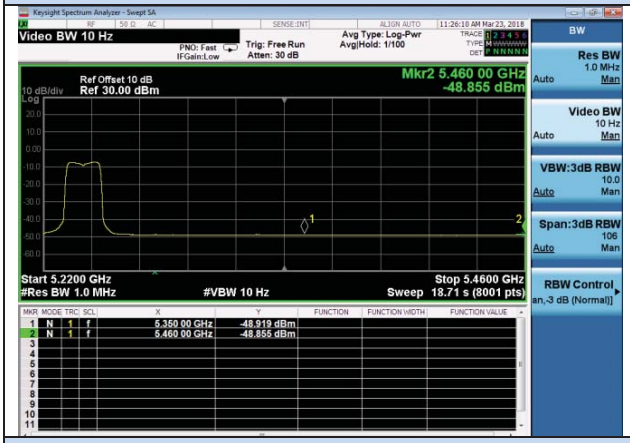
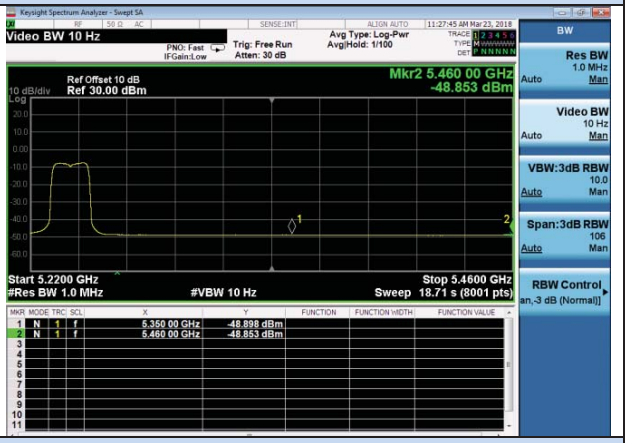
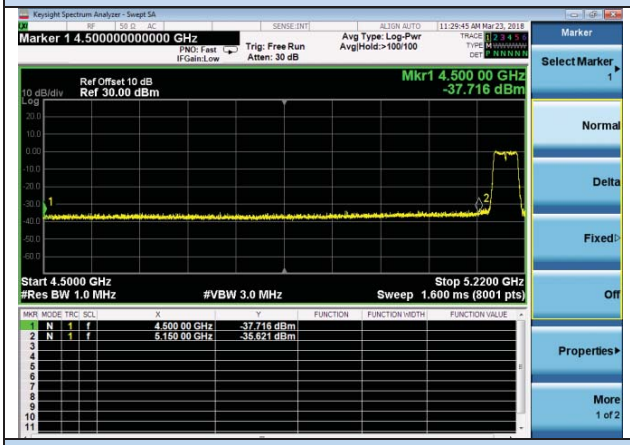
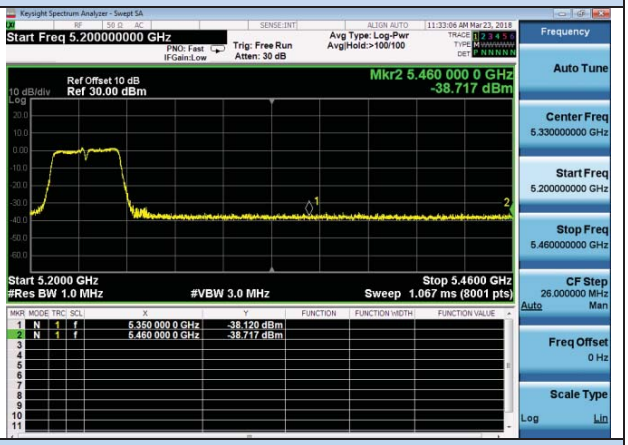
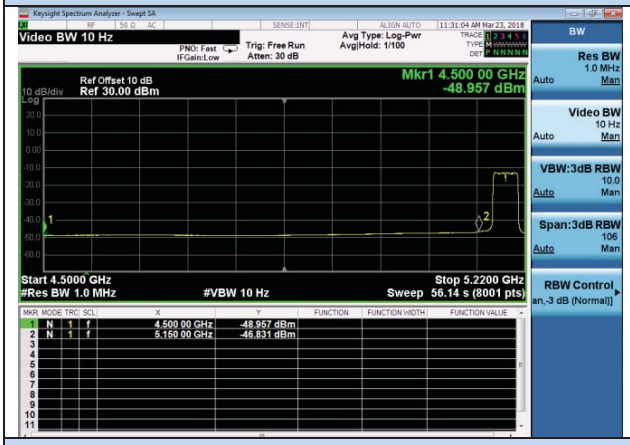
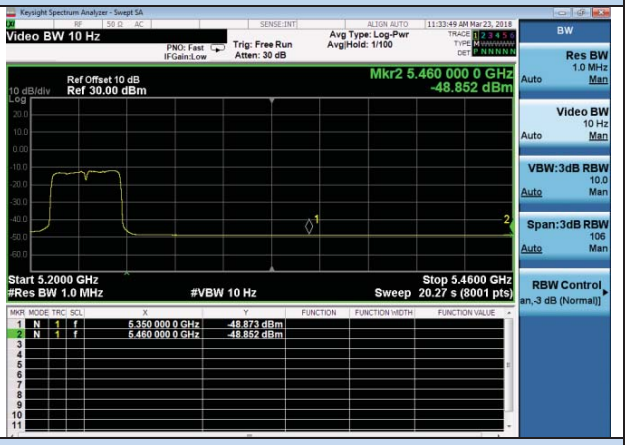
