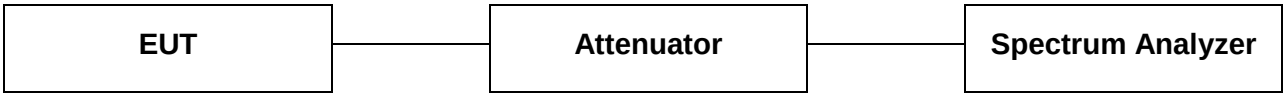
6. Peak Power Spectral Density

6.1. Test Setup



6.2. Limit

6.2.1. FCC

According to 15.407(a)(1)(iv)

For client devices in the 5.15-5.25 ㎓ band, the maximum conducted output power over the frequency band of operation shall not exceed 250 ㎽ provided the maximum antenna gain does not exceed 6 ㏈ i. In addition, the maximum power spectral density shall not exceed 11 ㏈ m in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

According to 15.407(a)(3)

For the band 5.725-5.85 ㎓, 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 ㏈m in any 500-㎑ band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i. However, fixed point-to point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 ㏈ i without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

6.2.2. IC

According to RSS-247 Issue 2,

6.2.1.1 Frequency band 5 150-5 250 ㎒

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 ㎽ or 1.76 + 10 $\log_{10}$B, ㏈ m, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 ㏈ below the maximum permitted e.i.r.p. of 30 ㎽.

For other devices, the maximum e.i.r.p. shall not exceed 200 ㎽ or 10 + 10 $\log_{10}$B, ㏈m, whichever power is less. B is the 99 % emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 ㏈m in any 1.0 ㎒ band.

6.2.4.1 Frequency band 5 725-5 850 ㎒

For equipment operating in the band 5 725-5 850 ㎒, the minimum 6 ㏈ bandwidth shall be at least 500 ㎑. The maximum conducted output power shall not exceed 1 W. The output power spectral density shall not exceed 30 ㏈m in any 500 ㎑ band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the output power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 ㏈i without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipoint[3] systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

6.3. Test Procedure

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.

1. This measurement settings are specified in section F of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

2. Create an average power spectrum for the EUT operating mode being tested by following the instructions in section II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, “Compute power…”. (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)

3. Use the peak search function on the instrument to find the peak of the spectrum and record its value.

4. Make the following adjustments to the peak value of the spectrum, if applicable:

   a) **If Method SA-2 or SA-2 Alternative was used, add 10 log(1/x), where x is the duty cycle, to the peak of the spectrum.**
   b) If Method SA-3 Alternative was used and the linear mode was used in step II.E.2.g)(viii), add 1 ㏈ to the final result to compensate for the difference between linear averaging and power averaging.

5. The result is the Maximum PSD over 1 ㎒ reference bandwidth.

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

   a) Set RBW ≥ 1/*T*, where *T* is defined in section II.B.1.a).
   b) Set VBW ≥ 3 RBW.
   c) If measurement bandwidth of Maximum PSD is specified in 500 ㎑, add 10log(500 ㎑/RBW) to the measured result, whereas RBW (< 500 ㎑) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
   d) If measurement bandwidth of Maximum PSD is specified in 1 ㎒, add 10log(1 ㎒/RBW) to the measured result, whereas RBW (< 1 ㎒) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
   e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

7. TDF function

- Attenuator and cable offset was compensated before measuring.

6.4. Test result

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

Test mode: 11a_ANT1

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	Measured PPSD (㏈m)	Duty Cycle Correction Factor (㏈)	Final PPSD (㏈m)	Limit (㏈m/1 ㎒)
U-NII 1	5 180	36	6	0.23	0.29	0.52	11
	5 220	44		-0.10		0.19	
	5 240	48		0.04		0.33	
Band	**Frequency (㎒)**	**Ch.**	**Data Rate (Mbps)**	**Measured PPSD (㏈m)**	**Duty Cycle Correction Factor (㏈)**	**Final PPSD (㏈m)**	**Limit (㏈m/500 ㎑)**
U-NII 3	5 745	149	6	-2.46	0.29	-2.17	30
	5 785	157		-2.22		-1.93	
	5 825	165		-2.51		-2.22	

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	Final PPSD (㏈m)	Antenna Gain (㏈i)	E.I.R.P. PPSD (㏈m)	IC Limit (㏈m/1 ㎒)
U-NII 1	5 180	36	6	0.52	2.54	3.06	10
	5 220	44		0.19		2.73	
	5 240	48		0.33		2.87	

Test mode: 11a_ANT2

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	Measured PPSD (㏈m)	Duty Cycle Correction Factor (㏈)	Final PPSD (㏈m)	Limit (㏈m/1 ㎒)
U-NII 1	5 180	36	6	-1.74	0.29	-1.45	11
	5 220	44		-1.91		-1.62	
	5 240	48		-1.56		-1.27	
Band	**Frequency (㎒)**	**Ch.**	**Data Rate (Mbps)**	**Measured PPSD (㏈m)**	**Duty Cycle Correction Factor (㏈)**	**Final PPSD (㏈m)**	**Limit (㏈m/500 ㎑)**
U-NII 3	5 745	149	6	-1.79	0.29	-1.50	30
	5 785	157		-1.75		-1.46	
	5 825	165		-2.01		-1.72	

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	Final PPSD (㏈m)	Antenna Gain (㏈i)	E.I.R.P. PPSD (㏈m)	IC Limit (㏈m/1 ㎒)
U-NII 1	5 180	36	6	-1.45	2.84	1.39	10
	5 220	44		-1.62		1.22	
	5 240	48		-1.27		1.57	

Test mode: 11n_HT20

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	ANT 1 Measured PPSD (㏈ m)	ANT 2 Measured PPSD (㏈ m)	ANT 1+ANT 2 PPSD (㏈ m)
U-NII 1	5 180	36	MCS8	-8.60	-8.10	-5.33
	5 220	44		-5.63	-8.35	-3.77
	5 240	48		-5.80	-8.18	-3.82
U-NII 3	5 745	149		-7.51	-8.26	-4.86
	5 785	157		-7.42	-7.82	-4.61
	5 825	165		-7.85	-8.10	-4.96

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	ANT 1+ANT 2 PPSD (㏈ m)	Duty Cycle Correction Factor (㏈)	ANT 1+ANT 2 Final PPSD (㏈ m)	Limit (㏈ m/1 ㎒)
U-NII 1	5 180	36	MCS8	-5.33	0.59	-4.74	11
	5 220	44		-3.77		-3.18	
	5 240	48		-3.82		-3.23	
Band	**Frequency (㎒)**	**Ch.**	**Data Rate (Mbps)**	**ANT 1+ANT 2 PPSD (㏈ m)**	**Duty Cycle Correction Factor (㏈)**	**ANT 1+ANT 2 Final PPSD (㏈ m)**	**Limit (㏈ m/500 ㎑)**
U-NII 3	5 745	149	MCS8	-4.86	0.59	-4.27	30
	5 785	157		-4.61		-4.02	
	5 825	165		-4.96		-4.37	

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	ANT 1+ANT 2 Final PPSD (㏈ m)	Antenna Gain (㏈ i)	ANT 1+ANT 2 E.I.R.P. PPSD (㏈ m)	IC Limit (㏈ m/1 ㎒)
U-NII 1	5 180	36	MCS8	-4.74	5.70	0.96	10
	5 220	44		-3.18		2.52	
	5 240	48		-3.23		2.47	

Test mode: 11n_HT40

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	ANT 1 Measured PPSD (㏈m)	ANT 2 Measured PPSD (㏈m)	ANT 1+ANT 2 PPSD (㏈m)
U-NII 1	5 190	38	MCS8	-9.31	-13.07	-7.78
	5 230	46		-8.97	-13.11	-7.55
U-NII 3	5 755	151		-11.53	-12.04	-8.77
	5 795	159		-12.00	-11.76	-8.87

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	ANT 1+ANT 2 PPSD (㏈m)	Duty Cycle Correction Factor (㏈)	ANT 1+ANT 2 Final PPSD (㏈m)	Limit (㏈m/1 ㎒)
U-NII 1	5 190	38	MCS8	-7.78	1.08	-6.70	11
	5 230	46		-7.55		-6.47	
Band	**Frequency (㎒)**	**Ch.**	**Data Rate (Mbps)**	**ANT 1+ANT 2 PPSD (㏈m)**	**Duty Cycle Correction Factor (㏈)**	**ANT 1+ANT 2 Final PPSD (㏈m)**	**Limit (㏈m/500 ㎑)**
U-NII 3	5 755	151	MCS8	-8.77	1.08	-7.69	30
	5 795	159		-8.87		-7.79	

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	ANT 1+ANT 2 Final PPSD (㏈m)	Antenna Gain (㏈i)	ANT 1+ANT 2 E.I.R.P. PPSD (㏈m)	IC Limit (㏈m/1 ㎒)
U-NII 1	5 190	38	MCS8	-6.70	5.70	-1.00	10
	5 230	46		-6.47		-0.77	

Test mode: 11ac_VHT80

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	ANT 1 Measured PPSD (㏈m)	ANT 2 Measured PPSD (㏈m)	ANT 1+ANT 2 PPSD (㏈m)
U-NII 1	5 210	42	MCS0	-13.19	-12.82	-9.99
U-NII 3	5 775	155		-15.27	-15.27	-12.26

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	ANT 1+ANT 2 PPSD (㏈m)	Duty Cycle Correction Factor (㏈)	ANT 1+ANT 2 Final PPSD (㏈m)	Limit (㏈m/1 ㎒)
U-NII 1	5 210	42	MCS0	-9.99	1.84	-8.15	11
Band	**Frequency (㎒)**	**Ch.**	**Data Rate (Mbps)**	**ANT 1+ANT 2 PPSD (㏈m)**	**Duty Cycle Correction Factor (㏈)**	**ANT 1+ANT 2 Final PPSD (㏈m)**	**Limit (㏈m/500 ㎑)**
U-NII 3	5 775	155	MCS0	-12.26	1.84	-10.42	30

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	ANT 1+ANT 2 Final PPSD (㏈m)	Antenna Gain (㏈i)	ANT 1+ANT 2 E.I.R.P. PPSD (㏈m)	IC Limit (㏈m/1 ㎒)
U-NII 1	5 210	42	MCS0	-8.15	5.70	-2.45	10

Remark;

According to KDB 662911 D01 v02r01, power spectral density of each port (ANT 1+ANT 2) was combined by using below calculation.

