

Test Report

Report No.: MTi210907019-01E3

Date of issue: December 20, 2021

Applicant: MAXMADE AUTO ELECTRONICS CO., LTD.

Product: Car multimedia player

Model(s): CAR110W, CAR110X, DCPA101

FCC ID: 2AT9B-AV1377W

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>

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5. Any objection to this test report shall be submitted to the laboratory within 15 days from the date of receipt of the report.

Contents

1	General Description	5
1.1	Description of the EUT	5
1.2	Description of test modes	5
1.3	Measurement uncertainty	6
2	Summary of the Test Results	7
3	Test Facilities and Accreditations	8
3.1	Test laboratory	8
4	Equipment List	9
5	Test Results	10
5.1	Antenna requirement	10
5.2	AC power line conducted emissions	11
5.3	26dB emission bandwidth	12
5.4	6dB emission bandwidth	17
5.5	RF output power	21
5.6	Power spectral density	23
5.7	Conducted spurious emissions	31
5.8	Conducted band edge	52
5.9	Radiated spurious emission	57
5.10	Frequency Stability Measurement	79
	Photographs of the Test Setup	81
	Photographs of the EUT	82

Test Result Certification	
Applicant:	MAXMADE AUTO ELECTRONICS CO., LTD.
Address:	Building 2, GIEC Industrial Park, Puzai Road, Pingdi, Longgang District, Shenzhen, China
Manufacturer:	MAXMADE AUTO ELECTRONICS CO., LTD.
Address:	Building 2, GIEC Industrial Park, Puzai Road, Pingdi, Longgang District, Shenzhen, China
Factory:	MAXMADE AUTO ELECTRONICS CO., LTD.
Address:	Building 2, GIEC Industrial Park, Puzai Road, Pingdi, Longgang District, Shenzhen, China
Product description	
Product name:	Car multimedia player
Trademark:	Dual, Jensen
Model name:	CAR110W
Serial Model:	CAR110X, DCPA101
Standards:	FCC 47 CFR Part 15 Subpart E
Test method:	ANSI C63.10-2013 KDB 789033 D02 v02r01
Date of Test	
Date of test:	2021-09-07 ~ 2021-12-20
Test result:	Pass

Test Engineer :



(Danny Xu)

Reviewed By :



(Leon Chen)

Approved By :



(Tom Xue)

1 General Description

1.1 Description of the EUT

Product name:	Car multimedia player
Model name:	CAR110W
Series Model:	CAR110X, DCPA101
Model difference:	All models have the same Circuit diagram, PCB layout and electrical construction. The difference lies only on the model's name.
Electrical rating:	Input: DC 12V
Hardware version:	V01
Software version:	V01
Accessories:	N/A
EUT serial number:	MTi210907019-01-S0001
RF specification:	
Operation frequency:	U-NII-1: 5150 MHz to 5250 MHz, U-NII-3: 5725 MHz to 5850 MHz
Modulation type:	OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11a/n/ac;
Transfer rate:	802.11a: 6,9,12,18,24,36,48,54Mbps; 802.11n(HT20/HT40): MCS0-MCS15; 802.11ac(VHT20): NSS1, MCS0-MCS8 802.11ac(VHT40):NSS1, MCS0-MCS9 802.11ac(VHT80) :NSS1,MCS0-MCS9
Channel bandwidth:	802.11a: 20 MHz 802.11n: 20 MHz, 40 MHz 802.11ac: 20 MHz, 40 MHz, 80MHz
Antenna designation:	FPC antenna, antenna Gain: 0.56 dBi
Max. output power:	U-NII-1: 13.91dBm U-NII-3: 12.26dBm

1.2 Description of test modes

1.2.1 Operation channel list

For U-NII-1:					
20 MHz bandwidth		40 MHz bandwidth		80 MHz bandwidth	
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
36	5180	38	5190	42	5210
40	5200	46	5230	--	--
44	5220	--	--	--	--
48	5240	--	--	--	--

For U-NII-3:

20 MHz		40 MHz bandwidth		80 MHz bandwidth	
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
149	5745	151	5755	155	5775
153	5765	159	5795	--	--
157	5785	--	--	--	--
161	5805	--	--	--	--
165	5825	--	--	--	--

Note: The test software has been used to control EUT for working in engineering mode, that enables selectable channel, and capable of continuous transmitting mode.

1.2.2 Description of support units
Support equipment list

Description	Model	Serial No.	Manufacturer
Laptop	E48	PF-1M37WV	LENOVO

1.3 Measurement uncertainty

Parameter	Measurement uncertainty
AC power line conducted emission (9 kHz~30 MHz)	±2.5 dB
Occupied Bandwidth	±3 %
Conducted RF output power	±0.16 dB
Conducted spurious emissions	±0.21 dB
Radiated emission (9 kHz ~ 30 MHz)	±4.0 dB
Radiated emission (30 MHz~1 GHz)	±4.2 dB
Radiated emission (above 1 GHz)	±4.3 dB

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

2 Summary of the Test Results

No.	FCC reference	Description of test	Result
1	§15.203 & 15.407	Antenna requirement	Pass
2	§ 15.207	AC power line conducted emissions	N/A
3	§15.407(a)	26dB emission bandwidth	Pass
4	§15.407(e)	6dB emission bandwidth	Pass
5	§15.407(a)	RF output power	Pass
6	§15.407(a)	Power spectral density	Pass
7	§15.407(b)	Conducted Spurious Emission	Pass
8	§15.407(b)	Conducted band edge	Pass
9	§15.407(b)	Radiation Spurious Emissions	Pass

3 Test Facilities and Accreditations

3.1 Test laboratory

Test laboratory:	Shenzhen Microtest Co., Ltd.
Test site location:	101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	(86-755)88850135
Fax:	(86-755)88850136
CNAS Registration No.:	CNAS L5868
FCC Registration No.:	448573

4 Equipment List

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
MTi-E002	EMI Test Receiver	R&S	ESCI3	101368	2021/06/02	2022/06/01
MTi-E023	Artificial power network	Schwarzbeck	NSLK8127	NSLK8127#841	2021/06/02	2022/06/01
MTi-E025	Artificial power network	Schwarzbeck	NSLK8127	8127183	2021/06/02	2022/06/01
MTi-E043	EMI test receiver	R&S	ESCI7	101166	2021/06/02	2022/06/01
MTi-E046	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00044	2021/05/30	2023/05/29
MTi-E044	Broadband antenna	Schwarzbeck	VULB9163	9163-1338	2021/05/30	2023/05/29
MTi-E045	Horn antenna	Schwarzbeck	BBHA9120D	9120D-2278	2021/05/30	2023/05/29
MTi-E047	Pre-amplifier	Hewlett-Packard	8447F	3113A06184	2021/06/02	2022/06/01
MTi-E048	Pre-amplifier	Agilent	8449B	3008A01120	2021/06/02	2022/06/01
MTi-E120	Broadband antenna	Schwarzbeck	VULB9163	9163-1419	2021/05/30	2023/05/29
MTi-E121	Pre-amplifier	Hewlett-Packard	8447D	2944A09365	2021/04/16	2022/04/15
MTi-E123	Pre-amplifier	Agilent	8449B	3008A04723	2021/05/06	2022/05/05
MTi-E135	Horn antenna	Schwarzbeck	BBHA 9170	00987	2021/05/30	2023/05/29
MTi-E136	Pre-amplifier	Space-Dtronics	EVLAN1840G-G45	210405001	2021/06/02	2022/06/01
MTi-E062	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2021/06/23	2022/06/22
MTi-E067	RF Control Unit	Tonscend	JS0806-1	19D8060152	2021/06/02	2022/06/01
MTi-E068	RF Control Unit	Tonscend	JS0806-2	19D8060153	2021/06/02	2022/06/01
MTi-E069	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2021/06/02	2022/06/01
MTi-E010S	EMI Measurement Software	Farad	EZ-EMC Ver. EMEC-3A1	/	/	/
MTi-E014S	RF Test System	Tonscend	TS@JS1120 V2.6.88.0330	/	/	/

5 Test Results

5.1 Antenna requirement

15.203 requirement

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

Description of the antenna of EUT

The antenna of EUT is FPC antenna (Antenna Gain: 0.56 dBi). which is no consideration of replacement.

5.2 AC power line conducted emissions

5.2.1 Limits

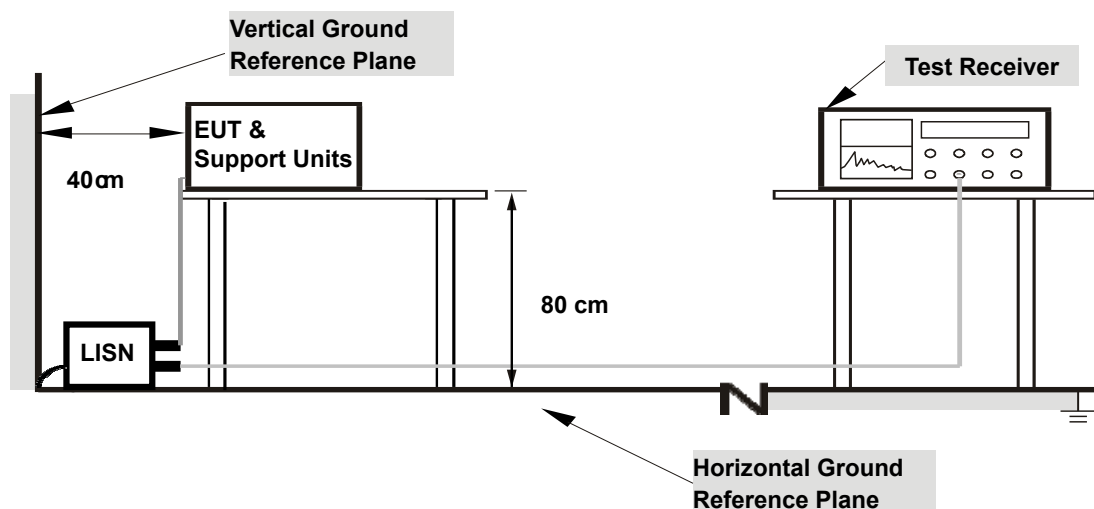
Frequency (MHz)	Detector type / Bandwidth	Limit-Quasi-peak dB μ V	Limit-Average dB μ V
0.15 -0.5	Average / 9 kHz	66 to 56	56 to 46
0.5 -5		56	46
5 -30		60	50

Note 1: the limit decreases with the logarithm of the frequency in the range of 0.15 MHz to 0.5 MHz.

5.2.2 Test Procedures

- The test setup is refer to the standard ANSI C63.10-2013.
- The EUT is connected to the main power through a line impedance stabilization network (LISN). All support equipment is powered from additional LISN(s).
- Emissions were measured on each current carrying line of the EUT using an EMI test receiver connected to the LISN powering the EUT.
- The test receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes described in Item 1.2.
- The test data of the worst-case condition(s) was recorded.

5.2.3 Test setup



For the actual test configuration, please refer to the related item – Photographs of the test setup.

5.2.4 Test Result

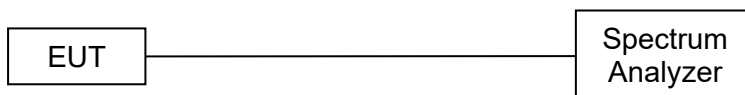
Notes: N/A, the EUT is not intended to be connected to AC mains power. Therefore, this test is not applicable

5.3 26dB emission bandwidth

5.3.1 Limits

None, for reporting purposes only.

5.3.2 Test setup



5.3.3 Test procedure

- a) Test method: for 26dB EBW - 789033 D02 v02r01 Section C.1.
- b) The transmitter output of EUT is connected to the spectrum analyzer.
- c) Spectrum analyzer setting:

26dB EBW:

RBW = approximately 1% of the emission bandwidth.

VBW $\geq$ RBW

Detector = Peak.

Trace mode = Max hold.

Measure the maximum width of the emission that is 26 dB down from the maximum of the emission.

5.3.4 Test results

U-NII-1 band:				
Mode	Test Channel	Frequency (MHz)	26dB EBW (MHz)	99% OBW
802.11a	CH36	5180	22.00	18.283
	CH40	5200	22.08	18.305
	CH48	5240	22.20	18.356
802.11n HT20	CH36	5180	22.12	18.268
	CH40	5200	21.76	18.215
	CH48	5240	21.72	18.112
802.11n HT40	CH38	5190	42.64	36.977
	CH46	5230	42.88	37.073
802.11ac VHT20	CH36	5180	22.36	18.419
	CH40	5200	22.64	18.328
	CH48	5240	22.20	18.256
802.11ac VHT40	CH38	5190	42.80	37.072
	CH46	5230	43.28	37.138
802.11ac VHT80	CH42	5210	86.24	76.412

26dB EBW & 99% OBW
802.11a - CH36 (5180 MHz)

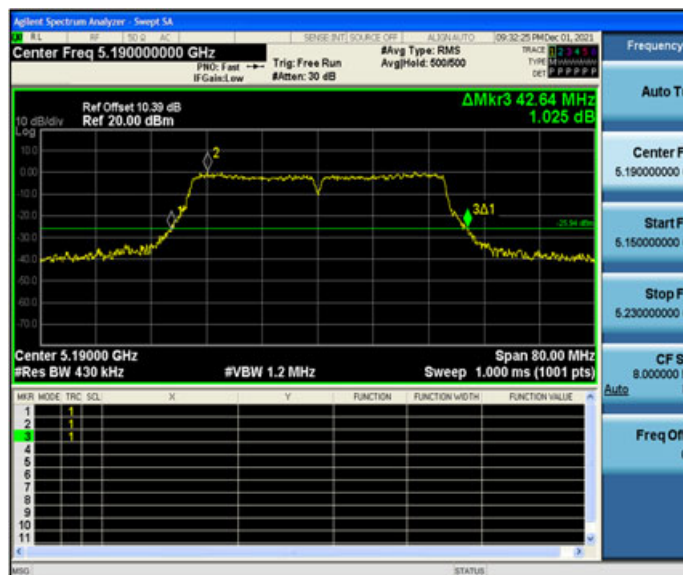
802.11a - CH40 (5200 MHz)

802.11a - CH48 (5240 MHz)

802.11n HT20 - CH36 (5180 MHz)

802.11n HT20 - CH40 (5200 MHz)

802.11n HT20 - CH48 (5240 MHz)


26dB EBW & 99% OBW
802.11n HT40 - CH38 (5190 MHz)

802.11n HT40 - CH46 (5230 MHz)

802.11ac VHT20 - CH36 (5180 MHz)

802.11ac VHT20 - CH40 (5200 MHz)

802.11ac VHT20 - CH48 (5240 MHz)

802.11ac VHT40 - CH38 (5190 MHz)


26dB EBW & 99% OBW
802. 11ac VHT40 – CH46 (5230 MHz)

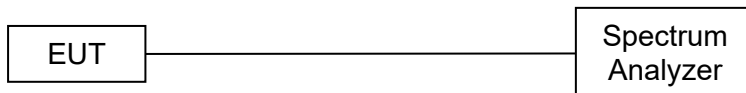
802. 11ac VHT80 – CH42 (5210 MHz)


5.4 6dB emission bandwidth

5.4.1 Limits

Within the 5.725-5.850 GHz and 5.850-5.895 GHz bands, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz

5.4.2 Test setup



5.4.3 Test procedure

- Test method: 789033 D02 v02r01 Section C.2.
- The transmitter output of EUT is connected to the spectrum analyzer.
- Spectrum analyzer setting:

RBW= 100 kHz.

