	5
	Body 1850	e'	51.8637	Relative Permittivity (ϵ_r):	51.86	53.30	-2.69	5
		e''	14.0560	Conductivity (σ):	1.45	1.52	-4.88	5
	Body 1880	e'	51.7636	Relative Permittivity (ϵ_r):	51.76	53.30	-2.88	5
		e''	14.2270	Conductivity (σ):	1.49	1.52	-2.16	5
	Body 1910	e'	51.8023	Relative Permittivity (ϵ_r):	51.80	53.30	-2.81	5
		e''	14.3098	Conductivity (σ):	1.52	1.52	-0.02	5
02/09/2012	Body 835	e'	53.4738	Relative Permittivity (ϵ_r):	53.47	55.20	-3.13	5
		e''	21.3232	Conductivity (σ):	0.99	0.97	2.06	5
	Body 820	e'	53.5778	Relative Permittivity (ϵ_r):	53.58	55.28	-3.07	5
		e''	21.3250	Conductivity (σ):	0.97	0.97	0.40	5
	Body 850	e'	53.4925	Relative Permittivity (ϵ_r):	53.49	55.16	-3.02	5
		e''	21.3639	Conductivity (σ):	1.01	0.99	2.29	5
02/15/2012	Body 2450	e'	54.4153	Relative Permittivity (ϵ_r):	54.42	52.70	3.25	5
		e''	14.3695	Conductivity (σ):	1.96	1.95	0.39	5
	Body 2410	e'	54.6689	Relative Permittivity (ϵ_r):	54.67	52.76	3.62	5
		e''	14.2029	Conductivity (σ):	1.90	1.91	-0.22	5
	Body 2435	e'	54.4883	Relative Permittivity (ϵ_r):	54.49	52.73	3.34	5
		e''	14.2872	Conductivity (σ):	1.93	1.93	0.17	5
	Body 2475	e'	54.4636	Relative Permittivity (ϵ_r):	54.46	52.67	3.41	5
		e''	14.5175	Conductivity (σ):	2.00	1.99	0.64	5
02/22/2012	Body 1900	e'	51.8078	Relative Permittivity (ϵ_r):	51.81	53.30	-2.80	5
		e''	14.2975	Conductivity (σ):	1.51	1.52	-0.63	5
	Body 1850	e'	52.0023	Relative Permittivity (ϵ_r):	52.00	53.30	-2.43	5
		e''	14.4653	Conductivity (σ):	1.49	1.52	-2.11	5
	Body 1880	e'	51.8909	Relative Permittivity (ϵ_r):	51.89	53.30	-2.64	5
		e''	14.2509	Conductivity (σ):	1.49	1.52	-1.99	5
	Body 1910	e'	51.7738	Relative Permittivity (ϵ_r):	51.77	53.30	-2.86	5
		e''	14.3222	Conductivity (σ):	1.52	1.52	0.07	5

11. SAR Measurement Procedures

11.1. 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.

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 ≥ 7x7x9 (above 4.5 GHz) or 5x5x7 (below 3 GHz) points 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.

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
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.

11.2. Volume scan procedures

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.

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 ≥ 7x7x9 (above 4.5 GHz) or 5x5x7 (below 3 GHz) points 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.

Step 4: 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 5: 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.

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 fine cube was chosen for 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)	SAR Measured (mW/g)		
				1g/10g	Head	Body
D835V2	4d117	4/15/11	835	1g	9.64	10.1
				10g	6.28	6.60
D1900V2	5d140	4/18/11	1900	1g	41.6	41.2
				10g	21.5	21.6
D2450V2	706	4/19/10	2450	1g	51.6	52.4
				10g	24.4	24.5

12.3. System performance check results

Date Tested	System validation dipole	Freq. (MHz)	Measured (Normalized to 1 W)		Target	Delta (%)	Tolerance (%)
01/30/12	D835V2 Body	835	1g SAR:	10.70	10.10	5.94	±10
			10g SAR:	7.05	6.60	6.82	
01/31/12	D1900V2 Body	1900	1g SAR:	40.70	41.20	-1.21	±10
			10g SAR:	21.70	21.60	0.46	
02/01/12	D1900V2 Head	1900	1g SAR:	39.40	41.60	-5.29	±10
			10g SAR:	21.00	21.50	-2.33	
02/02/12	D1900V2 Body	1900	1g SAR:	41.80	41.20	1.46	±10
			10g SAR:	22.00	21.60	1.85	
02/03/12	D1900V2 Body	1900	1g SAR:	41.80	41.20	1.46	±10
			10g SAR:	21.90	21.60	1.39	
02/03/12	D835V2 Body	835	1g SAR:	9.90	10.10	-1.98	±10
			10g SAR:	6.54	6.60	-0.91	
02/06/12	D1900V2 Body	1900	1g SAR:	41.30	41.20	0.24	±10
			10g SAR:	21.60	21.60	0.00	
02/06/12	D835V2 Head	835	1g SAR:	9.96	9.64	3.32	±10
			10g SAR:	6.56	6.28	4.46	
02/08/12	D2450V2 Head	2450	1g SAR:	53.40	51.60	3.49	±10
			10g SAR:	24.60	24.40	0.82	
02/08/12	D1900V2 Body	1900	1g SAR:	42.70	41.20	3.64	±10
			10g SAR:	22.40	21.60	3.70	
02/09/12	D835V2 Body	835	1g SAR:	10.60	10.10	4.95	±10
			10g SAR:	7.03	6.60	6.52	
02/15/12	D2450V2 Body	2450	1g SAR:	54.20	52.40	3.44	±10
			10g SAR:	25.00	24.50	2.04	
02/22/12	D1900V2 Body	1900	1g SAR:	41.10	41.20	-0.24	±10
			10g SAR:	21.50	21.60	-0.46	

13. Summary of Test Configurations

As the tablet has a diagonal size of greater than 20 cm, and in accordance with FCC training provided in October 2011 (TCBC Workshop) hotspot SAR is not required for this device.

The following test configurations are based on KDB 447498 4) b) Tablet Mode

13.1. Exposure conditions for WWAN

Configuration	Antenna-to-edge/surface	SAR Required	note
Rear	1.91 mm	Yes	
Edge 1	5.63 mm	Yes	
Edge 1 at 45° (Vertex)	> 4.9 mm	Yes	With full power
Edge 2	> 78 mm	No	This is not the most conservative antenna-to-user distance at edge mode. According to KDB 447498 4) b) ii) (2), SAR is required only for the edge with the most conservative exposure conditions.
Edge 3	> 193.7 mm	No	ditto
Edge 4	7.67 mm	Yes	

13.2. Exposure conditions for WiFi

Configuration	Antenna-to-edge/surface	SAR Required	note
Rear	< 0.85 mm	Yes	
Edge 1	>133.5mm	No	This is not the most conservative antenna-to-user distance at edge mode. According to KDB 447498 4) b) ii) (2), SAR is required only for the edge with the most conservative exposure conditions.
Edge 2	> 107.8 mm	No	ditto
Edge 3	> 40.7 mm	No	ditto
Edge 4	< 4.3 mm	Yes	
Edge 4 Tilt @ 45°	< 0.85 mm	Yes	ditto

14. SAR Test Result

14.1. GSM850

Head SAR with IR sensor activated (with power back-off)

Test Position	Mode	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
					1-g	10-g	
Left Touch	Voice	128	824.20	27.21			1
		190	836.60	27.20	0.422	0.291	
		251	848.80	27.19			1
Left Tilt	Voice	128	824.20	27.21			1
		190	836.60	27.20	0.476	0.321	
		251	848.80	27.19			1
Right Touch	Voice	128	824.20	27.21			1
		190	836.60	27.20	**0.795**	0.512	
		251	848.80	27.19			1
Right Tilt	Voice	128	824.20	27.21			1
		190	836.60	27.20	0.765	0.492	
		251	848.80	27.19			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.

Body SAR with Full Power

Test position	Distance (mm)	Mode	Ch No.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
						1-g	10-g	
Rear	8	GPRS 3 Slot	128	824.2	28.32			1
			190	836.6	28.31	0.419	0.267	
			251	848.8	28.32			1
Edge 1	5	GPRS 3 Slot	128	824.2	28.32			1
			190	836.6	28.31	0.487	0.322	
			251	848.8	28.32			1
Edge 1 @45° (Vertex)	0	GPRS 3 Slot	128	824.2	28.32			1
			190	836.6	28.31	0.287	0.125	
			251	848.8	28.32			1
Edge 4	0	GPRS 3 Slot	128	824.2	28.32			1
			190	836.6	28.31	0.449	0.277	
			251	848.8	28.32			1

Body SAR with Power Back Off

Test position	Distance (mm)	Mode	Ch No.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
						1-g	10-g	
Rear	0	GPRS 3 Slot	128	824.2	23.46			1
			190	836.6	23.44	0.569	0.314	
			251	848.8	23.44			1
			190	836.6	23.44	**0.620**	0.346	2
Edge 1	0	GPRS 3 Slot	128	824.2	23.46			1
			190	836.6	23.44	0.526	0.320	
			251	848.8	23.44			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. With headset attached.

14.2. GSM1900

Head SAR with IR sensor activated (with power back-off)

Test Position	Mode	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
					1-g	10-g	
Left Touch	Voice	512	1850.2	22.30			1
		661	1880.0	22.32	0.129	0.0703	
		810	1909.8	22.36			1
Left Tilt	Voice	512	1850.2	22.30			1
		661	1880.0	22.32	0.144	0.078	
		810	1909.8	22.36			1
Right Touch	Voice	512	1850.2	22.30			1
		661	1880.0	22.32	0.408	0.199	
		810	1909.8	22.36			1
Right Tilt	Voice	512	1850.2	22.30			1
		661	1880.0	22.32	**0.430**	0.207	
		810	1909.8	22.36			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.

