

TEST REPORT

For

ZTE Corporation

ZTE Plaza, Hi-Tech, Industrial Park, Nanshan District,
Shenzhen, Guangdong, China

FCC PART 15.247

FCC ID: Q78-ZXDSL931WII

Report Type: Class II Permissive Change	Product Type: VDSL CPE
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Report Number: RSZ110715001-00A1-247	
Report Date: 2011-08-05	
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* This report contains data that are not covered by the NVLAP accreditation and are marked with an asterisk "★" (Rev.2)

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *ZTE Corporation's* product, model number: *ZXDSL 931WIIB (FCC ID: Q78-ZXDSL931WII)* or the "EUT" as referred to in this report is a *VDSL CPE*, which measures approximately: 21.2 cm (L) x 4.9 cm (W) x 18.8 cm (H), rated input voltage: DC 12V adapter.

Adapter 1 information:

Model: MSP-C2000IC12.0-24W-US;

Input: AC 100-240V 50/60 Hz 0.8A Max;

Output: DC 12.0V 2A.

Adapter 2 information:

Model: CP5024120200U;

Input: AC 100-240V 50/60 Hz 0.55A;

Output: DC 12.0V 2A.

All measurement and test data in this report was gathered from production sample serial number: E40KB5F00016 (Assigned by Applicant). The EUT was received on 2011-07-15.

Objective

This Type approval report is prepared on behalf of *ZTE Corporation* in accordance with Part 2, Subpart J, 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 15.247 rules.

This is the CIIPC application of the device. The difference between the original device and the current one is as follows:

Part	Original	New
Adding a Adapter	Adapter: Model: MSP-C2000IC12.0-24W-US; Input: AC 100-240V 50/60 Hz 0.8A Max; Output: DC 12.0V 2A.	Adapter 1: Model: MSP-C2000IC12.0-24W-US; Input: AC 100-240V 50/60 Hz 0.8A Max; Output: DC 12.0V 2A. Adapter 2: Model: CP5024120200U; Input: AC 100-240V 50/60 Hz 0.55A; Output: DC 12.0V 2A.
Adding a WAN Port	No WAN Port	Adding a WAN Port

For the changes made to the device, the Conducted Emissions and Radiated Emissions below 1 GHz were performed.

Related Submittal(s)/Grant(s)

Part 15 B JBP submission with FCC ID: Q78-ZXDSL931WII.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2009, 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 emissions measurement was performed and Bay Area Compliance Laboratories 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 Laboratories 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 Laboratories 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 December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

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 Laboratories Corp. (Shenzhen) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



The current scope of accreditations can be found at <http://ts.nist.gov/Standards/scopes/2007070.htm>

SYSTEM TEST CONFIGURATION

Description of Test Configuration

For 802.11b and 802.11g & 802.11n-HT20 mode, 11 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437	/	/

EUT was tested with Channel 1, 6 and 11.

For 802.11n-HT40 mode, EUT was tested with Channel 3, 6 and 9.

The worst-case data rates are determined to be as follows for each mode based upon investigation by measuring the average power and PSD across all data rates bandwidths, and modulations.

EUT Exercise Software

ART_RUN.

Equipment Modifications

No modification was made to the unit tested.

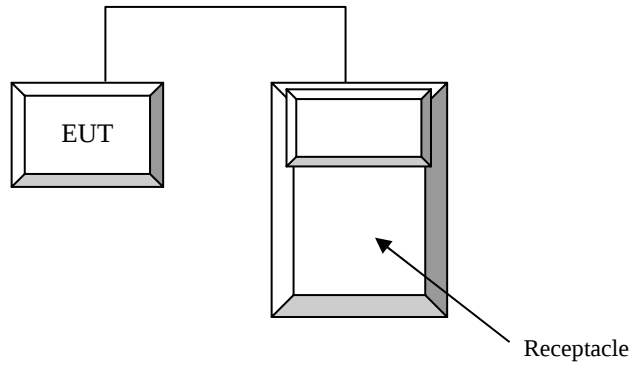
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
DELL	Laptop	D600	00045-438-852-864	DoC

