



NVLAP LAB CODE 200707-0



FCC PART 15.249

EMI MEASUREMENT AND TEST REPORT

For

Cooper Wiring Devices Inc.

203 Cooper Circle, Peachtree City, GA 30269, USA

FCC ID: UH2-RFUSB

This Report Concerns: <input checked="" type="checkbox"/> Original Report	Equipment Type: RF USB controller
Test Engineer: Merry Zhao <i>Merry Zhao</i>	
Report No.: RSH07011152	
Test Date: 2007-01-16 to 2007-01-31	
Report Date: 2007-02-02	
Reviewed By: EMC Manager: Boni Baniqued <i>Boni Baniqued</i>	
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Note: This test report is for the customer shown above and their specific product only. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratory Corp. (Shenzhen). This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the Federal Government.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Cooper Wiring Devices Inc.*'s product, model number: *RFUSB* or the "EUT" as referred to in this report is a *RF USB controller*, which measures approximately 8.0cmL x 3.2cmW x 0.9cmH, rated input voltage: DC 5V (PC USB port).

** The test data gathered are from production sample, serial number: 0701111 provided by the manufacturer, we receive the EUT on 2007-01-11.*

Objective

This Type approval report is prepared on behalf of *Cooper Wiring Devices Inc.* in accordance with Part 2, Subpart J, and Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.249 rules.

Related Submittal(s)/Grant(s)

No Related Submittals.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratory Corp. (Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratory Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 04, 2004. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratory Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0). The current scope of accreditations can be found at <http://ts.nist.gov/ts/htdocs/210/214/scopes/2007070.htm>.

Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
IBM	PC	ThinkCentre A50	99Y5469	DoC
Logitech	Keyboard	Y-SM48	SY513U22305	DoC
Logitech	Mouse	M-SAW83A	HCA33800404	DoC
IBM	CRT Monitor	6737-66W	23-P3229	BEJT17HD
ProMOS	Memory	V826616J24SATG-C0	D61A2605H	DoC
Intel	CPU	Pentium4 2800MHz	N/A	DoC
HP	Laser Jet5L	C3941A	JPTVOB2337	DoC
ECOM	Modem	EM-56DEV	6588D51200013	DoC

Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
Intel	Motherboard	D865GKD	11S19R1949ZJ1WCB46J1K8	DoC
IBM	Power	HIPRO-A2307F3T	11S49P2191ZJ1TAR472225	DoC
Maxtor	Hard Disk	6Y080L0	Y23QNXTE	DoC
ALPS	3.5' Floppy	06P5226	11S06P5226ZJ1W25373957	DoC
Lite-ON	CD-Rom	LTN-489S	11S71P7366ZJ1SYC130015	DoC
Intel	Ethernet	PRO 10/100 VE	N/A	DoC

External I/O Cable

Cable Description	Length (M)	From/Port	To
Shielded Detachable Keyboard Cable	1.5	Keyboard Port / Host	Keyboard
Shielded Detachable Mouse Cable	1.5	Mouse Port / Host	Mouse
Shielded Detachable Printer Cable	1.2	Parallel Port / Host	Printer
Shielded Detachable Serial Cable	1.2	Serial Port / Host	Modem
Shielded Detachable VGA Cable	1.5	VGA Port / Host	Monitor
Shielded Undetachable USB Cable	2.5	EUT	Host PC

SYSTEM TEST CONFIGURATION

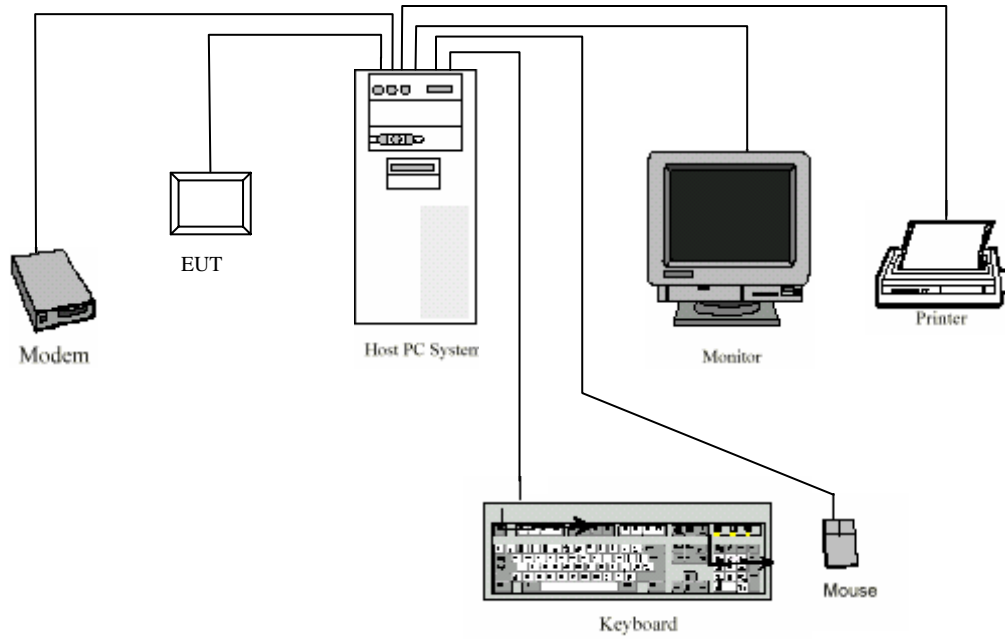
Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

