

TEST REPORT

Applicant : Shenzhen Haidege Technology Co., Ltd
Address : 13A13, No. 51, Pingxin North Rd., Shangmugu Comm., Pinghu St.,
Longgang Dist., Shenzhen, CHINA
Manufacturer : Shenzhen Haidege Technology Co., Ltd
Address : 13A13, No. 51, Pingxin North Rd., Shangmugu Comm., Pinghu St.,
Longgang Dist., Shenzhen, CHINA
Factory : Shenzhen Haidege Technology Co., Ltd
Address : 13A13, No. 51, Pingxin North Rd., Shangmugu Comm., Pinghu St.,
Longgang Dist., Shenzhen, CHINA
Product Name : Automatic Pet Feeder
Model Number : APF03, APF04, APF05
Trademark : /
FCC ID : 2BWGR-APF030405
Test Date : May. 08, 2026 – Aug. 18, 2026
Date of Report : Aug. 18, 2026
Test Result : This device described above has been tested by BKC, and the test results show that the equipment under test (EUT) is in compliance with the Standard requirements. And it is applicable only to the tested sample identified in the report.

Test Procedure Used:

Standards : FCC CFR47 Part 15 Section 15.407
ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to
C63.10a-2024

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Reviewer (Supervisor):
Casey Wang



Approved (Manager):
Levi Xiao



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[illegible]

1. General Information

1.1. Description of Device (EUT)

EUT Name : Automatic Pet Feeder

Model No. : APF03, APF04, APF05

Model Difference : All the models are the same, except the model name, appearance and accessories. The main test model is APF04

Power supply : Input: 5.0V $\pm$ 1.0A

SWITCHING ADAPTER Information : Model: M4-050100U
Input: 100-240V~ 50/60Hz 0.3A
Output 5.0V $\pm$ 1.0A
Manufacturer: Shenzhen Wanyou Electronic Co., Ltd.

Wi-Fi Specification : IEEE 802.11a/n

Operation frequency : IEEE 802.11a/n (20M): 5180MHz ~ 5240MHz/ 4 channel
IEEE 802.11n (40M): 5180MHz ~ 5240MHz/ 2 channel
IEEE 802.11a/n (20M): 5745MHz ~5825MHz/ 5 channel
IEEE 802.11n(40M): 5745MHz ~5825MHz/ 2 channel

Max. RF output power: : 10.11dBm

Modulation : Orthogonal Frequency Division Multiplexing(OFDM)

Antenna Type : PCB antenna,
5.15-5.25GHz max. gain: 1.97 dBi
5.725-5.875GHz max. gain: -0.76 dBi

Device type : N/A

wireless router : The restart time for the router and the module is 120 seconds

1.2. Channel List

U-NII-1 (5.15-5.25GHz)			
channel	Frequency(MHz)	channel	Frequency(MHz)
36	5180	38*	5190
40	5200	46*	5230
44	5220		
48	5240		

U-NII-3 (5.725-5.875GHz)			
channel	Frequency(MHz)	channel	Frequency(MHz)
149	5745	151*	5755
153	5765	159*	5795
157	5785		

161	5805		
165	5825		

Note:

1.The above Frequency and Channel in "" were 802.11n HT40

1.3.Summary of test result

RF PART		
Test Items	Test Requirement	Result
15.407(b), 15.209	Radiated Spurious Emission	PASS
15.207	Conducted Emission	PASS
15.407 (a) 15.407 (e)	99% , 6dB and 26dB Bandwidth	PASS
15.407 (a)	Maximum Conducted Output Power	PASS
15.407(b)	Band Edge	PASS
15.407 (a)	Power Spectral Density	PASS
15.407(g)	Frequency Stability	PASS
15.203	Antenna Requirement	PASS
Remark: N/A is an abbreviation for Not Applicable. Measurement Uncertainty is not taken into account for conformity statement		

1.4.Special Accessories and Auxiliary Equipment

Description	Manufacturer	Model No.	Serial Number
POWER ADAPTER	Wanyou	M4-050100U	/
/	/	/	/

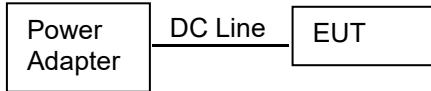
1.5.Test mode

The special RF test software was used to control EUT work in Continuous WIFI TX mode, and select test channel, wireless mode.

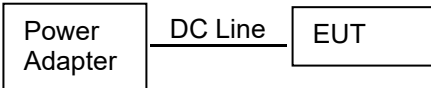
	Test mode	Description	Low channel	Middle channel	High channel
U-NII-1	TM1	802.11a	5180MHz	5200MHz	5240MHz
	TM2	802.11n20	5180MHz	5200MHz	5240MHz
	TM3	802.11n40	5190MHz	--	5230MHz
U-NII-3	TM4	802.11a	5745MHz	5785MHz	5825 MHz
	TM5	802.11n20	5745MHz	5785MHz	5825MHz
	TM6	802.11n40	5755MHz	--	5795MHz

1.6. Block Diagram

Conducted Emission



Radiated Emission



RF Conducted Test



1.7. Test Conditions

Category	Normal Conditions	Extreme Conditions
Temperature range	15-35°C	N/A
Humidity range	20-75%	N/A
Pressure range	86-106kPa	N/A
Power supply	DC 5V or Battery DC 3.7V	N/A
Note: N/A is an abbreviation for Not Applicable.		

1.8. Measurement Uncertainty (95% confidence levels, k=2)

Item	MU	Remark
Uncertainty for radio frequency	$\pm 7 \times 10^{-8}$	
Conducted Emissions (150kHz~30MHz)	$\pm 2.54\text{dB}$	
Radiated Emission(9KHz~30MHz)	$\pm 1.6\text{ dB}$	
Radiated Emission(30MHz~1GHz)	Vertical: $\pm 4.14\text{dB}$ Horizontal: $\pm 4.25\text{dB}$	
Radiated Emission(1GHz~6GHz)	$\pm 3.9\text{dB}$	
Radiated Emission(6GHz~18GHz)	$\pm 4.3\text{dB}$	
Radiated Emission(18GHz~40GHz)	$\pm 3.38\text{dB}$	
Uncertainty for conducted RF Power	$\pm 0.20\text{dB}$	
Conducted spurious emissions	$\pm 0.24\text{dB}$	
Uncertainty for temperature	0.6°C	
Uncertainty for humidity	1%	
Bandwidth	$\pm 1.5 \times 10^{-6}$	
Time	$\pm 2\%$	
Duty Cycle	$\pm 2\%$	

Remark: The coverage Factor (k=2), and measurement Uncertainty for a level of Confidence of 95%

1.9. Test Facility

Site Description		
Name of Firm	:	Shenzhen BKC Testing Co., Ltd.
Site Location	:	Room 103, 1/F, Huaya Building, Huaya Industrial Park, Longhua Community, Longhua District, Shenzhen, Guangdong, China.
ISED CAB identifier	:	CN0188
ISED Company Number	:	34333
FCC Designation Number	:	CN1416
FCC Test Firm Registration Number	:	701543



1.10.Test Equipment

Conducted Test Site

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	LISN	R&S	ENV216	102762	Mar. 11. 2026	Mar. 10. 2027
2	EMI Test Receiver	R&S	ESCI	101424	Mar. 11. 2026	Mar. 10. 2027
3	Rf cables	HTEC	HCE 2M-CE	N/A	Mar. 11. 2026	Mar. 10. 2027
4	Coupling/ Decoupling Network	Diamond	CX210	N/A	Mar. 11. 2026	Mar. 10. 2027
5	CE Testing software	EZ	EZ-EMC	/	/	/