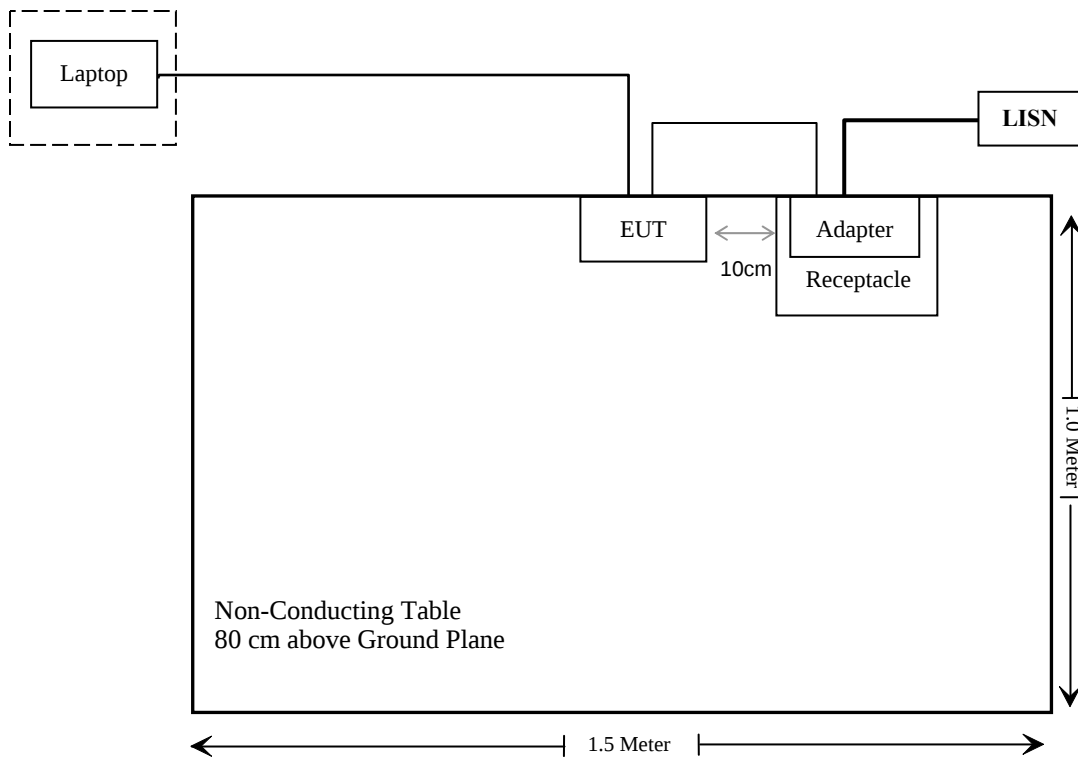
External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded detachable Power Line	1.5	Adapter	EUT

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §2.1091	Maximum Permissible exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance*
§15.207 (a),	AC Line Conducted Emissions	Compliance
§15.247(d)	Spurious Emissions at Antenna Port	Compliance*
§15.205, §15.209, §15.247(d)	Spurious Emissions & Restricted Band of Operation	Compliance
§15.247 (a)(2)	6 dB Bandwidth	Compliance*
§15.247(b)(3)	Maximum Peak Output Power	Compliance*
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance*
§15.247(e)	Power Spectral Density	Compliance*

Note: * Please refer to the report number RSZ10121605-247 granted on 2011-02-17, with
FCC ID: Q78-ZXDSL931WII.

FCC §15.247(i) & §2.1091 - RF EXPOSURE INFORMATION

Applicable Standards

According to FCC §15.247(i) and subpart §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density;

MPE Calculation

MPE is calculated at a given distance

$$S = PG/4\pi R^2$$

Where: S= power density (in appropriate units, e.g. mW/cm²);

P = power input to the antenna (in appropriate units, e.g., mW);

G = gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Radio Mode	Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
802.11b	2462	4.5	2.82	18.44	69.82	20	0.0392	1.0
802.11g	2412	4.5	2.82	15.26	33.57	20	0.0188	1.0

Radio Mode	Frequency (MHz)	Antenna Port	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
			(dBi)	(numeric)	(dBm)	(mW)			
802.11n-HT20	2462	1	4.5	2.82	15.33	34.12	20	0.034	1.0
		2	3.3	2.14	15.38	34.51			
802.11n-HT420	2452	1	4.5	2.82	15.41	34.75	20	0.034	1.0
		2	3.3	2.14	15.20	33.11			

Result: The device meets MPE limit at 20 cm distance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

