FCC RADIO TEST REPORT

FCC ID: 2BBNO-CA701

Sample : CARPLAY

Trade Name : N/A

Main Model : CA701

Additional Model : Additional model please refer to the page 8

Report No. : 23060629ER-64

Prepared for

Shenzhen jinnaibo Electronic Co., Ltd.

Floor 3, building L, Shasi hi tech park, Shasi Community, Shajing street, Baoan, Shenzhen, China

Prepared by

Global United Technology Services Co. Ltd.

No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

TEST RESULT CERTIFICATION

Applicant	:	Shenzhen jinnaibo Electronic Co., Ltd.
Address	:	Floor 3, building L, Shasi hi tech park, Shasi Community, Shajing street, Baoan, Shenzhen, China
Manufacturer	:	Shenzhen jinnaibo Electronic Co., Ltd.
Address	:	Floor 3, building L, Shasi hi tech park, Shasi Community, Shajing street, Baoan, Shenzhen, China
Product description		
Product	:	CARPLAY
Trade Name	:	N/A
Model Name	:	CA701, Additional model please refer to the page 8
Test Methods	:	FCC Rules and Regulations Part 15 Subpart C Section 15.407 ANSI C63.10: 2013

This device described above has been tested by Global United Technology Services Co. Ltd., 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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Date of Test	:	
Date (s) of performance of tests	:	Jun. 06, 2023 ~ Jun. 29, 2023
Date of Issue	:	Jul. 13, 2023
Test Result	:	Pass

Prepared By:		***Date:***	*2023-7-13*
	Project Engineer		
Check By:		***Date:***	*2023-7-13*
	Reviewer		

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1 TEST SUMMARY

1.1 TEST PROCEDURES AND RESULTS

Item	FCC Rules	Description Of Test	Result
1	FCC Part 15.407	6dB Bandwidth	Pass
2	FCC Part 15.407	Emission Bandwidth	Pass
3	FCC Part 15.407	Maximum conducted output power	Pass
4	FCC Part 15.407	Conducted Spurious Emission	Pass
5	FCC Part 15.407	Maximum Conducted Output Power Density	Pass
6	FCC Part 15.209	Radiated Emission	Pass
7	FCC Part 15.407	Band Edges	Pass
8	FCC Part 15.207	Line Conduction Emission	N/A
9	FCC Part 15.203	Antenna Requirement	Pass

Note:

“N/A” denotes test is not applicable in this Test Report.

1.2 TEST FACILITY

Test Firm	:	Global United Technology Services Co. Ltd.
Address	:	No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

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

● **FCC—Registration No.: 381383**

Designation Number: CN5029

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files.

● **IC —Registration No.: 9079A**

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

● **NVLAP (LAB CODE: 600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

1.3 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 %.

A. Conducted Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)
UNI	ANSI	9kHz ~ 150kHz	2.96
		150kHz ~ 30MHz	2.44

B. Radiated Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)
UNI	ANSI	9kHz ~ 30MHz	2.50
		30MHz ~ 1000MHz	4.80
		1000MHz ~ 18000MHz	4.13

C. RF Conducted Method:

Item	Measurement Uncertainty
Uncertainty of total RF power, conducted	U_c = ±0.8 dB
Uncertainty of RF power density, conducted	U_c = ±2.6 dB
Uncertainty of spurious emissions, conducted	U_c = ±2 %
Uncertainty of Occupied Channel Bandwidth	U_c = ±2 %

1.4 ENVIRONMENTAL CONDITIONS

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35 °C
Relative Humidity:	30~60 %
Air Pressure:	950~1050 hPa

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product:	CARPLAY
Trade Name:	N/A
Main Model:	CA701
Additional Model:	CA702, CA703, CA704, CA705, CA706, CA707, CA708, CA709, CA710, CA711, CA712, CA713, CA714, CA715, CA716, CA717, CA718, CA719, CA720, CA721, CA722, CA723, CA724, CA725, CA726, CA727, CA728, CA729, CA730, CA901, CA902, CA903, CA904, CA905, CA906, CA907, CA908, CA909, CA910, CA911, CA912, CA913, CA914, CA915, CA916, CA917, CA918, CA919, CA920, CA921, CA922, CA923, CA924, CA925, CA926, CA927, CA928, CA929, CA930, CA101, CA102, CA103, CA104, CA105, CA106, CA107, CA108, CA109, CLP1, CLP2, CLP3, CLP4, CLP5, CLP6, CLP7, CLP8, CLP9, CLP10, CLP11, CLP12, CLP13, CLP15, LY7C-B, QZ7C-S, LY9C-S, LY9C-B, CL2, AA2, LY7C-ZYZ, QZ7C-01, QZ7C-02, QZ7C-03, QZ7C-05, QZ7C-06, QZ7C-07, QZ7C-08, QZ7C-09, T76, T96, A7, A9, S7, S9, J704, J706, J708, J710, J901, J904, D100, D200, D300, D400, D500, D600, D700, D800, D900
Model Difference:	All model's the function, software and electric circuit are the same, only with a product color and model named different. Test sample model: CA701.
Operation Frequency:	Band 1: 5150 MHz～5250MHz; Band 4: 5725 MHz～5850MHz
Modulation Type:	BPSK, QPSK, 16QAM, 64QAM, 128QAM, 256QAM, OFDM
Maximum Peak Conducted Output Power:	Band 1: 7.55dBm; Band 4: 7.53dBm
Antenna Type:	PCB Antenna
Antenna Gain:	Band 1: 0.51dBi; Band 4: 1.76dBi
Battery:	N/A
Adapter:	N/A
Power Source:	DC 9-26V from car charger

2.2 CARRIER FREQUENCY OF CHANNELS

Frequency Band	Channel Number	Frequency	Frequency Band	Channel Number	Frequency
5150 MHz ~ 5250MHz	36	5180 MHz	5725 MHz ~ 5850MHz	149	5745 MHz
	38	5190 MHz		151	5755 MHz
	40	5200 MHz		153	5765 MHz
	42	5210 MHz		155	5775 MHz
	44	5220 MHz		157	5785 MHz
	46	5230 MHz		159	5795 MHz
	48	5240 MHz		165	5825MHz

Note: For 20MHz bandwidth system use Channel 36, 40, 48, 149, 157, 165; For 40MHz bandwidth system use Channel 38, 46, 151, 159.

2.3 TEST MODE

Mode	Available channel	Tested channel	Modulation	Date rate(Mbps)
802.11a/n20/ac20	36, 40, 44, 48, 149, 153, 157, 165	36, 40, 48, 149, 157, 165	OFDM	6Mbps/MCS0
802.11n40/ac40	38, 46, 151, 159;	38, 46, 151, 159	OFDM	MCS0
802.11ac80	42, 155	42, 155	OFDM	MCS0

Note:

1. The EUT has been set to operate continuously on tested channel individually, and the EUT is operating at its maximum duty cycle>or equal 98%.
2. All modes under which configure applicable have been tested and the worst mode test data recording in the test report, if no other mode data.

2.4 DESCRIPTION OF THE TEST MODES

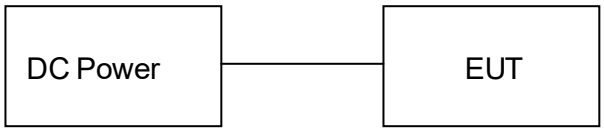
During the measurement the environmental conditions were within the listed ranges:

Voltage	Normal Voltage	DC 24V
	High Voltage	DC 26.4V
	Low Voltage	DC 21.6V
Other	Normal Temperature	24°C
	Relative Humidity	55 %
	Air Pressure	989 hPa

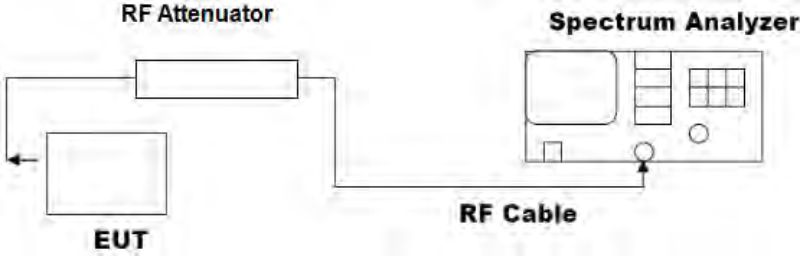
Note: All modes were test at Normal Voltage, High Voltage, and Low Voltage, only the worst results of Normal Voltage was reported in the test report.

2.5 TEST SETUP

Operation of EUT during Radiation testing:



Operation of EUT during RF Conducted testing:



2.6 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

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	Model No.	Cable Length(cm)	Remark
1	CARPLAY	CA701	--	EUT
2	Battery	--	--	AE

Note:

1. The support equipment was authorized by Declaration of Confirmation.
2. All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.

2.7 MEASUREMENT INSTRUMENTS LIST

Conducted Emission						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	July 12, 2022	July 11, 2027
2	EMI Test Receiver	R&S	ESCI 7	GTS552	April 14, 2023	April 13, 2024
3	LISN	ROHDE & SCHWARZ	ENV216	GTS226	April 14, 2023	April 13, 2024
4	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
5	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
6	Thermo meter	JINCHUANG	GSP-8A	GTS642	April 19, 2023	April 18, 2024
7	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	April 14, 2023	April 13, 2024
8	ISN	SCHWARZBECK	NTFM 8158	GTS565	April 14, 2023	April 13, 2024

9	High voltage probe	SCHWARZBECK	TK9420	GTS537	April 14, 2023	April 13, 2024
10	Antenna end assembly	Weinschel	1870A	GTS560	April 14, 2023	April 13, 2024

Radiated Emission:

Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi-Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	June 23, 2021	June 22, 2024
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	April 14, 2023	April 13, 2024
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	GTS640	March 19, 2023	March 18, 2025
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	April 17, 2023	April 16, 2025
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Coaxial Cable	GTS	N/A	GTS213	April 21, 2023	April 20, 2024
8	Coaxial Cable	GTS	N/A	GTS211	April 21, 2023	April 20, 2024
9	Coaxial cable	GTS	N/A	GTS210	April 21, 2023	April 20, 2024
10	Coaxial Cable	GTS	N/A	GTS212	April 21, 2023	April 20, 2024
11	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	April 14, 2023	April 13, 2024
12	Loop Antenna	ZHINAN	ZN30900A	GTS534	Nov. 29, 2022	Nov. 28, 2023
13	Broadband Preamplifier	SCHWARZBECK	BBV9718	GTS535	April 14, 2023	April 13, 2024
14	Amplifier(1GHz-26.5GHz)	HP	8449B	GTS601	April 14, 2023	April 13, 2024
15	Horn Antenna (18-26.5GHz)	/	UG-598A/U	GTS664	Oct. 30, 2022	Oct. 29, 2023
16	Horn Antenna (26.5-40GHz)	A.H Systems	SAS-573	GTS665	Oct. 30, 2022	Oct. 29, 2023
17	FSV·Signal Analyzer (10Hz-40GHz)	Keysight	FSV-40-N	GTS666	March 13, 2023	March 12, 2024
18	Amplifier	/	LNA-1000-30S	GTS650	April 14, 2023	April 13, 2024
19	CDNE M2+M3-16A	HCT	30MHz-300MHz	GTS668	Dec. 20, 2022	Dec.19, 2023
20	Thermo meter	JINCHUANG	GSP-8A	GTS643	April 19, 2023	April 18, 2024

RF Conducted Test:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	April 14, 2023	April 13, 2024
2	EMI Test Receiver	R&S	ESCI 7	GTS552	April 14, 2023	April 13, 2024
3	PSA Series Spectrum Analyzer	Agilent	E4440A	GTS536	April 14, 2023	April 13, 2024
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	April 14, 2023	April 13, 2024
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	April 14, 2023	April 13, 2024
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	April 14, 2023	April 13, 2024
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	April 14, 2023	April 13, 2024
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	April 14, 2023	April 13, 2024
9	Thermo meter	JINCHUANG	GSP-8A	GTS641	April 19, 2023	April 18, 2024

3 CONDUCTED EMISSION

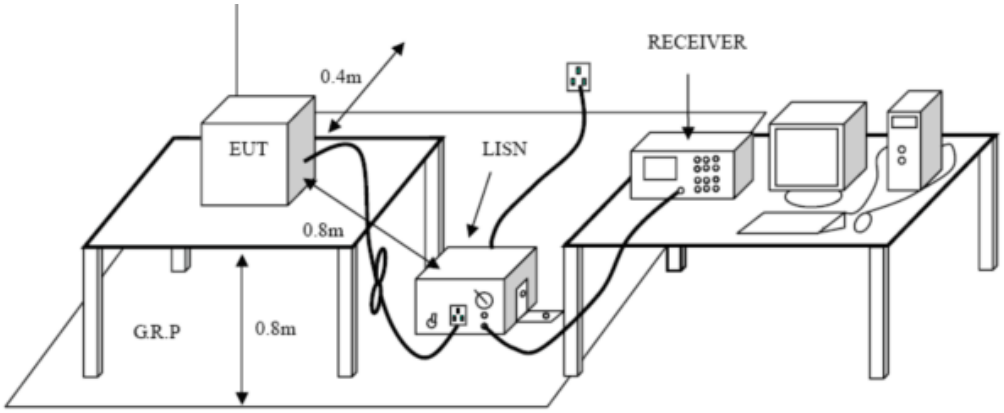
3.1 TEST LIMIT

For unintentional device, according to § 15.207(a) Line Conducted Emission Limits is as following

Frequency (MHz)	Maximum RF Line Voltage (dB V)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15~0.50	79	66	66~56*	56~46*
0.50~5.00	73	60	56	46
5.00~30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency.
For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

3.2 TEST SETUP



3.3 TEST PROCEDURE

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is placed on a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.

3.4 TEST RESULT

N/A

Remark:
The EUT is powered by DC power.

4 RADIATED EMISSION

4.1 TEST LIMIT

For unintentional device, according to §15.209(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values：

Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
0.009MHz-0.490MHz	2400/F (kHz)	-	Quasi-peak	300
0.490MHz-1.705MHz	24000/F (kHz)	-	Quasi-peak	30
1.705MHz-30MHz	30	-	Quasi-peak	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1GHz	500	54.0	Average	3
		74.0	Peak	3

Limit calculation and transfer to 3m distance as showed in the following table:

Frequency (MHz)	**Limit (dBuV/m)**	**Distance (m)**
0.009-0.490	20log(2400/F(KHz))+40log(300/3)	3
0.490-1.705	20log(24000/F(KHz))+40log(30/3)	3
1.705-30.0	69.5	3
30-88	40.0	3
88-216	43.5	3
216-960	46.0	3
Above 960	54.0	3

For intentional device, according to §15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

Limits of unwanted emission out of the restricted bands

Frequency (MHz)	EIRP Limits (dBm)	Equivalent Field Strength at 3m (dBuV/m)
5150~5250	-27	68.2
5250~5350	-27	68.2
5470~5725	-27	68.2
5725~5850	-27(Note 2)	68.2
	10(Note 2)	105.2
	15.6(Note 2)	110.8
	27(Note 2)	122.2

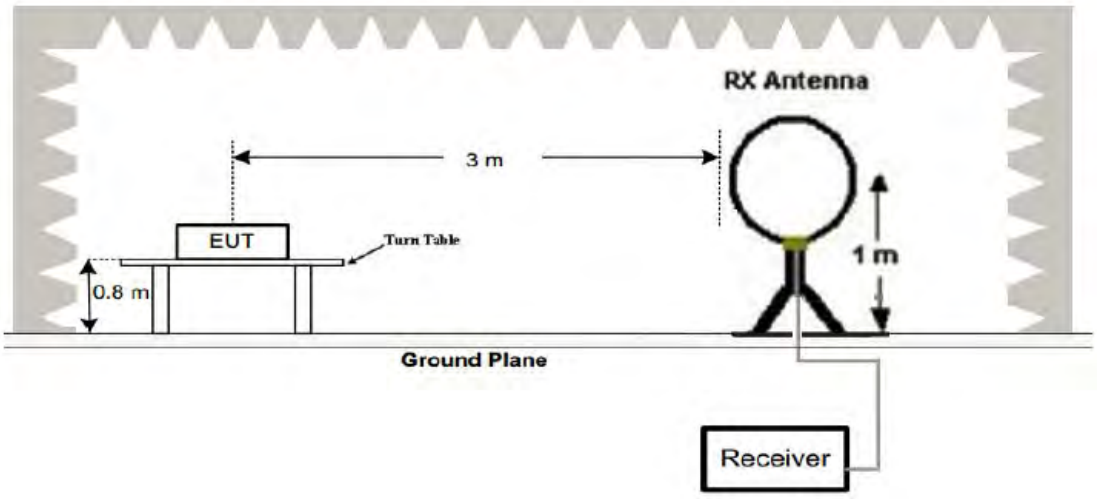
NOTE:
1, The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E=\frac{1000000\sqrt{30P}}{3}$$ uV/m, where P is the eirp (Watts)

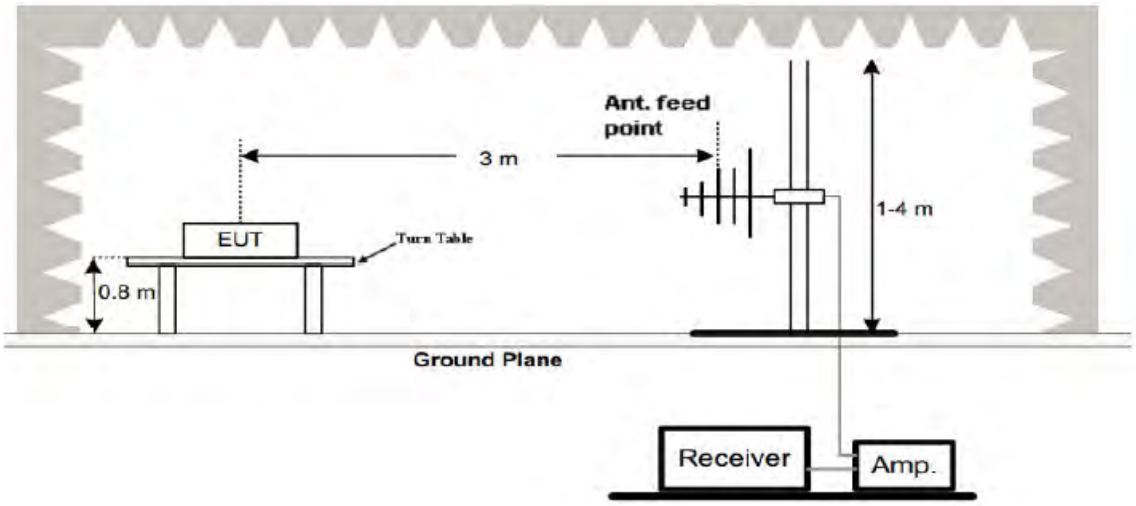
2, According to FCC 16-24,All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27dBm/MHz at the band edge.

4.2 TEST SETUP

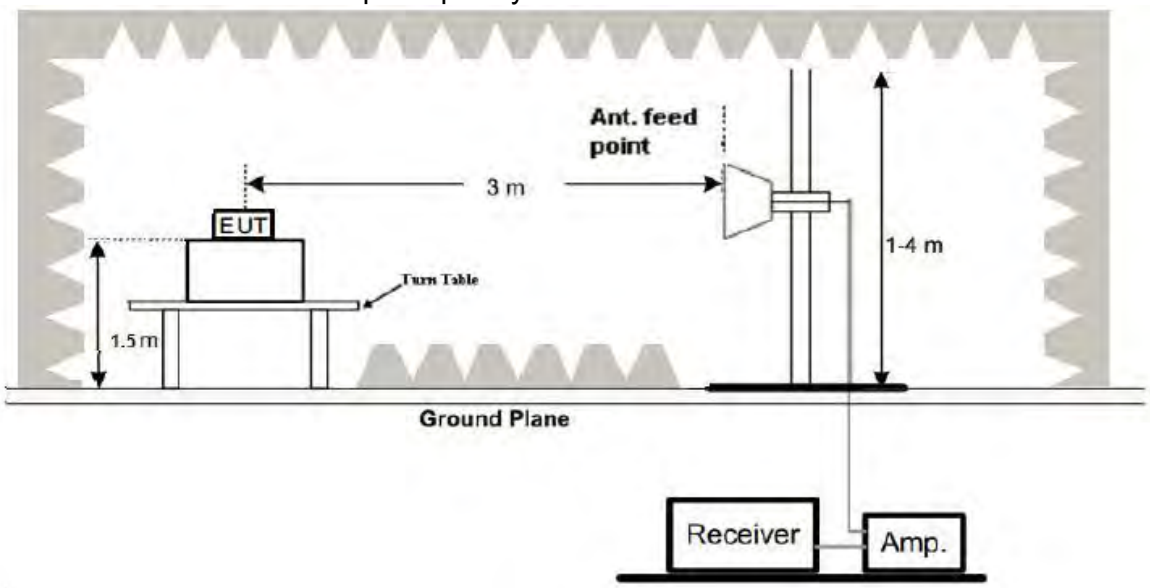
1. Radiated Emission Test-Up Frequency Below 30MHz



2. Radiated Emission Test-Up Frequency 30MHz~1GHz



3. Radiated Emission Test-Up Frequency Above 1GHz



4.3 TEST PROCEDURE

1. Below 1GHz measurement the EUT is placed on turntable which is 0.8m above ground plane. And above 1GHz measurement EUT was placed on low permittivity and low tangent turn table which is 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The test frequency range from 9kHz to 25GHz per FCC PART 15.33(a).

Note: For battery operated equipment, the equipment tests shall be performed using a new battery.

4.4 TEST RESULT

PASS

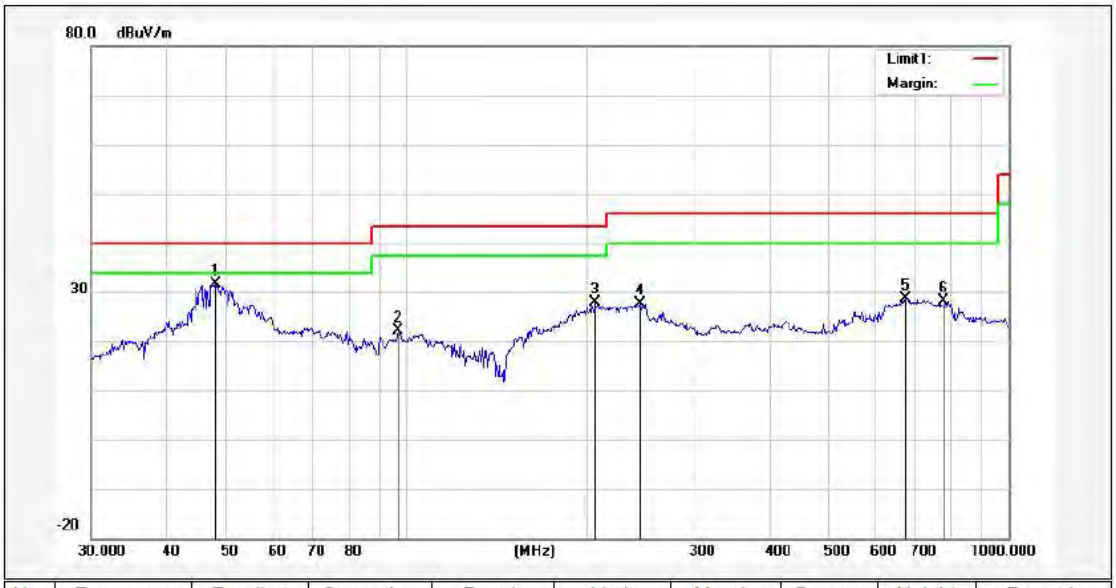
Remark:
1. All modes were test at Low, Middle, and High channel, only the worst result of band 1 802.11a Low Channel was reported for below 1GHz test.
2. By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “X axis” position was the worst, and test data recorded in this report.

Radiated emission below 30MHz

The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported.

Below 1GHz Test Results:

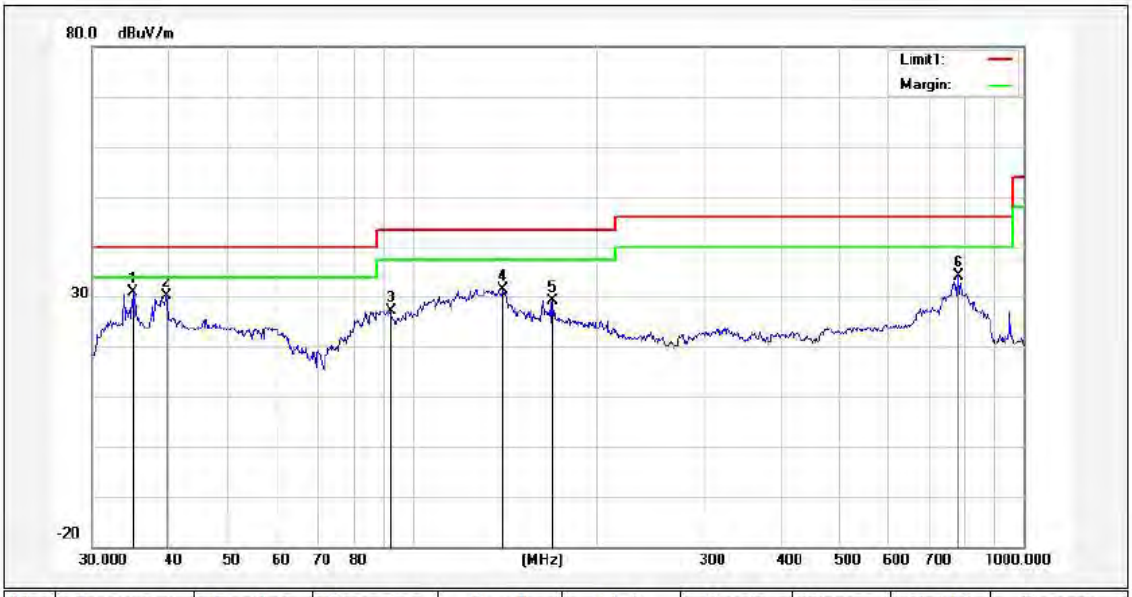
Temperature:	24℃	Relative Humidity:	48%
Test Date:	Jun. 13, 2023	Pressure:	1010hPa
Test Voltage:	DC 24V	Phase:	Horizontal
Test Mode:	Transmitting mode of band 1 802.11a 5180MHz		



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1*	48.1625	51.04	-19.48	31.56	40.00	-8.44	12	100	peak
2	96.7750	41.83	-19.63	22.20	43.50	-21.30	63	100	peak
3	205.6750	44.57	-16.72	27.85	43.50	-15.65	148	100	peak
4	244.2321	44.32	-16.74	27.58	46.00	-18.42	276	100	peak
5	672.8445	37.34	-8.71	28.63	46.00	-17.37	312	100	peak
6	779.6068	35.45	-7.25	28.20	46.00	-17.80	357	100	peak

Remark: Absolute Level = Reading Level + Factor, Margin = Absolute Level – Limit
Factor = Ant. Factor + Cable Loss – Pre-amplifier

Temperature:	24℃	Relative Humidity:	48%
Test Date:	Jun. 13, 2023	Pressure:	1010hPa
Test Voltage:	DC 24V	Phase:	Vertical
Test Mode:	Transmitting mode of band 1 802.11a 5180MHz		



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1*	34.8823	41.58	-10.78	30.80	40.00	-9.20	322	100	peak
2	39.5756	44.79	-14.68	30.11	40.00	-9.89	249	100	peak
3	92.1388	47.64	-20.40	27.24	43.50	-16.26	201	100	peak
4	140.8351	47.55	-16.12	31.43	43.50	-12.07	197	100	peak
5	169.5990	46.08	-16.87	29.21	43.50	-14.29	133	100	peak
6	782.3451	41.18	-7.16	34.02	46.00	-11.98	54	100	peak

Remark: Absolute Level = Reading Level + Factor, Margin = Absolute Level – Limit
Factor = Ant. Factor + Cable Loss – Pre-amplifier

Remark:
1. Radiated emission test from 9KHz to 10th harmonic of fundamental was verified, emission from 9kHz to 30MHz are more than 20dB below the limit, so it was not recorded in this report.
2. * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
3. The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120kHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10kHz.

Radiated emission above 1GHz

Temperature	25℃	**Relative Humidity**	60%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11a 5180MHz	**Antenna**	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10360.042	47.63	9.14	56.77	68.20	-11.43	peak
15540.063	42.44	10.22	52.66	74.00	-21.34	peak
15540.063	40.31	10.22	50.53	54.00	-3.47	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10360.042	46.59	9.14	55.73	68.20	-12.47	peak
15540.063	42.94	10.22	53.16	74.00	-20.84	peak
15540.063	31.43	10.22	41.65	54.00	-12.35	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Temperature	25℃	**Relative Humidity**	60%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11a 5200MHz	**Antenna**	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10400.042	47.86	9.14	57.00	68.20	-11.20	peak
15600.063	41.24	10.22	51.46	74.00	-22.54	peak
15600.063	31.63	10.22	41.85	54.00	-12.15	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10400.042	44.96	9.14	54.10	68.20	-14.10	peak
15600.063	41.25	10.22	51.47	74.00	-22.53	peak
15600.063	32.63	10.22	42.85	54.00	-11.15	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Temperature	25℃	**Relative Humidity**	60%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11a 5240MHz	**Antenna**	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10480.042	46.93	9.27	56.20	68.20	-12.00	peak
15720.063	41.46	10.38	51.84	74.00	-22.16	peak
15720.063	33.85	10.38	44.23	54.00	-9.77	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
10480.042	44.57	9.27	53.84	68.20	-14.36	peak
15720.063	41.83	10.38	52.21	74.00	-21.79	peak
15720.063	33.62	10.38	44.00	54.00	-10.00	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Temperature	25℃	**Relative Humidity**	60%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11a 5745MHz	**Antenna**	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11490.042	45.83	9.42	55.25	74.00	-18.75	peak
11490.042	38.20	9.42	47.62	54.00	-6.38	AVG
17235.063	41.29	10.51	51.80	68.20	-16.40	peak
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11490.042	44.63	9.42	54.05	74.00	-19.95	peak
11490.042	36.99	9.42	46.41	54.00	-7.59	AVG
17235.063	41.47	10.51	51.98	68.20	-16.22	peak
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Temperature	25℃	**Relative Humidity**	60%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11a 5785MHz	**Antenna**	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11570.042	45.78	9.42	55.20	74.00	-18.80	peak
11570.042	33.25	9.42	42.67	54.00	-11.33	AVG
17355.063	42.01	10.51	52.52	68.20	-15.68	peak
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11570.042	45.66	9.42	55.08	74.00	-18.92	peak
11570.042	33.96	9.42	43.38	54.00	-10.62	AVG
17355.063	40.25	10.51	50.76	68.20	-17.44	peak
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Temperature	25℃	**Relative Humidity**	60%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11a 5825MHz	**Antenna**	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11650.042	45.69	9.62	52.92	74.00	-21.02	peak
11650.042	36.92	9.62	45.05	54.00	-8.95	AVG
17475.063	41.33	10.75	47.61	68.20	-26.39	peak
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11650.042	48.92	9.62	53.55	74.00	-20.45	peak
11650.042	35.82	9.62	47.64	54.00	-6.36	AVG
17475.063	40.35	10.75	48.61	68.20	-25.39	peak
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Note: All test channels had been tested. The 802.11a is the worst case and recorded in the test report. Other frequencies radiation emission from 1GHz to 40GHz at least have 20dB margin and not recorded in the test report.

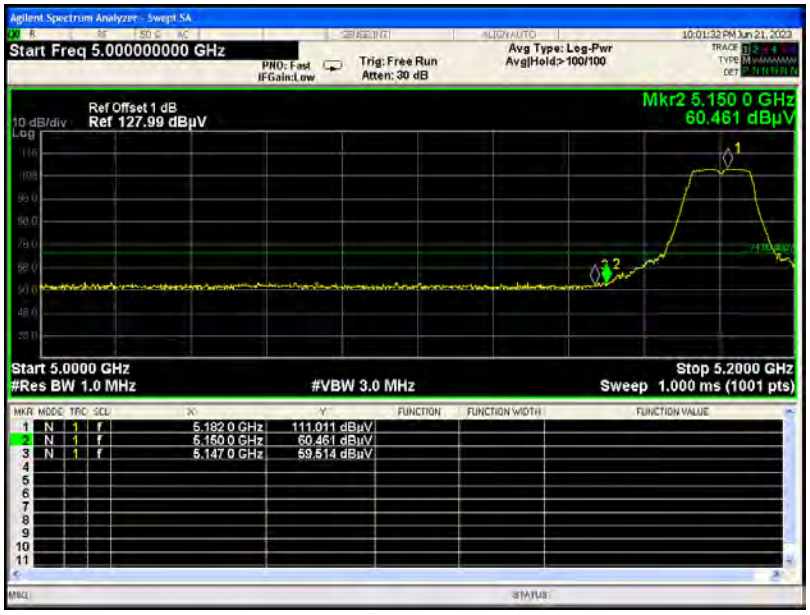
Factor = Antenna Factor + Cable loss - Amplifier gain, Margin= Limit-Level.

The “Factor” value can be calculated automatically by software of measurement system.

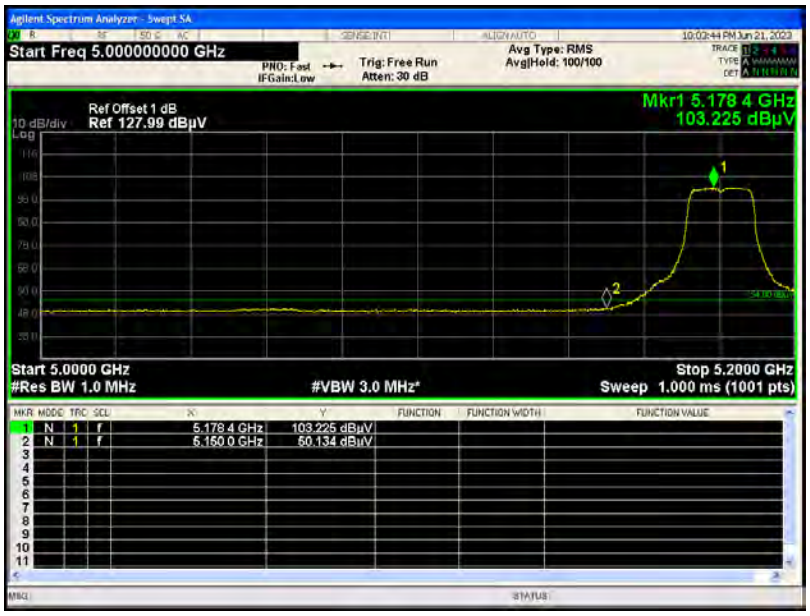
Test result for band edge emission at restricted bands

Temperature	25℃	**Relative Humidity**	60%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11a 5180MHz	**Antenna**	Horizontal

Test Graph for Peak Measurement



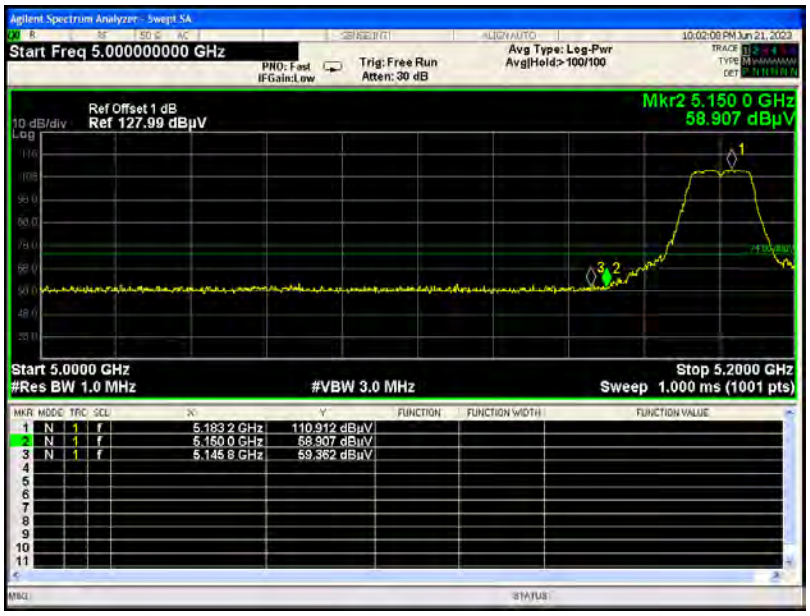
Test Graph for Average Measurement



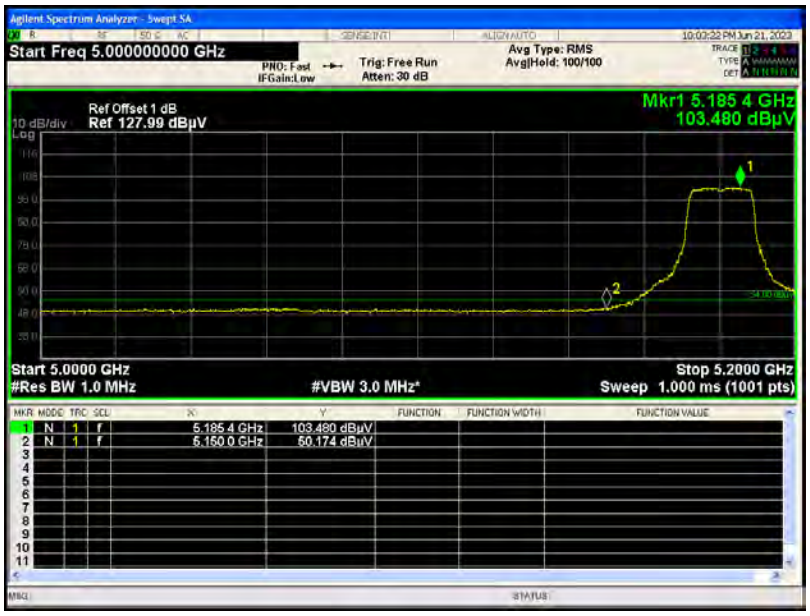
RESULT: PASS

Temperature	25℃	**Relative Humidity**	60%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11a 5180MHz	**Antenna**	Vertical

Test Graph for Peak Measurement



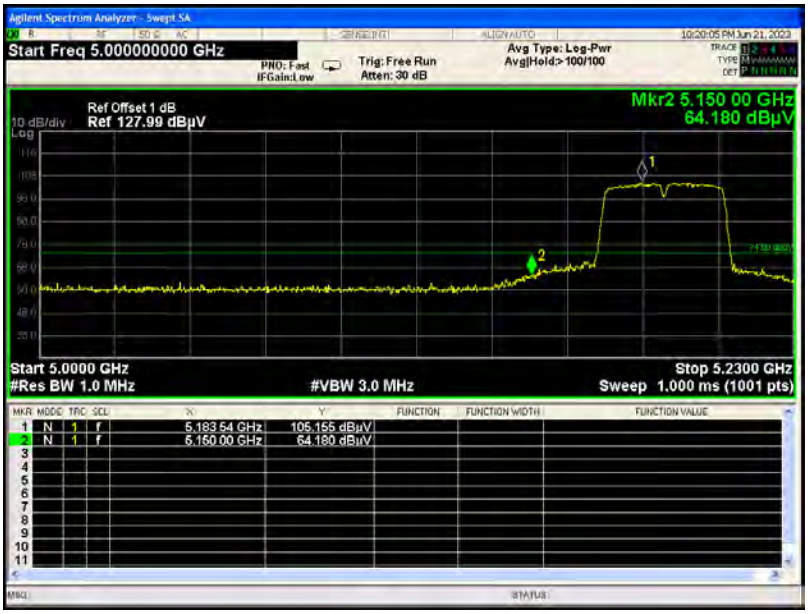
Test Graph for Average Measurement



RESULT: PASS

Temperature	25℃	**Relative Humidity**	60%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11n40 5190MHz	**Antenna**	Horizontal

Test Graph for Peak Measurement



Test Graph for Average Measurement

RESULT: PASS

Temperature	25℃	**Relative Humidity**	60%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11n40 5190MHz	**Antenna**	Vertical

Test Graph for Peak Measurement

Test Graph for Average Measurement

RESULT: PASS

Temperature	25℃	**Relative Humidity**	60%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11ac80 5210MHz	**Antenna**	Horizontal

Test Graph for Peak Measurement

Test Graph for Average Measurement

RESULT: PASS

Temperature	25℃	**Relative Humidity**	60%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11ac80 5210MHz	**Antenna**	Vertical

Test Graph for Peak Measurement

Test Graph for Average Measurement

RESULT: PASS

Note: 1. All the 20MHz bandwidth modulation had been tested, the 802.11a at 5180MHz was the worst case and record in his test report. All the 40MHz bandwidth modulation had been tested, the 802.11N40 at 5190MHz was the worst case and record in his test report. All the 80MHz bandwidth modulation had been tested, the 802.11AC80 at 5210MHz was the worst case and record in his test report.

2. The factor had been edited in the “Input Correction” of the Spectrum Analyzer.

3. Only the data of band edge emission at the restricted band 4.5GHz-5.15GHz and 5.35GHz-5.46GHz record in the report. Other restricted band 7.25GHz-7.77GHz were considered as ambient noise. No recording in the test report.

4. The sideband standard of Band 4 frequency band is not defined, the transmitted signal does not fall in the restricted band, and the edge signal is far away from the edge of other restricted bands, and it is not recorded in the report.

5 OCCUPIED BANDWIDTH

5.1 TEST LIMIT

The bandwidth at 26dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in KDB 789033 D02 , and at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26dB bandwidth.

FCC Part 15 Subpart C(15.407)		
Test Item	Limit	Frequency Range(MHz)
26 dB Bandwidth	N/A	5150~5250
		5250~5350
		5470~5725
6 dB Bandwidth	>500kHz	5725~5850

5.2 TEST PROCEDURE

-6dB bandwidth (DTS bandwidth):

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on operation frequency individually.
3. Set RBW = 100kHz.
4. Set the VBW ≥3*RBW. Detector = Peak. Trace mode = max hold.
5. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.

99% occupied bandwidth:

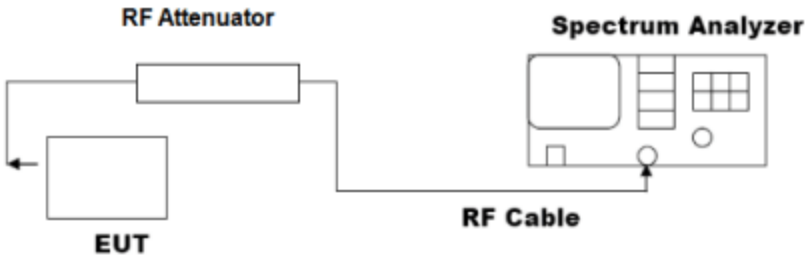
1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set Span = approximately 1.5 to 5 times the OBW, centered on a nominal channel
   The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW; Sweep = auto; Detector function = peak
4. Set SPA Trace 1 Max hold, then View.

-26dB Bandwidth:

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. 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%.

