FCC TEST REPORT
FCC ID:2BM4M-SUT1B1

Report Number.....:	**ZKT-24112016119E**
Date of Test.....	Jul. 05, 2024 to Jan. 13, 2025
Date of issue.....:	Jan. 13, 2025
Total number of pages.....	114
Test Result .....:	PASS
Testing Laboratory.....:	**Shenzhen ZKT Technology Co., Ltd.**
Address .....:	1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China
Applicant's name .....:	**SHENZHEN TAISHENG E-COMMERCE CO., LTD**
Address .....:	302, Building 1, No. 2 Rongshu Road, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen
Manufacturer's name .....:	**Shenzhen Hwe Computer Technology Co.,Ltd**
Address .....:	Floor 101, 201, 301, No. 2 Longshan 7th Road, Luotian Community, Yanluo Street, Bao'an District, Shenzhen
Test specification:	
Standard.....:	FCC CFR Title 47 Part 15 Subpart E Section 15.407 ANSI C63.10:2013 KDB 789033 D02 v02r01
Test procedure.....:	/
Non-standard test method .....:	N/A
Test Report Form No.....:	/
Test Report Form(s) Originator.....:	ZKT Testing
Master TRF .....:	Dated: 2020-01-06

This device described above has been tested by ZKT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
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Product name.....:	**Desktop computer**
Trademark .....:	SUEVERY
Model/Type reference.....:	SUT1B1-SUT1B9 SUT1W1-SUT1W9, SUV900W1-SUV900W9, SUV900B1-SUV900B9, SUV90W1-SUV90W9, SUV90B1-SUV90B9, SUV9W1-SUV9W9, SUV9B1-SUV9B9
Ratings.....:	Input : AC 110-240V 50/60Hz 2.0A

Testing procedure and testing location:

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

Table of Contents Page

1. VERSION 5
2. SUMMARY OF TEST RESULTS 6
2.1 TEST FACILITY 7
2.2 MEASUREMENT UNCERTAINTY 7
3. GENERAL INFORMATION 8
3.1 GENERAL DESCRIPTION OF EUT 8
3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED 11
3.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE) 11
3.5 EQUIPMENTS LIST FOR ALL TEST ITEMS 12
4.EMC EMISSION TEST 14
4.1 CONDUCTED EMISSION MEASUREMENT 14
4.1.1 POWER LINE CONDUCTED EMISSION Limits 14
4.1.2 TEST PROCEDURE 14
4.1.3 DEVIATION FROM TEST STANDARD 14
4.1.4 TEST SETUP 15
4.1.5 EUT OPERATING CONDITIONS 15
4.1.6 TEST RESULT 16
4.2 RADIATED EMISSION MEASUREMENT 18
4.2.1 APPLICABLE STANDARD 18
4.2.2 CONFORMANCE LIMIT 18
4.2.3 MEASURING INSTRUMENTS 18
4.2.4 TEST CONFIGURATION 19
4.2.5 TEST PROCEDURE 20
4.2.6 TEST RESULT 20
5. POWER SPECTRAL DENSITY TEST 29
5.1 APPLIED PROCEDURES / LIMIT 29
5.2 TEST PROCEDURE 30
5.3 DEVIATION FROM STANDARD 30
5.4 TEST SETUP 30
5.5 EUT OPERATION CONDITIONS 30
5.6 TEST RESULTS 31
6. 26DB EMISSION BANDWIDTH & 6DB OCCUPIED BANDWIDTH 47
6.1 APPLIED PROCEDURES / LIMIT 47
6.2 TEST PROCEDURE 47
6.3 EUT OPERATION CONDITIONS 47
6.4 TEST RESULTS 48

Table of Contents **Page**

7.MAXIMUM CONDUCTED OUTPUT POWER 74
7.1 PPLIED PROCEDURES / LIMIT 74
7.2 TEST PROCEDURE 74
7.3 DEVIATION FROM STANDARD 75
7.4 TEST SETUP 75
7.5 EUT OPERATION CONDITIONS 75
7.6 TEST RESULTS 76
8.OUT OF BAND EMISSIONS 79
8.1 APPLICABLE STANDARD 79
8.2 TEST PROCEDURE 79
8.3 DEVIATION FROM STANDARD 79
8.4 TEST SETUP 79
8.5 EUT OPERATION CONDITIONS 79
8.6 TEST RESULTS 80
9.SPURIOUS RF CONDUCTED EMISSIONS 86
9.1 CONFORMANCE LIMIT 86
9.2 MEASURING INSTRUMENTS 86
9.3 TEST SETUP 86
9.4 TEST PROCEDURE 86
9.5 TEST RESULTS 86
10.FREQUENCY STABILITY MEASUREMENT 93
10.1 LIMIT 93
10.2 TEST PROCEDURES 93
10.3 TEST SETUP LAYOUT 93
10.4 EUT OPERATION DURING TEST 93
10.5 TEST RESULTS 93
11. DUTY CYCLE 100
11.1 APPLIED PROCEDURES / LIMIT 100
11.2 DEVIATION FROM STANDARD 100
11.3 TEST SETUP 100
12. ANTENNA REQUIREMENT 113
13. TEST SETUP PHOTO 114
14. EUT CONSTRUCTIONAL DETAILS 114

1. VERSION

Report No.	Version	Description	Approved
ZKT-24112016119E	Rev.01	Initial issue of report	Jan. 13, 2025

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.407) , Subpart E			
Standard Section	Test Item	Judgment	Remark
15.207	AC Power Line Conducted Emission	PASS	
789033 D02 General U-NII	Duty Cycle	PASS	
15.209(a)	Spurious Radiated Emissions	PASS	
15.407 (a)(12) 15.407(e)	26dB Emission Bandwidth & 6dB Occupied Bandwidth	PASS	
15.407 (a)(3)	Maximum Conducted Output Power	PASS	
2.1051	Band Edge	PASS	
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

2.1 TEST FACILITY

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

FCC Test Firm Registration Number: 692225
Designation Number: CN1299
IC Registered No.: 27033
CAB identifier: CN0110

2.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	3m camber Radiated spurious emission(9KHz-30MHz)	U=4.5dB
2	3m camber Radiated spurious emission(30MHz-1GHz)	U=4.8dB
3	3m chamber Radiated spurious emission(1GHz-6GHz)	U=4.9dB
4	3m chamber Radiated spurious emission(6GHz-40GHz)	U=5.0dB
5	Conducted disturbance	U=3.2dB
6	RF Band Edge	U=1.68dB
7	RF power conducted	U=1.86dB
8	RF conducted Spurious Emission	U=2.2dB
9	RF Occupied Bandwidth	U=1.8MHz
10	RF Power Spectral Density	U=1.75dB
11	humidity uncertainty	U=5.3%
12	Temperature uncertainty	U=0.59℃

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Product Name:	Desktop computer			
Model No.:	SUT1B1-SUT1B9			
Serial Model:	SUT1W1-SUT1W9, SUV900W1-SUV900W9, SUV900B1-SUV900B9, SUV90W1-SUV90W9, SUV90B1-SUV90B9, SUV9W1-SUV9W9, SUV9B1-SUV9B9			
Model Different.:	All the model are the same circuit and RF module, only the model name is different.			
Sample ID	ZKT-24112016119E			
Sample(s) Status:	Engineer sample			
Product Description	IEEE 802.11 WLAN Mode Supported	☒ 802.11a/n/ac (20MHz channel bandwidth) ☒ 802.11ac/n (40MHz channel bandwidth) ☒ 802.11ac (80MHz channel bandwidth)		
	Data Rate	802.11a: 6/9/12/24/18/36/48/54Mbit/s 802.11n20/n40: MCS0-MCS7; 802.11ac20/ac40/ac80: MCS0-MCS9		
	Modulation	OFDM with BPSK / QPSK / 16-QAM / 64-QAM for 802.11a/n; OFDM with BPSK / QPSK / 16-QAM / 64-QAM / 256-QAM for 802.11ac;		
	Operating Frequency Range	☐ 5180-5240MHz for 802.11a/n20/ac20; ☐ 5190-5230MHz for 802.11ac40/n40; ☐ 5210MHz for 802.11 ac80. ☒ 5745-5825 MHz for 802.11a/n20/ac20; ☒ 5755-5795 MHz for 802.11ac40/n40; ☒ 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 ac40/n40 in the 5190-5230 MHz 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 ac40/n40 in the 5755-5795 MHz band ; ☒ 1 channels for 802.11 ac80 in the 5775MHz band		
Antenna Type:	External antenna A&B			
Antenna Gain:	Band	SISO ANT A	SISO ANT B	MIMO A+B
	5.8G	8.40dBi	6.82dBi	10.65dBi
	5.8G Band Working in MIMO model, then the antenna gain as below: Directional gain = 10 log[($10^{8.40/20}$ +$10^{6.82/20}$) ^{2} /2] = 10.65dBi.			
Power supply:	Input : AC 110-240V 50/60Hz 2.0A			
Battery capacity:	N/A			

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

802.11a/n/ac (20MHz) Frequency Channel for 5.8G							
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) Frequency Channel for 5.8G							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795				

802.11ac (80MHz) Frequency Channel for 5.8G							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
155	5775						

3.2 DESCRIPTION OF TEST MODES

Transmitting mode	Keep the EUT in continuously transmitting mode
Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.	
We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows: For battery operated equipment, the equipment tests shall be performed using a new battery.	
Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.	

Mode	802.11a	802.11n	802.11ac
Data rate	6Mbps	MCS0(HT0)	MCS0(VHT0)

Test Software	REALTEK 11ac 8822BU
Power level setup	Default

Pretest Mode	Description
Mode 1	802.11a/n20/ac20: CH 149/ CH 157/ CH 165
Mode 2	802.11n40/ac40: CH 151 / CH 159
Mode 3	802.11 ac80: CH 155

For Conducted Emission	
Final Test Mode	Description
Mode 1	802.11a/n20/ac20: CH 149/ CH 157/ CH 165
Mode 2	802.11n40/ac40: CH 151 / CH 159
Mode 3	802.11 ac80: CH 155

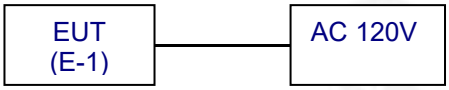
For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11a/n20/ac20: CH 149/ CH 157/ CH 165
Mode 2	802.11n40/ac40: CH 151 / CH 159
Mode 3	802.11 ac80: CH 155

Note:

3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted Emission

Radiated Emission



Conducted Spurious

3.4 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	Desktop computer	N/A	I22X W1-99	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
(3) EUT is tested with new battery.

3.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Conduction Emissions Test

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Last calibration	Calibrated until
1	LISN	R&S	ENV216	101471	N/A	Sep. 30, 2024	Sep. 29, 2025
2	LISN	CYBERTEK	EM5040A	E1850400149	N/A	Sep. 30, 2024	Sep. 29, 2025
3	Test Cable	N/A	C-01	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
4	EMI Test Receiver	R&S	ESCI3	101393	4.42 SP3	Sep. 29, 2024	Sep. 28, 2025
5	EMC Software	Frad	EZ-EMC	Ver.EMC-CON 3A1.1	N/A	\	\

Radiation Emissions & Radiation Spurious Emissions Test

Item	Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	KEYSIGHT	N9020A	MY55370835	A.17.05	Sep. 29, 2024	Sep. 28, 2025
2	Spectrum Analyzer (10kHz-39.9GHz)	R&S	FSV40-N	100363	1.71 SP2	Sep. 30, 2024	Sep. 29, 2025
3	EMI Test Receiver (9kHz-7GHz)	R&S	ESCI7	100969	4.32	Sep. 29, 2024	Sep. 28, 2025
4	Bilog Antenna (30MHz-1500MHz)	Schwarzbeck	VULB9168	00877	N/A	Sep. 30, 2024	Sep. 29, 2025
5	Horn Antenna (1GHz-18GHz)	Agilent	AH-118	071145	N/A	Sep. 30, 2024	Sep. 29, 2025
6	Horn Antenna (15GHz-40GHz)	A.H.System	SAS-574	588	N/A	Sep. 30, 2024	Sep. 29, 2025
7	Loop Antenna	TESEQ	HLA6121	58357	N/A	Oct. 11, 2024	Oct. 10, 2025
8	Amplifier (30-1000MHz)	EM Electronics	EM330 Amplifier	60747	N/A	Sep. 29, 2024	Sep. 28, 2025
9	Amplifier (1GHz-26.5GHz)	HuiPu	8449B	3008A00315	N/A	Sep. 29, 2024	Sep. 28, 2025
10	Amplifier (500MHz-40GHz)	QuanJuDa	DLE-161	097	N/A	Sep. 30, 2024	Sep. 29, 2025
11	Test Cable	N/A	R-01	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
12	Test Cable	N/A	R-02	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
13	Test Cable	N/A	R-03	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
14	D.C. Power Supply	LongWei	TPR-6405D	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
15	EMC Software	Frad	EZ-EMC	Ver.EMC-CO N 3A1.1	N/A	\	\
16	Turntable	MF	MF-7802BS	N/A	N/A	\	\
17	Antenna tower	MF	MF-7802BS	N/A	N/A	\	\

RF Conducted Test

Item	Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	KEYSIGHT	N9020A	MY55370835	A.17.05	Sep. 29, 2024	Sep. 28, 2025
2	Spectrum Analyzer (10kHz-39.9GHz)	R&S	FSV40-N	100363	1.71 SP2	Sep. 30, 2024	Sep. 29, 2025
3	Test Cable	N/A	RF-01	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
4	Test Cable	N/A	RF-02	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
5	Test Cable	N/A	RF-03	N/A	N/A	Sep. 30, 2024	Sep. 29, 2025
6	ESG Signal Generator	Agilent	E4421B	GB40051203	B.03.84	Sep. 29, 2024	Sep. 28, 2025
7	Signal Generator	Agilent	N5182A	MY47420215	A.01.87	Sep. 29, 2024	Sep. 28, 2025
8	Magnetic Field Probe Tester	Narda	ELT-400	0-0344	N/A	Sep. 29, 2024	Sep. 28, 2025
9	Van der Hoofden measuring head	Schwarzbeck Mess-elektronik	VDHH 9502	9502-039	N/A	Sep. 30, 2024	Sep. 29, 2025
10	Wideband Radio Communication Test	R&S	CMW500	106504	V 3.7.22	Sep. 30, 2024	Sep. 29, 2025
11	MWRF Power Meter Test system	MW	MW100-RFCB	10371	N/A	Sep. 29, 2024	Sep. 28, 2025
12	Power Meter	KEYSIGHT	N1912AP	926431	A.05.00	Sep. 29, 2024	Sep. 28, 2025
13	D.C. Power Supply	LongWei	TPR-6405D	GQ7516	N/A	Sep. 29, 2024	Sep. 28, 2025
14	RF Software	MW	MTS8310	V2.0.0.0	N/A	\	\

4.EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

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

4.1.1 POWER LINE CONDUCTED EMISSION Limits

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

Note:

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

4.1.2 TEST PROCEDURE

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

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

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

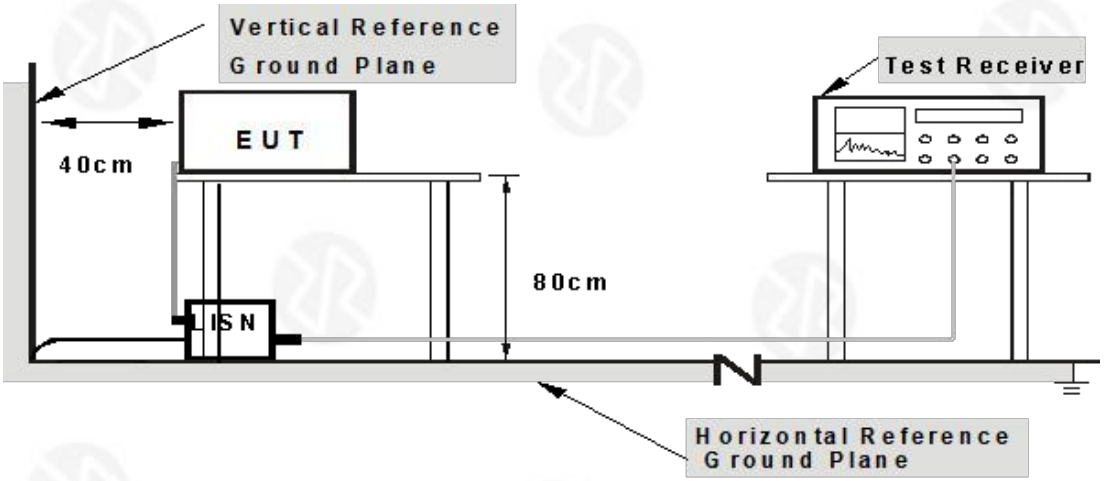
d. LISN at least 80 cm from nearest part of EUT chassis.

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

4.1.3 DEVIATION FROM TEST STANDARD

No deviation

4.1.4 TEST SETUP



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

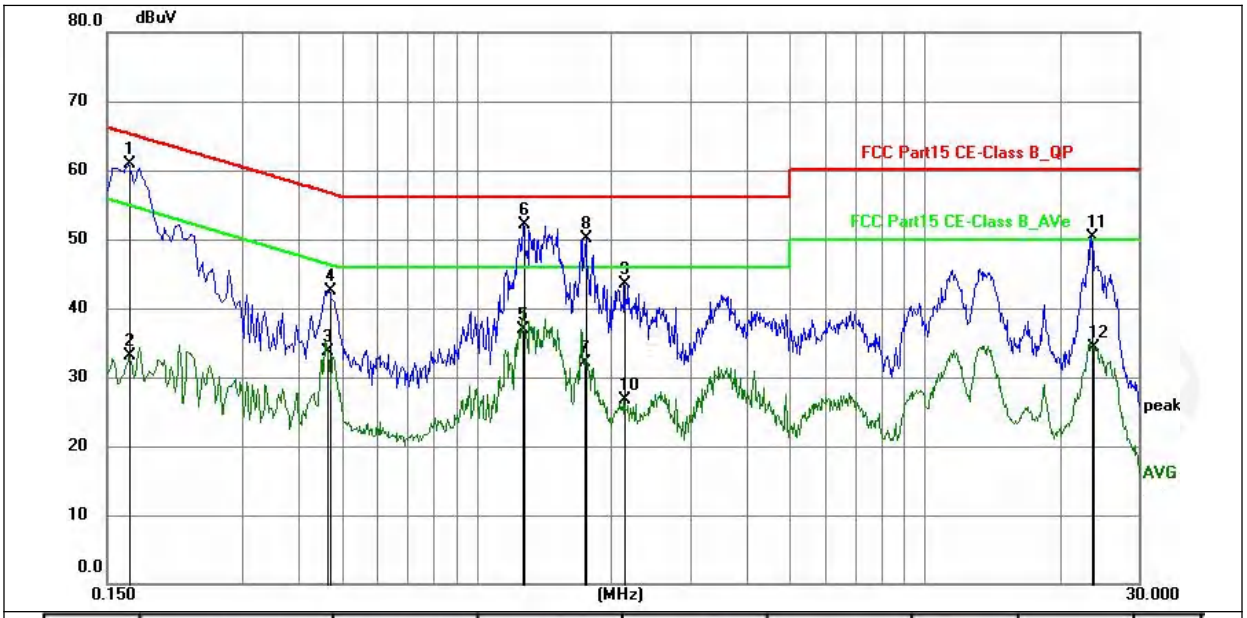
4.1.5 EUT OPERATING CONDITIONS

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

4.1.6 TEST RESULT

5.8G:

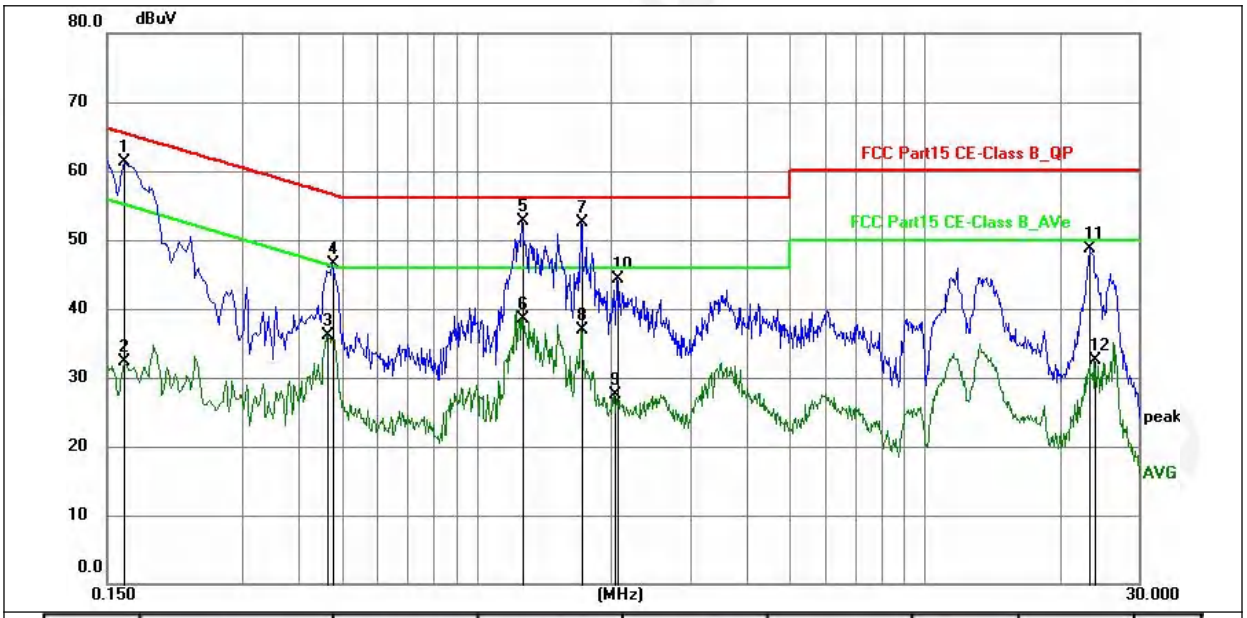
Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	L
Test Voltage:	AC 120V/60Hz	Test Mode:	MIMO A+B 802.11n20 - 5745MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1680	40.62	20.25	60.87	65.06	-4.19	QP	P
2	0.1680	12.86	20.25	33.11	55.06	-21.95	AVG	P
3	0.4661	13.37	20.31	33.68	46.58	-12.90	AVG	P
4	0.4695	22.17	20.31	42.48	56.52	-14.04	QP	P
5	1.2659	16.58	20.31	36.89	46.00	-9.11	AVG	P
6	1.2749	31.74	20.31	52.05	56.00	-3.95	QP	P
7	1.7384	11.80	20.30	32.10	46.00	-13.90	AVG	P
8	1.7564	29.77	20.31	50.08	56.00	-5.92	QP	P
9	2.1389	23.20	20.31	43.51	56.00	-12.49	QP	P
10	2.1389	6.46	20.31	26.77	46.00	-19.23	AVG	P
11	23.5725	29.62	20.60	50.22	60.00	-9.78	QP	P
12	23.6445	13.77	20.60	34.37	50.00	-15.63	AVG	P

Note:
1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Reading level + Correct Factor.
4. Correct Factor= Lisn factor+ Cable loss factor + limiter factor.
5. Margin= Measurement Level-Limit.
6. Both SISO ANT A and ANT B passed the test, the test data shows only the worst case MIMO A+B 802.11n20 - 5745MHz.

