



**FCC OET BULLETIN 65 SUPPLEMENT C
CLASS II PERMISSIVE CHANGE
SAR EVALUATION REPORT**

(WWAN PORTION)

For

**CDMA2000 1X/1X-EVDO, WCDMA/HSPA AND GSM/GPRS/EDGE
PCI EXPRESSTM MINI CARD**

(Tested inside of Notebook PC, Model NP-N150)

**MODEL: Gobi2000
FCC ID: A3LGOBI2000**

**REPORT NUMBER: 09I12978-3C
ISSUE DATE: February 3, 2010**

Prepared for

**SAMSUNG ELECTRONICS CO., LTD.
416 MAETAN 3-DONG,
YEONGTONG-GU, SUWON-CITY, GYEONGGI-DO
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Prepared by

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NVLAP LAB CODE 200065-0

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	January 6, 2010	Initial Issue	--
A	January 14, 2010	1. Updated model designation for WWAN 2. Add worst-case justification statement in Section 10.3	Sunny Shih
B	January 20, 2010	1. Added worst-case justification statement in section 11 2. Added KDB 447498 consideration statement in section 5	Sunny Shih
C	February 3, 2010	1. Added KDB 616217 D03 SAR Supp Note and Netbook Laptop v01 2. Updated conducted power in Section 10 3. Updated Summary of test results, to incl. KDB 616217 D01 SAR procedures in order to justify test reductions.	Sunny Shih

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD. 416 MAETAN 3-DONG, YEONGTONG-GU,SUWON-CITY, GYEONGGI-DO 443-742 KOREA		
EUT DESCRIPTION:	CDMA2000 1X/1X-EVDO, WCDMA/HSPA AND GSM/GPRS/EDGE PCI EXPRESSTM MINI CARD (Tested inside of Notebook PC, Model NP-N150)		
MODEL NUMBER:	Gobi2000		
DEVICE CATEGORY:	Portable		
EXPOSURE CATEGORY:	General Population/Uncontrolled Exposure		
DATE TESTED:	December 30, 2009		
THE HIGHEST SAR VALUES:			
FCC / IC Rule Parts	Frequency Range [MHz]	The Highest 1g SAR (1g_mW/g)	Limit (mW/g)
22H / RSS-132	824 - 849	0.036 (GPRS835 2 slots)	1.6
24E / RSS-133	1850 - 1910	0.048 (EV-DO Rel 0)	

APPLICABLE STANDARDS AND TEST PROCEDURES:

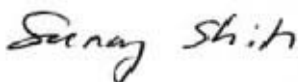
STANDARDS AND TEST PROCEDURES	TEST RESULTS
FCC OET Bulletin 65 Supplement C and the following specific Test Procedures: <ul style="list-style-type: none"> o KDB 941225 D01 SAR test for 3G devices v02 o KDB 941225 D03 SAR Test Reduction GSM/GPRS/EDGE vo1 o KDB 248227 SAR Measurement Procedure for 820.11abg Transmitters v0r02 o KDB 447498 D01 Mobile Portable RF Exposure v04 o KDB 616217 D01 SAR for Laptop with Screen Ant v01r01 o KDB 616217 D03 SAR Supp Note and Netbook Laptop v01 	Pass

Compliance Certification Services, Inc. (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 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 CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by 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.

Approved & Released For CCS By:

Tested By:




SUNNY SHIH
 ENGINEERING SUPERVISOR
 COMPLIANCE CERTIFICATION SERVICES

DEVIN CHANG
 EMC ENGINEER
 COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC OET Bulletin 65 Supplement C, 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 248227 SAR Measurement Procedure for 820.11abg Transmitters v0r02
- KDB 447498 D01 Mobile Portable RF Exposure v04
- KDB 616217 D01 SAR for Laptop with Screen Ant v01r01
- 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.

