



**FCC CFR47 PART 15, 22 H & 24 E CLASS II PERMISSIVE  
CHANGE**

**TEST REPORT**

*FOR*

**800MHz/1900MHz CDMA DUAL BAND PC CARD**

**MODEL: AirCard 555**

**FCC ID: N7NACRD555**

**REPORT NUMBER: 02U1327-1**

**ISSUE DATE: MAY 31, 2002**

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

*Prepared by*  
**COMPLIANCE ENGINEERING SERVICES, INC.**  
*d.b.a*  
**COMPLIANCE CERTIFICATION SERVICES  
561F MONTEREY ROAD  
MORGAN HILL, CA 95037, USA  
TEL: (408) 463-0885  
FAX: (408) 463-0888**



## TABLE OF CONTENT

<b>1. TEST RESULT CERTIFICATION.....</b>	<b>3</b>
<b>2. TEST SUMMARY.....</b>	<b>4</b>
<b>3. EUT DESCRIPTION.....</b>	<b>5</b>
<b>4. DESCRIPTION OF CLASS II PERMISSIVE CHANGE.....</b>	<b>5</b>
<b>5. TEST METHODOLOGY.....</b>	<b>5</b>
<b>6. TEST FACILITY.....</b>	<b>5</b>
<b>7. ACCREDITATION AND LISTING.....</b>	<b>5</b>
<b>8. MEASURING INSTRUMENT CALIBRATION.....</b>	<b>6</b>
<b>9. APPLICABLE RULES.....</b>	<b>6</b>
<b>10. TEST SETUP, PROCEDURE AND RESULT.....</b>	<b>9</b>
10.1. SECTION 22.913(A) ERP AND 24.232(B) EIRP .....	9
10.2. SECTION 2.1053: FIELD STRENGTH OF SPURIOUS RADIATION.....	13
10.2.1. Radiated emissions 22.917(e).....	18
10.2.2. Radiated emissions 24.238(a).....	20
10.3. FCC PART 15 SUBPART B TESTING.....	22
10.3.1. Radiated emissions 15.109.....	22
10.3.2. Conducted emissions 15.107.....	26

# 1. TEST RESULT CERTIFICATION

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

**CONTACT PERSON:** YING WANG / SENIOR RF DESIGNER

**TELEPHONE NO:** (604) 232-1440

**EUT DESCRIPTION:** 800/1900 MHZ CDMA DUAL BAND PC CARD

**MODEL NAME:** AirCard 555

**DATE TESTED:** MAY 20 - 24, 2002

EQUIPMENT TYPE	Wireless Network PCMCIA Card
MEASUREMENT PROCEDURE	ANSI 63.4 / 1992, TIA/EIA 603
PROCEDURE	FCC CLASS II PERMISSIVE CHANGE
FCC RULE	CFR 47 PART 2, 15, 22 Subpart H and 24 Subpart E

Compliance Certification Services, Inc. tested the above equipment for compliance with the requirement set forth in CFR 47, PART 15.107, 15.109, PART 22 Subpart H-Cellular Radiotelephone Service and PART 24 Subpart E-Broadband PCS. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

**Warning:** This document reports conditions under which testing was conducted and results of tests performed. 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.

Released For CCS By:

Tested By:



**MIKE HECKROTTE**  
CHIEF ENGINEER  
COMPLIANCE CERTIFICATION SERVICES

**KERWIN CORPUZ**  
ASSOCIATE EMC ENGINEER  
COMPLIANCE CERTIFICATION SERVICES

## 2. TEST SUMMARY

FCC RULE	DESCRIPTION OF TEST	REMARK
22.913(a), 24.232(b)	ERP, EIRP	Complies
2.1053	Field Strength of Spurious Radiation Emission	Complies
15.109	Radiated Emissions for Digital Device	Complies
15.107	AC Conducted Emissions for Digital Device	Complies
2.1093	SAR	Refer to Report No: 02U1327-2

### 3. EUT DESCRIPTION

The EUT is a wireless network PC Card operating in both Cellular and PCS bands. It comes with a single transceiving antenna, with a nominal conducted power output of 0.2 Watts.

### 4. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The changes made on the hardware section are, added directional coupler to the transmitter, added some tuning capacitors on the transmitter chain and modified the ground plane on the transmitter chain.

Also replaced end-fed monopole antenna with  $\frac{1}{2}$ wavelength at Cellular Band and full wavelength at PCS Band. Previous end-fed monopole antenna was  $\frac{1}{4}$ wavelength at Cellular Band and  $\frac{1}{2}$ wavelength at PCS Band. The average gain of the antenna in the horizontal plane is -1.0dBi at Cellular Band and -2.9dBi at PCS Band.

### 5. TEST METHODOLOGY

Both conducted and radiated testing were performed according to the procedures documented on chapter 13 of ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

### 6. TEST FACILITY

The open area test sites and conducted measurement facilities used to collect the radiated data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

### 7. ACCREDITATION AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code: 200065-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government. In addition, the test facilities are listed with Federal Communications Commission (reference no: 31040/SIT (1300B3) and 31040/SIT (1300F2))

## 8. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

## 9. APPLICABLE RULES

### 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 EIRP peak power.

*Spec limit: As specified above.*

### TYPE OF EMISSIONS

F9W (CDMA)

## **EMISSION LIMITS**

22.917(e) and 24.238(a); The magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under conditions specified in the instruction manual and/or alignment procedure, shall not be less than  $43+10 \log$  (mean output power in watts) dBc below the mean power output outside a licensee's frequency block.

Power Amplifier Mean Power = 0.2 Watts (23 dBm)  
 $43 + 10 \log (0.2 \text{ Watts}) = 36 \text{ dB}$

Out-of-Band and Band-Edges emissions must be attenuated by the following amount:  
 $23 \text{ dBm} - 36 \text{ dB} = -13 \text{ dBm}$

22.917(e) and 24.238(b) & (c);

Compliance with the out-of-band emissions requirement is based on test being performed with 1MHz analyzer RES BW.

