TEST REPORT

Report No.:	BCTC2207804598-2E
Applicant:	ETS GEORGES RENAULT
Product Name:	Panel PC
Model/Type reference:	INF-PPC-2-I3-17
Tested Date:	2022-07-15 to 2022-08-10
Issued Date:	2022-08-10

Shenzhen BCTC Testing Co., Ltd.

FCC ID: 2APE2-INFPPC

Product Name:	Panel PC
Trademark:	DESOUTTER
Model/Type reference:	INF-PPC-2-I3-17 INF-PPC-2-I5-17,INF-PPC-2-I7-17
Prepared For:	ETS GEORGES RENAULT
Address:	38, Rue Bobby Sands, 44800 SAINT HERBLAIN - FRANCE
Manufacturer:	Shenzhen TAICENN Technology Co., Limited
Address:	Room 507 Bldg. A, Fuxinlin Industrial park, Hangcheng industrial area, Xi'xiang, Bao'an district, SHENZHEN GUANGDONG 518126, CHINA
Prepared By:	Shenzhen BCTC Testing Co., Ltd.
Address:	1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date:	2022-07-15
Sample tested Date:	2022-07-15 to 2022-08-10
Issue Date:	2022-08-10
Report No.:	BCTC2207804598-2E
Test Standards:	FCC Part15 15.407 ANSI C63.10-2013 KDB 662911 D01 v02r01 KDB 789033 D02 v02r01
Test Results:	PASS
Remark:	This is WIFI-5GHz band radio test report.

Tested by:

Jack Li

Jack Li/Project Handler

Approved by:

Zero Zhou/Reviewer

The test report is effective only with both signature and specialized stamp.This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen BCTC Testing Co., Ltd, this report can't be reproduced except in full.The tested sample(s) and the sample information are provided by the client.

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(Note: N/A Means Not Applicable)

1. Version

Report No.	Issue Date	Description	Approved
BCTC2207804598-2E	2022-08-10	Original	Valid

2. Test Summary

The Product has been tested according to the following specifications:

No.	Test Parameter	Clause No.	Results
1	Spurious Radiated Emissions	15.209(a), 15.407 (b)	PASS
2	Conducted Emission	15.207	PASS
3	26 dB and 99% Emission Bandwidth	15.407 (a) 15.1049	PASS
4	Minimum 6 dB bandwidth	15.407(e)	PASS
5	Maximum Conducted Output Power	15.407 a	PASS
6	Band Edge	2.1051, 15.407b	PASS
7	Power Spectral Density	15.407 a	PASS
8	Spurious Emissions at Antenna Terminals	2.1051, 15.407(b)	PASS
9	Antenna Requirement	15.203	PASS

3. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Uncertainty
1	3m chamber Radiated spurious emission(30MHz-1GHz)	U=4.3dB
2	3m chamber Radiated spurious emission(9KHz-30MHz)	U=3.7dB
3	3m chamber Radiated spurious emission(1GHz-18GHz)	U=4.5dB
4	3m chamber Radiated spurious emission(18GHz-40GHz)	U=3.34dB
5	Conducted Emission (150kHz-30MHz)	U=3.20dB
6	Conducted Adjacent channel power	U=1.38dB
7	Conducted output power uncertainty Above 1G	U=1.576dB
8	Conducted output power uncertainty below 1G	U=1.28dB
9	humidity uncertainty	U=5.3%
10	Temperature uncertainty	U=0.59℃

4. Product Information And Test Setup

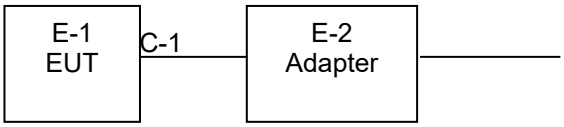
4.1 Product Information

Model/Type reference:	INF-PPC-2-I3-17 INF-PPC-2-I5-17,INF-PPC-2-I7-17
Model differences:	All the model are the same circuit and RF module, except model names.
Hardware Version:	N/A
Software Version:	N/A
IEEE 802.11 WLAN Mode Supported:	802.11a/n/ac(20MHz channel bandwidth) 802.11n/ac(40MHz channel bandwidth) 802.11ac(80MHz channel bandwidth)
Operation Frequency:	5745-5825 MHz for 802.11a/n(HT20)/ac20; 5755-5795 MHz for 802.11a/n(HT40)/ac40; 5775MHz for 802.11 ac80;
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-MCS
Type of Modulation:	OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11a/n/ac;
Number Of Channel:	5 channels for 802.11a/n20 in the 5745-5825MHz band ; 2 channels for 802.11 n40 in the 5755-5795MHz band ; 1 channels for 802.11 ac80 in the 5775MHz band.
Antenna installation:	External antenna*2
Antenna Gain:	WiFi (5.8GHz): Antenna A&B: 4.79 dBi
Ratings:	AC 120V/60Hz
Adapter:	MODEL:KPL-060F-VI INPUT:100-240V~50/60Hz 1.7A OUTPUT:DC 12V 5.0A 60.0W

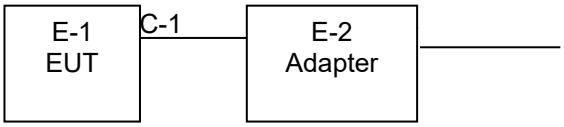
4.2 Test Setup Configuration

See test photographs attached in *EUT TEST SETUP PHOTOGRAPHS* for the actual connections between Product and support equipment.

Conducted Emission:



Radiated Spurious Emission



4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note
E-1	Panel PC	DESOUTTER	INF-PPC-2-I3-17	INF-PPC-2-I5-17,INF-PPC-2-I7-17	
E-2	Adapter	N/A	KPL-060F-VI	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	N/A	N/A	3M	DC cable unshielded

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.4 Channel List

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

802.11a/n/ac(20MHz) 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)**	**Channel**	**Frequency (MHz)**
151	5755	159	5795	-	-	-	-

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

4.5 Test Mode

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.

Pretest Mode	Description
Mode 1	802.11a /n/ ac 20 CH149/ CH157/ CH 165
Mode 2	802.11n/ ac40 CH 151 / CH 159
Mode 3	802.11 ac80 CH 155
Mode 4	Link Mode

Conducted Emission	
Final Test Mode	**Description**
Mode 4	Link Mode

For Radiated Emission	
Final Test Mode	**Description**
Mode 1	802.11a /n/ ac 20 CH149/ CH157/ CH 165
Mode 2	802.11n/ ac40 CH 151 / CH 159
Mode 3	802.11 ac80 CH 155

Note: The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.

4.6 Table Of Parameters Of Text Software Setting

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters

Test software Version	CMD		
Parameters	DEF	DEF	DEF

4.7 Antenna

Table for External antenna

Ant.	Brand	Model Name	Antenna Type	Gain (dBi)	NOTE
A	N/A	N/A	External antenna	4.79	N/A
B	N/A	N/A	External antenna	4.79	N/A

EUT has two External antenna with Max gain GANT 4.79dBi on every antenna, CDD device with one spatial streams, also can operat with one spatial streams according to KDB662911 D01 v02r01, Directional gain= GANT + Array Gain, where Array Gain is as follows.

1)For power spectral density(PSD) measurements,
Array Gain=10log(NANT/NSS)dB=10log(2/1)=3.01 dBi,
So the directional gain for PSD is 7.80 dBi

2)For power measurements,

The Array gain=0 for NANT≤4,
So the directional gain for Power measurements is 4.79dBi

5. Test Facility And Test Instrument Used

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at Shenzhen BCTC Testing Co., Ltd. Address:1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.
FCC Test Firm Registration Number: 712850
IC Registered No.: 23583

5.2 Test Instrument Used

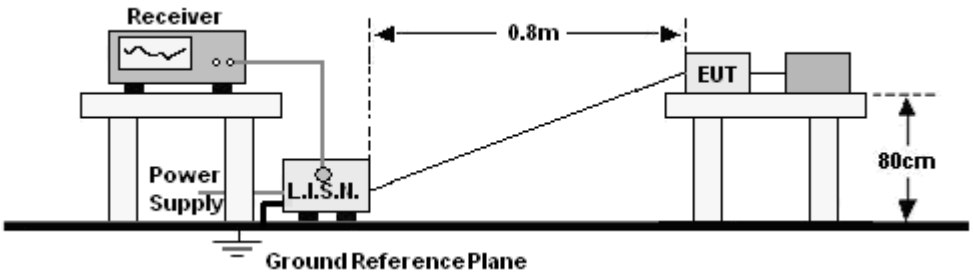
Conducted Emissions Test					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
Receiver	R&S	ESR3	102075	May 24, 2022	May 23, 2023
LISN	R&S	ENV216	101375	May 24, 2022	May 23, 2023
Software	Frad	EZ-EMC	EMC-CON 3A1	\	\
Attenuator	\	10dB C-6GHz	1650	May 24, 2022	May 23, 2023

RF Conducted Test					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
Power Metter	Keysight	E4419	\	May 24, 2022	May 23, 2023
Power Sensor (AV)	Keysight	E9300A	\	May 24, 2022	May 23, 2023
Signal Analyzer 20kHz-26.5GHz	Keysight	N9020A	MY49100060	May 24, 2022	May 23, 2023
Spectrum Analyzer 9kHz-40GHz	R&S	FSP 40	\	May 24, 2022	May 23, 2023

Radiated Emissions Test (966 Chamber)					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
966 chamber	ChengYu	966 Room	966	Jun. 06. 2020	Jun. 05, 2023
Receiver	R&S	ESR3	102075	May 24, 2022	May 23, 2023
Receiver	R&S	ESRP	101154	May 24, 2022	May 23, 2023
Amplifier	SKET	LAPA_01G18G-45dB	\	May 24, 2022	May 23, 2023
Amplifier	Schwarzbeck	BBV9744	9744-0037	May 24, 2022	May 23, 2023
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	942	May 26, 2022	May 25, 2023
Horn Antenna	Schwarzbeck	BBHA9120D	1541	Jun. 06, 2022	Jun. 05, 2023
Horn Antenn (18GHz-40GHz)	Schwarzbeck	BBHA9170	00822	Jun. 06, 2022	Jun. 05, 2023
Amplifier (18GHz-40GHz)	MITEQ	TTA1840-35-HG	2034381	May 26, 2022	May 25, 2023
Loop Antenna (9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	May 26, 2022	May 25, 2023
RF cables1 (9kHz-30MHz)	Huber+Suhnar	9kHz-30MHz	B1702988-0008	May 26, 2022	May 25, 2023
RF cables2 (30MHz-1GHz)	Huber+Suhnar	30MHz-1GHz	1486150	May 26, 2022	May 25, 2023
RF cables3 (1GHz-40GHz)	Huber+Suhnar	1GHz-40GHz	1607106	May 26, 2022	May 25, 2023
Power Metter	Keysight	E4419	\	May 26, 2022	May 25, 2023
Power Sensor (AV)	Keysight	E9300A	\	May 26, 2022	May 25, 2023
Signal Analyzer 20kHz-26.5GHz	Keysight	N9020A	MY49100060	May 26, 2022	May 25, 2023
Spectrum Analyzer 9kHz-40GHz	R&S	FSP 40	\	May 26, 2022	May 25, 2023
Software	Frad	EZ-EMC	FA-03A2 RE	\	\

6. Conducted Emissions

6.1 Block Diagram Of Test Setup



6.2 Limit

Frequency (MHz)	Limit (dBuV)	
	Quas-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00
Notes: 1. *Decreasing linearly with logarithm of frequency. 2. The lower limit shall apply at the transition frequencies.		

6.3 Test procedure

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

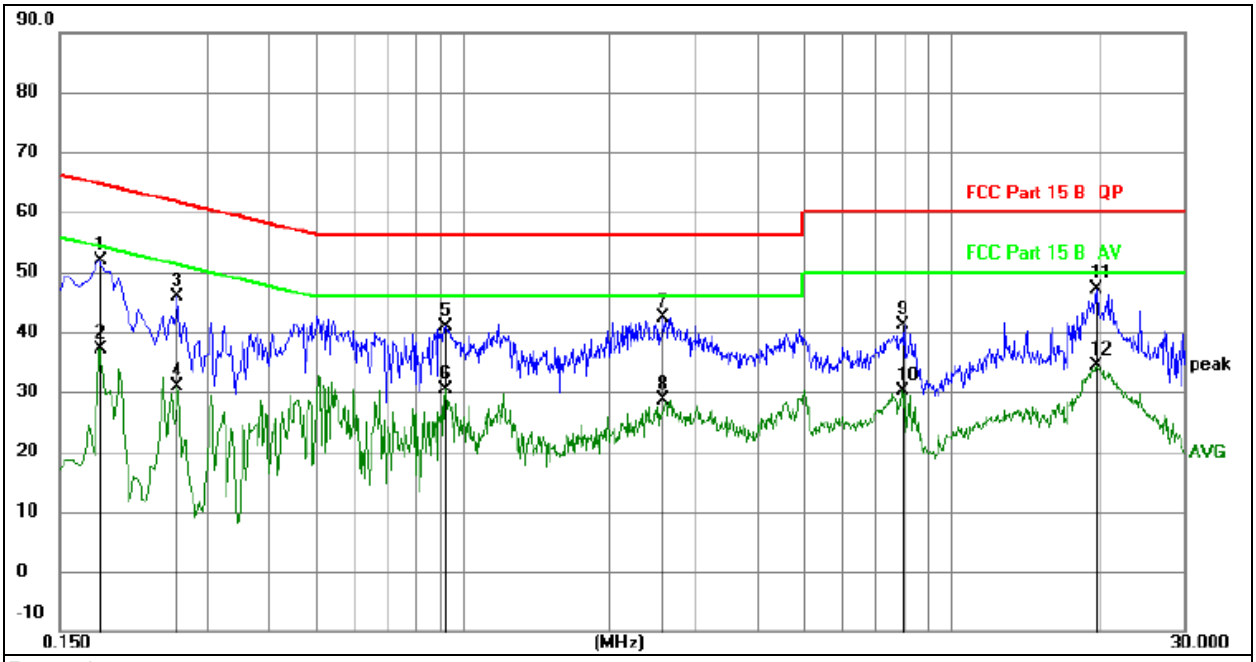
a. The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
b. The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
c. For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

6.4 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.

6.5 Test Result

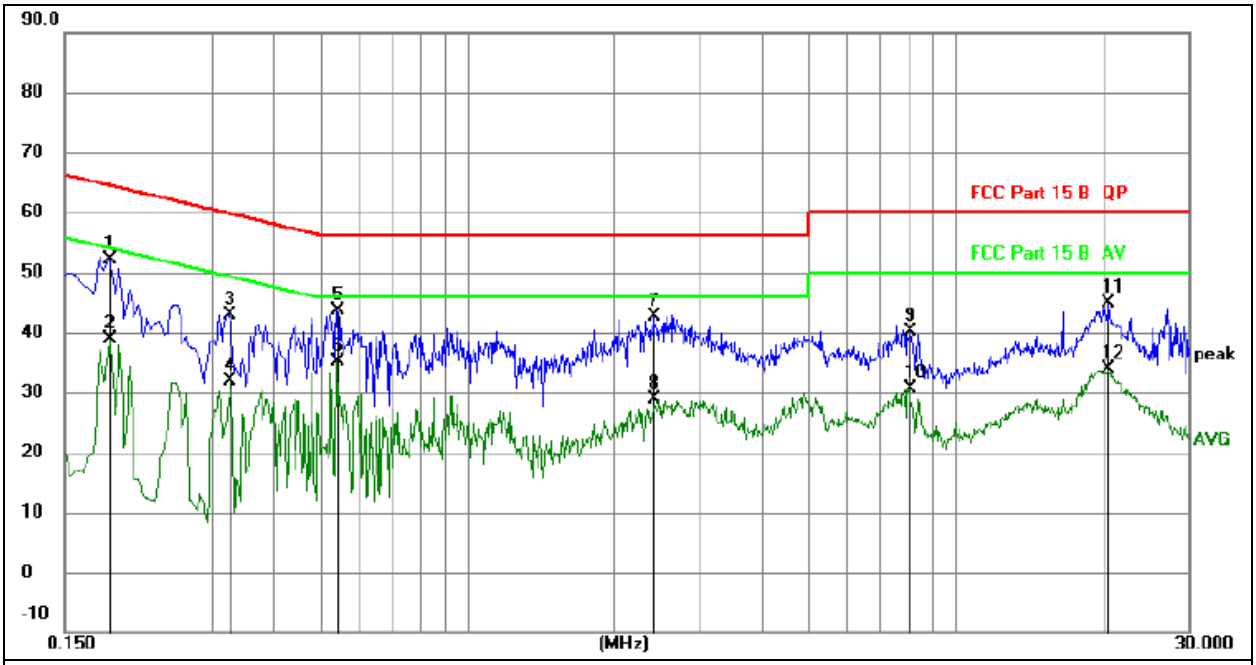
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage ：	AC120V/60Hz
Test Mode:	Mode 4	Polarization :	L



Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement = Reading Level + Correct Factor
4. Over = Measurement - Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1	*	0.1806	32.21	19.75	51.96	64.46	-12.50	QP
2		0.1806	17.41	19.75	37.16	54.46	-17.30	AVG
3		0.2615	26.03	19.78	45.81	61.38	-15.57	QP
4		0.2615	11.21	19.78	30.99	51.38	-20.39	AVG
5		0.9233	21.08	19.75	40.83	56.00	-15.17	QP
6		0.9233	10.75	19.75	30.50	46.00	-15.50	AVG
7		2.5807	22.46	19.94	42.40	56.00	-13.60	QP
8		2.5807	8.72	19.94	28.66	46.00	-17.34	AVG
9		7.9353	20.81	20.21	41.02	60.00	-18.98	QP
10		7.9353	9.94	20.21	30.15	50.00	-19.85	AVG
11		19.8445	26.68	20.50	47.18	60.00	-12.82	QP
12		19.8445	13.88	20.50	34.38	50.00	-15.62	AVG

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage ：	AC120V/60Hz
Test Mode:	Mode 4	Polarization :	N