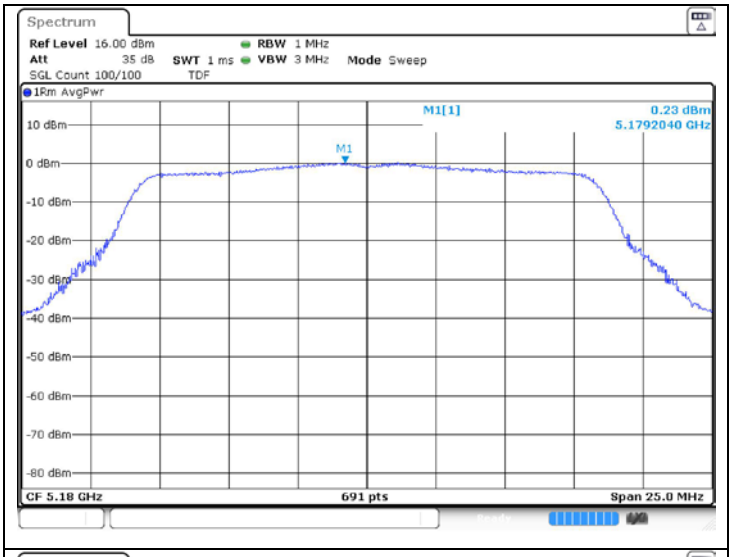
PPSD: 10 log {10^(ANT 1 PSD / 10)+10^(ANT 2 PSD / 10)}
Antenna Gain: 10 log [{10^(ANT 1 gain / 20)+10^(ANT 2 gain / 20)}^2 / 2]

Final PPSD (㏈m) = PPSD (㏈m) + Duty Correction Correction Factor (㏈)

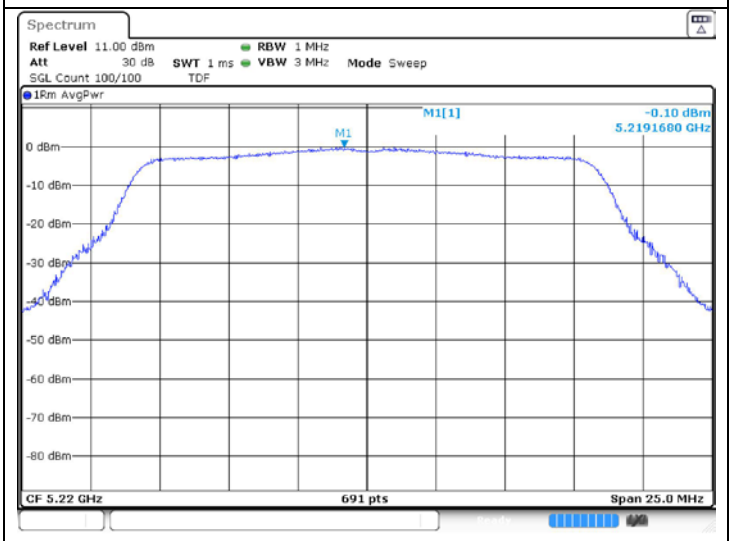
- Test plots

OFDM: 802.11a (Band 1)_ANT 1

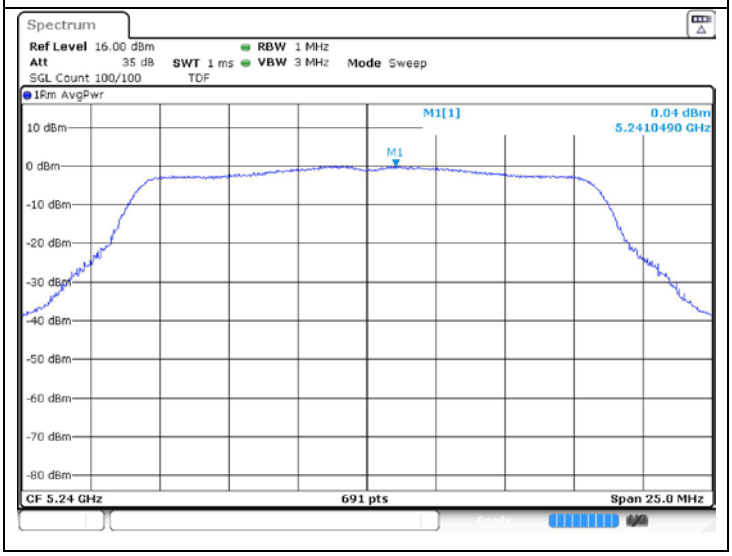
Low Channel
(5 180 ㎒)



Middle Channel
(5 220 ㎒)

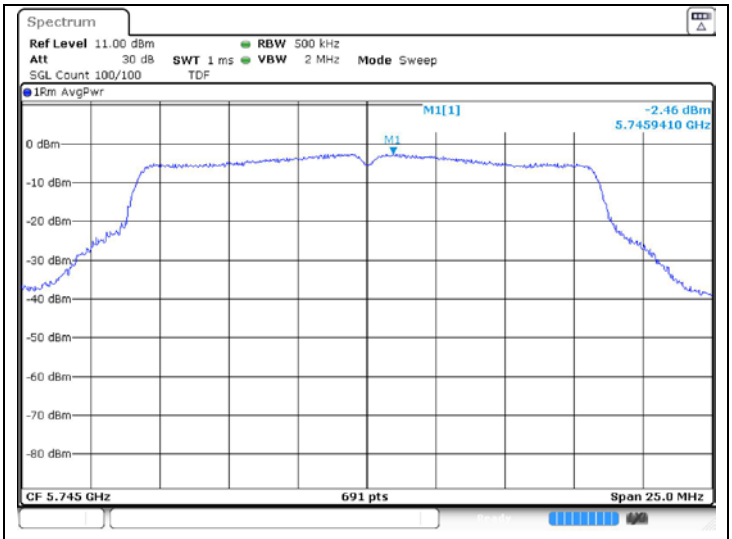


High Channel
(5 240 ㎒)

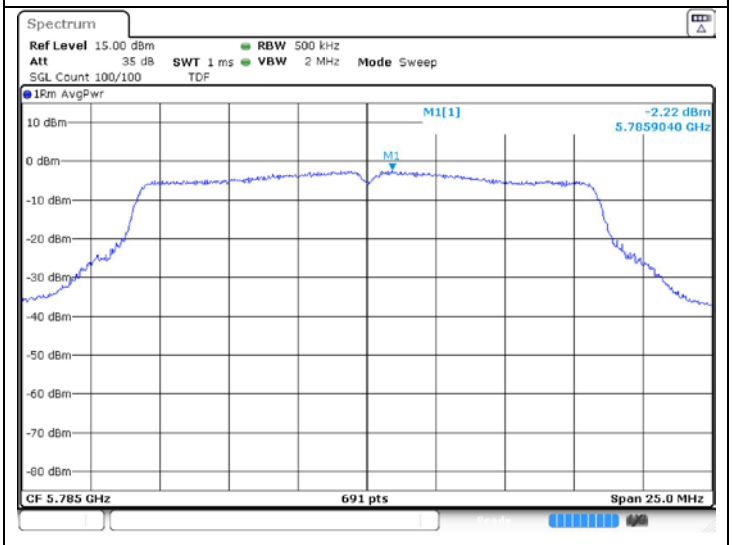


OFDM: 802.11a (Band 3)_ANT 1

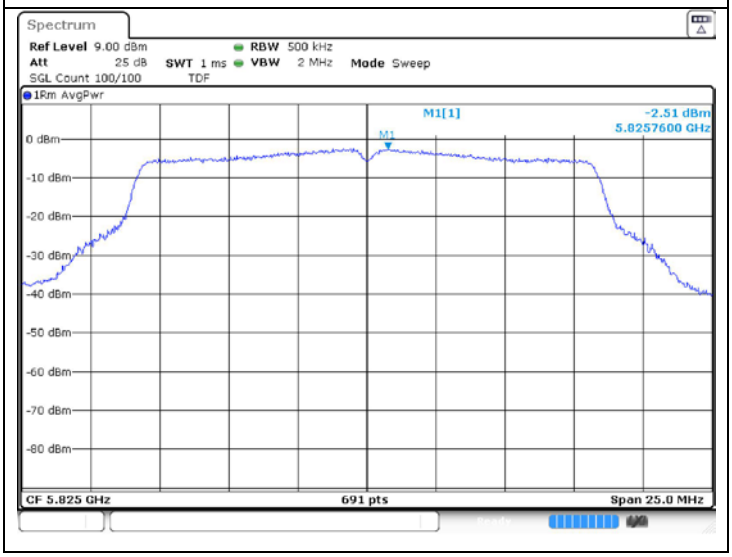
Low Channel
(5 745 ㎒)



