TEST REPORT

APPLICANT	:	Reliance Communications LLC
PRODUCT NAME	:	Orbic Speed X
MODEL NAME	:	RC400LX
BRAND NAME	:	Orbic, Kajeet
FCC ID	:	2ABGH-RC400LX
STANDARD(S)	:	47 CFR Part 15 Subpart E
RECEIPT DATE	:	2020-04-16
TEST DATE	:	2020-04-20 to 2020-04-21
ISSUE DATE	:	2020-07-11

Edited by: Peng Mi (Rapporteur)

Approved by: Peng Huarui (Supervisor)

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DIRECTORY

1. Technical Information ····· 3
1.1. Applicant and Manufacturer Information ····· 3
1.2. Equipment Under Test (EUT) Description ····· 3
1.3. Modulation Type and Data Rate of EUT ····· 5
1.4. The Channel Number and Frequency ····· 6
1.5. Test Standards and Results ····· 7
1.6. Environmental Conditions ····· 8
2. 47 CFR Part 15E Requirements ····· 9
2.1. Antenna Requirement ····· 9
2.2. Duty Cycle of the Test Signal ····· 10
2.3. Maximum Conducted Output Power ····· 14
2.4. Emission Bandwidth ····· 17
2.5. Peak Power spectral density ····· 34
2.6. Frequency Stability ····· 51
2.7. Conducted Emission ····· 53
2.8. Restricted Frequency Bands ····· 57
2.9. Radiated Emission ····· 81
Annex A Test Uncertainty ····· 108
Annex B Testing Laboratory Information ····· 109

Change History		
Version	Date	Reason for change
1.0	2020-07-11	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Reliance Communications LLC
Applicant Address:	91 Colin Drive, Unit 1, HOLBROOK, New York 11741, United States
Manufacturer:	Unimaxcomm
Manufacturer Address:	Room 602, Floor 6th, Building B, Software Park T3,Hi-Tech Park South, Nanshan District, Shenzhen, P.R. China

1.2. Equipment Under Test (EUT) Description

Product Name:	Orbic Speed X	
Serial No.:	(N/A, marked #1 by test site)	
Hardware Version:	V1.1	
Software Version:	ORB400LX_V1.0.2_BVZNAKJ	
Modulation Technology:	OFDM	
Modulation Mode:	802.11n(HT20), 802.11n(HT40) 802.11ac(VHT20), 802.11ac(VHT40), 802.11ac(VHT80),	
Operating Frequency Range:	5.180 GHz- 5.240GHz;5.745GHz- 5.825GHz	
Channel Number:	Refer to 1.4	
Antenna Type:	PIFA Antenna	
Antenna Gain:	4.50dBi	
Accessory Information:	Battery	
	Brand Name:	Orbic
	Model No.:	BTE-3003
	Serial No.:	(N/A, marked #1 by test site)
	Capacity:	3000mAh
	Rated Voltage:	3.7V
	Charge Limit:	4.2V

Accessory Information:	AC Adapter	
	Brand Name:	Orbic
	Model No.:	TPA-5950100UU
	Serial No.:	(N/A, marked #1 by test site)
	Rated Output:	5.0V⎓1A
	Rated Input:	100-240V~50/60Hz, 0.2A

Note 1: This test report is updated from report (Report No.: SZ20040157W03, FCC ID:2ABGH-RC400L), based on the similarity between before, modify the product name, model, software and hardware version; also add a brand; add 3G/4G RF front end components (Added UMTS Band 4 and LTE Band 7/12/14/17/25/26/30/41/71);disable LTE Band 13 (Remove LTE Band 13 components); disable WiFi MIMO function and change to SISO (Remove one WiFi connector and related components), the WiFi chip and circuit are the same as before, the other are all the same. The changes do not affect the test results.

Note 2: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.3. Modulation Type and Data Rate of EUT

Mode	Bandwidth (MHz)	Modulation Technology	Modulation Type	Data Rate
802.11n	20/40 (HT20/40)	OFDM	**BPSK**	**MCS0**~MCS7
			QPSK	
			16QAM	
			64QAM	
802.11ac	20/40/80 (VHT20/40/80)	OFDM	**BPSK**	**MSC0**~MCS9
			QPSK	
			16QAM	
			64QAM	
			256QAM	

Note1: The worst-case mode(black bold) in all data rates has been determined during the pre-scan, only the test data of the worst-case were recorded in this report.

1.4. The Channel Number and Frequency

Frequency Range: 5180MHz-5240MHz				
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)
20MHz	**36**	**5180**	40	5200
	44	**5220**	**48**	**5240**
40MHz	**38**	**5190**	**46**	**5230**
80MHz	**42**	**5210**		
Frequency Range: 5745-5825MHz				
Bandwidth	Channel	Frequency (MHz)	Channel	Frequency (MHz)
20MHz	**149**	**5745**	153	5765
	157	**5785**	161	5805
	165	**5825**		
40MHz	**151**	**5775**	**159**	**5795**
80MHz	**155**	**5775**		

Note 1: The black bold channels were selected for test.

1.5. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart E (U-NII band) for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 15(5-1-14 Edition)	Radio Frequency Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Test Date	Test Engineer	Result	Method determination /Remark
1	15.203	Antenna Requirement	N/A	N/A	PASS	No deviation
2	ANSI C63.10	Duty Cycle of the test signal	Apr 20, 2020	Tu Yanan	PASS	No deviation
3	15.407(a)	Maximum conducted output Power	Apr 20, 2020	Tu Yanan	PASS	No deviation
4	15.407(a)(e)	Emission Bandwidth	Apr 20, 2020	Tu Yanan	PASS	No deviation
5	15.407(a)	Maximum Power spectral density	Apr 20, 2020	Tu Yanan	PASS	No deviation
6	15.407(g)	Frequency Stability	Apr 20, 2020	Tu Yanan	PASS	No deviation
7	15.207	Conducted Emission	Apr 23, 2020	Huang Zhiye	PASS	No deviation
8	15.407(b)	Restricted Frequency Bands	Apr 20&21, 2020	Li Zihao	PASS	No deviation
9	15.407(b)	Radiated Emission	Apr 21, 2020	Li Zihao	PASS	No deviation

Note1: The tests of Conducted Emission and Radiated Emission were performed according to the method of measurements prescribed in ANSI C63.10 2013.

Note2: These RF tests were performed according to the method of measurements prescribed in KDB789033 D02 v02r01.

Note3: The path loss during the RF test is calibrated to correct the results by the offset setting in the test equipments. The ref offset 12.5dB contains two parts that cable loss 2.5dB and Attenuator 10dB.

Note 4: Additions to, deviation, or exclusions from the method shall be judged in the"method determination" column of add,deviate or exclude from the specific method shall be explained in the "Remark" of the above table.

1.6. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15-35
Relative Humidity (%):	30-60
Atmospheric Pressure (kPa):	86-106

2. 47 CFR Part 15E Requirements

2.1. Antenna Requirement

2.1.1. Applicable Standard

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

2.1.2. Result: Compliant

The EUT has a permanently and irreplaceable attached antenna with the RP-SMA Jack. Please refer to the EUT external and internal photos.

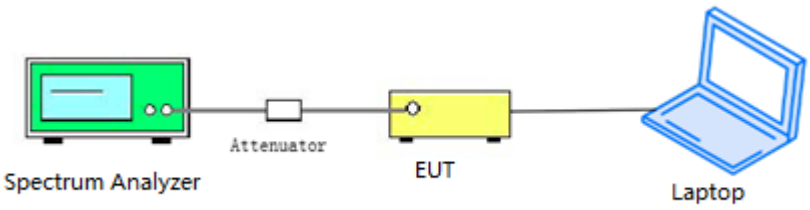
2.2. Duty Cycle of the Test Signal

2.2.1. Requirement

Preferably, all measurements of maximum conducted (average) output power will be performed with theEUT transmitting continuously (i.e., with a duty cycle of greater than or equal to 98%). When continuous operation cannot be realized, then the use of sweep triggering/signal gating techniques can be used to ensure that measurements are made only during transmissions at the maximum power control level. Such sweep triggering/signal gating techniques will require knowledge of the minimum transmission duration (T) over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation. Sweep triggering/signal gating techniques can then be used if the measurement/sweep time of the analyzer can be set such that it does not exceed T at any time that data are being acquired (i.e., no transmitter OFF-time is to be considered).
When continuous transmission cannot be achieved and sweep triggering/signal gating cannot be implemented, alternative procedures are provided that can be used to measure the average power; however, they will require an additional measurement of the transmitter duty cycle (D). Within this subclause, the duty cycle refers to the fraction of time over which the transmitter is ON and is transmitting at its maximum power control level. The duty cycle is considered to be constant if variations are less than ±2%; otherwise, the duty cycle is considered to be nonconstant.

2.2.2. Test Description

Test Setup:



The EUT is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

2.2.3. Test Procedure

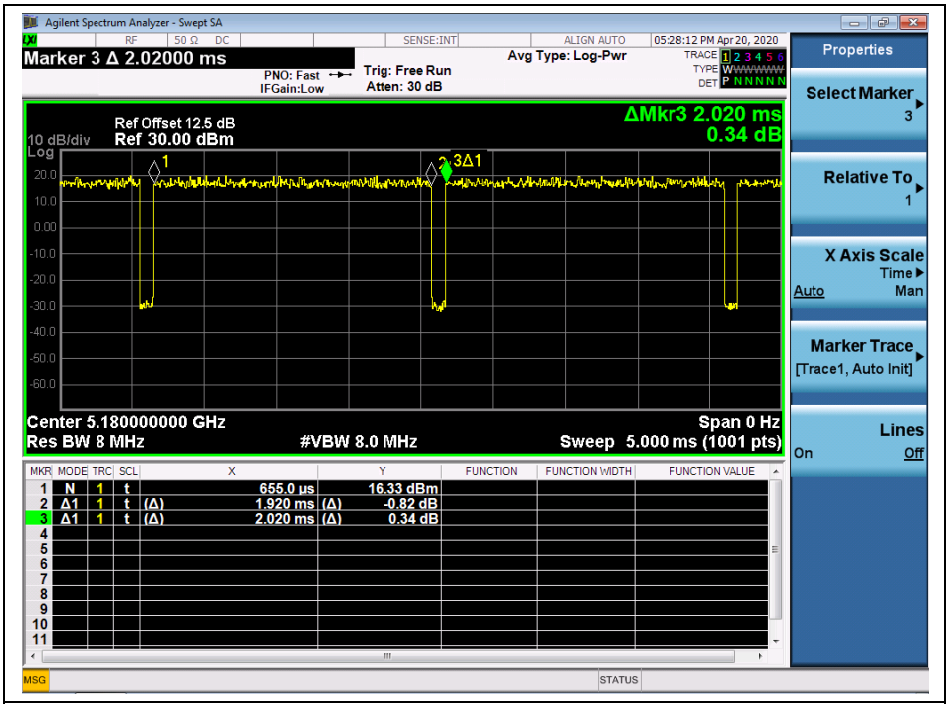
KDB 789033 Section B was used in order to provecompliance.

