TEST REPORT

Reference No.	:	WTZ22D12247428W
FCC ID	:	2A4UL-EWRPB4F
Applicant	:	Jiangmen Waytogo Technology Co., Ltd.
Address	:	1-3 Floor, Building 2, 301 Longxi Road, Jianghai District, Jiangmen, Guangdong Province, China 529000
Manufacturer	:	Jiangmen Waytogo Technology Co., Ltd.
Address	:	1-3 Floor, Building 2, 301 Longxi Road, Jianghai District, Jiangmen, Guangdong Province, China 529000
Product	:	LED EMERGENCY WRAP LIGHT
Model(s)	:	WR484040EFL
Standards	:	FCC CFR47 Part 15 Section 15.249
Date of Receipt sample	:	2022-12-09
Date of Test	:	2022-12-13 to 2022-12-16
Date of Issue	:	2022-12-23
Test Result	:	Pass

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:
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Compiled by:

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Approved by:

Deval Qin

Deval Qin /Designated Reviewer

2 Content

3 Revision History

Test Report No.	Date of Receipt Sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTZ22D12247428W	2022-12-09	2022-12-13 to 2022-12-16	2022-12-23	Original	-	Valid

4 General Information

4.1 General Description of E.U.T

Product:	LED EMERGENCY WRAP LIGHT
Model(s):	WR484040EFL
Model Differences:	N/A
Type of Modulation:	Unmodulated
Frequency Range:	5800±75MHz
Hardware Version:	REV A2
Software Version:	REV01
Antenna Gain:	4.3dBi
Antenna installation:	PCB Printed Antenna

4.2 Details of E.U.T.

Ratings: Input: AC 120-277V, 50/60Hz, 0.5A, 40W

4.3 Channel List

Channel No.	Frequency (MHz)
1	5800

4.4 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Test mode	Channel No.
Transmitting	5800MHz

5 Test Summary

Test Items	Test Requirement	Result
Conducted Emissions	15.207	PASS
Radiated Emission	15.249(a) 15.209 15.205(a)	PASS
Outside Restricted band	15.249 15.205 15.209	PASS
20dB Bandwidth	15:215(c)	PASS
Antenna Requirement	15.203	PASS

6 Equipment Used during Test

6.1 Equipments List

Conducted Emissions 2#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	EMI Test Receiver	R&S	ESCI	100947	2022-08-01	2023-07-31
2	LISN	R&S	ENV216	100115	2022-08-01	2023-07-31
3	Cable	Top	TYPE16(3.5M)	-	2022-08-01	2023-07-31
4	Test software	EZ-EMC	RA-03A1-1	-	2022-08-01	2023-07-31
3m Semi-anechoic Chamber for Radiation Emissions Test site 1#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	Spectrum Analyzer	R&S	FSP30	100091	2022-04-28	2023-04-27
2	Amplifier	Agilent	8447D	2944A10178	2022-08-01	2023-07-31
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	2022-08-07	2023-08-06
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	2022-04-28	2023-04-27
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	2022-04-28	2023-04-27
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	2022-07-29	2023-07-28
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2022-08-08	2023-08-07
8	Coaxial Cable (above 1GHz)	ZT26-NJ-NJ-8M/FA	1GHz-18GHz	NA	2022-04-28	2023-04-27
9	Microwave Broadband Preamplifier	SCHWARZBECK	BBV 9721	100472	2022-08-01	2023-07-31
10	Coaxial Cable	ZT40-2.92J-2.92J-2.0M	10MHz-40GHz	17100919	2022-04-28	2023-04-27
3m Semi-anechoic Chamber for Radiation Emissions Test site 2#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	Test Receiver	R&S	ESCI	101296	2022-04-28	2023-04-27
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2021-10-31	2022-10-30
3	Active Loop Antenna	Com-Power Corp.	AL-130R	10160007	2022-05-02	2023-05-01
4	Amplifier	ANRITSU	MH648A	M43381	2022-04-28	2023-04-27
5	Cable	HUBER+SUHNER	CBL2	525178	2022-04-28	2023-04-27

6.2 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	± 1 x 10^{-6}
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Radiated Spurious Emissions test	± 5.03 dB (Bilog antenna 30M~1000MHz)
	± 5.47 dB (Horn antenna 1000M~25000MHz)

6.3 Test Facility

The test facility has a test site registered with the following organizations:

ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.

Waltek Testing Group Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A, October 15, 2016.

FCC Designation No.: CN1201. Test Firm Registration No.: 523476.

Waltek Testing Group Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration number 523476, September 10, 2019.

6.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by GUANG ZHOU GRG METROLOGY & TEST CO., L TD. address is No.163, Pingyun Rd. West of Huangpu Ave,Tianhe District, Guangzhou, Guangdong, China.

7 Conducted Emission

Test Requirement: FCC 47CFR Part 15 Section 15.207

Test Method: ANSI C63.10:2013

Test Result: PASS

Frequency Range: 150kHz to 30MHz

Class/Severity: Class B

Limit:

Frequency (MHz)	Limit (dBμV)	
	Quasi-peak	Average
0.15 to 0.5	66 to 56	56 to 46
0.5 to 5	56	46
5 o 30	60	50

