FCC PART 15, CLASS B

TEST REPORT

For

X-Z LAB, INC.

2440 Camino Ramon, Suite 264 San Ramon, CA 94583

FCC ID: 2AC7P-111

Report Type:	Product Type:
Original Report	RadPavise

Test Engineer:	Allen Tian
Report Number:	RKS141106002-00A
Report Date:	2014-11-10
Reviewed By:	Jesse huang EMC Manager
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *X-Z LAB, INC.*'s product, model number: RadPavise (FCC ID: 2AC7P-111) or the "EUT" in this report was a RadPavise, which was measured approximately: 113 mm (L) x70 mm (W) x 24 mm (H), rated with input voltage: DC 4 V rechargeable Li-ion battery. The highest operating frequency is 8 MHz.

**All measurement and test data in this report was gathered from production sample serial number: 000032 (Assigned by the BACL, (Kunshan). The EUT supplied by the applicant was received on 2014-10-31*

Objective

This test report is prepared on behalf of X-Z LAB, INC in accordance with Part 2-Subpart J, Part 15-Subparts A and B of the Federal Communication Commissions rules.

The objective of the manufacturer is to determine the compliance of the EUT with FCC Part 15 B.

Related Submittal(s)/Grant(s)

N/A

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the Chenghu Luke Eoad, Kunshan Development Zone No.248, Kunshan, Jiangsu, China

Test site at Bay Area Compliance Laboratories Corp. (Kunshan) 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 06, 2014. 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.: 815570. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a manufacturer testing fashion.

EUT operation mode: Downloading (data transfer with computer)

EUT Exercise Software

“sscom42.exe” exercise software was used.

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

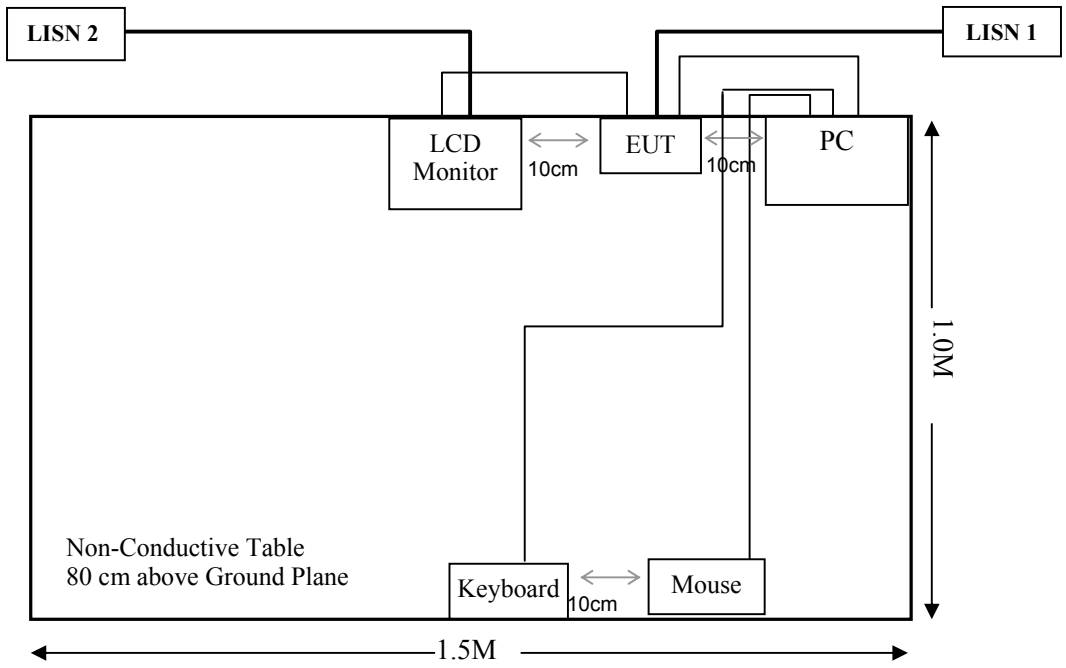
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	PC	OPTIPLEX GX620	HB82W81
ViewSonic	LCD Monitor	VLCDS23895-3W	A1D030300468
iMicro	Keyboard	KB-BL619EB	IMKH012071013088
iMicro	Mouse	MO-1008BU	IMBT012082301098
Motorola	USB Cable	N/A	N/A