Note: The EUT was tested according to KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

5.3 TEST SET-UP



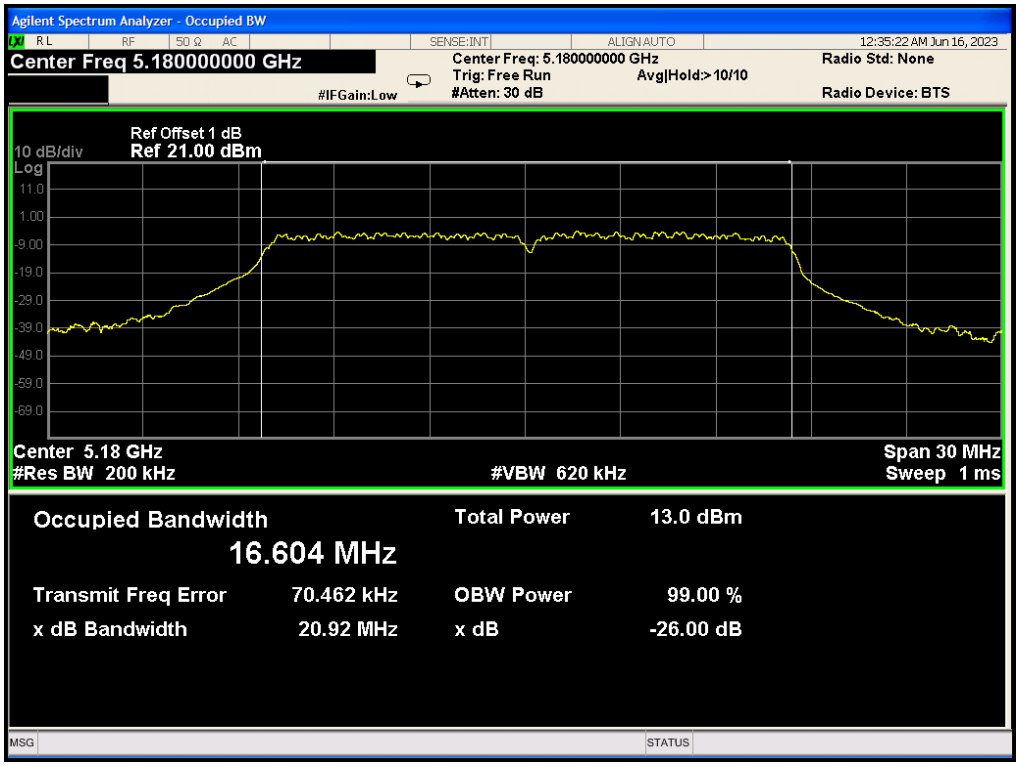
5.4 TEST RESULT

PASS

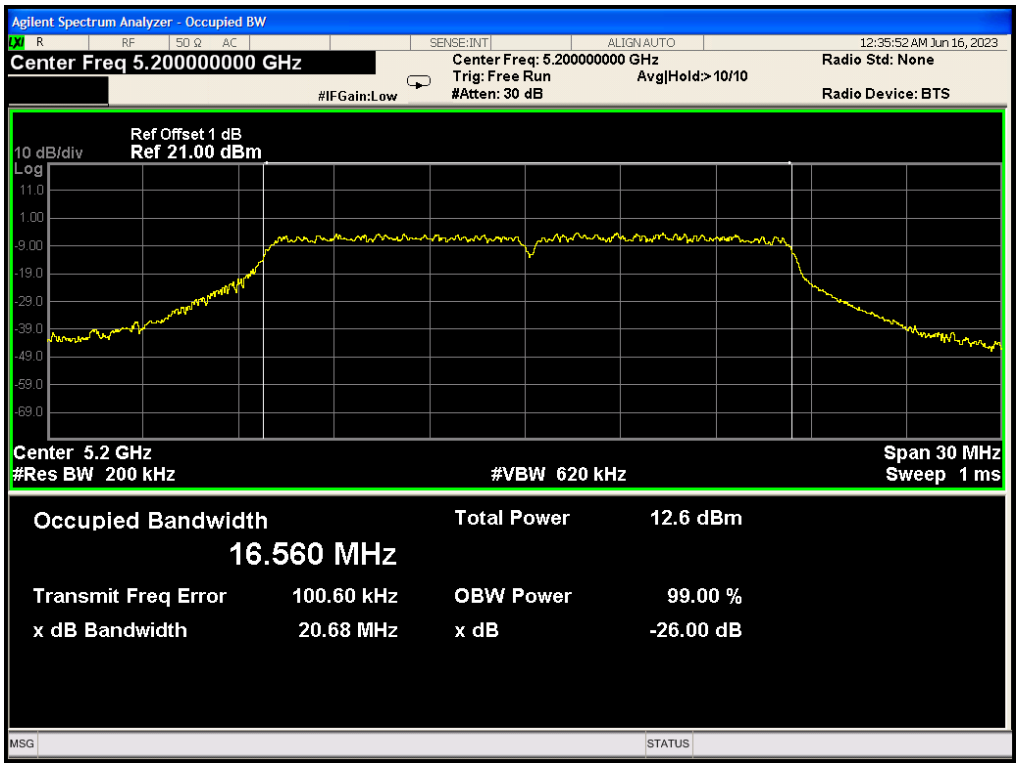
Test Data of Occupied Bandwidth and -26dB Bandwidth for band 5.15-5.25 GHz					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
802.11a	5180	16.604	20.92	N/A	Pass
	5200	16.560	20.68	N/A	Pass
	5240	16.534	20.62	N/A	Pass
802.11n20	5180	16.572	20.71	N/A	Pass
	5200	16.566	20.66	N/A	Pass
	5240	16.541	20.69	N/A	Pass
802.11n40	5190	35.811	38.60	N/A	Pass
	5230	35.796	38.53	N/A	Pass
802.11ac20	5180	17.691	21.54	N/A	Pass
	5200	17.690	21.44	N/A	Pass
	5240	17.687	21.49	N/A	Pass
802.11ac40	5190	35.827	38.52	N/A	Pass
	5230	35.805	38.57	N/A	Pass
802.11ac80	5210	75.436	80.16	N/A	Pass

Test Data of Occupied Bandwidth and DTS Bandwidth for band 5.725-5.85 GHz					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	DTS Bandwidth (MHz)	Limits (MHz)	Pass or Fail
802.11a	5745	16.633	16.53	0.5	Pass
	5785	16.545	16.51	0.5	Pass
	5825	16.589	16.54	0.5	Pass
802.11n20	5745	16.623	16.51	0.5	Pass
	5785	16.553	16.52	0.5	Pass
	5825	16.577	16.52	0.5	Pass
802.11n40	5755	35.876	36.38	0.5	Pass
	5795	35.807	36.37	0.5	Pass
802.11ac20	5745	17.577	17.67	0.5	Pass
	5785	17.698	17.74	0.5	Pass
	5825	17.724	17.72	0.5	Pass
802.11ac40	5755	35.882	36.37	0.5	Pass
	5795	35.788	36.37	0.5	Pass
802.11ac80	5775	75.574	75.72	0.5	Pass

Test Graphs of Occupied Bandwidth and -26dB Bandwidth for band 5.15-5.25 GHz



802.11a_ANT1_5180_6Mbps_OBW



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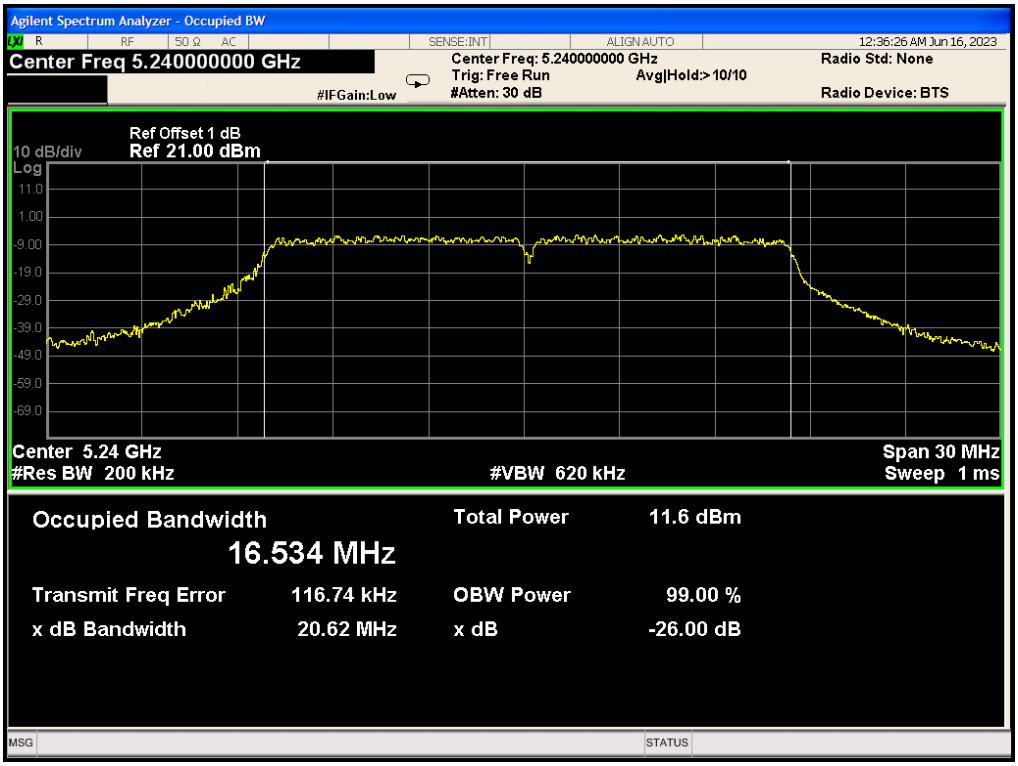

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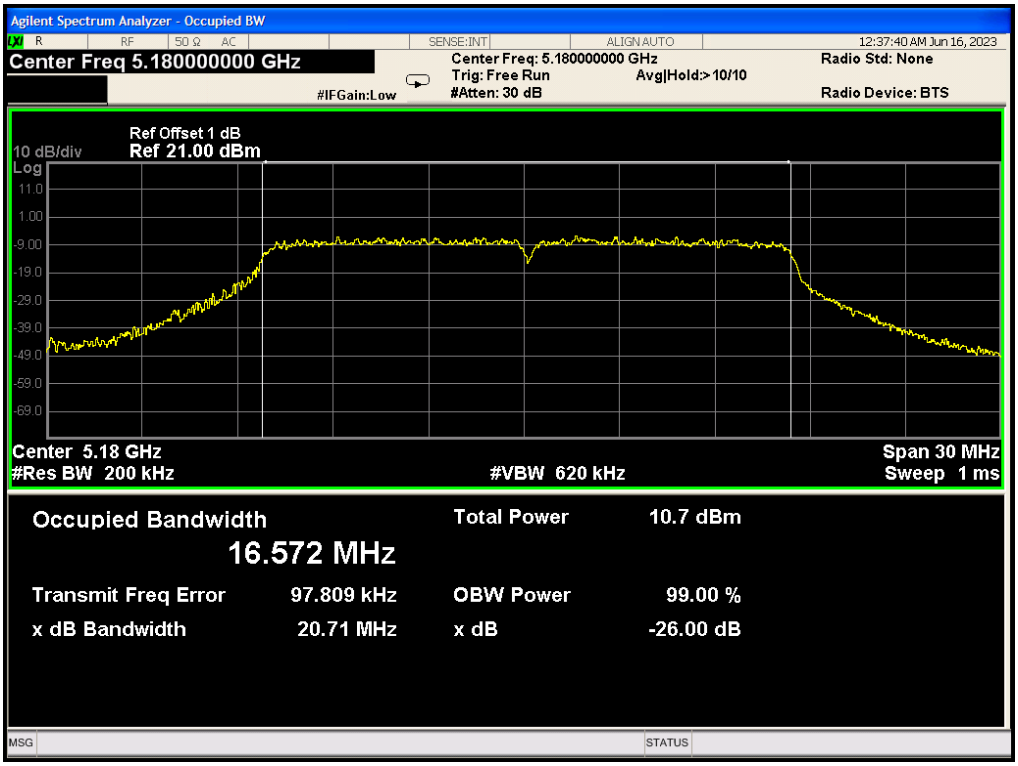

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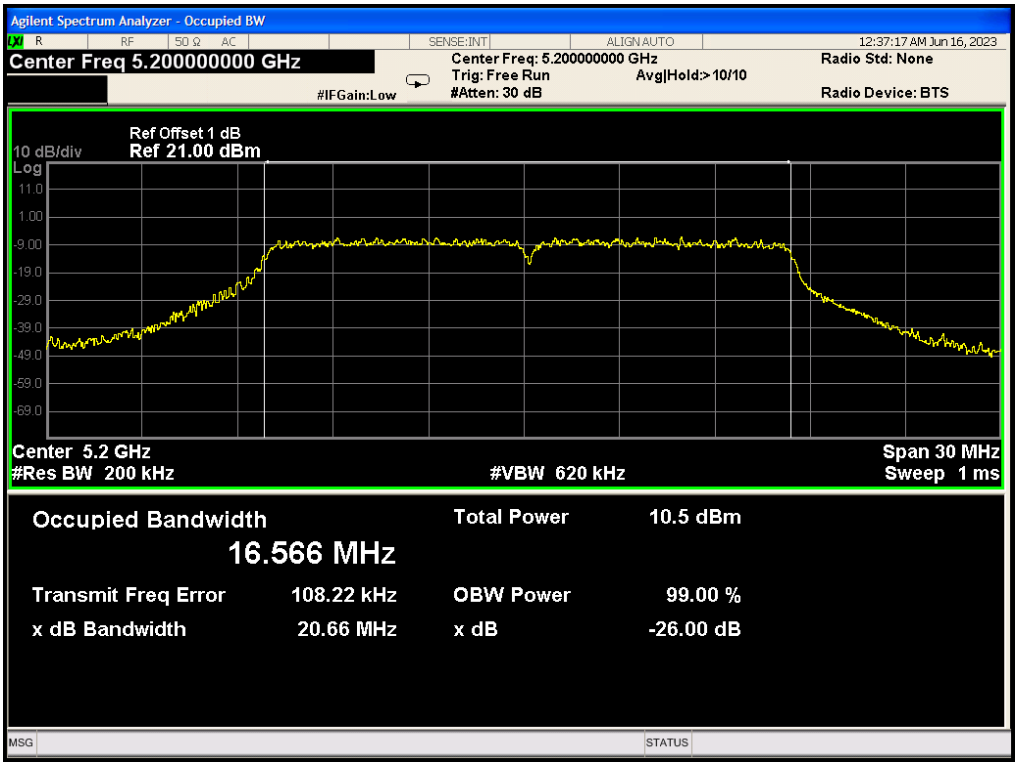

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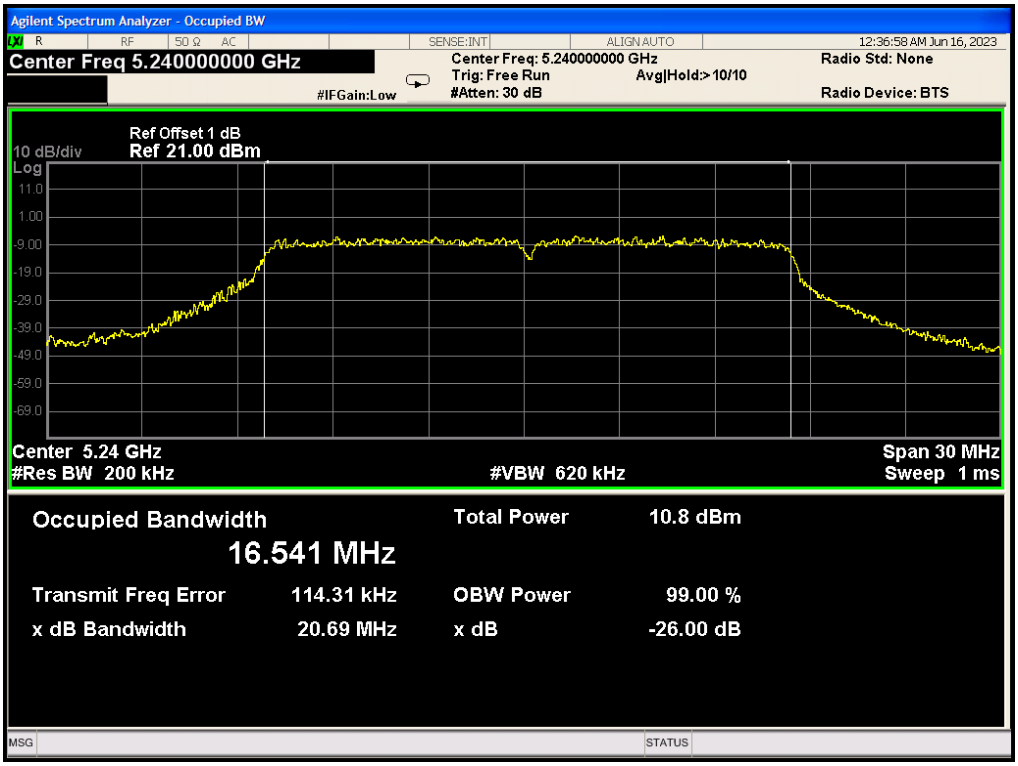

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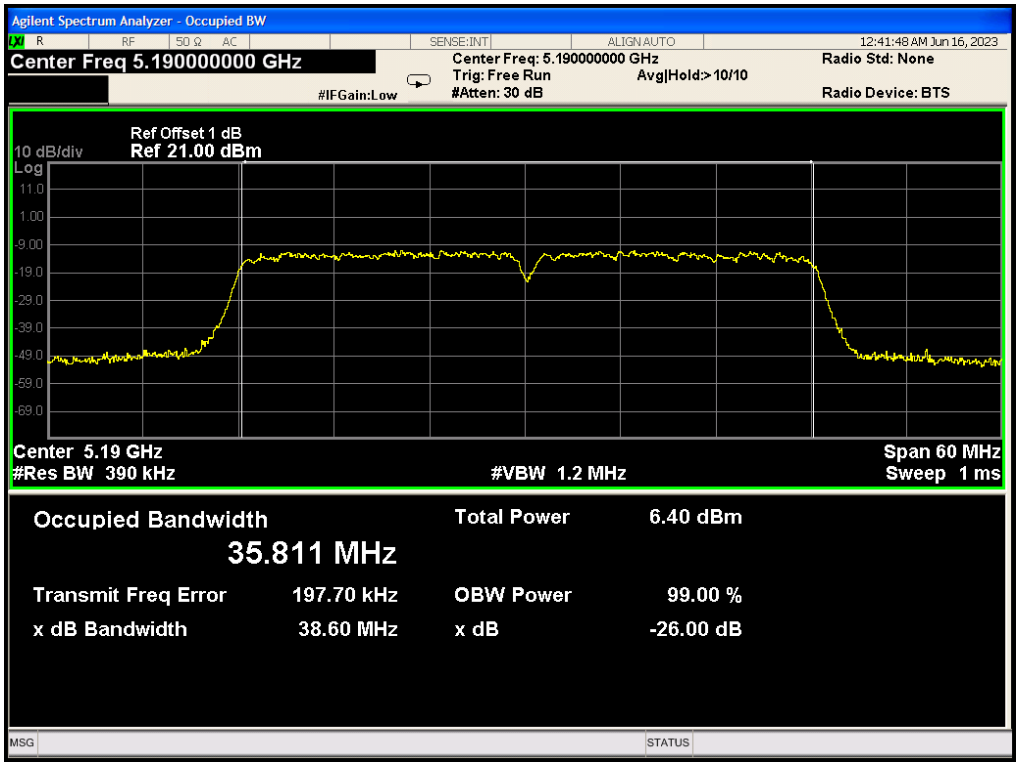
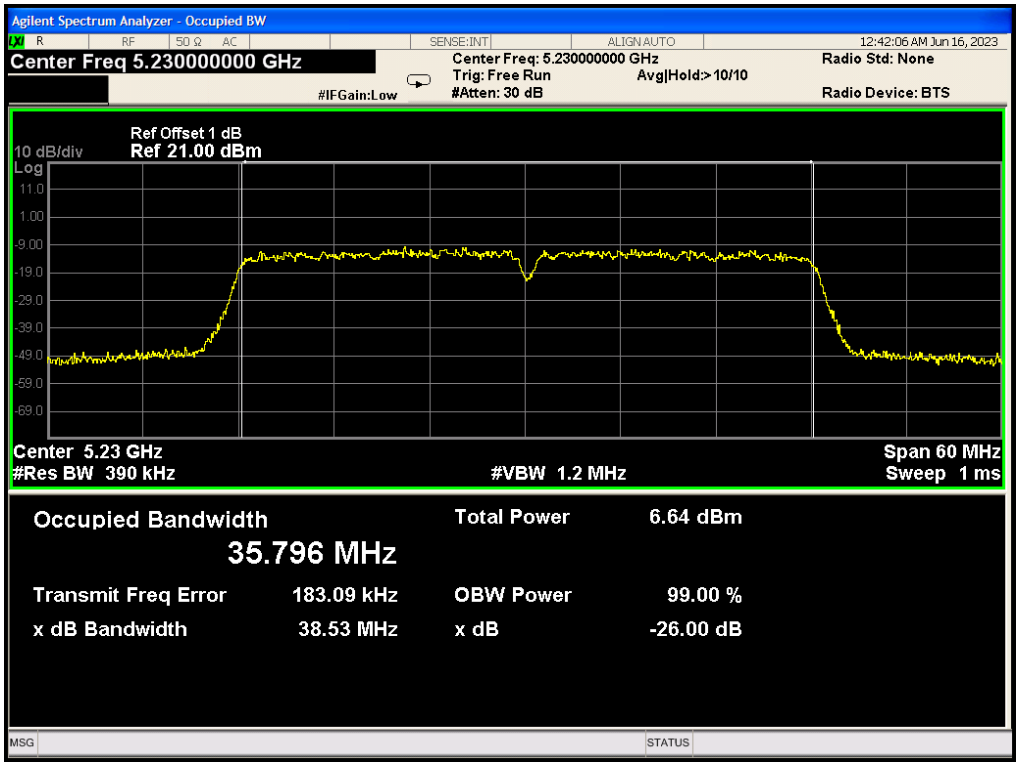


802.11n40_ANT1_5190_MCS0_OBW



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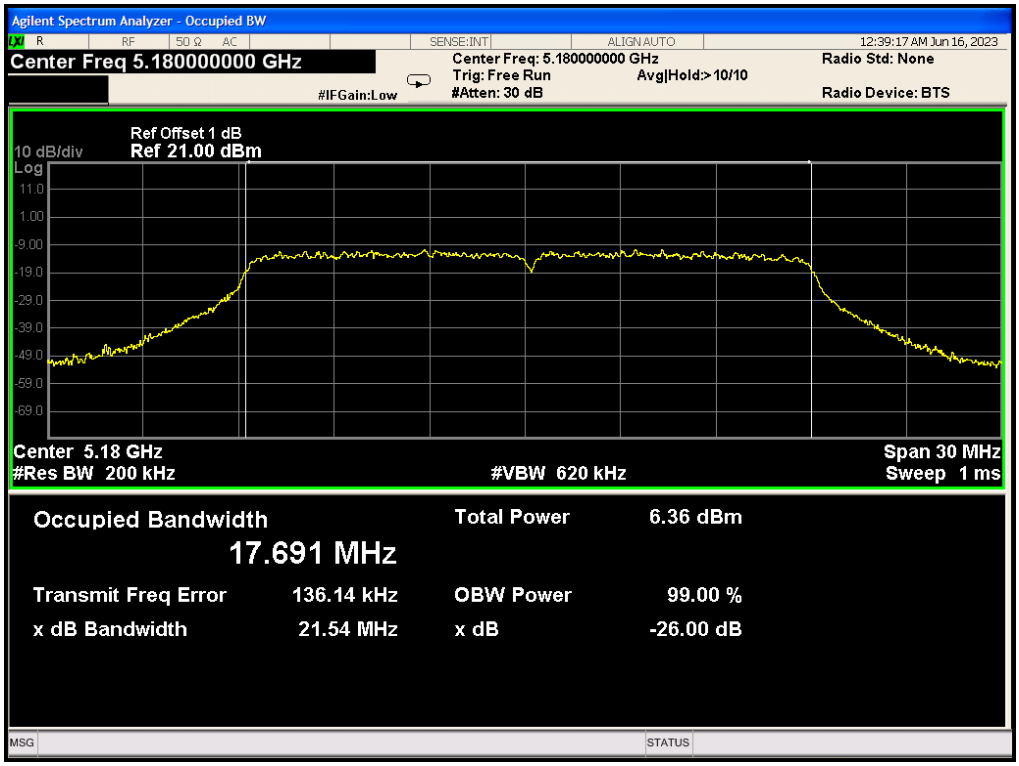
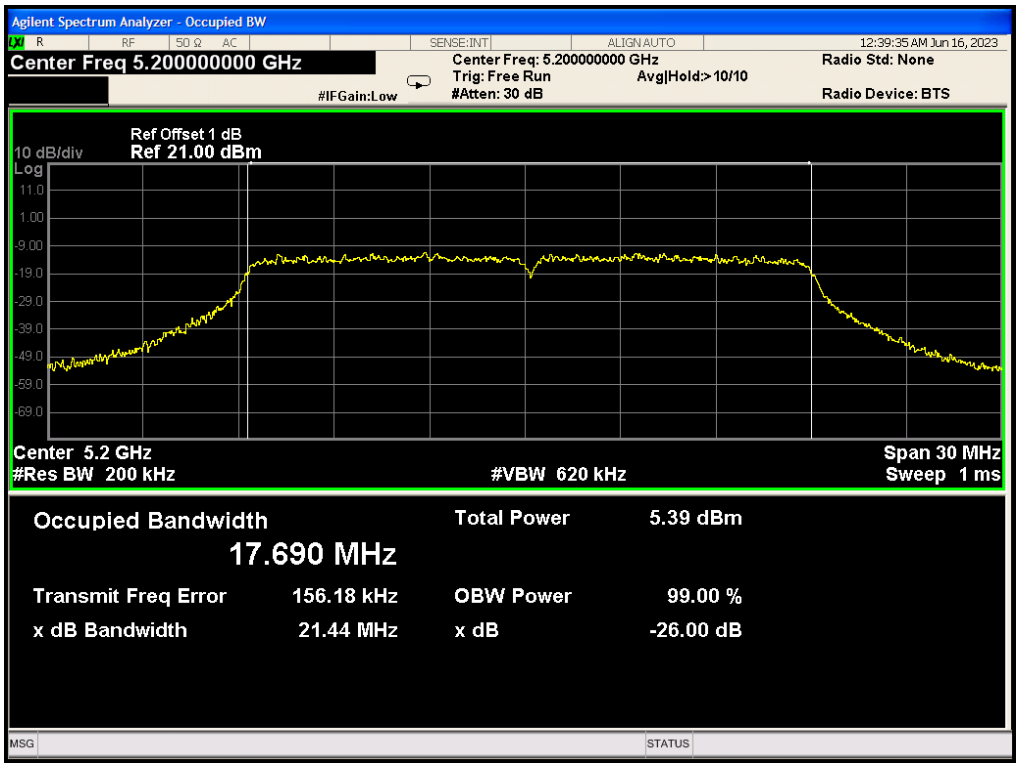


802.11ac20_ANT1_5180_MCS0_OBW



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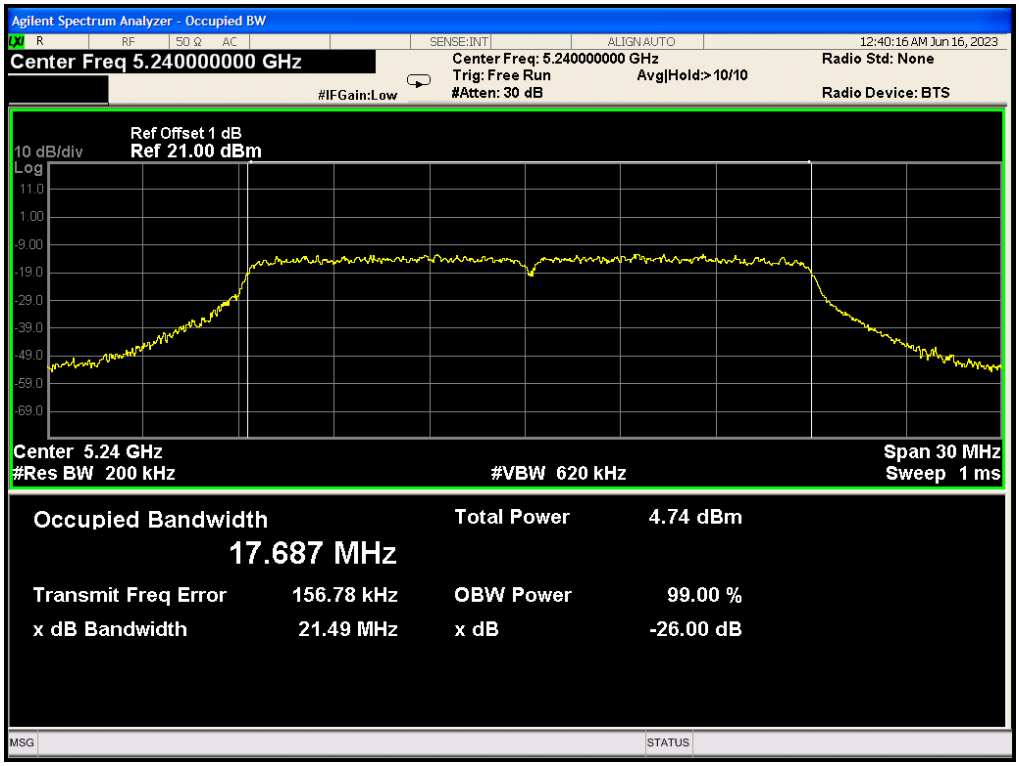

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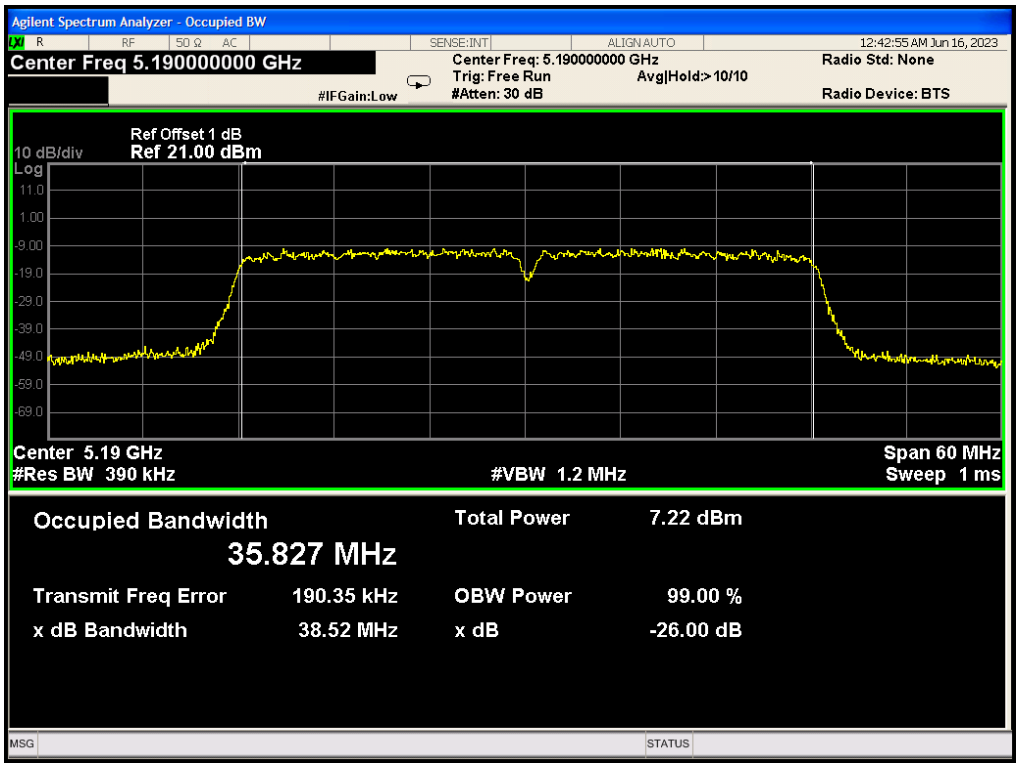

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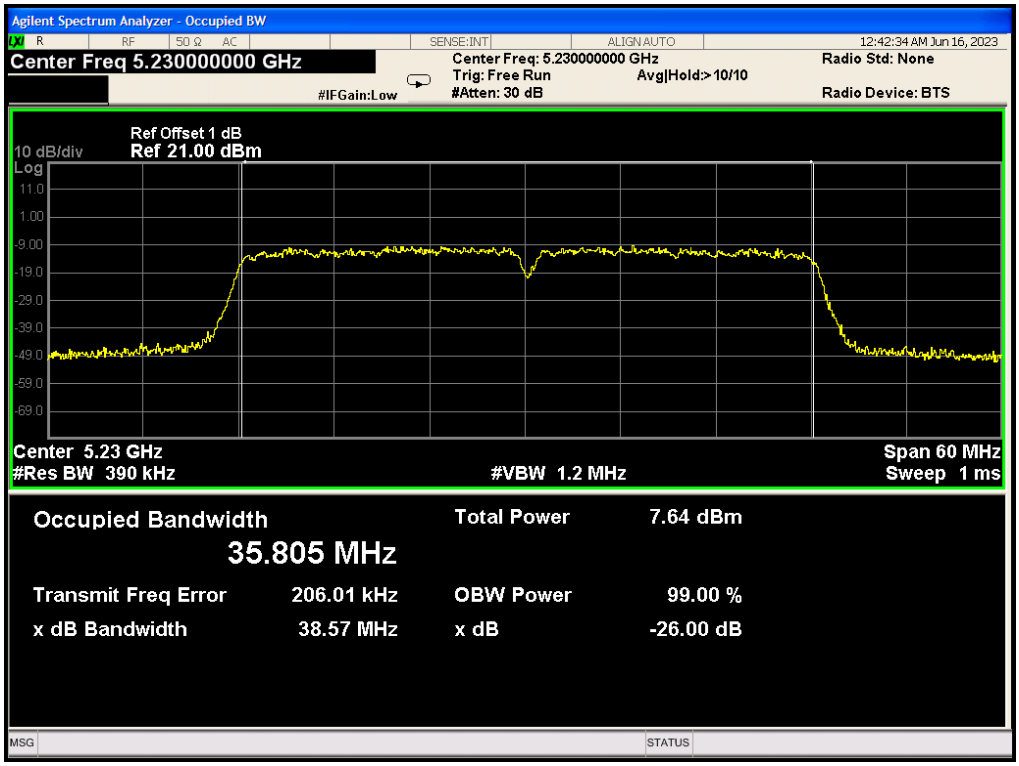
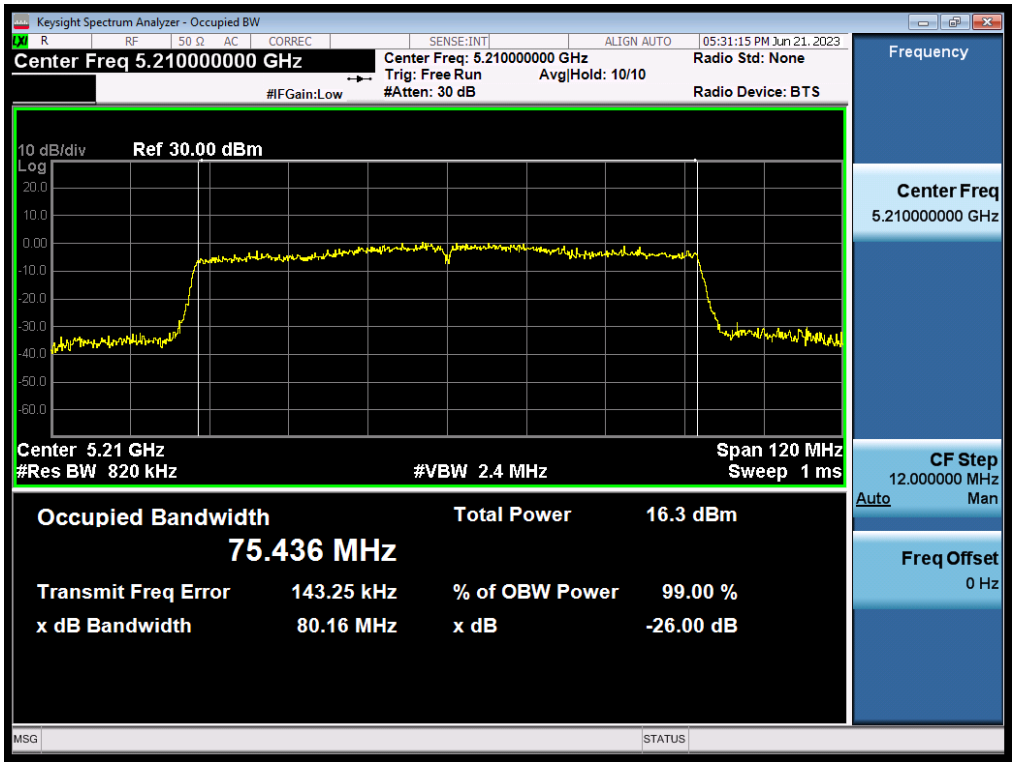
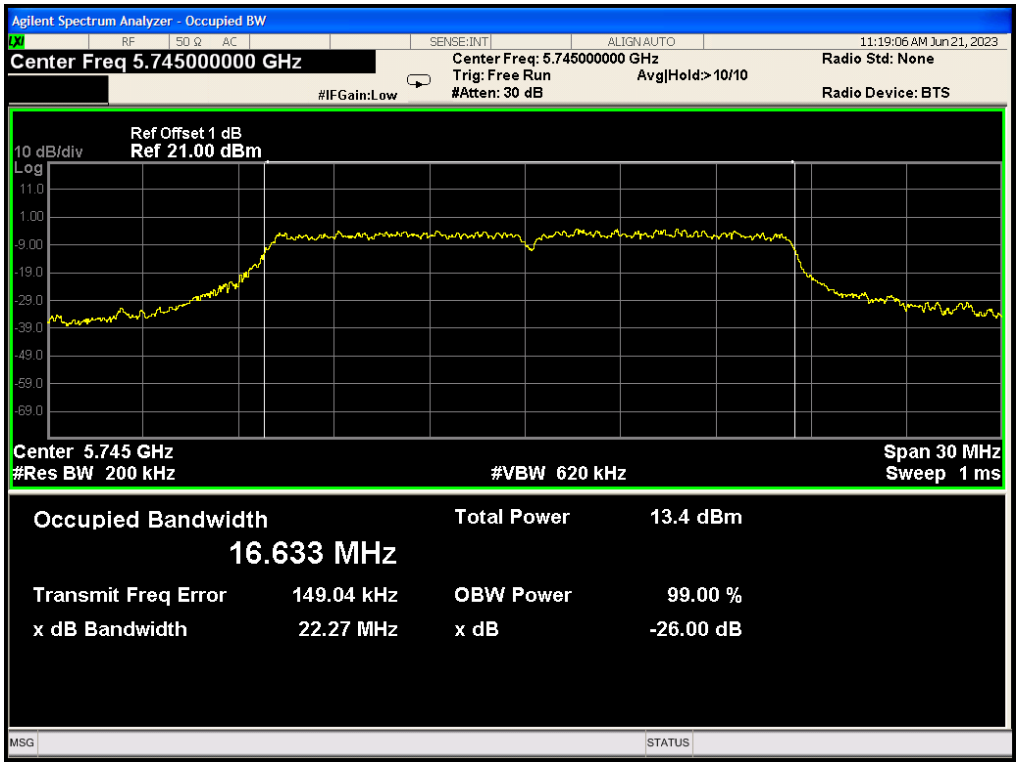


802.11ac40_ANT1_5230_MCS0_OBW

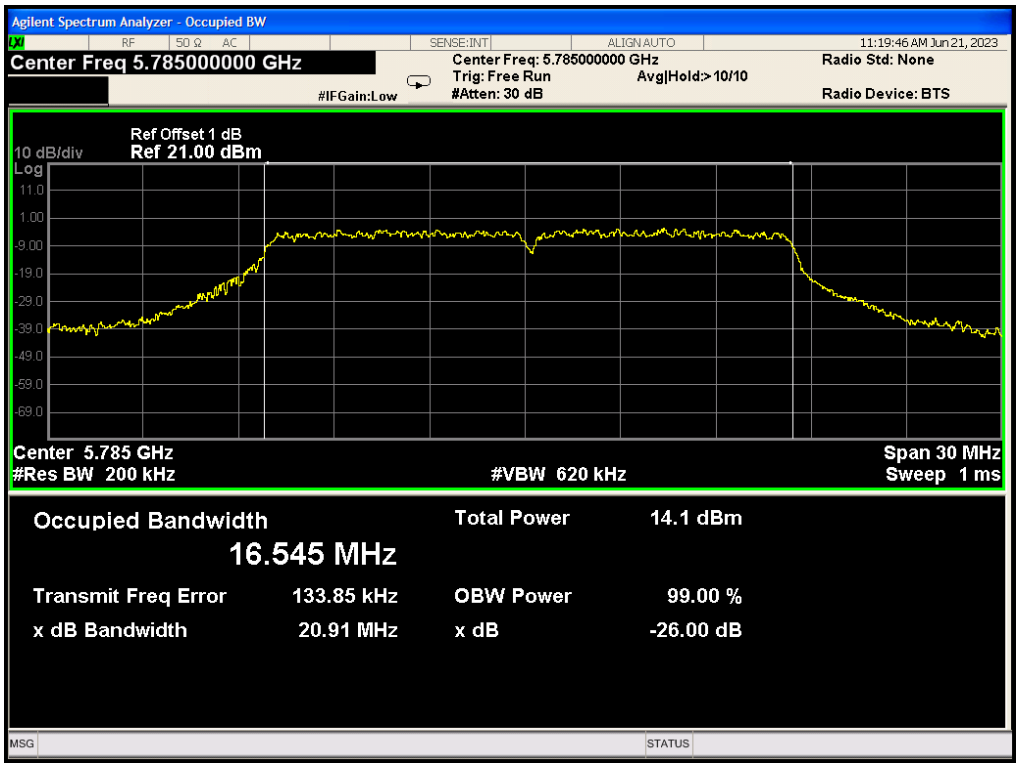


802.11ac80_ANT1_5210_MCS0_OBW

Test Graphs of Occupied Bandwidth for band 5.725-5.85 GHz



802.11a_ANT1_5745_6Mbps_OBW



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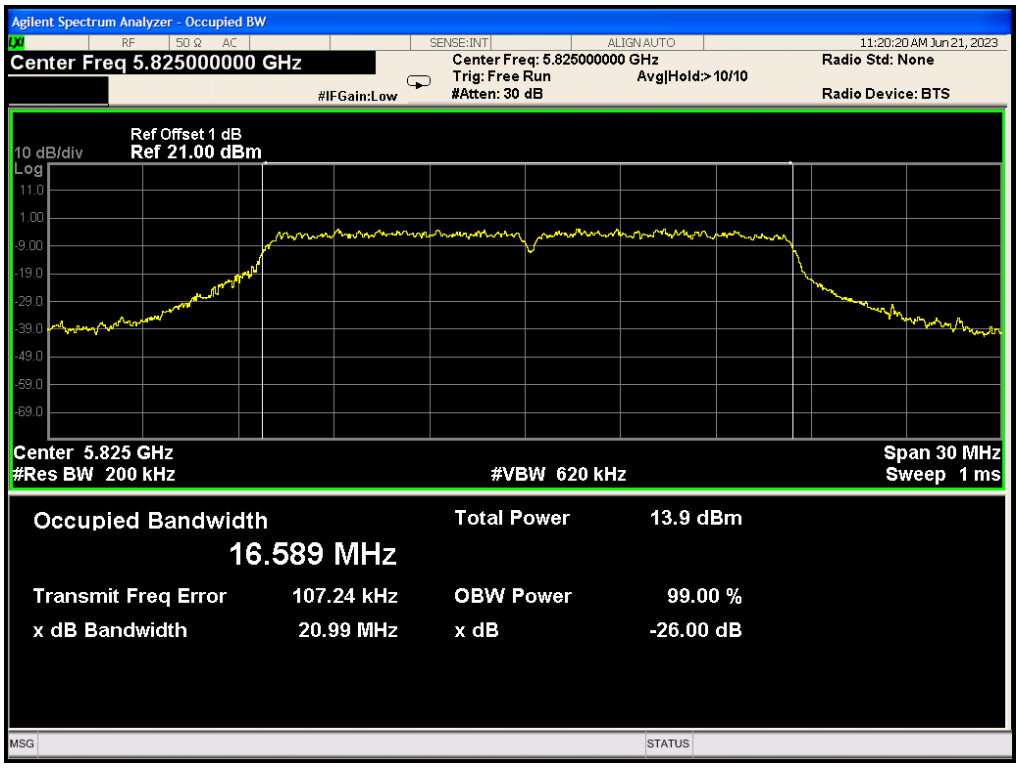
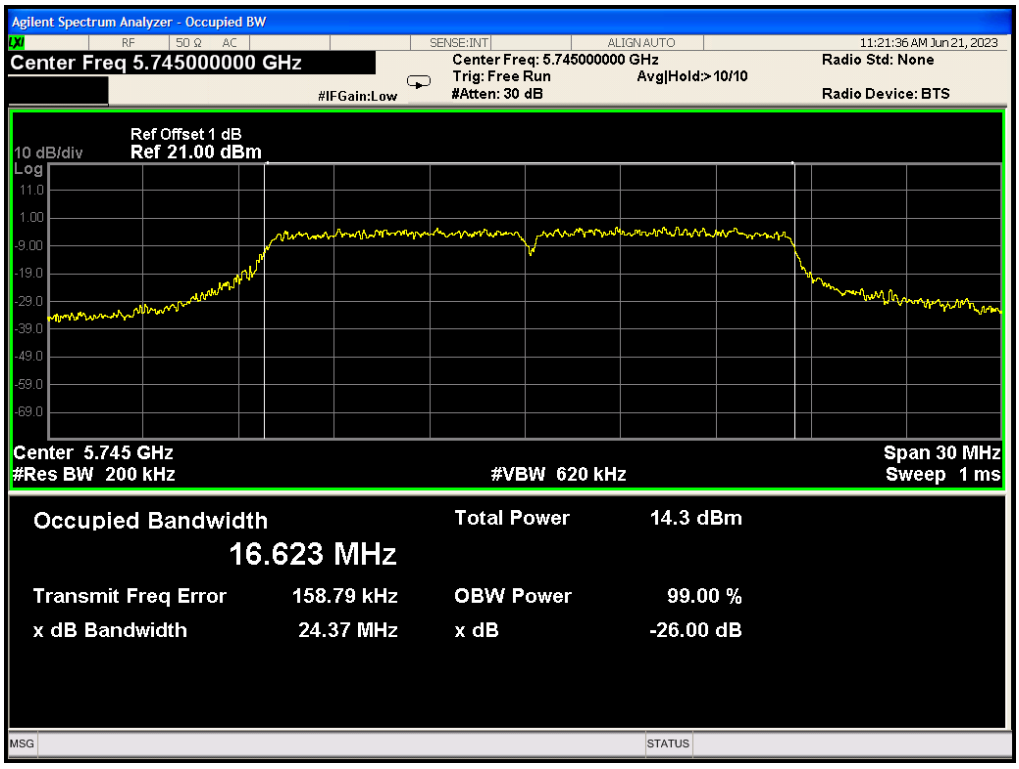


