FCC Part 15E Test Report
FCC ID: 2BN22-CD200A

Applicant:	Chengdu Cleverlight Technology Co.,Ltd
Address:	No. 2, 1st Floor, Building 6, 8 Xingye North Street, Xipu Town, Pi Du District, Chengdu City, Sichuan Province
Manufacturer:	Chengdu Cleverlight Technology Co.,Ltd
Address:	No. 2, 1st Floor, Building 6, 8 Xingye North Street, Xipu Town, Pi Du District, Chengdu City, Sichuan Province
EUT:	PROJECTOR (ANDROID VERSION)
Trade Mark:	N/A
Model Number:	CD200 CA200, CE200, CF200, CG200, C200, D200, CL200, CB200, C200S
Date of Receipt:	Feb. 19, 2025
Test Date:	Feb. 19, 2025 - Mar. 04, 2025
Date of Report:	Mar. 04, 2025
Prepared By:	Shenzhen DL Testing Technology Co., Ltd.
Address:	101-201, Comprehensive Building, Tongzhou Electronics Longgang Factory Area, No.1 Baolong Fifth Road, Baolong Community, Baolong Street, Longgang District, Shenzhen, China
Applicable Standards:	FCC PART 15 E 15.407 ANSI C63.10:2013
Test Result:	Pass
Report Number:	DL-250219026ER

Prepared (Test Engineer):	Alisa Song
Reviewer (Supervisor):	Jack Bu
Approved (Manager):	Jade Yang

This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Shenzhen DL Testing Technology Co., Ltd.

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1.. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.407) , Subpart E			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.407(b), 15.209	Radiated Spurious Emission	PASS	
15.407 (b)	Band Edge Emission	PASS	
15.407 (a)	Peak Output Power	PASS	
15.407 (a)	Power Spectral Density	PASS	
15.403(i) 15.407(e)	26dB bandwidth and 99%dB Bandwidth	PASS	
15.407(g)	Frequency Stability	PASS	
15.407(c)	Transmission in case of Absence of Information	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

Test lab: Shenzhen DL Testing Technology Co., Ltd.

Address: 101-201, Comprehensive Building, Tongzhou Electronics Longgang Factory Area, No.1 Baolong Fifth Road, Baolong Community, Baolong Street, Longgang District, Shenzhen, China

FCC Test Firm Registration Number: 854456
Designation Number: CN1307
IC Registered No.: 27485
CAB ID.: CN0118

1.1. MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**, where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

No.	Item	Uncertainty
1	Conducted Emission Test	±2.56dB
2	RF power,conducted	±0.42dB
3	Spurious emissions,conducted	±2.76dB
4	All emissions,radiated(<1G)	±3.65dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%
8	Bandwidth	±0.2MHz
9	Power Spectral Density	±2.45dBm
10	Frequency Stability	±0.3MHz
11	DUTY CYCLE	±0.53dB

2.. GENERAL INFORMATION

2.1. GENERAL DESCRIPTION OF EUT

Product Name:	PROJECTOR (ANDROID VERSION)
Trademark	N/A
Model No.:	CD200 CA200, CE200, CF200, CG200, C200, D200, CL200, CB200, C200S
Model Difference	All models are same as the samples except model name and appearance color, they have the same structure and circuit.
Operation Frequency:	5180-5240MHz(802.11a/n/ac(HT20)) 5190-5230MHz(802.11n/ac(HT40)) 5210MHzMHz (802.11ac(HT80))
Channel numbers:	See channel list
Channel separation:	5MHz
Modulation technology:	64QAM, 16QAM, QPSK, BPSK for OFDM
Rate of Transmitter	802.11a: 6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps,54Mbps 802.11n: Up to 500Mbps 802.11ac: up to 867Mbps
Antenna Type:	Internal Antenna
Antenna gain:	0.84dBi
Power supply:	DC 15V from adapter
Adapter:	Model: KE036A-1500240M Input: 100-240VAC 50/60Hz 0.8A MAX Output: DC15.0V⎓2.4A 36.0W Manufacturer: Shenzhen Keyu Long Technology Co., LTD

Note:
1.For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2.The EUT's all information provided by client.

2. Channel List

Channel List for 802.11a/n(HT20)/ac(HT20)			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220
40	5200	48	5240

Channel List for 802.11n(HT40)/ac(HT40)			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	46	5230

Channel List for 802.11ac(HT80)			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210	/	/

2.2. DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

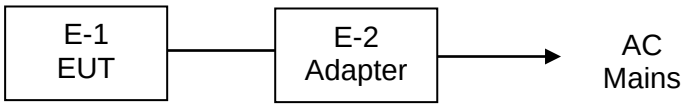
Description		
Pretest Mode	Channel	Band 1
Mode 1	802.11a/n/acHT20	CH36, CH44, CH48
Mode 2	802.11n/acHT40	CH38, CH46
Mode 3	802.11acHT80	CH42
Mode 4	Other	Link Mode

For Radiated Emission		
Pretest Mode	Channel	Band 1
Mode 1	802.11a/n/acHT20	CH36, CH44, CH48
Mode 2	802.11n/acHT40	CH38, CH46
Mode 3	802.11acHT80	CH42
Mode 4	Other	Link Mode

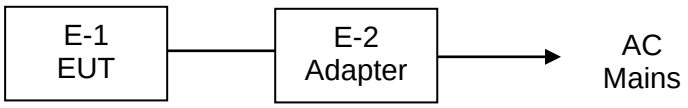
Note: 1. The measurements are performed at the highest, middle, lowest available channels.
2. During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.

2.3. BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



Power line conducted emission Test



2.4. DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Model/Type No.	Series No.	Note
E-1	PROJECTOR (ANDROID VERSION)	CD200	N/A	EUT
E-2	Adapter	KE036A-1500240M	N/A	Shenzhen Keyu Long Technology Co., LTD

Item	Shielded Type	Ferrite Core	Length	Note

Note:

(1) For detachable type I/O cable should be specified the length in cm in『Length』column.

2.5. TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

During testing, channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the end product.

Max output power Setting				
Test software Version	Test program: WiFi test-V1.0			
Mode	802.11a	802.11n HT20	802.11n HT40	802.11ac HT20/HT40/HT80
Data Rate	6Mbps	MSC0	MSC0	MSC0
Power Setting of Softwave	60	60	66	66

2.6. EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation test, Band-edge test and 6db bandwidth test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4408B	MY50140780	Nov. 01, 2024	Oct. 31, 2025
2	Test Receiver (9kHz-7GHz)	R&S	ESRP7	101393	Nov. 01, 2024	Oct. 31, 2025
3	Bilog Antenna (30MHz-1GHz)	R&S	VULB9162	00306	Nov. 01, 2024	Oct. 31, 2025
4	Horn Antenna (1GHz-18GHz)	Schwarzbeck	BBHA9120D	02139	Nov. 01, 2024	Oct. 31, 2025
5	Horn Antenna (18GHz-40GHz)	A.H. Systems	SAS-574	588	Nov. 01, 2024	Oct. 31, 2025
6	Amplifier (9KHz-6GHz)	Schwarzbeck	BBV9743B	00153	Nov. 01, 2024	Oct. 31, 2025
7	Amplifier (1GHz-18GHz)	EMEC	EM01G8GA	00270	Nov. 01, 2024	Oct. 31, 2025
8	Amplifier (18GHz-40GHz)	Quanjuda	DLE-161	97	Nov. 01, 2024	Oct. 31, 2025
9	Loop Antenna (9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	Nov. 01, 2024	Oct. 31, 2025
10	RF cables1 (9kHz-1GHz)	ChengYu	966	004	Nov. 01, 2024	Oct. 31, 2025
11	RF cables2 (1GHz-40GHz)	ChengYu	966	003	Nov. 01, 2024	Oct. 31, 2025
12	Antenna connector	Florida RF Labs	N/A	RF 01#	Nov. 01, 2024	Oct. 31, 2025
13	Power probe	KEYSIGHT	U2021XA	MY55210018	Nov. 01, 2024	Oct. 31, 2025
14	Signal Analyzer 9kHz-26.5GHz	Agilent	N9020A	MY55370280	Nov. 01, 2024	Oct. 31, 2025
15	Test Receiver 20kHz-40GHz	R&S	ESU 40	100376	Nov. 01, 2024	Oct. 31, 2025
16	D.C. Power Supply	LongWei	PS-305D	010964729	Nov. 01, 2024	Oct. 31, 2025

Conduction Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	843 Shielded Room	ChengYu	843 Room	843	Nov. 05, 2023	Nov. 04, 2026
2	EMI Receiver	R&S	ESR	101421	Nov. 01, 2024	Oct. 31, 2025
3	LISN	R&S	ENV216	102417	Nov. 01, 2024	Oct. 31, 2025
4	843 Cable 1#	ChengYu	CE Cable	001	Nov. 01, 2024	Oct. 31, 2025

Other

Item	Name	Manufacturer	Model	Software version
1	EMC Conduction Test System	FALA	EZ_EMC	EMC-CON 3A1.1
2	EMC radiation test system	FALA	EZ_EMC	FA-03A2
3	RF test system	MAIWEI	MTS8310	2.0.0.0
4	RF communication test system	MAIWEI	MTS8200	2.0.0.0

3.. EMC EMISSION TEST

3.1. CONDUCTED EMISSION MEASUREMENT

3.1.1. POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Limit (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.5 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2. TEST PROCEDURE

a. 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 equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

b. 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.

c. 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.

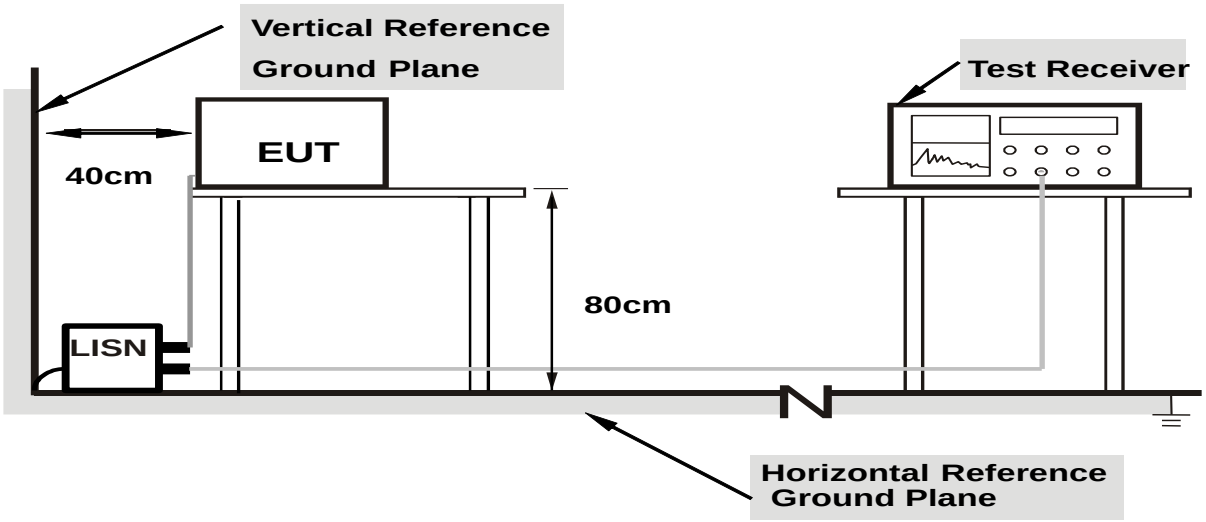
d. LISN at least 80 cm from nearest part of EUT chassis.

e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3. DEVIATION FROM TEST STANDARD

No deviation

3.1.4. TEST SETUP



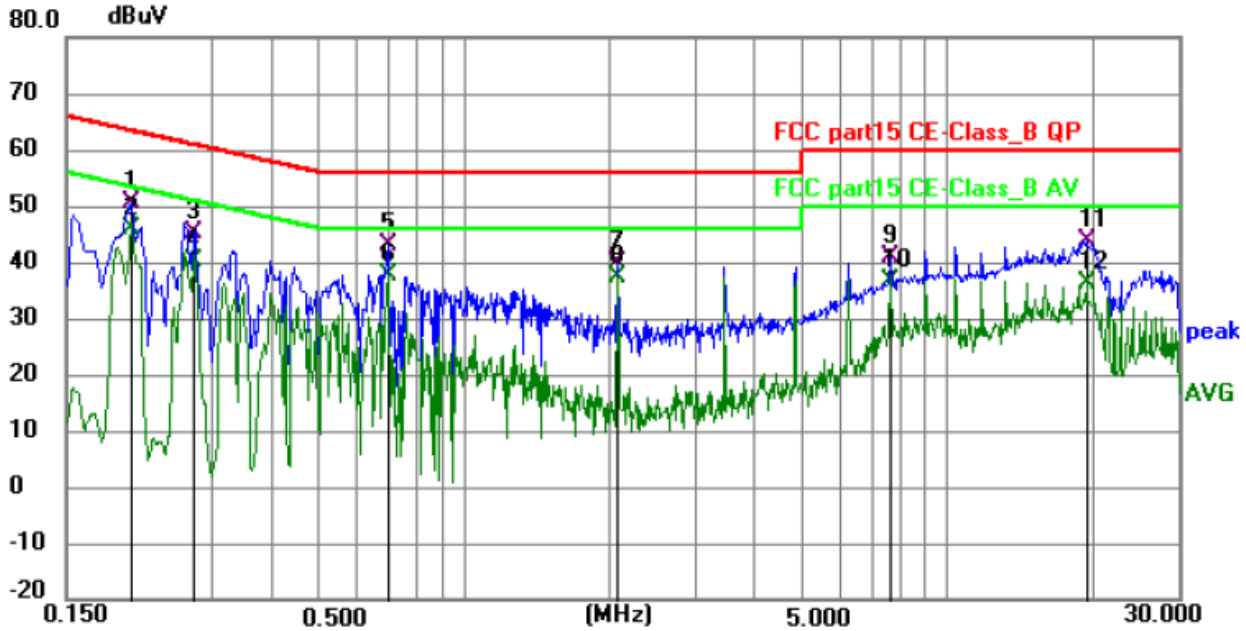
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5. EUT OPERATING CONDITIONS

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.
We pretest AC 120V and AC 230V, the worst voltage was AC 120V and the data recording in the report.

