

FCC PART 15C TEST REPORT FOR CERTIFICATION
On Behalf of

Dynasty ProAudio

5.8G WIRELESS SYSTEM

Model Number: WSA-5TR TX

Additional Model:UWA-SB5 TX

FCC ID: 2ARPWWSA5TR

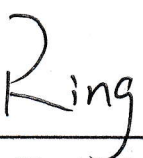
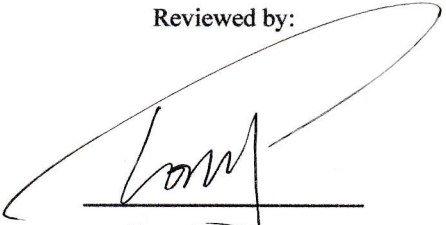
Prepared for:	Dynasty ProAudio
	4195 Chino Hills Parkway, Chino Hills, California, United States
Prepared By:	EST Technology Co., Ltd.
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Report Number:	ESTE-R1811093
Date of Test:	Nov. 08 ~ 26, 2018
Date of Report:	Nov. 27, 2018

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Test Report Verification

Applicant:	Dynasty ProAudio		
Address:	4195 Chino Hills Parkway, Chino Hills, California, United States		
Manufacturer	Mansion Industry Co.,Ltd.		
Address:	No.402, Xiangshan Rd., The 3rd Industrial Park, Luotian Community, Songgang Street, Baoan District, Shenzhen, Guangdong, 518105 China		
E.U.T:	5.8G WIRELESS SYSTEM		
Model Number:	WSA-5TR TX		
Additional Model:	UWA-SB5 TX Note: They are identical to each other, only except for model name.		
Power Supply:	DC 5V From Adapter Input AC 100-240V ~50/60Hz		
Test Voltage:	DC 5V From Adapter Input AC 120V/60Hz DC 5V From Adapter Input AC 240V/60Hz		
Trade Name:	DYNASTY PROAUDIO McLELLAND	Serial No.:	-----
Date of Receipt:	Oct. 19, 2018	Date of Test:	Nov. 08 ~ 26, 2018
Test Specification:	FCC Rules and Regulations Part 15 Subpart C:2018 ANSI C63.10:2013		
Test Result:	The device described above is tested by EST Technology Co., Ltd.. The measurement results were contained in this test report and EST Technology Co., Ltd. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the FCC Rules and Regulations Part 15 Subpart C requirements. This report applies to above tested sample only and shall not be reproduced in part without written approval of EST Technology Co., Ltd. Date: Nov. 27, 2018		
Prepared by:	Reviewed by:	Approved by:	
 Ring / Assistant	 Tony / Engineer	 Iceman.Hu / Manager	
Other Aspects:	None.		
<i>Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested</i>			
<i>This test report is based on a single evaluation of one sample of above mentioned products ,It is not permitted to be duplicated in extracts without written approval of EST Technology Co., Ltd.</i>			

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Product Name	:	5.8G WIRELESS SYSTEM
FCC ID	:	2ARPWWSA5TR
Model Number	:	WSA-5TR TX
Operation frequency	:	5729MHz-5820MHz
Number of channel	:	47
Antenna	:	PCB antenna 1.56dBi gain
Modulation	:	GFSK
Sample Type	:	Prototype production

2. SUMMARY OF TEST

2.1. Summary of test result

Description of Test Item	Standard	Results
Power Line Conducted Emissions	FCC Part 15C: 15.207 ANSI C63.10-2013	PASS
Radiated Emission Test	FCC Part 15C: 15.205 FCC Part 15C: 15.209 FCC Part 15C: 15.249 (a)(e) ANSI C63.10-2013	PASS
20 dB Bandwidth Test	FCC Part 15: 15.215 ANSI C63.10-2013	PASS
Band Edge Compliance Test	FCC Part 15C: 15.205 FCC Part 15C: 15.209 FCC Part 15C: 15.249 (a)(e) ANSI C63.10-2013	PASS
Antenna requirement	FCC Part 15: 15.203	PASS

2.2. Test Facilities

EMC Lab	:	Certificated by CNAS, CHINA Registration No.: L5288 Date of registration: November 13, 2017 Certificated by A2LA, USA Registration No.: 4366.01 Date of registration: November 07, 2017 Certificated by FCC, USA Designation Number: CN1215 Registration No.: 722932 Date of registration: November 21, 2017 Certificated by Industry Canada Registration No.: 9405A Date of registration: December 03, 2015 Certificated by VCCI, Japan Registration No.: R-13663; C-14103 Date of registration: July 25, 2017 This Certificate is valid until: July 24, 2020 Certificated by TUV Rheinland, Germany Registration No.: UA 50195514 0001 Date of registration: February 07, 2015 Certificated by TUV/PS, Shenzhen Registration No.: SCN1017 Date of registration: January 27, 2011 Certificated by Intertek ETL SEMKO Registration No.: 2011-RTL-L2-64 Date of registration: April 28, 2011 Certificated by Nemko, Hong Kong Registration No.: 175193 Date of registration: May 4, 2011
Name of Firm	:	EST Technology Co., Ltd.
Site Location	:	Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China

2.3. Measurement uncertainty

Test Item	Uncertainty
Uncertainty for Conduction emission test	$\pm 3.48\text{dB}$
Uncertainty for spurious emissions test (30MHz-1GHz)	$\pm 4.60\text{ dB(Polarize: H)}$
	$\pm 4.68\text{ dB(Polarize: V)}$
Uncertainty for spurious emissions test (1GHz to 18GHz)	$\pm 4.96\text{dB}$
Uncertainty for radio frequency	7×10^{-8}
Uncertainty for conducted RF Power	0.20dB
Uncertainty for Power density test	0.26dB

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

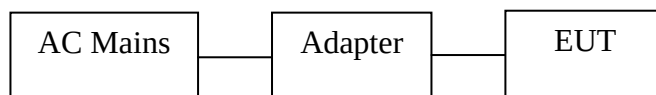
2.4. Assistant equipment used for test

2.4.1. Adapter

M/N	:	KT05W050100USU
Input	:	AC 100-240V~ 50/60Hz, 0.2A
Output	:	DC 5V, 1A

2.5. Block Diagram

For radiated emissions test: EUT was placed on a turn table, which is 0.8 or 1.5 meter high above ground. EUT was set into TX test mode by software.



(EUT: 5.8G WIRELESS SYSTEM)

2.6. Test mode

The test software was used to control EUT work in Continuous TX mode.

Mode	Frequency	
TX	CH 1	5729 MHz
	CH 24	5775 MHz
	CH 47	5820 MHz

2.7. Channel List

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	5729	18	5763	35	5797
2	5731	19	5765	36	5799
3	5733	20	5767	37	5801
4	5735	21	5769	38	5803
5	5737	22	5771	39	5805
6	5739	23	5773	40	5807
7	5741	24	5775	41	5809
8	5743	25	5777	42	5811
9	5745	26	5779	43	5813
10	5747	27	5781	44	5815
11	5749	28	5783	45	5817
12	5751	29	5785	46	5819
13	5753	30	5787	47	5820
14	5755	31	5789		
15	5757	32	5791		
16	5759	33	5793		
17	5761	34	5795		

2.8. Test Equipment

2.8.1. For conducted emission test

Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESHS30	832354	CEPREI	June 15,18	1 Year
Artificial Mains Network	Rohde & Schwarz	ENV216	101260	CEPREI	June 15,18	1 Year
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	101100	CEPREI	June 15,18	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A

2.8.2. For radiated emission test(9 kHz-30MHz)

Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESR7	101780	CEPREI	June 15,18	1 Year
Active Loop Antenna	SCHWARZB ECK	FMZB 1519B	1519B-088	N/A	Aug. 01,18	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A

2.8.3. For radiated emission test(30-1000MHz)

Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESR7	101780	CEPREI	June 15,18	1 Year
Bilog Antenna	Teseq	CBL 6111D	27090	CEPREI	June 15,18	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A

2.8.4. For radiated emission test(above 1GHz)

Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
Horn Antenna	SCHWARZB ECK	BBHA 9120 D	BBHA912 0D1002	CEPREI	June 18,18	1 Year
Horn Antenna	SCHWARZB ECK	BBHA9170	BBHA917 0242	CEPREI	June 18,18	1Year
Signal Amplifier	SCHWARZB ECK	BBV9718	9718-212	CEPREI	June 15,18	1 Year
Spectrum Analyzer	Rohde &Schwarz	FSV	103173	CEPREI	June 15,18	1 Year
PSA Series Spertrum Analyzer	Agilent	E4447A	MY50180 031	CEPREI	June 15,18	1Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A

3. POWER LINE CONDUCTED EMISSIONS

3.1. Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μ V)	Average Level dB(μ V)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

3.2. Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT was charged from PC's USB port which connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#).. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10:2013 on Conducted Emission Test.

The bandwidth of test receiver (R & S ESHS30) is set at 10kHz.

The frequency range from 150kHz to 30MHz is checked.

3.3. Test Result

PASS. (All emissions not reported below are too low against the prescribed limits.)

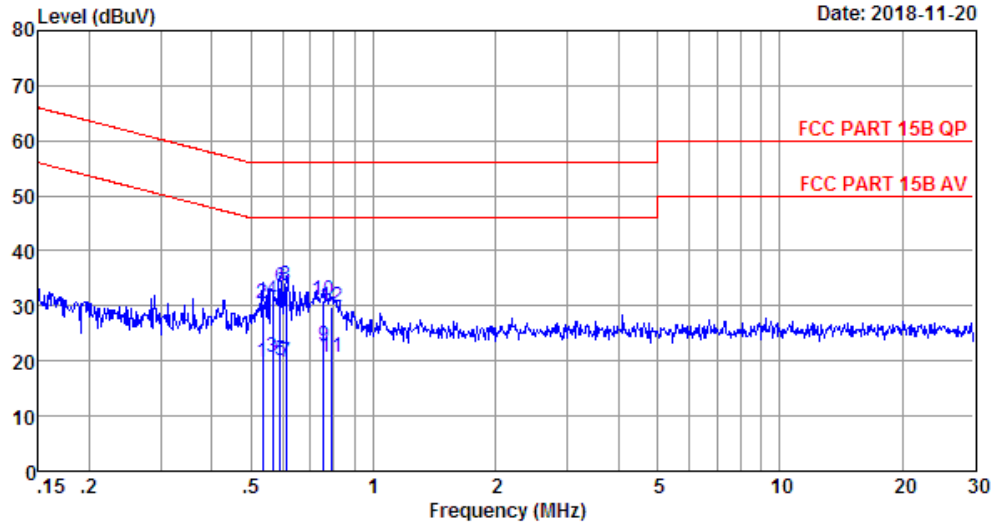
3.4. Test data

EST Technology

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Data: 198 File: \\Emc-ce-1\Test data\2018\MMansion.EM6 (205)

Date: 2018-11-20



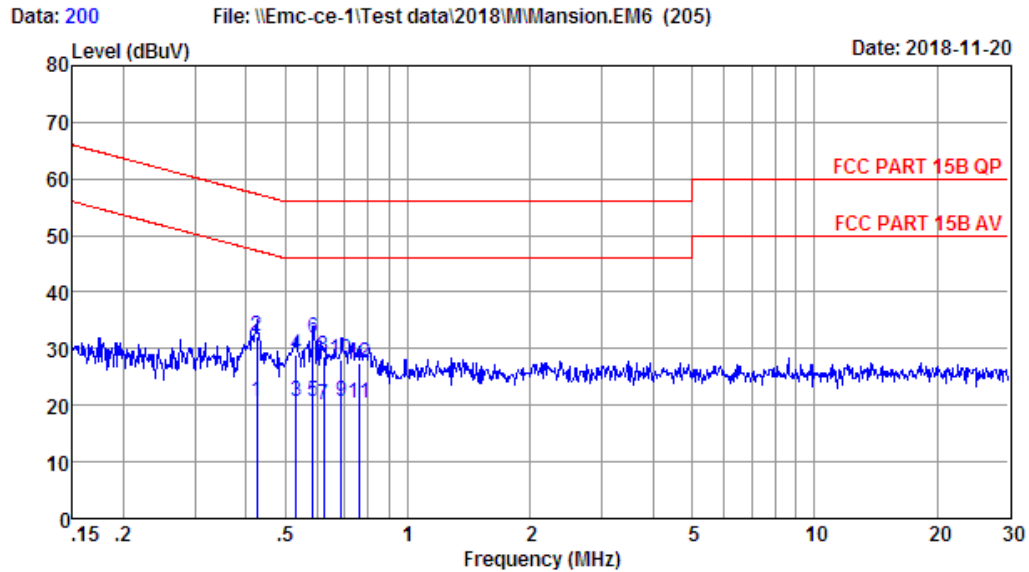
Site no : 844 Shield Room Data no. : 198
 Env. / Ins. : Temp:23.1'C Humi:50.3% Press:101.50kPa INE Phase : NEUTRAL
 Limit : FCC PART 15B QP
 Engineer : Viking
 EUT : 5.8G WIRELESS SYSTEM
 Power : DC 5V From Adapter Input AC 240V/60Hz
 M/N : WSA-5TR TX
 Test Mode : TX Mode

	Freq. (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.53	9.65	9.92	0.31	19.88	46.00	26.12	Average
2	0.53	9.65	9.92	10.70	30.27	56.00	25.73	QP
3	0.56	9.66	9.92	1.05	20.63	46.00	25.37	Average
4	0.56	9.66	9.92	11.31	30.89	56.00	25.11	QP
5	0.59	9.66	9.92	0.56	20.14	46.00	25.86	Average
6	0.59	9.66	9.92	13.87	33.45	56.00	22.55	QP
7	0.61	9.67	9.92	0.30	19.89	46.00	26.11	Average
8	0.61	9.67	9.92	13.94	33.53	56.00	22.47	QP
9	0.75	9.70	9.93	3.13	22.76	46.00	23.24	Average
10	0.75	9.70	9.93	11.32	30.95	56.00	25.05	QP
11	0.79	9.70	9.93	0.93	20.56	46.00	25.44	Average
12	0.79	9.70	9.93	10.08	29.71	56.00	26.29	QP

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.
 2. Margin= Limit - Emission Level.
 3. If the average limit is met when using a quasi-peak detector,
 the EUT shall be deemed to meet both limits and measurement
 with average detector is unnecessary.