Radiated Test Site(Below 1G and Above 1G)

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Antenna	Schwarzbeck	VULB 9168	01321	Mar. 20. 2025	Mar. 19. 2028
2	EMI Test Receiver	R&S	ESRP	101478	Mar. 11. 2026	Mar. 10. 2027
3	Preamplifier	HP	8447D	2727A05345	Mar. 11. 2026	Mar. 10. 2027
4	Double Ridged Broadband	SCHWARZBEC K	BBHA 9120D	02621	Mar. 10. 2025	Mar. 19. 2028
5	Preamplifier	Schwarzbeck	BBV 9718D	00041	Mar. 11. 2026	Mar. 10. 2027
6	Rf cables	HUBER+SUHNE R	8M-RE	N/A	Mar. 11. 2026	Mar. 10. 2027
7	Rf cables	HUBER+SUHNE R	1.5M-RE	N/A	Mar. 11. 2026	Mar. 10. 2027
8	Rf cables	HUBER+SUHNE R	1.5M-AP-RE	N/A	Mar. 09. 2026	Mar. 10. 2027
9	Spectrum	Agilent	N9020A	MY50510311	Mar. 11. 2026	Mar. 10. 2027
10	Spectrum analyzer	R&S	FSP40	200061	Mar. 11. 2026	Mar. 10. 2027
11	Double Ridged Broadband Horn Antenna	COM-POWER	AH-1840	10100009	Mar. 11. 2026	Mar. 10. 2027
12	RE Testing software	EZ	EZ-EMC	/	/	/

RF Test Site

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum	Agilent	N9020A	MY50510311	Mar. 11. 2026	Mar. 10. 2027
2	Vector source	Agilent	N5182A	MY47420223	Mar. 11. 2026	Mar. 10. 2027
3	All instrument	Rohde & Schwarz	CMW 500	101131	Mar. 11. 2026	Mar. 10. 2027
4	control unit	MW	MW100-RFCB	MW200411BK -34	Mar. 11. 2026	Mar. 10. 2027
5	Spectrum analyzer	R&S	FSP40	200061	Mar. 11. 2026	Mar. 10. 2027
6	RF Testing software	MW	MTS 8310	/	/	/

RF Test Site



Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum	Agilent	N9020A	MY50510311	Mar. 09. 2026	Mar. 10. 2027
					Mar. 11. 2026	Mar. 10. 2027
2	Vector source	Agilent	N5182A	MY47420223	Mar. 09. 2026	Mar. 10. 2027
					Mar. 11. 2026	Mar. 10. 2027
3	All instrument	Rohde & Schwarz	CMW 500	101131	Mar. 09. 2026	Mar. 10. 2027
					Mar. 11. 2026	Mar. 10. 2027
4	control unit	MW	MW100-RFCB	MW200411BK-34	Mar. 09. 2026	Mar. 10. 2027
					Mar. 11. 2026	Mar. 10. 2027
5	RF Testing software	MW	MTS 8310	/	/	/
6	Spectrum analyzer	R&S	FSP40	200061	Feb. 13. 2025	Feb. 12. 2026
					Mar. 11. 2026	Mar. 10. 2027

Test software

Software name	RF Testing software
Software version	2.0.0.0
Software name	RE Testing software
Software version	EMEC-03A2 RE+
Software name	CE Testing software
Software version	EMEC-3A1+

2. Conducted emission at the mains terminals test

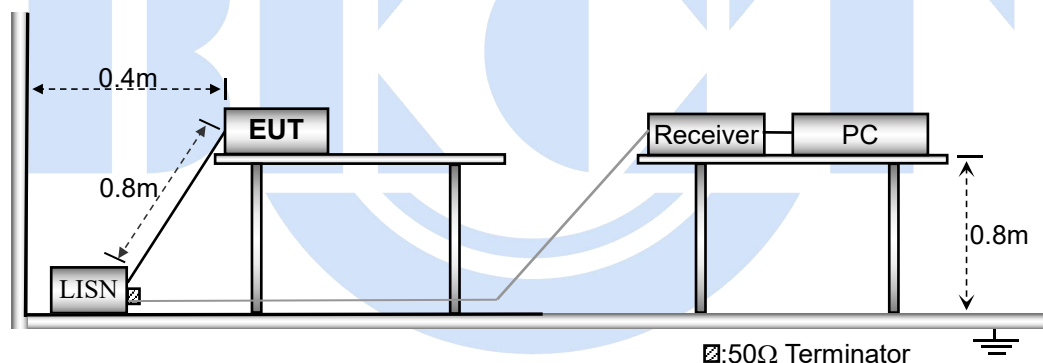
2.1.Limit

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024
Test Frequency Range:	150KHz to 30MHz
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

2.2.Test Setup

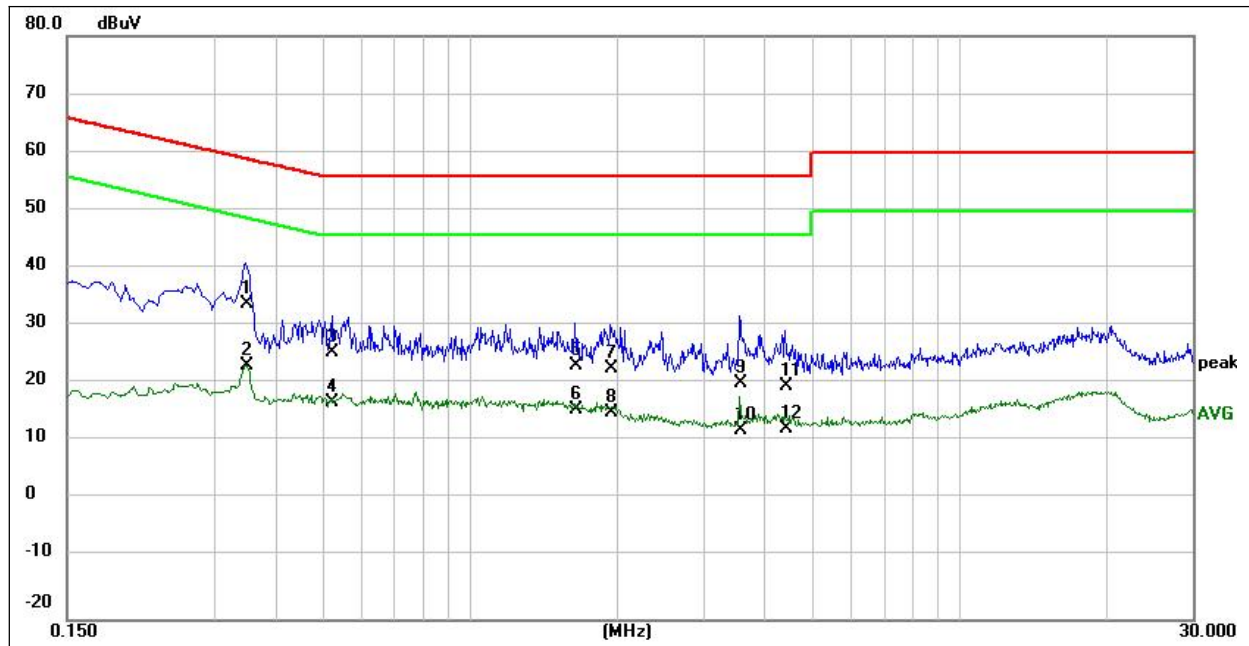


2.3.Test Procedure

1. The EUT was placed 0.1 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
2. 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.
3. 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.
4. LISN at least 80 cm from nearest part of EUT chassis.
5. For the actual test configuration, please refer to the related Item - EUT Test Photos.

