Test Report

FCC ID: 2AT9B-AV1347W

Date of issue: Dec. 12, 2020

Report number:	MTi20101905-2E2
Sample description:	Car multimedia player
Model(s):	CAR710W, J1CA7W, DCPA71W, AVM2407W, DCPA701W
Applicant:	MAXMADE AUTO ELECTRONICS CO., LTD.
Address:	Building 2, GIEC Industrial Park, Puzai Road, Pingdi, Longgang District, Shenzhen, China
Date of test:	Nov. 12, 2020 to Dec. 12, 2020

Shenzhen Microtest Co., Ltd.
http://www.mtitest.com

Tel:(86-755)88850135 Fax: (86-755) 88850136 Web: http://www.mtitest.com E-mail: mti@51mti.com
Address: 101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao' an District, Shenzhen, Guangdong, China.

Table of Contents

Test Result Certification

Applicant's name:	MAXMADE AUTO ELECTRONICS CO., LTD.
Address:	Building 2, GIEC Industrial Park, Puzai Road, Pingdi, Longgang District, Shenzhen, China
Manufacture's name:	MAXMADE AUTO ELECTRONICS CO., LTD.
Address:	Building 2, GIEC Industrial Park, Puzai Road, Pingdi, Longgang District, Shenzhen, China
Product name:	Car multimedia player
Trademark:	Dual, Jensen, Axxera
Model name:	CAR710W, J1CA7W, DCPA71W, AVM2407W, DCPA701W
Standards:	FCC Part 15.407
Test procedure:	ANSI C63.10-2013 KDB 789033 D02 General UNII Test Procedures New Rules v02r01

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

Tested by: Demi Mu Dec. 12, 2020

Reviewed by: Leo Su Dec. 12, 2020

Reviewed by: Tom Xue Dec. 12, 2020

1 General information

1.1 Description of EUT

Equipment:	Car multimedia player
Model name:	CAR710W
Serial model:	J1CA7W, DCPA71W, AVM2407W, DCPA701W
Model difference:	All the models are of the same circuit and RF module, except the Packaging, brands and model No..
Frequency range:	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 type:	FPC antenna
Antenna gain:	0.56dBi
Max. output power:	U-NII-1: 14.16dBm, U-NII-3: 8.89dBm
Hardware version:	V01
Software version:	V01
Power supply:	DC 12V from DC source
Adapter information:	N/A
Battery:	N/A
Serial number:	MTi20101905-2-S0001

1.2 Operation channel list

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5150-5250 MHz Band 1 (U-NII-1)	36	5180	44	5220
	38	5190	46	5230
	40	5200	48	5240
	42	5210	50	5250

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5725-5825 MHz Band 4 (U-NII-3)	149	5745	157	5785
	151	5755	159	5795
	153	5765	161	5805
	155	5775	165	5825

1.3 Test channel list

Ch. #	Band I : 5150-5250 MHz	Band IV : 5725-5850MHz
	802.11a	802.11a
Low	36	149
Middle	44	157
High	48	165

Ch. #	Band I : 5150-5250 MHz	Band IV : 5725-5850MHz
	802.11n HT20/ ac VHT20	802.11n HT20/ ac VHT20
Low	36	149
Middle	44	157
High	48	165

Ch. #	Band I : 5150-5250 MHz	Band IV：5725-5850MHz
	802.11n HT40/ac VHT40	802.11n HT40/ac VHT40
Low	38	151
Middle	-	-
High	46	159

Ch. #	Band I : 5150-5250 MHz	Band IV：5725-5850MHz
	802.11ac VHT80	802.11ac VHT80
Low	-	-
Middle	42	155
High	-	-

1.4 Ancillary equipment list

Equipment	Model	S/N	Manufacturer	Certificate type
DC source	/	/	/	/

1.5 Description of Support Units

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	Brand	Model/Type No.	Series No.	Note
/	/	/	/	/	/
/	/	/	/	/	/

Note:

(1)The support equipment was authorized by Declaration of Confirmation.

(2)For detachable type I/O cable should be specified the length in cm in『Length』column.

2 Summary of the Test Results

Test procedures according to the technical standards:

No.	Standard Section	Test Item	Result	Remark
1	15.203/15.407	Antenna Requirement	Pass	
2	15.407(a)	RF Output Power	Pass	
3	15.207	Power Line Conducted Emission	N/A	
4	15.407(a)	26dB Emission Bandwidth and Occupied bandwidth	Pass	
5	15.407(e)	6 dB bandwidth	Pass	
6	15.407(a)	Power Spectral Density	Pass	
7	15.407(b) 15.209	Radiation Spurious Emission	Pass	

3 Test Facilities and Accreditations

3.1 Test laboratory

Test Laboratory	Shenzhen Microtest Co., Ltd
Location	101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao' an District, Shenzhen, Guangdong, China.
FCC Registration No.:	448573

3.2 Environmental conditions

Temperature:	15ºC~35℃
Humidity	20%~75%
Atmospheric pressure	98kPa~101kPa

3.3 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 %

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power, conducted	±0.16dB
3	Spurious emissions, conducted	±0.21dB
4	All emissions, radiated(<1G)	±4.68dB
5	All emissions, radiated(>1G)	±4.89dB
6	Temperature	±0.5℃
7	Humidity	±2%

3.4 Test software

Software Name	Manufacturer	Model	Version
Bluetooth and WiFi Test System	Shenzhen JS tonscend co., ltd	JS1120-3	2.5.77.0418

4 Equipment list

Equipment No.	Equipment Name	Manufacturer	Model	Serial No.	Calibration date	Due date
MTI-E043	EMI Test Receiver	Rohde&schwarz	ESCI7	101166	2020/06/04	2021/06/03
MTI-E044	TRILOG Broadband Antenna	schwarabeck	VULB 9163	9163-1338	2020/06/05	2021/06/04
MTI-E047	Amplifier	Hewlett-Packard	8447F	3113A06150	2020/06/04	2021/06/03
MTI-E089	ESG Vector Signal Generator	Agilent	N5182A	MY49060455	2020/06/03	2021/06/02
MTI-E058	ESG Series Analog Ssignal Generator	Agilent	E4421B	GB40051240	2020/07/03	2021/07/04
MTI-E062	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2020/06/04	2021/06/03
MTI-E066	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2020/06/04	2021/06/03
MTI-E078	Synthesized Sweeper	Agilent	83752A	3610A01957	2020/06/04	2021/06/03
MTI-E079	DC Power Supply	Agilent	E3632A	MY40027695	2020/06/04	2021/06/03
MTI-E045	Double Ridged Broadband Horn Antenna	schwarabeck	BBHA 9120D	9120D-2278	2020/06/05	2021/06/04
MTI-E021	EMI Test Receiver	Rohde&schwarz	ESCS30	100210	2020/06/04	2021/06/03
MTI-E022	Pulse Limiter	Schwarzbeck	VSTD 9561-F	00679	2020/06/03	2021/06/02
MTI-E023	Artificial mains network	Schwarzbeck	NSLK 8127	NSLK 8127 #841	2020/06/04	2021/06/03
MTI-E046	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00044	2020/06/05	2021/06/04
MTI-E048	Amplifier	Agilent	8449B	3008A02400	2020/07/03	2021/07/04
MTI-E072	Thermometer Clock Humidity Monitor	-	HTC-1	/	2020/06/07	2021/06/06
Note: the calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).						

5 Test Results

5.1 Antenna requirement

5.1.1 Standard requirement

15.203 requirement: For intentional device, according to 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.

5.1.2 EUT Antenna

The antenna is FPC antenna, which was permanently affixed to the device and un-replaced, complies with 15.203. In addition, the maximum antenna gain is 0.56dBi.

5.2 RF output power

5.2.1 Limit

For the 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.

For the 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 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.

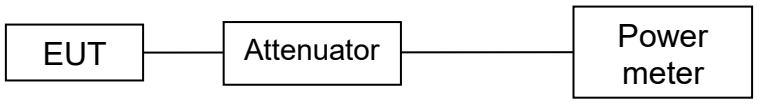
For the band 5.725-5.85 GHz

The maximum conducted output power over the frequency band of operation shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.2.2 Test procedure

The maximum peak conducted output power may be measured using a broadband Average RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the emission bandwidth and utilize a fast-responding diode detector.

5.2.3 Test setup



5.2.4 Test results

For U-NII-1

Modulation mode	Test Channel	Frequency(MHz)	Average Conducted Power		Limit(mW)
			(dBm)	(mW)	
11a	CH36	5180	11.58	14.39	250
11a	CH40	5200	10.43	11.04	250
11a	CH48	5240	10.74	11.86	250
11n (HT20)	CH36	5180	11.41	13.84	250
11n (HT20)	CH40	5200	10.07	10.16	250
11n (HT20)	CH48	5240	11.28	13.43	250
11n (HT40)	CH38	5190	13.92	24.66	250
11n (HT40)	CH46	5230	14.03	25.29	250

Modulation mode	Test Channel	Frequency(MHz)	Average Conducted Power		Limit(mW)
			(dBm)	(mW)	
11ac (HT20)	CH36	5180	11.37	13.71	250
11ac (HT20)	CH40	5200	11.57	14.35	250
11ac (HT20)	CH48	5240	10.53	11.30	250
11ac (HT40)	CH38	5190	11.57	14.35	250
11ac (HT40)	CH46	5230	10.85	12.16	250
11ac (HT80)	CH42	5210	14.16	26.06	250

For U-NII-3

Modulation mode	Test Channel	Frequency(MHz)	Average Conducted Power		Limit(mW)
			(dBm)	(mW)	
11a	CH149	5745	6.79	4.78	1000
11a	CH157	5785	7.10	5.13	1000
11a	CH165	5825	7.47	5.58	1000
11n (HT20)	CH149	5745	7.72	5.92	1000
11n (HT20)	CH157	5785	8.89	7.74	1000
11n (HT20)	CH165	5825	8.13	6.50	1000
11n (HT40)	CH151	5755	7.98	6.28	1000
11n (HT40)	CH159	5795	6.95	4.95	1000

Modulation mode	Test Channel	Frequency(MHz)	Average Conducted Power		Limit(mW)
			(dBm)	(mW)	
11ac (HT20)	CH149	5745	7.64	5.81	1000
11ac (HT20)	CH157	5785	7.12	5.15	1000
11ac (HT20)	CH165	5825	8.74	7.48	1000
11ac (HT40)	CH151	5755	7.02	5.04	1000
11ac (HT40)	CH159	5795	6.62	4.59	1000
11ac (HT80)	CH155	5775	8.52	7.11	1000

5.3 Power line conducted emission

5.3.1 Limits

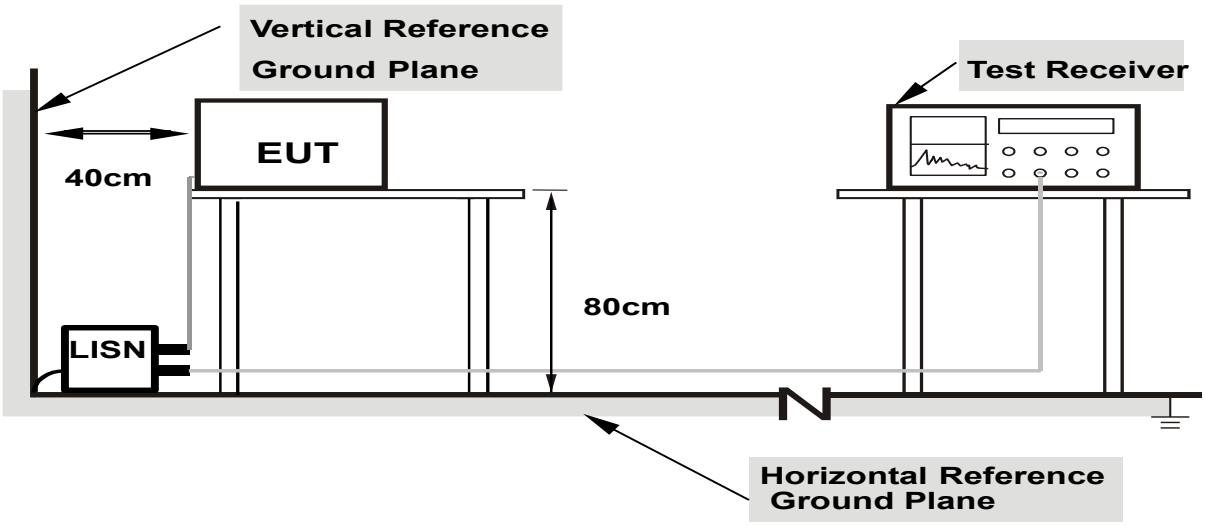
FREQUENCY (MHz)	Class B (dBuV)	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note

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

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

5.3.2 Test setup



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

5.3.3 Test procedure

a. EUT Operating Conditions

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

b. The following table is the setting of the receiver

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

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

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

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

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

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

5.3.4 Test results

Note: The device is a DC power supply and does not apply to conducted emissions.

5.4 26dB Emission Bandwidth and Occupied bandwidth

5.4.1 Limit

For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier

5.4.2 Test procedure

26d Emission bandwidth

Set RBW = approximately 1% of the emission bandwidth.

Set VBW ≥ 3*RBW

Detector = Peak.

Trace mode = Max hold.

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

Occupied Bandwidth

Set Span = 1.5 times to 5.0 times the OBW

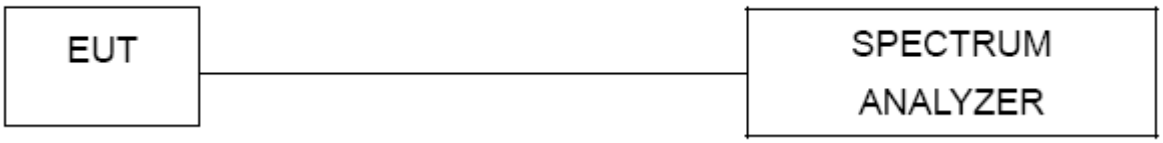
Set RBW = 1% to 5% of the OBW.

Set VBW ≥ 3*RBW, Detector = Peak.

Trace mode = Max hold.

Use the 99% power bandwidth function of the instrument.

5.4.3 Test setup



5.4.4 Test results

For U-NII-1

Channel	Test Channel	Frequency(MHz)	26dB bandwidth(MHz)	99% bandwidth	Limit(kHz)	Result
11a	CH36	5180	23.79	16.606	/	Pass
11a	CH40	5200	19.37	16.445	/	Pass
11a	CH48	5240	22.34	16.610	/	Pass
11n (HT20)	CH36	5180	25.54	17.756	/	Pass
11n (HT20)	CH40	5200	19.97	17.611	/	Pass
11n (HT20)	CH48	5240	19.98	17.592	/	Pass
11n (HT40)	CH38	5190	57.63	36.258	/	Pass
11n (HT40)	CH46	5230	59.14	36.243	/	Pass

Channel	Test Channel	Frequency(MHz)	26dB bandwidth(MHz)	99% bandwidth	Limit(kHz)	Result
11ac (HT20)	CH36	5180	22.55	17.736	/	Pass
11ac (HT20)	CH40	5200	19.92	17.585	/	Pass
11ac (HT20)	CH48	5240	20.03	17.590	/	Pass
11ac (HT40)	CH38	5190	58.27	36.241	/	Pass
11ac (HT40)	CH46	5230	38.67	36.019	/	Pass
11ac (HT80)	CH42	5210	108.9	75.653	/	Pass

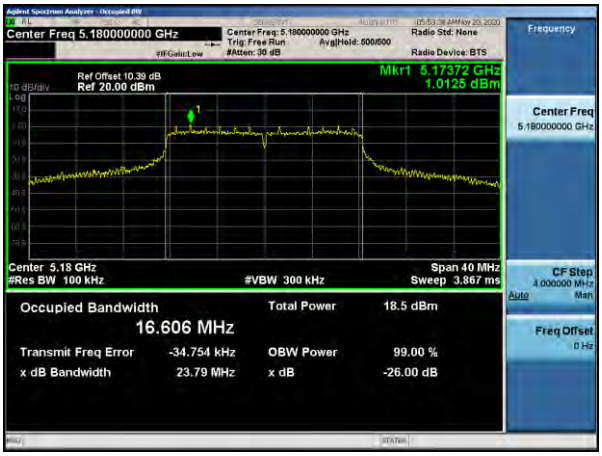
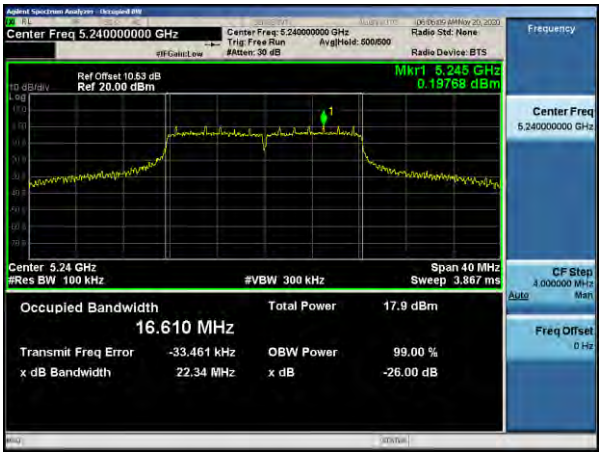
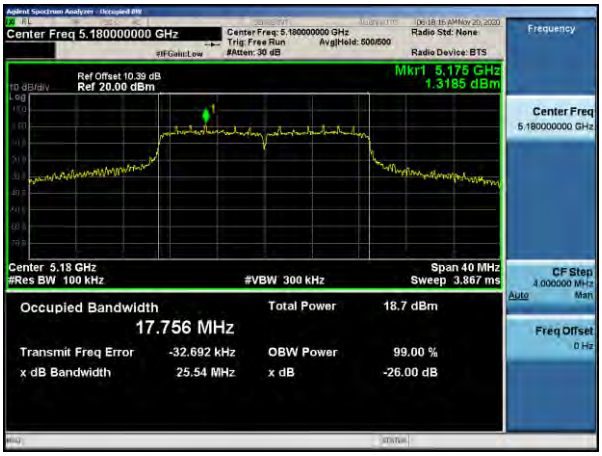
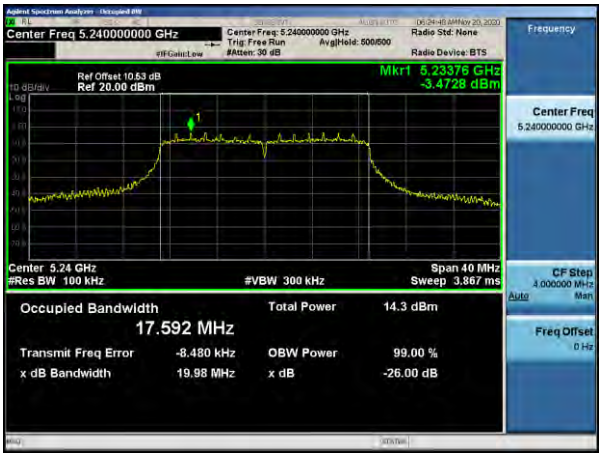
For U-NII-3