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		
Electronic Probe kit	HP	85070C	N/A	N/A		
S-Parameter Network Analyzer	Agilent	8753ES-6	MY40001647	11	22	2010
Signal Generator	Agilent	8753ES-6	MY40001647	11	22	2010
E-Field Probe	SPEAG	EX3DV4	3686	3	23	2010
Thermometer	ERTCO	639-1S	1718	5	1	2010
Data Acquisition Electronics	SPEAG	DAE3 V1	500	9	15	2010
System Validation Dipole	SPEAG	D835V2	4d002	4	23	2011
System Validation Dipole	SPEAG	D900V2	108	1	21	2010
System Validation Dipole	SPEAG	D1800V2	294	1	29	2010
System Validation Dipole	SPEAG	D1900V2	5d043	11	24	2011
System Validation Dipole	SPEAG	D2450V2	748	4	14	2010
System Validation Dipole	SPEAG	D5GHzV2	1075	9	3	2011
ESG Vector Signal Generator	Agilent	E4438C	US44271090	9	17	2010
Power Meter	Giga-tronics	8651A	8651404	1	11	2010
Power Sensor	Giga-tronics	80701A	1834588	1	11	2010
Amplifier	Mini-Circuits	ZVE-8G	90606	N/A		
Amplifier	Mini-Circuits	ZHL-42W	D072701-5	N/A		
Simulating Liquid	CCS	H1900	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	M1900	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	H1800	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	M1800	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	H1700	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	M1700	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	H835	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	M835	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	H900	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	M900	N/A	Within 24 hrs of first test		
Simulating Liquid	SPAEG	H2450	N/A	Within 24 hrs of first test		
Simulating Liquid	SPAEG	M2450	N/A	Within 24 hrs of first test		

4.2. MEASUREMENT UNCERTAINTY

Measurement uncertainty for 300 MHz – 3000 MHz

Uncertainty component	Tol. (±%)	Probe Dist.	Div.	Ci (1g)	Ci (10g)	Std. Unc.(±%)		
						Ui (1g)	Ui(10g)	
Measurement System								
Probe Calibration	4.80	N	1	1	1	4.80	4.80	
Axial Isotropy	4.70	R	1.732	0.707	0.707	1.92	1.92	
Hemispherical Isotropy	9.60	R	1.732	0.707	0.707	3.92	3.92	
Boundary Effects	1.00	R	1.732	1	1	0.58	0.58	
Linearity	4.70	R	1.732	1	1	2.71	2.71	
System Detection Limits	1.00	R	1.732	1	1	0.58	0.58	
Readout Electronics	1.00	N	1	1	1	1.00	1.00	
Response Time	0.80	R	1.732	1	1	0.46	0.46	
Integration Time	2.60	R	1.732	1	1	1.50	1.50	
RF Ambient Conditions - Noise	1.59	R	1.732	1	1	0.92	0.92	
RF Ambient Conditions - Reflections	0.00	R	1.732	1	1	0.00	0.00	
Probe Positioner Mechanical Tolerance	0.40	R	1.732	1	1	0.23	0.23	
Probe Positioning With Respect to Phantom Shell	2.90	R	1.732	1	1	1.67	1.67	
Extrapolation, interpolation, and integration algorithms for max. SAR evaluation	3.90	R	1.732	1	1	2.25	2.25	
Test sample Related								
Test Sample Positioning	1.10	N	1	1	1	1.10	1.10	
Device Holder Uncertainty	3.60	N	1	1	1	3.60	3.60	
Power and SAR Drift Measurement	5.00	R	1.732	1	1	2.89	2.89	
Phantom and Tissue Parameters								
Phantom Uncertainty	4.00	R	1.732	1	1	2.31	2.31	
Liquid Conductivity - Target	5.00	R	1.732	0.64	0.43	1.85	1.24	
Liquid Conductivity - Meas.	8.60	N	1	0.64	0.43	5.50	3.70	
Liquid Permittivity - Target	5.00	R	1.732	0.6	0.49	1.73	1.41	
Liquid Permittivity - Meas.	3.30	N	1	0.6	0.49	1.98	1.62	
Combined Standard Uncertainty						RSS	11.44	10.49
Expanded Uncertainty (95% Confidence Interval)						K=2	22.87	20.98
Notes for table								
1. Tol. - tolerance in influence quantity								
2. N - Normal								
3. R - Rectangular								
4. Div. - Divisor used to obtain standard uncertainty								
5. Ci - is the sensitivity coefficient								

