FCC OET BULLETIN 65 SUPPLEMENT C 01-01
IEEE 1528:2003
RSS-102 Issue 4, March 2010,
RSS-102 Supplementary Procedures (SPR)-001, January 1, 2011

Class II Permissive Change

SAR EVALUATION REPORT

For

Gobi3000 PCI Express Mini Card
Tested inside of Fujitsu LifeBook T Series (T901)

MODEL: Gobi3000
FCC ID: N7NMC8355
IC: 2417C-MC8355

REPORT NUMBER: 10U13589-1
ISSUE DATE: February 28, 2011

Prepared for

Fujitsu Australia Ltd.
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Melbourne, Victoria 3004, Australia

Prepared by

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	February 28, 2011	Initial Issue	--

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1. ATTESTATION OF TEST RESULTS

Tested for:	Fujitsu Australia Ltd. 570 St Kilda Road Melbourne, Victoria 3004, Australia		
EUT description:	Gobi3000 PCI Express Mini Card Tested inside of Fujitsu LifeBook T Series (T901)		
Model number:	Gobi3000		
Device category:	Portable		
Exposure category:	General Population/Uncontrolled Exposure		
Date tested:	January 25 - February 10, 2011		
FCC / IC Rule Parts	Freq. Range [MHz]	Highest 1-g SAR (mW/g)	Limit (mW/g)
22H / RSS-132	824 - 849	0.721 (GPRS850) Position: Tablet - Bottom Face	1.6
24E / RSS-133	1850 - 1910	1.46 (UMTS band II) Position: Tablet - Secondary Landscape	
27 / RSS-139	1710 - 1755	1.31 (UMTS band IV) Position: Tablet - Secondary Landscape	
Applicable Standards			Test Results
FCC OET Bulletin 65 Supplement C 01-01, IEEE STD 1528:2003 RSS-102 Issue 4, March 2010, and RSS-102 Supplementary Procedures (SPR)-001, January 1, 2011			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:

Devin Chang
EMC 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 01-01, IEEE Std 1528-2003, RSS-102 Issue 4, March 2010, and RSS-102 Supplementary Procedures (SPR)-001, January 1, 2011 and the following specific FCC Test Procedures.

- KDB 941225 D01 SAR test for 3G devices v02
- KDB 941225 D03 SAR Test Reduction GSM/GPRS/EDGE vo1
- KDB 447498 D01 Mobile Portable RF Exposure v04
- KDB 616217 D03 SAR Supp Note and Netbook Laptop v01

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	3403-91535	N/A		
DASY4 Measurement Server	SPEAG	SEUMS001BA	1041	N/A		
Probe Alignment Unit	SPEAG	LB (V2)	261	N/A		
SAM Phantom (SAM1)	SPEAG	QD000P40CA	1185	N/A		
SAM Phantom (SAM2)	SPEAG	QD000P40CA	1050	N/A		
Oval Flat Phantom (ELI 4.0)	SPEAG	QD OVA001 B	1003	N/A		
Dielectric Probe kit	HP	85070C	N/A	N/A		
ESA Series Network Analyzer	Agilent	E5071B	MY42100131	8	2	2011
Synthesized Signal Generator	HP	83732B	US34490599	7	14	2012
E-Field Probe	SPEAG	EX3DV4	3749	11	13	2011
Thermometer	ERTCO	639-1S	1718	7	19	2011
Data Acquisition Electronics	SPEAG	DAE3 V1	427	7	21	2011
System Validation Dipole	SPEAG	*D835V2	4d002	4	23	2012
System Validation Dipole	SPEAG	*D1800V2	294	11	24	2011
System Validation Dipole	SPEAG	*D1900V2	5d043	11	24	2012
Wireless comunication test set	Agilent	E5515C (8960)	GB46160222	6	17	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		
Simulating Liquid	SPEAG	MSL1800	N/A	Within 24 hrs of first test		
Simulating Liquid	SPEAG	MSL835	N/A	Within 24 hrs of first test		

Note:
*: 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 (test data on file in UL CCS)
4. Impedance is within 5Ω of calibrated measurement (test data on file in UL CCS)

4.2. MEASUREMENT UNCERTAINTY

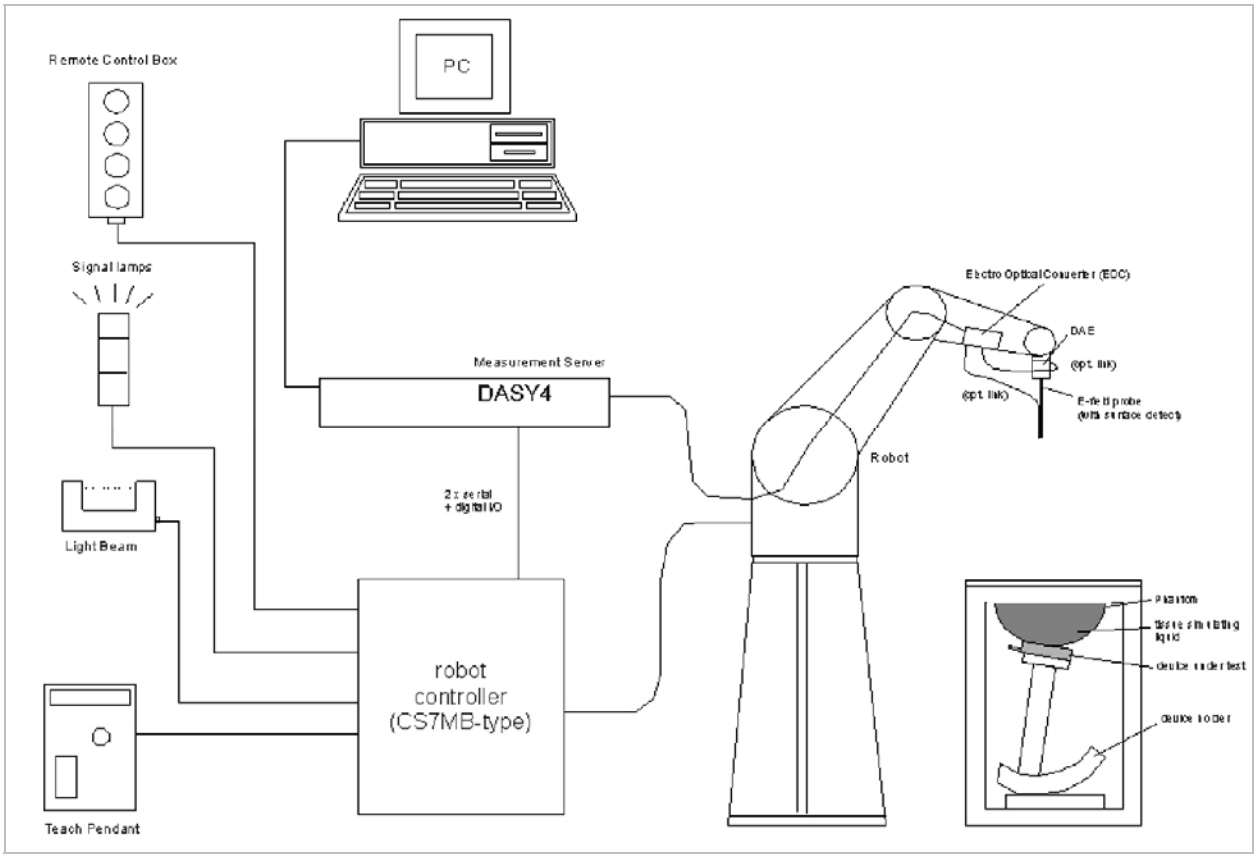
Measurement uncertainty for 300 MHz to 3 GHz averaged over 1 gram

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 1900 MHz)	-2.20	Normal	1	0.64	-1.41
Liquid Permittivity - deviation from target	5.00	Rectangular	1.732	0.6	1.73
Liquid Permittivity - measurement (Body 835 MHz)	-3.20	Normal	1	0.6	-1.92
Combined Standard Uncertainty Uc(y) =					9.74
Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =				19.47	%
Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =				1.55	dB

5. EQUIPMENT UNDER TEST

Gobi3000 PCI Express Mini Card installed into Fujitsu LifeBook T Series (T901) Transmitter: WWAN (UMTS/EVDO combo) Model Number: Gobi3000 Manufacturer: SIERRA WIRELESS INC Network Standard: GSM Release 6 UMTS bands : Band II, IV, V) GSM / EDGE bands: 850 / 1900 MHz (GPRS Multi-slot class: Class 10) 1xEv-Do bands: BC0 850 MHz / BC1 1900 MHz Tested inside of Fujitsu LifeBook T Series (T901), 13.3" LCD	
Normal operation:	Laptop mode (display open at 90° to the keyboard) Tablet bottom face, and Tablet edges - Multiple display orientations supporting both portrait and landscape configurations
WWAN Antenna tested:	Install in Fujitsu LifeBook T Series (T901) Manufactured: NISSEI ELECTRIC Model/Part #: Main: CP519214 (Monopole), AUX: CP519215 (PIFA)
Simultaneous transmission:	WWAN can transmit simultaneously with WiFi and Bluetooth

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

8. SIMULATING LIQUID PARAMETERS

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 just under 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 Head and Body Phantom

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in IEEE Standard 1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and 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)	Head		Body	
	ε_r	σ (S/m)	ε_r	σ (S/m)
150	52.3	0.76	61.9	0.8
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.9	55.2	0.97
900	41.5	0.97	55	1.05
915	41.5	0.98	55	1.06
1450	40.5	1.2	54	1.3
1610	40.3	1.29	53.8	1.4
1800 – 2000	40	1.4	53.3	1.52
2450	39.2	1.8	52.7	1.95
3000	38.5	2.4	52	2.73
5800	35.3	5.27	48.2	6

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

8.1. SIMULATING LIQUID CHECK RESULTS

Simulating Liquid Dielectric Parameters for Body 1900 MHz Measured by: Devin Chang

f (MHz)	Muscle Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
1900	e'	51.726	Relative Permittivity (ε_r):	51.7260	53.3	-2.95	± 5
	e"	14.269	Conductivity (σ):	1.50827	1.52	-0.77	± 5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C; Relative humidity = 42%
January 25 2011 10:34 AM

Frequency	e'	e''
1710000000.	52.3420	13.6479
1720000000.	52.3272	13.6742
1730000000.	52.3122	13.7025
1740000000.	52.2885	13.7407
1750000000.	52.2630	13.7750
1760000000.	52.2287	13.8137
1770000000.	52.1895	13.8607
1780000000.	52.1469	13.9046
1790000000.	52.1004	13.9492
1800000000.	52.0607	13.9939
1810000000.	52.0211	14.0299
1820000000.	51.9828	14.0628
1830000000.	51.9518	14.0961
1840000000.	51.9177	14.1165
1850000000.	51.8870	14.1361
1860000000.	51.8530	14.1578
1870000000.	51.8222	14.1771
1880000000.	51.7885	14.2040
1890000000.	51.7544	14.2365
1900000000.	**51.7260**	**14.2694**
1910000000.	51.6973	14.3105

The conductivity (σ) can be given as:

$$\sigma = \omega \varepsilon_0 e'' = 2 \pi f \varepsilon_0 e''$$

where f = target f * 10^6

$\varepsilon_0 = 8.854 * 10^{-12}$

Simulating Liquid Dielectric Parameters for Body 1900 MHz Measured by: Devin Chang

f (MHz)	Muscle Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
1900	e'	53.902	Relative Permittivity (ε_r):	53.9016	53.3	1.13	± 5
	e"	14.064	Conductivity (σ):	1.48650	1.52	-2.20	± 5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C; Relative humidity = 42%
January 26, 2011 11:06 PM

Frequency	e'	e''
1710000000.	54.2631	13.4907
1720000000.	54.2785	13.5374
1730000000.	54.3174	13.5821
1740000000.	54.3643	13.6250
1750000000.	54.3950	13.6580
1760000000.	54.3961	13.6843
1770000000.	54.3636	13.7022
1780000000.	54.2992	13.7287
1790000000.	54.2103	13.7487
1800000000.	54.1126	13.7773
1810000000.	54.0271	13.8107
1820000000.	53.9633	13.8516
1830000000.	53.9305	13.8991
1840000000.	53.9265	13.9436
1850000000.	53.9472	13.9843
1860000000.	53.9740	14.0178
1870000000.	53.9904	14.0392
1880000000.	53.9869	14.0533
1890000000.	53.9567	14.0583
1900000000.	**53.9016**	**14.0635**
1910000000.	53.8293	14.0766

The conductivity (σ) can be given as:

$$\sigma = \omega \varepsilon_0 e'' = 2 \pi f \varepsilon_0 e''$$

where f = target $f * 10^6$

$\varepsilon_0 = 8.854 * 10^{-12}$

Simulating Liquid Dielectric Parameters for Body 835 MHz Measured by: Devin Chang

f (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
835	e'	53.44	Relative Permittivity (ϵ_r):	53.436	55.2	-3.20	± 5
	e"	21.20	Conductivity (σ):	0.985	0.97	1.53	± 5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C
February 03, 2011 09:01 AM

Frequency	e'	e''
800000000.	53.8007	21.3547
805000000.	53.7530	21.3324
810000000.	53.6960	21.3111
815000000.	53.6444	21.2867
820000000.	53.5873	21.2630
825000000.	53.5341	21.2449
830000000.	53.4851	21.2214
835000000.	**53.4355**	**21.2021**
840000000.	53.3816	21.1803
845000000.	53.3321	21.1617
850000000.	53.2886	21.1380
855000000.	53.2319	21.1213
860000000.	53.1856	21.1000
865000000.	53.1338	21.0796
870000000.	53.0833	21.0577
875000000.	53.0378	21.0410
880000000.	52.9995	21.0265
885000000.	52.9413	21.0036
890000000.	52.8984	20.9865
895000000.	52.8535	20.9697
900000000.	52.8032	20.9509
905000000.	52.7519	20.9306
910000000.	52.7010	20.9139
915000000.	52.6500	20.8967
920000000.	52.6019	20.8806
925000000.	52.5537	20.8620
930000000.	52.5093	20.8411
935000000.	52.4554	20.8291
940000000.	52.4111	20.8080
945000000.	52.3636	20.7944
950000000.	52.3119	20.7744

The conductivity (σ) can be given as:

$$\sigma = \omega \varepsilon_0 e'' = 2 \pi f \varepsilon_0 e''$$

where f = target f * 10^6

$\varepsilon_0 = 8.854 * 10^{-12}$

Simulating Liquid Dielectric Parameters for Body 1900 MHz Measured by: David Lee

f (MHz)	Muscle Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
1900	e'	51.747	Relative Permittivity (ε_r):	51.7470	53.3	-2.91	± 5
	e"	14.089	Conductivity (σ):	1.48919	1.52	-2.03	± 5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C; Relative humidity = 39%
February 04, 2011 08:47 AM

Frequency	e'	e''
1710000000.	52.3984	13.4233
1720000000.	52.3632	13.4516
1730000000.	52.3302	13.4788
1740000000.	52.3040	13.5143
1750000000.	52.2771	13.5480
1760000000.	52.2478	13.5868
1770000000.	52.2195	13.6245
1780000000.	52.1934	13.6647
1790000000.	52.1594	13.7034
1800000000.	52.1270	13.7423
1810000000.	52.0912	13.7791
1820000000.	52.0541	13.8181
1830000000.	52.0140	13.8521
1840000000.	51.9702	13.8897
1850000000.	51.9307	13.9215
1860000000.	51.8915	13.9561
1870000000.	51.8541	13.9903
1880000000.	51.8164	14.0246
1890000000.	51.7791	14.0565
1900000000.	**51.7470**	**14.0889**
1910000000.	51.7120	14.1175

The conductivity (σ) can be given as:

$$\sigma = \omega \varepsilon_0 e'' = 2 \pi f \varepsilon_0 e''$$

where f = target $f * 10^6$

$\varepsilon_0 = 8.854 * 10^{-12}$

Simulating Liquid Dielectric Parameters for Body 835 MHz Measured by: David Lee

f (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
835	e'	54.22	Relative Permittivity (ϵ_r):	54.218	55.2	-1.78	± 5
	e"	21.32	Conductivity (σ):	0.990	0.97	2.10	± 5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C, Relative humidity = 39%
February 08, 2011 08:38 AM

