FCC PART 15B, CLASS B

TEST REPORT

For

Crestron Electronics Inc

15 Volvo Drive, Rockleigh, New Jersey, 07647, United States

FCC ID: EROAM-TX3

Report Type:	**Product Type:**
Original Report	Wireless Media Transmitter

Test Engineer:	Andy Yu Alan He Haiguo Li	Andy Yu Alan He Haiguo Li
Report Number:	RSZ210323004-EM-00	
Report Date:	2021-06-25	
Reviewed By:	Joson Xiao EMC Engineer	Joson Xiao
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 5F(B-West) , 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn	

Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "★".

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk '*'. Customer model name, addresses, names, trademarks etc. are not considered data.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Wireless Media Transmitter
Tested Model	M202018002
SKU Number	AM-TX3-100, AM-TX3-100-I
Voltage Range	DC 5V from Type-C Port
Highest operating frequency	5825MHz
Date of Test	2021-04-01 to 2021-06-24
Sample number	RSZ210323004-EM-S1(Assigned by BACL, Shenzhen)
Received date	2021-03-23
Sample/EUT Status	Good condition
Adapter information	N/A

Objective

This test report is 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.

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 expended 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		±1.95dB
Radiated Emissions	Below 1GHz	±4.75dB
	Above 1GHz	±4.88dB

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. 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 5F(B-West) , 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, 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 a manufacturer testing fashion.

EUT Exercise Software

No exercise software was used.

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

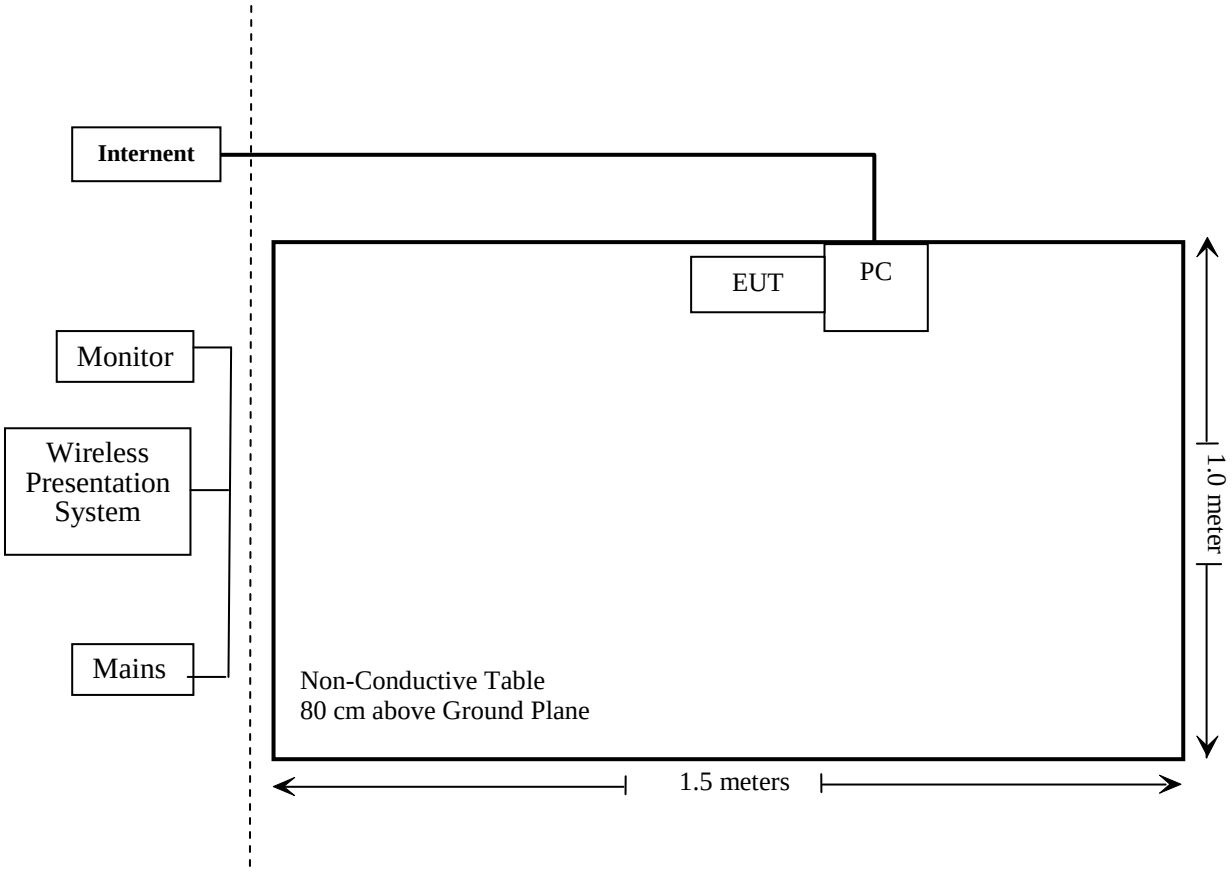
Manufacturer	Description	Model	Serial Number
Lenovo	PC	Thinkbook 14	Thinkbook 14
Redmi	PC 1	RedmiBook14	RedmiBook14
SAMSUNG	Monitor	S24E390HL	ZZFRH4ZN303357K
CRESTRON	Wireless Presentation System	M202018001	M202018001

