FCC Part 15E Test Report

FCC ID: 2AC47-WG155

Product Name:	Wireless Router
Trademark:	N/A
Model Name :	WG155
Prepared For : Address :	SHENZHEN ZHIBOTONG ELECTRONICS CO.,LTD. Floor 4, Bldg. A2, Hedian Industrial Park, NO.9 Shijing Rd, Guanlan, Longhua District, Shenzhen, China
Prepared By : Address :	Shenzhen BCTC Testing Co., Ltd. BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China
Test Date:	Oct. 22, 2019 – Nov. 26, 2019
Date of Report :	Nov. 27, 2019
Report No.:	BCTC-LH191001412E

TEST RESULT CERTIFICATION

Applicant's name	:	SHENZHEN ZHIBOTONG ELECTRONICS CO.,LTD.
Address	:	Floor 4, Bldg. A2, Hedian Industrial Park, NO.9 Shijing Rd, Guanlan, Longhua District, Shenzhen, China
Manufacture's Name	:	SHENZHEN ZHIBOTONG ELECTRONICS CO.,LTD.
Address	:	Floor 4, Bldg. A2, Hedian Industrial Park, NO.9 Shijing Rd, Guanlan, Longhua District, Shenzhen, China
Product description		
Product name	:	Wireless Router
Trademark	:	N/A
Model and/or type reference	:	WG155
Standards	:	FCC Part15 15.407 ANSI C63.10-2013 KDB 662911 D01 v02r01 KDB 789033 D02 v01r02

This device described above has been tested by BCTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Prepared by(Engineer):	Cai Fang Zhong	Cai Fang Zhong
Reviewer(Supervisor):	Eric Yang	
Approved(Manager):	Zero Zhou	

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Revision History

Report No.	Version	Description	Issued Date
BCTC-LH191001412E	Rev.01	Initial issue of report	Nov. 04, 2019

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.407) , Subpart E			
Standard Section	Test Item	Judgment	Remark
15.209(a), 15.407 (b)(1) 15.407 (b)(4) 15.407 (b)(6)	Spurious Radiated Emissions	PASS	
15.207	Conducted Emission	PASS	
15.407 (a)(1) 15.407 (a)(3) 15.1049	26 dB and 99% Emission Bandwidth	PASS	
15.407(e)	Minimum 6 dB bandwidth	PASS	
15.407 (a)(1) 15.407 (a)(3)	Maximum Conducted Output Power	PASS	
2.1051, 15.407(b)(1) 15.407(b)(4)	Band Edge	PASS	
15.407 (a)(1) 15.407 (a)(3)	Power Spectral Density	PASS	
2.1051, 15.407(b)	Spurious Emissions at Antenna Terminals	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

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

Outsourcing: The 26G-40G Spurious Radiated Emissions in this test were outsourced to the Shenzhen Academy of Metrology & Quality Inspection

1.1 TEST FACILITY

Shenzhen BCTC Testing Co., Ltd.
Add. : BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China
FCC Test Firm Registration Number: 712850
IC Registered No.: 23583

1.2 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(30MHz-1GHz)	U=4.3dB
2	3m chamber Radiated spurious emission(1GHz-18GHz)	U=4.5dB
3	3m chamber Radiated spurious emission(18GHz-40GHz)	U=3.34dB
4	Conducted Adjacent channel power	U=1.38dB
5	Conducted output power uncertainty Above 1G	U=1.576dB
6	Conducted output power uncertainty below 1G	U=1.28dB
7	humidity uncertainty	U=5.3%
8	Temperature uncertainty	U=0.59℃

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Wireless Router	
Trade Name	N/A	
Model Name	WG155	
Model Difference	N/A	
Product Description	IEEE 802.11 WLAN Mode Supported	☒802.11a/n/ac(20MHz channel bandwidth) ☒802.11n/ac(40MHz channel bandwidth) ☒802.11ac(80MHz channel bandwidth)
	Data Rate	802.11a: 6,9,12,18,24,36,48,54Mbps; 802.11n(HT20/HT40):MCS0-MCS15; 802.11ac(VHT20): NSS1, MCS0-MCS8 802.11ac(VHT40/VHT80):NSS1, MCS0-MCS9
	Modulation	OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11a/n/ac;
	Operating Frequency Range	☒5180-5240MHz for 802.11a/n(HT20)/ac20; 5190-5230MHz for 802.11n(HT40)/ac40; 5210MHz for 802.11 ac80; ☒5745-5825 MHz for 802.11a/n(HT20)/ac20; 5755-5795 MHz for 802.11a/n(HT40)/ac40; 5775MHz for 802.11 ac80;
	Number of Channels	☒4 channels for 802.11a/n20/ac20 in the 5180-5240MHz band ; 2 channels for 802.11 n40/ac40 in the 5190-5230MHz band ; 1 channels for 802.11 ac80 in the 5210MHz band ; ☒5 channels for 802.11a/n20/ac20 in the 5745-5825MHz band ; 2 channels for 802.11 n40/ac40 in the 5755-5795MHz band ; 1 channels for 802.11 ac80 in the 5775MHz band ;
	Antenna Type	External antenna
	Antenna Gain	2dBi
	Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.	
Channel List	Please refer to the Note 2.	
Power Supply	AC120V 60Hz	
Adapter	Model No.: G024A120200ZZUV Input: 100-240V~ 50/60Hz, 0.8A Output : AC 120V/60Hz 2.0A	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

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

2. Frequency and Channel list for 802.11a/n/ac(20MHz) band I (5180-5240MHz):

802.11a/n/ac(20MHz) Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220	-	-	-	-
40	5200	48	5240	-	-	-	-

802.11n /ac(40MHz) Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	-	-	-	-	-	-
46	5230	-	-	-	-	-	-

802.11ac (80MHz) Carrier Frequency Channel	
Channel	Frequency (MHz)
42	5210

Frequency and Channel list for 802.11a/n/ac(20 MHz) band IV (5745-5825MHz):

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

802.11n/ac 40MHz Carrier Frequency Channel					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795	-	-

802.11ac 80MHz Carrier Frequency Channel	
Channel	Frequency (MHz)
155	5775

Antenna A gain: 2dBi, Antenna B gain: 2Bi,
For MIMO mode for 802.11n / ac, Directional gain = GANT + 10 log(N_{ANT}) dBi =5.01dbi

Tx Antenna

Ant.	Brand	Model Name	Antenna Type	Gain (dBi)	NOTE
A	N/A	N/A	External antenna	2	
B	N/A	N/A	External antenna	2	

2.2 DESCRIPTION OF TEST MODES

Pretest Mode	Description
Mode 1	802.11a / n/ ac 20 CH36/ CH40/ CH 48 802.11a /n/ ac 20 CH149/ CH157/ CH 165
Mode 2	802.11n/ ac40 CH38/ CH 46 802.11n/ ac40 CH 151 / CH 159
Mode 3	802.11 ac80 CH 42/CH 155
Mode 4	802.11a / n/ ac 20 CH36/ CH40/ CH 48 802.11a /n/ ac 20 CH149/ CH157/ CH 165
Mode 5	Link Mode

Conducted Emission	
Final Test Mode	Description
Mode 5	Link Mode

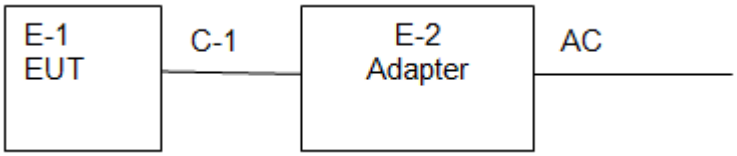
For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11a / n/ ac 20 CH36/ CH40/ CH 48 802.11a /n/ ac 20 CH149/ CH157/ CH 165
Mode 2	802.11n/ ac40 CH38/ CH 46 802.11n/ ac40 CH 151 / CH 159
Mode 3	802.11 ac80 CH 42/CH 155
Mode 4	802.11a / n/ ac 20 CH36/ CH40/ CH 48 802.11a /n/ ac 20 CH149/ CH157/ CH 165

Note:

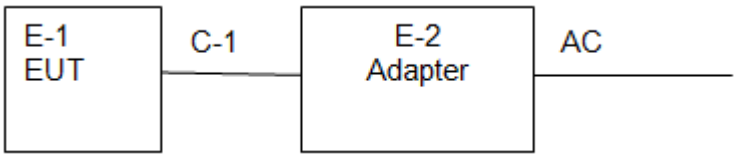
(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted Emission Test



Radiated Spurious Emission



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Wireless Router	N/A	WG155	N/A	EUT
E-2	Adapter	N/A	G024A120200ZZUV	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	1.0M	DC cableunshielded

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.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4407B	MY45109572	Jun. 13, 2019	Jun. 12, 2020
2	Test Receiver (9kHz-7GHz)	R&S	ESR7	101154	Jun. 13, 2019	Jun. 12, 2020
3	Bilog Antenna (30MHz-3GHz)	SCHWARZBECK	VULB9163	VULB9163-942	Jun. 22, 2019	Jun. 21, 2020
4	Horn Antenna (1GHz-18GHz)	SCHWARZBECK	BBHA9120D	1541	Jun. 22, 2019	Jun. 21, 2020
5	Horn Antenna (18GHz-40GHz)	SCHWARZBECK	BBHA9170	822	Jun. 22, 2019	Jun. 21, 2020
6	Amplifier (9KHz-6GHz)	SCHWARZBECK	BBV9744	9744-0037	Jun. 25, 2019	Jun. 24, 2020
7	Amplifier (0.5GHz-18GHz)	SCHWARZBECK	BBV9718	9718-309	Jun. 25, 2019	Jun. 24, 2020
8	Amplifier (18GHz-40GHz)	MITEQ	TTA1840-35-HG	2034381	Jun. 17, 2019	Jun. 16, 2020
9	Loop Antenna (9KHz-30MHz)	SCHWARZBECK	FMZB1519B	014	Jul. 02, 2019	Jul. 01, 2020
10	RF cables1 (9kHz-30MHz)	Huber+Suhnar	9kHz-30MHz	B1702988-0008	Jun. 25, 2019	Jun. 24, 2020
11	RF cables2 (30MHz-1GHz)	Huber+Suhnar	30MHz-1GHz	1486150	Jun. 25, 2019	Jun. 24, 2020
12	RF cables3 (1GHz-40GHz)	Huber+Suhnar	1GHz-40GHz	1607106	Jun. 25, 2019	Jun. 24, 2020
13	Power Metter	Keysight	E4419B	\	Jun. 17, 2019	Jun. 16, 2020
14	Power Sensor (AV)	Keysight	E9 300A	\	Jun. 17, 2019	Jun. 16, 2020
15	Signal Analyzer 20kHz-26.5GHz	KEYSIGHT	N9020A	MY49100060	Jun. 13, 2019	Jun. 12, 2020
16	Spectrum Analyzer 9kHz-40GHz	Aglient	FSP40	100363	Jun. 13, 2019	Jun. 12, 2020
17	D.C. Power Supply	LongWei	TPR-6405D	\	\	\
18	Software	Frad	EZ-EMC	FA-03A2 RE	\	\

