



**FCC CFR47 PART 22 SUBPART H
AND PART 24 SUBPART E**

**CLASS II PERMISSIVE CHANGE
CERTIFICATION TEST REPORT**

FOR

PCMCIA ExpressCard MODEM CDMA

MODEL NUMBER: AC597E

FCC ID: N7NAC597E

REPORT NUMBER: 07U11033-1

ISSUE DATE: MAY 19, 2007

Prepared for
**SIERRA WIRELESS
2290 COSMOS CT.
CARLSBAD, CA 92011 U.S.A.**

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



NVLAP LAB CODE 200065-0

Revision History

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TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS.....	4
2. TEST METHODOLOGY	5
3. FACILITIES AND ACCREDITATION	5
4. CALIBRATION AND UNCERTAINTY.....	5
4.1. <i>MEASURING INSTRUMENT CALIBRATION.....</i>	<i>5</i>
4.2. <i>MEASUREMENT UNCERTAINTY.....</i>	<i>5</i>
5. EQUIPMENT UNDER TEST.....	6
5.1. <i>DESCRIPTION OF EUT</i>	<i>6</i>
5.2. <i>CLASS II PERMISSIVE CHANGE DESCRIPTION</i>	<i>6</i>
5.3. <i>MAXIMUM OUTPUT POWER</i>	<i>6</i>
5.4. <i>DESCRIPTION OF AVAILABLE ANTENNAS.....</i>	<i>6</i>
5.5. <i>SOFTWARE AND FIRMWARE</i>	<i>6</i>
5.6. <i>WORST-CASE CONFIGURATION AND MODE.....</i>	<i>7</i>
5.7. <i>DESCRIPTION OF TEST SETUP</i>	<i>8</i>
6. TEST AND MEASUREMENT EQUIPMENT	10
7. LIMITS AND RESULTS	11
7.1. <i>RADIATED POWER OUTPUT</i>	<i>11</i>
7.2. <i>FIELD STRENGTH OF SPURIOUS RADIATION.....</i>	<i>14</i>
8. SETUP PHOTOS	17

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SIERRA WIRELESS
2290 COSMOS CT.
CARLSBAD, CA 92011 U.S.A.

EUT DESCRIPTION: PCMCIA ExpressCard MODEM CDMA

MODEL: AC597E

SERIAL NUMBER: 01942

DATE TESTED: MAY 10-11, 2007

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 22 SUBPART H	NO NON-COMPLIANCE NOTED
FCC PART 24 SUBPART E	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. 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 Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

Tested By:



THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

ANOOP SINGH
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA/EIA 603C (2004), ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15 and FCC CFR 47 Part 22H and 24E.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

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.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Radiated Emission, Above 2000 MHz	+/- 4.3 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a dual band 800 / 1900MHz PCMCIA CDMA wireless wide area network high-speed modem, and the module is manufactured by Sierra Wireless, Inc.

The module AC597E supports CDMA 1xRTT, and 1xEV-DO. REV A. Device capabilities are documented in the theory of operation.

5.2. CLASS II PERMISSIVE CHANGE DESCRIPTION

The EUT has an exact hardware, only replaced to the better tuned multi band dipole antenna.

5.3. MAXIMUM OUTPUT POWER

The transmitter has a maximum ERP and EIRP as follows:

Part 22 (824 - 849MHz) & Part 24 (1850 - 1910MHz) Authorized Band:

Frequency Range (MHz)	Modulation	ERP Peak Power (dBm)	ERP Peak Power (mW)
824.7 - 848.3	EVDO REV A	28.40	691.83

Frequency Range (MHz)	Modulation	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
1851.25 - 1908.75	EVDO REV A	25.60	363.08

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes Flex 2X antenna with a maximum gain of 0dBi for both Cell and PCS band.

5.5. SOFTWARE AND FIRMWARE

The EUT is linked with Agilent Communication Test Set.