2.2.4. Test Result

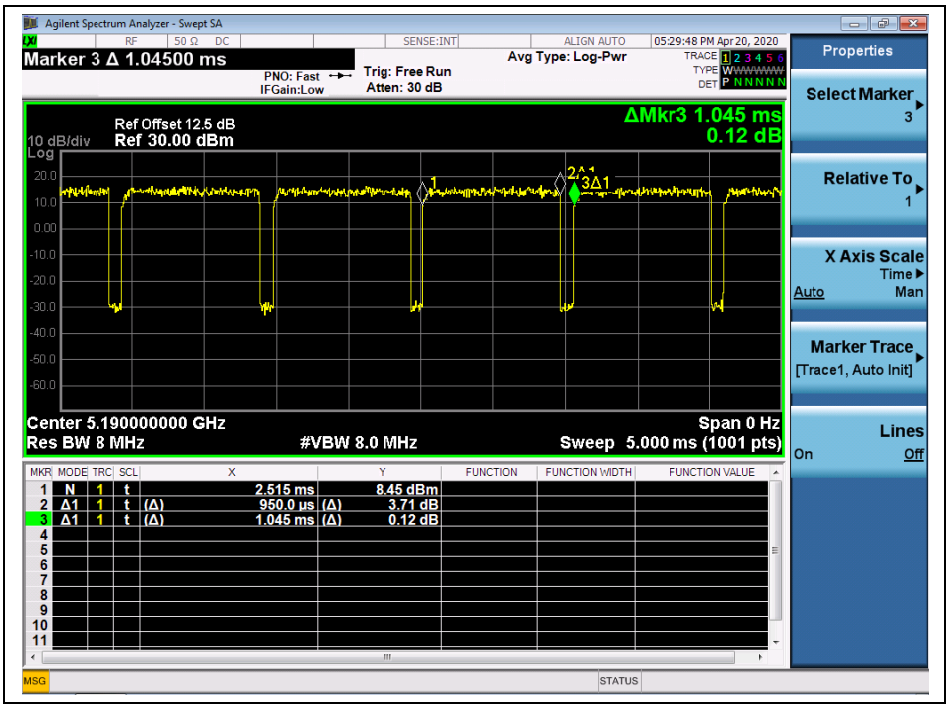
A. Test Verdict:

Test Mode	Duty Cycle (%) (D)	Duty Factor (10*log[1/D])
802.11n(HT20)	95.05	0.22
802.11n(HT40)	90.91	0.41
802.11ac(VHT20)	95.07	0.22
802.11ac(VHT40)	91.35	0.39
802.11ac(VHT80)	84.06	0.75

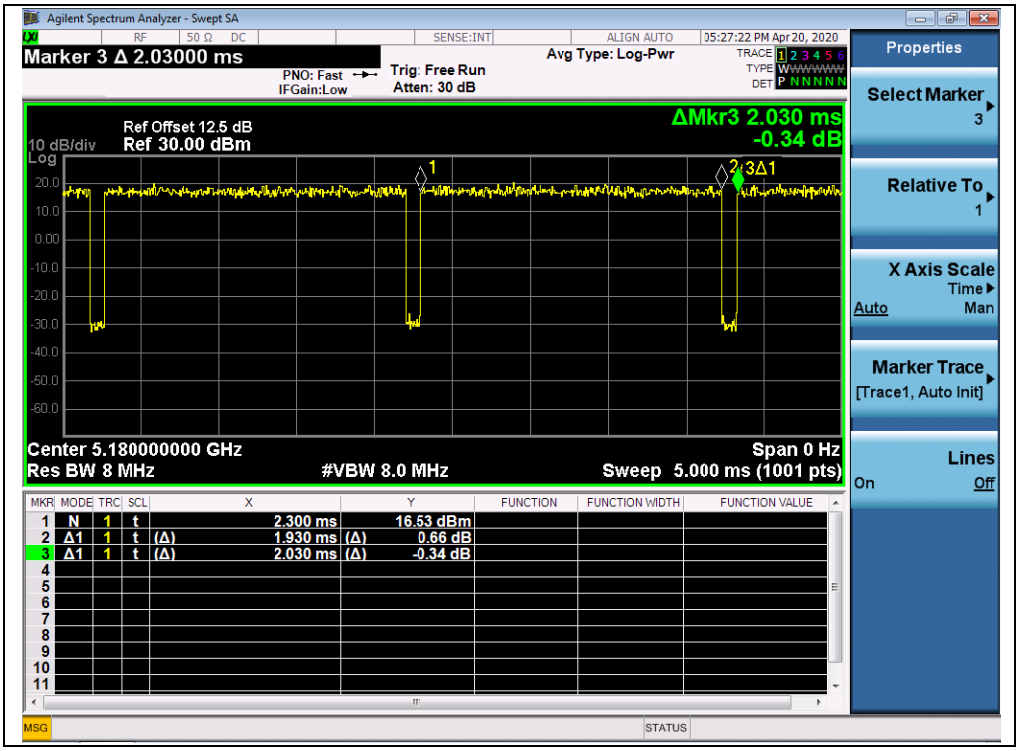
B. Test Plots



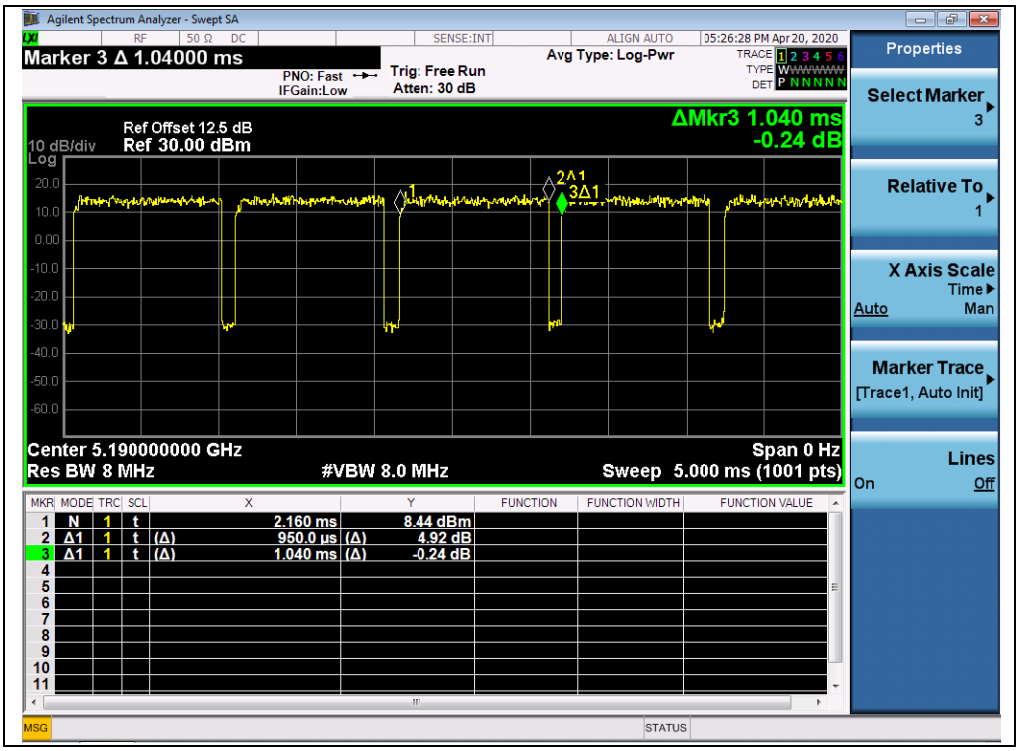
(CH36_5180MHz _802.11n(HT20))



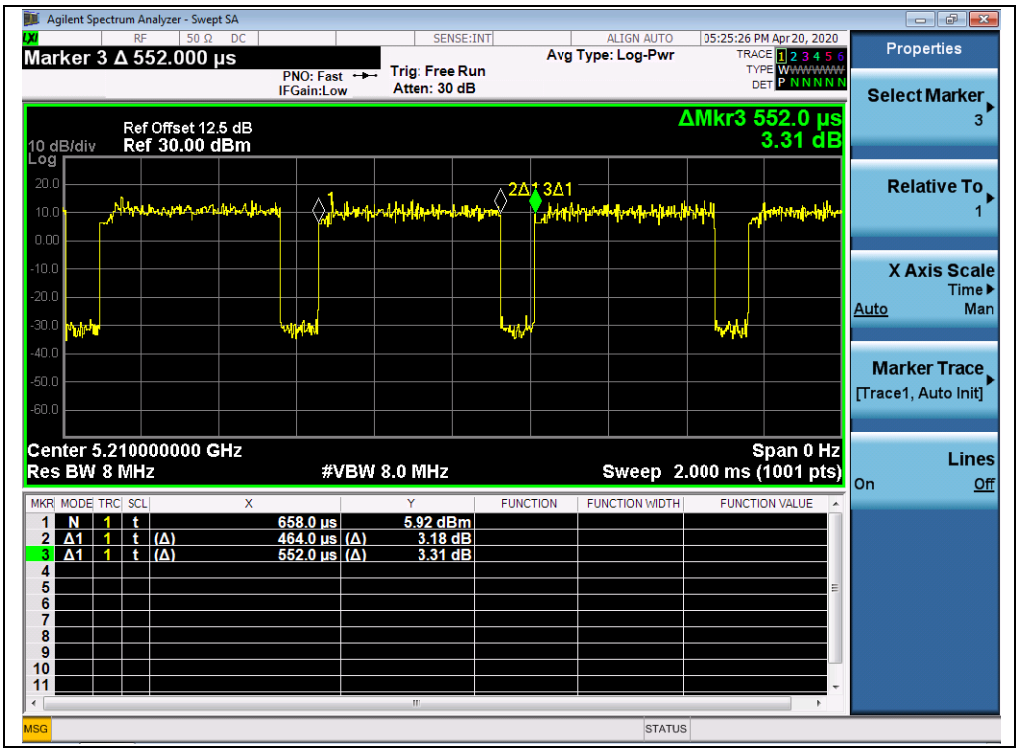
(CH38_5190MHz _802.11n(HT40))



(CH36_5180MHz _802.11ac(VHT20))



(CH38_5190MHz _802.11ac(VHT40))



(CH42_5210MHz _802.11ac(VHT80))

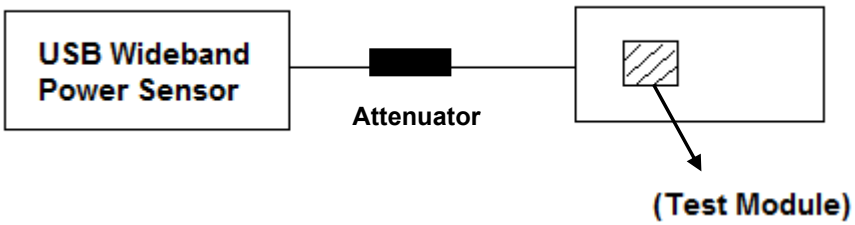
2.3. Maximum Conducted OutputPower

2.3.1. Requirement

(1) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.
(2)For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz.
(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.
If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
(4) According to KDB662911D01Measure-and-sum technique,the conducted emission level (e.g., transmit power or power in specified bandwidth) is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically to determine the total emission level from the device. Summing is performed in units that are directly proportional to power.
(5) According to KDB 662911 D01, the directional gain = G_{ANT} +10log(N_{ANT}) dBi, where G_{ANT} is the antenna gain in dBi, N_{ANT} is the number of outputs.

