



**FCC CFR47 PART 15 SUBPART B
ICES-003 ISSUE 4, 2004-02
TEST REPORT
FOR
USB MODEM**

MODEL NUMBER: COMPASS 597

FCC ID: N7NC597

IC: 2417C-C597

REPORT NUMBER: 07U11455-3

ISSUE DATE: FEBRUARY 06, 2008

Prepared for

**SIERRA WIRELESS
2290 COSMOS CT.
CARLSBAD, CA 92010, U.S.A.**

Prepared by

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NVLAP®

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Revision History

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TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS.....	4
2. TEST METHODOLOGY	5
3. FACILITIES AND ACCREDITATION.....	5
4. CALIBRATION AND UNCERTAINTY	5
4.1. <i>MEASURING INSTRUMENT CALIBRATION.....</i>	<i>5</i>
4.2. <i>MEASUREMENT UNCERTAINTY.....</i>	<i>5</i>
5. EQUIPMENT UNDER TEST	6
5.1. <i>DESCRIPTION OF EUT.....</i>	<i>6</i>
5.2. <i>TEST CONFIGURATIONS.....</i>	<i>6</i>
5.3. <i>MODE(S) OF OPERATION.....</i>	<i>6</i>
5.4. <i>SOFTWARE AND FIRMWARE.....</i>	<i>7</i>
5.5. <i>MODIFICATIONS.....</i>	<i>7</i>
5.6. <i>DETAILS OF TESTED SYSTEM</i>	<i>8</i>
6. TEST AND MEASUREMENT EQUIPMENT	10
7. APPLICABLE LIMITS AND TEST RESULTS	11
7.1. <i>RADIATED EMISSIONS</i>	<i>11</i>
7.2. <i>AC MAINS LINE CONDUCTED EMISSIONS</i>	<i>18</i>
8. SETUP PHOTOS.....	22

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SIERRA WIRELESS
2290 COSMOS CT.
CARLSBAD, CA 92010, USA

EUT DESCRIPTION: USB MODEM

MODEL: COMPASS 597

SERIAL NUMBER: 2079

DATE TESTED: FEBRUARY 06, 2008

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART B	No Non-Compliance Noted
ICES-003 ISSUE 4, 2004-02	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:



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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003 and ICES-003 ISSUE 4, 2004-02.

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. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Power Line Conducted Emission	+/- 2.3 dB
Radiated Emission	+/- 3.4 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a dual band 800 / 1900MHz USB Modem CDMA Module, and manufactured by Sierra Wireless, Inc.

GENERAL INFORMATION

CHASSIS MATERIAL	METAL
ENCLOSURE MATERIAL	PLASTIC
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	2.0 GHz CPU

5.2. TEST CONFIGURATIONS

The following configurations were investigated during preliminary testing:

EUT Configuration	Description
Typical	EUT connected to the laptop and printer, USB Mouse also connected to the Laptop

5.3. MODE(S) OF OPERATION

Mode	Description
Receiving & EMCTest	Receiving & I/O ports activated with H' patterns scrolling on the screen display.

5.4. SOFTWARE AND FIRMWARE

The test software used during the test was EMCTest software.

5.5. MODIFICATIONS

No modifications were made during testing.

5.6. DETAILS OF TESTED SYSTEM

SUPPORT EQUIPMENT & PERIPHERALS

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Printer	Microline 186	D22300A	AE5A048148A0	DoC
USB Mouse	Dell	M-UR69	LNA23661530	DoC
Modem	Hayes	4714US	A02247143261	BFJUSA-31719-M5-E
Laptop	Toshiba	PSDAGU-00J00V	37065149W	DoC
Laptop AC dapter	Targus	APM12	R0708027330	DoC

