

FCC TEST REPORT

FCC ID: 2A4K9-T2PLUS

Report No. : SSP25020136-4E

Applicant : YABER TECHNOLOGIES CO.,LIMITED

Product Name : Projector

Model Name : T2 Plus

Test Standard : FCC Part 15 Subpart E

Date of Issue : 2025-04-16



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This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen CCUT Quality Technology Co., Ltd.

Test Report Basic Information

Applicant:	YABER TECHNOLOGIES CO.,LIMITED Room 406,4 Floor, B Building, BanTian International Center, HuanCheng Address of Applicant.....:	South Road, BanTian Street, LongGang District, Shenzhen, China
Manufacturer:	YABER TECHNOLOGIES CO.,LIMITED Room 406,4 Floor, B Building, BanTian International Center, HuanCheng Address of Manufacturer.....:	South Road, BanTian Street, LongGang District, Shenzhen, China
Product Name:	Projector	
Brand Name:	Yaber	
Main Model:	T2 Plus	
Series Models:	G1, TP2, G2, S30	
Test Standard:	FCC Part 15 Subpart E KDB 789033 D02 v02r01 ANSI C63.4-2014 ANSI C63.10-2013	
Date of Test	2025-03-03 to 2025-04-16	
Test Result:	Passed	
Tested By	<u>Lorzix Luo</u> (Lorzix Luo)	
Reviewed By:	<u>Lieber Ouyang</u> (Lieber Ouyang)	
Authorized Signatory:	<u>Lahm Peng</u> (Lahm Peng)	
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CONTENTS

1. General Information.....	5
1.1 Product Information	5
1.2 Test Setup Information.....	8
1.3 Compliance Standards.....	9
1.4 Test Facilities.....	9
1.5 List of Measurement Instruments	10
1.6 Measurement Uncertainty	11
2. Summary of Test Results	12
3. Antenna Requirement.....	13
3.1 Standard and Limit.....	13
3.2 Test Result.....	13
4. Conducted Emissions	14
4.1 Standard and Limit.....	14
4.2 Test Procedure.....	14
4.3 Test Data and Results	15
5. Radiated Emissions(Below 1GHz).....	18
5.1 Standard and Limit.....	18
5.2 Test Procedure.....	18
5.3 Test Data and Results	19
6. Spurious Emissions(Above 1GHz).....	28
6.1 Standard and Limit.....	28
6.2 Test Procedure.....	28
6.3 Test Data and Results	29
7. Band-edge Emissions(Radiated)	34
7.1 Standard and Limit.....	34
7.2 Test Procedure.....	34
7.3 Test Data and Results	34
8. Maximum Conducted Output Power	40
8.1 Standard and Limit.....	40
8.2 Test Procedure.....	40
8.3 Test Data and Results	40
9. Occupied Bandwidth	41
9.1 Standard and Limit.....	41
9.2 Test Procedure.....	41
9.3 Test Data and Results	41
10. Maximum Power Spectral Density	42
10.1 Standard and Limit.....	42
10.2 Test Procedure.....	42
10.3 Test Data and Results	42
11. Frequency Stability	43
11.1 Standard and Limit.....	43
11.2 Test Procedure.....	43
11.3 Test Data and Results	43

Revision History

Revision	Issue Date	Description	Revised By
V1.0	2025-04-16	Initial Release	Lahm Peng

1. General Information

1.1 Product Information

Product Name:	Projector
Trade Name:	Yaber
Main Model:	T2 Plus
Series Models:	G1, TP2, G2, S30
Rated Voltage:	DC 11.1V by battery, Power Input: AC 100-240V~50/60Hz
Test Sample No:	SSP25020136-1
Hardware Version:	V1.0
Software Version:	V1.0

Note 1: The test data is gathered from a production sample, provided by the manufacturer.

Note 2: The complimentary accessories, color of appearance and model name of series models listed are different from the main model, but the circuit and the electronic construction are the same, declared by the manufacturer.

Wireless Specification	
Wireless Standard:	802.11a(HT20) 802.11n(HT20/HT40) 802.11ac(VHT20/VHT40/VHT80)
Operating Frequency:	802.11a/n/ac(HT/VHT20): U-NII Band 1: 5180MHz to 5240MHz, U-NII Band 2: 5260MHz to 5320MHz U-NII Band 3: 5500MHz to 5700MHz, U-NII Band 4: 5745MHz to 5825MHz 802.11n/ac(HT/VHT40): U-NII Band 1: 5190MHz to 5230MHz, U-NII Band 2: 5270MHz to 5310MHz U-NII Band 3: 5510MHz to 5710MHz, U-NII Band 4: 5755MHz to 5795MHz 802.11ac(HT/VHT80): U-NII Band 1: 5210MHz, U-NII Band 2: 5290MHz U-NII Band 3: 5530MHz, 5690MHz, U-NII Band 4: 5775MHz
Number of Channel:	Refer to the following channel list
Modulation:	OFDM(BPSK, QPSK, BPSK, 16QAM, 64QAM, 256QAM)
Antenna Gain:	ANT1: 2.34dBi ANT2: 2.11dBi Directional gain= $G_{ANT} + \text{Array Gain} = 5.35\text{dBi}$ Array Gain = $10 \log (N_{ANT}/N_{SS}) \text{ dB}$. G_{ANT} : equal to the gain of the antenna having the highest gain N_{ANT} : number of transmit antennas N_{SS} : number of spatial streams, The worst case directional gain will occur when $N_{SS} = 1$ Note: Signals transmitted by two WiFi antennas are correlated
Type of Antenna:	FPCB Antenna
Type of Device:	☐ Portable Device ☒ Mobile Device ☐ Modular Device

Channel List for UNII Band 1 (5150-5250MHz)							
802.11a/n/ac(20MHz)				802.11n/ac(40MHz)		802.11ac(80MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	<u>5180</u>	44	5220	38	<u>5190</u>	42	<u>5210</u>
40	<u>5200</u>	48	<u>5240</u>	46	<u>5230</u>	--	--

Channel List for UNII Band 2 (5260-5320MHz)							
802.11a/n/ac(20MHz)				802.11n/ac(40MHz)		802.11ac(80MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	<u>5260</u>	56	<u>5280</u>	54	<u>5270</u>	58	<u>5290</u>
60	5300	64	<u>5320</u>	62	<u>5310</u>	--	--

Channel List for UNII Band 3 (5500-5720MHz)							
802.11a/n/ac(20MHz)		802.11n/ac(40MHz)		802.11ac(80MHz)		(160MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	<u>5500</u>	102	<u>5510</u>	106	5530	--	--
104	5520	110	5550	122	5610	--	--
108	5540	118	<u>5590</u>	--	--	--	--
112	5560	126	5630	--	--	--	--
116	5580	134	<u>5670</u>	--	--	--	--
120	<u>5600</u>	142	5710	--	--	--	--
124	5620	--	--	--	--	--	--
128	5640	--	--	--	--	--	--
132	5660	--	--	--	--	--	--
136	5680	--	--	--	--	--	--
140	<u>5700</u>	--	--	--	--	--	--
--	--	--	--	--	--	--	--

Channel List for UNII Band 4 (5725-5850MHz)							
802.11a/n/ac(20MHz)		802.11n/ac(40MHz)		802.11ac(80MHz)		(160MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	<u>5745</u>	151	<u>5755</u>	155	<u>5775</u>	--	--
153	5765	159	<u>5795</u>	--	--	--	--
157	<u>5785</u>	--	--	--	--	--	--
161	5805	--	--	--	--	--	--
165	<u>5825</u>	--	--	--	--	--	--

1.2 Test Setup Information

List of Test Modes			
Test Mode	Description	Remark	
TM1	802.11a(HT20)	Band 1/2/3/4	
TM2	802.11n(HT20)	Band 1/2/3/4	
TM3	802.11n(HT40)	Band 1/2/3/4	
TM4	802.11ac(VHT20)	Band 1/2/3/4	
TM5	802.11ac(VHT40)	Band 1/2/3/4	
TM6	802.11ac(VHT80)	Band 1/2/3/4	
Note: SISO mode and MIMO mode have the same power setting, so only the worst case power mode(MIMO) will be record in the report.			
List and Details of Auxiliary Cable			
Description	Length (cm)	Shielded/Unshielded	With/Without Ferrite
-	-	-	-
-	-	-	-
List and Details of Auxiliary Equipment			
Description	Manufacturer	Model	Serial Number
-	-	-	-
-	-	-	-
Test Software & Power level setup of EUT			
Test Software		Power level setup	
SecureCRT		15	

Note: The DUT was installed in a test fixture and this test fixture is connected to a laptop computer. The laptop computer was used to configure the EUT to continuously transmit at a specified output power using all different modes and modulation schemes, using the proprietary tool SecureCRT.

1.3 Compliance Standards

Compliance Standards	
FCC Part 15 Subpart E	FEDERAL COMMUNICATIONS COMMISSION, RADIO FREQUENCY DEVICES, Unlicensed National Information Infrastructure Devices
All measurements contained in this report were conducted with all above standards	
According to standards for test methodology	
FCC Part 15 Subpart E	FEDERAL COMMUNICATIONS COMMISSION, RADIO FREQUENCY DEVICES, Unlicensed National Information Infrastructure Devices
KDB 789033 D02 v02r01	GUIDELINES FOR COMPLIANCE TESTING OF UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE (U-NII) DEVICES PART 15, SUBPART E
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.
ANSI C63.10-2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
Maintenance of compliance is the responsibility of the manufacturer or applicant. Any modification of the product, which result is lowering the emission, should be checked to ensure compliance has been maintained.	

1.4 Test Facilities

Laboratory Name:	Shenzhen CCUT Quality Technology Co., Ltd. 1F, Building 35, Changxing Technology Industrial Park, Yutang Street, Guangming District, Shenzhen, Guangdong, China
CNAS Laboratory No.:	L18863
A2LA Certificate No.:	6893.01
FCC Registration No.:	583813
FCC Designation No.:	CN1373
ISED Registration No.:	CN0164
All measurement facilities used to collect the measurement data are located at 1F, Building 35, Changxing Technology Industrial Park, Yutang Street, Guangming District, Shenzhen, Guangdong, China.	