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	N
Test Voltage:	AC 120V/60Hz	Test Mode:	MIMO A+B 802.11n20 - 5745MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1635	41.18	20.22	61.40	65.28	-3.88	QP	P
2	0.1635	12.18	20.22	32.40	55.28	-22.88	AVG	P
3	0.4650	15.80	20.31	36.11	46.60	-10.49	AVG	P
4	0.4785	26.13	20.31	46.44	56.37	-9.93	QP	P
5	1.2659	32.35	20.31	52.66	56.00	-3.34	QP	P
6	1.2659	18.24	20.31	38.55	46.00	-7.45	AVG	P
7	1.7159	32.28	20.30	52.58	56.00	-3.42	QP	P
8	1.7159	16.68	20.30	36.98	46.00	-9.02	AVG	P
9	2.0264	7.20	20.31	27.51	46.00	-18.49	AVG	P
10	2.0624	24.09	20.31	44.40	56.00	-11.60	QP	P
11	23.2800	28.03	20.62	48.65	60.00	-11.35	QP	P
12	24.0135	11.84	20.64	32.48	50.00	-17.52	AVG	P

Note:
1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Reading level + Correct Factor.
4. Correct Factor= Lisn factor+ Cable loss factor + limiter factor.
5. Margin= Measurement Level-Limit.
6. Both SISO ANT A and ANT B passed the test, the test data shows only the worst case MIMO A+B 802.11n20 - 5745MHz.

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 APPLICABLE STANDARD

According to FCC Part 15.407(d) and 15.209

4.2.2 CONFORMANCE LIMIT

According to FCC Part 15.407(b)(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			

.

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009~0.490	2400/F(KHz)	20 log (uV/m)	300
0.490~1.705	2400/F(KHz)	20 log (uV/m)	30
1.705~30.0	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Limits of Radiated Emission Measurement(Above 1000MHz)

Frequency(MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

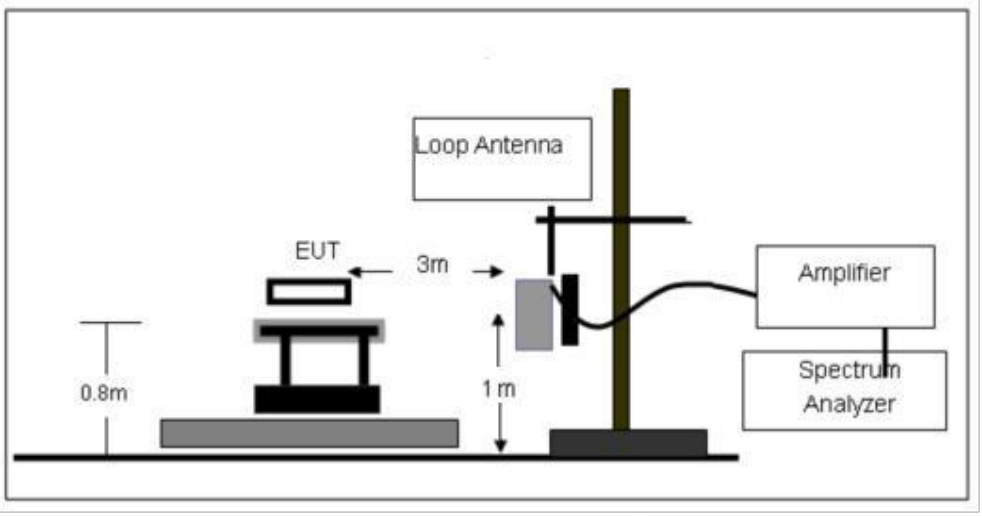
Remark :1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.

4.2.3 MEASURING INSTRUMENTS

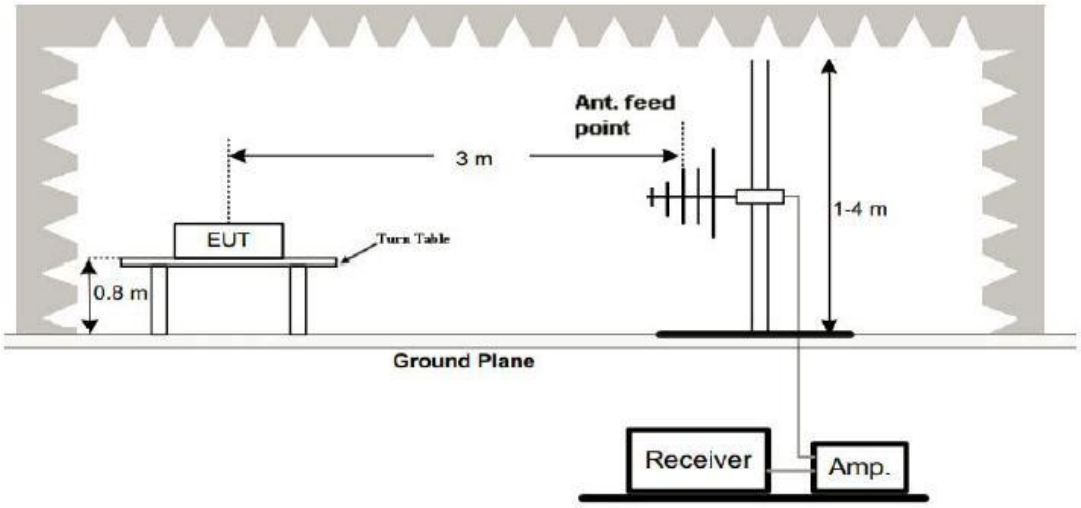
The Measuring equipment is listed in the section 6.3 of this test report.

4.2.4 TEST CONFIGURATION

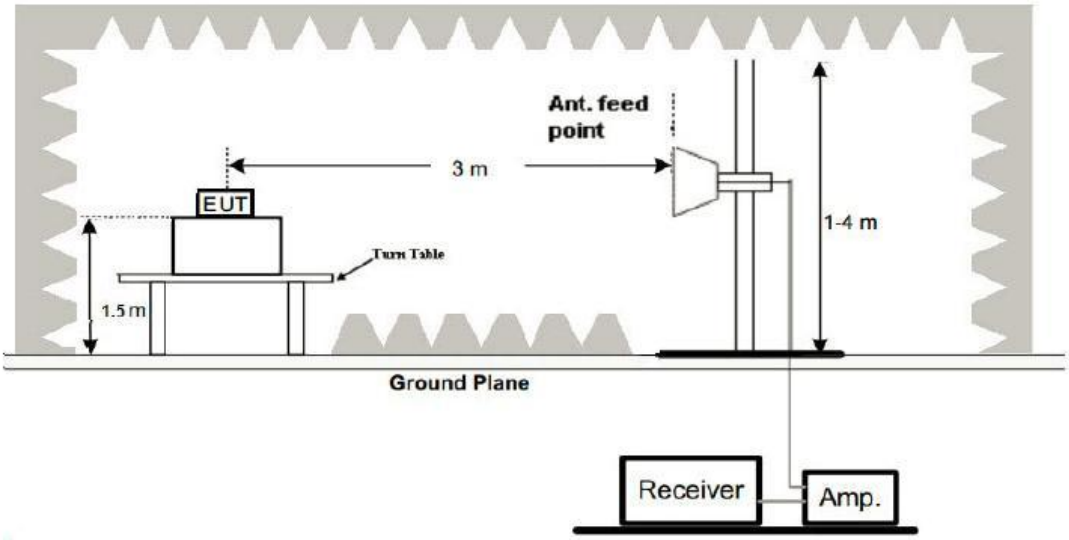
1.For radiated emissions below 30MHz



2.For radiated emissions from 30MHz to 1000MHz



3. Radiated Emission Test-Up Frequency Above 1GHz



4.2.5 TEST PROCEDURE

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10-2013. The test distance is 3m.The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.
This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT.
Use the following spectrum analyzer settings:

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item – EUT Test Photos.

Note:

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

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

Note: for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where RBWCF [dB] =10*lg(100 [kHz]/narrower RBW [kHz]). , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

4.2.6 TEST RESULT

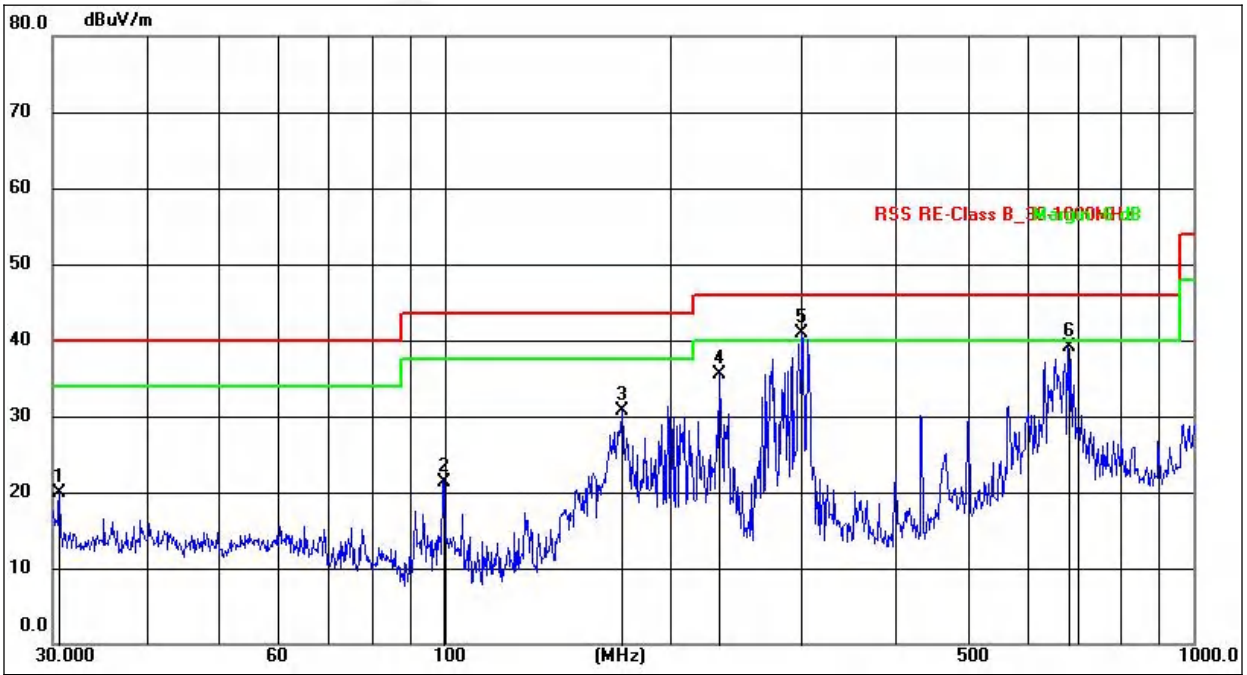
Between 9KHz – 30MHz

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

Between 30MHz – 1GHz

5.8G:

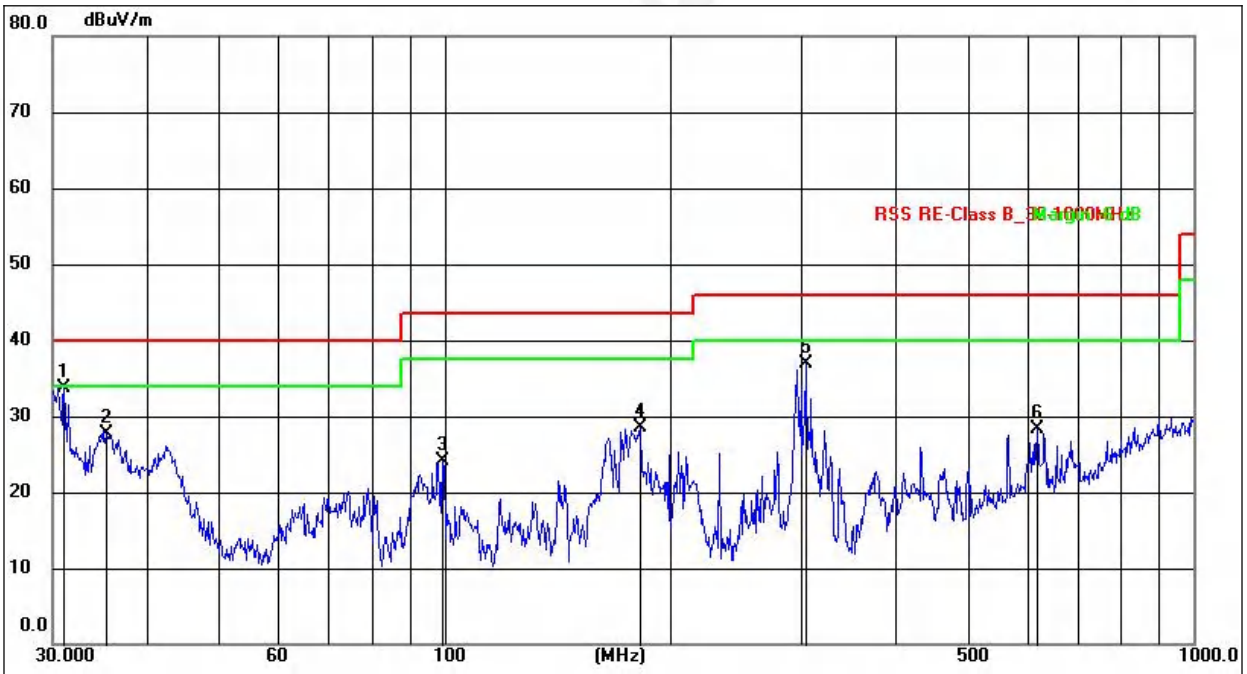
Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Test Mode :	MIMO A+B 802.11n20 - 5745MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.6378	34.02	-14.21	19.81	40.00	-20.19	QP
2	99.8777	40.91	-19.70	21.21	43.50	-22.29	QP
3	172.5987	47.70	-16.98	30.72	43.50	-12.78	QP
4	232.5318	52.04	-16.50	35.54	46.00	-10.46	QP
5	300.3672	57.53	-16.55	40.98	46.00	-5.02	QP
6	679.9600	45.99	-6.82	39.17	46.00	-6.83	QP

Note:
1. An initial pre-scan was performed on the peak detector.
2. Quasi-Peak measurement were performed at the frequencies with maximized peak emission.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.
4. Final Level = Reading level + Correct Factor.
5. Correct Factor= Antenna factor+ Cable loss factor - Amplifier factor.
6. Margin= Measurement Level-Limit.
7. Both SISO ANT A and ANT B passed the test, the test data shows only the worst case MIMO A+B 802.11n20 - 5745MHz.

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz	Test Mode :	MIMO A+B 802.11n20 - 5745MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	31.0706	51.81	-18.16	33.65	40.00	-6.35	QP
2	35.3750	45.12	-17.45	27.67	40.00	-12.33	QP
3	99.5281	45.30	-21.12	24.18	43.50	-19.32	QP
4	182.5592	48.15	-19.68	28.47	43.50	-15.03	QP
5	303.5437	54.78	-17.79	36.99	46.00	-9.01	QP
6	618.5368	35.59	-7.34	28.25	46.00	-17.75	QP

Note:
1. An initial pre-scan was performed on the peak detector.
2. Quasi-Peak measurement were performed at the frequencies with maximized peak emission.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.
4. Final Level = Reading level + Correct Factor.
5. Correct Factor= Antenna factor+ Cable loss factor - Amplifier factor.
6. Margin= Measurement Level-Limit.
7. Both SISO ANT A and ANT B passed the test, the test data shows only the worst case MIMO A+B 802.11n20 - 5745MHz.

Between 1GHz – 40GHz

Temperature :	26℃	Relative Humidity :	54%
Pressure :	1010 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	5.8G TX - 802.11a / n20 / n40 / ac20 / ac40 / ac80		
Note: All patterns have been tested, and only the worst test data recorded in this report is 802.11n20.			

SISO ANT A - 802.11n20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel:5745MHz									
V	11490.00	52.16	30.55	5.77	24.66	52.04	74.00	-21.96	PK
V	11490.00	43.48	30.55	5.77	24.66	43.36	54.00	-10.64	AV
V	17235.00	50.53	30.33	6.32	24.55	51.07	68.20	-17.13	PK
V	17235.00	43.89	30.33	6.32	24.55	44.43	54.00	-9.57	AV
V	22980.00	50.07	30.85	7.45	24.69	51.36	74.00	-22.64	PK
V	22980.00	43.58	30.85	7.45	24.69	44.87	54.00	-9.13	AV
V	28725.00	52.13	31.02	8.99	25.57	55.67	68.20	-12.53	PK
V	28725.00	43.36	31.02	8.99	25.57	46.90	54.00	-7.10	AV
H	11490.00	50.08	30.55	5.77	24.66	49.96	74.00	-24.04	PK
H	11490.00	43.41	30.55	5.77	24.66	43.29	54.00	-10.71	AV
H	17235.00	50.53	30.33	6.32	24.55	51.07	68.20	-17.13	PK
H	17235.00	43.93	30.33	6.32	24.55	44.47	54.00	-9.53	AV
H	22980.00	50.55	30.85	7.45	24.69	51.84	74.00	-22.16	PK
H	22980.00	43.43	30.85	7.45	24.69	44.72	54.00	-9.28	AV
H	28725.00	53.36	31.02	8.99	25.57	56.90	68.20	-11.30	PK
H	28725.00	43.54	31.02	8.99	25.57	47.08	54.00	-6.92	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Middle Channel:5785MHz									
V	11570.00	54.58	30.55	5.77	24.66	54.46	74.00	-19.54	PK
V	11570.00	43.93	30.55	5.77	24.66	43.81	54.00	-10.19	AV
V	17355.00	54.24	30.33	6.32	24.55	54.78	68.20	-13.42	PK
V	17355.00	43.73	30.33	6.32	24.55	44.27	54.00	-9.73	AV
V	23140.00	52.81	30.85	7.45	24.69	54.10	68.20	-14.10	PK
V	23140.00	43.82	30.85	7.45	24.69	45.11	54.00	-8.89	AV
V	28925.00	52.39	31.02	8.99	25.57	55.93	68.20	-12.27	PK
V	28925.00	43.10	31.02	8.99	25.57	46.64	54.00	-7.36	AV
H	11570.00	54.49	30.55	5.77	24.66	54.37	74.00	-19.63	PK
H	11570.00	43.78	30.55	5.77	24.66	43.66	54.00	-10.34	AV
H	17355.00	53.90	30.33	6.32	24.55	54.44	68.20	-13.76	PK
H	17355.00	43.55	30.33	6.32	24.55	44.09	54.00	-9.91	AV
H	23140.00	51.45	30.85	7.45	24.69	52.74	68.20	-15.46	PK
H	23140.00	43.21	30.85	7.45	24.69	44.50	54.00	-9.50	AV
H	28925.00	53.50	31.02	8.99	25.57	57.04	68.20	-11.16	PK
H	28925.00	43.64	31.02	8.99	25.57	47.18	54.00	-6.82	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
High Channel:5825MHz									
V	11650.00	54.48	30.55	5.77	24.66	54.36	74.00	-19.64	PK
V	11650.00	43.07	30.55	5.77	24.66	42.95	54.00	-11.05	AV
V	17475.00	52.34	30.33	6.32	24.55	52.88	68.20	-15.32	PK
V	17475.00	43.14	30.33	6.32	24.55	43.68	54.00	-10.32	AV
V	23300.00	51.68	30.85	7.45	24.69	52.97	68.20	-15.23	PK
V	23300.00	43.36	30.85	7.45	24.69	44.65	54.00	-9.35	AV
V	29125.00	52.32	31.02	8.99	25.57	55.86	68.20	-12.34	PK
V	29125.00	43.00	31.02	8.99	25.57	46.54	54.00	-7.46	AV
H	11650.00	51.89	30.55	5.77	24.66	51.77	74.00	-22.23	PK
H	11650.00	43.28	30.55	5.77	24.66	43.16	54.00	-10.84	AV
H	17475.00	54.34	30.33	6.32	24.55	54.88	68.20	-13.32	PK
H	17475.00	43.21	30.33	6.32	24.55	43.75	54.00	-10.25	AV
H	23300.00	54.98	30.85	7.45	24.69	56.27	68.20	-11.93	PK
H	23300.00	43.74	30.85	7.45	24.69	45.03	54.00	-8.97	AV
H	29125.00	53.84	31.02	8.99	25.57	57.38	68.20	-10.82	PK
H	29125.00	43.44	31.02	8.99	25.57	46.98	54.00	-7.02	AV

