RADIATED EMISSIONS PORTIONS OF
FCC CFR47 PART 22 SUBPART H
FCC CFR47 PART 24 SUBPART E
INDUSTRY CANADA RSS-132 ISSUE 2
INDUSTRY CANADA RSS-133 ISSUE 5

CERTIFICATION TEST REPORT

FOR

EXPRESSCARD WIRELESS MODEM

MODEL NUMBER: AirCard 504

FCC ID: N7NAC500
IC: 2417C-AC500

REPORT NUMBER: 09U12860-1

ISSUE DATE: NOVEMBER 13, 2009

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

Prepared by
COMPLIANCE CERTIFICATION SERVICES
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
---	11/13/09	Initial Issue	T. Chan

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1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: ExpressCard Wireless Modem

MODEL: AirCard 504

SERIAL NUMBER: F9E2619006E2-OC

DATE TESTED: NOVEMBER 05-08, 2009

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
Radiated emissions portions of CFR 47 Part 22 Subpart H	Pass
Radiated emissions portions of CFR 47 Part 24 Subpart E	Pass
Radiated emissions portions of INDUSTRY CANADA RSS-132 Issue 2	Pass
Radiated emissions portions of INDUSTRY CANADA RSS-133 Issue 5	Pass

Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For CCS By:

THU CHAN
EMC MANAGER
COMPLIANCE CERTIFICATION SERVICES

Tested By:

CHIN PANG
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-C, FCC CFR 47 Part 2, FCC CFR 47 Part 22, FCC CFR Part 24, RSS-132 Issue 2, and RSS-133 Issue 5.

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.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a multi-band wireless modem operating on the GSM/GPRS/EDGE/UMTS network. In the US and Canada, only cellular and PCS bands are used for EDGE/GPRS/UMTS operation, so this test report only contains data for these two bands (850MHz and 1900MHz).

5.2. SOFTWARE AND FIRMWARE

PROCEDURE USED TO ESTABLISH TEST SIGNAL

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

GPRS/EGPRS Mode

- Call Setup > Shift & Preset
- Active Cell > Active Cell (GSM/GPRS/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 > 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 (GPRS), MCS9 (EGPRS)

- Press “Start Data Connection”

WCDMA UMTS mode

Instrument information: (by press SYSTEM CONFIG)

Application:	WCDMA Lap App C
	E6703C C.03.11
Format:	WCDMA

Call Control: (by press CALL SETUP)

2 of 4 Cell Parameters:	PS Domain Information > Present
	ATT (IMSI Attach) Flag State > Set
4 of 4 Security Info:	Security Parameter - System Operations > None

Call Parms: (by press CALL SETUP)
1 of 3

Channel Type:	12.2k RMC
Paging Service:	RB Test Mode

HSDPA Parameters:
1 of 2
HSDPA RB Test Mode Setup
FRC Type > H-Set 5 QPSK
CN Domain > PS Domain
Uplink 64k DTCH for HSDPA Loopback State > On
HS-DSCH Data Pattern > CCITT PRBS15
RLC Header on HS-DSCH > Present

Channel (UARFCN) Parms:	DL Channel: 4357 / 4407 / 4458
	UL Channel: 4132 / 4182 / 4233
	UL Sep (Band) > 400MHz (Band 4)
	Freq Bnad Ind > On

2 of 3

DL DTCH Data:	ALL ONES
RLC Reestablish:	Off
Call Limit State:	Off
Call Drop Timer:	Off
SRB Config.:	13.6k DCCH

3 of 3

UE Target Power:	25 dBm
UL CL Pwr Ctrl Parms:	Active bits (Select “All Up bits” after linked to get maximum power)
DL Channel:	9662 / 9800 / 9938 / 4357 / 4407 / 4458
UL Channel:	9262 / 9400 / 9538 / 4132 / 4182 / 4233

5.3. WORST-CASE CONFIGURATION AND MODE

The worst-position was the EUT with highest emissions. To determine the worst-case, the EUT was investigated on antenna at X, Y and Z-Positions, and the worst position is antenna at Y position for both Cell and PCS bands.

5.4. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	Lenovo	T60 IBM ThinkPad	ZZBC354	DoC
AC Adapter	Lenovo	PA-1650-171	11S92P1160Z1ZAW65C90MH	DoC