Conduction Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Test Receiver	R&S	ESR3	102075	Jun. 13, 2019	Jun. 12, 2020
2	LISN	SCHWARZBECK	NSLK8127	8127739	Jun. 13, 2019	Jun. 12, 2020
3	LISN	R&S	ENV216	101375	Jun. 13, 2019	Jun. 12, 2020
4	RF cables	Huber+Suhnar	9kHz-30MHz	B1702988-0008	Jun. 25, 2019	Jun. 24, 2020
5	Software	Frad	EZ-EMC	EMC-CON 3A1	\	\

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

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

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

0.15 -0.5	66 - 56 *	56 - 46 *	FCC/ RSS-247
0.50 -5.0	56.00	46.00	FCC/ RSS-247
5.0 -30.0	60.00	50.00	FCC/ RSS-247

Note:

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

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

The following table is the setting of the receiver

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

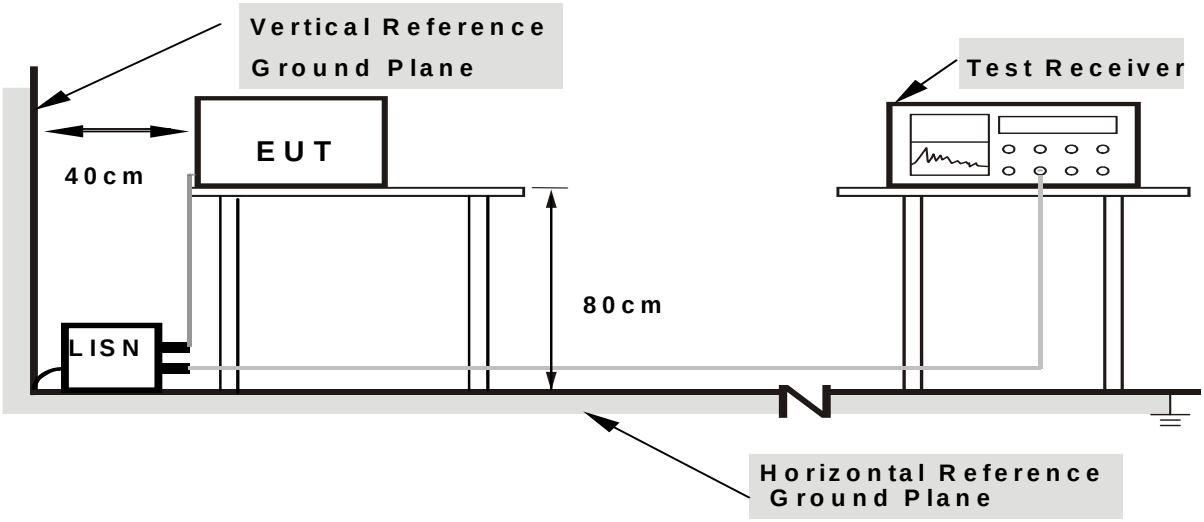
3.1.2 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



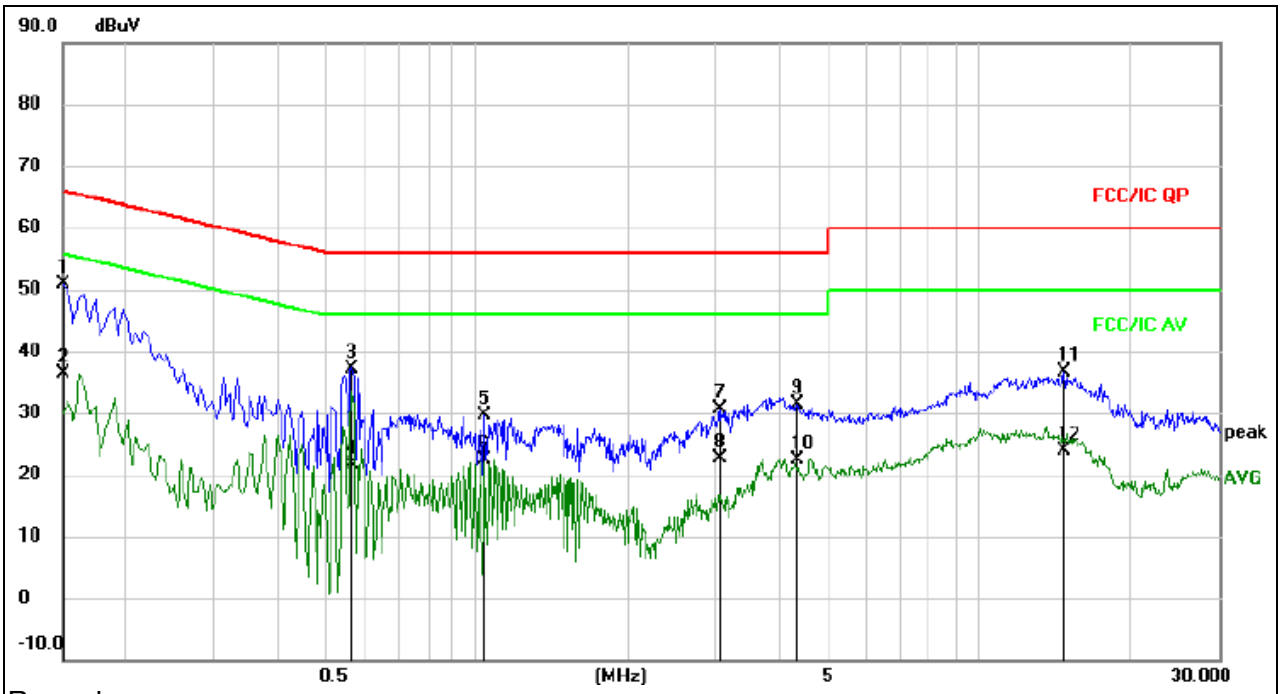
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

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

We pretest AC 120V and AC 240V, the worst voltage was AC 120V and the data recording in the report.

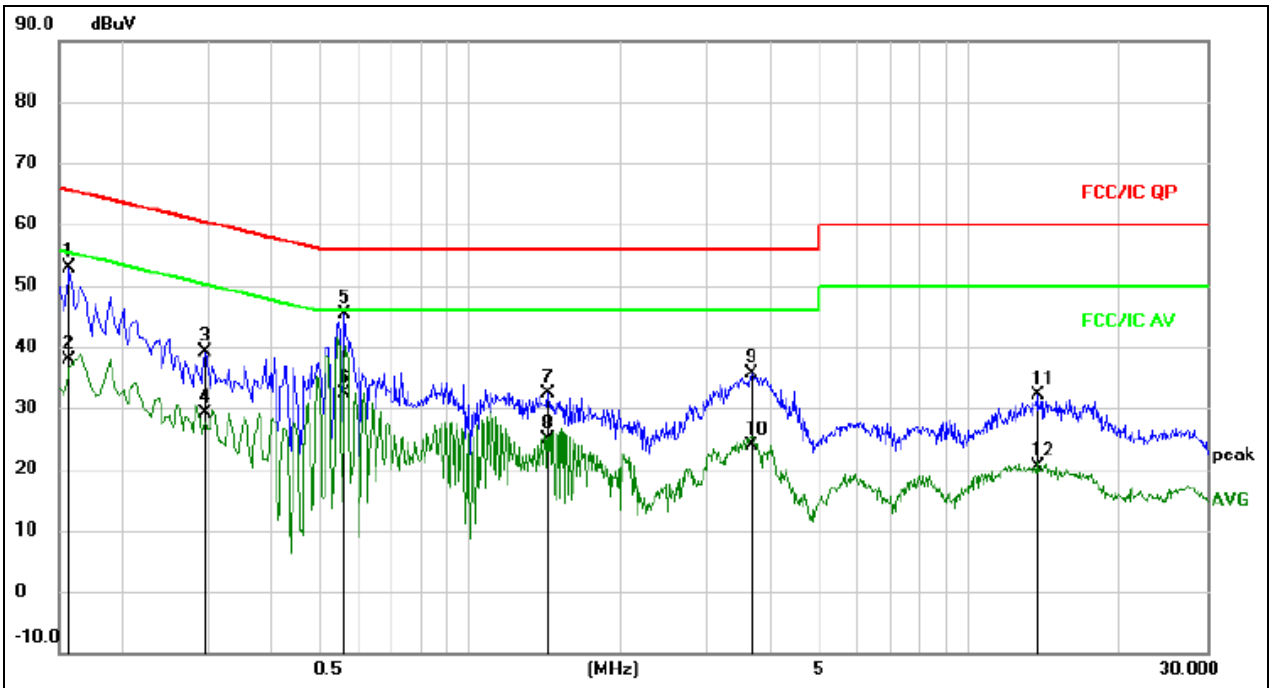
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Phase：	L
Test Voltage ：	AC120V 60Hz	Test Mode：	Mode 5



Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV		dBuV	dBuV	dB	Detector	Comment
1	*	0.1500	41.40	9.52	50.92	66.00	-15.08	QP	
2		0.1500	26.89	9.52	36.41	56.00	-19.59	AVG	
3		0.5660	27.39	9.86	37.25	56.00	-18.75	QP	
4		0.5660	11.70	9.86	21.56	46.00	-24.44	AVG	
5		1.0339	19.97	9.57	29.54	56.00	-26.46	QP	
6		1.0339	12.87	9.57	22.44	46.00	-23.56	AVG	
7		3.0500	20.89	9.66	30.55	56.00	-25.45	QP	
8		3.0500	12.96	9.66	22.62	46.00	-23.38	AVG	
9		4.3460	21.57	9.75	31.32	56.00	-24.68	QP	
10		4.3460	12.61	9.75	22.36	46.00	-23.64	AVG	
11		14.7700	26.97	9.70	36.67	60.00	-23.33	QP	
12		14.7700	14.26	9.70	23.96	50.00	-26.04	AVG	

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Phase：	N
Test Voltage ：	AC120V 60Hz	Test Mode：	Mode 5



Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV		dBuV	dBuV	dB	Detector	Comment
1		0.1580	43.43	9.51	52.94	65.57	-12.63	QP	
2		0.1580	28.28	9.51	37.79	55.57	-17.78	AVG	
3		0.2940	29.51	9.57	39.08	60.41	-21.33	QP	
4		0.2940	19.48	9.57	29.05	50.41	-21.36	AVG	
5	*	0.5620	35.60	9.84	45.44	56.00	-10.56	QP	
6		0.5620	22.43	9.84	32.27	46.00	-13.73	AVG	
7		1.4380	22.89	9.58	32.47	56.00	-23.53	QP	
8		1.4380	15.29	9.58	24.87	46.00	-21.13	AVG	
9		3.6620	25.83	9.71	35.54	56.00	-20.46	QP	
10		3.6620	14.23	9.71	23.94	46.00	-22.06	AVG	
11		13.7060	22.35	9.70	32.05	60.00	-27.95	QP	
12		13.7060	10.62	9.70	20.32	50.00	-29.68	AVG	

