Measurement and Test Report
For
Shenzhen Qiuyu Electronic Co., Ltd

FCC ID:2AL64-QY-KDTA

FCC Rule(s)/Methods:	FCC CFR Title 47 Part 15 Subpart E Section 15.407 ANSI C63.10:2013
Product Description:	KODAK TAB
Trademark	KODAK
Model/Type reference.:	KT802, KT102, KT106, KT108, K10, K11, K12, K13, K13 Plus, K14
Report No.:	MAX25042102750023F-3
Date of receipt of test item:	Mar 21, 2025
Date of sampling:	Mar 24, 2025
Tested Date:	Mar 24, 2025 to Mar 28, 2025
Issued Date:	Mar 29, 2025
Tested By:	Lris Yao/ Engineer
Reviewed By:	Levi Xiao/ EMC Manager
Approved & Authorized By:	Salon Ouyang / PSQ Manager

MAXLAB Testing Co.,Ltd.
1/F, Building B, Xinshidai GR Park, Shiyan Street, Bao'an District, Shenzhen, Shiyan Street, Bao'an District, Shenzhen, Guangdong, 518052, People’s Republic of China
Tel: 400-882-9628 Fax: 86- 755-26508703

Table of Contents **Page**

1. Version 4

2.SUMMARY OF TEST RESULTS 5

2.1 TEST FACILITY 6

2.2 MEASUREMENT UNCERTAINTY 6

3. GENERAL INFORMATION 7

3.1 GENERAL DESCRIPTION OF EUT 7

3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED 9

3.4 DESCRIPTION OF SUPPORT UNITS 9

3.5 EQUIPMENTS LIST FOR ALL TEST ITEMS 10

4.EMC EMISSION TEST 12

4.1 CONDUCTED EMISSION MEASUREMENT 12

4.1.1 POWER LINE CONDUCTED EMISSION Limits 12

4.1.2 TEST PROCEDURE 12

4.1.3 DEVIATION FROM TEST STANDARD 12

4.1.4 TEST SETUP 13

4.1.5 EUT OPERATING CONDITIONS 13

4.1.6 TEST RESULT（Worst case 802.11a 5180MHz） 14

4.2 RADIATED EMISSION MEASUREMENT 16

4.2.1 Applicable Standard 16

4.2.2 Conformance Limit 16

4.2.3 Measuring Instruments 17

4.2.4 Test Configuration 17

4.2.5 Test Procedure 18

4.2.6 TEST RESULT 19

5.POWER SPECTRAL DENSITY TEST 27

5.1 Applied procedures / limit 27

5.2 TEST PROCEDURE 27

5.3 DEVIATION FROM STANDARD 28

5.3 TEST METHOD 28

5.4 TEST SETUP 28

5.5 EUT OPERATION CONDITIONS 29

5.7 TEST RESULTS 30

6.26DB & 6DB & 99% Emission Bandwidth 35

6.1 Applied procedures / limit 35

6.2 TEST PROCEDURE 35

6.3 EUT OPERATION CONDITIONS 36

6.4 TEST RESULTS 36

Table of Contents **Page**

7.Maximum Conducted Output Power 41
7.1 pplied procedures / limit 41
7.2 TEST PROCEDURE 41
7.3 DEVIATION FROM STANDARD 41
7.4 TEST SETUP 41
7.5 EUT OPERATION CONDITIONS 41
7.6 TEST RESULTS 42

8.Out of Band Emissions 43
8.1 Applicable Standard 43
8.2 Test Procedure 43
8.3 DEVIATION FROM STANDARD 43
8.4 TEST SETUP 44
8.5 EUT OPERATION CONDITIONS 44
8.6 TEST RESULTS 45

10.Frequency Stability Measurement 49
10.1 Limit 49
10.2 Test Procedures 49
10.3 Test Setup Layout 49
10.4 EUT Operation during Test 49
10.5 TEST RESULTS 49

11. Duty Cycle 53

13. Test Setup Photo 59

14. EUT Constructional Details 59

1. VERSION

Report No.	Version	Description	Approved
MAX25042102750023F-3	Rev.01	Initial issue of report	Mar 29, 2025

2.SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.407) , Subpart E			
Standard Section	Test Item	Judgment	Remark
15.209(a) 15.407 (b)	Spurious Radiated Emissions	PASS	
KDB 789033	Duty Cycle	--	
15.207	Conducted Emission	PASS	
15.407 (a)(12) 2.1049	26 dB and 99% Emission Bandwidth	PASS	
15.407 (a)(1) 15.407 (a)(3)	Maximum Conducted Output Power&Eirp	PASS	
2.1051, 15.407(b)(1) 15.407(b)(4)	Band Edge	PASS	
15.407 (a)(1) 15.407 (a)(3)	Power Spectral Density	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

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

Test method：KDB 789033 D02 v01r02, KDB 662911 D01 Multiple Transmitter Output v02r01

2.1 TEST FACILITY

MAXLAB Testing Co.,Ltd.
Add. : 1/F, Building B, Xinshidai GR Park, Shiyan Street, Bao'an District, Shenzhen, Shiyan Street, Bao'an District, Shenzhen, Guangdong, 518052, People's Republic of China

FCC Test Firm Registration Number: 562200
Designation Number: CN1338
IC Registered No.: 11093A
CAB identifier: CN0019

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:	Shenzhen Qiuyu Electronic Co., Ltd
Address of applicant:	3F, E Building, Hongzhuyongqi Industrial Park, Lezhujiao village, xixiang town, Bao'an District ,Shenzhen, China
Manufacturer:	Shenzhen Qiuyu Electronic Co., Ltd
Address of manufacturer:	3F, E Building, Hongzhuyongqi Industrial Park, Lezhujiao village, xixiang town, Bao'an District ,Shenzhen, China
Product Name:	KODAK TAB
Model No.:	KT802, KT102, KT106, KT108, K10, K11, K12, K13, K13 Plus, K14
Test Model:	K12
Model Different.:	All models are electrical identical including the same software parameter and hardware design (i.e., circuit design, PCB Layout, RF module/circuit, antenna type(s) and antenna location, components on PCB, etc.,), same mechanical structure and design (including product enclosure, materials, etc.,). Only the naming of the model is different; everything else is exactly the same.
Sample(s) Status:	Engineer sample
Product Description	IEEE 802.11 WLAN Mode Supported: ☒ 802.11a/n (20MHz channel bandwidth) ☒ 802.11n (40MHz channel bandwidth) ☐ 802.11ac(80MHz channel bandwidth) Data Rate: 802.11a:6/9/12/18/24/36/48/54Mbps 802.11n(HT20):MCS0-MCS7 802.11n(HT40):MCS0-MCS9 Modulation: OFDM with BPSK/QPSK/16QAM/64QAM for 802.11a/n Operating Frequency Range: ☒ 5180-5240MHz for 802.11a/n(HT20)/n(HT40); ☐ 5745-5825MHz for 802.11a/n(HT20)/n(HT40); Number of Channels: ☒ 4 channels for 802.11 n40 in the 5180-5240 MHz band ☒ 2 channels for 802.11 n40 in the 5190-5230 MHz band
Channel List	Please refer to the Note 2.
Antenna Type:	FPC antenna
Antenna gain:	1.86dBi
PMN:	N/A
HVIN/Hardware version:	V1.0
FVIN/Software version:	V1.0
Power supply:	DC 5V from USB port; Battery: DC 3.8V, 8000mAh, 30.8Wh

Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220	38	5190	40	5200
46	5230	48	5240				

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.	

Pretest Mode	Description
Mode 1	802.11a/n 20 CH36/ CH40/ CH 48, 802.11n 40 CH38/ CH46
Mode 2	Link Mode

Conducted Emission	
Final Test Mode	Description
Mode 1	Link Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11a/n 20 CH36/ CH40/ CH 48, 802.11n 40 CH38/ CH46

Note:

(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.

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
/	Adapter	Zhixin	ZUAA050200UL	/	Input: 100-240V~ 50/60Hz 0.3A Max Output: DC 5V, 2A

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

Conducted Emission					
Test Equipment	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	BSL252	2024-10-27	2025-10-26
EMI Test Receiver	R&S	ESCI 7	BSL552	2024-10-27	2025-10-26
Coaxial Switch	ANRITSU CORP	MP59B	BSL225	2024-10-27	2025-10-26
ENV216 2-L-V-NETZNACHB.DE	ROHDE&SCHWARZ	ENV216	BSL226	2024-10-27	2025-10-26
Coaxial Cable	BSL	N/A	BSL227	N/A	N/A
EMI Test Software	AUDIX	E3	N/A	N/A	N/A
Thermo meter	KTJ	TA328	BSL233	2024-10-27	2025-10-26
Absorbing clamp	Elektronik-Feinmechanik	MDS21	BSL229	2024-10-27	2025-10-26
LISN	R&S	ENV216	308	2024-10-27	2025-10-26
LISN	R&S	ENV216	314	2024-10-27	2025-10-26

Radiation Test equipment					
Test Equipment	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)*6.4(H)	BSL250	2024-10-27	2025-10-26
Control Room	ZhongYu Electron	6.2(L)*2.5(W)*2.4(H)	BSL251	N/A	N/A
EMI Test Receiver	Rohde & Schwarz	ESU26	BSL203	2024-10-27	2025-10-26
BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	BSL214	2024-10-27	2025-10-26
Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	BSL208	2024-10-27	2025-10-26
Horn Antenna	ETS-LINDGREN	3160	BSL217	2024-10-27	2025-10-26
EMI Test Software	AUDIX	E3	N/A	N/A	N/A
Coaxial Cable	BSL	N/A	BSL213	2024-10-27	2025-10-26
Coaxial Cable	BSL	N/A	BSL211	2024-10-27	2025-10-26
Coaxial cable	BSL	N/A	BSL210	2024-10-27	2025-10-26
Coaxial Cable	BSL	N/A	BSL212	2024-10-27	2025-10-26
Amplifier(100kHz-3 GHz)	HP	8347A	BSL204	2024-10-27	2025-10-26
Amplifier(2GHz-20 GHz)	HP	84722A	BSL206	2024-10-27	2025-10-26
Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	BSL218	2024-10-27	2025-10-26
Band filter	Amindeon	82346	BSL219	2024-10-27	2025-10-26
Power Meter	Anritsu	ML2495A	BSL540	2024-10-27	2025-10-26

Power Sensor	Anritsu	MA2411B	BSL541	2024-10-27	2025-10-26
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	BSL575	2024-10-27	2025-10-26
Splitter	Agilent	11636B	BSL237	2024-10-27	2025-10-26
Loop Antenna	ZHINAN	ZN30900A	BSL534	2024-10-27	2025-10-26
Breitband hornantenne	SCHWARZBECK	BBHA 9170	BSL579	2024-10-27	2025-10-26
Amplifier	TDK	PA-02-02	BSL574	2024-10-27	2025-10-26
Amplifier	TDK	PA-02-03	BSL576	2024-10-27	2025-10-26
PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	BSL578	2024-10-27	2025-10-26

RF Conducted Test:					
Test Equipment	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
MXA Signal Analyzer	Agilent	N9020A	BSL566	2024-10-27	2025-10-26
EMI Test Receiver	R&S	ESCI 7	BSL552	2024-10-27	2025-10-26
Spectrum Analyzer	Agilent	E4440A	BSL533	2024-10-27	2025-10-26
MXG vector Signal Generator	Agilent	N5182A	BSL567	2024-10-27	2025-10-26
ESG Analog Signal Generator	Agilent	E4428C	BSL568	2024-10-27	2025-10-26
USB RF Power Sensor	DARE	RPR3006W	BSL569	2024-10-27	2025-10-26
RF Switch Box	Shongyi	RFSW3003328	BSL571	2024-10-27	2025-10-26
Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	BSL572	2024-10-27	2025-10-26

4.EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

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

4.1.1 POWER LINE CONDUCTED EMISSION Limits

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

Note:

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

4.1.2 TEST PROCEDURE

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

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

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

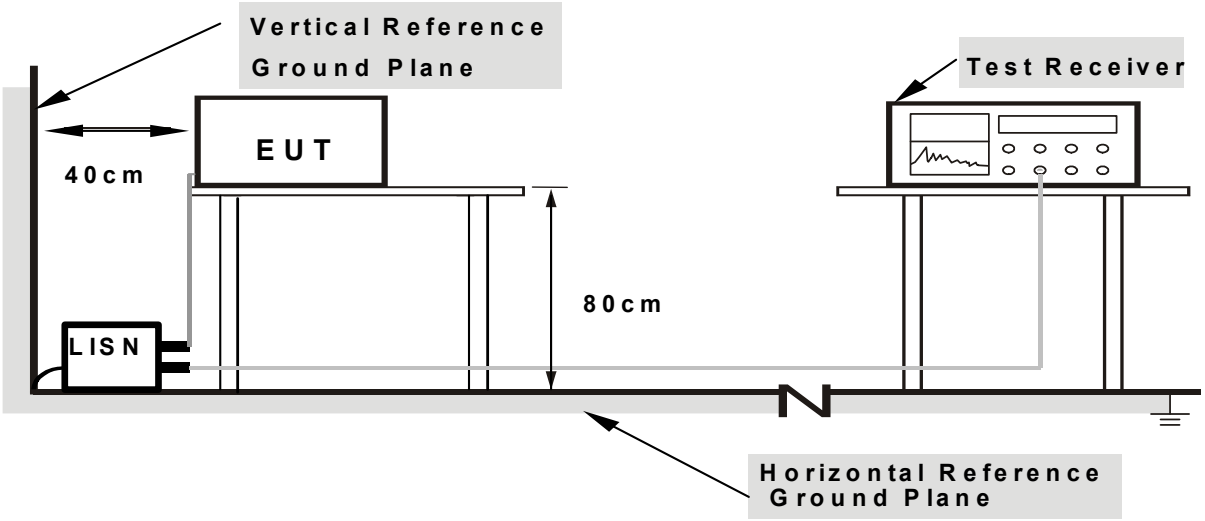
d. LISN at least 80 cm from nearest part of EUT chassis.

