

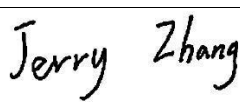
FCC PART 15 B TEST REPORT

For

Gouldin Technologies, LLC

2150 Chenault Dr. Carrollton, Texas 75006 United States

FCC ID: 2AOQ7-WP450

Report Type: Original Report	Product Type: Watchman
Report Number:	RXM180103051-00
Report Date:	2018-02-05
Reviewed By:	Jerry Zhang EMC Manager 
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

EUT Name:	Watchman
EUT Model:	WP450
FCC ID:	2AOQ7-WP450
Rated Input Voltage:	DC 12V or PoE
External Dimension:	Length (156mm)*Width (140mm)*High (302mm)
Serial Number:	180103051
EUT Received Date:	2018.01.03
The Highest operation frequency	399MHz

Objective

This test report is prepared on behalf of **Gouldin Technologies, LLC** in accordance with Part 2, Subpart J, and Part 15-Subparts A and B of the Federal Communications Commission's rules.

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

Related Submittal(s)/Grant(s)

N/A

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, 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 Laboratories Corp. (Dongguan).

Measurement Uncertainty

Parameter	Measurement Uncertainty
Unwanted Emissions, radiated	30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical 1G~6GHz: 4.45 dB, 6G~13GHz: 5.23 dB
Temperature	$\pm 1^{\circ}\text{C}$
Humidity	$\pm 5\%$
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062D.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in following mode:

Test Mode	M1	Adapter supply&talking
	M2	PoE supply&talking

EUT Exercise Software

No EUT software for testing.

Equipment Modifications

No modification was made to the EUT tested.

Local Support Equipment List and Details

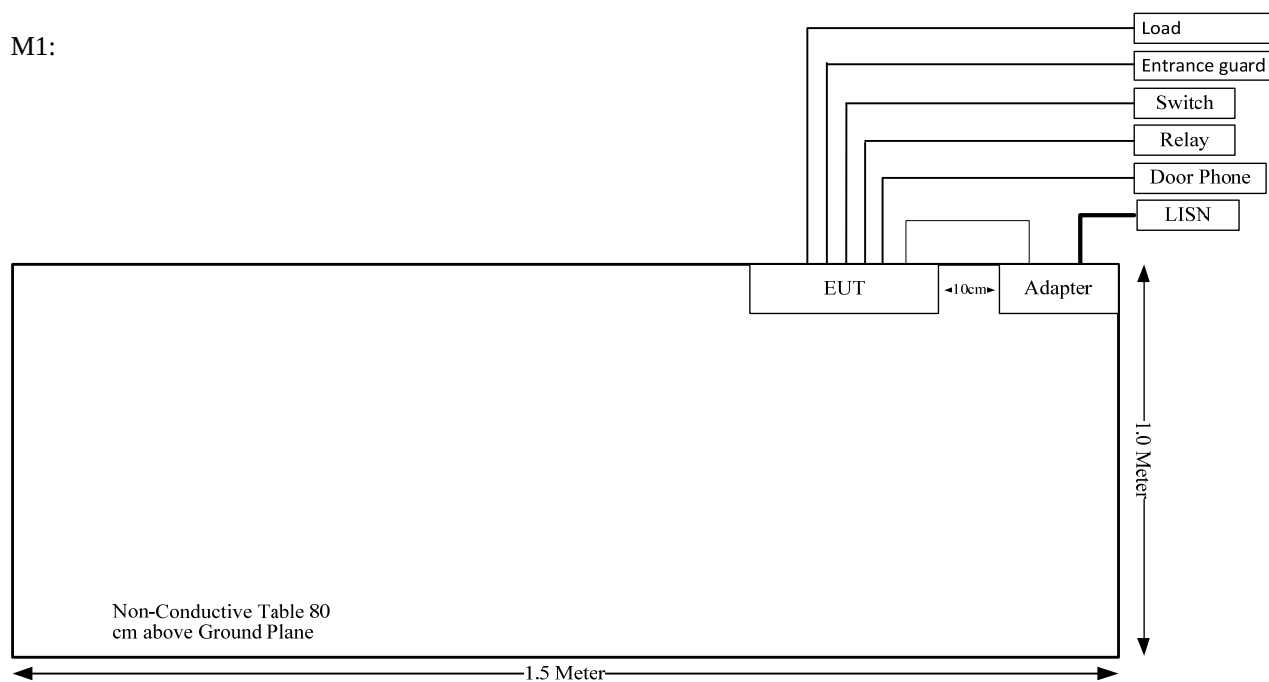
Manufacturer	Description	Model	Serial Number
PHIHONG	PoE	POE31U-1AT(SC)	N/A
TP-LINK	Switch	TL-SF1008P	114A297001782
Schneider	Relay	RXM2LB2BD	N/A
Gouldin	Door Phone	R20A	N/A
Lotus	Entrance guard	L8MF-W	N/A
Guohua Xiangcan	Load	RXG20	N/A
Fujia	Adapter	FJ-SW1201000C	N/A