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 APPLICABLE STANDARD

According to FCC Part 15.407(d) and 15.209

3.2.2 CONFORMANCE LIMIT

According to FCC Part 15.407(b)(7): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
According to FCC Part15.205, Restricted bands

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

20dBc in any 100 kHz bandwidth outside the operating frequency band. 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

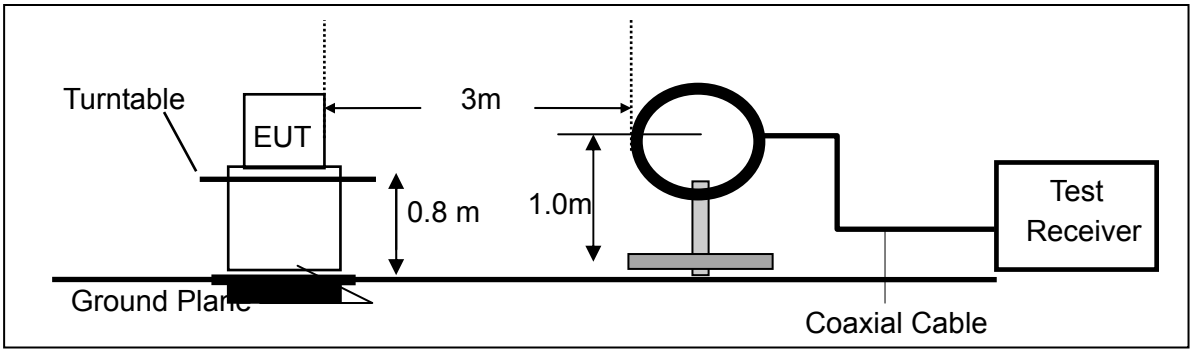
Remark :1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

3.2.3 MEASURING INSTRUMENTS

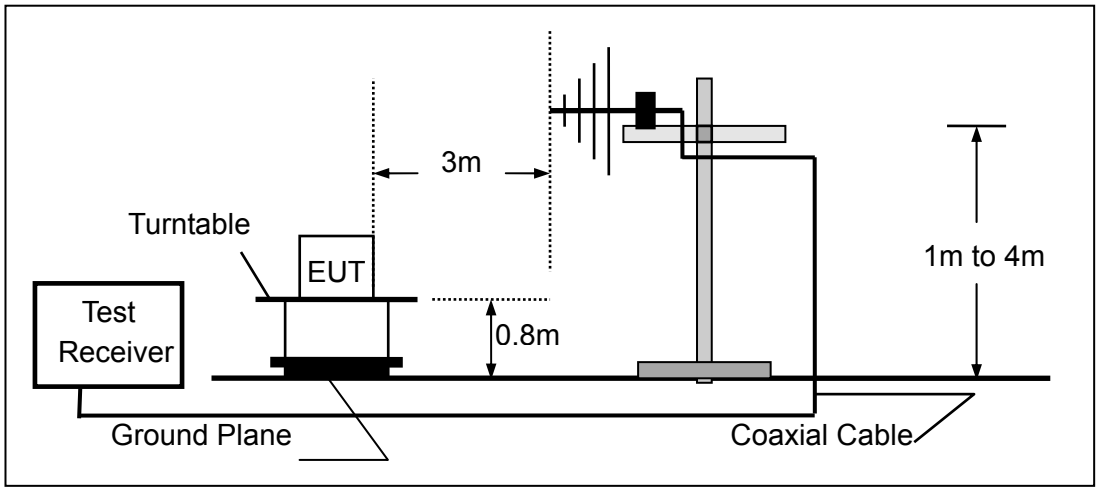
The Measuring equipment is listed in the section 6.3 of this test report.

3.2.4 TEST CONFIGURATION

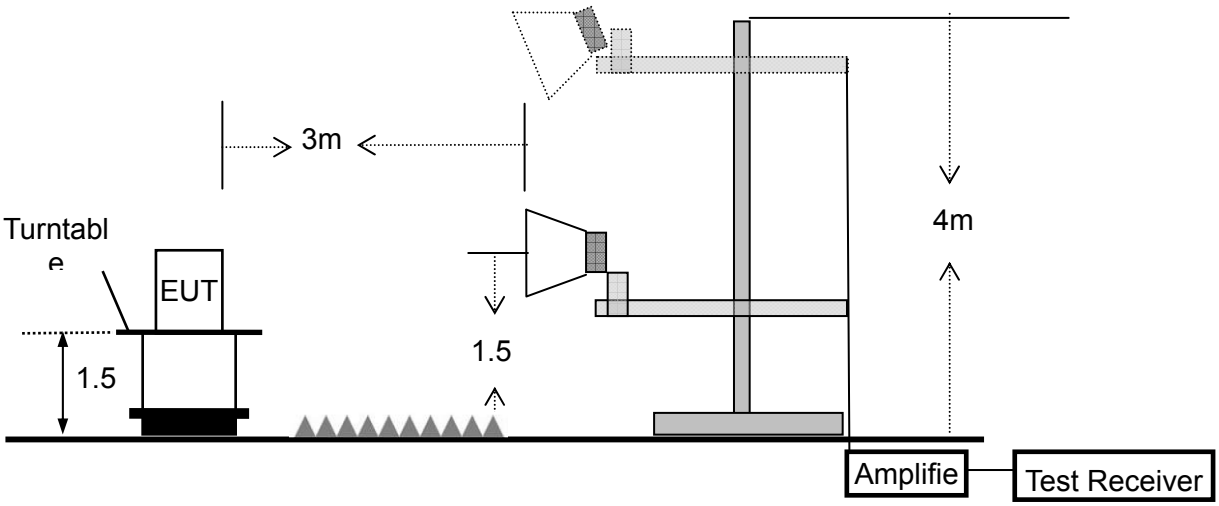
(a)For radiated emissions below 30MHz



(b)For radiated emissions from 30MHz to 1000MHz



(c) For radiated emissions above 1000MHz



3.2.5 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.

3.2.6 TEST RESULTS (9KHZ – 30 MHZ)

Temperature：	26℃	Relative Humidtity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	Mode 5	Polarization :	--

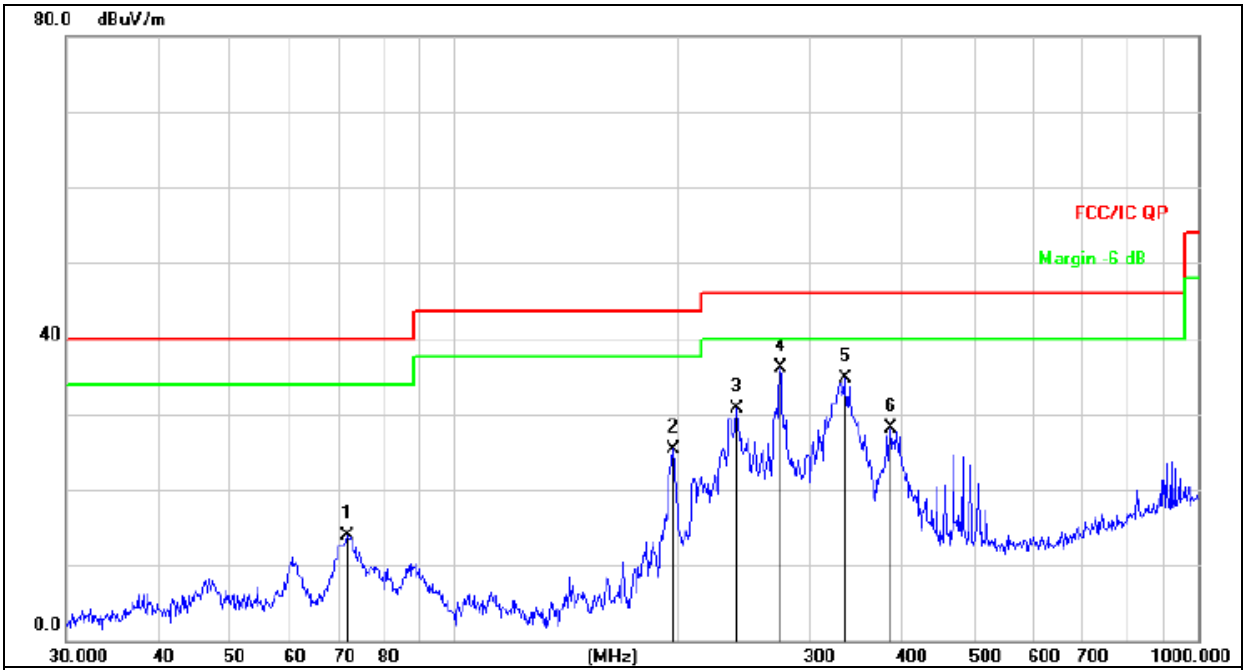
Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	N/A
--	--	--	--	N/A

NOTE:

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

3.2.7 TEST RESULTS (30MHZ – 1GHZ)

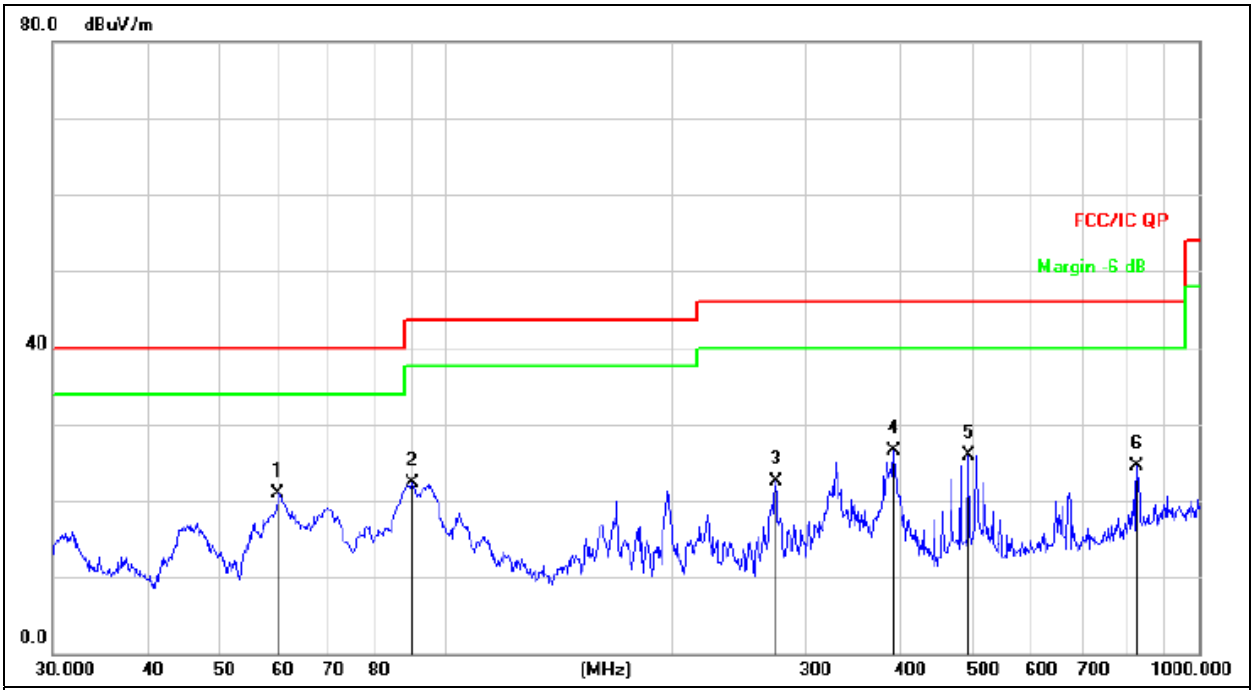
Temperature :	26℃	Relative Humidity :	54%
Pressure :	101 kPa	Polarization :	Horizontal
Test Voltage :	AC 120V/60Hz		
Test Mode :	Mode 5		



Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		71.5806	32.39	-18.54	13.85	40.00	-26.15	QP
2		197.2001	41.88	-16.48	25.40	43.50	-18.10	QP
3		239.1473	46.13	-15.40	30.73	46.00	-15.27	QP
4	*	274.1939	50.45	-14.40	36.05	46.00	-9.95	QP
5		334.8589	47.27	-12.64	34.63	46.00	-11.37	QP
6		386.6338	39.51	-11.39	28.12	46.00	-17.88	QP

Temperature：	26℃	Relative Humidity：	54%
Pressure：	101kPa	Polarization：	Vertical
Test Voltage ：	AC 120V/60Hz		
Test Mode ：	Mode 5		



Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	59.8588	36.81	-15.90	20.91	40.00	-19.09	QP
2		90.2205	40.29	-18.06	22.23	43.50	-21.27	QP
3		274.1939	36.94	-14.40	22.54	46.00	-23.46	QP
4		393.4723	37.65	-11.24	26.41	46.00	-19.59	QP
5		494.1984	35.00	-9.06	25.94	46.00	-20.06	QP
6		827.4934	27.46	-3.02	24.44	46.00	-21.56	QP

3.2.8 TEST RESULTS (1GHz-40GHz)

Test Mode :	TX(5.2G) - 802.11a

Polar	Frequency	Meter Reading	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Margin	Detector Type
(H/V)	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Low Channel (5180 MHz)-Above 1G									
Vertical	4434.157	62.25	5.94	35.40	44.00	59.59	68.20	-8.61	Pk
Vertical	4434.157	46.57	5.94	35.40	44.00	43.91	54.00	-10.09	AV
Vertical	10370.362	60.43	8.46	39.75	44.50	64.14	68.20	-4.06	Pk
Vertical	10370.362	41.97	8.46	39.75	44.50	45.68	54.00	-8.32	AV
Vertical	15540.196	61.43	10.12	38.80	44.10	66.25	74.00	-7.75	Pk
Vertical	15540.196	37.57	10.12	38.80	44.10	42.39	54.00	-11.61	AV
Horizontal	4434.521	66.52	5.94	35.40	44.00	63.86	68.20	-4.34	Pk
Horizontal	4434.521	44.15	5.94	35.40	44.00	41.49	54.00	-12.51	AV
Horizontal	10370.623	58.92	8.46	39.75	44.50	62.63	68.20	-5.57	Pk
Horizontal	10370.623	41.07	8.46	39.75	44.50	44.78	54.00	-9.22	AV
Horizontal	10540.865	56.99	10.12	38.38	44.10	61.39	74.00	-12.61	Pk
Horizontal	10540.865	38.85	10.12	38.38	44.10	43.25	54.00	-10.75	AV
middle Channel (5200 MHz)-Above 1G									
Vertical	4592.093	60.28	6.48	36.35	44.05	59.06	74.00	-14.94	Pk
Vertical	4592.093	41.96	6.48	36.35	44.05	40.74	54.00	-13.26	AV
Vertical	10401.424	59.63	8.47	37.88	44.51	61.47	68.20	-6.73	Pk
Vertical	10401.424	42.77	8.47	37.88	44.51	44.61	54.00	-9.39	AV
Vertical	15600.218	56.53	10.12	38.80	44.10	61.35	74.00	-12.65	Pk
Vertical	15600.218	36.64	10.12	38.80	44.10	41.46	54.00	-12.54	AV
Horizontal	4592.691	59.87	6.48	36.35	44.05	58.65	74.00	-15.35	Pk
Horizontal	4592.691	43.13	6.48	36.35	44.05	41.91	54.00	-12.09	AV
Horizontal	10400.114	58.87	8.47	37.88	44.51	60.71	68.20	-7.49	Pk
Horizontal	10400.114	42.24	8.47	37.88	44.51	44.08	54.00	-9.92	AV
Horizontal	15600.187	59.88	10.12	38.38	44.10	64.28	74.00	-9.72	Pk
Horizontal	15600.187	38.75	10.12	38.38	44.10	43.15	54.00	-10.85	AV
High Channel (5240 MHz)-Above 1G									
Vertical	4739.246	61.28	7.10	37.24	43.50	62.12	74.00	-11.88	Pk
Vertical	4739.246	44.44	7.10	37.24	43.50	45.28	54.00	-8.72	AV
Vertical	10480.371	60.58	8.46	37.68	44.50	62.22	68.20	-5.98	Pk
Vertical	10480.371	40.35	8.46	37.68	44.50	41.99	54.00	-12.01	AV
Vertical	15720.359	61.78	10.12	38.80	44.10	66.60	74.00	-7.40	Pk
Vertical	15720.359	39.65	10.12	38.80	44.10	44.47	54.00	-9.53	AV
Horizontal	4739.352	62.27	7.10	37.24	43.50	63.11	74.00	-10.89	Pk
Horizontal	4739.352	43.25	7.10	37.24	43.50	44.09	54.00	-9.91	AV
Horizontal	10481.111	62.58	8.46	37.68	44.50	64.22	68.20	-3.98	Pk
Horizontal	10481.111	43.34	8.46	37.68	44.50	44.98	54.00	-9.02	AV
Horizontal	15720.357	60.76	10.12	38.80	44.10	65.58	74.00	-8.42	Pk
Horizontal	15720.357	42.24	10.12	38.80	44.10	47.06	54.00	-6.94	AV

Note:"802.11n20(5G)" mode is the worst mode. PK value is lower than the Average value limit, So average didn't record.

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

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

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

Test Mode :	TX (5.8G) -- 802.11a

Polar	Frequency	Meter Reading	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Margin	Detector Type
(H/V)	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Low Channel (5745 MHz)-Above 1G									
Vertical	4679.195	59.95	5.94	35.40	44.00	57.29	74.00	-16.71	Pk
Vertical	4679.195	39.67	5.94	35.40	44.00	37.01	54.00	-16.99	AV
Vertical	11490.364	59.55	8.46	39.75	44.50	63.26	74.00	-10.74	Pk
Vertical	11490.364	42.16	8.46	39.75	44.50	45.87	54.00	-8.13	AV
Vertical	17235.101	55.54	10.12	38.80	44.10	60.36	68.20	-7.84	Pk
Vertical	17235.101	38.66	10.12	38.80	44.10	43.48	54.00	-10.52	AV
Horizontal	4679.332	57.95	5.94	35.40	44.00	55.29	74.00	-18.71	Pk
Horizontal	4679.332	44.57	5.94	35.40	44.00	41.91	54.00	-12.09	AV
Horizontal	11490.164	56.64	8.46	39.75	44.50	60.35	74.00	-13.65	Pk
Horizontal	11490.164	40.16	8.46	39.75	44.50	43.87	54.00	-10.13	AV
Horizontal	17235.196	58.64	10.12	38.80	44.10	63.46	68.20	-4.74	Pk
Horizontal	17235.196	41.25	10.12	38.80	44.10	46.07	54.00	-7.93	AV
middle Channel (5785 MHz)-Above 1G									
Vertical	4592.228	59.88	6.48	36.35	44.05	58.66	74.00	-15.34	Pk
Vertical	4592.228	43.35	6.48	36.35	44.05	42.13	54.00	-11.87	AV
Vertical	11570.203	61.17	8.47	37.88	44.51	63.01	74.00	-10.99	Pk
Vertical	11570.203	43.25	8.47	37.88	44.51	45.09	54.00	-8.91	AV
Vertical	17355.147	59.54	10.12	38.80	44.10	64.36	68.20	-3.84	Pk
Vertical	17355.147	42.27	10.12	38.80	44.10	47.09	54.00	-6.91	AV
Horizontal	4592.526	58.63	6.48	36.35	44.05	57.41	74.00	-16.59	Pk
Horizontal	4592.526	43.36	6.48	36.35	44.05	42.14	54.00	-11.86	AV
Horizontal	11570.123	60.06	8.47	37.88	44.51	61.90	74.00	-12.10	Pk
Horizontal	11570.123	42.24	8.47	37.88	44.51	44.08	54.00	-9.92	AV
Horizontal	17355.269	57.57	10.12	38.80	44.10	62.39	68.20	-5.81	Pk
Horizontal	17355.269	41.24	10.12	38.80	44.10	46.06	54.00	-7.94	AV
High Channel (5825 MHz)-Above 1G									
Vertical	6039.199	57.64	7.10	37.24	43.50	58.48	68.20	-9.72	Pk
Vertical	6039.199	42.26	7.10	37.24	43.50	43.10	54.00	-10.90	AV
Vertical	11652.562	58.97	8.46	37.68	44.50	60.61	74.00	-13.39	Pk
Vertical	11652.562	41.14	8.46	37.68	44.50	42.78	54.00	-11.22	AV
Vertical	17473.128	58.56	10.12	38.80	44.10	63.38	68.20	-4.82	Pk
Vertical	17473.128	40.34	10.12	38.80	44.10	45.16	54.00	-8.84	AV
Horizontal	6039.232	59.96	7.10	37.24	43.50	60.80	68.20	-7.40	Pk
Horizontal	6039.232	43.34	7.10	37.24	43.50	44.18	54.00	-9.82	AV
Horizontal	11652.319	52.23	8.46	37.68	44.50	53.87	74.00	-20.13	Pk
Horizontal	11652.319	40.16	8.46	37.68	44.50	41.80	54.00	-12.20	AV
Horizontal	17474.062	57.78	10.12	38.80	44.10	62.60	68.20	-5.60	Pk
Horizontal	17474.062	40.34	10.12	38.80	44.10	45.16	54.00	-8.84	AV

Note:"802.11a(5G)" mode is the worst mode. PK value is lower than the Average value limit, So average didn't record.

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value

has no need to be reported.

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

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

4. POWER SPECTRAL DENSITY TEST

4.1 APPLIED PROCEDURES / LIMIT

According to FCC §15.407(a)(3)

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.

For the band 5.725-5.85 GHz

(3)For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

,

4.2 TEST PROCEDURE

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

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

b) Set VBW ≥ 3 RBW.

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

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

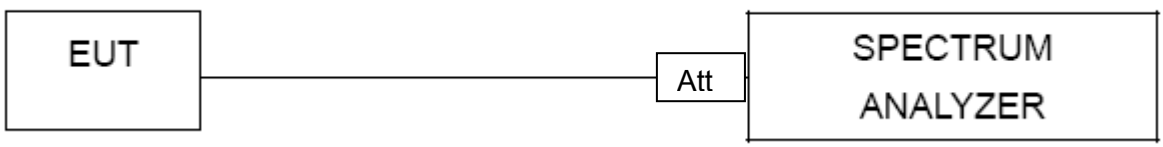
e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

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

4.3 DEVIATION FROM STANDARD

No deviation.