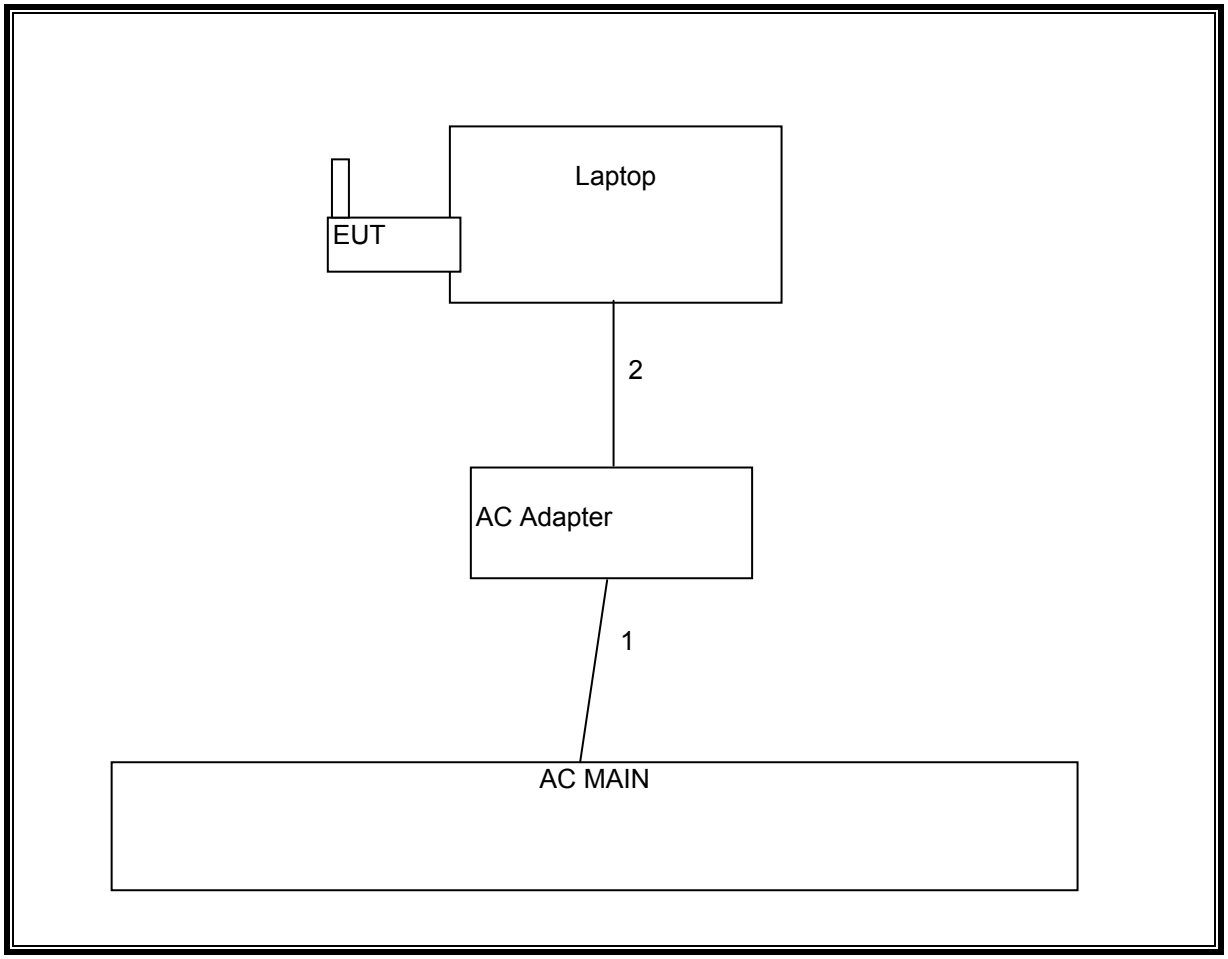
I/O CABLES

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	No
2	DC	1	DC	Un-shielded	2m	No

TEST SETUP

The EUT directly plugged into the laptop during the tests. The Wireless Communication test set exercised the EUT.

RADIATED TEST SETUP DIAGRAM



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, 26.5 GHz	Agilent / HP	E4440A	C01178	08/31/10
Antenna, Horn, 18 GHz	EMCO	3115	C00783	01/29/10
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	05/06/11
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	02/04/10
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	01/14/10
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00778	12/16/10
Wireless Communications Test Set	Agilent / HP	E5515C	NA	09/28/10
LISN, 30 MHz	FCC	LISN-50/250-25-2	2023	11/06/10
EMI Test Receiver, 30 MHz	R & S	ESHS 20	827129/006	08/06/10
Signal Generator 1024 MHz	R & S	SMY01	DE 12311	05/28/10
Dipole	EMCO	3121C-DB2	22435	06/17/10
2.7GHz HPF	MicroTronic	HPM13194	2	CNR
1.5GHz HPF	MicroTronic	HPM13195	1	CNR

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) & RSS133 § 6.4 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.
RSS-132 § 4.4 The maximum ERP shall be 6.3 Watts for mobile stations.

