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 (T731, TH701)

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

REPORT NUMBER: 11U13752-1
ISSUE DATE: June 6, 2011

Prepared for

Fujitsu Australia Ltd.
570 St Kilda Road
Melbourne, Victoria 3004, Australia

Prepared by

COMPLIANCE CERTIFICATION SERVICES (UL CCS)
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	June 6, 2011	Initial Issue	--

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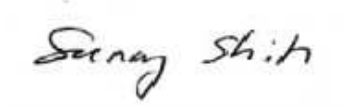
1. ATTESTATION OF TEST RESULTS

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 (T731, TH701)		
Model number:	Gobi3000		
Device category:	Portable		
Exposure category:	General Population/Uncontrolled Exposure		
Date tested:	April 20 - 26, 2011		
FCC / IC Rule Parts	Freq. Range [MHz]	Highest 1-g SAR	Limit (mW/g)
22H / RSS-132	824 - 849	0.616 mW/g (GSM850) Position: Tablet - Bottom Face	1.6
24E / RSS-133	1850 - 1910	1.23 mW/g (UMTS band II) Position: Tablet - Secondary Landscape	
27 / RSS-139	1710 - 1755	0.944 mW/g (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.

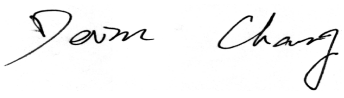
Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL CCS and all revisions are duly noted in the revisions section. Any alteration of this 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

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	TX90	C01209	N/A		
Robot Remote Control	Stäubli	CS8C	N/A	N/A		
DASY5 Measurement Server	SPEAG	SEUMS014AA	1064	N/A		
Probe Alignment Unit	SPEAG	LB5 / 80	N/A	N/A		
SAM Phantom	SPEAG	QP 000 P40 CC	1602	N/A		
Oval Flat Phantom (ELI 4.0)	SPEAG	QD OVA001 BB	1099	N/A		
Dielectric Probe Kit	HP	85070C	N/A	N/A		
S-Parameter Network Analyzer	Agilent	8753ES-6	8753ES-6	11	22	2011
Signal Generator	Agilent	8753ES-6	8753ES-6	11	22	2011
E-Field Probe	SPEAG	EX3DV4	3686	1	24	2012
Thermometer	ERTCO	639-1S	1718	7	19	2011
Data Acquisition Electronics	SPEAG	DAE3 V4	1239	11	17	2011
System Validation Dipole	SPEAG	D835V2*	4d002	4	4	2012
System Validation Dipole	SPEAG	D1800V2	294	11	24	2011
System Validation Dipole	SPEAG	D1900V2*	5d043	11	24	2011
Amplifier	Mini-Circuits	ZVE-8G	90606	N/A		
Amplifier	Mini-Circuits	ZHL-42W	D072701-5	N/A		
Simulating Liquid	SPEAG	M1900	N/A	Within 24 hrs of first test		
Simulating Liquid	SPEAG	M1800	N/A	Within 24 hrs of first test		
Simulating Liquid	SPEAG	M835	N/A	Within 24 hrs of first test		

Notes:

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

1. There is no physical damage on the dipole
2. System validation with specific dipole is within 10% of calibrated value.
3. Return-loss is within 20% of calibrated measurement (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) @ Body 1730 MHz	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 1730 MHz)	4.14	Normal	1	0.64	2.65
Liquid Permittivity - deviation from target	5.00	Rectangular	1.732	0.6	1.73
Liquid Permittivity - measurement uncertainty (Body 1730 MHz)	3.61	Normal	1	0.6	2.17
Combined Standard Uncertainty Uc(y) =					10.04
Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =				20.08	%
Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =				1.59	dB

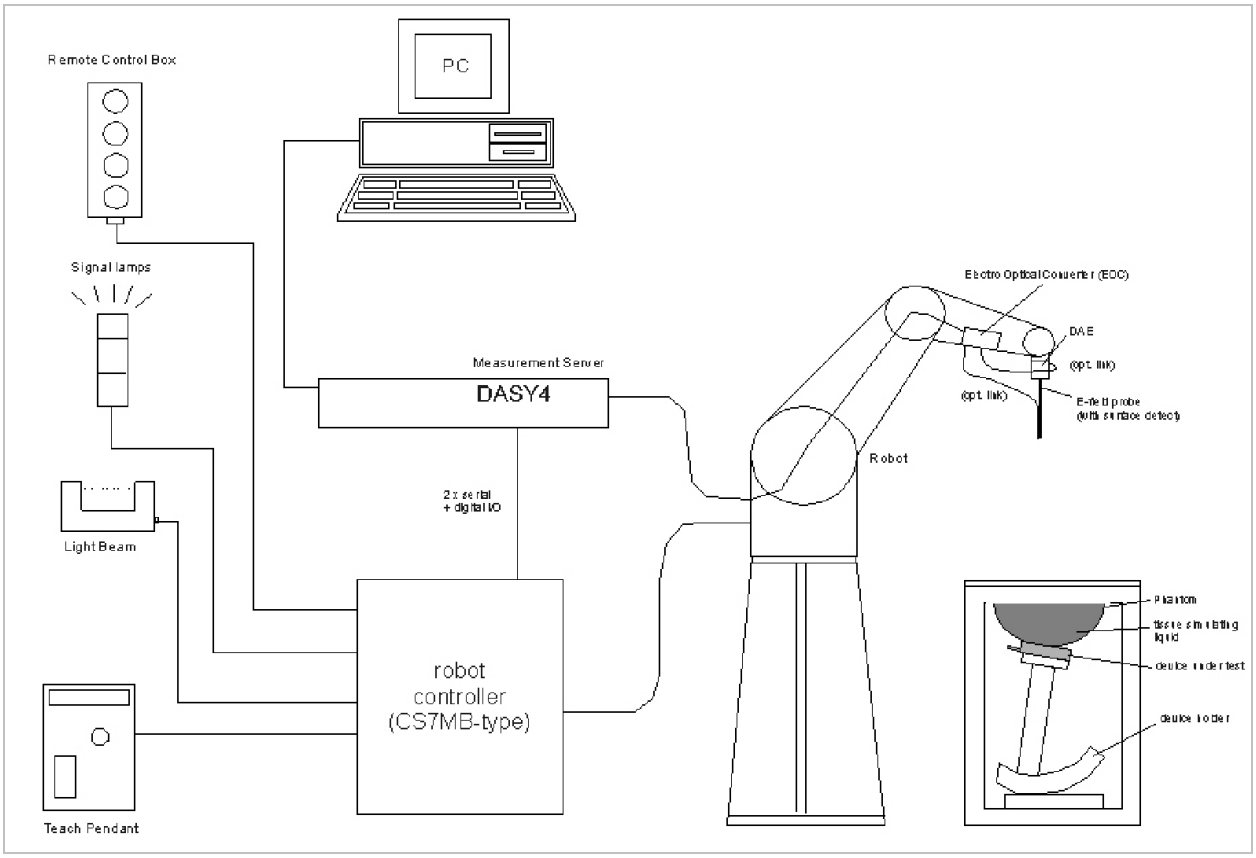
Measurement uncertainty for 300 MHz to 3 GHz averaged over 10 gram

Component	error, %	Probe Distribution	Divisor	Sensitivity	U (Xi), %
Measurement System					
Probe Calibration (k=1) @ Body 1730 MHz	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	0.43	1.24
Liquid Conductivity - measurement (Body 1730 MHz)	4.14	Normal	1	0.43	1.78
Liquid Permittivity - deviation from target	5.00	Rectangular	1.732	0.49	1.41
Liquid Permittivity - measurement uncertainty (Body 1730 MHz)	3.61	Normal	1	0.49	1.77
Combined Standard Uncertainty Uc(y), % =					9.62
Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =				19.24	%
Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence =				1.53	dB

5. EQUIPMENT UNDER TEST

Gobi3000 PCI Express Mini Card installed into Fujitsu LifeBook T Series (T731, TH701) 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	
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 (T731, TH701) 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: Art Tham

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
4/20/2011	Body 1900	e'	52.3490	Relative Permittivity (ε_r):	52.35	53.30	-1.78	5
		e''	14.3664	Conductivity (σ):	1.52	1.52	-0.15	5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C; Relative humidity = 42%
April 20, 2011 08:52 AM

Frequency	e'	e''
1710000000.	52.9692	13.7002
1720000000.	52.9398	13.7275
1730000000.	52.9135	13.7588
1740000000.	52.8838	13.7866
1750000000.	52.8564	13.8204
1760000000.	52.8262	13.8570
1770000000.	52.7956	13.8894
1780000000.	52.7658	13.9251
1790000000.	52.7362	13.9670
1800000000.	52.6976	14.0041
1810000000.	52.6670	14.0489
1820000000.	52.6319	14.0873
1830000000.	52.5975	14.1243
1840000000.	52.5633	14.1649
1850000000.	52.5288	14.1970
1860000000.	52.4945	14.2335
1870000000.	52.4608	14.2679
1880000000.	52.4234	14.3001
1890000000.	52.3873	14.3349
1900000000.	**52.3490**	**14.3664**
1910000000.	52.3187	14.4005

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: Art Tham

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
4/21/2011	Body 1900	e'	52.6181	Relative Permittivity (ε_r):	52.62	53.30	-1.28	5
		e''	14.2452	Conductivity (σ):	1.50	1.52	-0.99	5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C; Relative humidity = 39%
April 21, 2011 08:40 AM

Frequency	e'	e''
1710000000.	53.2732	13.5739
1720000000.	53.2493	13.6088
1730000000.	53.2200	13.6458
1740000000.	53.1900	13.6837
1750000000.	53.1603	13.7241
1760000000.	53.1261	13.7696
1770000000.	53.0908	13.8079
1780000000.	53.0548	13.8506
1790000000.	53.0171	13.8924
1800000000.	52.9780	13.9297
1810000000.	52.9401	13.9671
1820000000.	52.8983	14.0029
1830000000.	52.8632	14.0287
1840000000.	52.8230	14.0614
1850000000.	52.7903	14.0904
1860000000.	52.7507	14.1194
1870000000.	52.7171	14.1503
1880000000.	52.6801	14.1802
1890000000.	52.6508	14.2133
1900000000.	**52.6181**	**14.2452**
1910000000.	52.5853	14.2804

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: Art Tham

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
4/21/2011	Body 1730	e'	55.4240	Relative Permittivity (ε_r):	55.42	53.49	3.61	5
		e''	15.9558	Conductivity (σ):	1.53	1.47	4.14	5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C; Relative humidity = 42%
April 21, 2011 03:28 PM

Frequency	e'	e''
1710000000.	55.4481	15.9246
1720000000.	55.4394	15.9423
1730000000.	**55.4240**	**15.9558**
1740000000.	55.4020	15.9710
1750000000.	55.3639	15.9878
1760000000.	55.3200	16.0074
1770000000.	55.2675	16.0347
1780000000.	55.2154	16.0647
1790000000.	55.1719	16.1013
1800000000.	55.1437	16.1345
1810000000.	55.1217	16.1679
1820000000.	55.1070	16.2002
1830000000.	55.0931	16.2227
1840000000.	55.0733	16.2431
1850000000.	55.0388	16.2603
1860000000.	54.9961	16.2749
1870000000.	54.9418	16.2968
1880000000.	54.8846	16.3171
1890000000.	54.8268	16.3424
1900000000.	54.7823	16.3666
1910000000.	54.7497	16.3933

