FCC CFR47 PART 15 SUBPART B
DECLARATION OF CONFORMITY
TEST REPORT
FOR

EVDO Mini-PCI EXPRESS CARD CDMA MODEM MODULE INSIDE THE LAPTOP

MODEL NUMBER: MC5725, MC5725V*

FCC ID: N7N-MC5725

REPORT NUMBER: 06U10171-3, REVISION B

ISSUE DATE: MAY 18, 2006

Prepared for

SIERRA WIRELESS
2290 COSMOS CT.
CARLSBAD, CA 92009, USA

Prepared by

COMPLIANCE CERTIFICATION SERVICES
561F MONTEREY ROAD
MORGAN HILL, CA 95037, USA
TEL: (408) 463-0885
FAX: (408) 463-0888

*Details of specific model(s) tested and model differences are identified in the body of report.

LAB CODE:200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	5/3/6	Initial Issue	Thu
B	5/18/6	Report results for set-up without extender card.	A. Ilarina

COMPLIANCE CERTIFICATION SERVICES DOCUMENT NO: CCSUP4031A
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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SIERRA WIRELESS
2290 COSMOS CT.
CARLSBAD, CA 92009, USA

EUT DESCRIPTION: EVDO Mini-PCI EXPRESS CARD CDMA MODEM MODULE INSIDE THE LAPTOP

MODEL: MC5725

SERIAL NUMBER: 121103

DATE TESTED: MAY 17, 2006

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART B	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:

ALVIN ILARINA
EMC SUPERVISOR
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 ANSI C63.4-2003.

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
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 Express Mini-PCI Express Wireless CDMA Modem Module tested inside the IBM ThinkPad Z61m Laptop

The module is manufactured by SierraWireless.

GENERAL INFORMATION

CHASSIS MATERIAL	METAL
ENCLOSURE MATERIAL	METAL
POWER REQUIREMENTS	100-240 VAC / 50-60 Hz
POWERLINE FILTER MANUFACTURER AND MODEL	Built-In
LIST OF ALL OSCILLATOR FREQUENCIES GREATER THAN OR EQUAL TO 9 kHz	CPU: 2.0 GHz 48 MHz, 32.765 kHz

5.2. MANUFACTURER'S DESCRIPTION OF MODEL DIFFERENCES

The EUT model MC5725 is similar to MC5725V, which is the other model number listed in this report. Below is the description of model difference:

• The RF circuitry is the same for both models as well as the RF performance.
• The PCB (Printed Circuit Board) is the same for both modules.
• The MC5725V routes two audio lines via resistor selection to the IO connecter and the MC5725 does not.

5.3. TEST CONFIGURATION

The following configuration was investigated during testing:

EUT Configuration	Description
Typical Configuration	EUT connected to monitor, Telephone Simulator, USB mouse, Headset and Microphone

5.4. MODE(s) OF OPERATION

Mode	Description
Pinging/Audio/EMCTest	Ethernet, Audio, & all I/O ports activate with H' patterns scrolling on the screen display.

5.5. SOFTWARE AND FIRMWARE

The test software used during the tests was Pinging, Audio, and EMCTest

5.6. DETAILS OF TESTED SYSTEM

SUPPORT EQUIPMENT & PERIPHERALS

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter	IBM	92P1113	ES5031C	DoC
Laptop *	IBM	Thinkpad Z61m	1S8888888XX00074	DoC
Printer	Lexmark	Z735	D64Q880869	DoC
USB Mouse	Logitech	M-BT96a	HCA55002148	DoC
Monitor	LG	L1750S-SN	512MXXQ0B570	DoC
HeadSet and Microphone	Sony	DR-220	NA	NA
USB Card Reader	Belkin	FSU248	P10134	DoC
Telephone Simulator	Teltone	TLS3	993	NA