TEST PROCEDURE

RSS-132, RSS-133, & ANSI / TIA / EIA 603C Clause 2.2.17

RESULTS

850 MHz GPRS Mode

Channel	Frequency (MHz)	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low	824.2	29.90	977.24
Middle	836.6	31.00	1258.93
High	848.8	30.30	1071.52

850 MHz EGPRS Mode

Channel	Frequency (MHz)	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low	824.2	29.80	954.99
Middle	836.6	30.20	1047.13
High	848.8	29.30	851.14

850 MHz WCDMA Modulation

Channel	Frequency (MHz)	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low	826.4	24.50	281.84
Middle	836.4	24.60	288.40
High	846.6	24.50	281.84

1900 MHz GPRS Mode

Channel	Frequency (MHz)	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low	1850.2	27.30	537.03
Middle	1880.0	26.70	467.74
High	1909.8	26.60	457.09

1900 MHz EGPRS Mode

Channel	Frequency (MHz)	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low	1850.2	27.00	501.19
Middle	1880.0	26.70	467.74
High	1909.8	27.00	501.19

1900 MHz WCDMA Modulation

Channel	Frequency (MHz)	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low	1852.4	24.20	263.03
Middle	1880.0	25.60	363.08
High	1907.6	24.40	275.42

CELL BAND GPRS OUTPUT POWER (ERP)

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: Sierra Wireless
Project #: 09U12860
Date: 11/4/2009
Test Engineer: Chin Pang
Configuration:EUT/Laptop
Mode:TX, GPRS850

Test Equipment:
Receiving: Sunol T130, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 6ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch							
824.20	-7.0	V	32.6	25.6	38.5	-12.9	
824.20	-0.4	H	30.4	29.9	38.5	-8.5	
Mid Ch							
836.60	-6.8	V	32.7	25.9	38.5	-12.6	
836.60	0.3	H	30.7	31.0	38.5	-7.4	
High Ch							
848.80	-6.8	V	32.0	25.2	38.5	-13.3	
848.80	-0.5	H	30.8	30.3	38.5	-8.2	

Rev. 1.24.7

CELL BAND EGPRS OUTPUT POWER (ERP)

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: Sierra Wireless
Project #: 09U12860
Date: 11/4/2009
Test Engineer: Chin Pang
Configuration:EUT/Laptop
Mode:TX, EGPRS850

Test Equipment:
Receiving: Sunol T130, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 6ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch							
824.20	-3.7	V	32.6	28.9	38.5	-9.6	
824.20	-0.6	H	30.4	29.8	38.5	-8.7	
Mid Ch							
836.60	-4.0	V	32.7	28.7	38.5	-9.8	
836.60	-0.5	H	30.7	30.2	38.5	-8.2	
High Ch							
848.80	-3.8	V	32.0	28.2	38.5	-10.2	
848.80	-1.5	H	30.8	29.3	38.5	-9.2	

Rev. 1.24.7

CELL BAND WCDMA OUTPUT POWER (ERP)

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: Sierra Wireless
Project #: 09U12860
Date: 11/5/2009
Test Engineer: Chin Pang
Configuration:EUT/Laptop
Mode:TX, WCDMA850

Test Equipment:
Receiving: Sunol T130, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 6ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch							
826.40	-8.3	V	32.6	24.3	38.5	-14.2	
826.40	-5.9	H	30.4	24.5	38.5	-14.0	
Mid Ch							
836.40	-8.5	V	32.7	24.2	38.5	-14.3	
836.40	-6.1	H	30.7	24.6	38.5	-13.8	
High Ch							
846.60	-9.1	V	32.0	22.9	38.5	-15.6	
846.60	-6.3	H	30.8	24.5	38.5	-14.0	

Rev. 1.24.7

PCS BAND GPRS OUTPUT POWER (EIRP)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company:Sierra Wireless
Project #:09U12860
Date: 11/4/2009
Test Engineer: Chin Pang
Configuration:EUT/Laptop
Mode:TX, GPRS1900

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T72 Substitution, 6ft SMA Cable (208947003) Warehouse

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch							
1.850	-12.9	V	40.2	27.3	33.0	-5.7	
1.850	-15.3	H	39.5	24.2	33.0	-8.8	
Mid Ch							
1.880	-13.5	V	40.3	26.7	33.0	-6.3	
1.880	-15.4	H	40.1	24.7	33.0	-8.3	
High Ch							
1.910	-13.7	V	40.2	26.5	33.0	-6.5	
1.910	-13.5	H	40.1	26.6	33.0	-6.4	

Rev. 1.24.7

PCS BAND EGPRS OUTPUT POWER (EIRP)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company:Sierra Wireless
Project #:09U12860
Date: 11/4/2009
Test Engineer: Chin Pang
Configuration:EUT/Laptop
Mode:TX, EGPRS1900

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T72 Substitution, 6ft SMA Cable (208947003) Warehouse

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch							
1.850	-13.2	V	40.2	27.0	33.0	-6.0	
1.850	-15.2	H	39.5	24.3	33.0	-8.7	
Mid Ch							
1.880	-13.6	V	40.3	26.7	33.0	-6.4	
1.880	-14.0	H	40.1	26.1	33.0	-6.9	
High Ch							
1.910	-13.8	V	40.2	26.4	33.0	-6.6	
1.910	-13.1	H	40.1	27.0	33.0	-6.0	

Rev. 1.24.7

PCS BAND WCDMA OUTPUT POWER (EIRP)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company:Sierra Wireless
Project #:09U12860
Date: 11/5/2009
Test Engineer: Chin Pang
Configuration:EUT/Laptop
Mode:TX, WCDMA 1900

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T72 Substitution, 6ft SMA Cable (208947003) Warehouse