2.3.2. Test Description

Section E) 3) of KDB 789033 defines a methodology using a USB Wideband Power Sensor.
Test Setup:



The EUT (Equipment under the test) which is coupled to the USB Wideband Power Sensor; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading, all test result in USB Wideband Power Sensor.

2.3.3. Test Result

Maximum Average Conducted Output Power

802.11n (HT20) Test mode

Frequency (MHz)	Average Power (dBm)				Limit (dBm)		Verdict
	Measured	Duty Factor	Duty factor Calculated				
	dBm		dBm	W	dBm	W	
5180	12.63	0.22	12.85	0.019	24	0.25	PASS
5200	12.54		12.76	0.019			
5240	12.71		12.93	0.020			
5745	12.58		12.80	0.019	30	1	
5785	12.45		12.67	0.018			
5825	12.33		12.55	0.018			

802.11n (HT40) Test mode

Frequency (MHz)	Average Power (dBm)				Limit (dBm)		Verdict
	Measured	Duty Factor	Duty factor Calculated				
	dBm		dBm	W	dBm	W	
5190	12.26	0.41	12.67	0.018	24	0.25	PASS
5230	**12.31**		12.72	0.019			
5755	12.30		12.71	0.019	30	1	
5795	12.24		12.65	0.018			

802.11ac (VHT20) Test mode

Frequency (MHz)	Average Power (dBm)				Limit (dBm)		Verdict
	Measured	Duty Factor	Duty factor Calculated				
	dBm		dBm	W	dBm	W	
5180	12.55	0.22	12.77	0.019	24	0.25	PASS
5200	12.47		12.69	0.019			
5240	12.36		12.58	0.018			
5745	12.56		12.78	0.019	30	1	
5785	12.54		12.76	0.019			
5825	12.63		12.85	0.019			

802.11ac (VHT40) Test mode

Frequency (MHz)	Average Power (dBm)				Limit (dBm)		Verdict
	Measured	Duty Factor	Duty factor Calculated				
	dBm		dBm	W	dBm	W	
5190	12.25	0.39	12.64	0.018	24	0.25	PASS
5230	12.31		12.70	0.019			
5755	12.22		12.61	0.018	30	1	
5795	12.19		12.58	0.018			

802.11ac (VHT80) Test mode

Frequency (MHz)	Average Power (dBm)				Limit (dBm)		Verdict
	Measured	Duty Factor	Duty factor Calculated				
	dBm		dBm	W	dBm	W	
5210	12.13	0.75	12.88	0.019	24	0.25	PASS
5775	11.89		12.64	0.018	30	1	

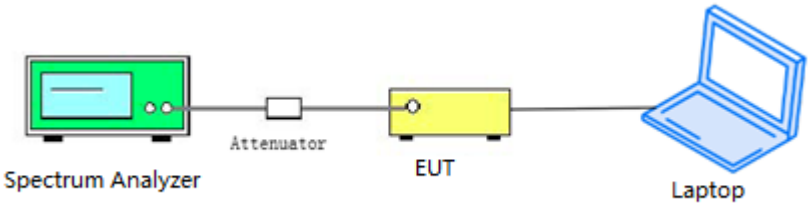
2.4. Emission Bandwidth

2.4.1. Requirement

For purposesof this subpart the emission bandwidth shall be determined by measuring thewidth of the signal between two points,one below the carrier center frequencyand one above the carrier center frequency,that are 26 dB down relative tothe maximum level of the modulatedcarrier. Determination of the emissionsbandwidth is based on the use of measurementinstrumentation employing apeak detector function with an instrumentresolution bandwidth approximatelyequal to 1.0 percent of the emissionbandwidth of the device undermeasurement.Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

2.4.2. Test Description

Test Setup:



The EUT is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

2.4.3. Test Procedure

1. KDB 789033 Section C) 1) Emission Bandwidth was used in order to prove compliance
a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
2. KDB 789033 Section C) 2) minimum emission bandwidth for the band 5.725-5.85GHz was used in order to prove compliance.
Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for theband 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 × RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

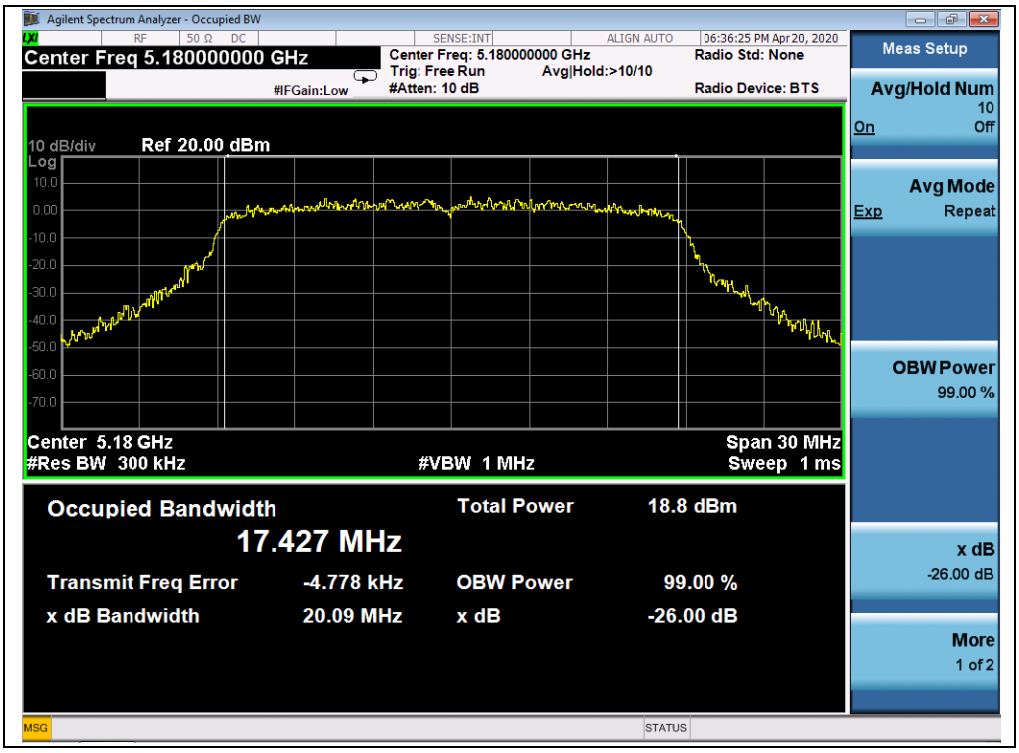
2.4.4. Test Result

802.11n (HT20) Test mode

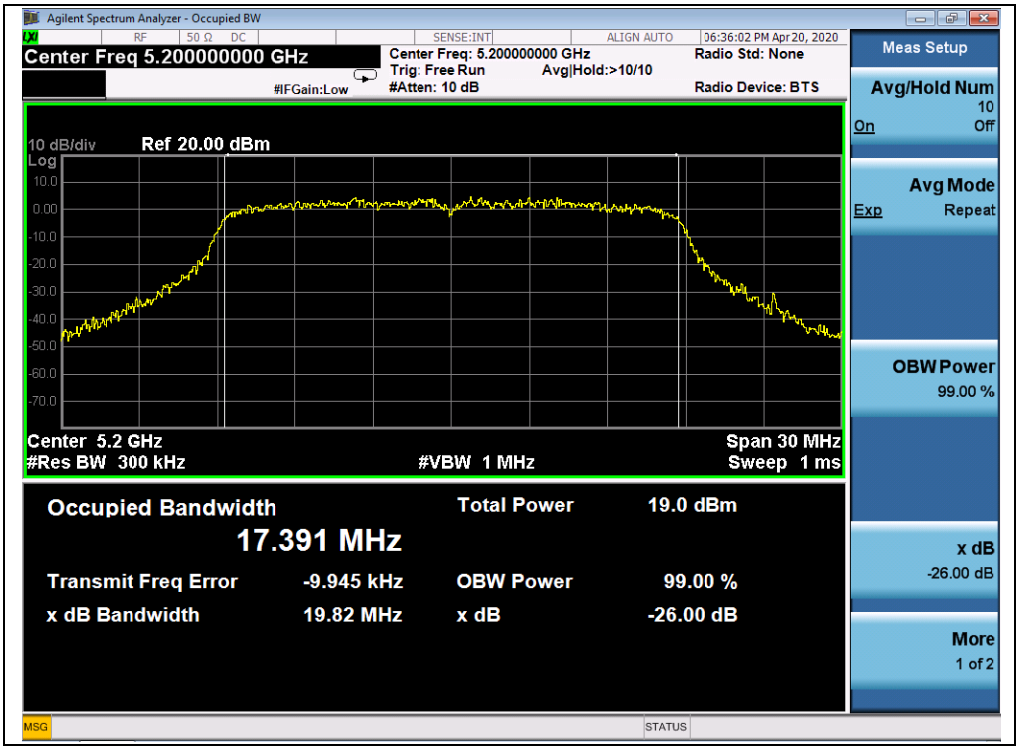
A. Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
36	5180	20.09
44	5220	19.82
48	5240	19.71
Channel	**Frequency (MHz)**	**6dB Bandwidth (MHz)**
149	5745	15.94
157	5785	15.11
165	5825	15.70