2.4. Test Result

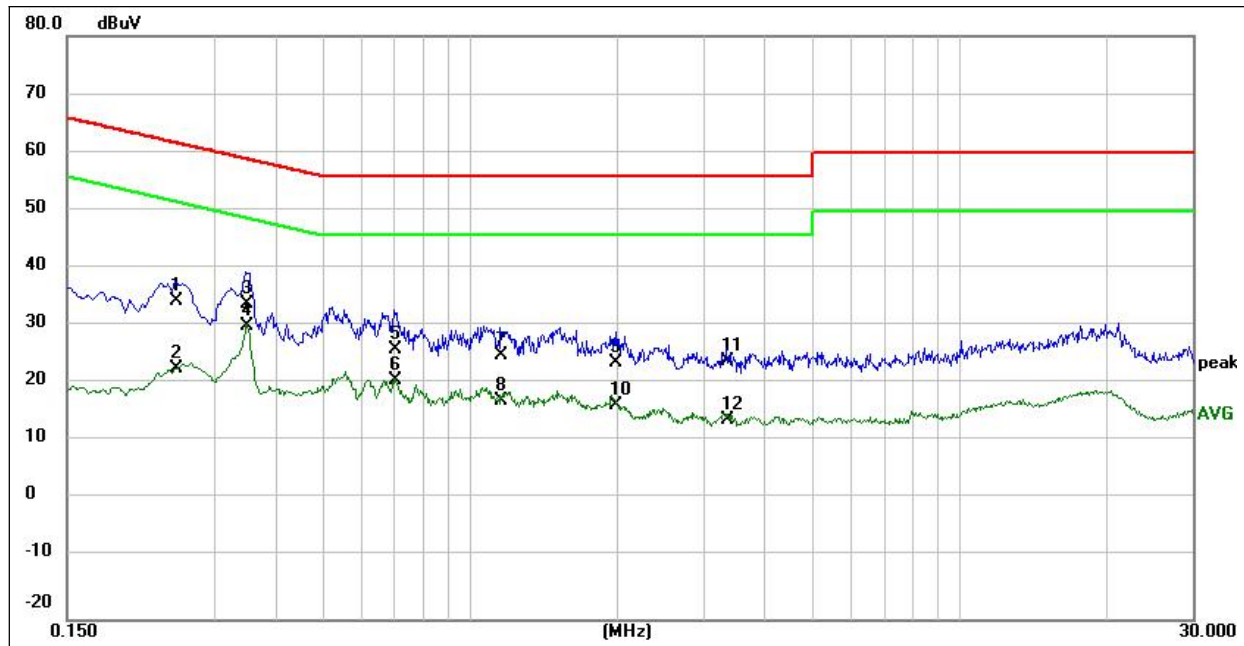
Conducted Emission At The Mains Terminals Test Data			
Temperature:	25.1°C	Relative Humidity:	56%
Pressure:	1008hPa	Phase :	Line
Test Voltage :	AC 120V/60Hz	Test Mode:	Working



No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measurement(dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.3500	12.24	21.88	34.12	58.96	-24.84	QP
2	0.3500	1.61	21.88	23.49	48.96	-25.47	AVG
3	0.5220	4.08	21.89	25.97	56.00	-30.03	QP
4	0.5220	-4.48	21.89	17.41	46.00	-28.59	AVG
5	1.6420	2.45	21.24	23.69	56.00	-32.31	QP
6	1.6420	-5.09	21.24	16.15	46.00	-29.85	AVG
7	1.9420	2.17	20.94	23.11	56.00	-32.89	QP
8	1.9420	-5.38	20.94	15.56	46.00	-30.44	AVG
9	3.5620	0.76	19.93	20.69	56.00	-35.31	QP
10	3.5620	-7.29	19.93	12.64	46.00	-33.36	AVG
11	4.4220	0.18	19.97	20.15	56.00	-35.85	QP
12	4.4220	-7.24	19.97	12.73	46.00	-33.27	AVG

Conducted Emission At The Mains Terminals Test Data

Temperature:	25.1°C	Relative Humidity:	56%
Pressure:	1008hPa	Phase :	Neutral
Test Voltage :	AC 120V/60Hz	Test Mode:	Working



No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measurement(dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2500	12.74	21.91	34.65	61.76	-27.11	QP
2	0.2500	1.25	21.91	23.16	51.76	-28.60	AVG
3	0.3500	12.24	21.88	34.12	58.96	-24.84	QP
4	0.3500	8.44	21.88	30.32	48.96	-18.64	AVG
5	0.7019	4.55	21.89	26.44	56.00	-29.56	QP
6	0.7019	-0.92	21.89	20.97	46.00	-25.03	AVG
7	1.1580	3.64	21.72	25.36	56.00	-30.64	QP
8	1.1580	-4.22	21.72	17.50	46.00	-28.50	AVG
9	1.9900	3.24	20.89	24.13	56.00	-31.87	QP
10	1.9900	-4.06	20.89	16.83	46.00	-29.17	AVG
11	3.3580	4.40	19.93	24.33	56.00	-31.67	QP
12	3.3580	-5.72	19.93	14.21	46.00	-31.79	AVG

3. Radiated Spurious Emissions

3.1.Limit

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.407

Test Method: KDB 558074 D01 15.247 Meas Guidance v05 August 24, 2018;
ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to
C63.10a-2024

Test Result: PASS

Measurement Distance: 3m

Frequency	Detector	RBW	VBW	Value
9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

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)	20log(2400/F(kHz)) + 80
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	20log(24000/F(kHz)) + 40
1.705 ~ 30	30	30	100 * 30	20log(30) + 40
30 ~ 88	100	3	100	20log(100)
88 ~ 216	150	3	150	20log(150)
216 ~ 960	200	3	200	20log(200)
Above 960	500	3	500	20log(500)

Undesirable emission limits

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.