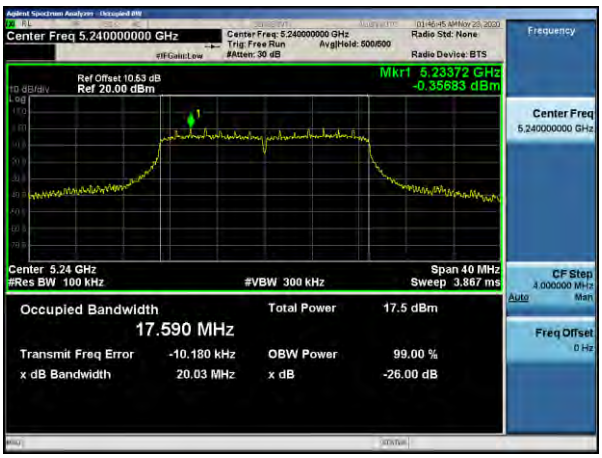
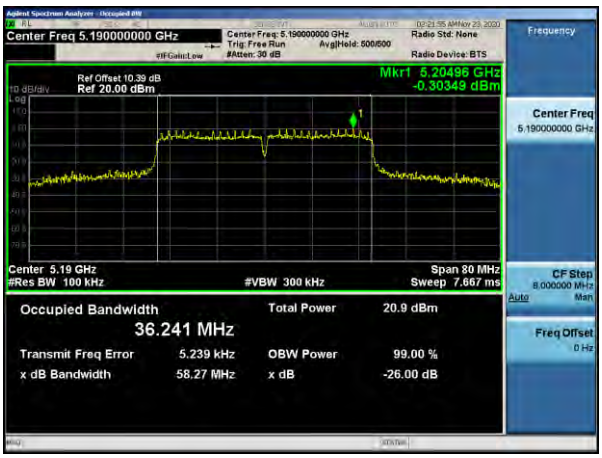
Channel	Test Channel	Frequency(MHz)	99% bandwidth	Limit(kHz)	Result
11a	CH149	5745	17.222	/	Pass
11a	CH157	5785	17.506	/	Pass
11a	CH165	5825	17.988	/	Pass
11n (HT20)	CH149	5745	18.270	/	Pass
11n (HT20)	CH157	5785	18.108	/	Pass
11n (HT20)	CH165	5825	18.234	/	Pass
11n (HT40)	CH151	5755	37.243	/	Pass
11n (HT40)	CH159	5795	36.983	/	Pass

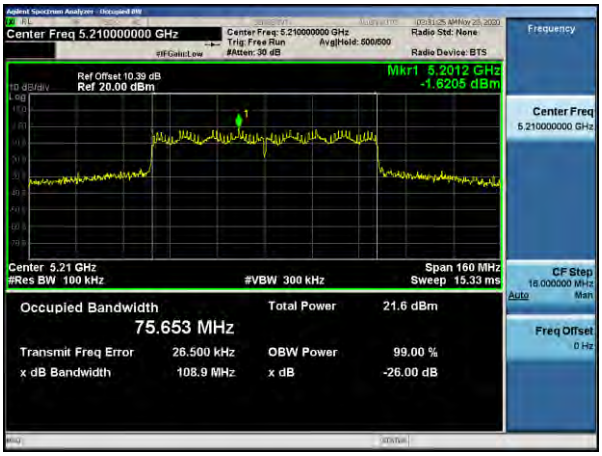
Channel	Test Channel	Frequency(MHz)	99% bandwidth	Limit(kHz)	Result
11ac (HT20)	CH149	5745	18.192	/	Pass
11ac (HT20)	CH157	5785	18.166	/	Pass
11ac (HT20)	CH165	5825	18.062	/	Pass
11ac (HT40)	CH151	5755	36.977	/	Pass
11ac (HT40)	CH159	5795	37.077	/	Pass
11ac (HT80)	CH155	5775	76.846	/	Pass

Test plots:

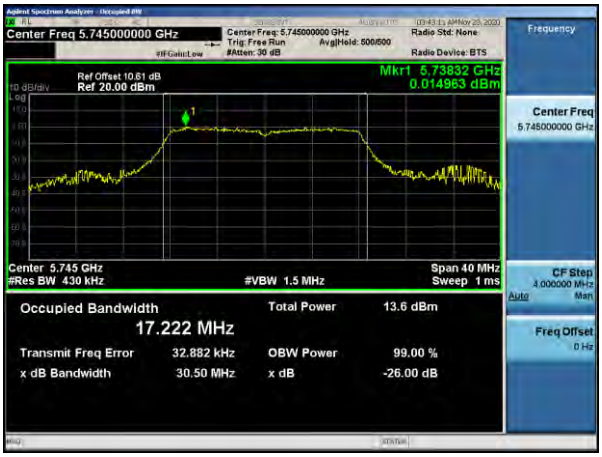
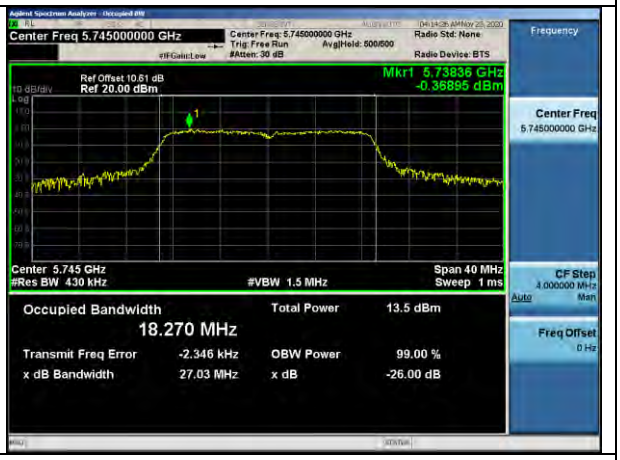
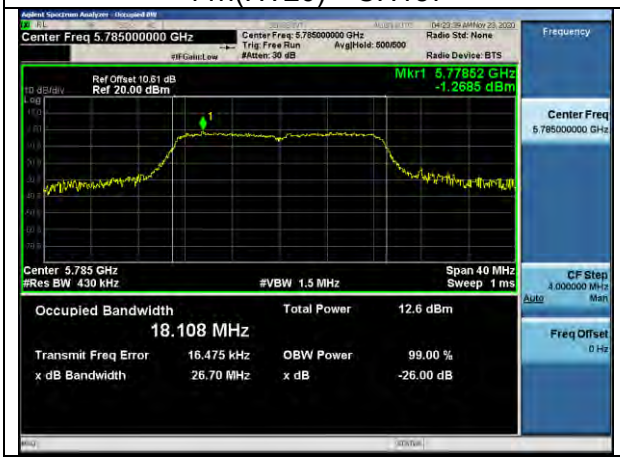
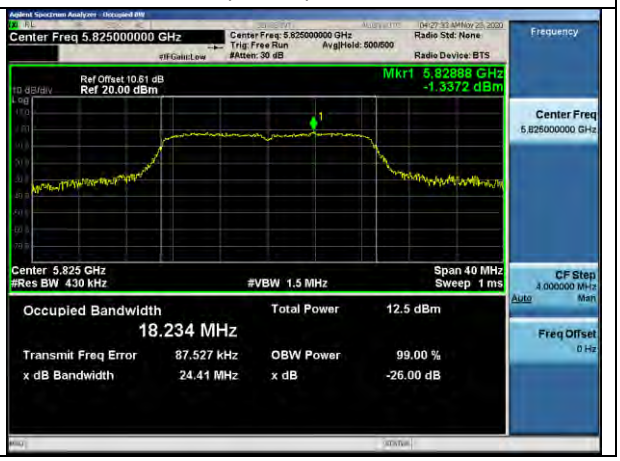
For U-NII-1

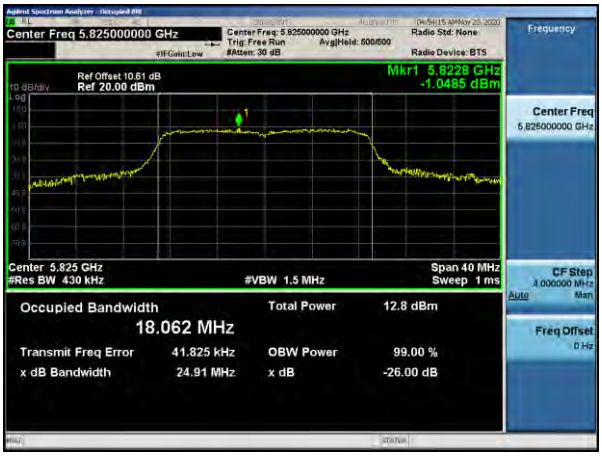
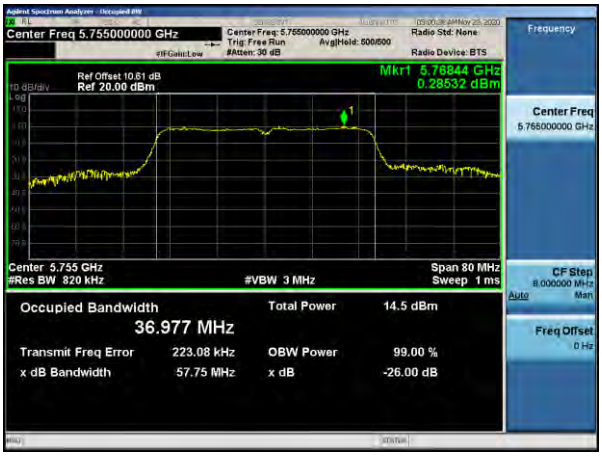
11a CH36	11a CH40
	
11a CH48	**11n (HT20) CH36**
	
11n (HT20) CH40	**11n (HT20) CH48**
	

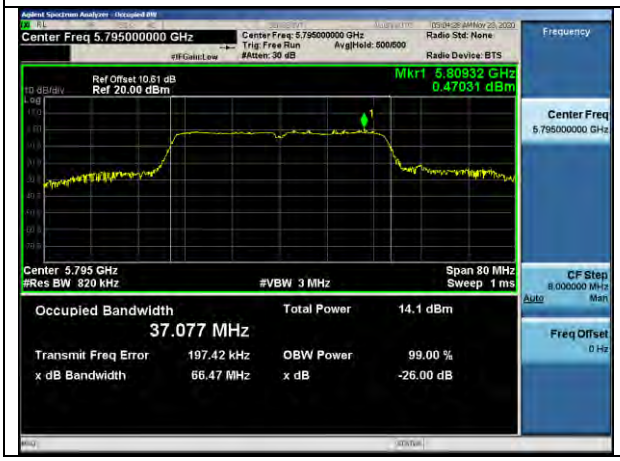
11n (HT40) CH38	11n (HT40) CH46
	
11ac (HT20) CH36	11ac (HT20) CH40
	
11ac (HT20) CH48	11ac (HT40) CH38
	

11ac (HT40) CH46	11ac (HT80) CH42
	

For U-NII-3

11a CH149	11a CH157
	
11a CH165	**11n(HT20) CH149**
	
11n(HT20) CH157	**11n(HT20) CH165**
	

11n (HT40) CH151	11n (HT40) CH159
	
11ac (HT20) CH149	**11ac (HT20) CH157**
	
11ac(HT20) CH165	**11ac(HT40) CH151**
	

11ac(HT40) CH159	11ac (HT80) CH155
	

5.5 6dB Bandwidth

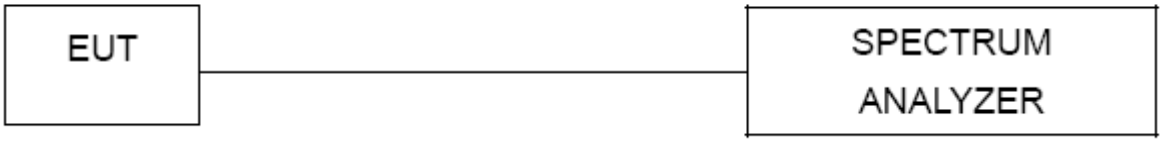
5.5.1 Limit

For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier

5.5.2 Test procedure

1. Set RBW= 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 26 dB relative to the maximum level measured in the fundamental emission.

5.5.3 Test setup



5.5.4 Test results

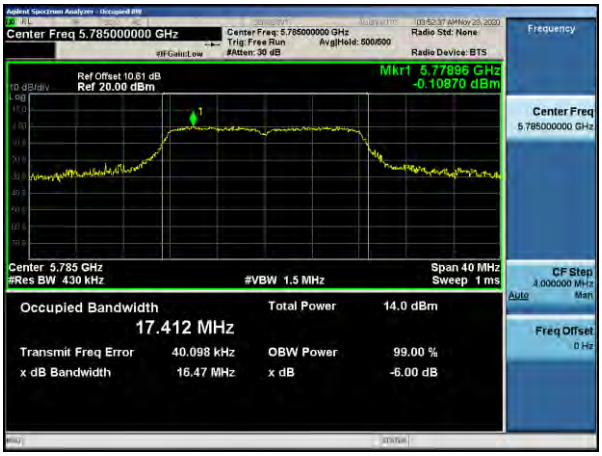
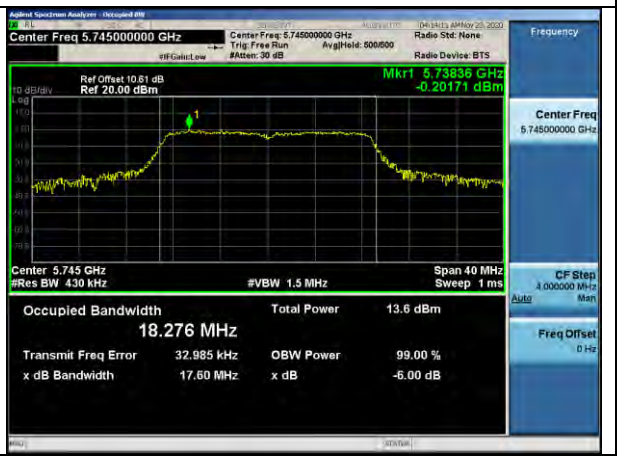
For U-NII-3

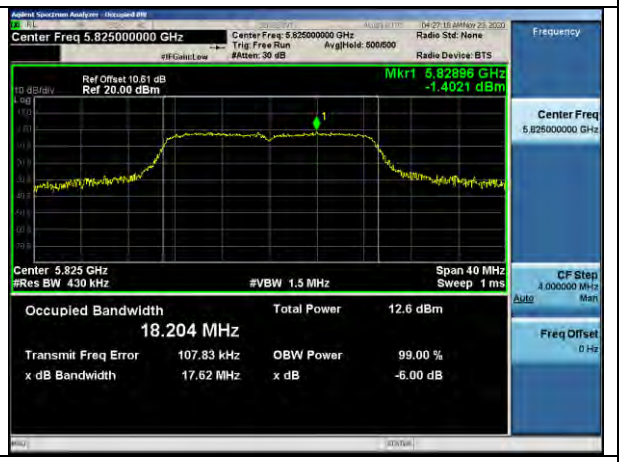
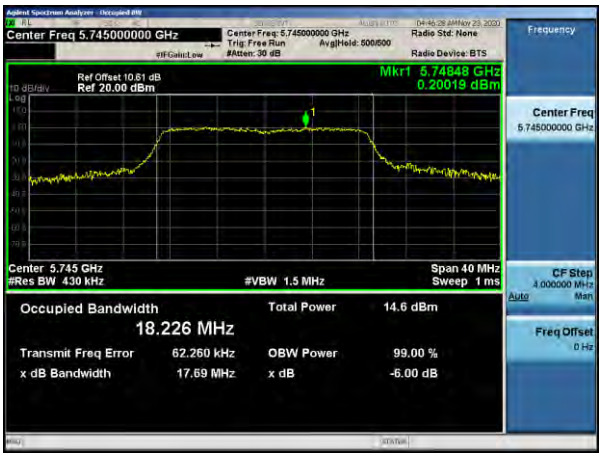
Channel	Test Channel	Frequency(MHz)	6dB bandwidth(MHz)	Limit(kHz)	Result
11a	CH149	5745	16.43	500	Pass
11a	CH157	5785	16.47	500	Pass
11a	CH165	5825	16.44	500	Pass
11n (HT20)	CH149	5745	17.60	500	Pass
11n (HT20)	CH157	5785	17.59	500	Pass
11n (HT20)	CH165	5825	17.62	500	Pass
11n (HT40)	CH151	5755	36.17	500	Pass
11n (HT40)	CH159	5795	36.13	500	Pass