5. EQUIPMENT UNDER TEST

CDMA2000 1X/1X-EVDO, WCDMA/HSPA AND GSM/GPRS/EDGE

PCI EXPRESSTM MINI CARD

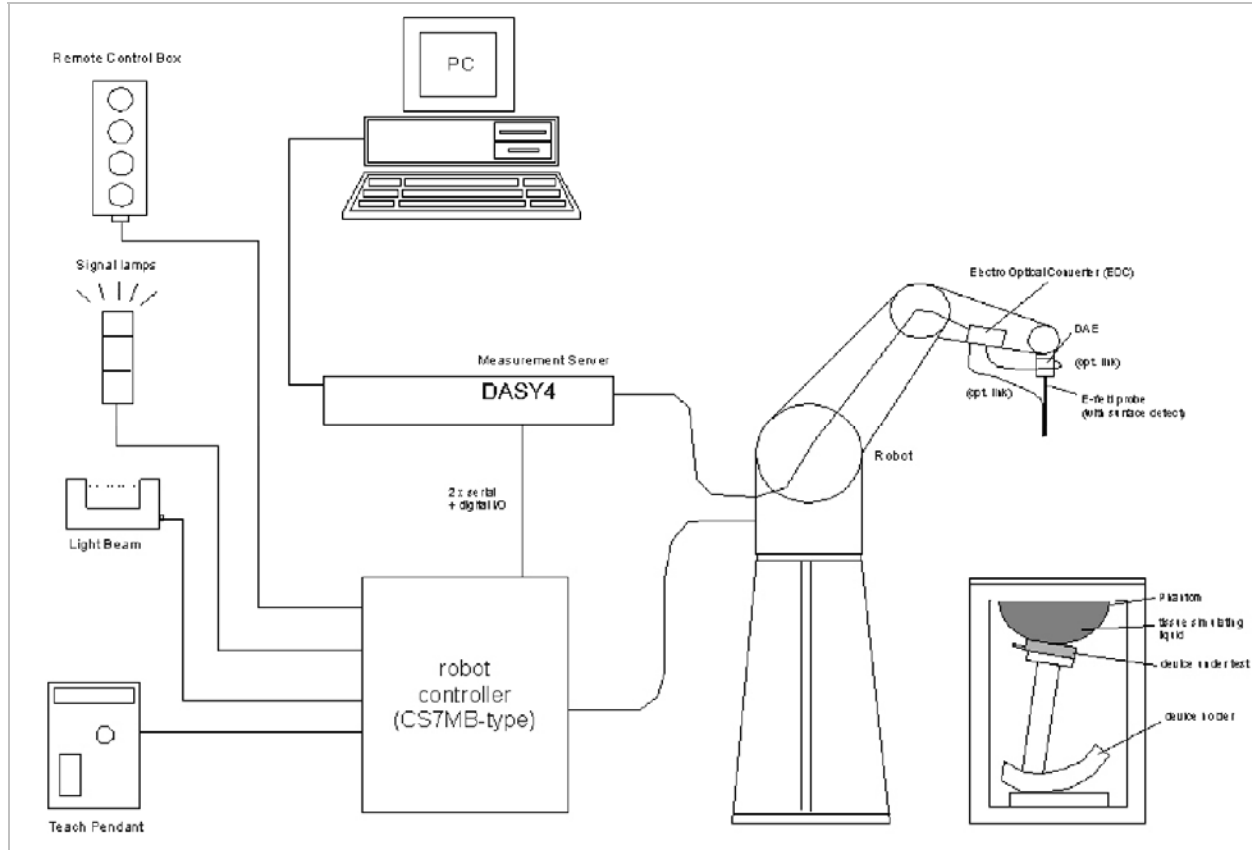
(Tested inside of Notebook PC, Model NP-N150)

Per KDB 447498 in section 2 a)ii), "A device may be approved for use in multiple host platforms, each with similar family attributes, for example, PDA, laptop/notebook/netbook computers, and tablet computers, when each host platform is tested in the most conservative exposure conditions and the 1-g SAR is < 0.8 W/kg for all configurations. Therefore, no WLAN SAR evaluation for WLAN due to NP-N150 Tx (Main) antenna-to-user's separation distance is greater than NP-N130