3.1.6. TEST RESULTS

Temperature:	25 ℃	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	L
Test Voltage :	AC 120V/60Hz	Test Mode:	Mode 4

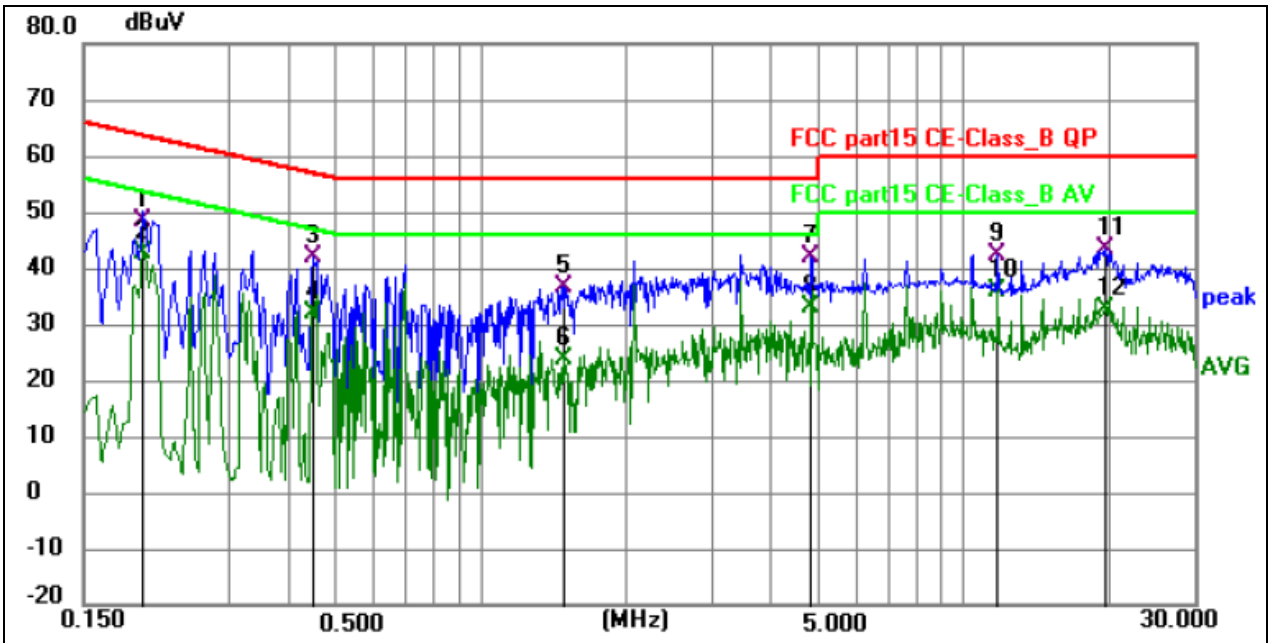


Remark:

Margin = Limit – Level, Correct Factor = Cable lose + LISN insertion loss, Level= Reading + Correct factor

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.2040	40.58	10.09	50.67	63.45	-12.78	QP	P	
2 *	0.2040	35.90	10.09	45.99	53.45	-7.46	AVG	P	
3	0.2760	35.15	10.18	45.33	60.94	-15.61	QP	P	
4	0.2760	29.93	10.18	40.11	50.94	-10.83	AVG	P	
5	0.6945	32.96	10.09	43.05	56.00	-12.95	QP	P	
6	0.6945	27.63	10.09	37.72	46.00	-8.28	AVG	P	
7	2.0805	29.73	10.07	39.80	56.00	-16.20	QP	P	
8	2.0805	27.20	10.07	37.27	46.00	-8.73	AVG	P	
9	7.6245	30.05	10.88	40.93	60.00	-19.07	QP	P	
10	7.6245	25.74	10.88	36.62	50.00	-13.38	AVG	P	
11	19.3470	31.65	12.02	43.67	60.00	-16.33	QP	P	
12	19.3470	24.09	12.02	36.11	50.00	-13.89	AVG	P	

Temperature:	25 ℃	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	N
Test Voltage :	AC 120V/60Hz	Test Mode:	Mode 4



Remark:

Margin = Limit – Level, Correct Factor = Cable lose + LISN insertion loss, Level= Reading + Correct factor

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1995	38.33	10.16	48.49	63.63	-15.14	QP	P	
2 *	0.1995	32.49	10.16	42.65	53.63	-10.98	AVG	P	
3	0.4470	31.75	10.18	41.93	56.93	-15.00	QP	P	
4	0.4470	21.82	10.18	32.00	46.93	-14.93	AVG	P	
5	1.4819	26.67	10.08	36.75	56.00	-19.25	QP	P	
6	1.4819	13.77	10.08	23.85	46.00	-22.15	AVG	P	
7	4.8480	31.64	10.29	41.93	56.00	-14.07	QP	P	
8	4.8480	22.63	10.29	32.92	46.00	-13.08	AVG	P	
9	11.7825	30.85	11.35	42.20	60.00	-17.80	QP	P	
10	11.7825	24.61	11.35	35.96	50.00	-14.04	AVG	P	
11	19.5720	31.34	11.89	43.23	60.00	-16.77	QP	P	
12	19.5720	20.70	11.89	32.59	50.00	-17.41	AVG	P	

3.2. RADIATED EMISSION MEASUREMENT

3.2.1. RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)
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.
The provisions of §15.205 apply to intentional radiators operating under this section,15.205 Restricted bands of operation

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

(4) Measurement was performed at an antenna to the closed point of EUT distance of meters.

(5) Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of 15.205, and the emissions located in restricted bands also comply with 15.209 limit.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	40GHz
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2. TEST PROCEDURE

Below 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre.
h. Test the EUT in the lowest channel, the middle channel, the Highest channel

Note:

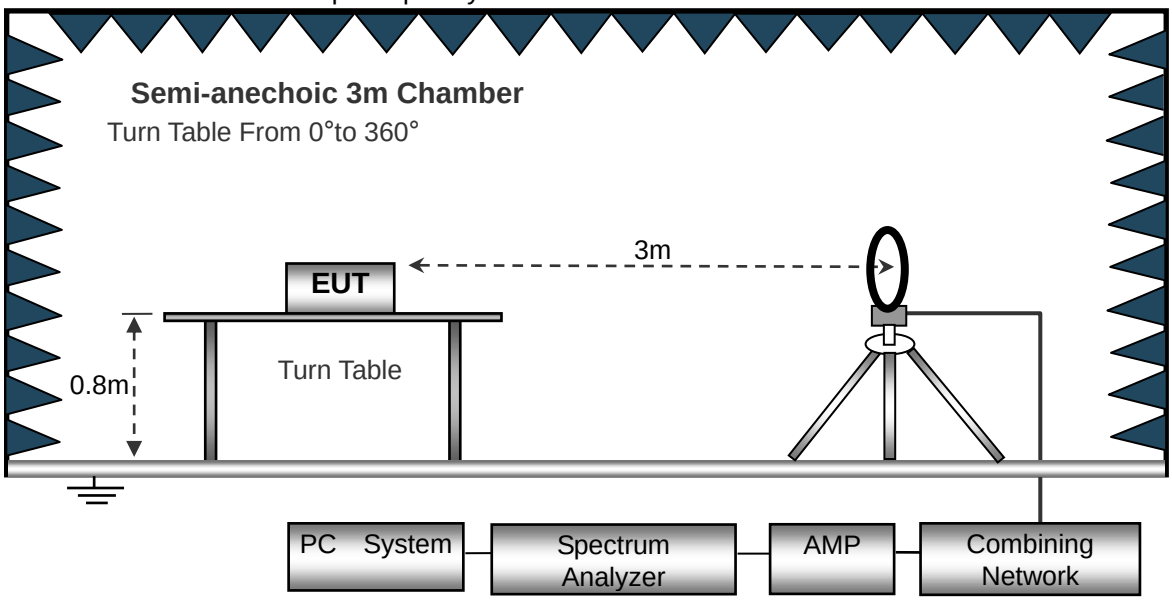
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3. DEVIATION FROM TEST STANDARD

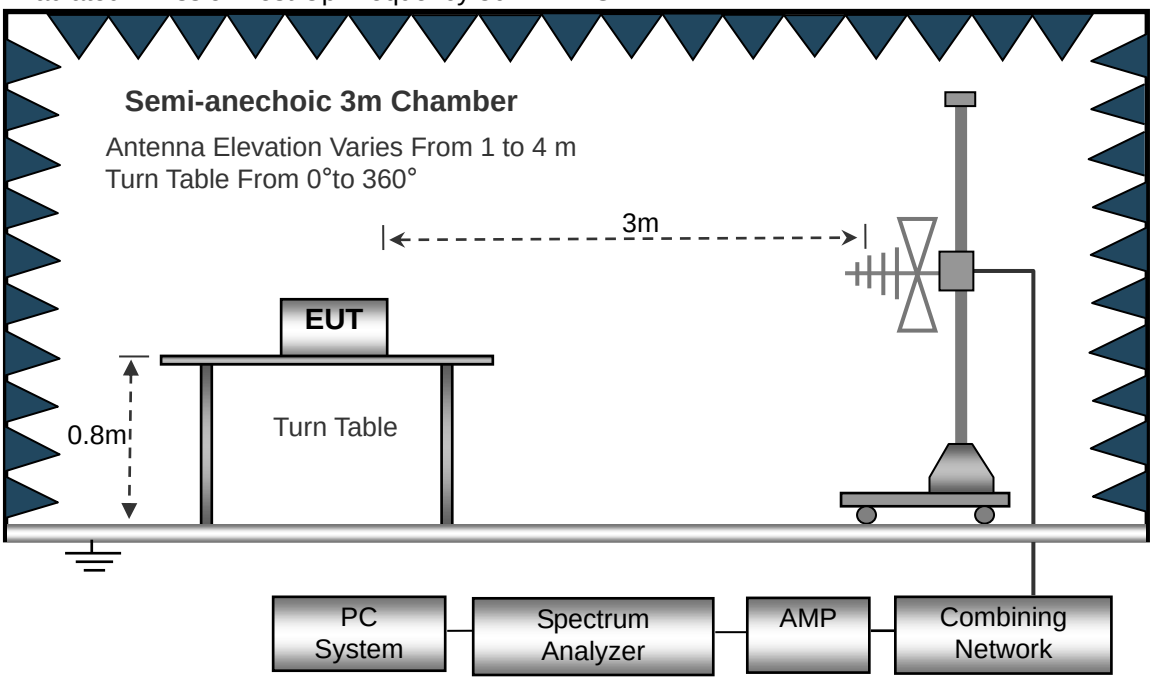
No deviation

3.2.4. TEST SETUP

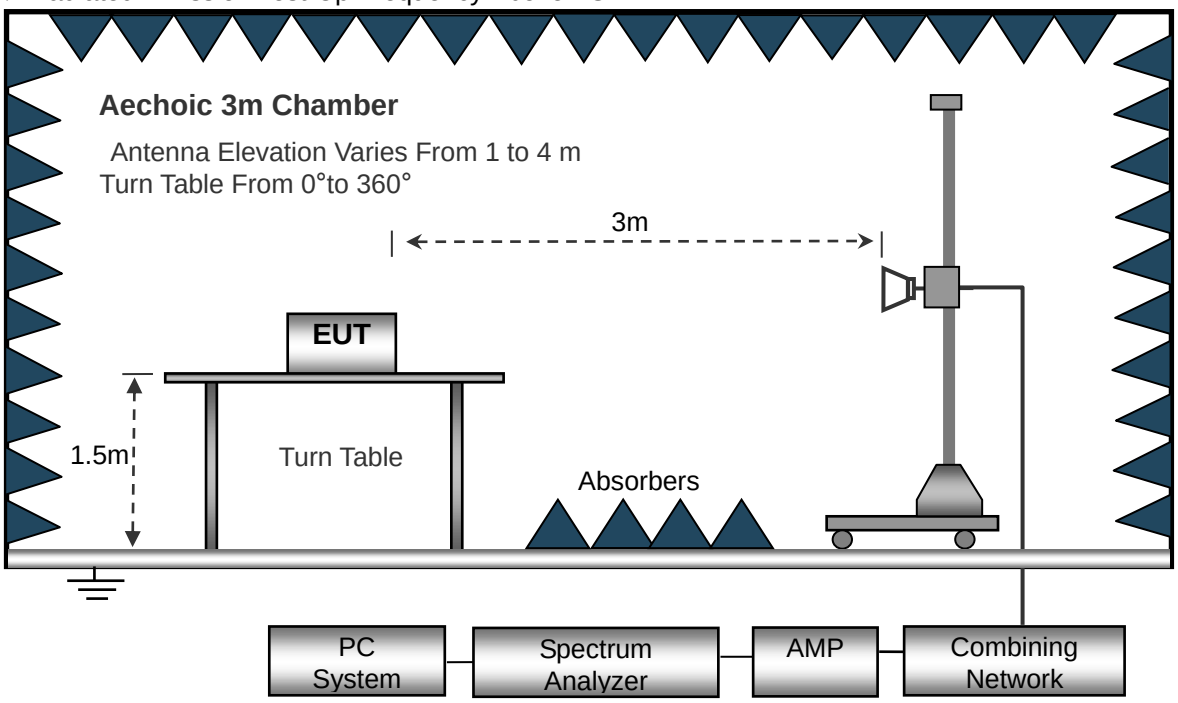
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