External I/O Cable

Cable Description	Length (m)	From/Port	To
Un-shielded detachable RJ45 cable	8.0	PC	Internent
Un-shielded detachable HDMI cable	1.0	Wireless Presentation System	Monitor
Un-shielded detachable AC cable	1.2	Wireless Presentation System	Mains
Un-shielded detachable AC cable	1.0	Monitor	Mains

Block Diagram of Test Setup

For Radiation Emission:



SUMMARY OF TEST RESULTS

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

EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2020/08/04	2021/08/03
Rohde & Schwarz	LISN	ENV216	101613	2020/08/04	2021/08/03
Rohde & Schwarz	Transient Limitor	ESH3Z2	DE25985	2020/11/29	2021/11/28
Unknown	CE Cable	CE Cable	UF A210B-1-0720-504504	2020/11/29	2021/11/28
Rohde & Schwarz	CE Test software	EMC 32	V8.53.0	NCR	NCR
Radiated Emission Test					
Sonoma instrument	Pre-amplifier	310 N	186238	2020/08/04	2021/08/03
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2020/12/22	2023/12/21
Unknown	Cable 2	RF Cable 2	F-03-EM197	2020/11/29	2021/11/28
Unknown	Cable	Chamber Cable 1	F-03-EM236	2020/11/29	2021/11/28
Unknown	Cable	Chamber Cable 4	EC-007	2020/11/29	2021/11/28
Rohde & Schwarz	Auto test software	EMC 32	V9.10	NCR	NCR
Yijia	Temperature & Humidity Meter	TA218B	E0938	2020/09/30	2021/09/29
Rohde & Schwarz	Spectrum Analyzer	FSV40-N	102259	2020/08/04	2021/08/03
COM-POWER	Pre-amplifier	PA-122	181919	2020/11/29	2021/11/28
Sunol Sciences	Horn Antenna	3115	9107-3694	2021/01/15	2024/01/14
Insulted Wire Inc.	RF Cable	SPS-2503-3150	02222010	2020/11/29	2021/11/28
Unknown	RF Cable	W1101-EQ1 OUT	F-19-EM005	2020/11/29	2021/11/28
Unknown	Signal Cable	RG-214	2	2020/11/29	2021/11/28

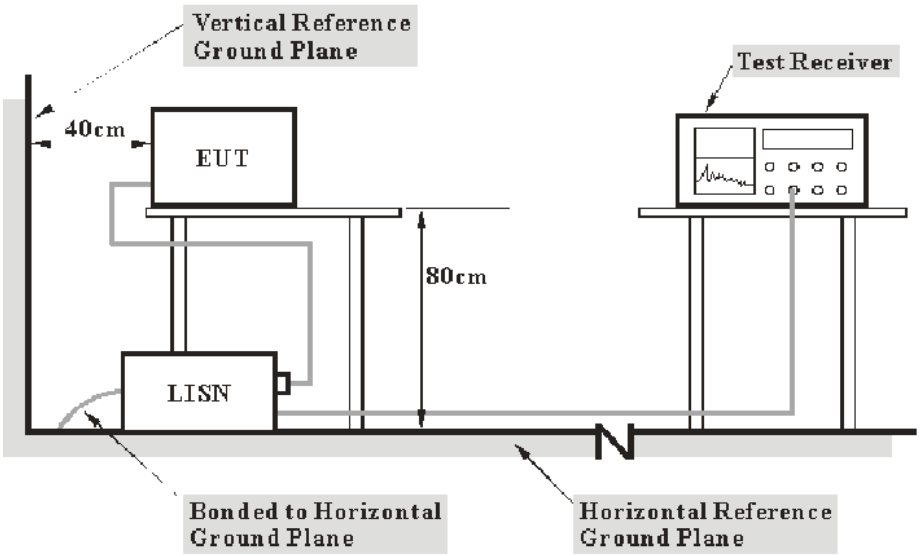
*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

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.