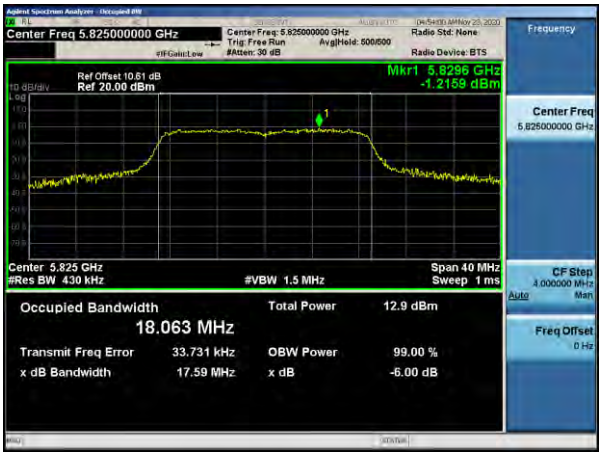
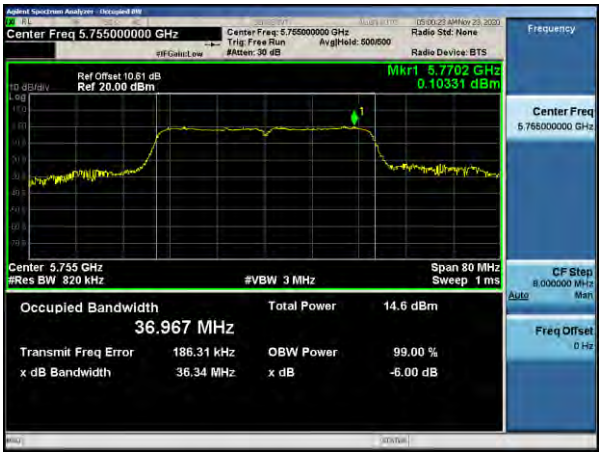
Channel	Test Channel	Frequency(MHz)	6dB bandwidth(MHz)	Limit(kHz)	Result
11ac (HT20)	CH149	5745	17.69	500	Pass
11ac (HT20)	CH157	5785	17.52	500	Pass
11ac (HT20)	CH165	5825	17.59	500	Pass
11ac (HT40)	CH151	5755	36.34	500	Pass
11ac (HT40)	CH159	5795	35.84	500	Pass
11ac (HT80)	CH155	5775	75.84	500	Pass

Test plots:

For U-NII-3

11a CH149	11a CH157
	
11a CH165	**11n(HT20) CH149**
	

11n(HT20) CH157	11n(HT20) CH165
	
11n (HT40) CH151	**11n (HT40) CH159**
	
11ac (HT20) CH149	**11ac (HT20) CH157**
	

11ac(HT20) CH165	11ac(HT40) CH151
	
11ac(HT40) CH159	**11ac(HT80) CH155**
	

5.6 Radiated spurious emission

5.6.1 Radiated Emission Limits

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

(2) For transmitters operating in the 5.25-5.35 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.

(3) 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.

(4) For transmitters operating in the 5.725-5.85 GHz band:

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

(ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Frequency Range	RBW	VBW	Measurement
30MHz-1GHz	1MHz	3MHz	Peak
Above 1GHz	1MHz	10Hz[Note1]	Average
	1MHz	>1/T [Note2]	Average
Note1	When duty cycle is no less than 98%		
Note2	When duty cycle is less than 98%		

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

5.6.2 Test procedure

The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.

The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

For emission measurements above 1 GHz, the EUT shall be placed at a height of 1.5 m above the floor on a support that is RF transparent for the frequencies of interest. Final measurements for the EUT require a measurement antenna height scan of 1 m to 4 m.

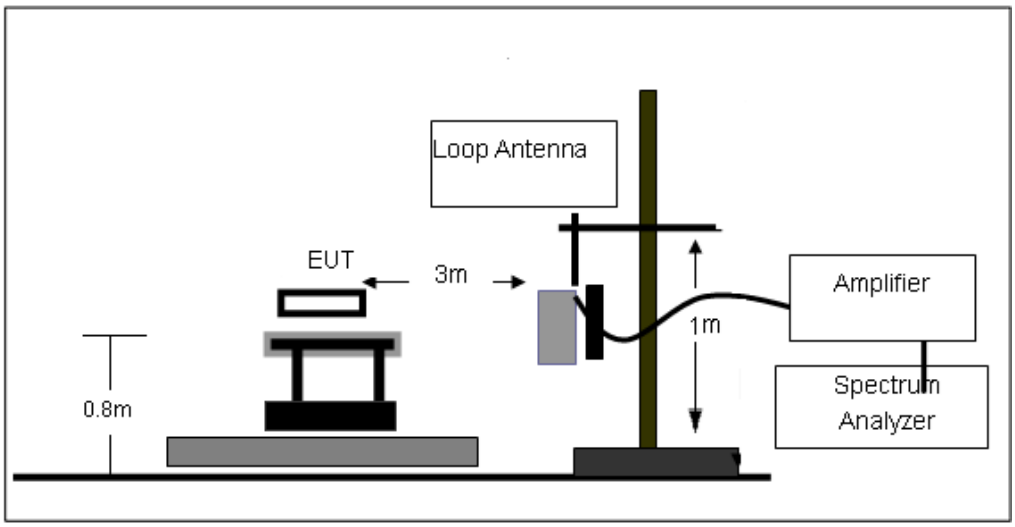
The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
For the actual test configuration, please refer to the related Item –EUT Test Photos.

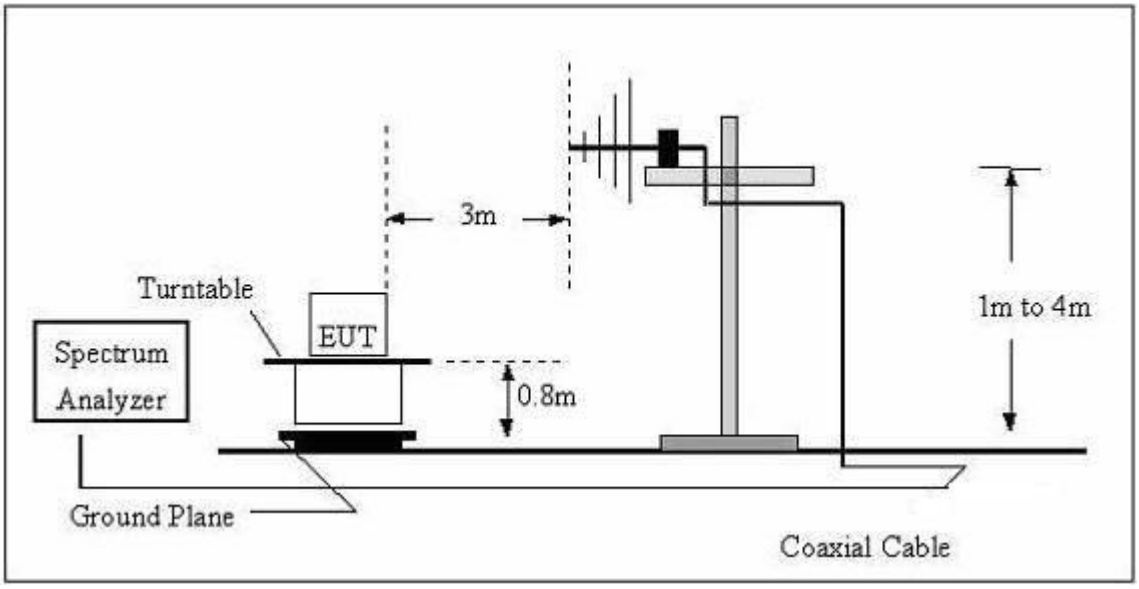
Note: Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

5.6.3 Test setup

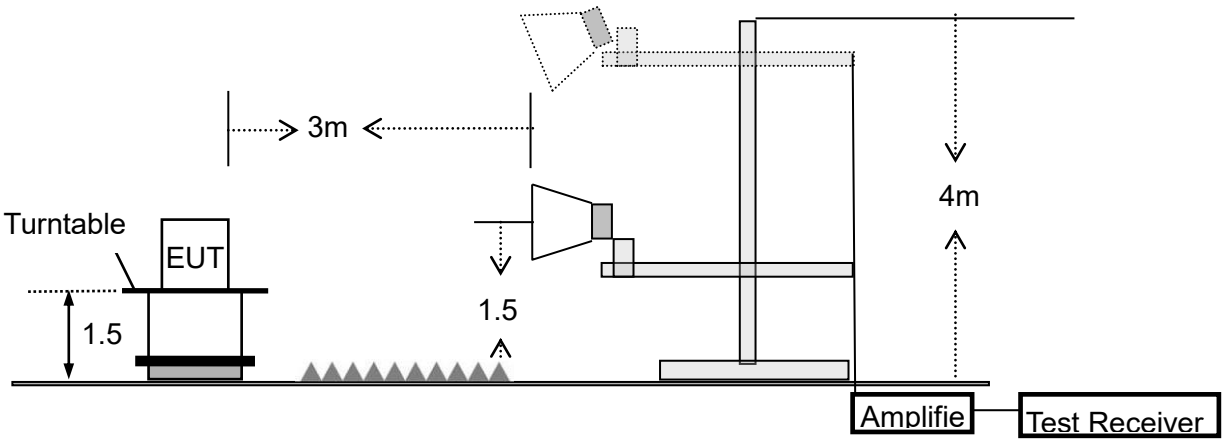
（A）Radiated Emission test-up Frequency Below 30MHz



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



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



5.6.4 Test results

EUT:	Car multimedia player	Model Name:	CAR710W
Pressure:	1010 hPa	Test Voltage:	DC 12V from DC source
Test Mode:	TX	Polarization:	--

Below 30MHz

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

Note1:The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Note2:Distance extrapolation factor =40 log (specific distance/test distance)(dB);Limit line = specific limits (dBuV) + distance extrapolation factor.

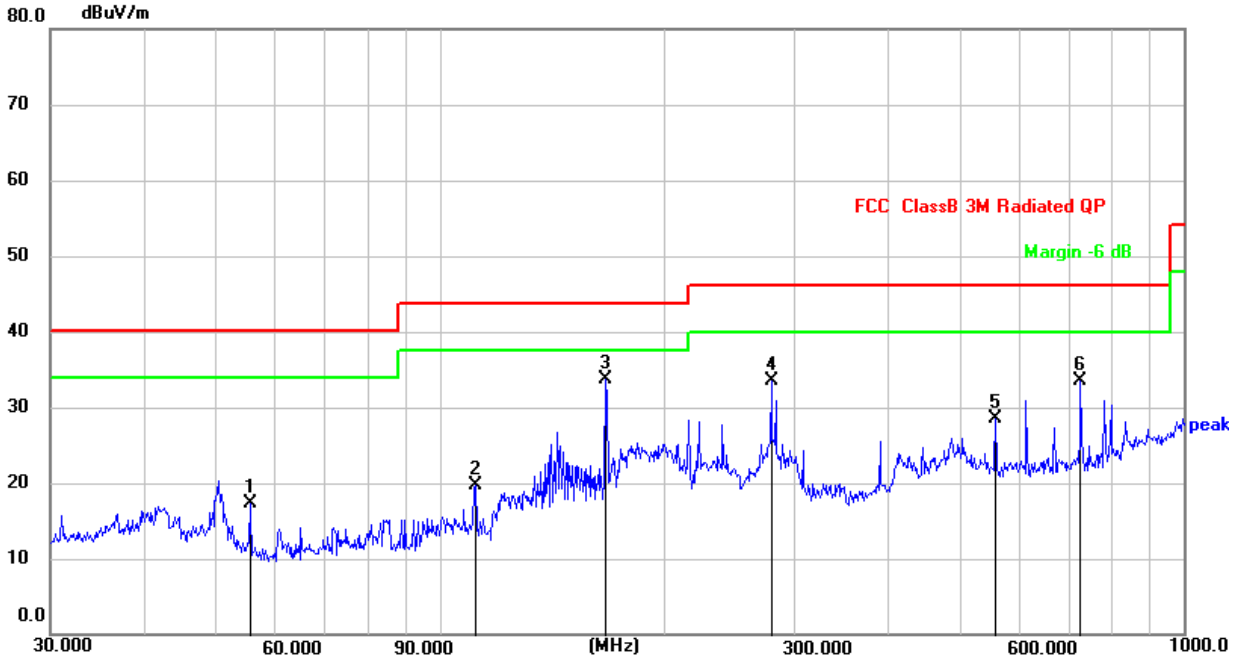
Between 30MHz – 1GHz

Note: All the mode has been tested for this test, the mode 11a CH36 is the worst mode. Just report the worst data.

Note 1: Emission Level = Meter Reading + Factor, Margin= Emission Level- Limit, Factor = Antenna Factor + Cable Loss – Pre-amplifier.

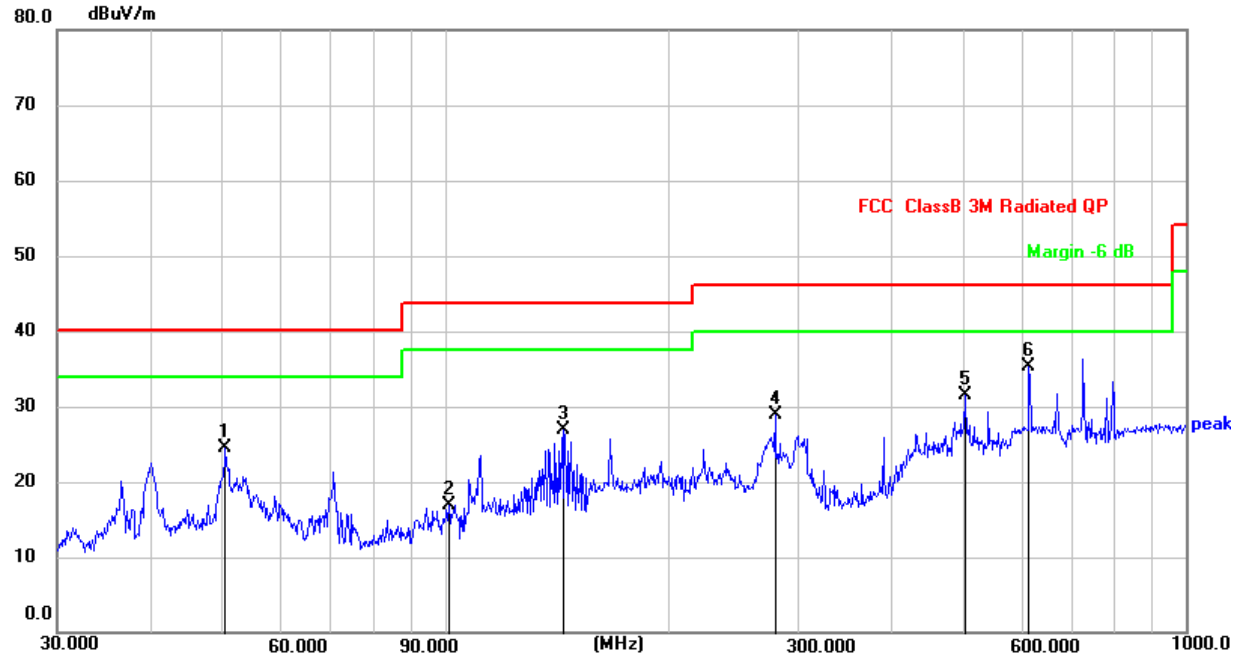
Note 2: The peak value is less than the AV value, AV value is not required Factor added by measurement software automatically.

EUT:	Car multimedia player	Model Name:	CAR710W
Pressure:	1010 hPa	Phase:	H
Test Voltage:	DC 12V from DC source	Mode:	TX



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	55.6092	31.43	-14.14	17.29	40.00	-22.71	QP
2	111.7377	34.58	-14.96	19.62	43.50	-23.88	QP
3 *	167.2366	50.01	-16.22	33.79	43.50	-9.71	QP
4	279.0436	44.65	-11.12	33.53	46.00	-12.47	QP
5	558.7300	34.29	-5.77	28.52	46.00	-17.48	QP
6	726.8052	36.47	-2.91	33.56	46.00	-12.44	QP

EUT:	Car multimedia player	Model Name:	CAR710W
Pressure:	1010 hPa	Phase:	V
Test Voltage:	DC 12V from DC source	Mode:	TX



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	50.5859	38.08	-13.57	24.51	40.00	-15.49	QP
2	101.2883	31.59	-14.75	16.84	43.50	-26.66	QP
3	144.8417	44.45	-17.45	27.00	43.50	-16.50	QP
4	279.0436	40.08	-11.12	28.96	46.00	-17.04	QP
5	502.9395	38.48	-6.89	31.59	46.00	-14.41	QP
6 *	614.2142	40.04	-4.71	35.33	46.00	-10.67	QP

1G-40GHz:

Note1: Emission Level = Meter Reading + Factor, Margin= Emission Level- Limit, Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Note2: The peak value is less than the AV value, AV value is not required Factor added by measurement software automatically.

Note3: The spurious emission of 25GHz – 40GHz band which the margin is lower more than 20dB, So that it is not reported in this test report.