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch							
1.852	-16.0	V	40.2	24.2	33.0	-8.8	
1.852	-19.6	H	39.5	19.9	33.0	-13.1	
Mid Ch							
1.880	-14.7	V	40.3	25.6	33.0	-7.5	
1.880	-20.0	H	40.1	20.1	33.0	-12.9	
High Ch							
1.908	-15.8	V	40.2	24.4	33.0	-8.6	
1.908	-19.0	H	40.1	21.1	33.0	-11.9	

Rev. 1.24.7

7.2. FIELD STRENGTH OF SPURIOUS EMISSION

LIMIT

§22.917 (e), §24.238 (a), RSS-132 § 4.5, & RSS-133 § 6.5 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

RSS-132, RSS-133, & ANSI / TIA / EIA 603C Clause 2.2.12

RESULTS

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

CELL BAND GPRS SPURIOUS & HARMONIC (ERP)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:Sierra Wireless
Project #:09U12860
Date:11/5/2009
Test Engineer:Chin Pang
Configuration:EUT/Laptop
Mode:TX, GPRS850

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	Part 22

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.2MHz										
1.648	-43.0	V	3.0	36.8	35.5	1.0	-40.8	-13.0	-27.8	
2.473	-54.0	V	3.0	41.7	35.4	1.0	-46.7	-13.0	-33.7	
1.648	-46.2	H	3.0	37.2	35.5	1.0	-43.5	-13.0	-30.5	
2.473	-53.4	H	3.0	39.8	35.4	1.0	-48.0	-13.0	-35.0	
Mid Ch,836.6MHz										
1.673	-52.8	V	3.0	37.1	35.5	1.0	-50.2	-13.0	-37.2	
2.510	-54.0	V	3.0	41.8	35.4	1.0	-46.6	-13.0	-33.6	
1.673	-52.0	H	3.0	37.5	35.5	1.0	-49.1	-13.0	-36.1	
2.510	-52.3	H	3.0	39.9	35.4	1.0	-46.8	-13.0	-33.8	
High Ch, 848.8MHz										
1.698	-50.7	V	3.0	37.4	35.5	1.0	-47.8	-13.0	-34.8	
2.546	-53.8	V	3.0	42.0	35.4	1.0	-46.3	-13.0	-33.3	
1.698	-52.1	H	3.0	37.7	35.5	1.0	-48.9	-13.0	-35.9	
2.546	-53.6	H	3.0	40.1	35.4	1.0	-47.9	-13.0	-34.9	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

CELL BAND EGPRS SPURIOUS & HARMONIC (ERP)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:Sierra Wireless
Project #:09U12860
Date:11/5/2009
Test Engineer:Chin Pang
Configuration:EUT/Laptop
Mode:TX, EGPRS850

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	Part 22

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.2MHz										
1.648	-45.2	V	3.0	36.8	35.5	1.0	-43.0	-13.0	-30.0	
2.473	-55.4	V	3.0	41.7	35.4	1.0	-48.1	-13.0	-35.1	
1.648	-46.5	H	3.0	37.2	35.5	1.0	-43.8	-13.0	-30.8	
2.473	-56.2	H	3.0	39.8	35.4	1.0	-50.8	-13.0	-37.8	
Mid Ch,836.6MHz										
1.673	-49.5	V	3.0	37.1	35.5	1.0	-46.9	-13.0	-33.9	
2.510	-54.0	V	3.0	41.8	35.4	1.0	-46.6	-13.0	-33.6	
1.673	-52.0	H	3.0	37.5	35.5	1.0	-49.1	-13.0	-36.1	
2.510	-52.3	H	3.0	39.9	35.4	1.0	-46.8	-13.0	-33.8	
High Ch, 848.8MHz										
1.698	-52.1	V	3.0	37.4	35.5	1.0	-49.2	-13.0	-36.2	
2.546	-55.2	V	3.0	42.0	35.4	1.0	-47.7	-13.0	-34.7	
1.698	-53.4	H	3.0	37.7	35.5	1.0	-50.2	-13.0	-37.2	
2.546	-55.6	H	3.0	40.1	35.4	1.0	-49.9	-13.0	-36.9	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

CELL BAND WCDMA SPURIOUS & HARMONIC (ERP)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:Sierra Wireless
Project #:09U12860
Date:11/6/2009
Test Engineer:Chin Pang
Configuration:EUT/Laptop
Mode:TX, WCDMA850