*Spec limit: As specified as above.*

**§2.1057- SPECTRUM RANGE TO BE INVESTIGATED**

Lowest radio frequency signal generated in the equipment, without going below 9 kHz, up to at least the frequency shown below:

(1) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

(2) If the equipment operates at or above 10 GHz and below 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.

(3) If the equipment operates at or above 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower.

(b) Particular attention should be paid to harmonics and sub-harmonics of the carrier frequency as well as to those frequencies removed from the carrier by multiples of the oscillator frequency.

Radiation at the frequencies of multiplier stages should also be checked.

(c) The amplitude of spurious emissions, which are attenuated more than 20 dB below the permissible value, need not be reported.

(d) Unless otherwise specified, measurements above 40 GHz shall be performed using a minimum resolution bandwidth of 1 MHz.

***Spec limit: Frequency investigation range from 30MHz to tenth harmonic (i.e. 20 GHz).***



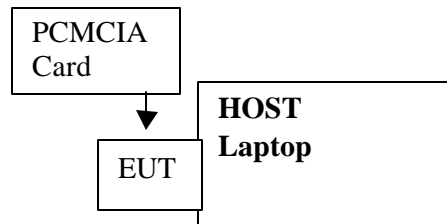
## 10. TEST SETUP, PROCEDURE AND RESULT

### 10.1. SECTION 22.913(a) ERP and 24.232(b) EIRP

#### INSTRUMENTS LIST

EQUIPMENT	MANUFACTURE	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Spectrum Analyzer	HP	8566B	2140A01296	5/23/03
(Rx) Horn Antenna	EMCO	3115	6739	1/31/03
(Tx) Horn Antenna	EMCO	3115	2238	6/20/02
Signal Generator	HP	83732B	US34490599	3/29/03

#### TEST SETUP



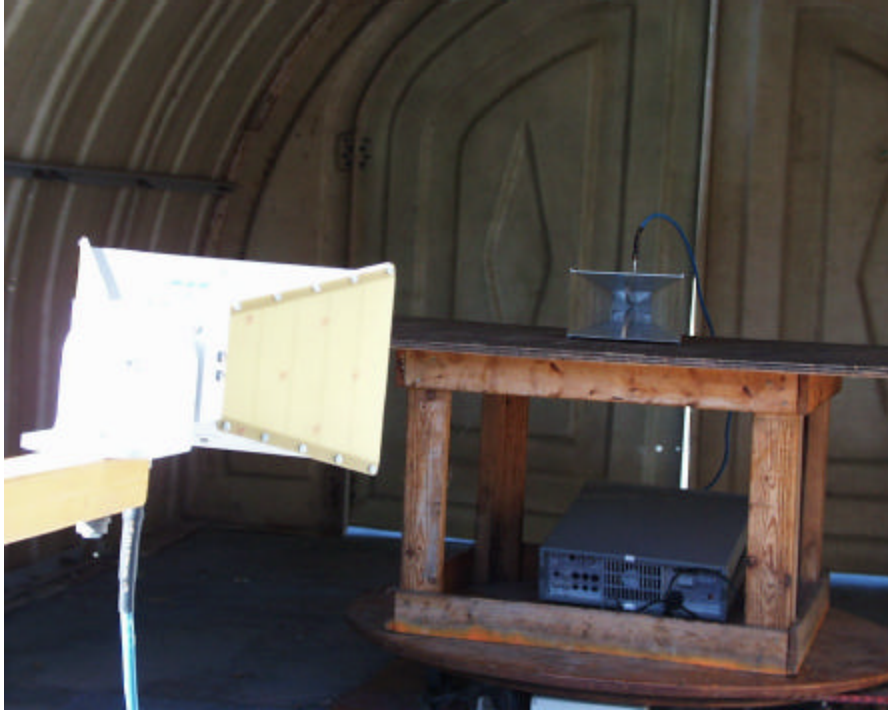
ERP Setup @ 800 MHz



**Substitution Method @ 800 MHz**



**ERP Setup @ 1900 MHz**



**Substitution Method @ 1900 MHz**

**TEST PROCEDURE**

Please see Section 8.2 Test Procedure.

**RESULT**

No non-compliance noted.

### Compliance Certification Services

#### Effective Isotropic Radiated Power

22.913(a)

5/21/02

B-Site (1 meter)

Kerwin Corpuz

Sierra Wireless, Inc.

800MHz/1900MHz Dual Band CDMA Card (M/N: AC555)

Frequency (MHz)	SA reading (dBm)	SG reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1850	-4.7	18.5	0.5	8.4	26.4	33	-6.6
1880	-3.1	21.4	0.5	8.4	29.3	33	-3.7
1909.95	-4.8	18.9	0.5	8.4	26.8	33	-6.2

EIRP = SG reading – CL + Gain

### Compliance Certification Services

#### Effective Radiated Power

24.232(b)

5/22/02

B-Site (3 meter)

Kerwin Corpuz

Sierra Wireless, Inc.

800MHz/1900MHz Dual Band CDMA Card (M/N: AC555)

Frequency (MHz)	SA reading (dBm)	SG reading (dBm)	CL (dB)	Gain (dBi)	ERP (dBm)	Limit (dBm)	Margin (dB)
824.04	-9.3	27.65	0.55	0	27.1	38.45	-11.35
836.52	-9.6	27.15	0.55	0	26.6	38.45	-11.85
848.97	-9.8	26.95	0.55	0	26.4	38.45	-12.05

