



**FCC CFR47 PART 22 SUBPART H  
AND PART 24 SUBPART E  
CERTIFICATION TEST REPORT**

**FOR**

**PC CARD WIRELESS MODEM**

**MODEL NUMBER: AirCard 880**

**FCC ID: N7NAC880**

**REPORT NUMBER: 07U10993-1**

**ISSUE DATE: APRIL 22, 2007**

*Prepared for*  
**SIERRA WIRELESS INC.  
13811 WIRELESS WAY  
RICHMOND, BC V6V 3A4, CANADA**

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



**NVLAP LAB CODE 200065-0**

Revision History

Rev.	Issue Date	Revisions	Revised By
--	04/22/07	Initial Issue	T. Chan

## TABLE OF CONTENTS

<b>1. ATTESTATION OF TEST RESULTS.....</b>	<b>4</b>
<b>2. TEST METHODOLOGY .....</b>	<b>5</b>
<b>3. FACILITIES AND ACCREDITATION .....</b>	<b>5</b>
<b>4. CALIBRATION AND UNCERTAINTY.....</b>	<b>5</b>
4.1. MEASURING INSTRUMENT CALIBRATION.....	5
4.2. MEASUREMENT UNCERTAINTY.....	5
<b>5. EQUIPMENT UNDER TEST.....</b>	<b>6</b>
5.1. DESCRIPTION OF EUT .....	6
5.2. SOFTWARE AND FIRMWARE .....	6
5.3. DESCRIPTION OF TEST SETUP .....	8
<b>6. TEST AND MEASUREMENT EQUIPMENT .....</b>	<b>10</b>
<b>7. LIMITS AND RESULTS .....</b>	<b>11</b>
7.1. RADIATED OUTPUT POWER .....	11
7.2. FIELD STRENGTH OF SPURIOUS RADIATION.....	22
<b>8. SETUP PHOTOS .....</b>	<b>31</b>

## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** SIERRA WIRELESS  
13811 WIRELESS WAY  
RICHMOND, BC V6V 3A4, CANADA

**EUT DESCRIPTION:** PC CARD WIRELESS MODEM

**MODEL:** AirCard 880

**SERIAL NUMBER:** S40008070032E3

**DATE TESTED:** APRIL 12-16, 2007

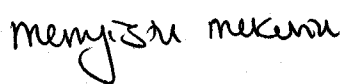
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 22 SUBPART H	NO NON-COMPLIANCE NOTED
FCC PART 24 SUBPART E	NO NON-COMPLIANCE NOTED

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

MENGISTU MEKURIA  
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 47173 Benicia Street, Fremont, 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 to 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 an 850/900/1800/1900/2100 MHz multi-band PC Card Wireless Modem and is manufactured by Sierra Wireless, Inc.

The module supports GSM, GPRS, EGPRS and UMTS. Device capabilities are documented in the theory of operation

Only the 850/1900 MHz frequency bands were investigated under this project, and the test result documented in this report only applies to EUT operating in the 850/1900 MHz frequency bands. This device contains 900 MHz /1800 MHz/2100 MHz functions but these frequency bands are not operational in the U.S. territories.

### 5.2. SOFTWARE AND FIRMWARE

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

#### GPRS Mode

- Call Setup > Shift & Preset
- Active Cell > Active Cell (GPRS)
- Connection Type > ETSI Type A
- BCH Parameters > Cell Band > PCS or GSM850 (US band)
- TCH Parameters > Traffic Band > PCS or GSM850 (US band)
  - > MS TX Level > 3 (33dBm for Cell band); 3 (30dBm for PCS band)
- PDTCH > Multislot Config > 1 Down, 4 Up
  - > MS TX Level > 3 (33dBm Cell band); 3 (30dBm PCS band)
  - > Coding Scheme > CS-4
- Press "Start Data Connection"

#### EGPRS Mode

- Call Setup > Shift & Preset
- Active Cell > Active Cell (EGPRS)
- Connection Type > ETSI Type A
- BCH Parameters > Cell Band > PCS or GSM850 (US band)
- TCH Parameters > Traffic Band > PCS or GSM850 (US band)
  - > MS TX Level > 6 (27dBm Cell band); 5 (26dBm PCS band)
- PDTCH > Multislot Config > 1 Down, 4 Up
  - > MS TX Level > 6 (27dBm Cell band); 5 (26dBm PCS band)
  - > Modulation Coding Scheme > Downlink > As Uplink
    - > Uplink > MSC-5 (8PSK)
- Press "Start Data Connection" and you will see "Transferring"