External I/O Cable

Cable Description	Length (m)	From/Port	To
Unshielding Detachable USB Cable	1.0	EUT	PC

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.107	AC Line Conducted Emissions	Compliance
§15.109	Radiated Spurious Emissions	Compliance

FCC §15.107 – AC LINE CONDUCTED EMISSIONS

Applicable Standard

According to FCC §15.107

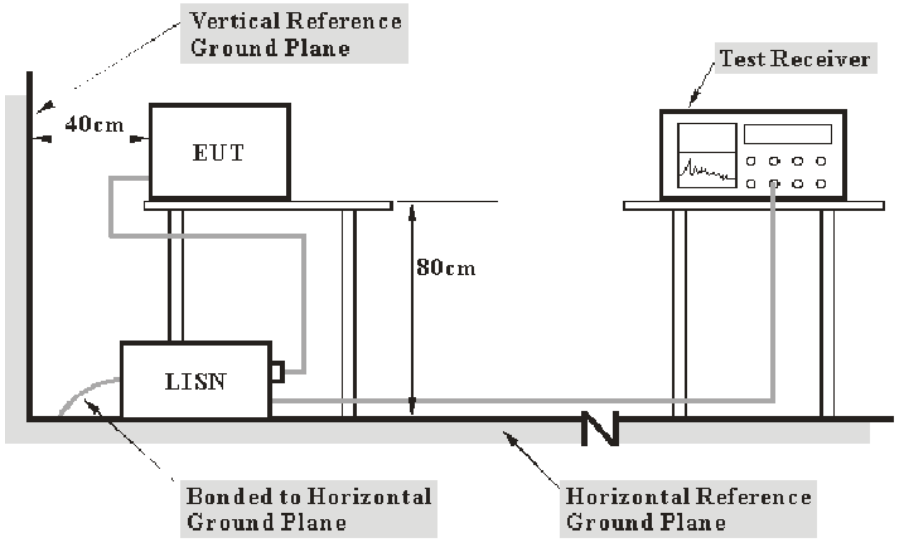
Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements maybe receiver reading, attenuation of the connection between LISN/ISN and receiver, LISN/ISN voltage division factor, LISN/ISN VDF frequency interpolation and receiver related input quantities, etc.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of conducted disturbance test at Bay Area Compliance Laboratories Corp. (Kunshan) is shown as below. And the uncertainty will not be taken into consideration for the test data recorded in the report

Port	Expanded Measurement uncertainty
AC Mains	3.26 dB (k=2, 95% level of confidence)
CAT 3	3.70 dB (k=2, 95% level of confidence)
CAT 5	3.86 dB (k=2, 95% level of confidence)
CAT 6	4.64 dB (k=2, 95% level of confidence)

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 measurement procedure of EUT setup is according with per ANSI C63.4-2009. The related limit was specified in FCC Part 15.107 Class B.

The spacing between the peripherals was 10 cm.

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

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

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:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the host PC was connected to the first LISN and the other relevant equipments were conncected to the second 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	831294/005	2014-09-16	2015-09-16
Rohde & Schwarz	LISN	ESH2-Z5	12008	2014-09-16	2015-09-16
Rohde & Schwarz	LISN	ESH2-Z5	12005	2014-09-16	2015-09-16
Rohde & Schwarz	CE Test software	EMC 32	V 09.10.0	--	--

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN/ISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Correction Factor = LISN VDF + Cable Loss + Transient Limiter Attenuation

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

Margin = Limit – Corrected Amplitude

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.107, with the worst margin reading of:

16.44 dB at 0.246000 MHz in the **Line** conducted mode

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in complies with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

in BACL., $U_{(Lm)}$ is less than U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

