FCC OET BULLETIN 65 SUPPLEMENT C

SAR EVALUATION REPORT

For

USB MODEM

(With External Antenna)

MODEL: AC250U

FCC ID: N7NAC250U

REPORT NUMBER: 10U13334-1

ISSUE DATE: June 21, 2011

Prepared for

SIERRA WIRELESS INC.

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CARLSBAD, CA 92008

Prepared by

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	June 21, 2011	Initial Issue	--

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SIERRA WIRELESS INC. 200 Faraday Avenue, Suite 150 CARLSBAD, CA 92008		
EUT DESCRIPTION:	USB MODEM		
MODEL NUMBER:	AC250U		
DEVICE CATEGORY:	Portable		
EXPOSURE CATEGORY:	General Population/Uncontrolled Exposure		
DATE TESTED:	May 20, 2011		
FCC Rule Parts	Frequency Range [MHz]	Highest 1-g SAR	Limit (mW/g)
22H	824 - 849	0.051 mW/g	1.6
24E	1850 - 1910	0.173 mW/g	
Applicable Standards			Test Results
FCC OET Bulletin 65 Supplement C 01-01 and the following SAR test procedures: o KDB 941225 D01 SAR test for 3G devices v02KDB 447498 D01 Mobile Portable RF Exposure v04 o KDB 447498 D02 SAR Procedures for Dongle Xmtr v02			Pass

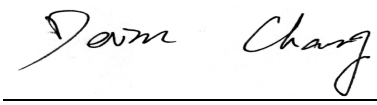
Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations and/or observations of test results. Measurement Uncertainties 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 (NIST Handbook 150, Annex A). This report is written to support regulatory compliance of the applicable standards stated above.

Approved & Released For CCS By:

SUNNY SHIH
ENGINEERING SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:



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 01-01 and the following SAR test procedures:

- KDB 941225 D01 SAR test for 3G devices v02
- KDB 447498 D01 Mobile Portable RF Exposure v04
- KDB 447498 D02 SAR Procedures for Dongle Xmtr v02

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
SAM Phantom	SPEAG	QP 000 P40 CC	1602	N/A		
Oval Flat Phantom (ELI 4.0)	SPEAG	QD OVA001 B	1099	N/A		
Dielectronic Probe kit	HP	85070C	N/A	N/A		
ESA Series Network Analyzer	Agilent	E5071B	MY42100131	8	2	2011
Synthesized Signal Generator	HP	83732B	US34490599	7	14	2012
Wireless comunication test set	Agilent	E5515C (8960)	GB46160222	6	17	2012
E-Field Probe	SPEAG	EX3DV3	3749	12	13	2012
Data Acquisition Electronics	SPEAG	DAE 4	1239	11	17	2011
Thermometer	ERTCO	639-1S	1718	7	19	2011
System Validation Dipole	SPEAG	D835V2	4d002	4	4	2013
System Validation Dipole	SPEAG	*D1900V2	5d043	11	24	2012
Power Meter	Giga-tronics	8651A	8651404	3	13	2012
Power Sensor	Giga-tronics	80701A	1834588	3	13	2012
Power Meter	Boonton	4541	12405	4	5	2012
Power Sensor	Boonton	57006	6940	3	31	2012
Amplifier	Mini-Circuits	ZHL-42W	D072701-5	N/A		
Simulating Liquid	SPEAG	MSL1900	N/A	Within 24 hrs of first test		
Simulating Liquid	SPEAG	MSL835	N/A	Within 24 hrs of first test		