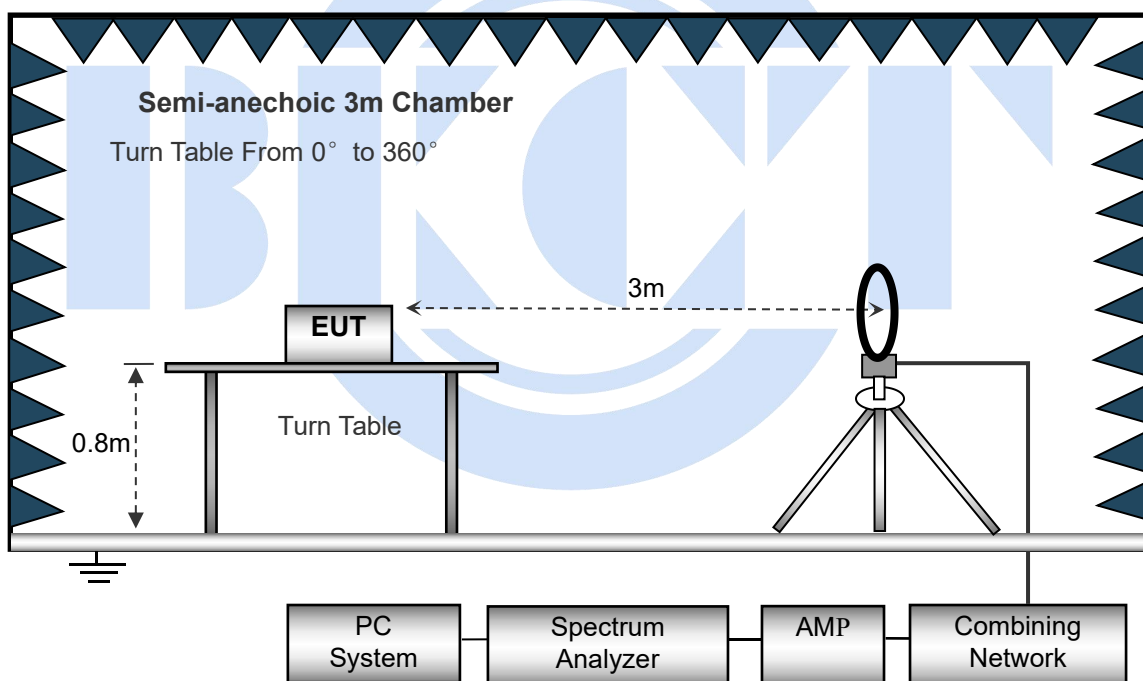
(4) For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly 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

Requirement	Limit(EIRP)	Limit (Field strength at 3m)
15.407(b)(1)	PK:-27(dBm/MHz)	PK:68.2(dB μ V/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)		

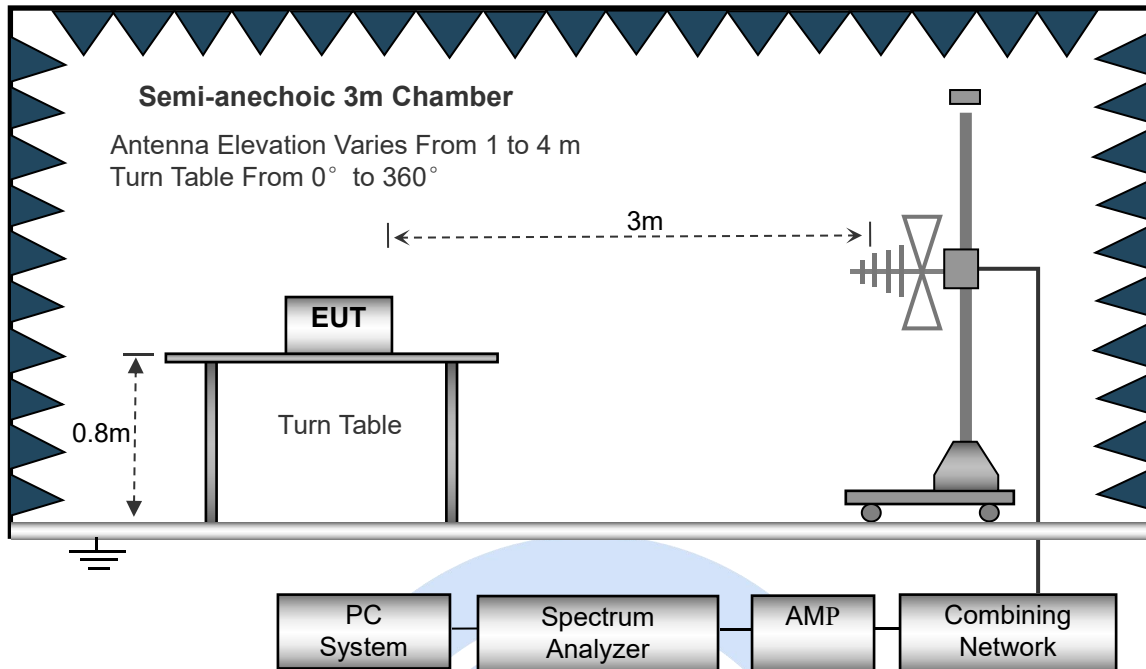
3.2.Test Setup

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

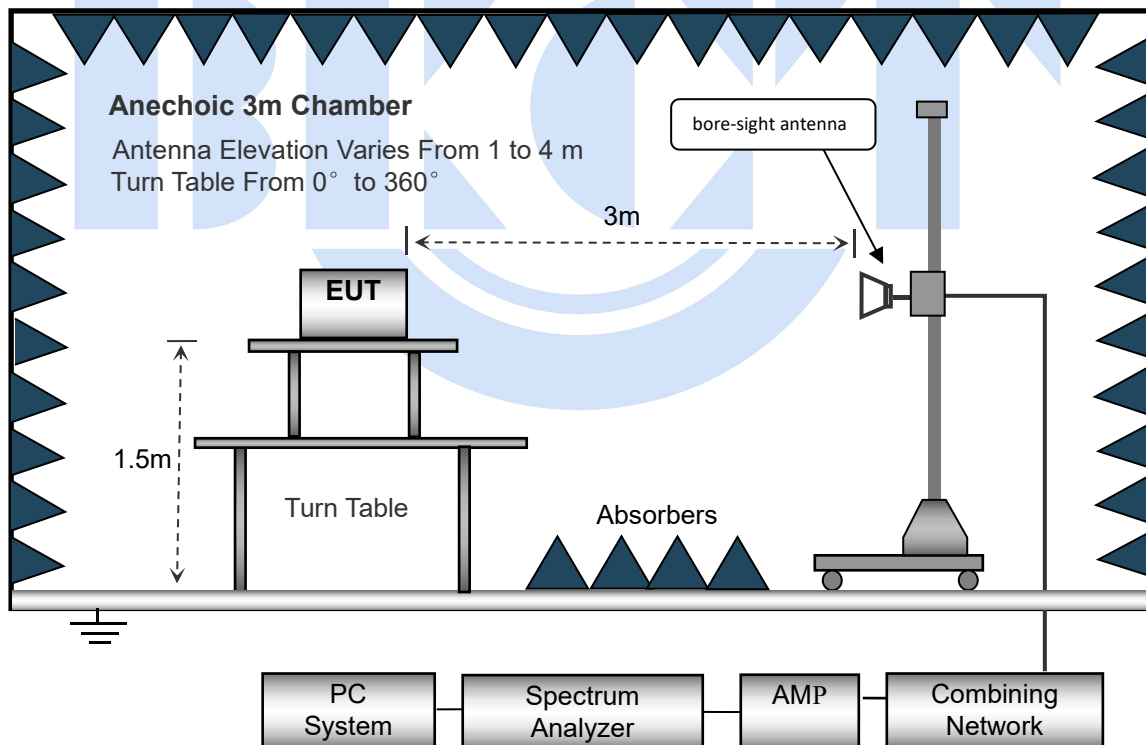
The test setup for emission measurement below 30MHz.