### UMTS

- Call Setup > Shift & Preset
- Cell Parameters: PS Domain Information > Present
  - ATT (IMSI Attach) Flag State > Set
- Security Parameter - System Operations > None
- Channel Type:
  - RMC: 12.2k, 64k, 144k, or 384k
  - AMC: 12.2 UL / 64/ DL AM RMC, 12.2 UL / 144/ DL AM RMC, or 12.2 UL / 384/ DL AM RMC,
- Paging Service: RB Test Mode
- Channel (UARFCN) Parms:

	<u>PCS band</u>	<u>Cell band</u>
▪ DL Channel:	9662 / 9800 / 9938	4357 / 4407 / 4458
▪ UL Channel:	9262 / 9400 / 9538	4132 / 4182 / 4233
- DL DTCH Data: All Ones
- RLC Reestablish: Off
- Call Limit State: Off
- Call Drop Timer: Off
- SRB Config.: 13.6k DCCH
- UE Target Power: 25 dBm
- UL CL Power Ctrl Parameters
  - UL CL Power Ctrl Mode: All Up Bits

### HSDPA

- Uplink Parameter:
  - UPLINK DPCH Bc / Bd Control: Manual
  - Manual Uplink DPCH Bc: 9
  - Manual Uplink DPCH Bd: 15
- Channel Type: 12.2k+HSDPA
- HSDPA Parameters:
  - HSDPA RB Test Mode Setup
    - HS-DSCH Configuration Type: FRC
    - FRC Type: **H-Set 3**
    - CN Domain: CS Domain
    - Uplink 64k DTCH for HSDPA Loopback State: On
    - HS-DSCH Data Pattern: All Ones
    - RLC Header on HS-DSCH: Present
  - HSDPA Uplink Parameters
    - DeltaACK: 5
    - DeltaNACK: 5
    - DeltaCQI: 2

### 5.3. DESCRIPTION OF TEST SETUP

#### SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	SONY	PCG691L	147774951 0618578	DoC
Communications Test Set	Agilent	E5515C	10092	DoC
Laptop	SONY	PCGA-AC16V6	3000007	DoC

#### I/O CABLES

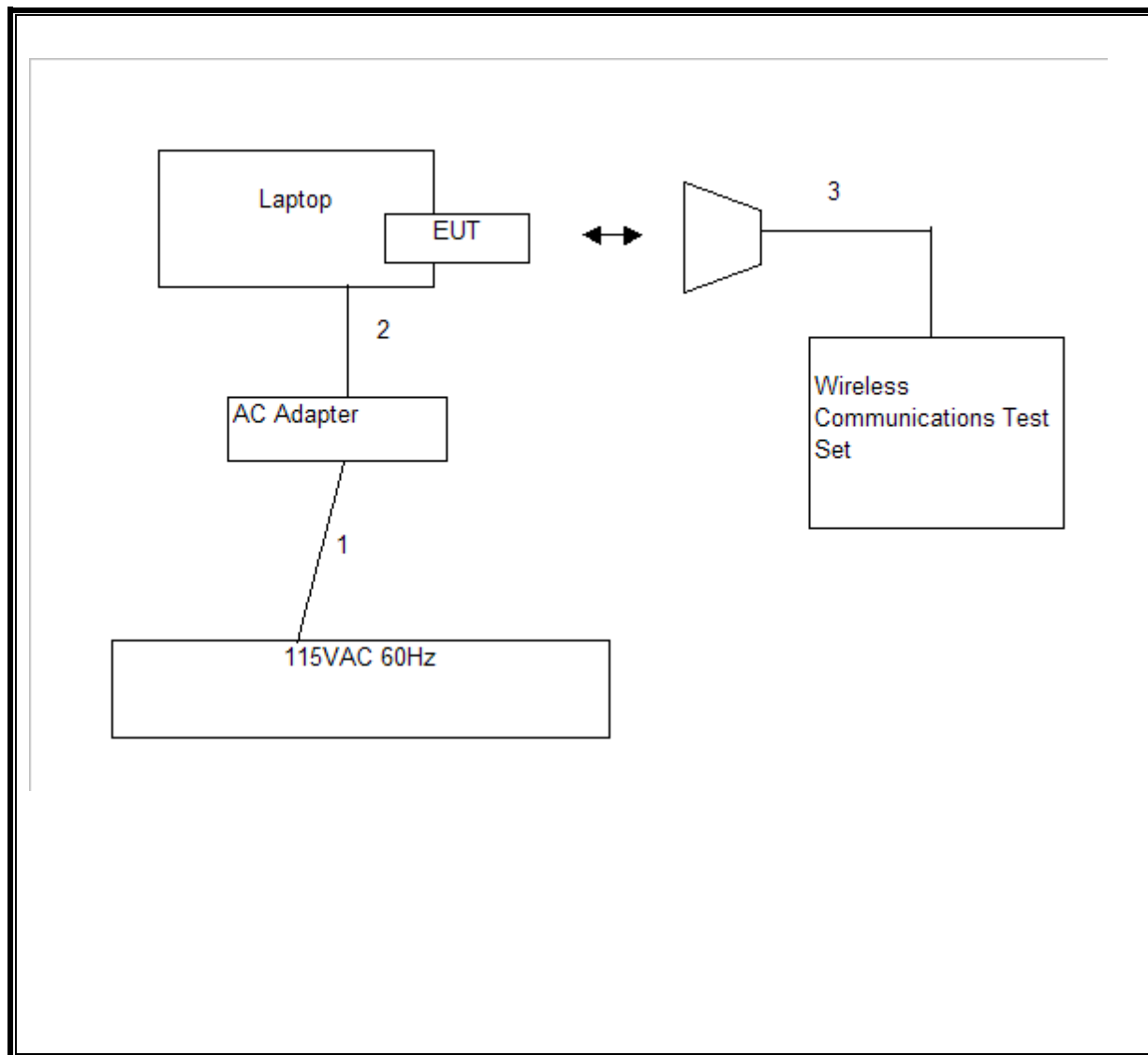
I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	US 115V	Un-shielded	2m	NA
2	DC	1	DC	Un-shielded	2m	NA
3	RF In/Out	1	Horn	Un-shielded	3m	NA