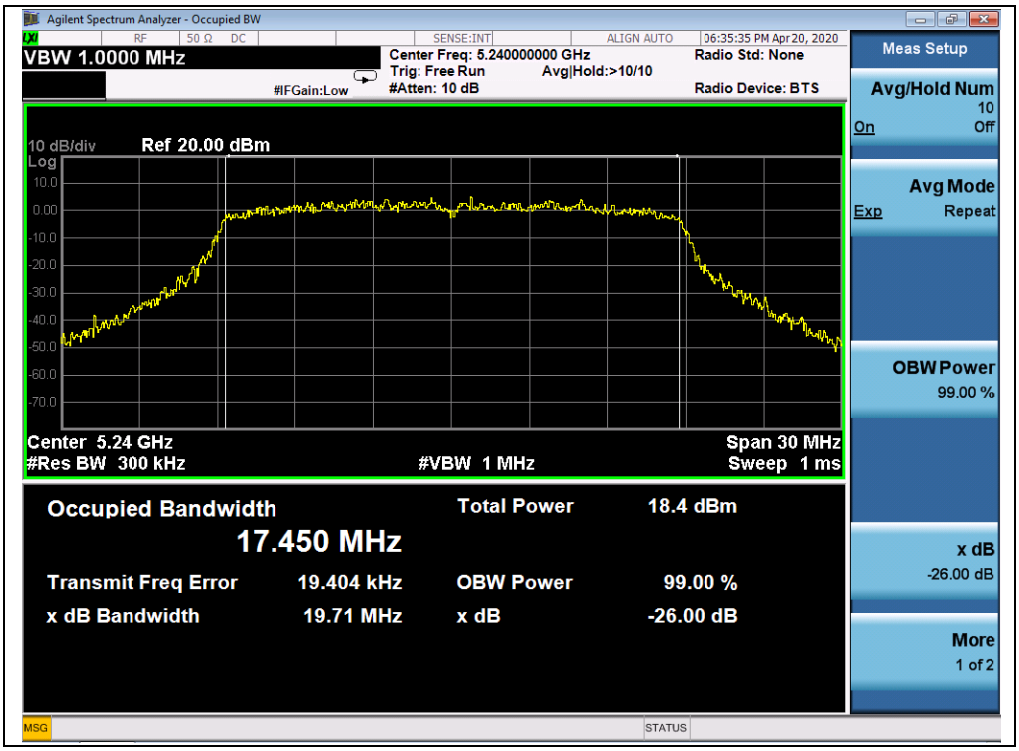
B. Test Plots



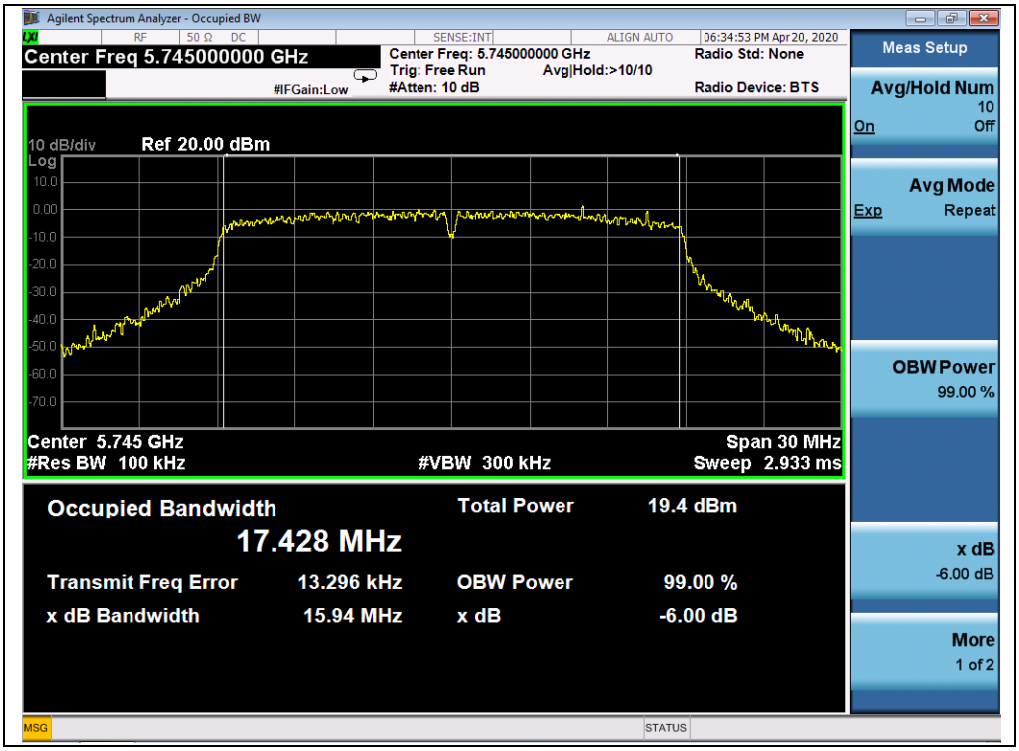
(Channel 36,5180MHz, 802.11n (HT20))



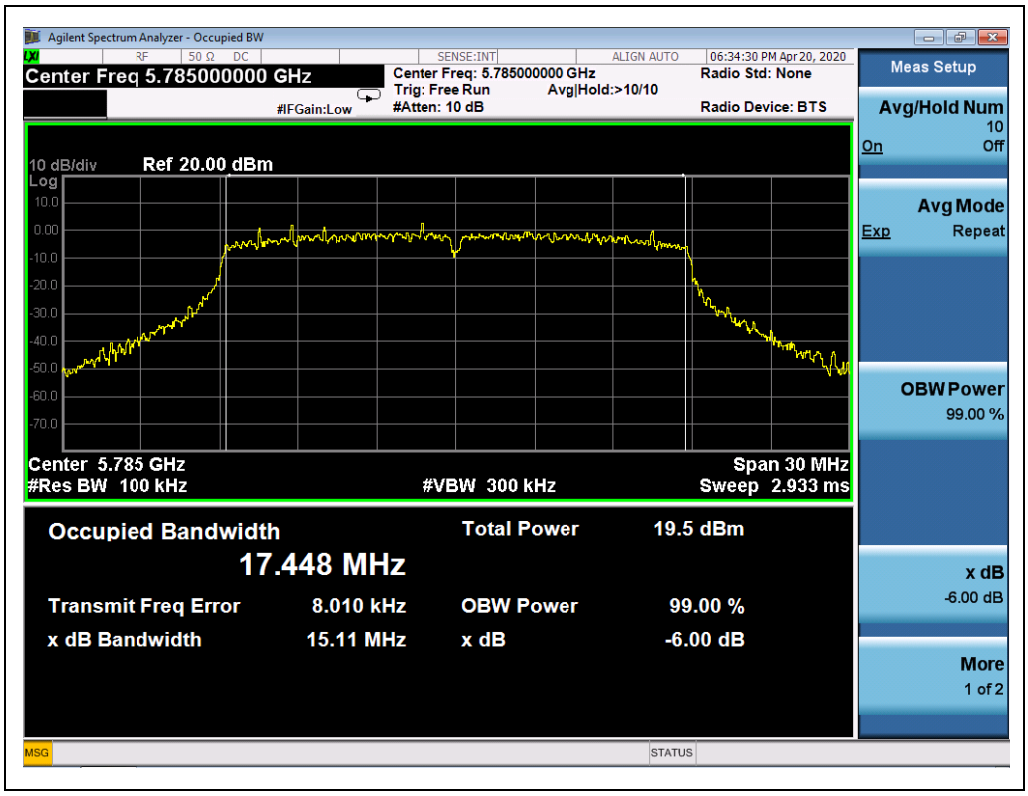
(Channel 44, 5220 MHz, 802.11n (HT20))



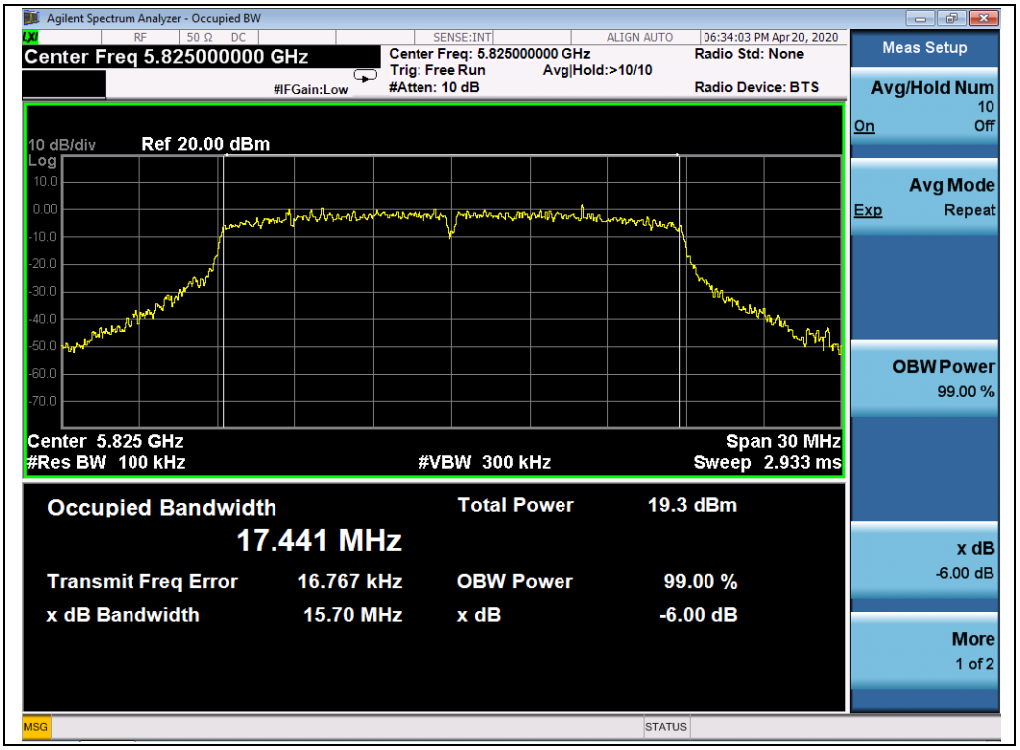
(Channel 48, 5240MHz, 802.11n (HT20))



(Channel 149,5745MHz, 802.11 n (HT20))



(Channel 157,5785MHz, 802.11 n (HT20))



