RF TEST REPORT

IC :29805-U0322P

FCC ID:2A9OO-U0322P

Report Number	ZKT-240429L4557-4
Date of Test	Apr. 25, 2024 to May 11, 2024
Date of issue	May 11, 2024
Total number of pages	79
Test Result	PASS
Testing Laboratory	**Shenzhen ZKT Technology Co., Ltd.**
Address	1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China
Applicant's name	**Ultimea Technology (Shenzhen) Limited**
Address	20th Floor, Building 4, Tianan Cloud Park, Bantian St., Longgang District, Shenzhen, China(Peoples Republic Of)
Manufacturer's name	**Ultimea Technology (Shenzhen) Limited**
Address	20th Floor, Building 4, Tianan Cloud Park, Bantian St., Longgang District, Shenzhen, China(Peoples Republic Of)
Factory	**CRE Electronic Technology Co.,limited**
Address	Building 9#, 5G Intelligent Terminal Industrial Park, Wangcheng District, Changsha,Hunan, China
Test specification:	
Standard	FCC CFR Title 47 Part 15 Subpart C Section 15.247 ANSI C63.10:2013 RSS-Gen Issue 5, February 2021 RSS-247 Issue 3 August 2023
Test procedure	/
Non-standard test method	N/A
Test Report Form No	TRF-EL-111_V0
Test Report Form(s) Originator	ZKT Testing
Master TRF	Dated: 2020-01-06

This device described above has been tested by ZKT, 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	**Nova C40 Smart Projector**
Trademark	ULTIMEA
Model/Type reference	U0322
Ratings	AC 100-240V, 50/60Hz, 1.5A

Testing procedure and testing location:

Testing Laboratory.....:	**Shenzhen ZKT Technology Co., Ltd.**
Address..... :	1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China
Tested by (name + signature)..... :	Alen He
Reviewer (name + signature).....:	Joe Liu
Approved (name + signature)..... :	Lake Xie

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1. VERSION

Report No.	Version	Description	Approved
ZKT-240429L4557-4	Rev.01	Initial issue of report	May 11, 2024

2.SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

RSS-Gen, RSS-247 Issue 3 KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 KDB 662911 D01 Multiple Transmitter Output v02r01			
Standard Section	Test Item	Result	Remark
FCC part 15.203/15.247 (c) RSS-Gen Section 6.8 RSS-247 5.4	Antenna requirement	PASS	
FCC part 15.207 RSS-Gen Section 8.8	AC Power Line Conducted Emission	PASS	
RSS-247 Section 5.4(d)	Conducted Peak Output Power	PASS	
RSS-247 Section 5.4(d)	equivalent isotropically radiated power (e.i.r.p.)	PASS	
FCC part 15.247 (a)(2) RSS-247 Section 5.2(a) RSS-Gen Section 6.7	Channel Bandwidth& 99% OCB	PASS	
FCC part 15.247 (e) RSS-247 Section 5.2(b)	Power Spectral Density	PASS	
FCC part 15.247(d) RSS-247 Section 6.2 RSS-Gen Section 8.9 RSS-Gen Section 8.10	Band Edge	PASS	
FCC part 15.205/15.209 RSS-247 Section 6.2 RSS-Gen Section 8.9 RSS-Gen Section 8.10	Spurious Emission	PASS	

NOTE:

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

2.1 TEST FACILITY

Shenzhen ZKT Technology Co., Ltd.
Add. : 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

FCC Test Firm Registration Number: 692225
Designation Number: CN1299
IC Registered No.: 27033

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=1.8dB
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

Applicant:	Ultimea Technology (Shenzhen) Limited	
Address of applicant:	20th Floor, Building 4, Tianan Cloud Park, Bantian St., Longgang District, Shenzhen, China(Peoples Republic Of)	
Manufacturer:	Ultimea Technology (Shenzhen) Limited	
Address of manufacturer:	20th Floor, Building 4, Tianan Cloud Park, Bantian St., Longgang District, Shenzhen, China(Peoples Republic Of)	
Factory:	CRE Electronic Technology Co.,limited	
Address of manufacturer:	Building 9#, 5G Intelligent Terminal Industrial Park, Wangcheng District, Changsha,Hunan, China	
Product Name:	Nova C40 Smart Projector	
Model No.:	U0322	
Model Different.:	N/A	
Sample ID	N/A	
Sample(s) Status:	Engineer sample	
Product Description	IEEE 802.11 WLAN Mode Supported	☒ 802.11a/n (20MHz channel bandwidth)
	Data Rate	802.11a:6/9/12/18/24/36/48/54Mbps 802.11n(HT20):MCS0-MCS7
	Modulation	OFDM with BPSK/QPSK/16QAM/64QAM for 802.11a/n
	Operating Frequency Range	☒ 5180-5240MHz for 802.11a/n(HT20) ☒ 5745-5850MHz for 802.11a/n(HT20);
	Number of Channels	☒ 4 channels for 802.11a/n20 in the 5180-5240MHz band ☒ 5channels for 802.11a/n20 in the 5745-5850MHz band
Channel List	Please refer to the Note 2.	
Antenna Type:	PCB antenna	
Antenna gain:	WIFI 1: 2.61dBi WIFI 2: 2.36dBi	
HVIN/Hardware version:	U0322	
FVIN/Software version:	V1.0	
Power supply:	AC 100-240V, 50/60Hz, 1.5A	
Note：		

802.11a/n(20MHz) Frequency Channel							
Channel	Frequenc y (MHz)	Channel	Frequenc y (MHz)	Channel	Frequenc y (MHz)	Channel	Frequenc y (MHz)
36	5180	44	5220	149	5745	157-	5785
40	5200	48	5240	153	5765	161	5805
165	5825						

3.2 DESCRIPTION OF TEST MODES

Transmitting mode	Keep the EUT in continuously transmitting mode
Remark: During the test, the duty cycle >98%, 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:

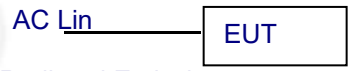
Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.

Mode	802.11a	802.11n(HT20)
Data rate	6Mbps	MSC0

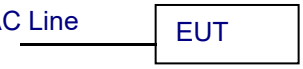
Test Software	Realtek Test Tool
Power level setup	<20dBm

3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

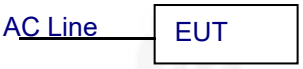
Conducted Emission



Radiated Emission



Conducted Spurious



3.4 DESCRIPTION OF SUPPORT UNITS

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
/	/	/	/	/	/
/	/	/	/	/	/

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

Radiation emissions& Radio Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	KEYSIGHT	9020A	MY55370835	A.17.05	Nov. 02, 2023	Nov. 01, 2024
2	Spectrum Analyzer (10kHz-39.9GHz)	R&S	FSV40-N	100363	1.71 SP2	Nov. 02, 2023	Nov. 01, 2024
3	EMI Test Receiver (9kHz-7GHz)	R&S	ESCI7	100969	4.32	Nov. 02, 2023	Nov. 01, 2024
4	Bilog Antenna (30MHz-1500MHz)	Schwarzbeck	VULB9168	N/A	N/A	Nov. 13, 2023	Nov. 12, 2024
5	Horn Antenna (1GHz-18GHz)	Agilent	AH-118	071145	N/A	Nov. 13, 2023	Nov. 12, 2024
6	Horn Antenna (15GHz-40GHz)	A.H.System	SAS-574	588	N/A	Nov. 13, 2023	Nov. 12, 2024
7	Loop Antenna	TESEQ	HLA6121	58357	N/A	Nov. 16, 2023	Nov. 15, 2024
8	Amplifier (30-1000MHz)	EM Electronics	EM330 Amplifier	60747	N/A	Nov. 02, 2023	Nov. 01, 2024
9	Amplifier (1GHz-26.5GHz)	HuiPu	8449B	3008A00315	N/A	Nov. 02, 2023	Nov. 01, 2024
10	Amplifier (500MHz-40GHz)	QuanJuDa	DLE-161	097	N/A	Nov. 02, 2023	Nov. 01, 2024
11	Test Cable	N/A	R-01	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
12	Test Cable	N/A	R-02	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
13	Test Cable	N/A	R-03	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
14	Test Cable	N/A	RF-01	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
15	Test Cable	N/A	RF-02	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
16	Test Cable	N/A	RF-03	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
17	ESG Signal Generator	Agilent	E4421B	N/A	B.03.84	Nov. 02, 2023	Nov. 01, 2024
18	Signal Generator	Agilent	N5182A	N/A	A.01.87	Nov. 02, 2023	Nov. 01, 2024
19	Magnetic Field Probe Tester	Narda	ELT-400	0-0344	N/A	Nov. 16, 2023	Nov. 15, 2024
20	Wideband Radio Communication Test	R&S	CMW500	106504	V 3.7.22	Nov. 02, 2023	Nov. 01, 2024
21	MWRF Power Meter Test system	MW	MW100-RF CB	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
22	D.C. Power Supply	LongWei	TPR-6405D	N/A	N/A	\	\
23	EMC Software	Frad	EZ-EMC	Ver.EMC-CO N 3A1.1	N/A	\	\
24	RF Software	MW	MTS8310	V2.0.0.0	N/A	\	\
25	Turntable	MF	MF-7802BS	N/A	N/A	\	\
26	Antenna tower	MF	MF-7802BS	N/A	N/A	\	\

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Last calibration	Calibrated until
1	LISN	R&S	ENV216	101471	N/A	Nov. 14, 2023	Nov. 13, 2024
2	LISN	CYBERTEK	EM5040A	E1850400149	N/A	Nov. 02, 2023	Nov. 01, 2024
3	Test Cable	N/A	C-01	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
4	Test Cable	N/A	C-02	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
5	Test Cable	N/A	C-03	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
6	EMI Test Receiver	R&S	ESCI3	101393	4.42 SP3	Nov. 02, 2023	Nov. 01, 2024
7	Triple-Loop Antenna	N/A	RF300	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
8	Absorbing Clamp	DZ	ZN23201	15034	N/A	Nov. 07, 2023	Nov. 06, 2024
9	EMC Software	Frad	EZ-EMC	Ver.EMC-CON 3A1.1	N/A	\	\

4.EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

Test Requirement:	FCC Part15 C Section 15.207 RSS-Gen Section 8.8
Test Method:	ANSI C63.10:2013 RSS-Gen
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.

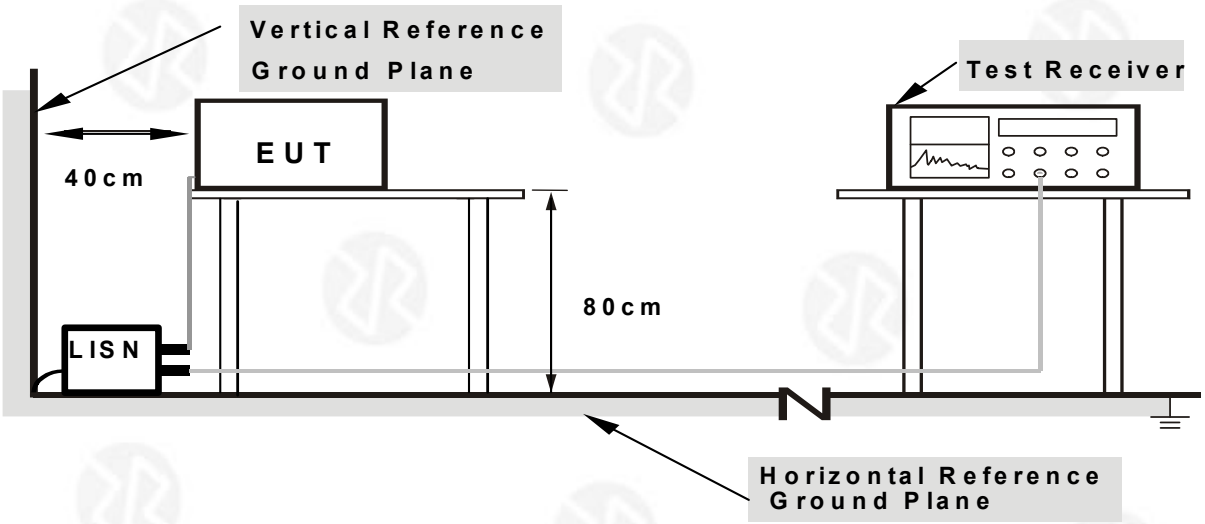
d. LISN at least 80 cm from nearest part of EUT chassis.

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

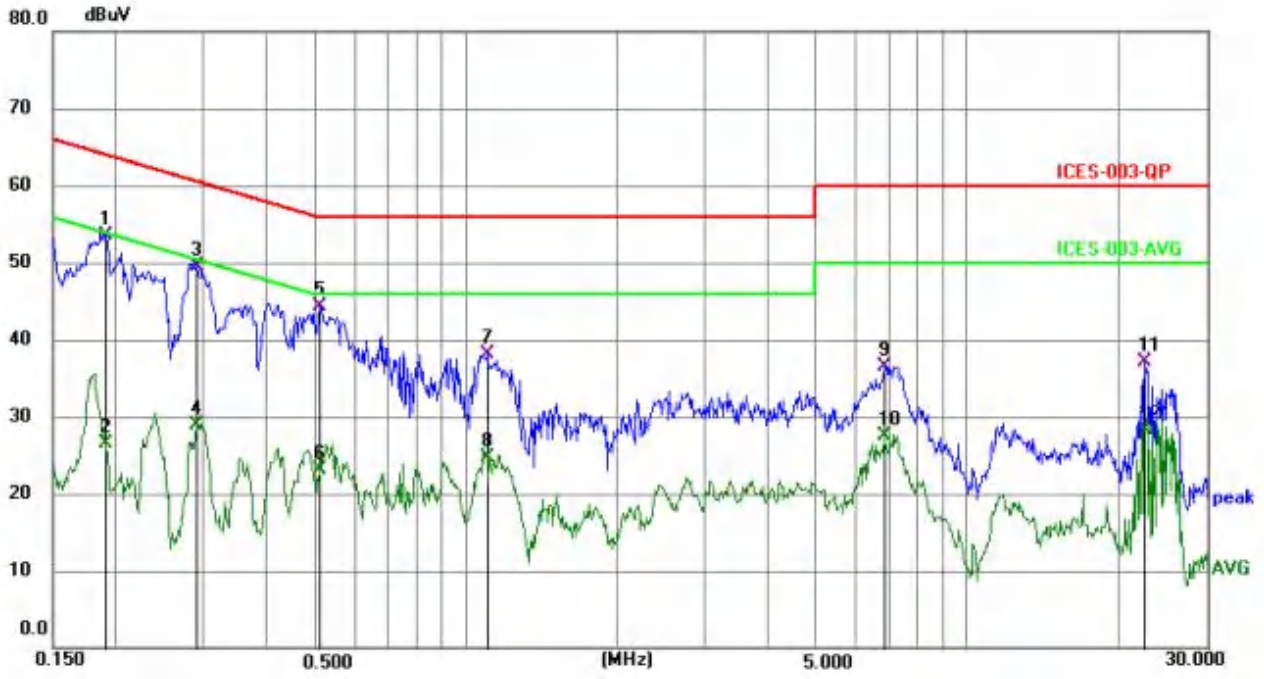
4.1.5 EUT OPERATING CONDITIONS

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.

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

4.1.6 TEST RESULTS

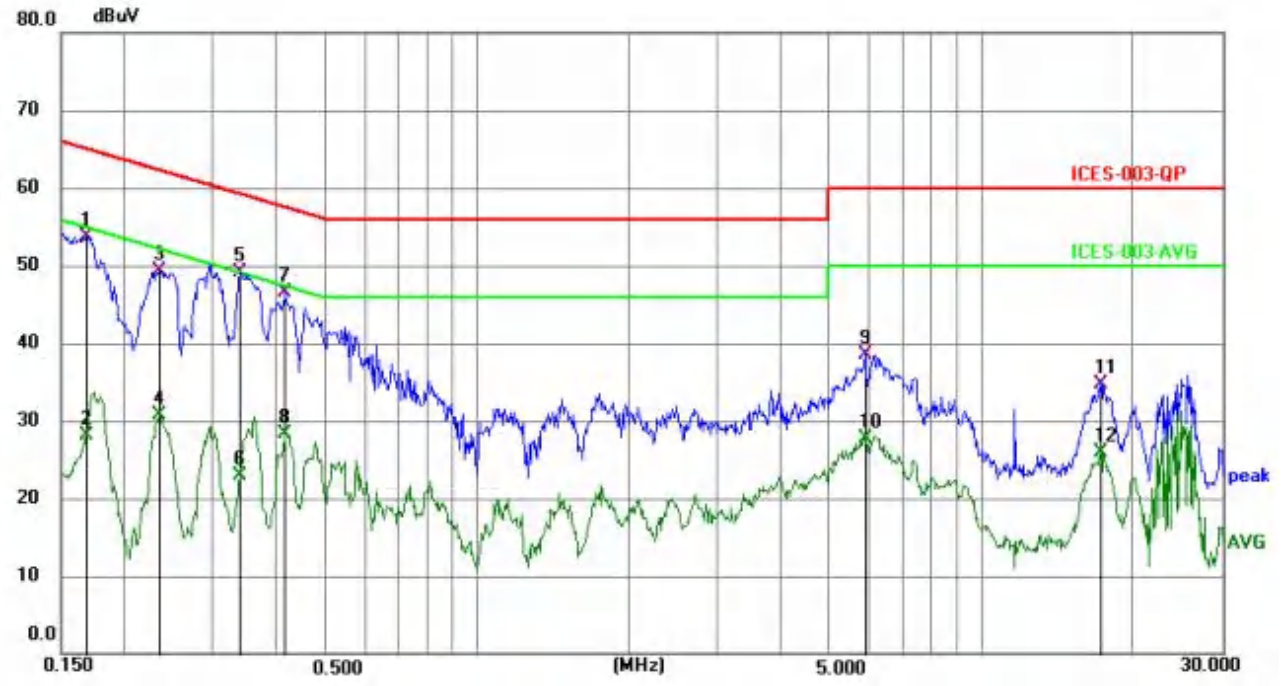
Temperature：	26℃	Relative Humidity：	54%
Pressure：	101kPa	Phase :	L
Test Voltage ：	AC 120V/60Hz		(802.11a 5180MHz--Worst case ant 1)



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1 *	0.1905	43.93	9.67	53.60	64.01	-10.41	QP	P	
2	0.1905	16.84	9.67	26.51	54.01	-27.50	AVG	P	
3	0.2893	39.76	9.68	49.44	60.54	-11.10	QP	P	
4	0.2893	19.21	9.68	28.89	50.54	-21.65	AVG	P	
5	0.5100	34.78	9.62	44.40	56.00	-11.60	QP	P	
6	0.5100	13.39	9.62	23.01	46.00	-22.99	AVG	P	
7	1.1040	28.58	9.54	38.12	56.00	-17.88	QP	P	
8	1.1040	15.20	9.54	24.74	46.00	-21.26	AVG	P	
9	6.8055	27.06	9.53	36.59	60.00	-23.41	QP	P	
10	6.8055	17.88	9.53	27.41	50.00	-22.59	AVG	P	
11	22.6539	27.39	9.63	37.02	60.00	-22.98	QP	P	
12	22.6539	18.76	9.63	28.39	50.00	-21.61	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.Mesurement Level = Reading level + Correct Factor

Temperature :	26℃	Relative Humidity:	54%
Pressure :	101kPa	Phase :	N
Test Voltage :	AC 120V/60Hz		(802.11a 5180MHz--Worst case ant 1)



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1680	44.17	9.58	53.75	65.06	-11.31	QP	P	
2	0.1680	18.61	9.58	28.19	55.06	-26.87	AVG	P	
3	0.2353	39.65	9.70	49.35	62.26	-12.91	QP	P	
4	0.2353	21.10	9.70	30.80	52.26	-21.46	AVG	P	
5 *	0.3390	39.54	9.66	49.20	59.23	-10.03	QP	P	
6	0.3390	13.15	9.66	22.81	49.23	-26.42	AVG	P	
7	0.4153	36.80	9.64	46.44	57.54	-11.10	QP	P	
8	0.4153	18.72	9.64	28.36	47.54	-19.18	AVG	P	
9	5.8963	29.07	9.53	38.60	60.00	-21.40	QP	P	
10	5.8963	18.22	9.53	27.75	50.00	-22.25	AVG	P	
11	17.2770	24.96	9.69	34.65	60.00	-25.35	QP	P	
12	17.2770	16.14	9.69	25.83	50.00	-24.17	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.Mesurement Level = Reading level + Correct Factor

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 APPLICABLE STANDARD

According to RSS-Gen Section 8.9 and 8.10, RSS-247 Section 6.2, 6.2.1.2 and 6.2.4.3

4.2.2 CONFORMANCE LIMIT

4.2.2 CONFORMANCE LIMIT

For transmitters operating in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. However, any unwanted emissions that fall into the band 5250-5350 MHz must be 26 dBc, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth, above 5.25 GHz. Otherwise, the transmission is considered as intentional and the devices shall implement dynamic frequency selection (DFS) and transmitter power control (TPC) as per the requirements for the band 5250-5350 MHz.