#### TEST SETUP

The EUT is installed in a Sony Laptop during the test. 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
Antenna, Horn 1 ~ 18 GHz	ETS	3117	29301	04/22/07
EMI Test Receiver	R & S	ESHS 20	827129/006	06/03/07
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	08/30/07
Quasi-Peak Adaptor	Agilent / HP	85650A	3145A01654	01/21/08
SA RF Section, 1.5 GHz	Agilent / HP	85680B	2814A04227	01/07/08
SA Display Section 2	Agilent / HP	85662A	2816A16696	04/07/08
Preamplifier, 1300 MHz	Agilent / HP	8447D	1937A02062	01/23/08
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A121003	09/03/07
Preamplifier, 1 ~ 26.5 GHz	Agilent / HP	8449B	3008A00561	10/03/07
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	MY43360112	05/03/07
Wireless Communications Test Set	Agilent	E5515C	10092	10/19/07
2.7GHz HPF	MicroTronic	HPM13194	2	CNR
1.5GHz HPF	MicroTronic	HPM13195	1	CNR
Signal Generator 2 -40 GHz	R & S	SMP04	DE 34210	06/02/07
Signal Generator 1024 MHz	R & S	SMY01	DE 12311	05/11/07
Dipole	EMCO	3121C-DB2	22435	06/25/07

## **7. LIMITS AND RESULTS**

### **7.1. RADIATED OUTPUT POWER**

#### **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.

850 MHz GPRS Mode

Channel	Frequency (MHz)	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low	824.2	30.50	1122.02
Middle	837	29.90	977.24
High	848.8	29.20	831.76

850 MHz EGPRS Mode

Channel	Frequency (MHz)	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low	824.2	25.60	363.08
Middle	837	25.00	316.23
High	848.8	24.30	269.15

850 MHz WCDMA Modulation

Channel	Frequency (MHz)	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low	826.4	23.80	239.88
Middle	836.4	23.20	208.93
High	846.6	22.80	190.55

850 MHz WCDMA+HSPDA Modulation

Channel	Frequency (MHz)	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low	826.4	24.60	288.40
Middle	836.4	23.70	234.42
High	848.6	23.10	204.17

1900 MHz GPRS Mode

Channel	Frequency (MHz)	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low	1850.2	29.20	831.76
Middle	1880.00	28.90	776.25
High	1909.8	28.60	724.44

1900 MHz EGPRS Mode

Channel	Frequency (MHz)	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low	1850.2	25.80	380.19
Middle	1880.00	25.90	389.05
High	1909.8	25.40	346.74

1900 MHz WCDMA Modulation

Channel	Frequency (MHz)	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low	1852.4	23.70	234.42
Middle	1880.00	23.30	213.80
High	1907.6	23.50	223.87

1900 MHz WCDMA+HSPDA Modulation

Channel	Frequency (MHz)	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low	1852.40	24.70	295.12
Middle	1880.00	24.40	275.42
High	1907.60	24.50	281.84

