FCC OET BULLETIN 65 SUPPLEMENT C
IC RSS-102 ISSUE 4,
IEEE STD 1528:2003
CLASS II PERMISSIVE CHANGE

SAR EVALUATION REPORT

For

Cellular/PCS WCDMA/GSM/EDGE Module
(Tested inside of Toshiba Tablet Computer, Toshiba AT100)

MODEL NUMBER: Ericsson F5521gw
FCC ID: VV7-MBMF5521GW1-T
IC ID: 287AG-MBMF5521GWT
IMEI: 357104/04/000092/8

REPORT NUMBER: 11U13971-1 Revision D

ISSUE DATE: December 13, 2011

Prepared for
Ericsson AB
Business Unit Network,
Lindholmspiren 11
Sweden

Prepared by
COMPLIANCE CERTIFICATION SERVICES (UL CCS)
47173 BENICIA STREET
FREMONT, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888

NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	October 17, 2011	Initial Issue	--
A	October 28, 2011	Updated report to accommodate FCC comments	Dave Weaver
B	November 11, 2011	Updated report to accommodate FCC comments	Dave Weaver
C	November 29, 2011	Updated FCC and IC ID Removed confidential antenna separation data	Dave Weaver
D	December 13, 2011	Added test data for secondary landscape tilted at 45 degrees	Dave Weaver

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

Applicant name:	ERICSSON AB BUSINESS UNIT NETWORK, LINDHOLSPIREN 11 SWEDEN		
EUT description:	The EUT is an 850/1900 GSM/WCDMA/GPRS/EDGE Module with HSPA (Tested inside of a TOSHIBA TABLET computer, AT100)		
Model number:	Ericsson F5521gw		
Device category:	Portable		
Exposure category:	General Population/Uncontrolled Exposure		
Dates tested:	August 9 - 22, 2011		
FCC / IC Rule Parts	Freq. Range [MHz]	Highest 1-g SAR (mW/g)	Limit (mW/g)
22H / RSS-132	824 - 849	1.180 mW/g Lap-held with 0 cm separation distance	1.6
24E / RSS-133	1850 - 1910	1.500 mW/g Lap-held with 0 cm separation distance	
Applicable Standards			Test Results
FCC OET Bulletin 65 Supplement C 01-01, IEEE Std 1528:2003 IC RSS 102 Issue 4			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 CCS By:	Tested By:
	
Dave Weaver Staff Engineer Compliance Certification Services (UL CCS)	Hung Thai 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, IEEE STD 1528: 2003, IC RSS 102 Issue 4 and the following specific FCC Test Procedures.

- KDB 941225 D01 SAR test for 3G devices
- KDB 616217 Laptop Computer SAR Procedures
- 447498 D01 Mobile Portable RF Exposure v04

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
Robot - Six Axes	Stäubli	RX90BL	N/A	N/A		
Robot Remote Control	Stäubli	CS7MB	S-0396	N/A		
DASY4 Measurement Server	SPEAG	SEUMS001BA	1246	N/A		
Probe Alignment Unit	SPEAG	LB5/ 80	SE UKS 030 AA	N/A		
SAM Twin Phantom	SPEAG	QDOOOP40CD	1629	N/A		
Oval Flat Phantom (ELI 5.0) A	SPEAG	QDOVA001BB	1120	N/A		
Oval Flat Phantom (ELI 5.0) B	SPEAG	QDOVA001BB	1118	N/A		
Dielectric Probe kit	HP	85070C	N/A	N/A		
ESA Series Network Analyzer	Agilent	E5071B	MY42100131	2	2	2012
Synthesized Signal Generator	HP	83732B	US34490599	7	14	2012
E-Field Probe	SPEAG	EX3DV4	3686	1	24	2012
E-Field Probe	SPEAG	EX3DV4	3772	5	3	2012
Thermometer	ERTCO	639-1S	1718	7	19	2012
Data Acquisition Electronics	SPEAG	DAE4	1239	10	18	2012
System Validation Dipole	SPEAG	D835V2	4d117	4	15	2012
System Validation Dipole	SPEAG	D1900V2	5d140	4	18	2012
Power Meter	Giga-tronics	8651A	8651404	3	13	2012
Power Sensor	Giga-tronics	80701A	1834588	3	13	2012
Amplifier	Mini-Circuits	ZVE-8G	90606	N/A		
Amplifier	Mini-Circuits	ZHL-42W	D072701-5	N/A		
Simulating Liquid	SPEAG	MSL900	N/A	Within 24 hrs of first test		
Simulating Liquid	SPEAG	MSL1900	N/A	Within 24 hrs of first test		

4.2. MEASUREMENT UNCERTAINTY

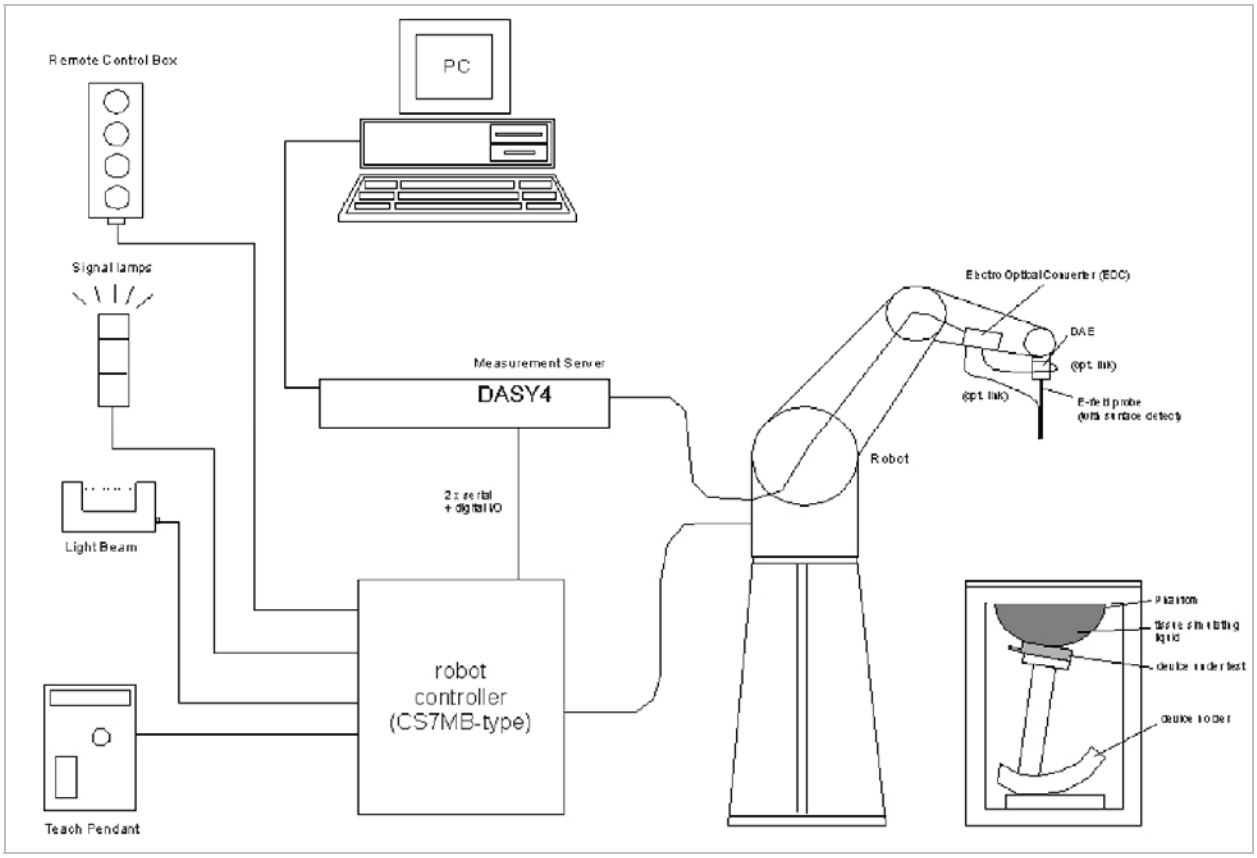
Measurement uncertainty for 300 MHz to 3 GHz averaged over 1 gram

Component	error, %	Probe Distribution	Divisor	Sensitivity	U (Xi), %
Measurement System					
Probe Calibration (k=1)	5.50	Normal	1	1	5.50
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 (Body 900)	2.58	Normal	1	0.64	1.65
Liquid Permittivity - deviation from target	5.00	Rectangular	1.732	0.6	1.73
Liquid Permittivity - measurement uncertainty (Body 1900)	-2.78	Normal	1	0.6	-1.67
Combined Standard Uncertainty Uc(y) =					9.73
Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =				19.46	%
Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =				1.54	dB

5. EQUIPMENT UNDER TEST

The EUT is an 850/1900 GSM/WCDMA/GPRS/EDGE Module with HSPA (Tested inside of a TOSHIBA TABLET computer, AT100)	
Normal operation:	Tablet mode
Antenna tested:	Manufacturer: Pegatron Part number: Main: C1335-520061-A
Antenna-to-antenna/user separation distances:	See Section 15 for details of antenna locations and separation distances.
Simultaneous transmission:	• WWAN cannot transmit simultaneously with WiFi • WWAN can transmit simultaneously with Bluetooth
Assessment for SAR evaluation for Simultaneous transmission:	The Bluetooth maximum output is 11.5 mW, which is <60/$f_{(GHz)}$, and stand-alone SAR is not required. Therefore simultaneous transmission evaluation is not required.

6. SYSTEM SPECIFICATIONS



The DASY4 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Stäubli RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- 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 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.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 2000 or Windows XP.
- DASY4 software.
- Remote controls with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing validating the proper functioning of the system.

7. COMPOSITION OF INGREDIENTS FOR TISSUE SIMULATING LIQUIDS

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

Simulating Liquids for 5 GHz, Manufactured by SPEAG

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

8. TISSUE DIELECTRIC PARAMETERS CHECK

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine of the dielectric parameters are within the tolerances of the specified target values. For frequencies in 300 MHz to 2 GHz, the measured conductivity and relative permittivity should be within ± 5% of the target values. For frequencies in the range of 2–3 GHz and above the measured conductivity should be within ± 5% of the target values. The measured relative permittivity tolerance can be relaxed to no more than ± 10%.