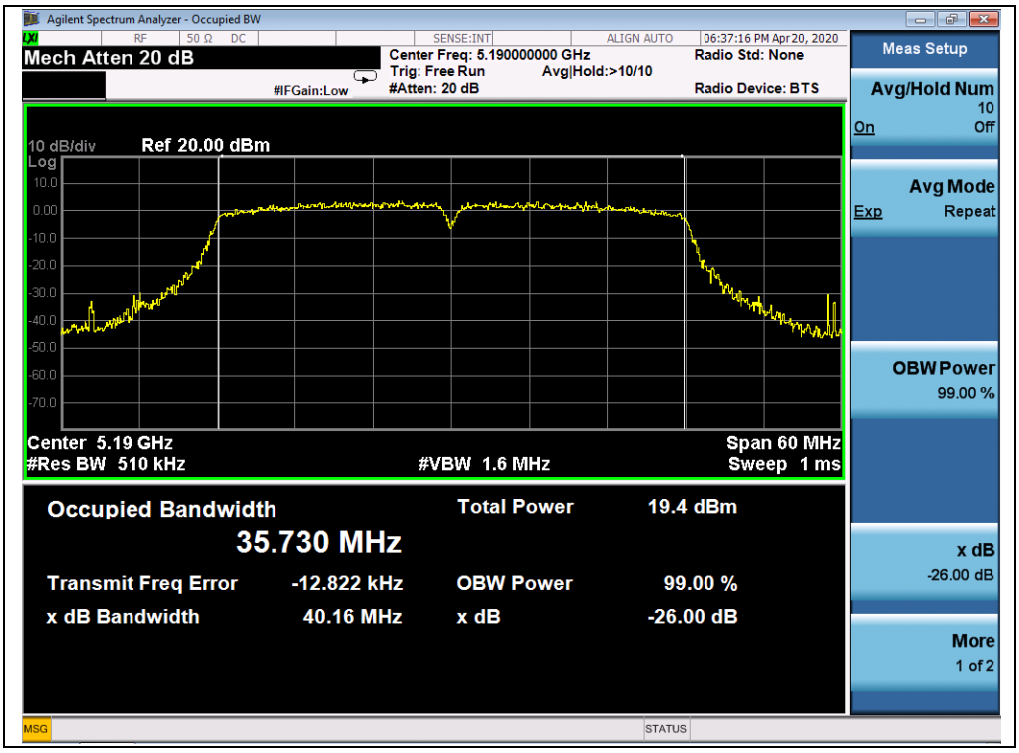
(Channel 165,5825MHz, 802.11 n (HT20))

802.11n (HT40) Test mode

A. Test Verdict:

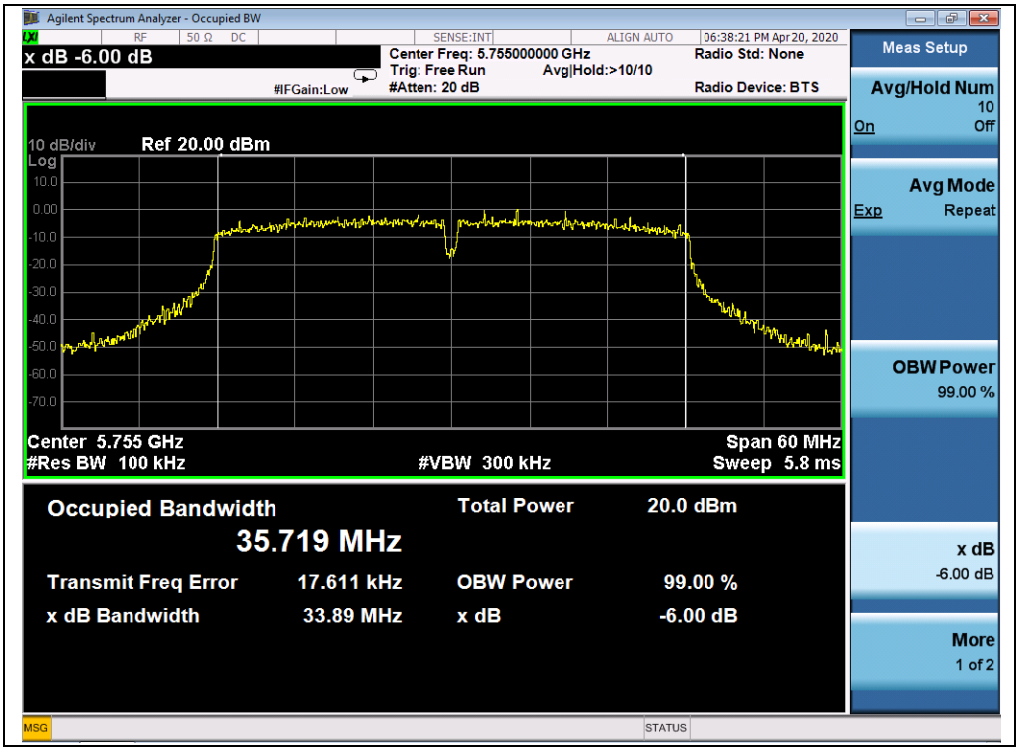
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
38	5190	40.16
46	5230	39.81
Channel	**Frequency (MHz)**	**6dB Bandwidth (MHz)**
151	5755	33.89
159	5795	34.77

B. Test Plots

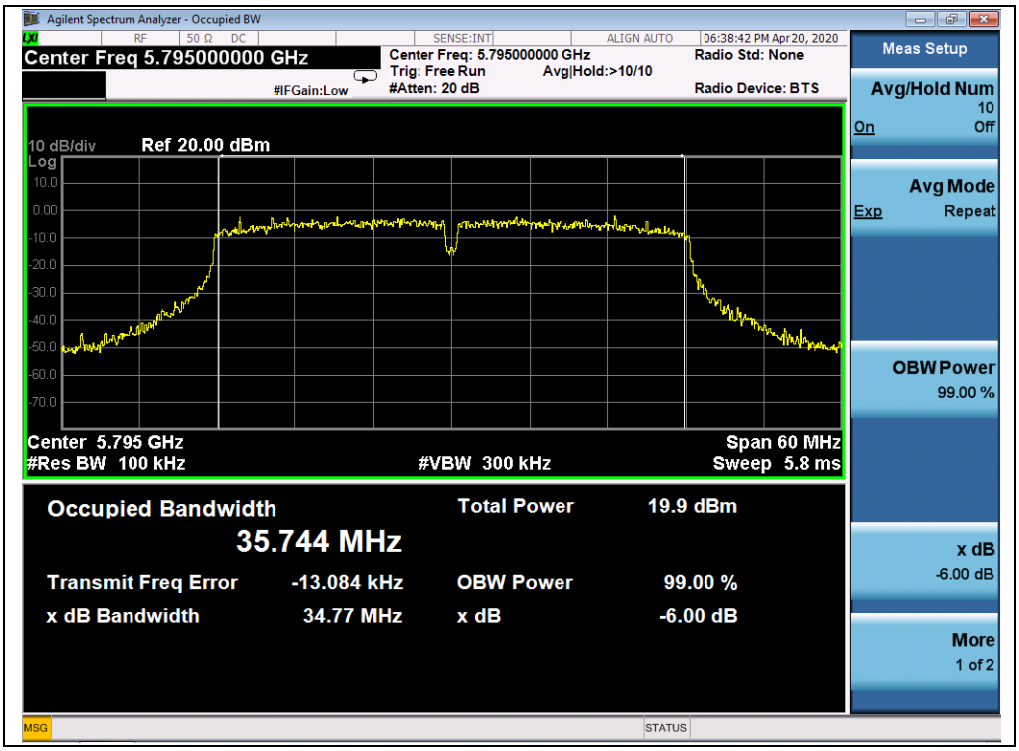


(Channel 38,5190MHz, 802.11n(HT40))

(Channel 46, 5230 MHz, 802.11n(HT40))



(Channel 151, 5755 MHz, 802.11n (HT40))



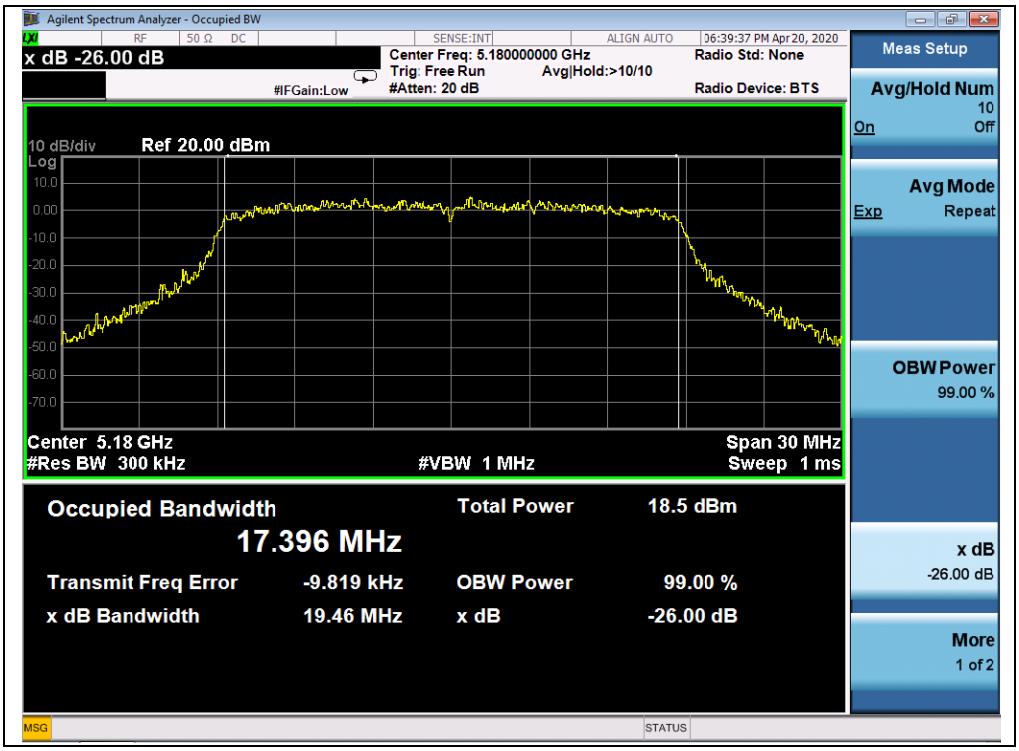
(Channel 159,5795MHz,802.11n(HT40))