802.11a_ANT1_5825_6Mbps_OBW



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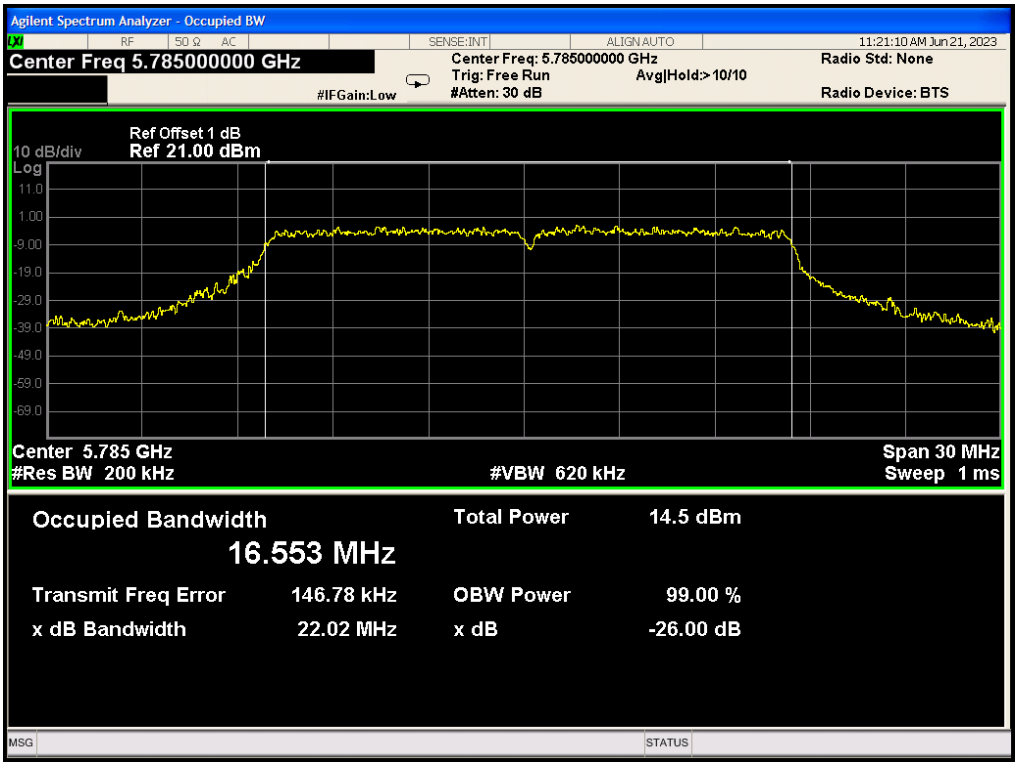

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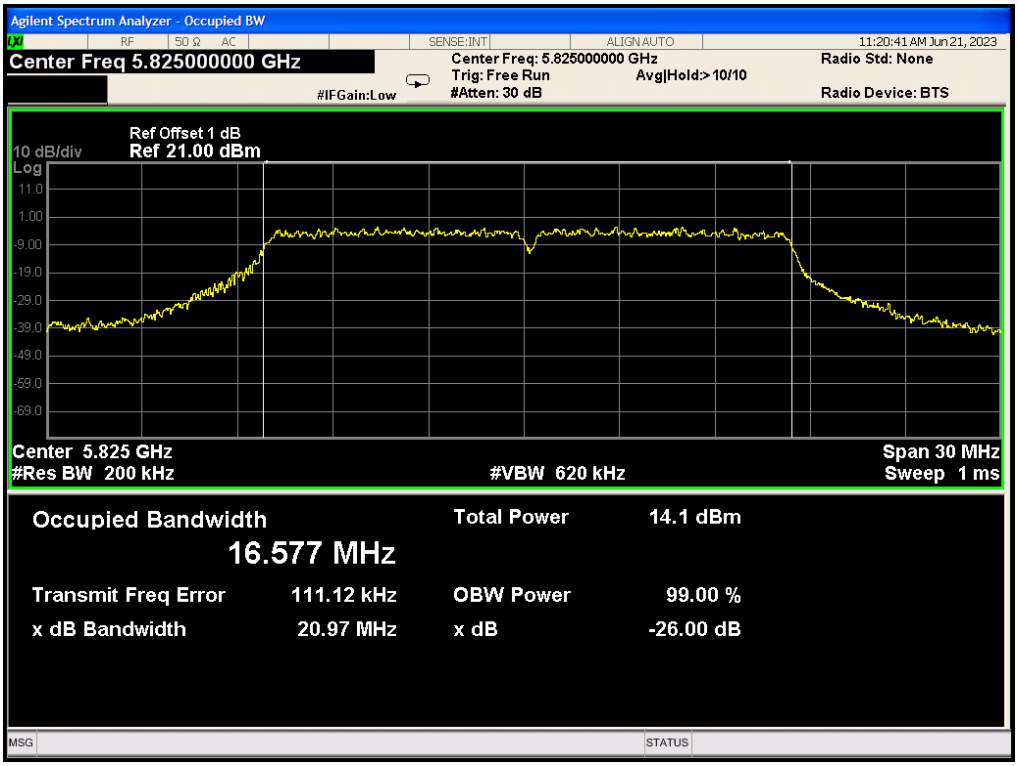

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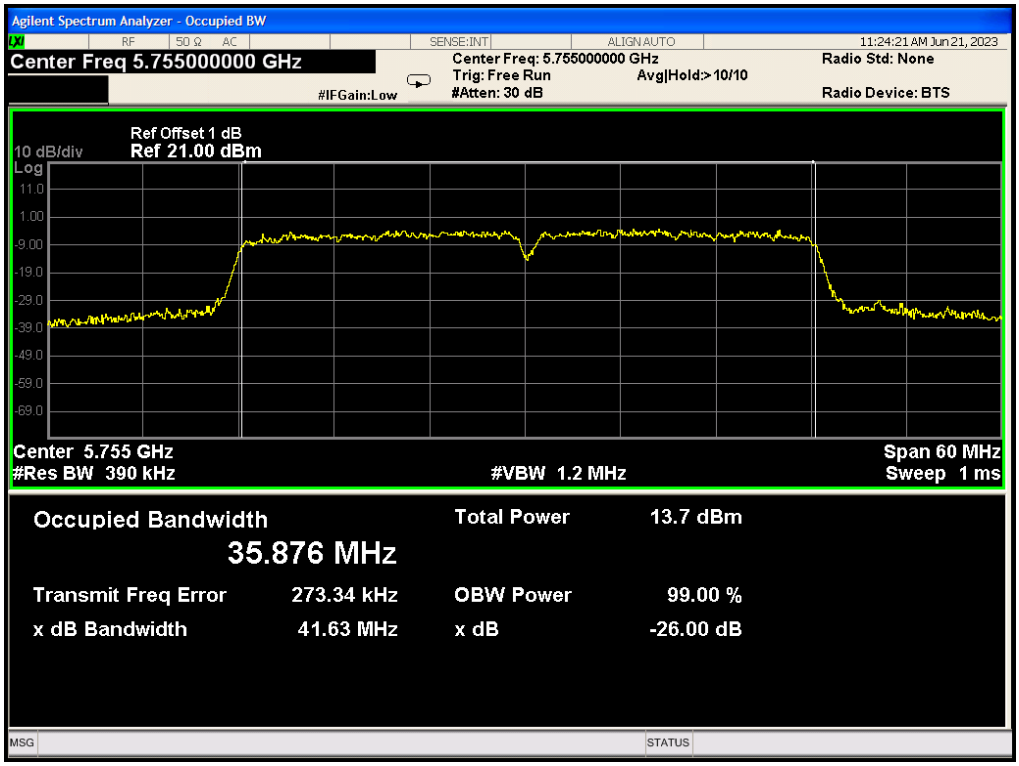

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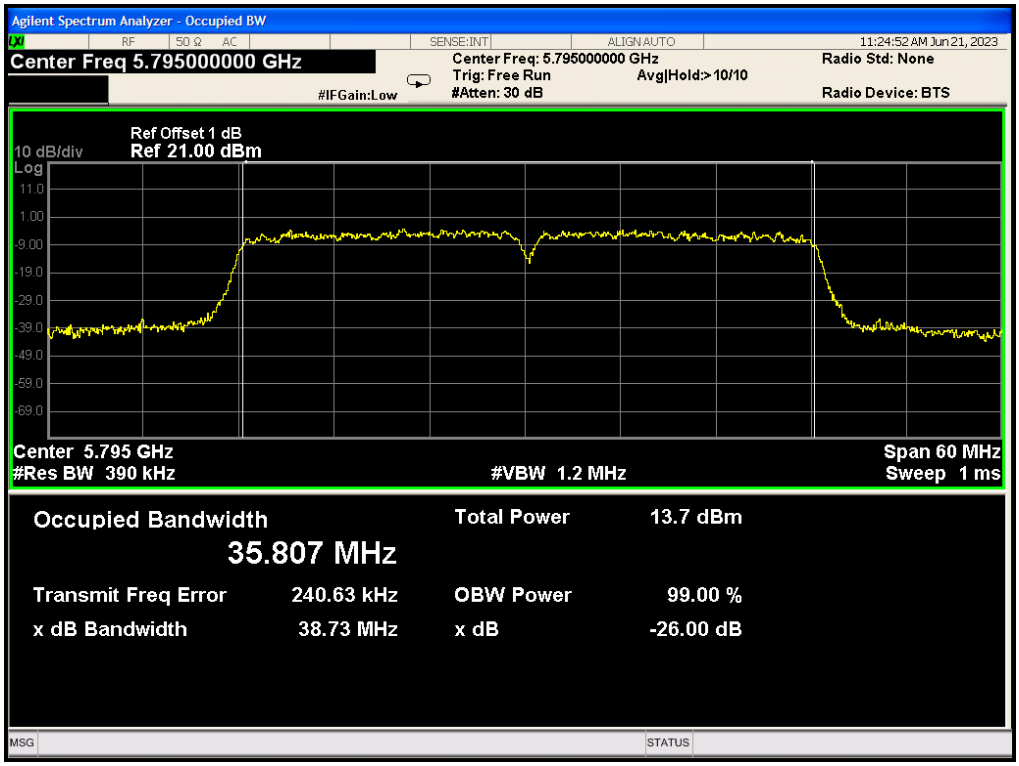

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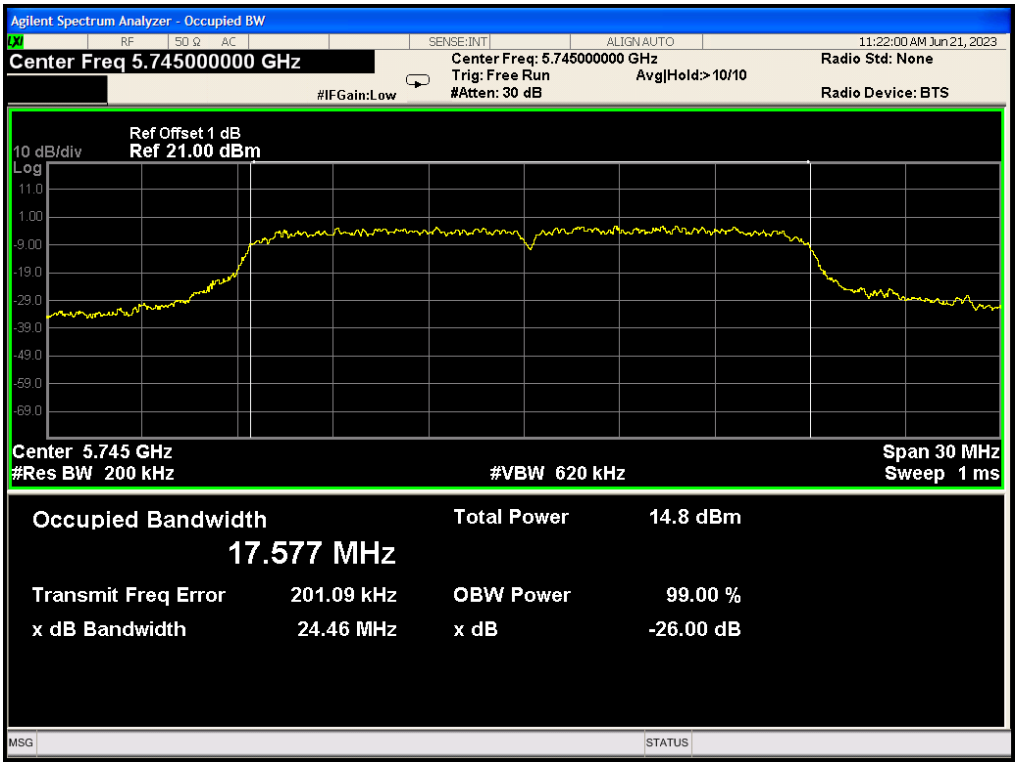

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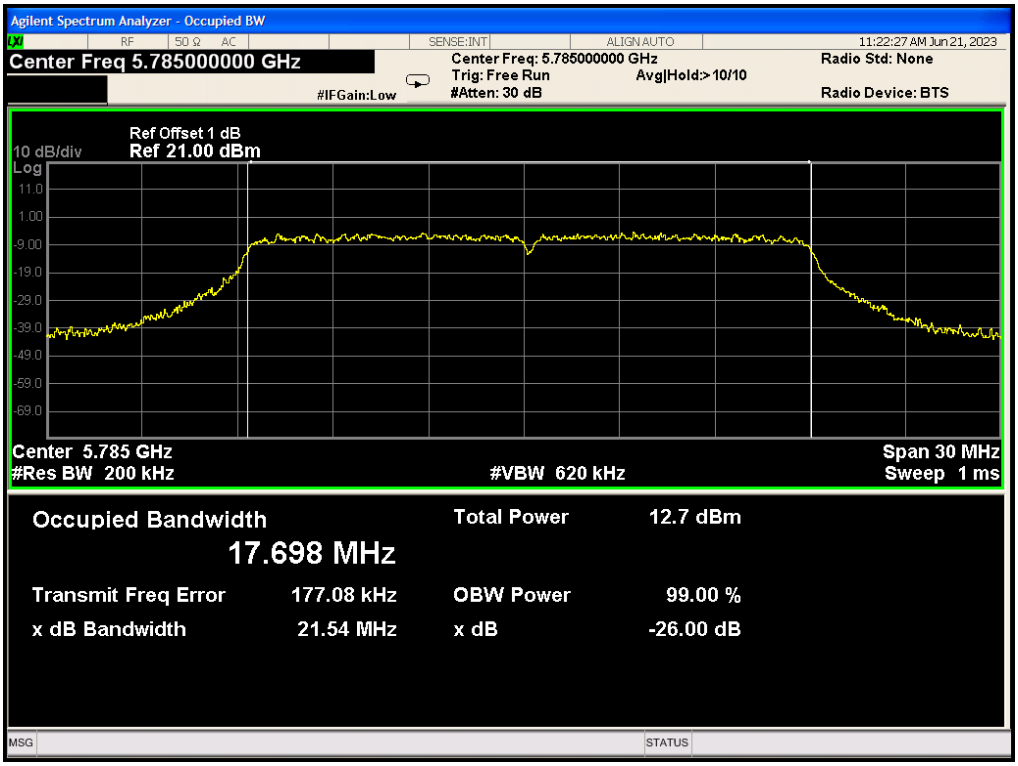

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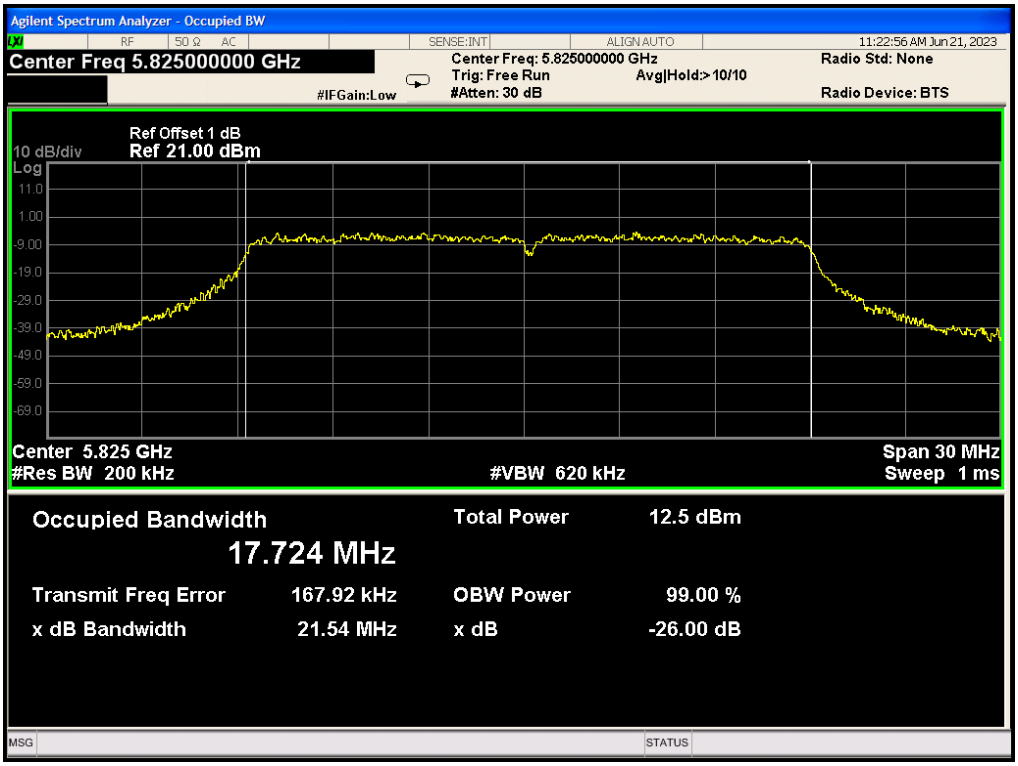

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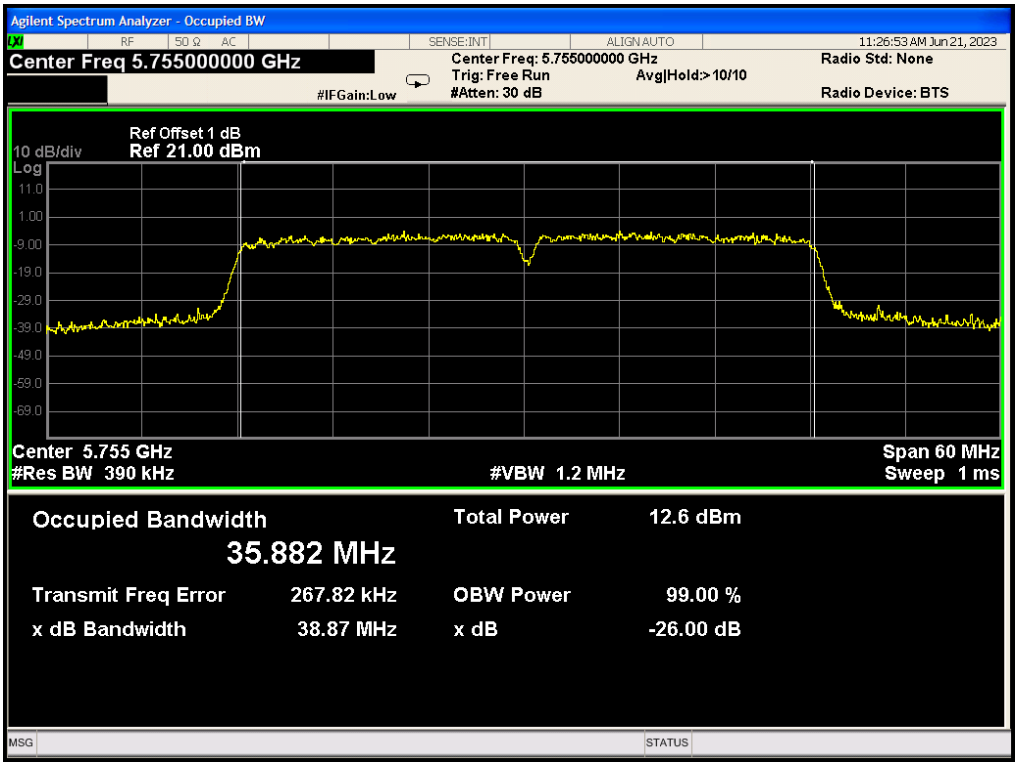

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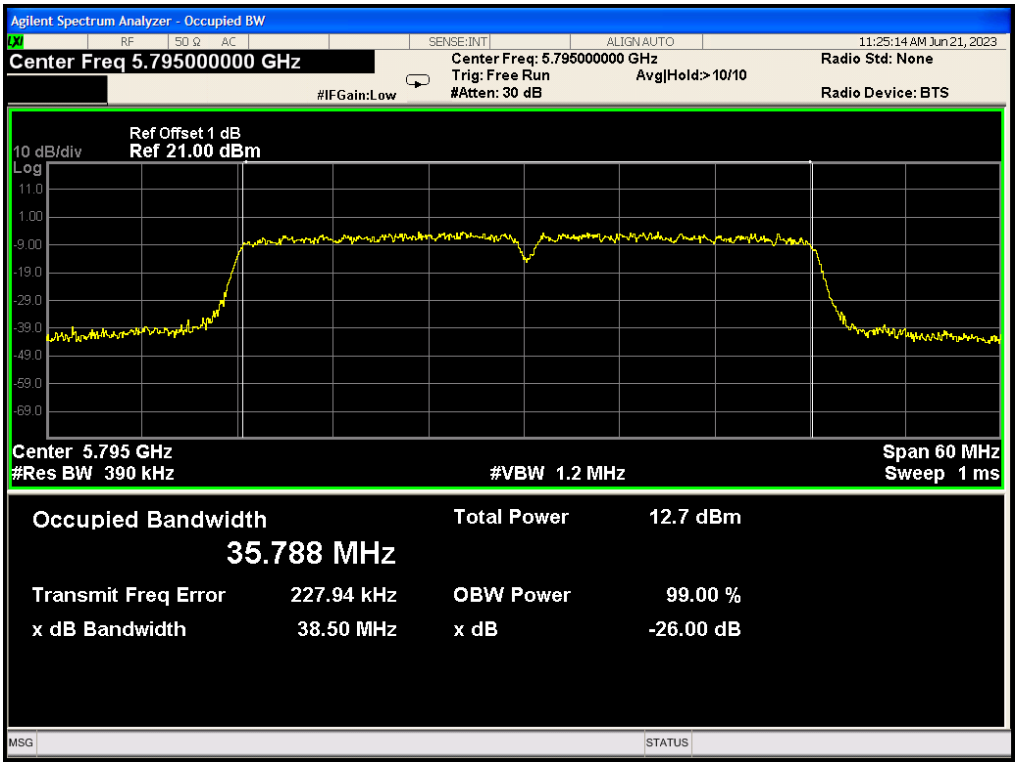
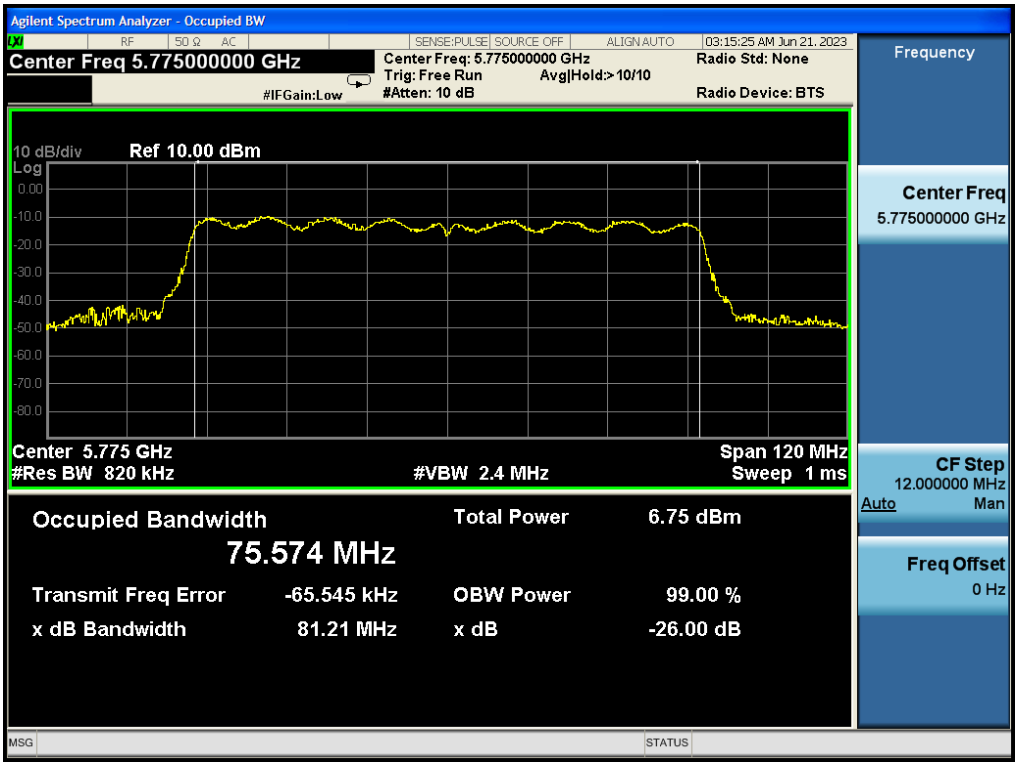
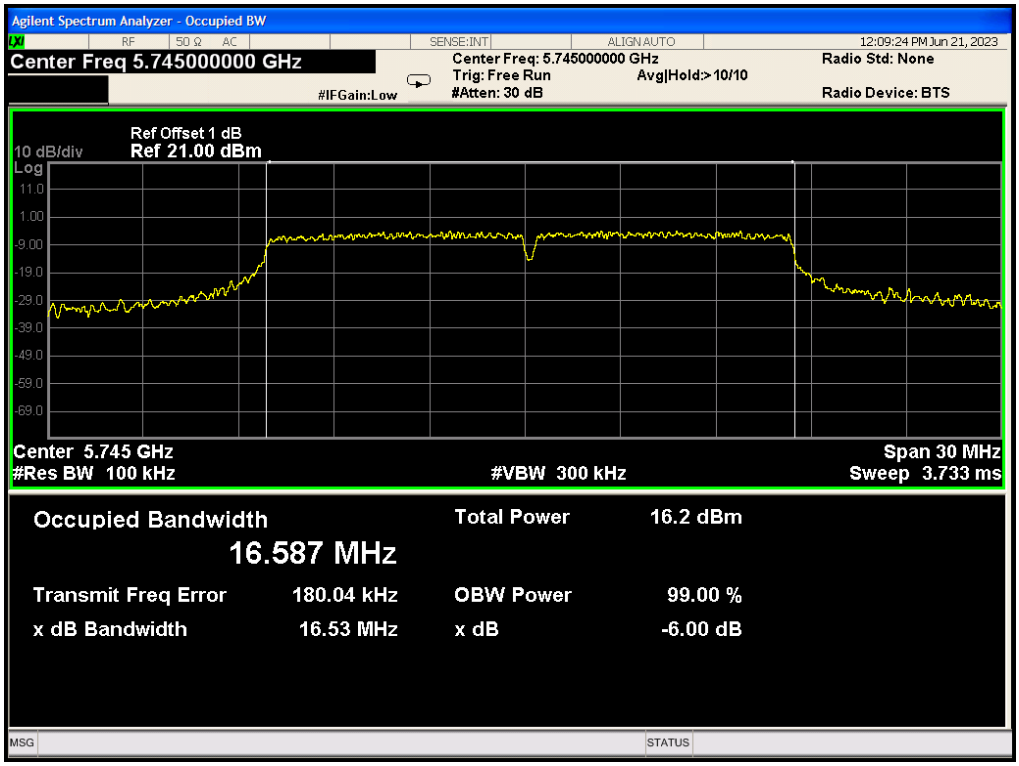


802.11ac40_ANT1_5795_MCS0_OBW

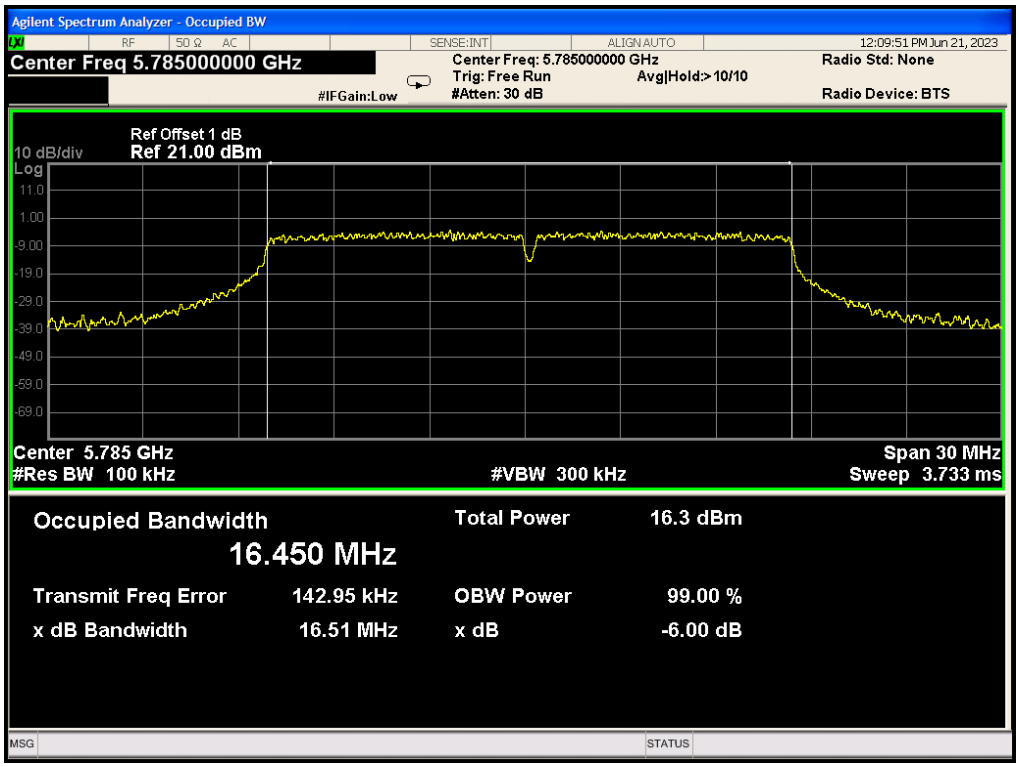


802.11ac80_ANT1_5775_MCS0_OBW

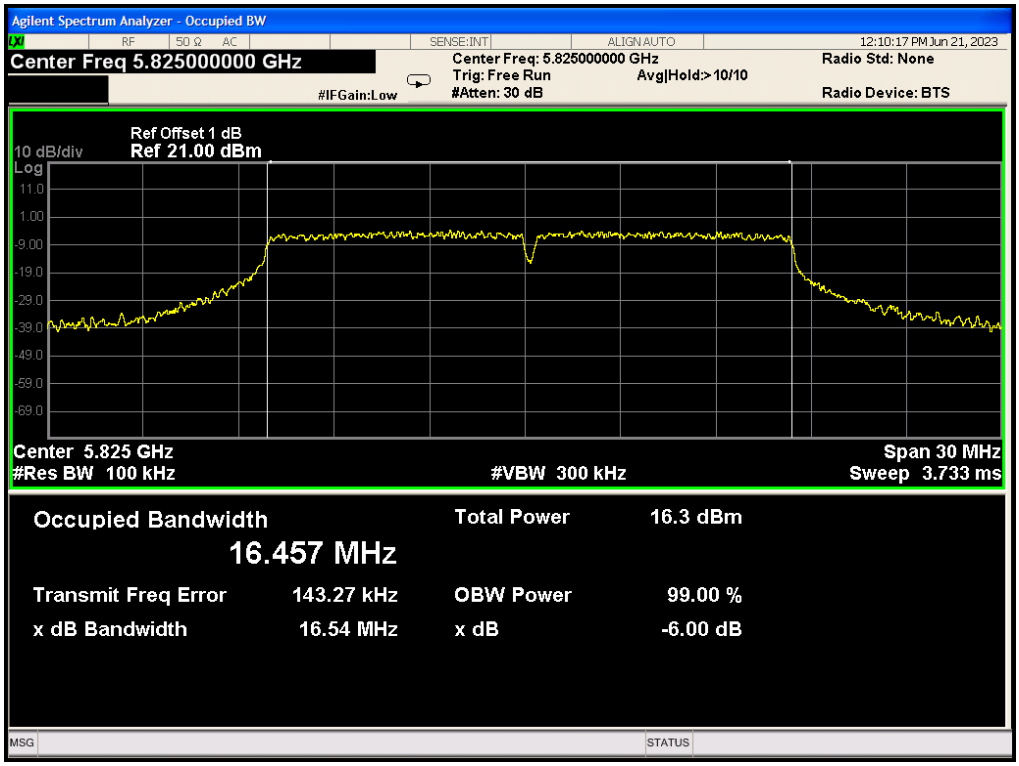
Test Graphs of DTS Bandwidth for band 5.725-5.85 GHz



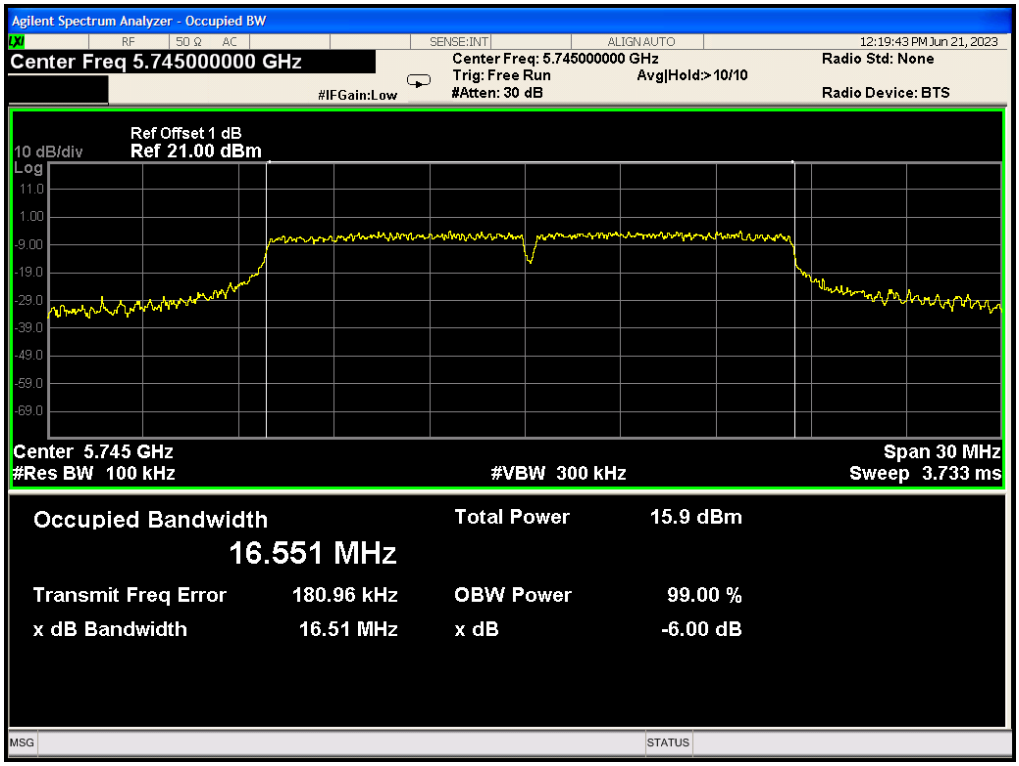
802.11a_ANT1_5745_6Mbps_DTSBW



802.11a_ANT1_5785_6Mbps_DTSBW



802.11a_ANT1_5825_6Mbps_DTSBW



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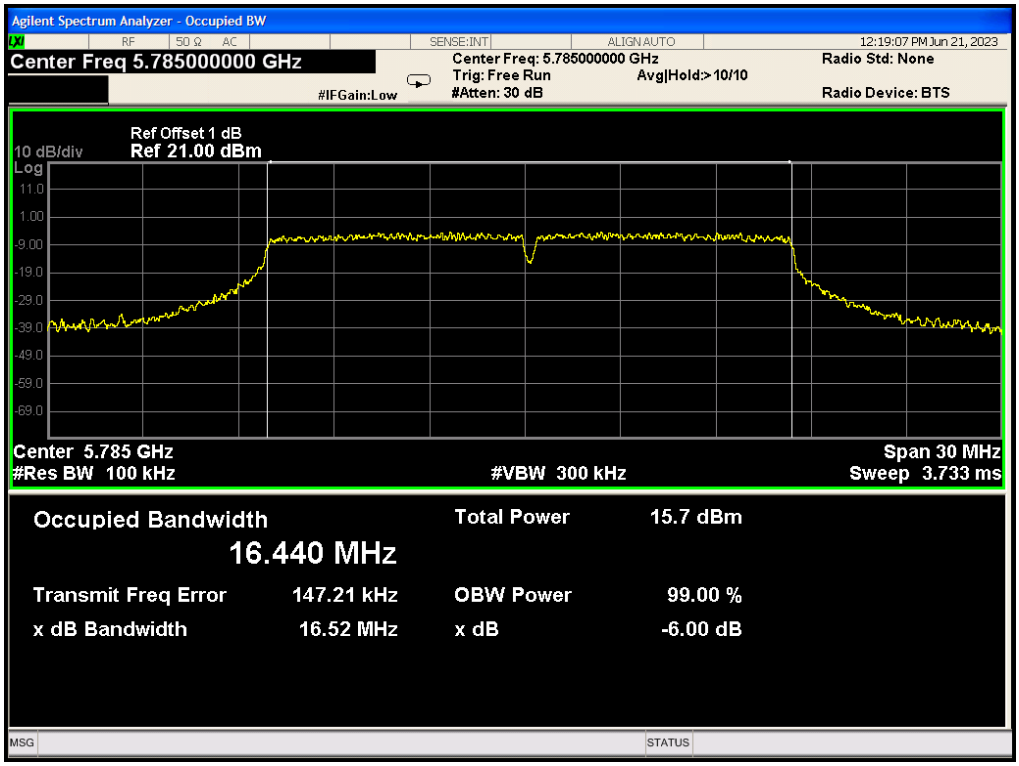
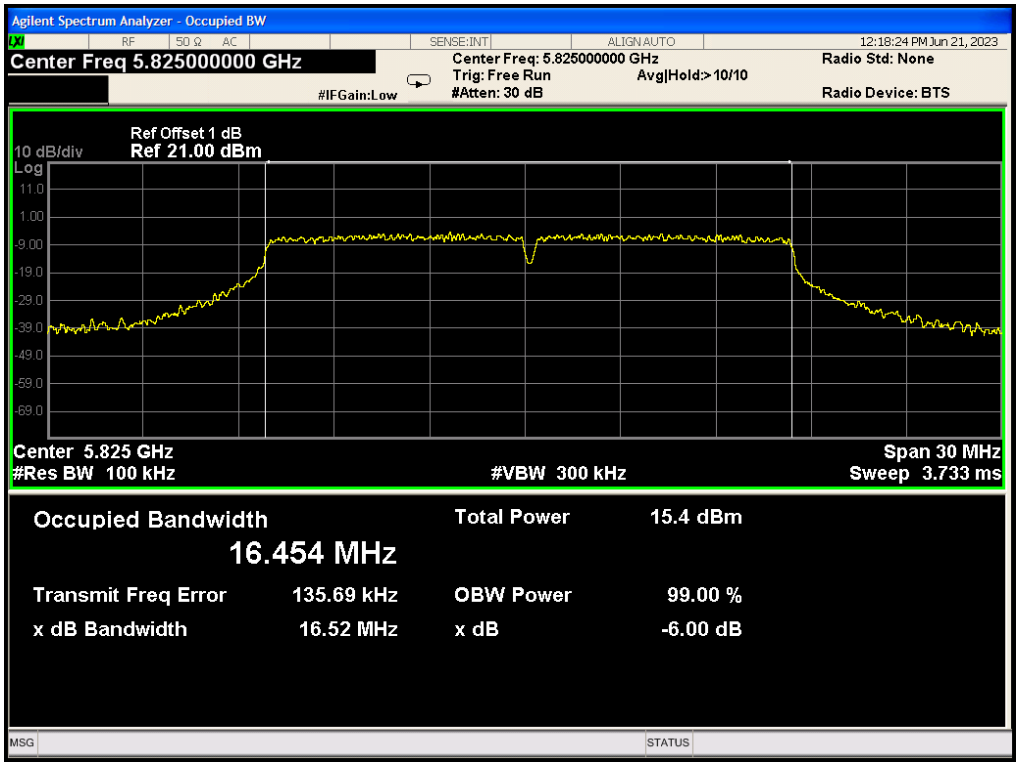
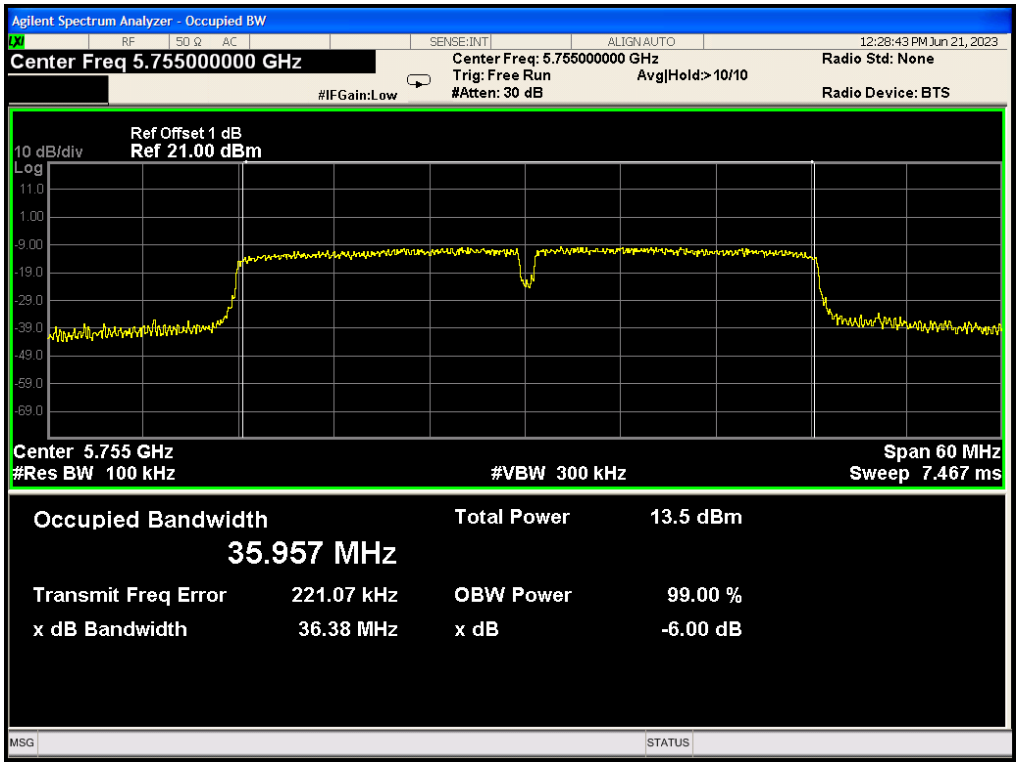