Body SAR with Full Power

Test position	Distance (mm)	Mode	Ch No.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
						1-g	10-g	
Rear	8	GPRS 3 Slot	512	1850.2	25.47	0.863	0.469	
			661	1880.0	25.43	0.874	0.474	
			810	1909.8	25.48	0.882	0.475	
			810	1909.8	25.48	0.888	0.473	2
Edge 1	5	GPRS 3 Slot	512	1850.2	25.47	0.781	0.411	
			661	1880.0	25.43	0.811	0.426	
			810	1909.8	25.48	0.826	0.432	
Edge 1 @45° (Vertex)	0	GPRS 3 Slot	512	1850.2	25.47	1.010	0.484	
			661	1880.0	25.43	1.050	0.502	
			810	1909.8	25.48	**1.060**	0.507	
Edge 4	0	GPRS 3 Slot	512	1850.2	25.47			1
			661	1880.0	25.43	0.643	0.321	
			810	1909.8	25.48			1

Body SAR with Power Back Off

Test position	Distance (mm)	Mode	Ch No.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
						1-g	10-g	
Rear	0	GPRS 3 Slot	512	1850.2	18.50			1
			661	1880.0	18.54	0.744	0.359	
			810	1909.8	18.54			1
Edge 1	0	GPRS 3 Slot	512	1850.2	18.50			1
			661	1880.0	18.54	0.406	0.188	
			810	1909.8	18.54			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. With headset attached.

14.3. UMTS (WCDMA) Band V

Test mode 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

Head SAR with IR sensor activated (with power back-off)

Test Position	Mode	UL Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
					1-g	10-g	
Left Touch	R99 (RMC, 12.2 kbps)	4132	826.4	14.99			1
		4183	836.6	14.84	0.364	0.253	
		4233	846.6	14.86			1
Left Tilt	R99 (RMC, 12.2 kbps)	4132	826.4	14.99			1
		4183	836.6	14.84	0.443	0.298	
		4233	846.6	14.86			1
Right Touch	R99 (RMC, 12.2 kbps)	4132	826.4	14.99			1
		4183	836.6	14.84	**0.792**	0.505	
		4233	846.6	14.86			1
Right Tilt	R99 (RMC, 12.2 kbps)	4132	826.4	14.99			1
		4183	836.6	14.84	0.769	0.488	
		4233	846.6	14.86			1

Body SAR with Full Power

Test position	Distance (mm)	Mode	Ch No.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
						1-g	10-g	
Rear	8	R99 (RMC, 12.2 kbps)	4132	826.4	21.99			1
			4183	836.6	21.84	0.368	0.235	
			4233	846.6	21.86			1
Edge 1	5	R99 (RMC, 12.2 kbps)	4132	826.4	21.99			1
			4183	836.6	21.84	0.394	0.259	
			4233	846.6	21.86			1
Top-edge @45° (Vertex)	0	R99 (RMC, 12.2 kbps)	4132	826.4	21.99			1
			4183	836.6	21.84	0.241	0.103	
			4233	846.6	21.86			1
Edge 4	0	R99 (RMC, 12.2 kbps)	4132	826.4	21.99			1
			4183	836.6	21.84	0.385	0.237	
			4233	846.6	21.86			1

Body SAR with Power Back Off

Test position	Distance (mm)	Mode	Ch No.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
						1-g	10-g	
Rear	0	R99 (RMC, 12.2 kbps)	4132	826.4	14.99			1
			4183	836.6	14.84	0.406	0.220	
			4233	846.6	14.86			1
			4183	836.6	14.84	**0.412**	0.224	2
Edge 1	0	R99 (RMC, 12.2 kbps)	4132	826.4	14.99			1
			4183	836.6	14.84	0.232	0.141	
			4233	846.6	14.86			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. With headset attached.

14.4. UMTS (WCDMA) Band II

Test mode 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

Head SAR with IR sensor activated (with power back-off)

Test Position	Mode	UL Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
					1-g	10-g	
Left Touch	R99 (RMC, 12.2 kbps)	9262	1852.4	14.43			1
		9400	1880.0	14.37	0.182	0.099	
		9538	1907.6	14.45			1
Left Tilt	R99 (RMC, 12.2 kbps)	9262	1852.4	14.43			1
		9400	1880.0	14.37	0.182	0.100	
		9538	1907.6	14.45			1
Right Touch	R99 (RMC, 12.2 kbps)	9262	1852.4	14.43			1
		9400	1880.0	14.37	**0.543**	0.261	
		9538	1907.6	14.45			1
Right Tilt	R99 (RMC, 12.2 kbps)	9262	1852.4	14.43			1
		9400	1880.0	14.37	0.503	0.242	
		9538	1907.6	14.45			1

Body SAR with Full Power

Test position	Distance (mm)	Mode	Ch No.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
						1-g	10-g	
Rear	8	R99 (RMC, 12.2 kbps)	9262	1852.4	21.43	0.845	0.462	
			9400	1880.0	21.37	0.867	0.472	
			9538	1907.6	21.45	0.867	0.471	
			9400	1880.0	21.37	0.899	0.483	2
Edge 1	5	R99 (RMC, 12.2 kbps)	9262	1852.4	21.43	0.965	0.505	
			9400	1880.0	21.37	0.953	0.495	
			9538	1907.6	21.45	0.988	0.511	
Top-edge @45° (Vertex)	0	R99 (RMC, 12.2 kbps)	9262	1852.4	21.43	1.11	0.567	
			9400	1880.0	21.37	1.07	0.541	
			9538	1907.6	21.45	**1.11**	0.558	
Edge 4	0	R99 (RMC, 12.2 kbps)	9262	1852.4	21.43	0.892	0.447	
			9400	1880.0	21.37	0.902	0.445	
			9538	1907.6	21.45	0.866	0.431	

Body SAR with Power Back Off

Test position	Distance (mm)	Mode	Ch No.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
						1-g	10-g	
Rear	0	R99 (RMC, 12.2 kbps)	9262	1852.4	14.43			1
			9400	1880.0	14.37	0.716	0.350	
			9538	1907.6	14.45			1
Edge 1	0	R99 (RMC, 12.2 kbps)	9262	1852.4	14.43			1
			9400	1880.0	14.37	0.501	0.229	
			9538	1907.6	14.45			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. With headset attached.

14.5. Wi-Fi 802.11bgn

Justification for using body phantom for measuring head SAR for WiFi Antenna

Due to the size of the DUT and the position of the WiFi antenna, it was impossible to get meaningful data for head SAR.

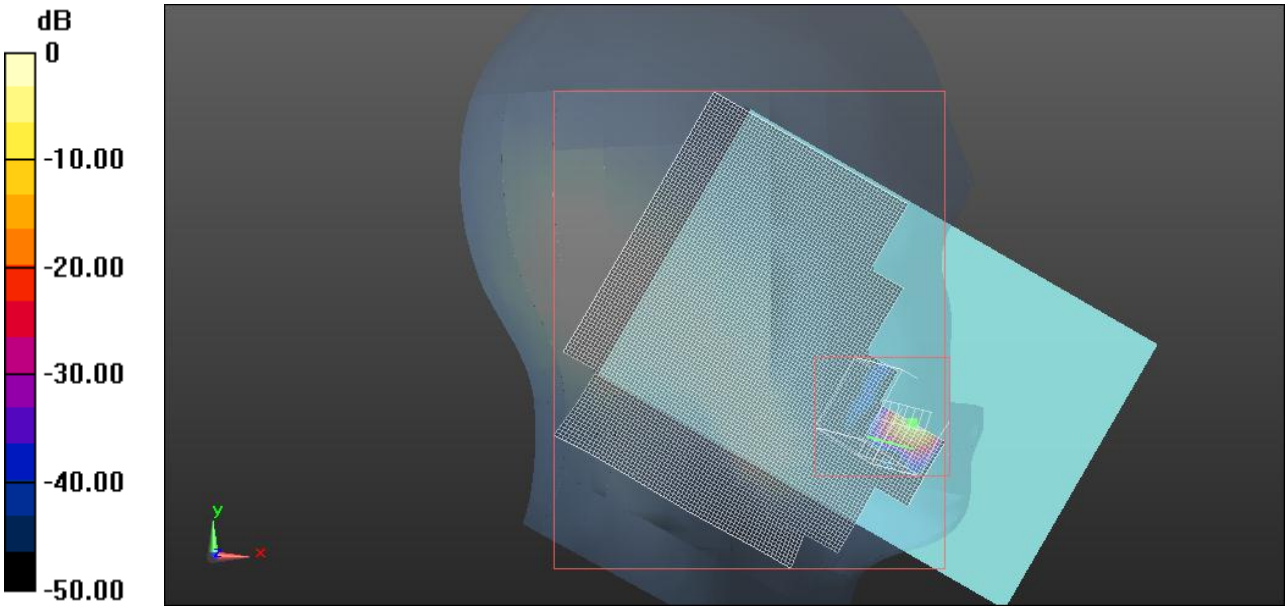
The following procedure was applied (KDB 648474 section on SAR Tests in Mouth and Jaw Regions of the SAM Phantom):

- DUT was positioned with its bottom edge positioned from the flat phantom with the same distance provided by the cheek touching position using SAM.
- The ear reference point (ERP, as defined for SAM) of the device should be positioned ½ cm from the flat phantom shell.
- The lower half of the DUT is secured in the test device holder at a fixed distance below the flat phantom determined by the minimum separation along the lower edge of the DUT in the cheek touching position using SAM.

The DUT protruded too far from the SAM to allow measurement from its bottom edge. The separation distance from the antenna to the phantom was used as a reference. This resulted in the antenna being closer to the phantom when the DUT was mounted on the left. Therefore the left head distance was used as the most conservative.

See section 21 Setup Photos for details on device positioning and photographs showing how separation distances are determined.

The following head SAR plot is provided to show the difficulties associated with using the Flat Phantom for measuring head SAR with this DUT.



WiFi Head SAR tests under Flat Phantom

Mode	Ch No.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
				1-g	10-g	
802.11b	1	2412	11.7			1
	6	2437	11.7	**0.084**	0.041	
	11	2462	11.7			1

Note(s):

1. Testing was performed on the channel with the highest output power only as the SAR was ≤ 0.8 W/kg with the operating frequency band having a range of < 100 MHz. Per KDB 447498 1) e) i).

Body SAR with 0 mm separation distance

Test Position	Mode	Ch #.	Freq. (MHz)	Avg Pwr (dBm)	SAR (mW/g)		Note
					1-g	10-g	
Rear	802.11b	1	2412	11.68			1
		6	2437	11.69	**0.344**	0.142	
		11	2462	11.66			1
		6	2437	11.69	0.340	0.142	2
Edge 4	802.11b	1	2412	11.68			1
		6	2437	11.69	0.218	0.091	
		11	2462	11.66			1
Edge 4 @ 45º	802.11b	1	2412	11.68			1
		6	2437	11.69	0.212	0.082	
		11	2462	11.66			1

Note(s):

1. Testing was performed on the channel with the highest output power only as the SAR was ≤ 0.8 W/kg with the operating frequency band having a range of < 100 MHz. Per KDB 447498 1) e) i)
2. With headset attached.