Remark:
1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

SISO ANT B - 802.11n20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel:5745MHz									
V	11490.00	50.10	30.55	5.77	24.66	49.98	74.00	-24.02	PK
V	11490.00	43.99	30.55	5.77	24.66	43.87	54.00	-10.13	AV
V	17235.00	50.50	30.33	6.32	24.55	51.04	68.20	-17.16	PK
V	17235.00	43.15	30.33	6.32	24.55	43.69	54.00	-10.31	AV
V	22980.00	50.80	30.85	7.45	24.69	52.09	74.00	-21.91	PK
V	22980.00	43.62	30.85	7.45	24.69	44.91	54.00	-9.09	AV
V	28725.00	53.76	31.02	8.99	25.57	57.30	68.20	-10.90	PK
V	28725.00	43.76	31.02	8.99	25.57	47.30	54.00	-6.70	AV
H	11490.00	50.31	30.55	5.77	24.66	50.19	74.00	-23.81	PK
H	11490.00	43.43	30.55	5.77	24.66	43.31	54.00	-10.69	AV
H	17235.00	53.95	30.33	6.32	24.55	54.49	68.20	-13.71	PK
H	17235.00	43.65	30.33	6.32	24.55	44.19	54.00	-9.81	AV
H	22980.00	51.06	30.85	7.45	24.69	52.35	74.00	-21.65	PK
H	22980.00	43.55	30.85	7.45	24.69	44.84	54.00	-9.16	AV
H	28725.00	54.56	31.02	8.99	25.57	58.10	68.20	-10.10	PK
H	28725.00	43.51	31.02	8.99	25.57	47.05	54.00	-6.95	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Middle Channel:5785MHz									
V	11570.00	53.51	30.55	5.77	24.66	53.39	74.00	-20.61	PK
V	11570.00	43.71	30.55	5.77	24.66	43.59	54.00	-10.41	AV
V	17355.00	50.70	30.33	6.32	24.55	51.24	68.20	-16.96	PK
V	17355.00	43.03	30.33	6.32	24.55	43.57	54.00	-10.43	AV
V	23140.00	51.43	30.85	7.45	24.69	52.72	68.20	-15.48	PK
V	23140.00	43.74	30.85	7.45	24.69	45.03	54.00	-8.97	AV
V	28925.00	51.80	31.02	8.99	25.57	55.34	68.20	-12.86	PK
V	28925.00	43.61	31.02	8.99	25.57	47.15	54.00	-6.85	AV
H	11570.00	53.94	30.55	5.77	24.66	53.82	74.00	-20.18	PK
H	11570.00	43.36	30.55	5.77	24.66	43.24	54.00	-10.76	AV
H	17355.00	54.72	30.33	6.32	24.55	55.26	68.20	-12.94	PK
H	17355.00	43.82	30.33	6.32	24.55	44.36	54.00	-9.64	AV
H	23140.00	51.71	30.85	7.45	24.69	53.00	68.20	-15.20	PK
H	23140.00	43.48	30.85	7.45	24.69	44.77	54.00	-9.23	AV
H	28925.00	52.01	31.02	8.99	25.57	55.55	68.20	-12.65	PK
H	28925.00	43.44	31.02	8.99	25.57	46.98	54.00	-7.02	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
High Channel:5825MHz									
V	11650.00	50.57	30.55	5.77	24.66	50.45	74.00	-23.55	PK
V	11650.00	43.62	30.55	5.77	24.66	43.50	54.00	-10.50	AV
V	17475.00	53.85	30.33	6.32	24.55	54.39	68.20	-13.81	PK
V	17475.00	43.87	30.33	6.32	24.55	44.41	54.00	-9.59	AV
V	23300.00	54.95	30.85	7.45	24.69	56.24	68.20	-11.96	PK
V	23300.00	43.78	30.85	7.45	24.69	45.07	54.00	-8.93	AV
V	29125.00	54.27	31.02	8.99	25.57	57.81	68.20	-10.39	PK
V	29125.00	43.05	31.02	8.99	25.57	46.59	54.00	-7.41	AV
H	11650.00	54.57	30.55	5.77	24.66	54.45	74.00	-19.55	PK
H	11650.00	43.54	30.55	5.77	24.66	43.42	54.00	-10.58	AV
H	17475.00	53.37	30.33	6.32	24.55	53.91	68.20	-14.29	PK
H	17475.00	43.43	30.33	6.32	24.55	43.97	54.00	-10.03	AV
H	23300.00	53.06	30.85	7.45	24.69	54.35	68.20	-13.85	PK
H	23300.00	43.74	30.85	7.45	24.69	45.03	54.00	-8.97	AV
H	29125.00	54.05	31.02	8.99	25.57	57.59	68.20	-10.61	PK
H	29125.00	43.31	31.02	8.99	25.57	46.85	54.00	-7.15	AV

Remark:
1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

MIMO A+B - 802.11n20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel:5745MHz									
V	11490.00	52.05	30.55	5.77	24.66	51.93	74.00	-22.07	PK
V	11490.00	43.16	30.55	5.77	24.66	43.04	54.00	-10.96	AV
V	17235.00	54.81	30.33	6.32	24.55	55.35	68.20	-12.85	PK
V	17235.00	43.10	30.33	6.32	24.55	43.64	54.00	-10.36	AV
V	22980.00	52.27	30.85	7.45	24.69	53.56	74.00	-20.44	PK
V	22980.00	43.28	30.85	7.45	24.69	44.57	54.00	-9.43	AV
V	28725.00	53.57	31.02	8.99	25.57	57.11	68.20	-11.09	PK
V	28725.00	43.25	31.02	8.99	25.57	46.79	54.00	-7.21	AV
H	11490.00	53.43	30.55	5.77	24.66	53.31	74.00	-20.69	PK
H	11490.00	43.31	30.55	5.77	24.66	43.19	54.00	-10.81	AV
H	17235.00	52.19	30.33	6.32	24.55	52.73	68.20	-15.47	PK
H	17235.00	43.83	30.33	6.32	24.55	44.37	54.00	-9.63	AV
H	22980.00	54.28	30.85	7.45	24.69	55.57	74.00	-18.43	PK
H	22980.00	43.75	30.85	7.45	24.69	45.04	54.00	-8.96	AV
H	28725.00	53.66	31.02	8.99	25.57	57.20	68.20	-11.00	PK
H	28725.00	43.49	31.02	8.99	25.57	47.03	54.00	-6.97	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Middle Channel:5785MHz									
V	11570.00	54.12	30.55	5.77	24.66	54.00	74.00	-20.00	PK
V	11570.00	43.39	30.55	5.77	24.66	43.27	54.00	-10.73	AV
V	17355.00	54.65	30.33	6.32	24.55	55.19	68.20	-13.01	PK
V	17355.00	43.24	30.33	6.32	24.55	43.78	54.00	-10.22	AV
V	23140.00	53.79	30.85	7.45	24.69	55.08	68.20	-13.12	PK
V	23140.00	43.89	30.85	7.45	24.69	45.18	54.00	-8.82	AV
V	28925.00	51.75	31.02	8.99	25.57	55.29	68.20	-12.91	PK
V	28925.00	43.85	31.02	8.99	25.57	47.39	54.00	-6.61	AV
H	11570.00	50.61	30.55	5.77	24.66	50.49	74.00	-23.51	PK
H	11570.00	43.11	30.55	5.77	24.66	42.99	54.00	-11.01	AV
H	17355.00	52.49	30.33	6.32	24.55	53.03	68.20	-15.17	PK
H	17355.00	43.91	30.33	6.32	24.55	44.45	54.00	-9.55	AV
H	23140.00	52.07	30.85	7.45	24.69	53.36	68.20	-14.84	PK
H	23140.00	43.00	30.85	7.45	24.69	44.29	54.00	-9.71	AV
H	28925.00	53.16	31.02	8.99	25.57	56.70	68.20	-11.50	PK
H	28925.00	43.36	31.02	8.99	25.57	46.90	54.00	-7.10	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
High Channel:5825MHz									
V	11650.00	50.21	30.55	5.77	24.66	50.09	74.00	-23.91	PK
V	11650.00	43.23	30.55	5.77	24.66	43.11	54.00	-10.89	AV
V	17475.00	54.11	30.33	6.32	24.55	54.65	68.20	-13.55	PK
V	17475.00	43.01	30.33	6.32	24.55	43.55	54.00	-10.45	AV
V	23300.00	54.41	30.85	7.45	24.69	55.70	68.20	-12.50	PK
V	23300.00	43.49	30.85	7.45	24.69	44.78	54.00	-9.22	AV
V	29125.00	51.96	31.02	8.99	25.57	55.50	68.20	-12.70	PK
V	29125.00	43.79	31.02	8.99	25.57	47.33	54.00	-6.67	AV
H	11650.00	52.94	30.55	5.77	24.66	52.82	74.00	-21.18	PK
H	11650.00	43.90	30.55	5.77	24.66	43.78	54.00	-10.22	AV
H	17475.00	53.66	30.33	6.32	24.55	54.20	68.20	-14.00	PK
H	17475.00	43.06	30.33	6.32	24.55	43.60	54.00	-10.40	AV
H	23300.00	53.15	30.85	7.45	24.69	54.44	68.20	-13.76	PK
H	23300.00	43.46	30.85	7.45	24.69	44.75	54.00	-9.25	AV
H	29125.00	51.52	31.02	8.99	25.57	55.06	68.20	-13.14	PK
H	29125.00	43.46	31.02	8.99	25.57	47.00	54.00	-7.00	AV

Remark:
1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

5. POWER SPECTRAL DENSITY TEST

5.1 APPLIED PROCEDURES / LIMIT

According to FCC §15.407(3)

Power limits:

(1) For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

5.2 TEST PROCEDURE

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

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

b) Set VBW ≥ 3 RBW.

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

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

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

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

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP

5.5 EUT OPERATION CONDITIONS

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

5.6 TEST RESULTS

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

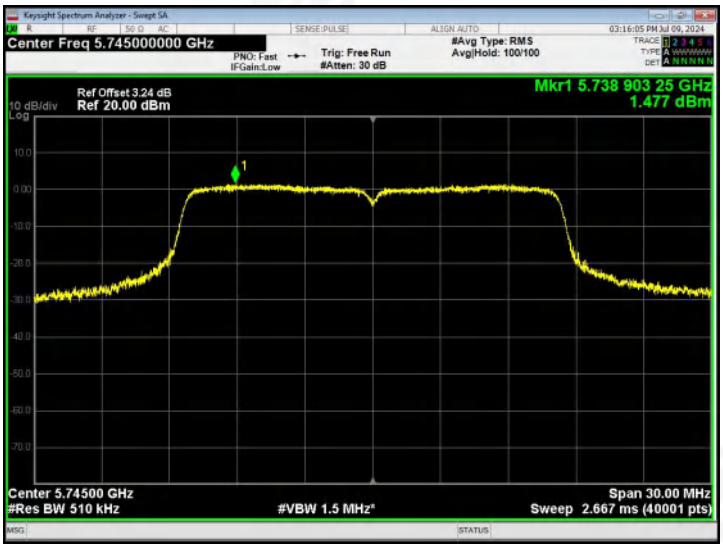
Mode	Antenna	Frequency (MHz)	PSD (dBm/500kHz)	Duty Cycle Factor (dB)	Total PSD (dBm/500kHz)	Ant Gain (dBi)	Limit (dBm)	Result
802.11a	SISO ANT A	5745	1.477	0.16	1.637	8.40	27.60	Pass
		5785	2.302	0.16	2.462	8.40	27.60	Pass
		5825	3.112	0.16	3.272	8.40	27.60	Pass
	SISO ANT B	5745	2.875	0.16	3.035	6.82	29.18	Pass
		5785	2.084	0.16	2.244	6.82	29.18	Pass
		5825	2.686	0.16	2.846	6.82	29.18	Pass

Note: Total PSD = PSD + Duty Cycle Factor(See page 101 for more details).

If the antenna gain exceeds 6 dBi, the limit must be reduced by the excess value. For example, Antenna A has a gain of 8.40 dBi (exceeding by 2.40 dBi), and Antenna B has a gain of 6.82 dBi (exceeding by 0.82 dBi).

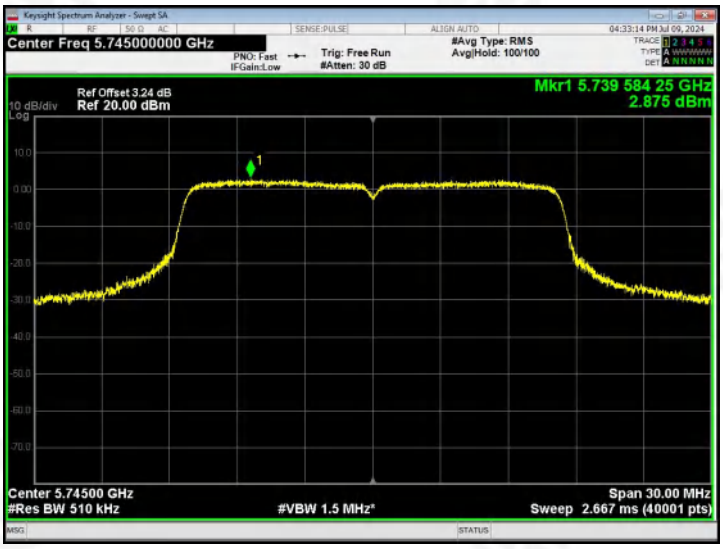
SISO ANT A - 802.11a

CH149

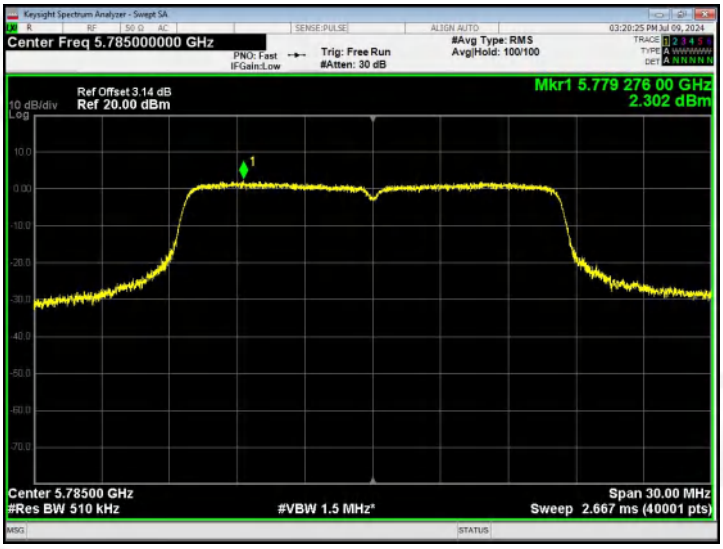


SISO ANT B - 802.11a

CH149



CH157



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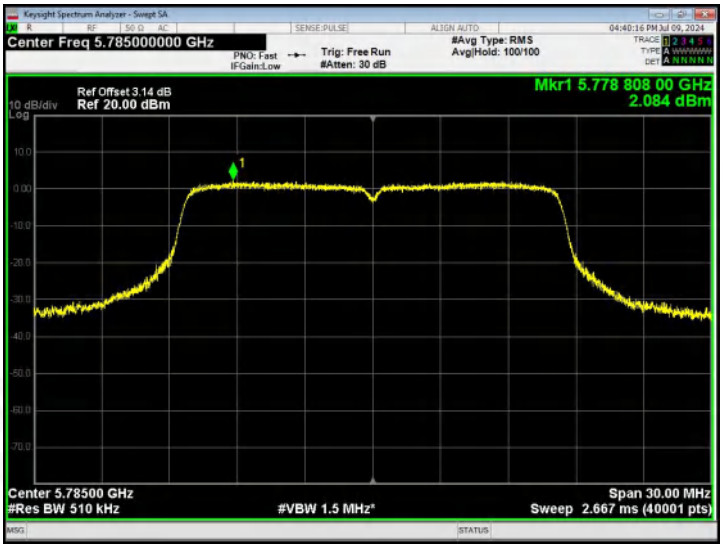

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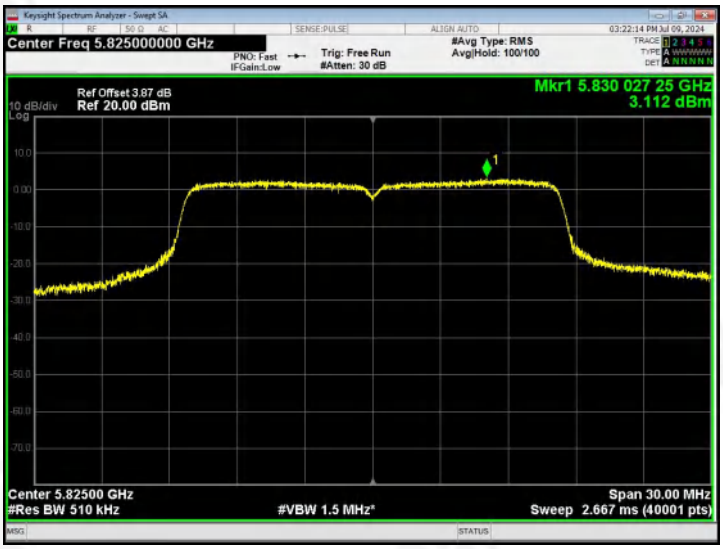

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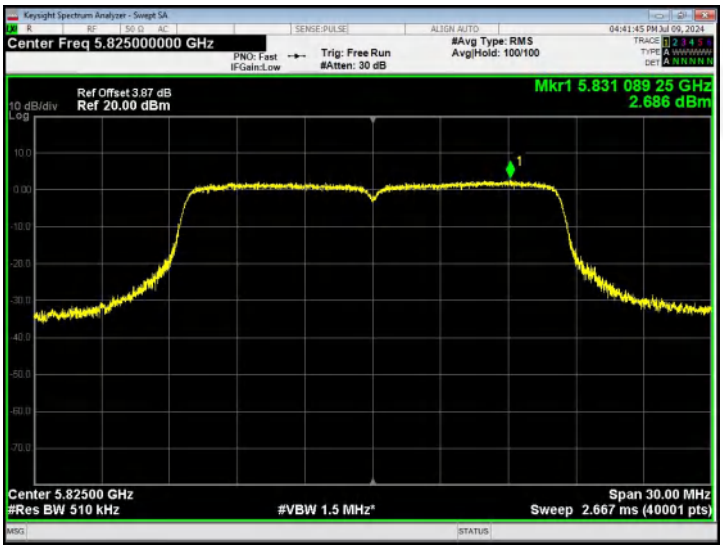


Temperature :	26 ℃	Relative Humidity :	54%
Pressure :	1015 hPa	Test Voltage :	AC 120V/60Hz

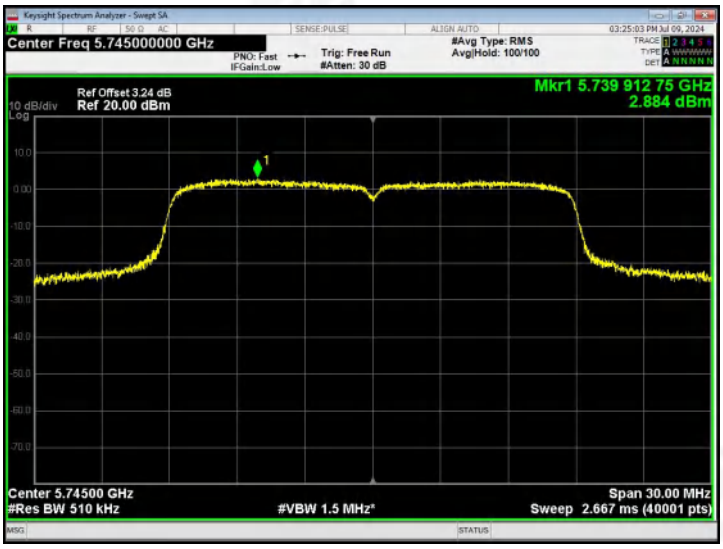
Mode	Antenna	Frequency (MHz)	PSD (dBm/500kHz)	Duty Cycle Factor (dB)	Total PSD (dBm/500kHz)	Ant Gain (dBi)	Limit (dBm)	Result
802.11n20	SISO ANT A	5745	2.884	0.17	3.054	8.40	27.60	Pass
		5785	3.043	0.17	3.213	8.40	27.60	Pass
		5825	3.982	0.17	4.152	8.40	27.60	Pass
	SISO ANT B	5745	2.085	0.17	2.255	6.82	29.18	Pass
		5785	1.719	0.17	1.889	6.82	29.18	Pass
		5825	1.978	0.17	2.148	6.82	29.18	Pass
	MIMO ANT A	5745	0.308	0.17	0.478	8.40	27.60	Pass
		5785	0.470	0.17	0.640	8.40	27.60	Pass
		5825	1.708	0.17	1.878	8.40	27.60	Pass
	MIMO ANT B	5745	-0.401	0.17	-0.231	6.82	29.18	Pass
		5785	-1.182	0.17	-1.012	6.82	29.18	Pass
		5825	-0.657	0.17	-0.487	6.82	29.18	Pass
	MIMO ANT A+B	5745	2.978	/	2.978	10.65	25.35	Pass
		5785	2.732	/	2.732	10.65	25.35	Pass
		5825	3.695	/	3.695	10.65	25.35	Pass

Note: Total PSD = PSD + Duty Cycle Factor(See page 101 for more details).

If the antenna gain exceeds 6 dBi, the limit must be reduced by the excess value. For example, Antenna A has a gain of 8.40 dBi (exceeding by 2.40 dBi), and Antenna B has a gain of 6.82 dBi (exceeding by 0.82 dBi). Additionally, the combined gain of Antennas A + B is 10.65 dBi(exceeding by 4.65 dBi).