7.1 E.U.T. Operation

Operating Environment **:**

Temperature: 21.5 °C

Humidity: 51.9 % RH

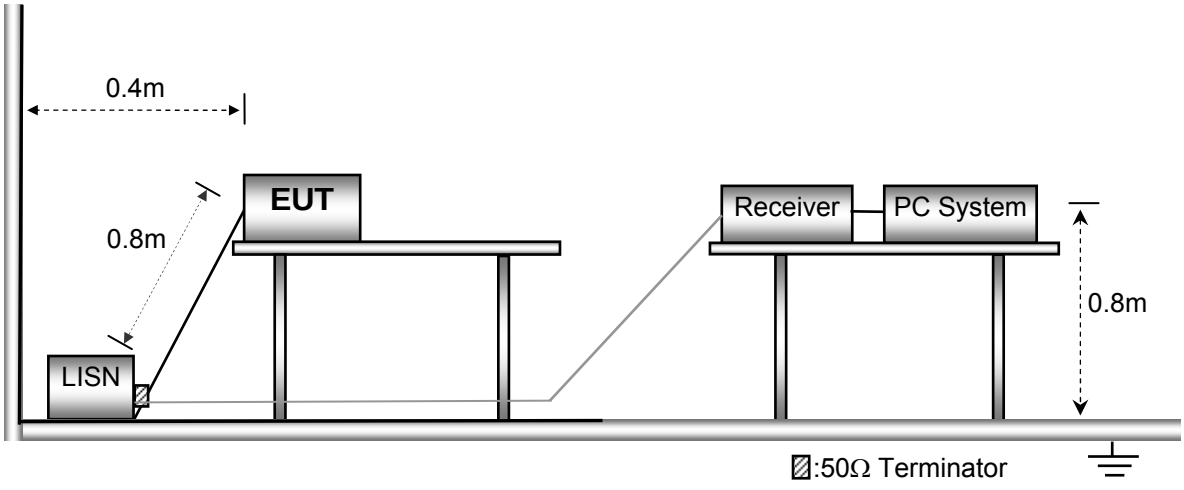
Atmospheric Pressure: 101.2kPa

EUT Operation :

The test was performed in TX transmitting mode, the worst data were shown in the report.

7.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10.