ERP = SG reading – CL + Gain

**10.2. SECTION 2.1053: FIELD STRENGTH OF SPURIOUS RADIATION**

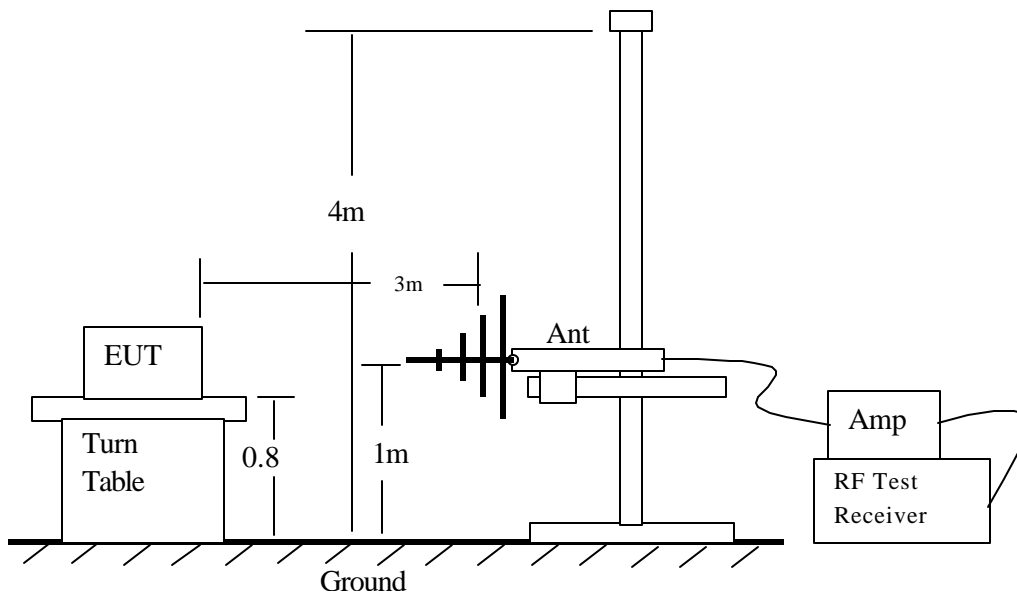
**INSTRUMENTS LIST**

EQUIPMENT	MANUFACTURE	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Spectrum Analyzer	HP	8566B	2140A01296	5/23/03
Amplifier(30-1000MHz)	HP	8447D	2944A06589	8/10/02
Bilog Antenna	CHASE	CBL6112	2049	8/2/02
Amplifier(1-26GHz)	MITEQ	NSP2600-44	646456	4/26/03
Signal Generator	HP	83732B	US34490599	3/29/03
Rx Horn Antenna	EMCO	3115	6739	6/20/02
Rx Horn Antenna	ARA	MWH1826/B	1013	7/26/02
Tx Horn Antenna	EMCO	3115	2238	6/20/02
HPF (2.4GHz)	MICROLAB	FH-2400H	N/A	N/A
HPF (1.8 GHz)	FSY	1800	002	N/A

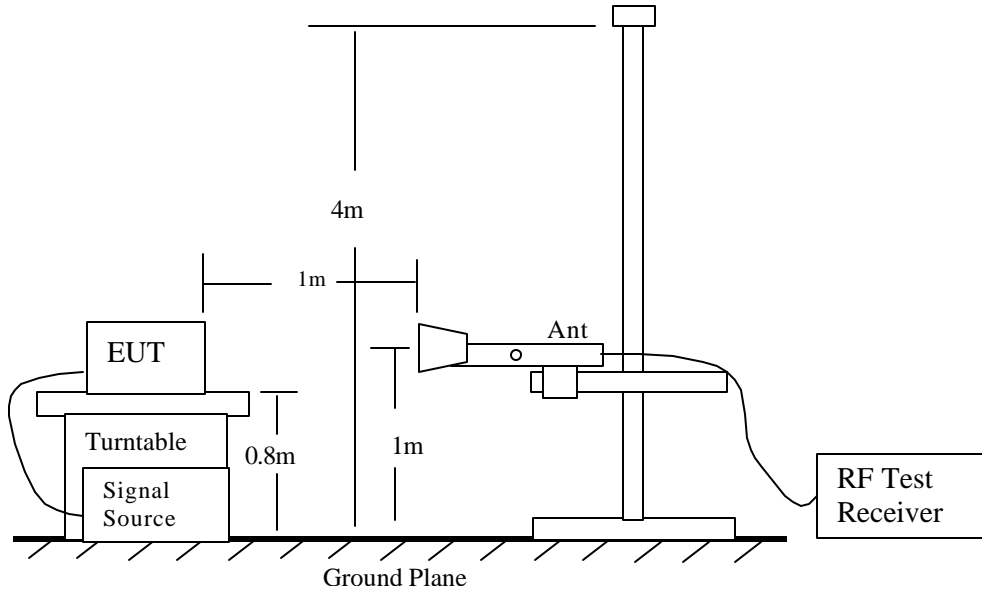
Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Below 1000	<input checked="" type="checkbox"/> Peak	<input checked="" type="checkbox"/> 100 kHz	<input checked="" type="checkbox"/> 100 kHz
	<input type="checkbox"/> Quasi-Peak	<input type="checkbox"/> 1 MHz	<input type="checkbox"/> 1 MHz
Above 1000	<input checked="" type="checkbox"/> Peak	<input checked="" type="checkbox"/> 1 MHz	<input checked="" type="checkbox"/> 1 MHz
	<input type="checkbox"/> Average	<input type="checkbox"/> 1 MHz	<input type="checkbox"/> 10 Hz