1.5 List of Measurement Instruments

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Conducted Emissions					
AMN	ROHDE&SCHWARZ	ENV216	101097	2024-08-07	2025-08-06
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	100242	2024-08-07	2025-08-06
Test Cable	N/A	Cable 5	N/A	2024-08-07	2025-08-06
EMI Test Software	FARA	EZ-EMC	EMEC-3A1+	N/A	N/A
Radiated Emissions					
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	100154	2024-08-07	2025-08-06
Spectrum Analyzer	KEYSIGHT	N9020A	MY48030972	2024-08-07	2025-08-06
Spectrum Analyzer	ROHDE&SCHWARZ	FSV40-N	101692	2024-08-07	2025-08-06
Amplifier	SCHWARZBECK	BBV 9743B	00251	2024-08-07	2025-08-06
Amplifier	HUABO	YXL0518-2.5-45	--	2024-08-07	2025-08-06
Amplifier	COM-MW	DLAN-18G-4G-02	10229104	2024-08-07	2025-08-06
Loop Antenna	DAZE	ZN30900C	21104	2024-08-03	2025-08-02
Broadband Antenna	SCHWARZBECK	VULB 9168	01320	2024-08-03	2025-08-02
Horn Antenna	SCHWARZBECK	BBHA 9120D	02553	2024-08-03	2025-08-02
Horn Antenna	COM-MW	ZLB7-18-40G-950	12221225	2024-08-03	2025-08-02
Attenuator	QUANJUDA	6dB	220731	2024-08-07	2025-08-06
Test Cable	N/A	Cable 1	N/A	2024-08-07	2025-08-06
Test Cable	N/A	Cable 2	N/A	2024-08-07	2025-08-06
Test Cable	N/A	Cable 3	N/A	2024-08-07	2025-08-06
Test Cable	N/A	Cable 4	N/A	2024-08-07	2025-08-06
Test Cable	N/A	Cable 8	N/A	2024-08-07	2025-08-06
Test Cable	N/A	Cable 9	N/A	2024-08-07	2025-08-06
EMI Test Software	FARA	EZ-EMC	FA-03A2 RE+	N/A	N/A
Conducted RF Testing					
RF Test System	MWRFTTest	MW100-RFCB	220418SQS-37	2024-08-07	2025-08-06
Spectrum Analyzer	KEYSIGHT	N9020A	ATO-90521	2024-08-07	2025-08-06
Spectrum Analyzer	ROHDE&SCHWARZ	FSV40-N	101692	2024-08-07	2025-08-06
RF Test Software	MWRFTTest	MTS 8310	N/A	N/A	N/A
Laptop	Lenovo	ThinkPad E15 Gen 3	SPPOZ22485	N/A	N/A
DUT Test Software	VanDyke Software	SecureCRT	N/A	N/A	N/A

1.6 Measurement Uncertainty

Test Item	Conditions	Uncertainty
Conducted Emissions	9kHz ~ 30MHz	±1.64 dB
Radiated Emissions	9kHz ~ 30MHz	±2.88 dB
	30MHz ~ 1GHz	±3.32 dB
	1GHz ~ 18GHz	±3.50 dB
	18GHz ~ 40GHz	±3.66 dB
Conducted Output Power	9kHz ~ 26GHz	±0.50 dB
Occupied Bandwidth	9kHz ~ 26GHz	±4.0 %
Conducted Spurious Emission	9kHz ~ 26GHz	±1.32 dB
Power Spectrum Density	9kHz ~ 26GHz	±0.62 dB

2. Summary of Test Results

FCC Rule	Description of Test Item	Result
FCC Part 15.203	Antenna Requirement	Passed
FCC Part 15.247(f)	RF Exposure(see the RF exposure report)	Passed
FCC Part 15.207, 15.407(b)(9)	Conducted Emissions	Passed
FCC Part 15.209, 15.407(b)(9), (10)	Radiated Emissions	Passed
FCC Part 15.407(b)(10)	Band-edge Emissions(Radiated)	Passed
FCC Part 15.407(a)(1), (2), (3)	Maximum Peak Conducted Output Power	Passed
FCC Part 15.407(a)(2), (e)	Occupied Bandwidth	Passed
FCC Part 15.407(a)(1), (2), (3)	Maximum Power Spectral Density	Passed
FCC Part 15.407 (g)	Frequency Stability	Passed
FCC Part 15.407 (h)	Transmit Power Control (TPC)	N/A
FCC Part 15.407 (h)	Dynamic Frequency Selection (DFS)	Passed
Passed: The EUT complies with the essential requirements in the standard Failed: The EUT does not comply with the essential requirements in the standard N/A: Not applicable EUT on the worst case mode CDD for final testing.		

3. Antenna Requirement

3.1 Standard and Limit

According to FCC Part 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

3.2 Test Result

This product has two FPCB antennas with different antenna gain, and the maximum antenna gain is 2.34dBi, fulfill the requirement of this section.

4. Conducted Emissions

4.1 Standard and Limit

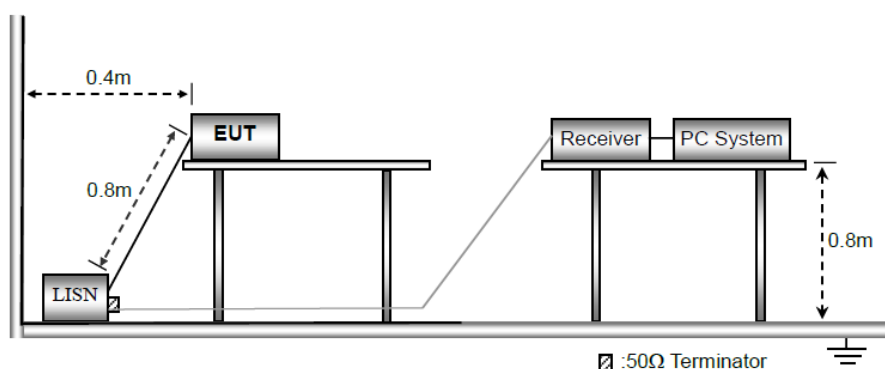
According to the rule FCC Part 15.207, Conducted emissions limit, the limit for a wireless device as below:

Frequency of Emission (MHz)	Conducted emissions (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

Note 1: Decreases with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz
 Note 2: The lower limit applies at the band edges

4.2 Test Procedure

Test is conducting under the description of ANSI C63.10 - 2013 section 6.2.



Test Setup Block Diagram

a) The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

b) The following is the setting of the receiver

Attenuation: 10dB

Start Frequency: 0.15MHz

Stop Frequency: 30MHz

IF Bandwidth: 9kHz

c) The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

d) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

e) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

f) LISN is at least 80 cm from nearest part of EUT chassis.

g) For the actual test configuration, please refer to the related Item - photographs of the test setup.

4.3 Test Data and Results

From band1 to band4 all of the 802.11a, 802.11n and 802.11ac modes have been tested, the EUT complied with the FCC Part 15.207 standard limit for a wireless device, and with the worst case 802.11a_5180MHz as below:

Remark: Level = Reading + Factor, Margin = Level - Limit

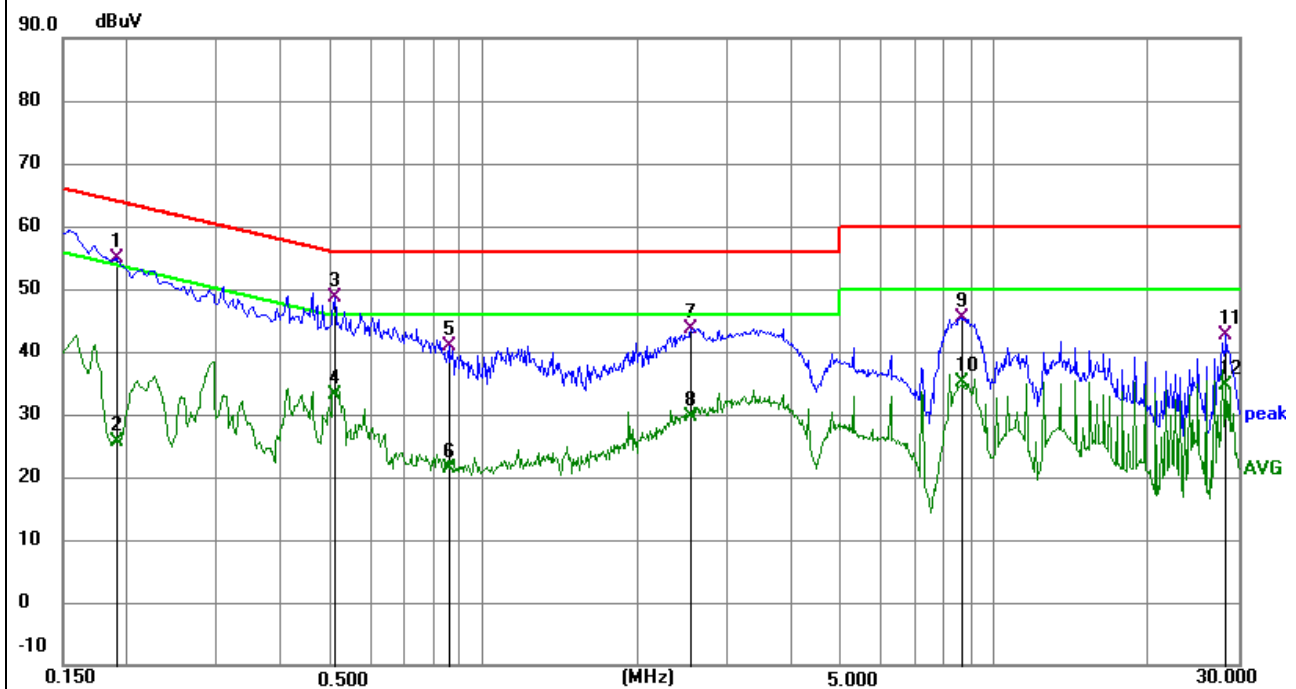
Test Plots and Data of Conducted Emissions

Tested Mode: TM1

Test Voltage: AC 120V/60Hz

Test Power Line: Neutral

Remark:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1905	45.57	9.21	54.78	64.01	-9.23	QP	P	
2	0.1905	16.54	9.21	25.75	54.01	-28.26	AVG	P	
3 *	0.5100	39.31	9.39	48.70	56.00	-7.30	QP	P	
4	0.5100	23.83	9.39	33.22	46.00	-12.78	AVG	P	
5	0.8565	31.53	9.39	40.92	56.00	-15.08	QP	P	
6	0.8565	11.87	9.39	21.26	46.00	-24.74	AVG	P	
7	2.5485	34.23	9.48	43.71	56.00	-12.29	QP	P	
8	2.5485	20.16	9.48	29.64	46.00	-16.36	AVG	P	
9	8.6640	35.80	9.57	45.37	60.00	-14.63	QP	P	
10	8.6640	25.62	9.57	35.19	50.00	-14.81	AVG	P	
11	28.3695	32.64	10.09	42.73	60.00	-17.27	QP	P	
12	28.3695	24.63	10.09	34.72	50.00	-15.28	AVG	P	

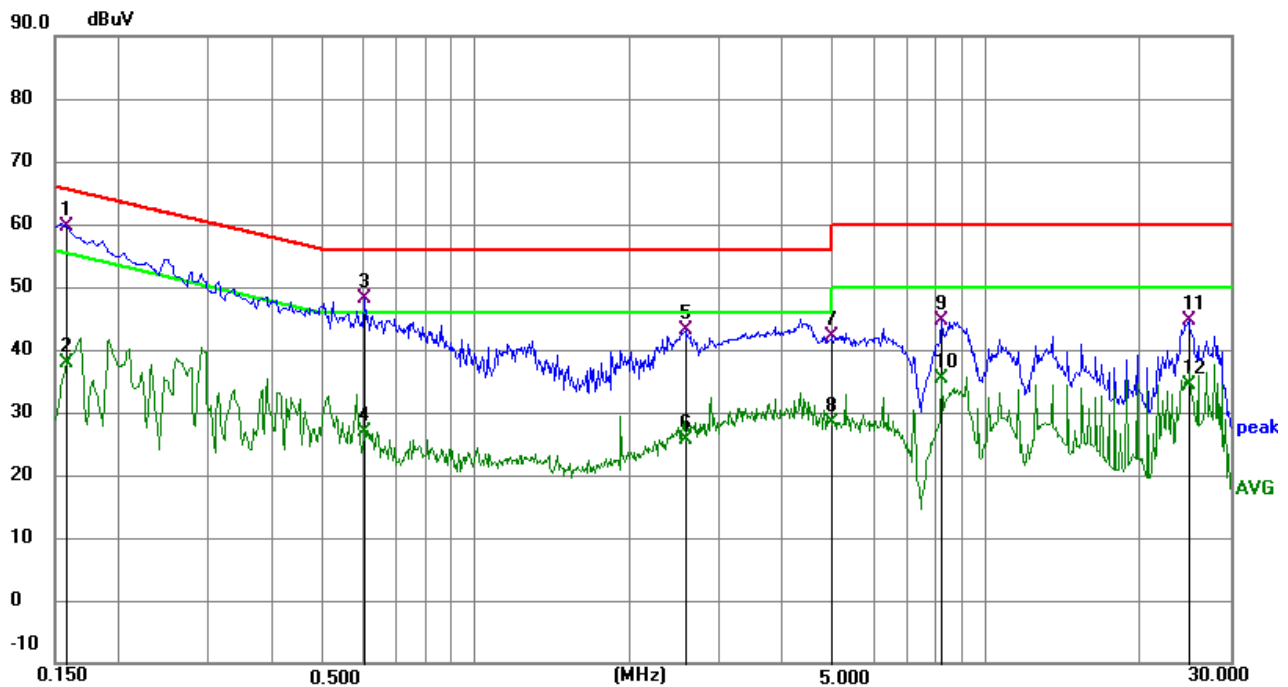
Test Plots and Data of Conducted Emissions