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: Art Tham

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
4/22/2011	Body 835	e'	54.6875	Relative Permittivity (ε_r):	54.69	55.20	-0.93	5
		e''	21.3950	Conductivity (σ):	0.99	0.97	2.41	5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C; Relative humidity = 39%
April 22, 2011 10:06 AM

Frequency	e'	e''
800000000.	55.0365	21.5927
805000000.	54.9940	21.5620
810000000.	54.9454	21.5417
815000000.	54.8923	21.5071
820000000.	54.8482	21.4816
825000000.	54.7865	21.4474
830000000.	54.7356	21.4223
835000000.	**54.6875**	**21.3950**
840000000.	54.6393	21.3704
845000000.	54.5955	21.3447
850000000.	54.5481	21.3155
855000000.	54.4963	21.2957
860000000.	54.4548	21.2754
865000000.	54.4094	21.2534
870000000.	54.3639	21.2295
875000000.	54.3288	21.2143
880000000.	54.2892	21.1966
885000000.	54.2548	21.1882
890000000.	54.2045	21.1746
895000000.	54.1579	21.1598
900000000.	54.1129	21.1480
905000000.	54.0676	21.1402
910000000.	54.0232	21.1259
915000000.	53.9738	21.1048
920000000.	53.9281	21.0933
925000000.	53.8836	21.0764
930000000.	53.8359	21.0600
935000000.	53.7914	21.0413
940000000.	53.7439	21.0301
945000000.	53.6899	21.0122
950000000.	53.6446	20.9988

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: Art Tham

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
4/24/2011	Body 835	e'	55.5765	Relative Permittivity (ε_r):	55.58	55.20	0.68	5
		e''	21.6190	Conductivity (σ):	1.00	0.97	3.48	5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C; Relative humidity = 40%
April 24, 2011 10:46 AM

Frequency	e'	e''
800000000.	55.6944	21.7246
805000000.	55.6560	21.6906
810000000.	55.6120	21.6605
815000000.	55.5765	21.6190
820000000.	55.5398	21.5907
825000000.	55.5038	21.5674
830000000.	55.4733	21.5463
835000000.	**55.4259**	**21.5345**
840000000.	55.3794	21.5243
845000000.	55.3313	21.4984
850000000.	55.2837	21.4771
855000000.	55.2300	21.4589
860000000.	55.1799	21.4388
865000000.	55.1233	21.4199
870000000.	55.0716	21.3937
875000000.	55.0195	21.3713
880000000.	54.9787	21.3500
885000000.	54.9276	21.3320
890000000.	54.8825	21.3117
895000000.	54.8391	21.2957
900000000.	54.7911	21.2774
905000000.	54.7486	21.2639
910000000.	54.7010	21.2444
915000000.	54.6567	21.2297
920000000.	54.6117	21.2072
925000000.	54.5706	21.1930
930000000.	54.5248	21.1723
935000000.	54.4846	21.1560
940000000.	54.4374	21.1418
945000000.	54.3981	21.1254
950000000.	54.3483	21.1091

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: hung thai

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
4/25/2011	Body 1900	e'	52.0784	Relative Permittivity (ε_r):	52.08	53.30	-2.29	5
		e''	14.2841	Conductivity (σ):	1.51	1.52	-0.72	5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C; Relative humidity = 39%
April 25, 2011 09:31 AM

Frequency	e'	e''
1710000000.	52.6955	13.6654
1720000000.	52.6518	13.6956
1730000000.	52.6105	13.7279
1740000000.	52.5746	13.7608
1750000000.	52.5466	13.7914
1760000000.	52.5257	13.8212
1770000000.	52.5049	13.8537
1780000000.	52.4823	13.8843
1790000000.	52.4609	13.9162
1800000000.	52.4310	13.9432
1810000000.	52.3913	13.9774
1820000000.	52.3453	14.0089
1830000000.	52.2980	14.0467
1840000000.	52.2573	14.0839
1850000000.	52.2166	14.1187
1860000000.	52.1862	14.1558
1870000000.	52.1579	14.1918
1880000000.	52.1301	14.2228
1890000000.	52.1071	14.2565
1900000000.	**52.0784**	**14.2841**
1910000000.	52.0434	14.3146

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 Rodgers

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
4/26/2011	Body 1900	e'	51.6742	Relative Permittivity (ϵ_r):	51.67	53.30	-3.05	5
		e''	13.9664	Conductivity (σ):	1.48	1.52	-2.93	5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C; Relative humidity = 42%
April 26, 2011 02:43 PM

Frequency	e'	e''
1710000000.	54.8542	13.3100
1720000000.	54.8392	13.3356
1730000000.	54.8223	13.3612
1740000000.	54.8023	13.3897
1750000000.	54.7758	13.4156
1760000000.	54.7324	13.4465
1770000000.	54.6919	13.4854
1780000000.	54.6510	13.5279
1790000000.	54.6142	13.5781
1800000000.	54.5854	13.6195
1810000000.	54.5577	13.6616
1820000000.	54.5388	13.7000
1830000000.	54.5171	13.7407
1840000000.	54.4942	13.7722
1850000000.	54.4638	13.8041
1860000000.	54.4199	13.8351
1870000000.	54.3687	13.8662
1880000000.	54.3166	13.8989
1890000000.	54.2646	13.9336
1900000000.	**54.2229**	**13.9664**
1910000000.	54.1927	14.0031

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 EX3DV4 SN3686 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	4/4/11	0.835	1g SAR:	9.47	10.0
				10g SAR:	6.18	6.59
D1800V2	D1800V2-294_Nov09	11/1/09	1.8	1g SAR:	39.6	37.7
				10g SAR:	20.9	20.0
D1900V2	D1900V2-5d043_Nov09	11/24/09	1.9	1g SAR:	39.8	40.4
				10g SAR:	20.7	21.4

9.1. SYSTEM CHECK RESULTS

System validation dipole	Date Tested	Measured (Normalized to 1 W)		Target	Delta (%)	Tolerance (%)
		Tissue:	Body			
D1900V2	04/20/11	1g SAR:	40.3	40.4	-0.25	±10
		10g SAR:	21.2	21.4	-0.93	
D1900V2	04/21/11	1g SAR:	40.6	40.4	0.50	±10
		10g SAR:	21.4	21.4	0.00	
D1800V2	04/21/11	1g SAR:	38.2	37.7	1.33	±10
		10g SAR:	19.8	20.0	-1.00	
D835V2	04/22/11	1g SAR:	9.91	10.0	-0.90	±10
		10g SAR:	6.5	6.59	-1.37	
D835V2	04/24/11	1g SAR:	9.97	10.0	-0.30	±10
		10g SAR:	6.53	6.59	-0.91	
D1900V2	04/25/11	1g SAR:	40.1	40.4	-0.74	±10
		10g SAR:	21.0	21.4	-1.87	
D1900V2	04/26/11	1g SAR:	40.0	40.4	-0.99	±10
		10g SAR:	21.0	21.4	-1.87	

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.	f (MHz)	Avg Pwr (dBm)
UMTS band V	Rel 99 12.2kbps RMC	4132	826.4	24.4
		4182	836.0	24.6
		4233	846.6	24.5
UMTS band IV	Rel 99 12.2kps RMC	1312	1712.4	24.3
		1427	1735.4	24.5
		1513	1754.0	24.6
UMTS band II	Rel 99 12.2kbps RMC	9262	1852.4	24.5
		9400	1880.0	24.8
		9538	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.	f (MHz)	Avg Pwr (dBm)
UMTS band V	Subtest 1	4132	826.4	24.5
		4182	836.0	24.6
		4233	846.6	24.5
	Subtest 2	4132	826.4	24.5
		4182	836.0	24.6
		4233	846.6	24.5
	Subtest 3	4132	826.4	24.0
		4182	836.0	24.1
		4233	846.6	23.9
	Subtest 4	4132	826.4	23.9
		4182	836.0	24.0
		4233	846.6	23.8
UMTS band IV	Subtest 1	4132	826.4	24.3
		4182	836.4	24.4
		4233	846.6	24.3
	Subtest 2	4132	826.4	24.3
		4182	836.4	24.4
		4233	846.6	24.3
	Subtest 3	4132	826.4	23.8
		4182	836.4	23.9
		4233	846.6	23.7
	Subtest 4	4132	826.4	23.7
		4182	836.4	23.8
		4233	846.6	23.6
UMTS band II	Subtest 1	9262	1852.4	24.4
		9400	1880.0	24.5
		9538	1907.6	24.0
	Subtest 2	9262	1852.4	24.1
		9400	1880.0	24.5
		9538	1907.6	23.6
	Subtest 3	9262	1852.4	23.9
		9400	1880.0	24.0
		9538	1907.6	24.5
	Subtest 4	9262	1852.4	23.9
		9400	1880.0	24.0
		9538	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.	f (MHz)	Avg Pwr (dBm)
UMTS band V	Subtest 1	4132	826.4	23.8
		4182	836.0	23.9
		4233	846.6	23.6
	Subtest 2	4132	826.4	22.0
		4182	836.0	22.1
		4233	846.6	21.8
	Subtest 3	4132	826.4	23.0
		4182	836.0	23.1
		4233	846.6	22.8
	Subtest 4	4132	826.4	22.1
		4182	836.0	22.2
		4233	846.6	21.9
	Subtest 5	4132	826.4	23.6
		4182	836.0	23.7
		4233	846.6	23.8
UMTS band IV	Subtest 1	1312	1712.4	24.2
		1412	1732.4	24.0
		1513	1754.0	24.0
	Subtest 2	1312	1712.4	22.8
		1412	1732.4	22.7
		1513	1754.0	22.7
	Subtest 3	1312	1712.4	23.1
		1412	1732.4	23.3
		1513	1754.0	23.2
	Subtest 4	1312	1712.4	22.8
		1412	1732.4	22.5
		1513	1754.0	22.6
	Subtest 5	1312	1712.4	23.8
		1412	1732.4	23.9
		1513	1754.0	23.8
UMTS band II	Subtest 1	9262	1852.4	23.9
		9400	1880.0	23.8
		9538	1907.6	23.6
	Subtest 2	9262	1852.4	22.1
		9400	1880.0	22.0
		9538	1907.6	21.8
	Subtest 3	9262	1852.4	23.0
		9400	1880.0	22.9
		9538	1907.6	22.8
	Subtest 4	9262	1852.4	22.2
		9400	1880.0	22.1
		9538	1907.6	21.9
	Subtest 5	9262	1852.4	23.8
		9400	1880.0	23.7
		9538	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)	Avg Pwr (dBm)		
		Ch.1013 824.7MHz	Ch.384 836.52 MHz	Ch.777 848.31 MHz
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)	Avg Pwr (dBm)		
		Ch.25 1851.25 MHz	Ch.600 1880 MHz	Ch.1175 1908.75 MHz
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)	Avg Pwr (dBm)
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)	Avg Pwr (dBm)
Cellular	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	1013	824.70	24.0
			384	836.52	24.1
			777	848.31	23.8
PCS	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	25	1851.25	24.2
			600	1880.00	24.3
			1175	1908.75	24.3