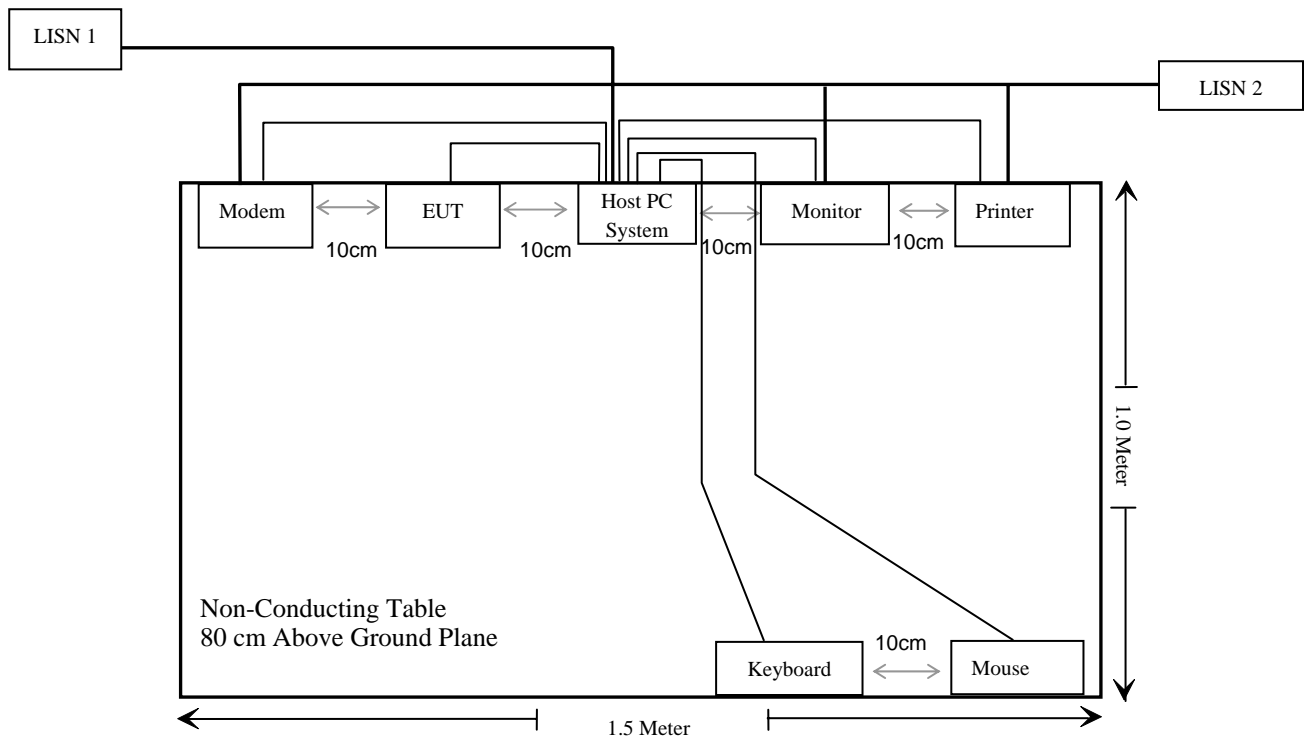
Equipment Modifications

Bay Area Compliance Laboratory Corp. (Shenzhen) has not done any modification on the EUT.