3.2.5. EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.6. TEST RESULTS (Between 9KHz – 30 MHz)

Temperature:	20℃	Relative Humidtity:	48%
Pressure:	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	Mode 4	Polarization :	--

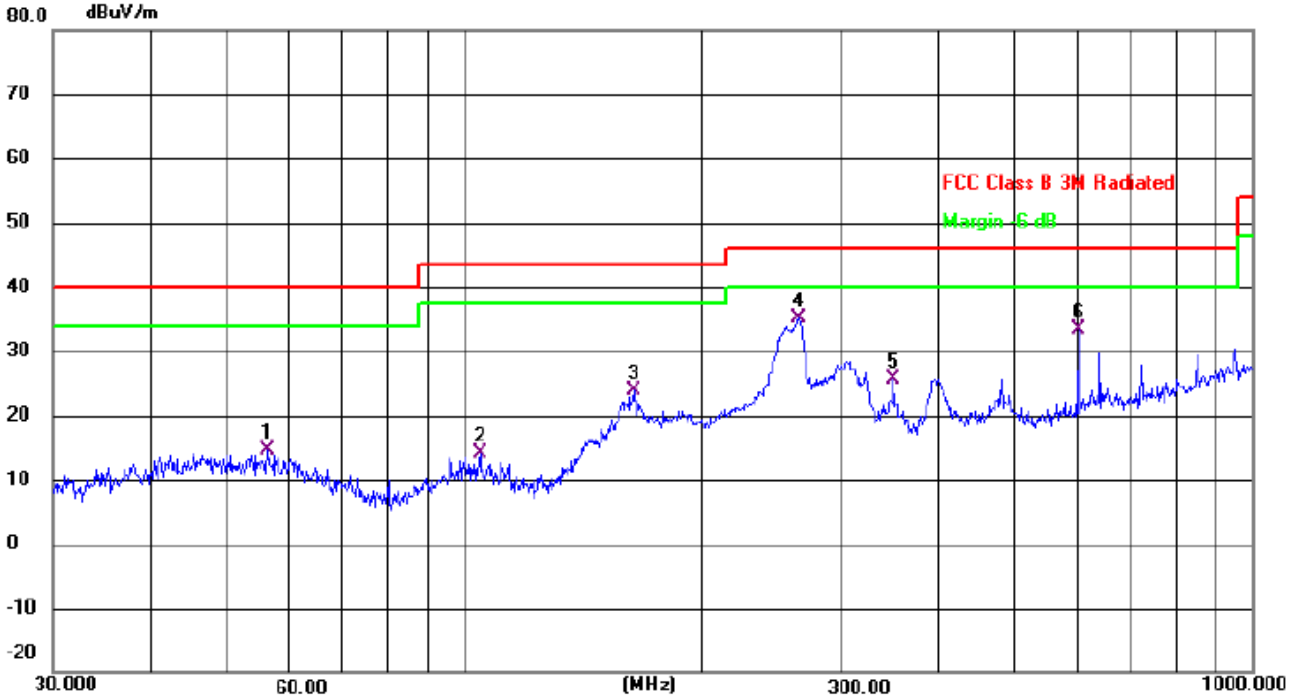
Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

3.2.7. TEST RESULTS (Between 30MHz – 1GHz)

Temperature:	26℃	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization :	Horizontal
Test Voltage :	AC 120V/60Hz		
Test Mode :	Mode 4		



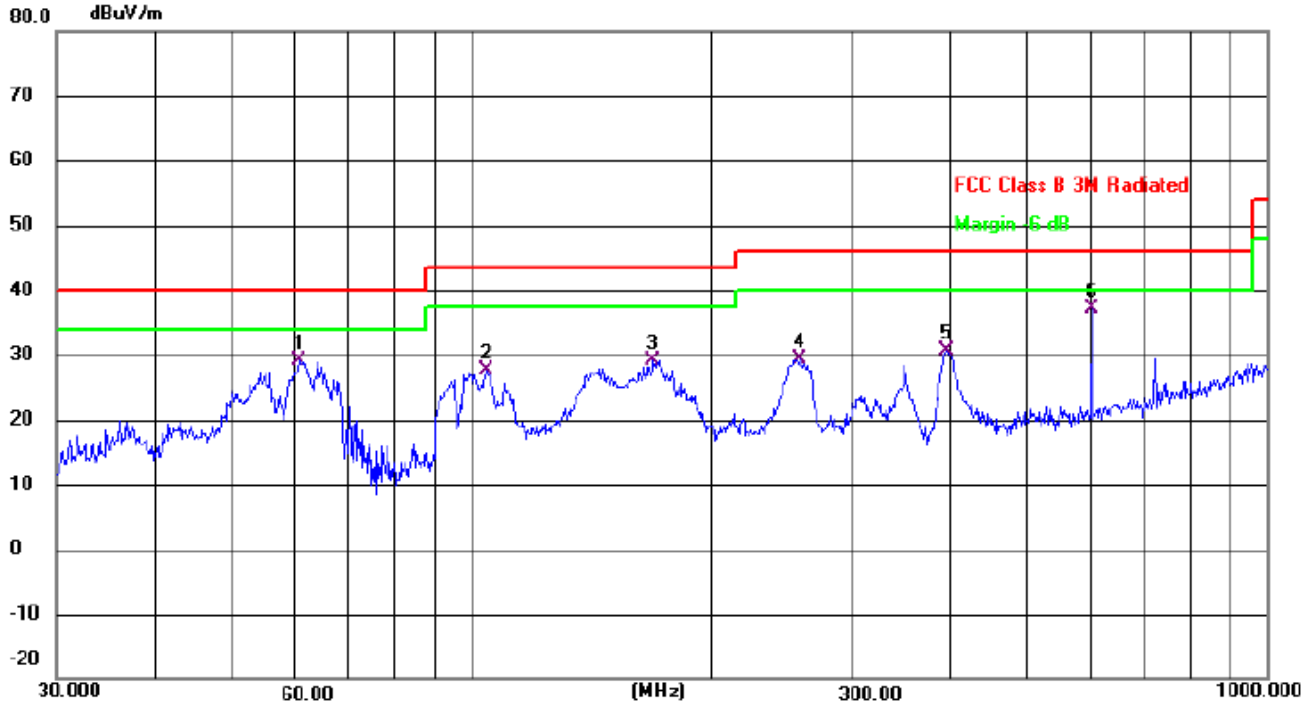
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		56.1974	27.89	-13.29	14.60	40.00	-25.40	QP
2		104.5361	28.59	-14.54	14.05	43.50	-29.45	QP
3		163.7550	41.28	-17.37	23.91	43.50	-19.59	QP
4	*	265.6757	47.78	-12.77	35.01	46.00	-10.99	QP
5		350.4768	36.40	-10.73	25.67	46.00	-20.33	QP
6		601.4265	38.99	-5.52	33.47	46.00	-12.53	QP

Remark:

Correct Factor = Cable loss + Antenna factor – Preamplifier;

Level = Reading Level + Correct Factor; Margin = Level - Limit;

Temperature:	26℃	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization :	Vertical
test voltage :	AC 120V/60Hz		
Test Mode :	Mode 4		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		60.4918	43.00	-13.81	29.19	40.00	-10.81	QP
2		104.1701	42.08	-14.52	27.56	43.50	-15.94	QP
3		169.0053	46.27	-17.04	29.23	43.50	-14.27	QP
4		258.3264	42.59	-13.23	29.36	46.00	-16.64	QP
5		394.8545	40.35	-9.78	30.57	46.00	-15.43	QP
6	*	601.4265	42.56	-5.52	37.04	46.00	-8.96	QP

Remark:

Correct Factor = Cable loss + Antenna factor – Preamplifier;

Level = Reading Level + Correct Factor; Margin = Level - Limit;

3.2.8. TEST RESULTS (1ghz~40ghZ)

802.11a band 1

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:5180									
V	10360	56.24	49.05	15.3	37.39	59.88	68.2	-8.32	PK
V	10360	41.63	49.05	15.3	37.39	45.27	54	-8.73	AV
V	15540	52.21	49.16	15.27	40.45	58.77	74	-15.23	PK
V	15540	39.87	49.16	15.27	40.45	46.43	54	-7.57	AV
H	10360	56.31	49.05	15.3	37.39	59.95	68.2	-8.25	PK
H	10360	40.85	49.05	15.3	37.39	44.49	54	-9.51	AV
H	15540	51.36	49.16	15.27	40.45	57.92	74	-16.08	PK
H	15540	38.25	49.16	15.27	40.45	44.81	54	-9.19	AV
operation frequency:5200									
V	10400	57.21	49.09	15.34	37.42	60.88	68.2	-7.32	PK
V	10400	39.66	49.09	15.34	37.42	43.33	54	-10.67	AV
V	15600	52.24	49.18	15.29	40.47	58.82	74	-15.18	PK
V	15600	38.92	49.18	15.29	40.47	45.5	54	-8.50	AV
H	10400	56.24	49.09	15.34	37.42	59.91	68.2	-8.29	PK
H	10400	39.85	49.09	15.34	37.42	43.52	54	-10.48	AV
H	15600	53.33	49.18	15.29	40.47	59.91	74	-14.09	PK
H	15600	38.21	49.18	15.29	40.47	44.79	54	-9.21	AV
operation frequency:5240									
V	10480	58.27	49.11	15.37	37.46	61.99	68.2	-6.21	PK
V	10480	39.56	49.11	15.37	37.46	43.28	54	-10.72	AV
V	15720	53.85	49.21	15.34	40.51	60.49	74	-13.51	PK
V	15720	38.32	49.21	15.34	40.51	44.96	54	-9.04	AV
H	10480	57.29	49.11	15.37	31.31	54.86	68.2	-13.34	PK
H	10480	45.34	49.11	15.37	31.31	42.91	54	-11.09	AV
H	15720	54.13	49.21	15.34	40.51	60.77	74	-13.23	PK
H	15720	37.85	49.21	15.34	40.51	44.49	54	-9.51	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.

802.11n HT20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:5180									
V	10360	56.21	49.05	15.3	37.39	59.85	68.2	-8.35	PK
V	10360	38.63	49.05	15.3	37.39	42.27	54	-11.73	AV
V	15540	52.57	49.16	15.27	40.45	59.13	74	-14.87	PK
V	15540	38.25	49.16	15.27	40.45	44.81	54	-9.19	AV
H	10360	56.63	49.05	15.3	37.39	60.27	68.2	-7.93	PK
H	10360	39.82	49.05	15.3	37.39	43.46	54	-10.54	AV
H	15540	51.97	49.16	15.27	40.45	58.53	74	-15.47	PK
H	15540	38.63	49.16	15.27	40.45	45.19	54	-8.81	AV
operation frequency:5200									
V	10400	56.52	49.09	15.34	37.42	60.19	68.2	-8.01	PK
V	10400	39.64	49.09	15.34	37.42	43.31	54	-10.69	AV
V	15600	52.63	49.18	15.29	40.47	59.21	74	-14.79	PK
V	15600	38.92	49.18	15.29	40.47	45.5	54	-8.50	AV
H	10400	55.89	49.09	15.34	37.42	59.56	68.2	-8.64	PK
H	10400	40.52	49.09	15.34	37.42	44.19	54	-9.81	AV
H	15600	53.21	49.18	15.29	40.47	59.79	74	-14.21	PK
H	15600	39.53	49.18	15.29	40.47	46.11	54	-7.89	AV
operation frequency:5240									
V	10480	57.58	49.11	15.37	37.46	61.3	68.2	-6.90	PK
V	10480	40.64	49.11	15.37	37.46	44.36	54	-9.64	AV
V	15720	52.56	49.21	15.34	40.51	59.2	74	-14.80	PK
V	15720	38.87	49.21	15.34	40.51	45.51	54	-8.49	AV
H	10480	57.22	49.11	15.37	31.31	54.79	68.2	-13.41	PK
H	10480	44.63	49.11	15.37	31.31	42.2	54	-11.80	AV
H	15720	51.65	49.21	15.34	40.51	58.29	74	-15.71	PK
H	15720	39.74	49.21	15.34	40.51	46.38	54	-7.62	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.

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Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:5190									
V	10380	56.21	49.07	15.33	37.41	59.88	68.2	-8.32	PK
V	10380	39.56	49.07	15.33	37.41	43.23	54	-10.77	AV
V	15570	52.67	49.17	15.28	40.46	59.24	74	-14.76	PK
V	15570	38.52	49.17	15.28	40.46	45.09	54	-8.91	AV
H	10380	56.26	49.07	15.33	37.41	59.93	68.2	-8.27	PK
H	10380	40.87	49.07	15.33	37.41	44.54	54	-9.46	AV
H	15570	52.52	49.17	15.28	40.46	59.09	74	-14.91	PK
H	15570	38.73	49.17	15.28	40.46	45.3	54	-8.70	AV
operation frequency:5230									
V	10460	57.21	49.11	15.37	37.46	60.93	68.2	-7.27	PK
V	10460	39.33	49.11	15.37	37.46	43.05	54	-10.95	AV
V	15690	52.18	49.21	15.34	40.51	58.82	74	-15.18	PK
V	15690	38.23	49.21	15.34	40.51	44.87	54	-9.13	AV
H	10460	57.84	49.11	15.37	31.31	55.41	68.2	-12.79	PK
H	10460	44.58	49.11	15.37	31.31	42.15	54	-11.85	AV
H	15690	52.83	49.21	15.34	40.51	59.47	74	-14.53	PK
H	15690	39.87	49.21	15.34	40.51	46.51	54	-7.49	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.