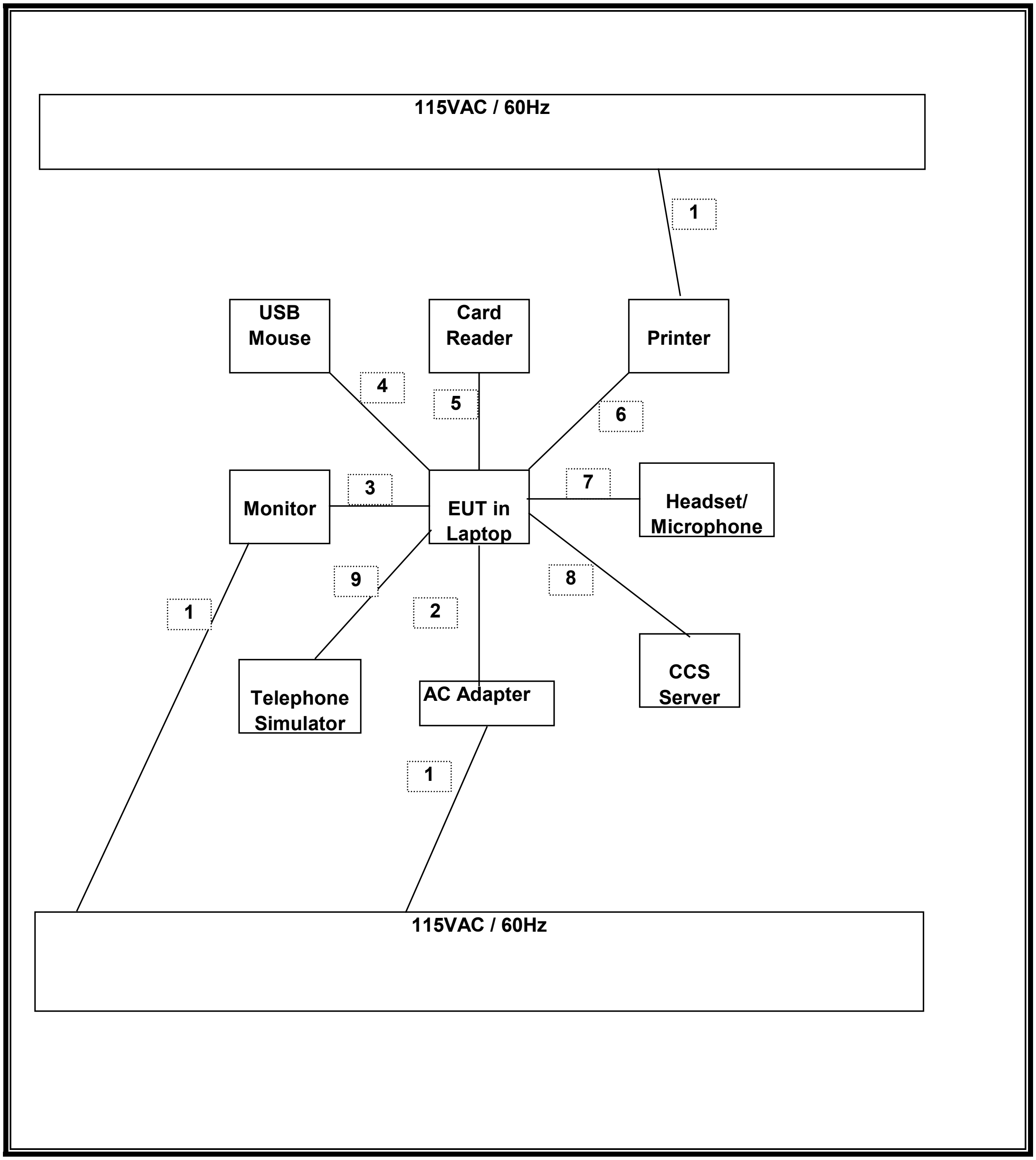
I/O CABLES

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	N/A
2	DC	1	DC	Un-shielded	2m	N/A
3	Video	1	DB15	Shielded	2m	One Torroid on Each End
4	USB	1	Mouse	Un-shielded	2m	N/A
5	USB	1	Card Reader	Un-shielded	2m	N/A
3	Parallel	1	DB25	Shielded	2m	N/A
7	Din	2	Headset/Micropho	Shielded	30m	N/A
8	Ethernet	1	RJ45	Shielded	30m	Connected to CCS Server
9	RJ11	1	Telephone	Un-shielded	3m	N/A

TEST SETUP

The EUT is installed in a typical configuration. Test software exercised the radio card and activated all I/O ports.

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**
EMI Test Receiver	R & S	ESHS 20	827129/006	6/3/2006
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	8/30/06
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	4/22/07
Preamplifier, 1 ~ 26.5 GHz	Agilent / HP	8449B	3008A00369	8/17/06
EMI Receiver, 9 kHz ~ 2.9 GHz	Agilent / HP	8542E	3942A00286	2/4/07
RF Filter Section	Agilent / HP	85420E	3705A00256	2/4/07
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	US42510266	10/19/06
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A121003	9/3/06

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7. APPLICABLE LIMITS AND TEST RESULTS

7.1. RADIATED EMISSIONS

TEST PROCEDURE

ANSI C63.4

The highest clock frequency generated or used in the EUT is 2.0GHz MHz, therefore the frequency range was investigated from 30 MHz to 10GHzMHz.