Support Cable List and Details

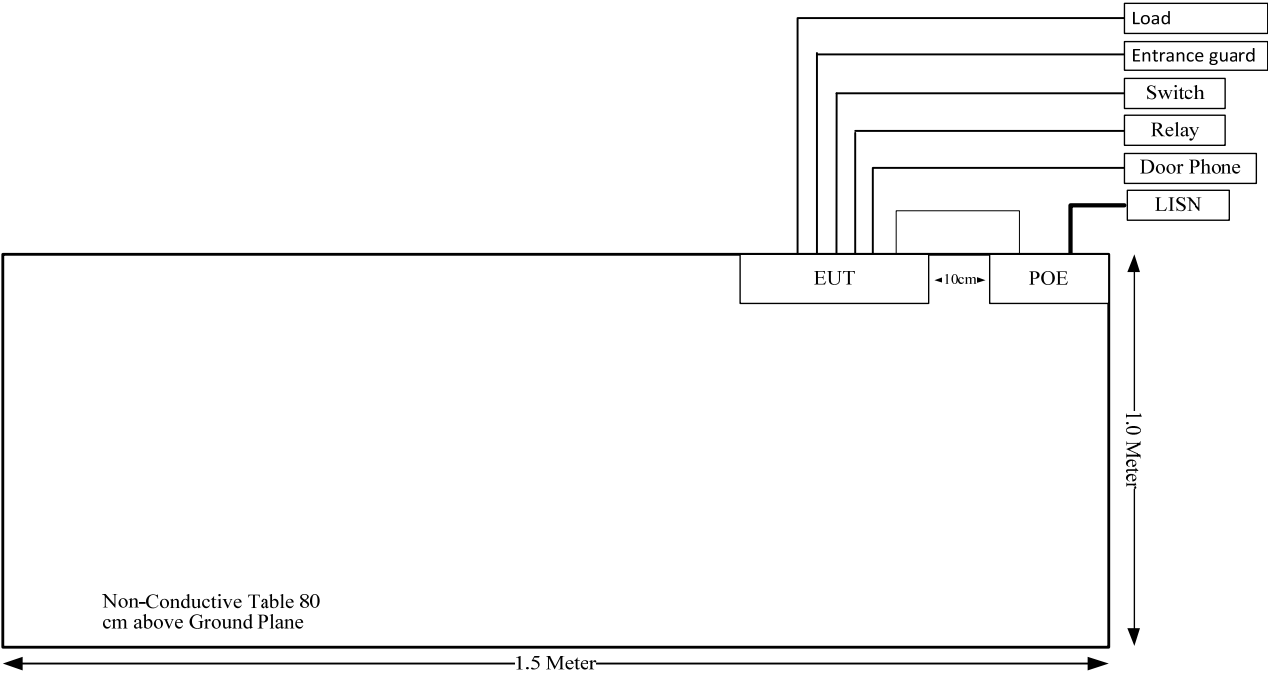
Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
RJ45 Cable	No	Yes	5	RJ45 Port of EUT	Door Phone
Power Cable	No	No	5	Power Port of EUT	Load
Signal Cable	No	No	5	Wiegand Port of EUT	Entrance guard
Signal Cable	No	No	5	RS485 Port of EUT	Switch
Signal Cable	No	No	5	Relay Port of EUT	Relay
Power Cable	No	No	1.4	Power Port of EUT	Adapter
RJ45 Cable	No	Yes	1	RJ45 Port of EUT	PoE
RJ45 Cable	No	No	5	RJ45 Port of PoE	Door Phone

Configuration of Test Setup

M1:



M2:

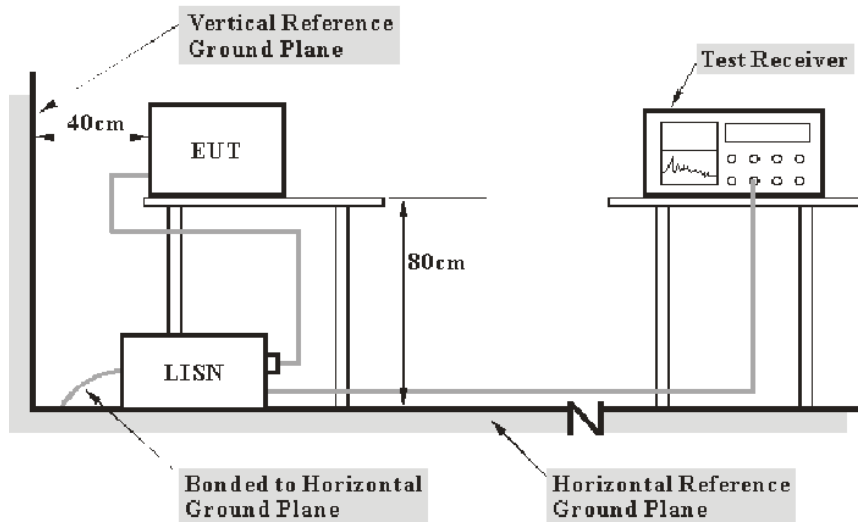


SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.107	Conducted Emissions	Compliant
§15.109	Radiated Emissions	Compliant

FCC§15.107 - CONDUCTED EMISSIONS

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 C63.4-2014 measurement procedure. The specification used was with the FCC Part 15 B 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 adapter or POE was connected to the Main LISN with 120V/60Hz AC 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:

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCS 30	830245/006	2017-12-11	2018-12-11
N/A	Coaxial Cable	C-NJNJ-50	C-0200-01	2017-09-05	2018-09-05
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A
R&S	Two-lineV-network	ENV 216	101614	2017-12-08	2018-12-08
R&S	L.I.S.N	ESH2-Z5	892107/021	2017-09-25	2018-09-25

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

Test Procedure

During the conducted emission test, the adapter or POE was connected to the outlet of the first 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.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

Herein,

V_C : corrected voltage amplitude

V_R : reading voltage amplitude

A_C : attenuation caused by cable loss

VDF: voltage division factor of AMN or ISN

The “**Margin**” column of the following data tables indicates the degree of compliance within 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 Part 15 B Class B.

Test Data

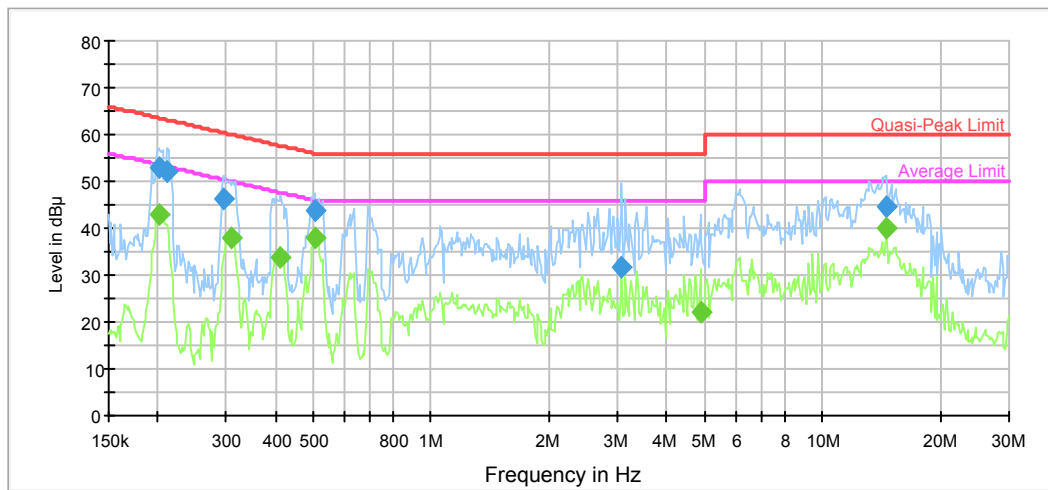
Environmental Conditions

Temperature:	23.3 °C
Relative Humidity:	35%
ATM Pressure:	101.6 kPa

The testing was performed by Jim Zhang on 2018-01-16.

