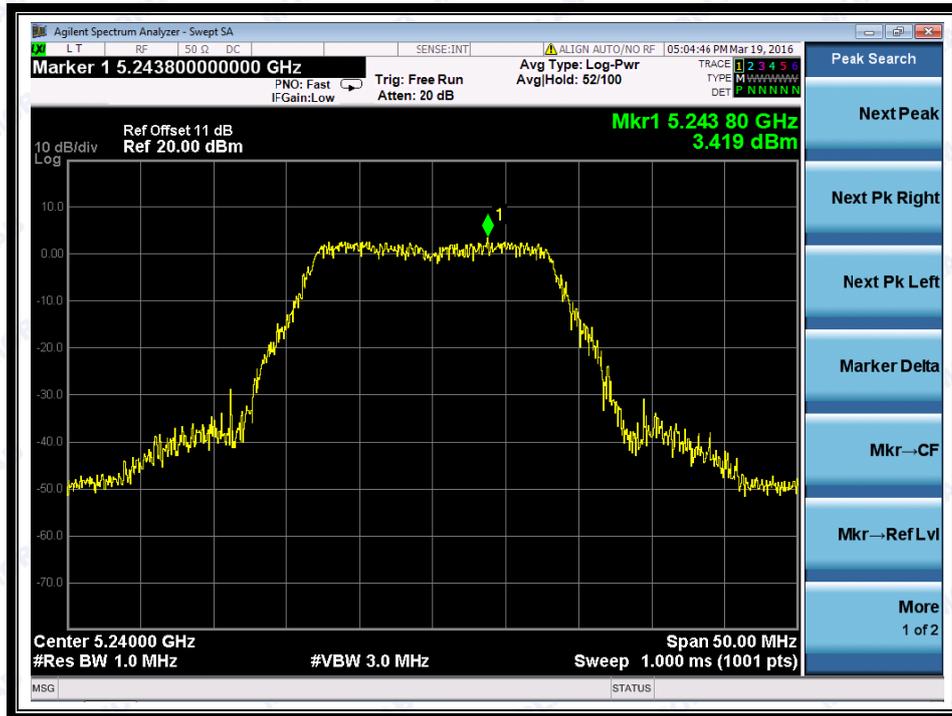
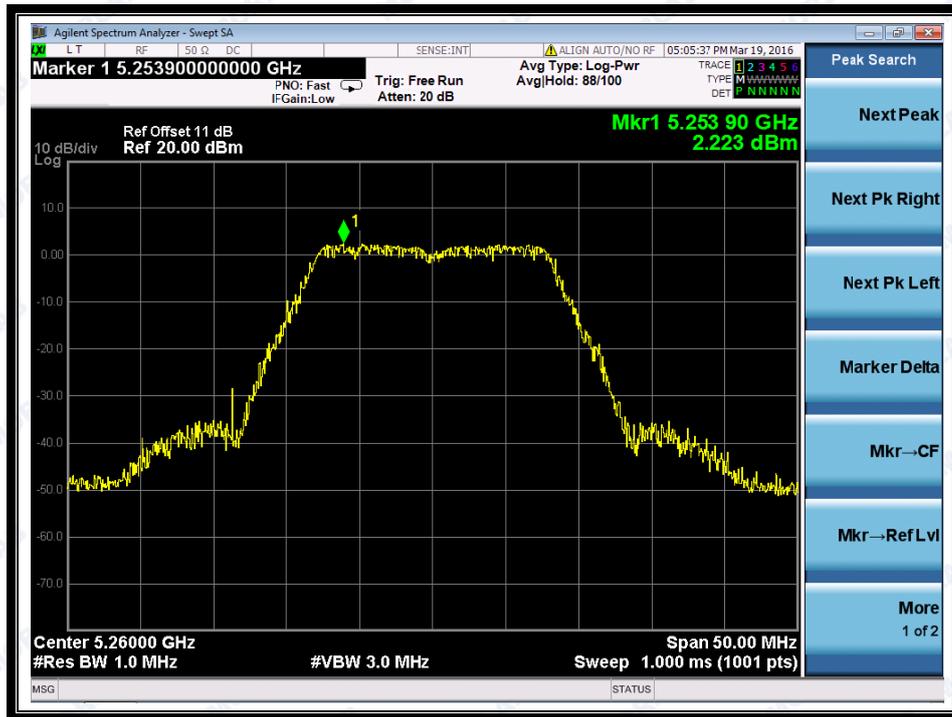


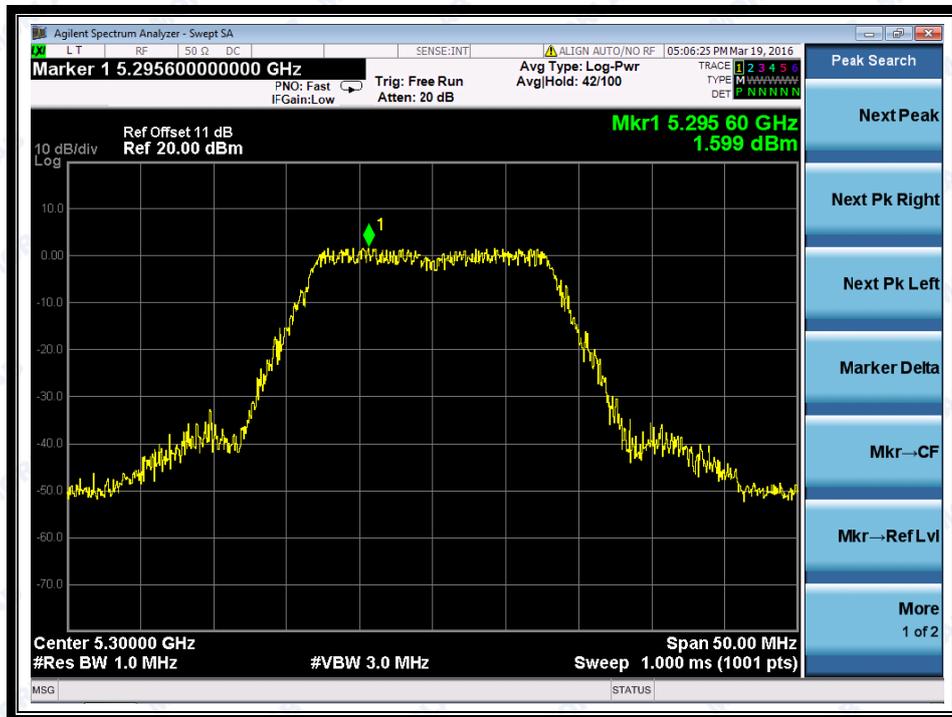
(Channel 44: 5220 MHz @802.11a)



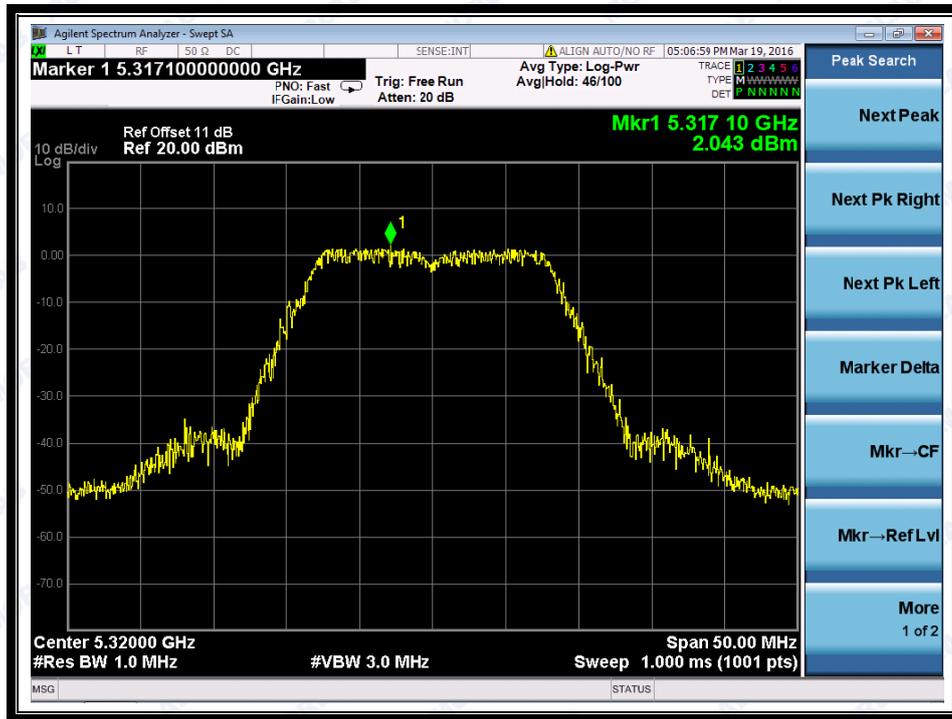
(Channel 48: 5240MHz @802.11a)



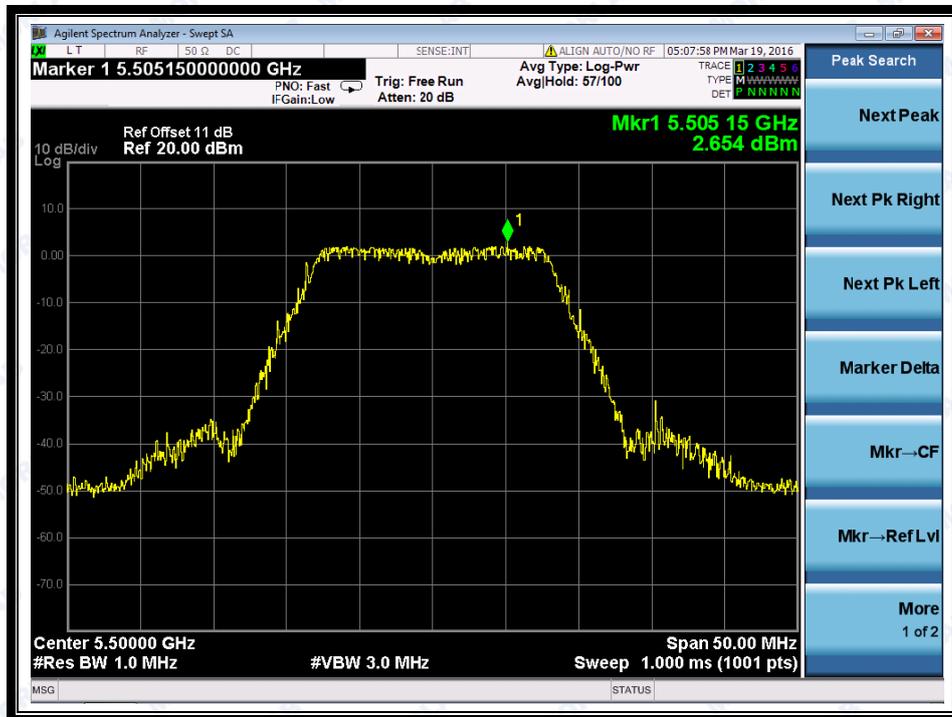
(Channel 52: 5260MHz @ 802.11a)



(Channel 60: 5300MHz @ 802.11a)



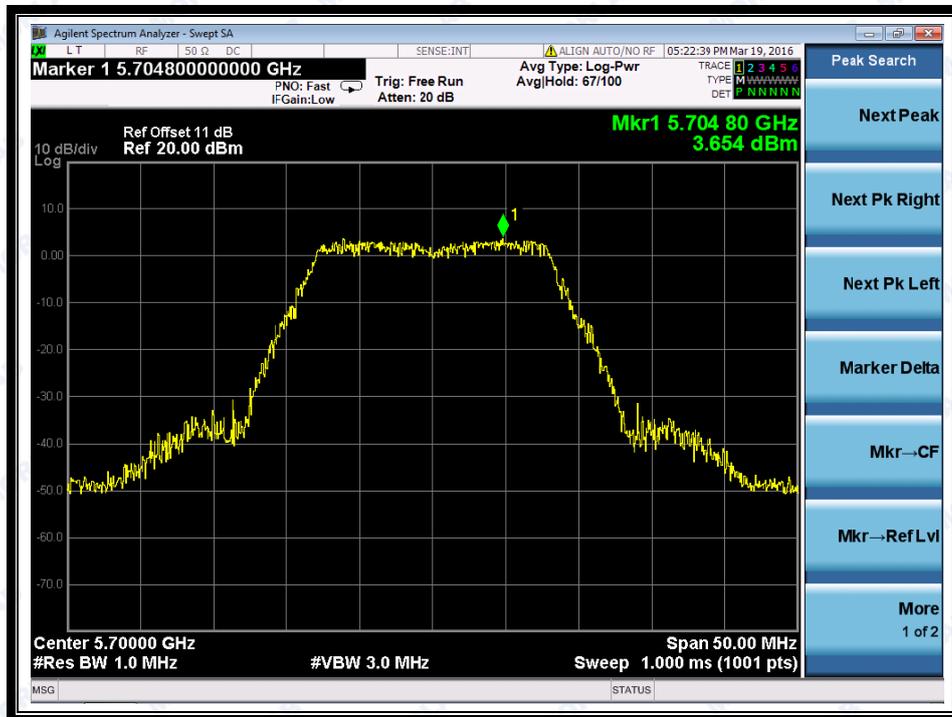
(Channel 64: 5320MHz @ 802.11a)



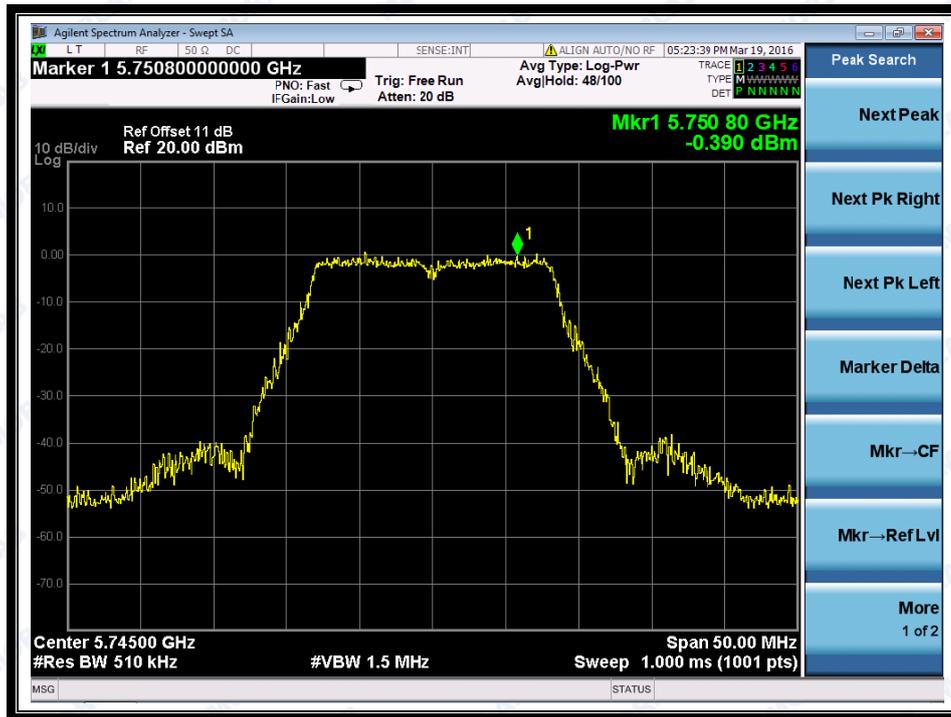
(Channel 100: 5500MHz @ 802.11a)



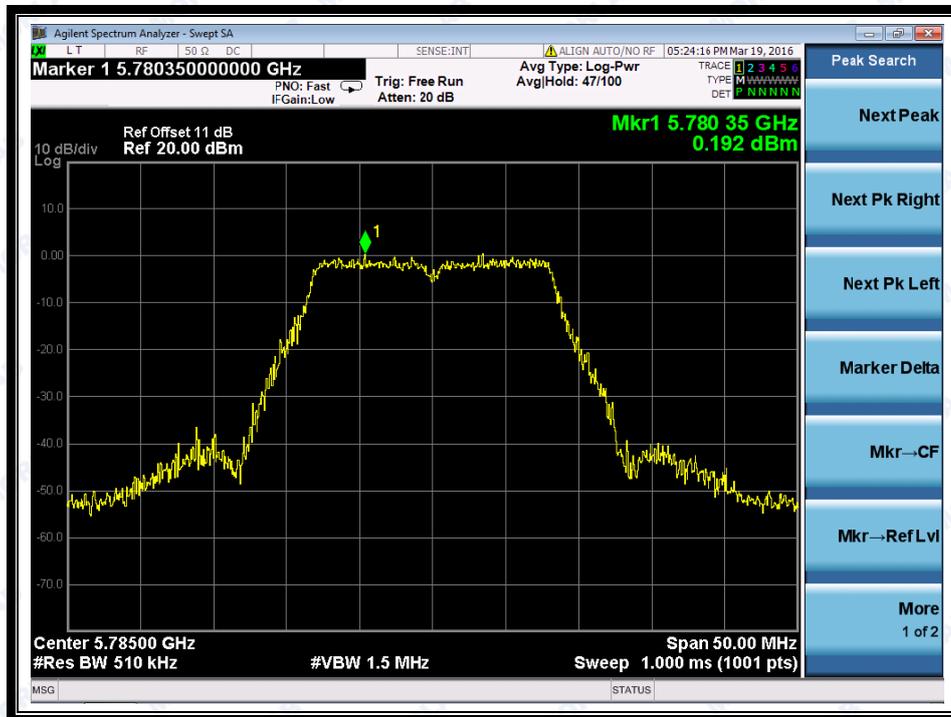
(Channel 120: 5600MHz @ 802.11a)



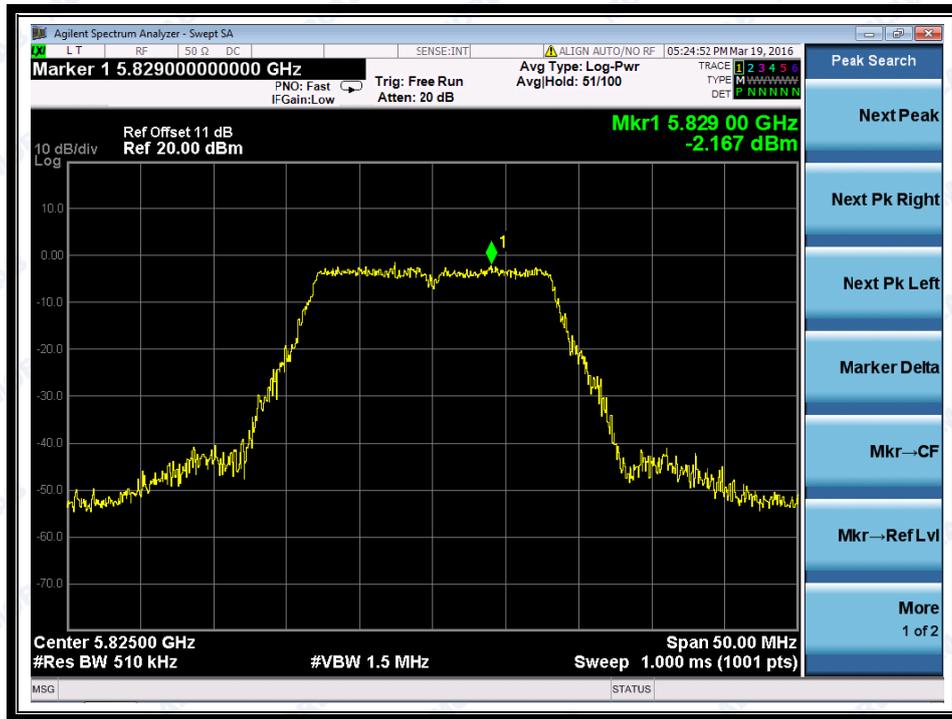
(Channel 140: 5700MHz @ 802.11a)



(Channel 149: 5745MHz @ 802.11a)



(Channel 157: 5785MHz @ 802.11a)



(Channel 165: 5825MHz @ 802.11a)

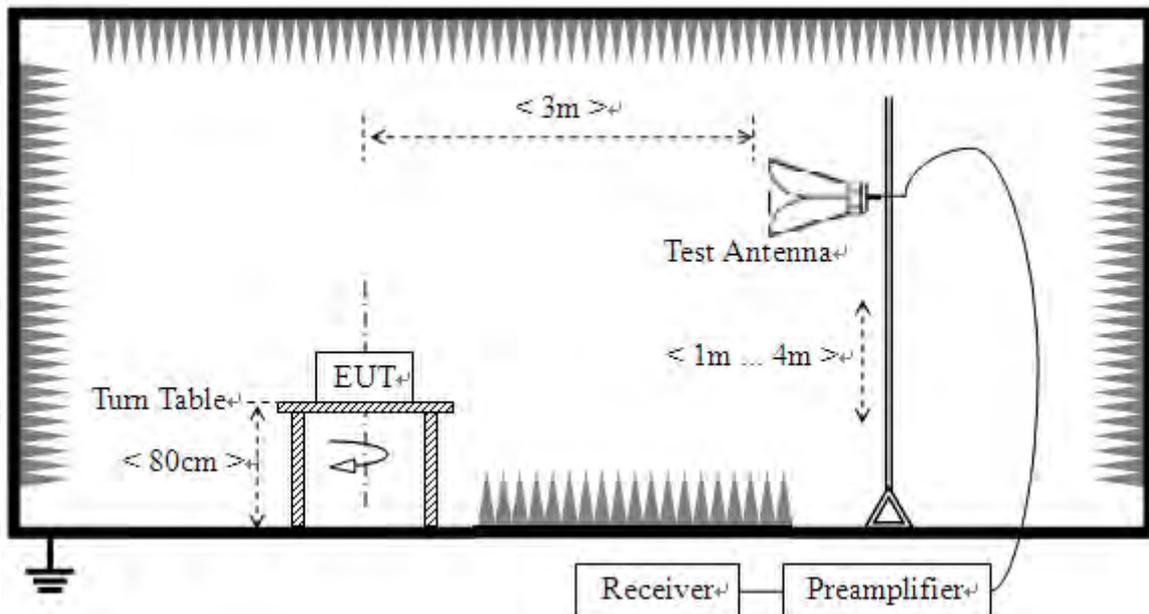
2.5 Restricted Frequency Bands

2.5.1 Requirement

According to FCC section 15.407(b)(7), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in 15.205(a), must also comply with the radiated emission limits specified in 15.209(a).

2.5.2 Test Description

A. Test Setup



The Module is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading.

KDB 789033 Section H) 3)5)6(d)) was used in order to prove compliance

For the Test Antenna:

Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength.



2.5.3 Test Result

The lowest and highest channels are tested to verify Restricted Frequency Bands.

The measurement results are obtained as below:

$$E \text{ [dB}\mu\text{V/m]} = U_R + A_T + A_{\text{Factor}} \text{ [dB]}; A_T = L_{\text{Cable loss}} \text{ [dB]} - G_{\text{preamp}} \text{ [dB]}$$

A_T : Total correction Factor except Antenna

U_R : Receiver Reading

G_{preamp} : Pre-amplifier Gain

A_{Factor} : Antenna Factor at 3m

Note: Restricted Frequency Bands were performed when antenna was at vertical and horizontal polarity, and only the worse test condition (vertical) was recorded in this test report.

2.5.3.1 802.11ac-20MHz Test mode

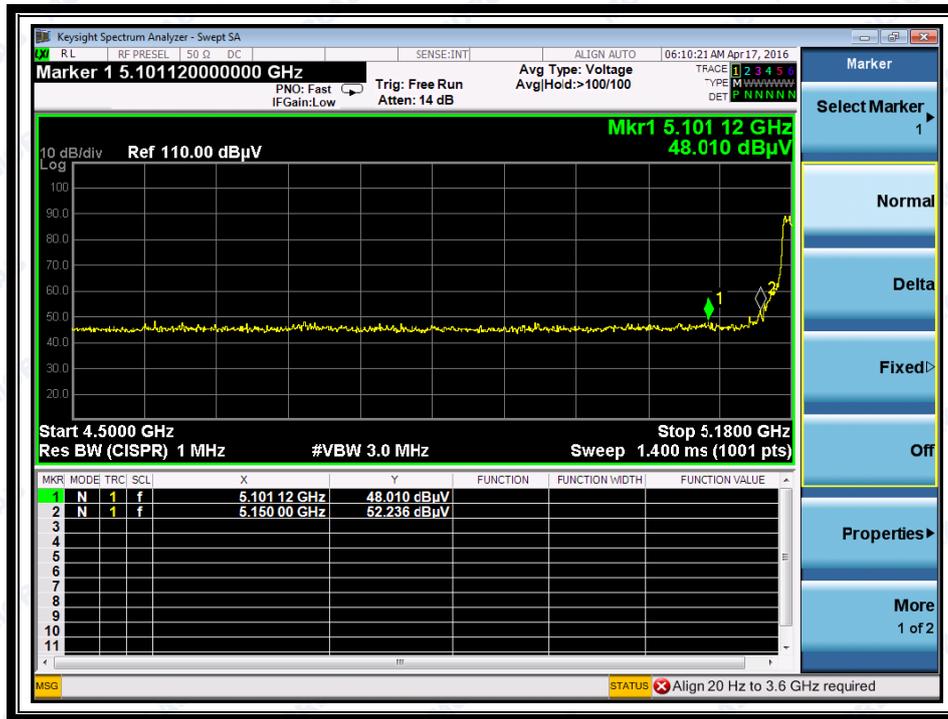
The lowest and highest channels are tested to verify the band edge emissions.