Tested Mode: TM1

Test Voltage: AC 120V/60Hz

Test Power Line: Live

Remark:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1 *	0.1581	50.13	9.41	59.54	65.56	-6.02	QP	P	
2	0.1581	28.37	9.41	37.78	55.56	-17.78	AVG	P	
3	0.6045	38.66	9.57	48.23	56.00	-7.77	QP	P	
4	0.6045	17.41	9.57	26.98	46.00	-19.02	AVG	P	
5	2.5754	33.33	9.68	43.01	56.00	-12.99	QP	P	
6	2.5754	16.02	9.68	25.70	46.00	-20.30	AVG	P	
7	4.9785	32.36	9.76	42.12	56.00	-13.88	QP	P	
8	4.9785	18.63	9.76	28.39	46.00	-17.61	AVG	P	
9	8.1735	34.77	9.77	44.54	60.00	-15.46	QP	P	
10	8.1735	25.73	9.77	35.50	50.00	-14.50	AVG	P	
11	24.8685	34.40	10.19	44.59	60.00	-15.41	QP	P	
12	24.8685	24.21	10.19	34.40	50.00	-15.60	AVG	P	

5. Radiated Emissions(Below 1GHz)

5.1 Standard and Limit

According to FCC Part 15.407(b)(9), Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in FCC Part 15.209.

According to the rule FCC Part 15.209, Radiated emission limit for a wireless device as below:

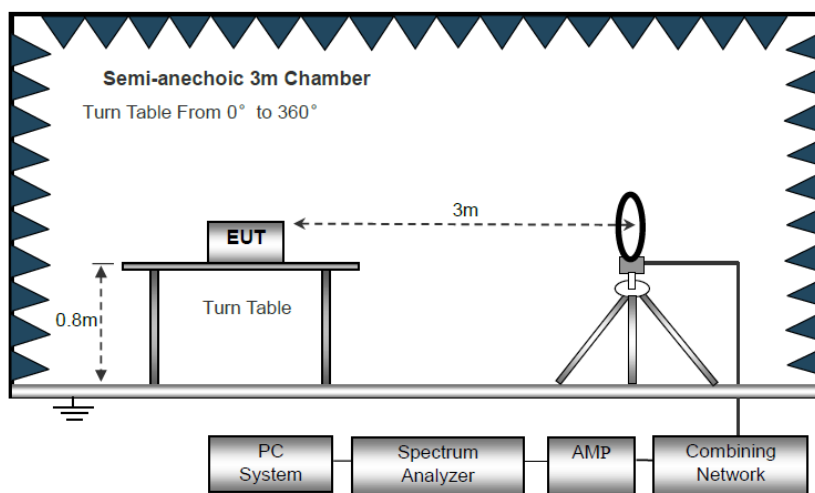
Frequency of Emission (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Note: The more stringent limit applies at transition frequencies.

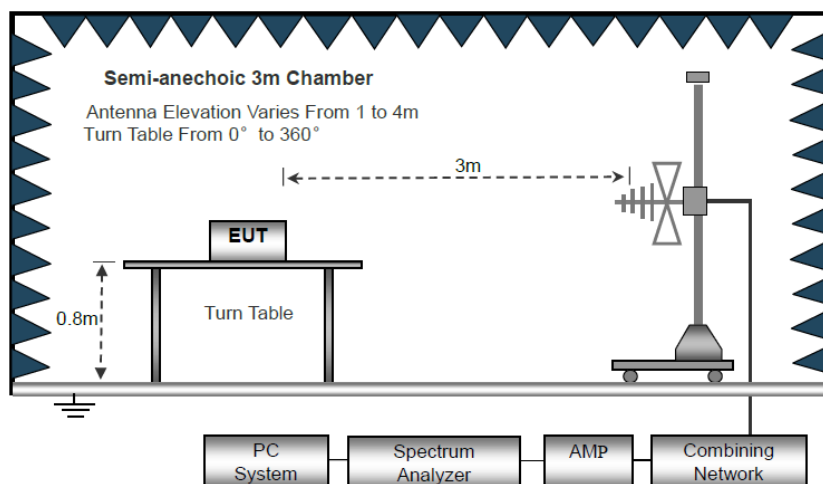
Note: Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

5.2 Test Procedure

Test is conducting under the description of ANSI C63.10 - 2013 section 6.3 to 6.6.



Block Diagram of Radiated Emission Below 30MHz



Block Diagram of Radiated Emission From 30MHz to 1GHz

- a) The EUT is placed on a turntable, which is 0.8m above ground plane for test frequency range below 1GHz.
- b) EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- c) Use the following spectrum analyzer settings:
 Span = wide enough to fully capture the emission being measured
 RBW = 100 kHz
 VBW $\geq$ RBW, Sweep = auto
 Detector function = peak
 Trace = max hold
- d) Follow the guidelines in ANSI C63.4-2014 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- e) For the actual test configuration, please refer to the related item - EUT test photos.

5.3 Test Data and Results

From band1 to band4 all of the 802.11a, 802.11n and 802.11ac modes have been tested, the EUT complied with the FCC Part 15.209 standard limit for a wireless device, and with the worst case 802.11a as below:

Remark: Level = Reading + Factor, Margin = Level - Limit

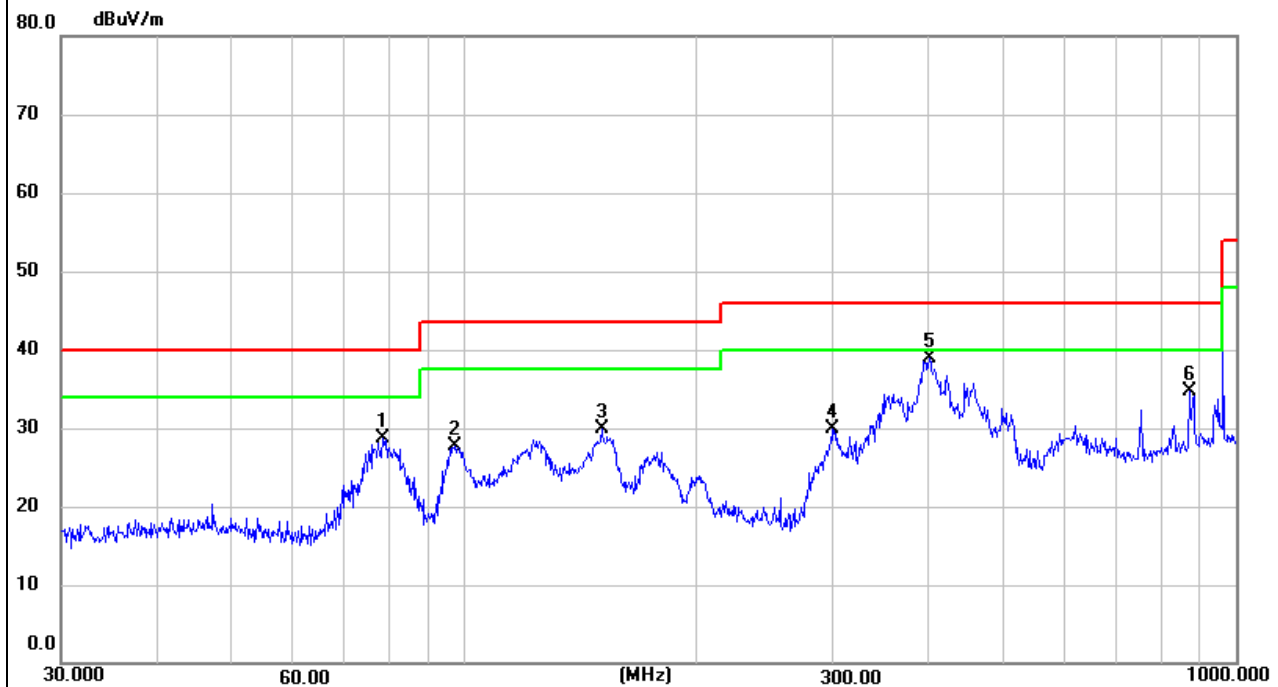
Radiated Emission Test Data (30MHz to 1GHz)

Tested Mode: TM1(802.11a_5180MHz)

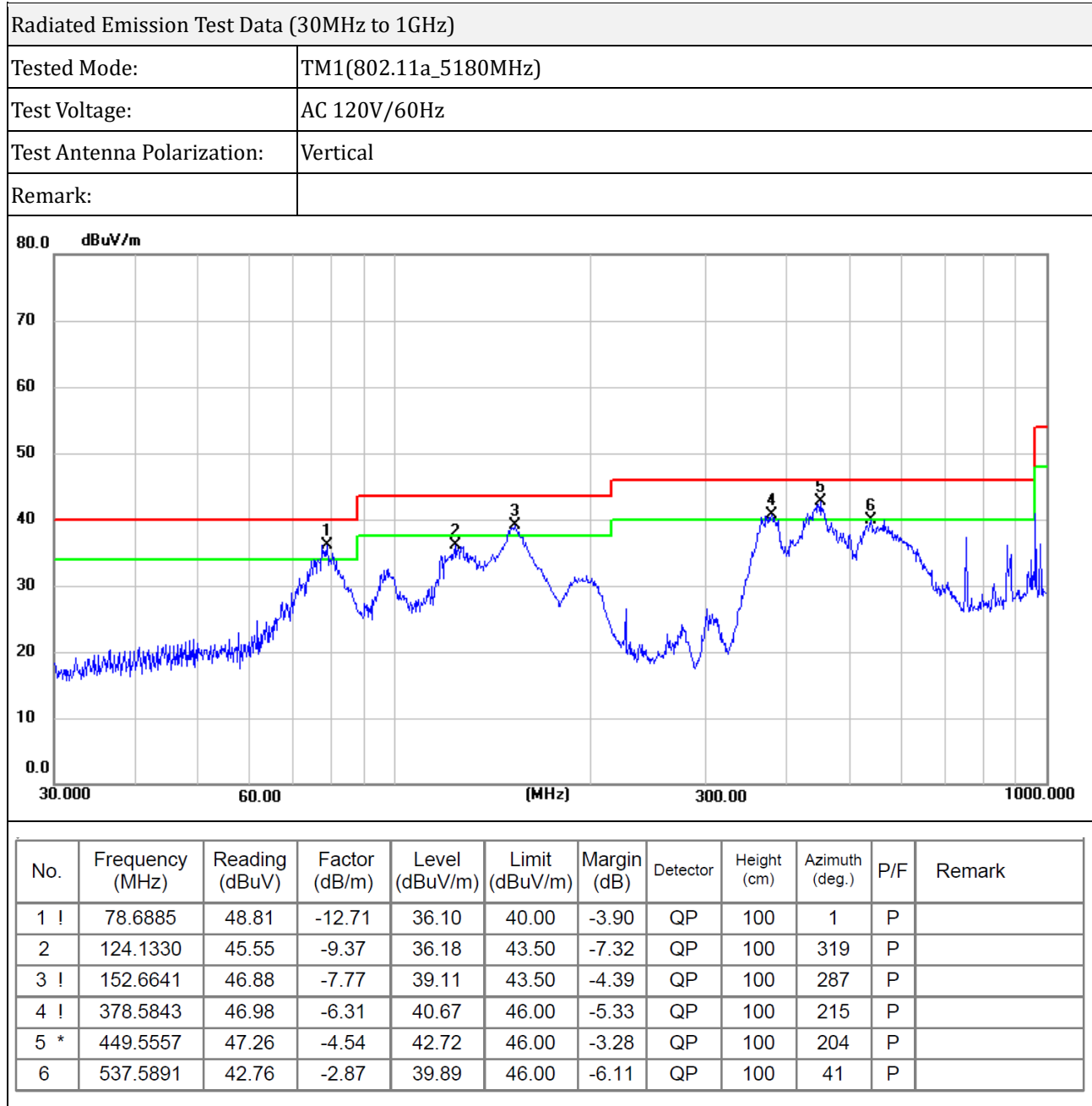
Test Voltage: AC 120V/60Hz

Test Antenna Polarization: Horizontal

Remark:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	78.4133	41.40	-12.68	28.72	40.00	-11.28	QP	100	51	P	
2	97.1148	40.12	-12.45	27.67	43.50	-15.83	QP	100	11	P	
3	150.5378	37.65	-7.73	29.92	43.50	-13.58	QP	100	5	P	
4	299.3158	37.94	-8.08	29.86	46.00	-16.14	QP	100	329	P	
5 *	400.4319	44.50	-5.56	38.94	46.00	-7.06	QP	100	5	P	
6	869.1302	32.73	1.95	34.68	46.00	-11.32	QP	100	237	P	