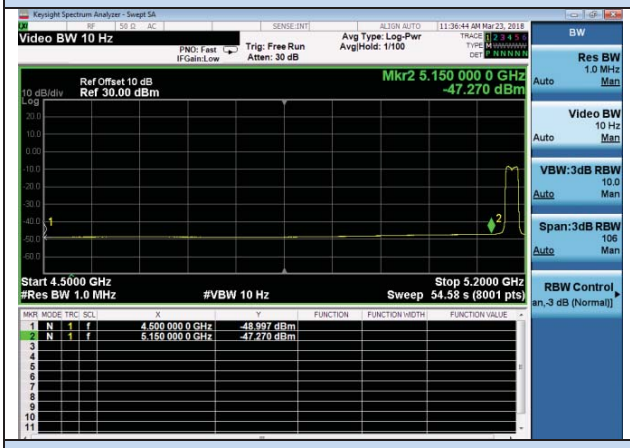
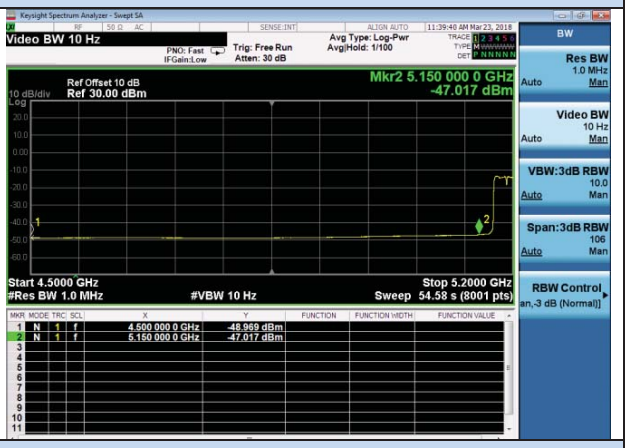
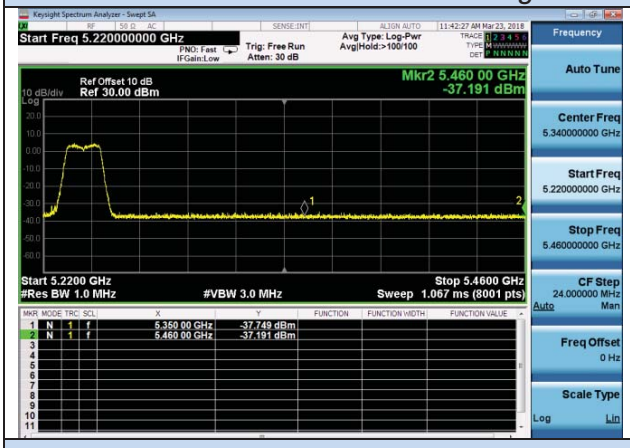
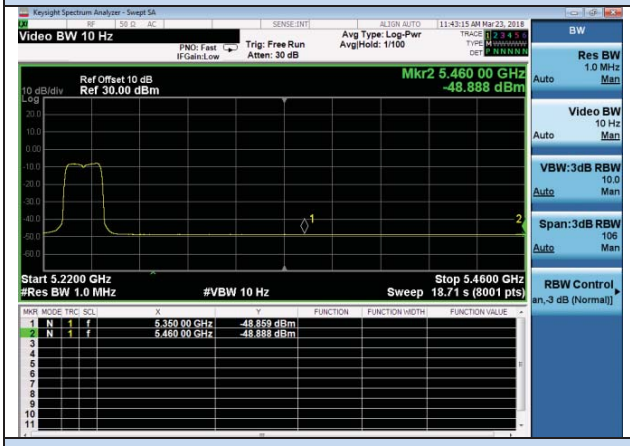
Undesirable emission	
IEEE 802.11a	IEEE 802.11n HT20
	