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 15.203	Antenna Requirement	Compliant
§ 15.207(a)	Conduction Emissions	Compliant
§ 15.205(a), § 15.209(a), § 15.249(a), § 15.249(c)	Radiated Emissions	Compliant*
§ 15.249(d)	Out of band emissions	Compliant

* Within measurement uncertainty.

§15.203 - ANTENNA REQUIREMENT

Standard Applicable

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used.

Antenna Connector Construction

The EUT antenna is a permanently attached antenna, which in accordance to section 15.203, is considered sufficient to comply with the provisions of this section.

Result: Compliance.

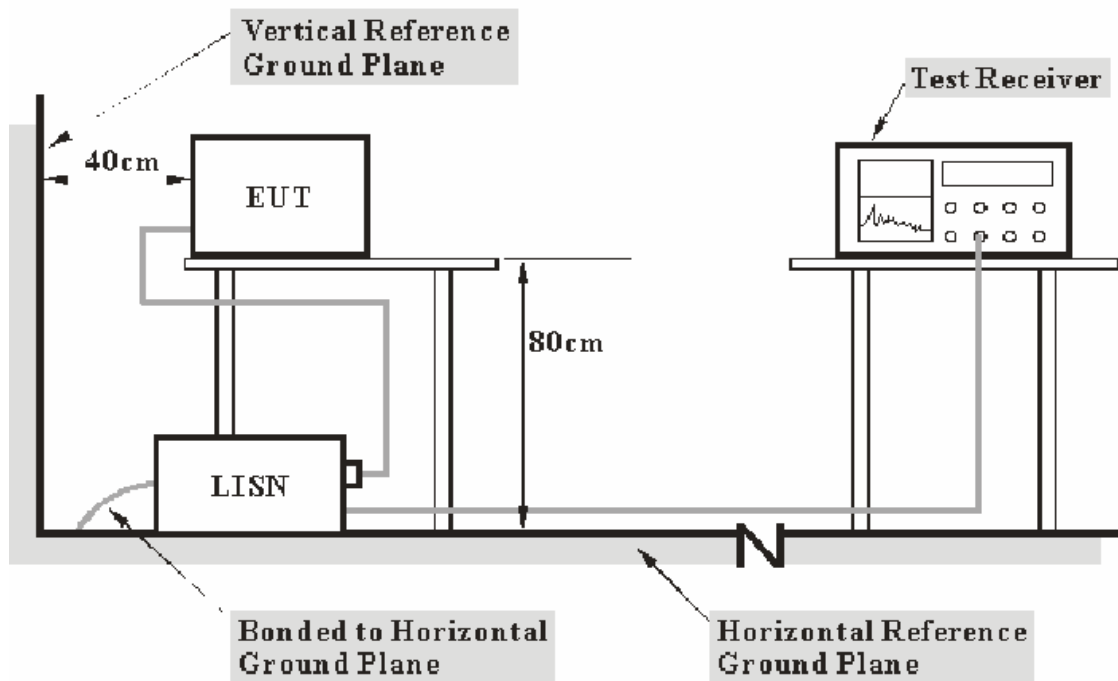
§15.207 - CONDUCTED EMISSIONS

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratory Corp. (Shenzhen) is ± 2.4 dB.

EUT Setup



- Note:**
1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15 .207 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The host PC was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

The test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

<u>Frequency Range</u>	<u>IFBW</u>
150 kHz – 30 MHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	DE25330	2006-03-20	2007-03-19
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2006-03-01	2007-03-01

* Com-Power's LISN were used as the supporting equipment.

* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

During the conducted emission test, the host PC was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, with the worst margin reading of:

Transmitting Mode: 7.50 dB at 1.985 MHz in the Live conductor mode.

Test Data**Environmental Conditions**

Temperature:	22 ° C
Relative Humidity:	55%
ATM Pressure:	1000mbar

The testing was performed by Merry Zhao on 2007-01-16.