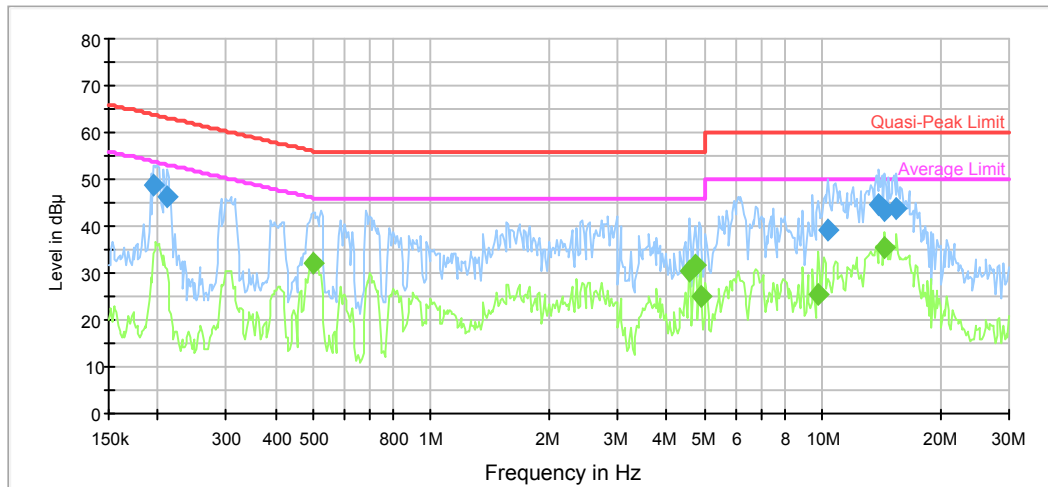
Test Mode: Adapter supply&talking

AC120V, 60Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.201433	53.1	9.000	L1	10.6	10.5	63.6	Compliance
0.211298	52.1	9.000	L1	10.6	11.1	63.2	Compliance
0.295282	46.2	9.000	L1	10.2	14.2	60.4	Compliance
0.503608	43.9	9.000	L1	9.9	12.1	56.0	Compliance
3.073500	31.7	9.000	L1	9.8	24.3	56.0	Compliance
14.535734	44.5	9.000	L1	9.9	15.5	60.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.203045	42.7	9.000	L1	10.6	10.8	53.5	Compliance
0.307284	38.1	9.000	L1	10.1	11.9	50.0	Compliance
0.409372	33.9	9.000	L1	10.0	13.8	47.7	Compliance
0.503608	38.1	9.000	L1	9.9	7.9	46.0	Compliance
4.879149	22.1	9.000	L1	9.8	23.9	46.0	Compliance
14.535734	40.1	9.000	L1	9.9	9.9	50.0	Compliance

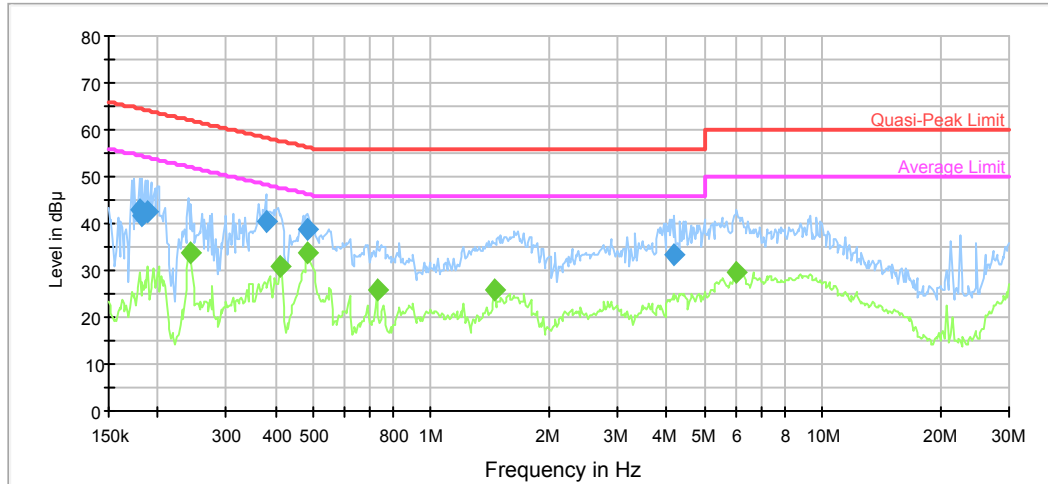
AC120V, 60Hz, Neutral:

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.195114	48.7	9.000	N	10.7	15.1	63.8	Compliance
0.211298	46.1	9.000	N	10.5	17.1	63.2	Compliance
10.318917	39.0	9.000	N	9.9	21.0	60.0	Compliance
13.968003	44.4	9.000	N	9.9	15.6	60.0	Compliance
14.420371	43.2	9.000	N	9.9	16.8	60.0	Compliance
15.492490	43.8	9.000	N	10.0	16.2	60.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.499611	32.0	9.000	N	9.9	14.0	46.0	Compliance
4.577832	30.2	9.000	N	9.8	15.8	46.0	Compliance
4.726090	31.7	9.000	N	9.8	14.3	46.0	Compliance
4.879149	25.0	9.000	N	9.8	21.0	46.0	Compliance
9.759114	25.4	9.000	N	9.9	24.6	50.0	Compliance
14.420371	35.6	9.000	N	9.9	14.4	50.0	Compliance