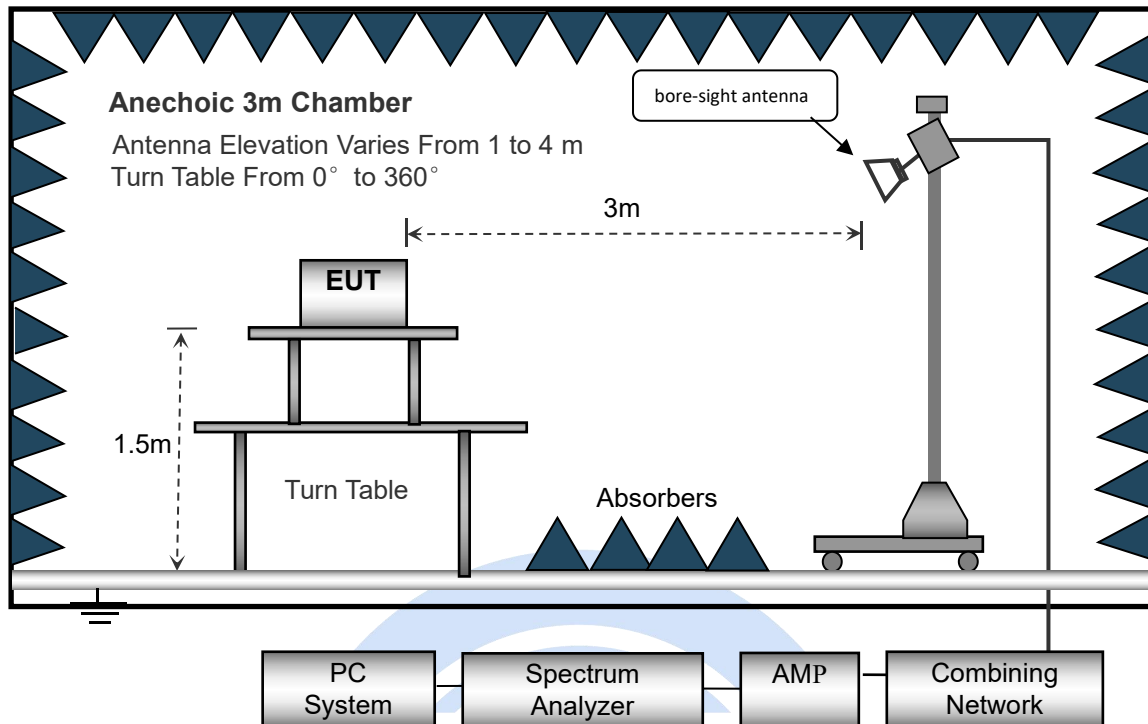


The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.





3.3.Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane for below 1GHz and 1.5m for 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.
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 performed in X,Y and Z axis positioning(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand),the worst condition was tested putting the eut in Z axis,so the worst data were shown as follow.
8. A 2.4GHz high - pass filter is used during radiated emissions above 1GHz measurement.

3.4. Test Result

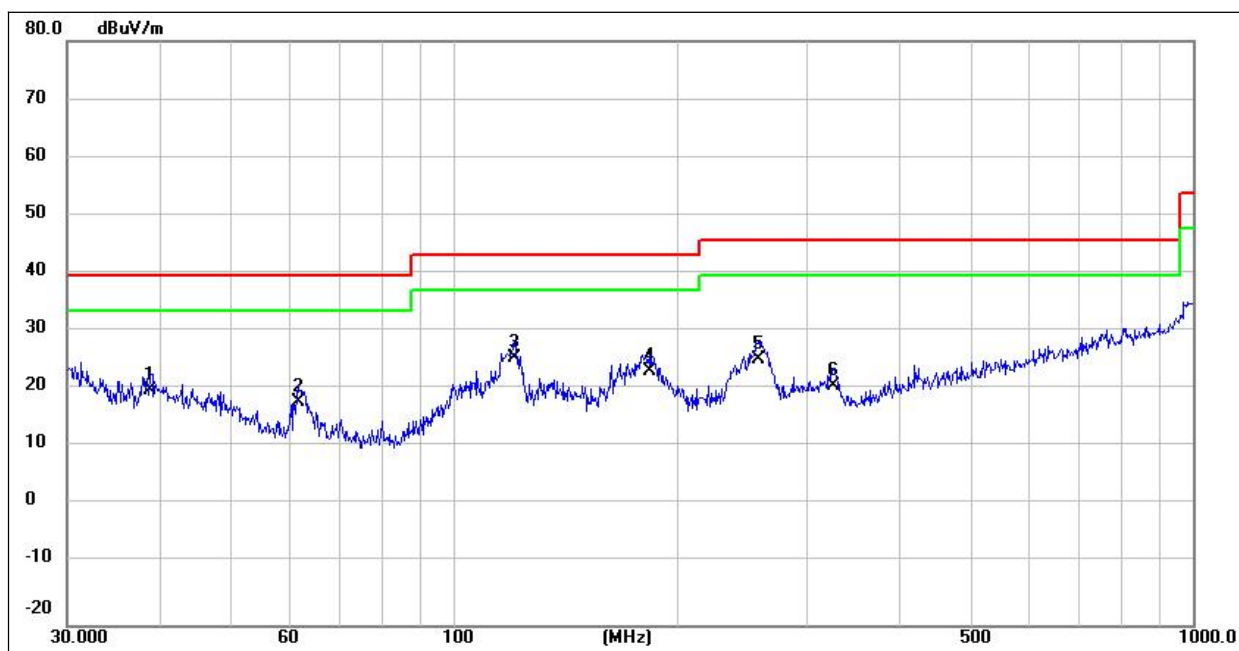
Test Frequency: 9KHz~30MHz

The measurements were more than 20 dB below the limit and not reported.

Note: Only the worst Data 802.11a_5180MHz mode Record in the report.

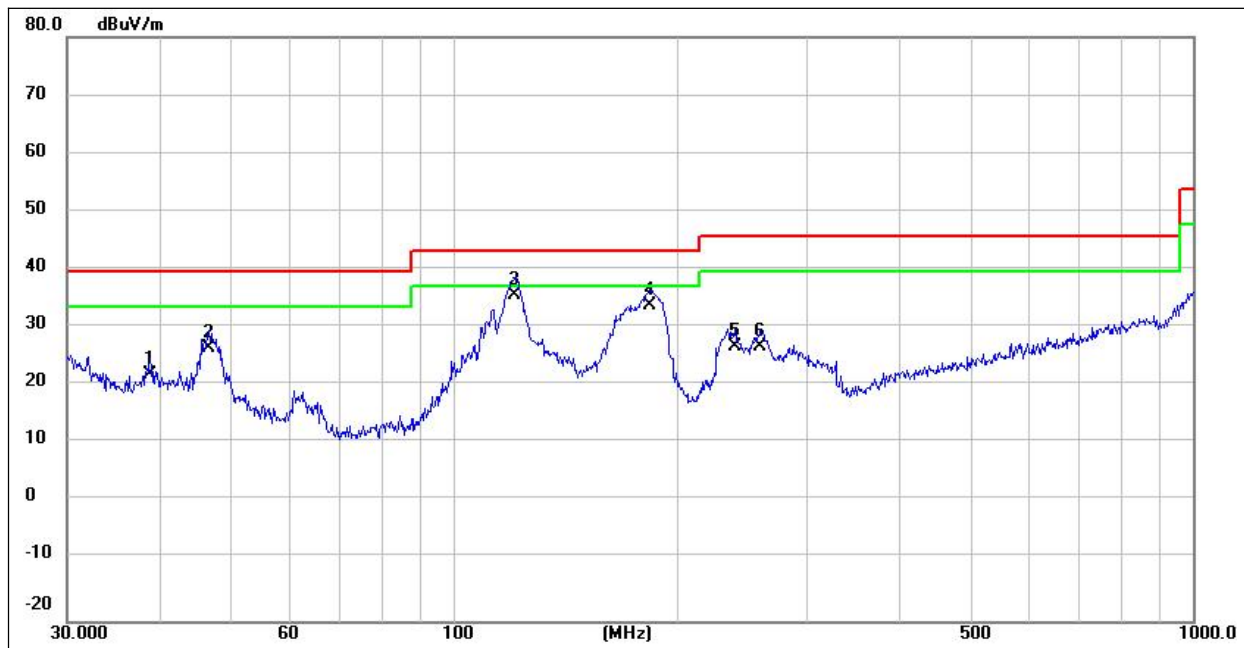
Test Frequency : 30MHz ~ 1GHz

Radiation Emission Test Data			
Temperature:	25.1℃	Relative Humidity:	56%
Pressure:	1008hPa	Phase :	Horizontal
Test Voltage :	AC 120V/60Hz	Test Mode	Working