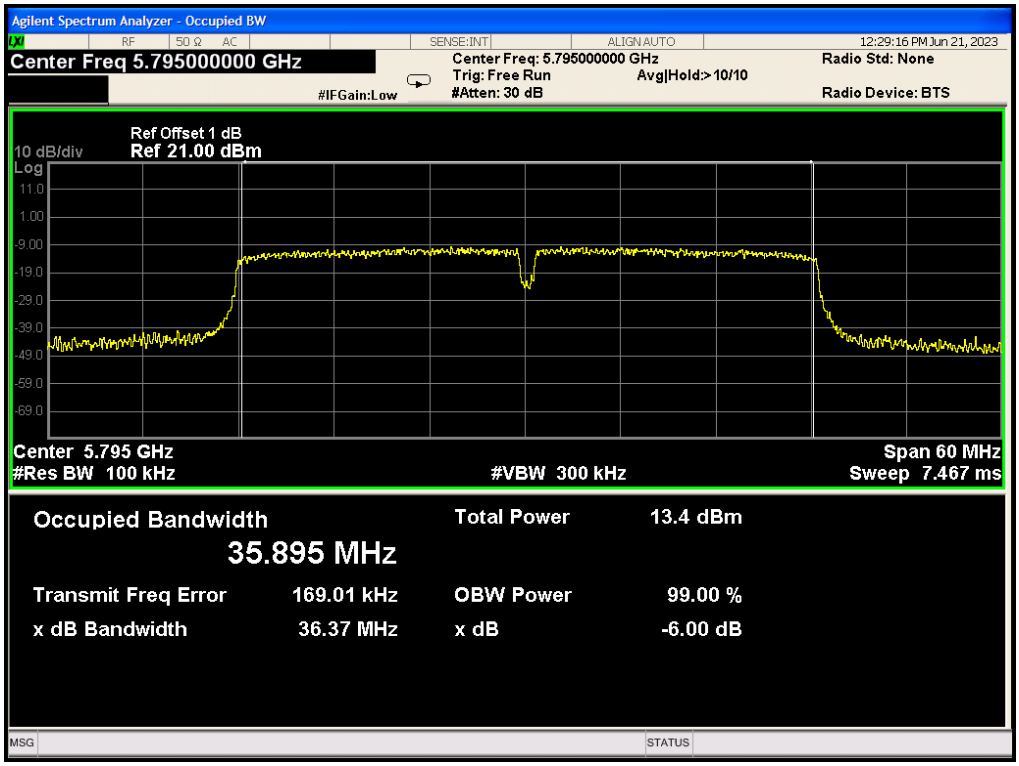
802.11n20_ANT1_5785_MCS0_DTSBW



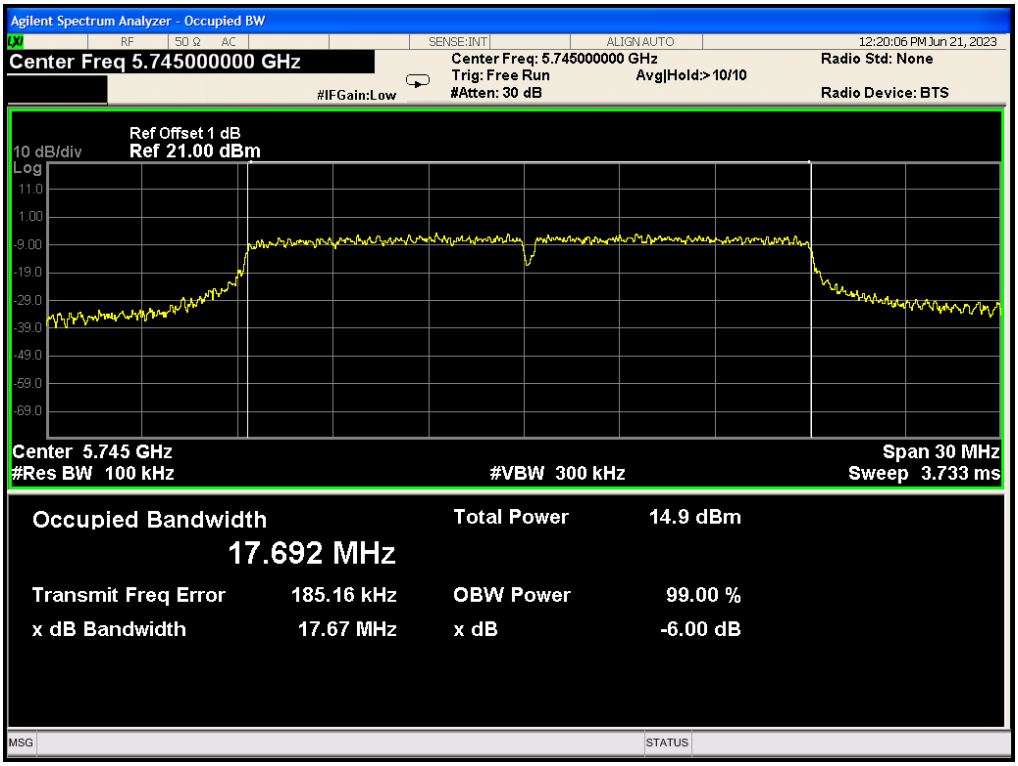
802.11n20_ANT1_5825_MCS0_DTSBW



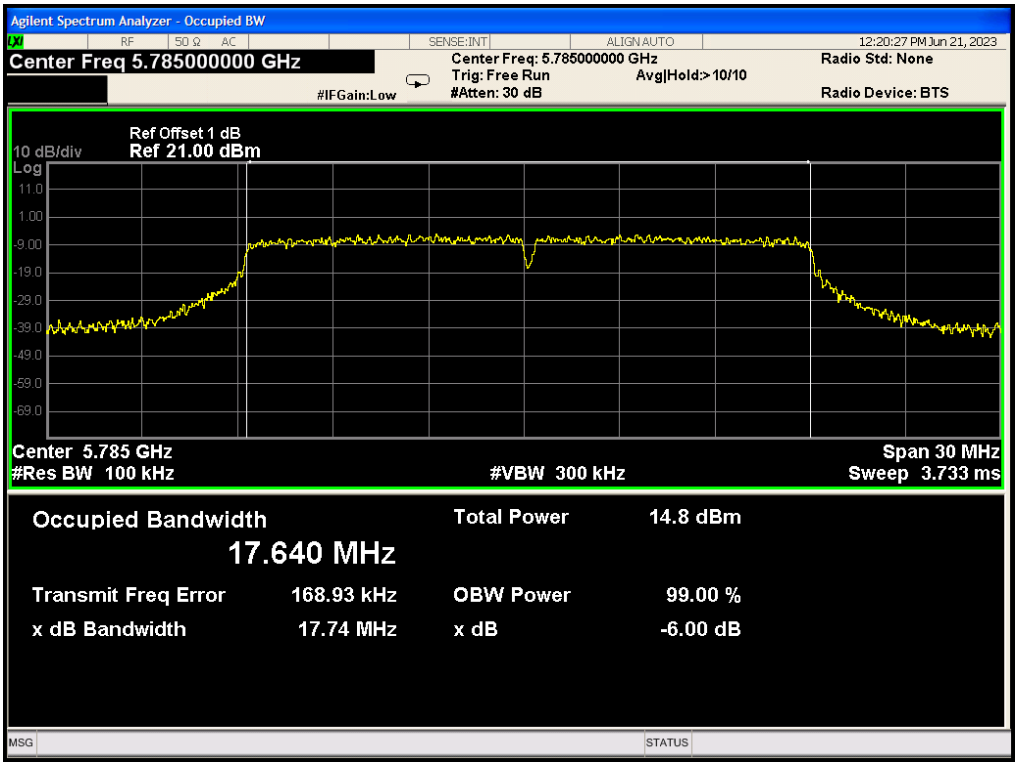
802.11n40_ANT1_5755_MCS0_DTSBW



802.11n40_ANT1_5795_MCS0_DTSBW



802.11ac20_ANT1_5745_MCS0_DTSBW



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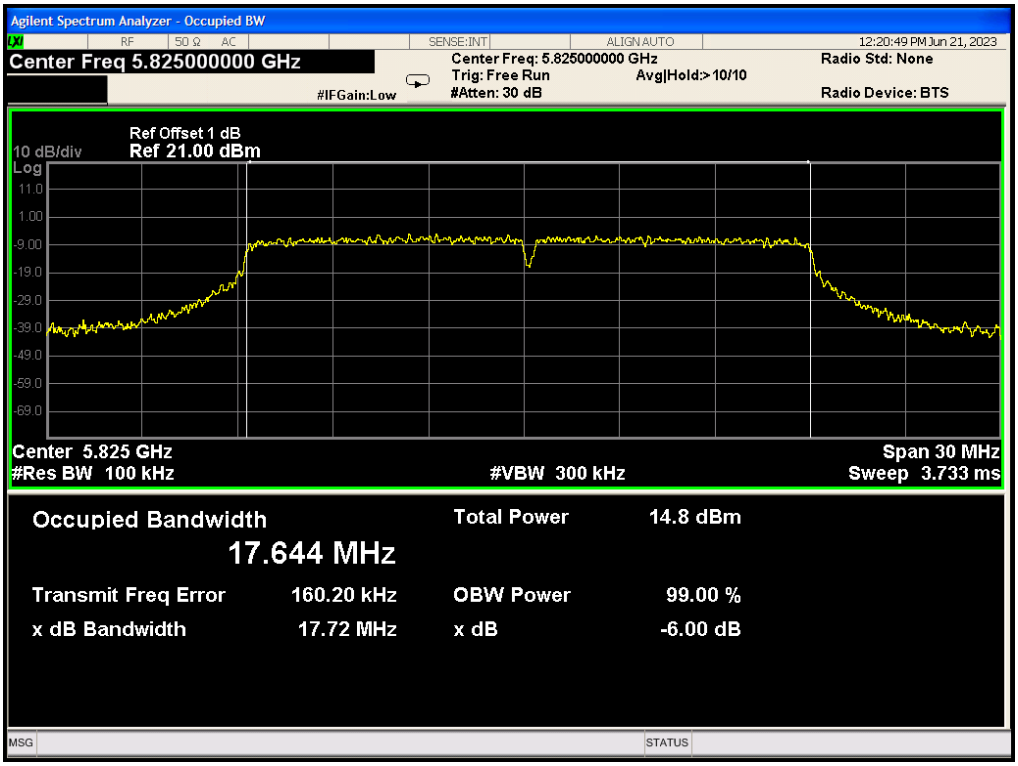

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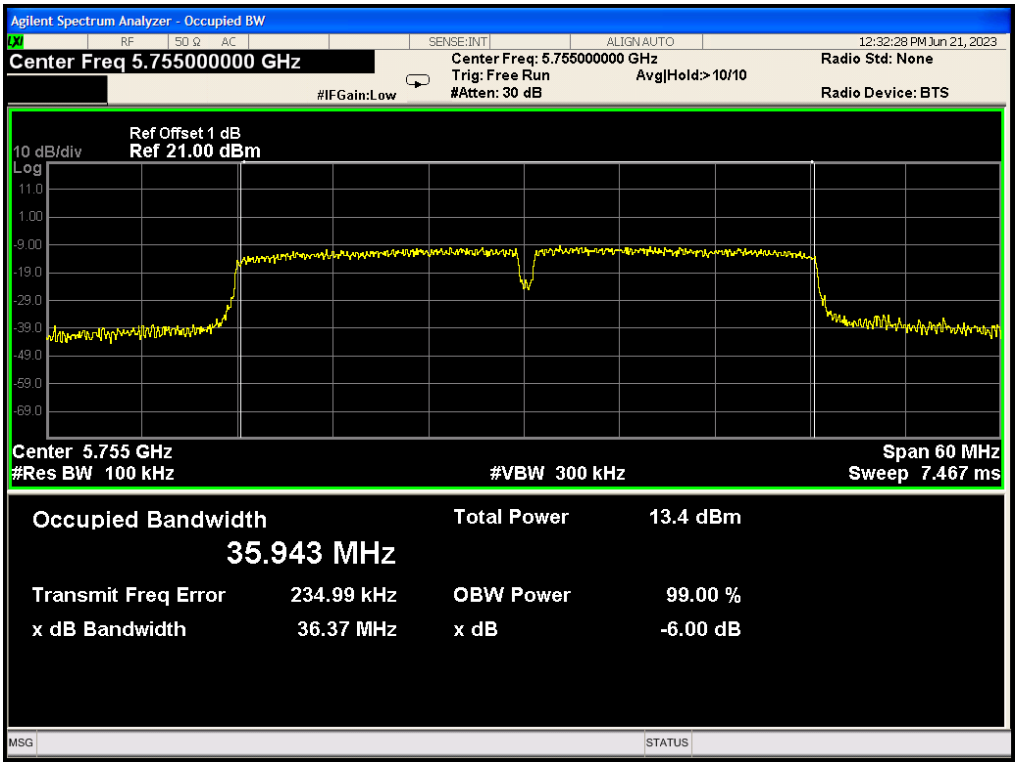
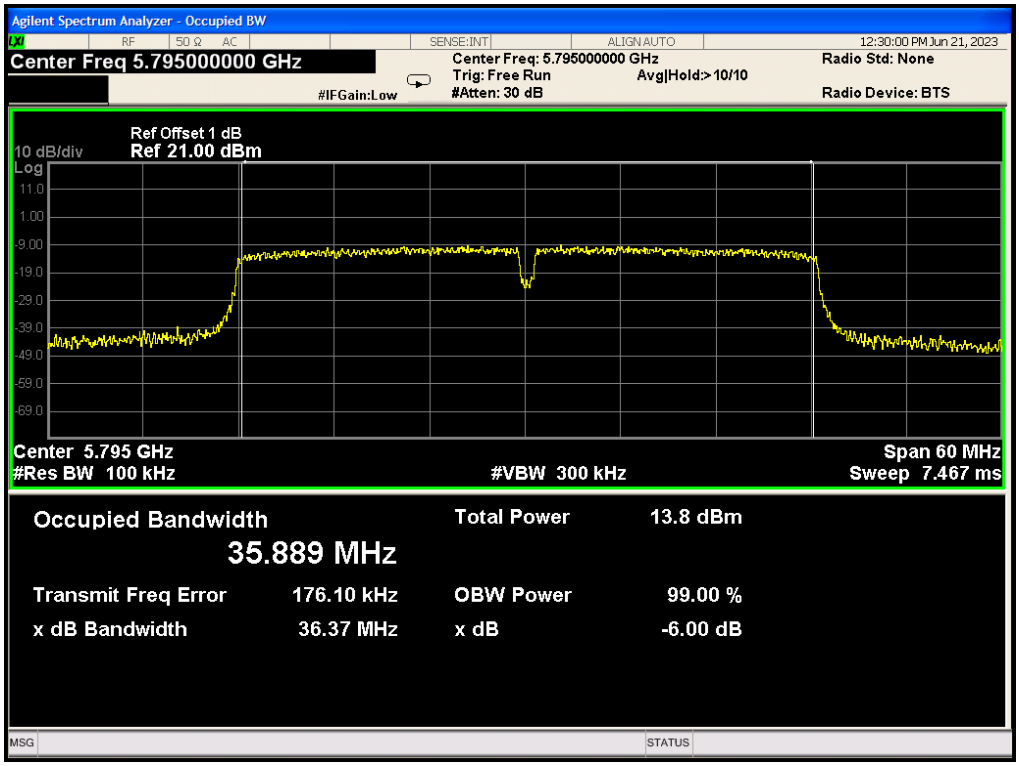
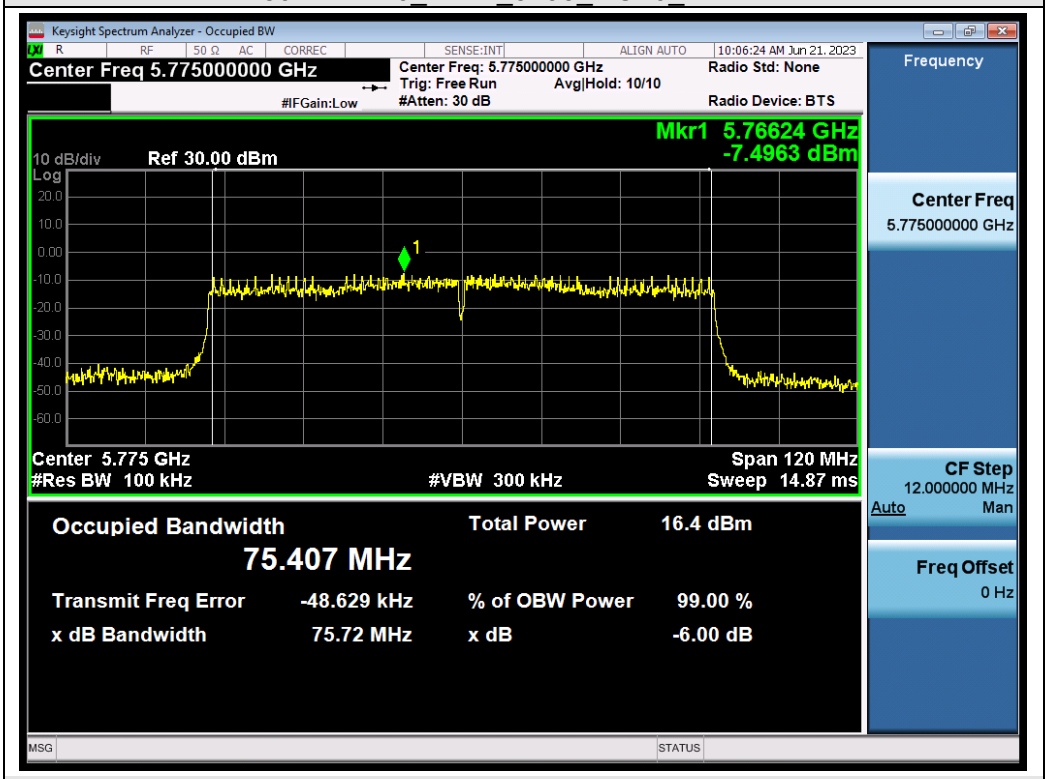


802.11ac40_ANT1_5755_MCS0_DTSBW



802.11ac40_ANT1_5795_MCS0_DTSBW



802.11ac80_ANT1_5775_MCS0_DTSBW

6 MAXIMUM CONDUCTED OUTPUT AVERAGE POWER SPECTRAL DENSITY

6.1 TEST LIMIT

FCC CFR Title 47 Part 15 Subpart E Section 15.407(a):

FCC Part 15 Subpart E(15.407)		
Test Item	**Limit**	**Frequency Range(MHz)**
Power Spectral Density	Outdoor AP, Indoor AP and Point-to-point AP : 17dBm/MHz Client devices : 11dBm/MHz	5150~5250
	11dBm/MHz	5250~5350
	11dBm/MHz	5470~5725
	30dBm/500kHz	5725~5850

6.2 TEST PROCEDURE

The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement is according to KDB 789033 D02 General UNII Test Procedures New Rules V02r01.

(1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
(2) Set analyser centre frequency to transmitting frequency.
(3) Set the span to encompass the entire emissions bandwidth (EBW)(alternatively, the entire 99% OBW) of the signal.
(4) Set the RBW to: 1 MHz
(5) Set the VBW to: 3 MHz
(6) Detector: RMS
(7) Trace: Max Hold
(7) Sweep time: auto
(8) Trace average at least 100 traces in power averaging.
(9) User the peak marker function to determine the maximum amplitude level within the RBW. Apply correction to the result if different RBW is used.

NOTE: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

6.3 TEST SET-UP

Same as 5.3.

6.4 EQUIPMENT USED

Same as Radiated Emission Measurement.

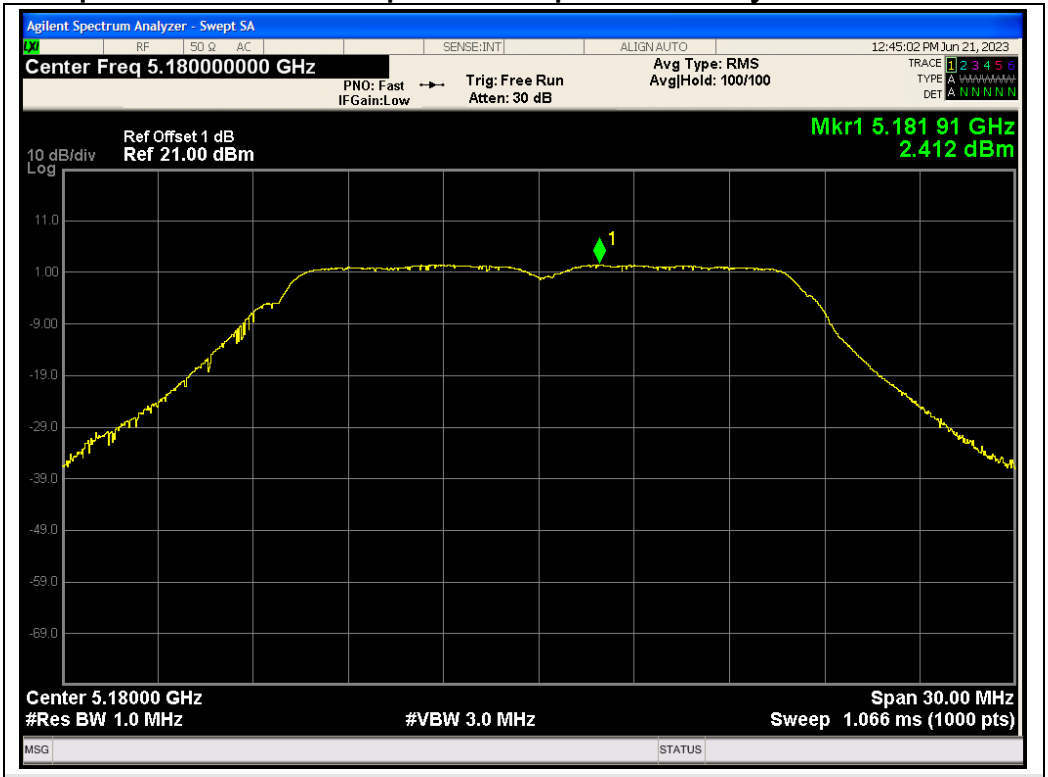
6.5 TEST RESULT

PASS

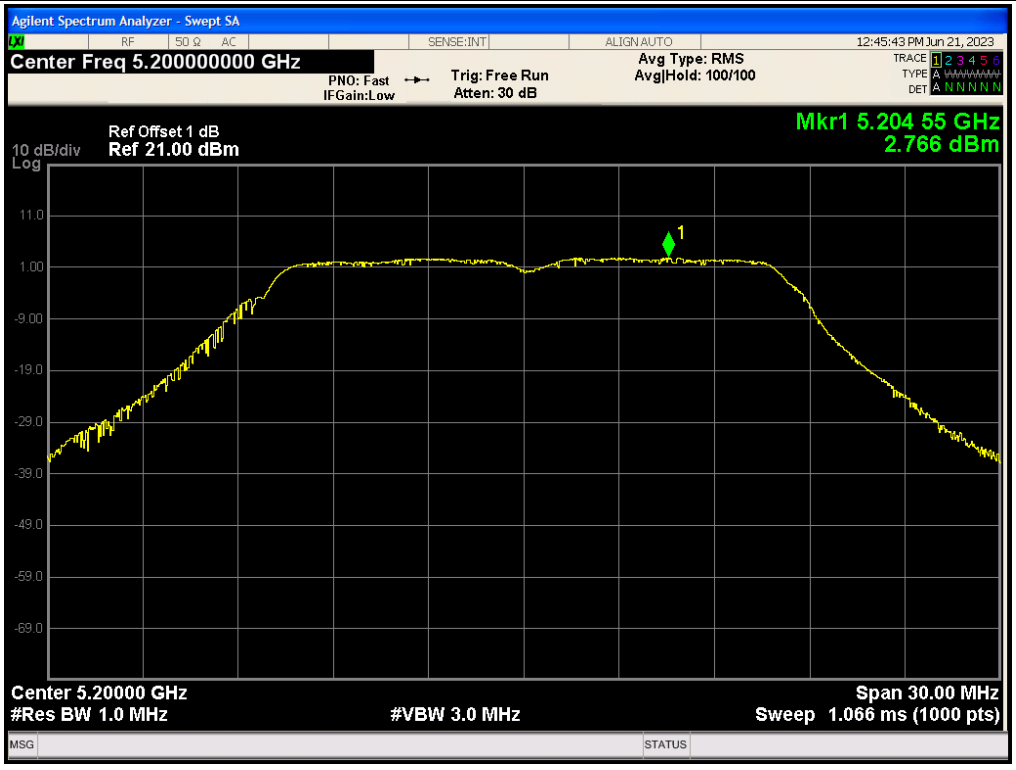
Test Data of Conducted Output Power Density for band 5.15-5.25 GHz				
Test Mode	Test Channel (MHz)	Average Power Density (dBm/MHz)	Limits (dBm/MHz)	Pass or Fail
802.11a	5180	2.412	11	Pass
	5200	2.766	11	Pass
	5240	3.301	11	Pass
802.11n20	5180	3.714	11	Pass
	5200	1.661	11	Pass
	5240	3.001	11	Pass
802.11n40	5190	1.124	11	Pass
	5230	3.600	11	Pass
802.11ac20	5180	2.230	11	Pass
	5200	2.835	11	Pass
	5240	4.393	11	Pass
802.11ac40	5190	0.368	11	Pass
	5230	2.663	11	Pass
802.11ac80	5210	-4.877	11	Pass

Test Data of Conducted Output Power Density for band 5.725-5.85 GHz				
Test Mode	Test Channel(MHz)	Average Power Density(dBm/500kHz)	Limits (dBm/500kHz)	Pass or Fail
802.11a	5745	0.490	30	Pass
	5785	1.957	30	Pass
	5825	1.638	30	Pass
802.11n20	5745	2.278	30	Pass
	5785	2.660	30	Pass
	5825	2.249	30	Pass
802.11n40	5755	1.011	30	Pass
	5795	1.641	30	Pass
802.11ac20	5745	3.818	30	Pass
	5785	2.375	30	Pass
	5825	2.350	30	Pass
802.11ac40	5755	0.411	30	Pass
	5795	1.322	30	Pass
802.11ac80	5775	-10.025	30	Pass

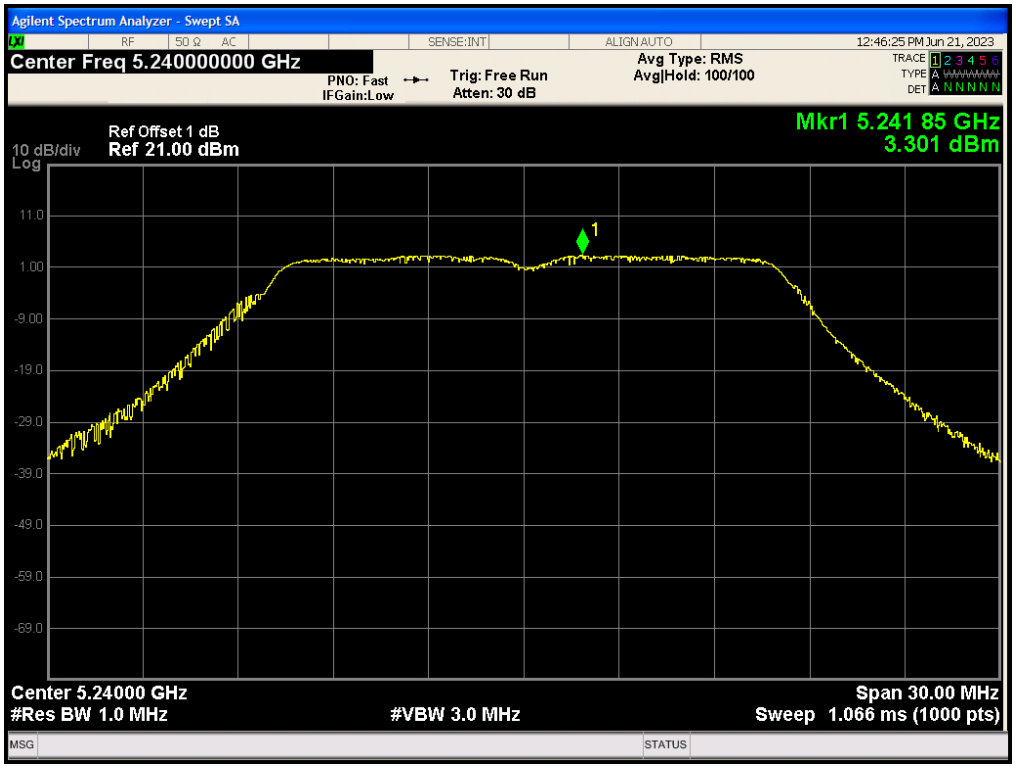
Test Graphs of Conducted Output Power Spectral Density for band 5.15-5.25 GHz



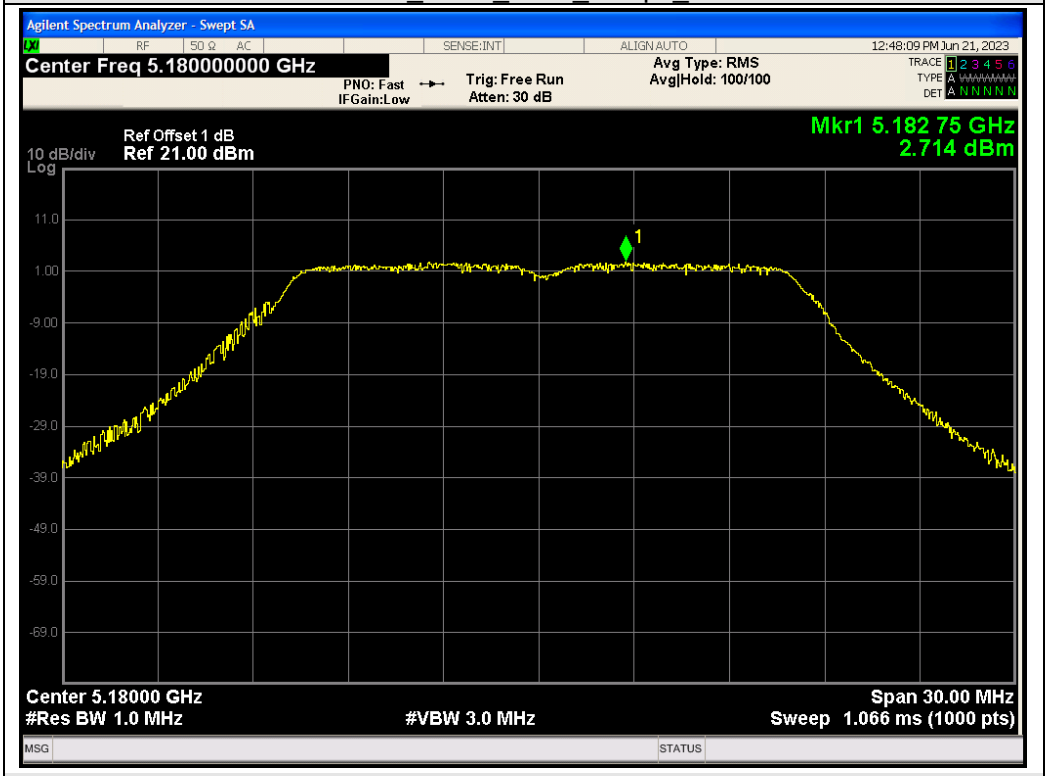
802.11a_ANT1_5180_6Mbps_PSD



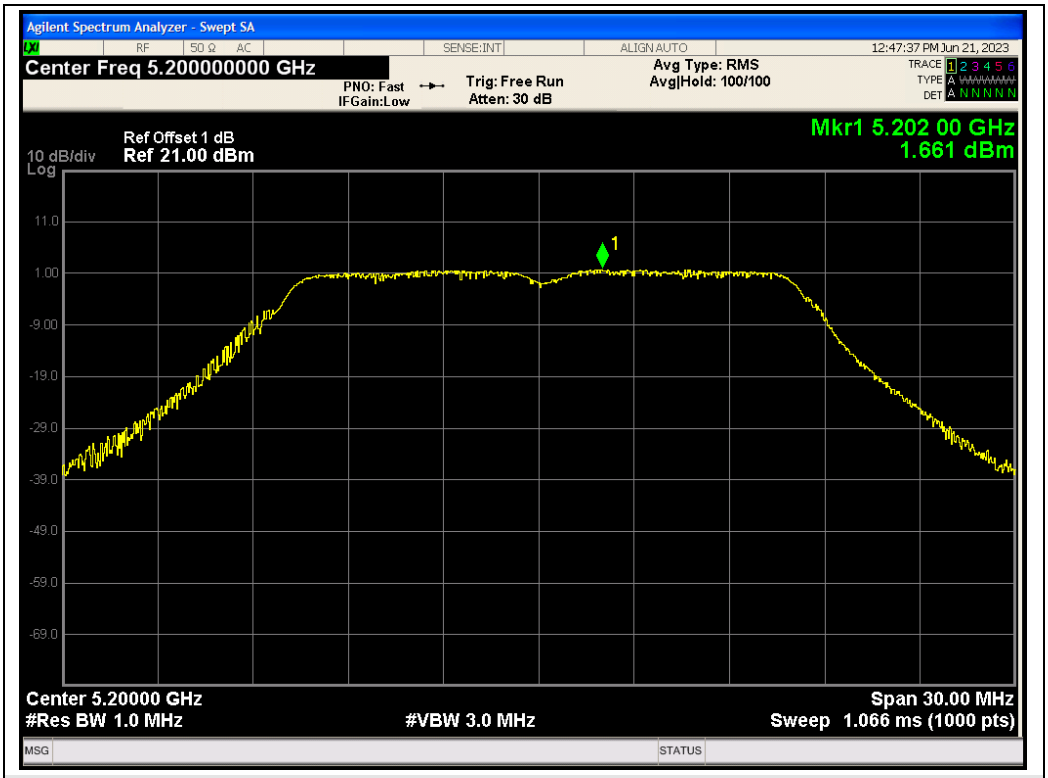
802.11a_ANT1_5200_6Mbps_PSD



802.11a_ANT1_5240_6Mbps_PSD



802.11n20_ANT1_5180_MCS0_PSD



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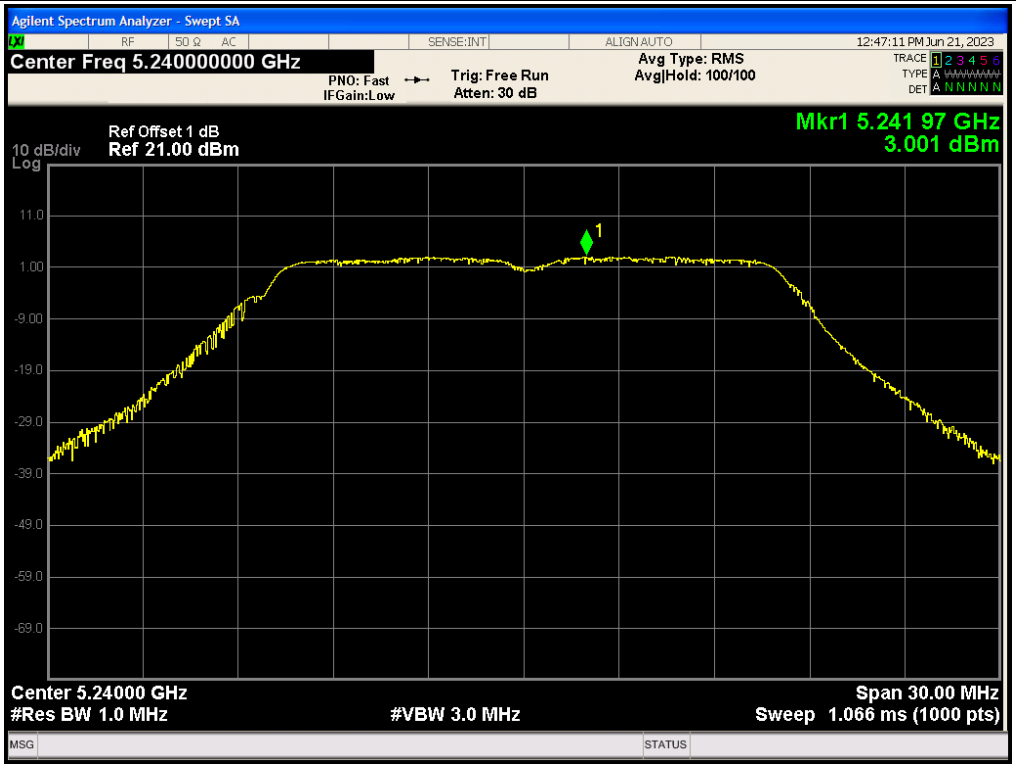

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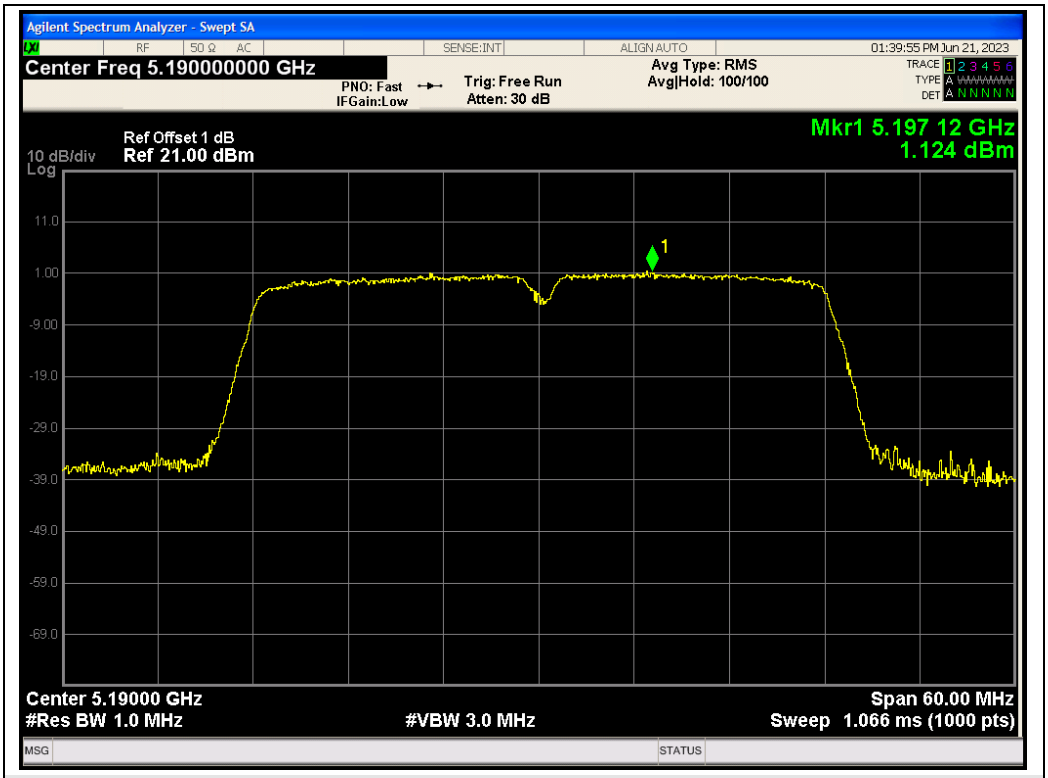
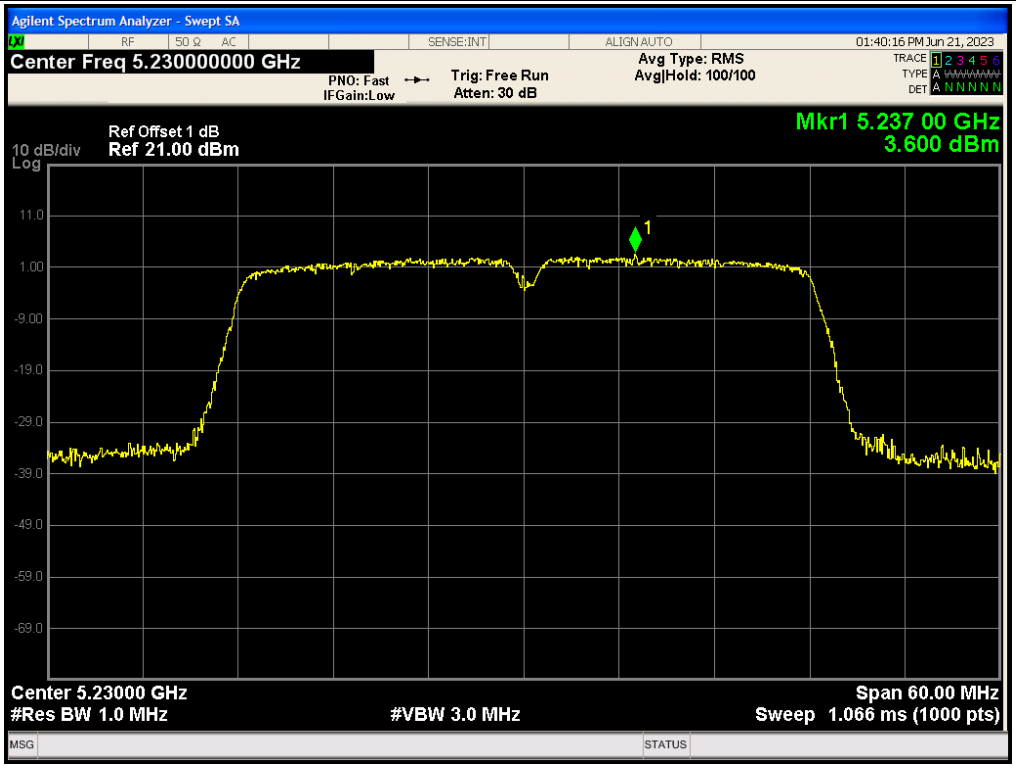
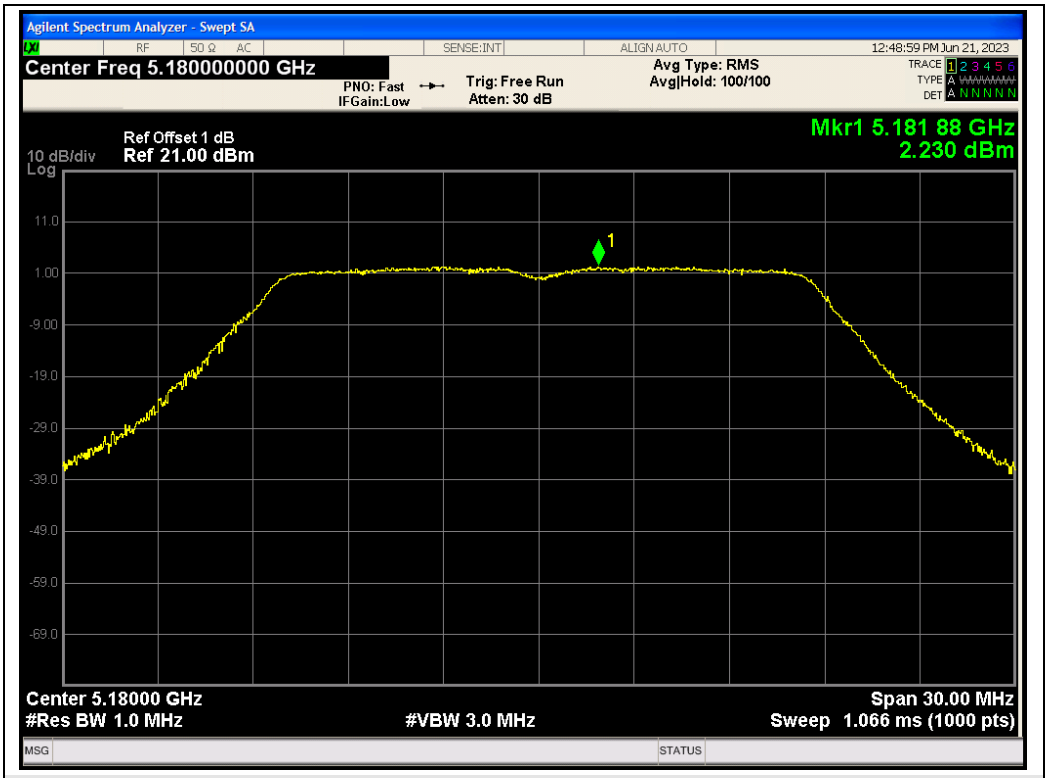