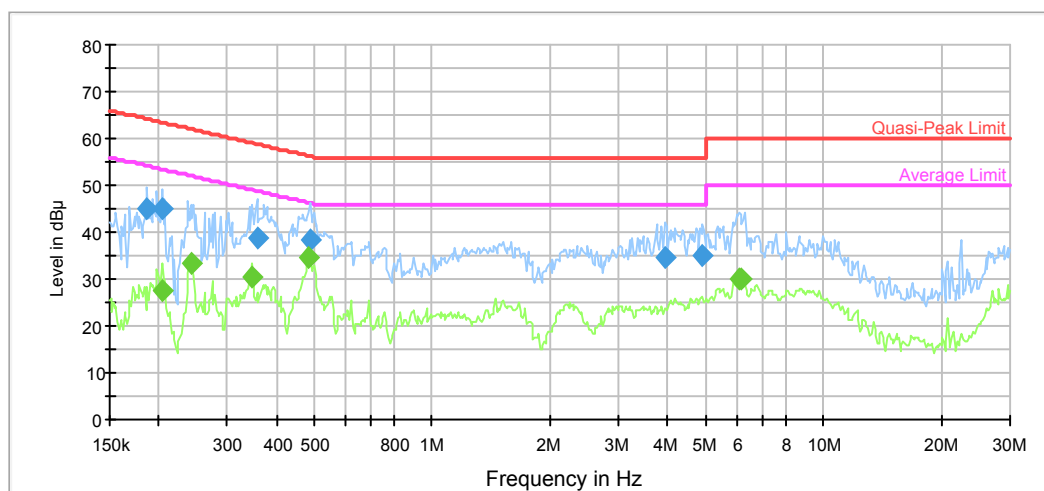
Test Mode: PoE supply&talking

AC120V, 60Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.180171	42.9	9.000	L1	10.8	21.6	64.5	Compliance
0.183065	41.8	9.000	L1	10.8	22.5	64.3	Compliance
0.188994	42.3	9.000	L1	10.7	21.8	64.1	Compliance
0.378019	40.4	9.000	L1	10.0	17.9	58.3	Compliance
0.483938	38.8	9.000	L1	9.9	17.5	56.3	Compliance
4.193667	33.4	9.000	L1	9.8	22.6	56.0	Compliance

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.241949	33.6	9.000	L1	10.4	18.4	52.0	Compliance
0.412647	30.8	9.000	L1	10.0	16.8	47.6	Compliance
0.483938	33.8	9.000	L1	9.9	12.5	46.3	Compliance
0.726569	25.9	9.000	L1	9.8	20.1	46.0	Compliance
1.453260	25.8	9.000	L1	9.7	20.2	46.0	Compliance
6.050321	29.7	9.000	L1	9.8	20.3	50.0	Compliance

AC120V, 60Hz, Neutral:

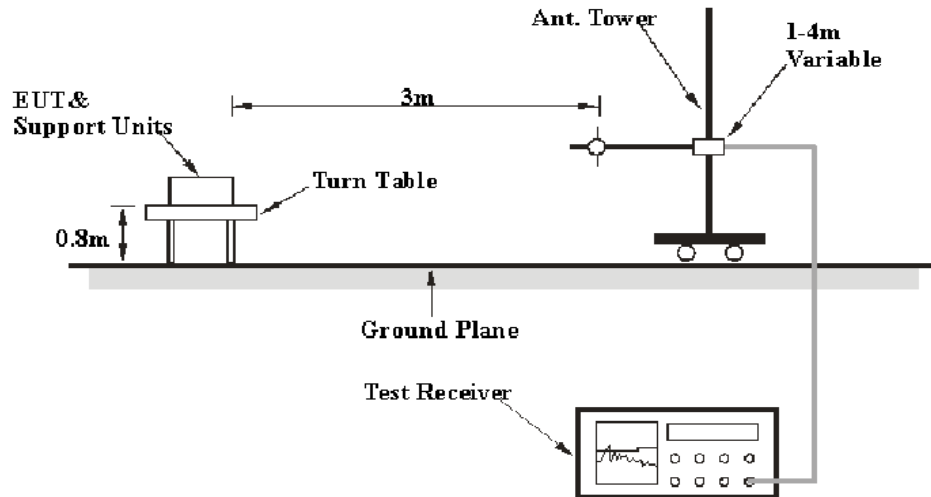
Frequency (MHz)	QuasiPeak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)	Comment
0.187494	44.8	9.000	N	10.7	19.3	64.1	Compliance
0.204669	44.8	9.000	N	10.6	18.6	63.4	Compliance
0.357511	38.6	9.000	N	10.0	20.2	58.8	Compliance
0.487810	38.5	9.000	N	9.9	17.7	56.2	Compliance
3.934683	34.7	9.000	N	9.8	21.3	56.0	Compliance
4.918182	35.0	9.000	N	9.8	21.0	56.0	Compliance

Frequency (MHz)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)	Comment
0.204669	27.6	9.000	N	10.6	25.8	53.4	Compliance
0.241949	33.4	9.000	N	10.4	18.6	52.0	Compliance
0.346296	30.5	9.000	N	10.0	18.6	49.1	Compliance
0.483938	34.4	9.000	N	9.9	11.9	46.3	Compliance
6.098724	29.8	9.000	N	9.8	20.2	50.0	Compliance
6.147514	30.0	9.000	N	9.8	20.0	50.0	Compliance

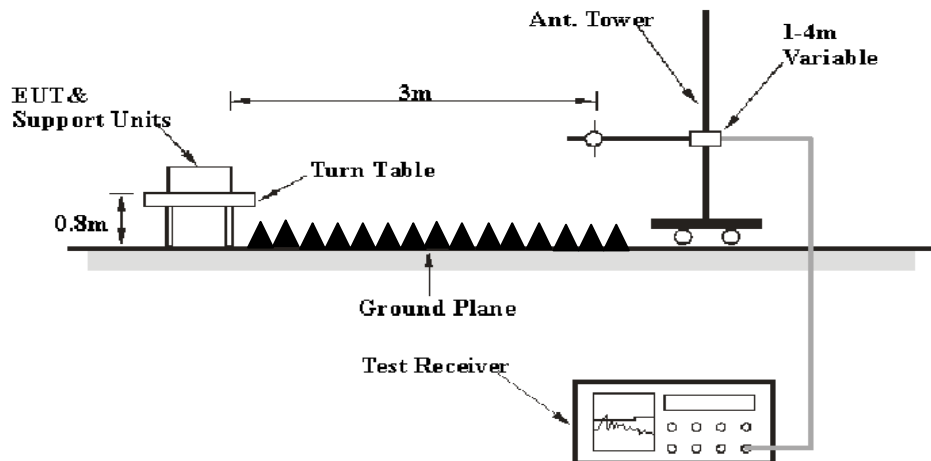
FCC §15.109 - RADIATED SPURIOUS EMISSIONS

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission Below 1GHz tests were performed in the 10 meters chamber test site, above 1GHz tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 Class B limits.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 6 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	Measurement
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	Peak
	1 MHz	10 Hz	/	AVG

Test Procedure

During the radiated emissions, the adapter or POE was connected to the first AC floor outlet.