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

4.1.3 DEVIATION FROM TEST STANDARD

No deviation

4.1.4 TEST SETUP



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

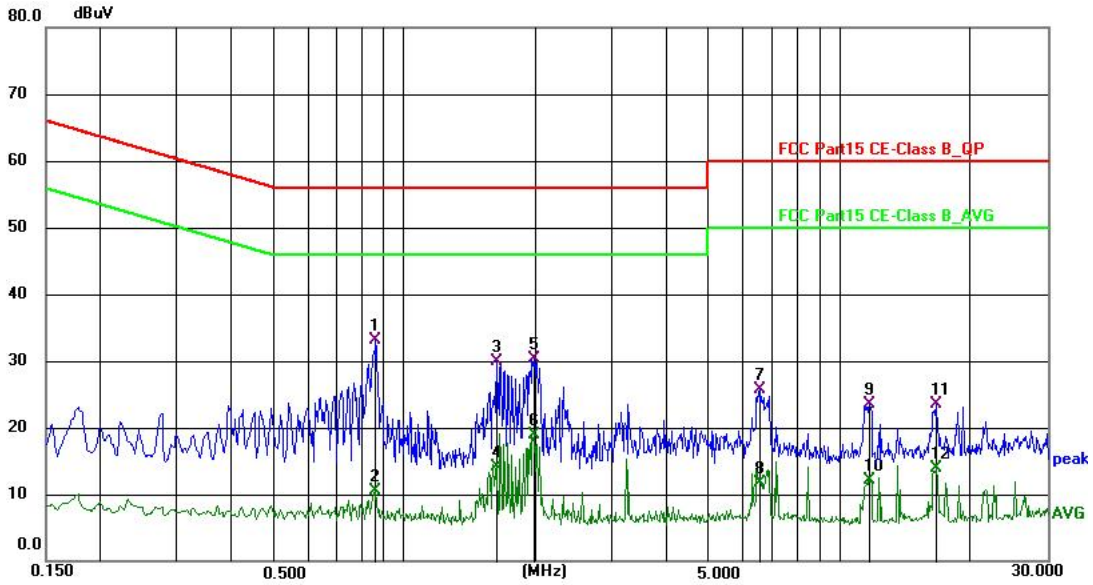
4.1.5 EUT OPERATING CONDITIONS

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

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

4.1.6 TEST RESULT（Worst case 802.11a 5180MHz）

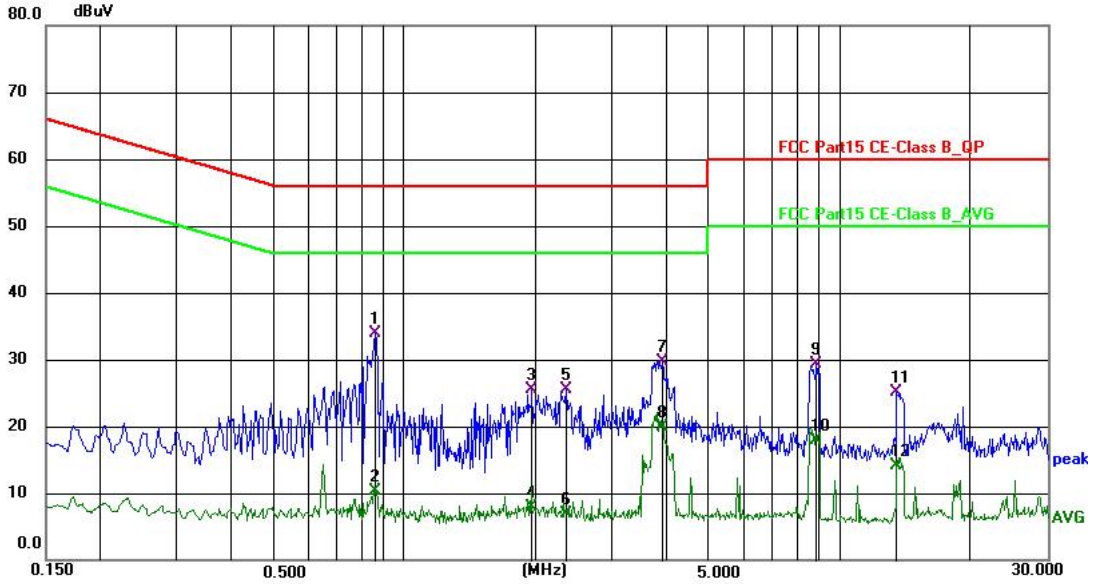
Temperature：	26℃	Relative Humidity：	54%
Pressure：	101kPa	Phase :	L
Test Voltage ：	AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1 *	0.8609	23.51	9.61	33.12	56.00	-22.88	QP	P	
2	0.8609	0.97	9.61	10.58	46.00	-35.42	AVG	P	
3	1.6305	20.32	9.65	29.97	56.00	-26.03	QP	P	
4	1.6305	4.49	9.65	14.14	46.00	-31.86	AVG	P	
5	1.9815	20.50	9.72	30.22	56.00	-25.78	QP	P	
6	1.9815	9.14	9.72	18.86	46.00	-27.14	AVG	P	
7	6.5849	16.08	9.53	25.61	60.00	-34.39	QP	P	
8	6.5849	2.18	9.53	11.71	50.00	-38.29	AVG	P	
9	11.7014	13.80	9.76	23.56	60.00	-36.44	QP	P	
10	11.7014	2.40	9.76	12.16	50.00	-37.84	AVG	P	
11	16.6424	13.79	9.71	23.50	60.00	-36.50	QP	P	
12	16.6424	4.18	9.71	13.89	50.00	-36.11	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		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1 *	0.8610	24.21	9.61	33.82	56.00	-22.18	QP	P	
2	0.8610	0.74	9.61	10.35	46.00	-35.65	AVG	P	
3	1.9680	15.81	9.71	25.52	56.00	-30.48	QP	P	
4	1.9680	-1.79	9.71	7.92	46.00	-38.08	AVG	P	
5	2.3550	15.89	9.68	25.57	56.00	-30.43	QP	P	
6	2.3550	-2.68	9.68	7.00	46.00	-39.00	AVG	P	
7	3.9210	20.19	9.54	29.73	56.00	-26.27	QP	P	
8	3.9210	10.42	9.54	19.96	46.00	-26.04	AVG	P	
9	8.8620	19.62	9.67	29.29	60.00	-30.71	QP	P	
10	8.8620	8.26	9.67	17.93	50.00	-32.07	AVG	P	
11	13.5330	15.31	9.77	25.08	60.00	-34.92	QP	P	
12	13.5330	4.42	9.77	14.19	50.00	-35.81	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 FCC Part 15.407(d) and 15.209

4.2.2 CONFORMANCE LIMIT

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

According to FCC Part15.205, Restricted bands

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

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

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.

For FCC Band Edge 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 −27 dBm/MHz.
(5)The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.
(6)Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209.

Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in § 15.207.

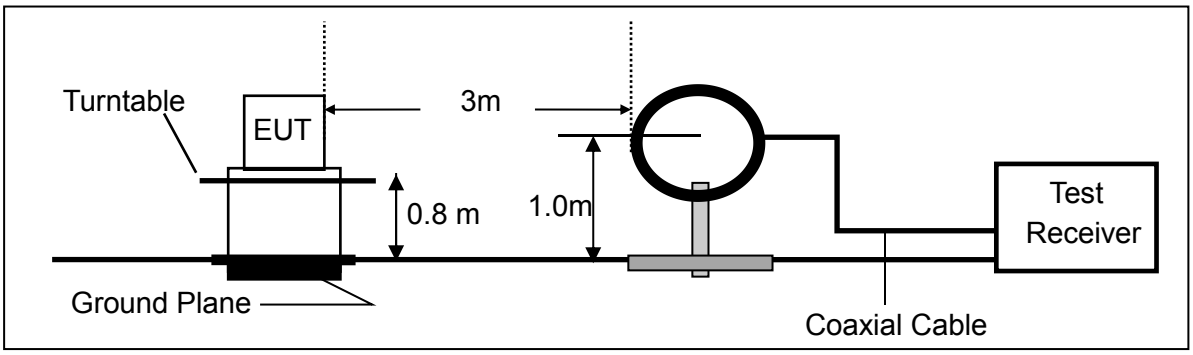
(7)The provisions of § 15.205 apply to intentional radiators operating under this section.

4.2.3 MEASURING INSTRUMENTS

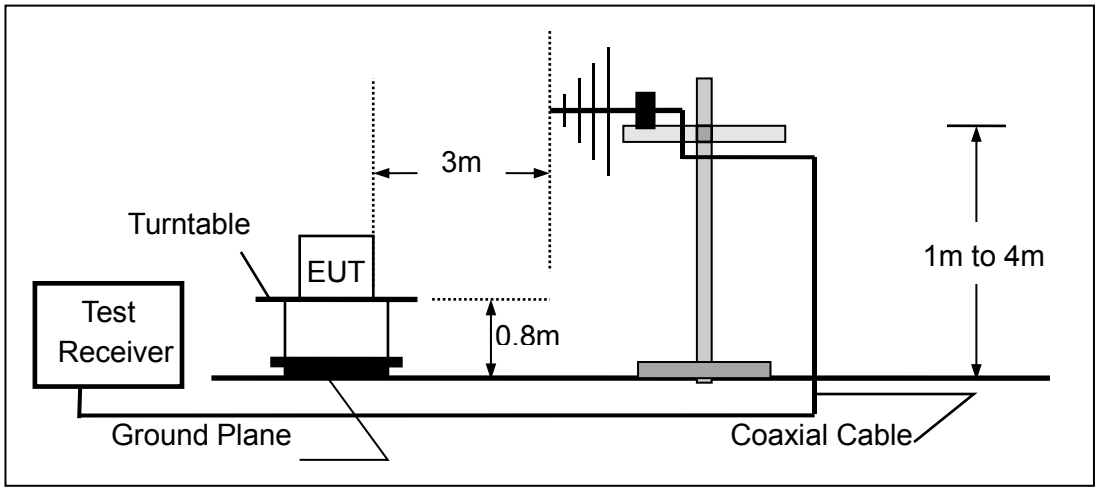
The Measuring equipment is listed in the section 6.3 of this test report.

4.2.4 TEST CONFIGURATION

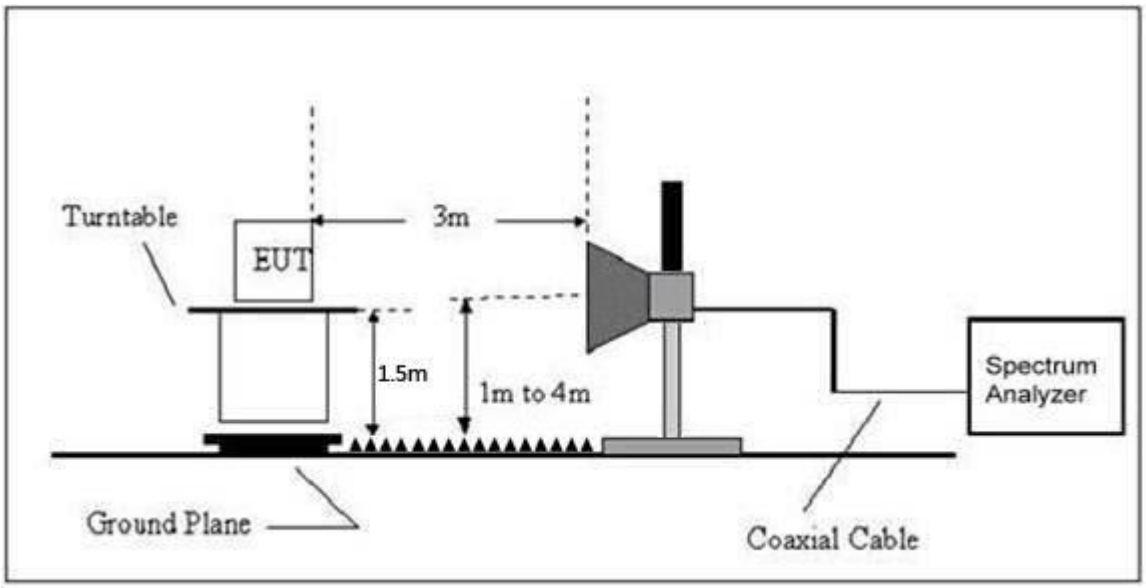
1.For radiated emissions below 30MHz



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.

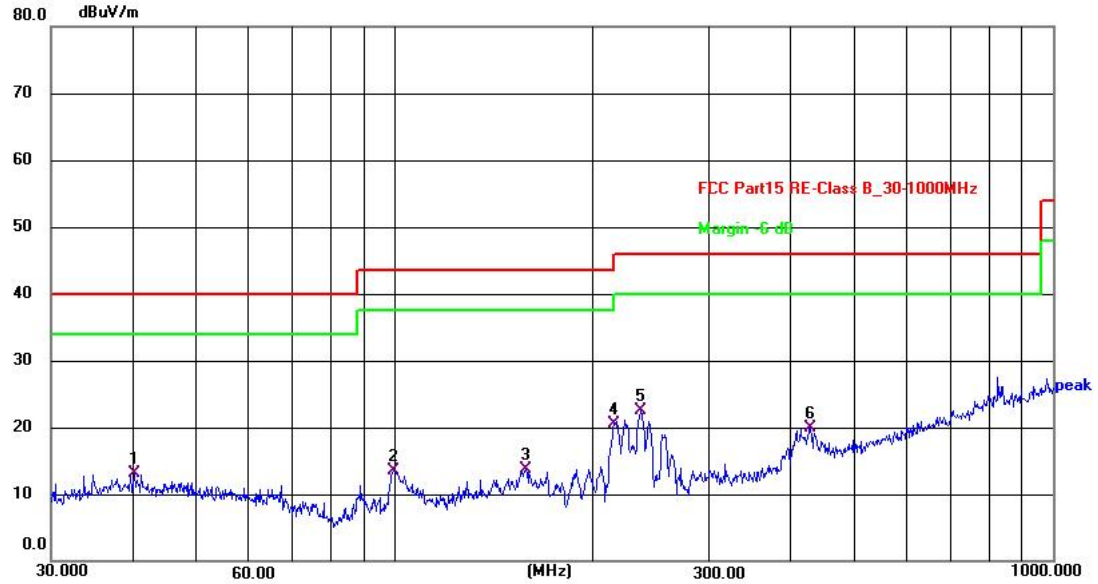
4.2.6 TEST RESULT

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.

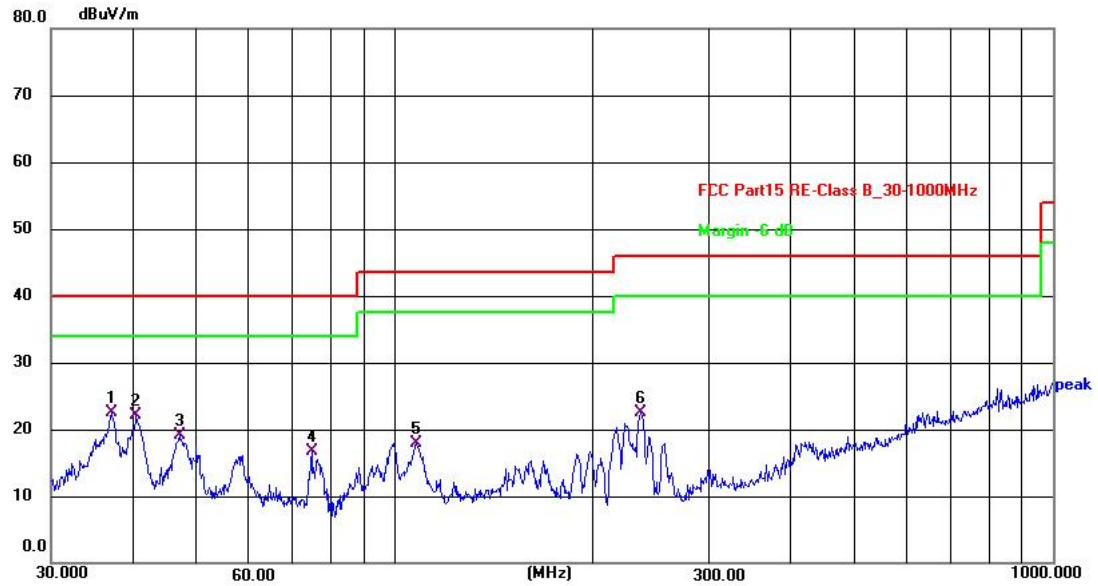
Between 30MHz – 1GHz

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	DC 3.8V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	40.1347	28.73	-15.70	13.03	40.00	-26.97	QP
2	99.5281	33.57	-20.04	13.53	43.50	-29.97	QP
3	158.1123	29.52	-15.91	13.61	43.50	-29.89	QP
4 *	215.2678	39.69	-19.20	20.49	43.50	-23.01	QP
5	236.6447	40.84	-18.29	22.55	46.00	-23.45	QP
6	428.0193	32.43	-12.44	19.99	46.00	-26.01	QP