15. Summary of Highest 1-g SAR

The test configuration for each body exposure condition (head, body and Hotspot) is dependent on the applicable voice or data modes, and antenna selected.

Technology/Band	Test configuration	Mode	Separation distance (mm)	Highest 1g SAR (W/kg)
GSM850	Head: Right Touch	Voice	--	0.795
	Body: Rear	GPRS 3 Slot, CS1	0	0.620
GSM1900	Head: Right Tilt	Voice	--	0.430
	Body: Edge 1 @ 45° (Vertex)	GPRS 3 Slot, CS1	0	1.06
UMTS (WCDMA) Band V 850 MHz	Head: Right touch	R99 (RMC, 12.2 kbps)	--	0.792
	Body: Rear	R99 (RMC, 12.2 kbps)	0	0.412
UMTS (WCDMA) Band II 1900 MHz	Head: Right touch	R99 (RMC, 12.2 kbps)	--	0.543
	Body: Edge 1 @ 45° (Vertex)	R99 (RMC, 12.2 kbps)	0	1.11
WiFi 802.11bgn 2.4 GHz	Head on Flat Phantom	802.11b	--	0.084
	Body: Rear	802.11b	0	0.344

16. Worst-case SAR Plots

Date: 2/6/2012

Test Laboratory: UL CCS SAR Lab B

GSM850 Head

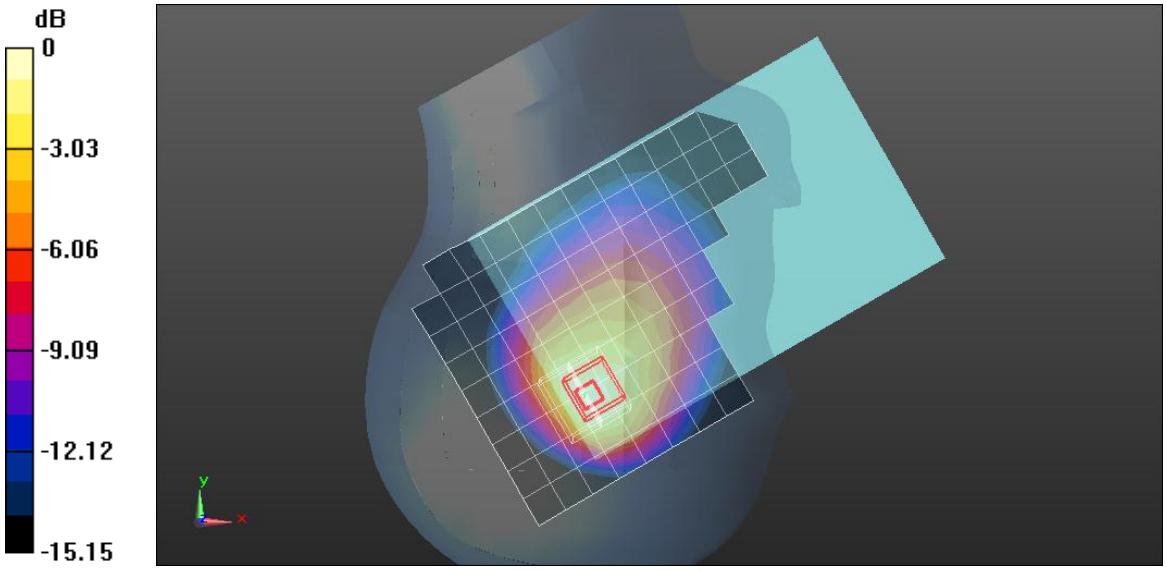
Communication System: GPRS-FDD(TDMA,GMSK, 1 slot); Frequency: 836.6 MHz; Duty Cycle: 1:8.30042
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.891 mho/m; ε_r = 41.244; ρ = 1000 kg/m^3
Phantom section: Right Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY5 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV3 - SN3531; ConvF(9.81, 9.81, 9.81); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1258; Calibrated: 5/2/2011
- Phantom: SAM; Type: QD000P40CD; Serial: 1629
- Measurement SW: DASY52, Version 52.8 (0);SEMCAD X Version 14.6.4 (4989)

RHS/Touch_M ch/Area Scan (10x13x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.908 mW/g

RHS/Touch_M ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.577 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.2360
SAR(1 g) = 0.795 mW/g; SAR(10 g) = 0.512 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.973 mW/g



0 dB = 0.970mW/g = -0.26 dB mW/g

Date: 1/30/2012

Test Laboratory: UL CCS SAR Lab B

GSM850

Communication System: GPRS-FDD (TDMA, GMSK, 3 slot); Frequency: 836.6 MHz; Duty Cycle: 1:2.60016
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.998 mho/m; ε_r = 54.381; ρ = 1000 kg/m^3
Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

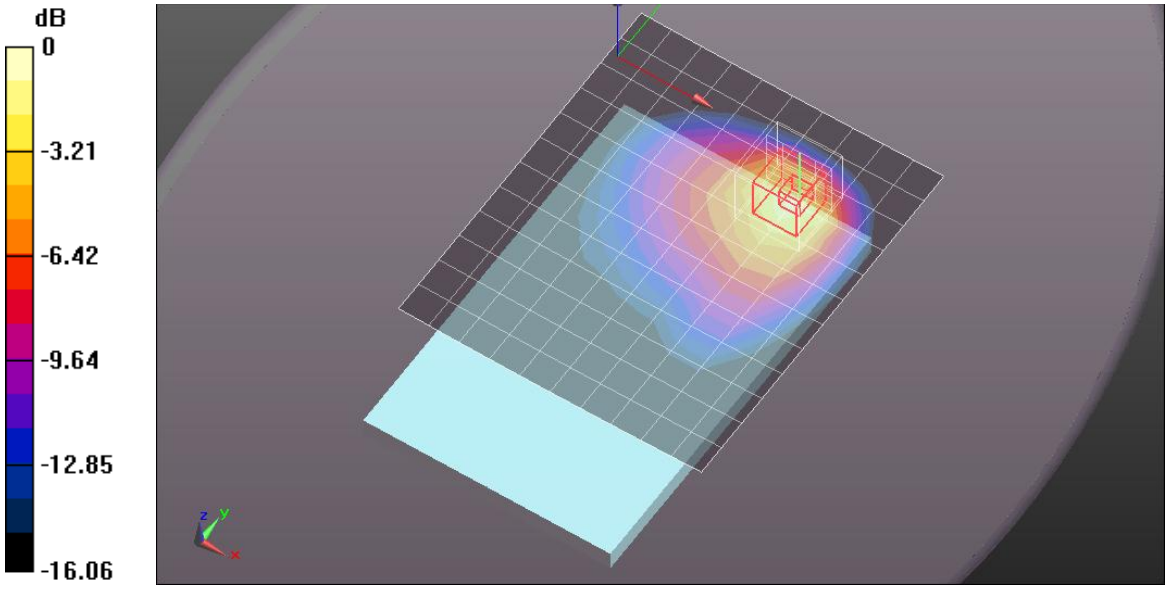
DASY5 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV3 - SN3531; ConvF(10, 10, 10); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1258; Calibrated: 5/2/2011
- Phantom: ELI v5.0 (B); Type: QDOVA001BB; Serial: 1118
- Measurement SW: DASY52, Version 52.8 (0);SEMCAD X Version 14.6.4 (4989)

Rear with power back off_GPRS_3 slots/M ch w/Headset/Area Scan (11x13x1):

Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.733 mW/g

Rear with power back off_GPRS_3 slots/M ch w/Headset/Zoom Scan (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.400 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.1220
SAR(1 g) = 0.620 mW/g; SAR(10 g) = 0.346 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.842 mW/g



0 dB = 0.840mW/g = -1.51 dB mW/g

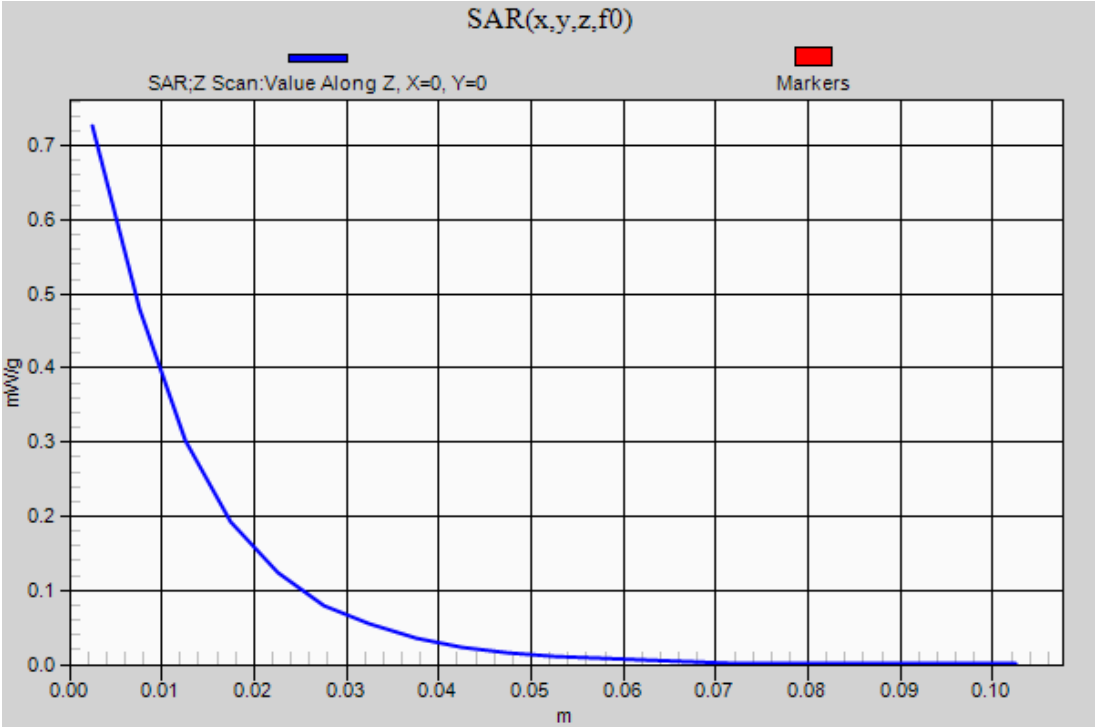
Date: 1/30/2012

Test Laboratory: UL CCS SAR Lab B

GSM850

Communication System: GPRS-FDD (TDMA, GMSK, 3 slot); Frequency: 836.6 MHz; Duty Cycle: 1:2.60016