**GSM850 GPRS Output Power (ERP)**

High Frequency Substitution Measurement									
Compliance Certification Services, Fremont 5m Chamber Site									
Company: Sierra Wireless									
Project #: 07U10993									
Date: 04/12/2007									
Test Engineer: Mengistu Mekuria									
Configuration: EUT With Support PC									
Mode: CELL TX, GPRS									
<u>Test Equipment:</u>									
Receiving: Sunol T122, and 5m Chamber N-type Cable (Setup this one for testing EUT)									
Substitution: Dipole S/N: 00022117, and 4ft SMA Cable Warehouse S/N: 177081002									
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 Ch									
824.20	104.2	V	30.6	0.5	0.0	30.1	38.5	-8.3	
824.20	107.5	H	31.0	0.5	0.0	30.5	38.5	-7.9	
Mid Ch									
836.50	104.0	V	30.2	0.6	0.0	29.6	38.5	-8.8	
836.50	107.3	H	30.5	0.6	0.0	29.9	38.5	-8.6	
High Ch									
848.80	103.5	V	29.9	0.7	0.0	29.2	38.5	-9.3	
848.80	106.0	H	29.4	0.7	0.0	28.7	38.5	-9.8	
Rev. 1.24.7									

**GSM850 EGPRS Output Power (ERP)**

**High Frequency Substitution Measurement**  
**Compliance Certification Services, Fremont 5m Chamber Site**

Company: Sierra Wireless  
Project #: 07U10993  
Date: 04/12/2007  
Test Engineer: Mengistu Mekuria  
Configuration: EUT With Support PC  
Mode: CELL TX, EGPRS

**Test Equipment:**

Receiving: Sunol T122, and 5m Chamber N-type Cable (Setup this one for testing EUT)  
Substitution: Dipole S/N: 00022117, and 4ft SMA Cable Warehouse S/N: 177081002

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
824.20	99.3	V	25.7	0.5	0.0	25.2	38.5	-13.3	
824.20	102.6	H	26.1	0.5	0.0	25.6	38.5	-12.8	
836.50	99.0	V	25.2	0.6	0.0	24.6	38.5	-13.8	
836.50	102.4	H	25.6	0.6	0.0	25.0	38.5	-13.5	
848.80	98.6	V	25.0	0.7	0.0	24.3	38.5	-14.2	
848.80	101.1	H	24.5	0.7	0.0	23.8	38.5	-14.7	

Rev. 1.24.7

**Cell Band WCDMA Output Power (ERP)**

<p align="center"><b>High Frequency Substitution Measurement</b>  <b>Compliance Certification Services, Fremont 5m Chamber Site</b></p> <p>Company: Sierra Wireless  Project #: 07U10993  Date: 04/16/2007  Test Engineer: Mengistu Mekuria  Configuration: EUT With Support PC  Mode: CELL TX, WCDMA</p> <p><u>Test Equipment:</u>  Receiving: Sunol T122, and 5m Chamber N-type Cable (Setup this one for testing EUT)  Substitution: Dipole S/N: 00022117, and 4ft SMA Cable Warehouse S/N: 177081002</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
<b>Low Ch</b>									
826.40	97.6	V	24.0	0.5	0.0	23.5	38.5	-15.0	
826.40	100.8	H	24.3	0.5	0.0	23.8	38.5	-14.7	
<b>Mid Ch</b>									
836.40	97.2	V	23.4	0.6	0.0	22.8	38.5	-15.6	
836.40	100.6	H	23.8	0.6	0.0	23.2	38.5	-15.2	
<b>High Ch</b>									
846.60	96.7	V	23.1	0.7	0.0	22.4	38.5	-16.1	
846.60	100.1	H	23.5	0.7	0.0	22.8	38.5	-15.7	
Rev. 1.24.7									



**Cell Band WCDMA+HSPDA Output Power (ERP)**

<p align="center"><b>High Frequency Substitution Measurement</b>  <b>Compliance Certification Services, Fremont 5m Chamber Site</b></p> <p>Company: Sierra Wireless  Project #: 07U10993  Date: 04/16/2007  Test Engineer: Mengistu Mekuria  Configuration: EUT With Support PC  Mode: CELL TX, WCDMA + HSDPA</p> <p><u>Test Equipment:</u>  Receiving: Sunol T122, and 5m Chamber N-type Cable (Setup this one for testing EUT)  Substitution: Dipole S/N: 00022117, and 4ft SMA Cable Warehouse S/N: 177081002</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
<b>Low Ch</b>									
826.40	98.0	V	24.4	0.5	0.0	23.9	38.5	-14.5	
826.40	101.6	H	25.1	0.5	0.0	24.6	38.5	-13.8	
<b>Mid Ch</b>									
836.40	97.7	V	24.0	0.6	0.0	23.4	38.5	-15.1	
836.40	101.1	H	24.3	0.6	0.0	23.7	38.5	-14.7	
<b>High Ch</b>									
846.60	97.0	V	23.4	0.7	0.0	22.7	38.5	-15.8	
846.60	100.4	H	23.8	0.7	0.0	23.1	38.5	-15.4	
Rev. 1.24.7									