For U-NII-1

Polar	Frequency	Meter Reading	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Margin	Detector Type
(H/V)	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Low Channel (5180 MHz)-Above 1G									
Vertical	4435.816	56.31	5.94	35.40	44.00	53.65	74.00	-20.35	Pk
Vertical	4435.187	44.45	5.94	35.40	44.00	41.79	54.00	-12.21	AV
Vertical	10370.239	63.14	8.46	39.75	44.50	66.85	74.00	-7.15	Pk
Vertical	10371.588	44.05	8.46	39.75	44.50	47.76	54.00	-6.24	Pk
Vertical	15540.576	55.35	10.12	38.80	44.10	60.17	74.00	-13.83	AV
Horizontal	15540.168	42.86	10.12	38.80	42.70	49.08	54.00	-4.92	Pk
Horizontal	4435.860	57.78	5.94	35.18	44.00	54.90	74.00	-19.10	AV
Horizontal	4434.768	43.93	5.94	35.18	44.00	41.05	54.00	-12.95	Pk
Horizontal	10370.663	62.46	8.46	38.71	44.50	65.13	74.00	-8.87	Pk
Horizontal	10731.778	44.83	8.46	38.71	44.50	47.50	54.00	-6.50	AV
middle Channel (5200 MHz)-Above 1G									
Vertical	4593.136	57.84	6.48	36.35	44.05	56.62	74.00	-17.38	Pk
Vertical	4593.903	42.15	6.48	36.35	44.05	40.93	54.00	-13.07	AV
Vertical	10403.106	62.34	8.47	37.88	44.51	64.18	74.00	-9.82	Pk
Vertical	10402.403	46.10	8.47	37.88	44.51	47.94	54.00	-6.06	Pk
Vertical	15600.549	58.35	10.12	38.8	44.10	63.17	74.00	-10.83	AV
Horizontal	15600.379	42.24	10.12	38.8	42.70	48.46	54.00	-5.54	Pk
Horizontal	4593.609	59.44	6.48	36.37	44.05	58.24	74.00	-15.76	AV
Horizontal	4594.023	41.69	6.48	36.37	44.05	40.49	54.00	-13.51	Pk
Horizontal	10400.923	60.58	8.47	38.64	44.50	63.19	74.00	-10.81	Pk
Horizontal	10400.261	47.35	8.47	38.64	44.50	49.96	54.00	-4.04	AV

High Channel (5240 MHz)-Above 1G									
Vertical	4740.481	60.38	7.10	37.24	43.50	61.22	74.00	-12.78	Pk
Vertical	4740.612	46.23	7.10	37.24	43.50	47.07	54.00	-6.93	AV
Vertical	10481.188	61.35	8.46	37.68	44.50	62.99	74.00	-11.01	Pk
Vertical	10481.832	46.34	8.46	37.68	44.50	47.98	54.00	-6.02	Pk
Vertical	15721.079	58.56	10.12	38.8	44.10	63.38	74.00	-10.62	AV
Horizontal	15720.835	43.26	10.12	38.8	42.70	49.48	54.00	-4.52	Pk
Horizontal	4740.621	59.12	7.10	37.24	43.50	59.96	74.00	-14.04	AV
Horizontal	4740.745	43.58	7.10	37.24	43.50	44.42	54.00	-9.58	Pk
Horizontal	10482.256	58.52	8.46	38.57	44.50	61.05	74.00	-12.95	Pk
Horizontal	10482.135	43.61	8.46	38.57	44.50	46.14	54.00	-7.86	AV

Note: Both horizontal and vertical antenna polarities were tested and only the worst case (horizontal) emissions were reported.

For U-NII-3

Polar	Frequency	Meter Reading	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Margin	Detector Type
(H/V)	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Low Channel (5745 MHz)-Above 1G									
Vertical	4680.765	58.93	5.94	35.40	44.00	56.27	74.00	-17.73	Pk
Vertical	4681.160	46.66	5.94	35.40	44.00	44.00	54.00	-10.00	AV
Vertical	11490.968	58.73	8.46	39.75	44.50	62.44	74.00	-11.56	Pk
Vertical	11491.376	45.91	8.46	39.75	44.50	49.62	54.00	-4.38	AV
Vertical	17235.664	58.28	10.12	38.80	44.10	63.10	74.00	-10.90	Pk
Horizontal	17235.799	41.61	10.12	38.80	42.70	47.83	54.00	-6.17	Pk
Horizontal	4679.525	58.33	5.94	35.18	44.00	55.45	74.00	-18.55	AV
Horizontal	4681.268	44.39	5.94	35.18	44.00	41.51	54.00	-12.49	Pk
Horizontal	11490.329	61.10	8.46	38.71	44.50	63.77	74.00	-10.23	AV
Horizontal	11492.197	44.30	8.46	38.71	44.50	46.97	54.00	-7.03	Pk
middle Channel (5785 MHz)-Above 1G									
Vertical	4594.222	59.49	6.48	36.35	44.05	58.27	74.00	-15.73	Pk
Vertical	4592.522	44.08	6.48	36.35	44.05	42.86	54.00	-11.14	AV
Vertical	11571.888	60.06	8.47	37.88	44.51	61.90	74.00	-12.10	Pk
Vertical	11571.999	43.77	8.47	37.88	44.51	45.61	54.00	-8.39	AV
Vertical	17356.135	59.34	10.12	38.8	44.10	64.16	74.00	-9.84	Pk
Horizontal	17355.436	42.13	10.12	38.8	42.70	48.35	54.00	-5.65	Pk
Horizontal	4594.195	60.72	6.48	36.37	44.05	59.52	74.00	-14.48	AV
Horizontal	4592.796	44.55	6.48	36.37	44.05	43.35	54.00	-10.65	Pk
Horizontal	11570.828	62.22	8.47	38.64	44.50	64.83	74.00	-9.17	AV
Horizontal	11572.077	46.59	8.47	38.64	44.50	49.20	54.00	-4.80	Pk
High Channel (5825 MHz)-Above 1G									
Vertical	5040.206	59.64	7.10	37.24	43.50	60.48	74.00	-13.52	Pk
Vertical	5039.349	47.10	7.10	37.24	43.50	47.94	54.00	-6.06	AV
Vertical	11651.067	55.74	8.46	37.68	44.50	57.38	74.00	-16.62	Pk
Vertical	11651.140	43.89	8.46	37.68	44.50	45.53	54.00	-8.47	AV
Vertical	17475.827	61.51	10.12	38.8	44.10	66.33	74.00	-7.67	Pk
Horizontal	17476.838	41.33	10.12	38.8	42.70	47.55	54.00	-6.45	Pk
Horizontal	5040.321	67.64	7.10	37.24	43.50	68.48	74.00	-5.52	AV
Horizontal	5041.208	43.78	7.10	37.24	43.50	44.62	54.00	-9.38	Pk
Horizontal	11651.794	56.50	8.46	38.57	44.50	59.03	74.00	-14.97	AV
Horizontal	11652.265	43.87	8.46	38.57	44.50	46.40	54.00	-7.60	Pk

Band edge – radiated

Note: Emission Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

For U-NII-1

For 802.11a mode: (CH36 5180MHz&CH64 5320MHz)

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5150	67.58	8.69	29.4	42.59	63.08	74	-10.92	Pk
Horizontal	5350	63.71	9.37	30.41	43.25	60.24	74	-13.76	Pk
Vertical	5150	68.87	9.21	29.4	42.59	64.89	74	-9.11	Pk
Vertical	5350	60.28	9.12	30.41	43.25	56.56	74	-17.44	Pk

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
Horizontal	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5150	47.20	8.69	29.4	42.59	42.70	54	-12.33	AV
Horizontal	5350	50.88	8.46	30.41	43.25	46.50	54	-8.68	AV
Vertical	5150	48.88	9.21	29.4	42.59	44.90	54	-8.50	AV
Vertical	5350	49.82	9.12	30.41	43.25	46.10	54	-6.16	AV

For 802.11n20 mode: (CH36 5180MHz&CH64 5320MHz)

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5150	66.18	8.69	29.4	42.59	61.68	74	-12.32	Pk
Horizontal	5350	68.41	9.37	30.41	43.25	64.94	74	-9.06	Pk
Vertical	5150	64.74	9.21	29.4	42.59	60.76	74	-13.24	Pk
Vertical	5350	67.33	9.12	30.41	43.25	63.61	74	-10.39	Pk

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5150	45.72	8.69	29.4	42.59	41.22	54	-12.78	AV
Horizontal	5350	47.63	8.46	30.41	43.25	43.25	54	-10.75	AV
Vertical	5150	50.16	9.21	29.4	42.59	46.18	54	-7.82	AV
Vertical	5350	50.31	9.12	30.41	43.25	46.59	54	-7.41	AV

For 802.11n40 mode: (CH38 5190MHz&CH62 5310MHz)

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5150	67.69	8.69	29.4	42.59	63.19	74	-10.81	Pk
Horizontal	5350	63.44	9.37	30.41	43.25	59.97	74	-14.03	Pk
Vertical	5150	63.86	9.21	29.4	42.59	59.88	74	-14.12	Pk
Vertical	5350	60.39	9.12	30.41	43.25	56.67	74	-17.33	Pk

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5150	45.50	8.69	29.4	42.59	41.00	54	-13.00	AV
Horizontal	5350	46.69	8.46	30.41	43.25	42.31	54	-11.69	AV
Vertical	5150	50.45	9.21	29.4	42.59	46.47	54	-7.53	AV
Vertical	5350	49.47	9.12	30.41	43.25	45.75	54	-8.25	AV

For 802.11ac20 mode: (CH36 5180MHz&CH64 5320MHz)

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5150	65.06	8.69	29.4	42.59	60.56	74	-13.44	Pk
Horizontal	5350	68.51	9.37	30.41	43.25	65.04	74	-8.96	Pk
Vertical	5150	65.09	9.21	29.4	42.59	61.11	74	-12.89	Pk
Vertical	5350	67.53	9.12	30.41	43.25	63.81	74	-10.19	Pk

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5150	46.77	8.69	29.4	42.59	42.27	54	-11.73	AV
Horizontal	5350	46.65	8.46	30.41	43.25	42.27	54	-11.73	AV
Vertical	5150	50.29	9.21	29.4	42.59	46.31	54	-7.69	AV
Vertical	5350	50.08	9.12	30.41	43.25	46.36	54	-7.64	AV

For 802.11ac40 mode: (CH38 5190MHz&CH62 5310MHz)

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5150	64.81	8.69	29.4	42.59	60.31	74	-13.69	Pk
Horizontal	5350	67.72	9.37	30.41	43.25	64.25	74	-9.75	Pk
Vertical	5150	65.17	9.21	29.4	42.59	61.19	74	-12.81	Pk
Vertical	5350	68.23	9.12	30.41	43.25	64.51	74	-9.49	Pk

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5150	46.13	8.69	29.4	42.59	41.63	54	-12.37	AV
Horizontal	5350	46.56	8.46	30.41	43.25	42.18	54	-11.82	AV
Vertical	5150	49.73	9.21	29.4	42.59	45.75	54	-8.25	AV
Vertical	5350	50.54	9.12	30.41	43.25	46.82	54	-7.18	AV

For 802.11ac80 mode: (CH42 5210MHz&CH58 5290MHz)

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5150	64.96	8.69	29.4	42.59	60.46	74	-13.54	Pk
Horizontal	5350	68.08	9.37	30.41	43.25	64.61	74	-9.39	Pk
Vertical	5150	65.19	9.21	29.4	42.59	61.21	74	-12.79	Pk
Vertical	5350	67.82	9.12	30.41	43.25	64.10	74	-9.90	Pk

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5150	45.56	8.69	29.4	42.59	41.06	54	-12.94	AV
Horizontal	5350	46.98	8.46	30.41	43.25	42.60	54	-11.40	AV
Vertical	5150	50.59	9.21	29.4	42.59	46.61	54	-7.39	AV
Vertical	5350	49.60	9.12	30.41	43.25	45.88	54	-8.12	AV

For U-NII-3

For 802.11a mode: (CH149 5745MHz&CH165 5825MHz)

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5725	67.59	8.69	29.4	42.59	63.09	74	-10.91	Pk
Horizontal	5850	63.46	9.37	30.41	43.25	59.99	74	-14.01	Pk
Vertical	5725	68.15	9.21	29.4	42.59	64.17	74	-9.83	Pk
Vertical	5850	59.82	9.12	30.41	43.25	56.10	74	-17.90	Pk

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
Horizontal	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5725	46.41	8.69	29.4	42.59	41.91	54	-12.09	AV
Horizontal	5850	50.29	8.46	30.41	43.25	45.91	54	-8.09	AV
Vertical	5725	50.54	9.21	29.4	42.59	46.56	54	-7.44	AV
Vertical	5850	50.16	9.12	30.41	43.25	46.44	54	-7.56	AV

For 802.11n20 mode: (CH149 5745MHz&CH165 5825MHz)

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5725	65.90	8.69	29.4	42.59	61.40	74	-12.60	Pk
Horizontal	5850	62.63	9.37	30.41	43.25	59.16	74	-14.84	Pk
Vertical	5725	69.44	9.21	29.4	42.59	65.46	74	-8.54	Pk
Vertical	5850	60.52	9.12	30.41	43.25	56.80	74	-17.20	Pk

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5725	46.61	8.69	29.4	42.59	42.11	54	-11.89	AV
Horizontal	5850	52.56	8.46	30.41	43.25	48.18	54	-5.82	AV
Vertical	5725	50.67	9.21	29.4	42.59	46.69	54	-7.31	AV
Vertical	5850	52.25	9.12	30.41	43.25	48.53	54	-5.47	AV

For 802.11n40 mode: (CH151 5755MHz&CH159 5795MHz)

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5725	66.53	8.69	29.4	42.59	62.03	74	-11.97	Pk
Horizontal	5850	63.66	9.37	30.41	43.25	60.19	74	-13.81	Pk
Vertical	5725	68.27	9.21	29.4	42.59	64.29	74	-9.71	Pk
Vertical	5850	59.51	9.12	30.41	43.25	55.79	74	-18.21	Pk

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5725	47.13	8.69	29.4	42.59	42.63	54	-11.37	AV
Horizontal	5850	51.89	8.46	30.41	43.25	47.51	54	-6.49	AV
Vertical	5725	49.00	9.21	29.4	42.59	45.02	54	-8.98	AV
Vertical	5850	52.81	9.12	30.41	43.25	49.09	54	-4.91	AV

For 802.11ac20 mode: (CH149 5745MHz&CH165 5825MHz)

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5725	65.53	8.69	29.4	42.59	61.03	74	-12.97	Pk
Horizontal	5850	64.16	9.37	30.41	43.25	60.69	74	-13.31	Pk
Vertical	5725	67.85	9.21	29.4	42.59	63.87	74	-10.13	Pk
Vertical	5850	62.19	9.12	30.41	43.25	58.47	74	-15.53	Pk

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5725	46.27	8.69	29.4	42.59	41.77	54	-12.23	AV
Horizontal	5850	51.85	8.46	30.41	43.25	47.47	54	-6.53	AV
Vertical	5725	49.95	9.21	29.4	42.59	45.97	54	-8.03	AV
Vertical	5850	51.35	9.12	30.41	43.25	47.63	54	-6.37	AV

For 802.11ac40 mode: (CH151 5755MHz&CH159 5795MHz)

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5725	68.21	8.69	29.4	42.59	63.71	74	-10.29	Pk
Horizontal	5850	65.30	9.37	30.41	43.25	61.83	74	-12.17	Pk
Vertical	5725	70.31	9.21	29.4	42.59	66.33	74	-7.67	Pk
Vertical	5850	59.82	9.12	30.41	43.25	56.10	74	-17.90	Pk

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5725	48.73	8.69	29.4	42.59	44.23	54	-9.77	AV
Horizontal	5850	50.06	8.46	30.41	43.25	45.68	54	-8.32	AV
Vertical	5725	48.14	9.21	29.4	42.59	44.16	54	-9.84	AV
Vertical	5850	50.59	9.12	30.41	43.25	46.87	54	-7.13	AV

For 802.11ac80 mode: (CH155 5775MHz)

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5725	67.57	8.69	29.4	42.59	63.07	74	-10.93	Pk
Horizontal	5850	62.87	9.37	30.41	43.25	59.40	74	-14.60	Pk
Vertical	5725	68.20	9.21	29.4	42.59	64.22	74	-9.78	Pk
Vertical	5850	60.57	9.12	30.41	43.25	56.85	74	-17.15	Pk

Polarization	Frequency	Read Lavel	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Over Limit	Detector Type
/	(MHz)	(dBuV)	(dB)	dB/m	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Horizontal	5725	46.77	8.69	29.4	42.59	42.27	54	-11.73	AV
Horizontal	5850	45.66	8.46	30.41	43.25	41.28	54	-12.72	AV
Vertical	5725	46.34	9.21	29.4	42.59	42.36	54	-11.64	AV
Vertical	5850	47.35	9.12	30.41	43.25	43.63	54	-10.37	AV

5.7 Conduction spurious emission

5.7.1 Limits

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

Frequency Band (MHz)	Limit
5150 - 5250	Outside of the 5.15-5.35 GHz band: e.i.r.p. -27 dBm
5250 - 5350	Outside of the 5.15-5.35 GHz band: e.i.r.p. -27 dBm
5470 - 5725	Outside of the 5.47-5.725 GHz band: e.i.r.p. -27 dBm
5725 - 5850	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.