Frequency	e'	e''
800000000.	54.6065	21.4106
805000000.	54.5514	21.4035
810000000.	54.4990	21.3924
815000000.	54.4422	21.3795
820000000.	54.3793	21.3673
825000000.	54.3292	21.3510
830000000.	54.2695	21.3356
835000000.	**54.2178**	**21.3206**
840000000.	54.1602	21.2929
845000000.	54.0989	21.2706
850000000.	54.0410	21.2524
855000000.	53.9748	21.2299
860000000.	53.9059	21.1995
865000000.	53.8331	21.1770
870000000.	53.7698	21.1436
875000000.	53.6901	21.1135
880000000.	53.6208	21.0902
885000000.	53.5470	21.0661
890000000.	53.4817	21.0424
895000000.	53.4192	21.0195
900000000.	53.3655	20.9974
905000000.	53.3164	20.9829
910000000.	53.2790	20.9676
915000000.	53.2454	20.9513
920000000.	53.2090	20.9341
925000000.	53.1680	20.9215
930000000.	53.1383	20.9034
935000000.	53.1197	20.8896
940000000.	53.1006	20.8709
945000000.	53.0787	20.8575
950000000.	53.0524	20.8455

The conductivity (σ) can be given as:

$$\sigma = \omega \varepsilon_0 e'' = 2 \pi f \varepsilon_0 e''$$

where f = target f * 10^6

$\varepsilon_0 = 8.854 * 10^{-12}$

Simulating Liquid Dielectric Parameters for Body 835 MHz Measured by: David Lee

f (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
835	e'	53.96	Relative Permittivity (ϵ_r):	53.955	55.2	-2.26	± 5
	e"	21.16	Conductivity (σ):	0.983	0.97	1.35	± 5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C, Relative humidity = 39%
February 09, 2011 09:25 AM

Frequency	e'	e''
800000000.	54.3170	21.3036
805000000.	54.2673	21.2769
810000000.	54.2192	21.2581
815000000.	54.1621	21.2370
820000000.	54.1123	21.2216
825000000.	54.0649	21.2020
830000000.	54.0104	21.1831
835000000.	**53.9550**	**21.1628**
840000000.	53.9085	21.1395
845000000.	53.8559	21.1288
850000000.	53.8069	21.1124
855000000.	53.7553	21.0951
860000000.	53.7086	21.0770
865000000.	53.6557	21.0582
870000000.	53.6018	21.0378
875000000.	53.5470	21.0221
880000000.	53.4966	21.0040
885000000.	53.4510	20.9864
890000000.	53.4019	20.9723
895000000.	53.3552	20.9597
900000000.	53.3087	20.9470
905000000.	53.2617	20.9287
910000000.	53.2176	20.9182
915000000.	53.1686	20.9032
920000000.	53.1181	20.8939
925000000.	53.0639	20.8803
930000000.	53.0171	20.8658
935000000.	52.9706	20.8583
940000000.	52.9204	20.8456
945000000.	52.8713	20.8305
950000000.	52.8291	20.8212

The conductivity (σ) can be given as:

$$\sigma = \omega \varepsilon_0 e'' = 2 \pi f \varepsilon_0 e''$$

where f = target f * 10^6

$\varepsilon_0 = 8.854 * 10^{-12}$

Simulating Liquid Dielectric Parameters for Body 1900 MHz Measured by: David Lee

f (MHz)	Muscle Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
1900	e'	53.020	Relative Permittivity (ε_r):	53.0201	53.3	-0.53	± 5
	e"	14.146	Conductivity (σ):	1.49520	1.52	-1.63	± 5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C; Relative humidity = 38%
February 10, 2011 09:12 AM

Frequency	e'	e''
1710000000.	53.6633	13.5381
1720000000.	53.6280	13.5612
1730000000.	53.6007	13.5916
1740000000.	53.5689	13.6174
1750000000.	53.5391	13.6510
1760000000.	53.5085	13.6854
1770000000.	53.4766	13.7232
1780000000.	53.4448	13.7635
1790000000.	53.4048	13.8007
1800000000.	53.3708	13.8403
1810000000.	53.3316	13.8782
1820000000.	53.2942	13.9141
1830000000.	53.2539	13.9477
1840000000.	53.2133	13.9753
1850000000.	53.1798	14.0065
1860000000.	53.1472	14.0342
1870000000.	53.1140	14.0618
1880000000.	53.0805	14.0875
1890000000.	53.0498	14.1188
1900000000.	**53.0201**	**14.1458**
1910000000.	52.9879	14.1770

The conductivity (σ) can be given as:

$$\sigma = \omega \varepsilon_0 e'' = 2 \pi f \varepsilon_0 e''$$

where f = target $f * 10^6$

$\varepsilon_0 = 8.854 * 10^{-12}$

Simulating Liquid Dielectric Parameters for Body 1730 MHz Measured by: Devin Chang

f (MHz)	Muscle Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
1730	e'	53.0	Relative Permittivity (ϵ_r):	52.962	53.5	-0.99	± 5
	e"	15.2	Conductivity (σ):	1.459	1.47	-0.73	± 5
1800	e'	53.0	Relative Permittivity (ϵ_r):	52.962	53.3	-0.63	± 5
	e"	15.3	Conductivity (σ):	1.533	1.52	0.87	± 5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C; Relative humidity = 38%
February 10, 2011 11:12 PM

Frequency	e'	e''
1710000000.	52.9842	15.0360
1720000000.	52.9595	15.0866
1730000000.	**52.9619**	**15.1632**
1740000000.	52.9529	15.2453
1750000000.	52.9413	15.3256
1760000000.	52.8631	15.3578
1770000000.	52.7700	15.3517
1780000000.	52.6907	15.3203
1790000000.	52.6339	15.2965
1800000000.	**52.5632**	**15.3108**
1810000000.	52.4858	15.3279
1820000000.	52.3942	15.3432
1830000000.	52.4023	15.3832
1840000000.	52.4082	15.4944
1850000000.	52.3714	15.6205
1860000000.	52.3010	15.6923
1870000000.	52.2230	15.6694
1880000000.	52.2241	15.6107
1890000000.	52.2363	15.5676
1900000000.	52.2296	15.5958
1910000000.	52.1562	15.6004

The conductivity (σ) can be given as:

$$\sigma = \omega \varepsilon_0 e'' = 2 \pi f \varepsilon_0 e''$$

where f = target f * 10^6

$\varepsilon_0 = 8.854 * 10^{-12}$

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 EX3DV3 SN3531 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.

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

System validation dipole	Cal. certificate #	Cal. date	Cal. Freq. (GHz)	SAR Avg (mW/g)		
				Tissue:	Head	Body
D835V2	D835V2-4d002_Apr09	4/23/09	0.835	SAR_{1g}:	9.64	9.96
				SAR_{10g}:	6.28	6.56
D1800V2	D1800V2-294_Nov09	11/1/09	1.8	SAR_{1g}:	39.6	37.7
				SAR_{10g}:	20.9	20.0
D1900V2	D1900V2-5d043_Nov09	11/24/09	1.9	SAR_{1g}:	39.8	40.4
				SAR_{10g}:	20.7	21.4
D2450V2	D2450V2-706_Apr10	4/19/10	2.45	SAR_{1g}:	51.6	52.4
				SAR_{10g}:	24.4	24.5

9.1. SYSTEM CHECK RESULTS

System validation dipole	Date Tested	Measured (Normalized to 1 W)		Target	Delta (%)	Tolerance (%)
		Tissue:	Body			
D1900V2	01/25/11	SAR_{1g}:	39.3	40.4	-2.72	±10
		SAR_{10g}:	20.4	21.4	-4.67	
D1900V2	01/26/11	SAR_{1g}:	38.2	40.4	-5.45	±10
		SAR_{10g}:	20.2	21.4	-5.61	
D835V2	02/03/11	SAR_{1g}:	10.2	9.96	2.41	±10
		SAR_{10g}:	6.67	6.56	1.68	
D1900V2	02/04/11	SAR_{1g}:	39.7	40.4	-1.73	±10
		SAR_{10g}:	20.5	21.4	-4.21	
D835V2	02/08/11	SAR_{1g}:	10.5	9.96	5.42	±10
		SAR_{10g}:	6.88	6.56	4.88	
D835V2	02/09/11	SAR_{1g}:	10.3	9.96	3.41	±10
		SAR_{10g}:	6.78	6.56	3.35	
D1900V2	02/10/11	SAR_{1g}:	38.9	40.4	-3.71	±10
		SAR_{10g}:	20.2	21.4	-5.61	
D1800V2	02/11/11	SAR_{1g}:	39.3	37.7	4.24	±10
		SAR_{10g}:	21.0	20.0	5.00	

SYSTEM CHECK PLOTS

Date/Time: 1/25/2011 2:59:47 PM

Test Laboratory: Compliance Certification Services (UL CCS)

System Performance Check - D1900V2

DUT: Dipole; Type: D1900V2; Serial: 5d043

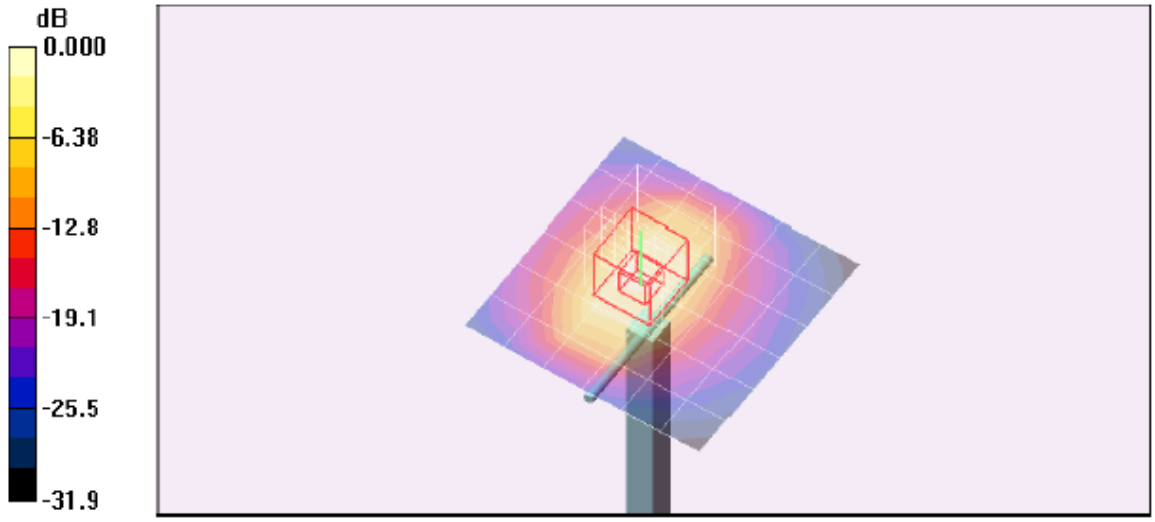
Communication System: System Check Signal - CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.51 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section

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

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3749; ConvF(7.33, 7.33, 7.33); Calibrated: 12/13/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn427; Calibrated: 7/21/2010
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=100mW/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.59 mW/g

d=10mm, Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.8 V/m; Power Drift = 0.403 dB
Peak SAR (extrapolated) = 7.28 W/kg
SAR(1 g) = 3.93 mW/g; SAR(10 g) = 2.04 mW/g
Maximum value of SAR (measured) = 4.97 mW/g



0 dB = 4.97mW/g

Date/Time: 1/25/2011 3:15:43 PM

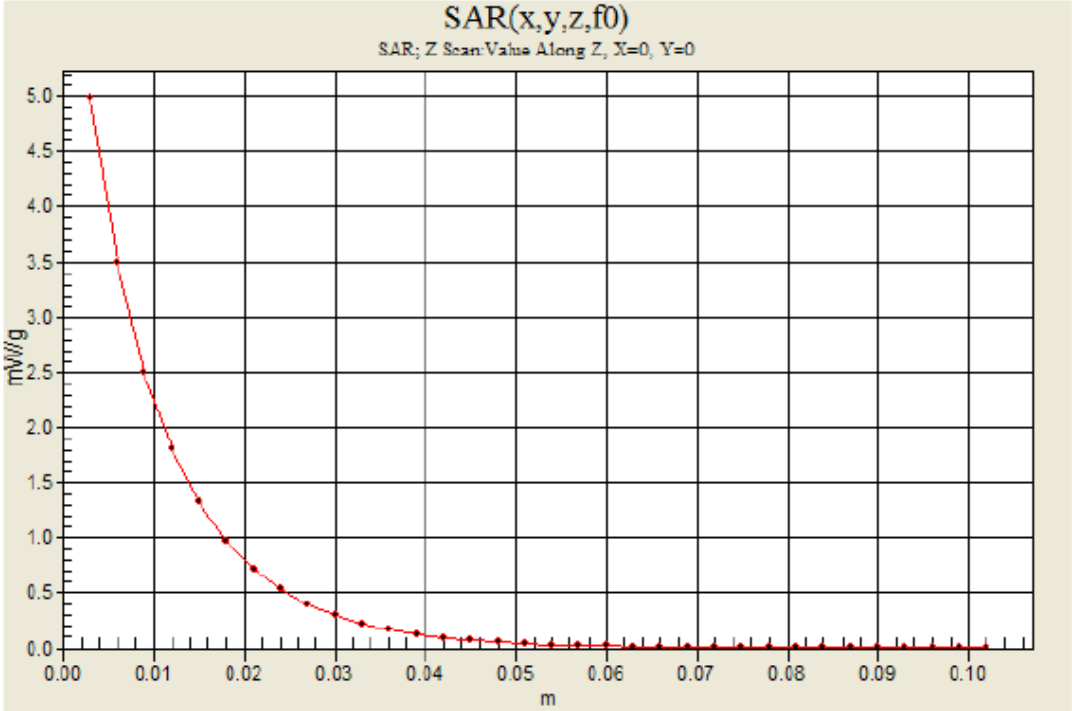
Test Laboratory: Compliance Certification Services (UL CCS)

System Performance Check - D1900V2

DUT: Dipole; Type: D1900V2; Serial: 5d043

Communication System: System Check Signal - CW; Frequency: 1900 MHz;Duty Cycle: 1:1

d=10mm, Pin=100mW/Z Scan (1x1x34): Measurement grid: dx=20mm, dy=20mm, dz=3mm
Maximum value of SAR (measured) = 4.99 mW/g



Date/Time: 1/26/2011 11:52:25 PM

Test Laboratory: Compliance Certification Services (UL CCS)

System Performance Check - D1900V2

DUT: Dipole; Type: D1900V2; Serial: 5d043

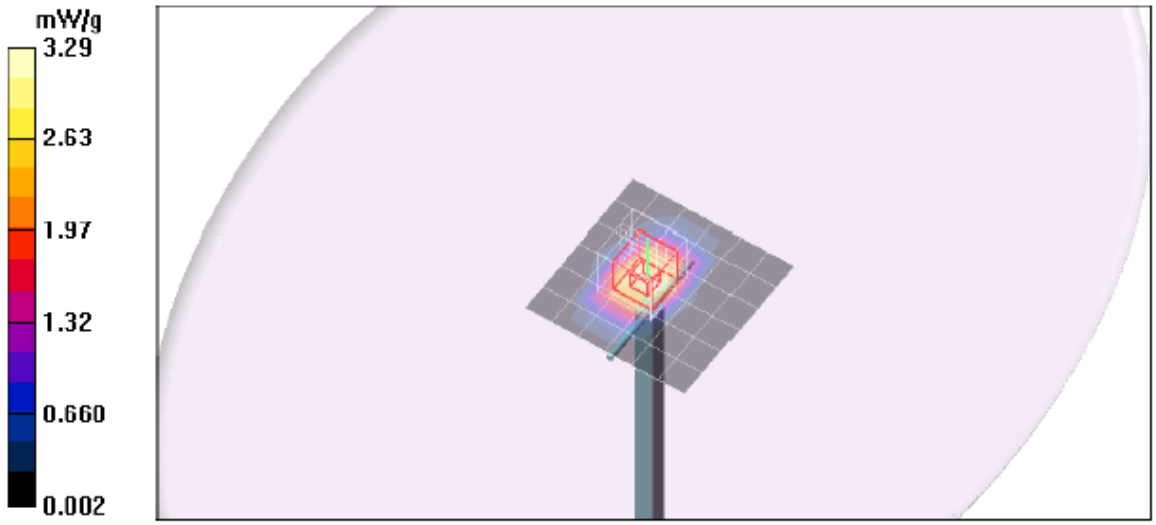
Communication System: System Check Signal - CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.49 mho/m; ε_r = 53.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