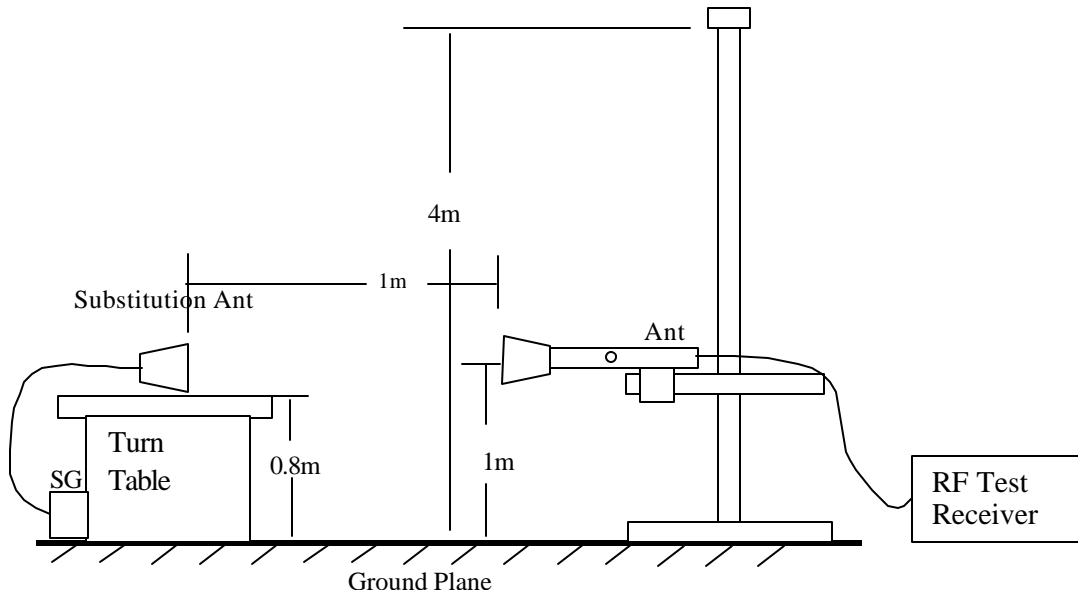
**TEST SETUP**



Radiated Emission Measurement below 1 GHz



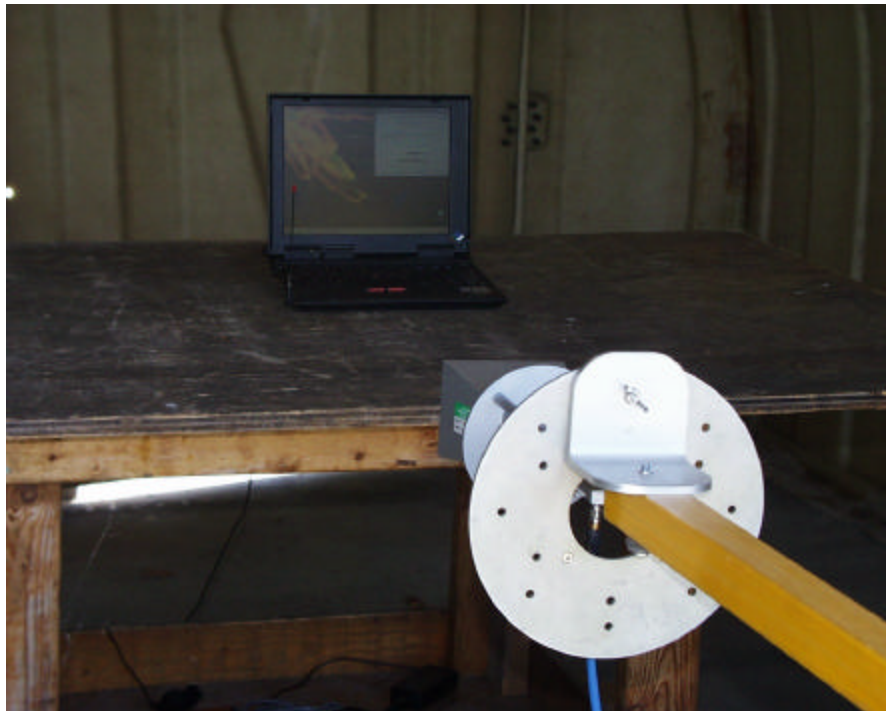
Radiated Emission Measurement above 1 GHz



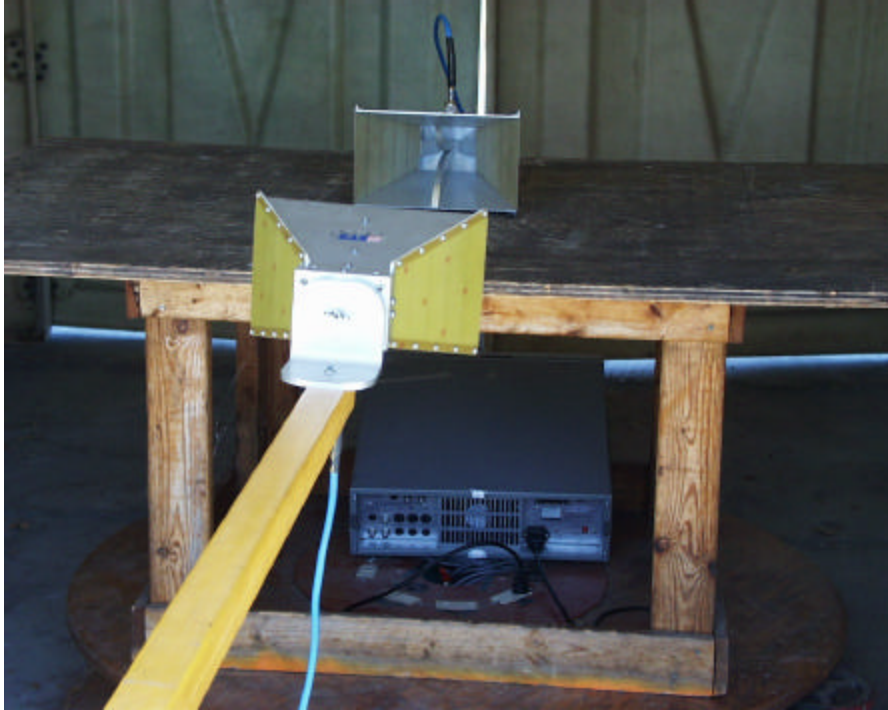
Radiated Emission – Substitution Method set-up