A. Test Verdict:

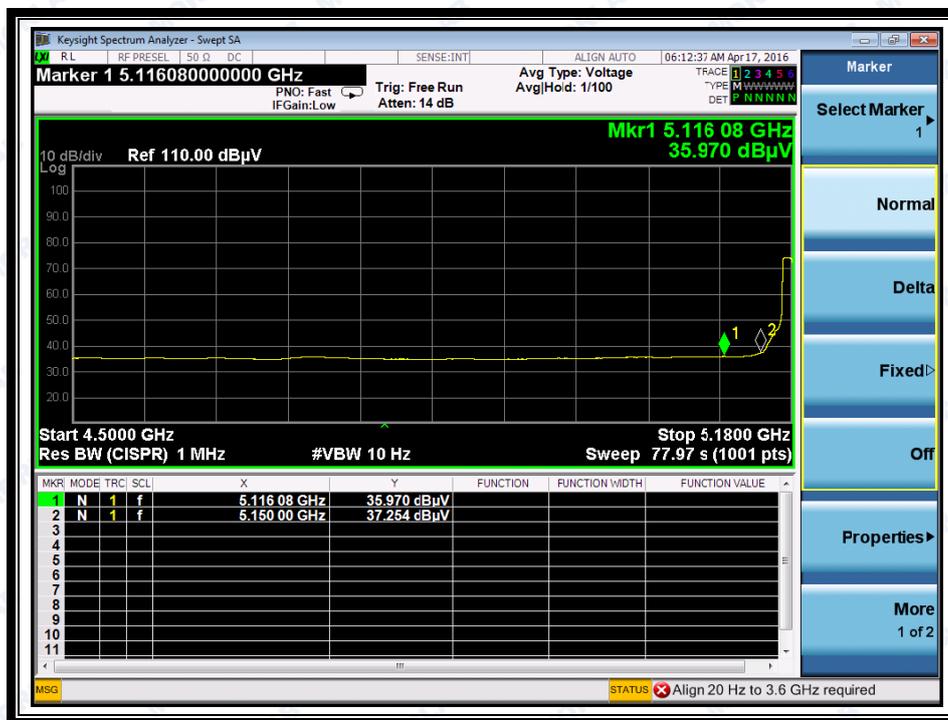
Channel	Frequency (MHz)	Detector	Receiver Reading	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dB μ V/m)	Limit (dB μ V/m)	Verdict
		PK/ AV	U_R (dB μ V)					
36	5101.12	PK	48.01	-50.65	32.11	29.47	74	Pass
36	5116.08	AV	35.97	-50.65	32.11	17.43	54	Pass
64	5354.50	PK	51.11	-50.65	32.11	32.57	74	Pass
64	5353.24	AV	36.23	-50.65	32.11	17.69	54	Pass
100	5275.10	PK	47.52	-50.65	32.11	28.98	74	Pass
100	5182.60	AV	35.62	-50.65	32.11	17.08	54	Pass
140	5776.00	PK	46.90	-50.65	32.11	28.36	74	Pass
140	5744.20	AV	35.60	-50.65	32.11	17.06	54	Pass



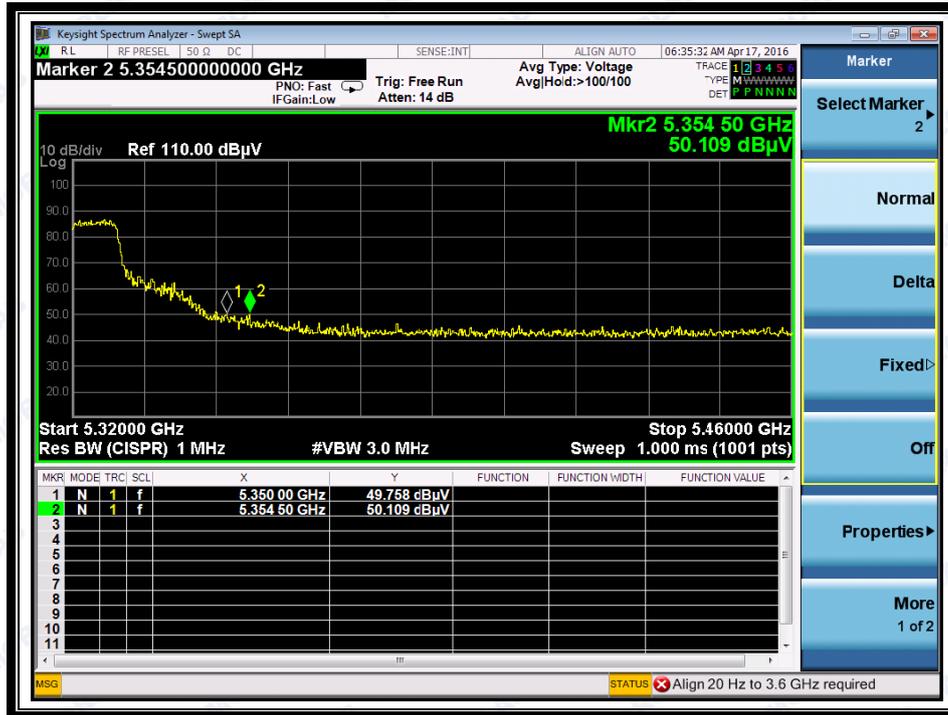
B. Test Plots:



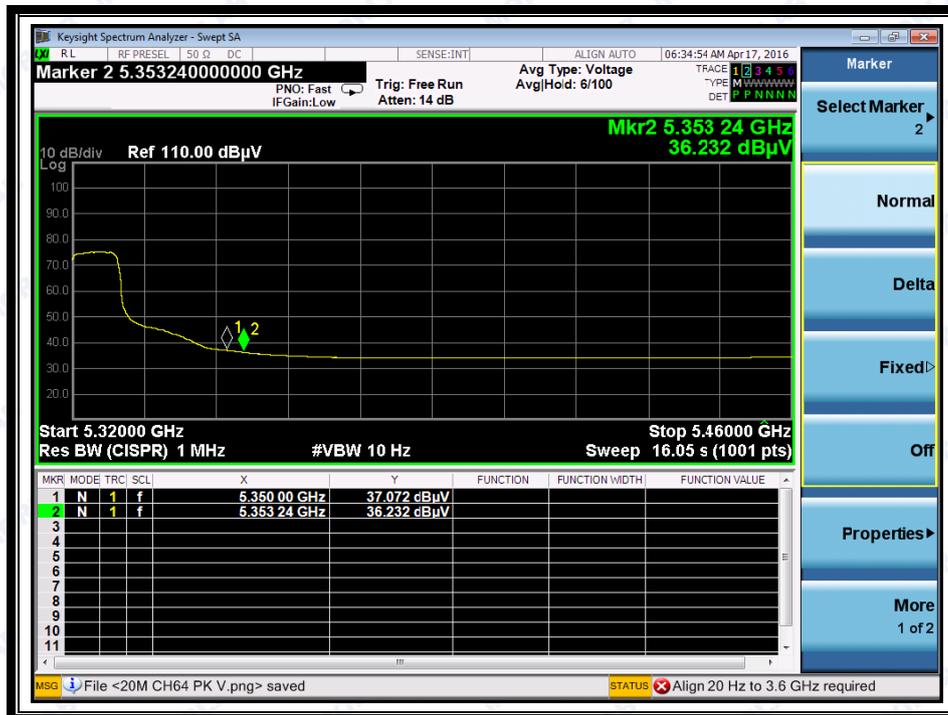
(Channel = 36 PEAK @ 802.11ac)



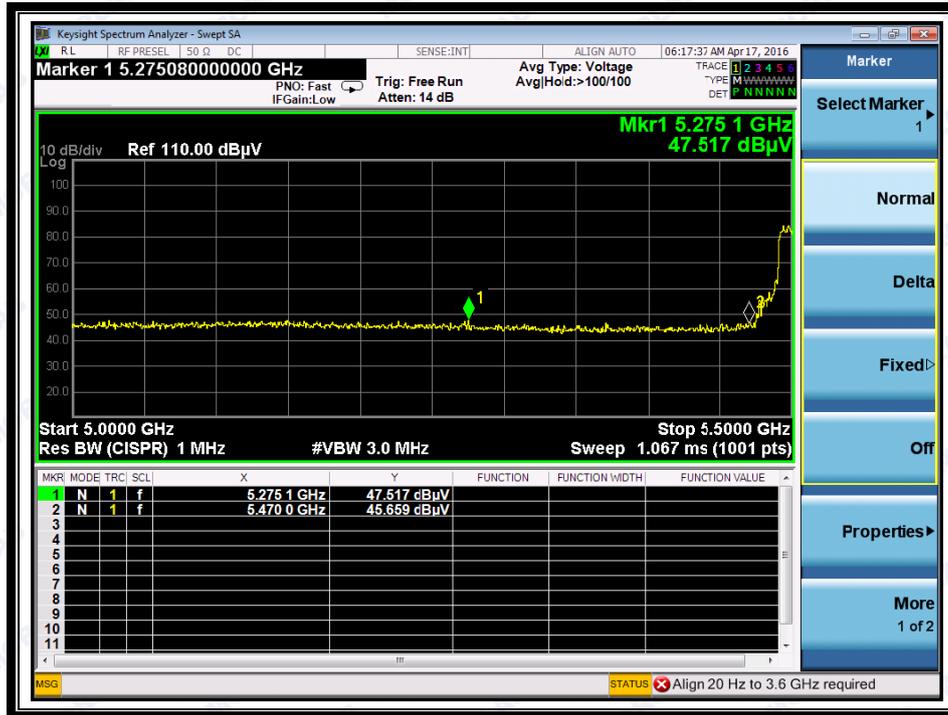
(Channel = 36 AVG @ 802.11ac)



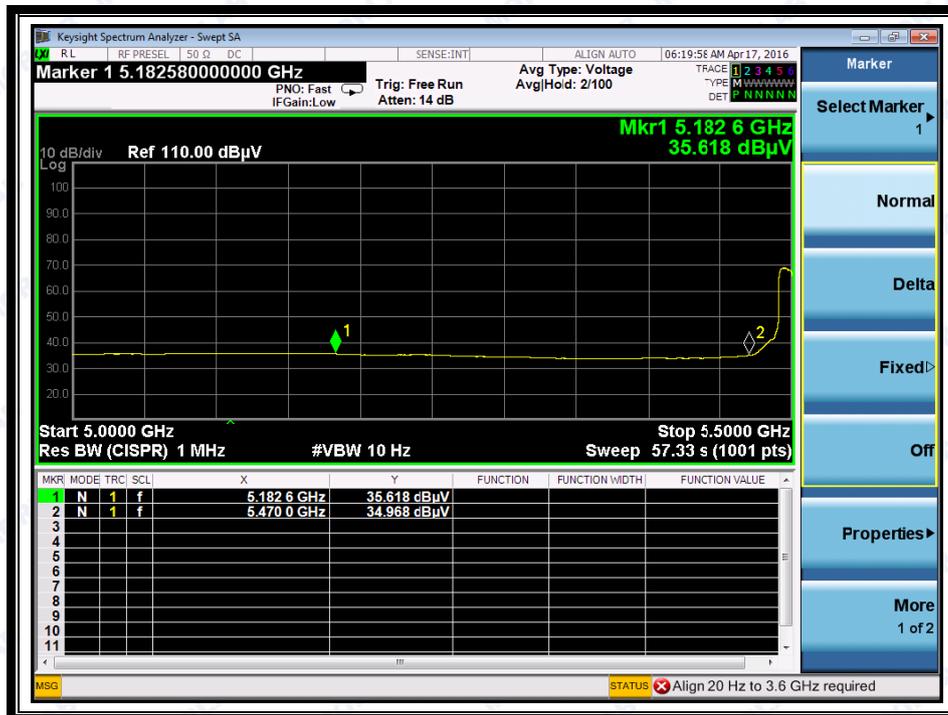
(Channel = 64 PEAK @ 802.11ac)



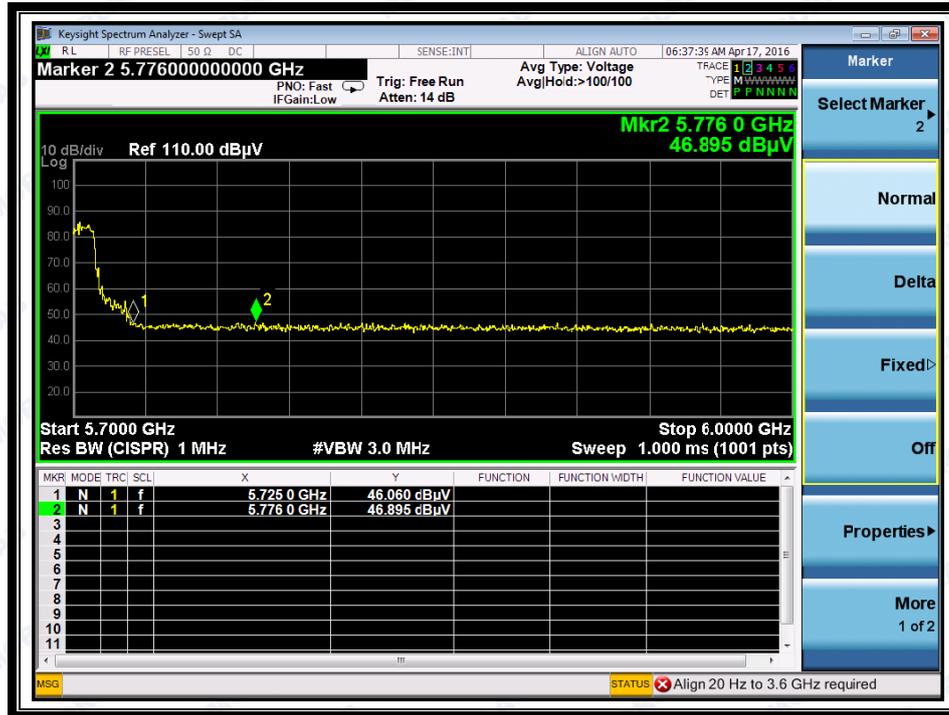
(Channel = 64 AVG @ 802.11ac)



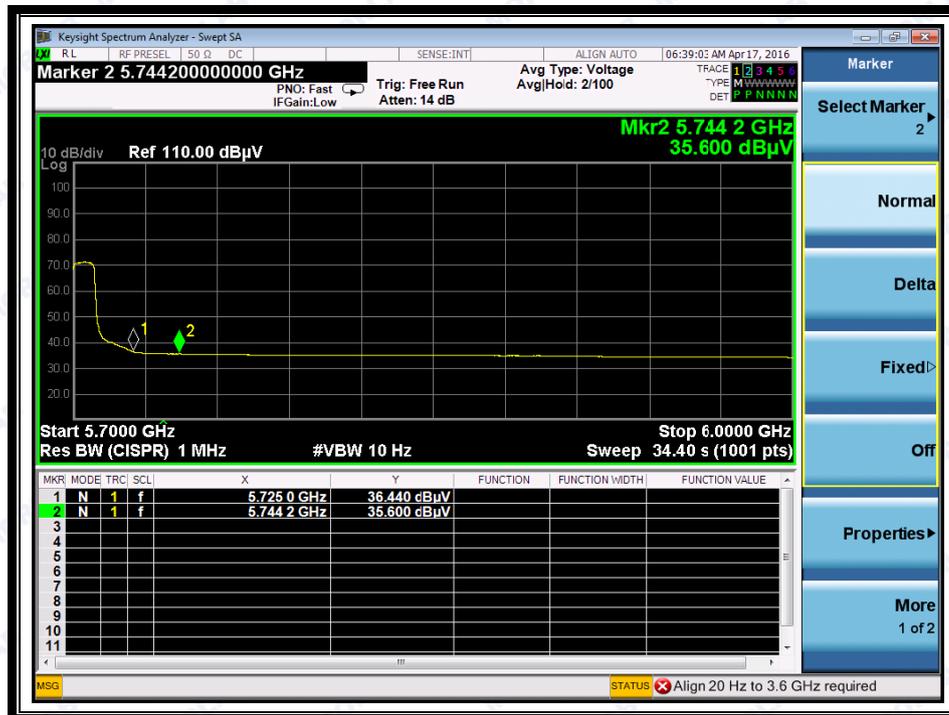
(Channel = 100 PEAK @ 802.11ac)



(Channel =100 AVG @ 802.11ac)



(Channel = 140 PEAK @ 802.11ac)



(Channel = 140 AVG @ 802.11ac)



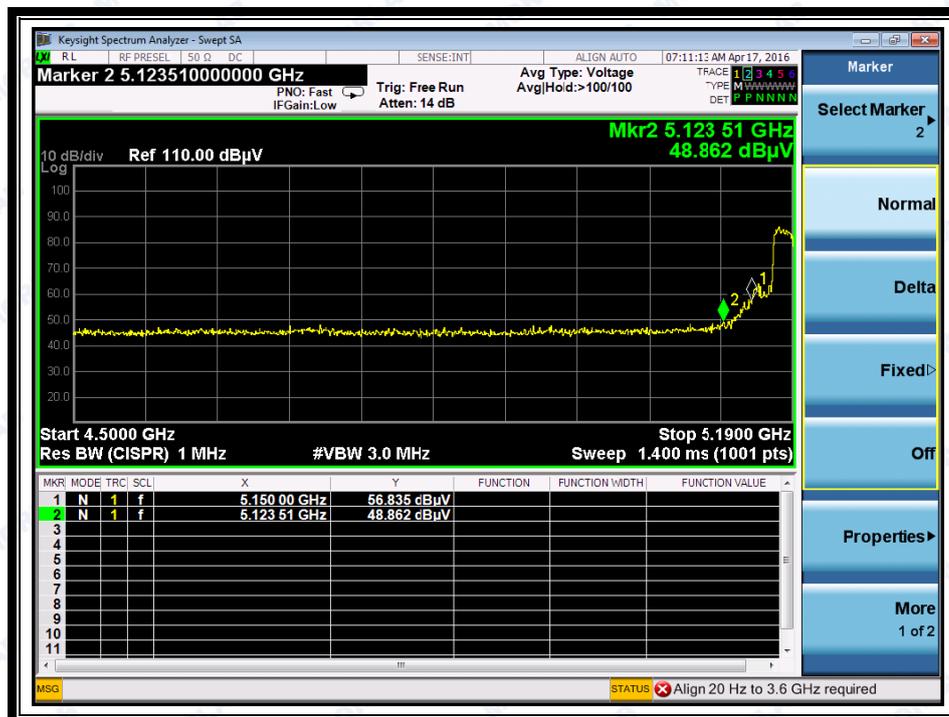
2.5.3.2 802.11ac-40MHz Test mode

The lowest and highest channels are tested to verify the band edge emissions.

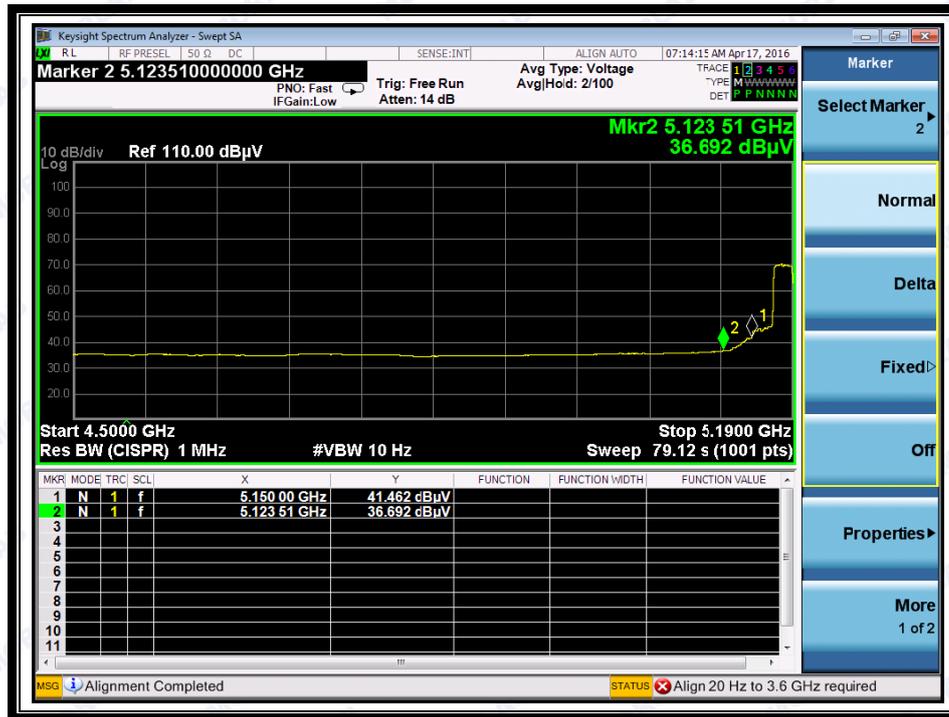
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading	A _T	A _{Factor}	Max. Emission E	Limit	Verdict
		PK/ AV	U _R (dBuV)	(dB)	(dB@3m)	(dBμV/m)	(dBμV/m)	
38	5123.51	PK	48.86	-50.65	32.11	30.32	74	Pass
38	5123.51	AV	36.69	-50.65	32.11	18.15	54	Pass
62	5356.50	PK	54.86	-50.65	32.11	36.32	74	Pass
62	5354.85	AV	40.53	-50.65	32.11	21.99	54	Pass
102	5454.57	PK	47.47	-50.65	32.11	28.93	74	Pass
102	5452.53	AV	35.31	-50.65	32.11	16.77	54	Pass
142	5735.91	PK	53.82	-50.65	32.11	35.28	74	Pass
142	5732.72	AV	41.19	-50.65	32.11	22.65	54	Pass

B. Test Plots:



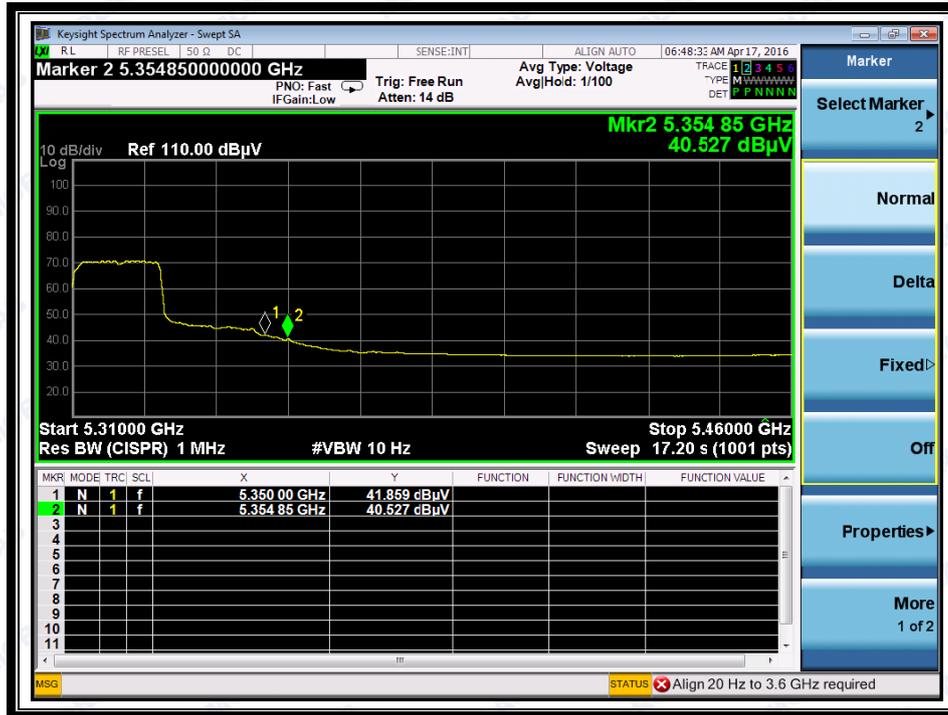
(Channel = 38 PEAK @ 802.11ac)



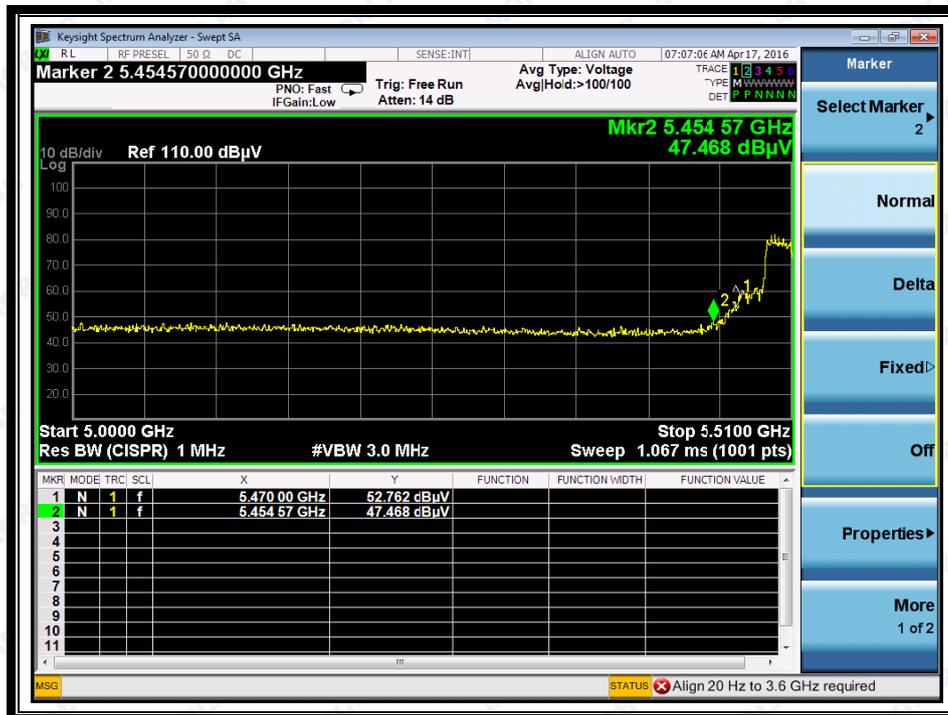
(Channel = 38 AVG @ 802.11ac)



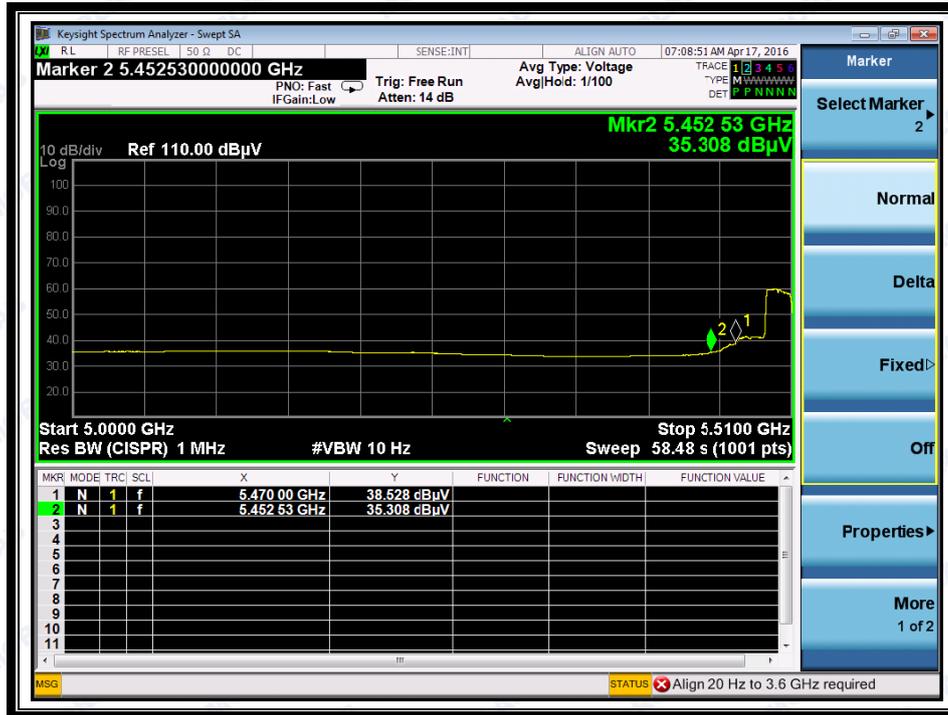
(Channel = 62 PEAK @ 802.11ac)



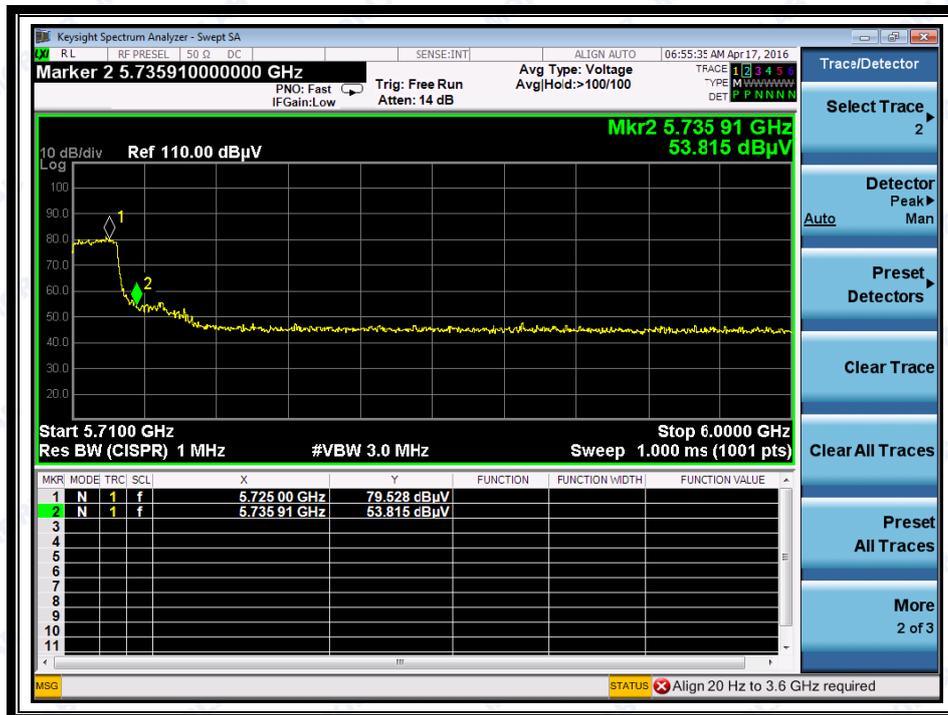
(Channel = 62 AVG @ 802.11ac)