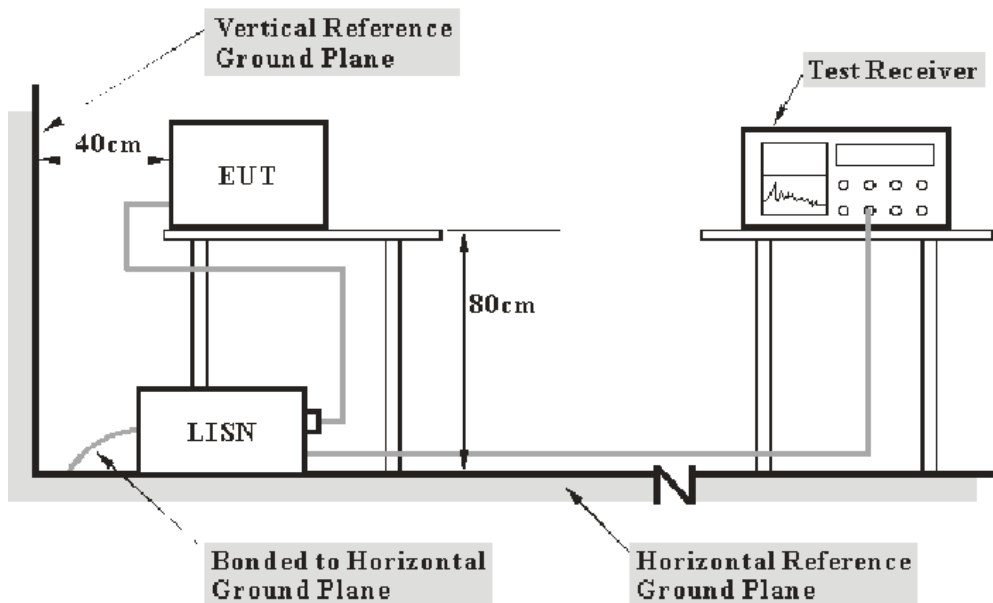
FCC §15.207

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 spacing between the peripherals was 10 cm.

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

EMI Test Receiver Setup

The EMI 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>IF B/W</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	830245/006	2011-03-03	2012-03-02
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2011-03-09	2012-03-08

* **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 adapter was connected to 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:

17.03 dB at 27.120 MHz in the **Line** conductor mode for Adapter 1

10.35 dB at 0.155 MHz in the **Neutral** conductor mode for Adapter 2

Test Data

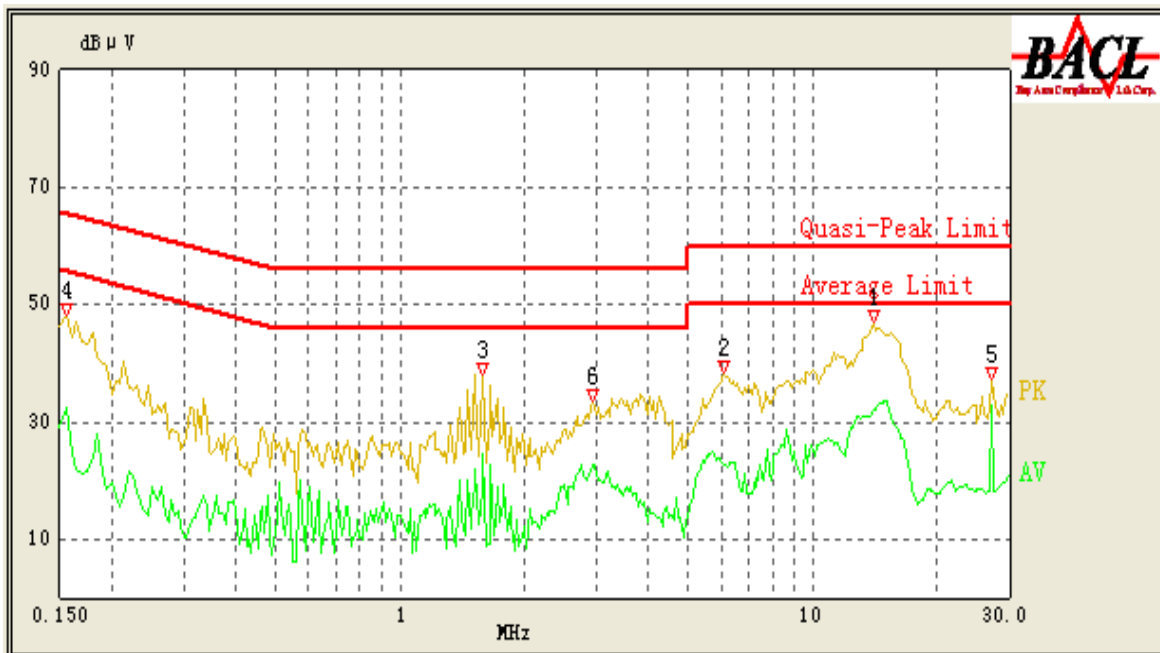
Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Eric Lee on 2011-07-22.