Middle Channel
(5 785 ㎒)

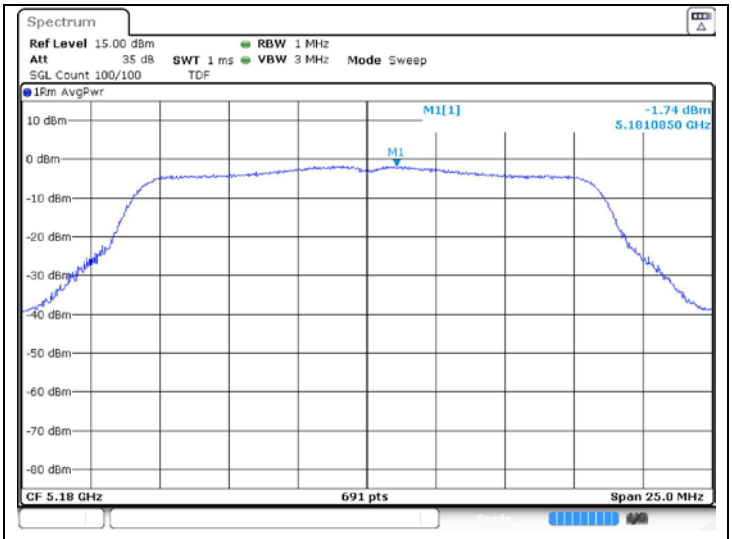


High Channel
(5 825 ㎒)

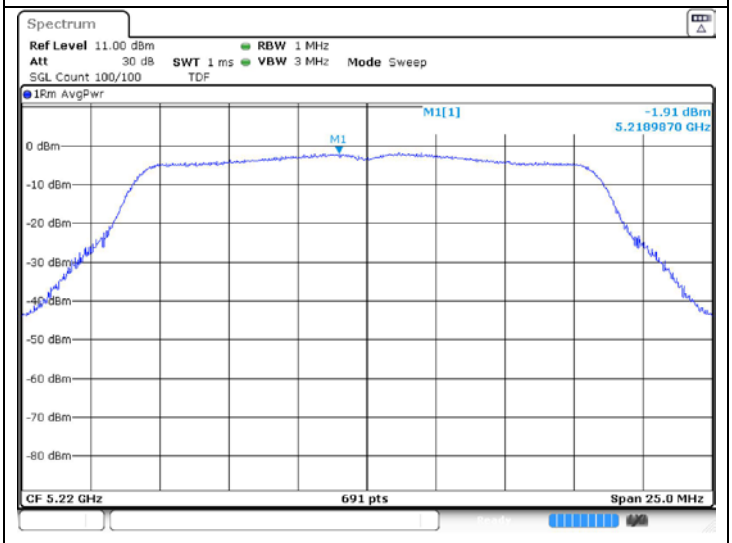


OFDM: 802.11a (Band 1)_ANT 2

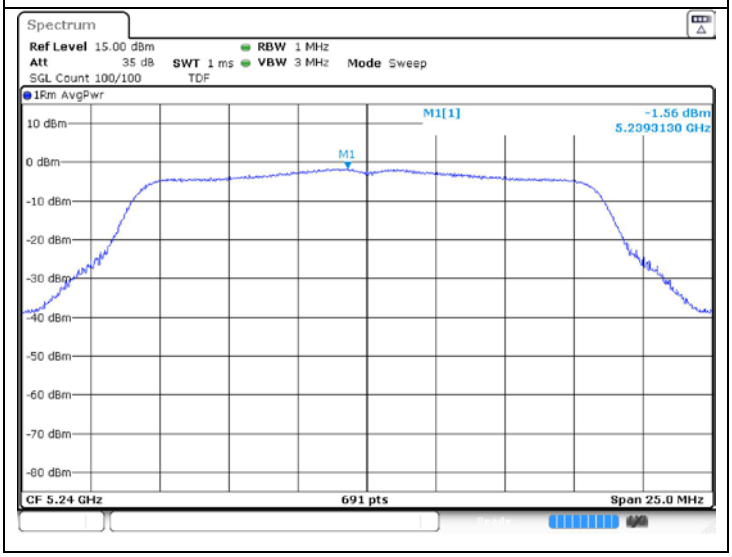
Low Channel
(5 180 ㎒)



Middle Channel
(5 220 ㎒)

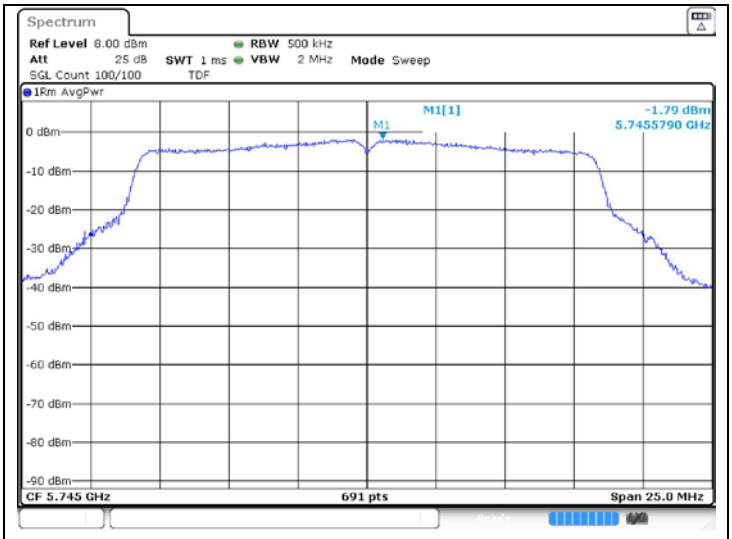


High Channel
(5 240 ㎒)

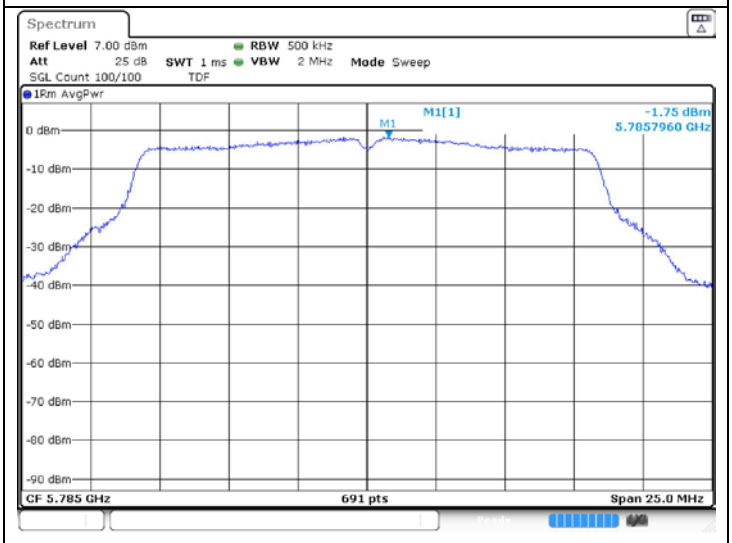


OFDM: 802.11a (Band 3)_ANT 2

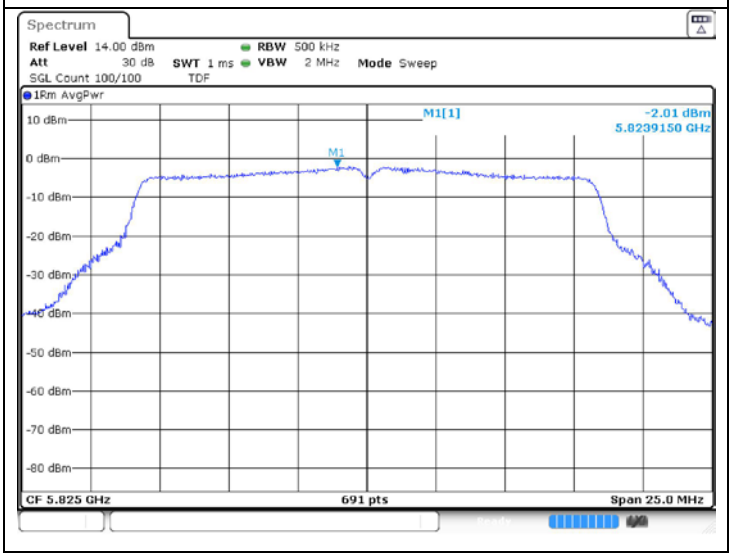
Low Channel
(5 745 ㎒)



Middle Channel
(5 785 ㎒)