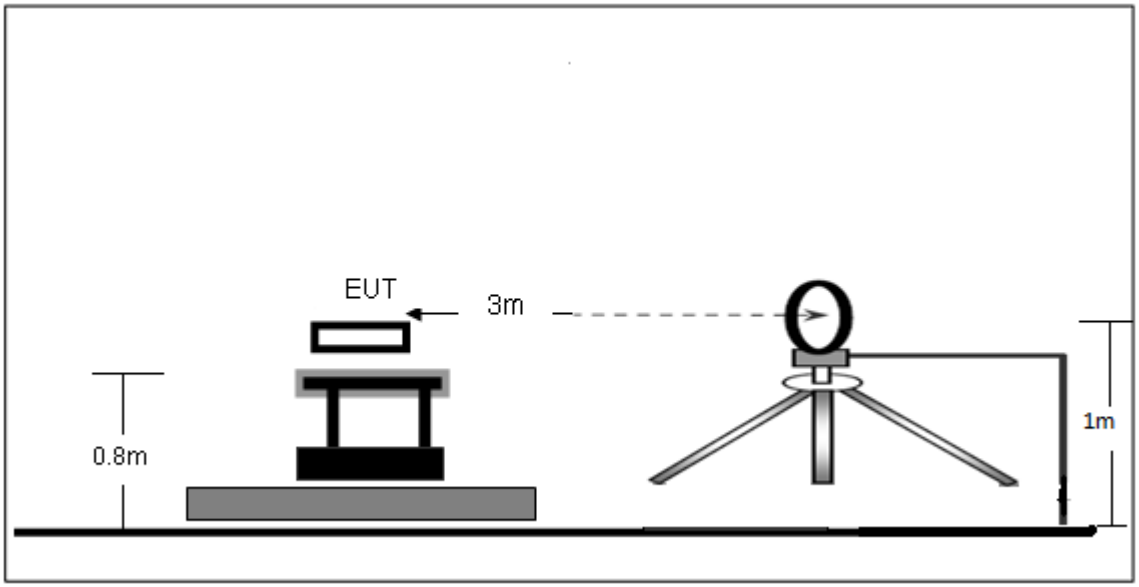
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement = Reading Level + Correct Factor
4. Over = Measurement - Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.1860	32.47	19.76	52.23	64.21	-11.98	QP
2		0.1860	19.18	19.76	38.94	54.21	-15.27	AVG
3		0.3255	23.07	19.77	42.84	59.57	-16.73	QP
4		0.3255	12.14	19.77	31.91	49.57	-17.66	AVG
5		0.5415	24.00	19.72	43.72	56.00	-12.28	QP
6	*	0.5415	15.42	19.72	35.14	46.00	-10.86	AVG
7		2.4180	22.71	19.93	42.64	56.00	-13.36	QP
8		2.4180	8.98	19.93	28.91	46.00	-17.09	AVG
9		8.0745	19.97	20.22	40.19	60.00	-19.81	QP
10		8.0745	10.42	20.22	30.64	50.00	-19.36	AVG
11		20.5215	24.34	20.51	44.85	60.00	-15.15	QP
12		20.5215	13.29	20.51	33.80	50.00	-16.20	AVG

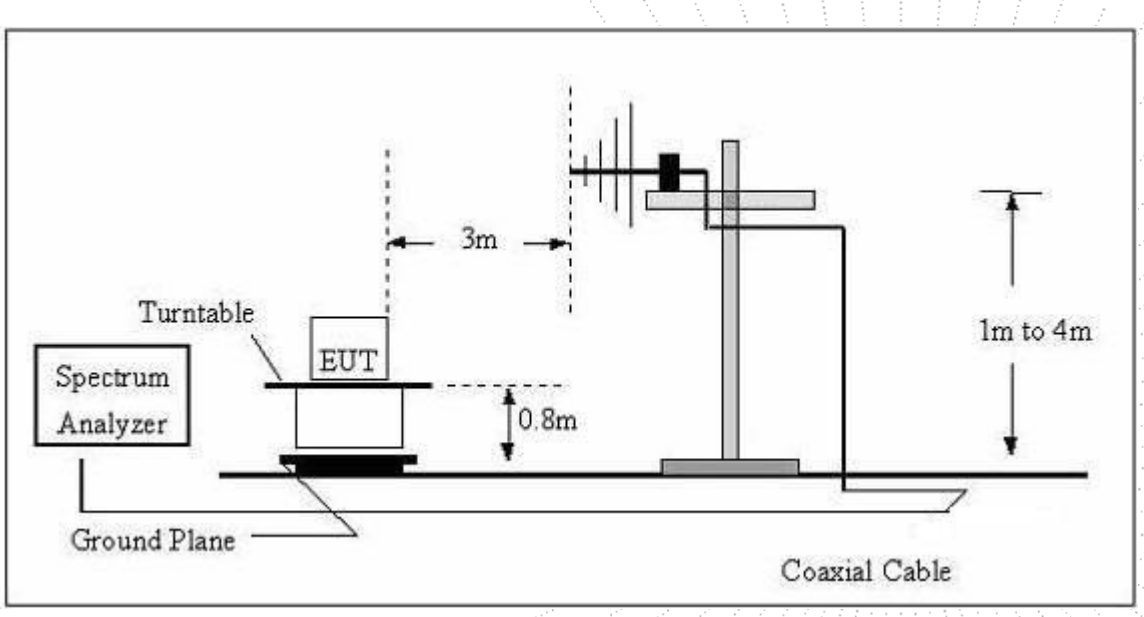
7. Radiated Emissions

7.1 Block Diagram Of Test Setup

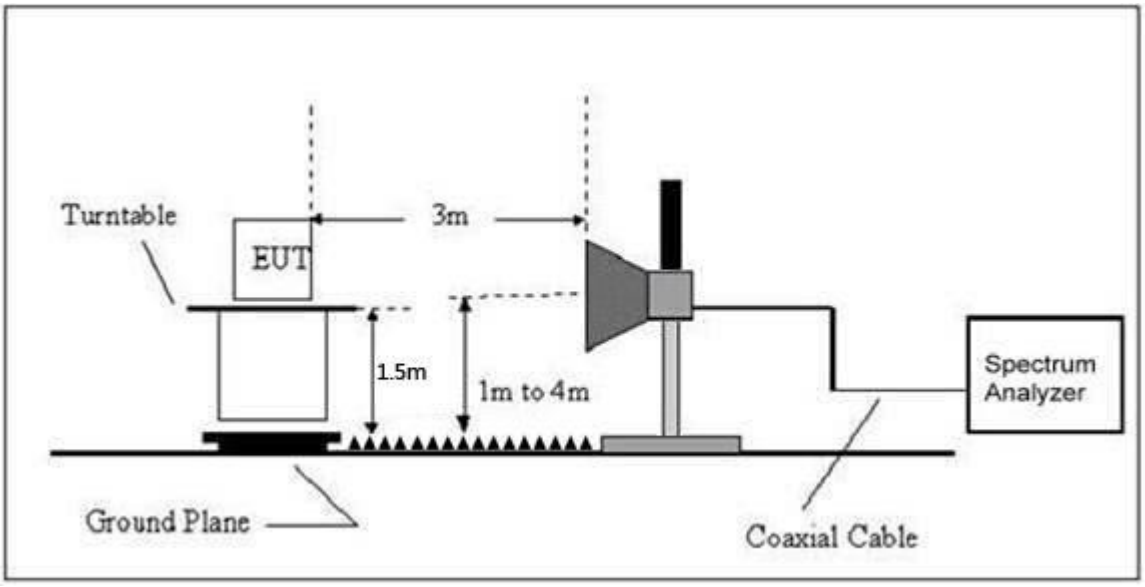
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



7.2 Limit

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.

Frequency	Field Strength	Distance	Field Strength Limit at 3m Distance	
(MHz)	uV/m	(m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))}$ + 80
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))}$ + 40
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)}$ + 40
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

Limits Of Radiated Emission Measurement (Above 1000MHz)

Frequency (MHz)	Limit (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).

7.3 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.

7.4 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.

7.5 Test Result

Below 30MHz

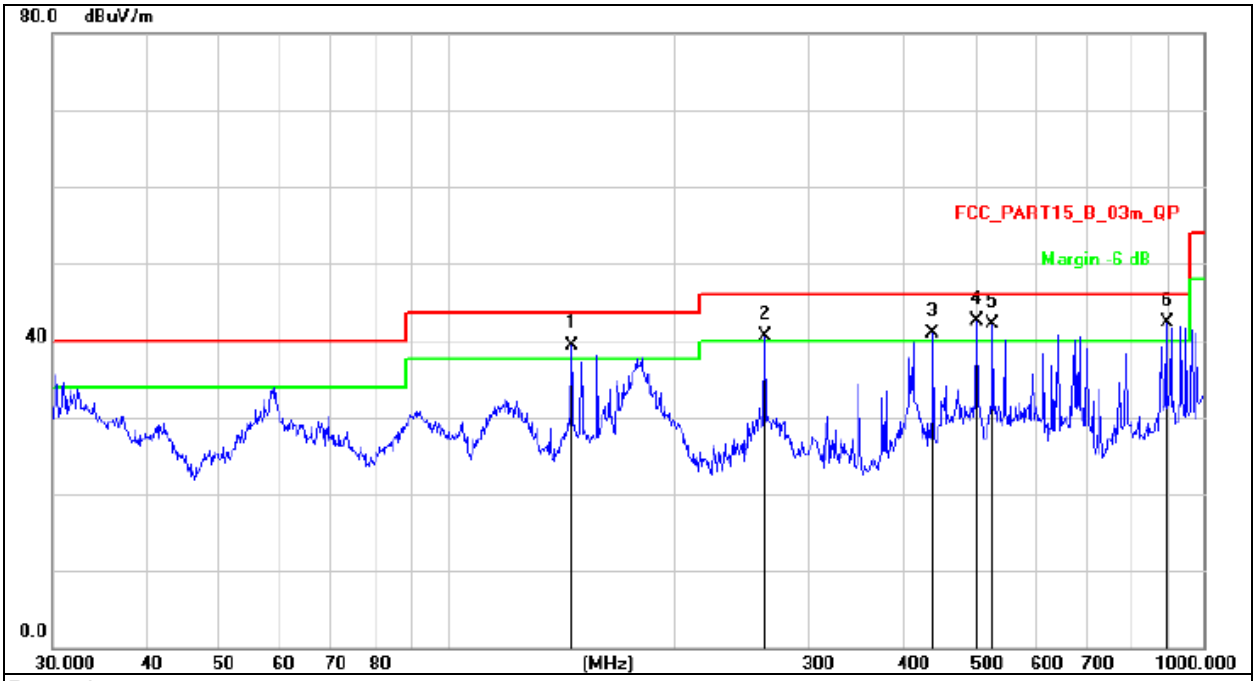
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage ：	AC120V/60Hz
Test Mode:	Mode 4	Polarization :	---

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

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.

Between 30MHz – 1GHz

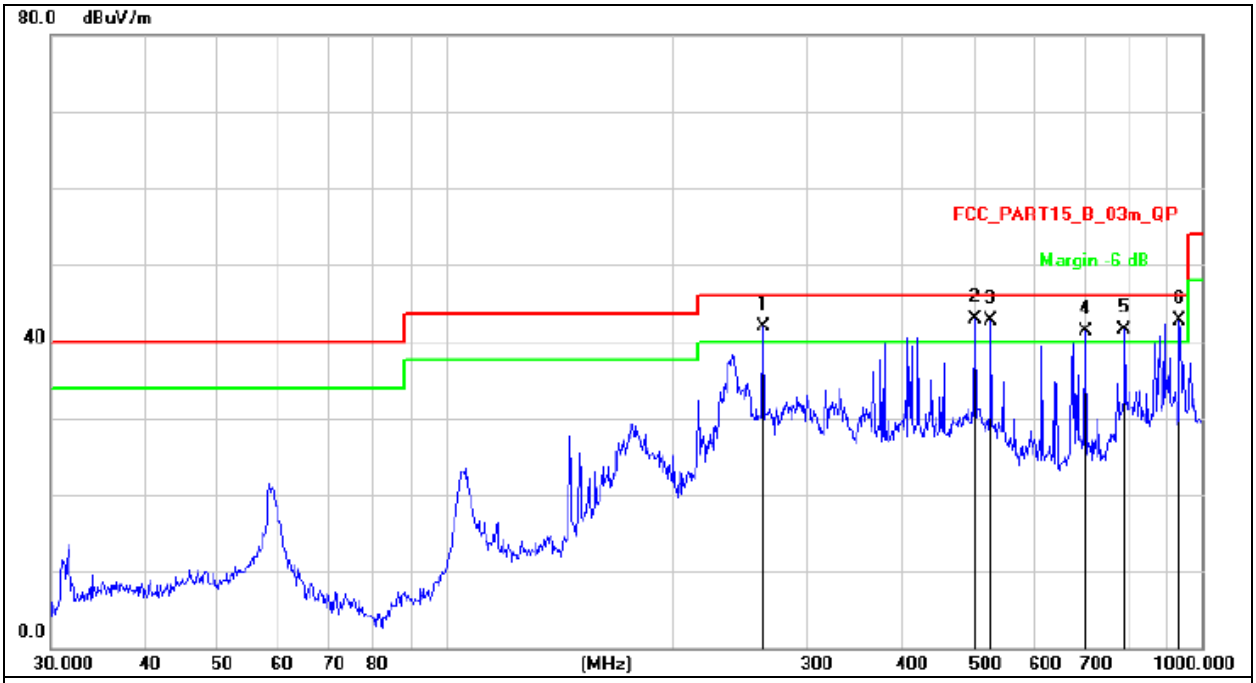
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage ：	AC120V/60Hz
Test Mode:	Mode 4	Polarization :	Horizontal



Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Measurement = Reading Level + Correct Factor
3. Over = Measurement - Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	!	145.8611	58.93	-19.60	39.33	43.50	-4.17	QP
2	!	262.8955	54.20	-13.61	40.59	46.00	-5.41	QP
3	!	438.6554	50.35	-9.44	40.91	46.00	-5.09	QP
4	*	501.1790	50.32	-7.81	42.51	46.00	-3.49	QP
5	!	526.3967	49.35	-7.30	42.05	46.00	-3.95	QP
6	!	893.8567	43.21	-0.93	42.28	46.00	-3.72	QP

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage ：	AC120V/60Hz
Test Mode:	Mode 4	Polarization :	Vertical



Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Measurement = Reading Level + Correct Factor
3. Over = Measurement - Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	!	262.8955	55.58	-13.61	41.97	46.00	-4.03	QP
2	*	501.1790	50.68	-7.81	42.87	46.00	-3.13	QP
3	!	526.3967	49.94	-7.30	42.64	46.00	-3.36	QP
4	!	701.7610	45.41	-4.03	41.38	46.00	-4.62	QP
5	!	790.6187	43.93	-2.42	41.51	46.00	-4.49	QP
6	!	935.5463	43.32	-0.59	42.73	46.00	-3.27	QP

Between 1GHz – 40GHz

Test Mode:	TX(5.8G) - 802.11a

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5745 MHz)-Above 1G									
V	4679.042	57.43	5.94	35.40	44.00	54.77	74	-19.23	PK
V	4679.042	43.75	5.94	35.40	44.00	41.09	54	-12.91	AV
V	11490.188	56.73	8.46	39.75	44.50	60.44	68.2	-7.76	PK
V	11490.188	43.22	8.46	39.75	44.50	46.93	54	-7.07	AV
V	17235.038	59.46	10.12	38.80	44.10	64.28	68.2	-3.92	PK
V	17235.038	43.48	10.12	38.80	42.70	49.70	54	-4.30	AV
H	4679.120	58.30	5.94	35.18	44.00	55.42	74	-18.58	PK
H	4679.120	43.92	5.94	35.18	44.00	41.04	54	-12.96	AV
H	11490.168	50.13	8.46	38.71	44.50	52.80	68.2	-15.40	PK
H	11490.168	42.05	8.46	38.71	44.50	44.72	54	-9.28	AV
H	17235.184	53.42	10.12	38.38	44.10	57.82	68.2	-10.38	PK
H	17235.184	43.85	10.12	38.38	44.10	48.25	54	-5.75	AV
Middle Channel (5785 MHz)-Above 1G									
V	4592.055	58.50	6.48	36.35	44.05	57.28	74	-16.72	PK
V	4592.055	43.15	6.48	36.35	44.05	41.93	54	-12.07	AV
V	11570.148	57.79	8.47	37.88	44.51	59.63	68.2	-8.57	PK
V	11570.148	43.61	8.47	37.88	44.51	45.45	54	-8.55	AV
V	17355.096	59.32	10.12	38.80	44.10	64.14	68.2	-4.06	PK
V	17355.096	39.37	10.12	38.80	42.70	45.59	54	-8.41	AV
H	4592.172	57.44	6.48	36.37	44.05	56.24	74	-17.76	PK
H	4592.172	43.56	6.48	36.37	44.05	42.36	54	-11.64	AV
H	11570.050	50.11	8.47	38.64	44.50	52.72	68.2	-15.48	PK
H	11570.050	44.07	8.47	38.64	44.50	46.68	54	-7.32	AV
H	17355.188	52.35	10.12	38.38	44.10	56.75	68.2	-11.45	PK
H	17355.188	40.74	10.12	38.38	44.10	45.14	54	-8.86	AV
High Channel (5825 MHz)-Above 1G									
V	6039.097	58.20	7.10	37.24	43.50	59.04	68.2	-9.16	PK
V	6039.097	43.66	7.10	37.24	43.50	44.50	54	-9.50	AV
V	11650.129	61.62	8.46	37.68	44.50	63.26	74	-10.74	PK
V	11650.129	43.46	8.46	37.68	44.50	45.10	54	-8.90	AV
V	17475.152	55.88	10.12	38.80	44.10	60.70	68.2	-7.50	PK
V	17475.152	43.46	10.12	38.80	42.70	49.68	54	-4.32	AV
H	6039.001	55.16	7.10	37.24	43.50	56.00	68.2	-12.20	PK
H	6039.001	43.06	7.10	37.24	43.50	43.90	54	-10.10	AV
H	11650.143	52.15	8.46	38.57	44.50	54.68	74	-19.32	PK
H	11650.143	41.87	8.46	38.57	44.50	44.40	54	-9.60	AV
H	17475.145	50.47	10.12	38.38	44.10	54.87	68.2	-13.33	PK
H	17475.145	40.65	10.12	38.38	44.10	45.05	54	-8.95	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G 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.
The worst case is Antenna A.