4.4 TEST SETUP



4.5 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.

4.6 TEST RESULTS

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC120V 60Hz
Test Mode ：	TX Frequency Band I (5150-5250MHz)		

Note: A(B) Represent the value of antenna A and B, The worst data is Antenna B, only shown Antenna B Plot.
Antenna A gain: 2dBi, Antenna B gain: 2dBi, Directional gain=[10log(GA+ G B)] dbi =5.01dbi

Mode	Frequency	Measured Power Density (dBm/MHz)			Limit (dBm)	Result
		ANT A	ANT B	Total		
802.11 a	5180 MHz	14.96	15.81	/	17	PASS
	5200 MHz	14.86	14.72	/	17	PASS
	5240 MHz	13.67	13.61	/	17	PASS
802.11 n20	5180 MHz	13.65	13.79	16.73	17	PASS
	5200 MHz	13.54	13.67	16.62	17	PASS
	5240 MHz	13.37	13.71	16.55	17	PASS
802.11 n40	5190 MHz	11.29	12.59	15.00	17	PASS
	5230 MHz	10.94	11.25	14.11	17	PASS
802.11 AC20	5180 MHz	13.85	13.94	16.91	17	PASS
	5200 MHz	13.53	13.69	16.62	17	PASS
	5240 MHz	13.54	14.21	16.90	17	PASS
802.11 AC40	5190 MHz	11.57	11.97	14.78	17	PASS
	5230 MHz	10.64	11.12	13.90	17	PASS
802.11 AC80	5210 MHz	9.40	10.14	12.80	17	PASS

(802.11a) PSD plot on channel 36

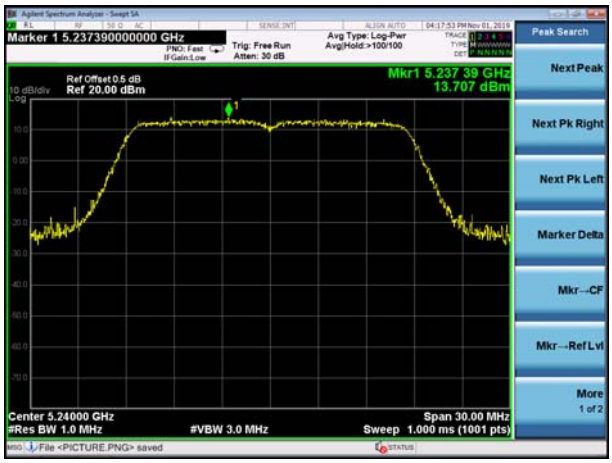
(802.11n20) PSD plot on channel 36

(802.11a) PSD plot on channel 40

(802.11n20) PSD plot on channel 40

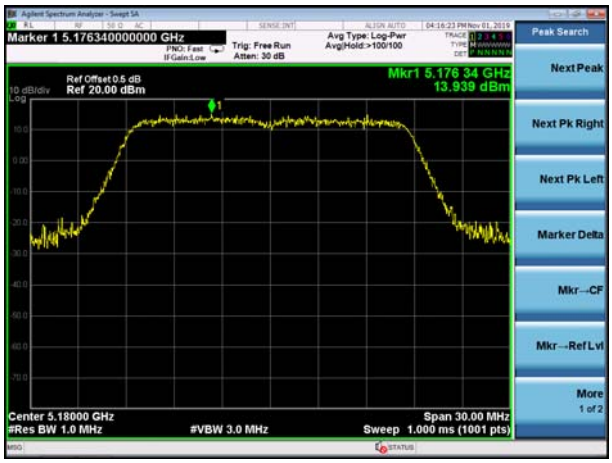
(802.11a) PSD plot on channel 48

(802.11n20) PSD plot on channel 48



(802.11n40) PSD plot on channel 38

(802.11ac20) PSD plot on channel 36



(802.11n40) PSD plot on channel 46

(802.11ac20) PSD plot on channel 40

(802.11ac20) PSD plot on channel 48

(802.11ac40) PSD plot on channel 38

(802.11ac80) PSD plot on channel 42

(802.11ac40) PSD plot on channel 46

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC120V 60Hz
Test Mode ：	TX Frequency Band IV (5745-5825MHz)		

Note: A(B) Represent the value of antenna A and B, The worst data is Antenna A ,only shown Antenna A Plot.

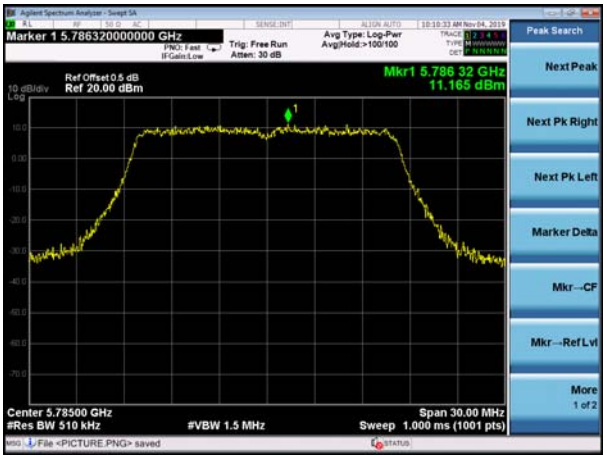
Antenna A gain: 2dBi, Antenna B gain: 2dBi, Directional gain=[10log(GA+ G B)] dbi =5.01dbi

Mode	Frequency	Measured Power Density (dBm/500KHz)			Limit (dBm/500KHz)	Result
		ANT A	ANT B	Total		
802.11 a	5745 MHz	11.82	11.20	/	30	PASS
	5785 MHz	11.17	10.14	/	30	PASS
	5825 MHz	10.20	9.15	/	30	PASS
802.11 n20	5745 MHz	11.22	10.50	13.89	30	PASS
	5785 MHz	10.30	9.66	13.00	30	PASS
	5825 MHz	10.82	9.26	13.12	30	PASS
802.11 n40	5755 MHz	8.44	7.31	10.92	30	PASS
	5795 MHz	7.78	7.77	10.79	30	PASS
802.11 AC20	5745 MHz	11.51	11.32	14.43	30	PASS
	5785 MHz	10.61	9.52	13.11	30	PASS
	5825 MHz	9.90	9.44	12.69	30	PASS
802.11 AC40	5755 MHz	7.90	7.45	10.69	30	PASS
	5795 MHz	7.56	6.43	10.04	30	PASS
802.11 AC80	5775 MHz	4.64	3.85	7.27	30	PASS

