

FCC PART 15B, CLASS B TEST REPORT

For

Grandstream Networks, Inc.

126 Brookline Ave., 3rd Floor Boston, MA 02215, USA

FCC ID: YZZGRP2613

Report Type: Original Report	Product Type: IP Phone
Report Number: RSZ190328011-00	
Report Date: 2019-04-26	
Alvin Huang 	
Reviewed By: Lab Manager	
Prepared By: Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn	

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	IP Phone
Model	GRP2613
Voltage Range	DC 5V from adapter or DC 48V from POE
Measure	203mm (L) * 193 mm (W) * 51.8mm (H)
Highest operating frequency	133MHz
Date of Test	2019-04-01 to 2019-04-11
Sample serial number	190328011
Received date	2019-03-28
Sample/EUT Status	Good condition
Adpter Information	Adapter 1 (MASSPOWER) Information: Model:NBS05B050060VU Input: AC100-240V, 50/60Hz, 0.2A Output: DC5.0V ,0.6A Adapter 2 (SUNLIGHT) Information: Model: F06US0500060A Input: AC100-240V, 50/60Hz, 0.2A max L.P.S Output: DC5.0V ,0.6A Adapter 3 (Frecom) Information: Model: F05L5-050060SPA U L.P.S Input: AC100-240V, 50/60Hz, 0.2A Output: DC5.0V ,0.6A

Objective

This test report is prepared on behalf of *Grandstream Networks, Inc.* in accordance with Part 2-Subpart J, Part 15-Subparts A, 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 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 emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

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 expanded combined standard uncertainty of test at Bay Area Compliance Laboratories Corp. (Shenzhen) is shown as below. And the uncertainty will be taken into consideration for the test data recorded in the report

Parameter		uncertainty
Conducted Emissions		$\pm 1.95\text{dB}$
Emissions, radiated	Below 1GHz	$\pm 4.75\text{dB}$
	Above 1GHz	$\pm 4.88\text{dB}$

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, 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.: 342867, the FCC Designation No.: CN1221.

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

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in normal mode.

EUT Exercise Software

No exercise software was made to the EUT tested.

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

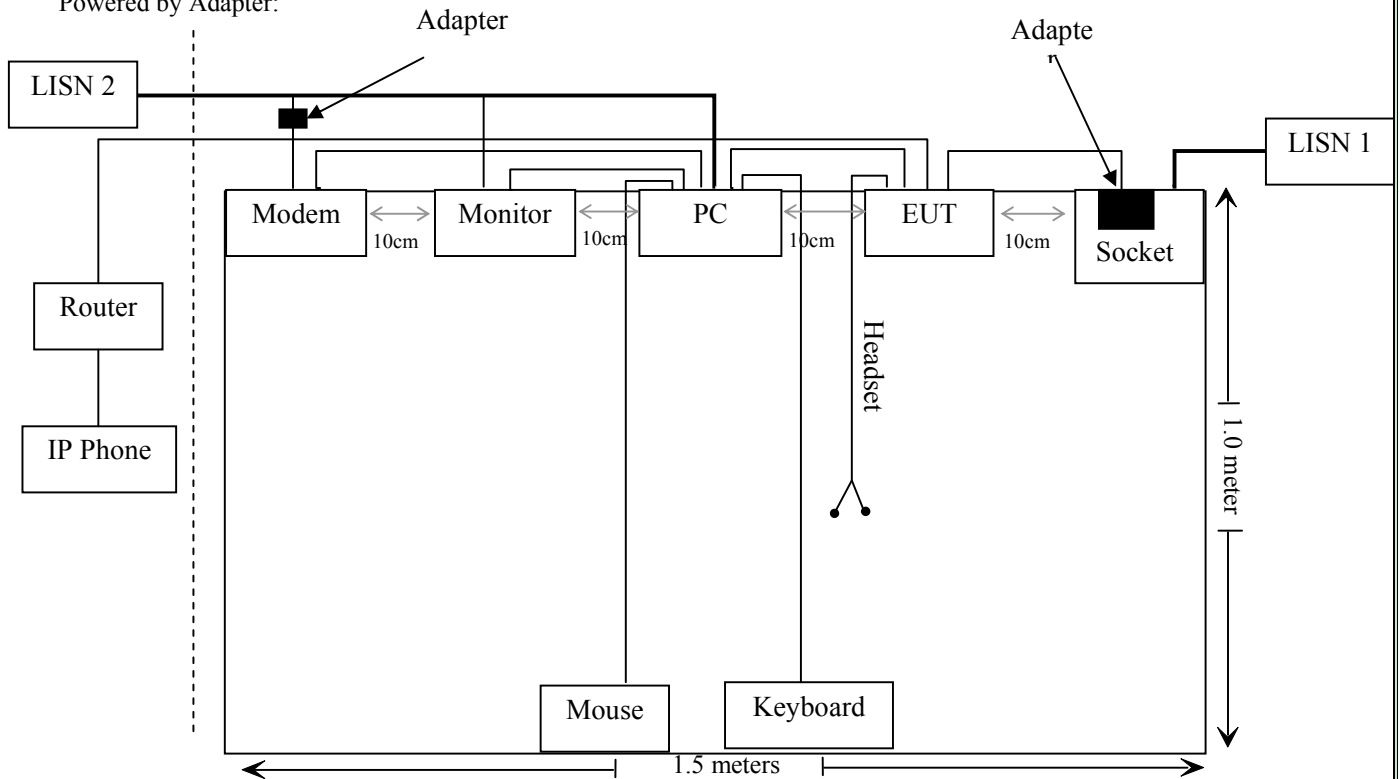
Manufacturer	Description	Model	Serial Number
BULL	Socket	GN-415K	5503290068073
Gigabit	POE	N/A	N/A
TCL	Monitor	TFT1560PS	ALA560S05C180409
DELL	Host PC	DCSCSF	127BP2X
DELL	Mouse	MOC5UO	G1900NKD
Microsoft	Keyboard	1406	0200706128743
DELL	Monitor	TFT1560PS	ALA560806C160409
SAST	Modem	AEM-2100	0293
SAGEMCOM	Router	F@ST 1704N	N/A
Grandstream	Headset	N/A	N/A
Grandstream	IP Phone	GRP2613	N/A

External I/O Cable

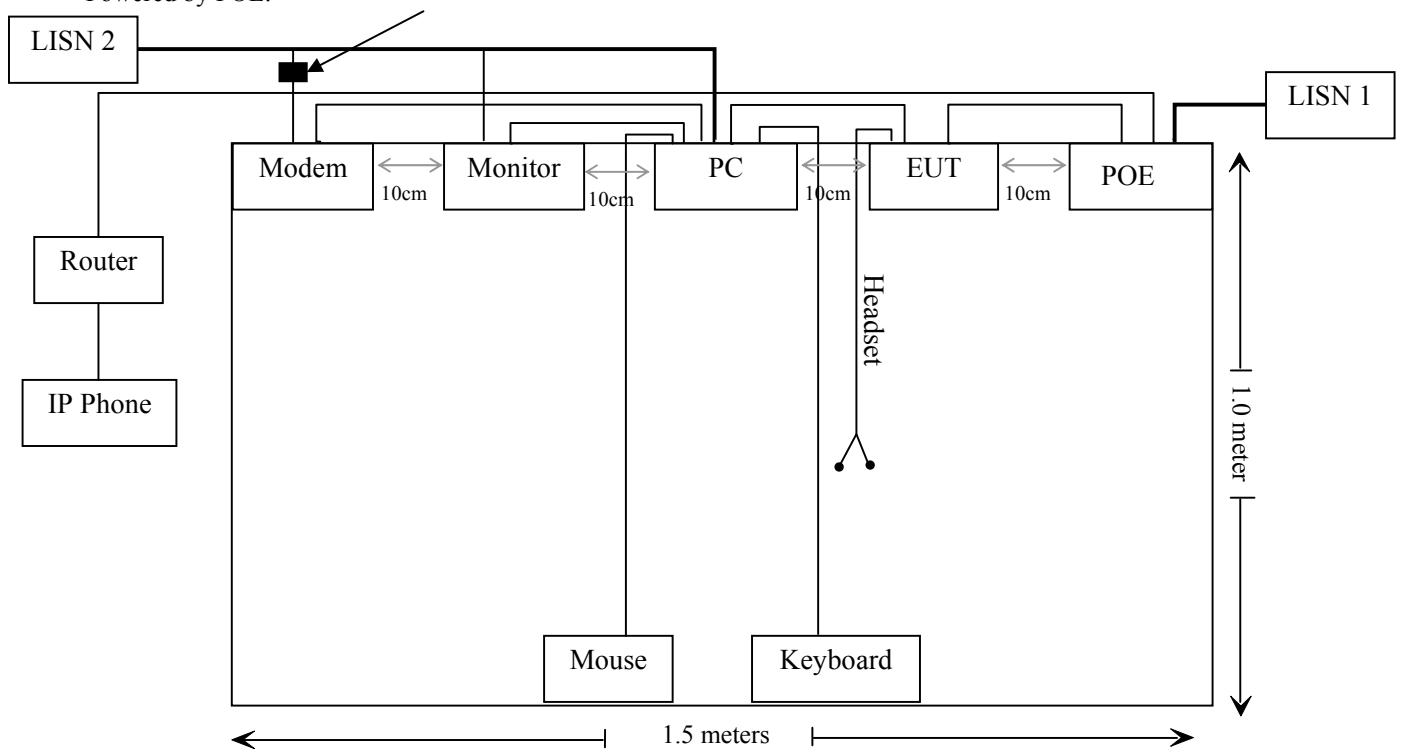
Cable description	Length (m)	From/port	To
Un-shielded un-detachable AC cable	1.0	Socket	Lisn 1
Un-shielded detachable RJ45 cable	10.0	Router	EUT /POE
Un-shielded detachable RJ45 cable	1.5	POE	EUT
Un-shielded detachable DC cable	1.8	EUT	Adapter
Un-shielded detachable AC cable	1.2	POE	Lisn 1
Un-shielded detachable RJ45 cable	1.5	Router	IP phone
Un-shielded detachable RJ45 cable	1.5	EUT	PC
Un-shielded detachable AC cable	1.2	Monitor	Lisn 2
Un-shielded detachable AC cable	1.2	PC	Lisn 2
Shielded detachable RS232 cable	1.0	PC	Modem
Shielded detachable VGA cable	1.0	PC	Monitor
Un-shielded un-detachable USB cable	1.2	PC	Mouse
Un-shielded un-detachable USB cable	1.5	PC	Keyboard
Un-shielded detachable AC cable	1.2	Adapter	Lisn 2
Un-shielded detachable DC cable	1.2	Adapter	Modem