***Note:**

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

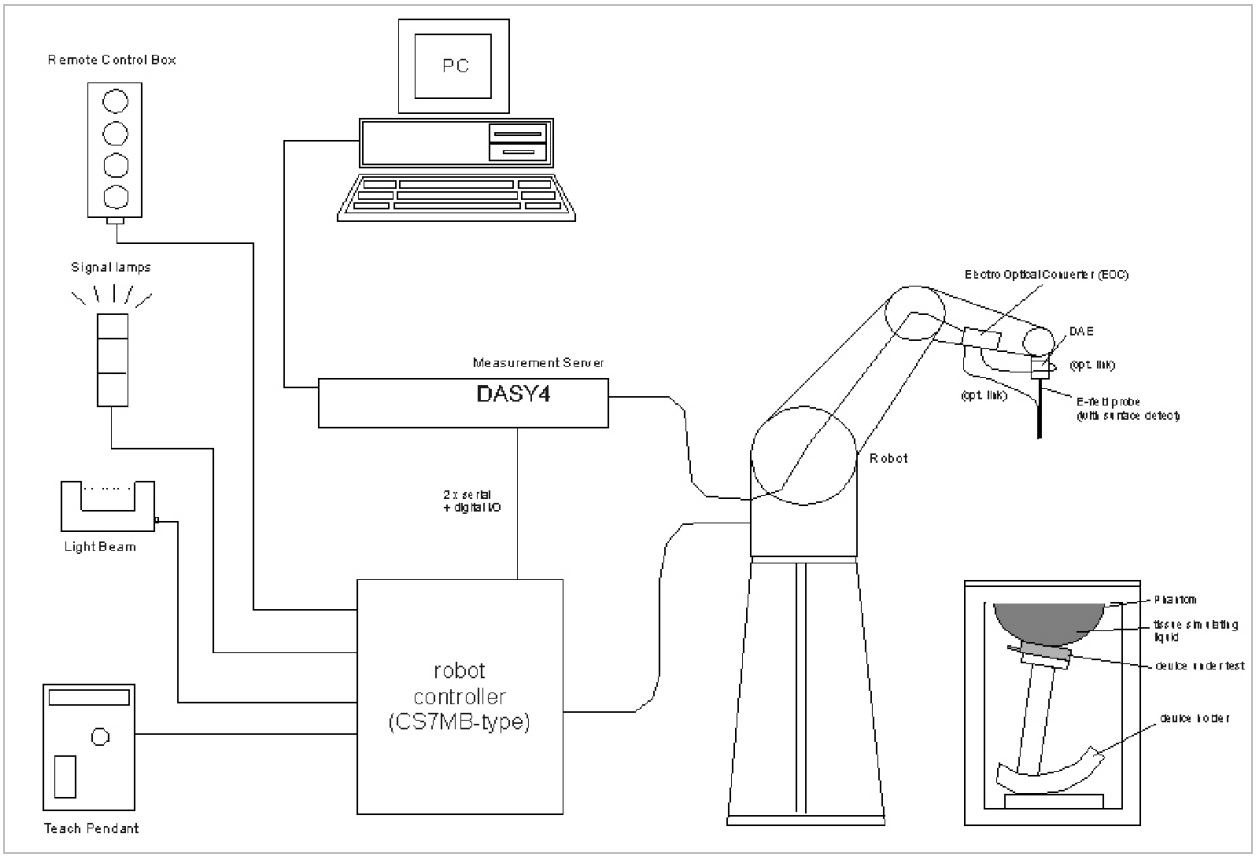
1. There is no physical damage on the dipole
2. System validation with specific dipole is within 10% of calibrated value.
3. Return-loss is within 20% of calibrated measurement (test data on file in UL CCS)
4. Impedance is within 5Ω of calibrated measurement (test data on file in UL CCS)