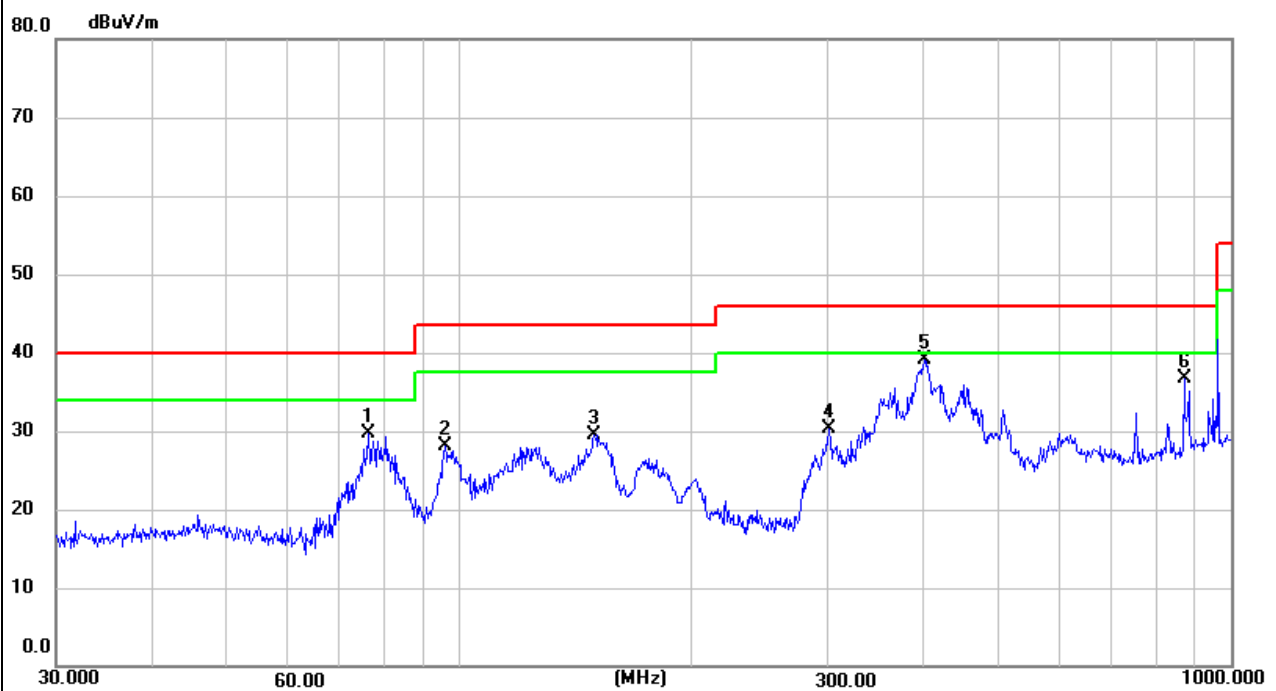
Radiated Emission Test Data (30MHz to 1GHz)

Tested Mode: TM1(802.11a_5260MHz)

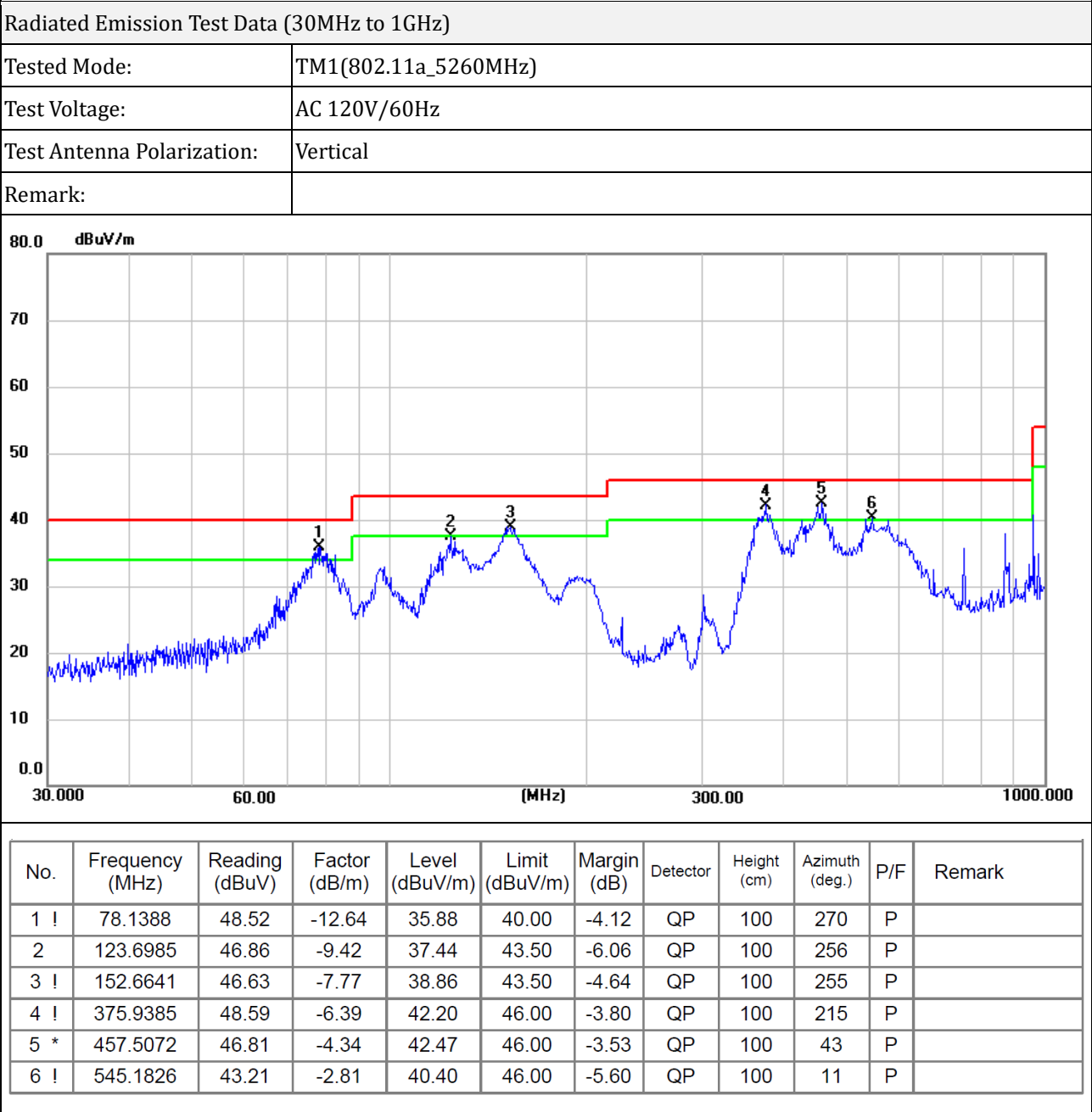
Test Voltage: AC 120V/60Hz

Test Antenna Polarization: Horizontal

Remark:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	76.2442	42.11	-12.41	29.70	40.00	-10.30	QP	100	12	P	
2	95.7622	40.67	-12.57	28.10	43.50	-15.40	QP	100	42	P	
3	149.4857	37.34	-7.75	29.59	43.50	-13.91	QP	100	12	P	
4	301.4224	38.36	-7.99	30.37	46.00	-15.63	QP	100	348	P	
5 *	400.4319	44.62	-5.56	39.06	46.00	-6.94	QP	100	22	P	
6	869.1302	34.71	1.95	36.66	46.00	-9.34	QP	100	12	P	



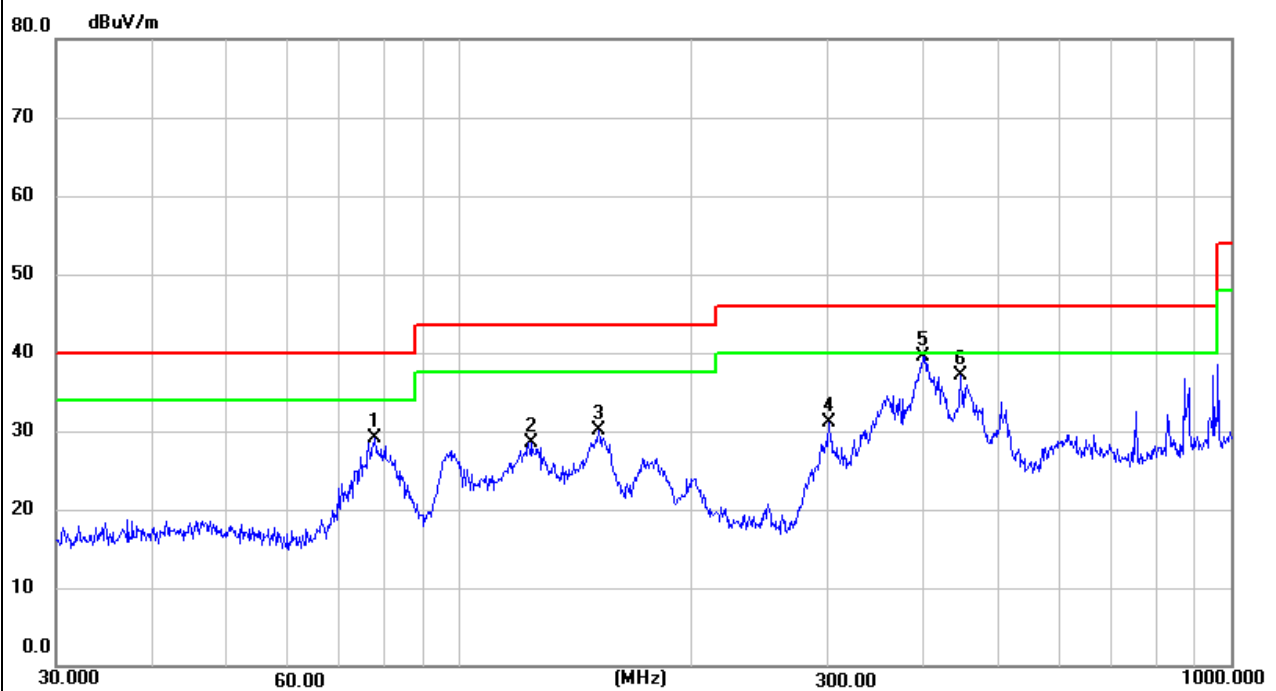
Radiated Emission Test Data (30MHz to 1GHz)