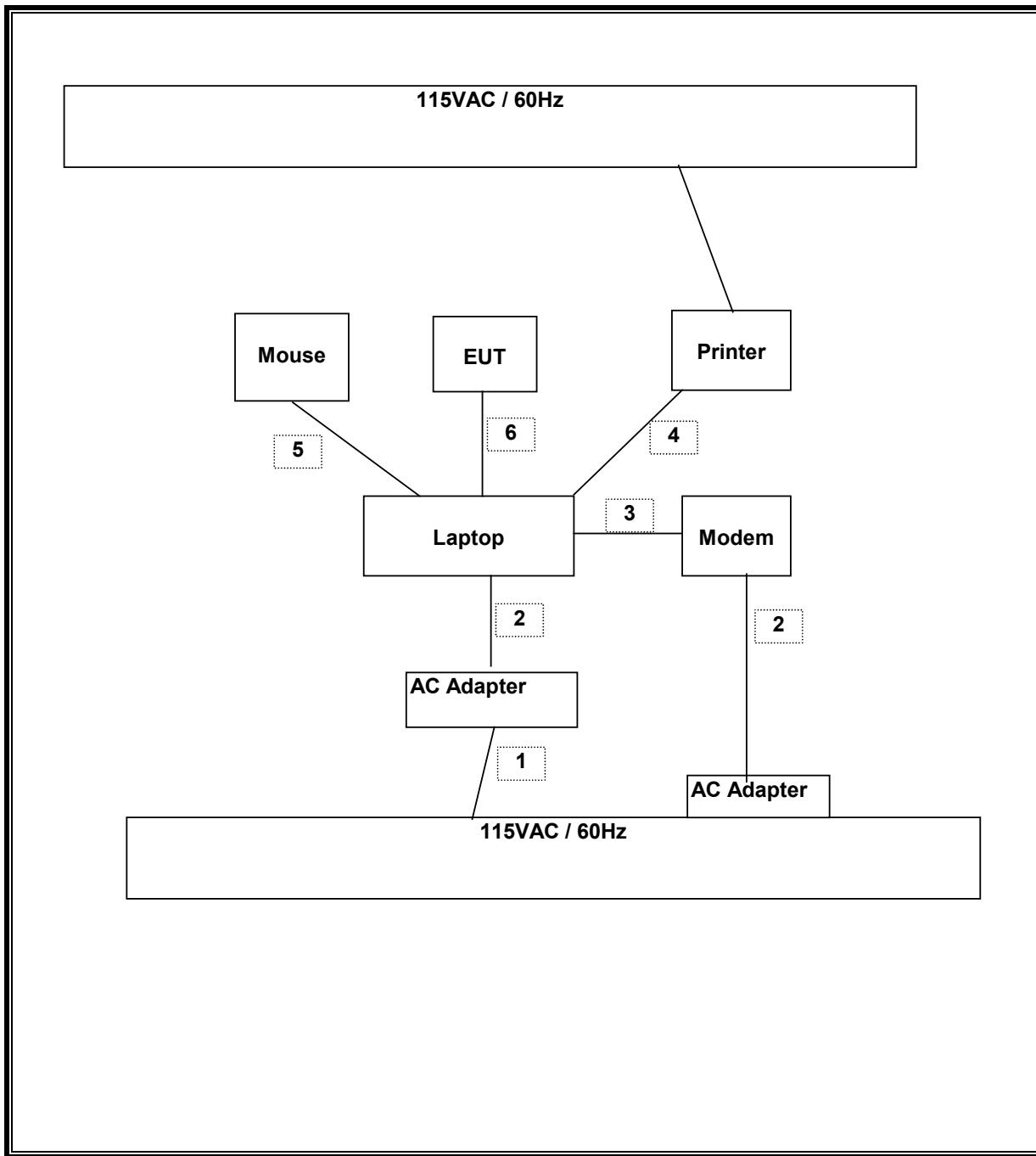
I/O CABLES

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	2	US 115V	Un-shielded	1m	NA
3	RJ11	1	Modem	Un-shielded	2m	NA
4	USB	1	Printer	Un-shielded	2m	NA
5	USB	1	Mouse	Un-shielded	2m	NA
6	USB	1	USB Cable	Un-shielded	0.5m	One ferrite at Laptop end

TEST SETUP

The EUT is installed in a typical configuration. Test software exercised the EUT.