Reference Values of Tissue Dielectric Parameters for Body (for 300 – 3000 MHz and 5800 MHz)
The body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations and extrapolated according to the head parameters specified in IEEE Standard 1528.

Target Frequency (MHz)	Body (Supplement C 01-01)	
	ε_r	σ (S/m)
300	58.20	0.92
450	56.70	0.94
835	55.20	0.97
900	55.00	1.05
915	55.00	1.06
1450	54.00	1.30
1610	53.80	1.40
1800 – 2000	53.30	1.52
2450	52.70	1.95
3000	52.00	2.73
5800	48.20	6.00

(ε_r = relative permittivity, σ = conductivity and ρ = 1000 kg/m^3)

8.1. Liquid Check Results for MSL 900 and 1900 MHz

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
8/9/2011	Body 835	e'	53.9200	Relative Permittivity (ϵ_r):	53.92	55.20	-2.32	5
		e"	21.4317	Conductivity (σ):	1.00	0.97	2.58	5
8/10/2011	Body 835	e'	54.3500	Relative Permittivity (ϵ_r):	54.35	55.20	-1.54	5
		e"	20.9953	Conductivity (σ):	0.97	0.97	0.49	5
8/10/2011	Body 1900	e'	52.4000	Relative Permittivity (ϵ_r):	52.40	53.30	-1.69	5
		e"	14.7210	Conductivity (σ):	1.56	1.52	2.32	5
8/12/2011	Body 1900	e'	54.2000	Relative Permittivity (ϵ_r):	54.20	53.30	1.69	5
		e"	14.6410	Conductivity (σ):	1.55	1.52	1.76	5
Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
12/6/2011	Body 1900	e'	52.2263	Relative Permittivity (ϵ_r):	52.23	53.30	-2.01	5
		e"	14.5226	Conductivity (σ):	1.53	1.52	0.94	5
	Body 1850	e'	52.4195	Relative Permittivity (ϵ_r):	52.42	53.30	-1.65	5
		e"	14.3540	Conductivity (σ):	1.48	1.52	-2.86	5
	Body 1880	e'	52.2967	Relative Permittivity (ϵ_r):	52.30	53.30	-1.88	5
		e"	14.4547	Conductivity (σ):	1.51	1.52	-0.59	5
	Body 1910	e'	52.1984	Relative Permittivity (ϵ_r):	52.20	53.30	-2.07	5
		e"	14.5554	Conductivity (σ):	1.55	1.52	1.70	5
Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
12/13/2011	Body 835	e'	54.6533	Relative Permittivity (ϵ_r):	54.65	55.20	-0.99	5
		e"	21.0195	Conductivity (σ):	0.98	0.97	0.61	5
	Body 815	e'	54.8632	Relative Permittivity (ϵ_r):	54.86	55.30	-0.78	5
		e"	21.1068	Conductivity (σ):	0.96	0.97	-1.20	5
	Body 825	e'	54.7551	Relative Permittivity (ϵ_r):	54.76	55.26	-0.91	5
		e"	21.0589	Conductivity (σ):	0.97	0.97	-0.29	5
	Body 850	e'	54.5036	Relative Permittivity (ϵ_r):	54.50	55.16	-1.18	5
		e"	20.9661	Conductivity (σ):	0.99	0.99	0.38	5
Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
12/13/2011	Body 1900	e'	51.8156	Relative Permittivity (ϵ_r):	51.82	53.30	-2.78	5
		e"	14.5687	Conductivity (σ):	1.54	1.52	1.26	5
	Body 1850	e'	52.0089	Relative Permittivity (ϵ_r):	52.01	53.30	-2.42	5
		e"	14.3991	Conductivity (σ):	1.48	1.52	-2.55	5
	Body 1880	e'	51.8889	Relative Permittivity (ϵ_r):	51.89	53.30	-2.65	5
		e"	14.4992	Conductivity (σ):	1.52	1.52	-0.29	5
	Body 1910	e'	51.7814	Relative Permittivity (ϵ_r):	51.78	53.30	-2.85	5
		e"	14.6017	Conductivity (σ):	1.55	1.52	2.02	5

9. SYSTEM VERIFICATION

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%.

System Performance Check Measurement Conditions

- The measurements were performed in the flat section of the SAM twin phantom filled with Head or Body simulating liquid of the following parameters.
- The DASY4 system with an Isotropic E-Field Probe EX3DV4 SN 3686 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 5x5x7 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.

Reference SAR Values for HEAD & BODY-tissue from calibration certificate of SPEAG.

System validation dipole	Cal. certificate #	Cal. date	SAR Avg (mW/g)		
			Tissue:	Head	Body
D835V2 SN: 4d117	D835V2 4d117_Apr11	4/15/11	SAR_{1g}:	9.64	10.1
			SAR_{10g}:	6.28	6.6
D1900V2 SN: 5d140	D1900V2 5d140_Apr11	4/18/11	SAR_{1g}:	41.6	41.2
			SAR_{10g}:	21.5	21.6

9.1. SYSTEM CHECK RESULTS

System validation dipole	Date Tested	Measured (Normalized to 1 W)		Target	Delta (%)	Tolerance (%)
		Tissue:	Body			
D835V2 SN: 4d117	08/09/11	SAR_{1g}:	10.2	10.1	0.99	±10
		SAR_{10g}:	6.75	6.6	2.27	
D835V2 SN: 4d117	08/10/11	SAR_{1g}:	10.2	10.1	0.99	±10
		SAR_{10g}:	6.7	6.6	1.52	
D1900V2 SN: 5d140	08/10/11	SAR_{1g}:	44.4	41.2	7.77	±10
		SAR_{10g}:	23.1	21.6	6.94	
D1900V2 SN: 5d140	08/12/11	SAR_{1g}:	45	41.2	9.22	±10
		SAR_{10g}:	23.4	21.6	8.33	
D1900V2 SN: 5d140	12/06/11	SAR_{1g}:	42.9	41.2	4.13	±10
		SAR_{10g}:	22.4	21.6	3.70	
D835V2 SN: 4d117	12/13/11	SAR_{1g}:	9.92	10.1	-1.78	±10
		SAR_{10g}:	6.53	6.6	-1.06	
D1900V2 SN: 5d140	12/13/11	SAR_{1g}:	43.4	41.2	5.34	±10
		SAR_{10g}:	22.6	21.6	4.63	

10. SYSTEM VERIFICATION

System Check Plots for 835 MHz

Date: 8/9/2011

Test Laboratory: UL CCS SAR Lab A

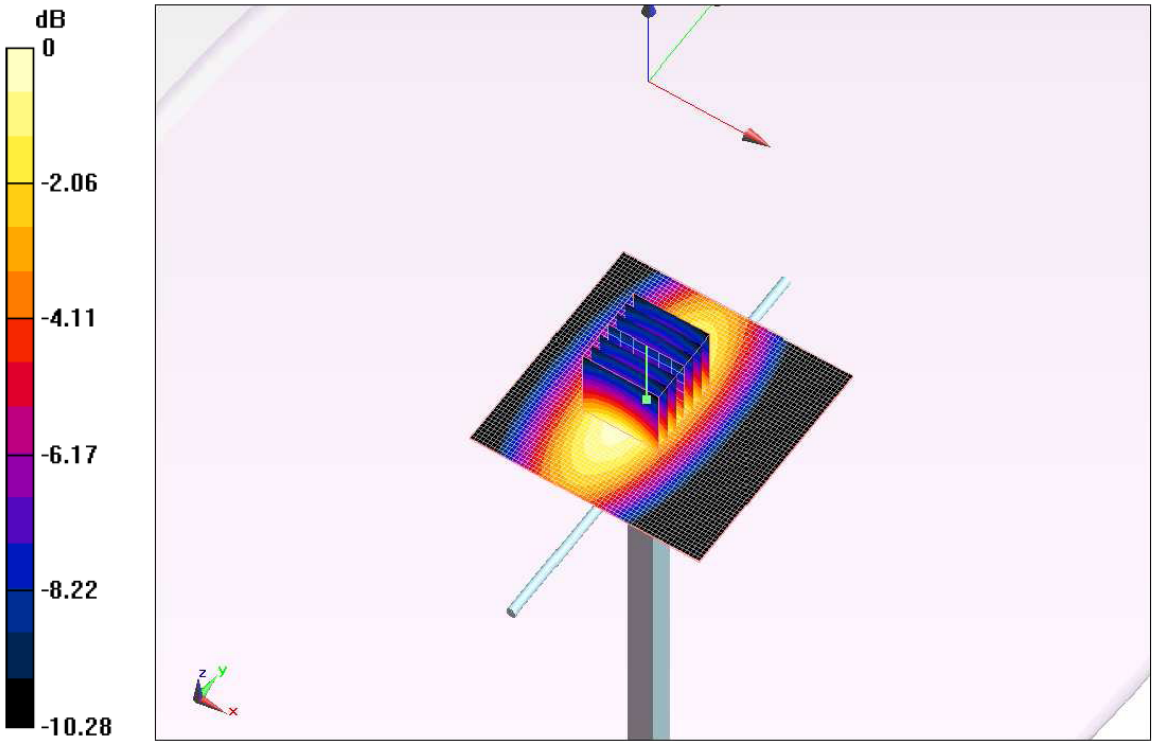
SystemPerformanceCheck-D835V2 SN 4d117

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 1.01 mho/m; ε_r = 54.396; 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: EX3DV4 - SN3686; ConvF(8.78, 8.78, 8.78); Calibrated: 1/24/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1239; Calibrated: 11/17/2010
- Phantom: ELI v4.0(A); Type: QDOVA001BB; Serial: 1119
- Measurement SW: DASY52, Version 52.6 (2);SEMCAD X Version 14.4.5 (3634)

Body/Pin=100 mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.243 mW/g

Body/Pin=100 mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 36.427 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.534 W/kg
SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.675 mW/g
Maximum value of SAR (measured) = 1.243 mW/g