No.	Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark			
1	38.8878	22.45	-2.04	20.41	40.00	-19.59	QP			
2	61.5618	28.28	-9.90	18.38	40.00	-21.62	QP			
3	120.6991	28.94	-3.18	25.76	43.50	-17.74	QP			
4	184.4898	30.51	-7.01	23.50	43.50	-20.00	QP			
5	258.3264	28.12	-2.46	25.66	46.00	-20.34	QP			
6	326.7395	23.44	-2.39	21.05	46.00	-24.95	QP			

Radiation Emission Test Data			
Temperature:	25.1℃	Relative Humidity:	56%
Pressure:	1008hPa	Phase :	Vertical
Test Voltage :	AC 120V/60Hz	Test Mode	Working



No.	Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark			
1	38.8877	24.42	-2.04	22.38	40.00	-17.62	QP			
2	46.6662	31.37	-4.60	26.77	40.00	-13.23	QP			
3	121.1230	39.12	-3.18	35.94	43.50	-7.56	QP			
4	184.4898	41.16	-7.01	34.15	43.50	-9.35	QP			
5	239.9873	31.93	-4.73	27.20	46.00	-18.80	QP			
6	260.1444	29.33	-2.27	27.06	46.00	-18.94	QP			

All the modes 802.11a/n has been tested and the worst result 802.11a recorded as below:

Undesirable radiated Spurious Emission Above 1GHz (1GHz to 40GHz)

U-NII-1 802.11a

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-ampl ifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/ m)	Margin (dBuV /m)	Detect or Type
Low Channel:5180MHz									
V	10360.00	53.02	33.13	2.73	31.60	54.22	68.20	-13.98	Pk
V	10360.00	43.65	33.13	2.73	31.60	44.85	54.00	-9.15	AV
V	15540.00	51.06	32.31	3.31	32.40	54.46	68.20	-13.74	Pk
V	15540.00	43.37	32.31	3.31	32.40	46.77	54.00	-7.23	AV
V	20720.00	54.69	34.84	4.42	33.90	58.17	68.20	-10.03	Pk
V	20720.00	43.08	34.84	4.42	33.90	46.56	54.00	-7.44	AV
V	25900.00	52.80	36.01	5.39	34.10	56.28	68.20	-11.92	Pk
V	25900.00	43.34	36.01	5.39	34.10	46.82	54.00	-7.18	AV
H	10360.00	51.87	33.13	2.73	31.60	53.07	68.20	-15.13	Pk
H	10360.00	43.30	33.13	2.73	31.60	44.50	54.00	-9.50	AV
H	15540.00	51.11	32.31	3.31	32.40	54.51	68.20	-13.69	Pk
H	15540.00	43.16	32.31	3.31	32.40	46.56	54.00	-7.44	AV
H	20720.00	51.88	34.84	4.42	33.90	55.36	68.20	-12.84	Pk
H	20720.00	43.38	34.84	4.42	33.90	46.86	54.00	-7.14	AV
H	25900.00	52.58	36.01	5.39	34.10	56.06	68.20	-12.14	Pk
H	25900.00	43.01	36.01	5.39	34.10	46.49	54.00	-7.51	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-ampl ifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/ m)	Margin (dBuV /m)	Detect or Type
Middle Channel: 5200MHz									
V	10400.00	54.51	33.11	2.75	31.61	55.76	68.20	-12.44	Pk
V	10400.00	43.17	33.11	2.75	31.61	44.42	54.00	-9.58	AV
V	15600.00	50.09	32.27	3.32	32.41	53.55	68.20	-14.65	Pk
V	15600.00	43.78	32.27	3.32	32.41	47.24	54.00	-6.76	AV
V	20800.00	54.81	34.87	4.44	33.92	58.30	68.20	-9.90	Pk
V	20800.00	43.76	34.87	4.44	33.92	47.25	54.00	-6.75	AV
V	26000.00	54.31	36.11	5.41	34.13	57.74	68.20	-10.46	Pk
V	26000.00	43.06	36.11	5.41	34.13	46.49	54.00	-7.51	AV
H	10400.00	52.28	33.11	2.75	31.61	53.53	68.20	-14.67	Pk
H	10400.00	43.73	33.11	2.75	31.61	44.98	54.00	-9.02	AV
H	15600.00	52.67	32.27	3.32	32.41	56.13	68.20	-12.07	Pk
H	15600.00	43.31	32.27	3.32	32.41	46.77	54.00	-7.23	AV
H	20800.00	50.61	34.87	4.44	33.92	54.10	68.20	-14.10	Pk
H	20800.00	43.98	34.87	4.44	33.92	47.47	54.00	-6.53	AV
H	26000.00	51.54	36.11	5.41	34.13	54.97	68.20	-13.23	Pk
H	26000.00	43.70	36.11	5.41	34.13	47.13	54.00	-6.87	AV



Polar (H/V)	Frequency	Meter Reading	Pre-amp lifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/ m)	(dBuV /m)	
High Channel:5240MHz									
V	10480.00	50.30	33.13	2.76	31.63	51.56	68.20	-16.64	Pk
V	10480.00	43.94	33.13	2.76	31.63	45.20	54.00	-8.80	AV
V	15720.00	51.55	32.29	3.33	32.42	55.01	68.20	-13.19	Pk
V	15720.00	43.62	32.29	3.33	32.42	47.08	54.00	-6.92	AV
V	20960.00	51.64	34.90	4.45	33.94	55.13	68.20	-13.07	Pk
V	20960.00	43.37	34.90	4.45	33.94	46.86	54.00	-7.14	AV
V	26200.00	50.07	36.13	5.44	34.15	53.53	68.20	-14.67	Pk
V	26200.00	43.07	36.13	5.44	34.15	46.53	54.00	-7.47	AV
H	10480.00	50.47	33.13	2.76	31.63	51.73	68.20	-16.47	Pk
H	10480.00	43.62	33.13	2.76	31.63	44.88	54.00	-9.12	AV
H	15720.00	52.41	32.29	3.33	32.42	55.87	68.20	-12.33	Pk
H	15720.00	43.35	32.29	3.33	32.42	46.81	54.00	-7.19	AV
H	20960.00	50.09	34.90	4.45	33.94	53.58	68.20	-14.62	Pk
H	20960.00	43.02	34.90	4.45	33.94	46.51	54.00	-7.49	AV
H	26200.00	54.93	36.13	5.44	34.15	58.39	68.20	-9.81	Pk
H	26200.00	43.77	36.13	5.44	34.15	47.23	54.00	-6.77	AV