802.11ac HT20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:5180									
V	10360	56.63	49.05	15.3	37.39	60.27	68.2	-7.93	PK
V	10360	39.14	49.05	15.3	37.39	42.78	54	-11.22	AV
V	15540	51.87	49.16	15.27	40.45	58.43	74	-15.57	PK
V	15540	38.63	49.16	15.27	40.45	45.19	54	-8.81	AV
H	10360	56.62	49.05	15.3	37.39	60.26	68.2	-7.94	PK
H	10360	38.37	49.05	15.3	37.39	42.01	54	-11.99	AV
H	15540	52.59	49.16	15.27	40.45	59.15	74	-14.85	PK
H	15540	39.52	49.16	15.27	40.45	46.08	54	-7.92	AV
operation frequency:5200									
V	10400	56.63	49.09	15.34	37.42	60.3	68.2	-7.90	PK
V	10400	41.54	49.09	15.34	37.42	45.21	54	-8.79	AV
V	15600	52.17	49.18	15.29	40.47	58.75	74	-15.25	PK
V	15600	40.53	49.18	15.29	40.47	47.11	54	-6.89	AV
H	10400	55.95	49.09	15.34	37.42	59.62	68.2	-8.58	PK
H	10400	40.56	49.09	15.34	37.42	44.23	54	-9.77	AV
H	15600	53.87	49.18	15.29	40.47	60.45	74	-13.55	PK
H	15600	41.82	49.18	15.29	40.47	48.4	54	-5.60	AV
operation frequency:5240									
V	10480	57.14	49.11	15.37	37.46	60.86	68.2	-7.34	PK
V	10480	40.63	49.11	15.37	37.46	44.35	54	-9.65	AV
V	15720	51.48	49.21	15.34	40.51	58.12	74	-15.88	PK
V	15720	39.63	49.21	15.34	40.51	46.27	54	-7.73	AV
H	10480	57.87	49.11	15.37	31.31	55.44	68.2	-12.76	PK
H	10480	44.29	49.11	15.37	31.31	41.86	54	-12.14	AV
H	15720	52.52	49.21	15.34	40.51	59.16	74	-14.84	PK
H	15720	40.73	49.21	15.34	40.51	47.37	54	-6.63	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.

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Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:5190									
V	10380	56.34	49.07	15.33	37.41	60.01	68.2	-8.19	PK
V	10380	40.82	49.07	15.33	37.41	44.49	54	-9.51	AV
V	15570	52.78	49.17	15.28	40.46	59.35	74	-14.65	PK
V	15570	39.52	49.17	15.28	40.46	46.09	54	-7.91	AV
H	10380	56.56	49.07	15.33	37.41	60.23	68.2	-7.97	PK
H	10380	40.58	49.07	15.33	37.41	44.25	54	-9.75	AV
H	15570	51.43	49.17	15.28	40.46	58	74	-16.00	PK
H	15570	39.17	49.17	15.28	40.46	45.74	54	-8.26	AV
operation frequency:5230									
V	10460	57.63	49.11	15.37	37.46	61.35	68.2	-6.85	PK
V	10460	41.62	49.11	15.37	37.46	45.34	54	-8.66	AV
V	15690	52.17	49.21	15.34	40.51	58.81	74	-15.19	PK
V	15690	39.29	49.21	15.34	40.51	45.93	54	-8.07	AV
H	10460	57.14	49.11	15.37	31.31	54.71	68.2	-13.49	PK
H	10460	44.36	49.11	15.37	31.31	41.93	54	-12.07	AV
H	15690	52.85	49.21	15.34	40.51	59.49	74	-14.51	PK
H	15690	40.21	49.21	15.34	40.51	46.85	54	-7.15	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.

802.11ac HT80

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:5210									
V	10420	56.89	49.07	15.33	37.41	60.56	68.2	-7.64	PK
V	10420	41.52	49.07	15.33	37.41	45.19	54	-8.81	AV
V	15630	51.51	49.17	15.28	40.46	58.08	74	-15.92	PK
V	15630	39.69	49.17	15.28	40.46	46.26	54	-7.74	AV
H	10420	56.77	49.07	15.33	37.41	60.44	68.2	-7.76	PK
H	10420	41.36	49.07	15.33	37.41	45.03	54	-8.97	AV
H	15630	52.52	49.17	15.28	40.46	59.09	74	-14.91	PK
H	15630	40.14	49.17	15.28	40.46	46.71	54	-7.29	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.

3.3 RADIATED BAND EMISSION MEASUREMENT

3.3.1 TEST REQUIREMENT:

15.407 (b)

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)
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.
The provisions of §15.205 apply to intentional radiators operating under this section,15.205 Restricted bands of operation

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	5000MHz
Stop Frequency	5420MHz
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

3.3.2 TEST PROCEDURE

Above 1GHz test procedure as below:

a. 1. The EUT was placed on the top of a rotating table 0.1 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

g. Test the EUT in the lowest channel,the Highest channel

Note:

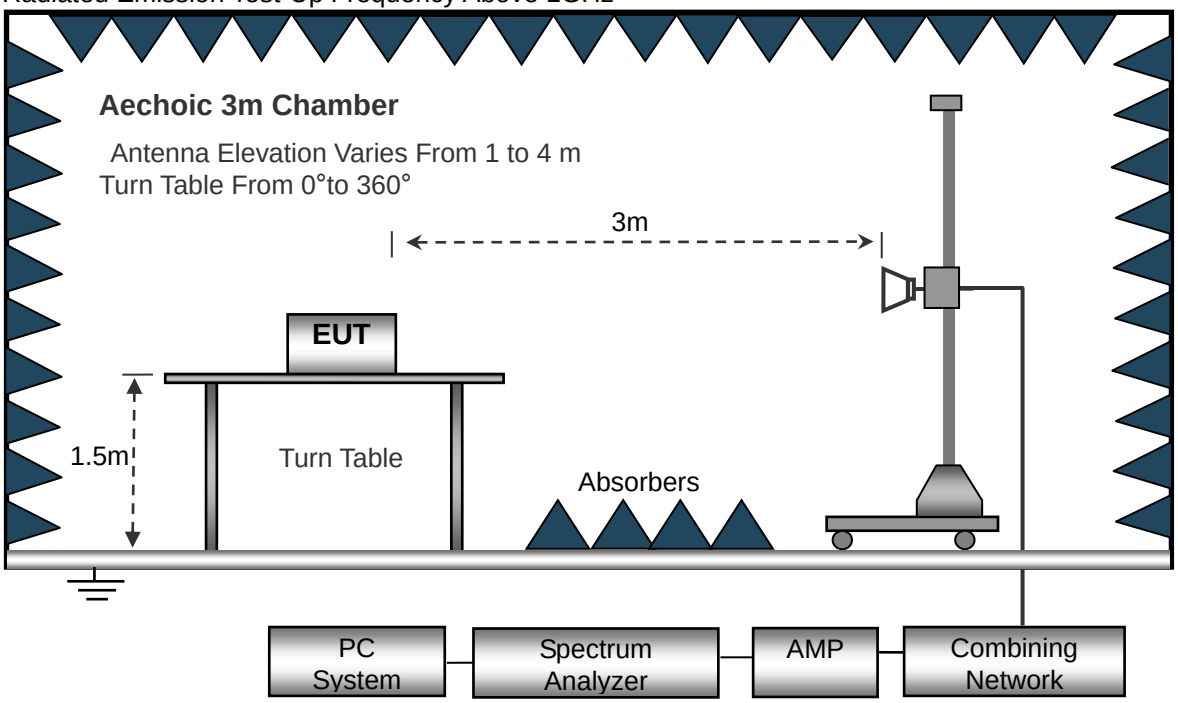
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

3.3.3 DEVIATION FROM TEST STANDARD

No deviation

3.3.4 TEST SETUP

Radiated Emission Test-Up Frequency Above 1GHz



3.3.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

3.3.6 TEST RESULT

802.11a

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:5180									
V	5150	53.24	49.12	15.6	37.34	57.06	74	-16.94	PK
V	5150	39.59	49.12	15.6	37.34	43.41	54	-10.59	AV
V	5145	54.32	49.19	15.24	40.43	60.8	74	-13.2	PK
V	5145	36.58	49.19	15.24	40.43	43.06	54	-10.94	AV
H	5150	52.63	49.12	15.6	37.34	56.45	74	-17.55	PK
H	5150	37.14	49.12	15.6	37.34	40.96	54	-13.04	AV
H	5145	54.53	49.19	15.24	40.43	61.01	74	-12.99	PK
H	5145	33.84	49.19	15.24	40.43	40.32	54	-13.68	AV
operation frequency:5240									
V	5350	53.26	49.13	15.32	37.46	56.91	74	-17.09	PK
V	5350	35.58	49.13	15.32	37.46	39.23	54	-14.77	AV
V	5370	53.34	49.24	15.36	40.51	59.97	74	-14.03	PK
V	5370	32.26	49.24	15.36	40.51	38.89	54	-15.11	AV
H	5350	52.58	49.13	15.32	31.31	50.08	74	-23.92	PK
H	5350	40.62	49.13	15.32	31.31	38.12	54	-15.88	AV
H	5370	52.63	49.24	15.36	40.51	59.26	74	-14.74	PK
H	5370	32.37	49.24	15.36	40.51	39	54	-15	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.

802.11n HT20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:5180									
V	5150	51.21	49.12	15.6	37.34	55.03	74	-18.97	PK
V	5150	33.26	49.12	15.6	37.34	37.08	54	-16.92	AV
V	5145	51.88	49.19	15.24	40.43	58.36	74	-15.64	PK
V	5145	33.84	49.19	15.24	40.43	40.32	54	-13.68	AV
H	5150	51.63	49.12	15.6	37.34	55.45	74	-18.55	PK
H	5150	33.38	49.12	15.6	37.34	37.2	54	-16.8	AV
H	5145	50.94	49.19	15.24	40.43	57.42	74	-16.58	PK
H	5145	32.27	49.19	15.24	40.43	38.75	54	-15.25	AV
operation frequency:5240									
V	5350	53.63	49.13	15.32	37.46	57.28	74	-16.72	PK
V	5350	34.62	49.13	15.32	37.46	38.27	54	-15.73	AV
V	5370	50.88	49.24	15.36	40.51	57.51	74	-16.49	PK
V	5370	33.26	49.24	15.36	40.51	39.89	54	-14.11	AV
H	5350	54.24	49.13	15.32	31.31	51.74	74	-22.26	PK
H	5350	36.79	49.13	15.32	31.31	34.29	54	-19.71	AV
H	5370	51.25	49.24	15.36	40.51	57.88	74	-16.12	PK
H	5370	33.86	49.24	15.36	40.51	40.49	54	-13.51	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.

802.11ac HT20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:5180									
V	5150	52.21	49.12	15.33	37.41	55.83	74	-18.17	PK
V	5150	34.36	49.12	15.33	37.41	37.98	54	-16.02	AV
V	5145	51.84	49.19	15.28	40.46	58.39	74	-15.61	PK
V	5145	33.87	49.19	15.28	40.46	40.42	54	-13.58	AV
H	5150	52.16	49.12	15.33	37.41	55.78	74	-18.22	PK
H	5150	34.52	49.12	15.33	37.41	38.14	54	-15.86	AV
H	5145	50.53	49.19	15.28	40.46	57.08	74	-16.92	PK
H	5145	33.37	49.19	15.28	40.46	39.92	54	-14.08	AV
operation frequency:5240									
V	5350	53.63	49.13	15.32	37.46	57.28	74	-16.72	PK
V	5350	36.14	49.13	15.32	37.46	39.79	54	-14.21	AV
V	5370	50.13	49.24	15.36	40.51	56.76	74	-17.24	PK
V	5370	33.68	49.24	15.36	40.51	40.31	54	-13.69	AV
H	5350	53.76	49.13	15.32	31.31	51.26	74	-22.74	PK
H	5350	40.52	49.13	15.32	31.31	38.02	54	-15.98	AV
H	5370	51.11	49.24	15.36	40.51	57.74	74	-16.26	PK
H	5370	35.49	49.24	15.36	40.51	42.12	54	-11.88	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.

802.11n HT40

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:5190									
V	5150	52.34	49.12	15.6	37.39	56.21	74	-17.79	PK
V	5150	35.63	49.12	15.6	37.39	39.5	54	-14.5	AV
V	5145	51.68	49.19	15.24	40.45	58.18	74	-15.82	PK
V	5145	34.21	49.19	15.24	40.45	40.71	54	-13.29	AV
H	5150	52.58	49.12	15.6	37.39	56.45	74	-17.55	PK
H	5150	34.62	49.12	15.6	37.39	38.49	54	-15.51	AV
H	5145	50.23	49.19	15.24	40.45	56.73	74	-17.27	PK
H	5145	35.28	49.19	15.24	40.45	41.78	54	-12.22	AV
operation frequency:5230									
V	5350	53.21	49.13	15.34	37.46	56.88	74	-17.12	PK
V	5350	37.34	49.13	15.34	37.46	41.01	54	-12.99	AV
V	5370	50.17	49.24	15.35	40.51	56.79	74	-17.21	PK
V	5370	36.86	49.24	15.35	40.51	43.48	54	-10.52	AV
H	5350	54.88	49.13	15.34	31.31	52.4	74	-21.6	PK
H	5350	41.21	49.13	15.34	31.31	38.73	54	-15.27	AV
H	5370	52.56	49.24	15.35	40.51	59.18	74	-14.82	PK
H	5370	36.74	49.24	15.35	40.51	43.36	54	-10.64	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.

802.11ac HT40

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:5190									
V	5150	52.21	49.12	15.32	37.41	55.82	74	-18.18	PK
V	5150	37.26	49.12	15.32	37.41	40.87	54	-13.13	AV
V	5145	52.88	49.19	15.36	40.46	59.51	74	-14.49	PK
V	5145	36.33	49.19	15.36	40.46	42.96	54	-11.04	AV
H	5150	52.52	49.12	15.32	37.41	56.13	74	-17.87	PK
H	5150	37.34	49.12	15.32	37.41	40.95	54	-13.05	AV
H	5145	51.16	49.19	15.36	40.46	57.79	74	-16.21	PK
H	5145	36.37	49.19	15.36	40.46	43	54	-11	AV
operation frequency:5230									
V	5350	54.21	49.13	15.34	37.34	57.76	74	-16.24	PK
V	5350	36.56	49.13	15.34	37.34	40.11	54	-13.89	AV
V	5370	51.57	49.24	15.35	40.43	58.11	74	-15.89	PK
V	5370	36.76	49.24	15.35	40.43	43.3	54	-10.7	AV
H	5350	54.64	49.13	15.34	37.34	58.19	74	-15.81	PK
H	5350	41.26	49.13	15.34	37.34	44.81	54	-9.19	AV
H	5370	50.14	49.24	15.35	40.43	56.68	74	-17.32	PK
H	5370	35.66	49.24	15.35	40.43	42.2	54	-11.8	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.