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Site no : 844 Shield Room Data no. : 200
Env. / Ins. : Temp:23.1'C Humi:50.3% Press:101.50kPa INE Phase : LINE
Limit : FCC PART 15B QP
Engineer : Viking
EUT : 5.8G WIRELESS SYSTEM
Power : DC 5V From Adapter Input AC 240V/60Hz
M/N : WSA-5TR TX
Test Mode : TX Mode

	Freq. (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.43	9.72	9.92	1.16	20.80	47.33	26.53	Average
2	0.43	9.72	9.92	12.46	32.10	57.33	25.23	QP
3	0.53	9.72	9.92	0.93	20.57	46.00	25.43	Average
4	0.53	9.72	9.92	9.25	28.89	56.00	27.11	QP
5	0.59	9.72	9.92	1.05	20.69	46.00	25.31	Average
6	0.59	9.72	9.92	12.27	31.91	56.00	24.09	QP
7	0.62	9.72	9.92	0.30	19.94	46.00	26.06	Average
8	0.62	9.72	9.92	9.01	28.65	56.00	27.35	QP
9	0.69	9.72	9.93	1.03	20.68	46.00	25.32	Average
10	0.69	9.72	9.93	8.30	27.95	56.00	28.05	QP
11	0.76	9.72	9.93	0.80	20.45	46.00	25.55	Average
12	0.76	9.72	9.93	7.90	27.55	56.00	28.45	QP

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.
2. Margin= Limit - Emission Level.
3. If the average limit is met when using a quasi-peak detector,
the EUT shall be deemed to meet both limits and measurement
with average detector is unnecessary.

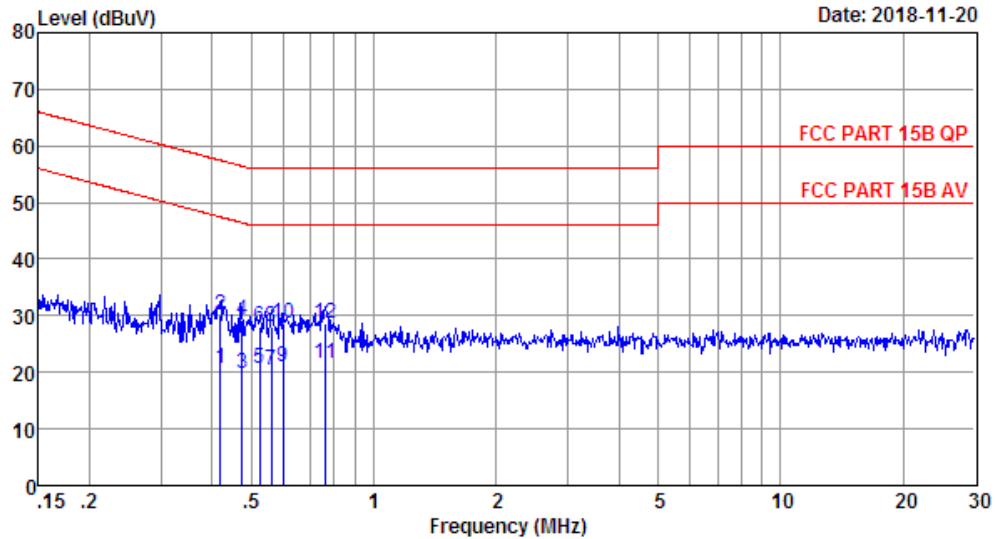
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Data: 202

File: \\Emc-ce-1\Test data\2018\MM\Mansion.EM6 (205)

Date: 2018-11-20



Site no : 844 Shield Room Data no. : 202
Env. / Ins. : Temp:23.1'C Humi:50.3% Press:101.50kPa INE Phase : LINE
Limit : FCC PART 15B QP
Engineer : Viking
EUT : 5.8G WIRELESS SYSTEM
Power : DC 5V From Adapter Input AC 120V/60Hz
M/N : WSA-5TR TX
Test Mode : TX Mode

	Freq. (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.42	9.72	9.92	1.16	20.80	47.46	26.66	Average
2	0.42	9.72	9.92	10.48	30.12	57.46	27.34	QP
3	0.47	9.72	9.92	0.20	19.84	46.45	26.61	Average
4	0.47	9.72	9.92	9.72	29.36	56.45	27.09	QP
5	0.52	9.72	9.92	0.93	20.57	46.00	25.43	Average
6	0.52	9.72	9.92	8.51	28.15	56.00	27.85	QP
7	0.56	9.72	9.92	0.80	20.44	46.00	25.56	Average
8	0.56	9.72	9.92	8.31	27.95	56.00	28.05	QP
9	0.60	9.72	9.92	1.30	20.94	46.00	25.06	Average
10	0.60	9.72	9.92	8.87	28.51	56.00	27.49	QP
11	0.76	9.72	9.93	1.80	21.45	46.00	24.55	Average
12	0.76	9.72	9.93	9.04	28.69	56.00	27.31	QP

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.
2. Margin= Limit - Emission Level.
3. If the average limit is met when using a quasi-peak detector,
the EUT shall be deemed to meet both limits and measurement
with average detector is unnecessary.

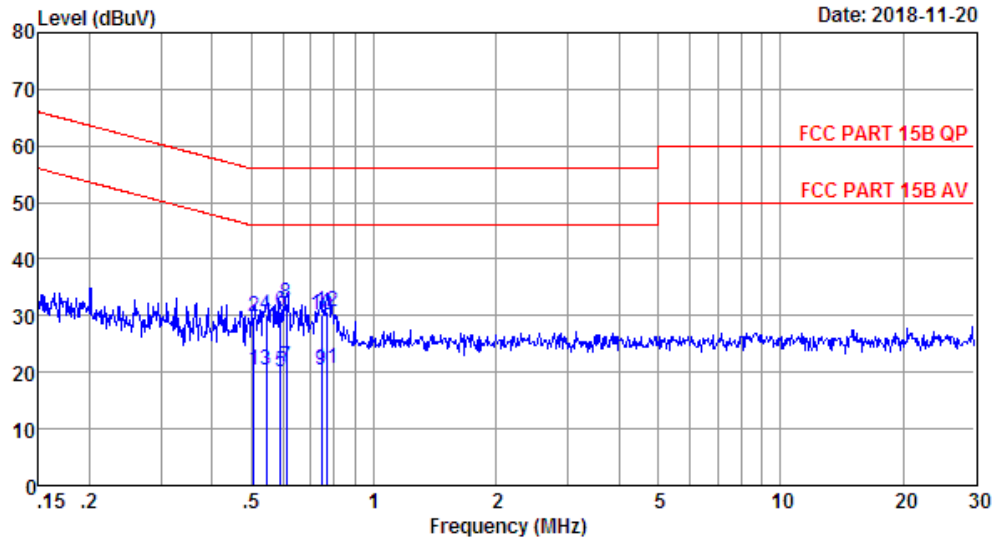
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File: \\Emc-ce-1\Test data\2018\MM\Mansion.EM6 (205)

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Site no : 844 Shield Room Data no. : 204
 Env. / Ins. : Temp:23.1'C Humi:50.3% Press:101.50kPa INE Phase : NEUTRAL
 Limit : FCC PART 15B QP
 Engineer : Viking
 EUT : 5.8G WIRELESS SYSTEM
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WSA-5TR TX
 Test Mode : TX Mode

	Freq. (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.51	9.65	9.92	0.93	20.50	46.00	25.50	Average
2	0.51	9.65	9.92	10.10	29.67	56.00	26.33	QP
3	0.54	9.66	9.92	0.80	20.38	46.00	25.62	Average
4	0.54	9.66	9.92	10.47	30.05	56.00	25.95	QP
5	0.59	9.66	9.92	0.56	20.14	46.00	25.86	Average
6	0.59	9.66	9.92	11.03	30.61	56.00	25.39	QP
7	0.61	9.67	9.92	1.30	20.89	46.00	25.11	Average
8	0.61	9.67	9.92	12.50	32.09	56.00	23.91	QP
9	0.74	9.69	9.93	0.74	20.36	46.00	25.64	Average
10	0.74	9.69	9.93	10.49	30.11	56.00	25.89	QP
11	0.77	9.70	9.93	1.13	20.76	46.00	25.24	Average
12	0.77	9.70	9.93	11.20	30.83	56.00	25.17	QP

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.
 2. Margin= Limit - Emission Level.
 3. If the average limit is met when using a quasi-peak detector,
 the EUT shall be deemed to meet both limits and measurement
 with average detector is unnecessary.

4. RADIATED EMISSIONS

4.1. Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak) 54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average)	

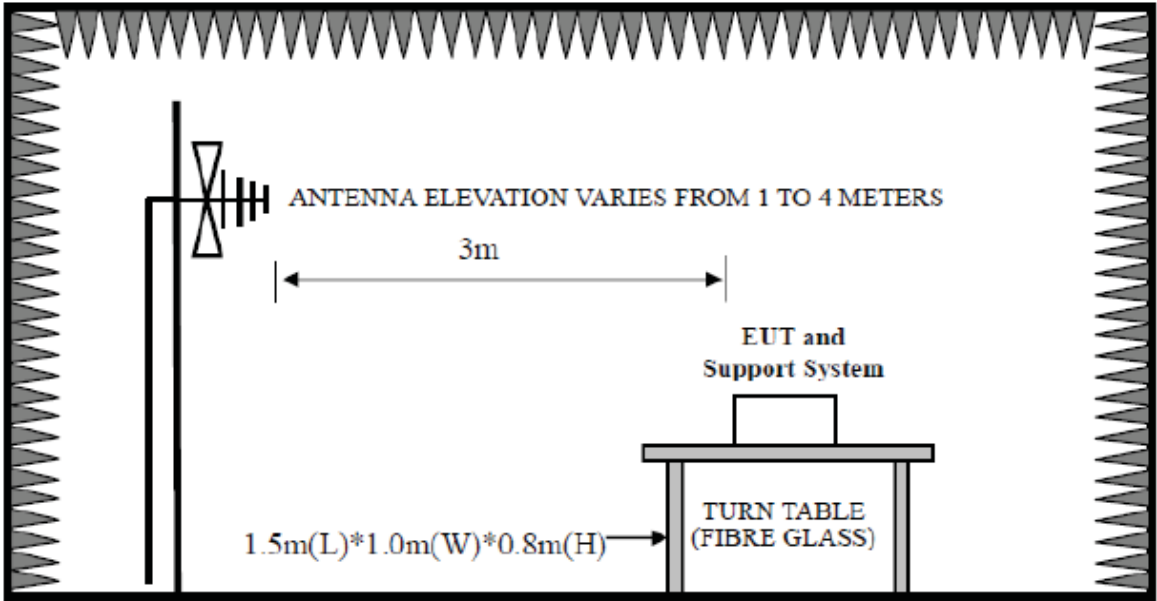
Remark : (1) Emission level $\text{dB}\mu\text{V} = 20 \log$ Emission level $\mu\text{V/m}$

(2) The smaller limit shall apply at the cross point between two frequency bands.