Block Diagram of Test Setup

Powered by Adapter:



Powered by POE:



SUMMARY OF TEST RESULTS

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

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
AC Line Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2018-07-11	2019-07-11
Rohde & Schwarz	LISN	ENV216	3560.6650.12-101613-Yb	2018-12-21	2019-12-21
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2018-11-12	2019-11-12
Rohde & Schwarz	CE Test software	EMC 32	V8.53.0	NCR	NCR
Unknown	Conducted Emission Cable	78652	UF A210B-1-0720-504504	2018-11-12	2019-11-12
Radiated Emission Test					
A.H. System	Horn Antenna	SAS-200/571	135	2018-09-01	2021-08-31
Rohde & Schwarz	Signal Analyzer	FSV40	101473	2019-01-09	2020-01-08
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017-12-22	2020-12-21
COM-POWER	Pre-amplifier	PA-122	181919	2018-11-12	2019-11-12
Sonoma instrument	Amplifier	310N	186238	2018-11-12	2019-11-12
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-101746-zn	2018-07-11	2019-07-11
Ducommun technologies	RF Cable	UFA147A-2362-100100	MFR64639 231029-003	2018-07-11	2021-07-10
Ducommun technologies	RF Cable	104PEA	218124002	2018-11-12	2019-11-12
Ducommun technologies	RF Cable	RG-214	1	2018-11-19	2019-05-21
Ducommun technologies	RF Cable	RG-214	2	2018-11-12	2019-11-12
Heatsink Required	Amplifier	QLW-18405536-J0	15964001002	2018-11-12	2019-11-12
Rohde & Schwarz	Auto test software	EMC 32	V9.10	NCR	NCR

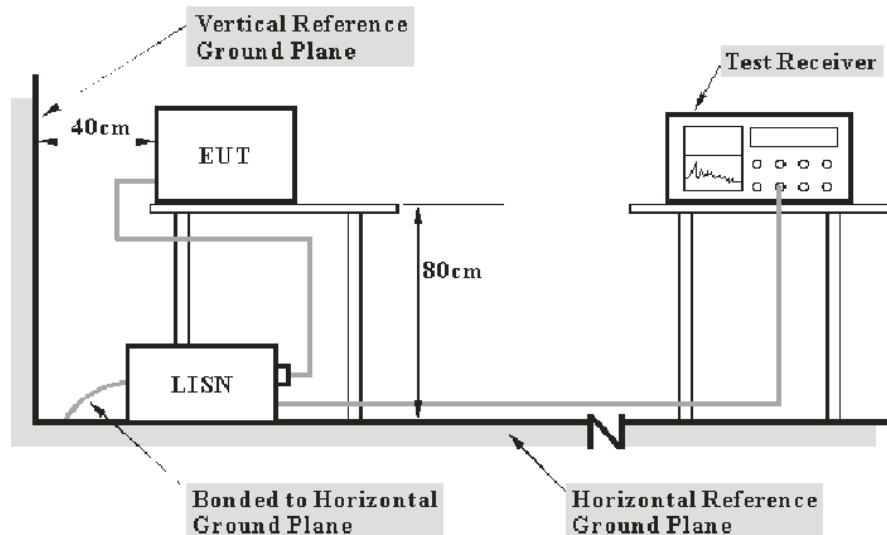
* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §15.107 – AC LINE CONDUCTED EMISSIONS

Applicable Standard

According to FCC §15.107

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 C63.4-2014. The related limit was specified in FCC Part 15.107 Class B.

The spacing between the peripherals was 10 cm.

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 adapter and AC mains port of POE were connected to the first LISN and the other relevant equipments were connected 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.

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:

$$\text{Correction Factor} = \text{LISN VDF} + \text{Cable Loss} + \text{Transient Limiter Attenuation}$$

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:

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

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.107,

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in compliance 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

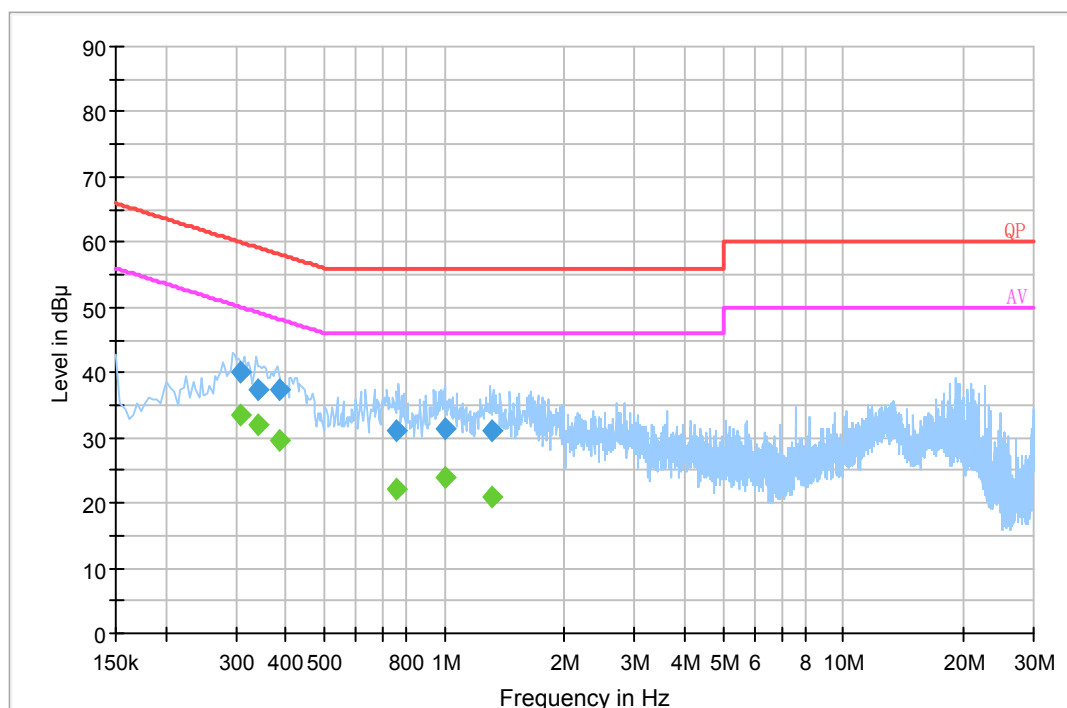
Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Haiguo Li on 2019-04-04.