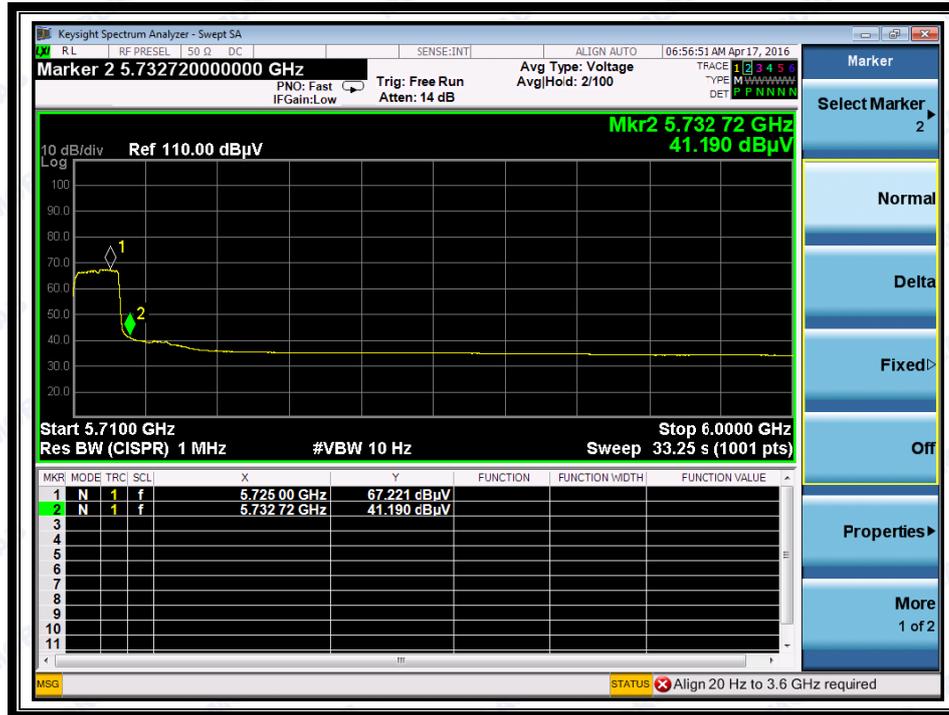
(Channel =102 PEAK @ 802.11ac)



(Channel = 102AVG @ 802.11ac)



(Channel = 142 PEAK @ 802.11ac)



(Channel = 142 AVG @ 802.11ac)

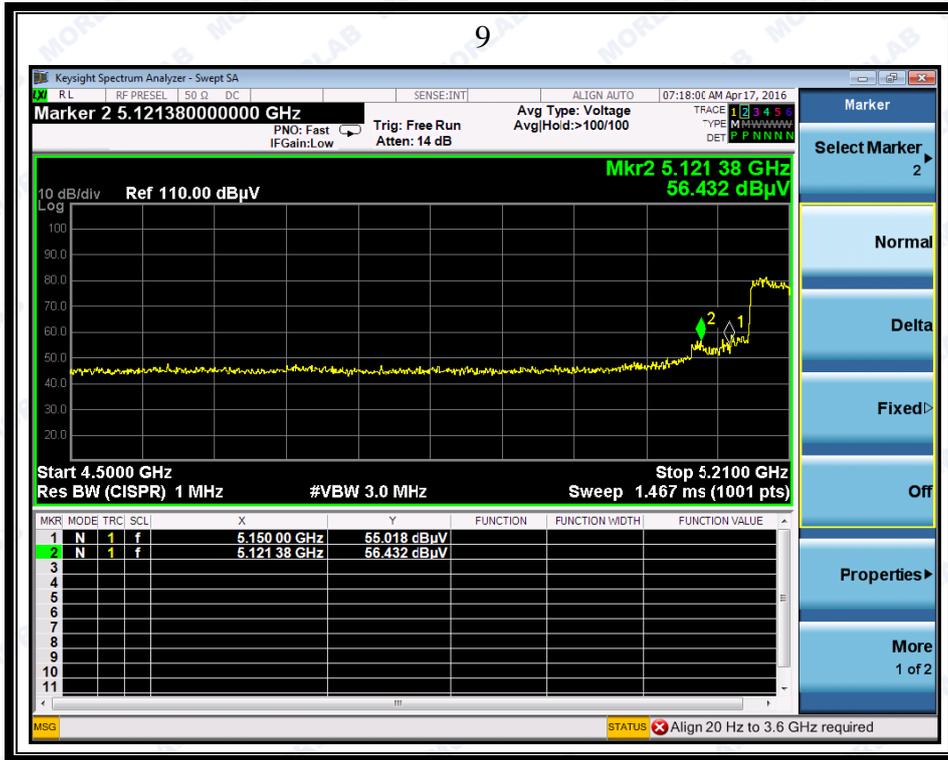
2.5.3.3 802.11ac-80MHz Test mode

The lowest and highest channels are tested to verify the band edge emissions.

A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV						
42	5121.38	PK	56.43	-50.65	32.11	37.89	74	Pass
42	5122.09	AV	40.47	-50.65	32.11	21.93	54	Pass
58	5371.78	PK	52.51	-50.65	32.11	33.97	74	Pass
58	5367.70	AV	36.62	-50.65	32.11	18.08	54	Pass
106	5441.15	PK	56.18	-50.65	32.11	37.64	74	Pass
106	5444.33	AV	37.10	-50.65	32.11	18.56	54	Pass
138	5734.59	PK	58.12	-50.65	32.11	39.58	74	Pass
138	5737.07	AV	37.62	-50.65	32.11	19.08	54	Pass

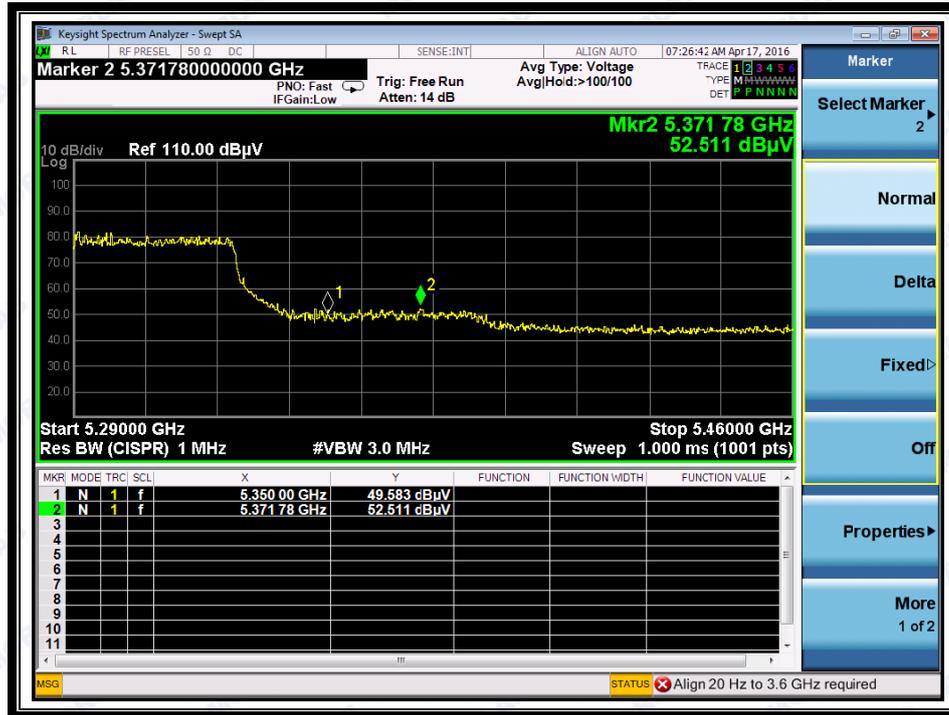
B. Test Plots:



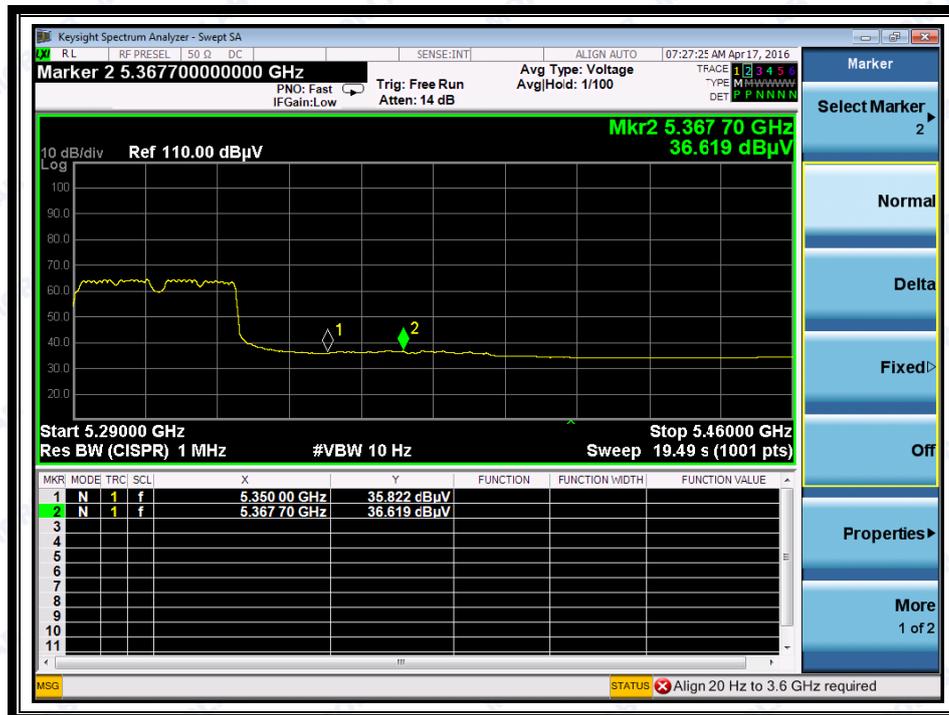
(Channel = 42 PEAK @ 802.11ac)



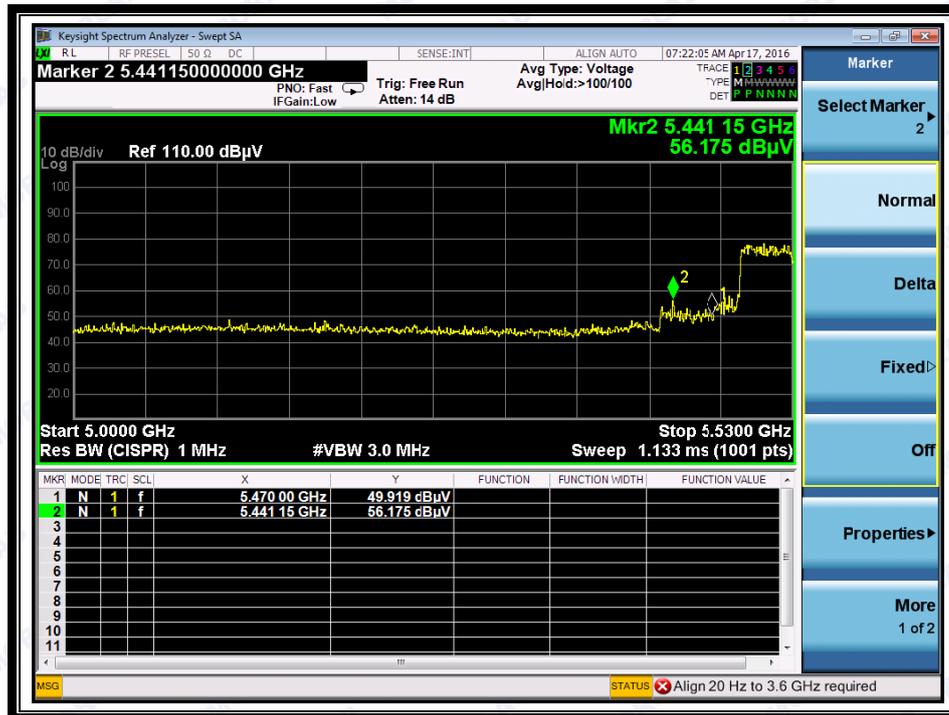
(Channel = 42 AVG @ 802.11ac)



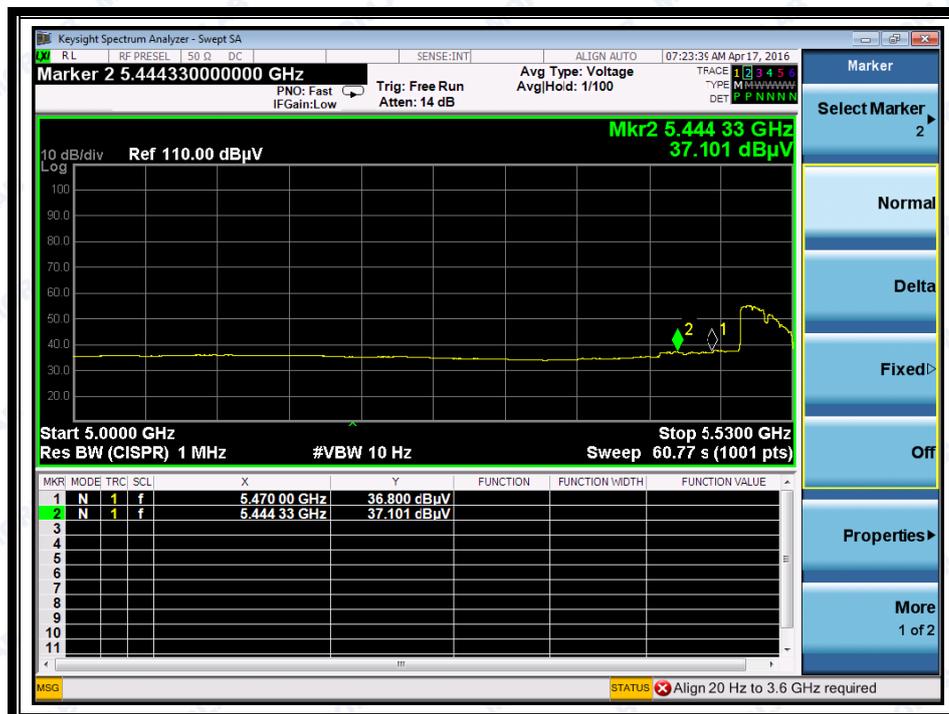
(Channel = 58 PEAK @ 802.11ac)



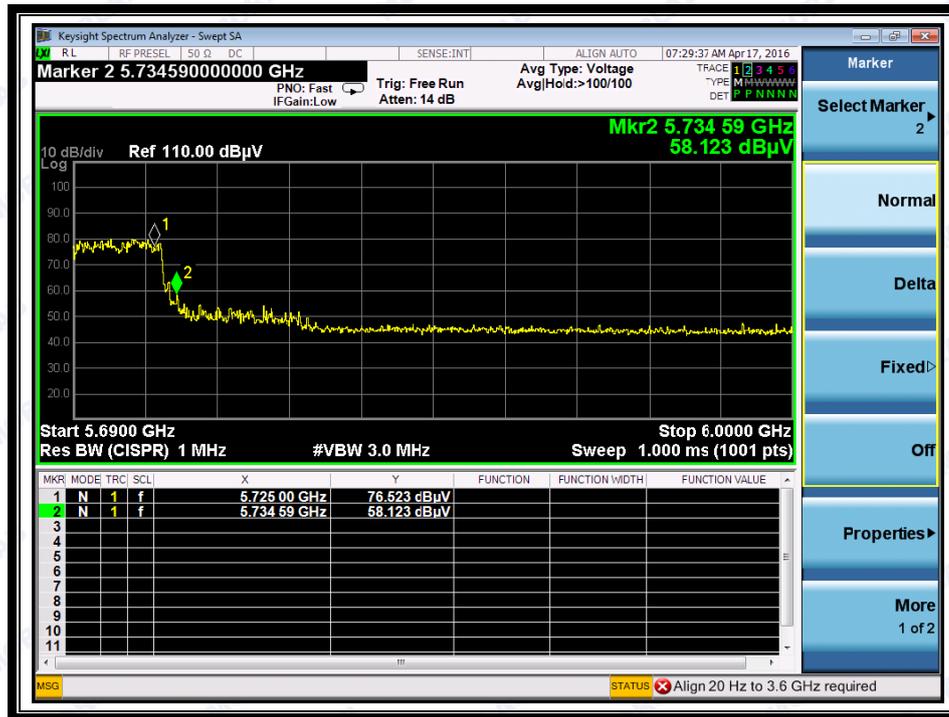
(Channel = 58 PEAK @ 802.11ac)



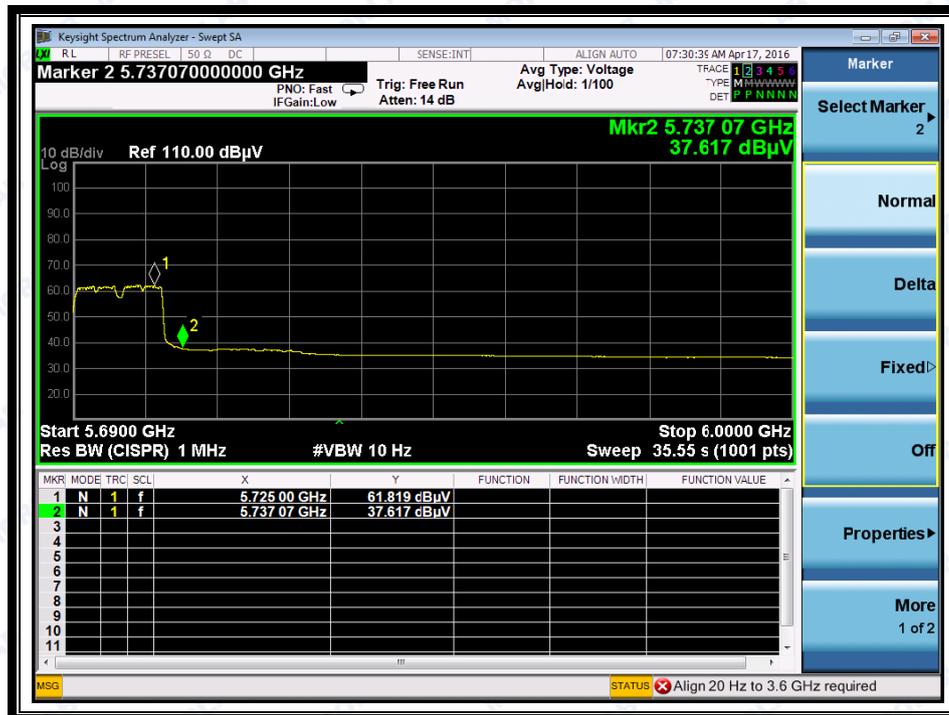
(Channel = 106 PEAK @ 802.11ac)



(Channel = 106 PEAK @ 802.11ac)



(Channel = 138 PEAK @ 802.11ac)



(Channel = 138 PEAK @ 802.11ac)

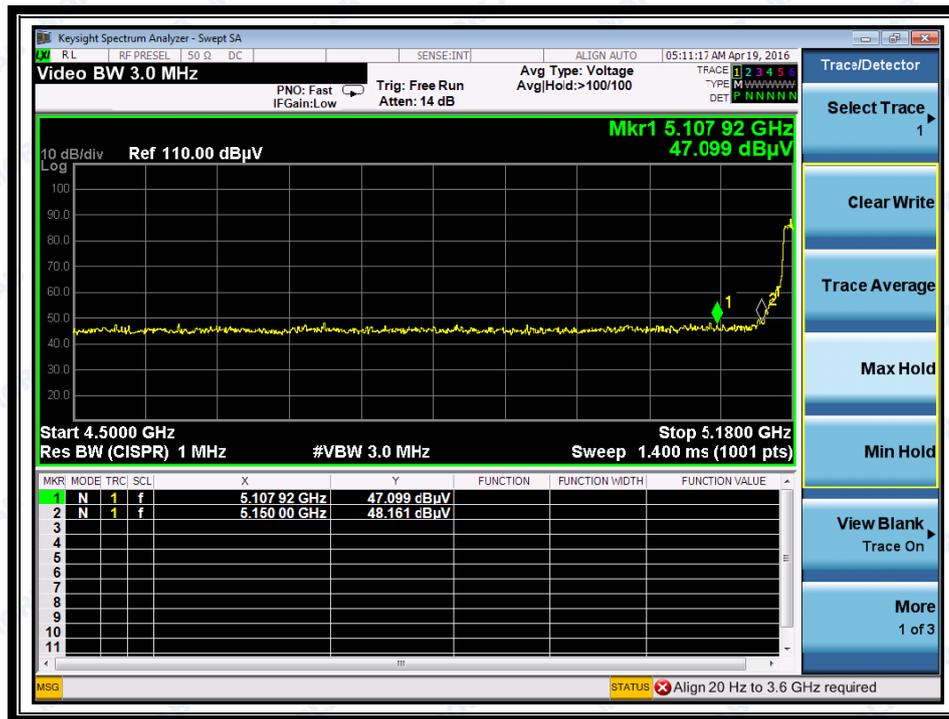
2.5.3.4 802.11n-20MHz Test mode

The lowest and highest channels are tested to verify the band edge emissions.

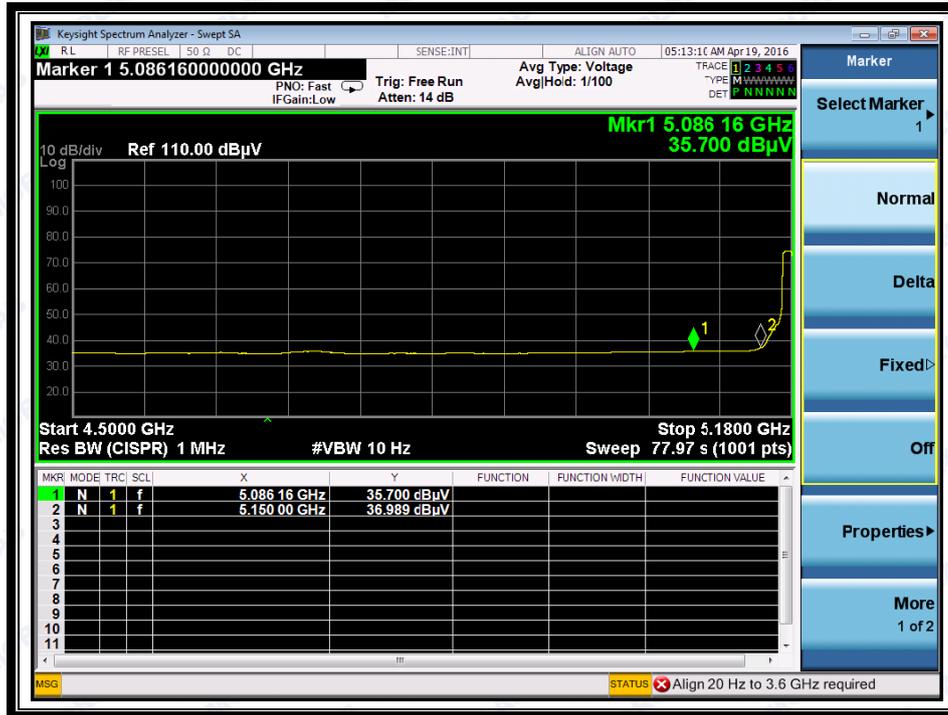
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading	A _T (dB)	A _{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV	U _R (dBuV)					
36	5107.92	PK	47.10	-50.65	32.11	28.56	74	Pass
36	5086.16	AV	35.70	-50.65	32.11	17.16	54	Pass
64	5353.58	PK	47.92	-50.65	32.11	29.38	74	Pass
64	5354.70	AV	35.02	-50.65	32.11	16.48	54	Pass
100	5165.70	PK	47.90	-50.65	32.11	29.36	74	Pass
100	5162.20	AV	35.65	-50.65	32.11	17.11	54	Pass
140	5797.00	PK	45.58	-50.65	32.11	27.04	74	Pass
140	5765.60	AV	35.30	-50.65	32.11	16.76	54	Pass

B. Test Plots:



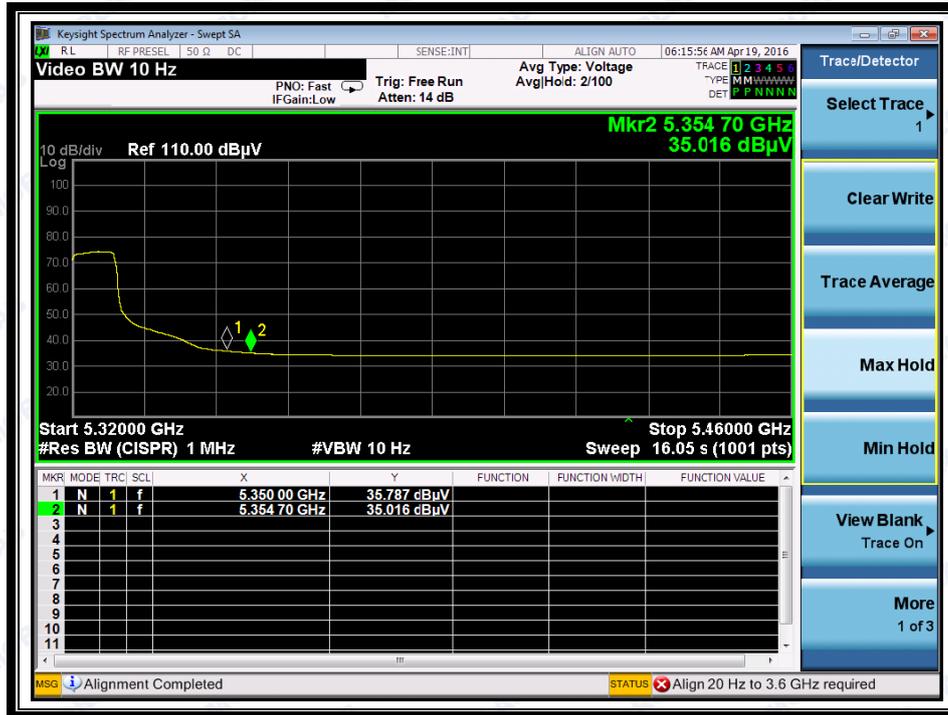
(Channel = 36 PEAK @ 802.11n 20MHz)