<u>Host platforms</u>	<u>Separation distance</u>
NP-N130	17.5 cm (SAR: 0.034 mW/g)
NP-N150	18.5 cm

Antenna(s):	<p><u>WWAN</u> Located at top of the display:</p> <table border="0"> <tr> <td><u>Vendor</u></td> <td><u>Model Number</u></td> </tr> <tr> <td>Galtronics</td> <td>Main: BA42-00276A</td> </tr> </table>	<u>Vendor</u>	<u>Model Number</u>	Galtronics	Main: BA42-00276A
<u>Vendor</u>	<u>Model Number</u>				
Galtronics	Main: BA42-00276A				
Separation distances					
from antenna-to-user:	18.5 cm - WWAN main antenna-to-user				
from antenna-to-antenna:	10.6 cm WiFi main antenna-to-WWAN main antenna. 8.3 cm WiFi Aux antenna-to-WWAN main antenna.				
Power supply:	Power supplied through laptop computer (host device)				

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 to validate 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. LIQUID PARAMETERS CHECK

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine if the dielectric parameters are within the tolerances of the specified target values. The relative permittivity and conductivity of the tissue material should be within $\pm 5\%$ of the values given in the table below.

Reference Values of Tissue Dielectric Parameters for Head and Body Phantom (for 150 – 3000 MHz and 5800 MHz)

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 $\rho = 1000 \text{ kg/m}^3$)

8.1. LIQUID CHECK RESULTS FOR 835 MHZ

Simulating Liquid Dielectric Parameters for Muscle 835 MHz

Room Ambient Temperature = 25°C; Relative humidity = 38%

Measured by: Devin Chang

f (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
835	e'	56.8	Relative Permittivity (ϵ_r):	56.829	55.2	2.95	± 5
	e"	21.1	Conductivity (σ):	0.979	0.97	0.98	± 5

Liquid Check

Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C

December 30, 2009 05:26 PM

Frequency	e'	e"
750000000.	57.4861	21.4586
755000000.	57.4319	21.4617
760000000.	57.3997	21.4013
765000000.	57.3691	21.3787
770000000.	57.3094	21.3522
775000000.	57.2734	21.3140
780000000.	57.2332	21.2831
785000000.	57.1778	21.2652
790000000.	57.1476	21.2390
795000000.	57.0893	21.2188
800000000.	57.0634	21.1955
805000000.	57.0356	21.1921
810000000.	56.9763	21.1873
815000000.	56.9497	21.1466
820000000.	56.9248	21.1237
825000000.	56.8773	21.0906
830000000.	56.8286	21.0859
835000000.	56.7947	21.0643
840000000.	56.7408	21.0450
845000000.	56.7053	21.0158
850000000.	56.6753	20.9704
855000000.	56.6037	20.9758
860000000.	56.5681	20.9790
865000000.	56.5145	20.9482
870000000.	56.4845	20.9176
875000000.	56.4298	20.9415
880000000.	56.3926	20.9245
885000000.	56.3500	20.9110
890000000.	56.3006	20.9062
895000000.	56.2766	20.8605
900000000.	56.2365	20.8595

The conductivity (σ) can be given as:

$$\sigma = \omega \epsilon_0 e'' = 2 \pi f \epsilon_0 e''$$

where $f = \text{target } f * 10^6$

$$\epsilon_0 = 8.854 * 10^{-12}$$

8.2. LIQUID CHECK RESULTS FOR 1900 MHZ

Simulating Liquid Dielectric Parameters for Muscle 1900 MHz

Room Ambient Temperature = 24°C; Relative humidity = 38%

Measured by: Devin Chang

f (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
1800	e'	54.0	Relative Permittivity (ϵ_r):	54.007	53.3	1.33	± 5
	e"	14.5	Conductivity (σ):	1.455	1.52	-4.26	± 5

