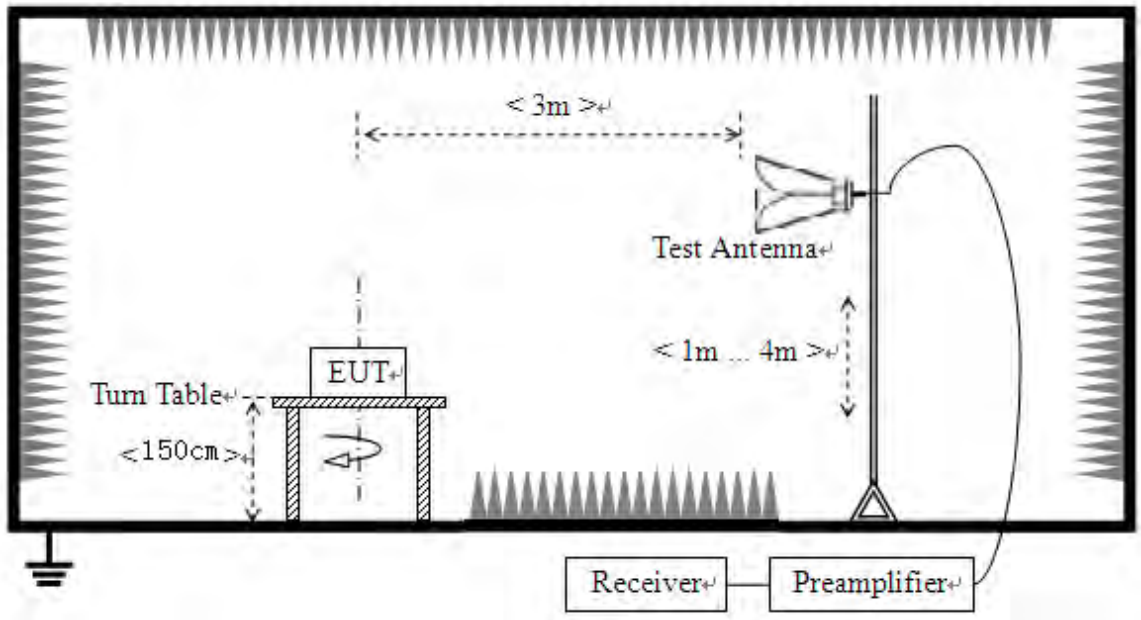
2.5 Restricted Frequency Bands

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:

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

A_T: Total correction Factor except Antenna

U_R: Receiver Reading

G_{preamp}: Preamplifier 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.

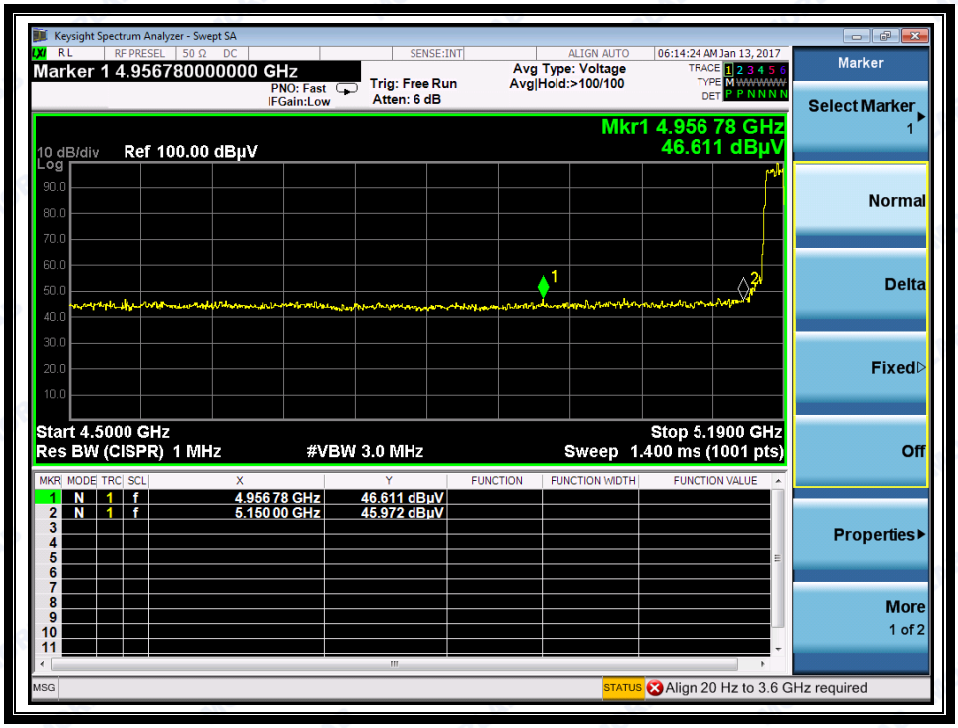
2.5.3.1 802.11a Test mode

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

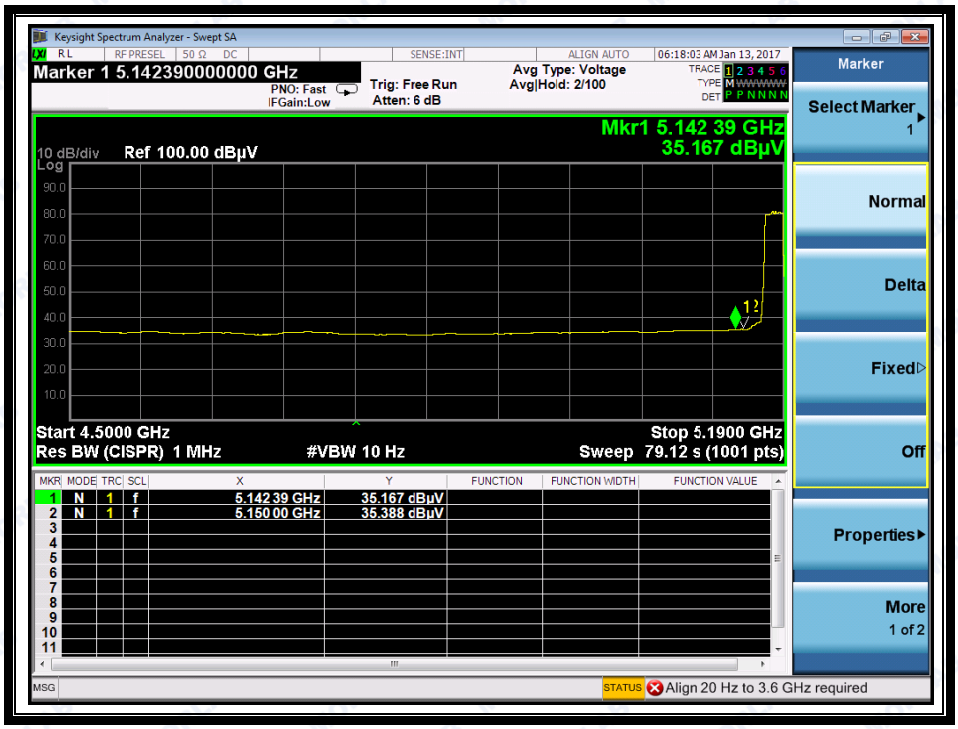
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV						
36	4956.78	PK	46.61	-50.65	32.11	28.07	74	Pass
36	5142.39	AV	35.17	-50.65	32.11	16.63	54	Pass
64	5383.84	PK	45.09	-50.65	32.11	26.55	74	Pass
64	5372.64	AV	33.51	-50.65	32.11	14.97	54	Pass
100	5465.50	PK	46.13	-50.65	32.11	27.59	74	Pass
100	5470.00	AV	34.72	-50.65	32.11	16.18	54	Pass
140	5785.80	PK	46.67	-50.65	32.11	28.13	74	Pass
140	5785.80	AV	34.40	-50.65	32.11	15.86	54	Pass

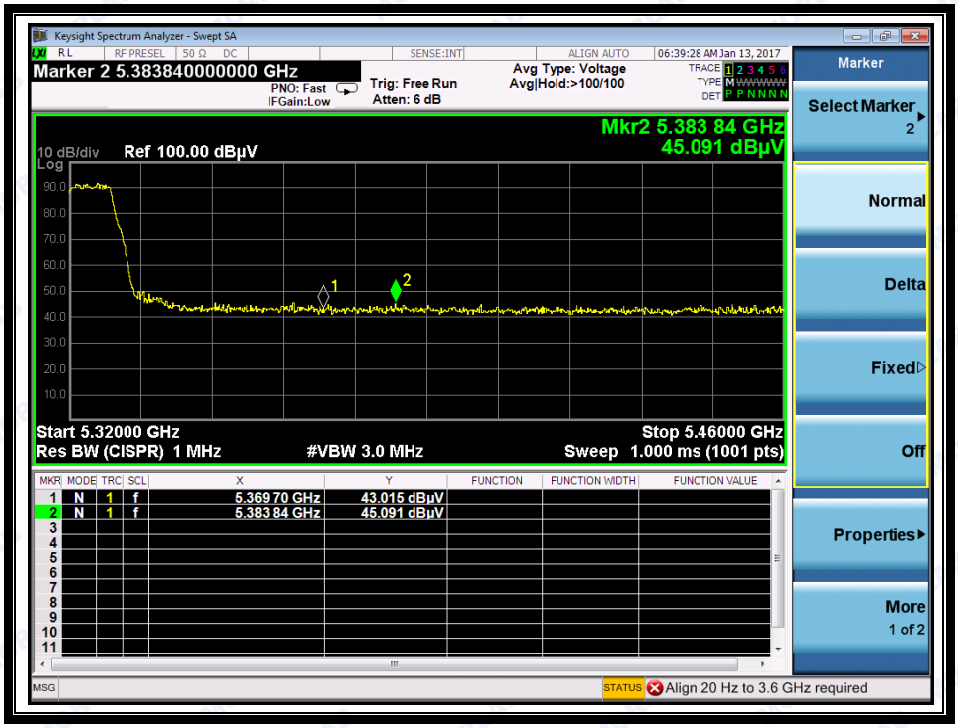
B. Test Plots:



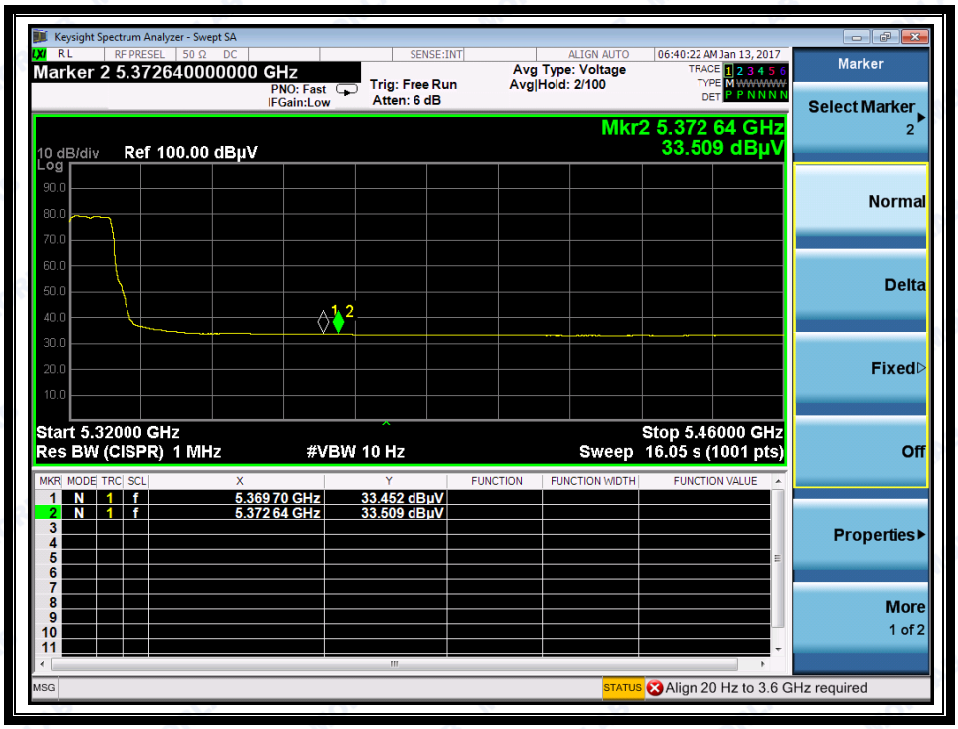
(Channel = 36 PEAK @ 802.11a)



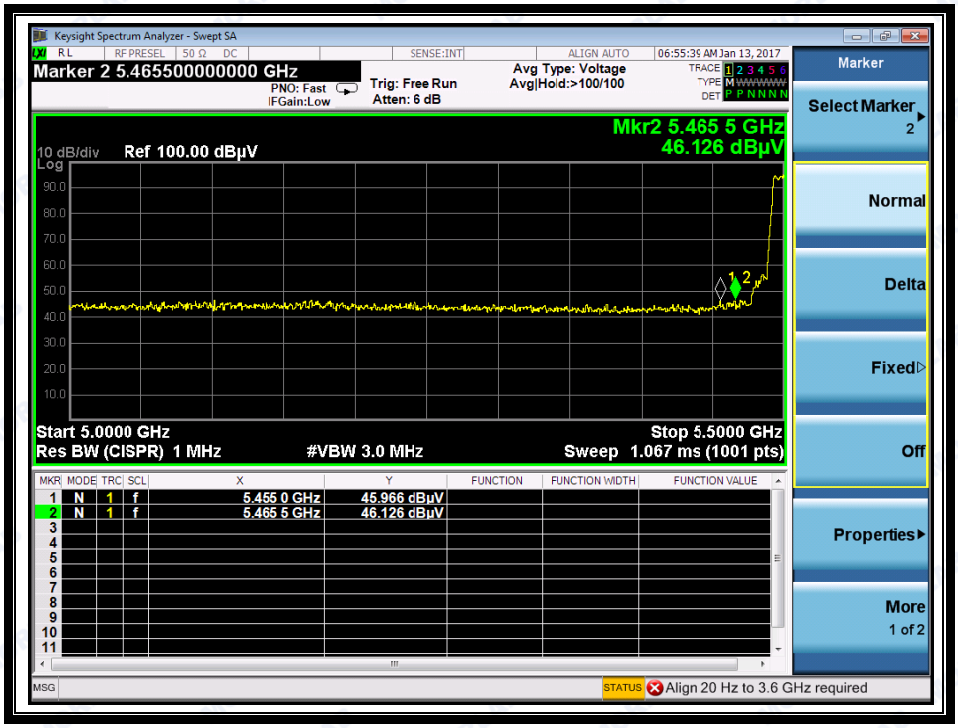
(Channel = 36 AVG @ 802.11a)