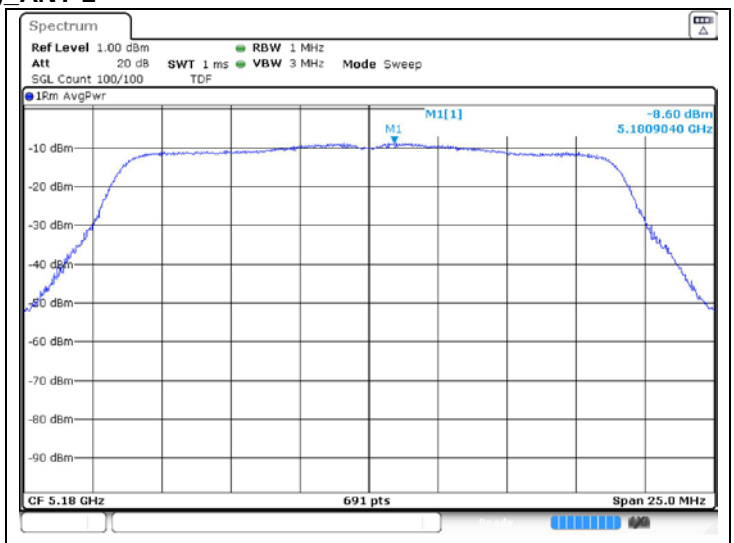


High Channel
(5 825 ㎒)

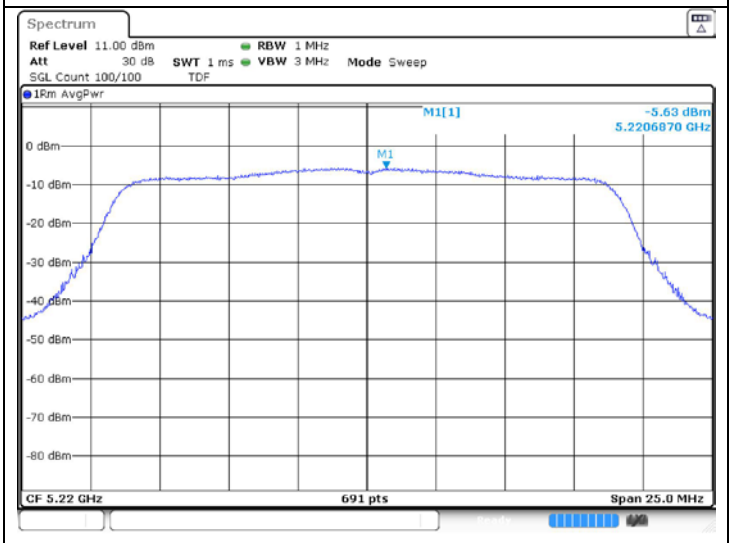


OFDM: 802.11n_HT20 (Band 1)_ANT 1

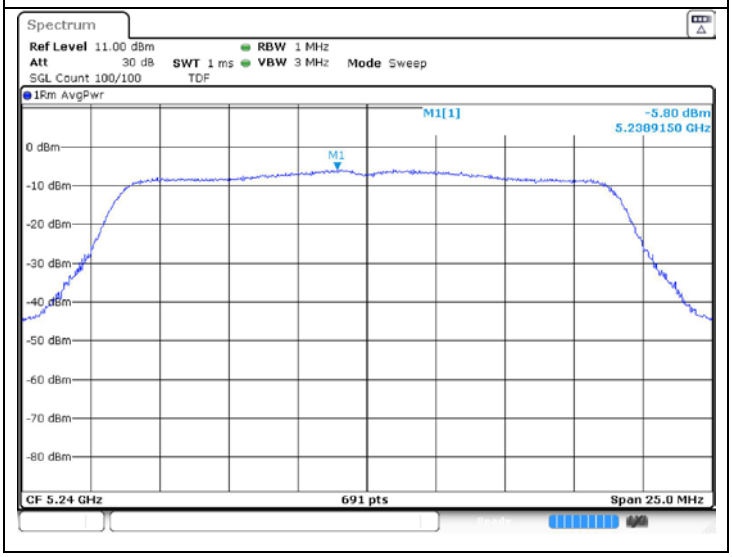
Low Channel
(5 180 ㎒)



Middle Channel
(5 220 ㎒)

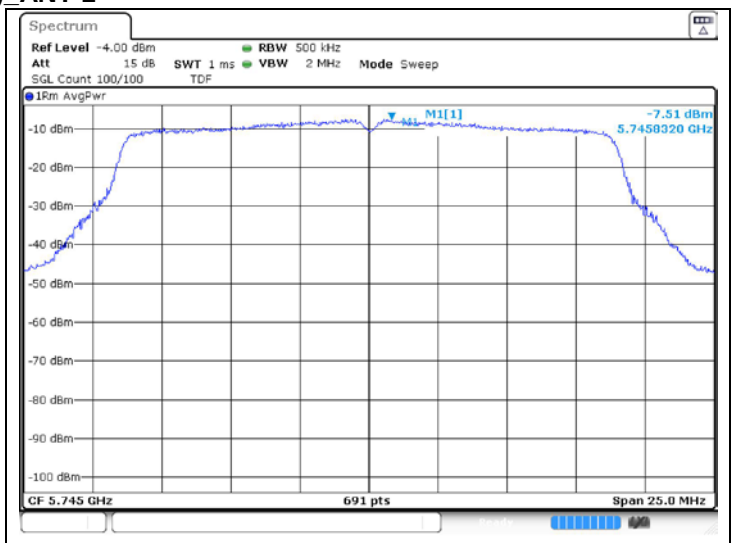


High Channel
(5 240 ㎒)

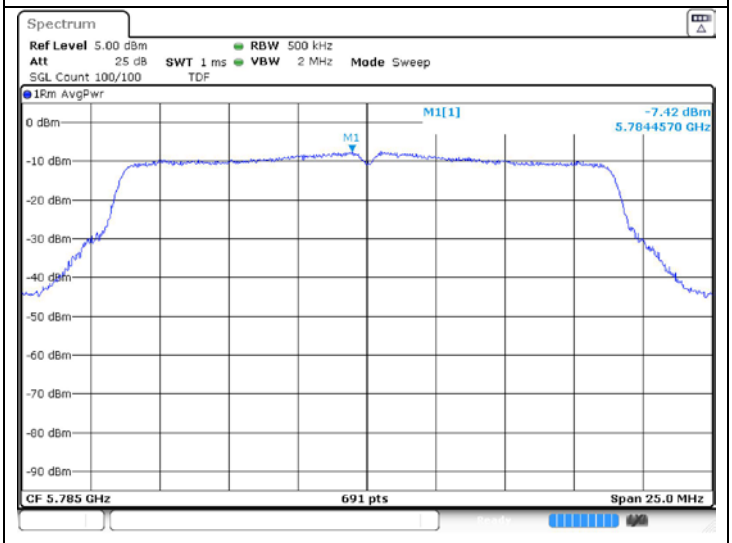


OFDM: 802.11n_HT20 (Band 3)_ANT 1

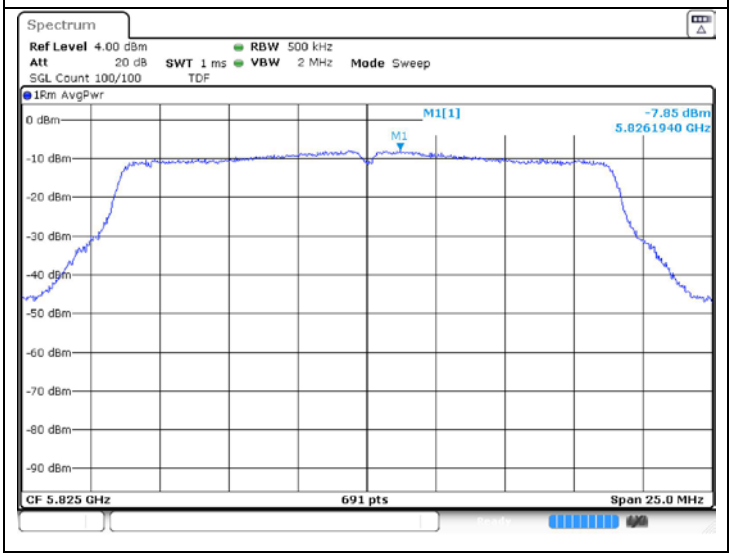
Low Channel
(5 745 ㎒)



Middle Channel
(5 785 ㎒)

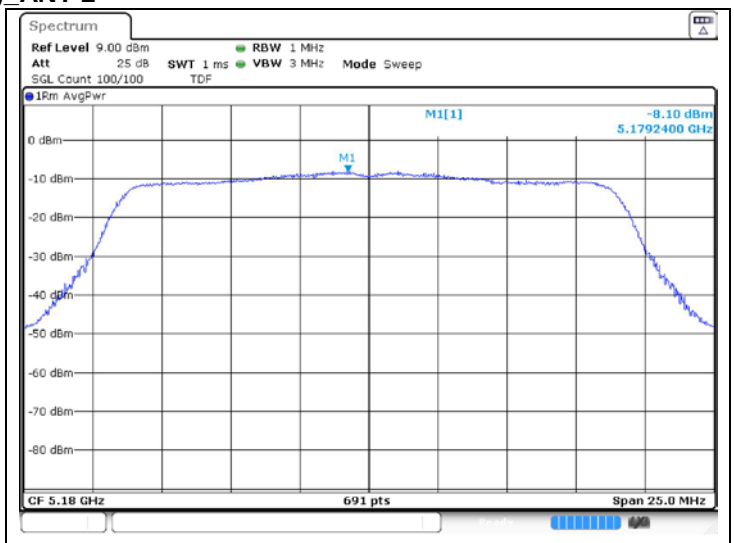


High Channel
(5 825 ㎒)