Test Mode: Transmitting

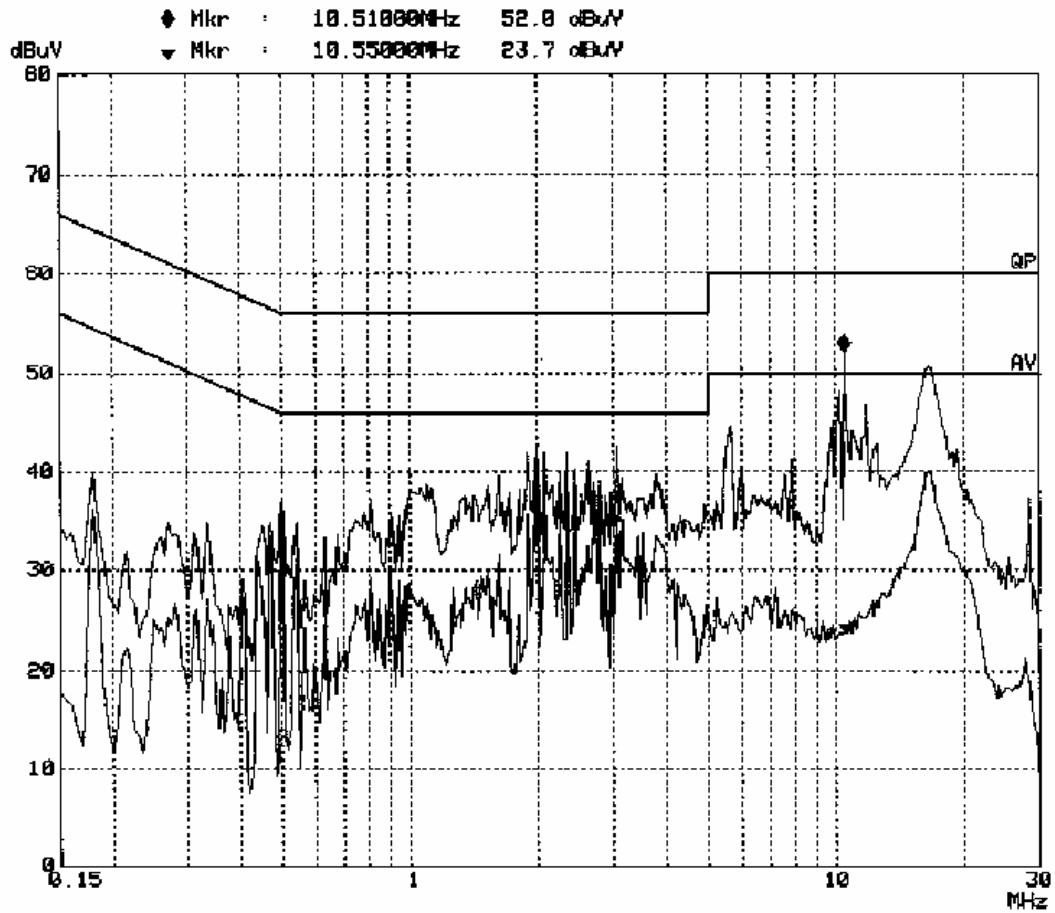
LINE CONDUCTED EMISSIONS				FCC PART 15 .207	
Frequency (MHz)	Amplitude (dB μ V)	Detector (QP/AV)	Phase (Live/Neutral)	Limit (dB μ V)	Margin (dB)
1.985	38.50	AV	Live	46.00	7.50
2.080	38.20	AV	Neutral	46.00	7.80
10.510	52.00	QP	Live	60.00	8.00
16.520	50.60	QP	Live	60.00	9.40
16.545	50.50	QP	Neutral	60.00	9.50
0.500	36.50	AV	Live	46.00	9.50
16.520	40.00	AV	Live	50.00	10.00
10.160	49.10	QP	Neutral	60.00	10.90
16.705	37.80	AV	Neutral	50.00	12.20
2.800	33.50	AV	Neutral	46.00	12.50
2.800	43.20	QP	Neutral	56.00	12.80
0.180	41.30	AV	Neutral	54.49	13.19
11.775	46.80	QP	Live	60.00	13.20
1.985	42.60	QP	Live	56.00	13.40
2.080	42.00	QP	Neutral	56.00	14.00
5.645	44.80	QP	Live	60.00	15.20
5.935	42.40	QP	Neutral	60.00	17.60
0.500	37.40	QP	Live	56.00	18.60
0.180	43.80	QP	Neutral	64.49	20.69
10.160	26.00	AV	Neutral	50.00	24.00
11.775	25.80	AV	Live	50.00	24.20
5.645	25.70	AV	Live	50.00	24.30
10.550	23.70	AV	Live	50.00	26.30
5.935	23.20	AV	Neutral	50.00	26.80

Plot(s) of Test Data

Plot(s) of Test Data is presented hereinafter as reference.