12. SUMMARY OF SAR TEST RESULTS

Configuration	Antenna-to-User distance	SAR Require	Comments
Lap-held	237 mm Antenna retracted	No	SAR is not required due to separation distance > 20 cm from antenna-to-user.
	237 mm Antenna extracted	No	SAR is not required due to separation distance > 20 cm from antenna-to-user.
(1), (2) Nearby Person **(IC only)**	-- Antenna retracted	Yes	SAR tested w/ 2.5 cm distance from back of the display. Per RSS-102 Supplementary Procedures (SPR)-001 January 1, 2011. IC requires SAR measurements to be performed if the integrated antenna(s) are located in the back side of the display screen
	-- Antenna extracted	Yes	
(3), (4) Bottom Face	32 mm Antenna retracted	Yes	
	32 mm Antenna extracted	Yes	
Primary Landscape	220 mm Antenna retracted	No	SAR is not required due to separation distance > 20 cm from antenna-to-user.
	220 mm Antenna extracted	No	SAR is not required due to separation distance > 20 cm from antenna-to-user.
(5) Secondary Landscape	Antenna extracted	N/A	
	2 mm Antenna retracted	Yes	
Edge – Primary Portrait	187 mm Antenna retracted	No	This is not the most conservative antenna-to-user distance at edge mode.
	187 mm Antenna extracted	No	This is not the most conservative antenna-to-user distance at edge mode.
(6) Secondary Portrait	47 mm Antenna retracted	Yes	
	99 mm Antenna extracted	No	This is not the most conservative antenna-to-user distance at edge mode. According to KDB 447498 4) b) ii) (2), SAR is required only for the edge with the most conservative exposure conditions.

12.1. GSM850

Plot No.	Mode	Test config.	Antenna	Ch	Freq. (MHz)	SAR (mW/g)	
						1-g	10-g
1	GPRS 2 slots	Nearby person	Retracted	190	836.6	0.00948	0.00687
2	GPRS 2 slots	Nearby person	Extracted	190	836.6	0.603	0.419
3	GPRS 2 slots	Bottom face	Retracted	190	836.6	0.00888	0.00784
4,5	GPRS 2 slots	Bottom face	Extracted	190	836.6	**0.616**	0.436
6	GPRS 2 slots	Secondary Landscape	Retracted	190	836.6	0.499	0.208
7	GPRS 2 slots	Secondary Portrait	Retracted	190	836.6	0.0120	0.0064

12.2. GSM1900

Plot No.	Mode	Test config.	Antenna	Ch	Freq. (MHz)	SAR (mW/g)	
						1-g	10-g
1	GPRS 2 slots	Nearby person	Retracted	661	1880.0	0.016	0.011
2	GPRS 2 slots	Nearby person	Extracted	661	1880.0	0.215	0.137
3	GPRS 2 slots	Bottom face	Retracted	661	1880.0	0.00176	0.000327
4	GPRS 2 slots	Bottom face	Extracted	661	1880.0	0.196	0.132
5,6	GPRS 2 slots	Secondary Landscape	Retracted	661	1880.0	**0.656**	0.286
7	GPRS 2 slots	Secondary Portrait	Retracted	661	1880.0	0.046	0.022

12.3. UMTS band V

Plot No.	Mode	Test config.	Antenna	Ch	Freq. (MHz)	SAR (mW/g)	
						1-g	10-g
1	R99 12.2kbps RMC	Nearby person	Retracted	4183	836.6	0.00075	0.00018
2		Nearby person	Extracted	4183	836.6	0.342	0.241
3		Bottom face	Retracted	4183	836.6	0.00268	0.00096
4,5		Bottom face	Extracted	4183	836.6	**0.367**	0.261
6		Secondary Landscape	Retracted	4183	836.6	0.267	0.104
7		Secondary Portrait	Retracted	4183	836.6	0.00299	0.00178

12.4. UMTS Band IV

Plot No.	Mode	Test config.	Antenna	Ch	Freq. (MHz)	SAR (mW/g)	
						1-g	10-g
1	R99 12.2kbps RMC	Nearby person	Retracted	1427	1735.4	0.016	0.012
2		Nearby person	Extracted	1427	1735.4	0.247	0.157
3		Bottom face	Retracted	1427	1735.4	0.025	0.021
4		Bottom face	Extracted	1427	1735.4	0.255	0.167
5		Secondary Landscape	Retracted	1312	1712.4	0.838	0.357
6,7		Secondary Landscape	Retracted	1427	1735.4	**0.944**	0.401
8		Secondary Landscape	Retracted	1513	1754.0	0.865	0.364
9		Secondary Portrait	Retracted	1427	1735.4	0.034	0.016

12.5. UMTS Band II

Plot No.	Mode	Test config.	Antenna	Ch	Freq. (MHz)	SAR (mW/g)	
						1-g	10-g
1	R99 12.2kbps RMC	Nearby person	Retracted	9400	1880.0	0.026	0.019
2		Nearby person	Extracted	9400	1880.0	0.352	0.220
3		Bottom face	Retracted	9400	1880.0	0.027	0.023
4		Bottom face	Extracted	9400	1880.0	0.287	0.187
5		Secondary Landscape	Retracted	9262	1850.2	0.843	0.366
6,7		Secondary Landscape	Retracted	9400	1880.0	**1.230**	0.538
8		Secondary Landscape	Retracted	9538	1907.6	0.751	0.329
9		Secondary Portrait	Retracted	9400	1880.0	0.096	0.045

12.6. CDMA2000 (850)

Plot No.	Mode	Test config.	Antenna	Ch	Freq. (MHz)	SAR (mW/g)	
						1-g	10-g
1	1xRTT (RC3, SO32)	Nearby person	Retracted	384	836.52	0.00508	0.00304
2,3		Nearby person	Extracted	384	836.52	**0.363**	0.255
4		Bottom face	Retracted	384	836.52	0.00738	0.00685
5		Bottom face	Extracted	384	836.52	0.350	0.249
6		Secondary Landscape	Retracted	384	836.52	0.252	0.101
7		Secondary Portrait	Retracted	384	836.52	0.00485	0.00272
8	1x EV-DO Release 0	Nearby person	Retracted	384	836.52	0.00466	0.0034
9		Nearby person	Extracted	384	836.52	0.361	0.254
10		Bottom face	Retracted	384	836.52	0.0021	0.00027
11		Bottom face	Extracted	384	836.52	0.358	0.252
12		Secondary Landscape	Retracted	384	836.52	0.252	0.100
13		Secondary Portrait	Retracted	384	836.52	0.00473	0.00197

12.7. CDMA2000 (1900)

Plot No.	Mode	Test config.	Antenna	Ch	Freq. (MHz)	SAR (mW/g)	
						1-g	10-g
1	1xRTT (RC3, SO32)	Nearby person	Retracted	600	1880.0	0.011	0.00605
2,3		Nearby person	Extracted	600	1880.0	0.242	0.153
4		Bottom face	Retracted	600	1880.0	0.00041	0.00001
5		Bottom face	Extracted	600	1880.0	0.228	0.135
		Secondary Landscape	Retracted	25	1851.3	0.848	0.363
6		Secondary Landscape	Retracted	600	1880.0	1.070	0.456
		Secondary Landscape	Retracted	1175	1908.8	0.806	0.343
7		Secondary Portrait	Retracted	600	1880.0	0.110	0.053
8	1x EV-DO Release 0	Nearby person	Retracted	600	1880.0	0.0099	0.00543
9		Nearby person	Extracted	600	1880.0	0.251	0.149
10		Bottom face	Retracted	600	1880.0	0.017	0.00879
11		Bottom face	Extracted	600	1880.0	0.236	0.144
		Secondary Landscape	Retracted	25	1851.3	0.929	0.408
12		Secondary Landscape	Retracted	600	1880.0	**1.200**	0.401
		Secondary Landscape	Retracted	1175	1908.8	1.090	0.463
13		Secondary Portrait	Retracted	600	1880.0	0.085	0.042

13. WORST-CASE SAR TEST PLOTS

Worst-case SAR Plot for Part 22

Date/Time: 4/22/2011 11:26:14 PM

Test Laboratory: UL CCS

Bottom face

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

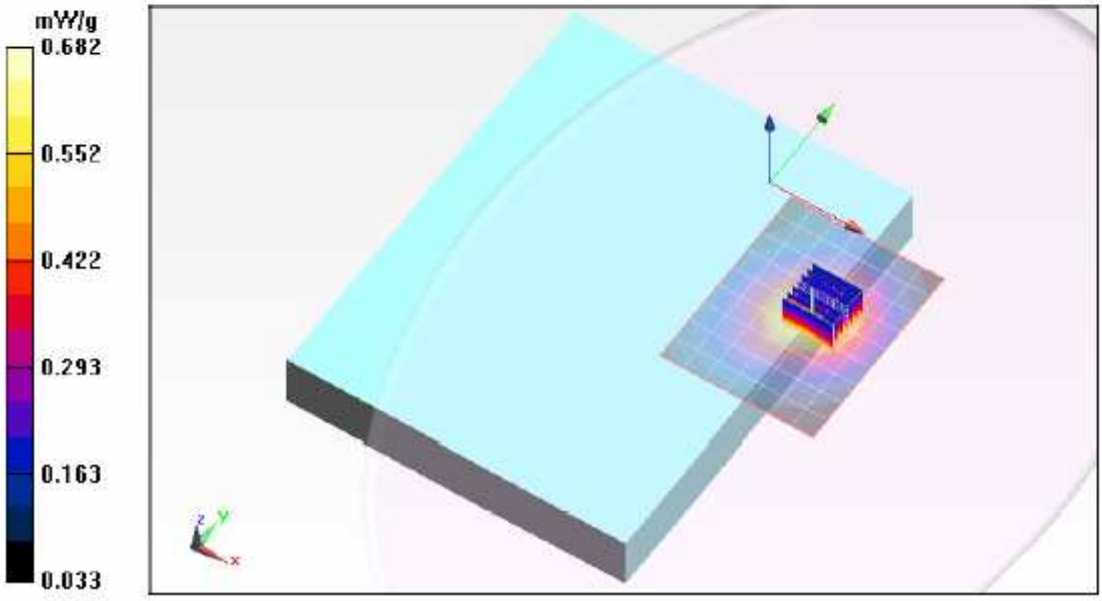
Communication System: GPRS850 2slot; Frequency: 836.6 MHz;Duty Cycle: 1:4.00037
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.995 mho/m; ε_r = 54.672; ρ = 1000 kg/m^3
Phantom section: Flat Section

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 4.0; Type: QDOVA001BB; Serial: 1099
- Measurement SW: DASY52, Version 52.6 (1);SEMCAD X Version 14.4.2 (2595)

GPRS (850)/M-ch_Ant extracted/Area Scan (8x10x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.682 mW/g

GPRS (850)/M-ch_Ant extracted/Zoom Scan (8x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 26.510 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.869 W/kg
SAR(1 g) = 0.616 mW/g; SAR(10 g) = 0.436 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.716 mW/g