Devices operating in the band 5725-5850 MHz shall comply with the following e.i.r.p. spectral density limits:

27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 Bm/MHz at 5 MHz above or below the band edges;
15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;
10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and
-27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

According to IC RSS-Gen 8.10: radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits.
According to IC RSS-Gen, Restricted bands and limit

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	Above 38.6
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

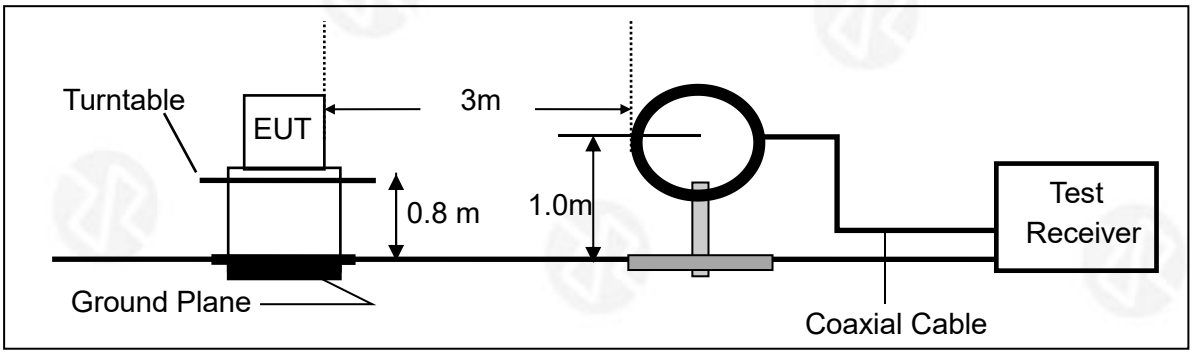
Remark :1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

4.2.3 MEASURING INSTRUMENTS

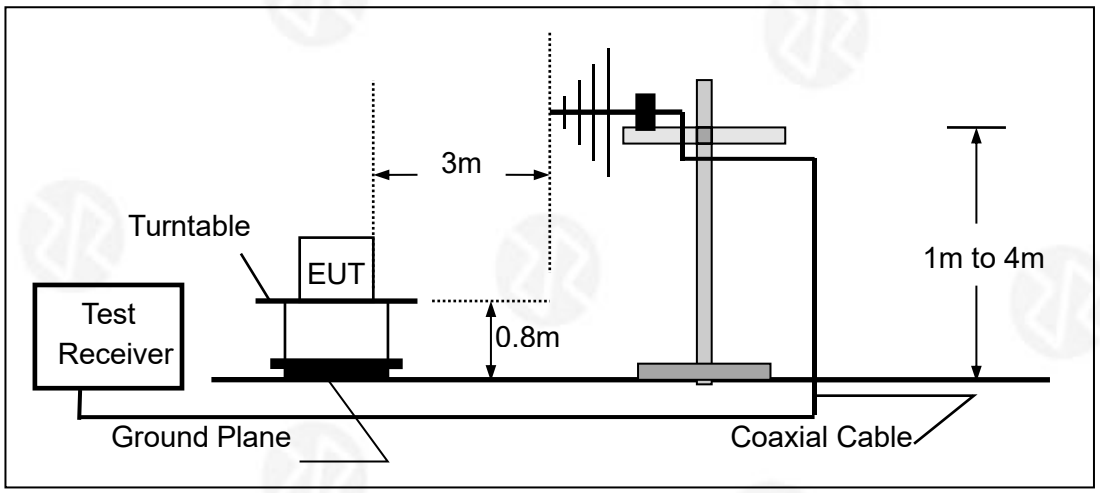
The Measuring equipment is listed in the section 6.3 of this test report.

4.2.4 TEST CONFIGURATION

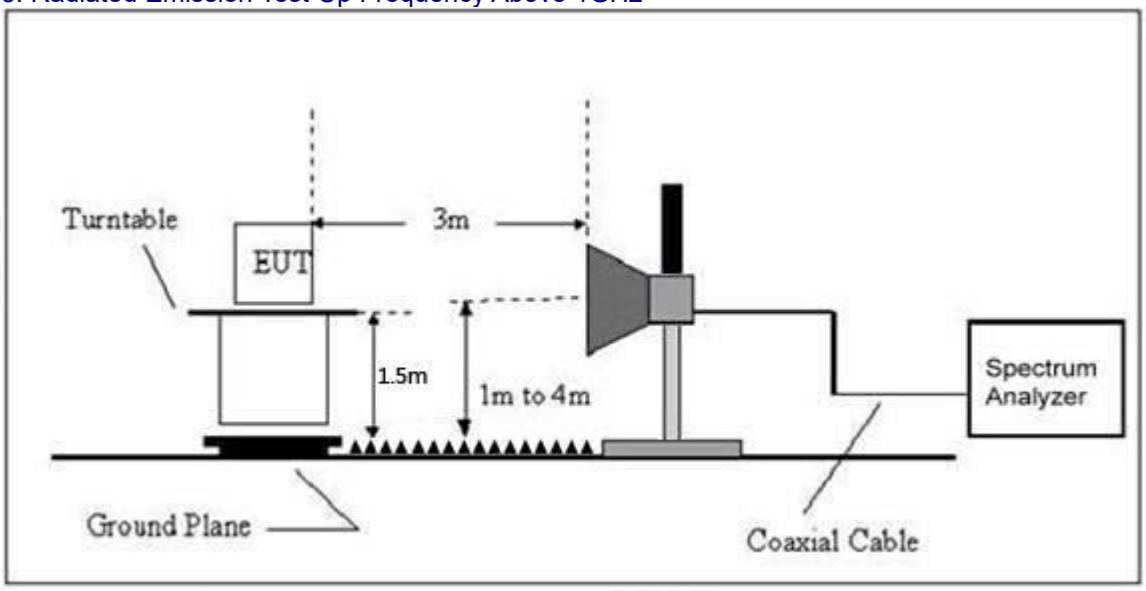
1.For radiated emissions below 30MHz



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.

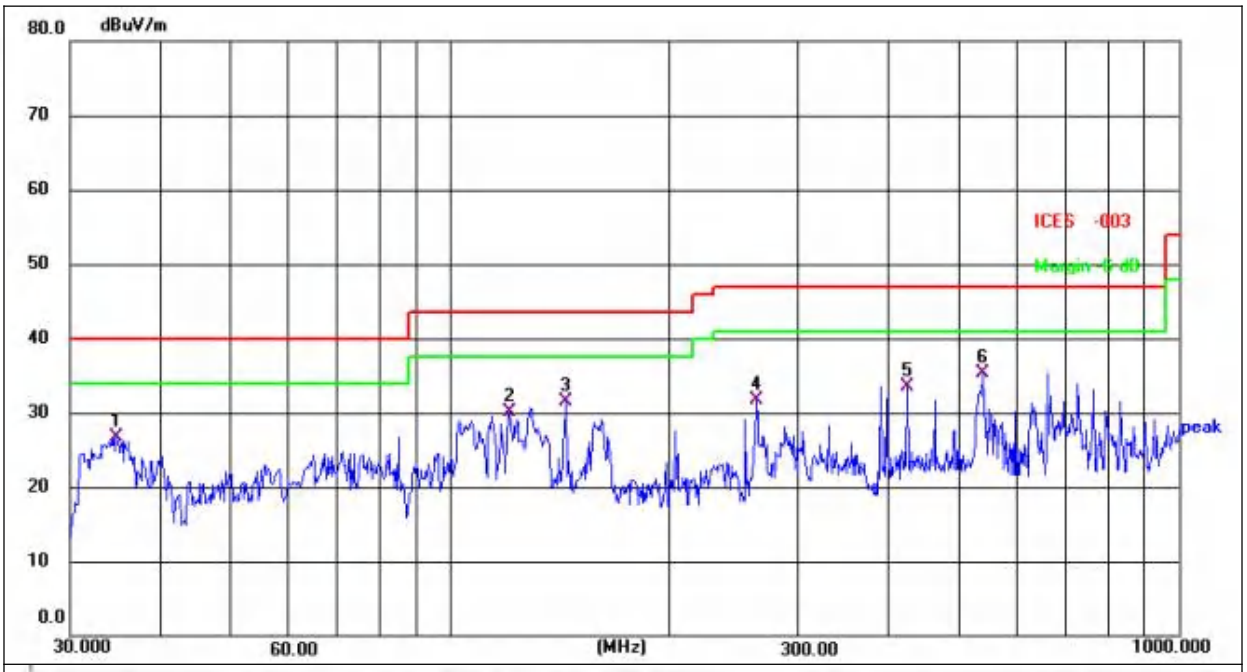
4.2.6 TEST RESULT

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) & RSS-Gen 6.13, the test result no need to reported.

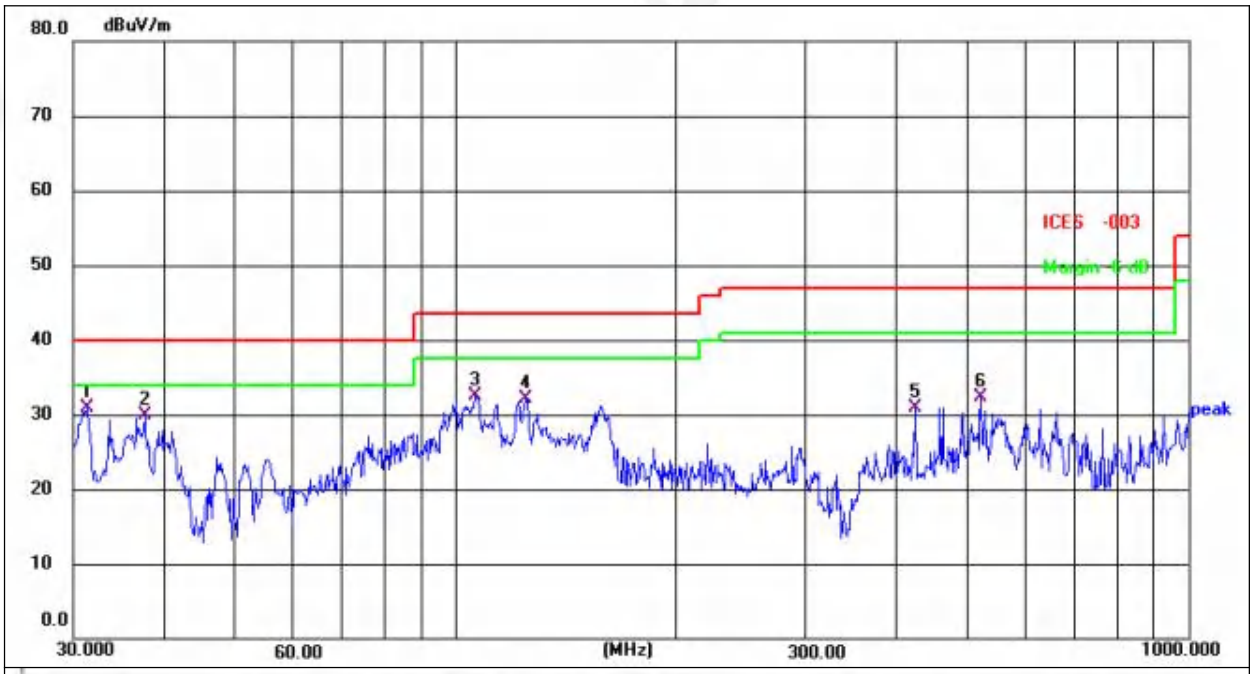
Between 30MHz – 1GHz

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	(802.11a 5180MHz--Worst case ant 1)	



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	34.7601	43.22	-16.48	26.74	40.00	-13.26	QP
2	120.6991	48.25	-18.13	30.12	43.50	-13.38	QP
3	143.8291	48.00	-16.42	31.58	43.50	-11.92	QP
4	262.8955	49.25	-17.49	31.76	47.00	-15.24	QP
5	423.5402	46.12	-12.57	33.55	47.00	-13.45	QP
6 *	537.5891	45.30	-10.02	35.28	47.00	-11.72	QP

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz	(802.11a 5180MHz--Worst case ant 1)	



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	31.2892	48.02	-17.20	30.82	40.00	-9.18	QP
2	37.5478	45.93	-16.05	29.88	40.00	-10.12	QP
3	106.0126	51.89	-19.42	32.47	43.50	-11.03	QP
4	124.5690	50.06	-17.92	32.14	43.50	-11.36	QP
5	423.5402	43.39	-12.57	30.82	47.00	-16.18	QP
6	520.8881	42.63	-10.40	32.23	47.00	-14.77	QP

Remarks:
1.Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2.The emission levels of other frequencies are very lower than the limit and not show in test report.
3.The test data shows only the worst case 802.11a 5180MHz ant1 mode

Between 1GHz – 40GHz

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

802.11a Ant2									
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	10360	52.36	30.55	5.77	24.66	52.24	74.00	-21.76	PK
V	10360	43.25	30.55	5.77	24.66	43.13	54.00	-10.87	AV
V	15540	51.36	30.33	6.32	24.55	51.90	74.00	-22.10	PK
V	15540	43.83	30.33	6.32	24.55	44.37	54.00	-9.63	AV
V	20720	52.63	30.85	7.45	24.69	53.92	74.00	-20.08	PK
V	20720	43.16	30.85	7.45	24.69	44.45	54.00	-9.55	AV
V	25900	51.70	31.02	8.99	25.57	55.24	74.00	-18.76	PK
V	25900	43.41	31.02	8.99	25.57	46.95	54.00	-7.05	AV
H	10360	53.66	30.55	5.77	24.66	53.54	74.00	-20.46	PK
H	10360	43.46	30.55	5.77	24.66	43.34	54.00	-10.66	AV
H	15540	51.51	30.33	6.32	24.55	52.05	74.00	-21.95	PK
H	15540	43.79	30.33	6.32	24.55	44.33	54.00	-9.67	AV
H	20720	50.06	30.85	7.45	24.69	51.35	74.00	-22.65	PK
H	20720	43.96	30.85	7.45	24.69	45.25	54.00	-8.75	AV
H	25900	50.37	31.02	8.99	25.57	53.91	74.00	-20.09	PK
H	25900	43.35	31.02	8.99	25.57	46.89	54.00	-7.11	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	10400	52.38	30.55	5.77	24.66	52.26	74.00	-21.74	PK
V	10400	43.47	30.55	5.77	24.66	43.35	54.00	-10.65	AV
V	15600	51.32	30.33	6.32	24.55	51.86	74.00	-22.14	PK
V	15600	43.93	30.33	6.32	24.55	44.47	54.00	-9.53	AV
V	20800	53.34	30.85	7.45	24.69	54.63	74.00	-19.37	PK
V	20800	43.82	30.85	7.45	24.69	45.11	54.00	-8.89	AV
V	26000	51.45	31.02	8.99	25.57	54.99	74.00	-19.01	PK
V	26000	43.01	31.02	8.99	25.57	46.55	54.00	-7.45	AV
H	10400	52.56	30.55	5.77	24.66	52.44	74.00	-21.56	PK
H	10400	43.92	30.55	5.77	24.66	43.80	54.00	-10.20	AV
H	15600	53.88	30.33	6.32	24.55	54.42	74.00	-19.58	PK
H	15600	43.79	30.33	6.32	24.55	44.33	54.00	-9.67	AV
H	20800	54.44	30.85	7.45	24.69	55.73	74.00	-18.27	PK
H	20800	43.63	30.85	7.45	24.69	44.92	54.00	-9.08	AV
H	26000	51.72	31.02	8.99	25.57	55.26	74.00	-18.74	PK
H	26000	43.08	31.02	8.99	25.57	46.62	54.00	-7.38	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	10480	54.91	30.55	5.77	24.66	54.79	74.00	-19.21	PK
V	10480	43.69	30.55	5.77	24.66	43.57	54.00	-10.43	AV
V	15720	54.48	30.33	6.32	24.55	55.02	74.00	-18.98	PK
V	15720	43.06	30.33	6.32	24.55	43.60	54.00	-10.40	AV
V	20960	54.29	30.85	7.45	24.69	55.58	74.00	-18.42	PK
V	20960	43.18	30.85	7.45	24.69	44.47	54.00	-9.53	AV
V	26200	52.15	31.02	8.99	25.57	55.69	74.00	-18.31	PK
V	26200	43.18	31.02	8.99	25.57	46.72	54.00	-7.28	AV
H	10480	51.46	30.55	5.77	24.66	51.34	74.00	-22.66	PK
H	10480	43.65	30.55	5.77	24.66	43.53	54.00	-10.47	AV
H	15720	53.11	30.33	6.32	24.55	53.65	74.00	-20.35	PK
H	15720	43.45	30.33	6.32	24.55	43.99	54.00	-10.01	AV
H	20960	52.06	30.85	7.45	24.69	53.35	74.00	-20.65	PK
H	20960	43.32	30.85	7.45	24.69	44.61	54.00	-9.39	AV
H	26200	53.10	31.02	8.99	25.57	56.64	74.00	-17.36	PK
H	26200	43.09	31.02	8.99	25.57	46.63	54.00	-7.37	AV

802.11n20 MIMO

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	10360	53.59	30.55	5.77	24.66	53.47	74.00	-20.53	PK
V	10360	43.19	30.55	5.77	24.66	43.07	54.00	-10.93	AV
V	15540	51.91	30.33	6.32	24.55	52.45	74.00	-21.55	PK
V	15540	43.84	30.33	6.32	24.55	44.38	54.00	-9.62	AV
V	20720	52.53	30.85	7.45	24.69	53.82	74.00	-20.18	PK
V	20720	43.43	30.85	7.45	24.69	44.72	54.00	-9.28	AV
V	25900	50.03	31.02	8.99	25.57	53.57	74.00	-20.43	PK
V	25900	43.54	31.02	8.99	25.57	47.08	54.00	-6.92	AV
H	10360	54.37	30.55	5.77	24.66	54.25	74.00	-19.75	PK
H	10360	43.16	30.55	5.77	24.66	43.04	54.00	-10.96	AV
H	15540	54.37	30.33	6.32	24.55	54.91	74.00	-19.09	PK
H	15540	43.15	30.33	6.32	24.55	43.69	54.00	-10.31	AV
H	20720	50.90	30.85	7.45	24.69	52.19	74.00	-21.81	PK
H	20720	43.19	30.85	7.45	24.69	44.48	54.00	-9.52	AV
H	25900	51.48	31.02	8.99	25.57	55.02	74.00	-18.98	PK
H	25900	43.54	31.02	8.99	25.57	47.08	54.00	-6.92	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	10400	51.35	30.55	5.77	24.66	51.23	74.00	-22.77	PK
V	10400	43.62	30.55	5.77	24.66	43.50	54.00	-10.50	AV
V	15600	50.75	30.33	6.32	24.55	51.29	74.00	-22.71	PK
V	15600	43.94	30.33	6.32	24.55	44.48	54.00	-9.52	AV
V	20800	51.35	30.85	7.45	24.69	52.64	74.00	-21.36	PK
V	20800	43.93	30.85	7.45	24.69	45.22	54.00	-8.78	AV
V	26000	51.32	31.02	8.99	25.57	54.86	74.00	-19.14	PK
V	26000	43.14	31.02	8.99	25.57	46.68	54.00	-7.32	AV
H	10400	53.06	30.55	5.77	24.66	52.94	74.00	-21.06	PK
H	10400	43.10	30.55	5.77	24.66	42.98	54.00	-11.02	AV
H	15600	53.09	30.33	6.32	24.55	53.63	74.00	-20.37	PK
H	15600	43.89	30.33	6.32	24.55	44.43	54.00	-9.57	AV
H	20800	51.13	30.85	7.45	24.69	52.42	74.00	-21.58	PK
H	20800	43.98	30.85	7.45	24.69	45.27	54.00	-8.73	AV
H	26000	53.28	31.02	8.99	25.57	56.82	74.00	-17.18	PK
H	26000	43.42	31.02	8.99	25.57	46.96	54.00	-7.04	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	10480	53.00	30.55	5.77	24.66	52.88	74.00	-21.12	PK
V	10480	43.46	30.55	5.77	24.66	43.34	54.00	-10.66	AV
V	15720	52.91	30.33	6.32	24.55	53.45	74.00	-20.55	PK
V	15720	43.36	30.33	6.32	24.55	43.90	54.00	-10.10	AV
V	20960	54.22	30.85	7.45	24.69	55.51	74.00	-18.49	PK
V	20960	43.46	30.85	7.45	24.69	44.75	54.00	-9.25	AV
V	26200	50.66	31.02	8.99	25.57	54.20	74.00	-19.80	PK
V	26200	43.10	31.02	8.99	25.57	46.64	54.00	-7.36	AV
H	10480	52.27	30.55	5.77	24.66	52.15	74.00	-21.85	PK
H	10480	43.59	30.55	5.77	24.66	43.47	54.00	-10.53	AV
H	15720	51.02	30.33	6.32	24.55	51.56	74.00	-22.44	PK
H	15720	43.65	30.33	6.32	24.55	44.19	54.00	-9.81	AV
H	20960	50.13	30.85	7.45	24.69	51.42	74.00	-22.58	PK
H	20960	43.97	30.85	7.45	24.69	45.26	54.00	-8.74	AV
H	26200	50.76	31.02	8.99	25.57	54.30	74.00	-19.70	PK
H	26200	43.49	31.02	8.99	25.57	47.03	54.00	-6.97	AV

Temperature：	26℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	5.8G TX- 802.11a/n20(Worst case)		