VBW $\geq 3 \times$ RBW.

Detector = Peak.

Trace mode = max hold.

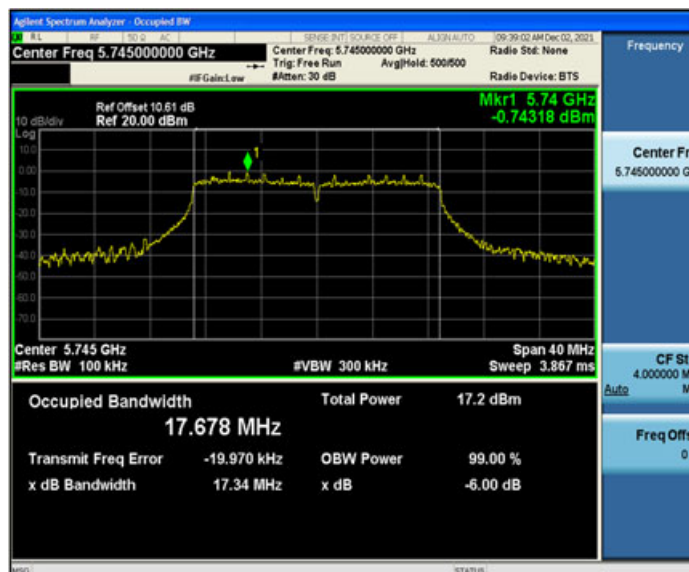
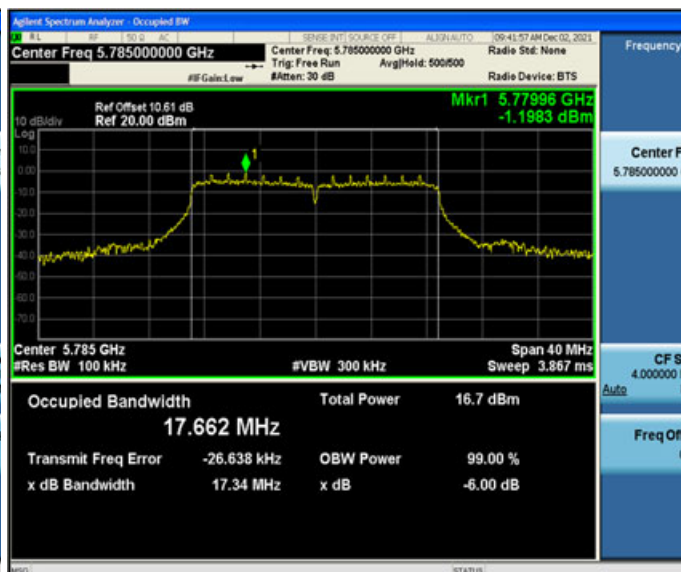
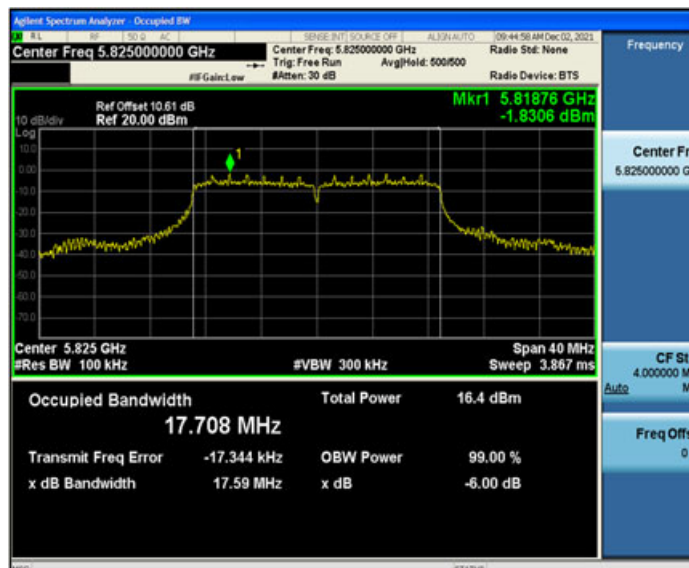
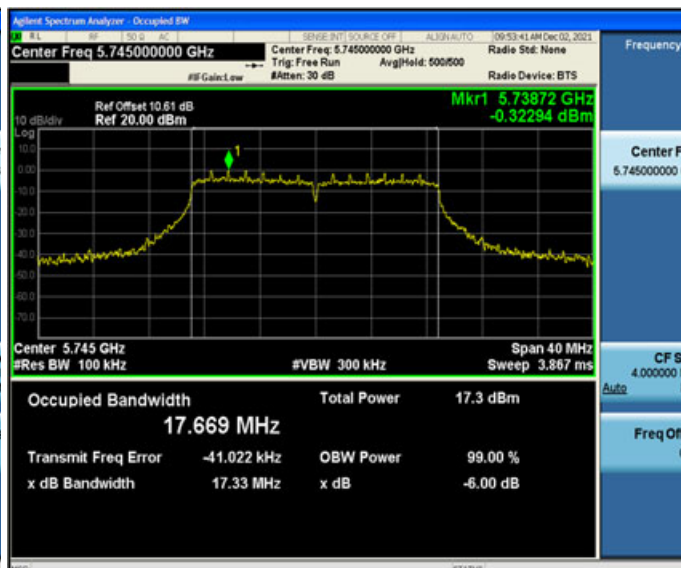
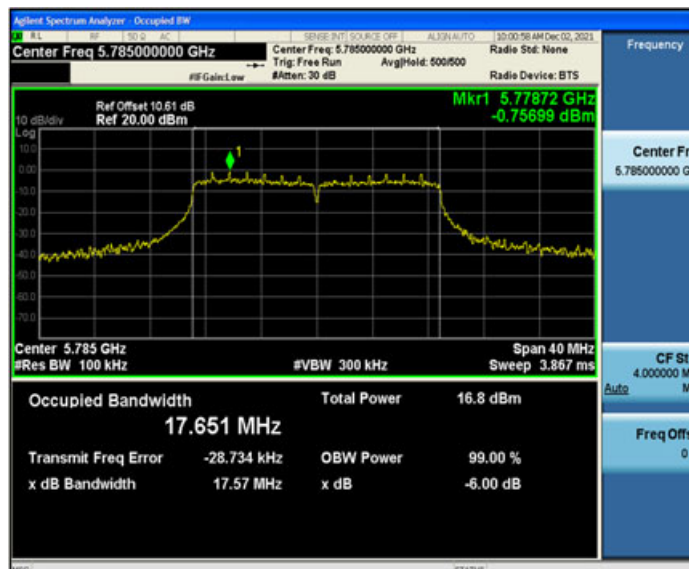
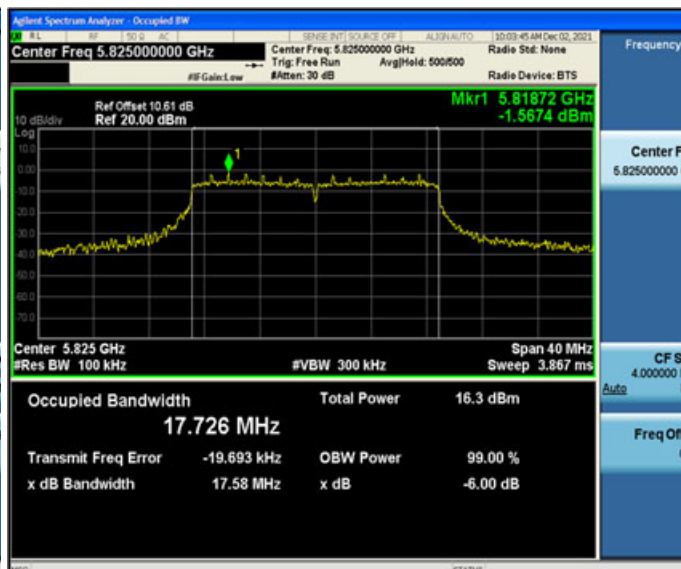
Sweep = auto couple.

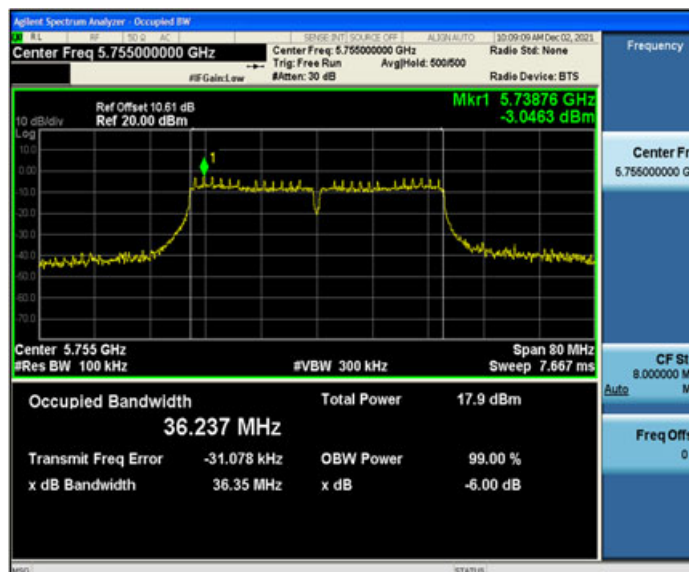
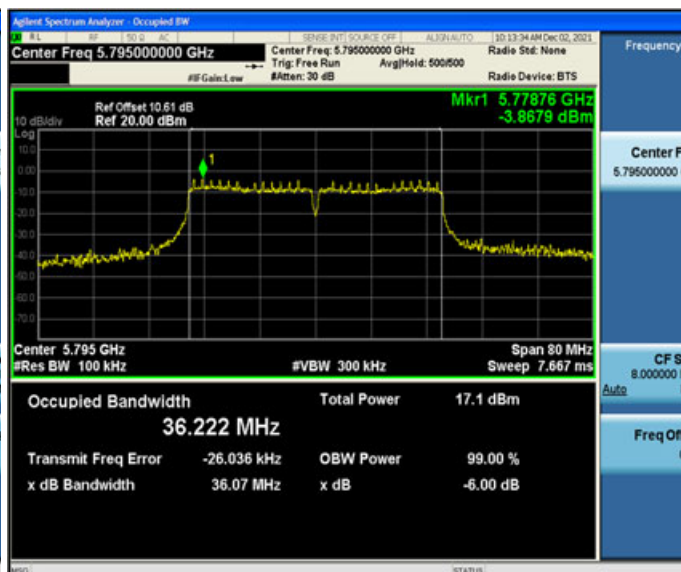
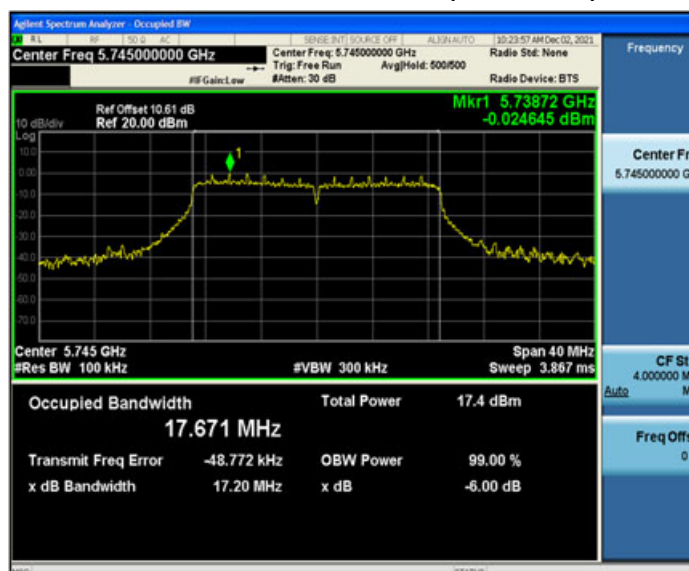
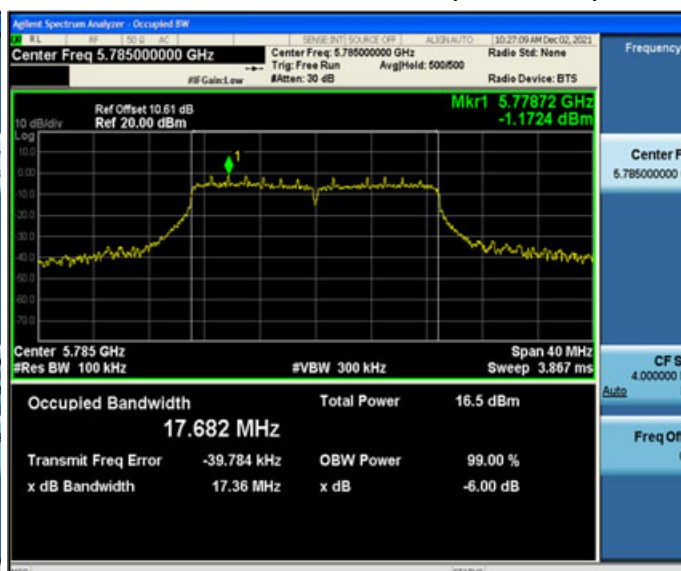
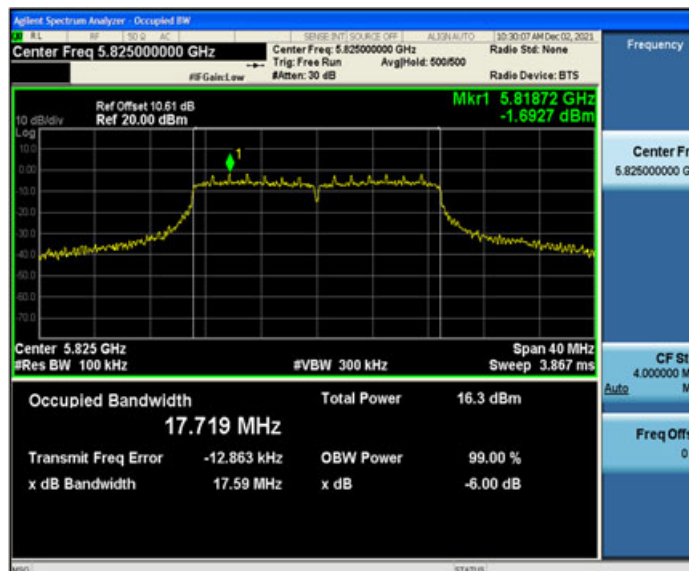
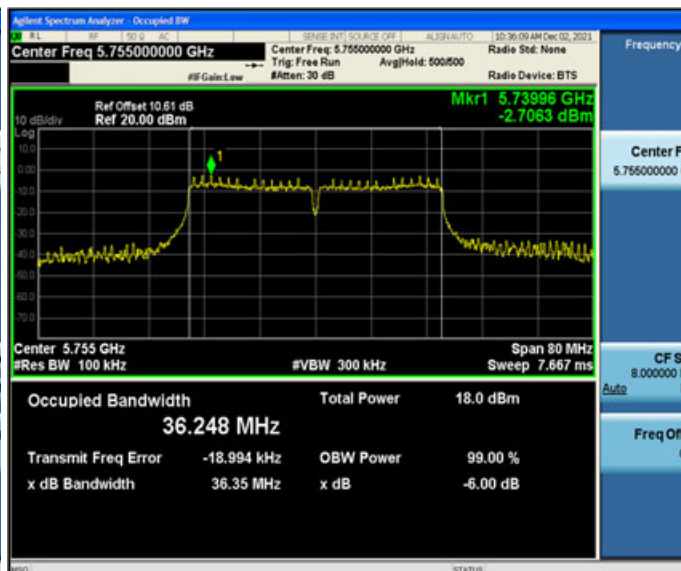
Allow the trace to stabilize.