5.6. WORST-CASE CONFIGURATION AND MODE

Pre-scan was performed on RF conducted port to determine the worst-case scenario:

PROCEDURE USED TO ESTABLISH TEST SIGNAL

3G CDMA2000 1xEV DO Revision A (Rev A)

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

<u>Application</u>	<u>Rev, License</u>
1xEV-DO Terminal Test	A.06.06, L

FETAP

- Call Setup > Shift & Preset
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > FETAP
- FTAP Rate > 307.2 kbps (2 Slot, QPSK)
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 0
- Access Network Info > Cell Parameters > Sector ID > 00000000 > Subnet Mask > 0
- Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Rvs Power Ctrl > All Up bits (to get the maximum power)

RETAP

- Call Setup > Shift & Preset
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > RETAP
- F-Traffic Format > 4 (1024, 2, 128) Canonical (307.2k, QPSK)
- R-Data Pkt Size > 4096 (for PCS band), 12288 (for Cellular band)
- 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)

EV-DO REV A Worst Case Data

Based on the above results from the different modulations, EV-DO, REV A Protocol RETAP to be the worst-case scenario for all measurements.

The worst-case channel is determined as the channel with the highest output power. The highest measured output power was at mid channel for both bands.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Sony	VSIO PCG-6P2L	28247031309	DoC
Wireless Communications Test Set	Agilent	E5515C	10092	DoC
AC Adapter	Sony	VGP-AC19V13	D0610GA	DoC

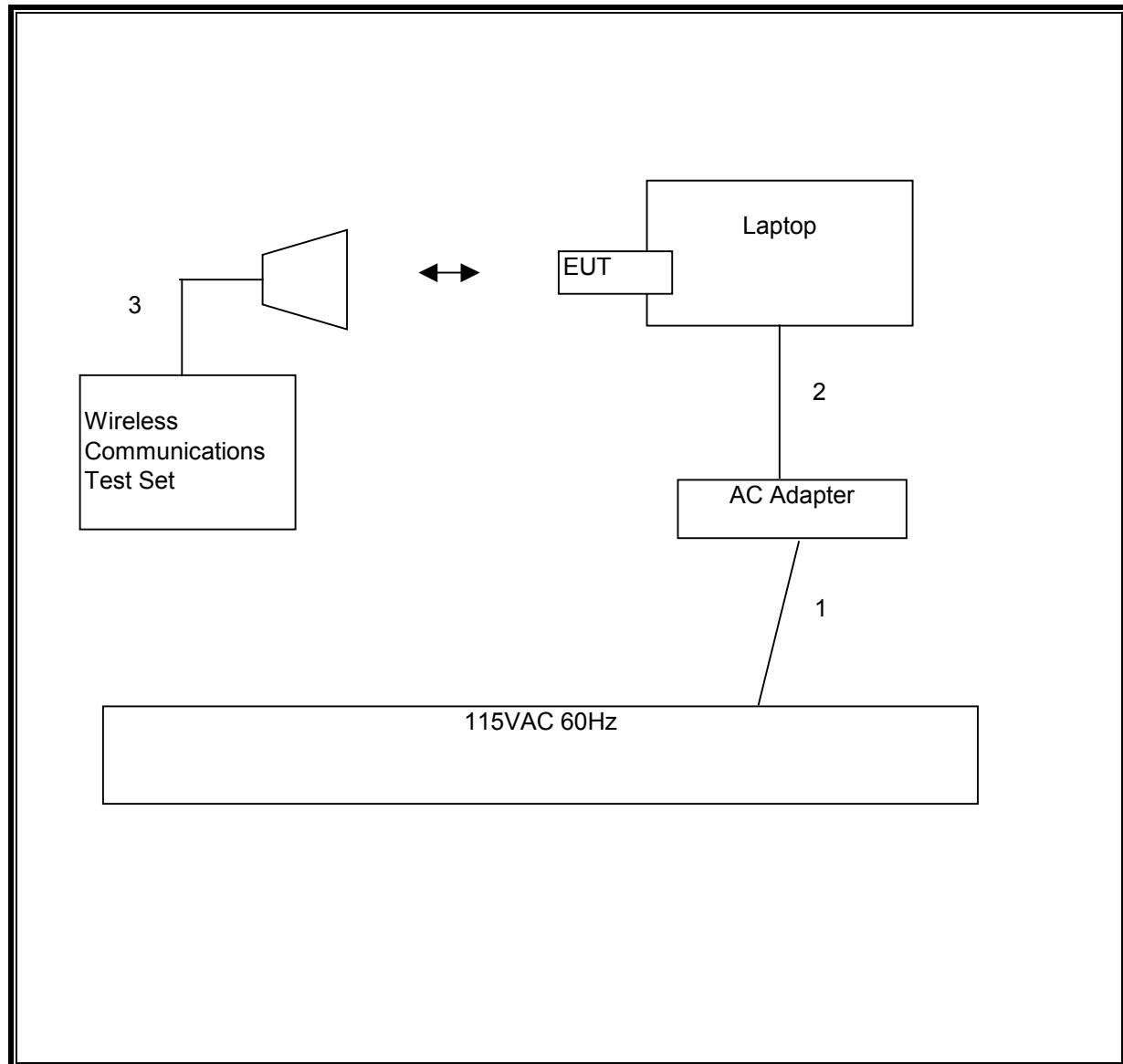
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	US115V	Un-shielded	2m	N/A
2	DC	1	DC	Un-shielded	1m	Ferrite on Laptop's end
3	RF In/Out	1	N-Type	Shielded	2m	N/A