Rear with power back off_GPRS_3 slots/M ch w/Headset/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.727 mW/g



Date: 2/1/2012

Test Laboratory: UL CCS SAR Lab B

GSM 1900 Head

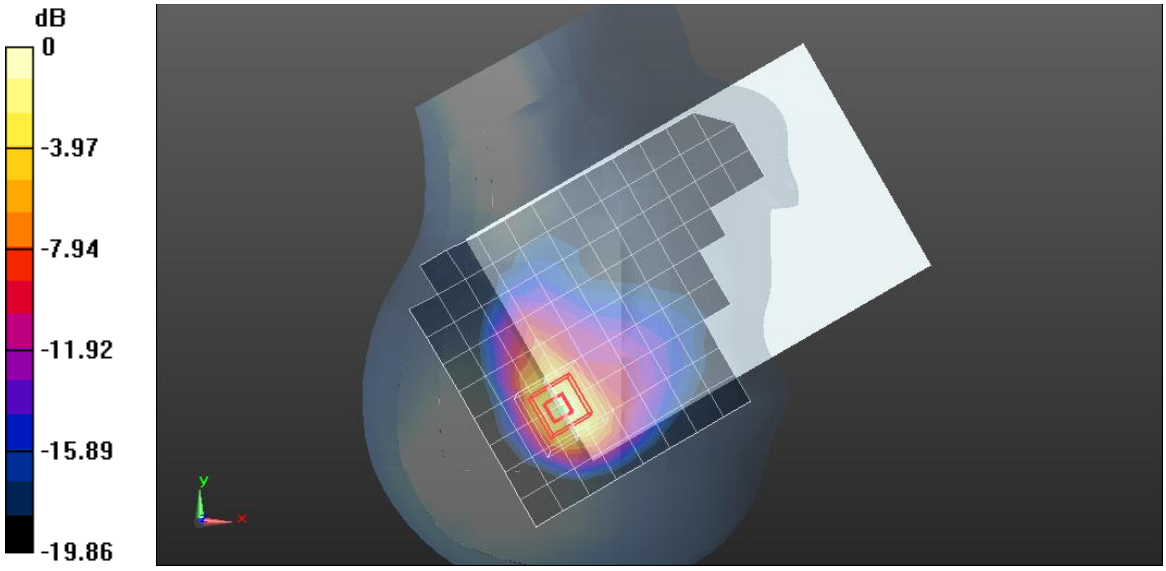
Communication System: GPRS-FDD (TDMA, GMSK, 1 slot); Frequency: 1880 MHz; Duty Cycle: 1:8.30042
Medium parameters used: f = 1880 MHz; σ = 1.428 mho/m; ε_r = 38.607; ρ = 1000 kg/m^3
Phantom section: Right Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY5 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV3 - SN3531; ConvF(8.53, 8.53, 8.53); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1258; Calibrated: 5/2/2011
- Phantom: SAM; Type: QD000P40CD; Serial: 1629
- Measurement SW: DASY52, Version 52.8 (0);SEMCAD X Version 14.6.4 (4989)

RHS/Tilt_M ch/Area Scan (10x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.390 mW/g

RHS/Tilt_M ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.157 V/m; Power Drift = 0.27 dB
Peak SAR (extrapolated) = 0.8140
SAR(1 g) = 0.430 mW/g; SAR(10 g) = 0.207 mW/g
Maximum value of SAR (measured) = 0.599 mW/g



0 dB = 0.600mW/g = -4.44 dB mW/g

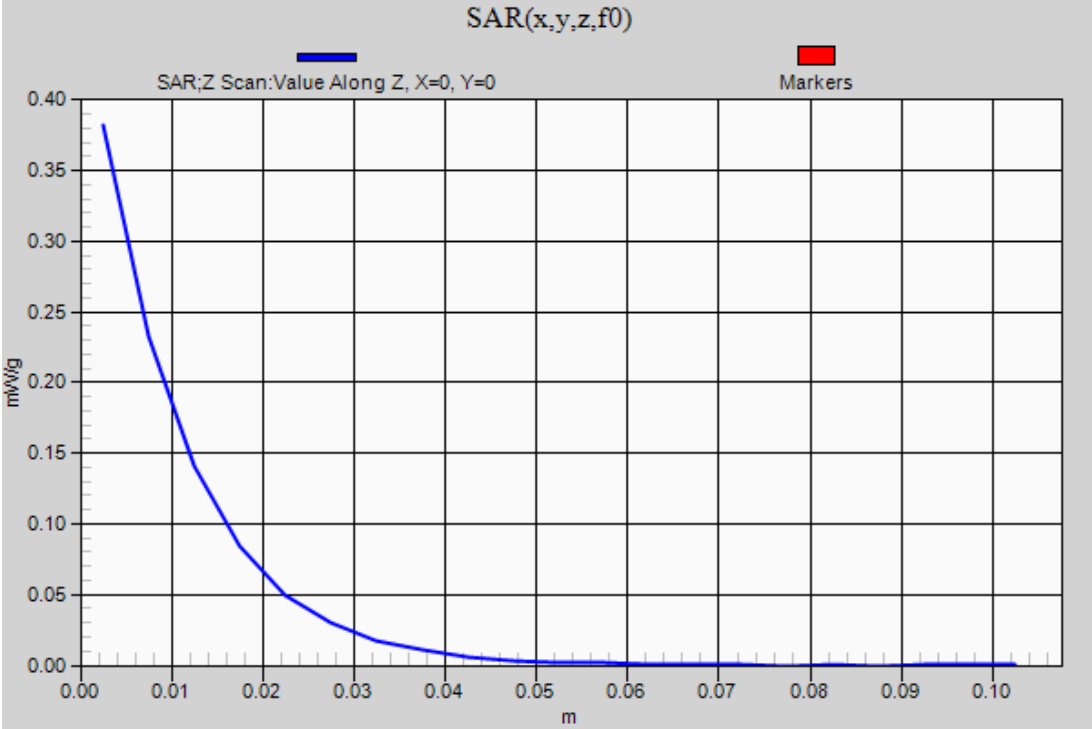
Date: 2/1/2012

Test Laboratory: UL CCS SAR Lab B

GSM 1900 Head

Communication System: GPRS-FDD (TDMA, GMSK, 1 slot); Frequency: 1880 MHz; Duty Cycle: 1:8.30042

RHS/Tilt_M ch/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 0.382 mW/g



Date: 2/2/2012

Test Laboratory: UL CCS SAR Lab B

GSM1900

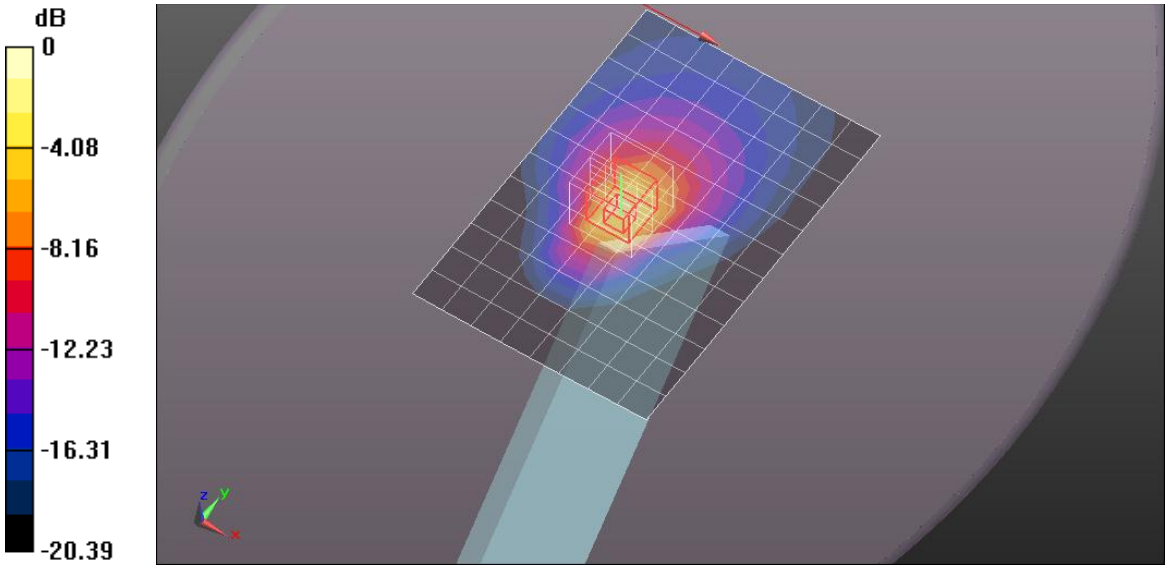
Communication System: GPRS-FDD (TDMA, GMSK, 3 slot); Frequency: 1909.8 MHz; Duty Cycle: 1:2.60016
Medium parameters used: f = 1910 MHz; σ = 1.512 mho/m; ε_r = 53.377; ρ = 1000 kg/m^3
Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY5 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV3 - SN3531; ConvF(7.91, 7.91, 7.91); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1258; Calibrated: 5/2/2011
- Phantom: ELI v5.0 (A); Type: QDOVA001BB; Serial: 1120
- Measurement SW: DASY52, Version 52.8 (0);SEMCAD X Version 14.6.4 (4989)

Edge 1 at 45deg_GPRS_3 slots/H ch/Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.981 mW/g

Edge 1 at 45deg_GPRS_3 slots/H ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.276 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 2.0060
SAR(1 g) = 1.06 mW/g; SAR(10 g) = 0.507 mW/g
Maximum value of SAR (measured) = 1.477 mW/g