Worst-case SAR Plot for Part 22 – Z plot

Date/Time: 4/22/2011 11:46:44 PM

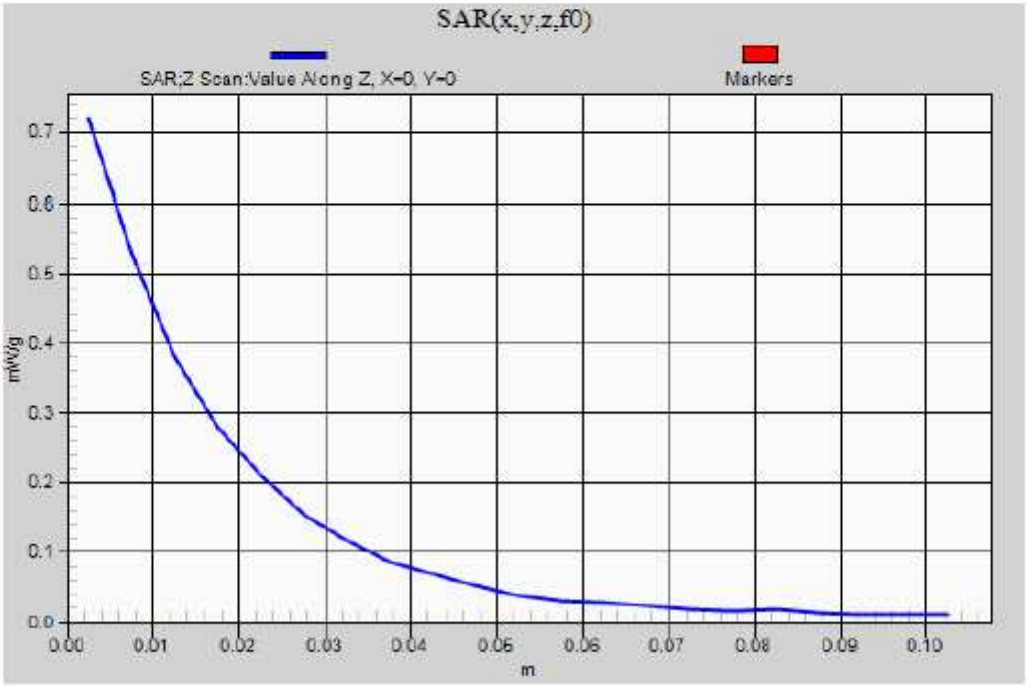
Test Laboratory: UL CCS

Bottom face

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

Communication System: GPRS850 2slot; Frequency: 836.6 MHz;Duty Cycle: 1:4.00037

GPRS (850)/M-ch_Ant extracted/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.720 mW/g



Worst-case SAR Plot for Part 24

Date/Time: 4/20/2011 4:48:22 PM

Test Laboratory: UL CCS

Secondary Landscape

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

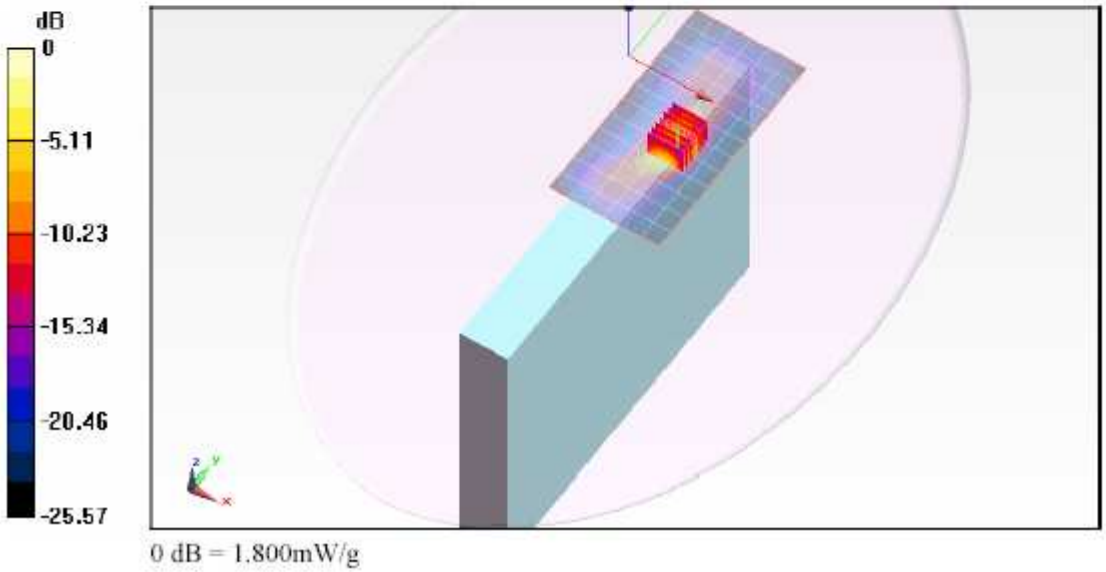
Communication System: UMTS FDD (WCDMA); Frequency: 1880 MHz;Duty Cycle: 1:2.18776
Medium parameters used: f = 1880 MHz; σ = 1.496 mho/m; ε_r = 52.423; ρ = 1000 kg/m^3
Phantom section: Flat Section

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 4.0; Type: QDOVA001BB; Serial: 1099
- Measurement SW: DASY52, Version 52.6 (1);SEMCAD X Version 14.4.2 (2595)

UMTS band II/M-ch_Ant retracted/Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.005 mW/g

UMTS band II/M-ch_Ant retracted/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 25.986 V/m; Power Drift = 0.241 dB
Peak SAR (extrapolated) = 2.740 W/kg
SAR(1 g) = 1.23 mW/g; SAR(10 g) = 0.538 mW/g
Maximum value of SAR (measured) = 1.796 mW/g



0 dB = 1.800mW/g

Worst-case SAR Plot for Part 24 - Z plot

Date/Time: 4/20/2011 5:06:07 PM

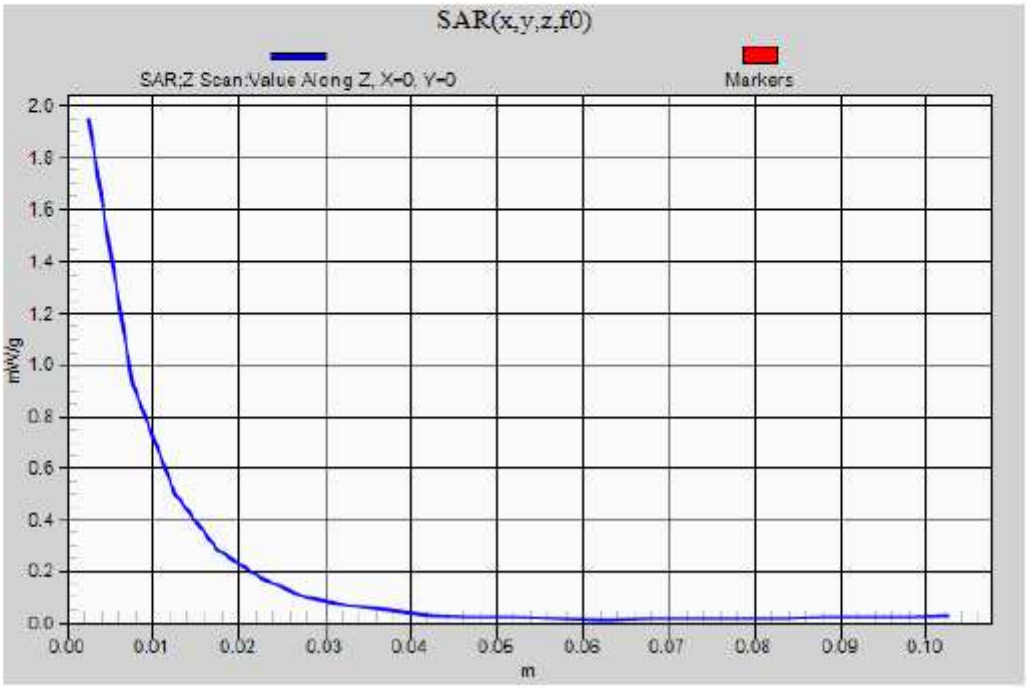
Test Laboratory: UL CCS

Secondary Landscape

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

Communication System: UMTS FDD (WCDMA); Frequency: 1880 MHz;Duty Cycle: 1:2.18776

UMTS band II/M-ch_Ant retracted/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 1.946 mW/g



Worst-case SAR Plot for Part 27

Date/Time: 4/21/2011 5:16:33 PM

Test Laboratory: UL CCS

Secondary Landscape

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

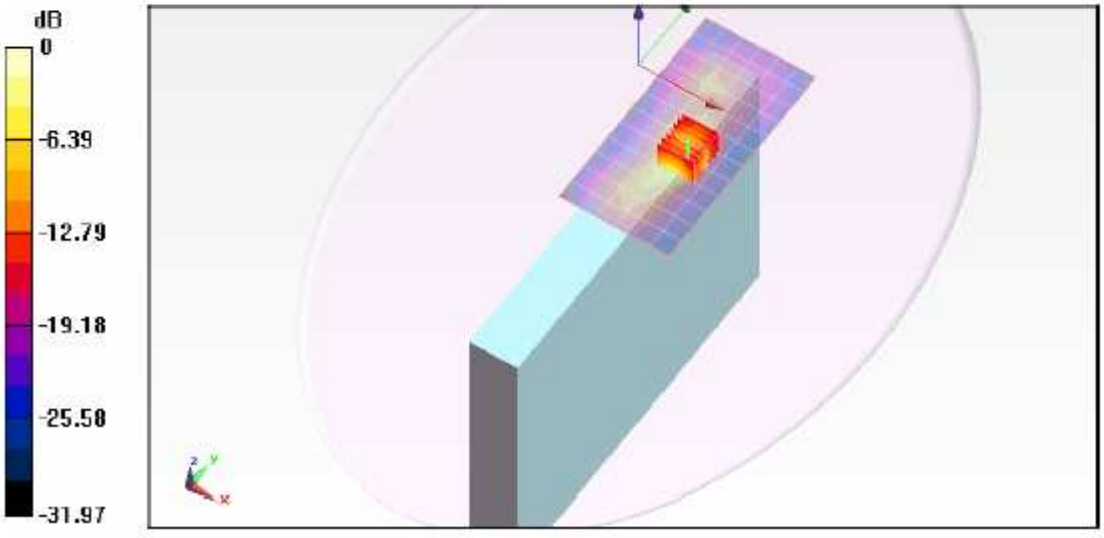
Communication System: UMTS Band IV; Frequency: 1735.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1735.4 MHz; σ = 1.541 mho/m; ε_r = 55.412; ρ = 1000 kg/m^3
Phantom section: Flat Section

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(7.28, 7.28, 7.28); Calibrated: 1/24/2011
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1239; Calibrated: 11/17/2010
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1099
- Measurement SW: DASY52, Version 52.6 (1);SEMCAD X Version 14.4.2 (2595)

UMTS band IV/M-ch_Ant retracted/Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.799 mW/g