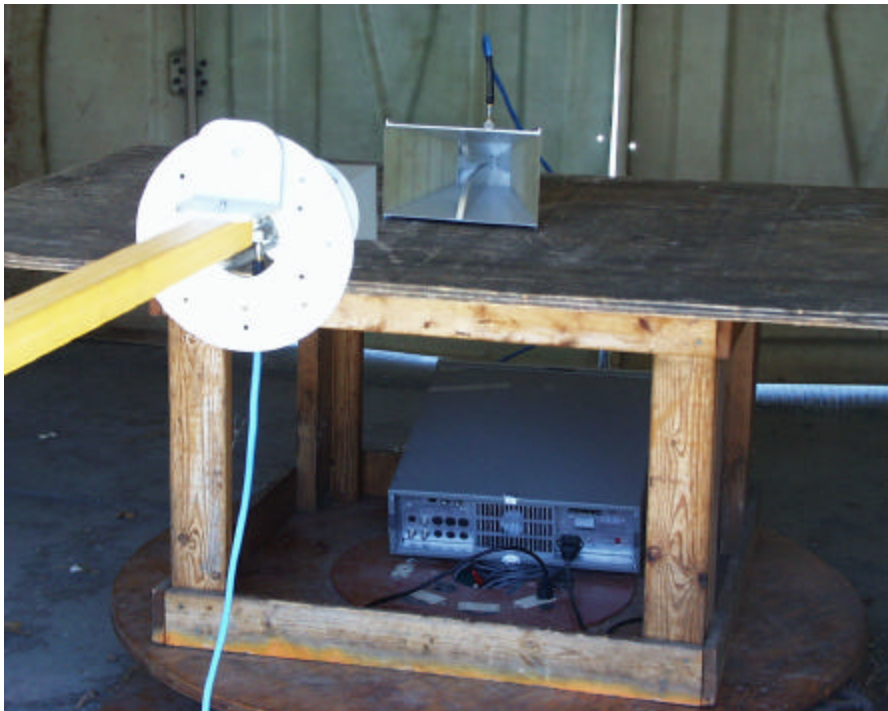
**Above 1GHz Radiated Emission Setup**



**Above 18 GHz Radiated Emission Setup**



**1 – 18 GHz Substitution Method Setup**



**Above 18 GHz Substitution Method Setup**



**TEST PROCEDURE (PART 22 and 24)**

- 1). On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.
- 2). The test antenna shall be oriented initially for vertical polarization located 1m from the EUT to correspond to the frequency of the transmitter.
- 3). The output of the test antenna shall be connected to the measuring receiver and either a peak or average detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
- 4). The transmitter shall be switched on, if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
- 5). The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- 6). The transmitter shall than be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- 7). The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- 8). The maximum signal level detected by the measuring receiver shall be noted.
- 9). The transmitter shall be replaced by a substitution antenna.
- 10). The substitution antenna shall be oriented for vertical polarization.
- 11). The substitution antenna shall be connected to a calibrated signal generator.
- 12). If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- 13). The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
- 14). The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
- 15). The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
- 16). The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.
- 17). The measure of the effective radiated power is the larger of the two levels recorded, at the input to the substitution antenna, corrected for the gain of the substitution antenna if necessary.

**RESULT**

No non-compliance noted.

### 10.2.1. Radiated emissions 22.917(e)

#### Compliance Certification Services

Radiated Emissions  
 22.917(e)

5/23/02  
 B-Site (1 meter)  
 Kerwin Corpuz

Sierra Wireless, Inc.  
 800MHz/1900MHz Dual Band CDMA PC Card (M/N: AC555)

**fo = 824.04 MHz (LOW)**

frequency (MHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
1648.08V	63.4	-50.4	1.1	8.2	6.05	-45.45	-13	-32.45
1648.08H	59.4	-54.4	1.1	8.2	6.05	-49.45	-13	-36.45
2472.12V	58.7	-56.1	1.3	9	6.85	-50.55	-13	-37.55
2472.12H	55.1	-59.5	1.3	9	6.85	-53.95	-13	-40.95
3296.16V	58.9	-54.3	1.5	8.9	6.75	-49.05	-13	-36.05
3296.16H	51.4	-61.5	1.5	8.9	6.75	-56.25	-13	-43.25
4120.2*	43.9	-77	1.7	10.1	7.95	-70.75	-13	-57.75
4944.24*	44.5	-77	1.9	9.9	7.75	-71.15	-13	-58.15
5768.28*	45.8	-77	2.1	10.6	8.45	-70.65	-13	-57.65
6592.32*	47.4	-74	2.3	10.5	8.35	-67.95	-13	-54.95
7416.36*	47.6	-74	2.4	10.4	8.25	-68.15	-13	-55.15
8240.4*	47.2	-74	2.6	10.5	8.35	-68.25	-13	-55.25

**fo = 836.52 MHz (MID)**

frequency (MHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
1673.04V	69.7	-45.2	1.1	8.2	6.05	-40.25	-13	-27.25
1673.04H	64.5	-50.4	1.1	8.2	6.05	-45.45	-13	-32.45
2509.56V	56.3	-59.3	1.3	9	6.85	-53.75	-13	-40.75
2509.56H	50	-65.6	1.3	9	6.85	-60.05	-13	-47.05
3346.08V	54	-60	1.5	8.9	6.75	-54.75	-13	-41.75
3346.08H	50.2	-63.9	1.5	8.9	6.75	-58.65	-13	-45.65
4182.6*	43.9	-77	1.7	10.1	7.95	-70.75	-13	-57.75
5019.12*	44.5	-77	1.9	9.9	7.75	-71.15	-13	-58.15
5855.64*	45.8	-77	2.1	10.6	8.45	-70.65	-13	-57.65
6692.16*	47.4	-74	2.3	10.5	8.35	-67.95	-13	-54.95
7528.68*	47.6	-74	2.4	10.4	8.25	-68.15	-13	-55.15
8365.2*	47.2	-74	2.6	10.5	8.35	-68.25	-13	-55.25

**fo = 848.97 MHz (HIGH)**

frequency (MHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
1697.94V	66.4	-49.9	1.1	8.2	6.05	-44.95	-13	-31.95
1697.94H	60.3	-56	1.1	8.2	6.05	-51.05	-13	-38.05
2546.91V	57	-57.7	1.3	9	6.85	-52.15	-13	-39.15
2546.91H	54.7	-60	1.3	9	6.85	-54.45	-13	-41.45
3395.88V	54.6	-59	1.5	8.9	6.75	-53.75	-13	-40.75
3395.88H	53	-60.6	1.5	8.9	6.75	-55.35	-13	-42.35
4244.85*	43.9	-77	1.7	10.1	7.95	-70.75	-13	-57.75
5093.82*	44.5	-77	1.9	9.9	7.75	-71.15	-13	-58.15
5942.79*	45.8	-77	2.1	10.6	8.45	-70.65	-13	-57.65
6791.76*	47.4	-74	2.3	10.5	8.35	-67.95	-13	-54.95
7640.73*	47.6	-74	2.4	10.4	8.25	-68.15	-13	-55.15
8489.7*	47.2	-74	2.6	10.5	8.35	-68.25	-13	-55.25