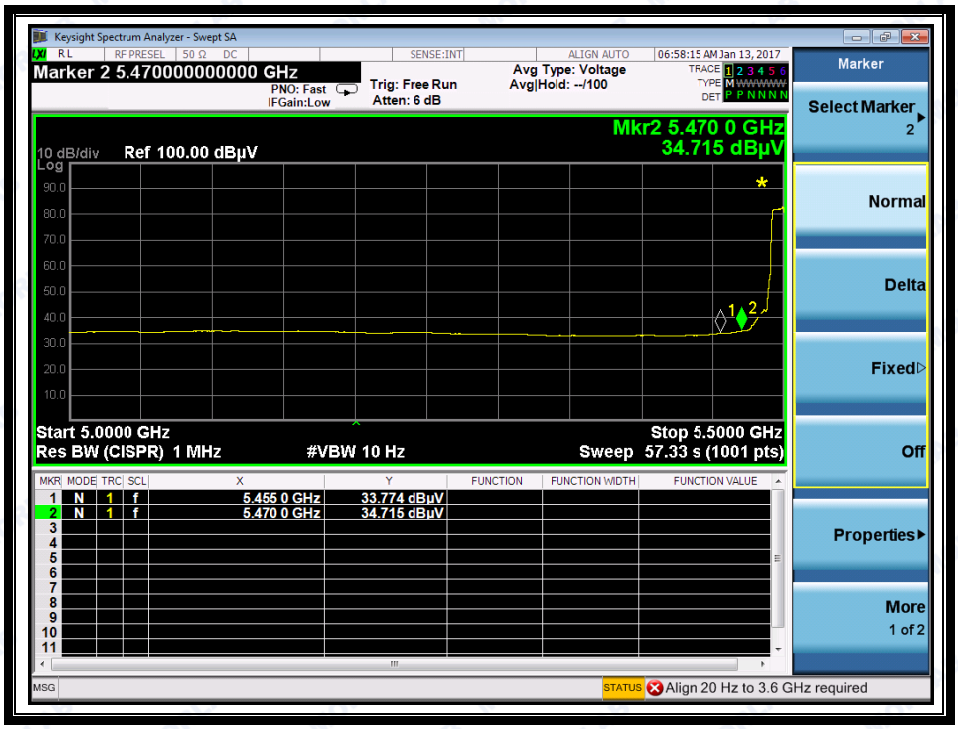
(Channel = 64 PEAK @ 802.11a)



(Channel = 64 AVG @ 802.11a)

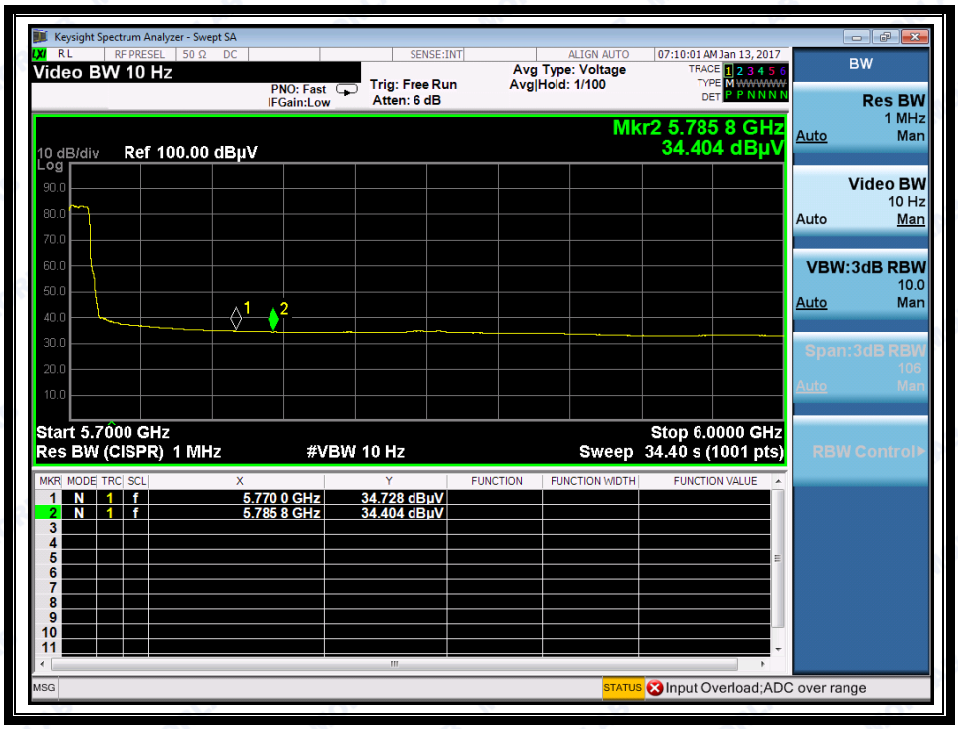


(Channel = 100 PEAK @ 802.11a)



(Channel =100 AVG @ 802.11a)

(Channel = 140 PEAK @ 802.11a)



(Channel = 140 AVG @ 802.11a)

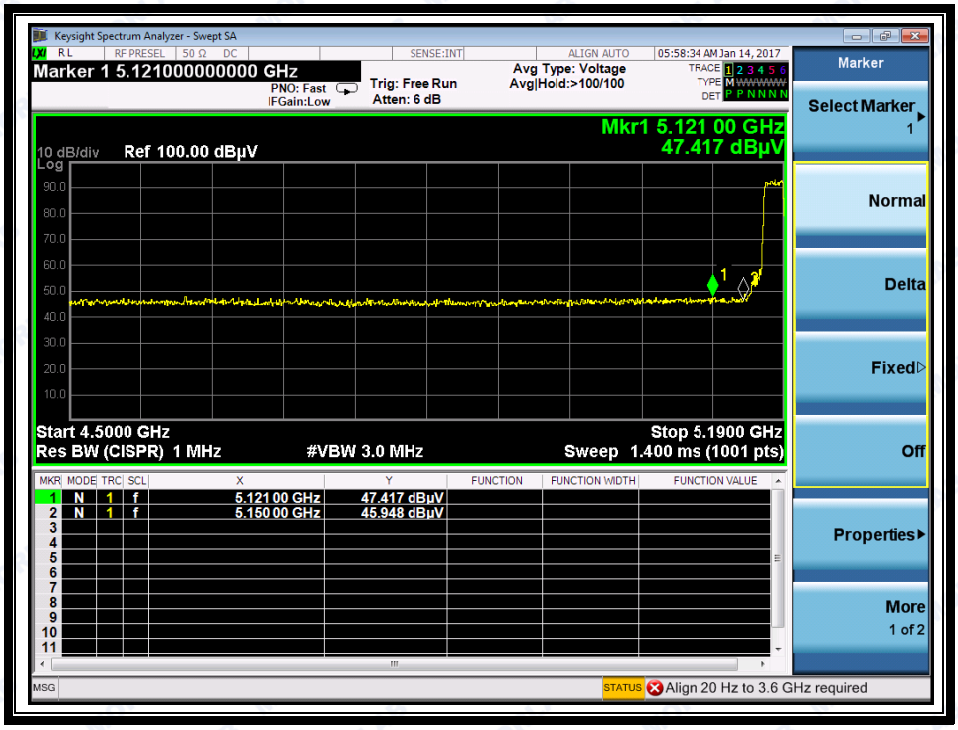
2.5.3.2 802.11n-20MHz Test mode

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

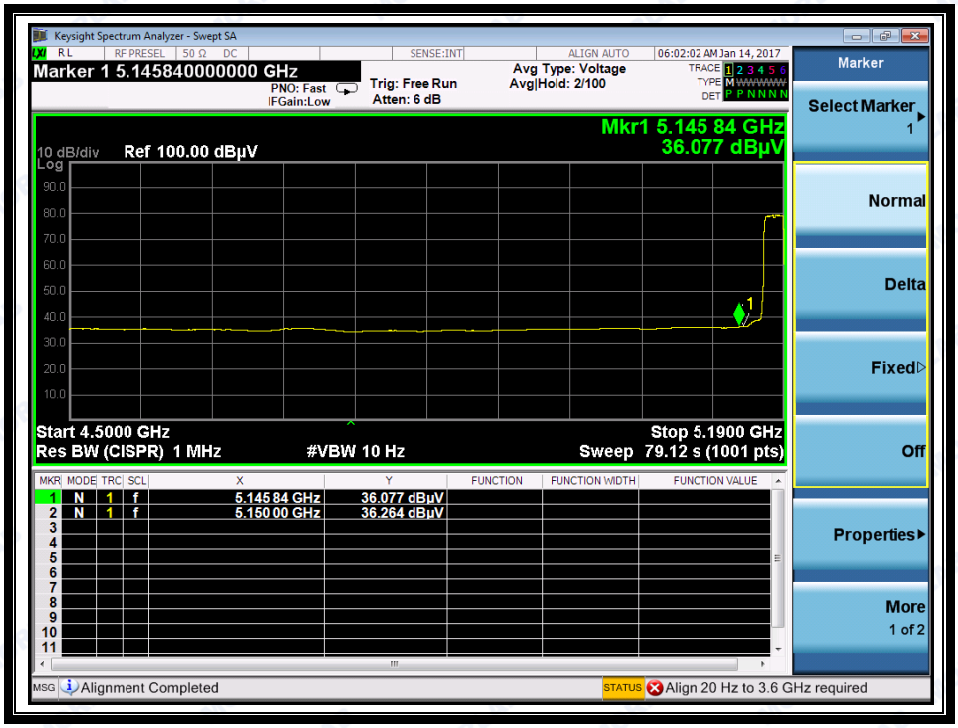
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBµV/m)	Limit (dBµV/m)	Verdict
		PK/ AV						
36	5121.00	PK	47.42	-50.65	32.11	28.88	74	Pass
36	5145.84	AV	36.08	-50.65	32.11	17.54	54	Pass
64	5371.80	PK	48.85	-50.65	32.11	30.31	74	Pass
64	5374.04	AV	32.86	-50.65	32.11	14.32	54	Pass
100	5444.50	PK	45.74	-50.65	32.11	27.20	74	Pass
100	5453.50	AV	32.85	-50.65	32.11	14.31	54	Pass
140	5770.80	PK	47.83	-50.65	32.11	29.29	74	Pass
140	5767.80	AV	34.17	-50.65	32.11	15.63	54	Pass

B. Test Plots:



(Channel = 36 PEAK @ 802.11n 20MHz)

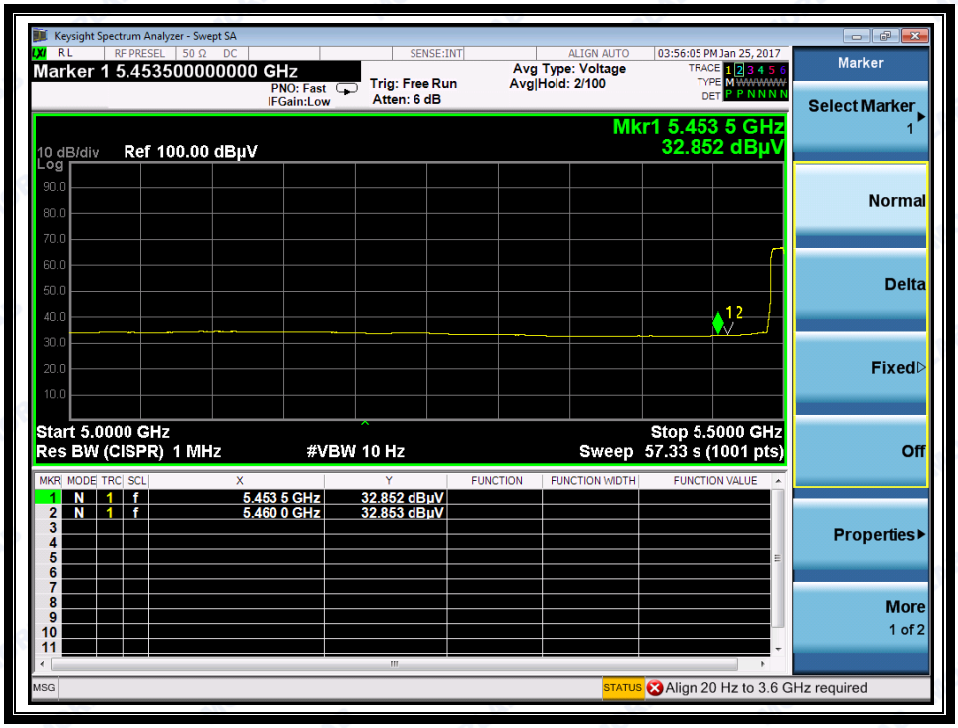


(Channel = 36 AVG @ 802.11n 20MHz)

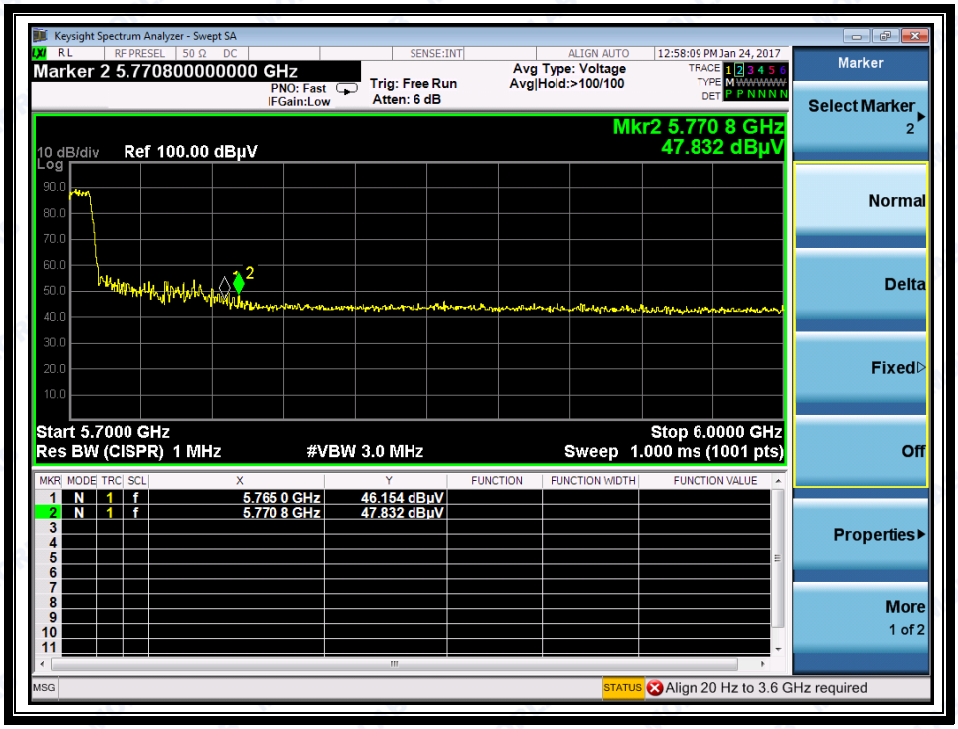
(Channel = 64 PEAK @ 802.11n 20MHz)

(Channel = 64 AVG @ 802.11n 20MHz)