802.11a-Ant2

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	51.97	30.55	5.77	24.66	51.85	74.00	-22.15	PK
V	11490.00	43.74	30.55	5.77	24.66	43.62	54.00	-10.38	AV
V	17235.00	50.56	30.33	6.32	24.55	51.10	74.00	-22.90	PK
V	17235.00	43.28	30.33	6.32	24.55	43.82	54.00	-10.18	AV
V	22980.00	54.63	30.85	7.45	24.69	55.92	74.00	-18.08	PK
V	22980.00	43.67	30.85	7.45	24.69	44.96	54.00	-9.04	AV
V	28725.00	52.62	31.02	8.99	25.57	56.16	74.00	-17.84	PK
V	28725.00	43.15	31.02	8.99	25.57	46.69	54.00	-7.31	AV
H	11490.00	54.18	30.55	5.77	24.66	54.06	74.00	-19.94	PK
H	11490.00	43.09	30.55	5.77	24.66	42.97	54.00	-11.03	AV
H	17235.00	52.64	30.33	6.32	24.55	53.18	74.00	-20.82	PK
H	17235.00	43.49	30.33	6.32	24.55	44.03	54.00	-9.97	AV
H	22980.00	50.71	30.85	7.45	24.69	52.00	74.00	-22.00	PK
H	22980.00	43.32	30.85	7.45	24.69	44.61	54.00	-9.39	AV
H	28725.00	54.56	31.02	8.99	25.57	58.10	74.00	-15.90	PK
H	28725.00	43.75	31.02	8.99	25.57	47.29	54.00	-6.71	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	52.31	30.55	5.77	24.66	52.19	74.00	-21.81	PK
V	11570.00	43.93	30.55	5.77	24.66	43.81	54.00	-10.19	AV
V	17355.00	50.43	30.33	6.32	24.55	50.97	74.00	-23.03	PK
V	17355.00	43.04	30.33	6.32	24.55	43.58	54.00	-10.42	AV
V	23140.00	54.53	30.85	7.45	24.69	55.82	74.00	-18.18	PK
V	23140.00	43.94	30.85	7.45	24.69	45.23	54.00	-8.77	AV
V	28925.00	51.69	31.02	8.99	25.57	55.23	74.00	-18.77	PK
V	28925.00	43.96	31.02	8.99	25.57	47.50	54.00	-6.50	AV
H	11570.00	53.85	30.55	5.77	24.66	53.73	74.00	-20.27	PK
H	11570.00	43.39	30.55	5.77	24.66	43.27	54.00	-10.73	AV
H	17355.00	53.37	30.33	6.32	24.55	53.91	74.00	-20.09	PK
H	17355.00	43.96	30.33	6.32	24.55	44.50	54.00	-9.50	AV
H	23140.00	53.05	30.85	7.45	24.69	54.34	74.00	-19.66	PK
H	23140.00	43.55	30.85	7.45	24.69	44.84	54.00	-9.16	AV
H	28925.00	51.54	31.02	8.99	25.57	55.08	74.00	-18.92	PK
H	28925.00	43.06	31.02	8.99	25.57	46.60	54.00	-7.40	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	53.19	30.55	5.77	24.66	53.07	74.00	-20.93	PK
V	11650.00	43.41	30.55	5.77	24.66	43.29	54.00	-10.71	AV
V	17475.00	54.42	30.33	6.32	24.55	54.96	74.00	-19.04	PK
V	17475.00	43.62	30.33	6.32	24.55	44.16	54.00	-9.84	AV
V	23300.00	50.45	30.85	7.45	24.69	51.74	74.00	-22.26	PK
V	23300.00	43.71	30.85	7.45	24.69	45.00	54.00	-9.00	AV
V	29125.00	54.54	31.02	8.99	25.57	58.08	74.00	-15.92	PK
V	29125.00	43.91	31.02	8.99	25.57	47.45	54.00	-6.55	AV
H	11650.00	50.05	30.55	5.77	24.66	49.93	74.00	-24.07	PK
H	11650.00	43.91	30.55	5.77	24.66	43.79	54.00	-10.21	AV
H	17475.00	51.71	30.33	6.32	24.55	52.25	74.00	-21.75	PK
H	17475.00	43.03	30.33	6.32	24.55	43.57	54.00	-10.43	AV
H	23300.00	53.03	30.85	7.45	24.69	54.32	74.00	-19.68	PK
H	23300.00	43.23	30.85	7.45	24.69	44.52	54.00	-9.48	AV
H	29125.00	54.33	31.02	8.99	25.57	57.87	74.00	-16.13	PK
H	29125.00	43.97	31.02	8.99	25.57	47.51	54.00	-6.49	AV

802.11n20 MIMO

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	50.62	30.55	5.77	24.66	50.50	74.00	-23.50	PK
V	11490.00	43.96	30.55	5.77	24.66	43.84	54.00	-10.16	AV
V	17235.00	50.13	30.33	6.32	24.55	50.67	74.00	-23.33	PK
V	17235.00	43.11	30.33	6.32	24.55	43.65	54.00	-10.35	AV
V	22980.00	50.22	30.85	7.45	24.69	51.51	74.00	-22.49	PK
V	22980.00	43.58	30.85	7.45	24.69	44.87	54.00	-9.13	AV
V	28725.00	52.90	31.02	8.99	25.57	56.44	74.00	-17.56	PK
V	28725.00	43.97	31.02	8.99	25.57	47.51	54.00	-6.49	AV
H	11490.00	53.15	30.55	5.77	24.66	53.03	74.00	-20.97	PK
H	11490.00	43.70	30.55	5.77	24.66	43.58	54.00	-10.42	AV
H	17235.00	52.46	30.33	6.32	24.55	53.00	74.00	-21.00	PK
H	17235.00	43.59	30.33	6.32	24.55	44.13	54.00	-9.87	AV
H	22980.00	51.41	30.85	7.45	24.69	52.70	74.00	-21.30	PK
H	22980.00	43.15	30.85	7.45	24.69	44.44	54.00	-9.56	AV
H	28725.00	54.01	31.02	8.99	25.57	57.55	74.00	-16.45	PK
H	28725.00	43.98	31.02	8.99	25.57	47.52	54.00	-6.48	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	54.11	30.55	5.77	24.66	52.23	74.00	-21.77	PK
V	11570.00	43.25	30.55	5.77	24.66	43.48	54.00	-10.52	AV
V	17355.00	54.81	30.33	6.32	24.55	54.16	74.00	-19.84	PK
V	17355.00	43.89	30.33	6.32	24.55	43.66	54.00	-10.34	AV
V	23140.00	53.07	30.85	7.45	24.69	53.63	74.00	-20.37	PK
V	23140.00	43.63	30.85	7.45	24.69	44.52	54.00	-9.48	AV
V	28925.00	52.36	31.02	8.99	25.57	56.82	74.00	-17.18	PK
V	28925.00	43.51	31.02	8.99	25.57	47.86	54.00	-6.14	AV
H	11570.00	54.73	30.55	5.77	24.66	53.14	74.00	-20.86	PK
H	11570.00	43.39	30.55	5.77	24.66	43.13	54.00	-10.87	AV
H	17355.00	54.90	30.33	6.32	24.55	52.82	74.00	-21.18	PK
H	17355.00	43.05	30.33	6.32	24.55	43.19	54.00	-10.81	AV
H	23140.00	54.23	30.85	7.45	24.69	54.46	74.00	-19.54	PK
H	23140.00	43.04	30.85	7.45	24.69	44.82	54.00	-9.18	AV
H	28925.00	51.25	31.02	8.99	25.57	54.88	74.00	-19.12	PK
H	28925.00	43.07	31.02	8.99	25.57	45.75	54.00	-8.25	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	54.09	30.55	5.77	24.66	52.23	74.00	-21.77	PK
V	11650.00	43.47	30.55	5.77	24.66	43.48	54.00	-10.52	AV
V	17475.00	52.04	30.33	6.32	24.55	54.16	74.00	-19.84	PK
V	17475.00	43.17	30.33	6.32	24.55	43.66	54.00	-10.34	AV
V	23300.00	52.85	30.85	7.45	24.69	53.63	74.00	-20.37	PK
V	23300.00	43.95	30.85	7.45	24.69	44.52	54.00	-9.48	AV
V	29125.00	54.66	31.02	8.99	25.57	56.82	74.00	-17.18	PK
V	29125.00	43.34	31.02	8.99	25.57	47.86	54.00	-6.14	AV
H	11650.00	54.41	30.55	5.77	24.66	53.14	74.00	-20.86	PK
H	11650.00	43.75	30.55	5.77	24.66	43.13	54.00	-10.87	AV
H	17475.00	52.93	30.33	6.32	24.55	52.82	74.00	-21.18	PK
H	17475.00	43.56	30.33	6.32	24.55	43.19	54.00	-10.81	AV
H	23300.00	52.39	30.85	7.45	24.69	54.46	74.00	-19.54	PK
H	23300.00	43.84	30.85	7.45	24.69	44.82	54.00	-9.18	AV
H	29125.00	51.97	31.02	8.99	25.57	54.88	74.00	-19.12	PK
H	29125.00	43.59	31.02	8.99	25.57	45.75	54.00	-8.25	AV

Remark:
1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
4.-27dBm(EIRP)=68.3dBuV/m(Field strength at 3m), According to the test results of the above table, while fulfill the requirements of out-of-band spurious

5.POWER SPECTRAL DENSITY TEST

5.1 APPLIED PROCEDURES / LIMIT

According to FCC §15.407(3)&RSS 247 section 6.2.1.1/6.2.4.1

Power limits For FCC:

(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.

Power limits For IC:

5.15-5.25 GHz bands
For other devices, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.
5.25-5.35 GHz bands
a) The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
b) The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.
5.47-5.725 GHz bands
The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.
The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.
5.725-5.85 GHz bands
The maximum conducted output power shall not exceed 1 W. The output 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 output 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 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-multipoint3 systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

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.

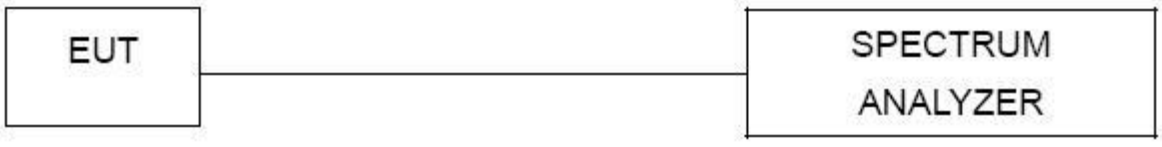
5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST METHOD

KDB662911 D01 MULTIPLE TRANSMITTER OUTPUT V02R01
KDB789033 D02 GENERAL U-NII TEST PROCEDURES NEW RULES V02R01, SECTION F

5.5 TEST SETUP



5.6 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

5.7 TEST RESULTS

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1015 hPa	Test Voltage：	AC 120V/60Hz
Test Mode ：	TX		

EIRP Power Spectral Density=Power Spectral Density +antenna gain
EUT supports MIMO mode for 802.11n mode, Direction Gain = 10 log[(10$^{G1/20}$ + 10$^{G2/20}$)^2/2] dBi = 5.5dBi

Ant1(ISED)

Band	Operation mode	CH	Power Spectral Density			
			Conducted (dBm/MHz)	Ant. Gain (dBi)	e.i.r.p. spectral density (dBm/MHz)	Limit (dBm/MHz)
U-NII-1	802.11a	Low	-0.71	2.61	1.9	10
		Middle	-0.38	2.61	2.23	
		High	0.12	2.61	2.73	
	802.11n(HT20)	Low	-0.96	2.61	1.65	
		Middle	-1.06	2.61	1.55	
		High	-0.43	2.61	2.18	

Ant1(FCC)

Band	Operation mode	CH	Power Spectral Density	
			Conducted (dBm/MHz)	Limit (dBm/MHz)
U-NII-1	802.11a	Low	-0.71	11
		Middle	-0.38	
		High	0.12	
	802.11n(HT20)	Low	-0.96	
		Middle	-1.06	
		High	-0.43	

Ant2(ISED)

Band	Operation mode	CH	Power Spectral Density			
			Conducted (dBm/MHz)	Ant. Gain (dBi)	e.i.r.p. spectral density (dBm/MHz)	Limit (dBm/MHz)
U-NII-1	802.11a	Low	-0.68	2.36	1.68	10
		Middle	-1.52	2.36	0.84	
		High	-1.01	2.36	1.35	
	802.11n(HT20)	Low	-2.39	2.36	-0.03	
		Middle	-1.4	2.36	0.96	
		High	-2.71	2.36	-0.35	

Ant2(FCC)

Band	Operation mode	CH	Power Spectral Density	
			Conducted (dBm/MHz)	Limit (dBm/MHz)
U-NII-1	802.11a	Low	-0.68	11
		Middle	-1.52	
		High	-1.01	
	802.11n(HT20)	Low	-2.39	
		Middle	-1.4	
		High	-2.71	

Ant 1 + Ant 2(ISED)

Band	Operation mode	CH	Power Spectral Density			
			Conducted (dBm/MHz)	Ant. Gain (dBi)	e.i.r.p. spectral density (dBm/MHz)	Limit (dBm/MHz)
U-NII-1	802.11n(HT20)	Low	1.39	5.5	6.89	10
		Middle	1.78	5.5	7.28	
		High	1.59	5.5	7.09	

Ant 1 + Ant 2(FCC)

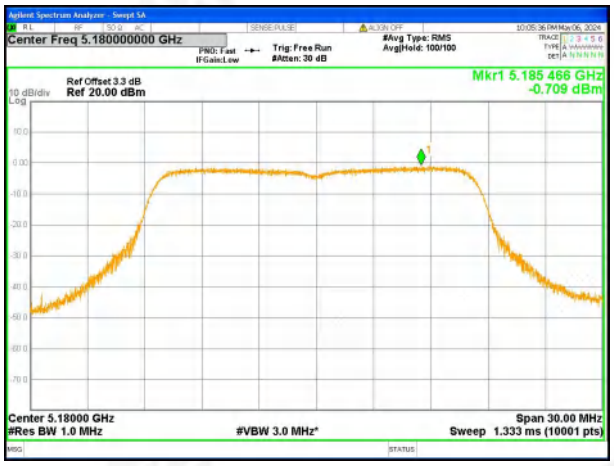
Band	Operation mode	CH	Power Spectral Density	
			Conducted (dBm/MHz)	Limit (dBm/MHz)
U-NII-1	802.11n(HT20)	Low	1.39	11
		Middle	1.78	
		High	1.59	

Band	Operation mode	CH	Power Spectral Density (dBm/0.5Mhz)			
			ANT1	ANT2	Total	Limit
U-NII-3	802.11a	Low	-2.11	-1.36	/	30
		Middle	-2.46	-2	/	
		High	-2.29	-2.31	/	
	802.11n(HT20)	Low	-2.66	-0.57	1.52	
		Middle	-3.32	-0.93	1.05	
		High	-3.09	-3.09	-0.08	

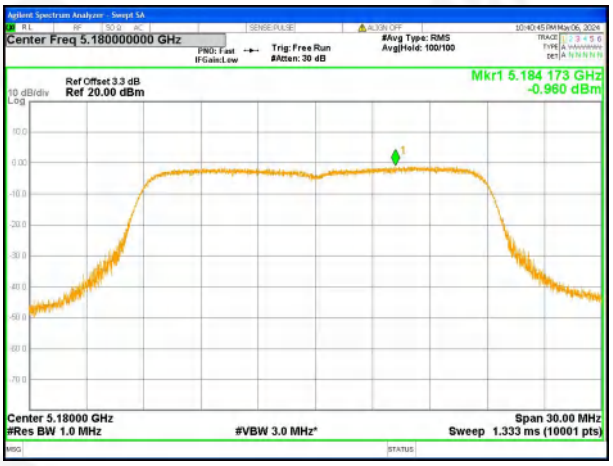
All OBW test data for 5180-5240MHz are fall within the 5.150-5.250 MHz band
Only 802.11n(HT20) support MIMO
Duty cycle Factor=0