Tested Mode: TM1(802.11a_5500MHz)

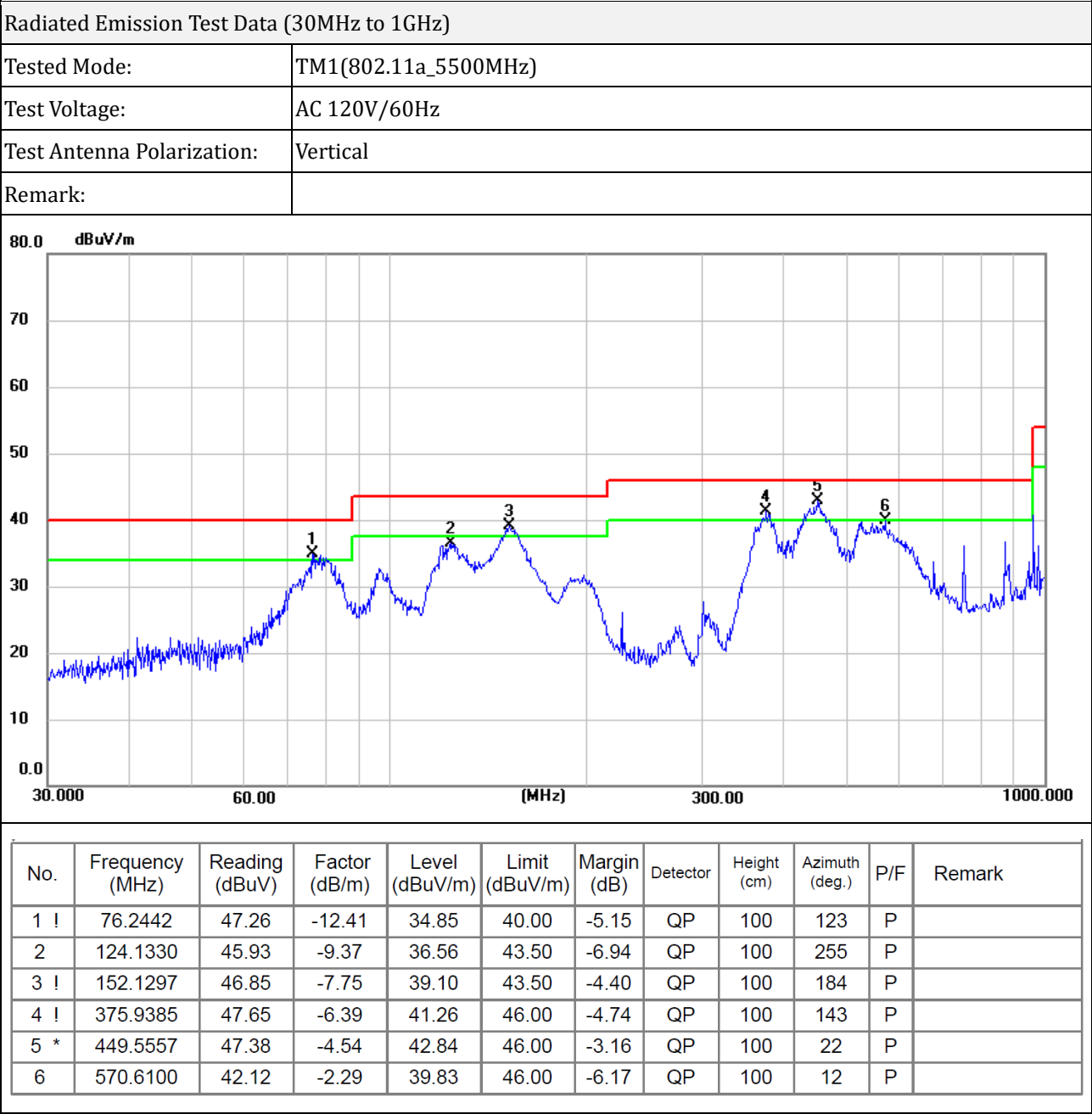
Test Voltage: AC 120V/60Hz

Test Antenna Polarization: Horizontal

Remark:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	77.5928	41.60	-12.57	29.03	40.00	-10.97	QP	100	12	P	
2	124.1330	37.85	-9.37	28.48	43.50	-15.02	QP	100	22	P	
3	151.5972	37.86	-7.75	30.11	43.50	-13.39	QP	100	12	P	
4	301.4224	39.08	-7.99	31.09	46.00	-14.91	QP	100	12	P	
5 *	399.0302	45.07	-5.60	39.47	46.00	-6.53	QP	100	22	P	
6	446.4141	41.71	-4.60	37.11	46.00	-8.89	QP	100	227	P	



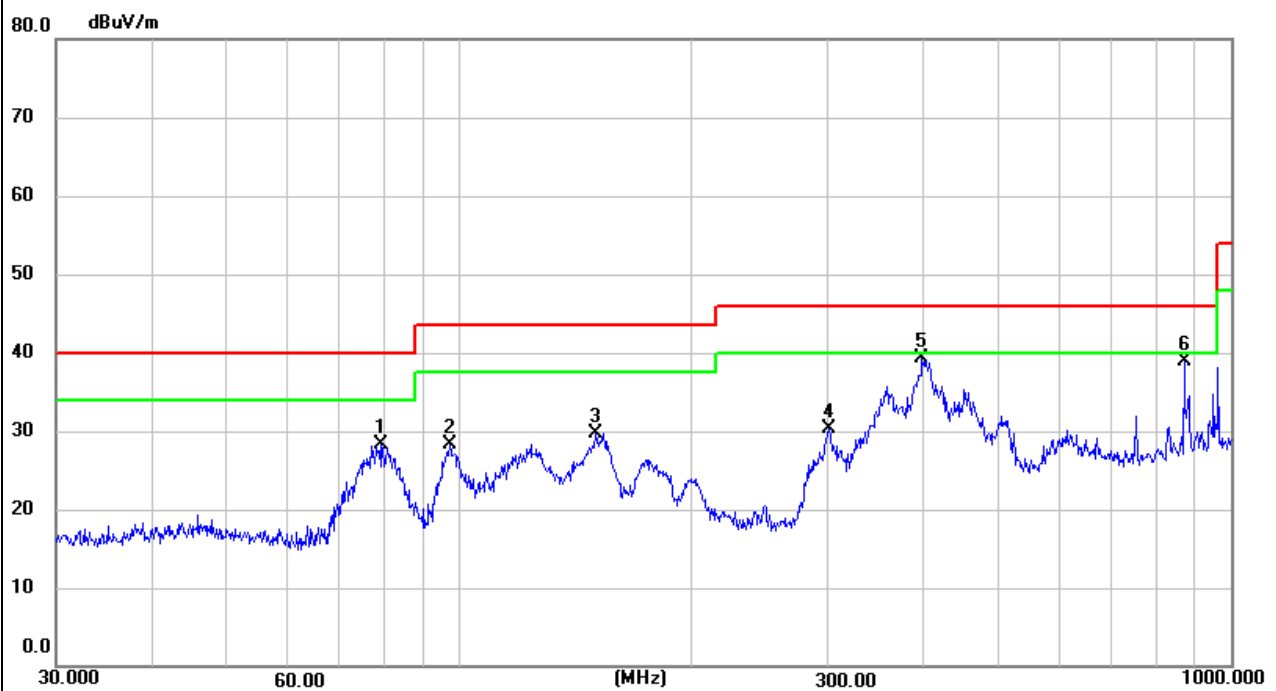
Radiated Emission Test Data (30MHz to 1GHz)

Tested Mode: TM1(802.11a_5745MHz)

Test Voltage: AC 120V/60Hz

Test Antenna Polarization: Horizontal

Remark:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	79.2426	41.03	-12.76	28.27	40.00	-11.73	QP	100	21	P	
2	97.1148	40.85	-12.45	28.40	43.50	-15.10	QP	100	11	P	
3	150.0108	37.37	-7.72	29.65	43.50	-13.85	QP	100	175	P	
4	301.4224	38.32	-7.99	30.33	46.00	-15.67	QP	100	21	P	
5 *	397.6334	45.05	-5.66	39.39	46.00	-6.61	QP	100	1	P	
6	869.1302	36.96	1.95	38.91	46.00	-7.09	QP	100	249	P	

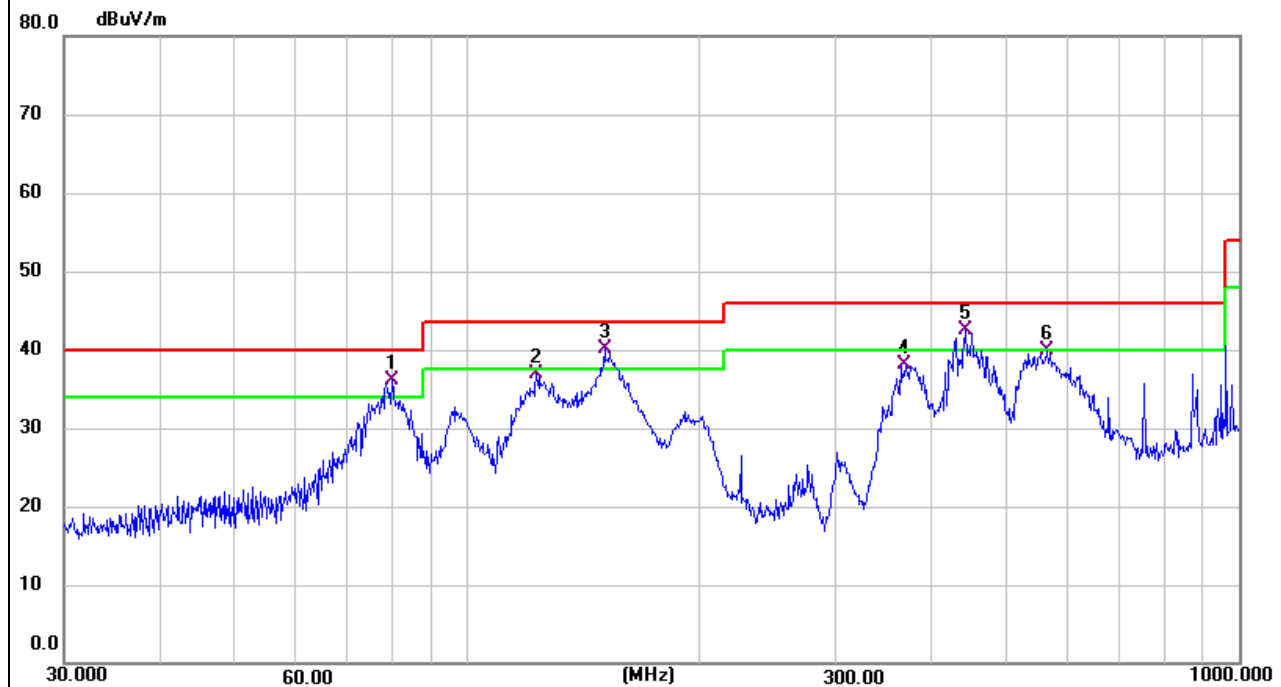
Radiated Emission Test Data (30MHz to 1GHz)

Tested Mode: TM1(802.11a_5745MHz)

Test Voltage: AC 120V/60Hz

Test Antenna Polarization: Vertical

Remark:



No.	Frequency (MHz)	Reading (dBUV)	Factor (dB/m)	Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 !	79.8002	48.97	-12.82	36.15	40.00	-3.85	QP	100	5	P	
2	122.8340	46.30	-9.49	36.81	43.50	-6.69	QP	100	268	P	
3 *	150.5378	47.91	-7.73	40.18	43.50	-3.32	QP	100	215	P	
4	369.4045	44.82	-6.66	38.16	46.00	-7.84	QP	100	124	P	
5 !	441.7425	47.16	-4.70	42.46	46.00	-3.54	QP	100	85	P	
6	564.6389	42.30	-2.42	39.88	46.00	-6.12	QP	100	54	P	

Note 1: this EUT was tested in 3 orthogonal positions with the X-axis being the worst and the worst case position data was reported.