0 dB = 1.240mW/g

System Check Z Plots for 835 MHz

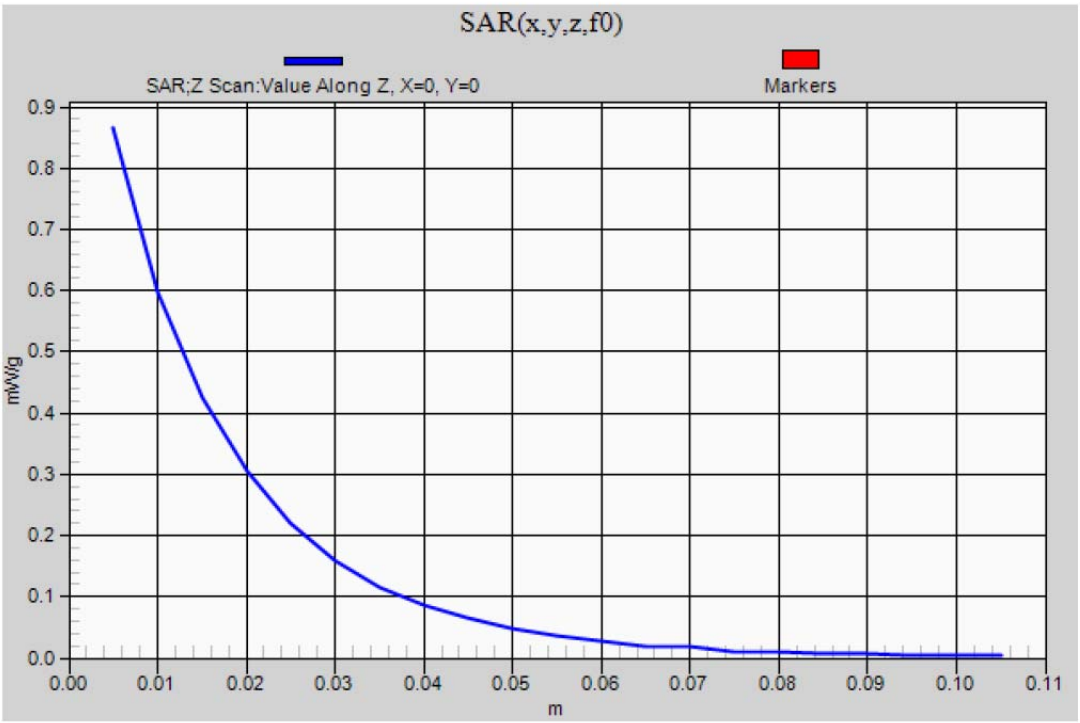
Date: 8/9/2011

Test Laboratory: UL CCS SAR Lab A

SystemPerformanceCheck-D835V2 SN 4d117

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Body/Pin=100 mW/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 0.866 mW/g



System Check Plots for 1900 MHz

Date: 8/12/2011

Test Laboratory: UL CCS SAR Lab A

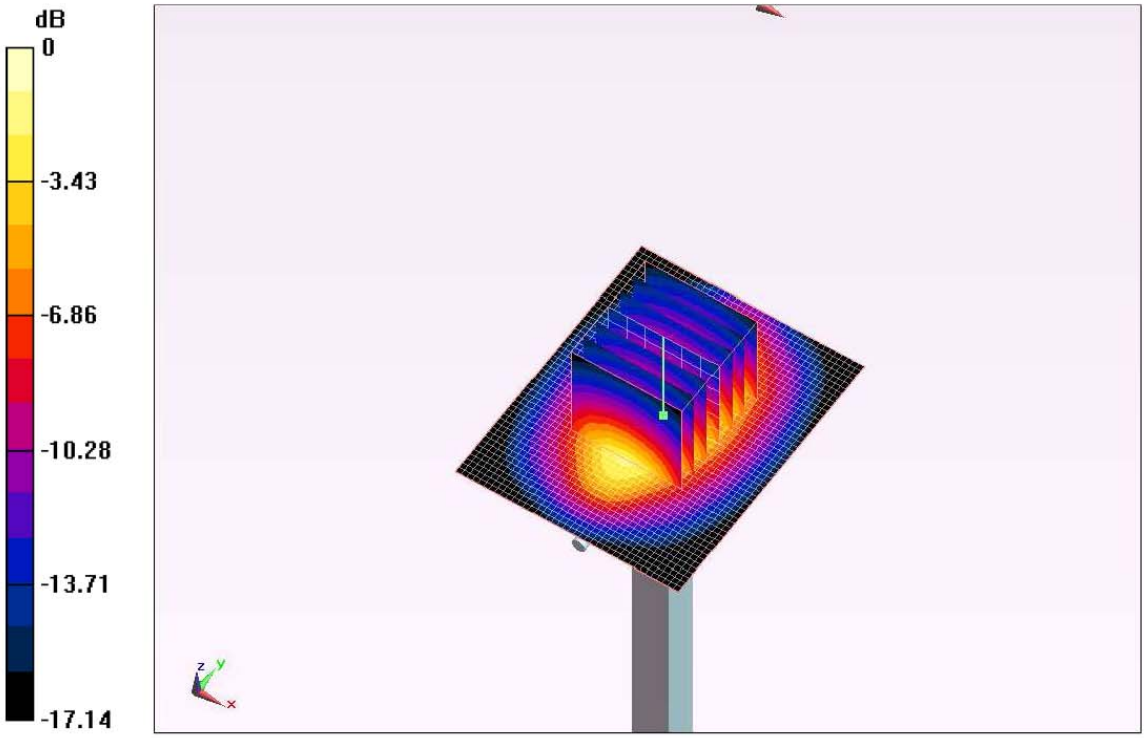
System Check_D1900V2_SN 5d140

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.548 mho/m; ε_r = 52.187; 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: EX3DV4 - SN3686; ConvF(6.99, 6.99, 6.99); Calibrated: 1/24/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1239; Calibrated: 11/17/2010
- Phantom: ELI v4.0(B); Type: QDOVA001BB; Serial: 1099
- Measurement SW: DASY52, Version 52.6 (2);SEMCAD X Version 14.4.5 (3634)

D1900V2/Pin=100 mW 2/Area Scan (41x51x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 6.348 mW/g

D1900V2/Pin=100 mW 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 63.325 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 8.219 W/kg
SAR(1 g) = 4.5 mW/g; SAR(10 g) = 2.34 mW/g
Maximum value of SAR (measured) = 6.087 mW/g



0 dB = 6.090mW/g

System Check Z Plots for 1900 MHz

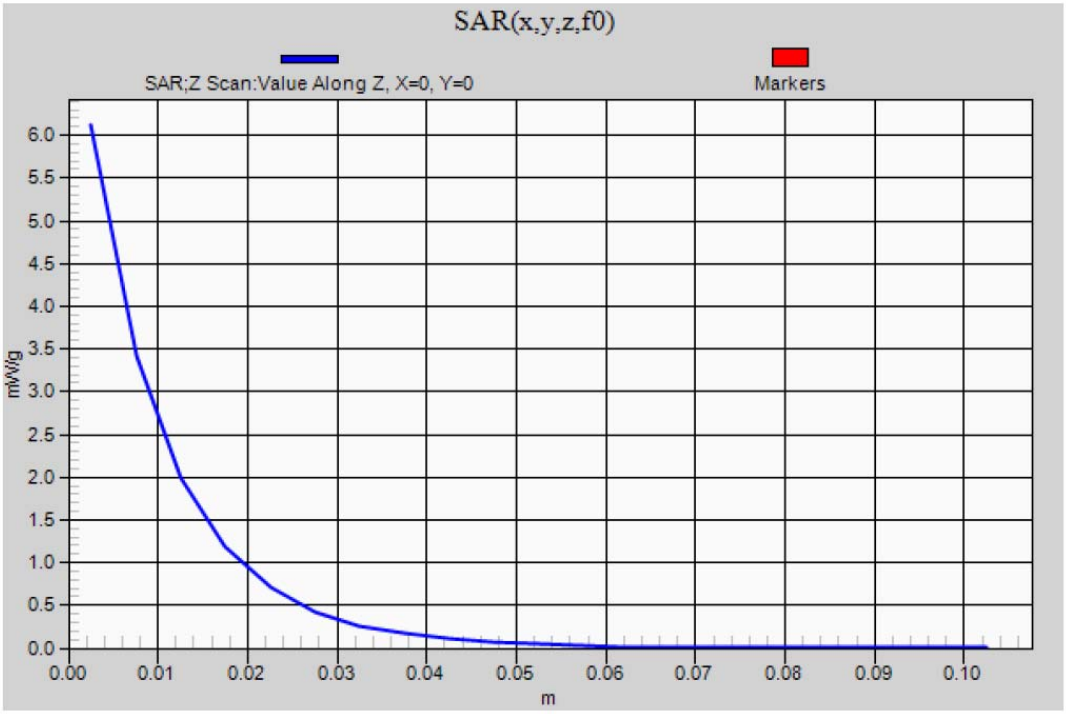
Date: 8/12/2011

Test Laboratory: UL CCS SAR Lab A

System Check_D1900V2_SN 5d140

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

D1900V2/Pin=100 mW 2/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 6.120 mW/g



11. OUTPUT POWER VERIFICATION

11.1. GSM 850 & GPRS 1900

GPRS (GMSK) - Coding Scheme: CS1

Band	Ch No.	f (MHz)	Avg burst Pwr (dBm)				Power Reduction Enabled				Power Reduction (dB)
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr	1 slots	Frame Avg Pwr	2 slots	Frame Avg Pwr	
GSM850	128.0	824.2	32.2	23.2	29.7	**23.7**	26.7	17.7	23.8	**17.7**	6.0
	190.0	836.6	32.3	23.2	29.8	**23.8**	26.7	17.7	23.9	**17.8**	5.9
	251.0	848.8	32.3	23.2	29.8	**23.8**	26.8	17.7	23.9	**17.8**	6.0
GSM1900	512.0	1850.2	28.8	19.8	28.2	**22.1**	23.3	14.3	22.3	**16.3**	5.9
	661.0	1880.0	28.9	19.9	28.2	**22.2**	23.4	14.4	22.4	**16.4**	5.8
	810.0	1909.8	28.9	19.9	28.4	**22.3**	23.6	14.5	22.6	**16.5**	5.8

EGPRS (8PSK) - Coding Scheme: MCS5

Band	Ch No.	f (MHz)	Avg burst Pwr (dBm)				Power Reduction Enabled				Power Reduction (dB)
			1 slot	Frame Avg Pwr	2 slots	Frame Avg Pwr	1 slots	Frame Avg Pwr	2 slots	Frame Avg Pwr	
GSM850	128.0	824.2	26.9	17.8	27.0	**20.9**	21.0	12.0	21.0	**15.0**	5.9
	190.0	836.6	26.9	17.9	26.9	**20.9**	21.1	12.1	21.1	**15.1**	5.8
	251.0	848.8	27.0	17.9	27.0	**20.9**	21.1	12.0	21.1	**15.0**	5.9
GSM1900	512.0	1850.2	25.2	16.2	25.2	**19.2**	19.4	10.4	19.4	**13.3**	5.8
	661.0	1880.0	25.4	16.3	25.3	**19.3**	19.5	10.5	19.5	**13.5**	5.9
	810.0	1909.8	25.4	16.4	25.4	**19.4**	19.6	10.6	19.6	**13.6**	5.8

Frame average power = measured power (dBm) – 10*LOG (8/number of slots)

Notes:

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 above and time slots, the following worst-case configurations were chosen for Body SAR testing.
    a. GPRS850 2 time slots
    b. GPRS1900 2 time slots

3. The WWAN module is capable of Multislot Class12 operation but is restricted to Class 10 operation in this implementation.