**GSM1900 Band GPRS Output Power (EIRP)**

<p align="center"><b>High Frequency Fundamental Measurement</b>  Compliance Certification Services, Fremont 5m Chamber Site</p> <p>Company: Sierra Wireless  Project #: 07U10993  Date: 04/12/2007  Test Engineer: Mengistu Mekuria  Configuration: EUT With Support PC  Mode: PCS TX, GPRS</p> <p><b>Test Equipment:</b>  Receiving: Horn T73, and 12ft S/N: 197209005 (Setup this one for testing EUT)  Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse S/N: 177081002</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
<b>Low Ch</b>									
1.850	95.2	V	21.8	0.9	8.3	29.2	33.0	-3.8	
1.850	93.2	H	19.3	0.9	8.3	26.7	33.0	-6.4	
<b>Mid Ch</b>									
1.880	95.8	V	21.5	0.9	8.3	28.9	33.0	-4.1	
1.880	92.0	H	17.2	0.9	8.3	24.6	33.0	-8.4	
<b>High Ch</b>									
1.910	94.4	V	21.1	0.9	8.4	28.6	33.0	-4.4	
1.910	90.7	H	17.9	0.9	8.4	25.3	33.0	-7.7	
Rev. 1.24.7									

**GSM1900 Band EGPRS Output Power (EIRP)**

<p align="center"><b>High Frequency Fundamental Measurement</b>  <b>Compliance Certification Services, Fremont 5m Chamber Site</b></p> <p>Company: Sierra Wireless  Project #: 07U10993  Date: 04/12/2007  Test Engineer: Mengistu Mekuria  Configuration: EUT With Support PC  Mode: PCS TX, EGPRS</p> <p><u>Test Equipment:</u>  Receiving: Horn T73, and 12ft S/N: 197209005 (Setup this one for testing EUT)  Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse S/N: 177081002</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
<b>Low Cg</b>									
1.850	91.8	V	18.4	0.9	8.3	25.8	33.0	-7.2	
1.850	90.2	H	16.3	0.9	8.3	23.7	33.0	-9.3	
<b>Mid Ch</b>									
1.880	92.8	V	18.5	0.9	8.3	25.9	33.0	-7.1	
1.880	89.1	H	14.3	0.9	8.3	21.7	33.0	-11.3	
<b>High Ch</b>									
1.910	91.2	V	17.9	0.9	8.4	25.4	33.0	-7.6	
1.910	87.8	H	15.0	0.9	8.4	22.5	33.0	-10.6	
Rev. 1.24.7									

**PCS Band WCDMA Output Power (EIRP)**

High Frequency Fundamental Measurement									
Compliance Certification Services, Fremont 5m Chamber Site									
Company: Sierra Wireless									
Project #: 07U10993									
Date: 04/16/2007									
Test Engineer: Mengistu Mekuria									
Configuration: EUT With Support PC									
Mode: PCS TX, WCDMA									
<b>Test Equipment:</b>									
Receiving: Horn T73, and 12ft S/N: 197209005 (Setup this one for testing EUT)									
Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse S/N: 177081002									
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low Ch</b>									
1.852	89.7	V	16.3	0.9	8.3	23.7	33.0	-9.3	
1.852	87.8	H	13.9	0.9	8.3	21.3	33.0	-11.7	
<b>Mid Ch</b>									
1.880	90.2	V	15.9	0.9	8.3	23.3	33.0	-9.7	
1.880	88.6	H	13.8	0.9	8.3	21.2	33.0	-11.8	
<b>High Ch</b>									
1.908	89.3	V	16.0	0.9	8.4	23.5	33.0	-9.5	
1.908	86.7	H	13.9	0.9	8.4	21.4	33.0	-11.7	
Rev. 1.24.7									

**PCS Band WCDMA + HSPDA Output Power (EIRP)**

High Frequency Fundamental Measurement									
Compliance Certification Services, Fremont 5m Chamber Site									
Company: Sierra Wireless									
Project #: 07U10993									
Date: 04/16/2007									
Test Engineer: Mengistu Mekuria									
Configuration: EUT With Support PC									
Mode: PCS TX, WCDMA + HSDPA									
<b>Test Equipment:</b>									
Receiving: Horn T73, and 12ft S/N: 197209005 (Setup this one for testing EUT)									
Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse S/N: 177081002									
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low Ch</b>									
1.852	90.7	V	17.3	0.9	8.3	24.7	33.0	-8.3	
1.852	88.6	H	14.7	0.9	8.3	22.1	33.0	-10.9	
<b>Mid Ch</b>									
1.880	91.3	V	17.0	0.9	8.3	24.4	33.0	-8.6	
1.880	89.4	H	14.6	0.9	8.3	22.0	33.0	-11.0	
<b>High Ch</b>									
1.908	90.3	V	17.0	0.9	8.4	24.5	33.0	-8.5	
1.908	87.8	H	15.0	0.9	8.4	22.5	33.0	-10.6	
Rev. 1.24.7									

## **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 603 Clause 3.2.12, FCC 22.917 (h), & FCC 24.238 (b)

### **RESULTS**

No non-compliance noted.