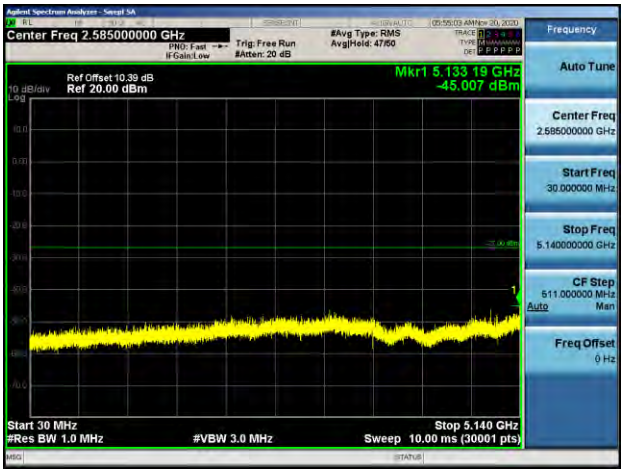
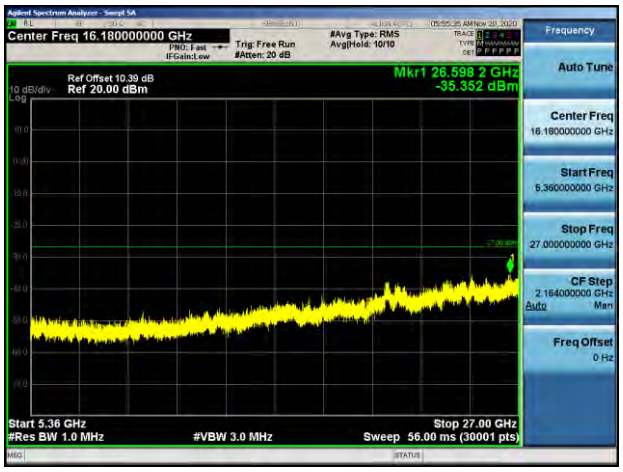
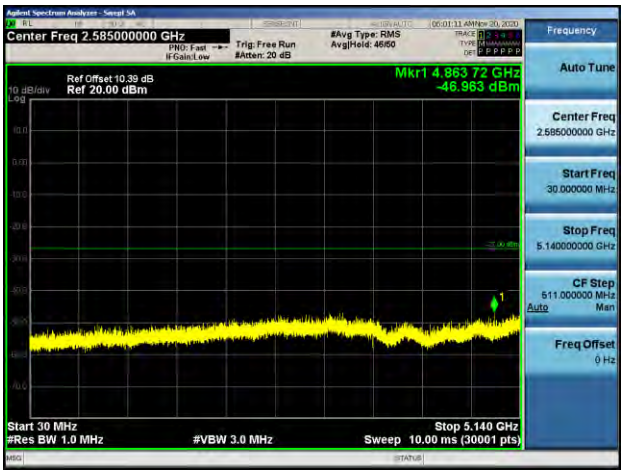
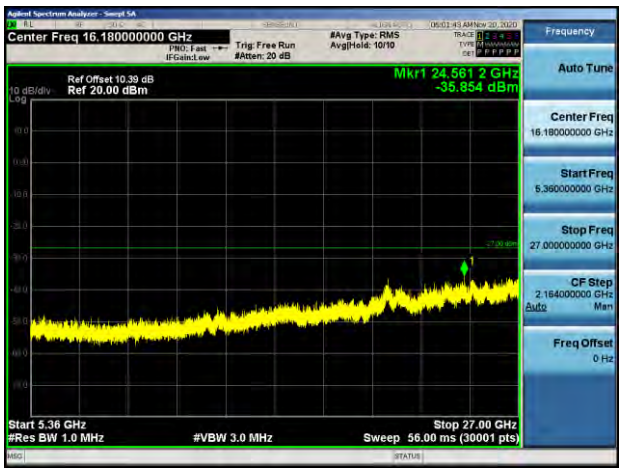
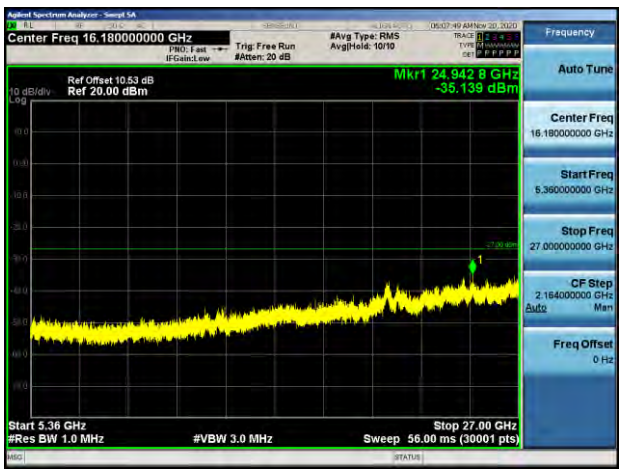
5.7.2 Test setup

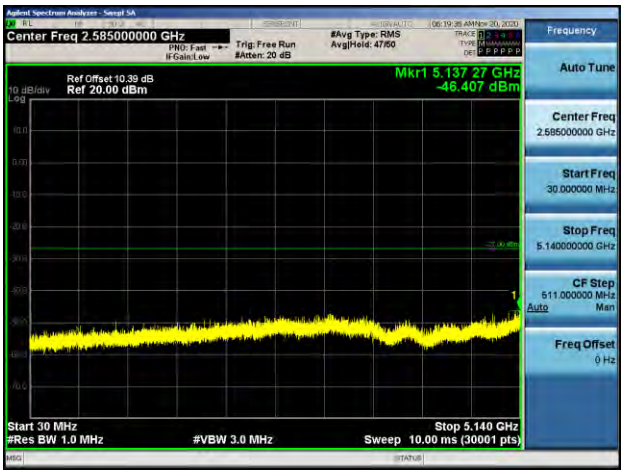
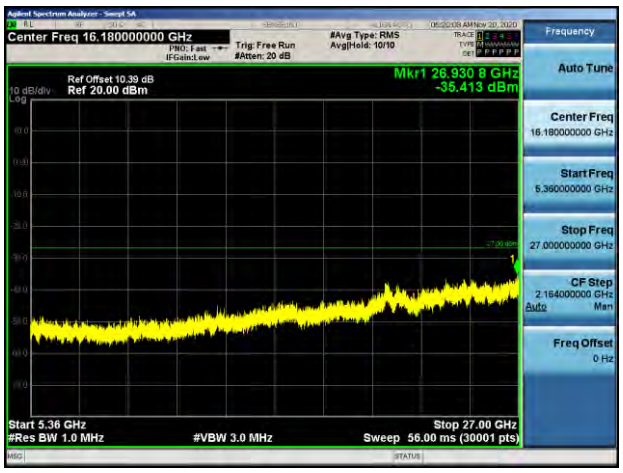
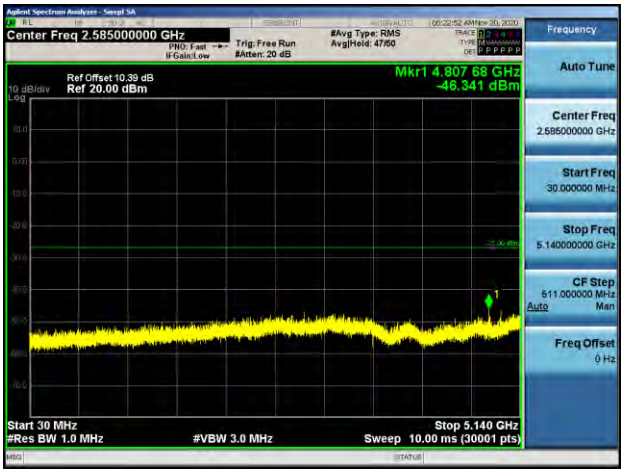
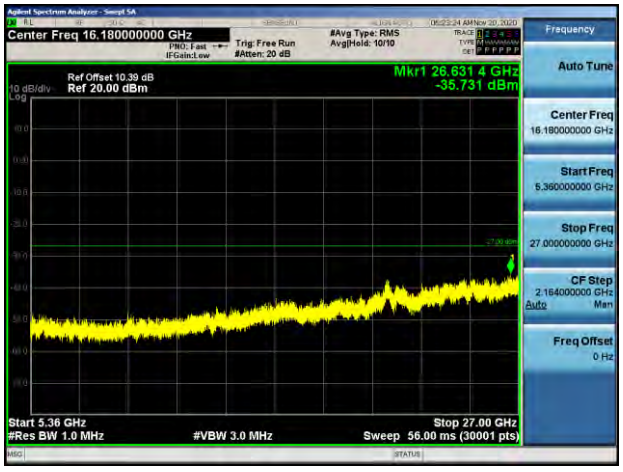
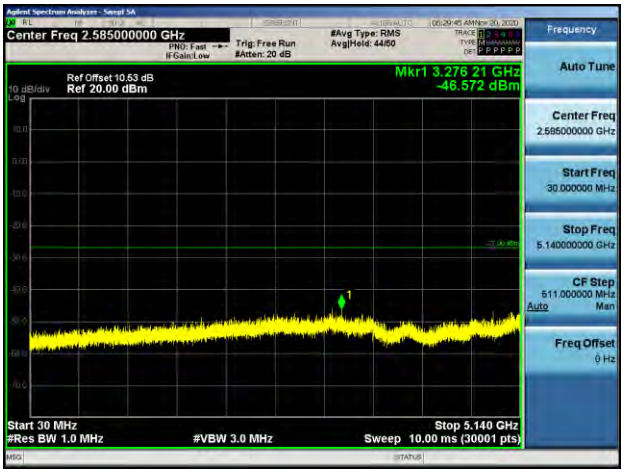
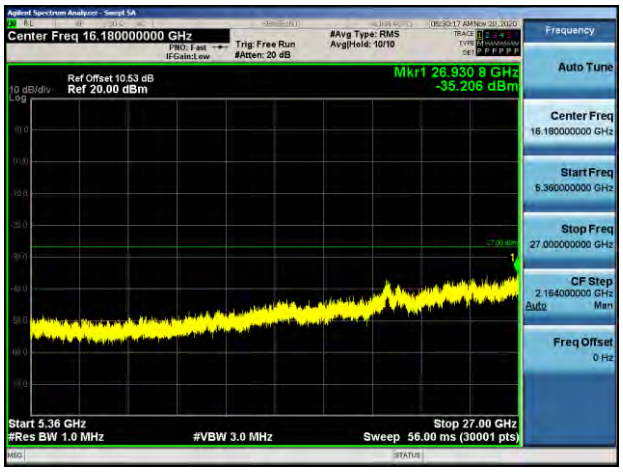
5.7.3 Test procedure

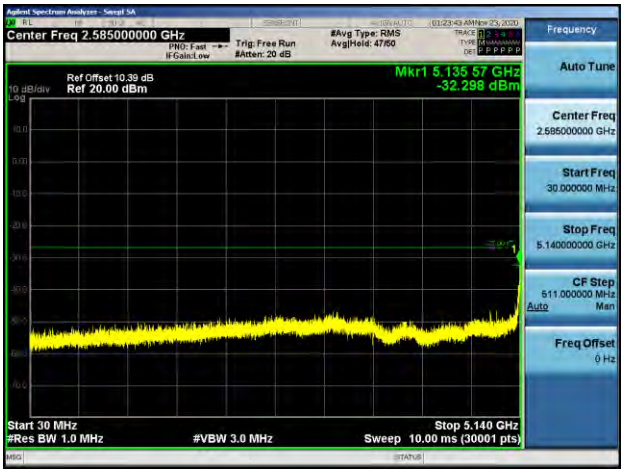
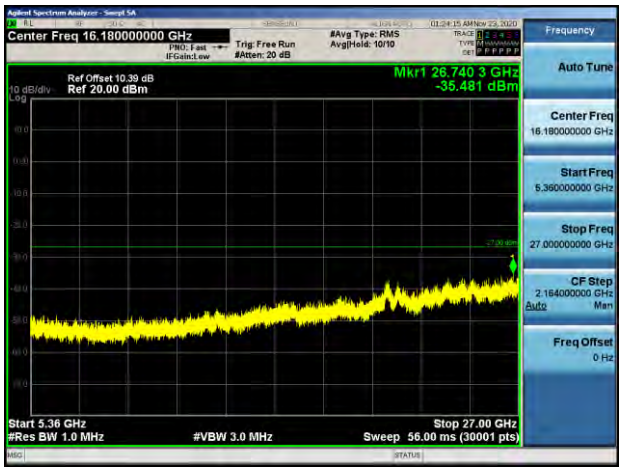
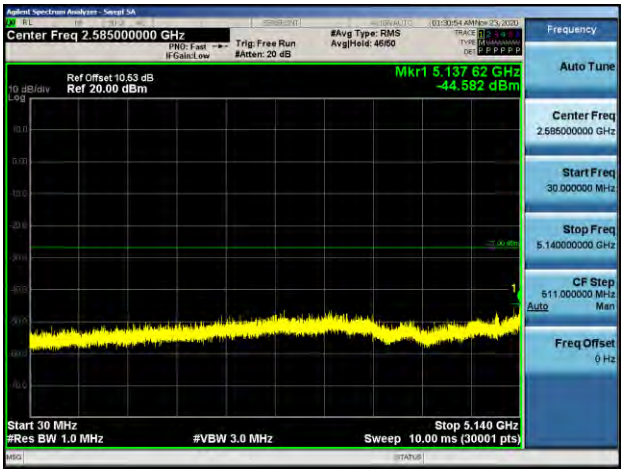
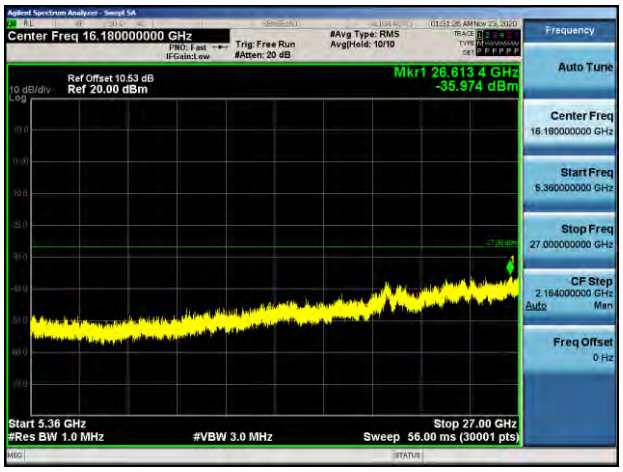
Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize

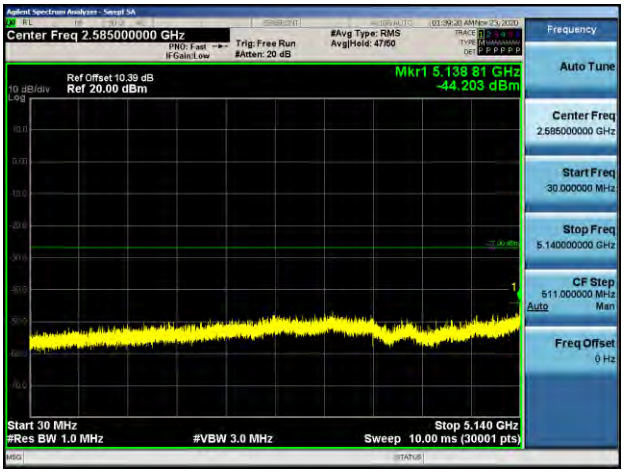
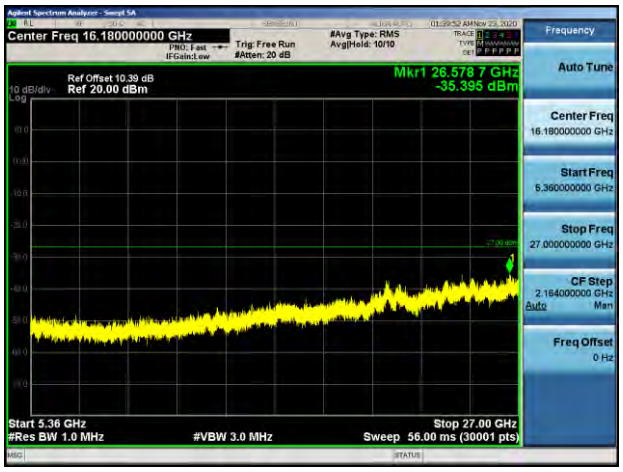
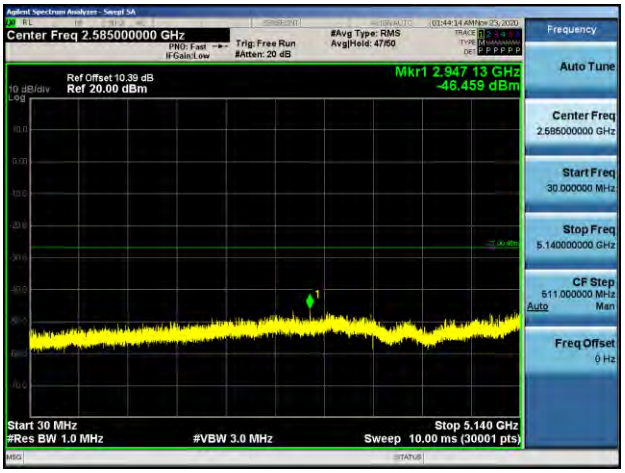
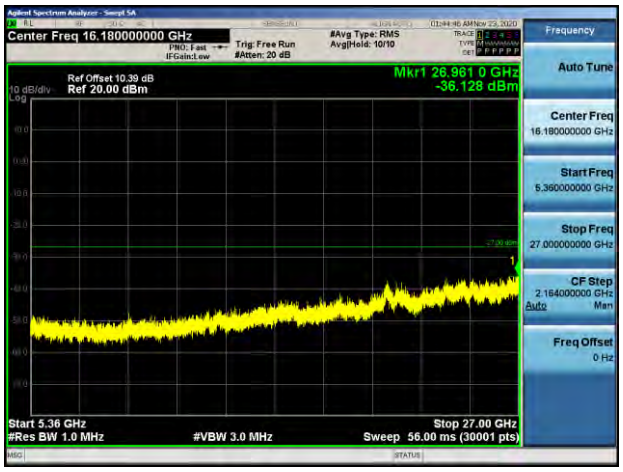
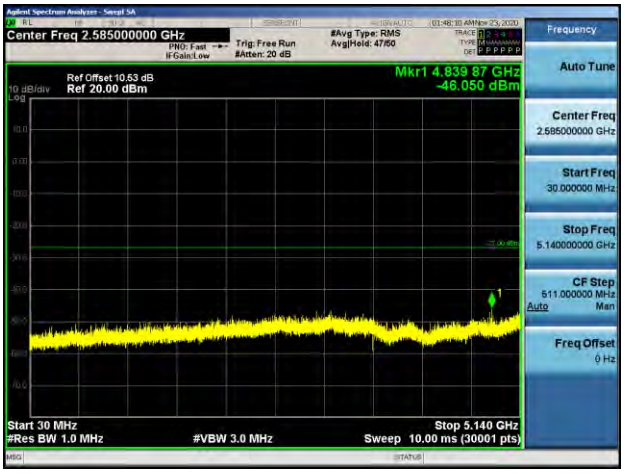
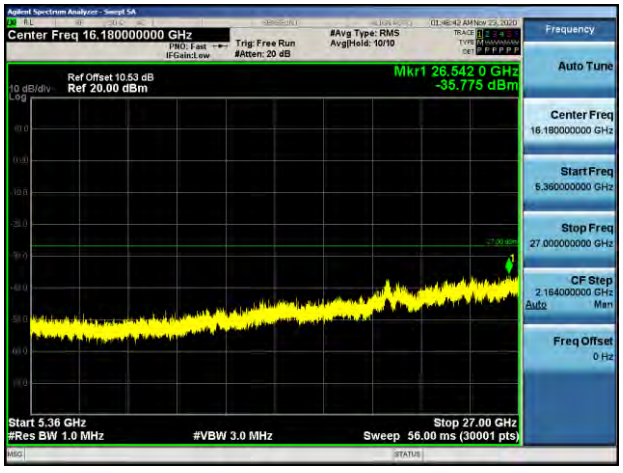
5.7.4 Test results

