Test Report

Product name	:	2T2R Wi-Fi + Bluetooth Module
Trademark	:	n.a.
Model no.	:	T7663B2
Series Model(s).	:	n.a.
FCC ID	:	2ANM3T7663B2
IC	:	23165-T7663B2
HVIN	:	T7663B2
Report No	:	C241224099-RF04
Test Standards	:	CFR47 FCC Part 15: Subpart E Section 15.407 CFR47 FCC Part 15: Subpart C Section 15.207 CFR47 FCC Part 15: Subpart C Section 15.209 RSS-247 Issue 3 RSS-Gen Issue 5
Applicant	:	Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Address of applicant	:	13F-16F, Unit A, Skyworth Building, Shennan Road, Nanshan District, Shenzhen, Guangdong, China.
Manufacturer	:	Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Manufacturer Address	:	13F-16F, Unit A, Skyworth Building, Shennan Road, Nanshan District, Shenzhen, Guangdong, China.
Date of Test Date	:	Dec 24, 2024 to May 08, 2025
Date of issue.	:	May 08, 2025
Test result	:	Compliance

Prepared By : Adil Yang/Engineer

Reviewed By : Greg Zhang/Engineer

Approved By : Tom Gan/Manager

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	May.08, 2025	Initial Issue	ALL	Adil Yang

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1. TEST SUMMARY

1.1. TEST DESCRIPTION

Test procedures according to the technical standards:

Item	Clause	Result	Note
Conducted Emission on AC Mains	Part 15.207(a) RSS-GEN clause 8.8	PASS*	
Radiated Spurious Emission	Part 15.407(b) Part 15.205 Part 15.209 RSS-247 clause 6.2 RSS-GEN clause 8.9 RSS-GEN clause 8.10	PASS	
Maximum Conducted Output Power	Part 15.407(a) RSS-247 clause 6.2	PASS*	Note 5
Conducted Power Spectral Density	Part 15.407(a) RSS-247 clause 6.2	PASS*	Note 5
6dB Bandwidth	Part 15.407(e) RSS-247 clause 6.2	PASS*	
26dB Bandwidth	Part 15.407(e) RSS-Gen Clause 6.6	PASS*	
99% Bandwidth	Part 15.407(a) RSS-Gen Clause 6.6	PASS*	
Frequency Stability	Part 15.407(g) RSS-Gen Clause 6.11	PASS*	
Dynamic Frequency Selection (DFS)	Part 15.407(h) RSS-247 clause 6.3	PASS	
Antenna Requirement	Part 15.407(b)(4) Part 15.203	PASS	

Note:
1) “PASS*”, The manufacturer added an optional antenna. We have retested the Radiated Spurious Emissions item. The other test terms were not affected, thus, the other test data were continued to be referenced. details refer to the original test report C240918049-RF04 published by Shenzhen Central Standard International Center Co., Ltd. on Nov 21,2024.
2) All tests are according to ANSI C63.10-2013.
3) The statements of test result on the above are decided by the request of test standard only; the measurement uncertainties are not factored into this compliance determination.
4) The information of measurement uncertainty is available upon the customer’s request.
5) According to the requirements of KDB 662911 D01, 802.11n and ac mode have MIMO function and different directional gain values, this test report tests the output power and PSD items of the NII Band I (5150-5250MHz) part, and the EIRP values of the output power part of other frequency bands are updated according to the new gain values.

1.2. TEST FACILITY

Shenzhen Central Standard International Center Co., Ltd. (CSIC)

Room 201, Building 1, Mogen Fashion Industrial Park, No. 10, Shilongzai Road, Xinshi Community, Dalang Street, Longhua District, Shenzhen.

The test facility is recognized, certified or accredited by the following organizatios:

CNAS	Registration No.: L11671	
FCC	Registration No.: 0031378433	Designation Number: CN1317
IC	CAB identifier: CN0051	
A2LA	Lab Cert. No.: 6426.01	

1.3. MEASUREMENT UNCERTAINTY

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

Below is the best measurement capability for Shenzhen Central Standard International Center Co., Ltd.

Test Items	Measurement Uncertainty	Notes
RF output power, conducted	±1.04dB	(1)
Unwanted Emissions, conducted	±1.38dB	(1)
All emissions, radiated 9KHz-30MHz	±4.44dB	(1)
All emissions, radiated 30-1GHz	±4.56dB	(1)
All emissions, radiated 1G-6GHz	±4.84dB	(1)
All emissions, radiated>6G	±4.84dB	(1)
Conducted Emission (9KHz-150KHz)	±3.22dB	(1)
Conducted Emission (150KHz-30MHz)	±3.24dB	(1)

Note(1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2. GENERAL INFORMATION

2.1. GENERAL DESCRIPTION OF EUT

EUT(Product Specifications)	
Product Name:	2T2R Wi-Fi + Bluetooth Module
Model No.:	T7663B2
Series Models:	n.a.
Power supply:	DC 3.3V
Hardware version:	VER 00.03
Software version:	7E7. 09.19
WIFI-5G (RF Specifications)	
Operating Frequency	5150-5350MHz, 5470-5725MHz, 5725-5850MHz
Channel number:	5180-5320MHz, 14CHs, 802.11 a/n20/n40/ac20/ac40/ac80 5500-5700MHz, 21CHs, 802.11 a/n20/n40/ac20/ac40/ac80 5745-5825MHz, 8CHs, 802.11 a/n20/n40/ac20/ac40/ac80
Channel Spacing	20MHz, 40MHz, 80MHz
Modulation	OFDM (BPSK, QPSK, 16QAM, 64QAM,256QAM)
Type of Product	Adaptive equipment and does not support non-adaptive mode: LBT based Detect and Avoid (load-based equipment)
Type of Product	Client Device without Radar Detection
TX Power Control (TPC)	Not Supported
Antenna Type	ANT1/2: PIFA Antenna
Antenna Gain	ANT1/2: 5150MHz to 5350MHz: 4.39 dBi, 5470MHz to 5725MHz: 4.72 dBi, 5725MHz to 5850MHz: 4.26 dBi

Note:

1. For a more detailed features description, please refer to the manufacture’s specifications or the user’s manual.
2. Full tests were applied to sample C241224099-Y01/01 only in this document.

2.2. DESCRIPTION OF TEST MODES AND TEST FREQUENCY

The EUT has been tested under typical operating conditions. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting mode for testing.

Operation Frequency List for WIFI：

Channel List for 802.11a/n20/ac20							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	**5180**	**40**	**5200**	44	5220	**48**	**5240**
52	**5260**	56	5280	**60**	**5300**	**64**	**5320**
100	**5500**	104	5520	108	5540	112	5560
116	**5580**	120	5600	124	5620	128	5640
132	5660	136	5680	**140**	**5700**	**149**	**5745**
153	5765	**157**	**5785**	159	5795	**165**	**5825**

Channel List for 802.11n40/ac40							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	**5190**	**46**	**5230**	**54**	**5270**	**62**	**5310**
102	**5510**	**110**	**5550**	118	5590	126	5630
134	**5670**	**151**	**5755**	**159**	**5795**		

Channel List for 802.11ac80							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	**5210**	**58**	**5290**	**106**	**5530**	**155**	**5775**

Note: The channels in bold in the table are used for testing. Per RSS-247 section 6.2.3, transmission on channels which overlap 5600-5650MHz is prohibited.

2.3. MEASUREMENT INSTRUMENTS LIST

RF Connected Test					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY50200391	May. 26, 2025
2	Spectrum Analyzer	R&S	FSV40	1632339B	May. 26, 2025
3	Power sensor	KEYSIGHT	U2021XA	MY55080015	May. 26, 2025
4	Power sensor	KEYSIGHT	U2021XA	MY54250016	May. 26, 2025
5	Power sensor	KEYSIGHT	U2021XA	MY54250020	May. 26, 2025
6	Power sensor	KEYSIGHT	U2021XA	MY54210030	May. 26, 2025
7	Vector Signal Generator	Agilent	N5182A	MY50140130	May. 26, 2025
8	Signal generator	Agilent	SML03	100925	May. 26, 2025
9	Temperature Humidity Chamber	GZ-ESPEC	ER-10AGT	0005091-2	May. 26, 2025
10	EXTENDED RANGE DC POWER SUPPLY	TAKASAGO	ZX-400LA	N/A	May. 26, 2025
11	Inverter power supply	AKE	AKE-2003-P2	N/A	May. 26, 2025
12	Power sensor Box	MWRFtest	N/A	N/A	N/A
13	RF Switch Box	MWRFtest	MW100-RFCB	N/A	N/A
14	MTS 8310	MWRFtest	V：2.0.0.0		

Radiation Test equipment					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	EMI TEST RECEIVER	R&S	ESIB26	100342	May. 26, 2025
2	Spectrum Analyzer	R&S	FSV40	1632339B	May. 26, 2025
3	Amplifier	EMCO	EM330	980204	May. 26, 2025
4	Amplifier	MW	DPA8-1000-18000-1012	8220837	Mar. 06, 2025
5	Amplifier	SKET	LNPA_1840-50	SK201801801	Mar. 05, 2025
6	Loop Antenna	SCHNARZBECK	FMZB1519B	00023	Nov. 12, 2025
7	Bilog Antenna	Sunol Sciences	JB1	n.a.	Jul. 01, 2025
8	Horn Antenna	COMMW	ZAB-1-18G-50	20171109	Jul. 01, 2025
9	Horn Antenna	A-INFOMW	LB-180400-KF	J211020657	Sep. 25, 2025
10	3M Chamber	Maor	9*6*6	--	Mar. 01, 2026
11	EZ-EMC	Farad	V3.1		

Mains Terminal Disturbance Voltage Test equipment					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESRP3	101936	May. 26, 2025
2	LISN	R&S	ENV216	100002	May. 26, 2025
3	LISN	MEB	NNB 42	--	May. 26, 2025
4	Shelding Room	Maor	8*4*3	--	Mar. 01, 2025
8	EZ-EMC	Fara	V3.1		

Note:

1) The cable loss has calculated in test result which connection between each test instruments.

2.4. DESCRIPTION OF THE TEST MODES

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

Worst Mode	Description	Data Rate
Mode 1	TX IEEE 802.11a CH36&CH40&CH48	6 Mbps
Mode 2	TX IEEE 802.11n HT20 CH36&CH40&CH48	6.5 Mbps
Mode 3	TX IEEE 802.11ac VHT20 CH36&CH40&CH48	6.5 Mbps
Mode 4	TX IEEE 802.11a CH52&CH60&CH64	6 Mbps
Mode 5	TX IEEE 802.11n HT20 CH52&CH60&CH64	6.5 Mbps
Mode 6	TX IEEE 802.11ac VHT20 CH52&CH60&CH64	6.5 Mbps
Mode 7	TX IEEE 802.11a CH100&CH116&CH140	6 Mbps
Mode 8	TX IEEE 802.11n HT20 CH100&CH116&CH140	6.5 Mbps
Mode 9	TX IEEE 802.11ac VHT20 CH100&CH116&CH140	6.5 Mbps
Mode 10	TX IEEE 802.11a CH149&CH157&CH165	6 Mbps
Mode 11	TX IEEE 802.11n HT20 CH149&CH157&CH165	6.5 Mbps
Mode 12	TX IEEE 802.11ac VHT20 CH149&CH157&CH165	6.5 Mbps
Mode 13	TX IEEE 802.11n HT40 CH38&CH46	13.5 Mbps
Mode 14	TX IEEE 802.11ac VHT40 CH38&CH46	13.5 Mbps
Mode 15	TX IEEE 802.11n HT40 CH54&CH62	13.5 Mbps
Mode 16	TX IEEE 802.11ac VHT40 CH54&CH62	13.5 Mbps
Mode 17	TX IEEE 802.11n HT40 CH102&CH110&CH134	13.5 Mbps
Mode 18	TX IEEE 802.11ac VHT40 CH102&CH110&CH134	13.5 Mbps
Mode 19	TX IEEE 802.11n HT40 CH151&CH159	13.5 Mbps
Mode 20	TX IEEE 802.11ac VHT40 CH151&CH159	13.5 Mbps
Mode 21	TX IEEE 802.11ac VHT80 CH42	29 Mbps
Mode 22	TX IEEE 802.11ac VHT80 CH58	29 Mbps
Mode 23	TX IEEE 802.11ac VHT80 CH106&122	29 Mbps
Mode 24	TX IEEE 802.11ac VHT80 CH155	29 Mbps

Note:

1) The measurements are performed at the high, middle, low available channels.
2) All the bit rate of transmitter have been tested and found the lowest rate is found to be the worst case and recorded.
3) This test was performed with EUT in X, Y, Z position and worst case was found when EUT in X position.
4) For radiated emission above 1 GHz test, 1GHz-40GHz have been pre-tested and in this report only recorded the worst case. The remaining spurious points are all below the limit value of 20dB.

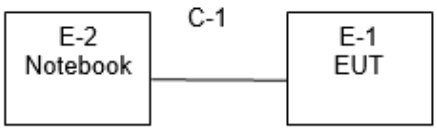
2.5. TEST SOFTWARE AND POWER LEVEL

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

RF Function	Type	Mode Or Modulation type	Ant Gain(dBi)	Power Setting	Software For Testing
WIFI(5G)	5G WIFI	802.11a	5150MHz to 5350MHz: 4.39 dBi, 5470MHz to 5725MHz: 4.72 dBi, 5725MHz to 5850MHz: 4.26 dBi(ANT1&2).	0A	QA UI(MT7663) V 0.0.2.6
		802.11n20		5150MHz-5250MHz:06 Other: 0A	
		802.11n40		5150MHz-5250MHz:06 Other: 0C	
		802.11ac20		5150MHz-5250MHz:07 Other: 0A	
		802.11ac40		5150MHz-5250MHz:06 Other: 0C	
		802.11ac80		0A	

2.6. BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

a. Radiated Spurious Emission Test



b. Conducted Emission Test

2.7. DESCRIPTION OF NECESSARY ACCESSORIES AND 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.

Necessary accessories					
Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
N/A	N/A	N/A	N/A	N/A	N/A

Support units					
Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
E-2	Notebook	DELL	Vostro 3400	N/A	N/A
E-3	Router	GL iNet	GL-MT3000	N/A	N/A
C-1	RJ45 Cable	N/A	100cm	N/A	N/A

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) The Router FCC ID: 2AFIW-MT3000; IC ID: 23019-MT3000.