802.11ac HT80

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:5210									
V	5150	52.27	49.13	15.32	37.48	55.94	74	-18.06	PK
V	5150	35.42	49.13	15.32	37.48	39.09	54	-14.91	AV
V	5145	51.83	49.24	15.36	40.42	58.37	74	-15.63	PK
V	5145	35.68	49.24	15.36	40.42	42.22	54	-11.78	AV
H	5150	52.52	49.13	15.32	37.48	56.19	74	-17.81	PK
H	5150	36.83	49.13	15.32	37.48	40.5	54	-13.5	AV
H	5145	50.38	49.24	15.36	40.42	56.92	74	-17.08	PK
H	5145	35.64	49.24	15.36	40.42	42.18	54	-11.82	AV
V	5350	53.26	49.13	15.32	37.46	56.91	74	-17.09	PK
V	5350	35.18	49.13	15.32	37.46	38.83	54	-15.17	AV
V	5370	53.65	49.24	15.36	40.51	60.28	74	-13.72	PK
V	5370	32.23	49.24	15.36	40.51	38.86	54	-15.14	AV
H	5350	52.37	49.13	15.32	31.31	49.87	74	-24.13	PK
H	5350	40.96	49.13	15.32	31.31	38.46	54	-15.54	AV
H	5370	52.34	49.24	15.36	40.51	58.97	74	-15.03	PK
H	5370	32.93	49.24	15.36	40.51	39.56	54	-14.44	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.

4.. AVERAGE OUTPUT POWER

4.1. APPLIED PROCEDURES / LIMIT

For mobile and portable 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.

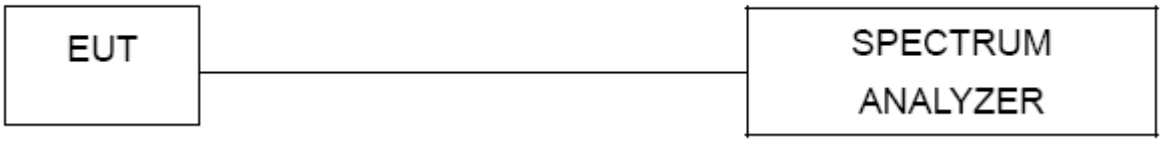
4.1.1. TEST PROCEDURE

Method SA-2 uses trace averaging across ON and OFF times of the EUT transmissions, followed by duty cycle correction. The procedure for this method is as follows:
a)Measure the duty cycle D of the transmitter output signal as described in 12.2.
b)Set span to encompass the entire 26 dB EBW or 99% OBW of the signal.
c)Set RBW=1 MHz.
d)Set VBW ≥3 MHz.
e)Number of points in sweep ≥ [2 x span / RBW]. (This gives bin-to-bin spacing ≤ RBW / 2, so that narrowband signals are not lost between frequency bins.)
f)Sweep time = auto.
g) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
h) Do not use sweep triggering. Allow the sweep to "free run."
i) Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the ON and OFF periods of the transmitter.
j)Compute power by integrating the spectrum across the 26 dB EBW or 99% OBW of the signal using the instrument's band power measurement function with band limits set equal to the EBW or OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at 1MHz intervals extending across the 26 dB EBW or 99% OBW of the spectrum.
k) Add [10 log (1 / D)], where D is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the ON and ofF times of the transmission). For example, add [10 log (1 / 0.25)] = 6 dB if the duty cycle is 25%.

4.1.2. DEVIATION FROM STANDARD

No deviation.

4.1.3. TEST SETUP



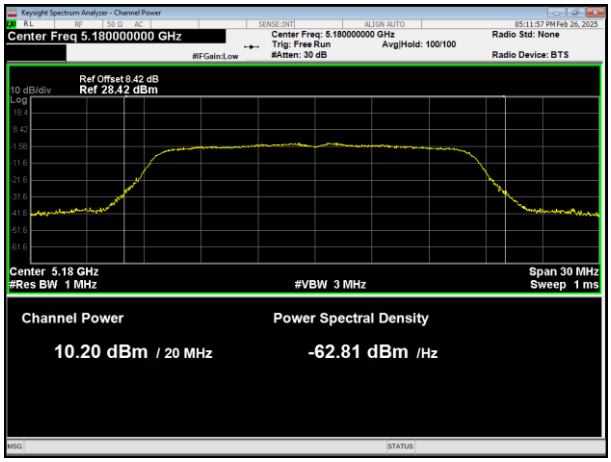
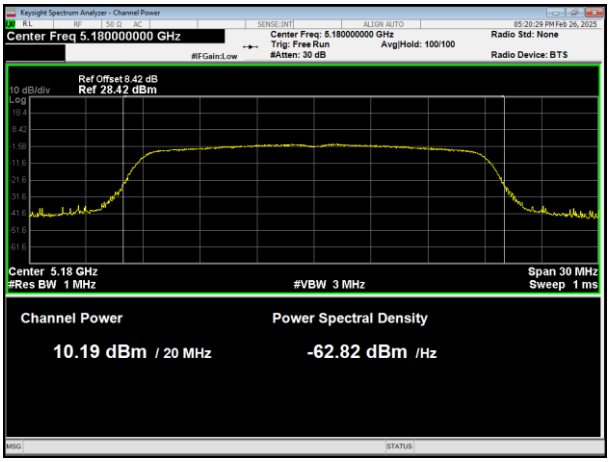
4.1.4. EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

4.1.5. TEST RESULTS

Temperature:	25 ℃	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage :	AC 120V/60Hz

Band	Mode	Test Channel	Average Output Power (dBm)	Duty factor (dB)	Total Output Power(dB)	LIMIT (dBm)
Band 1	802.11a	Low	10.203	0.87	11.073	23.98
		Middle	10.24	0.87	11.11	23.98
		High	9.776	0.87	10.646	23.98
	802.11n HT20	Low	10.194	0.16	10.354	23.98
		Middle	10.347	0.13	10.477	23.98
		High	10.697	0.13	10.827	23.98
	802.11n HT40	Low	10.053	0.33	10.383	23.98
		High	10.284	0.26	10.544	23.98
	802.11ac HT20	Low	10.086	0.13	10.216	23.98
		Middle	10.075	0.13	10.205	23.98
		High	10.175	0.13	10.305	23.98
	802.11ac HT40	Low	9.78	0.26	10.04	23.98
		High	9.945	0.32	10.265	23.98
	802.11ac HT80	/	9.721	0.63	10.351	23.98

802.11a	802.11n HT20
	
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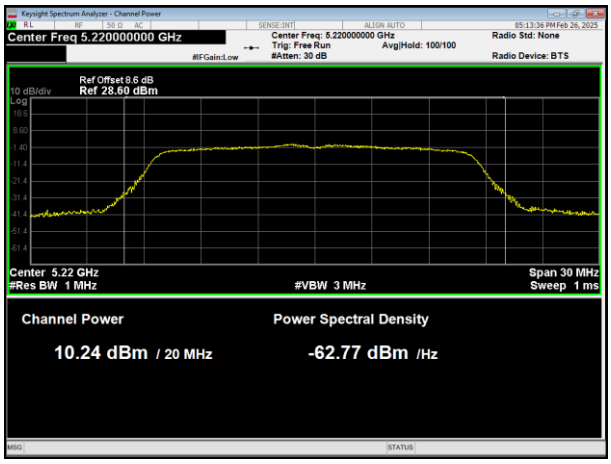	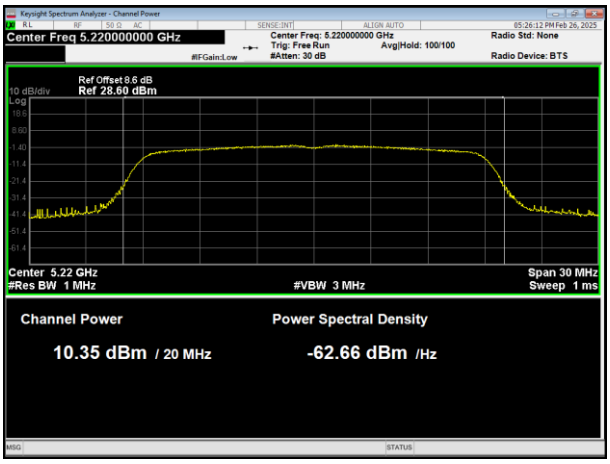
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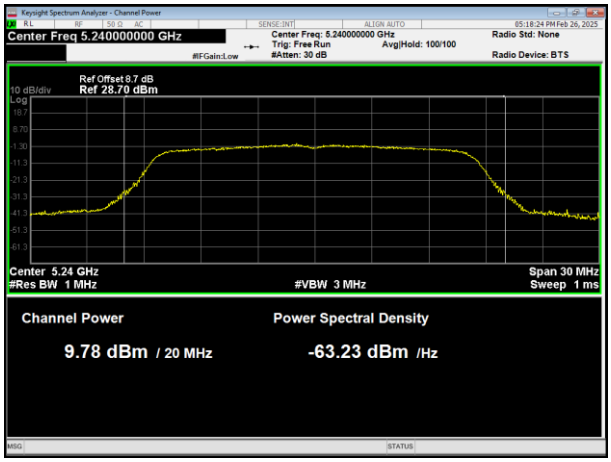
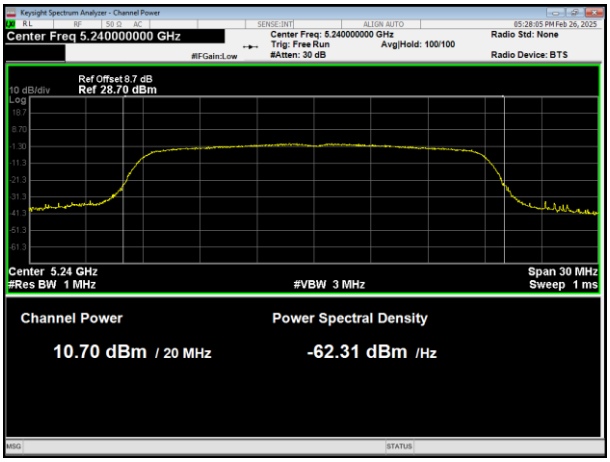
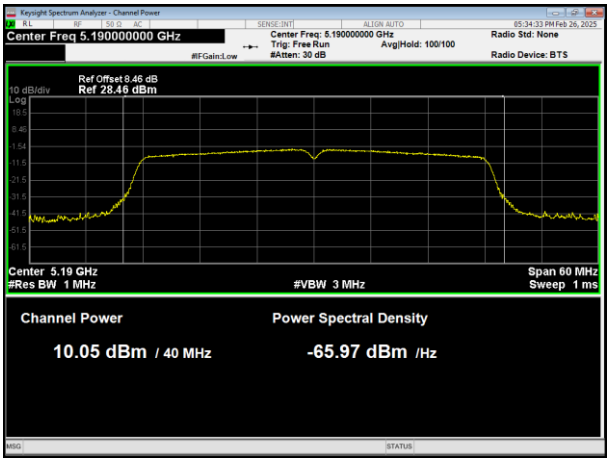
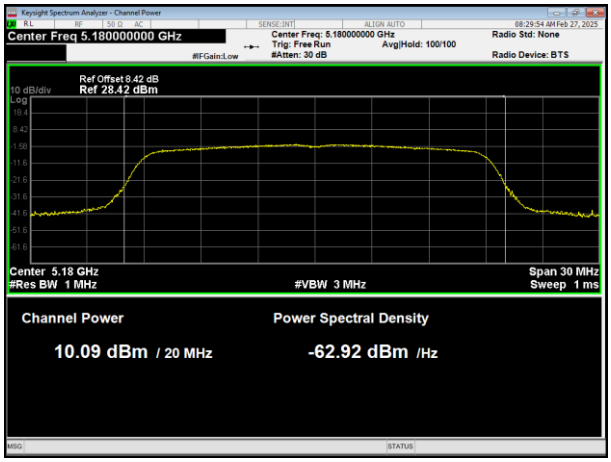
	