Note 2: Testing is carried out with frequency rang 9kHz to 1GHz. The measurements greater than 20dB below the limit from 9kHz to 30MHz.

6. Spurious Emissions(Above 1GHz)

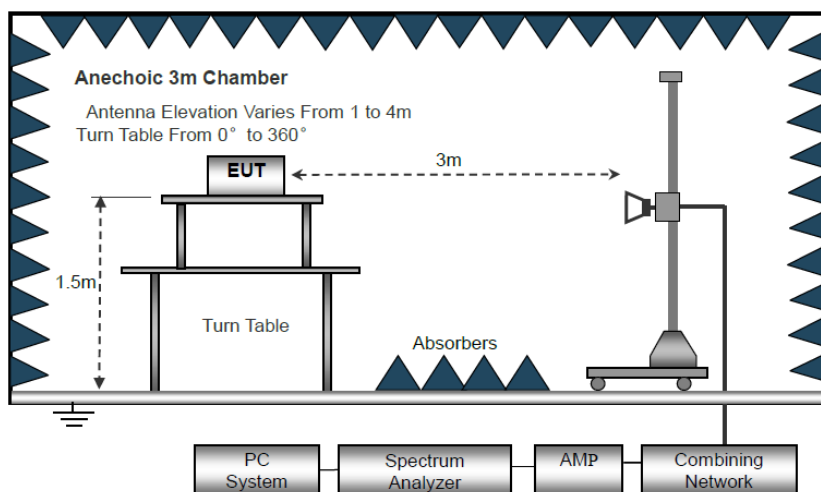
6.1 Standard and Limit

According to FCC Part 15.407(b), Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15–5.25 GHz band: All emissions outside of the 5.15–5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25–5.35 GHz band: All emissions outside of the 5.15–5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47–5.725 GHz band: All emissions outside of the 5.47–5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating solely in the 5.725–5.850 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
- (5) The provisions of § 15.205 apply to intentional radiators operating under this section.
- (6) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

6.2 Test Procedure

Test is conducting under the description of ANSI C63.10 - 2013 section 6.3 to 6.6.



Block Diagram of Radiated Emission Above 1GHz

- a) The EUT is placed on a turntable, which is 1.5m above ground plane for test frequency range above 1GHz.
- b) EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- c) Use the following spectrum analyzer settings:
Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for $f \geq 1\text{GHz}$
VBW $\geq$ RBW, Sweep = auto
Detector function = peak
Trace = max hold
- d) Follow the guidelines in ANSI C63.4-2014 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- e) For the actual test configuration, please refer to the related item - EUT test photos.

6.3 Test Data and Results

From band1 to band4 all of the 802.11a, 802.11n and 802.11ac modes have been tested, the EUT complied with the FCC Part 15.407 standard limit, and with the worst case 802.11a_HT20, 802.11n_HT20 and 802.11ac_HT20 as below:

Remark: Level = Reading + Factor, Margin = Level - Limit

UNII Band 1

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
802.11a_20MHz_Lowest Channel (5180MHz)							
10360	62.7	-6.22	56.48	68.2	-11.72	H	Peak
15540	56.29	-5.4	50.89	74	-23.11	H	Peak
10360	59.85	-6.22	53.63	68.2	-14.57	V	Peak
15540	52.88	-5.4	47.48	74	-26.52	V	Peak
802.11a_20MHz_Highest Channel (5240MHz)							
10480	63.39	-5.99	57.4	68.2	-10.8	H	Peak
15720	50.61	-5.53	45.08	74	-28.92	H	Peak
10480	58.93	-5.99	52.94	68.2	-15.26	V	Peak
15720	52.85	-5.53	47.32	74	-26.68	V	Peak
802.11n_20MHz_Lowest Channel (5180MHz)							
10360	61.44	-6.22	55.22	68.2	-12.98	H	Peak
15540	50.96	-5.4	45.56	74	-28.44	H	Peak
10360	58.26	-6.22	52.04	68.2	-16.16	V	Peak
15540	50.32	-5.4	44.92	74	-29.08	V	Peak
802.11n_20MHz_Highest Channel (5240MHz)							
10480	60.66	-5.99	54.67	68.2	-13.53	H	Peak
15720	55.24	-5.53	49.71	74	-24.29	H	Peak
10480	58.03	-5.99	52.04	68.2	-16.16	V	Peak
15720	59	-5.53	53.47	74	-20.53	V	Peak
802.11ac_20MHz_Lowest Channel (5180MHz)							
10360	61.7	-6.22	55.48	68.2	-12.72	H	Peak
15540	53.36	-5.4	47.96	74	-26.04	H	Peak
10360	64.01	-6.22	57.79	68.2	-10.41	V	Peak
15540	52.79	-5.4	47.39	74	-26.61	V	Peak
802.11ac_20MHz_Highest Channel (5240MHz)							
10480	60.43	-5.99	54.44	68.2	-13.76	H	Peak
15720	55	-5.53	49.47	74	-24.53	H	Peak
10480	63.11	-5.99	57.12	68.2	-11.08	V	Peak
15720	53.55	-5.53	48.02	74	-25.98	V	Peak

UNII Band 2

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
802.11a_20MHz_Lowest Channel (5260MHz)							
10520	62.4	-4.97	57.43	68.2	-10.77	H	Peak
15780	51.19	-4.78	46.41	74	-27.59	H	Peak
10520	61	-4.97	56.03	68.2	-12.17	V	Peak
15780	50.66	-4.78	45.88	74	-28.12	V	Peak
802.11a_20MHz_Highest Channel (5320MHz)							
10640	56.64	-4.74	51.9	74	-22.1	H	Peak
15960	56.88	-4.91	51.97	74	-22.03	H	Peak
10640	56.57	-4.74	51.83	74	-22.17	V	Peak
15960	56.13	-4.91	51.22	74	-22.78	V	Peak
802.11n_20MHz_Lowest Channel (5260MHz)							
10520	56.71	-4.97	51.74	68.2	-16.46	H	Peak
15780	56.39	-4.78	51.61	74	-22.39	H	Peak
10520	57.59	-4.97	52.62	68.2	-15.58	V	Peak
15780	58.06	-4.78	53.28	74	-20.72	V	Peak
802.11n_20MHz_Highest Channel (5320MHz)							
10640	57.27	-4.74	52.53	74	-21.47	H	Peak
15960	57.11	-4.91	52.2	74	-21.8	H	Peak
10640	57.02	-4.74	52.28	74	-21.72	V	Peak
15960	52.02	-4.91	47.11	74	-26.89	V	Peak
802.11ac_20MHz_Lowest Channel (5260MHz)							
10520	57.48	-4.97	52.51	68.2	-15.69	H	Peak
15780	56.42	-4.78	51.64	74	-22.36	H	Peak
10520	57.9	-4.97	52.93	68.2	-15.27	V	Peak
15780	56.21	-4.78	51.43	74	-22.57	V	Peak
802.11ac_20MHz_Highest Channel (5320MHz)							
10640	57.54	-4.74	52.8	74	-21.2	H	Peak
15960	52.47	-4.91	47.56	74	-26.44	H	Peak
10640	56.04	-4.74	51.3	74	-22.7	V	Peak
15960	56.7	-4.91	51.79	74	-22.21	V	Peak

UNII Band 3

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
802.11a_20MHz_Lowest Channel (5500MHz)							
11000	56.54	-4.02	52.52	74	-21.48	H	Peak
16500	56.31	-4.11	52.2	68.2	-16	H	Peak
11000	56.33	-4.02	52.31	74	-21.69	V	Peak
16500	54.27	-4.11	50.16	68.2	-18.04	V	Peak
802.11a_20MHz_Highest Channel (5700MHz)							
11400	56.14	-3.54	52.6	74	-21.4	H	Peak
17100	55.44	-2.98	52.46	68.2	-15.74	H	Peak
11400	56.4	-3.54	52.86	74	-21.14	V	Peak
17100	52	-2.98	49.02	68.2	-19.18	V	Peak
802.11n_20MHz_Lowest Channel (5500MHz)							
11000	56.11	-4.02	52.09	74	-21.91	H	Peak
16500	56.8	-4.11	52.69	68.2	-15.51	H	Peak
11000	57.12	-4.02	53.1	74	-20.9	V	Peak
16500	56.46	-4.11	52.35	68.2	-15.85	V	Peak
802.11n_20MHz_Highest Channel (5700MHz)							
11400	54.09	-3.54	50.55	74	-23.45	H	Peak
17100	51.87	-2.98	48.89	68.2	-19.31	H	Peak
11400	56.49	-3.54	52.95	74	-21.05	V	Peak
17100	54.97	-2.98	51.99	68.2	-16.21	V	Peak
802.11ac_20MHz_Lowest Channel (5500MHz)							
11000	56.37	-4.02	52.35	74	-21.65	H	Peak
16500	54.8	-4.11	50.69	68.2	-17.51	H	Peak
11000	57.19	-4.02	53.17	74	-20.83	V	Peak
16500	52.92	-4.11	48.81	68.2	-19.39	V	Peak
802.11ac_20MHz_Highest Channel (5700MHz)							
11400	55.15	-3.54	51.61	74	-22.39	H	Peak
17100	51.34	-2.98	48.36	68.2	-19.84	H	Peak
11400	56.49	-3.54	52.95	74	-21.05	V	Peak
17100	51.62	-2.98	48.64	68.2	-19.56	V	Peak

UNII Band 4

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
802.11a_20MHz_Lowest Channel (5745MHz)							
11490	56.87	-4.34	52.53	74	-21.47	H	Peak
17235	55.81	-3.29	52.52	68.2	-15.68	H	Peak
11490	56.6	-4.34	52.26	74	-21.74	V	Peak
17235	53.85	-3.29	50.56	68.2	-17.64	V	Peak
802.11a_20MHz_Highest Channel (5825MHz)							
11650	56.73	-4.16	52.57	74	-21.43	H	Peak
17475	51.34	-2.53	48.81	68.2	-19.39	H	Peak
11650	57.71	-4.16	53.55	74	-20.45	V	Peak
17475	52.03	-2.53	49.5	68.2	-18.7	V	Peak
802.11n_20MHz_Lowest Channel (5745MHz)							
11490	56.63	-4.34	52.29	74	-21.71	H	Peak
17235	55.78	-3.29	52.49	68.2	-15.71	H	Peak
11490	56.77	-4.34	52.43	74	-21.57	V	Peak
17235	53.86	-3.29	50.57	68.2	-17.63	V	Peak
802.11n_20MHz_Highest Channel (5825MHz)							
11650	57.07	-4.16	52.91	74	-21.09	H	Peak
17475	51.16	-2.53	48.63	68.2	-19.57	H	Peak
11650	57.88	-4.16	53.72	74	-20.28	V	Peak
17475	52.42	-2.53	49.89	68.2	-18.31	V	Peak
802.11ac_20MHz_Lowest Channel (5745MHz)							
11490	56.94	-4.34	52.6	74	-21.4	H	Peak
17235	54.1	-3.29	50.81	68.2	-17.39	H	Peak
11490	56.06	-4.34	51.72	74	-22.28	V	Peak
17235	50.07	-3.29	46.78	68.2	-21.42	V	Peak
802.11ac_20MHz_Highest Channel (5825MHz)							
11650	58.12	-4.16	53.96	74	-20.04	H	Peak
17475	52.6	-2.53	50.07	68.2	-18.13	H	Peak
11650	56.01	-4.16	51.85	74	-22.15	V	Peak
17475	56.34	-2.53	53.81	68.2	-14.39	V	Peak

Note 1: this EUT was tested in 3 orthogonal positions with the X-axis being the worst and the worst case position data was reported.