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	DC 3.8V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	37.0250	38.58	-16.14	22.44	40.00	-17.56	QP
2	40.4170	37.77	-15.72	22.05	40.00	-17.95	QP
3	46.9947	35.27	-16.23	19.04	40.00	-20.96	QP
4	74.6568	36.11	-19.33	16.78	40.00	-23.22	QP
5	107.8877	37.14	-19.22	17.92	43.50	-25.58	QP
6	236.6447	40.73	-18.29	22.44	46.00	-23.56	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 802.11n20 5180mode

Between 1GHz – 40GHz

Temperature:	26℃	Relative Humidity:	54%
Pressure:	1010 hPa	Test Voltage :	DC 3.8V
Test Mode :	5.2G TX- 802.11a/n20/n40(Worst case)		

802.11a

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel:5180MHz									
V	10360.00	50.32	30.55	5.77	24.66	50.20	74.00	-23.80	PK
V	10360.00	43.53	30.55	5.77	24.66	43.41	54.00	-10.59	AV
V	15540.00	53.53	30.33	6.32	24.55	54.07	74.00	-19.93	PK
V	15540.00	43.36	30.33	6.32	24.55	43.90	54.00	-10.10	AV
V	20720.00	52.10	30.85	7.45	24.69	53.39	74.00	-20.61	PK
V	20720.00	43.53	30.85	7.45	24.69	44.82	54.00	-9.18	AV
V	25900.00	53.58	31.02	8.99	25.57	57.12	74.00	-16.88	PK
V	25900.00	43.22	31.02	8.99	25.57	46.76	54.00	-7.24	AV
H	10360.00	50.59	30.55	5.77	24.66	50.47	74.00	-23.53	PK
H	10360.00	43.19	30.55	5.77	24.66	43.07	54.00	-10.93	AV
H	15540.00	51.68	30.33	6.32	24.55	52.22	74.00	-21.78	PK
H	15540.00	43.13	30.33	6.32	24.55	43.67	54.00	-10.33	AV
H	41440.00	54.16	30.85	7.45	24.69	55.45	74.00	-18.55	PK
H	41440.00	43.95	30.85	7.45	24.69	45.24	54.00	-8.76	AV
H	25900.00	52.18	31.02	8.99	25.57	55.72	74.00	-18.28	PK
H	25900.00	43.45	31.02	8.99	25.57	46.99	54.00	-7.01	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	10400.00	50.80	30.55	5.77	24.66	50.68	74.00	-23.32	PK
V	10400.00	43.79	30.55	5.77	24.66	43.67	54.00	-10.33	AV
V	15600.00	50.01	30.33	6.32	24.55	50.55	74.00	-23.45	PK
V	15600.00	43.38	30.33	6.32	24.55	43.92	54.00	-10.08	AV
V	20800.00	54.28	30.85	7.45	24.69	55.57	74.00	-18.43	PK
V	20800.00	43.82	30.85	7.45	24.69	45.11	54.00	-8.89	AV
V	26000.00	54.61	31.02	8.99	25.57	58.15	74.00	-15.85	PK
V	26000.00	43.79	31.02	8.99	25.57	47.33	54.00	-6.67	AV
H	10400.00	53.49	30.55	5.77	24.66	53.37	74.00	-20.63	PK
H	10400.00	43.27	30.55	5.77	24.66	43.15	54.00	-10.85	AV
H	15600.00	50.77	30.33	6.32	24.55	51.31	74.00	-22.69	PK
H	15600.00	43.21	30.33	6.32	24.55	43.75	54.00	-10.25	AV
H	41600.00	50.43	30.85	7.45	24.69	51.72	74.00	-22.28	PK
H	41600.00	43.74	30.85	7.45	24.69	45.03	54.00	-8.97	AV
H	26000.00	50.61	31.02	8.99	25.57	54.15	74.00	-19.85	PK
H	26000.00	43.45	31.02	8.99	25.57	46.99	54.00	-7.01	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	10480.00	54.80	30.55	5.77	24.66	54.68	74.00	-19.32	PK
V	10480.00	43.54	30.55	5.77	24.66	43.42	54.00	-10.58	AV
V	15720.00	50.34	30.33	6.32	24.55	50.88	74.00	-23.12	PK
V	15720.00	43.22	30.33	6.32	24.55	43.76	54.00	-10.24	AV
V	20960.00	52.32	30.85	7.45	24.69	53.61	74.00	-20.39	PK
V	20960.00	43.04	30.85	7.45	24.69	44.33	54.00	-9.67	AV
V	26200.00	53.85	31.02	8.99	25.57	57.39	74.00	-16.61	PK
V	26200.00	43.77	31.02	8.99	25.57	47.31	54.00	-6.69	AV
H	10480.00	52.24	30.55	5.77	24.66	52.12	74.00	-21.88	PK
H	10480.00	43.89	30.55	5.77	24.66	43.77	54.00	-10.23	AV
H	15720.00	51.76	30.33	6.32	24.55	52.30	74.00	-21.70	PK
H	15720.00	43.83	30.33	6.32	24.55	44.37	54.00	-9.63	AV
H	41920.00	54.79	30.85	7.45	24.69	56.08	74.00	-17.92	PK
H	41920.00	43.01	30.85	7.45	24.69	44.30	54.00	-9.70	AV
H	26200.00	50.69	31.02	8.99	25.57	54.23	74.00	-19.77	PK
H	26200.00	43.39	31.02	8.99	25.57	46.93	54.00	-7.07	AV

802.11n20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel:5180MHz									
V	10360.00	50.92	30.55	5.77	24.66	50.80	74.00	-23.20	PK
V	10360.00	43.19	30.55	5.77	24.66	43.07	54.00	-10.93	AV
V	15540.00	52.14	30.33	6.32	24.55	52.68	74.00	-21.32	PK
V	15540.00	43.63	30.33	6.32	24.55	44.17	54.00	-9.83	AV
V	20720.00	52.20	30.85	7.45	24.69	53.49	74.00	-20.51	PK
V	20720.00	43.88	30.85	7.45	24.69	45.17	54.00	-8.83	AV
V	25900.00	50.17	31.02	8.99	25.57	53.71	74.00	-20.29	PK
V	25900.00	43.22	31.02	8.99	25.57	46.76	54.00	-7.24	AV
H	10360.00	52.28	30.55	5.77	24.66	52.16	74.00	-21.84	PK
H	10360.00	43.71	30.55	5.77	24.66	43.59	54.00	-10.41	AV
H	15540.00	54.91	30.33	6.32	24.55	55.45	74.00	-18.55	PK
H	15540.00	43.79	30.33	6.32	24.55	44.33	54.00	-9.67	AV
H	41440.00	50.89	30.85	7.45	24.69	52.18	74.00	-21.82	PK
H	41440.00	43.57	30.85	7.45	24.69	44.86	54.00	-9.14	AV
H	25900.00	50.57	31.02	8.99	25.57	54.11	74.00	-19.89	PK
H	25900.00	43.67	31.02	8.99	25.57	47.21	54.00	-6.79	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Middle Channel:5200MHz									
V	10400.00	51.56	30.55	5.77	24.66	51.44	74.00	-22.56	PK
V	10400.00	43.45	30.55	5.77	24.66	43.33	54.00	-10.67	AV
V	15600.00	50.01	30.33	6.32	24.55	50.55	74.00	-23.45	PK
V	15600.00	43.25	30.33	6.32	24.55	43.79	54.00	-10.21	AV
V	20800.00	51.00	30.85	7.45	24.69	52.29	74.00	-21.71	PK
V	20800.00	43.34	30.85	7.45	24.69	44.63	54.00	-9.37	AV
V	26000.00	52.05	31.02	8.99	25.57	55.59	74.00	-18.41	PK
V	26000.00	43.30	31.02	8.99	25.57	46.84	54.00	-7.16	AV
H	10400.00	52.33	30.55	5.77	24.66	52.21	74.00	-21.79	PK
H	10400.00	43.65	30.55	5.77	24.66	43.53	54.00	-10.47	AV
H	15600.00	52.96	30.33	6.32	24.55	53.50	74.00	-20.50	PK
H	15600.00	43.06	30.33	6.32	24.55	43.60	54.00	-10.40	AV
H	41600.00	52.21	30.85	7.45	24.69	53.50	74.00	-20.50	PK
H	41600.00	43.58	30.85	7.45	24.69	44.87	54.00	-9.13	AV
H	26000.00	52.53	31.02	8.99	25.57	56.07	74.00	-17.93	PK
H	26000.00	43.47	31.02	8.99	25.57	47.01	54.00	-6.99	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	10480.00	52.20	30.55	5.77	24.66	52.08	74.00	-21.92	PK
V	10480.00	43.53	30.55	5.77	24.66	43.41	54.00	-10.59	AV
V	15720.00	52.77	30.33	6.32	24.55	53.31	74.00	-20.69	PK
V	15720.00	43.51	30.33	6.32	24.55	44.05	54.00	-9.95	AV
V	20960.00	54.51	30.85	7.45	24.69	55.80	74.00	-18.20	PK
V	20960.00	43.19	30.85	7.45	24.69	44.48	54.00	-9.52	AV
V	26200.00	54.97	31.02	8.99	25.57	58.51	74.00	-15.49	PK
V	26200.00	43.93	31.02	8.99	25.57	47.47	54.00	-6.53	AV
H	10480.00	52.86	30.55	5.77	24.66	52.74	74.00	-21.26	PK
H	10480.00	43.33	30.55	5.77	24.66	43.21	54.00	-10.79	AV
H	15720.00	52.13	30.33	6.32	24.55	52.67	74.00	-21.33	PK
H	15720.00	43.25	30.33	6.32	24.55	43.79	54.00	-10.21	AV
H	41920.00	54.12	30.85	7.45	24.69	55.41	74.00	-18.59	PK
H	41920.00	43.61	30.85	7.45	24.69	44.90	54.00	-9.10	AV
H	26200.00	52.01	31.02	8.99	25.57	55.55	74.00	-18.45	PK
H	26200.00	43.86	31.02	8.99	25.57	47.40	54.00	-6.60	AV

802.11n40

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:5190MHz									
V	10380.00	54.07	30.55	5.77	24.66	53.95	74.00	-20.05	PK
V	10380.00	43.77	30.55	5.77	24.66	43.65	54.00	-10.35	AV
V	15570.00	51.42	30.33	6.32	24.55	51.96	74.00	-22.04	PK
V	15570.00	43.98	30.33	6.32	24.55	44.52	54.00	-9.48	AV
V	20760.00	50.02	30.85	7.45	24.69	51.31	74.00	-22.69	PK
V	20760.00	43.47	30.85	7.45	24.69	44.76	54.00	-9.24	AV
V	25950.00	52.28	31.02	8.99	25.57	55.82	74.00	-18.18	PK
V	25950.00	43.56	31.02	8.99	25.57	47.10	54.00	-6.90	AV
H	10380.00	52.90	30.55	5.77	24.66	52.78	74.00	-21.22	PK
H	10380.00	43.74	30.55	5.77	24.66	43.62	54.00	-10.38	AV
H	15570.00	50.56	30.33	6.32	24.55	51.10	74.00	-22.90	PK
H	15570.00	43.08	30.33	6.32	24.55	43.62	54.00	-10.38	AV
H	41520.00	50.70	30.85	7.45	24.69	51.99	74.00	-22.01	PK
H	41520.00	43.46	30.85	7.45	24.69	44.75	54.00	-9.25	AV
H	25950.00	51.67	31.02	8.99	25.57	55.21	74.00	-18.79	PK
H	25950.00	43.03	31.02	8.99	25.57	46.57	54.00	-7.43	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:5230MHz									
V	10460.00	52.60	30.55	5.77	24.66	52.48	74.00	-21.52	PK
V	10460.00	43.96	30.55	5.77	24.66	43.84	54.00	-10.16	AV
V	15690.00	54.59	30.33	6.32	24.55	55.13	74.00	-18.87	PK
V	15690.00	43.37	30.33	6.32	24.55	43.91	54.00	-10.09	AV
V	20920.00	50.63	30.85	7.45	24.69	51.92	74.00	-22.08	PK
V	20920.00	43.07	30.85	7.45	24.69	44.36	54.00	-9.64	AV
V	26150.00	50.05	31.02	8.99	25.57	53.59	74.00	-20.41	PK
V	26150.00	43.94	31.02	8.99	25.57	47.48	54.00	-6.52	AV
H	10460.00	52.26	30.55	5.77	24.66	52.14	74.00	-21.86	PK
H	10460.00	43.58	30.55	5.77	24.66	43.46	54.00	-10.54	AV
H	15690.00	51.54	30.33	6.32	24.55	52.08	74.00	-21.92	PK
H	15690.00	43.65	30.33	6.32	24.55	44.19	54.00	-9.81	AV
H	41840.00	54.62	30.85	7.45	24.69	55.91	74.00	-18.09	PK
H	41840.00	43.46	30.85	7.45	24.69	44.75	54.00	-9.25	AV
H	26150.00	51.14	31.02	8.99	25.57	54.68	74.00	-19.32	PK
H	26150.00	43.36	31.02	8.99	25.57	46.90	54.00	-7.10	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)

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.

5.2 TEST PROCEDURE

Notwithstanding that some regulatory requirements refer to peak power spectral density (PPSD), in some cases the intent is to measure the maximum value of the time average of the power spectral density during a period of continuous transmission. The procedure for this method is as follows:

a) Create an average power spectrum for the EUT operating mode being tested by following the instructions in 12.3.2 for measuring maximum conducted output power using a spectrum analyzer or EMI receiver; that is, select the appropriate test method (SA-1, SA-2, SA-3, or their respective alternatives) and apply it up to, but not including, the step labeled, “Compute power….” (This procedure is required even if the maximum conducted output power measurement was performed using the power meter method PM.)

b) Use the peak search function on the instrument to find the peak of the spectrum.

c) Make the following adjustments to the peak value of the spectrum, if applicable:

1) If method SA-2 or SA-2A was used, then add [10 log (1 / D)], where D is the duty cycle, to the peak of the spectrum.

2) If method SA-3A was used and the linear mode was used in step h) of 12.3.2.7, add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.

d) The result is the PPSD.

e) The procedure in item a) through item c) requires the use of 1 MHz resolution bandwidth to satisfy the 1 MHz measurement bandwidth specified by some regulatory authorities.95 This requirement also permits use of resolution bandwidths less than 1 MHz “provided that the measured power is integrated to show the total power over the measurement bandwidth” (i.e., 1 MHz). If measurements are performed using a reduced resolution bandwidth and integrated over 1 MHz bandwidth, the following adjustments to the procedures apply:

1) Set RBW ≥ 1 / T, where T is defined in 12.2 a).

2) Set VBW ≥ [3 × RBW].

3) Care shall be taken such that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

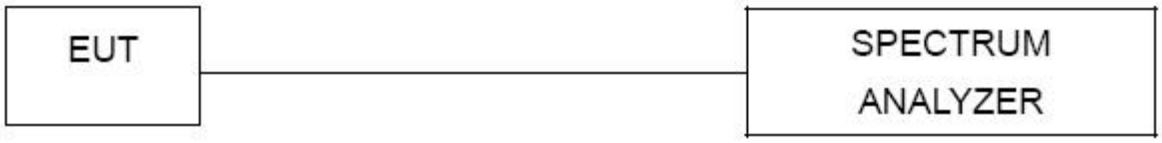
5.3 DEVIATION FROM STANDARD

No deviation.