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 device 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.

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 Data

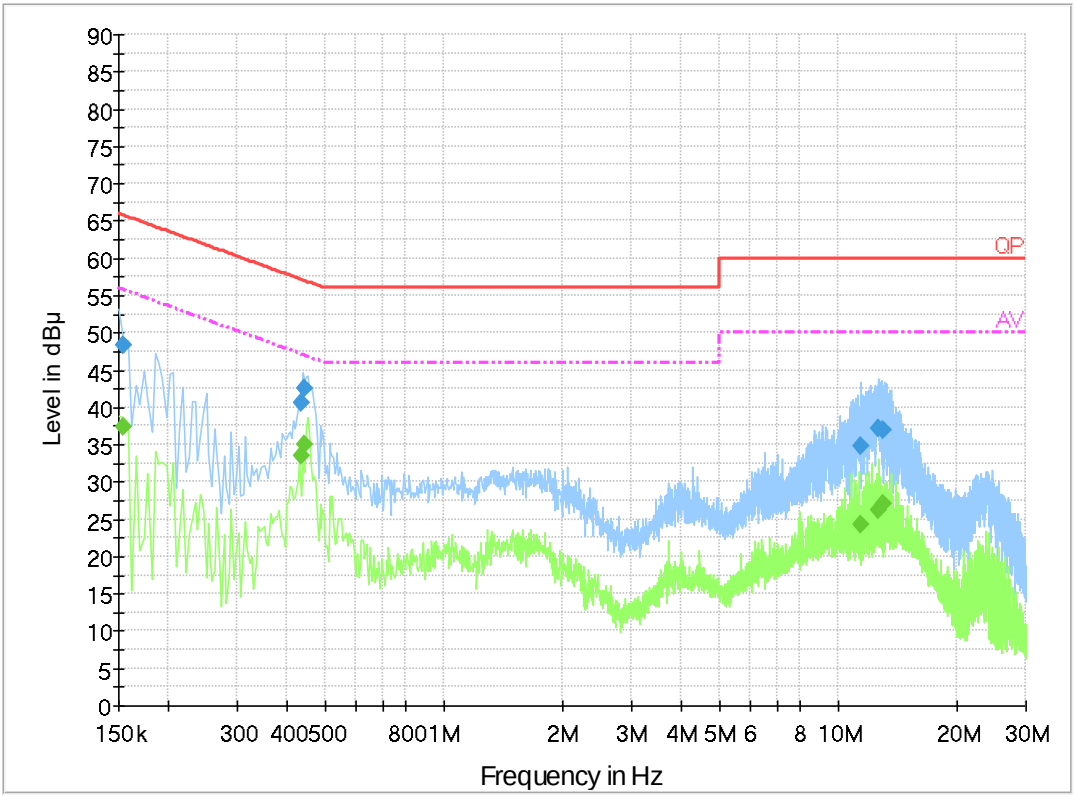
Environmental Conditions

Temperature:	25℃
Relative Humidity:	70 %
ATM Pressure:	101.0 kPa

The testing was performed by Haiguo Li on 2021-06-24.