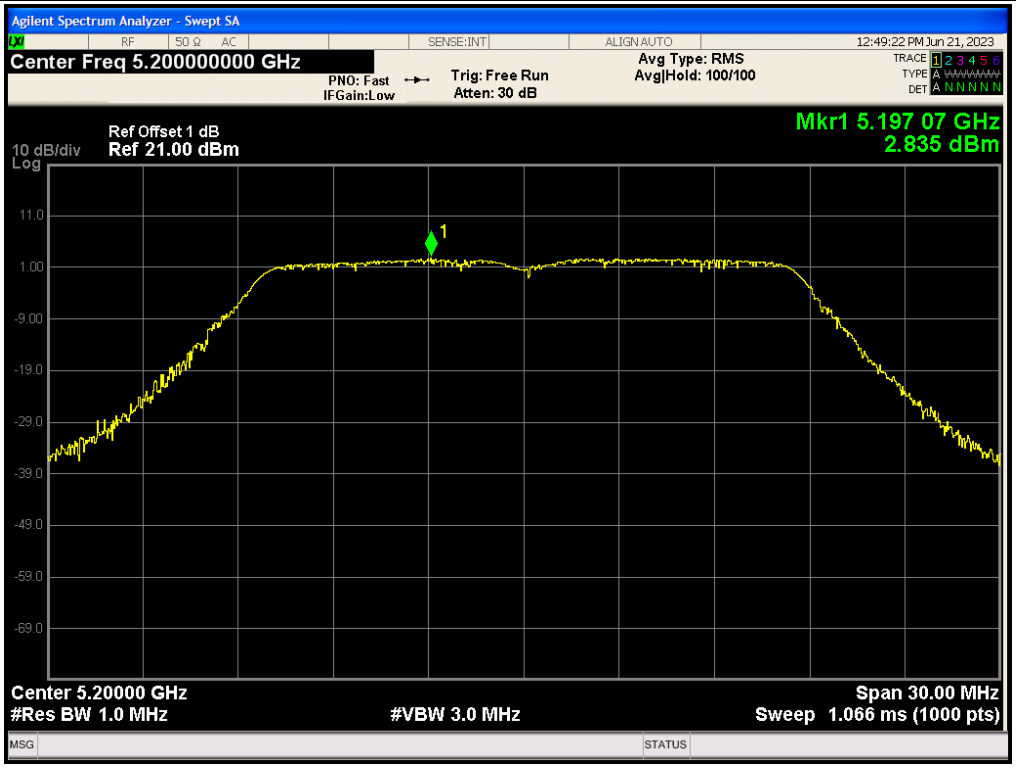
802.11n40_ANT1_5190_MCS0_PSD



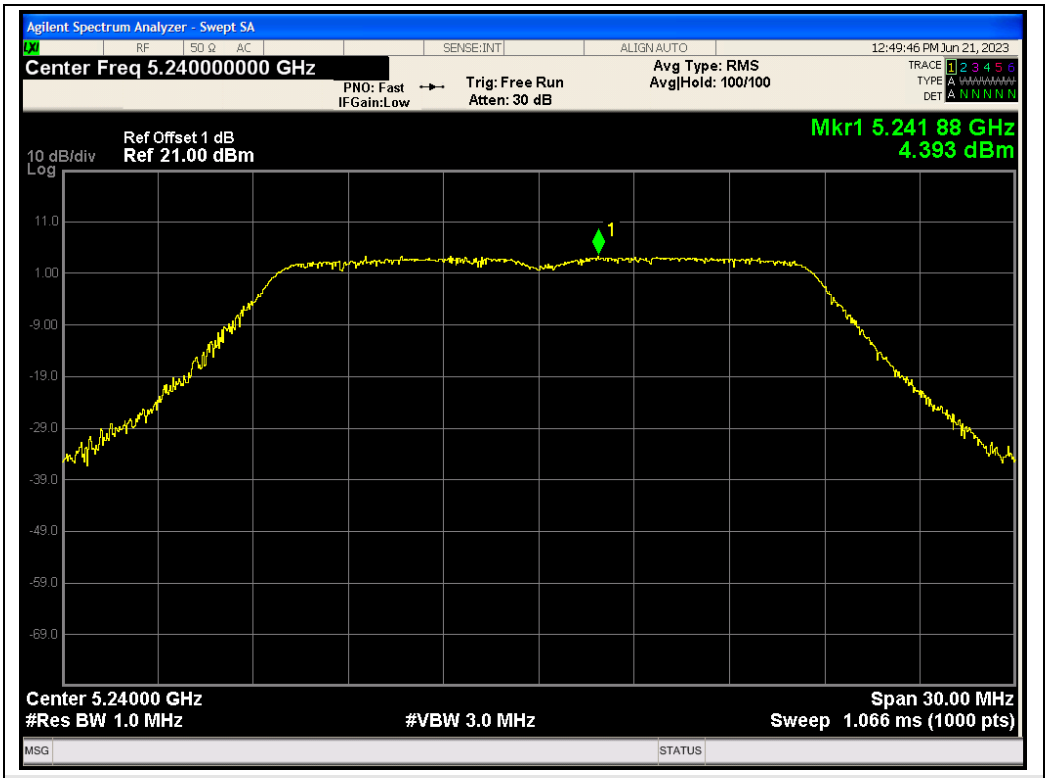
802.11n40_ANT1_5230_MCS0_PSD



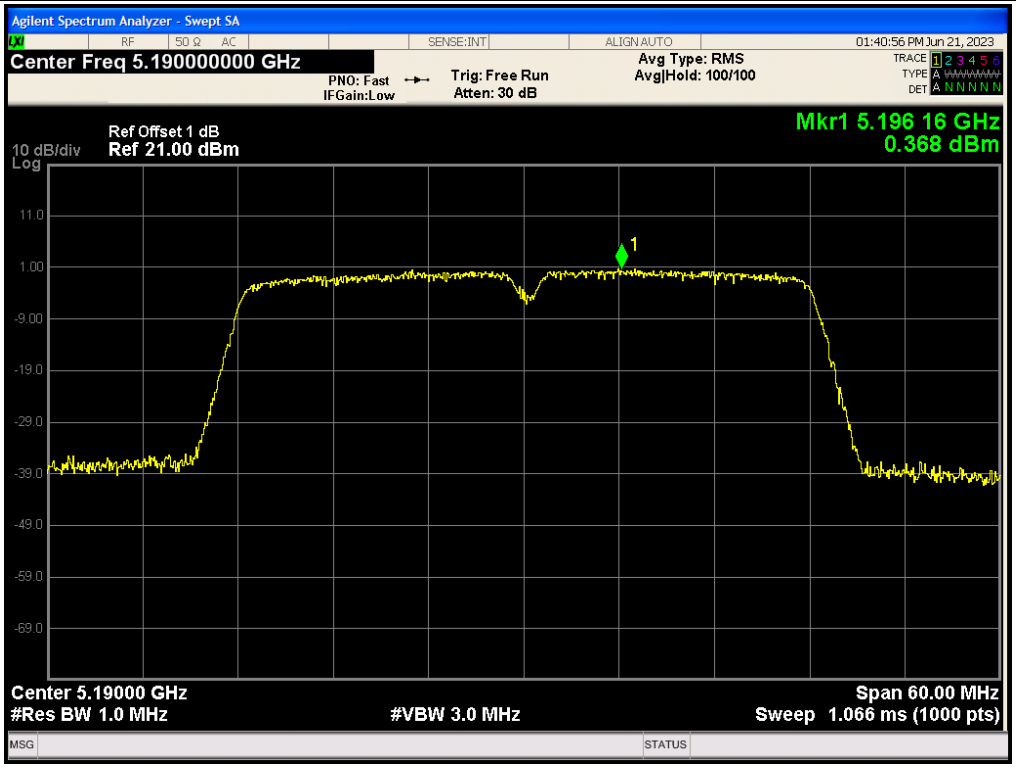
802.11ac20_ANT1_5180_MCS0_PSD



802.11ac20_ANT1_5200_MCS0_PSD



802.11ac20_ANT1_5240_MCS0_PSD



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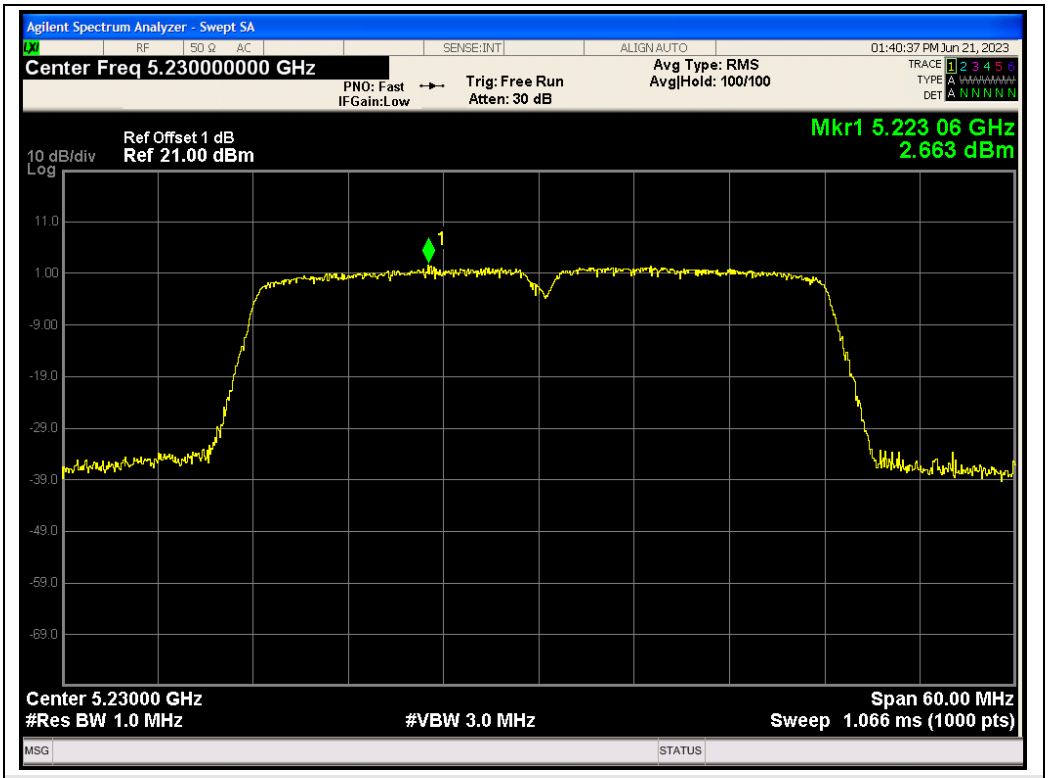
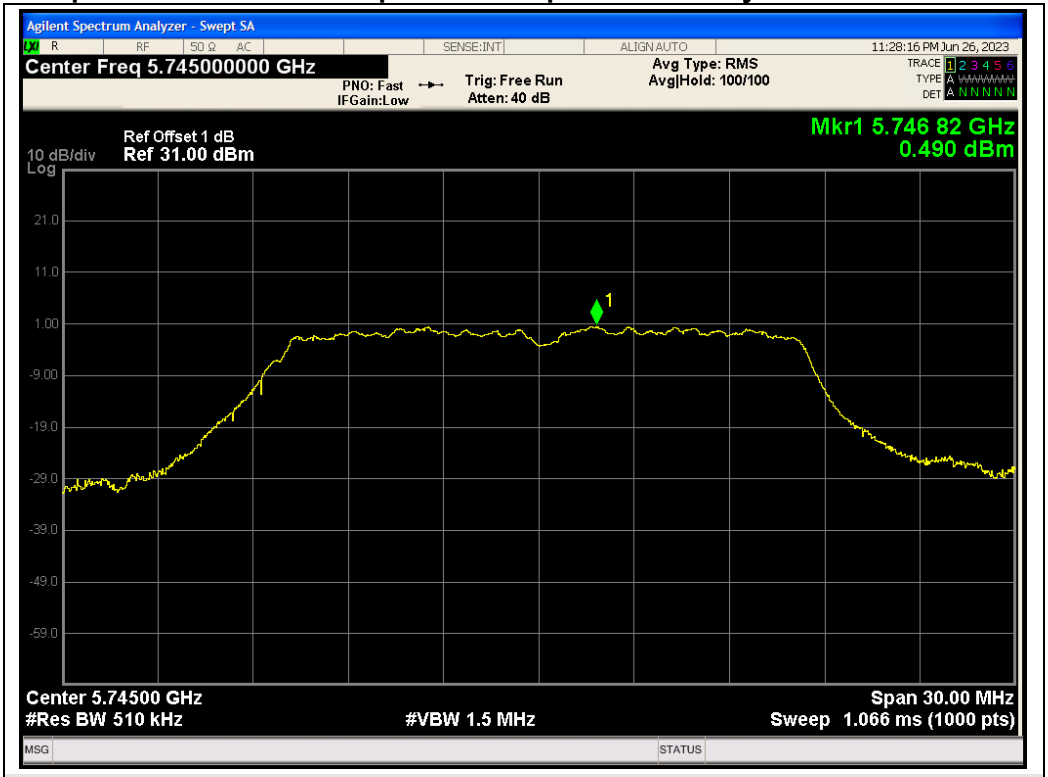


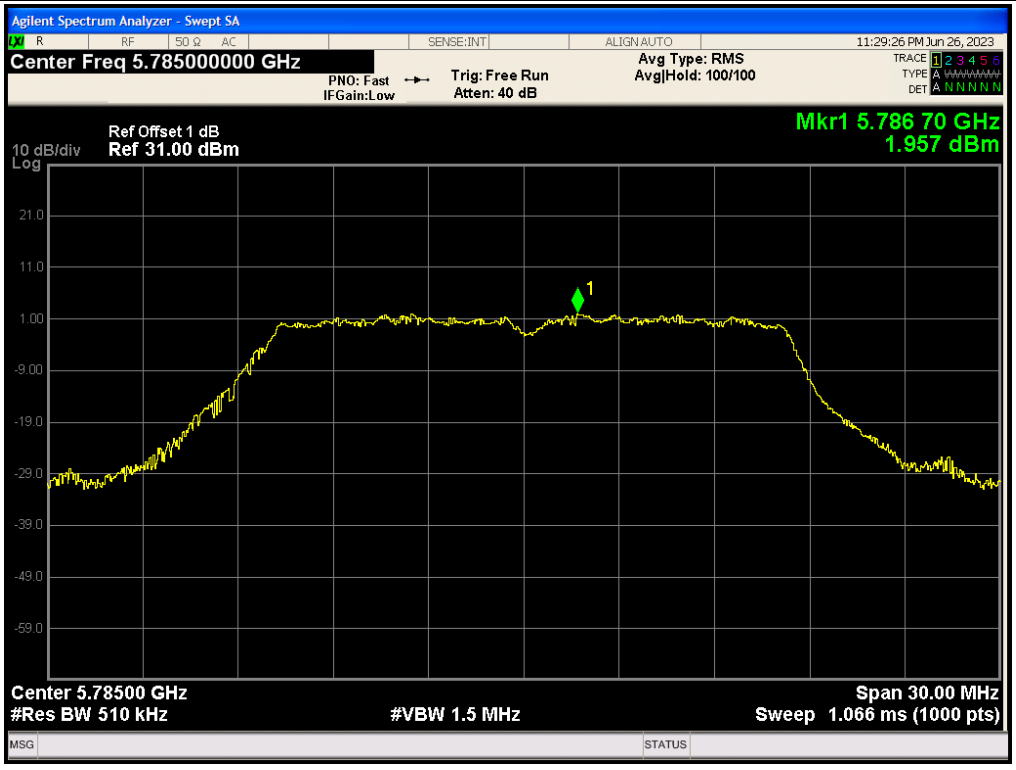
802.11ac40_ANT1_5230_MCS0_PSD

802.11ac80_ANT1_5210_MCS0_PSD

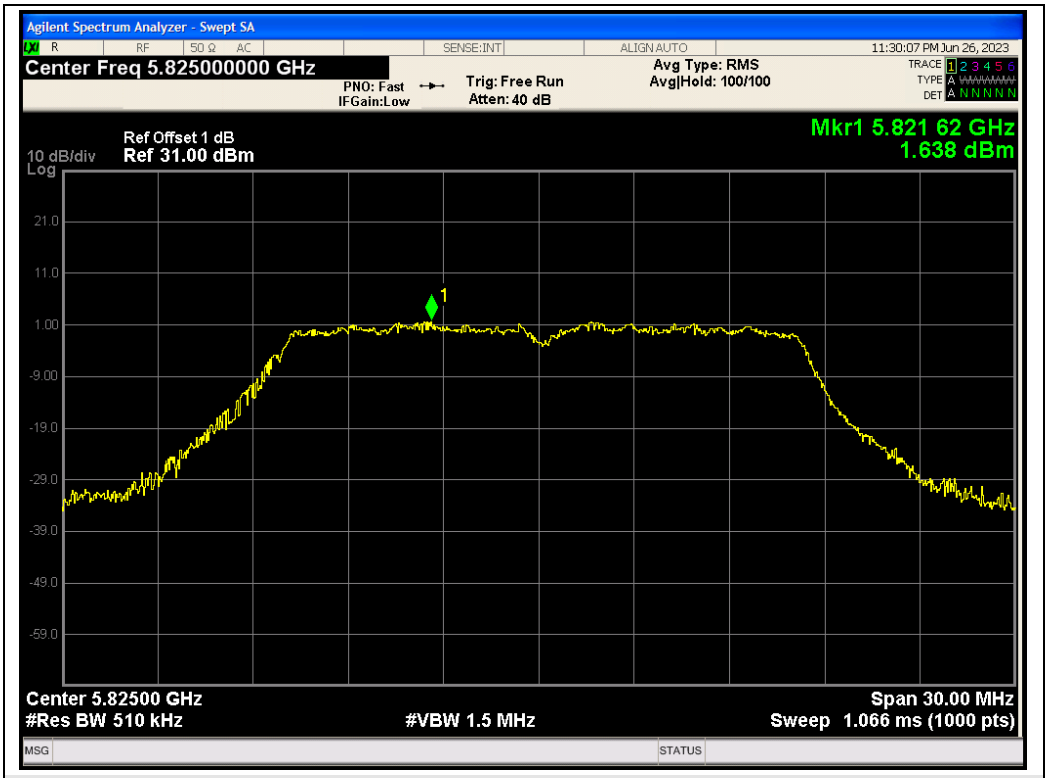
Test Graphs of Conducted Output Power Spectral Density for band 5.725-5.85 GHz



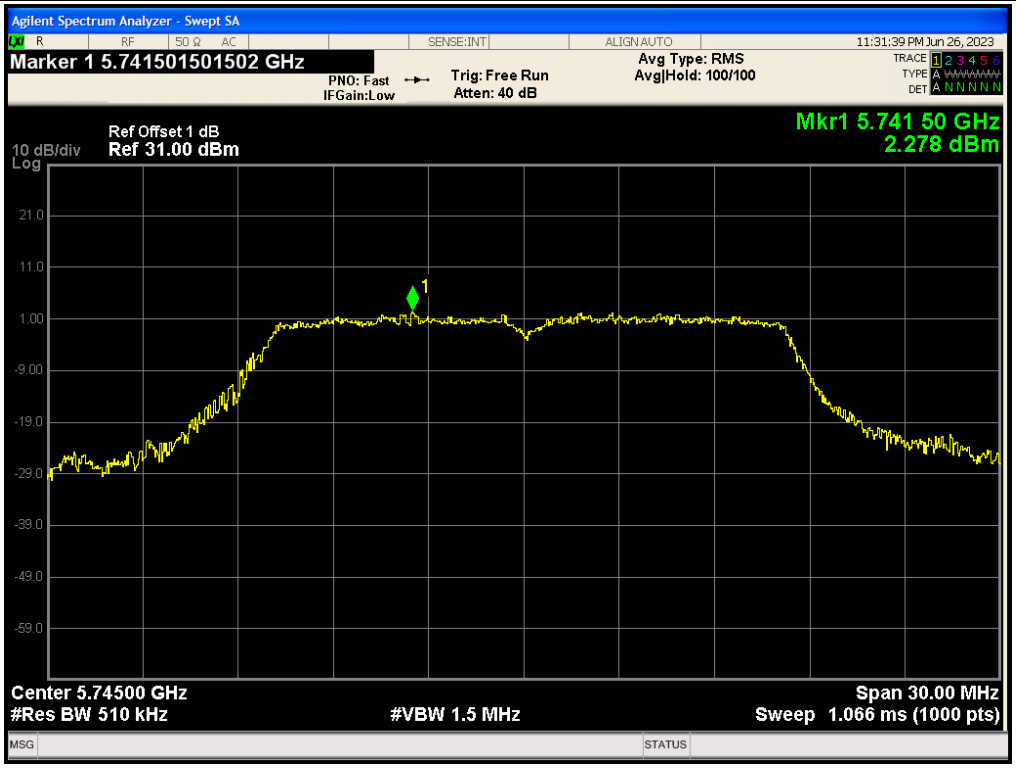
802.11a_ANT1_5745_6Mbps_PSD



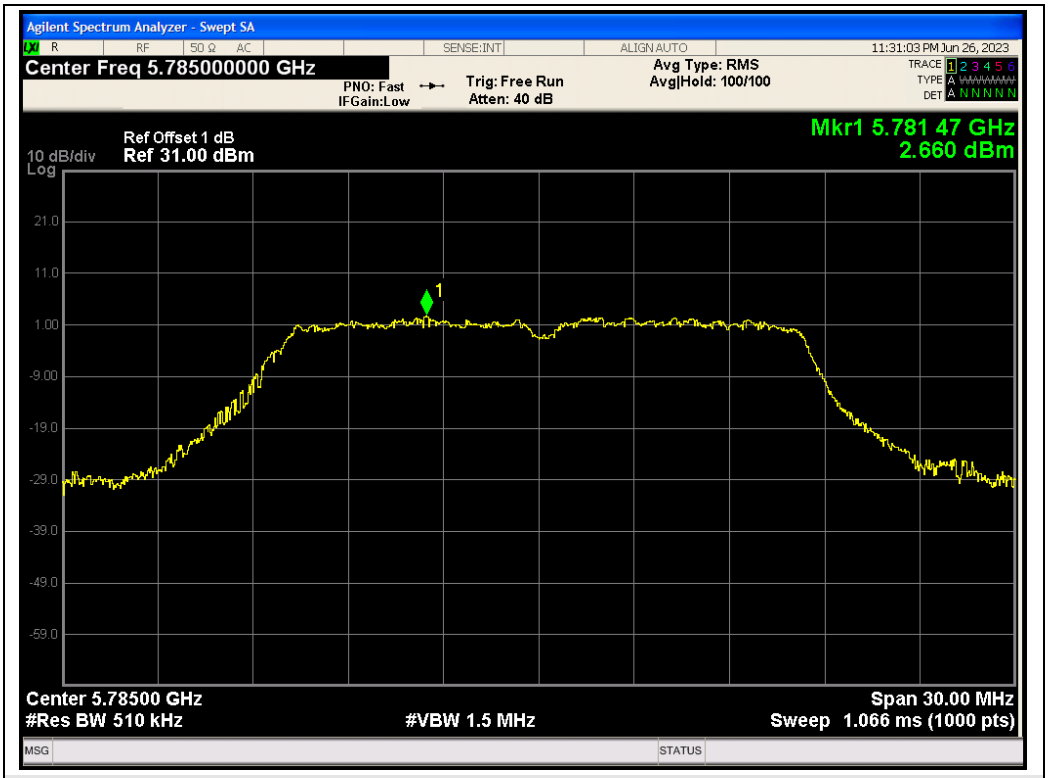
802.11a_ANT1_5785_6Mbps_PSD



802.11a_ANT1_5825_6Mbps_PSD



802.11n20_ANT1_5745_MCS0_PSD



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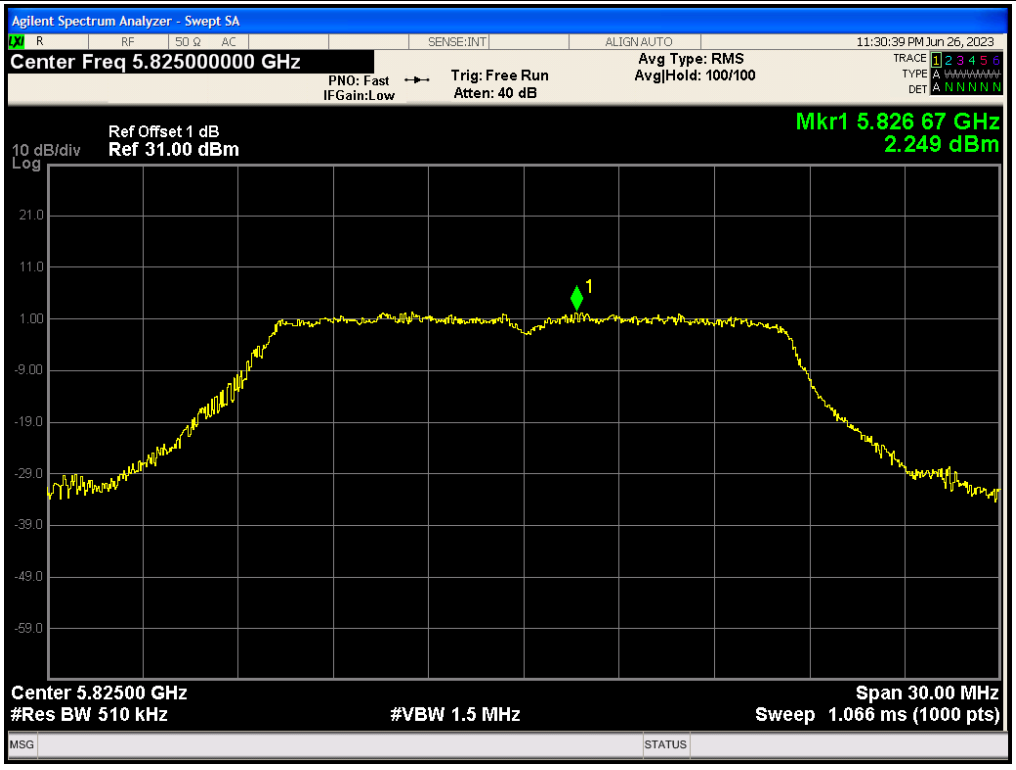
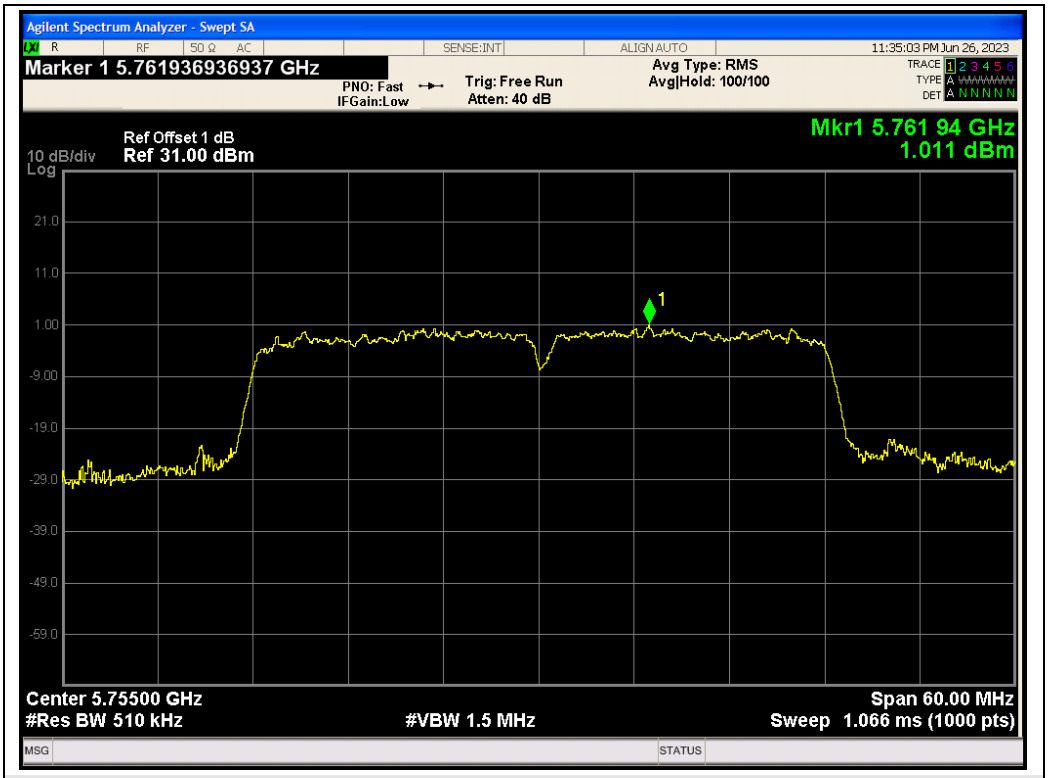
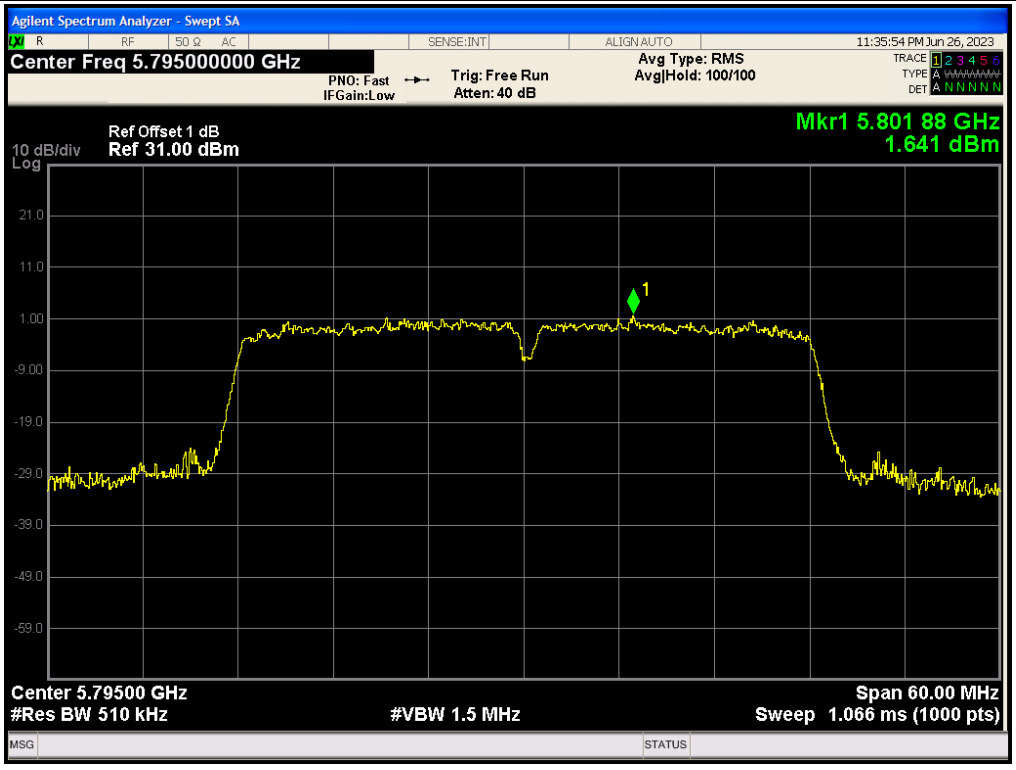


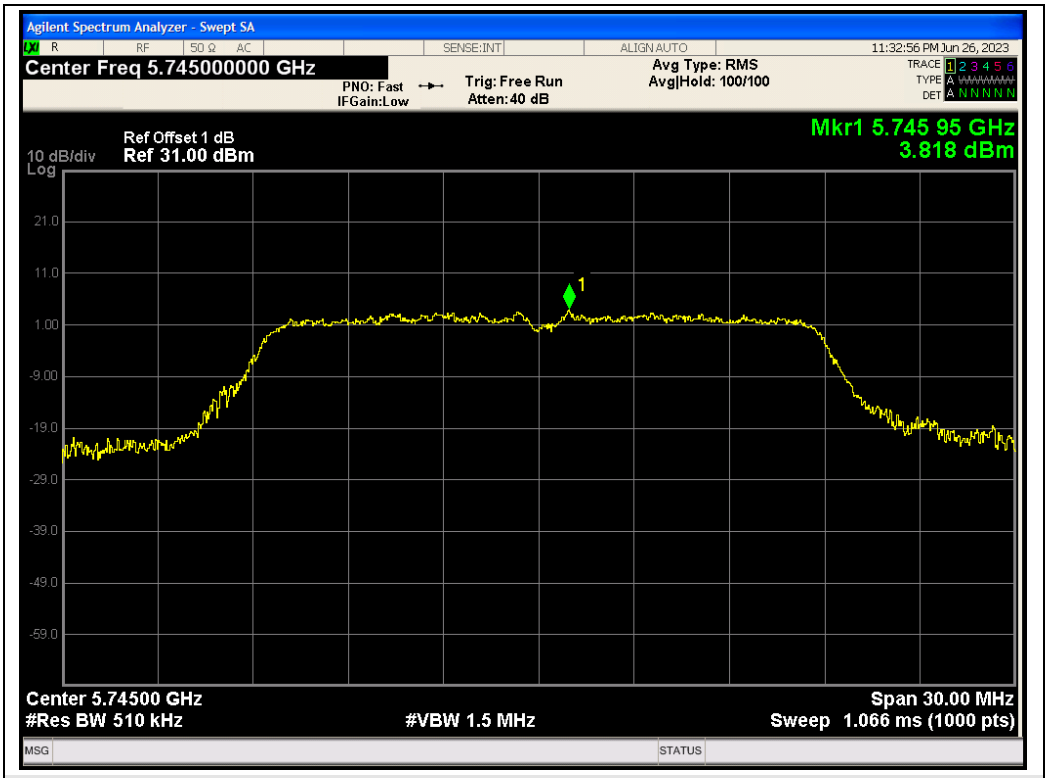
802.11n20_ANT1_5825_MCS0_PSD



802.11n40_ANT1_5755_MCS0_PSD



802.11n40_ANT1_5795_MCS0_PSD



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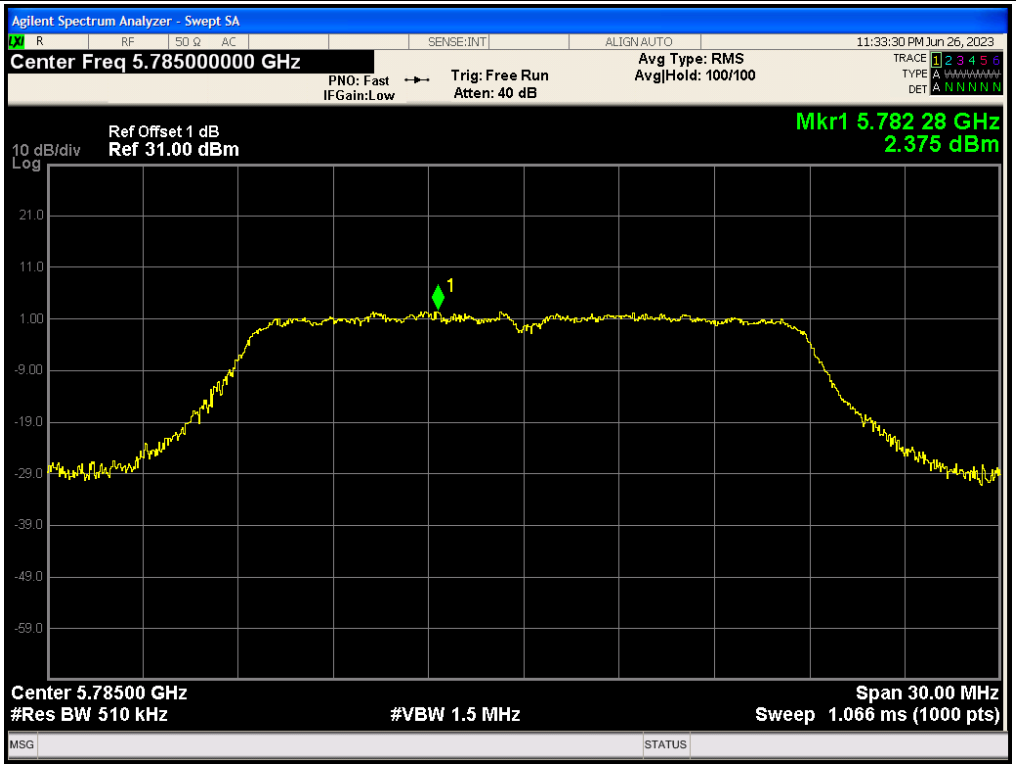

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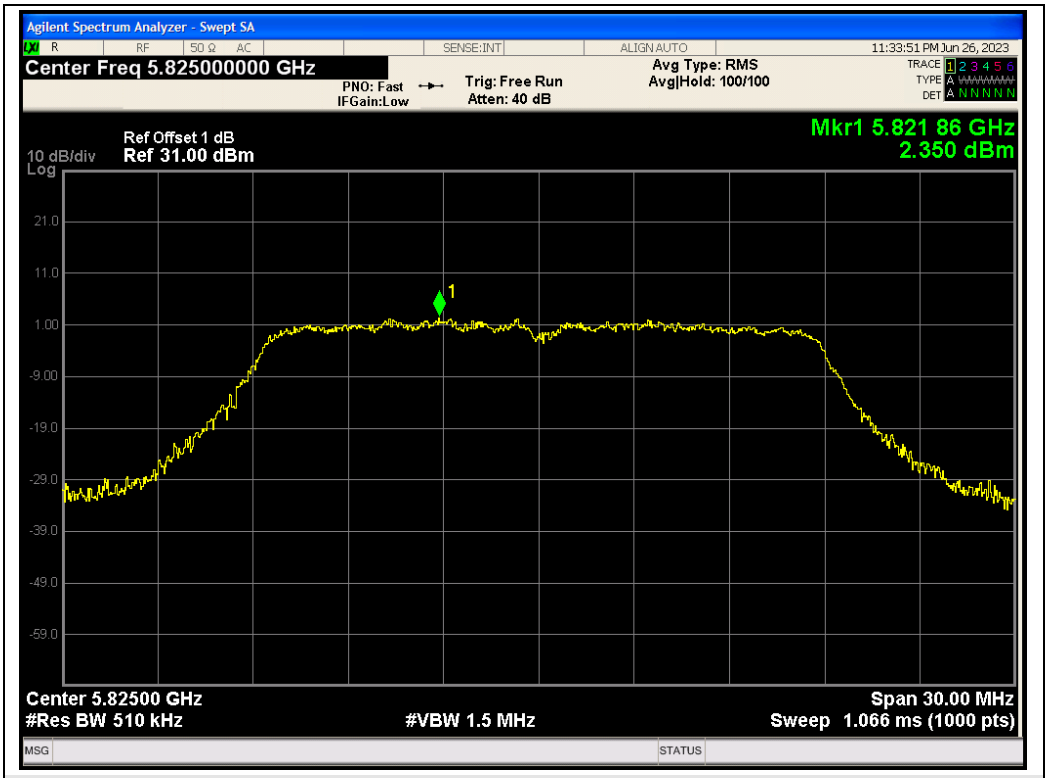
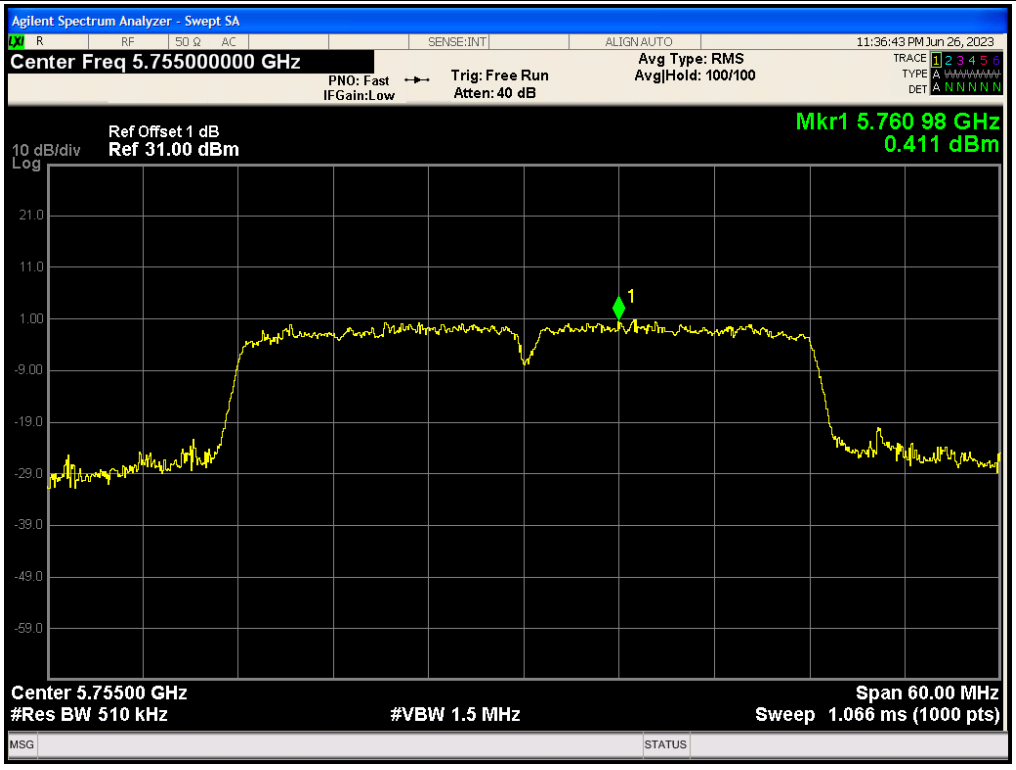


802.11ac20_ANT1_5825_MCS0_PSD



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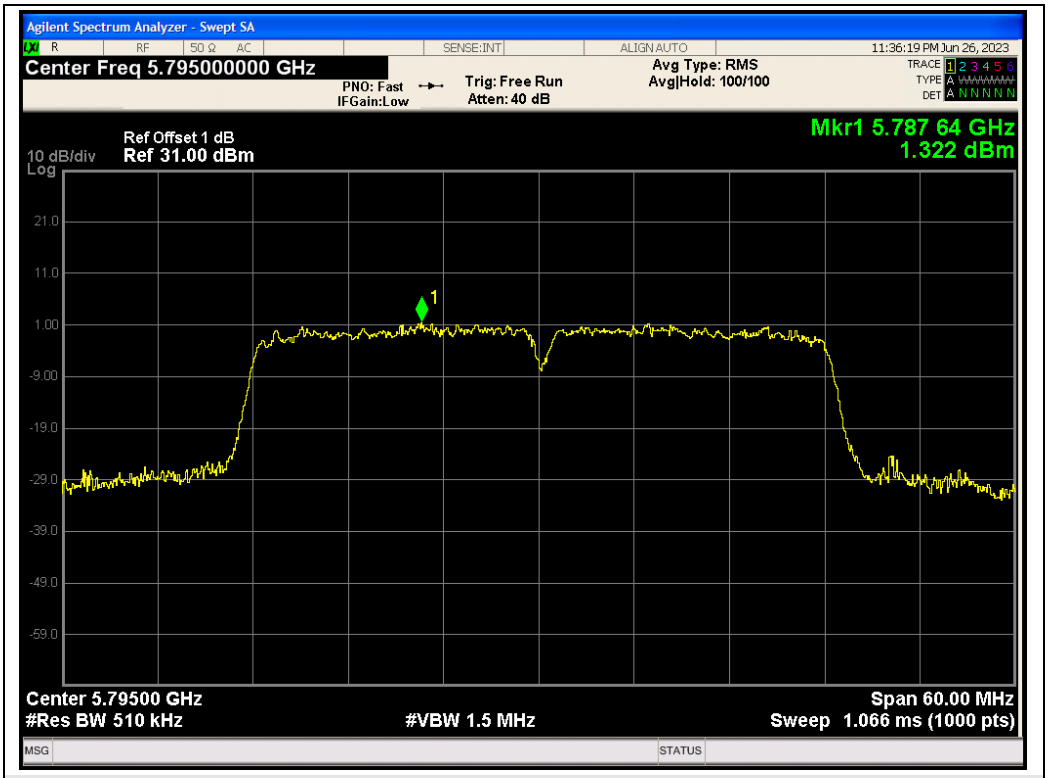
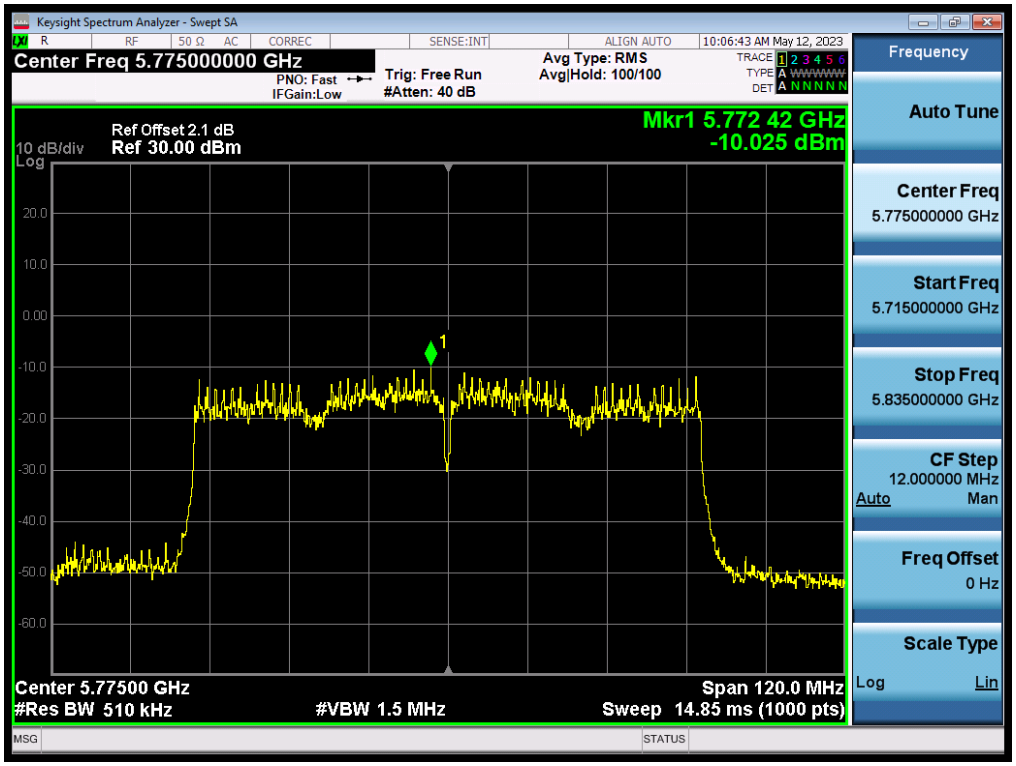


802.11ac40_ANT1_5795_MCS0_PSD



802.11ac80_ANT1_5775_MCS0_PSD

7 AVERAGE OUTPUT POWER

7.1 TEST LIMIT

FCC CFR Title 47 Part 15 Subpart E Section 15.407(a):

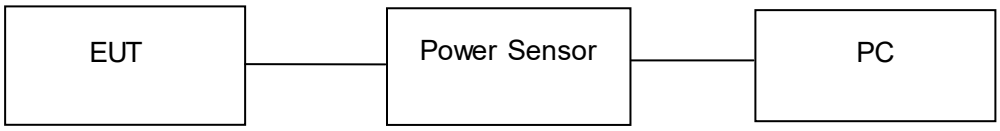
FCC Part 15 Subpart E(15.407)		
Test Item	**Limit**	**Frequency Range(MHz)**
Conducted Output Power	Outdoor AP, Indoor AP and Point-to-point AP: 1 Watt (30dBm) Client devices: 250mW (24dBm)	5150~5250
	250mW (24dBm)	5250~5350
	250mW (24dBm)	5470~5725
	1 Watt (30dBm)	5725~5850

7.2 TEST PROCEDURE

1. The EUT was tested according to according to section 3 of KDB 789033 D02 General UNII Test Procedures New Rules V02r01.
2. The maximum conducted output power may be measured using a broadband AVG RF power meter.
3. Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor.
4. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.
5. Record the measurement data.

7.3 TEST SET-UP

AVERAGE POWER SETUP



7.4 EQUIPMENT USED

Same as Radiated Emission Measurement.