5.3 TEST METHOD

KDB789033 D02 GENERAL U-NII TEST PROCEDURES NEW RULES V02R01, SECTION F

5.4 TEST SETUP



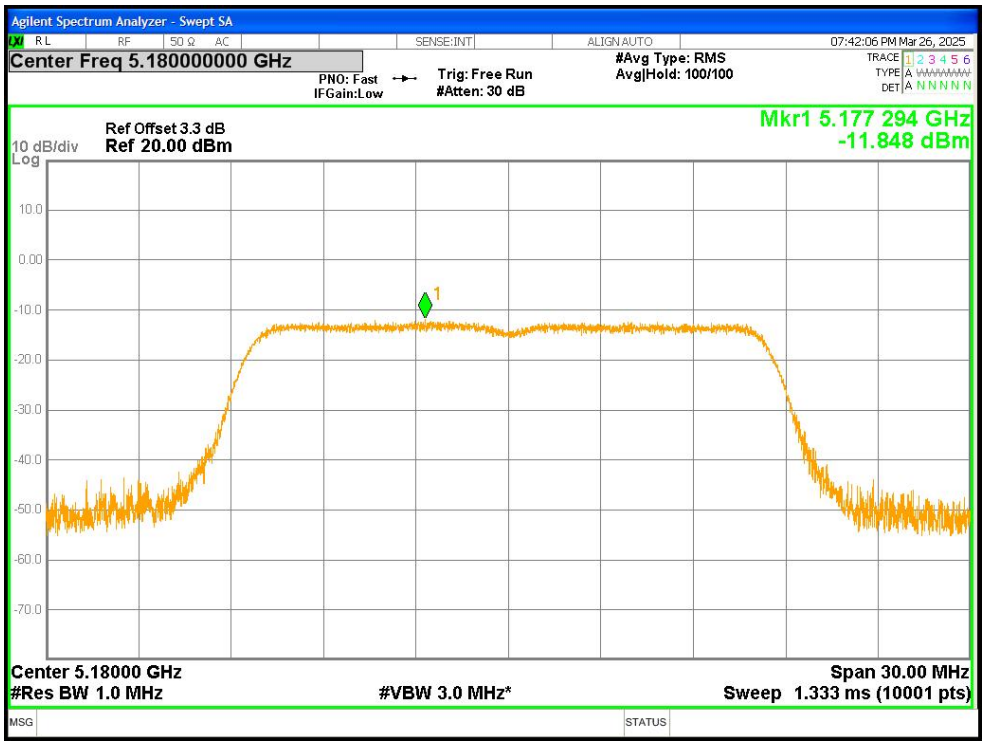
5.5 EUT OPERATION CONDITIONS

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.

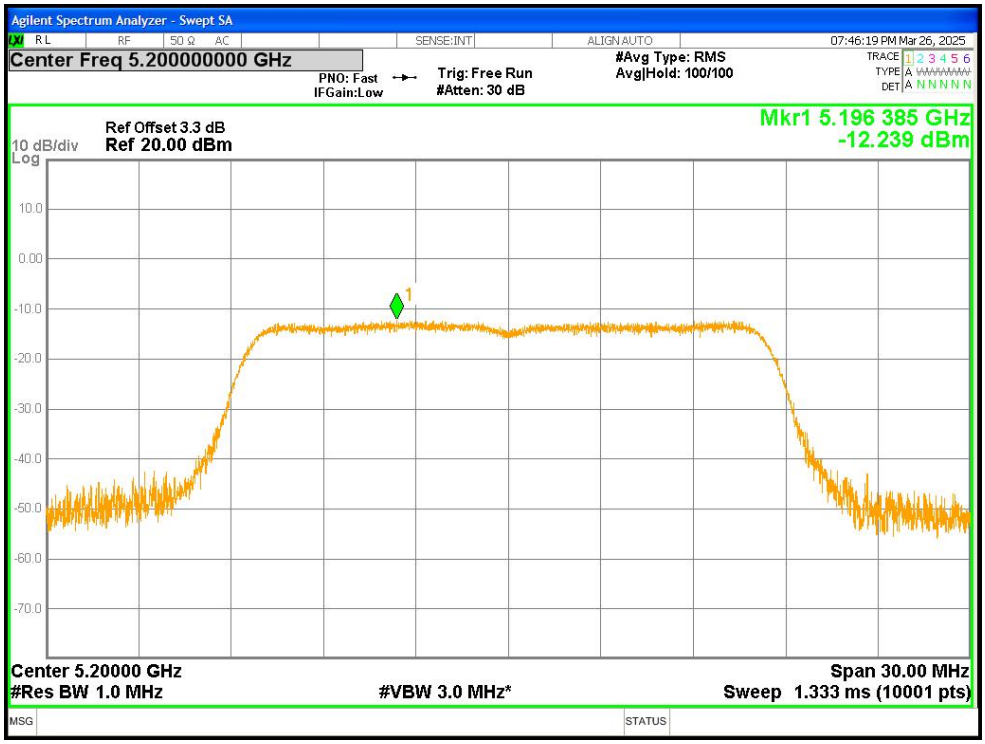
5.7 TEST RESULTS

Mode	Frequency (MHz)	Conducted PSD (dBm/MHz)	Limit (dBm/MHz) <=	Verdict
a	5180	-11.85	11	Pass
a	5200	-12.24	11	Pass
a	5240	-11.92	11	Pass
n20	5180	-12.58	11	Pass
n20	5200	-12.5	11	Pass
n20	5240	-12.36	11	Pass
n40	5190	-15.84	11	Pass
n40	5230	-15.83	11	Pass

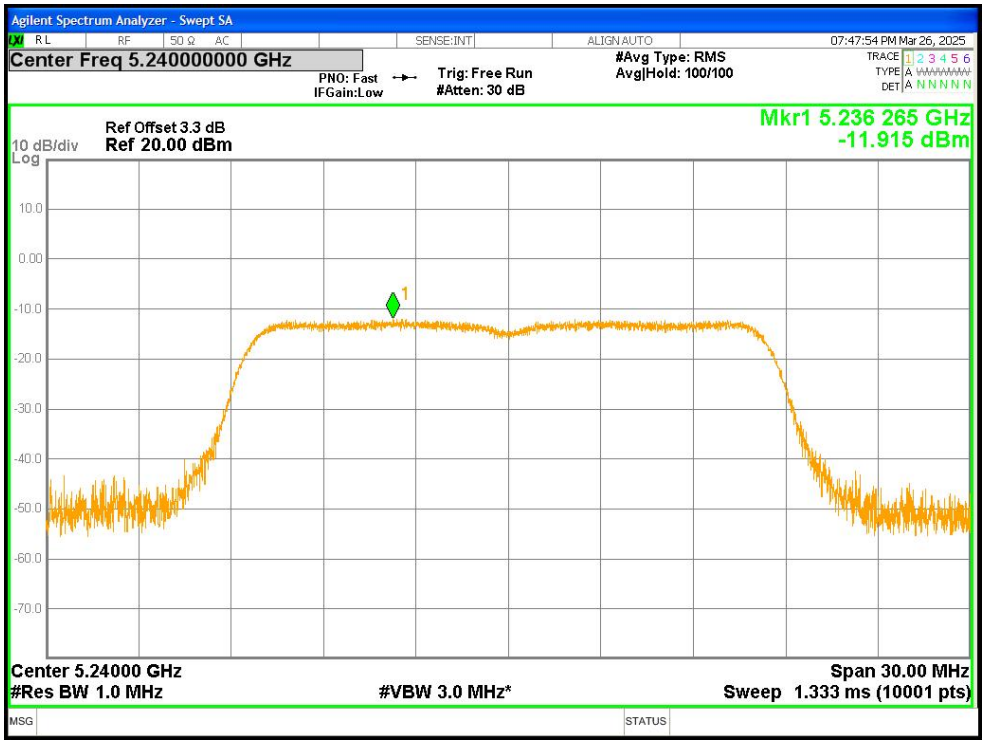
Note: This test has increased duty cycle Factor.