U-NII-3 802.11a

Polar (H/V)	Frequency	Meter Reading	Pre-ampl ifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/ m)	(dBuV /m)	
Low Channel:5745MHz									
V	11490.00	51.66	33.13	2.93	32.61	54.07	68.20	-14.13	Pk
V	11490.00	43.01	33.13	2.93	32.61	45.42	54.00	-8.58	AV
V	17235.00	50.56	32.31	3.51	33.43	55.19	68.20	-13.01	Pk
V	17235.00	43.84	32.31	3.51	33.43	48.47	54.00	-5.53	AV
V	22980.00	52.37	34.84	4.62	34.90	57.05	68.20	-11.15	Pk
V	22980.00	43.01	34.84	4.62	34.90	47.69	54.00	-6.31	AV
V	28725.00	51.06	36.01	5.59	35.13	55.77	68.20	-12.43	Pk
V	28725.00	43.87	36.01	5.59	35.13	48.58	54.00	-5.42	AV
H	11490.00	50.01	33.13	2.93	32.61	52.42	68.20	-15.78	Pk
H	11490.00	43.77	33.13	2.93	32.61	46.18	54.00	-7.82	AV
H	17235.00	50.77	32.31	3.51	33.43	55.40	68.20	-12.80	Pk
H	17235.00	43.90	32.31	3.51	33.43	48.53	54.00	-5.47	AV
H	22980.00	52.05	34.84	4.62	34.90	56.73	68.20	-11.47	Pk
H	22980.00	43.70	34.84	4.62	34.90	48.38	54.00	-5.62	AV
H	28725.00	52.14	36.01	5.59	35.13	56.85	68.20	-11.35	Pk
H	28725.00	43.27	36.01	5.59	35.13	47.98	54.00	-6.02	AV

Polar (H/V)	Frequency	Meter Reading	Pre-amp lifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/ m)	(dBuV /m)	
Middle Channel: 5785MHz									
V	11570.00	53.74	33.11	2.95	32.62	56.20	68.20	-12.00	Pk
V	11570.00	43.22	33.11	2.95	32.62	45.68	54.00	-8.32	AV
V	17355.00	53.25	32.27	3.52	33.45	57.95	68.20	-10.25	Pk
V	17355.00	43.30	32.27	3.52	33.45	48.00	54.00	-6.00	AV
V	23140.00	52.06	34.87	4.64	34.93	56.76	68.20	-11.44	Pk
V	23140.00	43.88	34.87	4.64	34.93	48.58	54.00	-5.42	AV
V	28925.00	51.34	36.11	5.61	35.17	56.01	68.20	-12.19	Pk
V	28925.00	43.28	36.11	5.61	35.17	47.95	54.00	-6.05	AV
H	11570.00	54.53	33.11	2.95	32.62	56.99	68.20	-11.21	Pk
H	11570.00	43.94	33.11	2.95	32.62	46.40	54.00	-7.60	AV
H	17355.00	51.53	32.27	3.52	33.45	56.23	68.20	-11.97	Pk
H	17355.00	43.91	32.27	3.52	33.45	48.61	54.00	-5.39	AV
H	23140.00	53.27	34.87	4.64	34.93	57.97	68.20	-10.23	Pk
H	23140.00	44.00	34.87	4.64	34.93	48.70	54.00	-5.30	AV
H	28925.00	54.44	36.11	5.61	35.17	59.11	68.20	-9.09	Pk
H	28925.00	43.02	36.11	5.61	35.17	47.69	54.00	-6.31	AV

Polar (H/V)	Frequency	Meter Reading	Pre-amp lifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/ m)	(dBuV /m)	
	High Channel:5825MHz								
V	11650.00	52.82	33.13	2.96	32.63	55.28	68.20	-12.92	Pk
V	11650.00	43.20	33.13	2.96	32.63	45.66	54.00	-8.34	AV
V	17475.00	51.09	32.29	3.53	33.47	55.80	68.20	-12.40	Pk
V	17475.00	44.00	32.29	3.53	33.47	48.71	54.00	-5.29	AV
V	23300.00	53.56	34.90	4.65	34.95	58.26	68.20	-9.94	Pk
V	23300.00	43.07	34.90	4.65	34.95	47.77	54.00	-6.23	AV
V	29125.00	53.44	36.13	5.64	35.19	58.14	68.20	-10.06	Pk
V	29125.00	43.87	36.13	5.64	35.19	48.57	54.00	-5.43	AV
H	11650.00	53.90	33.13	2.96	32.63	56.36	68.20	-11.84	Pk
H	11650.00	43.36	33.13	2.96	32.63	45.82	54.00	-8.18	AV
H	17475.00	53.66	32.29	3.53	33.47	58.37	68.20	-9.83	Pk
H	17475.00	43.47	32.29	3.53	33.47	48.18	54.00	-5.82	AV
H	23300.00	51.51	34.90	4.65	34.95	56.21	68.20	-11.99	Pk
H	23300.00	43.53	34.90	4.65	34.95	48.23	54.00	-5.77	AV
H	29125.00	52.25	36.13	5.64	35.19	56.95	68.20	-11.25	Pk
H	29125.00	43.74	36.13	5.64	35.19	48.44	54.00	-5.56	AV

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss - Pre-amplifier,

Margin= Emission Level - Limit

2. If peak below the average limit, the average emission was no test.

3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Restrict Band EMISSION MEASUREMENT

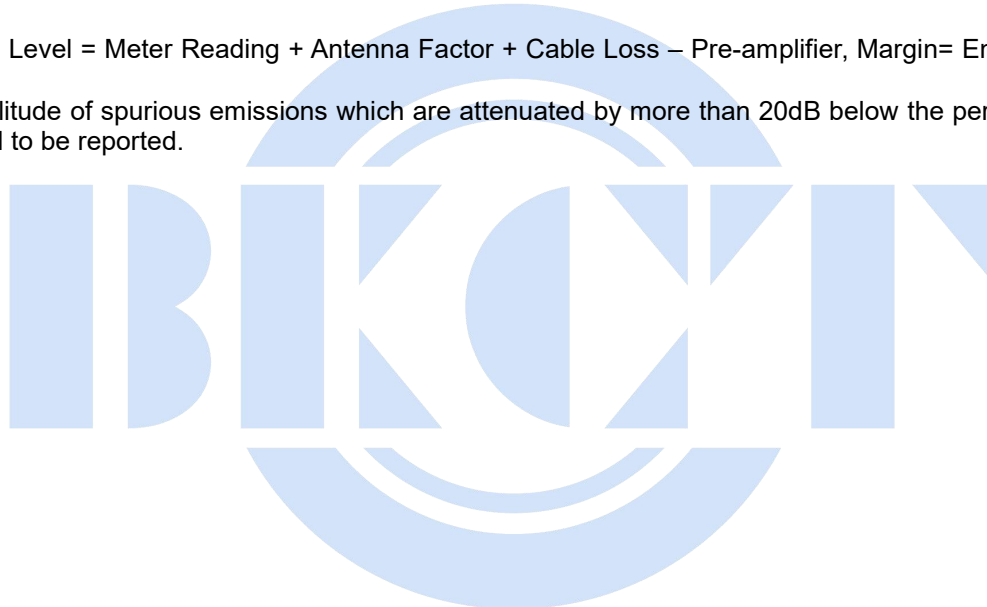
All the modes have tested and recorded the worst mode (802.11n20) in the report.