4.2. MEASUREMENT UNCERTAINTY

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

Component	error, %	Probe Distribution	Divisor	Sensitivity	U (Xi), %
Measurement System					
Probe Calibration (k=1)	5.50	Normal	1	1	5.50
Axial Isotropy	1.15	Rectangular	1.732	0.7071	0.47
Hemispherical Isotropy	2.30	Rectangular	1.732	0.7071	0.94
Boundary Effect	0.90	Rectangular	1.732	1	0.52
Probe Linearity	3.45	Rectangular	1.732	1	1.99
System Detection Limits	1.00	Rectangular	1.732	1	0.58
Readout Electronics	0.30	Normal	1	1	0.30
Response Time	0.80	Rectangular	1.732	1	0.46
Integration Time	2.60	Rectangular	1.732	1	1.50
RF Ambient Conditions - Noise	3.00	Rectangular	1.732	1	1.73
RF Ambient Conditions - Reflections	3.00	Rectangular	1.732	1	1.73
Probe Positioner Mechanical Tolerance	0.40	Rectangular	1.732	1	0.23
Probe Positioning with respect to Phantom	2.90	Rectangular	1.732	1	1.67
Extrapolation, Interpolation and Integration	1.00	Rectangular	1.732	1	0.58
Test Sample Related					
Test Sample Positioning	2.90	Normal	1	1	2.90
Device Holder Uncertainty	3.60	Normal	1	1	3.60
Output Power Variation - SAR Drift	5.00	Rectangular	1.732	1	2.89
Phantom and Tissue Parameters					
Phantom Uncertainty (shape and thickness)	4.00	Rectangular	1.732	1	2.31
Liquid Conductivity - deviation from target	5.00	Rectangular	1.732	0.64	1.85
Liquid Conductivity - measurement @ Body 1900 MHz	-1.55	Normal	1	0.64	-0.99
Liquid Permittivity - deviation from target	5.00	Rectangular	1.732	0.6	1.73
Liquid Permittivity - measurement@ Body 835 MHz	-0.90	Normal	1	0.6	-0.54
				Combined Standard Uncertainty Uc(y) =	9.51
				Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence = 19.02	%
				Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence = 1.51	dB

5. 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.

6. 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

7. LIQUID PARAMETERS CHECK

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine of the dielectric parameters are within the tolerances of the specified target values. For frequencies in 300 MHz to 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)

7.1. LIQUID CHECK RESULTS

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
5/20/2011	Body 835	e'	54.7057	Relative Permittivity (ϵ_r):	54.71	55.20	-0.90	5
		e''	21.1200	Conductivity (σ):	0.98	0.97	1.09	5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C; Relative humidity = 40%
May 20, 2011 03:27 PM

Frequency	e'	e''
800000000.	55.0635	21.2691
805000000.	55.0160	21.2478
810000000.	54.9669	21.2322
815000000.	54.9071	21.2106
820000000.	54.8615	21.1848
825000000.	54.8081	21.1635
830000000.	54.7573	21.1432
835000000.	**54.7057**	**21.1200**
840000000.	54.6622	21.0948
845000000.	54.6105	21.0733
850000000.	54.5657	21.0538
855000000.	54.5192	21.0315
860000000.	54.4723	21.0127
865000000.	54.4316	20.9890
870000000.	54.3791	20.9719
875000000.	54.3347	20.9531
880000000.	54.2860	20.9380
885000000.	54.2397	20.9204
890000000.	54.1913	20.9056
895000000.	54.1391	20.8826
900000000.	54.0931	20.8649
905000000.	54.0449	20.8481
910000000.	53.9981	20.8282
915000000.	53.9529	20.8117
920000000.	53.9064	20.7910
925000000.	53.8580	20.7722
930000000.	53.8110	20.7551
935000000.	53.7700	20.7375
940000000.	53.7269	20.7217
945000000.	53.6840	20.6977
950000000.	53.6410	20.6829

The conductivity (σ) can be given as:

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

where f = target f * 10^6

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

Date	Freq. (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit ±(%)
5/20/2011	Body 1900	e'	53.2378	Relative Permittivity (ϵ_r):	53.24	53.30	-0.12	5
		e''	14.1641	Conductivity (σ):	1.50	1.52	-1.55	5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C; Relative humidity = 42%
May 20, 2011 08:58 AM

Frequency	e'	e''
1710000000.	53.8757	13.4730
1720000000.	53.8537	13.5071
1730000000.	53.8279	13.5402
1740000000.	53.7983	13.5786
1750000000.	53.7764	13.6154
1760000000.	53.7485	13.6589
1770000000.	53.7169	13.7029
1780000000.	53.6853	13.7482
1790000000.	53.6517	13.7905
1800000000.	53.6143	13.8304
1810000000.	53.5749	13.8720
1820000000.	53.5372	13.9108
1830000000.	53.4964	13.9458
1840000000.	53.4554	13.9818
1850000000.	53.4225	14.0143
1860000000.	53.3799	14.0393
1870000000.	53.3412	14.0737
1880000000.	53.3062	14.1020
1890000000.	53.2711	14.1320
1900000000.	**53.2378**	**14.1641**
1910000000.	53.2080	14.1982

The conductivity (σ) can be given as:

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

where f = target f * 10^6

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

8. 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 SN3749 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
- The results are normalized to 1 W input power.