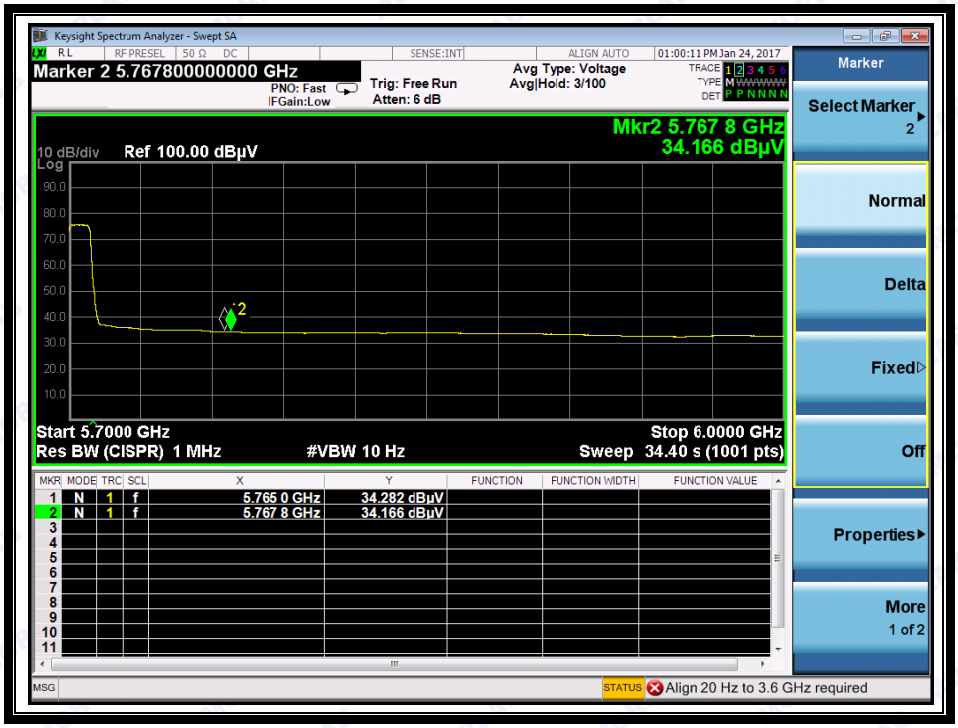
(Channel = 100 PEAK @ 802.11n 20MHz)



(Channel =100 AVG @802.11n 20MHz)



(Channel = 140 PEAK @802.11n 20MHz)



(Channel = 140 AVG @ 802.11n 20MHz)

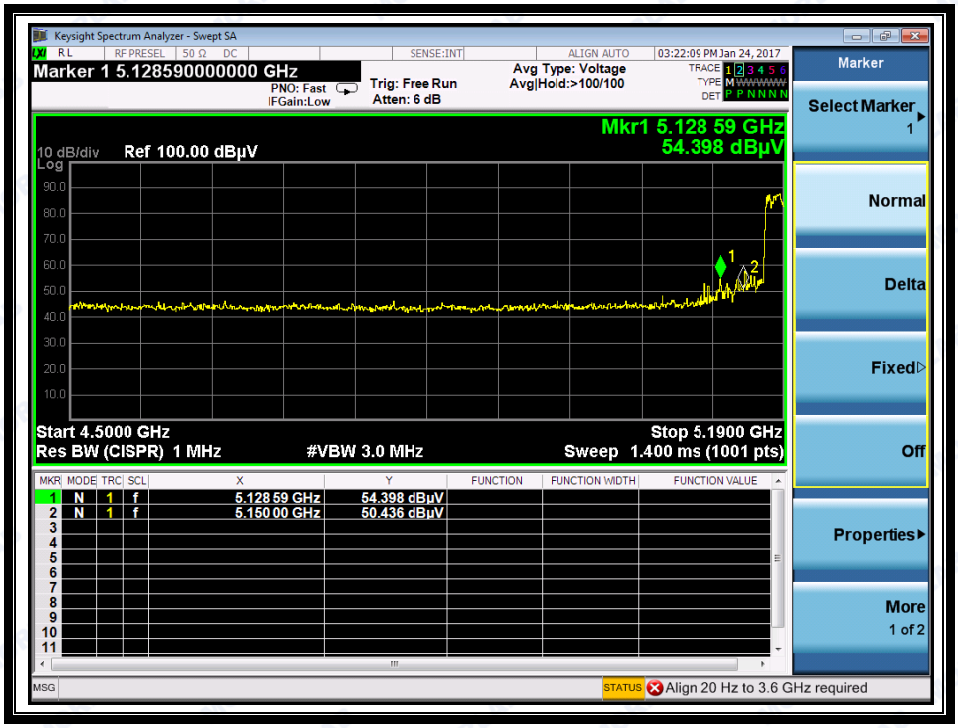
2.5.3.3 802.11n-40MHz Test mode

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

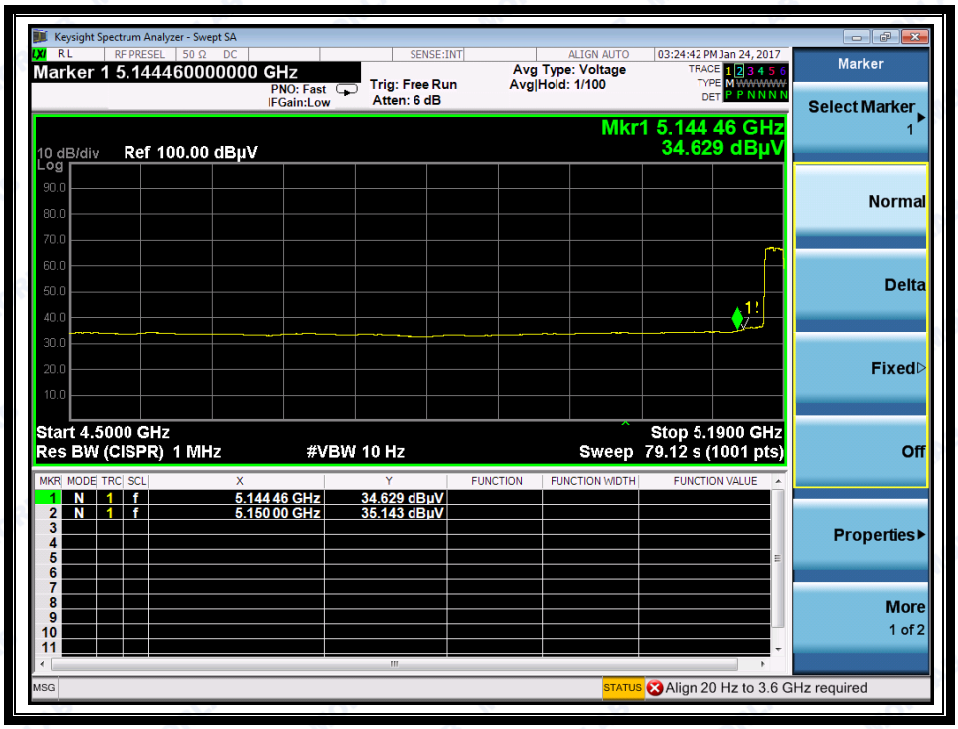
A. Test Verdict:

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	5218.59	PK	54.40	-50.65	32.11	35.86	74	Pass
38	5144.46	AV	34.63	-50.65	32.11	16.09	54	Pass
62	5354.25	PK	51.02	-50.65	32.11	32.48	74	Pass
62	5352.45	AV	33.52	-50.65	32.11	14.98	54	Pass
102	5406.47	PK	45.75	-50.65	32.11	27.21	74	Pass
102	5441.15	AV	32.78	-50.65	32.11	14.24	54	Pass
142	5748.90	PK	49.68	-50.65	32.11	31.14	74	Pass
142	5748.30	AV	34.38	-50.65	32.11	15.84	54	Pass

B. Test Plots:

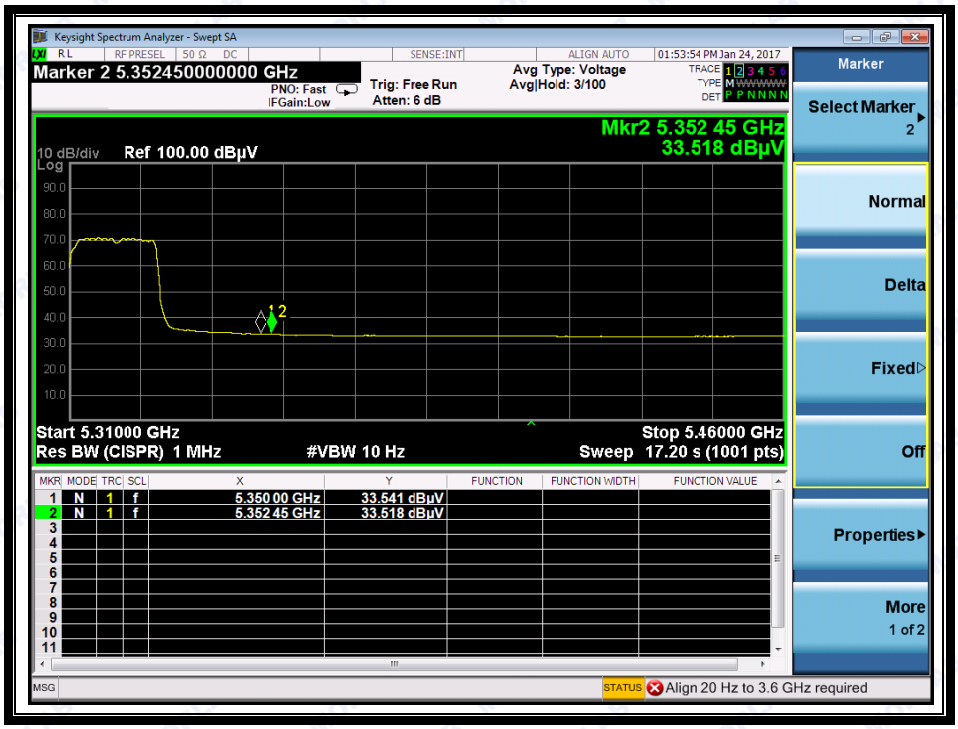


(Channel = 38 PEAK @ 802.11n 40MHz)

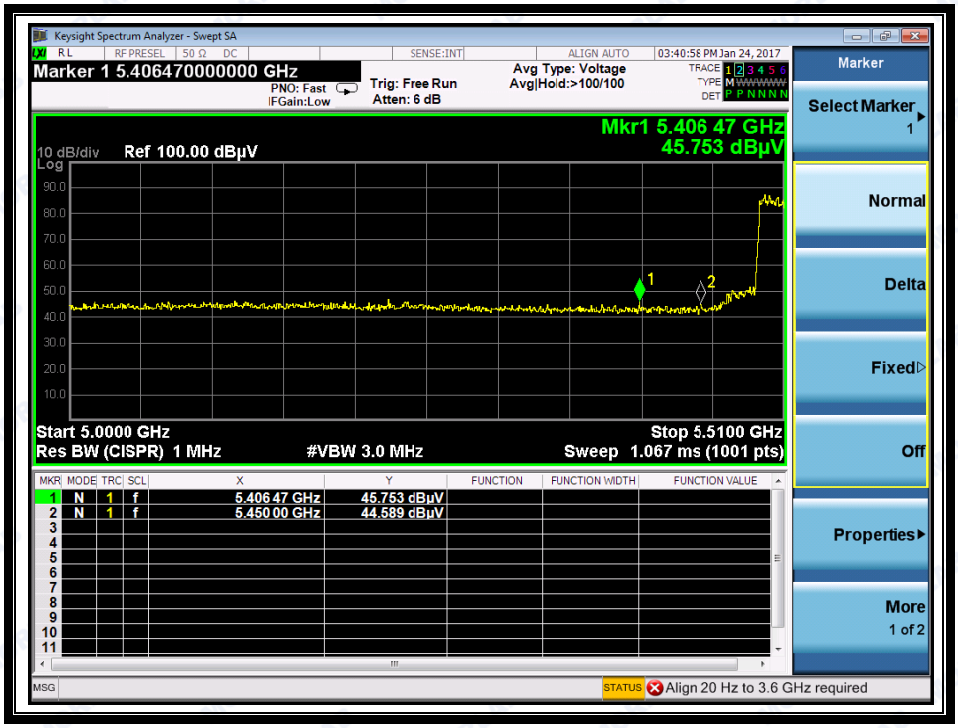


(Channel = 38 AVG @ 802.11n 40MHz)

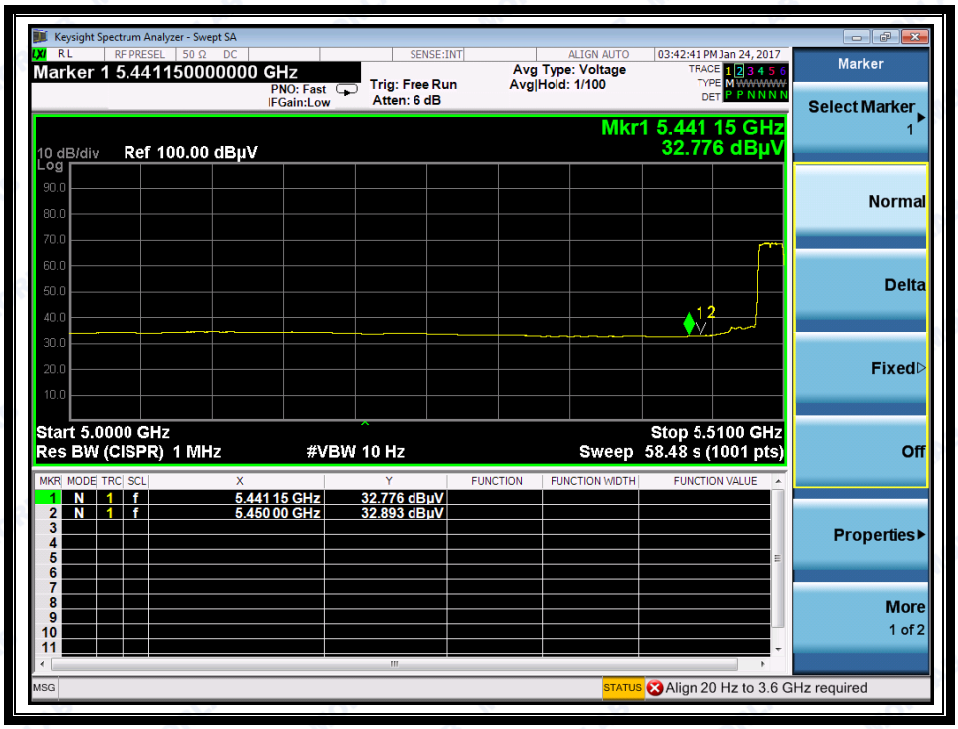
(Channel = 62 PEAK @ 802.11n 40MHz)



(Channel = 62 AVG @ 802.11n 40MHz)