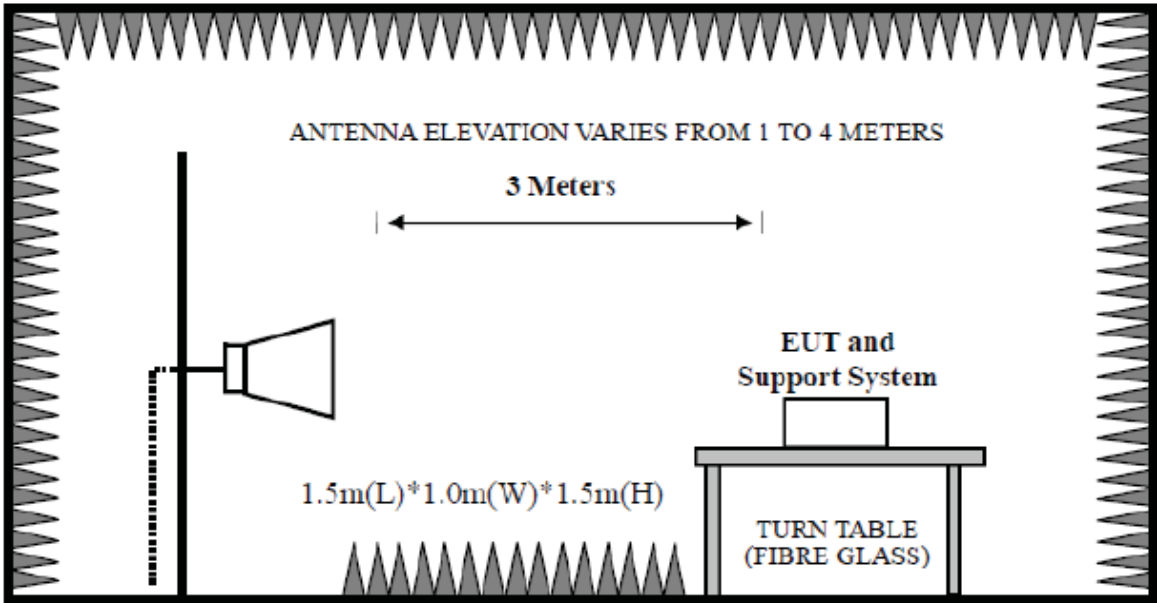
(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system

4.2. Block Diagram of Test setup

30~1000MHz



Above 1GHz



4.3. Test Procedure

EUT was placed on a turn table, which is 0.8 meter high above ground for 30~1000MHz test, and which is 1.5 meter high above ground for above 1GHz test. The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it working in test mode, then test it. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

The bandwidth of the EMI test receiver is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's VBW is set at 1MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz

PEAK detector, 1MHz/1MHz for PAEK measurement,

PEAK detector, 1MHz/10Hz for Average measurement

The frequency range from 30MHz to 10th harmonic (40GHz) are checked.

4.4. Test Result

Pass

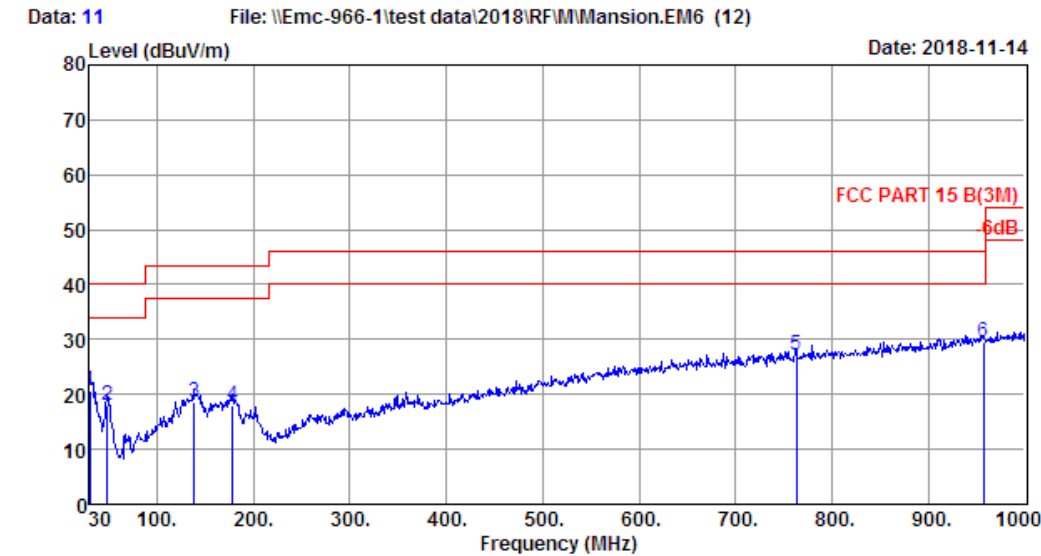
Note: 1、 For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.

4.5. Test Data

30 MHz – 1000 MHz

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Site no. : 1# 966 Chamber Data no. : 11
Dis. / Ant. : 3m 37062 Ant. pol. : VERTICAL
Limit : FCC PART 15 B(3M)
Env. / Ins. : Temp:23.9';Humi:52%;Press:101.52kPa
Engineer : Viking
EUT : 5.8G WIRELESS SYSTEM
Power : DC 5V From Adapter Input AC 120V/60Hz
M/N : WSA-5TR TX
Test Mode : TX Mode

	Freq. (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.00	18.10	0.31	2.31	20.72	40.00	19.28	QP
2	48.43	9.10	0.45	8.46	18.01	40.00	21.99	QP
3	138.64	12.06	1.25	5.24	18.55	43.50	24.95	QP
4	178.41	9.63	1.44	6.96	18.03	43.50	25.47	QP
5	763.32	22.43	3.79	1.07	27.29	46.00	18.71	QP
6	957.32	24.47	4.75	0.42	29.64	46.00	16.36	QP

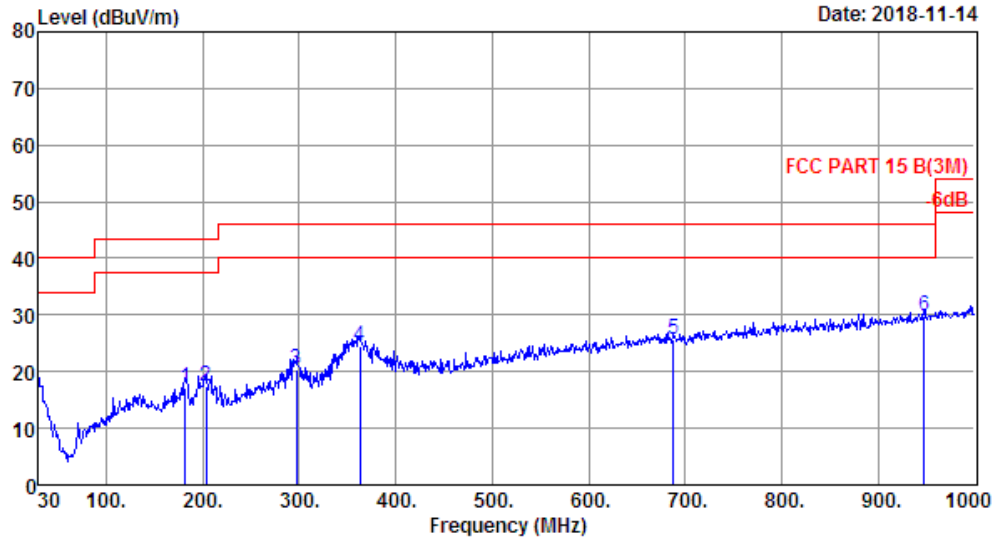
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

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Data: 12 File: \\Emc-966-1\test data\2018\RF\MM\ Mansion.EM6 (12)

Date: 2018-11-14



Site no. : 1# 966 Chamber Data no. : 12
 Dis. / Ant. : 3m 37062 Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 B(3M)
 Env. / Ins. : Temp:23.9';Humi:52%;Press:101.52kPa
 Engineer : Viking
 EUT : 5.8G WIRELESS SYSTEM
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WSA-5TR TX
 Test Mode : TX Mode

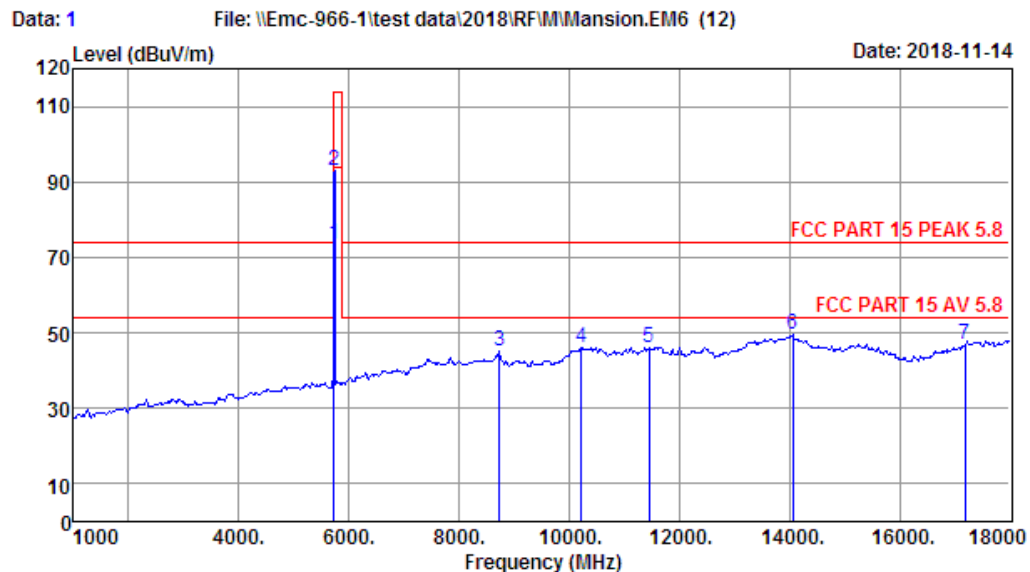
	Freq. (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	182.29	9.36	1.43	6.19	16.98	43.50	26.52	QP
2	203.63	8.36	1.51	7.67	17.54	43.50	25.96	QP
3	296.75	13.68	2.04	4.76	20.48	46.00	25.52	QP
4	362.71	15.23	2.38	6.78	24.39	46.00	21.61	QP
5	687.66	21.28	3.40	1.15	25.83	46.00	20.17	QP
6	947.62	24.40	4.61	0.72	29.73	46.00	16.27	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

1000-18000MHz

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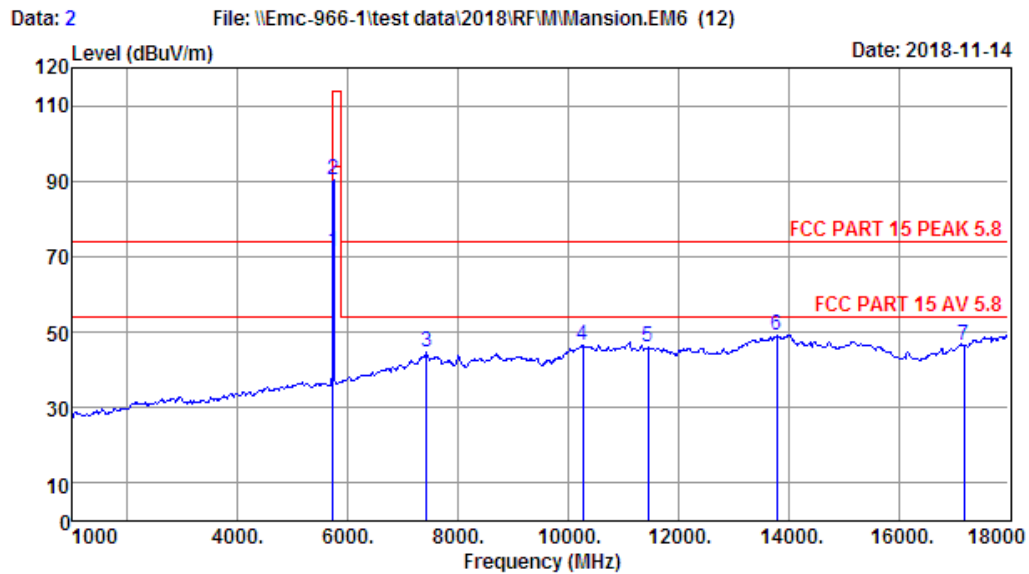
Site no. : 1# 966 Chamber Data no. : 1
 Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 5.8
 Env. / Ins. : Temp:23.9'; Humi:52%; Press:101.52kPa
 Engineer : Viking
 EUT : 5.8G WIRELESS SYSTEM
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WSA-5TR TX
 Test Mode : TX 5729MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	5729.00	33.22	5.19	35.93	71.00	73.48	94.00	20.52	Average
2	5729.00	33.22	5.19	35.93	90.30	92.78	114.00	21.22	Peak
3	8735.00	37.53	6.90	32.88	33.41	44.96	74.00	29.04	Peak
4	10214.00	39.19	9.77	34.43	31.38	45.91	74.00	28.09	Peak
5	11458.00	40.08	8.28	32.62	30.28	46.02	74.00	27.98	Peak
6	14056.00	41.65	10.13	32.95	30.88	49.71	74.00	24.29	Peak
7	17187.00	42.20	10.83	31.25	24.96	46.74	74.00	27.26	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