ANT1

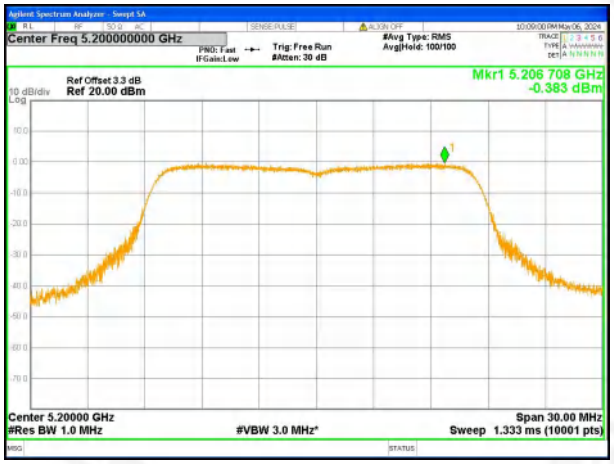
802.11a U-NII-1 Low channel



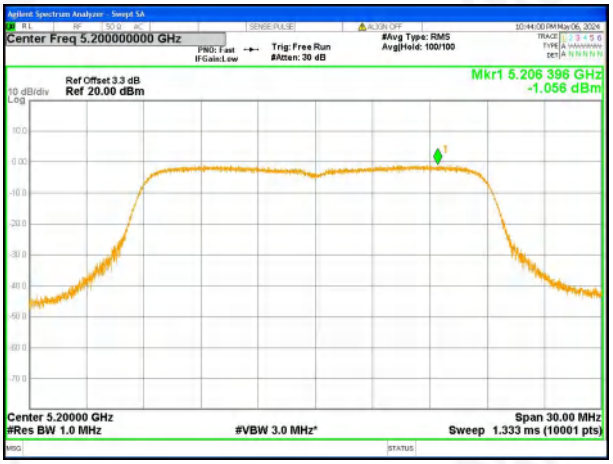
802.11n(HT20) U-NII-1 Low channel



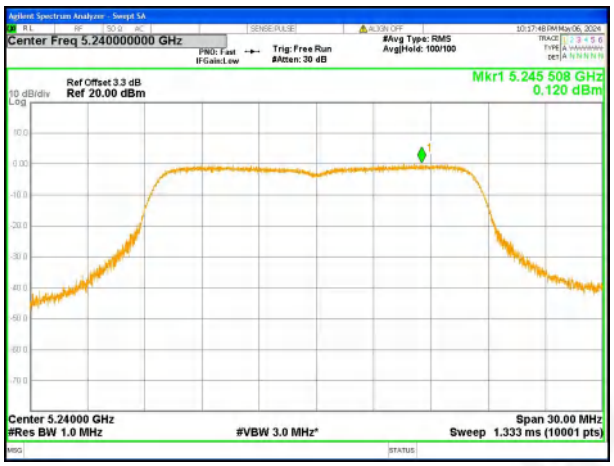
802.11a U-NII-1 Middle channel



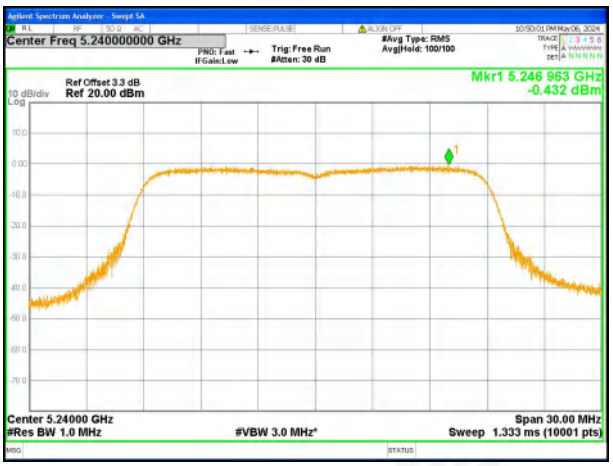
802.11n(HT20) U-NII-1 Middle channel



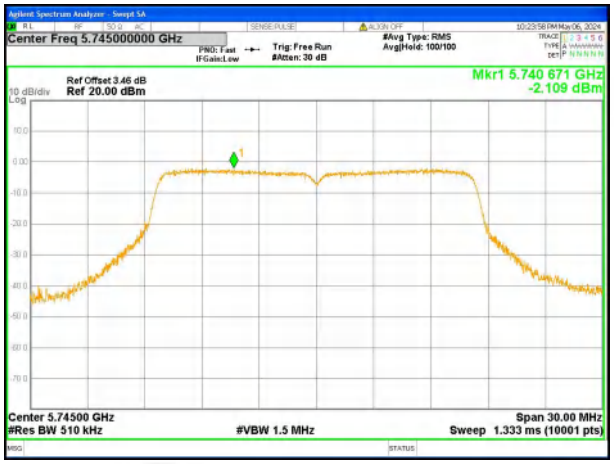
802.11a U-NII-1 High channel



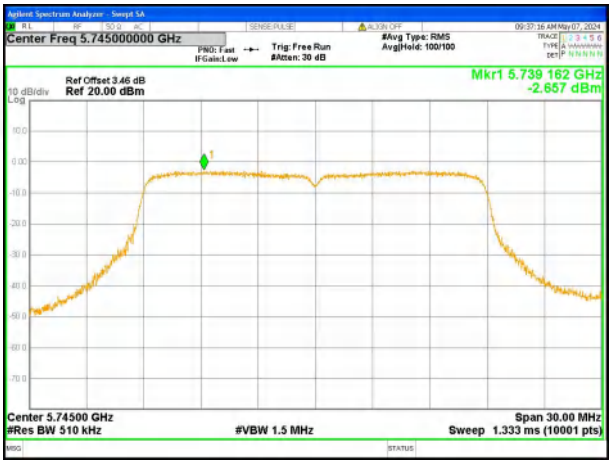
802.11n(HT20) U-NII-1 High channel



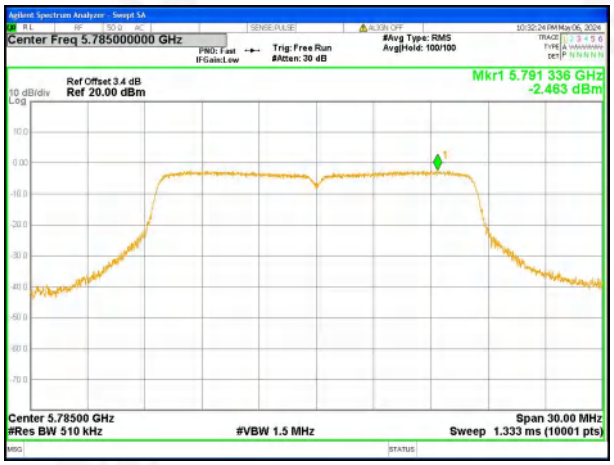
802.11a U-NII-3 Low channel



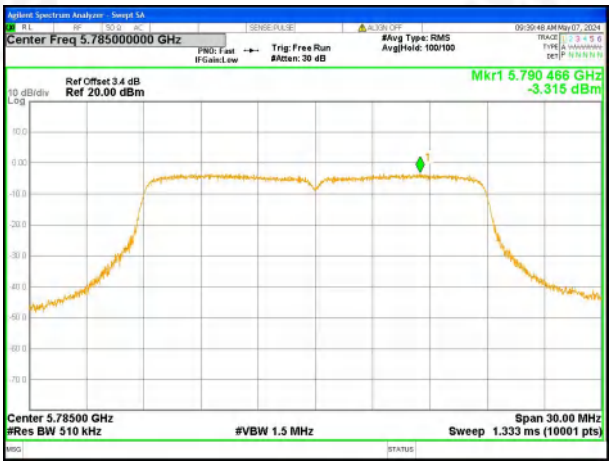
802.11n(HT20) U-NII-3 Low channel



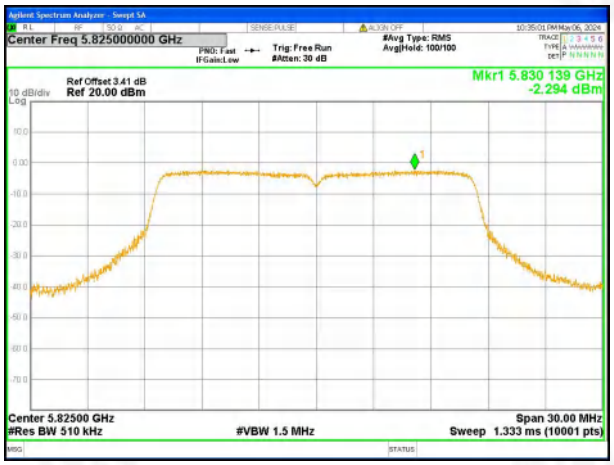
802.11a U-NII-3 Middle channel



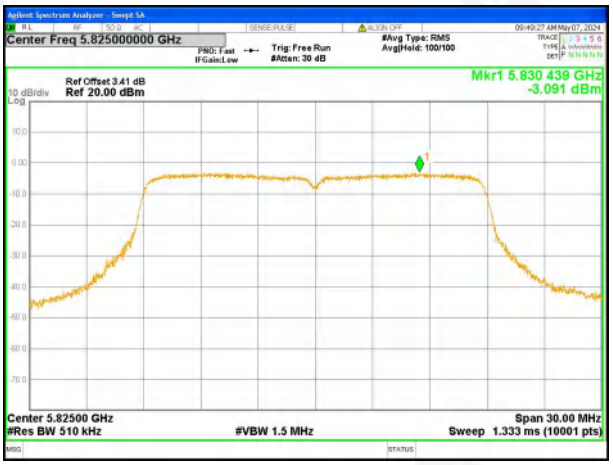
802.11n(HT20) U-NII-3 Middle channel



802.11a U-NII-3 High channel

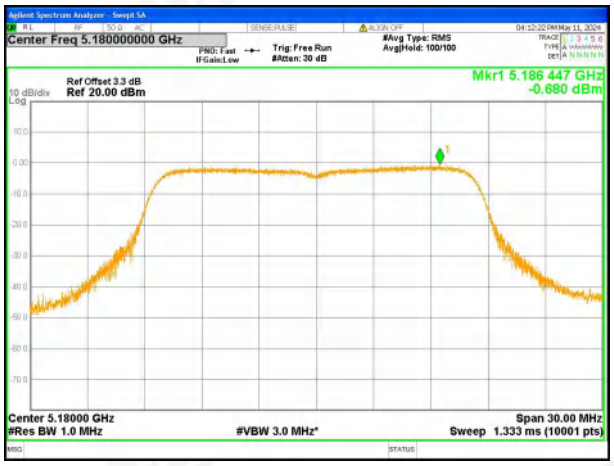


802.11n(HT20) U-NII-3 High channel



ANT2

802.11a U-NII-1 Low channel



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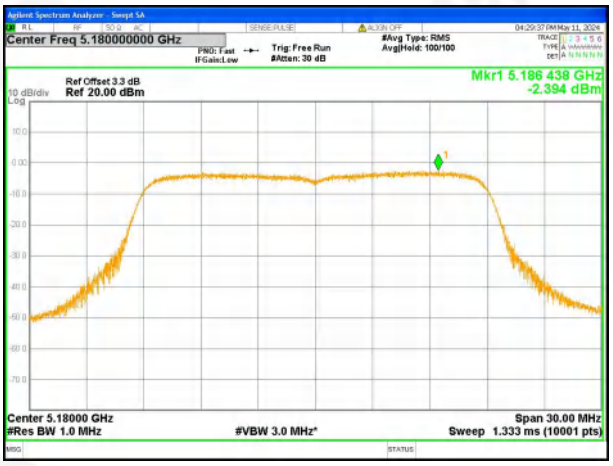
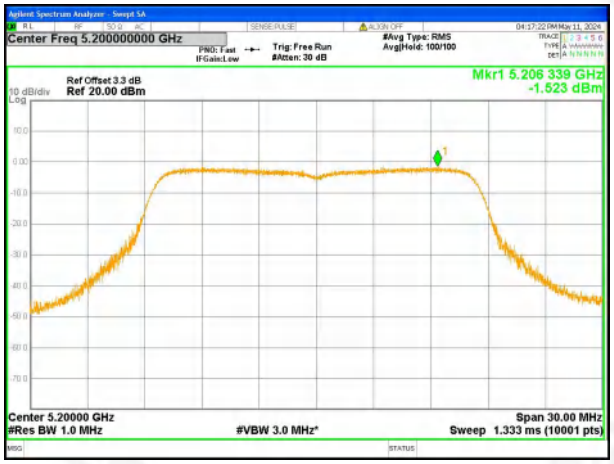
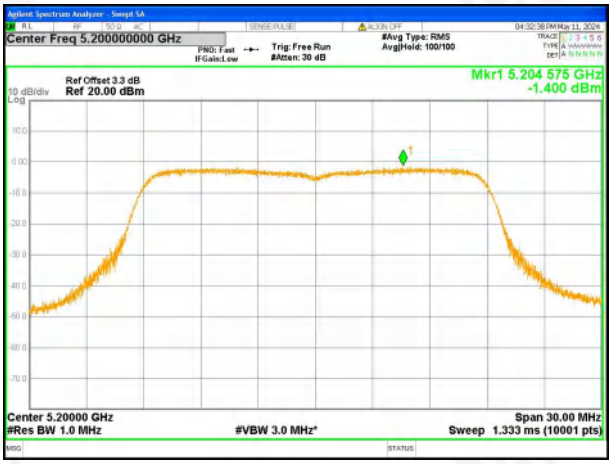


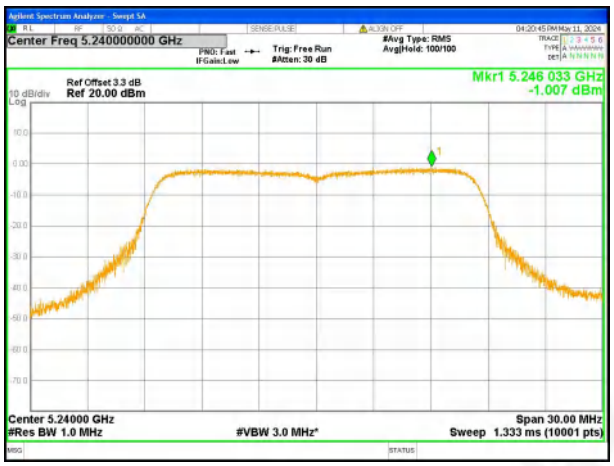
802.11a U-NII-1 Middle channel



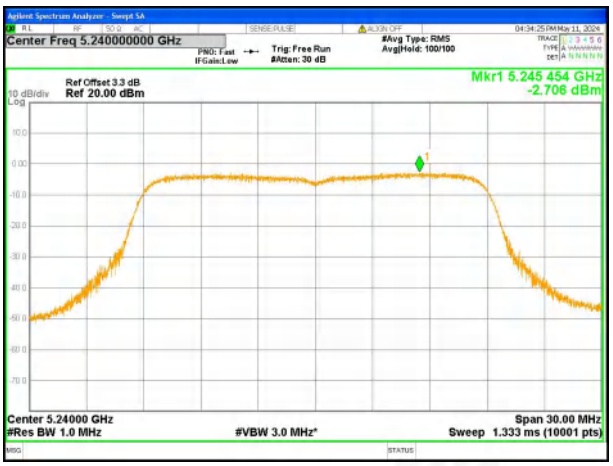
802.11n(HT20) U-NII-1 Middle channel



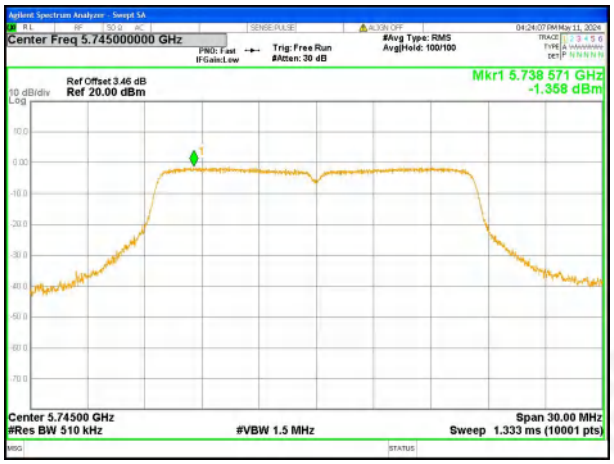
802.11a U-NII-1 High channel



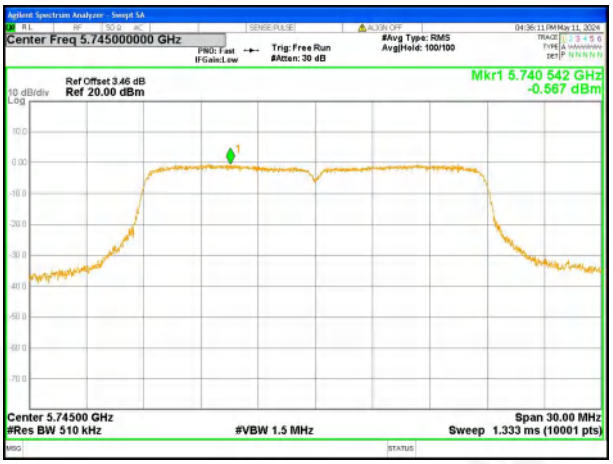
802.11n(HT20) U-NII-1 High channel



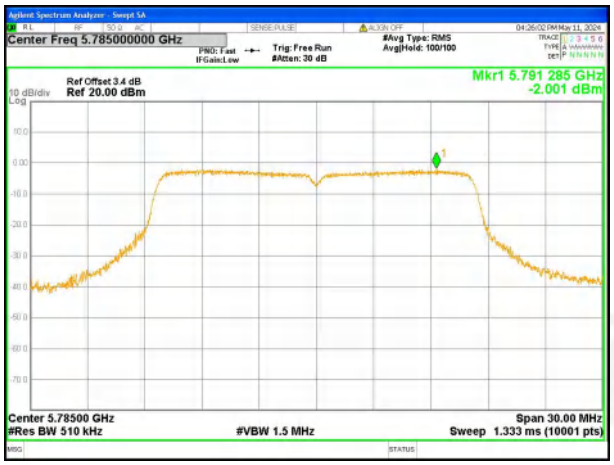
802.11a U-NII-3 Low channel



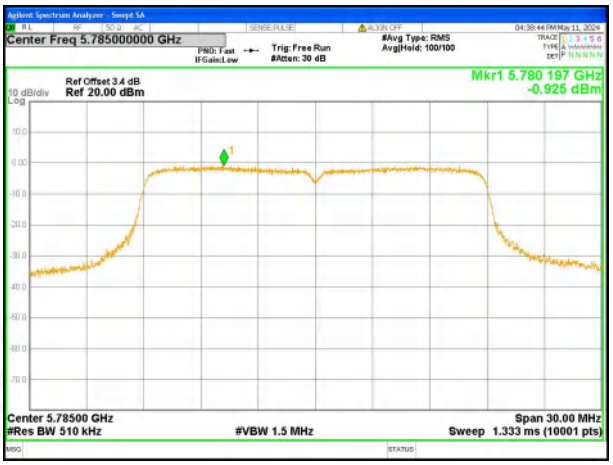
802.11n(HT20) U-NII-3 Low channel



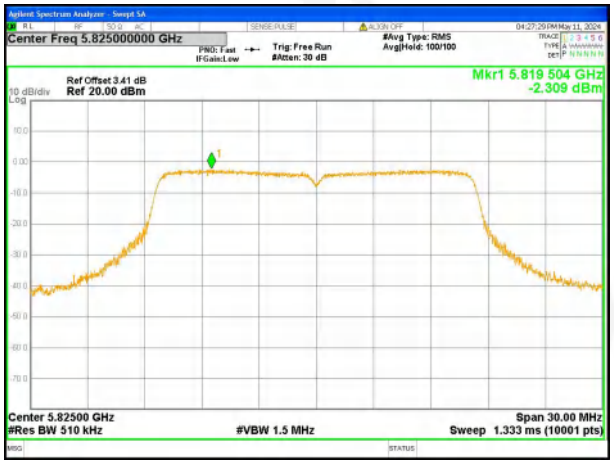
802.11a U-NII-3 Middle channel



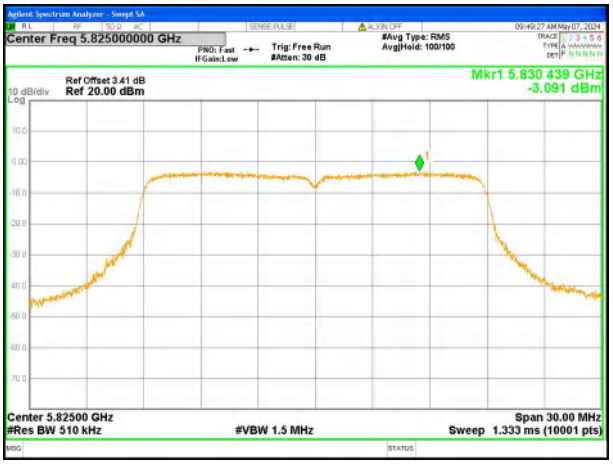
802.11n(HT20) U-NII-3 Middle channel



802.11a U-NII-3 High channel



802.11n(HT20) U-NII-3 High channel



6.26DB & 6DB & 99% EMISSION 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.

IC BW Limit

Frequency band 5725-5850 MHz：

For equipment operating in the band 5725-5850 MHz, the minimum 6 dB bandwidth shall be at least 500 kHz.

Frequency band 5150-5250 MHz

The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS)and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.

6.2 TEST PROCEDURE

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 (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.

2. Set span = 1.5 times to 5.0 times the OBW.

3. Set RBW = 1 % to 5 % of the OBW

4. Set VBW ≥ 3 · RBW

5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.

6. Use the 99 % power bandwidth function of the instrument (if available).

7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

6.3 EUT OPERATION CONDITIONS

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

6.4 TEST RESULTS

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX (worst case)		

ANT1

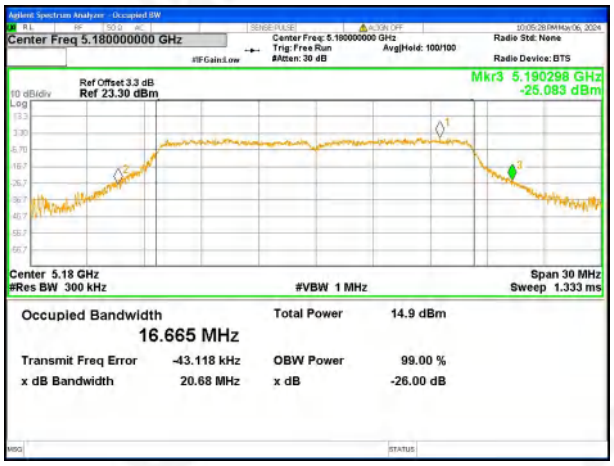
Band	Operation mode	26 dB Bandwidth (MHz)			99% Bandwidth (MHz)		
		Low	Middle	High	Low	Middle	High
U-NII-1	802.11a	20.682	20.755	20.654	16.665	16.673	16.696
	802.11n(HT20)	21.157	21.53	21.439	17.724	17.746	17.741

ANT2

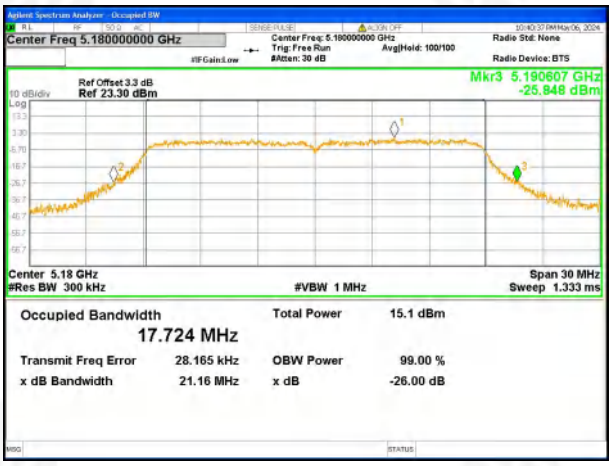
Band	Operation mode	26 dB Bandwidth (MHz)			99% Bandwidth (MHz)		
		Low	Middle	High	Low	Middle	High
U-NII-1	802.11a	20.728	20.815	20.63	16.667	16.709	16.696
	802.11n(HT20)	21.365	21.412	21.572	17.709	17.757	17.734

Test plot Antenna 1

802.11a U-NII-1 Low channel

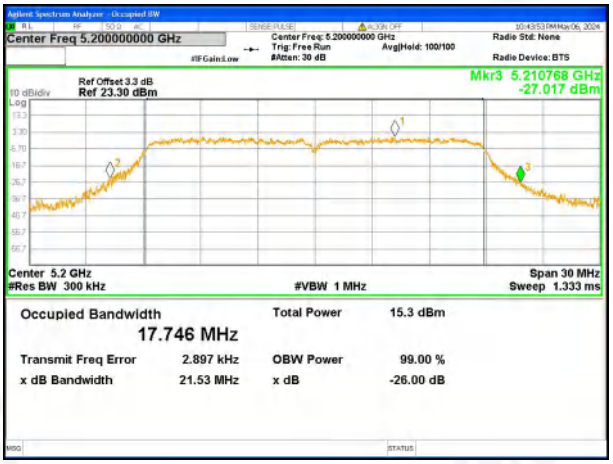


802.11n(HT20) U-NII-1 Low channel



802.11a U-NII-1 Middle channel

802.11n(HT20) U-NII-1 Middle channel

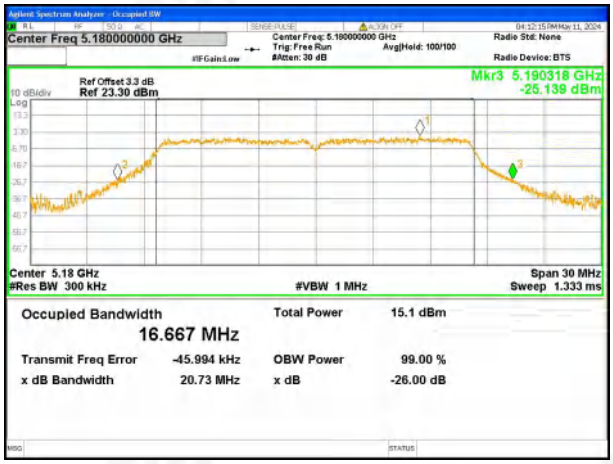


802.11a U-NII-1 High channel

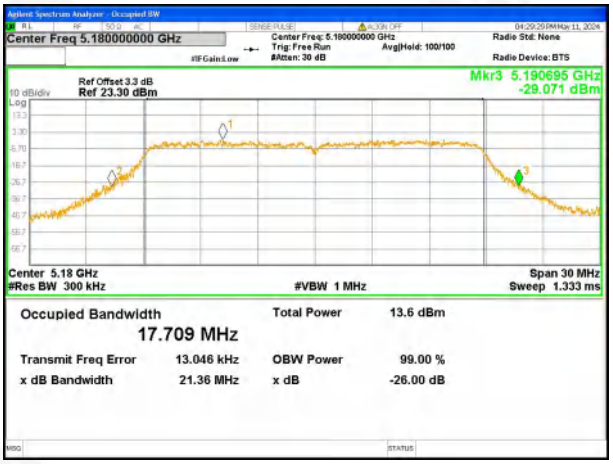
802.11n(HT20) U-NII-1 High channel

Test plot Antenna 2

802.11a U-NII-1 Low channel

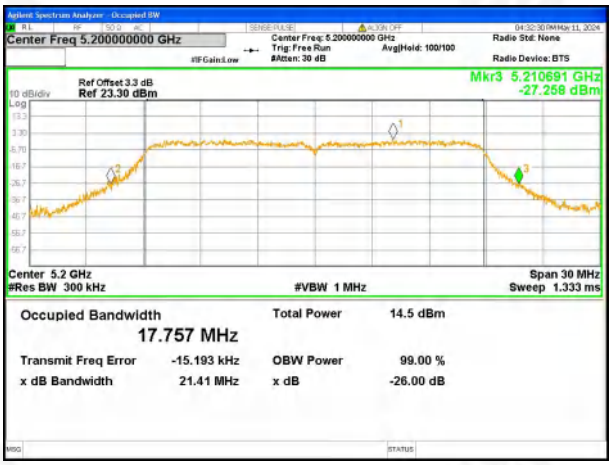


802.11n(HT20) U-NII-1 Low channel



802.11a U-NII-1 Middle channel

802.11n(HT20) U-NII-1 Middle channel



802.11a U-NII-1 High channel

802.11n(HT20) U-NII-1 High channel

ANT 1

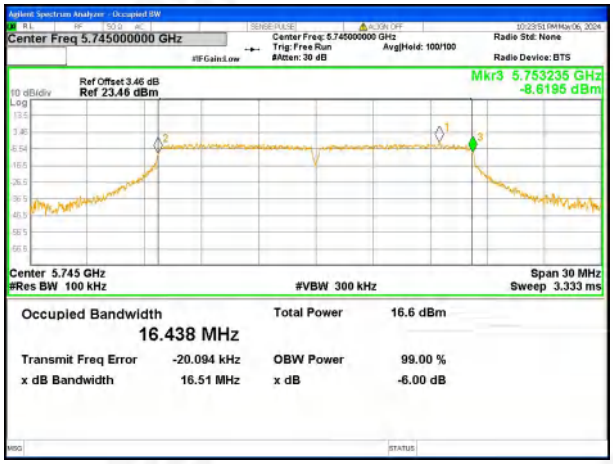
Band	Operation mode	-6dB Channel Bandwidth (MHz)			Limit(KHz)
		Low	Middle	High	
U-NII-3	802.11a	16.438	16.442	16.445	＞500
	802.11n(HT20)	17.600	17.610	17.600	