Channel 48 / 5240 MHz – Average	Channel 48 / 5240 MHz – Average
IEEE 802.11n HT40	IEEE 802.11n HT40
	
Channel 38 / 5190 MHz – Peak	Channel 46 / 5230 MHz – Peak
	
Channel 38 / 5190 MHz – Average	Channel 46 / 5230 MHz – Average

Undesirable emission

IEEE 802.11ac VHT20	IEEE 802.11ac VHT40
	
Channel 36 / 5180 MHz – Peak	Channel 38 / 5190 MHz – Peak
	
Channel 36 / 5180 MHz – Average	Channel 38 / 5190 MHz – Average
	
Channel 48 / 5240 MHz – Peak	Channel 46 / 5230 MHz – Peak

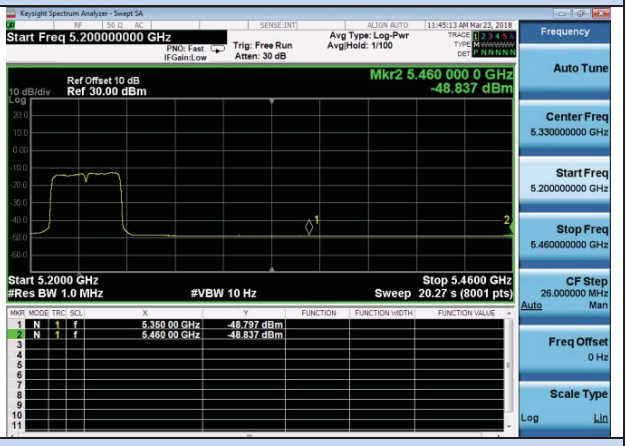
Undesirable emission

IEEE 802.11ac VHT20



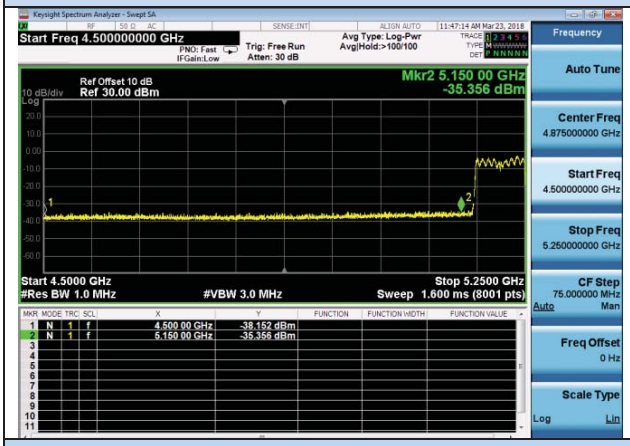
Channel 48 / 5240 MHz – Average

IEEE 802.11ac VHT40



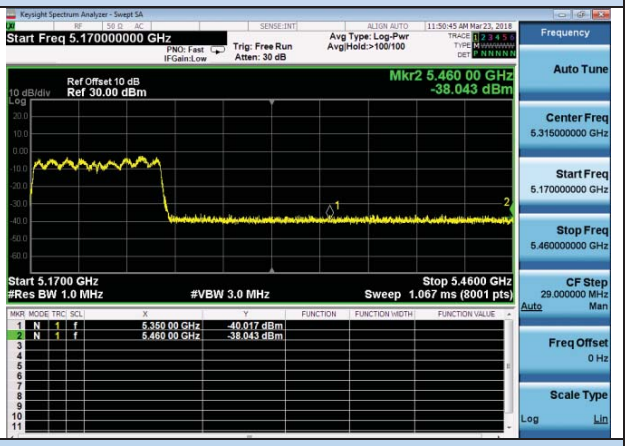
Channel 46 / 5230 MHz – Average

IEEE 802.11ac VHT80



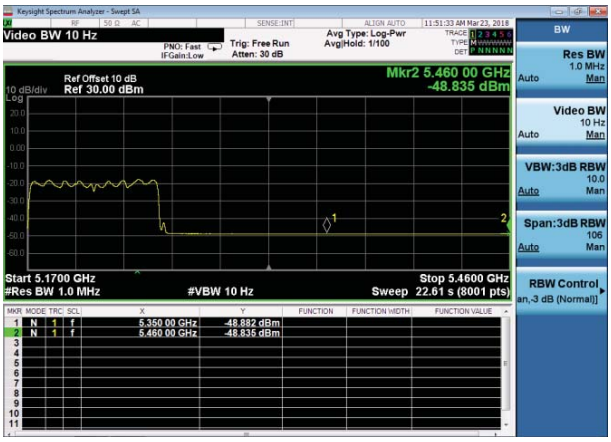
Channel 42 / 5210 MHz – Peak(left)

IEEE 802.11ac VHT80



Channel 46 / 5230 MHz – Peak(right)

Channel 42 / 5210 MHz – Average(left)



Channel 46 / 5230 MHz – Average(right)

5.8.4.2 UNII Band 3

IEEE 802.11a							
Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	EIRP (dBm/1MHz)	Detector	Limit (dBm/1MHz)	Over limit (dB)	Verdict
5686.100	-53.310	2.00	-51.310	Peak	-0.286	-51.024	PASS