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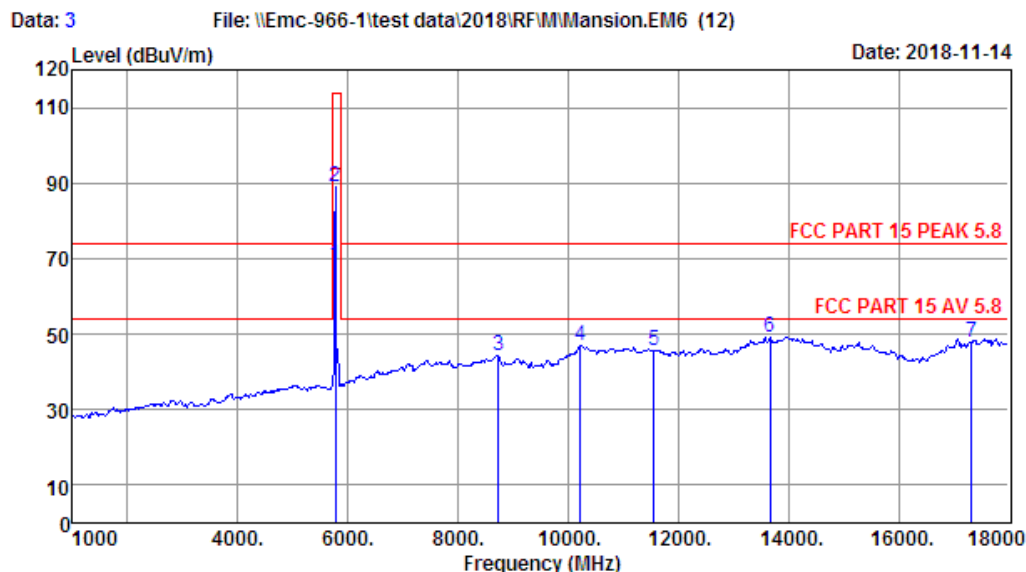
Site no. : 1# 966 Chamber Data no. : 2
 Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 5.8
 Env. / Ins. : Temp:23.9';Humi:52%;Press:101.52kPa
 Engineer : Viking
 EUT : 5.8G WIRELESS SYSTEM
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WSA-5TR TX
 Test Mode : TX 5729MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	5729.00	33.22	5.19	35.93	68.75	71.23	94.00	22.77	Average
2	5729.00	33.22	5.19	35.93	87.87	90.35	114.00	23.65	Peak
3	7426.00	37.05	6.13	33.11	34.58	44.65	74.00	29.35	Peak
4	10265.00	39.21	9.98	34.39	31.59	46.39	74.00	27.61	Peak
5	11458.00	40.08	8.28	32.62	30.13	45.87	74.00	28.13	Peak
6	13784.00	41.53	10.05	32.72	30.20	49.06	74.00	24.94	Peak
7	17187.00	42.20	10.83	31.25	24.62	46.40	74.00	27.60	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

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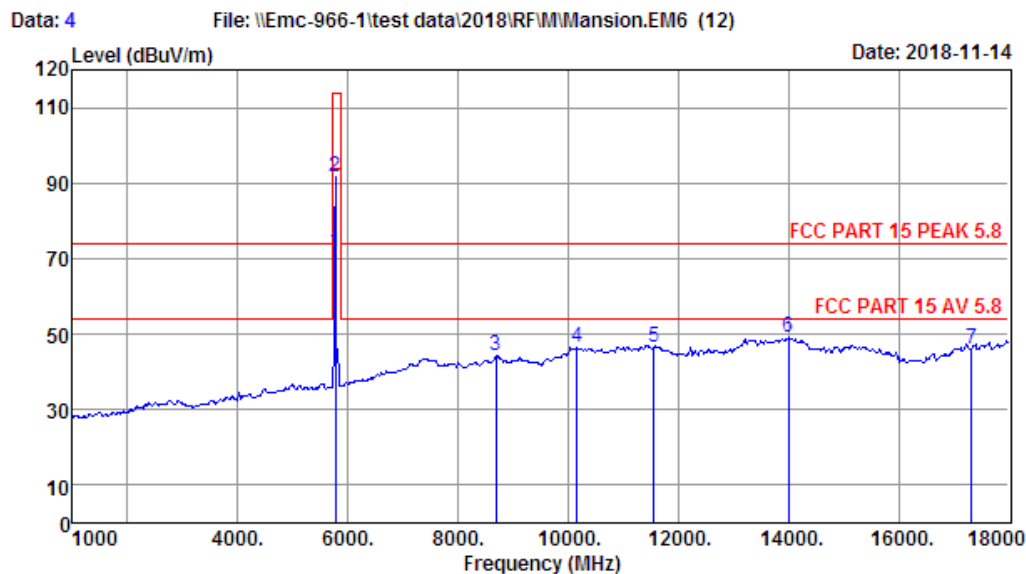
Site no. : 1# 966 Chamber Data no. : 3
 Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 5.8
 Env. / Ins. : Temp:23.9';Humi:52%;Press:101.52kPa
 Engineer : Viking
 EUT : 5.8G WIRELESS SYSTEM
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WSA-5TR TX
 Test Mode : TX 5775MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	5775.00	33.28	5.26	35.88	65.41	68.07	94.00	25.93	Average
2	5775.00	33.28	5.26	35.88	86.29	88.95	114.00	25.05	Peak
3	8735.00	37.53	6.90	32.88	32.60	44.15	74.00	29.85	Peak
4	10214.00	39.19	9.77	34.43	32.41	46.94	74.00	27.06	Peak
5	11550.00	40.03	8.27	32.46	29.72	45.56	74.00	28.44	Peak
6	13665.00	41.43	9.89	32.62	30.66	49.36	74.00	24.64	Peak
7	17325.00	42.70	11.13	31.07	25.09	47.85	74.00	26.15	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

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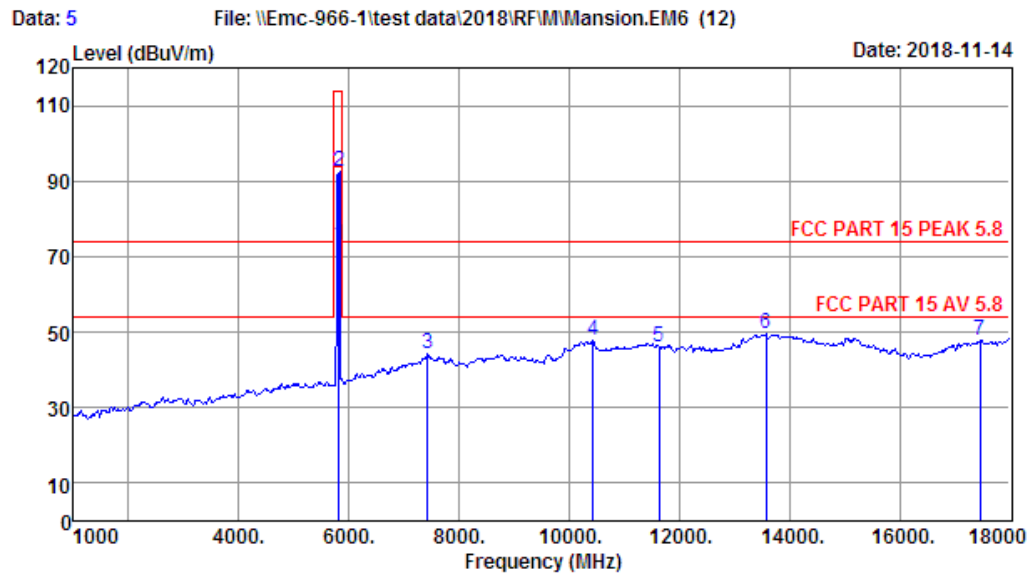
Site no. : 1# 966 Chamber Data no. : 4
 Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 5.8
 Env. / Ins. : Temp:23.9';Humi:52%;Press:101.52kPa
 Engineer : Viking
 EUT : 5.8G WIRELESS SYSTEM
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WSA-5TR TX
 Test Mode : TX 5775MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	5775.00	33.28	5.26	35.88	69.02	71.68	94.00	22.32	Average
2	5775.00	33.28	5.26	35.88	89.17	91.83	114.00	22.17	Peak
3	8684.00	37.46	6.90	33.06	33.05	44.35	74.00	29.65	Peak
4	10163.00	39.17	9.55	34.49	32.26	46.49	74.00	27.51	Peak
5	11550.00	40.03	8.27	32.46	30.76	46.60	74.00	27.40	Peak
6	14005.00	41.70	10.13	32.88	30.11	49.06	74.00	24.94	Peak
7	17325.00	42.70	11.13	31.07	23.38	46.14	74.00	27.86	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

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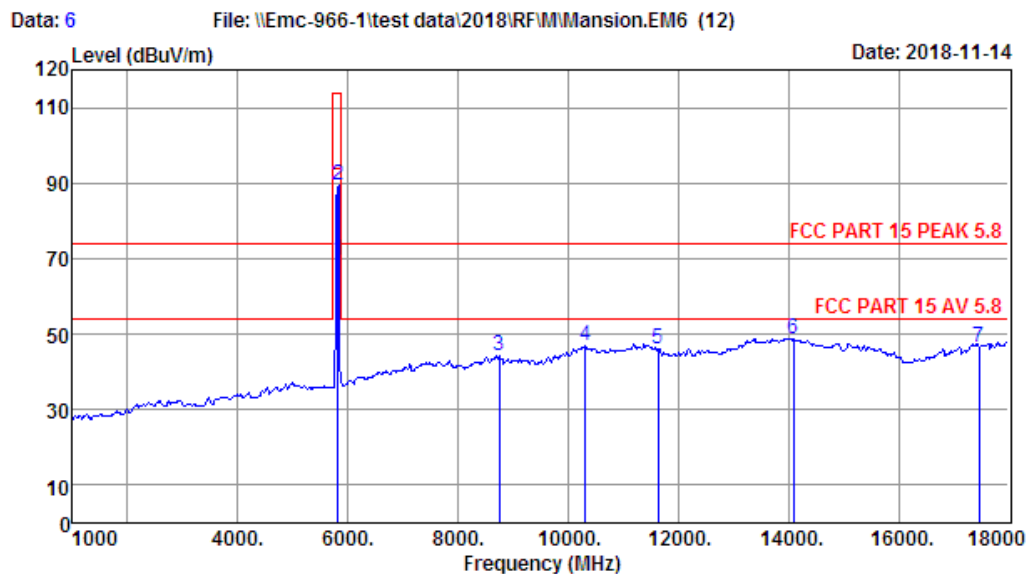
Site no. : 1# 966 Chamber Data no. : 5
 Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 5.8
 Env. / Ins. : Temp:23.9';Humi:52%;Press:101.52kPa
 Engineer : Viking
 EUT : 5.8G WIRELESS SYSTEM
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WSA-5TR TX
 Test Mode : TX 5820MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	5820.00	33.33	5.35	35.83	70.03	72.88	94.00	21.12	Average
2	5820.00	33.33	5.35	35.83	89.72	92.57	114.00	21.43	Peak
3	7426.00	37.05	6.13	33.11	34.20	44.27	74.00	29.73	Peak
4	10435.00	39.27	9.85	34.20	32.80	47.72	74.00	26.28	Peak
5	11640.00	39.91	8.25	32.37	30.44	46.23	74.00	27.77	Peak
6	13580.00	41.37	9.78	32.57	30.86	49.44	74.00	24.56	Peak
7	17460.00	43.21	11.44	31.05	24.36	47.96	74.00	26.04	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

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Site no. : 1# 966 Chamber Data no. : 6
 Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 5.8
 Env. / Ins. : Temp:23.9';Humi:52%;Press:101.52kPa
 Engineer : Viking
 EUT : 5.8G WIRELESS SYSTEM
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WSA-5TR TX
 Test Mode : TX 5820MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	5820.00	33.33	5.35	35.83	66.70	69.55	94.00	24.45	Average
2	5820.00	33.33	5.35	35.83	86.67	89.52	114.00	24.48	Peak
3	8752.00	37.55	6.90	32.88	32.68	44.25	74.00	29.75	Peak
4	10316.00	39.23	10.20	34.34	31.77	46.86	74.00	27.14	Peak
5	11640.00	39.91	8.25	32.37	30.14	45.93	74.00	28.07	Peak
6	14090.00	41.61	10.14	32.99	29.99	48.75	74.00	25.25	Peak
7	17460.00	43.21	11.44	31.05	23.05	46.65	74.00	27.35	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

18000MHz – 40000MHz

Pass

Note: The amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

5. 20 DB BANDWIDTH

5.1. Test Procedure

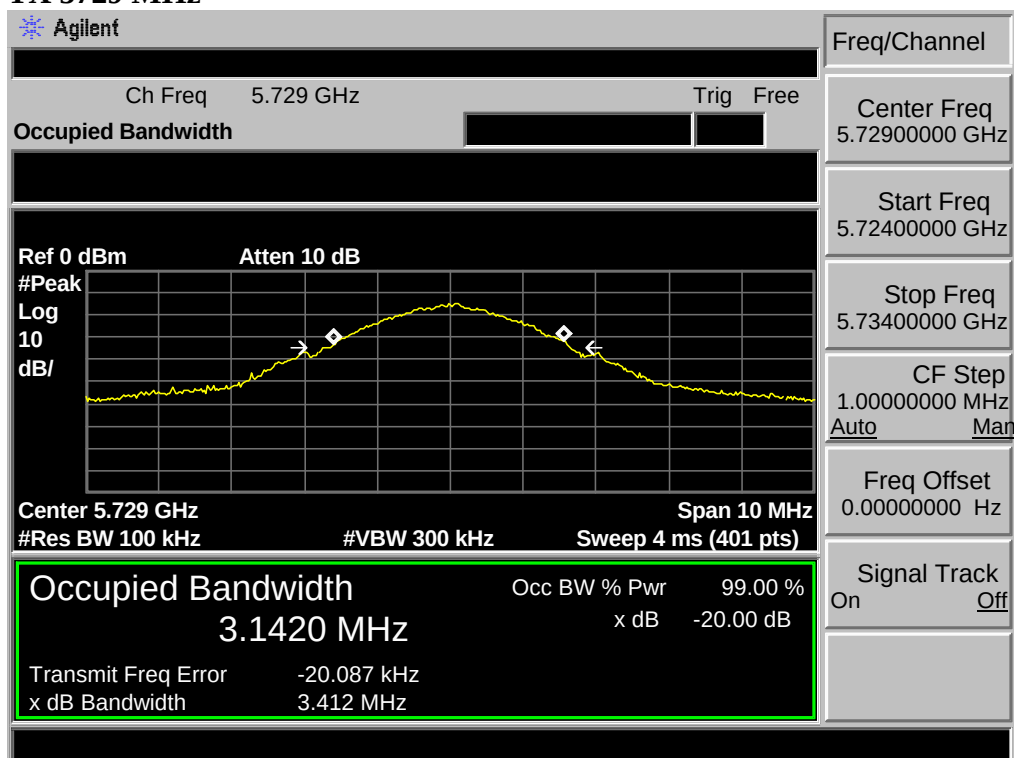
The transmitter output was coupled to a spectrum analyzer via a antenna. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 300kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