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	Part 22

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.4MHz										
1.653	-56.0	V	3.0	36.8	35.5	1.0	-53.7	-13.0	-40.7	
2.479	-64.0	V	3.0	41.7	35.4	1.0	-56.7	-13.0	-43.7	
1.6528	-57.2	H	3.0	37.3	35.5	1.0	-54.5	-13.0	-41.5	
2.4792	-62.6	H	3.0	39.8	35.4	1.0	-57.2	-13.0	-44.2	
Mid Ch, 836.4MHz										
1.673	-54.0	V	3.0	37.1	35.5	1.0	-51.4	-13.0	-38.4	
2.510	-62.7	V	3.0	41.8	35.4	1.0	-55.3	-13.0	-42.3	
1.673	-56.5	H	3.0	37.5	35.5	1.0	-53.6	-13.0	-40.6	
2.510	-63.4	H	3.0	39.9	35.4	1.0	-57.9	-13.0	-44.9	
High Ch, 846.6MHz										
1.693	-54.5	V	3.0	37.4	35.5	1.0	-51.6	-13.0	-38.6	
2.540	-64.6	V	3.0	41.9	35.4	1.0	-57.1	-13.0	-44.1	
1.693	-56.2	H	3.0	37.7	35.5	1.0	-53.1	-13.0	-40.1	
2.540	-64.5	H	3.0	40.1	35.4	1.0	-58.8	-13.0	-45.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

PCS BAND GPRS SPURIOUS & HARMONIC (EIRP)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:Sierra Wireless
Project #:09U12860
Date:11/6/2009
Test Engineer:Chin Pang
Configuration:EUT/Laptop
Mode:TX, GPRS1900

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	Part 24

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz										
3.700	-60.0	V	3.0	45.1	35.4	1.0	-49.2	-13.0	-36.2	
7.401	-63.0	V	3.0	51.3	35.7	1.0	-46.4	-13.0	-33.4	
9.259	-64.2	V	3.0	53.6	35.6	1.0	-45.2	-13.0	-32.2	
3.700	-59.7	H	3.0	45.3	35.4	1.0	-48.7	-13.0	-35.7	
7.401	-61.0	H	3.0	53.0	35.7	1.0	-42.7	-13.0	-29.7	
9.259	-64.3	H	3.0	55.1	35.6	1.0	-43.8	-13.0	-30.8	
Mid Ch,1880MHz										
3.760	-60.4	V	3.0	45.3	35.3	1.0	-49.5	-13.0	-36.5	
7.520	-60.0	V	3.0	51.4	35.7	1.0	-43.3	-13.0	-30.3	
9.400	-63.0	V	3.0	53.7	35.6	1.0	-43.8	-13.0	-30.8	
3.760	-60.5	H	3.0	45.5	35.3	1.0	-49.3	-13.0	-36.3	
7.520	-65.0	H	3.0	53.1	35.7	1.0	-46.6	-13.0	-33.6	
9.400	-63.8	H	3.0	55.2	35.6	1.0	-43.1	-13.0	-30.1	
High Ch, 1909.8MHz										
3.820	-60.8	V	3.0	45.4	35.3	1.0	-49.7	-13.0	-36.7	
7.639	-62.0	V	3.0	51.6	35.7	1.0	-45.1	-13.0	-32.1	
9.549	-63.0	V	3.0	53.9	35.6	1.0	-43.6	-13.0	-30.6	
3.820	-60.6	H	3.0	45.7	35.3	1.0	-49.2	-13.0	-36.2	
7.639	-61.1	H	3.0	53.2	35.7	1.0	-42.6	-13.0	-29.6	
9.549	-63.8	H	3.0	55.4	35.6	1.0	-43.0	-13.0	-30.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

PCS BAND EGPRS SPURIOUS & HARMONIC (EIRP)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:Sierra Wireless
Project #:09U12860
Date:11/5/2009
Test Engineer:Chin Pang
Configuration:EUT/Laptop
Mode:TX, EGPRS1900

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	Part 24

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz										
3.700	-60.4	V	3.0	45.1	35.4	1.0	-49.6	-13.0	-36.6	
7.401	-61.6	V	3.0	51.3	35.7	1.0	-45.0	-13.0	-32.0	
9.259	-64.8	V	3.0	53.6	35.6	1.0	-45.8	-13.0	-32.8	
3.700	-60.8	H	3.0	45.3	35.4	1.0	-49.8	-13.0	-36.8	
7.401	-62.0	H	3.0	53.0	35.7	1.0	-43.7	-13.0	-30.7	
9.259	-65.0	H	3.0	55.1	35.6	1.0	-44.5	-13.0	-31.5	
Mid Ch,1880MHz										
3.760	-61.6	V	3.0	45.3	35.3	1.0	-50.7	-13.0	-37.7	
7.520	-61.3	V	3.0	51.4	35.7	1.0	-44.6	-13.0	-31.6	
9.400	-64.2	V	3.0	53.7	35.6	1.0	-45.0	-13.0	-32.0	
3.760	-61.5	H	3.0	45.5	35.3	1.0	-50.3	-13.0	-37.3	
7.520	-63.2	H	3.0	53.1	35.7	1.0	-44.8	-13.0	-31.8	
9.400	-64.1	H	3.0	55.2	35.6	1.0	-43.4	-13.0	-30.4	
High Ch, 1909.8MHz										
3.820	-62.0	V	3.0	45.4	35.3	1.0	-50.9	-13.0	-37.9	
7.639	-60.2	V	3.0	51.6	35.7	1.0	-43.3	-13.0	-30.3	
9.549	-64.0	V	3.0	53.9	35.6	1.0	-44.6	-13.0	-31.6	
3.820	-62.5	H	3.0	45.7	35.3	1.0	-51.1	-13.0	-38.1	
7.639	-60.8	H	3.0	53.2	35.7	1.0	-42.3	-13.0	-29.3	
9.549	-62.6	H	3.0	55.4	35.6	1.0	-41.8	-13.0	-28.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