UMTS band IV/M-ch_Ant retracted/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 22.900 V/m; Power Drift = 0.230 dB
Peak SAR (extrapolated) = 2.196 W/kg
SAR(1 g) = 0.944 mW/g; SAR(10 g) = 0.401 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.355 mW/g



0 dB = 1.350mW/g

Worst-case SAR Plot for Part 27 - Z plot

Date/Time: 4/21/2011 5:34:21 PM

Test Laboratory: UL CCS

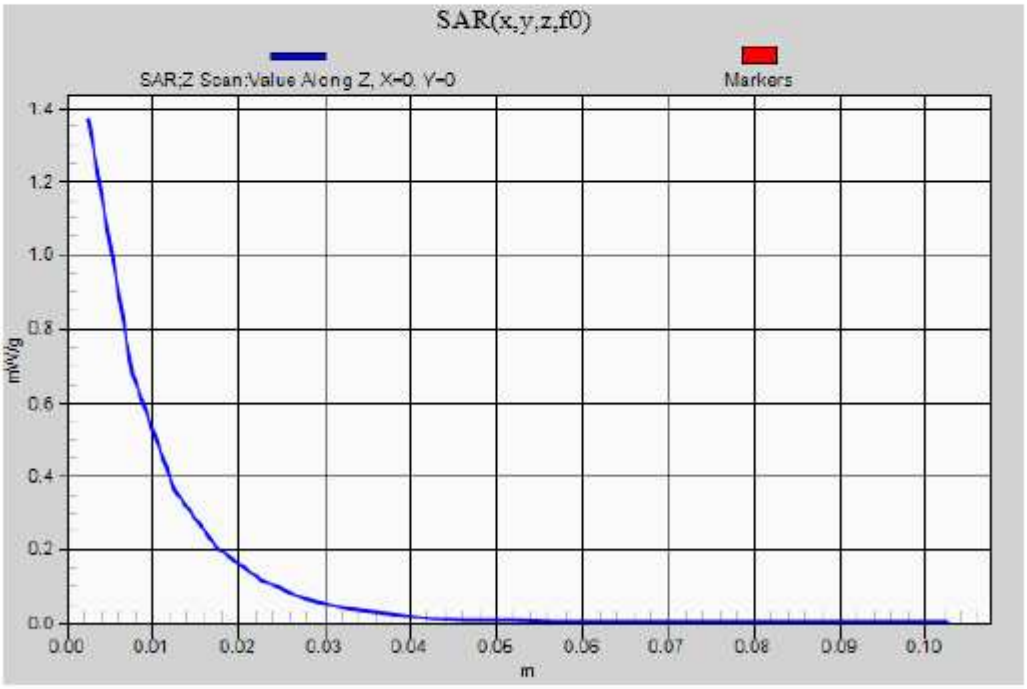
Secondary Landscape

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

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

UMTS band IV/M-ch_Ant retracted/Z Scan (1x1x21): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.369 mW/g



14. KDB 648474 SIMULTANEOUS TRANSMISSION CONSIDERATION

SUMMARY OF SAR EVALUATION FOR A DEVICE WITH MULTIPLE TRANSMITTERS

Individual Transmitter	Stand-alone SAR
WWAN	Yes
WiFi	Yes
Bluetooth*	Not required (average output is < $60/f_{(GHz)}$ mW)

SIMULTANEOUS TRANSMISSION

- WWAN can transmit simultaneously with WiFi
- WWAN can transmit simultaneously with Bluetooth
- WiFi can transmit simultaneously with Bluetooth

15. SIMULTANEOUS SAR TEST DATA SUMMARY

The following tables show the peak SAR value for WWAN and WiFi** and the corresponding summation of such 1 gram SAR values for the different exposure conditions listed under the heading “Test Position” for the bands listed. These tables are provided for the purpose of showing that when the SAR summation is >1.6 W/kg the SAR to Peak location separation ratio of the simultaneous transmitting antenna pair is <0.3.

Notes:

1. *: Bluetooth - BCM92070MD_REF6
2. **: Please refer to the following WiFi and Bluetooth SAR reports submitted under respective FCC ID applications.
   - M110361_FCC_62205ANHMW_SAR_5.6 (Intel 62205ANHMW) - FCC ID: EJE-WL0026
   - M110361_FCC_62205ANHMW_SAR_2.4 (Intel 62205ANHMW) - FCC ID: EJE-WL0026
   - M110363_FCC_AR5B97_SAR_2.4 (Atheros AR5B97) - FCC ID: PPD-AR5B97-F
   - M110362_FCC_AR5BHB116_SAR_2.4 (Atheros AR5BHB116) - FCC ID: PPD-AR5HB116
   - M110362_FCC_AR5BHB116_SAR_5.6 (Atheros AR5BHB116) - FCC ID: PPD-AR5HB116
3. The following WiFi SAR reports (worst-case) are used to calculate the Sum of SAR values.
   - M110361_FCC_62205ANHMW_SAR_5.6 (Intel 62205ANHMW) - FCC ID: EJE-WL0026
   - M110361_FCC_62205ANHMW_SAR_2.4 (Intel 62205ANHMW) - FCC ID: EJE-WL0026

15.1. Simultaneous Transmission – WWAN + WiFi 2.4 GHz Antenna B

Test Position	Antenna	Band	Cellular	Wi-Fi 2.4 GHz	∑ 1g SAR (W/kg)
Bottom face	Retracted	GSM850 GPRS 2 slot	0.00888	0	0.009
Bottom face	Extracted		0.616	0	0.616
Secondary Landscape	Retracted		0.499	0.079	0.578
Secondary Portrait	Retracted		0.012	1.480	**1.492**
Bottom face	Retracted	UMTS Band V	0.00268	0	0.003
Bottom face	Extracted		0.367	0	0.367
Secondary Landscape	Retracted		0.267	0.079	0.346
Secondary Portrait	Retracted		0.00299	1.480	1.483
Bottom face	Retracted	CDMA2000 Cell 1xRTT (RC3, SO32)	0.00738	0	0.007
Bottom face	Extracted		0.350	0	0.350
Secondary Landscape	Retracted		0.252	0.079	0.331
Secondary Portrait	Retracted		0.00485	1.480	1.485
Bottom face	Retracted	CDMA2000 Cell 1x EV-DO (Release 0)	0.0021	0	0.002
Bottom face	Extracted		0.358	0	0.358
Secondary Landscape	Retracted		0.252	0.079	0.331
Secondary Portrait	Retracted		0.00473	1.480	1.485
Bottom face	Retracted	UMTS band IV	0.025	0	0.025
Bottom face	Extracted		0.255	0	0.255
Secondary Landscape	Retracted		0.838	0.079	0.917
Secondary Landscape	Retracted		0.944	0.079	1.023
Secondary Landscape	Retracted		0.865	0.079	0.944
Secondary Portrait	Retracted		0.034	1.480	**1.514**
Bottom face	Retracted	GSM1900 GPRS 2 slot	0.00176	0	0.002
Bottom face	Extracted		0.196	0	0.196
Secondary Landscape	Retracted		0.656	0.079	0.735
Secondary Portrait	Retracted		0.046	1.480	1.526
Bottom face	Retracted	UMTS band II	0.027	0	0.027
Bottom face	Extracted		0.287	0	0.287
Secondary Landscape	Retracted		0.843	0.079	0.922
Secondary Landscape	Retracted		1.230	0.079	1.309
Secondary Landscape	Retracted		0.751	0.079	0.830
Secondary Portrait	Retracted		0.096	1.480	1.576
Bottom face	Retracted	CDMA2000 PCS 1xRTT (RC3, SO32)	0.00041	0	0.000
Bottom face	Extracted		0.228	0	0.228
Secondary Landscape	Retracted		0.848	0.079	0.927
Secondary Landscape	Retracted		1.070	0.079	1.149
Secondary Landscape	Retracted		0.806	0.079	0.885
Secondary Portrait	Retracted		0.110	1.480	**1.590**
Bottom face	Retracted	CDMA2000 PCS 1x EV-DO (Release 0)	0.017	0	0.017
Bottom face	Extracted		0.236	0	0.236
Secondary Landscape	Retracted		0.929	0.079	1.008
Secondary Landscape	Retracted		1.200	0.079	1.279
Secondary Landscape	Retracted		1.090	0.079	1.169
Secondary Portrait	Retracted		0.085	1.480	1.565

15.2. Simultaneous Transmission – WWAN + WiFi 5 GHz Antenna B

Test Position	Antenna	Band	WWAN	Wi-Fi 5 GHz	∑ 1g SAR (W/kg)
Bottom face	Retracted	GSM850 GPRS 2 slot	0.00888	0	0.009
Bottom face	Extracted		0.616	0	0.616
Secondary Landscape	Retracted		0.499	0.610	1.109
Secondary Portrait	Retracted		0.0120	1.480	**1.492**
Bottom face	Retracted	UMTS band V	0.00268	0	0.003
Bottom face	Extracted		0.367	0	0.367
Secondary Landscape	Retracted		0.267	0.610	0.877
Secondary Portrait	Retracted		0.00299	1.480	1.483
Bottom face	Retracted	CDMA2000 Cell 1xRTT (RC3, SO32)	0.00738	0	0.007
Bottom face	Extracted		0.350	0	0.350
Secondary Landscape	Retracted		0.252	0.610	0.862
Secondary Portrait	Retracted		0.00485	1.480	1.485
Bottom face	Retracted	CDMA2000 Cell 1x EV-DO (Release 0)	0.0021	0	0.002
Bottom face	Extracted		0.358	0	0.358
Secondary Landscape	Retracted		0.252	0.610	0.862
Secondary Portrait	Retracted		0.00473	1.480	1.485
Bottom face	Retracted	UMTS band IV	0.025	0	0.025
Bottom face	Extracted		0.255	0	0.255
Secondary Landscape	Retracted		0.838	0.610	1.448
Secondary Landscape	Retracted		0.944	0.610	**1.554**
Secondary Landscape	Retracted		0.865	0.610	1.475
Secondary Portrait	Retracted		0.034	1.480	1.514
Bottom face	Retracted	GSM1900 GPRS 2 slot	0.00176	0	0.002
Bottom face	Extracted		0.196	0	0.196
Secondary Landscape	Retracted		0.656	0.610	1.266
Secondary Portrait	Retracted		0.046	1.480	1.526
Bottom face	Retracted	UMTS band II	0.027	0	0.027
Bottom face	Extracted		0.287	0	0.287
Secondary Landscape	Retracted		0.843	0.610	1.453
Secondary Landscape	Retracted		1.230	0.610	**1.840**
Secondary Landscape	Retracted		0.751	0.610	1.361
Secondary Portrait	Retracted		0.096	1.480	1.576
Bottom face	Retracted	CDMA2000 PCS 1xRTT (RC3, SO32)	0.00041	0	0.000
Bottom face	Extracted		0.228	0	0.228
Secondary Landscape	Retracted		0.848	0.610	1.458
Secondary Landscape	Retracted		1.070	0.610	**1.680**
Secondary Landscape	Retracted		0.806	0.610	1.416
Secondary Portrait	Retracted		0.110	1.480	1.590
Bottom face	Retracted	CDMA2000 PCS 1x EV-DO (Release 0)	0.017	0	0.017
Bottom face	Extracted		0.236	0	0.236
Secondary Landscape	Retracted		0.929	0.610	1.539
Secondary Landscape	Retracted		1.200	0.610	**1.810**
Secondary Landscape	Retracted		1.090	0.610	**1.700**
Secondary Portrait	Retracted		0.085	1.480	1.565