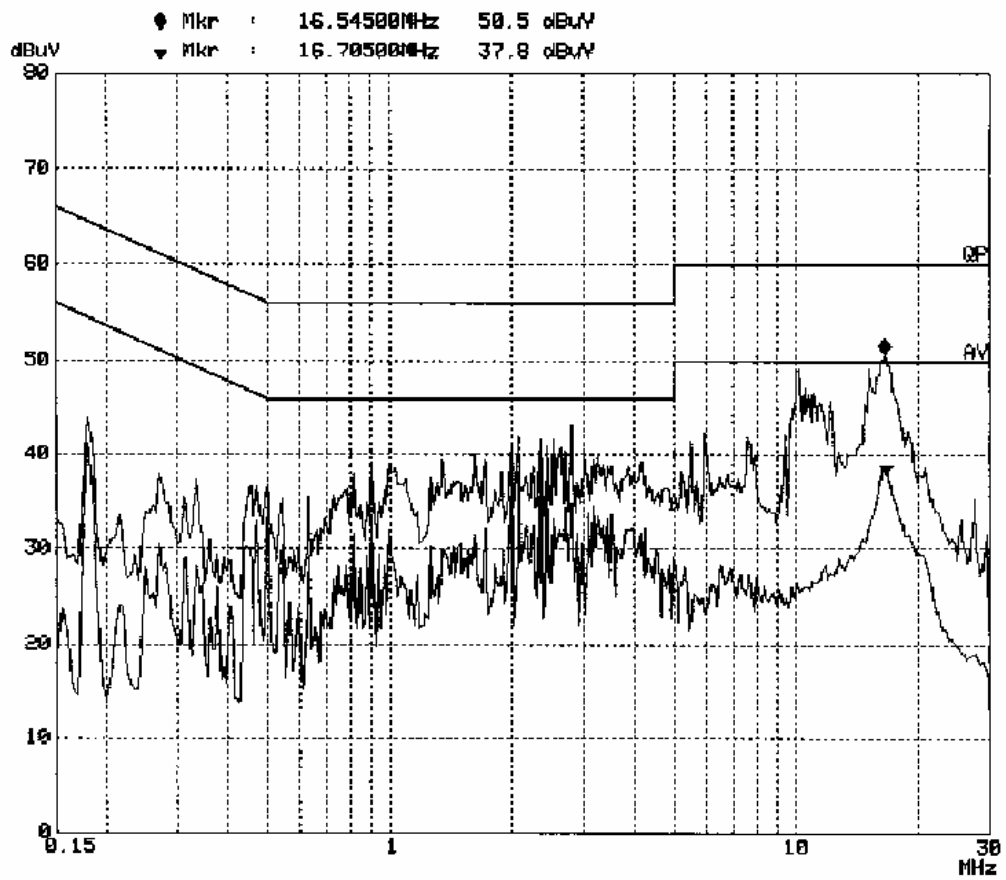
Conduction Emission Test FCC Part 15

EUT: RF USB Controller
Manuf: Copper
Op Cond: Transmitting
Operator: Merry.zhao
Test Spec: AC 120V/60Hz L
Comment: Temp:25°C Humi:56%
Date: 16. Jan 07 10:32



Conduction Emission Test FCC PART 15

EUT: RF USB Controller
Manuf: Copper
Op Cond: Transmitting
Operator: Merry.zhao
Test Spec: AC 120V/60Hz N
Comment: Temp:25°C Humi:56%
Date: 16. Jan 07 10:58



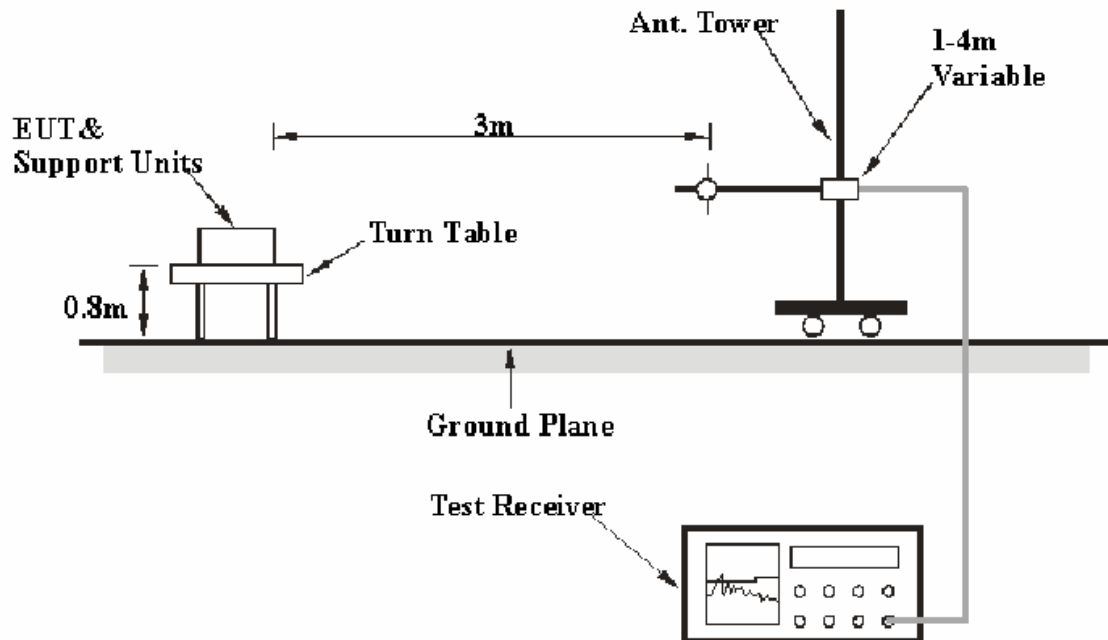
§15.205 §15.209(a) §15.249(a) §15.249(c) - RADIATED EMISSIONS