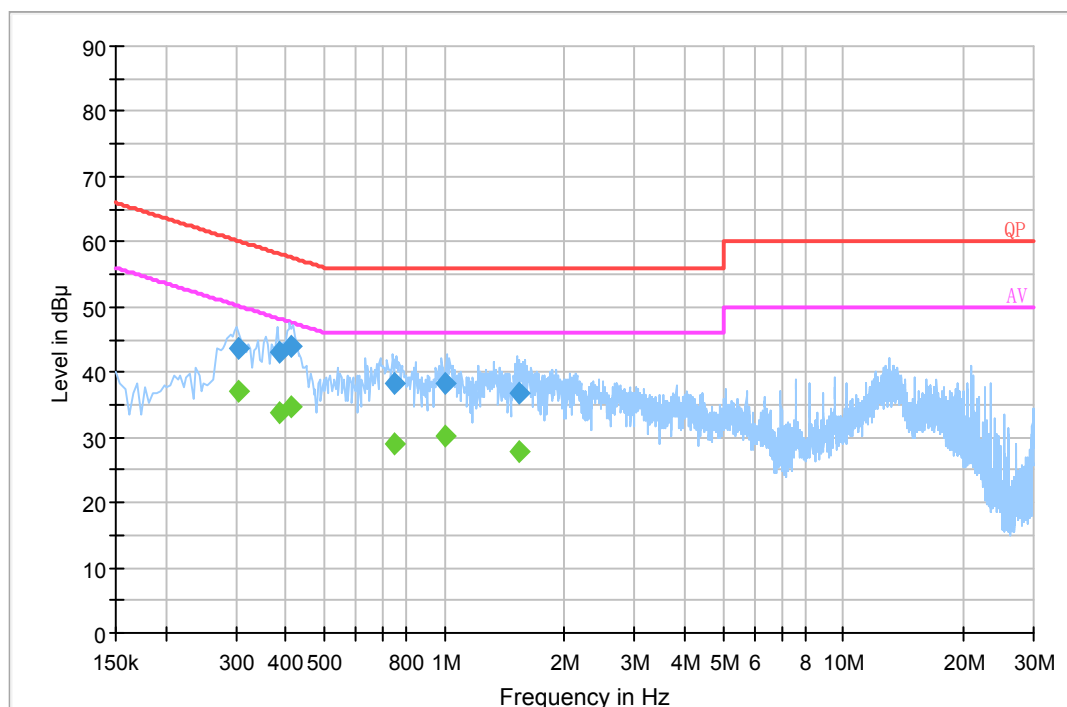
EUT Operation Mode: Working (Talking with another IP Phone and Ping with PC)

Powered by Adapter 1 (MASSPOWER):

AC 120V/60 Hz, Line



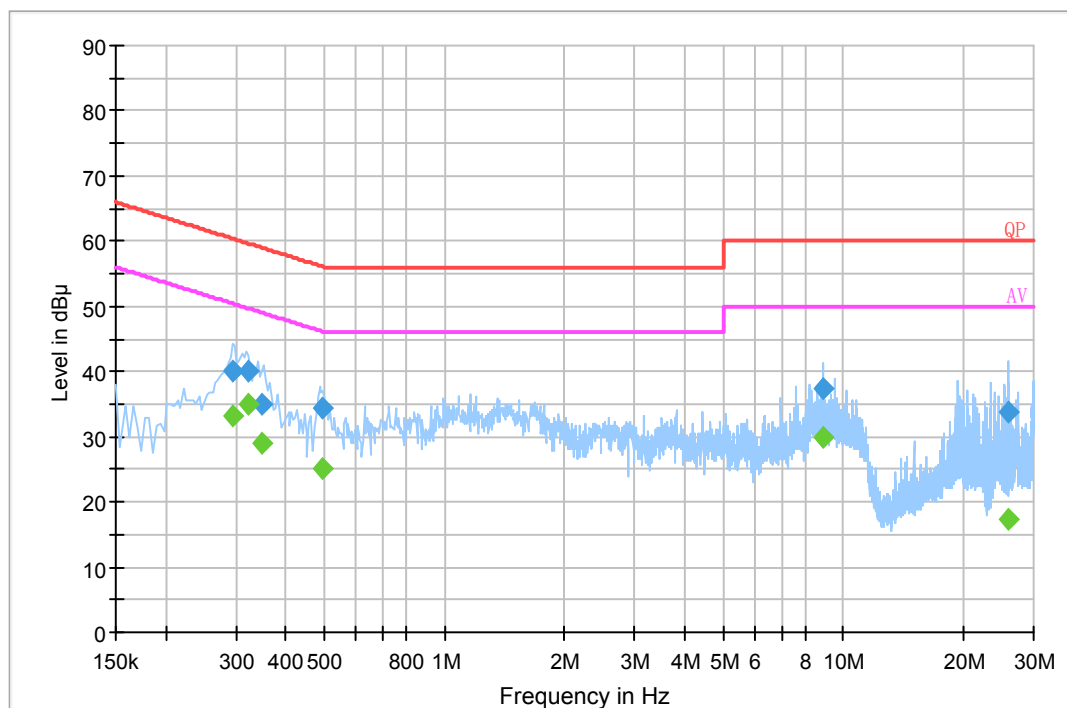
Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
0.309290	40.2	19.7	60.0	19.8	QP
0.340930	37.3	19.9	59.2	21.9	QP
0.384270	37.5	19.9	58.2	20.7	QP
0.758450	31.1	19.8	56.0	24.9	QP
1.002970	31.4	19.9	56.0	24.6	QP
1.322410	31.0	19.8	56.0	25.0	QP
0.309290	33.4	19.7	50.0	16.6	Ave.
0.340930	32.0	19.9	49.2	17.2	Ave.
0.384270	29.7	19.9	48.2	18.5	Ave.
0.758450	22.1	19.8	46.0	23.9	Ave.
1.002970	24.1	19.9	46.0	21.9	Ave.
1.322410	21.0	19.8	46.0	25.0	Ave.

AC 120V/60 Hz, Neutral

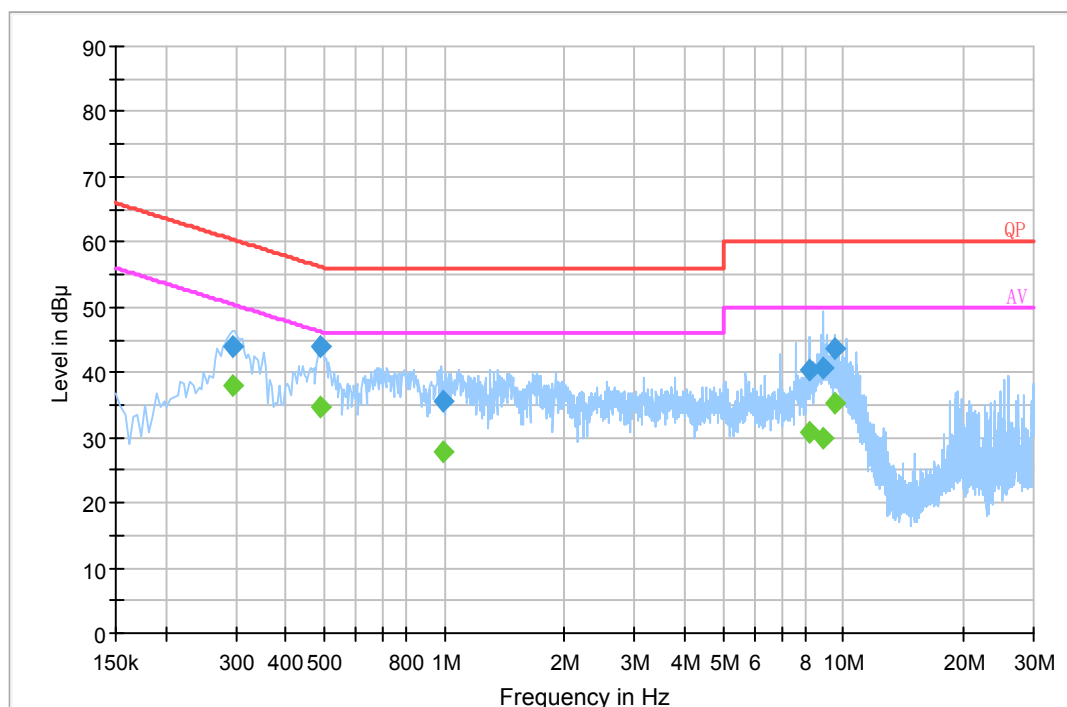
Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
0.305470	43.8	19.7	60.1	16.3	QP
0.384270	43.1	19.8	58.2	15.1	QP
0.411850	43.9	19.8	57.6	13.7	QP
0.753130	38.3	19.8	56.0	17.7	QP
1.002850	38.3	19.8	56.0	17.7	QP
1.536710	36.9	19.8	56.0	19.1	QP
0.305470	37.0	19.7	50.1	13.0	Ave.
0.384270	33.7	19.8	48.2	14.5	Ave.
0.411850	34.7	19.8	47.6	12.9	Ave.
0.753130	29.1	19.8	46.0	16.9	Ave.
1.002850	30.3	19.8	46.0	15.7	Ave.
1.536710	27.9	19.8	46.0	18.1	Ave.