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

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3749; ConvF(7.33, 7.33, 7.33); Calibrated: 12/13/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn427; Calibrated: 7/21/2010
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=100mW/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.29 mW/g

d=10mm, Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.8 V/m; Power Drift = 0.237 dB
Peak SAR (extrapolated) = 6.87 W/kg
SAR(1 g) = 3.82 mW/g; SAR(10 g) = 2.02 mW/g
Maximum value of SAR (measured) = 4.81 mW/g



Date/Time: 1/27/2011 12:08:28 AM

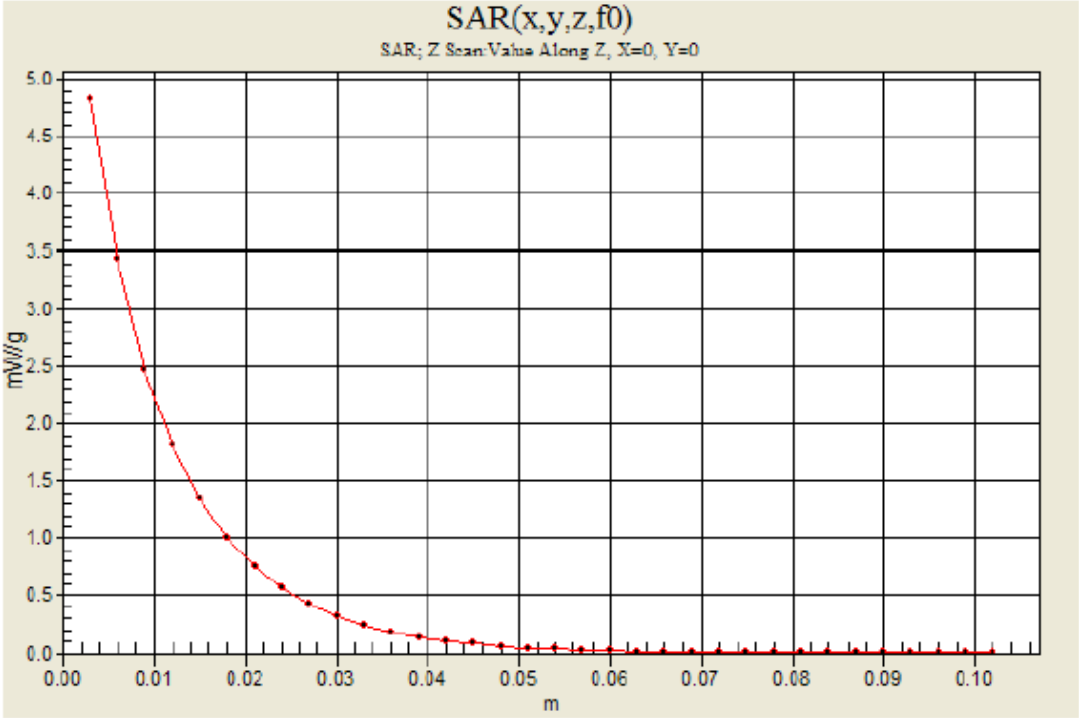
Test Laboratory: Compliance Certification Services (UL CCS)

System Performance Check - D1900V2

DUT: Dipole; Type: D1900V2; Serial: 5d043

Communication System: System Check Signal - CW; Frequency: 1900 MHz;Duty Cycle: 1:1

d=10mm, Pin=100mW/Z Scan (1x1x34): Measurement grid: dx=20mm, dy=20mm, dz=3mm
Maximum value of SAR (measured) = 4.83 mW/g



Date/Time: 2/3/2011 9:11:16 AM

Test Laboratory: Compliance Certification Services (UL CCS)

System Performance Check - D835V2

DUT: D835V2; Type: D835V2; Serial: 4d002

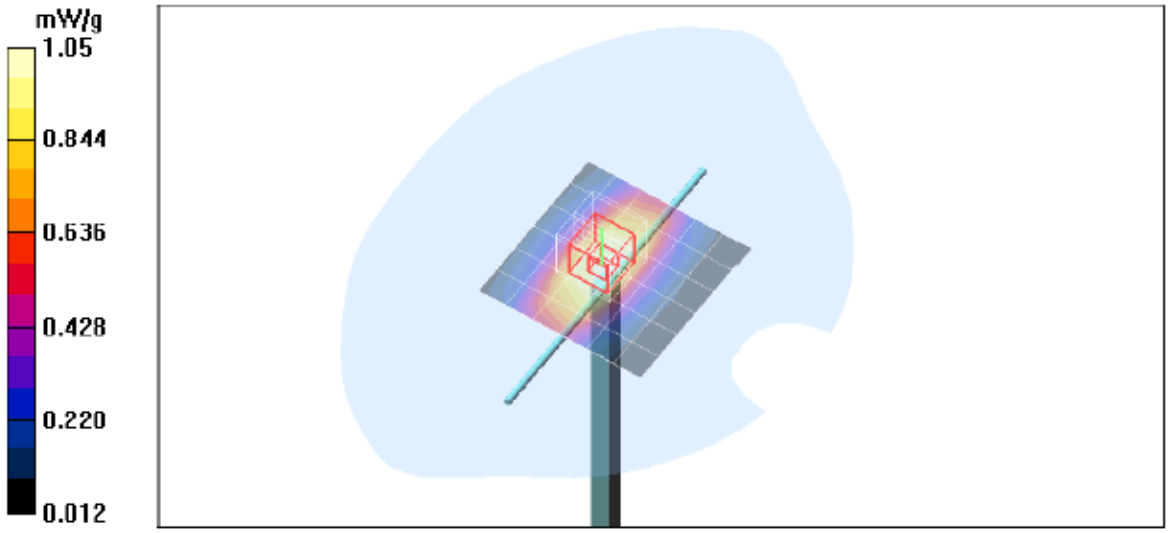
Communication System: System Check Signal - CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.985 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

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

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3749; ConvF(8.79, 8.79, 8.79); Calibrated: 12/13/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn427; Calibrated: 7/21/2010
- Phantom: SAM 2 (Twin); Type: SAM 2; Serial: 1050
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=100mW/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.05 mW/g

d=10mm, Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 34.9 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 1.54 W/kg
SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.667 mW/g
Maximum value of SAR (measured) = 1.19 mW/g



Date/Time: 2/3/2011 9:28:20 AM

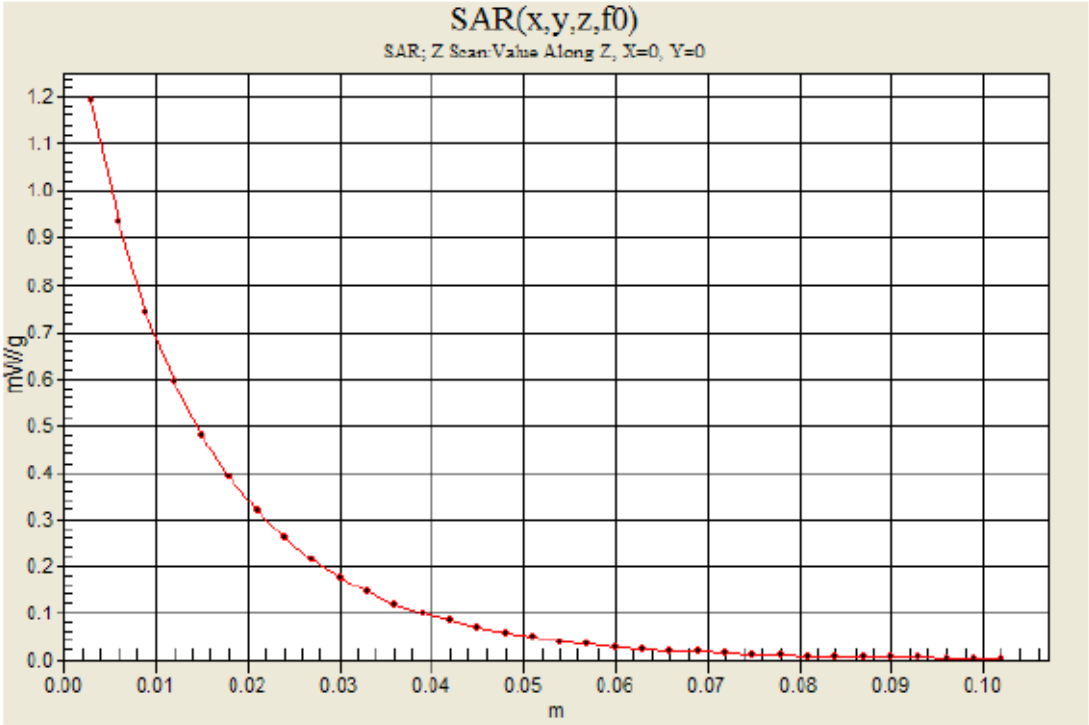
Test Laboratory: Compliance Certification Services (UL CCS)

System Performance Check - D835V2

DUT: D835V2; Type: D835V2; Serial: 4d002

Communication System: System Check Signal - CW; Frequency: 835 MHz;Duty Cycle: 1:1

d=10mm, Pin=100mW/Z Scan (1x1x34): Measurement grid: dx=20mm, dy=20mm, dz=3mm
Maximum value of SAR (measured) = 1.19 mW/g



Date/Time: 2/4/2011 9:24:57 AM

Test Laboratory: Compliance Certification Services (UL CCS)

System Performance Check - D1900V2

DUT: Dipole; Type: D1900V2; Serial: 5d043

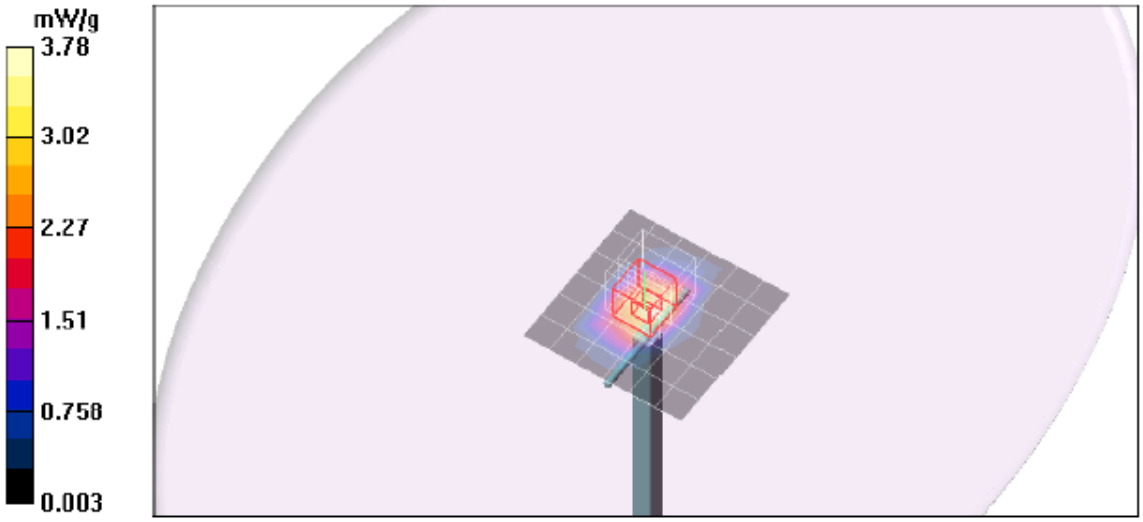
Communication System: System Check Signal - CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.49 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section

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

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3749; ConvF(7.33, 7.33, 7.33); Calibrated: 12/13/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn427; Calibrated: 7/21/2010
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=100mW/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.78 mW/g

d=10mm, Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.3 V/m; Power Drift = -0.002 dB
Peak SAR (extrapolated) = 7.38 W/kg
SAR(1 g) = 3.97 mW/g; SAR(10 g) = 2.05 mW/g
Maximum value of SAR (measured) = 5.06 mW/g



Date/Time: 2/4/2011 9:40:45 AM

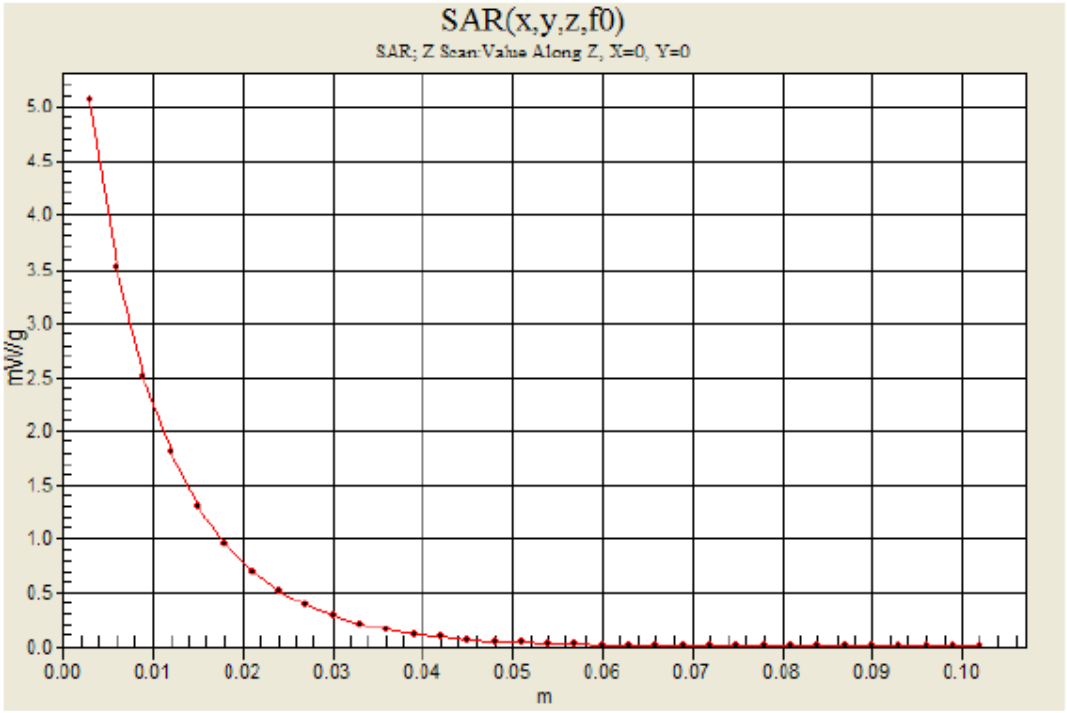
Test Laboratory: Compliance Certification Services (UL CCS)

System Performance Check - D1900V2

DUT: Dipole; Type: D1900V2; Serial: 5d043

Communication System: System Check Signal - CW; Frequency: 1900 MHz;Duty Cycle: 1:1

d=10mm, Pin=100mW/Z Scan (1x1x34): Measurement grid: dx=20mm, dy=20mm, dz=3mm
Maximum value of SAR (measured) = 5.07 mW/g



Date/Time: 2/8/2011 9:00:57 AM

Test Laboratory: Compliance Certification Services (UL CCS)

System Performance Check - D835V2

DUT: D835V2; Type: D835V2; Serial: 4d002

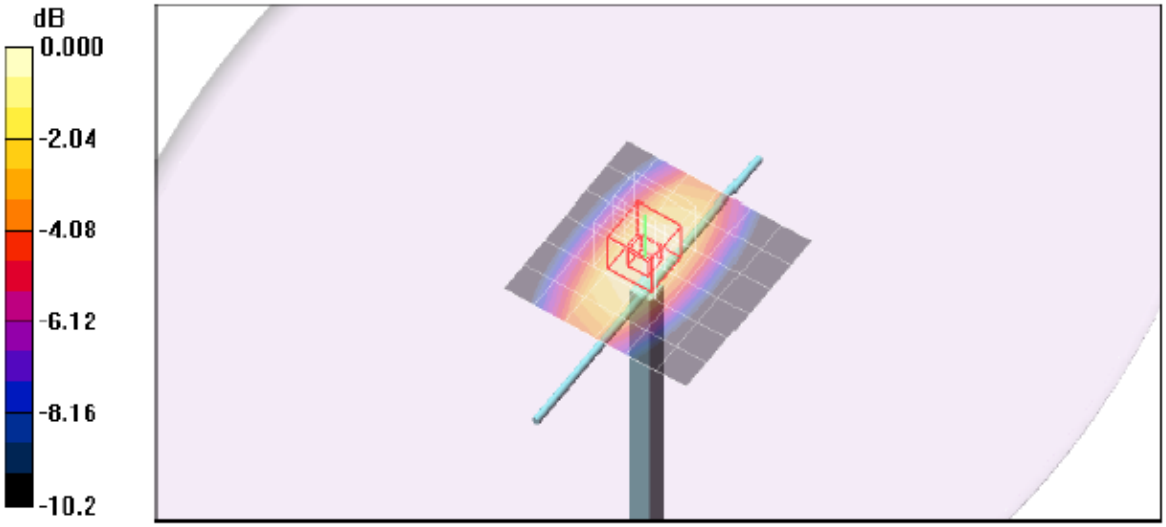
Communication System: System Check Signal - CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.99 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