TEST SETUP

The EUT card is inserted into the PCMCIA slot of SONY Laptop during the tests. The Wireless Communication test set exercised the EUT.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	Cal Due
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	US42070220	07/29/07
Peak Power Meter	Agilent / HP	E4416A	GB41291160	12/02/07
Peak / Average Power Sensor	Agilent	E9327A	US40440755	12/02/07
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	9001-3245	04/22/08
Preamplifier, 1 ~ 26.5 GHz	Agilent / HP	8449B	3008A00561	10/03/07
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A121003	09/03/07
Wireless Communications Test Set	Agilent	E5515C	10092	10/19/07
2.7GHz HPF	MicroTronic	HPM13194	2	CNR
1.5GHz HPF	MicroTronic	HPM13195	1	CNR
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	04/22/08
Signal Generator 2 -40 GHz	R & S	SMP04	DE 34210	06/02/07
Signal Generator 1024 MHz	R & S	SMY01	DE 12311	05/11/08
Dipole	EMCO	3121C-DB2	22435	03/25/08

7. LIMITS AND RESULTS

7.1. RADIATED POWER OUTPUT

LIMIT

22.913(a) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.
24.232(b) Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.2.17

RESULTS

No non-compliance noted.

800MHz CELL CDMA Modulation

Channel	Frequency (MHz)	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low	824.7	28.40	691.83
Middle	836.5	28.40	691.83
High	848.3	27.80	602.56

1900MHz PCS Modulation

Channel	Frequency (MHz)	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low	1851.25	25.60	363.08
Middle	1880.00	25.20	331.13
High	1908.75	24.10	257.04

NOTE: RBW=VBW=3MHz

Cellular Output Power (ERP)

<p align="center">Cellular Fundamental Substitution Measurement Compliance Certification Services, Fremont Immunity Chamber</p> <p>Company: Sierra Wireless Project #: 07U11033 Date: 05/10/2007 Test Engineer: Anoop Singh Configuration: EUT Only Mode: TX Cell 850 EV-DO REV-A</p> <p><u>Test Equipment:</u> Receiving: EMCO LP T17, and 12 ft Chin SMA Cable (Setup this one for testing EUT) Substitution: Dipole ETS S/N: 1629, and 6ft SMA Cable Warehouse S/N: 208947 002</p>									
f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel									
824.70	100.8	V	26.8	0.5	0.0	26.3	38.5	-12.2	
824.70	102.8	H	28.9	0.5	0.0	28.4	38.5	-10.0	
Mid Channel									
836.52	101.3	V	27.9	0.6	0.0	27.3	38.5	-11.2	
836.52	102.2	H	29.0	0.6	0.0	28.4	38.5	-10.0	
High Channel									
848.31	100.7	V	27.7	0.7	0.0	27.0	38.5	-11.4	
848.31	101.5	H	28.5	0.7	0.0	27.8	38.5	-10.7	

PCS Output Power (EIRP)