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	Asset	Cal Due
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	8/7/2008
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	9/28/2008
Power Sensor	Agilent	E9327A	C00964	12/7/2008
Peak Power Meter	Agilent / HP	E4416A	C00963	12/7/2008
Antenna, Horn, 18 GHz	EMCO	3115	C00945	4/15/2008
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	10/25/2008
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	1/27/2008
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	9/27/2008
Preamplifier, 1300 MHz	Agilent / HP	8447D	NA	5/9/2008

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 GHz, therefore the frequency range was investigated from 30 MHz to 10GHz.

LIMIT

§15.109 (g) As an alternative to the radiated emission limits shown in paragraphs (a) and (b) of this section, digital devices may be shown to comply with the standards contained in Third Edition of the International Special Committee on Radio Interference (CISPR), Pub. 22, "Information Technology Equipment—Radio Disturbance Characteristics—Limits and Methods of Measurement" (incorporated by reference, see §15.38). In addition:

(1) The test procedure and other requirements specified in this part shall continue to apply to digital devices.

(2) If, in accordance with §15.33 of this part, measurements must be performed above 1000 MHz, compliance above 1000 MHz shall be demonstrated with the emission limit in paragraph (a) or (b) of this section, as appropriate. Measurements above 1000 MHz may be performed at the distance specified in the CISPR 22 publications for measurements below 1000 MHz provided the limits in paragraphs (a) and (b) of this section are extrapolated to the new measurement distance using an inverse linear distance extrapolation factor (20 dB/decade), e.g., the radiated limit above 1000 MHz for a Class B digital device is 150 uV/m, as measured at a distance of 10 meters.

(3) The measurement distances shown in CISPR Pub. 22, including measurements made in accordance with this paragraph above 1000 MHz, are considered, for the purpose of §15.31(f)(4) of this part, to be the measurement distances specified in this part.

(4) If the radiated emissions are measured to demonstrate compliance with the alternative standards in this paragraph, compliance must also be demonstrated with the conducted limits shown in §15.107(e).