ANT 2

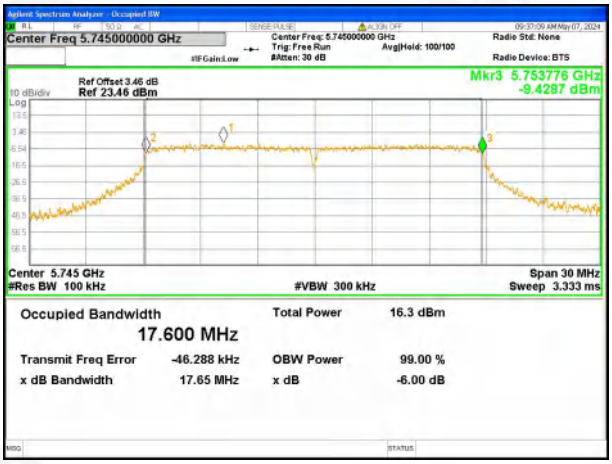
Band	Operation mode	-6dB Channel Bandwidth (MHz)			Limit(KHz)
		Low	Middle	High	
U-NII-3	802.11a	16.453	16.453	16.448	＞500
	802.11n(HT20)	17.619	17.635	17.600	

Test plot Antenna 1

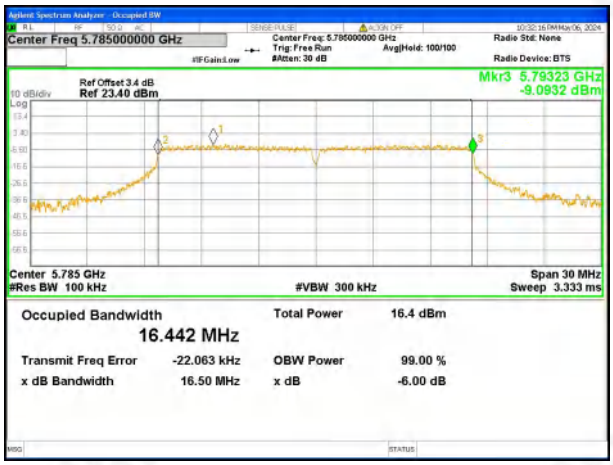
802.11a U-NII-3 Low channel



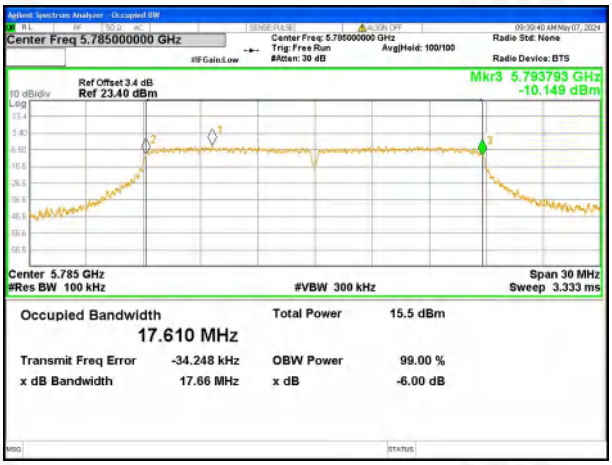
802.11n(HT20) U-NII-3 Low channel



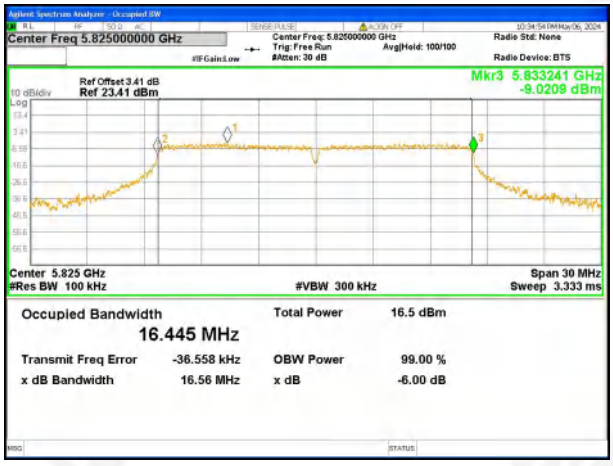
802.11a U-NII-3 Middle channel



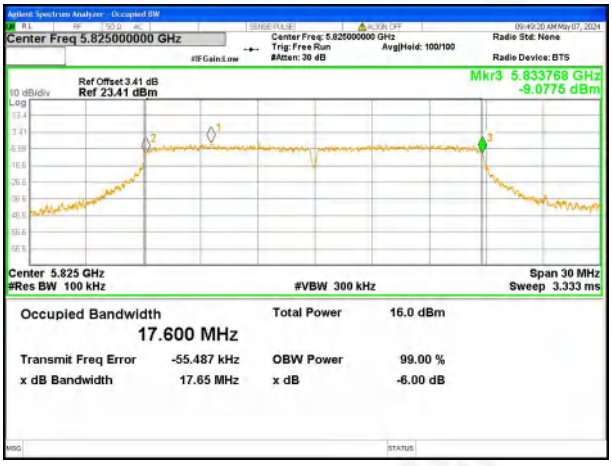
802.11n(HT20) U-NII-3 Middle channel



802.11a U-NII-3 High channel

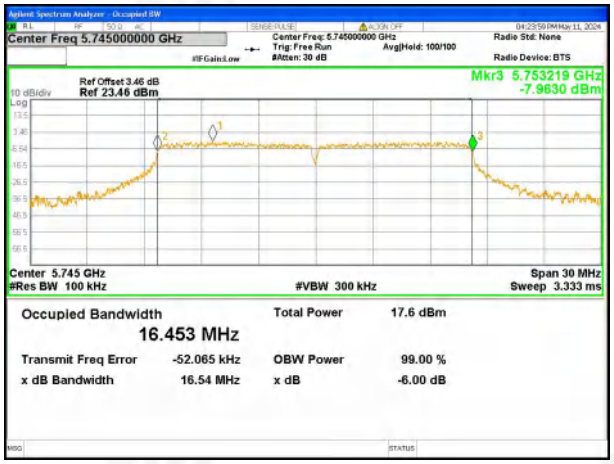


802.11n(HT20) U-NII-3 High channel

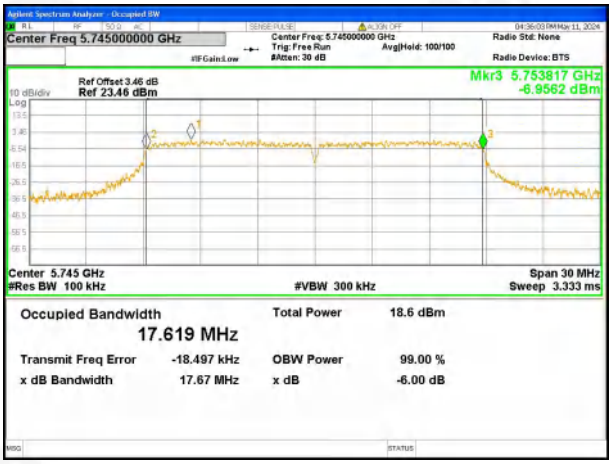


Test plot Antenna 2

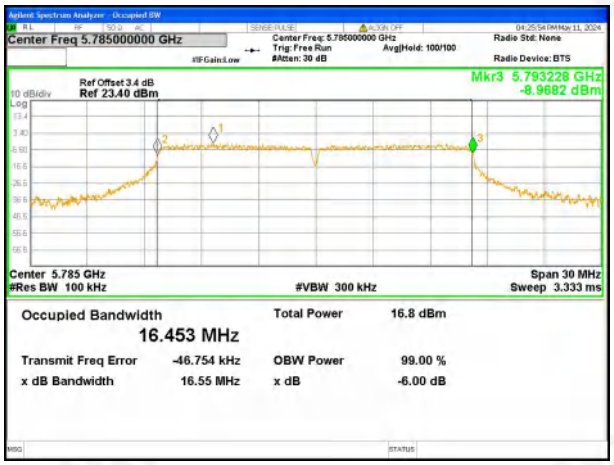
802.11a U-NII-3 Low channel



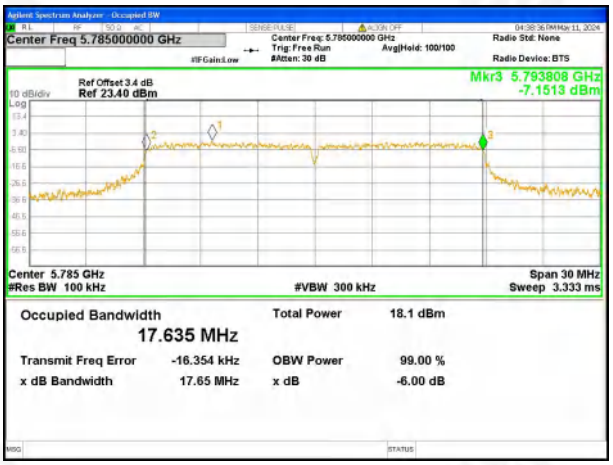
802.11n(HT20) U-NII-3 Low channel



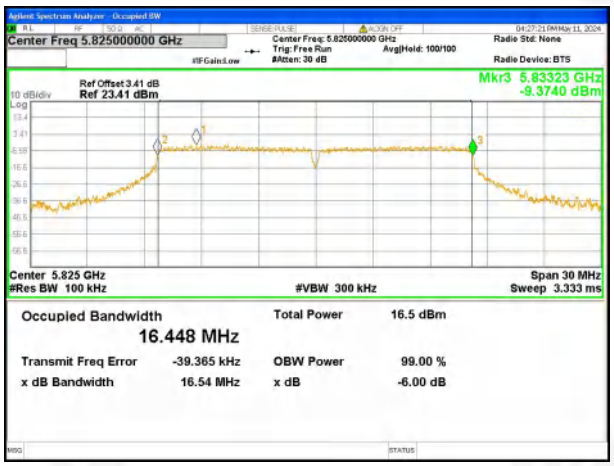
802.11a U-NII-3 Middle channel



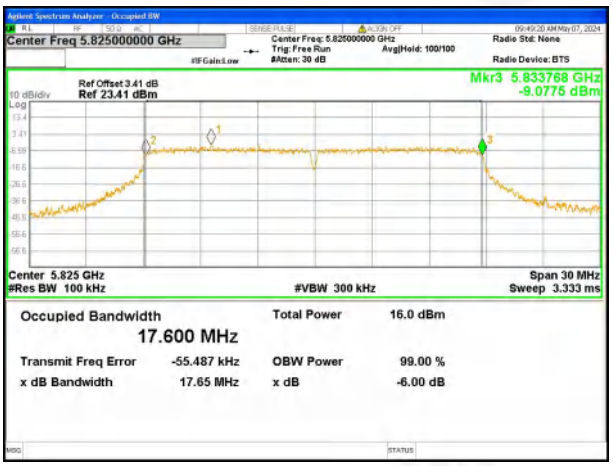
802.11n(HT20) U-NII-3 Middle channel



802.11a U-NII-3 High channel



802.11n(HT20) U-NII-3 High channel



ANT1

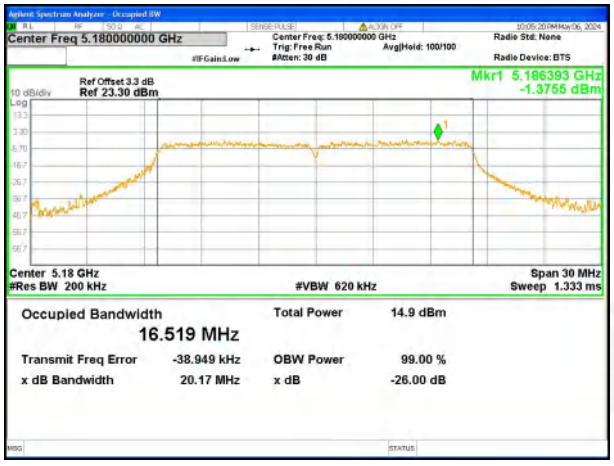
Mode	Frequency (MHz)	99% OBW (MHz)
a	5745	16.519
a	5785	16.547
a	5825	16.514
n20	5745	16.541
n20	5785	16.564
n20	5825	16.555

ANT2

Mode	Frequency (MHz)	99% OBW (MHz)
a	5745	16.505
a	5785	16.544
a	5825	16.53
n20	5745	16.558
n20	5785	16.559
n20	5825	16.567

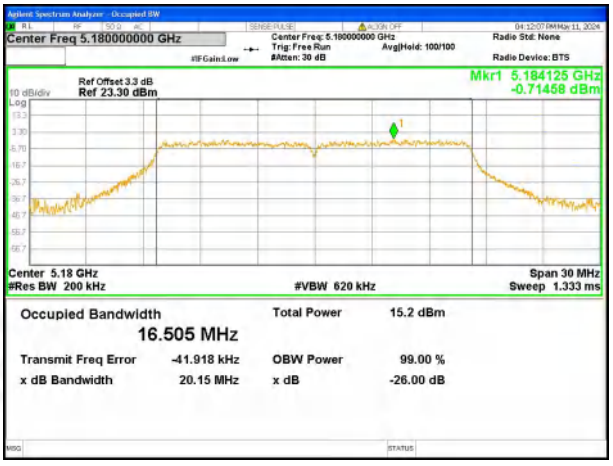
OBW

Antenna 1

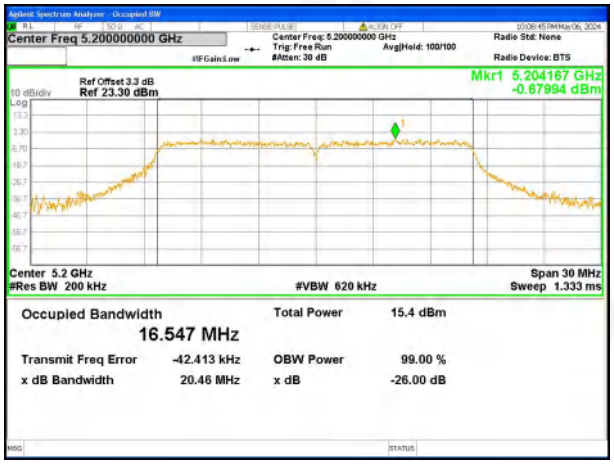


OBW NVNT a 5745MHz Ant1

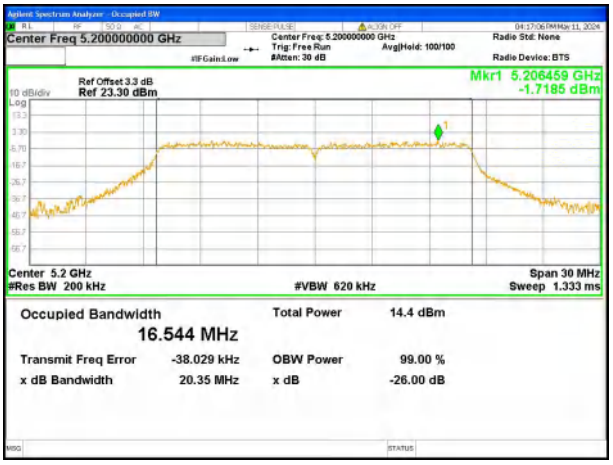
Antenna 2



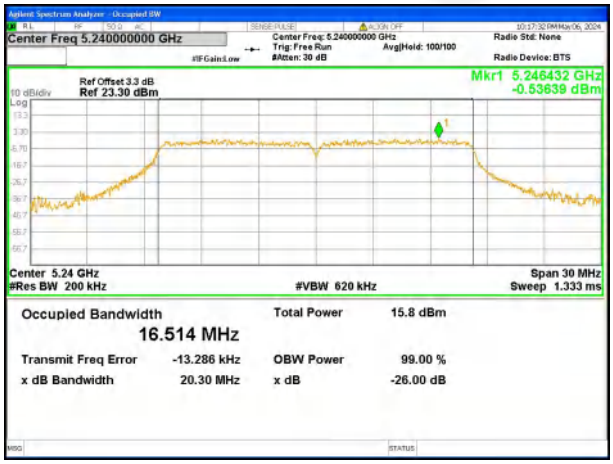
OBW NVNT a 5745MHz Ant2



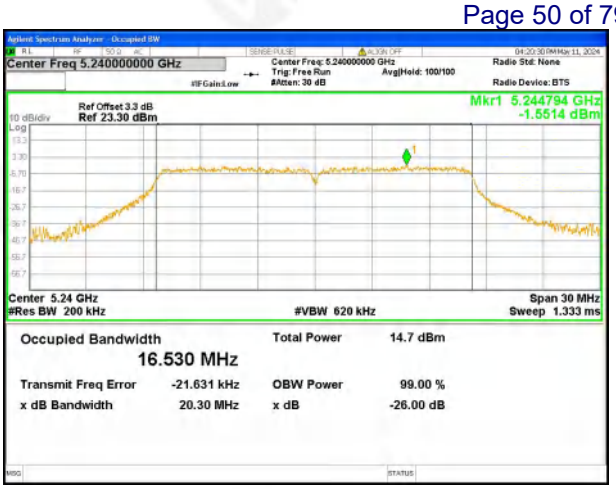
OBW NVNT a 5785MHz Ant1



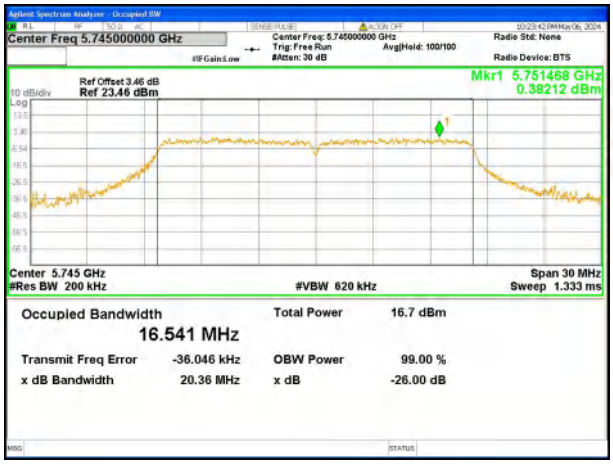
OBW NVNT a 5785MHz Ant2



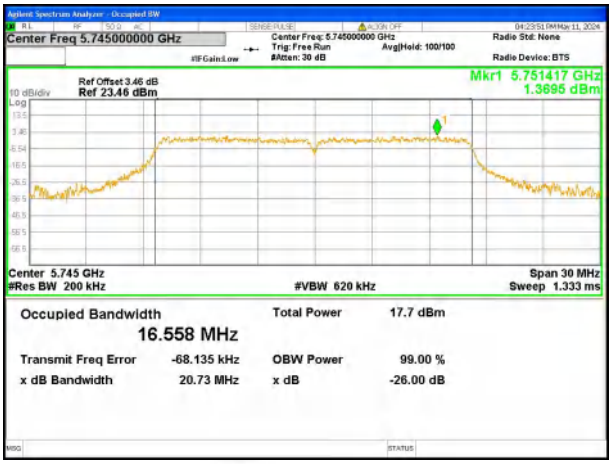
OBW NVNT a 5825MHz Ant1



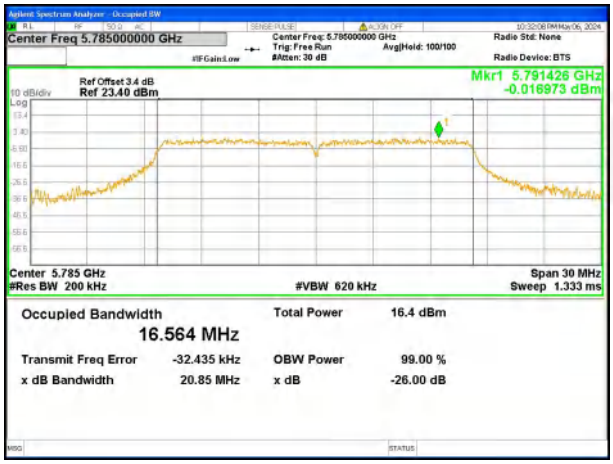
OBW NVNT a 5825MHz Ant2



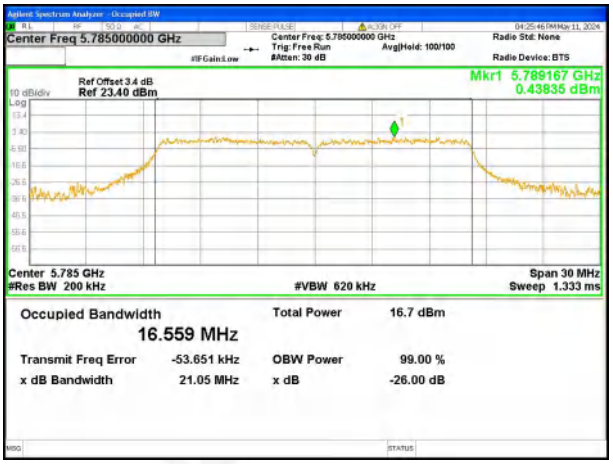
OBW NVNT n20 5745MHz Ant1



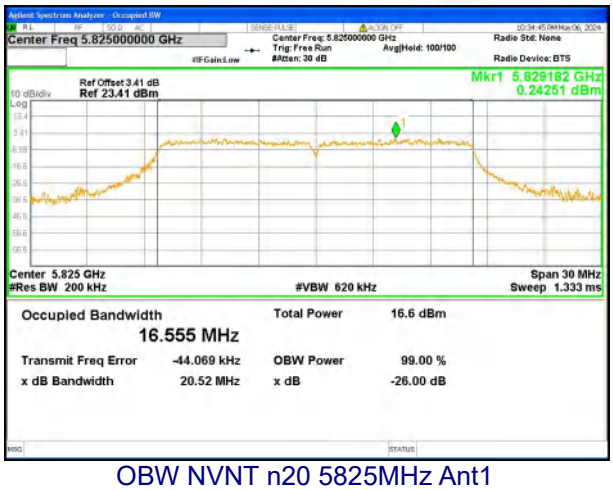
OBW NVNT n20 5745MHz Ant2



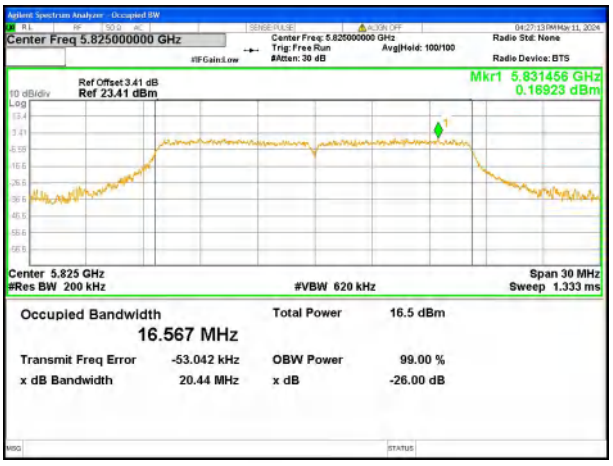
OBW NVNT n20 5785MHz Ant1



OBW NVNT n20 5785MHz Ant2



OBW NVNT n20 5825MHz Ant1



OBW NVNT n20 5825MHz Ant2

7.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

For equipment operating in the band 5725-5850 MHz

The maximum conducted output power shall not exceed 1 W. The output 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 output 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 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-multipointFootnote3 systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

For equipment operating in the band 5150-5250 MHz
The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.
So for 802.11a/n mode the worst limit should be 10+10*log (16.673) =22.2dBm for 5150-5250 MHz

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”.