Test Mode:	TX(5.8G) - 802.11n-HT20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5745 MHz)-Above 1G									
V	4679.092	58.80	5.94	35.40	44.00	56.14	74	-17.86	PK
V	4679.092	43.70	5.94	35.40	44.00	41.04	54	-12.96	AV
V	11490.111	54.79	8.46	39.75	44.50	58.50	68.2	-9.70	PK
V	11490.111	43.69	8.46	39.75	44.50	47.40	54	-6.60	AV
V	17235.048	57.93	10.12	38.80	44.10	62.75	68.2	-5.45	PK
V	17235.048	43.24	10.12	38.80	42.70	49.46	54	-4.54	AV
H	4679.176	59.10	5.94	35.18	44.00	56.22	74	-17.78	PK
H	4679.176	43.87	5.94	35.18	44.00	40.99	54	-13.01	AV
H	11490.182	49.07	8.46	38.71	44.50	51.74	68.2	-16.46	PK
H	11490.182	43.60	8.46	38.71	44.50	46.27	54	-7.73	AV
H	17235.191	51.36	10.12	38.38	44.10	55.76	68.2	-12.44	PK
H	17235.191	43.67	10.12	38.38	44.10	48.07	54	-5.93	AV
Middle Channel (5785 MHz)-Above 1G									
V	4592.192	62.51	6.48	36.35	44.05	61.29	74	-12.71	PK
V	4592.192	43.63	6.48	36.35	44.05	42.41	54	-11.59	AV
V	11570.078	55.64	8.47	37.88	44.51	57.48	68.2	-10.72	PK
V	11570.078	43.30	8.47	37.88	44.51	45.14	54	-8.86	AV
V	17355.023	59.92	10.12	38.80	44.10	64.74	68.2	-3.46	PK
V	17355.023	43.84	10.12	38.80	42.70	50.06	54	-3.94	AV
H	4592.043	59.56	6.48	36.37	44.05	58.36	74	-15.64	PK
H	4592.043	43.44	6.48	36.37	44.05	42.24	54	-11.76	AV
H	11570.127	50.47	8.47	38.64	44.50	53.08	68.2	-15.12	PK
H	11570.127	40.61	8.47	38.64	44.50	43.22	54	-10.78	AV
H	17355.079	51.15	10.12	38.38	44.10	55.55	68.2	-12.65	PK
H	17355.079	44.94	10.12	38.38	44.10	49.34	54	-4.66	AV
High Channel (5825 MHz)-Above 1G									
V	6039.066	55.47	7.10	37.24	43.50	56.31	68.2	-11.89	PK
V	6039.066	43.16	7.10	37.24	43.50	44.00	54	-10.00	AV
V	11650.167	56.74	8.46	37.68	44.50	58.38	74	-15.62	PK
V	11650.167	43.79	8.46	37.68	44.50	45.43	54	-8.57	AV
V	17475.046	55.73	10.12	38.80	44.10	60.55	68.2	-7.65	PK
V	17475.046	43.59	10.12	38.80	42.70	49.81	54	-4.19	AV
H	6039.091	55.70	7.10	37.24	43.50	56.54	68.2	-11.66	PK
H	6039.091	43.68	7.10	37.24	43.50	44.52	54	-9.48	AV
H	11650.068	51.53	8.46	38.57	44.50	54.06	74	-19.94	PK
H	11650.068	41.11	8.46	38.57	44.50	43.64	54	-10.36	AV
H	17475.002	52.96	10.12	38.38	44.10	57.36	68.2	-10.84	PK
H	17475.002	42.13	10.12	38.38	44.10	46.53	54	-7.47	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G 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 is MIMO Mode.

Test Mode:	TX(5.8G) - 802.11n-HT40

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5755 MHz)-Above 1G									
V	4679.018	58.52	5.94	35.40	44.00	55.86	74	-18.14	PK
V	4679.018	43.13	5.94	35.40	44.00	40.47	54	-13.53	AV
V	11510.146	56.56	8.46	39.75	44.50	60.27	74	-13.73	PK
V	11510.146	43.93	8.46	39.75	44.50	47.64	54	-6.36	AV
V	17265.031	59.49	10.12	38.80	44.10	64.31	68.2	-3.89	PK
V	17265.031	2.00	10.12	38.80	42.70	8.22	54	-45.78	AV
H	4679.115	58.64	5.94	35.18	44.00	55.76	74	-18.24	PK
H	4679.115	43.28	5.94	35.18	44.00	40.40	54	-13.60	AV
H	11510.172	53.15	8.46	38.71	44.50	55.82	74	-18.18	PK
H	11510.172	40.39	8.46	38.71	44.50	43.06	54	-10.94	AV
H	17265.127	53.17	10.12	38.38	44.10	57.57	68.2	-10.63	PK
H	17265.127	40.06	10.12	38.38	44.10	44.46	54	-9.54	AV
High Channel (5795 MHz)-Above 1G									
V	6039.129	56.31	6.48	36.35	44.05	55.09	68.2	-13.11	PK
V	6039.129	43.55	6.48	36.35	44.05	42.33	54	-11.67	AV
V	11590.011	59.12	8.47	37.88	44.51	60.96	74	-13.04	PK
V	11590.011	43.77	8.47	37.88	44.51	45.61	54	-8.39	AV
V	17385.172	55.47	10.12	38.80	44.10	60.29	68.2	-7.91	PK
V	17385.172	41.09	10.12	38.80	42.70	47.31	54	-6.69	AV
H	6039.027	57.26	6.48	36.37	44.05	56.06	68.2	-12.14	PK
H	6039.027	43.42	6.48	36.37	44.05	42.22	54	-11.78	AV
H	11590.065	52.97	8.47	38.64	44.50	55.58	74	-18.42	PK
H	11590.065	44.82	8.47	38.64	44.50	47.43	54	-6.57	AV
H	17385.039	53.04	10.12	38.38	44.10	57.44	68.2	-10.76	PK
H	17385.039	44.68	10.12	38.38	44.10	49.08	54	-4.92	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G 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 is MIMO Mode.

Test Mode:	TX(5.8G) - 802.11ac-HT20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5745 MHz)-Above 1G									
V	4679.194	58.77	5.94	35.40	44.00	56.11	74	-17.89	PK
V	4679.194	43.83	5.94	35.40	44.00	41.17	54	-12.83	AV
V	11490.025	53.87	8.46	39.75	44.50	57.58	68.2	-10.62	PK
V	11490.025	43.04	8.46	39.75	44.50	46.75	54	-7.25	AV
V	17235.107	61.84	10.12	38.80	44.10	66.66	68.2	-1.54	PK
V	17235.107	43.84	10.12	38.80	42.70	50.06	54	-3.94	AV
H	4679.011	59.58	5.94	35.18	44.00	56.70	74	-17.30	PK
H	4679.011	43.28	5.94	35.18	44.00	40.40	54	-13.60	AV
H	11490.200	51.42	8.46	38.71	44.50	54.09	68.2	-14.11	PK
H	11490.200	40.73	8.46	38.71	44.50	43.40	54	-10.60	AV
H	17235.059	50.12	10.12	38.38	44.10	54.52	68.2	-13.68	PK
H	17235.059	41.52	10.12	38.38	44.10	45.92	54	-8.08	AV
Middle Channel (5785 MHz)-Above 1G									
V	4592.188	58.02	6.48	36.35	44.05	56.80	74	-17.20	PK
V	4592.188	43.01	6.48	36.35	44.05	41.79	54	-12.21	AV
V	11570.001	56.58	8.47	37.88	44.51	58.42	68.2	-9.78	PK
V	11570.001	43.60	8.47	37.88	44.51	45.44	54	-8.56	AV
V	17355.200	58.29	10.12	38.80	44.10	63.11	68.2	-5.09	PK
V	17355.200	43.05	10.12	38.80	42.70	49.27	54	-4.73	AV
H	4592.102	58.32	6.48	36.37	44.05	57.12	74	-16.88	PK
H	4592.102	43.09	6.48	36.37	44.05	41.89	54	-12.11	AV
H	11570.068	51.17	8.47	38.64	44.50	53.78	68.2	-14.42	PK
H	11570.068	40.54	8.47	38.64	44.50	43.15	54	-10.85	AV
H	17355.009	51.98	10.12	38.38	44.10	56.38	68.2	-11.82	PK
H	17355.009	41.28	10.12	38.38	44.10	45.68	54	-8.32	AV
High Channel (5825 MHz)-Above 1G									
V	6039.142	59.83	7.10	37.24	43.50	60.67	68.2	-7.53	PK
V	6039.142	43.95	7.10	37.24	43.50	44.79	54	-9.21	AV
V	11650.169	57.43	8.46	37.68	44.50	59.07	74	-14.93	PK
V	11650.169	43.50	8.46	37.68	44.50	45.14	54	-8.86	AV
V	17475.083	55.55	10.12	38.80	44.10	60.37	68.2	-7.83	PK
V	17475.083	43.39	10.12	38.80	42.70	49.61	54	-4.39	AV
H	6039.172	57.39	7.10	37.24	43.50	58.23	68.2	-9.97	PK
H	6039.172	43.72	7.10	37.24	43.50	44.56	54	-9.44	AV
H	11650.160	52.26	8.46	38.57	44.50	54.79	74	-19.21	PK
H	11650.160	43.35	8.46	38.57	44.50	45.88	54	-8.12	AV
H	17475.128	52.00	10.12	38.38	44.10	56.40	68.2	-11.80	PK
H	17475.128	42.53	10.12	38.38	44.10	46.93	54	-7.07	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G 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 is MIMO Mode.

Test Mode:	TX(5.8G) - 802.11ac-HT40

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5755 MHz)-Above 1G									
V	4679.173	60.26	5.94	35.40	44.00	57.60	74	-16.40	PK
V	4679.173	43.69	5.94	35.40	44.00	41.03	54	-12.97	AV
V	11510.098	55.63	8.46	39.75	44.50	59.34	74	-14.66	PK
V	11510.098	43.36	8.46	39.75	44.50	47.07	54	-6.93	AV
V	17265.196	57.39	10.12	38.80	44.10	62.21	68.2	-5.99	PK
V	17265.196	2.00	10.12	38.80	42.70	8.22	54	-45.78	AV
H	4679.059	57.73	5.94	35.18	44.00	54.85	74	-19.15	PK
H	4679.059	43.62	5.94	35.18	44.00	40.74	54	-13.26	AV
H	11510.012	53.22	8.46	38.71	44.50	55.89	74	-18.11	PK
H	11510.012	42.23	8.46	38.71	44.50	44.90	54	-9.10	AV
H	17265.180	54.39	10.12	38.38	44.10	58.79	68.2	-9.41	PK
H	17265.180	44.82	10.12	38.38	44.10	49.22	54	-4.78	AV
High Channel (5795 MHz)-Above 1G									
V	6039.151	56.07	6.48	36.35	44.05	54.85	68.2	-13.35	PK
V	6039.151	43.85	6.48	36.35	44.05	42.63	54	-11.37	AV
V	11590.004	58.92	8.47	37.88	44.51	60.76	74	-13.24	PK
V	11590.004	43.12	8.47	37.88	44.51	44.96	54	-9.04	AV
V	17385.140	55.17	10.12	38.80	44.10	59.99	68.2	-8.21	PK
V	17385.140	41.38	10.12	38.80	42.70	47.60	54	-6.40	AV
H	6039.160	58.61	6.48	36.37	44.05	57.41	68.2	-10.79	PK
H	6039.160	43.90	6.48	36.37	44.05	42.70	54	-11.30	AV
H	11590.008	52.39	8.47	38.64	44.50	55.00	74	-19.00	PK
H	11590.008	40.94	8.47	38.64	44.50	43.55	54	-10.45	AV
H	17385.072	54.83	10.12	38.38	44.10	59.23	68.2	-8.97	PK
H	17385.072	41.49	10.12	38.38	44.10	45.89	54	-8.11	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G 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 is MIMO Mode.

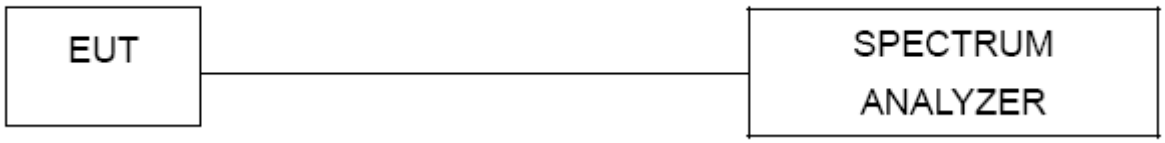
Test Mode:	TX(5.8G) - 802.11ac-HT80

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
(5775 MHz)-Above 1G									
V	4679.007	59.45	5.94	35.40	44.00	56.79	74	-17.21	PK
V	4679.007	43.68	5.94	35.40	44.00	41.02	54	-12.98	AV
V	11550.153	56.73	8.46	39.75	44.50	60.44	74	-13.56	PK
V	11550.153	43.24	8.46	39.75	44.50	46.95	54	-7.05	AV
V	17325.000	59.99	10.12	38.80	44.10	64.81	68.2	-3.39	PK
V	17325.000	41.69	10.12	38.80	42.70	47.91	54	-6.09	AV
H	4679.160	57.00	5.94	35.18	44.00	54.12	74	-19.88	PK
H	4679.160	43.11	5.94	35.18	44.00	40.23	54	-13.77	AV
H	11550.098	53.61	8.46	38.71	44.50	56.28	74	-17.72	PK
H	11550.098	42.09	8.46	38.71	44.50	44.76	54	-9.24	AV
H	17325.124	54.84	10.12	38.38	44.10	59.24	68.2	-8.96	PK
H	17325.124	42.97	10.12	38.38	44.10	47.37	54	-6.63	AV

Note: PK value is lower than the Average value limit, So average didn't record.
The 26.5-40G 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 is MIMO Mode.

8. Power Spectral Density Test

8.1 Block Diagram Of Test Setup



8.2 Limit

For the band 5.15-5.25 GHz,
(i)For an outdoor Wifi Repeater 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 Wifi Repeater 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 Wifi Repeaters 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.

8.3 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.

8.4 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.

8.5 Test Result

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage:	AC120V/60Hz
Test Mode:	TX Frequency U-NII-3 (5745-5825MHz)		

Condition	Mode	Frequency (MHz)	Conducted PSD (dBm/500KHz)		Total (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
			Ant A	Ant B			
NVNT	a	5745	2.414	2.931	/	30	Pass
NVNT	a	5785	1.619	1.529	/	30	Pass
NVNT	a	5825	1.083	0.690	/	30	Pass
NVNT	n20	5745	1.593	1.964	4.793	28.2	Pass
NVNT	n20	5785	1.180	1.089	4.145	28.2	Pass
NVNT	n20	5825	0.362	-0.152	3.123	28.2	Pass
NVNT	n40	5755	-2.698	-1.936	0.710	28.2	Pass
NVNT	n40	5795	-3.755	-3.393	-0.560	28.2	Pass
NVNT	ac20	5745	1.147	2.287	4.765	28.2	Pass
NVNT	ac20	5785	1.117	1.500	4.323	28.2	Pass
NVNT	ac20	5825	0.127	-0.269	2.944	28.2	Pass
NVNT	ac40	5755	-2.831	-2.132	0.543	28.2	Pass
NVNT	ac40	5795	-3.418	-3.205	-0.300	28.2	Pass
NVNT	ac80	5775	-5.634	-5.651	-2.632	28.2	Pass

Note:
Antenna A gain:4.79 dBi, Antenna B gain: 4.79 dBi,

Array Gain=10log(NANT/NSS)dB=10log(2/1)=3.01 dBi
Directional gain=[GainANT + Array Gain) dBi] =7.80 dbi>6dbi
Limit=30-(7.80-6)=28.2 dbi

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

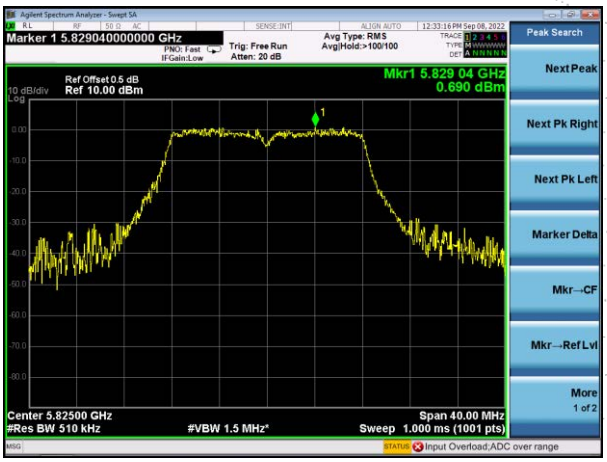
(802.11a) PSD plot on channel 149

(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



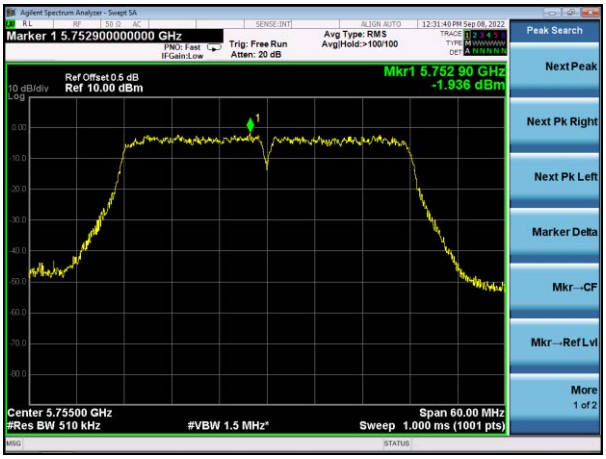
(802.11n20) PSD plot on channel 165

(802.11ac20) PSD plot on channel 149

(802.11ac20) PSD plot on channel 157

(802.11ac20) PSD plot on channel 165

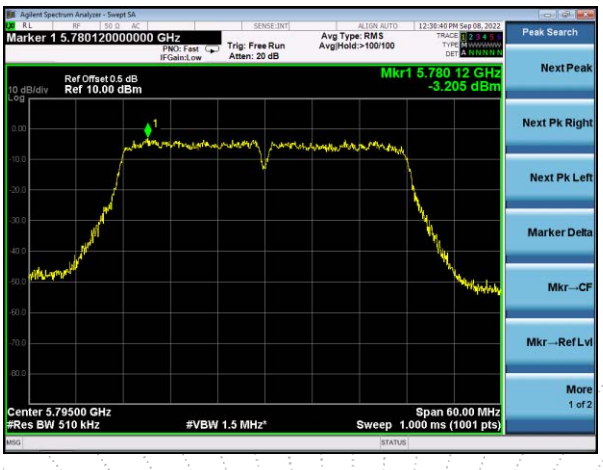
(802.11n40) PSD plot on channel 151



(802.11ac40) PSD plot on channel 151

(802.11n40) PSD plot on channel 159

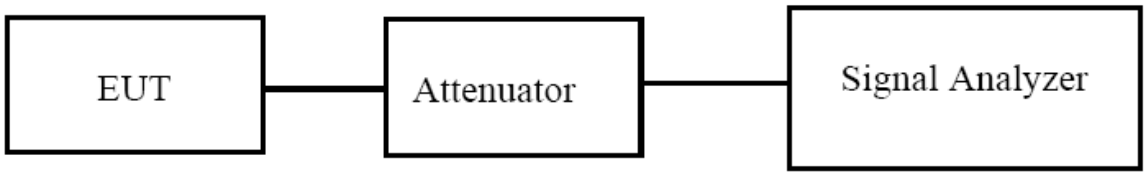
(802.11ac40) PSD plot on channel 159



(802.11ac80) PSD plot on channel 155

9. 26dB & 6dB & 99% Emission Bandwidth

9.1 Block Diagram Of Test Setup



9.2 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.

9.3 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.

9.4 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.