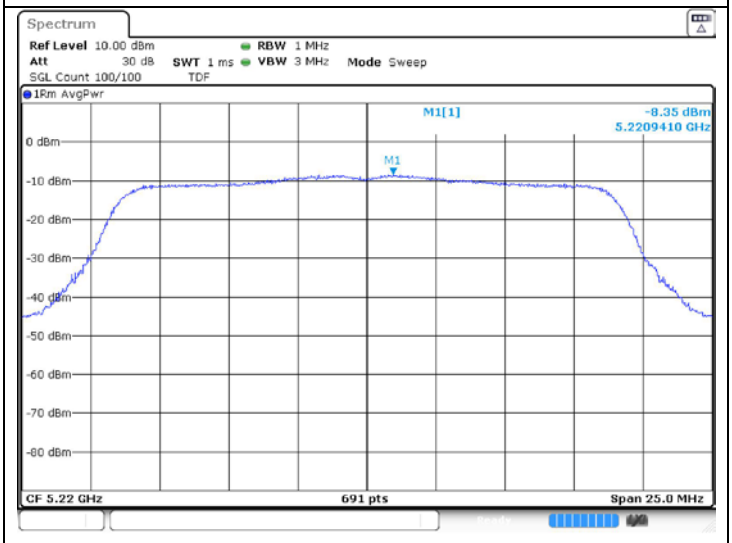


OFDM: 802.11n_HT20 (Band 1)_ANT 2

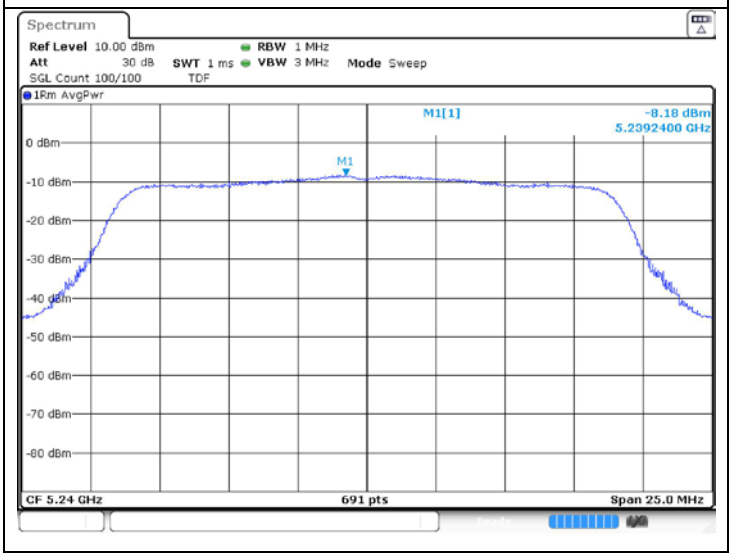
Low Channel
(5 180 ㎒)



Middle Channel
(5 220 ㎒)

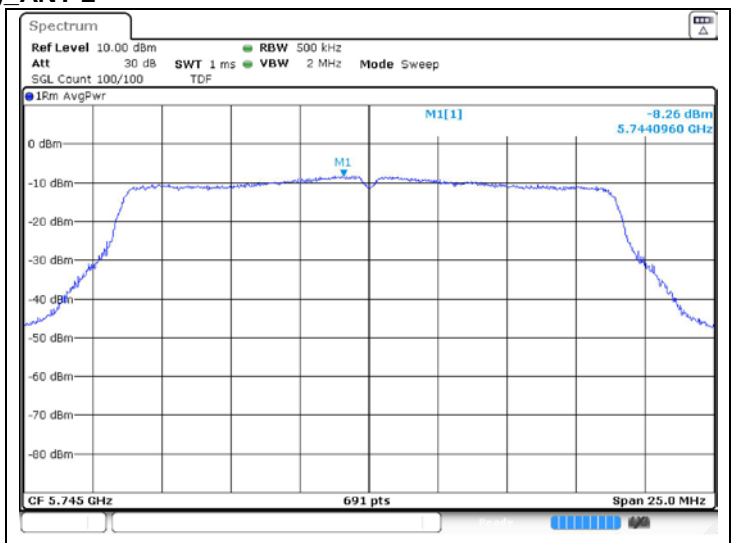


High Channel
(5 240 ㎒)

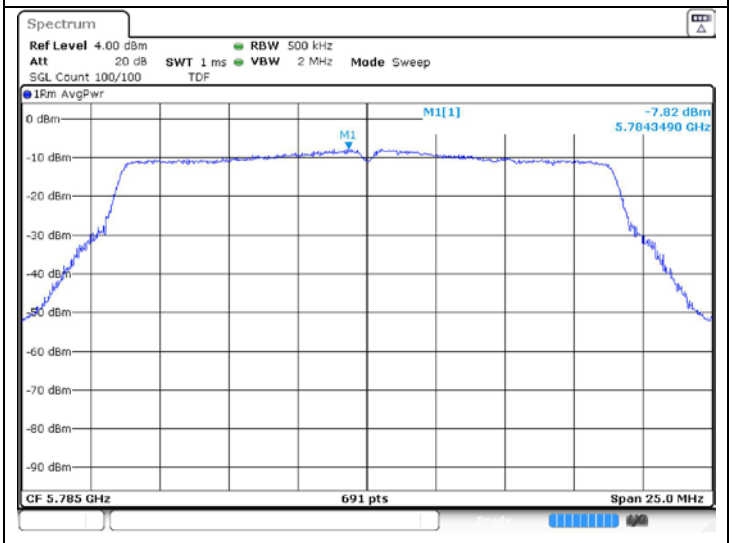


OFDM: 802.11n_HT20 (Band 3)_ANT 2

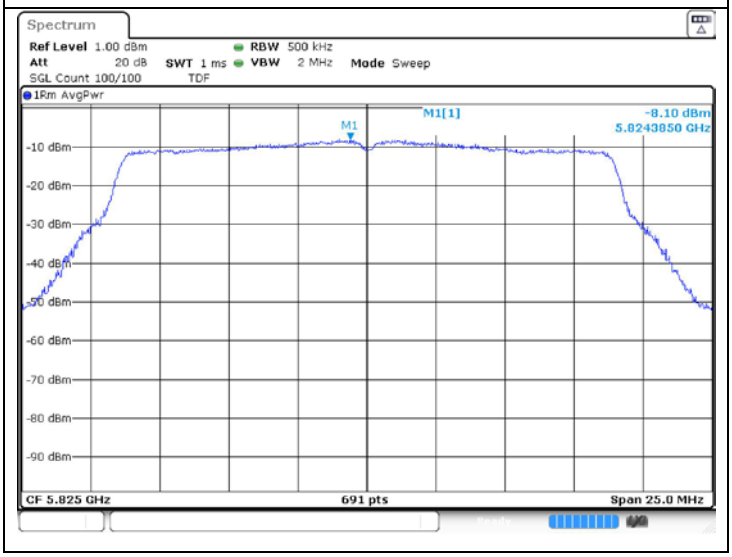
Low Channel
(5 745 ㎒)



Middle Channel
(5 785 ㎒)

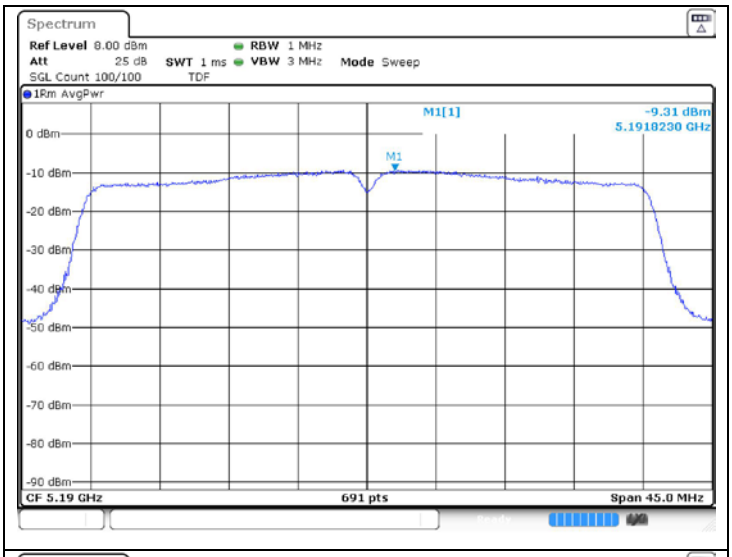


High Channel
(5 825 ㎒)