Liquid Check

Ambient temperature: 23 deg. C; Liquid temperature: 22 deg. C

December 30, 2009 11:20 PM

Frequency	e'	e"
1710000000.	54.5925	13.9045
1720000000.	54.5640	13.9276
1730000000.	54.5382	13.9562
1740000000.	54.4920	14.0143
1750000000.	54.4571	14.0462
1760000000.	54.4186	14.0847
1770000000.	54.3915	14.1290
1780000000.	54.3462	14.1640
1790000000.	54.3022	14.1948
1800000000.	54.2801	14.2160
1810000000.	54.2596	14.2446
1820000000.	54.2268	14.2432
1830000000.	54.2029	14.2795
1840000000.	54.1794	14.3001
1850000000.	54.1467	14.3403
1860000000.	54.1226	14.3814
1870000000.	54.0850	14.4197
1880000000.	54.0559	14.4508
1890000000.	54.0465	14.4953
1900000000.	54.0074	14.5324
1910000000.	53.9797	14.5748

The conductivity (σ) can be given as:

$$\sigma = \omega \epsilon_0 e'' = 2 \pi f \epsilon_0 e''$$

where $f = \text{target } f * 10^6$

$$\epsilon_0 = 8.854 * 10^{-12}$$

9. SYSTEM CHECK

The system performance check is performed prior to any usage of the system in order to guarantee reproducible results. The system performance check verifies that the system operates within its specifications of $\pm 10\%$.

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 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 250 mW $\pm 3\%$.
- The results are normalized to 1 W input power.

Reference SAR Values for Body-tissue (From SPEAG)

Dipole Type	Distance	Frequency	SAR (1g)	SAR (10g)	SAR (peak)
	(mm)	(MHz)	[W/kg]	[W/kg]	[W/kg]
D835V2	15	835	9.96	6.56	14.1
D1900V2	10	1900	39.8	20.7	69.6

9.1. SYSTEM CHECK RESULTS FOR D835V2

System Validation Dipole: D835V2 SN:4d002

Date: December 30, 2009

Ambient Temperature = 25°C; Relative humidity = 40%

Measured by: Devin Chang

Medium	CW Signal (MHz)	Forward power (mW)	Measured (Normalized to 1 W)		Target	Delta (%)	Tolerance (%)
Body	835	100	1g SAR:	10.3	9.96	3.41	±10
			10g SAR:	6.79	6.56	3.51	

9.2. SYSTEM CHECK RESULTS FOR D1900V2

System Validation Dipole: D1900V2 SN: 5d043

Date: December 31, 2009

Ambient Temperature = 24°C; Relative humidity = 35%

Measured by: Devin Chang

Medium	CW Signal (MHz)	Forward power (mW)	Measured (Normalized to 1 W)		Target	Delta (%)	Tolerance (%)
Body	1900	100	1g SAR:	38.4	39.8	-3.52	±10
			10g SAR:	20.0	20.7	-3.38	

10. OUTPUT POWER VERIFICATION

10.1. (E)GPRS

GPRS (GMSK) - Coding Scheme: MCS4

Band	Ch No.	Frequency	Conducted output power (dBm)			
			1 slot	2 slot	3 slot	4 slot
GSM850	128	824.2	32.50	32.40	n/a	n/a
	190	836.6	32.61	32.50	n/a	n/a
	251	848.8	32.35	32.40	n/a	n/a
GSM1900	512	1850.2	29.51	29.50	n/a	n/a
	661	1880	29.31	29.50	n/a	n/a
	810	1909.8	29.20	29.40	n/a	n/a

10.2. UMTS RELEASE 99

Rel 99 (12.2kps RMC)

Band	Mode	UL Ch No.	DL Ch No.	f (MHz)	Measured O/P Power (dBm)
UMTS850 (Band V)	Rel 99 12.2kps RMC	4132	4357	826.4	24.51
		4182	4407	836.4	24.52
		4233	4458	846.6	24.51
UMTS1900 (Band II)	Rel 99 12.2kps RMC	9262	9662	1852.4	24.19
		9400	9800	1880.0	24.43
		9538	9938	1907.6	24.10

10.3. CDMA2000 1xRTT

Band	FWD RC/TAP	REV RC/TAP	Channel	f (MHz)	Measured O/P Power (dBm)
Cellular	RC3	RC3 (SO55)	1013	824.70	24.76
			384	836.52	24.55
			777	848.31	24.63
PCS	RC3	RC3 (SO55)	25	1851.25	24.70
			600	1880.00	24.59
			1175	1908.75	24.64