5723.500	-46.164	2.00	-44.164	Peak	23.58	-67.744	PASS
5725.000	-52.310	2.00	-50.31	Peak	27.00	-77.31	PASS
5850.000	-55.711	2.00	-53.711	Peak	27.00	-80.711	PASS
5850.500	-53.475	2.00	-51.475	Peak	25.86	-77.335	PASS
5860.700	-54.868	2.00	-52.868	Peak	14.00	-66.868	PASS

IEEE 802.11n HT20							
Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	EIRP (dBm/1MHz)	Detector	Limit (dBm/1MHz)	Over limit (dB)	Verdict
5714.000	-53.207	2.00	-51.207	Peak	13.92	-65.127	PASS
5722.800	-44.771	2.00	-42.771	Peak	21.98	-64.751	PASS
5725.000	-49.237	2.00	-47.237	Peak	27.00	-74.237	PASS
5850.000	-56.476	2.00	-54.476	Peak	27.00	-81.476	PASS
5858.300	-55.100	2.00	-53.100	Peak	14.68	-67.780	PASS
5891.600	-54.705	2.00	-52.705	Peak	-2.28	-50.425	PASS

IEEE 802.11n HT40							
Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	EIRP (dBm/1MHz)	Detector	Limit (dBm/1MHz)	Over limit (dB)	Verdict
5714.500	-53.518	2.00	-51.518	Peak	14.06	-65.578	PASS
5724.100	-51.792	2.00	-49.792	Peak	24.95	-74.742	PASS
5725.000	-53.329	2.00	-51.329	Peak	27.00	-78.329	PASS
5850.000	-56.722	2.00	-54.722	Peak	27.00	-81.722	PASS
5853.500	-54.763	2.00	-52.763	Peak	19.02	-71.783	PASS
5898.200	-54.863	2.00	-52.863	Peak	-7.17	-45.693	PASS