0 dB = 1.480mW/g = 3.41 dB mW/g

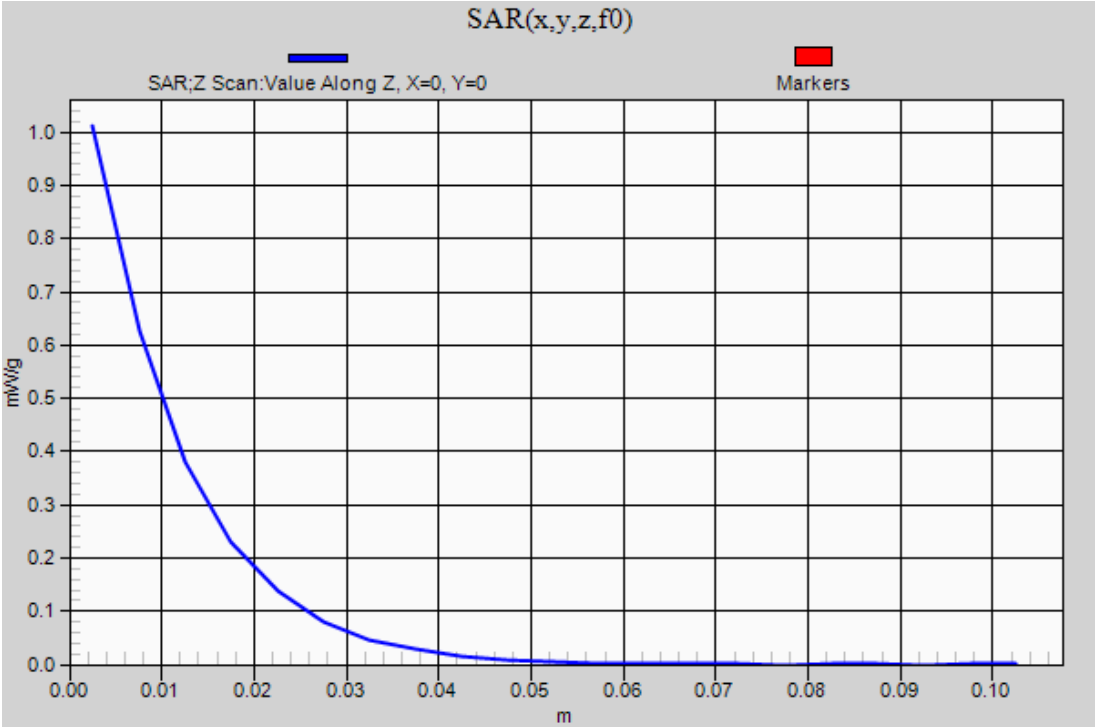
Date: 2/2/2012

Test Laboratory: UL CCS SAR Lab B

GSM1900

Communication System: GPRS-FDD (TDMA, GMSK, 3 slot); Frequency: 1909.8 MHz; Duty Cycle: 1:2.60016

Edge 1 at 45deg_GPRS_3 slots/H ch/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 1.012 mW/g



Date: 2/6/2012

Test Laboratory: UL CCS SAR Lab B

UMTS Band V

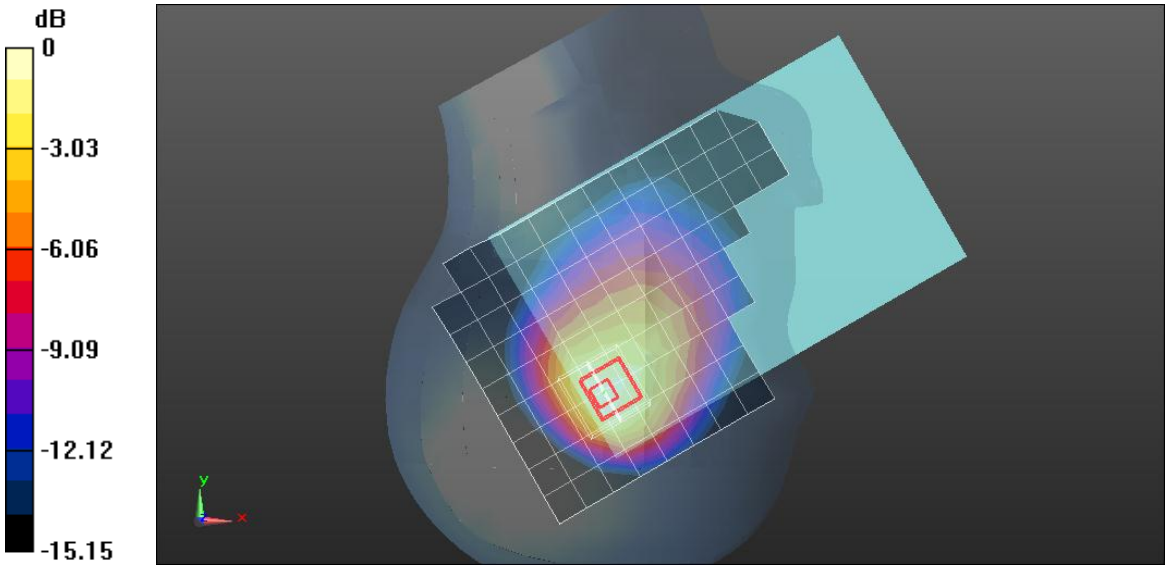
Communication System: UMTS-FDD (WCDMA); Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.891 mho/m; ε_r = 41.244; ρ = 1000 kg/m^3
Phantom section: Right Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY5 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV3 - SN3531; ConvF(9.81, 9.81, 9.81); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1258; Calibrated: 5/2/2011
- Phantom: SAM; Type: QD000P40CD; Serial: 1629
- Measurement SW: DASY52, Version 52.8 (0);SEMCAD X Version 14.6.4 (4989)

Right/Touch_R99 RMC, 12.2 kbps _M ch/Area Scan (10x13x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.977 mW/g

Right/Touch_R99 RMC, 12.2 kbps _M ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.476 V/m; Power Drift = 0.0067 dB
Peak SAR (extrapolated) = 1.2520
SAR(1 g) = 0.792 mW/g; SAR(10 g) = 0.505 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.971 mW/g



0 dB = 0.970mW/g = -0.26 dB mW/g

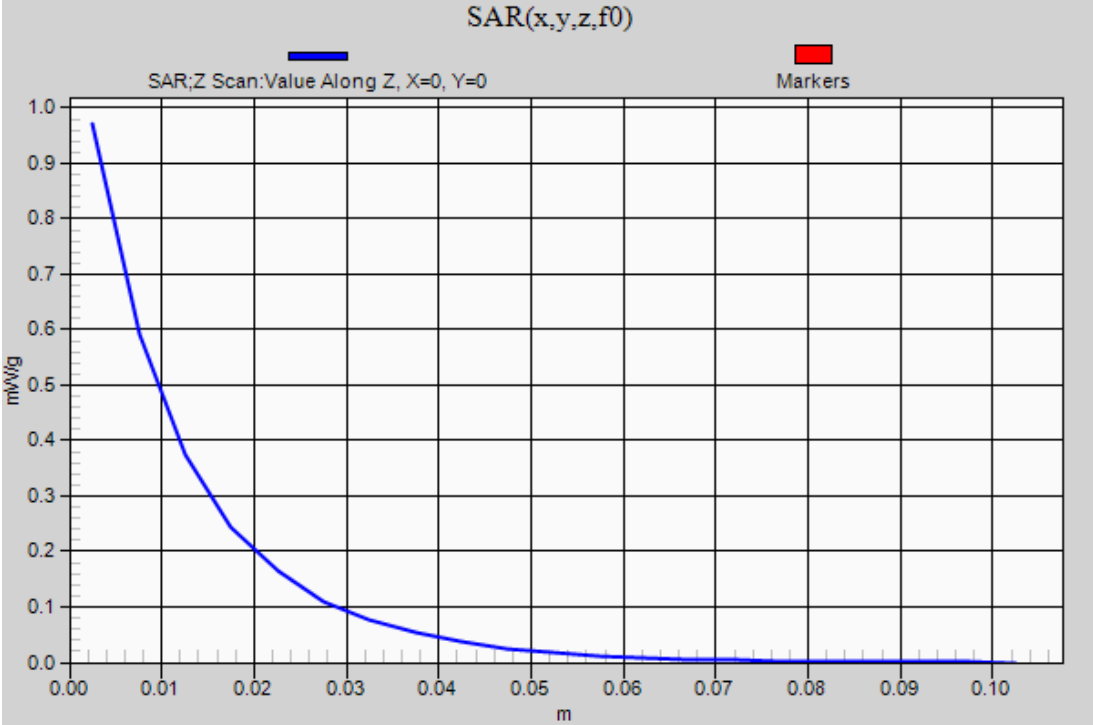
Date: 2/6/2012

Test Laboratory: UL CCS SAR Lab B

UMTS Band V

Communication System: UMTS-FDD (WCDMA); Frequency: 836.6 MHz; Duty Cycle: 1:1

Right/Touch_R99 RMC, 12.2 kbps _M ch/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.971 mW/g



Date: 1/30/2012

Test Laboratory: UL CCS SAR Lab B

UMTS Band V

Communication System: UMTS-FDD (WCDMA); Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.998 mho/m; ε_r = 54.381; ρ = 1000 kg/m^3
Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

