FCC TEST REPORT
FCC ID:2BOM3-X1

Report Number.....:	**DLE-250407006R**
Date of Test.....	Mar. 24, 2025 to Mar. 31, 2025
Date of issue.....:	Mar. 31, 2025
Total number of pages.....	94
Test Result .....:	PASS
Testing Laboratory.....:	**Shenzhen DL Testing Technology Co., Ltd.**
Address .....:	101-201, Building C, Shuanghuan, No.8, Baoqing Roa Baolong Industrial Zone, Baolong Street, Longgang Shenzhen, Guangdong, China
Applicant's name .....:	**Shenzhen Shunruyi Electronics Co., Ltd**
Address .....:	401, Building 1, Haoerjia Shitai Technology Park, No. 164 Fengtang Avenue, Zhancheng Community, Fuhai Street, Bao'an District, Shenzhen, China
Manufacturer's name .....:	**Shenzhen Shunruyi Electronics Co., Ltd**
Address .....:	401, Building 1, Haoerjia Shitai Technology Park, No. 164 Fengtang Avenue, Zhancheng Community, Fuhai Street, Bao'an District, Shenzhen, China
Test specification:	
Standard.....:	FCC CFR Title 47 Part 15 Subpart E Section 15.407 ANSI C63.10:2013 KDB 789033 D02 v02r01
Test procedure.....:	/
Non-standard test method .....:	N/A
Test Report Form No.....:	TRF-EL-113_V0
Test Report Form(s) Originator.....:	DL Testing
Master TRF .....:	Dated: 2020-01-06

This device described above has been tested by DL, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
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Product name.....:	**Network set-top box**
Trademark .....:	N/A
Model/Type reference.....:	X1 X7, X8, X9
Ratings.....:	Input: 12V⎓1A AC/DC Adapter Input: 100-240V ~ 50/60Hz, 0.5A

Testing procedure and testing location:

Testing Laboratory..... :	**Shenzhen DL Testing Technology Co., Ltd.**
Address..... :	101-201, Building C, Shuanghuan, No.8, Baoqing Roa Baolong Industrial Zone, Baolong Street, Longgang Shenzhen, Guangdong, China
Tested by (name + signature)..... :	Jim Liu
Reviewer (name + signature)..... :	Jackson Fang
Approved (name + signature)..... :	Jade Yang

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1. VERSION

Report No.	Version	Description	Approved
DLE-250407006R	Rev.01	Initial issue of report	Mar. 31, 2025

2. 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	AC Power Line Conducted Emission	PASS	
789033 D02 General U-NII	Duty Cycle	PASS	
15.209(a) 15.407 (b)(1) 15.407 (b)(4) 15.407 (b)(8)	Spurious Radiated Emissions	PASS	
15.407 (a)(12) 15.407(e)	26dB Emission Bandwidth & 6dB Occupied Bandwidth	PASS	
15.407 (a)(1) 15.407 (a)(3)	Maximum Conducted Output Power	PASS	
2.1051, 15.407(b)(1) 15.407(b)(4)	Band Edge	PASS	
15.407 (a)(1) 15.407 (a)(3)	Power Spectral Density	PASS	
2.1051, 15.407(b)	Spurious Emissions at Antenna Terminals	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

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

2.1 TEST FACILITY

Shenzhen DL Testing Technology Co., Ltd.
Add. : 101-201, Building C, Shuanghuan, No.8, Baoqing Roa Baolong Industrial Zone, Baolong Street, Longgang Shenzhen, Guangdong, China

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

2.2 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	3m camber Radiated spurious emission(9KHz-30MHz)	U=4.5dB
2	3m camber Radiated spurious emission(30MHz-1GHz)	U=4.8dB
3	3m chamber Radiated spurious emission(1GHz-6GHz)	U=4.9dB
4	3m chamber Radiated spurious emission(6GHz-40GHz)	U=5.0dB
5	Conducted disturbance	U=3.2dB
6	RF Band Edge	U=1.68dB
7	RF power conducted	U=1.86dB
8	RF conducted Spurious Emission	U=2.2dB
9	RF Occupied Bandwidth	U=1.8MHz
10	RF Power Spectral Density	U=1.75dB
11	humidity uncertainty	U=5.3%
12	Temperature uncertainty	U=0.59℃

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Product Name:	Network set-top box		
Model No.:	X1		
Serial Model:	X7, X8, X9		
Model Different.:	All the model are the same circuit and RF module,Only the model name different.		
Hardware Version:	V1.0		
Software Version:	V1.1		
Sample ID	E-1		
Sample(s) Status:	Engineer sample		
Product Description:	IEEE 802.11 WLAN Mode Supported	☒ 802.11a/n/ac	
	Data Rate	802.11a: 6/9/12/24/18/36/48/54Mbit/s 802.11n: MCS0-MCS7 802.11ac: MCS0-MCS9	
	Modulation	802.11a/n/ac: Orthogonal Frequency Division Multiplexing(OFDM)	
	Operating Frequency Range	☒ 5180-5240MHz for 802.11a/n/ac (20M); ☒ 5190-5230MHz for 802.11n/ac (40M); ☒ 5210MHz for 802.11 ac (80M); ☒ 5745-5825 MHz for 802.11a/n/ac (20M); ☒ 5755-5795 MHz for 802.11n/ac (40M); ☒ 5775MHz for 802.11 ac (80M).	
	Number of Channels	☒ 4 channels for 802.11 a/n/ac (20M) in the 5180-5240MHz band; ☒ 2 channels for 802.11 n/ac (40M) in the 5190-5230 MHz band; ☒ 1 channels for 802.11 ac (80M) in the 5210MHz band; ☒ 5 channels for 802.11 a/n/ac (20M) in the 5745-5825MHz band; ☒ 2 channels for 802.11 n/ac (40M) in the 5755-5795 MHz band; ☒ 1 channels for 802.11 ac (80M) in the 5775MHz band.	
Channel List	Please refer to the Note 2.		
Antenna Type:	FPC Antenna		
Antenna gain:	Band	5.2G	5.8G
	Gain	2.88dBi	3.46dBi
Power Supply:	Input: 12V⎓1A		
AC/DC Adapter:	Input: 100-240V ~ 50/60Hz, 0.5A Output: 12V⎓1A		
AC/DC Adapter Model:	GDZ-003		

Note:
For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

802.11a/n/ac(20MHz) Frequency Channel For 5.2G							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	40	5200	44	5220	48	5240

802.11n/ac(40MHz) Frequency Channel For 5.2G							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	46	5230	-	-	-	-

802.11ac(80MHz) Frequency Channel For 5.2G							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210			-	-	-	-

802.11a/n/ac(20MHz) Frequency Channel For 5.8G							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	153	5765	157	5785	161	5805
165	5825	-	-	-	-	-	-

802.11n/ac(40MHz) Frequency Channel For 5.8G							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795	-	-	-	-

802.11ac(80MHz) Frequency Channel For 5.8G							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
155	5775			-	-	-	-

3.2 DESCRIPTION OF TEST MODES

Pretest Mode	Description
Mode 1	802.11 a/n/ac (20M) CH 36/CH 40/CH 48 For 5.2G CH 149/CH 157/CH 165 For 5.8G
Mode 2	802.11 n/ac (40M) CH 38/CH 46 For 5.2G CH 151/CH 159 For 5.8G
Mode 3	802.11 ac (80M) CH 42 For 5.2G CH 155 For 5.8G

Final Test Mode	For Conducted Emission
	Description
Mode 1	802.11 a/n/ac (20M) CH 36/CH 40/CH 48 For 5.2G CH 149/CH 157/CH 165 For 5.8G
Mode 2	802.11 n/ac (40M) CH 38/CH 46 For 5.2G CH 151/CH 159 For 5.8G
Mode 3	802.11 ac (80M) CH 42 For 5.2G CH 155 For 5.8G

Final Test Mode	For Radiated Emission
	Description
Mode 1	802.11 a/n/ac (20M) CH 36/CH 40/CH 48 For 5.2G CH 149/CH 157/CH 165 For 5.8G
Mode 2	802.11 n/ac (40M) CH 38/CH 46 For 5.2G CH 151/CH 159 For 5.8G
Mode 3	802.11 ac (80M) CH 42 For 5.2G CH 155 For 5.8G

Transmitting mode	Keep the EUT in continuously transmitting mode
Remark: 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.	

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

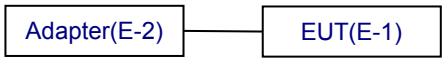
Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.

Mode	802.11a	802.11n20/n40	802.11ac20/ac40/ac80
Data rate	6Mbps	MCS0(HT0)	MCS0(VHT0)

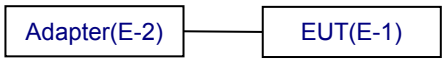
Test Software	CMD
Power level setup	Default

3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

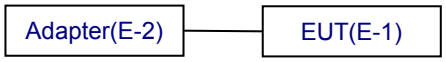
Conducted Emission



Radiated Emission



Conducted Spurious



3.4 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	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Network set-top box	N/A	X1	N/A	EUT
E-2	AC/DC Adapter	N/A	GDZ-003	N/A	Auxiliary

Item	Shielded Type	Ferrite Core	Length	Note

Note:

(1) The support equipment was authorized by Declaration of Confirmation.

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

3.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Conduction Emissions Test

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Last calibration	Calibrated until
1	LISN	R&S	ENV216	101471	N/A	Sep. 30, 2024	Sep. 29, 2025
2	LISN	CYBERTEK	EM5040A	E1850400149	N/A	Sep. 30, 2024	Sep. 29, 2025
3	Test Cable	N/A	C-01	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
4	EMI Test Receiver	R&S	ESCI3	101393	4.42 SP3	Sep. 29, 2024	Sep. 28, 2025
5	EMC Software	Frad	EZ-EMC	Ver.EMC-CON 3A1.1	N/A	\	\

Radiation Emissions & Radiation Spurious Emissions Test

Item	Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	KEYSIGHT	N9020A	MY55370835	A.17.05	Sep. 29, 2024	Sep. 28, 2025
2	Spectrum Analyzer (10kHz-39.9GHz)	R&S	FSV40-N	100363	1.71 SP2	Sep. 30, 2024	Sep. 29, 2025
3	EMI Test Receiver (9kHz-7GHz)	R&S	ESCI7	100969	4.32	Sep. 29, 2024	Sep. 28, 2025
4	Bilog Antenna (30MHz-1500MHz)	Schwarzbeck	VULB9168	00877	N/A	Sep. 30, 2024	Sep. 29, 2025
5	Horn Antenna (1GHz-18GHz)	Agilent	AH-118	071145	N/A	Sep. 30, 2024	Sep. 29, 2025
6	Horn Antenna (15GHz-40GHz)	A.H.System	SAS-574	588	N/A	Sep. 30, 2024	Sep. 29, 2025
7	Loop Antenna	TESEQ	HLA6121	58357	N/A	Oct. 11, 2024	Oct. 10, 2025
8	Amplifier (30-1000MHz)	EM Electronics	EM330 Amplifier	60747	N/A	Sep. 29, 2024	Sep. 28, 2025
9	Amplifier (1GHz-26.5GHz)	HuiPu	8449B	3008A00315	N/A	Sep. 29, 2024	Sep. 28, 2025
10	Amplifier (500MHz-40GHz)	QuanJuDa	DLE-161	097	N/A	Sep. 30, 2024	Sep. 29, 2025
11	Test Cable	N/A	R-01	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
12	Test Cable	N/A	R-02	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
13	Test Cable	N/A	R-03	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
14	D.C. Power Supply	LongWei	TPR-6405D	GQ7516	N/A	Sep. 29, 2024	Sep. 28, 2025
15	EMC Software	Frad	EZ-EMC	Ver.EMC-CO N 3A1.1	N/A	\	\
16	Turntable	MF	MF-7802BS	N/A	N/A	\	\
17	Antenna tower	MF	MF-7802BS	N/A	N/A	\	\

RF Conducted Test

Item	Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	KEYSIGHT	N9020A	MY55370835	A.17.05	Sep. 29, 2024	Sep. 28, 2025
2	Spectrum Analyzer (10kHz-39.9GHz)	R&S	FSV40-N	100363	1.71 SP2	Sep. 30, 2024	Sep. 29, 2025
3	Test Cable	N/A	RF-01	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
4	Test Cable	N/A	RF-02	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
5	Test Cable	N/A	RF-03	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
6	ESG Signal Generator	Agilent	E4421B	GB40051203	B.03.84	Sep. 29, 2024	Sep. 28, 2025
7	Signal Generator	Agilent	N5182A	MY47420215	A.01.87	Sep. 29, 2024	Sep. 28, 2025
8	Magnetic Field Probe Tester	Narda	ELT-400	0-0344/M-1752	N/A	Sep. 29, 2024	Sep. 28, 2025
9	Van der Hoofden measuring head	Schwarzbeck Mess-elektronik	VDHH 9502	9502-039	N/A	Sep. 30, 2024	Sep. 29, 2025
10	Wideband Radio Communication Test	R&S	CMW500	106504	V 3.7.22	Sep. 30, 2024	Sep. 29, 2025
11	MWRF Power Meter Test system	MW	MW100-RFCB	10371	N/A	Sep. 29, 2024	Sep. 28, 2025
12	Power Meter	KEYSIGHT	N1912AP	926431	A.05.00	Sep. 29, 2024	Sep. 28, 2025
13	D.C. Power Supply	LongWei	TPR-6405D	GQ7516	N/A	Sep. 29, 2024	Sep. 28, 2025
14	RF Software	MW	MTS8310	V2.0.0.0	N/A	\	\

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10:2013
Test Frequency Range:	150KHz to 30MHz
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto

4.1.1 POWER LINE CONDUCTED EMISSION LIMITS

FREQUENCY (MHz)	Limit (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

(1) *Decreases with the logarithm of the frequency.

4.1.2 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.

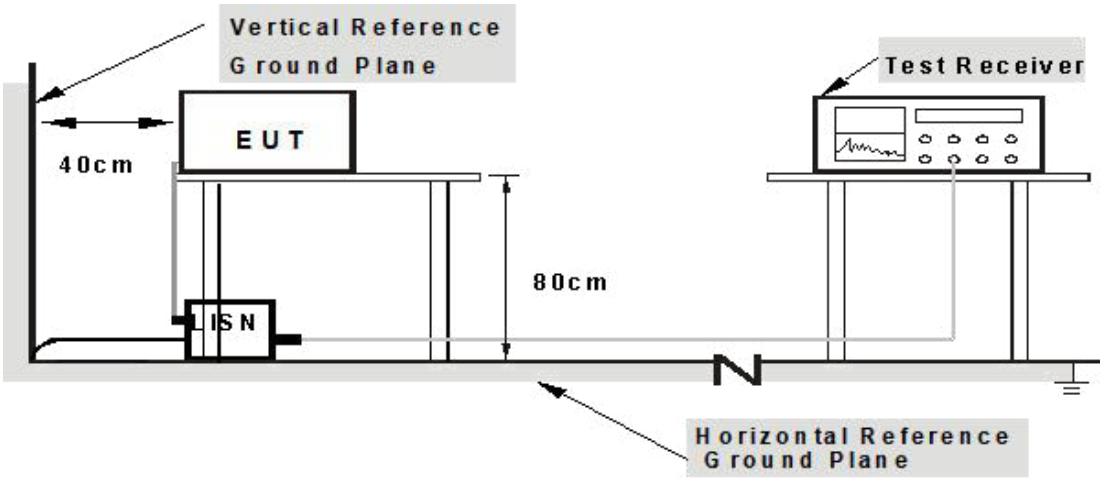
d. LISN at least 80 cm from nearest part of EUT chassis.

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

4.1.3 DEVIATION FROM TEST STANDARD

No deviation

4.1.4 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

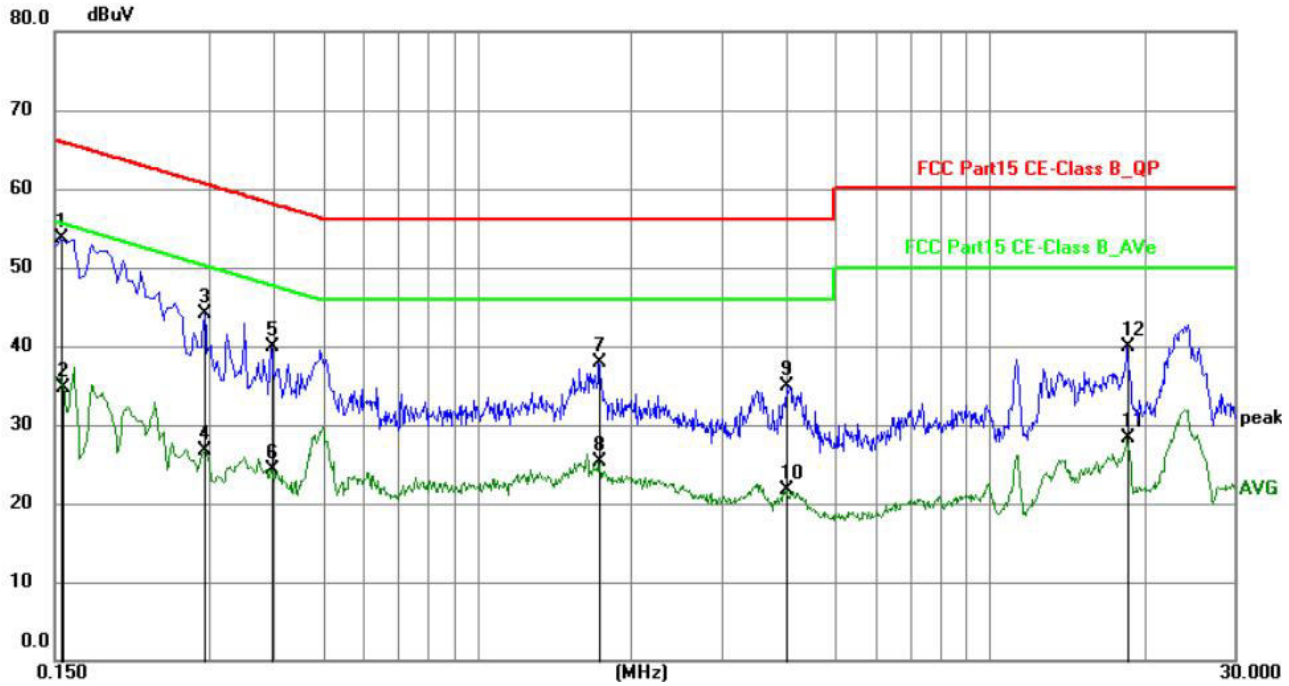
4.1.5 EUT OPERATING CONDITIONS

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.

4.1.6 TEST RESULT

5.2G:

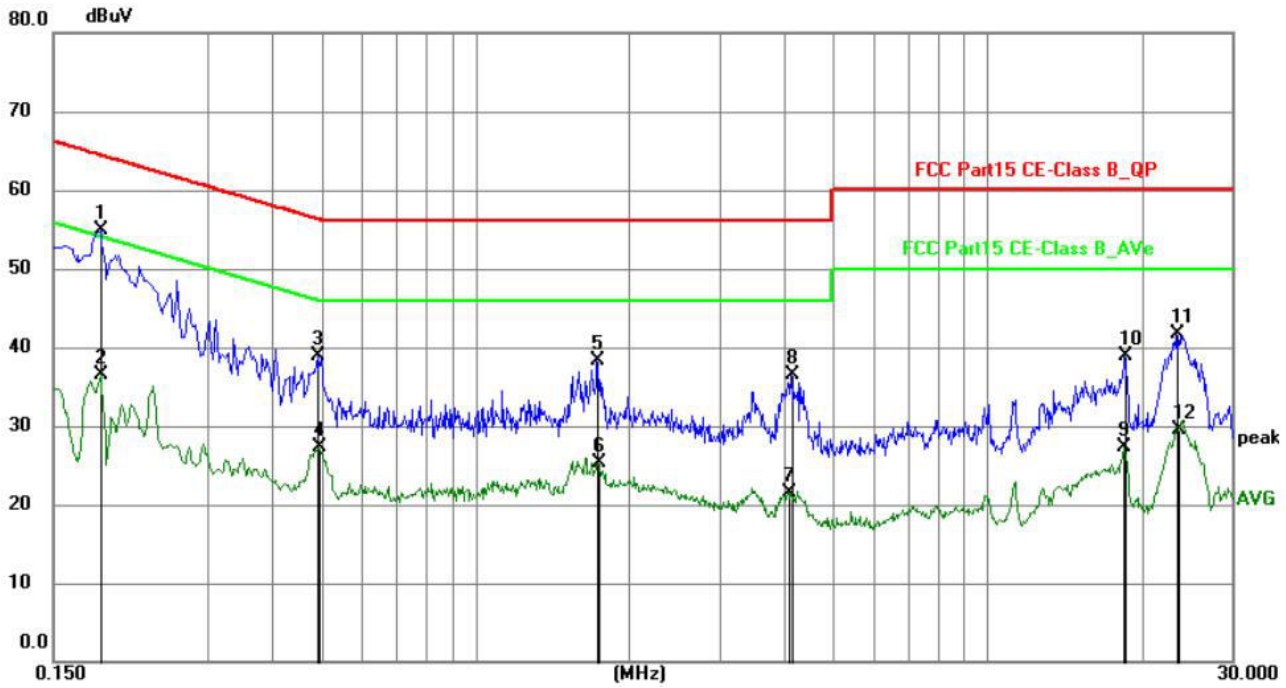
Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	L
Test Voltage:	AC 120V/60Hz	Test Mode:	802.11n20 - 5180MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1544	33.47	20.20	53.67	65.76	-12.09	QP	P	
2	0.1554	14.57	20.20	34.77	55.71	-20.94	AVG	P	
3	0.2938	23.78	20.35	44.13	60.42	-16.29	QP	P	
4	0.2938	6.31	20.35	26.66	50.42	-23.76	AVG	P	
5	0.3975	19.49	20.32	39.81	57.91	-18.10	QP	P	
6	0.3975	4.05	20.32	24.37	47.91	-23.54	AVG	P	
7	1.7338	17.61	20.30	37.91	56.00	-18.09	QP	P	
8	1.7338	4.98	20.30	25.28	46.00	-20.72	AVG	P	
9	4.0155	14.59	20.34	34.93	56.00	-21.07	QP	P	
10	4.0155	1.28	20.34	21.62	46.00	-24.38	AVG	P	
11	18.5274	7.80	20.50	28.30	50.00	-21.70	AVG	P	
12	18.5275	19.40	20.50	39.90	60.00	-20.10	QP	P	

Notes:
1.An initial pre-scan was performed on the line and neutral lines with peak detector.
2.Quasi - Peak and Average measurement were performed at the frequencies with maximized peak emission.
3.Final Level = Reading level + Correct Factor.
4.Correct Factor = Lisn factor+ Cable loss factor + limiter factor.
5.Margin = Measurement Level-Limit.
6.The test data shows only the worst case TX 802.11n20 - 5180MHz.