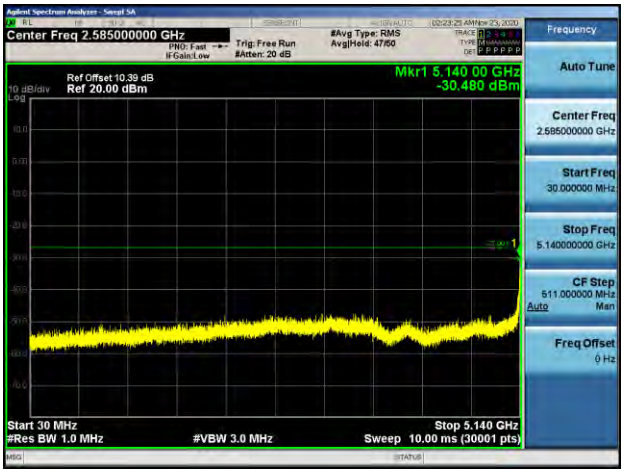
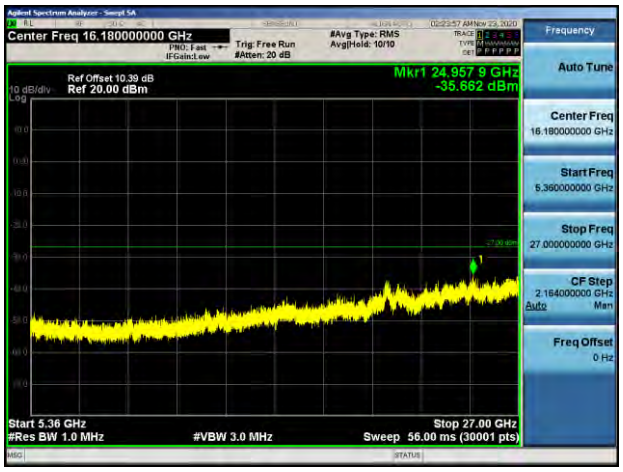
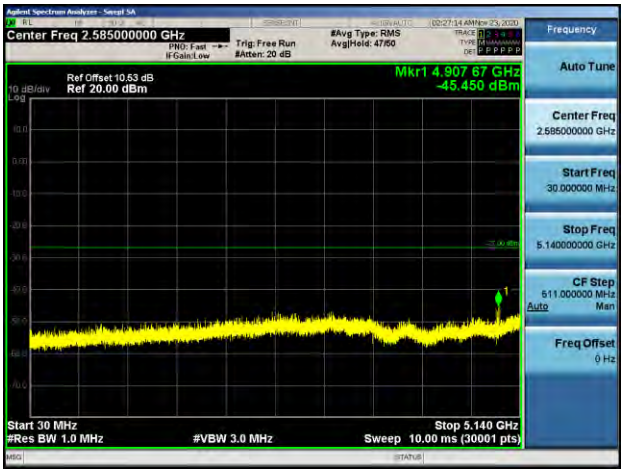
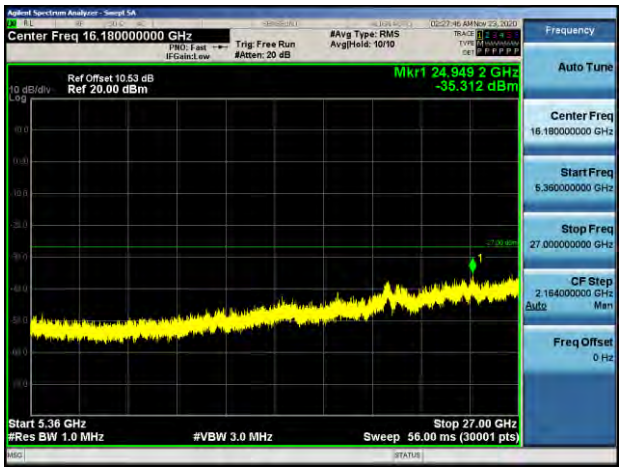
For U-NII-1

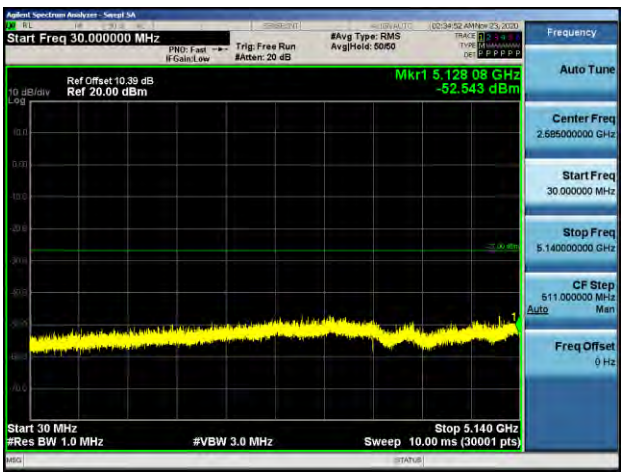
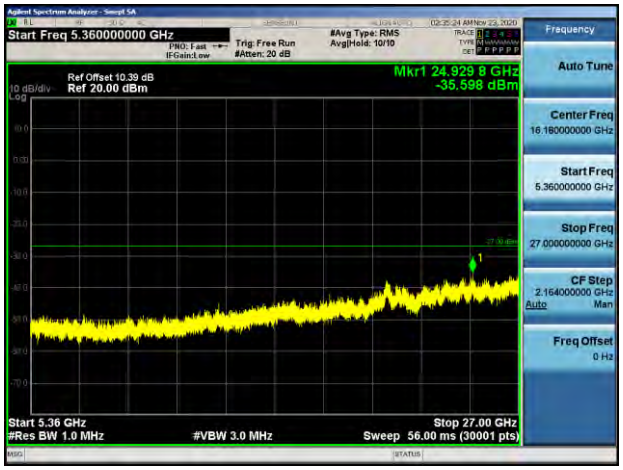
11a	
Low channel	Low channel
	
Middle channel	Middle channel
	
High channel	High channel
	

11n20	
Low channel	Low channel
	
Middle channel	Middle channel
	
High channel	High channel
	

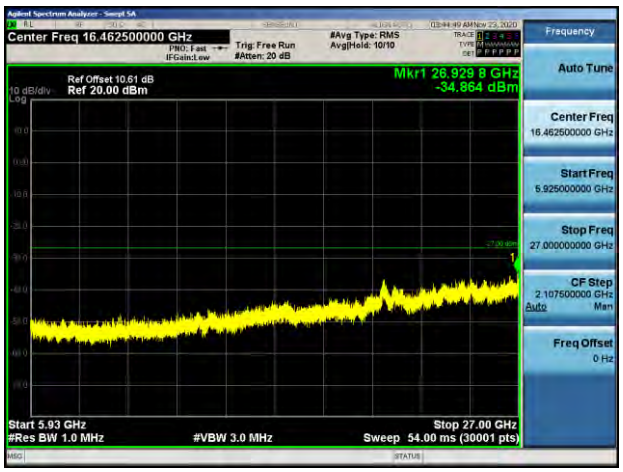
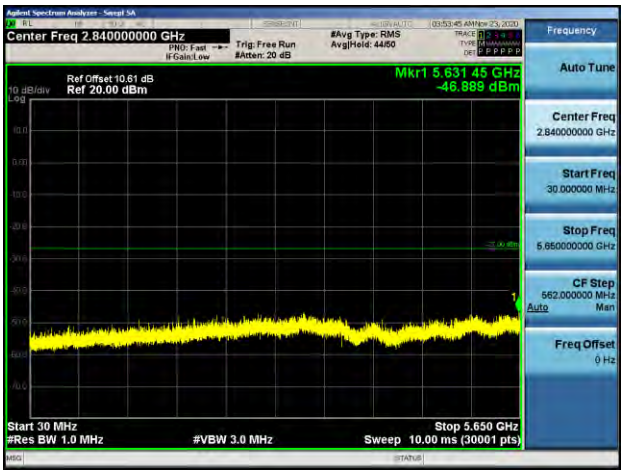
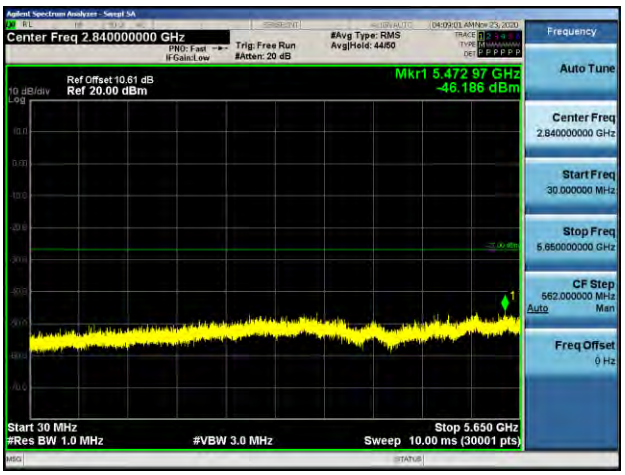
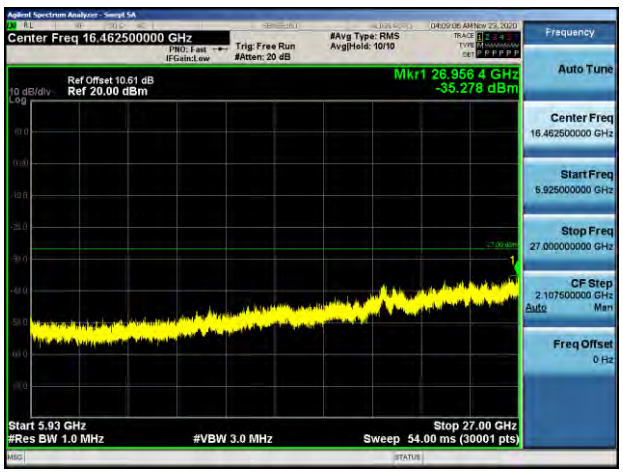
11n40	
Low channel	Low channel
	
High channel	High channel
	

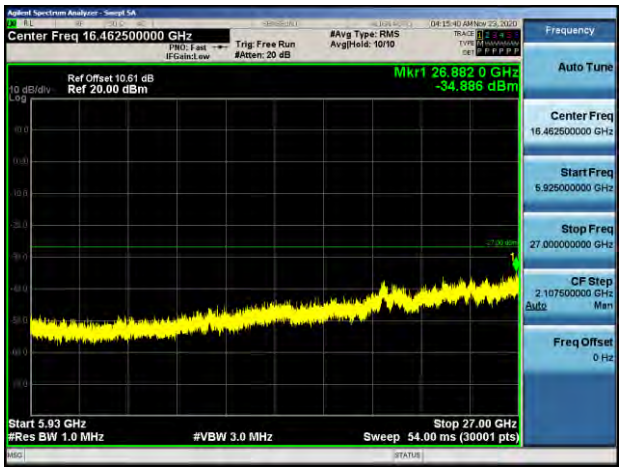
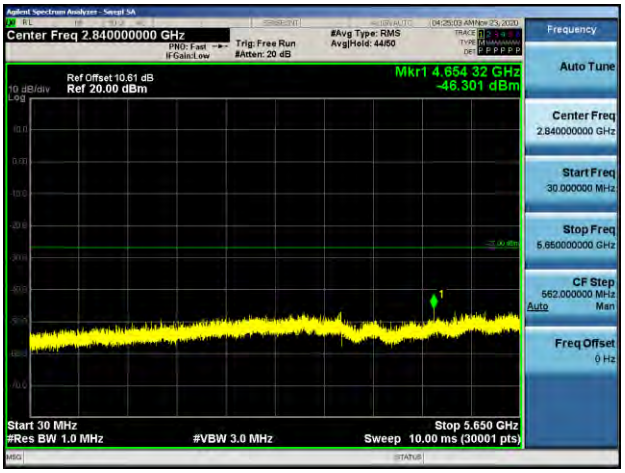
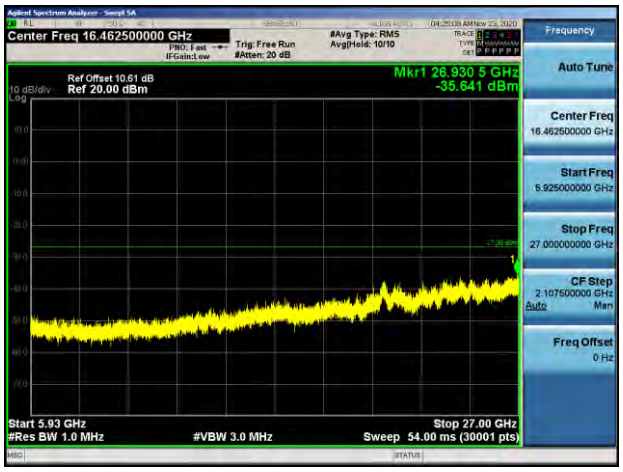
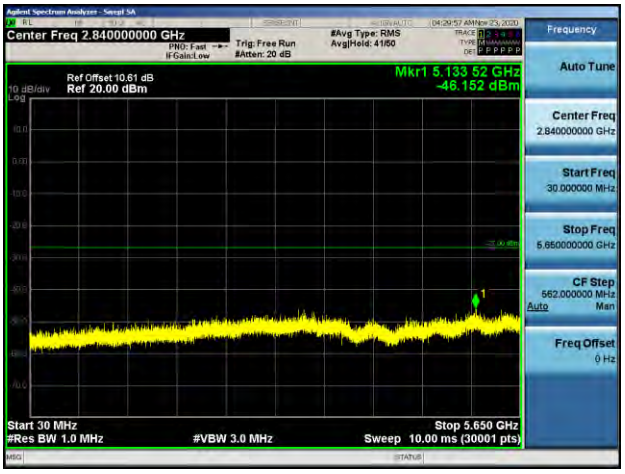
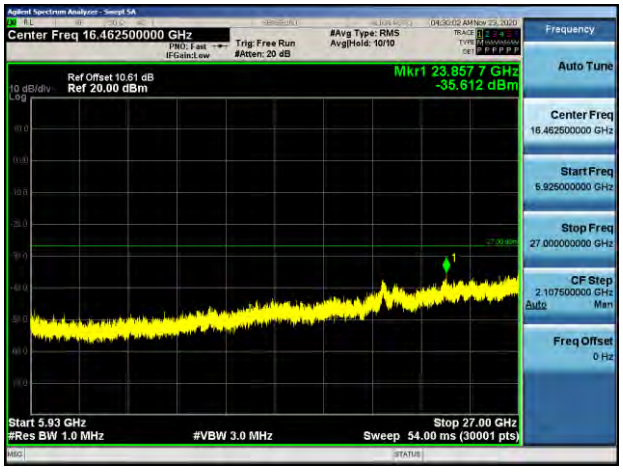
11ac20	
Low channel	Low channel
	
Middle channel	Middle channel
	
High channel	High channel
	

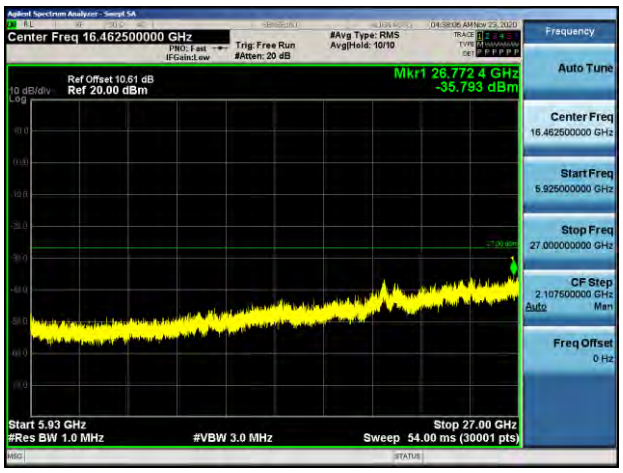
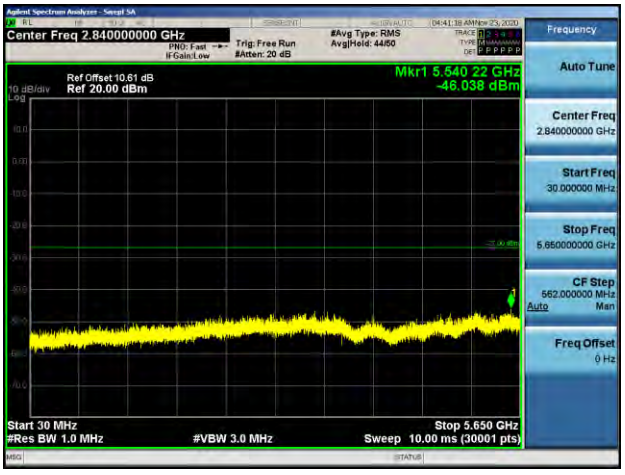
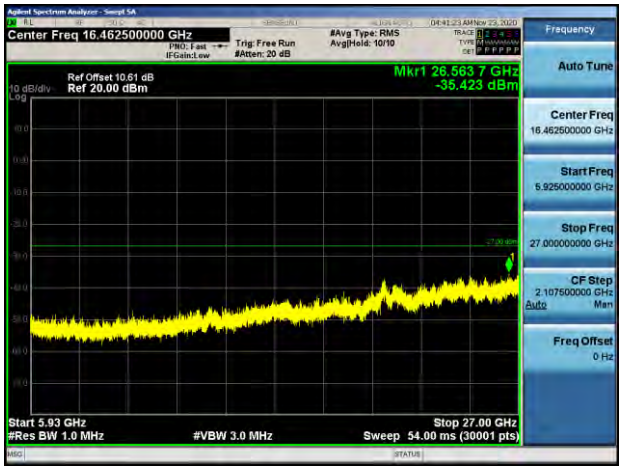
11ac40	
Low channel	Low channel
	