LIMIT

§15.109 (a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Limits for radiated disturbance of Class B ITE at measuring distance of 3 m	
Frequency range (MHz)	Quasi-peak limits (dBμV/m)
30 to 88	40
88 to 216	43.5
216 to 960	46
Above 960 MHz	54
Note: The lower limit shall apply at the transition frequency.	

RESULTS

No non-compliance noted:

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

HORIZONTAL PLOT

561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
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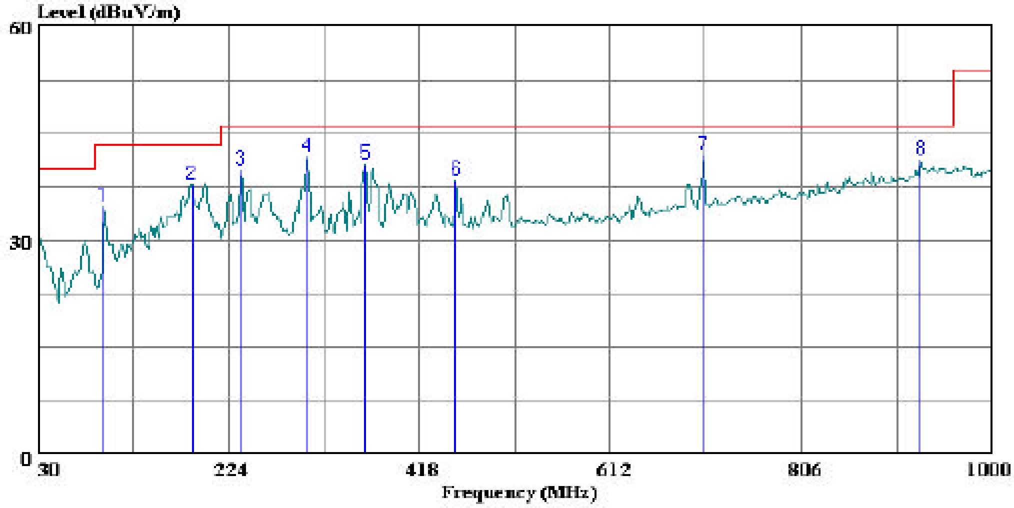

(Audix ATC)

Trace: 13 Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator : Chin Pang
Project # : 06U10171
Company : Sierra Wireless Inc.
EUT : PCA,EVDO Mini-PCI Express Card CDMA
: Modem Module inside Laptop
Model No : MC5725
S/N :
Configuration : EUT/Support Equipment
Mode of operation: EMCtest Program

HORIZONTAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	96.930	24.19	10.58	34.77	43.50	-8.73	Peak
2	187.140	24.96	12.87	37.83	43.50	-5.67	Peak
3	237.580	26.54	13.39	39.93	46.00	-6.07	Peak
4	303.540	26.00	15.75	41.75	46.00	-4.25	Peak
5	363.680	23.50	17.23	40.73	46.00	-5.27	Peak
6	455.830	19.03	19.33	38.36	46.00	-7.64	Peak
7	708.030	18.71	23.23	41.94	46.00	-4.06	Peak
8	926.280	15.04	26.23	41.27	46.00	-4.73	Peak

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

VERTICAL PLOT

COMPLIANCE Engineering Services, Inc.