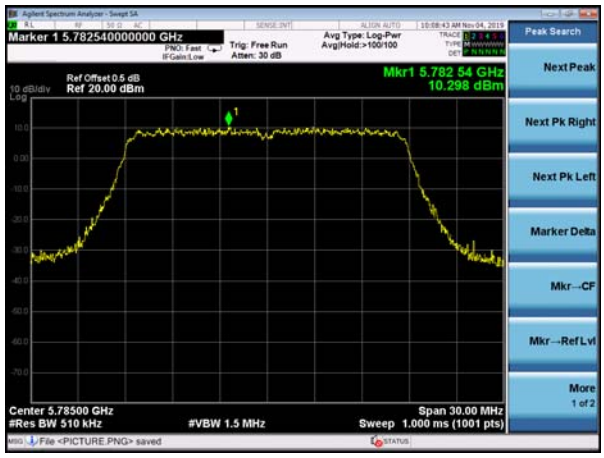
(802.11a) PSD plot on channel 149

(802.11n20) PSD plot on channel 149

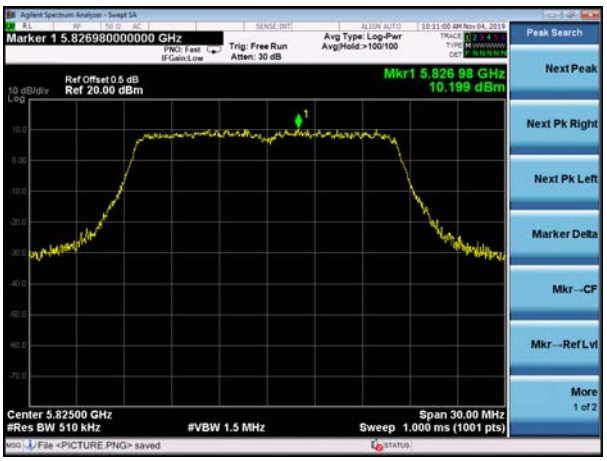
(802.11a) PSD plot on channel 157



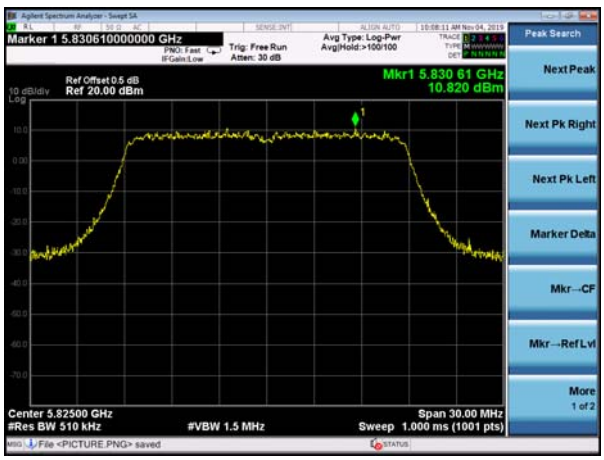
(802.11n20) PSD plot on channel 157



(802.11a) PSD plot on channel 165

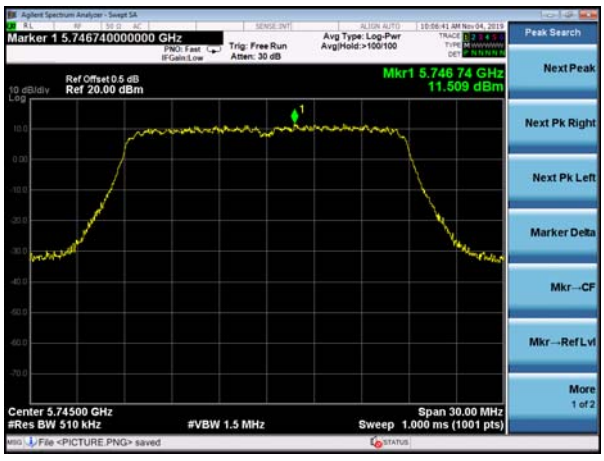


(802.11n20) PSD plot on channel 165



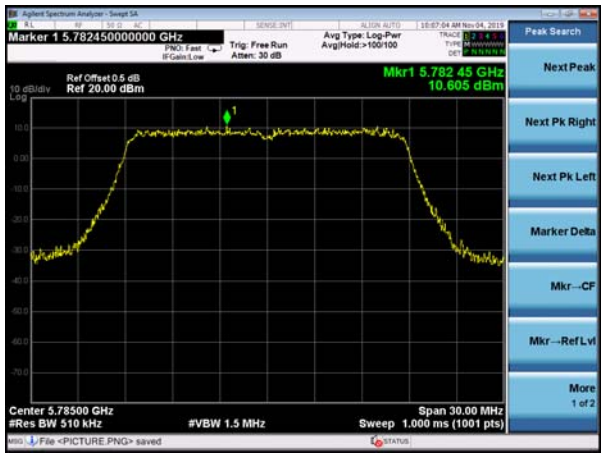
(802.11n40) PSD plot on channel 151

(802.11ac20) PSD plot on channel 149

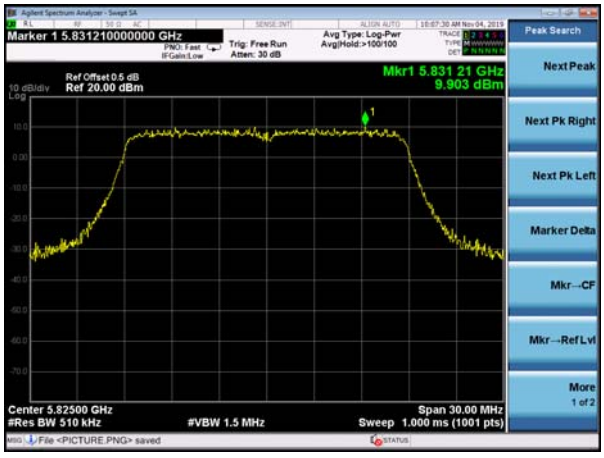


(802.11n40) PSD plot on channel 159

(802.11ac20) PSD plot on channel 157

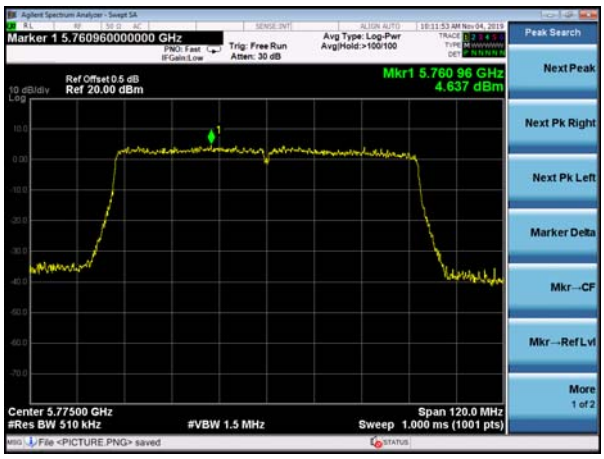


(802.11ac20) PSD plot on channel 165



(802.11ac40) PSD plot on channel 151

(802.11ac80) PSD plot on channel 155



(802.11ac40) PSD plot on channel 159

5. 26DB & 6DB & 99% EMISSION BANDWIDTH

5.1 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 are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. 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.

5.2 TEST PROCEDURE

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

b) Set the VBW > RBW.

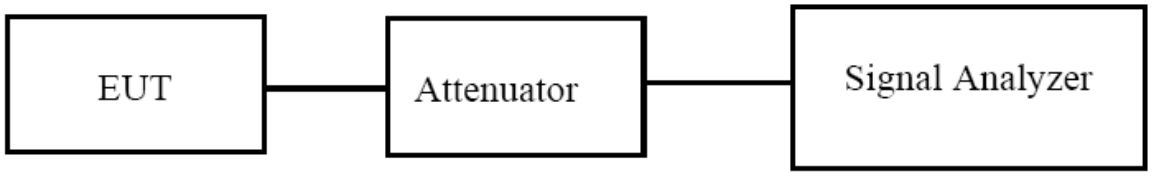
c) Detector = Peak.

d) Trace mode = max hold.

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

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.



5.3 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.

5.4 TEST RESULTS

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX Frequency Band I (5150-5250MHz)		

Note: A(B) Represent the value of antenna A and B, The worst data is Antenna A ,only shown Antenna A Plot.

Mode	Channel	Frequency (MHz)	99% bandwidth(MHz)	26dB bandwidth (MHz)	Limit MHz	Result
			ANT A	ANT A		
802.11a	CH36	5180	16.535	21.80	≥500	Pass
	CH40	5200	16.513	22.73	≥500	Pass
	CH48	5240	16.524	22.91	≥500	Pass
802.11 n20	CH36	5180	17.692	22.16	≥500	Pass
	CH40	5200	17.691	23.57	≥500	Pass
	CH48	5240	17.738	24.24	≥500	Pass
802.11 n40	CH 38	5190	36.286	43.40	≥500	Pass
	CH 46	5230	36.334	44.59	≥500	Pass
802.11 AC20	CH36	5180	17.694	22.88	≥500	Pass
	CH40	5200	17.708	23.07	≥500	Pass
	CH48	5240	17.738	23.75	≥500	Pass
802.11 AC40	CH 38	5190	36.302	43.57	≥500	Pass
	CH 46	5230	36.368	44.00	≥500	Pass
802.11 AC80	CH 42	5210	75.287	80.91	≥500	Pass

Mode	Channel	Frequency (MHz)	99% bandwidth(MHz)	26dB bandwidth (MHz)	Limit MHz	Result
			ANT B	ANT B		
802.11a	CH36	5180	16.348	21.69	≥500	Pass
	CH40	5200	16.347	22.46	≥500	Pass
	CH48	5240	16.361	22.53	≥500	Pass
802.11 n20	CH36	5180	17.573	22.10	≥500	Pass
	CH40	5200	17.569	22.75	≥500	Pass
	CH48	5240	17.578	22.98	≥500	Pass
802.11 n40	CH 38	5190	36.864	43.35	≥500	Pass
	CH 46	5230	36.952	44.45	≥500	Pass
802.11 AC20	CH36	5180	17.566	22.33	≥500	Pass
	CH40	5200	17.565	22.69	≥500	Pass
	CH48	5240	17.570	22.84	≥500	Pass
802.11 AC40	CH 38	5190	36.273	43.41	≥500	Pass
	CH 46	5230	36.130	43.68	≥500	Pass
802.11 AC80	CH 42	5210	75.647	80.14	≥500	Pass

Test plot

(802.11a) 26dB&99%Bandwidth plot on channel 36

(802.11 n20) 26dB&99%Bandwidth plot on channel 36

(802.11a) 26dB&99%Bandwidth plot on channel 40

(802.11 n20) 26dB&99%Bandwidth plot on channel 40

(802.11a) 26dB&99%Bandwidth plot on channel 48

(802.11 n20) 26dB&99%Bandwidth plot on channel 48

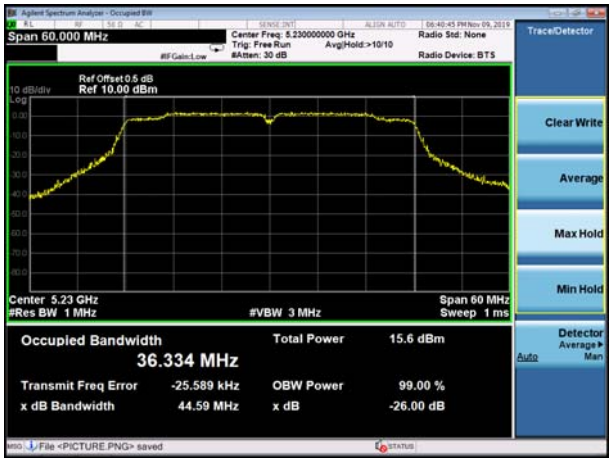
Test plot

(802.11 n40) 26dB&99%Bandwidth plot on channel 38

(802.11 AC20) 26dB&99%Bandwidth plot on channel 36

(802.11 n40) 26dB&99%Bandwidth plot on channel 46

(802.11 AC20) 26dB&99%Bandwidth plot on channel 40

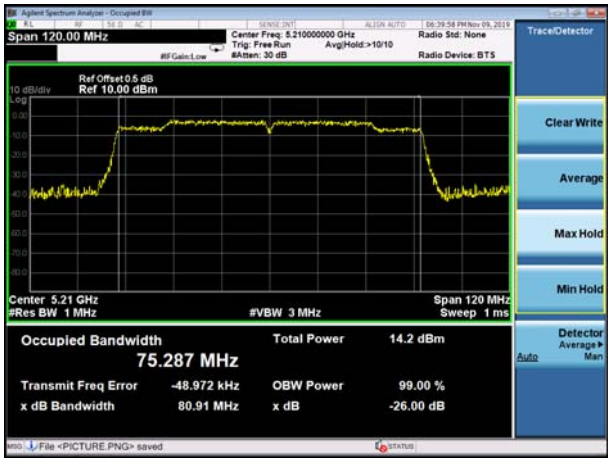


(802.11 AC20) 26dB&99%Bandwidth plot on channel 48

Test plot

(802.11 AC40) 26dB&99%Bandwidth plot on channel 38

(802.11 AC80) 26dB&99%Bandwidth plot on channel 42



(802.11 AC40) 26dB&99%Bandwidth plot on channel 46

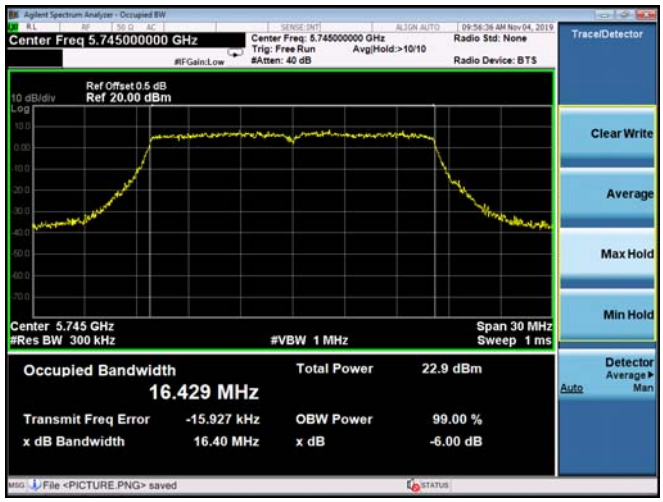
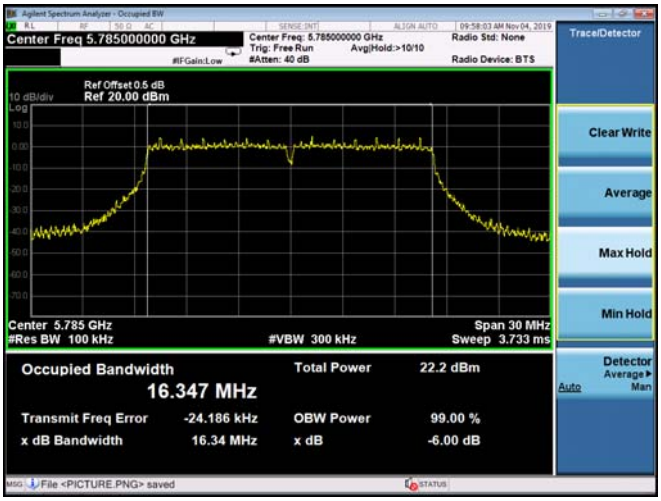
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX Frequency Band IV(5745-5850MHz)		