802.11ac (VHT20) Test mode

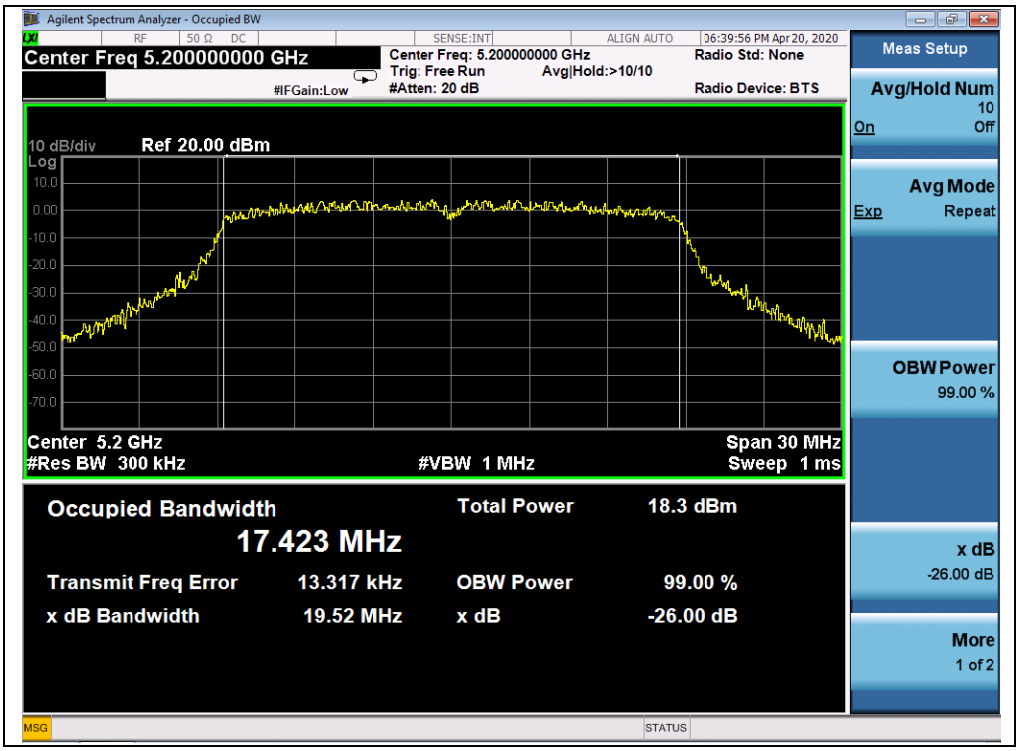
A. Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
36	5180	19.46
44	5220	19.52
48	5240	19.67
Channel	**Frequency (MHz)**	**6dB Bandwidth (MHz)**
149	5745	15.05
157	5785	15.56
165	5825	16.81

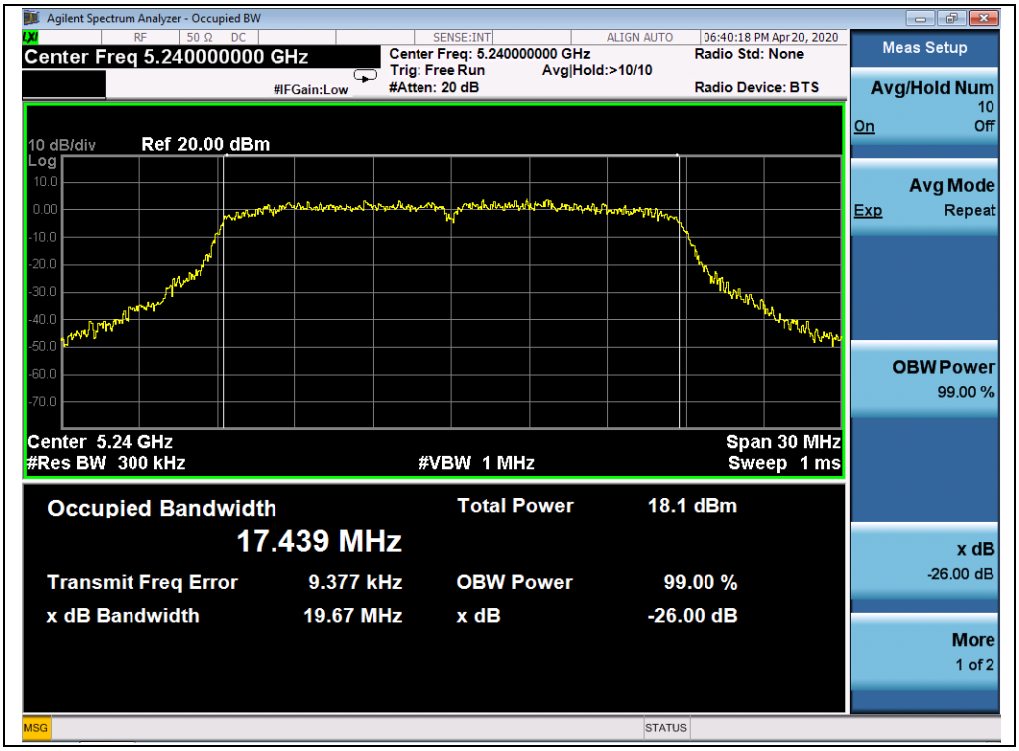
B. Test Plots



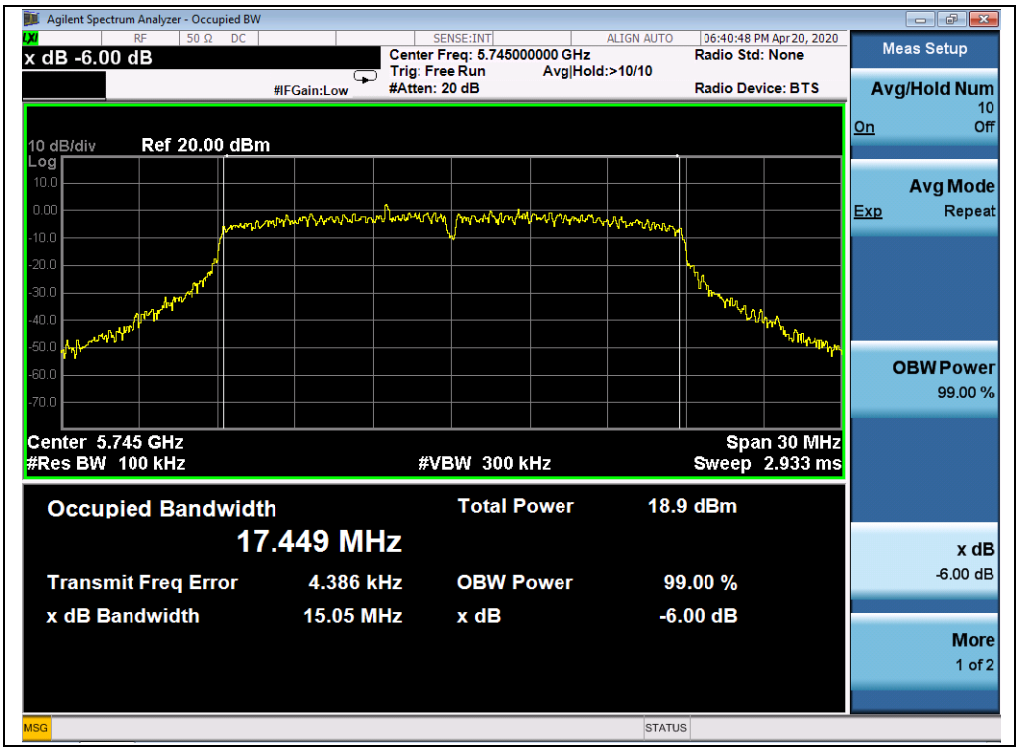
(Channel 36,5180MHz, 802.11ac (VHT20))



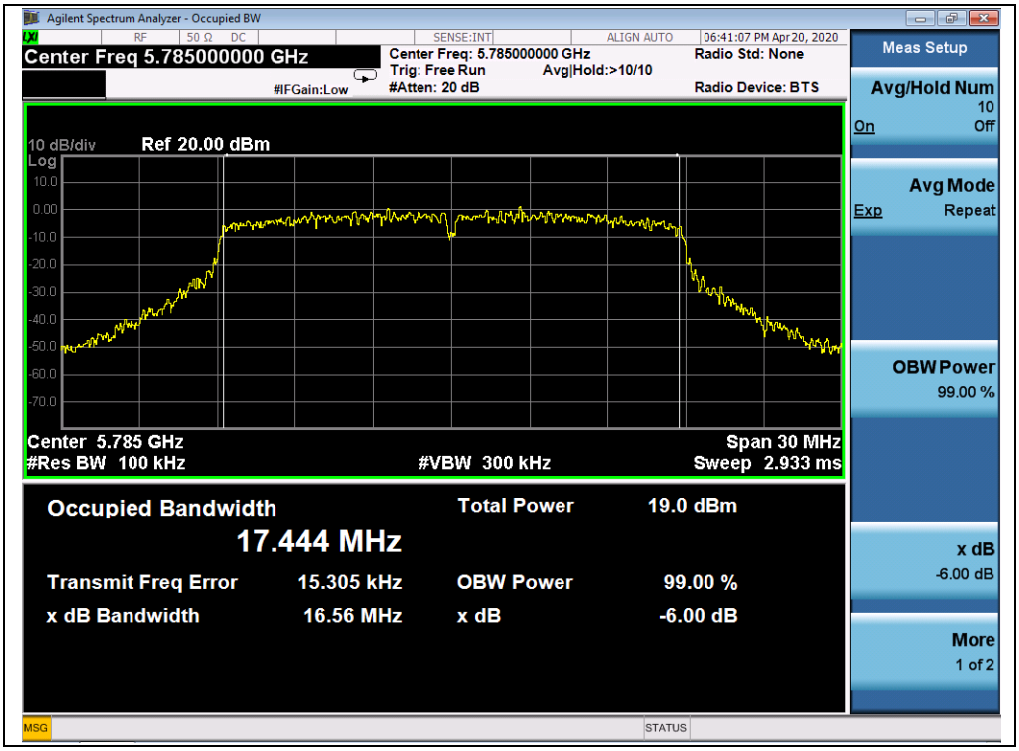
(Channel 44, 5220 MHz, 802.11ac (VHT20))