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	N
Test Voltage:	AC 120V/60Hz	Test Mode:	802.11n20 - 5180MHz

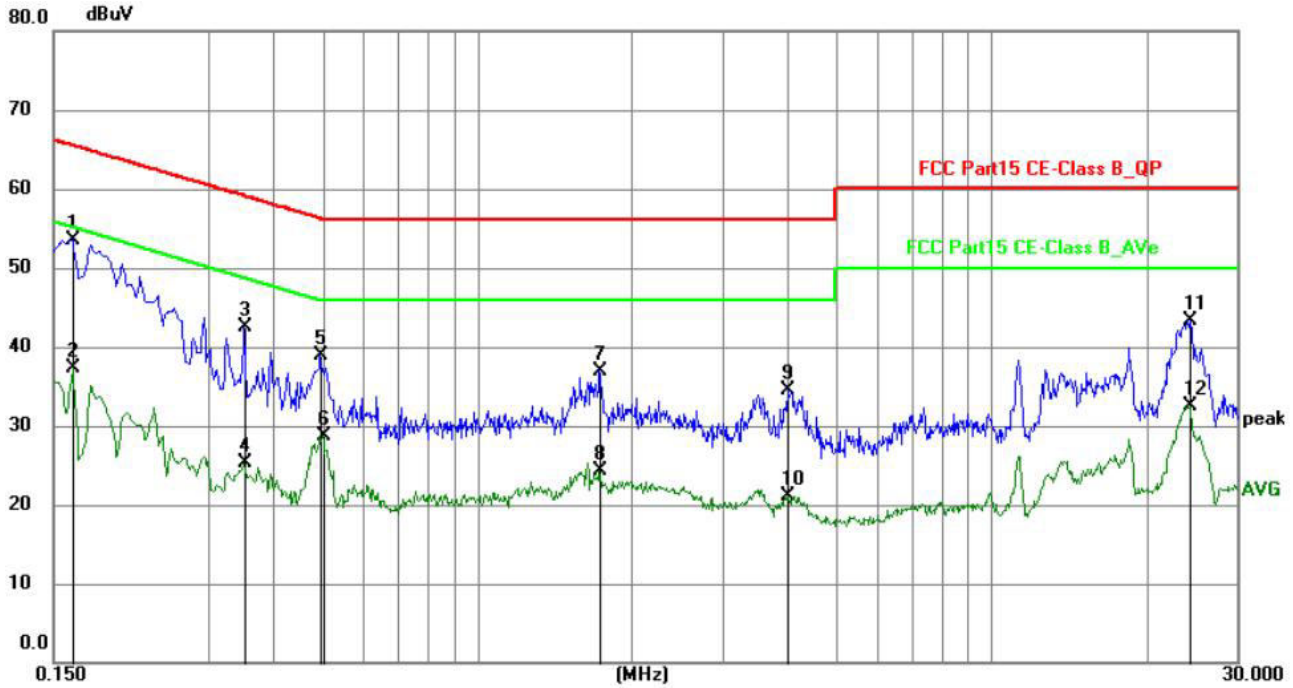


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1859	34.52	20.32	54.84	64.22	-9.38	QP	P	
2	0.1859	16.27	20.32	36.59	54.22	-17.63	AVG	P	
3	0.4919	18.55	20.30	38.85	56.14	-17.29	QP	P	
4	0.4964	6.94	20.30	27.24	46.06	-18.82	AVG	P	
5	1.7338	18.00	20.30	38.30	56.00	-17.70	QP	P	
6	1.7424	5.09	20.30	25.39	46.00	-20.61	AVG	P	
7	4.0830	1.23	20.34	21.57	46.00	-24.43	AVG	P	
8	4.1505	16.10	20.34	36.44	56.00	-19.56	QP	P	
9	18.4965	6.84	20.52	27.36	50.00	-22.64	AVG	P	
10	18.5320	18.31	20.52	38.83	60.00	-21.17	QP	P	
11	23.4690	21.01	20.62	41.63	60.00	-18.37	QP	P	
12	23.6310	8.81	20.63	29.44	50.00	-20.56	AVG	P	

Notes:
1.An initial pre-scan was performed on the line and neutral lines with peak detector.
2.Quasi - Peak and Average measurement were performed at the frequencies with maximized peak emission.
3.Final Level = Reading level + Correct Factor.
4.Correct Factor = Lisn factor+ Cable loss factor + limiter factor.
5.Margin = Measurement Level-Limit.
6.The test data shows only the worst case TX 802.11n20 - 5180MHz.

5.8G:

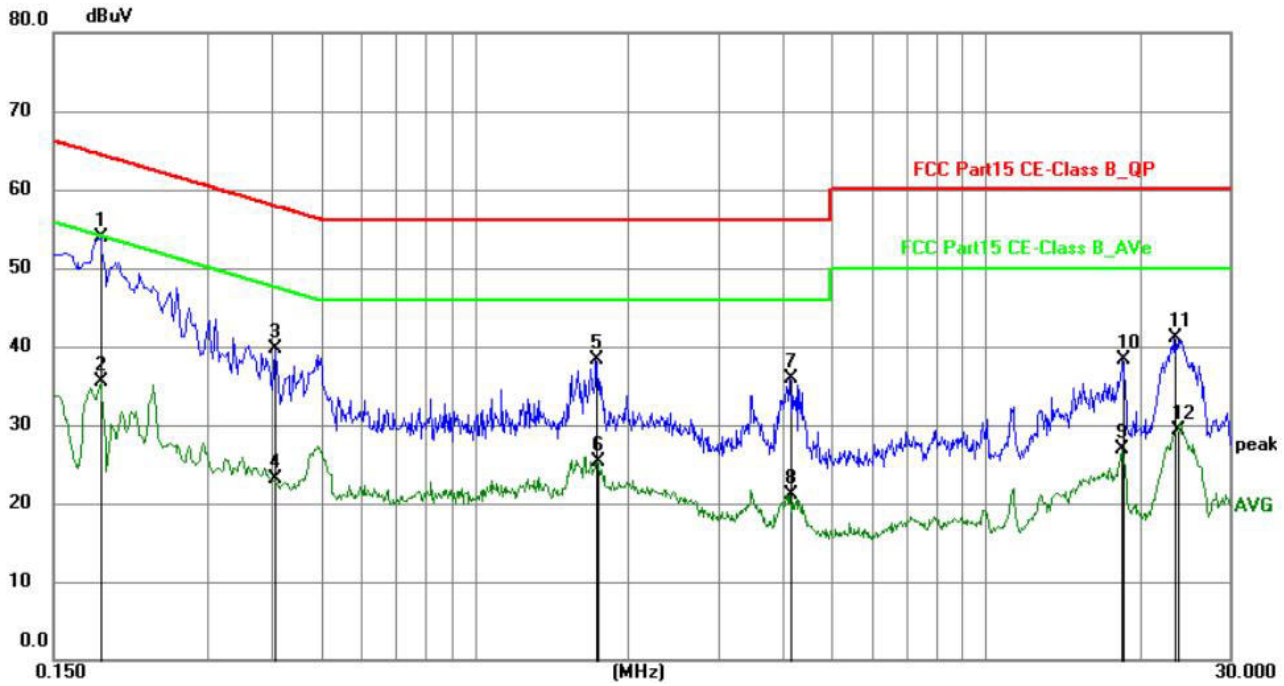
Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	L
Test Voltage:	AC 120V/60Hz	Test Mode:	802.11n20 - 5745MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1635	33.30	20.23	53.53	65.28	-11.75	QP	P	
2	0.1635	17.07	20.23	37.30	55.28	-17.98	AVG	P	
3	0.3523	22.14	20.33	42.47	58.91	-16.44	QP	P	
4	0.3523	5.05	20.33	25.38	48.91	-23.53	AVG	P	
5	0.4964	18.68	20.30	38.98	56.06	-17.08	QP	P	
6	0.5010	8.42	20.30	28.72	46.00	-17.28	AVG	P	
7	1.7338	16.61	20.30	36.91	56.00	-19.09	QP	P	
8	1.7338	3.98	20.30	24.28	46.00	-21.72	AVG	P	
9	4.0155	14.09	20.34	34.43	56.00	-21.57	QP	P	
10	4.0155	0.78	20.34	21.12	46.00	-24.88	AVG	P	
11	24.3060	22.60	20.62	43.22	60.00	-16.78	QP	P	
12	24.3060	11.84	20.62	32.46	50.00	-17.54	AVG	P	

Notes:
1.An initial pre-scan was performed on the line and neutral lines with peak detector.
2.Quasi - Peak and Average measurement were performed at the frequencies with maximized peak emission.
3.Final Level = Reading level + Correct Factor.
4.Correct Factor = Lisn factor+ Cable loss factor + limiter factor.
5.Margin = Measurement Level-Limit.
6.The test data shows only the worst case TX 802.11n20 - 5745MHz.

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	N
Test Voltage:	AC 120V/60Hz	Test Mode:	802.11n20 - 5745MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1859	33.52	20.32	53.84	64.22	-10.38	QP	P	
2	0.1859	15.27	20.32	35.59	54.22	-18.63	AVG	P	
3	0.4062	19.46	20.32	39.78	57.73	-17.95	QP	P	
4	0.4062	2.88	20.32	23.20	47.73	-24.53	AVG	P	
5	1.7338	18.00	20.30	38.30	56.00	-17.70	QP	P	
6	1.7423	5.09	20.30	25.39	46.00	-20.61	AVG	P	
7	4.1505	15.60	20.34	35.94	56.00	-20.06	QP	P	
8	4.1505	0.72	20.34	21.06	46.00	-24.94	AVG	P	
9	18.4965	6.34	20.52	26.86	50.00	-23.14	AVG	P	
10	18.5320	17.81	20.52	38.33	60.00	-21.67	QP	P	
11	23.4690	20.51	20.62	41.13	60.00	-18.87	QP	P	
12	23.7525	8.58	20.63	29.21	50.00	-20.79	AVG	P	

Notes:
1.An initial pre-scan was performed on the line and neutral lines with peak detector.
2.Quasi - Peak and Average measurement were performed at the frequencies with maximized peak emission.
3.Final Level = Reading level + Correct Factor.
4.Correct Factor = Lisn factor+ Cable loss factor + limiter factor.
5.Margin = Measurement Level-Limit.
6.The test data shows only the worst case TX 802.11n20 - 5745MHz.

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 APPLICABLE STANDARD

According to FCC Part 15.407(d) and 15.209

4.2.2 CONFORMANCE LIMIT

According to FCC Part 15.407(b)(7): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

According to FCC Part15.205, Restricted bands

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			

.

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009~0.490	2400/F(KHz)	20 log (uV/m)	300
0.490~1.705	2400/F(KHz)	20 log (uV/m)	30
1.705~30.0	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Limits of Radiated Emission Measurement(Above 1000MHz)

Frequency(MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

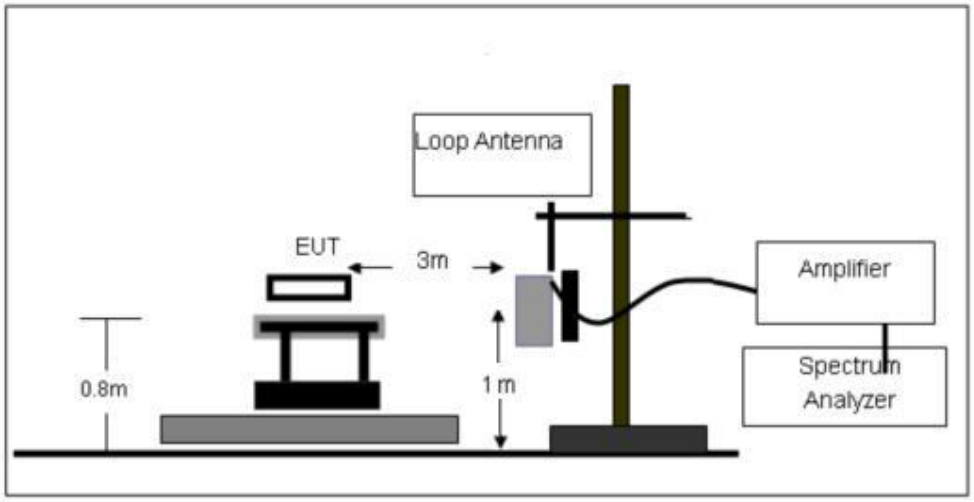
Remark :1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

4.2.3 MEASURING INSTRUMENTS

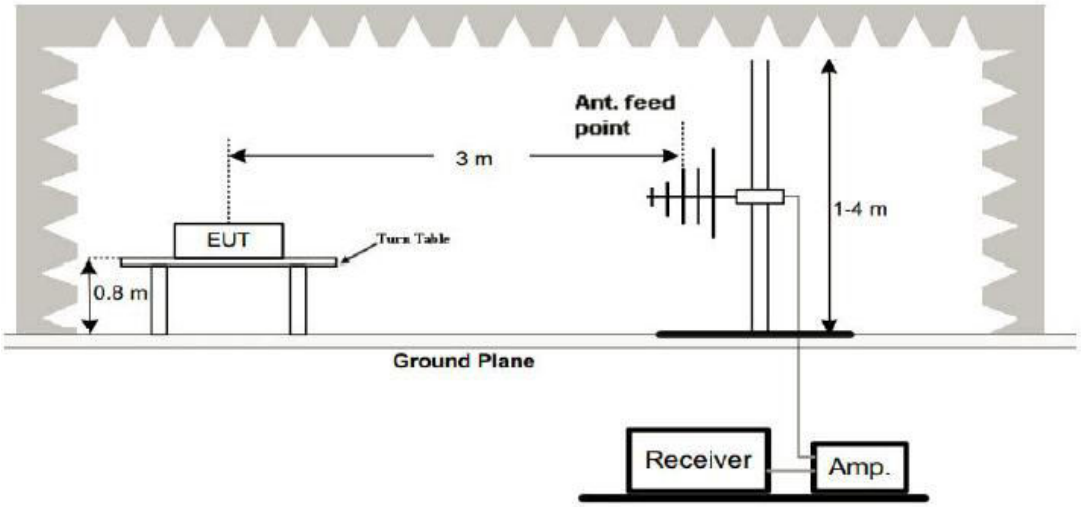
The Measuring equipment is listed in the section 3.5 of this test report.

4.2.4 TEST CONFIGURATION

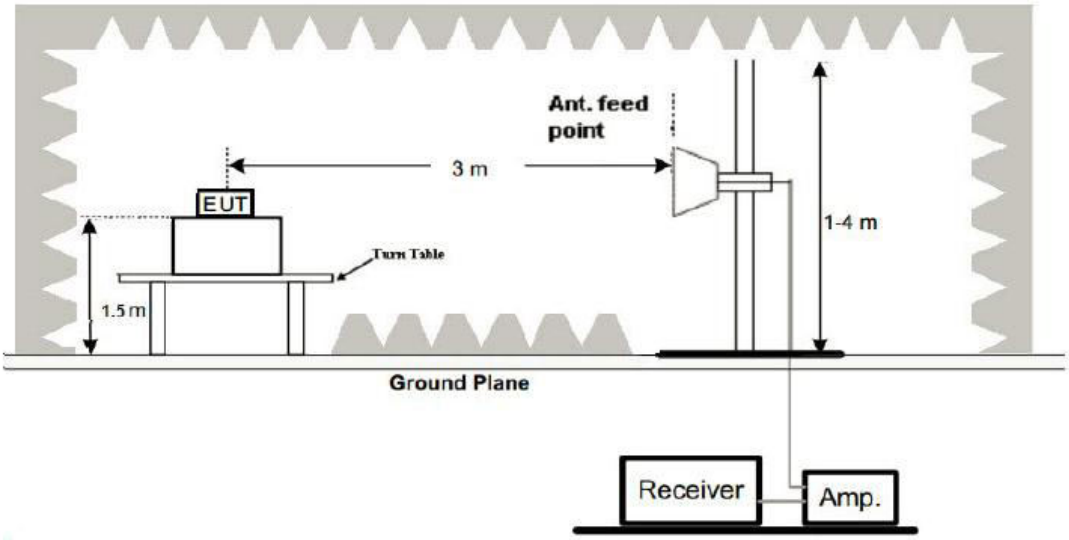
1.For radiated emissions below 30MHz



2.For radiated emissions from 30MHz to 1000MHz



3. Radiated Emission Test-Up Frequency Above 1GHz



4.2.5 TEST PROCEDURE

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10-2013. The test distance is 3m.The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.
This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT.
Use the following spectrum analyzer settings:

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
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

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item – EUT Test Photos.

Note:

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

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

Note: for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where RBWCF [dB] =10*lg(100 [kHz]/narrower RBW [kHz]). , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

4.2.6 TEST RESULT

Between 9KHz – 30MHz

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) the test result no need to reported.

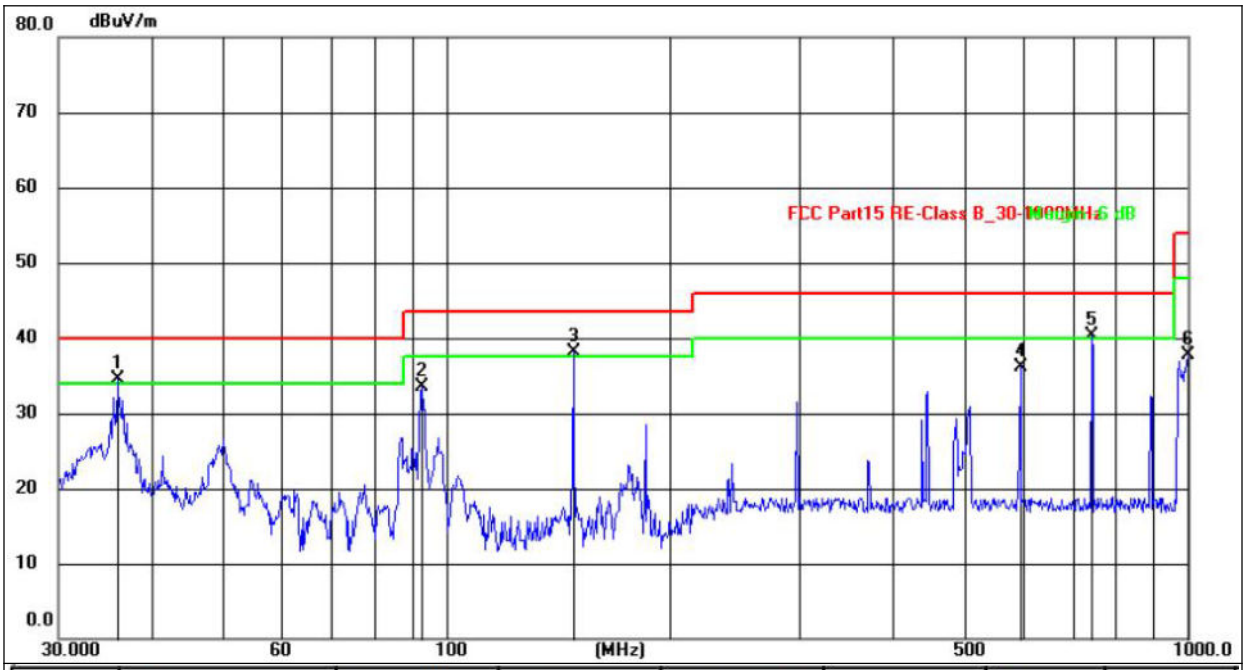
5.2G Between 30MHz – 1GHz:

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	DC 12V	Test Mode :	TX 802.11n20 - 5180MHz

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	148.4410	51.66	-16.40	35.26	43.50	-8.24	QP
2	185.7880	54.07	-17.85	36.22	43.50	-7.28	QP
3	245.0900	54.25	-15.73	38.52	46.00	-7.48	QP
4	446.4139	50.91	-13.72	37.19	46.00	-8.81	QP
5	595.1326	48.59	-8.52	40.07	46.00	-5.93	QP
6	893.8564	46.78	-6.69	40.09	46.00	-5.91	QP

Note:
1.An initial pre-scan was performed on the peak detector.
2.Quasi-Peak measurement were performed at the frequencies with maximized peak emission.
3.The emission levels of other frequencies are very lower than the limit and not show in test report.
4.Final Level = Reading level + Correct Factor.
5.Correct Factor = Antenna factor+ Cable loss factor - Amplifier factor.
6.Margin= Measurement Level-Limit.
7.The test data shows only the worst case TX 802.11n20 - 5180MHz.