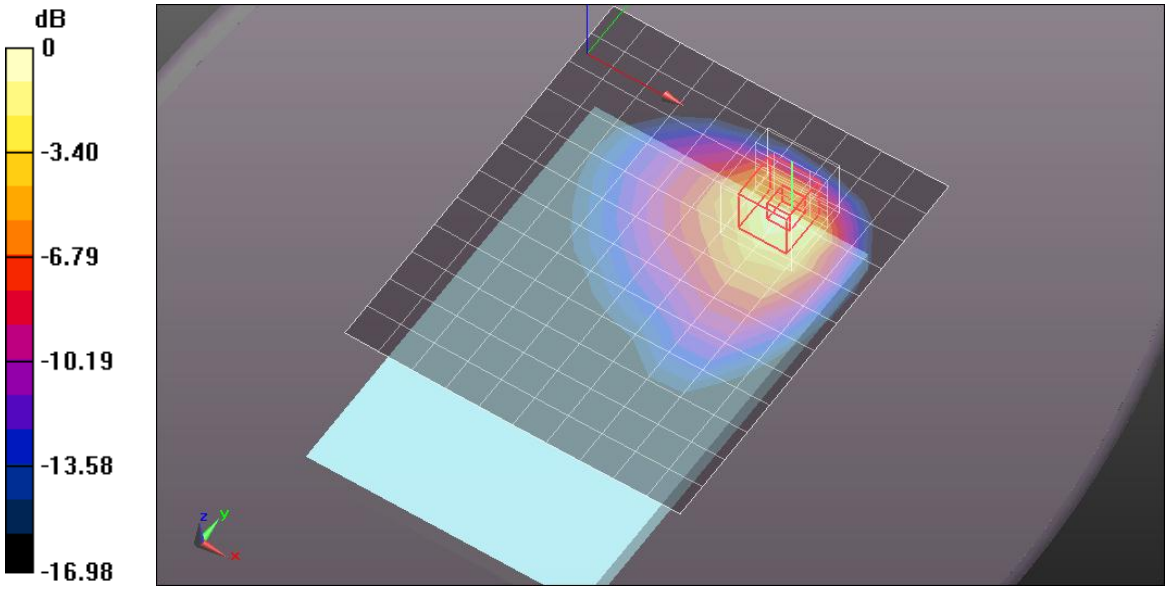
DASY5 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV3 - SN3531; ConvF(10, 10, 10); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1258; Calibrated: 5/2/2011
- Phantom: ELI v5.0 (B); Type: QDOVA001BB; Serial: 1118
- Measurement SW: DASY52, Version 52.8 (0);SEMCAD X Version 14.6.4 (4989)

Rear with power back off_R99 RMC, 12.2 kbps /M ch w/Headset/Area Scan (11x13x1):

Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.489 mW/g

Rear with power back off_R99 RMC, 12.2 kbps /M ch w/Headset/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 22.399 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.7940
SAR(1 g) = 0.412 mW/g; SAR(10 g) = 0.224 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.564 mW/g



0 dB = 0.560mW/g = -5.04 dB mW/g

Date: 1/30/2012

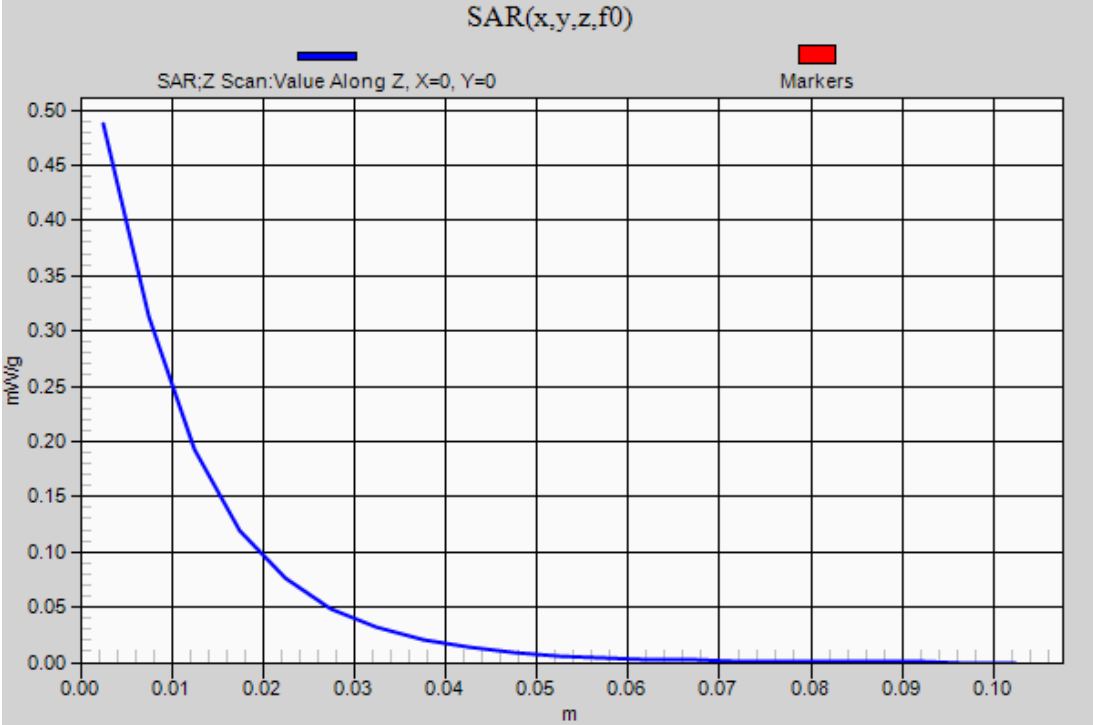
Test Laboratory: UL CCS SAR Lab B

UMTS Band V

Communication System: UMTS-FDD (WCDMA); Frequency: 836.6 MHz; Duty Cycle: 1:1

Rear with power back off_R99 RMC, 12.2 kbps /M ch w/Headset/Z Scan (1x1x21):

Measurement grid: dx=20mm, dy=20mm, dz=5mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.487 mW/g



Date: 2/1/2012

Test Laboratory: UL CCS SAR Lab B

UMTS band II

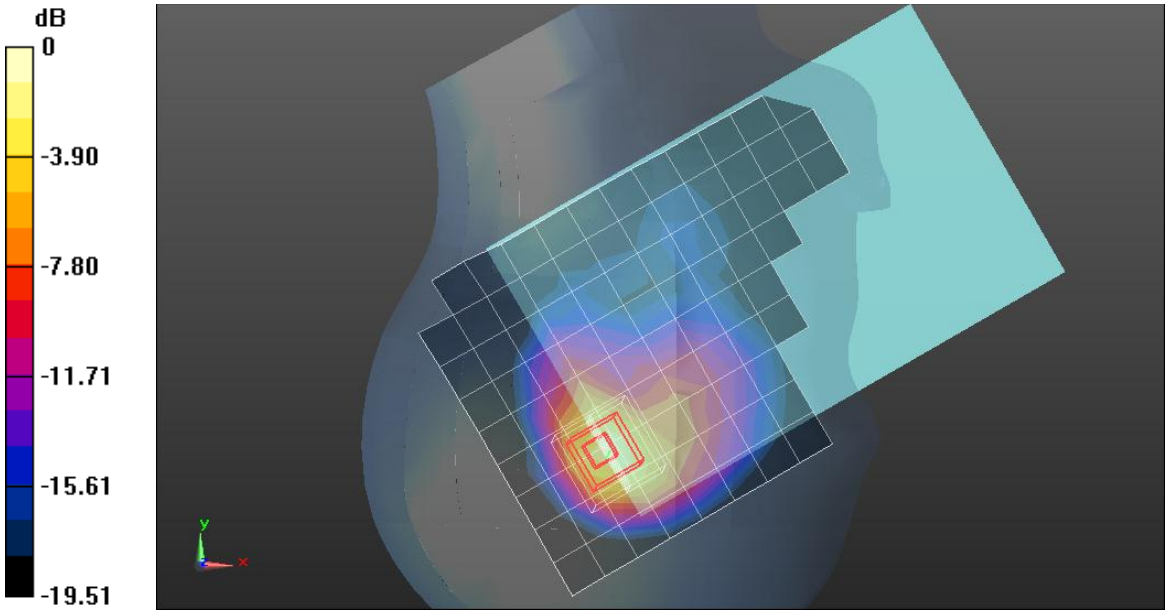
Communication System: UMTS-FDD (WCDMA); Frequency: 1880 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.428 mho/m; ε_r = 38.607; ρ = 1000 kg/m^3
Phantom section: Right Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY5 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV3 - SN3531; ConvF(8.53, 8.53, 8.53); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1258; Calibrated: 5/2/2011
- Phantom: SAM; Type: QD000P40CD; Serial: 1629
- Measurement SW: DASY52, Version 52.8 (0);SEMCAD X Version 14.6.4 (4989)

Right/Touch_R99 RMC, 12.2 kbps_M ch /Area Scan (10x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.541 mW/g

Right/Touch_R99 RMC, 12.2 kbps_M ch /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.913 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 1.0450
SAR(1 g) = 0.543 mW/g; SAR(10 g) = 0.261 mW/g
Maximum value of SAR (measured) = 0.746 mW/g



0 dB = 0.750mW/g = -2.50 dB mW/g

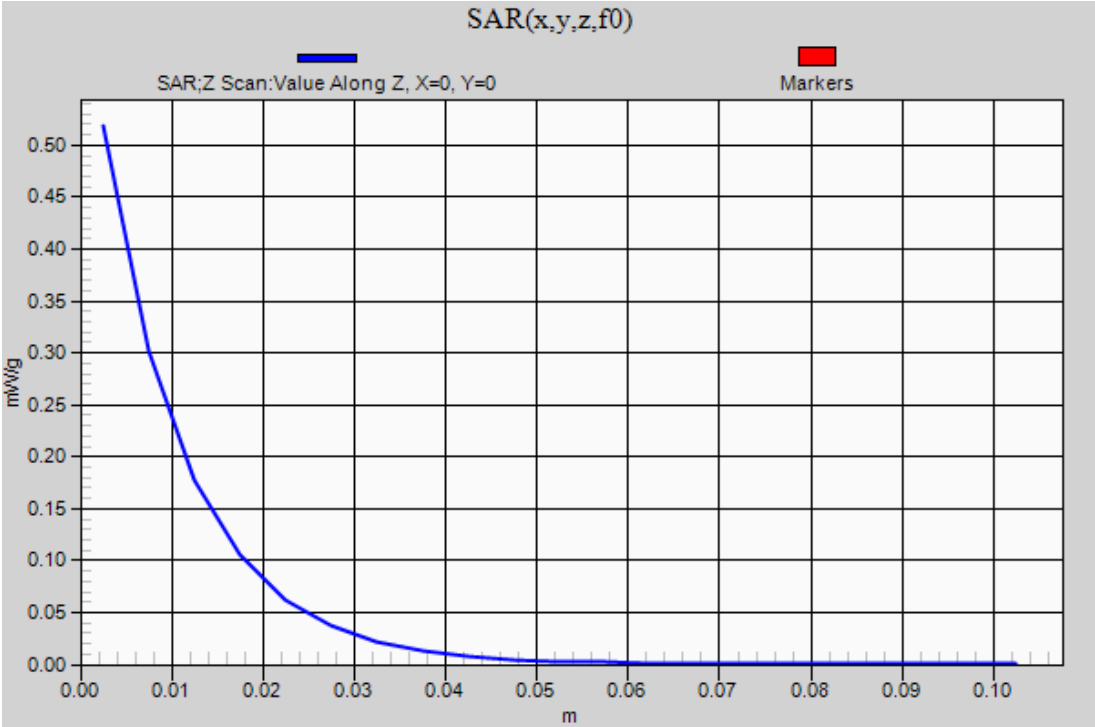
Date: 2/1/2012

Test Laboratory: UL CCS SAR Lab B

UMTS band II

Communication System: UMTS-FDD (WCDMA); Frequency: 1880 MHz; Duty Cycle: 1:1

Right/Touch_R99 RMC, 12.2 kbps_M ch /Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 0.518 mW/g