Powered by Adapter 2 (SUNLIGHT):

AC 120 V/60 Hz, Line:



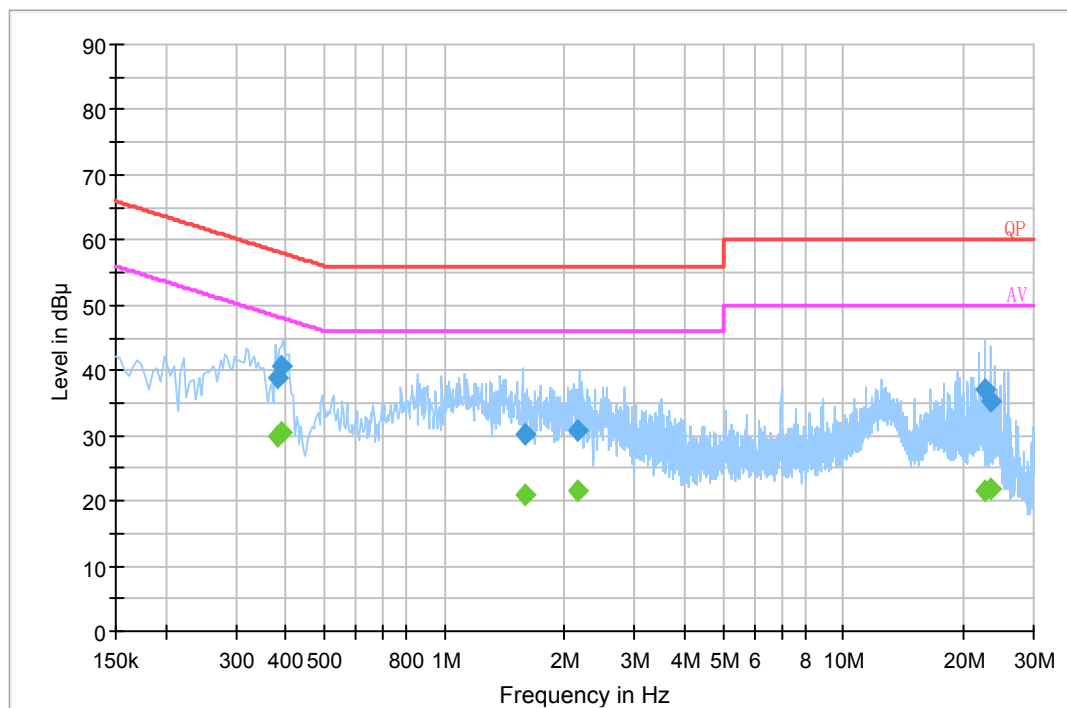
Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
0.293500	40.2	19.7	60.4	20.3	QP
0.321230	40.1	19.8	59.7	19.6	QP
0.348690	35.1	19.9	59.0	23.9	QP
0.493290	34.3	19.8	56.1	21.8	QP
8.884770	37.5	20.0	60.0	22.5	QP
26.011790	33.9	20.3	60.0	26.1	QP
0.293500	33.1	19.7	50.4	17.3	Ave.
0.321230	34.9	19.8	49.7	14.8	Ave.
0.348690	28.9	19.9	49.0	20.1	Ave.
0.493290	25.0	19.8	46.1	21.1	Ave.
8.884770	29.9	20.0	50.0	20.1	Ave.
26.011790	17.4	20.3	50.0	32.6	Ave.

AC 120V/ 60 Hz, Neutral:

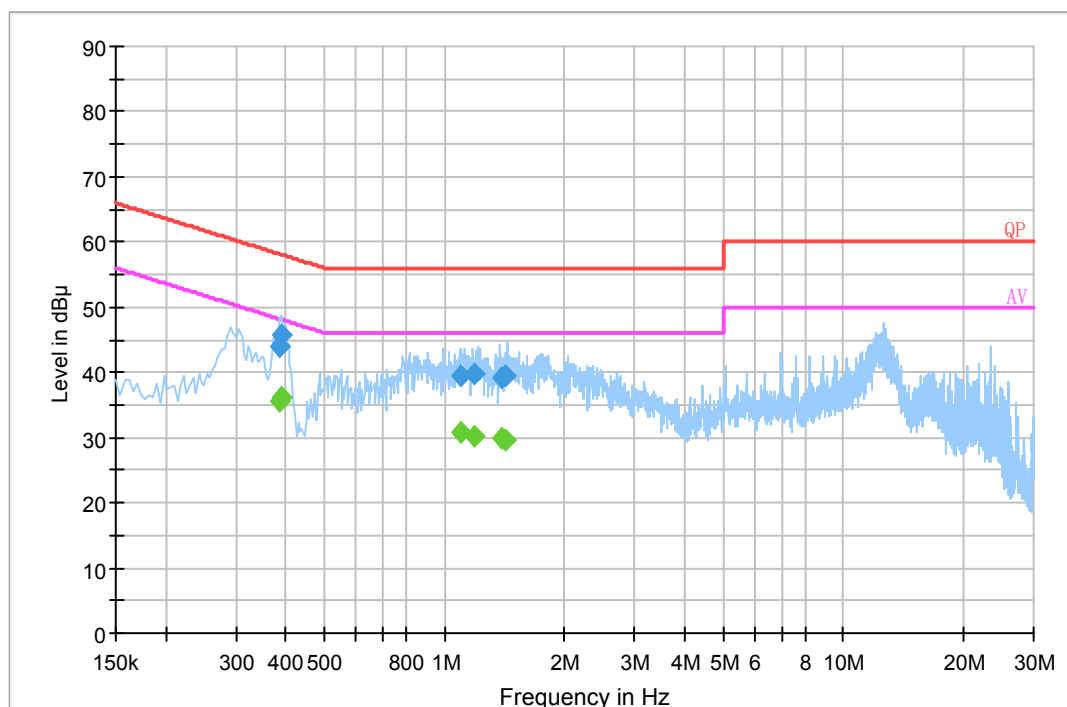
Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
0.293500	43.9	19.7	60.4	16.5	QP
0.490710	44.0	19.8	56.2	12.2	QP
0.995210	35.6	19.8	56.0	20.4	QP
8.238430	40.5	19.9	60.0	19.5	QP
8.888890	40.7	19.9	60.0	19.3	QP
9.511350	43.8	19.9	60.0	16.2	QP
0.293500	37.9	19.7	50.4	12.5	Ave.
0.490710	34.8	19.8	46.2	11.3	Ave.
0.995210	27.8	19.8	46.0	18.2	Ave.
8.238430	30.8	19.9	50.0	19.2	Ave.
8.888890	29.9	19.9	50.0	20.1	Ave.
9.511350	35.3	19.9	50.0	14.7	Ave.

Powered by Adapter 3(Frecom):

AC 120 V/60 Hz, Line:



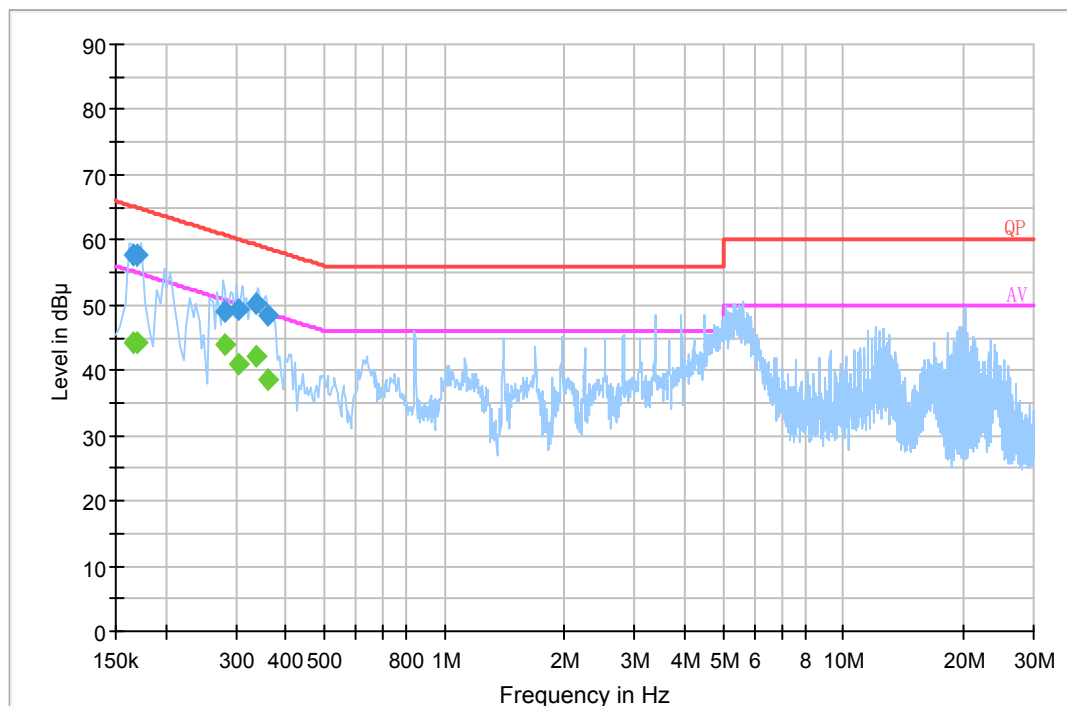
Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
0.383670	39.0	19.9	58.2	19.2	QP
0.392090	40.7	19.9	58.0	17.3	QP
1.586510	30.1	19.9	56.0	25.9	QP
2.145390	30.7	19.9	56.0	25.3	QP
22.535990	37.1	20.4	60.0	22.9	QP
23.324050	35.4	20.4	60.0	24.6	QP
0.383670	30.0	19.9	48.2	18.2	Ave.
0.392090	30.6	19.9	48.0	17.4	Ave.
1.586510	21.0	19.9	46.0	25.0	Ave.
2.145390	21.5	19.9	46.0	24.5	Ave.
22.535990	21.6	20.4	50.0	28.4	Ave.
23.324050	21.7	20.4	50.0	28.3	Ave.