7.5 TEST RESULT

PASS

Test Data of Conducted Output Power for band 5.15-5.25 GHz				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5180	7.55	23.98	Pass
	5200	6.96	23.98	Pass
	5240	7.53	23.98	Pass
802.11n20	5180	6.39	23.98	Pass
	5200	6.53	23.98	Pass
	5240	7.21	23.98	Pass
802.11n40	5190	6.44	23.98	Pass
	5230	6.43	23.98	Pass
802.11ac20	5180	5.89	23.98	Pass
	5200	5.85	23.98	Pass
	5240	6.82	23.98	Pass
802.11ac40	5190	5.68	23.98	Pass
	5230	5.64	23.98	Pass
802.11ac80	5210	3.79	23.98	Pass

Test Data of Conducted Output Power for band 5.725-5.85 GHz				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5745	7.53	30	Pass
	5782	7.49	30	Pass
	5825	7.45	30	Pass
802.11n20	5745	6.66	30	Pass
	5782	6.52	30	Pass
	5825	6.44	30	Pass
802.11n40	5755	6.44	30	Pass
	5795	6.44	30	Pass
802.11ac20	5745	6.75	30	Pass
	5785	6.93	30	Pass
	5825	6.95	30	Pass
802.11ac40	5755	5.69	30	Pass
	5795	5.56	30	Pass
802.11ac80	5775	6.54	30	Pass

8 CONDUCTED SPURIOUS EMISSION

8.1 TEST LIMIT

Applicable Limits	Channel
-27dBm/MHz	5150MHz-5250MHz
All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more a bove 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.	5725MHz-5850MHz

8.2 TEST SETUP

Same as 5.3

8.3 TEST PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Trace 1 Max hold, then View.

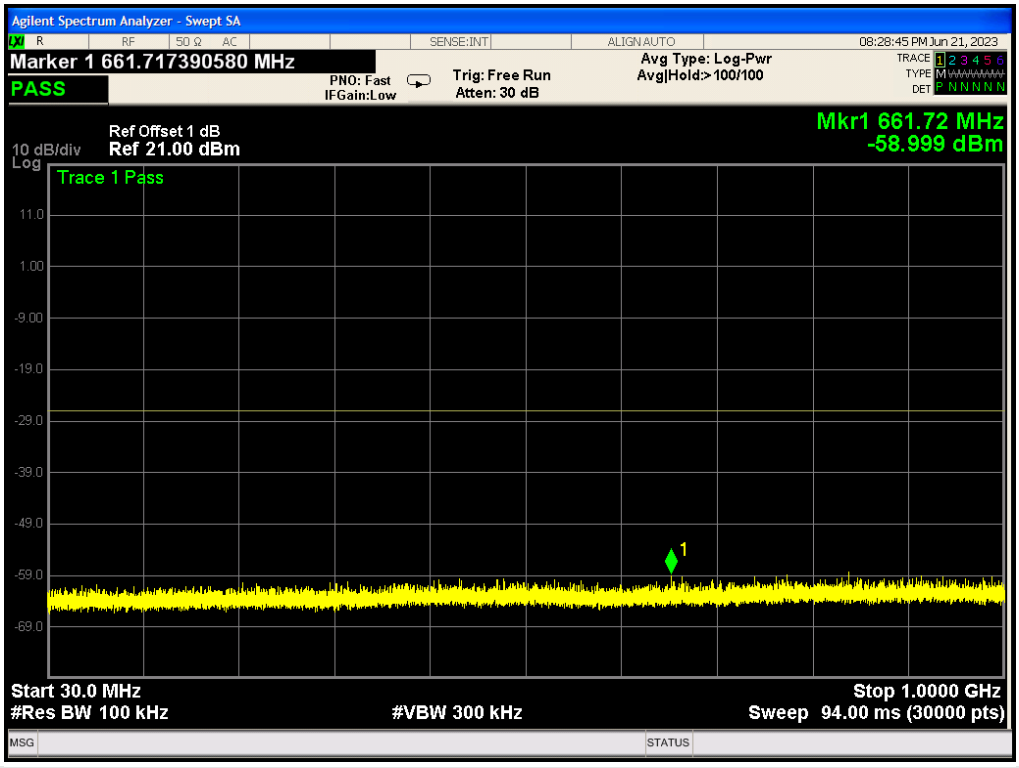
Note: The EUT was tested according to KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

8.4 TEST RESUL

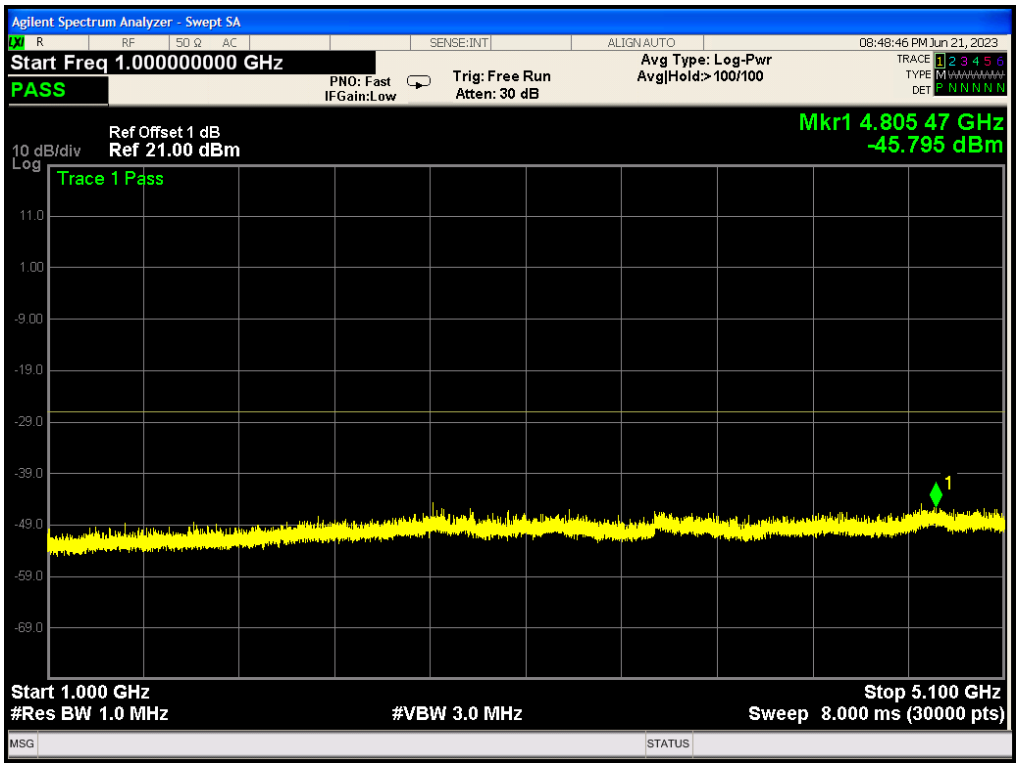
PASS

Note: All the 20MHz bandwidth modulation had been tested, the 802.11a was the worst case and record in this test report. All the 40MHz bandwidth modulation had been tested, the 802.11N40 was the worst case and record in this test report. All the 80MHz bandwidth modulation had been tested, the 802.11AC80 was the worst case and record in his test report.

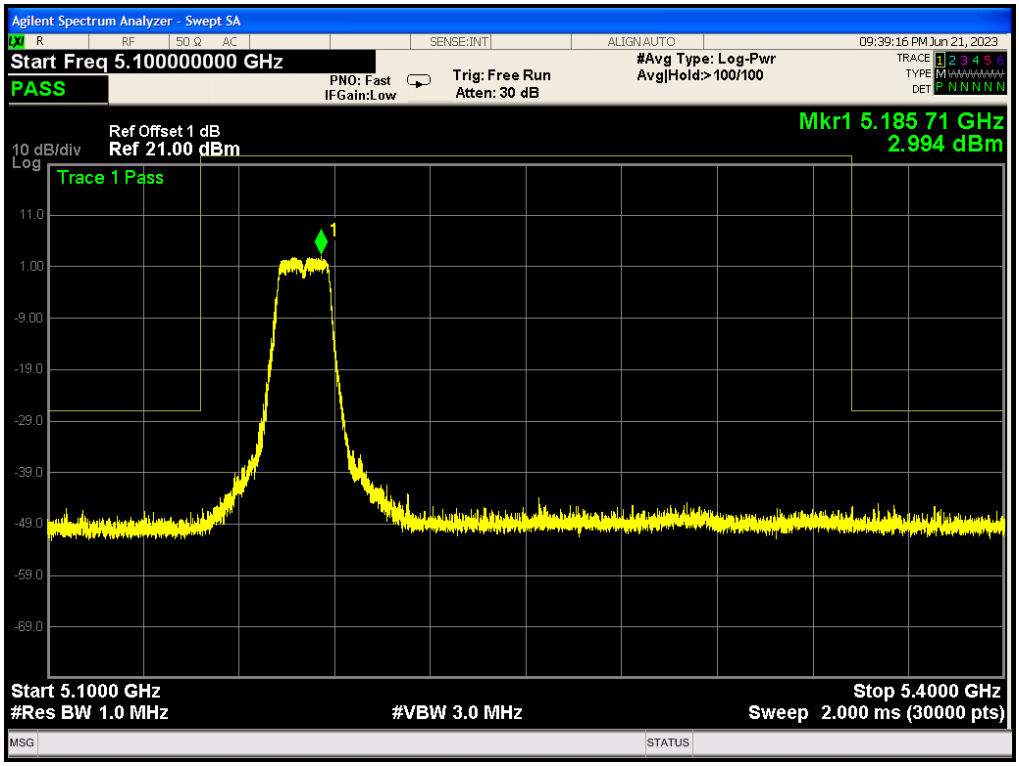
Test Graphs of Spurious Emissions outside of the 5.15-5.35 GHz band for transmitters operating in the 5.15-5.25 GHz band



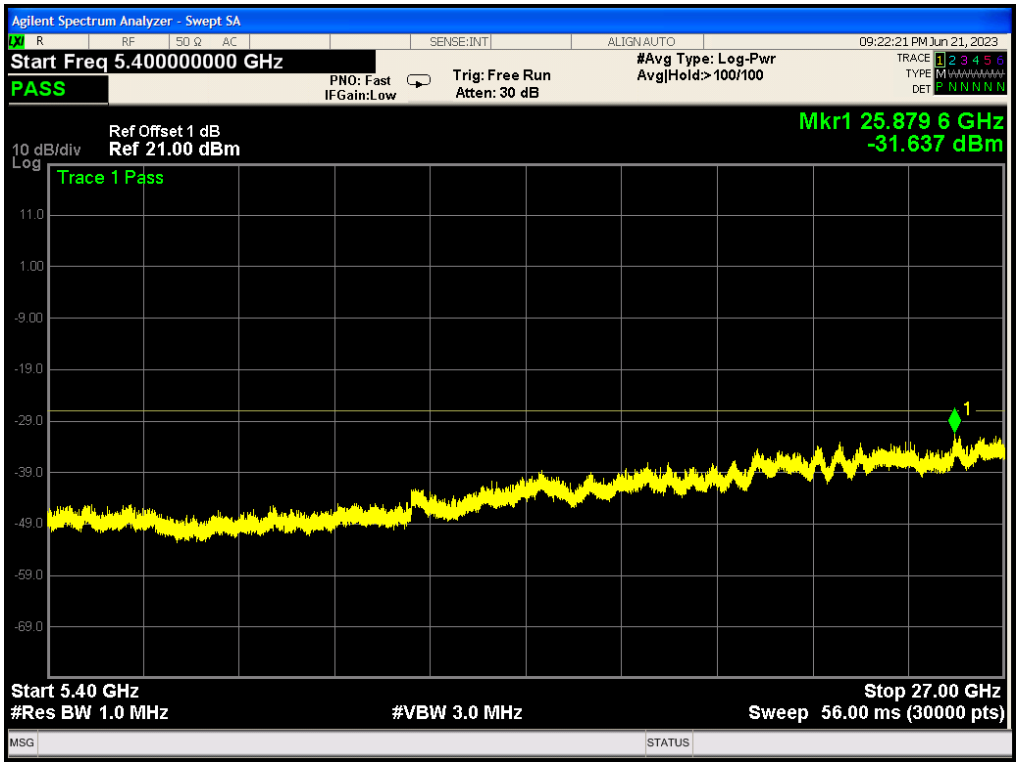
802.11a_ANT1_5180_6Mbps_Frequency Band 1



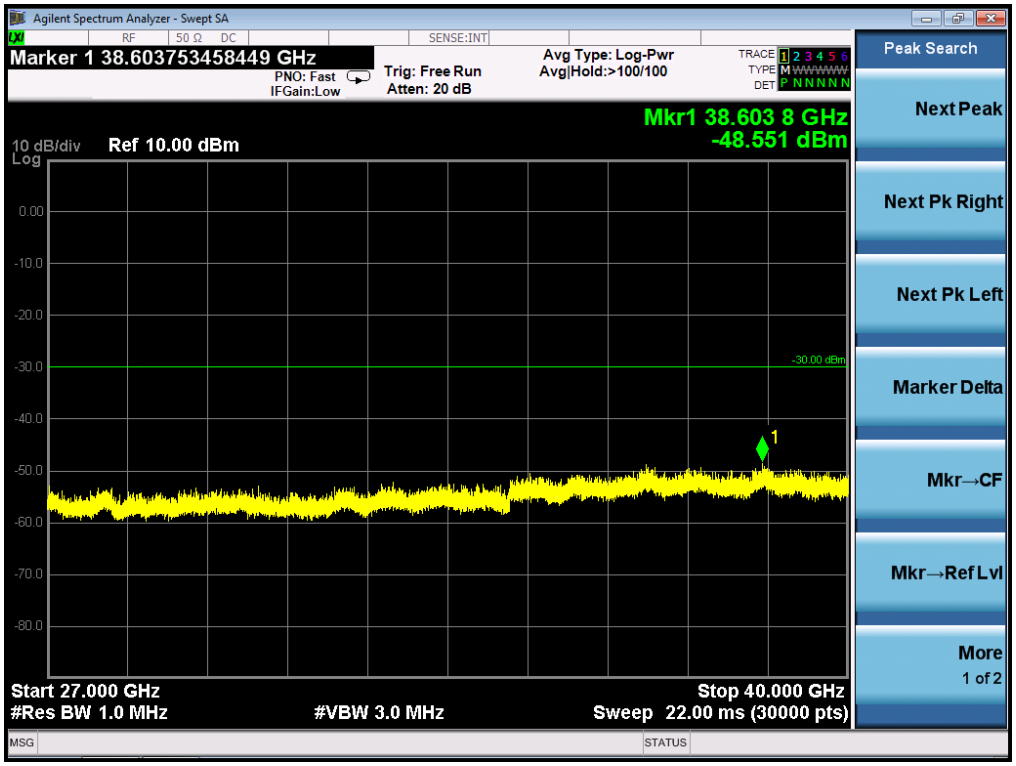
802.11a_ANT1_5180_6Mbps_Frequency Band 2



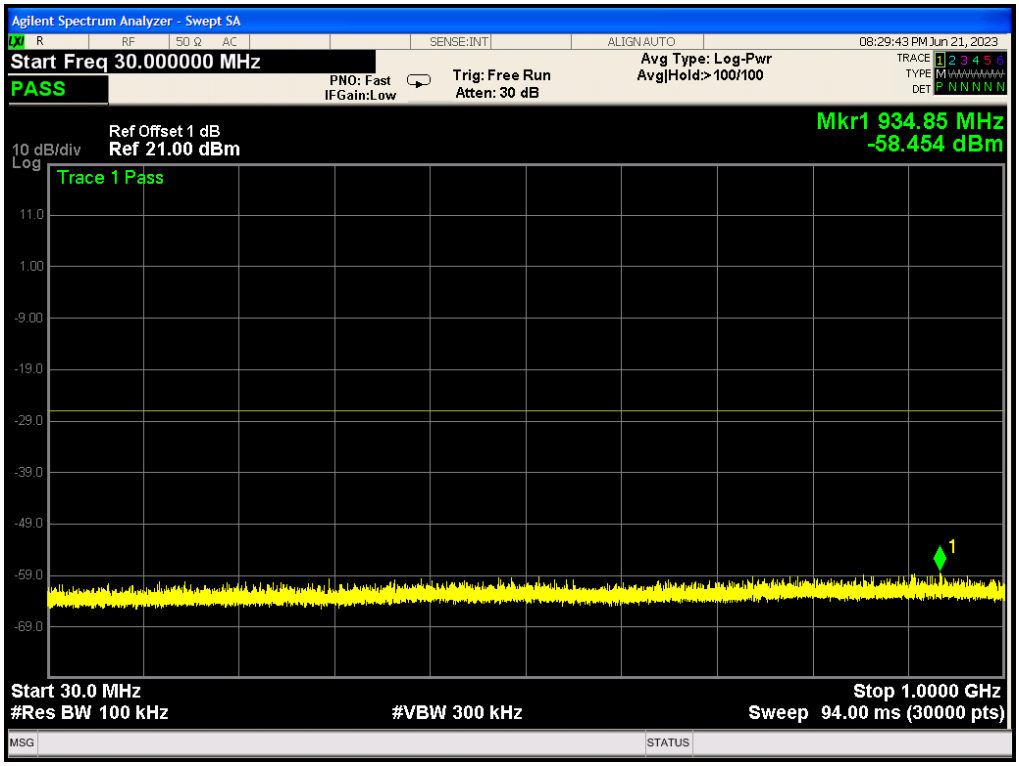
802.11a_ANT1_5180_6Mbps_Frequency Band 3



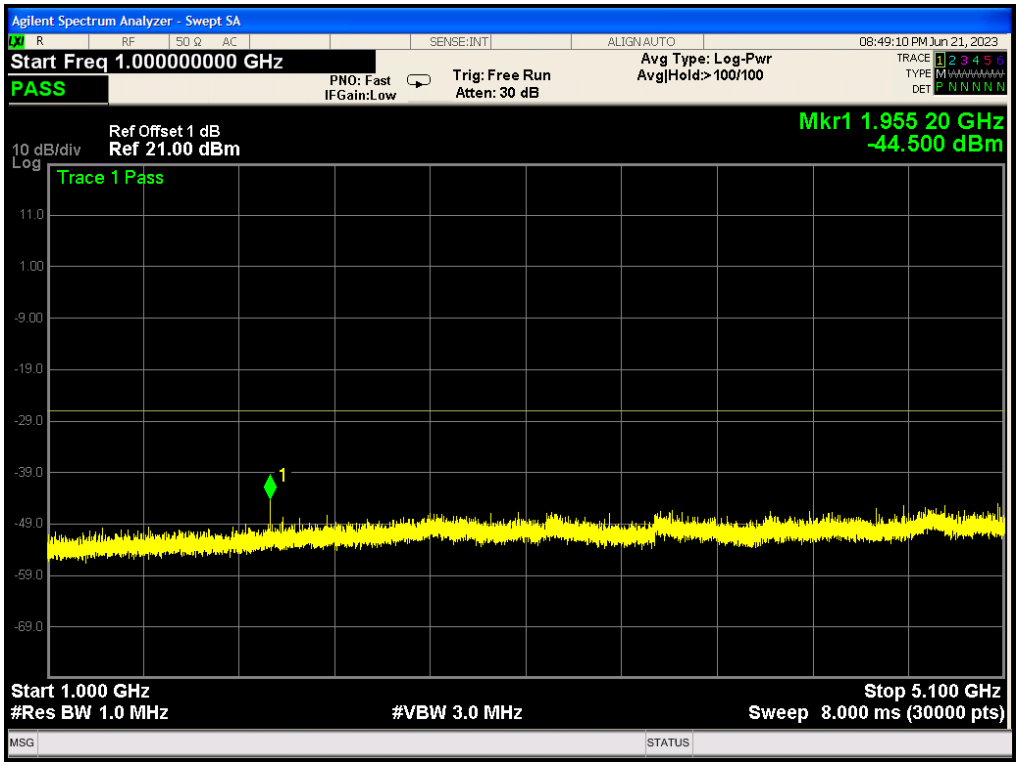
802.11a_ANT1_5180_6Mbps_Frequency Band 4



802.11a_ANT1_5180_6Mbps_Frequency Band 5



802.11a_ANT1_5240_6Mbps_Frequency Band 1



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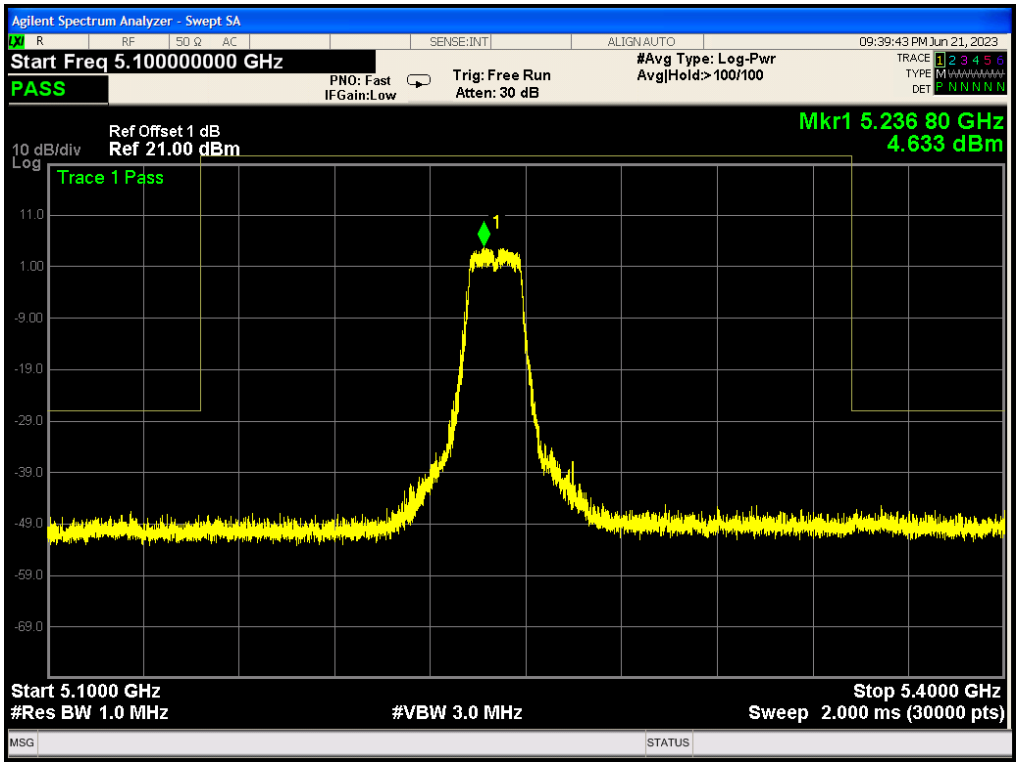

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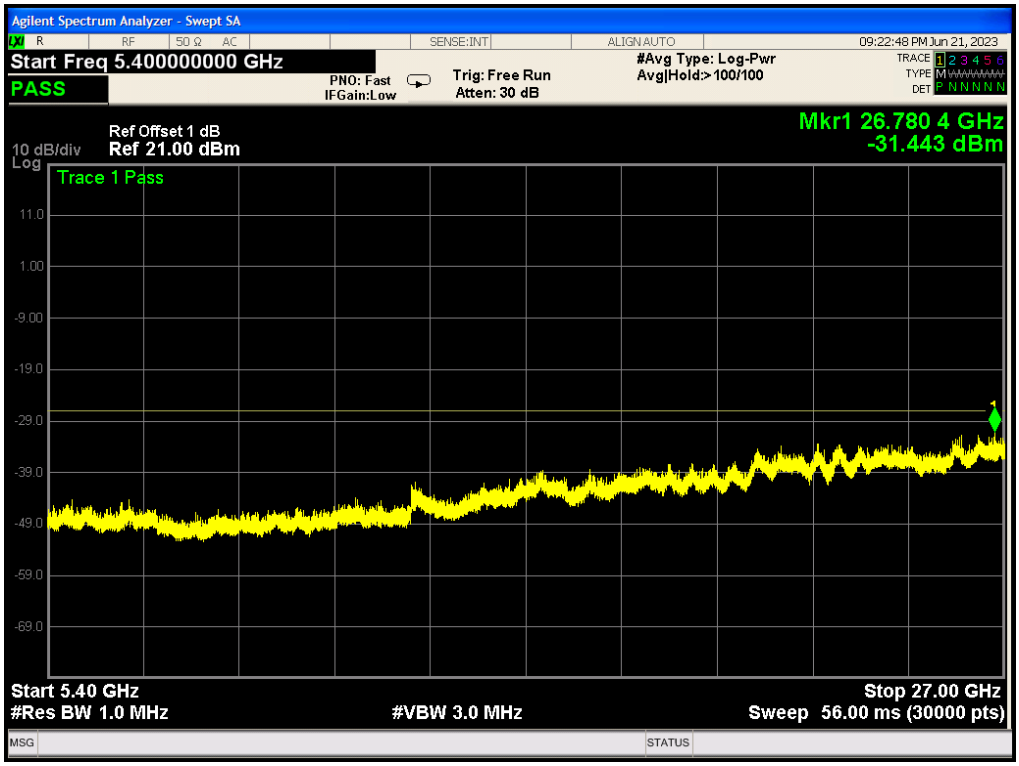

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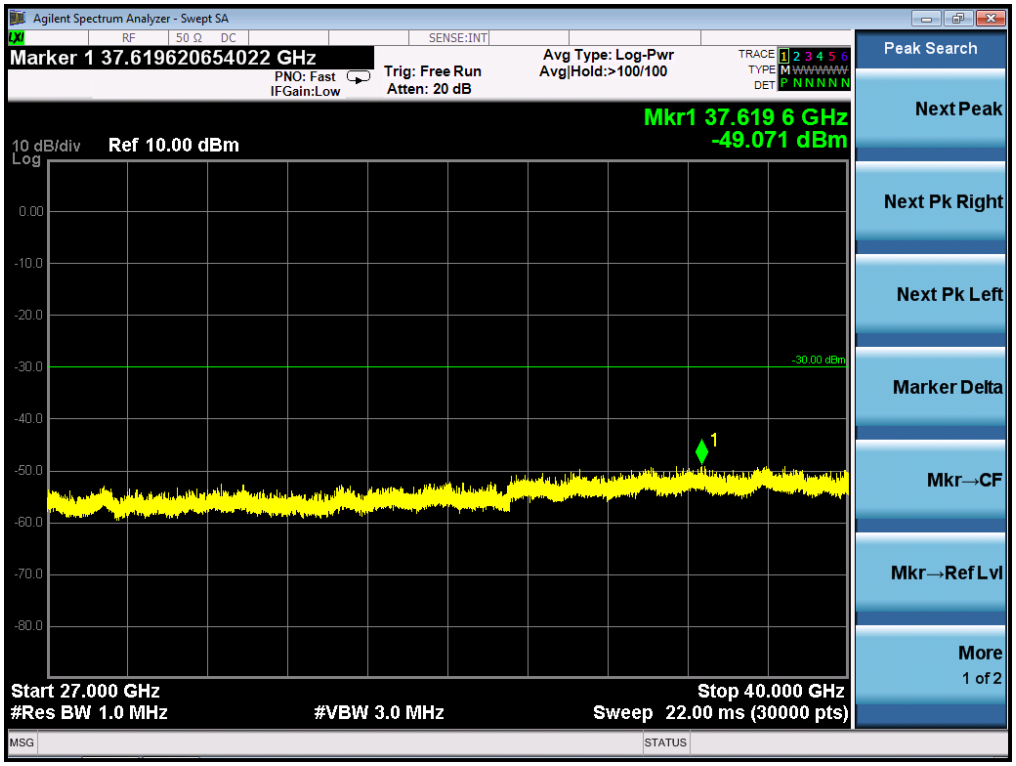
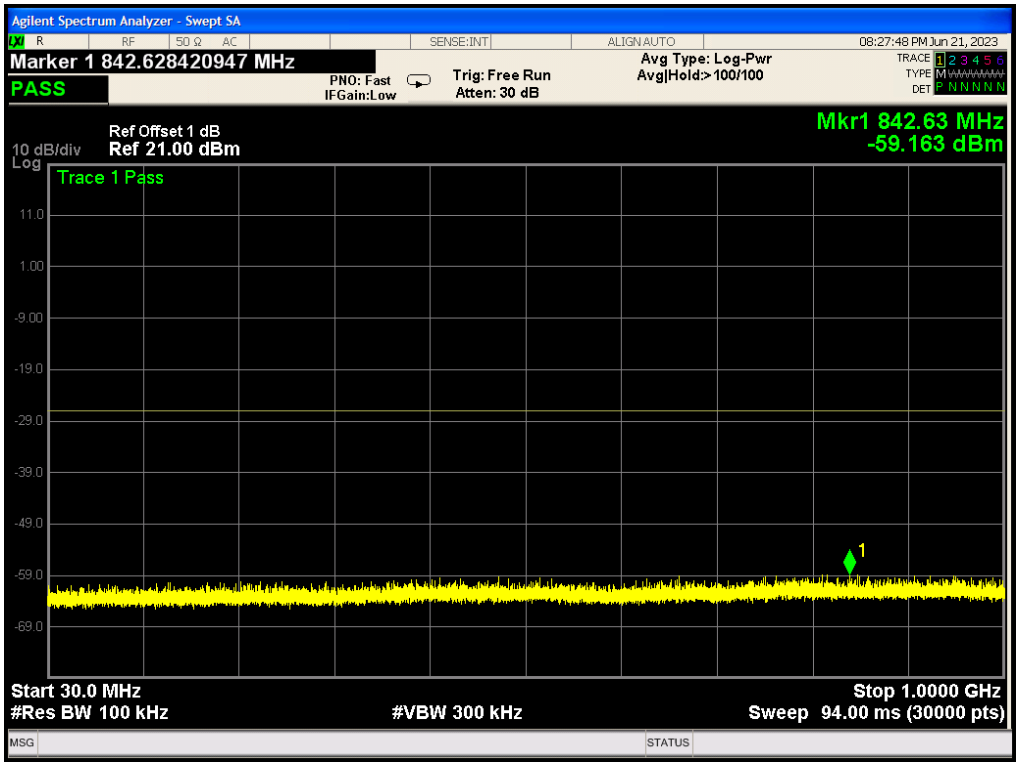
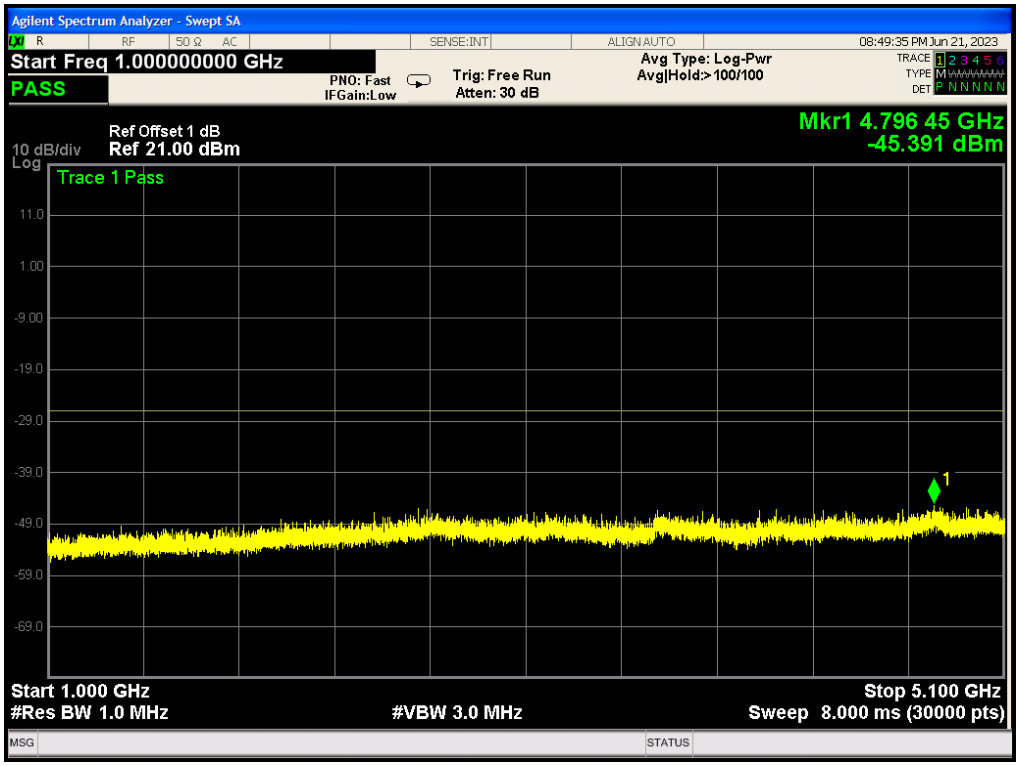


802.11a_ANT1_5240_6Mbps_Frequency Band 5



802.11n40_ANT1_5190_MCS0_Frequency Band 1



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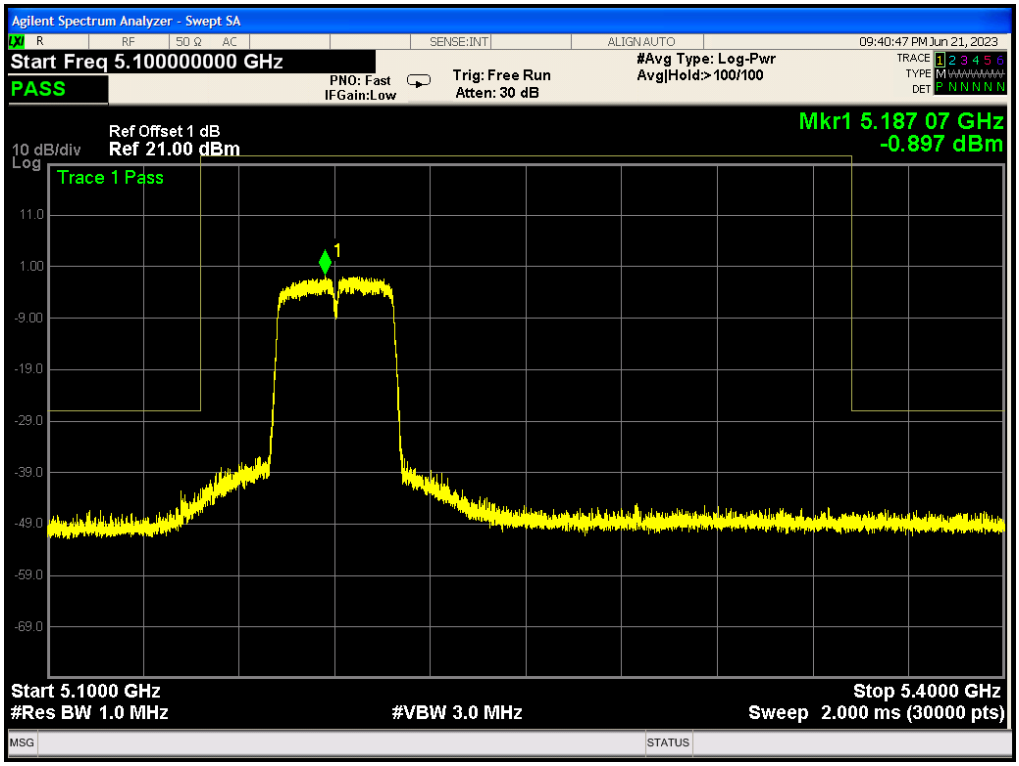

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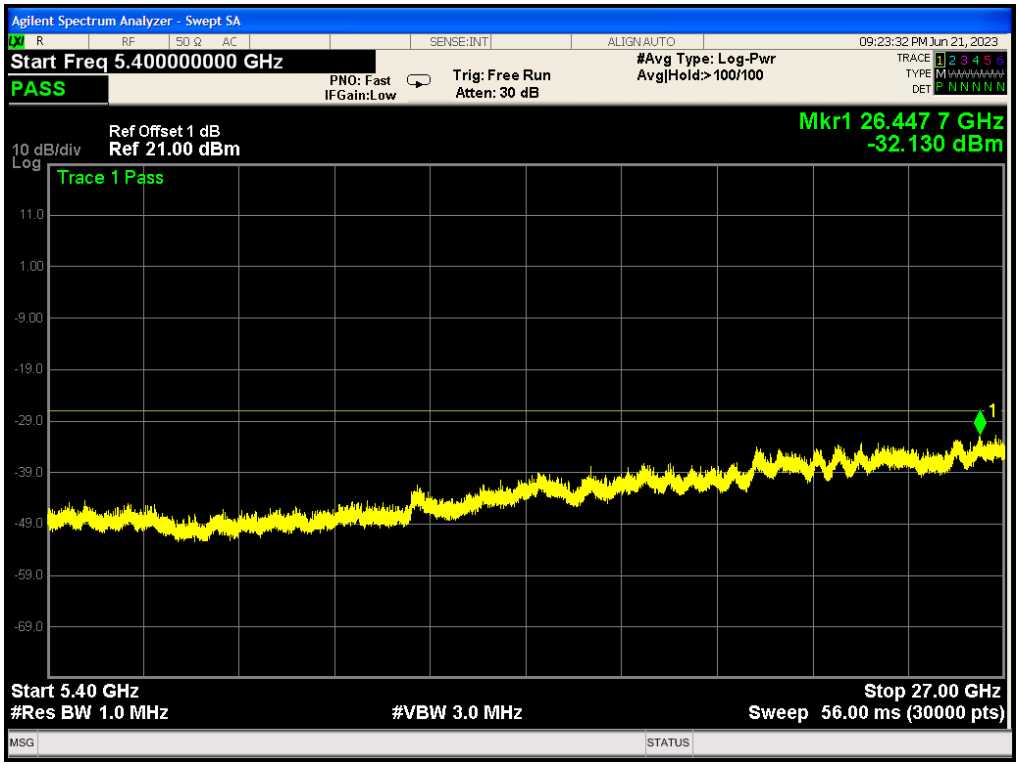

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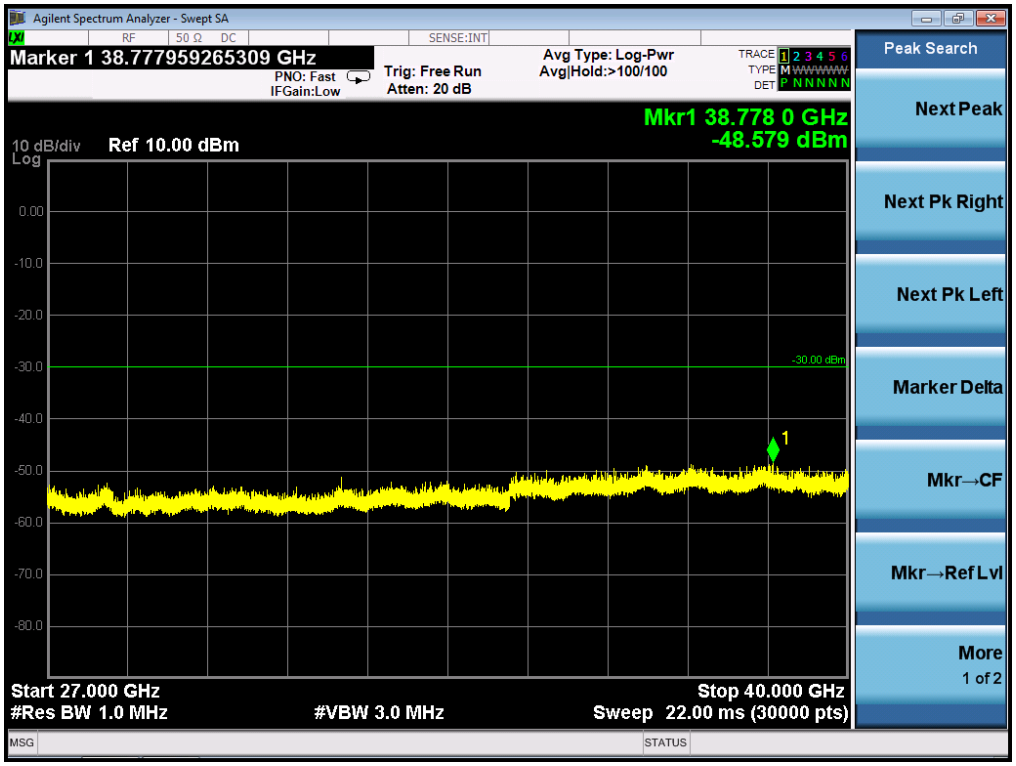

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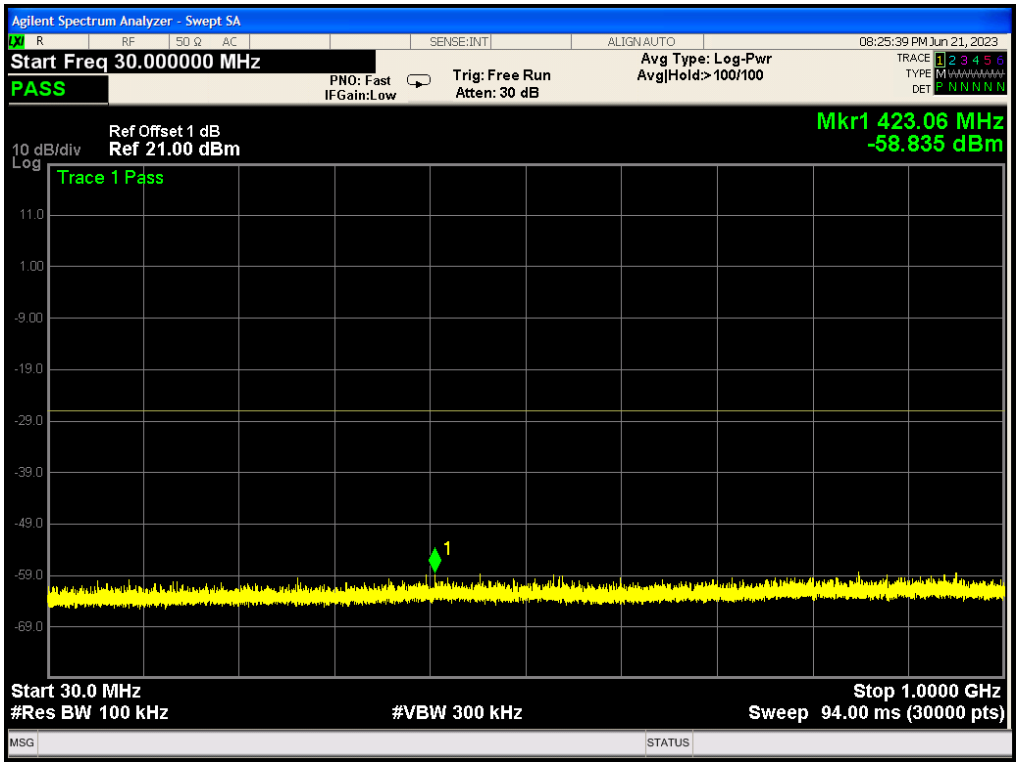
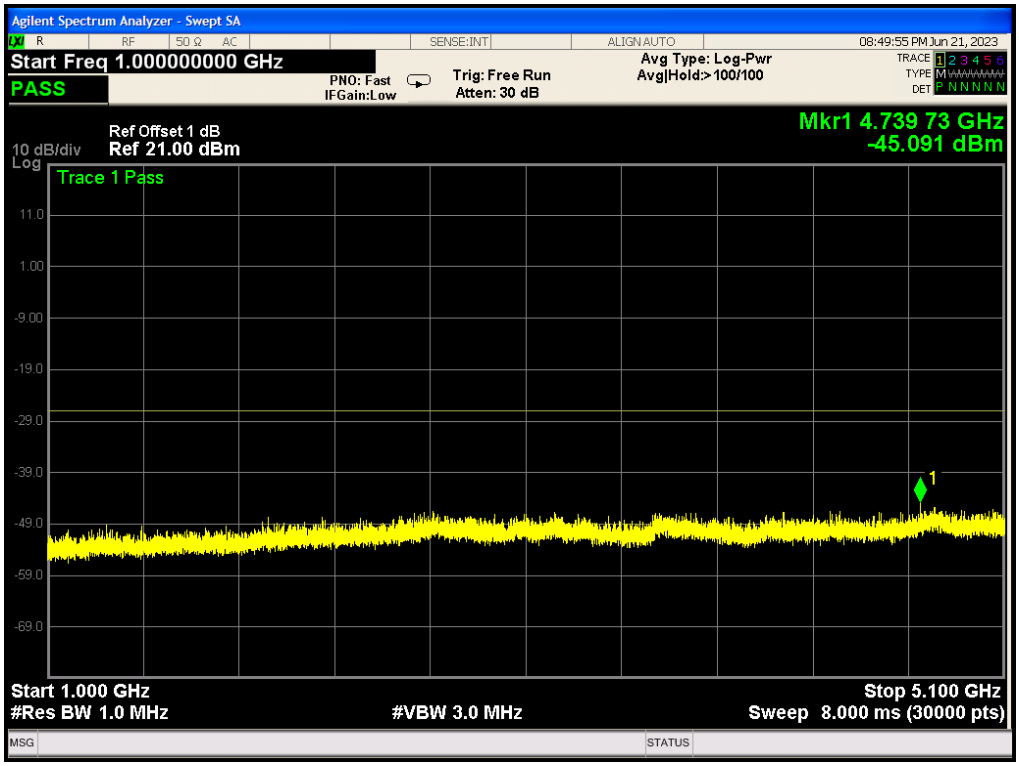


802.11n40_ANT1_5230_MCS0_Frequency Band 1



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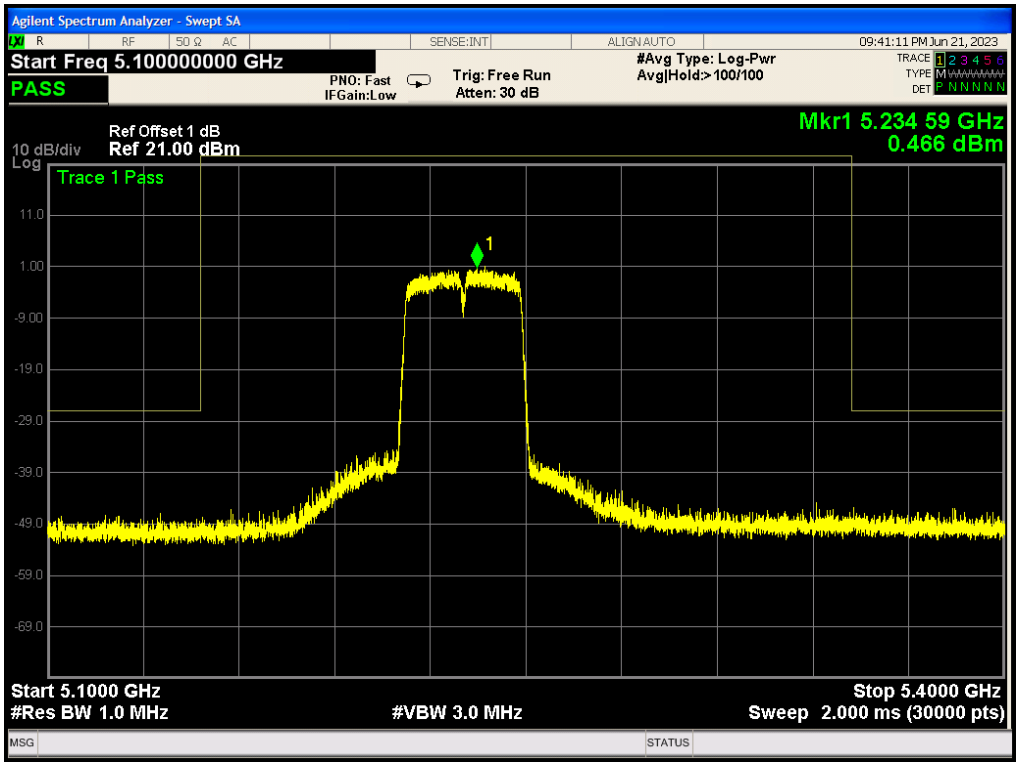