2.8. ENVIRONMENTAL CONDITIONS FOR TESTING

Test Item	Temperature (°C)	Relative Humidity (%)	Test Voltage	Tested by
Radiated Spurious Emission	24.3	52.0	DC 3.3V	Adil Yang
Dynamic Frequency Selection	23.8	51.0	DC 3.3V	Adil Yang

3. EMC TEST

3.1. Radiated Spurious Emission Measurement

Limit

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the Restricted band specified on Part15.205 (a)&209(a) and RSS-247 3.3 limit in the table and according to ANSI C63.10-2013 and RSS-Gen below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (0.009MHz - 1000MHz)

For FCC:

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

For IC:

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	6.37/F(KHz)	300
0.490~1.705	63.7/F(KHz)	30
1.705~30.0	0.08	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (1GHz-25 GHz)

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

Notes:

1) The limit for radiated test was performed according to FCC PART 15C.
2) The tighter limit applies at the band edges.
3) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RESTRICTED FREQUENCY BANDS

For FCC:

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	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	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	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			

For IC:

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	13.36-13.41	960-1427	9.0-9.2
0.495-0.505	16.42-16.423	1435-1626.5	9.3-9.5
2.1735-2.1905	16.69475-16.69525	1645.5-1646.5	10.6-12.7
3.020-3.026	16.80425-16.80475	1660-1710	13.25-13.4
4.125-4.128	25.5-25.67	1718.8-1722.2	14.47-14.5
4.17725-4.17775	37.5-38.25	2200-2300	15.35-16.2
4.20725-4.20775	73-74.6	2310-2390	17.7-21.4
5.677-5.683	74.8-75.2	2483.5-2500	22.01-23.12
6.215-6.218	108-138	2655-2900	23.6-24.0
6.26775-6.26825	149.9-150.05	3260-3267	31.2-31.8
6.31175-6.31225	156.52475-156.52525	3332-3339	36.43-36.5
8.291-8.294	156.7-156.9	3345.8-3358	Above 38.6
8.362-8.366	162.0125-167.17	3500-4400	--
8.37625-8.38675	167.72-173.2	4500-5150	--
8.41425-8.41475	240-285	5350-5460	--
12.29-12.293	322-335.4	7250-7750	--
12.51975-12.52025	399.9-410	8025-8500	--
12.57675-12.57725	608-614	--	--

For Radiated Emission	
Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/QP/AVG
Start Frequency	9 KHz/150KHz(Peak/QP/AVG)
Stop Frequency	150KHz/30MHz(Peak/QP/AVG)
RB / VB (emission in restricted band)	200Hz (From 9kHz to 0.15MHz)/
	9KHz (From 0.15MHz to 30MHz);
	200Hz (From 9kHz to 0.15MHz)/
	9KHz (From 0.15MHz to 30MHz)
Attenuation	Auto
Detector	Peak/QP
Start Frequency	30 MHz(Peak/QP)
Stop Frequency	1000 MHz (Peak/QP)
RB / VB (emission in restricted band)	120 KHz / 300 KHz
Attenuation	Auto
Detector	Peak/AVG
Start Frequency	1000 MHz(Peak/AVG)
Stop Frequency	10th carrier hamonic(Peak/AVG)
RB / VB (emission in restricted band)	1 MHz / 3 MHz(Peak)
	1 MHz/1/T MHz(AVG)
For Restricted band	
Spectrum Parameter	Setting
Detector	Peak/AVG
Start/Stop Frequency	Lower Band Edge: 2310 to 2410 MHz
	Upper Band Edge: 2476 to 2500 MHz
RB / VB	1 MHz / 3 MHz(Peak)
	1 MHz/1/T MHz(AVG)
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for Peak & AVG
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for Peak & AVG
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

Test Procedure

a) The measuring distance of at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz,and above 1GHz.
b) The EUT was placed on the top of a rotating table 0.8 meters (above 1GHz is 1.5 m) above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c) The height of the equipment shall be 0.8 m(above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. 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 QuasiPeak 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.

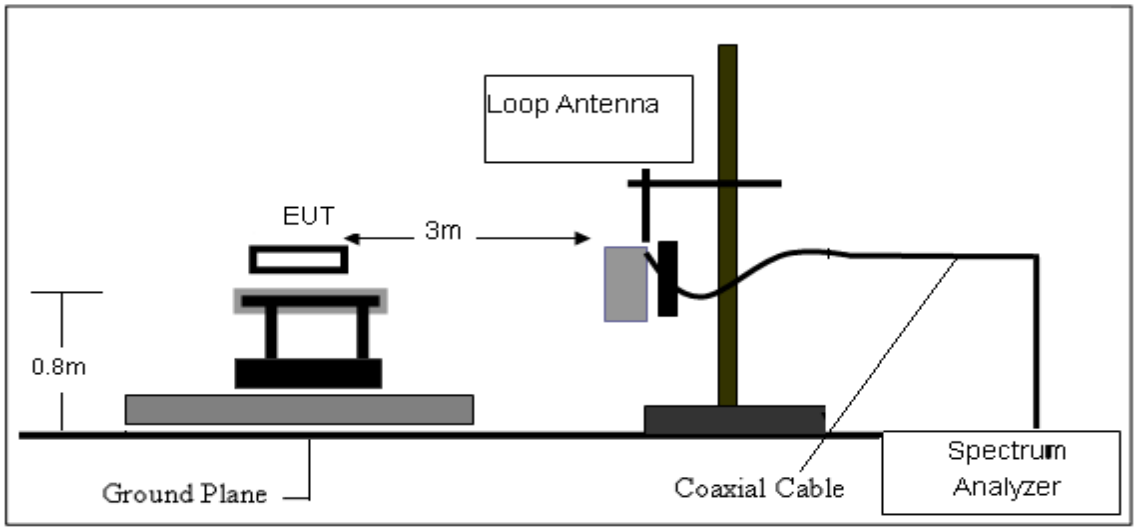
Note:
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

DEVIATION FROM TEST STANDARD

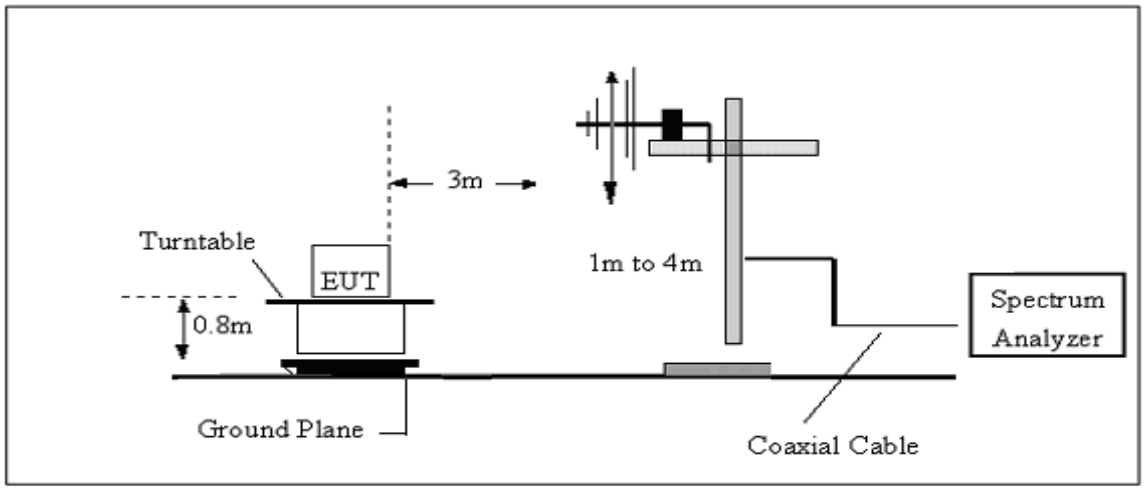
No deviation.

Test Setup

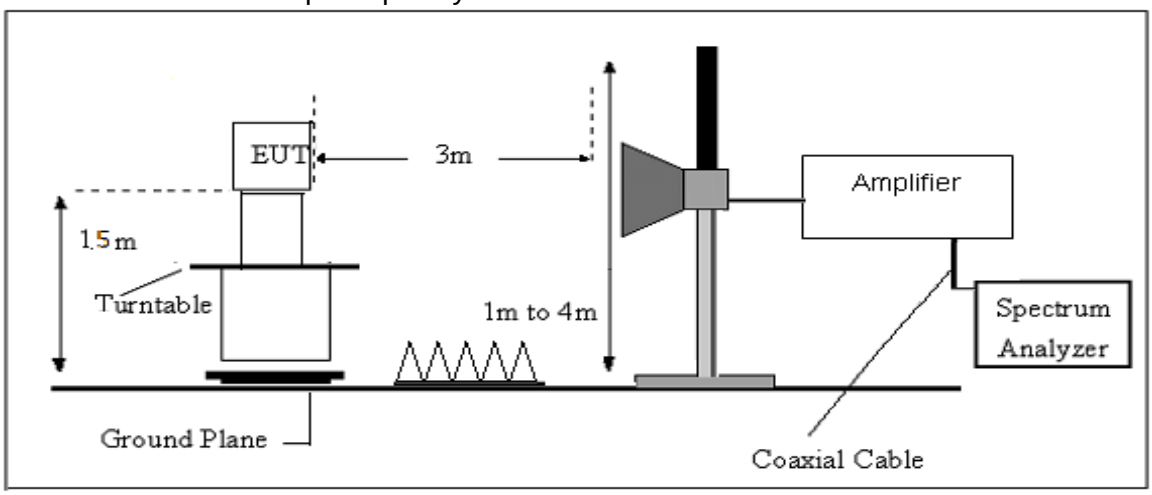
1. Radiated Emission Test-Up Frequency Below 30MHz



2. Radiated Emission Test-Up Frequency Below1GHz



3. Radiated Emission Test-Up Frequency Above 1GHz



EUT OPERATING CONDITIONS

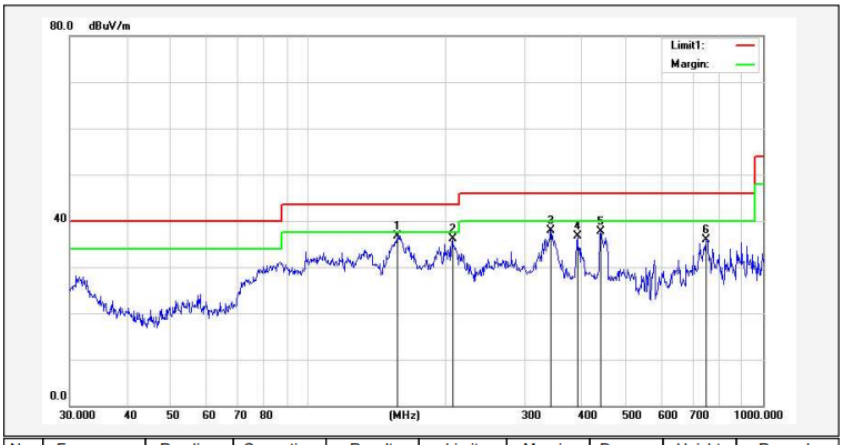
The EUT tested system was configured as the statements of 2.5 Unless otherwise a special operating condition is specified in the follows during the testing.

Test Result

Note: Testing was carried out within frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and 18GHz - 40GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.
All the data rate and configurations have been tested and only the worst case mode (ac(VHT20)) reported.

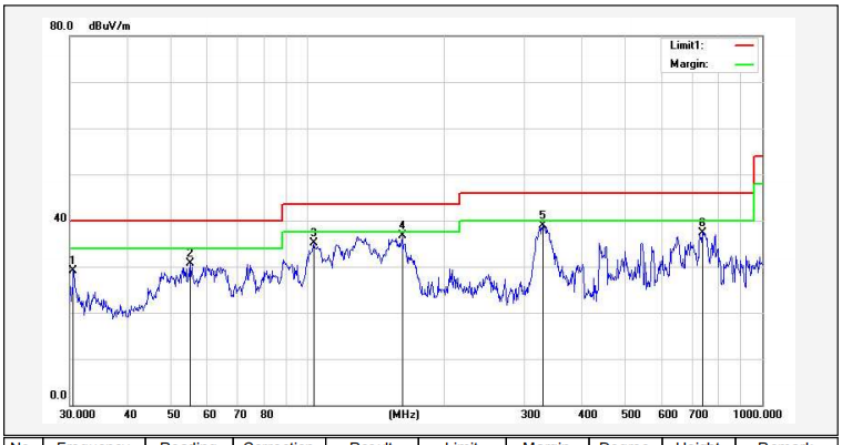
Below 1G:			
Test Mode：	working	Test Voltage ：	DC 3.3V

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1*	157.5587	49.80	-13.16	36.64	43.50	-6.86			QP
2	207.8500	49.76	-13.69	36.07	43.50	-7.43			QP
3	341.9786	48.21	-10.24	37.97	46.00	-8.03			QP
4	390.7225	45.60	-8.95	36.65	46.00	-9.35			QP
5	440.1963	45.15	-7.44	37.71	46.00	-8.29			QP
6	750.1082	38.70	-2.75	35.95	46.00	-10.05			QP

Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1	30.5304	35.54	-6.48	29.06	40.00	-10.94			QP
2	55.2207	49.66	-18.92	30.74	40.00	-9.26			QP
3	103.0800	51.28	-16.08	35.20	43.50	-8.30			QP
4*	161.4740	49.95	-13.22	36.73	43.50	-6.77			QP
5	329.0390	49.44	-10.50	38.94	46.00	-7.06			QP
6	739.6603	40.10	-2.86	37.24	46.00	-8.76			QP

Correction Factor = antenna factor + cable loss – amplifier gain;
Reading = Reading Amplitude in the instrument;
Result = Correction Factor + Reading;
Margin = Result – Limit

Above 1GHz：

Note: All modes and antenna have been tested, and the report only reflects the worst mode(802.11ac(VHT20) MIMO).