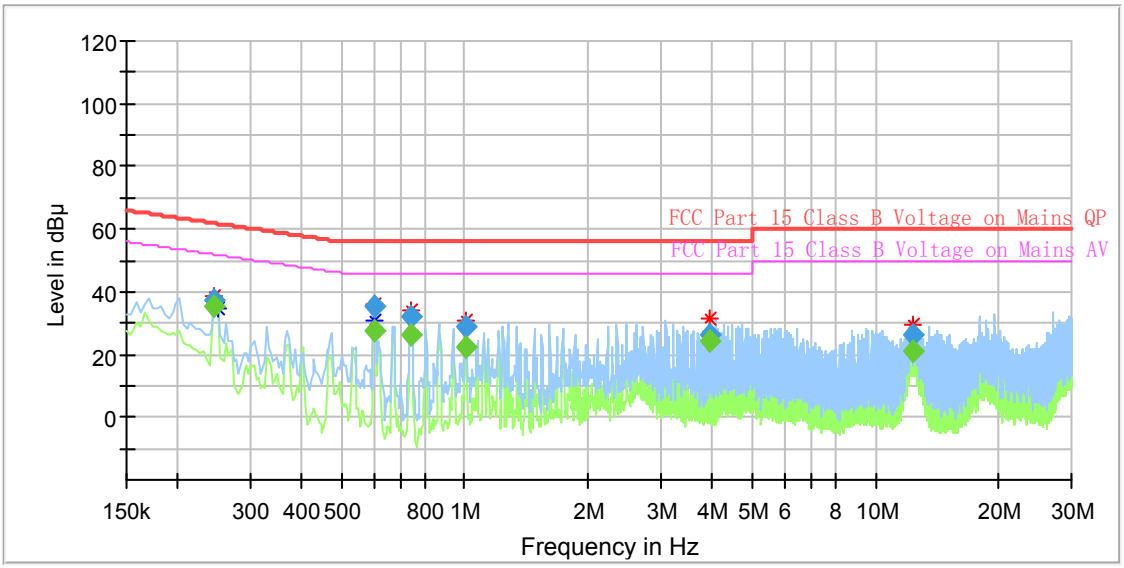
Environmental Conditions

Temperature:	27℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Allen.tian on 2014-11-03

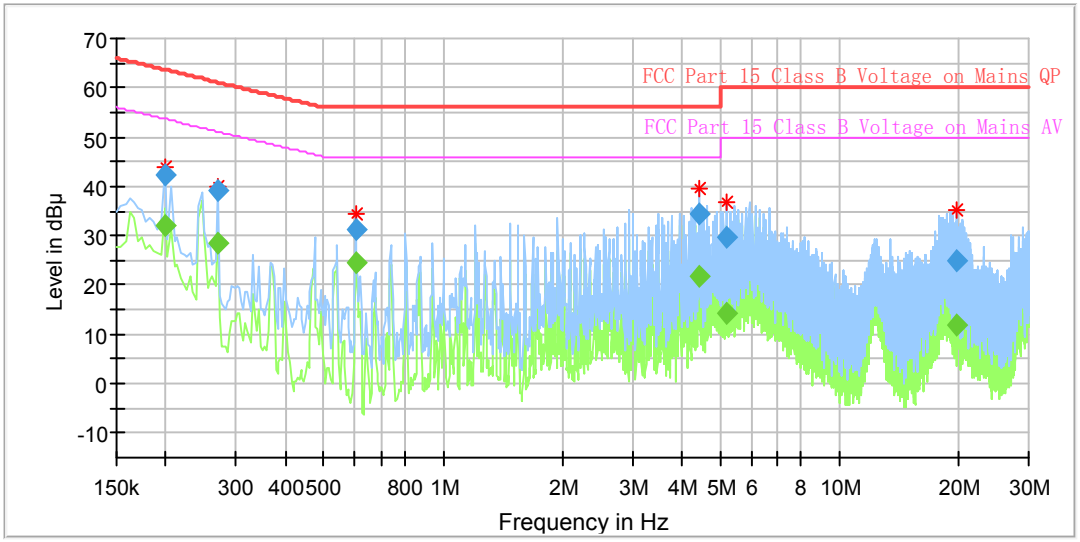
EUT Operation Mode: Downloading

AC 120V/60 Hz, Line



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.246000	---	35.45	51.89	16.44	L1	3.1
0.246000	37.20	---	61.89	24.69	L1	3.1
0.602000	---	27.42	46.00	18.58	L1	3.2
0.602000	35.15	---	56.00	20.85	L1	3.2
0.738000	---	26.48	46.00	19.52	L1	3.2
0.738000	31.94	---	56.00	24.06	L1	3.2
1.006000	---	22.45	46.00	23.55	L1	3.3
1.006000	28.89	---	56.00	27.11	L1	3.3
3.958000	---	24.07	46.00	21.93	L1	3.5
3.958000	26.45	---	56.00	29.55	L1	3.5
12.350000	---	20.73	50.00	29.27	L1	3.7
12.350000	26.34	---	60.00	33.66	L1	3.7