**NOTE: \* Measured noise floor (worse case vertical); H=horizontal and V=vertical**

**SA:** Spectrum Analyzer

**SG:** Signal Generator

**CL:** SMA cable loss (5ft)

**SPECTRUM ANALYZER SETTING**

1MHz = RESBW = VBW

**Gain (dBd) =** TX Antenna - 2.15

**ERP =** SG reading - CL + Gain (dBd)

**Margin =** ERP - Limit

## 10.2.2. Radiated emissions 24.238(a)

### Compliance Certification Services

Radiated Emissions  
 24.238(a)

5/23/02  
 B-Site (1meter)  
 Kerwin Corpuz

Sierra Wireless, Inc.  
 800MHz/1900MHz Dual Band CDMA PC Card (M/N: AC555)

#### fo = 1850 MHz (LOW)

frequency (MHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
3700V	60.9	-51.8	1.35	9	-44.15	-13	-31.15
3700H	56.8	-55.9	1.35	9	-48.25	-13	-35.25
5550V	48	-64	1.65	10.2	-55.45	-13	-42.45
5550H	46.1	-66	1.65	10.2	-57.45	-13	-44.45
7400*	47.7	-74	1.9	10.3	-65.6	-13	-52.6
9250*	48.2	-74	2.2	10.2	-66	-13	-53
11100*	48	-67	2.4	11.7	-57.7	-13	-44.7
12950*	50	-67	2.7	11.9	-57.8	-13	-44.8
14800*	52	-67	3	15.1	-54.9	-13	-41.9
16650*	51.8	-60	3.3	10	-53.3	-13	-40.3
18500*	54.1	-60	3.55	23.9	-39.65	-13	-26.65

#### fo = 1880 MHz (MID)

frequency (MHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
3760V	54.6	-56.1	1.35	9	-48.45	-13	-35.45
3760H	51.1	-59.5	1.35	9	-51.85	-13	-38.85
5640V	47	-66	1.65	10.2	-57.45	-13	-44.45
5640H	46	-67	1.65	10.2	-58.45	-13	-45.45
7520*	47.7	-74	1.9	10.3	-65.6	-13	-52.6
9400*	48.2	-74	2.2	10.2	-66	-13	-53
11280*	48	-67	2.4	11.7	-57.7	-13	-44.7
13160*	50	-67	2.7	11.9	-57.8	-13	-44.8
15040*	52	-67	3	15.1	-54.9	-13	-41.9
16920*	51.8	-60	3.3	10	-53.3	-13	-40.3
18800*	54.1	-60	3.55	23.9	-39.65	-13	-26.65

**fo = 1909.95 MHz (HIGH)**

frequency (MHz)	SA reading (dBUV)	SG reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)
3819.9V	58.2	-55.3	1.35	9	-47.65	-13	-34.65
3819.9H	53.1	-60.4	1.35	9	-52.75	-13	-39.75
5729.85V	46.9	-64.3	1.65	10.2	-55.75	-13	-42.75
5729.85H	46	-65.3	1.65	10.2	-56.75	-13	-43.75
7639.8*	47.7	-74	1.9	10.3	-65.6	-13	-52.6
9549.75*	48.2	-74	2.2	10.2	-66	-13	-53
11459.7*	48	-67	2.4	11.7	-57.7	-13	-44.7
13369.65*	50	-67	2.7	11.9	-57.8	-13	-44.8
15279.6*	52	-67	3	15.1	-54.9	-13	-41.9
17189.55*	51.8	-60	3.3	10	-53.3	-13	-40.3
19099.5*	54.1	-60	3.55	23.9	-39.65	-13	-26.65

**NOTE: \* Measured noise floor (worse case vertical); H=horizontal and V=vertical**

**SA:** Spectrum Analyzer

**SG:** Signal Generator

**CL:** Cable Loss (5ft) SMA type

**SPECTRUM ANALYZER SETTING**

1 MHz = RESBW = VBW

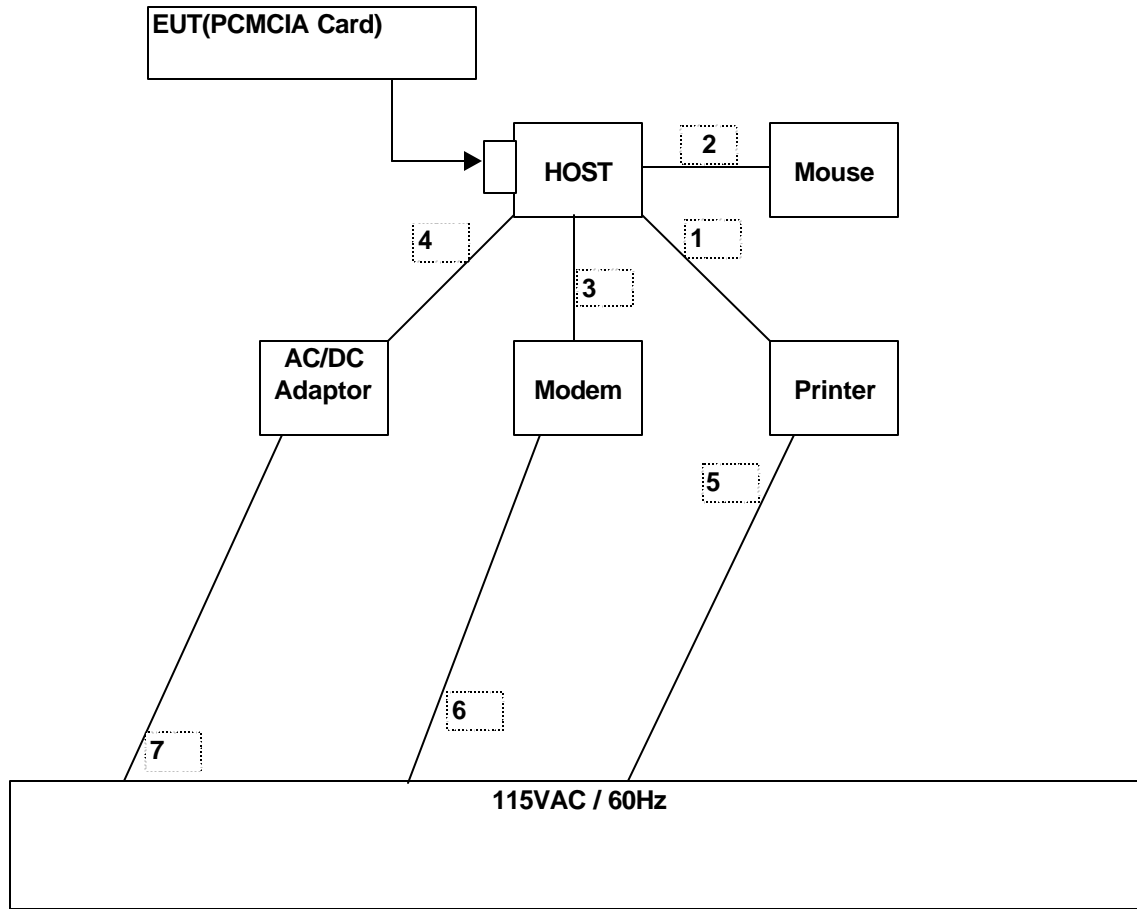
**EIRP =** SG reading - CL + Gain (dBi)