Testing was carried out within frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and 18GHz - 26.5GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.

Band I：

802.11 ac20-Low Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1986	66.35	-21.01	45.34	68.2	-22.86	peak
2	3142	63.98	-19.25	44.73	68.2	-23.47	peak
3	6168	56.57	-9.92	46.65	68.2	-21.55	peak
4	7494	55.55	-7.13	48.42	68.2	-19.78	peak
5	10690	54.19	-2.89	51.3	68.2	-16.9	peak
6	12424	55	-1.81	53.19	68.2	-15.01	peak

802.11 ac20-Low Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2156	70.87	-21.09	49.78	68.2	-18.42	peak
2	3142	71.19	-19.25	51.94	68.2	-16.26	peak
3	7562	55.91	-7.22	48.69	68.2	-19.51	peak
4	10350	57.08	-4.13	52.95	68.2	-15.25	peak
5	11302	54.54	-2.14	52.4	68.2	-15.8	peak
6	12424	54.96	-1.81	53.15	68.2	-15.05	peak

802.11 ac20-Middle Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1748	67.63	-24.09	43.54	68.2	-24.66	peak
2	3142	64.59	-19.25	45.34	68.2	-22.86	peak
3	4944	57.74	-12.85	44.89	68.2	-23.31	peak
4	7494	55.53	-7.13	48.4	68.2	-19.8	peak
5	10418	55.37	-4.09	51.28	68.2	-16.92	peak
6	12458	54.41	-1.59	52.82	68.2	-15.38	peak

802.11 ac20-Middle Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2156	68.64	-21.09	47.55	68.2	-20.65	peak
2	3992	61.81	-15.01	46.8	68.2	-21.4	peak
3	6916	56.58	-8.8	47.78	68.2	-20.42	peak
4	7630	56.46	-7.44	49.02	68.2	-19.18	peak
5	11302	53.49	-2.14	51.35	68.2	-16.85	peak
6	12458	54.74	-1.59	53.15	68.2	-15.05	peak

802.11 ac20-High Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1952	65.64	-22.17	43.47	68.2	-24.73	peak
2	3142	64.51	-19.25	45.26	68.2	-22.94	peak
3	4910	58.38	-12.91	45.47	68.2	-22.73	peak
4	7494	55.97	-7.13	48.84	68.2	-19.36	peak
5	10486	54.87	-3.53	51.34	68.2	-16.86	peak
6	12730	53.95	-0.78	53.17	68.2	-15.03	peak

802.11 ac20-High Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3176	69.02	-19.14	49.88	68.2	-18.32	peak
2	7562	55.87	-7.22	48.65	68.2	-19.55	peak
3	8276	56.34	-7.36	48.98	68.2	-19.22	peak
4	10486	55.14	-3.53	51.61	68.2	-16.59	peak
5	11064	54.71	-2.65	52.06	68.2	-16.14	peak
6	12424	54.6	-1.81	52.79	68.2	-15.41	peak

Band II：

Note: All modes and antenna have been tested, and the report only reflects the worst mode (802.11ac (VHT20) MIMO).

Testing was carried out within frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and 18GHz - 26.5GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.

802.11 ac20-Low Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1986	66.44	-21.01	45.43	68.2	-22.77	peak
2	3924	59.51	-15.19	44.32	68.2	-23.88	peak
3	6746	57.42	-9.21	48.21	68.2	-19.99	peak
4	7460	55.65	-7.09	48.56	68.2	-19.64	peak
5	11812	54.69	-2.56	52.13	68.2	-16.07	peak
6	12458	55.35	-1.59	53.76	68.2	-14.44	peak

802.11 ac20-Low Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2156	68.36	-21.09	47.27	68.2	-20.93	peak
2	7494	55.51	-7.13	48.38	68.2	-19.82	peak
3	8378	55.52	-7.1	48.42	68.2	-19.78	peak
4	10520	54.62	-3.25	51.37	68.2	-16.83	peak
5	11064	54.48	-2.65	51.83	68.2	-16.37	peak
6	12764	54.62	-0.83	53.79	68.2	-14.41	peak

802.11 ac20-Middle Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1952	67.21	-22.17	45.04	68.2	-23.16	peak
2	3550	61.96	-16.79	45.17	68.2	-23.03	peak
3	6814	56.62	-8.86	47.76	68.2	-20.44	peak
4	8276	55.65	-7.36	48.29	68.2	-19.91	peak
5	10554	54.17	-2.97	51.2	68.2	-17	peak
6	12424	55.03	-1.81	53.22	68.2	-14.98	peak

802.11 ac20-Middle Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1986	69.31	-21.01	48.3	68.2	-19.9	peak
2	3142	70.34	-19.25	51.09	68.2	-17.11	peak
3	3958	65.12	-15.09	50.03	68.2	-18.17	peak
4	6848	57.67	-8.84	48.83	68.2	-19.37	peak
5	10554	54.41	-2.97	51.44	68.2	-16.76	peak
6	12424	55.1	-1.81	53.29	68.2	-14.91	peak

802.11 ac20-High Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2564	70.96	-20.69	50.27	68.2	-17.93	peak
2	3958	64.48	-15.09	49.39	68.2	-18.81	peak
3	7528	55.5	-7.17	48.33	68.2	-19.87	peak
4	10418	55.88	-4.09	51.79	68.2	-16.41	peak
5	11064	55.07	-2.65	52.42	68.2	-15.78	peak
6	12458	55.04	-1.59	53.45	68.2	-14.75	peak

802.11 ac20-High Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1986	65.17	-21.01	44.16	68.2	-24.04	peak
2	3176	64.46	-19.14	45.32	68.2	-22.88	peak
3	6916	56.32	-8.8	47.52	68.2	-20.68	peak
4	8412	55.26	-7.14	48.12	68.2	-20.08	peak
5	11336	54.21	-2.04	52.17	68.2	-16.03	peak
6	12424	55.26	-1.81	53.45	68.2	-14.75	peak

Band III：

Note: All modes and antenna have been tested, and the report only reflects the worst mode (802.11ac (VHT20) MIMO).

Testing was carried out within frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and 18GHz - 26.5GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.

802.11 ac20-Low Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1986	65.84	-21.01	44.83	68.2	-23.37	peak
2	4740	59.44	-14.06	45.38	68.2	-22.82	peak
3	7494	56.25	-7.13	49.12	68.2	-19.08	peak
4	10588	54.11	-2.7	51.41	68.2	-16.79	peak
5	11404	53.72	-1.87	51.85	68.2	-16.35	peak
6	12458	54.99	-1.59	53.4	68.2	-14.8	peak

802.11 ac20-Low Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1986	68.62	-21.01	47.61	68.2	-20.59	peak
2	3176	69.26	-19.14	50.12	68.2	-18.08	peak
3	4706	63.18	-14.52	48.66	68.2	-19.54	peak
4	7596	55.69	-7.26	48.43	68.2	-19.77	peak
5	10588	54.68	-2.7	51.98	68.2	-16.22	peak
6	12424	54.62	-1.81	52.81	68.2	-15.39	peak

802.11 ac20-Middle Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1578	74.64	-24.84	49.8	68.2	-18.4	peak
2	3142	65.74	-19.25	46.49	68.2	-21.71	peak
3	6916	56.57	-8.8	47.77	68.2	-20.43	peak
4	8174	56.82	-7.68	49.14	68.2	-19.06	peak
5	10554	55.2	-2.97	52.23	68.2	-15.97	peak
6	12424	54.73	-1.81	52.92	68.2	-15.28	peak

802.11 ac20-Middle Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1986	71.26	-21.01	50.25	68.2	-17.95	peak
2	3142	68.82	-19.25	49.57	68.2	-18.63	peak
3	4672	65.49	-14.57	50.92	68.2	-17.28	peak
4	7494	56.18	-7.13	49.05	68.2	-19.15	peak
5	11404	53.83	-1.87	51.96	68.2	-16.24	peak
6	12458	54.49	-1.59	52.9	68.2	-15.3	peak

802.11 ac20-High Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1544	74.48	-25.07	49.41	68.2	-18.79	peak
2	3176	63.74	-19.14	44.6	68.2	-23.6	peak
3	4944	57.77	-12.85	44.92	68.2	-23.28	peak
4	8310	56.23	-7.28	48.95	68.2	-19.25	peak
5	11064	54.97	-2.65	52.32	68.2	-15.88	peak
6	12458	54.93	-1.59	53.34	68.2	-14.86	peak

802.11 ac20-High Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1748	71.75	-24.09	47.66	68.2	-20.54	peak
2	3108	68.56	-19.37	49.19	68.2	-19.01	peak
3	4706	63.77	-14.52	49.25	68.2	-18.95	peak
4	7494	56.15	-7.13	49.02	68.2	-19.18	peak
5	10588	54.15	-2.7	51.45	68.2	-16.75	peak
6	12458	54.95	-1.59	53.36	68.2	-14.84	peak

Band IV：

Note: All modes and antenna have been tested, and the report only reflects the worst mode (802.11ac (VHT20) MIMO).

Testing was carried out within frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and 18GHz - 26.5GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.

802.11 ac20-Low Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1578	74.16	-24.84	49.32	68.2	-18.88	peak
2	3890	59.63	-15.36	44.27	68.2	-23.93	peak
3	4944	58.15	-12.85	45.3	68.2	-22.9	peak
4	8208	56.59	-7.62	48.97	68.2	-19.23	peak
5	10554	54.55	-2.97	51.58	68.2	-16.62	peak
6	11336	54.79	-2.04	52.75	68.2	-15.45	peak

802.11 ac20-Low Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2156	68.44	-21.09	47.35	68.2	-20.85	peak
2	4706	61.45	-14.52	46.93	68.2	-21.27	peak
3	7834	56.86	-8.27	48.59	68.2	-19.61	peak
4	10384	55.61	-4.2	51.41	68.2	-16.79	peak
5	11302	53.8	-2.14	51.66	68.2	-16.54	peak
6	12458	55.29	-1.59	53.7	68.2	-14.5	peak

802.11 ac20-Middle Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1544	74.5	-25.07	49.43	68.2	-18.77	peak
2	3176	64.49	-19.14	45.35	68.2	-22.85	peak
3	4944	58.57	-12.85	45.72	68.2	-22.48	peak
4	7562	55.46	-7.22	48.24	68.2	-19.96	peak
5	10418	55.89	-4.09	51.8	68.2	-16.4	peak
6	11064	54.9	-2.65	52.25	68.2	-15.95	peak

802.11 ac20-Middle Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4740	62.34	-14.06	48.28	68.2	-19.92	peak
2	7494	56.03	-7.13	48.9	68.2	-19.3	peak
3	8276	56.78	-7.36	49.42	68.2	-18.78	peak
4	10554	54.28	-2.97	51.31	68.2	-16.89	peak
5	11064	54.48	-2.65	51.83	68.2	-16.37	peak
6	13138	53.49	0.12	53.61	68.2	-14.59	peak

802.11 ac20-High Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1578	76.78	-24.84	51.94	68.2	-16.26	peak
2	2564	69.82	-20.69	49.13	68.2	-19.07	peak
3	4332	61.62	-14.54	47.08	68.2	-21.12	peak
4	7358	55.97	-7.23	48.74	68.2	-19.46	peak
5	10724	54.25	-3	51.25	68.2	-16.95	peak
6	12424	55.34	-1.81	53.53	68.2	-14.67	peak

802.11 ac20-High Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1544	73.69	-25.07	48.62	68.2	-19.58	peak
2	3176	64.41	-19.14	45.27	68.2	-22.93	peak
3	7630	55.78	-7.44	48.34	68.2	-19.86	peak
4	8242	56.63	-7.48	49.15	68.2	-19.05	peak
5	10554	55	-2.97	52.03	68.2	-16.17	peak
6	12458	54.46	-1.59	52.87	68.2	-15.33	peak

Node:

1、Radiated emissions measured in frequency above 1GHz were made with an instrument using peak/average detector mode.

2、Average test would be performed if the peak result were greater than the average limit or as required by the applicant.

3、Margin (dB), result in dBuV/m – limit in dBuV/m.

4、All restricted band have a frequency margin greater than 14.2dB (14.2dB = 68.2dBuV/m-54dBuV/m), meet the 54dBuV/m limit, and do not require AVG.

Restricted band Requirements							
Band I							
Note: Since the distance of band IV exceeds 200 MHz and the distance limit is greater than 20 dB, only band I to band III data is reflected in this document All antennas and bandwidths are tested, and only the worst mode (802.11ac (VHT20) MIMO) is reported in the report.							
802.11 ac (VHT20)-Low (worst mode)							
Horizontal							
No.	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV)**	**Factor(dB/m)**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
1	4736.6	66.83	-14.1	52.73	68.2	-15.47	peak
2	4736.6	50.73	-14.1	36.63	54	-17.37	AVG
3	5150	67.75	-12.61	55.14	68.2	-13.06	peak
4	5150	51.73	-12.61	39.12	54	-14.88	AVG
Vertical							
No.	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV)**	**Factor(dB/m)**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
1	4921.4	61.05	-12.89	48.16	68.2	-20.04	peak
2	4923.156	46.07	-12.88	33.19	54	-20.81	AVG
3	5150	59.19	-12.61	46.58	68.2	-21.62	peak
4	5150	44.65	-12.61	32.04	54	-21.96	AVG
802.11 ac (VHT20)-High (worst mode)							
Horizontal							
No.	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV)**	**Factor(dB/m)**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
1	5350	57.52	-12.59	44.93	68.2	-23.27	peak
2	5350	45.93	-12.59	33.34	54	-20.66	AVG
3	5405.76	59.78	-12.49	47.29	68.2	-20.91	peak
4	5405.76	46.65	-12.49	34.16	54	-19.84	AVG
Vertical							
No.	**Frequency**	**Reading**	**Correct**	**Result**	**Limit**	**Margin**	**Remark**
	(MHz)	**(dBuV)**	**Factor(dB/m)**	**(dBuV/m)**	**(dBuV/m)**	**(dB)**	
1	5350	57.32	-12.59	44.73	68.2	-23.47	peak
2	5350	45.56	-12.59	32.97	54	-21.03	AVG
3	5424	58.28	-12.44	45.84	68.2	-22.36	peak
4	5424	44.66	-12.44	32.22	54	-21.78	AVG

Correction Factor = antenna factor + cable loss – amplifier gain;
Reading = Reading Amplitude in the instrument;
Result = Correction Factor + Reading;
Margin = Result – Limit

Band II

Note: Since the distance of band IV exceeds 200 MHz and the distance limit is greater than 20 dB, only band I to band III data is reflected in this document All antennas and bandwidths are tested, and only the worst mode (802.11ac (VHT20) MIMO) is reported in the report.