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

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3749; ConvF(8.79, 8.79, 8.79); Calibrated: 12/13/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn427; Calibrated: 7/21/2010
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=100mW/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.11 mW/g

d=10mm, Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 35.4 V/m; Power Drift = -0.051 dB
Peak SAR (extrapolated) = 1.57 W/kg
SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.688 mW/g
Maximum value of SAR (measured) = 1.22 mW/g



0 dB = 1.22mW/g

Date/Time: 2/8/2011 9:16:59 AM

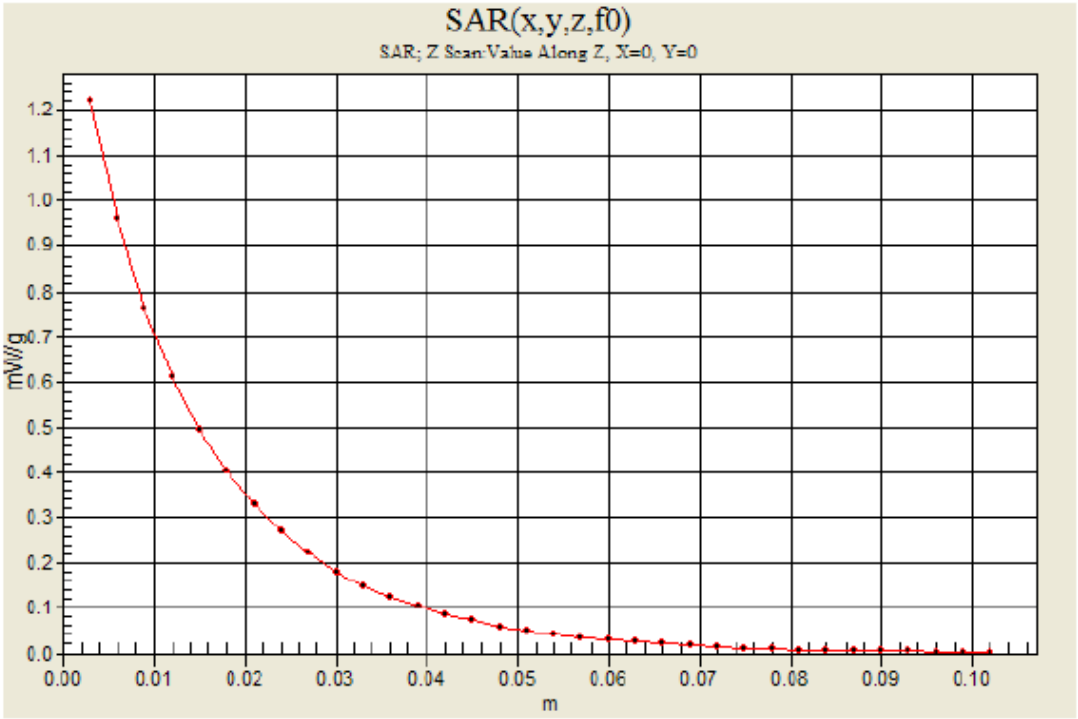
Test Laboratory: Compliance Certification Services (UL CCS)

System Performance Check - D835V2

DUT: D835V2; Type: D835V2; Serial: 4d002

Communication System: System Check Signal - CW; Frequency: 835 MHz;Duty Cycle: 1:1

d=10mm, Pin=100mW/Z Scan (1x1x34): Measurement grid: dx=20mm, dy=20mm, dz=3mm
Maximum value of SAR (measured) = 1.22 mW/g



Date/Time: 2/9/2011 9:43:58 AM

Test Laboratory: Compliance Certification Services (UL CCS)

System Performance Check - D835V2

DUT: D835V2; Type: D835V2; Serial: 4d002

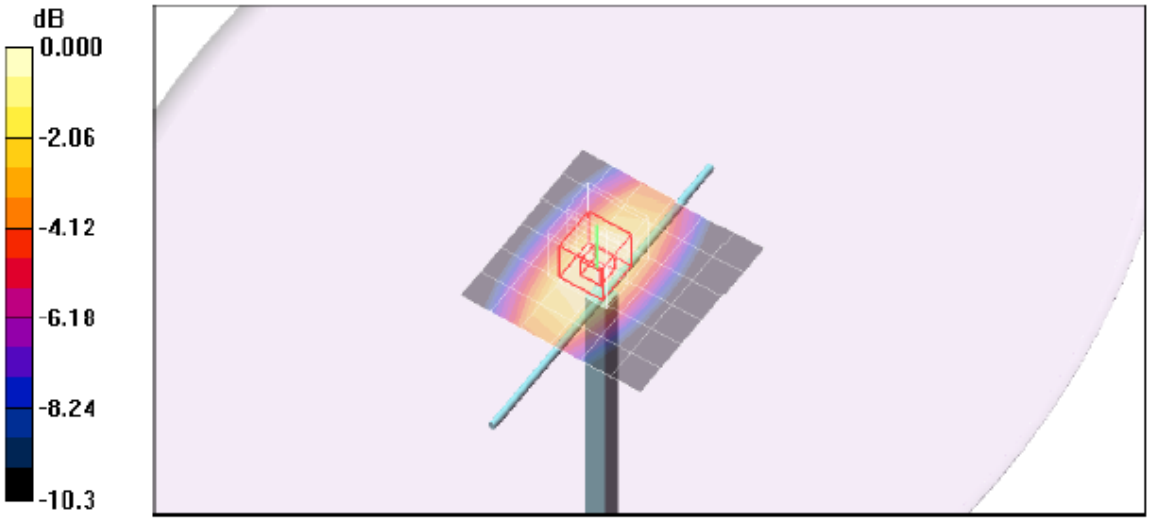
Communication System: System Check Signal - CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.983 mho/m; ε_r = 54; ρ = 1000 kg/m^3
Phantom section: Flat Section

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

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3749; ConvF(8.79, 8.79, 8.79); Calibrated: 12/13/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn427; Calibrated: 7/21/2010
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=100mW/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.07 mW/g

d=10mm, Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 35.1 V/m; Power Drift = 0.016 dB
Peak SAR (extrapolated) = 1.54 W/kg
SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.678 mW/g
Maximum value of SAR (measured) = 1.20 mW/g



0 dB = 1.20mW/g

Date/Time: 2/9/2011 10:00:01 AM

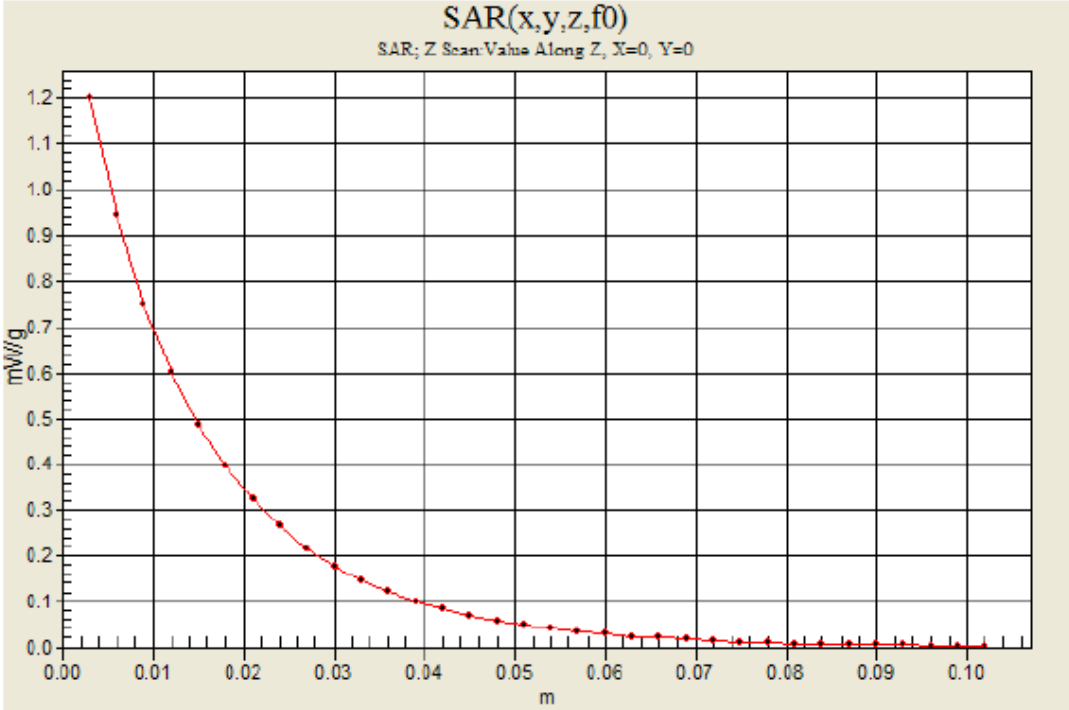
Test Laboratory: Compliance Certification Services (UL CCS)

System Performance Check - D835V2

DUT: D835V2; Type: D835V2; Serial: 4d002

Communication System: System Check Signal - CW; Frequency: 835 MHz;Duty Cycle: 1:1

d=10mm, Pin=100mW/Z Scan (1x1x34): Measurement grid: dx=20mm, dy=20mm, dz=3mm
Maximum value of SAR (measured) = 1.20 mW/g



Date/Time: 2/10/2011 9:41:15 AM

Test Laboratory: Compliance Certification Services (UL CCS)

System Performance Check - D1900V2

DUT: Dipole; Type: D1900V2; Serial: 5d043

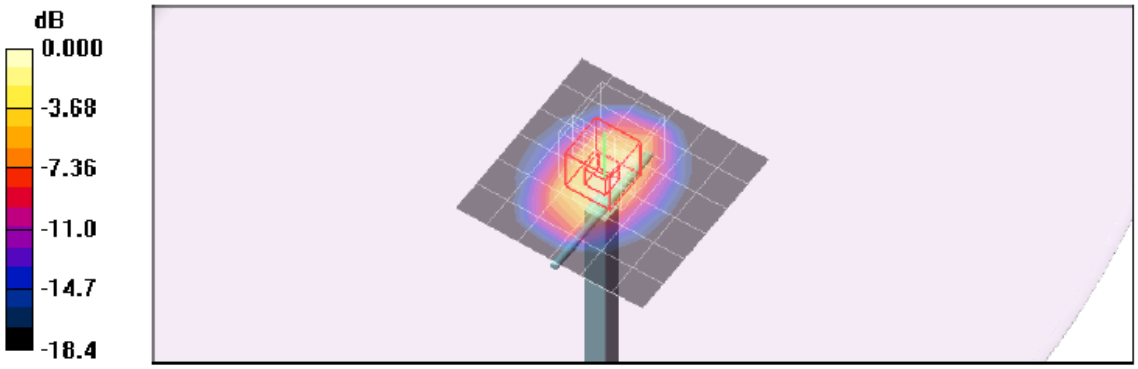
Communication System: System Check Signal - CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.5 mho/m; ε_r = 53; ρ = 1000 kg/m^3
Phantom section: Flat Section

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

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3749; ConvF(7.33, 7.33, 7.33); Calibrated: 12/13/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn427; Calibrated: 7/21/2010
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=100mW/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 4.07 mW/g

d=10mm, Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.7 V/m; Power Drift = -0.162 dB
Peak SAR (extrapolated) = 7.17 W/kg
SAR(1 g) = 3.89 mW/g; SAR(10 g) = 2.02 mW/g
Maximum value of SAR (measured) = 4.94 mW/g



0 dB = 4.94mW/g

Date/Time: 2/10/2011 9:57:05 AM

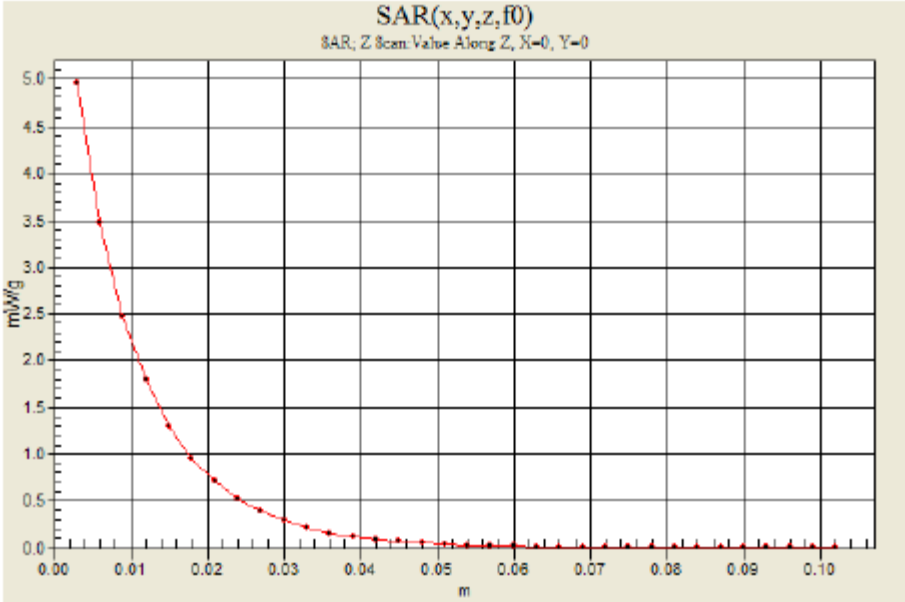
Test Laboratory: Compliance Certification Services (UL CCS)

System Performance Check - D1900V2

DUT: Dipole; Type: D1900V2; Serial: 5d043

Communication System: System Check Signal - CW; Frequency: 1900 MHz;Duty Cycle: 1:1

d=10mm, Pin=100mW/Z Scan (1x1x34): Measurement grid: dx=20mm, dy=20mm, dz=3mm
Maximum value of SAR (measured) = 4.95 mW/g



Date/Time: 2/11/2011 12:01:54 AM

Test Laboratory: Compliance Certification Services (UL CCS)

System Performance Check D1800V2

DUT: Dipole; Type: D1800V2; Serial: 294

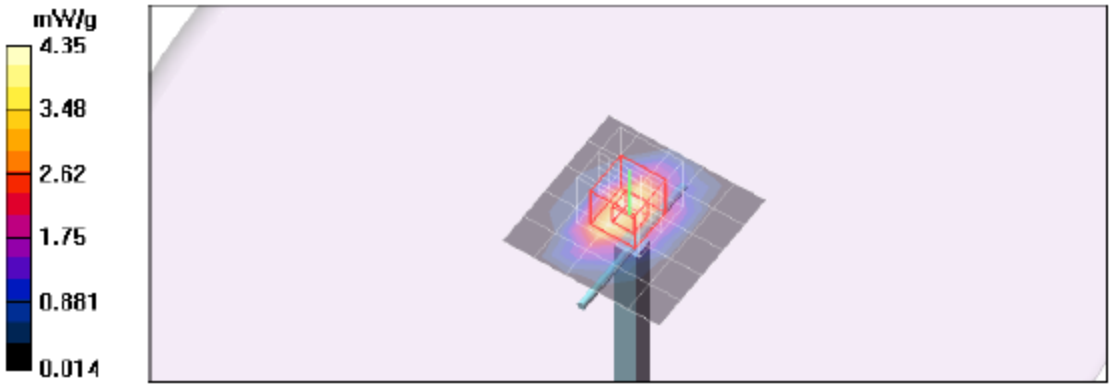
Communication System: System Check Signal - CW; Frequency: 1800 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1800 MHz; σ = 1.53 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

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

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3749; ConvF(7.51, 7.51, 7.51); Calibrated: 12/13/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn427; Calibrated: 7/21/2010
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm; Pin=250mW/Area Scan (6x6x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 4.35 mW/g

d=10mm; Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.3 V/m; Power Drift = -0.156 dB
Peak SAR (extrapolated) = 6.99 W/kg
SAR(1 g) = 3.93 mW/g; SAR(10 g) = 2.1 mW/g
Maximum value of SAR (measured) = 4.96 mW/g