High channel	High channel
	

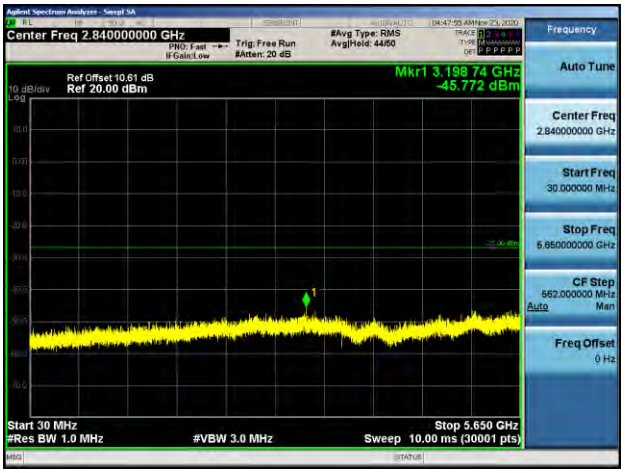
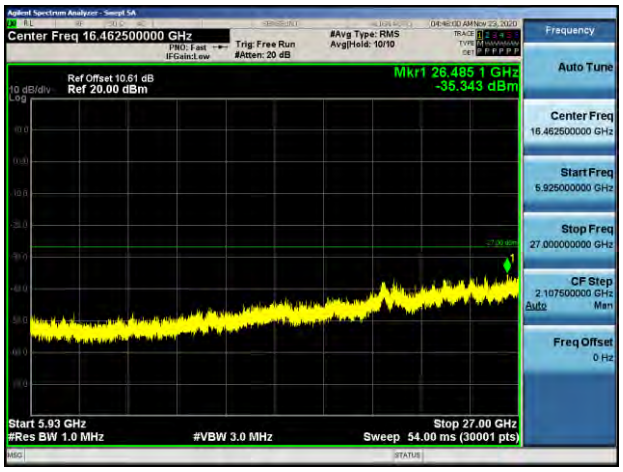
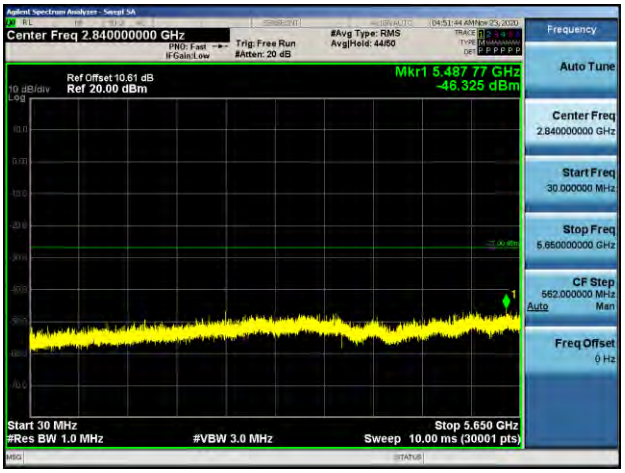
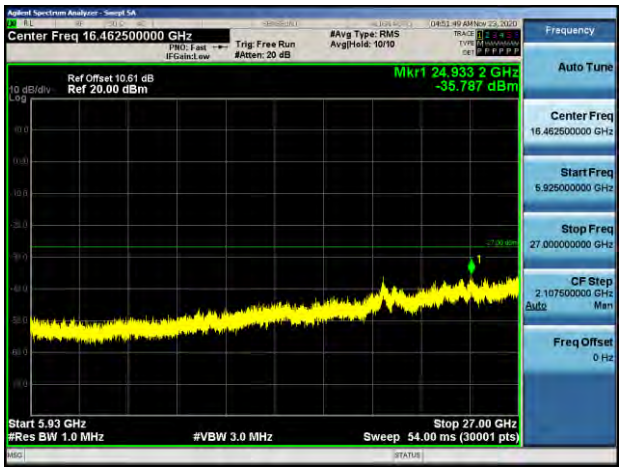
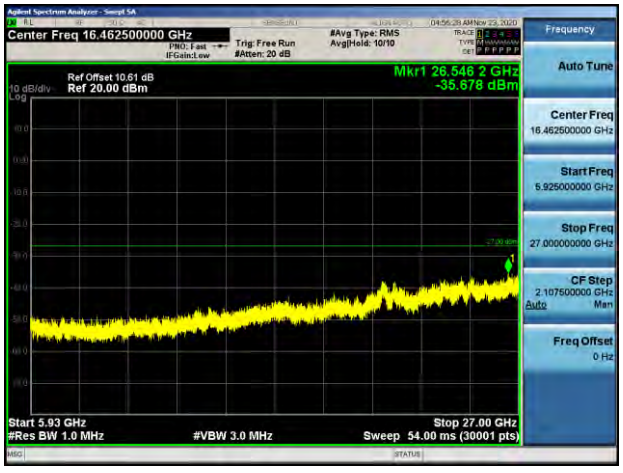
11ac80	
	

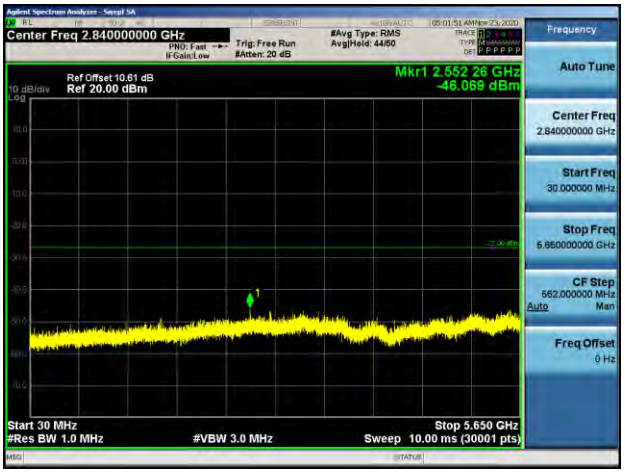
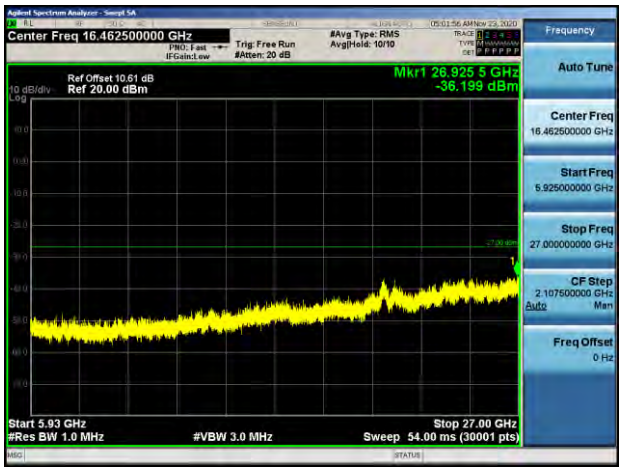
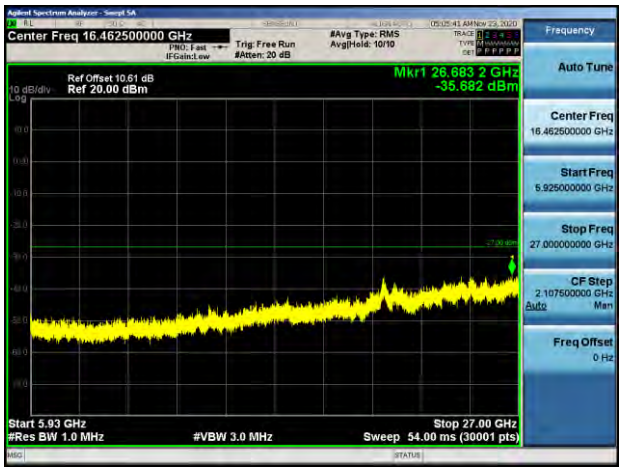
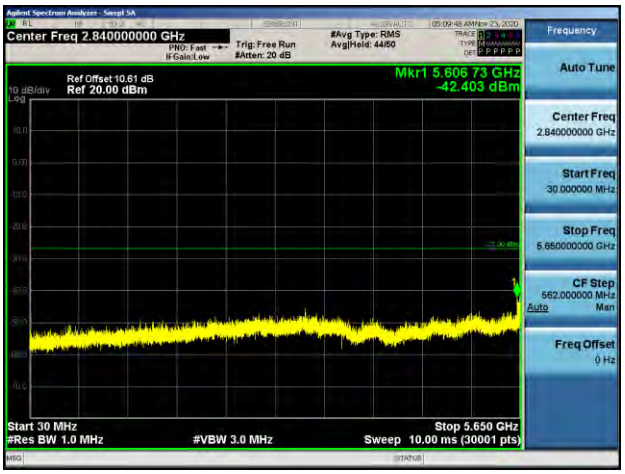
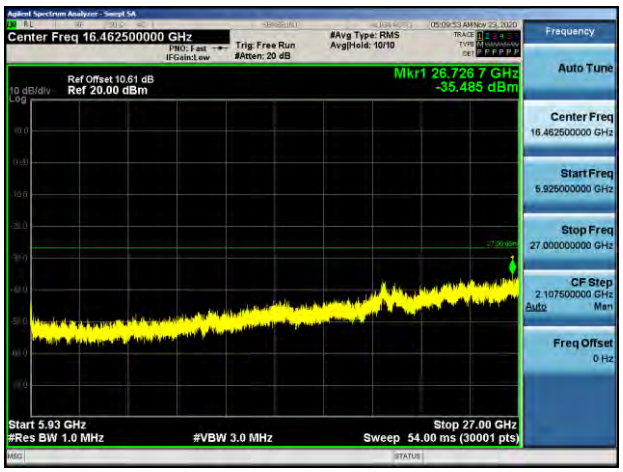
For U-NII-3

11a	
Low channel	Low channel
	
Middle channel	Middle channel
	
High channel	High channel
	

11n20	
Low channel	Low channel
	
Middle channel	Middle channel
	
High channel	High channel
	

11n40	
Low channel	Low channel
	
High channel	High channel
	

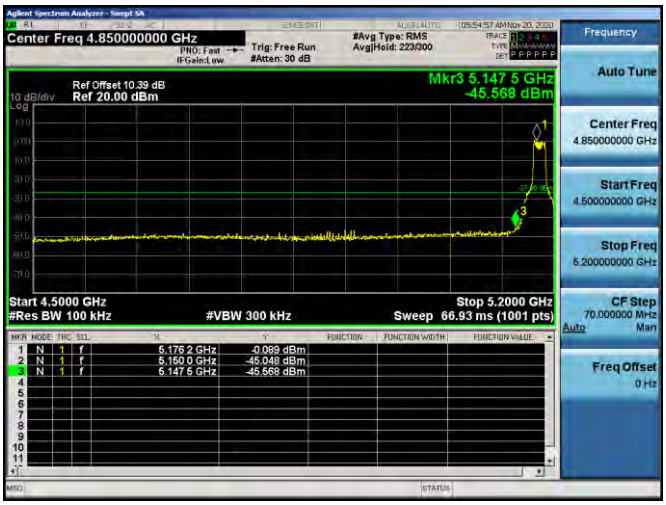
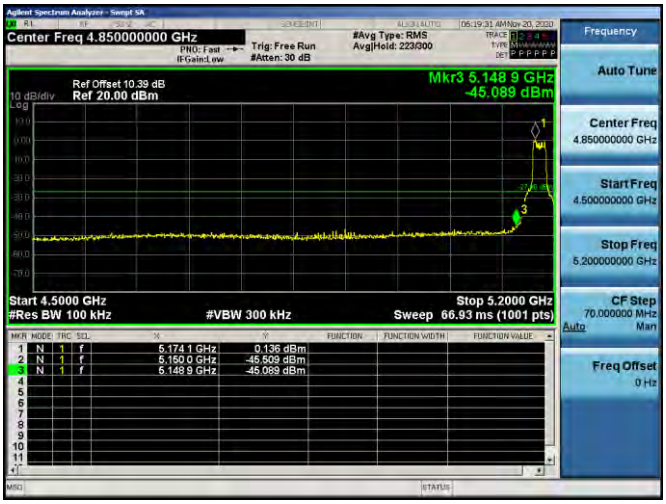
11ac20	
Low channel	Low channel
	
Middle channel	Middle channel
	
High channel	High channel
	

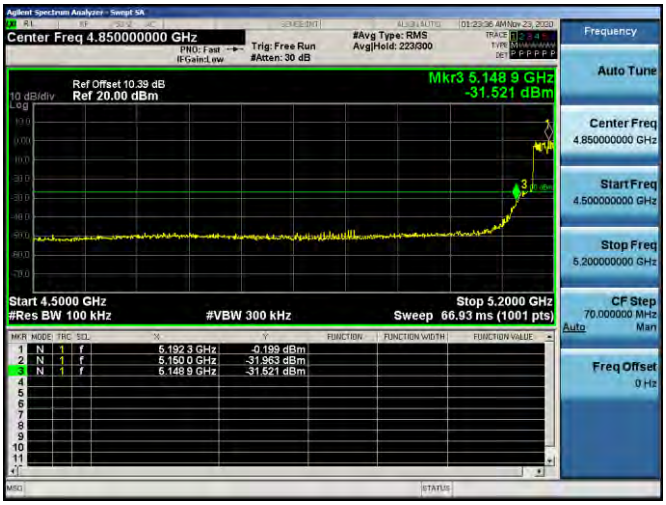
11ac40	
Low channel	Low channel
	
High channel	High channel
	
11ac80	
	

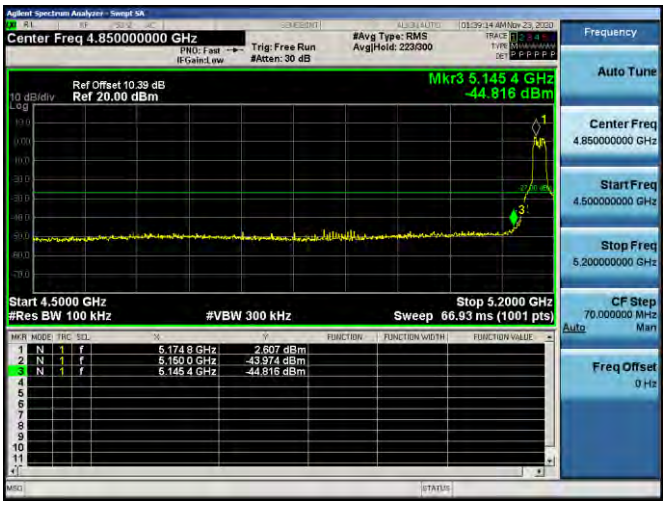
Note: The test result of 27G-40GHz is far below the limit, so it is no need to report.

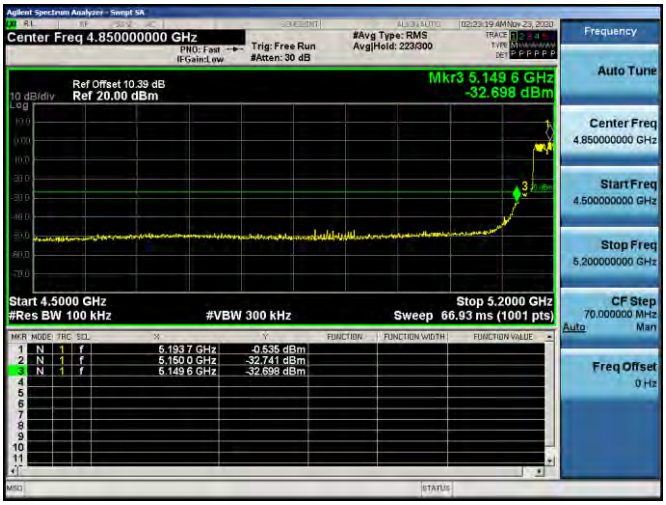
5.7.5 Conduction Band edge

For U-NII-1 test plot

11a	
Band edge-Left	Band edge-Right
	
11n20	
Band edge-Left	Band edge-Right
	

11n40	
Band edge-Left	Band edge-Right
	

11ac20	
Band edge-Left	Band edge-Right
	

11ac40	
Band edge-Left	Band edge-Right
	
11ac80	
Band edge-Left	Band edge-Right
	

Conduction Band edge

For U-NII-3 test plot

11a	
Band edge-Left	Band edge-Right
	
11n20	
Band edge-Left	Band edge-Right
	
11n40	
Band edge-Left	Band edge-Right
	

11ac20	
Band edge-Left	Band edge-Right
	
11ac40	
Band edge-Left	Band edge-Right
	
11ac80	
Band edge-Left	Band edge-Right
	

5.8 Power spectral density

5.8.1 Limit

For the band 5.15-5.25 GHz

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

For the band 5.25-5.35 GHz and 5.47-5.725 GHz

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, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz

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, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.8.2 Test procedure

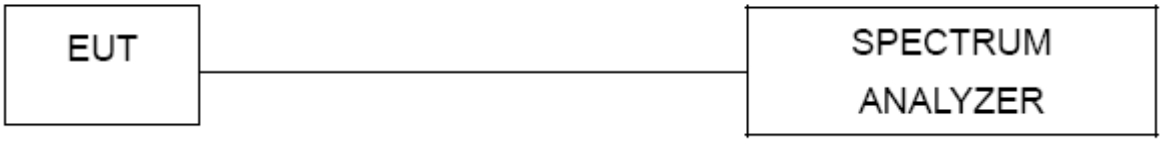
For U-NII-1

1. Set analyzer center frequency to NII channel center frequency.
2. Set the RBW ≥ 1MHz.
3. Set the VBW ≥ 3 x RBW.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the maximum amplitude level.