UMTS 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 EUT 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

Rel 99 (12.2kps RMC)

Band	Mode	UL Ch No.	f (MHz)	Avg Tx Pwr (dBm)	Avg Tx Pwr with Power Reduction	Power Reduction
UMTS850 (Band V)	Rel 99 12.2kbps RMC	4132	826.4	24.2	20.1	4.1
		4183	836.6	24.2	20.1	4.1
		4233	846.6	24.2	20.2	4.0
UMTS1900 (Band II)	Rel 99 12.2kps RMC	9262	1852.4	23.1	19.1	4.0
		9400	1880.0	23.1	19.2	3.9
		9538	1907.6	23.1	19.2	3.9

Note: Based on above Frame average power measurements result, the following worst-case mode/channel number has been chosen for SAR testing.

- UMTS Band V – Rel 99/High-channel (826.4 MHz)
- UMTS Band II – Rel 99/Middle-channel (1880 MHz)

11.2. UMTS 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	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	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

Rel 6 HSDPA

Band	Mode	UL Ch No.	DL Ch No.	f (MHz)	Avg Tx Pwr (dBm)	Avg Tx Pwr with Power reduction	Power reduction (dB)
UMTS850 (Band V)	Subtest 1	4132	4357	826.4	23.8	19.9	3.9
		4183	4408	836.6	23.9	19.9	4.0
		4233	4458	846.6	23.8	19.8	4.0
	Subtest 2	4132	4357	826.4	23.8	20.0	3.8
		4183	4408	836.6	23.9	19.9	4.0
		4233	4458	846.6	23.8	19.8	4.0
	Subtest 3	4132	4357	826.4	23.2	19.3	3.9
		4183	4408	836.0	23.3	19.3	4.0
		4233	4458	846.6	23.3	19.3	4.0
	Subtest 4	4132	4357	826.4	23.2	19.2	4.0
		4183	4408	836.4	23.3	19.3	4.0
		4233	4458	846.6	23.3	19.3	4.0
UMTS1900 (Band II)	Subtest 1	9262	9662	1852.4	23.4	19.5	3.9
		9400	9800	1880.0	23.4	19.3	4.1
		9538	9938	1907.6	23.4	19.3	4.1
	Subtest 2	9262	9662	1852.4	23.4	19.4	4.0
		9400	9800	1880.0	23.4	19.3	4.1
		9538	9938	1907.6	23.4	19.3	4.1
	Subtest 3	9262	9662	1852.4	22.9	19.0	3.9
		9400	9800	1880.0	23.0	19.1	3.9
		9538	9938	1907.6	22.9	19.0	3.9
	Subtest 4	9262	9662	1852.4	22.9	19.0	3.9
		9400	9800	1880.0	22.9	18.9	4.0
		9538	9938	1907.6	22.9	19.0	3.9

Note: 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

11.3. UMTS Rel 6 HSPA

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	Rel6 HSPA	Rel6 HSPA	Rel6 HSPA	Rel6 HSPA	Rel6 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

Rel 6 HSPA (HSDPA & HSUPA)

Band	Mode	UL Ch No.	DL Ch No.	f (MHz)	Avg Tx Pwr (dBm)	AVG Tx PWR with Power reduction	Power reduction (dB)
UMTS850 (Band V)	Subtest 1	4132	4357	826.4	23.8	19.7	4.1
		4183	4408	836.6	23.8	19.7	4.1
		4233	4458	846.6	23.8	19.8	4.0
	Subtest 2	4132	4357	826.4	23.9	19.8	4.1
		4183	4408	836.6	23.9	19.8	4.1
		4233	4458	846.6	23.8	19.7	4.1
	Subtest 3	4132	4357	826.4	22.9	19.0	3.9
		4183	4408	836.6	22.9	18.9	4.0
		4233	4458	846.6	22.8	18.9	3.9
	Subtest 4	4132	4357	826.4	21.9	18.0	3.9
		4183	4408	836.0	21.9	17.9	4.0
		4233	4458	846.6	21.8	17.9	3.9
	Subtest 5	4132	4357	826.4	23.9	19.9	4.0
		4183	4408	836.4	24.0	19.9	4.1
		4233	4458	846.6	23.9	19.9	4.0
UMTS1900 (Band II)	Subtest 1	9262	9662	1852.4	23.2	19.3	3.9
		9400	9800	1880.0	23.1	19.2	3.9
		9538	9938	1907.6	22.9	19.0	3.9
	Subtest 2	9262	9662	1852.4	23.1	19.2	3.9
		9400	9800	1880.0	23.1	19.2	3.9
		9538	9938	1907.6	22.9	19.1	3.8
	Subtest 3	9262	9662	1852.4	22.1	18.1	4.0
		9400	9800	1880.0	22.1	18.1	4.0
		9538	9938	1907.6	22.0	18.1	3.9
	Subtest 4	9262	9662	1852.4	21.1	17.0	4.1
		9400	9800	1880.0	21.1	17.1	4.0
		9538	9938	1907.6	20.9	17.0	3.9
	Subtest 5	9262	9662	1852.4	23.1	19.1	4.0
		9400	9800	1880.0	23.0	19.1	3.9
		9538	9938	1907.6	22.8	19.0	3.8

Note: 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.

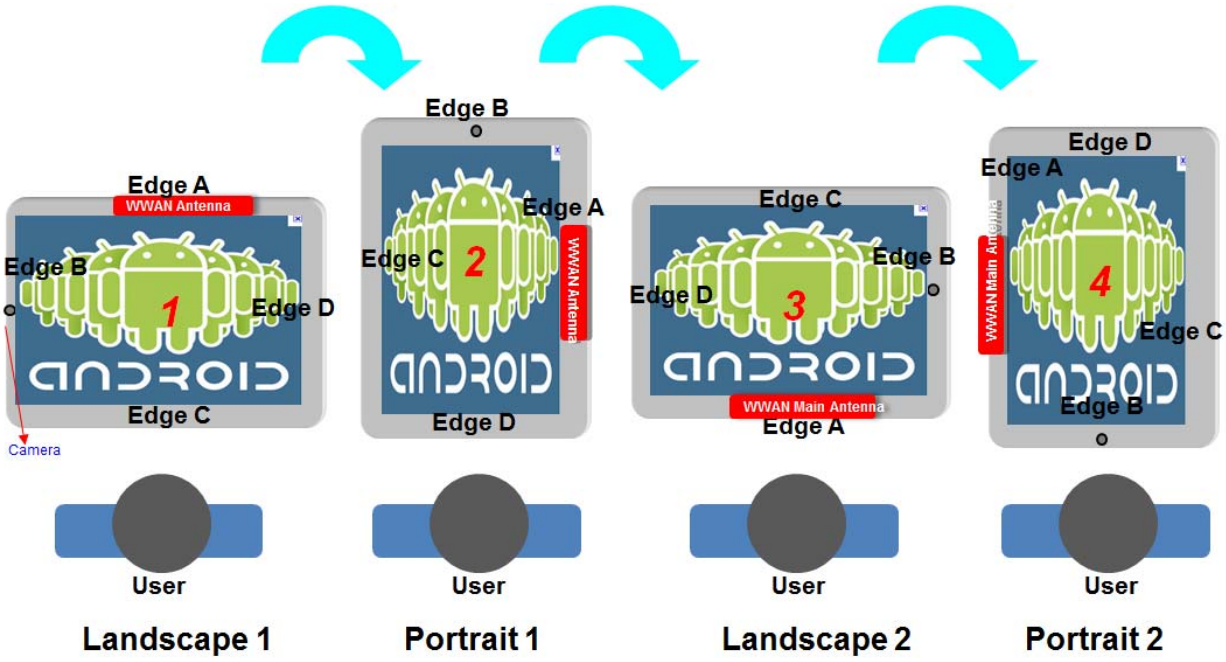
12. G-Sensor operation

To address RF exposure compliance when the AT100 is positioned with Edge A held against the body, the WWAN output power is reduced. The power reduction is triggered by a G-sensor (accelerometer) that detects the orientation of the AT100. The output power level is linked to the displayed image orientation. Power reduction will occur when the user tips the AT100 in order rotate the screen image.

If the user rotates the AT100 without tipping then the image on the screen will not change orientation and no power reduction will occur. This is not considered a normal operating mode.