AC 120V/ 60 Hz, Neutral:

Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
0.384150	44.1	19.8	58.2	14.1	QP
0.388210	45.7	19.8	58.1	12.4	QP
1.093590	39.5	19.8	56.0	16.5	QP
1.191850	39.8	19.8	56.0	16.2	QP
1.385270	39.2	19.8	56.0	16.8	QP
1.424370	39.6	19.8	56.0	16.4	QP
0.384150	35.5	19.8	48.2	12.7	Ave.
0.388210	36.1	19.8	48.1	12.0	Ave.
1.093590	30.8	19.8	46.0	15.2	Ave.
1.191850	30.3	19.8	46.0	15.7	Ave.
1.385270	29.8	19.8	46.0	16.2	Ave.
1.424370	29.7	19.8	46.0	16.3	Ave.

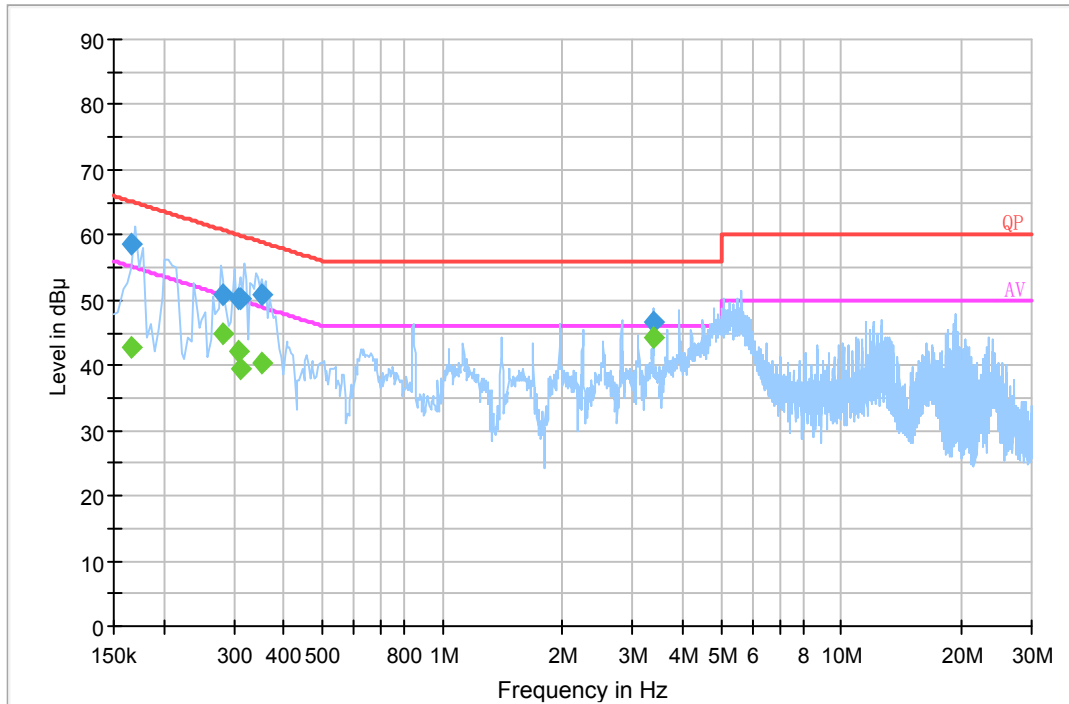
Powered by POE:

AC 120 V/60 Hz, Line:



Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
0.165500	57.8	19.9	65.2	7.4	QP
0.169500	57.9	19.9	65.0	7.1	QP
0.282500	49.2	19.7	60.7	11.6	QP
0.305470	49.2	19.7	60.1	10.9	QP
0.336870	50.1	19.8	59.3	9.2	QP
0.360630	48.4	19.9	58.7	10.3	QP
0.165500	44.3	19.9	55.2	10.9	Ave.
0.169500	44.4	19.9	55.0	10.6	Ave.
0.282500	43.8	19.7	50.7	6.9	Ave.
0.305470	41.0	19.7	50.1	9.1	Ave.
0.336870	42.3	19.8	49.3	7.0	Ave.
0.360630	38.5	19.9	48.7	10.2	Ave.

AC 120V/ 60 Hz, Neutral:



Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
0.165500	58.7	19.8	65.2	6.4	QP
0.282500	50.8	19.7	60.7	10.0	QP
0.306530	50.4	19.7	60.1	9.7	QP
0.313230	50.1	19.7	59.9	9.8	QP
0.352690	50.9	19.9	58.9	8.0	QP
3.371390	46.6	19.9	56.0	9.4	QP
0.165500	42.7	19.8	55.2	12.5	Ave.
0.282500	45.0	19.7	50.7	5.8	Ave.
0.306530	42.1	19.7	50.1	8.0	Ave.
0.313230	39.6	19.7	49.9	10.3	Ave.
0.352690	40.4	19.9	48.9	8.5	Ave.
3.371390	44.2	19.9	46.0	1.8	Ave.

Note:

- 1) Correction Factor = LISN VDF (Voltage Division Factor) + Cable Loss + Transient Limiter Attenuation
- 2) Corrected Amplitude = Reading + Correction Factor
- 3) Margin = Limit – Corrected Amplitude

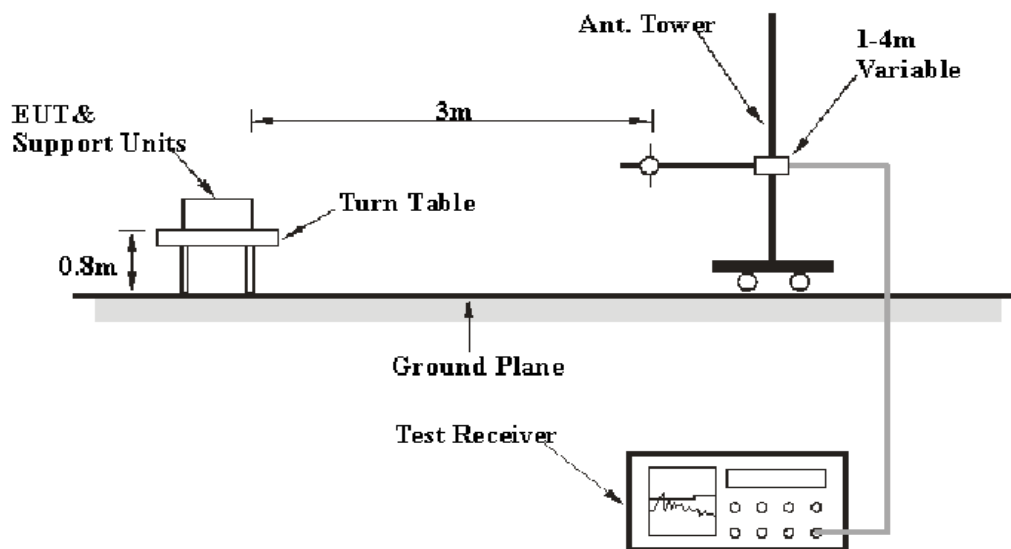
FCC §15.109 - RADIATED SPURIOUS EMISSIONS

Applicable Standard

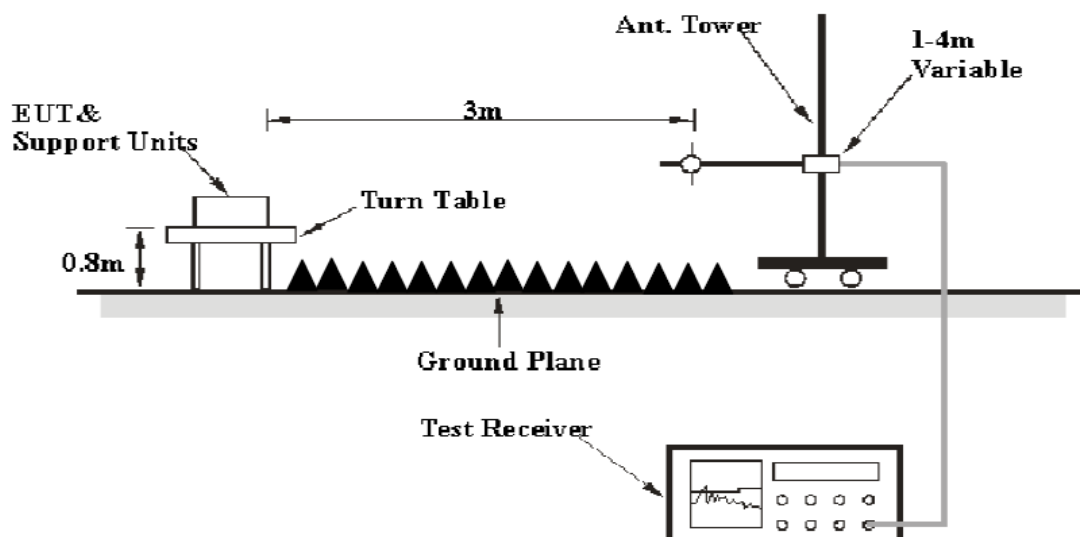
FCC §15.109

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission 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.

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.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 2 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	Measurment
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.