U-NII-1

	Polar (H/V)	Frequenc y (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV /m)	Detec tor Type	Result
802.11a	Low Channel: 5180MHz									
	H	5150.00	53.36	34.58	5.61	24.69	49.08	74.00	PK	PASS
	H	5150.00	44.06	34.58	5.61	24.69	39.78	54.00	AV	PASS
	V	5150.00	54.79	34.57	5.73	24.51	50.46	74.00	PK	PASS
	V	5150.00	44.85	34.57	5.73	24.51	40.52	54.00	AV	PASS
	High Channel: 5240MHz									
	H	5350.00	54.29	34.22	5.85	24.98	50.90	74.00	PK	PASS
	H	5350.00	44.01	34.22	5.85	24.98	40.62	54.00	AV	PASS
	V	5350.00	53.54	34.19	5.86	25.03	50.24	74.00	PK	PASS
	V	5350.00	44.45	34.19	5.86	25.03	41.15	54.00	AV	PASS

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit
2. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



4. Maximum Peak Output Power

4.1.Limit

According to FCC §15.407

For an outdoor 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. 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

For the band 5.725–5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

4.2.Test Setup



4.3.Test Procedure

The EUT was directly connected to the Power meter

1. Device Configuration

If possible, configure or modify the operation of the EUT so that it transmits continuously at its maximum power control level (see section II.B.).

The intent is to test at 100 percent duty cycle; however a small reduction in duty cycle (to no lower than 98 percent) is permitted if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test lab to permit such continuous operation.

b) If continuous transmission (or at least 98 percent duty cycle) cannot be achieved due to hardware limitations (e.g., overheating), the EUT shall be operated at its maximum power control level with the transmit duration as long as possible and the duty cycle as high as possible.

2. Measurement using a Spectrum Analyzer or EMI Receiver (SA)

Measurement of maximum conducted output power using a spectrum analyzer requires integrating the spectrum across a frequency span that encompasses, at a minimum, either the EBW or the 99-percent occupied bandwidth of the signal.¹ However, the EBW must be used to determine bandwidth dependent limits on maximum conducted output power in accordance with § 15.407(a).

a) The test method shall be selected as follows: (i) Method SA-1 or SA-1 Alternative (averaging with the EUT transmitting at full power throughout each sweep) shall be applied if either of the following conditions can be satisfied:

- The EUT transmits continuously (or with a duty cycle ≥ 98 percent).
- Sweep triggering or gating can be implemented in a way that the device transmits at the maximum power control level throughout the duration of each of the instrument sweeps to be averaged. This condition can generally be achieved by triggering the instrument's sweep if the duration of the sweep (with the analyzer configured as in Method SA-1, below) is equal to or shorter than the duration T of each transmission from the EUT and if those transmissions exhibit full power throughout their durations.

(ii) Method SA-2 or SA-2 Alternative (averaging across on and off times of the EUT transmissions, followed by duty cycle correction) shall be applied if the conditions of (i) cannot be achieved and the transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than ± 2 percent.

(iii) Method SA-3 (RMS detection with max hold) or SA-3 Alternative (reduced VBW with max hold) shall be applied if the conditions of (i) and (ii) cannot be achieved.

b) Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep): (i) Set span

to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1 MHz.

(iii) Set VBW $\geq$ 3 MHz.

(iv) Number of points in sweep $\geq$ 2 Span / RBW. (This ensures that bin-to-bin spacing is $\leq$ RBW/2, so that narrowband signals are not lost between frequency bins.)

(v) Sweep time = auto.

(vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

(vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle $\geq$ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".

(viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum

4.4. Test Result

Please see the attachment for WIFI 5G data.

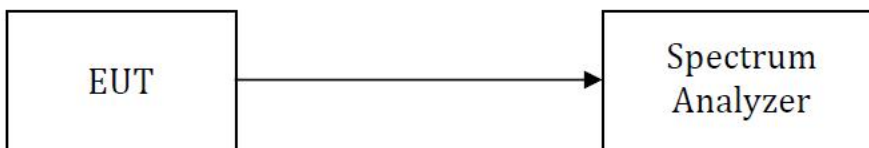


5. -26 dB Bandwidth,-6dB Bandwidth and 99% Bandwidth Measurement

5.1.Limit

Test Standard	FCC Part15 C Section 15.407
	The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band, the minimum bandwidth 6 dB bandwidth of U-NII devices shall be at least 500KHz. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

5.2.Test Setup



5.3.Test Procedure

- Set RBW = 1%-5%*OBW for measuring -26dB bandwidth
- Set RBW = 100kHz for measuring -6dB bandwidth
- Set the VBW $\geq 3 \cdot$ RBW.
- Detector = Peak.
- Trace mode = max hold.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

The following procedure shall be used for measuring (99 %) power bandwidth:

- Set center frequency to the nominal EUT channel center frequency.
- Set span = 1.5 times to 5 times the OBW.
- Set RBW = 1 % to 5 % of the OBW
- Set VBW $\geq 3 \cdot$ RBW
- Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
- Use the 99 % power bandwidth function of the instrument (if available).
- If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

5.4.Test Result

Please see the attachment for WIFI 5G data.

6. Power Spectral density

6.1.Limit

According to FCC § 15.407(3)

(1) For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 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.

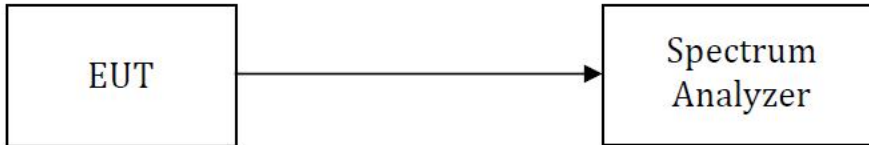
(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For client devices in the 5.15-5.25 GHz band, 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.

(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 5.725-5.85 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. 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. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

6.2. Test Setup



6.3. Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above,
2. The testing follows FCC KDB 789033 D02.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
4. For U-NII1, U-NII-2A, U-NII-2C Band:
Set RBW=1MHz, VBW=3MHz, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
For U-NII-3 Band:
Set RBW=510 kHz, VBW=3*RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
5. Use the cursor on spectrum to peak search the highest level of trace
6. Record the max. reading and add 10 log(1/duty cycle).

6.4. Test Result

Please see the attachment for WIFI 5G data.

7. Out of Band Emissions and Spurious Emission

7.1.Limit

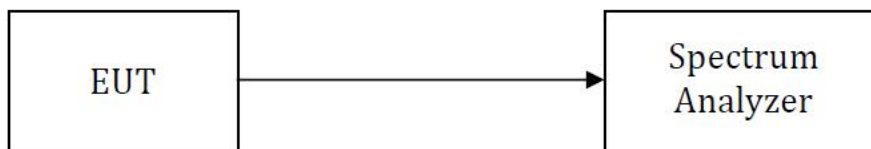
According to FCC §15.407(b)

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 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.

7.2.Test Setup



7.3.Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

7.4.Test Result

Please see the attachment for WIFI 5G data.

8. Frequency Stability Measurement

8.1.Limit

FCC

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.

The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band(IEEE802.11n specification).

8.2.Test setup



8.3.Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 30 kHz with peak detector and maxhold settings.
5. f_c is declaring of channel frequency. Then the frequency error formula is $(f_c - f)/f_c \times 10^6$ ppm and the limit is less than ± 20 ppm (IEEE 802.11n specification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
Extreme temperature is $-20^{\circ}\text{C} \sim +50^{\circ}\text{C}$.

8.4.Test Result

Please see the attachment for WIFI 5G data.

9. 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 an ceramic antenna fulfill the requirement of this section.