Date/Time: 2/11/2011 12:16:45 AM

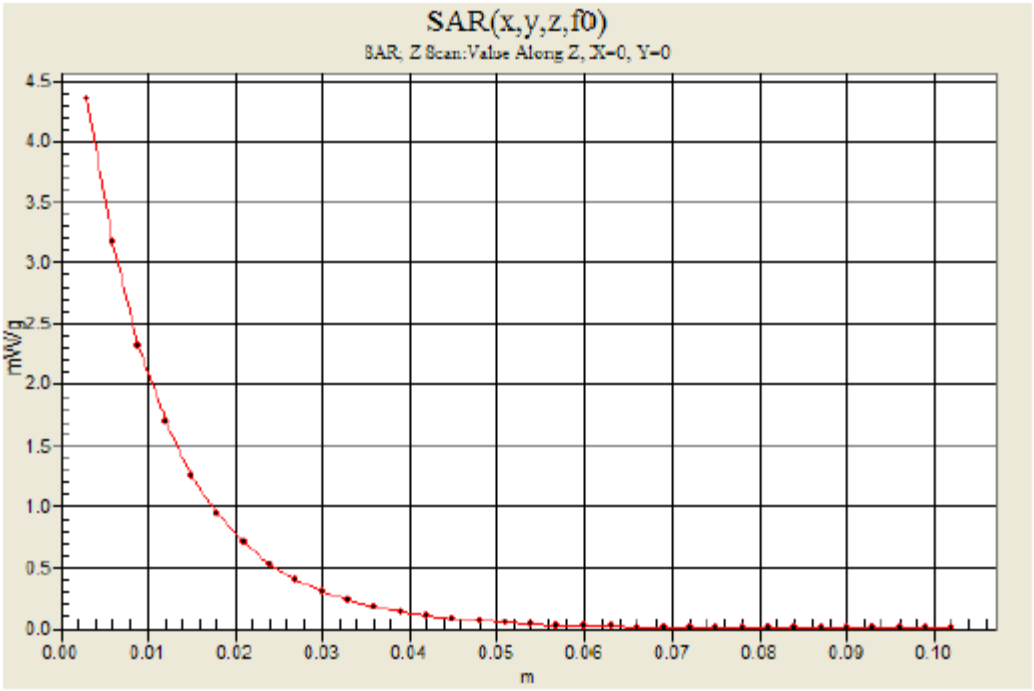
Test Laboratory: Compliance Certification Services (UL CCS)

System Performance Check D1800V2

DUT: Dipole; Type: D1800V2; Serial: 294

Communication System: System Check Signal - CW; Frequency: 1800 MHz;Duty Cycle: 1:1

d=10mm; Pin=250mW/Z Scan (1x1x34): Measurement grid: dx=20mm, dy=20mm, dz=3mm
Maximum value of SAR (measured) = 4.36 mW/g



10. SAR MEASUREMENT 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 (for example, 1.2 mm for an EX3DV3 probe type).

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 DASY4 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, EN 50361 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 ≥ 7 x 7 x 9 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. RF OUTPUT POWER VERIFICATION

11.1. GPRS & EGPRS

GPRS (GMSK) - Coding Scheme: CS1

Band	Ch No.	f (MHz)	Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slot	Frame Avg Pwr
GSM850	128	824.2	32.8	23.8	32.9	**26.9**
	190	836.6	32.9	23.9	32.9	**26.9**
	251	848.8	32.9	23.9	32.9	**26.9**
GSM1900	512	1850.2	30.3	21.3	30.4	**24.4**
	661	1880.0	30.4	21.4	30.4	**24.4**
	810	1909.8	30.2	21.2	30.3	**24.3**

EGPRS (8PSK) - Coding Scheme: MCS5

Band	Ch No.	f (MHz)	Avg burst Pwr (dBm)			
			1 slot	Frame Avg Pwr	2 slot	Frame Avg Pwr
GSM850	128	824.2	27.3	18.3	27.3	21.3
	190	836.6	27.4	18.4	27.4	21.4
	251	848.8	27.3	18.3	27.3	21.3
GSM1900	512	1850.2	26.3	17.3	26.4	20.4
	661	1880.0	26.4	17.4	26.4	20.4
	810	1909.8	26.4	17.4	26.4	20.4

Note: 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

11.2. 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 (12.2kbps RMC)

Band	Mode	UL Ch No.	DL Ch No.	f (MHz)	Avg Pwr (dBm)
UMTS band V	Rel 99 12.2kbps RMC	4132	4357	826.4	24.4
		4182	4407	836.4	24.6
		4233	4458	846.6	24.5
UMTS band IV	Rel 99 12.2kps RMC	1312	1537	1712.4	24.3
		1427	1652	1735.4	24.5
		1513	1738	1754.0	24.6
UMTS band II	Rel 99 12.2kbps RMC	9262	9662	1852.4	24.5
		9400	9800	1880.0	24.8
		9538	9938	1907.6	23.9

HSDPA

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

	Mode	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
	MPR (dB)	0	0	0.5	0.5
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 Pwr (dBm)
UMTS band V	Subtest 1	4132	4357	826.4	24.5
		4182	4407	836.4	24.6
		4233	4458	846.6	24.5
	Subtest 2	4132	4357	826.4	24.5
		4182	4407	836.4	24.6
		4233	4458	846.6	24.5
	Subtest 3	4132	4357	826.4	24.0
		4182	4407	836.4	24.1
		4233	4458	846.6	23.9
	Subtest 4	4132	4357	826.4	23.9
		4182	4407	836.4	24.0
		4233	4458	846.6	23.8
UMTS band IV	Subtest 1	4132	4357	826.4	24.3
		4182	4407	836.4	24.4
		4233	4458	846.6	24.3
	Subtest 2	4132	4357	826.4	24.3
		4182	4407	836.4	24.4
		4233	4458	846.6	24.3
	Subtest 3	4132	4357	826.4	23.8
		4182	4407	836.4	23.9
		4233	4458	846.6	23.7
	Subtest 4	4132	4357	826.4	23.7
		4182	4407	836.4	23.8
		4233	4458	846.6	23.6
UMTS band II	Subtest 1	9262	9662	1852.4	24.4
		9400	9800	1880.0	24.5
		9538	9938	1907.6	24.0
	Subtest 2	9262	9662	1852.4	24.1
		9400	9800	1880.0	24.5
		9538	9938	1907.6	23.6
	Subtest 3	9262	9662	1852.4	23.9
		9400	9800	1880.0	24.0
		9538	9938	1907.6	24.5
	Subtest 4	9262	9662	1852.4	23.9
		9400	9800	1880.0	24.0
		9538	9938	1907.6	23.5

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% (1.2 W/kg) of the SAR limit.

HSPA (HSDPA & HSUPA)

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

	Mode	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 HSDPA/HSUPA

Band	Mode	UL Ch No.	DL Ch No.	f (MHz)	Avg Tx Pwr (dBm)
UMTS band V	Subtest 1	4132	4357	826.4	23.8
		4182	4407	836.4	23.9
		4233	4458	846.6	23.6
	Subtest 2	4132	4357	826.4	22.0
		4182	4407	836.4	22.1
		4233	4458	846.6	21.8
	Subtest 3	4132	4357	826.4	23.0
		4182	4407	836.4	23.1
		4233	4458	846.6	22.8
	Subtest 4	4132	4357	826.4	22.1
		4182	4407	836.4	22.2
		4233	4458	846.6	21.9
	Subtest 5	4132	4357	826.4	23.6
		4182	4407	836.4	23.7
		4233	4458	846.6	23.8
UMTS band IV	Subtest 1	1312	1537	1712.4	24.2
		1412	1637	1732.4	24.0
		1513	1738	1754.0	24.0
	Subtest 2	1312	1537	1712.4	22.8
		1412	1637	1732.4	22.7
		1513	1738	1754.0	22.7
	Subtest 3	1312	1537	1712.4	23.1
		1412	1637	1732.4	23.3
		1513	1738	1754.0	23.2
	Subtest 4	1312	1537	1712.4	22.8
		1412	1637	1732.4	22.5
		1513	1738	1754.0	22.6
	Subtest 5	1312	1537	1712.4	23.8
		1412	1637	1732.4	23.9
		1513	1738	1754.0	23.8
UMTS band II	Subtest 1	9262	9662	1852.4	23.9
		9400	9800	1880.0	23.8
		9538	9938	1907.6	23.6
	Subtest 2	9262	9662	1852.4	22.1
		9400	9800	1880.0	22.0
		9538	9938	1907.6	21.8
	Subtest 3	9262	9662	1852.4	23.0
		9400	9800	1880.0	22.9
		9538	9938	1907.6	22.8
	Subtest 4	9262	9662	1852.4	22.2
		9400	9800	1880.0	22.1
		9538	9938	1907.6	21.9
	Subtest 5	9262	9662	1852.4	23.8
		9400	9800	1880.0	23.7
		9538	9938	1907.6	23.6

Note: KDB 941225 D01, Body SAR is not required for device 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.

11.3. CDMA2000

1xRTT

Maximum output power is verified on the Low, Middle and High channels according to procedures in section 4.4.5.2 of 3GPP2 C.S0011/TIA-98-E for 1xRTT.

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

Application	Rev, License
CDMA2000 Mobile Test	B.15.18

- Protocol Rev > 6 (IS-2000-0)
- System ID: 2004; NID: 65535 (Cell & PCS); Reg. Ch. #.: 283/384 (Cell) & 325 (PCS)
- Radio Config (RC) > Please see following table for details
- FCH Service Option (SO) Setup > Please see following table or details
- Traffic Data Rate > Full
- TDSO SCH Info > F-SCH Parameters > F-SCH Data Rate > 153.6 kbps
  > R-SCH Parameters > R-SCH Data Rate > 153.6 kbps
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

Cellular Band

Radio Configuration (RC)	Service Option (SO)	Conducted Output Power (dBm)					
		Ch. 1013 / 824.7MHz		Ch. 384 / 836.52 MHz		Ch. 777 / 848.31 MHz	
		Average	Peak	Average	Peak	Average	Peak
RC1	2 (Loopback)	24.6		24.3		24.4	
	55 (Loopback)	24.6		24.6		24.5	
RC2	9 (Loopback)	24,52		24.6		24.5	
	55 (Loopback)	24.6		24.7		24.5	
RC3	55 (Loopback)	24.6		24.7		24.6	
	32 (+ F-SCH)	**24.6**		**24.8**		**24.6**	

PCS Band

Radio Configuration (RC)	Service Option (SO)	Conducted Output Power (dBm)					
		Ch. 25 / 1851.25 MHz		Ch. 600 / 1880 MHz		Ch. 1175 / 1908.75 MHz	
		Average	Peak	Average	Peak	Average	Peak
RC1	2 (Loopback)	24.9		25.0		24.5	
	55 (Loopback)	24.7		25.1		24.5	
RC2	9 (Loopback)	24.7		25.0		24.5	
	55 (Loopback)	24.6		24.9		24.5	
RC3	55 (Loopback)	24.7		25.1		24.5	
	32 (+ F-SCH)	**25.0**		**25.1**		**25.1**	

1xEv-Do Release 0 (Rel. 0)

Maximum output power is verified on the Low, Middle and High channels according to procedures in section 3.1.2.3.4 of 3GPP2 C.S0033-0/TIA-866 for Rel. 0 and section 4.3.4 of 3GPP2 C.S0033-A for Rev. A

1xEv-Do Release 0 (Rel. 0)

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

EVDO Release 0 - RTAP

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00800580 : 00000000 : 00000000 : 00000000 > Subnet Mask > 0 ,Ch. #.: 37/589 (Cell) & 325 (PCS)
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Parms:
  - Cell Power > -105.5 dBm/1.23 MHz
  - Cell Band > (Select US Cellular or US PCS)
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > RTAP
  - RTAP Rate > 153.6 kbps
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

EVDO Release 0 - FTAP

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00840AC0 : 00000000 : 00000000 : 00000000 > Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Parms:
  - Cell Power > -105.5 dBm/1.23 MHz
  - Cell Band > (Select US Cellular or US PCS)
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > FTAP (default)
  - FTAP Rate > 307.2 kbps (2 Slot, QPSK)
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

RF Power Output for EV-DO Rel 0

Band	FTAP Rate	RTAP Rate	Channel	f (MHz)	Conducted power (dBm)	
					Average	Peak
Cellular	307.2 kbps (2 slot, QPSK)	153.6 kbps	1013	824.70	24.40	
			384	836.52	24.50	
			777	848.31	24.30	
PCS	307.2 kbps (2 slot, QPSK)	153.6 kbps	25	1851.25	24.50	
			600	1880.00	24.70	
			1175	1908.75	24.30	

1xEv-Do Revision A (Rev. A)

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

Application	Rev, License
1xEV-DO Terminal Test	A.09.13

EVDO Rev. A – RETAP

- Call Setup > Shift & Preset
- Cell Power > -60 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > RETAP
- R-Data Pkt Size > 4096
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2 > PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Access Network Info > Cell Parameters > Sector ID > 00800580 : 00000000 : 00000000: > Subnet Mask > 0 , Ch. #.: 37/589 (Cell) & 325 (PCS)
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots > ACK R-Data After > Subpacket 0 (All ACK)
- Rvs Power Ctrl > All Up bits (to get the maximum power)

EVDO Rev. A - FETAP

- Call Setup > Shift & Preset
- Cell Power > -60 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > FETAP
- F-Traffic Format > 4 (1024, 2,128) Canonical (307.2k, QPSK)
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2 > PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Access Network Info > Cell Parameters > Sector ID > 00840AC0: 00000000: 00000000: 00000000 > Subnet Mask > 0
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots > ACK R-Data After > Subpacket 0 (All ACK)
- Rvs Power Ctrl > All Up bits (to get the maximum power)

Band	FETAP Traffic Format	RETAP Data Payload Size	Channel	f (MHz)	Conducted power (dBm)	
					Average	Peak
Cellular	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	1013	824.70	24.0	28.7
			384	836.52	24.1	28.7
			777	848.31	23.8	28.6
PCS	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	25	1851.25	24.2	28.4
			600	1880.00	24.3	27.9
			1175	1908.75	24.3	27.8

12. SUMMARY OF SAR TEST RESULTS

12.1. GPRS 850 & 1900

Lap-held (with the display open at 90° to the keyboard)

Separation distance: 245 mm from Main antenna-to-phantom

Note: SAR is not required due to separation distance is greater than 20 cm from Main antenna-to-user/phantom.

Nearby Person (w/ 25 mm separation distance)

Band	Mode	Antenna position	Ch No.	Freq. (MHz)	SAR (mW/g)	
					1-g	10-g
850	GPRS 2 slots	Retracted	128	824.2		
			190	836.6	0.00712	0.00595
			251	848.8		
		Extracted	128	824.2		
			190	836.6	0.443	0.310
			251	848.8		
Band	Mode	Antenna position	Ch No.	Freq. (MHz)	SAR (mW/g)	
					1-g	10-g
1900	GPRS 2 slots	Retracted	512	1850.2		
			661	1880.0	0.020	0.013
			810	1909.8		
		Extracted	512	1850.2		
			661	1880.0	0.138	0.086
			810	1909.8		

Bottom Face

Separation distance: 29 mm from Main antenna-to-phantom

Band	Mode	Antenna position	Ch No.	Freq. (MHz)	SAR (mW/g)	
					1-g	10-g
850	GPRS 2 slots	Retracted	128	824.2		
			190	836.6	0.010	0.00939
			251	848.8		
		Extracted	128	824.2		
			190	836.6	**0.721**	0.502
			251	848.8		
	GPRS 1 slot		190	836.6	0.395	0.285
Band	Mode	Antenna position	Ch No.	Freq. (MHz)	SAR (mW/g)	
					1-g	10-g
1900	GPRS 2 lots	Retracted	512	1850.2		
			661	1880.0	0.031	0.023
			810	1909.8		
		Extracted	512	1850.2		
			661	1880.0	0.329	0.212
			810	1909.8		

Primary Landscape (No SAR)

Separation distance: 228 mm from Main antenna-to-phantom

Note: 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.