SISO ANT A - 802.11n20

CH149



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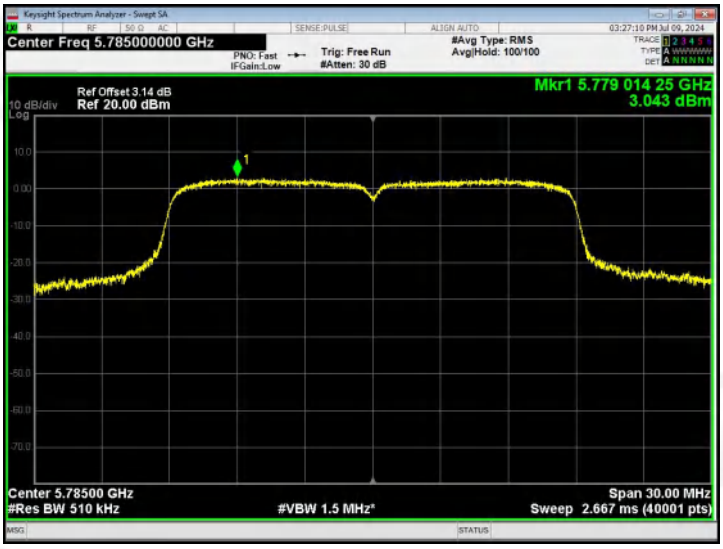

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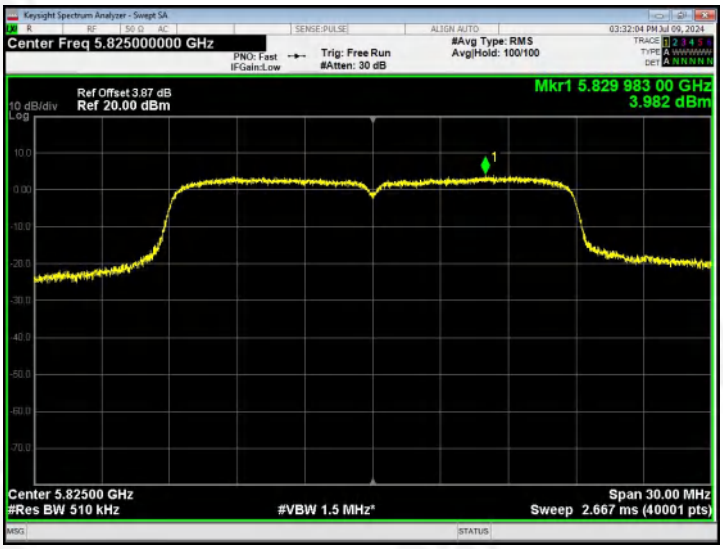
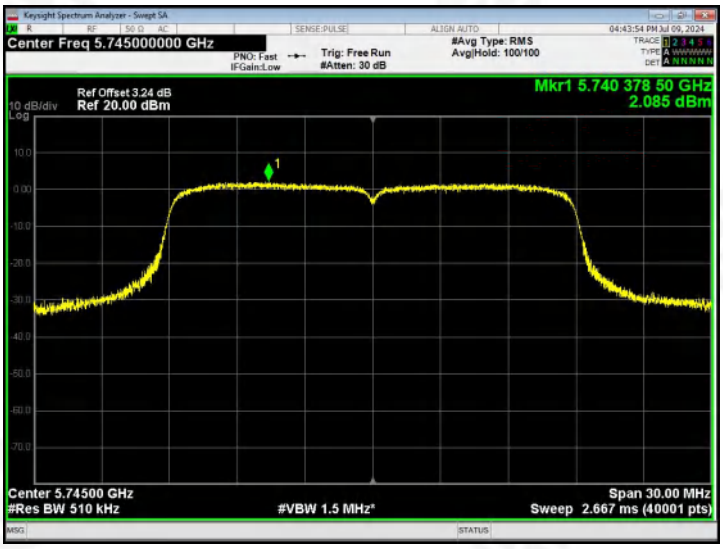


SISO ANT B - 802.11n20

CH149



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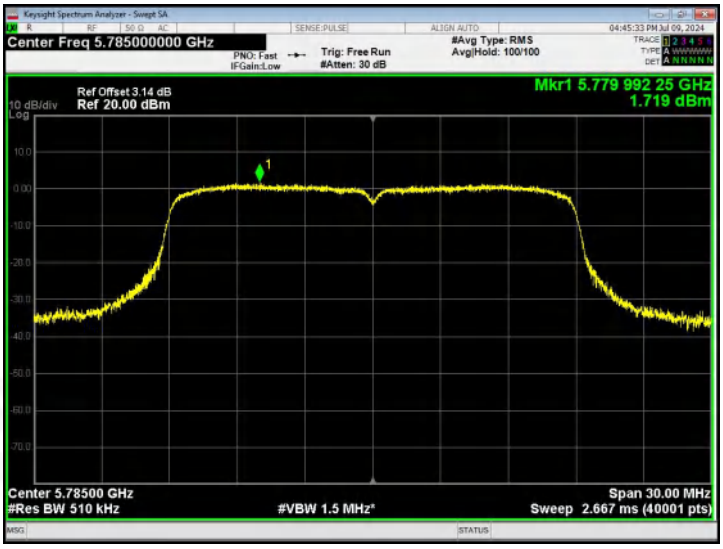

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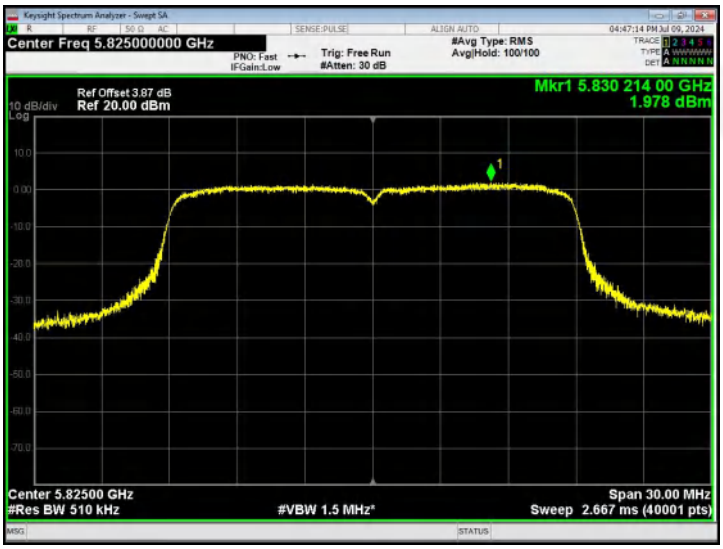
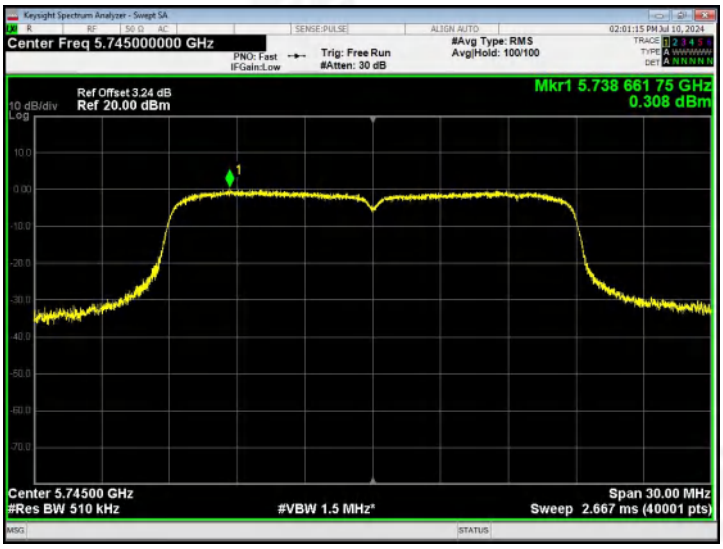


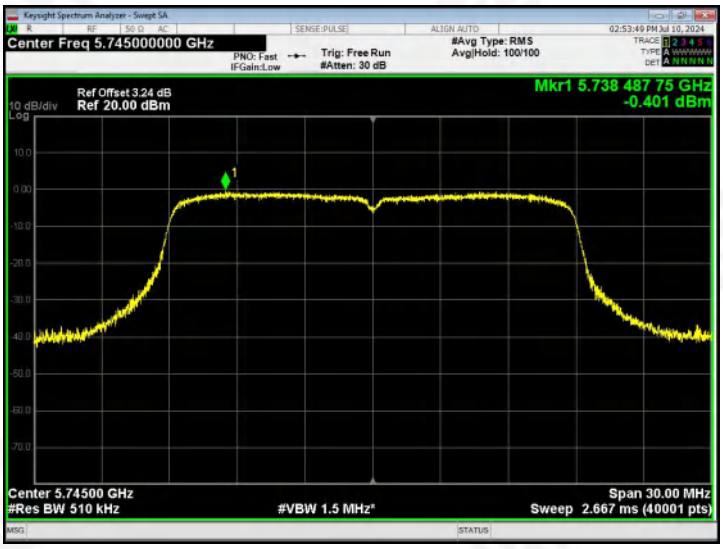
MIMO ANT A - 802.11n20

CH149



MIMO ANT B - 802.11n20

CH149



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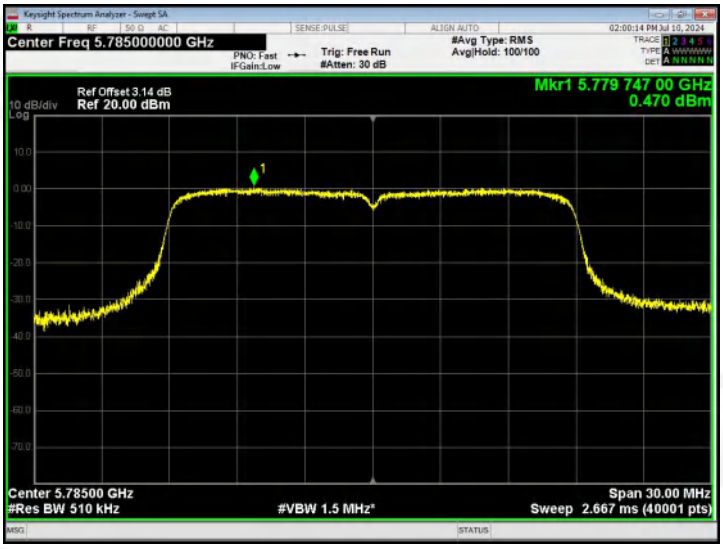

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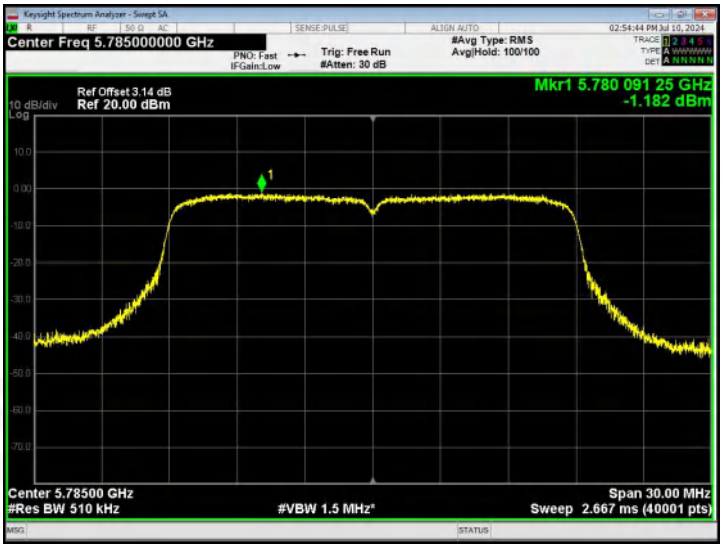

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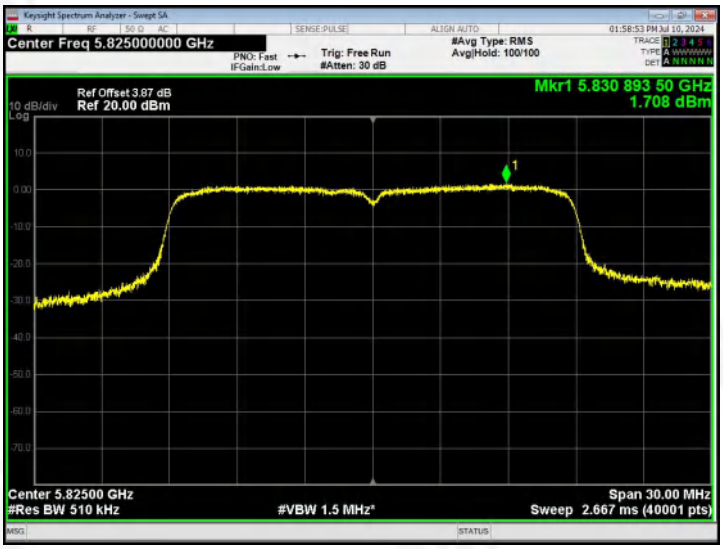

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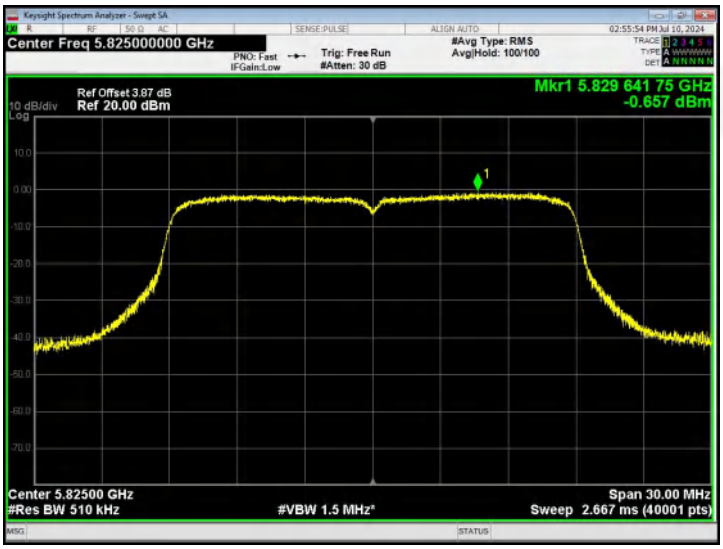


Temperature :	26 ℃	Relative Humidity :	54%
Pressure :	1015 hPa	Test Voltage :	AC 120V/60Hz

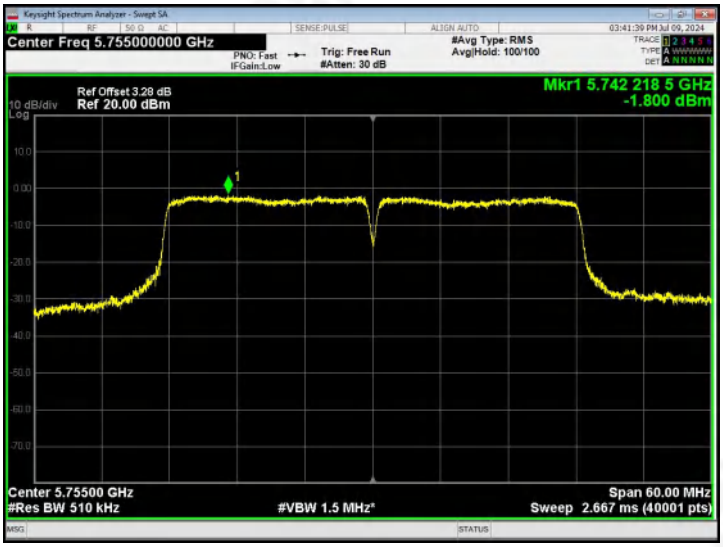
Mode	Antenna	Frequency (MHz)	PSD (dBm/500kHz)	Duty Cycle Factor (dB)	Total PSD (dBm/500kHz)	Ant Gain (dBi)	Limit (dBm)	Result
802.11n40	SISO ANT A	5755	-1.800	0.34	-1.460	8.40	27.60	Pass
		5795	-1.043	0.34	-0.703	8.40	27.60	Pass
	SISO ANT B	5755	-1.951	0.34	-1.611	6.82	29.18	Pass
		5795	-2.581	0.34	-2.241	6.82	29.18	Pass
	MIMO ANT A	5755	-3.949	0.34	-3.609	8.40	27.60	Pass
		5795	-3.462	0.34	-3.122	8.40	27.60	Pass
	MIMO ANT B	5755	-4.026	0.34	-3.686	6.82	29.18	Pass
		5795	-4.596	0.34	-4.256	6.82	29.18	Pass
	MIMO ANT A+B	5755	-0.977	/	-0.977	10.65	25.35	Pass
		5795	-0.982	/	-0.982	10.65	25.35	Pass

Note: Total PSD = PSD + Duty Cycle Factor(See page 101 for more details).

If the antenna gain exceeds 6 dBi, the limit must be reduced by the excess value. For example, Antenna A has a gain of 8.40 dBi (exceeding by 2.40 dBi), and Antenna B has a gain of 6.82 dBi (exceeding by 0.82 dBi). Additionally, the combined gain of Antennas A + B is 10.65 dBi(exceeding by 4.65 dBi).

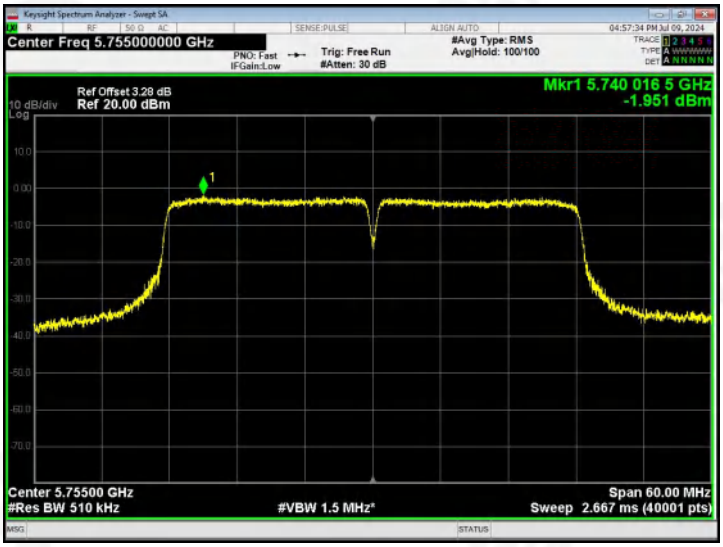
SISO ANT A - 802.11n40

CH151

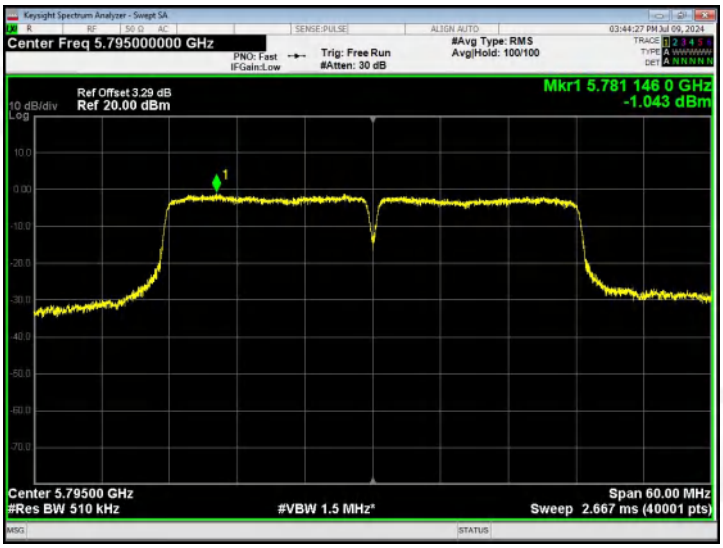


SISO ANT B - 802.11n40

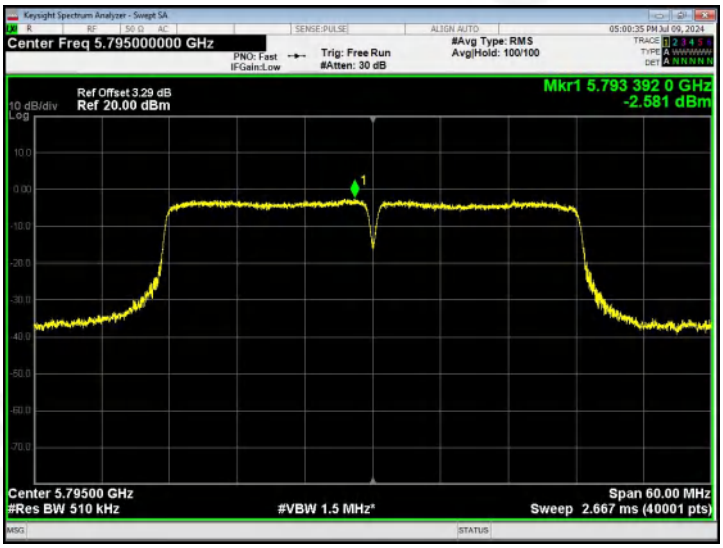
CH151



CH159

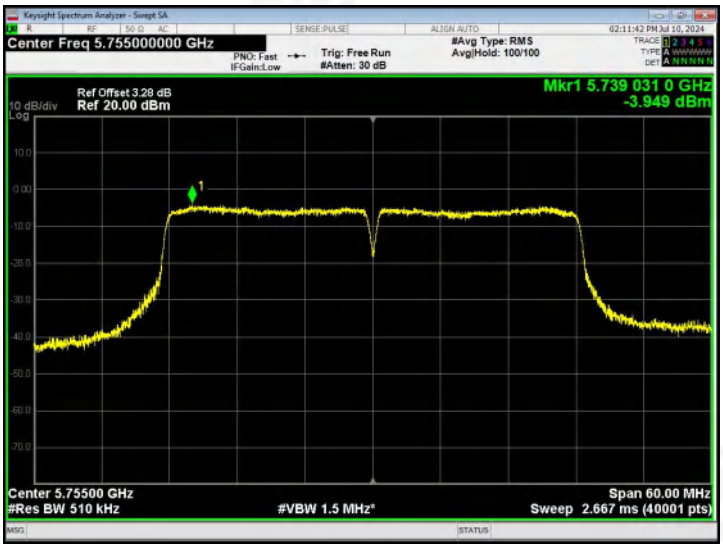


CH159



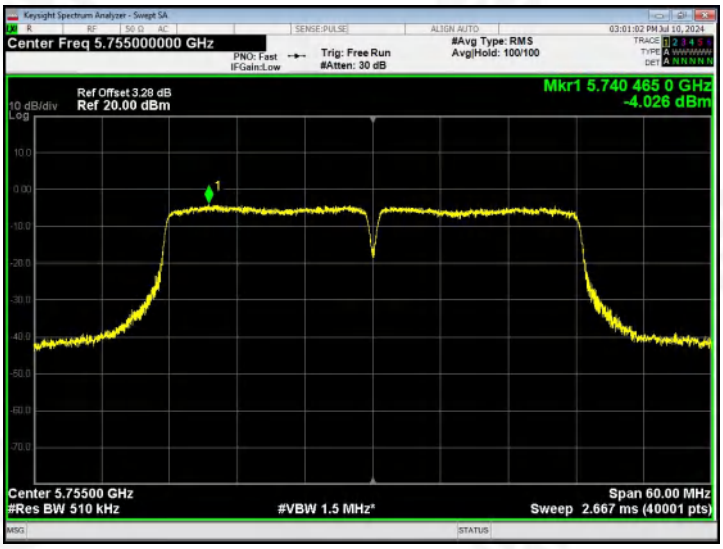
MIMO ANT A - 802.11n40

CH151



MIMO ANT B - 802.11n40

CH151



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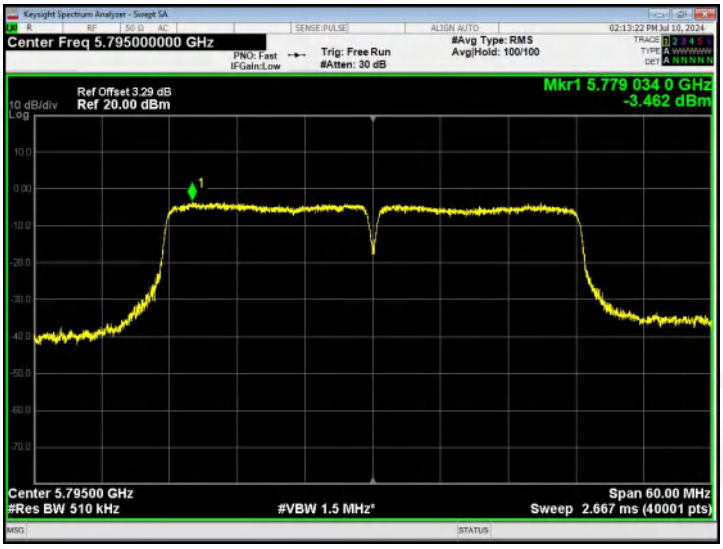