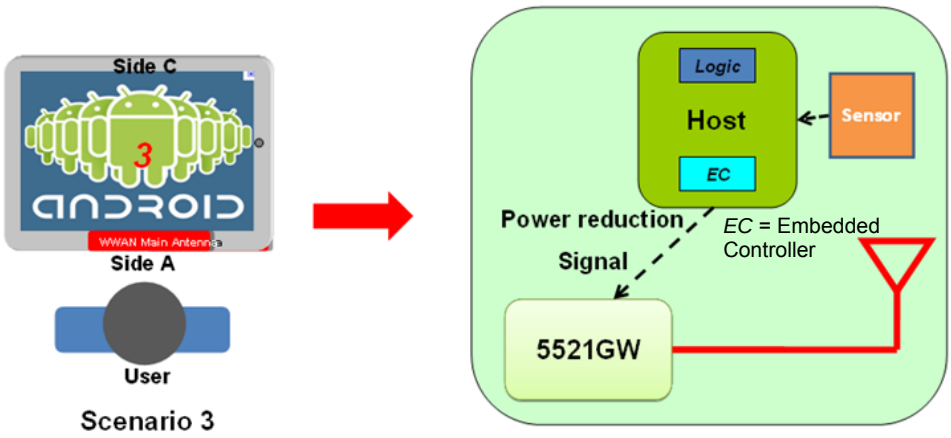
The AT100 features a slider switch that locks the display orientation but this does not affect the power reduction operation.

The AT100 does not use proximity sensors



Operational Process for Sensor

Tx Power Reduction Will Be Enabled at Edge Status to Solve "Antenna Tip SAR"



13. Power reduction levels

Power reduction when sensor is activated

Modes	Power Reduction (dB) when tip sensor is activated
GPRS 850	6
GPRS1900	6
WCDMA band V	4
WCDMA band II	4

14. SAR Test Configurations

Configuration per Sec. 13 Figures	WWAN Tx Antenna-to-Edge/Surface distance	SAR Require	Comments
(1) Secondary Landscape	3.57 mm	Yes	SAR evaluation was performed with the EUT edge in direct contact with oval phantom flat section (0 mm separation). **Power reduction.**
(2) Secondary Portrait	119.39 mm	No	SAR evaluation was not performed for this configuration as this was not the most conservative edge. Testing was as per KDB 447498 4) b) ii) (2)
(3) Primary Landscape	162.2 mm	No	SAR evaluation was not performed for this configuration as this was not the most conservative edge. Testing was as per KDB 447498 4) b) ii) (2)
(4) Primary Portrait	88.39 mm	no	SAR evaluation was not performed for this configuration as this was not the most conservative edge. Testing was as per KDB 447498 4) b) ii) (2)
(5) Base (Back Surface/Lap Held)	11.39 mm	Yes	SAR evaluation was performed with the EUT surface in direct contact with oval phantom flat section (0 mm separation). . **Full Power.**
(6) Secondary Landscape tilted at 45 degrees	Undefined	Yes	SAR evaluation was performed with the EUT edge in direct contact with oval phantom flat section and tilted at 45 degrees (Back of EUT facing phantom) (0 mm separation). **Power reduction.**

15. SUMMARY OF TEST RESULTS

15.1. GPRS850

Body SAR Bottom Face Touch (GMSK)

Test position	Mode	Ch No.	f (MHz)	Avg Pwr (dBm)	1g SAR (mW/g)	10g SAR (mW/g)	Notes
Bottom Face	GPRS 2 slots	128	824.2	29.7			
		190	836.6	29.8	0.627	0.386	1
		251	848.8	29.8			

Body SAR Secondary LandScape Touch with Power Reduction Enabled

Test position	Mode	Ch No.	f (MHz)	Avg Pwr (dBm)	Power Reduction (dB)	1g SAR (mW/g)	10g SAR (mW/g)	Notes
Secondary Landscape	GPRS 2 slots	128	824.2	23.8	5.9			
		190	836.6	23.9	5.9	0.180	0.090	1
		251	848.8	23.9	6.0			

45 degrees Body SAR Touch with Power Reduction Enabled

Test position	Mode	Ch No.	f (MHz)	Avg Pwr (dBm)	Power Reduction (dB)	1g SAR (mW/g)	10g SAR (mW/g)	Notes
Secondary Landscape tilted at 45 degrees	GPRS 2 slots	128	824.2	23.8	5.9			
		190	836.6	23.9	5.9	0.374	0.197	1
		251	848.8	23.9	6.0			

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.

15.2. WCDMA (UMTS BAND V)

Body SAR Bottom Face with Power Reduction Disabled

Test position	Mode	UL Ch No.	f (MHz)	Avg Pwr (dBm)	1g SAR (mW/g)	10g SAR (mW/g)	Notes
Bottom Face	Rel 99 12.2kps RMC	4132	826.4	24.2	1.040	0.636	
		4183	836.6	24.2	1.180	0.720	
		4233	846.6	24.2	0.968	0.589	

Body SAR Secondary LandScape Touch with Power Reduction Enabled

Test position	Mode	UL Ch No.	f (MHz)	Avg Pwr (dBm)	Power Reduction	1g SAR (mW/g)	10g SAR (mW/g)	Notes
Secondary Landscape	Rel 99 12.2kps RMC	4132	826.4	20.1	4.1			
		4183	836.6	20.1	4.1	0.423	0.209	1
		4233	846.6	20.2	4.0			

45 degrees Body SAR Touch with Power Reduction Enabled

Test position	Mode	UL Ch No.	f (MHz)	Avg Pwr (dBm)	Power Reduction	1g SAR (mW/g)	10g SAR (mW/g)	Notes
Secondary Landscape tilted at 45 degrees	Rel 99 12.2kps RMC	4132	826.4	20.1	4.1			
		4183	836.6	20.1	4.1	0.723	0.380	1
		4233	846.6	20.2	4.0			

Notes:
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. 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.
3. 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.

15.3. GPRS1900

Body SAR Bottom Face Touch (GMSK) Power Reduction Disabled

Test position	Mode	Ch No.	f (MHz)	Avg Pwr (dBm)	1g SAR (mW/g)	10g SAR (mW/g)	Notes
Bottom Face	GPRS 2 slots	512	1850.2	28.2	0.954	0.573	
		661	1880.0	28.2	1.320	0.786	
		810	1909.8	28.4	**1.500**	**0.882**	

Body SAR Secondary LandScape Touch with Power Reduction Enabled

Test position	Mode	Ch No.	f (MHz)	Avg Pwr (dBm)	Power Reduction (dB)	1g SAR (mW/g)	10g SAR (mW/g)	Notes
Secondary Landscape	GPRS 2 slots	512	1850.2	22.3	5.9			
		661	1880.0	22.4	5.8	0.432	0.212	1
		810	1909.8	22.6	5.8			

45 degrees Body SAR Touch with Power Reduction Enabled

Test position	Mode	Ch No.	f (MHz)	Avg Pwr (dBm)	Power Reduction (dB)	1g SAR (mW/g)	10g SAR (mW/g)	Notes
	GPRS 2 slots	512	1850.2	22.3	5.9			
		661	1880.0	22.4	5.8			
		810	1909.8	22.6	5.8	0.838	0.369	2

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 test was performed in worst case configuration only

15.4. WCDMA (UMTS BAND II)

Body SAR Bottom Face Power Reduction Disabled

Test position	Mode	UL Ch No.	f (MHz)	Avg Pwr (dBm)	1g SAR (mW/g)	10g SAR (mW/g)	Notes
Bottom Face	Rel 99 12.2kps RMC	9262	1852.4	23.1	0.961	0.608	
		9400	1880.0	23.1	1.170	0.724	
		9538	1907.6	23.1	1.180	0.718	

Body SAR Secondary LandScape Touch with/Power Reduction Enabled

Test position	Mode	UL Ch No.	f (MHz)	Avg Pwr (dBm)	Power Reduction (dB)	1g SAR (mW/g)	10g SAR (mW/g)	Notes
Secondary Landscape	Rel 99 12.2kps RMC	9262	1852.4	19.1	4.0	0.820	0.409	
		9400	1880.0	19.2	3.9	0.824	0.405	
		9538	1907.6	19.2	3.9	0.813	0.395	

45 degrees Body SAR Touch with/Power Reduction Enabled

Test position	Mode	UL Ch No.	f (MHz)	Avg Pwr (dBm)	Power Reduction (dB)	1g SAR (mW/g)	10g SAR (mW/g)	Notes
	Rel 99 12.2kps RMC	9262	1852.4	19.1	4.0			
		9400	1880.0	19.2	3.9	0.952	0.477	1
		9538	1907.6	19.2	3.9			

Notes:
1. SAR test was performed in worst case configuration only.
2. SAR is not required due to antenna-to-top edge's distance is greater than 2.5 cm.
3. 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.
4. 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.

Date: 8/9/2011

Test Laboratory: UL CCS SAR Lab A

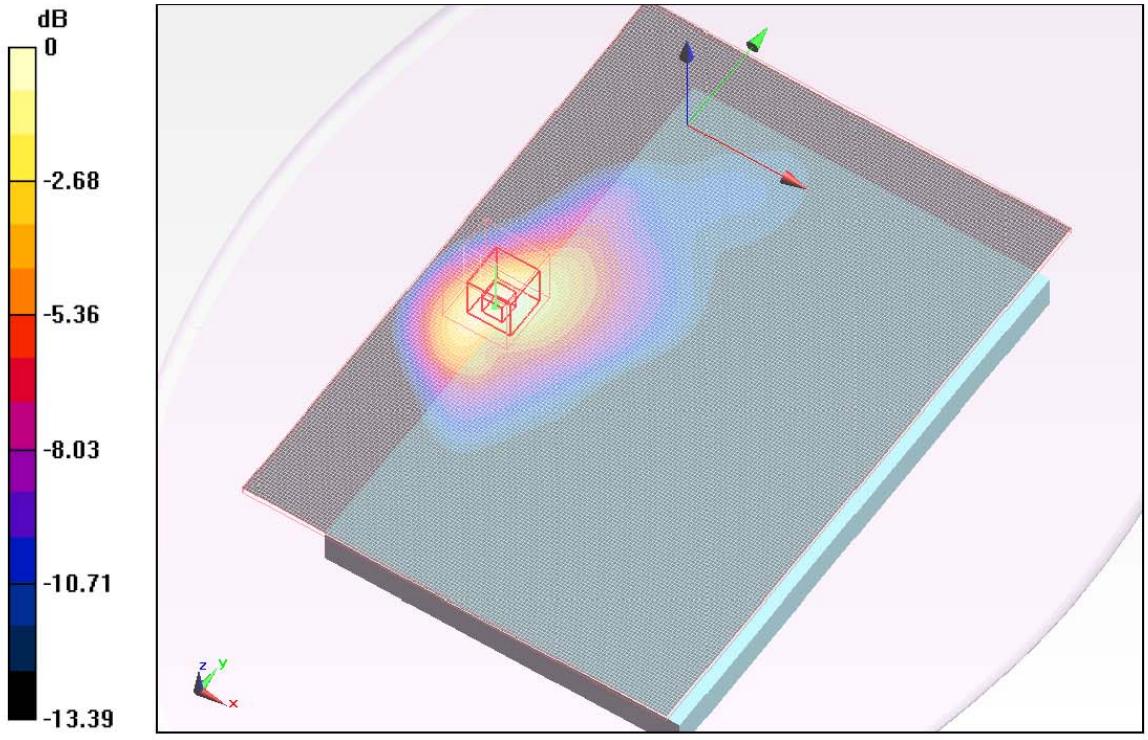
01_Bottom_GPRS850

Communication System: GPRS (GMSK, 2 slots); Frequency: 836.6 MHz; Duty Cycle: 1:4.00037
Medium parameters used (interpolated): f = 836.6 MHz; σ = 1.012 mho/m; ε_r = 54.389; 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: EX3DV4 - SN3686; ConvF(8.78, 8.78, 8.78); Calibrated: 1/24/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1239; Calibrated: 11/17/2010
- Phantom: ELI v4.0(A); Type: QDOVA001BB; Serial: 1119
- Measurement SW: DASY52, Version 52.6 (2);SEMCAD X Version 14.4.5 (3634)