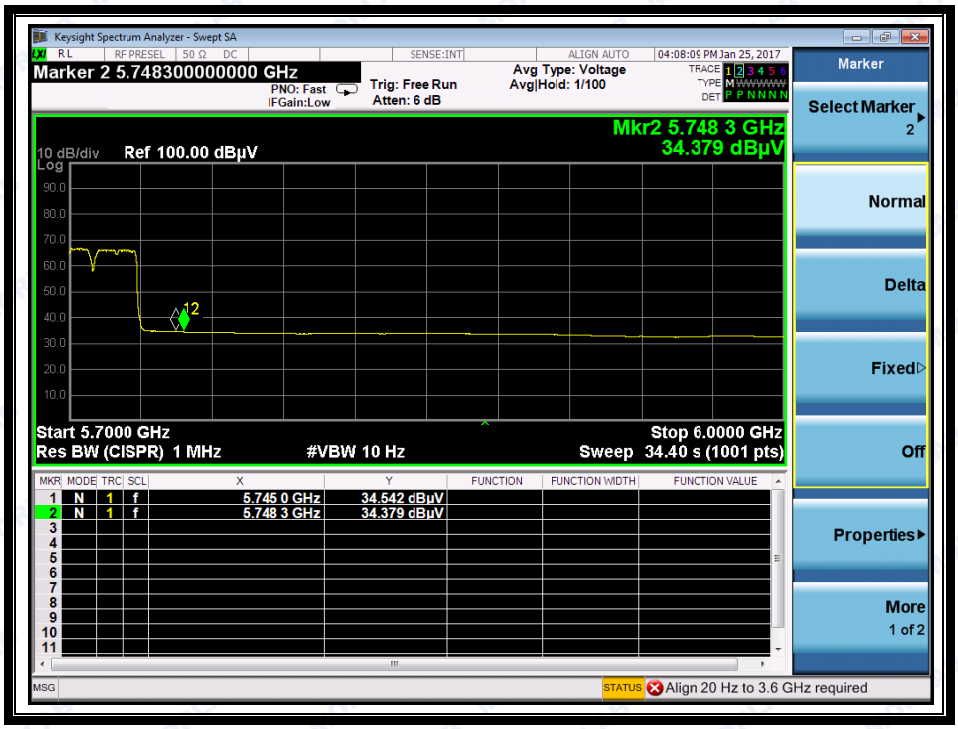


(Channel =102 PEAK @ 802.11n 40MHz)



(Channel = 102AVG @ 802.11n 40MHz)

(Channel = 142 PEAK @ 802.11n 40MHz)



(Channel = 142 AVG @ 802.11n 40MHz)

2.6 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^{o} 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%	3.7	+20(Ref)	5,179,999,995	5	0.00000010
100%		-30	5,180,000,016	16	0.00000031
100%		-20	5,180,000,007	7	0.00000014
100%		-10	5,179,999,985	15	0.00000029
100%		0	5,179,999,988	12	0.00000023
100%		+10	5,180,000,014	14	0.00000027
100%		+20	5,179,999,996	4	0.00000008
100%		+30	5,180,000,027	27	0.00000052
100%		+40	5,180,000,011	11	0.00000021
100%		+50	5,180,000,020	20	0.00000039
85%	3.55	+20	5,180,000,017	17	0.00000033
115%	4.35	+20	5,179,999,994	6	0.00000012

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq Dev. (Hz)	Deviation (%)
100%	3.7	+20(Ref)	5,260,000,010	10	0.00000019
100%		-30	5,260,000,033	33	0.00000063
100%		-20	5,259,999,996	4	0.00000008
100%		-10	5,260,000,023	23	0.00000044
100%		0	5,259,999,978	22	0.00000042
100%		+10	5,260,000,002	2	0.00000004
100%		+20	5,259,999,981	19	0.00000036
100%		+30	5,259,999,977	23	0.00000044
100%		+40	5,259,999,982	18	0.00000034
100%		+50	5,260,000,091	91	0.00000173
85%	3.55	+20	5,260,000,013	13	0.00000025
115%	4.35	+20	5,259,999,985	15	0.00000029

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq Dev. (Hz)	Deviation (%)
100%	3.7	+20(Ref)	5,500,000,008	8	0.00000015
100%		-30	5,499,999,984	16	0.00000029
100%		-20	5,500,000,026	26	0.00000047
100%		-10	5,499,999,978	22	0.00000040
100%		0	5,500,000,012	12	0.00000022
100%		+10	5,499,999,982	18	0.00000033
100%		+20	5,500,000,072	72	0.00000131
100%		+30	5,500,000,015	15	0.00000027
100%		+40	5,499,999,997	3	0.00000005
100%		+50	5,500,000,012	12	0.00000022
85%	3.55	+20	5,500,000,090	90	0.00000164
115%	4.35	+20	5,499,999,987	13	0.00000024

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq Dev. (Hz)	Deviation (%)
100%	3.7	+20(Ref)	5,744,999,987	13	0.00000023
100%		-30	5,744,999,979	21	0.00000037
100%		-20	5,745,000,042	42	0.00000073
100%		-10	5,744,999,969	31	0.00000054
100%		0	5,745,000,021	21	0.00000037
100%		+10	5,745,000,008	8	0.00000014
100%		+20	5,745,000,007	7	0.00000012
100%		+30	5,745,000,018	18	0.00000031
100%		+40	5,744,999,988	12	0.00000021
100%		+50	5,745,000,001	1	0.00000002
85%	3.55	+20	5,745,000,017	17	0.00000030
115%	4.35	+20	5,744,999,987	13	0.00000023

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

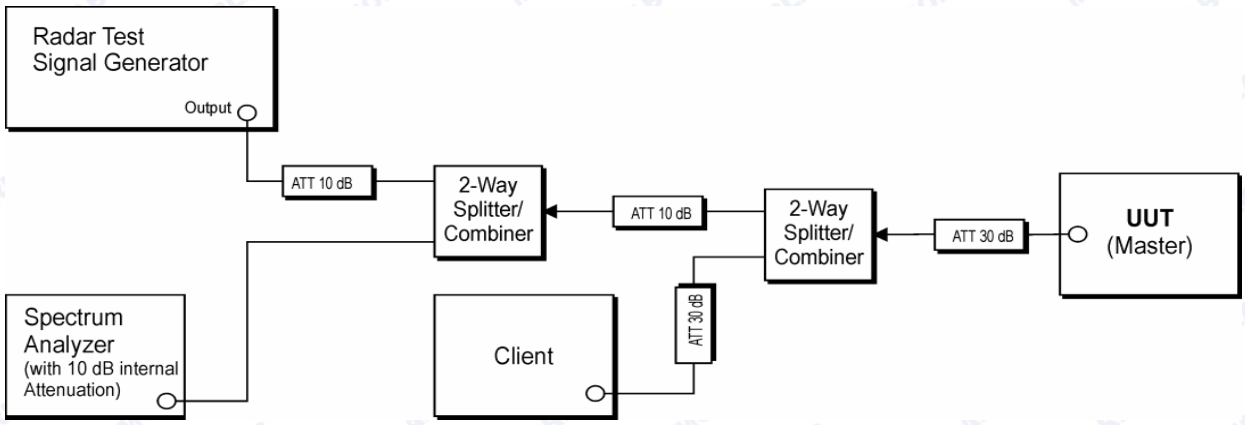


Figure 2: Example Conducted Setup where UUT is a Master and Radar Test Waveforms are injected into the Master

B.2 Setup for Client with injection at the Master

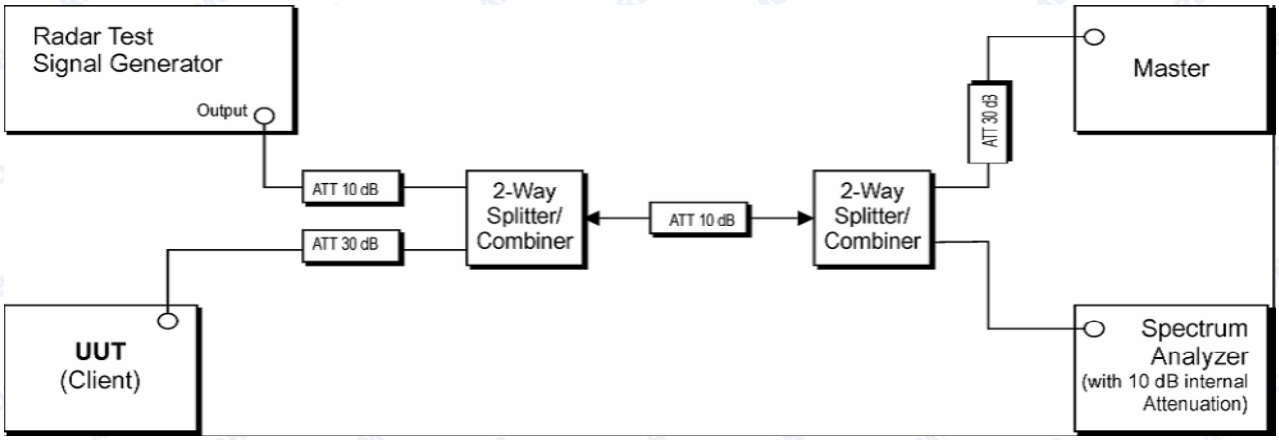


Figure 3: Example Conducted Setup where UUT is a Client and Radar Test Waveforms are injected into the Master

B.3 Setup for Client with injection at the Client

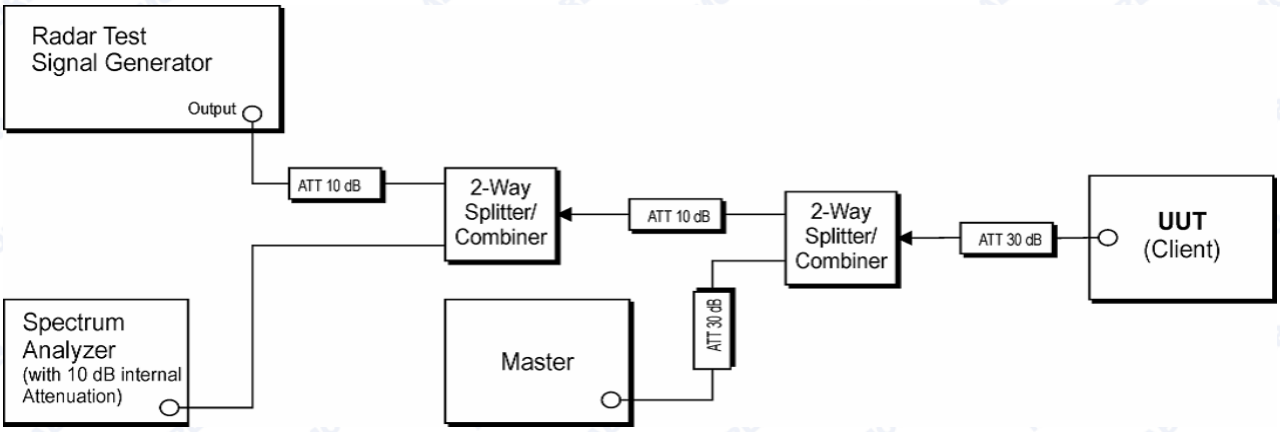
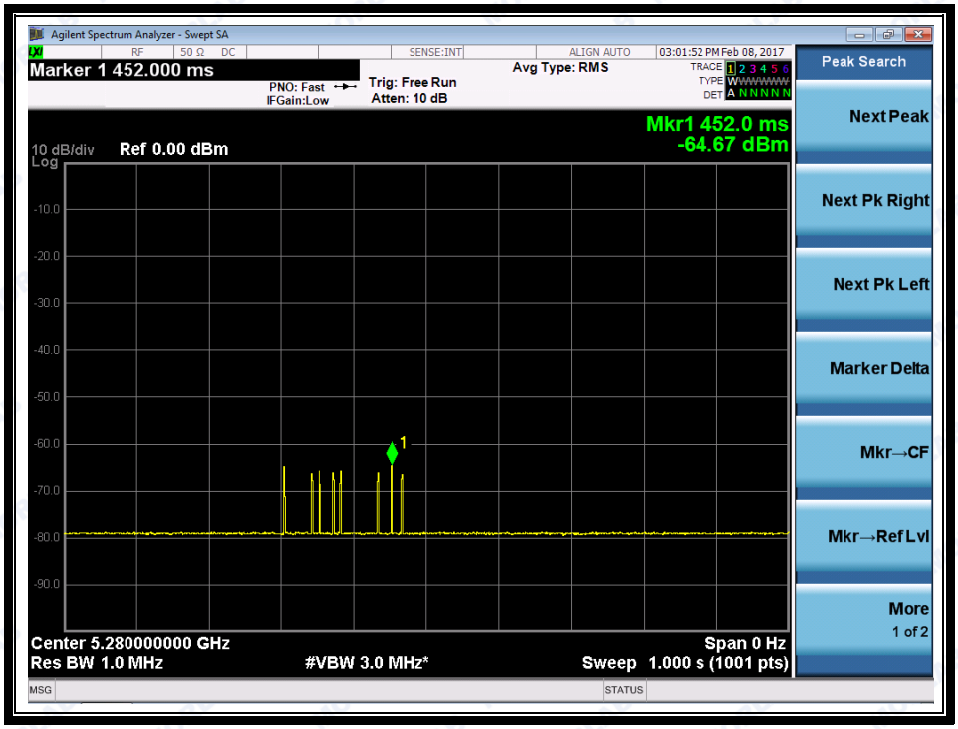


Figure 4: Example Conducted Setup where UUT is a Client and Radar Test Waveforms are injected into the Client

2.7.3 Test Result

2.7.3.1 Radar Test Waveforms are injected into the Master：



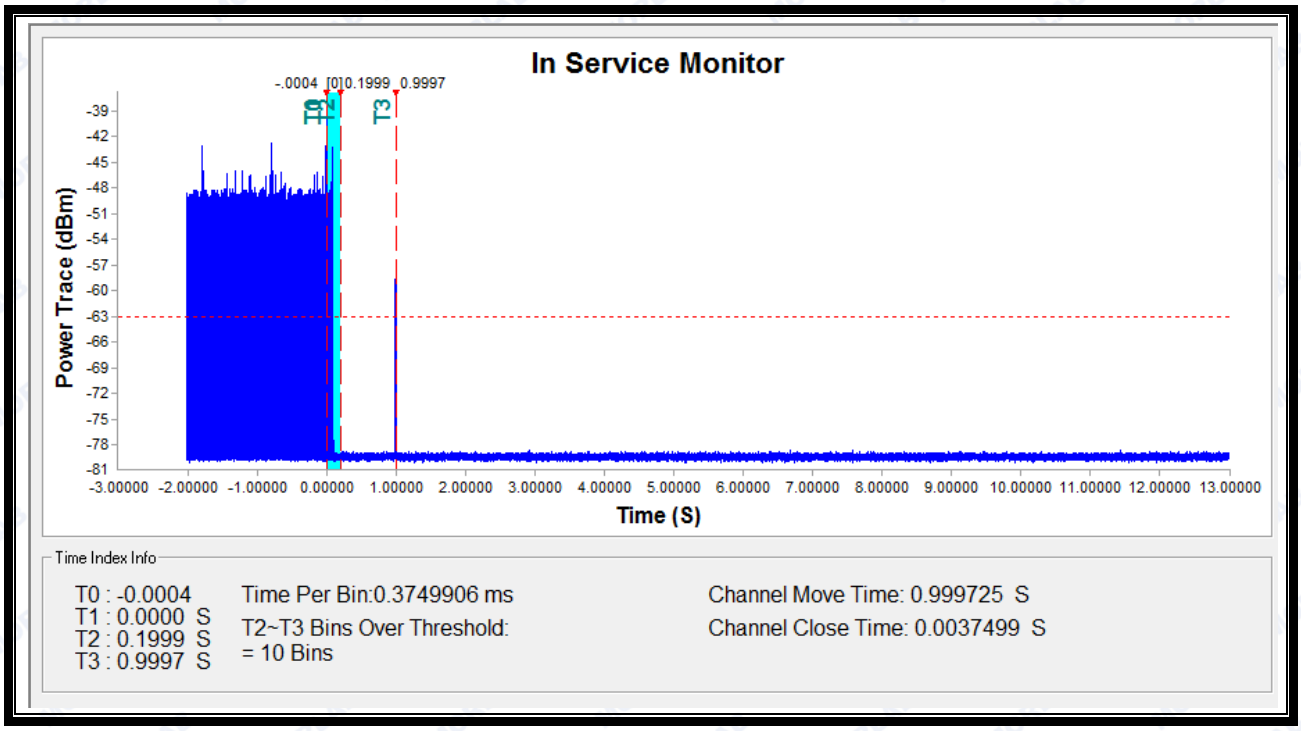
2.7.3.2 EUT is a Client Device Without Radar Detection :