802.11 ac (VHT20)-Low (worst mode)

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5047.56	60.38	-12.61	47.77	68.2	-20.43	peak
2	5047.56	46.5	-12.61	33.89	54	-20.11	AVG
3	5150	58.47	-12.61	45.86	68.2	-22.34	peak
4	5150	45.19	-12.61	32.58	54	-21.42	AVG

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5056.92	59.1	-12.57	46.53	68.2	-21.67	peak
2	5056.92	45.95	-12.57	33.38	54	-20.62	AVG
3	5150	59.13	-12.61	46.52	68.2	-21.68	peak
4	5150	45.08	-12.61	32.47	54	-21.53	AVG

802.11 ac (VHT20)-High (worst mode)

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350	65.37	-12.59	52.78	68.2	-15.42	peak
2	5350	52.72	-12.59	40.13	54	-13.87	AVG
3	5371.36	68.23	-12.55	55.68	68.2	-12.52	peak
4	5371.36	51.4	-12.55	38.85	54	-15.15	AVG

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350	56.44	-12.59	43.85	68.2	-24.35	peak
2	5350	46.35	-12.59	33.76	54	-20.24	AVG
3	5395.68	58.31	-12.51	45.8	68.2	-22.4	peak
4	5395.68	45.81	-12.51	33.3	54	-20.7	AVG

Correction Factor = antenna factor + cable loss – amplifier gain;
Reading = Reading Amplitude in the instrument;
Result = Correction Factor + Reading;
Margin = Result – Limit

Band III

Note: Since the distance of band IV exceeds 200 MHz and the distance limit is greater than 20 dB, only band I to band III data is reflected in this document All antennas and bandwidths are tested, and only the worst mode (802.11ac (VHT20) MIMO) is reported in the report.

802.11 ac(VHT20)-Low (worst mode)

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5424.96	73.36	-12.44	60.92	68.2	-7.28	peak
2	5424.96	53.21	-12.44	40.77	54	-13.23	AVG
3	5460	60.5	-12.3	48.2	68.2	-20	peak
4	5460	52.03	-12.3	39.73	54	-14.27	AVG

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5452.32	72.04	-12.34	59.7	68.2	-8.5	peak
2	5452.32	52.63	-12.34	40.29	54	-13.71	AVG
3	5460	57.69	-12.3	45.39	68.2	-22.81	peak
4	5460	51.95	-12.3	39.65	54	-14.35	AVG

802.11 ac (VHT20)-High (worst mode)

Note: Since the distance restricted band of this part frequency exceeds 200 MHz and the distance limit is greater than 20 dB.

Correction Factor = antenna factor + cable loss – amplifier gain;
Reading = Reading Amplitude in the instrument;
Result = Correction Factor + Reading;
Margin = Result – Limit

3.2. Maximum Conducted Output Power Measurement

Limit

Type	Test Item	Frequency [MHz]	Limit
FCC	Conducted Output Power	5150-5250	⩽ 250mW (24dBm)
		5250-5350 5470-5725	⩽ 250mW(24dBm) or 11dBm+10logB, where B is the 26 dB emission bandwidth in MHz, where is lesser.
		5725-5850	⩽1W (30dBm)
IC	E.I.R.P	5150-5250	⩽200mW (23dBm) or 10 dBm + 10 logB, where B is the 99% emission bandwidth in MHz, where is lesser.
		5250-5350	⩽1W (30dBm) or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz.
		5470-5600	
		5650-5725	
	Conducted Output Power	5725-5850	⩽1W (30dBm)

Test Procedure

The EUT was directly connected to the Power Sensor & PC.
Some regulatory agencies permit the maximum conducted (average) output power to be measured as an alternative to the maximum peak conducted output power for determining compliance to the limit. When this option is exercised, the measured power is to be referenced to the OBW rather than to the DTS bandwidth (see 11.2 for definitions and 6.9.2 for measurement guidance).
When using a spectrum analyzer or EMI receiver to perform these measurements, it shall be capable of utilizing a number of measurement points in each sweep that is greater than or equal to twice the span / RBW, to set a bin-to-bin spacing of ≤ RBW / 2 so that narrowband signals are not lost between frequency bins. If possible, configure or modify the operation of the EUT so that it transmits continuously at its maximum power control level (see 11.6).
The intent is to test at 100% duty cycle; however, a small reduction in duty cycle (to no lower than 98%) is permitted, if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test laboratory to permit such continuous operation.
If continuous transmission (or at least 98% duty cycle) cannot be achieved because of 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 during which sweep triggering/signal gating techniques may be used to perform the measurement over the transmission duration.

Measurement using a power meter (PM)：

1. Method AVGPM：

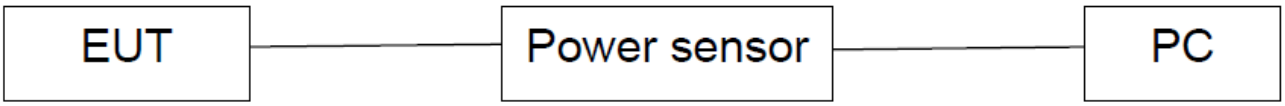
Method AVGPM is a measurement using an RF average power meter, as follows:
a) As an alternative to spectrum analyzer or EMI receiver measurements, measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied:
1) The EUT is configured to transmit continuously, or to transmit with a constant duty cycle.
2) At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.
3) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
b) If the transmitter does not transmit continuously, measure the duty cycle, D, of the transmitter

output signal as described in 11.6.
c) Measure the average power of the transmitter. This measurement is an average over both the ON
and OFF periods of the transmitter.
d) Adjust the measurement in dBm by adding [10 log (1 / D)], where D is the duty cycle.

2. Method AVGPM-G：

Method AVGPM-G is a measurement using a gated RF average power meter.
Alternatively, measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Because the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

Test Configuration



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.

Test Results

Pass

802.11a mode								
CH	Freq.	Conducted Power (dBm)		E.I.R.P. (dBm)		Limit (dBm)		Result
		ANT1	ANT2	ANT1	ANT2	IC	FCC	
36	5180	11.146	11.083	15.536	15.473	22.15	23.98	Pass
40	5200	10.672	10.867	15.062	15.257	22.15	23.98	Pass
48	5240	10.355	11.059	14.745	15.449	22.14	23.98	Pass
52	5260	10.402	10.744	14.792	15.134	23.17	23.98	Pass
60	5300	10.309	10.198	14.699	14.588	23.15	23.98	Pass
64	5320	10.311	10.35	14.701	14.74	23.15	23.98	Pass
100	5500	11.572	11.715	16.292	16.435	23.15	23.98	Pass
116	5580	11.897	12.173	16.617	16.893	23.15	23.98	Pass
140	5700	11.572	11.914	16.292	16.634	23.14	23.98	Pass
149	5745	11.072	10.902	n.a.	n.a.	30	30	Pass
157	5785	11.564	12.352	n.a.	n.a.	30	30	Pass
165	5825	11.788	12.25	n.a.	n.a.	30	30	Pass

Note:
1) The cable loss is taken into account in results.
2) Antenna gain(G) of 802.11 a/n/ac: 5150MHz to 5350MHz: 4.39 dBi, 5470MHz to 5725MHz: 4.72 dBi, 5725MHz to 5850MHz: 4.26 dBi(ANT1&2).
3) For 5150-5250MHz in ISED's limit, 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.
4) For 5250-5350MHz, 5470-5600MHz, 5650-5725MHz and 5725-5850MHz in ISED's limit, the maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less, whichever power is less. B is the 99% emission bandwidth in megahertz.

802.11n HT20 mode								
CH	Freq.	Conducted Power (dBm)		Total Power (dBm)		Limit (dBm)		Result
		ANT1	ANT2	Conducted	E.I.R.P.	IC	FCC	
36	5180	5.227	6.091	8.691	13.081	22.43	23.98	Pass
40	5200	4.946	6.256	8.661	13.051	22.44	23.98	Pass
48	5240	4.715	6.158	8.506	12.896	22.44	23.98	Pass
52	5260	8.997	9.622	12.331	16.721	23.45	23.98	Pass
60	5300	8.81	9.294	12.069	16.459	23.45	23.98	Pass
64	5320	8.952	9.235	12.106	16.496	23.45	23.98	Pass
100	5500	10.062	10.513	13.304	18.024	23.45	23.98	Pass
116	5580	10.609	11.016	13.828	18.548	23.44	23.98	Pass
140	5700	10.131	10.703	13.437	18.157	23.44	23.98	Pass
149	5745	10.484	10.492	13.498	n.a.	30	30	Pass
157	5785	10.388	11.416	13.943	n.a.	30	30	Pass
165	5825	10.628	11.087	13.874	n.a.	30	30	Pass

Note:

1) The cable loss is taken into account in results.

2) Antenna gain(G) of 802.11 a/n/ac: 5150MHz to 5350MHz: 4.39 dBi, 5470MHz to 5725MHz: 4.72 dBi, 5725MHz to 5850MHz: 4.26 dBi(ANT1&2).

3) For 5150-5250MHz in ISED's limit, 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.

4) For 5250-5350MHz, 5470-5600MHz, 5650-5725MHz and 5725-5850MHz in ISED's limit, the maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less, whichever power is less. B is the 99% emission bandwidth in megahertz.

802.11n HT40 mode								
CH	Freq.	Conducted Power (dBm)		Total Power (dBm)		Limit (dBm)		Result
		ANT1	ANT2	Conducted	E.I.R.P.	IC	FCC	
38	5190	7.798	8.849	11.366	15.756	23	23.98	Pass
46	5230	7.478	9.045	11.342	15.732	23	23.98	Pass
54	5270	10.86	11.351	14.123	18.513	23.98	23.98	Pass
62	5310	10.713	10.987	13.862	18.252	23.98	23.98	Pass
102	5510	12.052	12.262	15.169	19.889	23.98	23.98	Pass
110	5550	11.953	12.588	15.292	20.012	23.98	23.98	Pass
134	5670	12.142	12.62	15.398	20.118	23.98	23.98	Pass
151	5755	11.925	12.371	15.164	n.a.	30	30	Pass
159	5795	11.89	12.665	15.305	n.a.	30	30	Pass

Note:
1) The cable loss is taken into account in results.
2) Antenna gain(G) of 802.11 a/n/ac: 5150MHz to 5350MHz: 4.39 dBi, 5470MHz to 5725MHz: 4.72 dBi, 5725MHz to 5850MHz: 4.26 dBi(ANT1&2).
3) For 5150-5250MHz in ISED's limit, 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.
4) For 5250-5350MHz, 5470-5600MHz, 5650-5725MHz and 5725-5850MHz in ISED's limit, the maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less, whichever power is less. B is the 99% emission bandwidth in megahertz.

802.11ac VHT20 mode								
CH	Freq.	Conducted Power (dBm)		Total Power (dBm)		Limit (dBm)		Result
		ANT1	ANT2	Conducted	E.I.R.P.	IC	FCC	
36	5180	5.3	6.561	8.986	13.376	22.44	23.98	Pass
40	5200	4.833	6.315	8.647	13.037	22.43	23.98	Pass
48	5240	4.964	6.891	9.044	13.434	22.43	23.98	Pass
52	5260	9.056	9.556	12.323	16.713	23.44	23.98	Pass
60	5300	8.879	9.305	12.108	16.498	23.45	23.98	Pass
64	5320	8.987	9.295	12.154	16.544	23.46	23.98	Pass
100	5500	10.046	10.313	13.192	17.912	23.46	23.98	Pass
116	5580	10.647	11.085	13.882	18.602	23.46	23.98	Pass
140	5700	10.409	10.833	13.636	18.356	23.45	23.98	Pass
149	5745	9.532	9.564	12.558	n.a.	30	30	Pass
157	5785	8.642	9.138	11.907	n.a.	30	30	Pass
165	5825	9.179	10.051	12.647	n.a.	30	30	Pass

Note:
1) The cable loss is taken into account in results.
2) Antenna gain(G) of 802.11 a/n/ac: 5150MHz to 5350MHz: 4.39 dBi, 5470MHz to 5725MHz: 4.72 dBi, 5725MHz to 5850MHz: 4.26 dBi(ANT1&2).
3) For 5150-5250MHz in ISED's limit, 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.
4) For 5250-5350MHz, 5470-5600MHz, 5650-5725MHz and 5725-5850MHz in ISED's limit, the maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less, whichever power is less. B is the 99% emission bandwidth in megahertz.