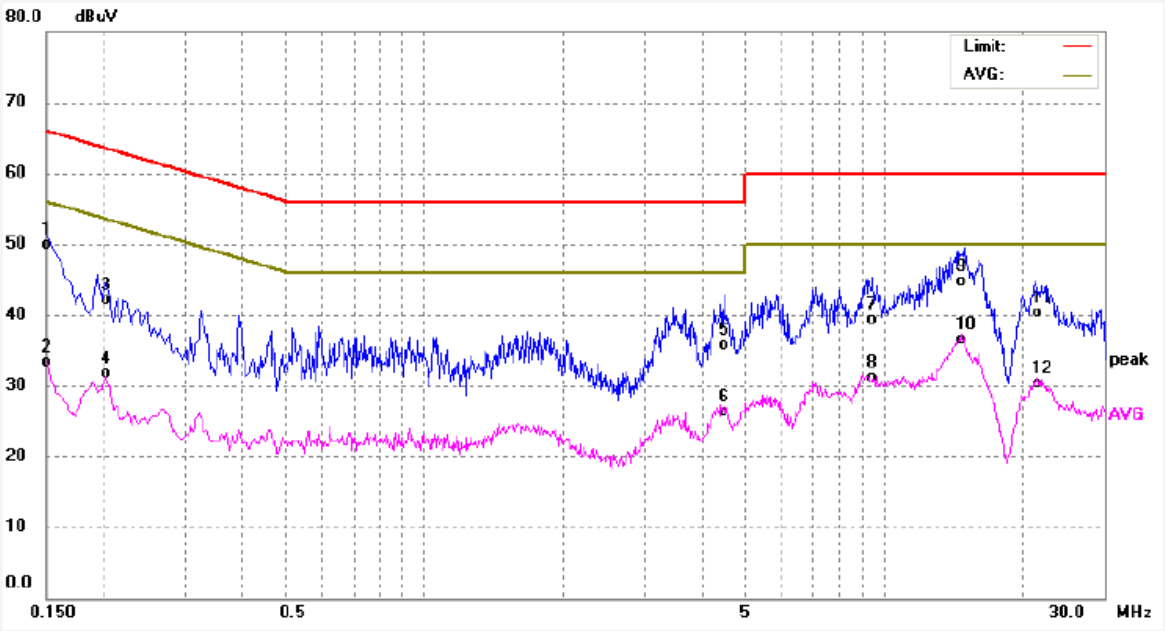


7.3 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

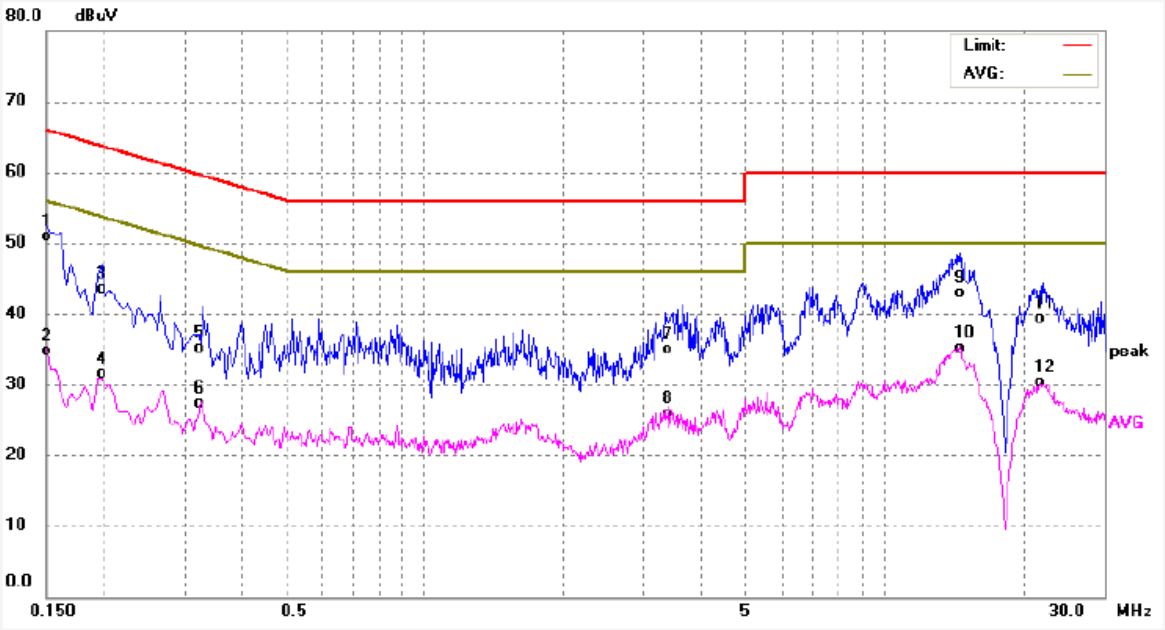
7.4 Conducted Emission Test Result

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1500	39.53	10.36	49.89	65.99	-16.10	QP	
2	0.1500	22.93	10.36	33.29	55.99	-22.70	AVG	
3	0.2020	31.80	10.26	42.06	63.52	-21.46	QP	
4	0.2020	21.36	10.26	31.62	53.52	-21.90	AVG	
5	4.4660	25.66	9.99	35.65	56.00	-20.35	QP	
6	4.4660	16.39	9.99	26.38	46.00	-19.62	AVG	
7	9.4460	28.95	10.28	39.23	60.00	-20.77	QP	
8	9.4460	20.88	10.28	31.16	50.00	-18.84	AVG	
9	14.6700	34.03	10.70	44.73	60.00	-15.27	QP	
10	14.6700	25.86	10.70	36.56	50.00	-13.44	AVG	
11	21.4900	29.46	10.91	40.37	60.00	-19.63	QP	
12	21.4900	19.41	10.91	30.32	50.00	-19.68	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1500	40.46	10.44	50.90	65.99	-15.09	QP	
2	0.1500	24.36	10.44	34.80	55.99	-21.19	AVG	
3	0.1980	33.24	10.35	43.59	63.69	-20.10	QP	
4	0.1980	21.16	10.35	31.51	53.69	-22.18	AVG	
5	0.3260	24.74	10.29	35.03	59.55	-24.52	QP	
6	0.3260	17.05	10.29	27.34	49.55	-22.21	AVG	
7	3.3860	24.89	10.05	34.94	56.00	-21.06	QP	
8	3.3860	15.76	10.05	25.81	46.00	-20.19	AVG	
9	14.5819	31.96	10.87	42.83	60.00	-17.17	QP	
10	14.5819	24.29	10.87	35.16	50.00	-14.84	AVG	
11	21.7740	27.55	11.71	39.26	60.00	-20.74	QP	
12	21.7740	18.51	11.71	30.22	50.00	-19.78	AVG	

8 Radiation Emission Test

Test Requirement: FCC Part15 Paragraph 15.249&15.209&15.205

Test Method: ANSI 63.10: 2013

Measurement Distance: 3m

Test Result: PASS

15.249(a)Limit:

Fundamental frequency	Field strength of fundamental		Field strength of harmonics	
	mV/m	dBuV/m	uV/m	dBuV/m
902-928 MHz	50	94	500	54
2400-2483.5 MHz	50	94	500	54
5725-5875 MHz	50	94	500	54
24.0-24.25 GHz	250	108	2500	68

15.209 Limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))}$ + 80
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))}$ + 40
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)}$ + 40
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

Note: RF Voltage(dBuV)=20 $\log_{10}$ RF Voltage(uV)