PCS BAND WCDMA SPURIOUS & HARMONIC (EIRP)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:Sierra Wireless
Project #:09U12860
Date:11/5/2009
Test Engineer:Chin Pang
Configuration:EUT/Laptop
Mode:TX, WCDMA1900

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	Part 24

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.4MHz										
3.704	-54.1	V	3.0	45.1	35.4	1.0	-43.3	-13.0	-30.3	
5.557	-65.2	V	3.0	49.2	35.4	1.0	-50.4	-13.0	-37.4	
3.704	-54.3	H	3.0	45.3	35.4	1.0	-43.3	-13.0	-30.3	
5.557	-65.0	H	3.0	50.0	35.4	1.0	-49.4	-13.0	-36.4	
Mid Ch,1880MHz										
3.760	-57.2	V	3.0	45.3	35.3	1.0	-46.3	-13.0	-33.3	
5.640	-66.0	V	3.0	49.3	35.4	1.0	-51.1	-13.0	-38.1	
3.760	-58.5	H	3.0	45.5	35.3	1.0	-47.3	-13.0	-34.3	
5.640	-65.0	H	3.0	50.2	35.4	1.0	-49.3	-13.0	-36.3	
High Ch, 1907.6MHz										
3.815	-63.5	V	3.0	45.4	35.3	1.0	-52.4	-13.0	-39.4	
5.723	-66.2	V	3.0	49.4	35.4	1.0	-51.3	-13.0	-38.3	
3.815	-60.0	H	3.0	45.7	35.3	1.0	-48.6	-13.0	-35.6	
5.723	-66.5	H	3.0	50.3	35.4	1.0	-50.6	-13.0	-37.6	

Rev. 03.03.09

7.3. RECEIVER SPURIOUS EMISSIONS

LIMIT

RSS-Gen § 6a

Spurious Emission Limits for Receivers:

Spurious Frequency (MHz)	Field Strength (microvolts/m at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960	500

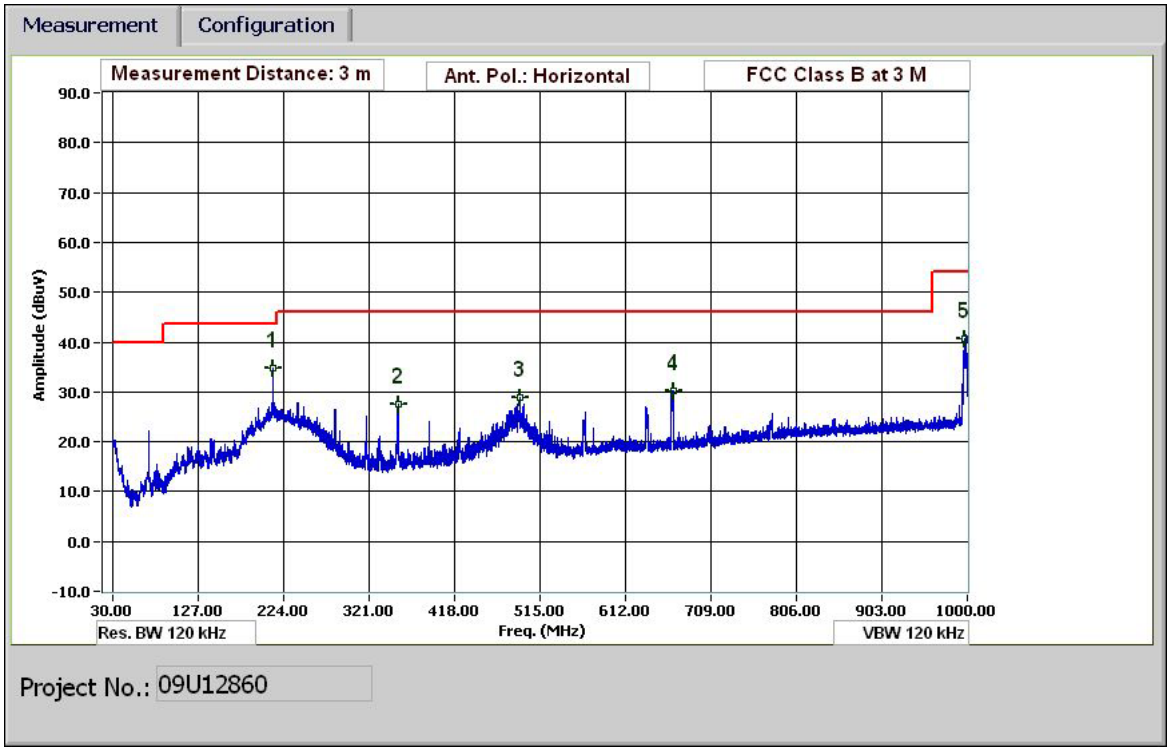
TEST PROCEDURE

The search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (local oscillator frequency, intermediate frequency or carrier frequency), or 30 MHz, whichever is the higher, to at least 3 times the highest tunable and local oscillator frequencies.