Secondary Landscape

Separation distance: 2 mm from Main antenna-to-phantom

Band	Mode	Antenna position	Ch No.	Freq. (MHz)	SAR (mW/g)	
					1-g	10-g
850	GPRS 2 slots	Retracted	128	824.2		
			190	836.6	0.399	0.150
			251	848.8		
Band	Mode	Antenna position	Ch No.	Freq. (MHz)	SAR (mW/g)	
					1-g	10-g
1900	GPRS 2 slots	Retracted	512	1850.2	0.960	0.423
			661	1880.0	**1.370**	0.593
			810	1909.8	0.833	0.363
	GPRS 1 slot		661	1880.0	0.669	0.295

Primary Portrait

Separation distance: 16.6 mm from Main antenna-to-phantom

Band	Mode	Antenna position	Ch No.	Freq. (MHz)	SAR (mW/g)	
					1-g	10-g
850	GPRS 2 slots	Retracted	128	824.2		
			190	836.6	0.011	0.00598
			251	848.8		
Band	Mode	Antenna position	Ch No.	Freq. (MHz)	SAR (mW/g)	
					1-g	10-g
1900	GPRS 2 slots	Retracted	512	1850.2		
			661	1880.0	0.041	0.022
			810	1909.8		

Separation distance: 69 mm from Main antenna-to-phantom

Band	Mode	Antenna position	Ch No.	Freq. (MHz)	SAR (mW/g)	
					1-g	10-g
850	GPSR 2 slots	Extracted	128	824.2		
			190	836.6	0.222	0.145
			251	848.8		
Band	Mode	Antenna position	Ch No.	Freq. (MHz)	SAR (mW/g)	
					1-g	10-g
1900	GPRS 2 slots	Extracted	512	1850.2		
			661	1880.0	0.341	0.199
			810	1909.8		

Secondary Portrait (No SAR)

Separation distance: 239 mm from Main antenna-to-phantom

Note: 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.

12.2. UMTS BAND V, IV & II

Test reduction considerations:

1) 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.

Lap-held (with the display open at 90° to the keyboard)

Separation distance: 245 mm from Main antenna-to-phantom

Note: SAR is not required due to separation distance is greater than 20 cm from Main antenna-to-user/phantom.

Nearby Person (w/ 25 mm separation distance)

Band	Mode	Antenna position	UL Ch No.	DL Ch No.	f (MHz)	SAR (mW/g)	
						1-g	10-g
Band V	R99 12.2kbps RMC	Retracted	4132	4357	826.4		
			4183	4408	836.6	0.00595	0.00516
			4233	4458	846.6		
		Extracted	4132	4357	826.4		
			4183	4408	836.6	0.363	0.254
			4233	4458	846.6		
Band	Mode	Antenna position	UL Ch No.	DL Ch No.	f (MHz)	SAR (mW/g)	
						1-g	10-g
Band IV	R99 12.2kbps RMC	Retracted	1312	1537	1712.4		
			1427	1652	1735.4	0.034	0.023
			1513	1738	1754.0		
	R99 12.2kbps RMC	Extracted	1312	1537	1712.4		
			1427	1652	1735.4	0.311	0.195
			1513	1738	1754.0		
Band	Mode	Antenna position	UL Ch No.	DL Ch No.	f (MHz)	SAR (mW/g)	
						1-g	10-g
Band II	R99 12.2kbps RMC	Retracted	9262	9662	1850.2		
			9400	9800	1880.0	0.034	0.024
			9538	9938	1907.6		
	R99 12.2kbps RMC	Extracted	9262	9662	1850.2		
			9400	9800	1880.0	0.287	0.182
			9538	9938	1907.6		

Bottom Face

Separation distance: 29 mm from Main antenna-to-phantom

Band	Mode	Antenna position	UL Ch No.	DL Ch No.	f (MHz)	SAR (mW/g)	
						1-g	10-g
Band V	R99 12.2kbps RMC	Retracted	4132	4357	826.4		
			4183	4408	836.6	0.010	0.00935
			4233	4458	846.6		
		Extracted	4132	4357	826.4		
			4183	4408	836.6	**0.603**	0.422
			4233	4458	846.6		
Band	Mode	Antenna position	UL Ch No.	DL Ch No.	f (MHz)	SAR (mW/g)	
						1-g	10-g
Band IV	R99 12.2kbps RMC	Retracted	1312	1537	1712.4		
			1427	1652	1735.4	0.036	0.029
			1513	1738	1754.0		
	R99 12.2kbps RMC	Extracted	1312	1537	1712.4		
			1427	1652	1735.4	0.495	0.316
			1513	1738	1754.0		
Band	Mode	Antenna position	UL Ch No.	DL Ch No.	f (MHz)	SAR (mW/g)	
						1-g	10-g
Band II	R99 12.2kbps RMC	Retracted	9262	9662	1850.2		
			9400	9800	1880.0	0.032	0.025
			9538	9938	1907.6		
	R99 12.2kbps RMC	Extracted	9262	9662	1850.2		
			9400	9800	1880.0	0.426	0.274
			9538	9938	1907.6		

Primary Landscape (No SAR)

Separation distance: 228 mm from Main antenna-to-phantom

Note: 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.

Secondary Landscape

Separation distance: 2 mm from Main antenna-to-phantom

Band	Mode	Antenna position	UL Ch No.	DL Ch No.	f (MHz)	SAR (mW/g)	
						1-g	10-g
Band V	R99 12.2kbps RMC	Retracted	4132	4357	826.4		
			4183	4408	836.6	0.246	0.089
			4233	4458	846.6		
Band	Mode	Antenna position	UL Ch No.	DL Ch No.	f (MHz)	SAR (mW/g)	
						1-g	10-g
Band IV	R99 12.2kbps RMC	Retracted	1312	1537	1712.4	1.150	0.513
			1427	1652	1735.4	**1.310**	0.583
			1513	1738	1754.0	1.160	0.515
Band	Mode	Antenna position	UL Ch No.	DL Ch No.	f (MHz)	SAR (mW/g)	
						1-g	10-g
Band II	R99 12.2kbps RMC	Retracted	9262	9662	1850.2	1.170	0.514
			9400	9800	1880.0	**1.460**	0.639
			9538	9938	1907.6	1.330	0.580

Primary Portrait

Separation distance: 16.6 mm from Main antenna-to-phantom

Band	Mode	Antenna position	UL Ch No.	DL Ch No.	f (MHz)	SAR (mW/g)	
						1-g	10-g
Band V	R99 12.2kbps RMC	Retracted	4132	4357	826.4		
			4183	4408	836.6	0.00511	0.0024
			4233	4458	846.6		
Band	Mode	Antenna position	UL Ch No.	DL Ch No.	f (MHz)	SAR (mW/g)	
						1-g	10-g
Band IV	R99 12.2kbps RMC	Retracted	1312	1537	1712.4		
			1427	1652	1735.4	0.048	0.027
			1513	1738	1754.0		
Band	Mode	Antenna position	UL Ch No.	DL Ch No.	f (MHz)	SAR (mW/g)	
						1-g	10-g
Band II	R99 12.2kbps RMC	Retracted	9262	9662	1850.2		
			9400	9800	1880.0	0.037	0.021
			9538	9938	1907.6		

Primary Portrait

Separation distance: 69 mm from Main antenna-to-phantom

Band	Mode	Antenna position	UL Ch No.	DL Ch No.	f (MHz)	SAR (mW/g)	
						1-g	10-g
Band V	R99 12.2kbps RMC	Extracted	4132	4357	826.4		
			4183	4408	836.6	0.161	0.106
			4233	4458	846.6		
Band	Mode	Antenna position	UL Ch No.	DL Ch No.	f (MHz)	SAR (mW/g)	
						1-g	10-g
Band IV	R99 12.2kbps RMC	Extracted	1312	1537	1712.4		
			1427	1652	1735.4	0.457	0.251
			1513	1738	1754.0		
Band	Mode	Antenna position	UL Ch No.	DL Ch No.	f (MHz)	SAR (mW/g)	
						1-g	10-g
Band II	R99 12.2kbps RMC	Extracted	9262	9662	1850.2		
			9400	9800	1880.0	0.355	0.208
			9538	9938	1907.6		

Secondary Portrait (No SAR)

Separation distance: 239 mm from Main antenna-to-phantom

Note: 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.

12.3. CDMA Cell & PCS Band

Due to the maximum average output of 1x RTT (RC3, SO32) is greater than ¼ dB higher than that measured for Rel. 0 and Rev A, thus Body SAR measurement procedures in the CDMA 200 1 x Handsets section were applied.

Lap-held (with the display open at 90° to the keyboard)

Separation distance: 245 mm from Main antenna-to-phantom

Note: SAR is not required due to separation distance is greater than 20 cm from Main antenna-to-user/phantom.

Nearby Person (w/ 25 mm separation distance)

Band	Mode	Antenna position	Ch No.	f (MHz)	SAR (mW/g)	
					1-g	10-g
Cellular	1xRTT (RC3, SO32)	Retracted	1013	824.70		
			384	836.52	0.00428	0.00347
			777	848.31		
		Extracted	1013	824.70		
			384	836.52	0.253	0.180
			777	848.31		
	1x EV-DO Release 0	Retracted	1013	824.70		
			384	836.52	0.00479	0.00394
			777	848.31		
		Extracted	1013	824.70		
			384	836.52	0.251	0.179
			777	848.31		
Band	Mode	Antenna position	Ch No.	f (MHz)	SAR (mW/g)	
					1-g	10-g
PCS	1xRTT (RC3, SO32)	Retracted	25	1851.25		
			600	1880.00	0.020	0.012
			1175	1908.75		
		Extracted	25	1851.25		
			600	1880.00	0.209	0.131
			1175	1908.75		
	1x EV-DO Release 0	Retracted	25	1851.25		
			600	1880.00	0.020	0.012
			1175	1908.75		
		Extracted	25	1851.25		
			600	1880.00	0.208	0.131
			1175	1908.75		

Bottom Face

Separation distance: 29 mm from Main antenna-to-phantom

Band	Mode	Antenna position	Ch No.	f (MHz)	SAR (mW/g)	
					1-g	10-g
Cellular	1xRTT (RC3, SO32)	Retracted	1013	824.70		
			384	836.52	0.011	0.0098
			777	848.31		
		Extracted	1013	824.70		
			384	836.52	**0.615**	0.426
			777	848.31		
	1x EV-DO Release 0	Retracted	1013	824.70		
			384	836.52	0.013	0.012
			777	848.31		
		Extracted	1013	824.70		
			384	836.52	0.606	0.410
			777	848.31		
Antenna position	Mode	Antenna position	Ch No.	f (MHz)	SAR (mW/g)	
					1-g	10-g
PCS	1xRTT (RC3, SO32)	Retracted	25	1851.25		
			600	1880.00	0.032	0.025
			1175	1908.75		
		Extracted	25	1851.25		
			600	1880.00	0.471	0.303
			1175	1908.75		
	1x EV-DO Release 0	Retracted	25	1851.25		
			600	1880.00	0.035	0.028
			1175	1908.75		
		Extracted	25	1851.25		
			600	1880.00	0.474	0.303
			1175	1908.75		

Primary Landscape (No SAR)

Separation distance: 228 mm from Main antenna-to-phantom

Note: 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.

Secondary Landscape

Separation distance: 2 mm from Main antenna-to-phantom

Band	Mode	Antenna position	Ch No.	f (MHz)	SAR (mW/g)	
					1-g	10-g
Cellular	1xRTT (RC3, SO32)	Retracted	1013	824.70		
			384	836.52	0.357	0.124
			777	848.31		
	1x EV-DO Release 0	Retracted	1013	824.70		
			384	836.52	0.353	0.124
			777	848.31		
Band	Mode	Antenna position	Ch No.	f (MHz)	SAR (mW/g)	
					1-g	10-g
PCS	1xRTT (RC3, SO32)	Retracted	25	1851.25	1.120	0.492
			600	1880.00	**1.450**	0.628
			1175	1908.75	1.140	0.491
	1x EV-DO Release 0	Retracted	25	1851.25	1.110	0.488
			600	1880.00	1.400	0.609
			1175	1908.75	1.160	0.506

Primary Portrait

Separation distance: 16.6 mm from Main antenna-to-phantom

Band	Mode	Antenna	Ch No.	f (MHz)	SAR (mW/g)	
					1-g	10-g
Cellular	1xRTT (RC3, SO32)	Retracted	1013	824.70		
			384	836.52	0.011	0.00678
			777	848.31		
	1x EV-DO Release 0	Retracted	1013	824.70		
			384	836.52	0.011	0.0062
			777	848.31		
Band	Mode	Antenna position	Ch No.	f (MHz)	SAR (mW/g)	
					1-g	10-g
PCS	1xRTT (RC3, SO32)	Retracted	25	1851.25		
			600	1880.00	0.047	0.026
			1175	1908.75		
	1x EV-DO Release 0	Retracted	25	1851.25		
			600	1880.00	0.061	0.032
			1175	1908.75		

Separation distance: 69 mm from Main antenna-to-phantom

Band	Mode	Antenna position	Ch No.	f (MHz)	SAR (mW/g)	
					1-g	10-g
Cellular	1xRTT (RC3, SO32)	Extracted	1013	824.70		
			384	836.52	0.230	0.146
			777	848.31		
	1x EV-DO Release 0	Extracted	1013	824.70		
			384	836.52	0.234	0.143
			777	848.31		
Band	Mode	Antenna position	Ch No.	f (MHz)	SAR (mW/g)	
					1-g	10-g
PCS	1xRTT (RC3, SO32)	Extracted	25	1851.25		
			600	1880.00	0.392	0.230
			1175	1908.75		
	1x EV-DO Release 0	Extracted	25	1851.25		
			600	1880.00	0.479	0.271
			1175	1908.75		

Secondary Portrait (No SAR)

Separation distance: 239 mm from Main antenna-to-phantom

Note: 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.

13. WORST-CASE SAR TEST PLOTS

Worst-case SAR Plot for Part 22

Date/Time: 2/8/2011 2:11:04 PM

Test Laboratory: Compliance Certification Services (UL CCS)

Cell 850_Bottom face

DUT: Fujitsu-Australia; Type: NA; Serial: NA

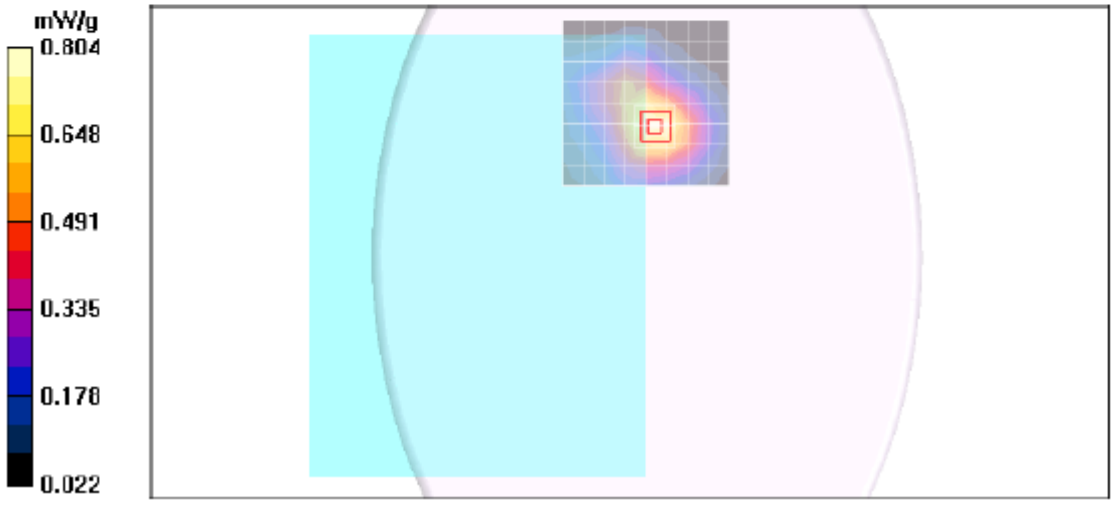
Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:4
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.992 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

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

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3749; ConvF(8.79, 8.79, 8.79); Calibrated: 12/13/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn427; Calibrated: 7/21/2010
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

2 slot_M-ch_Ant extracted/Area Scan (9x9x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.804 mW/g

2 slot_M-ch_Ant extracted/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 28.7 V/m; Power Drift = -0.157 dB
Peak SAR (extrapolated) = 1.01 W/kg
SAR(1 g) = 0.721 mW/g; SAR(10 g) = 0.502 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.813 mW/g



Worst-case SAR Plot for Part 22 – Z plot

Date/Time: 2/8/2011 2:33:23 PM

Test Laboratory: Compliance Certification Services (UL CCS)