8.1 EUT Operation

Operating Environment **:**

Temperature: 23.5 °C

Humidity: 51.1 % RH

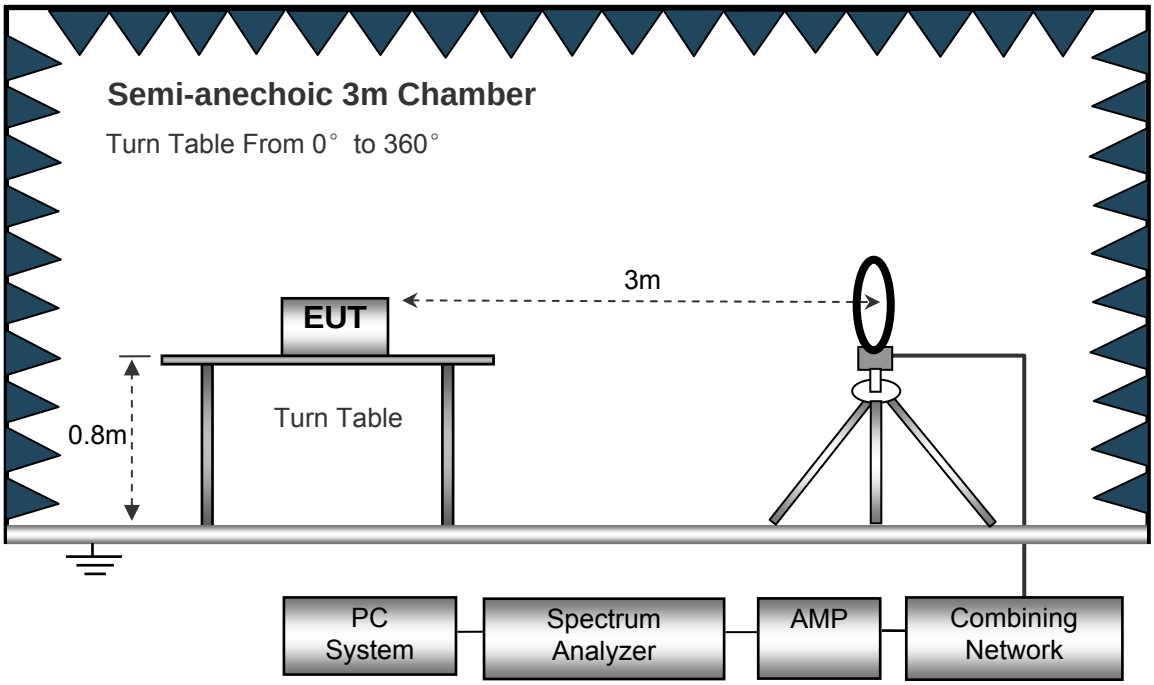
Atmospheric Pressure: 101.2kPa

EUT Operation **:**

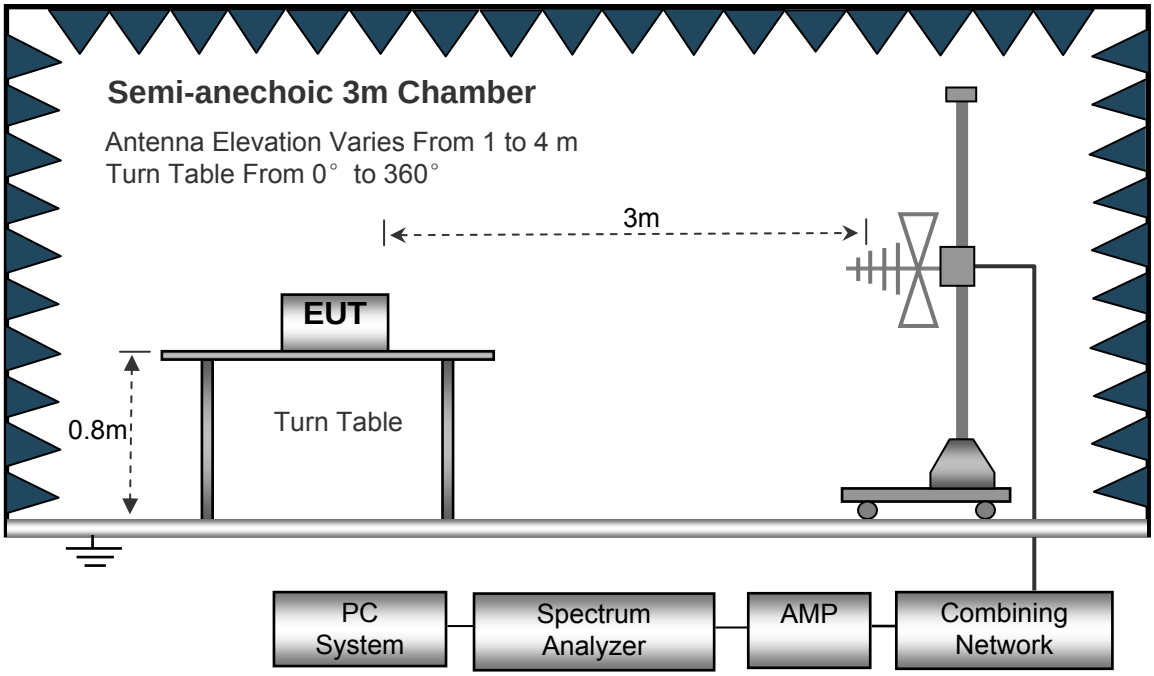
The test was performed in transmitting mode, the test data were shown in the report.

8.2 Test Setup

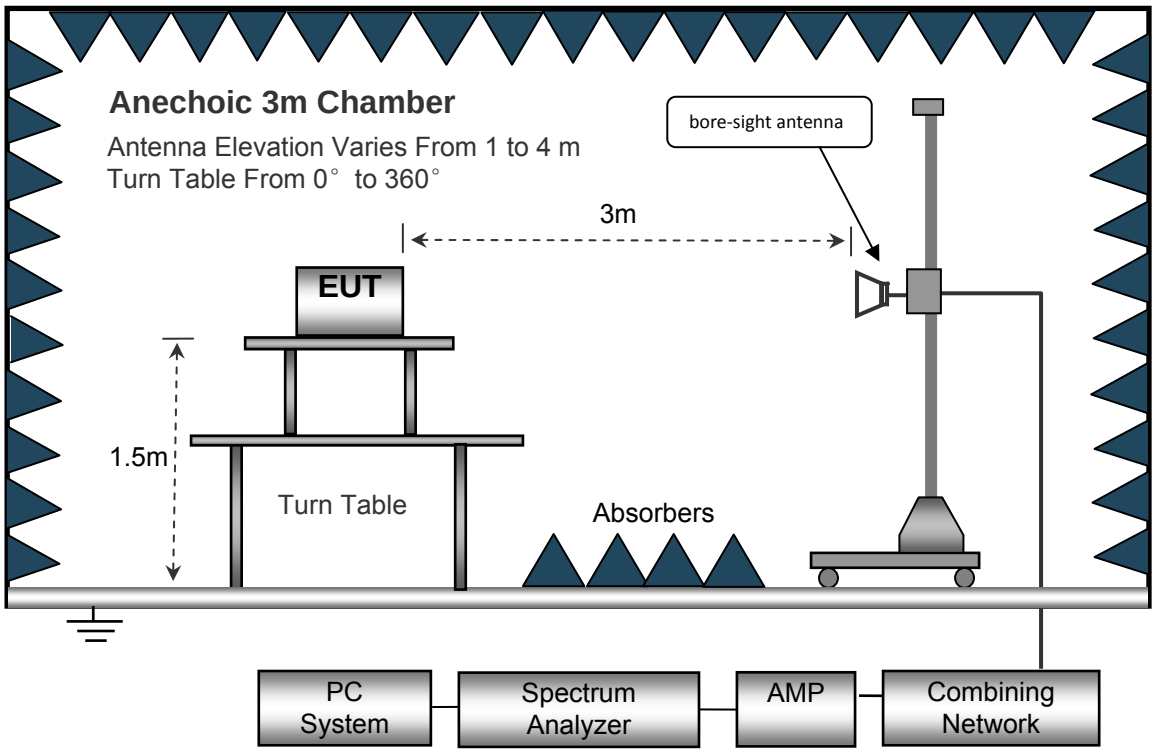
The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10.
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30MHz to 1GHz.



The test setup for emission measurement above 1 GHz.



8.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed ..... Auto
IF Bandwidth..... 10kHz
Video Bandwidth 10kHz

Resolution Bandwidth 10kHz

30MHz ~ 1GHz

Sweep Speed ..... Auto
Detector..... PK
Resolution Bandwidth..... 100kHz
Video Bandwidth 300kHz

Above 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 1MHz
Video Bandwidth 3MHz
Detector ..... Ave.
Resolution Bandwidth..... 1MHz
Video Bandwidth 10Hz

8.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane for below 1GHz and 1.5m above 1GHz.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

8.5 Test Result

Test Frequency : 9KHz~ 30MHz
The measurements were more than 20 dB below the limit and not reported.