IEEE 802.11ac VHT20							
Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	EIRP (dBm/1MHz)	Detector	Limit (dBm/1MHz)	Over limit (dB)	Verdict
5697.700	-54.587	2.00	-52.587	Peak	8.29	-60.877	PASS
5724.300	-53.760	2.00	-51.760	Peak	25.40	-77.160	PASS
5725.000	-55.428	2.00	-53.428	Peak	27.00	-80.428	PASS
5850.000	-56.740	2.00	-54.740	Peak	27.00	-81.740	PASS
5858.200	-54.694	2.00	-52.694	Peak	19.70	-72.394	PASS
5862.300	-53.342	2.00	-51.342	Peak	13.56	-64.902	PASS

IEEE 802.11ac VHT40							
Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	EIRP (dBm/1MHz)	Detector	Limit (dBm/1MHz)	Over limit (dB)	Verdict
5714.900	-52.012	2.00	-50.012	Peak	14.17	-64.182	PASS
5719.700	-52.071	2.00	-50.071	Peak	15.52	-65.587	PASS
5725.000	-55.526	2.00	-53.526	Peak	27.00	-80.526	PASS
5850.000	-57.747	2.00	-55.747	Peak	27.00	-82.747	PASS
5856.700	-55.425	2.00	-53.425	Peak	15.12	--68.545	PASS
5882.900	-54.551	2.00	-52.551	Peak	4.15	-56.701	PASS

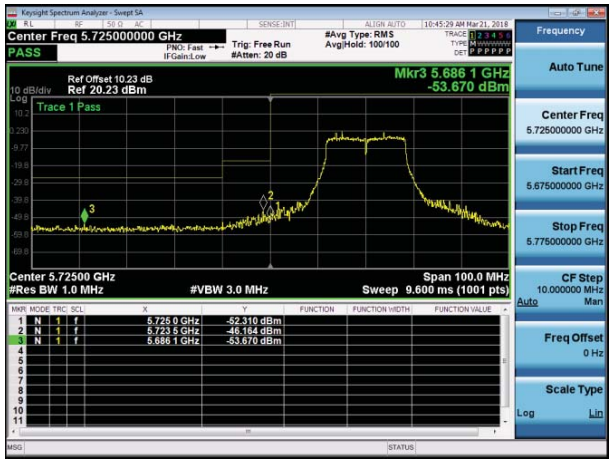
IEEE 802.11ac VHT80							
Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	EIRP (dBm/1MHz)	Detector	Limit (dBm/1MHz)	Over limit (dB)	Verdict
5714.900	-52.519	2.00	-50.519	Peak	14.17	-64.689	PASS
5719.700	-52.072	2.00	-50.072	Peak	15.52	-65.588	PASS
5725.000	-55.019	2.00	-53.019	Peak	27.00	-80.019	PASS
5850.000	-55.437	2.00	-53.437	Peak	27.00	-80.437	PASS
5851.900	-52.967	2.00	-50.967	Peak	22.67	-73.637	PASS
5867.200	-54.061	2.00	-52.061	Peak	12.18	-64.241	PASS

Remark:

1. *Measured unwanted emission at difference data rate for each mode and recorded worst case for each mode.*
2. *Test results including cable loss;*
3. *Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40, IEEE 802.11ac VHT20, IEEE 802.11ac VHT40, IEEE 802.11ac VHT80;*
4. *EIRP = Conducted power + Directional Gain*
5. *EIRP calculation. A value representative of an upper bound on out-of-band antenna gain (in dBi) shall be added to the measured antenna-port conducted emission power to compute EIRP within the specified measurement bandwidth. (For emissions in the restricted bands, additional calculations are required to convert EIRP to field strength at the specified distance.) The upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands or 2 dBi, whichever is greater.3 However, for devices that operate in multiple bands using the same transmit antenna, the highest gain of the antenna within the operating band nearest to the out-of-band frequency being measured may be used in lieu of the overall highest gain when measuring emissions at frequencies within 20% of the absolute frequency at the nearest edge of that band, but in no case shall a value less than 2 dBi be selected.*
6. *Over limit = EIRP - Limit*
7. *Please refer to following test plots;*