RESULTS

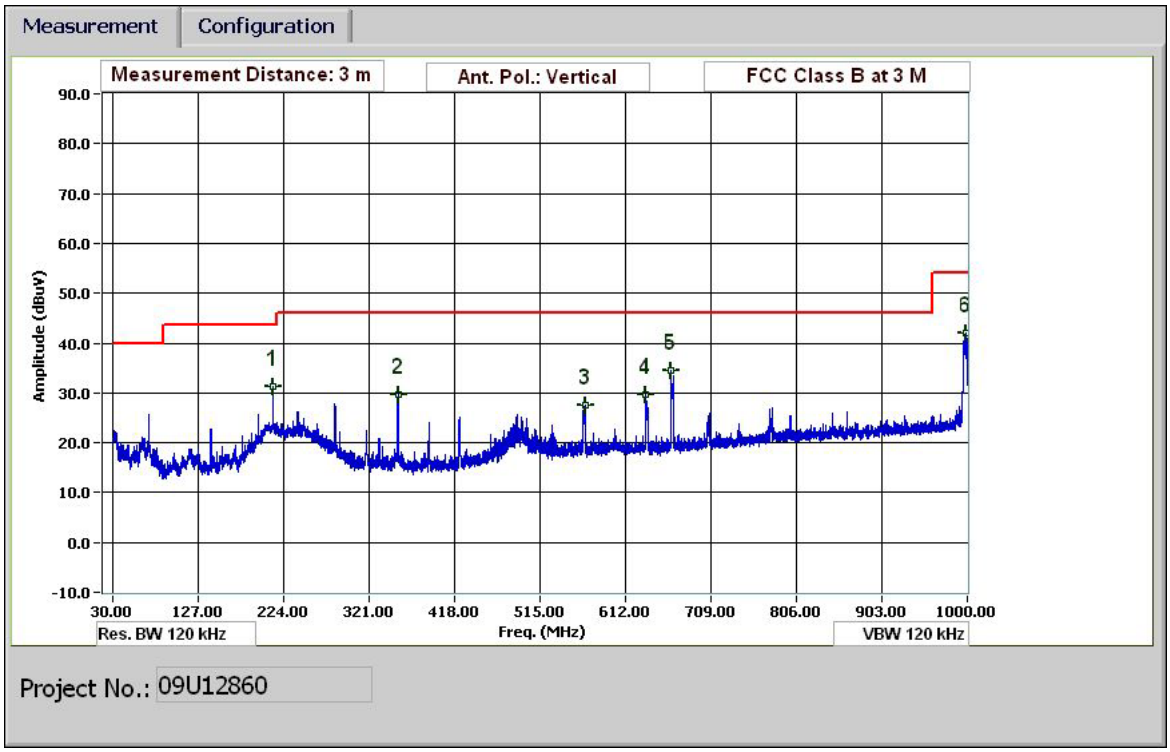
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

VERTICAL PLOT



SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)

HORIZONTAL AND VERTICAL DATA

30-1000MHz Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Chin Pang
Date: 11/06/09
Project #: 09U12860
Company: Sierra Wireless
EUT Description: EUT with Laptop
EUT M/N: AirCard 504
Test Target: FCC Class B
Mode Oper: Normal

f	Measurement Frequency	Amp	Preamp Gain
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters
Read	Analyzer Reading	Filter	Filter Insert Loss
AF	Antenna Factor	Corr.	Calculated Field Strength
CL	Cable Loss	Limit	Field Strength Limit

Margin Margin vs. Limit

f MHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filter dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
vert													
212.288	3.0	46.8	12.0	1.3	28.9	0.0	0.0	31.2	43.5	-12.3	V	P	
353.893	3.0	42.7	14.2	1.8	29.1	0.0	0.0	29.6	46.0	-16.4	V	P	
566.302	3.0	37.2	17.8	2.3	29.7	0.0	0.0	27.6	46.0	-18.4	V	P	
634.945	3.0	38.2	18.6	2.5	29.6	0.0	0.0	29.7	46.0	-16.3	V	P	
663.866	3.0	42.6	18.9	2.5	29.6	0.0	0.0	34.4	46.0	-11.6	V	P	
999.160	3.0	44.6	22.6	3.2	28.4	0.0	0.0	42.0	54.0	-12.0	V	P	
211.567	3.0	50.3	12.0	1.3	28.9	0.0	0.0	34.7	43.5	-8.8	H	P	
353.893	3.0	40.6	14.2	1.8	29.1	0.0	0.0	27.5	46.0	-18.5	H	P	
492.379	3.0	39.7	16.7	2.1	29.7	0.0	0.0	28.7	46.0	-17.3	H	P	
665.906	3.0	38.4	18.9	2.5	29.6	0.0	0.0	30.2	46.0	-15.8	H	P	
996.400	3.0	43.2	22.6	3.2	28.4	0.0	0.0	40.6	54.0	-13.4	H	P	