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 Results Summary

According to the data in the following table, the EUT complied with the FCC §15.109 Class B,

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

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

In BACL, $U_{(L_m)}$ 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

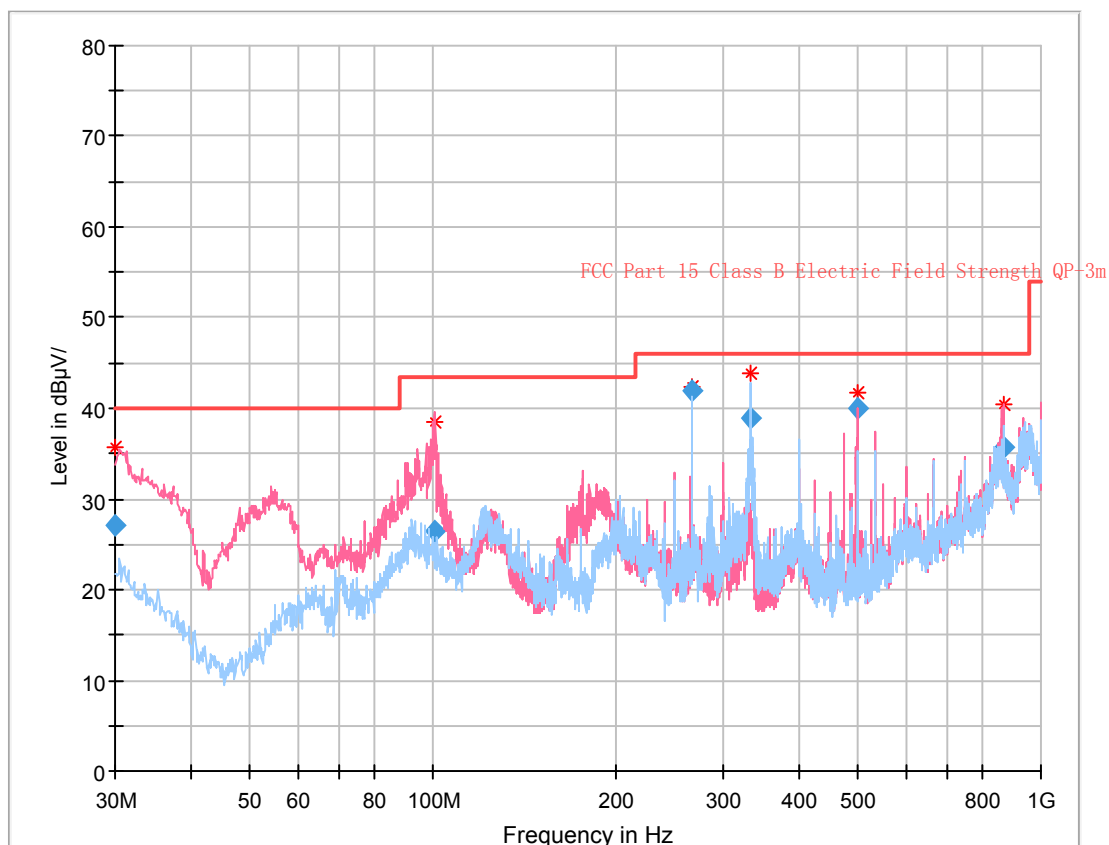
Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Baston Chen on 2019-04-10 to 2019-04-11 and Leo Huang on 2019-04-01.

EUT Operation Mode: Working (Talking with another IP Phone and Ping with PC)

Powered by Adapter 1 (MASSPOWER):

30 MHz~1 GHz:



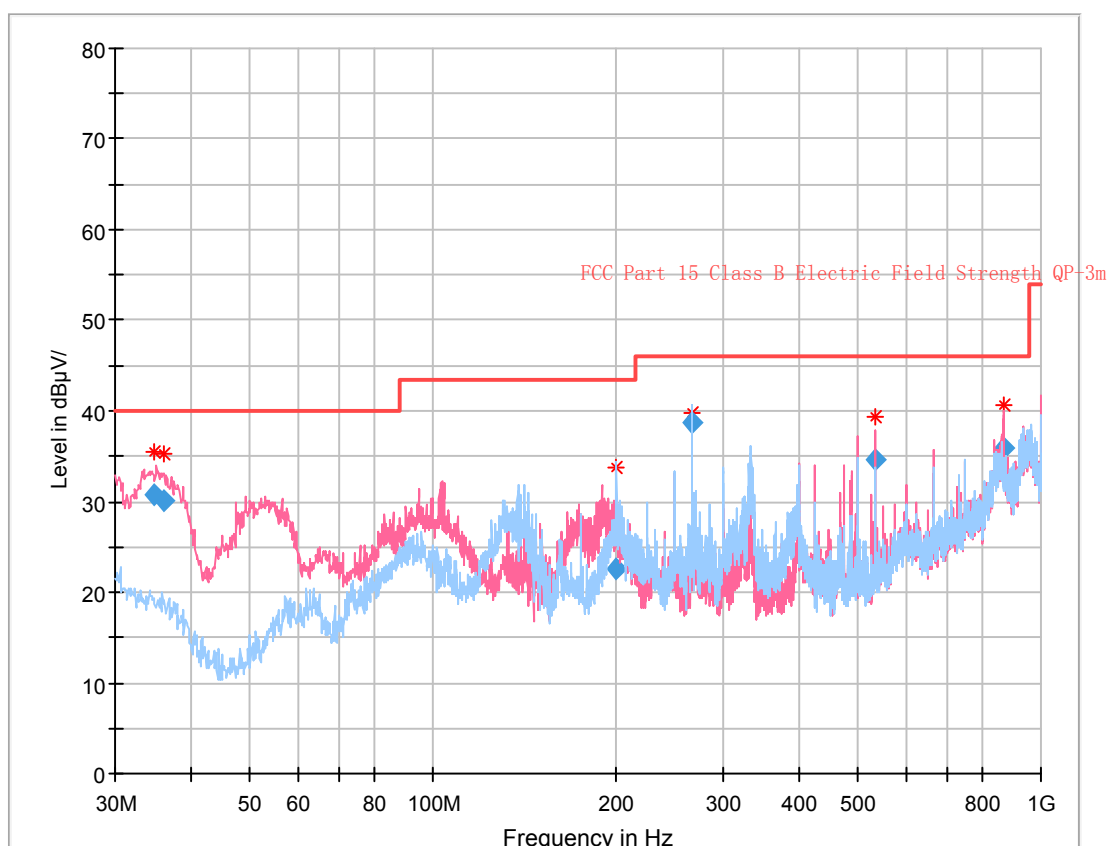
Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna height (cm)	Antenna Polarity	Turntable position (degree)	Correction Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
30.060947	27.03	106.0	V	57.0	-7.7	40.00	12.97
100.615875	26.37	116.0	V	121.0	-17.1	43.50	17.13
266.668250	41.86	108.0	H	203.0	-12.9	46.00	4.14
333.234125	38.85	108.0	H	188.0	-10.8	46.00	7.15
499.987750	39.91	106.0	V	195.0	-7.2	46.00	6.09
868.213500	35.63	115.0	V	193.0	5.9	46.00	10.37

1 GHz – 2 GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBuV/m)	FCC Part 15B	
	Reading (dBuV)	PK/QP/Ave.		Height (m)	Polar (H / V)			Limit (dBuV/m)	Margin (dB)
1045.60	43.21	PK	34	1.6	H	-5.11	38.10	74	35.90
1045.60	30.24	Ave.	34	1.6	H	-5.11	25.13	54	28.87
1045.60	43.62	PK	334	1.1	V	-5.11	38.51	74	35.49
1045.60	30.41	Ave.	334	1.1	V	-5.11	25.30	54	28.70
1753.30	44.37	PK	320	2.2	H	-2.01	42.36	74	31.64
1753.30	31.25	Ave.	320	2.2	H	-2.01	29.24	54	24.76
1753.30	44.56	PK	40	2.0	V	-2.01	42.55	74	31.45
1753.30	31.32	Ave.	40	2.0	V	-2.01	29.31	54	24.69

Powered by Adapter 2 (SUNLIGHT):