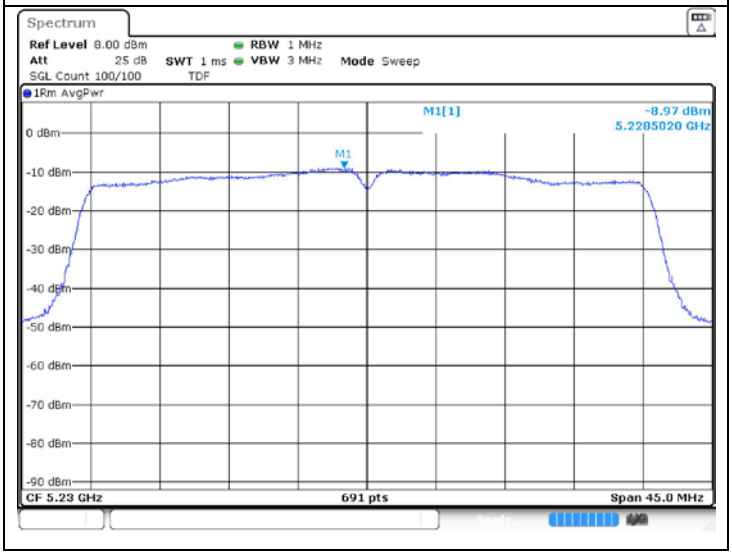


OFDM: 802.11n_HT40 (Band 1)_ANT 1

Low Channel
(5 190 ㎒)

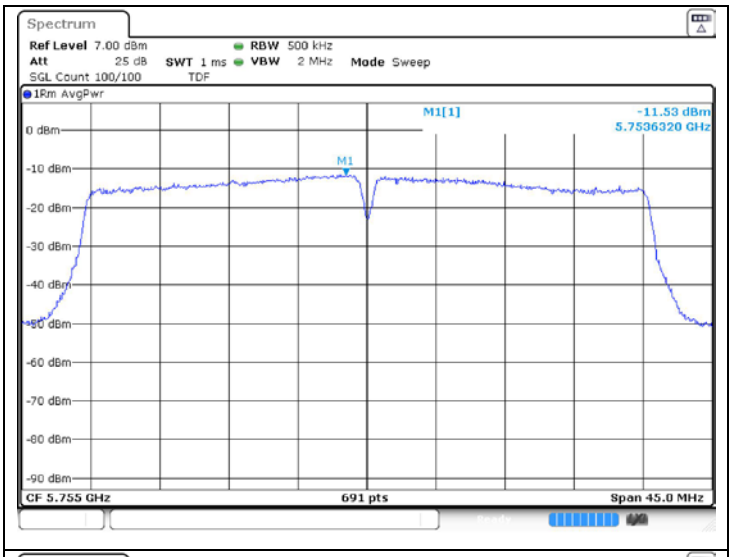


High Channel
(5 230 ㎒)

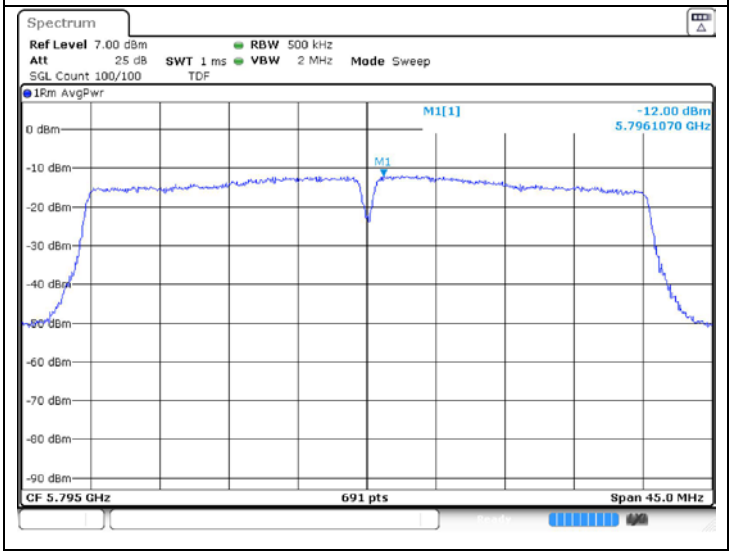


OFDM: 802.11n_HT40 (Band 3)_ANT 1

Low Channel
(5 755 ㎒)

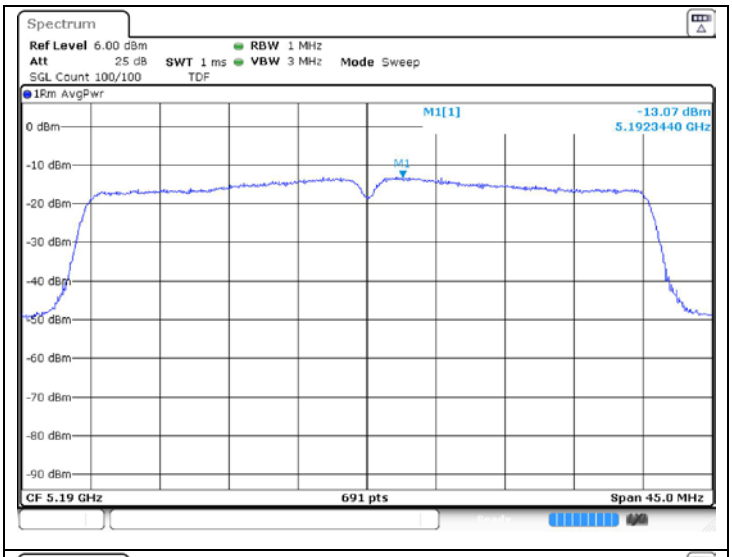


High Channel
(5 795 ㎒)

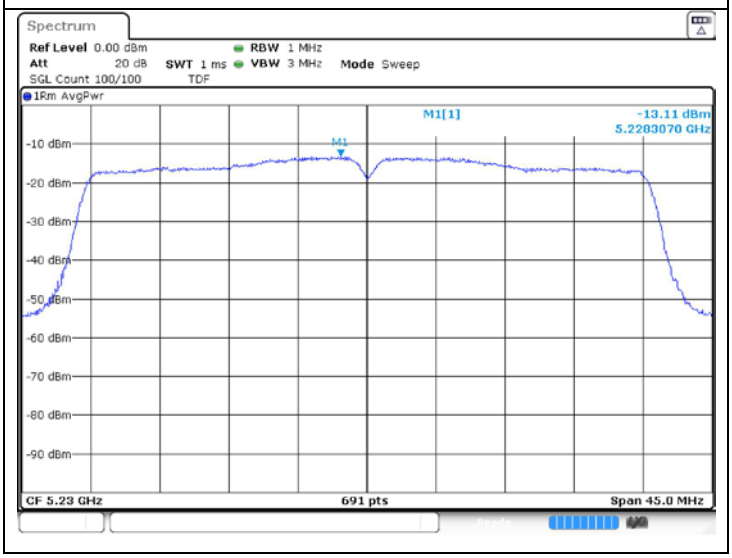


OFDM: 802.11n_HT40 (Band 1)_ANT 2

Low Channel
(5 190 ㎒)

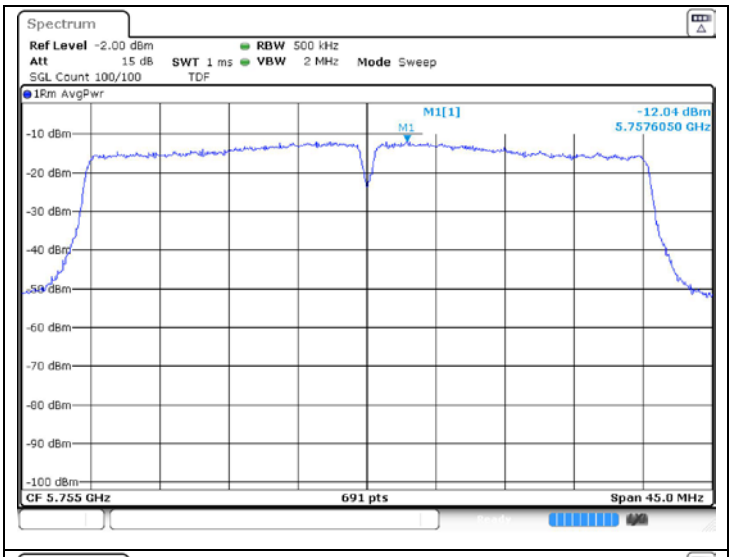


High Channel
(5 230 ㎒)

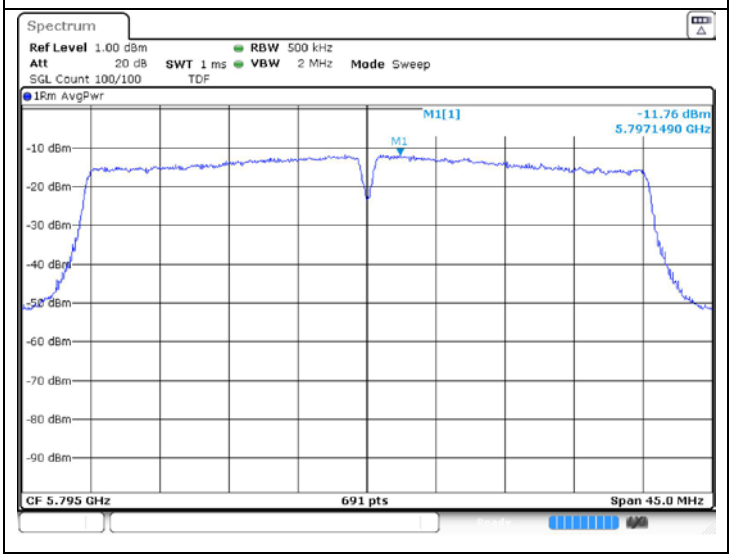


OFDM: 802.11n_HT40 (Band 3)_ANT 2

Low Channel
(5 755 ㎒)