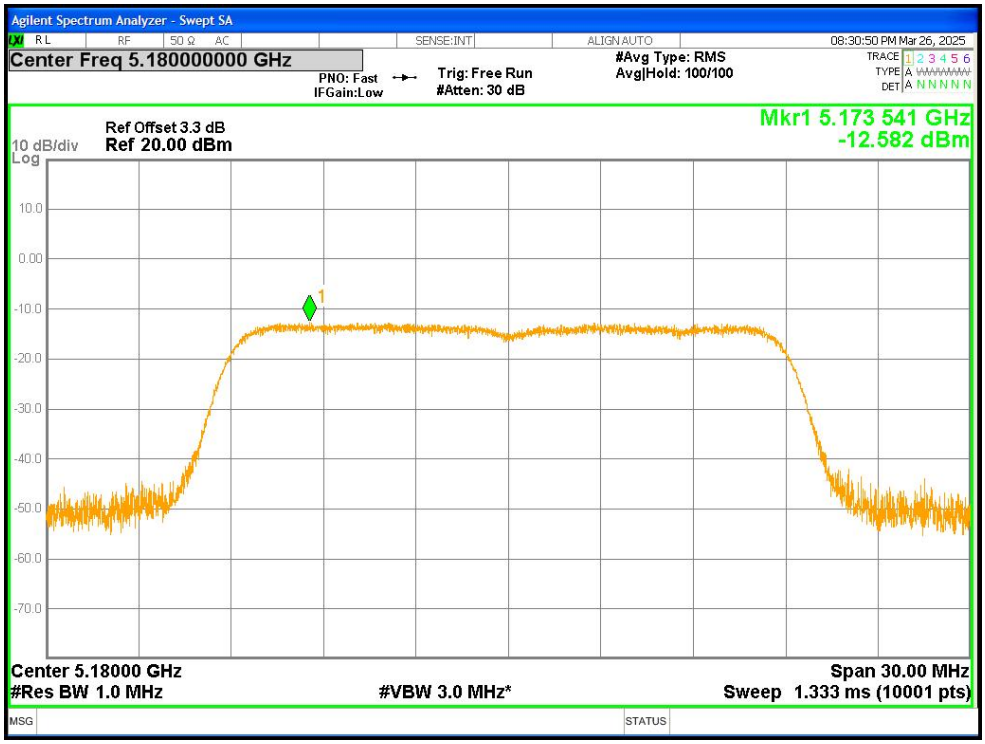
PSD NVNT a 5180MHz Ant1



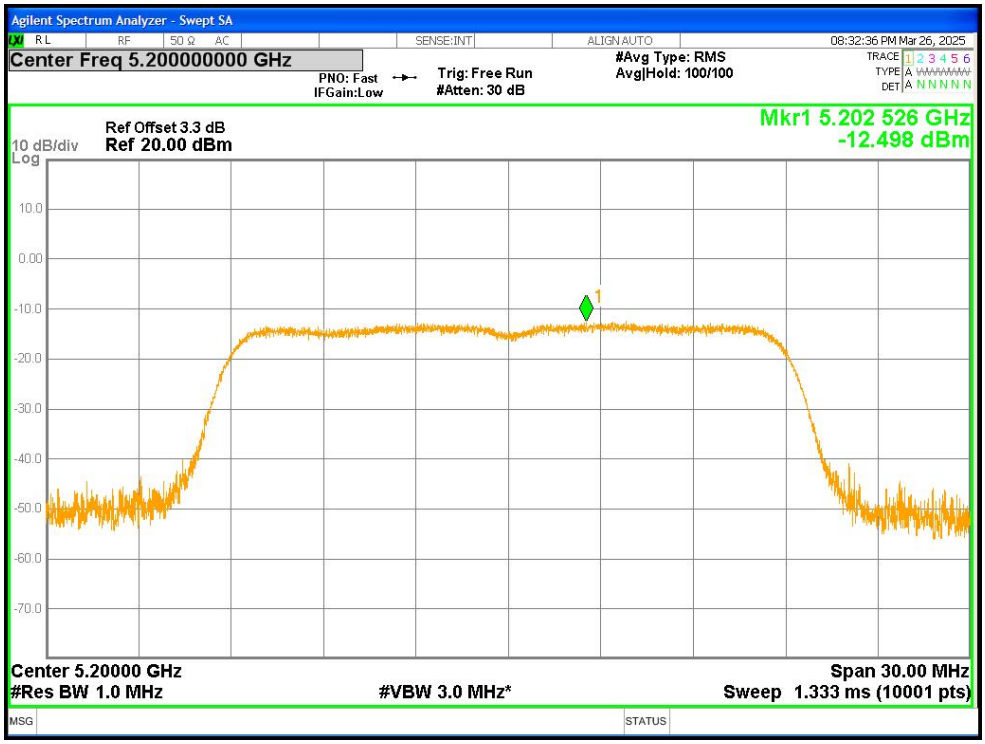
PSD NVNT a 5200MHz Ant1



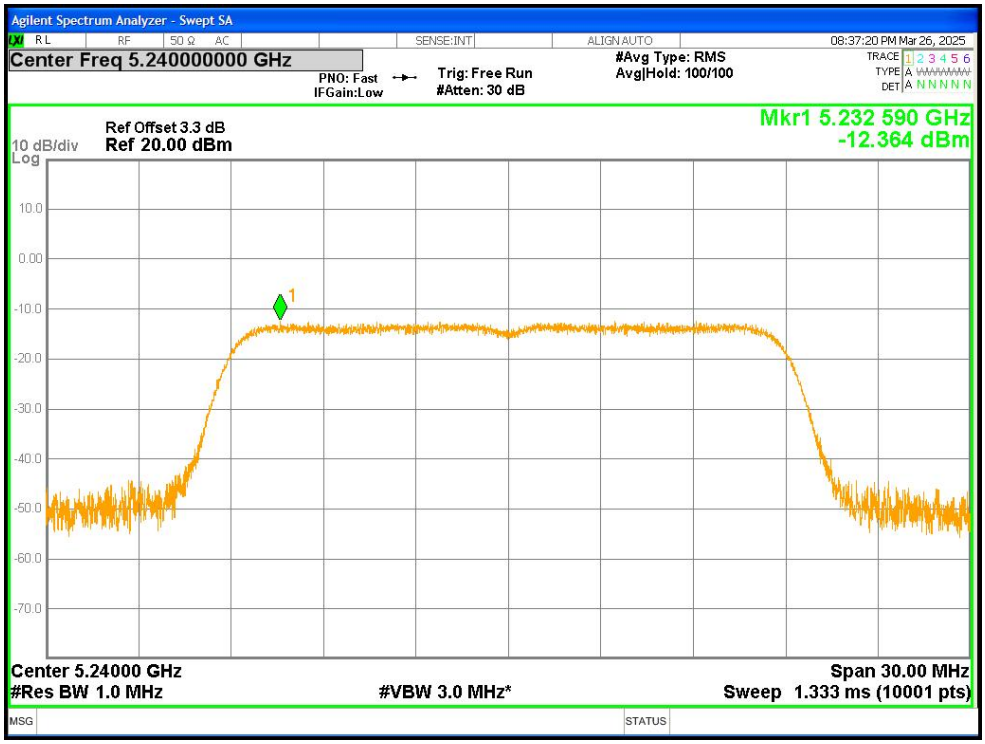
PSD NVNT a 5240MHz Ant1



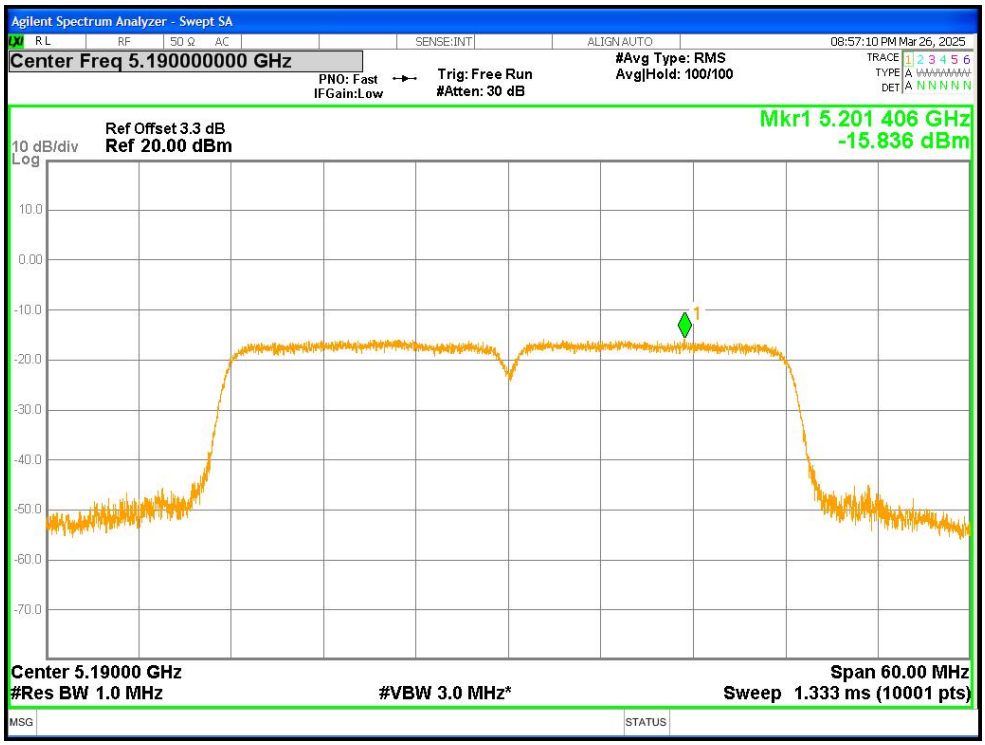
PSD NVNT n20 5180MHz Ant1



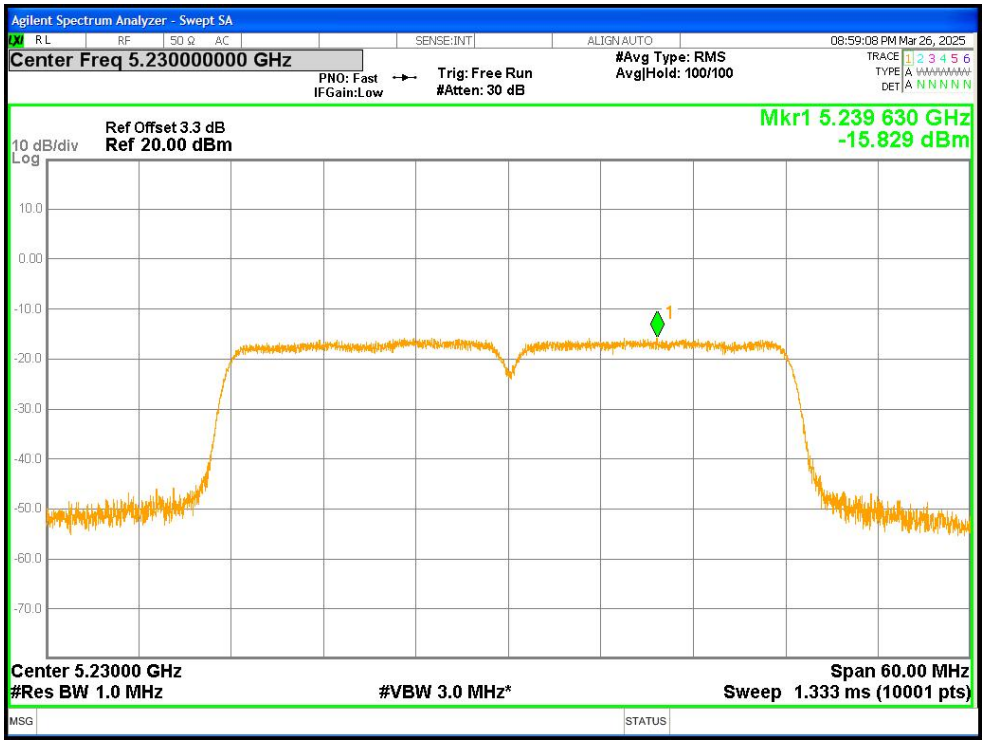
PSD NVNT n20 5200MHz Ant1



PSD NVNT n20 5240MHz Ant1



PSD NVNT n40 5190MHz Ant1



PSD NVNT n40 5230MHz Ant1

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.

6.2 TEST PROCEDURE

a) Set RBW = Approximately 1% of the bandwidth.

b) Set the VBW > RBW.

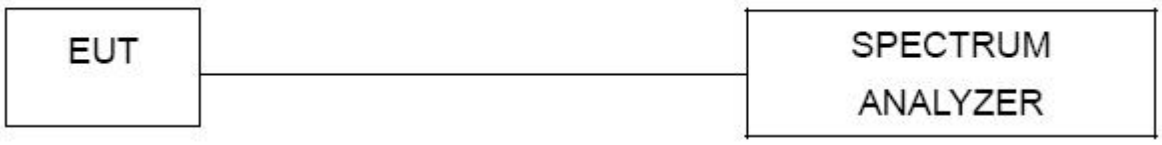
c) Detector = Peak.

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.

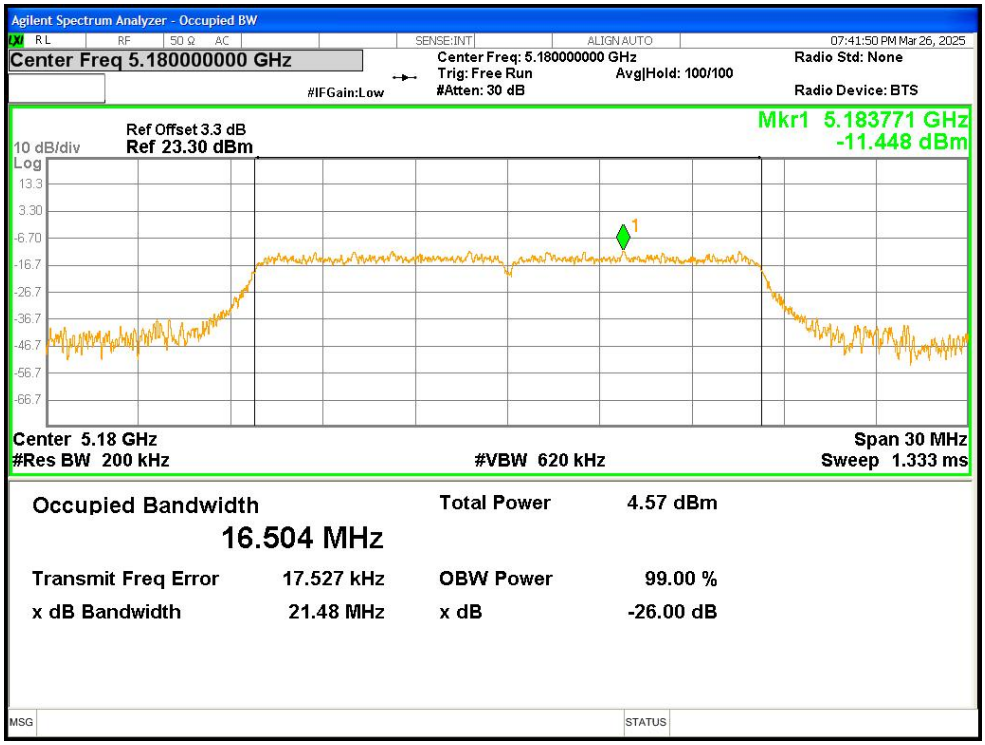


6.3 EUT OPERATION CONDITIONS

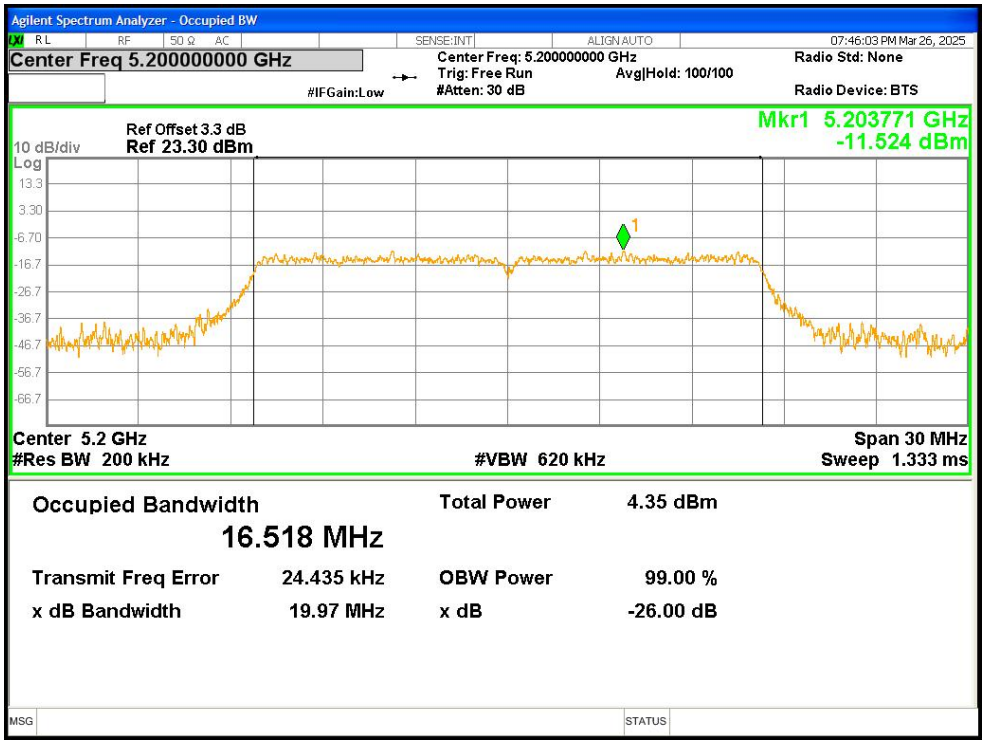
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

6.4 TEST RESULTS

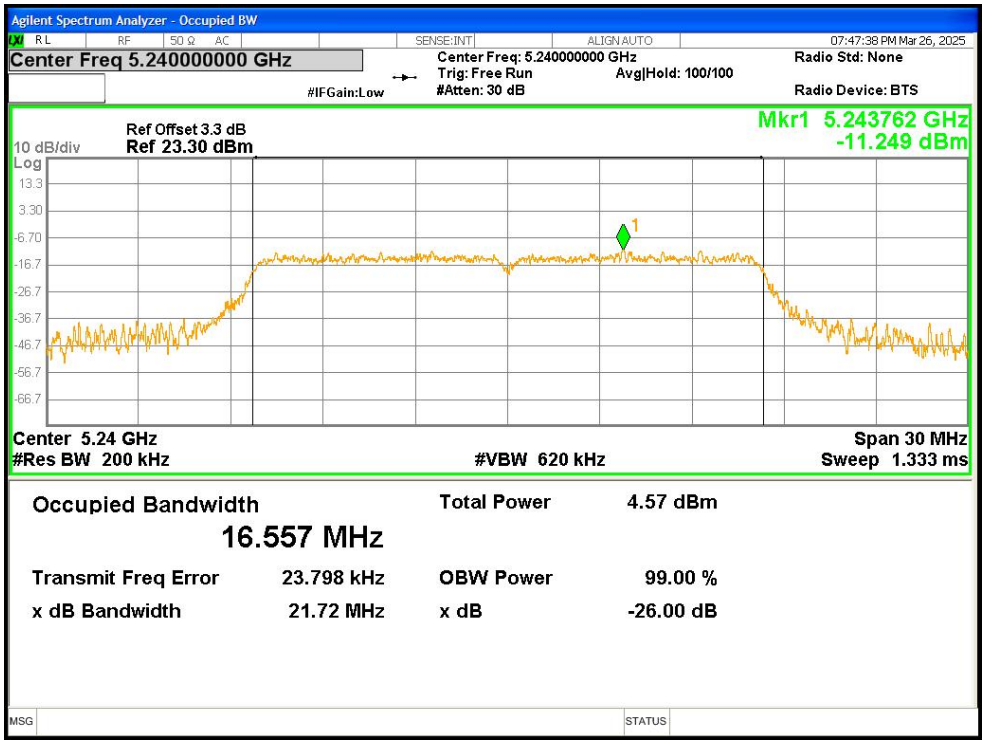
Mode	Frequency (MHz)	99% OBW (MHz)	-26 dB Bandwidth (MHz)
a	5180	16.504	21.48
a	5200	16.518	19.97
a	5240	16.557	21.72
n20	5180	17.569	22.81
n20	5200	17.576	25.78
n20	5240	17.571	21.64
n40	5190	36.104	46.66
n40	5230	36.151	51.05