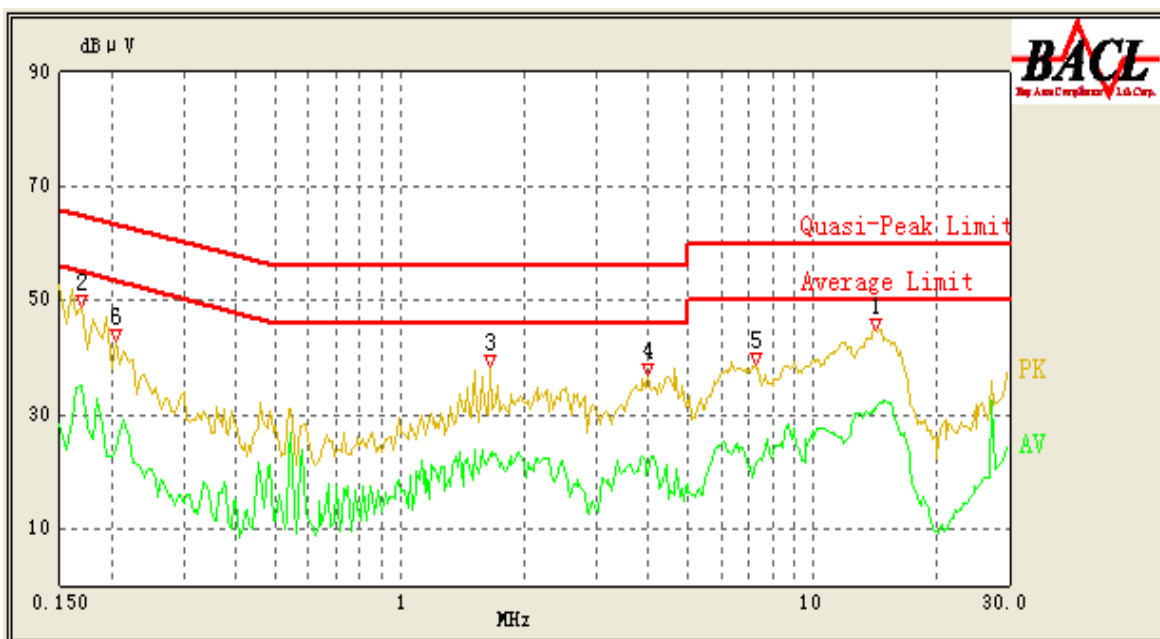
Test Mode: Transmitting (Worst case for Adapter 1)

AC 120 V/60 Hz, Line



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Cord. Result (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/ QP /Ave)
27.120	32.97	10.10	50.00	17.03	Ave
14.085	32.16	10.10	50.00	17.84	Ave
1.590	24.49	10.10	46.00	21.51	Ave
14.090	37.95	10.10	60.00	22.05	QP
1.590	32.73	10.10	56.00	23.27	QP
0.155	32.56	10.10	55.86	23.30	Ave
2.935	22.69	10.10	46.00	23.31	Ave
0.155	39.63	10.10	65.86	26.23	QP
27.120	33.62	10.10	60.00	26.38	QP
6.050	23.11	10.10	50.00	26.89	Ave
2.925	27.13	10.10	56.00	28.87	QP
6.105	29.53	10.10	60.00	30.47	QP