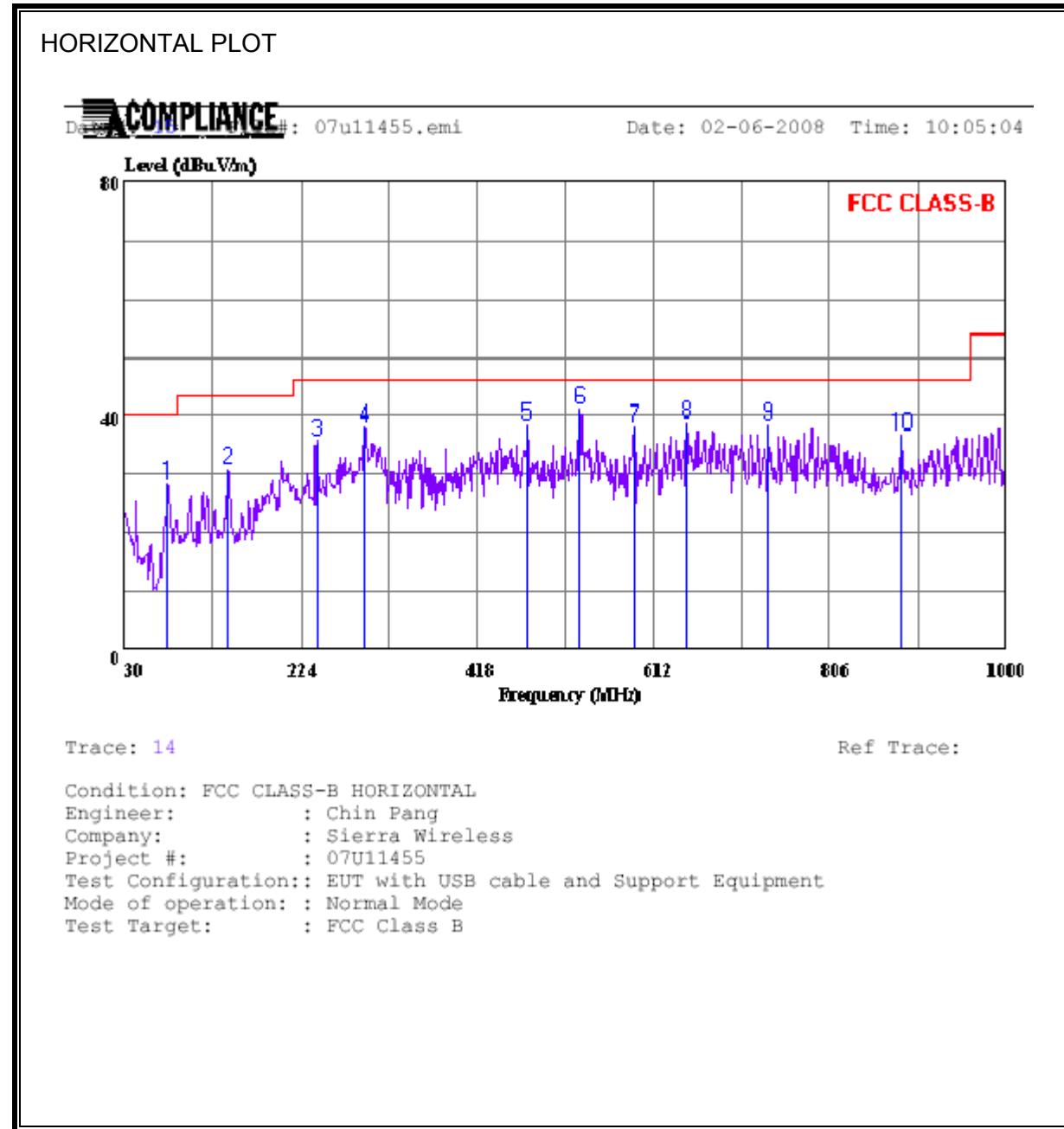
Limits for radiated disturbance of Class B ITE at measuring distance of 10 m	
Frequency range (MHz)	Quasi-peak limits (dB μ V/m)
30 to 230	30
230 to 1000	37
Note: The lower limit shall apply at the transition frequency.	

Limits for radiated disturbance of Class B ITE at measuring distance of 3 m		
Frequency range (MHz)	Peak limits (dB μ V/m)	Average limits (dB μ V/m)
Above 1000	74	54

RESULTS

No non-compliance noted:

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

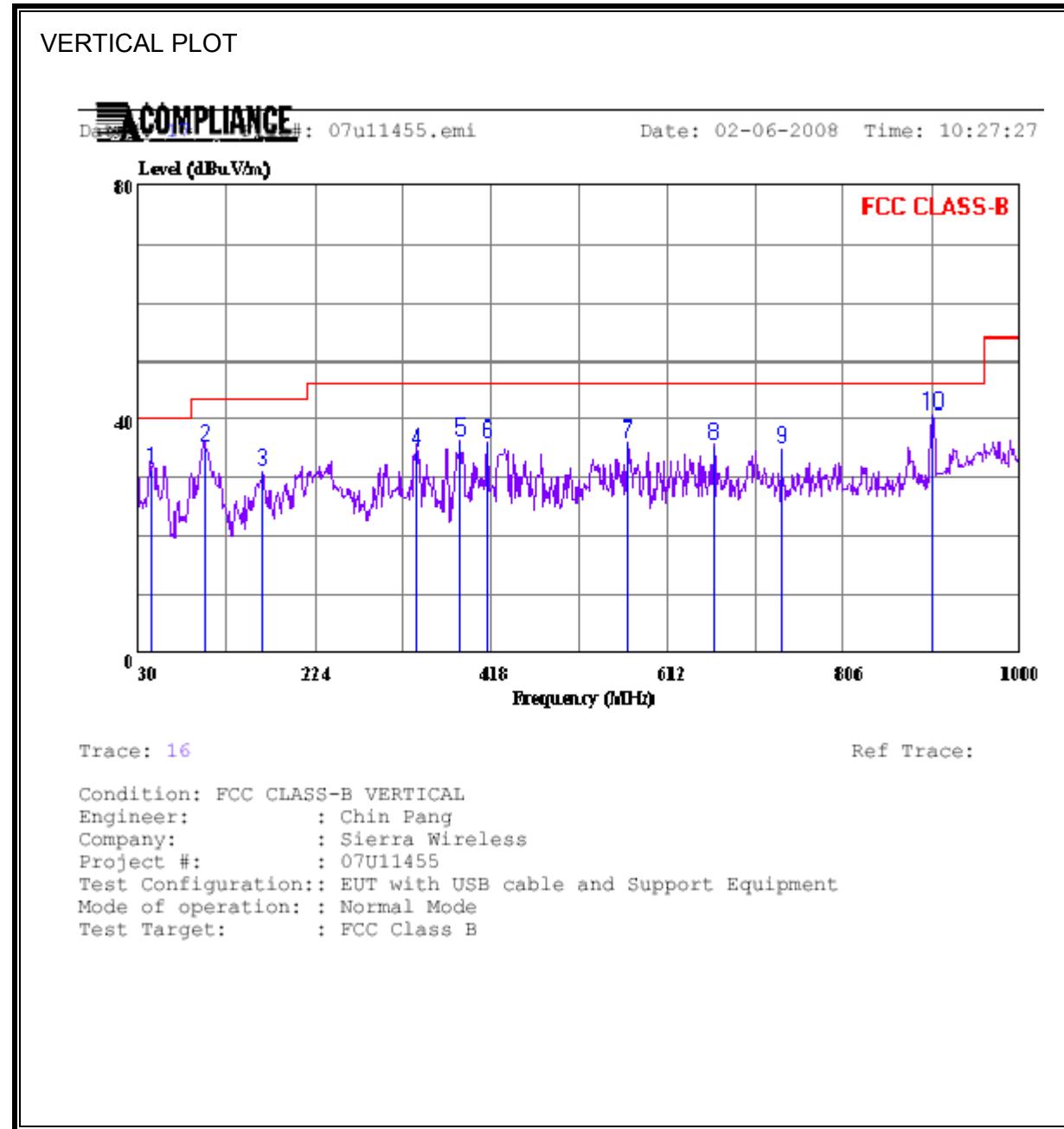


HORIZONTAL DATA

Page: 1

Freq	Read		Limit	Over	Line	Limit	Remark
	Level	Factor					
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	dB	
1	76.560	47.66	-19.24	28.42	40.00	-11.58	Peak
2	143.490	44.17	-13.48	30.69	43.50	-12.81	Peak
3	241.460	50.00	-14.45	35.55	46.00	-10.45	Peak
4	294.810	50.50	-12.45	38.05	46.00	-7.95	Peak
5	472.320	46.33	-7.98	38.35	46.00	-7.65	Peak
6	530.520	47.83	-6.76	41.07	46.00	-4.93	Peak
7	590.660	43.67	-5.59	38.08	46.00	-7.92	Peak
8	648.860	43.33	-4.43	38.90	46.00	-7.10	Peak
9	738.100	41.17	-2.87	38.30	46.00	-7.70	Peak
10	884.570	37.83	-1.25	36.58	46.00	-9.42	Peak