**GSM850 GPRS Spurious & Harmonic (ERP)**

Cellular Harmonic Substitution Measurement									
Compliance Certification Services, Fremont Immunity Chamber									
<b>Company:</b> Sierra Wireless <b>Project #:</b> 07U10993 <b>Date:</b> April 12th 2007 <b>Test Engineer:</b> Anoop Singh <b>Configuration:</b> EUT Only <b>Mode:</b> TX, GSM 850 GPRS									
<b>Test Equipment:</b> 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
<b>Low Channel (82)</b> 824.2MHz									
1.648	54.9	V	-52.0	0.8	7.7	-45.1	-13.0	-32.1	
2.473	56.5	V	-53.5	1.0	9.4	-45.1	-13.0	-32.1	
1.648	56.4	H	-49.3	1.2	9.7	-40.8	-13.0	-27.8	
2.473	52.5	H	-52.3	1.3	9.9	-43.6	-13.0	-30.6	
<b>Mid Channel (83)</b> 837.0MHz									
1.674	54.1	V	-51.6	0.8	7.7	-44.8	-13.0	-31.8	
2.511	52.3	V	-57.5	1.0	9.4	-49.1	-13.0	-36.1	
1.674	54.1	H	-51.6	0.8	7.7	-44.7	-13.0	-31.7	
2.511	53.4	H	-55.7	1.0	9.4	-47.3	-13.0	-34.3	
<b>High Channel (84)</b> 848.8MHz									
1.698	56.9	V	-52.0	0.8	7.8	-45.1	-13.0	-32.1	
2.546	53.0	V	-56.3	1.0	9.4	-47.9	-13.0	-34.9	
1.698	53.7	H	-52.3	1.2	9.7	-43.8	-13.0	-30.8	
2.546	53.4	H	-51.9	1.4	10.1	-43.2	-13.0	-30.2	
No other frequency was detected above noise floor									

**GSM850 EGPRS Spurious & Harmonic (ERP)**

<b>Cellular Harmonic Substitution Measurement</b> <b>Compliance Certification Services, Fremont Immunity Chamber</b>									
<b>Company:</b> Sierra Wireless <b>Project #:</b> 07U10993 <b>Date:</b> April 13th 2007 <b>Test Engineer:</b> Anoop Singh <b>Configuration:</b> EUT Only <b>Mode:</b> TX, GSM 850 EGPRS									
<b>Test Equipment:</b> 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
<b>Low Channel (82) 824.2MHz</b>									
1.648	57.9	V	-49.1	0.8	7.7	-42.2	-13.0	-29.2	
2.473	52.7	V	-57.2	1.0	9.4	-48.8	-13.0	-35.8	
1.648	56.5	H	-49.2	1.2	9.7	-40.7	-13.0	-27.7	
2.473	52.2	H	-52.5	1.3	9.9	-43.9	-13.0	-30.9	
<b>Mid Channel (83) 837.0MHz</b>									
1.674	54.0	V	-51.7	0.8	7.7	-44.9	-13.0	-31.9	
2.511	53.1	V	-56.8	1.0	9.4	-48.4	-13.0	-35.4	
1.674	54.4	H	-51.3	0.8	7.7	-44.4	-13.0	-31.4	
2.511	52.3	H	-56.8	1.0	9.4	-48.4	-13.0	-35.4	
<b>High Channel (84) 848.8MHz</b>									
1.698	54.7	V	-54.2	0.8	7.8	-47.3	-13.0	-34.3	
2.546	53.4	V	-56.0	1.0	9.4	-47.6	-13.0	-34.6	
1.698	54.0	H	-52.0	1.2	9.7	-43.5	-13.0	-30.5	
2.546	52.9	H	-52.4	1.4	10.1	-43.7	-13.0	-30.7	
No other frequency was detected above the noise floor									