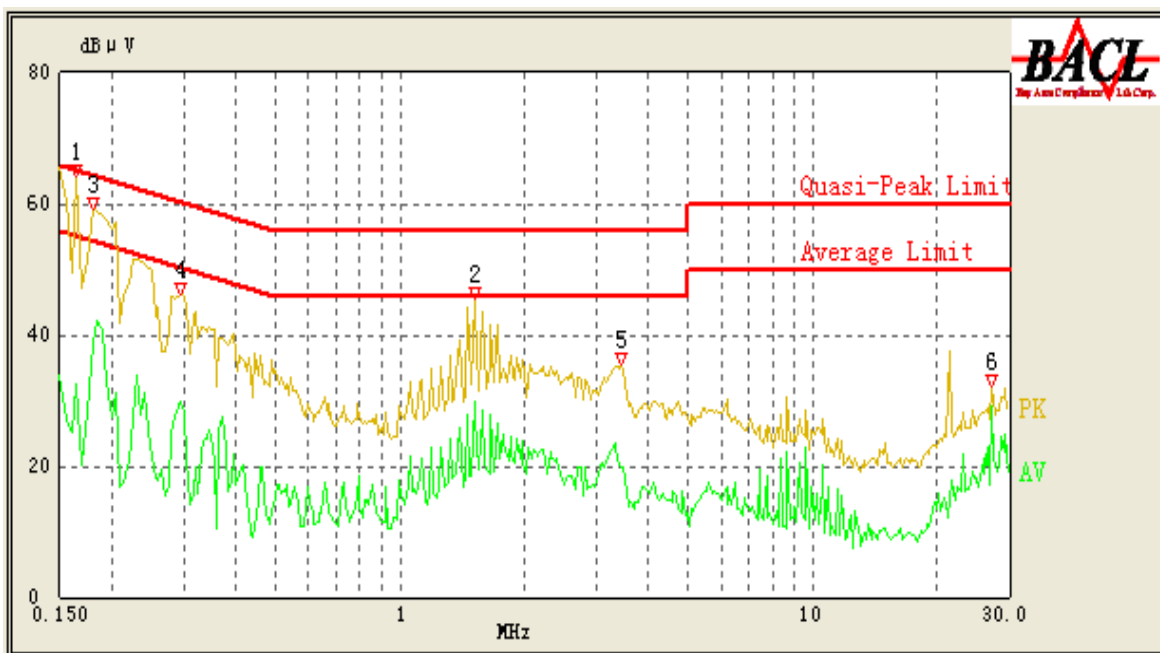
AC 120 V/ 60 Hz, Neutral



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Cord. Result (dB μ V)	Correction Factor (dB)	Limit (dB μ V)	Margin (dB)	Detector (PK/ QP /Ave)
14.130	30.68	10.10	50.00	19.32	Ave
0.170	35.02	10.10	55.43	20.41	Ave
1.670	23.33	10.10	46.00	22.67	Ave
1.655	31.91	10.10	56.00	24.09	QP
14.240	35.59	10.10	60.00	24.41	QP
0.170	40.94	10.10	65.43	24.49	QP
0.205	39.29	10.10	64.43	25.14	QP
3.995	29.33	10.10	56.00	26.67	QP
3.960	19.28	10.10	46.00	26.72	Ave
7.280	21.47	10.10	50.00	28.53	Ave
0.205	23.72	10.10	54.43	30.71	Ave
7.315	27.22	10.10	60.00	32.78	QP