Test Frequency: 30MHz ~ 1GHz

Antenna Polarization: Horizontal

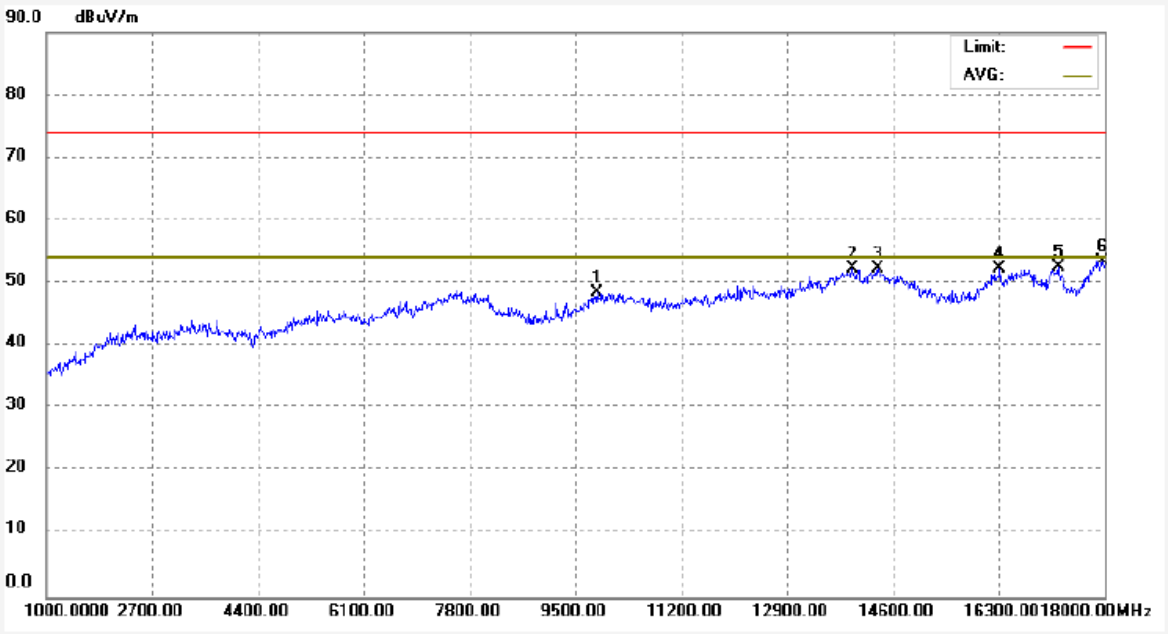
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	33.3279	39.53	-19.84	19.69	40.00	-20.31	QP	
2	93.1132	53.14	-22.63	30.51	43.50	-12.99	QP	
3	152.1297	50.10	-17.19	32.91	43.50	-10.59	QP	
4	239.9873	50.80	-19.12	31.68	46.00	-14.32	QP	
5	317.7011	44.23	-16.32	27.91	46.00	-18.09	QP	
6	513.6331	45.76	-10.98	34.78	46.00	-11.22	QP	

Antenna Polarization: Vertical

No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	30.1054	53.17	-19.97	33.20	40.00	-6.80	QP	
2	42.3022	45.05	-19.40	25.65	40.00	-14.35	QP	
3	72.5916	46.60	-21.20	25.40	40.00	-14.60	QP	
4	85.8984	51.67	-23.27	28.40	40.00	-11.60	QP	
5	152.6641	53.53	-17.20	36.33	43.50	-7.17	QP	
6	196.5098	49.77	-20.04	29.73	43.50	-13.77	QP	