9.5 Test Result

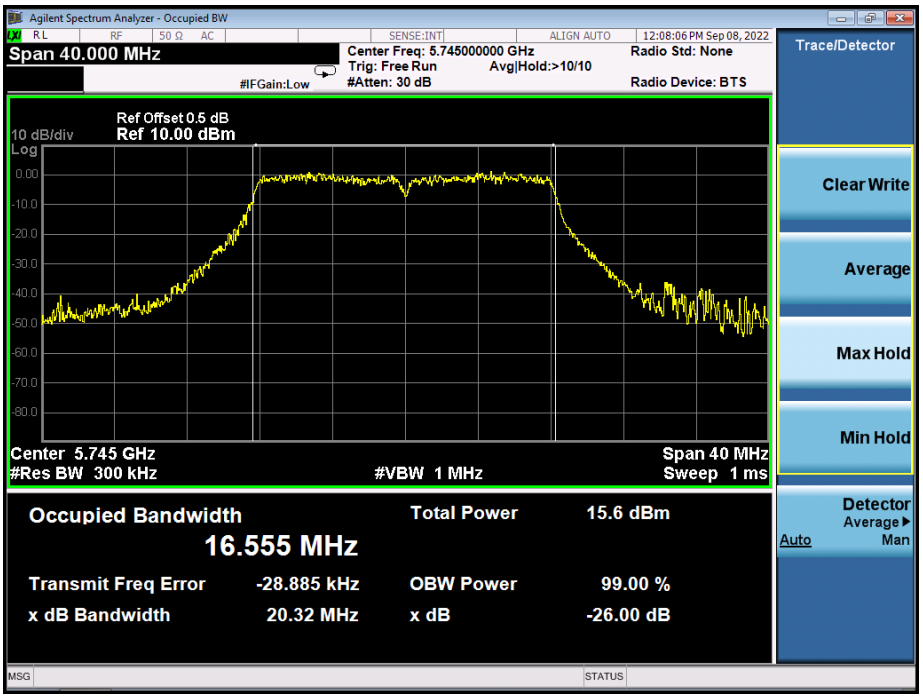
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage:	AC120V/60Hz
Test Mode:	TX Frequency U-NII-3 (5745-5825MHz)		

Condition	Mode	Frequency (MHz)	99% OBW (MHz)	
			Ant A	Ant B
NVNT	a	5745	16.64	16.56
NVNT	a	5785	16.67	16.61
NVNT	a	5825	16.67	16.63
NVNT	n20	5745	17.68	17.66
NVNT	n20	5785	17.69	17.66
NVNT	n20	5825	17.70	17.65
NVNT	n40	5755	35.98	35.94
NVNT	n40	5795	35.95	35.96
NVNT	ac20	5745	17.71	17.68
NVNT	ac20	5785	17.67	17.68
NVNT	ac20	5825	17.70	17.70
NVNT	ac40	5755	35.97	35.89
NVNT	ac40	5795	36.00	35.94
NVNT	ac80	5775	75.12	75.05

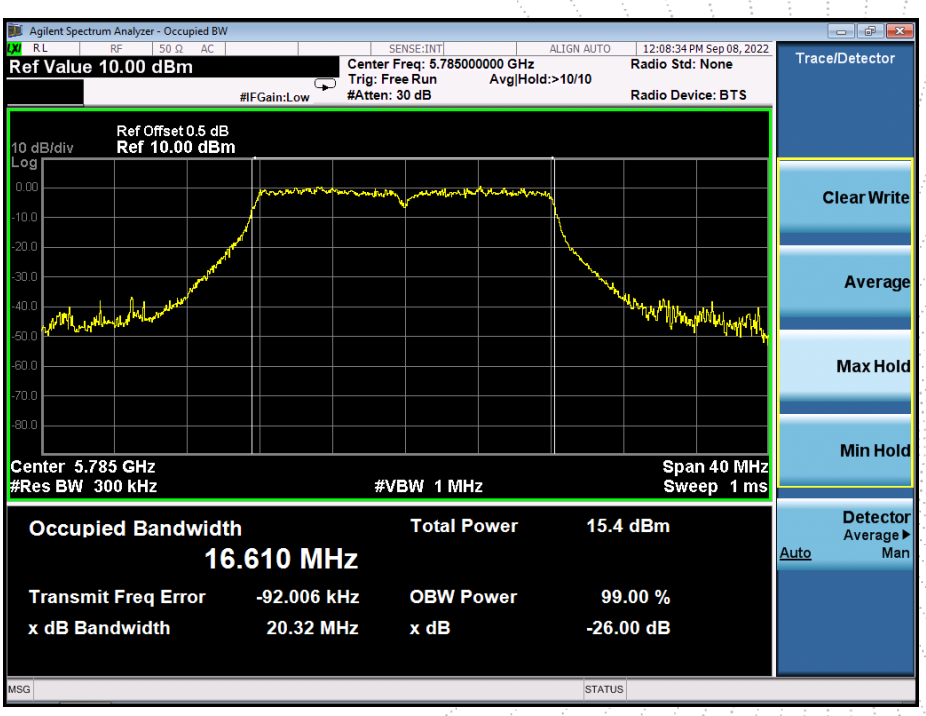
Condition	Mode	Frequency (MHz)	-6 dB Bandwidth (MHz)		Limit -6 dB Bandwidth (MHz)	Verdict
			Ant A	Ant B		
NVNT	a	5745	16.53	16.51	0.5	Pass
NVNT	a	5785	16.53	16.50	0.5	Pass
NVNT	a	5825	16.51	16.50	0.5	Pass
NVNT	n20	5745	17.64	17.63	0.5	Pass
NVNT	n20	5785	17.67	17.62	0.5	Pass
NVNT	n20	5825	17.68	17.64	0.5	Pass
NVNT	n40	5755	36.44	36.39	0.5	Pass
NVNT	n40	5795	36.44	36.40	0.5	Pass
NVNT	ac20	5745	17.66	17.65	0.5	Pass
NVNT	ac20	5785	17.68	17.68	0.5	Pass
NVNT	ac20	5825	17.65	17.63	0.5	Pass
NVNT	ac40	5755	36.40	36.38	0.5	Pass
NVNT	ac40	5795	36.43	36.40	0.5	Pass
NVNT	ac80	5775	75.29	75.66	0.5	Pass