Note 2: Testing is carried out with frequency rang 1GHz to the40GHz, If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit, so there is no record.

Note 3: Above 18GHz not recorded for no spurious point have a margin of less than 6 dB with respect to the limits.

7. Band-edge Emissions(Radiated)

7.1 Standard and Limit

According to §15.407(b), Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15–5.25 GHz band: All emissions outside of the 5.15–5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

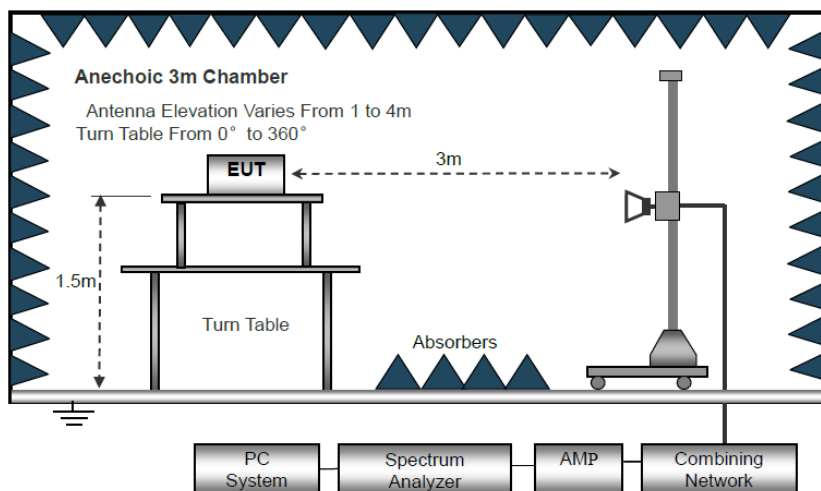
(2) For transmitters operating in the 5.25–5.35 GHz band: All emissions outside of the 5.15–5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(3) For transmitters operating in the 5.47–5.725 GHz band: All emissions outside of the 5.47–5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(4) For transmitters operating solely in the 5.725–5.850 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

7.2 Test Procedure

Test is conducting under the description of ANSI C63.10 - 2013 section 6.3 to 6.6 and section 6.10.



Test Setup Block Diagram

7.3 Test Data and Results

Based on all tested data, the EUT complied with the FCC Part 15.407 standard limit, and with the worst case as below:

Remark: Level = Reading + Factor, Margin = Level - Limit

UNII Band 1_ 802.11a_20MHz_Lowest Channel (5180MHz)

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
5150	65.14	-13.96	51.18	74	-22.82	H	Peak
5150	62.28	-13.96	48.32	74	-25.68	V	Peak

UNII Band 1_ 802.11a_20MHz_Highest Channel (5240MHz)

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
5350	58.54	-13.26	45.28	74	-28.72	H	Peak
5460	54.52	-12.88	41.64	74	-32.36	H	Peak
5350	57.33	-13.26	44.07	74	-29.93	V	Peak
5460	52.15	-12.88	39.27	74	-34.73	V	Peak

UNII Band 1_802.11n_40MHz_Lowest Channel (5190MHz)

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
5150	66.25	-13.96	52.29	74	-21.71	H	Peak
5150	63.67	-13.96	49.71	74	-24.29	V	Peak

UNII Band 1_ 802.11n_40MHz_Highest Channel (5230MHz)

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
5350	57.49	-13.26	44.23	74	-29.77	H	Peak
5460	55.25	-12.88	42.37	74	-31.63	H	Peak
5350	55.81	-13.26	42.55	74	-31.45	V	Peak
5460	53.79	-12.88	40.91	74	-33.09	V	Peak

UNII Band 1_802.11ac_80MHz_5210MHz

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
5150	64.33	-13.96	50.37	74	-23.63	H	Peak
5350	55.41	-13.26	42.15	74	-31.85	H	Peak
5460	55.19	-12.88	42.31	74	-31.69	H	Peak
5150	62.89	-13.96	48.93	74	-25.07	V	Peak
5350	53.84	-13.26	40.58	74	-33.42	V	Peak
5460	51	-12.88	38.12	74	-35.88	V	Peak

UNII Band 2_802.11a_20MHz_Lowest Channel (5260MHz)

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
5150	61.93	-13.96	47.97	74	-26.03	H	Peak
5150	58.8	-13.96	44.84	74	-29.16	V	Peak

UNII Band 2_802.11a_20MHz_Highest Channel (5320MHz)

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
5350	57.96	-13.26	44.7	74	-29.3	H	Peak
5460	53.01	-12.88	40.13	74	-33.87	H	Peak
5350	56.28	-13.26	43.02	74	-30.98	V	Peak
5460	51.51	-12.88	38.63	74	-35.37	V	Peak

UNII Band 2_802.11n_40MHz_Lowest Channel (5270MHz)

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
5150	65.31	-13.96	51.35	74	-22.65	H	Peak
5150	59.71	-13.96	45.75	74	-28.25	V	Peak

UNII Band 2_802.11n_40MHz_Highest Channel (5310MHz)

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
5350	66.02	-13.26	52.76	74	-21.24	H	Peak
5460	54.02	-12.88	41.14	74	-32.86	H	Peak
5350	63.29	-13.26	50.03	74	-23.97	V	Peak
5460	50.16	-12.88	37.28	74	-36.72	V	Peak

UNII Band 2_802.11ac_80MHz_5290MHz

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
5150	60.23	-13.96	46.27	74	-27.73	H	Peak
5350	64.21	-13.26	50.95	74	-23.05	H	Peak
5460	50.47	-12.88	37.59	74	-36.41	H	Peak
5150	65.46	-13.96	51.5	74	-22.5	V	Peak
5350	64.02	-13.26	50.76	74	-23.24	V	Peak
5460	54.43	-12.88	41.55	74	-32.45	V	Peak

UNII Band 3_ 802.11a_20MHz_Lowest Channel (5500MHz)

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
5460	63.29	-12.88	50.41	74	-23.59	H	Peak
5460	61.21	-12.88	48.33	74	-25.67	V	Peak

UNII Band 3_ 802.11a_20MHz_Highest Channel (5700MHz)

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
5725	65.93	-12.08	53.85	74	-20.15	H	Peak
6000	52.23	-11.28	40.95	74	-33.05	H	Peak
5725	57.15	-12.08	45.07	74	-28.93	V	Peak
6000	51.04	-11.28	39.76	74	-34.24	V	Peak

UNII Band 3_802.11n_40MHz_Lowest Channel (5510MHz)

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
5460	66.36	-12.88	53.48	74	-20.52	H	Peak
5460	64.22	-12.88	51.34	74	-22.66	V	Peak

UNII Band 3_ 802.11n_40MHz_Highest Channel (5670MHz)

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
5725	63.32	-12.08	51.24	74	-22.76	H	Peak
6000	51.7	-11.28	40.42	74	-33.58	H	Peak
5725	63.14	-12.08	51.06	74	-22.94	V	Peak
6000	50.47	-11.28	39.19	74	-34.81	V	Peak

UNII Band 3_802.11ac_80MHz_5530MHz

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
5460	64.57	-12.88	51.69	74	-22.31	H	Peak
5725	63.7	-12.08	51.62	74	-22.38	H	Peak
6000	53.98	-11.28	42.7	74	-31.3	H	Peak
5460	62.46	-12.88	49.58	74	-24.42	V	Peak
5725	60.65	-12.08	48.57	74	-25.43	V	Peak
6000	55.98	-11.28	44.7	74	-29.3	V	Peak

UNII Band 3_802.11ac_80MHz_5610MHz

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
5460	66.76	-12.88	53.88	74	-20.12	H	Peak
5725	57	-12.08	44.92	74	-29.08	H	Peak
6000	55.85	-11.28	44.57	74	-29.43	H	Peak
5460	63.67	-12.88	50.79	74	-23.21	V	Peak
5725	61.75	-12.08	49.67	74	-24.33	V	Peak
6000	53.11	-11.28	41.83	74	-32.17	V	Peak

UNII Band 4_ 802.11a_20MHz_Lowest Channel (5745MHz)

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
5650	53.69	-12.3	41.39	68.2	-26.81	H	Peak
5700	54.56	-12.16	42.4	105.6	-63.2	H	Peak
5720	67.4	-12.09	55.31	110.8	-55.49	H	Peak
5650	55.02	-12.3	42.72	68.2	-25.48	V	Peak
5700	53.48	-12.16	41.32	105.6	-64.28	V	Peak
5720	70.32	-12.09	58.23	110.8	-52.57	V	Peak

UNII Band 4_ 802.11a_20MHz_Highest Channel (5825MHz)

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
5850	68.3	-11.72	56.58	122.2	-65.62	H	Peak
5875	59.53	-11.64	47.89	110.8	-62.91	H	Peak
5925	53.53	-11.5	42.03	68.2	-26.17	H	Peak
5850	68.22	-11.72	56.5	122.2	-65.7	V	Peak
5875	56.42	-11.64	44.78	110.8	-66.02	V	Peak
5925	55.67	-11.5	44.17	68.2	-24.03	V	Peak

UNII Band 4_802.11n_40MHz_Lowest Channel (5755MHz)

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
5650	50.46	-12.3	38.16	68.2	-30.04	H	Peak
5700	52.82	-12.16	40.66	105.6	-64.94	H	Peak
5720	71.34	-12.09	59.25	110.8	-51.55	H	Peak
5650	51.15	-12.3	38.85	68.2	-29.35	V	Peak
5700	53.33	-12.16	41.17	105.6	-64.43	V	Peak
5720	70.21	-12.09	58.12	110.8	-52.68	V	Peak

UNII Band 4_802.11n_40MHz_Highest Channel (5795MHz)

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
5850	67.56	-11.72	55.84	122.2	-66.36	H	Peak
5875	59.42	-11.64	47.78	110.8	-63.02	H	Peak
5925	51.65	-11.5	40.15	68.2	-28.05	H	Peak
5850	68	-11.72	56.28	122.2	-65.92	V	Peak
5875	62.42	-11.64	50.78	110.8	-60.02	V	Peak
5925	52.17	-11.5	40.67	68.2	-27.53	V	Peak

UNII Band 4_802.11ac_80MHz_5775MHz

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
MHz	dBuV/m	dB/m	dBuV/m	dBuV/m	dB	H/V	Peak
5650	51.93	-12.3	39.63	68.2	-28.57	H	Peak
5700	52.47	-12.16	40.31	105.6	-65.29	H	Peak
5720	71.59	-12.09	59.5	110.8	-51.3	H	Peak
5850	67.12	-11.72	55.4	122.2	-66.8	H	Peak
5875	60.99	-11.64	49.35	110.8	-61.45	H	Peak
5925	50.84	-11.5	39.34	68.2	-28.86	H	Peak
5650	52.78	-12.3	40.48	68.2	-27.72	V	Peak
5700	51.57	-12.16	39.41	105.6	-66.19	V	Peak
5720	76.81	-12.09	64.72	110.8	-46.08	V	Peak
5850	73.49	-11.72	61.77	122.2	-60.43	V	Peak
5875	63.35	-11.64	51.71	110.8	-59.09	V	Peak
5925	53.4	-11.5	41.9	68.2	-26.3	V	Peak

Note: If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit, so there is no record.

8. Maximum Conducted Output Power

8.1 Standard and Limit

According to 15.407(a): (1) For the band 5.15–5.25 GHz.

For an outdoor or indoor access point operating in the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band..

For client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

(2) For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725–5.895 GHz: the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

8.2 Test Procedure

A spectrum analyzer or similar device shall be used to observe a sample of the modulated transmitter's radio frequency power output.