5240MHz	5240MHz

802.11n HT40	802.11ac HT20
	
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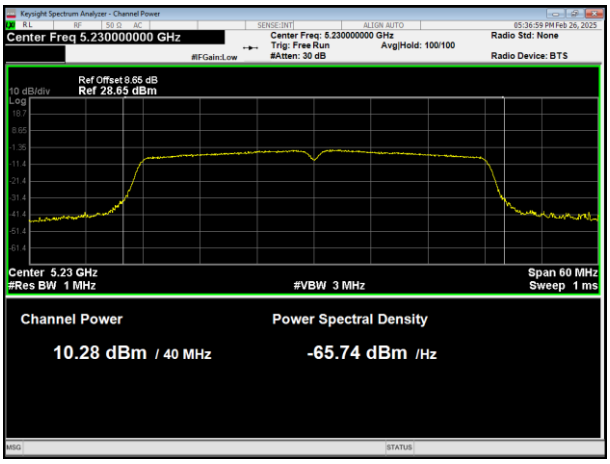	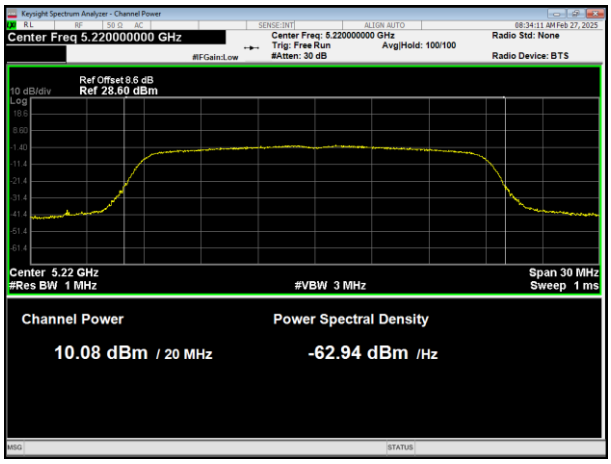
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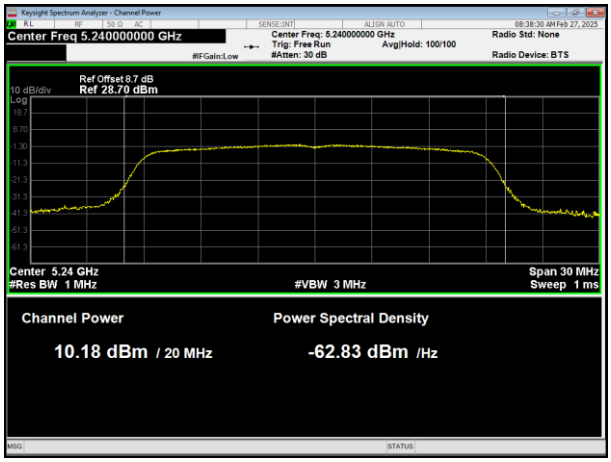
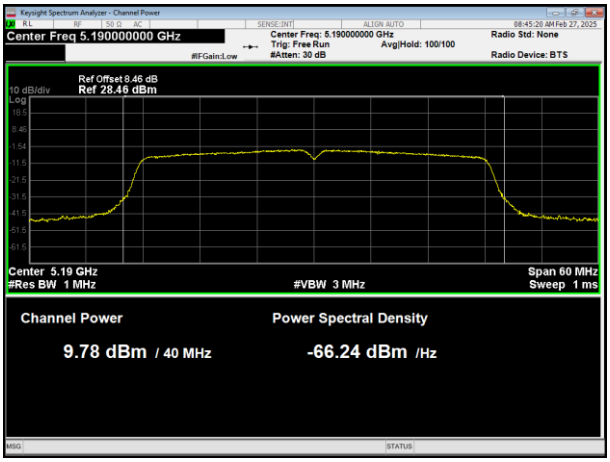
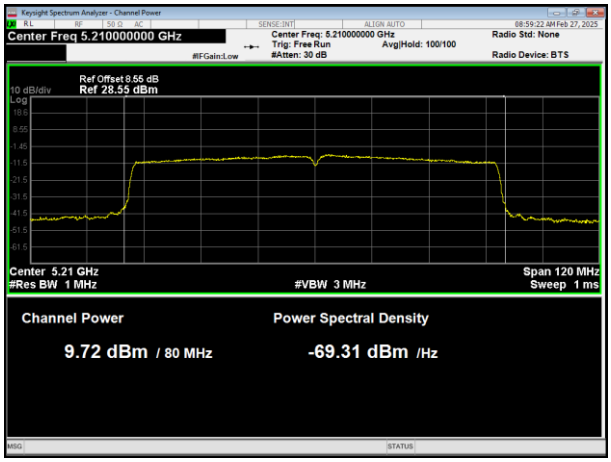
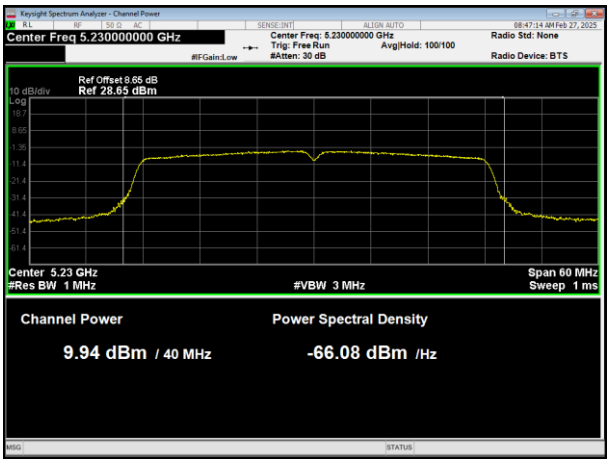
	
	5240MHz

802.11ac HT40	802.11ac HT80
	
5190MHz	5210MHz
	
5230MHz	

5.. POWER SPECTRAL DENSITY TEST

5.1. APPLIED PROCEDURES / LIMIT

In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	= the frequency band of operation
RB	RBW ≥ 1MHz for band 1 RBW ≥ 510KHz for band 4
VB	VBW ≥ 3RBW
Detector	RMS (i.e., power averaging).
Trace	Max Hold
Sweep Time	Auto

5.1.1. TEST PROCEDURE

Method SA-2 uses trace averaging across ON and OFF times of the EUT transmissions, followed by duty cycle correction. The procedure for this method is as follows:
a)Measure the duty cycle D of the transmitter output signal as described in 12.2.
b)Set span to encompass the entire 26 dB EBW or 99% OBW of the signal.
c)Set RBW=1 MHz.
d)Set VBW ≥3 MHz.
e)Number of points in sweep ≥ [2 x span / RBW]. (This gives bin-to-bin spacing ≤ RBW / 2, so that narrowband signals are not lost between frequency bins.)
f)Sweep time = auto.
g) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
h) Do not use sweep triggering. Allow the sweep to "free run."
i) Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the ON and OFF periods of the transmitter.
j)Compute power by integrating the spectrum across the 26 dB EBW or 99% OBW of the signal using the instrument's band power measurement function with band limits set equal to the EBW or OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at 1MHz intervals extending across the 26 dB EBW or 99% OBW of the spectrum.
k) Add [10 log (1 / D)], where D is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the ON and ofF times of the transmission). For example, add [10 log (1 / 0.25)] = 6 dB if the duty cycle is 25%.

Notwithstanding that some regulatory requirements refer to peak power spectral density (PPSD), in some
cases the intent is to measure the maximum value of the time average of the power spectral density during a
period of continuous transmission. The procedure for this method is as follows:
a) Create an average power spectrum for the EUT operating mode being tested by following the instructions in 12.3.2 for measuring maximum conducted output power using a spectrum analyzer or EMI receiver; that is, select the appropriate test method (SA-1, SA-2, SA-3, or their respective alternatives) and apply it up to, but not including, the step labeled, “Compute power....”(This procedure is required even if the maximum conducted output power measurement was performed using the power meter method PM.)
b) Use the peak search function on the instrument to find the peak of the spectrum.
c)Make the following adjustments to the peak value of the spectrum, if applicable:
1) If method SA-2or SA-2A was used, then add [10 log (1 / D)], where D is the duty cycle, to the peak of the spectrum.
2)If method SA-3A was used and the linear mode was used in step h) of 12.3.2.7, add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.
d) The result is the PPSD.
e) The procedure in item a) through item c) requires the use of 1 MHz resolution bandwidth to satisfy the 1MHz measurement bandwidth specified by some regulatory authorities." This requirement also permits use of resolution bandwidths less than I MHz“provided that the measured power is integrated to show the total power over the measurement bandwidth”(i.e., 1 MHz). If measurements are performed using a reduced resolution bandwidth and integrated over 1 MHz bandwidth, the following adjustments to the procedures apply:
1)Set RBW≥ 1 / T, where T is defined in12.2 a).
2)Set VBW ≥[3 x RBW].
3) Care shall be taken such that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

5.1.2. DEVIATION FROM STANDARD

No deviation.

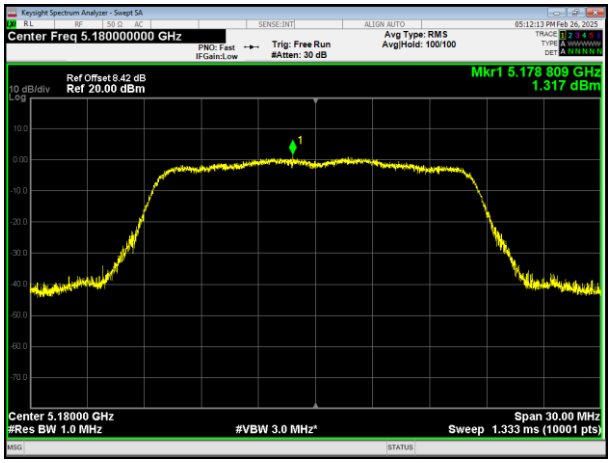
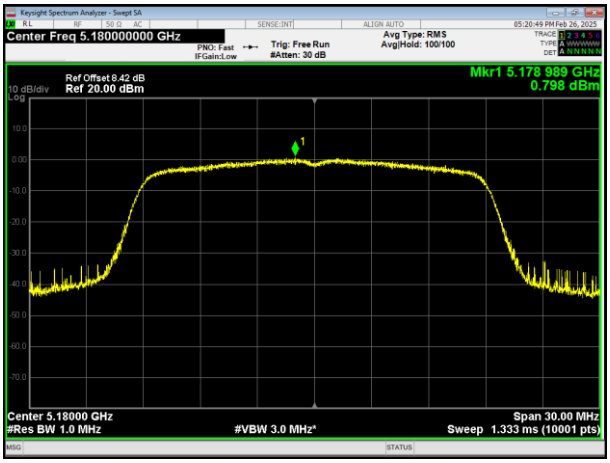
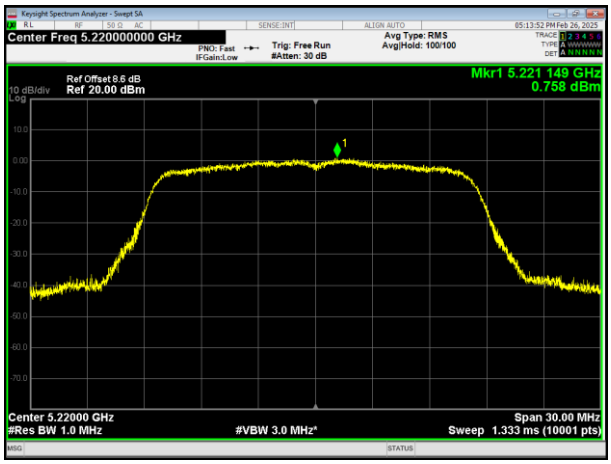
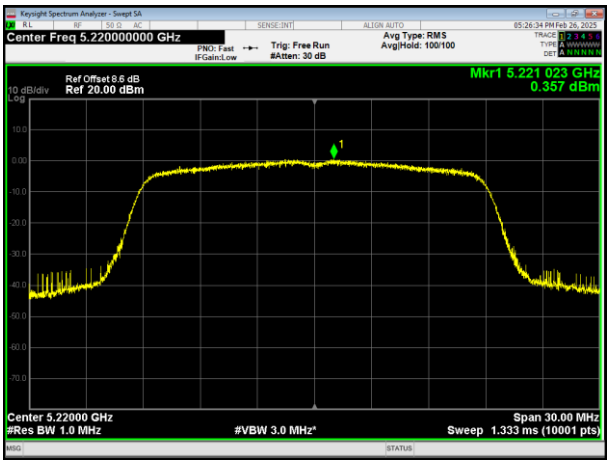
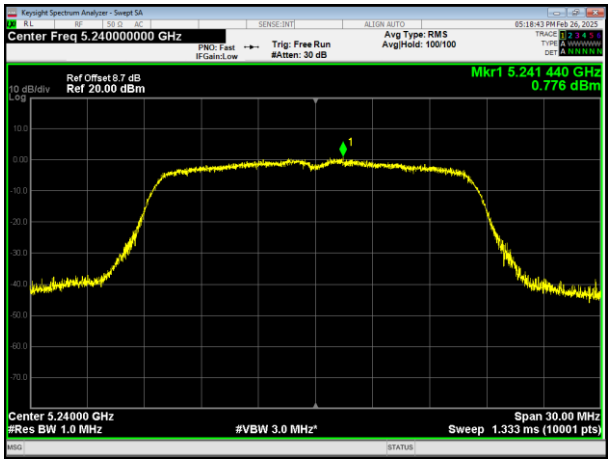
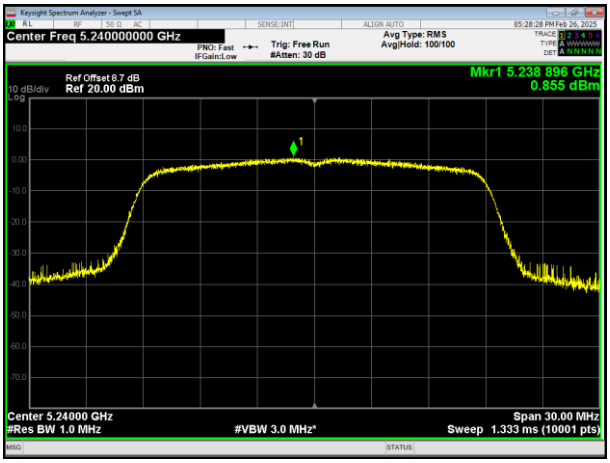
5.1.3. TEST SETUP