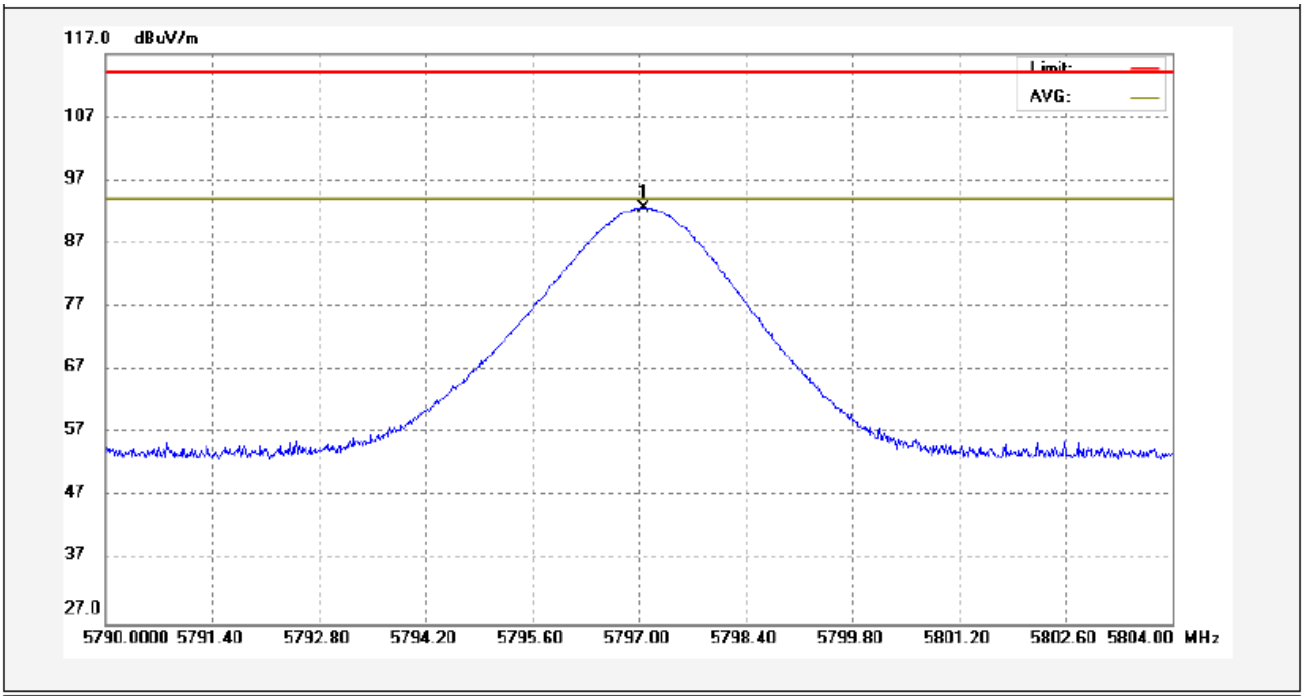
Test Frequency: 1GHz ~ 18GHz

Antenna Polarization: Horizontal



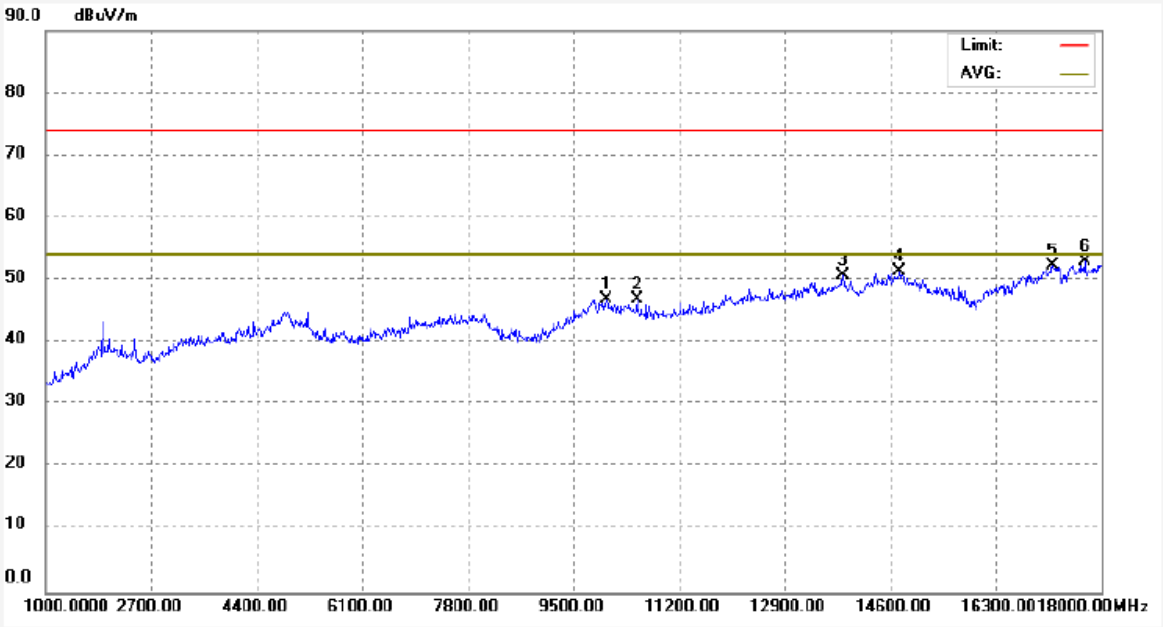
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	9840.000	43.73	4.83	48.56	74.00	-25.44	peak	
2	13954.000	41.55	10.77	52.32	74.00	-21.68	peak	
3	14362.000	42.13	10.20	52.33	74.00	-21.67	peak	
4	16317.000	42.16	10.11	52.27	74.00	-21.73	peak	
5	17252.000	36.91	15.67	52.58	74.00	-21.42	peak	
6	17966.000	34.91	18.58	53.49	74.00	-20.51	peak	

Fundamental



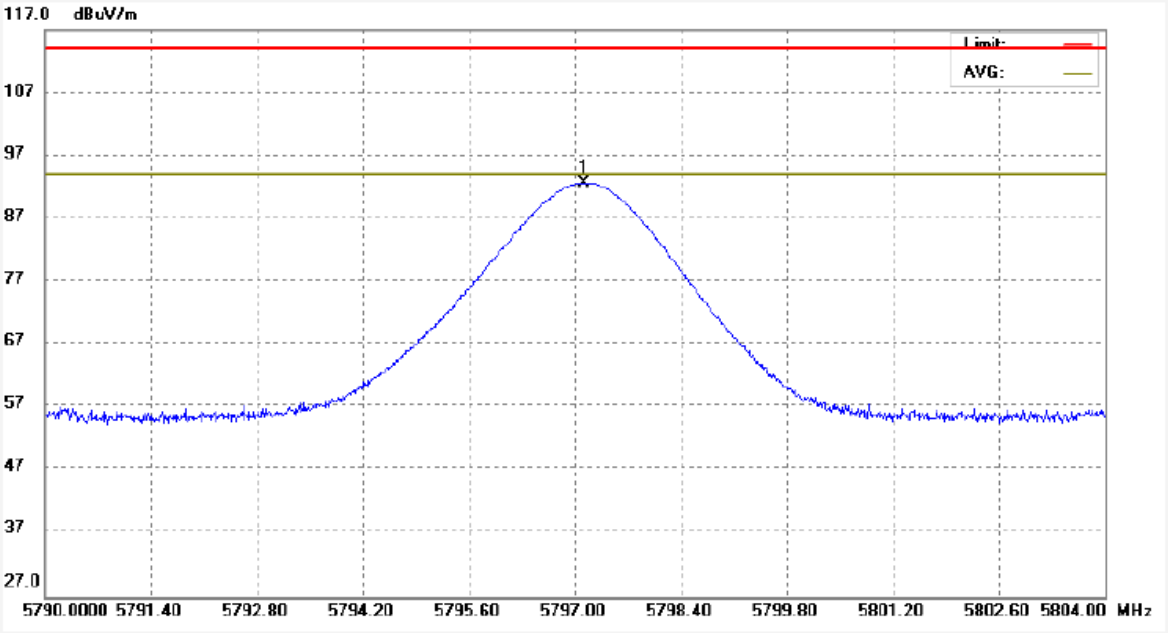
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	5797.056	82.70	9.92	92.62	114.00	-21.38	peak	

Antenna Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	10027.000	42.94	3.92	46.86	74.00	-27.14	peak	
2	10520.000	42.22	4.66	46.88	74.00	-27.12	peak	
3	13835.000	41.15	9.54	50.69	74.00	-23.31	peak	
4	14753.000	41.20	10.17	51.37	74.00	-22.63	peak	
5	17218.000	38.36	13.98	52.34	74.00	-21.66	peak	
6	17728.000	37.24	15.83	53.07	74.00	-20.93	peak	

Fundamental



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	5797.112	82.35	10.34	92.69	114.00	-21.31	peak	

Test Frequency : 18GHz~ 40GHz
The measurements were more than 20 dB below the limit and not reported.