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

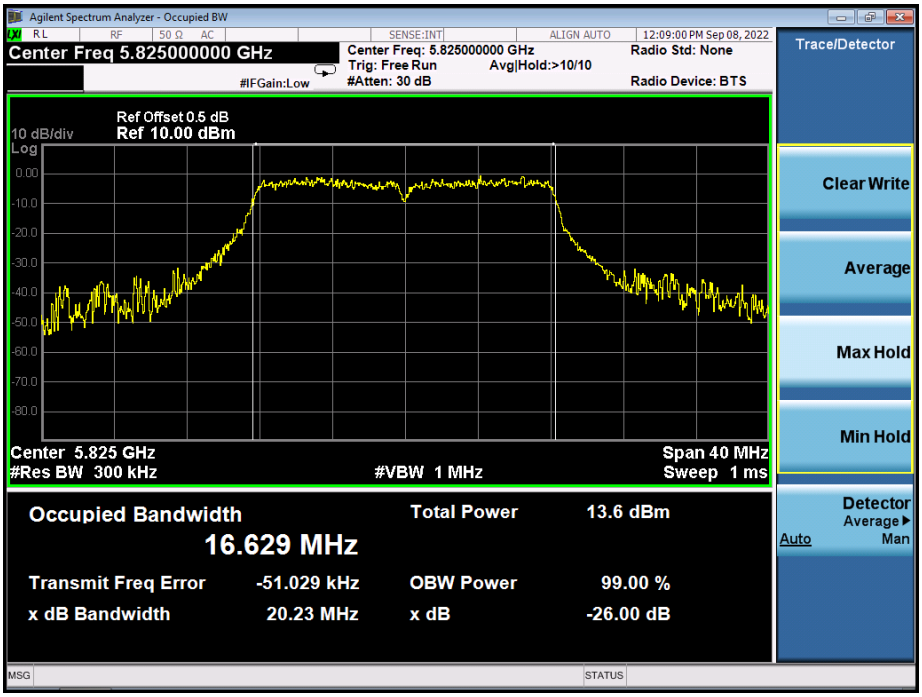
802.11a 5745MHz 99% bandwidth



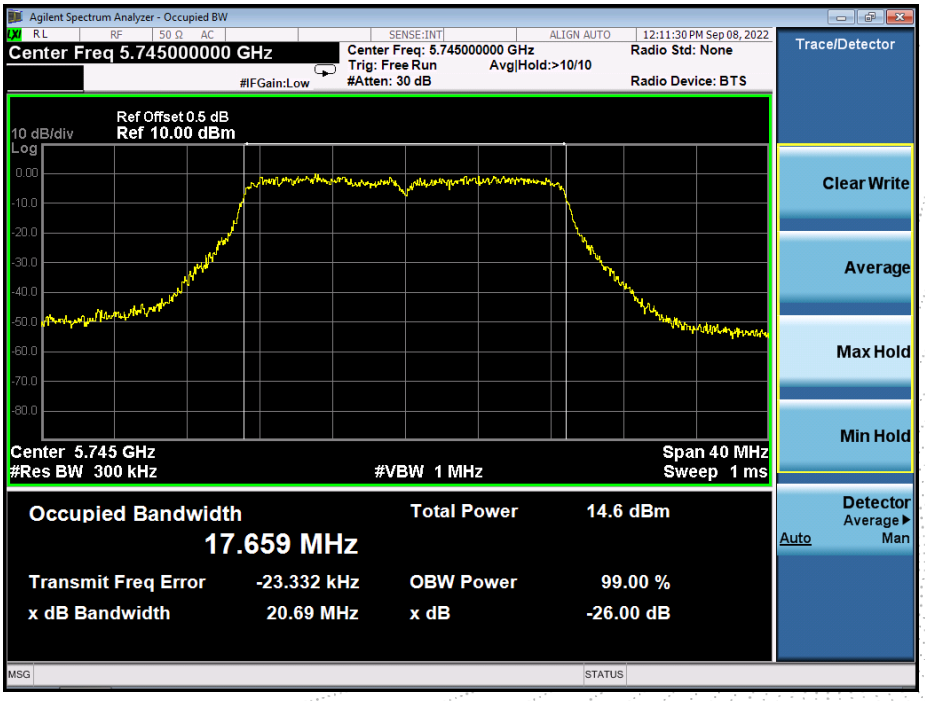
802.11a 5785MHz 99% bandwidth



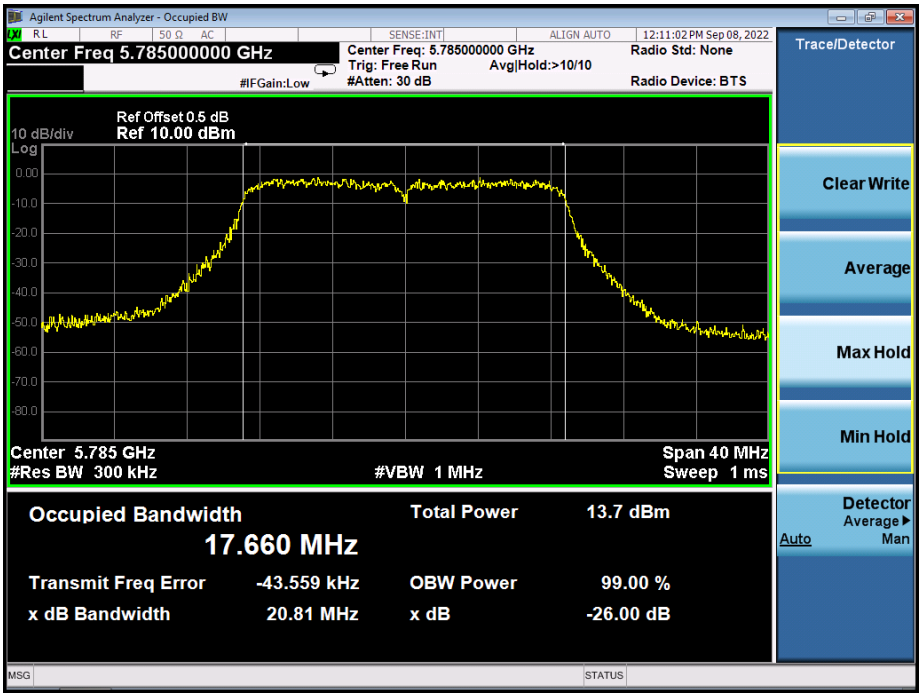
802.11a 5825MHz 99% bandwidth



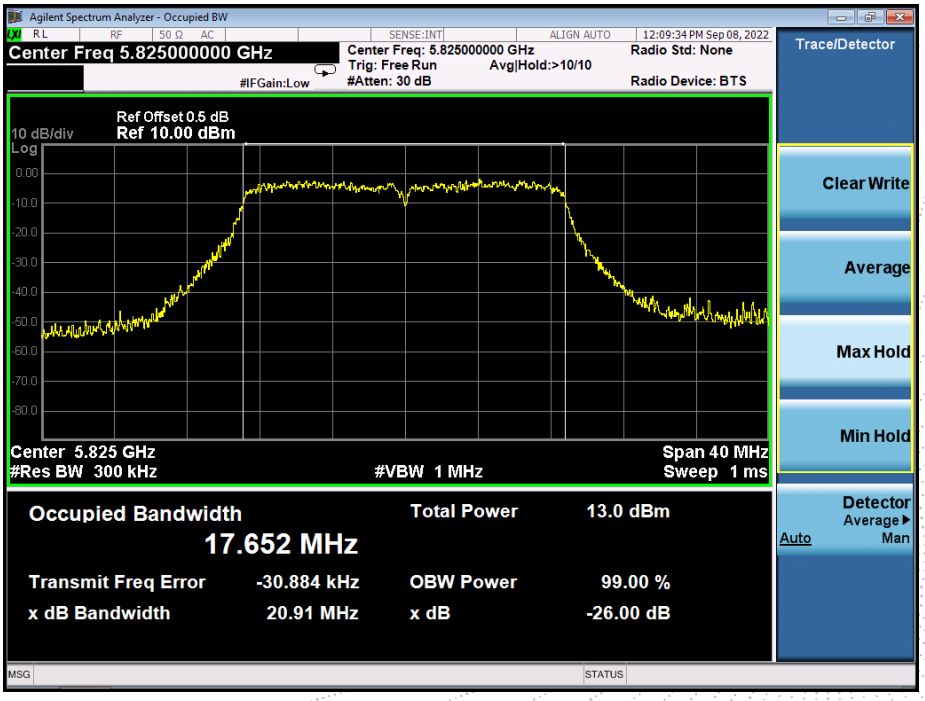
802.11n20 5745MHz 99% bandwidth



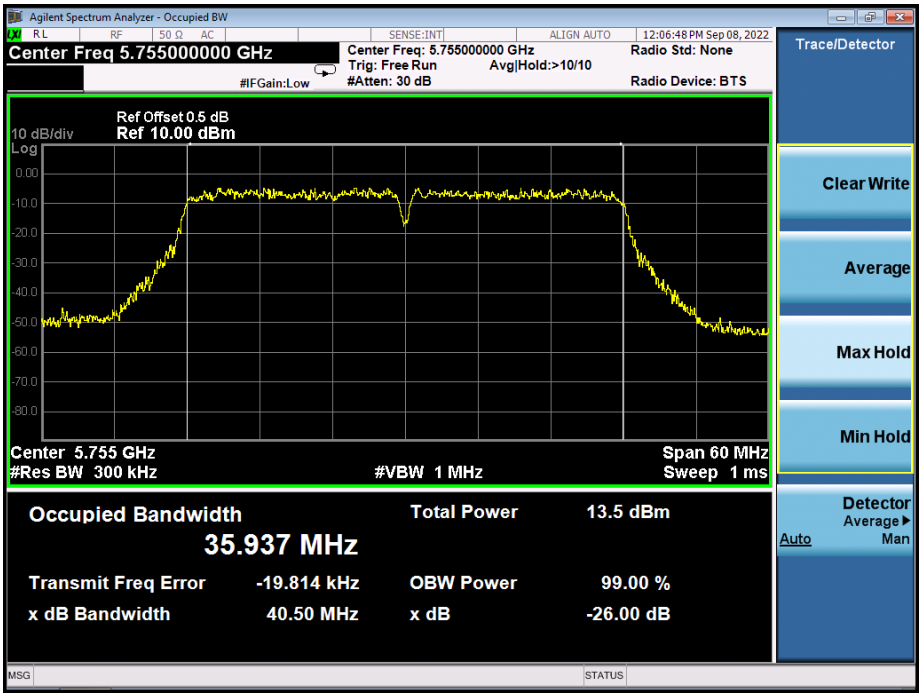
802.11n20 5785MHz 99% bandwidth



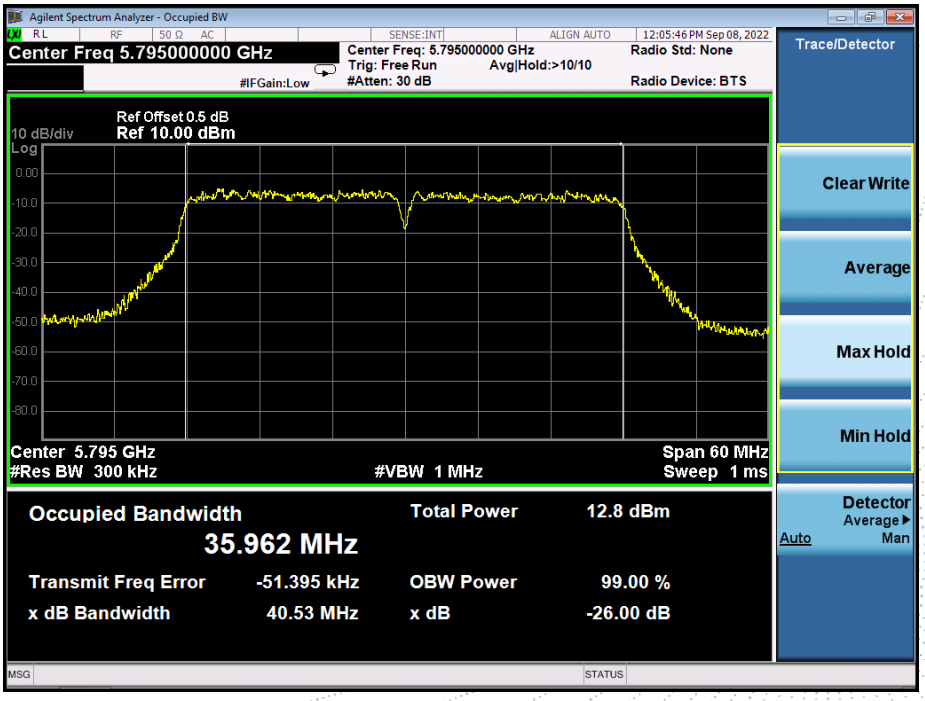
802.11n20 5825MHz 99% bandwidth



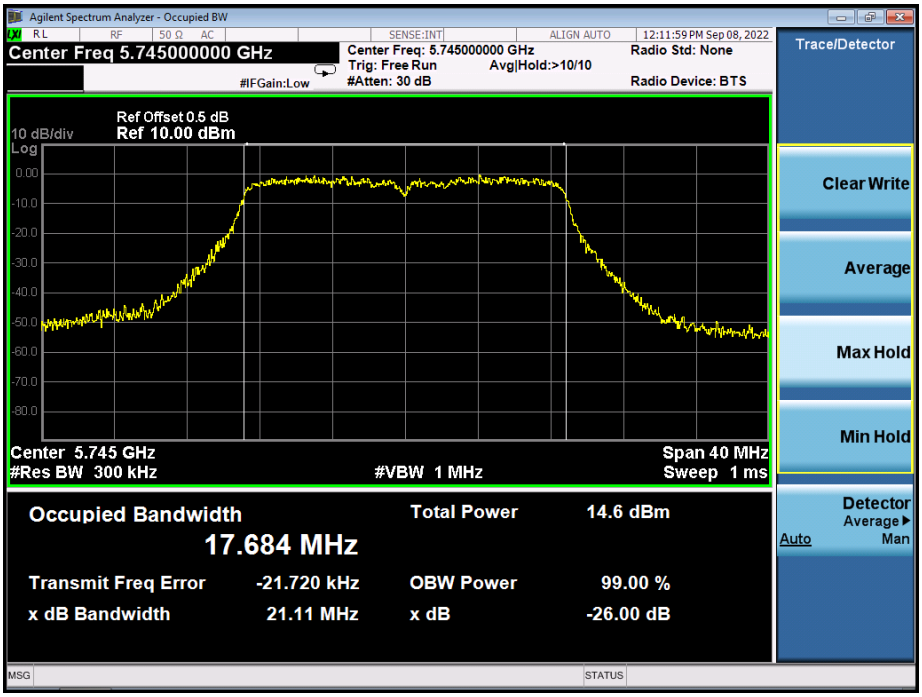
802.11 n40 5755MHz 99% bandwidth



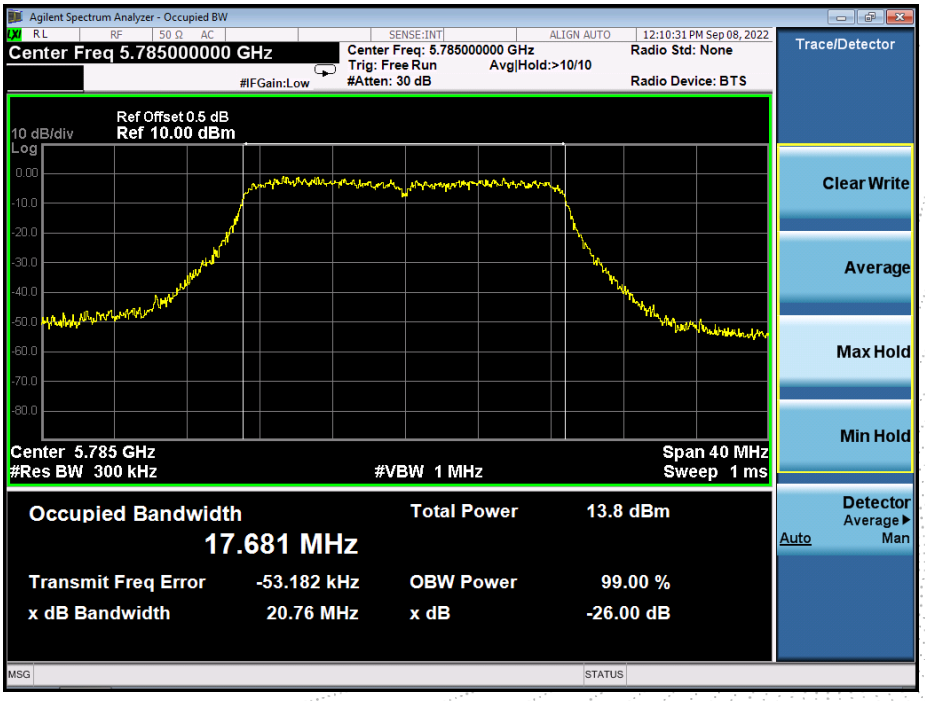
802.11 n40 5795MHz 99% bandwidth



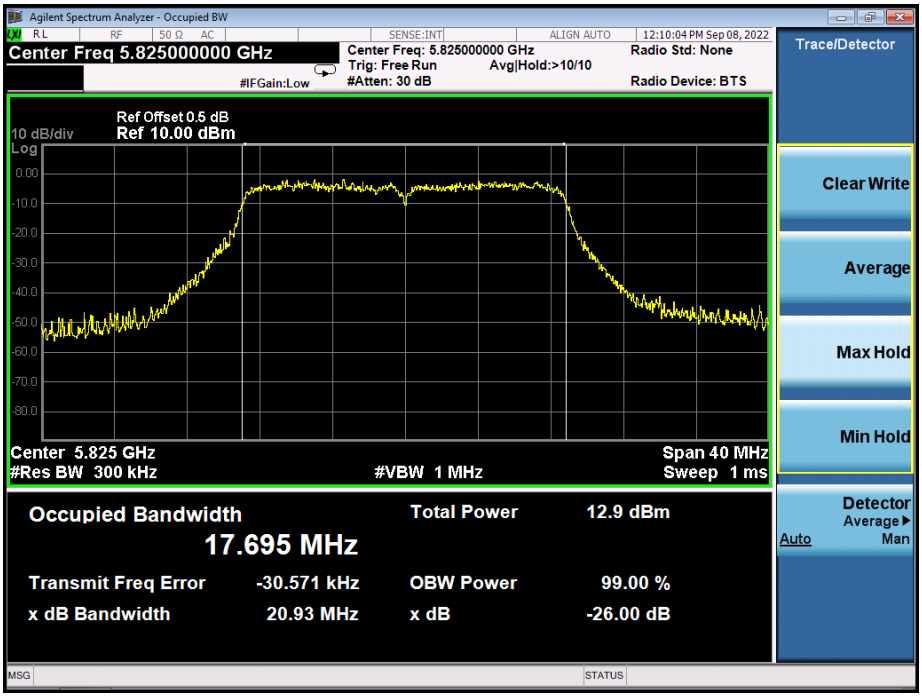
802.11ac20 5745MHz 99% bandwidth



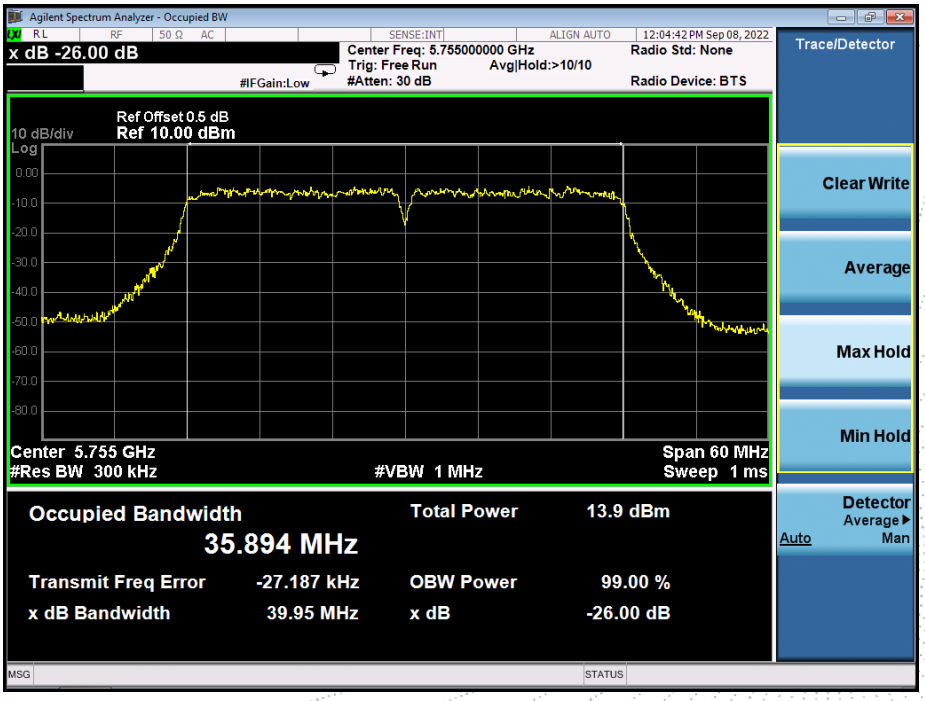
802.11ac20 5785MHz 99% bandwidth



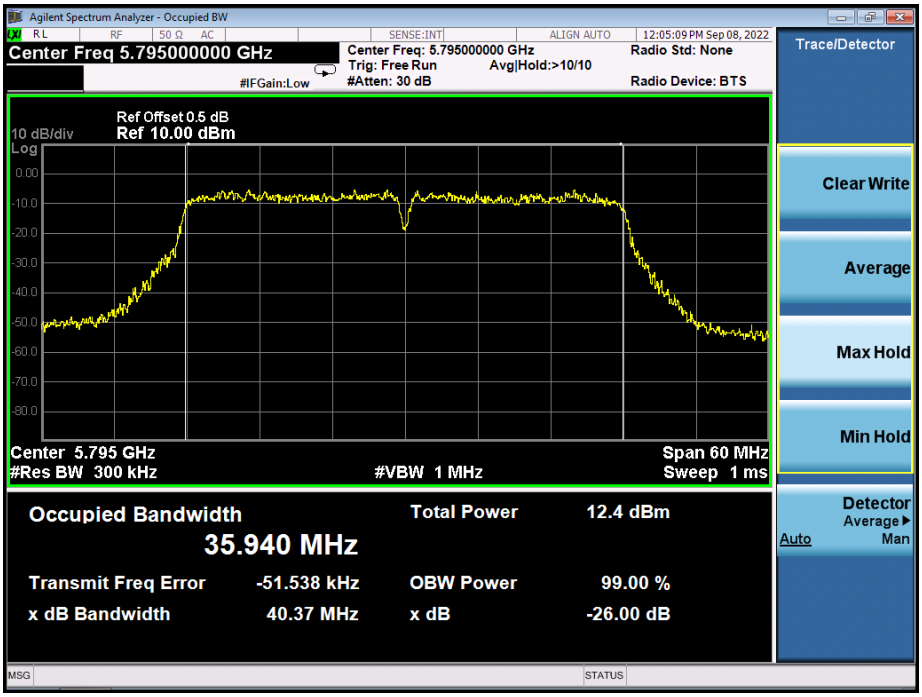
802.11ac20 5825MHz 99% bandwidth



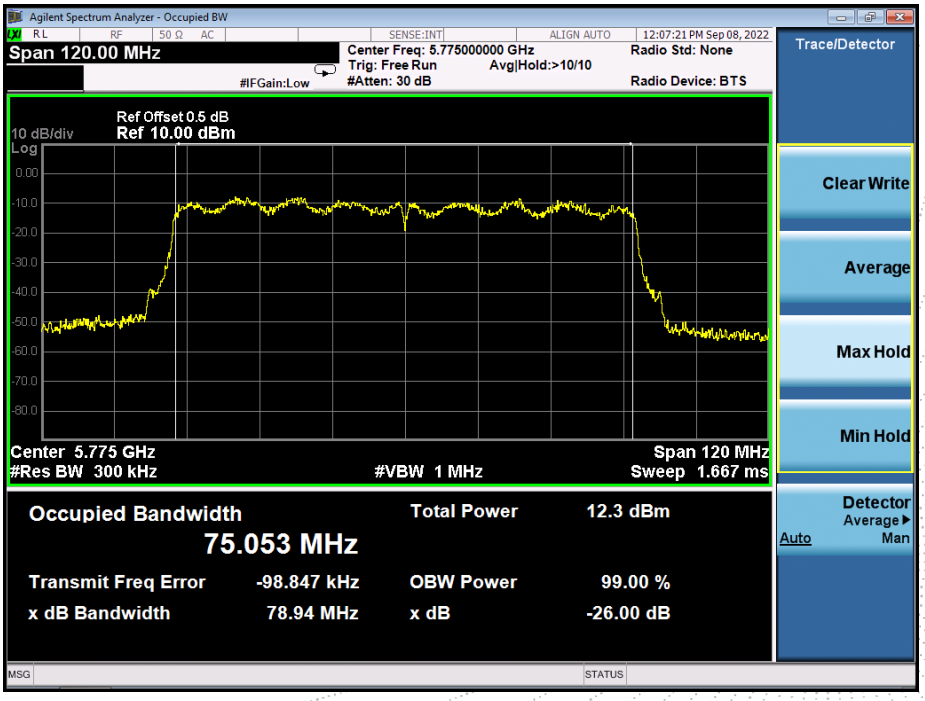
802.11 ac40 5755MHz 99% bandwidth



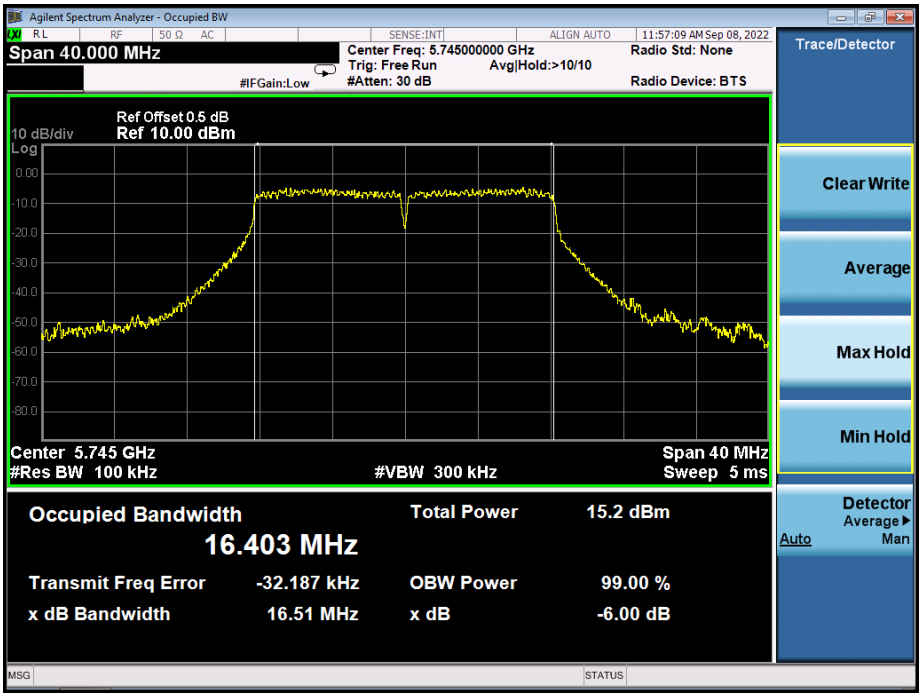
802.11 ac40 5795MHz 99% bandwidth



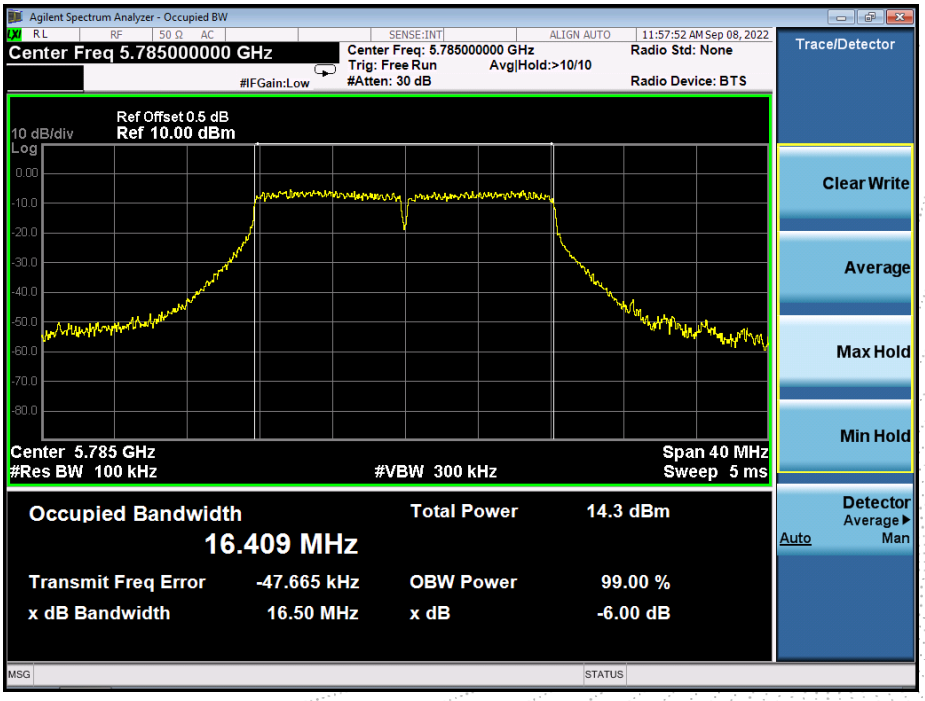
802.11 ac80 5775MHz 99% bandwidth



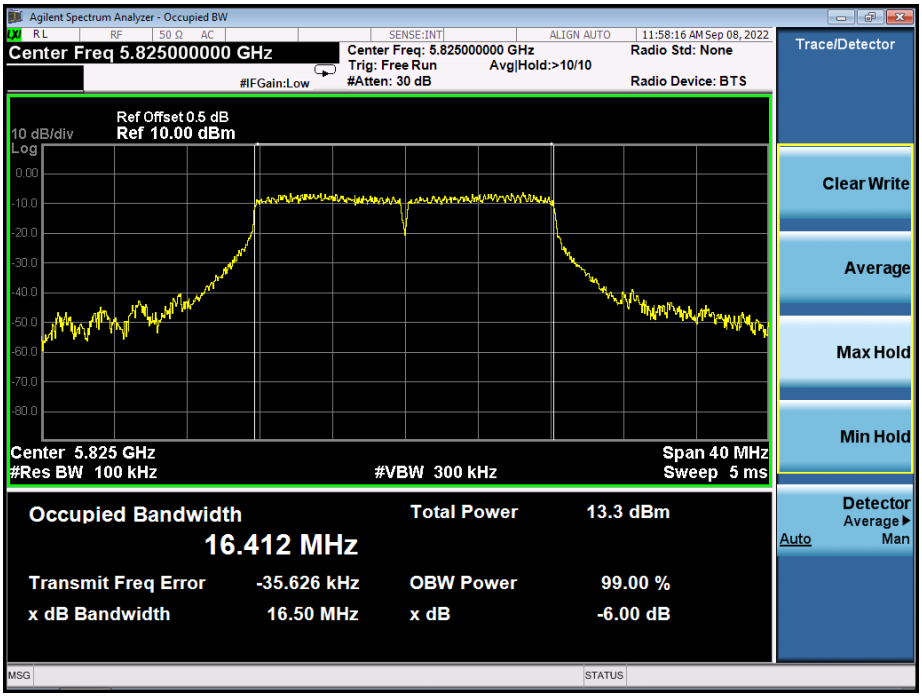
802.11a 5745MHz 6dB bandwidth



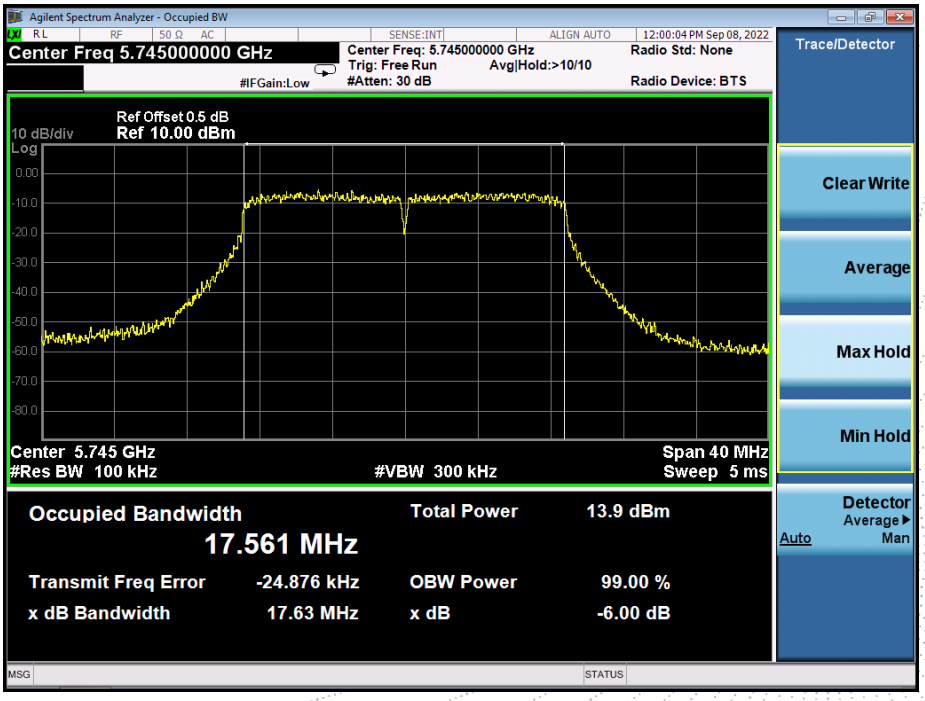
802.11a 5785MHz 6dB bandwidth



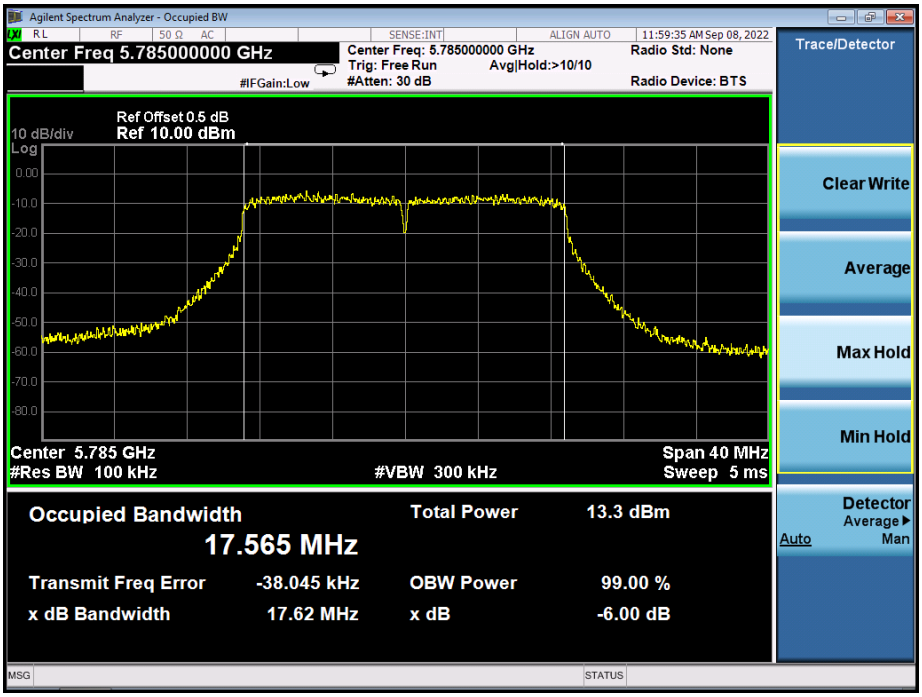
802.11a 5825MHz 6dB bandwidth



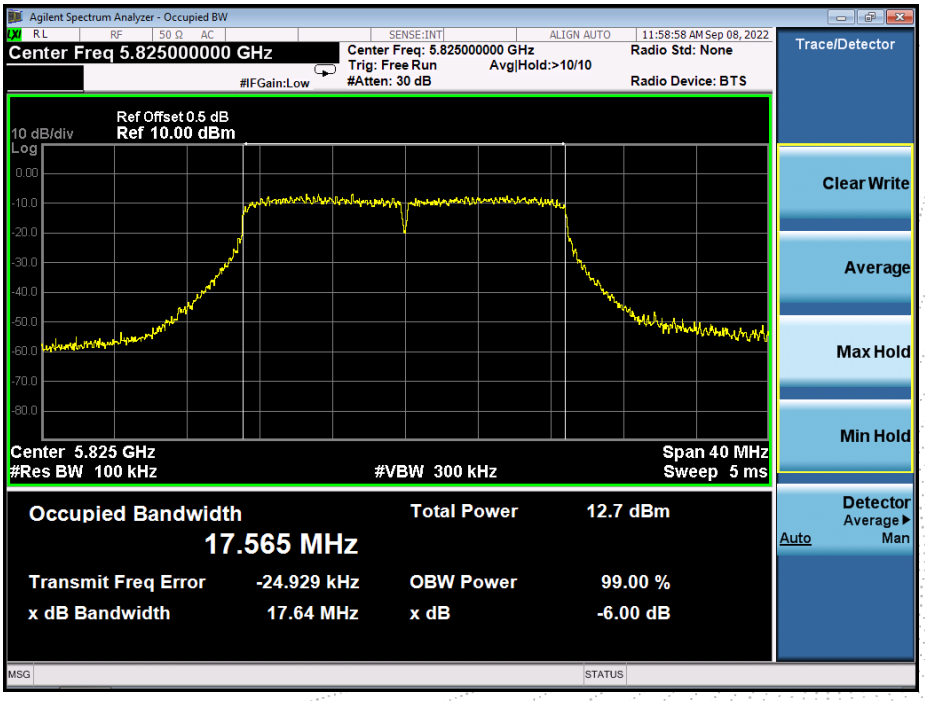
802.11n20 5745MHz 6dB bandwidth



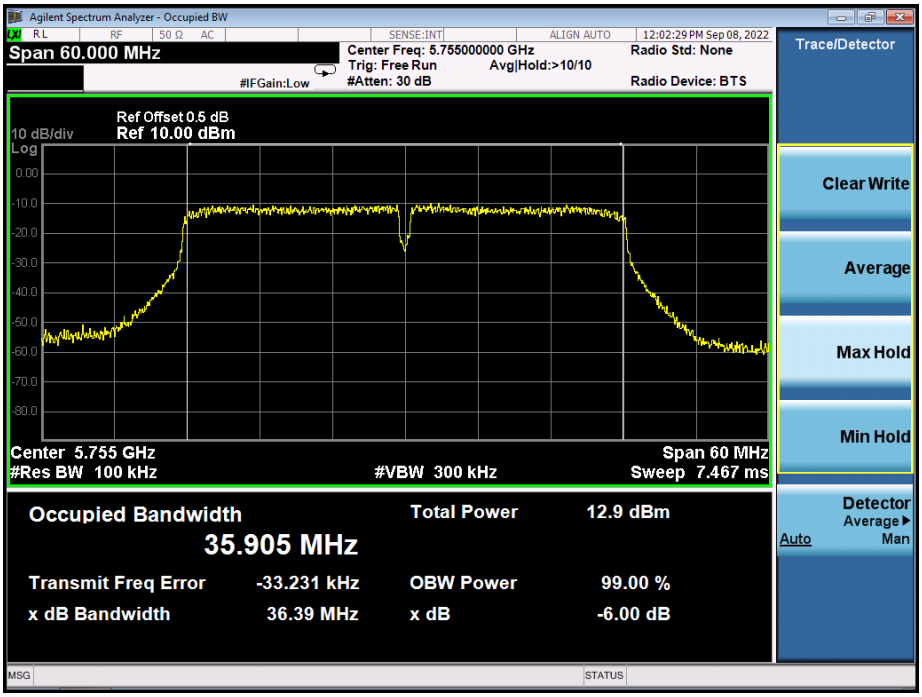
802.11n20 5785MHz 6dB bandwidth



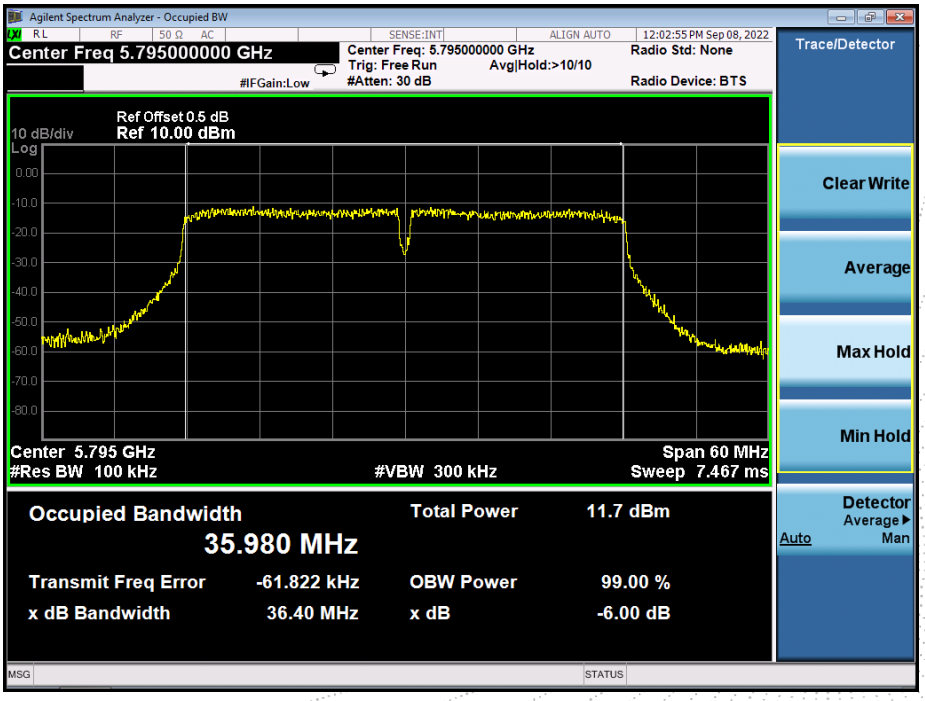
802.11n20 5825MHz 6dB bandwidth



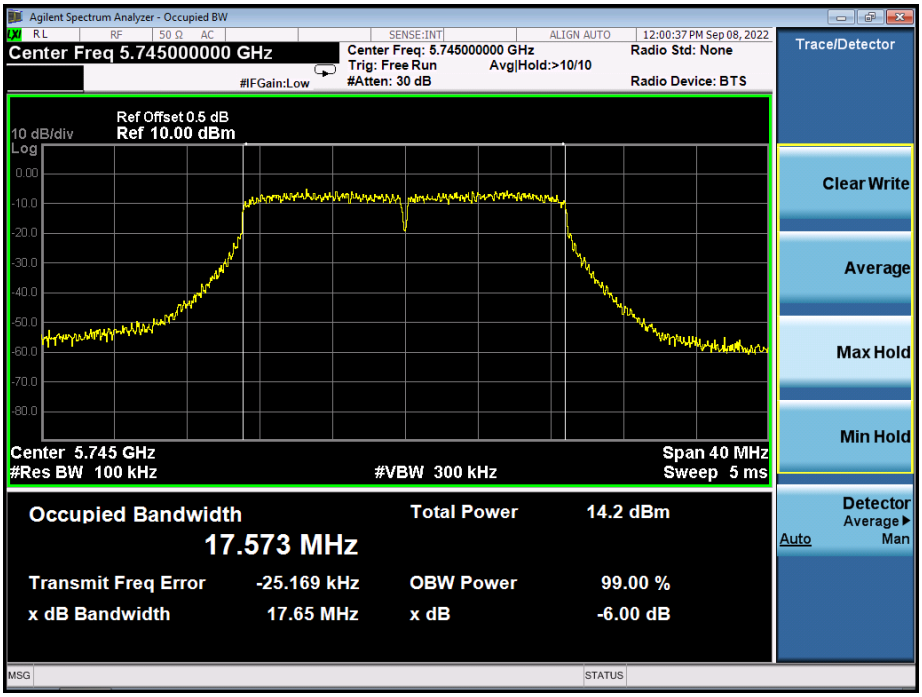
802.11 n40 5755MHz 6dB bandwidth



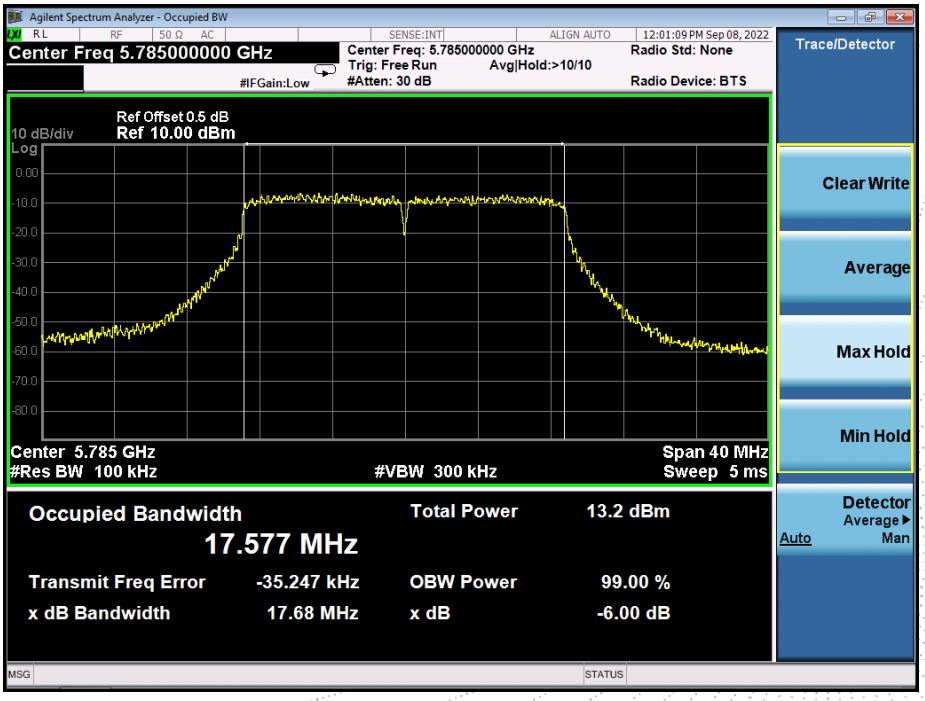
802.11 n40 5795MHz 6dB bandwidth



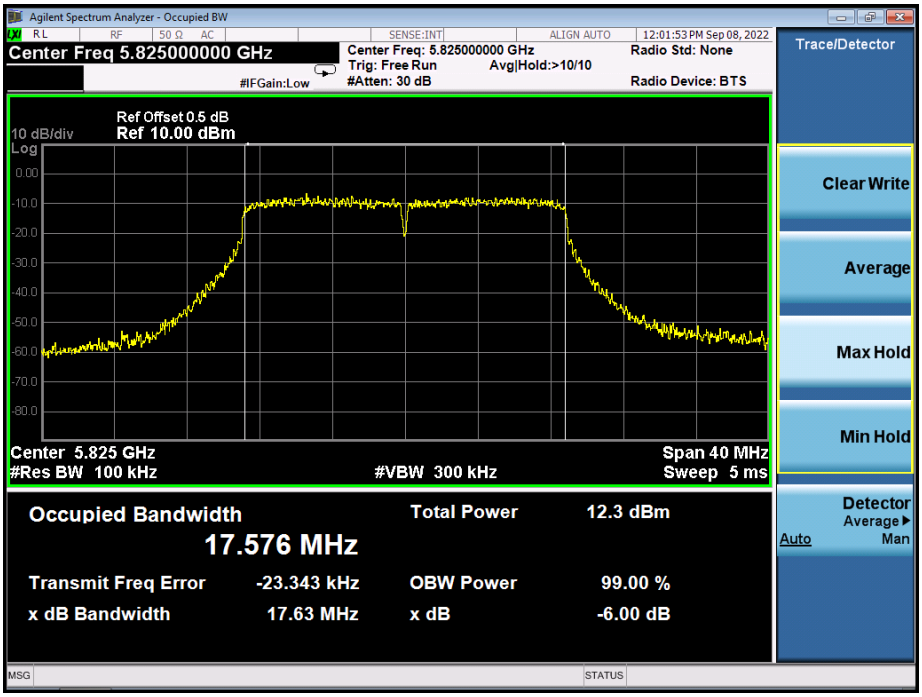
802.11ac20 5745MHz 6dB bandwidth



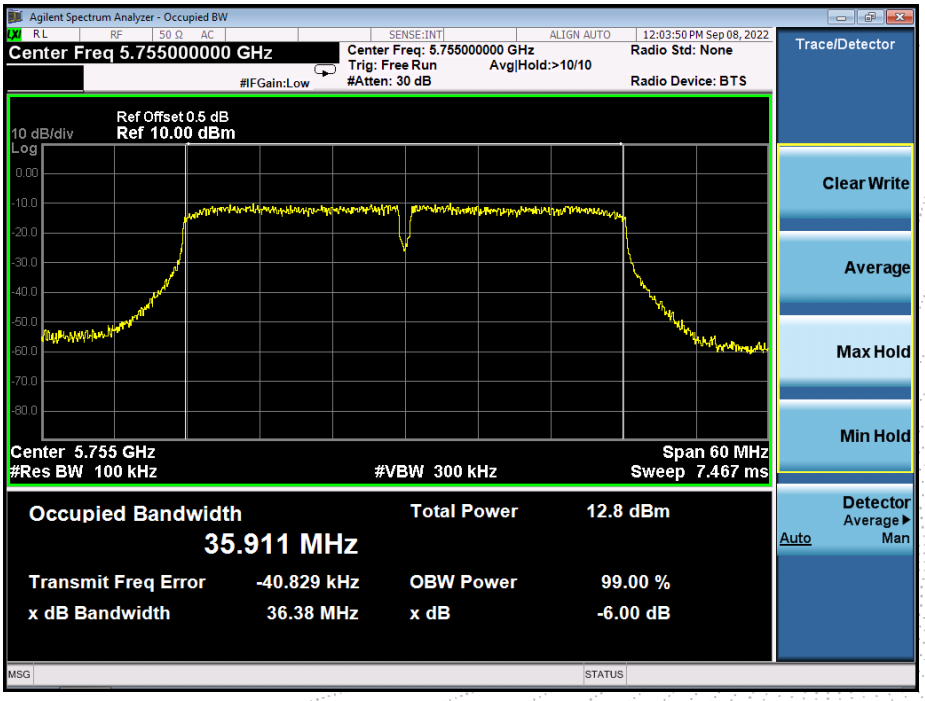
802.11ac20 5785MHz 6dB bandwidth



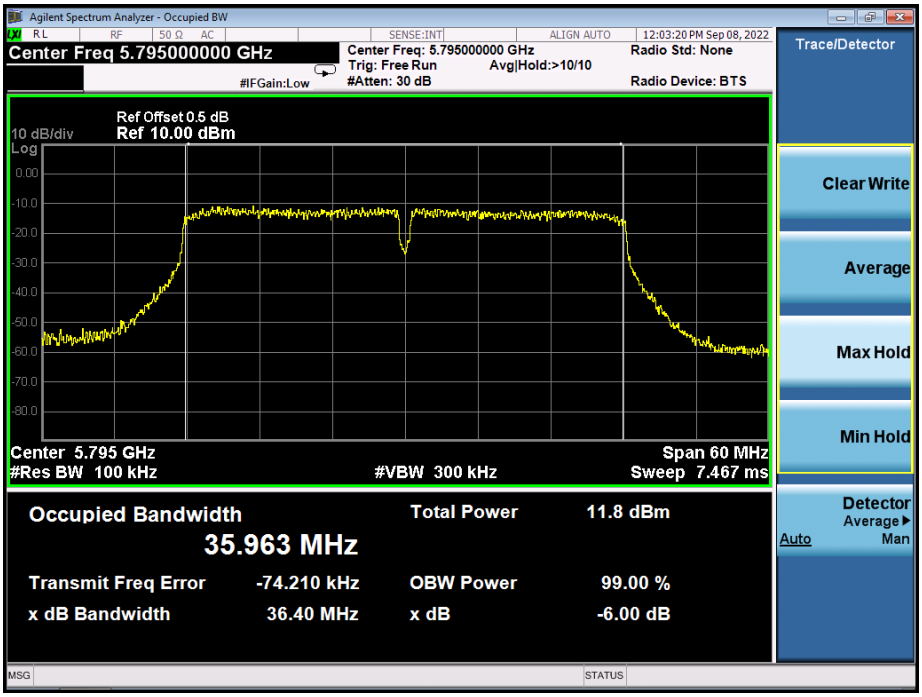
802.11ac20 5825MHz 6dB bandwidth



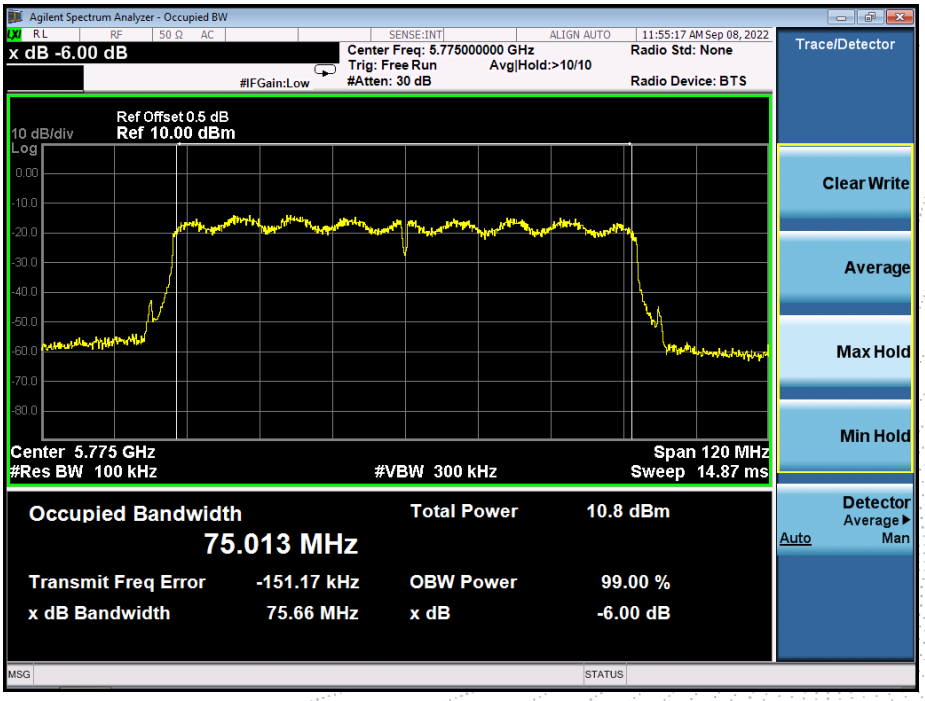
802.11 ac40 5755MHz 6dB bandwidth



802.11 ac40 5795MHz 6dB bandwidth

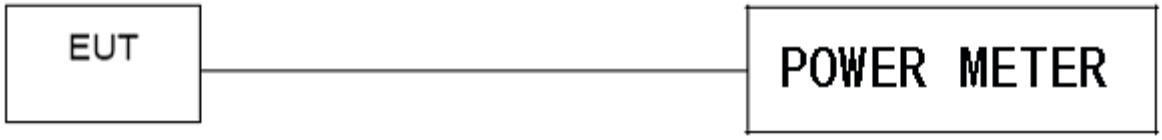


802.11 ac80 5775MHz 6dB bandwidth



10. Maximum Conducted Output Power

10.1 Block Diagram Of Test Setup



10.2 Limit

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