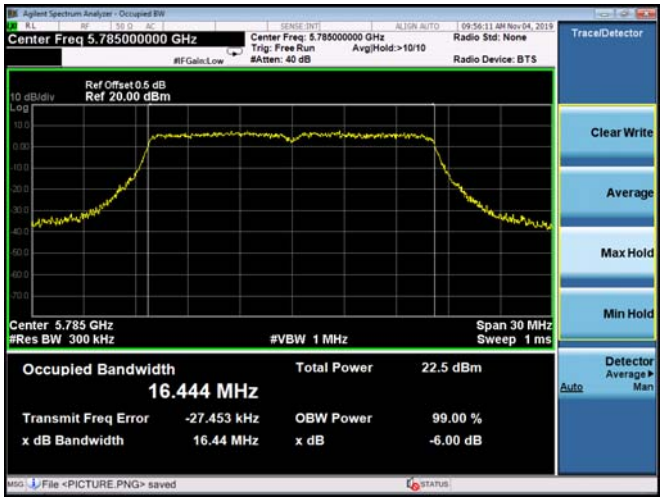
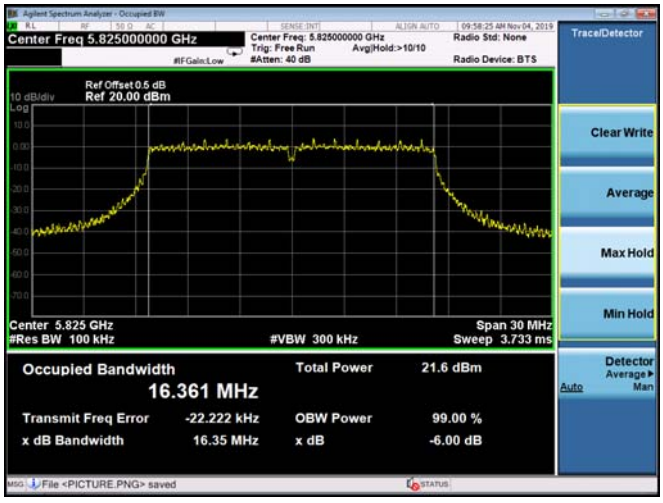
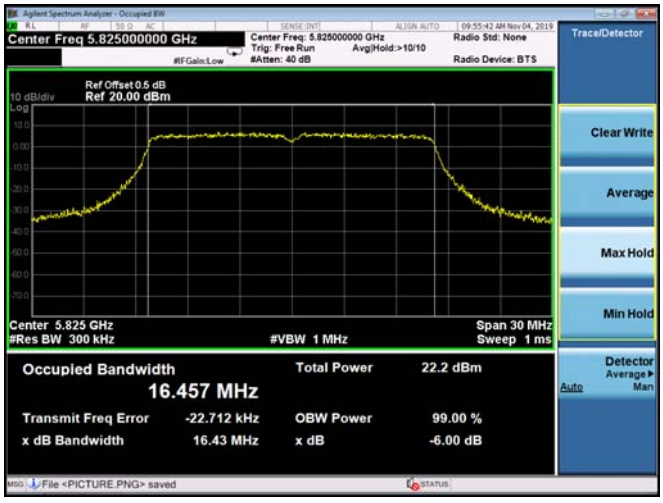
Note: A(B) Represent the value of antenna A and B, The worst data is Antenna A ,only shown Antenna A Plot.

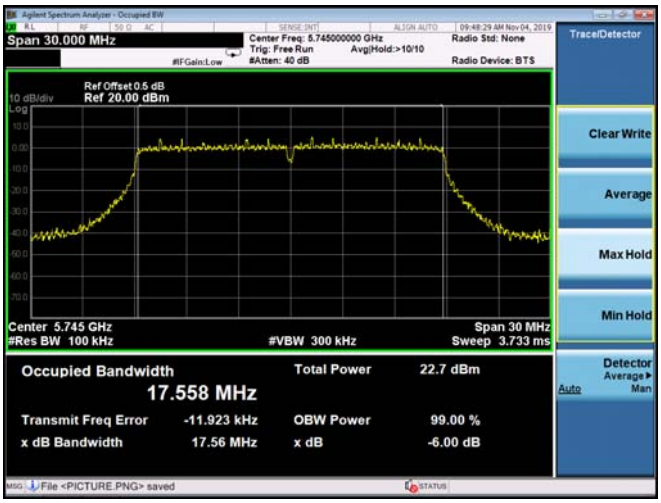
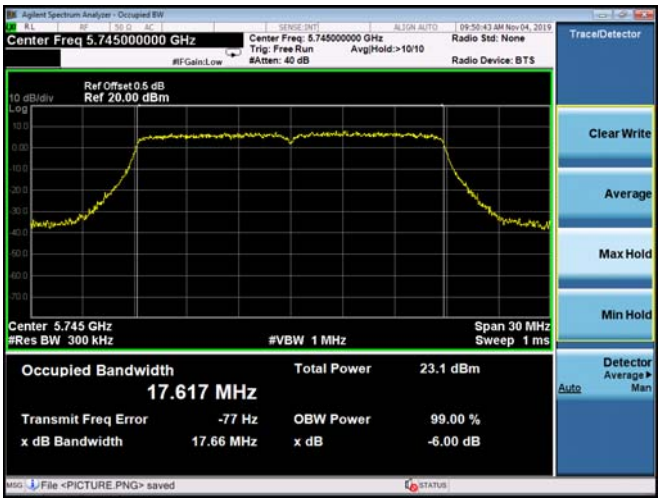
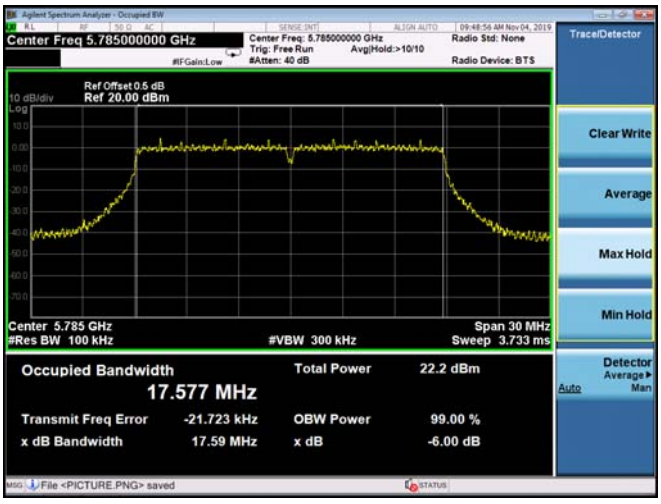
Mode	Channel	Frequency (MHz)	99% bandwidth(MHz)	6dB bandwidth (MHz)	Limit MHz	Result
			ANT A	ANT A		
802.11a	CH149	5745	16.429	16.37	≥500	Pass
	CH157	5785	16.444	16.34	≥500	Pass
	CH165	5825	16.457	16.35	≥500	Pass
802.11 n20	CH149	5745	17.617	17.56	≥500	Pass
	CH157	5785	17.621	17.59	≥500	Pass
	CH165	5825	17.650	17.59	≥500	Pass
802.11 n40	CH151	5755	36.142	35.13	≥500	Pass
	CH159	5795	36.160	35.30	≥500	≥500
802.11 AC20	CH149	5745	17.627	17.59	≥500	≥500
	CH157	5785	17.641	17.57	≥500	≥500
	CH165	5825	17.651	17.59	≥500	≥500
802.11 AC40	CH151	5755	36.112	35.06	≥500	≥500
	CH159	5795	36.160	35.34	≥500	≥500
802.11 AC80	CH155	5775	75.749	75.80	≥500	≥500

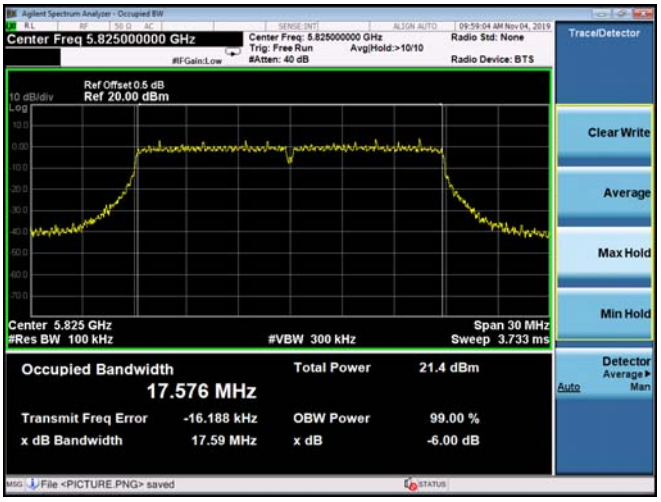
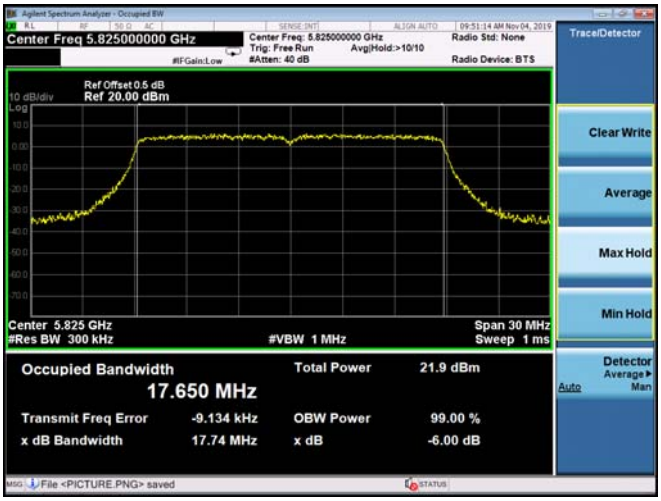
Mode	Channel	Frequency (MHz)	99% bandwidth(MHz)	6dB bandwidth (MHz)	Limit MHz	Result
			ANT B	ANT B		
802.11a	CH149	5745	16.426	16.34	≥500	Pass
	CH157	5785	16.464	16.33	≥500	Pass
	CH165	5825	16.474	16.32	≥500	Pass
802.11 n20	CH149	5745	17.625	17.57	≥500	Pass
	CH157	5785	17.665	17.61	≥500	Pass
	CH165	5825	17.646	17.63	≥500	Pass
802.11 n40	CH151	5755	36.171	34.45	≥500	Pass
	CH159	5795	36.127	35.74	≥500	Pass
802.11 AC20	CH149	5745	17.646	17.62	≥500	Pass
	CH157	5785	17.647	17.57	≥500	Pass
	CH165	5825	17.678	17.70	≥500	Pass
802.11 AC40	CH151	5755	36.130	34.42	≥500	Pass
	CH159	5795	36.127	34.64	≥500	Pass
802.11 AC80	CH155	5775	75.647	75.78	≥500	Pass