9 Restricted band

Test Requirement: FCC Part15 Paragraph 15.205

Test Method: ANSI C63.10: 2013

Test Result: N/A

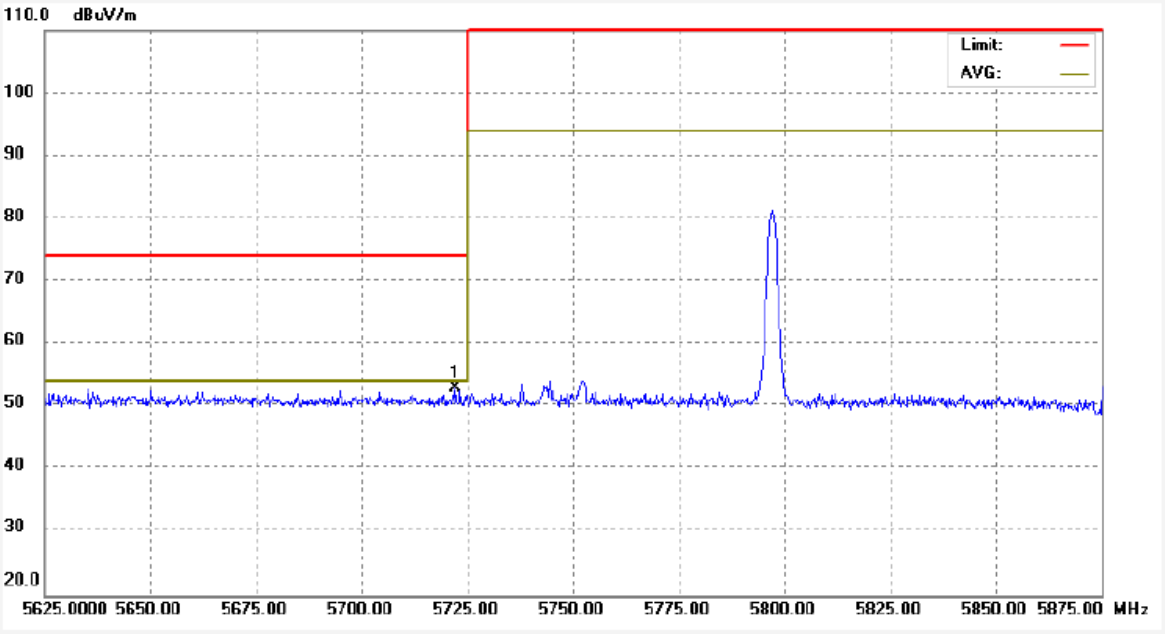
9.1 Requiments

emissions that fall in the restricted bands(15.205).Above 1000MHz, compliance with the emissions limits in section 15.209 shall be demonstrated based on the average value of the measured emissions,The provisions in section 15.35apply to these measurements.

9.2 Test Result

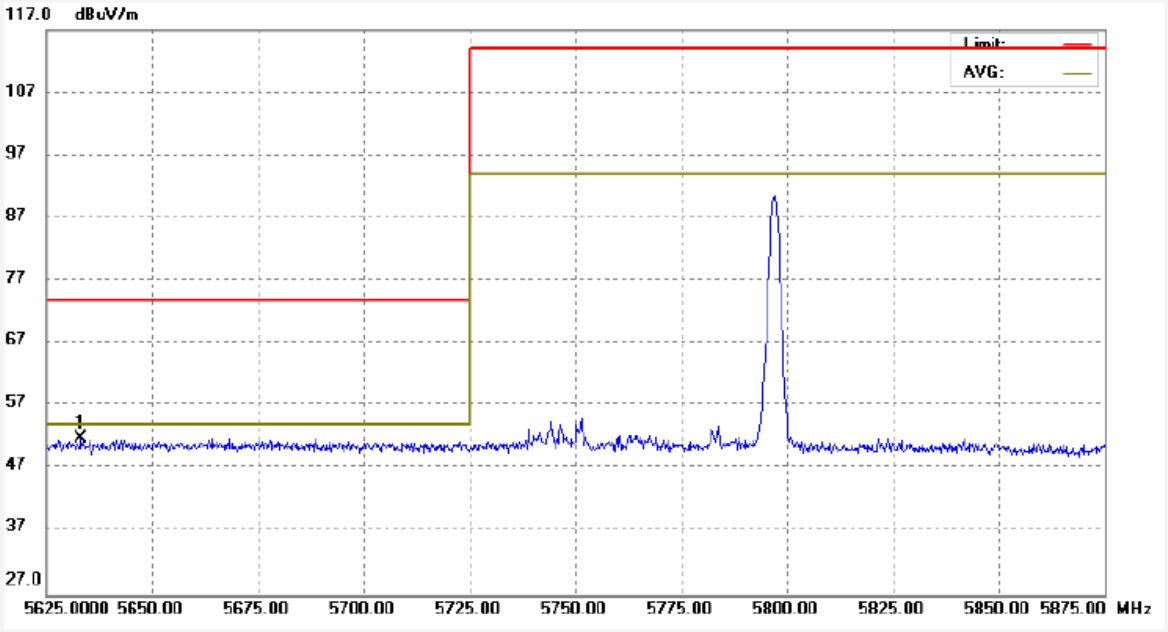
Band edge-left side

Antenna Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	5722.250	43.12	9.86	52.98	74.00	-21.02	peak	