Date: 2/6/2012

Test Laboratory: UL CCS SAR Lab B

UMTS Band II

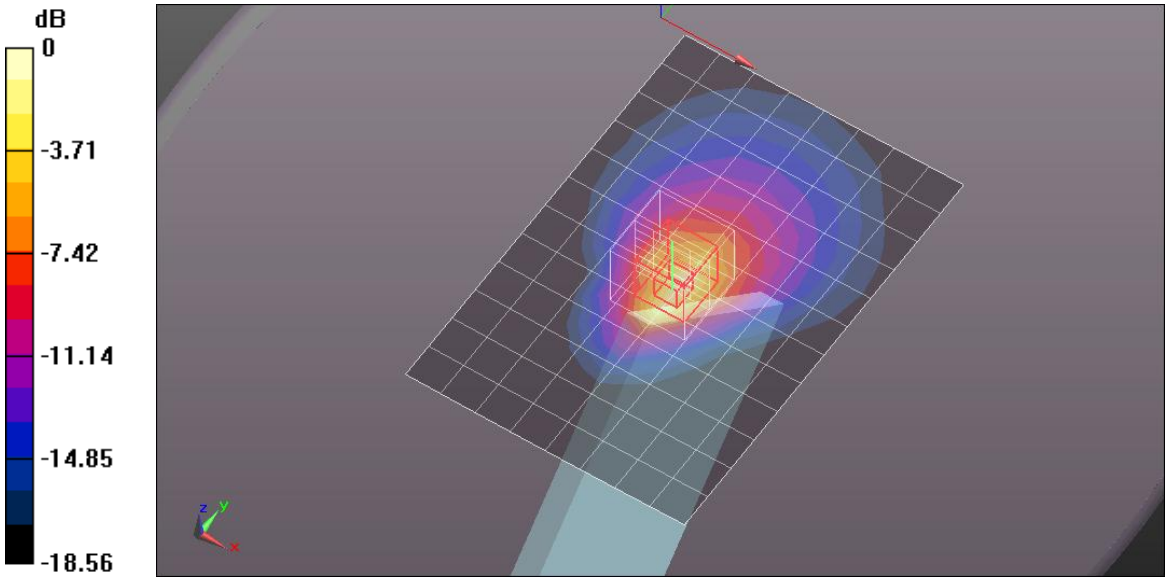
Communication System: UMTS-FDD (WCDMA); Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1907.6 MHz; σ = 1.513 mho/m; ε_r = 52.087; ρ = 1000 kg/m^3
Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY5 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV3 - SN3531; ConvF(7.91, 7.91, 7.91); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1258; Calibrated: 5/2/2011
- Phantom: ELI v5.0 (B); Type: QDOVA001BB; Serial: 1118
- Measurement SW: DASY52, Version 52.8 (0);SEMCAD X Version 14.6.4 (4989)

Edge 1 at 45deg_R99 RMC, 12.2 kbps /H ch/Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.296 mW/g

Edge 1 at 45deg_R99 RMC, 12.2 kbps /H ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.726 V/m; Power Drift = -0.0066 dB
Peak SAR (extrapolated) = 1.9930
SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.558 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.520 mW/g



0 dB = 1.520mW/g = 3.64 dB mW/g

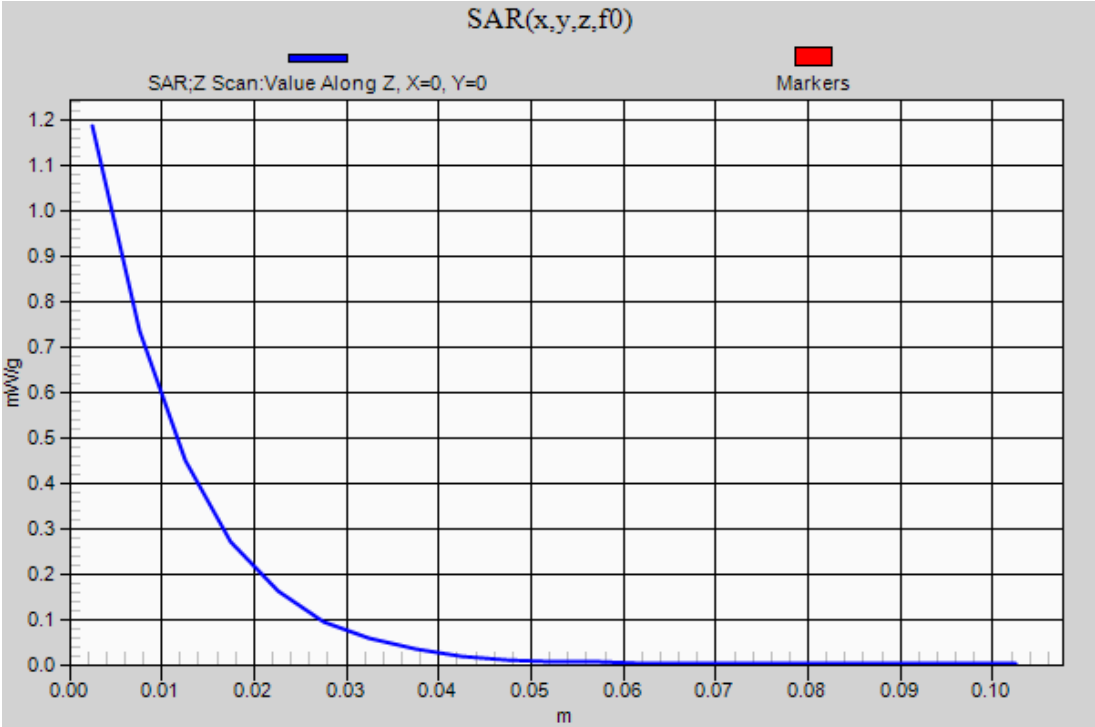
Date: 2/6/2012

Test Laboratory: UL CCS SAR Lab B

UMTS Band II

Communication System: UMTS-FDD (WCDMA); Frequency: 1907.6 MHz; Duty Cycle: 1:1

Edge 1 at 45deg_R99 RMC, 12.2 kbps /H ch/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.187 mW/g



Date: 2/8/2012

Test Laboratory: UL CCS SAR Lab B

2.4GHz Head

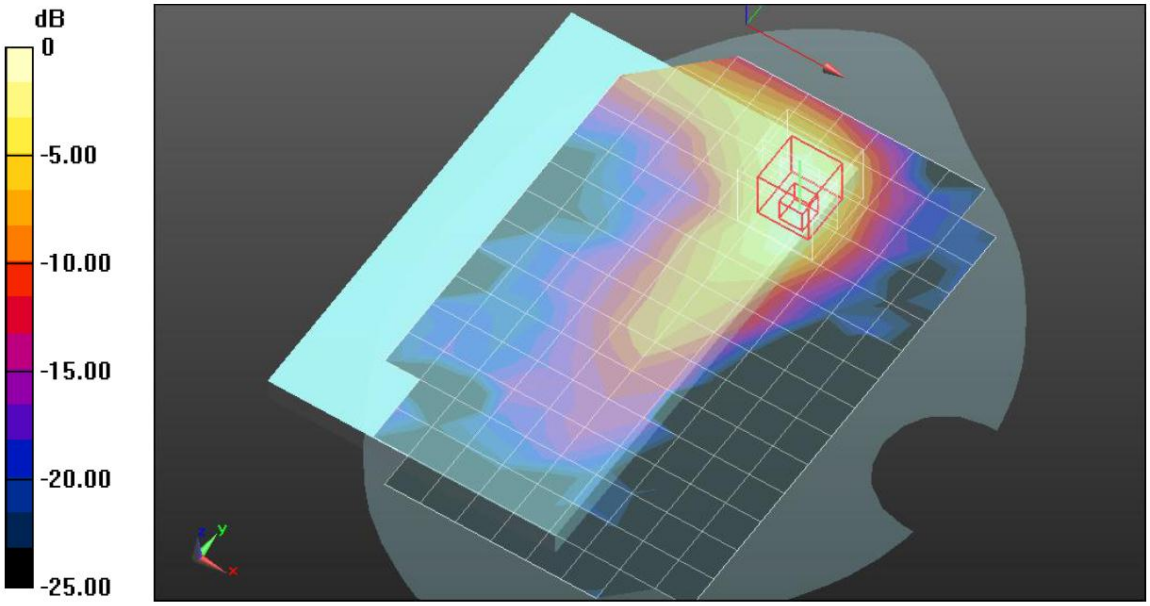
Communication System: IEEE 802.11b/g/n 2.4 GHz Band; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.814 mho/m; ε_r = 39.178; ρ = 1000 kg/m^3
Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY5 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV3 - SN3531; ConvF(7.4, 7.4, 7.4); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1258; Calibrated: 5/2/2011
- Phantom: SAM; Type: QD000P40CD; Serial: 1629
- Measurement SW: DASY52, Version 52.8 (0);SEMCAD X Version 14.6.4 (4989)

Flat Phantom/802.11b_ch 6/Area Scan (11x16x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.104 mW/g

Flat Phantom/802.11b_ch 6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.651 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.1750
SAR(1 g) = 0.084 mW/g; SAR(10 g) = 0.041 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.118 mW/g