AC 120V/60 Hz, Neutral



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.198000	---	32.07	53.69	21.62	N	3.0
0.198000	42.33	---	63.69	21.36	N	3.0
0.270000	---	28.42	51.12	22.70	N	3.1
0.270000	39.10	---	61.12	22.02	N	3.1
0.602000	---	24.67	46.00	21.33	N	3.2
0.602000	31.14	---	56.00	24.86	N	3.2
4.430000	---	21.88	46.00	24.12	N	3.5
4.430000	34.48	---	56.00	21.52	N	3.5
5.174000	---	14.12	50.00	35.88	N	3.5
5.174000	29.86	---	60.00	30.14	N	3.5
19.714000	---	11.93	50.00	38.07	N	3.8
19.714000	24.97	---	60.00	35.03	N	3.8

Note:
1) Correction Factor =LISN VDF (Voltage Division Factor) + Cable Loss + Transient Limiter Attenuation
The corrected factor has been input into the transducer of the test software.
2) Corrected Amplitude = Reading + Correction Factor
3) Margin = Limit – Corrected Amplitude

FCC §15.109 - RADIATED SPURIOUS EMISSIONS

Applicable Standard

FCC §15.109

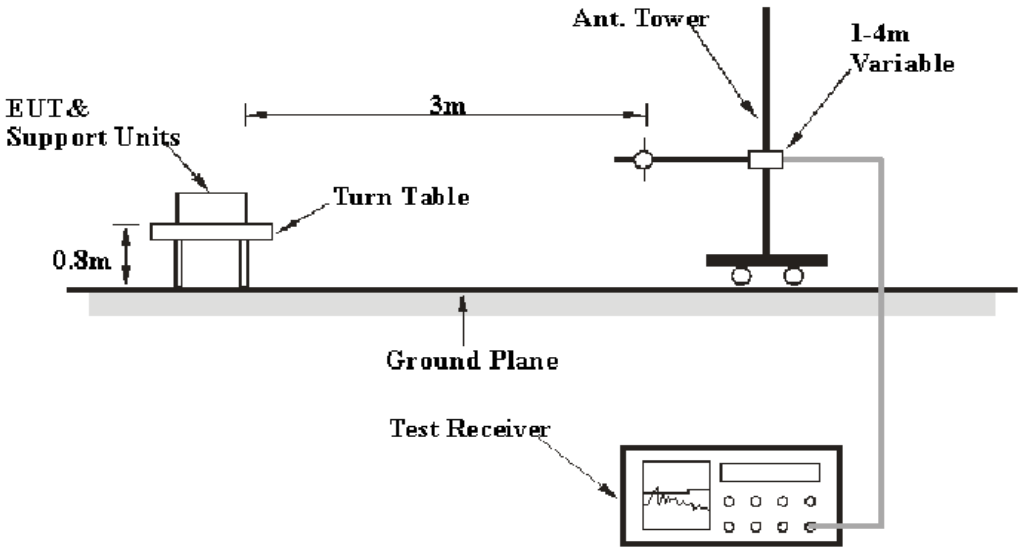
Measurement Uncertainty

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 CISPR 16-4-2:2011, the expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Kunshan) is shown in below table. And the uncertainty will not be taken into consideration for the test data recorded in the report

Frequency	Polarity	Measurement uncertainty
30 MHz~200 MHz	Horizontal	4.62 dB (k=2, 95% level of confidence)
	Vertical	4.54 dB (k=2, 95% level of confidence)
200 MHz~1 GHz	Horizontal	4.84 dB (k=2, 95% level of confidence)
	Vertical	5.91 dB (k=2, 95% level of confidence)
1 GHz~6 GHz	Horizontal/Vertical	4.68 dB (k=2, 95% level of confidence)
Above 6 GHz	Horizontal/Vertical	4.92 dB (k=2, 95% level of confidence)

EUT Setup



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC Part 15.109 Class B 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 to1 GHz.