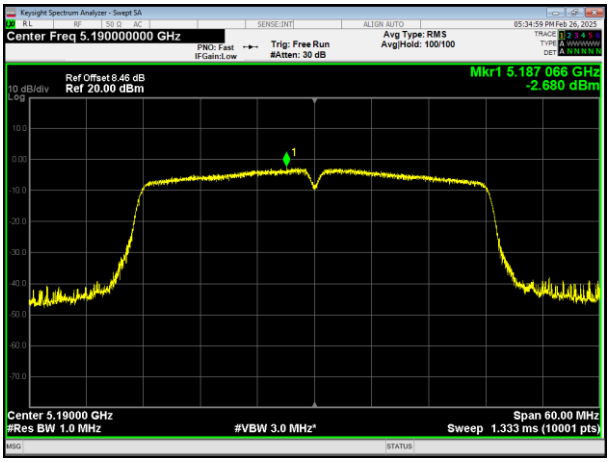
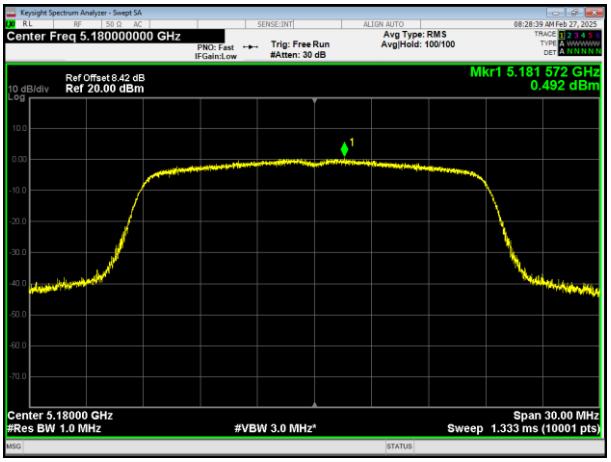
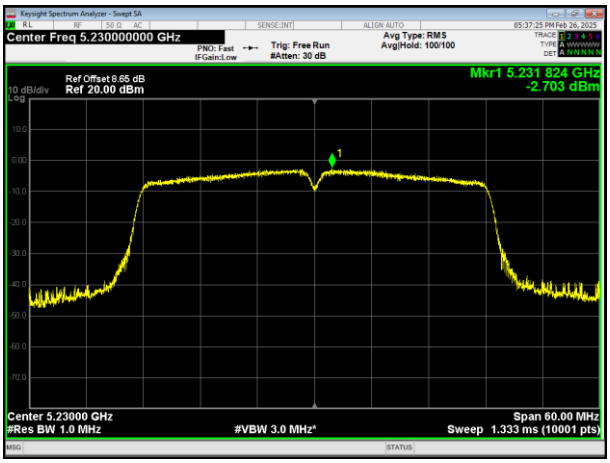
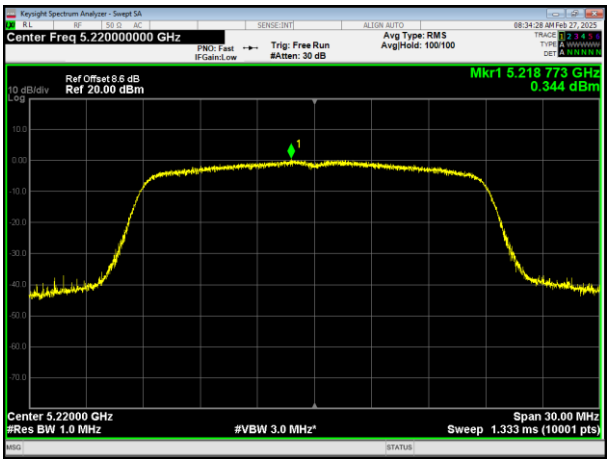
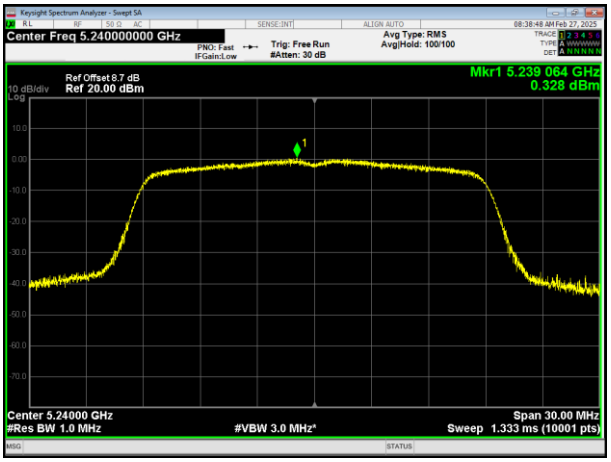
5.1.4. EUT OPERATION CONDITIONS

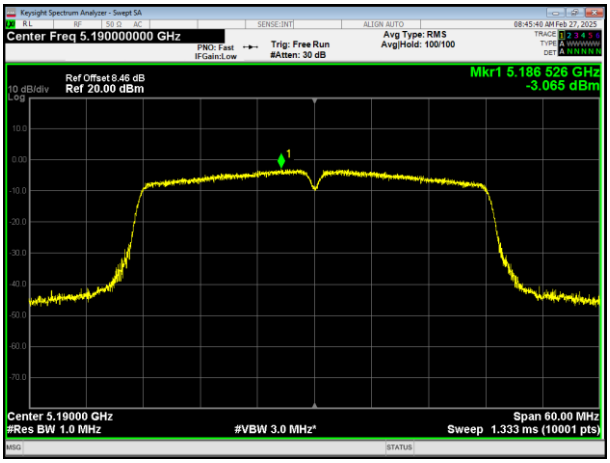
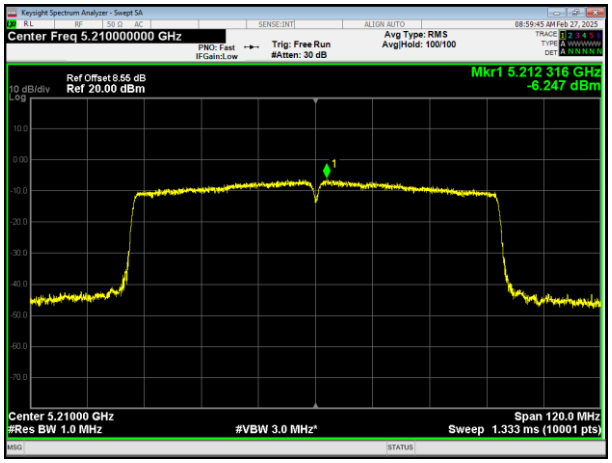
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.5. TEST RESULTS

	Mode	Test Channel	Reading Level (dBm)	Duty factor (dB)	PSD (dBm/MHz)	Limit (dBm)	Result
Band1	802.11a	Low	1.317	0.87	2.187	11.00	PASS
		Middle	0.758	0.87	1.628	11.00	PASS
		High	0.776	0.87	1.646	11.00	PASS
	802.11n20	Low	0.798	0.16	0.958	11.00	PASS
		Middle	0.357	0.13	0.487	11.00	PASS
		High	0.855	0.13	0.985	11.00	PASS
	802.11n40	Low	-2.68	0.33	-2.35	11.00	PASS
		High	-2.703	0.26	-2.443	11.00	PASS
	802.11ac20	Low	0.492	0.13	0.622	11.00	PASS
		Middle	0.344	0.13	0.474	11.00	PASS
		High	0.328	0.13	0.458	11.00	PASS
	802.11ac40	Low	-3.065	0.26	-2.805	11.00	PASS
		High	-2.892	0.32	-2.572	11.00	PASS
	802.11ac80	/	-6.247	0.63	-5.617	11.00	PASS

802.11a	802.11n HT20
	
5180MHz	5180MHz
	
5200MHz	5200MHz
	
5240MHz	5240MHz

802.11n HT40	802.11ac HT20
	
5190MHz	5180MHz
	
5230MHz	5200MHz
	
	5240MHz

802.11ac HT40	802.11ac HT80
	
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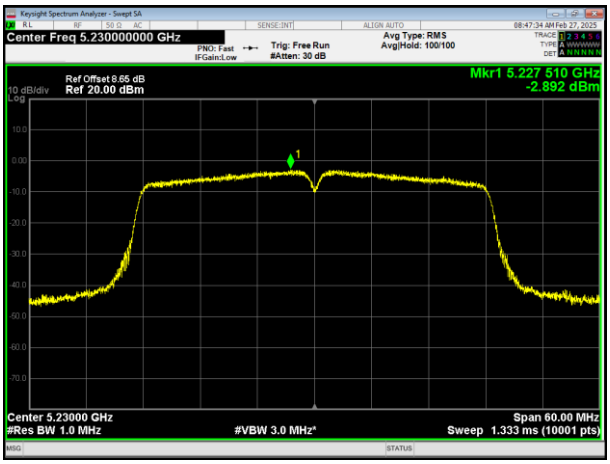
	
5230MHz	

6.. 26DB&99% BANDWIDTH TEST

6.1. APPLIED PROCEDURES / LIMIT

The 26 dB bandwidth is used to determine the conducted power limits.

There is no limit bandwidth for U-NII-1, U-NII-2-A and U-NII-2-C.

6.1.1. TEST PROCEDURE

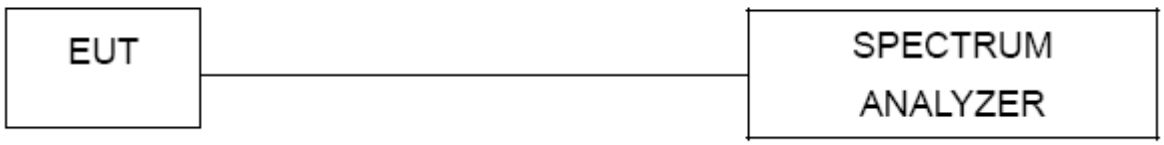
26dB Bandwidth	
Spectrum Parameters	Setting
RBW	approximately 1% of the emission bandwidth
VBW	>RBW
Span	30MHz(20MHz Bandwidth mode) 60MHz(40MHz Bandwidth mode) 120MHz(80MHz Bandwidth mode)
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

99% Occupied Bandwidth	
Spectrum Parameters	Setting
RBW	1% to 5% of the OBW
VBW	Approximately three times the RBW
Span	between 1.5 times and 5.0 times the OBW
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

6.1.2. DEVIATION FROM STANDARD

No deviation.

6.1.3. TEST SETUP



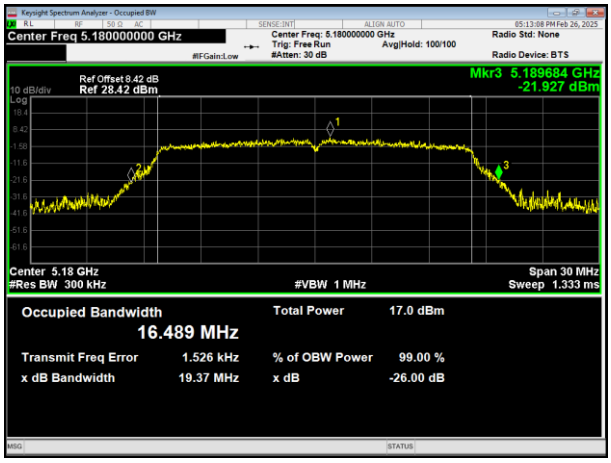
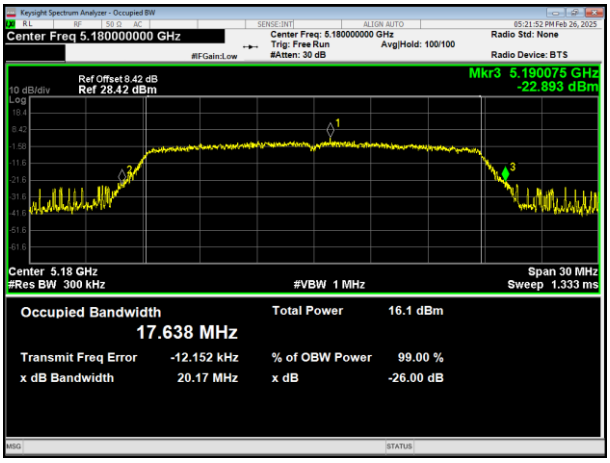
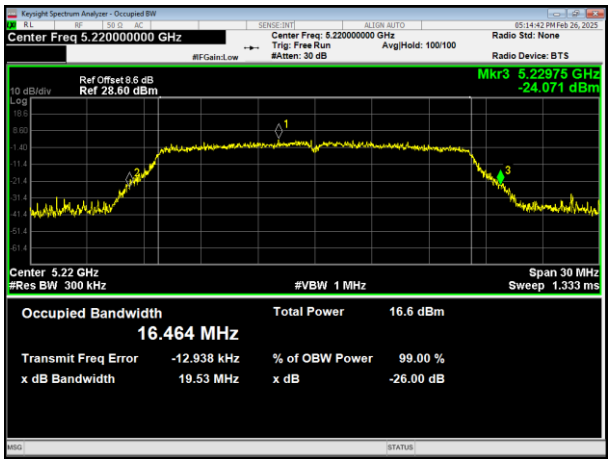
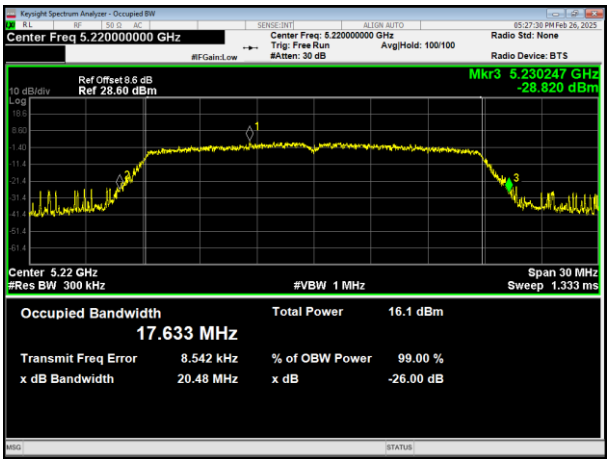
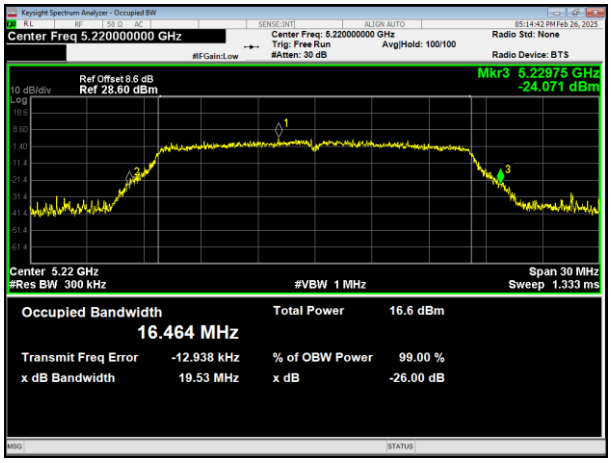
6.1.4. EUT OPERATION CONDITIONS