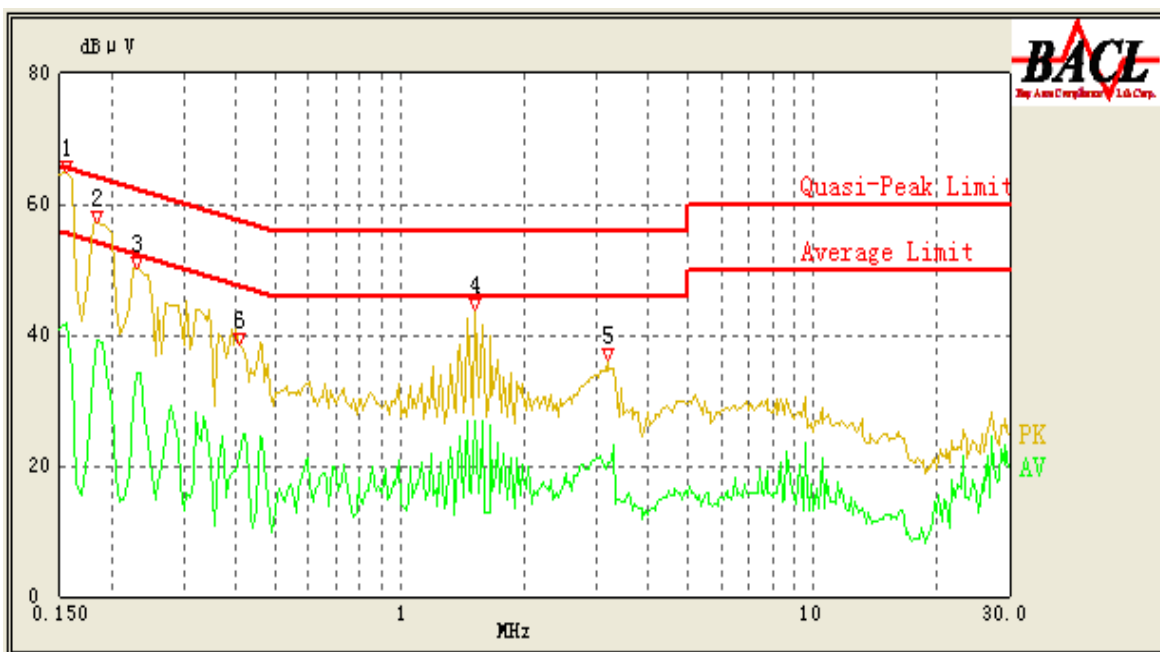
Test Mode: Transmitting (Worst case for Adapter 2)

AC 120 V/60 Hz, Line



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Cord. Result (dB μ V)	Correction Factor (dB)	Limit (dB μ V)	Margin (dB)	Detector (PK/ QP /Ave)
0.180	52.66	10.10	65.14	12.48	QP
1.520	43.49	10.10	56.00	12.51	QP
1.520	29.76	10.10	46.00	16.24	Ave
0.180	38.84	10.10	55.14	16.30	Ave
0.165	48.34	10.10	65.57	17.23	QP
27.120	29.05	10.10	50.00	20.95	Ave
0.295	29.70	10.10	51.86	22.16	Ave
0.165	32.55	10.10	55.57	23.02	Ave
0.295	36.01	10.10	61.86	25.85	QP
3.430	19.69	10.10	46.00	26.31	Ave
27.120	31.72	10.10	60.00	28.28	QP
3.425	27.45	10.10	56.00	28.55	QP

AC 120 V/ 60 Hz, Neutral



Conducted Emissions			FCC Part 15.207		
Frequency (MHz)	Cord. Result (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/ QP /Ave)
0.155	55.51	10.10	65.86	10.35	QP
0.185	54.45	10.10	65.00	10.55	QP
0.155	41.68	10.10	55.86	14.18	Ave
1.520	40.36	10.10	56.00	15.64	QP
0.185	39.33	10.10	55.00	15.67	Ae
0.230	46.96	10.10	63.71	16.75	QP
1.520	26.87	10.10	46.00	19.13	Ave
0.230	34.30	10.10	53.71	19.41	Ave
3.180	20.59	10.10	46.00	25.41	Ave
0.410	33.10	10.10	58.57	25.47	QP
0.410	21.41	10.10	48.57	27.16	Ave
3.180	26.84	10.10	56.00	29.16	QP

FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS & RESTRICTED BAND OF OPERATION