Channel & Bandwidth	Requirement	Operational Mode	Test Result	Limit	Verdict
		Client Without Radar Detection			
20MHz 5260MHz	Channel Move Time	Yes	8.47s	＜10s	Pass
	Channel Closing Transmission Time	Yes	0.03s	＜1s	Pass
	Non-occupancy period	Yes	⩾30	⩾30 Minutes	Pass
40MHz 5510MHz	Channel Move Time	Yes	3.48s	＜10s	Pass
	Channel Closing Transmission Time	Yes	0.08s	＜1s	Pass
	Non-occupancy period	Yes	⩾30	⩾30 Minutes	Pass

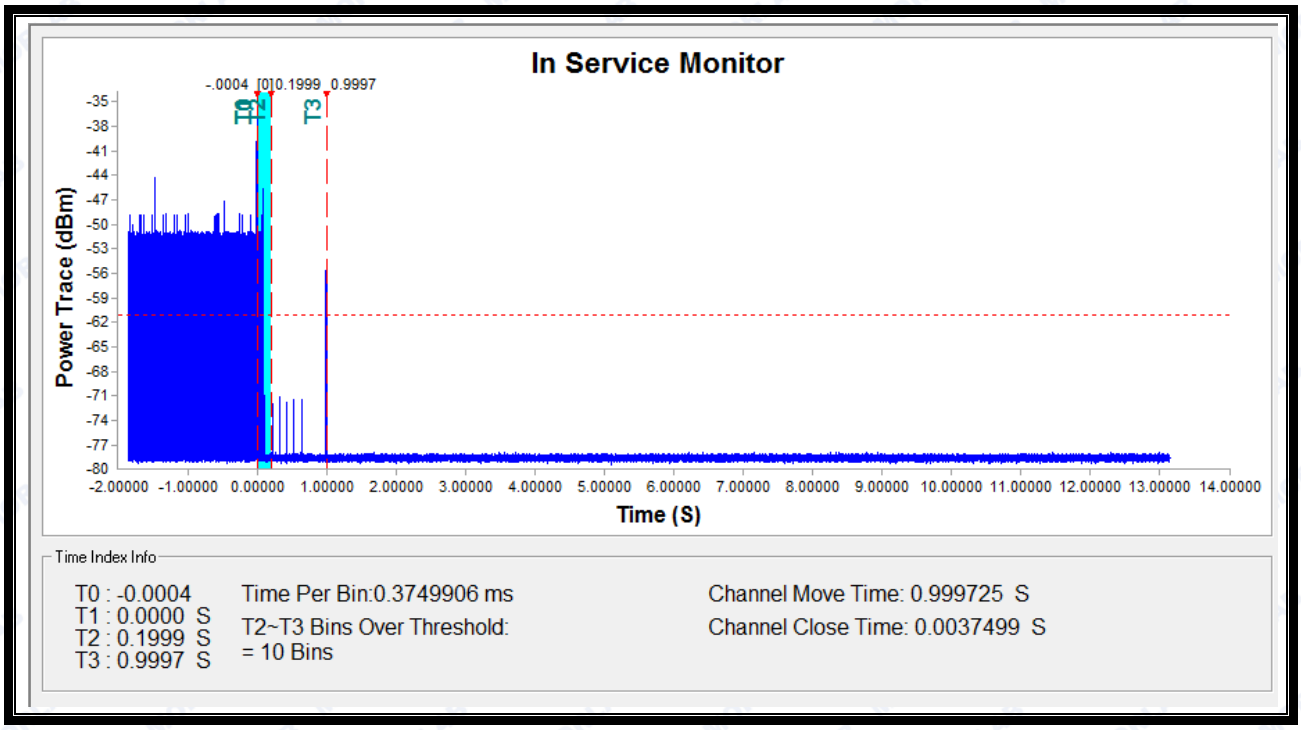
2.7.3.3 Test Plots

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/5260MHz:



40MHz/5510MHz:



2.7.3.4 Test Photo for DFS

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 50μH/50Ω line impedance stabilization network (LISN).

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

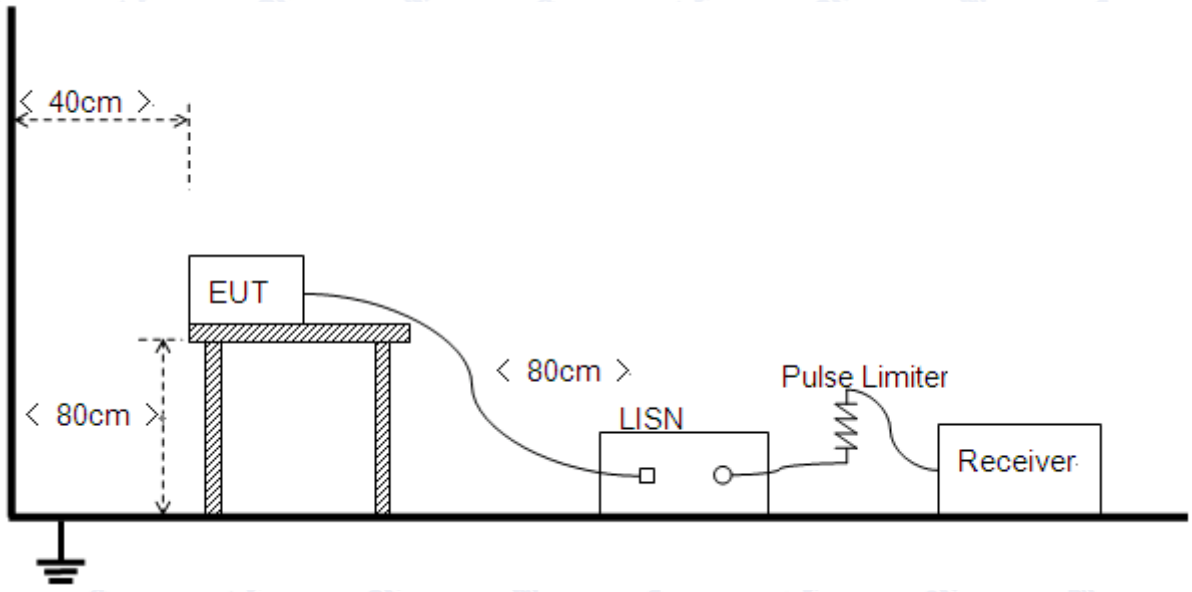
NOTE:

(a) The lower limit shall apply at the band edges.

(b) 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 C63.10: 2013.

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.

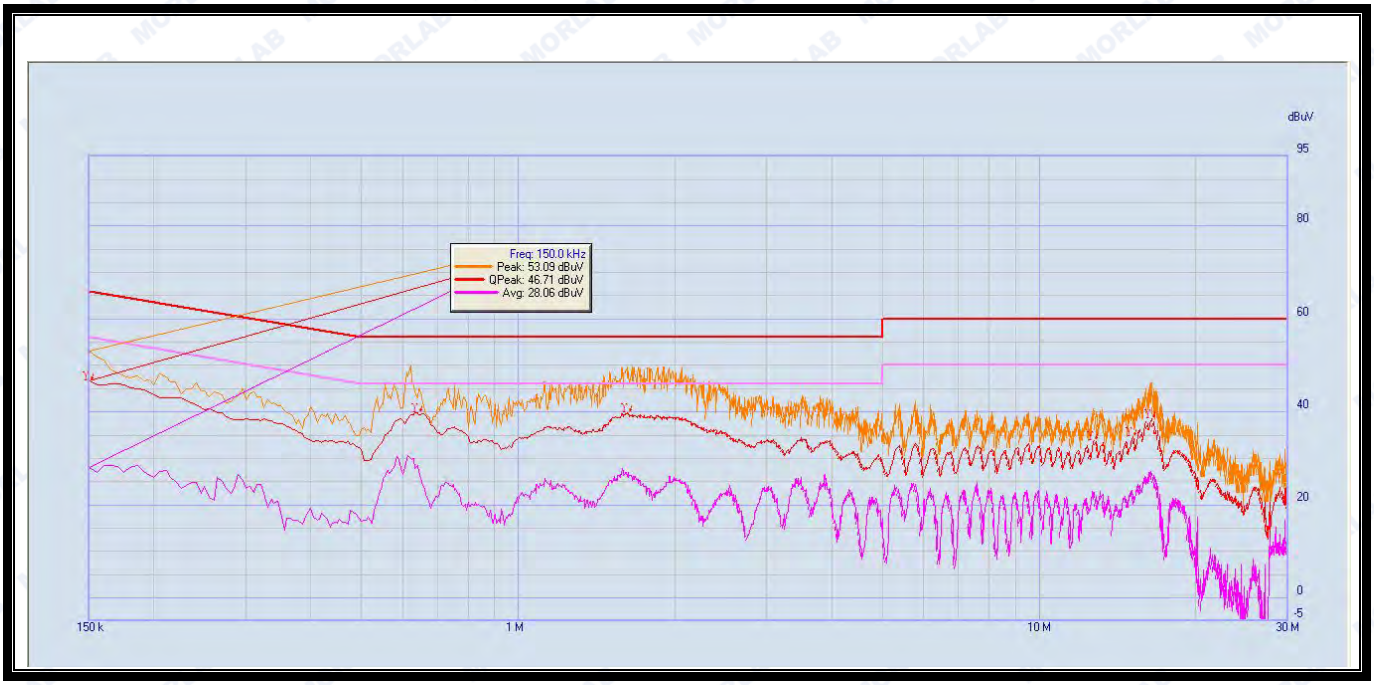
Note: All test modes are performed, only the worst case is recorded in this report.

A. Test setup:

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

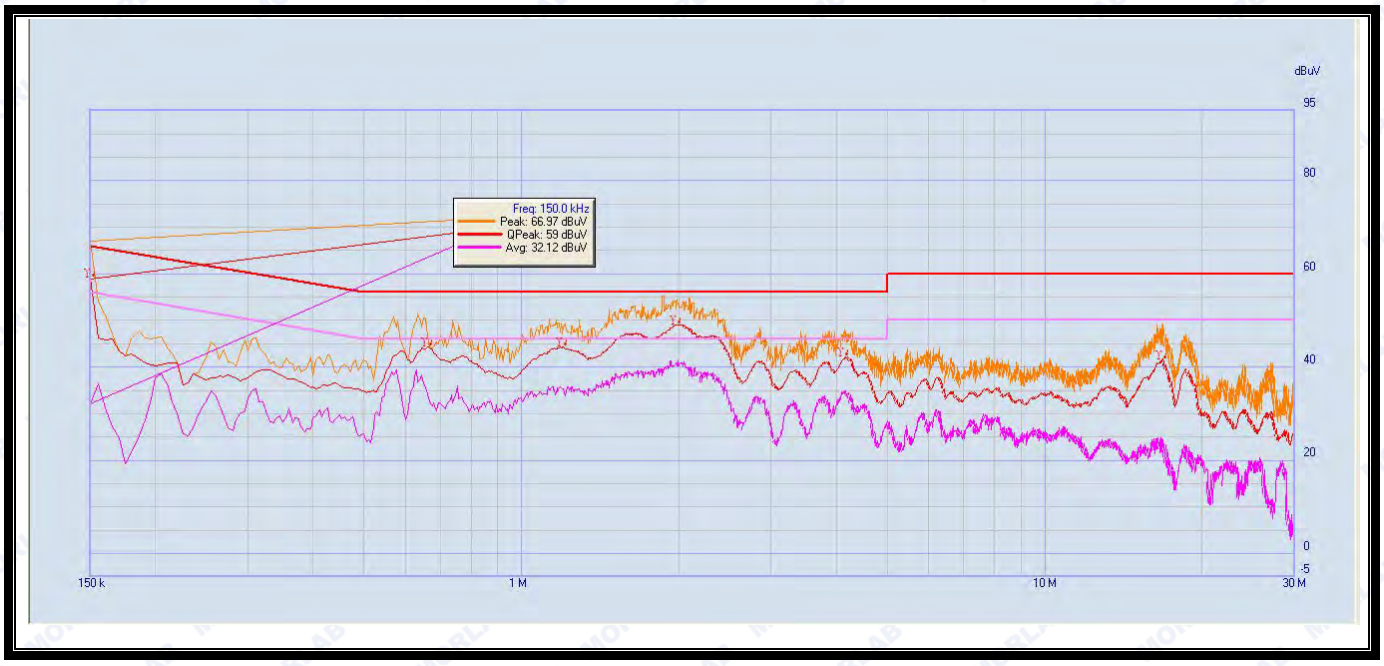
Note: The test voltage is AC 120V/60Hz.

B. Test Plots:



(Plot A: L Phase)

NO.	Fre. (MHz)	Emission Level (dBμV)		Limit (dBμV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.15	46.71	28.06	66	56	Line	PASS
2	0.64	39.88	28.48	56	46		PASS
3	1.615	39.87	26.18	56	46		PASS
4	12.695	33.37	21.76	60	50		PASS
5	15.08	34.34	21.71	60	50		PASS
6	16.37	38.11	26.38	60	50		PASS



(Plot B: N Phase)

NO.	Fre. (MHz)	Emission Level (dBμV)		Limit (dBμV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.15	59.00	32.12	66	56	Neutral	PASS
2	0.66	44.41	34.35	56	46		PASS
3	1.195	44.21	35.32	56	46		PASS
4	1.965	48.95	40.78	56	46		PASS
5	4.125	41.77	35.00	56	46		PASS
6	16.735	41.22	23.46	60	50		PASS

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 (dBμV/m);

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

where P is the EIRP in Watts

Therefore: -27 dBm/MHz = 68.23 dBuV/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 (μV/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:

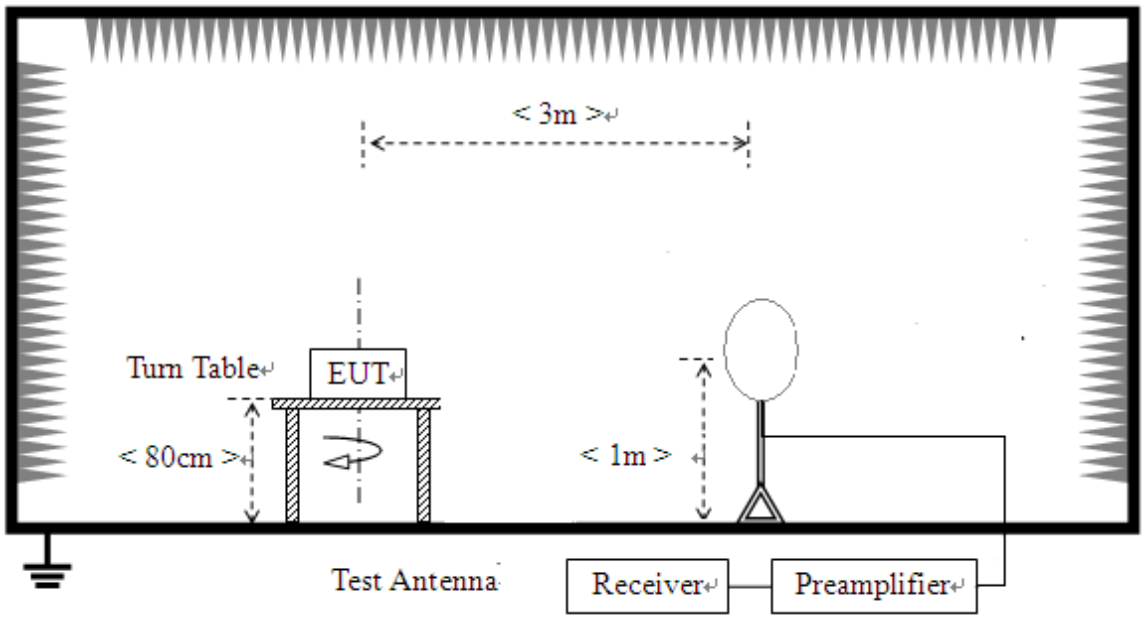
For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.