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

10.3 Test procedure

Maximum conducted output power may be measured using a spectrum analyzer/EMI receiver or an RF power meter.

1. Device Configuration
If possible, configure or modify the operation of the EUT so that it transmits continuously at its maximum power control level (see section II.B.).

a) The intent is to test at 100 percent duty cycle; however a small reduction in duty cycle (to no lower than 98 percent) is permitted if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test lab to permit such continuous operation.

b) If continuous transmission (or at least 98 percent duty cycle) cannot be achieved due to hardware limitations (e.g., overheating), the EUT shall be operated at its maximum power control level with the transmit duration as long as possible and the duty cycle as high as possible.

2. Measurement using a Spectrum Analyzer or EMI Receiver (SA)
Measurement of maximum conducted output power using a spectrum analyzer requires integrating the spectrum across a frequency span that encompasses, at a minimum, either the EBW or the 99-percent occupied bandwidth of the signal.1 However, the EBW must be used to determine bandwidth dependent limits on maximum conducted output power in accordance with § 15.407(a).

a) The test method shall be selected as follows: (i) Method SA-1 or SA-1 Alternative (averaging with the EUT transmitting at full power throughout each sweep) shall be applied if either of the following conditions can be satisfied:

• The EUT transmits continuously (or with a duty cycle ≥ 98 percent).

• Sweep triggering or gating can be implemented in a way that the device transmits at the maximum power control level throughout the duration of each of the instrument sweeps to be averaged. This condition can generally be achieved by triggering the instrument's sweep if the duration of the sweep (with the analyzer configured as in Method SA-1, below) is equal to or shorter than the duration T of each transmission from the EUT and if those transmissions exhibit full power throughout their durations.

(ii) Method SA-2 or SA-2 Alternative (averaging across on and off times of the EUT transmissions, followed by duty cycle correction) shall be applied if the conditions of (i) cannot be achieved and the

transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than ± 2 percent.

(iii) Method SA-3 (RMS detection with max hold) or SA-3 Alternative (reduced VBW with max hold) shall be applied if the conditions of (i) and (ii) cannot be achieved.

b) Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep): (i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1 MHz.

(iii) Set VBW ≥ 3 MHz.

(iv) Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)

(v) Sweep time = auto.

(vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

(vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run”.

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

(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum

10.4 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.

10.5 Test Result

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage:	AC120V/60Hz
Test Mode:	TX (5.8G) Mode Frequency U-NII-3 5745-5825MHz		

Condition	Mode	Frequency (MHz)	Conducted Power (dBm)		Total(dBm)	Limit (dBm)	Verdict
			Ant A	Ant B			
NVNT	a	5745	10.64	10.23	/	30	Pass
NVNT	a	5785	9.91	9.60	/	30	Pass
NVNT	a	5825	8.96	8.65	/	30	Pass
NVNT	n20	5745	9.58	9.19	12.40	30	Pass
NVNT	n20	5785	8.74	8.70	11.73	30	Pass
NVNT	n20	5825	7.94	7.85	10.91	30	Pass
NVNT	n40	5755	8.58	8.67	11.64	30	Pass
NVNT	n40	5795	7.45	7.35	10.41	30	Pass
NVNT	ac20	5745	9.28	9.58	12.44	30	Pass
NVNT	ac20	5785	8.72	8.59	11.67	30	Pass
NVNT	ac20	5825	7.92	7.73	10.84	30	Pass
NVNT	ac40	5755	8.60	8.64	11.63	30	Pass
NVNT	ac40	5795	7.40	7.74	10.58	30	Pass
NVNT	ac80	5775	7.15	7.30	10.24	30	Pass

Note:
The Array gain=0 for NANT≤4，
So the directional gain for Power measurements is 4.79dBi

11. Out Of Band Emissions

11.1 Block Diagram Of Test Setup

11.2 Limit

According to FCC §15.407(b)
Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:
(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(2) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

11.3 Test procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

11.4 EUT operating Conditions

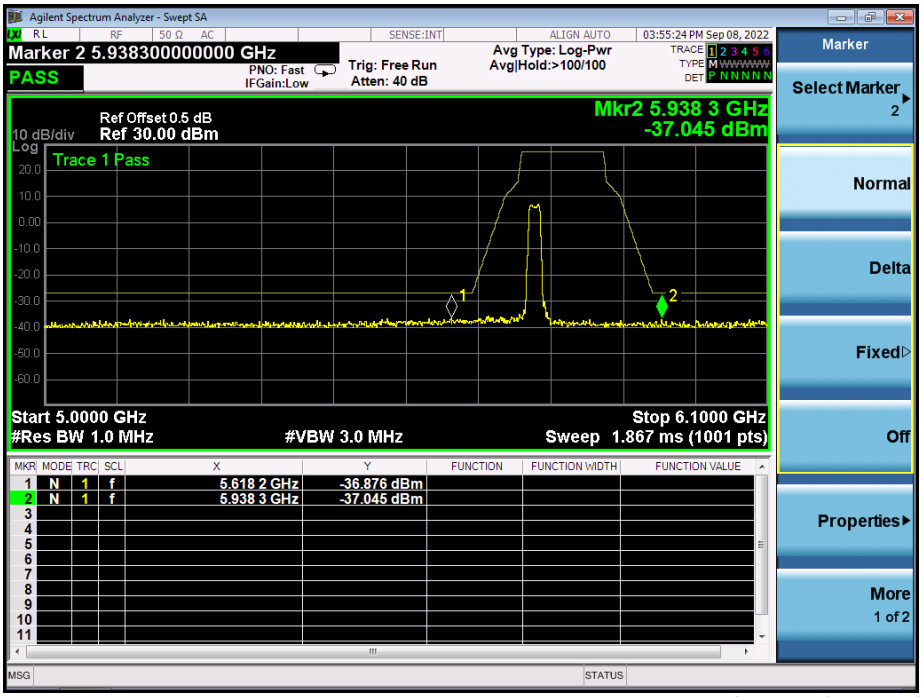
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data

11.5 Test Result

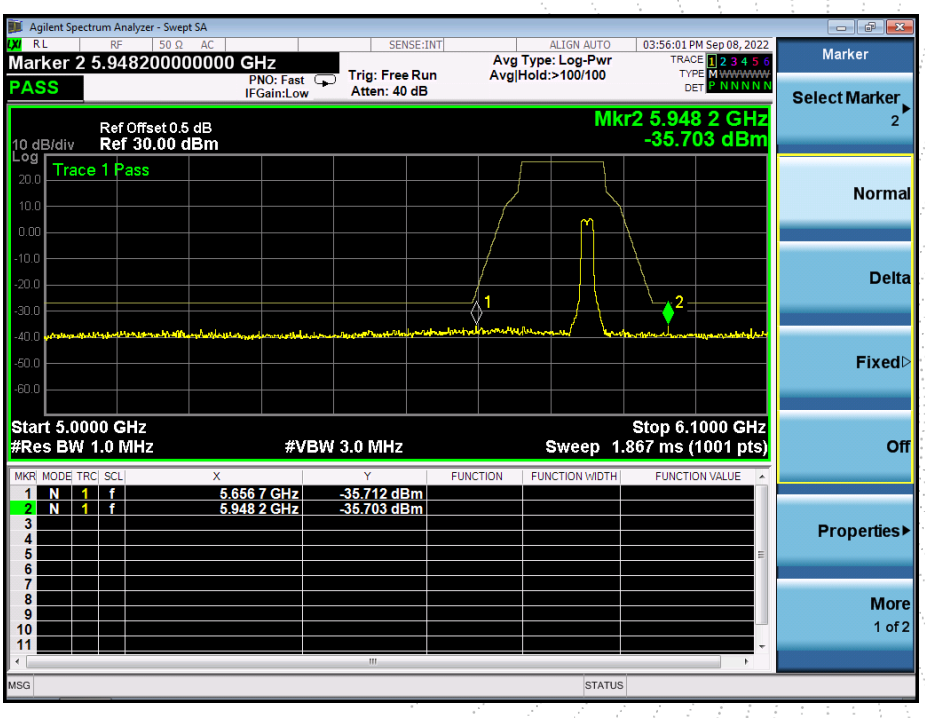
Note: A(B) Represent the value of antenna A and B, The worst data is Antenna A, only shown Antenna A Plot.