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	DC 12V	Test Mode :	TX 802.11n20 - 5180MHz

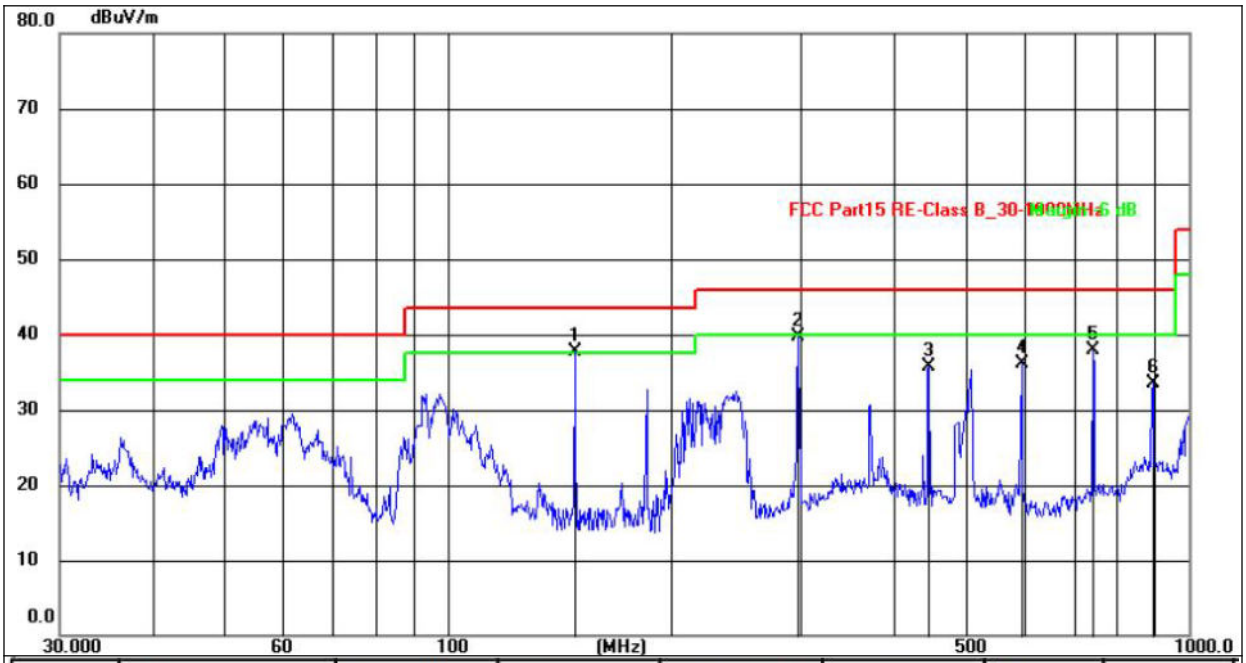


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	36.0007	51.94	-17.35	34.59	40.00	-5.41	QP
2	92.7870	54.85	-21.29	33.56	43.50	-9.94	QP
3	148.4410	58.53	-20.40	38.13	43.50	-5.37	QP
4	595.1326	43.64	-7.51	36.13	46.00	-9.87	QP
5	742.2586	45.99	-5.65	40.34	46.00	-5.66	QP
6	1000.0000	37.56	0.09	37.65	54.00	-16.35	QP

Note:
1.An initial pre-scan was performed on the peak detector.
2.Quasi-Peak measurement were performed at the frequencies with maximized peak emission.
3.The emission levels of other frequencies are very lower than the limit and not show in test report.
4.Final Level = Reading level + Correct Factor.
5.Correct Factor = Antenna factor+ Cable loss factor - Amplifier factor.
6.Margin= Measurement Level-Limit.
7.The test data shows only the worst case TX 802.11n20 - 5180MHz.

5.8G Between 30MHz – 1GHz:

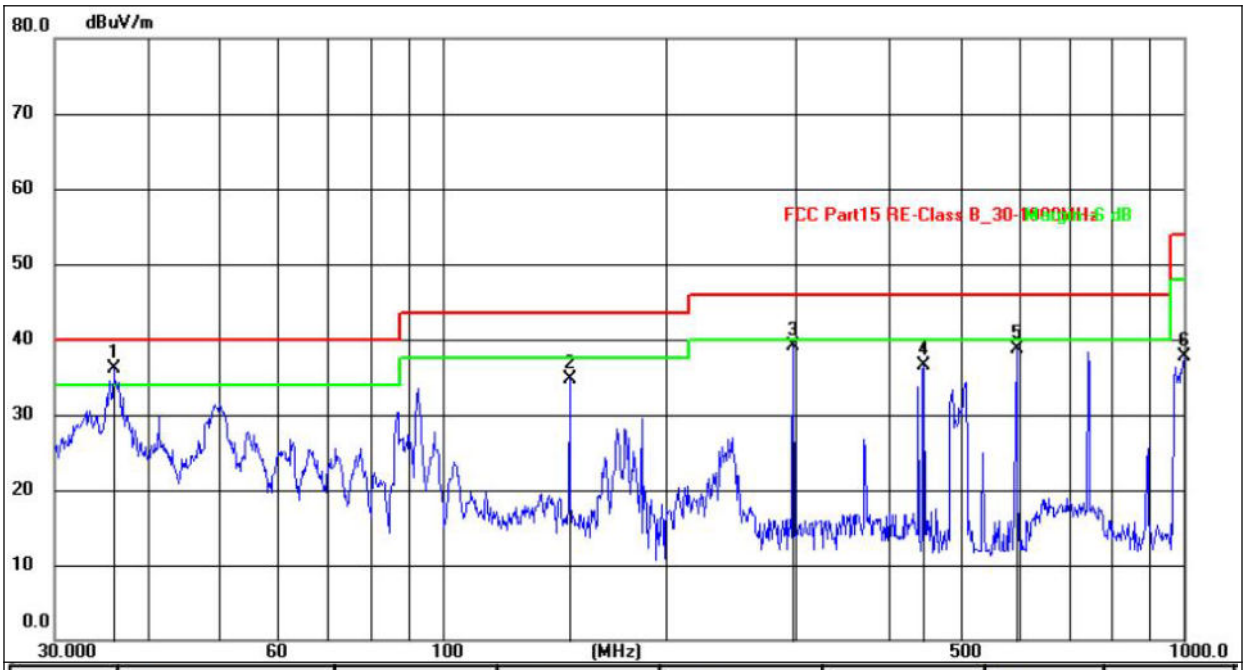
Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	DC 12V	Test Mode :	TX 802.11n20 - 5745MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	148.4410	54.16	-16.40	37.76	43.50	-5.74	QP
2	297.2238	55.91	-16.18	39.73	46.00	-6.27	QP
3	446.4139	49.41	-13.72	35.69	46.00	-10.31	QP
4	595.1326	44.59	-8.52	36.07	46.00	-9.93	QP
5	742.2586	44.44	-6.53	37.91	46.00	-8.09	QP
6	893.8564	40.28	-6.69	33.59	46.00	-12.41	QP

Note:
1.An initial pre-scan was performed on the peak detector.
2.Quasi-Peak measurement were performed at the frequencies with maximized peak emission.
3.The emission levels of other frequencies are very lower than the limit and not show in test report.
4.Final Level = Reading level + Correct Factor.
5.Correct Factor = Antenna factor+ Cable loss factor - Amplifier factor.
6.Margin= Measurement Level-Limit.
7.The test data shows only the worst case TX 802.11n20 - 5745MHz.

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	DC 12V	Test Mode :	TX 802.11n20 - 5745MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	36.0007	53.44	-17.35	36.09	40.00	-3.91	QP
2	148.4410	55.03	-20.40	34.63	43.50	-8.87	QP
3	297.2238	57.01	-17.98	39.03	46.00	-6.97	QP
4	446.4139	49.36	-12.87	36.49	46.00	-9.51	QP
5	595.1326	46.14	-7.51	38.63	46.00	-7.37	QP
6	1000.0000	37.56	0.09	37.65	54.00	-16.35	QP

Note:
1.An initial pre-scan was performed on the peak detector.
2.Quasi-Peak measurement were performed at the frequencies with maximized peak emission.
3.The emission levels of other frequencies are very lower than the limit and not show in test report.
4.Final Level = Reading level + Correct Factor.
5.Correct Factor = Antenna factor+ Cable loss factor - Amplifier factor.
6.Margin= Measurement Level-Limit.
7.The test data shows only the worst case TX 802.11n20 - 5745MHz.

5.2G Between 1GHz – 40GHz

Temperature :	26℃	Relative Humidity :	54%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	5.2G TX - 802.11a/n20/n40/ac20/ac40/ac80		
Note: All patterns have been tested, and only the worst test data recorded in this report is 802.11a/n20/ac20.			

802.11a

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel:5180MHz									
V	5150.00	44.33	30.45	8.77	38.66	61.31	74.00	-12.69	PK
V	5150.00	30.77	30.45	8.77	38.66	47.75	54.00	-6.25	AV
V	10360.00	48.87	30.55	5.77	24.66	48.75	68.20	-19.45	PK
V	10360.00	34.19	30.55	5.77	24.66	34.07	54.00	-19.93	AV
V	15540.00	51.08	30.33	6.32	24.55	51.62	74.00	-22.38	PK
V	15540.00	36.59	30.33	6.32	24.55	37.13	54.00	-16.87	AV
V	20720.00	52.10	30.85	7.45	24.69	53.39	74.00	-20.61	PK
V	20720.00	37.67	30.85	7.45	24.69	38.96	54.00	-15.04	AV
V	25900.00	53.16	31.02	8.99	25.57	56.70	68.20	-11.50	PK
V	25900.00	37.74	31.02	8.99	25.57	41.28	54.00	-12.72	AV
H	5150.00	43.55	30.45	8.77	38.66	60.53	74.00	-13.47	PK
H	5150.00	31.25	30.45	8.77	38.66	48.23	54.00	-5.77	AV
H	10360.00	49.02	30.55	5.77	24.66	48.90	68.20	-19.30	PK
H	10360.00	35.23	30.55	5.77	24.66	35.11	54.00	-18.89	AV
H	15540.00	51.55	30.33	6.32	24.55	52.09	74.00	-21.91	PK
H	15540.00	37.50	30.33	6.32	24.55	38.04	54.00	-15.96	AV
H	20720.00	53.00	30.85	7.45	24.69	54.29	74.00	-19.71	PK
H	20720.00	38.04	30.85	7.45	24.69	39.33	54.00	-14.67	AV
H	25900.00	51.53	31.02	8.99	25.57	55.07	68.20	-13.13	PK
H	25900.00	37.67	31.02	8.99	25.57	41.21	54.00	-12.79	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Middle Channel:5200MHz									
V	5150.00	43.86	30.45	8.77	38.66	60.84	74.00	-13.16	PK
V	5150.00	31.34	30.45	8.77	38.66	48.32	54.00	-5.68	AV
V	10400.00	49.07	30.55	5.77	24.66	48.95	68.20	-19.25	PK
V	10400.00	33.88	30.55	5.77	24.66	33.76	54.00	-20.24	AV
V	15600.00	50.55	30.33	6.32	24.55	51.09	74.00	-22.91	PK
V	15600.00	36.67	30.33	6.32	24.55	37.21	54.00	-16.79	AV
V	20800.00	51.73	30.85	7.45	24.69	53.02	74.00	-20.98	PK
V	20800.00	38.31	30.85	7.45	24.69	39.60	54.00	-14.40	AV
V	26000.00	52.74	31.02	8.99	25.57	56.28	68.20	-11.92	PK
V	26000.00	37.53	31.02	8.99	25.57	41.07	54.00	-12.93	AV
H	5150.00	43.93	30.45	8.77	38.66	60.91	74.00	-13.09	PK
H	5150.00	31.03	30.45	8.77	38.66	48.01	54.00	-5.99	AV
H	10400.00	49.81	30.55	5.77	24.66	49.69	68.20	-18.51	PK
H	10400.00	36.16	30.55	5.77	24.66	36.04	54.00	-17.96	AV
H	15600.00	51.16	30.33	6.32	24.55	51.70	74.00	-22.30	PK

H	15600.00	36.95	30.33	6.32	24.55	37.49	54.00	-16.51	AV
H	20800.00	52.08	30.85	7.45	24.69	53.37	74.00	-20.63	PK
H	20800.00	37.75	30.85	7.45	24.69	39.04	54.00	-14.96	AV
H	26000.00	51.41	31.02	8.99	25.57	54.95	68.20	-13.25	PK
H	26000.00	38.05	31.02	8.99	25.57	41.59	54.00	-12.41	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
High Channel:5240MHz									
V	5350.00	43.62	30.45	8.77	38.66	60.60	74.00	-13.40	PK
V	5350.00	31.11	30.45	8.77	38.66	48.09	54.00	-5.91	AV
V	10480.00	48.94	30.55	5.77	24.66	48.82	68.20	-19.38	PK
V	10480.00	34.23	30.55	5.77	24.66	34.11	54.00	-19.89	AV
V	15720.00	50.92	30.33	6.32	24.55	51.46	74.00	-22.54	PK
V	15720.00	36.87	30.33	6.32	24.55	37.41	54.00	-16.59	AV
V	20960.00	51.48	30.85	7.45	24.69	52.77	74.00	-21.23	PK
V	20960.00	38.38	30.85	7.45	24.69	39.67	54.00	-14.33	AV
V	26200.00	52.81	31.02	8.99	25.57	56.35	68.20	-11.85	PK
V	26200.00	38.47	31.02	8.99	25.57	42.01	54.00	-11.99	AV
H	5350.00	44.43	30.45	8.77	38.66	61.41	74.00	-12.59	PK
H	5350.00	31.25	30.45	8.77	38.66	48.23	54.00	-5.77	AV
H	10480.00	49.91	30.55	5.77	24.66	49.79	68.20	-18.41	PK
H	10480.00	36.28	30.55	5.77	24.66	36.16	54.00	-17.84	AV
H	15720.00	51.98	30.33	6.32	24.55	52.52	74.00	-21.48	PK
H	15720.00	37.10	30.33	6.32	24.55	37.64	54.00	-16.36	AV
H	20960.00	52.63	30.85	7.45	24.69	53.92	74.00	-20.08	PK
H	20960.00	37.75	30.85	7.45	24.69	39.04	54.00	-14.96	AV
H	26200.00	51.61	31.02	8.99	25.57	55.15	68.20	-13.05	PK
H	26200.00	37.67	31.02	8.99	25.57	41.21	54.00	-12.79	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.

802.11n20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel:5180MHz									
V	5150.00	43.79	30.45	8.77	38.66	60.77	74.00	-13.23	PK
V	5150.00	30.97	30.45	8.77	38.66	47.95	54.00	-6.05	AV
V	10360.00	49.54	30.55	5.77	24.66	49.42	68.20	-18.78	PK
V	10360.00	34.14	30.55	5.77	24.66	34.02	54.00	-19.98	AV
V	15540.00	50.89	30.33	6.32	24.55	51.43	74.00	-22.57	PK
V	15540.00	37.30	30.33	6.32	24.55	37.84	54.00	-16.16	AV
V	20720.00	51.53	30.85	7.45	24.69	52.82	74.00	-21.18	PK
V	20720.00	38.10	30.85	7.45	24.69	39.39	54.00	-14.61	AV
V	25900.00	53.12	31.02	8.99	25.57	56.66	68.20	-11.54	PK
V	25900.00	37.71	31.02	8.99	25.57	41.25	54.00	-12.75	AV
H	5150.00	44.26	30.45	8.77	38.66	61.24	74.00	-12.76	PK
H	5150.00	30.61	30.45	8.77	38.66	47.59	54.00	-6.41	AV
H	10360.00	49.62	30.55	5.77	24.66	49.50	68.20	-18.70	PK
H	10360.00	35.36	30.55	5.77	24.66	35.24	54.00	-18.76	AV
H	15540.00	51.83	30.33	6.32	24.55	52.37	74.00	-21.63	PK
H	15540.00	36.80	30.33	6.32	24.55	37.34	54.00	-16.66	AV
H	20720.00	53.04	30.85	7.45	24.69	54.33	74.00	-19.67	PK
H	20720.00	38.92	30.85	7.45	24.69	40.21	54.00	-13.79	AV
H	25900.00	51.70	31.02	8.99	25.57	55.24	68.20	-12.96	PK
H	25900.00	37.59	31.02	8.99	25.57	41.13	54.00	-12.87	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Middle Channel:5200MHz									
V	5150.00	43.91	30.45	8.77	38.66	60.89	74.00	-13.11	PK
V	5150.00	30.35	30.45	8.77	38.66	47.33	54.00	-6.67	AV
V	10400.00	49.48	30.55	5.77	24.66	49.36	68.20	-18.84	PK
V	10400.00	33.87	30.55	5.77	24.66	33.75	54.00	-20.25	AV
V	15600.00	51.00	30.33	6.32	24.55	51.54	74.00	-22.46	PK
V	15600.00	37.42	30.33	6.32	24.55	37.96	54.00	-16.04	AV
V	20800.00	51.65	30.85	7.45	24.69	52.94	74.00	-21.06	PK
V	20800.00	38.28	30.85	7.45	24.69	39.57	54.00	-14.43	AV
V	26000.00	52.43	31.02	8.99	25.57	55.97	68.20	-12.23	PK
V	26000.00	37.69	31.02	8.99	25.57	41.23	54.00	-12.77	AV
H	5150.00	44.03	30.45	8.77	38.66	61.01	74.00	-12.99	PK
H	5150.00	31.52	30.45	8.77	38.66	48.50	54.00	-5.50	AV
H	10400.00	48.96	30.55	5.77	24.66	48.84	68.20	-19.36	PK
H	10400.00	35.55	30.55	5.77	24.66	35.43	54.00	-18.57	AV
H	15600.00	50.96	30.33	6.32	24.55	51.50	74.00	-22.50	PK
H	15600.00	37.11	30.33	6.32	24.55	37.65	54.00	-16.35	AV
H	20800.00	52.85	30.85	7.45	24.69	54.14	74.00	-19.86	PK
H	20800.00	38.45	30.85	7.45	24.69	39.74	54.00	-14.26	AV
H	26000.00	51.09	31.02	8.99	25.57	54.63	68.20	-13.57	PK
H	26000.00	37.86	31.02	8.99	25.57	41.40	54.00	-12.60	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
High Channel:5240MHz									
V	5350.00	43.47	30.45	8.77	38.66	60.45	74.00	-13.55	PK
V	5350.00	30.76	30.45	8.77	38.66	47.74	54.00	-6.26	AV
V	10480.00	49.38	30.55	5.77	24.66	49.26	68.20	-18.94	PK
V	10480.00	33.75	30.55	5.77	24.66	33.63	54.00	-20.37	AV
V	15720.00	51.21	30.33	6.32	24.55	51.75	74.00	-22.25	PK
V	15720.00	36.75	30.33	6.32	24.55	37.29	54.00	-16.71	AV
V	20960.00	52.37	30.85	7.45	24.69	53.66	74.00	-20.34	PK
V	20960.00	37.79	30.85	7.45	24.69	39.08	54.00	-14.92	AV
V	26200.00	52.90	31.02	8.99	25.57	56.44	68.20	-11.76	PK
V	26200.00	38.17	31.02	8.99	25.57	41.71	54.00	-12.29	AV
H	5350.00	43.85	30.45	8.77	38.66	60.83	74.00	-13.17	PK
H	5350.00	31.55	30.45	8.77	38.66	48.53	54.00	-5.47	AV
H	10480.00	49.51	30.55	5.77	24.66	49.39	68.20	-18.81	PK
H	10480.00	35.19	30.55	5.77	24.66	35.07	54.00	-18.93	AV
H	15720.00	51.63	30.33	6.32	24.55	52.17	74.00	-21.83	PK
H	15720.00	37.08	30.33	6.32	24.55	37.62	54.00	-16.38	AV
H	20960.00	52.81	30.85	7.45	24.69	54.10	74.00	-19.90	PK
H	20960.00	38.77	30.85	7.45	24.69	40.06	54.00	-13.94	AV
H	26200.00	51.39	31.02	8.99	25.57	54.93	68.20	-13.27	PK
H	26200.00	38.05	31.02	8.99	25.57	41.59	54.00	-12.41	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.

802.11ac20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel:5180MHz									
V	5150.00	44.02	30.45	8.77	38.66	61.00	74.00	-13.00	PK
V	5150.00	30.94	30.45	8.77	38.66	47.92	54.00	-6.08	AV
V	10360.00	49.06	30.55	5.77	24.66	48.94	68.20	-19.26	PK
V	10360.00	34.06	30.55	5.77	24.66	33.94	54.00	-20.06	AV
V	15540.00	51.33	30.33	6.32	24.55	51.87	74.00	-22.13	PK
V	15540.00	36.63	30.33	6.32	24.55	37.17	54.00	-16.83	AV
V	20720.00	52.06	30.85	7.45	24.69	53.35	74.00	-20.65	PK
V	20720.00	38.49	30.85	7.45	24.69	39.78	54.00	-14.22	AV
V	25900.00	52.49	31.02	8.99	25.57	56.03	68.20	-12.17	PK
V	25900.00	38.06	31.02	8.99	25.57	41.60	54.00	-12.40	AV
H	5150.00	44.30	30.45	8.77	38.66	61.28	74.00	-12.72	PK
H	5150.00	31.03	30.45	8.77	38.66	48.01	54.00	-5.99	AV
H	10360.00	49.41	30.55	5.77	24.66	49.29	68.20	-18.91	PK
H	10360.00	35.54	30.55	5.77	24.66	35.42	54.00	-18.58	AV
H	15540.00	51.98	30.33	6.32	24.55	52.52	74.00	-21.48	PK
H	15540.00	37.00	30.33	6.32	24.55	37.54	54.00	-16.46	AV
H	20720.00	52.48	30.85	7.45	24.69	53.77	74.00	-20.23	PK
H	20720.00	37.91	30.85	7.45	24.69	39.20	54.00	-14.80	AV
H	25900.00	51.37	31.02	8.99	25.57	54.91	68.20	-13.29	PK
H	25900.00	38.52	31.02	8.99	25.57	42.06	54.00	-11.94	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Middle Channel:5200MHz									
V	5150.00	43.48	30.45	8.77	38.66	60.46	74.00	-13.54	PK
V	5150.00	31.04	30.45	8.77	38.66	48.02	54.00	-5.98	AV
V	10400.00	49.46	30.55	5.77	24.66	49.34	68.20	-18.86	PK
V	10400.00	33.95	30.55	5.77	24.66	33.83	54.00	-20.17	AV
V	15600.00	50.78	30.33	6.32	24.55	51.32	74.00	-22.68	PK
V	15600.00	37.43	30.33	6.32	24.55	37.97	54.00	-16.03	AV
V	20800.00	52.16	30.85	7.45	24.69	53.45	74.00	-20.55	PK
V	20800.00	38.03	30.85	7.45	24.69	39.32	54.00	-14.68	AV
V	26000.00	52.66	31.02	8.99	25.57	56.20	68.20	-12.00	PK
V	26000.00	38.02	31.02	8.99	25.57	41.56	54.00	-12.44	AV
H	5150.00	44.10	30.45	8.77	38.66	61.08	74.00	-12.92	PK
H	5150.00	30.61	30.45	8.77	38.66	47.59	54.00	-6.41	AV
H	10400.00	49.28	30.55	5.77	24.66	49.16	68.20	-19.04	PK
H	10400.00	35.31	30.55	5.77	24.66	35.19	54.00	-18.81	AV
H	15600.00	51.96	30.33	6.32	24.55	52.50	74.00	-21.50	PK
H	15600.00	37.34	30.33	6.32	24.55	37.88	54.00	-16.12	AV
H	20800.00	52.79	30.85	7.45	24.69	54.08	74.00	-19.92	PK
H	20800.00	38.73	30.85	7.45	24.69	40.02	54.00	-13.98	AV
H	26000.00	52.07	31.02	8.99	25.57	55.61	68.20	-12.59	PK
H	26000.00	38.25	31.02	8.99	25.57	41.79	54.00	-12.21	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
High Channel:5240MHz									
V	5350.00	43.67	30.45	8.77	38.66	60.65	74.00	-13.35	PK
V	5350.00	30.32	30.45	8.77	38.66	47.30	54.00	-6.70	AV
V	10480.00	49.06	30.55	5.77	24.66	48.94	68.20	-19.26	PK
V	10480.00	34.34	30.55	5.77	24.66	34.22	54.00	-19.78	AV
V	15720.00	51.29	30.33	6.32	24.55	51.83	74.00	-22.17	PK
V	15720.00	37.46	30.33	6.32	24.55	38.00	54.00	-16.00	AV
V	20960.00	51.43	30.85	7.45	24.69	52.72	74.00	-21.28	PK
V	20960.00	38.62	30.85	7.45	24.69	39.91	54.00	-14.09	AV
V	26200.00	52.75	31.02	8.99	25.57	56.29	68.20	-11.91	PK
V	26200.00	38.50	31.02	8.99	25.57	42.04	54.00	-11.96	AV
H	5350.00	43.88	30.45	8.77	38.66	60.86	74.00	-13.14	PK
H	5350.00	30.41	30.45	8.77	38.66	47.39	54.00	-6.61	AV
H	10480.00	49.21	30.55	5.77	24.66	49.09	68.20	-19.11	PK
H	10480.00	36.13	30.55	5.77	24.66	36.01	54.00	-17.99	AV
H	15720.00	51.31	30.33	6.32	24.55	51.85	74.00	-22.15	PK
H	15720.00	37.37	30.33	6.32	24.55	37.91	54.00	-16.09	AV
H	20960.00	52.22	30.85	7.45	24.69	53.51	74.00	-20.49	PK
H	20960.00	38.23	30.85	7.45	24.69	39.52	54.00	-14.48	AV
H	26200.00	51.74	31.02	8.99	25.57	55.28	68.20	-12.92	PK
H	26200.00	38.02	31.02	8.99	25.57	41.56	54.00	-12.44	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.