802.11ac VHT40 mode								
CH	Freq.	Conducted Power (dBm)		Total Power (dBm)		Limit (dBm)		Result
		ANT1	ANT2	Conducted	E.I.R.P.	IC	FCC	
38	5190	7.773	9.115	11.506	15.896	23	23.98	Pass
46	5230	7.558	9.395	11.583	15.973	23	23.98	Pass
54	5270	10.9	11.406	14.171	18.561	23.98	23.98	Pass
62	5310	10.422	10.834	13.643	18.033	23.98	23.98	Pass
102	5510	11.798	12.16	14.993	19.713	23.98	23.98	Pass
110	5550	11.368	12.045	14.73	19.45	23.98	23.98	Pass
134	5670	11.843	12.157	15.013	19.733	23.98	23.98	Pass
151	5755	11.836	12.264	15.066	n.a.	30	30	Pass
159	5795	12.106	12.915	15.54	n.a.	30	30	Pass

Note:
1) The cable loss is taken into account in results.
2) Antenna gain(G) of 802.11 a/n/ac: 5150MHz to 5350MHz: 4.39 dBi, 5470MHz to 5725MHz: 4.72 dBi, 5725MHz to 5850MHz: 4.26 dBi(ANT1&2).
3) For 5150-5250MHz in ISED's limit, 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.
4) For 5250-5350MHz, 5470-5600MHz, 5650-5725MHz and 5725-5850MHz in ISED's limit, the maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less, whichever power is less. B is the 99% emission bandwidth in megahertz.

802.11ac VHT80 mode								
CH	Freq.	Conducted Power (dBm)		Total Power (dBm)		Limit (dBm)		Result
		ANT1	ANT2	Conducted	E.I.R.P.	IC	FCC	
42	5210	10.266	10.644	13.469	17.859	23	23.98	Pass
58	5290	10.082	10.364	13.236	17.626	23.98	23.98	Pass
106	5530	11.086	11.674	14.4	19.12	23.98	23.98	Pass
155	5775	11.109	11.76	14.457	n.a.	30	30	Pass

Note:
1) The cable loss is taken into account in results.
2) Antenna gain(G) of 802.11 a/n/ac: 5150MHz to 5350MHz: 4.39 dBi, 5470MHz to 5725MHz: 4.72 dBi, 5725MHz to 5850MHz: 4.26 dBi(ANT1&2).
3) For 5150-5250MHz in ISED's limit, 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.
4) For 5250-5350MHz, 5470-5600MHz, 5650-5725MHz and 5725-5850MHz in ISED's limit, the maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less, whichever power is less. B is the 99% emission bandwidth in megahertz.

3.3. Conducted Power Spectral Density Measurement

Limits

Type	Frequency [MHz]	Limit
FCC	5150-5250 5250-5350 5470-5725	⩽11dBm/MHz
	5725-5850	⩽30dBm/500KHz
IC	5150-5250	⩽10dBm/MHz
	5250-5350	⩽11dBm/MHz
	5470-5600	
	5650-5725	
	5725-5850	⩽30dBm/500KHz

Test Procedure

1. The setting follows Method SA-1 of FCC KDB 789033 D02 General U-NII Test Procedures New Rules v02r01.
For devices operating in the band, 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 10 log (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 10 log (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 sections5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

TEST SETUP

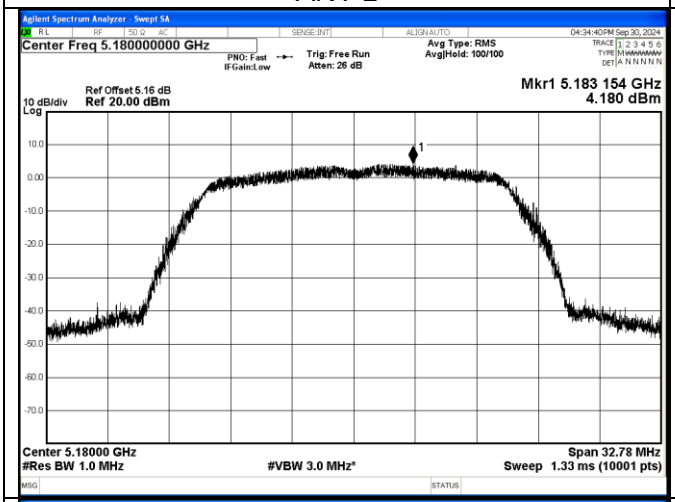
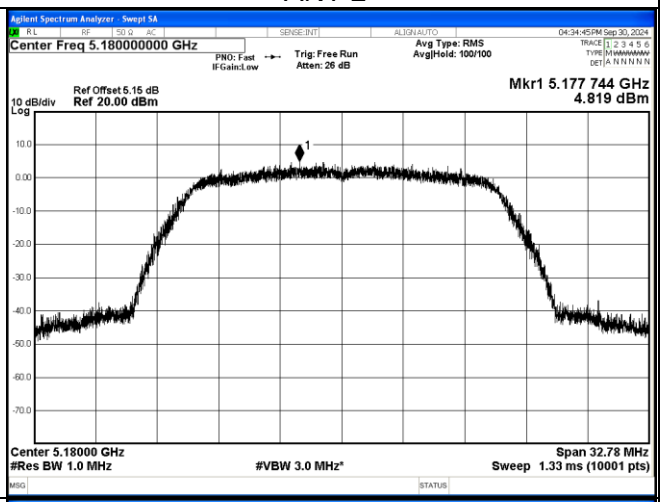
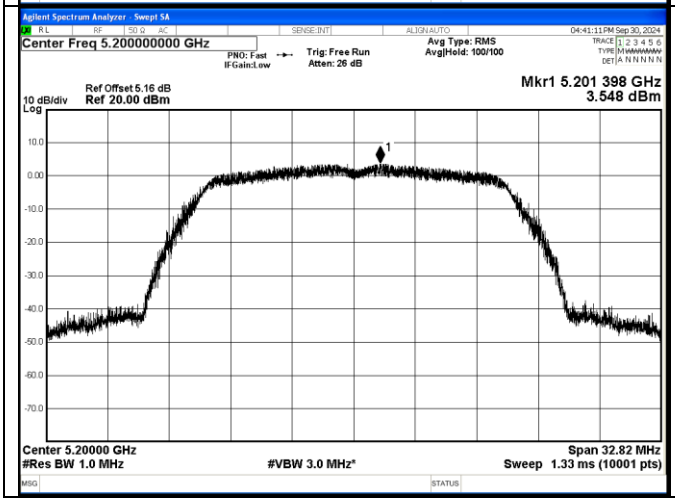
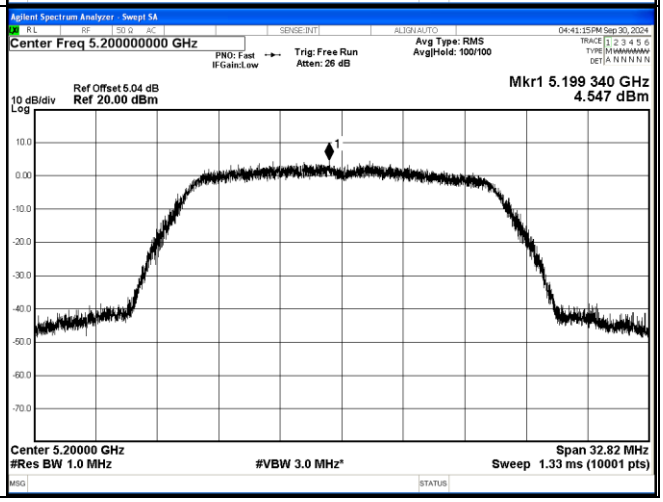
EUT OPERATION CONDITIONS

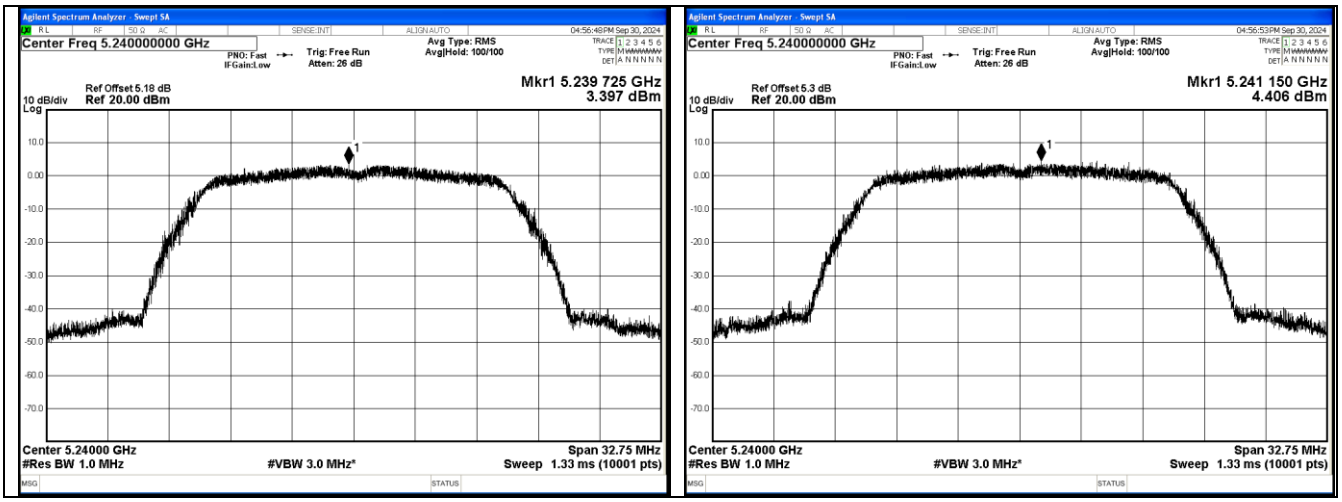
The EUT tested system was configured as the statements of 2.5 Unless otherwise a special operating condition is specified in the follows during the testing.

Test Results

802.11a mode:								
CH	Freq.	FCC PSD (dBm/MHz)		IC EIRP PSD (dBm/MHz)		IC Limit (dBm/MHz)	FCC Limit (dBm/MHz)	Result
		ANT1	ANT2	ANT1	ANT2			
36	5180	4.18	4.819	8.570	9.209	10	11	Pass
44	5200	3.548	4.547	7.938	8.937	10	11	Pass
48	5240	3.397	4.406	7.787	8.796	10	11	Pass

Note:
Antenna gain(G) of 802.11 a/n/ac: 5150MHz to 5350MHz: 4.39 dBi, 5470MHz to 5725MHz: 4.72 dBi, 5725MHz to 5850MHz: 4.26 dBi(ANT1&2).
For the data of other bands other than the above bands, the margin of the worst-case scenario is 2.759dB.

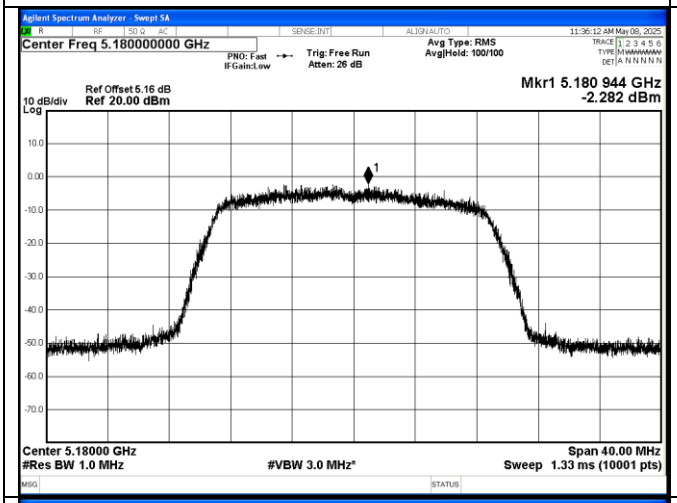
ANT 1	ANT 2
	
	

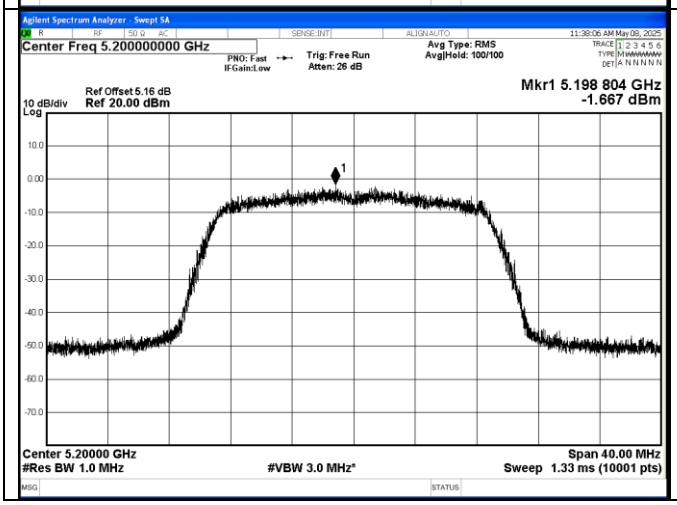

Agilent Spectrum Analyzer - Swept SA
Center Freq 5.240000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 26 dB
Avg Type: RMS
Avg|Hold: 100/100
04:56:48PM Sep 30, 2024
Mkr1 5.239 725 GHz
3.397 dBm
Ref Offset 5.18 dB
10 dB/div
Log
Ref 20.00 dBm
Center 5.24000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Span 32.75 MHz
Sweep 1.33 ms (10001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.240000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 26 dB
Avg Type: RMS
Avg|Hold: 100/100
04:56:53PM Sep 30, 2024
Mkr1 5.241 150 GHz
4.406 dBm
Ref Offset 5.3 dB
10 dB/div
Log
Ref 20.00 dBm
Center 5.24000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Span 32.75 MHz
Sweep 1.33 ms (10001 pts)

802.11n HT20 mode:								
CH	Freq.	ANT1_PSD (dBm/MHz)	ANT2_PSD (dBm/MHz)	FCC MIMO PSD (dBm/MHz)	IC MIMO EIRP PSD (dBm/MHz)	IC Limit (dBm/MHz)	FCC Limit (dBm/MHz)	Result
36	5180	-2.282	-1.637	1.063	8.463	10	11	Pass
44	5200	-1.667	-0.913	1.737	9.137	10	11	Pass
48	5240	-2.593	-1.159	1.193	8.593	10	11	Pass

Note:
Antenna gain(G) of 802.11 a/n/ac: 5150MHz to 5350MHz: 4.39 dBi, 5470MHz to 5725MHz: 4.72 dBi, 5725MHz to 5850MHz: 4.26 dBi(ANT1&2).
For 802.11n and 802.11ac, the EUT incorporates a MIMO function. The Antenna directional gain = G_{ANT} + Array Gain = 7.40 dBi, where Array Gain = 10 log(2/1) = 3.01 dB.
For the data of other bands other than the above bands, the margin of the worst-case scenario is 2.759dB.