10.4. CDMA2000 1xEv-Do

10.4.1. Rel 0

Band	FTAP Rate	RTAP Rate	Channel	f (MHz)	Measured O/P Power (dBm)
Cellular	307.2 kbps (2 slot, QPSK)	76.8 kbps	1013	824.70	24.12
			384	836.52	24.50
			777	848.31	24.21
PCS	307.2 kbps (2 slot, QPSK)	76.8 kbps	25	1851.25	24.53
			600	1880.00	24.55
			1175	1908.75	24.25

10.4.2. 80Rev A

Band	FETAP Traffic Format	RETAP Data Payload Size	Channel	f (MHz)	Measured O/P Power (dBm)
Cellular	307.2 k, QPSK/ ACK channel is transmitted at all the slots	4096	1013	824.70	24.12
			384	836.52	24.22
			777	848.31	24.35
PCS	307.2 k, QPSK/ ACK channel is transmitted at all the slots	4096	25	1851.25	23.95
			600	1880.00	24.26
			1175	1908.75	24.27

11. SUMMARY OF TEST RESULTS

Per KDB616217 D01, Antenna-to-user distance $\geq (5 + \frac{1}{2} \cdot n)$ cm: test SAR on highest output channel only. Base on the high margin to the SAR limit, only the following modes with the highest transmit power were tested.

- GPRS 850 / Class 10
- EVDO Rel.0/1900

11.1. GSM850

Test position	Test mode	Ch. No.	Freq. (MHz)	SAR (mW/g)	
				1g	10 g
Lap-held	GSPS 10 slots	128	824.2		
		190	836.6	0.036	0.029
		251	848.8		

11.2. CDMA2000

Test position	Mode	Ch No.	f (MHz)	SAR (mW/g)	
				1-g	10-g
Lap-held	1xEV-DO Rel 0	1013	824.70		
		384	836.52	0.048	0.038
		777	848.31		

12. SAR TEST PLOTS

SAR Plot for GPRS850

Date/Time: 12/30/2009 9:45:25 PM

Test Laboratory: Compliance Certification Services

GSM835

DUT: Samsung; Type: NP-N150; Serial: n/a

Communication System: GSM850; Frequency: 836.6 MHz; Duty Cycle: 1:4
Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 56.8$; $\rho = 1000$ kg/m³
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 - SN3686; ConvF(8.7, 8.7, 8.7); Calibrated: 3/23/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn500; Calibrated: 9/15/2009
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Lap-held, M-ch, 2 slots/Area Scan (9x10x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.040 mW/g

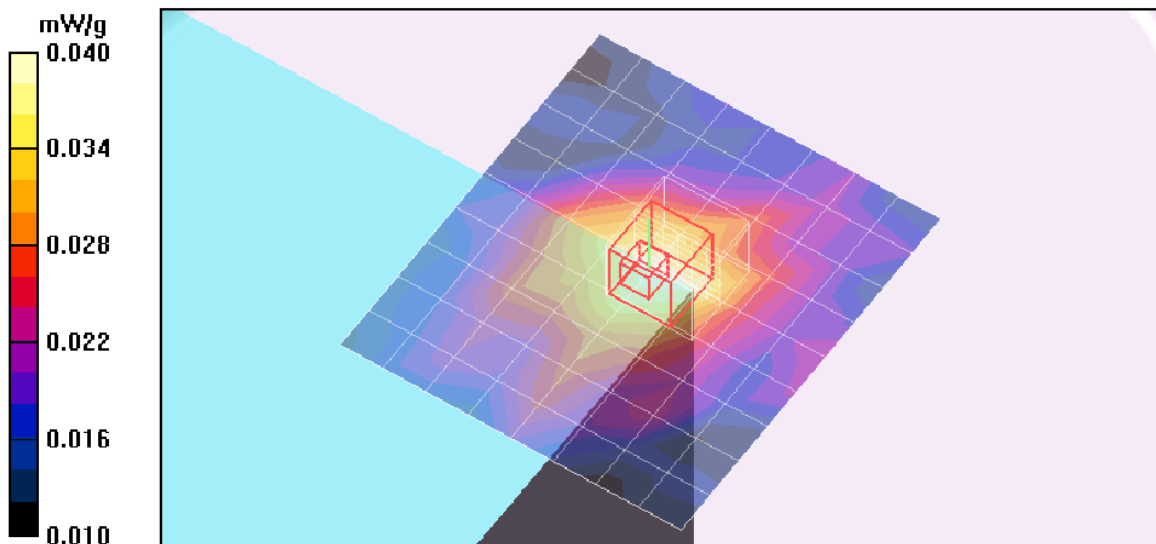
Lap-held, M-ch, 2 slots/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 3.25 V/m; Power Drift = 0.498 dB