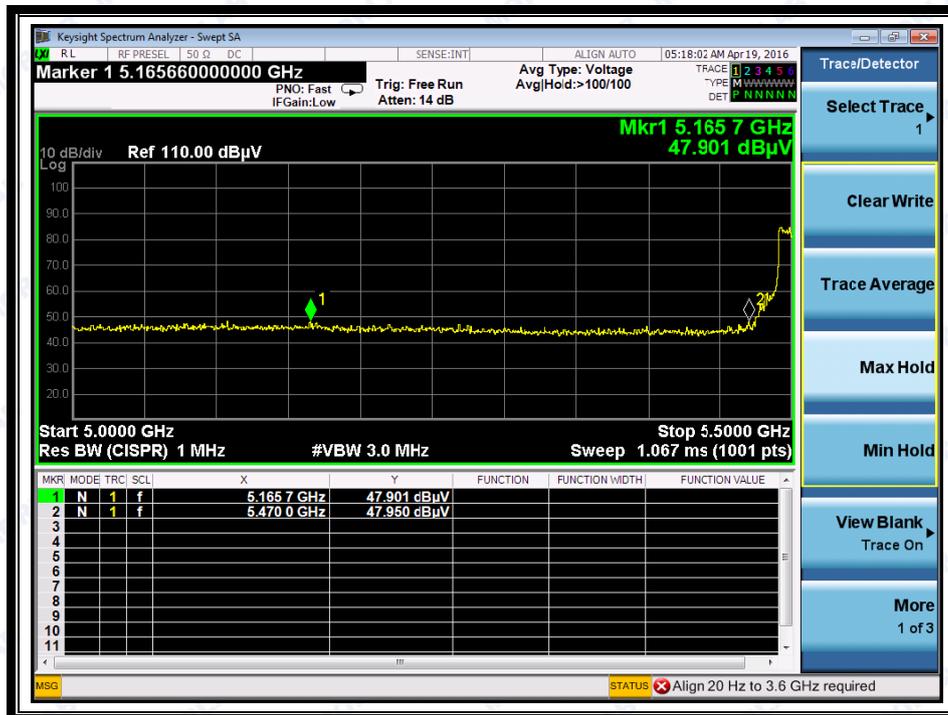
(Channel = 36 AVG @ 802.11n 20MHz)



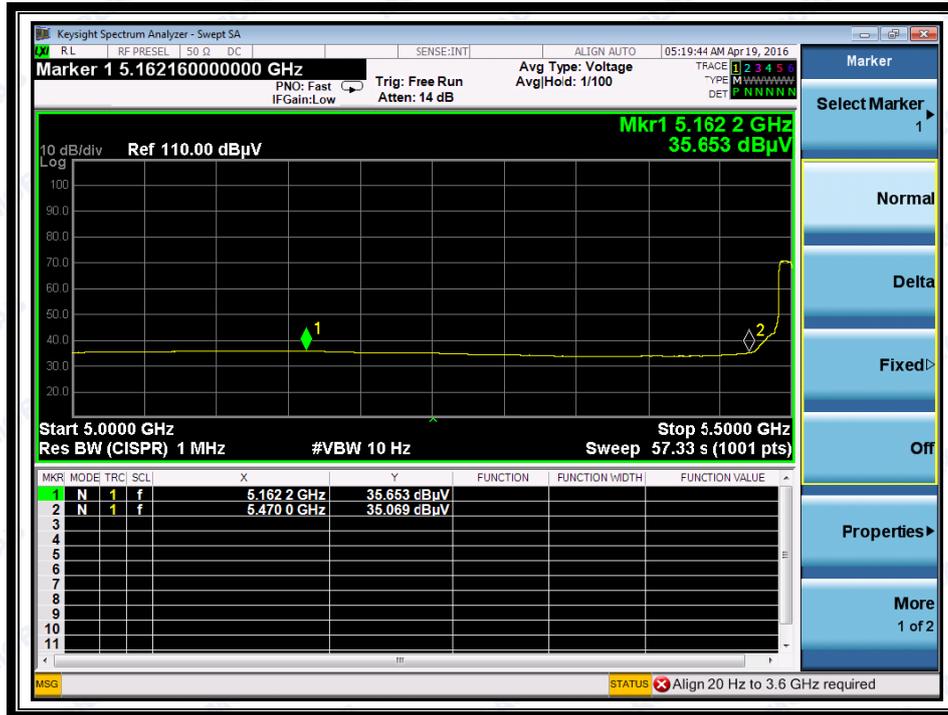
(Channel = 64 PEAK @ 802.11n 20MHz)



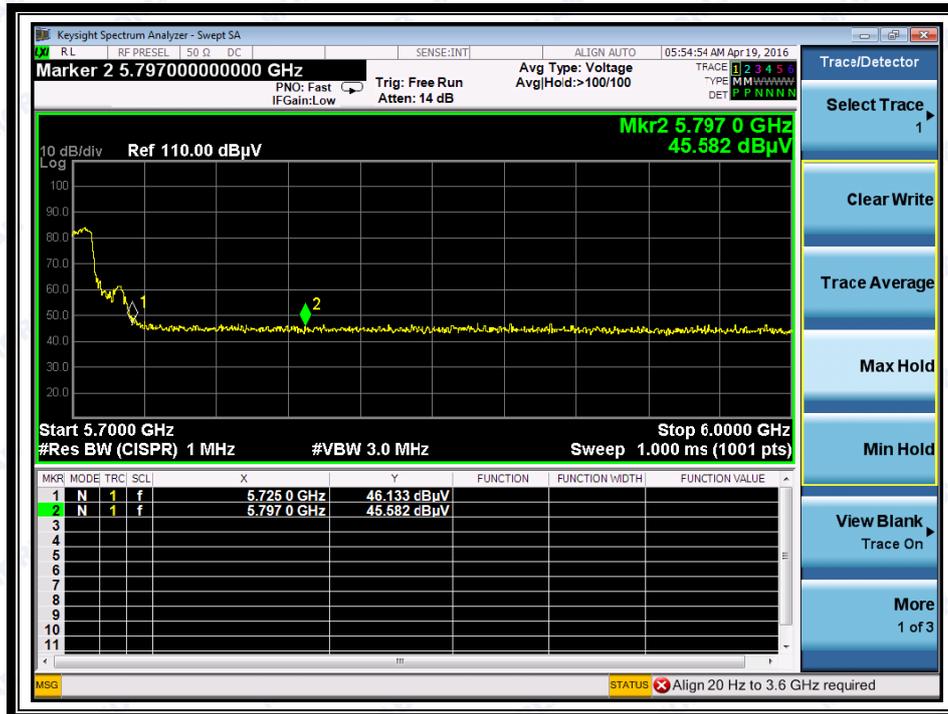
(Channel = 64 AVG @ 802.11n 20MHz)



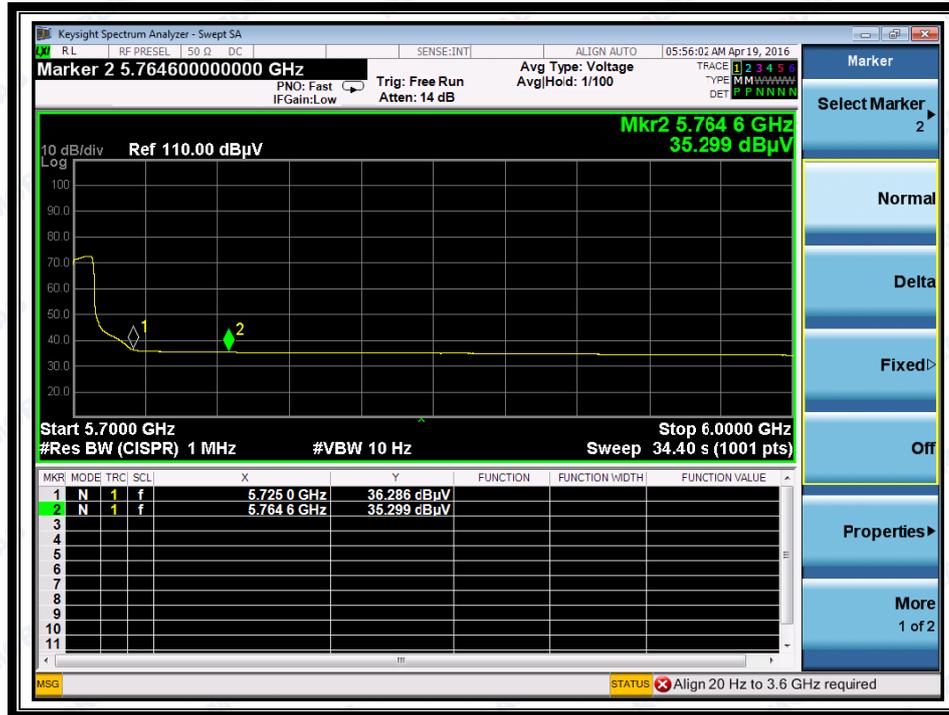
(Channel = 100 PEAK @ 802.11n 20MHz)



(Channel = 100 AVG @ 802.11n 20MHz)



(Channel = 140 PEAK @ 802.11n 20MHz)



(Channel = 140 AVG @ 802.11n 20MHz)

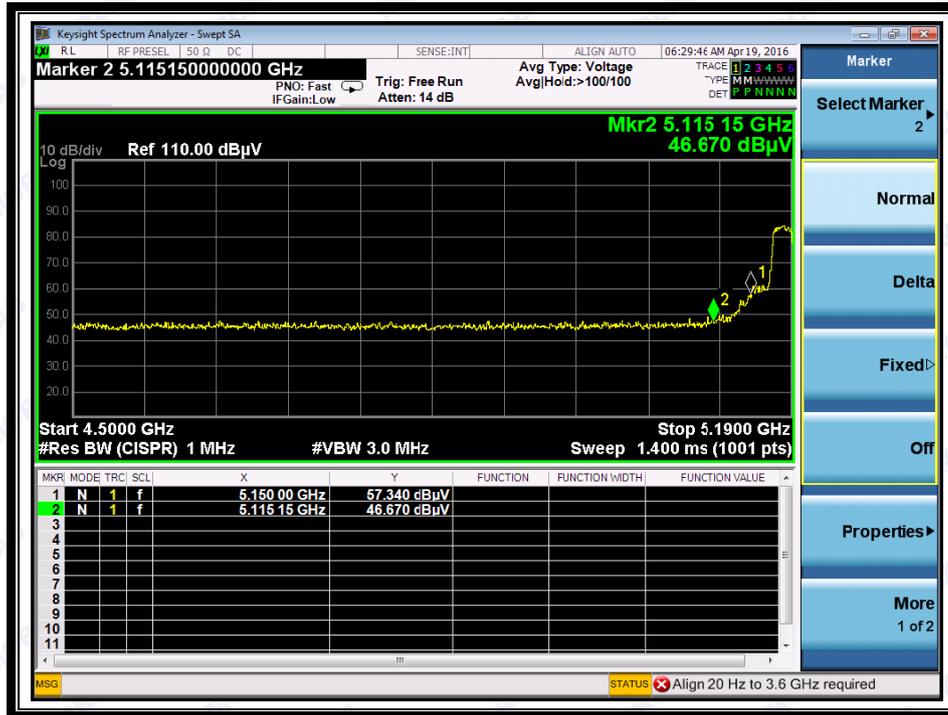
2.5.3.5 802.11n-40MHz Test mode

The lowest and highest channels are tested to verify the band edge emissions.

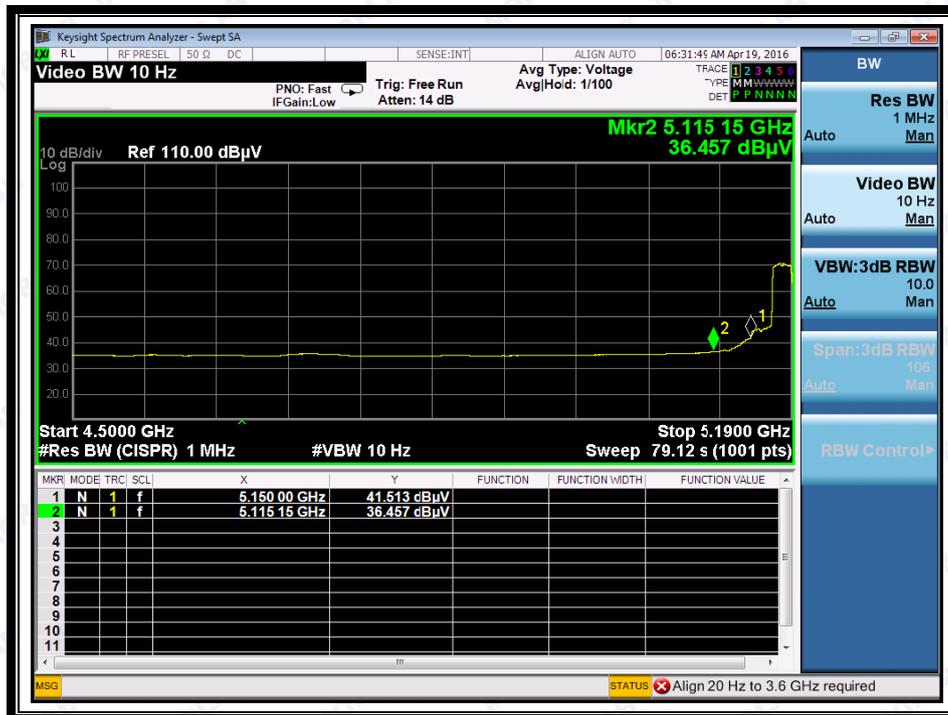
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV						
38	5115.15	PK	46.67	-50.65	32.11	28.13	74	Pass
38	5115.15	AV	36.46	-50.65	32.11	17.92	54	Pass
62	5352.20	PK	58.06	-50.65	32.11	39.52	74	Pass
62	5352.20	AV	41.48	-50.65	32.11	22.94	54	Pass
102	5448.69	PK	46.65	-50.65	32.11	28.11	74	Pass
102	5454.30	AV	35.58	-50.65	32.11	17.04	54	Pass
142	5744.22	PK	60.84	-50.65	32.11	42.3	74	Pass
142	5744.22	AV	43.53	-50.65	32.11	24.99	54	Pass

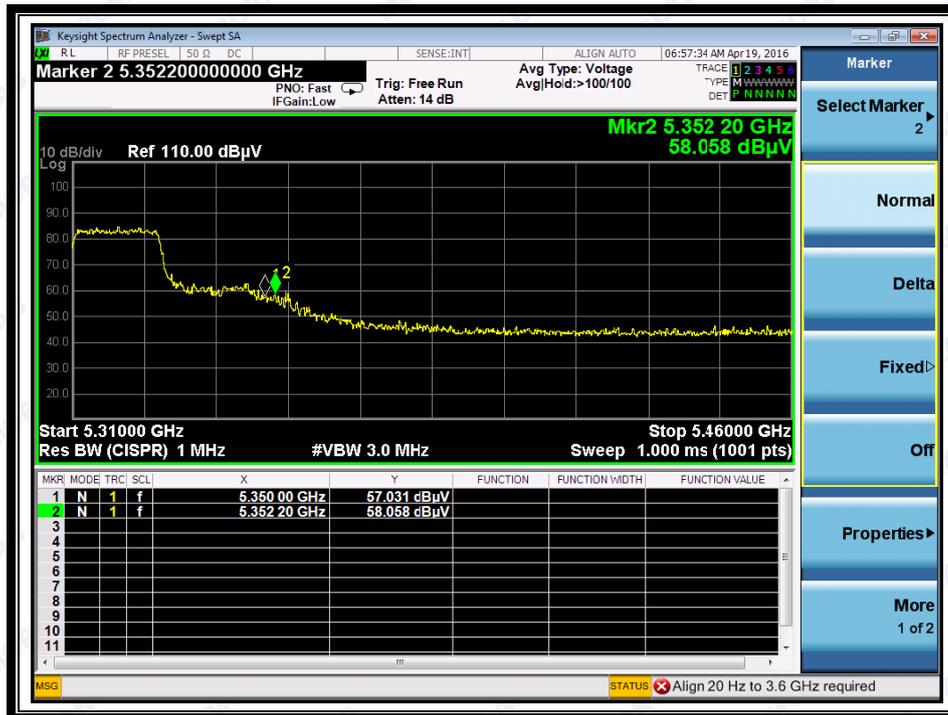
B. Test Plots:



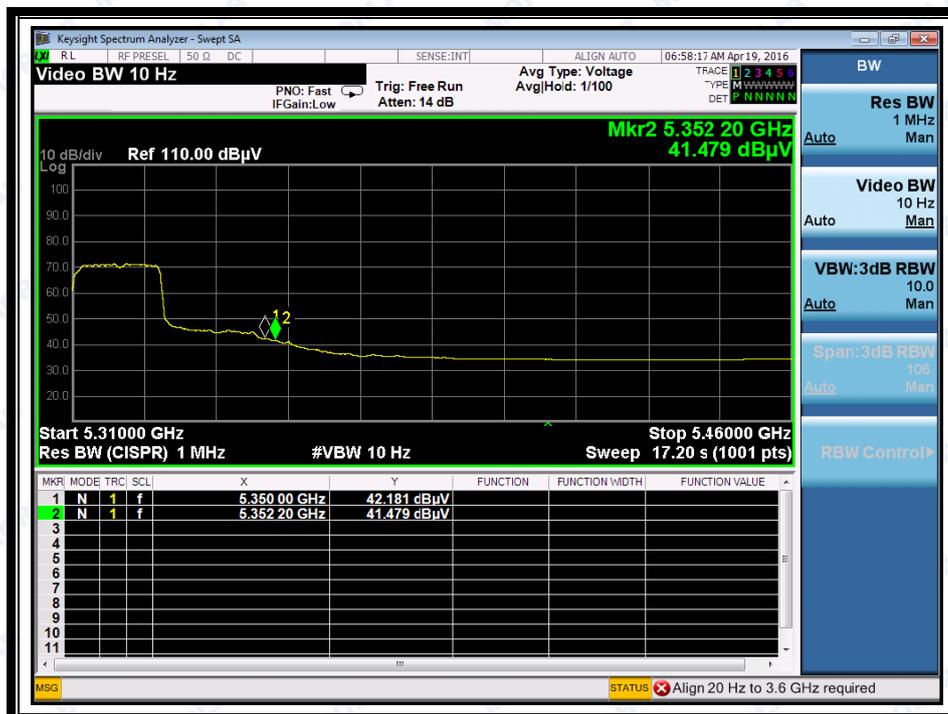
(Channel = 38 PEAK @ 802.11n 40MHz)



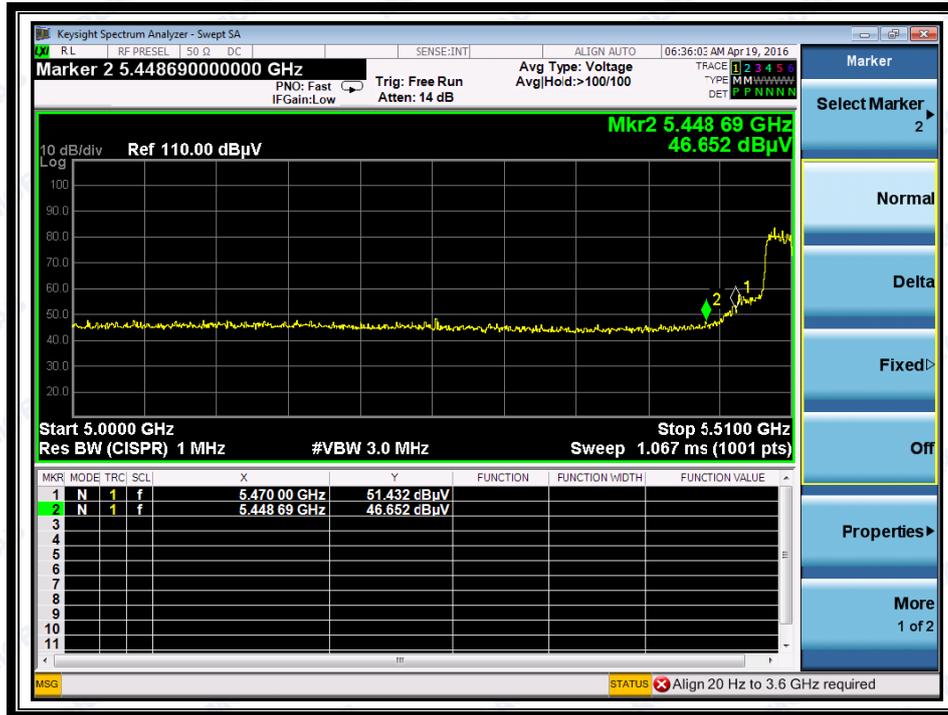
(Channel = 38 AVG @ 802.11n 40MHz)



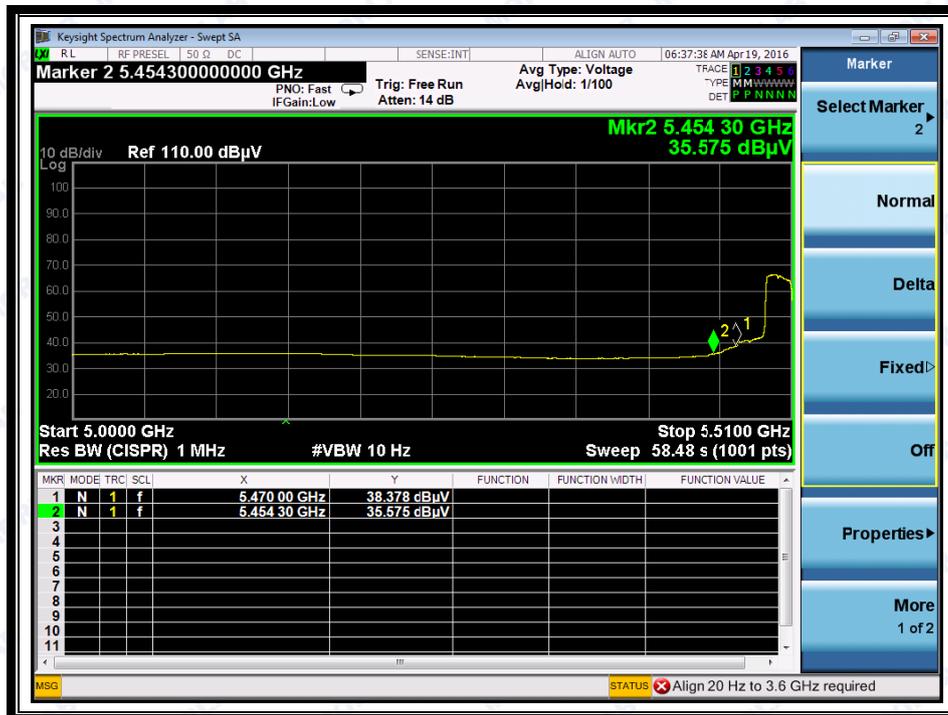
(Channel = 62 PEAK @ 802.11n 40MHz)



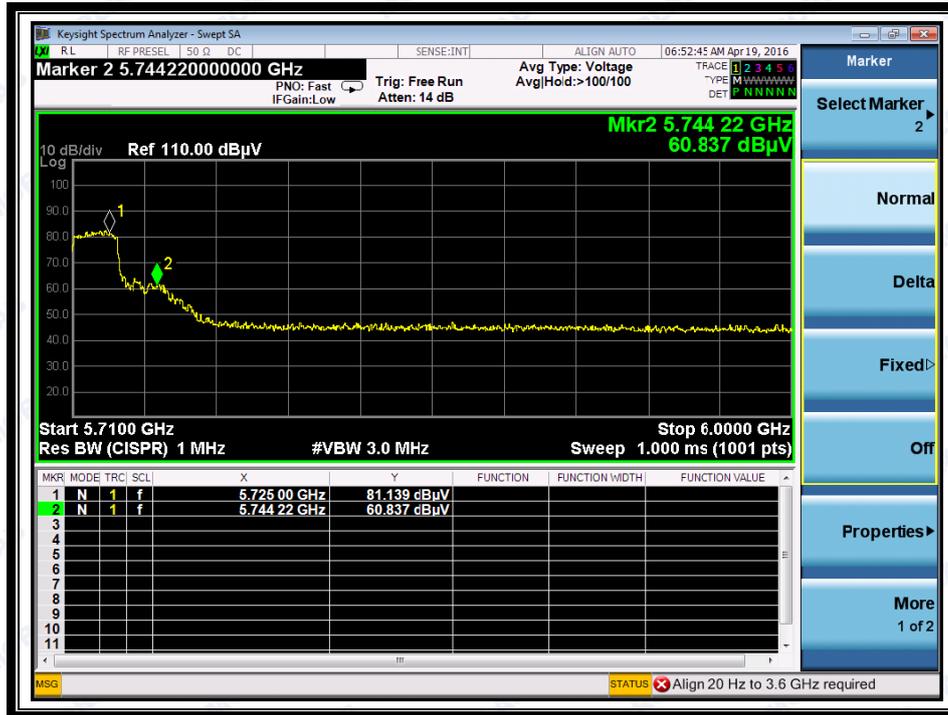
(Channel = 62 AVG @ 802.11n 40MHz)



(Channel =102 PEAK @ 802.11n 40MHz)



(Channel = 102AVG @ 802.11n 40MHz)



(Channel = 142 PEAK @ 802.11n 40MHz)



(Channel = 142 AVG @ 802.11n 40MHz)



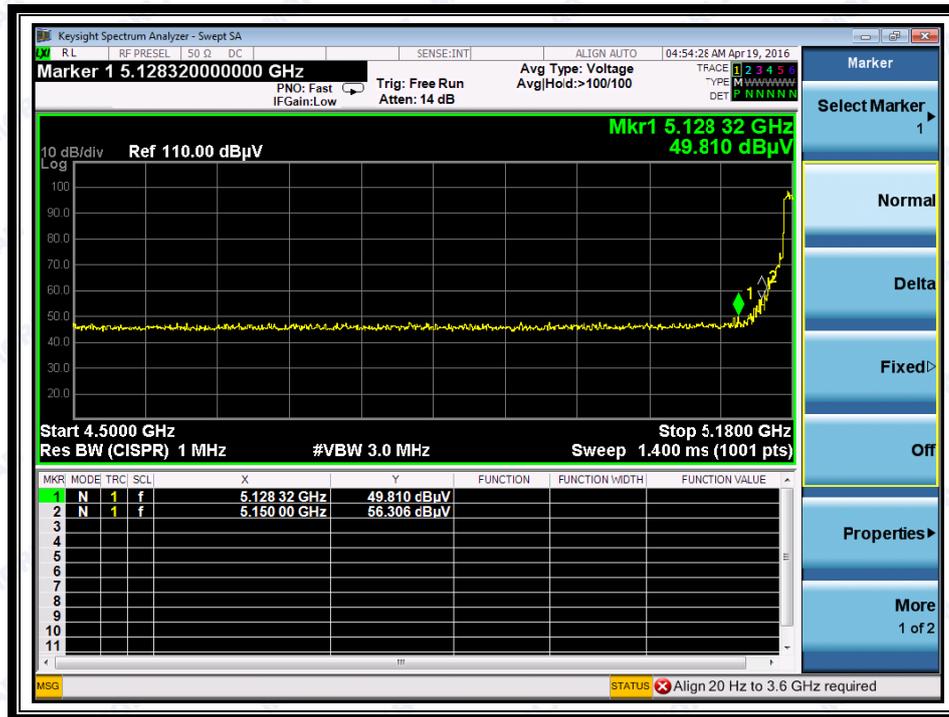
2.5.3.6 802.11a Test mode

The lowest and highest channels are tested to verify the band edge emissions.