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

System validation dipole	Cal. certificate #	Cal. date	SAR Avg (mW/g)		
			Tissue:	Head	Body
D835V2 SN: 4d002	D835V2-4d002_Apr11	4/4/2011	1g SAR:	9.36	10.2
			10g SAR:	6.12	6.68
D1900V2 SN: 5d043	D1900V2-5d043_Nov09	11/24/2009	1g SAR:	39.8	40.4
			10g SAR:	20.7	21.4

8.1. SYSTEM CHECK RESULTS

System validation dipole	Date Tested	Measured (Normalized to 1 W)		Target	Delta (%)	Tolerance (%)
		Tissue:	Body			
D835V2	05/20/11	SAR_{1g}:	9.5	10.2	-6.86	±10
		SAR_{10g}:	6.23	6.68	-6.74	
D1900V2	05/20/11	SAR_{1g}:	42.0	40.4	3.96	±10
		SAR_{10g}:	21.8	21.4	1.87	

9. OUTPUT POWER VERIFICATION

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, 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

9.1. CDMA2000 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.13.08, L

- Protocol Rev > 6 (IS-2000-0)
- Radio Config (RC) > Please see following table or 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 > Active bits
  - Rvs Power Ctrl > All Up bits (Maximum TxPout)

RF Output Power for Cellular Band

Radio Configuration (RC)	Service Option (SO)	Conducted Output Power (dBm)					
		Ch. 1013 / 824.7 MHz		Ch. 384 / 836.52 MHz		Ch. 777 / 848.31 MHz	
		Average	Peak	Average	Peak	Average	Peak
RC1	2 (Loopback)	23.74		23.80		23.72	
	55 (Loopback)	24.16		24.15		23.75	
RC2	9 (Loopback)	23.57		23.77		23.71	
	55 (Loopback)	23.65		23.80		23.74	
RC3	2 (Loopback)	23.50		23.83		23.67	
	55 (Loopback)	23.56		23.80		23.70	
	32 (Test Data)	23.50		23.85		23.67	
RC4	2 (Loopback)	23.47		23.87		23.70	
	55 (Loopback)	23.56		23.89		23.69	
	32 (Test Data)	23.65		23.82		23.70	
RC5	9 (Loopback)	23.56		23.85		23.69	
	55 (Loopback)	23.58		23.79		23.70	

RF Output Power for PCS Band

Radio Configuration (RC)	Service Option (SO)	Conducted Output Power (dBm)					
		Ch. 25 / 1851.25 MHz		Ch. 600 / 1880 MHz		Ch. 1175 / 1908.75 MHz	
		Average	Peak	Average	Peak	Average	Peak
RC1	2 (Loopback)	24.08		24.00		24.00	
	55 (Loopback)	24.32		24.34		24.32	
RC2	9 (Loopback)	24.05		24.20		24.30	
	55 (Loopback)	24.03		24.15		24.30	
RC3	2 (Loopback)	24.18		24.20		24.25	
	55 (Loopback)	24.20		24.12		24.30	
	32 (Test Data)	24.00		24.10		24.25	
RC4	2 (Loopback)	24.20		24.10		24.30	
	55 (Loopback)	24.03		24.08		24.30	
	32 (Test Data)	24.19		24.15		24.26	
RC5	9 (Loopback)	24.15		24.20		24.30	
	55 (Loopback)	24.13		24.10		24.30	