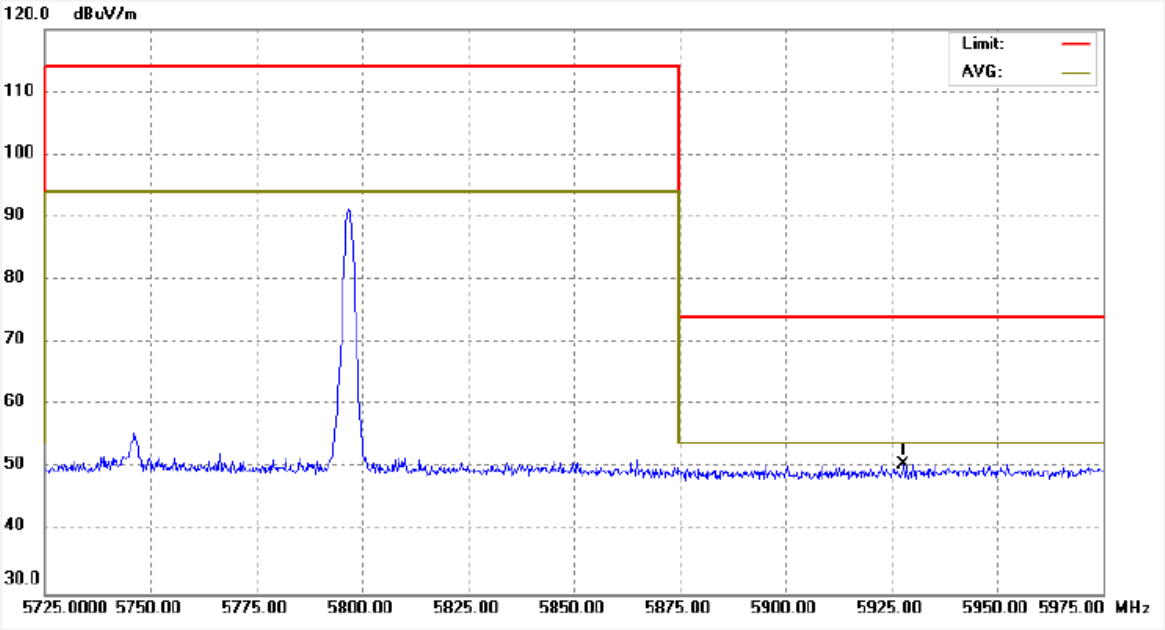
Antenna Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	5633.250	41.66	10.23	51.89	74.00	-22.11	peak	

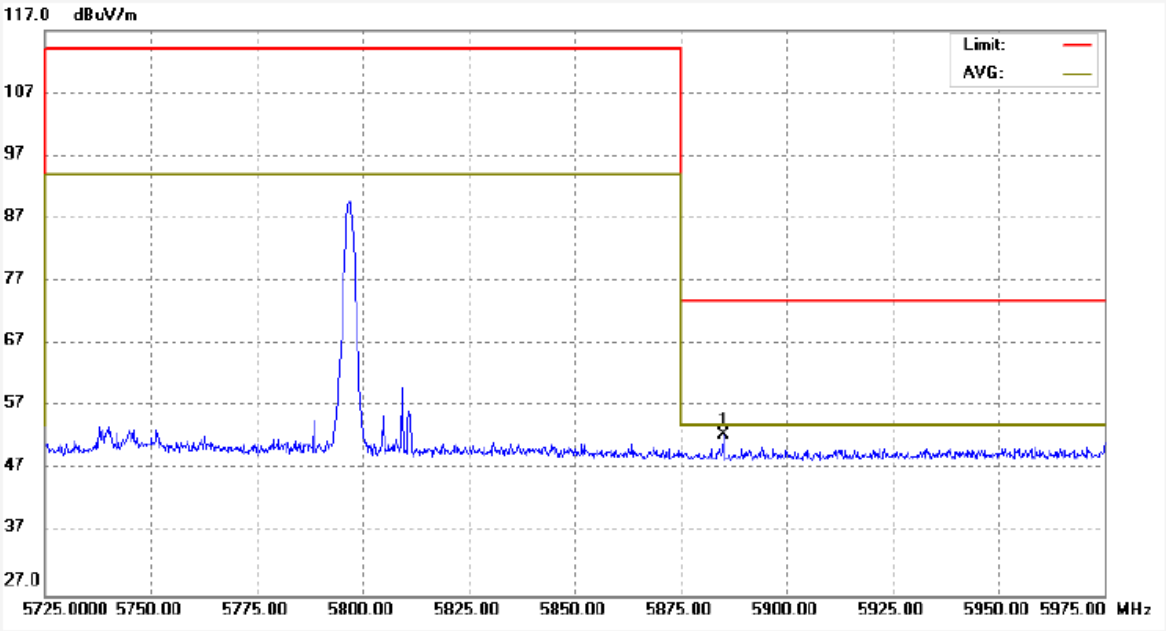
Band edge-right side

Antenna Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	5927.953	40.53	10.02	50.55	74.00	-23.45	peak	

Antenna Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	5885.160	42.16	10.41	52.57	74.00	-21.43	peak	

10 20 dB Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.215(c)

Test Method: ANSI C63.10:2013

Test Mode: Transmitting

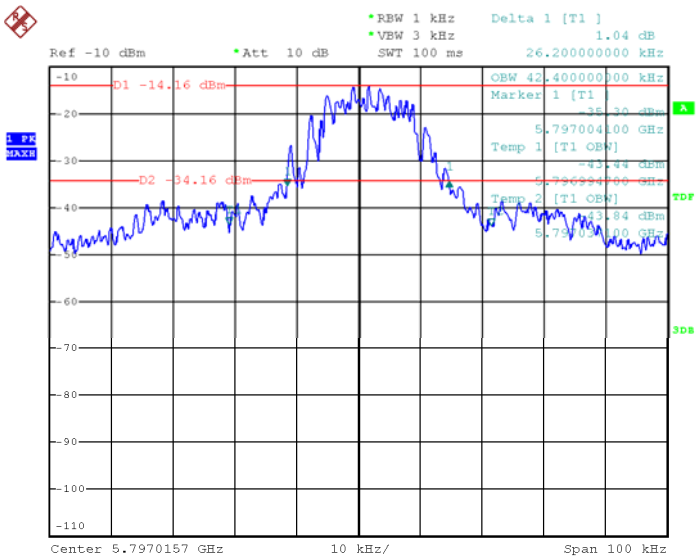
10.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 1%-5% OBW, VBW = 3RBW

10.2 Test Result

Frequency (MHz)	Bandwidth Emission (kHz)
5800	26.2

Test plots



11 Antenna Requirement

According to the FCC Part 15 Paragraph 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. This product has a Internal Antenna , fulfil the requirement of this section.

12 Photographs - Constructional Details

Note: Please refer to appendix: Appendix-WR484040EFL-Photos.

======End of Report======