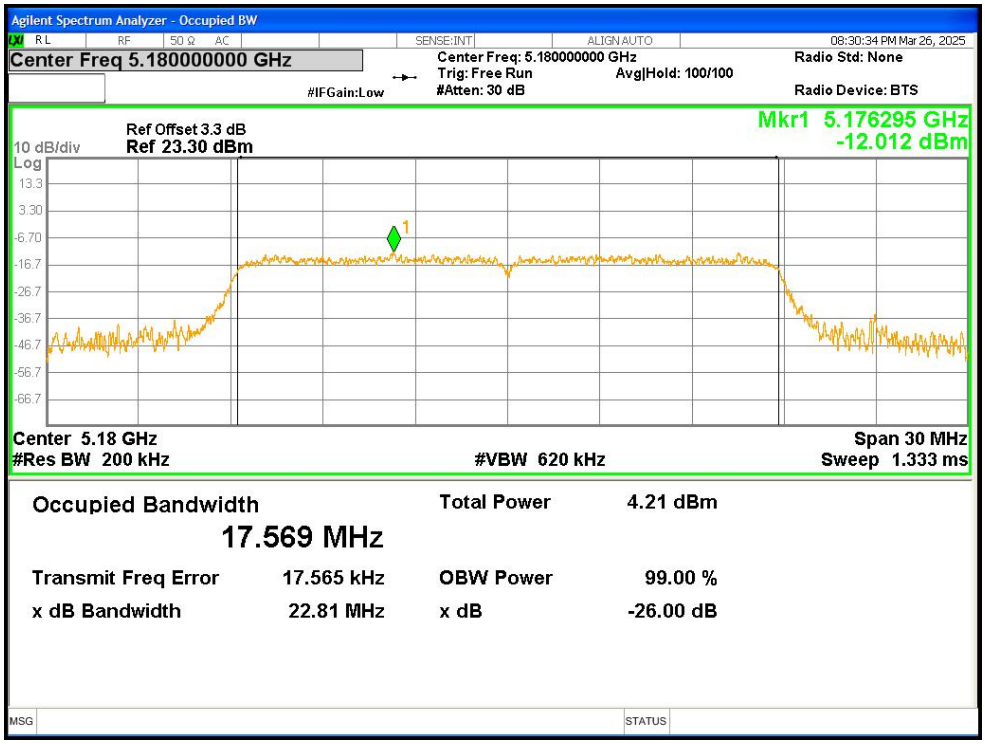
OBW NVNT a 5180MHz Ant1



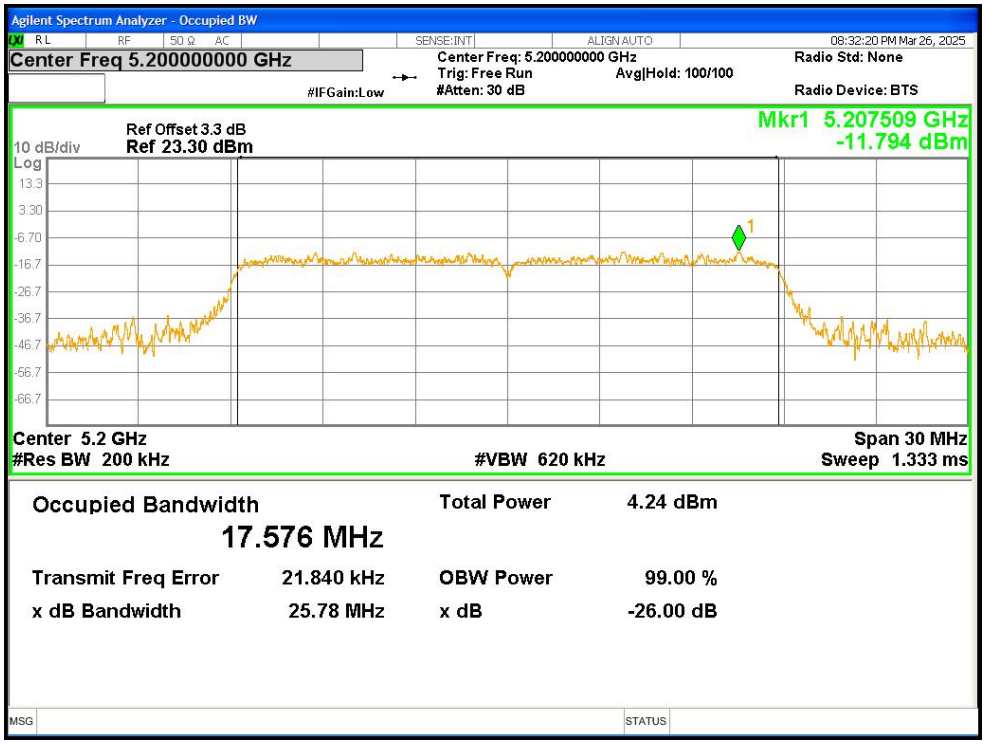
OBW NVNT a 5200MHz Ant1



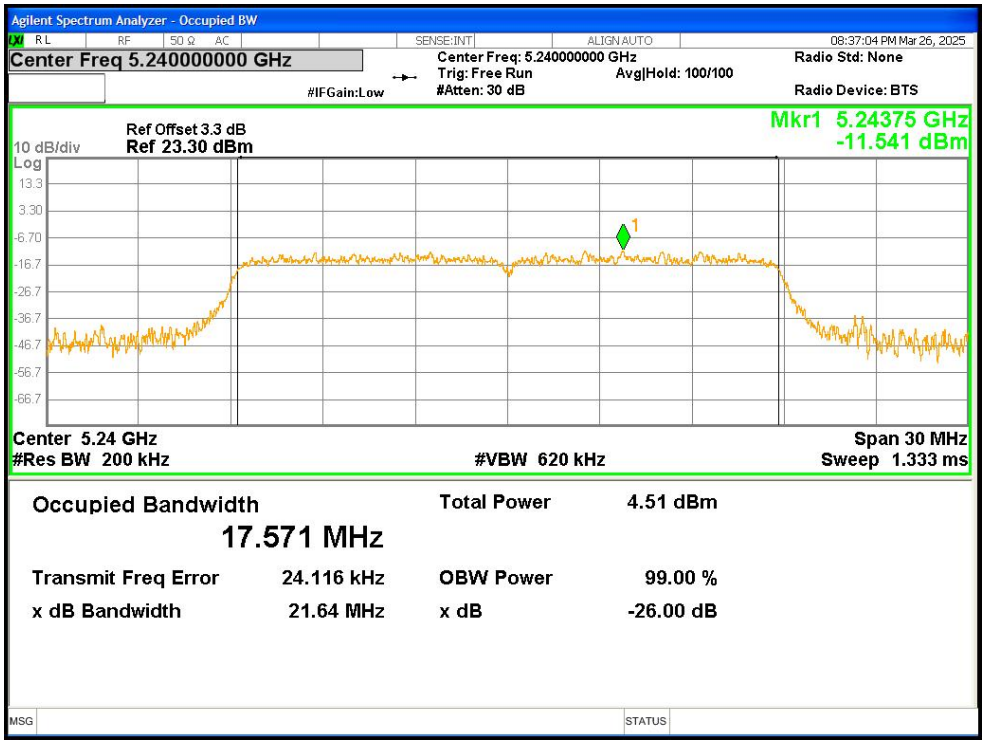
OBW NVNT a 5240MHz Ant1



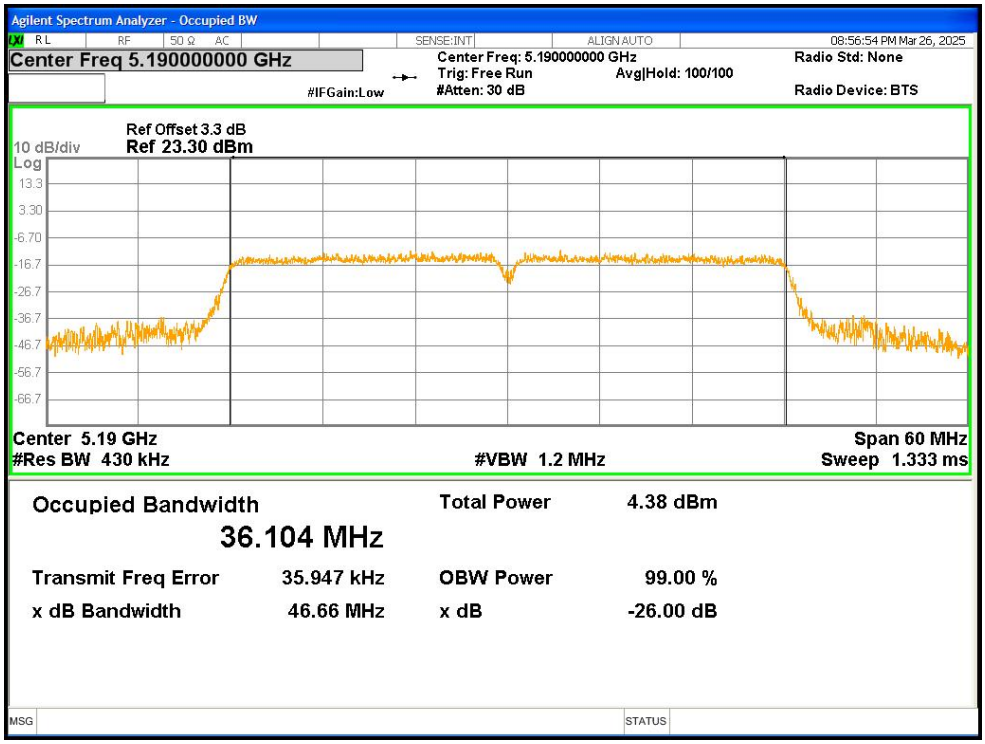
OBW NVNT n20 5180MHz Ant1



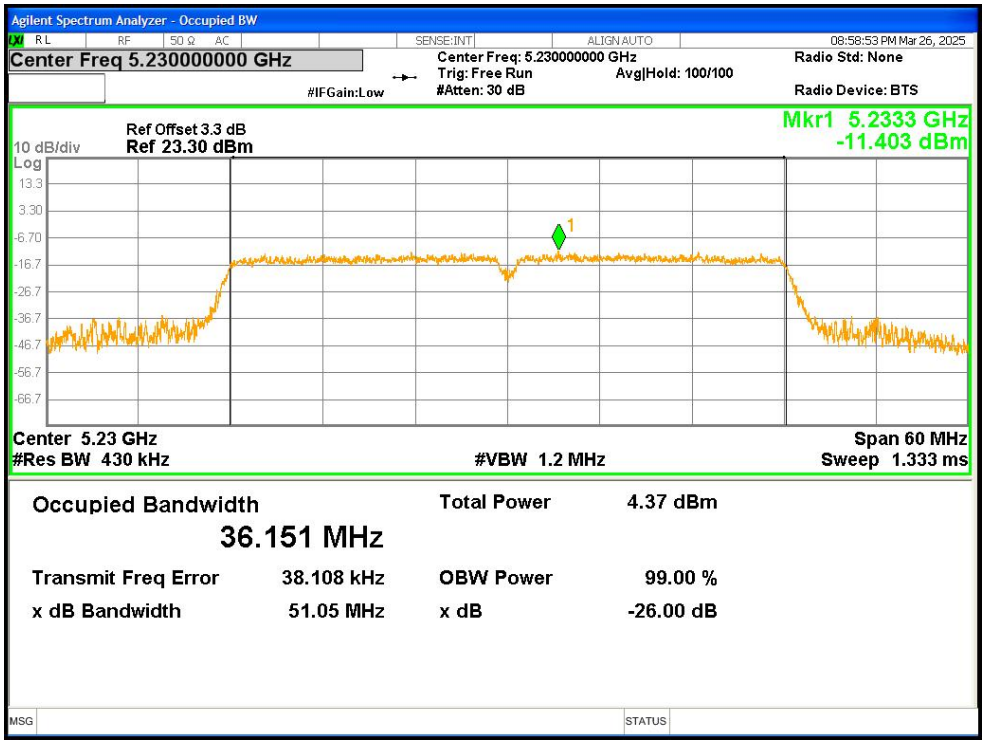
OBW NVNT n20 5200MHz Ant1



OBW NVNT n20 5240MHz Ant1



OBW NVNT n40 5190MHz Ant1



OBW NVNT n40 5230MHz Ant1

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

7.2 TEST PROCEDURE

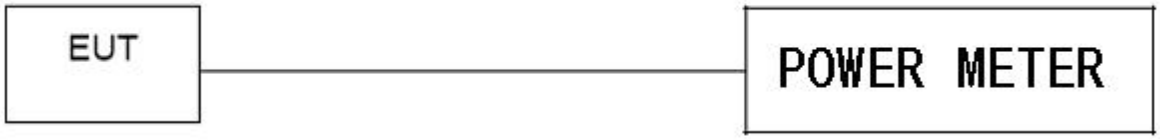
The EUT was directly connected to the Power meter

1. The EUT maintains a continuous transmission state
2. The power meter already includes the calculation of duty cycle

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

Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
a	5180	-1.56	24	Pass
a	5200	-1.69	24	Pass
a	5240	-1.56	24	Pass
n20	5180	-1.80	24	Pass
n20	5200	-1.93	24	Pass
n20	5240	-1.61	24	Pass
n40	5190	-2.10	24	Pass
n40	5230	-2.12	24	Pass

Note: This test has increased duty cycle Factor.

8.OUT OF BAND EMISSIONS

8.1 APPLICABLE STANDARD

According to FCC §15.407(b) FCC §15.407

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.

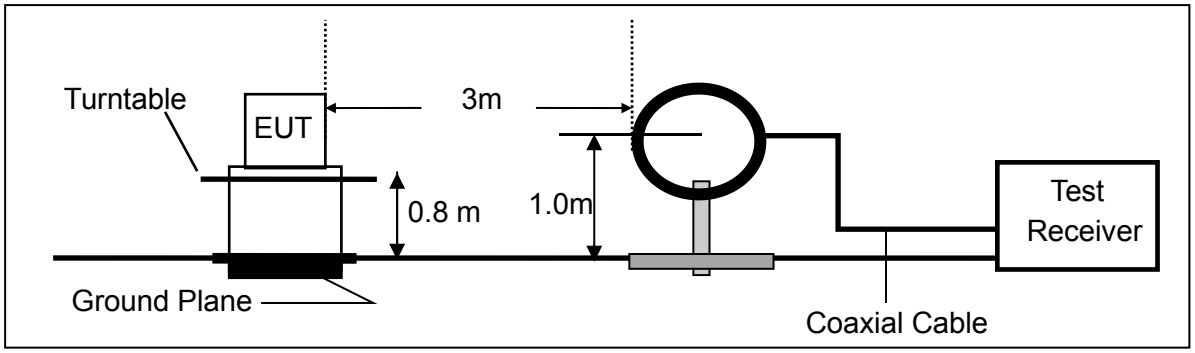
8.2 TEST PROCEDURE

Refer to section 4.2.5

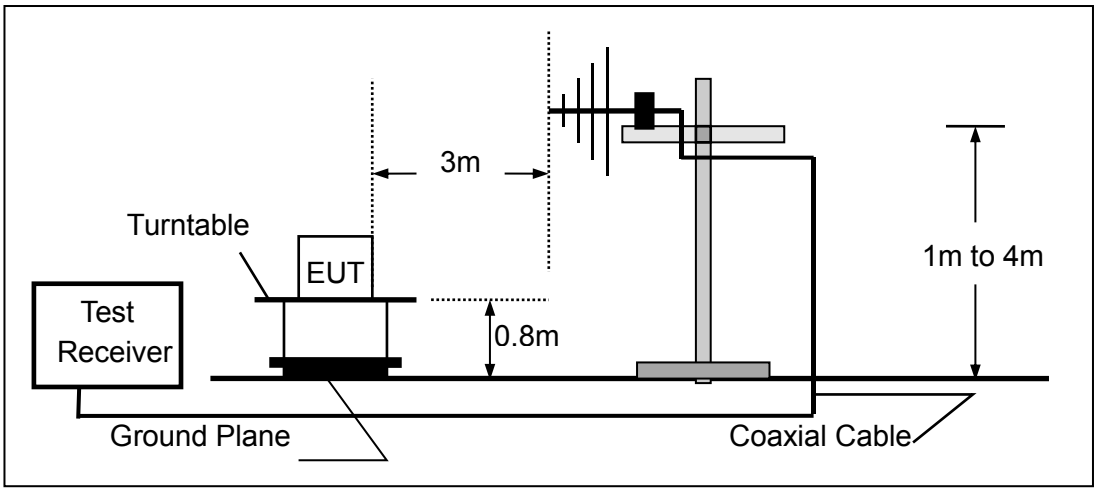
8.3 DEVIATION FROM STANDARD

No deviation.