Applicable Standard

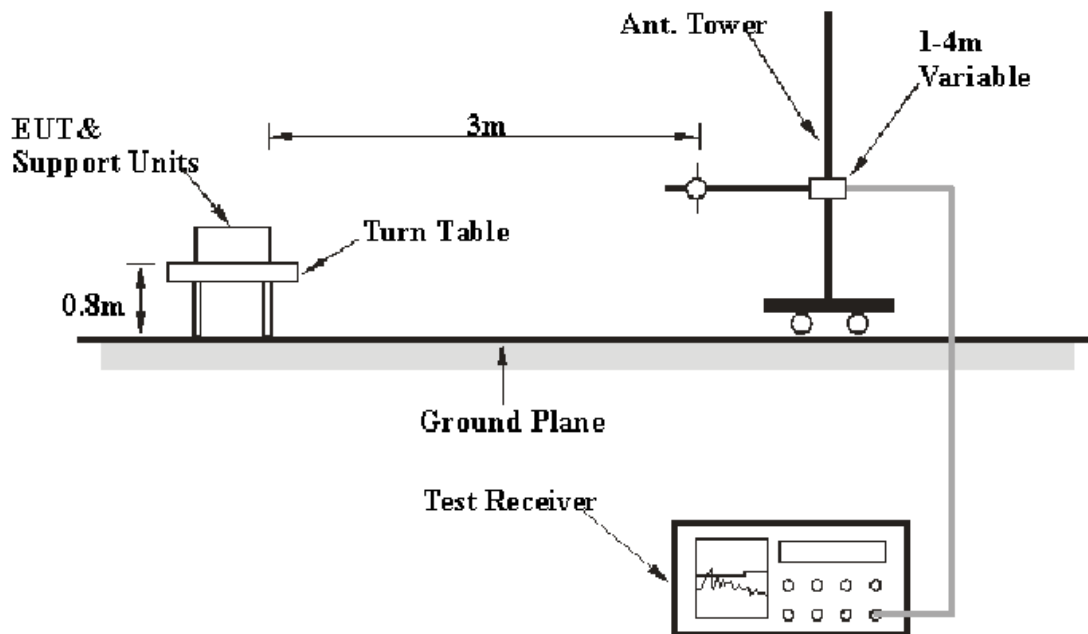
FCC §15.247 (d); §15.209; §15.205.

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 Laboratories Corp. (Shenzhen) is +4.0 dB.

EUT Setup



The radiated emission tests were performed in the 3 meters chamber B test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209, and FCC 15.247 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 adapter was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

<i>Frequency Range</i>	<i>RBW</i>	<i>Video B/W</i>	<i>Detector</i>
30 MHz – 1000 MHz	100 kHz	300 kHz	QP
1000 MHz – 25 GHz	1 MHz	3 MHz	PK
1000 MHz – 25 GHz	1 MHz	10 Hz	Ave

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447D	2944A09795	2010-08-02	2011-08-02
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-24	2011-11-24
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2011-03-11	2012-03-11
Mini-Circuits	Amplifier	ZVA-213+	T-E27H	2011-03-08	2012-03-08
Sunol Sciences	Horn Antenna	DRH-118	A052604	2011-05-05	2012-05-04
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2011-07-08	2012-07-08

* **Statement of Traceability:** Bay Area Compliance Laboratories 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 adapter 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.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1GHz and peak and Average detection modes for frequencies above 1GHz.

Corrected Amplitude & Margin Calculation

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

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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 limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.109, 15.209 and 15.247, with the worst margin reading of:

30 -1000 MHz:

0.3 dB at 625.006750 MHz in the **Vertical** polarization for Adapter 1

0.8 dB at 625.006000 MHz in the **Vertical** polarization for Adapter 2

Test Data

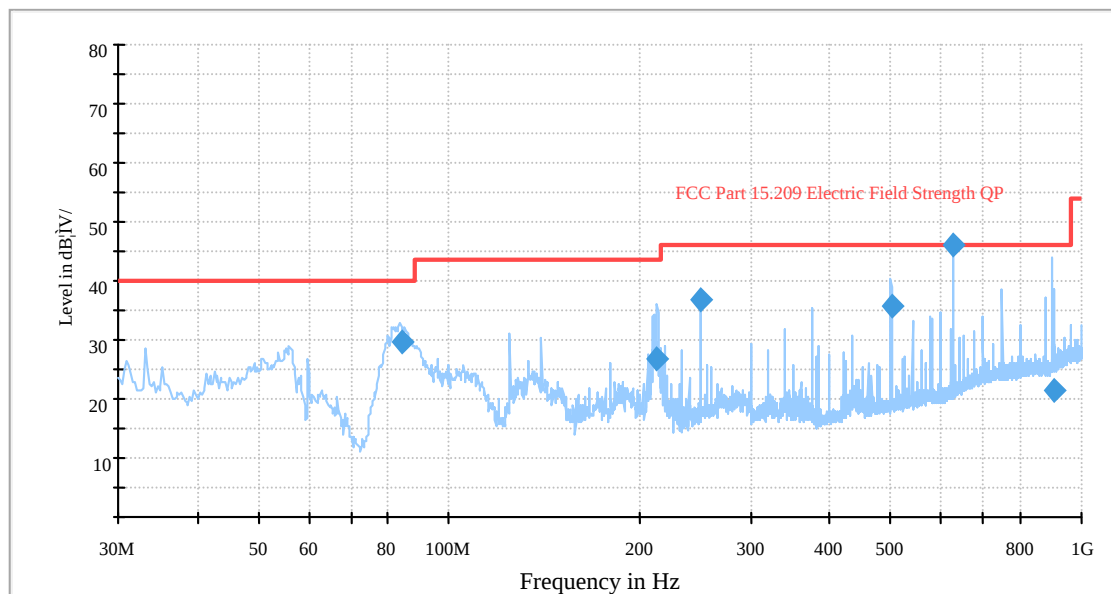
Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Eric Zhang on 2011-07-29.