EUT Operation Mode: Projection screen

AC 120V/60 Hz, Line



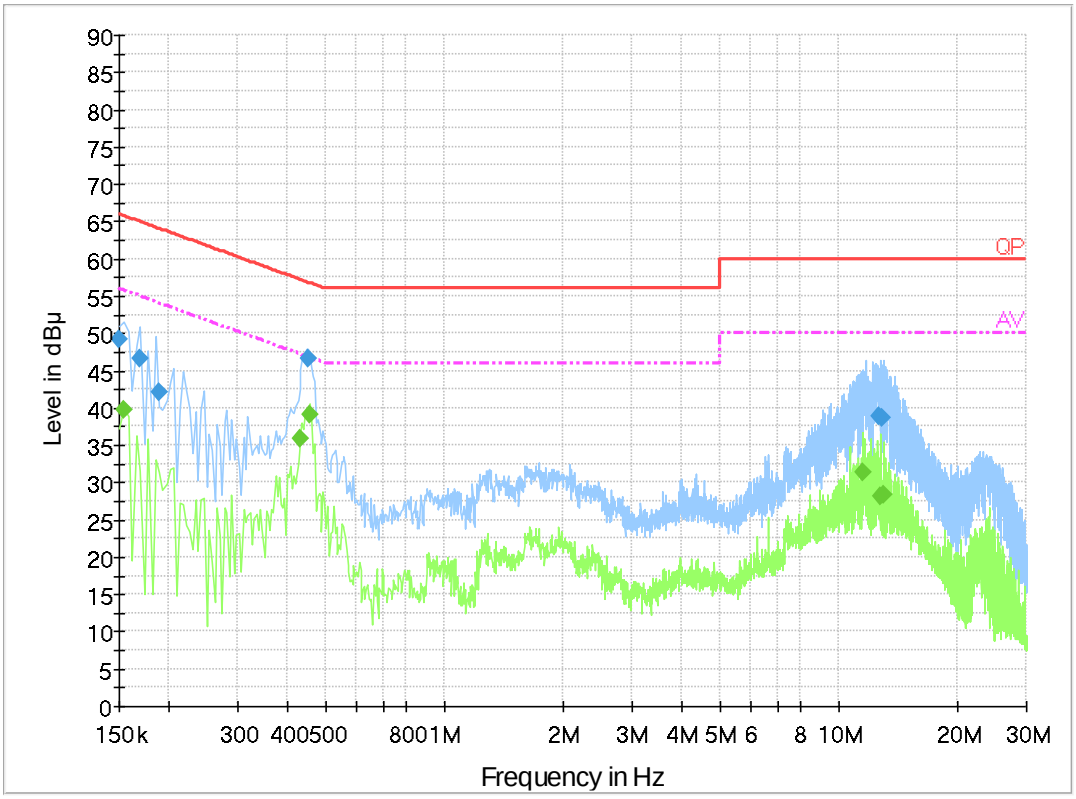
Final Result 1

Frequency (MHz)	QuasiPeak (dBµ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)
0.154000	48.4	9.000	L1	19.8	17.4	65.8
0.435550	40.7	9.000	L1	19.8	16.4	57.1
0.443370	42.4	9.000	L1	19.8	14.6	57.0
11.482670	34.8	9.000	L1	20.0	25.2	60.0
12.659050	37.1	9.000	L1	20.0	22.9	60.0
12.984530	36.9	9.000	L1	20.0	23.1	60.0

Final Result 2

Frequency (MHz)	Average (dBµ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)
0.154000	37.4	9.000	L1	19.8	18.4	55.8
0.435550	33.5	9.000	L1	19.8	13.6	47.1
0.443370	35.0	9.000	L1	19.8	12.0	47.0
11.482670	24.3	9.000	L1	20.0	25.7	50.0
12.659050	26.1	9.000	L1	20.0	23.9	50.0
12.984530	27.1	9.000	L1	20.0	22.9	50.0

AC 120V/60 Hz, Neutral:



Final Result 1

Frequency (MHz)	QuasiPeak (dBµ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)
0.150000	49.2	9.000	N	19.8	16.8	66.0
0.169500	46.7	9.000	N	19.8	18.3	65.0
0.189500	42.2	9.000	N	19.8	21.9	64.1
0.451250	46.5	9.000	N	19.8	10.4	56.9
12.682630	38.8	9.000	N	20.0	21.2	60.0
12.974430	38.6	9.000	N	19.9	21.4	60.0

Final Result 2

Frequency (MHz)	Average (dBµ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)
0.154000	39.7	9.000	N	19.8	16.1	55.8
0.430000	35.9	9.000	N	19.8	11.4	47.3
0.458000	39.1	9.000	N	19.8	7.6	46.7
11.542000	31.4	9.000	N	20.0	18.6	50.0
12.842000	28.1	9.000	N	19.9	21.9	50.0
13.054000	28.3	9.000	N	19.9	21.7	50.0