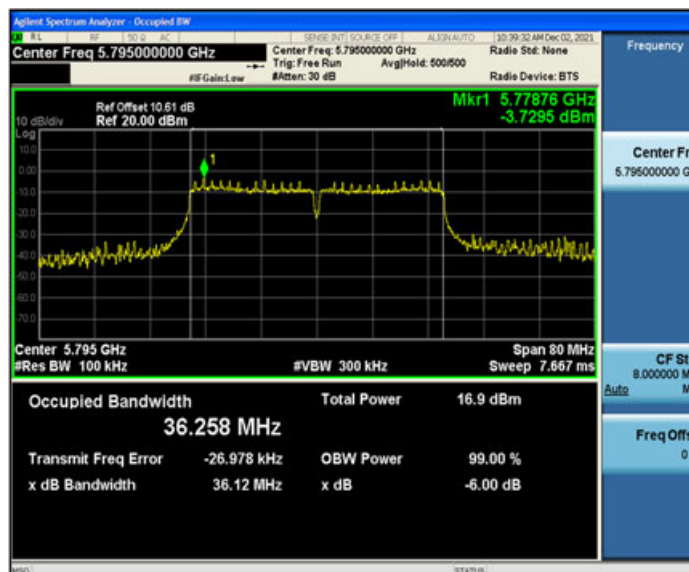
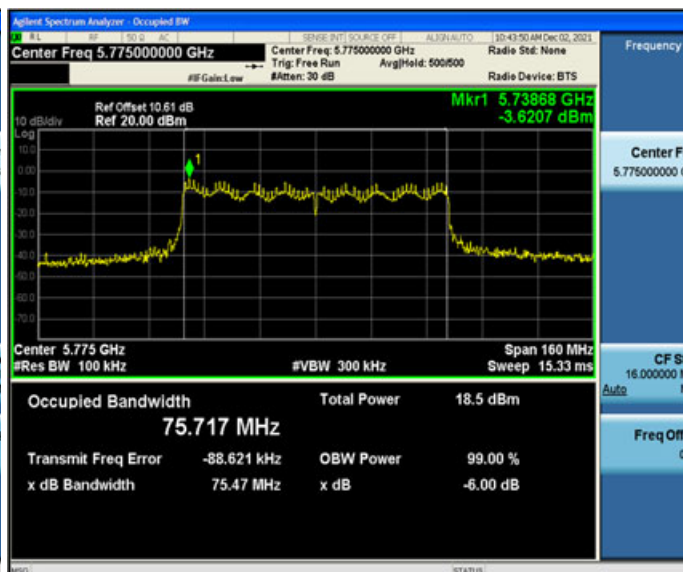
Measure the EBW using the automatic bandwidth measurement capability of the spectrum analyzer.

5.4.4 Test results

U-NII-3 band:				
Mode	Test Channel	Frequency (MHz)	6dB EBW (MHz)	Limit (MHz)
802.11a	CH149	5745	17.34	≥ 0.5
	CH157	5785	17.34	
	CH165	5825	17.59	
802.11n HT20	CH149	5745	17.33	
	CH157	5785	17.57	
	CH165	5825	1.58	
802.11n HT40	CH151	5755	36.35	
	CH159	5795	36.07	
802.11ac VHT20	CH149	5745	17.20	
	CH157	5785	17.36	
	CH165	5825	17.59	
802.11ac VHT40	CH151	5755	36.35	
	CH159	5795	36.12	
802.11ac VHT80	CH155	5775	75.47	

6dB EBW
802.11a - CH149 (5745 MHz)

802.11a - CH157 (5785 MHz)

802.11a - CH165 (5825 MHz)

802.11n HT20 - CH149 (5745 MHz)

802.11n HT20 - CH157 (5785 MHz)

802.11n HT20 - CH165 (5825 MHz)


6dB EBW
802.11n HT40 - CH151 (5755 MHz)

802.11n HT40 - CH159 (5795 MHz)

802.11ac VHT20 - CH149 (5745 MHz)

802.11ac VHT20 - CH157 (5785 MHz)

802.11ac VHT20 - CH165 (5825 MHz)

802.11ac VHT40 - CH151 (5755 MHz)


6dB EBW
802. 11ac VHT40 – CH159 (5795 MHz)

802. 11ac VHT80 – CH155 (5775 MHz)


5.5 RF output power

5.5.1 Limits

5.15 - 5.25 GHz band

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. 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.

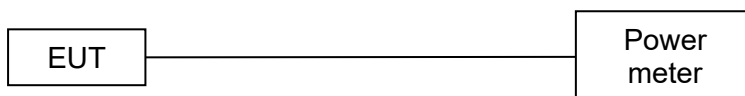
5.25-5.35 GHz and 5.47-5.725 GHz band

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 $11 \text{ dBm} + 10 \log B$, 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.

5.725-5.85 GHz band

For the band 5.725-5.850 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.

5.5.2 Test setup



5.5.3 Test procedure

Test method: 789033 D02 v02r01 Section E.3.b

5.5.4 Test results

U-NII-1 band:

Mode	Test Channel	Frequency (MHz)	RF output power (dBm)	Limit (dBm)
802.11a	CH36	5180	13.68	≤ 24
	CH40	5200	13.83	
	CH48	5240	13.48	
802.11n HT20	CH36	5180	11.71	
	CH40	5200	11.68	
	CH48	5240	11.35	
802.11n HT40	CH38	5190	11.79	
	CH46	5230	11.71	
802.11ac VHT20	CH36	5180	13.80	
	CH40	5200	13.87	
	CH48	5240	13.52	
802.11ac VHT40	CH38	5190	13.89	
	CH46	5230	13.91	
802.11ac VHT80	CH42	5210	11.87	

U-NII-3 band:

Mode	Test Channel	Frequency (MHz)	RF output power (dBm)	Limit (dBm)
802.11a	CH149	5745	12.26	≤ 30
	CH157	5785	11.40	
	CH165	5825	11.03	
802.11n HT20	CH149	5745	11.95	
	CH157	5785	11.48	
	CH165	5825	11.06	
802.11n HT40	CH151	5755	12.05	
	CH159	5795	11.39	
802.11ac VHT20	CH149	5745	12.03	
	CH157	5785	11.35	
	CH165	5825	10.87	
802.11ac VHT40	CH151	5755	12.21	
	CH159	5795	10.57	
802.11ac VHT80	CH155	5775	11.94	

5.6 Power spectral density

5.6.1 Limits

5.15 - 5.25 GHz band

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. 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.

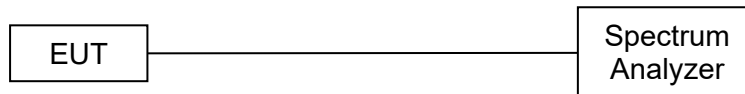
5.25-5.35 GHz and 5.47-5.725 GHz band

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 $11 \text{ dBm} + 10 \log B$, 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.

5.725-5.85 GHz band

For the band 5.725-5.850 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.

5.6.2 Test setup



5.6.3 Test procedure

Test method: 789033 D02 v02r01 Section F.

Spectrum analyzer setting for U-NII-1 band:

Set analyzer center frequency to NII channel center frequency.
Set the RBW $\geq 1\text{MHz}$.
Set the VBW $\geq 3 \times \text{RBW}$.
Detector = peak.
Sweep time = auto couple.
Trace mode = max hold.
Allow trace to fully stabilize.
Use the peak marker function to determine the maximum amplitude level.

Spectrum analyzer setting for U-NII-3 band:

Set analyzer center frequency to NII channel center frequency.
Set the RBW $\geq 510\text{kHz}$.
Set the VBW $\geq 3 \times \text{RBW}$.
Detector = peak
Sweep time = auto couple.
Trace mode = max hold.
Allow trace to fully stabilize.
Use the peak marker function to determine the maximum amplitude level.

5.6.4 Test results

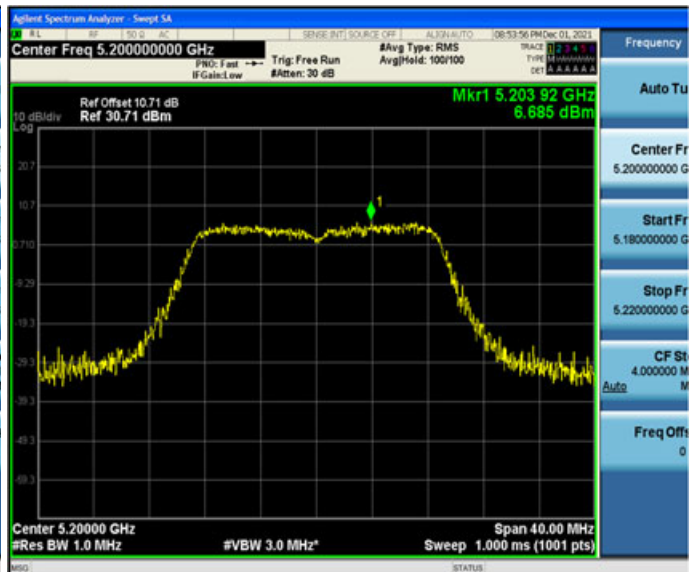
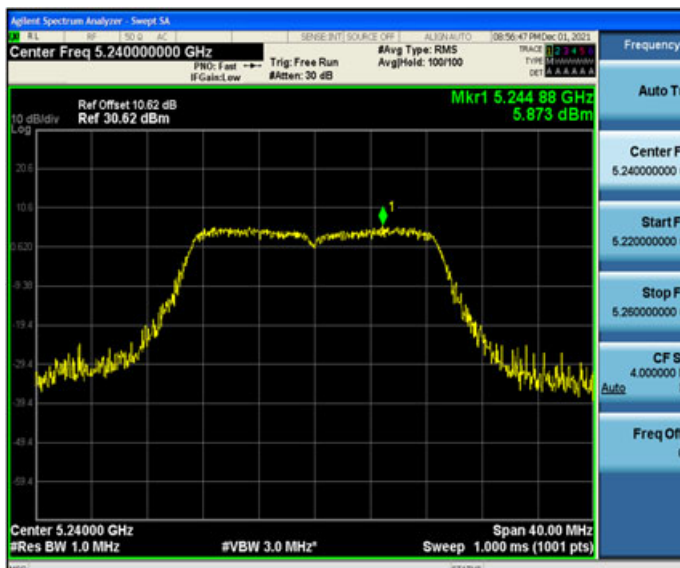
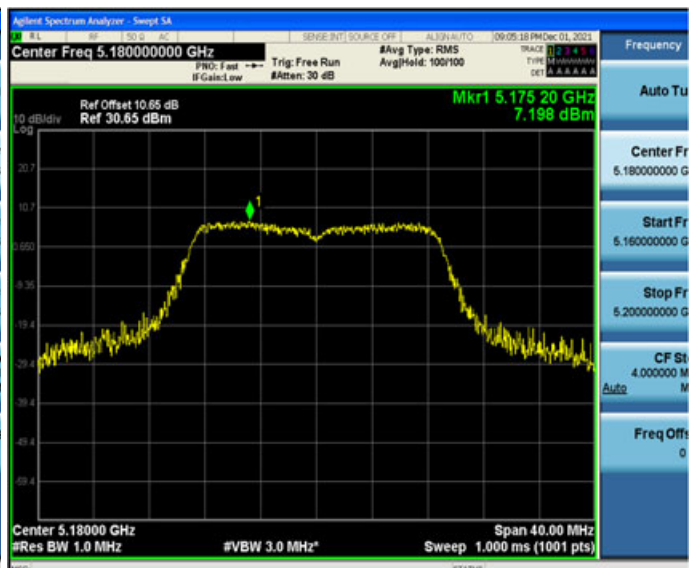
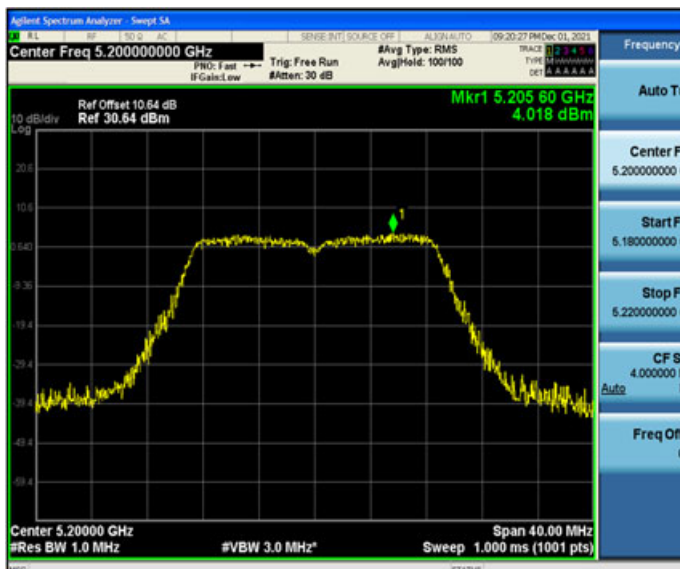
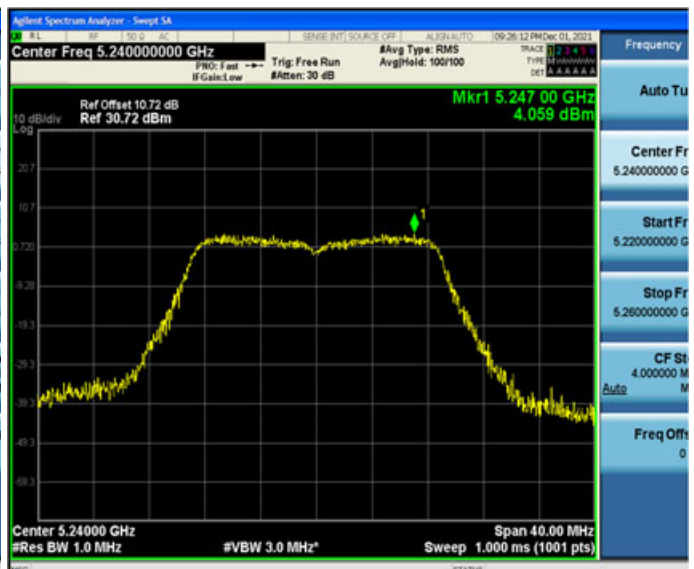
U-NII-1 band:

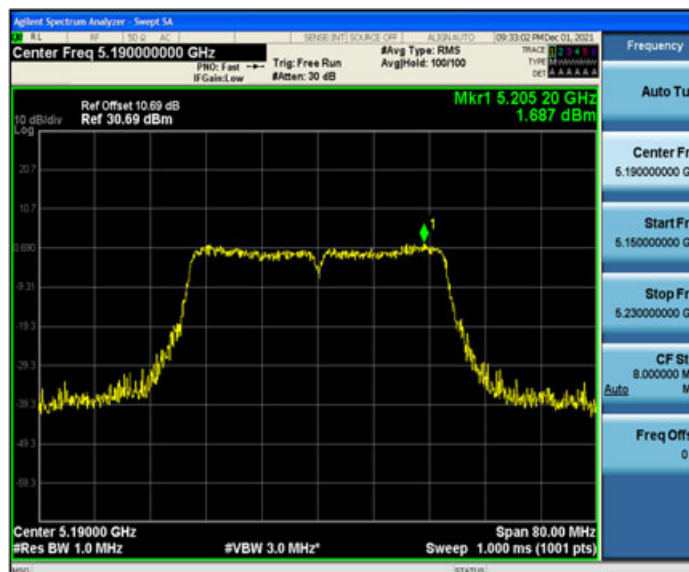
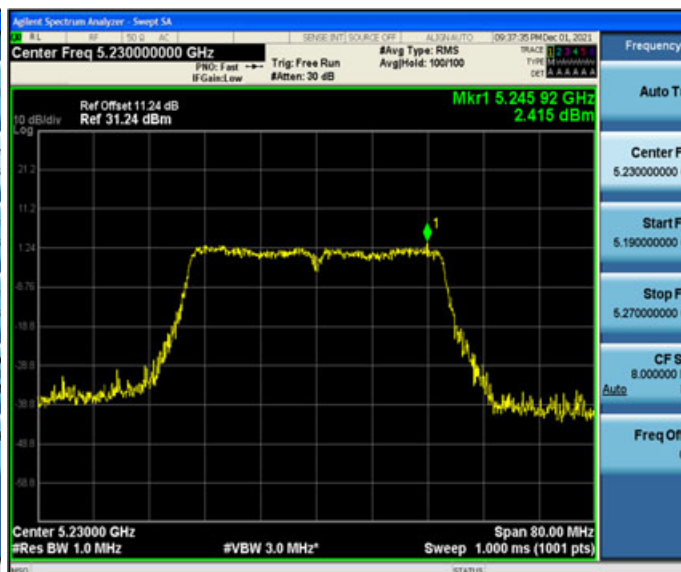
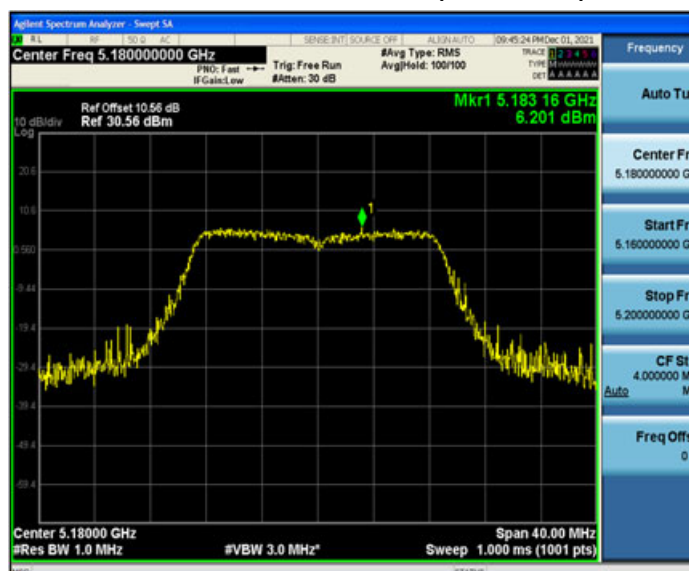
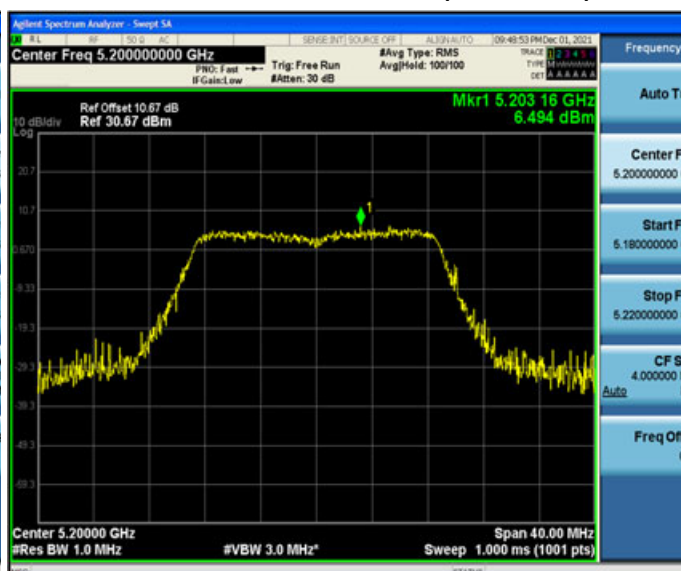
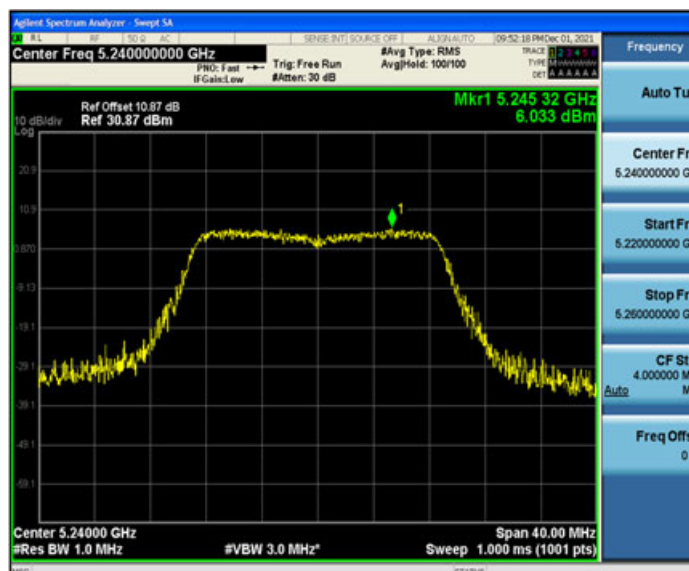
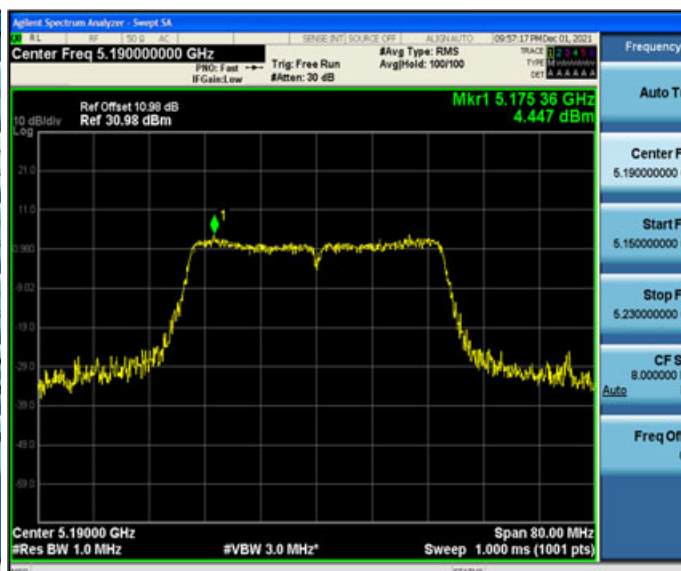
Mode	Test Channel	Frequency (MHz)	PSD (dBm/MHz)	Limit (dBm/MHz)
802.11a	CH36	5180	6.09	≤ 11
	CH40	5200	6.69	
	CH48	5240	5.87	
802.11n HT20	CH36	5180	7.2	
	CH40	5200	4.02	
	CH48	5240	4.06	
802.11n HT40	CH38	5190	1.69	
	CH46	5230	2.42	
802.11ac VHT20	CH36	5180	6.2	
	CH40	5200	6.49	
	CH48	5240	6.03	
802.11ac VHT40	CH38	5190	4.45	
	CH46	5230	4.28	
802.11ac VHT80	CH42	5210	0.78	

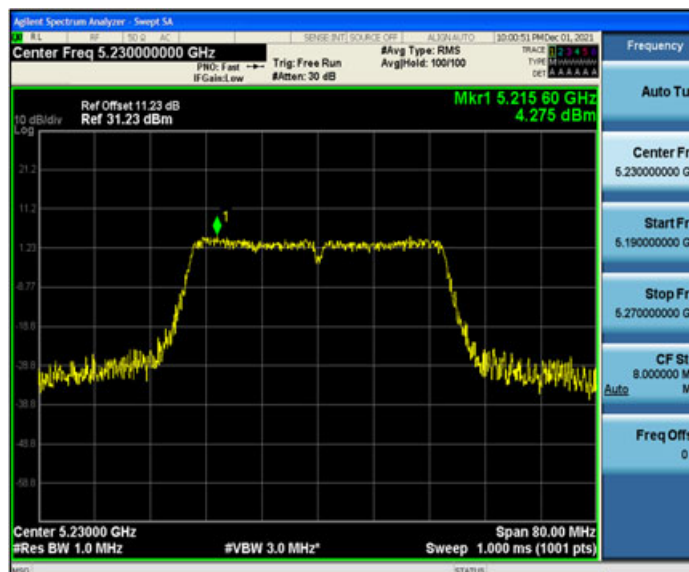
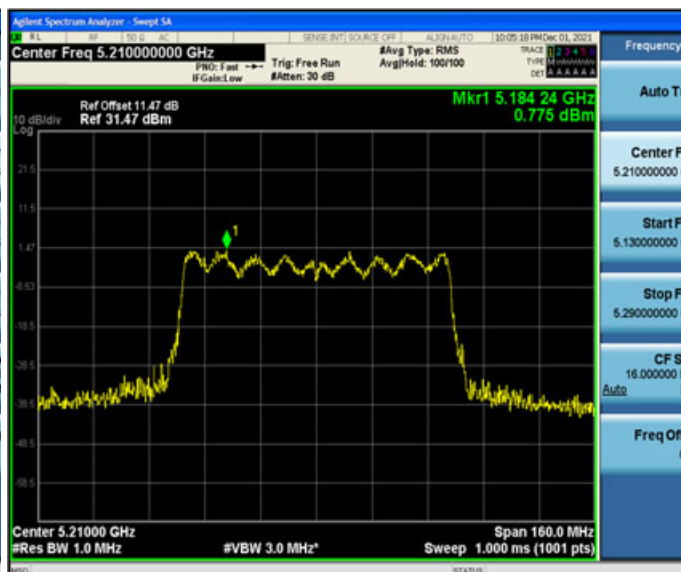
U-NII-3 band:

Mode	Test Channel	Frequency (MHz)	PSD (dBm/500kHz)	Limit (dBm/500kHz)
802.11a	CH149	5745	3.99	≤ 30
	CH157	5785	2.43	
	CH165	5825	1.47	
802.11n HT20	CH149	5745	2.83	
	CH157	5785	2.02	
	CH165	5825	1.49	
802.11n HT40	CH151	5755	0.31	
	CH159	5795	-0.26	
802.11ac VHT20	CH149	5745	2.81	
	CH157	5785	3.11	
	CH165	5825	1.42	
802.11ac VHT40	CH151	5755	0.21	
	CH159	5795	-1.36	
802.11ac VHT80	CH155	5775	-0.33	

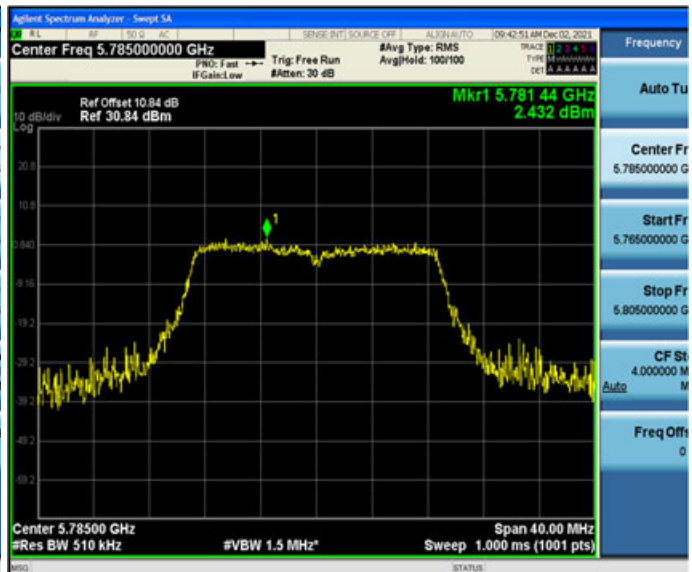
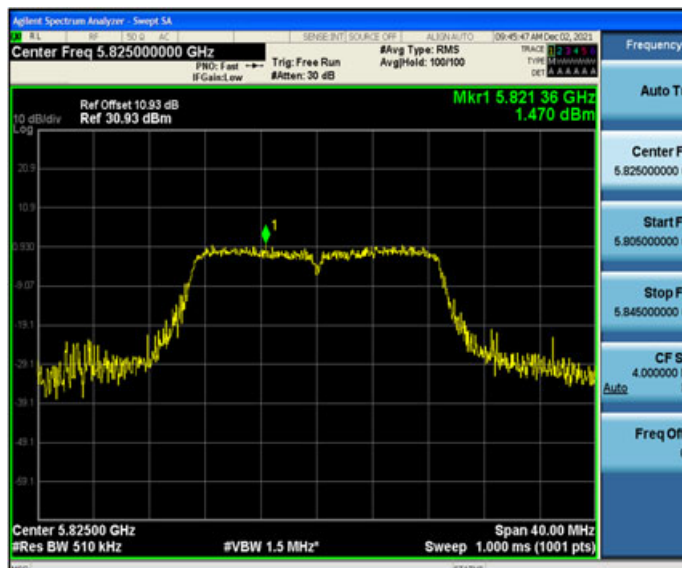
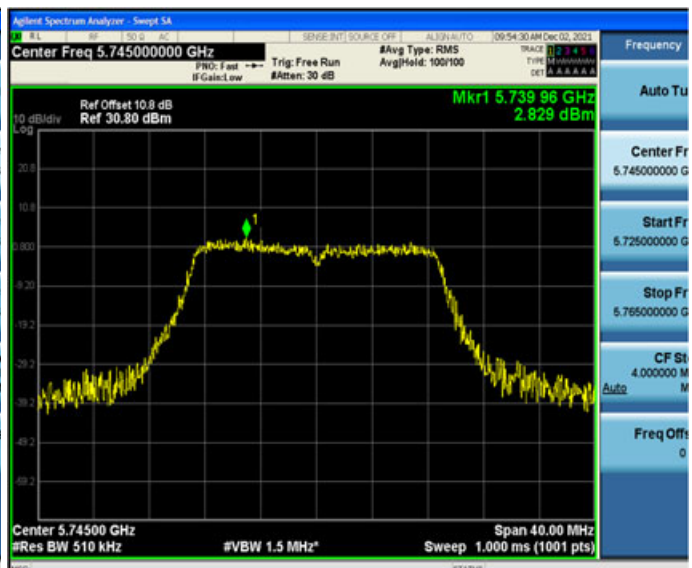
PSD – U-NII-1 band
802.11a - CH36 (5180 MHz)