**CELL Band WCDMA Spurious & Harmonic (ERP)**

High Frequency Substitution Measurement										
Compliance Certification Services, Fremont 5m B-Chamber										
<b>Company:</b> Sierra Wireless <b>Project #:</b> 07U10993 <b>Date:</b> 04/16/2007 <b>Test Engineer:</b> Mengistu Mekuria <b>Configuration:</b> EUT With Support PC <b>Mode:</b> CELL TX, WCDMA										
<b>Test Equipment:</b>										
<div style="border: 1px solid black; padding: 2px; background-color: #e0f7fa;">EMCO Horn 1-18GHz</div> <div style="border: 1px solid black; padding: 2px; background-color: #e0f7fa;">T 60; S/N: 2238 @3m</div>		<div style="border: 1px solid black; padding: 2px; background-color: #e0f7fa;">Horn &gt; 18GHz</div>		<div style="border: 1px solid black; padding: 2px; background-color: #e0f7fa;">Limit</div> <div style="border: 1px solid black; padding: 2px; background-color: #e0f7fa;">ERP</div>		<div style="border: 1px solid black; padding: 2px; background-color: #e0f7fa;"> <input checked="" type="checkbox"/> High Pass Filter         </div>				
<div style="border: 1px solid black; padding: 2px; background-color: #e0f7fa;">           Hi Frequency Cables  <input type="checkbox"/> (2 ft)              <input type="checkbox"/> (2 ~ 3 ft)              <input type="checkbox"/> (4 ~ 6 ft)              <input checked="" type="checkbox"/> (12 ft)         </div>				<div style="border: 1px solid black; padding: 2px; background-color: #e0f7fa;">           Pre-amplifier 1-26GHz            T34 HP 8449B         </div>		<div style="border: 1px solid black; padding: 2px; background-color: #e0f7fa;">           Pre-amplifier 26-40GHz         </div>				
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low Ch 826.4MHz</b>										
1.653	49.0	H	-56.2	3.8	7.1	4.9	-55.1	-13.0	-42.1	
2.479	52.0	H	-50.8	4.9	9.3	7.1	-48.6	-13.0	-35.6	
1.653	47.8	V	-58.1	3.8	7.1	4.9	-57.0	-13.0	-44.0	
2.479	48.6	V	-54.4	4.9	9.3	7.1	-52.2	-13.0	-39.2	
<b>Mid Ch 836.4MHz</b>										
1.673	48.7	H	-56.4	3.9	7.2	5.0	-55.3	-13.0	-42.3	
2.509	51.6	H	-51.0	4.9	9.3	7.1	-48.8	-13.0	-35.8	
1.673	46.2	V	-59.6	3.9	7.2	5.0	-58.5	-13.0	-45.5	
2.509	47.5	V	-55.3	4.9	9.3	7.1	-53.1	-13.0	-40.1	
<b>Hi Ch 846.6MHz</b>										
1.693	47.3	H	-57.7	3.9	7.2	5.1	-56.6	-13.0	-43.6	
2.540	50.3	H	-52.2	4.9	9.3	7.1	-50.0	-30.0	-20.0	
1.693	46.5	V	-59.2	3.9	7.2	5.1	-58.1	-13.0	-45.1	
2.539	48.7	V	-54.0	4.9	9.3	7.1	-51.8	-13.0	-38.8	
Rev. 5.1.6 Note: No other emissions were detected above the system noise floor.										



**GSM1900 Band GPRS Spurious & Harmonic (EIRP)**

<b>PCS Harmonic Substitution Measurement</b> <b>Compliance Certification Services, Fremont Immunity Chamber</b>									
<b>Company:</b> Sierra Wireless <b>Project #:</b> 07U10993 <b>Date:</b> April 12th 2007 <b>Test Engineer:</b> Anoop Singh <b>Configuration:</b> EUT Only <b>Mode:</b> TX,GSM 1900 GPRS									
<b>Test Equipment:</b> Receiving: Horn T60, Pre-amp T145, 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 (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low Channel 1850.2MHz</b>									
3.700	56.0	V	-48.6	0.9	9.7	-39.8	-13.0	-26.8	
5.551	50.6	V	-52.0	1.3	11.0	-42.3	-13.0	-29.3	
3.700	52.3	H	-48.7	1.4	12.0	-38.1	-13.0	-25.1	
5.551	48.8	H	-48.4	1.9	12.7	-37.6	-13.0	-24.6	
<b>Mid Channel 1880MHz</b>									
3.760	55.4	V	-49.4	0.9	9.7	-40.6	-13.0	-27.6	
5.640	50.5	V	-52.7	1.4	11.2	-42.9	-13.0	-29.9	
3.760	52.6	H	-48.5	1.4	12.0	-37.9	-13.0	-24.9	
5.640	49.3	H	-48.6	1.9	12.7	-37.8	-13.0	-24.8	
<b>High Channel 1909.8MHz</b>									
3.820	54.2	V	-49.8	0.9	9.7	-41.0	-13.0	-28.0	
5.729	51.0	V	-52.5	1.4	11.3	-42.6	-13.0	-29.6	
3.820	53.5	H	-47.0	1.5	12.0	-36.5	-13.0	-23.5	
5.729	50.2	H	-47.2	1.9	12.7	-36.3	-13.0	-23.3	
No other frequency was detected above noise floor									