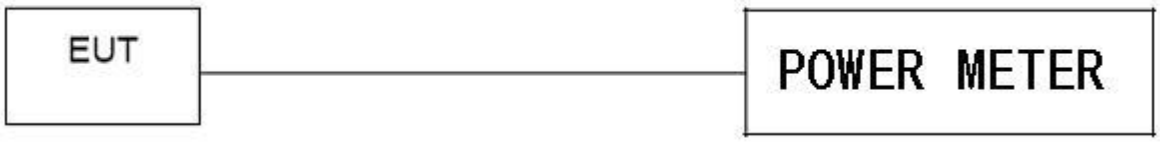
(viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

(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 2.4 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 ：	AC 120V/60Hz
Test Mode ：	TX		

Ant1(ISED)

Band	Operation mode	CH	Output power			
			Conducted (dBm)	Ant. Gain (dBi)	EIRP (dBm/MHz)	Limit(dBm)
U-NII-1	802.11a	Low	9.58	2.61	12.19	22.2
		Middle	10.32	2.61	12.93	
		High	10.33	2.61	12.94	
	802.11n(HT20)	Low	10.21	2.61	12.82	
		Middle	10	2.61	12.61	
		High	10.36	2.61	12.97	

Ant1(FCC)

Band	Operation mode	CH	Output power	
			Conducted (dBm)	Limit(dBm)
U-NII-1	802.11a	Low	9.58	24
		Middle	10.32	
		High	10.33	
	802.11n(HT20)	Low	10.21	
		Middle	10	
		High	10.36	

Ant2(ISED)

Band	Operation mode	CH	Output power			
			Conducted (dBm)	Ant. Gain (dBi)	EIRP (dBm/MHz)	Limit(dBm)
U-NII-1	802.11a	Low	9.99	2.36	12.35	22.2
		Middle	9.01	2.36	11.37	
		High	9.35	2.36	11.71	
	802.11n(HT20)	Low	8.02	2.36	10.38	
		Middle	9.01	2.36	11.37	
		High	8.01	2.36	10.37	

Ant2(FCC)

Band	Operation mode	CH	Output power	
			Conducted (dBm)	Limit(dBm)
U-NII-1	802.11a	Low	9.99	24
		Middle	9.01	
		High	9.35	
	802.11n(HT20)	Low	8.02	
		Middle	9.01	
		High	8.01	

Ant 1 + Ant 2(ISED)

Band	Operation mode	CH	Output power			
			Conducted (dBm)	Ant. Gain (dBi)	EIRP (dBm/MHz)	Limit (dBm)
U-NII-1	802.11n(HT20)	Low	12.26	5.5	17.76	22.2
		Middle	12.54	5.5	18.04	
		High	12.35	5.5	17.85	

Ant 1 + Ant 2(FCC)

Band	Operation mode	CH	Output power	
			Conducted (dBm)	Limit (dBm)
U-NII-1	802.11n(HT20)	Low	12.26	24
		Middle	12.54	
		High	12.35	

Band	Operation mode	CH	Conducted Output Power (dBm)			EIRP
			ANT1	ANT2	Total	Total
U-NII-3	802.11a	Low	11.35	12.38	/	/
		Middle	11.09	11.36	/	/
		High	11.13	11.09	/	/
	802.11n(HT20)	Low	11.14	13.14	15.26	/
		Middle	10.54	12.62	14.71	/
		High	10.94	10.94	13.95	/

8.OUT OF BAND EMISSIONS

8.1 APPLICABLE STANDARD

According to FCC §15.407(b) FCC §15.407&RSS 247 section 6.2.1.2/6.2.4.2

For FCC Limit

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

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

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

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

(4) For transmitters operating in the 5.725-5.85 GHz band:

(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.

(ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.

For IC Limit

(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 −27dBm/MHz.

For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350MHz shall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when

measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz.

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

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

(4) For transmitters operating in the 5.725-5.85 GHz band:

a) 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;

b) 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;

c) 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and

d) -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

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

8.2 TEST PROCEDURE

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.

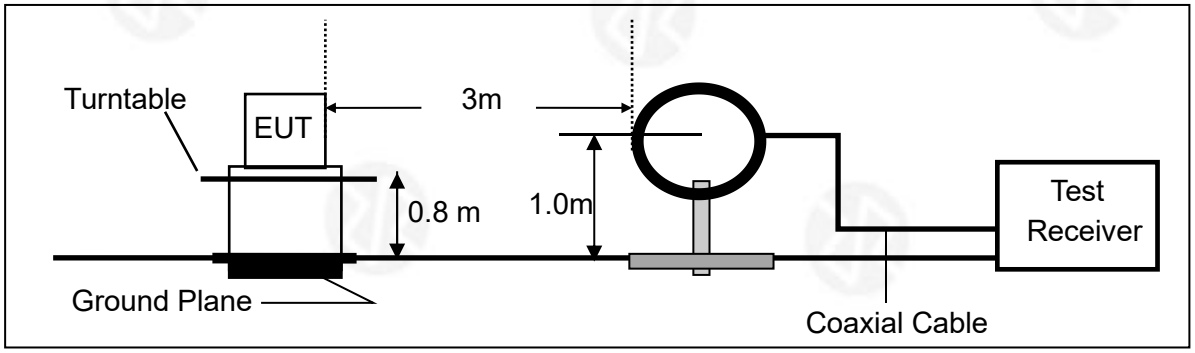
Note:

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

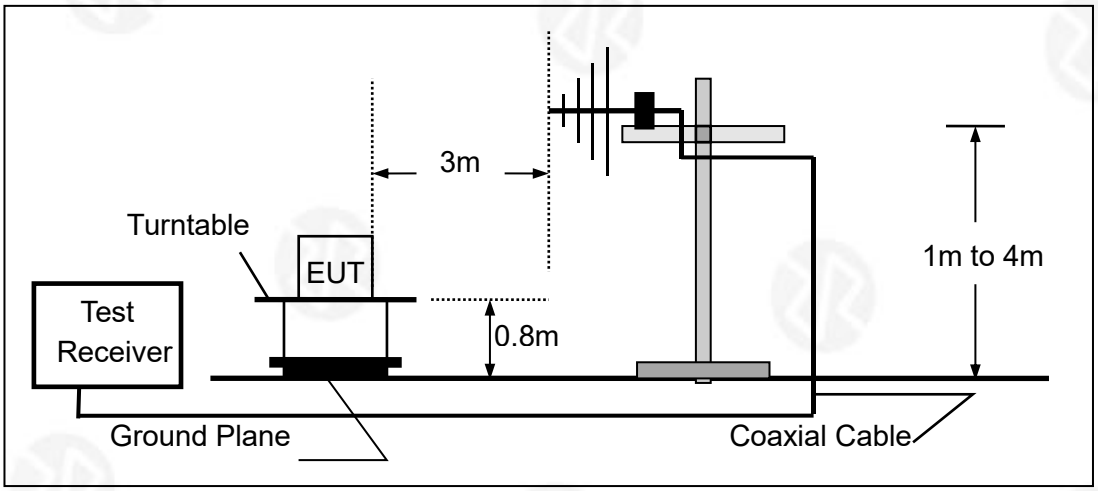
8.3 DEVIATION FROM STANDARD

No deviation.

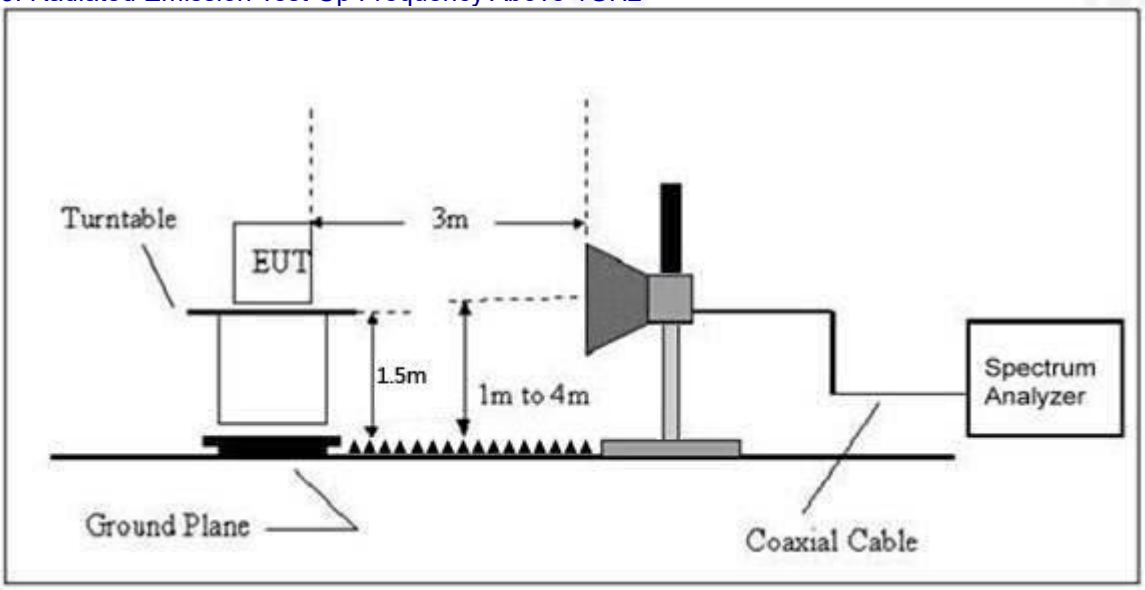
8.4 TEST SETUP



2.For radiated emissions from 30MHz to 1000MHz



3. Radiated Emission Test-Up Frequency Above 1GHz



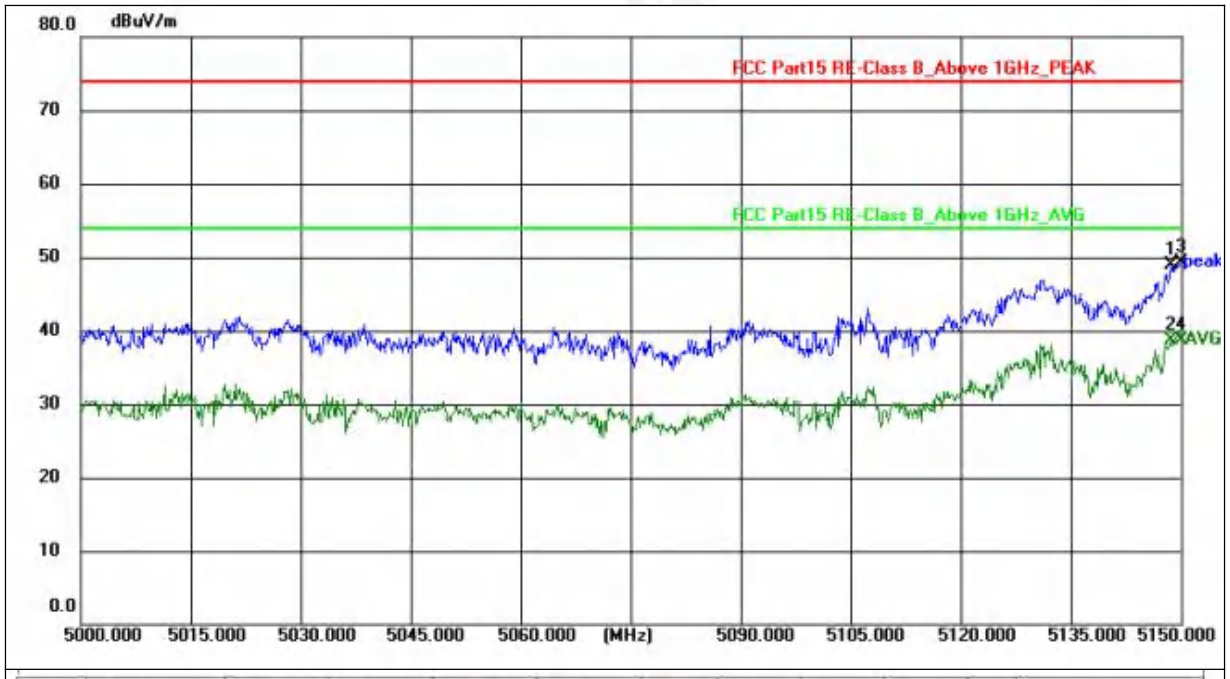
Conducted Measurements：
Maximum emission levels are measured by setting the analyzer as follows:
(i) RBW = 1 MHz.
(ii) VBW ≥ 3 MHz.
(iii) Detector = Peak.
(iv) Sweep time = auto.
(v) Trace mode = max hold.
(vi) Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately 1/x, where x is the duty cycle. For example, at 50% duty cycle, the measurement time will increase by a factor of two relative to measurement time for continuous transmission.

8.5 EUT OPERATION CONDITIONS

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

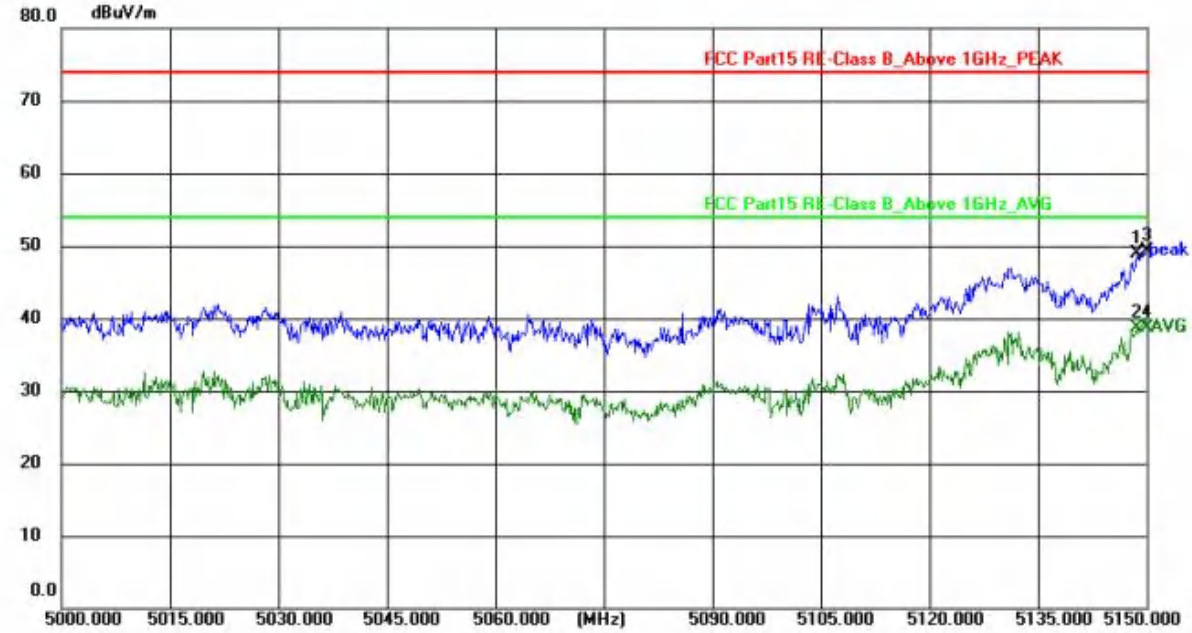
8.6 TEST RESULTS

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Test Mode	802.11a 5180MHz TX (Worst case ant1)



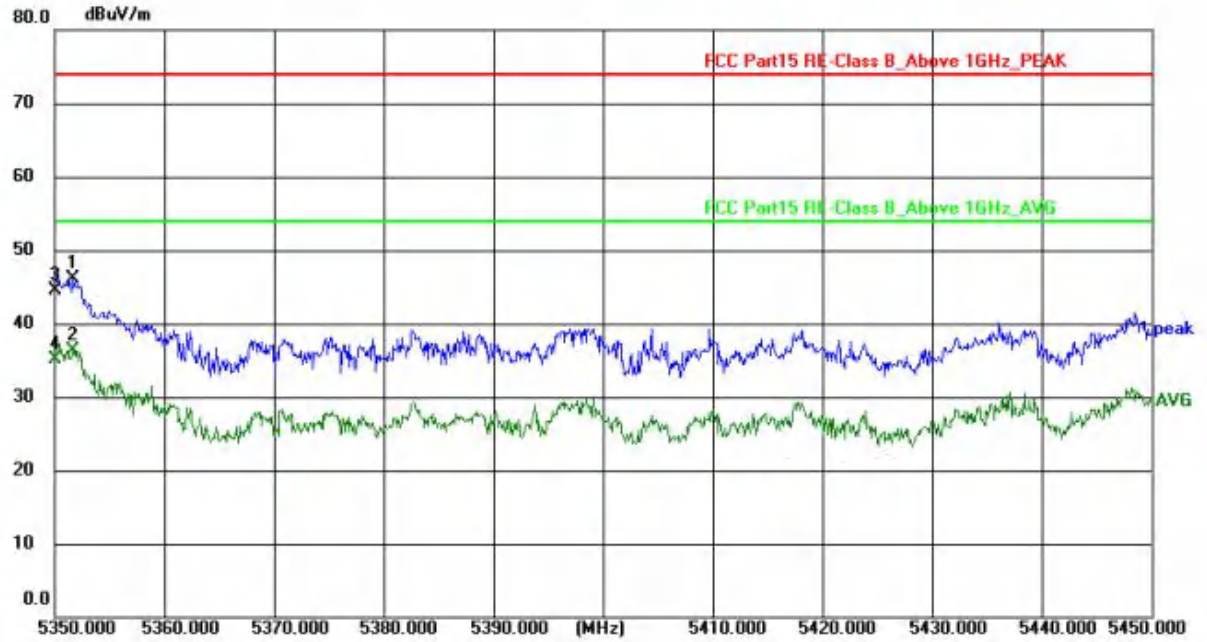
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	5148.650	46.23	2.67	48.90	74.00	-25.10	peak			P	
2 *	5148.650	36.01	2.67	38.68	54.00	-15.32	AVG			P	
3	5150.000	46.56	2.67	49.23	74.00	-24.77	peak			P	
4	5150.000	35.99	2.67	38.66	54.00	-15.34	AVG			P	

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz	Test Mode	802.11a 5180MHz TX (Worst case ant1)



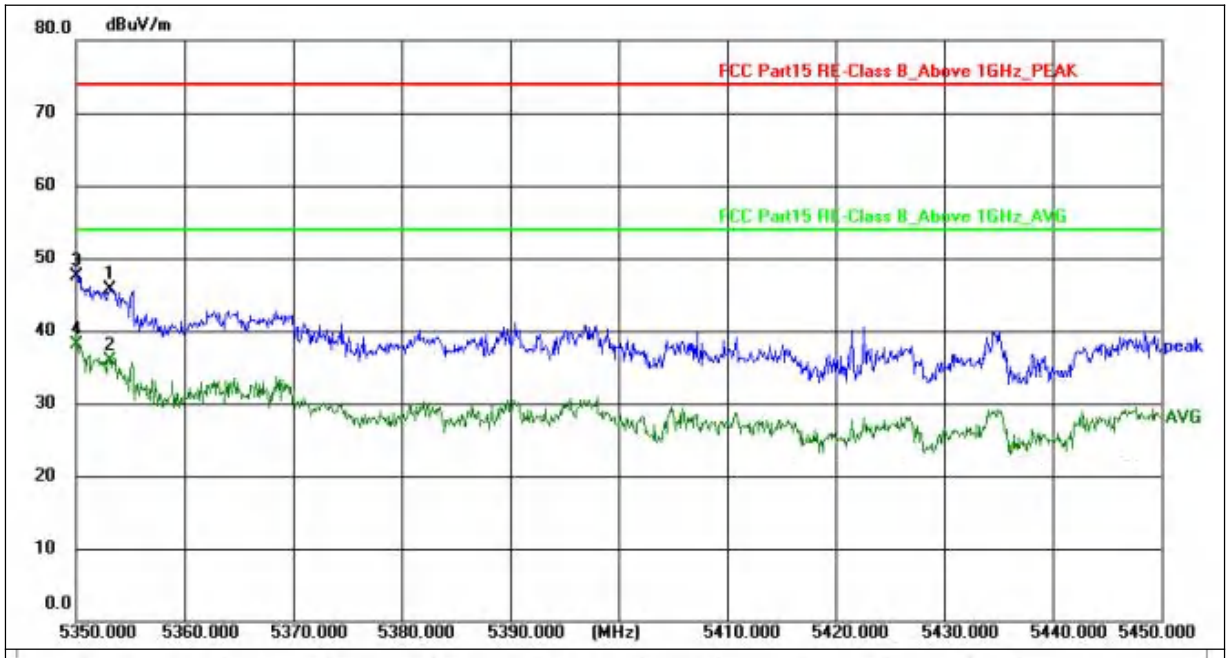
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	5148.650	46.23	2.67	48.90	74.00	-25.10	peak			P	
2 *	5148.650	36.01	2.67	38.68	54.00	-15.32	AVG			P	
3	5150.000	46.56	2.67	49.23	74.00	-24.77	peak			P	
4	5150.000	35.99	2.67	38.66	54.00	-15.34	AVG			P	