9.2. CDMA2000 1xEv-Do

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

RF Power Output for EV-DO Rel 0

Band	FTAP Rate	RTAP Rate	Channel	f (MHz)	Conducted power (dBm)	
					Average	Peak
Cellular	307.2 kbps (2 slot, QPSK)	153.6 kbps	1013	824.70	23.60	
			384	836.52	23.78	
			777	848.31	23.85	
PCS	307.2 kbps (2 slot, QPSK)	153.6 kbps	25	1851.25	24.15	
			600	1880.00	24.18	
			1175	1908.75	24.25	

9.2.2. Revision 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 Release 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 > 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)

EVDO Release 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 > 00000000 > Subnet Mask > 0
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots > ACK R-Data After > Subpacket 0 (All ACK)
- Rvs Power Ctrl > All Up bits (to get the maximum power)

Band	FETAP Traffic Format	RETAP Data Payload Size	Channel	f (MHz)	Conducted power (dBm)	
					Average	Peak
Cellular	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	1013	824.70	23.70	
			384	836.52	24.00	
			777	848.31	23.98	
PCS	307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	25	1851.25	24.40	
			600	1880.00	24.30	
			1175	1908.75	24.45	

10. SUMMARY OF TEST RESULTS

Front side with 2.5 cm separation distance from EUT-to-flat phantom

Band	Mode	Test position	Ch No.	f (MHz)	SAR (mW/g)	
					1-g	10-g
Cellular	EV-DO Rev A	Front Side	1013	824.70		
			384	836.52	0.051	0.033
			777	848.31		
PCS	EV-DO Rev A	Front Side	25	1851.25		
			600	1880.00	0.173	0.107
			1175	1908.75		

11. SAR TEST PLOTS

SAR PLOT

Date/Time: 5/20/2011 4:57:11 PM

Test Laboratory: UL CCS

Nearby Person_CDMA2000 Cell band

DUT: Sierra Wireless; Type: N/A; Serial: N/A

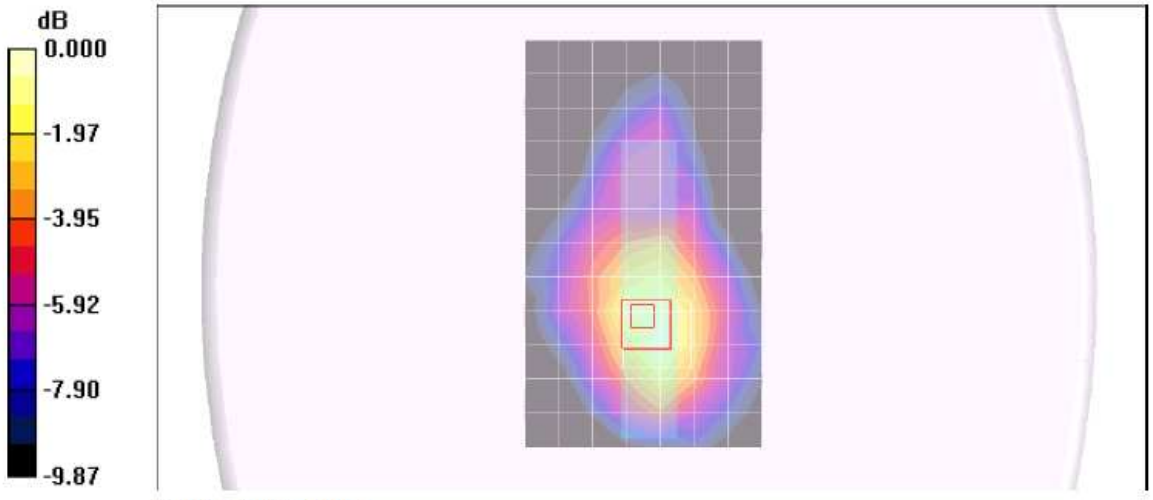
Communication System: CDMA Cell Band; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.982 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section

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

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3749; ConvF(8.79, 8.79, 8.79); Calibrated: 12/13/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn427; Calibrated: 7/21/2010
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BB; Serial: SN:1017
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1xEv-Do-A_M-ch/Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.063 mW/g

1xEv-Do-A_M-ch/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 6.63 V/m; Power Drift = 0.187 dB
Peak SAR (extrapolated) = 0.117 W/kg
SAR(1 g) = 0.051 mW/g; SAR(10 g) = 0.033 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.065 mW/g