5.8G Between 1GHz – 40GHz:

Temperature :	26℃	Relative Humidity :	54%
Pressure :	1010 hPa	Test Voltage :	DC 12V
Test Mode :	5.8G TX - 802.11a/n20/n40/ac20/ac40/ac80		
Note: All patterns have been tested, and only the worst test data recorded in this report is 802.11a/n20/ac20.			

802.11a

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel:5745MHz									
V	11490.00	48.93	30.55	5.77	24.66	48.81	74.00	-25.19	PK
V	11490.00	39.01	30.55	5.77	24.66	38.89	54.00	-15.11	AV
V	17235.00	51.02	30.33	6.32	24.55	51.56	68.20	-16.64	PK
V	17235.00	41.39	30.33	6.32	24.55	41.93	54.00	-12.07	AV
V	22980.00	53.47	30.85	7.45	24.69	54.76	74.00	-19.24	PK
V	22980.00	43.49	30.85	7.45	24.69	44.78	54.00	-9.22	AV
V	28725.00	55.59	31.02	8.99	25.57	59.13	68.20	-9.07	PK
V	28725.00	44.93	31.02	8.99	25.57	48.47	54.00	-5.53	AV
H	11490.00	49.29	30.55	5.77	24.66	49.17	74.00	-24.83	PK
H	11490.00	38.43	30.55	5.77	24.66	38.31	54.00	-15.69	AV
H	17235.00	51.55	30.33	6.32	24.55	52.09	68.20	-16.11	PK
H	17235.00	40.81	30.33	6.32	24.55	41.35	54.00	-12.65	AV
H	22980.00	53.84	30.85	7.45	24.69	55.13	74.00	-18.87	PK
H	22980.00	43.30	30.85	7.45	24.69	44.59	54.00	-9.41	AV
H	28725.00	56.19	31.02	8.99	25.57	59.73	68.20	-8.47	PK
H	28725.00	45.85	31.02	8.99	25.57	49.39	54.00	-4.61	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Middle Channel:5785MHz									
V	11570.00	48.25	30.55	5.77	24.66	48.13	74.00	-25.87	PK
V	11570.00	37.29	30.55	5.77	24.66	37.17	54.00	-16.83	AV
V	17355.00	49.38	30.33	6.32	24.55	49.92	68.20	-18.28	PK
V	17355.00	40.56	30.33	6.32	24.55	41.10	54.00	-12.90	AV
V	23140.00	52.57	30.85	7.45	24.69	53.86	68.20	-14.34	PK
V	23140.00	41.50	30.85	7.45	24.69	42.79	54.00	-11.21	AV
V	28925.00	53.71	31.02	8.99	25.57	57.25	68.20	-10.95	PK
V	28925.00	44.16	31.02	8.99	25.57	47.70	54.00	-6.30	AV
H	11570.00	48.28	30.55	5.77	24.66	48.16	74.00	-25.84	PK
H	11570.00	37.32	30.55	5.77	24.66	37.20	54.00	-16.80	AV
H	17355.00	50.17	30.33	6.32	24.55	50.71	68.20	-17.49	PK
H	17355.00	39.95	30.33	6.32	24.55	40.49	54.00	-13.51	AV
H	23140.00	52.63	30.85	7.45	24.69	53.92	68.20	-14.28	PK
H	23140.00	42.49	30.85	7.45	24.69	43.78	54.00	-10.22	AV
H	28925.00	54.08	31.02	8.99	25.57	57.62	68.20	-10.58	PK
H	28925.00	43.73	31.02	8.99	25.57	47.27	54.00	-6.73	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
High Channel:5825MHz									
V	11650.00	47.77	30.55	5.77	24.66	47.65	74.00	-26.35	PK
V	11650.00	37.40	30.55	5.77	24.66	37.28	54.00	-16.72	AV
V	17475.00	49.28	30.33	6.32	24.55	49.82	68.20	-18.38	PK
V	17475.00	40.41	30.33	6.32	24.55	40.95	54.00	-13.05	AV
V	23300.00	52.67	30.85	7.45	24.69	53.96	68.20	-14.24	PK
V	23300.00	41.42	30.85	7.45	24.69	42.71	54.00	-11.29	AV
V	29125.00	54.59	31.02	8.99	25.57	58.13	68.20	-10.07	PK
V	29125.00	44.41	31.02	8.99	25.57	47.95	54.00	-6.05	AV
H	11650.00	48.18	30.55	5.77	24.66	48.06	74.00	-25.94	PK
H	11650.00	38.21	30.55	5.77	24.66	38.09	54.00	-15.91	AV
H	17475.00	50.42	30.33	6.32	24.55	50.96	68.20	-17.24	PK
H	17475.00	40.66	30.33	6.32	24.55	41.20	54.00	-12.80	AV
H	23300.00	52.73	30.85	7.45	24.69	54.02	68.20	-14.18	PK
H	23300.00	42.51	30.85	7.45	24.69	43.80	54.00	-10.20	AV
H	29125.00	54.90	31.02	8.99	25.57	58.44	68.20	-9.76	PK
H	29125.00	44.13	31.02	8.99	25.57	47.67	54.00	-6.33	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)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel:5745MHz									
V	11490.00	49.73	30.55	5.77	24.66	49.61	74.00	-24.39	PK
V	11490.00	38.96	30.55	5.77	24.66	38.84	54.00	-15.16	AV
V	17235.00	50.28	30.33	6.32	24.55	50.82	68.20	-17.38	PK
V	17235.00	41.81	30.33	6.32	24.55	42.35	54.00	-11.65	AV
V	22980.00	53.05	30.85	7.45	24.69	54.34	74.00	-19.66	PK
V	22980.00	43.43	30.85	7.45	24.69	44.72	54.00	-9.28	AV
V	28725.00	54.98	31.02	8.99	25.57	58.52	68.20	-9.68	PK
V	28725.00	45.81	31.02	8.99	25.57	49.35	54.00	-4.65	AV
H	11490.00	49.08	30.55	5.77	24.66	48.96	74.00	-25.04	PK
H	11490.00	39.09	30.55	5.77	24.66	38.97	54.00	-15.03	AV
H	17235.00	51.05	30.33	6.32	24.55	51.59	68.20	-16.61	PK
H	17235.00	41.05	30.33	6.32	24.55	41.59	54.00	-12.41	AV
H	22980.00	53.54	30.85	7.45	24.69	54.83	74.00	-19.17	PK
H	22980.00	43.42	30.85	7.45	24.69	44.71	54.00	-9.29	AV
H	28725.00	55.06	31.02	8.99	25.57	58.60	68.20	-9.60	PK
H	28725.00	46.20	31.02	8.99	25.57	49.74	54.00	-4.26	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Middle Channel:5785MHz									
V	11570.00	48.56	30.55	5.77	24.66	48.44	74.00	-25.56	PK
V	11570.00	37.68	30.55	5.77	24.66	37.56	54.00	-16.44	AV
V	17355.00	49.84	30.33	6.32	24.55	50.38	68.20	-17.82	PK
V	17355.00	40.16	30.33	6.32	24.55	40.70	54.00	-13.30	AV
V	23140.00	52.14	30.85	7.45	24.69	53.43	68.20	-14.77	PK
V	23140.00	42.10	30.85	7.45	24.69	43.39	54.00	-10.61	AV
V	28925.00	54.11	31.02	8.99	25.57	57.65	68.20	-10.55	PK
V	28925.00	43.45	31.02	8.99	25.57	46.99	54.00	-7.01	AV
H	11570.00	48.23	30.55	5.77	24.66	48.11	74.00	-25.89	PK
H	11570.00	37.54	30.55	5.77	24.66	37.42	54.00	-16.58	AV
H	17355.00	49.75	30.33	6.32	24.55	50.29	68.20	-17.91	PK
H	17355.00	39.72	30.33	6.32	24.55	40.26	54.00	-13.74	AV
H	23140.00	52.54	30.85	7.45	24.69	53.83	68.20	-14.37	PK
H	23140.00	41.82	30.85	7.45	24.69	43.11	54.00	-10.89	AV
H	28925.00	53.87	31.02	8.99	25.57	57.41	68.20	-10.79	PK
H	28925.00	44.30	31.02	8.99	25.57	47.84	54.00	-6.16	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
High Channel:5825MHz									
V	11650.00	47.82	30.55	5.77	24.66	47.70	74.00	-26.30	PK
V	11650.00	37.96	30.55	5.77	24.66	37.84	54.00	-16.16	AV
V	17475.00	49.85	30.33	6.32	24.55	50.39	68.20	-17.81	PK
V	17475.00	40.49	30.33	6.32	24.55	41.03	54.00	-12.97	AV
V	23300.00	51.50	30.85	7.45	24.69	52.79	68.20	-15.41	PK
V	23300.00	42.09	30.85	7.45	24.69	43.38	54.00	-10.62	AV
V	29125.00	54.20	31.02	8.99	25.57	57.74	68.20	-10.46	PK
V	29125.00	44.55	31.02	8.99	25.57	48.09	54.00	-5.91	AV
H	11650.00	48.28	30.55	5.77	24.66	48.16	74.00	-25.84	PK
H	11650.00	37.85	30.55	5.77	24.66	37.73	54.00	-16.27	AV
H	17475.00	49.77	30.33	6.32	24.55	50.31	68.20	-17.89	PK
H	17475.00	39.81	30.33	6.32	24.55	40.35	54.00	-13.65	AV
H	23300.00	52.44	30.85	7.45	24.69	53.73	68.20	-14.47	PK
H	23300.00	42.03	30.85	7.45	24.69	43.32	54.00	-10.68	AV
H	29125.00	54.60	31.02	8.99	25.57	58.14	68.20	-10.06	PK
H	29125.00	44.48	31.02	8.99	25.57	48.02	54.00	-5.98	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)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel:5745MHz									
V	11490.00	49.44	30.55	5.77	24.66	49.32	74.00	-24.68	PK
V	11490.00	38.16	30.55	5.77	24.66	38.04	54.00	-15.96	AV
V	17235.00	50.59	30.33	6.32	24.55	51.13	68.20	-17.07	PK
V	17235.00	40.85	30.33	6.32	24.55	41.39	54.00	-12.61	AV
V	22980.00	53.51	30.85	7.45	24.69	54.80	74.00	-19.20	PK
V	22980.00	42.72	30.85	7.45	24.69	44.01	54.00	-9.99	AV
V	28725.00	55.11	31.02	8.99	25.57	58.65	68.20	-9.55	PK
V	28725.00	45.02	31.02	8.99	25.57	48.56	54.00	-5.44	AV
H	11490.00	49.22	30.55	5.77	24.66	49.10	74.00	-24.90	PK
H	11490.00	39.04	30.55	5.77	24.66	38.92	54.00	-15.08	AV
H	17235.00	50.81	30.33	6.32	24.55	51.35	68.20	-16.85	PK
H	17235.00	41.47	30.33	6.32	24.55	42.01	54.00	-11.99	AV
H	22980.00	53.17	30.85	7.45	24.69	54.46	74.00	-19.54	PK
H	22980.00	43.54	30.85	7.45	24.69	44.83	54.00	-9.17	AV
H	28725.00	56.04	31.02	8.99	25.57	59.58	68.20	-8.62	PK
H	28725.00	45.58	31.02	8.99	25.57	49.12	54.00	-4.88	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Middle Channel:5785MHz									
V	11570.00	47.89	30.55	5.77	24.66	47.77	74.00	-26.23	PK
V	11570.00	37.52	30.55	5.77	24.66	37.40	54.00	-16.60	AV
V	17355.00	49.03	30.33	6.32	24.55	49.57	68.20	-18.63	PK
V	17355.00	39.72	30.33	6.32	24.55	40.26	54.00	-13.74	AV
V	23140.00	51.95	30.85	7.45	24.69	53.24	68.20	-14.96	PK
V	23140.00	41.49	30.85	7.45	24.69	42.78	54.00	-11.22	AV
V	28925.00	53.99	31.02	8.99	25.57	57.53	68.20	-10.67	PK
V	28925.00	43.61	31.02	8.99	25.57	47.15	54.00	-6.85	AV
H	11570.00	48.71	30.55	5.77	24.66	48.59	74.00	-25.41	PK
H	11570.00	37.68	30.55	5.77	24.66	37.56	54.00	-16.44	AV
H	17355.00	49.44	30.33	6.32	24.55	49.98	68.20	-18.22	PK
H	17355.00	39.81	30.33	6.32	24.55	40.35	54.00	-13.65	AV
H	23140.00	52.72	30.85	7.45	24.69	54.01	68.20	-14.19	PK
H	23140.00	42.73	30.85	7.45	24.69	44.02	54.00	-9.98	AV
H	28925.00	53.96	31.02	8.99	25.57	57.50	68.20	-10.70	PK
H	28925.00	44.72	31.02	8.99	25.57	48.26	54.00	-5.74	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
High Channel:5825MHz									
V	11650.00	48.70	30.55	5.77	24.66	48.58	74.00	-25.42	PK
V	11650.00	37.77	30.55	5.77	24.66	37.65	54.00	-16.35	AV
V	17475.00	50.10	30.33	6.32	24.55	50.64	68.20	-17.56	PK
V	17475.00	40.20	30.33	6.32	24.55	40.74	54.00	-13.26	AV
V	23300.00	52.47	30.85	7.45	24.69	53.76	68.20	-14.44	PK
V	23300.00	42.07	30.85	7.45	24.69	43.36	54.00	-10.64	AV
V	29125.00	53.66	31.02	8.99	25.57	57.20	68.20	-11.00	PK
V	29125.00	44.48	31.02	8.99	25.57	48.02	54.00	-5.98	AV
H	11650.00	48.65	30.55	5.77	24.66	48.53	74.00	-25.47	PK
H	11650.00	37.58	30.55	5.77	24.66	37.46	54.00	-16.54	AV
H	17475.00	49.99	30.33	6.32	24.55	50.53	68.20	-17.67	PK
H	17475.00	40.15	30.33	6.32	24.55	40.69	54.00	-13.31	AV
H	23300.00	52.69	30.85	7.45	24.69	53.98	68.20	-14.22	PK
H	23300.00	42.13	30.85	7.45	24.69	43.42	54.00	-10.58	AV
H	29125.00	54.24	31.02	8.99	25.57	57.78	68.20	-10.42	PK
H	29125.00	43.95	31.02	8.99	25.57	47.49	54.00	-6.51	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.

5. POWER SPECTRAL DENSITY TEST

5.1 APPLIED PROCEDURES / LIMIT

According to FCC §15.407(3)

Power limits:

(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 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.

5.2 TEST PROCEDURE

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/T, where T is defined in section II.B.I.a).

b) Set VBW ≥ 3 RBW.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10log(1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections 5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP

5.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of chapter 3, Unless otherwise a special operating condition is specified in the follows during the testing.

5.6 TEST RESULTS

Temperature :	26 ℃	Relative Humidity :	54%
Pressure :	1015 hPa	Test Voltage :	DC 12V
Test Band :	5.2G		

Test mode	Frequency (MHz)	PSD (dBm)	duty cycle Factor (dB)	Total PSD (dBm)	Limit (dBm)	Result
802.11a	5180	3.340	0.09	3.430	11	Pass
	5200	3.317	0.09	3.407	11	Pass
	5240	3.083	0.09	3.173	11	Pass
802.11n20	5180	3.115	0.05	3.165	11	Pass
	5200	2.811	0.05	2.861	11	Pass
	5240	2.818	0.05	2.868	11	Pass
802.11n40	5190	-0.046	0.05	0.004	11	Pass
	5230	1.652	0.05	1.702	11	Pass
802.11ac20	5180	3.291	0.05	3.341	11	Pass
	5200	3.132	0.05	3.182	11	Pass
	5240	2.806	0.05	2.856	11	Pass
802.11ac40	5190	-0.286	0.05	-0.236	11	Pass
	5230	1.488	0.05	1.538	11	Pass
802.11ac80	5210	-2.525	0.05	-2.475	11	Pass
Note: Total PSD = PSD + Duty Cycle Factor.						