0 dB = 0.120mW/g = -18.42 dB mW/g

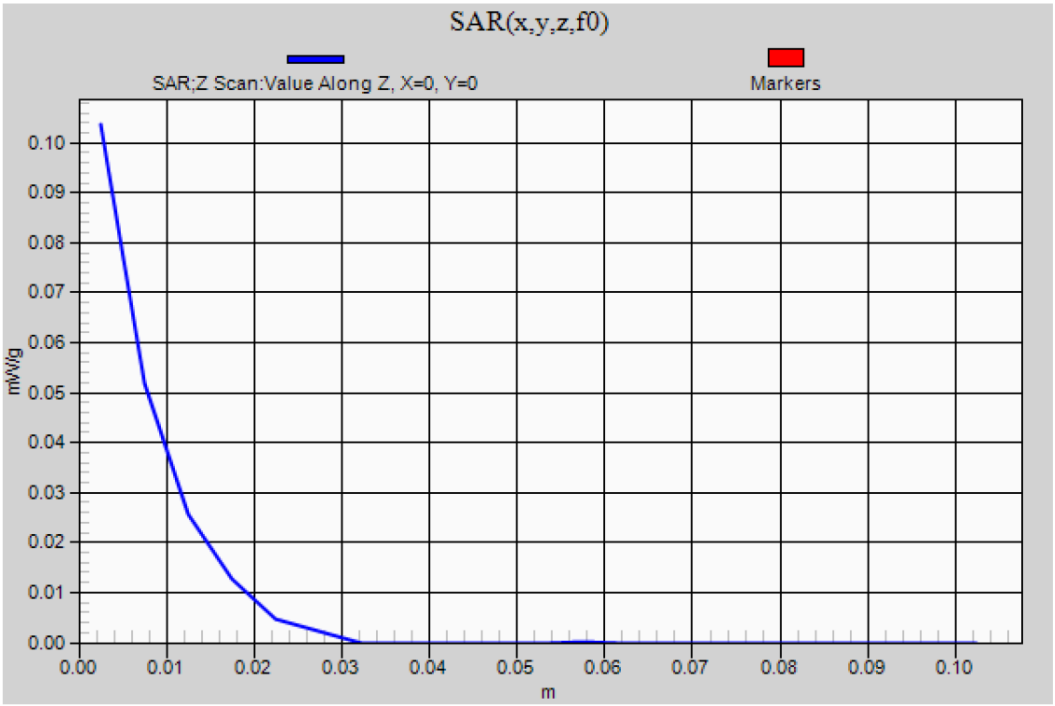
Date: 2/8/2012

Test Laboratory: UL CCS SAR Lab B

2.4GHz Head

Communication System: IEEE 802.11b/g/n 2.4 GHz Band; Frequency: 2437 MHz; Duty Cycle: 1:1

Flat Phantom/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) = 0.104 mW/g



Date: 2/15/2012

Test Laboratory: UL CCS SAR Lab B

2.4 GHz Body

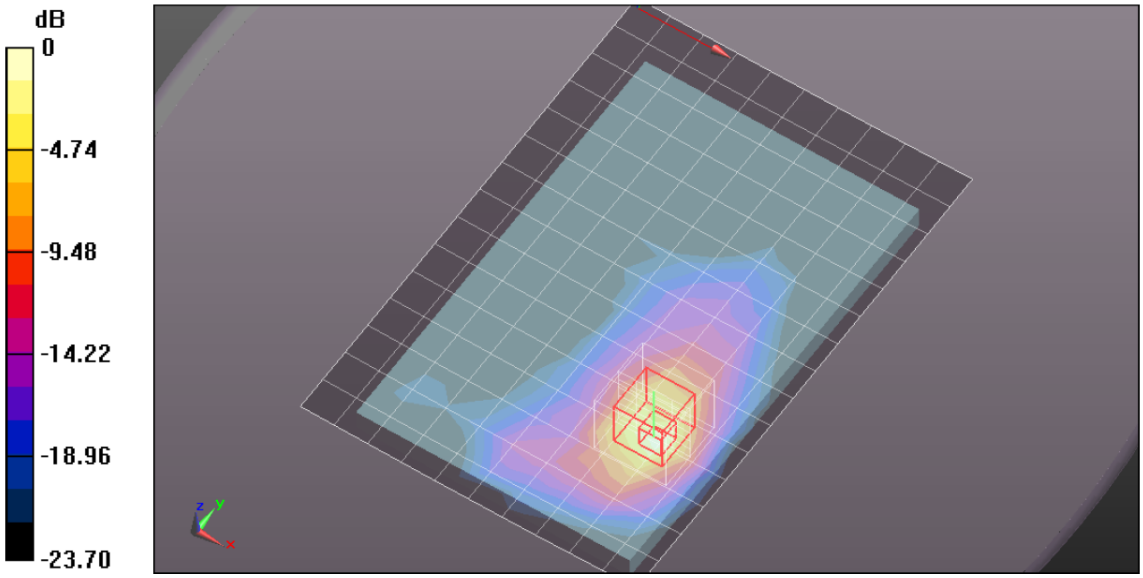
Communication System: IEEE 802.11b/g/n 2.4 GHz Band; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.938 mho/m; ε_r = 54.475; ρ = 1000 kg/m^3
Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY5 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV3 - SN3531; ConvF(7.44, 7.44, 7.44); Calibrated: 12/19/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1258; Calibrated: 5/2/2011
- Phantom: ELI v5.0 (B); Type: QDOVA001BB; Serial: 1118
- Measurement SW: DASY52, Version 52.8 (0);SEMCAD X Version 14.6.4 (4989)

Rear/802.11b_Ch 6/Area Scan (11x16x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.511 mW/g

Rear/802.11b_Ch 6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.109 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.9140
SAR(1 g) = 0.344 mW/g; SAR(10 g) = 0.142 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.556 mW/g



0 dB = 0.560mW/g = -5.04 dB mW/g

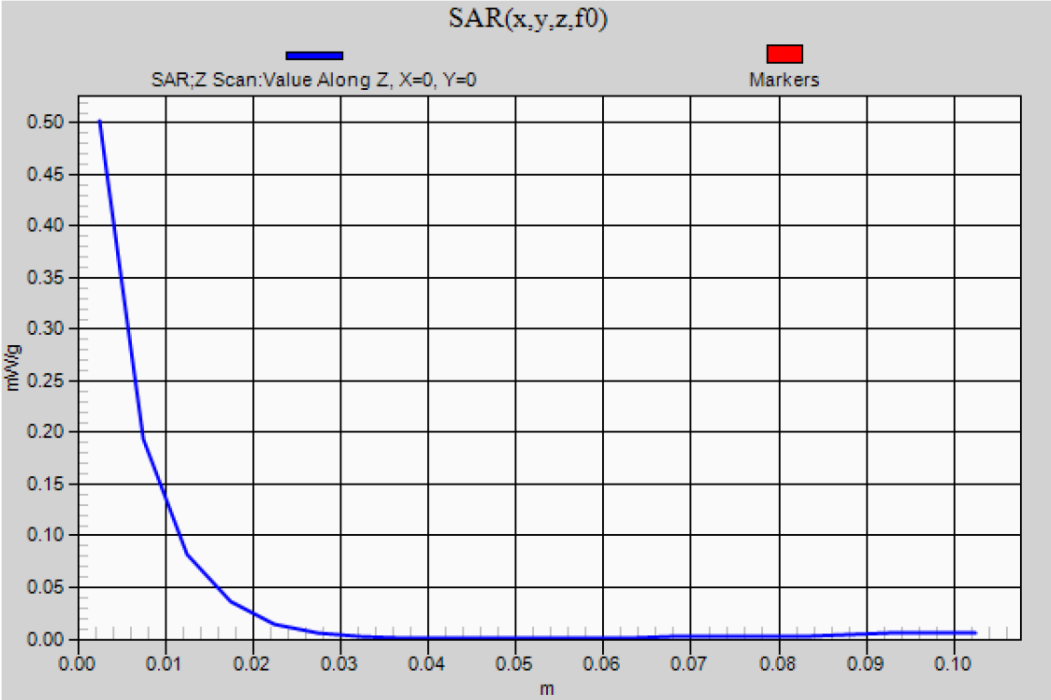
Date: 2/15/2012

Test Laboratory: UL CCS SAR Lab B

2.4 GHz Body

Communication System: IEEE 802.11b/g/n 2.4 GHz Band; Frequency: 2437 MHz; Duty Cycle: 1:1

Rear/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) = 0.502 mW/g



17. Simultaneous Transmission SAR Analysis

The Bluetooth's output power is < 25 mW [60/$f_{(GHz)}$], which stand-alone SAR evaluation is not required. Therefore, simultaneous transmission SAR evaluation is not required.

17.1. Head exposure condition (WWAN + WiFi)

Test Position	Data/Voice				Data	Sum of 1g SAR (mW/g)
	GSM850	GSM1900	UMTS Band V	UMTS Band II	WiFi 2.4G	
Left Touch	0.422				0.084	0.506
		0.129			0.084	0.213
			0.364		0.084	0.448
				0.182	0.084	0.266
Left Tilt	0.476				0.084	0.560
		0.144			0.084	0.228
			0.443		0.084	0.527
				0.182	0.084	0.266
Right Touch	0.795				0.084	0.879
		0.408			0.084	0.492
			0.792		0.084	0.876
				0.543	0.084	0.627
Right Tilt	0.765				0.084	0.849
		0.430			0.084	0.514
			0.769		0.084	0.853
				0.503	0.084	0.587

Conclusions:
Simultaneous transmission SAR measurement (volume scan) is not required due to the sum of the 1-g SAR is < 1.6 W/kg.

17.2. Body exposure condition (WWAN + WiFi)

Test Position	Data/Voice				Data	Sum of 1g SAR (mW/g)
	GSM 850	GSM 1900	UMTS Band V	UMTS Band II	WiFi 2.4G	
Rear	0.62				0.344	0.964
		0.888			0.344	1.232
			0.412		0.344	0.756
				0.899	0.344	1.243
Edge 4	0.449				0.218	0.667
		0.643			0.218	0.861
			0.385		0.218	0.603
				0.902	0.218	1.120

Conclusions:
Simultaneous transmission SAR measurement (volume scan) is not required due to the sum of the 1-g SAR is < 1.6 W/kg.

18. Appendixes

Refer to separated files for the following appendixes.

18.1. System check plots

18.2. SAR test plots for GSM850

18.3. SAR test plots for GSM1900

18.4. SAR test plots for UMTS band V

18.5. SAR test plots for UMTS band II

18.6. SAR test plots for WiFi 2.4 GHz

18.7. Calibration certificate for E-Field Probe EX3DV4 SN 3531

18.8. Calibration certificate for D835V2 SN 4d117

18.9. Calibration certificate for D1900V2 SN 5d140

18.10. Calibration certificate for D2450V2 SN: 706 w/ extended cal. Data