0 dB = 0.065mW/g

Date/Time: 5/20/2011 5:22:20 PM

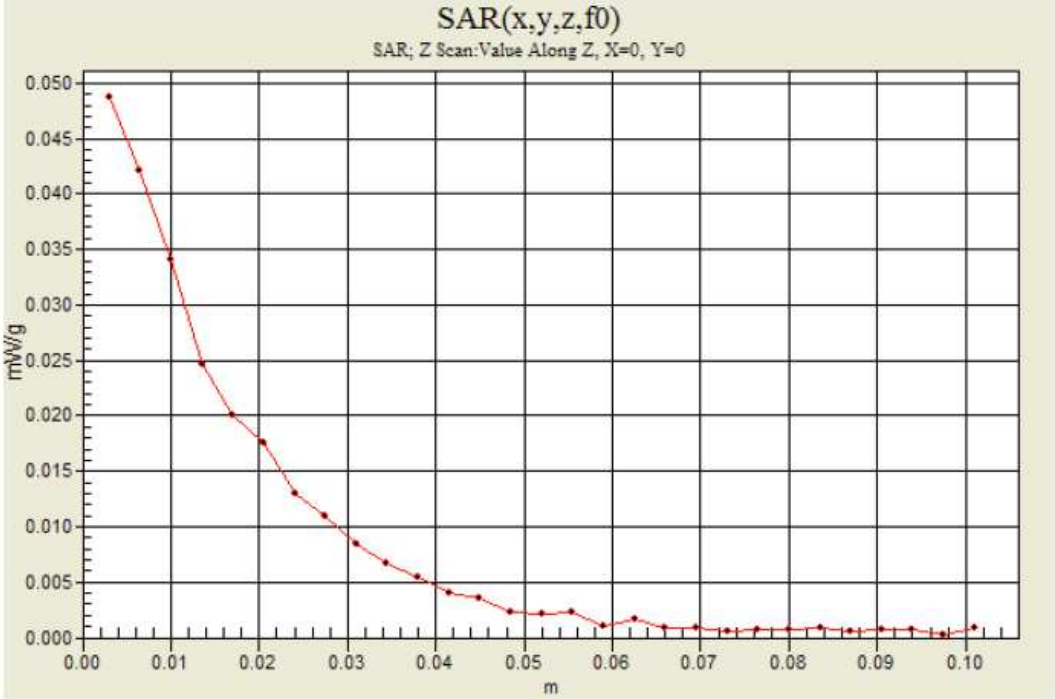
Test Laboratory: UL CCS

Nearby Person_CDMA2000 Cell band

DUT: Sierra Wireless; Type: N/A; Serial: N/A

Communication System: CDMA Cell Band; Frequency: 836.52 MHz;Duty Cycle: 1:1

1xEv-Do-A_M-ch/Z Scan (1x1x29): Measurement grid: dx=20mm, dy=20mm, dz=3.5mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.049 mW/g



SAR PLOT

Date/Time: 5/20/2011 2:15:16 PM

Test Laboratory: UL CCS

Nearby Person_CDMA2000 PCS band

DUT: Sierra Wireless; Type: N/A; Serial: N/A

Communication System: CDMA PCS Band; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.47 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3
Phantom section: Flat Section