802.11a

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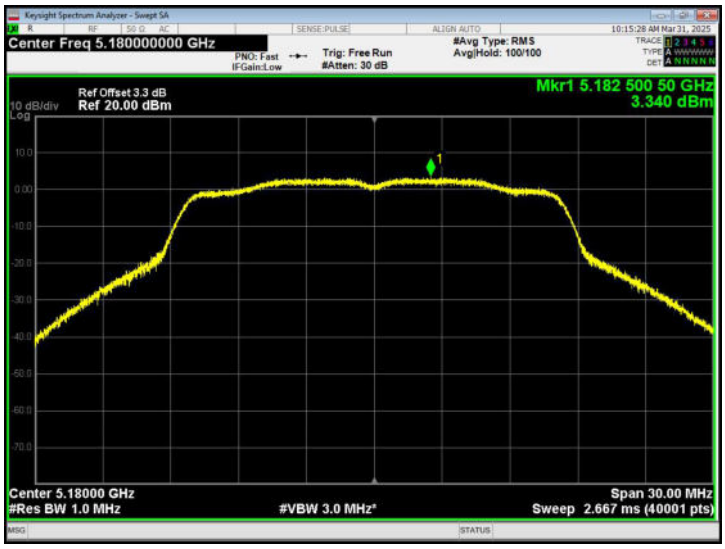
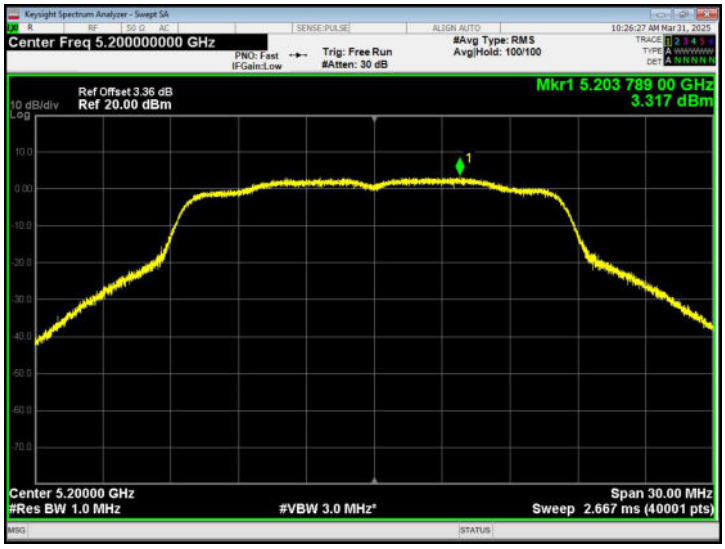
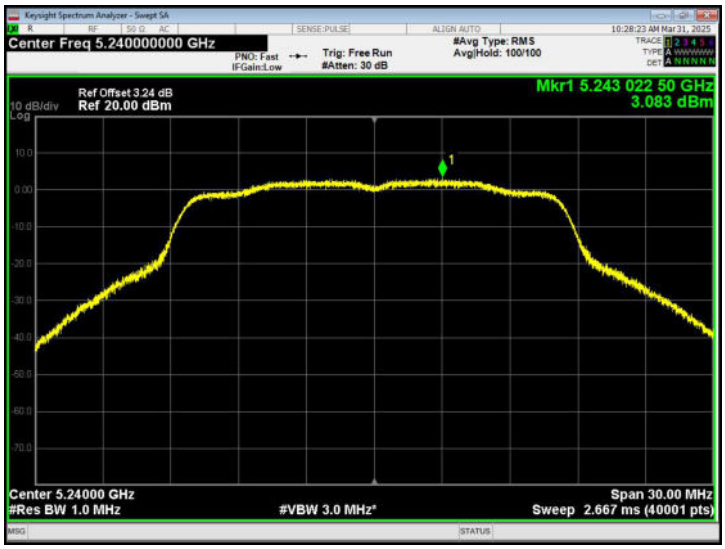


CH40



CH48



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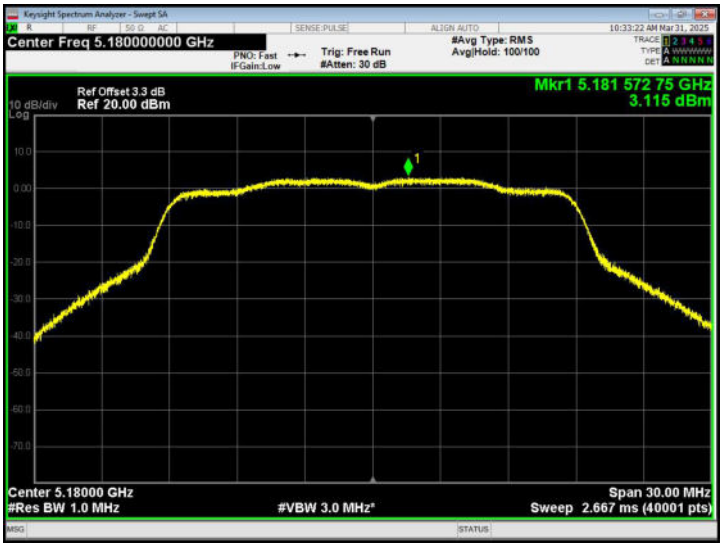

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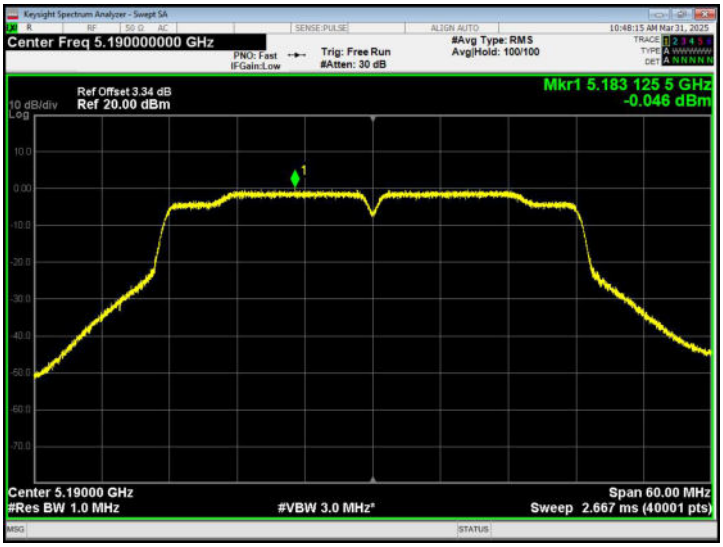
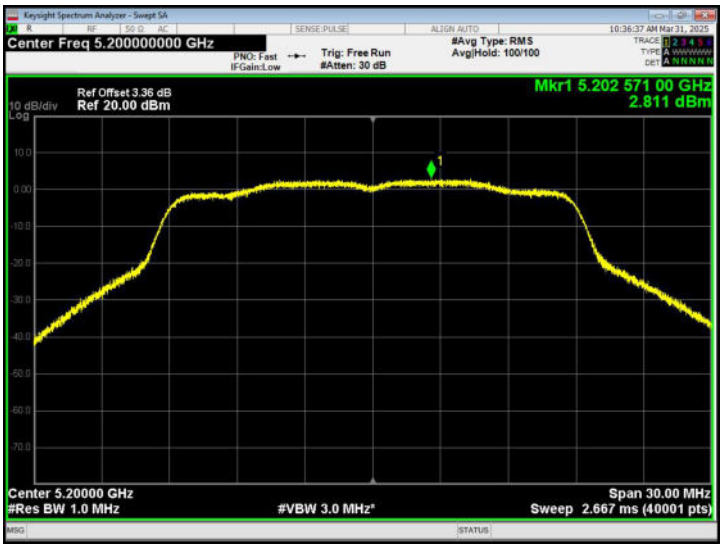
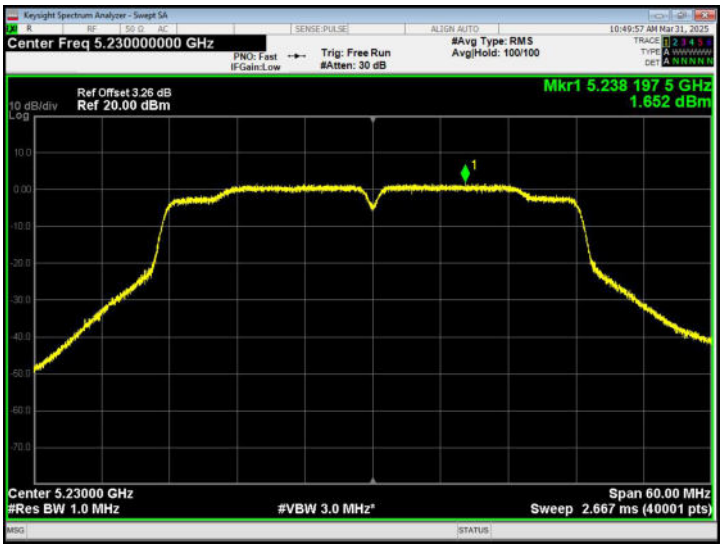


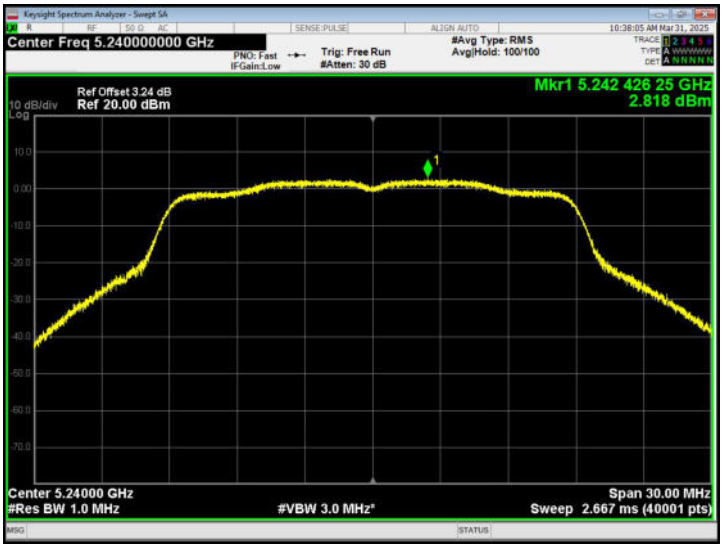
CH40



CH46

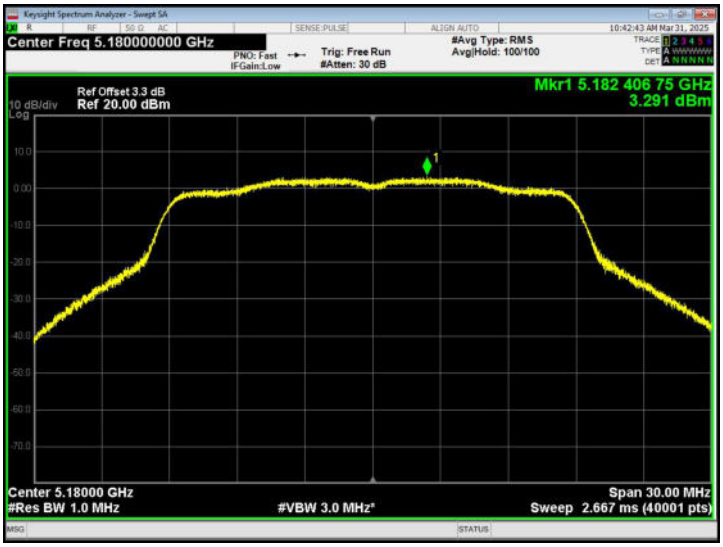


CH48



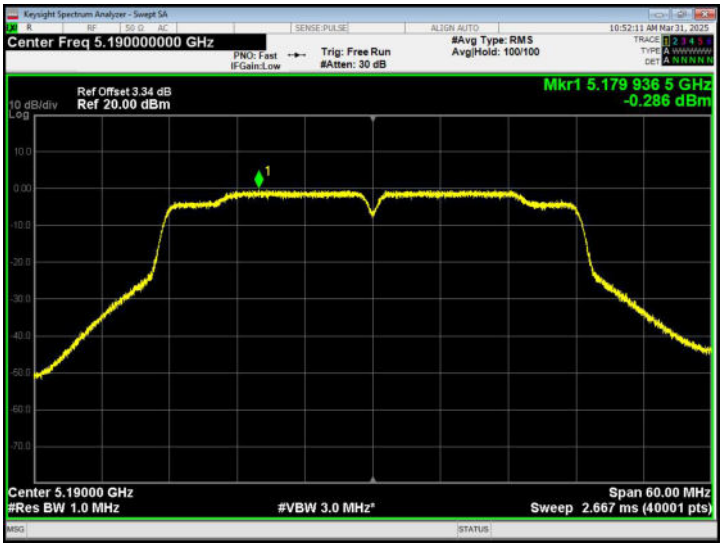
802.11ac20

CH36

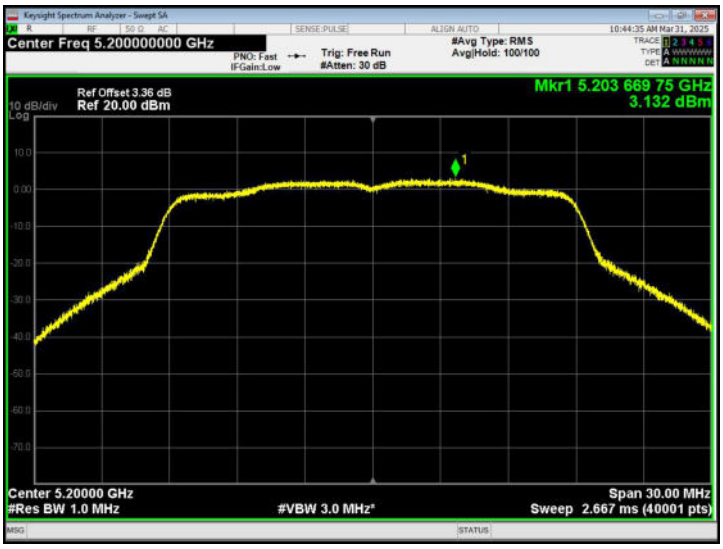


802.11ac40

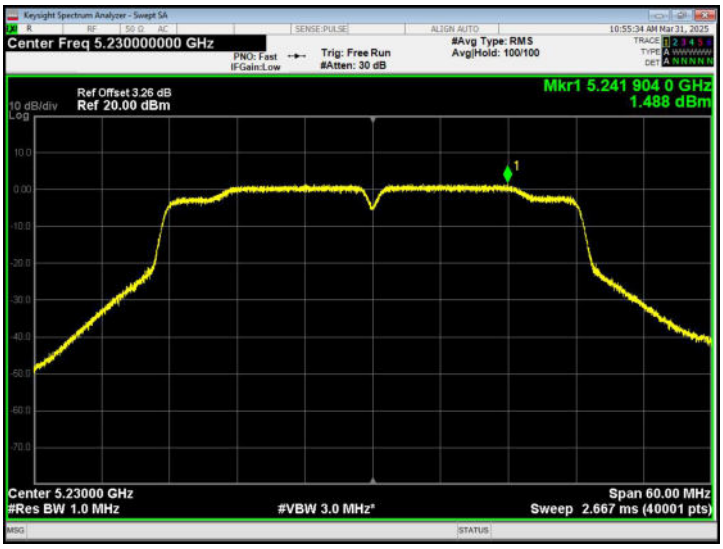
CH38



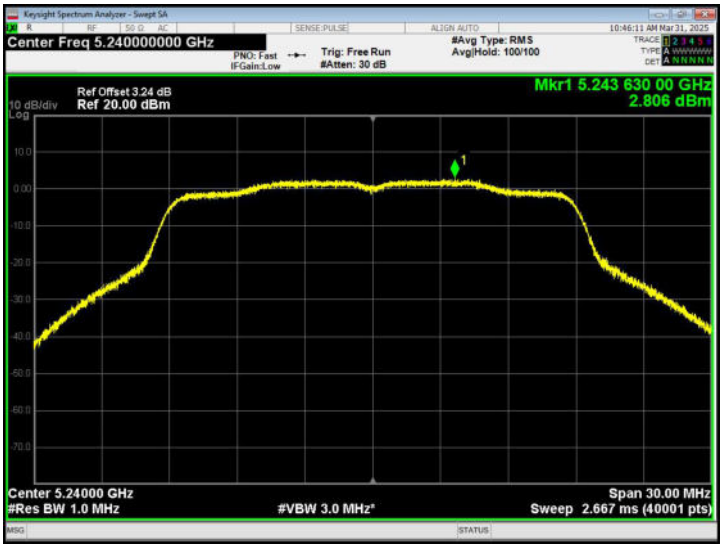
CH40



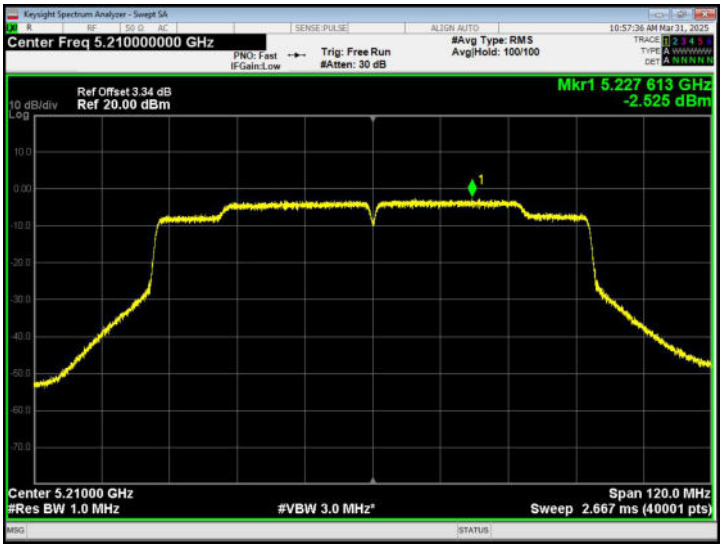
CH46



CH48



802.11ac80 - CH 42

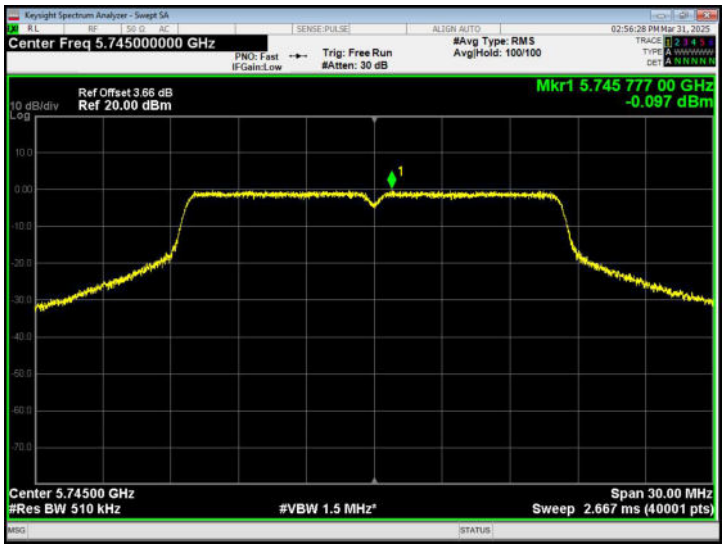


Temperature :	26 ℃	Relative Humidity :	54%
Pressure :	1015 hPa	Test Voltage :	DC 12V
Test Band :	5.8G		

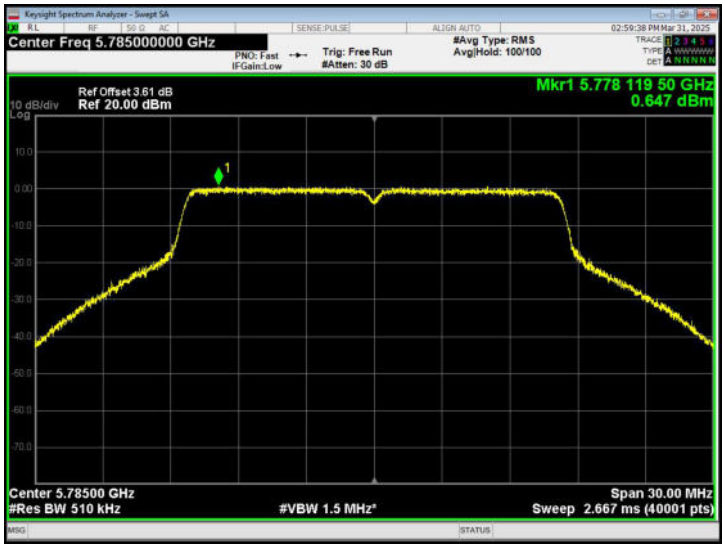
Test mode	Frequency (MHz)	PSD (dBm/500kHz)	duty cycle Factor (dB)	Total PSD (dBm)	Limit (dBm/500kHz)	Result
802.11a	5745	-0.097	0.10	0.003	30	Pass
	5785	0.647	0.10	0.747	30	Pass
	5825	1.321	0.10	1.421	30	Pass
802.11n20	5745	-0.449	0.04	-0.409	30	Pass
	5785	0.437	0.04	0.477	30	Pass
	5825	0.821	0.04	0.861	30	Pass
802.11n40	5755	-1.576	0.05	-1.526	30	Pass
	5795	-0.831	0.05	-0.781	30	Pass
802.11ac20	5745	-0.507	0.05	-0.457	30	Pass
	5785	0.309	0.05	0.359	30	Pass
	5825	0.948	0.05	0.998	30	Pass
802.11ac40	5755	-1.394	0.05	-1.344	30	Pass
	5795	-0.977	0.05	-0.927	30	Pass
802.11ac80	5775	-2.856	0.04	-2.816	30	Pass
Note: Total PSD = PSD + Duty Cycle Factor.						