5.2. Test Result

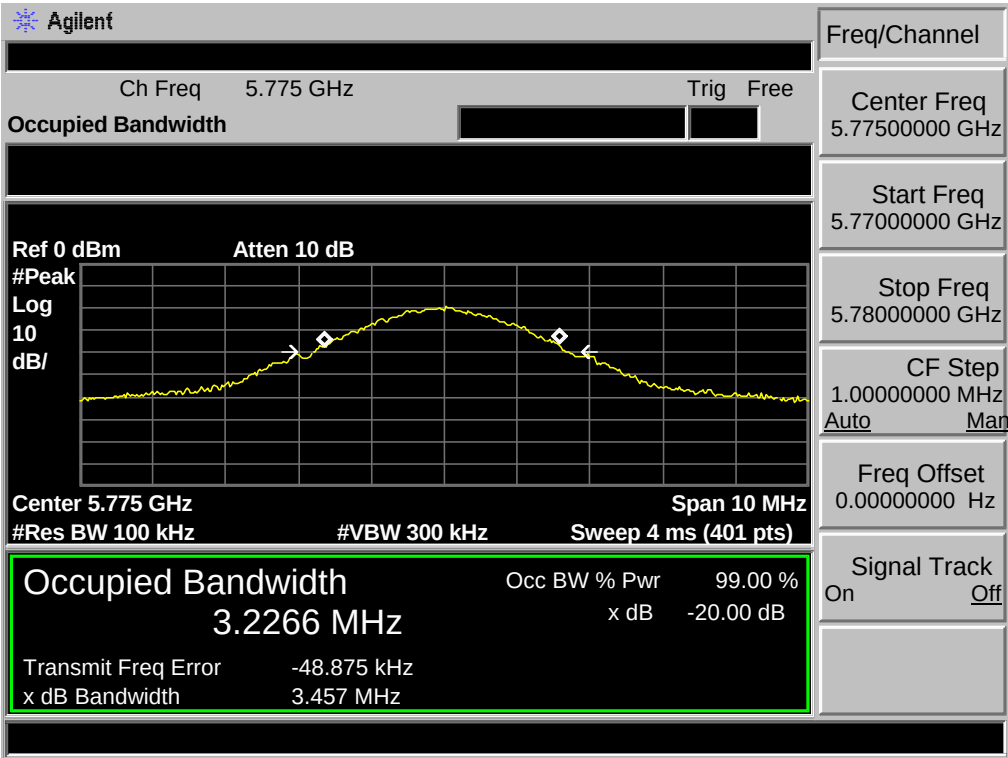
EUT: 5.8G WIRELESS SYSTEM				
M/N: WSA-5TR TX				
Test date: 2018-11-12		Test site: RF site		Tested by: Viking
Mode	Freq (MHz)	20dB Bandwidth (MHz)	Limit (kHz)	Conclusion
TX	5729	3.412	/	PASS
	5775	3.457	/	PASS
	5820	3.834	/	PASS

5.3. Test Data

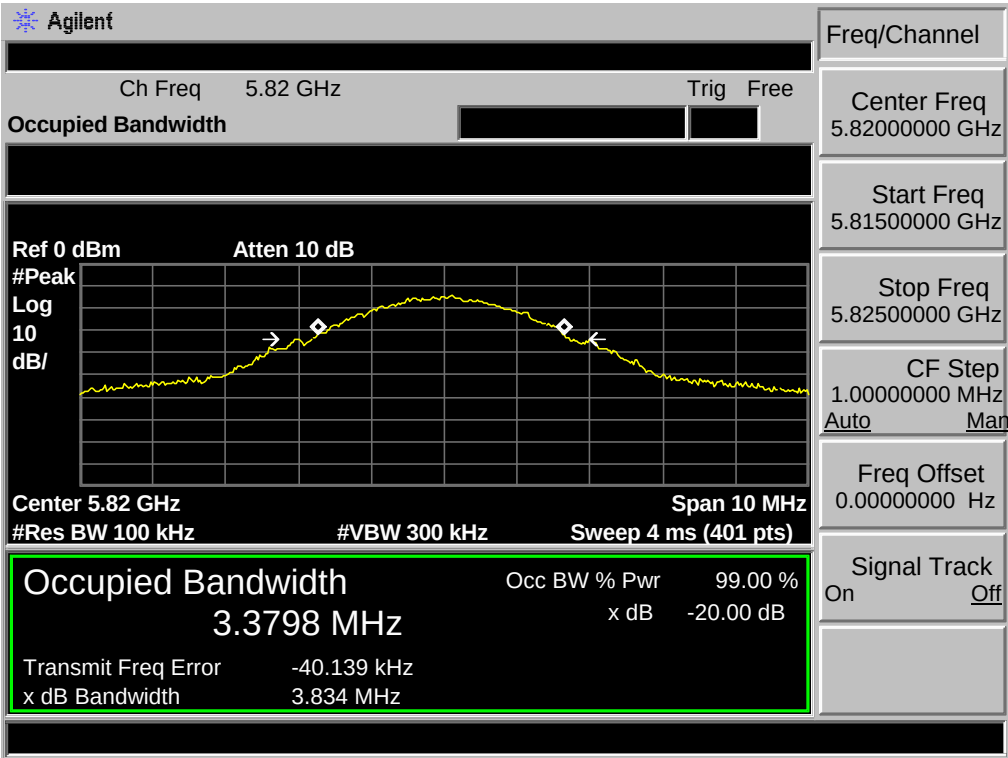
TX 5729 MHz



TX 5775 MHz

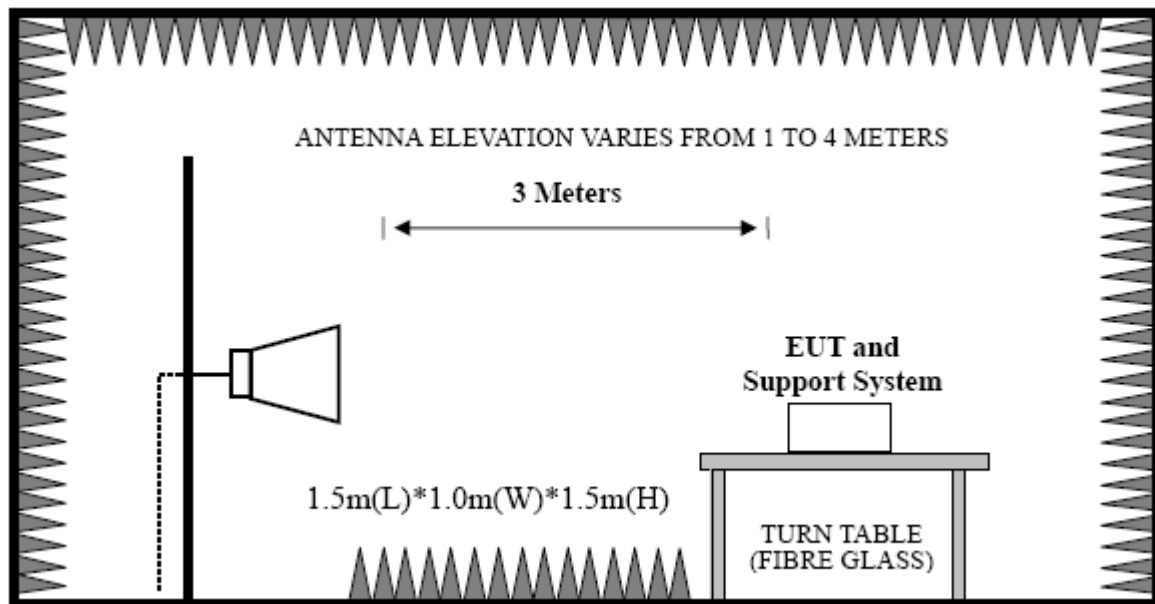


TX 5820 MHz



6. BAND EDGE COMPLIANCE

6.1. Block Diagram of Test setup



6.2. Test Procedure

EUT was placed on a turn table, which is 1.5 meter high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it working in test mode, then test it. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of emissions

Peak : RBW = 1MHz, VBW = 1MHz, Detector=PEAK detector, Sweep time = auto.

AV : RBW = 1MHz, VBW = 10Hz, Detector=PEAK detector, Sweep time = auto .

6.3. Test Result

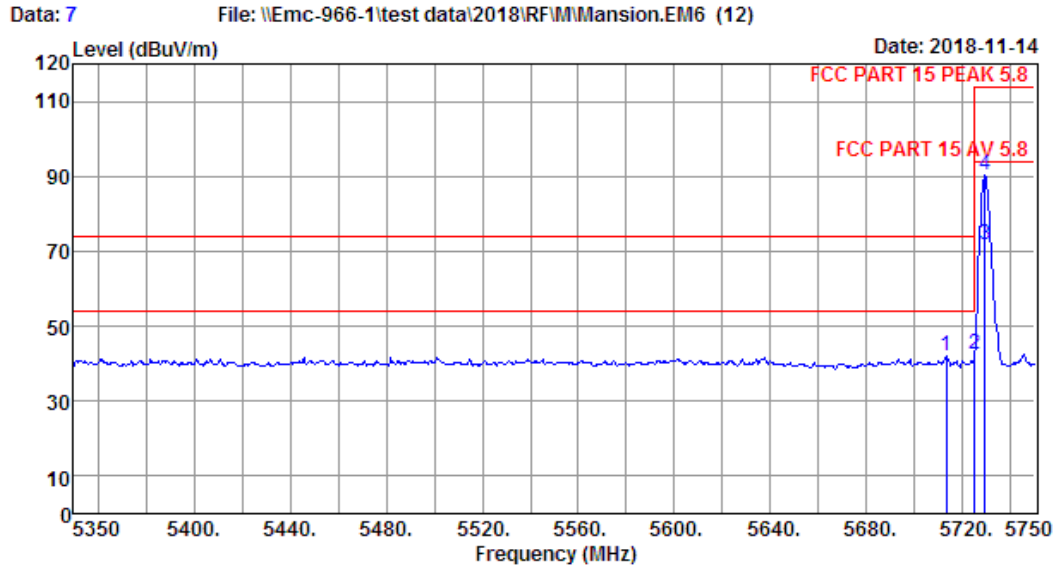
Pass.

Note: If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.

6.4. Test Data

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 Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 5.8
 Env. / Ins. : Temp:23.9';Humi:52%;Press:101.52kPa
 Engineer : Viking
 EUT : 5.8G WIRELESS SYSTEM
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WSA-5TR TX
 Test Mode : TX 5729MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	5713.20	33.21	5.19	35.93	39.66	42.13	74.00	31.87	Peak
2	5725.00	33.22	5.19	35.93	39.92	42.40	74.00	31.60	Peak
3	5729.20	33.22	5.19	35.91	69.16	71.66	94.00	22.34	Average
4	5729.20	33.22	5.19	35.91	87.64	90.14	114.00	23.86	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

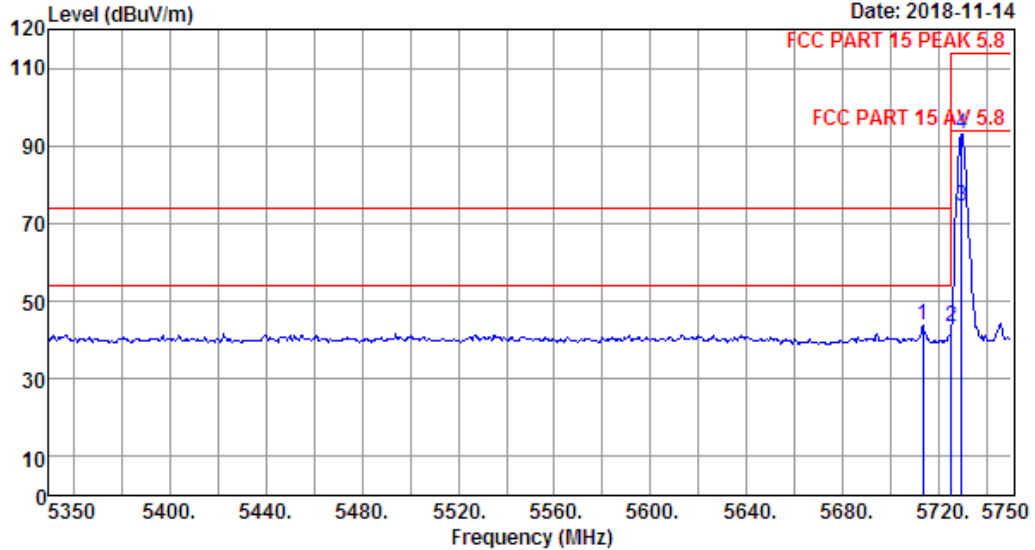
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Data: 8