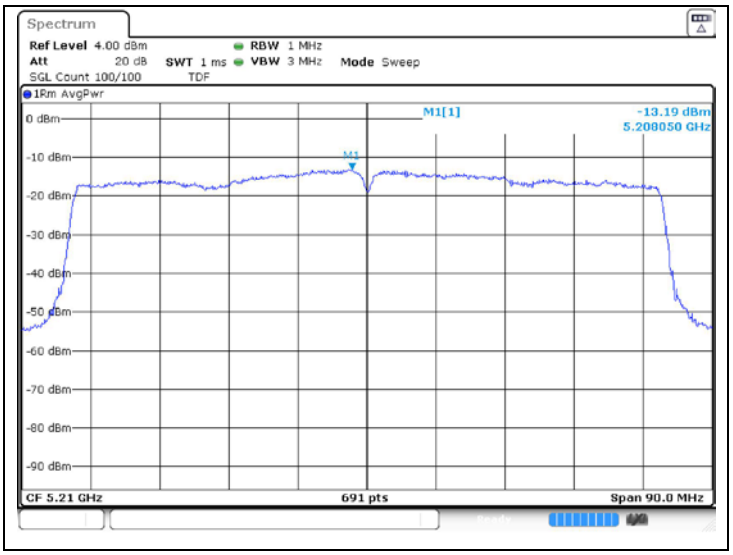


High Channel
(5 795 ㎒)



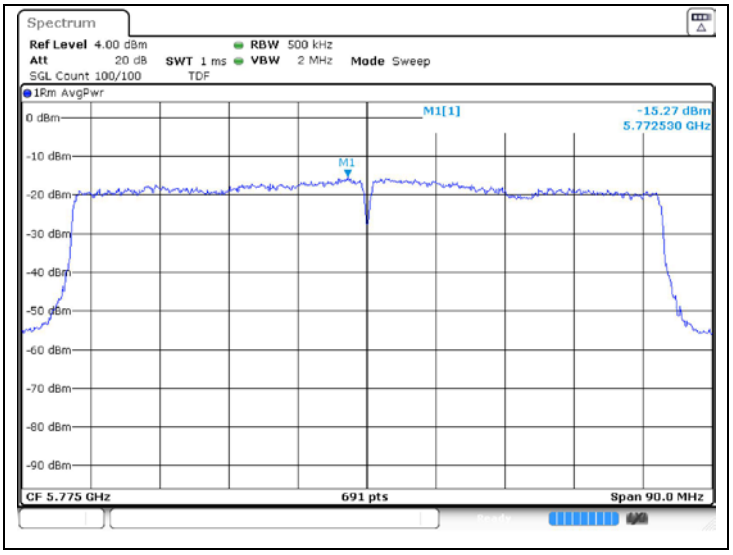
OFDM: 802.11ac_VHT80 (Band 1)_ANT 1

Middle Channel
(5 210 ㎒)



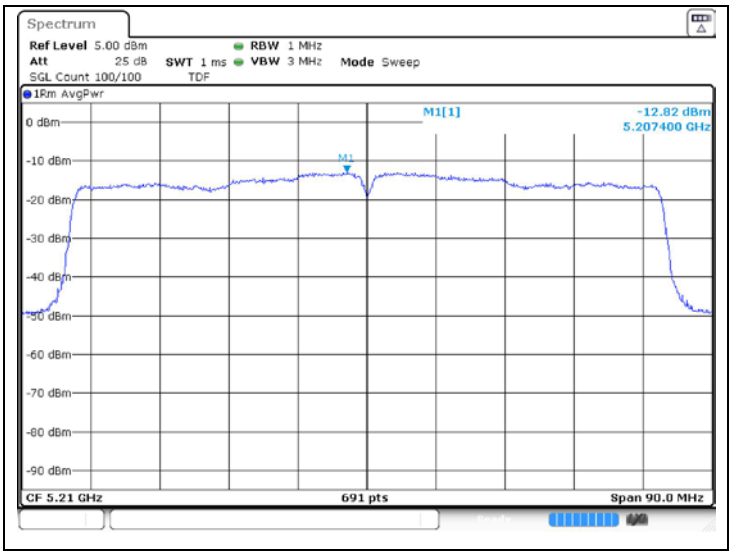
OFDM: 802.11ac_VHT80 (Band 3)_ANT 1

Middle Channel
(5 775 ㎒)



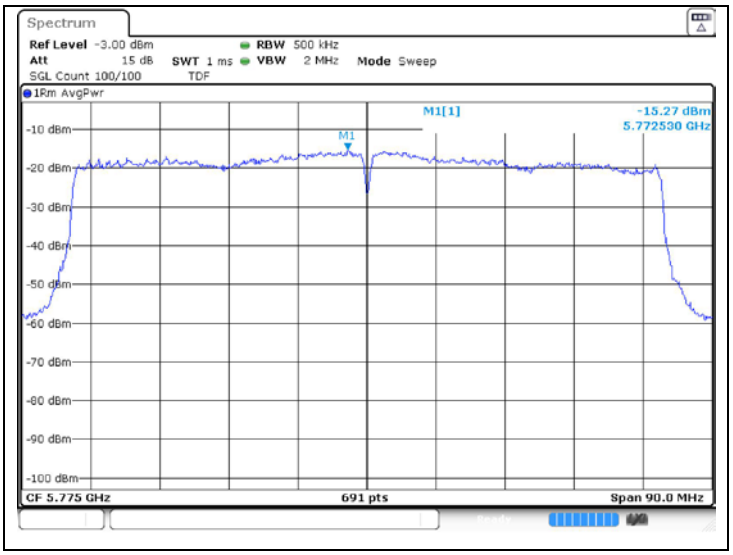
OFDM: 802.11ac_VHT80 (Band 1)_ANT 2

Middle Channel
(5 210 ㎒)



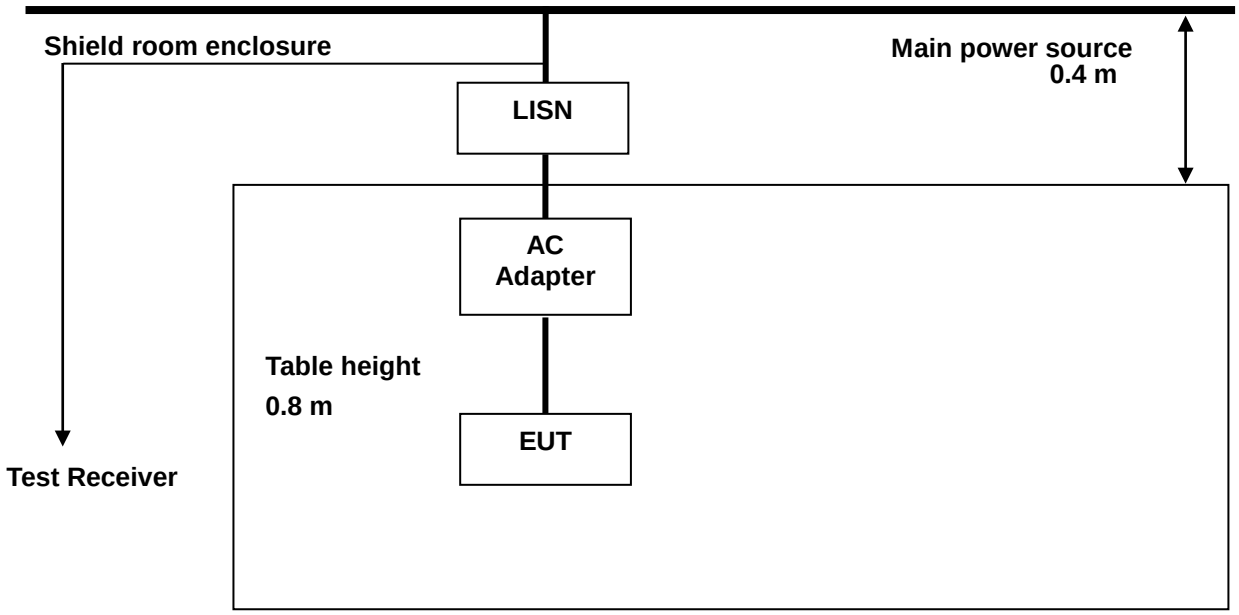
OFDM: 802.11ac_VHT80 (Band 3)_ANT 2

Middle Channel
(5 775 ㎒)



7. AC Power Line Conducted Emission

7.1. Test Setup



7.2. Limit

7.2.1. FCC

According to §15.207(a), for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 ㎑ to 30 ㎒, shall not exceed the limits in the following table, as measured using a 50 μH /50 ohms line impedance stabilization network (LISN).

Compliance with the provision of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (㎒)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

7.2.2. IC

RSS-Gen Issue 5, 8.8, Unless stated otherwise in the applicable RSS, for radio apparatus that are designed to be connected to the public utility AC power network, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the range 150 ㎑ to 30 ㎒ shall not exceed the limits in table 4, as measured using a 50 μH / 50 Ω line impedance stabilization network. This requirement applies for the radio frequency voltage measured between each power line and the ground terminal of each AC power-line mains cable of the EUT.

For an EUT that connects to the AC power lines indirectly, through another device, the requirement for compliance with the limits in table 4 shall apply at the terminals of the AC power-line mains cable of a representative support device, while it provides power to the EUT. The lower limit applies at the boundary between the frequency ranges. The device used to power the EUT shall be representative of typical applications.