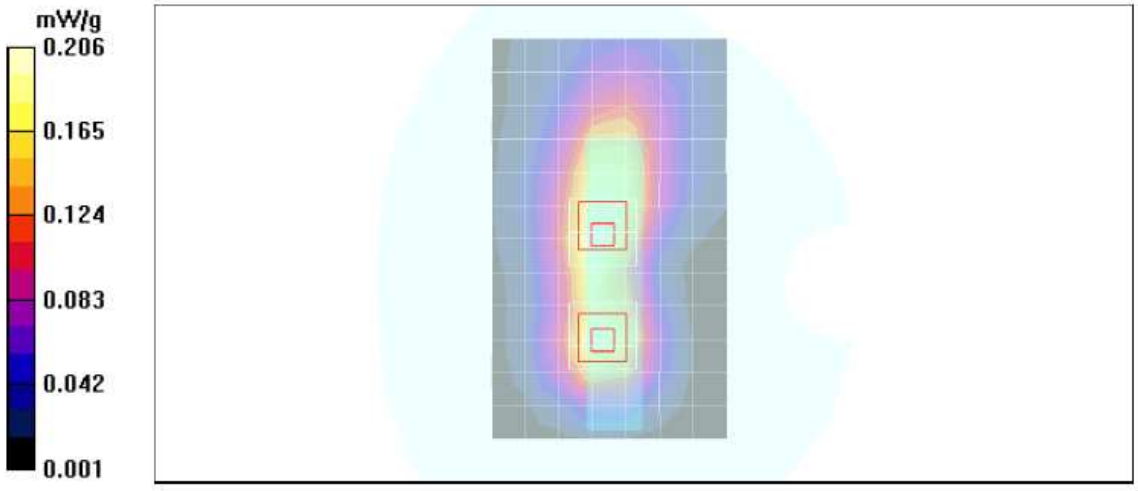
Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3749; ConvF(7.33, 7.33, 7.33); Calibrated: 12/13/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn427; Calibrated: 7/21/2010
- Phantom: SAM 2 (Twin); Type: SAM 2; Serial: 1050
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

1xEv-Do-A_M-ch/Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.206 mW/g

1xEv-Do-A_M-ch/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 11.9 V/m; Power Drift = -0.113 dB
Peak SAR (extrapolated) = 0.281 W/kg
SAR(1 g) = 0.182 mW/g; SAR(10 g) = 0.116 mW/g
Maximum value of SAR (measured) = 0.213 mW/g

1xEv-Do-A_M-ch/Zoom Scan (7x7x9)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 11.9 V/m; Power Drift = -0.113 dB
Peak SAR (extrapolated) = 0.271 W/kg
SAR(1 g) = 0.173 mW/g; SAR(10 g) = 0.107 mW/g
Maximum value of SAR (measured) = 0.205 mW/g