SPURIOUS EMISSIONS ABOVE 1000 MHz

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Sierra Wireless
Project #: 09U12860
Date: 11/6/09
Test Engineer: Chin Pang
Configuration: EUT (without Extender Card) and Basic peripheral
Mode: Normal

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T59; S/N: 3245 @3m	T145 Agilent 3008A0056			FCC 15.209

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
1.063	3.0	62.0	40.8	24.2	2.4	-36.1	0.0	0.0	52.5	31.3	74	54	-21.5	-22.7	V
1.330	3.0	57.8	40.0	25.2	2.7	-35.9	0.0	0.0	49.8	32.0	74	54	-24.2	-22.0	V
1.065	3.0	55.0	35.8	24.2	2.4	-36.1	0.0	0.0	45.5	26.3	74	54	-28.5	-27.7	H
1.327	3.0	53.6	37.0	25.1	2.7	-35.9	0.0	0.0	45.6	29.0	74	54	-28.4	-25.0	H

Rev. 11.10.08
Note: No other emissions were detected above the system noise floor.

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

7.4. POWER LINE CONDUCTED EMISSION

LIMIT

RSS-Gen 7.2.2

Except when the requirements applicable to a given device state otherwise, for any licence-exempt radio communication device equipped to operate from the public utility AC power supply, either directly or indirectly, the radio frequency voltage that is conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in Table 2. The tighter limit applies at the frequency range boundaries.

Table 2 – AC Power Lines Conducted Emission Limits

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

RESULTS

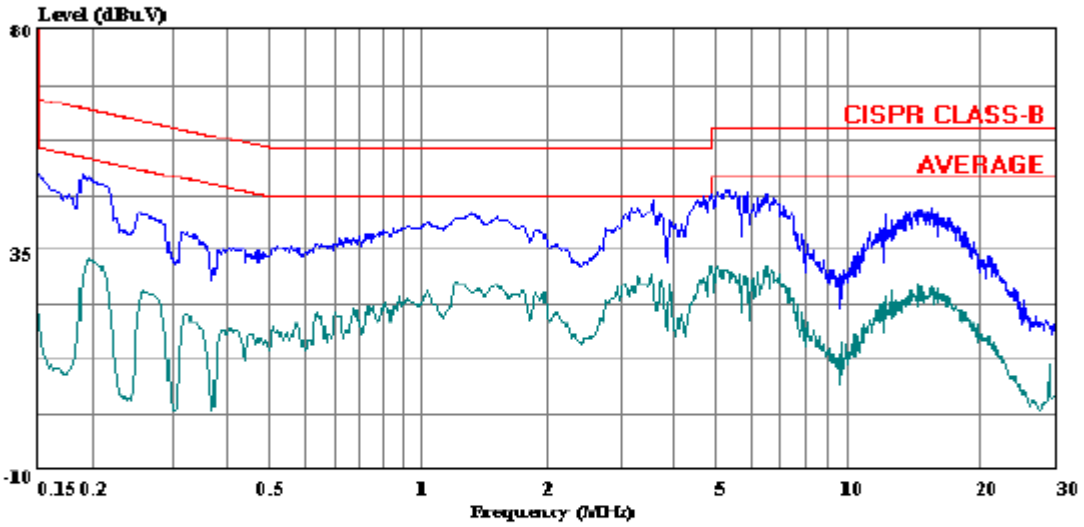
6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	**Reading**			**Closs**	**Limit**	**EN_B**	**Margin**		**Remark**
(MHz)	**PK (dBuV)**	**QP (dBuV)**	**AV (dBuV)**	**(dB)**	**QP**	**AV**	**QP (dB)**	**AV (dB)**	**L1 / L2**
0.19	50.29	--	32.94	0.00	64.04	54.04	-13.75	-21.10	L1
3.64	45.30	--	30.11	0.00	56.00	46.00	-10.70	-15.89	L1
6.81	46.58	--	30.73	0.00	60.00	50.00	-13.42	-19.27	L1
0.20	49.28	--	33.15	0.00	63.82	53.82	-14.54	-20.67	L2
3.64	44.61	--	30.54	0.00	56.00	46.00	-11.39	-15.46	L2
5.14	47.32	--	32.02	0.00	60.00	50.00	-12.68	-17.98	L2
6 Worst Data									

LINE 1 RESULTS

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 7 File#: 09u12860.EMI Date: 11-06-2009 Time: 10:00:17



(Line Conduction)

Trace: 5 Ref Trace:

Condition: CISPR CLASS-B
Test Operator: : Chin Pang
Project #: : 09U12860
Company: : Sierra Wireless
EUT Description:: ExpressCard Wireless Modem
Configuration: : EUT (without PC Card adapter) and basic
: peripheral
Mode: : Normal
Target: : FCC Class B
Voltage: : 115VAC 60Hz
: L1: Peak (Blue), Average (Green)

LINE 2 RESULTS