ANT 1





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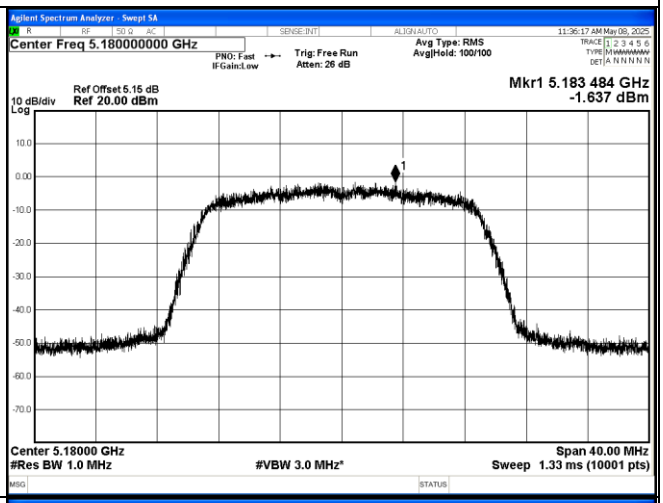

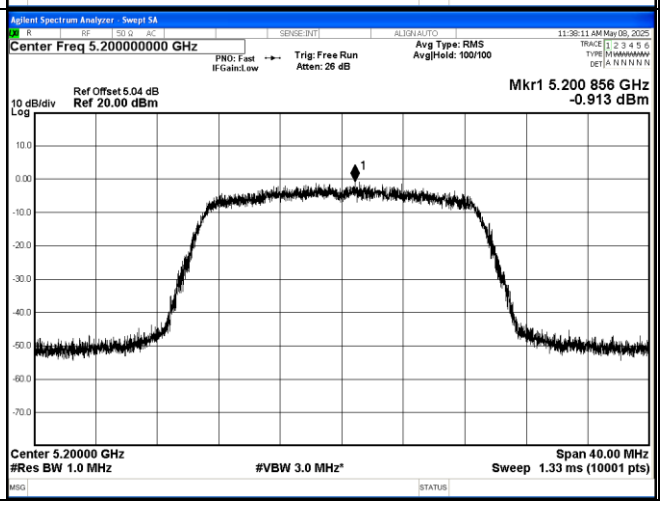

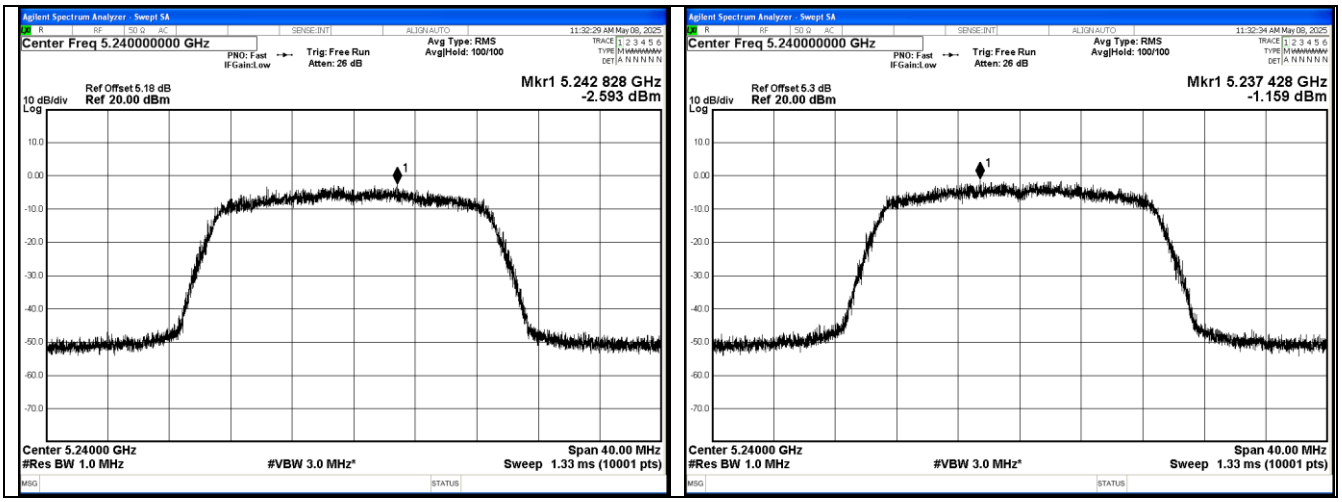
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.240000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 26 dB
Avg Type: RMS
Avg|Hold: 100/100
11:32:29 AM May 08, 2025
Mkr1 5.242 828 GHz
-2.593 dBm
Ref Offset 5.18 dB
10 dB/div
Log
Ref 20.00 dBm
Center 5.24000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Span 40.00 MHz
Sweep 1.33 ms (10001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.240000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 26 dB
Avg Type: RMS
Avg|Hold: 100/100
11:32:34 AM May 08, 2025
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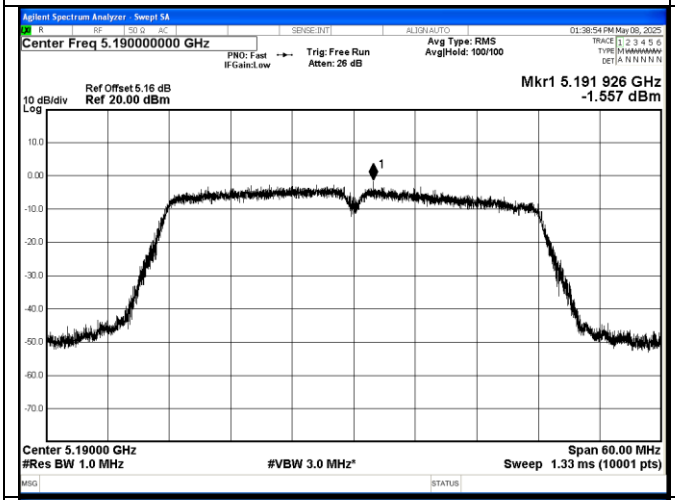
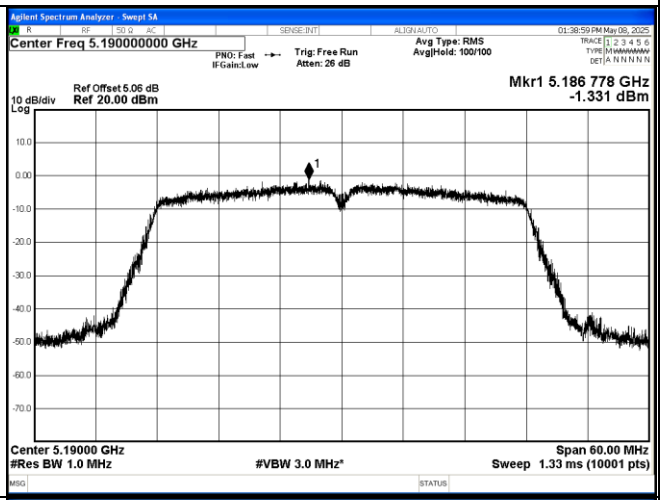
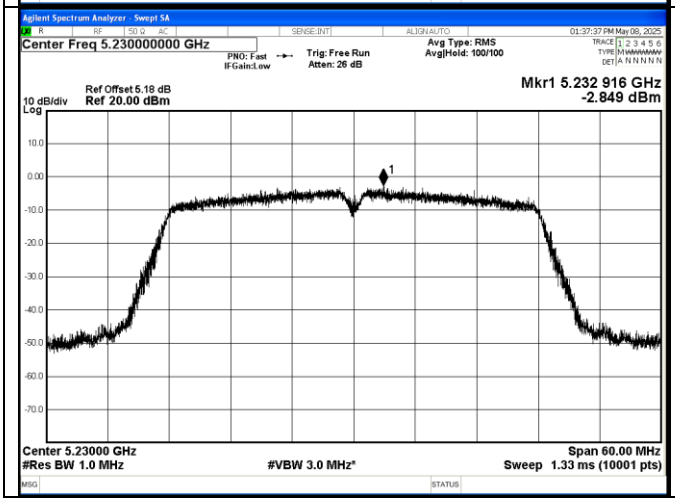
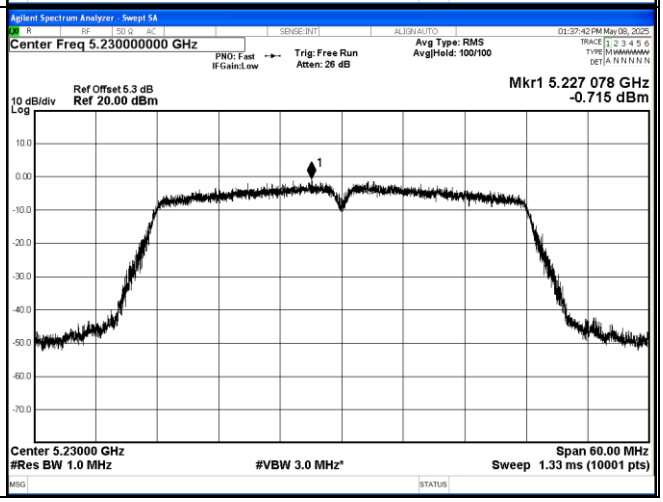
-1.159 dBm
Ref Offset 5.3 dB
10 dB/div
Log
Ref 20.00 dBm
Center 5.24000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Span 40.00 MHz
Sweep 1.33 ms (10001 pts)

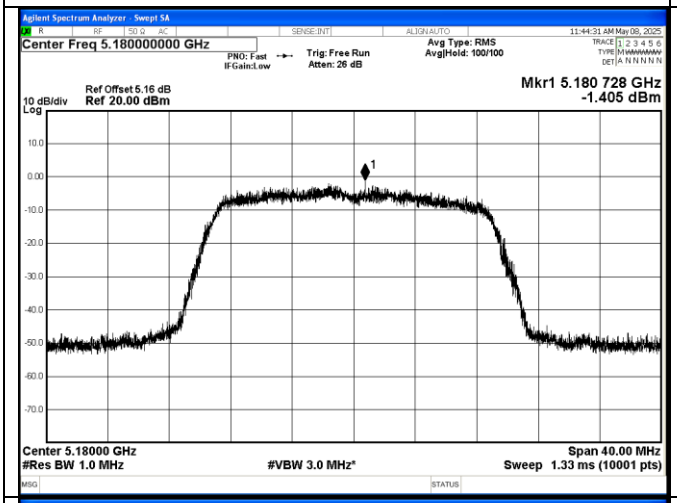
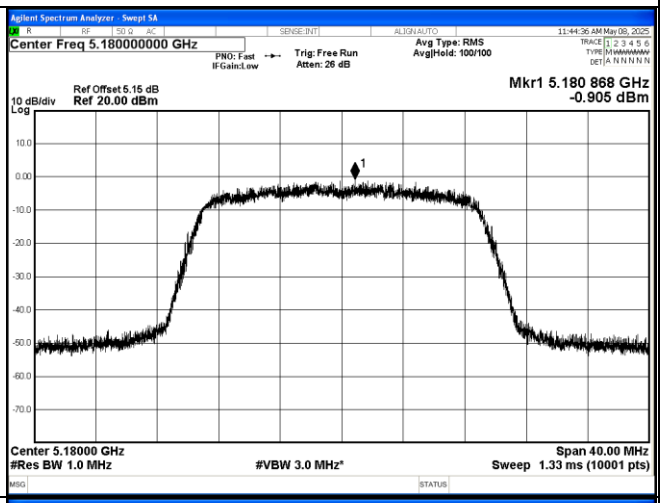
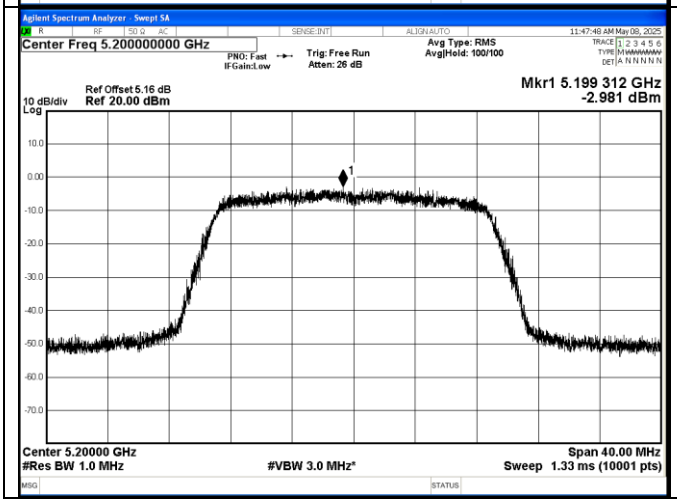
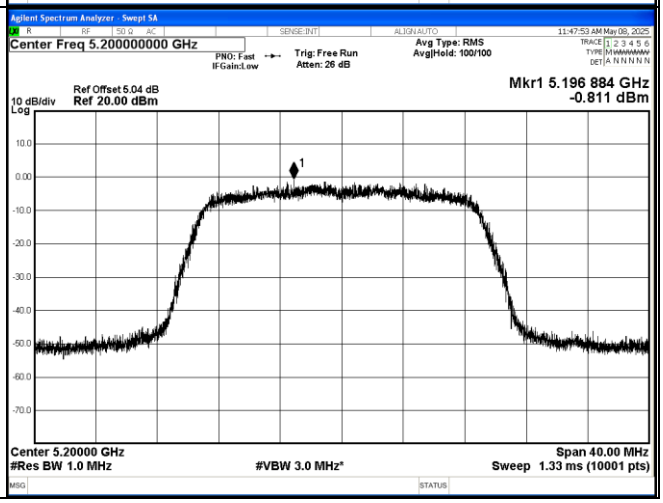
802.11n HT40 mode:								
CH	Freq.	ANT1_PSD (dBm/MHz)	ANT2_PSD (dBm/MHz)	FCC MIMO PSD (dBm/MHz)	IC MIMO EIRP PSD (dBm/MHz)	IC Limit (dBm/MHz)	FCC Limit (dBm/MHz)	Result
38	5190	-1.557	-1.331	1.568	8.968	10	11	Pass
46	5230	-2.849	-0.715	1.358	8.758	10	11	Pass