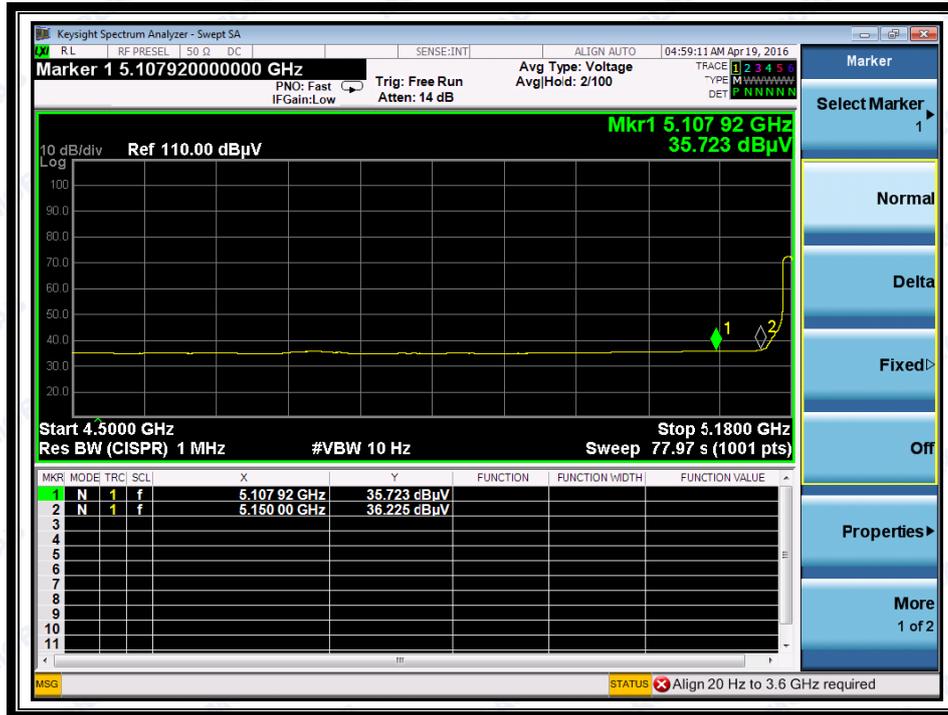
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading	A _T (dB)	A _{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV	U _R (dBuV)					
36	5128.32	PK	49.81	-50.65	32.11	31.27	74	Pass
36	5107.92	AV	35.72	-50.65	32.11	17.18	54	Pass
64	5354.70	PK	50.20	-50.65	32.11	31.66	74	Pass
64	5354.70	AV	35.47	-50.65	32.11	16.93	54	Pass
100	5394.20	PK	46.52	-50.65	32.11	27.98	74	Pass
100	5373.70	AV	33.80	-50.65	32.11	15.26	54	Pass
140	5776.00	PK	48.44	-50.65	32.11	29.9	74	Pass
140	5767.00	AV	35.29	-50.65	32.11	16.75	54	Pass

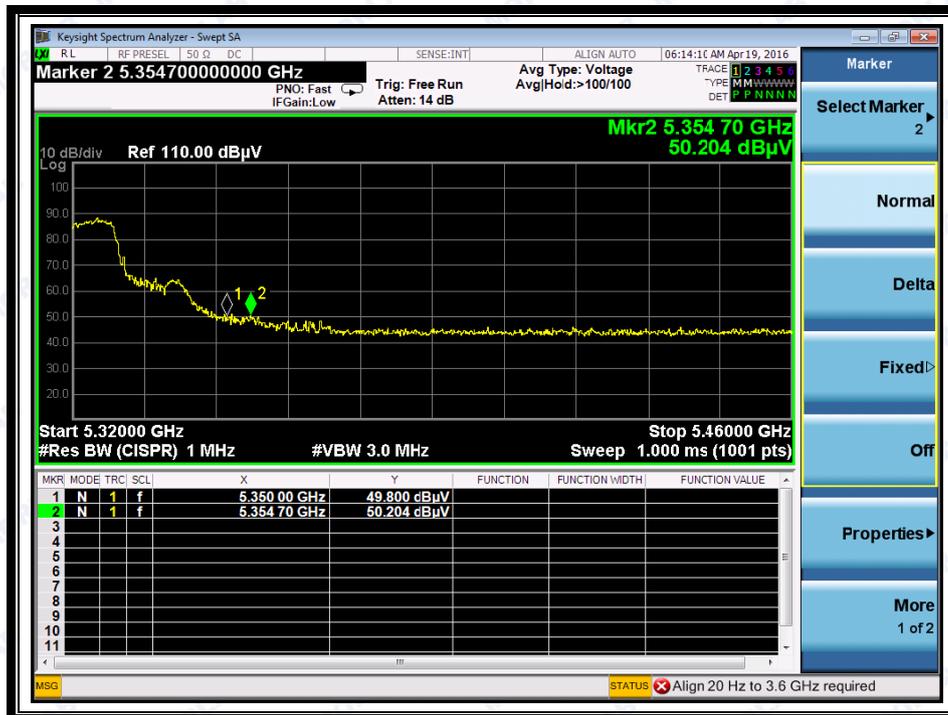
B. Test Plots:



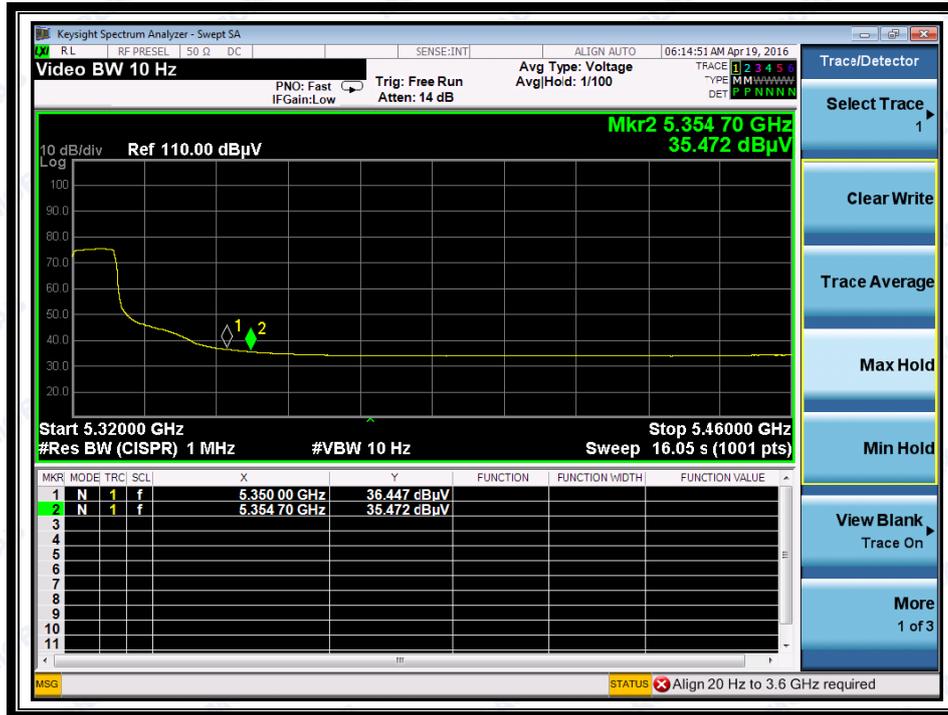
(Channel = 36 PEAK @ 802.11a)



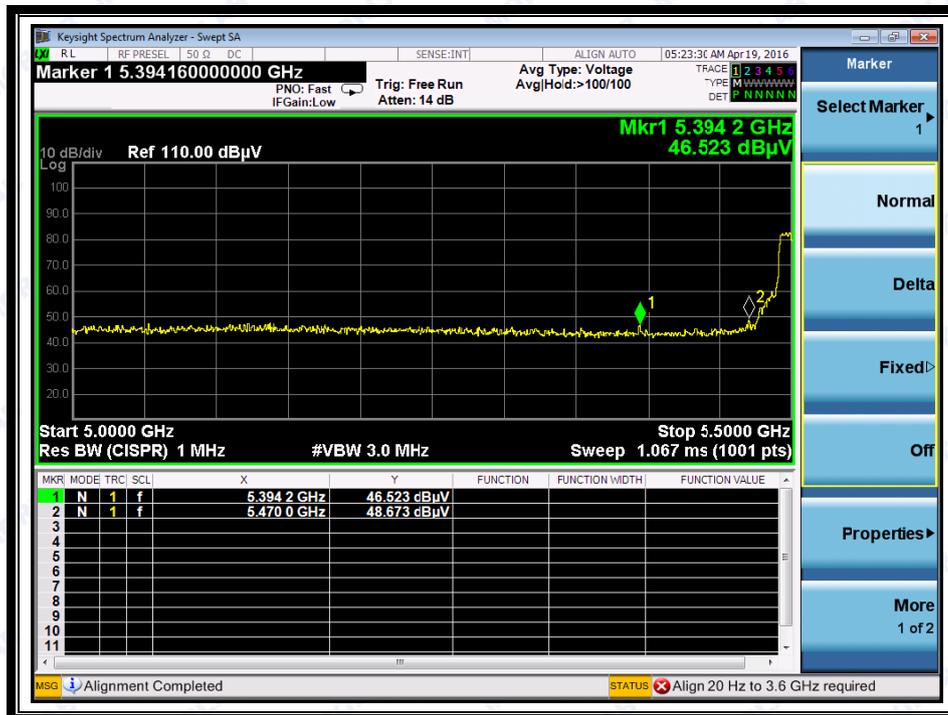
(Channel = 36 AVG @ 802.11a)



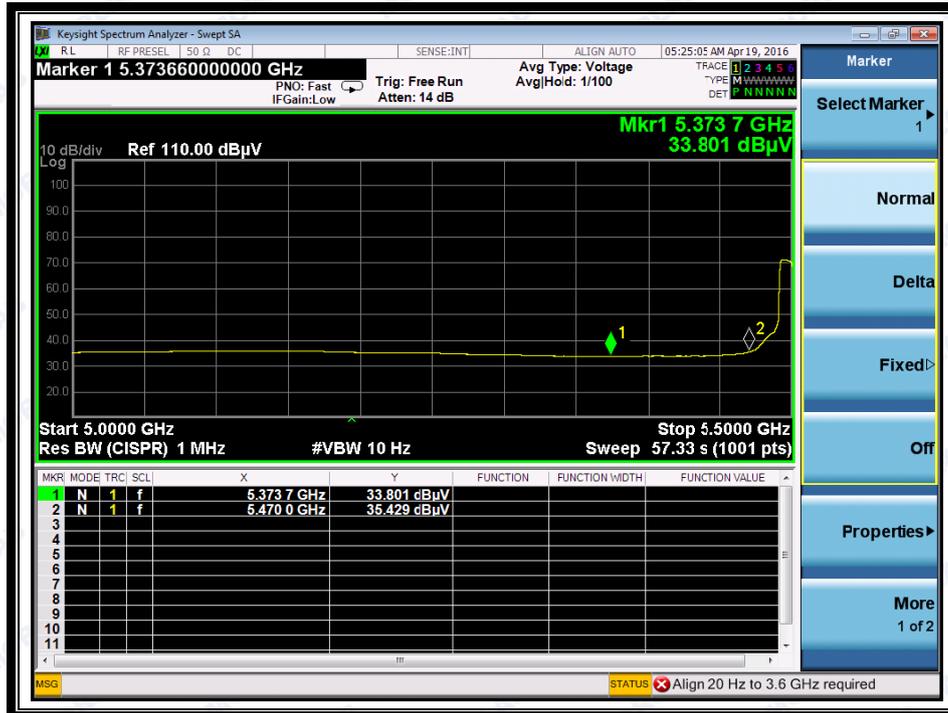
(Channel = 64 PEAK @ 802.11a)



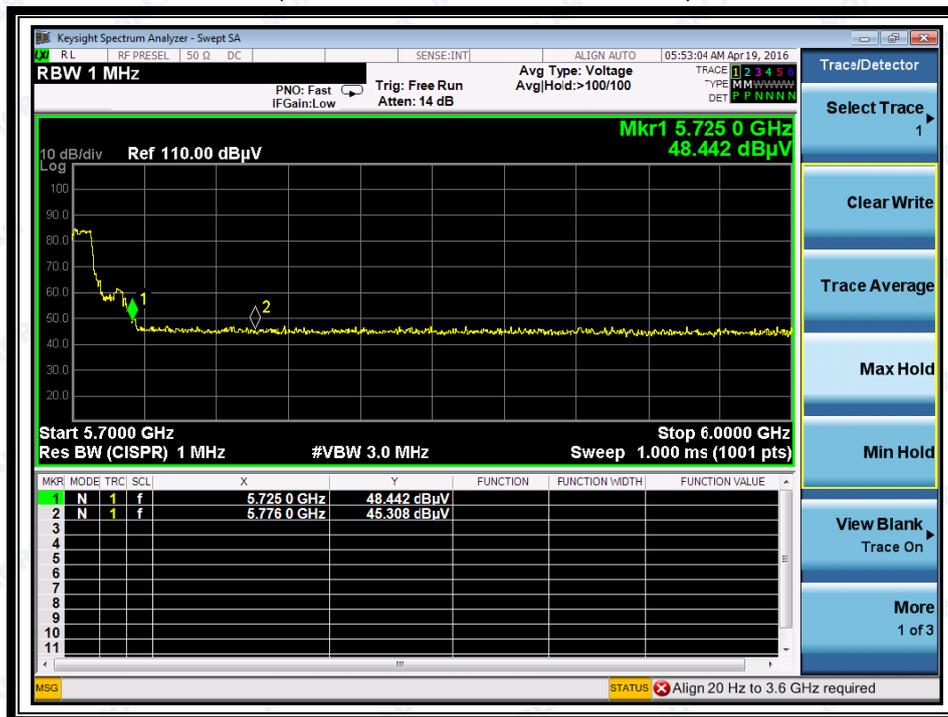
(Channel = 64 AVG @ 802.11a)



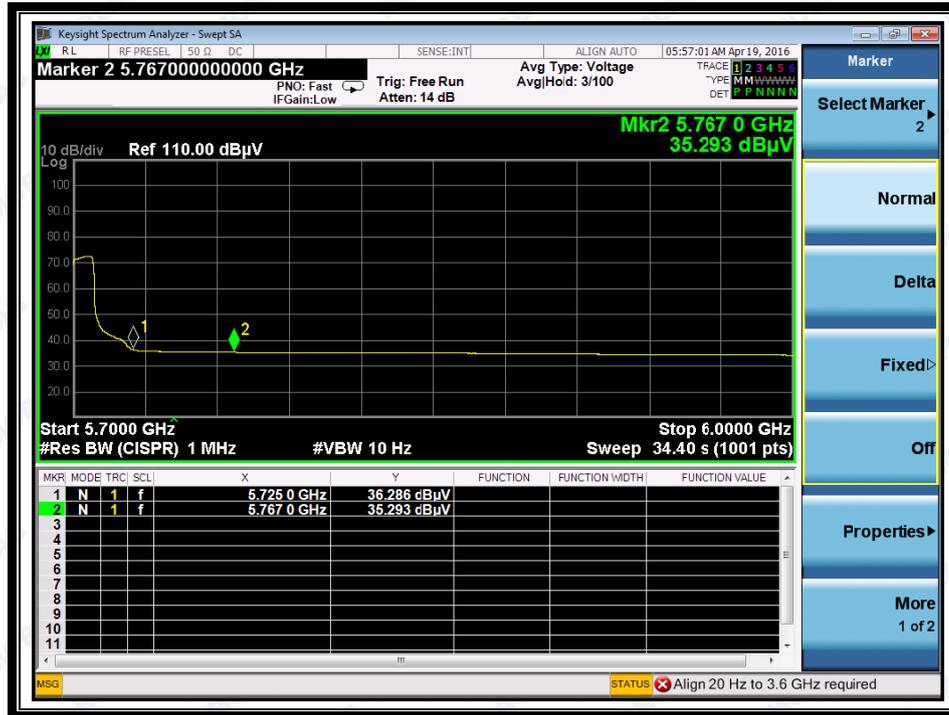
(Channel = 100 PEAK @ 802.11a)



(Channel = 100 AVG @ 802.11a)



(Channel = 140 PEAK @ 802.11a)



(Channel = 140 AVG @ 802.11a)



2.6 Frequency Stability

2.6.1 Requirement

Manufacturers 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.

2.6.2 Test Procedure

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30°C and +50°C. The temperature was incremented by 10° intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded. Data for the worst case channel is shown below.

2.6.3 Test Result

Frequency Stability Measurements for UNII Band 1 (Ch. 36)

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq Dev. (Hz)	Deviation (%)
100%	5.0	+20(Ref)	5,179,999,991	9	0.00000015
100%		-30	5,180,000,004	-4	-0.00000008
100%		-20	5,180,000,001	3	0.00000006
100%		-10	5,179,999,989	-9	-0.00000017
100%		0	5,179,999,999	-15	-0.00000029
100%		+10	5,180,000,005	-7	-0.00000014
100%		+20	5,179,999,990	-10	-0.00000019
100%		+30	5,180,000,011	10	0.00000019
100%		+40	5,180,000,001	4	0.00000008
100%		+50	5,179,999,996	-12	-0.00000023
114%		4.75	+20	5,180,000,013	9
BATT.END POINT	5.25	+20	5,179,999,988	-3	-0.00000006



Frequency Stability Measurements for UNII Band 2A (Ch. 52)

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq Dev. (Hz)	Deviation (%)
100%	5.0	+20(Ref)	5,260,000,012	12	0.00000023
100%		-30	5,260,000,066	66	0.00000125
100%		-20	5,259,999,969	-31	-0.00000059
100%		-10	5,260,000,085	85	0.00000162
100%		0	5,260,000,037	37	0.00000070
100%		+10	5,259,999,919	-81	-0.00000154
100%		+20	5,259,999,962	-38	-0.00000072
100%		+30	5,259,999,925	-75	-0.00000143
100%		+40	5,260,000,033	33	0.00000063
100%		+50	5,260,000,084	84	0.00000160
114%		4.75	+20	5,259,999,966	-34
BATT.END POINT	5.25	+20	5,259,999,978	-22	-0.00000042

Frequency Stability Measurements for UNII Band 2C (Ch. 100)

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq Dev. (Hz)	Deviation (%)
100%	5.0	+20(Ref)	5,499,999,997	-3	-0.00000005
100%		-30	5,499,999,926	-74	-0.00000135
100%		-20	5,500,000,051	51	0.00000093
100%		-10	5,499,999,962	-38	-0.00000069
100%		0	5,500,000,088	88	0.00000160
100%		+10	5,500,000,034	34	0.00000062
100%		+20	5,500,000,051	51	0.00000093
100%		+30	5,500,000,016	16	0.00000029
100%		+40	5,499,999,935	-65	-0.00000118
100%		+50	5,500,000,043	43	0.00000078
114%		4.75	+20	5,500,000,092	92
BATT.END POINT	5.25	+20	5,499,999,968	-32	-0.00000058



Frequency Stability Measurements for UNII Band 3 (Ch. 149)

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq Dev. (Hz)	Deviation (%)
100%	5.0	+20(Ref)	5,744,999,989	-8	-0.00000014
100%		-30	5,744,999,993	-17	-0.00000030
100%		-20	5,745,000,016	11	0.00000019
100%		-10	5,744,999,991	-4	-0.00000007
100%		0	5,745,000,005	3	0.00000005
100%		+10	5,745,000,011	-13	-0.00000023
100%		+20	5,745,000,008	13	0.00000023
100%		+30	5,745,000,004	7	0.00000012
100%		+40	5,744,999,990	-9	-0.00000016
100%		+50	5,745,000,005	9	0.00000016
114%		4.75	+20	5,745,000,010	1
BATT.ENDP OINT	5.25	+20	5,744,999,993	-5	-0.00000009

Note: Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.



2.7 Transmit Power Control (TPC) and Dynamic Frequency Selection (DFS)

2.7.1 Requirement

According to FCC section 15.407(h), (1) Transmit power control (TPC). U-NII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

(2) Radar Detection Function of Dynamic Frequency Selection (DFS). U-NII devices operating with any part of its 26 dB emission bandwidth in the 5.25-5.35 GHz and 5.47-5.725 GHz bands shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems. Operators shall only use equipment with a DFS mechanism that is turned on when operating in these bands. The device must sense for radar signals at 100 percent of its emission bandwidth. The minimum DFS detection threshold for devices with a maximum e.i.r.p. of 200 mW to 1 W is -64 dBm. For devices that operate with less than 200 mW e.i.r.p. and a power spectral density of less than 10 dBm in a 1 MHz band, the minimum detection threshold is -62 dBm. The detection threshold is the received power averaged over 1 microsecond referenced to a 0 dBi antenna. For the initial channel setting, the manufacturers shall be permitted to provide for either random channel selection or manual channel selection.

A U-NII network will employ a DFS function to detect signals from radar systems and to avoid co-channel operation with these systems. This applies to the 5250-5350 MHz and/or 5470-5725 MHz bands.¹

Within the context of the operation of the DFS function, a U-NII device will operate in either Master Mode or Client Mode. U-NII devices operating in Client Mode can only operate in a network controlled by a U-NII device operating in Master Mode.²

Tables 1 and 2 shown below summarize the information contained in sections 5.1.1 and 5.1.2.

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes



Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode	
	Master	Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar Detection	Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required

Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.

The operational behavior and individual DFS requirements that are associated with these modes are as follows:

2.7.1.1 Master Devices

- a) The Master Device will use DFS in order to detect Radar Waveforms with received signal strength above the DFS Detection Threshold in the 5250 – 5350 MHz and 5470 – 5725 MHz bands. DFS is not required in the 5150 – 5250 MHz or 5725 – 5825 MHz bands.
- b) Before initiating a network on a Channel, the Master Device will perform a Channel Availability Check for a specified time duration (Channel Availability Check Time) to ensure that there is no radar system operating on the Channel, using DFS described under subsection a) above.
- c) The Master Device initiates a U-NII network by transmitting control signals that will enable other U-NII devices to Associate with the Master Device.
- d) During normal operation, the Master Device will monitor the Channel (In-Service Monitoring) to ensure that there is no radar system operating on the Channel, using DFS described under a).
- e) If the Master Device has detected a Radar Waveform during In-Service Monitoring as described under d), the Operating Channel of the U-NII network is no longer an Available Channel. The Master Device will instruct all associated Client Device(s) to stop transmitting on this Channel within the Channel Move Time. The transmissions during the Channel Move Time will be limited to



the Channel Closing Transmission Time.

f) Once the Master Device has detected a Radar Waveform it will not utilize the Channel for the duration of the Non-Occupancy Period. 3

g) If the Master Device delegates the In-Service Monitoring to a Client Device, then the combination will be tested to the requirements described under d) through f) above.

2.7.1.2 Client Devices

a) A Client Device will not transmit before having received appropriate control signals from a Master Device.

b) A Client Device will stop all its transmissions whenever instructed by a Master Device to which it is associated and will meet the Channel Move Time and Channel Closing Transmission Time requirements. The Client Device will not resume any transmissions until it has again received control signals from a Master Device.

c) If a Client Device is performing In-Service Monitoring and detects a Radar Waveform above the DFS Detection Threshold, it will inform the Master Device. This is equivalent to the Master Device detecting the Radar Waveform and d) through f) of section 5.1.1 apply.

d) Irrespective of Client Device or Master Device detection the Channel Move Time and Channel Closing Transmission Time requirements remain the same.

e) The client test frequency must be monitored to ensure no transmission of any type has occurred for 30 minutes. Note: If the client moves with the master, the device is considered compliant if nothing appears in the client non-occupancy period test. For devices that shut down (rather than moving channels), no beacons should appear.

2.7.1.3 DFS Detection Thresholds

Table 3 below provides the DFS Detection Thresholds for Master Devices as well as Client Devices incorporating In-Service Monitoring.

Table 3: DFS Detection Thresholds for Master Devices and Client Devices With Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP ≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm

Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.

Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.

Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.

2.7.1.4 Response Requirements

Table 4 provides the response requirements for Master and Client Devices incorporating DFS.

Table 4: DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.

Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.

Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

2.7.2 Test Description

Section 7.2 of KDB 905462 D02 V01R01

B. Test Setup:

B.1 Setup for Master with injection at the Master

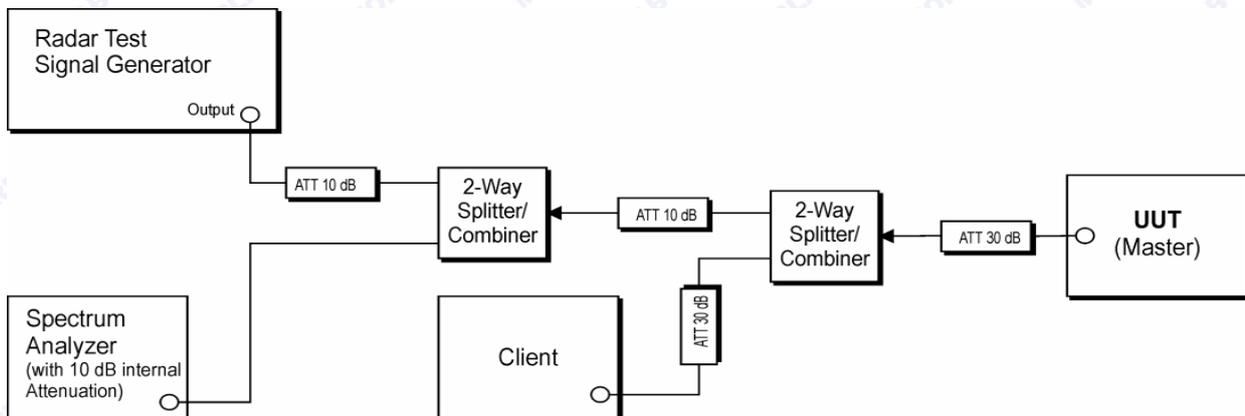


Figure 2: Example Conducted Setup where UUT is a Master and Radar Test Waveforms are injected into the Master

B.2 Setup for Client with injection at the Master

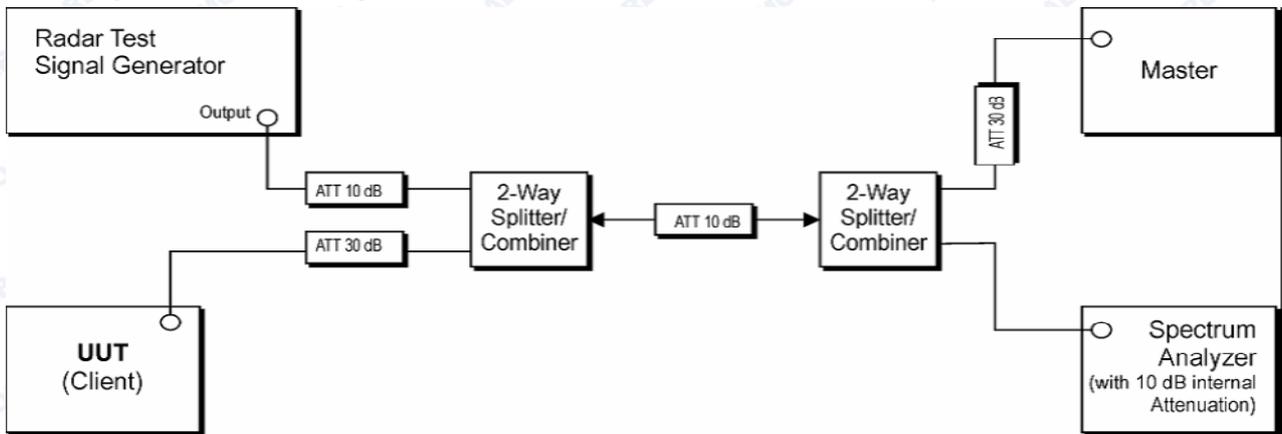


Figure 3: Example Conducted Setup where UUT is a Client and Radar Test Waveforms are injected into the Master

B.3 Setup for Client with injection at the Client

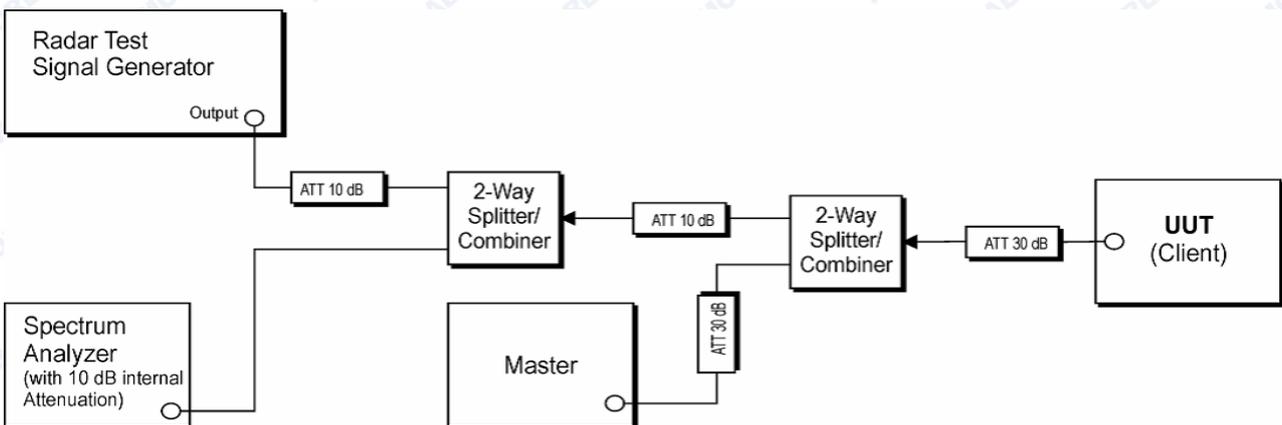
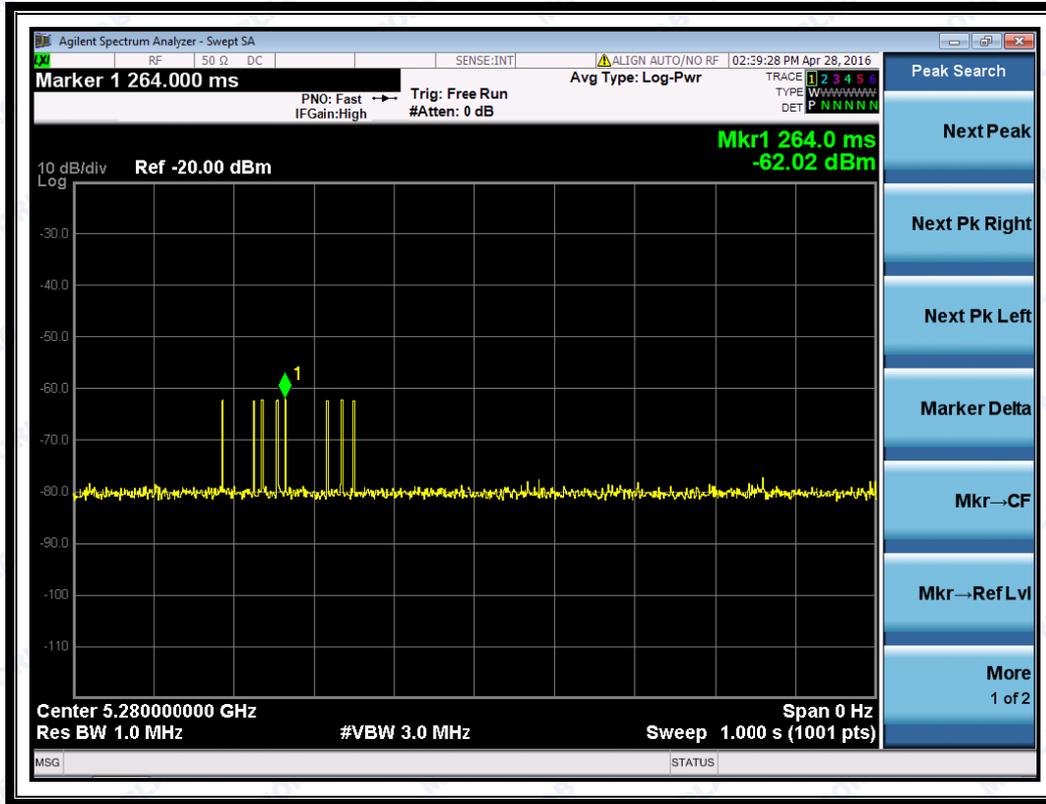


Figure 4: Example Conducted Setup where UUT is a Client and Radar Test Waveforms are injected into the Client



2.7.3 Test Result

2.7.3.1 Radar Test Waveforms are injected into the Master:



2.7.3.2 EUT is a Client Device Without Radar Detection :

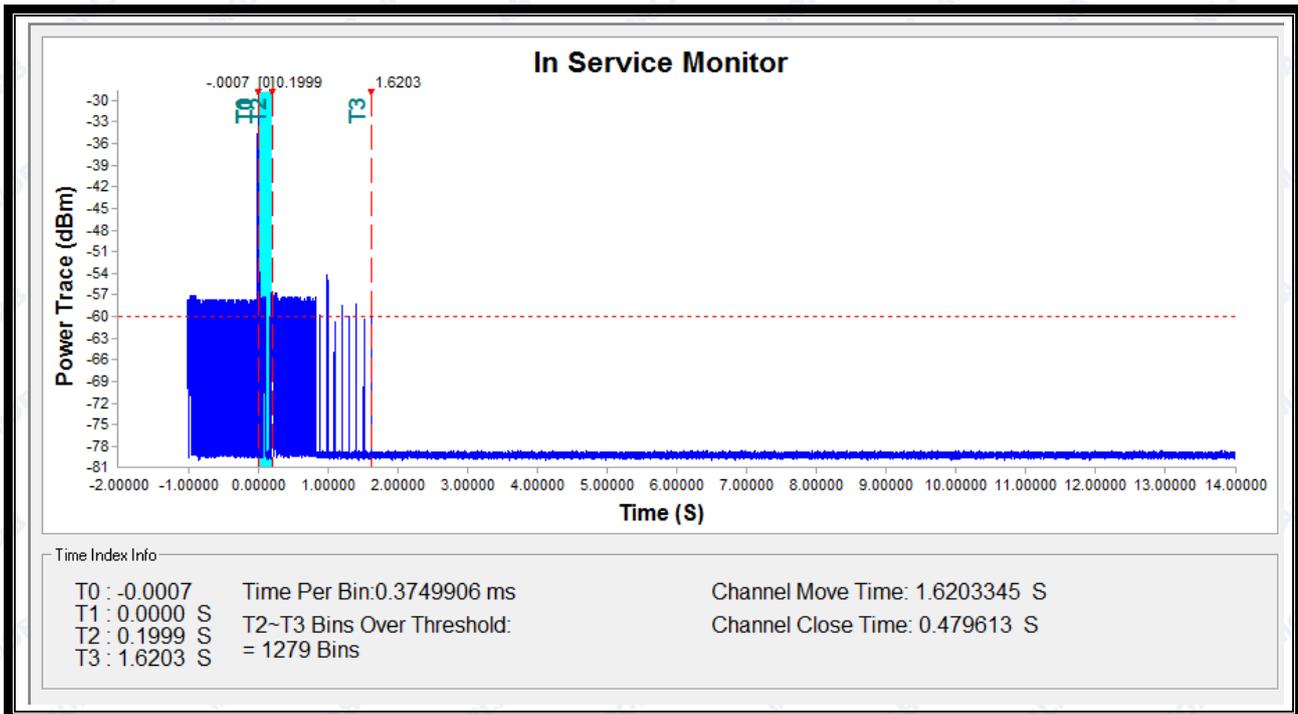
Channel & Bandwidth	Requirement	Operational Mode	Test Result	Limit	Verdict
		Client Without Radar Detection			
20MHz 5280MHz	Channel Move Time	Yes	1.62s	<10s	Pass
	Channel Closing Transmission Time	Yes	0.48s	<1s	Pass
	Non-occupancy period	Yes	≥30	≥30 Minutes	Pass
40MHz 5310MHz	Channel Move Time	Yes	0.7s	<10s	Pass
	Channel Closing Transmission Time	Yes	0.003s	<1s	Pass
	Non-occupancy period	Yes	≥30	≥30 Minutes	Pass
80MHz 5530MHz	Channel Move Time	Yes	1.01s	<10s	Pass
	Channel Closing Transmission Time	Yes	0.007	<1s	Pass
	Non-occupancy period	Yes	≥30	≥30 Minutes	Pass



2.7.3.3 Test Plots

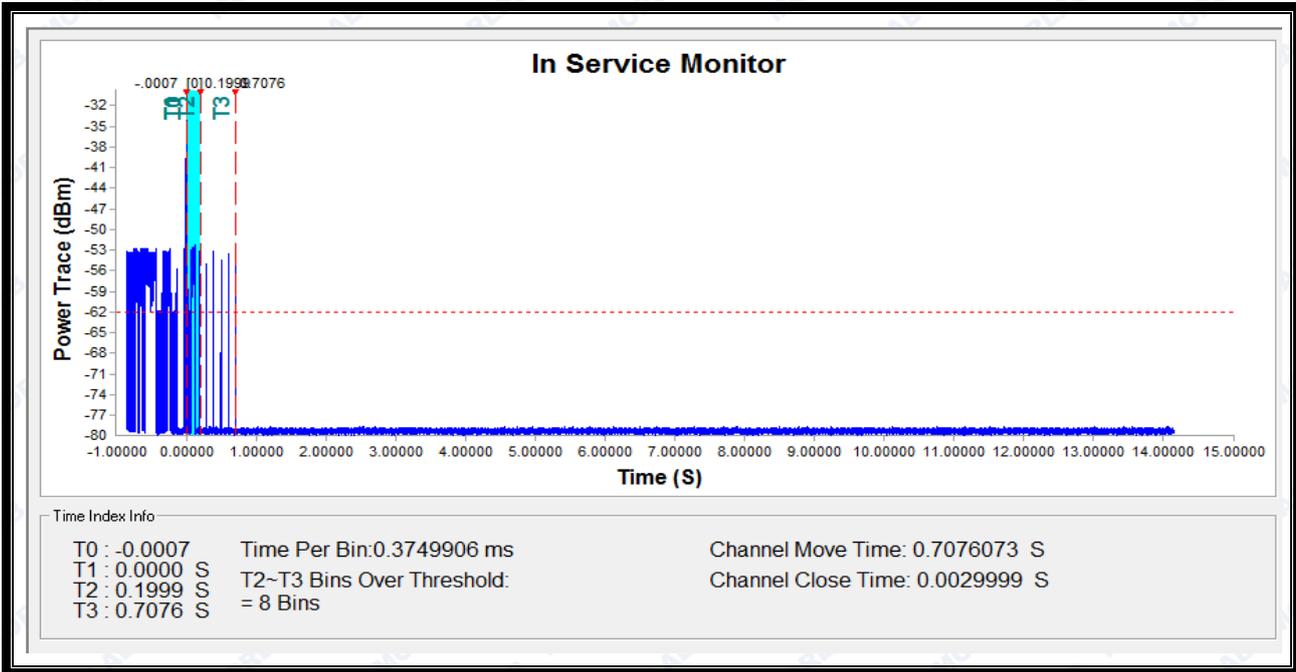
Note: T0 denotes the start time of the Radar single transmitted, T1 denotes the end time of the Radar single transmit end. T2 denotes the data transmission time of 200ms from T1. T3 denotes the end of the Channel Move Time, the time of T3 from T1 is less than 12s.

20MHz/5280MHz:

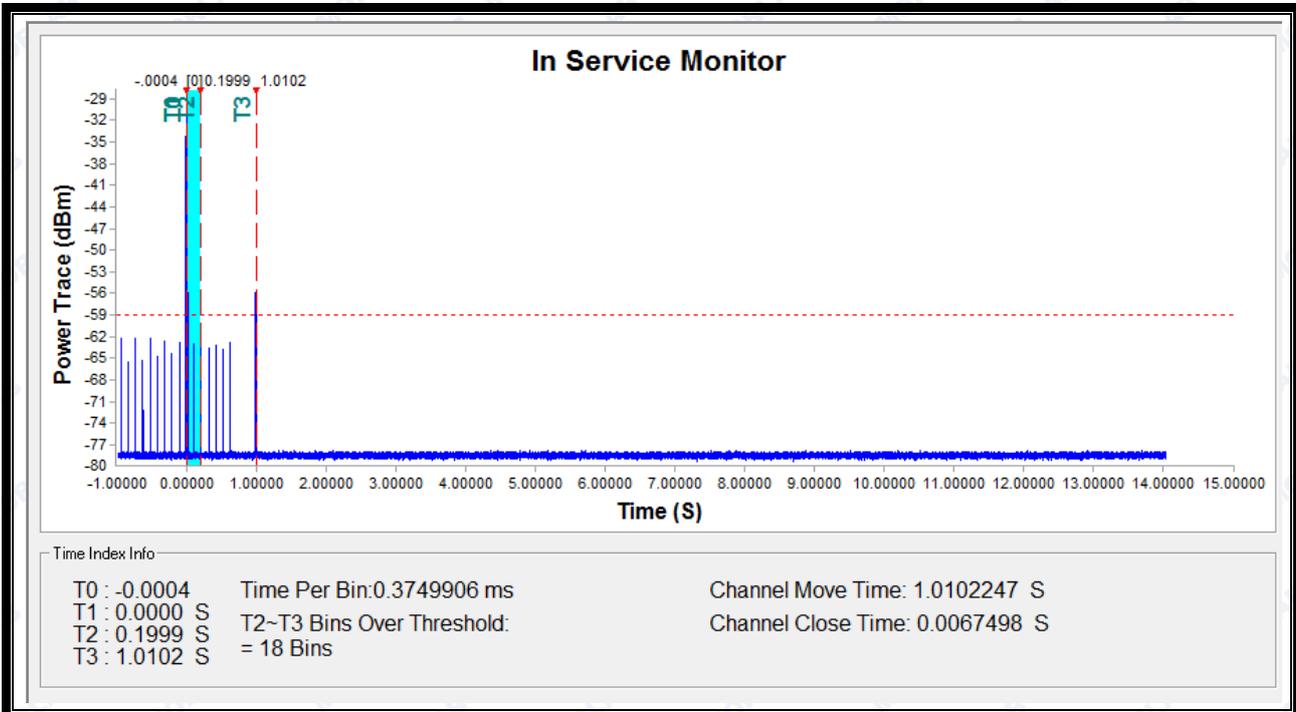




40MHz/5310MHz:



80MHz/5530MHz:



2.8 Conducted Emission

2.8.1 Requirement

According to FCC section 15.207, 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 within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 Ω line impedance stabilization network (LISN).

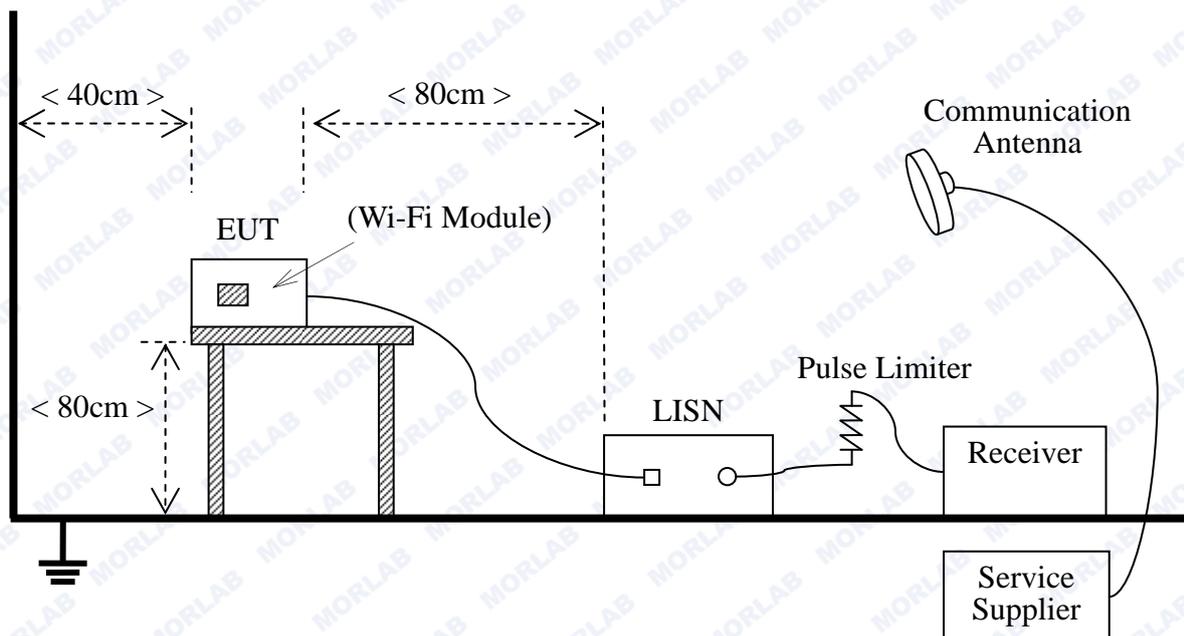
Frequency range (MHz)	Conducted Limit (dB μ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

NOTE:

- The lower limit shall apply at the band edges.
- The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

2.8.2 Test Description

A. Test Setup:



The Table-top EUT was placed upon a non-metallic table 0.8m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.4:2009

The EUT is powered by the Battery charged with the AC Adapter which is powered by 120V, 60Hz

AC mains supply. The factors of the site are calibrated to correct the reading. During the measurement, the EUT is activated and controlled by the Wi-Fi Service Supplier (SS) via a Common Antenna.

2.8.3 Test Result

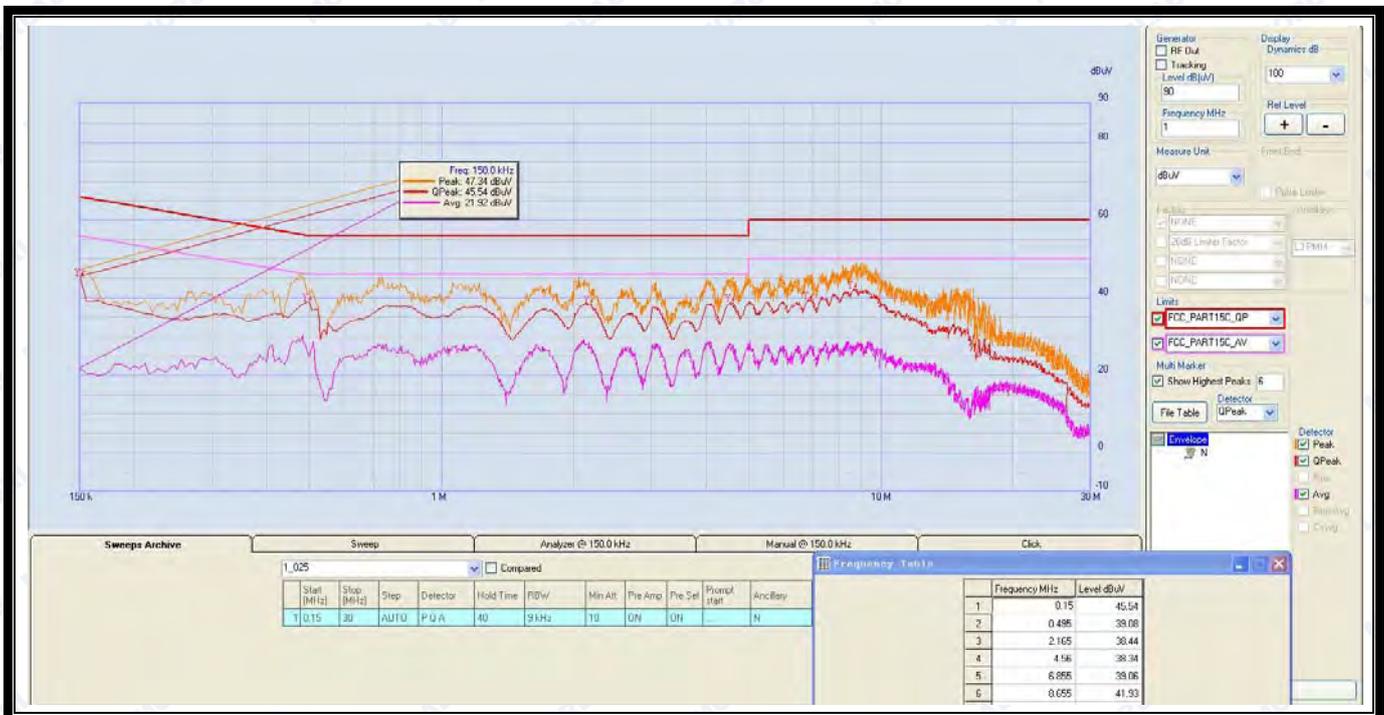
The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.

Note: All test modes are performed, only the worst case is recorded in this report.

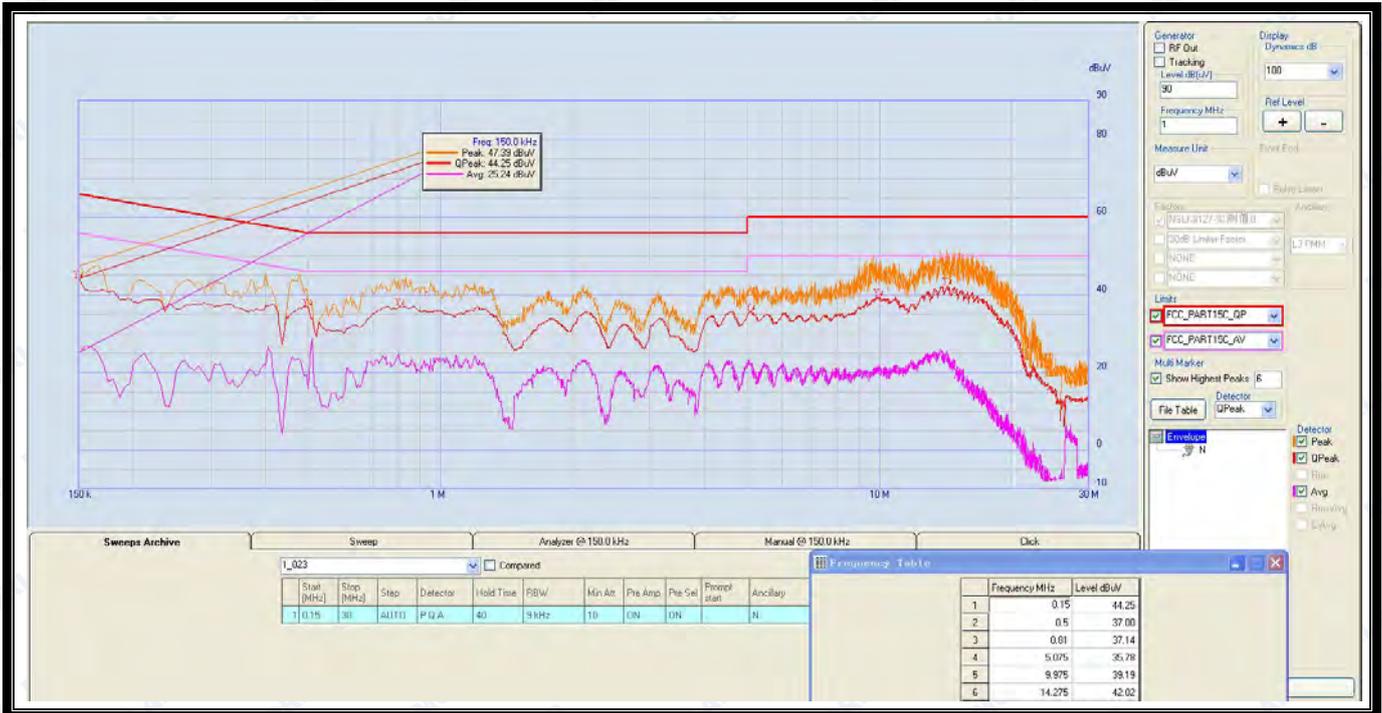
A. Test setup:

The EUT configuration of the emission tests is EUT + Link.

B. Test Plots:



(Plot A: L Phase)



(Plot B: N Phase)



2.9 Radiated Emission

2.9.1 Requirement

The peak emissions outside of the frequency bands of operation shall be attenuated in accordance with the following 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 EIRP of -27dBm/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 EIRP of -27dBm/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 EIRP of -27dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.

The following formula is used to convert the equipment isotropic radiated power(eirp) to field strength (dB μ V/m);

$$E = 1000000 \times \sqrt{30P} / 3 \mu\text{V/m}$$

where P is the EIRP in Watts

Therefore: -27 dBm/MHz = 68.23 dB μ V/m

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209. According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μ V/m)	Measurement Distance (m)
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

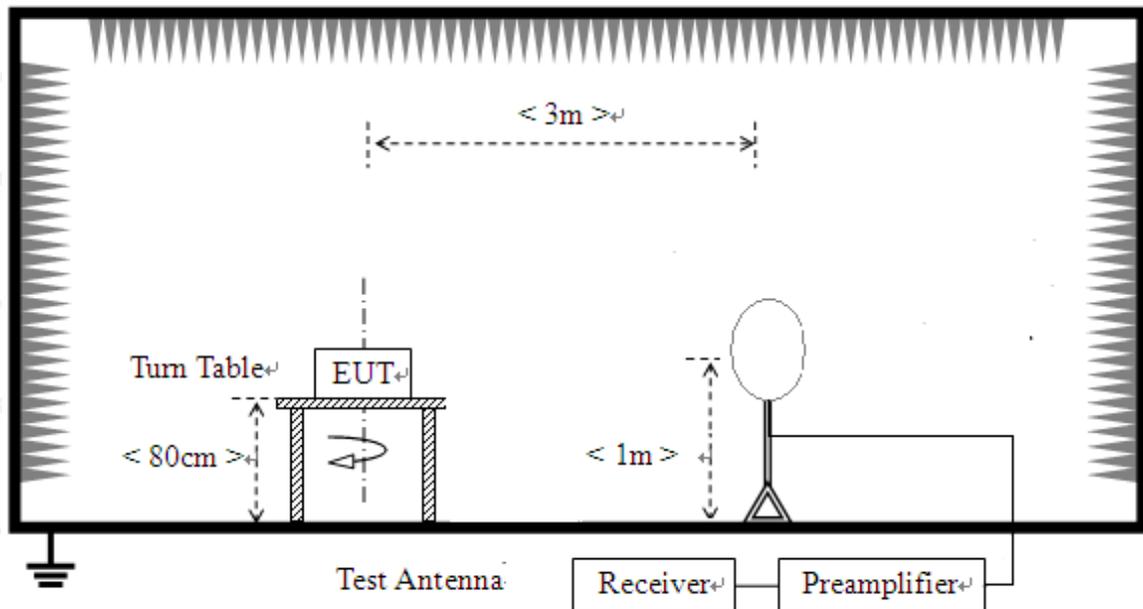
Note:

For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.