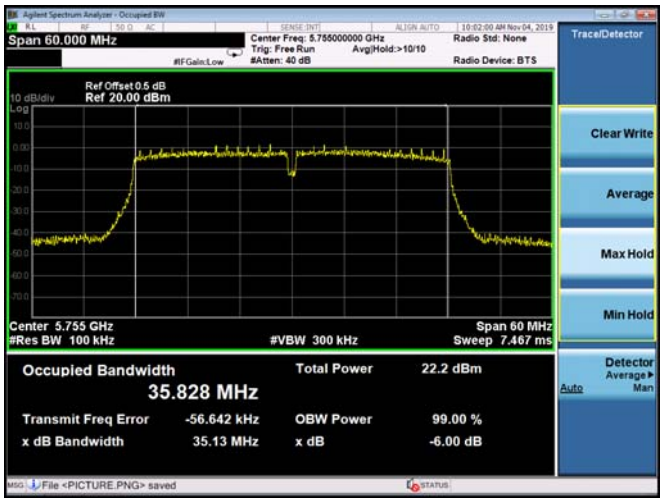
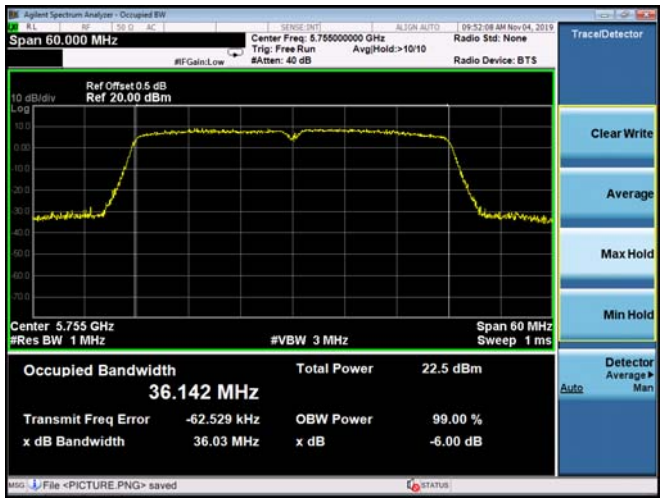
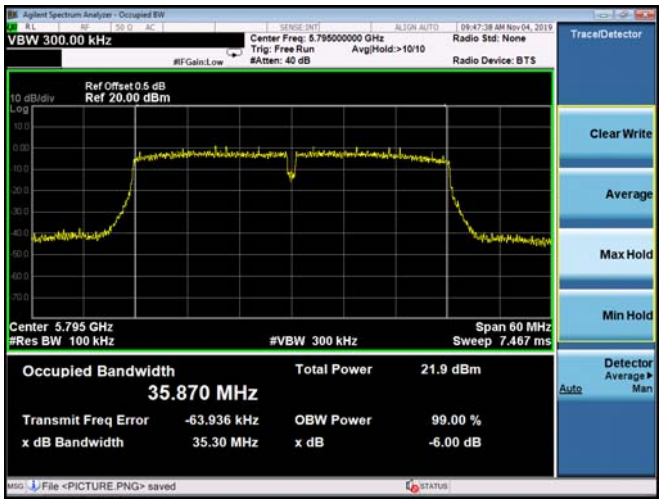
Antenna A: 5725-5850MHz

Mode:	**802.11a**
5745MHz **6dB bandwidth**	
5745MHz 99% bandwidth	
5785MHz 6dB bandwidth	

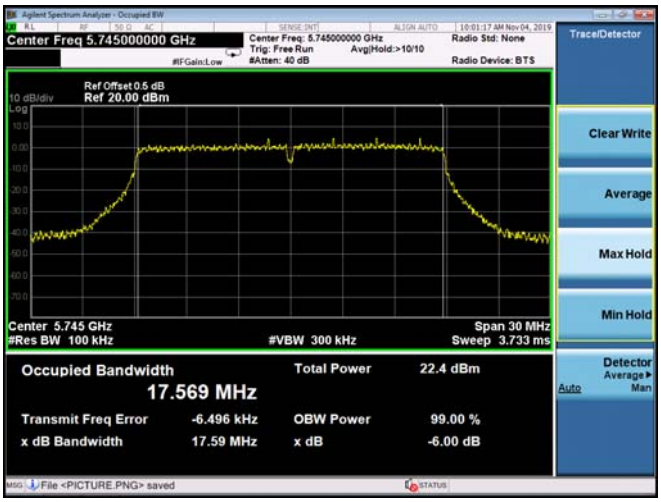
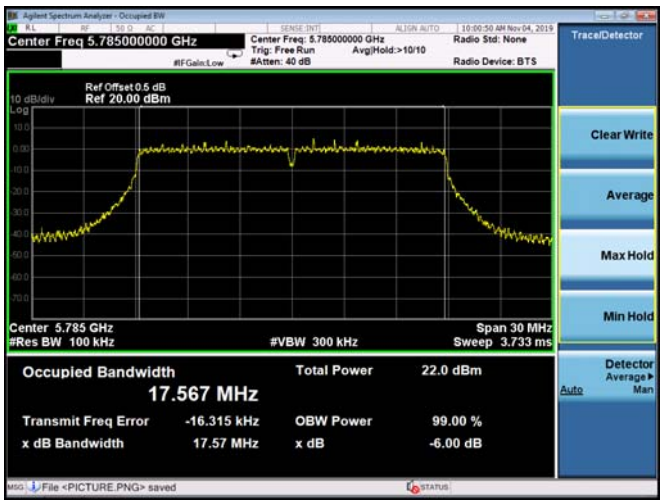
5785MHz 99% bandwidth	
5825MHz **6dB bandwidth**	
5825MHz 99% bandwidth	

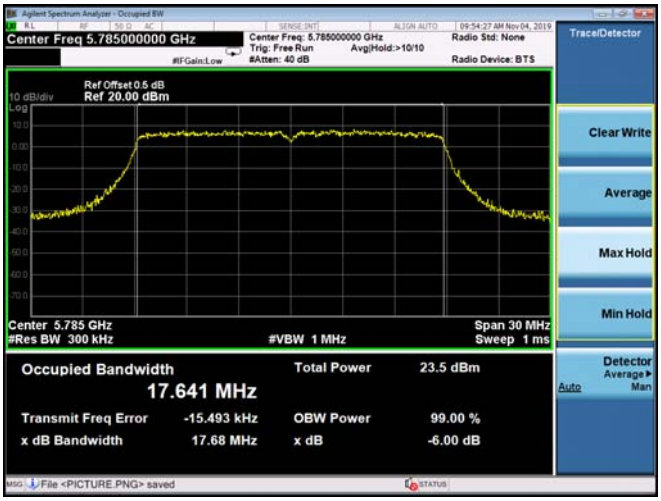
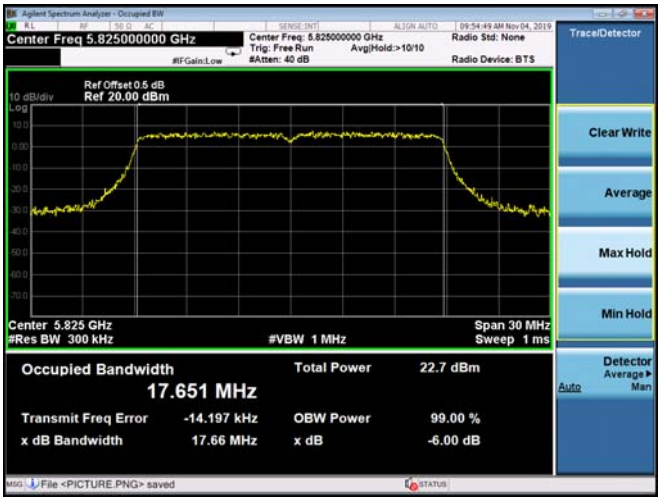
Mode:	802.11n-HT20
5745MHz **6dB bandwidth**	
5745MHz 99% bandwidth	
5785MHz **6dB bandwidth**	

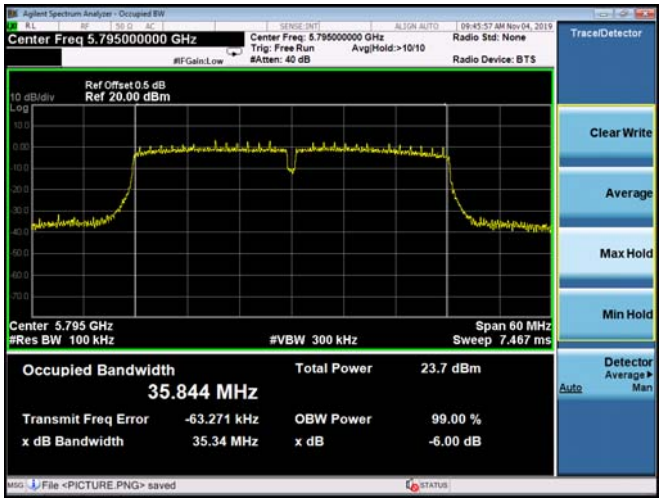
5785MHz 99% bandwidth	
5825MHz **6dB bandwidth**	
5825MHz 99% bandwidth	

Mode:	**802.11n-HT40**
5755 MHz **6dB bandwidth**	
5755 MHz 99% bandwidth	
5795 MHz 6dB bandwidth	

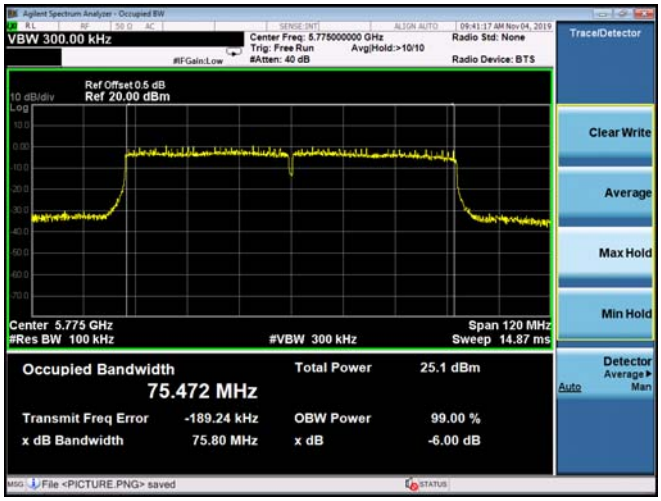
5795 MHz **99% bandwidth**	

Mode:	802.11ac-HT20
5745MHz **6dB bandwidth**	
5745MHz 99% bandwidth	
5785MHz **6dB bandwidth**	

5785MHz 99% bandwidth	
5825MHz **6dB bandwidth**	
5825MHz 99% bandwidth	

Mode:	**802.11ac-HT40**
5755 MHz **6dB bandwidth**	
5755 MHz 99% bandwidth	
5795 MHz 6dB bandwidth	

5795 MHz **99% bandwidth**	

Mode:	**802.11ac-HT80**
5755 MHz **6dB bandwidth**	
5755 MHz 99% bandwidth