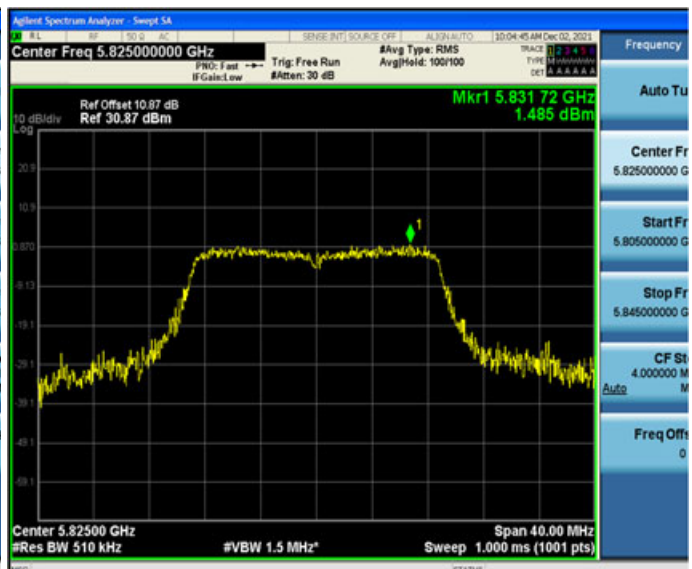
802.11a - CH40 (5200 MHz)

802.11a - CH48 (5240 MHz)

802.11n HT20 - CH36 (5180 MHz)

802.11n HT20 - CH40 (5200 MHz)

802.11n HT20 - CH48 (5240 MHz)


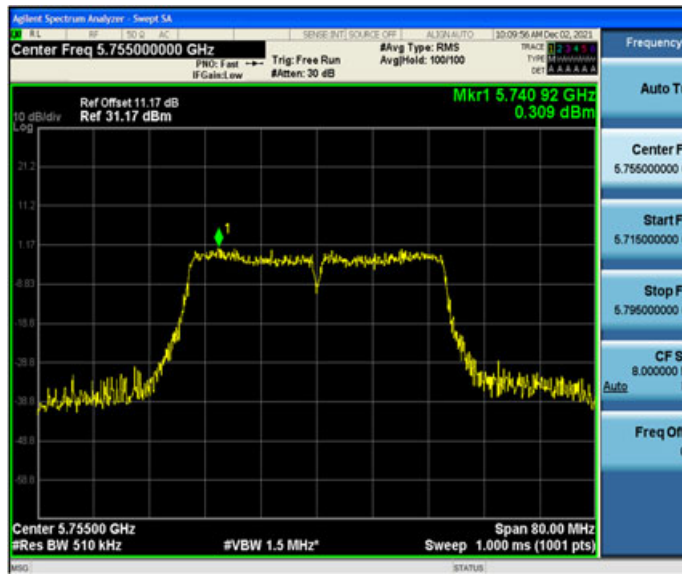
PSD – U-NII-1 band
802.11n HT40 - CH38 (5190 MHz)

802. 11n HT40 – CH46 (5230 MHz)

802.11ac VHT20 - CH36 (5180 MHz)

802. 11ac VHT20 – CH40 (5200 MHz)

802. 11ac VHT20 – CH48 (5240 MHz)

802. 11ac VHT40 – CH38 (5190 MHz)


PSD – U-NII-1 band
802.11ac VHT40 – CH46 (5230 MHz)

802.11ac VHT80 – CH42 (5210 MHz)


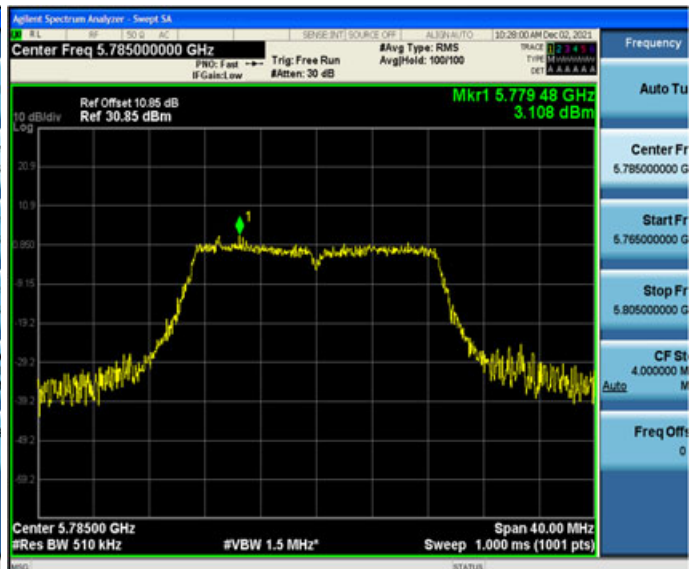
PSD – U-NII-3 band
802.11a - CH149 (5745 MHz)

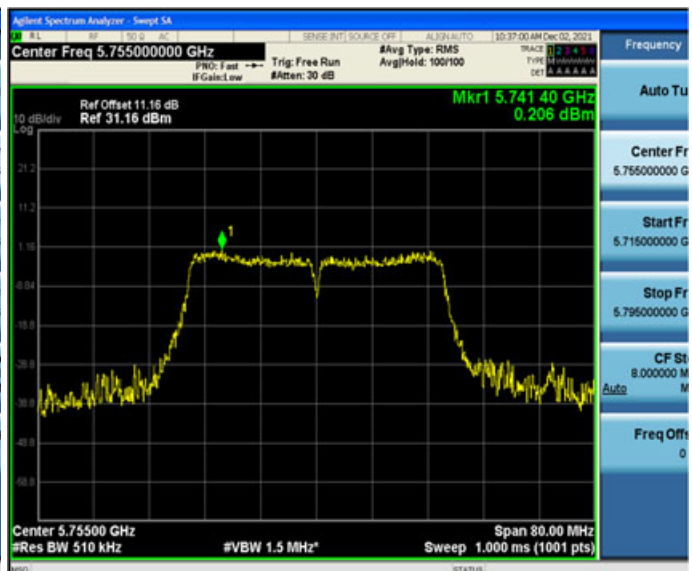
802.11a – CH157 (5785 MHz)

802.11a – CH165 (5825 MHz)

802.11n HT20 - CH149 (5745 MHz)

802.11n HT20 – CH157 (5785 MHz)

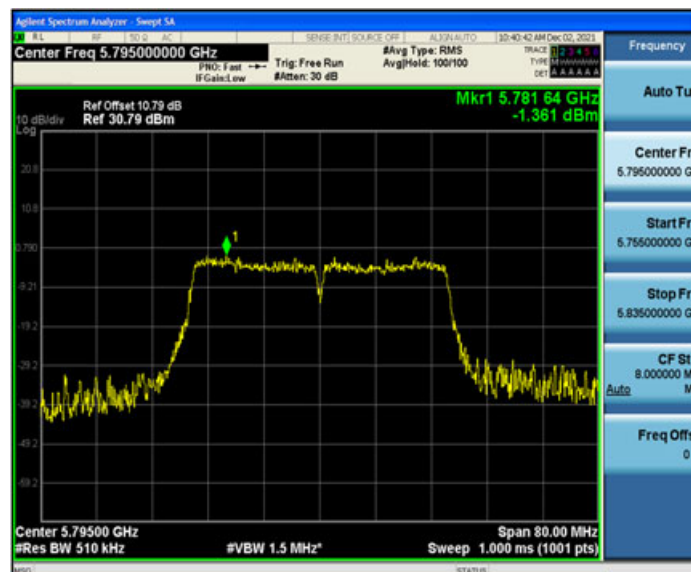
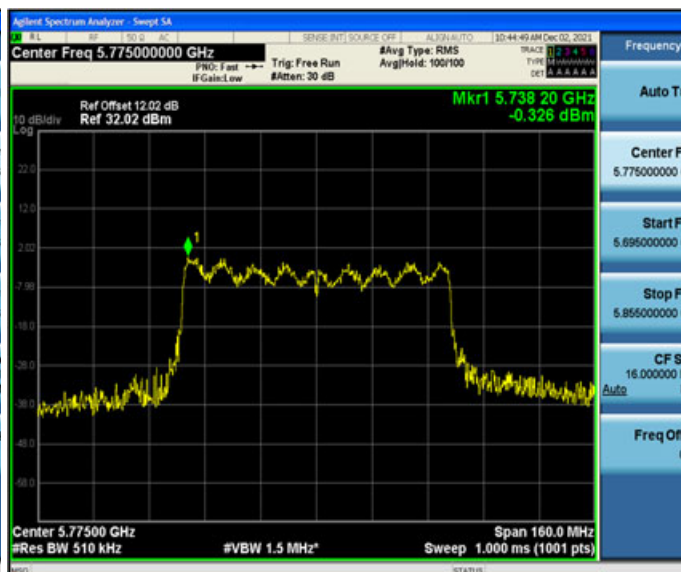
802.11n HT20 – CH165 (5825 MHz)


PSD – U-NII-3 band
802.11n HT40 - CH151 (5755 MHz)

802.11n HT40 – CH159 (5795 MHz)

802.11ac VHT20 – CH149 (5745 MHz)

802.11ac VHT20 – CH157 (5785 MHz)

802.11ac VHT20 – CH165 (5825 MHz)

802.11ac VHT40 – CH151 (5755 MHz)


PSD – U-NII-3 band
802.11ac VHT40 – CH159 (5795 MHz)

802.11ac VHT80 – CH155 (5775 MHz)


5.7 Conducted spurious emissions

5.7.1 Limits

Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

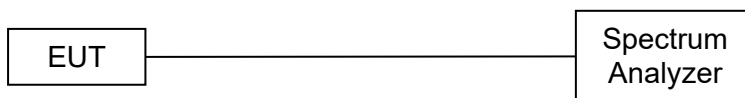
For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating solely in the 5.725-5.850 GHz band:

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

5.7.2 Test setup



5.7.3 Test procedure

Spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.

RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz

VBW $\geq$ RBW

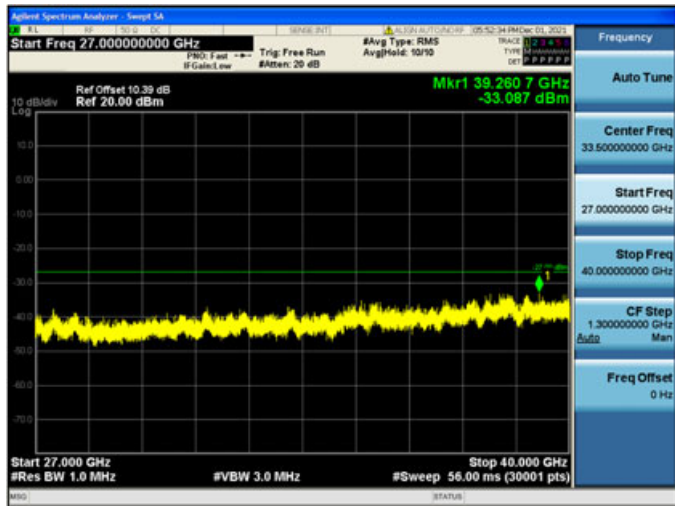
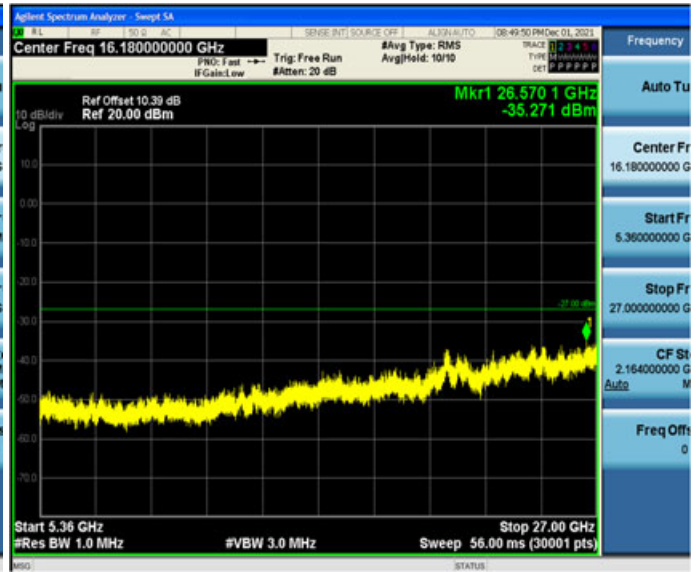
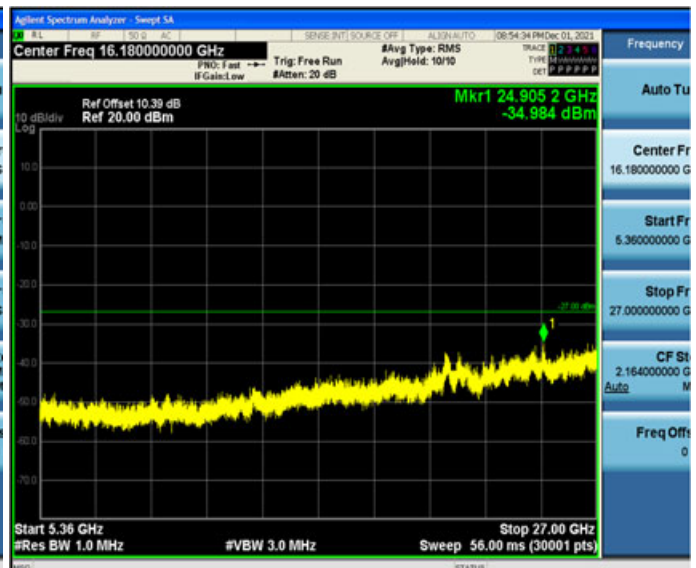
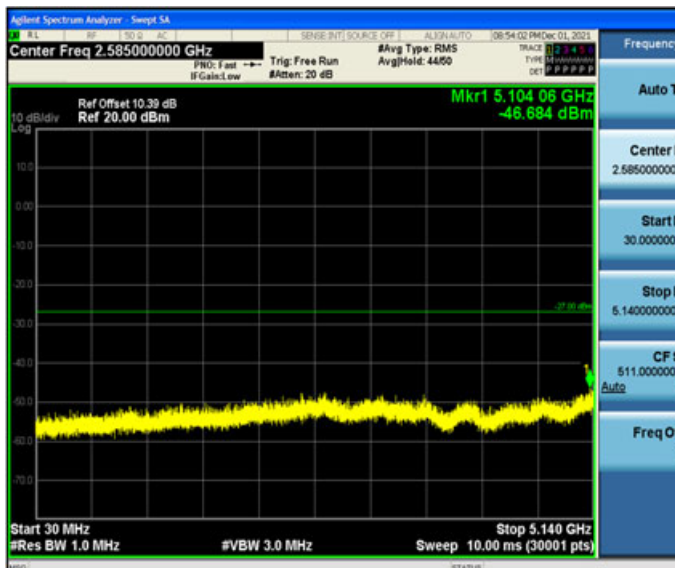
Sweep = auto