File: \\Emc-966-1\\test data\\2018\\RF\\MM\\Mansion.EM6 (12)

Date: 2018-11-14



Site no. : 1# 966 Chamber Data no. : 8
 Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 5.8
 Env. / Ins. : Temp:23.9';Humi:52%;Press:101.52kPa
 Engineer : Viking
 EUT : 5.8G WIRELESS SYSTEM
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WSA-5TR TX
 Test Mode : TX 5729MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	5713.20	33.21	5.19	35.93	41.20	43.67	74.00	30.33	Peak
2	5725.00	33.22	5.19	35.93	40.82	43.30	74.00	30.70	Peak
3	5729.20	33.22	5.19	35.91	71.96	74.46	94.00	19.54	Average
4	5729.20	33.22	5.19	35.91	90.59	93.09	114.00	20.91	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

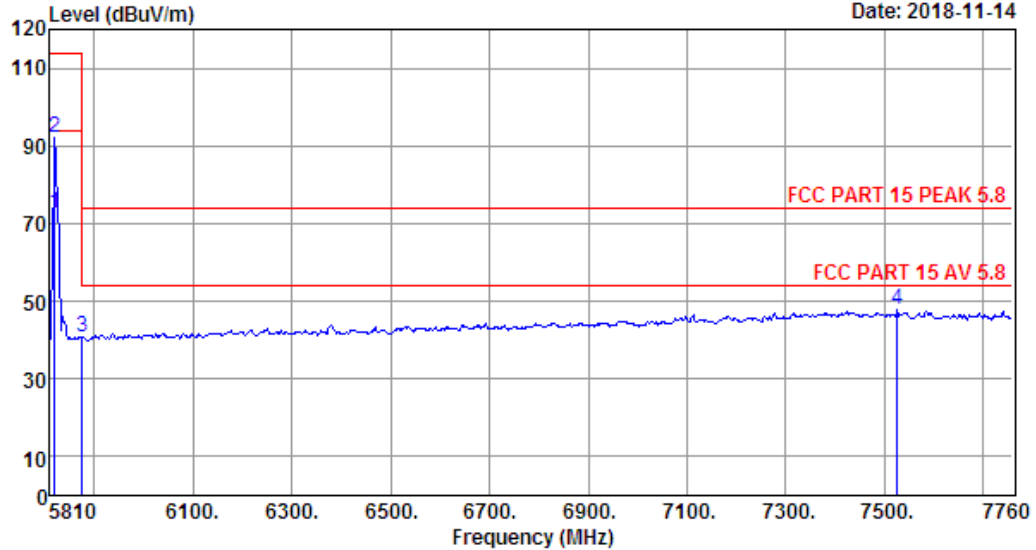
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Data: 9

File: \\Emc-966-1\\test data\\2018\\RF\\M\\Mansion.EM6 (12)

Date: 2018-11-14



Site no. : 1# 966 Chamber Data no. : 9
 Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 5.8
 Env. / Ins. : Temp:23.9';Humi:52%;Press:101.52kPa
 Engineer : Viking
 EUT : 5.8G WIRELESS SYSTEM
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WSA-5TR TX
 Test Mode : TX 5820MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	5819.75	33.33	5.35	35.83	69.77	72.62	94.00	21.38	Average
2	5819.75	33.33	5.35	35.83	89.23	92.08	114.00	21.92	Peak
3	5875.00	33.38	5.44	35.78	37.56	40.60	74.00	33.40	Peak
4	7526.00	37.23	6.15	32.97	37.24	47.65	74.00	26.35	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

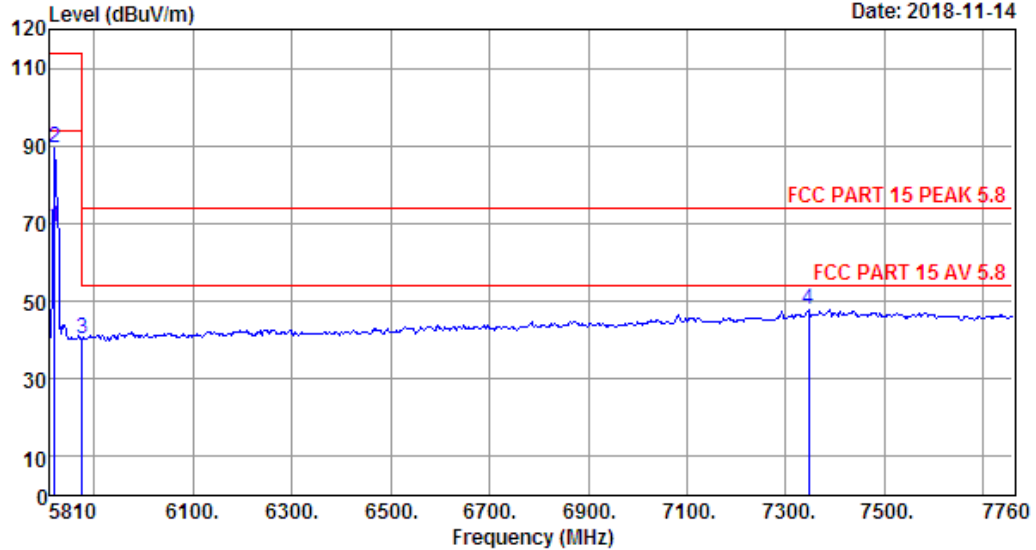
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Data: 10

File: \\Emc-966-1\\test data\\2018\\RF\\MM\\Mansion.EM6 (12)

Date: 2018-11-14



Site no. : 1# 966 Chamber Data no. : 10
 Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 5.8
 Env. / Ins. : Temp:23.9';Humi:52%;Press:101.52kPa
 Engineer : Viking
 EUT : 5.8G WIRELESS SYSTEM
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WSA-5TR TX
 Test Mode : TX 5820MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	5819.75	33.33	5.35	35.83	66.37	69.22	94.00	24.78	Average
2	5819.75	33.33	5.35	35.83	86.48	89.33	114.00	24.67	Peak
3	5875.00	33.38	5.44	35.78	37.25	40.29	74.00	33.71	Peak
4	7346.60	36.86	6.10	33.25	38.11	47.82	74.00	26.18	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. Margin= Limit - Emission Level.
 3. The emission levels that are 20dB below the official limit are not reported.

7. ANTENNA REQUIREMENTS

7.1. Limit

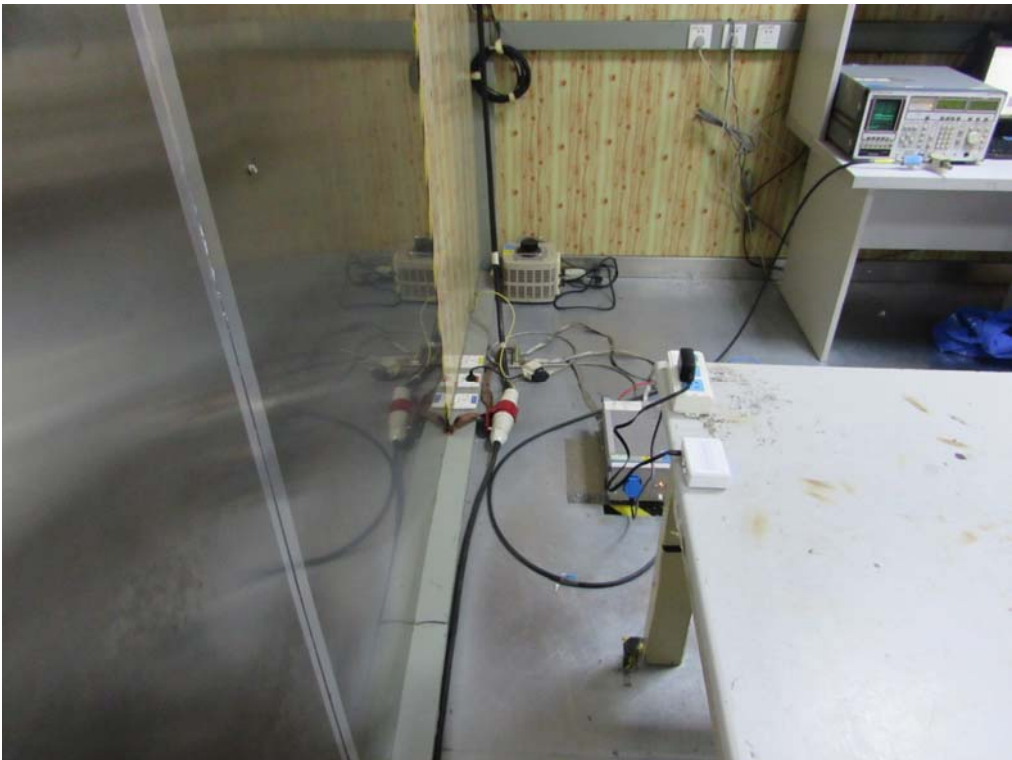
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.249 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

7.2. Result

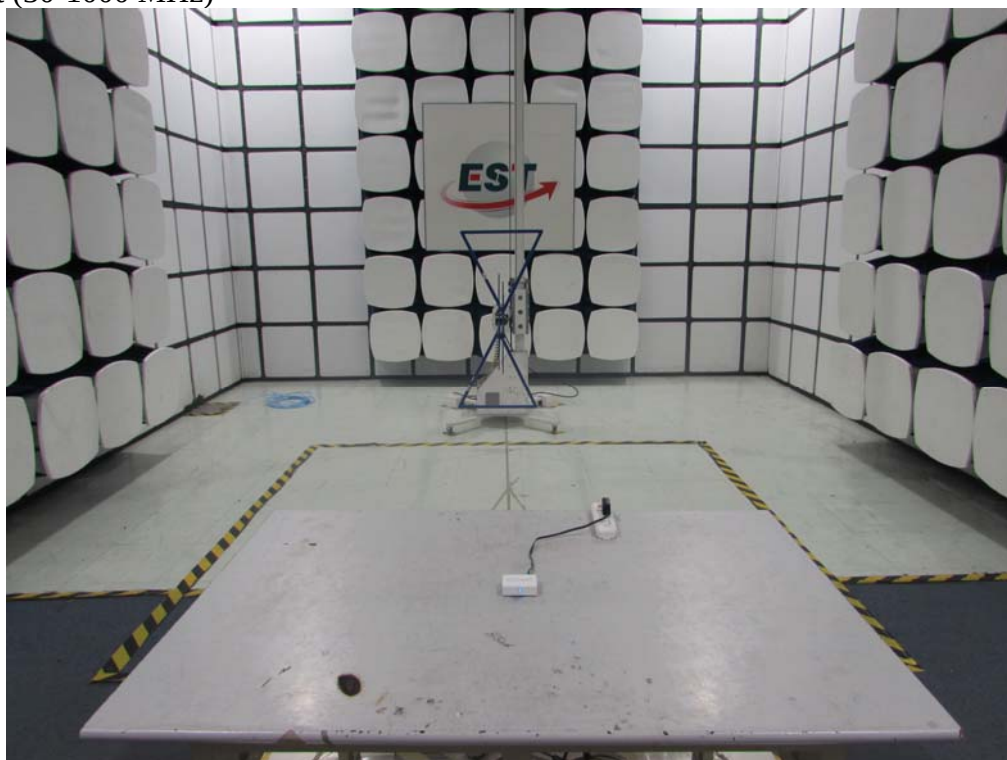
The antennas used for this product are PCB Antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 1.56dBi.