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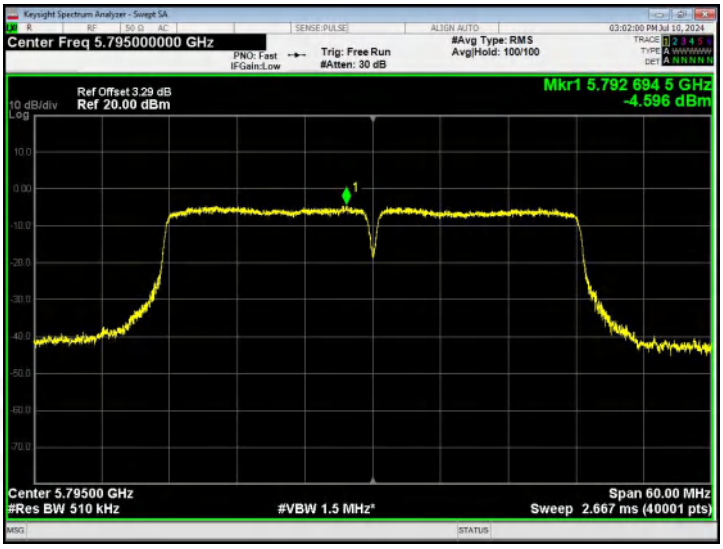


Temperature :	26 ℃	Relative Humidity :	54%
Pressure :	1015 hPa	Test Voltage :	AC 120V/60Hz

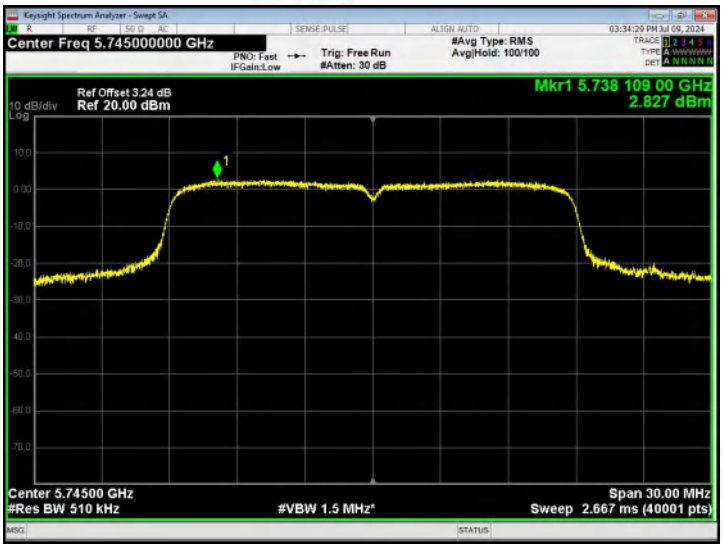
Mode	Antenna	Frequency (MHz)	PSD (dBm/500kHz)	Duty Cycle Factor (dB)	Total PSD (dBm/500kHz)	Ant Gain (dBi)	Limit (dBm)	Result
802.11ac20	SISO ANT A	5745	2.827	0.17	2.997	8.40	27.60	Pass
		5785	2.922	0.17	3.092	8.40	27.60	Pass
		5825	3.716	0.17	3.886	8.40	27.60	Pass
	SISO ANT B	5745	1.892	0.17	2.062	6.82	29.18	Pass
		5785	1.342	0.17	1.512	6.82	29.18	Pass
		5825	1.708	0.17	1.878	6.82	29.18	Pass
	MIMO ANT A	5745	-0.131	0.17	0.039	8.40	27.60	Pass
		5785	0.195	0.17	0.365	8.40	27.60	Pass
		5825	1.723	0.17	1.893	8.40	27.60	Pass
	MIMO ANT B	5745	-0.366	0.17	-0.196	6.82	29.18	Pass
		5785	-1.135	0.17	-0.965	6.82	29.18	Pass
		5825	-0.351	0.17	-0.181	6.82	29.18	Pass
	MIMO ANT A+B	5745	2.763	/	2.763	10.65	25.35	Pass
		5785	2.591	/	2.591	10.65	25.35	Pass
		5825	3.819	/	3.819	10.65	25.35	Pass

Note: Total PSD = PSD + Duty Cycle Factor(See page 101 for more details).

If the antenna gain exceeds 6 dBi, the limit must be reduced by the excess value. For example, Antenna A has a gain of 8.40 dBi (exceeding by 2.40 dBi), and Antenna B has a gain of 6.82 dBi (exceeding by 0.82 dBi). Additionally, the combined gain of Antennas A + B is 10.65 dBi(exceeding by 4.65 dBi).

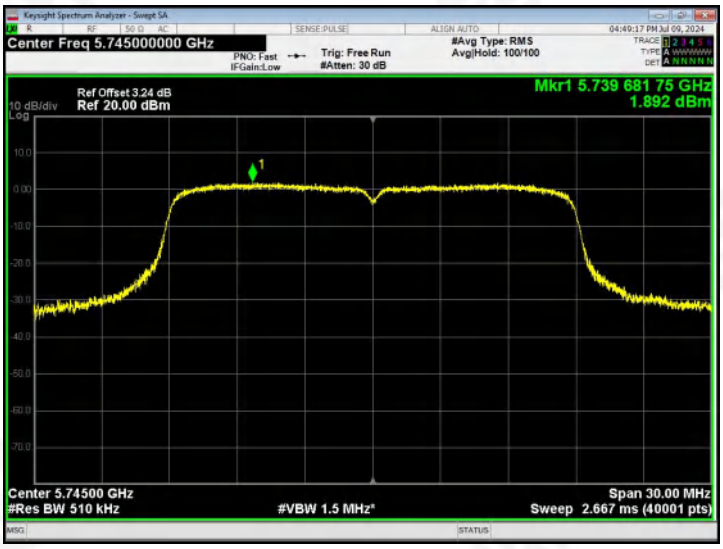
SISO ANT A - 802.11ac20

CH149

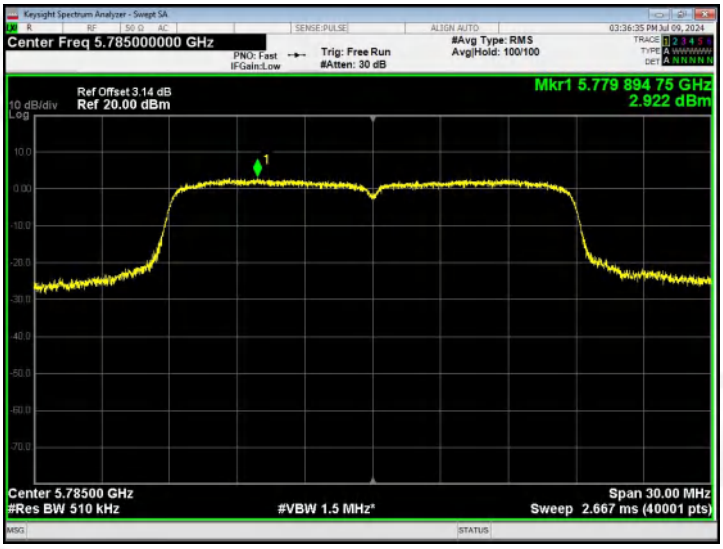


SISO ANT B - 802.11ac20

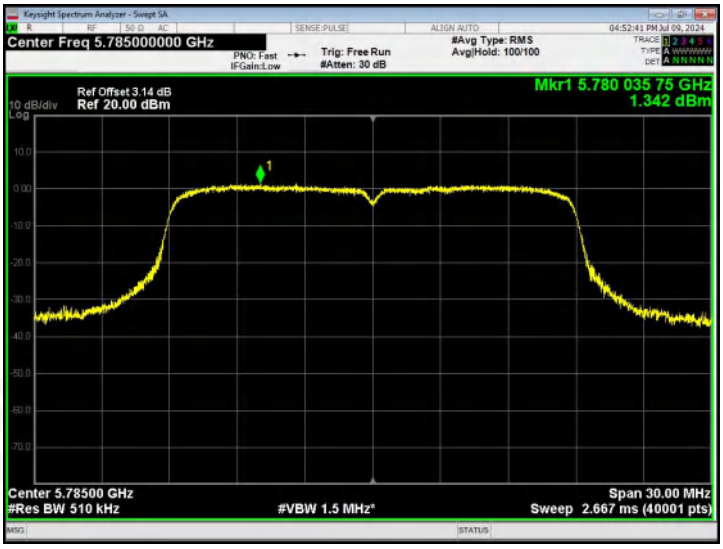
CH149



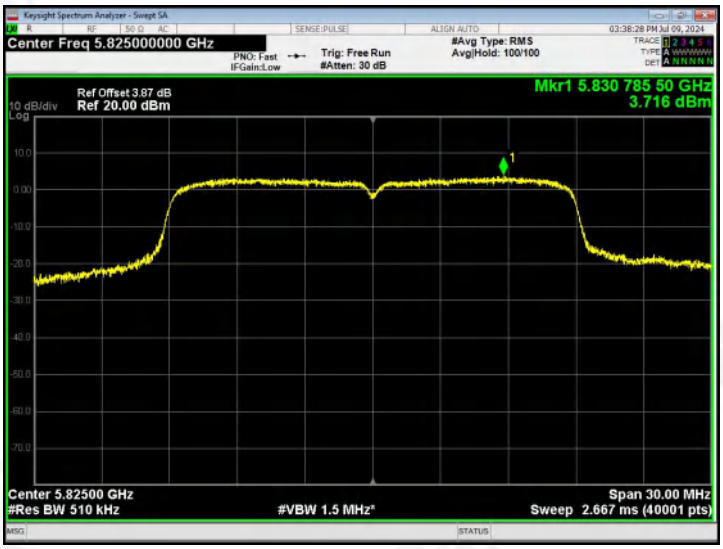
CH157



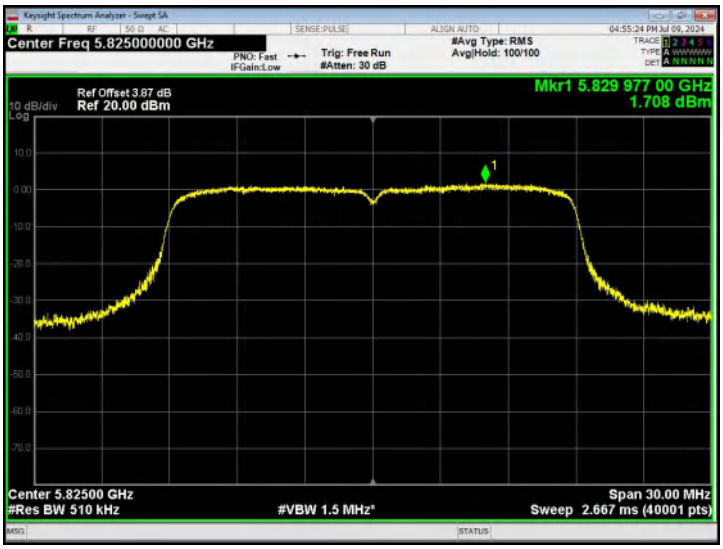
CH157



CH165

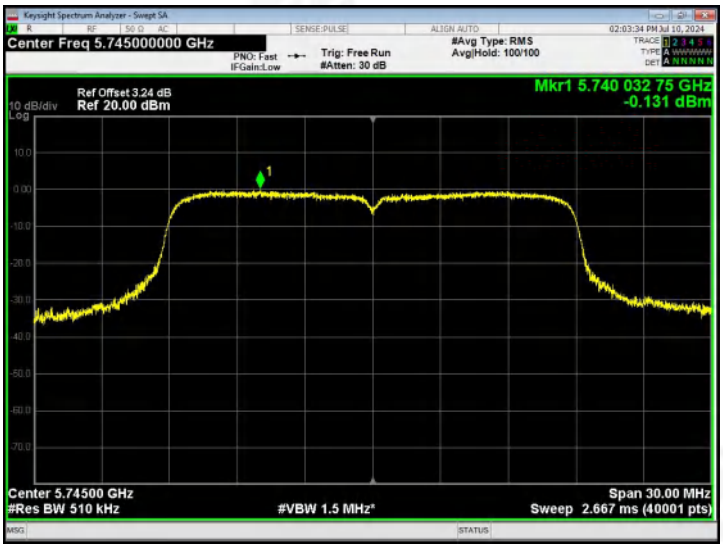


CH165

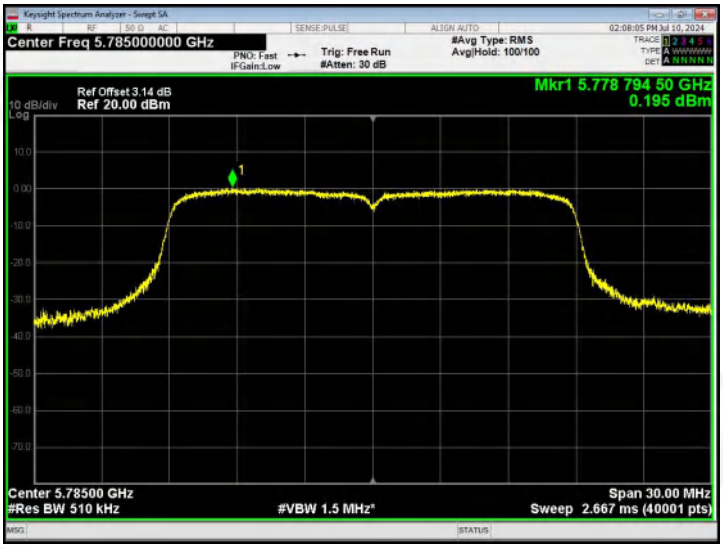


MIMO ANT A - 802.11ac20

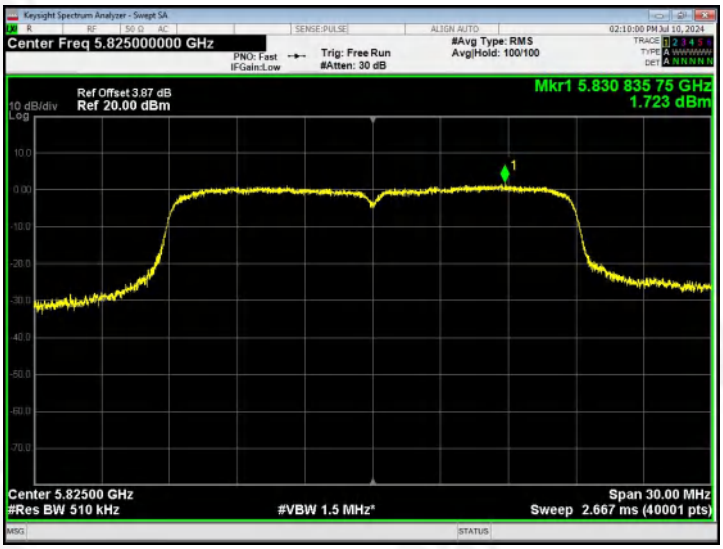
CH149



CH157

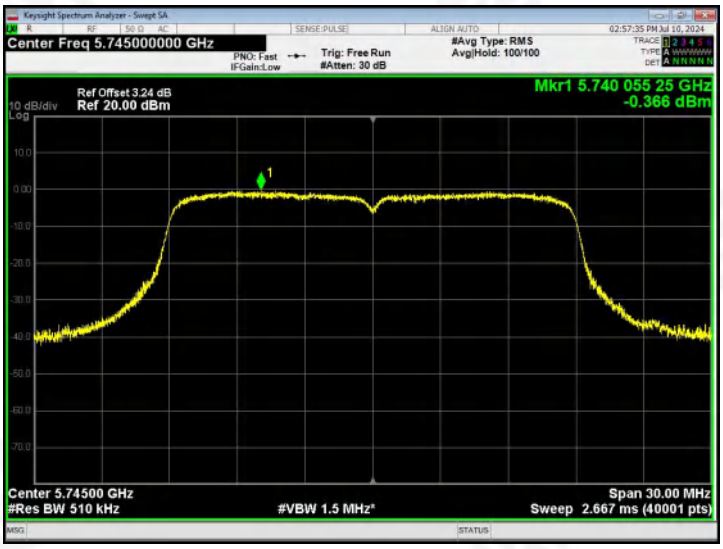


CH165

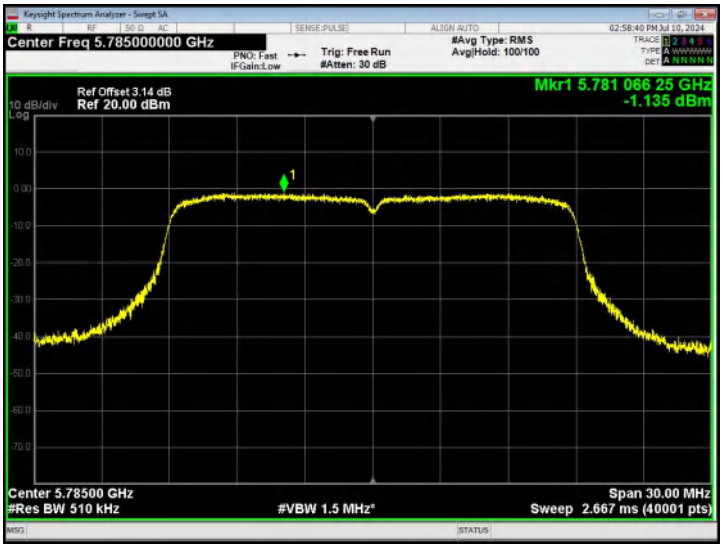


MIMO ANT B - 802.11ac20

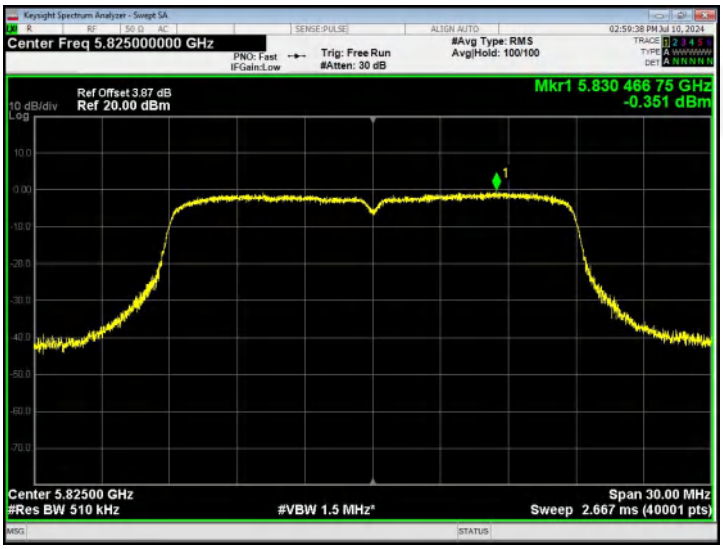
CH149



CH157



CH165



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

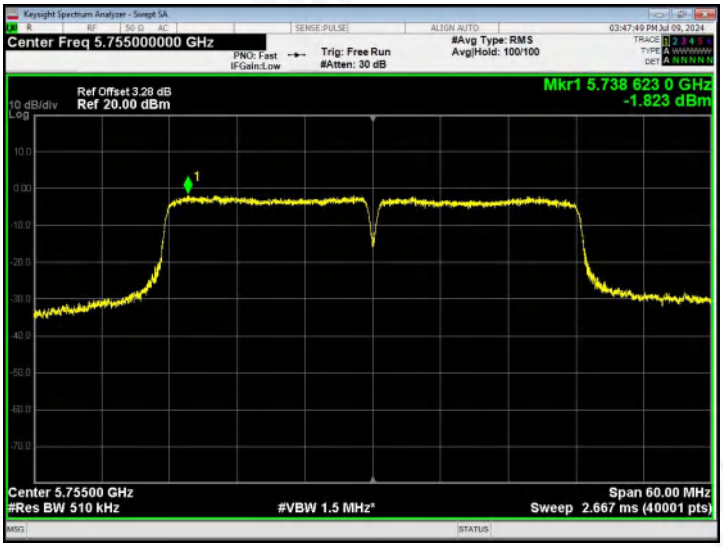
Mode	Antenna	Frequency (MHz)	PSD (dBm/500kHz)	Duty Cycle Factor (dB)	Total PSD (dBm/500kHz)	Ant Gain (dBi)	Limit (dBm)	Result
802.11ac40	SISO ANT A	5755	-1.823	0.34	-1.483	8.40	27.60	Pass
		5795	-1.193	0.34	-0.853	8.40	27.60	Pass
	SISO ANT B	5755	-2.094	0.34	-1.754	6.82	29.18	Pass
		5795	-2.573	0.34	-2.233	6.82	29.18	Pass
	MIMO ANT A	5755	-4.224	0.34	-3.884	8.40	27.60	Pass
		5795	-3.909	0.34	-3.569	8.40	27.60	Pass
	MIMO ANT B	5755	-3.751	0.34	-3.411	6.82	29.18	Pass
		5795	-4.507	0.34	-4.167	6.82	29.18	Pass
	MIMO ANT A+B	5755	-0.971	/	-0.971	10.65	25.35	Pass
		5795	-1.187	/	-1.187	10.65	25.35	Pass

Note: Total PSD = PSD + Duty Cycle Factor(See page 101 for more details).

If the antenna gain exceeds 6 dBi, the limit must be reduced by the excess value. For example, Antenna A has a gain of 8.40 dBi (exceeding by 2.40 dBi), and Antenna B has a gain of 6.82 dBi (exceeding by 0.82 dBi). Additionally, the combined gain of Antennas A + B is 10.65 dBi(exceeding by 4.65 dBi).