30 MHz~1 GHz:



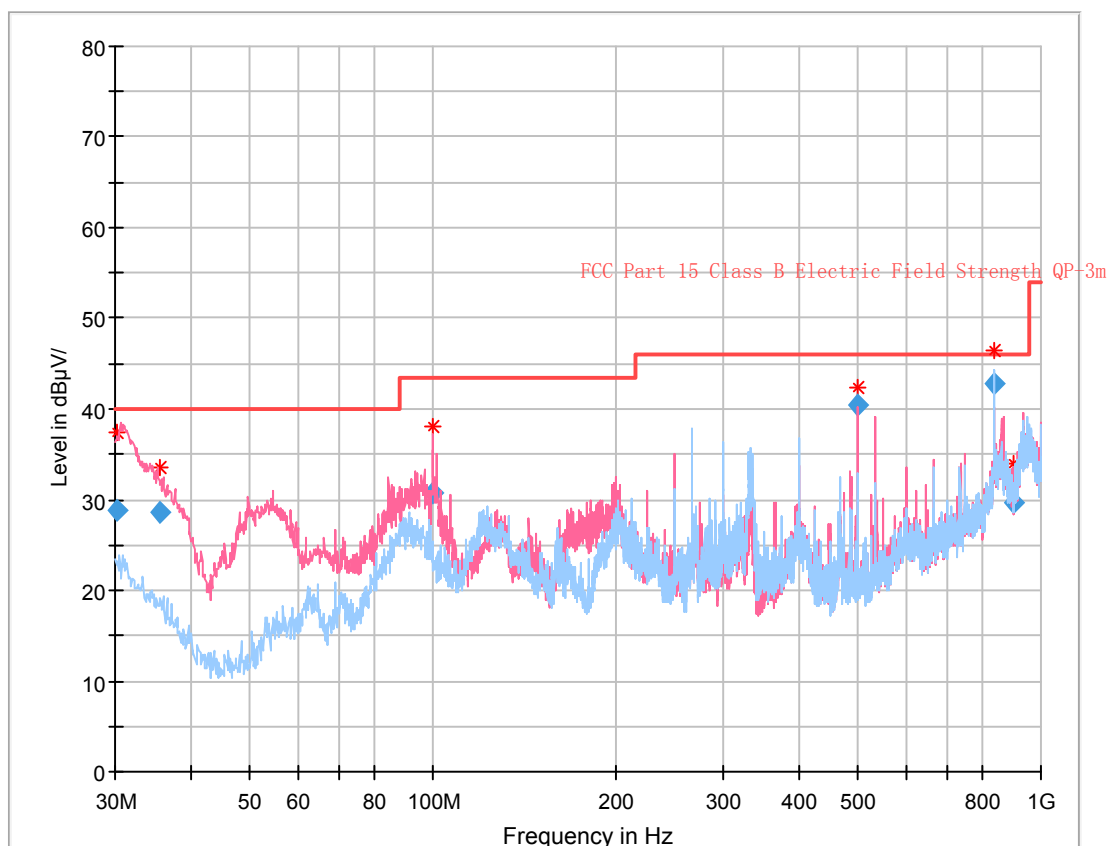
Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna height (cm)	Antenna Polarity	Turntable position (degree)	Correction Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
34.787625	30.68	99.0	V	179.0	-10.4	40.00	9.32
36.138250	30.05	138.0	V	210.0	-11.3	40.00	9.95
200.619250	22.61	105.0	H	229.0	-13.8	43.50	20.89
266.643875	38.72	108.0	H	101.0	-12.9	46.00	7.28
533.282875	34.64	114.0	V	312.0	-6.0	46.00	11.36
869.176750	36.01	112.0	V	193.0	5.9	46.00	9.99

1 GHz – 2 GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBuV/m)	FCC Part 15B	
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H / V)			Limit (dBuV/m)	Margin (dB)
1071.60	43.12	PK	46	2.1	H	-4.69	38.43	74	35.57
1071.60	30.26	Ave.	46	2.1	H	-4.69	25.57	54	28.43
1071.60	43.22	PK	126	1.6	V	-4.69	38.53	74	35.47
1071.60	30.43	Ave.	126	1.6	V	-4.69	25.74	54	28.26
1876.30	44.36	PK	71	1.6	H	-1.68	42.68	74	31.32
1876.30	31.33	Ave.	71	1.6	H	-1.68	29.65	54	24.35
1876.30	44.19	PK	252	1.6	V	-1.68	42.51	74	31.49
1876.30	30.84	Ave.	252	1.6	V	-1.68	29.16	54	24.84

Powered by Adapter 3 (Frecom):

30 MHz~1 GHz:

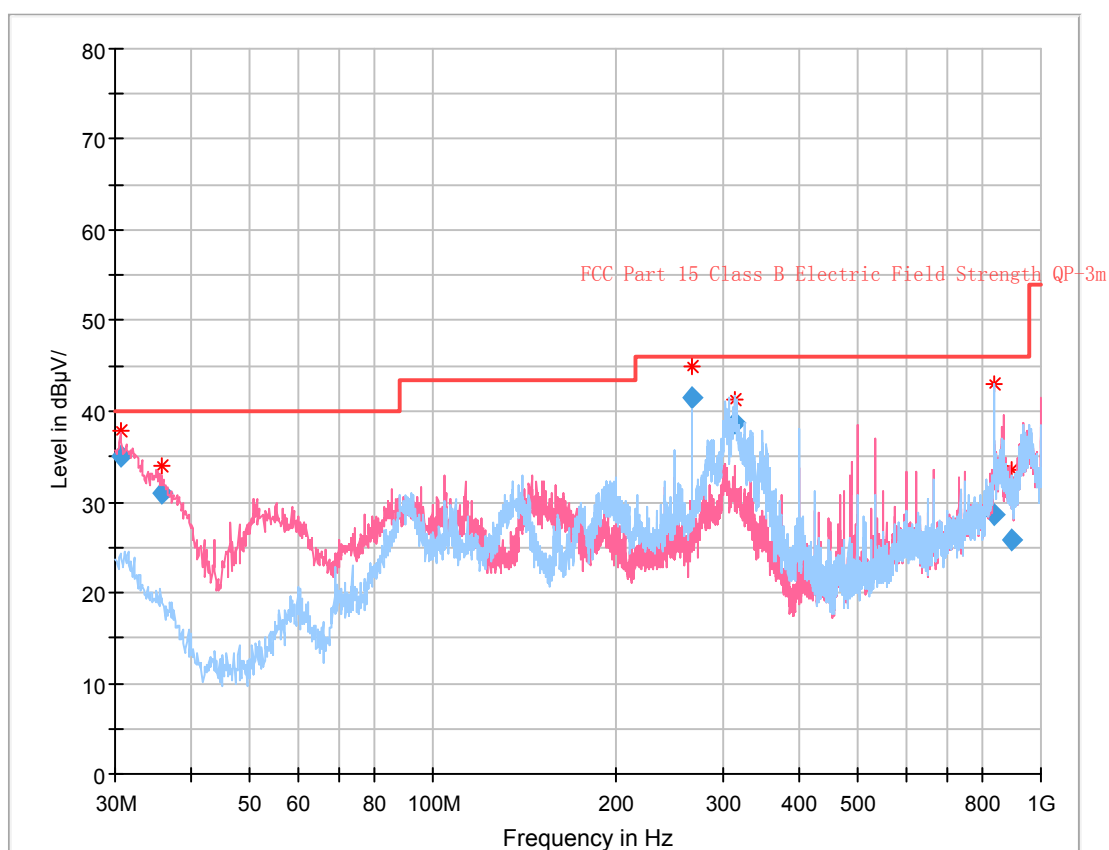


Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna height (cm)	Antenna Polarity	Turntable position (degree)	Correction Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
30.148500	28.78	106.0	V	76.0	-7.7	40.00	11.22
35.602000	28.54	116.0	V	169.0	-10.9	40.00	11.46
99.593625	30.66	100.0	V	267.0	-17.3	43.50	12.84
500.001625	40.36	100.0	V	206.0	-7.2	46.00	5.64
836.658625	42.82	188.0	H	326.0	5.6	46.00	3.18
902.354625	29.66	119.0	V	185.0	4.4	46.00	17.34

1 GHz – 2GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBuV/m)	FCC Part 15B	
	Reading (dBuV)	PK/QP/Ave.		Height (m)	Polar (H / V)			Limit (dBuV/m)	Margin (dB)
1035.50	43.26	PK	154	1.3	H	-5.11	38.15	74	35.85
1035.50	30.42	AV	154	1.3	H	-5.11	25.31	54	28.69
1035.50	43.52	PK	40	2.5	V	-5.11	38.41	74	35.59
1035.50	30.26	AV	40	2.5	V	-5.11	25.15	54	28.85
1824.30	44.35	PK	32	1.4	H	-1.81	42.54	74	31.46
1824.30	31.24	AV	32	1.4	H	-1.81	29.43	54	24.57
1824.30	44.43	PK	6	2.3	V	-1.81	42.62	74	31.38
1824.30	31.26	AV	6	2.3	V	-1.81	29.45	54	24.55

Powered by POE:

30 MHz~1 GHz:

Frequency (MHz)	Corrected Amplitude (dB μ V/m)	Antenna height (cm)	Antenna Polarity	Turntable position (degree)	Correction Factor (dB/m)	Limit (dB μ V/m)	Margin (dB)
30.660375	34.96	106.0	V	190.0	-8.0	40.00	5.04
35.819125	30.96	106.0	V	221.0	-11.1	40.00	9.04
266.675500	41.48	118.0	H	90.0	-12.9	46.00	4.52
313.709125	38.65	102.0	H	193.0	-10.7	46.00	7.35
836.528375	28.62	373.0	H	57.0	5.6	46.00	17.38
894.856000	25.80	190.0	V	318.0	4.4	46.00	20.20