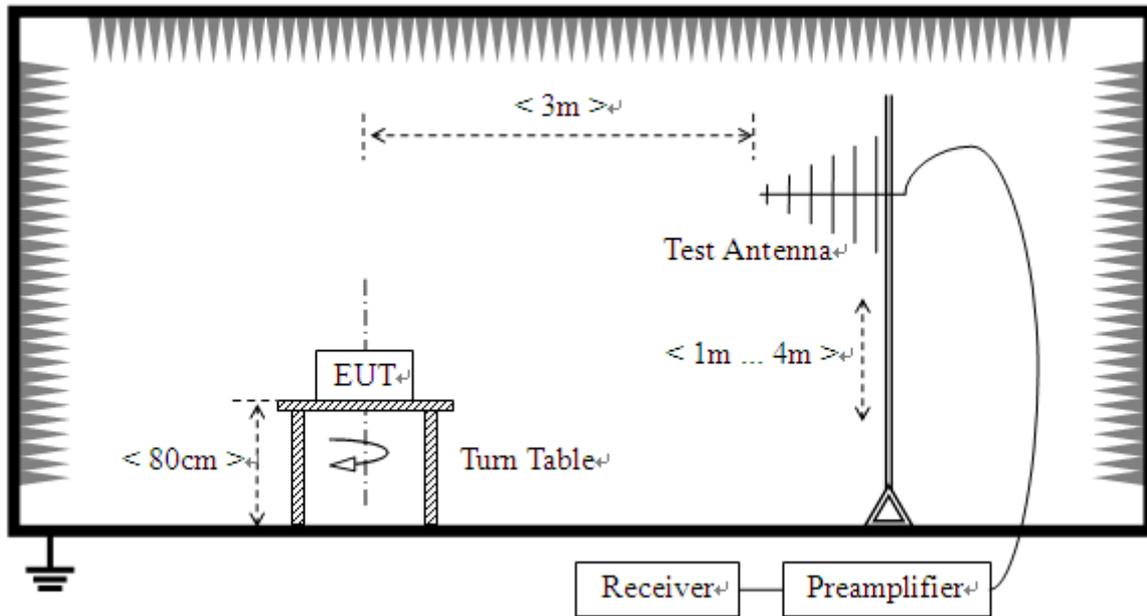
In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table)

2.9.2 Test Description**A. Test Setup:**

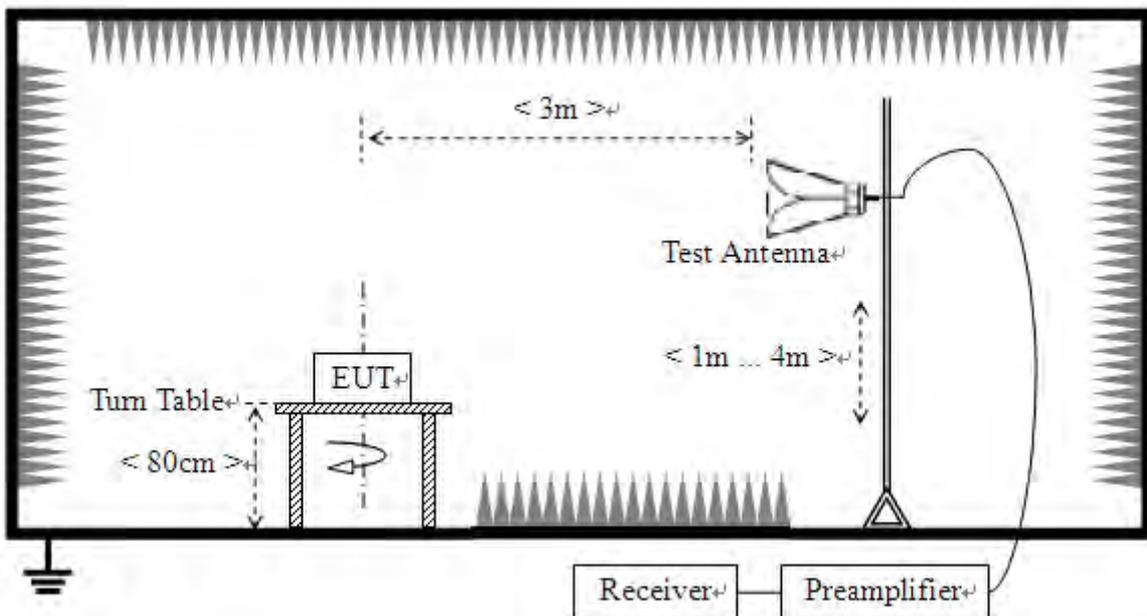
- 1) For radiated emissions from 9kHz to 30MHz



- 2) For radiated emissions from 30MHz to 1GHz



3) For radiated emissions above 1GHz



The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.4 (2009). The EUT was set-up on insulator 80cm above the Ground Plane. The set-up and test methods were according to ANSI C63.4.



The EUT of the EUT is powered by the Battery charged with the AC Adapter which is powered by 120V, 60Hz AC mains supply. The Module is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading. During the measurement, the EUT is activated and controlled by the Wireless Router via a Common Antenna, and is set to operate under hopping-on test mode.

For the Test Antenna:

- (a) In the frequency range of 9kHz to 30MHz, magnetic field is measured with Loop Test Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.
- (b) In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 2GHz) and Horn Test Antenna (above 2GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

2.9.3 Test Result

According to ANSI C63.4 selection 4.2.2, because of peak detection will yield amplitudes equal to or greater than amplitudes measured with the quasi-peak (or average) detector, the measurement data from a spectrum analyzer peak detector will represent the worst-case results, if the peak measured value complies with the quasi-peak limit, it is unnecessary to perform an quasi-peak measurement.

The measurement results are obtained as below:

$$E \text{ [dB}\mu\text{V/m]} = U_R + A_T + A_{\text{Factor}} \text{ [dB]}; A_T = L_{\text{Cable loss}} \text{ [dB]} - G_{\text{preamp}} \text{ [dB]}$$

A_T : Total correction Factor except Antenna

U_R : Receiver Reading

G_{preamp} : Preamplifier Gain

A_{Factor} : Antenna Factor at 3m

During the test, the total correction Factor A_T and A_{Factor} were built in test software.

Note: All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

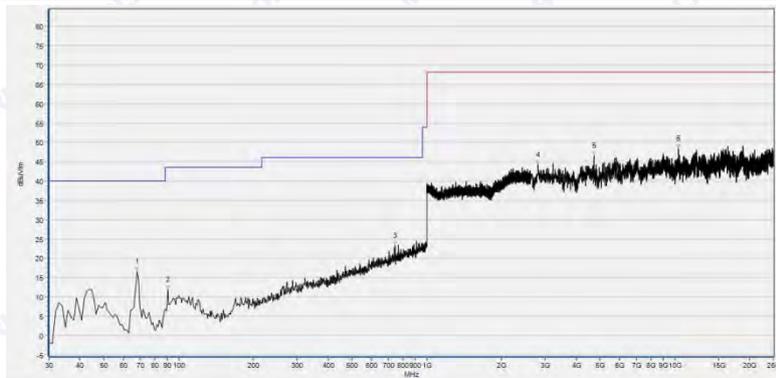
The low frequency, which started from 9KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.



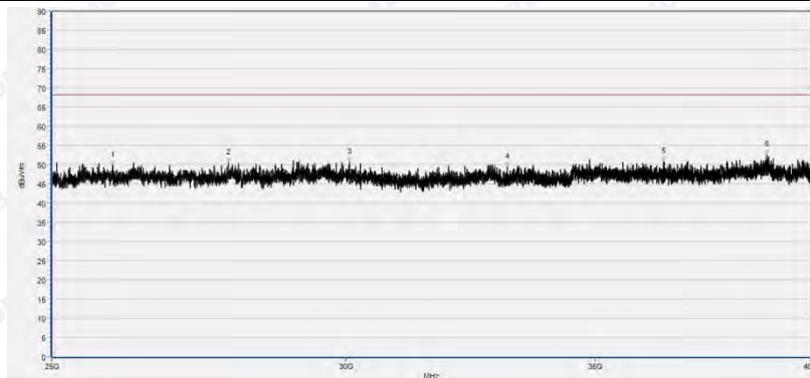
2.9.3.1 802.11ac-20MHz Test mode

A. Test Plots for the Whole Measurement Frequency Range:

Plots for Channel = 36

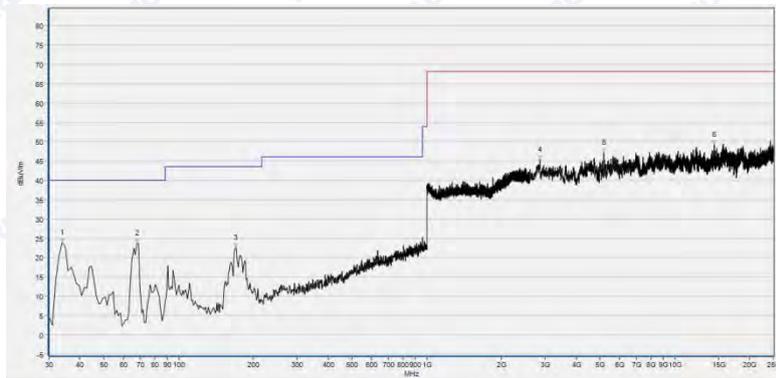


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
67.868	16.59	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
90.200	11.93	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
744.635	23.24	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
2806.121	44.28	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
4710.502	46.64	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
10351.950	48.33	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

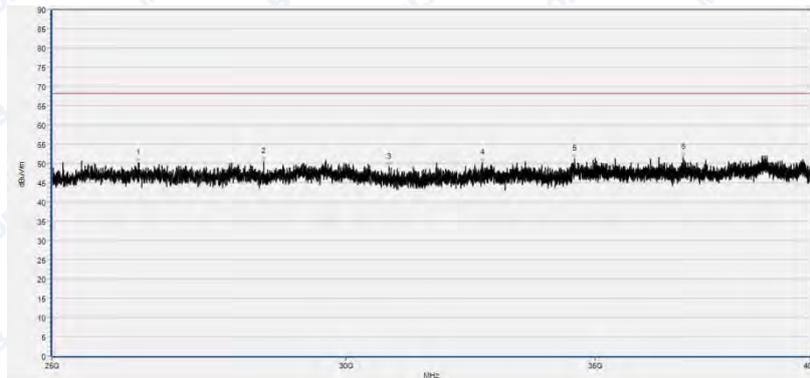


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
25965.746	49.87	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
27887.861	50.62	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
30063.133	50.66	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
33157.270	49.42	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
36525.191	50.93	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
38936.742	52.70	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 40GHz)



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
33.884	23.89	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
67.868	23.84	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
169.820	22.67	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
2859.892	45.43	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5176.515	47.25	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
14402.681	49.26	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

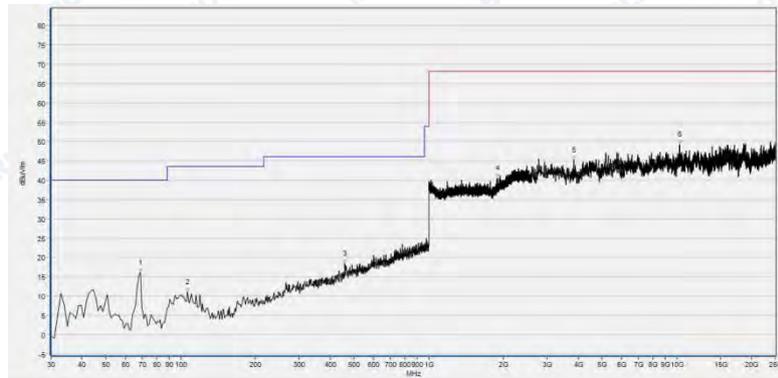


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
26372.672	50.16	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
28504.813	50.51	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
30811.351	49.09	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
32639.705	50.09	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
34565.571	51.22	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
36963.995	51.55	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

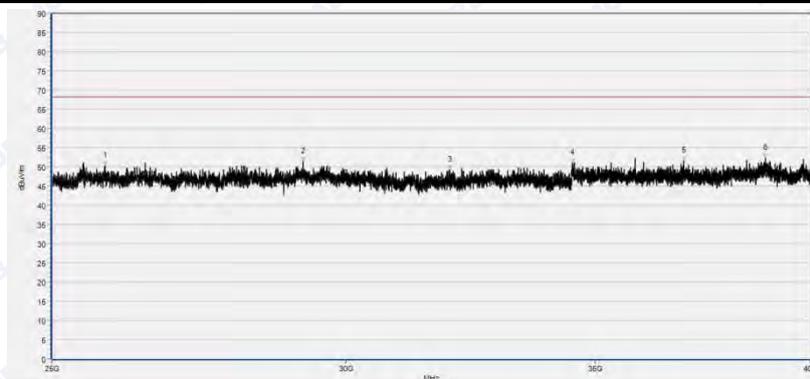
(Antenna Vertical, 30MHz to 40GHz)



Plot for Channel = 44

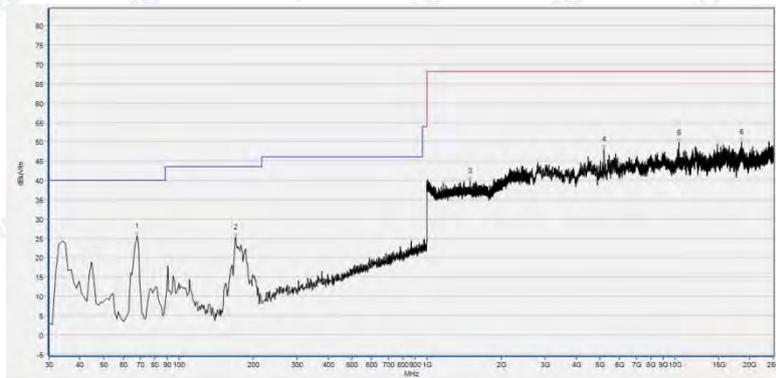


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
68.839	16.06	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
106.707	11.06	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
458.198	18.35	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
1897.366	40.49	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
3836.727	45.26	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
10280.256	49.32	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

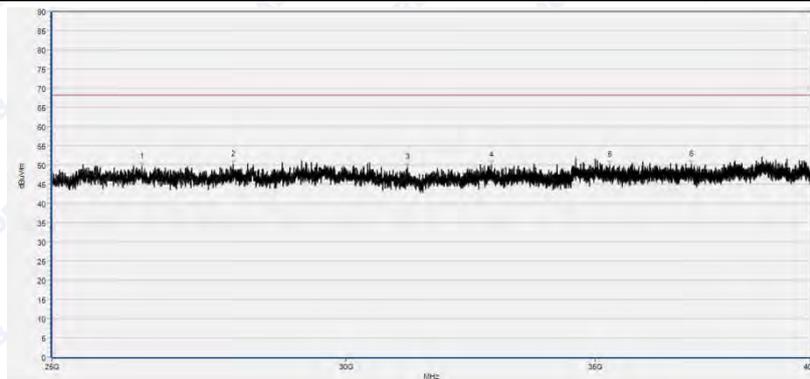


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
25834.479	50.28	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
29213.652	51.36	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
31996.500	49.30	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
34507.438	51.00	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
36986.498	51.66	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
38902.988	52.36	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
67.868	25.53	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
169.820	25.22	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
1495.098	39.86	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5172.034	48.00	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
10356.431	49.79	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
18583.357	49.99	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

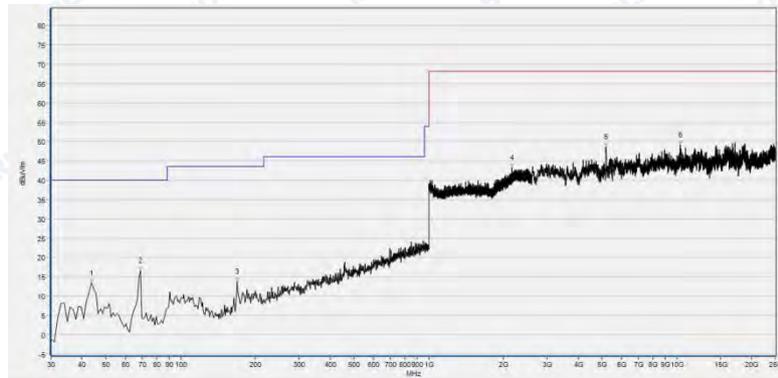


Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
26436.430	49.64	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
27975.997	50.26	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
31163.895	49.38	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
32825.353	49.94	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
35321.290	50.02	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
37162.770	50.24	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

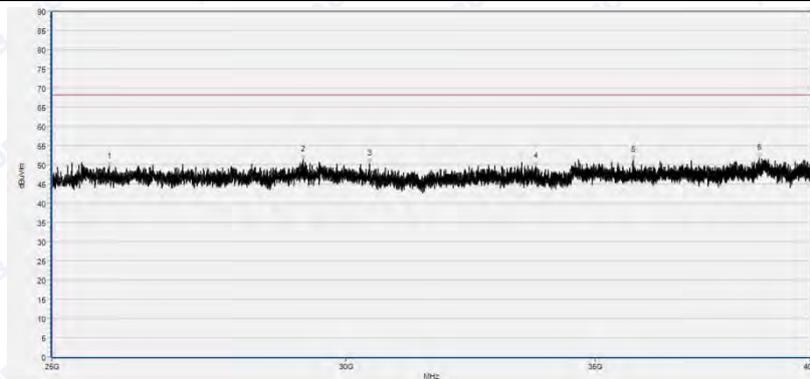
(Antenna Vertical, 30MHz to 40GHz)



Plot for Channel = 48

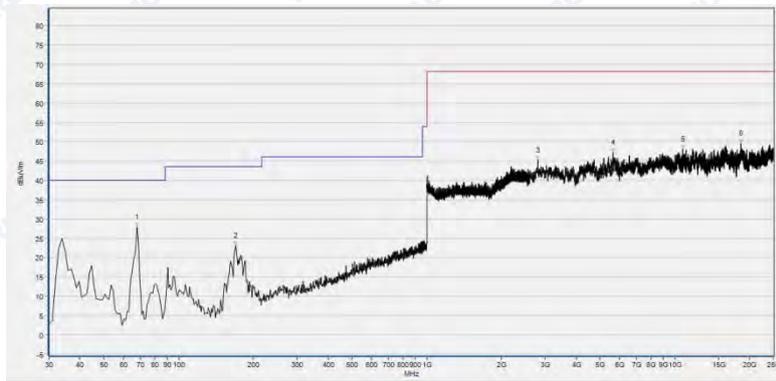


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
43.594	13.40	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
68.839	16.50	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
168.849	13.73	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
2158.786	43.16	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
5176.515	48.52	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
10338.508	49.13	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

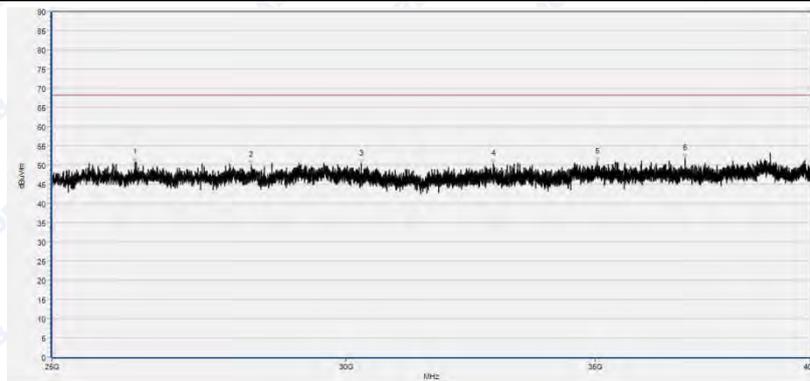


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
25901.988	49.66	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
29215.527	51.45	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
30438.180	50.40	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
33740.468	49.70	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
35846.356	51.17	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
38754.844	51.71	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 40GHz)



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
67.868	27.96	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
169.820	23.05	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
2797.159	45.29	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5633.567	47.27	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
10795.559	48.02	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
18493.739	49.50	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

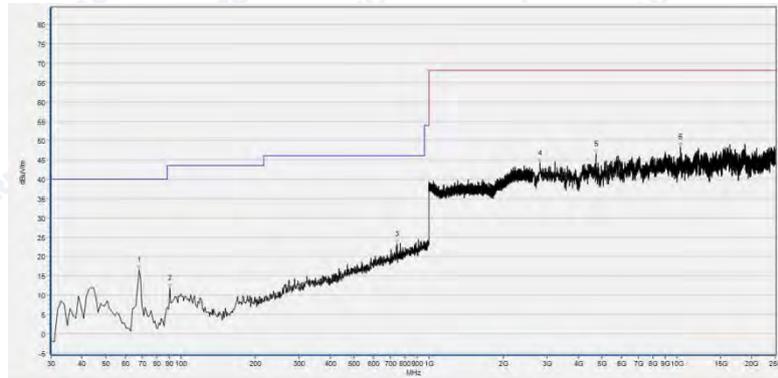


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
26322.040	50.63	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
28289.161	50.07	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
30282.535	50.31	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
32872.234	50.42	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
35047.506	50.81	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
37009.001	51.72	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

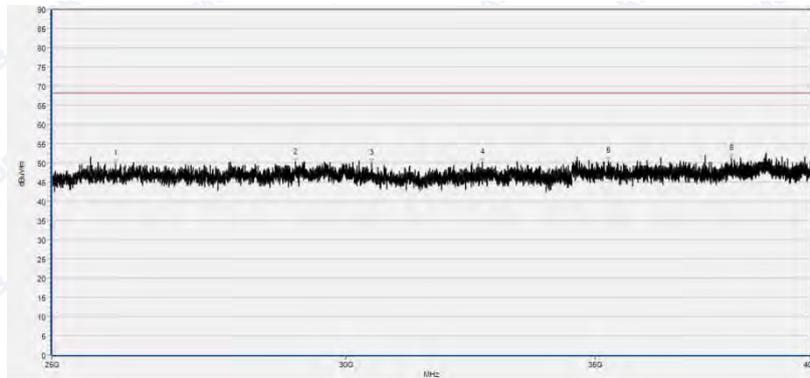
(Antenna Vertical, 30MHz to 40GHz)



Plots for Channel = 52

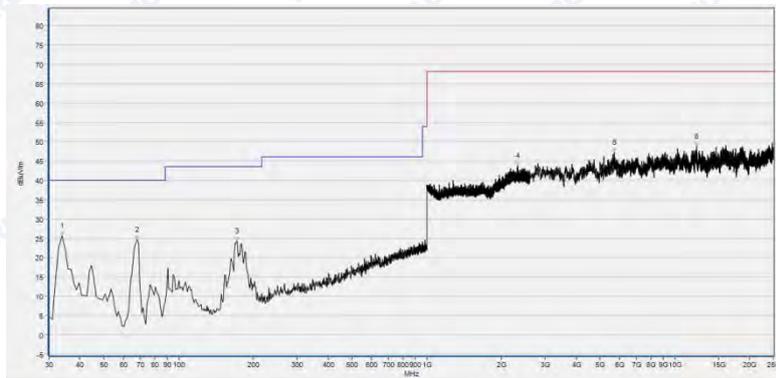


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
42.623	12.09	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
67.868	16.43	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
485.385	19.15	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
2850.930	45.57	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
7045.049	46.79	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
16096.459	49.77	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

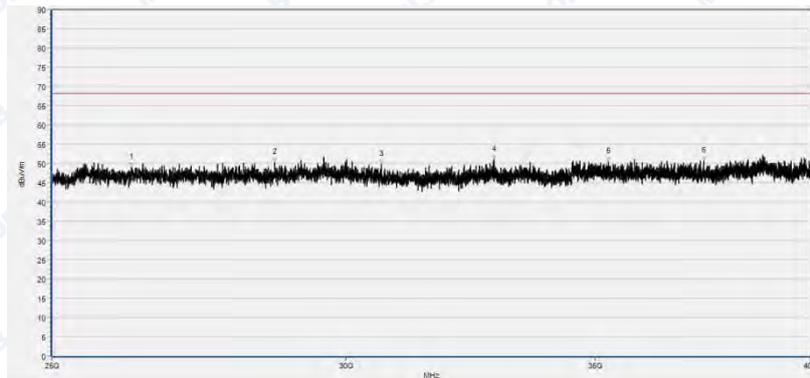


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
26003.250	49.85	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
29069.259	50.17	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
30475.684	50.02	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
32641.580	50.13	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
35287.536	50.57	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
38094.762	51.28	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 40GHz)



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
33.884	25.61	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
67.868	24.58	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
171.762	24.24	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
2323.641	43.74	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5709.742	47.18	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
12260.812	48.77	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

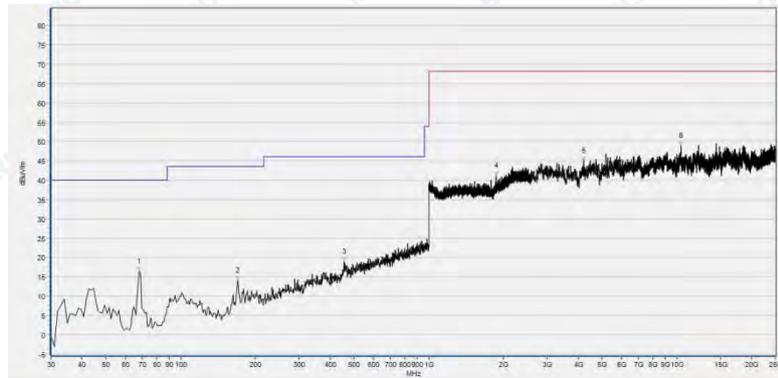


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
26260.158	49.20	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
28705.463	50.44	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
30666.958	49.75	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
32883.485	50.99	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
35296.912	50.60	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
37445.931	50.68	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

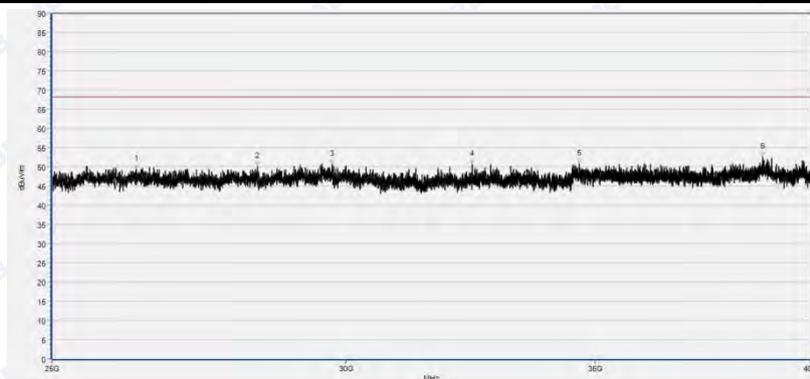
(Antenna Vertical, 30MHz to 40GHz)



Plot for Channel = 60

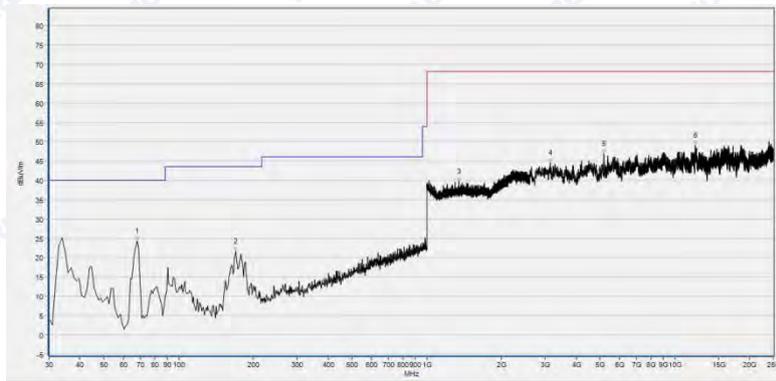


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
67.868	16.43	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
169.820	14.02	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
454.314	18.88	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
1870.157	41.19	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
4208.642	45.04	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
10360.912	48.88	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