**Margin =** EIRP - Limit

### 10.3. FCC PART 15 SUBPART B TESTING

#### 10.3.1. Radiated emissions 15.109

##### TEST SETUP



TEST I / O CABLES								
Cable No	I/O Port	# of I/O Port	Connector Type	Type of Cable	Cable Length	Data Traffic	Bundled	Remark
1	Parallel	1	DB25	Shielded	2m	No	Yes	N/A
2	Mouse	1	PS/2	Drain-Wire	1.8m	Yes	No	N/A
3	Serial	1	RS232	Shielded	1m	No	No	N/A
4	DC	1	DC port	Un-Shielded	1.5m	No	Yes	Bundled during LC test only
5	AC	1	USA	Un-Shielded	1.8m	No	No	N/A
6	AC/DC	1	USA	Un-Shielded	2m	No	No	N/A
7	AC	1	USA	Un-Shielded	1.0m	No	No	N/A

TEST PERIPHERALS				
Device Type	Manufacturer	Model Number	Serial Number	FCC ID
HOST	IBM	TYPE 2609-62U	BA-C8274	DoC
AC/DC Adaptor	IBM	P/N:02K6557	J16AW8770NB	N/A
Mouse	LOGITECH	M-S34	LZC93203079	DZL211029
Modem	HAYES	07-00038	A30200153492	BFJ9D907-00038
Printer	JCM Gold	GP965	20001149	DoC



15.109 front setup



**15.109 back setup**

#### **PART 15.109 RADIATED EMISSION TEST PROCEDURE**

The EUT was placed on a wooden table 80 cm above the ground screen and all other support equipment were placed on the flush mounted turntable. Antenna to EUT distance was at 3 meter, measured E-Field with the range of 30M – 1GHz and a distance of 1 meter, measured 1GHz and above frequency. During the test, the table is rotated 360 degrees to maximize emissions and the antenna is positioned from 1 to 4 meters above the ground screen to further maximize emissions. The antenna is polarized in both vertical and horizontal positions.

EUT test configuration is according to Section 8 of ANSI C63.4/1992.


Monitor the frequency range of interest at a fixed antenna height and EUT azimuth. Frequency span should be small enough to easily differentiate between broadcast stations and intermittent ambient. Rotate EUT 360 degrees to maximize emissions received from EUT. If emission increases by more than 1 dB, or if another emission appears that is greater by 1 dB, return to azimuth where maximum occurred and perform additional cable manipulation to further maximize received emission.

Move antenna up and down to further maximize suspected highest amplitude signal. If emission increased by 1 dB or more, or if another emission appears that is greater by 1dB or more, return to antenna height where maximum signal was observed and manipulate cables to produce highest emissions, noting frequency and amplitude.

#### **RESULT**

No non-compliance noted.



		<b>Project #:</b> <u>02U1327-1</u> <b>Report #:</b> <u>020520B2</u> <b>Date &amp; Time:</b> <u>05/20/02 3:57 PM</u> <b>Test Engr:</b> <u>KERWIN CORPUZ</u>									
FCC, VCCI, CISPR, CE, AUSTEL, NZ UL, CSA, TUV, BSMI, DHHS, NVLAP 561F MONTEREY ROAD, SAN JOSE, CA 95037-9001 PHONE: (408) 463-0885 FAX: (408) 463-0888											
<b>Company:</b> <u>SIERRA WIRELESS, INC.</u> <b>EUT Description:</b> <u>800MHz/1900MHz DUAL BAND CDMA PC CARD(M/N:AC555)</u> <b>Test Configuration:</b> <u>EUT/LAPTOP/MOUSE/PRINTER/MODEM</u> <b>Type of Test:</b> <u>FCC CLASS B</u> <b>Mode of Operation:</b> <u>Rx</u>											
		<div style="border: 1px solid black; padding: 2px; display: inline-block;">                 &lt;&lt; Main Sheet             </div>									
Freq. (MHz)	Reading (dBuV)	AF (dB)	Class (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
232.34	60.40	10.95	3.24	28.99	45.59	46.00	-0.41	3mH	180.00	1.00	QP
280.63	56.50	12.65	3.63	28.86	43.91	46.00	-2.09	3mH	90.00	1.00	P
431.44	50.70	16.31	4.77	29.47	42.31	46.00	-3.69	3mH	180.00	1.00	P
280.62	52.60	12.65	3.62	28.86	40.01	46.00	-5.99	3mV	180.00	1.00	P
398.31	48.00	15.80	4.55	29.33	39.02	46.00	-6.98	3mH	180.00	1.00	P
165.91	53.30	9.74	2.71	29.32	36.43	43.50	-7.07	3mV	225.00	1.00	P
6 Worst Data											