561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

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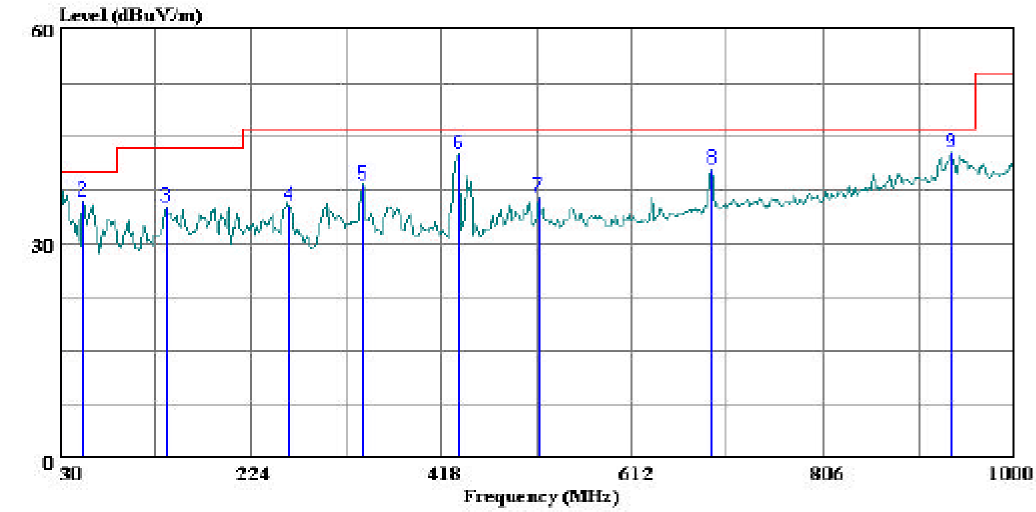

(Audix ATC)
Trace: 11 Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator : Chin Pang
Project # : 06U10171
Company : Sierra Wireless Inc.
EUT : PCA,EVDO Mini-PCI Express Card CDMA
: Modem Module inside Laptop
Model No : MC5725
S/N :
Configuration : EUT/Support Equipment
Mode of operation: EMCtest Program

VERTICAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	31.940	18.31	19.94	38.25	40.00	-1.75	Peak
2	53.280	27.07	8.94	36.01	40.00	-3.99	Peak
3	138.640	20.30	14.89	35.19	43.50	-8.31	Peak
4	262.800	21.03	14.37	35.39	46.00	-10.61	Peak
5	338.460	21.61	16.59	38.20	46.00	-7.80	Peak
6	436.430	23.66	18.89	42.55	46.00	-3.45	Peak
7	516.940	16.12	20.48	36.59	46.00	-9.41	Peak
8	693.480	17.55	23.00	40.55	46.00	-5.45	Peak

SPURIOUS EMISSIONS ABOVE 1 GHz

High Frequency Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Company:Sierra Wireless Inc.
Project #:06U10171
Date: 05/17/06
Test Engineer: Chin Pang
Configuration: EUT / Support Peripherals
Mode: EMCtest Program/Pinging

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T34 HP 8449B			FCC 15.209

9.6

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Chin 197538001	Chin 200354001		

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)
1.330	3.0	62.0	39.4	25.0	1.6	-37.8	0.0	0.0	50.8	28.2	74	54	-23.2	-25.8	H
1.595	3.0	60.4	37.8	26.0	1.8	-37.4	0.0	0.0	50.7	28.1	74	54	-23.3	-25.9	H
2.500	3.0	55.5	37.0	28.6	2.2	-36.3	0.0	0.0	50.1	31.6	74	54	-23.9	-22.4	H
1.200	3.0	61.6	38.3	24.5	1.6	-38.0	0.0	0.0	49.7	26.4	74	54	-24.3	-27.6	V
1.995	3.0	62.5	41.3	27.4	2.0	-36.9	0.0	0.0	55.0	33.8	74	54	-19.0	-20.2	V
2.500	3.0	60.2	39.6	28.6	2.2	-36.3	0.0	0.0	54.8	34.2	74	54	-19.2	-19.8	V

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		

7.2. AC MAINS LINE CONDUCTED EMISSIONS

TEST PROCEDURE

ANSI C63.4

LIMIT

§15.107 (a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Frequency range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Notes:
1. The lower limit shall apply at the transition frequencies
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

RESULTS

No non-compliance noted:

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
0.20	53.46	--	38.00	0.00	63.82	53.82	-10.36	-15.82	L1
0.26	47.00	--	34.23	0.00	61.34	51.34	-14.34	-17.11	L1
3.62	45.58	--	34.80	0.00	56.00	46.00	-10.42	-11.20	L1
0.20	52.96	--	37.45	0.00	63.82	53.82	-10.86	-16.37	L2
0.26	42.68	--	33.73	0.00	61.34	51.34	-18.66	-17.61	L2
3.42	44.64	--	31.30	0.00	56.00	46.00	-11.36	-14.70	L2
6 Worst Data									

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LINE 1 RESULTS

Compliance Certification Services
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Morgan Hill, CA 95037
Tel: (408) 463-0885
Fax: (408) 463-0888