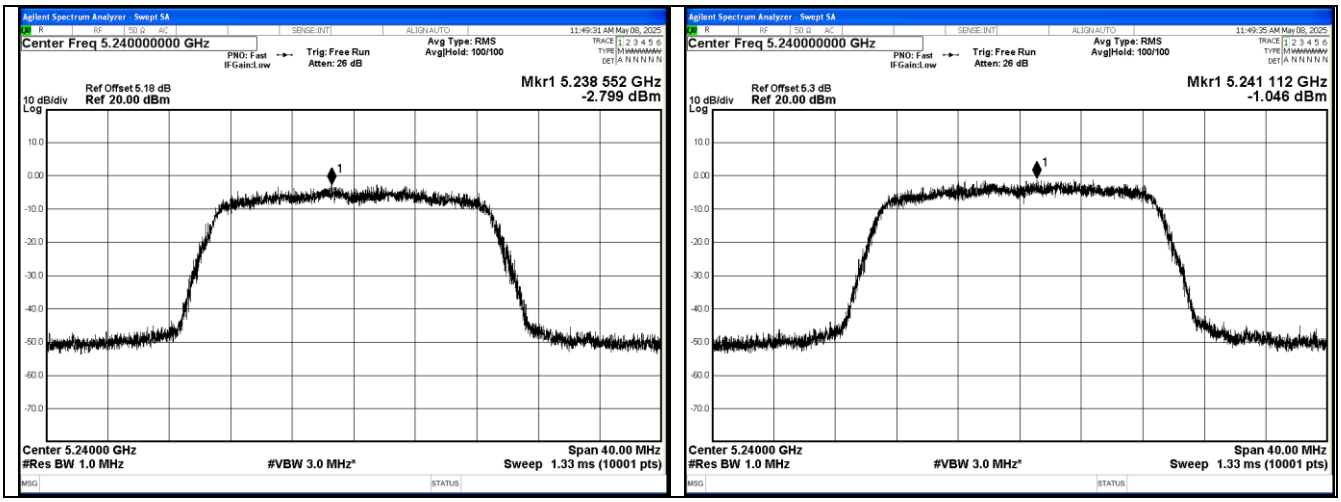
Note:
Antenna gain(G) of 802.11 a/n/ac: 5150MHz to 5350MHz: 4.39 dBi, 5470MHz to 5725MHz: 4.72 dBi, 5725MHz to 5850MHz: 4.26 dBi(ANT1&2).
For 802.11n and 802.11ac, the EUT incorporates a MIMO function. The Antenna directional gain = G_{ANT} + Array Gain = 7.40 dBi, where Array Gain = 10 log(2/1) = 3.01 dB.
For the data of other bands other than the above bands, the margin of the worst-case scenario is 2.759dB.

ANT 1	ANT 2
	
	

802.11ac VHT20 mode:								
CH	Freq.	ANT1_PSD (dBm/MHz)	ANT2_PSD (dBm/MHz)	FCC MIMO PSD (dBm/MHz)	IC MIMO EIRP PSD (dBm/MHz)	IC Limit (dBm/MHz)	FCC Limit (dBm/MHz)	Result
36	5180	-1.405	-0.905	1.862	9.262	10	11	Pass
44	5200	-2.981	-0.811	1.248	8.648	10	11	Pass
48	5240	-2.799	-1.046	1.176	8.576	10	11	Pass

Note:
Antenna gain(G) of 802.11 a/n/ac: 5150MHz to 5350MHz: 4.39 dBi, 5470MHz to 5725MHz: 4.72 dBi, 5725MHz to 5850MHz: 4.26 dBi(ANT1&2).
For 802.11n and 802.11ac, the EUT incorporates a MIMO function. The Antenna directional gain = G_{ANT} + Array Gain = 7.40 dBi, where Array Gain = 10 log(2/1) = 3.01 dB.
For the data of other bands other than the above bands, the margin of the worst-case scenario is 2.759dB.

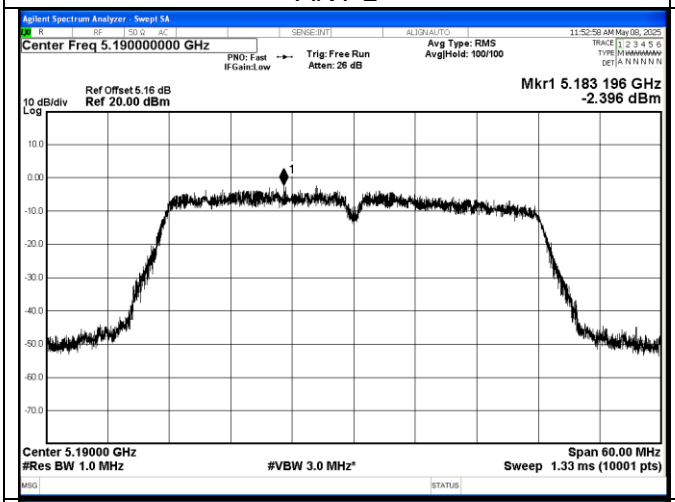
ANT 1	ANT 2
	
	

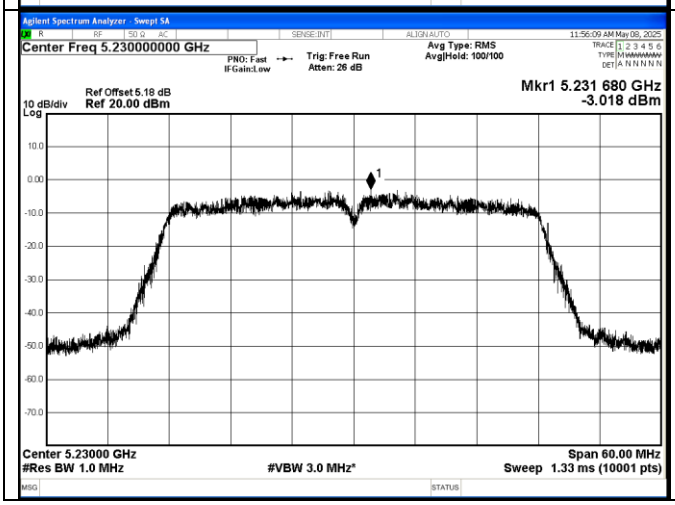

Agilent Spectrum Analyzer - Swept SA
Center Freq 5.240000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 26 dB
Avg Type: RMS
Avg|Hold: 100/100
11:49:31 AM May 08, 2025
Mkr1 5.238 552 GHz
-2.799 dBm
Ref Offset 5.18 dB
10 dB/div
Log
Ref 20.00 dBm
Center 5.24000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Span 40.00 MHz
Sweep 1.33 ms (10001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.240000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 26 dB
Avg Type: RMS
Avg|Hold: 100/100
11:49:35 AM May 08, 2025
Mkr1 5.241 112 GHz
-1.046 dBm
Ref Offset 5.3 dB
10 dB/div
Log
Ref 20.00 dBm
Center 5.24000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Span 40.00 MHz
Sweep 1.33 ms (10001 pts)

802.11ac VHT40 mode:								
CH	Freq.	ANT1_PSD (dBm/MHz)	ANT2_PSD (dBm/MHz)	FCC MIMO PSD (dBm/MHz)	IC MIMO EIRP PSD (dBm/MHz)	IC Limit (dBm/MHz)	FCC Limit (dBm/MHz)	Result
38	5190	-2.396	-1.201	1.253	8.653	10	11	Pass
46	5230	-3.018	-1.246	0.968	8.368	10	11	Pass

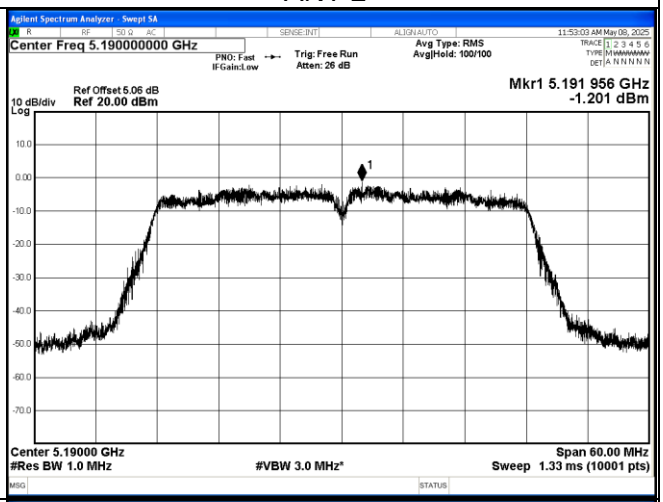
Note:
Antenna gain(G) of 802.11 a/n/ac: 5150MHz to 5350MHz: 4.39 dBi, 5470MHz to 5725MHz: 4.72 dBi, 5725MHz to 5850MHz: 4.26 dBi(ANT1&2).
For 802.11n and 802.11ac, the EUT incorporates a MIMO function. The Antenna directional gain = G_{ANT} + Array Gain = 7.40 dBi, where Array Gain = 10 log(2/1) = 3.01 dB.
For the data of other bands other than the above bands, the margin of the worst-case scenario is 2.759dB.

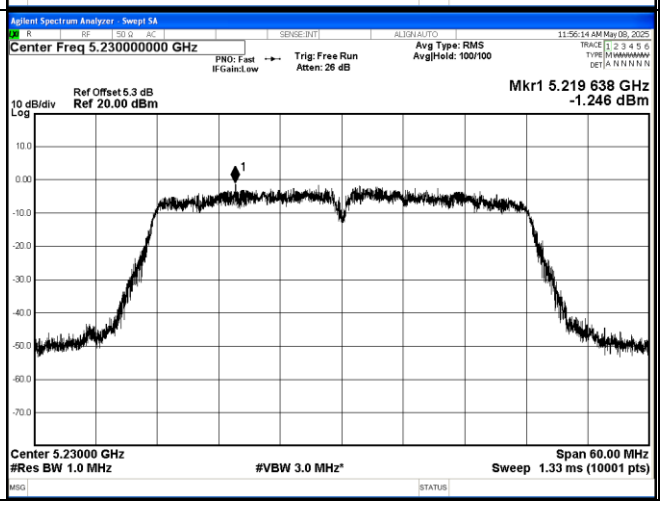
ANT 1





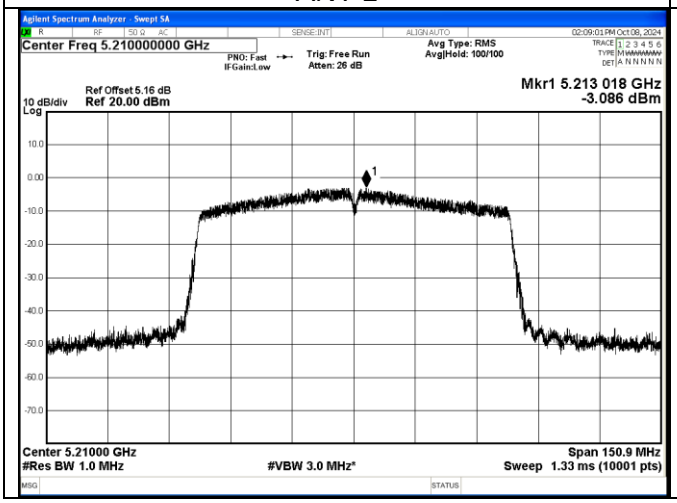
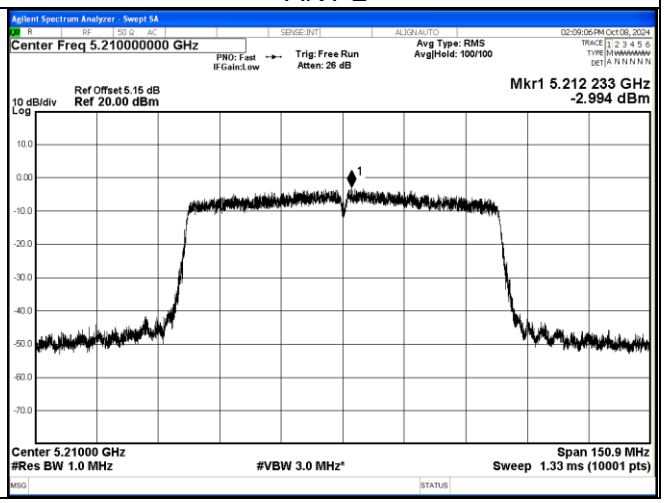
ANT 2





802.11ac VHT80 mode:								
CH	Freq.	ANT1_PSD (dBm/MHz)	ANT2_PSD (dBm/MHz)	FCC MIMO PSD (dBm/MHz)	IC MIMO EIRP PSD (dBm/MHz)	IC Limit (dBm/MHz)	FCC Limit (dBm/MHz)	Result
42	5210	-3.086	-2.994	-0.029	7.371	10	11	Pass

Note:
Antenna gain(G) of 802.11 a/n/ac: 5150MHz to 5350MHz: 4.39 dBi, 5470MHz to 5725MHz: 4.72 dBi, 5725MHz to 5850MHz: 4.26 dBi(ANT1&2).
For 802.11n and 802.11ac, the EUT incorporates a MIMO function. The Antenna directional gain = G_{ANT} + Array Gain = 7.40 dBi, where Array Gain = 10 log(2/1) = 3.01 dB.
For the data of other bands other than the above bands, the margin of the worst-case scenario is 2.759dB.