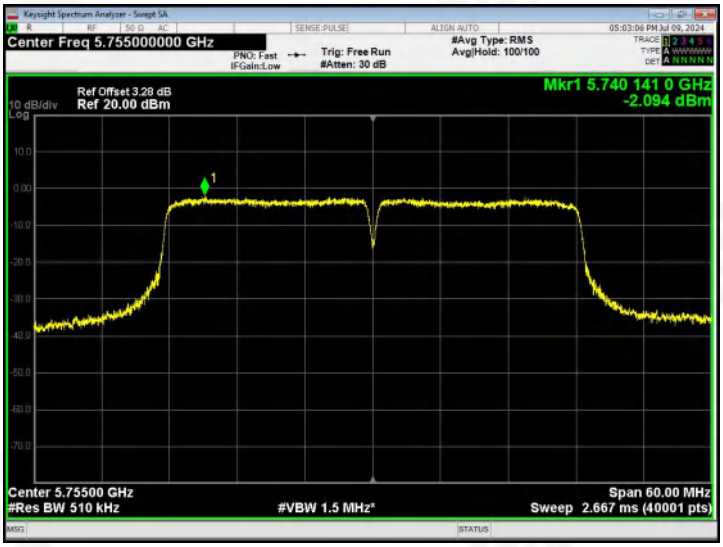
SISO ANT A - 802.11ac40

CH151

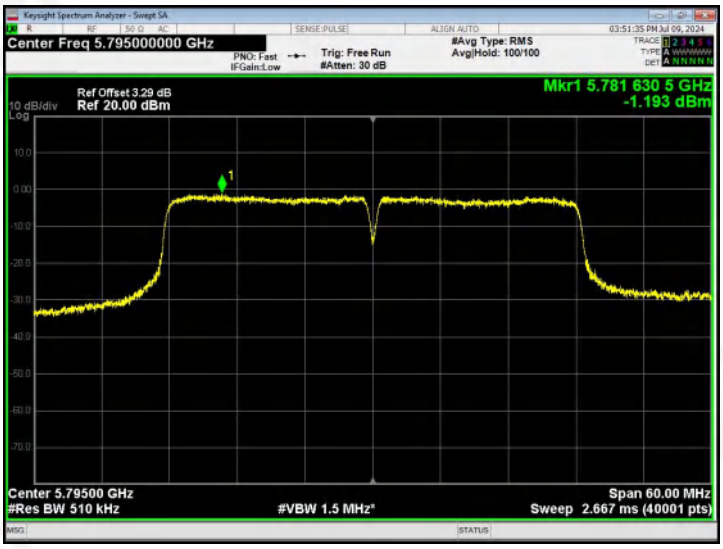


SISO ANT B - 802.11ac40

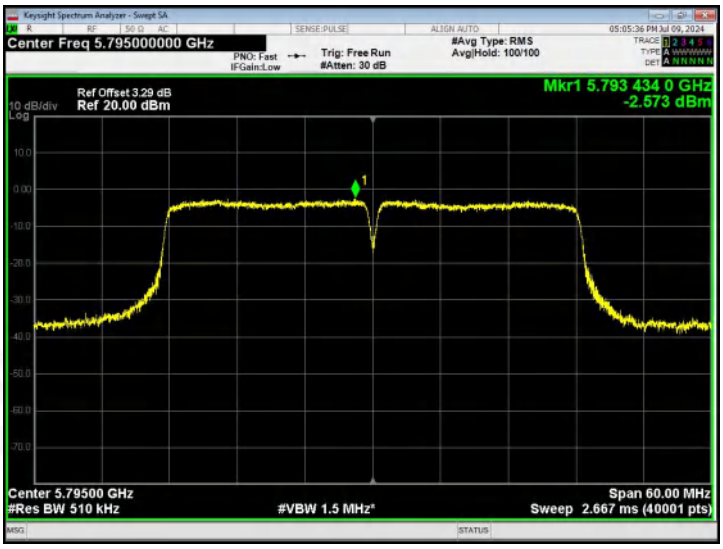
CH151



CH159

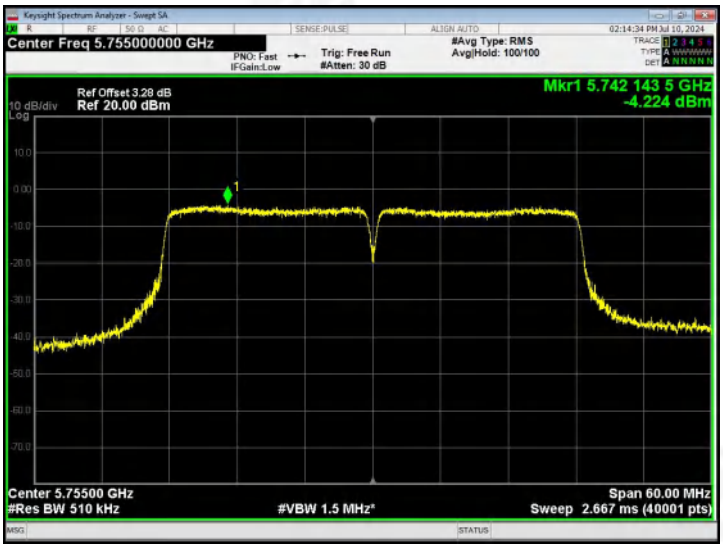


CH159



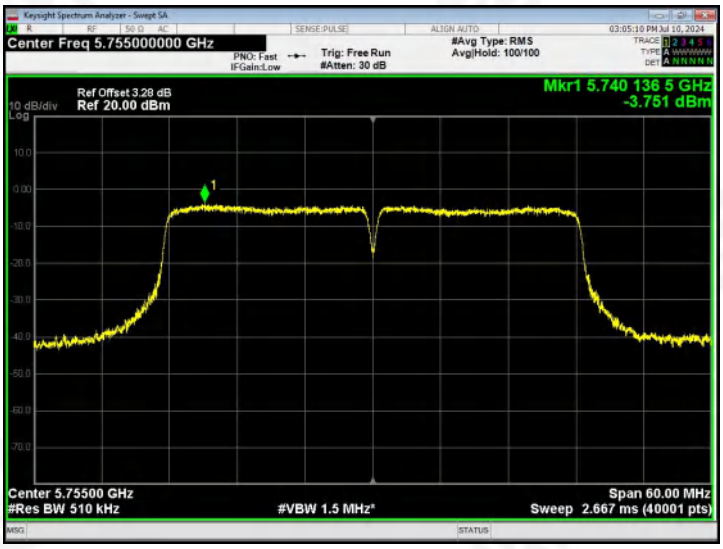
MIMO ANT A - 802.11ac40

CH151

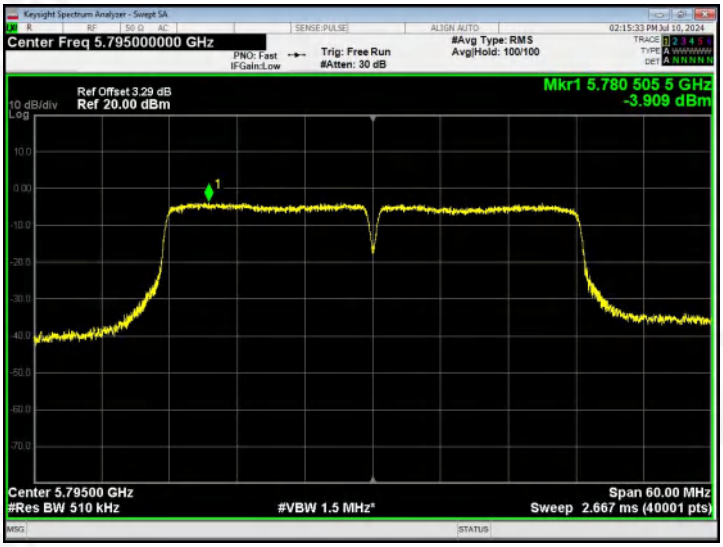


MIMO ANT B - 802.11ac40

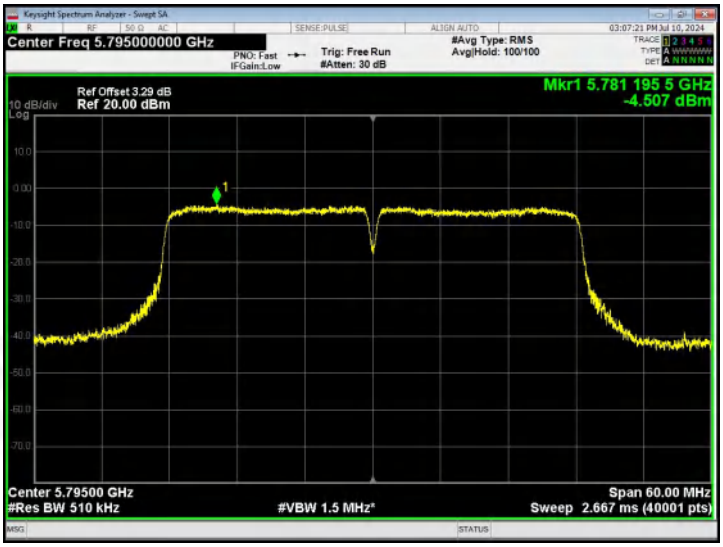
CH151



CH159



CH159



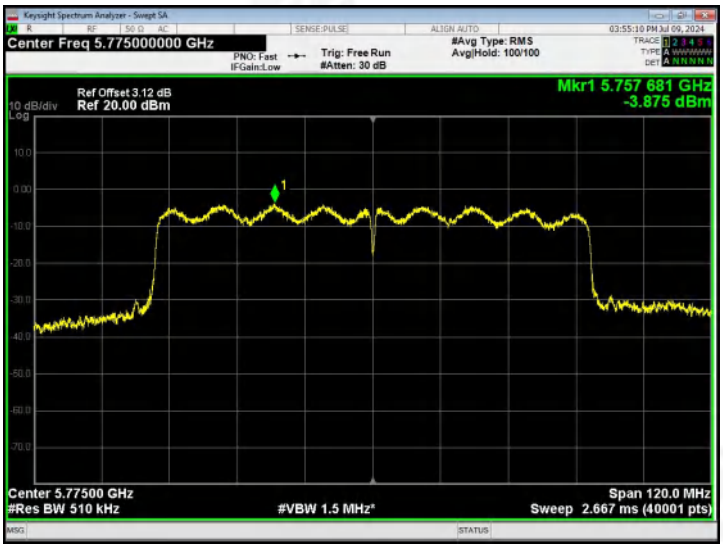
Temperature :	26 ℃	Relative Humidity :	54%
Pressure :	1015 hPa	Test Voltage :	AC 120V/60Hz

Mode	Antenna	Frequency (MHz)	PSD (dBm/500kHz)	Duty Cycle Factor (dB)	Total PSD (dBm/500kHz)	Ant Gain (dBi)	Limit (dBm)	Result
802.11ac80	SISO ANT A	5775	-3.875	0.66	-3.215	8.40	27.60	Pass
	SISO ANT B	5775	-4.977	0.65	-4.327	6.82	29.18	Pass
	MIMO ANT A	5775	-5.947	0.66	-5.287	8.40	27.60	Pass
	MIMO ANT B	5775	-7.164	0.66	-6.504	6.82	29.18	Pass
	MIMO ANT A+B	5775	-3.503	/	-3.503	10.65	25.35	Pass

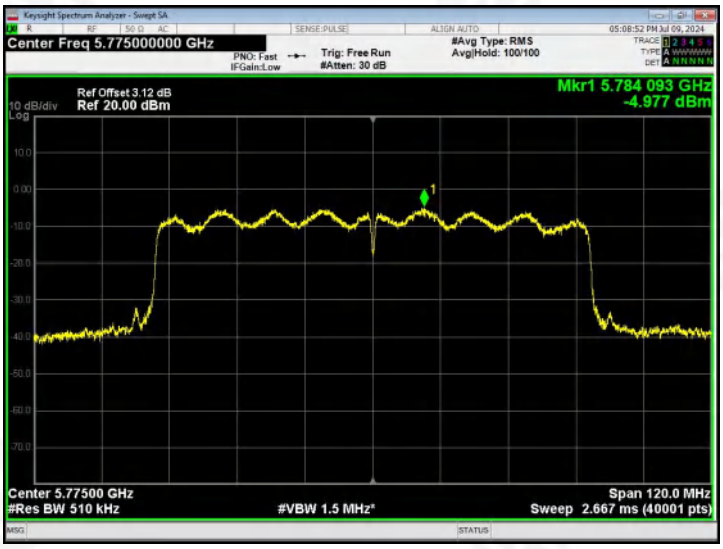
Note: Total PSD = PSD + Duty Cycle Factor(See page 101 for more details).

If the antenna gain exceeds 6 dBi, the limit must be reduced by the excess value. For example, Antenna A has a gain of 8.40 dBi (exceeding by 2.40 dBi), and Antenna B has a gain of 6.82 dBi (exceeding by 0.82 dBi). Additionally, the combined gain of Antennas A + B is 10.65 dBi(exceeding by 4.65 dBi).

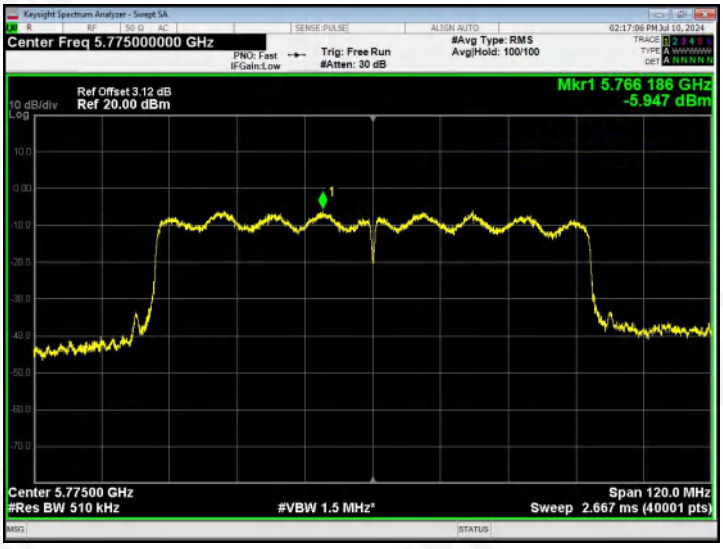
SISO ANT A - 802.11ac80
CH155



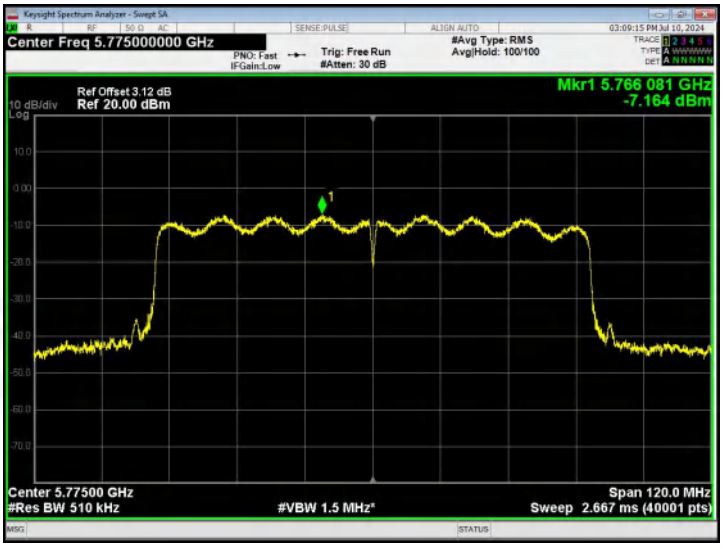
SISO ANT B - 802.11ac80
CH155



MIMO ANT A - 802.11ac80
CH155



MIMO ANT B - 802.11ac80
CH155



6. 26DB EMISSION BANDWIDTH & 6DB OCCUPIED BANDWIDTH

6.1 APPLIED PROCEDURES / LIMIT

The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band, the minimum bandwidth 6 dB bandwidth of U-NII devices shall be at least 500KHz. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

6.2 TEST PROCEDURE

The following procedure shall be used for measuring 6dB Occupied Bandwidth:

The procedure for this method is as follows:

a) Set RBW = 100KHz.

b) Set the VBW > RBW.

c) Detector = Peak.

d) Trace mode = max hold.

e) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

The following procedure shall be used for measuring 26dB Emission bandwidth:

The procedure for this method is as follows:

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 peak of the emission. Compare this with the RBW setting of the instrument. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

6.3 EUT OPERATION CONDITIONS

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

6.4 TEST RESULTS

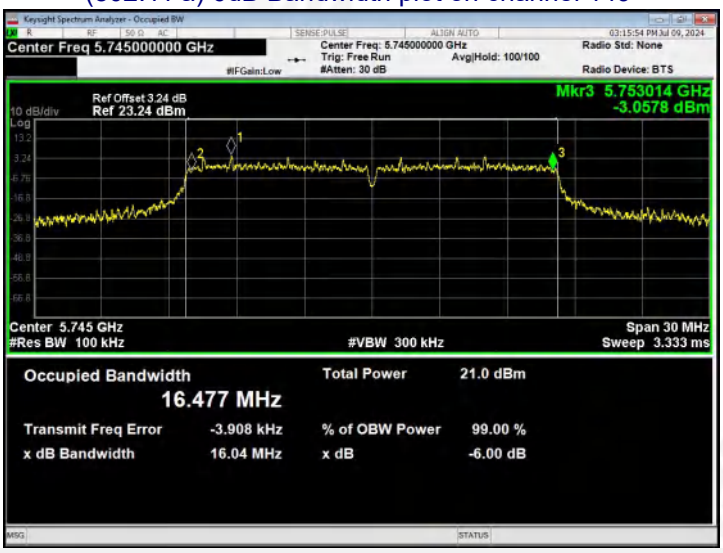
Temperature :	26 ℃	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	AC 120V/60Hz

Test Mode	Antenna	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
802.11a	SISO ANT A	5745	16.04	>500	Pass
		5785	16.06		
		5825	16.28		
	SISO ANT B	5745	15.92	>500	Pass
		5785	16.31		
		5825	16.01		

Test Mode	Antenna	Frequency (MHz)	26 Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit	Result
802.11a	SISO ANT A	5745	25.53	16.638	N/A	Pass
		5785	24.18	16.561		
		5825	27.30	16.768		
	SISO ANT B	5745	22.40	16.489	N/A	Pass
		5785	19.83	16.493		
		5825	20.18	16.470		

SISO ANT A - 802.11a

(802.11 a) 6dB Bandwidth plot on channel 149



(802.11 a) 26dB & 99% Bandwidth plot on channel 149

(802.11 a) 6dB Bandwidth plot on channel 157

(802.11 a) 26dB & 99% Bandwidth plot on channel 157

(802.11 a) 6dB Bandwidth plot on channel 165

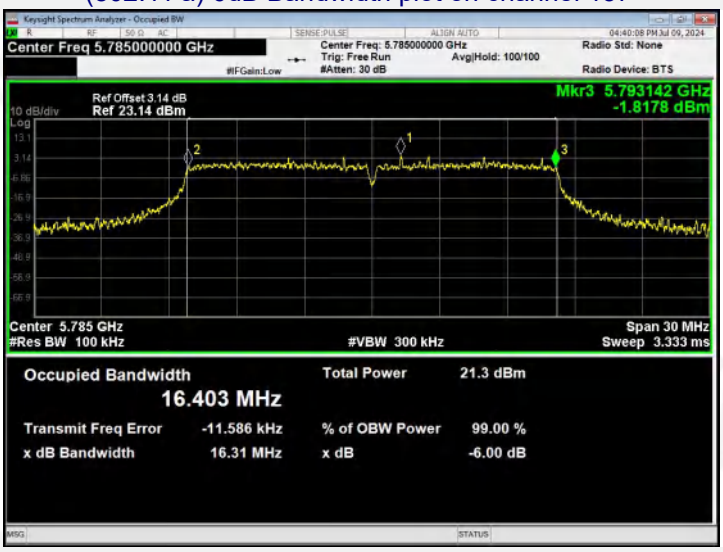
(802.11 a) 26dB & 99% Bandwidth plot on channel 165

SISO ANT B - 802.11a

(802.11 a) 6dB Bandwidth plot on channel 149

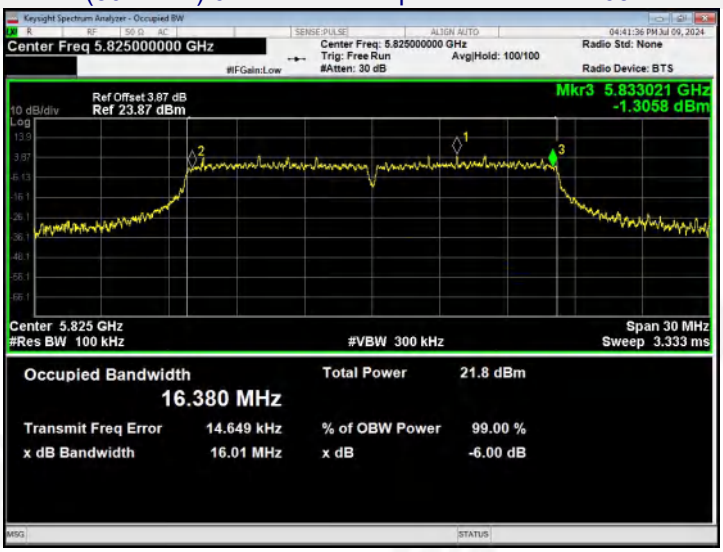
(802.11 a) 26dB & 99% Bandwidth plot on channel 149