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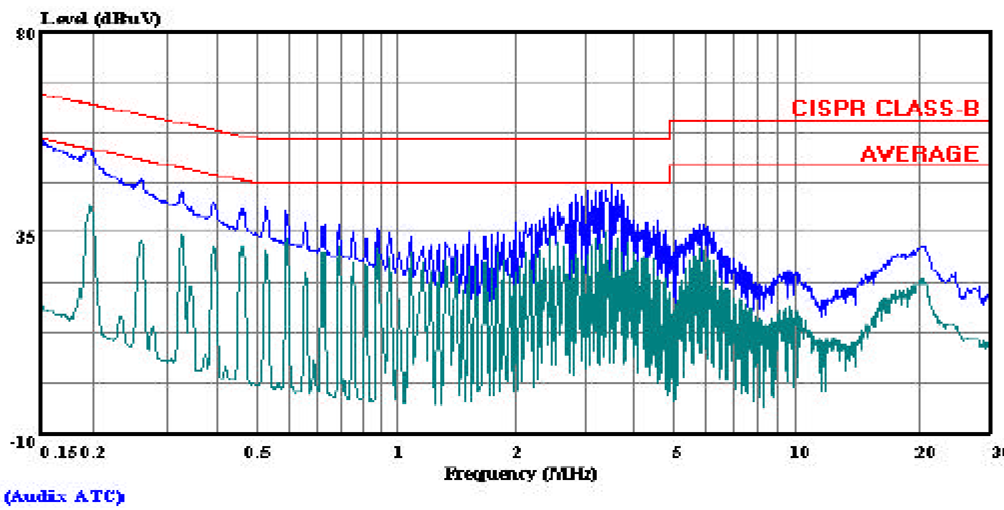

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Condition: CISPR CLASS-B
Test Operator     : Chin Pang
Project #         : 06U10171
Company           : Sierra Wireless Inc.
EUT Description   : PCA, EVDO Mini-PCI Express Card CDMA
                  : Modem inside the Laptop
Model             : MC5725
EUT Config        : EUT wiih Support Equipment
Mode Of Operation: Emctest Program
Target            : FCC Class B
Power Source      : 115VAC, 60 Hz
                  : L1 Peak ( Black ), Averge( Green )
```

LINE 2 RESULTS

COMPLIANCE Engineering Services, Inc.

Compliance Certification Services
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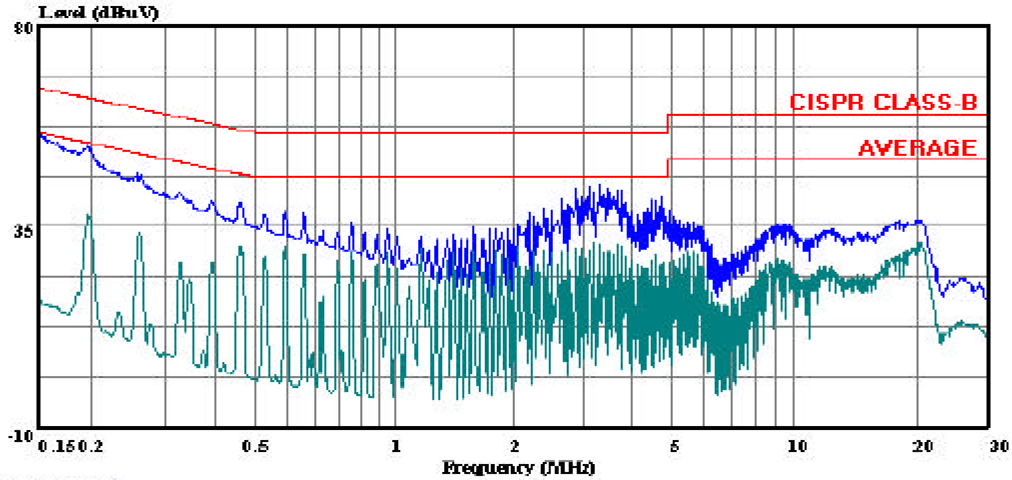
Data#: 28 File#: 06U10171LC.EMI Date: 05-17-2006 Time: 14:49:10



(Audix ATC)
Trace: 26 Ref Trace:

Condition: CISPR CLASS-B
Test Operator : Chin Pang
Project # : 06U10171
Company : Sierra Wireless Inc.
EUT Description : PCA, EVDO Mini-PCI Express Card CDMA
: Modem inside the Laptop
Model : MC5725
EUT Config : EUT wiih Support Equipment
Mode Of Operation: Emctest Program
Target : FCC Class B
Power Source : 115VAC, 60 Hz
: L2: Peak (Black), Averge(Green)