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



VERTICAL DATA

Page: 1

		Read		Limit	Over	
Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB
1	44.550	47.17	-15.53	31.64	40.00	-8.36 Peak
2	103.720	51.67	-16.36	35.30	43.50	-8.20 Peak
3	166.770	45.50	-14.50	31.00	43.50	-12.50 Peak
4	335.550	46.17	-11.37	34.80	46.00	-11.20 Peak
5	384.050	46.50	-10.24	36.26	46.00	-9.74 Peak
6	413.150	45.67	-9.52	36.15	46.00	-9.85 Peak
7	569.320	41.83	-5.99	35.85	46.00	-10.15 Peak
8	663.410	40.00	-4.18	35.82	46.00	-10.18 Peak
9	738.100	38.00	-2.87	35.13	46.00	-10.87 Peak
10	903.970	41.83	-1.03	40.81	46.00	-5.19 Peak

SPURIOUS EMISSIONS ABOVE 1000 MHz (WORST-CASE CONFIGURATION)

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber															
Company: Sierra Wireless Project #: 07U11455 Date: 2/06/2008 Test Engineer: Chin Pang Configuration: EUT in the cradle and basic Support Equipment Mode: Normal															
Test Equipment:															
Horn 1-18GHz		Pre-amplifier 1-26GHz		Pre-amplifier 26-40GHz		Horn > 18GHz		Limit							
T73; S/N: 6717 @3m		T145 Agilent 3008A005						FCC 15.209							
Hi Frequency Cables															
2 foot cable		3 foot cable		12 foot cable		HPF		Reject Filter		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)
1.003	3.0	63.0	37.2	25.7	3.2	-36.1	0.0	0.0	55.8	30.0	74	54	-18.2	-24.0	V
1.126	3.0	57.7	33.6	26.1	3.4	-36.1	0.0	0.0	51.1	27.0	74	54	-22.9	-27.0	V
1.335	3.0	57.2	33.0	26.6	3.7	-35.9	0.0	0.0	51.6	27.4	74	54	-22.4	-26.6	V
2.005	3.0	61.0	36.3	28.4	4.5	-35.4	0.0	0.0	58.5	33.8	74	54	-15.5	-20.2	V
1.003	3.0	61.8	35.0	25.7	3.2	-36.1	0.0	0.0	54.6	27.8	74	54	-19.4	-26.2	H
1.335	3.0	55.3	34.1	26.6	3.7	-35.9	0.0	0.0	49.7	28.5	74	54	-24.3	-25.5	H
1.606	3.0	54.2	32.5	27.3	4.0	-35.7	0.0	0.0	49.9	28.2	74	54	-24.1	-25.8	H
2.008	3.0	58.4	35.4	28.4	4.5	-35.4	0.0	0.0	56.0	33.0	74	54	-18.0	-21.0	H
Rev. 4.12.7															
f Measurement Frequency Dist Distance to Antenna Read Analyzer Reading AF Antenna Factor CL Cable Loss					Amp Preamp Gain D Corr Distance Correct to 3 meters Avg Average Field Strength @ 3 m Peak Calculated Peak Field Strength HPF High Pass Filter					Avg Lim Average Field Strength Limit Pk Lim Peak Field Strength Limit Avg Mar Margin vs. Average Limit Pk Mar Margin vs. Peak Limit					

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 μ H/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 (dB μ V)	
	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.