For U-NII-3

1. Set analyzer center frequency to NII channel center frequency.
2. Set the RBW ≥ 510kHz.
3. Set the VBW ≥ 3 x RBW.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the maximum amplitude level.

5.8.3 Test setup



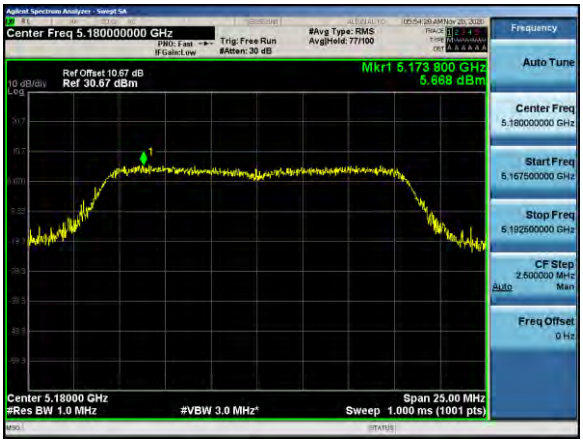
5.8.4 Test results

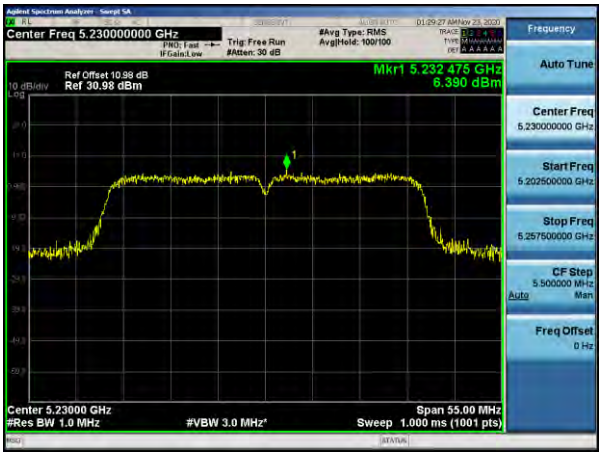
For U-NII-1

Mode	Channel	Frequency(MHz)	Measurement PSD (dBm/MHz)	Limit (dBm/MHz)	Result
11a	CH36	5180	5.668	11	Pass
11a	CH44	5220	3.737	11	Pass
11a	CH48	5240	6.377	11	Pass
11n(HT20)	CH36	5180	5.532	11	Pass
11n(HT20)	CH44	5220	1.068	11	Pass
11n(HT20)	CH48	5240	5.309	11	Pass
11n(HT40)	CH38	5190	6.022	11	Pass
11n(HT40)	CH46	5230	6.390	11	Pass
11ac (VHT20)	CH36	5180	7.881	11	Pass
11ac (VHT20)	CH40	5200	7.398	11	Pass
11ac (VHT20)	CH48	5240	4.834	11	Pass
11ac (VHT40)	CH38	5190	5.863	11	Pass
11ac (VHT40)	CH46	5230	2.773	11	Pass
11ac (VHT80)	CH42	5210	3.681	11	Pass

Test plots

For U-NII-1

11a CH36 5180	11a CH44 5200
	
11a CH48 5240	**11n20 CH36 5180**
	
11n20 CH44 5200	**11n20 CH48 5240**
	

11n40 CH38 5190	11n40 CH46 5230
	
11ac20 CH36 5180	**11ac20 CH40 5200**
	
11ac20 CH48 5240	**11ac40 CH38 5210**
	

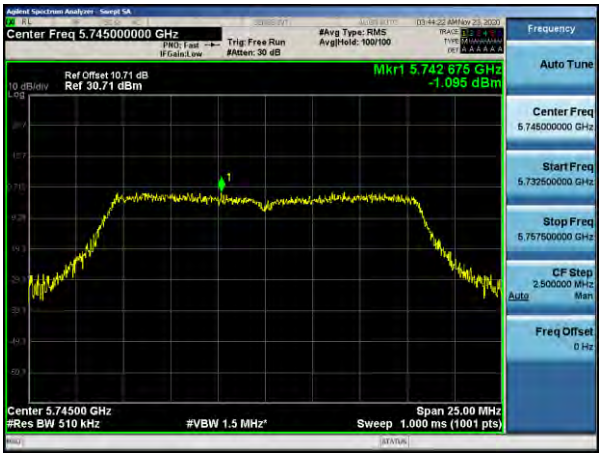
11ac40 CH46 5230	11ac80 CH42 5210
	

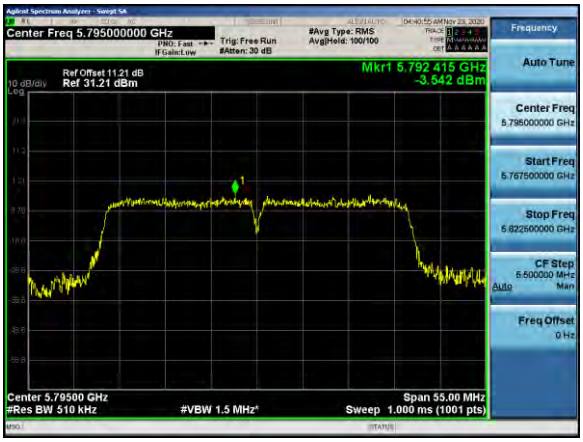
For U-NII-3

Mode	Channel	Frequency(MHz)	PSD (dBm/510kHz)	PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
11a	CH149	5745	-1.095	0.762	30	Pass
11a	CH157	5785	-0.392	0.896	30	Pass
11a	CH165	5825	-2.591	0.540	30	Pass
11n20	CH149	5745	-2.968	0.495	30	Pass
11n20	CH157	5785	1.476	1.377	30	Pass
11n20	CH165	5825	0.100	1.003	30	Pass
11n40	CH151	5755	-4.781	0.326	30	Pass
11n40	CH159	5795	-3.542	0.434	30	Pass
11ac20	CH149	5745	-0.630	0.848	30	Pass
11ac20	CH157	5785	1.848	1.500	30	Pass
11ac20	CH165	5825	0.482	1.095	30	Pass
11ac40	CH151	5755	-3.763	0.412	30	Pass
11ac40	CH159	5795	-2.870	0.506	30	Pass
11ac80	CH155	5775	-3.477	0.440	30	Pass
Note: If the measurement is X dBm/510kHz, thus X dBm/510kHz = $(10^{X/10})$*(500 / 510) dBm/500kHz						

Test plots

For U-NII-3

11a CH149	11a CH157
	
11a CH165	**11n20 CH149**
	
11n20 CH157	**11n20 CH165**
	

11n40 CH151	11n40 CH159
	
11ac20 CH149	**11ac20 CH157**
	
11ac20 CH165	**11ac40 CH151**
	

11ac40 CH159	11ac80 CH155
	

5.9 Frequency Stability Measurement

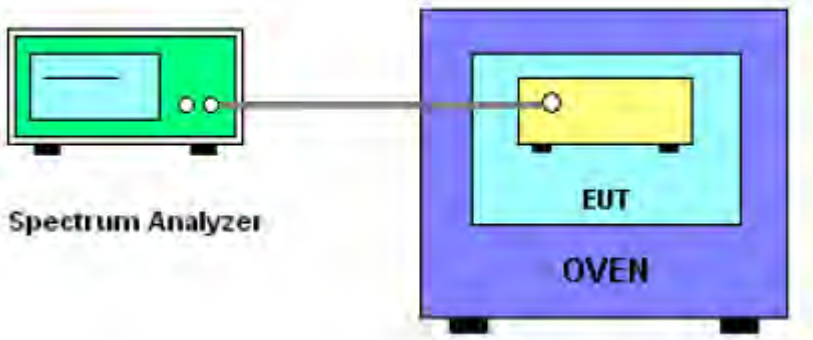
5.9.1 Limit

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

5.9.2 Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and max hold settings.
5. Fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 106 ppm and the limit is less than ±20ppm (IEEE 802.11nspecification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature is -20°C~70°C.

5.9.3 Test Setup Layout



5.9.4 EUT Operation during Test

The EUT was programmed to be in continuously un-modulation transmitting mode.

5.9.5 TEST RESULTS

For U-NII-1

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12.00	5180.0141	5180	0.0141	-2.7220
		V max (V)	13.80	5180.0197	5180	0.0197	-3.7988
		V min (V)	10.20	5180.0113	5180	0.0113	-2.1815
Limits				within 5150-5250MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	12	T (°C)	-20	5180.0136	5180	0.0136	-2.6274
		T (°C)	-10	5180.0102	5180	0.0102	-1.9691
		T (°C)	0	5180.0126	5180	0.0126	-2.4324
		T (°C)	10	5180.0132	5180	0.0132	-2.5483
		T (°C)	20	5180.0123	5180	0.0123	-2.3745
		T (°C)	30	5180.0134	5180	0.0134	-2.5869
		T (°C)	40	5180.0110	5180	0.0110	-2.1236
		T (°C)	50	5180.0123	5180	0.0123	-2.3745
		T (°C)	60	5180.0141	5180	0.0141	-2.7220
		T (°C)	70	5180.0143	5180	0.0143	-2.7606
Limits				within 5150-5250MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12.00	5200.0122	5200	0.0122	-2.3462
		V max (V)	13.80	5200.0118	5200	0.0118	-2.2692
		V min (V)	10.20	5200.0135	5200	0.0135	-2.5962
Limits				within 5150-5250MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	12	T (°C)	-20	5200.0191	5200	0.0191	-3.6731
		T (°C)	-10	5200.0134	5200	0.0134	-2.5769
		T (°C)	0	5200.0124	5200	0.0124	-2.3846
		T (°C)	10	5200.0113	5200	0.0113	-2.1731
		T (°C)	20	5200.0121	5200	0.0121	-2.3269
		T (°C)	30	5200.0132	5200	0.0132	-2.5385
		T (°C)	40	5200.0110	5200	0.0110	-2.1154
		T (°C)	50	5200.0111	5200	0.0111	-2.1346
		T (°C)	60	5200.0119	5200	0.0119	-2.2885
		T (°C)	70	5200.0129	5200	0.0129	-2.4808
Limits				within 5150-5250MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12.00	5240.0153	5240	0.0153	-2.9198
		V max (V)	13.80	5240.0188	5240	0.0188	-3.5878
		V min (V)	10.20	5240.0145	5240	0.0144	-2.7576
Limits				within 5150-5250MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	12	T (°C)	-20	5240.0233	5240	0.0233	-4.4466
		T (°C)	-10	5240.0123	5240	0.0123	-2.3473
		T (°C)	0	5240.0138	5240	0.0138	-2.6336
		T (°C)	10	5240.0163	5240	0.0163	-3.1107
		T (°C)	20	5240.0140	5240	0.0140	-2.6718
		T (°C)	30	5240.0130	5240	0.0130	-2.4809
		T (°C)	40	5240.0120	5240	0.0120	-2.2901
		T (°C)	50	5240.0118	5240	0.0118	-2.2519
		T (°C)	60	5240.0111	5240	0.0111	-2.1183
		T (°C)	70	5240.0120	5240	0.0120	-2.2901
Limits				within 5150-5250MHz			
Result				Complies			

For U-NII-3
Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (° C)	20	V nom (V)	12.00	5745.00830	5745	0.00830	-1.4447
		V max (V)	13.80	5745.00894	5745	0.00894	-1.5570
		V min (V)	10.20	5745.00753	5745	0.00753	-1.3101
Limits				within 5725-5850MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	12	T (°C)	-20	5745.00468	5745	0.00468	-0.8147
		T (°C)	-10	5745.00824	5745	0.00824	-1.4344
		T (°C)	0	5745.00986	5745	0.00986	-1.7163
		T (°C)	10	5745.01068	5745	0.01068	-1.8586
		T (°C)	20	5745.01349	5745	0.01349	-2.3483
		T (°C)	30	5745.00076	5745	0.00076	-0.1331
		T (°C)	40	5745.00762	5745	0.00762	-1.3263
		T (°C)	50	5745.00115	5745	0.00115	-0.2007
		T (°C)	60	5745.00360	5745	0.00360	-0.6261
		T (°C)	70	5745.00831	5745	0.00831	-1.4461
Limits				within 5725-5850MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12.00	5785.00830	5785	0.00830	-1.4342
		V max (V)	13.80	5785.01337	5785	0.01337	-2.3105
		V min (V)	10.20	5785.01053	5785	0.01053	-1.8200
Limits				within 5725-5850MHz			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	12	T (°C)	-20	5785.00845	5785	0.00845	-1.4607
		T (°C)	-10	5785.00426	5785	0.00426	-0.7356
		T (°C)	0	5785.00780	5785	0.00780	-1.3491
		T (°C)	10	5785.00026	5785	0.00026	-0.0447
		T (°C)	20	5785.01241	5785	0.01241	-2.1454
		T (°C)	30	5785.00649	5785	0.00649	-1.1223
		T (°C)	40	5785.01069	5785	0.01069	-1.8471
		T (°C)	50	5785.01303	5785	0.01303	-2.2523
		T (°C)	60	5785.00954	5785	0.00954	-1.6487
		T (°C)	70	5785.00769	5785	0.00769	-1.3288
Limits				within 5725-5850MHz			
Result				Complies			

Voltage vs. Frequency Stability

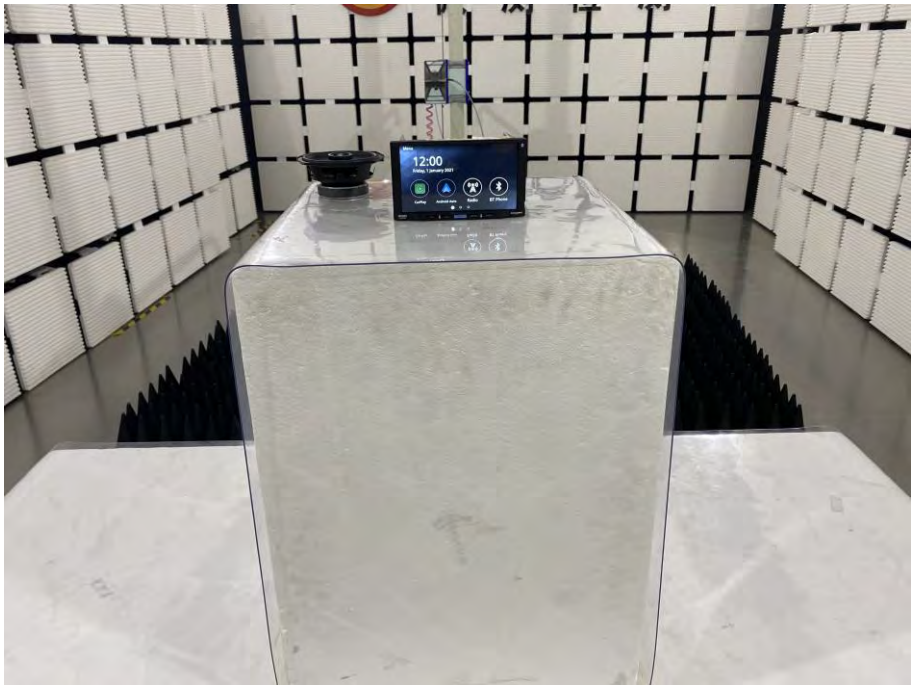
TEST CONDITIONS				Reference Frequency：5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12.00	5825.00015	5825	0.00015	-0.0260
		V max (V)	13.80	5825.00220	5825	0.00220	-0.3771
		V min (V)	10.20	5825.00763	5825	0.00763	-1.3103
Limits				within 5725-5850MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	12	T (°C)	-20	5825.01005	5825	0.01005	-1.7258
		T (°C)	-10	5825.00674	5825	0.00674	-1.1566
		T (°C)	0	5825.00251	5825	0.00251	-0.4310
		T (°C)	10	5825.01088	5825	0.01088	-1.8685
		T (°C)	20	5825.01008	5825	0.01008	-1.7310
		T (°C)	30	5825.00698	5825	0.00698	-1.1983
		T (°C)	40	5825.00689	5825	0.00689	-1.1826
		T (°C)	50	5825.00431	5825	0.00431	-0.7399
		T (°C)	60	5825.00810	5825	0.00810	-1.3908
		T (°C)	70	5825.00247	5825	0.00247	-0.4232
Limits				within 5725-5850MHz			
Result				Complies			

Photographs of the Test Setup

Radiated emission



Photographs of the EUT

See the APPENDIX 1: EUT PHOTO in the report No.: MTi20101905-2E1-1.

----END OF REPORT----