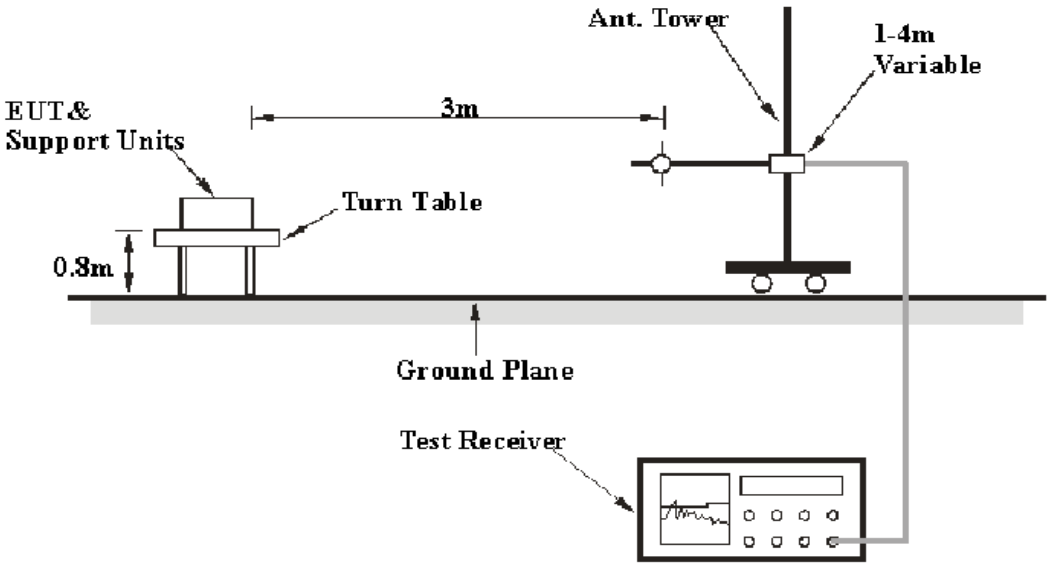
FCC §15.109 - RADIATED SPURIOUS EMISSIONS

Applicable Standard

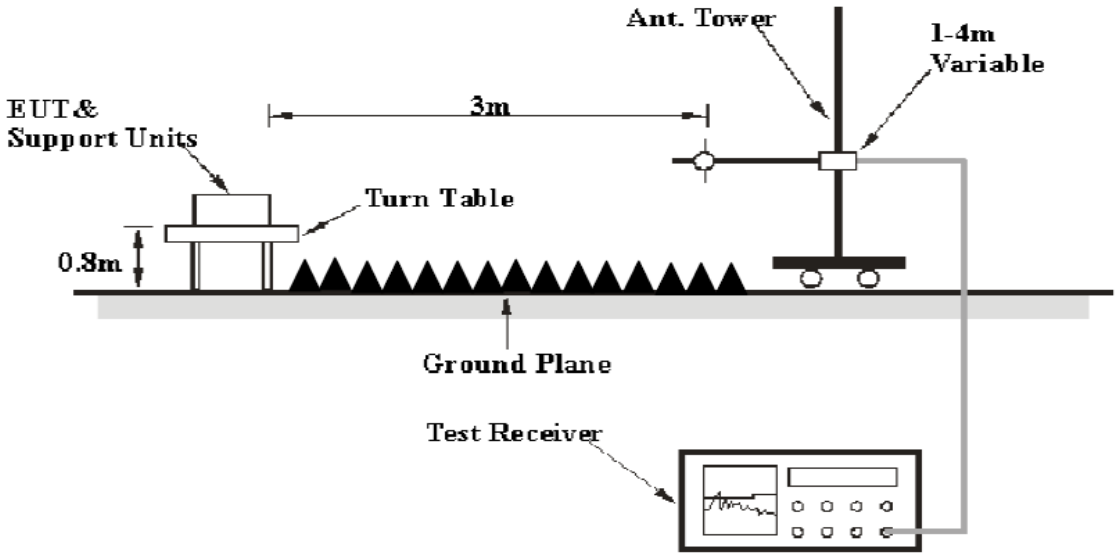
FCC §15.109

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 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

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:

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 Data

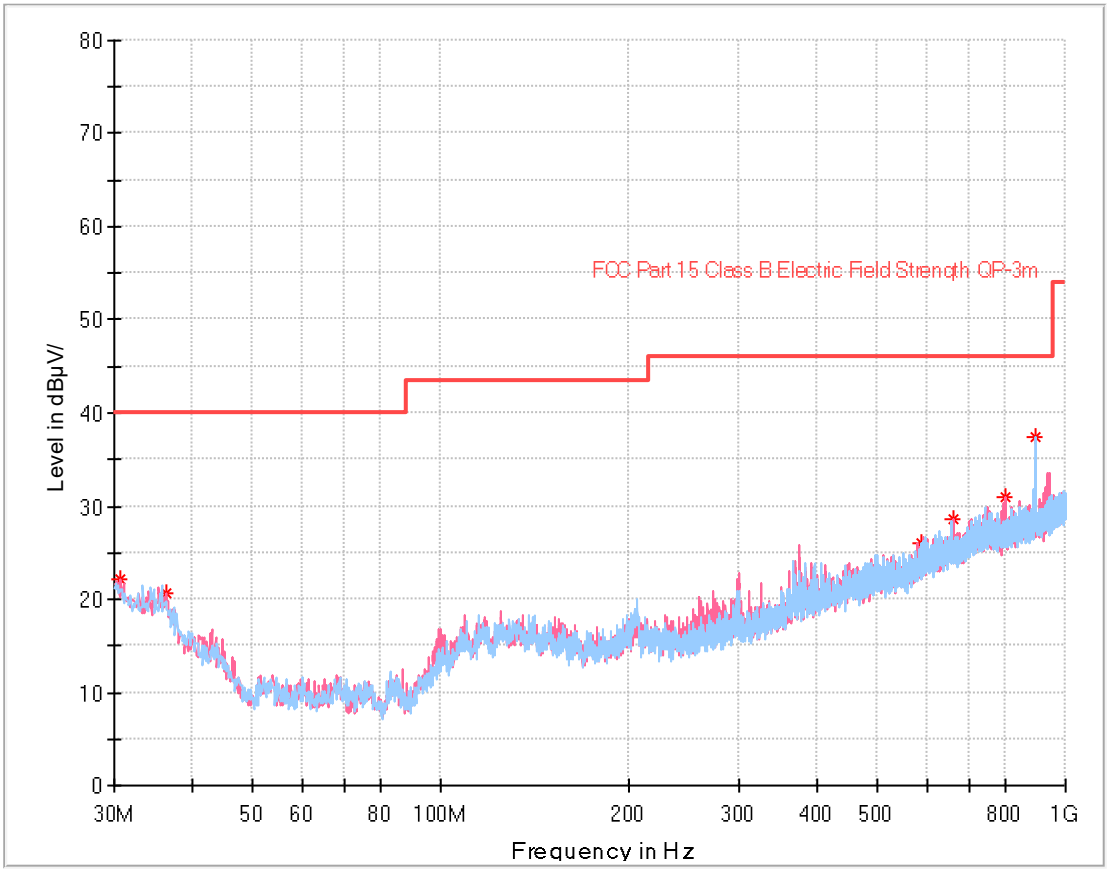
Environmental Conditions

Temperature:	25.3~26 ℃
Relative Humidity:	49~54 %
ATM Pressure:	100.9~101.0 kPa

The testing was performed by Andy Yu on 2021-04-01 for below 1GHz and Alan He on 2021-04-01 for above 1GHz.

EUT Operation Mode: Projection screen

30 MHz~1 GHz:



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
586.658750	26.08	46.00	19.92	200.0	H	107.0	-3.5
895.725000	37.40	46.00	8.60	300.0	H	71.0	0.9
30.727500	22.16	40.00	17.84	100.0	V	0.0	-4.1
663.410000	28.53	46.00	17.47	100.0	V	0.0	-2.2
36.305000	20.63	40.00	19.37	100.0	V	276.0	-8.1
799.816250	30.90	46.00	15.10	200.0	V	48.0	-0.5

1-30 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)
1235.58	43.58	PK	17	1.6	H	-4.68	38.90	74	35.10
1235.58	28.54	Ave.	17	1.6	H	-4.68	23.86	54	30.14
1235.58	43.72	PK	26	1.3	V	-4.68	39.04	74	34.96
1235.58	28.63	Ave.	26	1.3	V	-4.68	23.95	54	30.05
2637.63	43.86	PK	26	1.7	H	0.24	44.10	74	29.90
2637.63	28.69	Ave.	26	1.7	H	0.24	28.93	54	25.07
2637.63	44.15	PK	48	1.2	V	0.24	44.39	74	29.61
2637.63	28.74	Ave.	48	1.2	V	0.24	28.98	54	25.02

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