ANT 1	ANT 2
	

3.4. Dynamic Frequency Selection (DFS) Measurement

Applicability of DFS requirements

Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	☐Master	☒Client Without Radar Detection	☐Client with Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Applicability of DFS requirements during normal operation

Requirement	Operational Mode	
	☐Master Device or Client with Radar Detection	☒Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	☐Master Device or Client with Radar Detection	☒Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW Mode available for the link
All other tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20MHz channels and the channel center frequency.		

Limit

DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP ⩾ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.

Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.
Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required facilitating a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.
Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

Parameters of radar test waveforms

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a	$\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{\text{PRI}_{\mu\text{sec}}}\right)\right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.

A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. If more than 30 waveforms are used for Short Pulse Radar Types 2 through 4, then each

additional
waveform must also be unique and not repeated from the previous waveforms. If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test
B and must also be unique and not repeated from the previous waveforms in Tests A or B.

Calibration of radar waveform

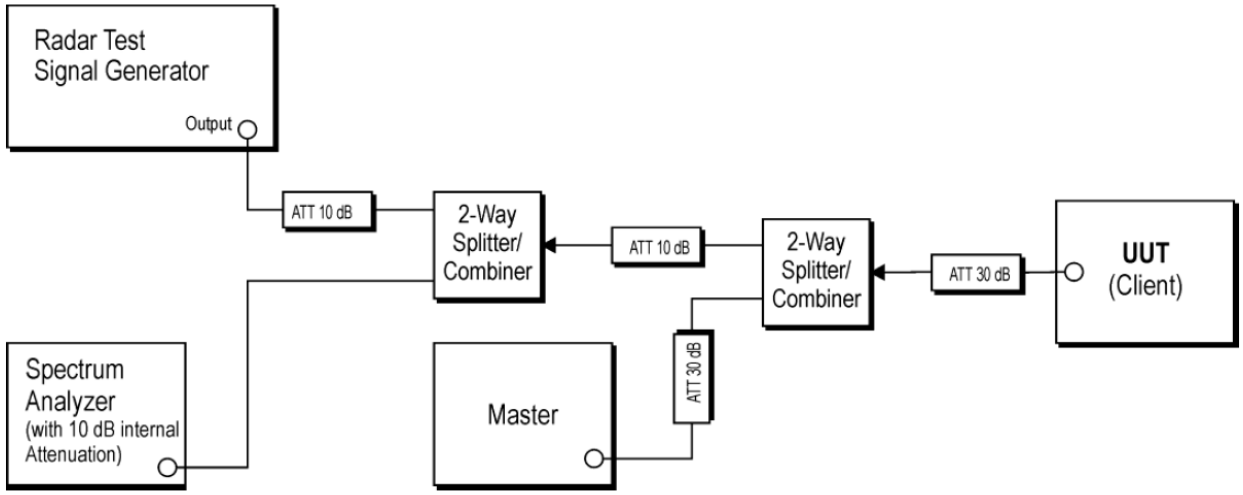
Radar Waveform Calibration Procedure:
(1) A 50 ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to place of the master
(2) The interference Radar Detection Threshold Level is -62dBm + 0dBi +1dB = -61dBm that had been taken into account the output power range and antenna gain.
(3) The following equipment setup was used to calibrate the conducted radar waveform. A vector signal generator was utilized to establish the test signal level for radar type 0. During this process there were no transmissions by either the master or client device. The spectrum analyzer was switched to the zero spans (time domain) at the frequency of the radar waveform generator. Peak detection was used. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 3 MHz. The spectrum analyzer had offset -1.0dB to compensate RF cable loss 1.0dB.
(4) The vector signal generator amplitude was set so that the power level measured at the spectrum analyzer was - -62dBm + 0dBi +1dB = -61dBm. Capture the spectrum analyzer plots on short pulse radar waveform.
Conducted Calibration Setup:

Channel closing transmission time, channel move time and non-occupancy period

Block diagram of test setup Test Procedure:
(1) The radar pulse generator is setup to provide a pulse at frequency that the master and client are operating. A type 0 radar pulse with a 1us pulse width and a 1428us PRI is used for the testing.
(2) The vector signal generator is adjusted to provide the radar burst (18 pulses) at the level of approximately -61dBm at the antenna port of the master device.
(3) A trigger is provided from the pulse generator to the DFS monitoring system in order to capture the traffic and the occurrence of the radar pulse.
(4) EUT will associate with the master at channel. The file “iperf.exe” specified by the FCC is streamed from the PC 2 through the master and the client device to the PC 1 and played in full motion video using Test Software in order to properly load the network for the entire period of the test.
(5) When radar burst with a level equal to the DFS Detection Threshold +1dB is generated on the operating channel of the U-NII device. At time T0 the radar waveform generator sends a burst of pulse of the radar waveform at Detection Threshold +1dB.
(6) Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel. Measure and record the transmissions from the UUT during the observation time (Channel Move Time). One 15 seconds plot is reported for the Short Pulse Radar Type 0. The plot for the Short Pulse Radar Types start at the end of the radar burst. The Channel Move Time will be calculated based on the zoom in 600ms plot of the Short Pulse Radar Type.
(7) Measurement of the aggregate duration of the Channel Closed Transmission Time method. With the
(8) spectrum analyzer set to zero span tuned to the center frequency of the EUT operating channel at the radar simulated frequency, peak detection, and max hold, the dwell time per bin is given by: Dwell (0.3ms) =S (12000ms) / B (4000); where Dwell is the dwell time per spectrum analyzer sampling bin, S is sweep time and B is the number of spectrum analyzer sampling bins. An upper bound of the aggregate duration of the intermittent control signals of Channel Closing Transmission Time is calculated by: C (ms)= N X Dwell (0.3ms); where C is the Closing Time, N is the number of spectrum analyzer sampling bins (intermittent control

signals) showing a U-NII transmission and Dwell is the dwell time per bin.
(9) Measurement the EUT for more than 30 minutes following the channel move time to verify that no transmission or beacons occur on this channel.

Test setup

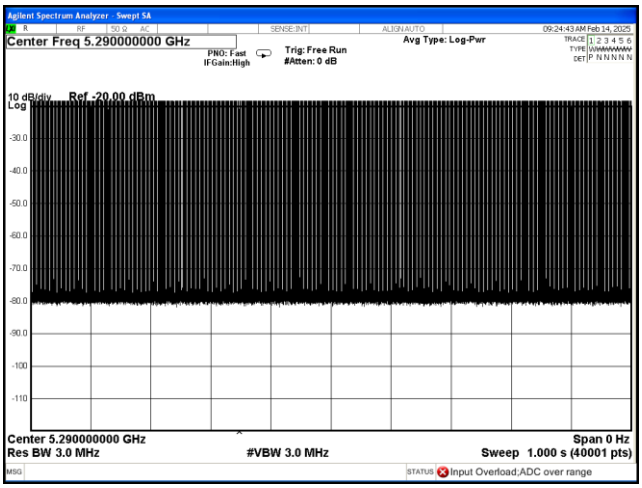


Test result

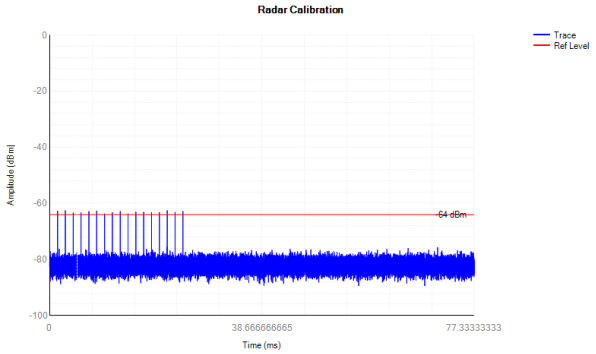
Band II					
Description	Radar Type	Radar Freq.	Measured Val.(s)	Requirement	Status
Channel closing transmission time	1	5290	0.0219	<60ms	Complies
Channel move time	1	5290	1.1756	<10s	Complies
Non-Occupancy Period	1	5290	not be less than 30 Min	30 Minutes	Complies

Band III					
Description	Radar Type	Radar Freq.	Measured Val.(s)	Requirement	Status
Channel closing transmission time	1	5530	0.0252	<60ms	Complies
Channel move time	1	5530	1.1822	<10s	Complies
Non-Occupancy Period	1	5530	not be less than 30 Min	30 Minutes	Complies

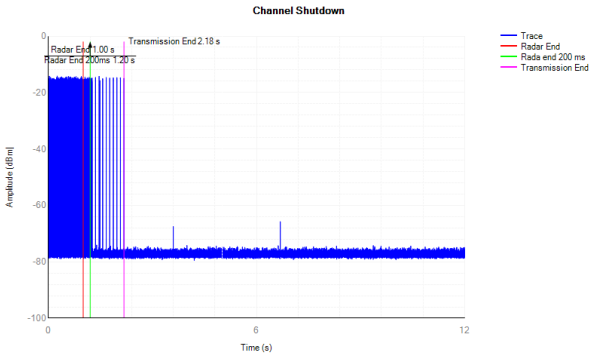
Remark: Tests were performed using the conduction test method. DFS is not applicable to 5600-5650 frequency band for IC.



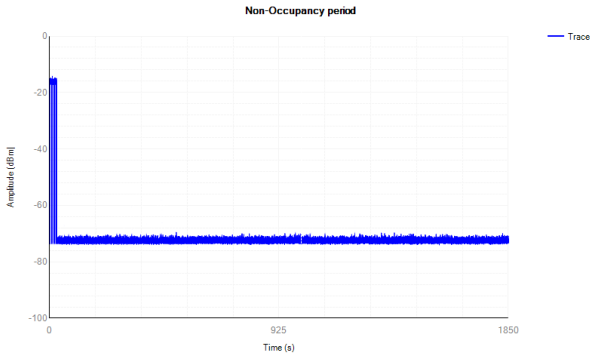
Bandwidth 80MHz



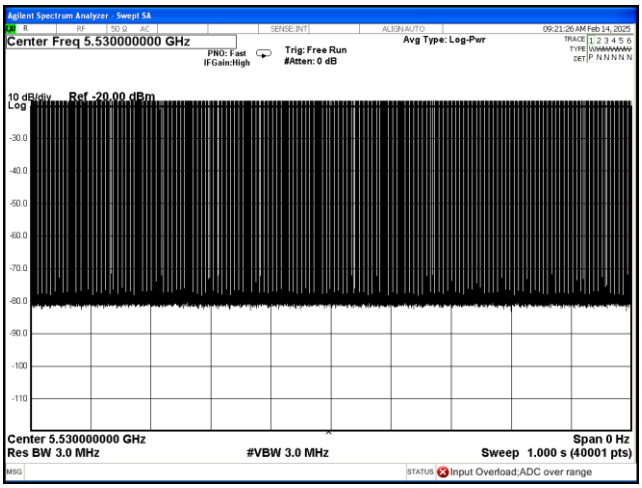
DFS Detection Thresholds



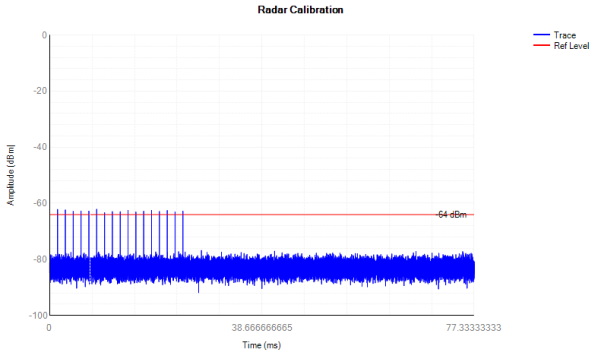
5290MHz Shutdown



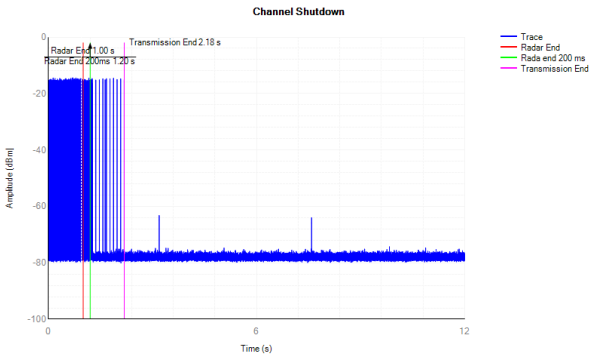
5290MHz Non-Occupancy Period



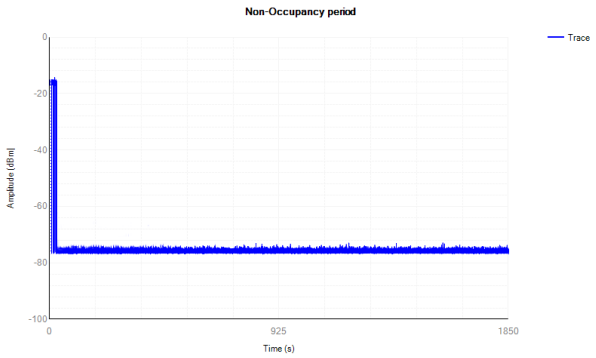
Bandwidth 80MHz



DFS Detection Thresholds



5530MHz Shutdown



5530MHz Non-Occupancy Period

3.5. ANTENNA REQUIREMENT

STANDARD REQUIREMENT

According to the manufacturer declared, the EUT has PIFA Antenna and PCB Antenna, the directional gain of antenna is WIFI antenna Gain: 5150MHz to 5350MHz: 4.39 dBi; 5470MHz to 5725MHz: 4.72 dBi; 5725MHz to 5850MHz: 4.26 dBi(ANT1&2), and the antenna and other components are all on the same PCB and cannot be replaced. Therefore, the EUT is considered sufficient to comply with the provision.

EUT ANTENNA

The Bluetooth is PCB Antenna and wi-fi is PIFA Antenna. It complies with the standard requirement.

4. TEST PHOTOS

Please refer to Appendix C Test Setup.

5. EUT PHOTOS

External Photos Please refer to Appendix A and Internal Photos Please refer to Appendix B.

**************************THE END**************************