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)

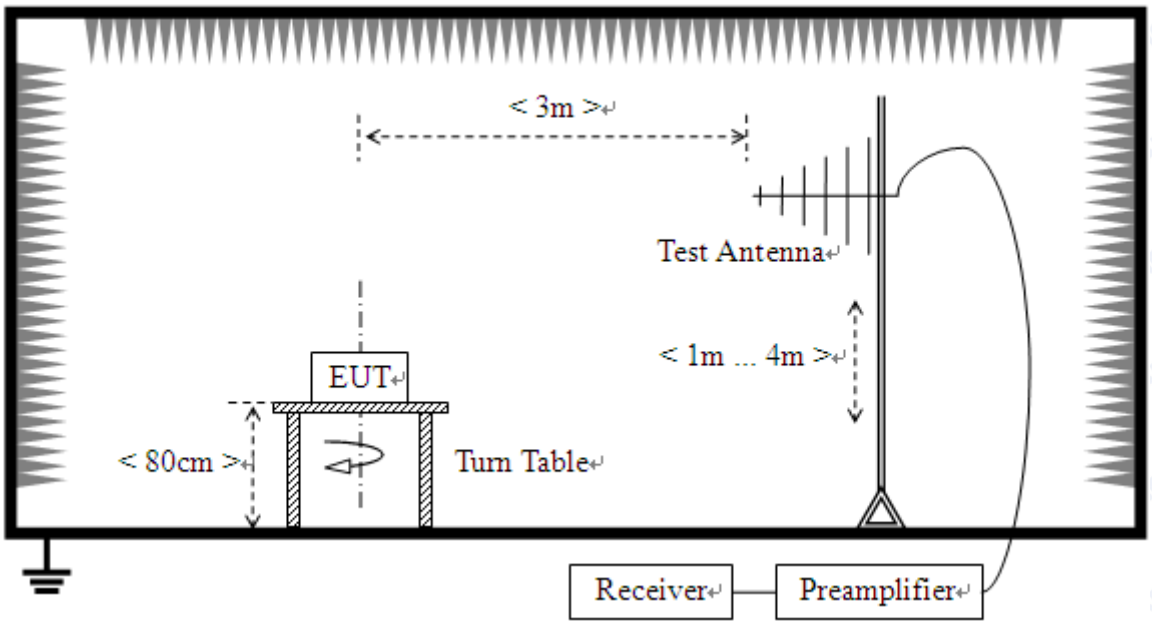
2.9.2 Test Description

A. Test Setup:

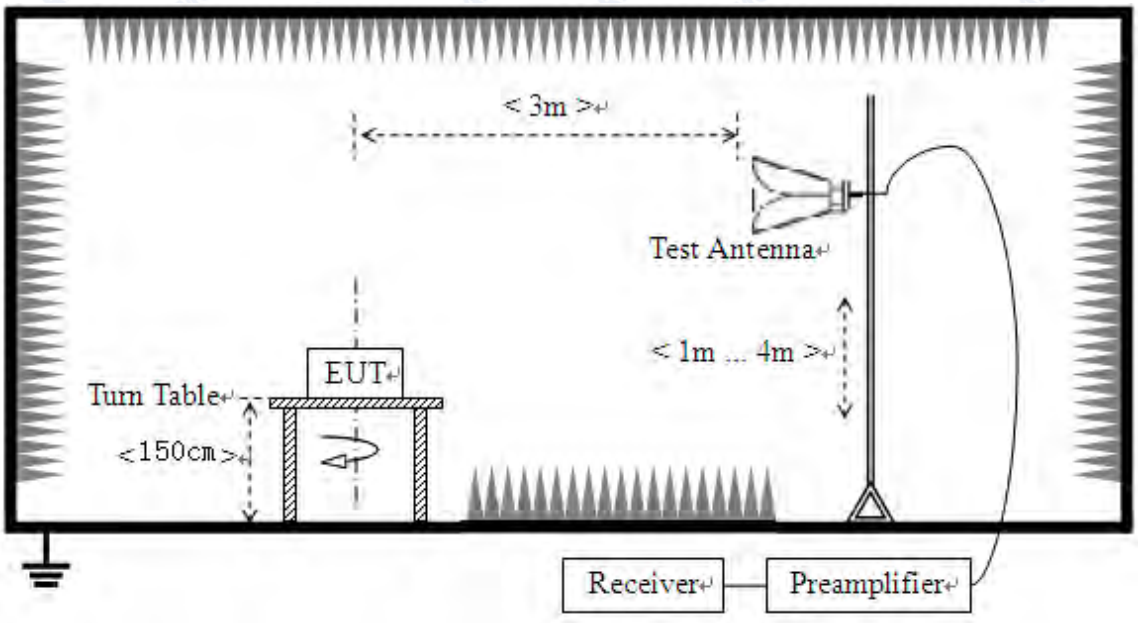
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to1GHz



3) For radiated emissions above 1GHz



The RF absorbing material used on the reference ground plane and on the turntable have a maximum height (thickness) of 30 cm (12 in) and have a minimum-rated attenuation of 20 dB at all frequencies from 1 GHz to 18 GHz. Test site have a minimum area of the ground plane covered with RF absorbing material as specified in Figure 6 of ANSI C63.4: 2014.

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to

the standards: ANSI C63.10 (2013). For radiated emissions below or equal to 1GHz, The EUT was set-up on insulator 80cm above the Ground Plane, For radiated emissions above 1GHz, The EUT was set-up on insulator 150cm above the Ground Plane. The set-up and test methods were according to ANSI C63.10

For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

The EUT 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

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 1GHz) and Horn Test Antenna (above 1GHz) are used. Place the test antenna at 3m away from area of the EUT, while keeping the test antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The test antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final test antenna elevation shall be that which maximizes the emissions. The test antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. 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:

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

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.

Note1: 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.

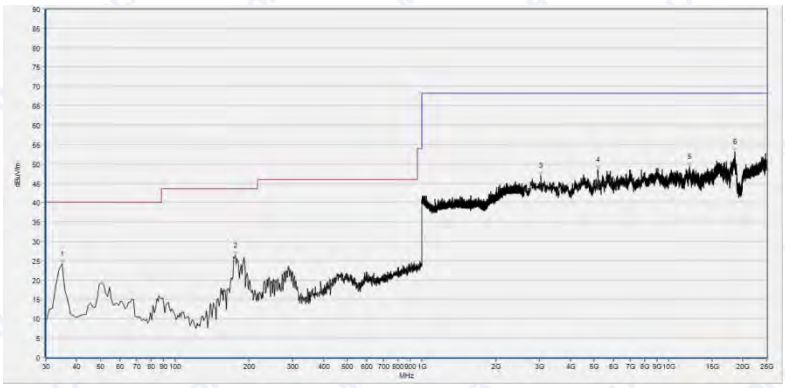
Note2: The low frequency, which started from 9KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

For the frequency, which started from 25G to 40G, was pre-scanned and the result which was 10dB lower than the limit.

2.9.3.1 802.11n-20MHz Test mode

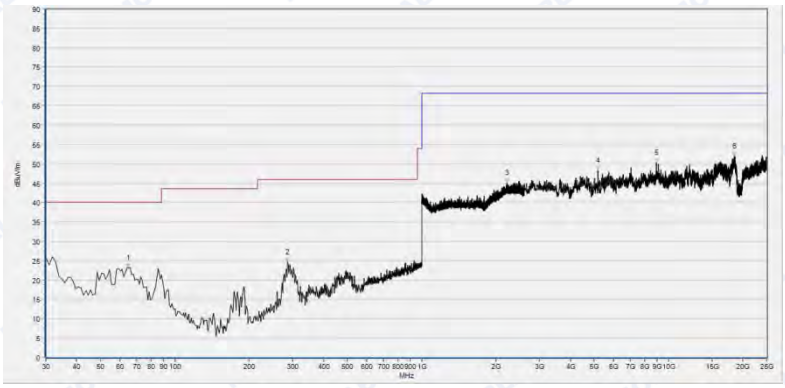
A. Test Plots for the Whole Measurement Frequency Range:

Plots for Channel = 36



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
34.855	24.11	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
175.646	26.39	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
3043.609	46.91	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
5185.477	48.46	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
12148.790	49.20	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
18592.318	53.12	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

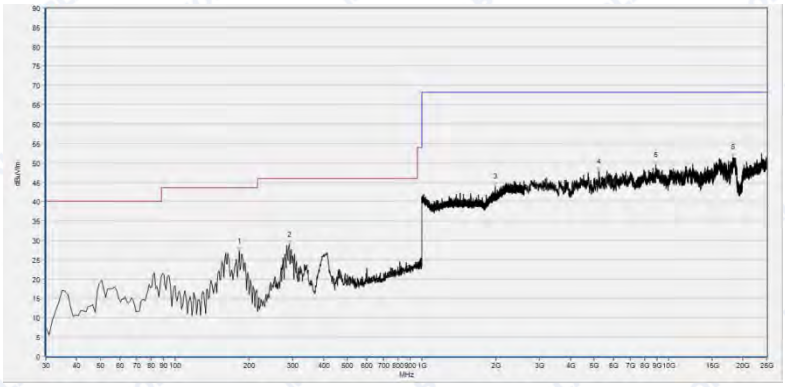
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
64.955	23.09	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
286.336	24.64	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
2219.073	45.02	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5180.996	48.22	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
8935.987	50.29	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
18413.083	51.88	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

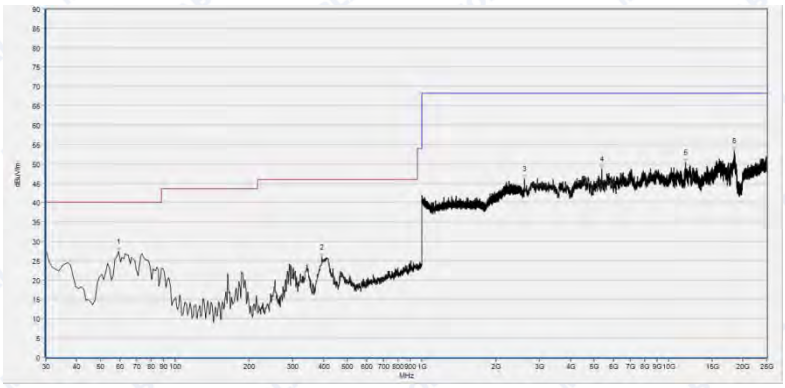
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 44



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
182.442	27.09	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
290.220	28.82	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
1987.529	43.94	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
5216.843	47.71	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
8882.216	49.37	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
18215.923	51.39	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

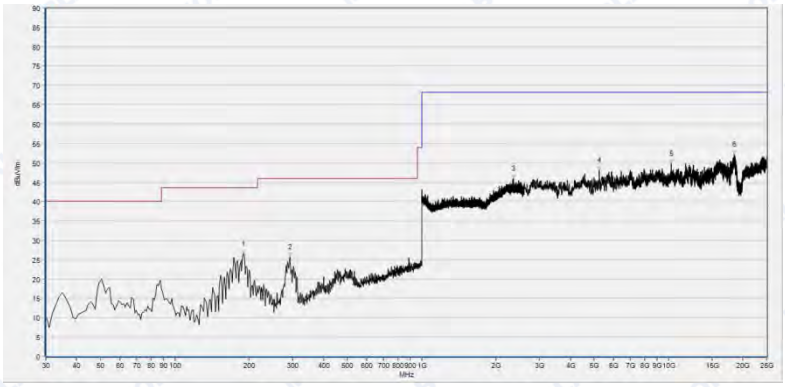
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
59.129	27.31	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
394.114	25.77	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
2608.962	46.05	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5369.194	48.55	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
11727.586	50.36	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
18489.258	53.30	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

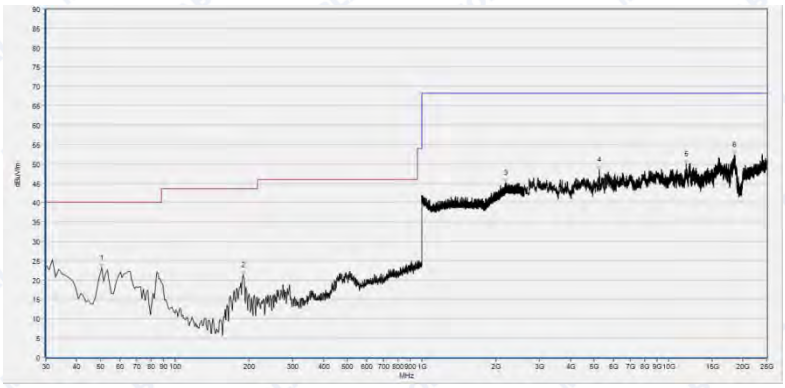
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 48



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
189.239	26.43	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
292.162	25.59	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
2351.384	45.91	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
5239.248	48.05	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
10284.737	49.75	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
18417.564	52.17	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

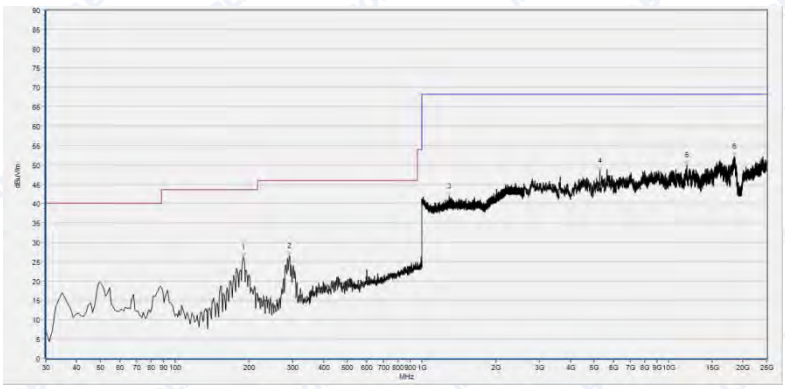
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
50.390	23.18	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
189.239	21.21	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
2192.397	45.10	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5248.210	48.38	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
11785.837	49.88	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
18502.701	52.29	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