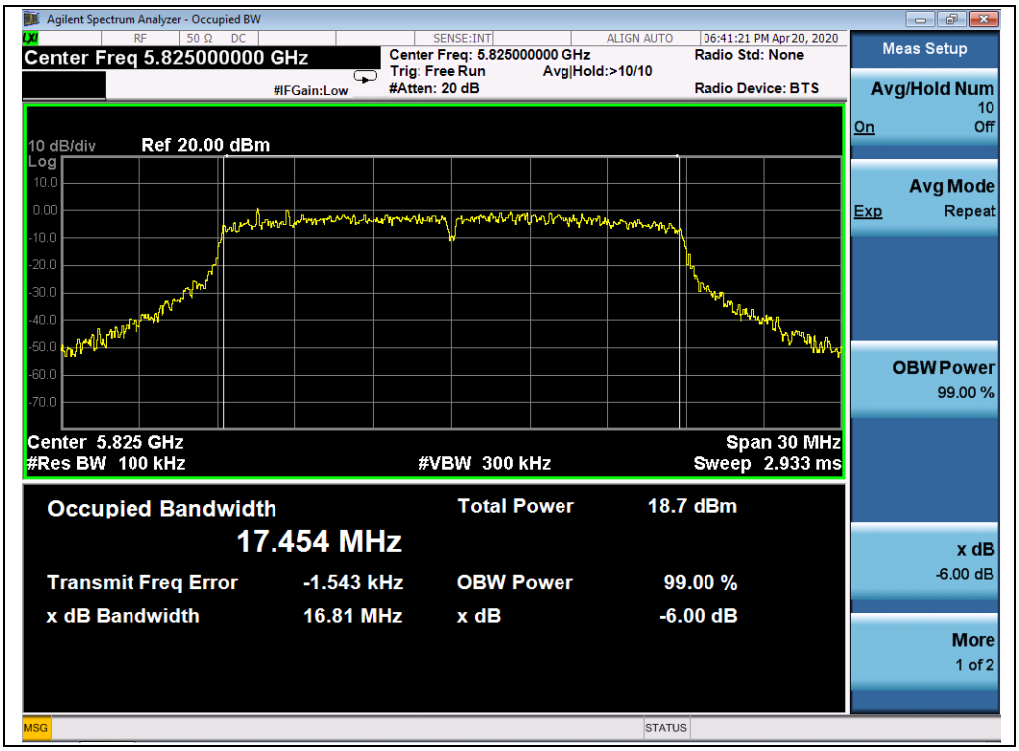
(Channel 48, 5240MHz, 802.11ac (VHT20))



(Channel 149,5745MHz, 802.11 ac (VHT20))



(Channel 157,5785MHz, 802.11 ac (VHT20))



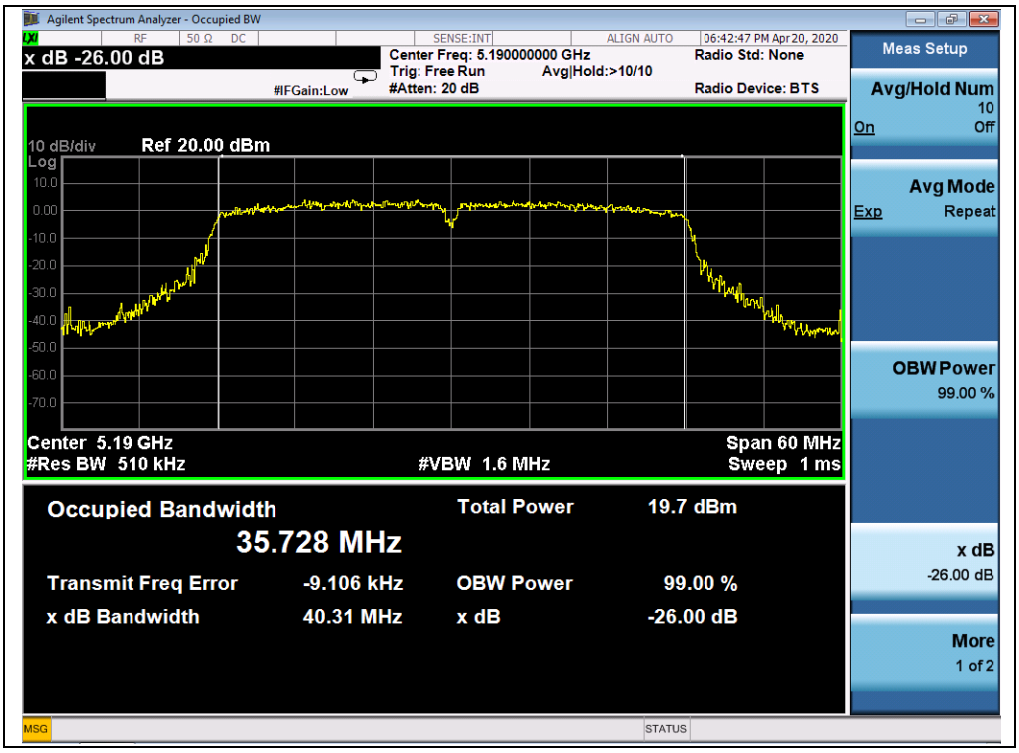
(Channel 165,5825MHz, 802.11 ac (VHT20))

802.11ac (VHT40) Test mode

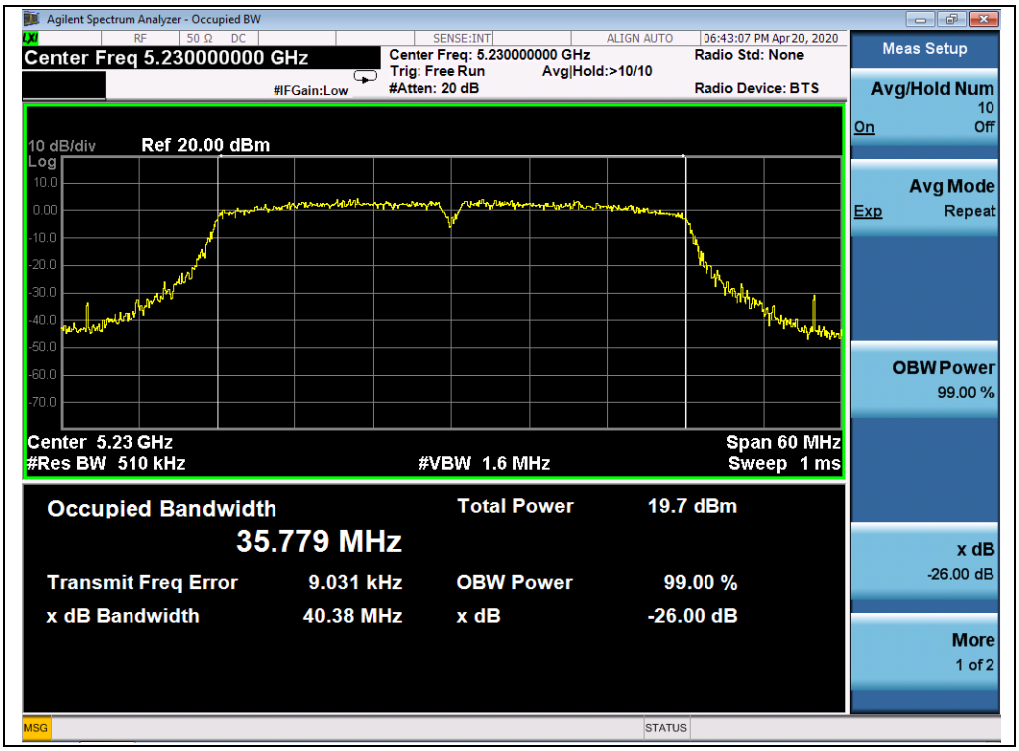
A. Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
38	5190	40.31
46	5230	40.38
Channel	**Frequency (MHz)**	**6dB Bandwidth (MHz)**
151	5755	32.69
159	5795	34.25

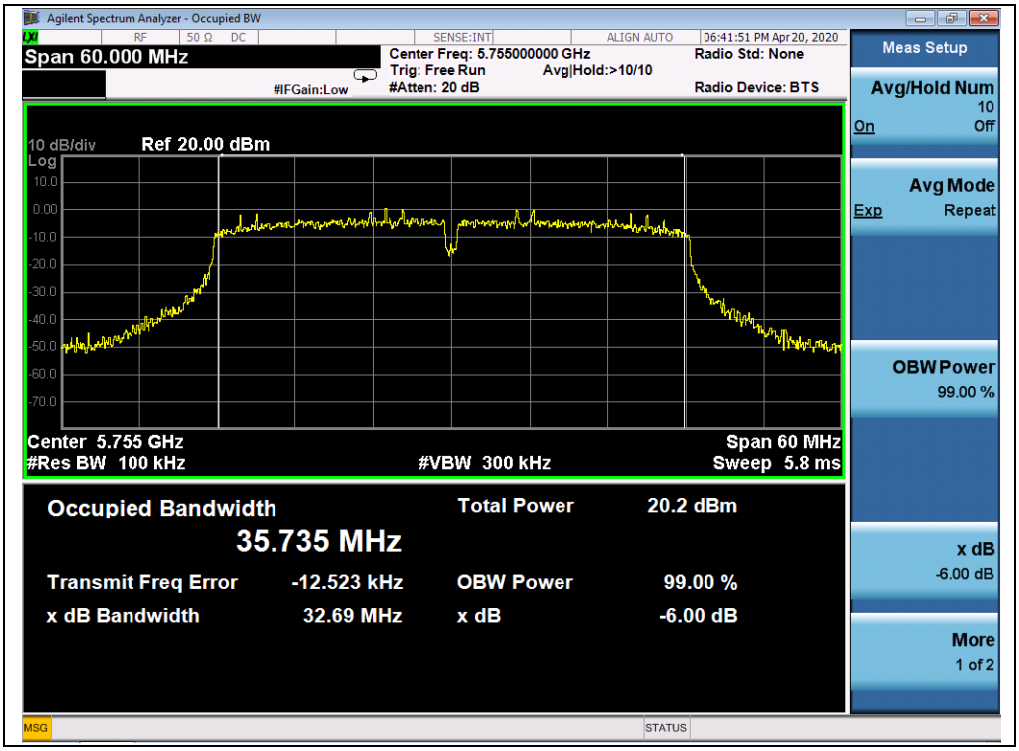
B. Test Plots



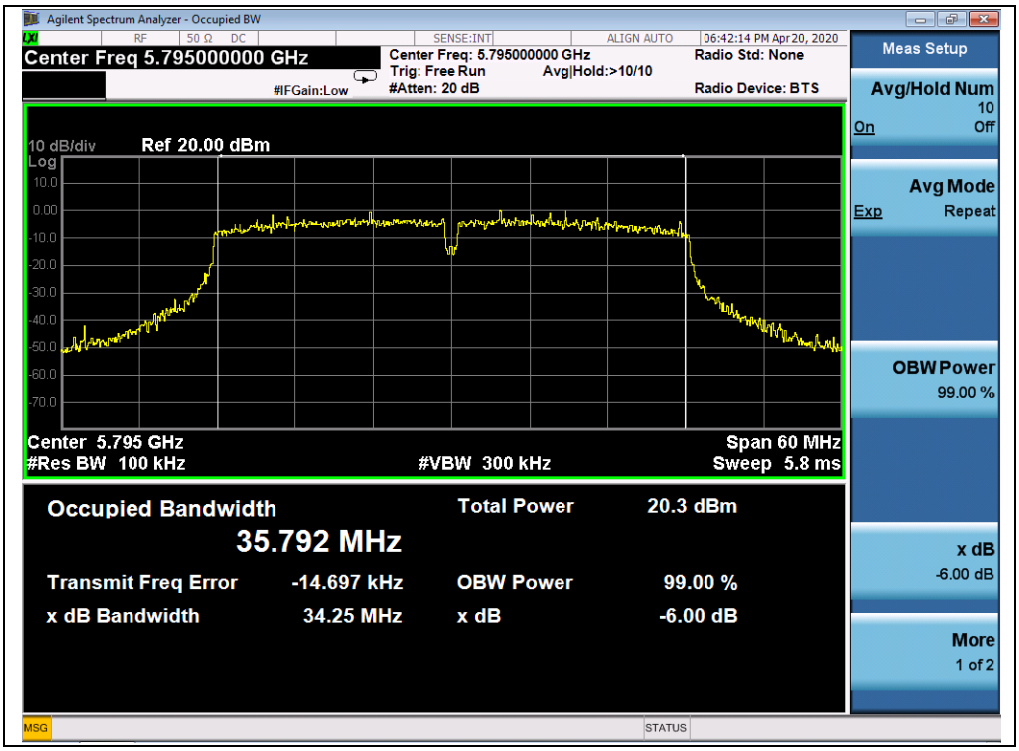
(Channel 38,5190MHz, 802.11ac (VHT40))