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratory Corp. (Shenzhen) is ± 4.0 dB.

EUT Setup



The radiated emission and out of band emission tests were performed in the 3 meters chamber B, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209 and FCC 15.249 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The host PC was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 25000 MHz.

During the radiated emission and out of band emission test, the test receiver was set with the following configurations:

<i>Frequency Range</i>	<i>RBW</i>	<i>Video B/W</i>
30 – 1000 MHz	100 kHz	300 kHz
1000 MHz – 25000 MHz	1MHz	3 MHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2006-09-29	2007-09-29
HP	Amplifier	8447E	1937A01046	2006-11-15	2007-11-15
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2006-08-14	2007-08-14
HP	Amplifier	8449B	3008A00277	2006-09-29	2007-09-29
Sunol Sciences	Horn Antenna	DRH-118	A052604	2006-07-20	2007-07-20
Agilent	Spectrum Analyzer	8564E	3943A01781	2006-11-22	2007-11-22

* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

For the radiated emissions test, the host PC was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the peak and average detection mode.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Meter Reading} + \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corr. Ampl.}$$

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209 & 15.249, with the worst margin reading of:

Transmitting Mode:

30 -1000MHz: **2.99 dB** at **41.12 MHz** in the **Vertical** polarization.
Above 1GHz: **15.45 dB** at **1354.00 MHz** in the **Vertical** polarization.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	53%
ATM Pressure:	1009mbar

The testing was performed by Merry Zhao on 2007-01-31.

Test Mode: Transmitting

Frequency (MHz)	Meter Reading (dBuV)	Detector PK/QP/AV	Direction Degree	Height (m)	Polar H / V	Antenna Factor (dB/m)	Cable loss (dB)	Amplifier Gain (dB)	Corr. Amp. (dBuV/m)	FCC Part 15.209 & 15.249		
										Limit (dBuV/m)	Margin (dB)	Comment
30 -1000MHz												
41.12	49.49	QP	45	1.0	V	14.30	0.23	27.01	37.01	40.00	2.99*	Spurious
30.21	39.45	QP	45	1.0	H	24.10	0.37	27.02	36.90	40.00	3.10*	Spurious
30.00	35.43	QP	289	1.0	H	24.10	0.37	27.02	32.88	40.00	7.12	Spurious
65.81	49.91	QP	60	1.2	V	8.50	0.79	26.91	32.29	40.00	7.71	Spurious
449.56	44.57	QP	35	3.8	V	16.80	3.12	27.24	37.25	46.00	8.75	Spurious
112.13	46.30	QP	35	3.8	V	12.20	1.16	26.77	32.89	43.50	10.61	Spurious
64.89	45.43	QP	289	1.0	H	8.10	0.62	26.91	27.24	40.00	12.76	Spurious
116.95	42.67	QP	60	1.0	H	13.30	1.17	26.77	30.37	43.50	13.13	Spurious
258.33	41.60	QP	180	1.2	H	12.40	2.32	26.31	30.01	46.00	15.99	Spurious
234.16	42.35	QP	45	1.2	H	11.70	2.17	26.44	29.78	46.00	16.22	Spurious
203.52	25.69	QP	180	1.2	H	12.60	1.92	26.58	13.63	43.50	29.87	Spurious

* Within measurement uncertainty.