GPRS_2 slots/M-ch/Area Scan (141x201x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.779 mW/g

GPRS_2 slots/M-ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.489 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.013 W/kg
SAR(1 g) = 0.627 mW/g; SAR(10 g) = 0.386 mW/g
Maximum value of SAR (measured) = 0.792 mW/g



0 dB = 0.790mW/g

Date: 8/9/2011

Test Laboratory: UL CCS SAR Lab A

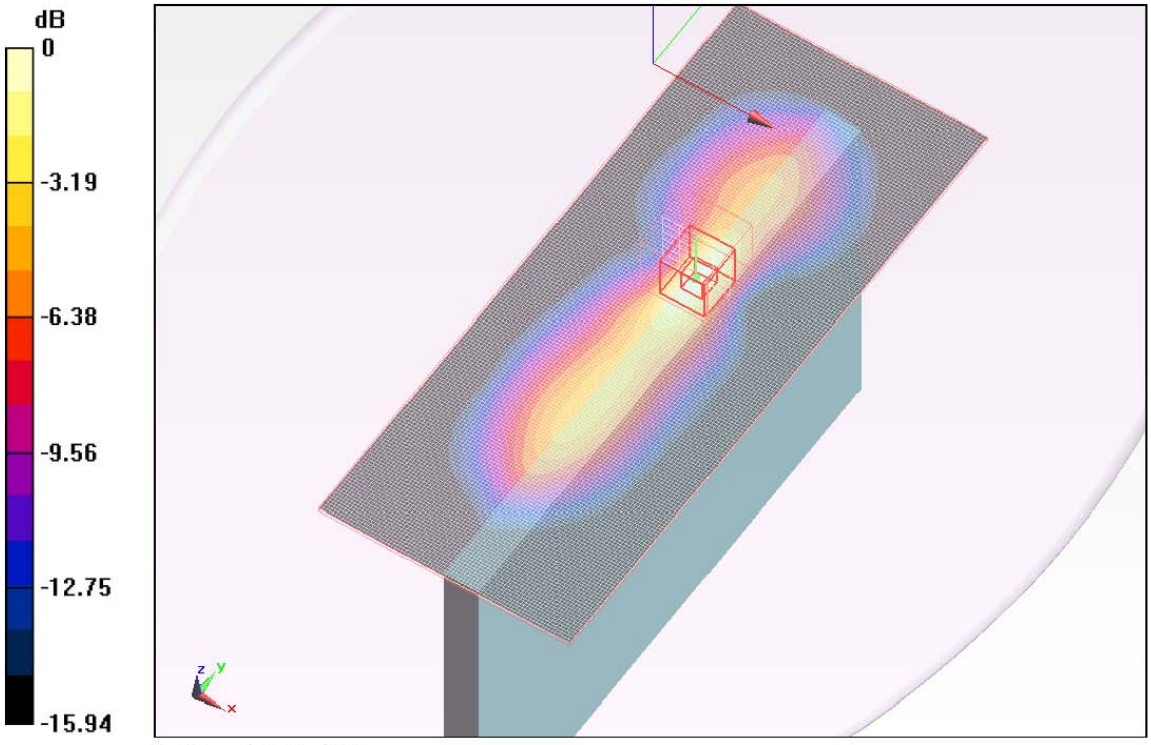
02_Secondary Landscape_GPRS850

Communication System: GPRS (GMSK, 2 slots); Frequency: 836.6 MHz; Duty Cycle: 1:4.00037
Medium parameters used (interpolated): f = 836.6 MHz; σ = 1.012 mho/m; ε_r = 54.389; 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: EX3DV4 - SN3686; ConvF(8.78, 8.78, 8.78); Calibrated: 1/24/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1239; Calibrated: 11/17/2010
- Phantom: ELI v4.0(A); Type: QDOVA001BB; Serial: 1119
- Measurement SW: DASY52, Version 52.6 (2);SEMCAD X Version 14.4.5 (3634)

GPRS_2 slots/M-ch/Area Scan (81x201x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.239 mW/g

GPRS_2 slots/M-ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.475 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.393 W/kg
SAR(1 g) = 0.180 mW/g; SAR(10 g) = 0.090 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.257 mW/g



0 dB = 0.260mW/g

Date: 8/10/2011

Test Laboratory: UL CCS SAR Lab A

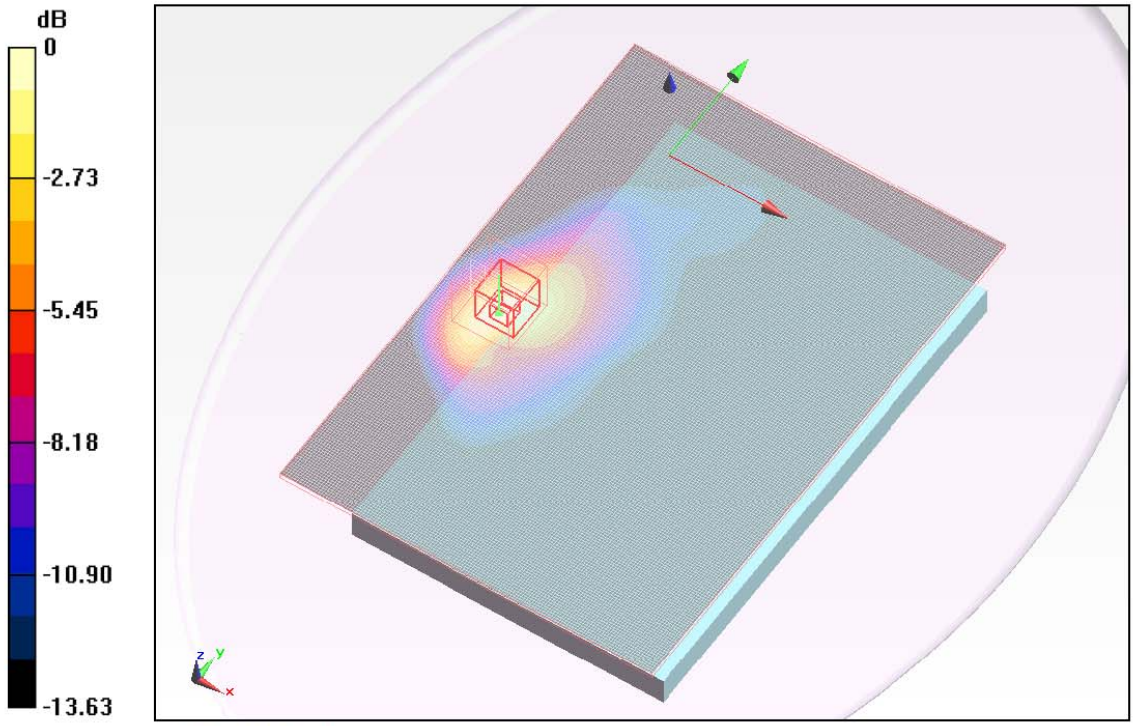
02_Bottom Face_UMTS850_Band V

Communication System: WCDMA (UMTS); Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.989 mho/m; ε_r = 54.969; 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: EX3DV4 - SN3686; ConvF(8.78, 8.78, 8.78); Calibrated: 1/24/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1239; Calibrated: 11/17/2010
- Phantom: ELI v4.0(A); Type: QDOVA001BB; Serial: 1119
- Measurement SW: DASY52, Version 52.6 (2);SEMCAD X Version 14.4.5 (3634)

UMTS/M-ch/Area Scan (141x201x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.421 mW/g

UMTS/M-ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.349 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.919 W/kg
SAR(1 g) = 1.18 mW/g; SAR(10 g) = 0.720 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.483 mW/g