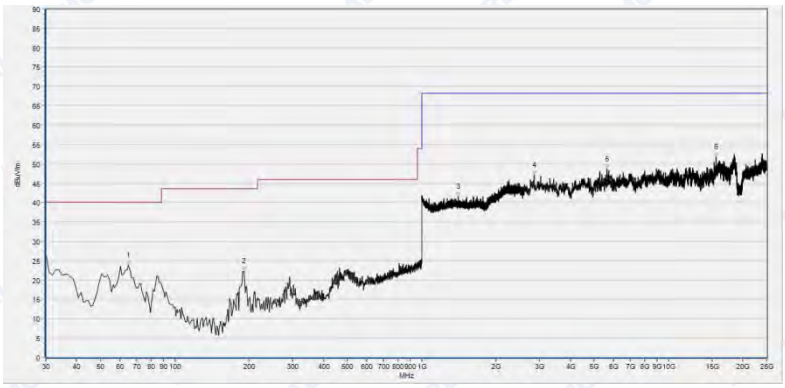
(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 52



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
189.239	26.08	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
290.220	26.51	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
1288.630	41.82	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
5257.171	48.47	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
11866.493	49.87	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
18475.815	52.12	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

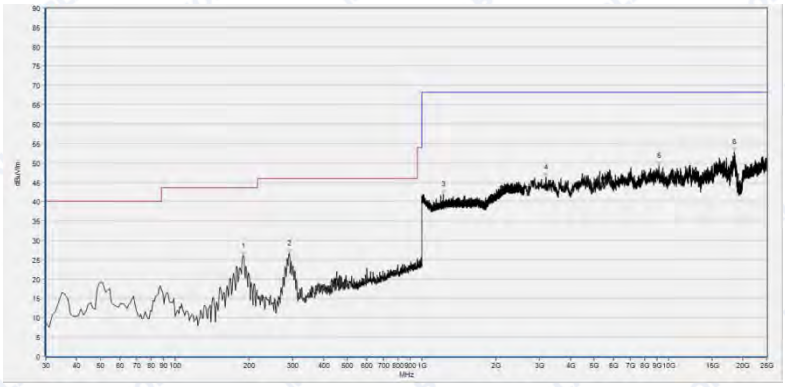
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
64.955	23.81	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
190.210	22.25	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
1406.536	41.64	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
2850.930	47.13	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5638.048	48.63	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
15617.003	51.70	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

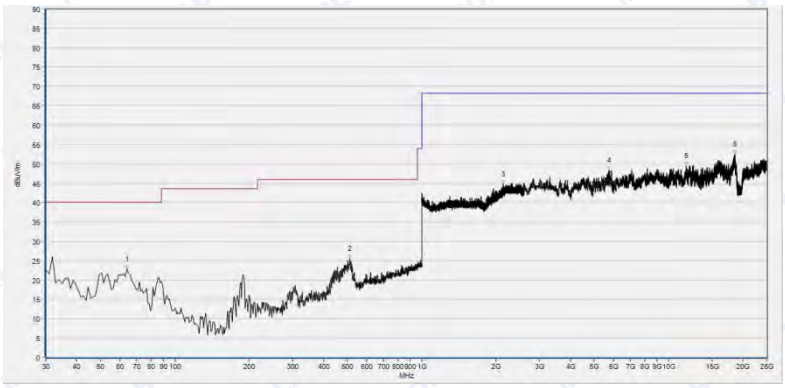
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 60



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
189.239	26.03	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
290.220	26.61	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
1225.142	41.90	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
3191.478	46.26	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
9142.108	49.27	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
18489.258	52.82	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

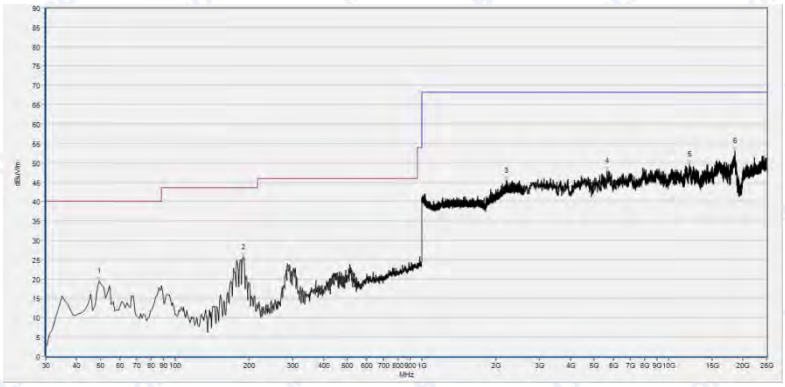
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
63.984	22.73	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
511.602	25.43	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
2131.044	44.81	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5718.704	48.30	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
11776.875	49.43	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
18583.357	52.42	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

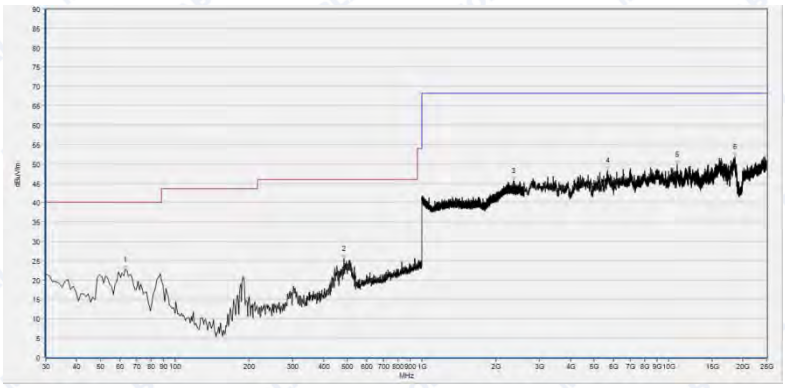
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 64



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
49.419	19.42	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
189.239	25.64	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
2200.934	45.43	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
5638.048	47.99	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
12139.828	49.54	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
18574.395	53.08	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

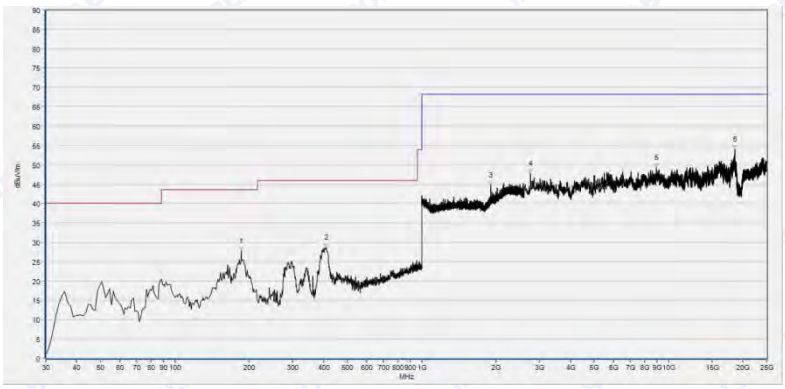
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
63.013	22.58	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
484.414	25.53	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
2355.118	45.57	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5660.452	48.30	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
10817.964	49.72	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
18574.395	51.87	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

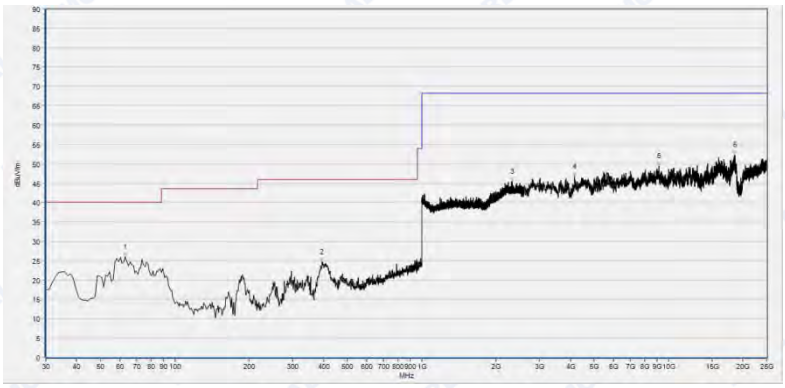
(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 100



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
185.355	27.58	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
410.621	28.66	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
1902.701	44.72	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
2761.312	47.69	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
8931.506	49.28	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
18583.357	54.00	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

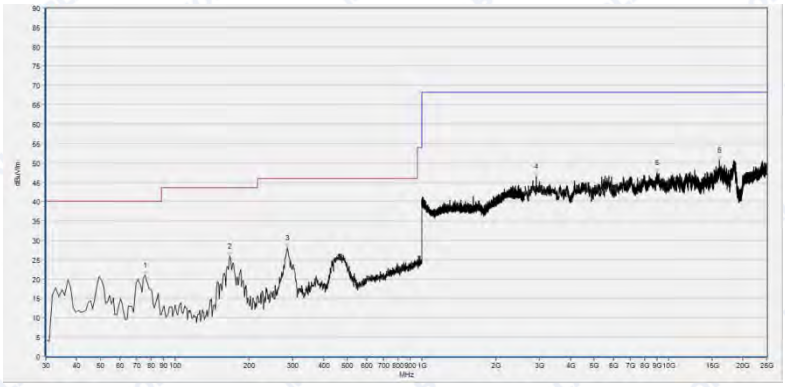
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
63.013	25.95	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
395.085	24.60	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
2326.842	45.35	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
4163.833	46.80	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
9128.666	49.47	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
18583.357	52.33	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

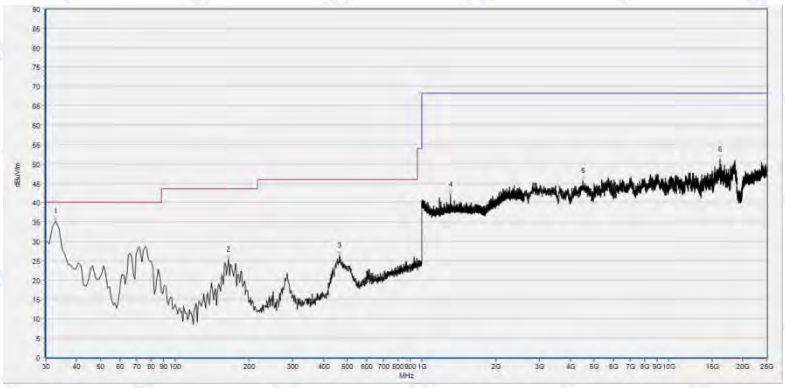
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 120



Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
75.636	20.98	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
166.907	25.81	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
285.365	28.06	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
2909.182	46.43	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
8953.911	47.45	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
16100.940	50.64	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

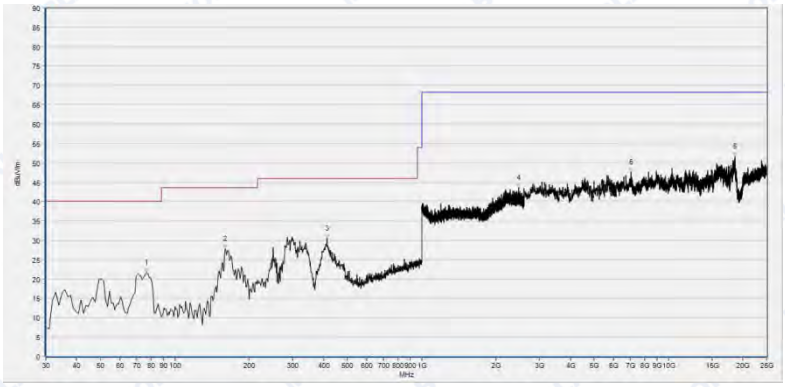
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
32.913	35.24	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
164.965	25.35	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
464.024	26.38	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
1307.302	42.09	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
4495.419	45.55	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
16199.520	51.18	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

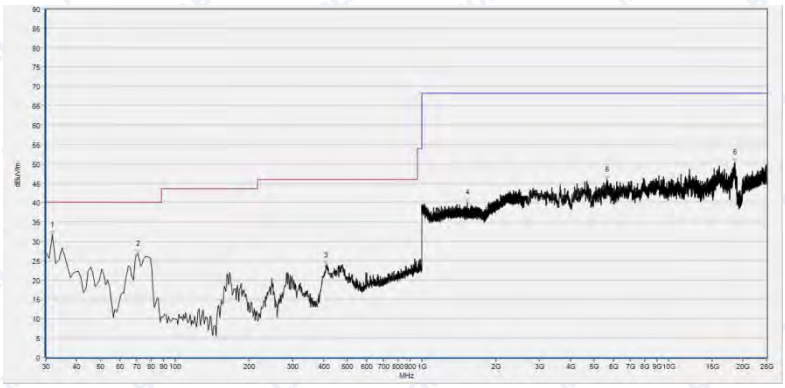
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 140



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
76.607	21.56	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
160.110	27.84	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
412.563	30.52	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
2474.625	43.49	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
7036.087	47.63	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
18596.799	51.60	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



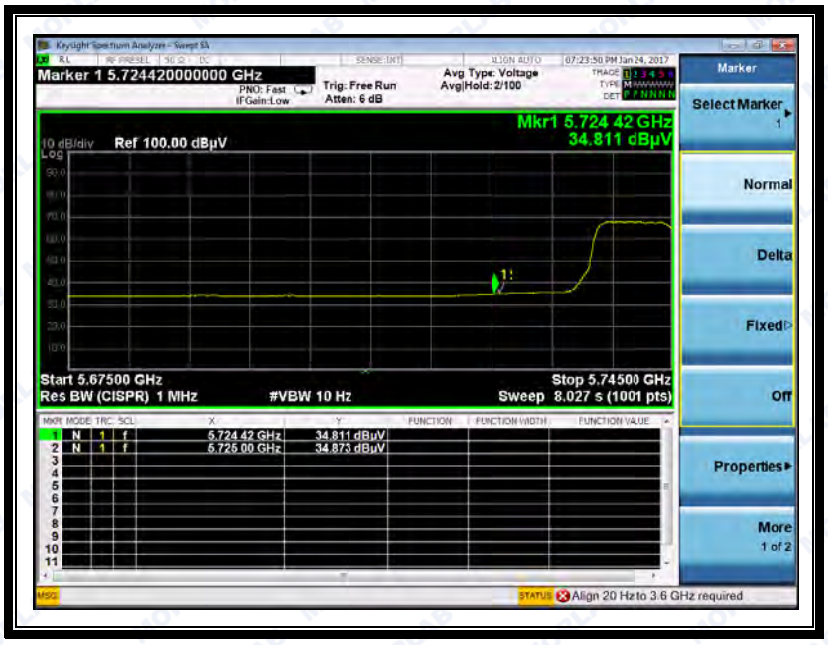
Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
31.942	31.68	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
70.781	26.80	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
409.650	23.80	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
1526.576	40.06	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5633.567	45.92	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
18587.838	50.38	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

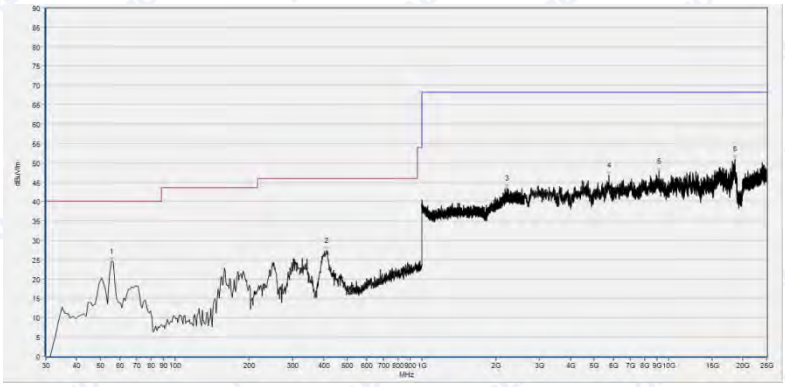
Plots for Channel = 149

Channel	Frequency (MHz)	Antenna Horiz./ Vert.	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
149	5722.46	Horizontal	51.08	-50.65	32.11	32.54	78.2	Pass
149	5724.42	Vertical	34.81	-50.65	32.11	16.27	78.2	Pass