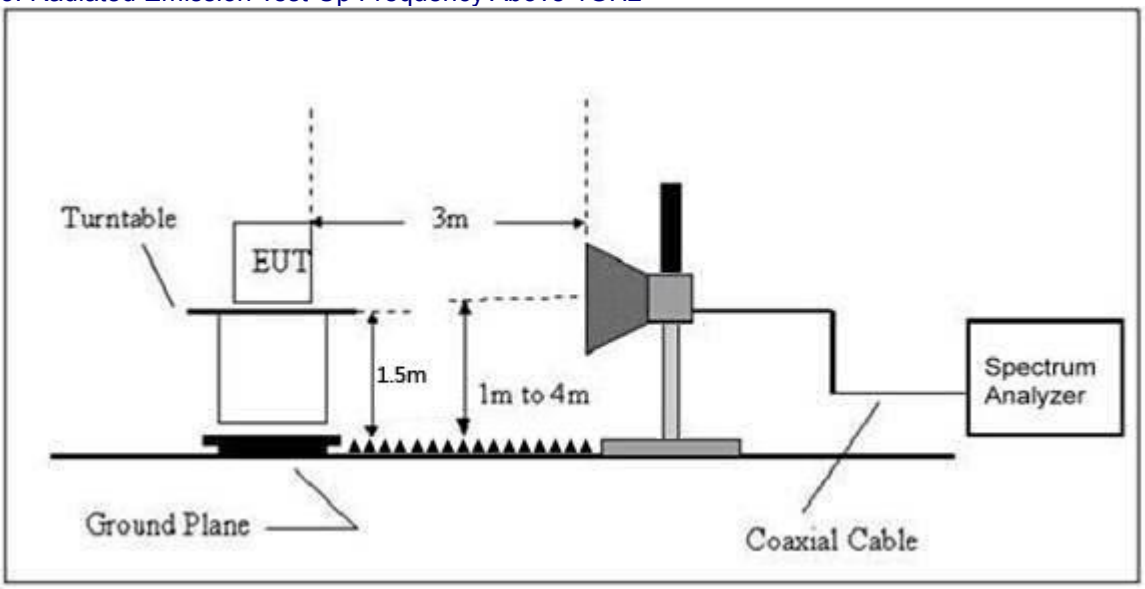
8.4 TEST SETUP



2.For radiated emissions from 30MHz to 1000MHz



3. Radiated Emission Test-Up Frequency Above 1GHz

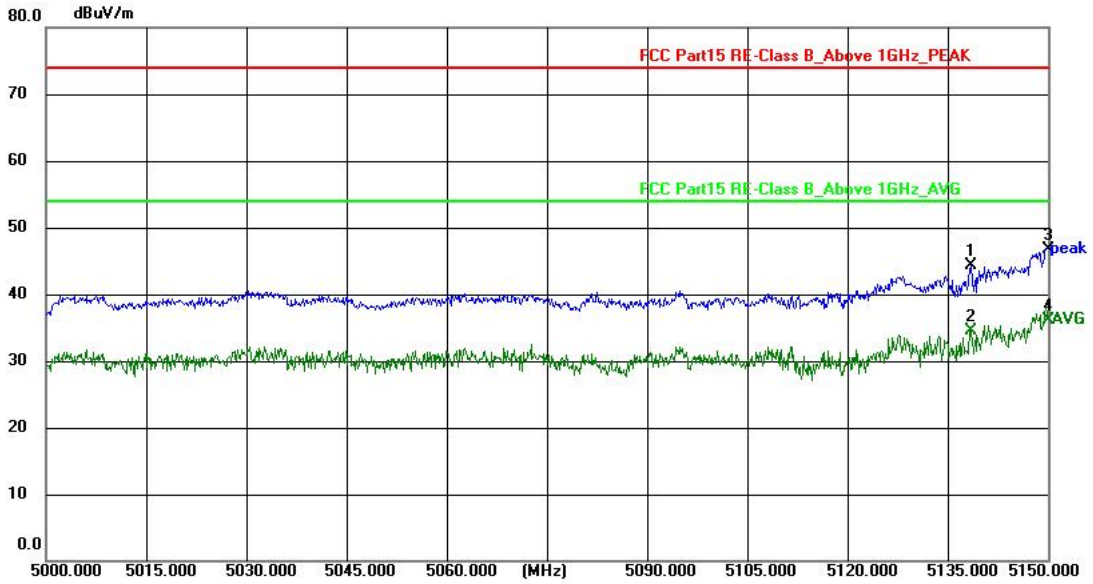


8.5 EUT OPERATION CONDITIONS

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.

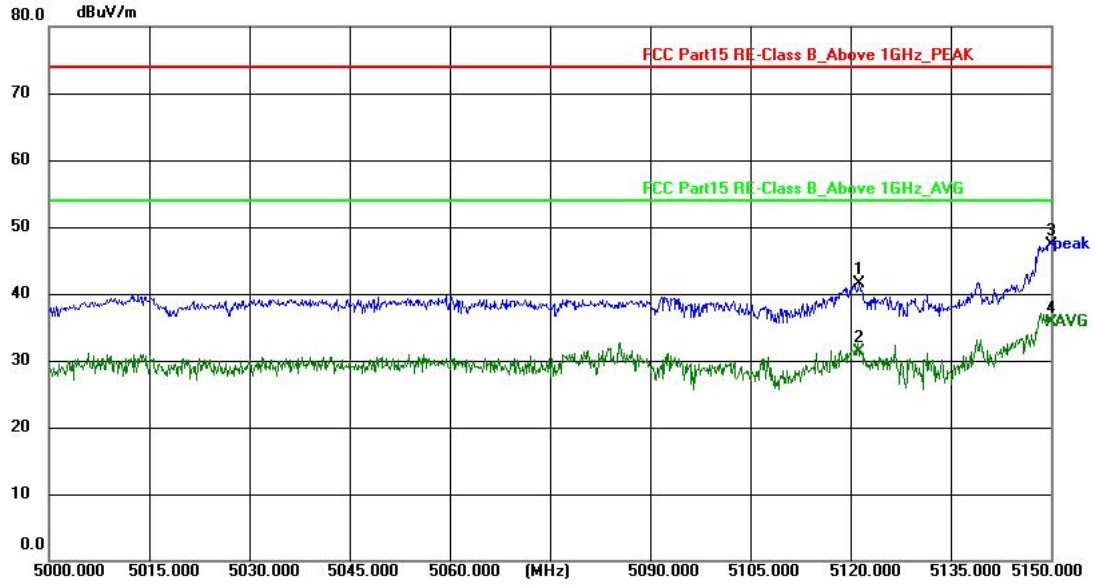
8.6 TEST RESULTS

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Horizontal
Test Voltage:	DC 3.8V	Test channel	802.11a 5180MHz(Worst case)



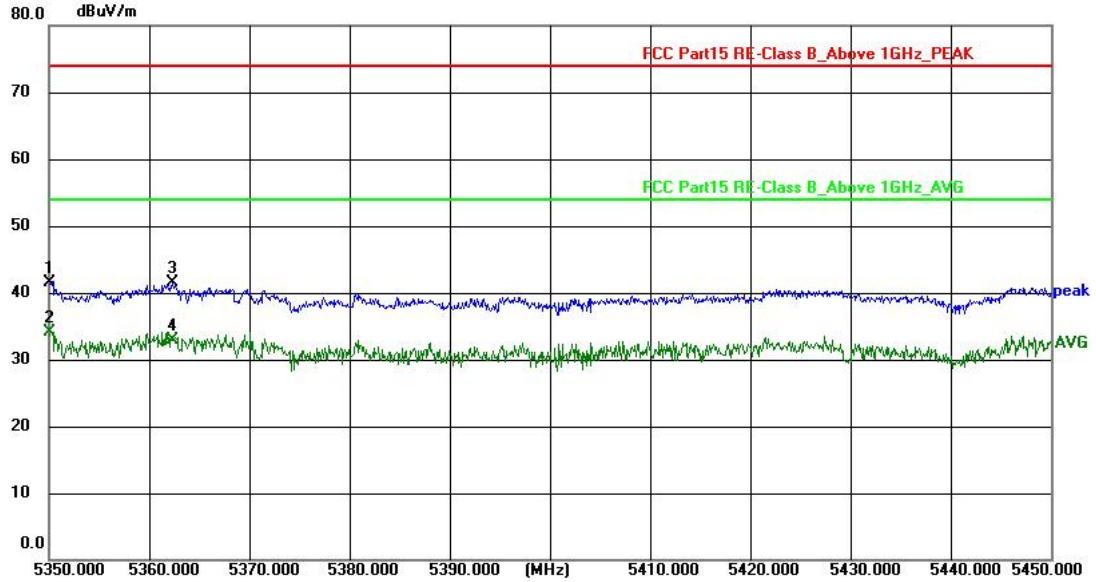
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	5138.450	41.74	2.65	44.39	74.00	-29.61	peak
2	5138.450	31.93	2.65	34.58	54.00	-19.42	AVG
3	5150.000	44.06	2.67	46.73	74.00	-27.27	peak
4 *	5150.000	33.49	2.67	36.16	54.00	-17.84	AVG

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	DC 3.8V	Test channel	802.11a 5180MHz(Worst case)



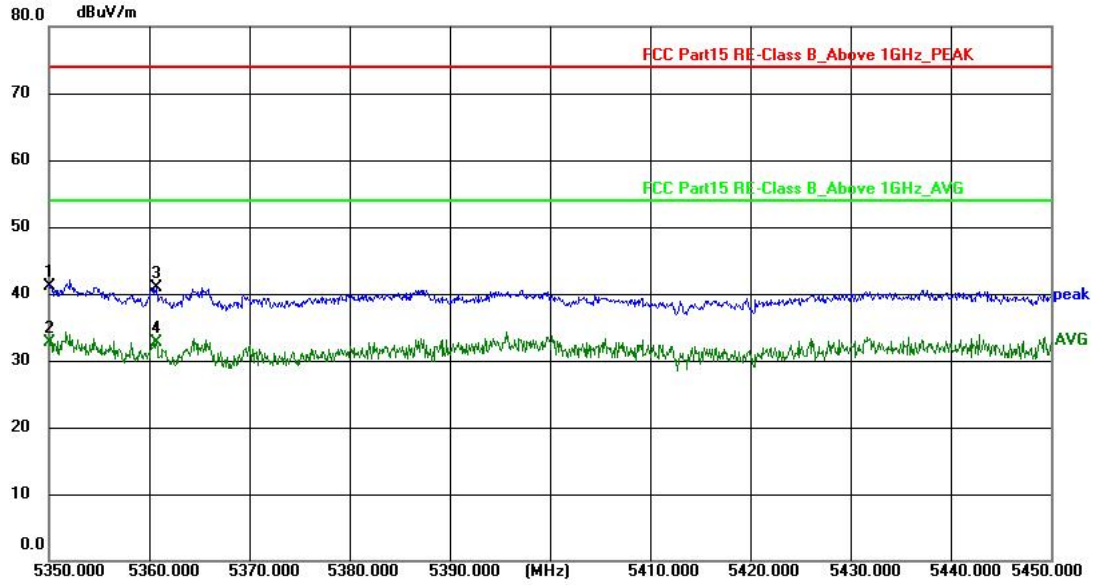
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	5121.350	38.94	2.62	41.56	74.00	-32.44	peak
2	5121.350	28.68	2.62	31.30	54.00	-22.70	AVG
3	5150.000	44.56	2.67	47.23	74.00	-26.77	peak
4 *	5150.000	32.99	2.67	35.66	54.00	-18.34	AVG

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Horizontal
Test Voltage:	DC 3.8V	Test channel	802.11a 5240MHz(Worst case)



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	5350.000	37.79	3.72	41.51	74.00	-32.49	peak
2 *	5350.000	30.45	3.72	34.17	54.00	-19.83	AVG
3	5362.300	37.76	3.74	41.50	74.00	-32.50	peak
4	5362.300	29.19	3.74	32.93	54.00	-21.07	AVG

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	DC 3.8V	Test channel	802.11a 5240MHz(Worst case)



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	5350.000	37.29	3.72	41.01	74.00	-32.99	peak
2 *	5350.000	28.95	3.72	32.67	54.00	-21.33	AVG
3	5360.700	37.17	3.74	40.91	74.00	-33.09	peak
4	5360.700	28.92	3.74	32.66	54.00	-21.34	AVG

10.Frequency Stability Measurement

10.1 LIMIT

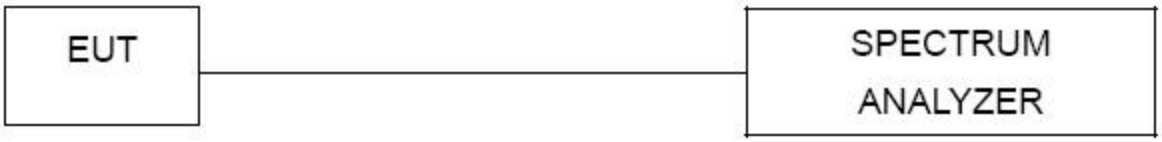
Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

The transmitter center frequency tolerance shall be within the operation band 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 within the operation band (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 :	DC 3.8V
Test Mode :	TX		

Environment Temperature (°C)	Power Supplied (VDC)	Mode	Frequency (MHz)	Measured Frequency (MHz)	Frequency Error (Hz)	Deviation (ppm)
50	3.8	CW	5180	5179.98	20000	3.82
40	3.8	CW	5180	5179.98	20000	3.82
30	3.8	CW	5180	5179.95	50000	9.55
20	4.37	CW	5180	5179.97	30000	5.73
20	3.8	CW	5180	5179.94	60000	11.46
20	4.23	CW	5180	5179.98	20000	3.82
10	3.8	CW	5180	5179.93	70000	13.37
0	3.8	CW	5180	5179.97	30000	5.73
-10	3.8	CW	5180	5179.98	20000	3.82
-20	3.8	CW	5180	5179.99	10000	1.91
-30	3.8	CW	5180	5179.99	10000	1.91

Environment Temperature (°C)	Power Supplied (VDC)	Mode	Frequency (MHz)	Measured Frequency (MHz)	Frequency Error (Hz)	Deviation (ppm)
50	3.8	CW	5200	5199.99	10000	1.91
40	3.8	CW	5200	5199.97	30000	5.73
30	3.8	CW	5200	5199.98	20000	3.82
20	4.37	CW	5200	5179.98	20000	3.82
20	3.8	CW	5200	5199.95	50000	9.55
20	4.23	CW	5200	5199.99	10000	1.91
10	3.8	CW	5200	5199.97	30000	5.73
0	3.8	CW	5200	5199.96	40000	7.64
-10	3.8	CW	5200	5199.97	30000	5.73
-20	3.8	CW	5200	5199.99	10000	1.91
-30	3.8	CW	5200	5199.99	10000	1.91

Environment Temperature (°C)	Power Supplied (VDC)	Mode	Frequency (MHz)	Measured Frequency (MHz)	Frequency Error (Hz)	Deviation (ppm)
50	3.8	CW	5240	5239.98	20000	3.82
40	3.8	CW	5240	5239.98	20000	3.82
30	3.8	CW	5240	5239.97	30000	5.73
20	4.37	CW	5240	5199.99	10000	1.91
20	3.8	CW	5240	5239.95	50000	9.55
20	4.23	CW	5240	5239.97	30000	5.73
10	3.8	CW	5240	5239.95	50000	9.55
0	3.8	CW	5240	5239.97	30000	5.73
-10	3.8	CW	5240	5239.97	30000	5.73
-20	3.8	CW	5240	5239.96	40000	7.64
-30	3.8	CW	5240	5239.99	10000	1.91

Environment Temperature (°C)	Power Supplied (VDC)	Mode	Frequency (MHz)	Measured Frequency (MHz)	Frequency Error (Hz)	Deviation (ppm)
50	3.8	CW	5190	5189.98	20000	3.82
40	3.8	CW	5190	5189.98	20000	3.82
30	3.8	CW	5190	5189.96	40000	7.64
20	4.37	CW	5190	5189.96	40000	7.64
20	3.8	CW	5190	5189.94	60000	11.46
20	4.23	CW	5190	5189.98	20000	3.82
10	3.8	CW	5190	5189.95	50000	9.55
0	3.8	CW	5190	5189.96	40000	7.64
-10	3.8	CW	5190	5189.98	20000	3.82
-20	3.8	CW	5190	5189.98	20000	3.82
-30	3.8	CW	5190	5189.99	10000	1.91