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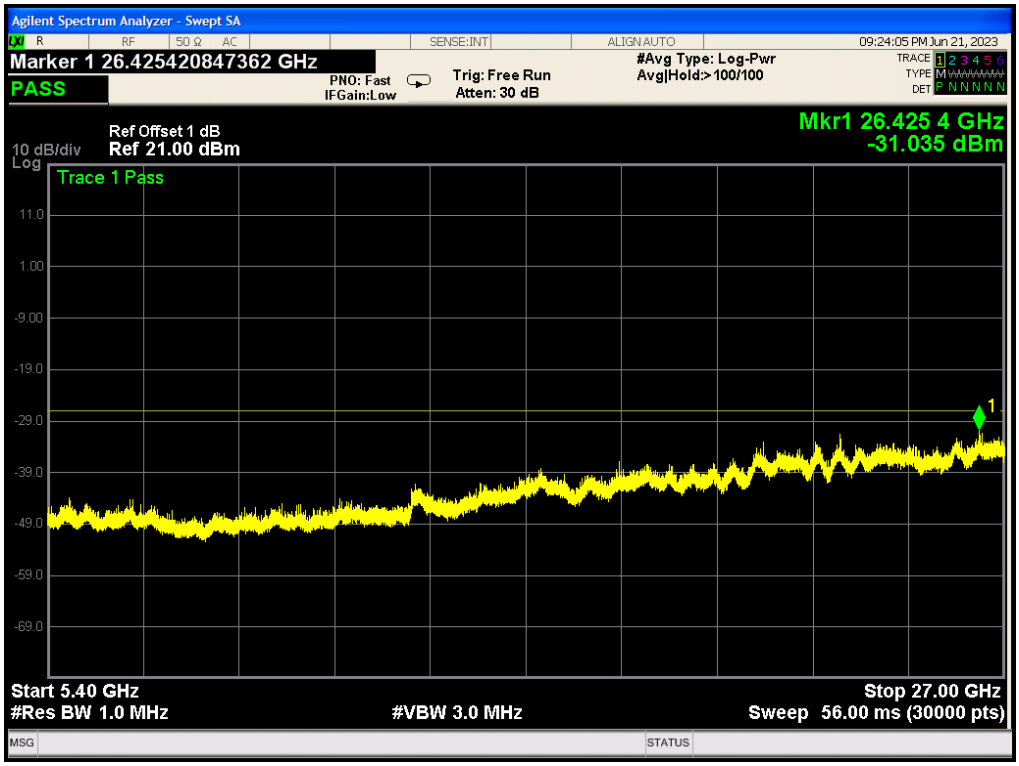

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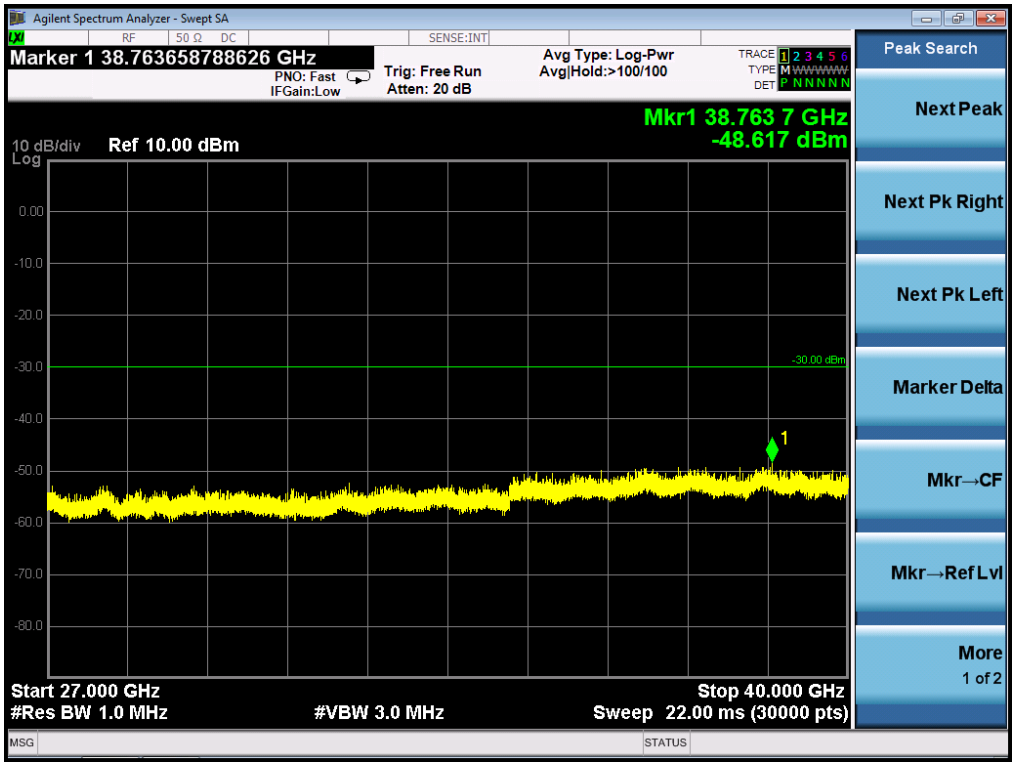

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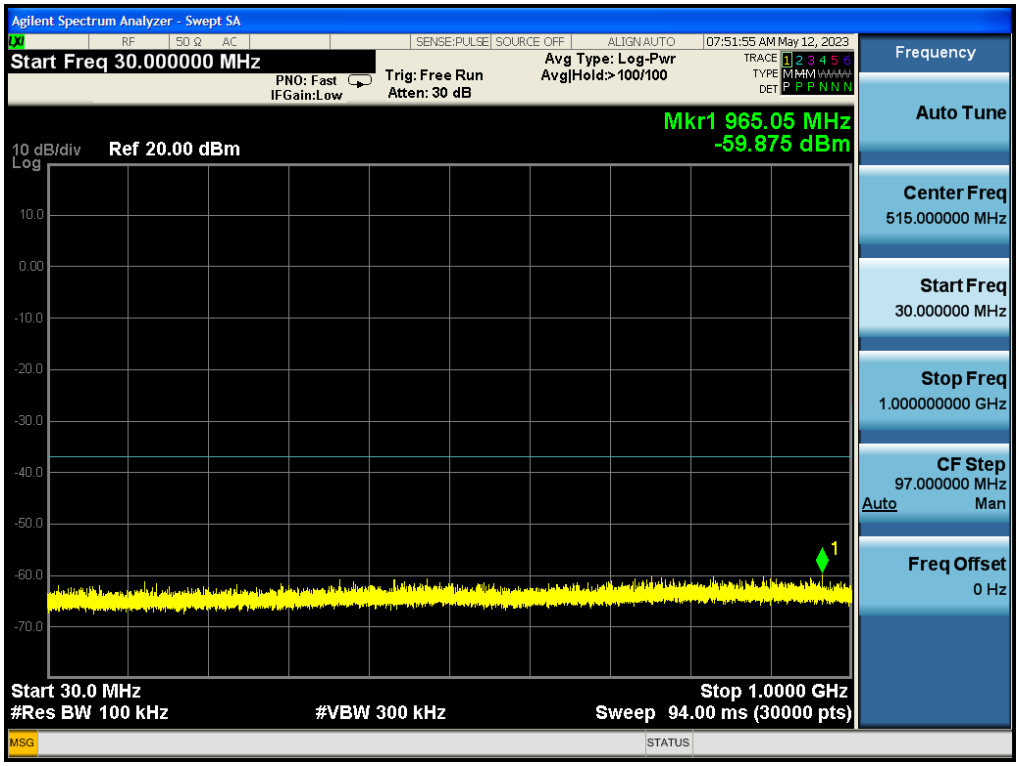
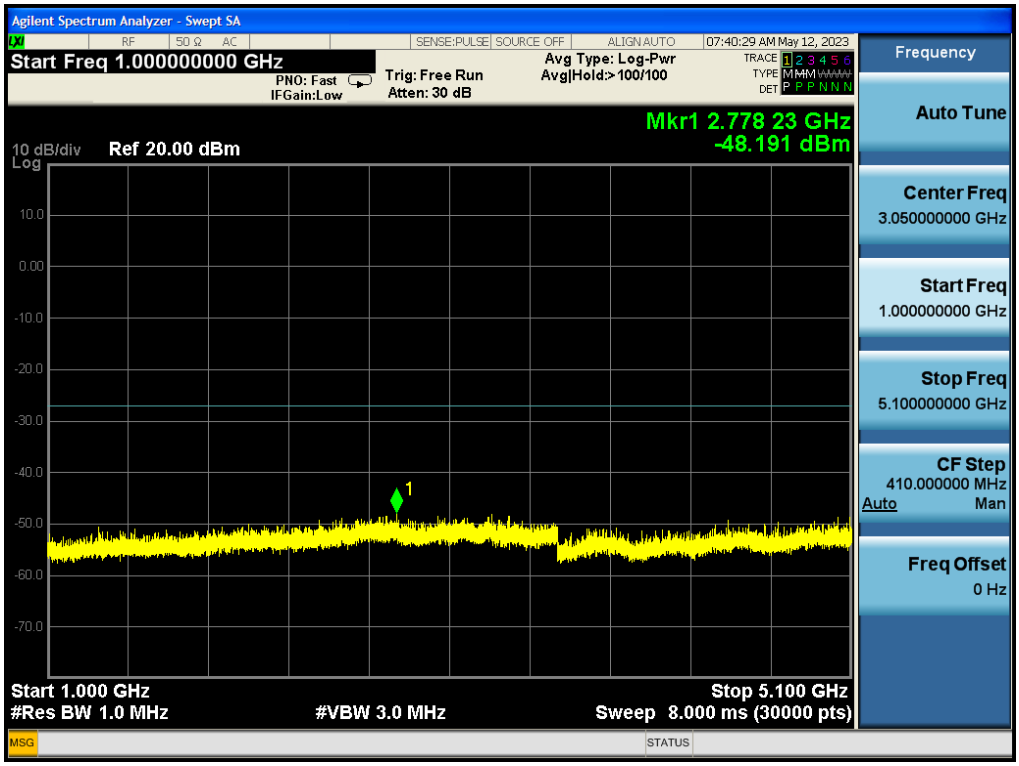


802.11ac80_ANT1_5210_MCS0_Frequency Band 1



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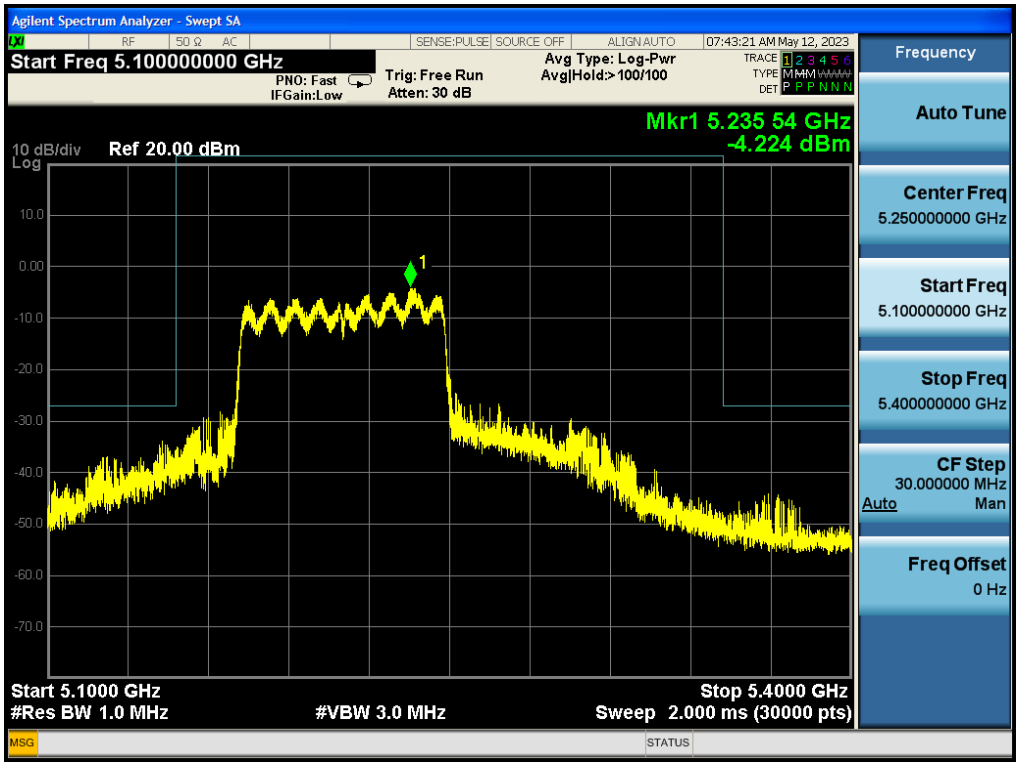
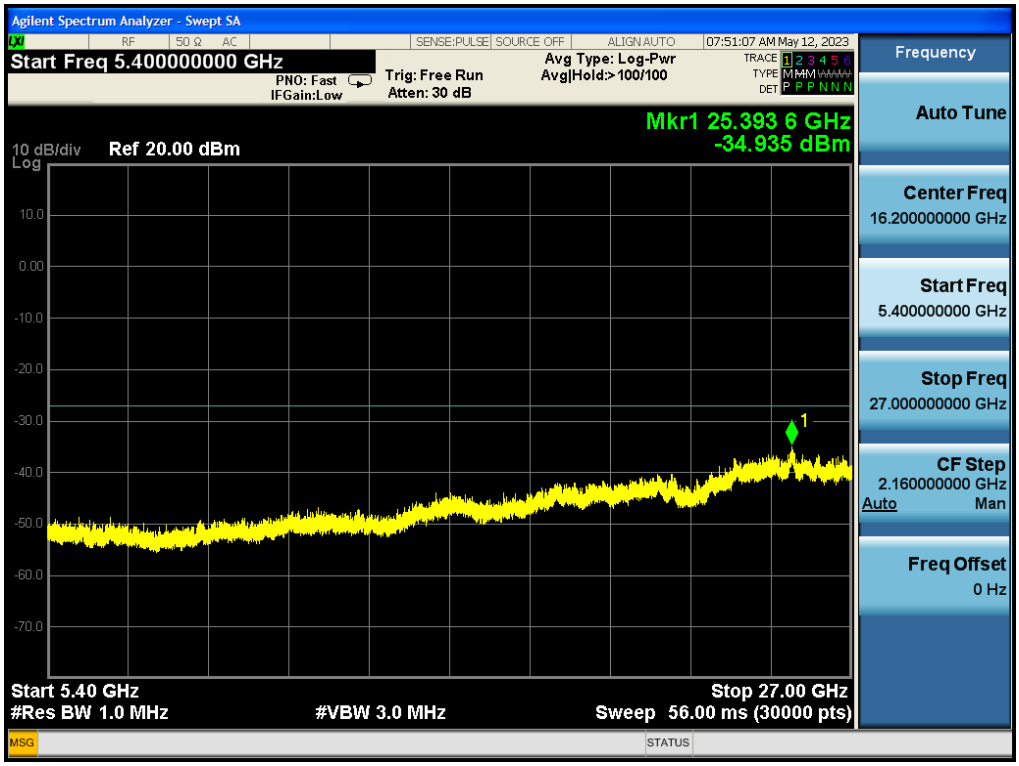


802.11ac80_ANT1_5210_MCS0_Frequency Band 3



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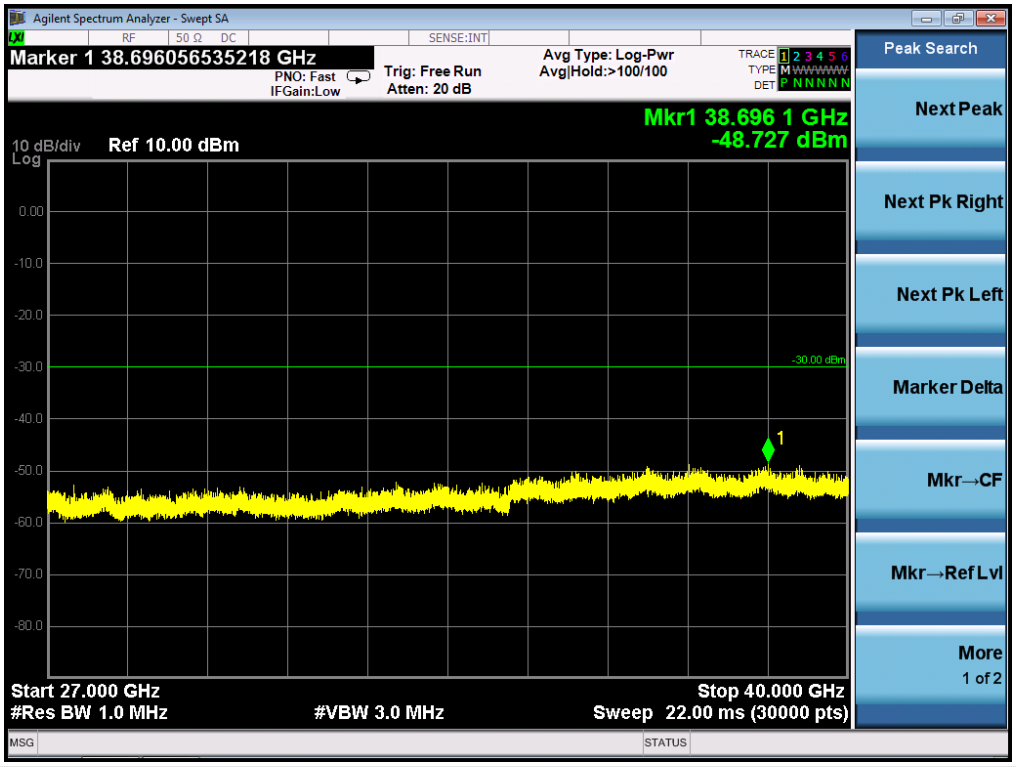
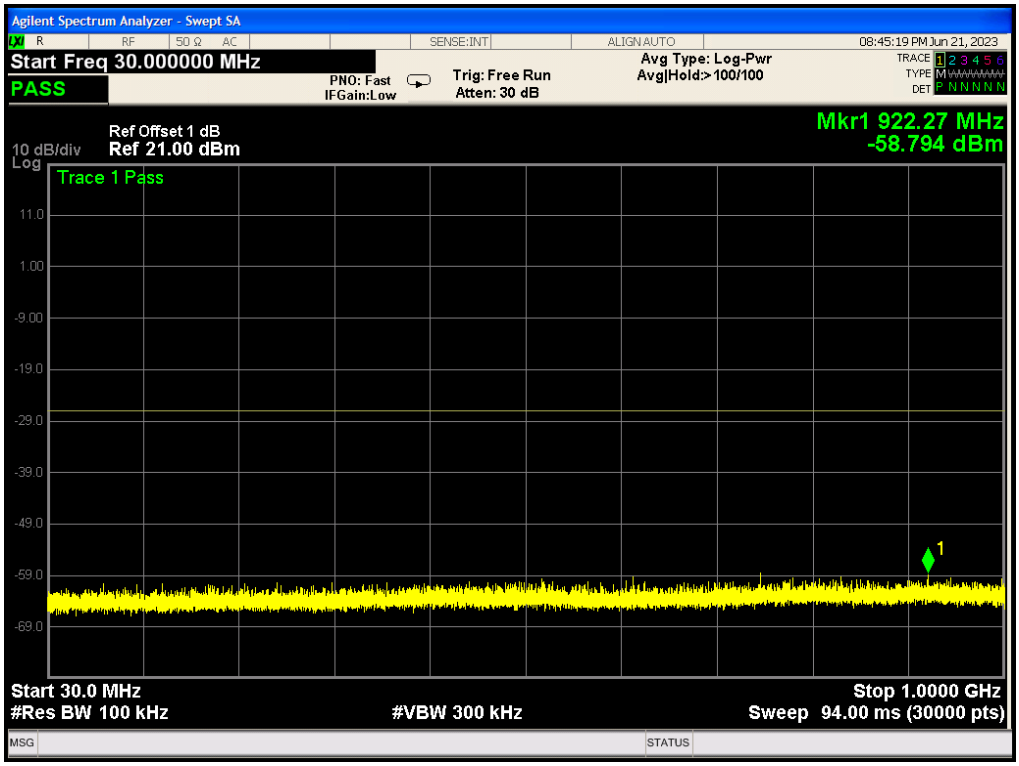
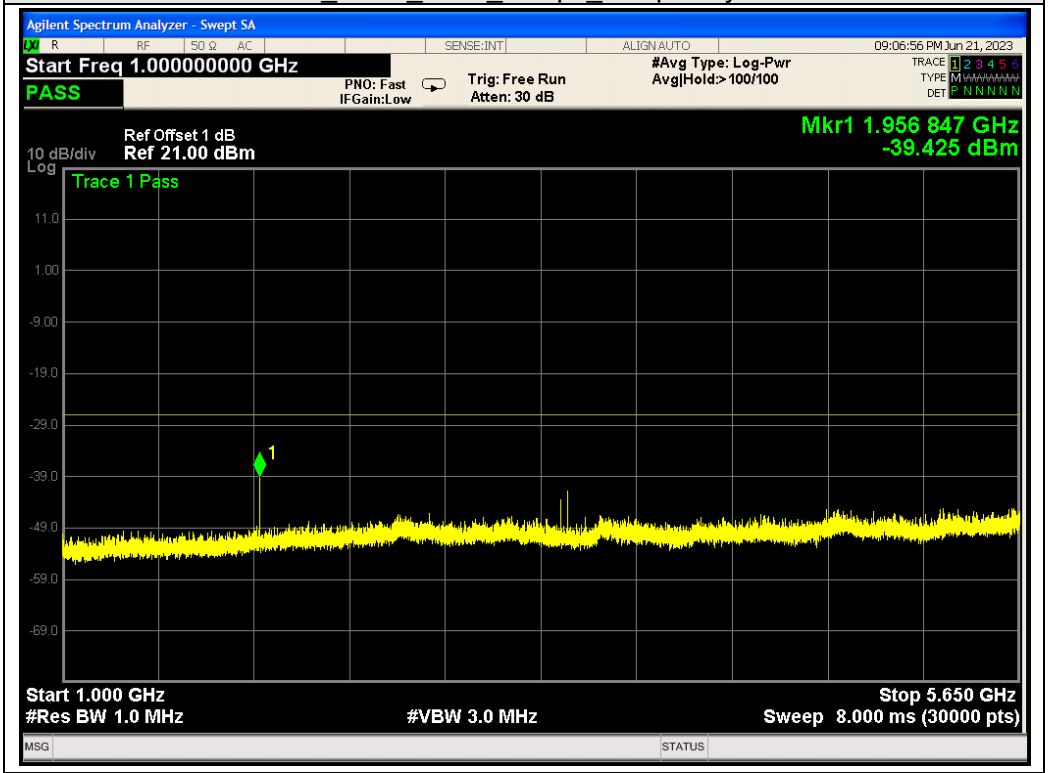


802.11ac80_ANT1_5210_MCS0_Frequency Band 5

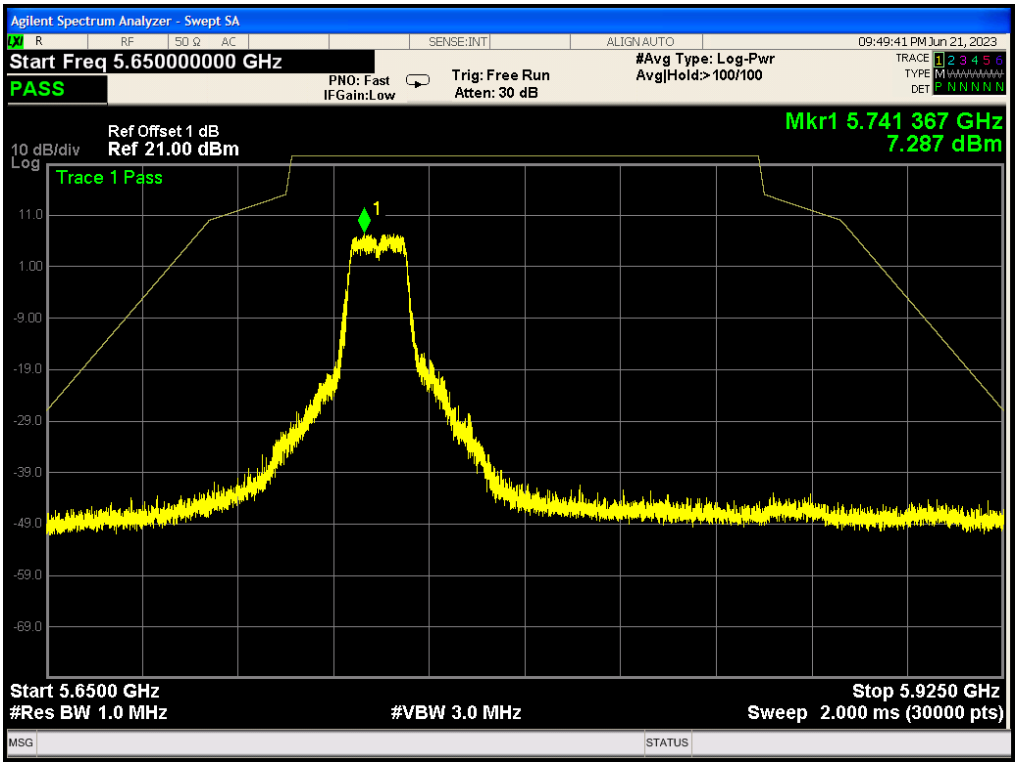
Test Graphs of Spurious Emissions outside of the 5.725-5.85 GHz band for transmitters operating in the 5.725-5.85 GHz band