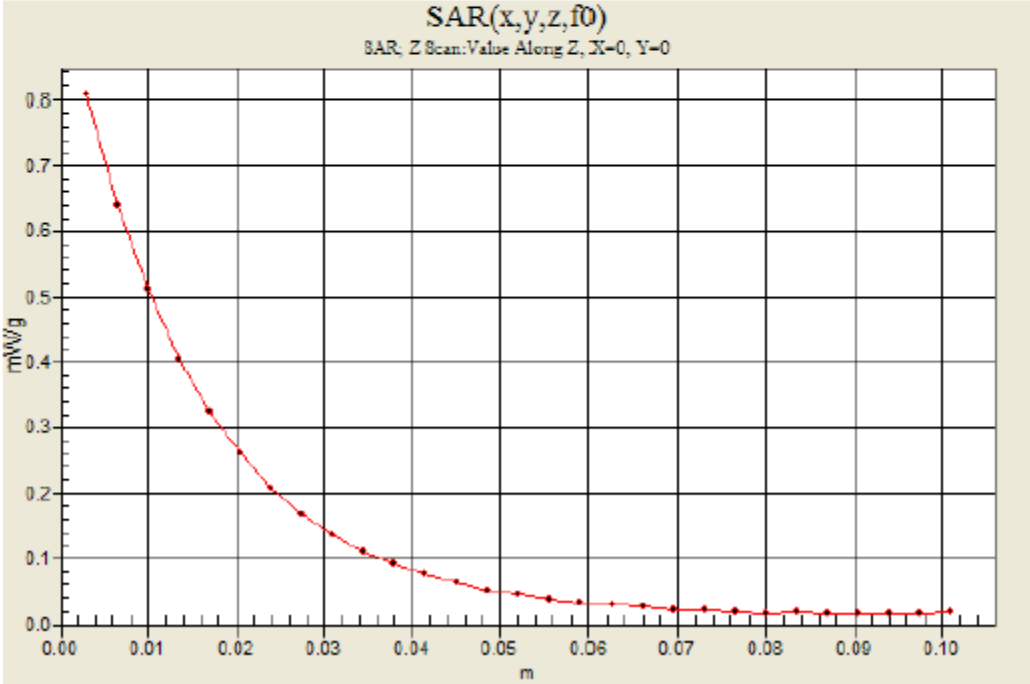
Cell 850_Bottom face

DUT: Fujitsu-Australia; Type: NA; Serial: NA

Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:4

2 slot_M-ch_Ant extracted/Z Scan (1x1x29): Measurement grid: dx=20mm, dy=20mm, dz=3.5mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.808 mW/g



Worst-case SAR Plot for Part 24

Date/Time: 1/25/2011 9:17:51 PM

Test Laboratory: Compliance Certification Services (UL CCS)

UMTS Bnad II_Secondary Landscape

DUT: Fujitsu-Australia; Type: NA; Serial: NA

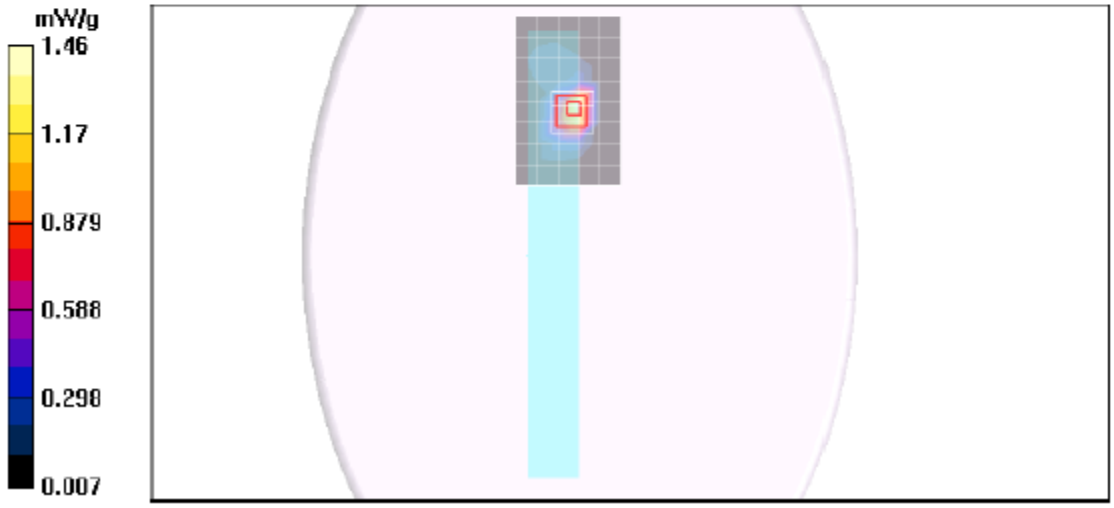
Communication System: UMTS Band II; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.49 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3
Phantom section: Flat Section

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

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3749; ConvF(7.33, 7.33, 7.33); Calibrated: 12/13/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn427; Calibrated: 7/21/2010
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

M-ch_Ant retracted/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.46 mW/g

M-ch_Ant retracted/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 31.3 V/m; Power Drift = 0.139 dB
Peak SAR (extrapolated) = 3.52 W/kg
SAR(1 g) = 1.46 mW/g; SAR(10 g) = 0.639 mW/g
Maximum value of SAR (measured) = 2.01 mW/g



Worst-case SAR Plot for Part 24 - Z plot

Date/Time: 1/25/2011 9:37:08 PM

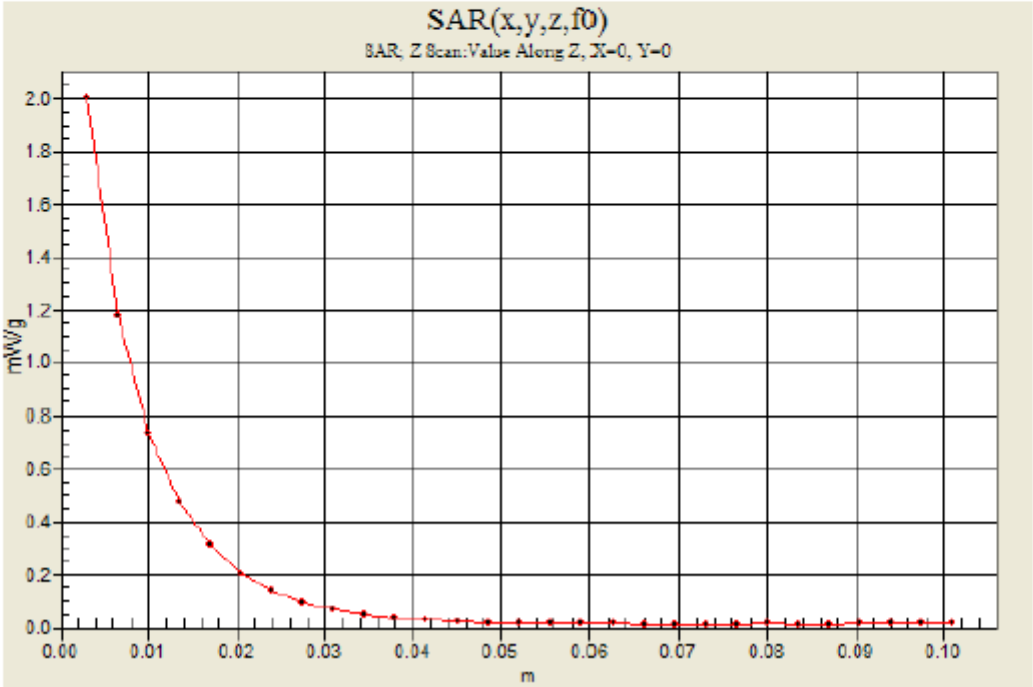
Test Laboratory: Compliance Certification Services (UL CCS)

UMTS Bnad II_Secondary Landscape

DUT: Fujitsu-Australia; Type: NA; Serial: NA

Communication System: UMTS Band II; Frequency: 1880 MHz;Duty Cycle: 1:1

M-ch_Ant retracted/Z Scan (1x1x29): Measurement grid: dx=20mm, dy=20mm, dz=3.5mm
Maximum value of SAR (measured) = 2.01 mW/g



Worst-case SAR Plot for Part 27

Date/Time: 2/11/2011 3:36:34 AM

Test Laboratory: Compliance Certification Services (UL CCS)

UMTS Bnad IV_Secondary Landscape

DUT: Fujitsu-Australia; Type: NA; Serial: NA

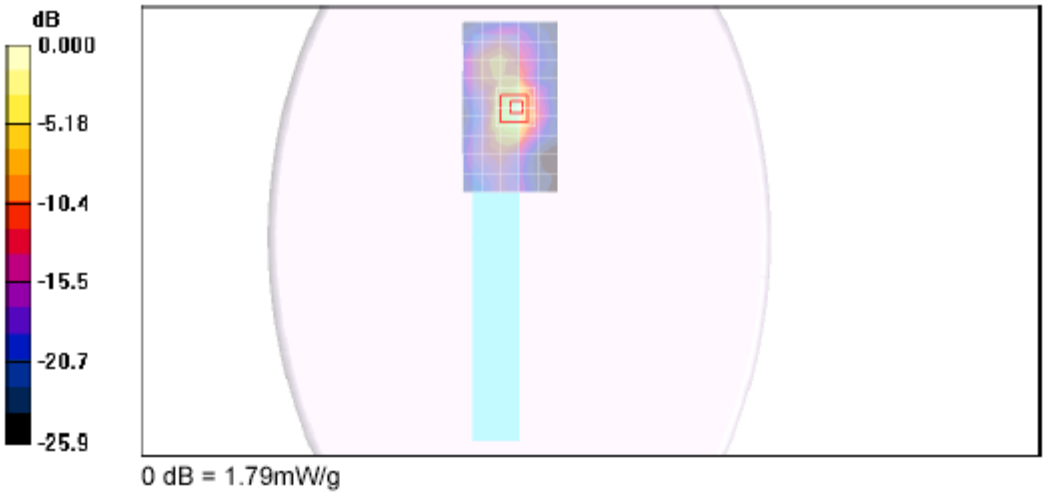
Communication System: UMTS Band IV; Frequency: 1735.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1735.4 MHz; σ = 1.47 mho/m; ε_r = 53; ρ = 1000 kg/m^3
Phantom section: Flat Section

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

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3749; ConvF(7.51, 7.51, 7.51); Calibrated: 12/13/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn427; Calibrated: 7/21/2010
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

M-ch_Ant retracted/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.41 mW/g

M-ch_Ant retracted/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 31.0 V/m; Power Drift = 0.219 dB
Peak SAR (extrapolated) = 3.12 W/kg
SAR(1 g) = 1.31 mW/g; SAR(10 g) = 0.583 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.79 mW/g



0 dB = 1.79mW/g

Worst-case SAR Plot for Part 27 - Z plot

Date/Time: 2/11/2011 3:56:12 AM

Test Laboratory: Compliance Certification Services (UL CCS)

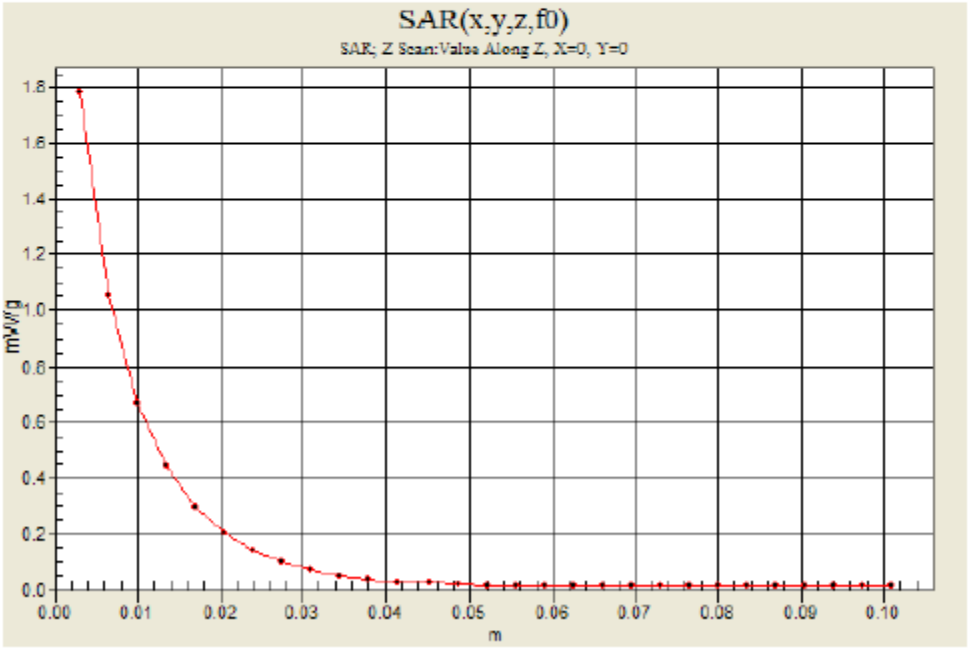
UMTS Bnad IV_Secondary Landscape

DUT: Fujitsu-Australia; Type: NA; Serial: NA

Communication System: UMTS Band IV; Frequency: 1735.4 MHz;Duty Cycle: 1:1

M-ch_Ant retracted/Z Scan (1x1x29): Measurement grid: dx=20mm, dy=20mm, dz=3.5mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.79 mW/g



14. KDB 447498 SIMULTANEOUS TRANSMISSION SAR EVAULATION

Acc. to KDB 447498 4) b)
iii) For each edge positioned closest to the user, simultaneous transmission SAR evaluation is not required when the simultaneous transmitting antennas along that edge are:
(1) located < 5 cm from the edge and the sum of the stand-alone SAR is < the SAR limit for these antennas or the SAR to peak location separation ratios are < 0.3 for all antenna pairs.

Finding: When the EUT is positioned at the edge (Secondary Landscape) configuration, WWAN and WiFi antenna are within 5 cm to the body of user.

The sum of the stand-alone SAR and the SAR to peak location separation ratios
WWAN (Gobi3000) & WiFi (Intel, FCC ID: EJE-WL0024)

WWAN Cell Band + WiFi						
Tes position	Highest 1-g SAR (W/kg)			∑ 1g SAR (W/kg)	SAR to peak location	
	WWAN		WiFi 2.4G		Separation (cm)	Ratio
Tablet - Bottom face	GPRS850	0.721	0.069	0.790	n/a	n/a
	Highest 1-g SAR (W/kg)			∑ 1g SAR (W/kg)	SAR to peak location	
	WWAN		WiFi 5 G		Separation (cm)	Ratio
	GPRS850	0.721	0.096	0.817	n/a	n/a
WWAM PCS Band + WiFi						
Tes position	Highest 1-g SAR (W/kg)			∑ 1g SAR (W/kg)	SAR to peak location	
	WWAN		WiFi 2.4G		Separation (cm)	Ratio
Edge - Secondary Landscape	UMTS Band II	1.460	0.340	**1.800**	13.96	0.129
	Highest 1-g SAR (W/kg)			∑ 1g SAR (W/kg)	SAR to peak location	
	WWAN		WiFi 5G		Separation (cm)	Ratio
	UMTS Band II	1.460	1.53	**2.990**	13.24	0.226
UMTS Band IV + WiFi						
Tes position	Highest 1-g SAR (W/kg)			∑ 1g SAR (W/kg)	SAR to peak location	
	WWAN		WiFi 2.4G		Separation (cm)	Ratio
Edge - Secondary Landscape	UMTS Band IV	1.310	0.340	**1.650**	13.67	0.121
	Highest 1-g SAR (W/kg)			∑ 1g SAR (W/kg)	SAR to peak location	
	WWAN		WiFi 5G		Separation (cm)	Ratio
	UMTS Band IV	1.310	1.53	**2.840**	12.94	0.219

CONCLUSIONS:

WWAN – WiFi: Simultaneous transmission is SAR not required for WWAN & WiFi because the sum of the 1-g SA is < 1.6 W/kg or the SAR to peak location separation ratios are < 0.3 for all antenna pairs.