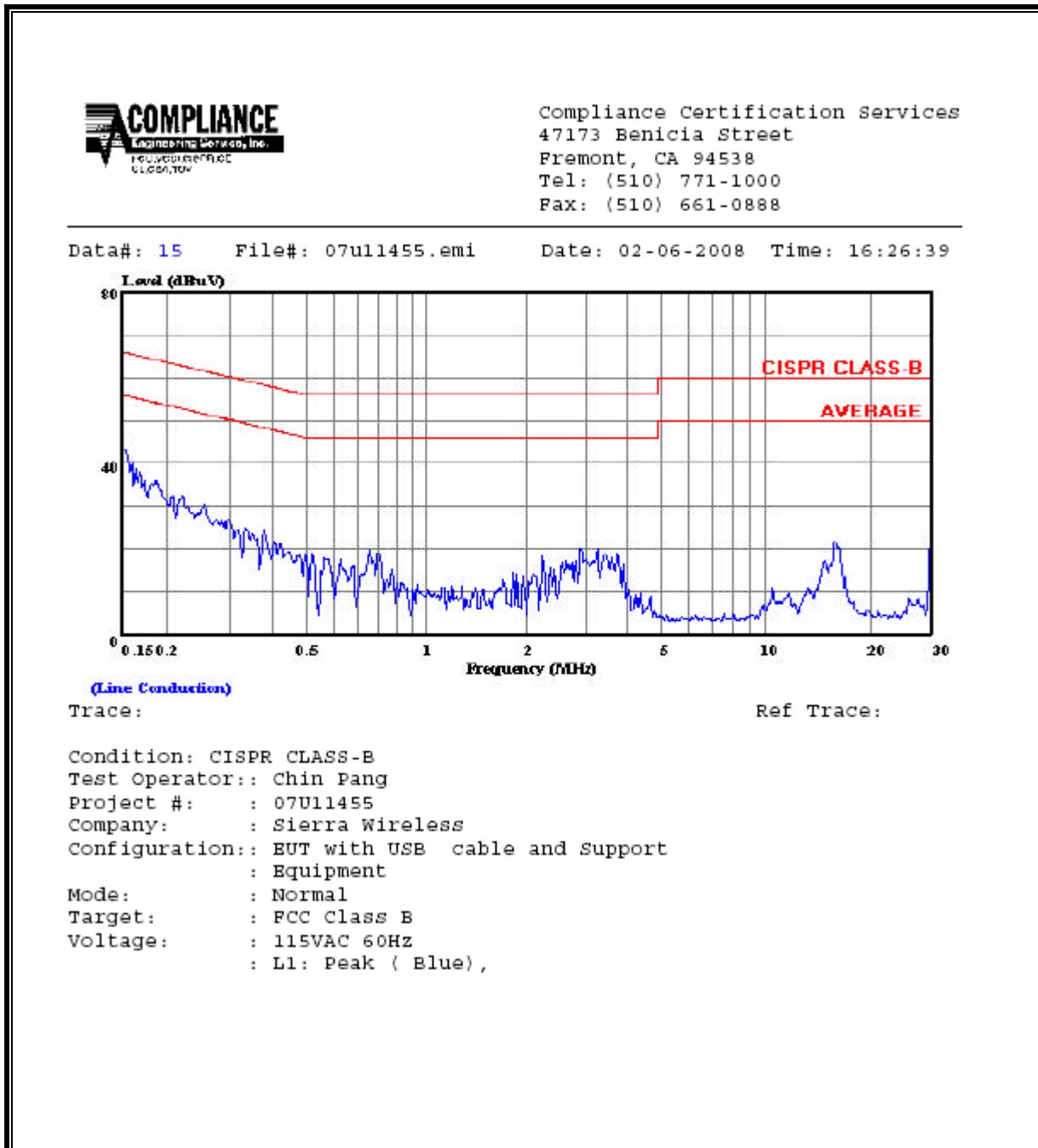
RESULTS

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6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq. (MHz)	Reading			Closs (dB)	Limit QP	EN B AV	Margin		Remark L1 / L2
	PK (dBuV)	QP (dBuV)	AV (dBuV)				QP (dB)	AV (dB)	
0.15	44.52	--	--	0.00	66.00	56.00	-21.48	-11.48	L1
3.36	19.96	--	--	0.00	56.00	46.00	-36.04	-26.04	L1
15.97	21.55	--	--	0.00	60.00	50.00	-38.45	-28.45	L1
0.15	46.26	--	--	0.00	65.89	55.89	-19.63	-9.63	L2
0.80	32.43	--	--	0.00	56.00	46.00	-23.57	-13.57	L2
3.80	29.40	--	--	0.00	56.00	46.00	-26.60	-16.60	L2
6 Worst Data									

LINE 1 RESULTS



LINE 2 RESULTS