**PCS Band WCDMA Spurious & Harmonic (EIRP)**

High Frequency Substitution Measurement										
Compliance Certification Services, Fremont 5m B-Chamber										
Company: Sierra Wireless Project #: 07U10993 Date: 04/16/2007 Test Engineer: Mengistu Mekuria Configuration: EUT With Support PC Mode: PCS TX, WCDMA										
Test Equipment:										
EMCO Horn 1-18GHz		Horn > 18GHz			Limit		<input checked="" type="checkbox"/> High Pass Filter			
T60; S/N: 2238 @3m					EIRP					
Hi Frequency Cables <input type="checkbox"/> (2 ft) <input type="checkbox"/> (2 ~ 3 ft) <input type="checkbox"/> (4 ~ 6 ft) <input checked="" type="checkbox"/> (12 ft)										
Pre-amplifier 1-26GHz		Pre-amplifier 26-40GHz								
T34 HP 8449B										
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low Ch 1852.4MHz</b>										
3.705	48.5	H	-48.7	5.9	9.7	7.5	-45.0	-13.0	-32.0	
5.557	49.6	H	-41.2	7.4	11.0	8.9	-37.6	-13.0	-24.6	
3.705	47.1	V	-50.2	5.9	9.7	7.5	-46.5	-13.0	-33.5	
5.557	47.3	V	-44.5	7.4	11.0	8.9	-40.9	-13.0	-27.9	
<b>Mid Ch 1890.0MHz</b>										
3.760	50.0	H	-47.0	6.0	9.7	7.5	-43.3	-13.0	-30.3	
5.640	48.6	H	-42.3	7.4	11.2	9.0	-38.6	-13.0	-25.6	
3.760	48.2	V	-48.9	6.0	9.7	7.5	-45.2	-13.0	-32.2	
5.640	47.7	V	-44.2	7.4	11.2	9.0	-40.5	-13.0	-27.5	
<b>Hi Ch 1907.6MHz</b>										
3.815	52.6	H	-44.1	6.0	9.7	7.6	-40.5	-13.0	-27.5	
5.723	49.0	H	-42.1	7.5	11.3	9.1	-38.3	-13.0	-25.3	
3.815	50.5	V	-46.3	6.0	9.7	7.6	-42.7	-13.0	-29.7	
5.723	47.5	V	-44.6	7.5	11.3	9.1	-40.8	-13.0	-27.8	
Rev. 5.1.6										
Note: No other emissions were detected above the system noise floor.										

**PCS Band WCDMA+HSPDA Spurious & Harmonic (EIRP)**

High Frequency Substitution Measurement										
Compliance Certification Services, Fremont 5m B-Chamber										
Company: Sierra Wireless Project #: 07U10993 Date: 04/16/2007 Test Engineer: Mengistu Mekuria Configuration: EUT With Support PC Mode: PCS TX, WCDMA + HSDPA										
Test Equipment:										
EMCO Horn 1-18GHz		Horn > 18GHz		Limit		<input checked="" type="checkbox"/> High Pass Filter				
T60; S/N: 2238 @3m				EIRP						
Hi Frequency Cables: <input type="checkbox"/> (2 ft) <input type="checkbox"/> (2 ~ 3 ft) <input type="checkbox"/> (4 ~ 6 ft) <input checked="" type="checkbox"/> (12 ft)										
Pre-amplifier 1-26GHz		Pre-amplifier 26-40GHz								
T34 HP 8449B										
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low Ch 1852.4MHz</b>										
3.705	56.8	H	-40.4	5.9	9.7	7.5	-36.7	-13.0	-23.7	
5.557	49.7	H	-41.1	7.4	11.0	8.9	-37.5	-13.0	-24.5	
3.705	53.7	V	-43.6	5.9	9.7	7.5	-39.9	-13.0	-26.9	
5.557	47.8	V	-44.0	7.4	11.0	8.9	-40.4	-13.0	-27.4	
<b>Mid Ch 1880.0MHz</b>										
3.760	56.7	H	-40.3	6.0	9.7	7.5	-36.6	-13.0	-23.6	
5.640	45.4	H	-45.5	7.4	11.2	9.0	-41.8	-13.0	-28.8	
3.760	53.0	V	-44.1	6.0	9.7	7.5	-40.4	-13.0	-27.4	
5.640	47.6	V	-44.3	7.4	11.2	9.0	-40.6	-13.0	-27.6	
<b>Hi Ch 1907.6MHz</b>										
3.815	55.7	H	-41.0	6.0	9.7	7.6	-37.4	-13.0	-24.4	
5.723	52.6	H	-38.5	7.5	11.3	9.1	-34.7	-13.0	-21.7	
3.815	52.8	V	-44.0	6.0	9.7	7.6	-40.4	-13.0	-27.4	
5.723	48.9	V	-43.2	7.5	11.3	9.1	-39.4	-13.0	-26.4	
Rev. 5.1.6										
Note: No other emissions were detected above the system noise floor.										