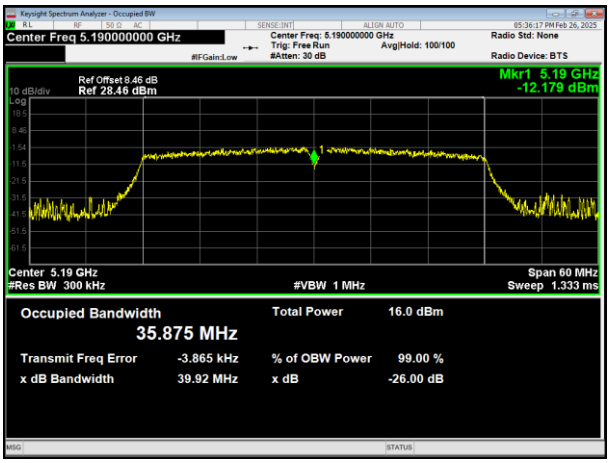
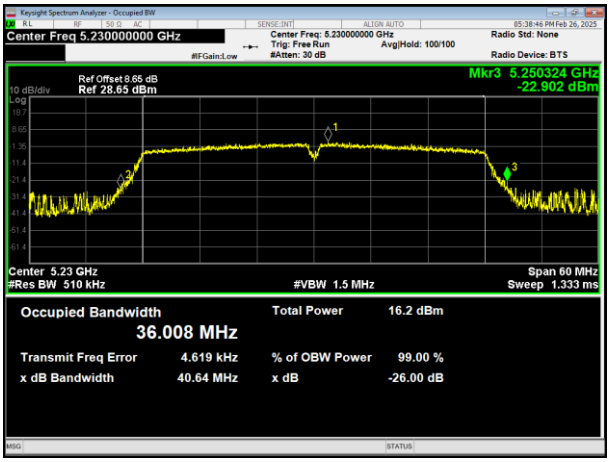
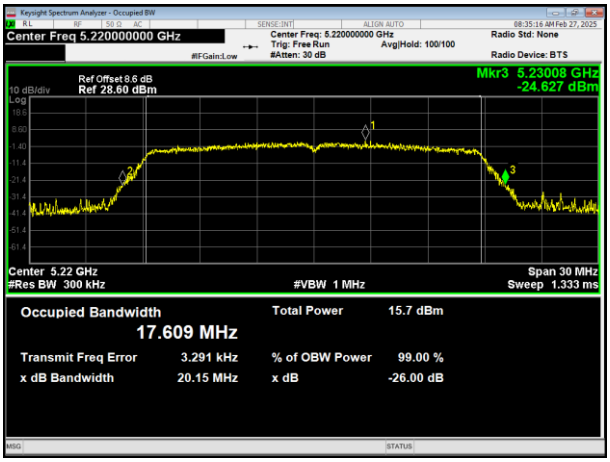
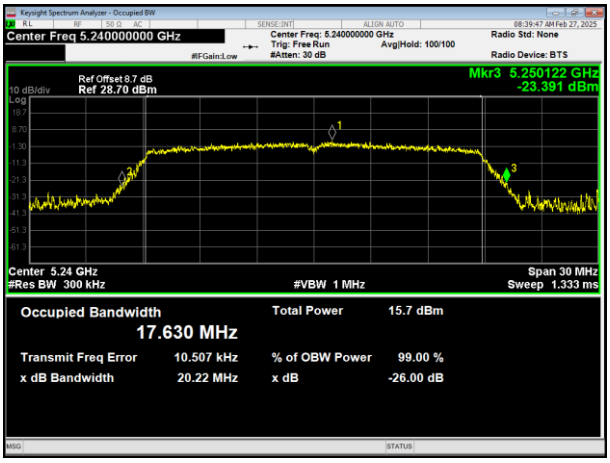
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

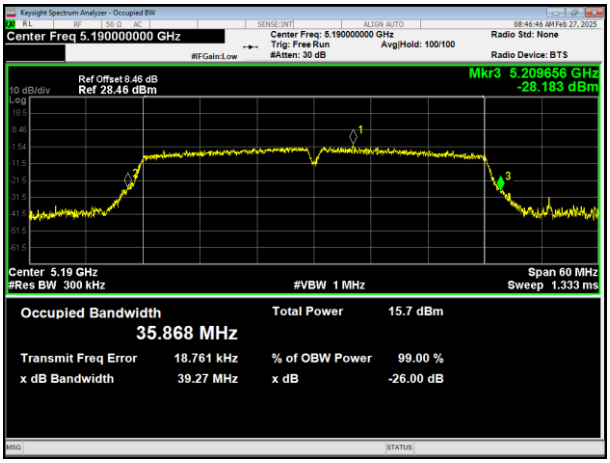
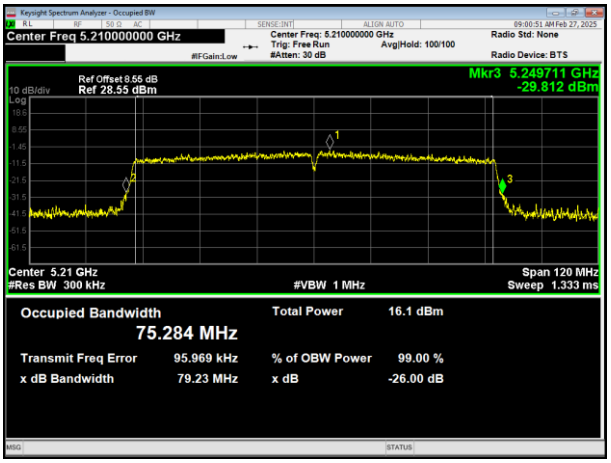
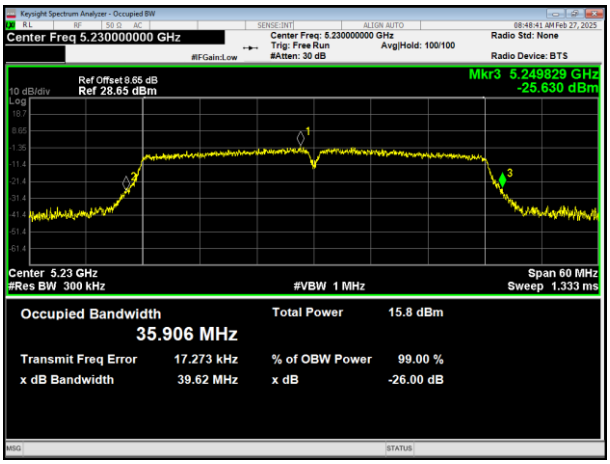
6.1.5. TEST RESULTS

		Test Channel	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Result
Band 1	802.11a	Low	19.37	16.388	Pass
		Middle	19.53	16.383	Pass
		High	19.74	16.376	Pass
	802.11n HT20	Low	20.17	17.554	Pass
		Middle	20.48	17.556	Pass
		High	20.50	17.560	Pass
	802.11n HT40	Low	39.92	36.005	Pass
		High	40.64	35.950	Pass
	802.11ac HT20	Low	20.47	17.540	Pass
		Middle	20.15	17.560	Pass
		High	20.22	17.539	Pass
	802.11ac HT40	Low	39.27	35.946	Pass
		High	39.62	35.936	Pass
	802.11ac HT80	/	79.23	75.218	Pass

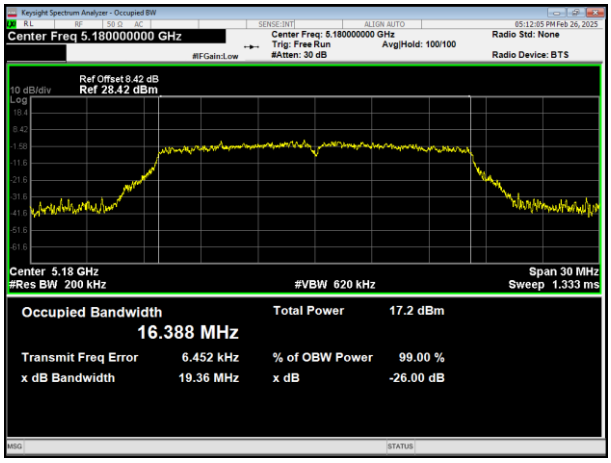
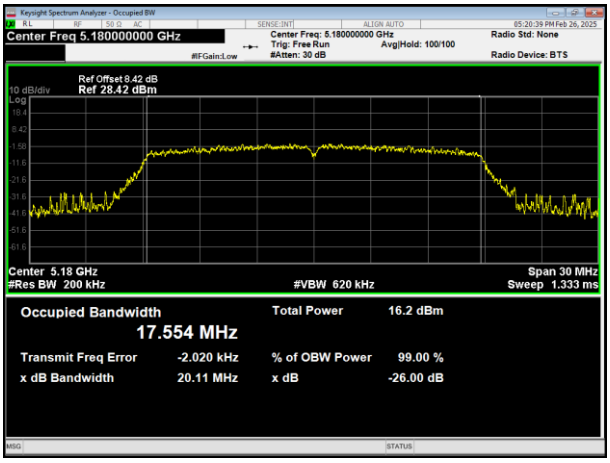
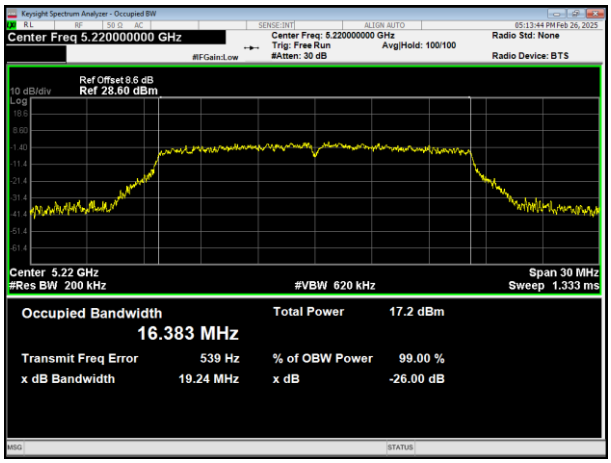
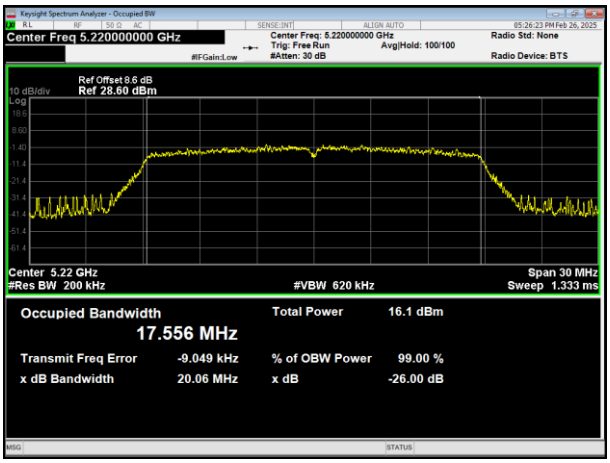
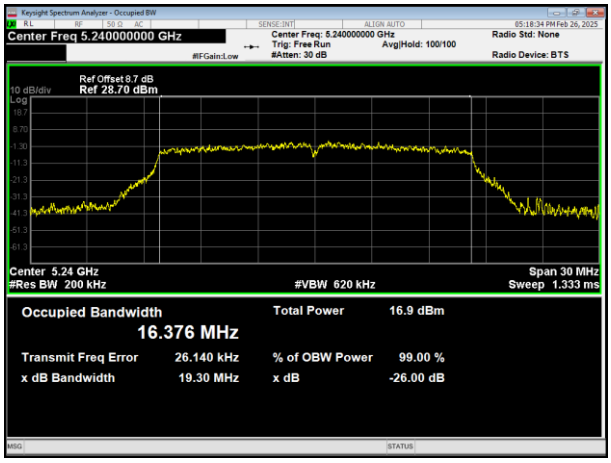
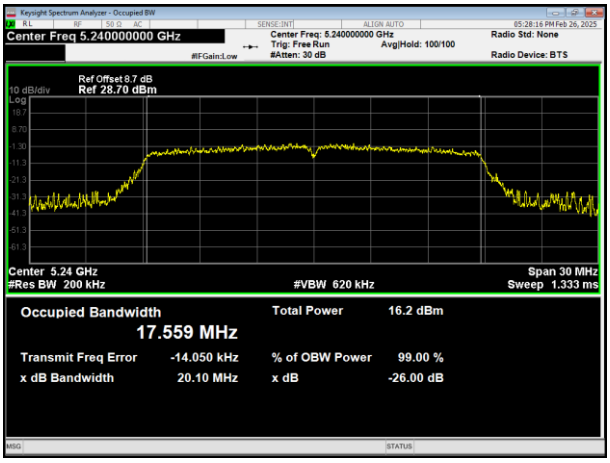
26dB Bandwidth

802.11a	802.11n HT20
	
5180MHz	5180MHz
	
5200MHz	5200MHz
	
5240MHz	5240MHz

802.11n HT40	802.11ac HT20
	
5190MHz	5180MHz
	
5230MHz	5200MHz
	
	5240MHz

802.11ac HT40	802.11ac HT80
	
5190MHz	5210MHz
	
5230MHz	

99% Bandwidth

802.11a	802.11n HT20
	
5180MHz	5180MHz
	
5200MHz	5200MHz
	
5240MHz	5240MHz