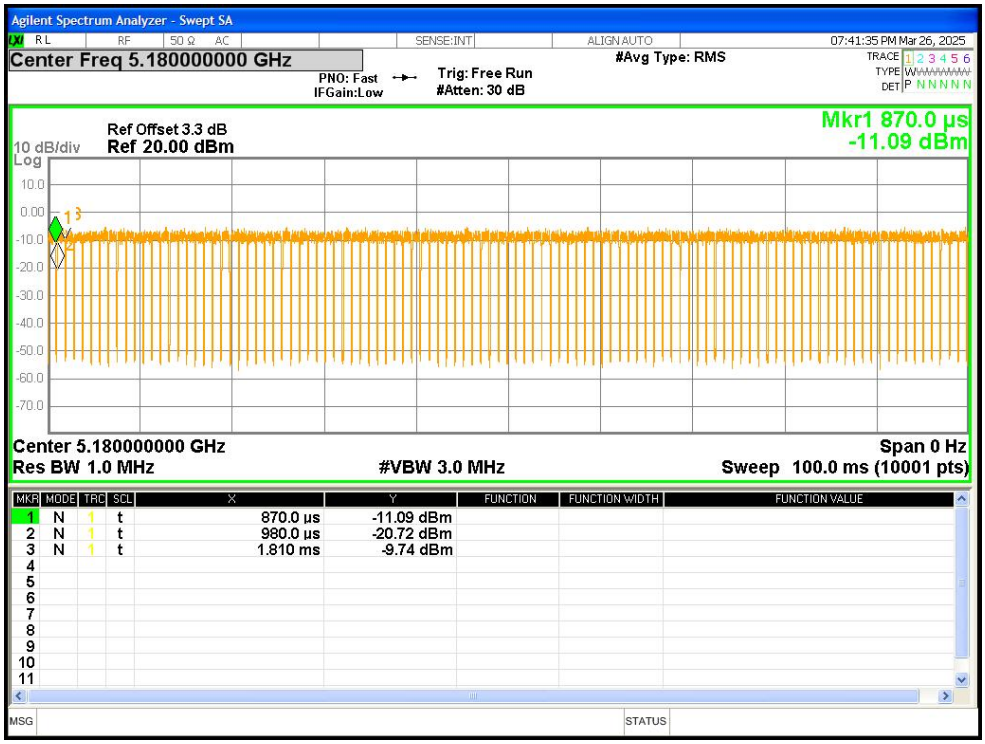
Environment Temperature (°C)	Power Supplied (VDC)	Mode	Frequency (MHz)	Measured Frequency (MHz)	Frequency Error (Hz)	Deviation (ppm)
50	3.8	CW	5230	5229.98	20000	3.82
40	3.8	CW	5230	5229.98	20000	3.82
30	3.8	CW	5230	5229.96	40000	7.64
20	4.37	CW	5230	5229.98	20000	3.82
20	3.8	CW	5230	5229.94	60000	11.46
20	4.23	CW	5230	5229.96	40000	7.64
10	3.8	CW	5230	5229.95	50000	9.55
0	3.8	CW	5230	5229.96	40000	7.64
-10	3.8	CW	5230	5229.98	20000	3.82
-20	3.8	CW	5230	5229.98	20000	3.82
-30	3.8	CW	5230	5229.99	10000	1.91

11. DUTY CYCLE

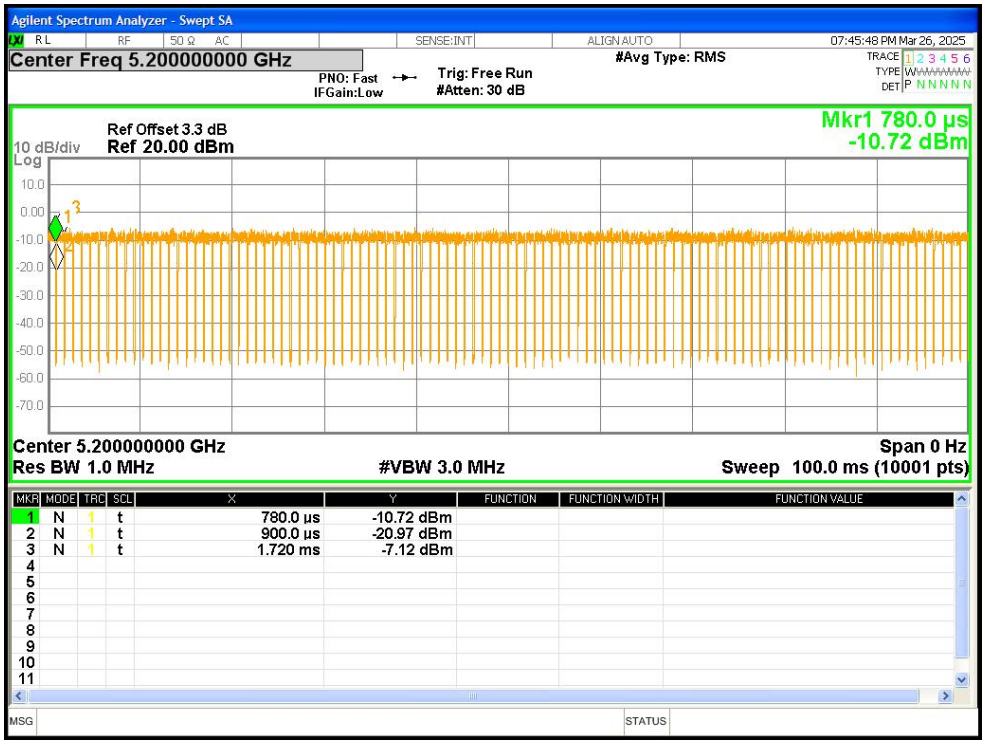
Test Requirement:	47 CFR Part 15E 15.407 KDB789033 D02 General U-NII Test Procedures New Rules v02r01, Section (B)
Test Method:	ANSI C63.10: 2013
Test Limit:	N/A
Test Result:	PASS
Remark:	Through Pre-scan, The duty cycle set for channel low, middle and high are same, and the duty cycle test is performed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

Test Result：

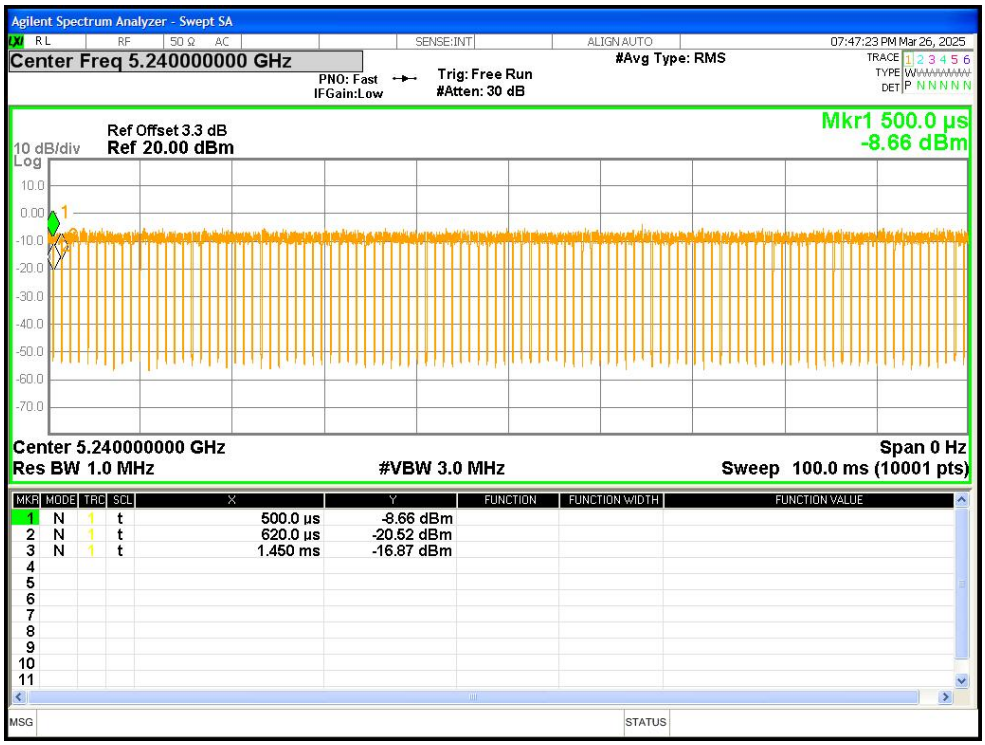
Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
a	5180	88.3	0.54	N/A
a	5200	87.23	0.59	N/A
a	5240	87.37	0.59	N/A
n20	5180	86.67	0.62	N/A
n20	5200	86.67	0.62	N/A
n20	5240	86.67	0.62	N/A
n40	5190	78	1.08	N/A
n40	5230	78.43	1.06	N/A



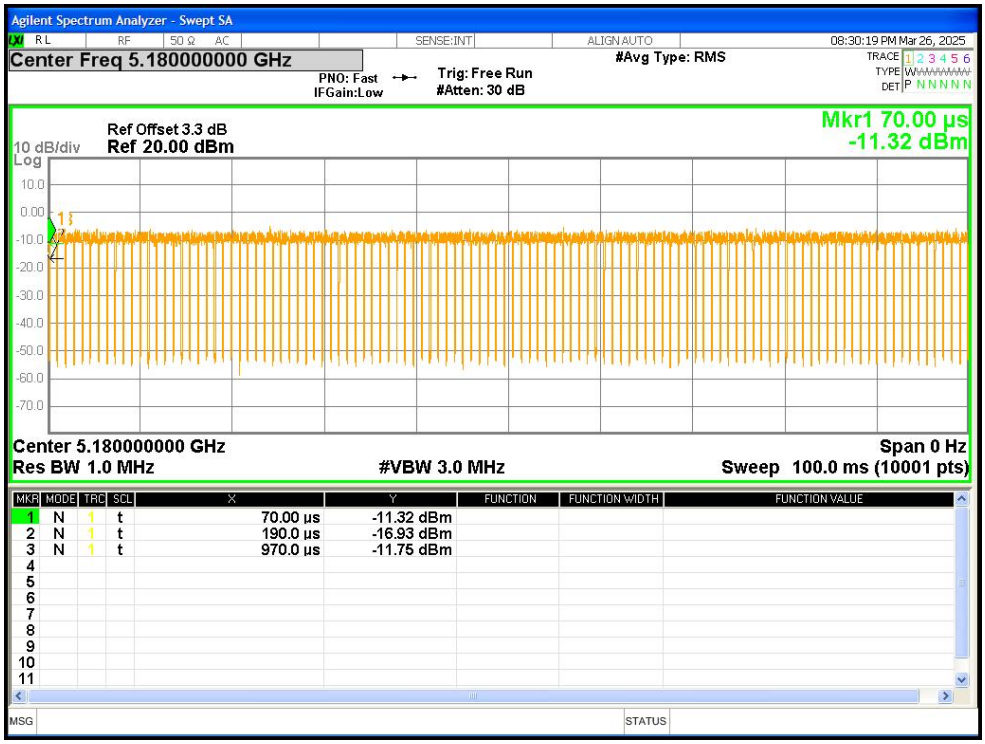
Duty Cycle NVNT a 5180MHz Ant1



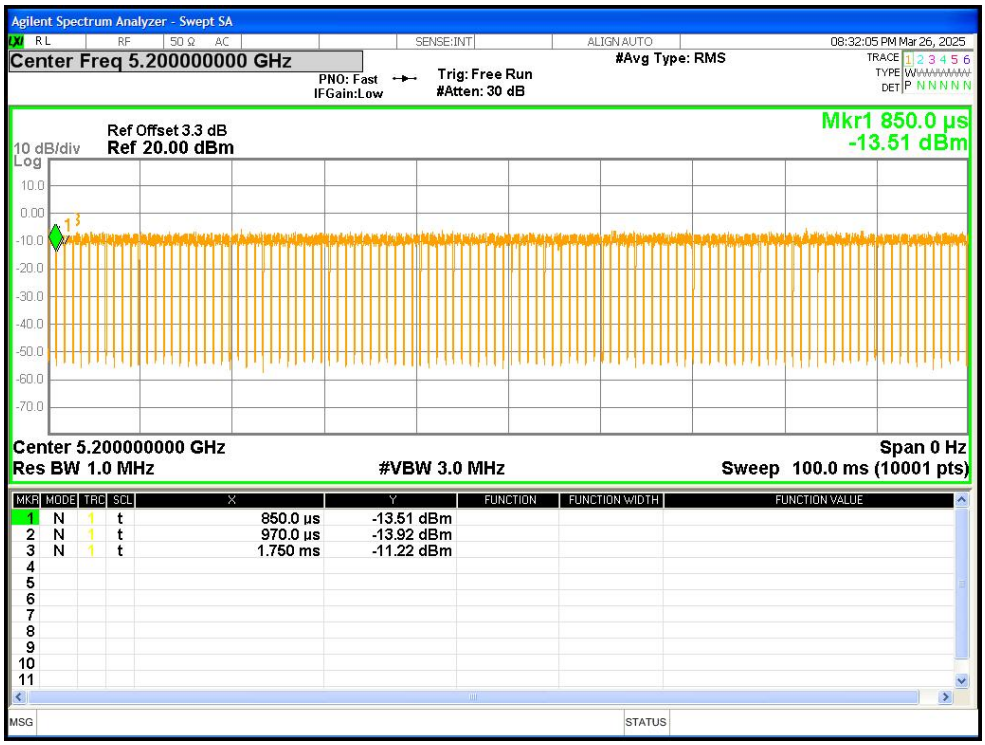
Duty Cycle NVNT a 5200MHz Ant1



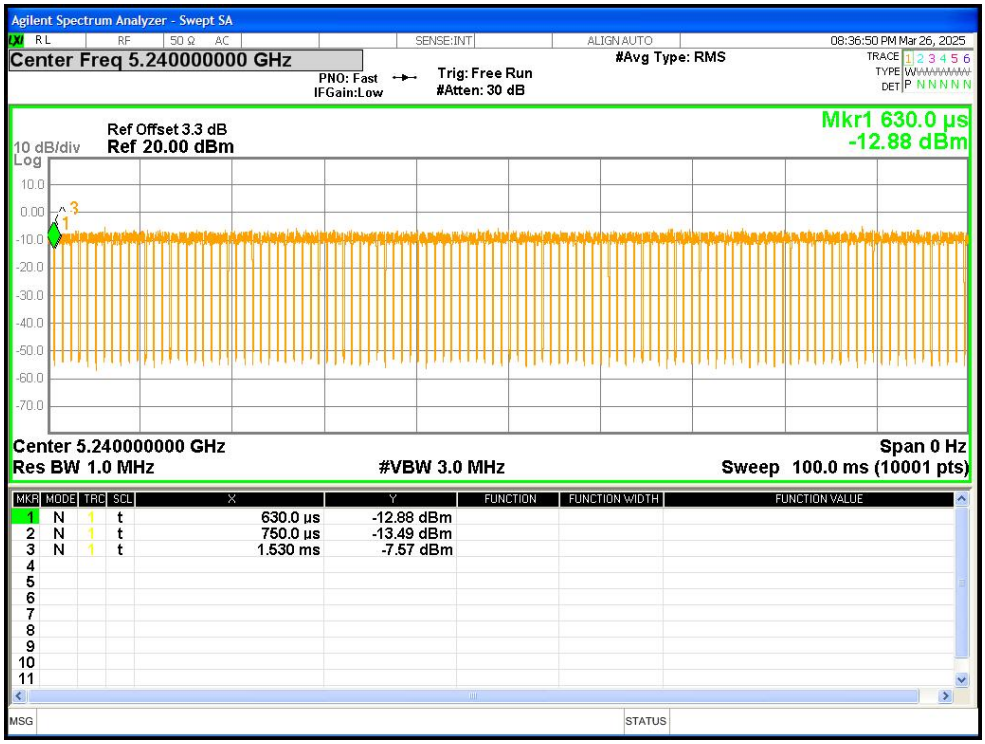
Duty Cycle NVNT a 5240MHz Ant1



Duty Cycle NVNT n20 5180MHz Ant1



Duty Cycle NVNT n20 5200MHz Ant1



Duty Cycle NVNT n20 5240MHz Ant1

Duty Cycle NVNT n40 5190MHz Ant1

Duty Cycle NVNT n40 5230MHz Ant1

12.ANTENNA REQUIREMENT

Standard requirement:	FCC Section 15.203
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. 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. This device uses of Two antennas that uses a specified coupling to the intentional radiator. Antenna connectors complied with the requirement.	
EUT Antenna:	
The WIFI 5G antennas are FPC antenna, the best case gain for two antennas are 1.86dBi, 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.

※※※※※ END OF REPORT ※※※※※