*****Antenna Pair SAR to Peak Location Separation Ratio ∑ 1-g SAR > 1.6 W/kg:

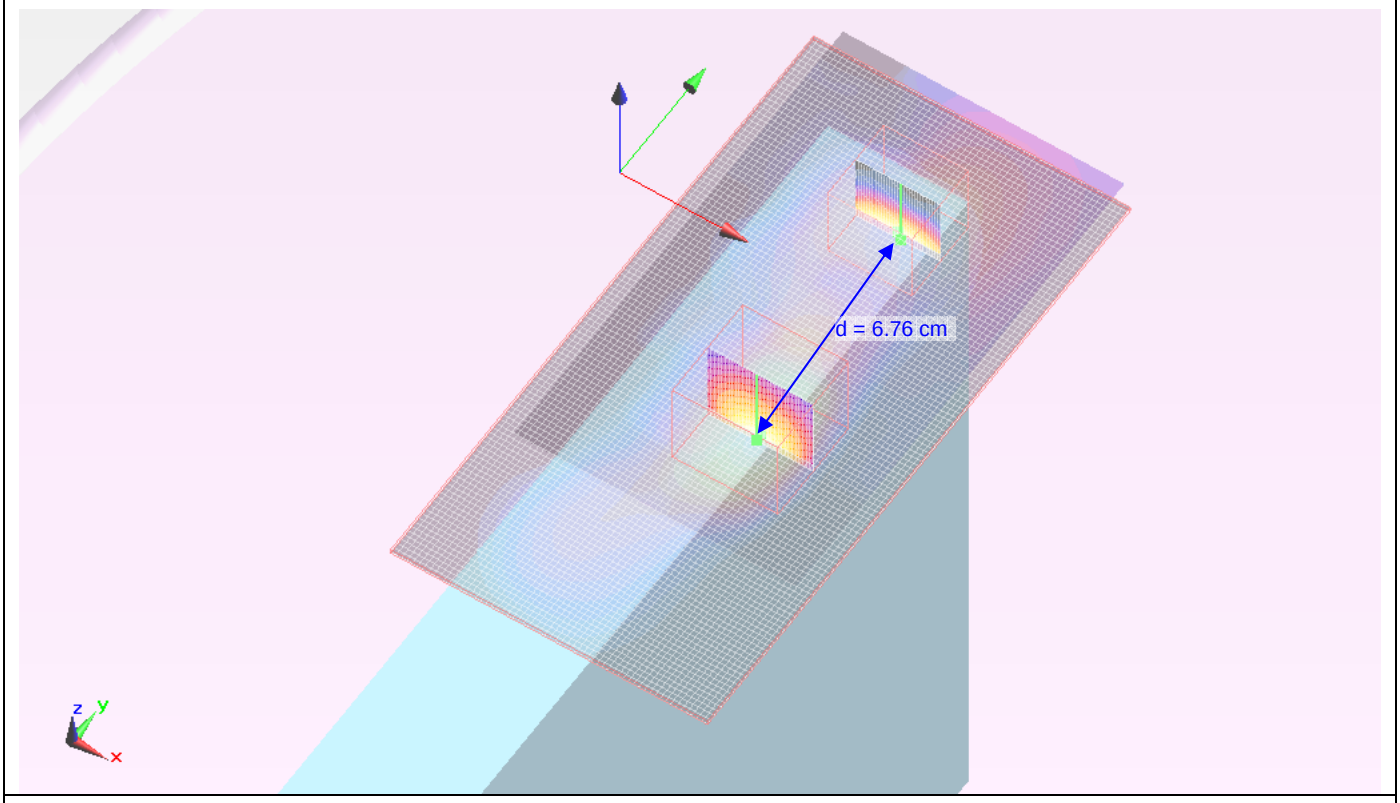
∑ 1-g SAR (W/kg)	Separation distance (cm) Cellular-to-WiFi antenna	Antenna Pair SAR to Peak Location Separation Ratio
1.840	6.76	0.272
1.680	7.15	0.235
1.810	7.66	0.236
1.700	7.71	0.220

Notes:

1. This table indicates the actual measured distance between peak SAR locations. Refer to the following pages for 3D distances.
2. Simultaneous transmission SAR evaluation is not required due to SAR to peak location separation ratios are less than 0.3.

UMTS band II

Peaks SAR separation distance from cellular-to-WiFi 5 GHz bands antenna B

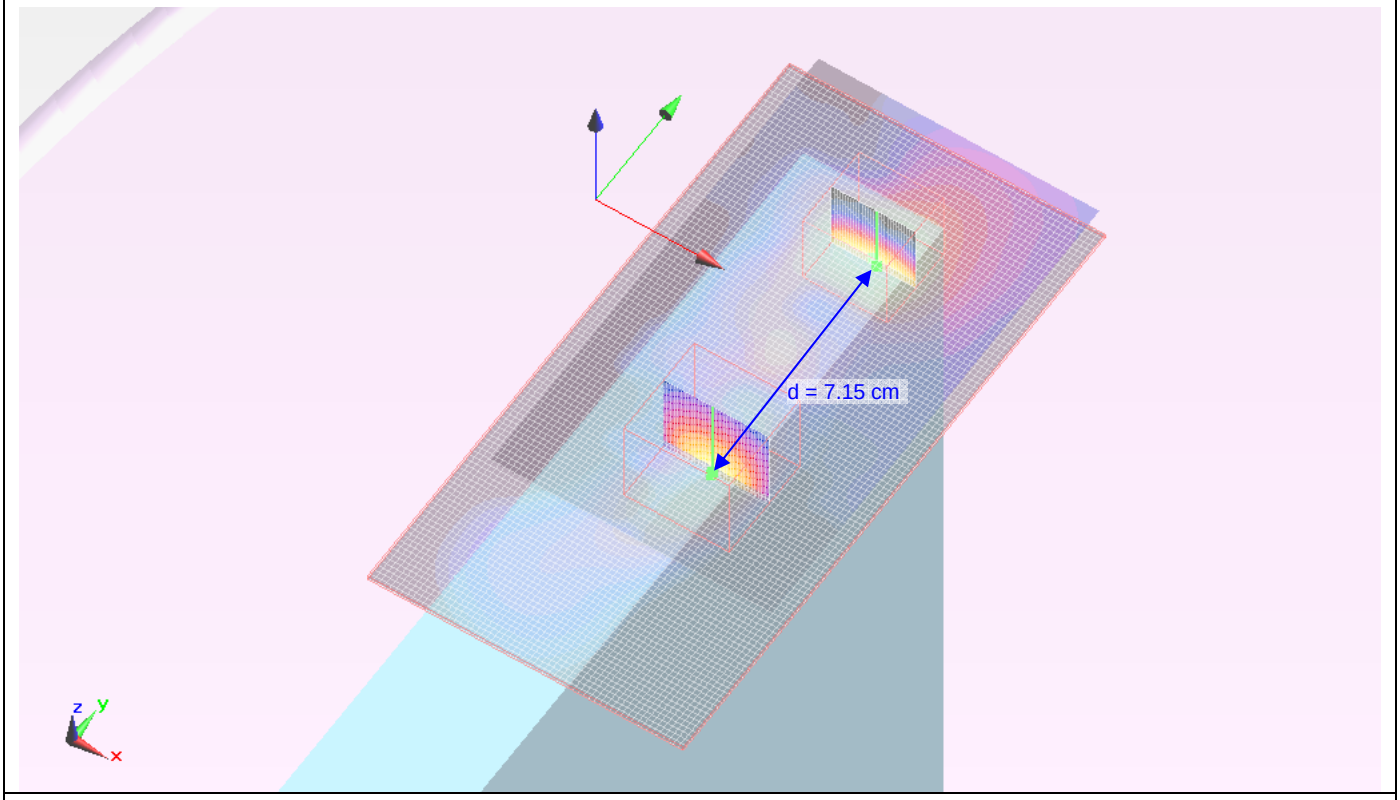


	Value of SAR	X	Y	Z
	mW/g	m	m	m
UMTS Band II	2.74	-0.002	0.0615	-0.181
WiFi 5GHz	3.48	-0.0062	0.129	-0.18
	m	cm		

Separation distance (d) =	0.0676	**6.76**	
	SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)		

CDMA2000 PCS band 1xRTT

Peaks SAR separation distance from cellular-to-WiFi 5 GHz bands antenna B

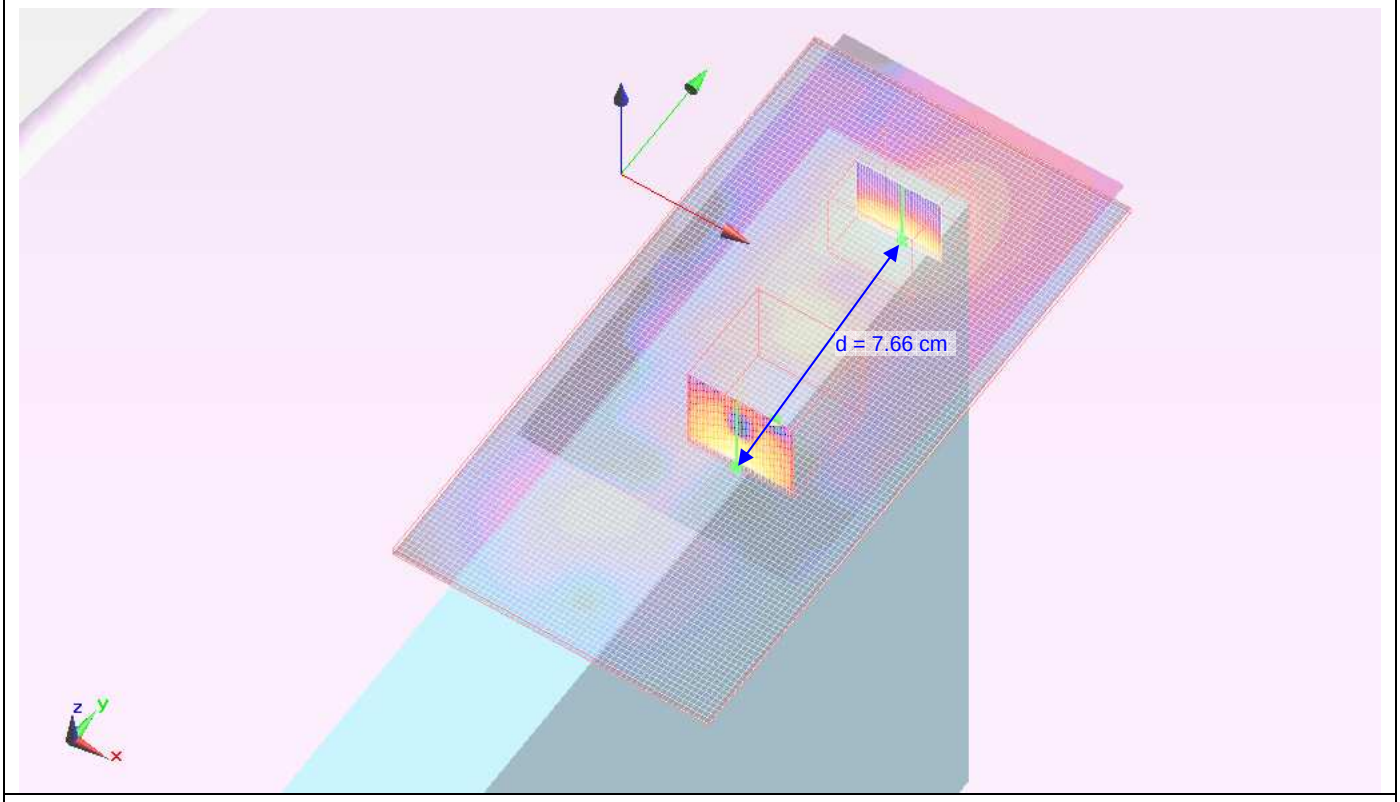


	Value of SAR	X	Y	Z
	mW/g	m	m	m
CDMA2000 PCS 1xRTT	2.49	-0.005	0.0575	-0.181
WiFi 5GHz	3.48	-0.0062	0.129	-0.18

	m	cm	
Separation distance (d) =	0.0715	**7.15**	
	SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)		