Table 4 - AC power-line conducted emissions limits

Frequency (㎒)	Conducted limit (㏈㎶)	
	Quasi-peak	Average
0.15-0.5	66 to 56[1]	56 to 46[1]
0.5-5	56	46
5-30	60	50

Note 1: The level decreases linearly with the logarithm of the frequency.

For an EUT with a permanent or detachable antenna operating between 150 ㎑ and 30 ㎒, the AC power-line conducted emissions must be measured using the following configurations:

(a) Perform the AC power-line conducted emissions test with the antenna connected to determine compliance with the limits of table 4 outside the transmitter's fundamental emission band.

(b) Retest with a dummy load instead of the antenna to determine compliance with the limits of table 4 within the transmitter's fundamental emission band. For a detachable antenna, remove the antenna and connect a suitable dummy load to the antenna connector. For a permanent antenna, remove the antenna and terminate the RF output with a dummy load or network that simulates the antenna in the fundamental frequency band.

7.3. Test Procedures

AC conducted emissions from the EUT were measured according to the dictates of ANSI C63.10-2013

1. The test procedure is performed in a 6.5 m × 3.5 m × 3.5 m (L × W × H) shielded room. The EUT along with its peripherals were placed on a 1.0 m (W) × 1.5 m (L) and 0.8 m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
2. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room.
3. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.
4. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

7.4. Test Results

The following table shows the highest levels of conducted emissions on both phase of Hot and Neutral line.

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

Frequency range : 0.15 ㎒ - 30 ㎒
Measured Bandwidth : 9 ㎑

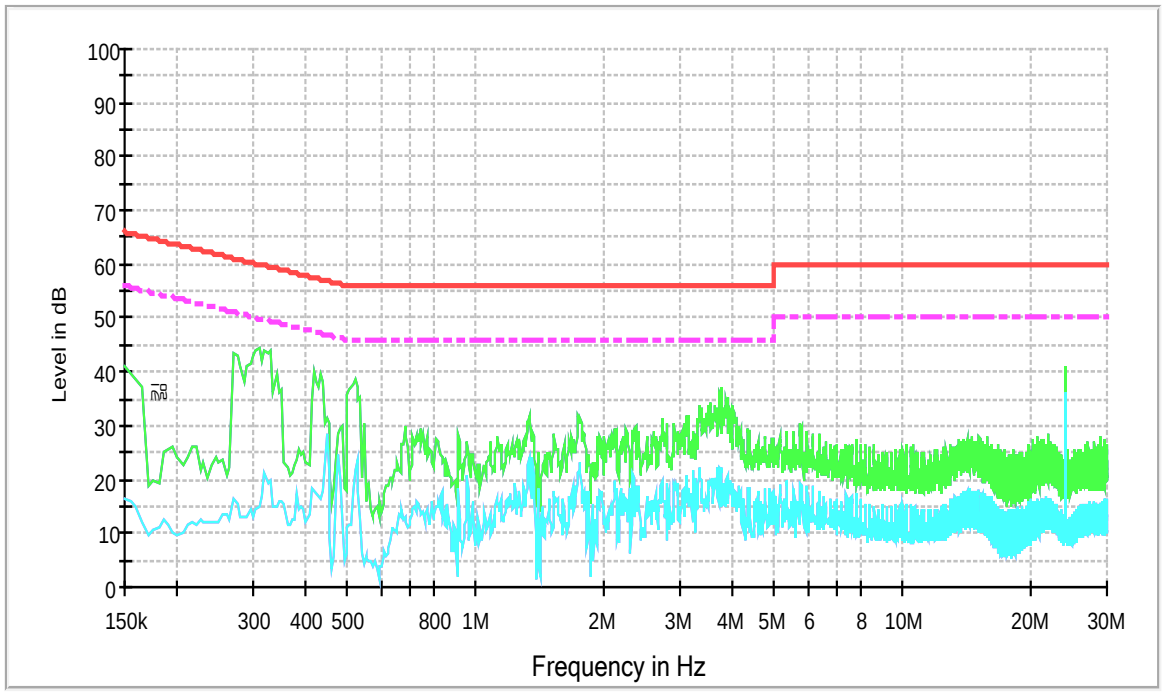
FREQ.	LEVEL (dBμV)		LINE	LIMIT (dBμV)		MARGIN (dB)	
(㎒)	Q-Peak	Average		Q-Peak	Average	Q-Peak	Average
0.27	31.50	15.20	N	61.12	51.12	29.62	35.92
0.31	33.70	14.80	N	59.97	49.97	26.27	35.17
0.52	32.90	24.70	N	56.00	46.00	23.10	21.30
1.74	24.00	19.20	N	56.00	46.00	32.00	26.80
3.74	28.90	22.10	N	56.00	46.00	27.10	23.90
24.02	37.00	26.90	N	60.00	50.00	23.00	23.10
0.16	36.80	23.90	H	65.46	55.46	28.66	31.56
0.52	43.40	27.80	H	56.00	46.00	12.60	18.20
0.75	31.30	21.00	H	56.00	46.00	24.70	25.00
1.34	31.00	22.70	H	56.00	46.00	25.00	23.30
3.77	30.60	19.30	H	56.00	46.00	25.40	26.70
24.00	37.30	34.50	H	60.00	50.00	22.70	15.50

Remark;

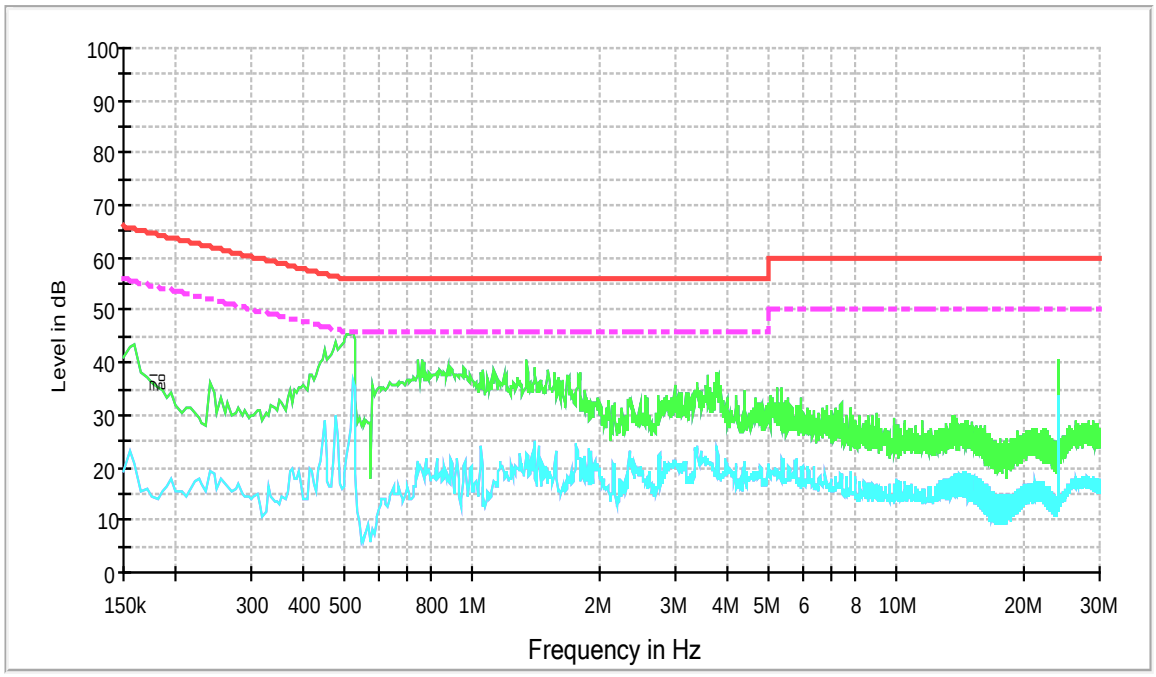
1. Line (H): Hot, Line (N): Neutral.
2. All modes of operation were investigated and the worst-case emissions were reported using **11a_ANT1 _(Band 3) / 6 Mbps / Low channel.**
3. The limit for Class B device(s) from 150 ㎑ to 30 ㎒ are specified in Section of the Title 47 CFR.
4. Traces shown in plot were made by using a peak detector and average detector.
5. Deviations to the Specifications: None.

- Test plots

Test mode: (Neutral)



Test mode: (Hot)



8. Antenna Requirement

8.1. 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 shall be considered sufficient to comply with the provisions of this section and according to FCC 47 CFR Section §15.247(b) if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the gain of the antenna exceeds 6 dBi.

8.2. Antenna Connected Construction

Antenna used in this product is PCB & Cable Assembly antenna and peak max gain of antenna as below.

Band	5 150 ㎒ – 5 250 ㎒	5 725 ㎒ – 5 850 ㎒
Mode	11a/n_HT20, HT40, 11ac_VHT20, VHT40, VHT80	
ANT1 Gain	2.54 dBi	2.45 dBi
ANT2 Gain	2.84 dBi	2.73 dBi
ANT1+ANT2 Gain	5.70 dBi	5.60 dBi

Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, …, G_N dBi
(i) If transmit signals are correlated, then
Directional gain = 10 log[$(10^{G_1/20} + 10^{G_2/20} + \ldots + 10^{G_N/20})^2/N_{ANT}$] dBi [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

- End of the Test Report -