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

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

Test Procedure

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

All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sonoma Instrunent	Amplifier	330	171377	2014-09-16	2015-09-16
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2014-09-16	2015-09-16
Sunol Sciences	Broadband Antenna	JB3	A090314-1	2014.09.12	2015-09-12
ETS	Horn Antenna	3115	6229	2014.09.12	2015-09-12
Rohde & Schwarz	Signal Analyzer	FSIQ26	100048	2014.09.16	2015-09-16
Mini	Pre-amplifier	ZVA-183-S+	857001418	2014-09-16	2015-09-16
champrotek	Chamber	Chamber A	1#	2014-09-17	2015-09-17
R&S	Auto test Software	EMC32	V 09.10.0	-	-

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

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:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

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

Margin = Limit – Corrected Amplitude

Test Results Summary

According to the data in the following table, the EUT complied with the FCC §15.109 Class B, with the worst margin reading of:

11.90 dB at 400.540000 MHz in the **Horizontal** polarization mode

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL, $U_{(Lm)}$ is less than U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

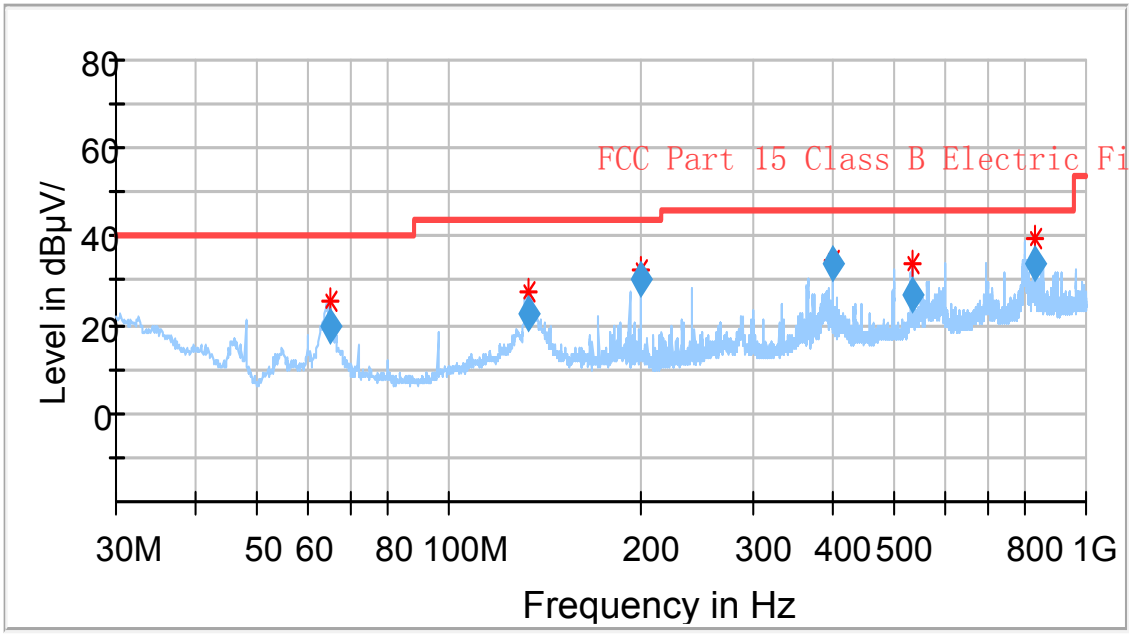
Environmental Conditions

Temperature:	27 ℃
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Allen.tian on 2014-11-03

EUT Operation Mode: Downloading

30MHz ~ 1GHz



Frequency (MHz)	QuasiPeak (dBV/m)	Limit (dBV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarity	Azimuth (deg)	Corrected Factor (dB)
64.920000	19.63	40.00	20.37	1.0	120.000	301.0	H	319.0	-16.5
132.820000	22.45	43.50	21.05	1.0	120.000	99.0	V	256.0	-10.8
200.235000	30.50	43.50	13.00	1.0	120.000	200.0	H	152.0	-11.5
400.540000	34.10	46.00	11.90	1.0	120.000	201.0	V	310.0	-7.8
532.581250	26.54	46.00	19.46	1.0	120.000	99.0	V	27.0	-5.2
833.523750	33.61	46.00	12.39	1.0	120.000	301.0	H	8.0	-1.4

Note:
1) Correction Factor=Antenna factor (RX) + cable loss – amplifier factor
2) Corrected Amplitude = Correction Factor + Reading
3) Margin = Limit - Corrected Amplitude

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