Fundamental:

Frequency (MHz)	Meter Reading (dBuV)	Detector PK/QP/AV	Direction Degree	Height (m)	Polar H / V	Antenna Factor (dB/m)	Cable loss (dB)	Amplifier Gain (dB)	Corr. Amp. (dBuV/m)	FCC Part 15.249		
										Limit (dBuV/m)	Margin (dB)	Comment
908.40	87.79	AV	45	1.0	H	22.90	3.55	26.44	87.80	94.00	6.20	Fundamental
908.40	84.09	AV	90	1.2	V	22.90	3.55	26.44	84.10	94.00	9.90	Fundamental
908.40	90.79	PK	180	1.2	H	22.90	3.55	26.44	90.80	114.00	23.20	Fundamental
908.40	87.09	PK	45	1.2	V	22.90	3.55	26.44	87.10	114.00	26.90	Fundamental

Above 1000MHz

Frequency (MHz)	Meter Reading (dBuV)	Detector PK/QP/AV	Direction Degree	Height (m)	Polar H / V	Antenna Factor (dB/m)	Cable loss (dB)	Amplifier Gain (dB)	Corr. Amp. (dBuV/m)	FCC Part 15.209 & 15.249		
										Limit (dBuV/m)	Margin (dB)	Comment
Above 1000MHz												
1354.00	46.40	AV	60	1	V	25.2	2.65	35.7	38.55	54	15.45	Spurious
2725.20	37.60	AV	45	1.2	H	28.4	4.4	33.4	37.00	54	17.00	Harmonic
1204.00	42.57	AV	75	1.1	V	24.8	2.5	35.8	34.07	54	19.93	Spurious
2725.20	33.90	AV	45	1.2	V	28.4	4.4	33.4	33.30	54	20.70	Harmonic
1816.80	37.57	AV	180	1.2	V	27.1	2.82	35.0	32.49	54	21.51	Harmonic
1881.30	37.00	AV	135	1.5	H	27.2	2.82	35.1	31.92	54	22.08	Spurious
1816.80	36.57	AV	180	1.2	H	27.1	2.82	35.0	31.49	54	22.51	Harmonic
1333.00	37.30	AV	135	1	V	25.1	2.65	35.7	29.35	54	24.65	Spurious
2725.20	47.73	PK	180	1.2	V	28.4	4.4	33.4	47.13	74	26.87	Harmonic
2725.20	47.50	PK	180	1.2	H	28.4	4.4	33.4	46.90	74	27.10	Harmonic
1333.00	53.70	PK	60	1	V	25.1	2.65	35.7	45.75	74	28.25	Spurious
1095.00	35.73	AV	135	1	H	24.6	1.19	35.9	25.62	54	28.38	Spurious
1354.00	53.23	PK	45	1.2	V	25.2	2.65	35.7	45.38	74	28.62	Spurious
1881.30	49.73	PK	60	1.5	H	27.2	2.82	35.1	44.65	74	29.35	Spurious
1816.80	49.23	PK	45	1.2	V	27.1	2.82	35	44.15	74	29.85	Harmonic
1204.00	51.90	PK	92	1.1	V	24.8	2.5	35.8	43.40	74	30.60	Spurious
1816.80	47.73	PK	45	1.2	H	27.1	2.82	35	42.65	74	31.35	Harmonic
1095.00	50.40	PK	60	1	H	24.6	1.19	35.9	40.29	74	33.71	Spurious

§15.249(d) – OUT OF BAND EMISSIONS

Standard Applicable

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set the RBW to 10 kHz and VBW of spectrum analyzer to 30 kHz with a convenient frequency span including the specified frequencies of band edges.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2006-09-29	2007-09-29

* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

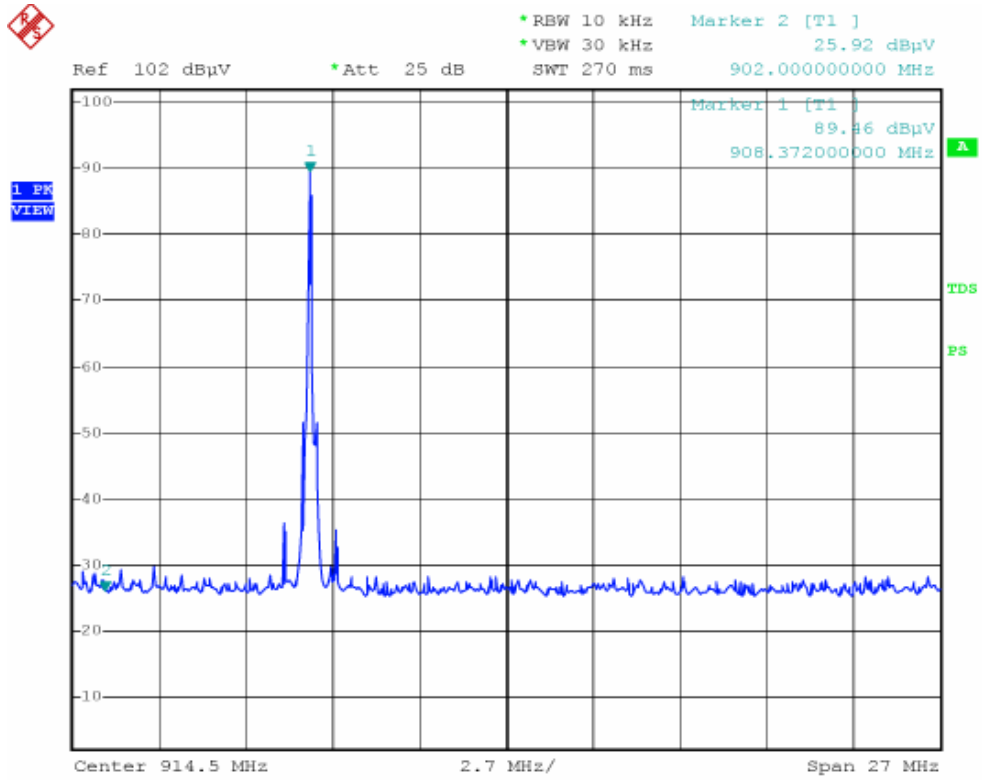
Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	53%
ATM Pressure:	1009mbar

The testing was performed by Merry Zhao on 2007-01-31.

Test Mode: Transmitting

Test Result: Pass, please refer to the plots.

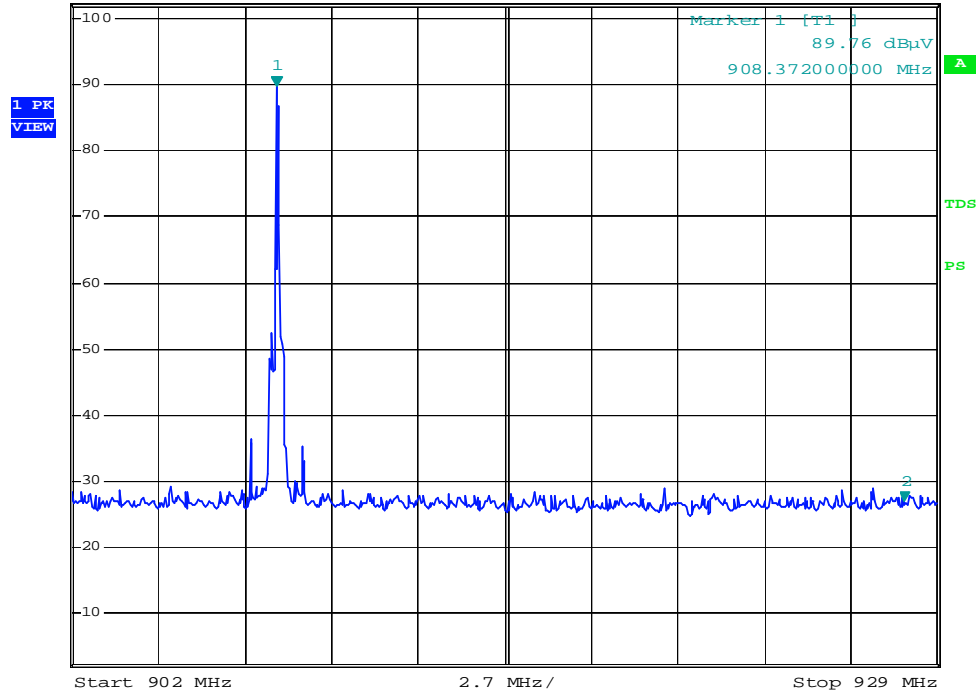


Copper RFUSB controller out of band emission-left

Date: 31.JAN.2007 11:07:35



Ref 102 dBμV *Att 25 dB *RBW 10 kHz Marker 2 [T1]
*VSW 30 kHz 26.82 dBμV
SWT 270 ms 928.00000000 MHz



Copper RFUSB controller out of band emission-right

Date: 31.JAN.2007 11:05:42