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Test Mode	802.11a 5240MHz TX (Worst case ant1)



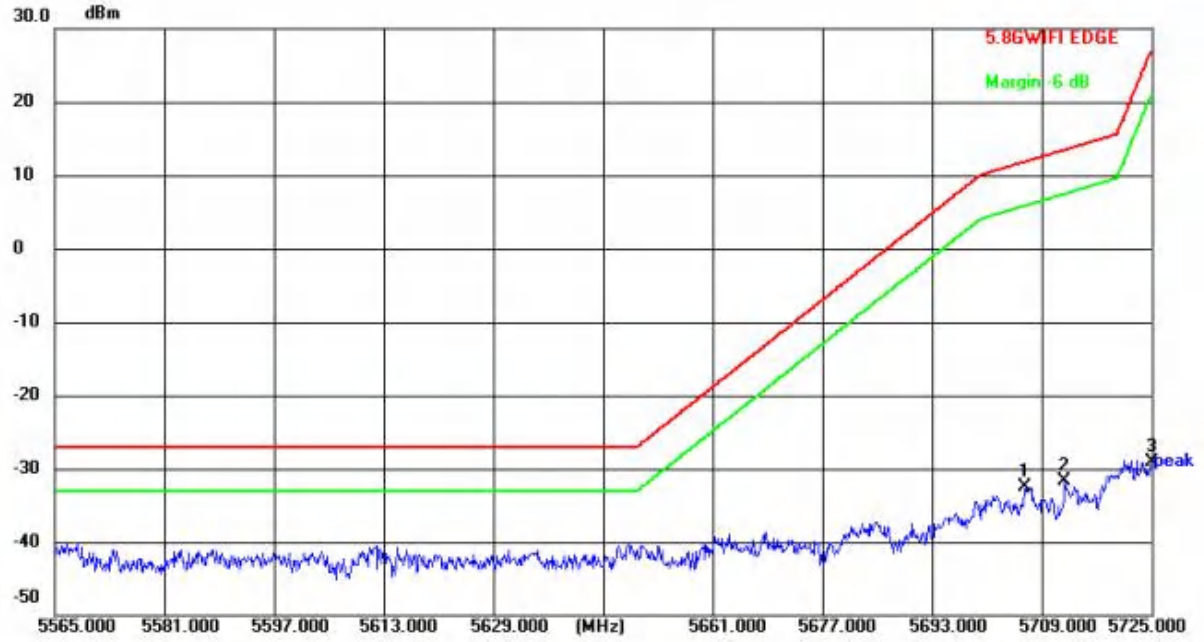
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	5351.700	42.33	3.72	46.05	74.00	-27.95	peak			P	
2 *	5351.700	32.50	3.72	36.22	54.00	-17.78	AVG			P	
3	5350.000	40.79	3.72	44.51	74.00	-29.49	peak			P	
4	5350.000	31.45	3.72	35.17	54.00	-18.83	AVG			P	

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz	Test Mode	802.11a 5240MHz TX (Worst case ant1)



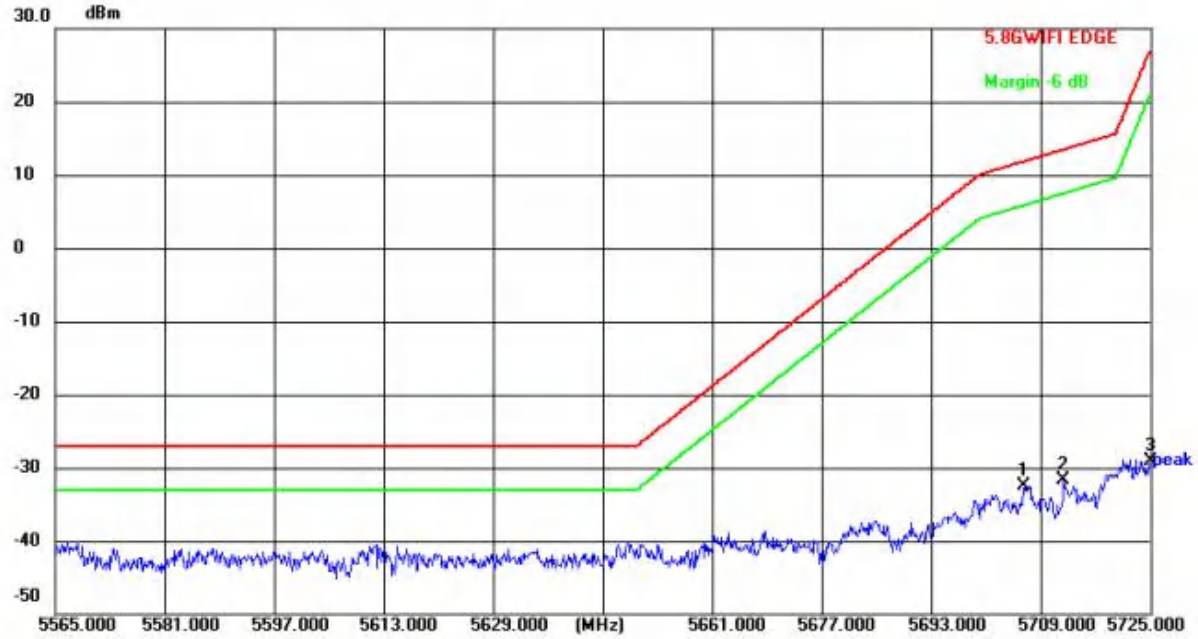
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	5353.100	41.89	3.72	45.61	74.00	-28.39	peak			P	
2	5353.100	32.20	3.72	35.92	54.00	-18.08	AVG			P	
3	5350.000	43.79	3.72	47.51	74.00	-26.49	peak			P	
4 *	5350.000	34.45	3.72	38.17	54.00	-15.83	AVG			P	

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Test Mode	802.11a 5745MHz TX (Worst case ant1)



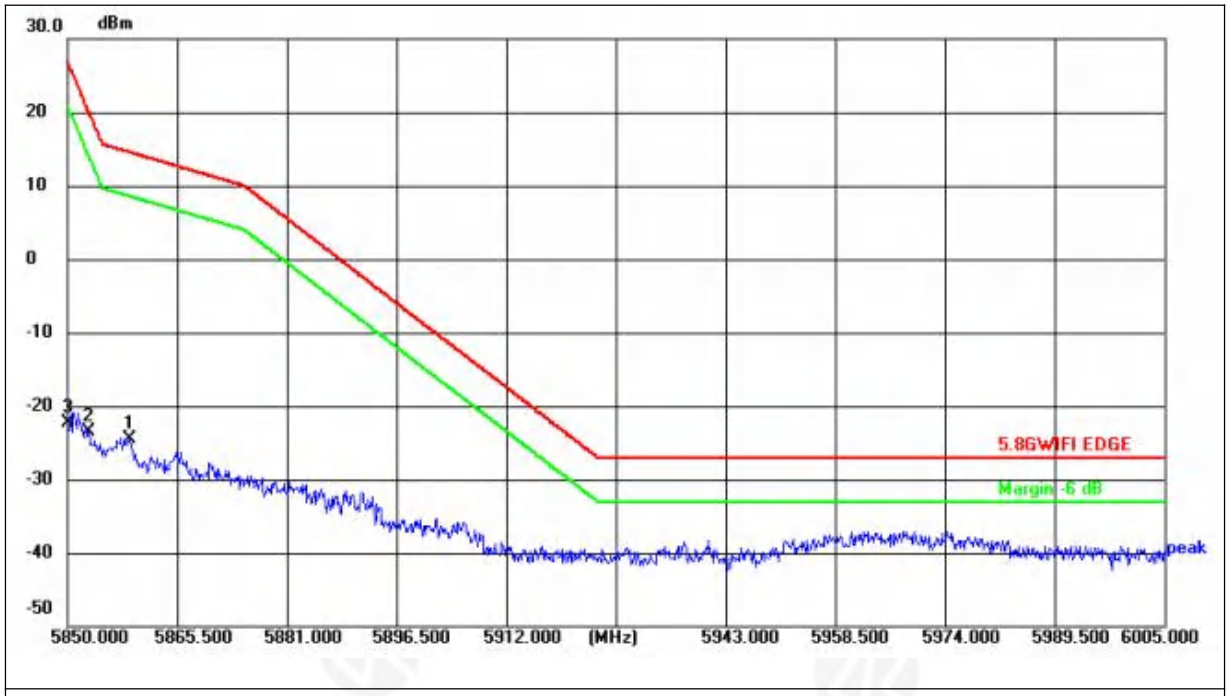
No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 *	5706.700	-36.42	3.93	-32.49	11.88	-44.37	peak			P	
2	5712.368	-35.70	3.94	-31.76	13.47	-45.23	peak			P	
3	5725.000	-32.99	3.97	-29.02	27.00	-56.02	peak			P	

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz	Test Mode	802.11a 5745MHz TX (Worst case ant1)



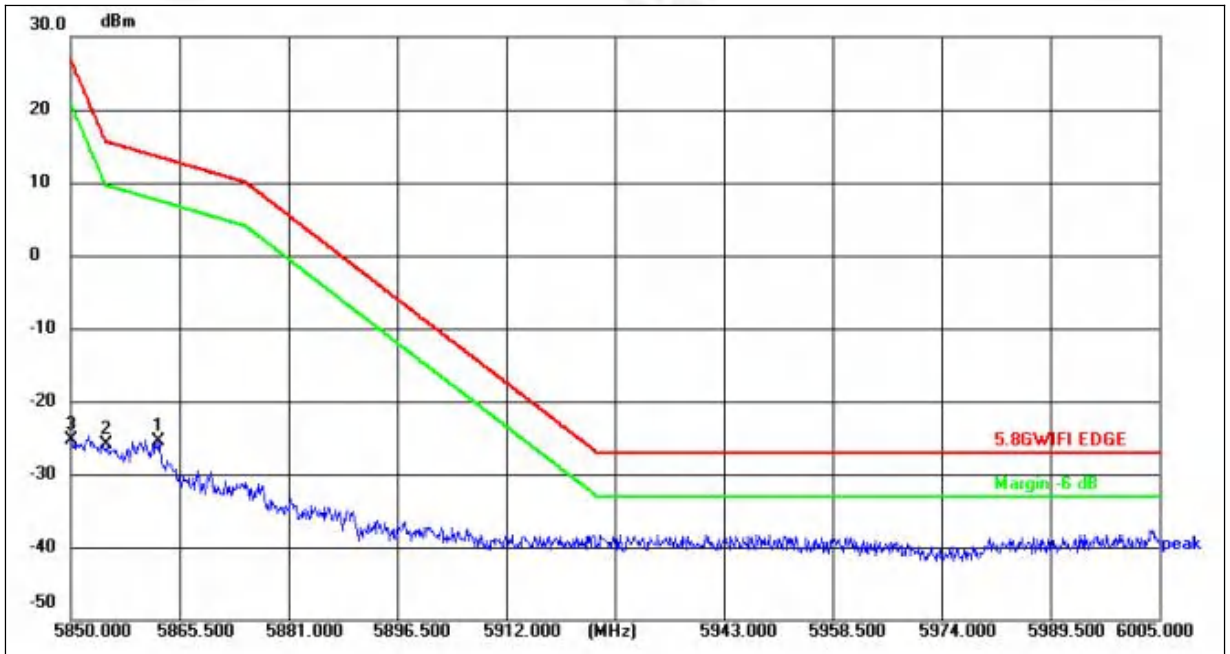
No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 *	5706.700	-36.42	3.93	-32.49	11.88	-44.37	peak			P	
2	5712.368	-35.70	3.94	-31.76	13.47	-45.23	peak			P	
3	5725.000	-32.99	3.97	-29.02	27.00	-56.02	peak			P	

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Test Mode	802.11a 5825MHz TX (Worst case ant1)



No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 *	5858.853	-28.81	4.34	-24.47	14.52	-38.99	peak			P	
2	5852.951	-27.76	4.32	-23.44	20.27	-43.71	peak			P	
3	5850.000	-26.71	4.32	-22.39	27.00	-49.39	peak			P	

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	V
Test Voltage:	AC 120V/60Hz	Test Mode	802.11a 5825MHz TX (Worst case ant1)



No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 *	5862.568	-29.93	4.35	-25.58	13.48	-39.06	peak			P	
2	5855.275	-30.30	4.33	-25.97	15.52	-41.49	peak			P	
3	5850.000	-29.71	4.32	-25.39	27.00	-52.39	peak			P	

Remarks:
1.Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2.The emission levels of other frequencies are very lower than the limit and not show in test report.
3.The test data shows only the worst case mode

10.Frequency Stability Measurement

10.1 LIMIT

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

The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification).

10.2 TEST PROCEDURES

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and max hold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 106 ppm and the limit is less than ±20ppm (IEEE 802.11nspecification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature is -20°C~70°C.

10.3 TEST SETUP LAYOUT

10.4 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously un-modulation transmitting mode.

10.5 TEST RESULTS

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1012 hPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX		

5.8G

802.11a20

Reference Frequency(Middle Channel): 5785MHz			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		MCF	Error (ppm)
50	120	21	0.00353
40	120	24	0.00427
30	120	32	0.00525
20	120	22	0.0021
10	120	12	0.00208
0	120	32	0.00542
-10	120	24	0.00429
-20	120	22	0.0031
-30	120	12	0.00207

802.11n_HT20

Reference Frequency(Middle Channel): 5785MHz			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		MCF	Error (ppm)
50	120	13	0.00228
40	120	21	0.00353
30	120	32	0.00542
20	120	55	0.00986
10	120	42	0.00714
0	120	32	0.00541
-10	120	24	0.00485
-20	120	22	0.0037
-30	120	12	0.00205

So, Frequency Stability Versus Input Voltage is:

802.11a20

Reference Frequency(Middle Channel): 5785MHz			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		Frequency	Error (ppm)
20	120	44	0.00759
	138	43	0.00742
	102	42	0.00723

802.11n_HT20

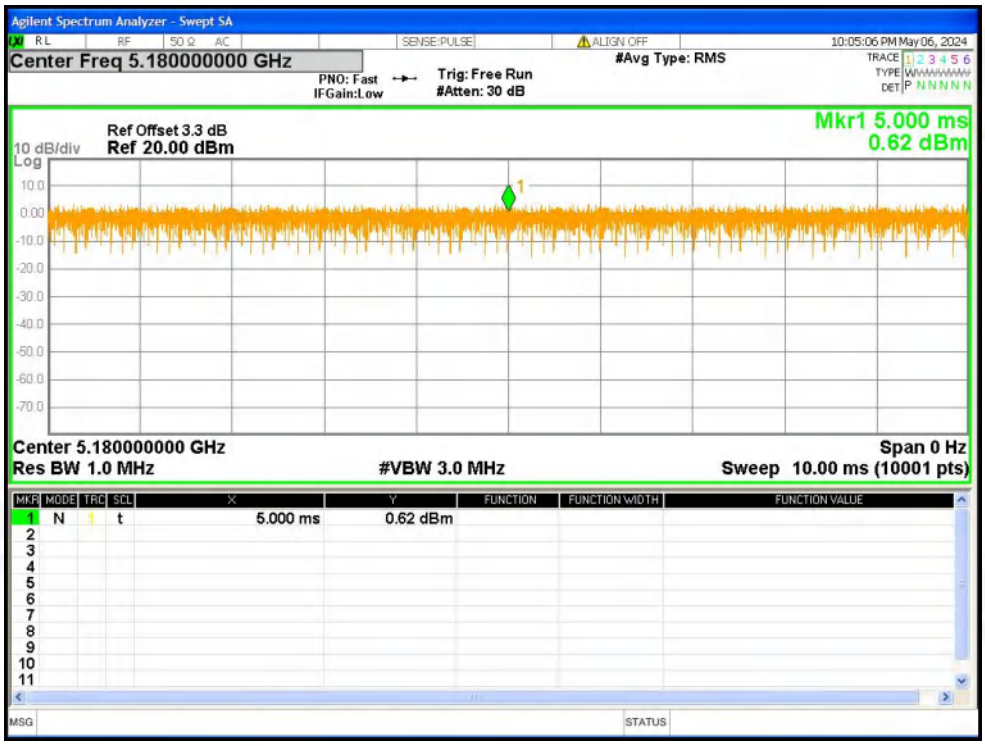
Reference Frequency(Middle Channel): 5785MHz			
Environment Temperature (°C)	Power Supplied (VAC)	Frequency Measure with Time Elapsed	
		Frequency	Error (ppm)
20	120	21	0.00364
	138	43	0.00741
	102	55	0.00956

11. DUTY CYCLE

Test Requirement:	47 CFR Part 15E 15.407 KDB789033 D02 General U-NII Test Procedures New Rules v02r01, Section (B)
Test Method:	ANSI C63.10: 2013
Test Limit:	N/A
Test Result:	PASS
Remark:	Through Pre-scan, The duty cycle set for channel low, middle and high are same, and the duty cycle test is performed at channel low only, The report only records the test data of antenna 1

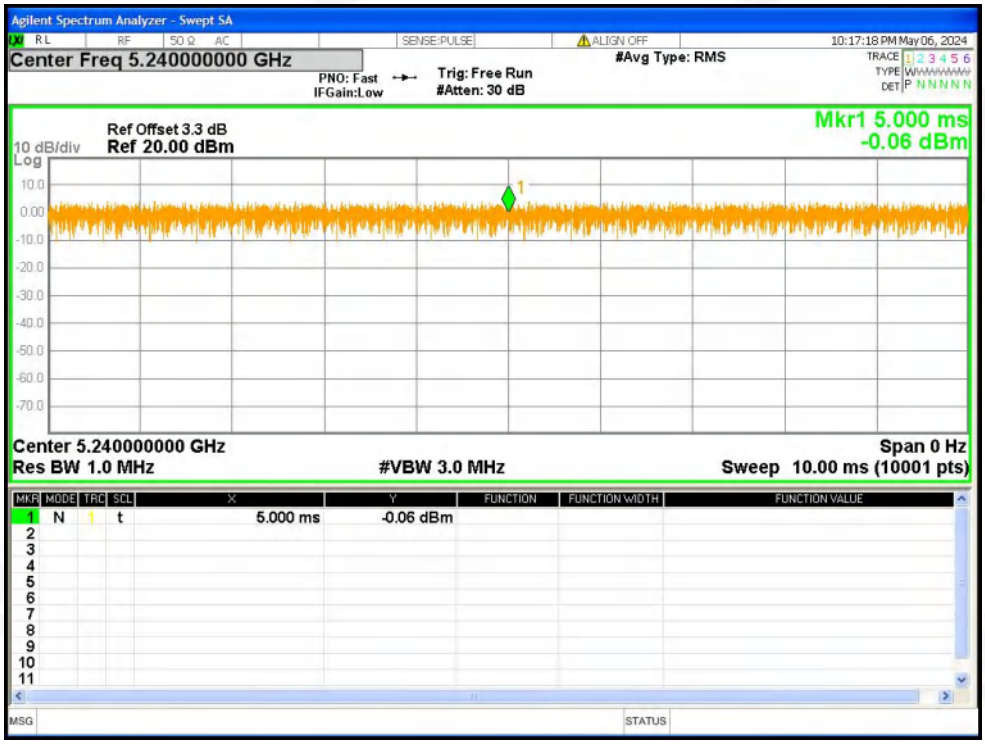
Test Result：

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)
NVNT	a	5180	Ant1	100	0
NVNT	a	5200	Ant1	100	0
NVNT	a	5240	Ant1	100	0
NVNT	n20	5180	Ant1	100	0
NVNT	n20	5200	Ant1	100	0
NVNT	n20	5240	Ant1	100	0
NVNT	a	5745	Ant1	100	0
NVNT	a	5785	Ant1	100	0
NVNT	a	5825	Ant1	100	0
NVNT	n20	5745	Ant1	100	0
NVNT	n20	5785	Ant1	100	0
NVNT	n20	5825	Ant1	100	0