(Channel = 149 Horizontal @ 802.11n)

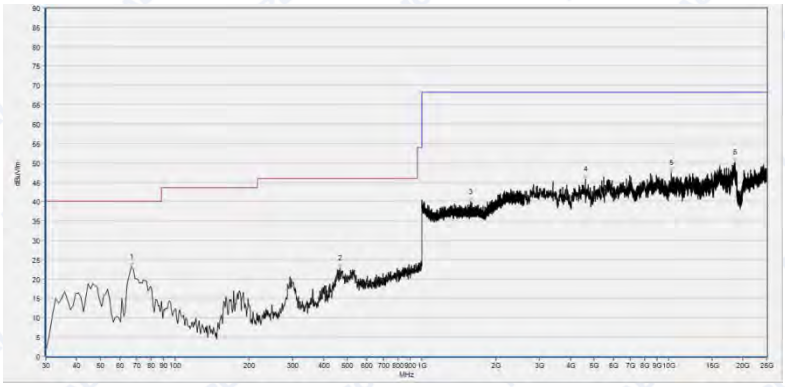


(Channel = 149 Vertical @ 802.11n)



Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
55.245	24.55	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
411.592	27.38	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
2216.405	43.33	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
5723.185	46.74	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
9124.185	47.75	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
18587.838	51.00	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

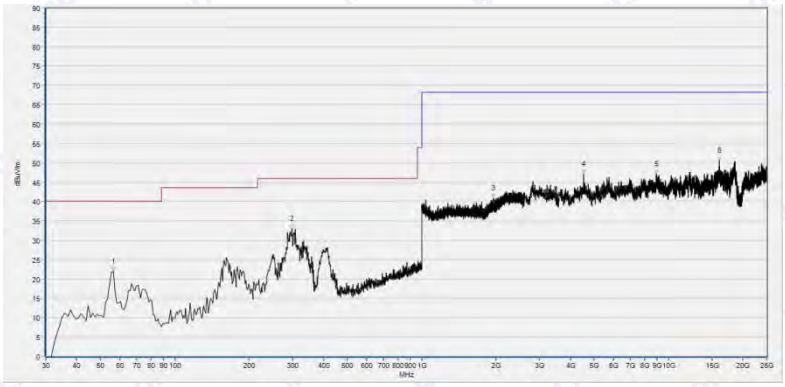
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
66.897	23.21	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
465.966	22.72	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
1582.061	39.89	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
4598.480	45.69	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
10284.737	47.37	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
18587.838	50.06	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

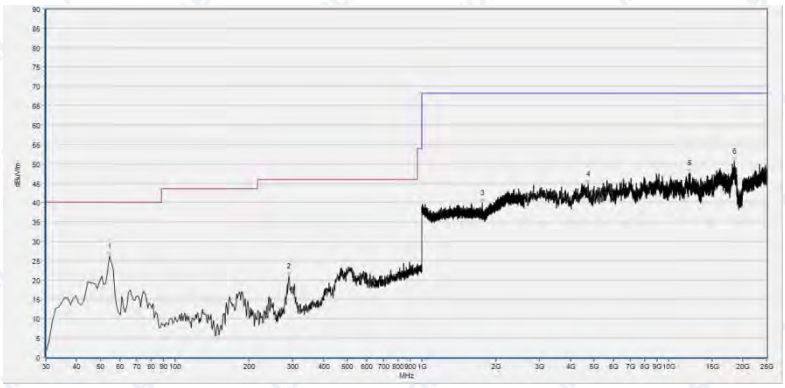
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 157



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
56.216	22.04	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
298.959	32.99	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
1944.848	40.84	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
4535.747	47.13	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
8940.468	47.03	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
16038.208	50.64	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)

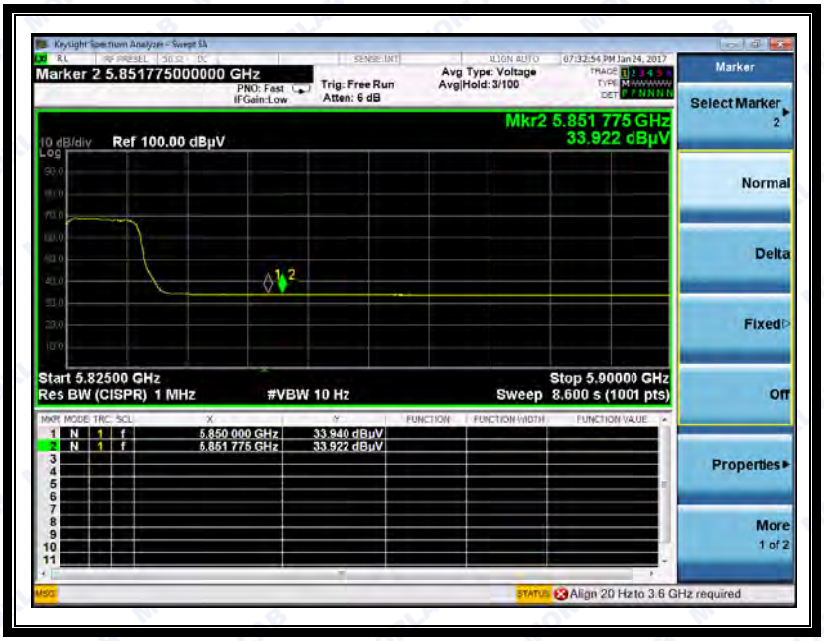


Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
54.274	26.14	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
289.249	20.90	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
1759.186	39.88	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
4728.426	44.67	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
12139.828	47.62	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
18489.258	50.65	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

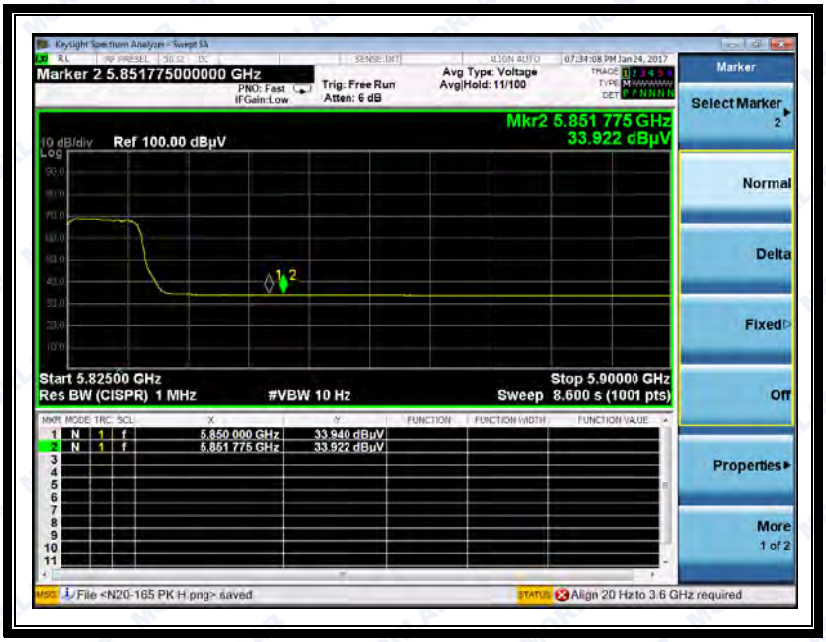
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 165

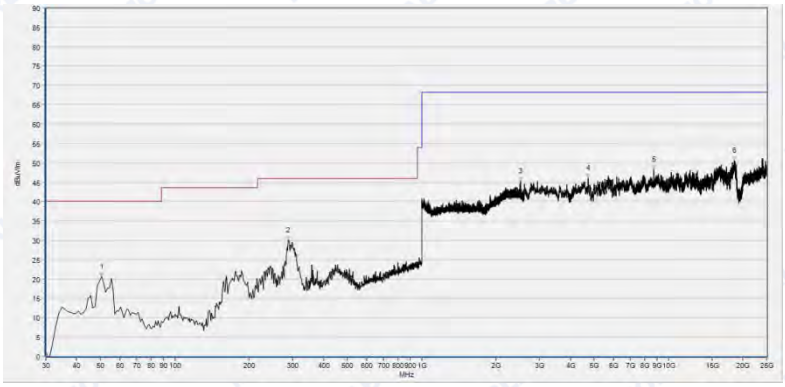
Channel	Frequency (MHz)	Antenna Horiz./ Vert.	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
165	5851.78	Horizontal	33.92	-50.65	32.11	15.38	78.2	Pass
165	5851.78	Vertical	33.92	-50.65	32.11	15.38	78.2	Pass



(Channel = 165 Horizontal @ 802.11n)

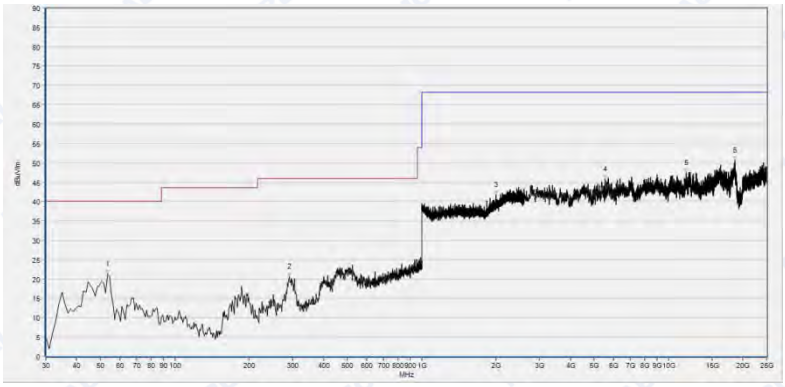


(Channel = 165 Vertical @ 802.11n)



Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
50.390	20.62	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
288.278	29.98	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
2513.038	45.23	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
4732.907	46.13	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
8698.500	48.22	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
18484.777	50.56	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



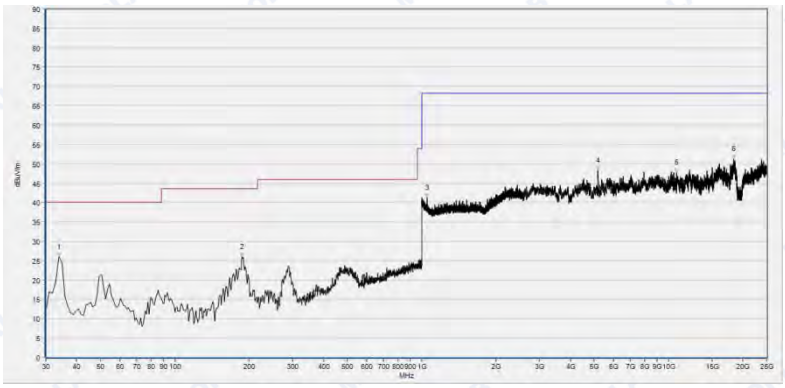
Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
53.303	21.21	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
290.220	20.57	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
1999.266	41.78	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5543.949	45.68	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
11781.356	47.38	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
18578.876	50.67	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

2.9.3.2 802.11a-20MHz Test mode

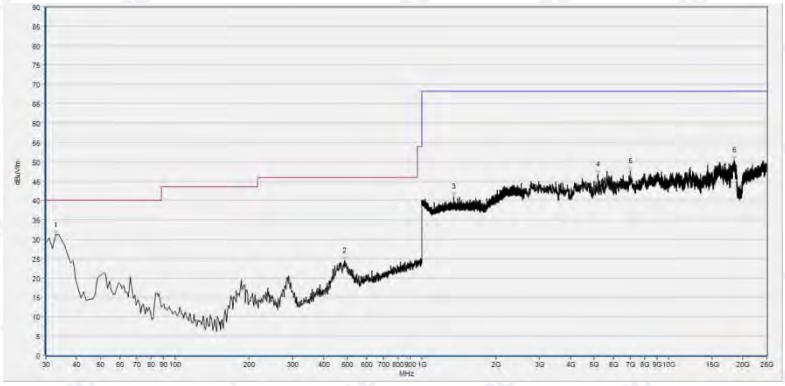
A. Test Plots for the Whole Measurement Frequency Range:

Plots for Channel = 36



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
33.884	25.93	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
187.297	26.05	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
1049.617	41.25	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
5176.515	48.23	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
10800.040	47.81	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
18377.235	51.24	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

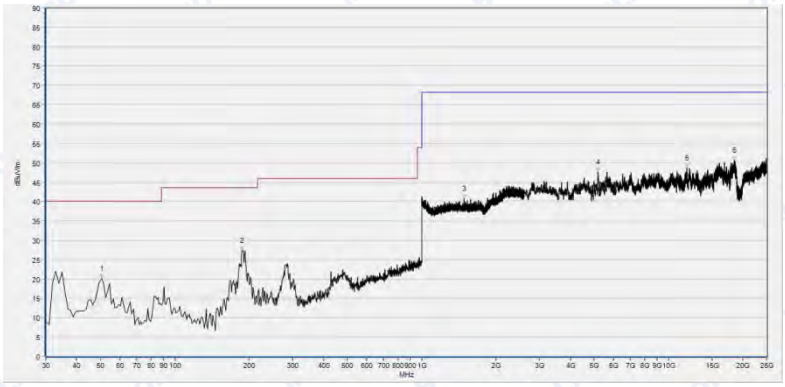
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
32.913	31.10	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
488.298	24.53	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
1351.050	41.03	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5180.996	46.71	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
7009.202	47.52	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
18489.258	50.48	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

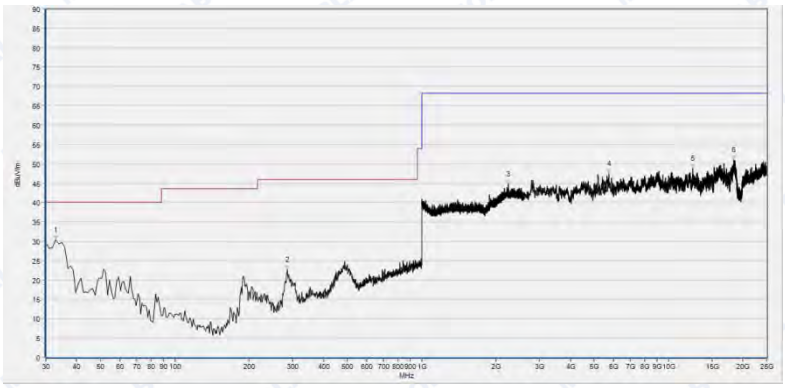
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 44



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
50.390	20.11	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
187.297	27.26	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
1483.361	40.66	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
5185.477	47.53	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
11844.089	48.58	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS
18448.930	50.67	N.A	N.A	68.23	N.A	N.A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
32.913	30.29	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
285.365	22.62	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
2248.416	44.77	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
5723.185	47.47	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
12552.070	48.81	N.A	N.A	68.23	N.A	N.A	Vertical	PASS
18408.602	50.87	N.A	N.A	68.23	N.A	N.A	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)