(802.11 a) 6dB Bandwidth plot on channel 157

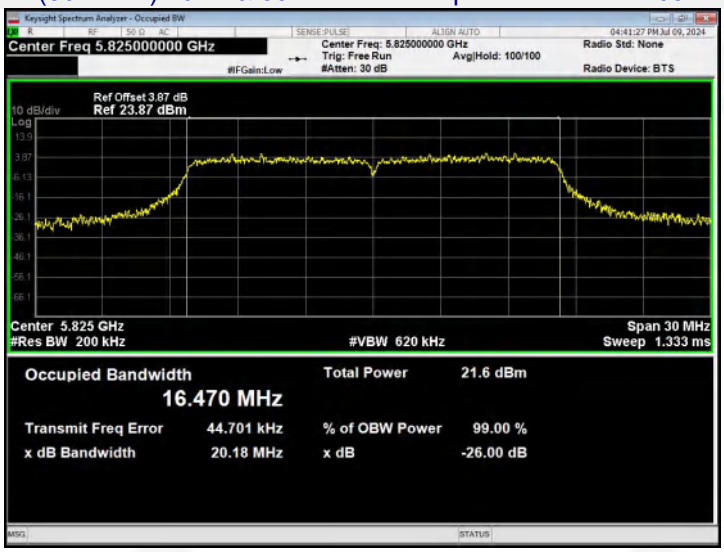


(802.11 a) 26dB & 99% Bandwidth plot on channel 157

(802.11 a) 6dB Bandwidth plot on channel 165



(802.11 a) 26dB & 99% Bandwidth plot on channel 165



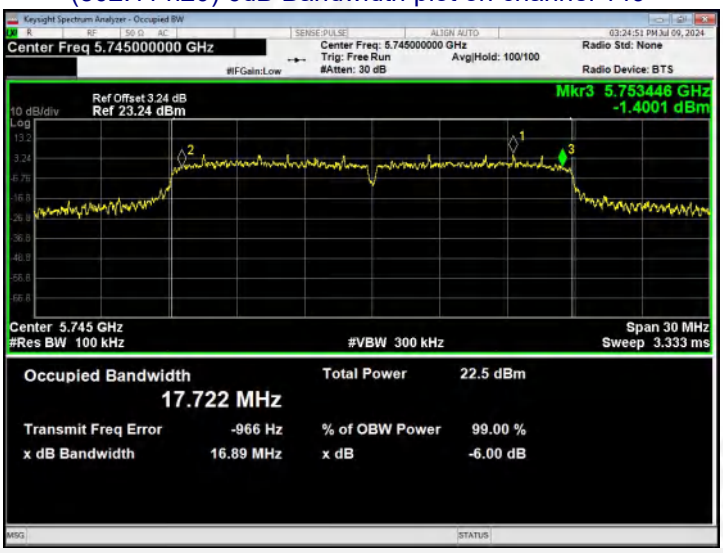
Temperature :	26 ℃	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	AC 120V/60Hz

Test Mode	Antenna	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
802.11n20	SISO ANT A	5745	16.89	>500	Pass
		5785	16.38		
		5825	16.05		
	SISO ANT B	5745	16.66	>500	Pass
		5785	16.51		
		5825	16.65		
	MIMO ANT A	5745	16.76	>500	Pass
		5785	16.71		
		5825	16.75		
	MIMO ANT B	5745	16.09	>500	Pass
		5785	16.29		
		5825	15.90		

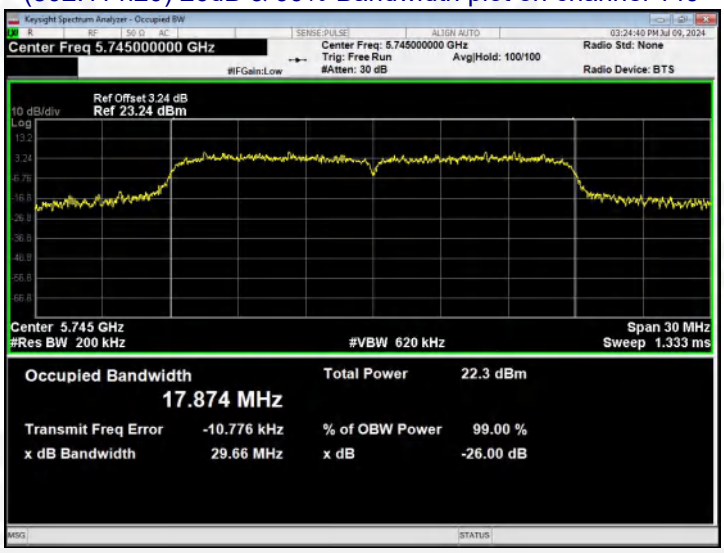
Test Mode	Antenna	Frequency (MHz)	26 Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit	Result
802.11n20	SISO ANT A	5745	29.66	17.874	N/A	Pass
		5785	28.31	17.738		
		5825	30.00	18.230		
	SISO ANT B	5745	21.51	17.564	N/A	Pass
		5785	20.65	17.533		
		5825	20.53	17.550		
	MIMO ANT A	5745	21.93	17.593	N/A	Pass
		5785	20.62	17.583		
		5825	26.27	17.732		
	MIMO ANT B	5745	20.40	17.538	N/A	Pass
		5785	20.27	17.543		
		5825	20.02	17.552		

SISO ANT A - 802.11n20

(802.11 n20) 6dB Bandwidth plot on channel 149

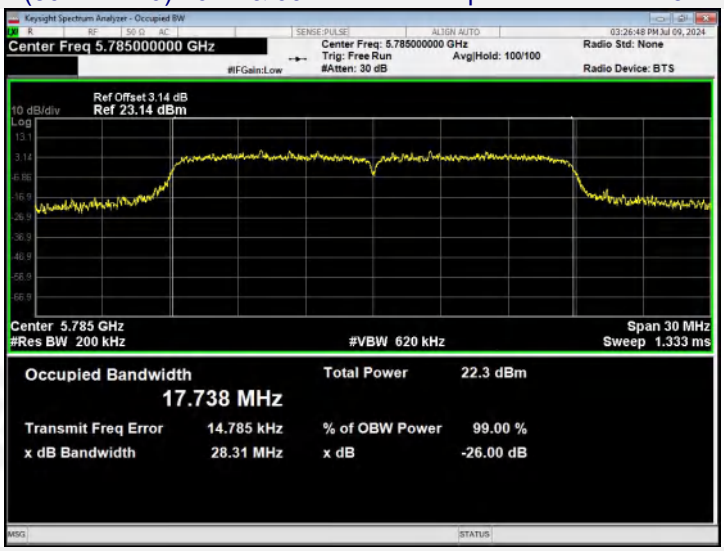


(802.11 n20) 26dB & 99% Bandwidth plot on channel 149



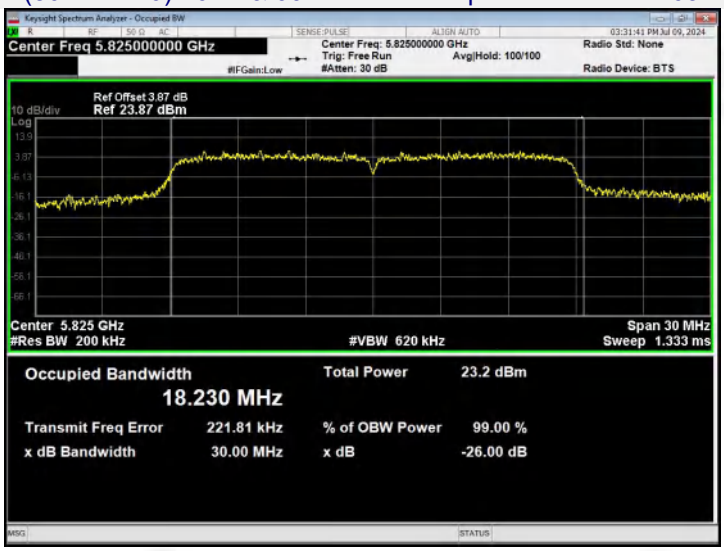
(802.11 n20) 6dB Bandwidth plot on channel 157

(802.11 n20) 26dB & 99% Bandwidth plot on channel 157



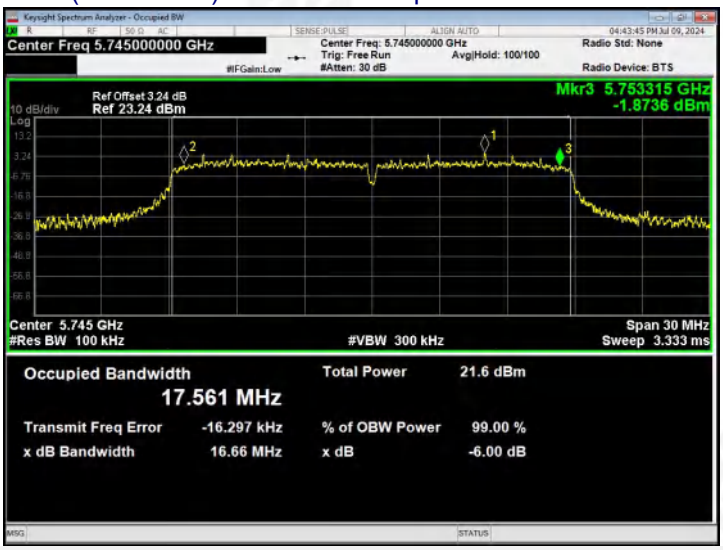
(802.11 n20) 6dB Bandwidth plot on channel 165

(802.11 n20) 26dB & 99% Bandwidth plot on channel 165

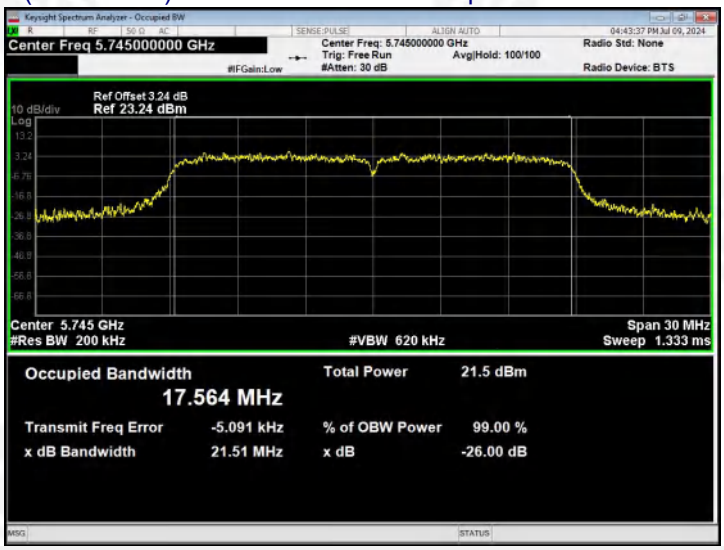


SISO ANT B - 802.11n20

(802.11 n20) 6dB Bandwidth plot on channel 149

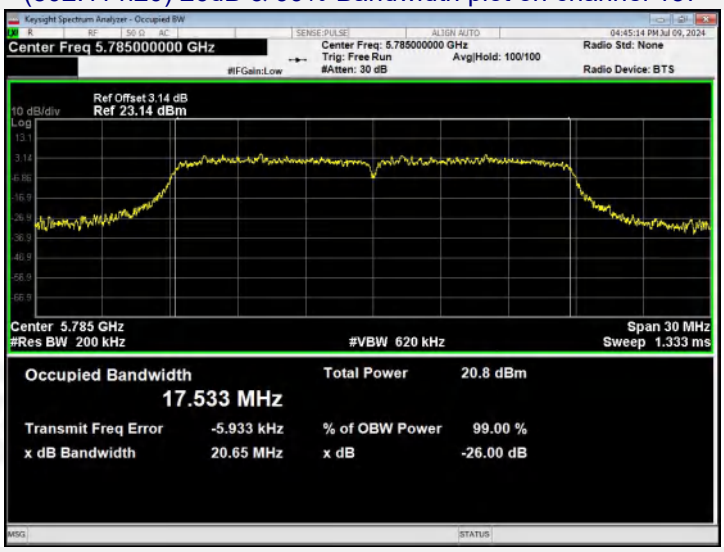


(802.11 n20) 26dB & 99% Bandwidth plot on channel 149



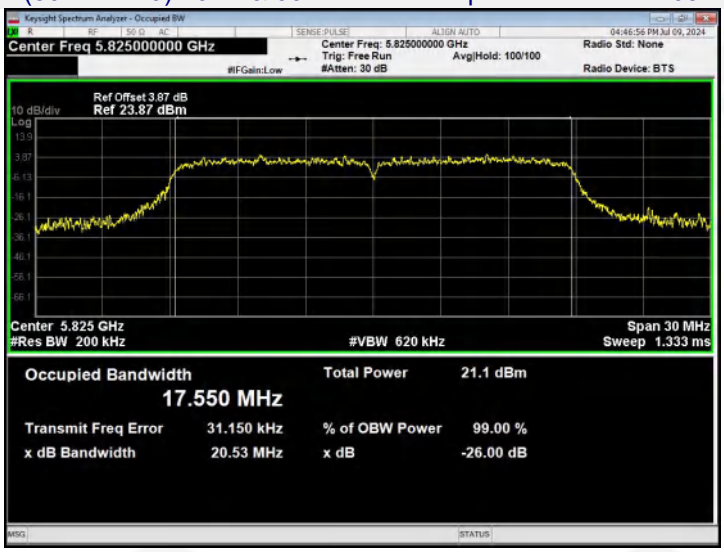
(802.11 n20) 6dB Bandwidth plot on channel 157

(802.11 n20) 26dB & 99% Bandwidth plot on channel 157



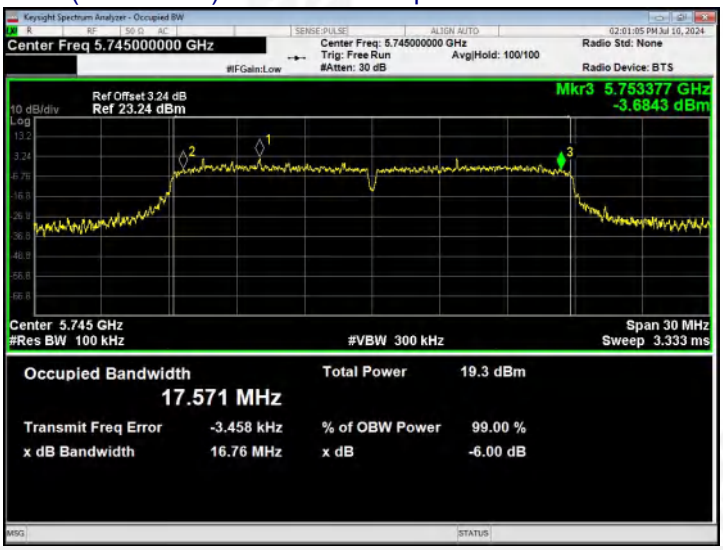
(802.11 n20) 6dB Bandwidth plot on channel 165

(802.11 n20) 26dB & 99% Bandwidth plot on channel 165

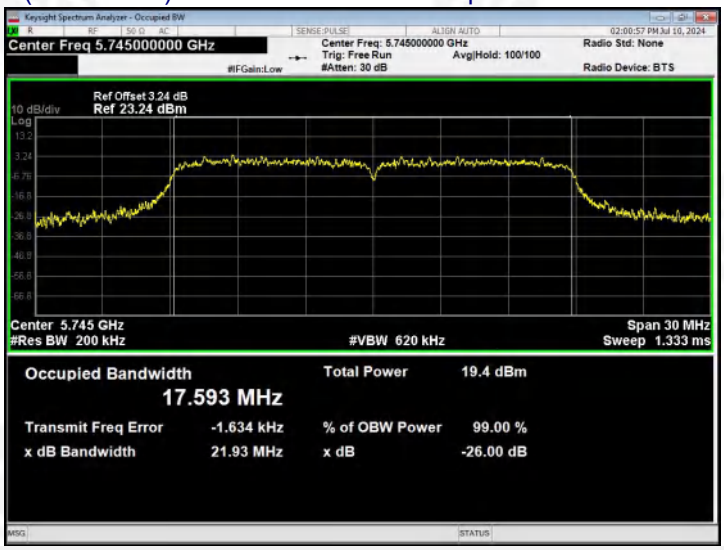


MIMO ANT A - 802.11n20

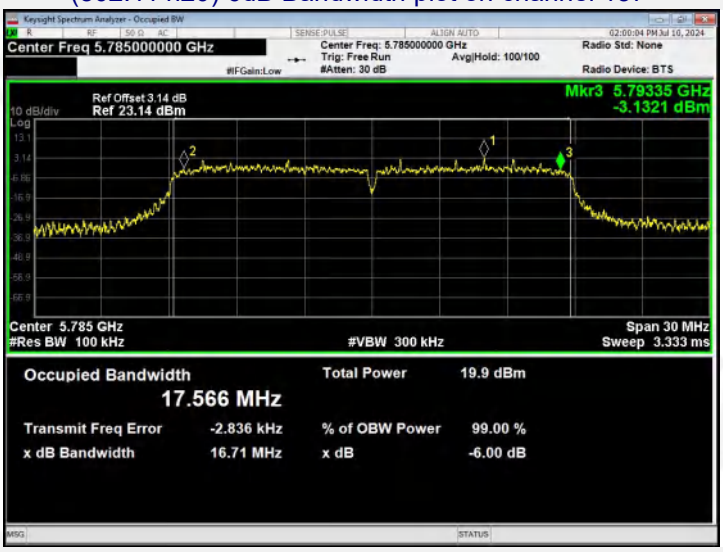
(802.11 n20) 6dB Bandwidth plot on channel 149



(802.11 n20) 26dB & 99% Bandwidth plot on channel 149



(802.11 n20) 6dB Bandwidth plot on channel 157



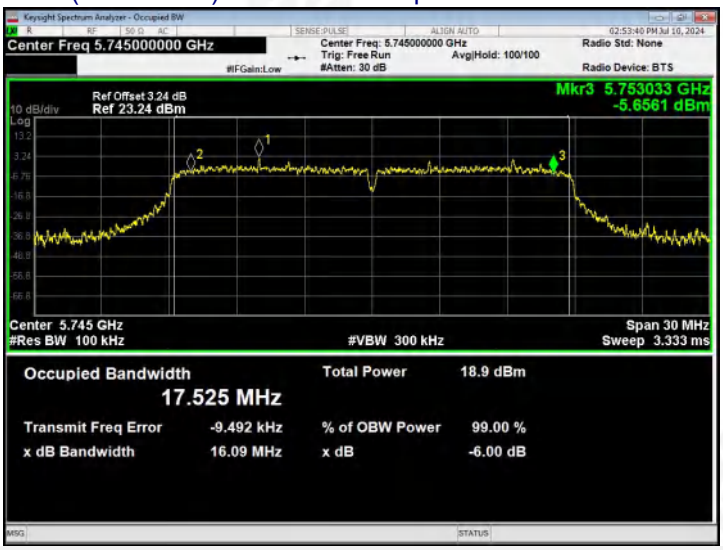
(802.11 n20) 26dB & 99% Bandwidth plot on channel 157

(802.11 n20) 6dB Bandwidth plot on channel 165

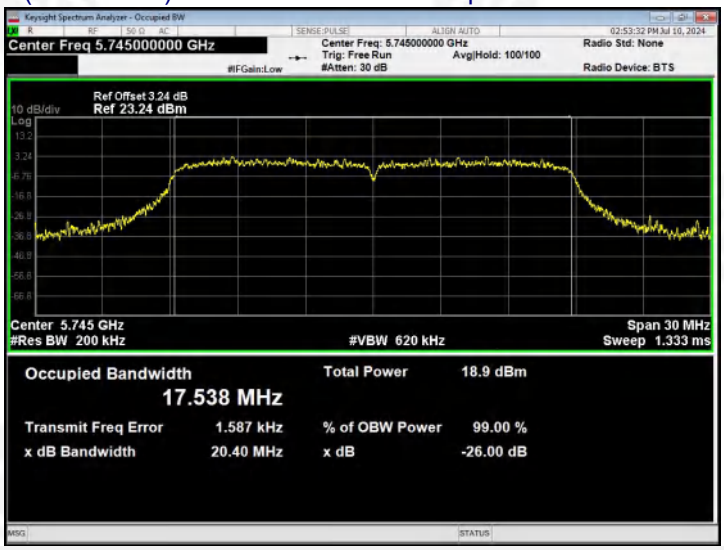
(802.11 n20) 26dB & 99% Bandwidth plot on channel 165

MIMO ANT B - 802.11n20

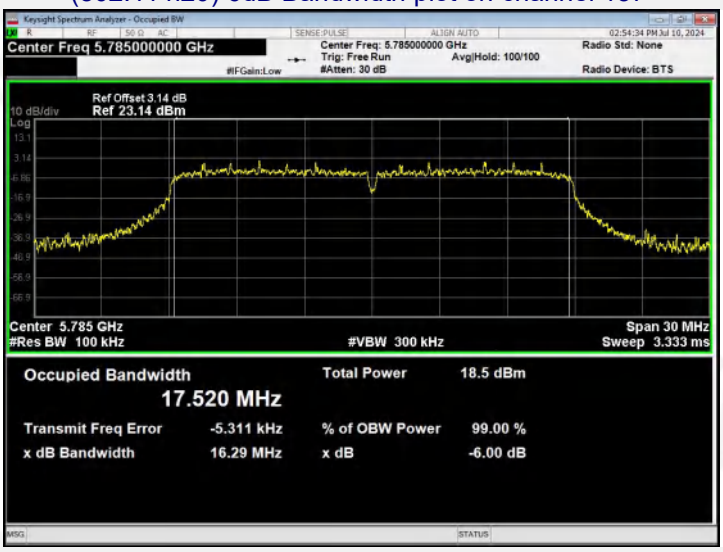
(802.11 n20) 6dB Bandwidth plot on channel 149



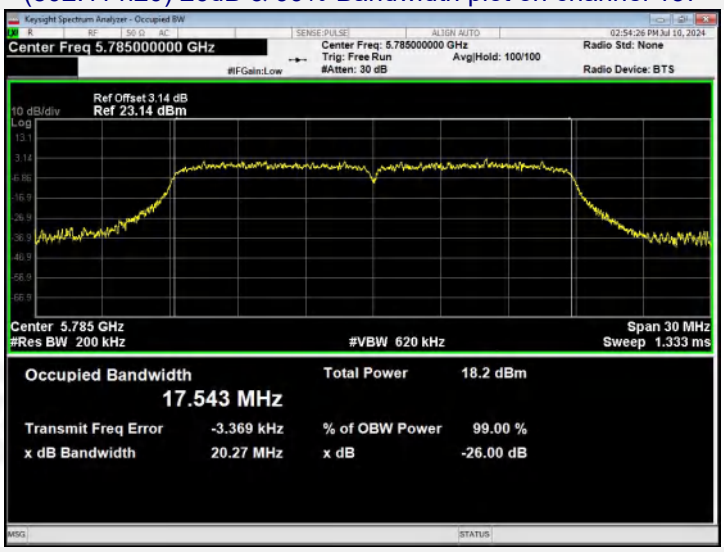
(802.11 n20) 26dB & 99% Bandwidth plot on channel 149