CDMA2000 PCS band 1xEVDO_Mid Channel

Peaks SAR separation distance from cellular-to-WiFi 5 GHz bands antenna B

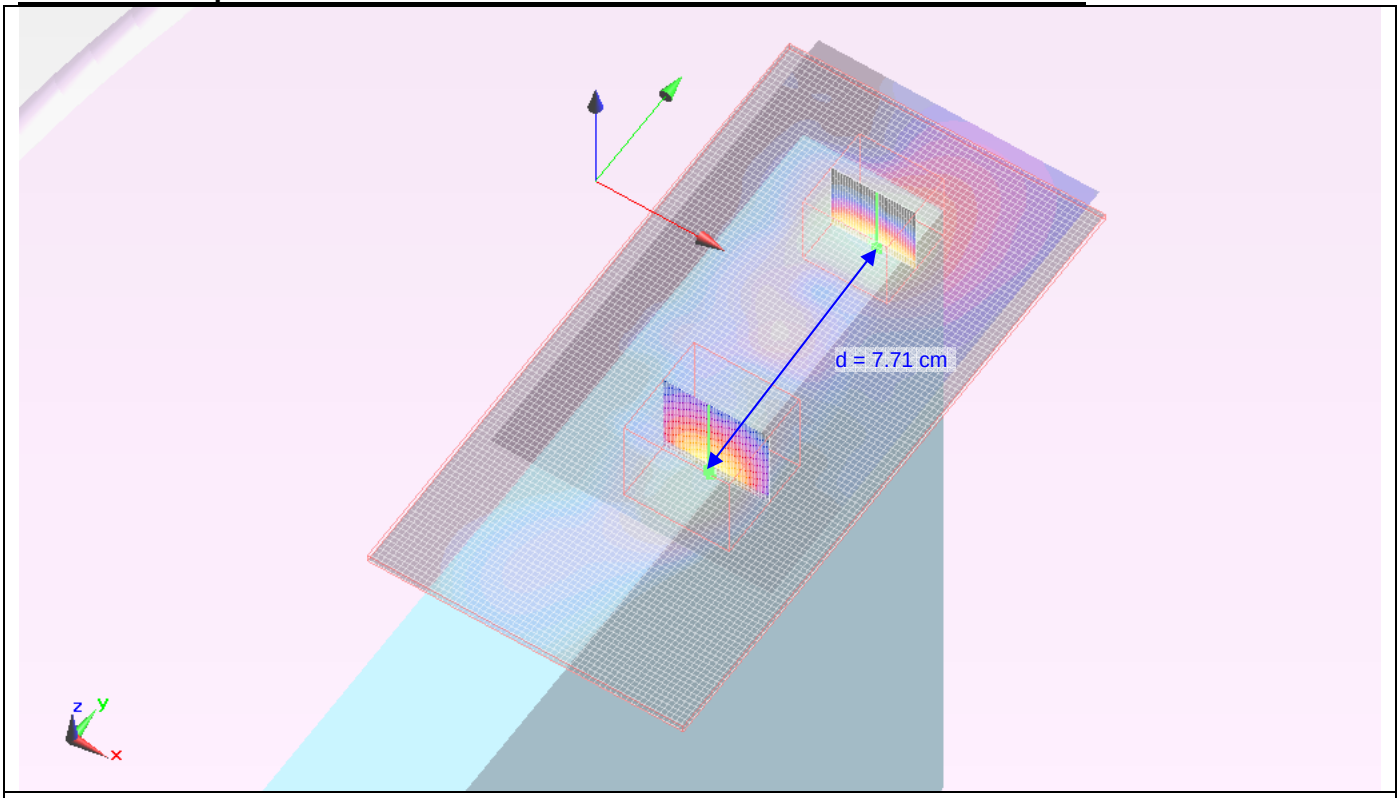


	Value of SAR	X	Y	Z
	mW/g	m	m	m
CDMA2000 PCS 1xEVDO	3.17	-0.002	0.0525	-0.182
WiFi 5GHz	3.48	-0.0062	0.129	-0.18

	m	cm	
Separation distance (d) =	0.0766	**7.66**	
	SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)		

CDMA2000 PCS band 1xEVDO_High channel

Peaks SAR separation distance from cellular-to-WiFi 5 GHz bands antenna B



	Value of SAR	X	Y	Z
	mW/g	m	m	m
CDMA2000 PCS 1xEVDO	2.48	-0.003	0.052	-0.182
WiFi 5GHz	3.48	-0.0062	0.129	-0.18
	m	cm		
Separation distance (d) =	0.0771	**7.71**		
	SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)			

15.3. Simultaneous Transmission – WWAN + WiFi 5 GHz Antenna A

Test Position	Antenna	Band	WWAN	Wi-Fi 5 GHz	∑ 1g SAR (W/kg)
Bottom face	Retracted	GSM850 GPRS 2 slot	0.00888	0	0.009
Bottom face	Extracted		0.616	0	0.616
Secondary Landscape	Retracted		0.499	1.120	**1.619**
Secondary Portrait	Retracted		0.0120	0	0.012
Bottom face	Retracted	UMTS band V	0.00268	0	0.003
Bottom face	Extracted		0.367	0	0.367
Secondary Landscape	Retracted		0.267	1.120	1.387
Secondary Portrait	Retracted		0.00299	0	0.003
Bottom face	Retracted	CDMA2000 Cell 1xRTT (RC3, SO32)	0.00738	0	0.007
Bottom face	Extracted		0.350	0	0.350
Secondary Landscape	Retracted		0.252	1.120	1.372
Secondary Portrait	Retracted		0.00485	0	0.005
Bottom face	Retracted	CDMA2000 Cell 1x EV-DO (Release 0)	0.0021	0	0.002
Bottom face	Extracted		0.358	0	0.358
Secondary Landscape	Retracted		0.252	1.120	1.372
Secondary Portrait	Retracted		0.00473	0	0.005
Bottom face	Retracted	UMTS band IV	0.025	0	0.025
Bottom face	Extracted		0.255	0	0.255
Secondary Landscape	Retracted		0.838	1.120	**1.958**
Secondary Landscape	Retracted		0.944	1.120	**2.064**
Secondary Landscape	Retracted		0.865	1.120	**1.985**
Secondary Portrait	Retracted		0.034	0	0.034
Bottom face	Retracted	GSM1900 GPRS 2 slot	0.00176	0	0.002
Bottom face	Extracted		0.196	0	0.196
Secondary Landscape	Retracted		0.656	1.120	**1.776**
Secondary Portrait	Retracted		0.046	0	0.046
Bottom face	Retracted	UMTS band II	0.027	0	0.027
Bottom face	Extracted		0.287	0	0.287
Secondary Landscape	Retracted		0.843	1.120	**1.963**
Secondary Landscape	Retracted		1.230	1.120	**2.350**
Secondary Landscape	Retracted		0.751	1.120	**1.871**
Secondary Portrait	Retracted		0.096	0	0.096
Bottom face	Retracted	CDMA2000 PCS 1xRTT (RC3, SO32)	0.00041	0	0.000
Bottom face	Extracted		0.228	0	0.228
Secondary Landscape	Retracted		0.848	1.120	**1.968**
Secondary Landscape	Retracted		1.070	1.120	**2.190**
Secondary Landscape	Retracted		0.806	1.120	**1.926**
Secondary Portrait	Retracted		0.110	0	0.110
Bottom face	Retracted	CDMA2000 PCS 1x EV-DO (Release 0)	0.017	0	0.017
Bottom face	Extracted		0.236	0	0.236
Secondary Landscape	Retracted		0.929	1.120	**2.049**
Secondary Landscape	Retracted		1.200	1.120	**2.320**
Secondary Landscape	Retracted		1.090	1.120	**2.210**
Secondary Portrait	Retracted		0.085	0	0.085

Antenna Pair SAR to Peak Location Separation Ratio ∑ 1-g SAR > 1.6 W/kg:

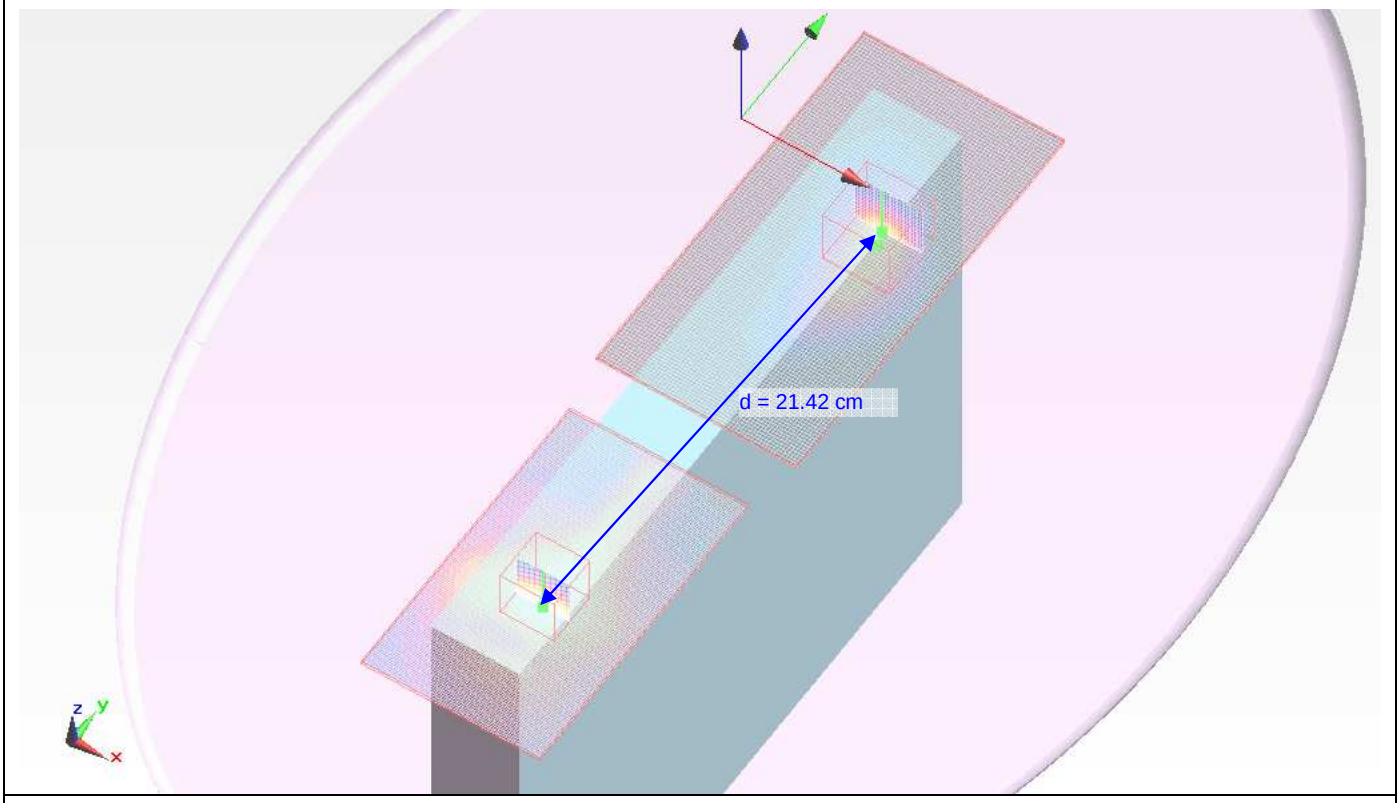
∑ 1-g SAR (W/kg)	Separation distance (cm) WWAN-to-WiFi antenna	Antenna Pair SAR to Peak Location Separation Ratio
1.619	21.42	0.076
1.958	17.92	0.109
2.064	17.92	0.115
1.985	17.92	0.111
1.776	18.16	0.098
1.963	18.16	0.108
2.350	18.16	0.129
1.871	18.16	0.103
1.968	18.16	0.108
2.190	18.16	0.121
1.926	18.16	0.106
2.049	18.16	0.113
2.320	18.16	0.128
2.210	18.16	0.122

Notes:

1. This table indicates the actual measured distance between peak SAR locations. Refer to the following pages for 3D distances.
2. Simultaneous transmission SAR evaluation is not required due to SAR to peak location separation ratios are less than 0.3.

GSM850 GPRS 2 slot

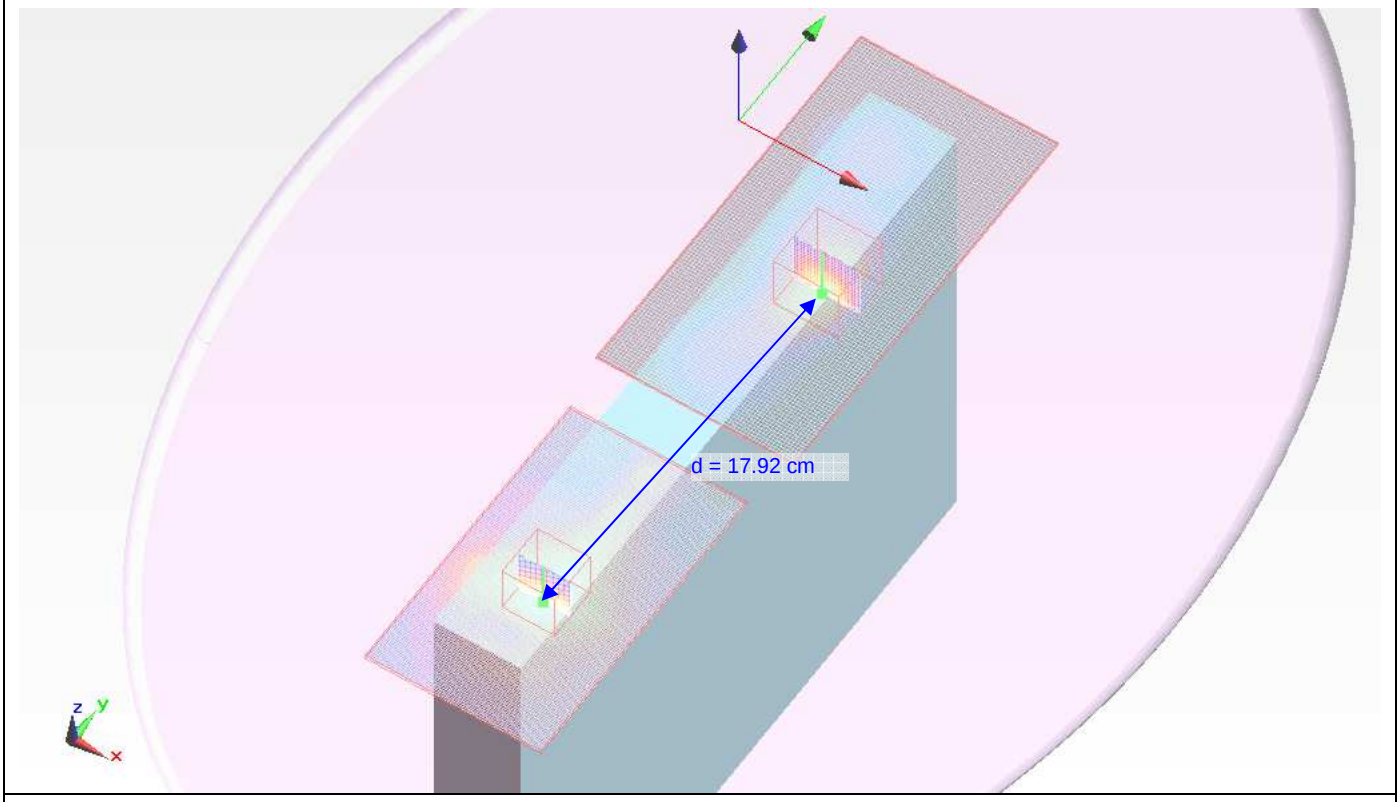
Peaks SAR separation distance from WWAN-to-WiFi 5 GHz bands antenna A



	Value of SAR	X	Y	Z
	mW/g	m	m	m
GSM850 GPRS 2 slot	1.65	0.0005	0.094	-0.182
WiFi 5GHz	7.36	-0.009	-0.12	-0.181
	m	cm		
Separation distance (d) =	0.2142	**21.42**		
	SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)			

UMTS Band IV_Mid channel

Peaks SAR separation distance from WWAN-to-WiFi 5 GHz band antenna A

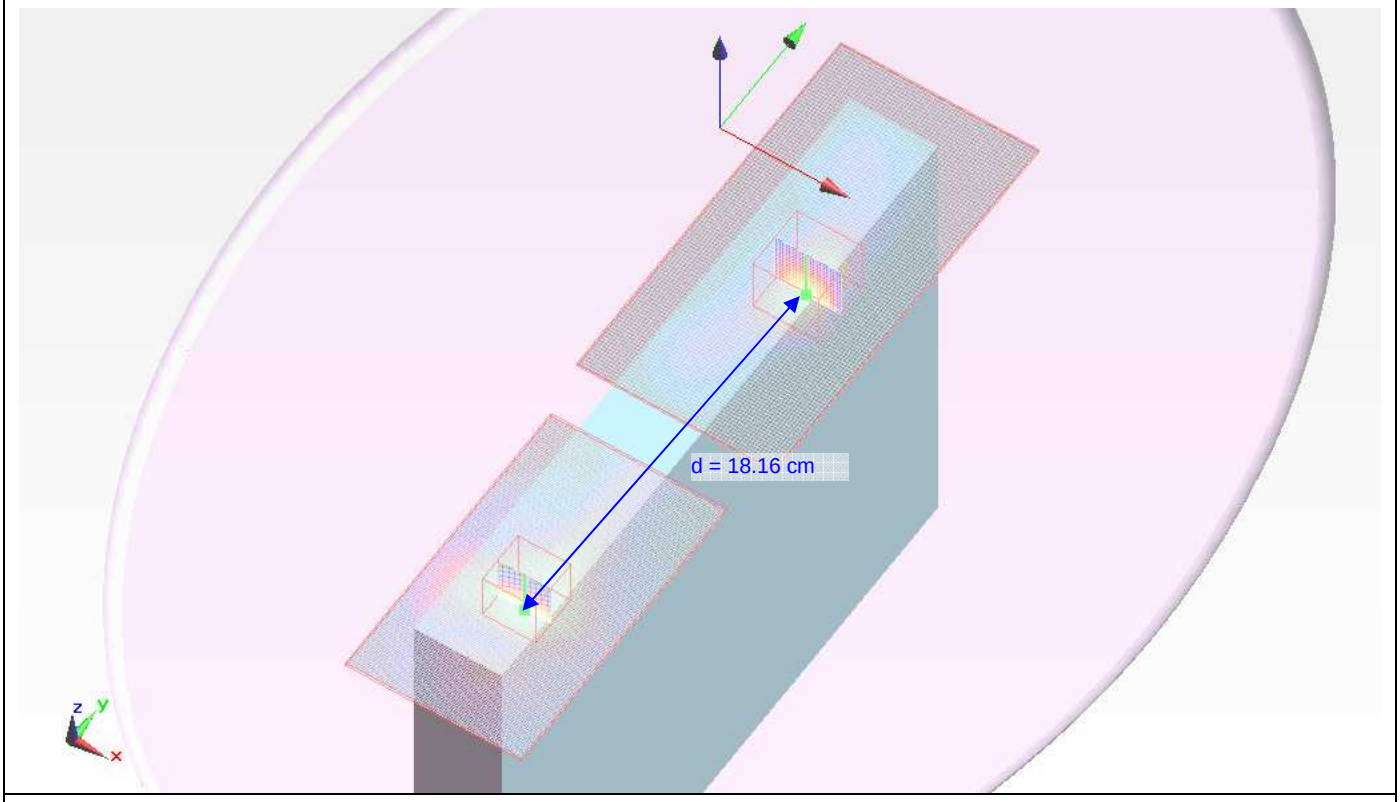


	Value of SAR	X	Y	Z
	mW/g	m	m	m
UMTS band IV	2.2	-0.0015	0.059	-0.18
WiFi 5GHz	7.36	-0.009	-0.12	-0.181

	m	cm	
Separation distance (d) =	0.1792	**17.92**	
	SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)		

UMTS Band II_Mid channel

Peaks SAR separation distance from WWAN-to-WiFi 5 GHz band antenna A



	Value of SAR	X	Y	Z
	mW/g	m	m	m
UMTS band II	2.74	-0.002	0.0615	-0.181
WiFi 5GHz	7.36	-0.009	-0.12	-0.181
m	cm			

Separation distance (d) =	0.1816	**18.16**	
	SQRT((X1-X2)^2+(Y1-Y2)^2+(Z1-Z2)^2)		

16. ATTACHMENTS

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