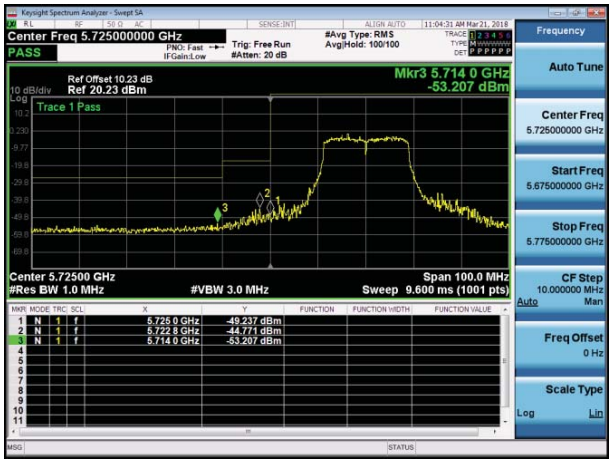
Unwanted emission

IEEE 802.11a

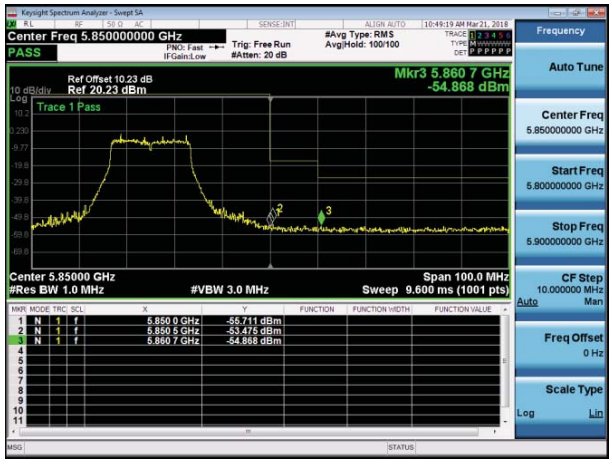


Channel 149 / 5745 MHz – Peak

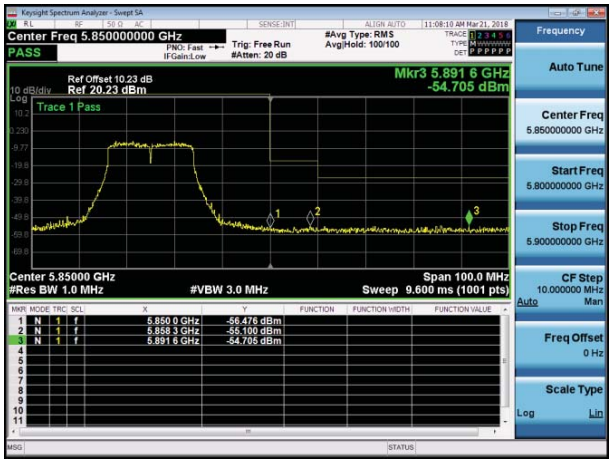
IEEE 802.11n HT20



Channel 149 / 5745 MHz – Peak

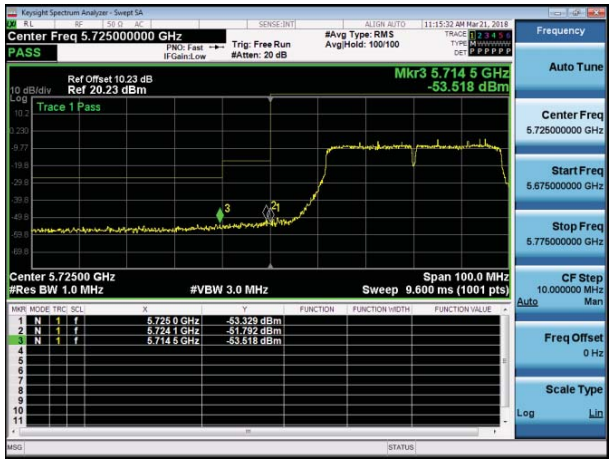


Channel 165 / 5825 MHz – Peak



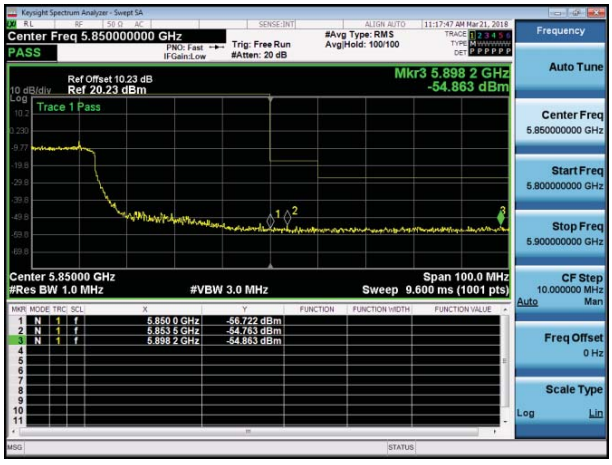
Channel 165 / 5825 MHz – Peak

IEEE 802.11n HT40



Channel 151 / 5755 MHz – Peak

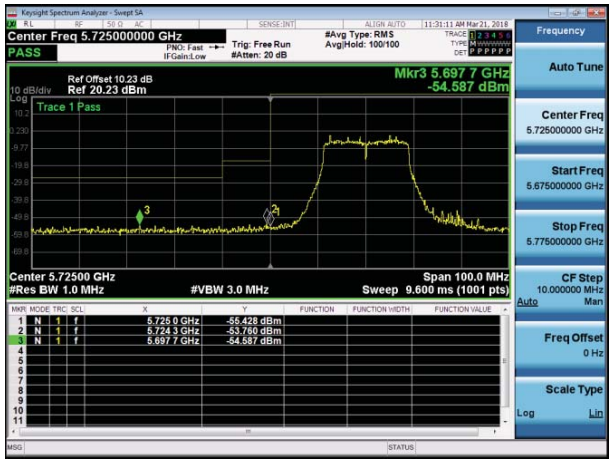
IEEE 802.11n HT40



Channel 159 / 5795 MHz – Peak

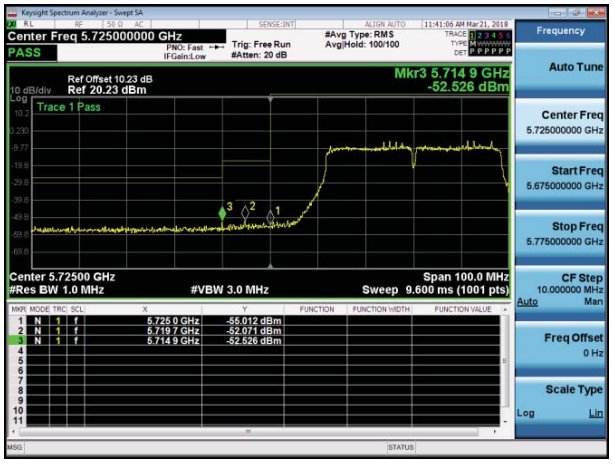
Unwanted emission

IEEE 802.11ac VHT20

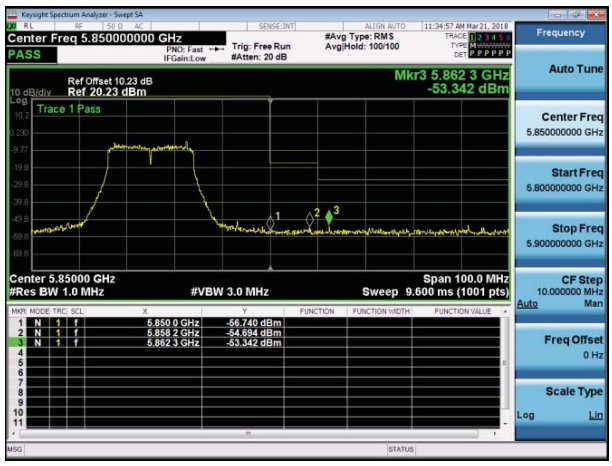


Channel 149 / 5745 MHz – Peak

IEEE 802.11ac VHT40



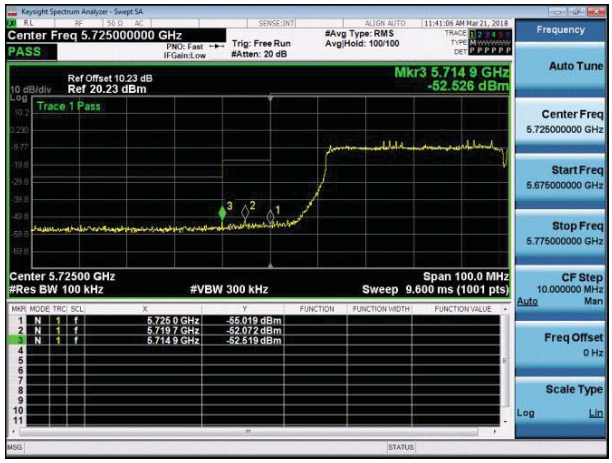
Channel 151 / 5755 MHz – Peak



Channel 165 / 5825 MHz – Peak

Channel 159 / 5795 MHz – Peak

IEEE 802.11ac VHT80



Channel 155 / 5775 MHz – Peak(left)

IEEE 802.11ac VHT80

Channel 155 / 5775 MHz – Peak(right)

5.9. Antenna Requirements

5.9.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, 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