<p align="center">PCS Fundamental Substitution Measurement Compliance Certification Services, Fremont Immunity Chamber</p> <p>Company: Sierra Wireless Project #: 07U11033 Date: 05/10/2007 Test Engineer: Anoop Singh Configuration: EUT Only Mode: TX PCS 1900 EV-DO REV-A</p> <p><u>Test Equipment:</u> Receiving: Horn T60, SMA Cables 12 ft (Setup this one for testing EUT) S/N187207004 Substitution: Horn T59, 6ft SMA Cable Warehouse S/N: 187215001</p>									
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel									
1851.25	92.8	V	18.2	0.9	8.3	25.6	33.0	-7.4	
1851.25	90.6	H	15.7	0.9	8.3	23.1	33.0	-9.9	
Mid Channel									
1880.00	92.2	V	17.7	0.9	8.3	25.2	33.0	-7.9	
1880.00	90.0	H	15.7	0.9	8.3	23.2	33.0	-9.8	
High Channel									
1908.75	91.3	V	16.6	0.9	8.4	24.1	33.0	-8.9	
1908.75	90.5	H	15.3	0.9	8.4	22.8	33.0	-10.2	

7.2. FIELD STRENGTH OF SPURIOUS RADIATION

LIMIT

§22.917 (e) and §24.238 (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

TEST PROCEDURE

ANSI / TIA / EIA 603C Clause 2.2.12, FCC 22.917 (h), & FCC 24.238 (b)

RESULTS

No non-compliance noted.

Note: No emissions were found within 30-1000MHz of 20dB below the system noise.

CELL Spurious & Harmonic (ERP)

Cellular Harmonic Substitution Measurement
Compliance Certification Services, Fremont Immunity Chamber

Company: Sierra Wireless
Project #: 07U11033
Date: 05/11/2007
Test Engineer: Anoop Singh
Configuration: EUT Only
Mode: TX, Cell 850 EV-DO REV-A

Test Equipment:
Receiving: Horn T60, Pre-amp T145, CAN SMA Cables 3 & 12 ft (Setup this one for testing EUT) S/N: 187207004 & 187308840
Substitution: Horn T59, 6ft SMA Cable Warehouse S/N: 187215001

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel (824.70MHz)									
1.649	59.9	V	-47.0	0.8	7.7	-40.2	-13.0	-27.2	
2.474	46.9	V	-63.0	1.0	9.4	-54.6	-13.0	-41.6	
3.299	45.1	V	-60.6	1.2	9.7	-52.1	-13.0	-39.1	
1.649	59.3	H	-54.3	0.8	7.7	-47.5	-13.0	-34.5	
2.474	45.6	H	-64.9	1.0	9.4	-56.5	-13.0	-43.5	
3.299	44.4	H	-62.3	1.2	9.7	-53.8	-13.0	-40.8	
Mid Channel (836.52MHz)									
1.673	56.1	V	-49.6	0.8	7.7	-42.7	-13.0	-29.7	
2.510	47.3	V	-62.5	1.0	9.4	-54.1	-13.0	-41.1	
3.346	45.8	V	-60.4	1.2	9.7	-51.9	-13.0	-38.9	
1.673	55.0	H	-50.7	0.8	7.7	-43.8	-13.0	-30.8	
2.510	46.5	H	-62.6	1.0	9.4	-54.2	-13.0	-41.2	
3.346	44.8	H	-61.5	1.2	9.7	-53.0	-13.0	-40.0	
High Channel (848.31MHz)									
1.697	50.5	V	-58.4	0.8	7.8	-51.4	-13.0	-38.4	
2.545	52.6	V	-56.7	1.0	9.4	-48.3	-13.0	-35.3	
3.393	46.6	V	-59.4	1.2	9.7	-50.9	-13.0	-37.9	
1.697	49.1	H	-58.4	0.8	7.8	-51.5	-13.0	-38.5	
2.545	50.9	H	-58.6	1.0	9.4	-50.2	-13.0	-37.2	
3.393	45.7	H	-60.5	1.2	9.7	-52.0	-13.0	-39.0	

PCS Spurious & Harmonic (EIRP)

Cellular Harmonic Substitution Measurement

Compliance Certification Services, Fremont Immunity Chamber

Company: Sierra Wireless

Project #: 07U11033

Date: 05/11/2007

Test Engineer: Anoop Singh

Configuration: EUT Only

Mode: TX, PCS 1900 EV-DO REV-A

Test Equipment:

Receiving: Horn T60, Pre-amp T145, CAN SMA Cables 3 & 12 ft (Setup this one for testing EUT) S/N: 187207004 & 187308840

Substitution: Horn T59, 6ft SMA Cable Warehouse S/N: 187215001

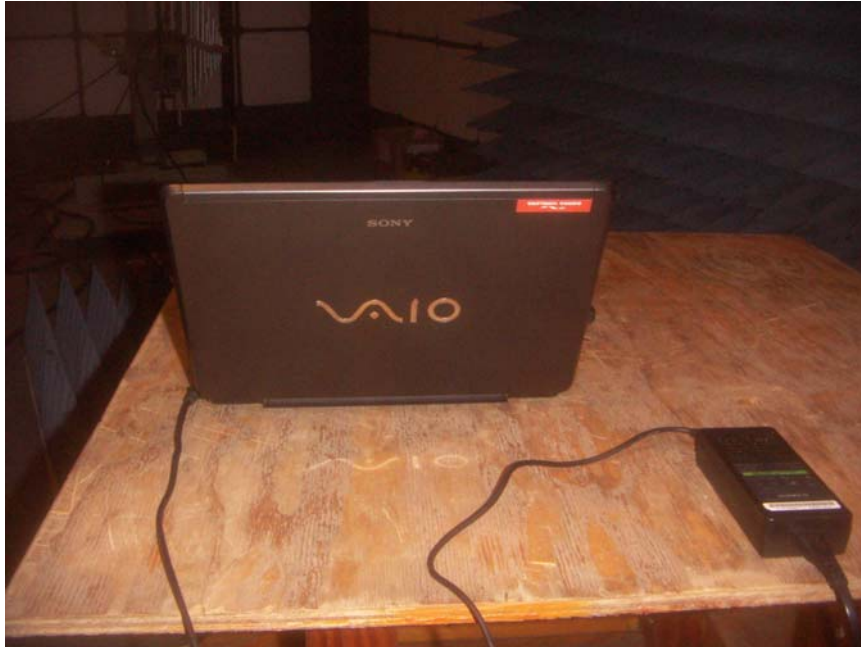
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel (1851.25MHz)									
3.703	63.1	V	-43.8	0.8	7.7	-37.0	-13.0	-24.0	
5.554	47.2	V	-62.7	1.0	9.4	-54.3	-13.0	-41.3	
7.405	53.6	V	-52.1	1.2	9.7	-43.6	-13.0	-30.6	
3.703	61.6	H	-52.0	0.8	7.7	-45.1	-13.0	-32.1	
5.554	45.2	H	-65.3	1.0	9.4	-56.9	-13.0	-43.9	
7.405	52.0	H	-54.7	1.2	9.7	-46.2	-13.0	-33.2	
Mid Channel (1880.00MHz)									
3.760	59.8	V	-45.9	0.8	7.7	-39.0	-13.0	-26.0	
5.640	49.5	V	-60.4	1.0	9.4	-52.0	-13.0	-39.0	
7.520	52.1	V	-54.1	1.2	9.7	-45.6	-13.0	-32.6	
3.760	58.3	H	-47.4	0.8	7.7	-40.5	-13.0	-27.5	
5.640	47.0	H	-62.2	1.0	9.4	-53.8	-13.0	-40.8	
7.520	51.9	H	-54.4	1.2	9.7	-45.9	-13.0	-32.9	
High Channel (1908.75MHz)									
3.818	64.5	V	-44.4	0.8	7.8	-37.5	-13.0	-24.5	
5.726	51.7	V	-57.6	1.0	9.4	-49.2	-13.0	-36.2	
7.635	53.5	V	-52.5	1.2	9.7	-44.0	-13.0	-31.0	
3.818	70.4	H	-37.1	0.8	7.8	-30.2	-13.0	-17.2	
5.726	49.9	H	-59.6	1.0	9.4	-51.2	-13.0	-38.2	
7.635	51.7	H	-54.5	1.2	9.7	-46.0	-13.0	-33.0	

8. SETUP PHOTOS

RADIATED RF MEASUREMENT SETUP FOR MOBILE CONFIGURATION



RADIATED BACK PHOTO



END OF REPORT