1 GHz – 2 GHz:

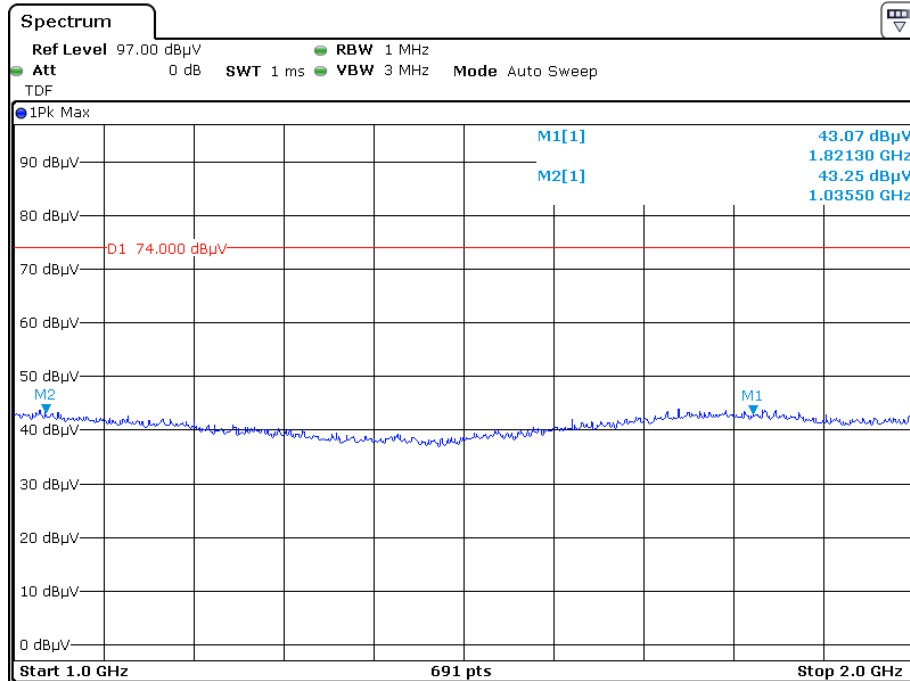
Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dB μ V/m)	FCC Part 15B	
	Reading (dB μ V)	PK/QP/Ave.		Height (m)	Polar (H / V)			Limit (dB μ V/m)	Margin (dB)
1036.90	43.54	PK	187	2.2	H	-5.11	38.43	74	35.57
1036.90	30.29	AV	187	2.2	H	-5.11	25.18	54	28.82
1036.90	43.64	PK	286	1.3	V	-5.11	38.53	74	35.47
1036.90	30.37	AV	286	1.3	V	-5.11	25.26	54	28.74
1777.90	44.36	PK	208	1.5	H	-1.91	42.45	74	31.55
1777.90	31.45	AV	208	1.5	H	-1.91	29.54	54	24.46
1777.90	44.46	PK	25	2.0	V	-1.91	42.55	74	31.45
1777.90	31.23	AV	25	2.0	V	-1.91	29.32	54	24.68

Note:

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

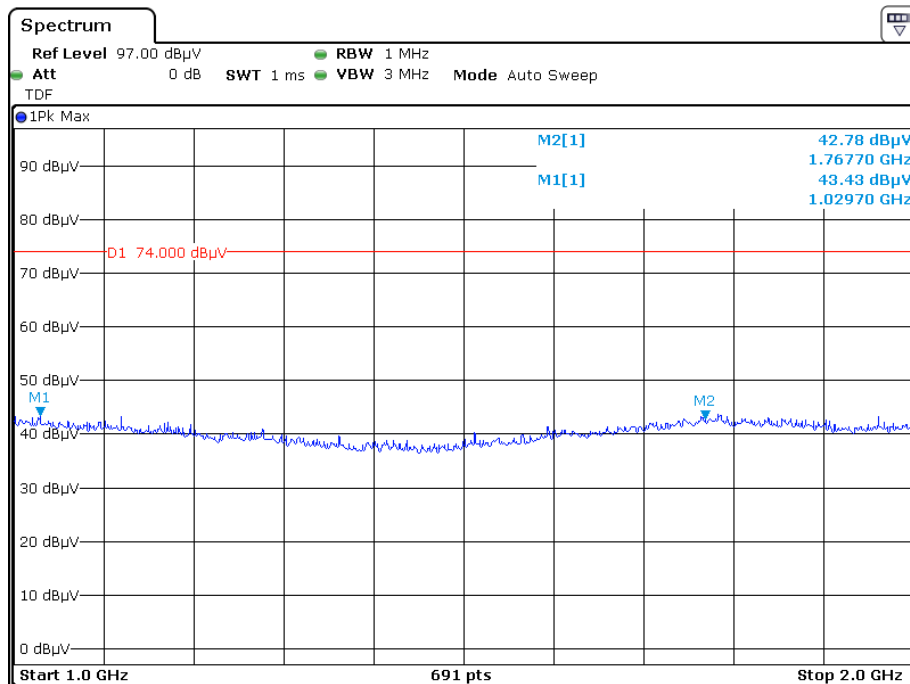
Pre-scan for peak

Horizontal – Peak (1-2GHz)



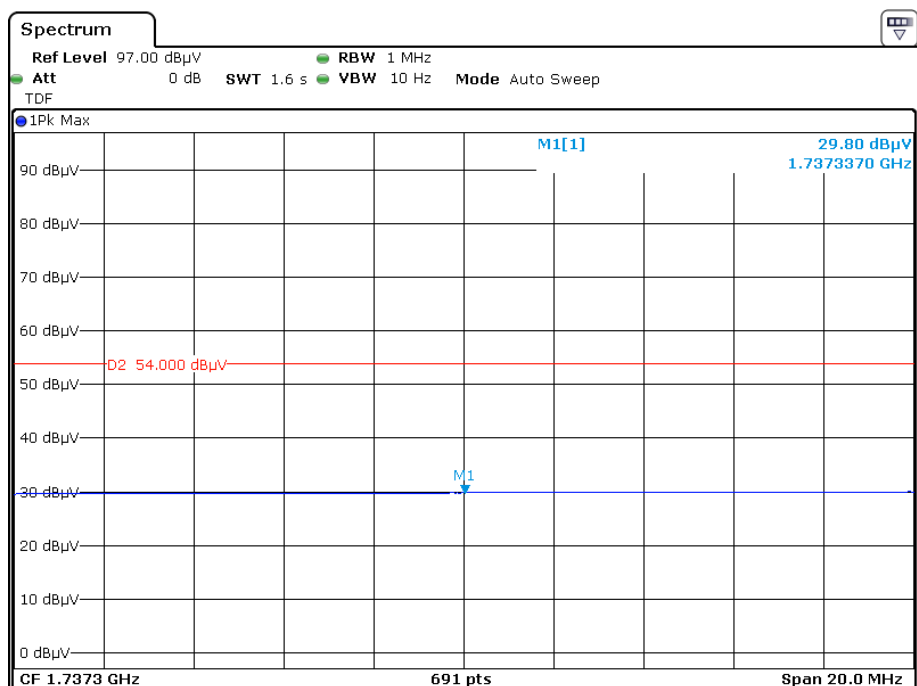
Date: 1.APR.2019 00:34:46

Vertical - Peak (1-2 GHz)



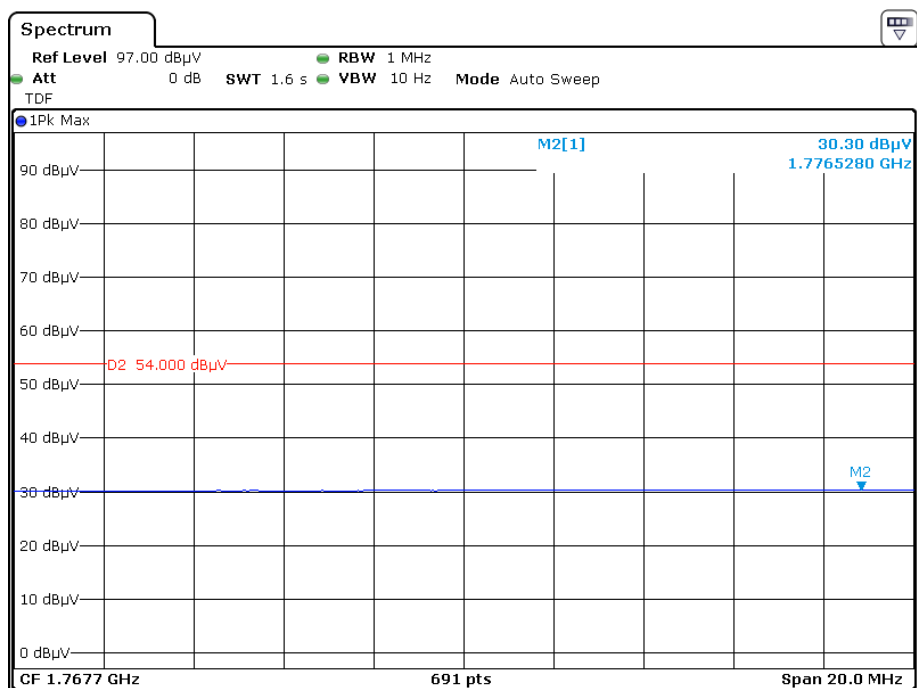
Date: 1.APR.2019 00:40:55

Horizontal – Average



Date: 1.APR.2019 00:37:36

Vertical - Average



Date: 1.APR.2019 00:42:34

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