802.11a

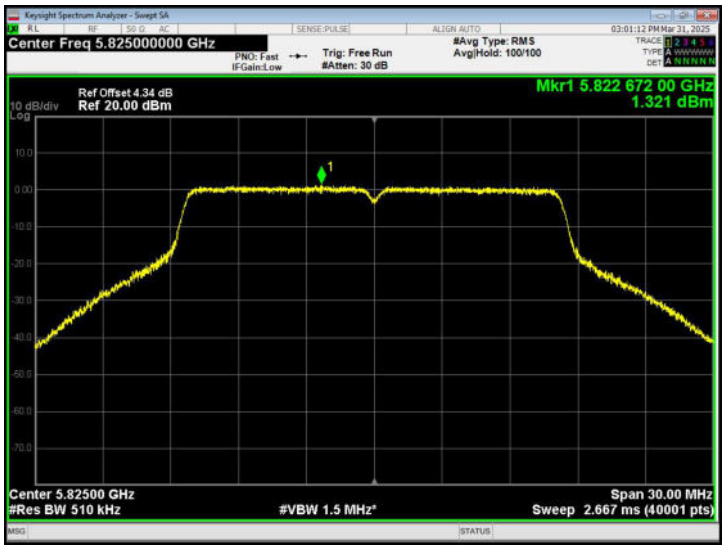
CH149



CH157

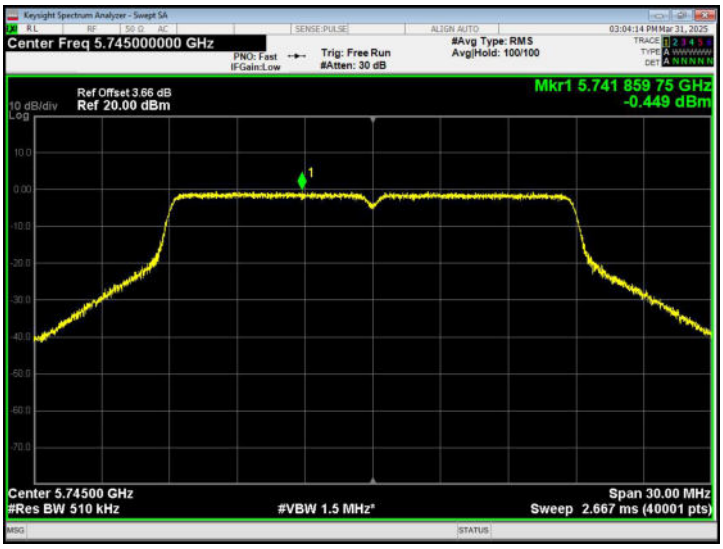


CH165



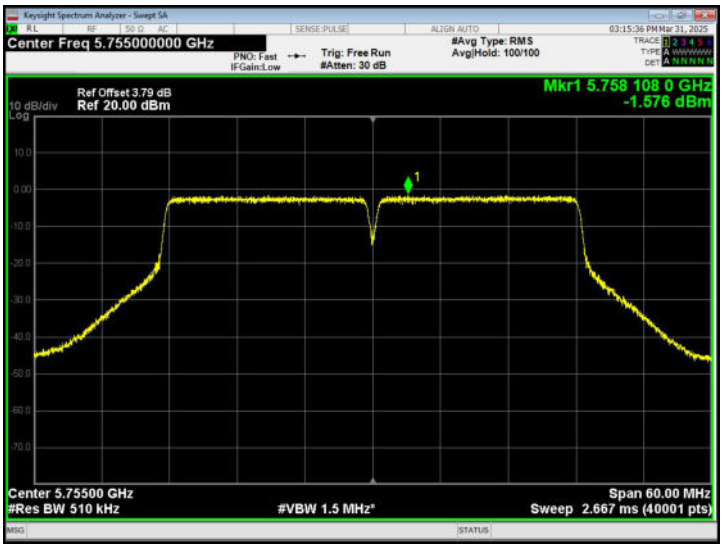
802.11n20

CH149

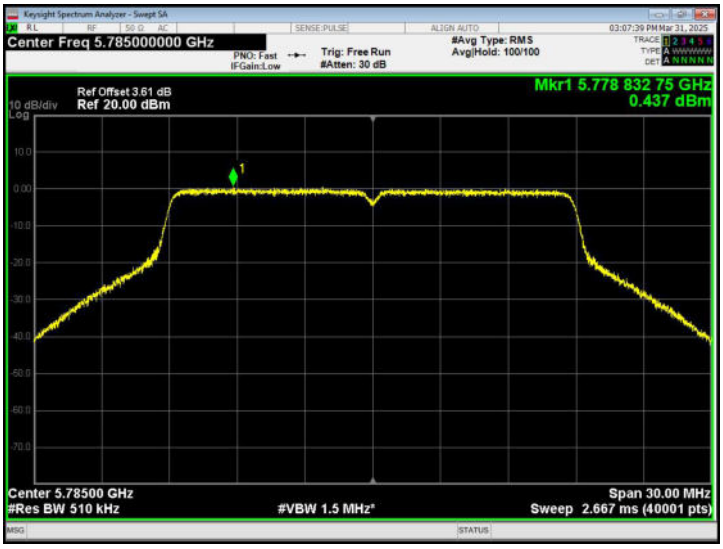


802.11n40

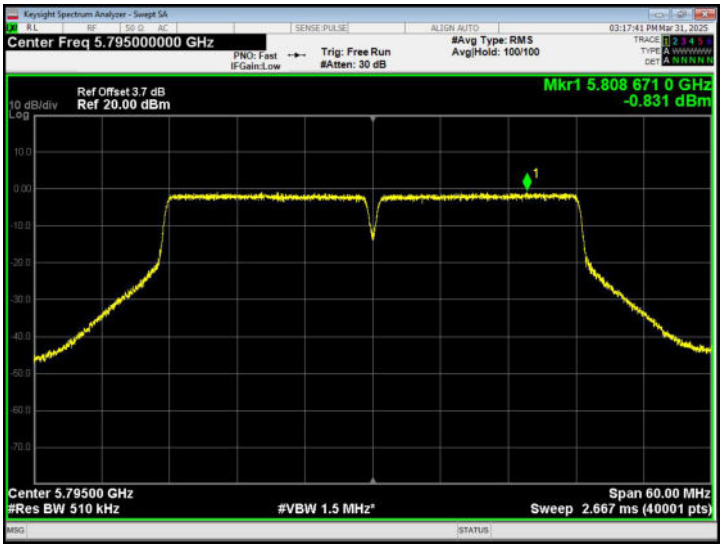
CH151



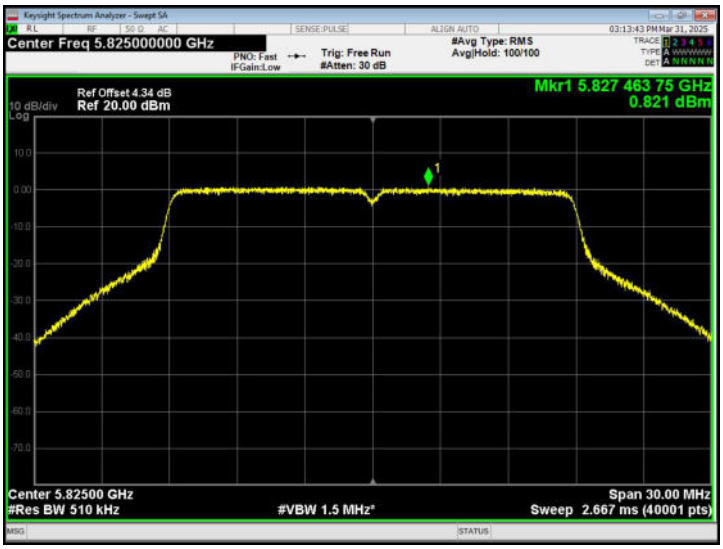
CH157



CH159

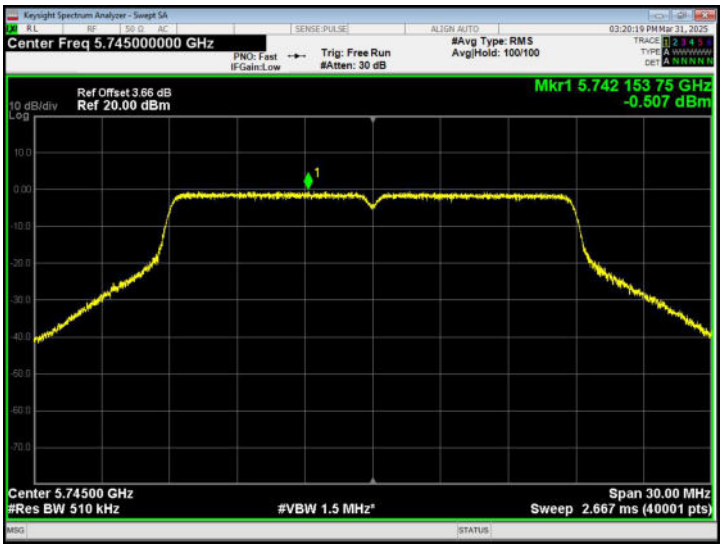


CH165



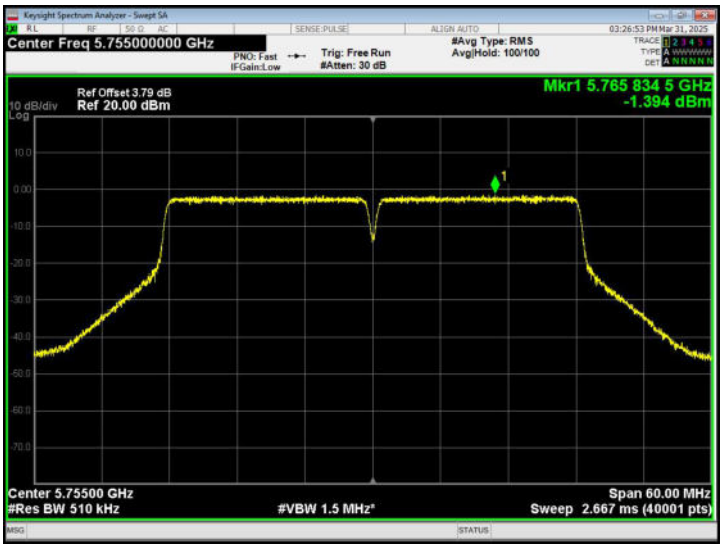
802.11ac20

CH149

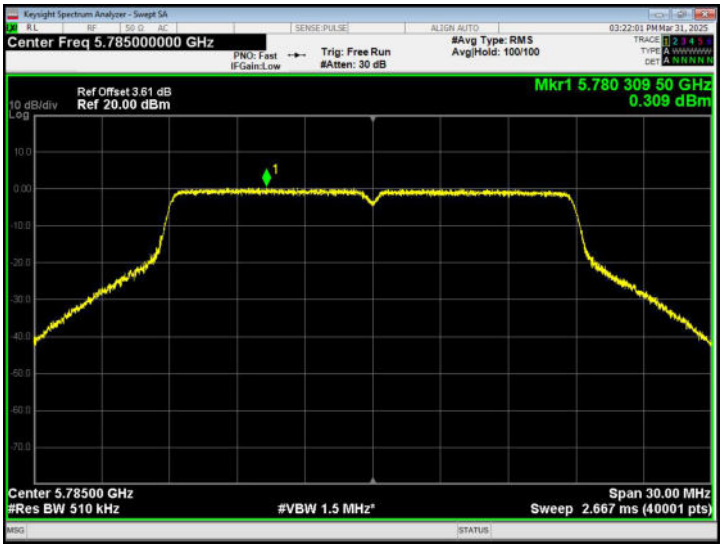


802.11ac40

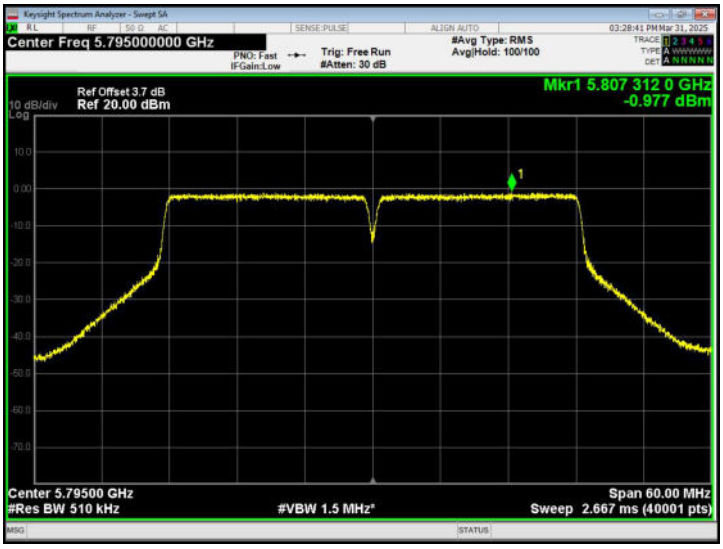
CH151



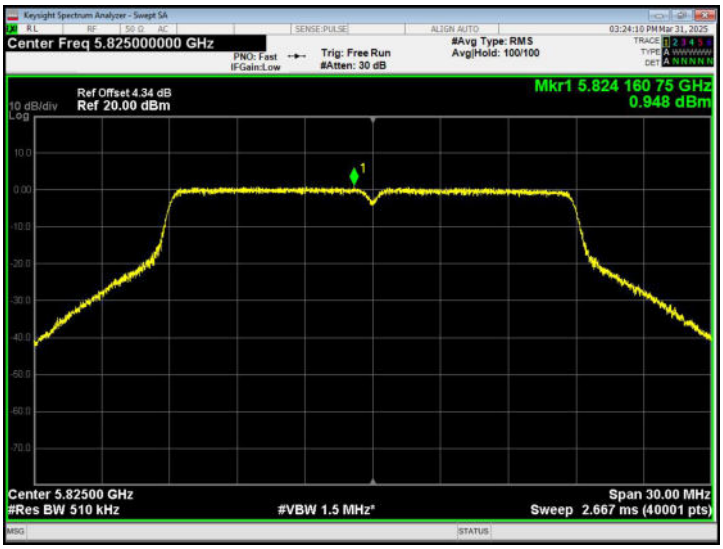
CH157



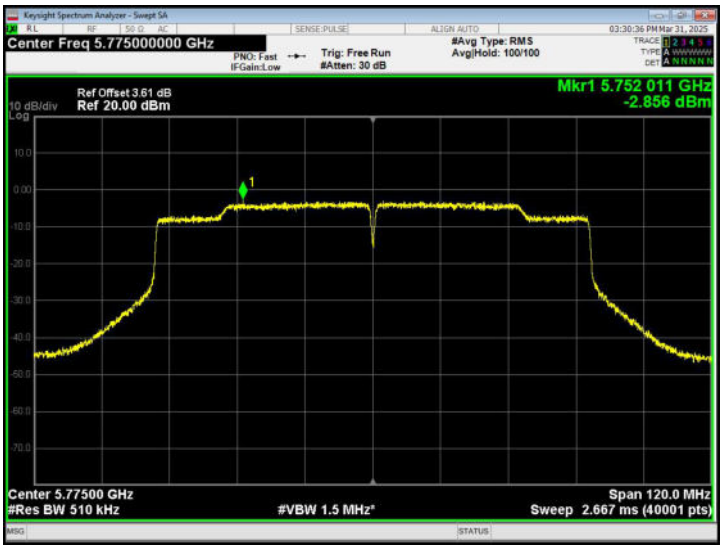
CH159



CH165



802.11ac80 - CH 155



6. 26DB EMISSION BANDWIDTH & 6DB OCCUPIED BANDWIDTH

6.1 APPLIED PROCEDURES / LIMIT

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.

6.2 TEST PROCEDURE

The following procedure shall be used for measuring 6dB Occupied Bandwidth:

The procedure for this method is as follows:

a) Set RBW = 100KHz.

b) Set the VBW > RBW.

c) Detector = Peak.

d) Trace mode = max hold.

e) 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 26dB Emission bandwidth:

The procedure for this method is as follows:

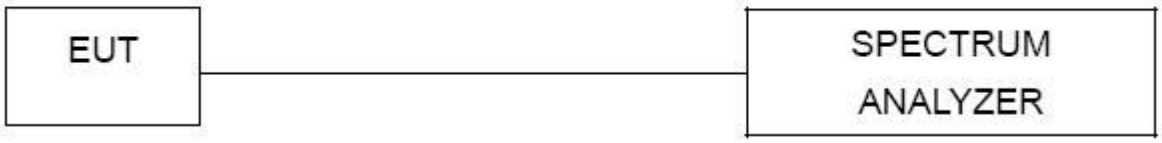
a) Set RBW = approximately 1% of the emission bandwidth.

b) Set the VBW > RBW.

c) Detector = peak.

d) Trace mode = max hold.

e) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the instrument. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.



6.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of chapter 3, Unless otherwise a special operating condition is specified in the follows during the testing.

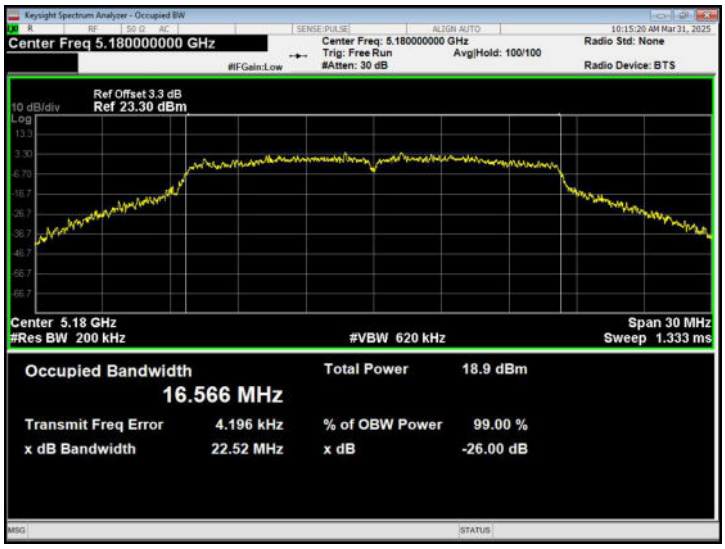
6.4 TEST RESULTS

Temperature :	26 ℃	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC 12V
Test Band :	5.2G		

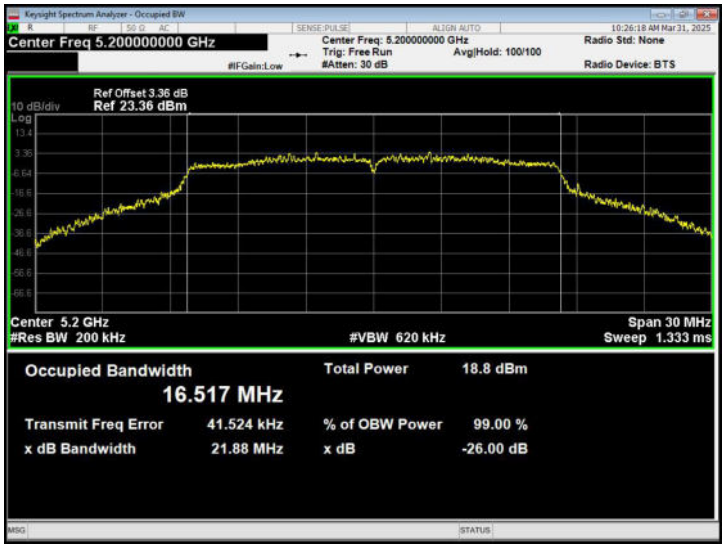
Test Mode	Frequency (MHz)	26dB Emission Bandwidth (MHz)	Limit (MHz)	Result
802.11a	5180	22.52	N/A	Pass
	5200	21.88		
	5240	22.80		
802.11n20	5180	22.73	N/A	Pass
	5200	22.78		
	5240	23.17		
802.11n40	5190	42.94	N/A	Pass
	5230	42.23		
802.11ac20	5180	23.69	N/A	Pass
	5200	22.29		
	5240	23.05		
802.11ac40	5190	42.96	N/A	Pass
	5230	42.72		
802.11ac80	5210	84.49	N/A	Pass