30-1000 MHz:*Test Mode: Transmitting (worst case for Adapter 1)*

Auto Test (FCC 15.209)

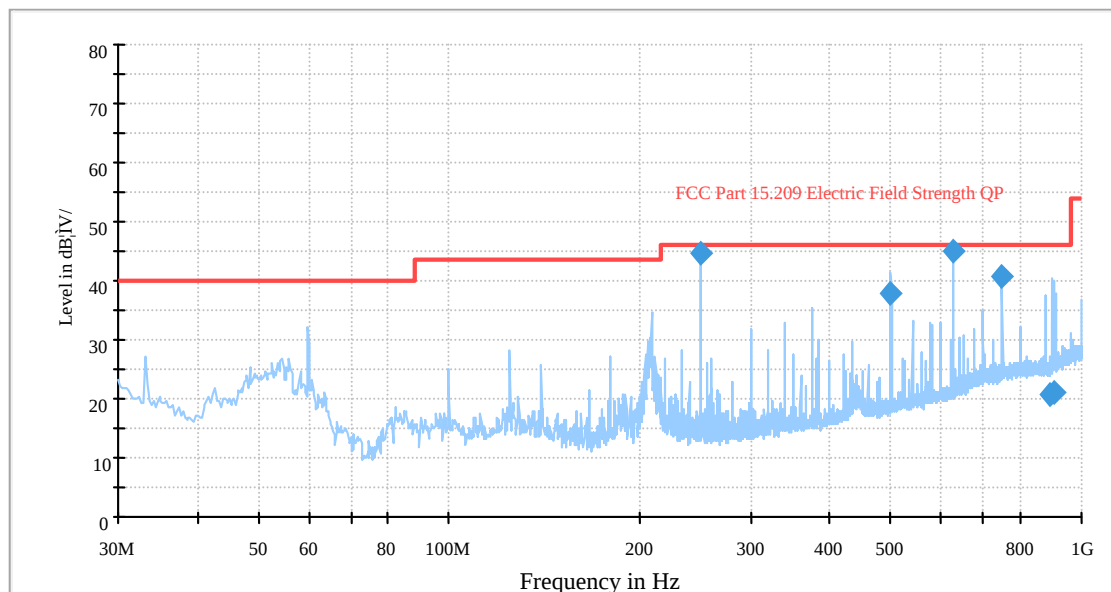


Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (degree)	Correction Factor (dB)	Limit (dBμV/m)	Margin (dB)
625.006750	45.7	119.0	V	173.0	-5.7	46.0	0.3*
249.431250	36.8	133.0	V	214.0	-13.6	46.0	9.2
500.552000	35.8	221.0	H	219.0	-8.4	46.0	10.2
84.597750	29.6	212.0	V	8.0	-17.8	40.0	10.4
213.112250	26.8	251.0	V	179.0	-14.1	43.5	16.7
907.365750	21.3	287.0	V	314.0	-0.6	46.0	24.7

*Within measurement uncertainty.

Test Mode: Transmitting (worst case for Adapter 2)

Auto Test (FCC 15.209)



Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (degree)	Correction Factor (dB)	Limit (dBμV/m)	Margin (dB)
625.006000	45.2	99.0	V	132.0	-5.7	46.0	0.8*
249.997500	44.6	99.0	V	163.0	-13.5	46.0	1.4*
750.012750	40.7	119.0	H	23.0	-2.4	46.0	5.3
499.994250	37.8	99.0	V	347.0	-8.4	46.0	8.2
906.971250	21.1	201.0	H	94.0	-0.6	46.0	24.9
894.870500	20.8	221.0	H	21.0	-1.0	46.0	25.2

*Within measurement uncertainty.

***** END OF REPORT *****