5.745~5.825 GHz

(802.11a) Band Edge, Left Side

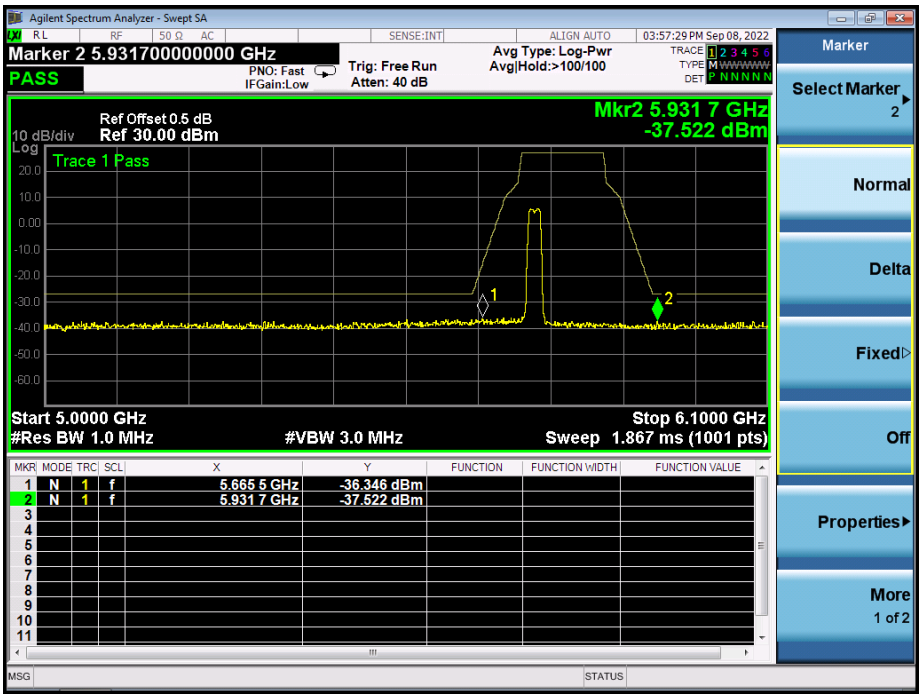


(802.11a) Band Edge, Right Side

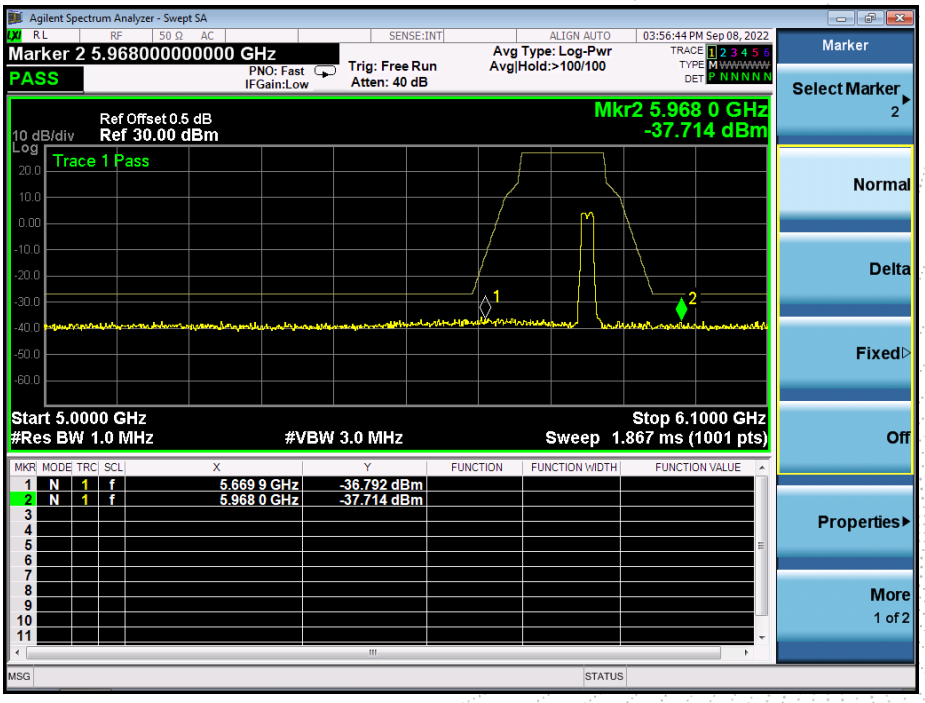


5.745~5.825 GHz

(802.11n20) Band Edge, Left Side

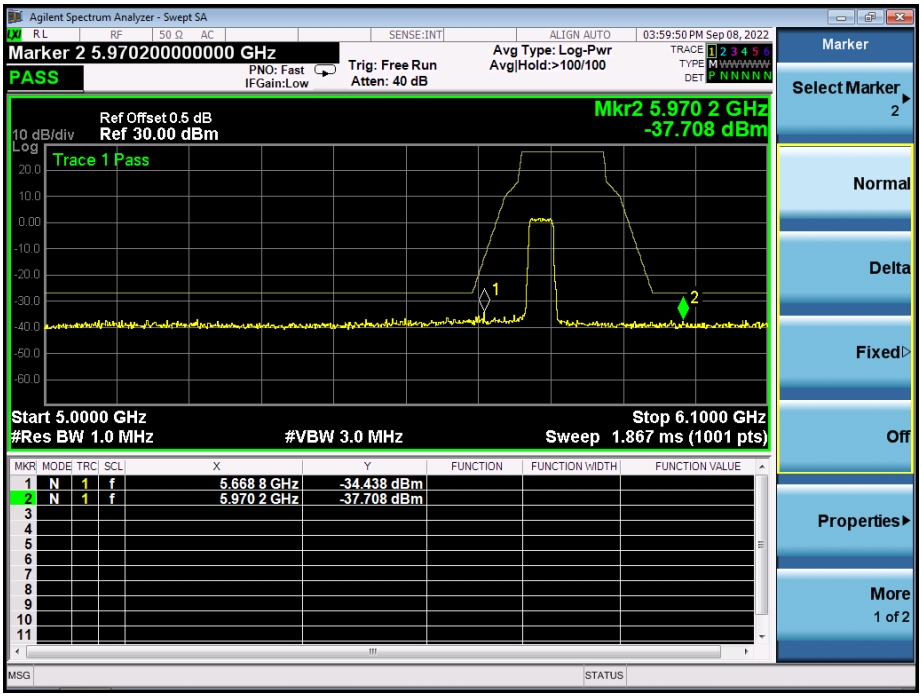


(802.11n20) Band Edge, Right Side

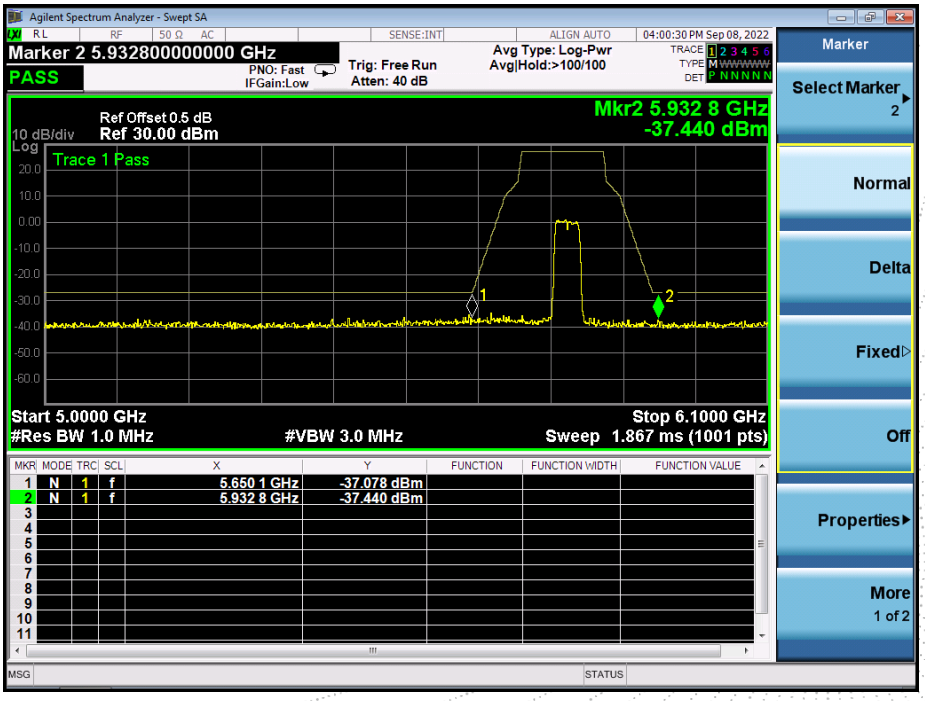


5.745~5.825 GHz

(802.11n40) Band Edge, Left Side

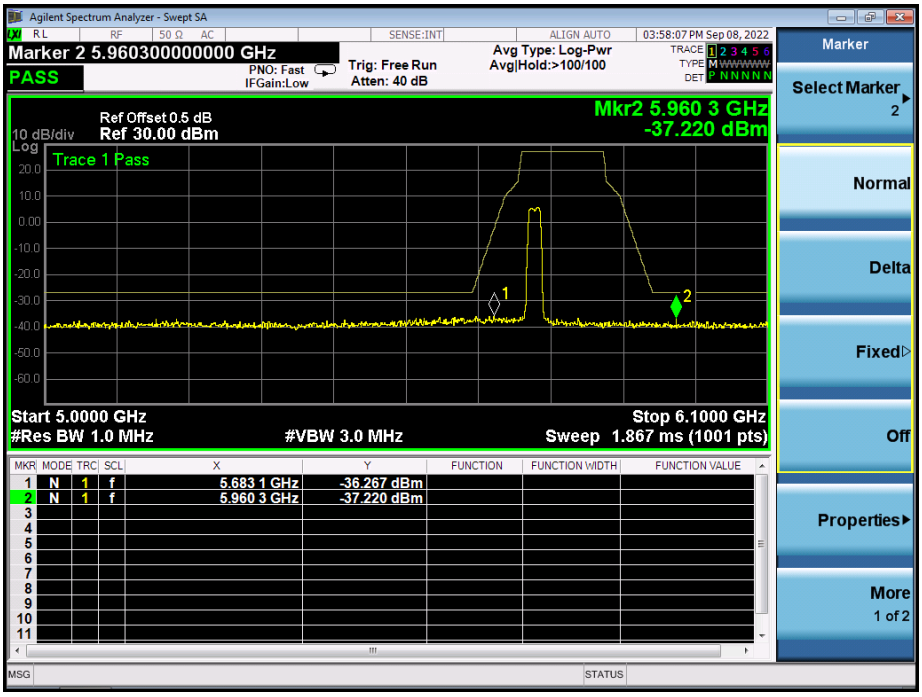


(802.11n40) Band Edge, Right Side

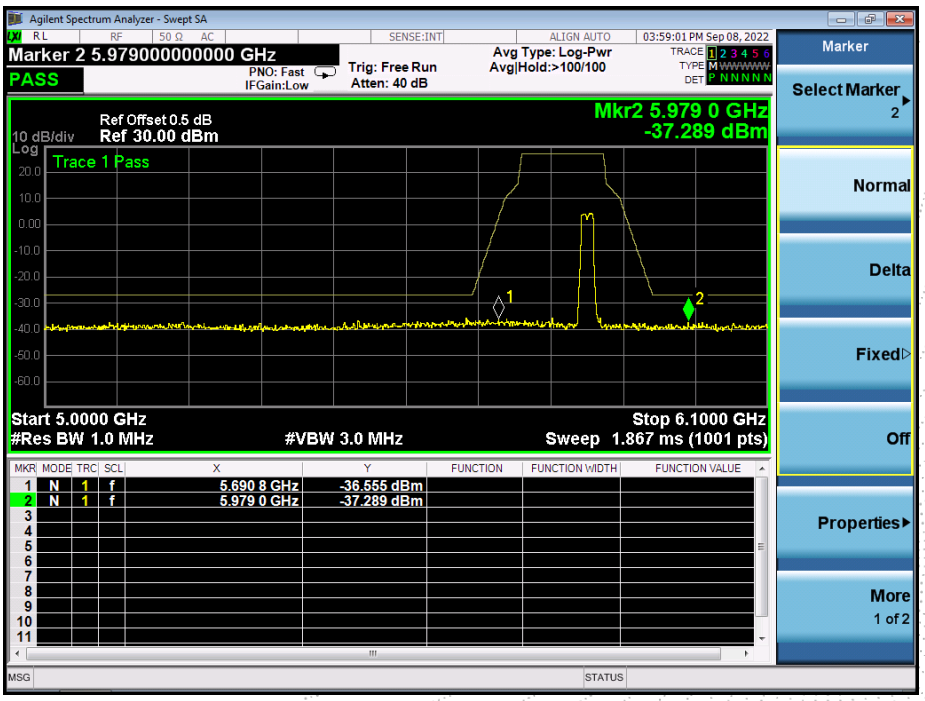


5.745~5.825 GHz

(802.11ac20) Band Edge, Left Side

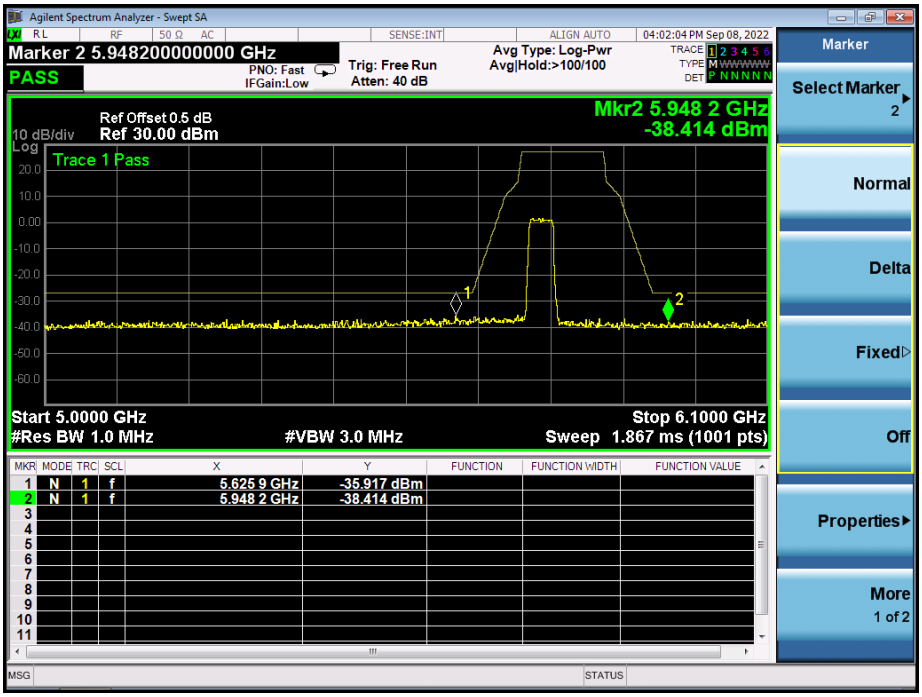


(802.11ac20) Band Edge, Right Side

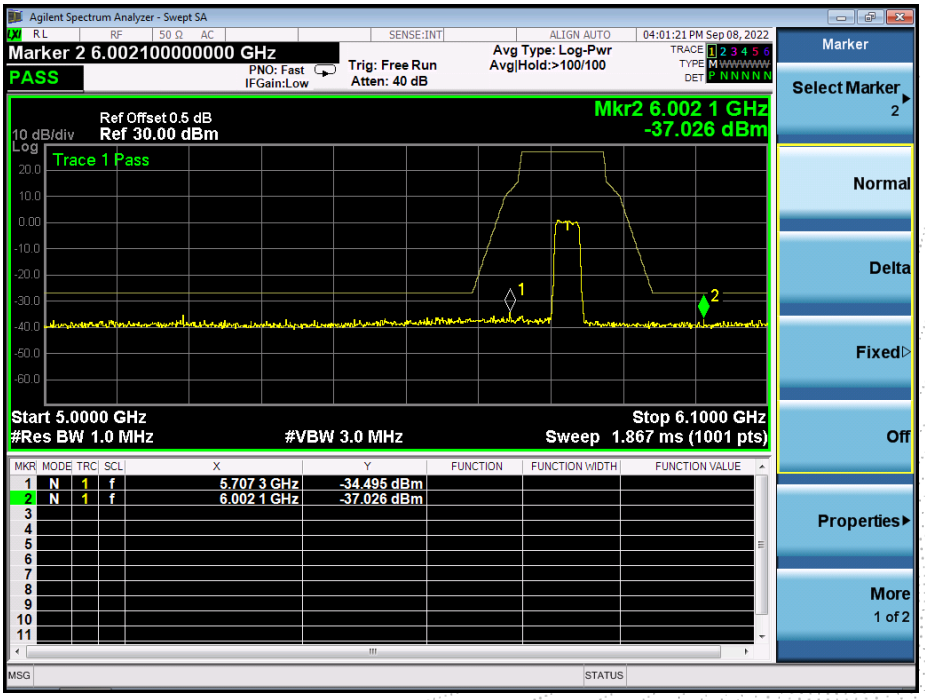


5.745~5.825 GHz

(802.11ac40) Band Edge, Left Side

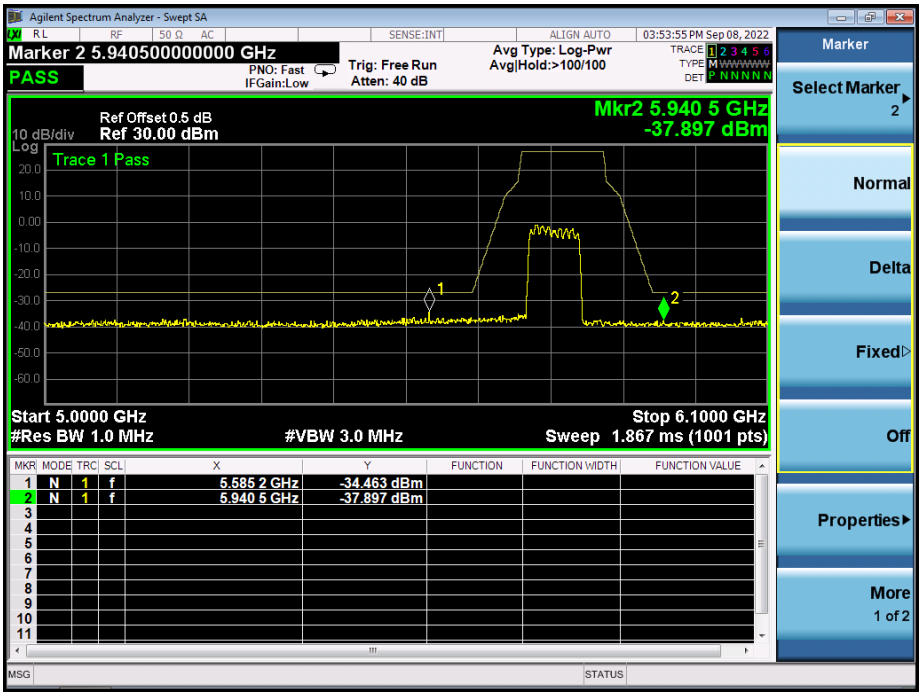


(802.11ac40) Band Edge, Right Side

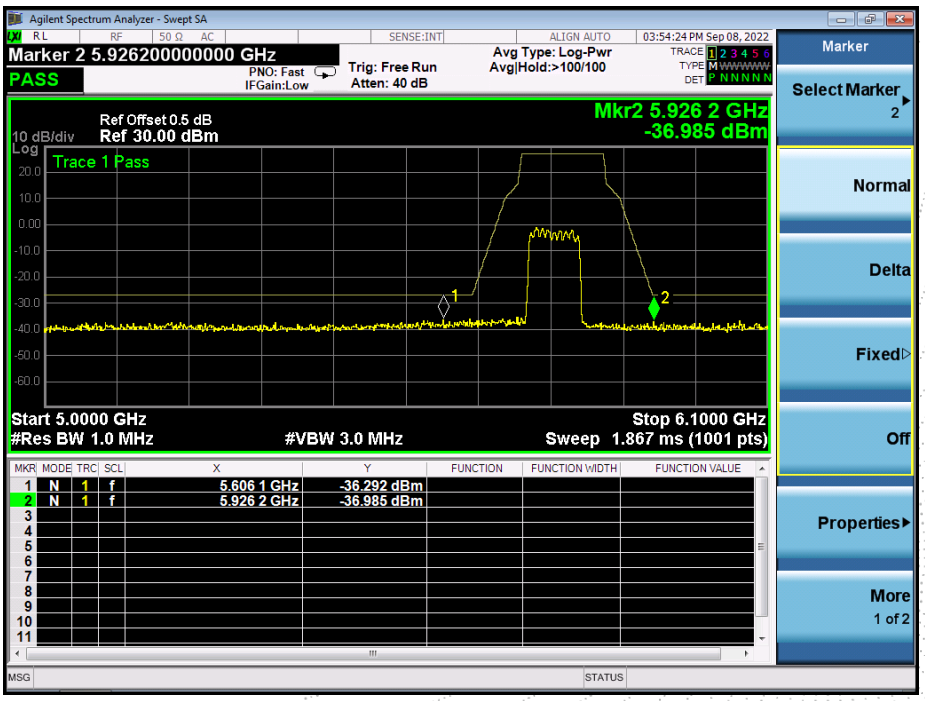


5.745~5.825 GHz

(802.11ac80) Band Edge, Left Side

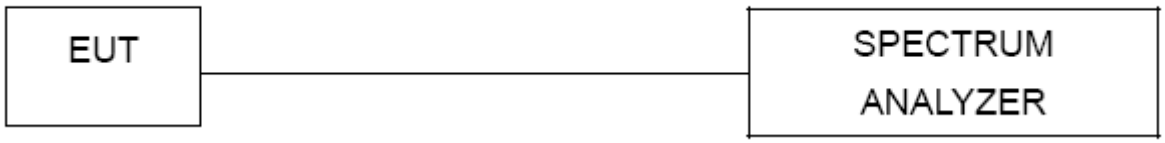


(802.11ac80) Band Edge, Right Side



12. Spurious RF Conducted Emissions

12.1 Block Diagram Of Test Setup



12.2 Limit

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:
(1)For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(2)For transmitters operating in the 5.725-5.85 GHz band(i) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

12.3 Test procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

12.4 Test Result

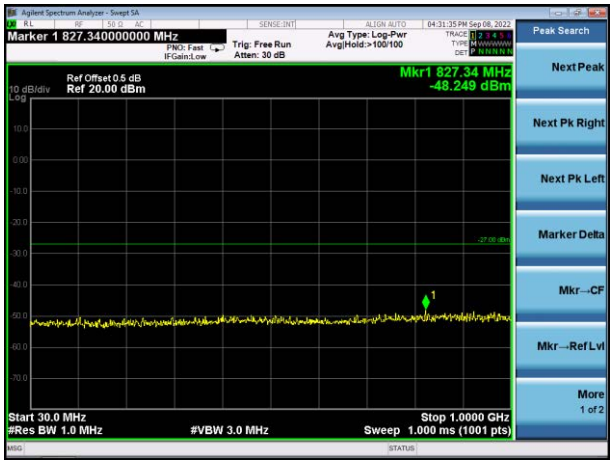
Remark: The measurement frequency range is from 9KHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and bandege measurement data.

About:26.5GHz-40GHz, The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Note: A(B) Represent the value of antenna A and B, The worst data is Antenna B, only shown Antenna B Plot.

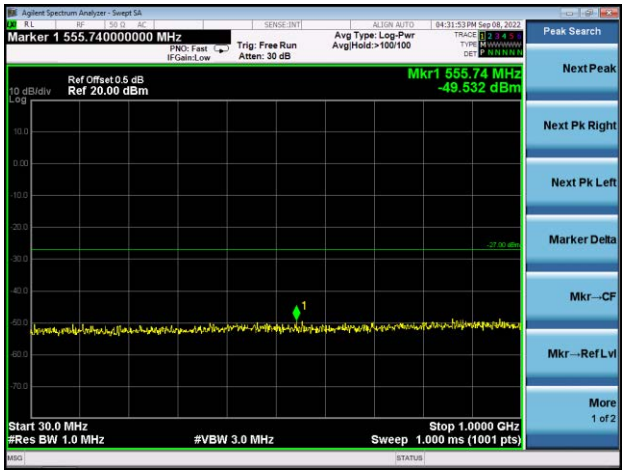
Note: A(B) Represent the value of antenna A and B, The worst data is Antenna A, only shown Antenna A Plot.

Test Plot

802.11a on channel 149



802.11a on channel 157



802.11a on channel 149

802.11a on channel 157

802.11a on channel 149

802.11a on channel 157