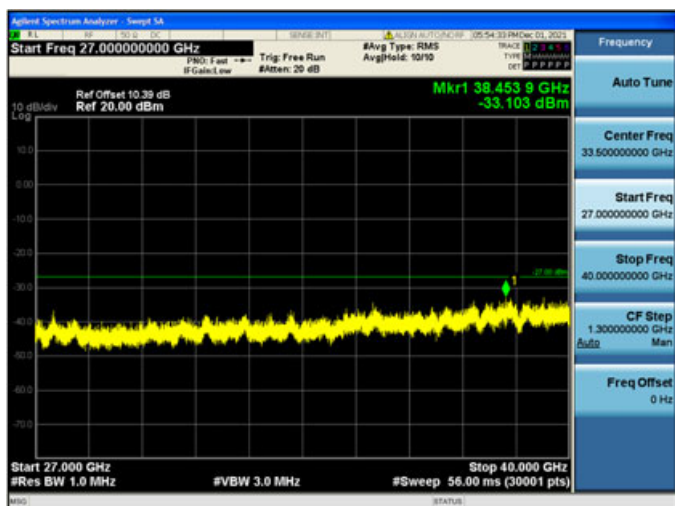
Detector function = peak

Trace = max hold

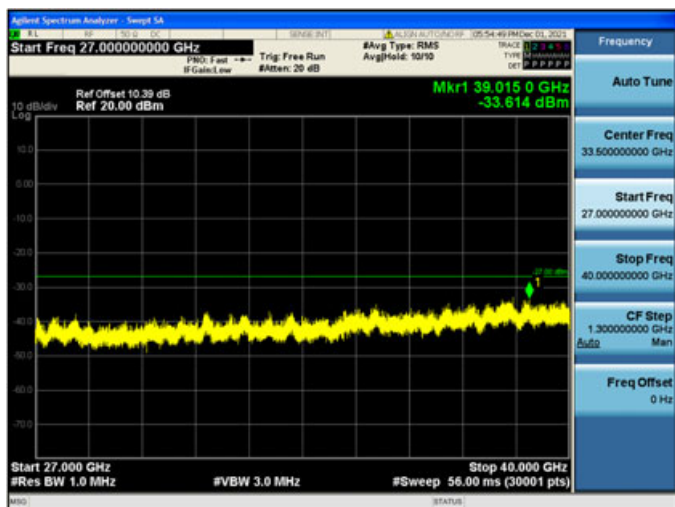
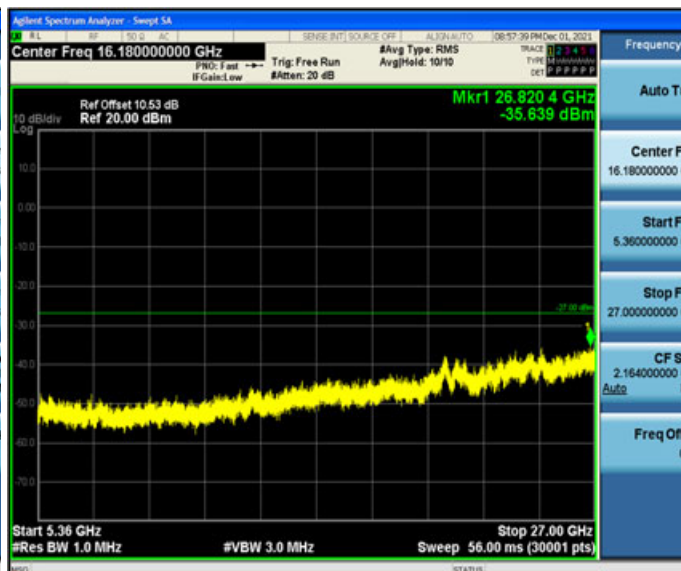
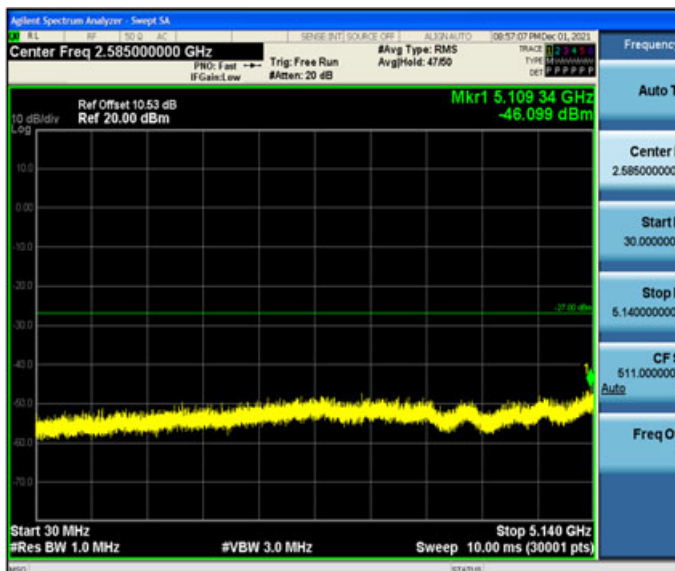
Allow the trace to stabilize

5.7.4 Test results

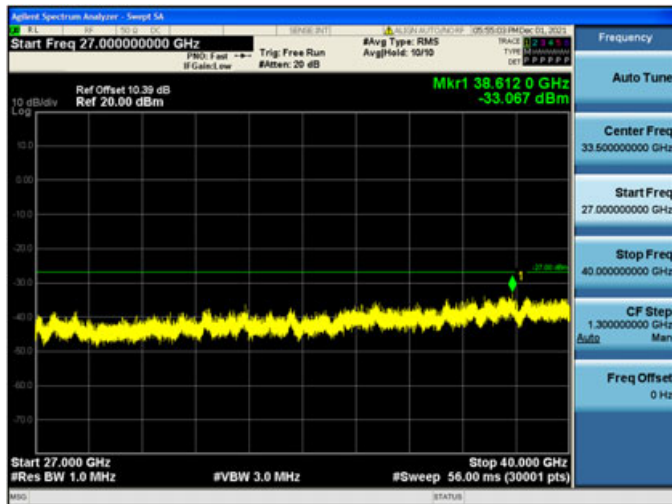
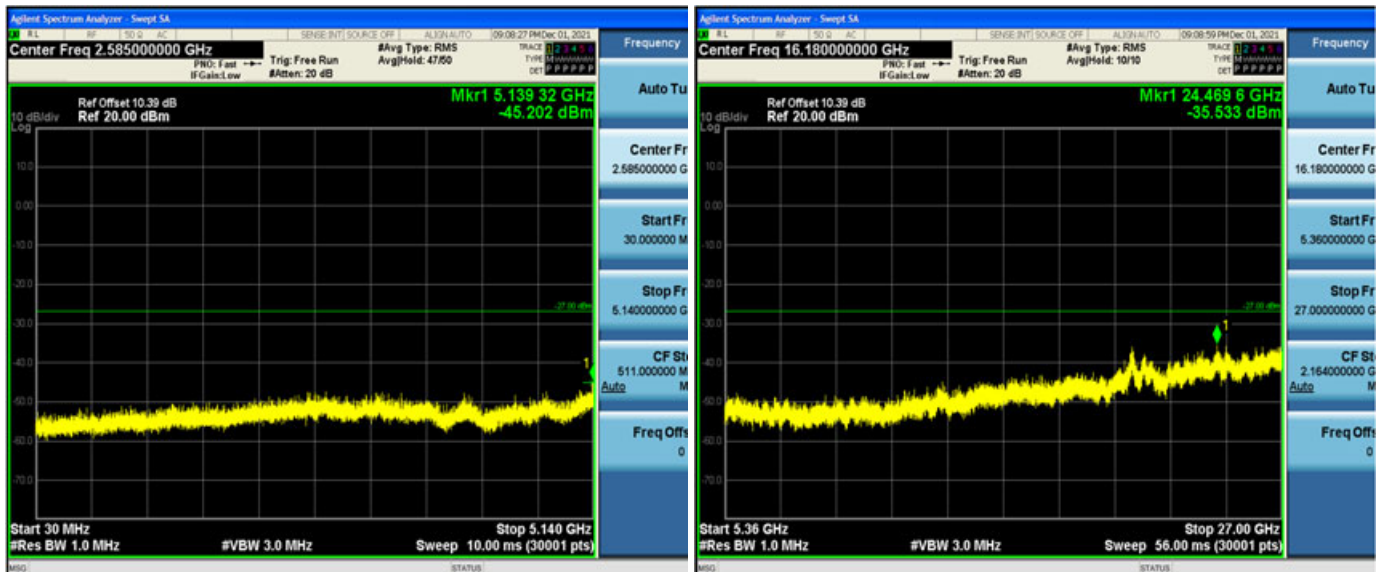
Conducted spurious emissions – U-NII-1 band
802.11a - CH36 (5180 MHz)

802.11a – CH40 (5200 MHz)




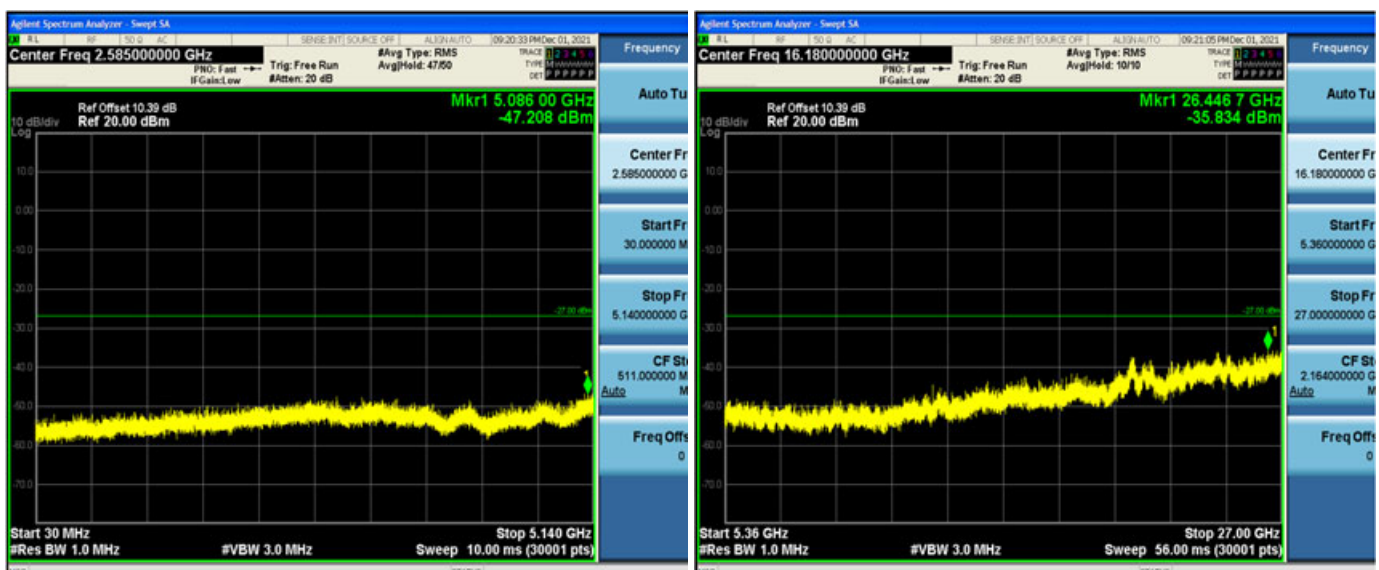
802.11a – CH48 (5240 MHz)

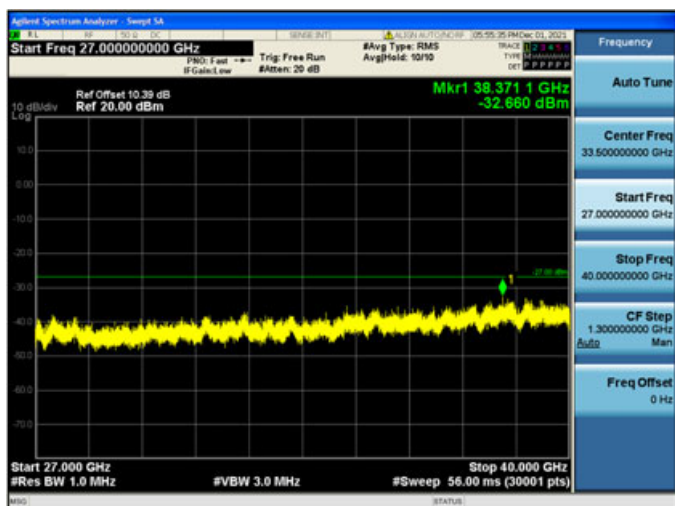


802.11n HT20 - CH36 (5180 MHz)