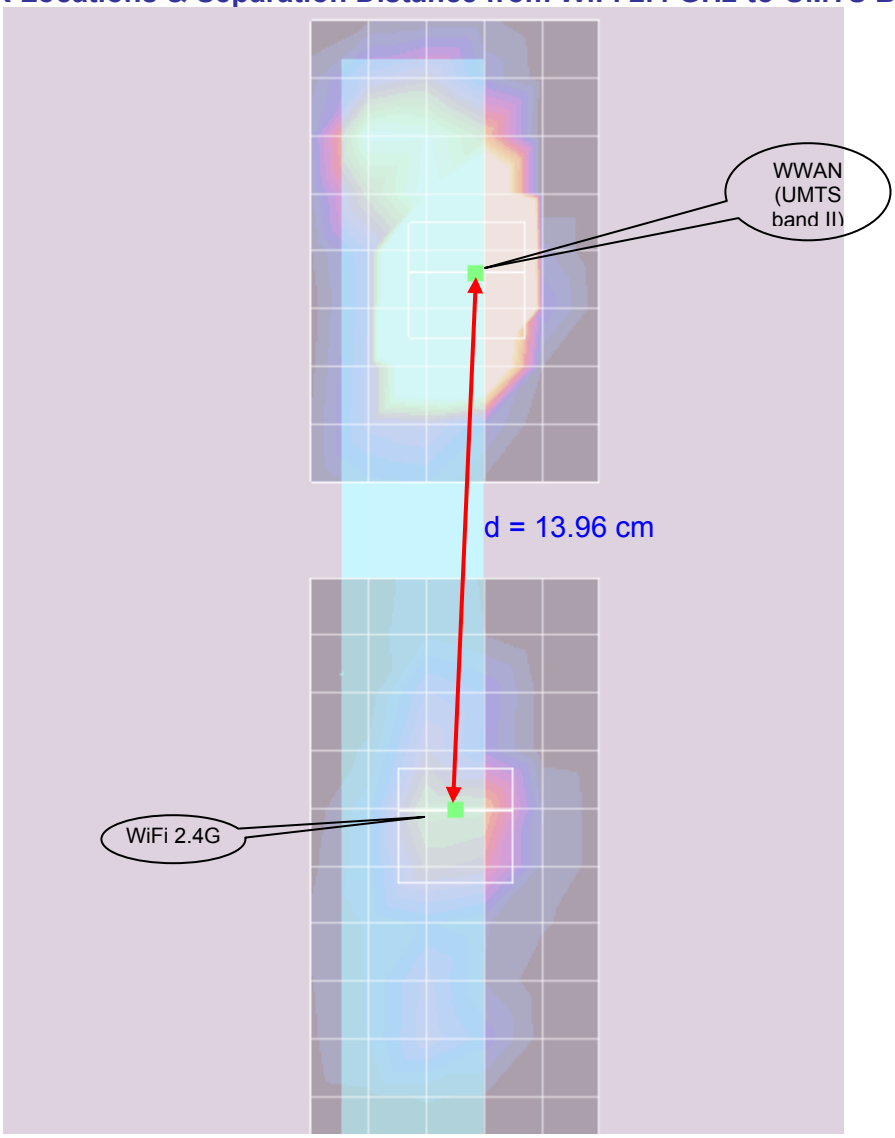
The sum of the stand-alone SAR and the SAR to peak location separation ratios
WWAN (Gobi3000) & WiFi (Atheros, FCC ID: PPD-AR5BHB116)

WWAN Cell Band + WiFi						
Tes position	Highest 1-g SAR (W/kg)			∑ 1g SAR (W/kg)	SAR to peak location	
	WWAN		WiFi 2.4G		Separation (cm)	Ratio
Tablet - Bottom face	GPRS850	0.721	0.083	0.804	n/a	n/a
	Highest 1-g SAR (W/kg)			∑ 1g SAR (W/kg)	SAR to peak location	
	WWAN		WiFi 5 G		Separation (cm)	Ratio
	GPRS850	0.721	0.089	0.810	n/a	n/a
WWAM PCS Band + WiFi						
Tes position	Highest 1-g SAR (W/kg)			∑ 1g SAR (W/kg)	SAR to peak location	
	WWAN		WiFi 2.4G		Separation (cm)	Ratio
Edge - Secondary Landscape	UMTS Band II	1.460	0.236	1.696	13.96	0.121
	Highest 1-g SAR (W/kg)			∑ 1g SAR (W/kg)	SAR to peak location	
	WWAN		WiFi 5G		Separation (cm)	Ratio
	UMTS Band II	1.460	1.20	**2.660**	13.24	0.201
UMTS bnad IV + WiFi						
Tes position	Highest 1-g SAR (W/kg)			∑ 1g SAR (W/kg)	SAR to peak location	
	WWAN		WiFi 2.4G		Separation (cm)	Ratio
Edge - Secondary Landscape	UMTS Band IV	1.310	0.236	1.546	13.67	0.113
	Highest 1-g SAR (W/kg)			∑ 1g SAR (W/kg)	SAR to peak location	
	WWAN		WiFi 5G		Separation (cm)	Ratio
	UMTS Band IV	1.310	1.20	**2.510**	12.94	0.194

CONCLUSIONS:

Simultaneous transmission is SAR not required for WWAN & WiFi because the sum of the 1-g SAR is < 1.6 W/kg or the SAR to peak location separation ratios are < 0.3 for all antenna pairs.

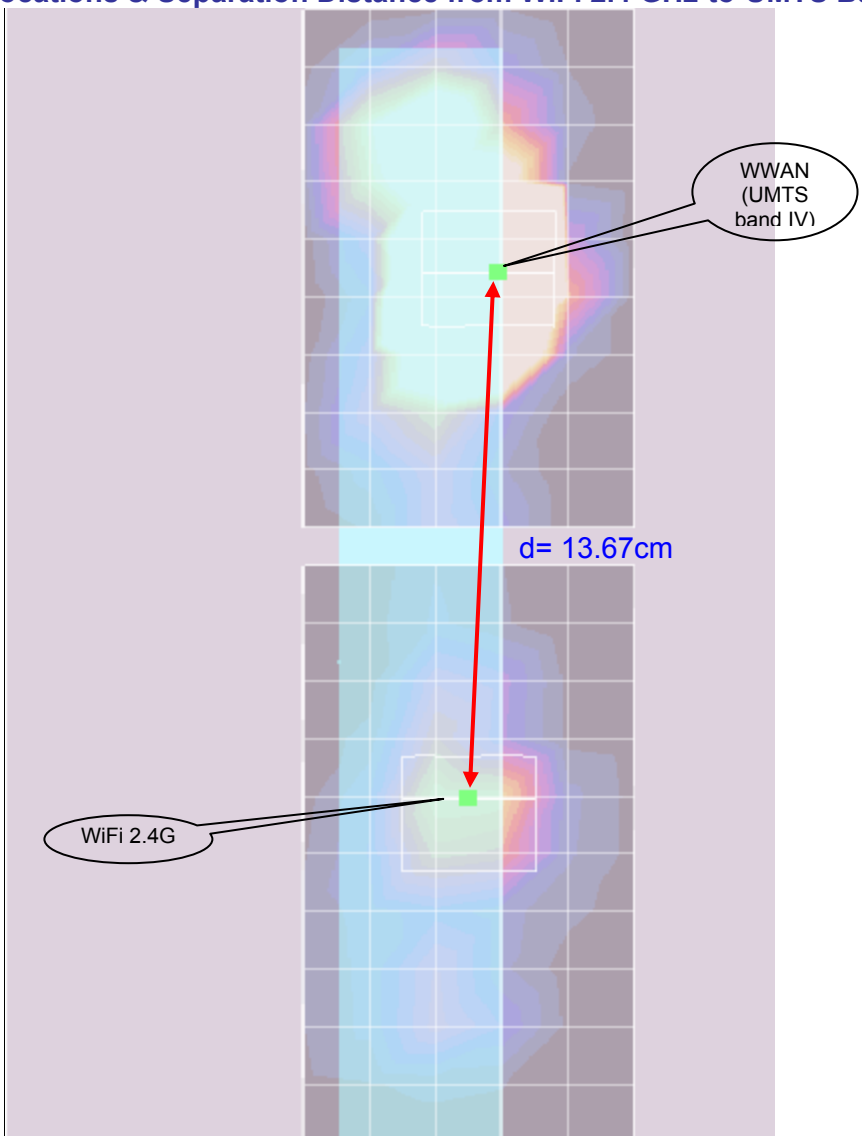
Peak SAR Locations & Separation Distance from WiFi 2.4 GHz-to-UMTS Band II



	Value of SAR	X	Y	Z
	mW/g	m	m	m
WiFi	0.263	-0.00749	-0.0355	-0.181
WWAN	3.52	-0.00247	0.104	-0.179
	m	cm		
Separation distance:	0.1396	**13.96**		

$$d = \sqrt[2]{(X1 - X2)^2 + (Y1 - Y2)^2 + (Z1 - Z2)^2}$$

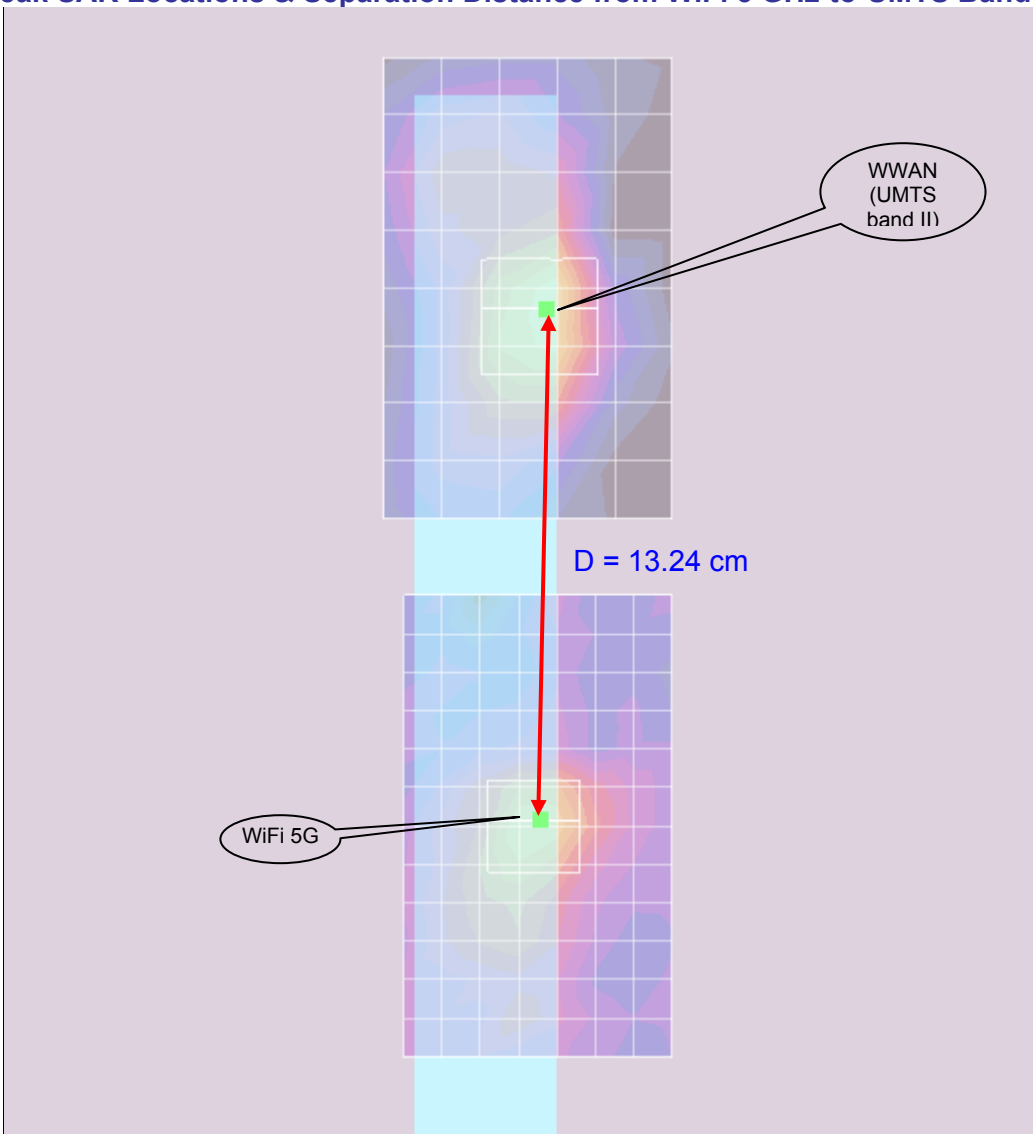
Peak SAR Locations & Separation Distance from WiFi 2.4 GHz-to-UMTS Band IV



	Value of SAR	X	Y	Z
	mW/g	m	m	m
WiFi	0.263	-0.00749	-0.0355	-0.181
WWAN	3.12	-0.00096	0.101	-0.18
	m	cm		
Separation distance:	0.1367	**13.67**		

$$d = \sqrt[2]{(X1 - X2)^2 + (Y1 - Y2)^2 + (Z1 - Z2)^2}$$

Peak SAR Locations & Separation Distance from WiFi 5 GHz-to-UMTS Band II

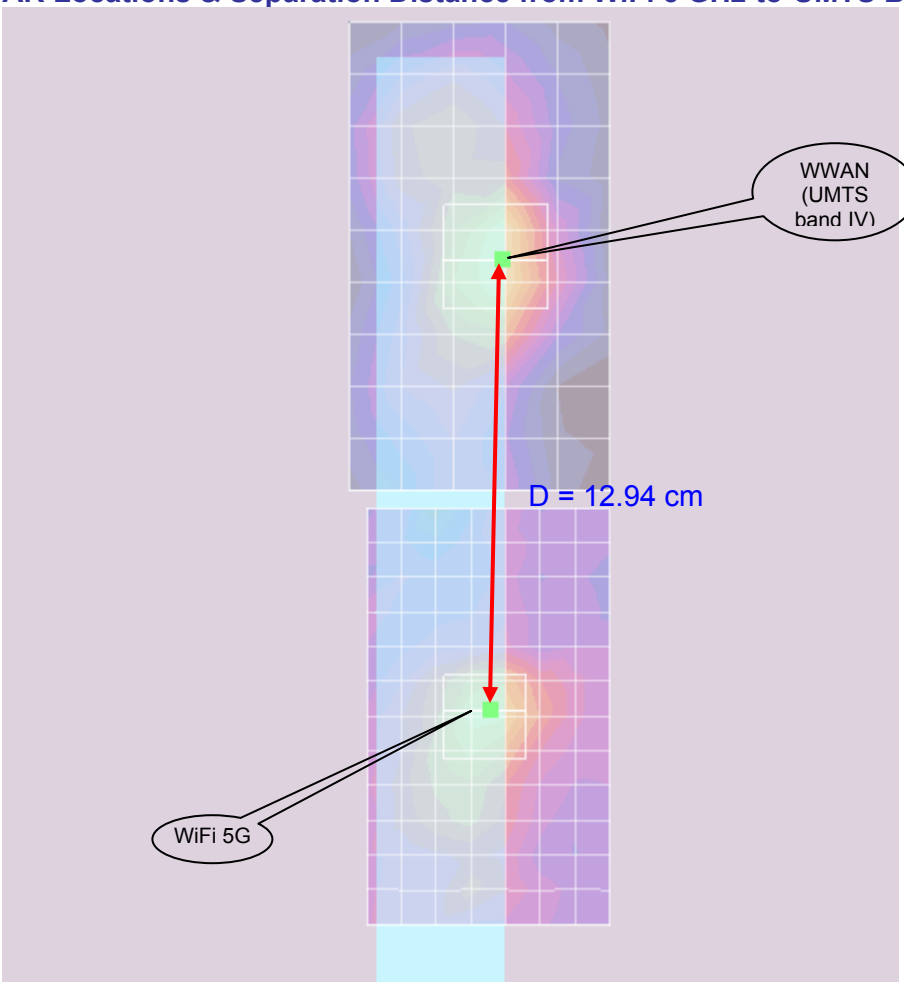


	Value of SAR	X	Y	Z
	mW/g	m	m	m
WiFi	2.52	-0.00436	-0.0284	-0.181
WWAN	3.52	-0.00247	0.104	-0.179

	m	cm
Separation distance:	0.1324	**13.24**

$$d = \sqrt[2]{(X1 - X2)^2 + (Y1 - Y2)^2 + (Z1 - Z2)^2}$$

Peak SAR Locations & Separation Distance from WiFi 5 GHz-to-UMTS Band IV



	Value of SAR	X	Y	Z
	mW/g	m	m	m
WiFi	2.52	-0.00436	-0.0284	-0.181
WWAN	3.12	-0.00096	0.101	-0.18
	m	cm		
Separation distance:	0.1294	**12.94**		

$$d = \sqrt[2]{(X1 - X2)^2 + (Y1 - Y2)^2 + (Z1 - Z2)^2}$$

15. ATTACHMENTS

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