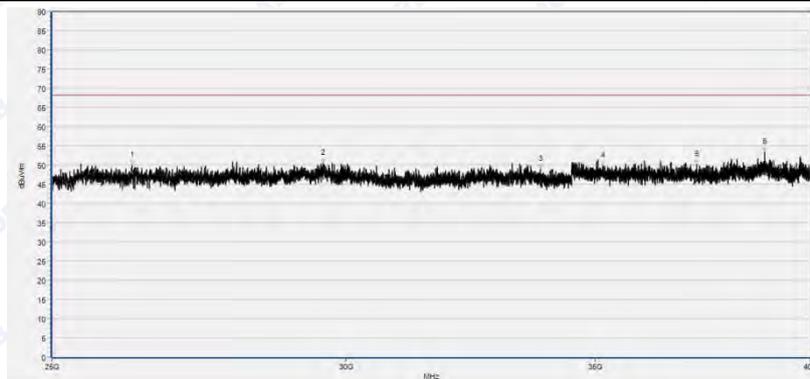


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
26338.917	49.46	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
28394.174	50.24	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
29746.218	50.72	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
32439.055	50.80	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
34664.958	50.87	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
38837.355	52.68	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
67.868	24.34	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
169.820	21.57	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
1350.517	39.63	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
3142.188	44.58	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5185.477	46.87	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
12090.538	49.02	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

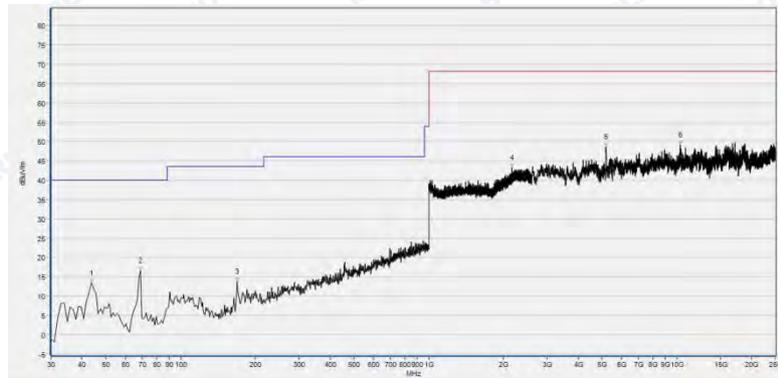


Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
26269.534	49.96	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
29573.697	50.56	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
33834.229	48.87	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
35167.521	49.89	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
37279.035	50.12	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
38887.986	53.32	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

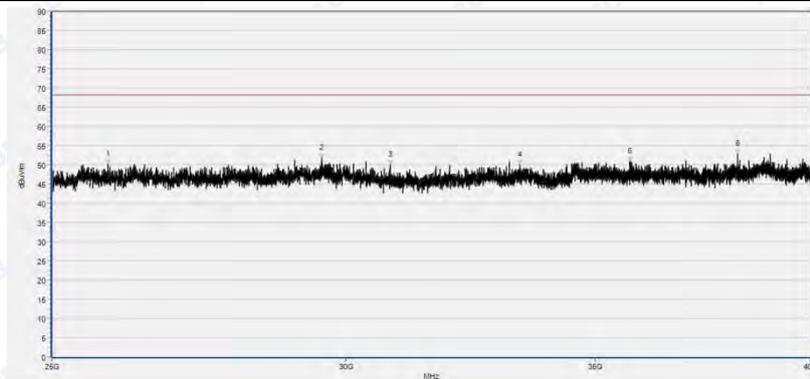
(Antenna Vertical, 30MHz to 40GHz)



Plot for Channel = 64

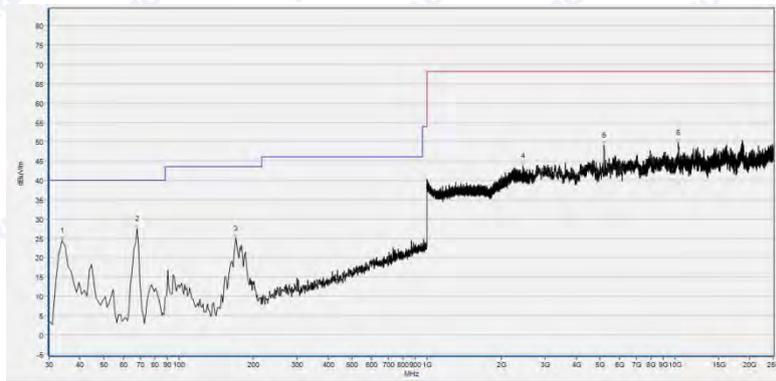


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
44.565	12.72	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
67.868	15.30	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
445.576	17.15	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
2413.805	44.94	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
4517.824	46.14	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
10275.775	48.24	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

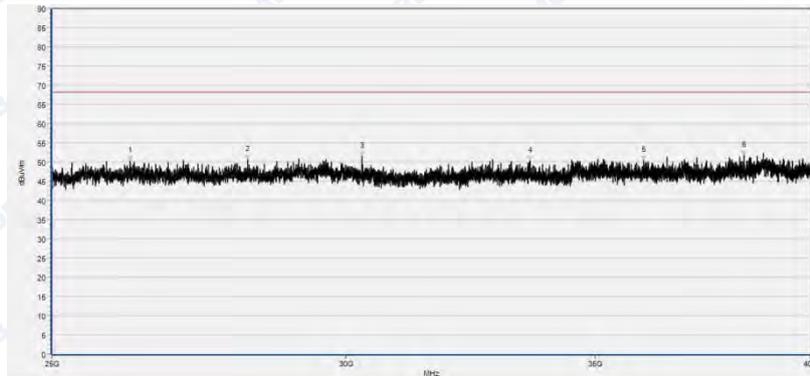


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
25883.235	50.11	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
29545.568	51.80	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
30830.104	49.97	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
33402.925	49.95	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
35765.721	50.92	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
38231.654	52.81	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 40GHz)



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
33.884	24.44	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
67.868	27.52	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
169.820	24.91	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
2441.014	43.79	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5180.996	49.15	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
10347.469	49.71	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

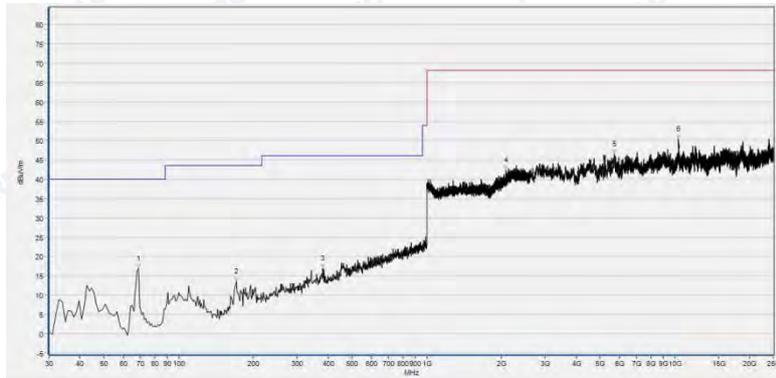


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
26239.530	50.44	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
28219.777	50.65	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
30293.787	51.63	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
33618.577	50.28	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
36071.384	50.59	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
38392.924	51.78	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

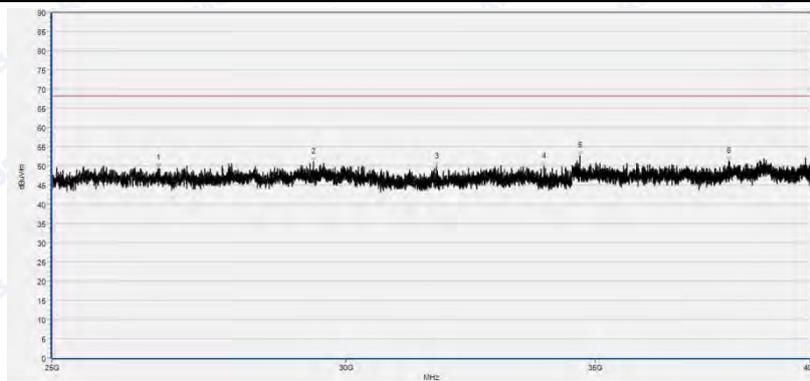
(Antenna Vertical, 30MHz to 40GHz)



Plots for Channel = 100

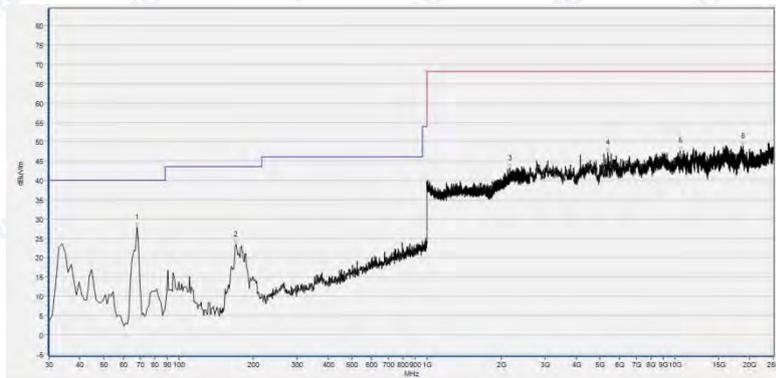


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
68.839	16.92	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
170.791	13.57	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
380.521	16.97	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
2090.497	42.41	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
5709.742	46.53	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
10351.950	50.33	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

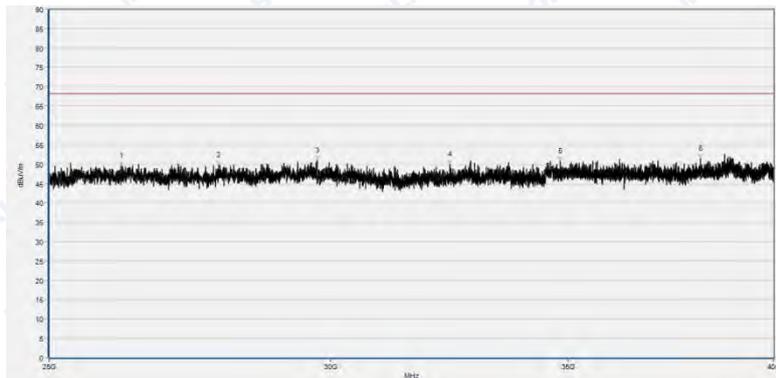


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
26710.214	49.48	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
29399.300	51.15	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
31726.466	49.87	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
33911.114	49.83	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
34674.334	52.71	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
38031.004	51.24	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 40GHz)



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
67.868	27.89	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
169.820	23.48	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
2156.119	43.14	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5364.713	47.16	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
10526.705	47.68	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
18771.554	48.86	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

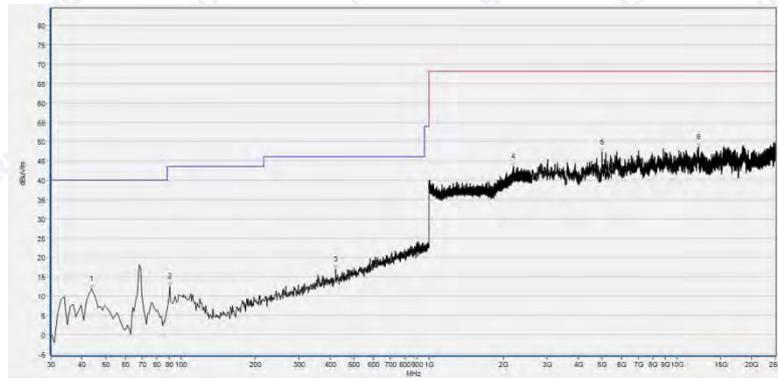


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
26198.275	49.62	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
27914.114	49.77	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
29748.094	50.95	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
32418.427	49.91	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
34833.729	50.83	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
38145.393	51.38	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

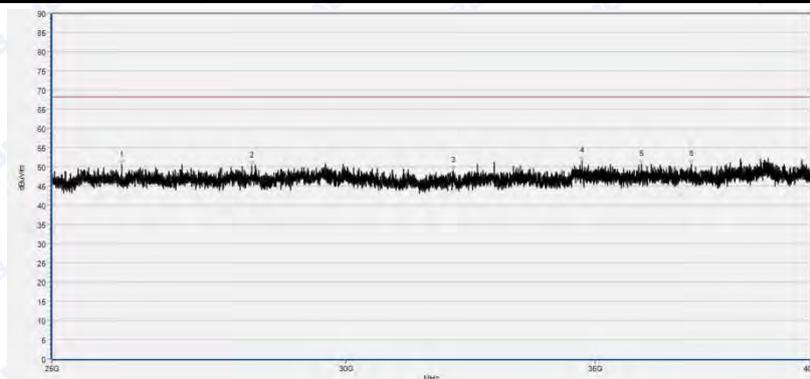
(Antenna Vertical, 30MHz to 40GHz)



Plot for Channel = 120

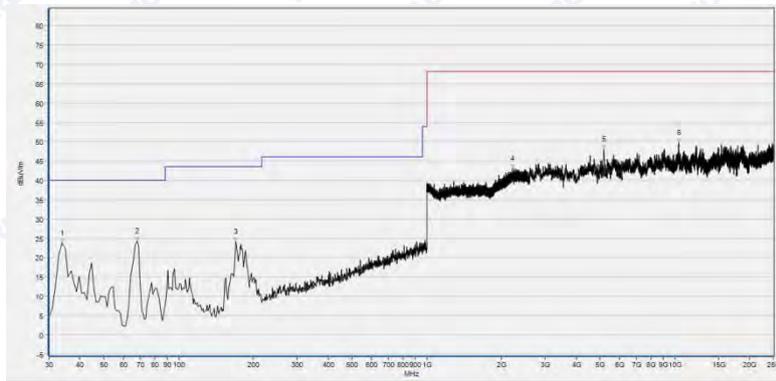


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
43.594	11.91	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
90.200	12.46	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
421.301	16.83	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
2194.532	43.59	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
4992.799	47.21	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
12247.369	48.58	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

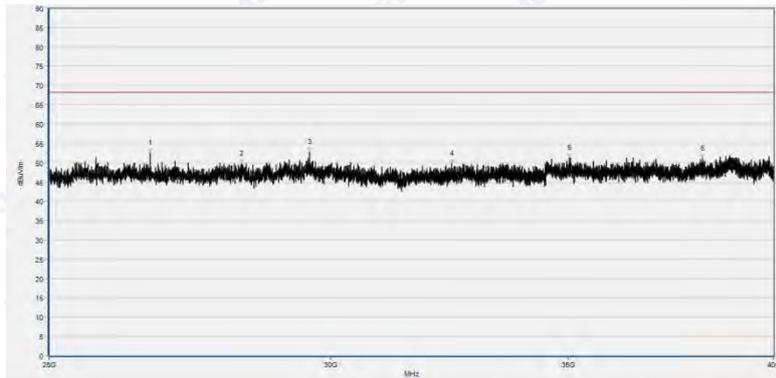


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
26104.513	50.47	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
28300.413	50.36	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
32056.507	49.09	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
34724.966	51.54	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
36024.503	50.70	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
37151.519	50.64	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
33.884	23.84	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
67.868	24.23	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
169.820	24.03	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
2216.939	43.09	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5180.996	48.09	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
10360.912	49.72	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

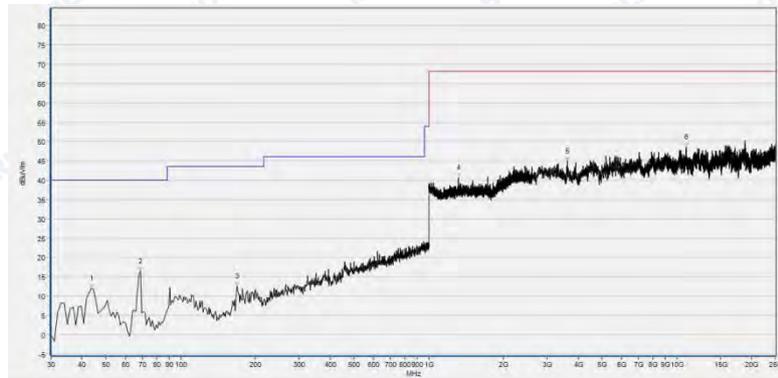


Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
26693.337	52.54	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
28326.666	49.80	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
29607.451	52.72	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
32459.682	49.75	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
35038.130	51.21	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
38192.274	51.16	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

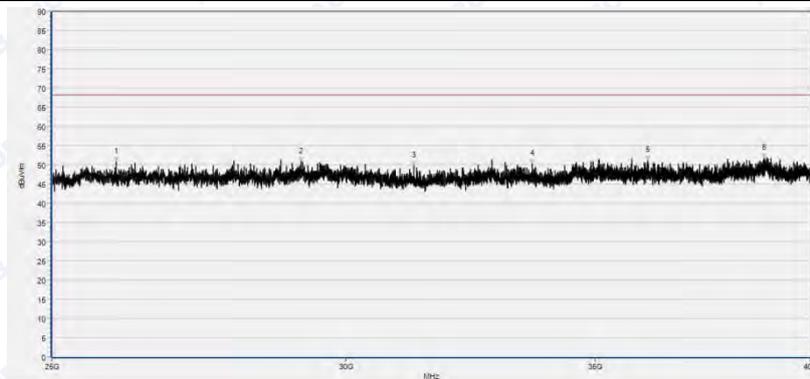
(Antenna Vertical, 30MHz to 40GHz)



Plot for Channel = 140

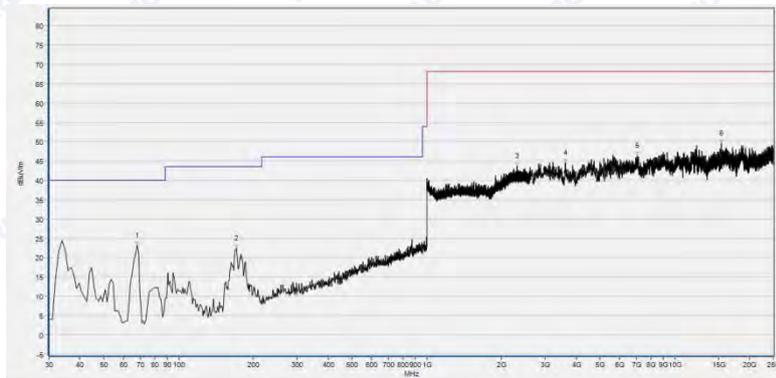


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
43.594	12.01	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
68.839	16.39	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
168.849	12.54	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
1315.839	40.68	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
3608.202	44.85	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
10912.062	48.64	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

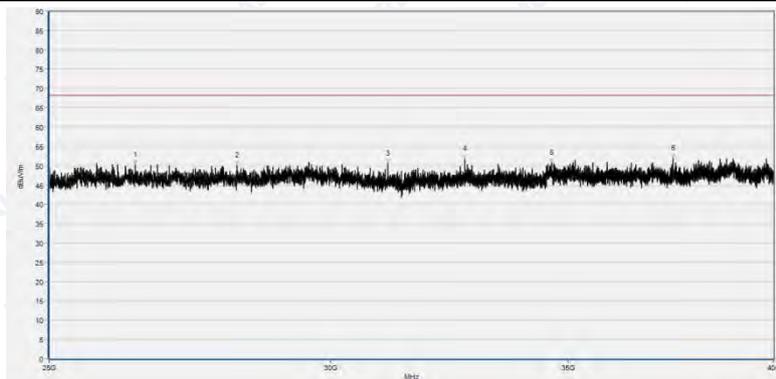


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
26018.252	50.90	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
29174.272	50.93	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
31287.661	49.80	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
33665.458	50.32	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
36167.021	51.18	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
38871.109	51.86	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 40GHz)



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
67.868	23.17	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
170.791	22.43	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
2317.239	43.76	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
3626.125	44.50	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
7067.453	46.37	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
15383.997	49.53	N.A	N.A	68.23	N.A	N.A	Vertical	PASS



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
26436.430	50.33	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
28244.156	50.15	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
31147.018	50.61	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
32744.718	51.78	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
34640.580	50.86	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
37468.434	51.97	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

(Antenna Vertical, 30MHz to 40GHz)



Plots for Channel = 149

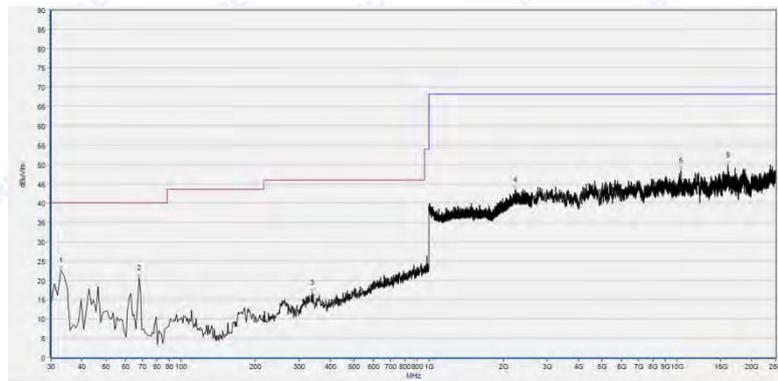
Channel	Frequency (MHz)	Antenna	Receiver Reading	A _T (dB)	A _{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		Horiz./ Vert.	U _R (dBuV)					
149	5725.00	Horizontal	68.58	-50.65	32.11	50.04	78.2	Pass
149	5725.00	Vertical	53.22	-50.65	32.11	34.68	78.2	Pass



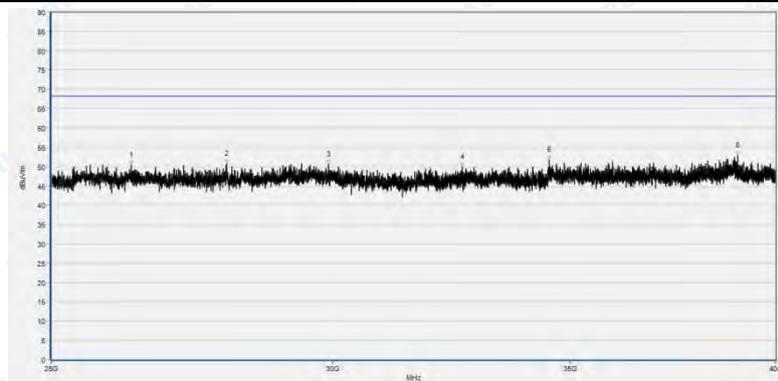
(Channel = 149 Horizontal @ 802.11ac)



(Channel = 149 Vertical @ 802.11ac)

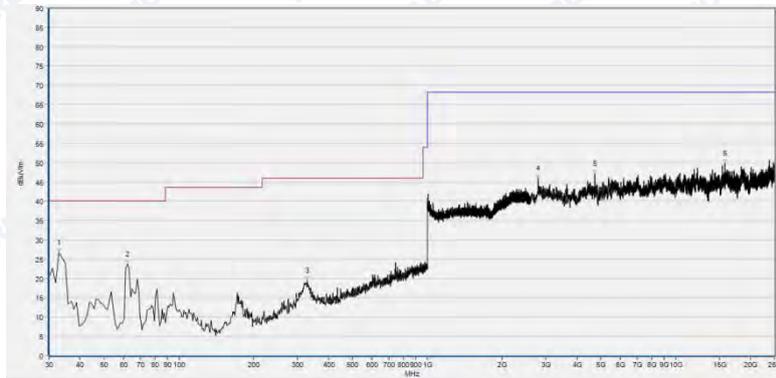


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
32.913	22.61	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
67.868	20.60	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
338.769	16.68	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
2226.009	43.36	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
10414.683	48.44	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
16091.978	49.80	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

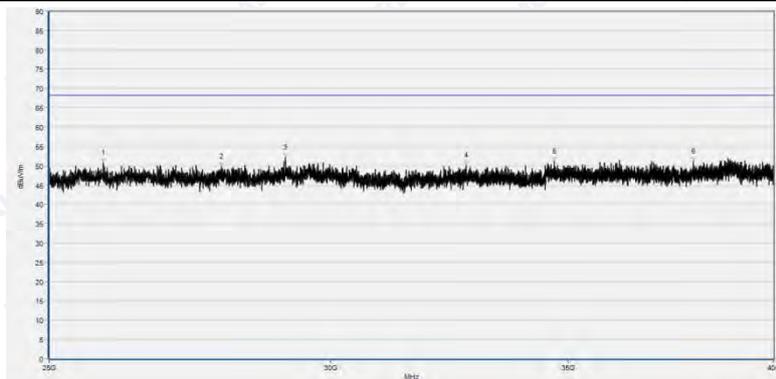


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
26333.292	50.40	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
28011.626	50.85	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
29928.116	50.58	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
32647.206	49.92	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
34533.692	51.72	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
39030.504	52.93	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 40GHz)



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
32.913	26.64	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
62.042	23.56	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
328.088	19.39	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
2792.679	45.94	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
4728.426	47.11	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
15751.430	49.71	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

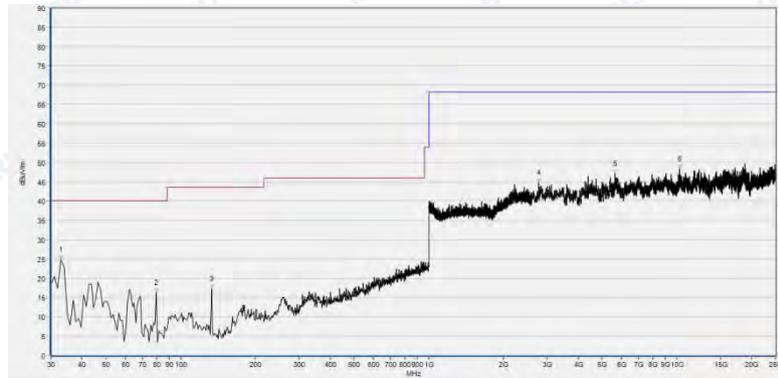


Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
25894.487	50.83	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
27957.245	49.72	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
29146.143	52.12	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
32769.096	50.18	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
34689.336	51.11	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
37969.121	51.18	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

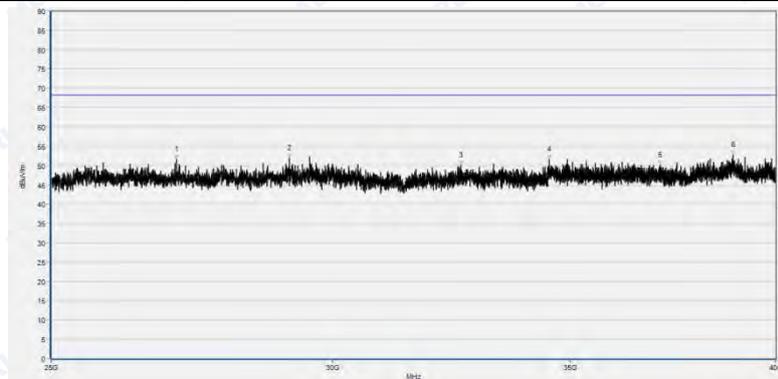
(Antenna Vertical, 30MHz to 40GHz)



Plot for Channel = 157



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
32.913	24.87	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
79.520	16.24	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
132.923	17.26	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
2770.274	44.71	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
5642.529	47.12	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
10280.256	48.20	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS



Fre.(MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
27122.765	51.54	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
29174.272	51.88	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
32609.701	50.07	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
34533.692	51.62	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
37108.389	50.17	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
38917.990	52.82	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)