**10.3.2. Conducted emissions 15.107**

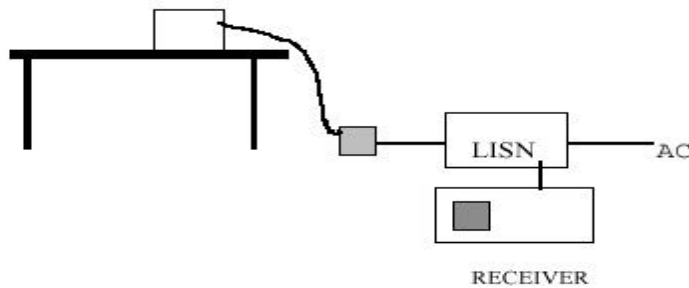
**INSTRUMENTS LIST**

EQUIPMENT	MANUFACTURE	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Receiver	R&S	ESHS 20	827129/006	4/17/03
LISN	Fischer	FCC-LISN-50/250-25-2	114	8/8/02
LISN	Solar	8012-50-R-24-BNC	837990	8/8/02

Detector Function Setting of Test Receiver

Frequency Range(MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
0.45 - 30	<input checked="" type="checkbox"/> Peak <input type="checkbox"/> Quasi-Peak	<input checked="" type="checkbox"/> 10 kHz	<input checked="" type="checkbox"/> 10 kHz

**TEST SETUP**





**15.107 front setup**



**15.107 back setup**

**15.107 CONDUCTED EMISSION TEST PROCEDURE**

The EUT was setup and located so that the distance between the boundary of the EUT and the closest surface to the LISN was 0.8m or more.

EUT test configuration was according to Section 7 of ANSI C63.4/1992.

Conducted disturbance was measured between the phase lead and the ground, and between the neutral lead and the ground. The frequency 0.450 - 30 MHz was investigated.

The EMI receiver was set to PEAK detector setting, and swept continuously over the frequency range to be investigated. The resolution bandwidth was set to 9kHz minimum. The EMI receiver input cable was connected to LINE 1 RF measurement connection on the LISN. A 50ohm terminator was connected to the unused RF port on the LISN. For each mode of EUT operation, emissions readings were maximized by manipulating cable and wire positions. The configuration for each EUT power cord that produced emissions closest to the limit was recorded. The same procedure was repeated for LINE 2 of each EUT power cord.

**RESULT**

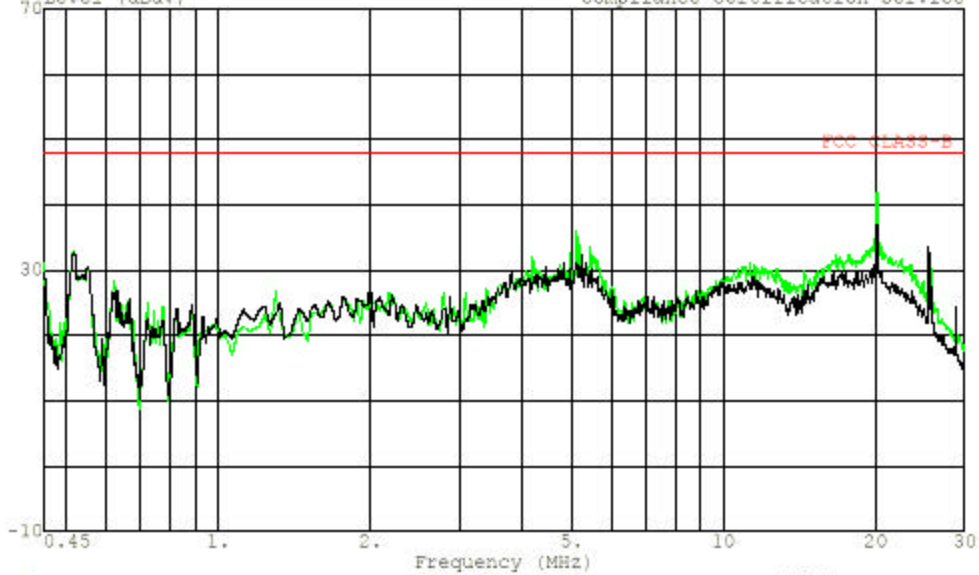
CONDUCTED EMISSIONS DATA for model AC555 (115VAC 60Hz)										
Freq. (MHz)	Reading			Class (dB)	Limit QP	FCC B		Margin		Remark L1 / L2
	PK (dBuV)	QP (dBuV)	AV (dBuV)			AV	QP (dB)	AV (dB)		
0.52	32.90	--	--	0.00	48.00	--	-15.10	--	L1	
5.12	36.11	--	--	0.00	48.00	--	-11.89	--	L1	
20.05	41.61	--	--	0.00	48.00	--	-6.39	--	L1	
0.52	32.74	--	--	0.00	48.00	--	-15.26	--	L2	
20.13	36.98	--	--	0.00	48.00	--	-11.02	--	L2	
25.47	33.51	--	--	0.00	48.00	--	-14.49	--	L2	
6 Worst Data										

No non-compliance noted.



561F Monterey Road,  
San Jose, CA 95037 USA  
Tel: (408) 463-0885  
Fax: (408) 463-0888

Data#: 7 File#: LC1327.EMI Date: 05-21-2002 Time: 11:05:40  
Level (dBuV) Compliance Certification Service



Trace: 3 Ref Trace:  
Project # : 02U1327-1  
Test Engineer: Kerwin Corpuz  
Company : Sierra Wireless, Inc.  
EUT : 800MHz/1900MHz Dual Band CDMA PC Card  
Model: AC555  
Test Config : EUT/Laptop/Mouse/Printer/Modem  
Type of Test : FCC Class B  
Mode of Op. : Rx Mode  
PEAK: L1|green|, L2|black|  
: 115Vac, 60Hz

**END OF REPORT**