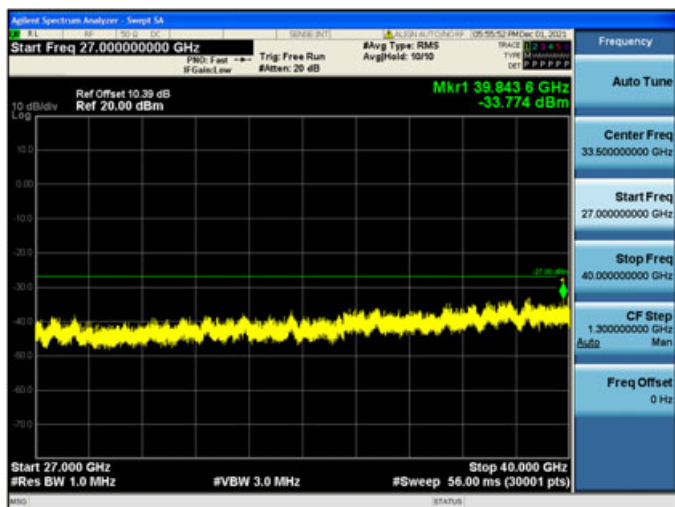
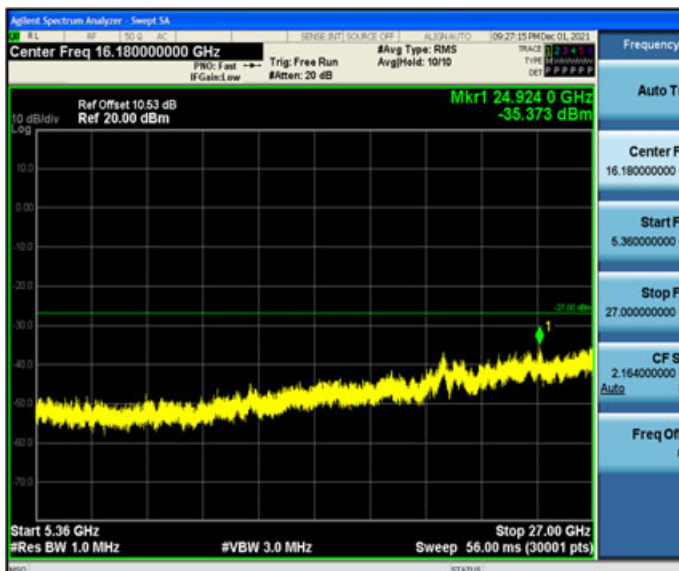
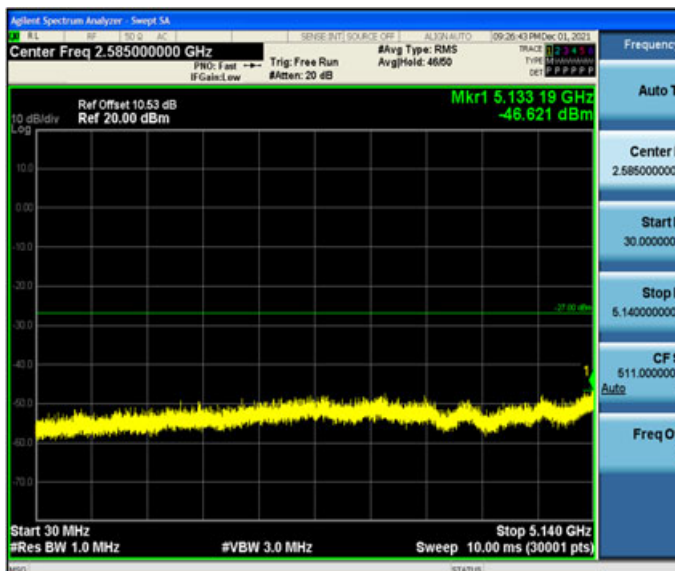


802.11n HT20 - CH40 (5200 MHz)

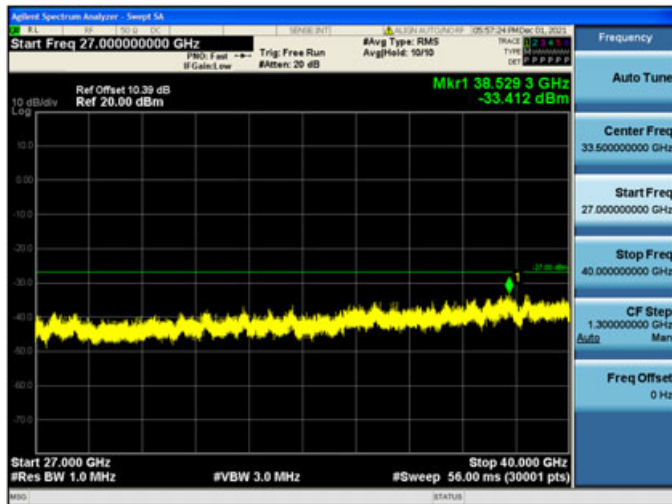
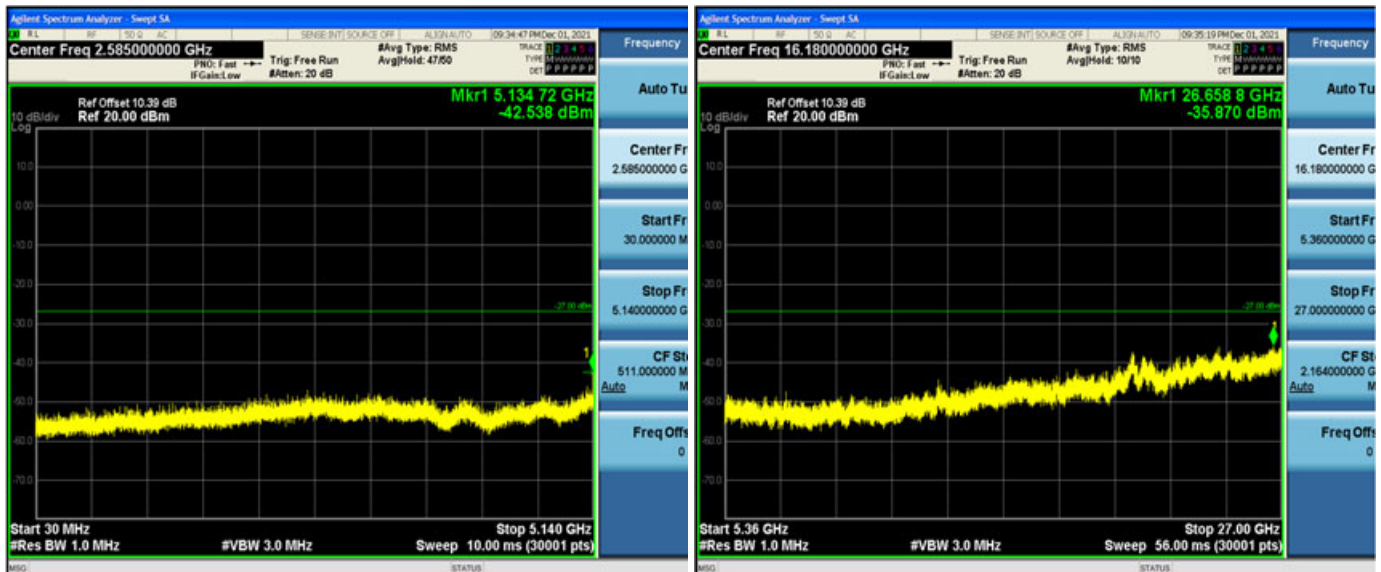




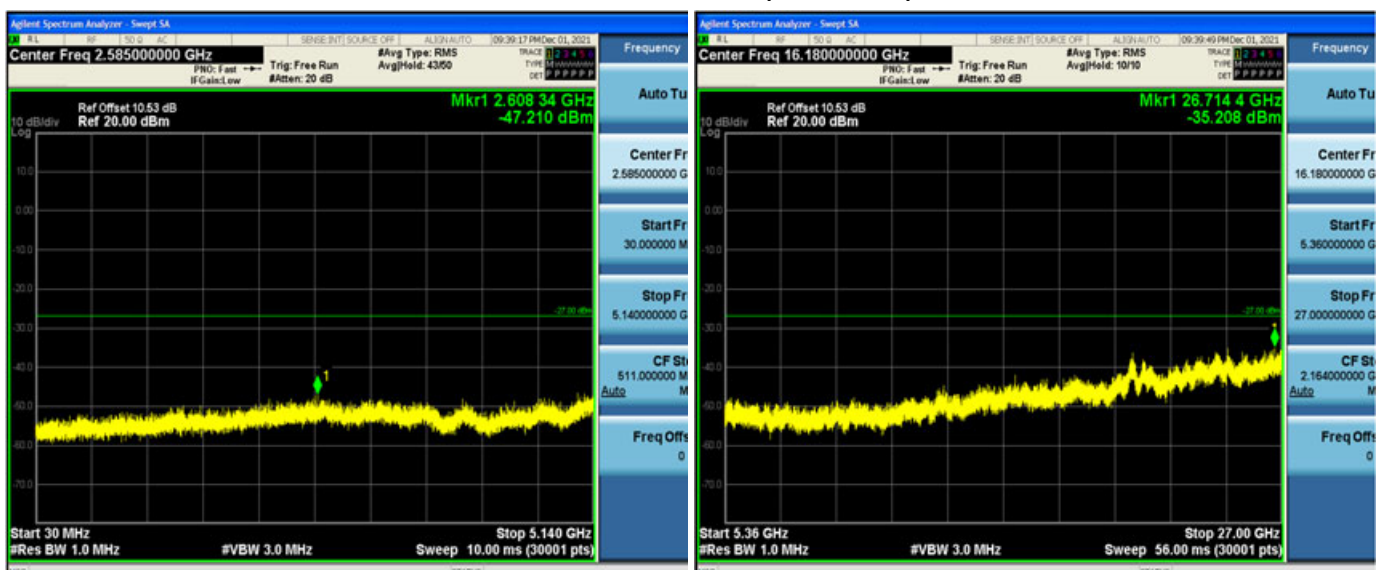
802.11n HT20 – CH48 (5240 MHz)

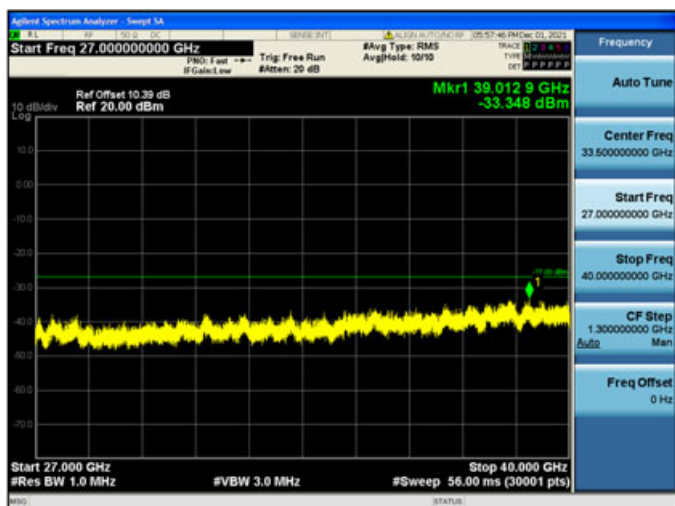


802.11n HT40 - CH38 (5190 MHz)

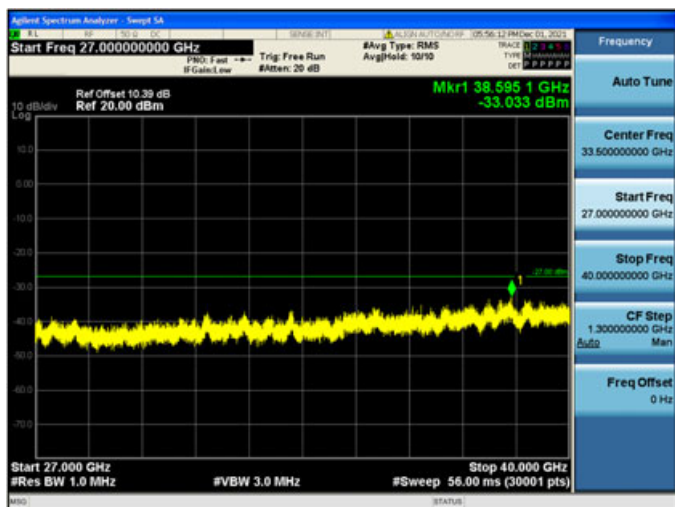
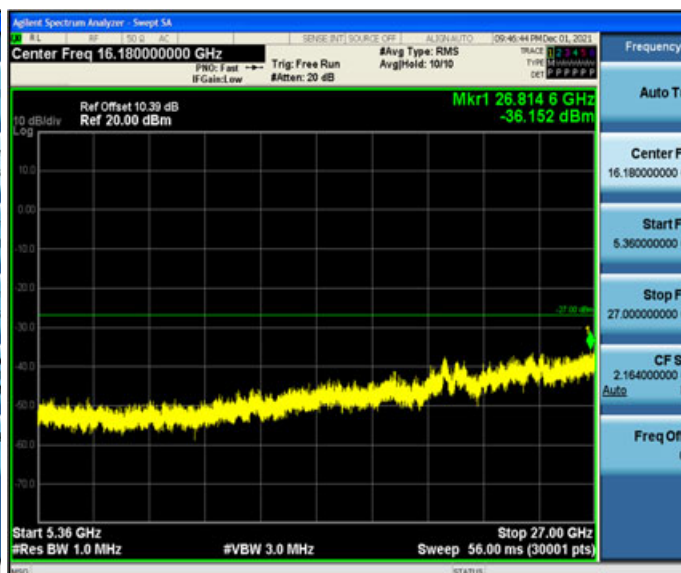
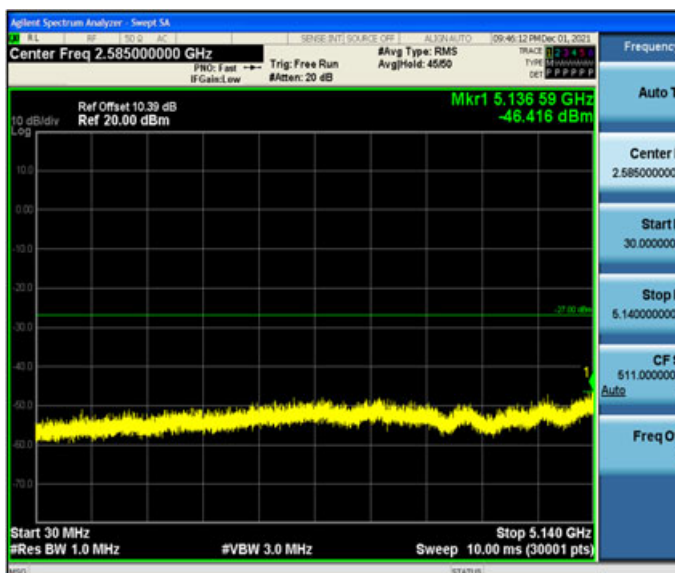


802.11n HT40 - CH46 (5230 MHz)