8. TESTSETUP PHOTO

Conducted Test



Radiated Test (30-1000 MHz)



Radiated Test (Above 1GHz)

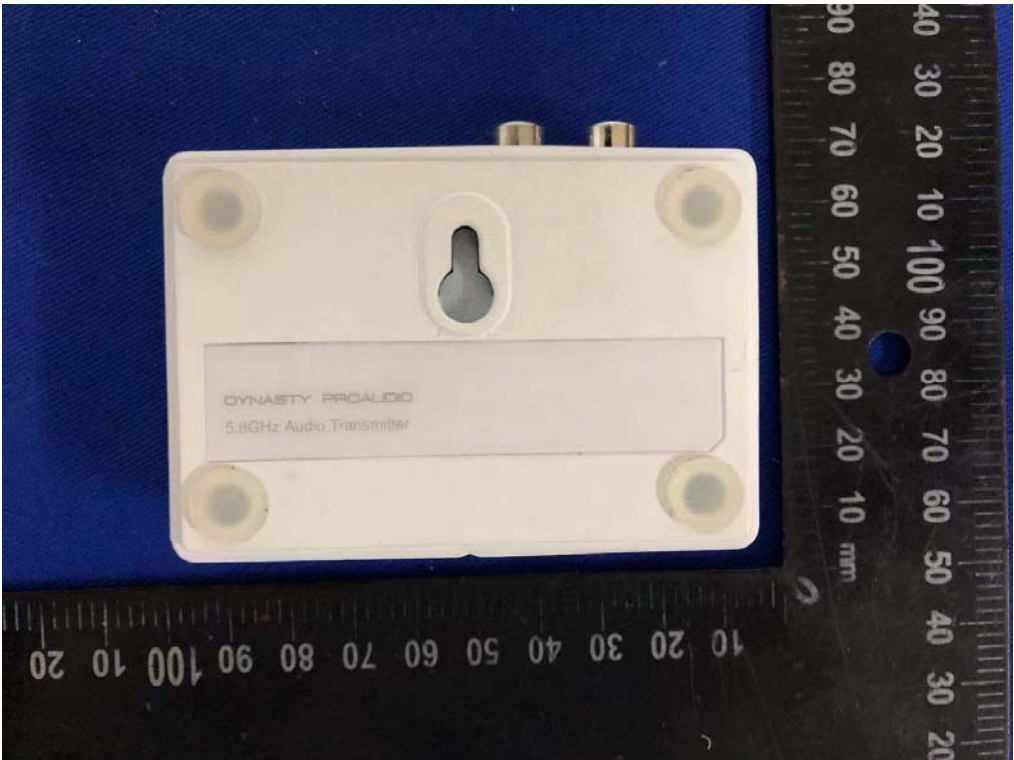


9. PHOTO OF EUT

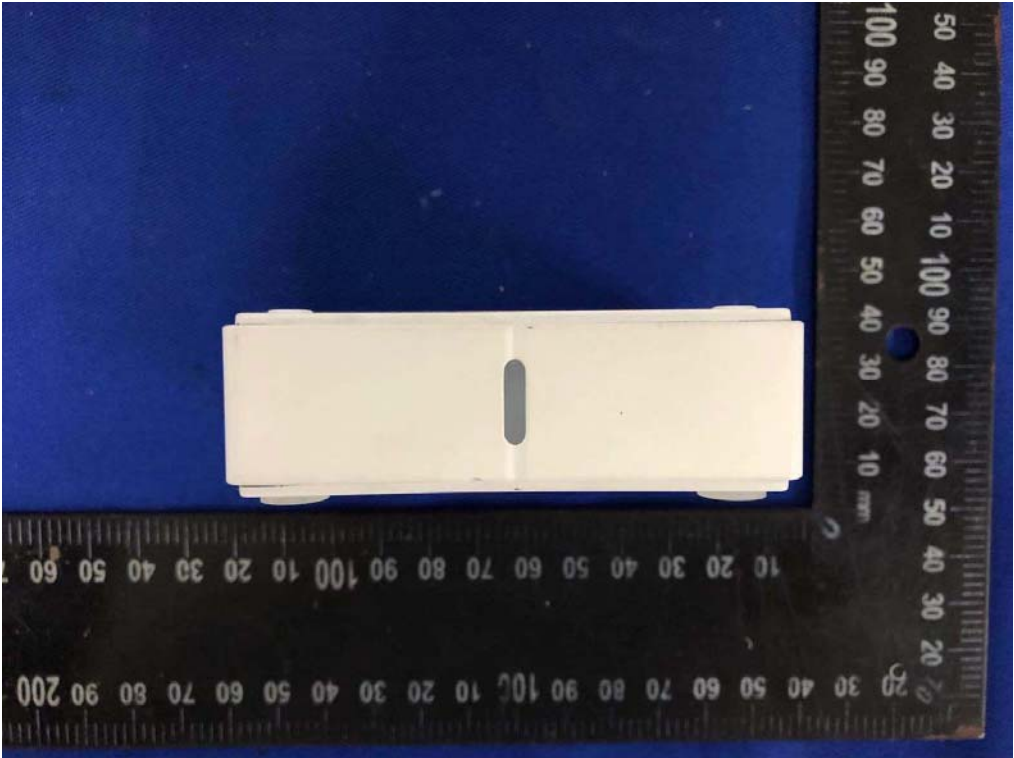
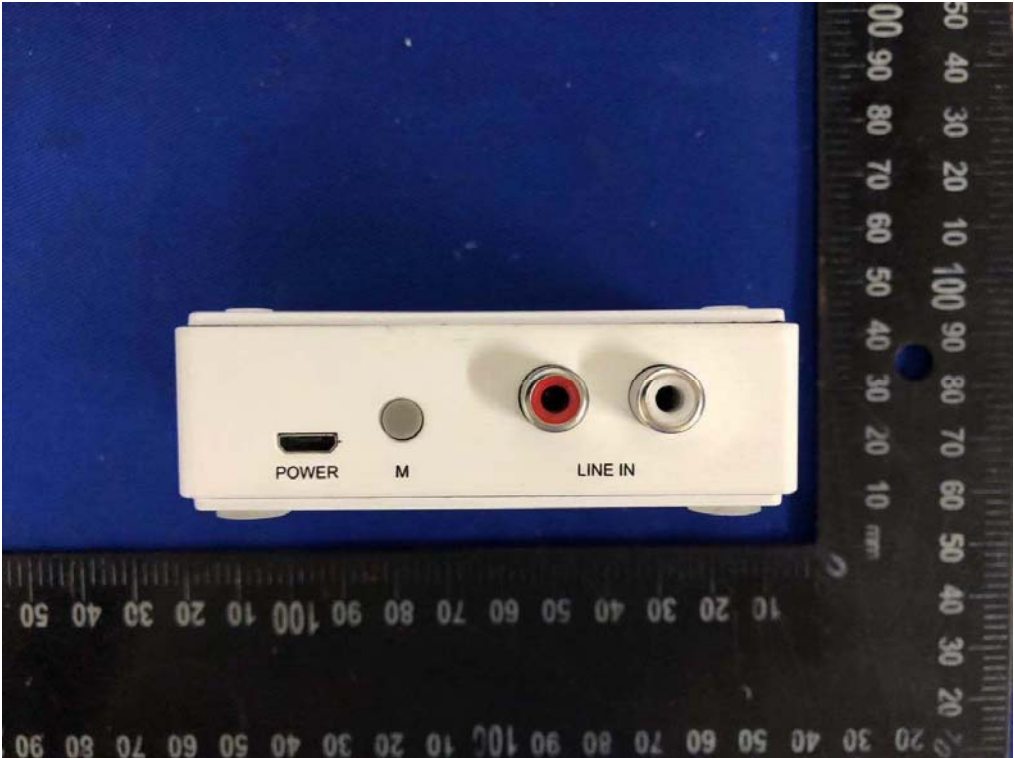
External Photos
M/N: WSA-5TR TX



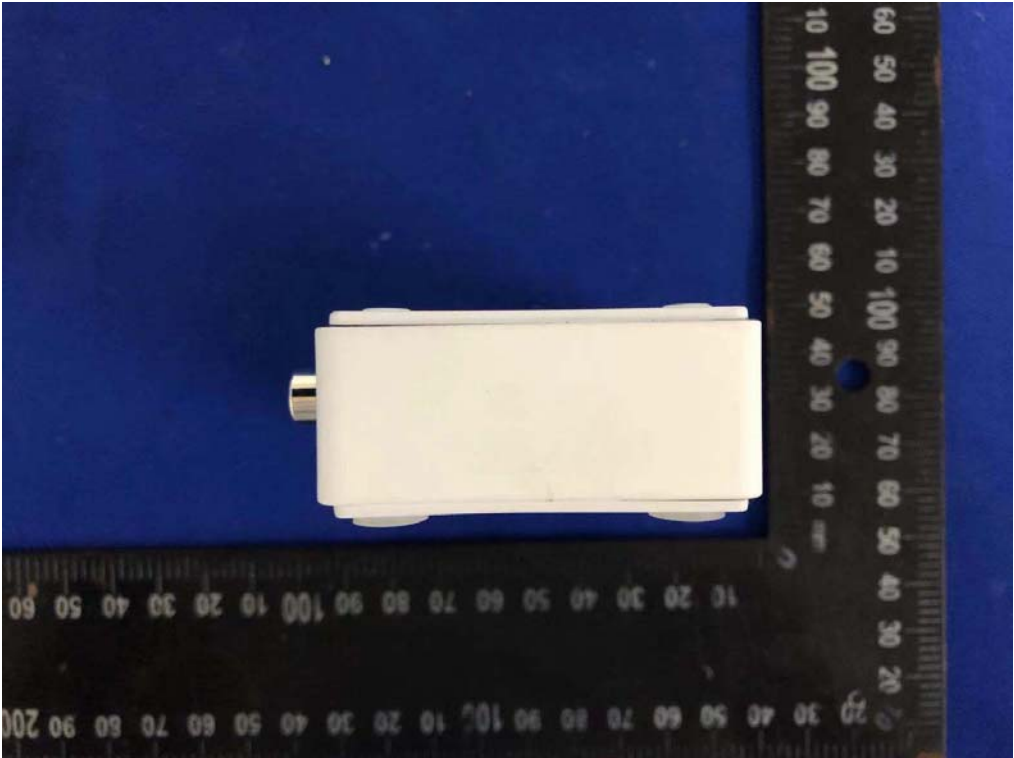
External Photos
M/N:WSA-5TR TX



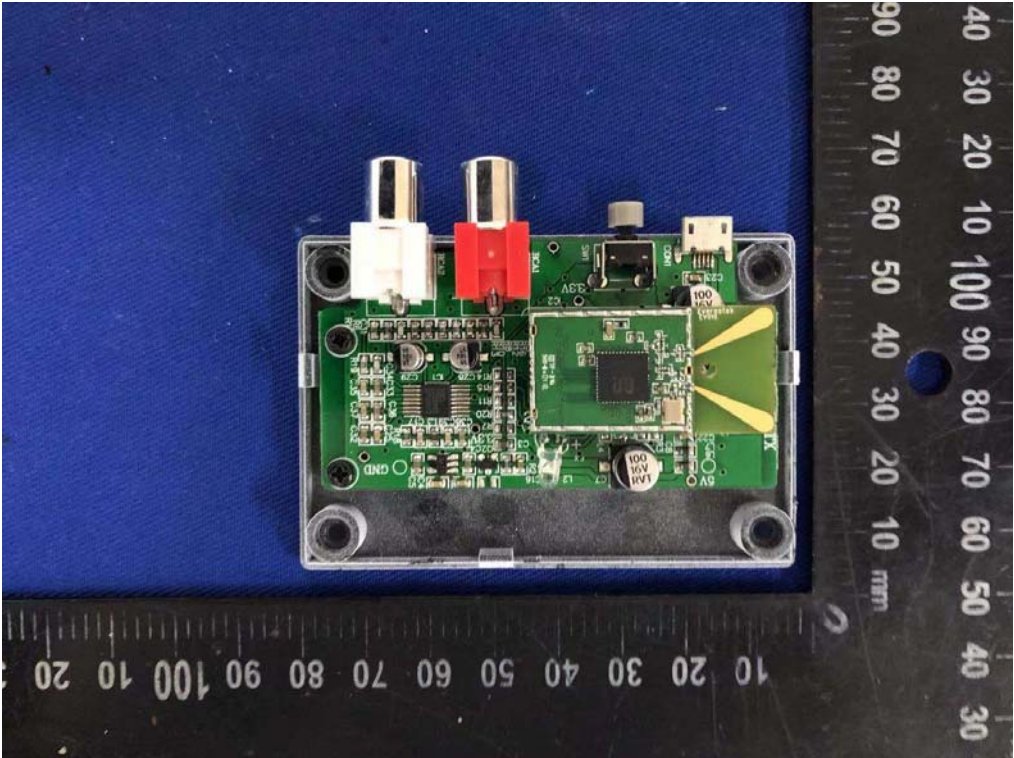
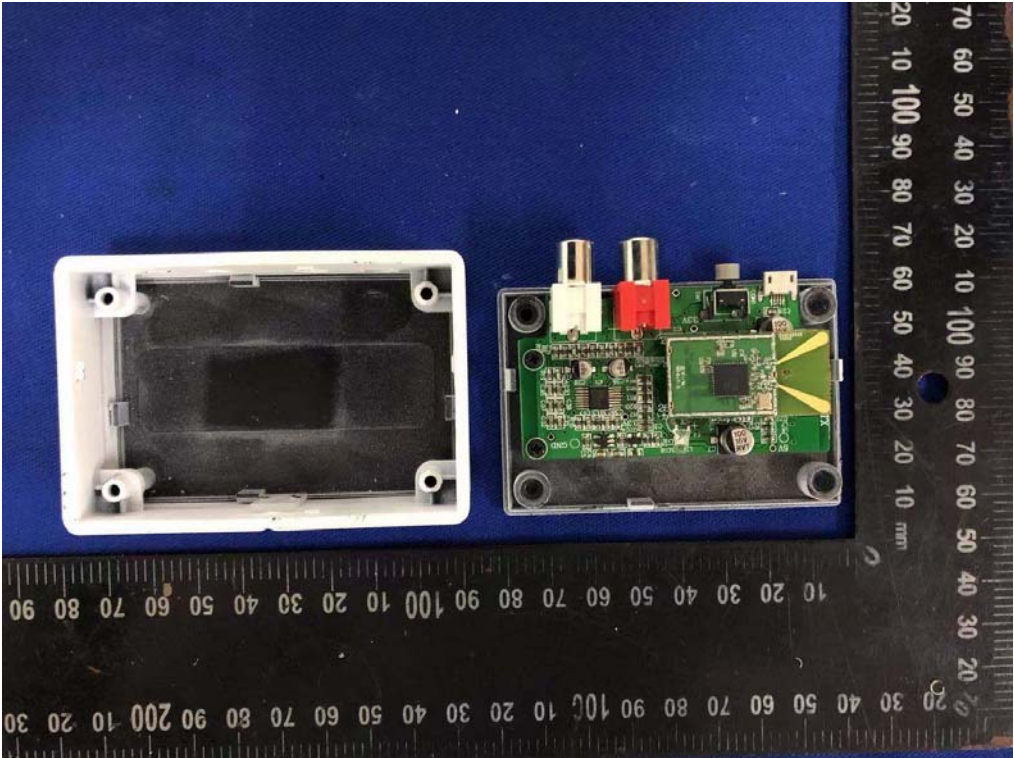
External Photos
M/N: WSA-5TR TX