802.11a

26dB Bandwidth plot on channel 36



26dB Bandwidth plot on channel 40



26dB Bandwidth plot on channel 48

802.11n20

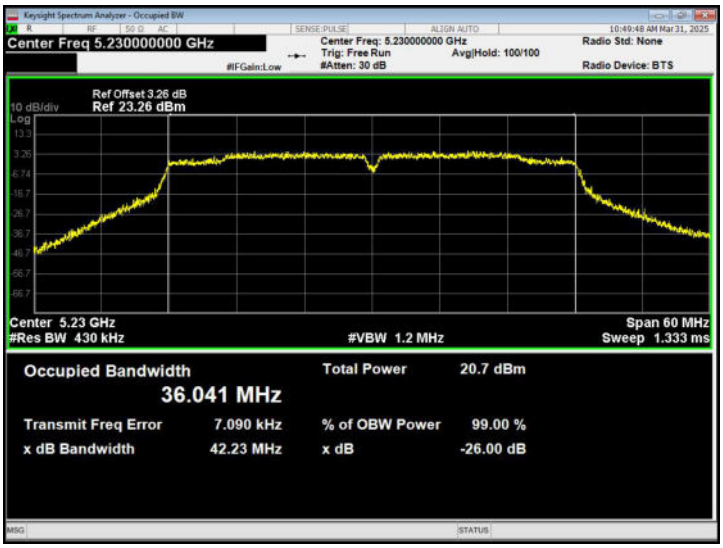
26dB Bandwidth plot on channel 36

802.11n40

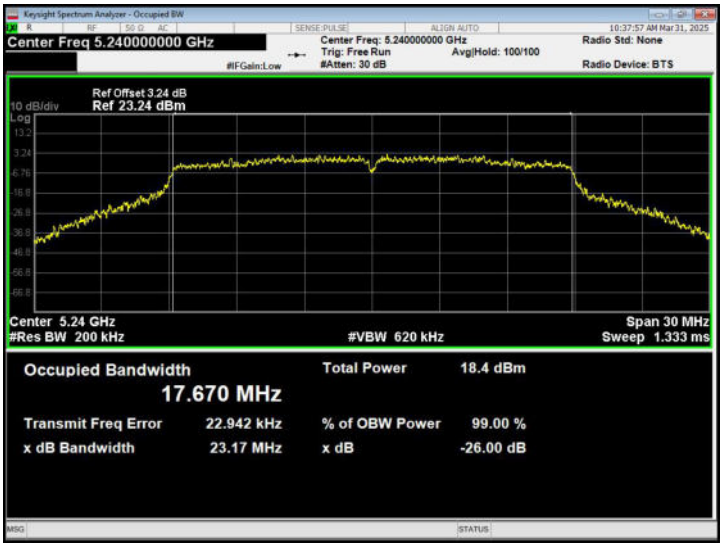
26dB Bandwidth plot on channel 38

26dB Bandwidth plot on channel 40

26dB Bandwidth plot on channel 46

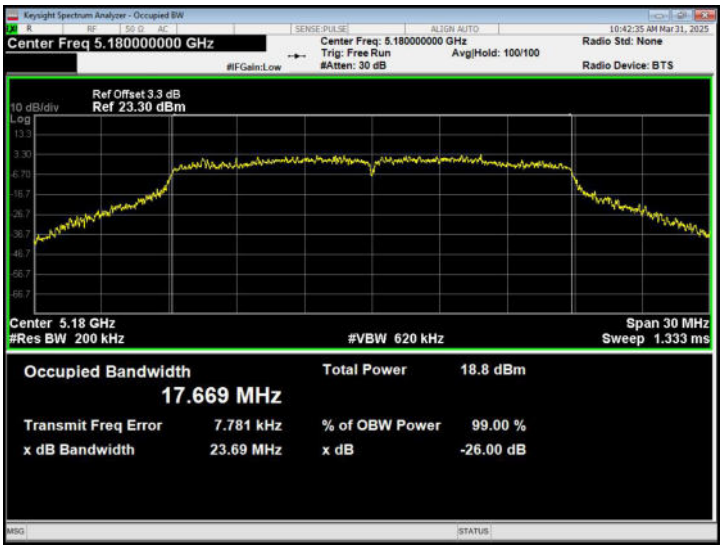


26dB Bandwidth plot on channel 48



802.11ac20

26dB Bandwidth plot on channel 36

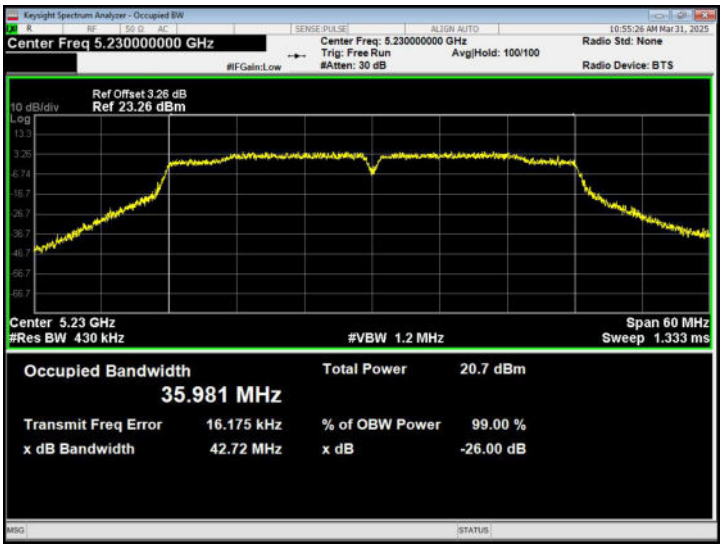


802.11ac40

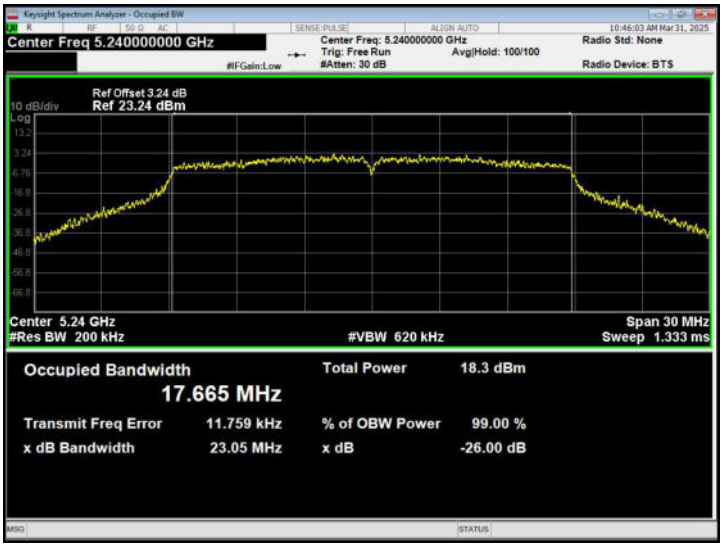
26dB Bandwidth plot on channel 38

26dB Bandwidth plot on channel 40

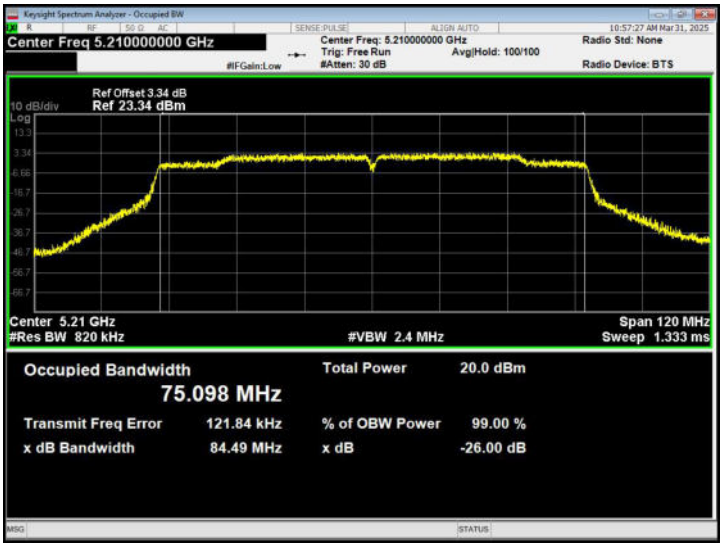
26dB Bandwidth plot on channel 46



26dB Bandwidth plot on channel 48



802.11ac80 - 26dB Bandwidth plot on channel 42

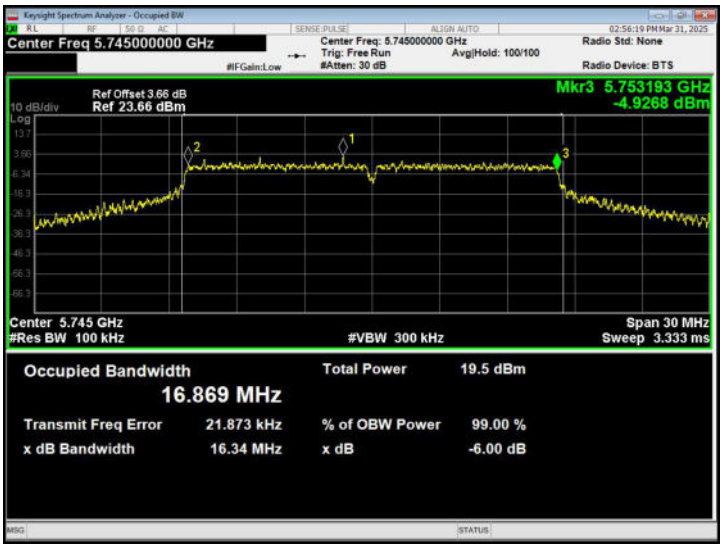


Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	DC 12V
Test Band ：	5.8G		

Test Mode	Frequency (MHz)	6dB Bandwidth (MHz)	26dB Bandwidth (MHz)	6dB Limit (kHz)	Result
802.11a	5745	16.34	25.99	>500	Pass
	5785	16.34	22.53		
	5825	16.31	24.02		
802.11n20	5745	17.56	23.43	>500	Pass
	5785	17.55	23.03		
	5825	17.56	23.38		
802.11n40	5755	36.31	44.19	>500	Pass
	5795	36.33	43.94		
802.11ac20	5745	17.55	22.73	>500	Pass
	5785	17.56	23.27		
	5825	17.56	23.40		
802.11ac40	5755	36.31	43.61	>500	Pass
	5795	36.34	43.86		
802.11ac80	5755	52.74	84.87	>500	Pass