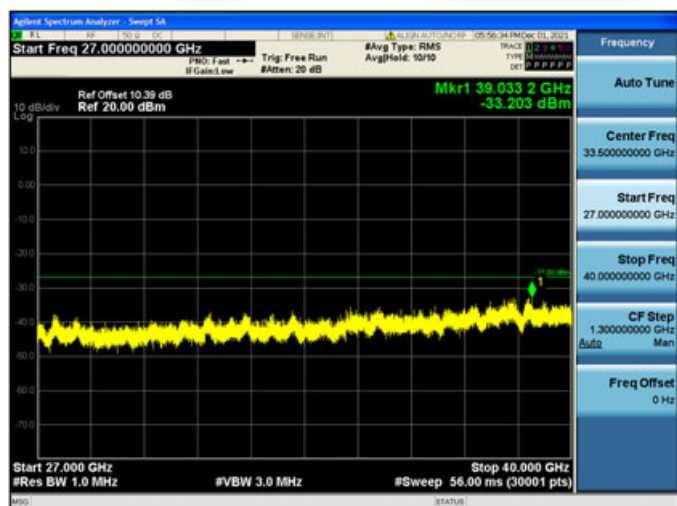
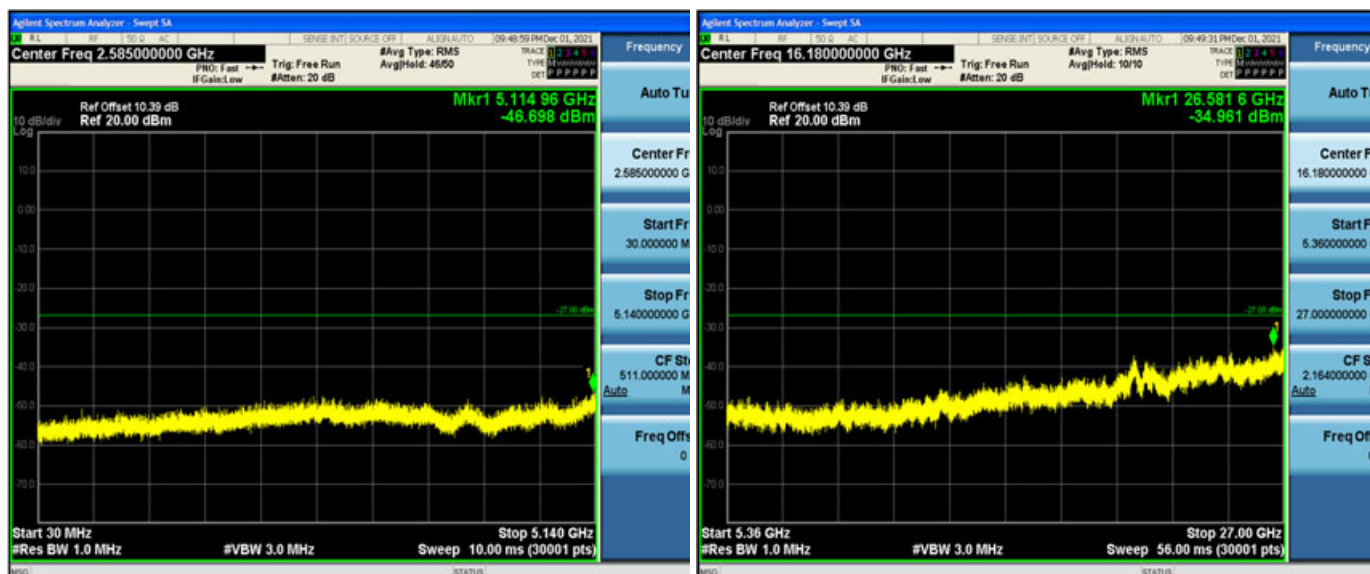




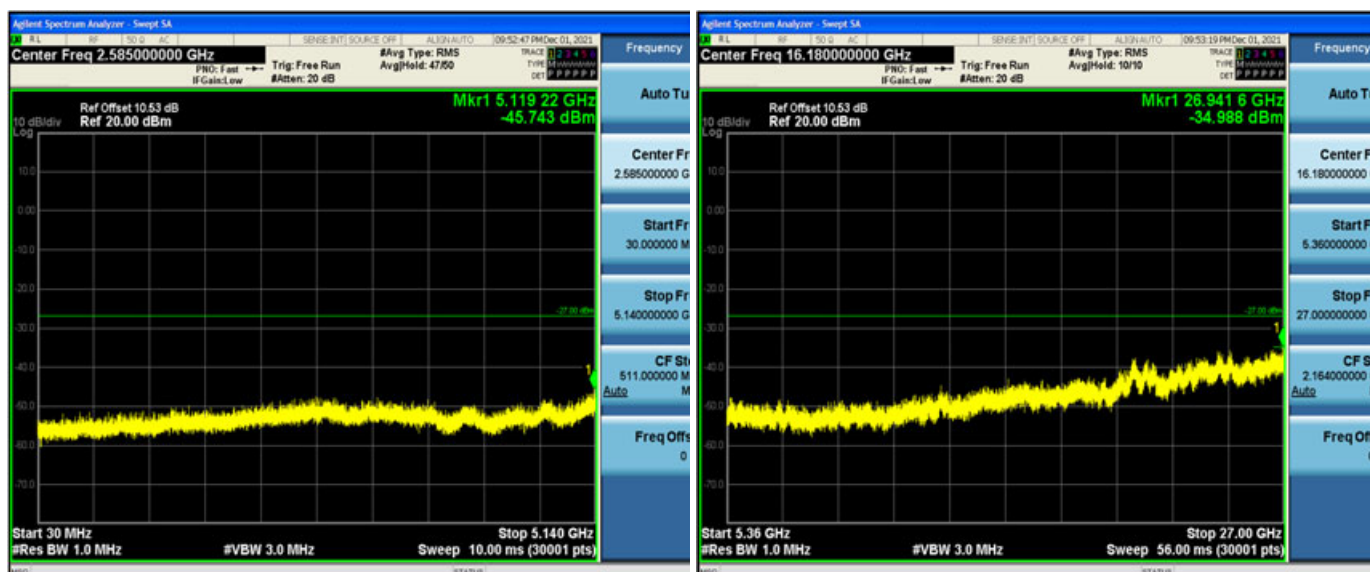
802.11ac VHT20 - CH36 (5180 MHz)

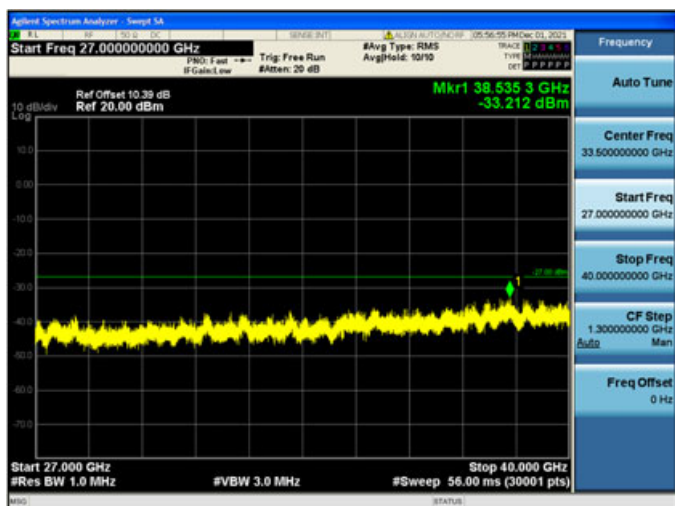


802.11ac VHT20 – CH40 (5200 MHz)

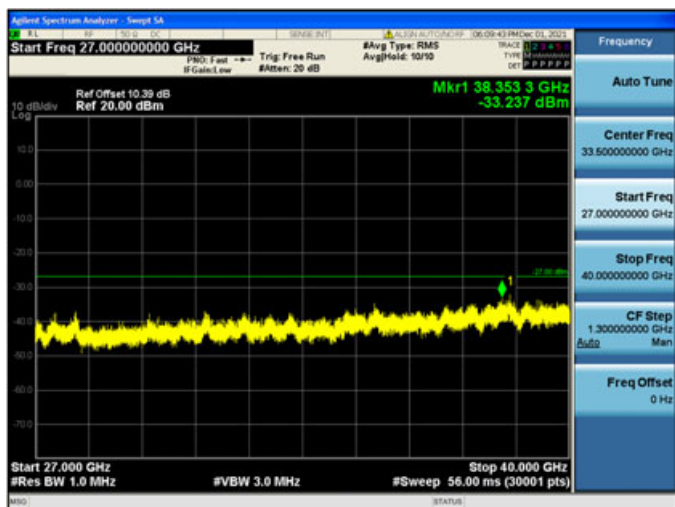
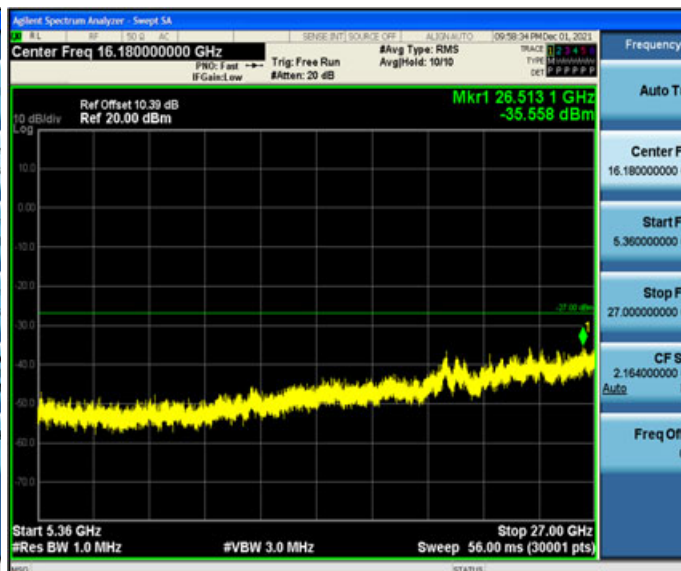
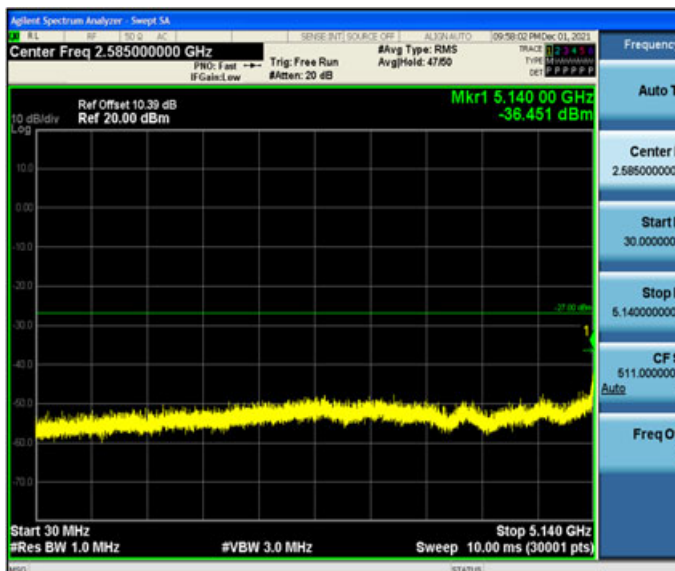


802.11ac VHT20 – CH48 (5240 MHz)

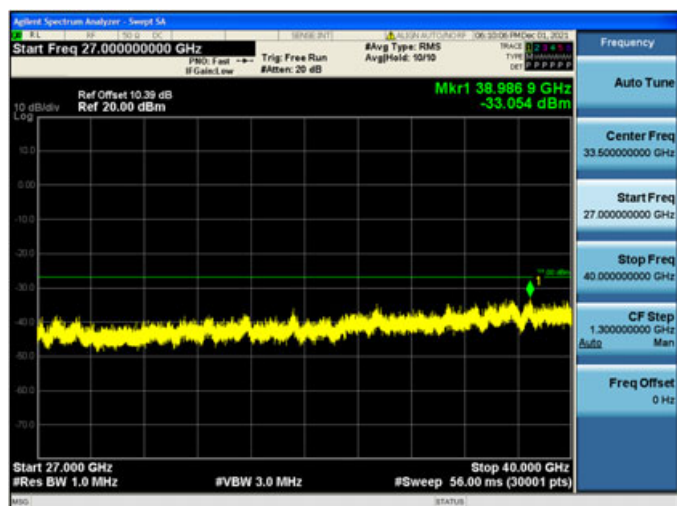
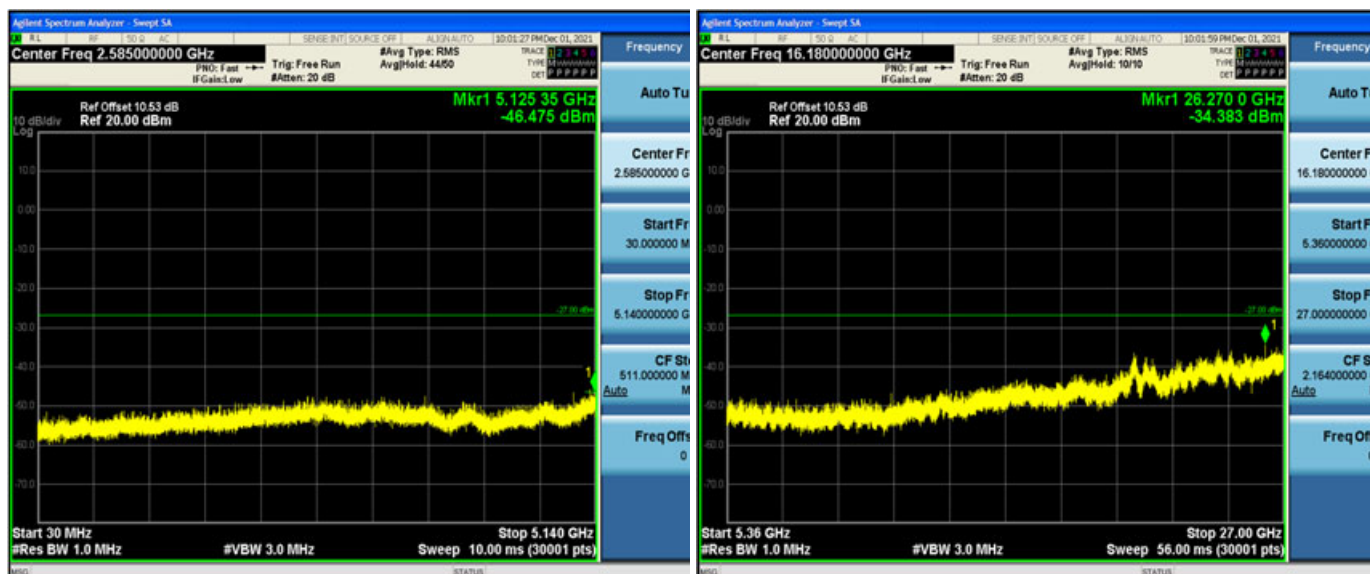




802.11ac VHT40 – CH38 (5190 MHz)



802.11ac VHT40 – CH46 (5230 MHz)



802.11ac VHT80 – CH42 (5210 MHz)