And according to FCC 47 CFR Section 15.407 (a), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

5.9.2 Antenna Connected Construction

5.9.2.1. Standard Applicable

According to § 15.203 & RSS-Gen, 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.

5.9.2.2. Antenna Connector Construction

The directional gains of antenna used for transmitting is 0dBi, and the antenna is a PIFA antenna connect to PCB board and no consideration of replacement. Please see EUT photo for details.

The WLAN and BT share same modular and same antenna;

5.9.2.3. Results: Compliance.

Measurement

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module.
Conducted power refers ANSI C63.10:2013 Output power test procedure for NII devices.
Radiated power refers to ANSI C63.10:2013 Radiated emissions tests.

Measurement parameters

Measurement parameter	
Detector:	Peak
Sweep Time:	Auto
Resolution bandwidth:	1MHz
Video bandwidth:	3MHz
Trace-Mode:	Max hold

Limits

FCC	ISED
Antenna Gain	
6 dBi	

Note: The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module. For WLAN devices, the OFDM (IEEE 802.11a) mode is used;

T_{nom}	V_{nom}	Lowest Channel 5180 MHz	Middle Channel 5200 MHz	Highest Channel 5240 MHz
Conducted power [dBm] Measured with OFDM modulation		13.69	13.25	13.17
Radiated power [dBm] Measured with OFDM modulation		15.404	14.991	14.936
Gain [dBi] Calculated		1.714	1.741	1.766
Measurement uncertainty			± 1.6 dB (cond.) / ± 3.8 dB (rad.)	

T_{nom}	V_{nom}	Lowest Channel 5745 MHz	Middle Channel 5785 MHz	Highest Channel 5825 MHz
Conducted power [dBm] Measured with OFDM modulation		14.60	14.56	13.92
Radiated power [dBm] Measured with OFDM modulation		16.402	16.314	15.707
Gain [dBi] Calculated		1.802	1.754	1.787
Measurement uncertainty			± 1.6 dB (cond.) / ± 3.8 dB (rad.)	

6. TEST SETUP PHOTOGRAPHS OF EUT

Please refer to separate file for test setup photos.

7. EXTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separate file for exterior photos of eut.

8. INTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separate file for interior photos of eut.

----------THE END OF REPORT----------