0 dB = 1.480mW/g

Date: 8/11/2011

Test Laboratory: UL CCS SAR Lab A

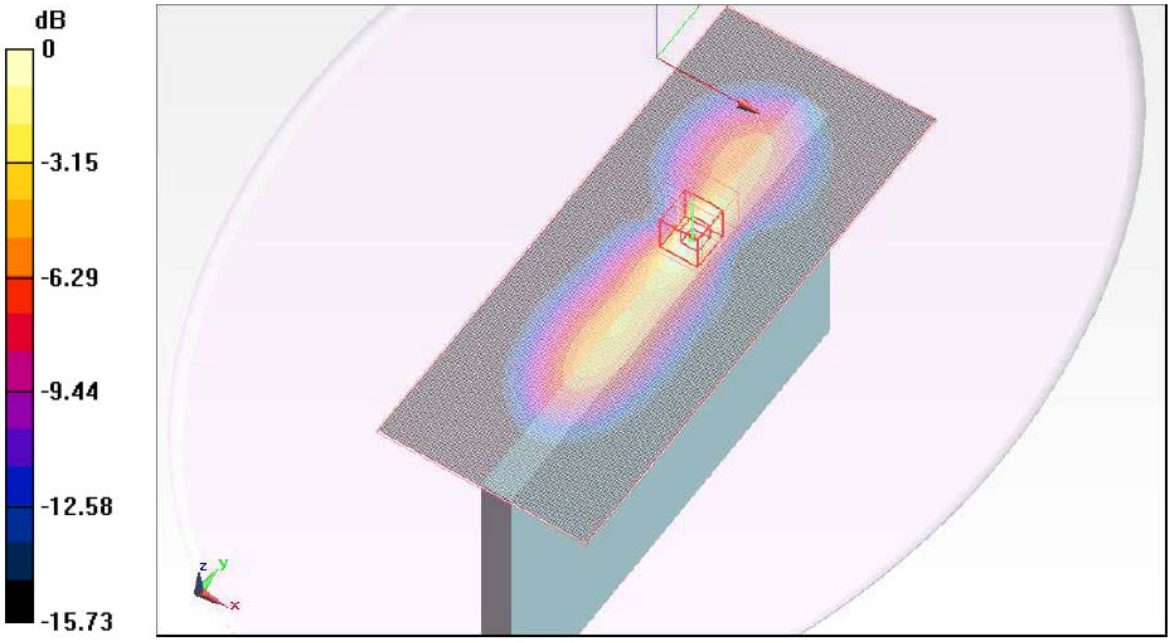
02_Secondary Landscape_UMTS850_Band V

Communication System: WCDMA (UMTS); Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.989 mho/m; ε_r = 54.969; 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: EX3DV4 - SN3686; ConvF(8.78, 8.78, 8.78); Calibrated: 1/24/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1239; Calibrated: 11/17/2010
- Phantom: ELI v4.0(A); Type: QDOVA001BB; Serial: 1119
- Measurement SW: DASY52, Version 52.6 (2);SEMCAD X Version 14.4.5 (3634)

UMTS/M-ch/Area Scan (81x201x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.595 mW/g

UMTS/M-ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.645 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.878 W/kg
SAR(1 g) = 0.423 mW/g; SAR(10 g) = 0.209 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.618 mW/g



0 dB = 0.620mW/g

Date: 8/10/2011

Test Laboratory: UL CCS SAR Lab A

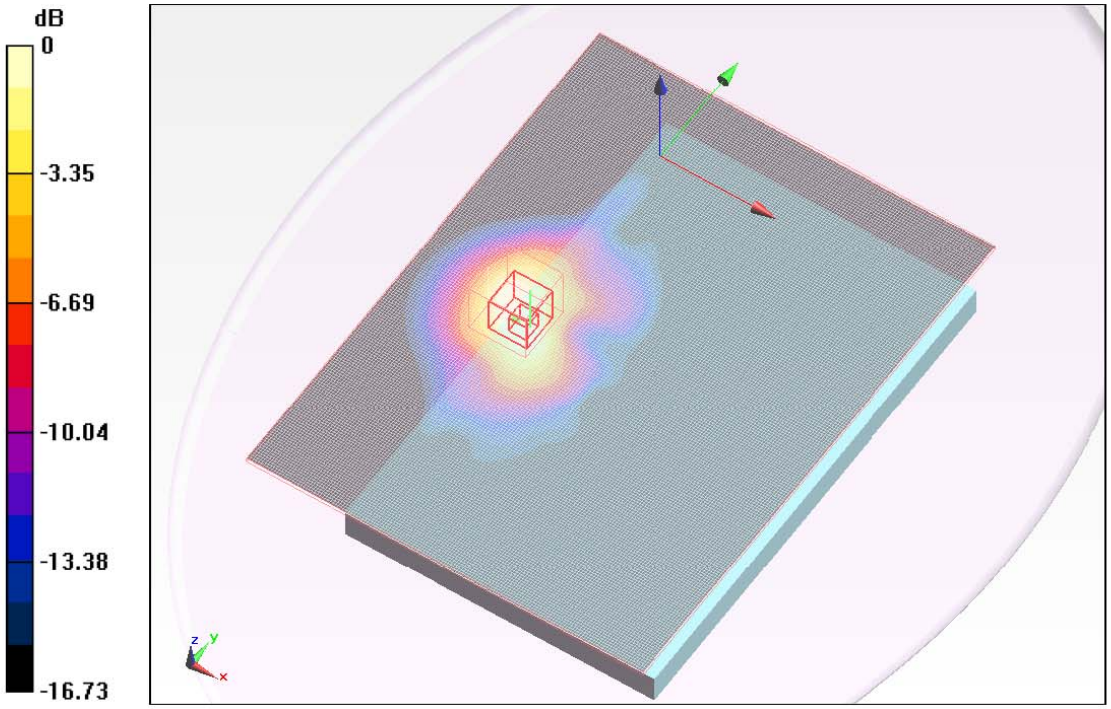
03_Bottom Face_M-ch_GPRS1900

Communication System: GPRS-FDD (TDMA, GMSK, 2 slot); Frequency: 1909.8 MHz ;Duty Cycle: 1:4.00037
Medium parameters used: f = 1910 MHz; σ = 1.568 mho/m; ε_r = 52.372; 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: EX3DV4 - SN3686; ConvF(6.99, 6.99, 6.99); Calibrated: 1/24/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1239; Calibrated: 11/17/2010
- Phantom: ELI v4.0(B); Type: QDOVA001BB; Serial: 1099
- Measurement SW: DASY52, Version 52.6 (2);SEMCAD X Version 14.4.5 (3634)

GPRS_2 slot/H-ch /Area Scan (151x201x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.825 mW/g

GPRS_2 slot/H-ch /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.200 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 2.370 W/kg
SAR(1 g) = 1.5 mW/g; SAR(10 g) = 0.882 mW/g
Maximum value of SAR (measured) = 1.813 mW/g



0 dB = 1.810mW/g

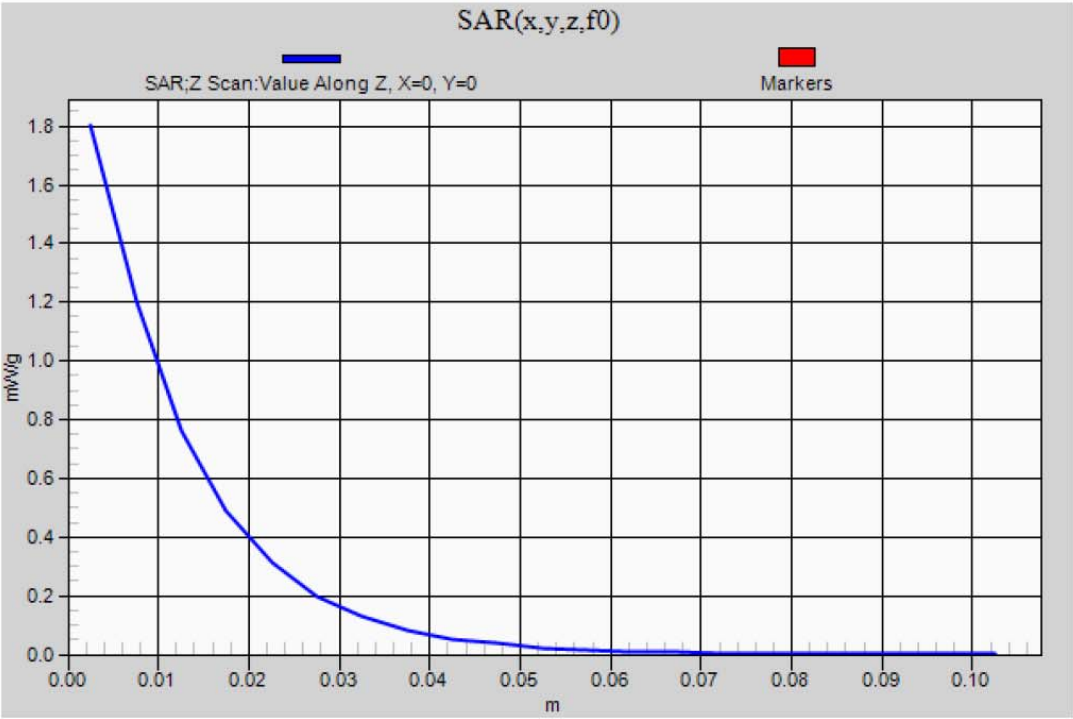
Date: 8/10/2011

Test Laboratory: UL CCS SAR Lab A

03_Bottom Face_M-ch_GPRS1900

Communication System: GPRS-FDD (TDMA, GMSK, 2 slots); Frequency: 1909.8 MHz; Duty Cycle: 1:4.00037

GPRS_2 slots/H-ch /Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 1.802 mW/g