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

The data was recorded in the Quasi-peak detection mode for below 1 GHz, peak and average detection mode above 1 GHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100035	2017-08-04	2018-08-04
Sunol Sciences	Antenna	JB3	A060611-3	2017-07-21	2019-07-21
HP	Amplifier	8447F	2443A01912	2017-09-05	2018-09-05
Agilent	Spectrum Analyzer	E4440A	SG43360054	2017-12-08	2018-12-08
ETS-Lindgren	Horn Antenna	3115	000 527 35	2016-01-05	2019-01-04
MITEQ	Amplifier	AFS42-00101800-2 5-S-42	2001271	2017-09-05	2018-09-05
N/A	Coaxial Cable	C-NJNJ-50	C-0400-01	2017-09-05	2018-09-05
N/A	Coaxial Cable	C-NJNJ-50	C-0075-01	2017-09-05	2018-09-05
N/A	Coaxial Cable	C-NJNJ-50	C-1000-01	2017-09-05	2018-09-05
N/A	Coaxial Cable	C-SJSJ-50	C-0800-01	2017-09-05	2018-09-05
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, 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:

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

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

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

Test Data

Environmental Conditions

Temperature:	16.7~23.8 °C
Relative Humidity:	42~50 %
ATM Pressure:	101.0~101.5 kPa

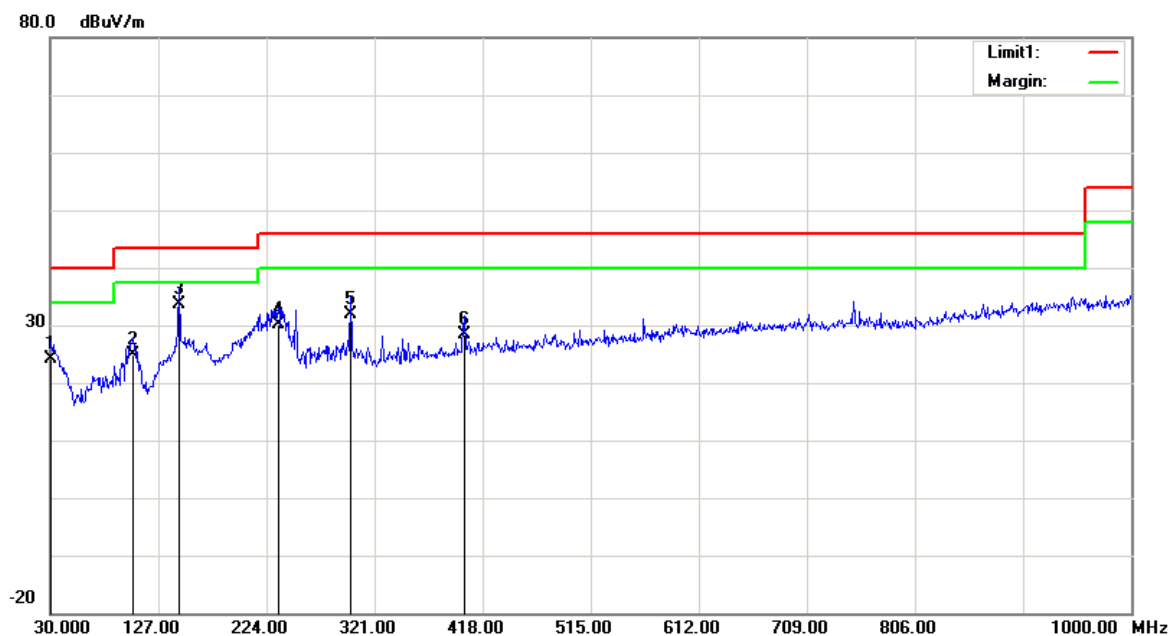
The testing was performed by Jim Zhang on 2018-01-24 & 2018-01-30.

Test Result: Compliance

Test Mode: Adapter supply&talking

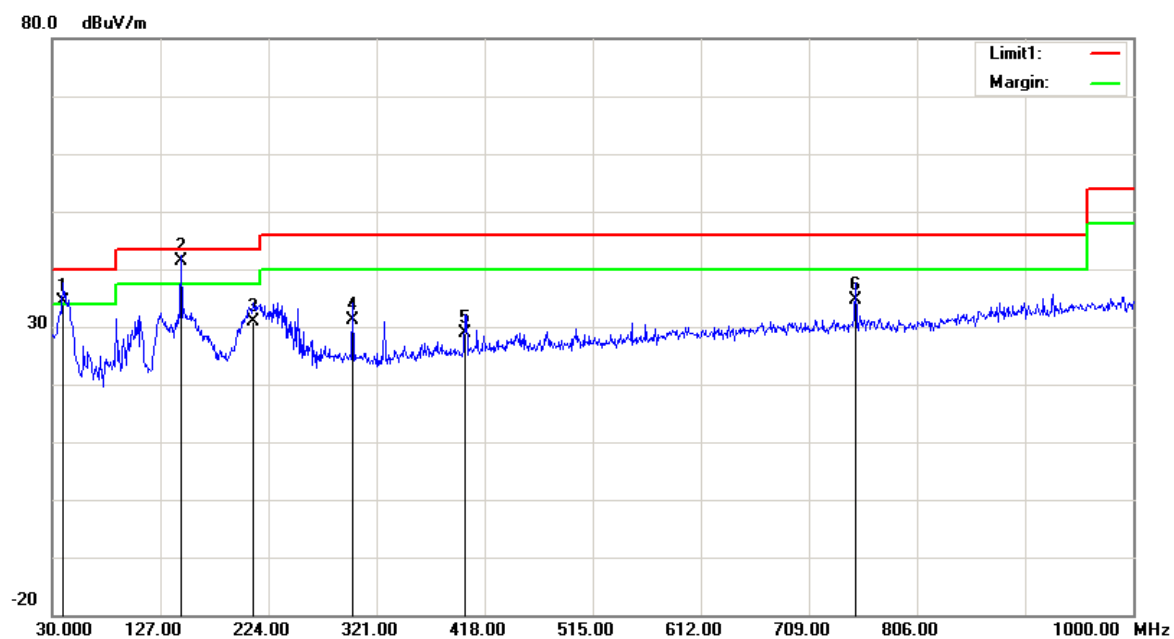
1) Below 1GHz:

Horizontal



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
30.0000	26.02	QP	-1.82	24.20	40.00	15.80
104.6900	35.92	QP	-11.12	24.80	43.50	18.70
145.4300	40.29	QP	-6.59	33.70	43.50	9.80
234.6700	37.82	QP	-7.62	30.20	46.00	15.80
299.6600	36.62	QP	-4.62	32.00	46.00	14.00
401.5100	30.39	QP	-1.89	28.50	46.00	17.50

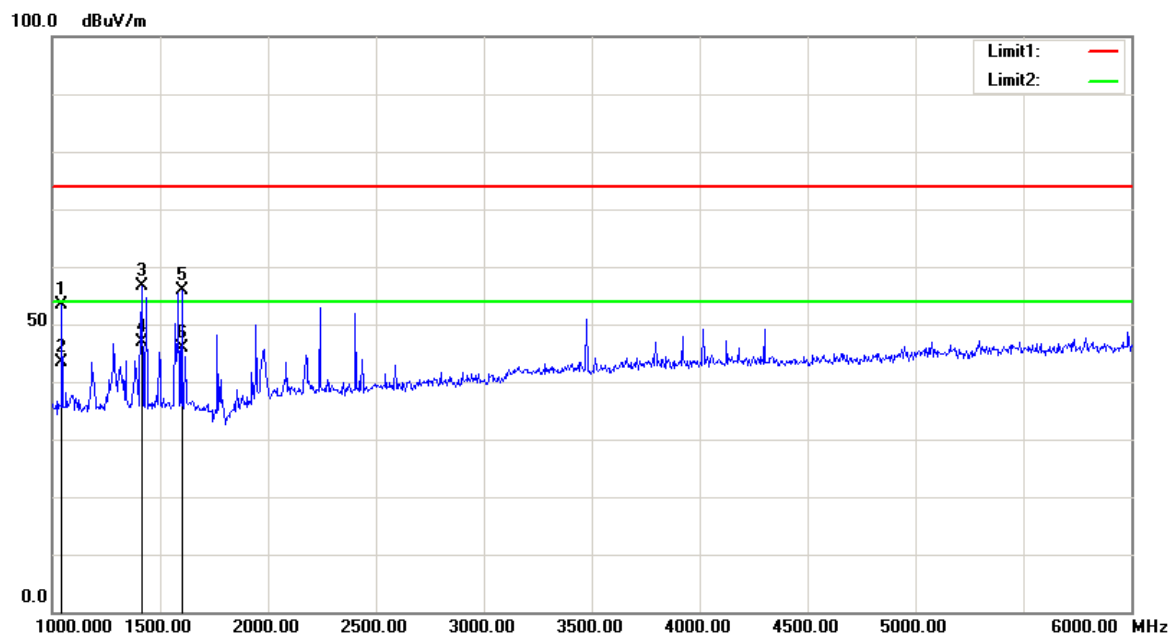
Vertical



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
39.7000	40.84	QP	-6.54	34.30	40.00	5.70
145.4300	48.09	QP	-6.59	41.50	43.50	2.00
210.4200	39.71	QP	-8.71	31.00	43.50	12.50
299.6600	35.82	QP	-4.62	31.20	46.00	14.80
400.5400	30.92	QP	-1.92	29.00	46.00	17.00
750.7100	29.04	QP	5.56	34.60	46.00	11.40

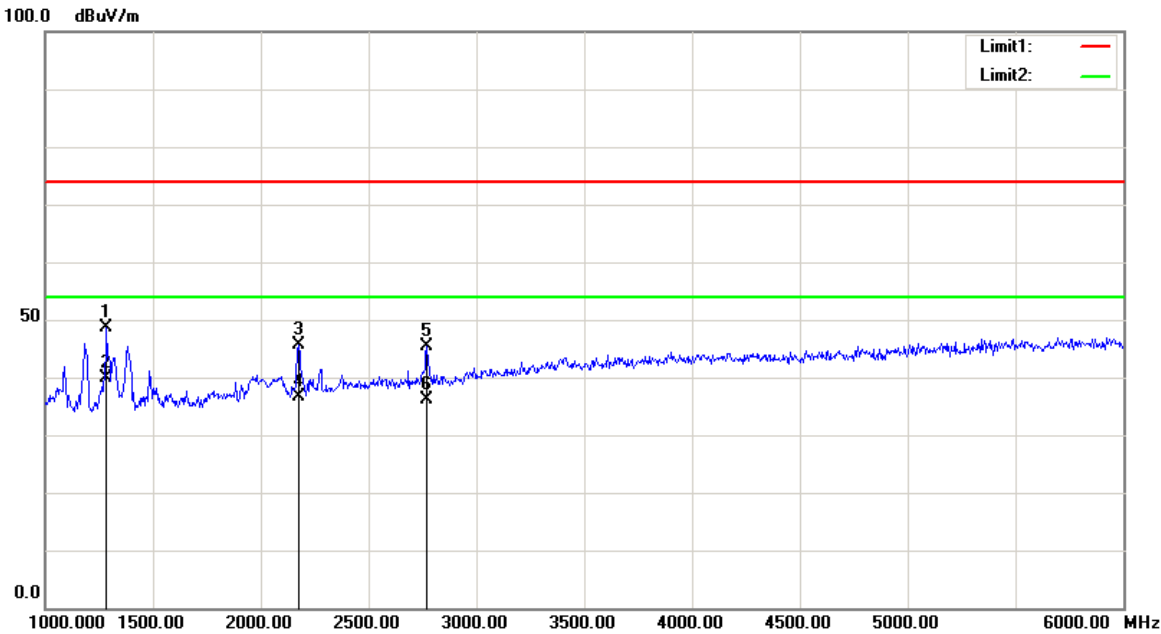
2) Above 1GHz:

Horizontal



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1045.000	63.98	peak	-10.55	53.43	74.00	20.57
1045.000	53.99	AVG	-10.55	43.44	54.00	10.56
1415.000	66.14	peak	-9.47	56.67	74.00	17.33
1415.000	56.27	AVG	-9.47	46.80	54.00	7.20
1600.000	64.48	peak	-8.72	55.76	74.00	18.24
1600.000	54.56	AVG	-8.72	45.84	54.00	8.16

Vertical

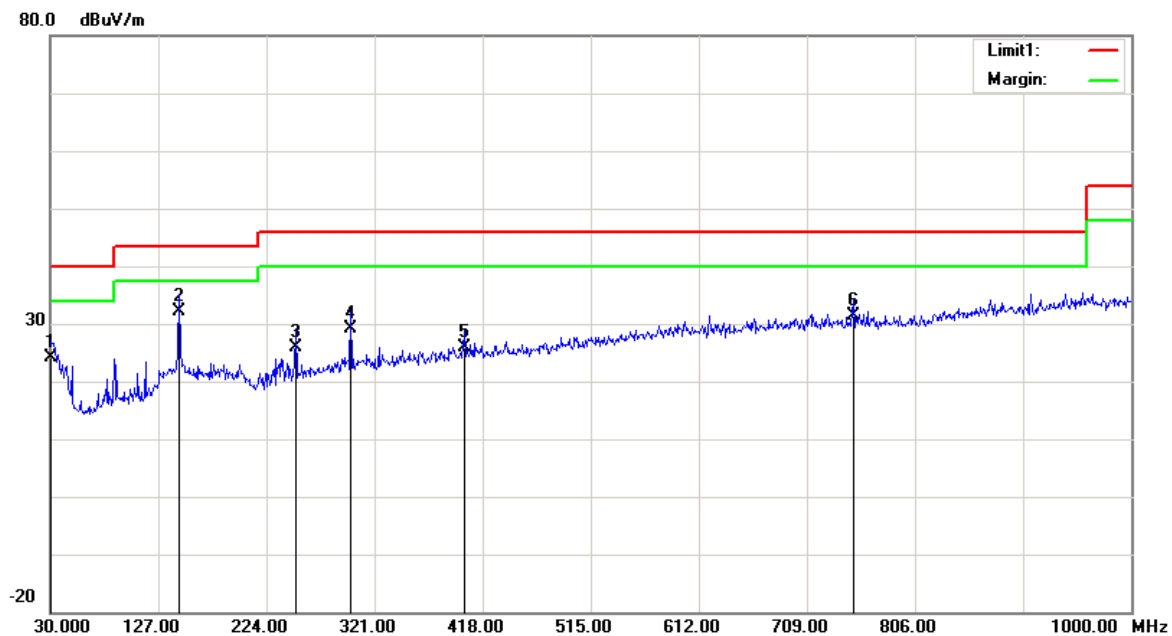


Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1287.500	58.46	peak	-9.87	48.59	74.00	25.41
1287.500	49.68	AVG	-9.87	39.81	54.00	14.19
2177.500	52.33	peak	-6.78	45.55	74.00	28.45
2177.500	43.48	AVG	-6.78	36.70	54.00	17.30
2772.500	50.78	peak	-5.33	45.45	74.00	28.55
2772.500	41.56	AVG	-5.33	36.23	54.00	17.77

Test Mode: POE supply&talking

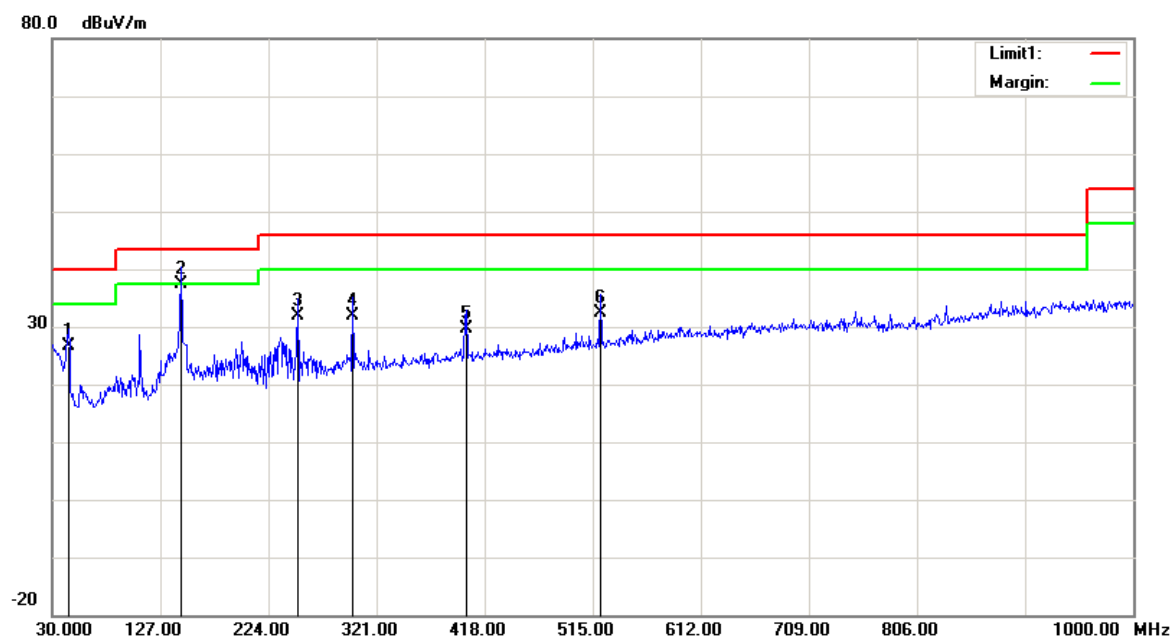
1) Below 1GHz:

Horizontal



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
30.0000	26.02	QP	-1.82	24.20	40.00	15.80
145.4300	38.69	QP	-6.59	32.10	43.50	11.40
250.1900	33.15	QP	-7.15	26.00	46.00	20.00
299.6600	33.82	QP	-4.62	29.20	46.00	16.80
401.5100	27.79	QP	-1.89	25.90	46.00	20.10
750.7100	25.84	QP	5.56	31.40	46.00	14.60