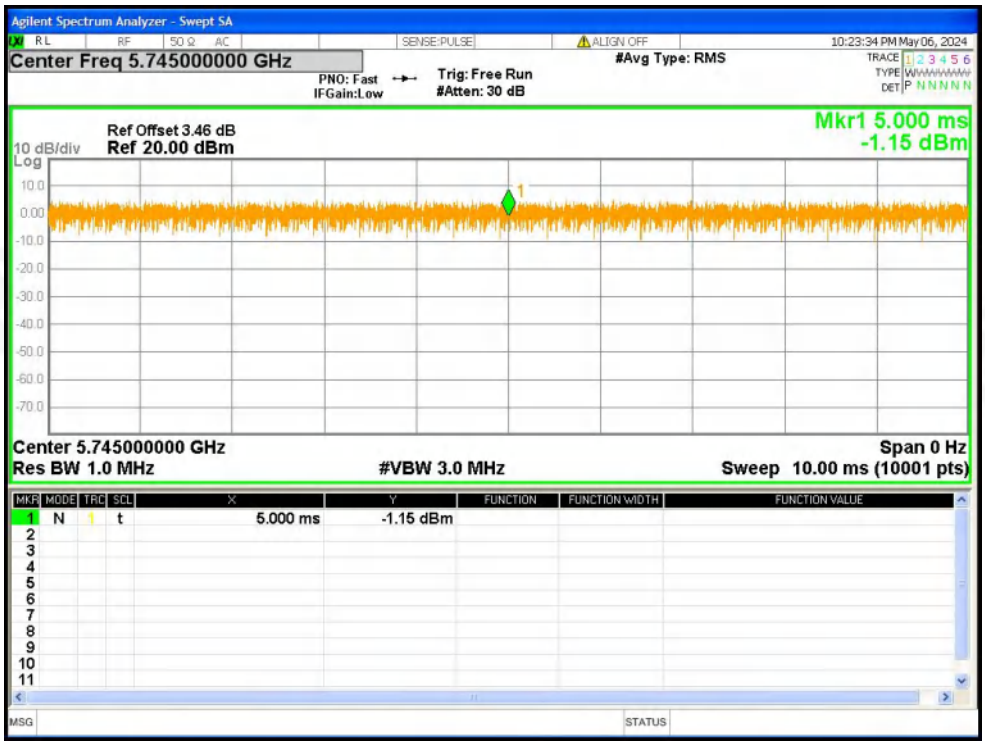


Duty Cycle NVNT a 5180MHz Ant1

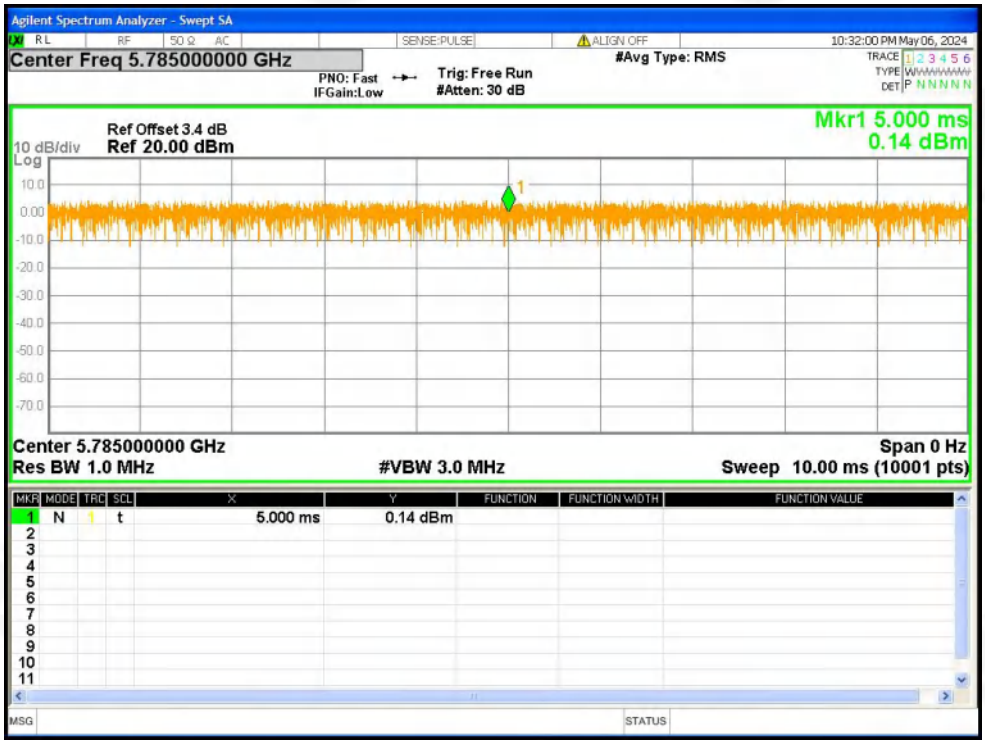
Duty Cycle NVNT a 5200MHz Ant1



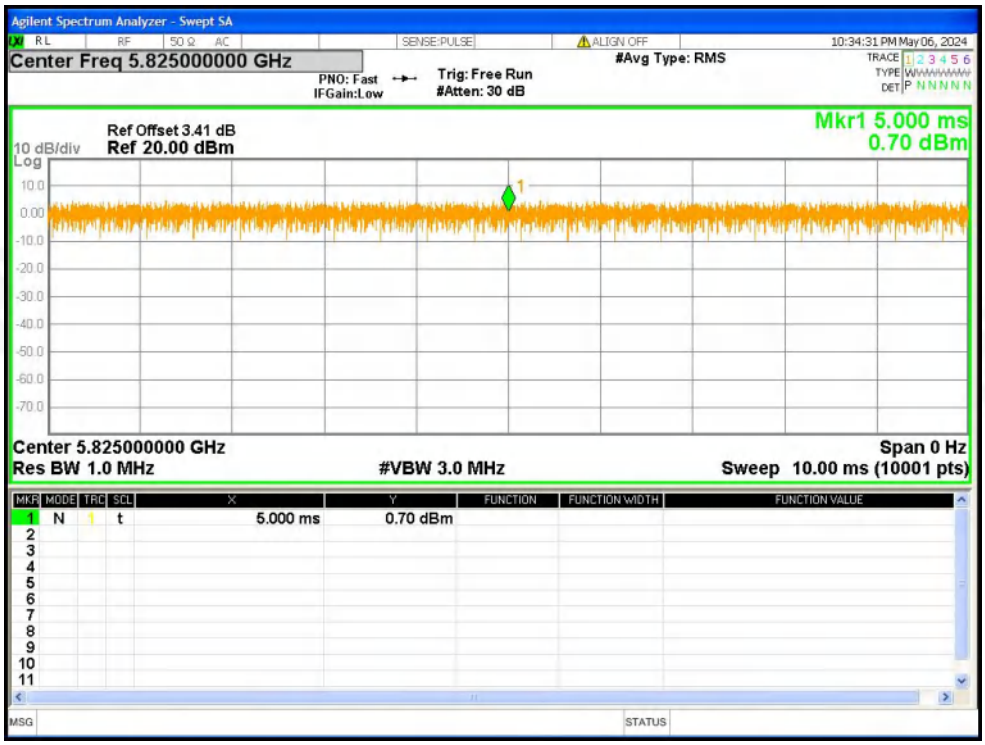
Duty Cycle NVNT a 5240MHz Ant1



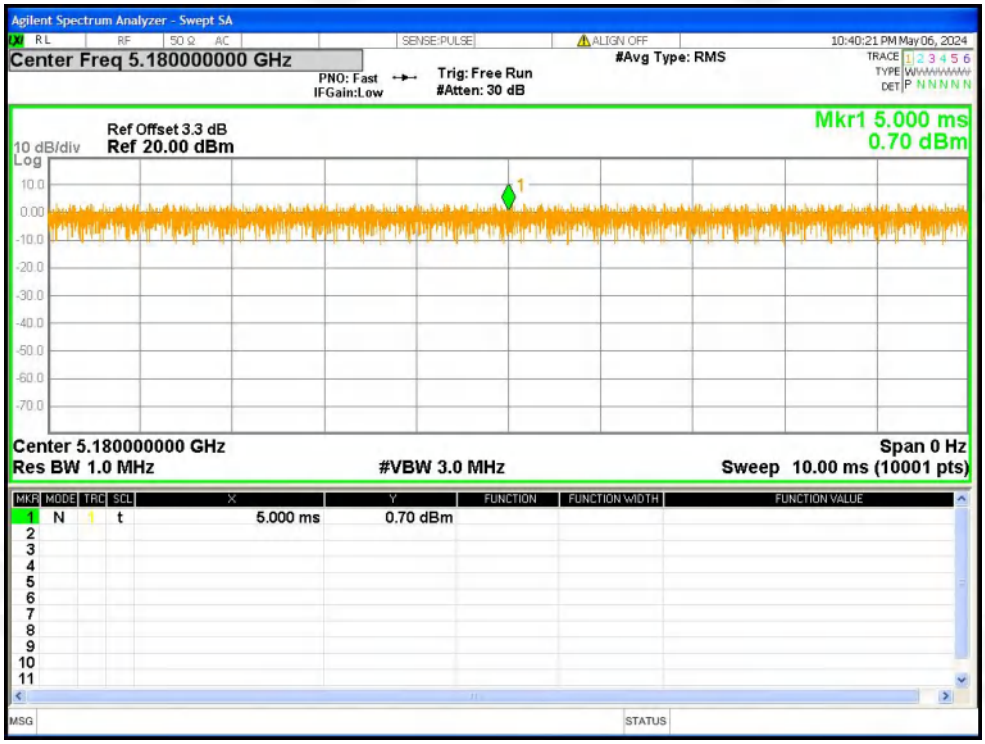
Duty Cycle NVNT a 5745MHz Ant1



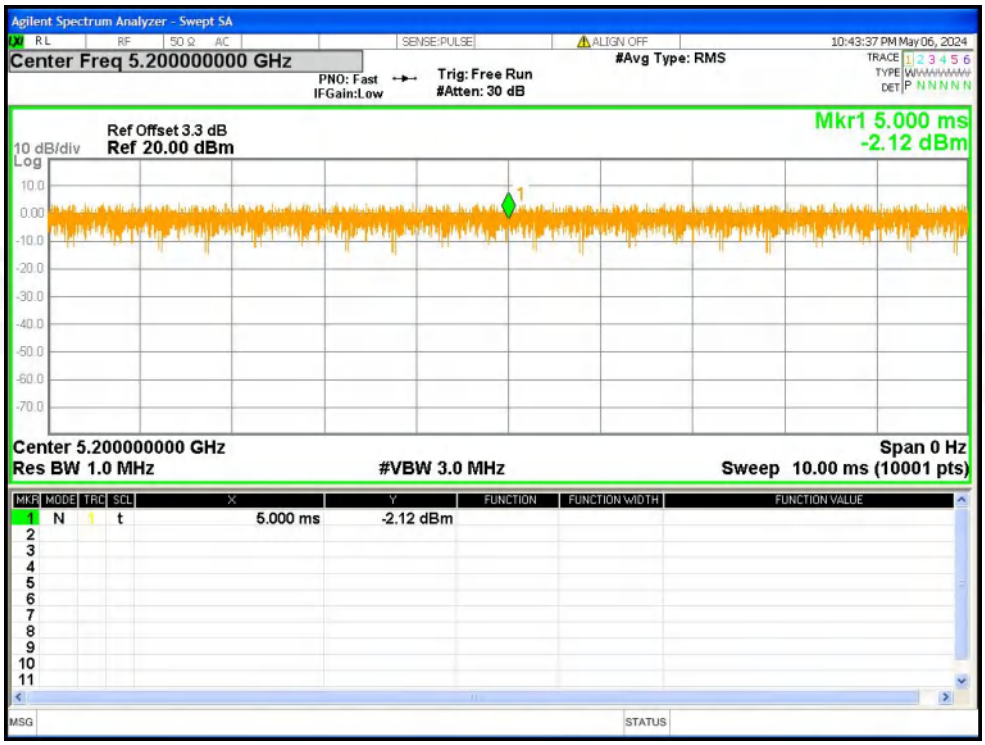
Duty Cycle NVNT a 5785MHz Ant1



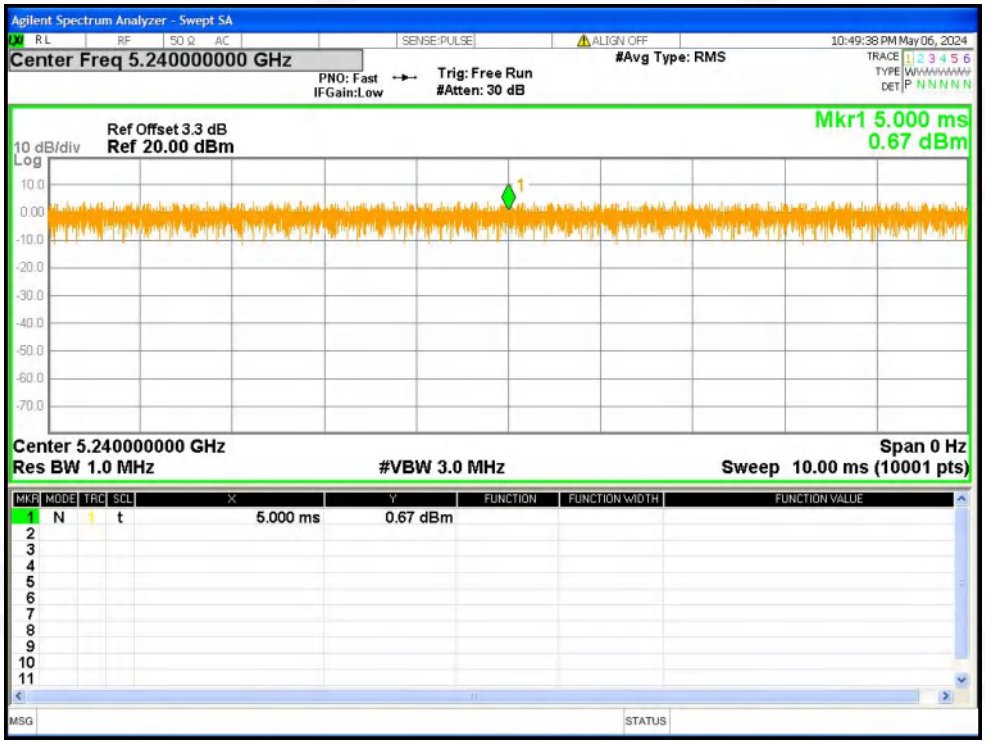
Duty Cycle NVNT a 5825MHz Ant1



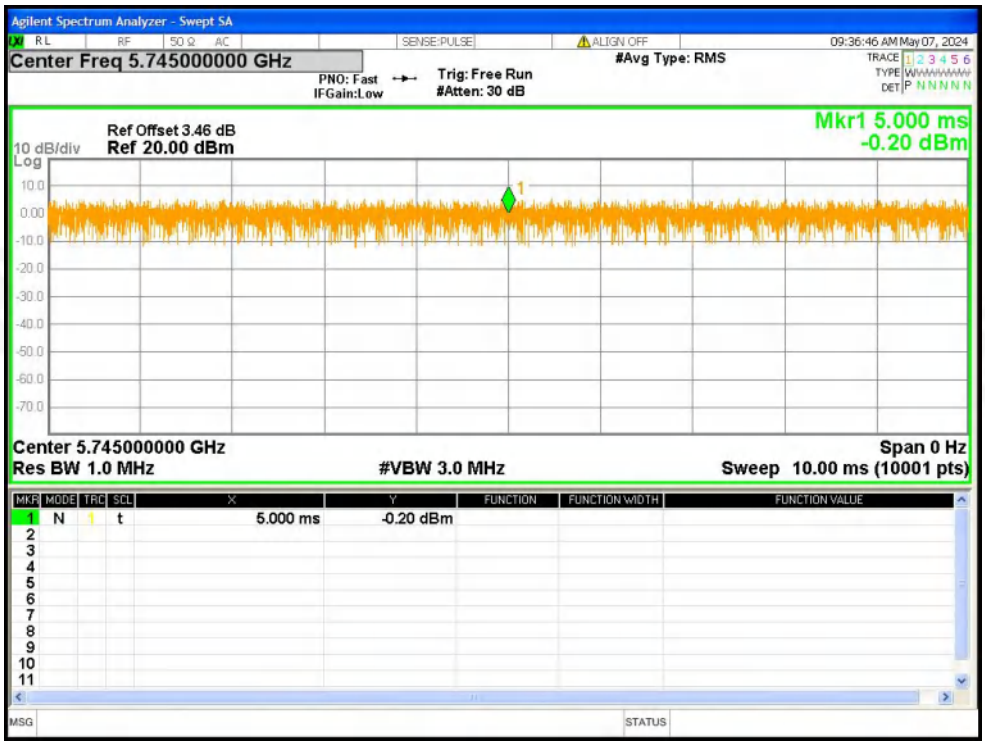
Duty Cycle NVNT n20 5180MHz Ant1



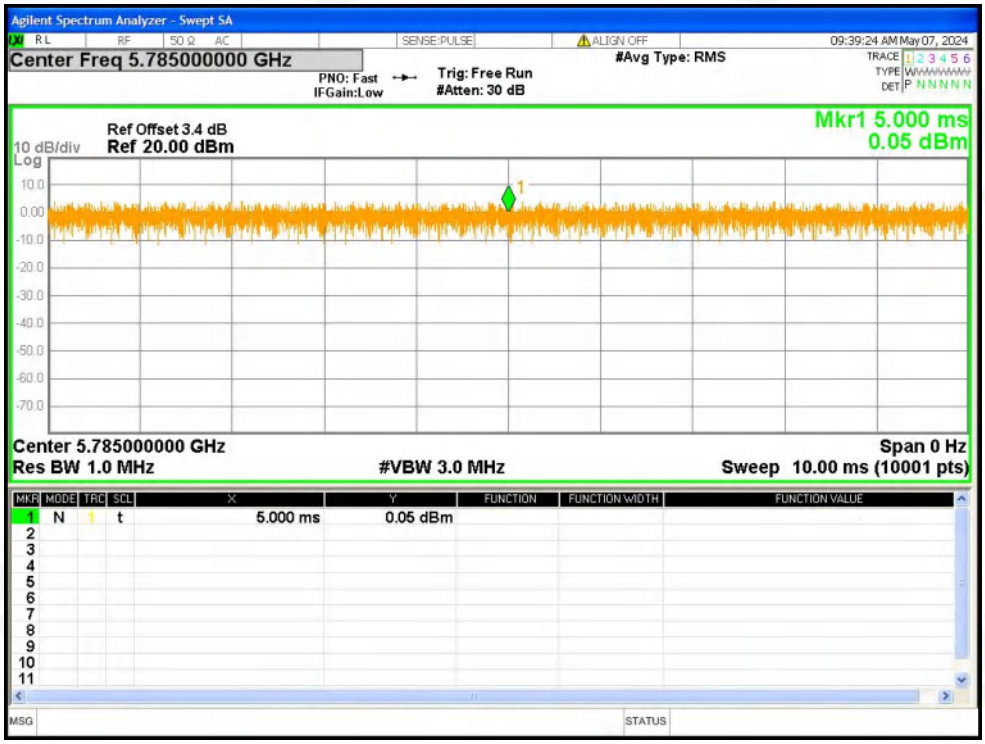
Duty Cycle NVNT n20 5200MHz Ant1



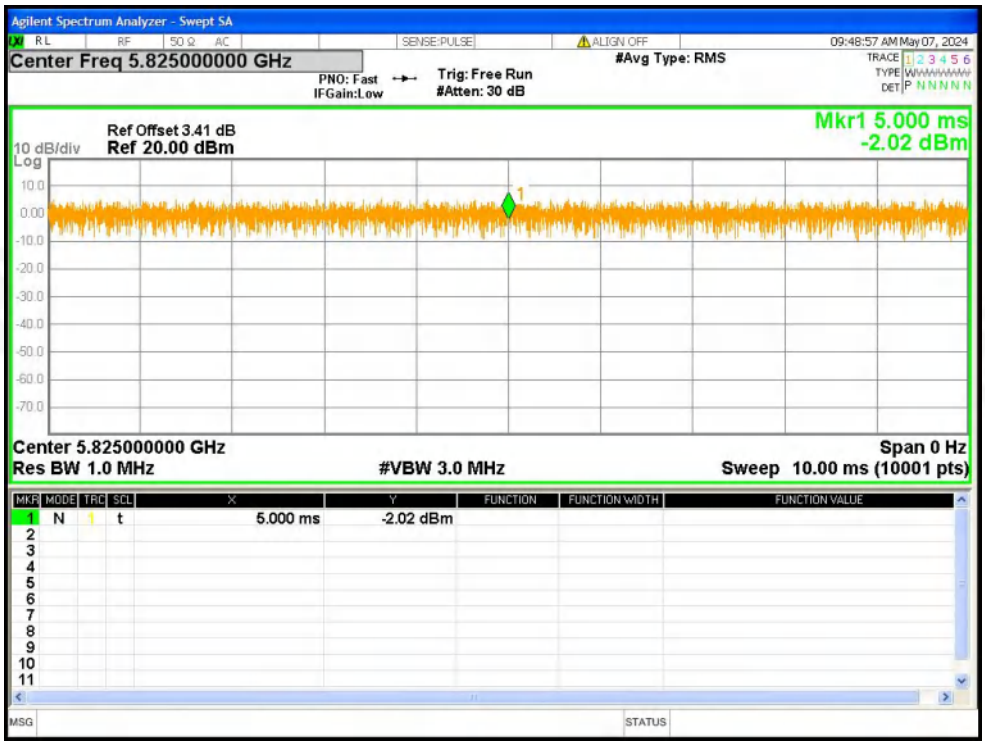
Duty Cycle NVNT n20 5240MHz Ant1



Duty Cycle NVNT n20 5745MHz Ant1



Duty Cycle NVNT n20 5785MHz Ant1



Duty Cycle NVNT n20 5825MHz Ant1

12.ANTENNA REQUIREMENT

Standard requirement:	FCC Part15 C Section 15.203 /247(c) RSS-Gen Section 6.8
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 15.247(c) (1)(i) requirement: (i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi. When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer. For transmitters of RF output power of 10 milliwatts or less, only the portion of the antenna gain that is in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power to demonstrate compliance with the radiated power limits specified in the applicable standard. For transmitters of output power greater than 10 milliwatts, the total antenna gain shall be added to the measured RF output power to demonstrate compliance to the specified radiated power RSS-Gen requirement: According to the RSS-Gen Section 6.8, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.	
EUT Antenna:	
There are two PCB antennas for WIFI 5G, the best case gain for one antenna is 2.61dBi, the other is 2.36dBi. reference to the appendix II for details	

13. TEST SETUP PHOTO

Reference to the appendix I for details.

14. EUT CONSTRUCTIONAL DETAILS

Reference to the appendix II for details.

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