Peak SAR (extrapolated) = 0.049 W/kg

SAR(1 g) = 0.036 mW/g; SAR(10 g) = 0.029 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)



SAR Plot for CDMA2000 1xEV-DO PSC Band

Date/Time: 12/31/2009 01:00:41 AM

Test Laboratory: Compliance Certification Services

PCS1900

DUT: Samsung; Type: NP-N150; Serial: n/a

Communication System: CDMA PCS band; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 54.1$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

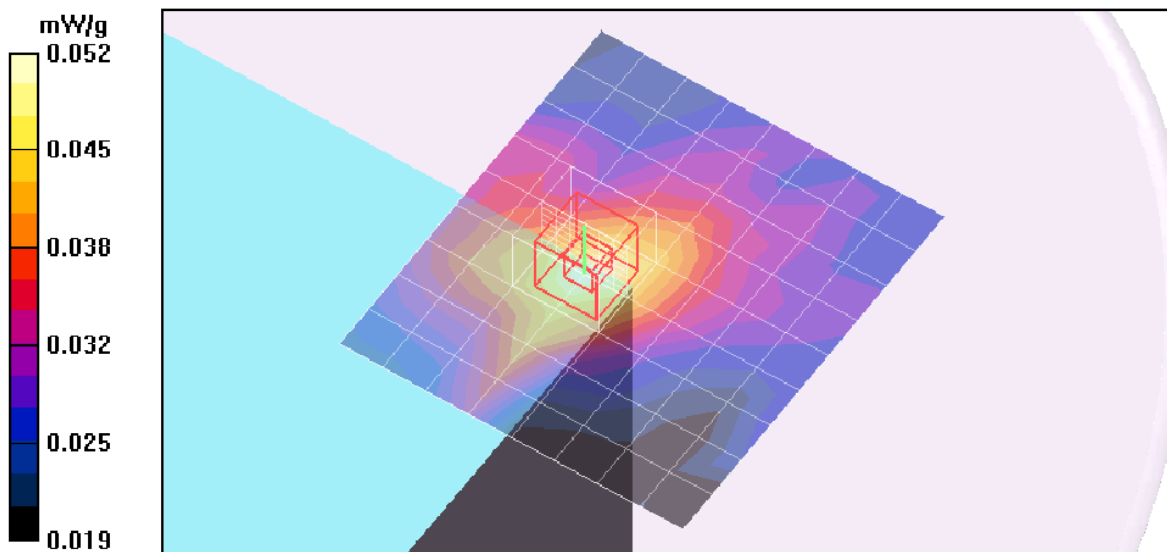
Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

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 - SN3686; ConvF(6.85, 6.85, 6.85); Calibrated: 3/23/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn500; Calibrated: 9/15/2009
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Lap-held, M-ch/Area Scan (9x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.052 mW/g

Lap-held, M-ch/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 3.79 V/m; Power Drift = 0.057 dB
Peak SAR (extrapolated) = 0.073 W/kg
SAR(1 g) = 0.048 mW/g; SAR(10 g) = 0.038 mW/g
Maximum value of SAR (measured) = 0.054 mW/g



13. ATTACHMENTS

<u>No.</u>	<u>Contents</u>	<u>No. of page (s)</u>
1	System Performance Check Plots	4
2	Certificate of E-Field Probe – EX3DV4 SN3686	10
3	Certificate of System Validation Dipole - D835V2 SN:4d002	9
4	Certificate of System Validation Dipole - D1900V2 SN:5d043	9

14. TEST SETUP PHOTO

Lap-held Position



15. HOST DEVICE PHOTO

HOST DEVICE (NP-N150)



WLAN Main & Aux Antenna WWAN Main Antenna



END OF REPORT