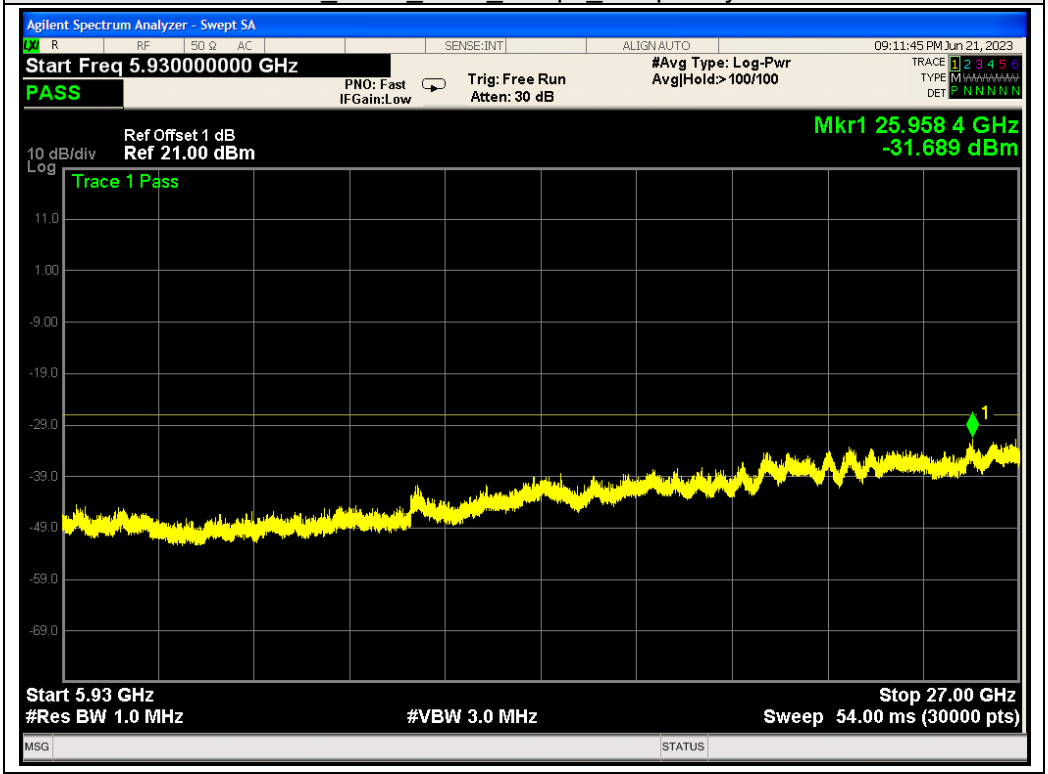
802.11a_ANT1_5745_6Mbps_Frequency Band1



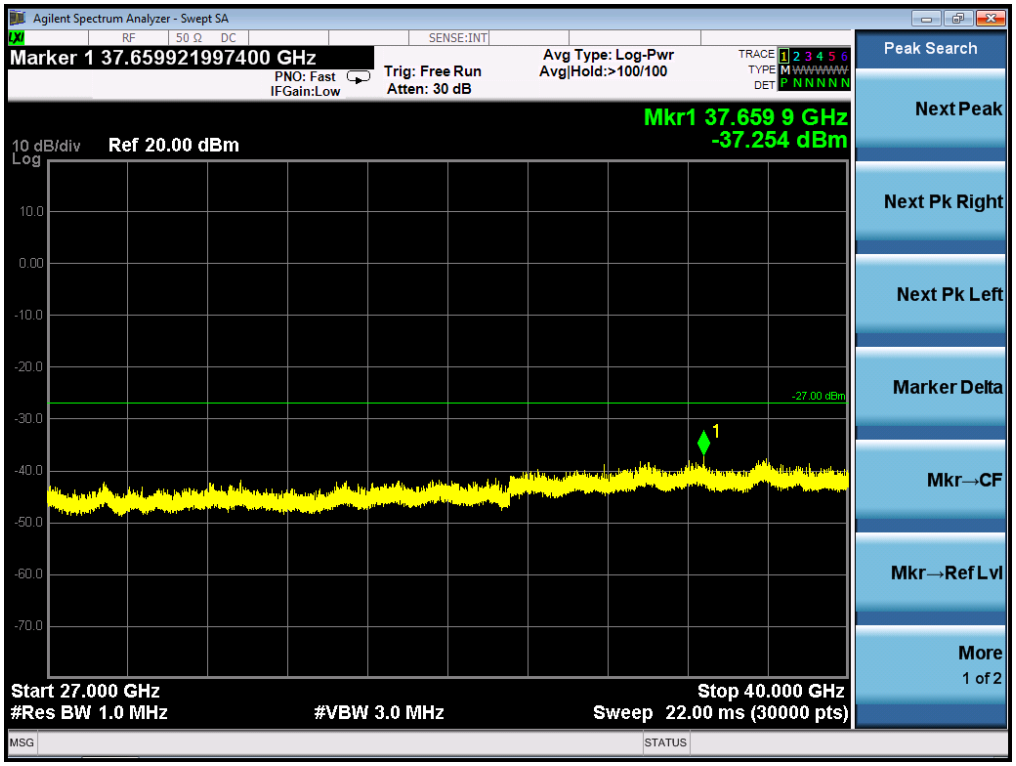
802.11a_ANT1_5745_6Mbps_Frequency Band2



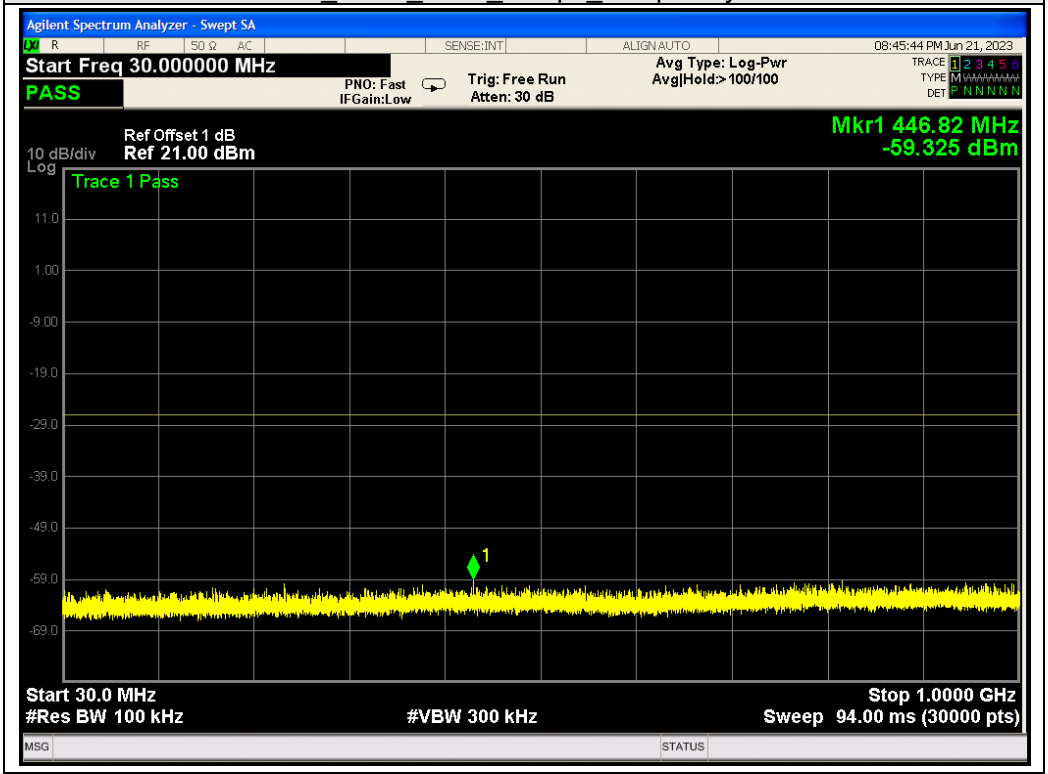
802.11a_ANT1_5745_6Mbps_Frequency Band3



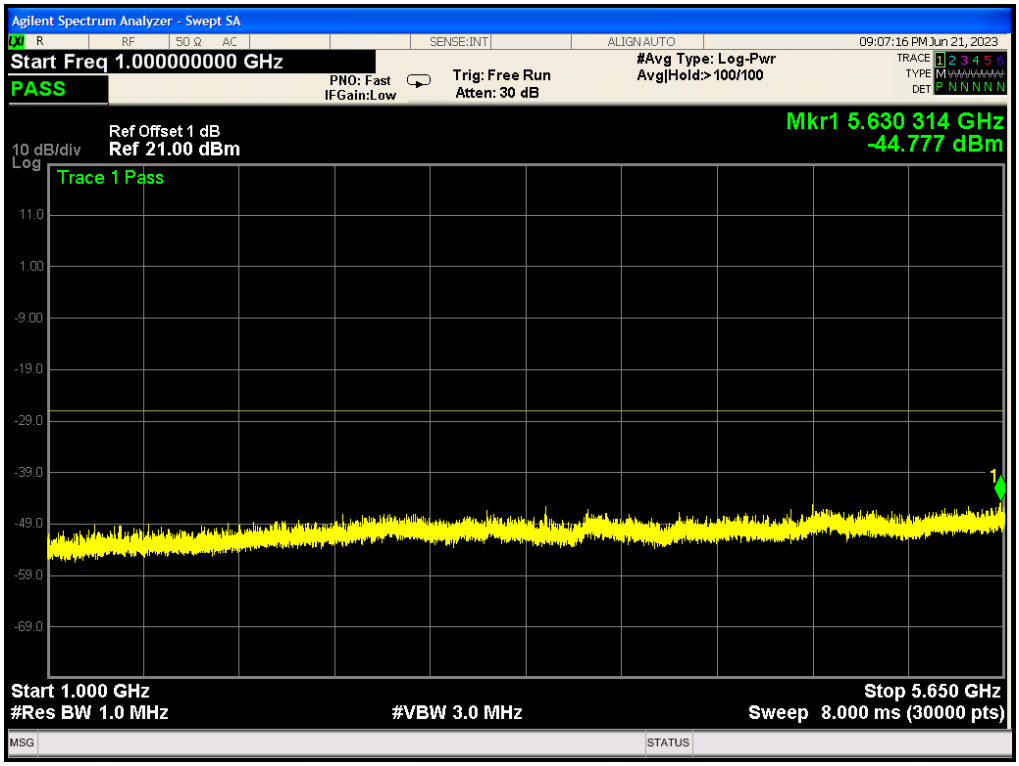
802.11a_ANT1_5745_6Mbps_Frequency Band4



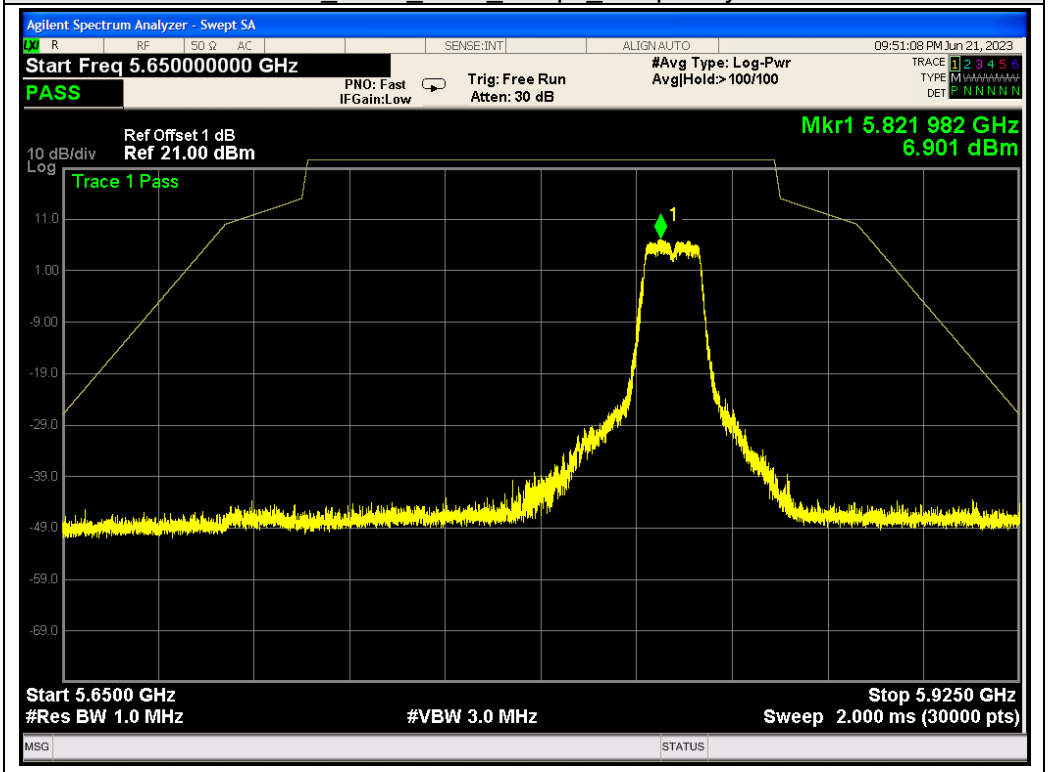
802.11a_ANT1_5745_6Mbps_Frequency Band5



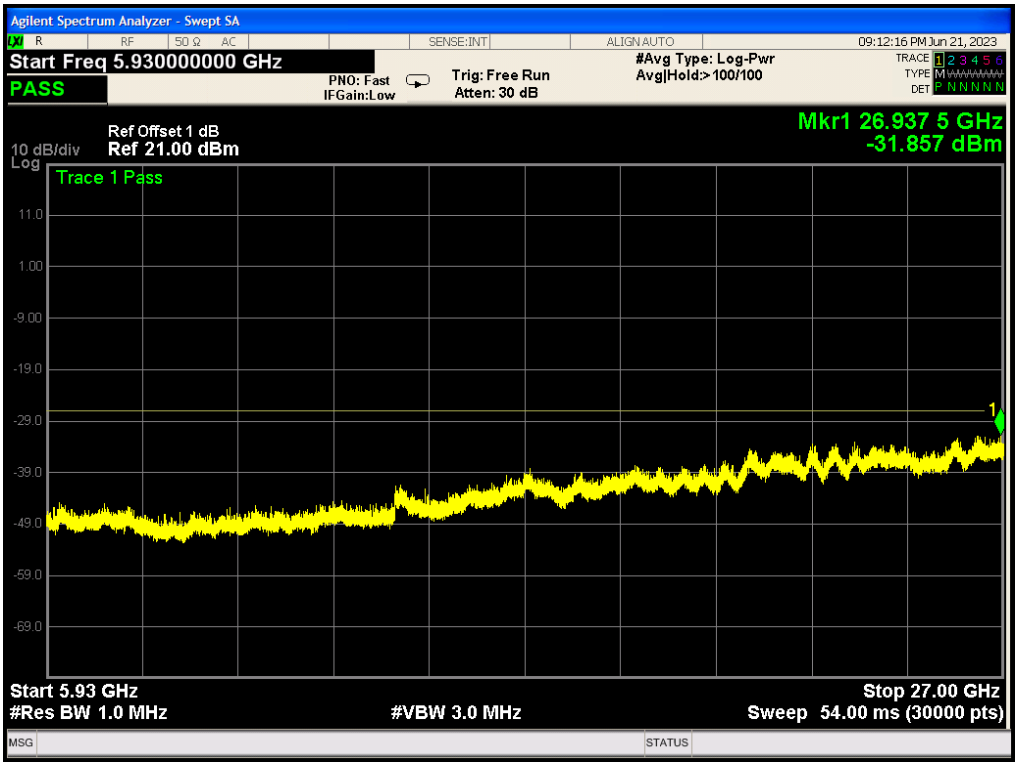
802.11a_ANT1_5825_6Mbps_Frequency Band1



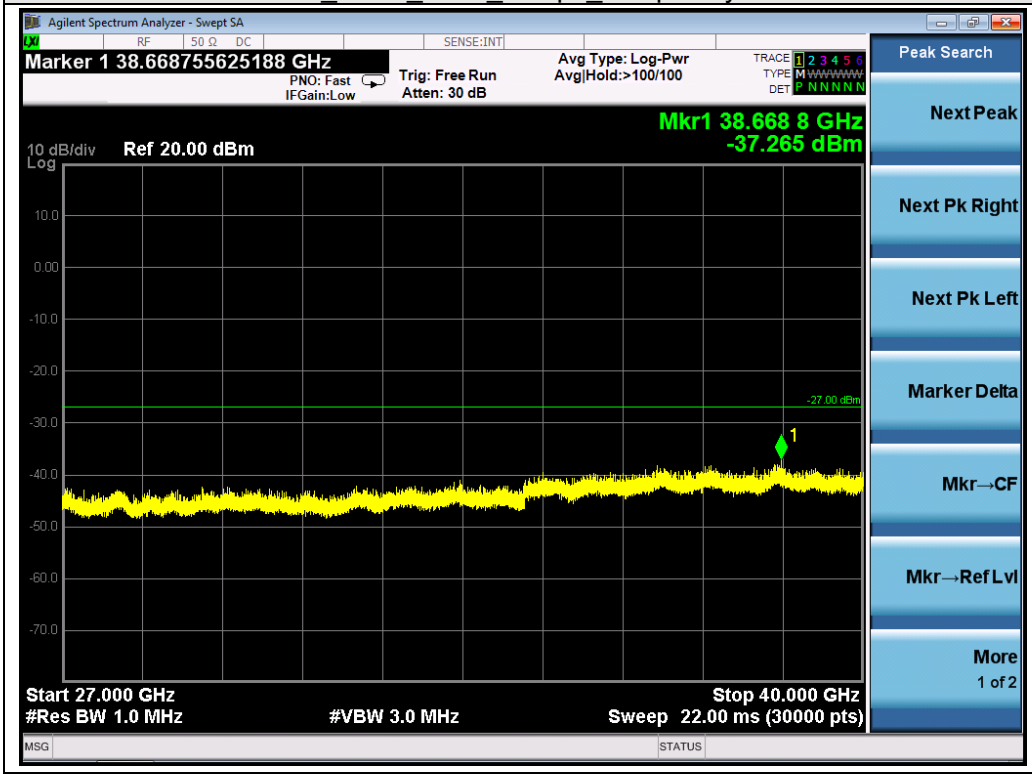
802.11a_ANT1_5825_6Mbps_Frequency Band2



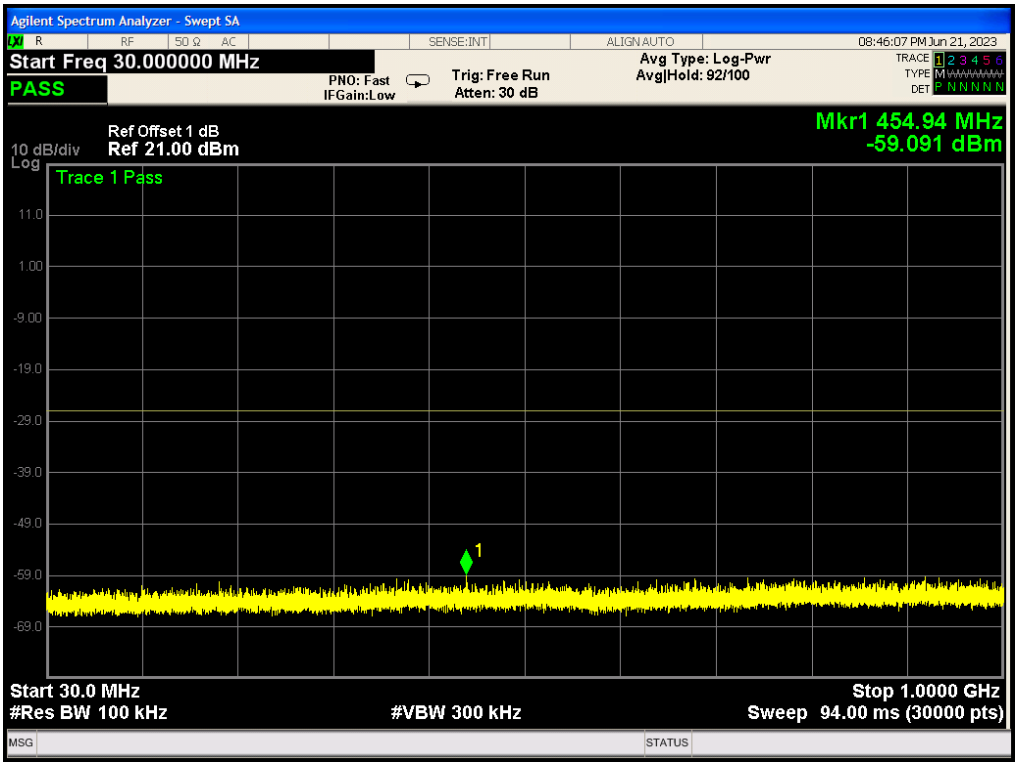
802.11a_ANT1_5825_6Mbps_Frequency Band3



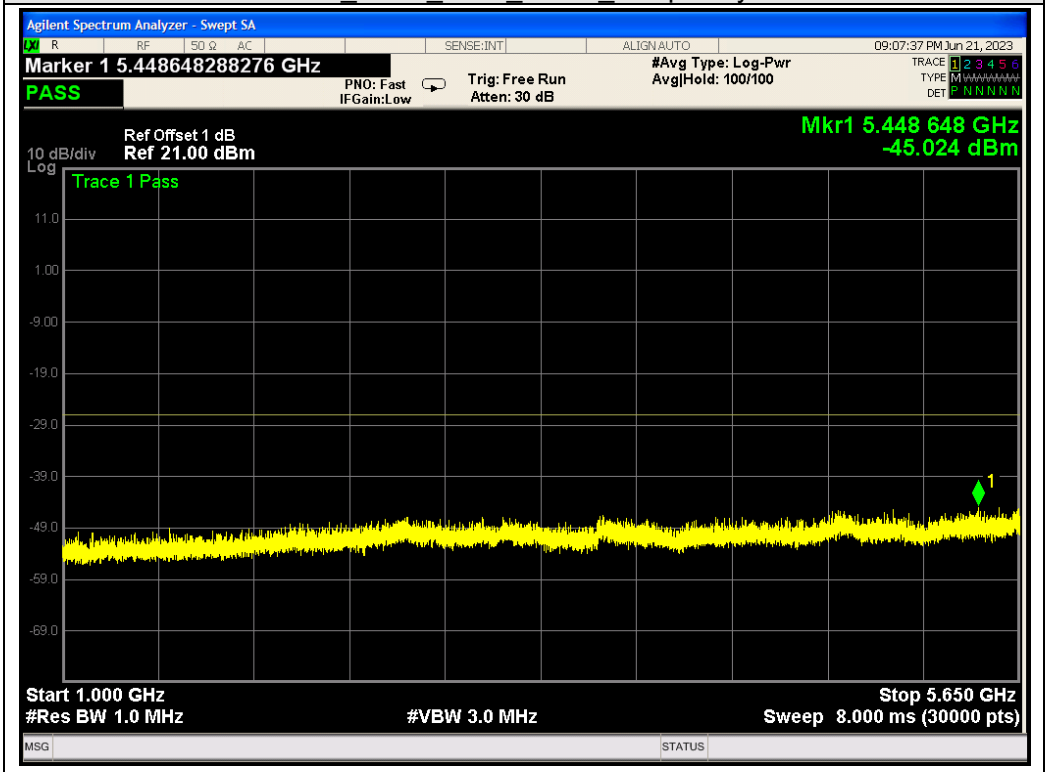
802.11a_ANT1_5825_6Mbps_Frequency Band4



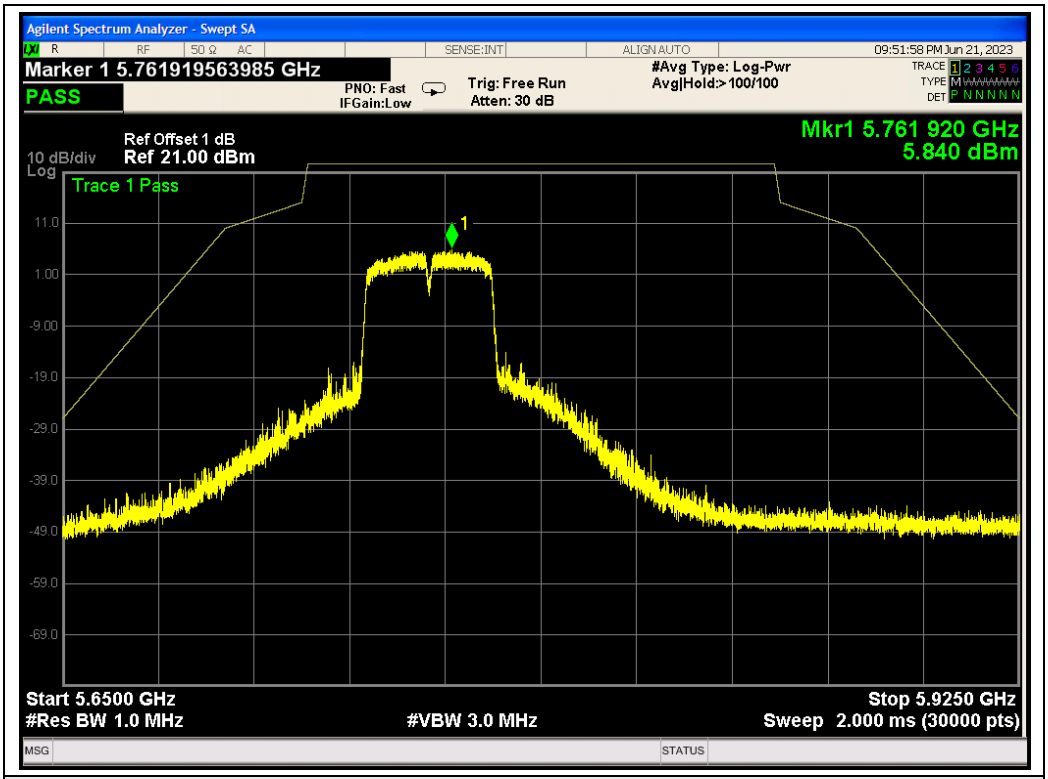
802.11a_ANT1_5825_6Mbps_Frequency Band5



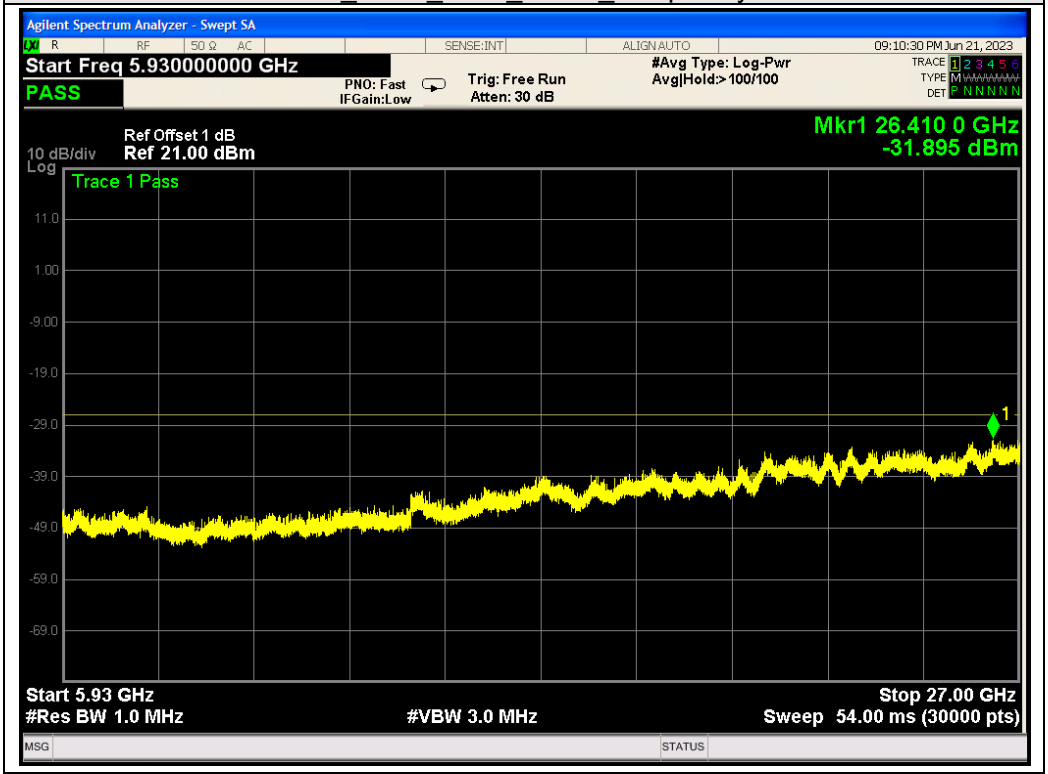
802.11n40_ANT1_5755_MCS0_Frequency Band1



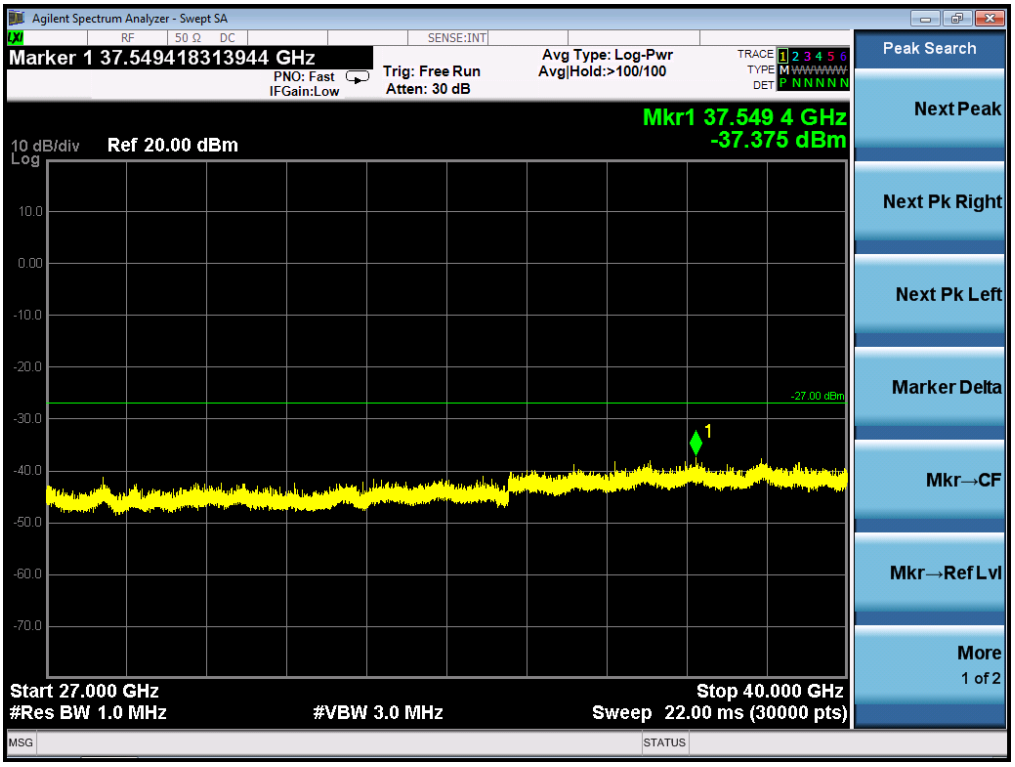
802.11n40_ANT1_5755_MCS0_Frequency Band2



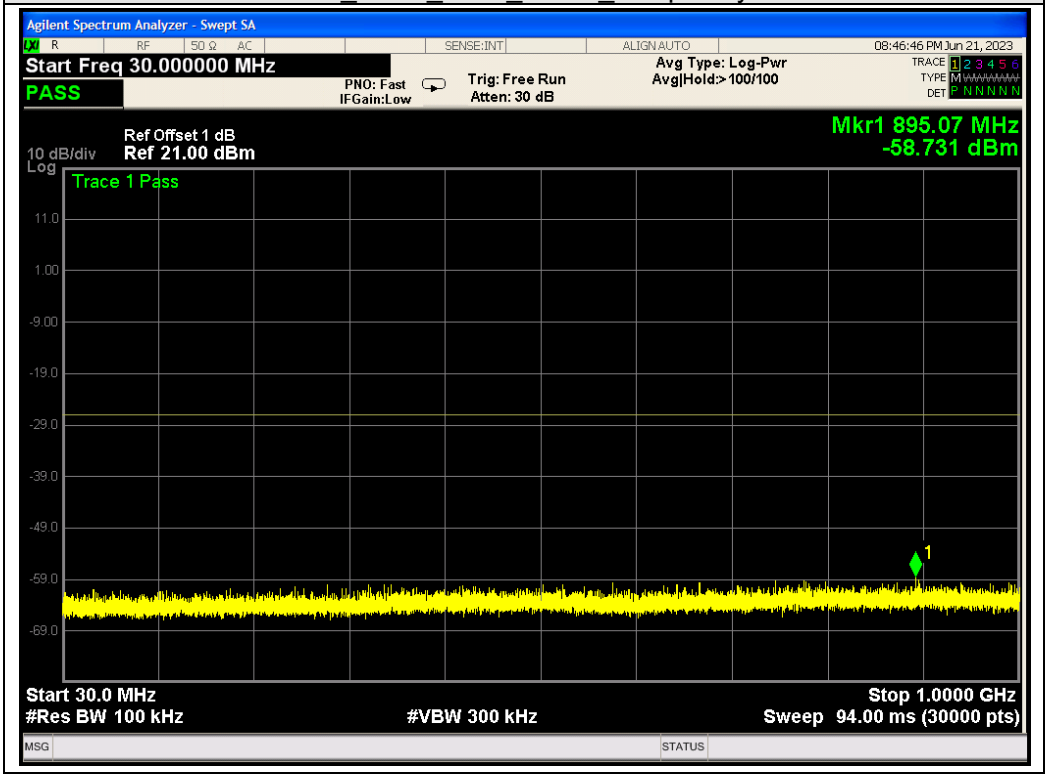
802.11n40_ANT1_5755_MCS0_Frequency Band3



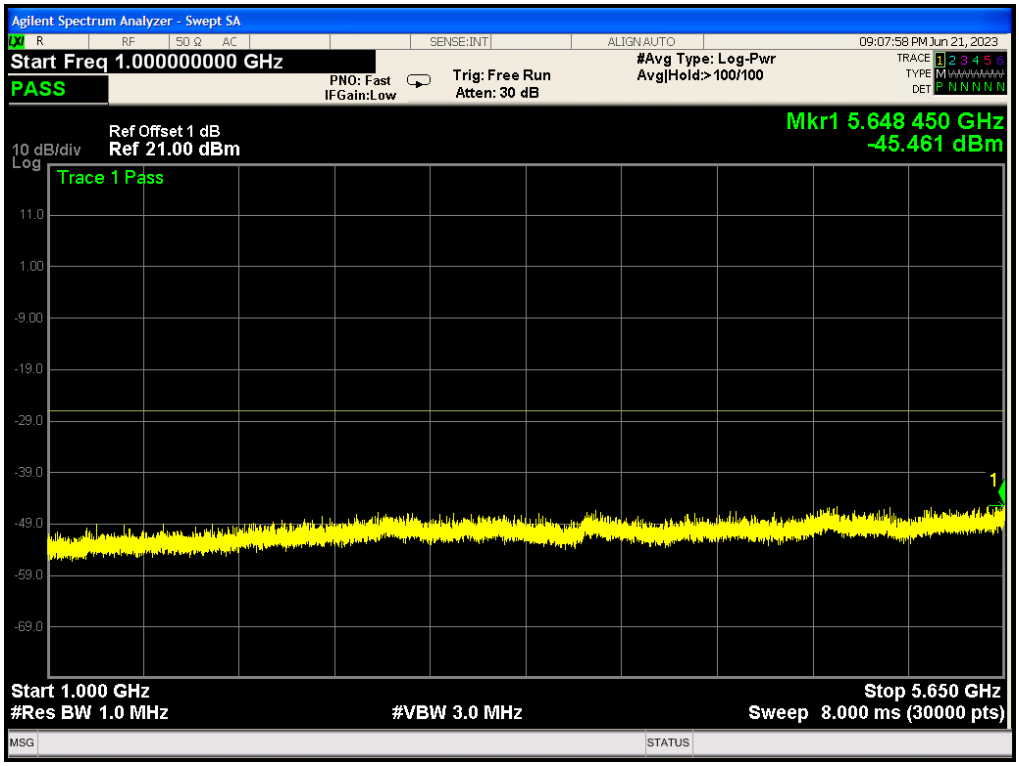
802.11n40_ANT1_5755_MCS0_Frequency Band4



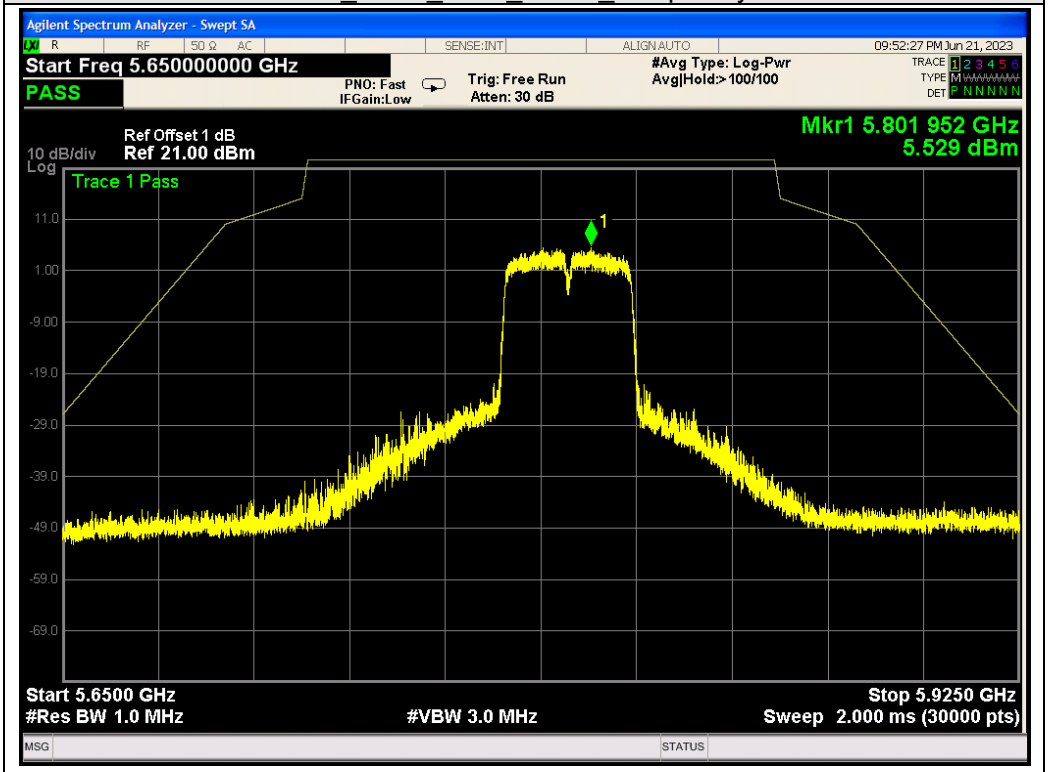
802.11n40_ANT1_5755_MCS0_Frequency Band5



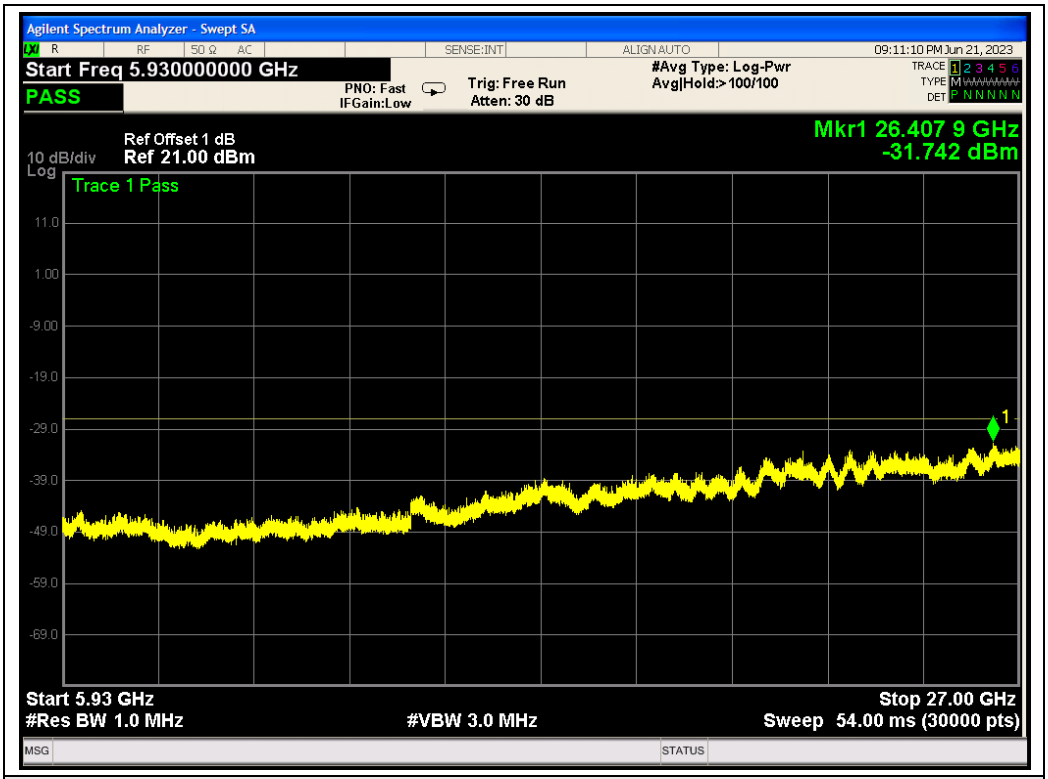
802.11n40_ANT1_5795_MCS0_Frequency Band1



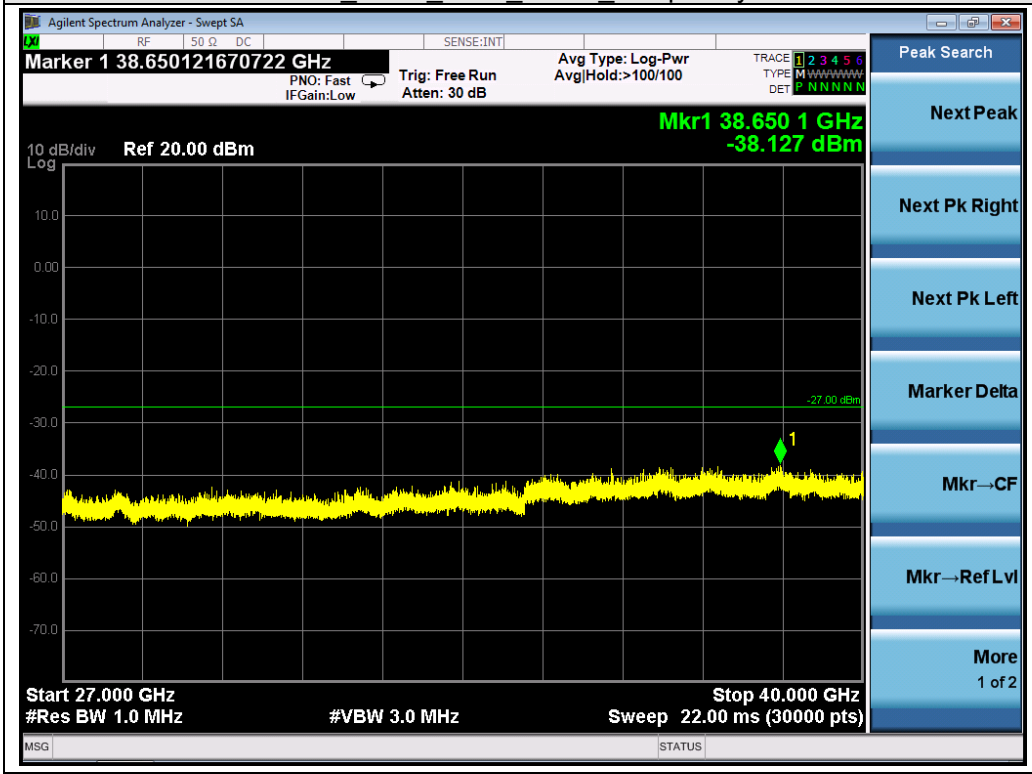
802.11n40_ANT1_5795_MCS0_Frequency Band2



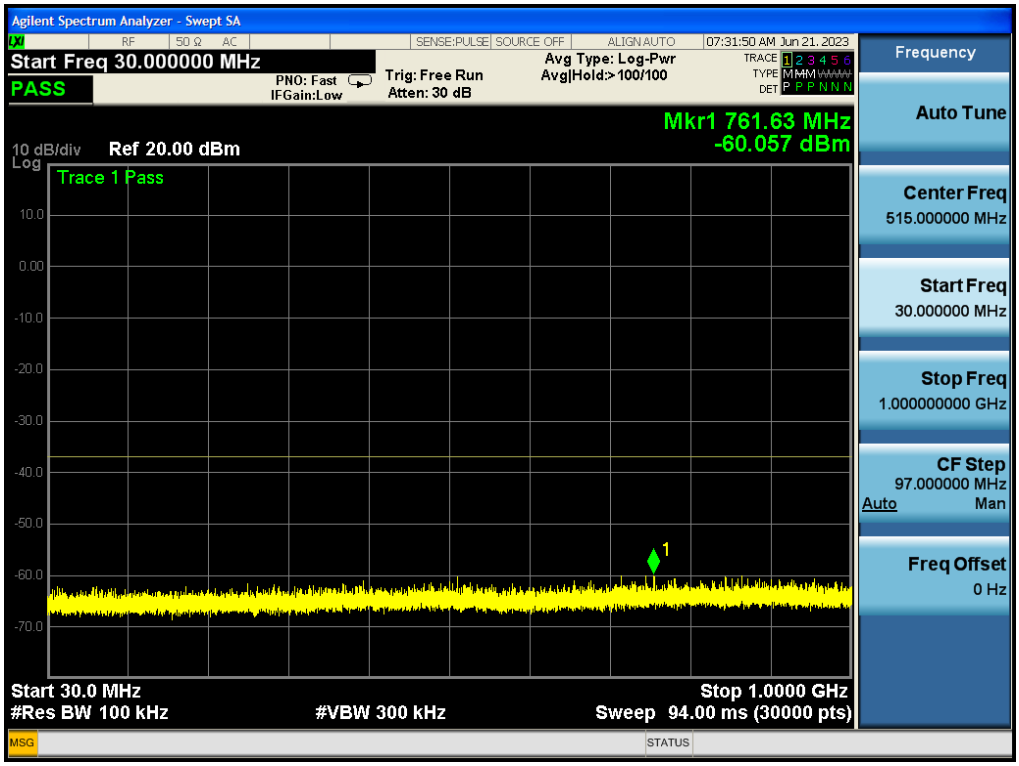
802.11n40_ANT1_5795_MCS0_Frequency Band3



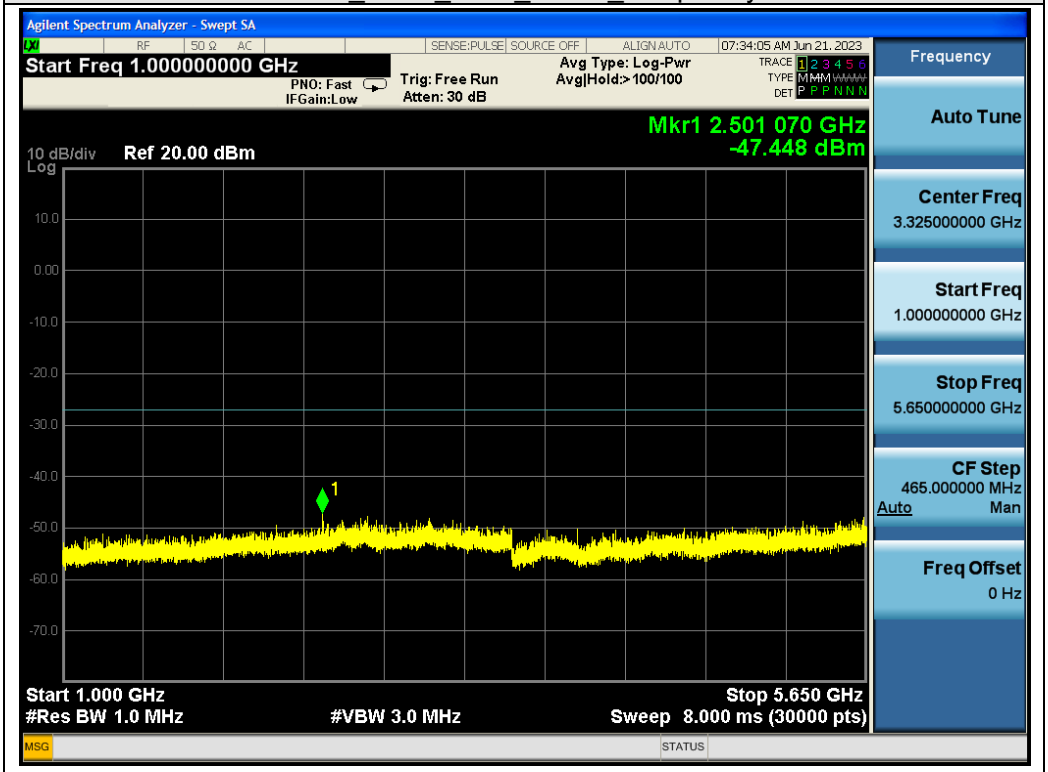
802.11n40_ANT1_5795_MCS0_Frequency Band4



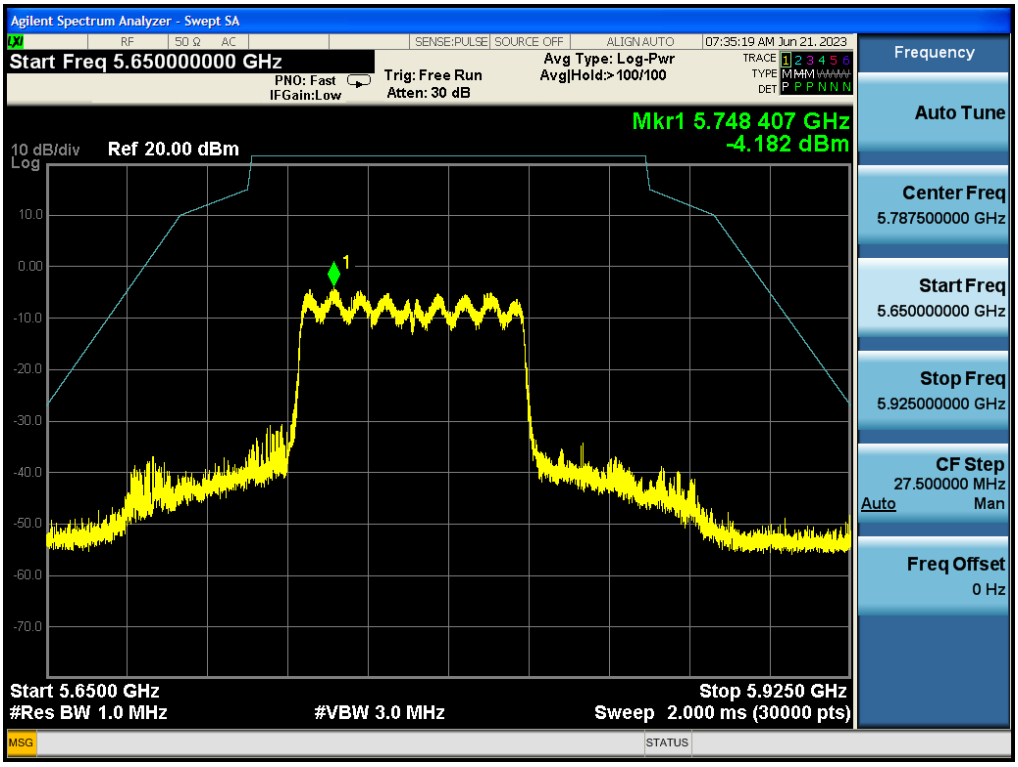
802.11n40_ANT1_5795_MCS0_Frequency Band5



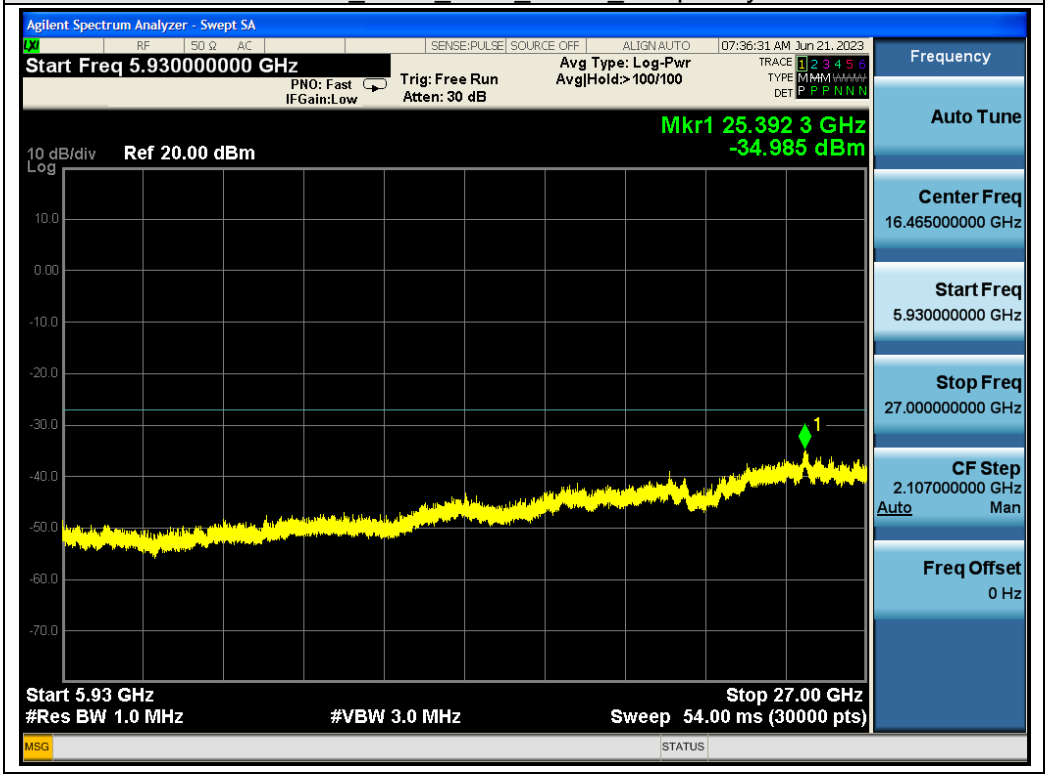
802.11ac80_ANT1_5775_MCS0_Frequency Band1



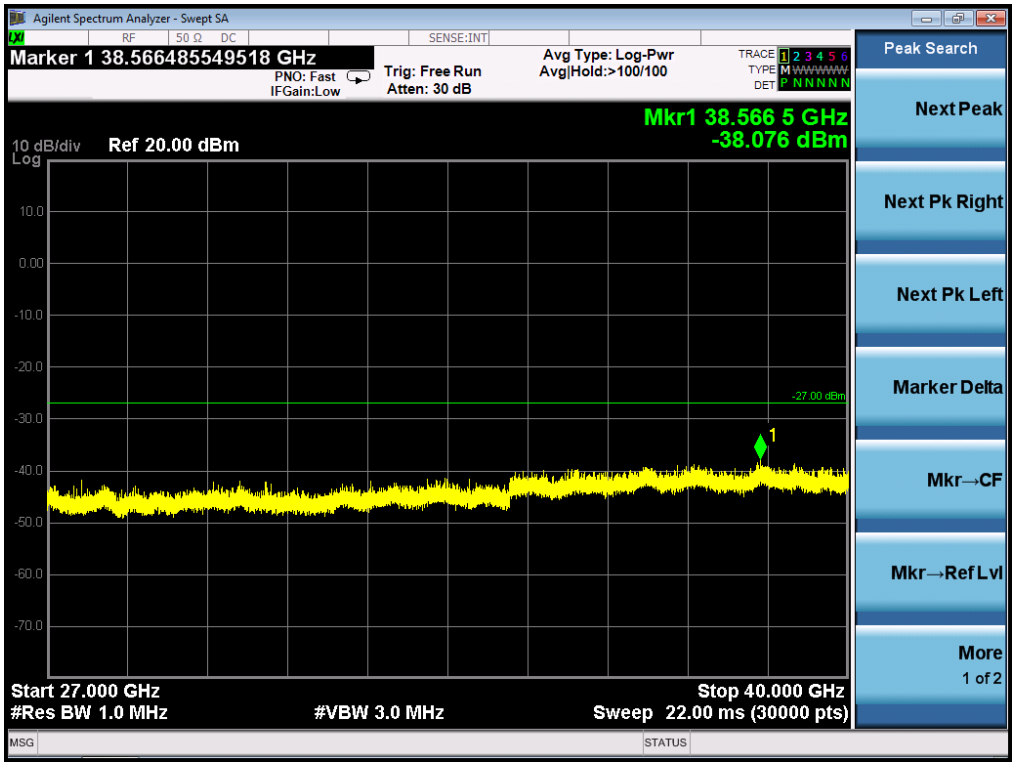
802.11ac80_ANT1_5775_MCS0_Frequency Band2



802.11ac80_ANT1_5775_MCS0_Frequency Band3



802.11ac80_ANT1_5775_MCS0_Frequency Band4



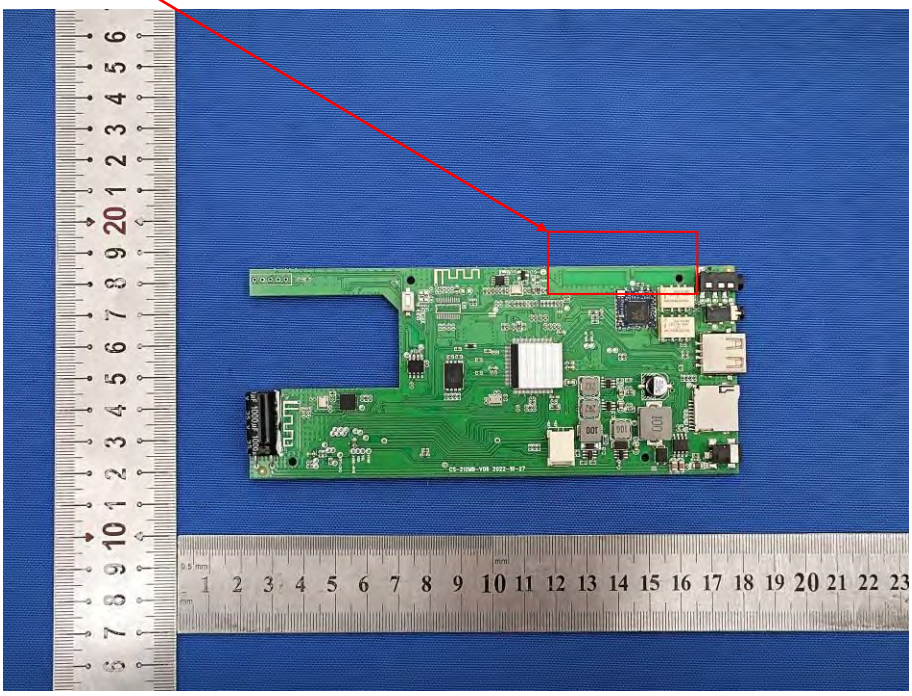
802.11ac80 ANT1 5775 MCS0 Frequency Band5

9 ANTENNA REQUIREMENT

Standard Applicable:
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

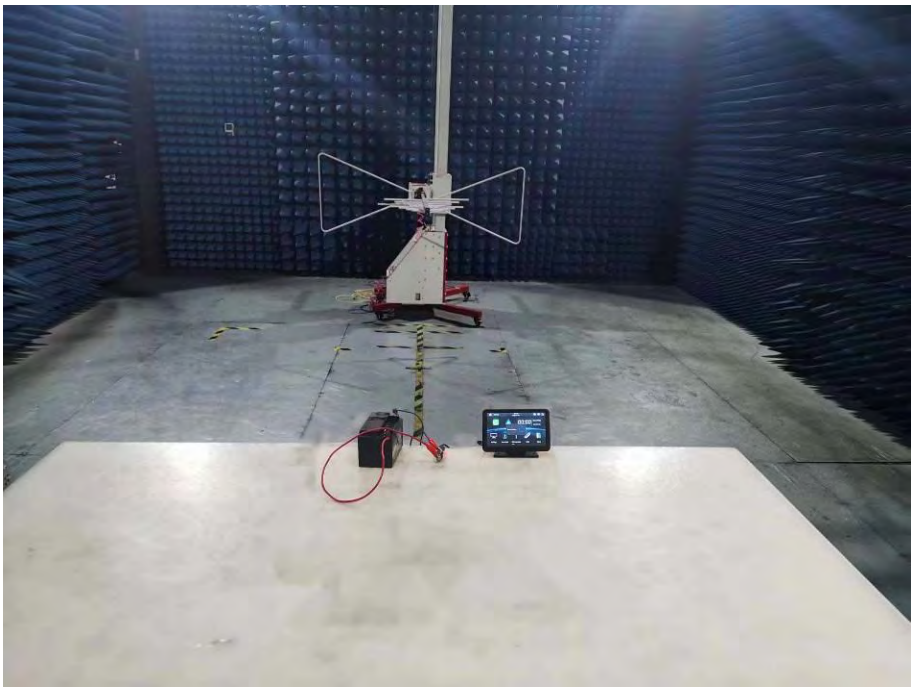
Antenna Connected Construction
The antenna used in this product is a PCB Antenna.

ANTENNA:

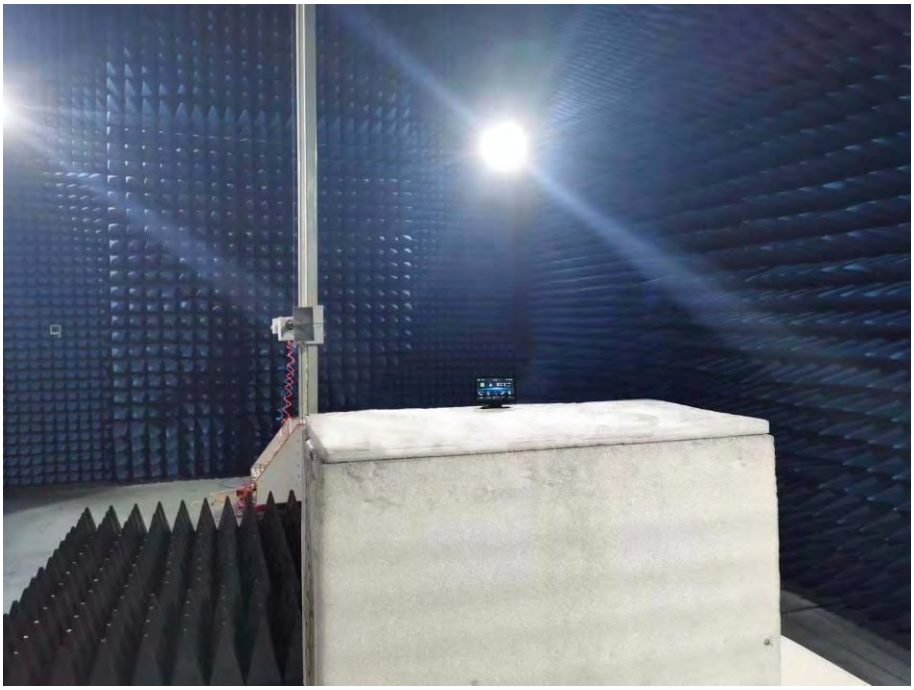


10 PHOTO OF TEST

RADIATED EMISSION

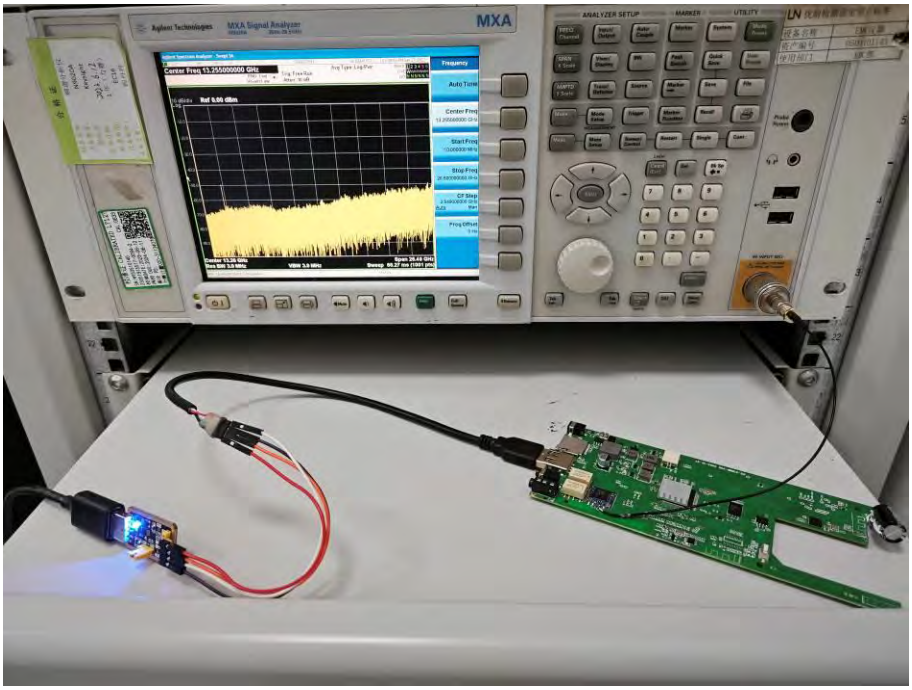


30MHz-1000MHz



Above 1GHz

RF Conducted



End of Report