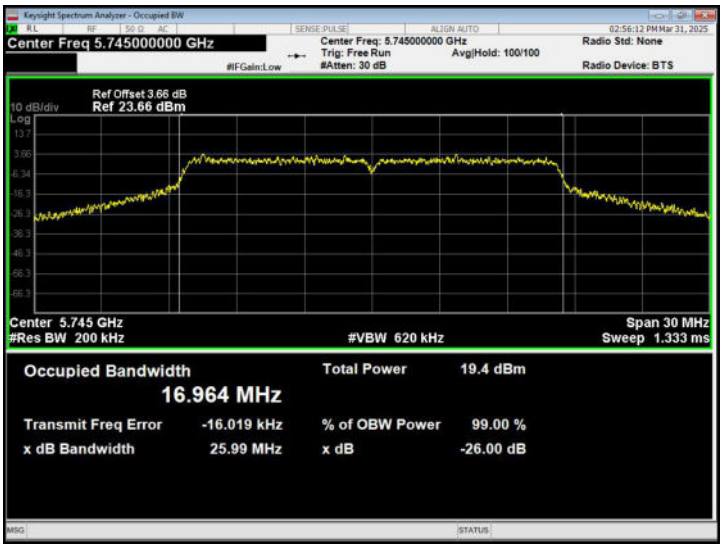
802.11a

6dB Bandwidth plot on channel 149

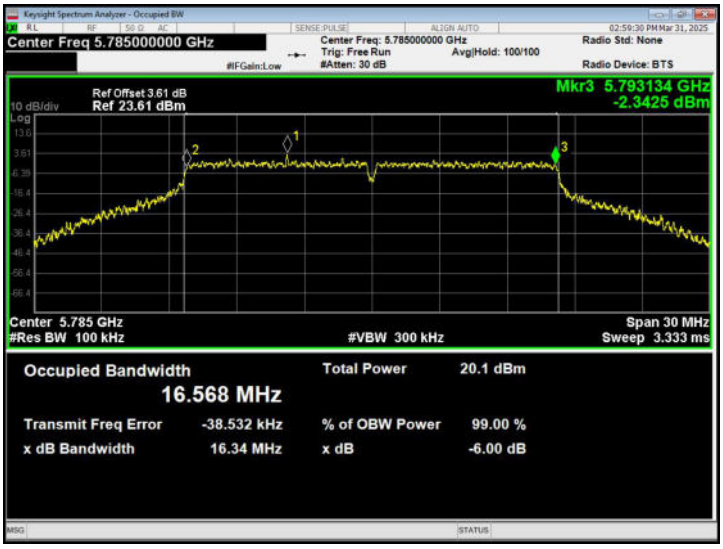


802.11a

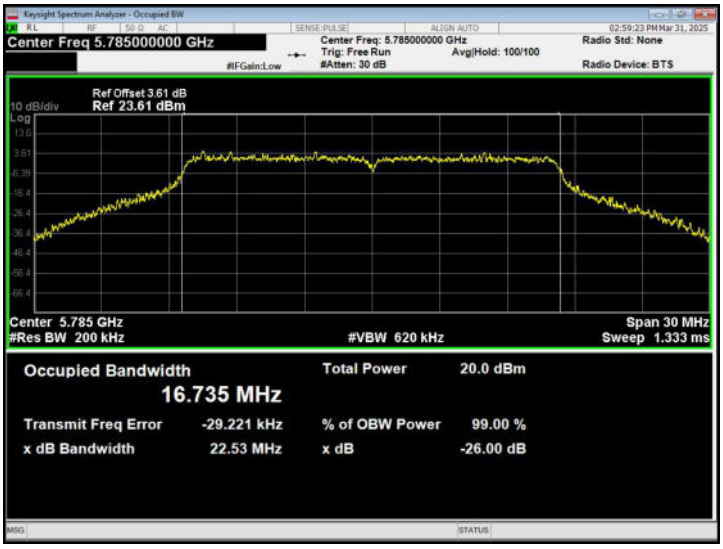
26dB Bandwidth plot on channel 149



6dB Bandwidth plot on channel 157

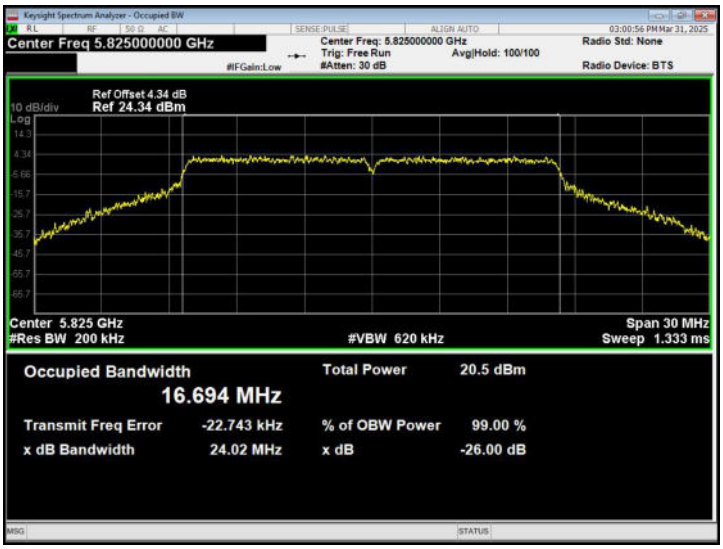


26dB Bandwidth plot on channel 157



6dB Bandwidth plot on channel 165

26dB Bandwidth plot on channel 165

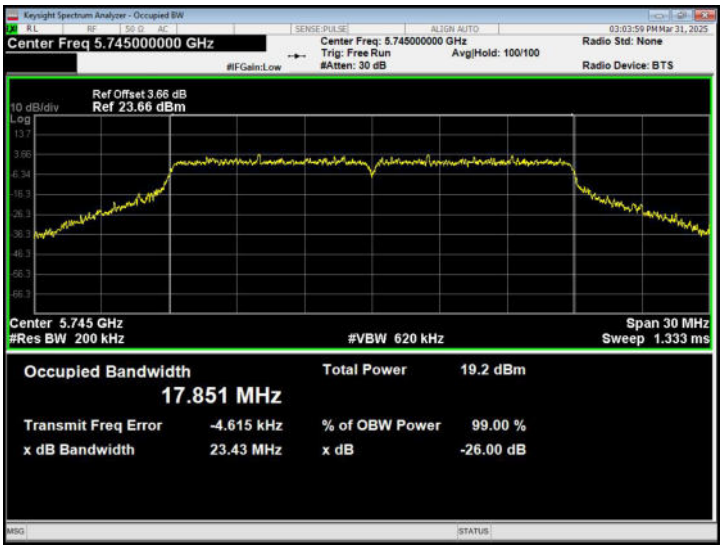


802.11n20

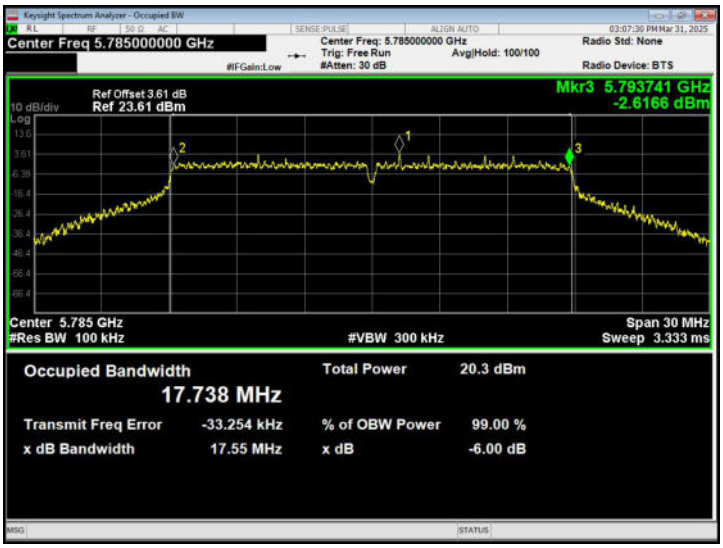
6dB Bandwidth plot on channel 149

802.11n20

26dB Bandwidth plot on channel 149

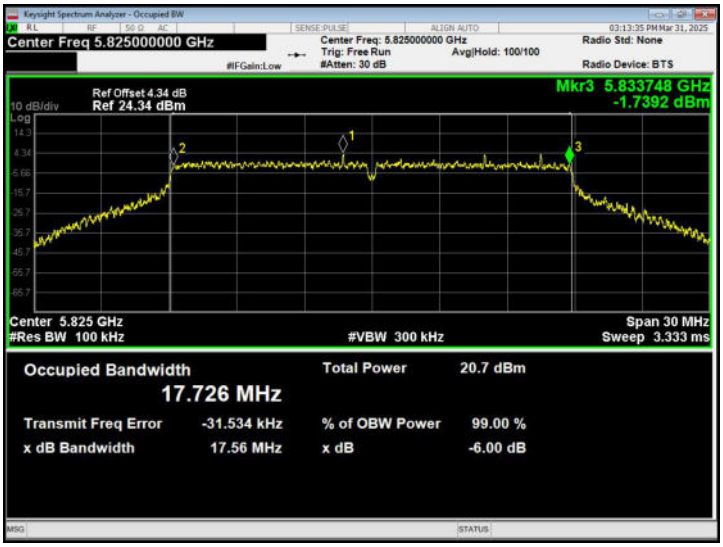


6dB Bandwidth plot on channel 157

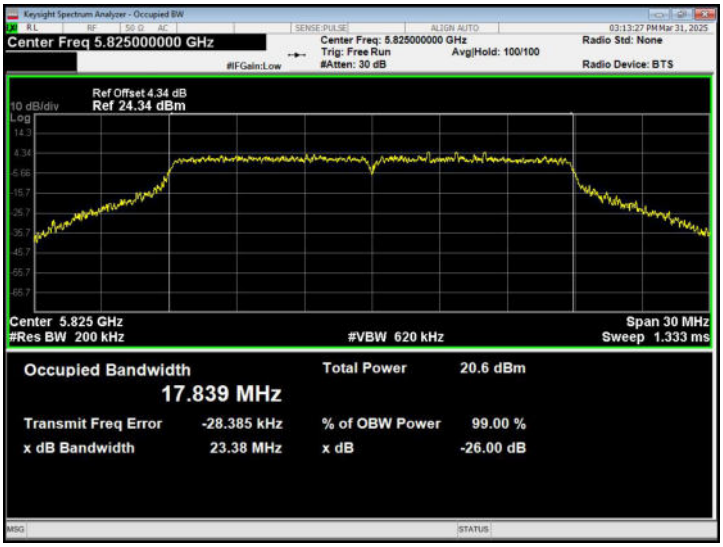


26dB Bandwidth plot on channel 157

6dB Bandwidth plot on channel 165

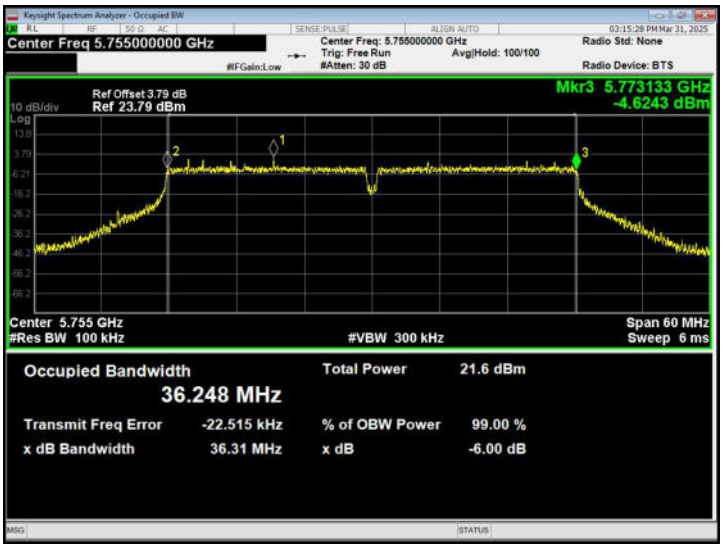


26dB Bandwidth plot on channel 165



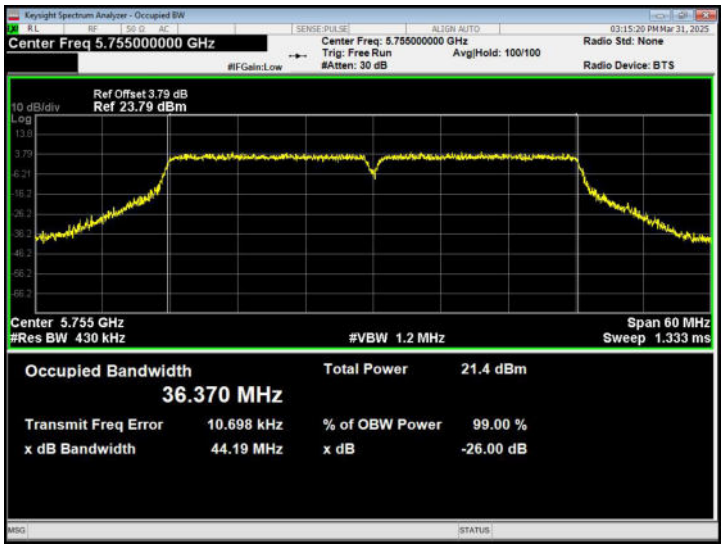
802.11n40

6dB Bandwidth plot on channel 151



802.11n40

26dB Bandwidth plot on channel 151

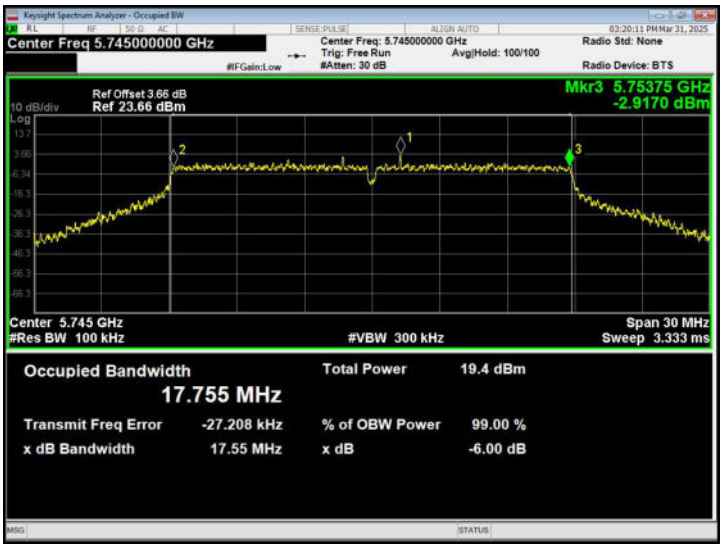


6dB Bandwidth plot on channel 159

26dB Bandwidth plot on channel 159

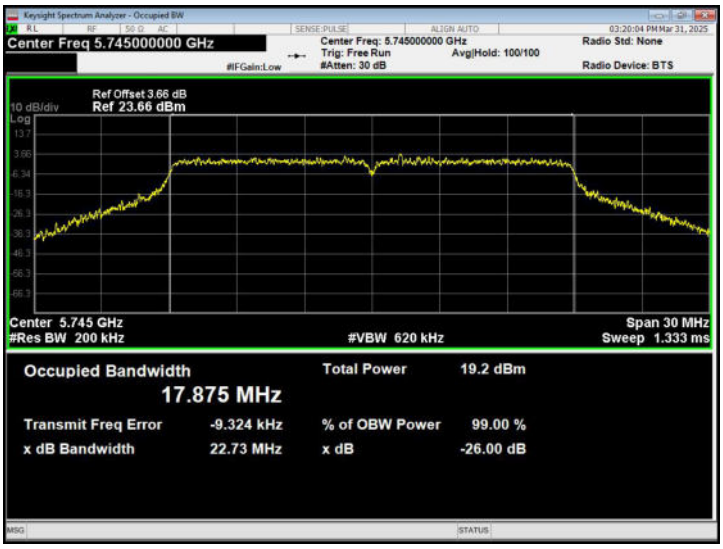
802.11ac20

6dB Bandwidth plot on channel 149

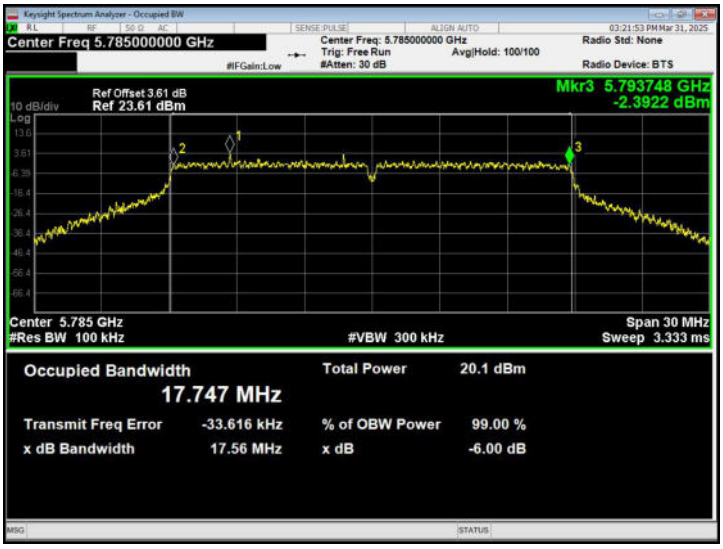


802.11ac20

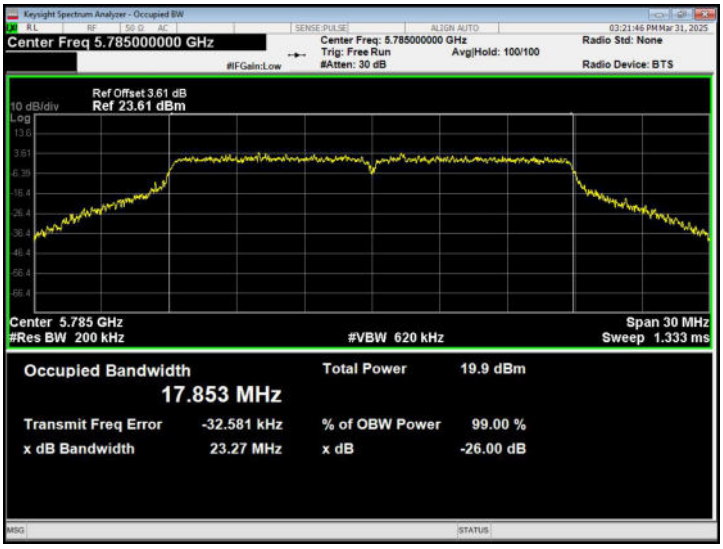
26dB Bandwidth plot on channel 149



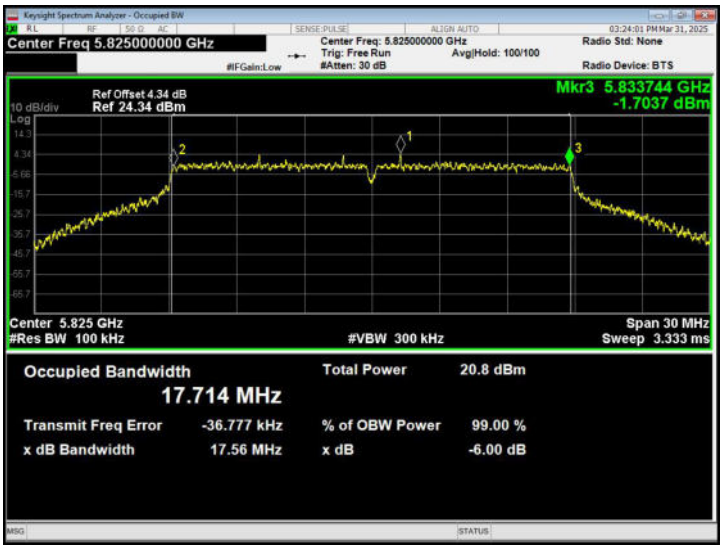
6dB Bandwidth plot on channel 157



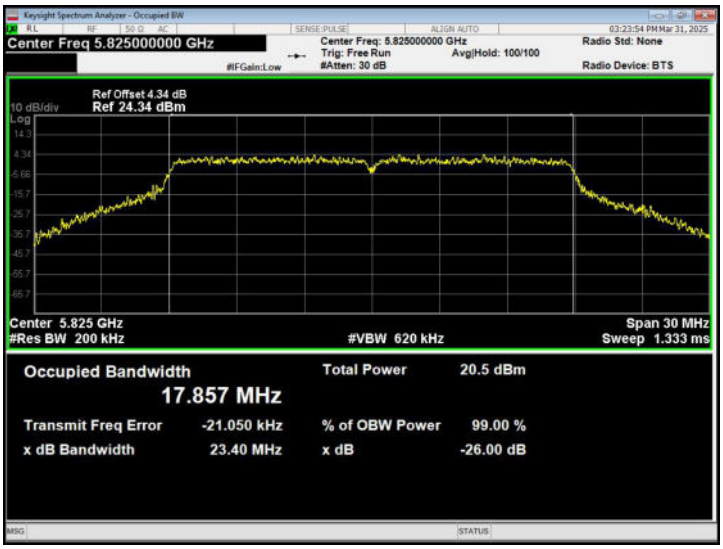
26dB Bandwidth plot on channel 157



6dB Bandwidth plot on channel 165

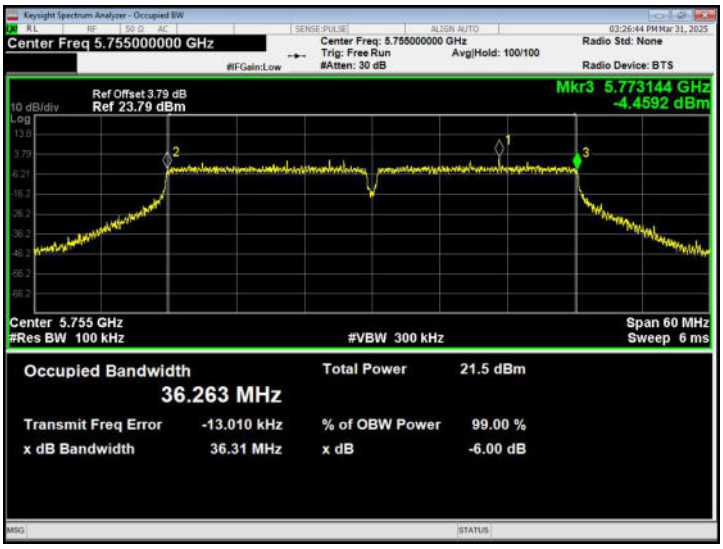


26dB Bandwidth plot on channel 165



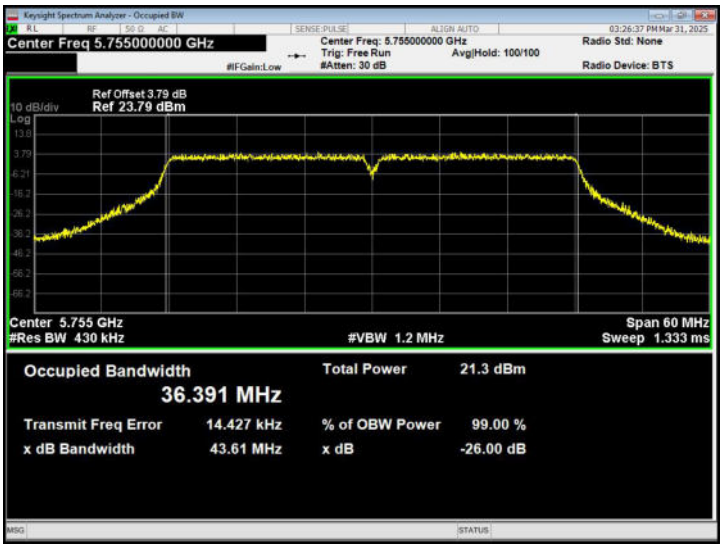
802.11ac40

6dB Bandwidth plot on channel 151

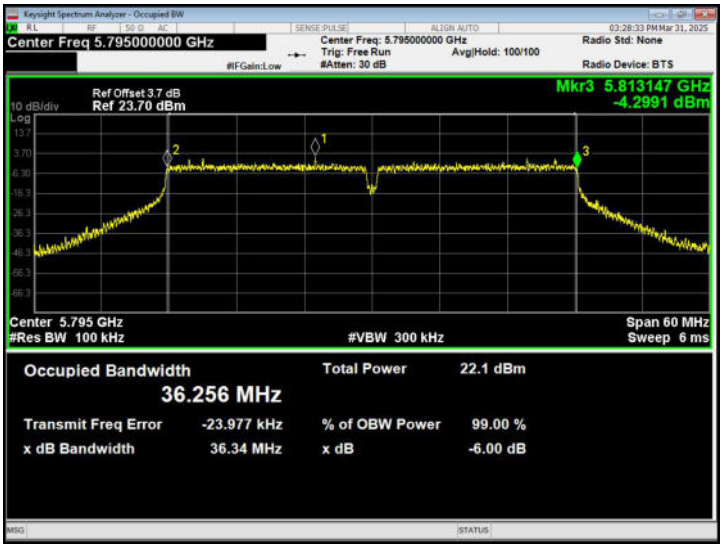


802.11ac40

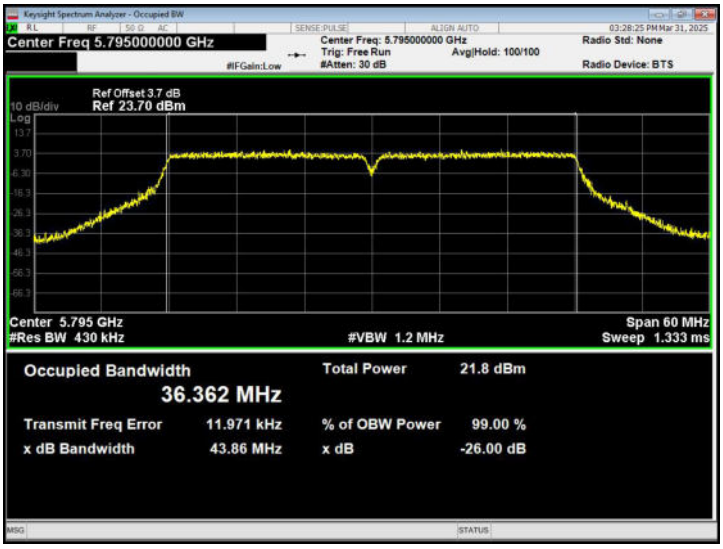
26dB Bandwidth plot on channel 151



6dB Bandwidth plot on channel 159

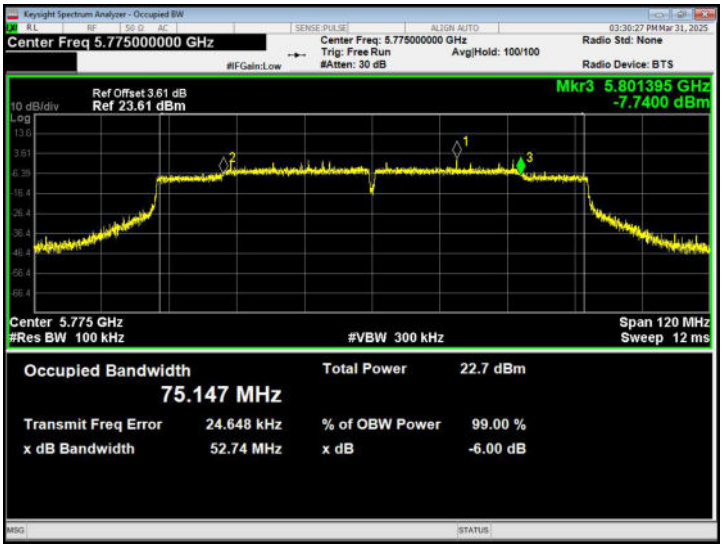


26dB Bandwidth plot on channel 159



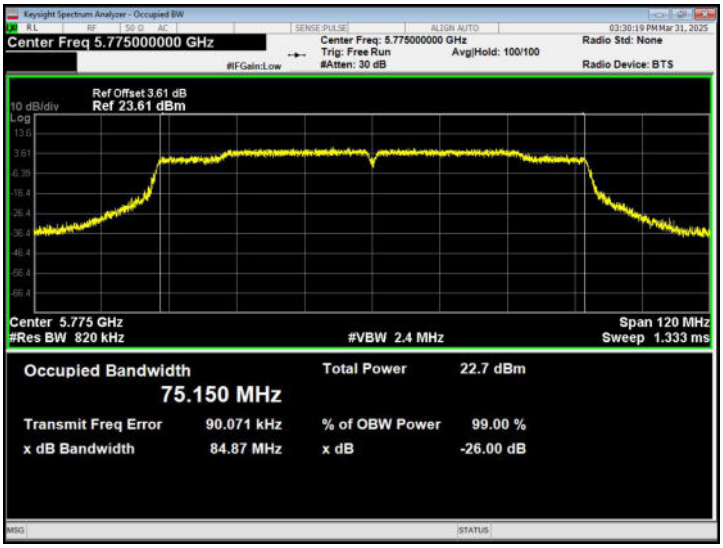
802.11ac80

6dB Bandwidth plot on channel 155



802.11ac80

26dB Bandwidth plot on channel 155



6. MAXIMUM CONDUCTED OUTPUT POWER

7.1 PPLIED PROCEDURES / LIMIT

According to FCC §15.407
The maximum conduced output power should not exceed:

Frequency Band(MHz)	Limit
5150~5250	250mW
5725~5850	1W

7.2 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.).
a) 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.

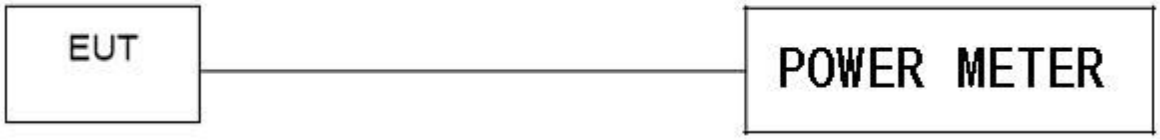
2. Measurement using a Spectrum Analyzer or EMI Receiver (SA)
Measurement of maximum conducted output power using a spectrum analyzer requires integrating the spectrum across a frequency span that encompasses, at a minimum, either the EBW or the 99-percent occupied bandwidth of the signal.1 However, 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 ≥ 3 MHz.
(iv) Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ 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 ≥ 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

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of chapter 3, Unless otherwise a special operating condition is specified in the follows during the testing.

7.6 TEST RESULTS

Temperature :	26 ℃	Relative Humidity :	54%
Pressure :	1012 hPa	Test Voltage :	DC 12V
Test Band :	5.2G		

Test Mode	Frequency (MHz)	Output power (dBm)	Duty cycle factor (dB)	Total power (dBm)	Limit (dBm)	Result
802.11 a	5180	13.162	0.09	13.252	23.98	Pass
	5200	12.959	0.09	13.049	23.98	Pass
	5240	12.694	0.09	12.784	23.98	Pass
802.11 n20	5180	13.075	0.05	13.125	23.98	Pass
	5200	12.907	0.05	12.957	23.98	Pass
	5240	12.721	0.05	12.771	23.98	Pass
802.11 n40	5190	13.140	0.05	13.190	23.98	Pass
	5230	14.032	0.05	14.082	23.98	Pass
802.11 ac20	5180	13.009	0.05	13.059	23.98	Pass
	5200	12.868	0.05	12.918	23.98	Pass
	5240	12.645	0.05	12.695	23.98	Pass
802.11 ac40	5190	13.154	0.05	13.204	23.98	Pass
	5230	14.268	0.05	14.273	23.98	Pass
802.11 ac80	5210	13.529	0.05	13.579	23.98	Pass
Note: Total power = Output power + Duty cycle factor.						

Temperature :	26 ℃	Relative Humidity :	54%
Pressure :	1012 hPa	Test Voltage :	DC 12V
Test Band :	5.8G		

Test Mode	Frequency (MHz)	Output power (dBm)	Duty cycle factor (dB)	Total power (dBm)	Limit (dBm)	Result
802.11 a	5745	13.447	0.10	13.547	30	Pass
	5785	14.261	0.10	14.361	30	Pass
	5825	14.877	0.10	14.977	30	Pass
802.11 n20	5745	13.490	0.04	13.530	30	Pass
	5785	14.331	0.04	14.371	30	Pass
	5825	14.849	0.04	14.889	30	Pass
802.11 n40	5755	15.605	0.05	15.655	30	Pass
	5795	16.061	0.05	16.111	30	Pass
802.11 ac20	5745	13.495	0.05	13.545	30	Pass
	5785	14.320	0.05	14.370	30	Pass
	5825	14.836	0.05	14.886	30	Pass
802.11 ac40	5755	15.525	0.05	15.575	30	Pass
	5795	16.071	0.05	16.121	30	Pass
802.11 ac80	5775	16.360	0.04	16.400	30	Pass
Note: Total power = Output power + Duty cycle factor.						

7. OUT OF BAND EMISSIONS

8.1 APPLICABLE STANDARD

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)

(i) 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.

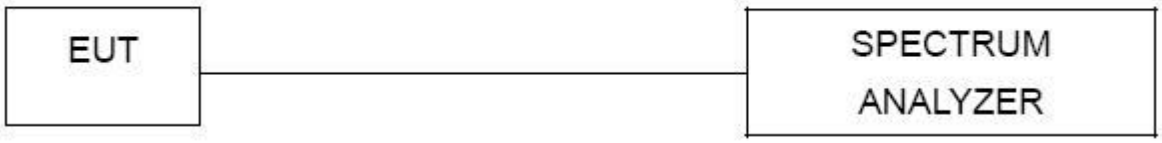
8.2 TEST PROCEDURE

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.

8.3 DEVIATION FROM STANDARD

No deviation.

8.4 TEST SETUP



8.5 EUT OPERATION CONDITIONS

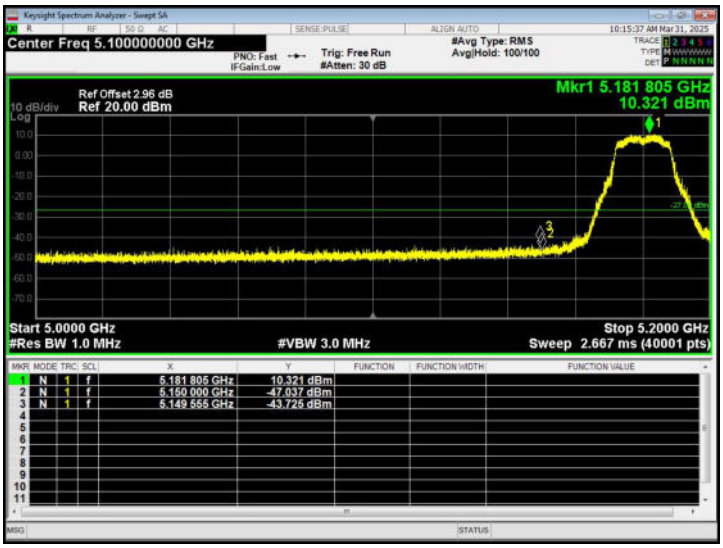
The EUT tested system was configured as the statements of chapter 3, Unless otherwise a special operating condition is specified in the follows during the testing.

8.6 TEST RESULTS

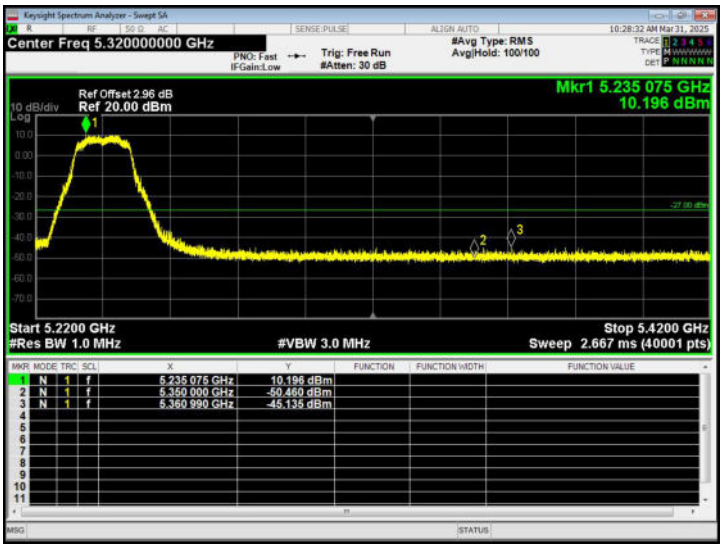
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1012 hPa	Test Voltage：	DC 12V
Test band：	5.2G	Antenna gain：	2.88dBi

5.180~5.240 GHz

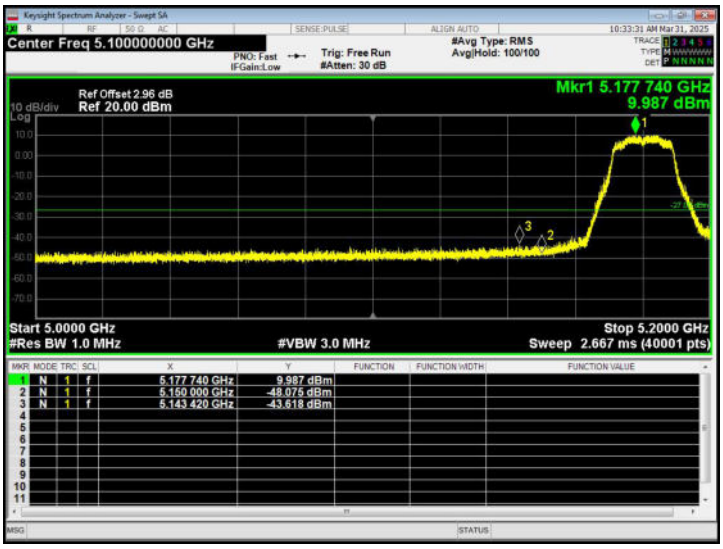
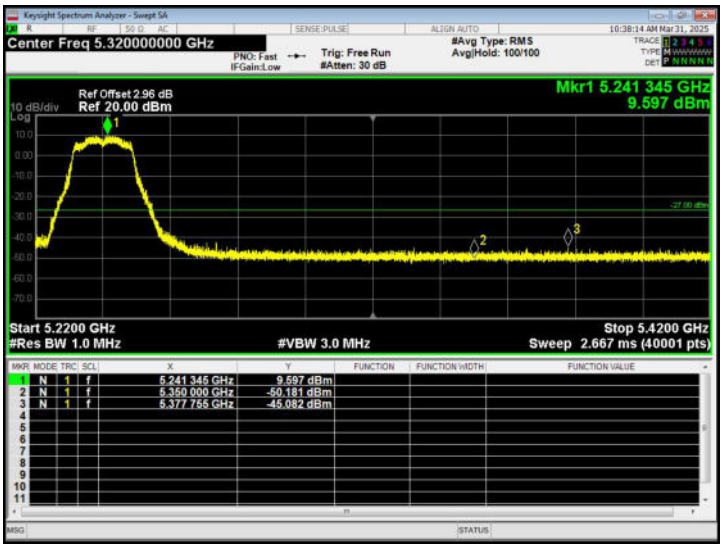
(802.11a) Band Edge, Left Side



(802.11a) Band Edge, Right Side



(802.11n20) Band Edge, Left Side



(802.11n20) Band Edge, Right Side