Date: 8/10/2011

Test Laboratory: UL CCS SAR Lab A

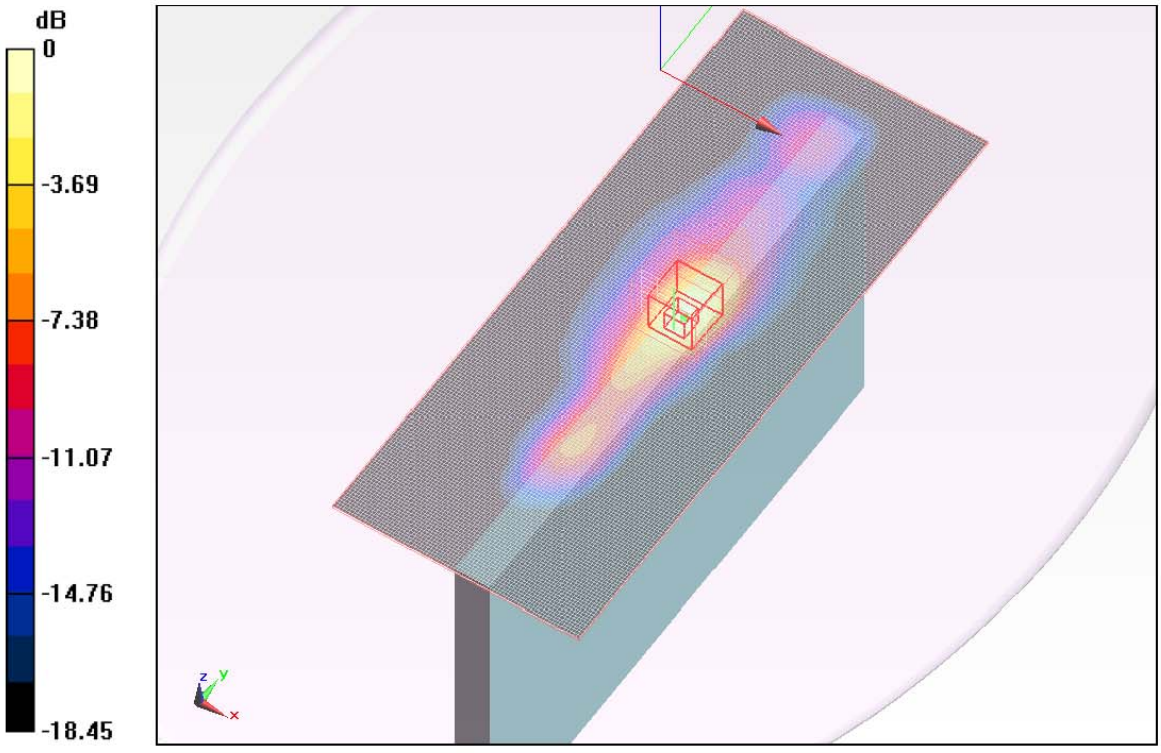
02_Secondary Landscape_GPRS1900

Communication System: GPRS (GMSK, 2 slots); Frequency: 1880 MHz; Duty Cycle: 1:4.00037
Medium parameters used: f = 1880 MHz; σ = 1.533 mho/m; ε_r = 52.471; 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: EX3DV4 - SN3686; ConvF(6.99, 6.99, 6.99); Calibrated: 1/24/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1239; Calibrated: 11/17/2010
- Phantom: ELI v4.0(B); Type: QDOVA001BB; Serial: 1099
- Measurement SW: DASY52, Version 52.6 (2);SEMCAD X Version 14.4.5 (3634)

GPRS_2 slots/M-ch/Area Scan (81x201x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.495 mW/g

GPRS_2 slots/M-ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.029 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 0.845 W/kg
SAR(1 g) = 0.432 mW/g; SAR(10 g) = 0.212 mW/g
Maximum value of SAR (measured) = 0.624 mW/g



0 dB = 0.620mW/g

Date: 8/12/2011

Test Laboratory: UL CCS SAR Lab A

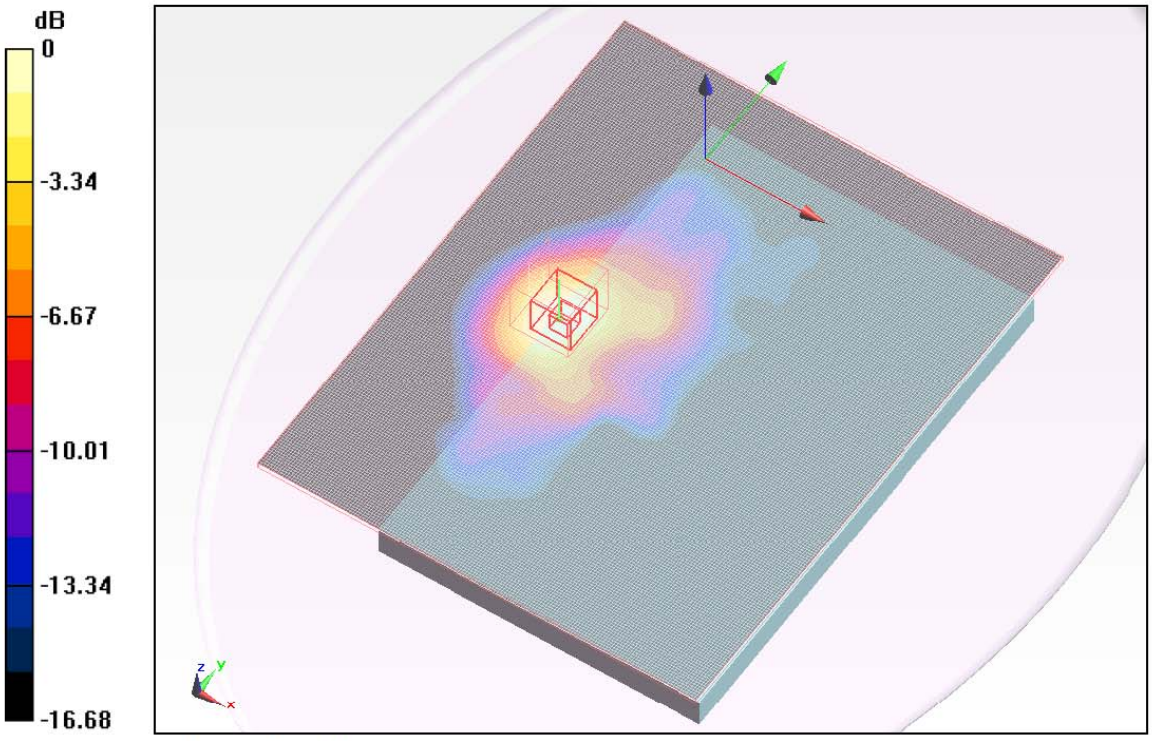
03_Bottom Face_UMTS1900_Band II

Communication System: WCDMA (UMTS); Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1907.6 MHz; σ = 1.556 mho/m; ε_r = 52.164; 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: EX3DV4 - SN3686; ConvF(6.99, 6.99, 6.99); Calibrated: 1/24/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1239; Calibrated: 11/17/2010
- Phantom: ELI v4.0(B); Type: QDOVA001BB; Serial: 1099
- Measurement SW: DASY52, Version 52.6 (2);SEMCAD X Version 14.4.5 (3634)

UMTS/H-ch/Area Scan (161x201x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.558 mW/g

UMTS/H-ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.764 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.799 W/kg
SAR(1 g) = 1.18 mW/g; SAR(10 g) = 0.718 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.411 mW/g



0 dB = 1.410mW/g

Date: 8/12/2011

Test Laboratory: UL CCS SAR Lab A

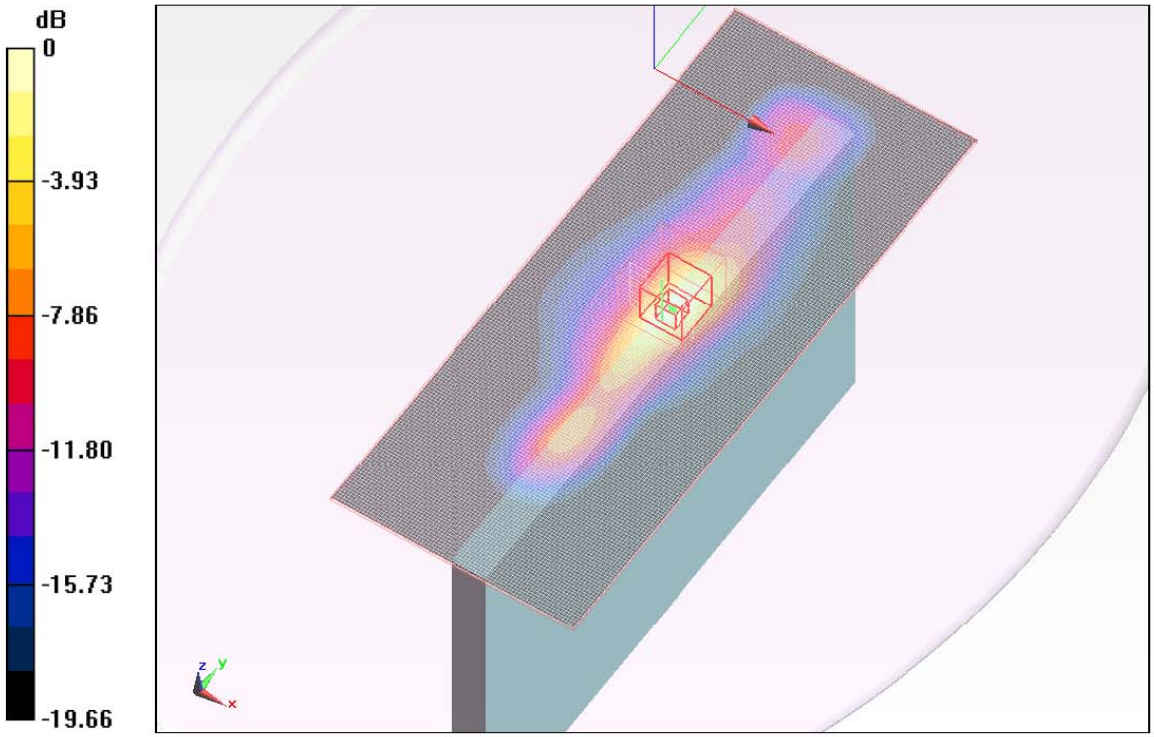
05_Secondary Landscape_UMTS1900_Band II

Communication System: WCDMA (UMTS); Frequency: 1880 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.525 mho/m; ε_r = 52.26; 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: EX3DV4 - SN3686; ConvF(6.99, 6.99, 6.99); Calibrated: 1/24/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1239; Calibrated: 11/17/2010
- Phantom: ELI v4.0(B); Type: QDOVA001BB; Serial: 1099
- Measurement SW: DASY52, Version 52.6 (2);SEMCAD X Version 14.4.5 (3634)

UMTS/M-ch/Area Scan (81x201x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.018 mW/g

UMTS/M-ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.321 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 1.594 W/kg
SAR(1 g) = 0.824 mW/g; SAR(10 g) = 0.405 mW/g
Maximum value of SAR (measured) = 1.152 mW/g



0 dB = 1.150mW/g

16. Appendices

Refer to separate files for the following appendixes

16.1. Appendix A: System check plots

16.2. Appendix B: GPRS 850 test plots

16.3. Appendix C: GPRS 1900 test plots

16.4. Appendix D: UMTS 850 V test plots

16.5. Appendix E: UMTS 1900 II test plots

16.6. Appendix F: Calibration certificate for E-Field Probe EX3DV4 SN 3686

16.7. Appendix G: Calibration Certificate - E-Field Probe EX3DV4 - SN 3772

16.8. Appendix H: Calibration certificate for D835V2 – SN 4d117

16.9. Appendix I Calibration Certificate - Validation Dipole D1900V2 - SN 5d140

16.10. Appendix J_Calibration Certificate - DAE4 - SN 1239