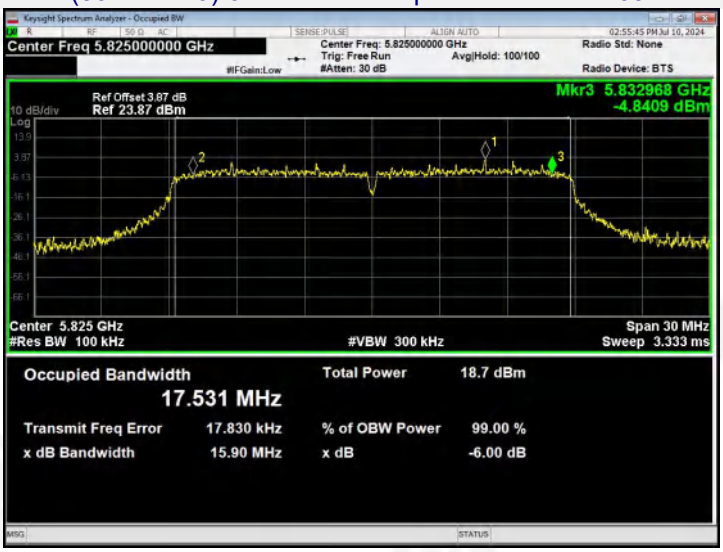
(802.11 n20) 6dB Bandwidth plot on channel 157



(802.11 n20) 26dB & 99% Bandwidth plot on channel 157



(802.11 n20) 6dB Bandwidth plot on channel 165



(802.11 n20) 26dB & 99% Bandwidth plot on channel 165

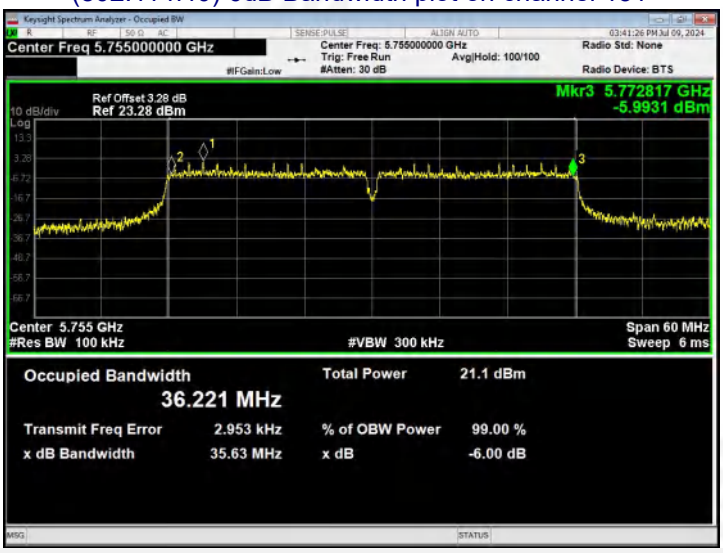
Temperature :	26 ℃	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	AC 120V/60Hz

Test Mode	Antenna	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
802.11n40	SISO ANT A	5755	35.63	>500	Pass
		5795	35.46		
	SISO ANT B	5755	35.58	>500	Pass
		5795	35.67		
	MIMO ANT A	5755	35.67	>500	Pass
		5795	35.83		
	MIMO ANT B	5755	35.69	>500	Pass
		5795	35.52		

Test Mode	Antenna	Frequency (MHz)	26 Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit	Result
802.11n40	SISO ANT A	5755	58.39	36.444	N/A	Pass
		5795	54.73	36.534		
	SISO ANT B	5755	42.36	36.324	N/A	Pass
		5795	43.02	36.279		
	MIMO ANT A	5755	42.54	36.388	N/A	Pass
		5795	48.82	36.442		
	MIMO ANT B	5755	43.17	36.305	N/A	Pass
		5795	42.99	36.307		

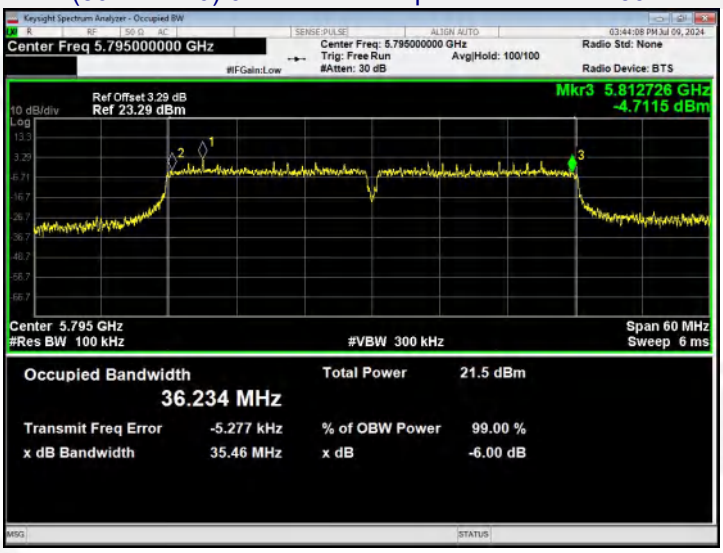
SISO ANT A - 802.11n40

(802.11 n40) 6dB Bandwidth plot on channel 151

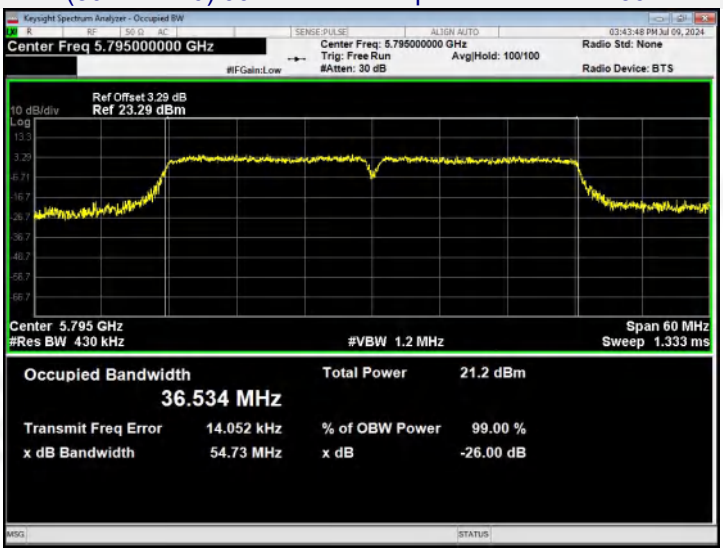


(802.11 n40) 26dB & 99% Bandwidth plot on channel 151

(802.11 n40) 6dB Bandwidth plot on channel 159

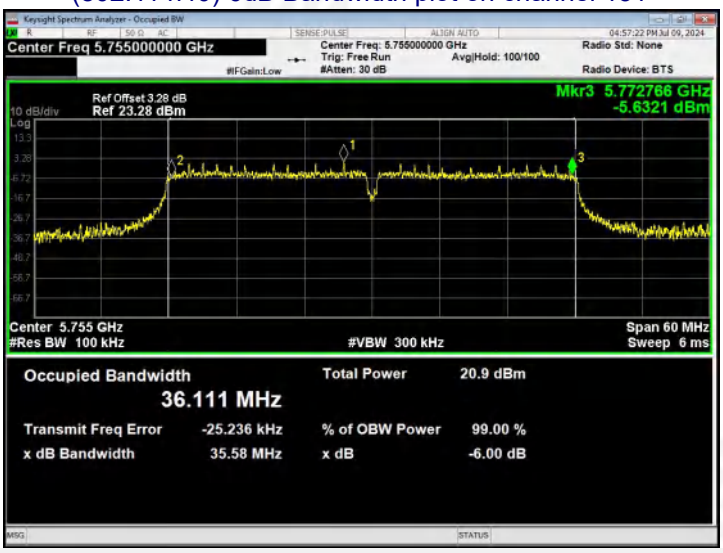


(802.11 n40) 99% Bandwidth plot on channel 159

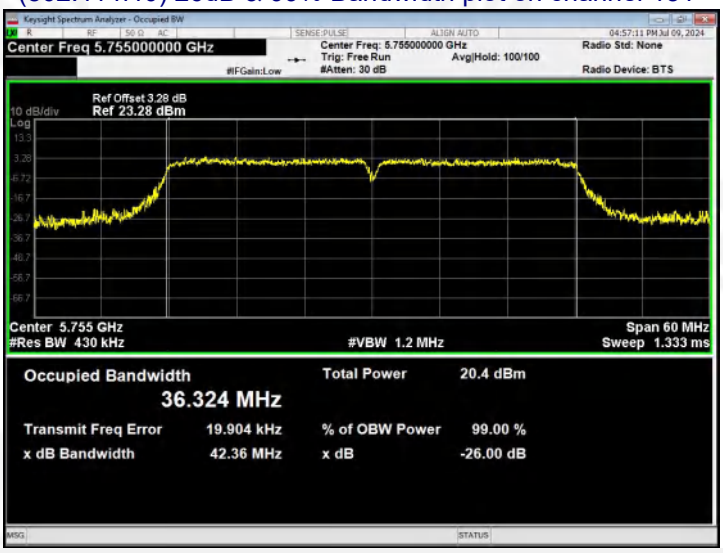


SISO ANT B - 802.11n40

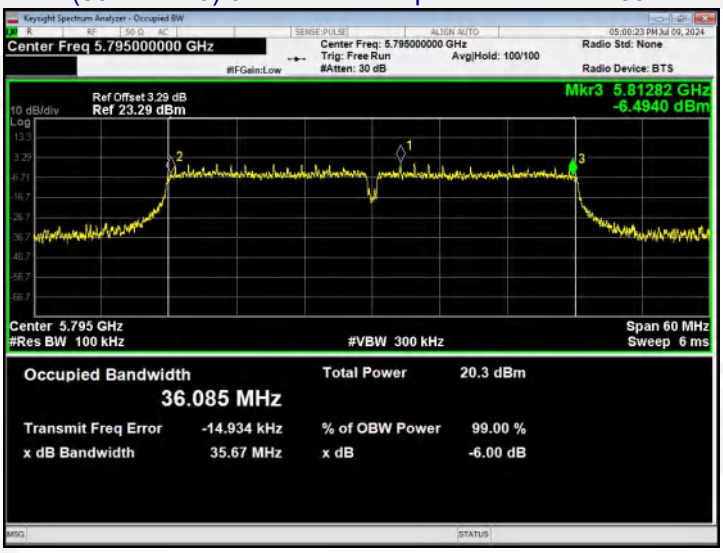
(802.11 n40) 6dB Bandwidth plot on channel 151



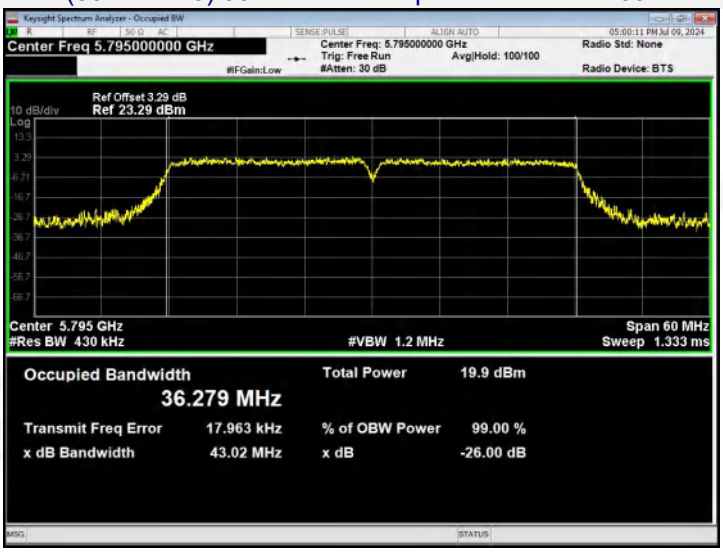
(802.11 n40) 26dB & 99% Bandwidth plot on channel 151



(802.11 n40) 6dB Bandwidth plot on channel 159

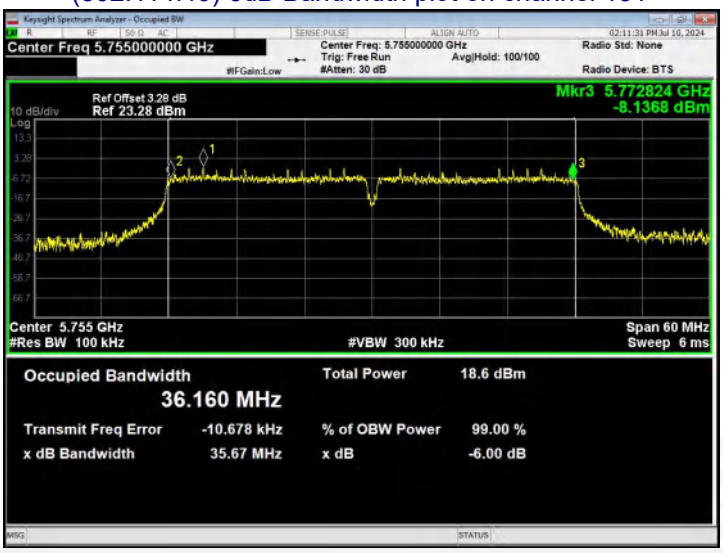


(802.11 n40) 99% Bandwidth plot on channel 159

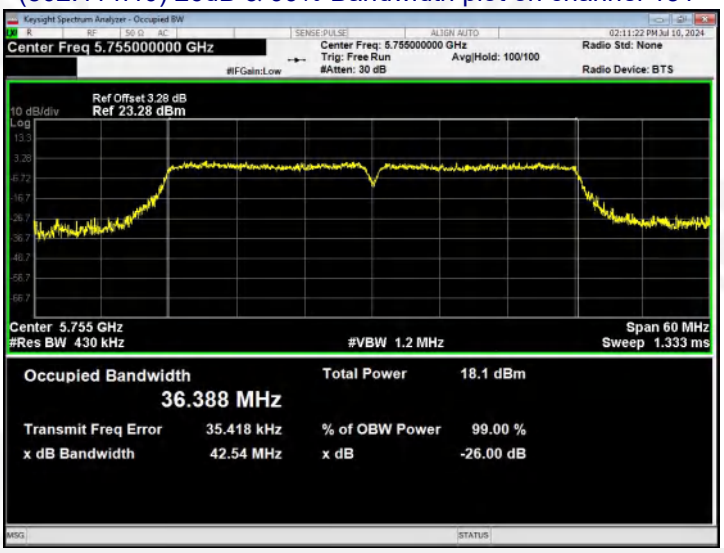


MIMO ANT A - 802.11n40

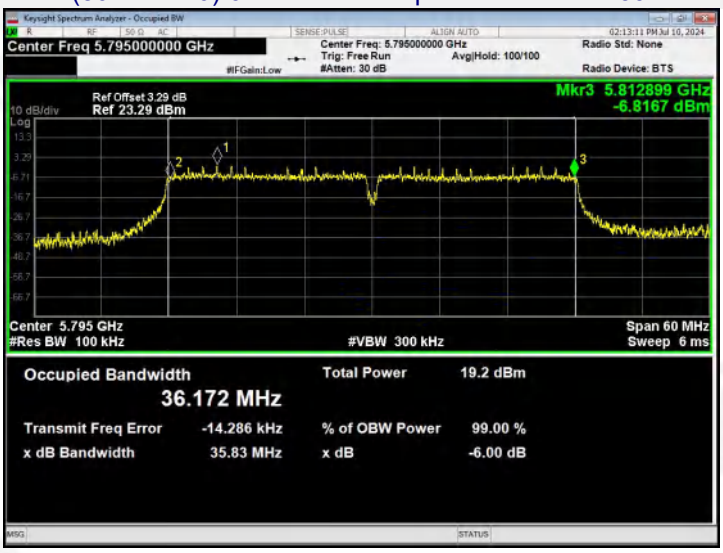
(802.11 n40) 6dB Bandwidth plot on channel 151



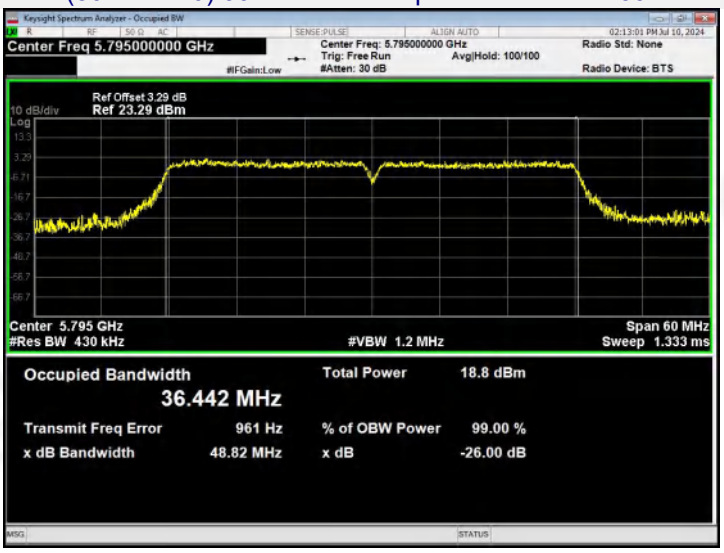
(802.11 n40) 26dB & 99% Bandwidth plot on channel 151



(802.11 n40) 6dB Bandwidth plot on channel 159

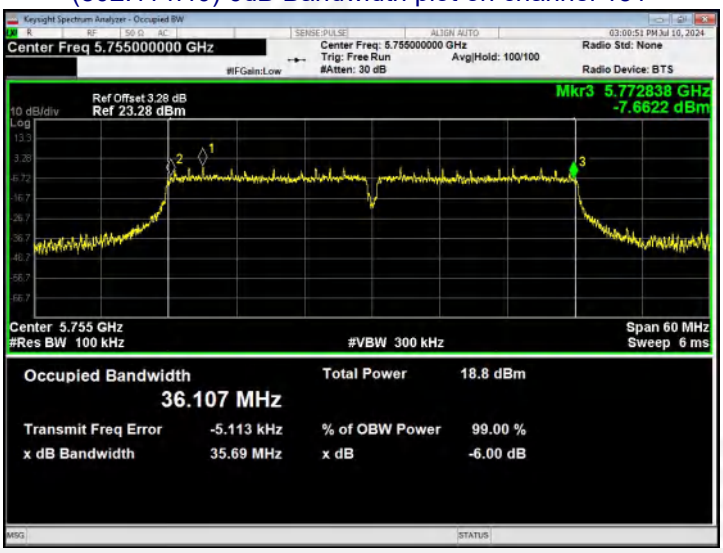


(802.11 n40) 99% Bandwidth plot on channel 159

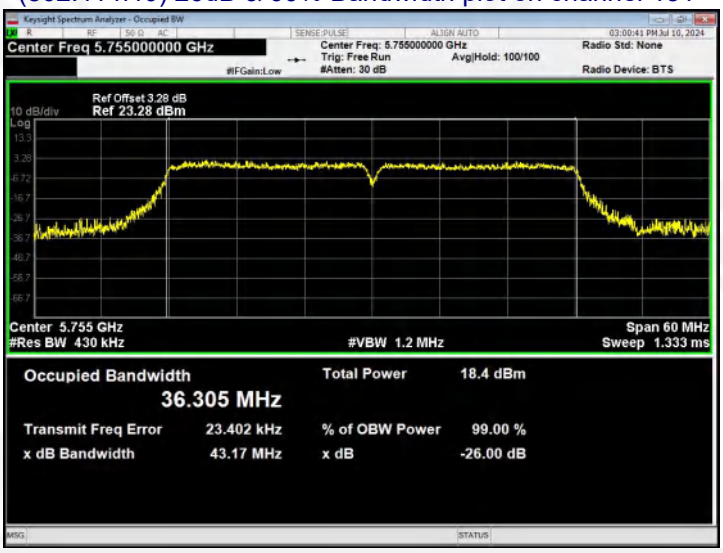


MIMO ANT B - 802.11n40

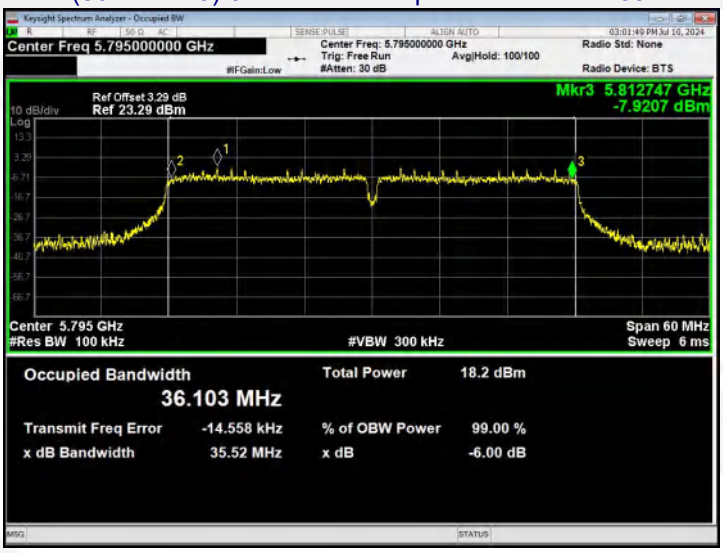
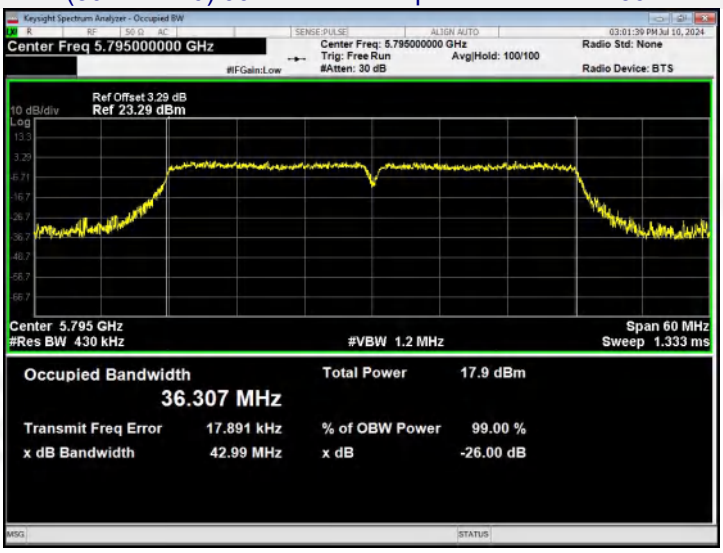
(802.11 n40) 6dB Bandwidth plot on channel 151



(802.11 n40) 26dB & 99% Bandwidth plot on channel 151



(802.11 n40) 6dB Bandwidth plot on channel 159



(802.11 n40) 99% Bandwidth plot on channel 159