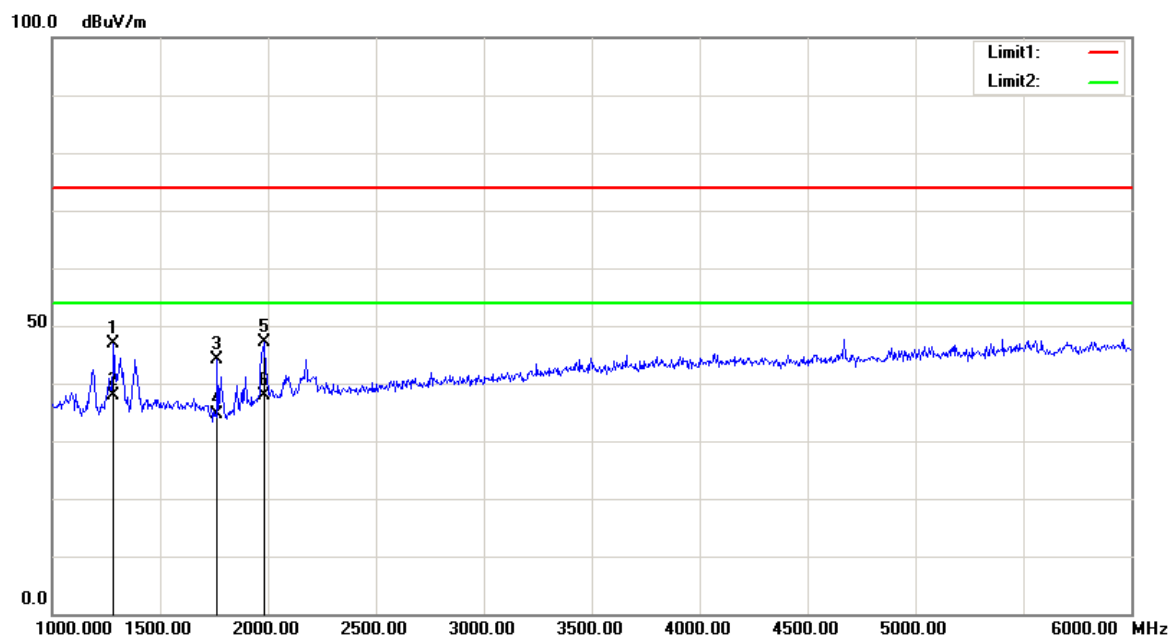
Vertical



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
44.5500	36.24	QP	-9.54	26.70	40.00	13.30
145.4300	43.89	QP	-6.59	37.30	43.50	6.20
250.1900	39.05	QP	-7.15	31.90	46.00	14.10
299.6600	36.62	QP	-4.62	32.00	46.00	14.00
401.5100	31.49	QP	-1.89	29.60	46.00	16.40
521.7900	31.51	QP	0.99	32.50	46.00	13.50

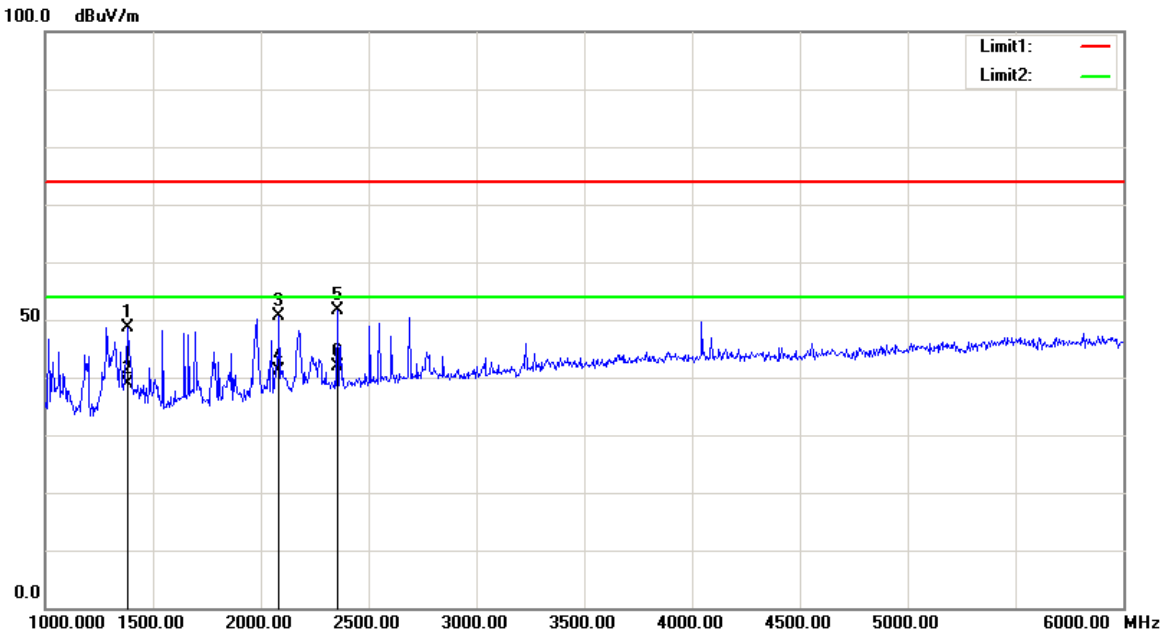
2) Above 1GHz:

Horizontal



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1287.500	56.77	peak	-9.87	46.90	74.00	27.10
1287.500	47.63	AVG	-9.87	37.76	54.00	16.24
1767.500	52.06	peak	-8.00	44.06	74.00	29.94
1767.500	42.54	AVG	-8.00	34.54	54.00	19.46
1980.000	54.25	peak	-7.24	47.01	74.00	26.99
1980.000	45.18	AVG	-7.24	37.94	54.00	16.06

Vertical



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1385.000	58.09	peak	-9.58	48.51	74.00	25.49
1385.000	48.56	AVG	-9.58	38.98	54.00	15.02
2085.000	57.73	peak	-7.05	50.68	74.00	23.32
2085.000	48.15	AVG	-7.05	41.10	54.00	12.90
2355.000	58.32	peak	-6.63	51.69	74.00	22.31
2355.000	48.63	AVG	-6.63	42.00	54.00	12.00

END OF REPORT