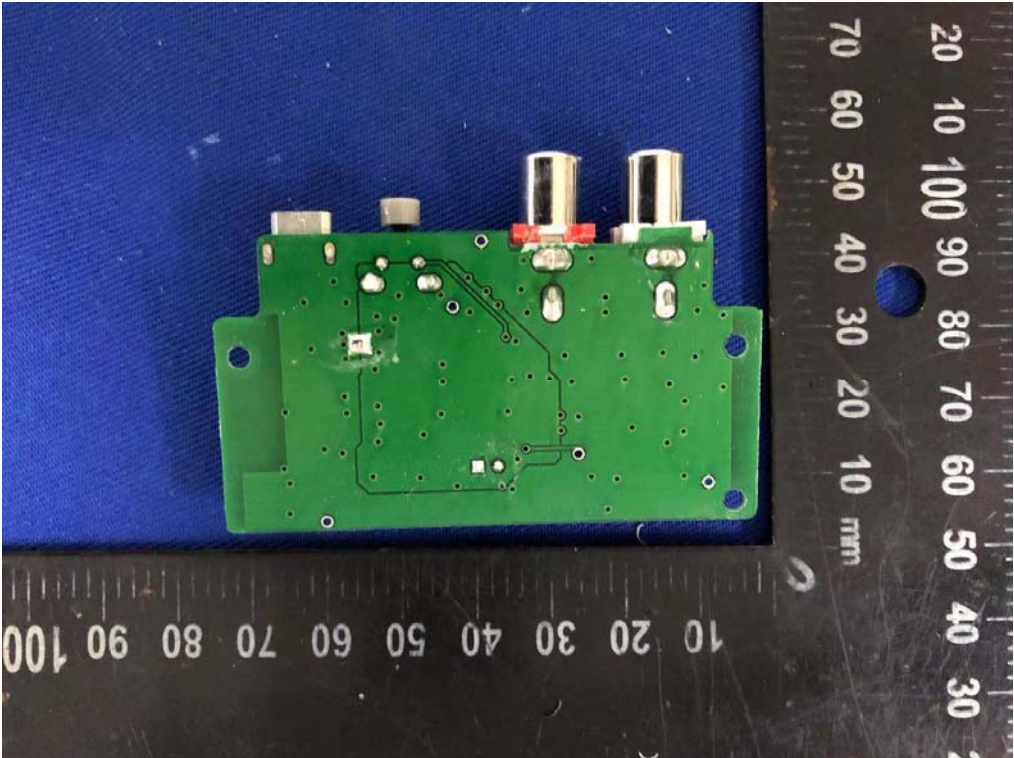
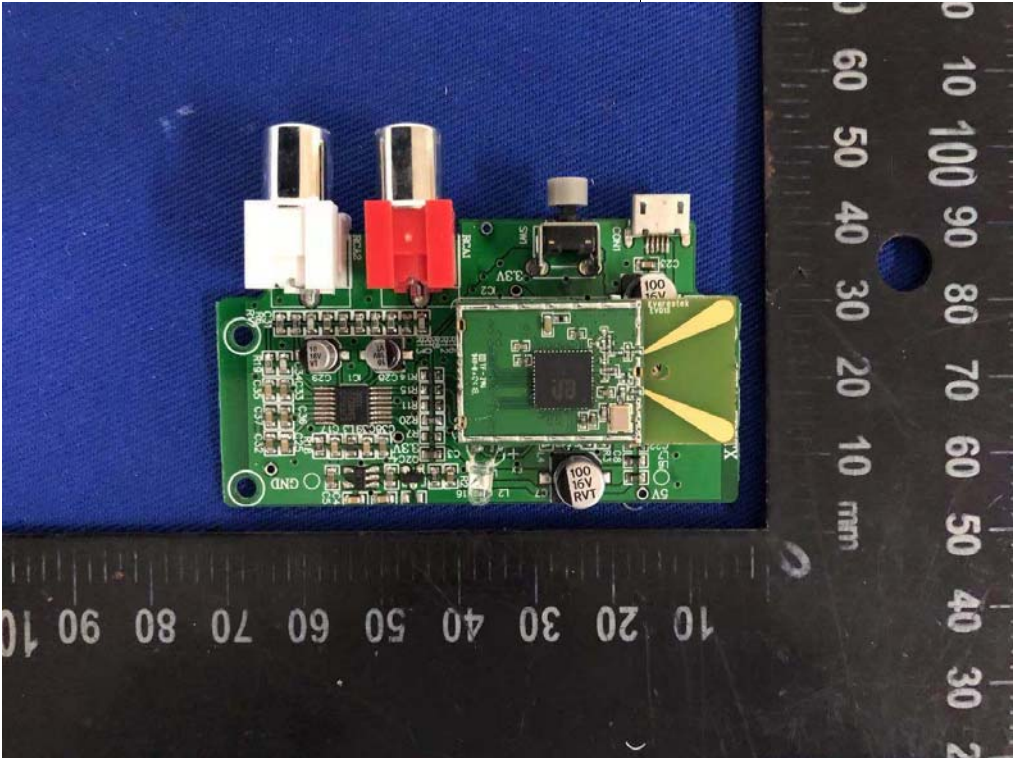
External Photos
M/N: WSA-5TR TX



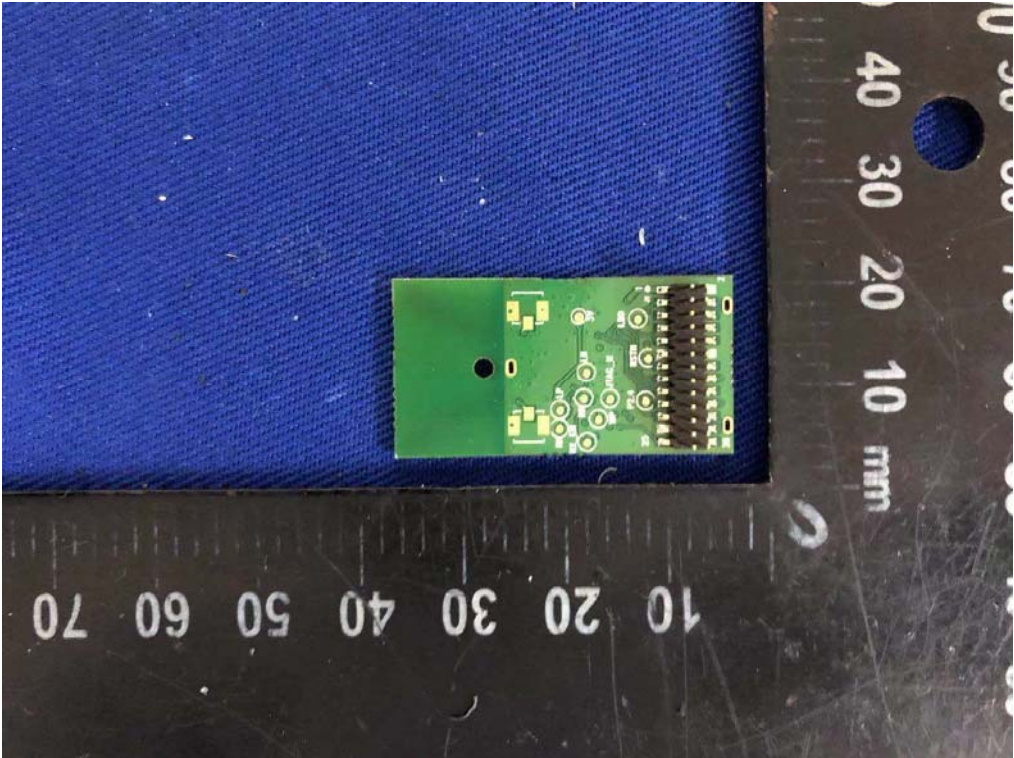
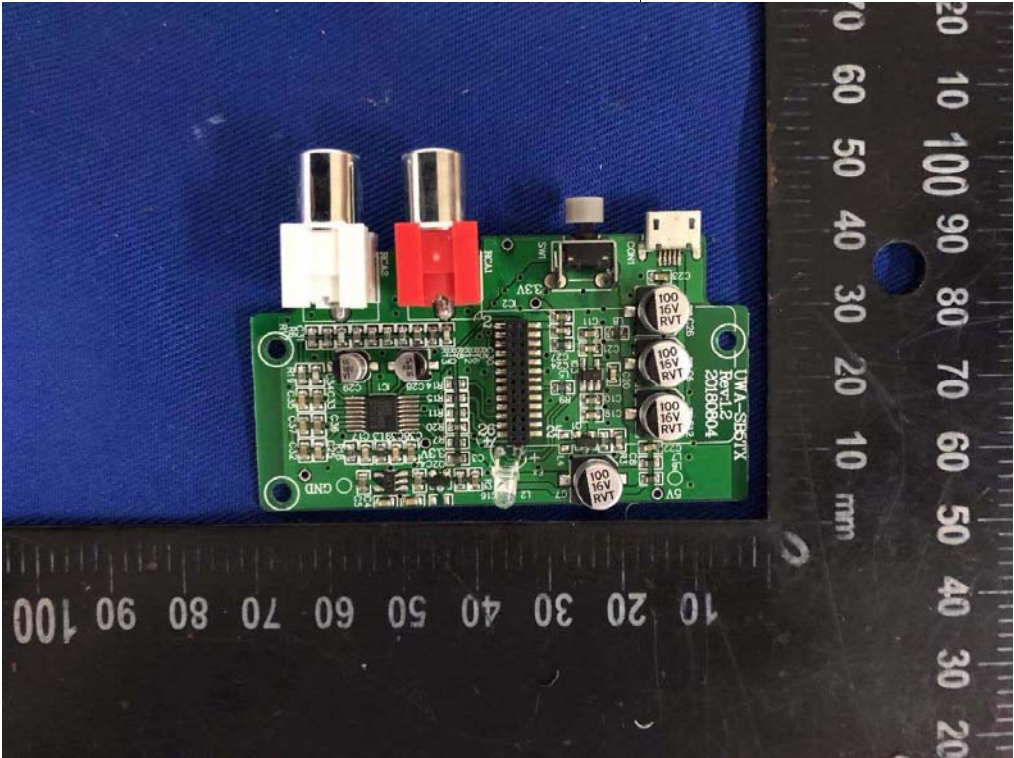
Internal Photos
M/N: WSA-5TR TX



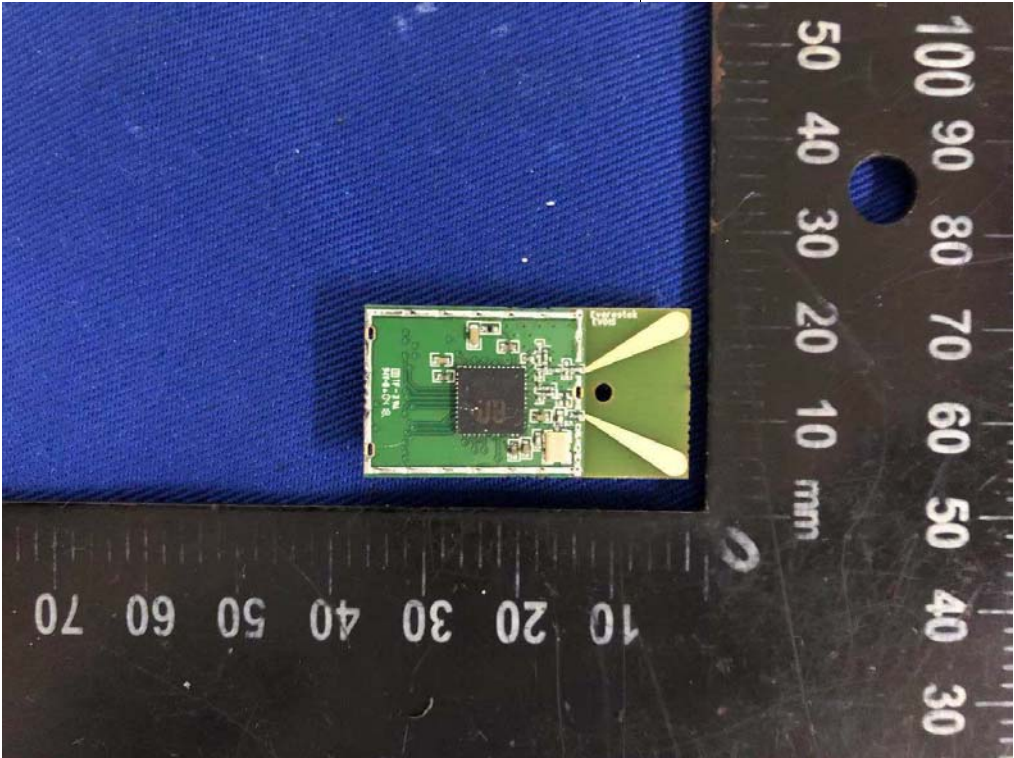
Internal Photos
M/N: WSA-5TR TX



Internal Photos
M/N: WSA-5TR TX



Internal Photos
M/N: WSA-5TR TX



RX
Antenna

TX
Antenna