Date/Time: 5/20/2011 2:57:41 PM

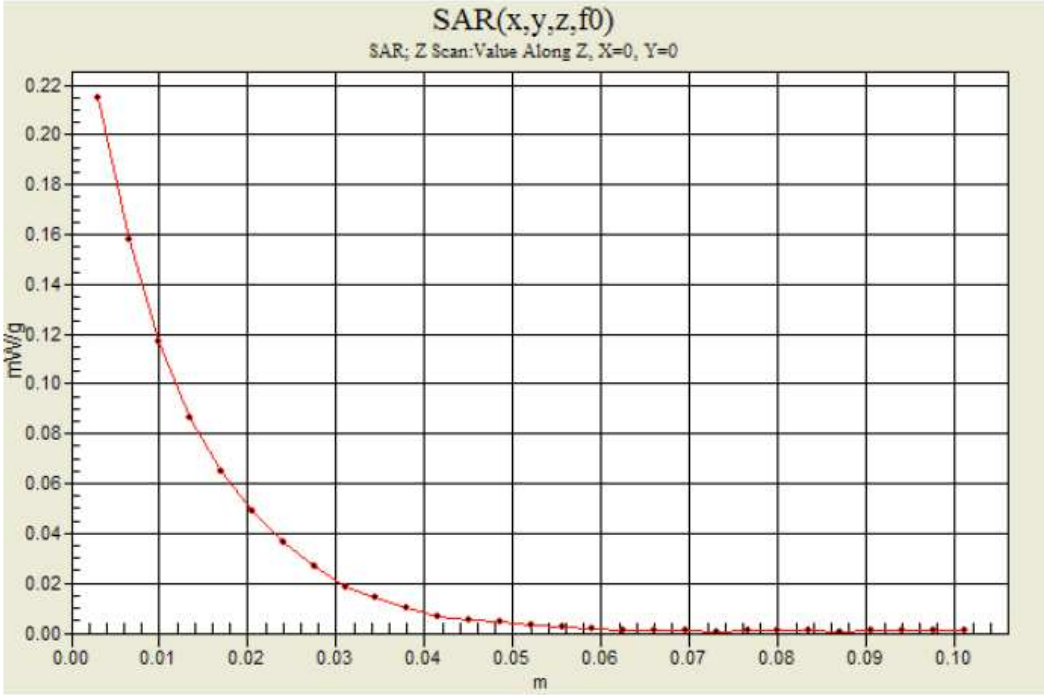
Test Laboratory: UL CCS

Nearby Person_CDMA2000 PCS band

DUT: Sierra Wireless; Type: N/A; Serial: N/A

Communication System: CDMA PCS Band; Frequency: 1880 MHz;Duty Cycle: 1:1

1xEv-Do-A_M-ch/Z Scan (1x1x29): Measurement grid: dx=20mm, dy=20mm, dz=3.5mm
Maximum value of SAR (measured) = 0.215 mW/g

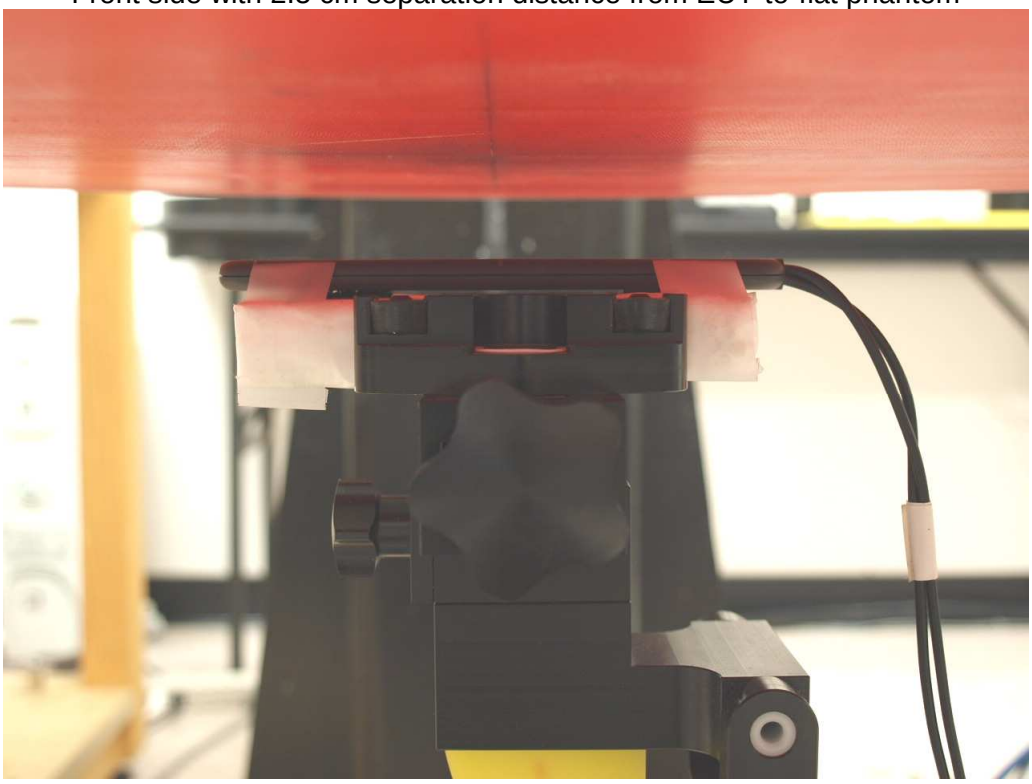


12. ATTACHMENTS

No.	Contents	No. of page (s)
1	System Check Plots	4
2	Certificate of E-Field Probe EX3DV4 SN3749	11
3	Certificate of System Validation Dipole D835V2 SN:4d002	9
4	Certificate of System Validation Dipole D1900V2 SN:5d043	9

13. TEST SETUP PHOTO

Front side with 2.5 cm separation distance from EUT-to-flat phantom



14. EXTERNAL ANTENNA PHOTO

Front Side

Back Side

END OF REPORT