- 1) A measurement instrument with an integrated channel bandwidth function may be used to automate the test process.
- 2) Set center of frequency = operating frequency.
- 3) Connect the EUT to the RF input of the spectrum analyzer via a low loss RF cable
- 4) Set the RBW = 1MHz, VBW = 3MHz, Detector = RMS, Sweep = Auto.
- 5) Set the SPAN to 40MHz/80MHz/160MHz for 20MHz/40MHz/80MHz emission bandwidth mode.
- 6) Measure the highest amplitude appearing on spectral display and mark the value.
- 7) Repeat the above procedures until all frequency measured was complete.



Test Setup Block Diagram

8.3 Test Data and Results

Please refer to the appendix for details.

9. Occupied Bandwidth

9.1 Standard and Limit

According to 15.407(a), Within the 5.250–5.350 GHz and 5.470–5.725 GHz bands the 26 dB bandwidth shall be tested.

According to 15.407(e), Within the 5.725–5.850 GHz and 5.850–5.895 GHz bands, the minimum 6 dB bandwidth of U–NII devices shall be at least 500 kHz.

9.2 Test Procedure

According to the ANSI 63.10-2013, section 6.9, the emission bandwidth test method as follows.

- 1) Remove the antenna from the EUT and connect to the spectrum analyzer via a low loss RF cable.
- 2) Set the spectrum analyzer to any one measured frequency within its operating range.
- 3) Set RBW to 1%~5% of bandwidth, VBW $\geq$ RBW, Sweep = Auto.
- 4) Set a reference level on the measuring instrument equal to the highest peak value.
- 5) Measure the frequency difference of two frequencies that were attenuated 6dB or 26dB from the reference level. Record the frequency difference as the emission bandwidth.
- 6) Repeat the above procedures until all frequencies measured were complete.



Test Setup Block Diagram

9.3 Test Data and Results

Please refer to the appendix for details.

10. Maximum Power Spectral Density

10.1 Standard and Limit

According to 15.407(a):

(1) For the band 5.15–5.25 GHz.

For an outdoor or indoor access point operating in the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band..

For client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

(2) For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725–5.895 GHz: the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500–kHz band.

10.2 Test Procedure

- 1) Remove the antenna from the EUT and connect to the spectrum analyzer via a low loss RF cable.
- 2) Set the spectrum analyzer to any one measured frequency within its operating range.
- 3) Set RBW = 1MHz, VBW = 3MHz, Sweep = Auto, Detector = RMS.
- 4) Measure the highest amplitude appearing on spectral display and mark the value.
- 5) Repeat above procedures until all frequencies measured were complete.



Test Setup Block Diagram

10.3 Test Data and Results

Please refer to the appendix for details.

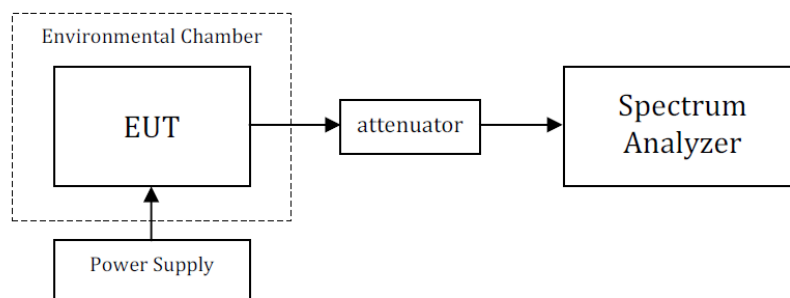
11. Frequency Stability

11.1 Standard and Limit

According to 15.407(g), Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

11.2 Test Procedure

Test is conducting under the description of ANSI C63.10-2013 section 6.8.



Test Setup Block Diagram

11.3 Test Data and Results

Mode	Frequency (MHz)	Temperature (°C)	Voltage (VDC)	Measured Frequency (MHz)	Limit (MHz)	Verdict
Carrier Wave	5180	20	9.99	5179.956	5150 to 5250	Pass
			11.1	5179.962	5150 to 5250	Pass
			12.21	5179.963	5150 to 5250	Pass
		-30	11.1	5179.959	5150 to 5250	Pass
		-20	11.1	5179.962	5150 to 5250	Pass
		-10	11.1	5179.963	5150 to 5250	Pass
		0	11.1	5179.965	5150 to 5250	Pass
		10	11.1	5179.962	5150 to 5250	Pass
		30	11.1	5179.963	5150 to 5250	Pass
		40	11.1	5179.963	5150 to 5250	Pass
		50	11.1	5179.962	5150 to 5250	Pass
	5200	20	9.99	5199.915	5150 to 5250	Pass
			11.1	5199.922	5150 to 5250	Pass
			12.21	5199.913	5150 to 5250	Pass
		-30	11.1	5199.914	5150 to 5250	Pass
		-20	11.1	5199.915	5150 to 5250	Pass
		-10	11.1	5199.912	5150 to 5250	Pass

		0	11.1	5199.913	5150 to 5250	Pass
		10	11.1	5199.913	5150 to 5250	Pass
		30	11.1	5199.915	5150 to 5250	Pass
		40	11.1	5199.913	5150 to 5250	Pass
		50	11.1	5199.912	5150 to 5250	Pass
	5240	20	9.99	5239.936	5150 to 5250	Pass
			11.1	5239.942	5150 to 5250	Pass
			12.21	5239.931	5150 to 5250	Pass
		-30	11.1	5239.932	5150 to 5250	Pass
		-20	11.1	5239.933	5150 to 5250	Pass
		-10	11.1	5239.936	5150 to 5250	Pass
		0	11.1	5239.932	5150 to 5250	Pass
		10	11.1	5239.946	5150 to 5250	Pass
		30	11.1	5239.933	5150 to 5250	Pass
		40	11.1	5239.944	5150 to 5250	Pass
		50	11.1	5239.943	5150 to 5250	Pass
	5260	20	9.99	5260.015	5260 to 5320	Pass
			11.1	5260.012	5260 to 5320	Pass
			12.21	5260.012	5260 to 5320	Pass
		-30	11.1	5260.013	5260 to 5320	Pass
		-20	11.1	5260.014	5260 to 5320	Pass
		-10	11.1	5260.017	5260 to 5320	Pass
		0	11.1	5260.015	5260 to 5320	Pass
		10	11.1	5260.013	5260 to 5320	Pass
		30	11.1	5260.015	5260 to 5320	Pass
		40	11.1	5260.017	5260 to 5320	Pass
		50	11.1	5260.027	5260 to 5320	Pass
	5280	20	9.99	5279.983	5260 to 5320	Pass
			11.1	5279.986	5260 to 5320	Pass
			12.21	5279.983	5260 to 5320	Pass
		-30	11.1	5279.984	5260 to 5320	Pass
		-20	11.1	5279.982	5260 to 5320	Pass
		-10	11.1	5279.986	5260 to 5320	Pass
		0	11.1	5279.983	5260 to 5320	Pass
		10	11.1	5279.986	5260 to 5320	Pass
		30	11.1	5279.985	5260 to 5320	Pass
		40	11.1	5279.984	5260 to 5320	Pass
		50	11.1	5279.984	5260 to 5320	Pass
	5320	20	9.99	5319.943	5260 to 5320	Pass
			11.1	5319.943	5260 to 5320	Pass
			12.21	5319.945	5260 to 5320	Pass
		-30	11.1	5319.946	5260 to 5320	Pass
		-20	11.1	5319.945	5260 to 5320	Pass

		-10	11.1	5319.944	5260 to 5320	Pass
		0	11.1	5319.943	5260 to 5320	Pass
		10	11.1	5319.946	5260 to 5320	Pass
		30	11.1	5319.945	5260 to 5320	Pass
		40	11.1	5319.943	5260 to 5320	Pass
		50	11.1	5319.944	5260 to 5320	Pass
	5500	20	9.99	5500.014	5500 to 5720	Pass
			11.1	5500.011	5500 to 5720	Pass
			12.21	5500.012	5500 to 5720	Pass
		-30	11.1	5500.014	5500 to 5720	Pass
		-20	11.1	5500.013	5500 to 5720	Pass
		-10	11.1	5500.012	5500 to 5720	Pass
		0	11.1	5500.009	5500 to 5720	Pass
		10	11.1	5500.008	5500 to 5720	Pass
		30	11.1	5500.012	5500 to 5720	Pass
		40	11.1	5500.012	5500 to 5720	Pass
		50	11.1	5500.016	5500 to 5720	Pass
	5600	20	9.99	5599.945	5500 to 5720	Pass
			11.1	5599.945	5500 to 5720	Pass
			12.21	5599.944	5500 to 5720	Pass
		-30	11.1	5599.946	5500 to 5720	Pass
		-20	11.1	5599.942	5500 to 5720	Pass
		-10	11.1	5599.943	5500 to 5720	Pass
		0	11.1	5599.943	5500 to 5720	Pass
		10	11.1	5599.946	5500 to 5720	Pass
		30	11.1	5599.942	5500 to 5720	Pass
		40	11.1	5599.941	5500 to 5720	Pass
		50	11.1	5599.942	5500 to 5720	Pass
	5700	20	9.99	5699.923	5500 to 5720	Pass
			11.1	5699.925	5500 to 5720	Pass
			12.21	5699.926	5500 to 5720	Pass
		-30	11.1	5699.925	5500 to 5720	Pass
		-20	11.1	5699.923	5500 to 5720	Pass
		-10	11.1	5699.926	5500 to 5720	Pass
		0	11.1	5699.922	5500 to 5720	Pass
		10	11.1	5699.925	5500 to 5720	Pass
		30	11.1	5699.924	5500 to 5720	Pass
		40	11.1	5699.924	5500 to 5720	Pass
		50	11.1	5699.924	5500 to 5720	Pass
	5745	20	9.99	5744.916	5725 to 5850	Pass
			11.1	5744.913	5725 to 5850	Pass
			12.21	5744.915	5725 to 5850	Pass
		-30	11.1	5744.916	5725 to 5850	Pass

		-20	11.1	5744.914	5725 to 5850	Pass
		-10	11.1	5744.916	5725 to 5850	Pass
		0	11.1	5744.915	5725 to 5850	Pass
		10	11.1	5744.913	5725 to 5850	Pass
		30	11.1	5744.912	5725 to 5850	Pass
		40	11.1	5744.912	5725 to 5850	Pass
		50	11.1	5744.912	5725 to 5850	Pass
	5785	20	9.99	5784.933	5725 to 5850	Pass
			11.1	5784.939	5725 to 5850	Pass
			12.21	5784.934	5725 to 5850	Pass
		-30	11.1	5784.933	5725 to 5850	Pass
		-20	11.1	5784.932	5725 to 5850	Pass
		-10	11.1	5784.932	5725 to 5850	Pass
		0	11.1	5784.933	5725 to 5850	Pass
		10	11.1	5784.934	5725 to 5850	Pass
		30	11.1	5784.933	5725 to 5850	Pass
		40	11.1	5784.934	5725 to 5850	Pass
		50	11.1	5784.935	5725 to 5850	Pass
	5825	20	9.99	5824.911	5725 to 5850	Pass
			11.1	5824.914	5725 to 5850	Pass
			12.21	5824.913	5725 to 5850	Pass
		-30	11.1	5824.913	5725 to 5850	Pass
		-20	11.1	5824.912	5725 to 5850	Pass
		-10	11.1	5824.914	5725 to 5850	Pass
		0	11.1	5824.913	5725 to 5850	Pass
		10	11.1	5824.914	5725 to 5850	Pass
		30	11.1	5824.915	5725 to 5850	Pass
		40	11.1	5824.911	5725 to 5850	Pass
		50	11.1	5824.913	5725 to 5850	Pass

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