(Channel 46, 5230 MHz, 802.11ac (VHT40))



(Channel 151, 5755 MHz, 802.11ac (VHT40))



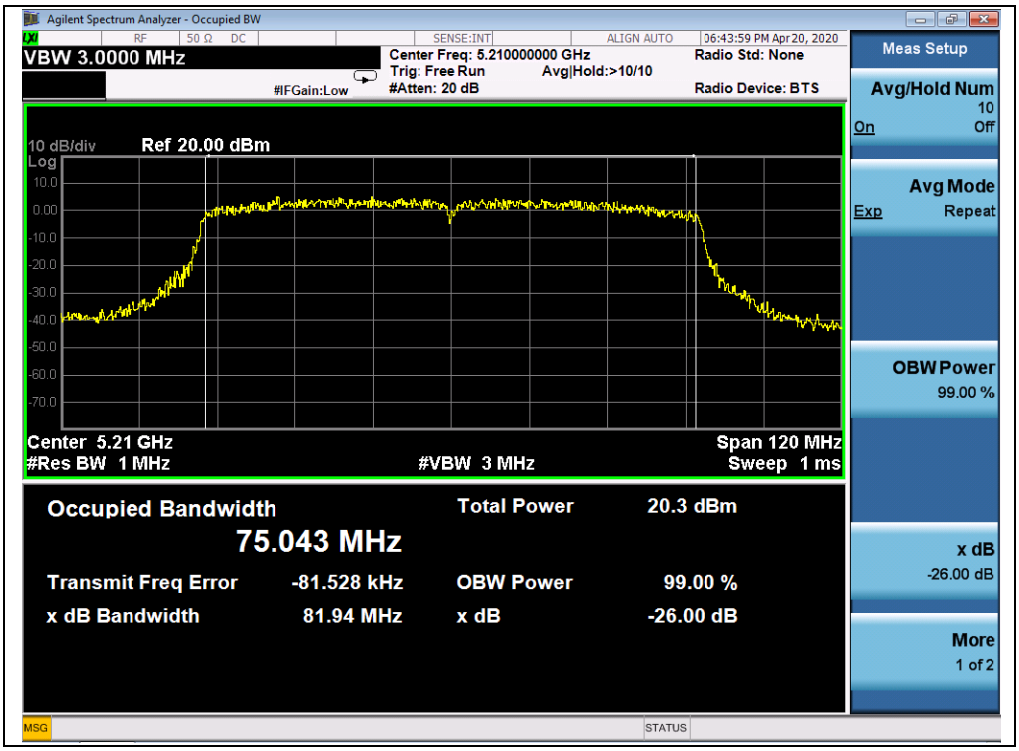
(Channel 159,5795MHz,802.11ac (VHT40))

802.11ac (VHT80) Test mode

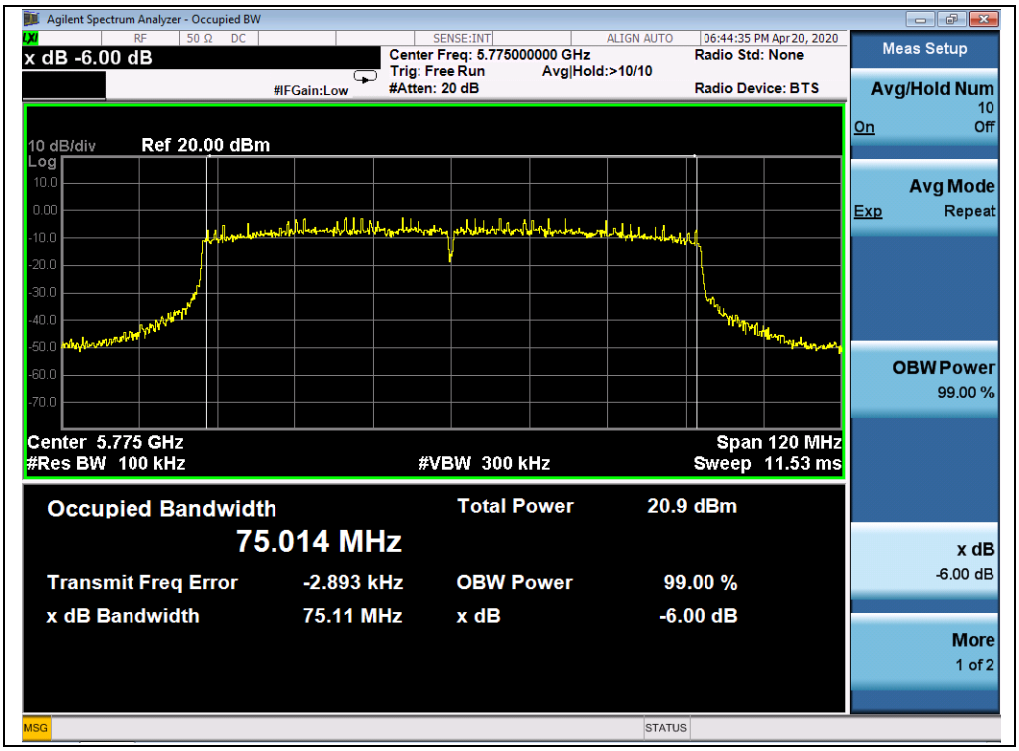
A. Test Verdict:

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
42	5210	81.94
Channel	**Frequency (MHz)**	**6dB Bandwidth (MHz)**
155	5775	75.11

B. Test Plots



(Channel 42,5210MHz, 802.11ac (VHT80))



(Channel 155, 5775 MHz, 802.11ac (VHT80))

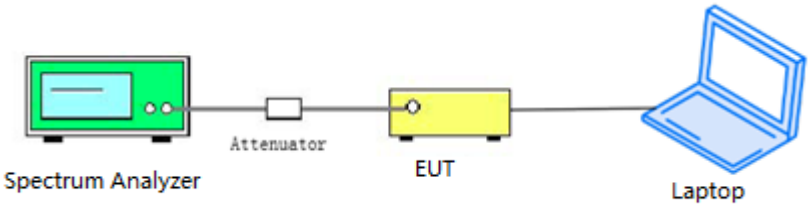
2.5. Peak Power spectral density

2.5.1. Requirement

(1)For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.
(2)For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.
(3) For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500KHz band.
If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
(4) According to KDB662911D01Measure-and-sum technique, the conducted emission level (e.g., transmit power or power in specified bandwidth) is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically to determine the total emission level from the device. Summing is performed in units that are directly proportional to power.
(5) According to KDB 662911 D01, the directional gain = G_{ANT} +10log(N_{ANT}) dBi, where G_{ANT} is the antenna gain in dBi, N_{ANT} is the number of outputs.

2.5.2. Test Description

Test Setup:



The EUT is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

2.5.3. Test Procedure

KDB 789033 Section F)Maximum Power Spectral Density (PSD) Method SA-1 was used in order to prove compliance

1) Set span to encompass the entire 26-dB emission bandwidth
2) Set RBW = 1 MHz. Set VBW ≥ 3 MHz.
3) Number of points in sweep ≥ 2 Span / RBW. Sweep time = auto.
4) Detector = Peak
5) Trace mode=Max hold
6) Record the max value

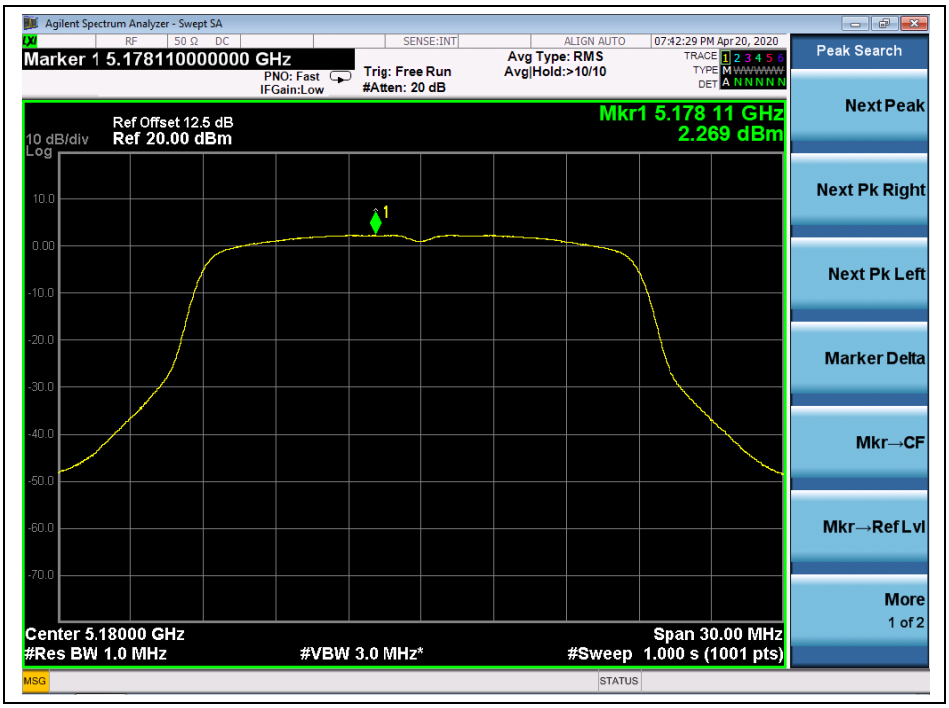
2.5.4. Test Result

802.11n (HT20) Test mode

A. Test Verdict:

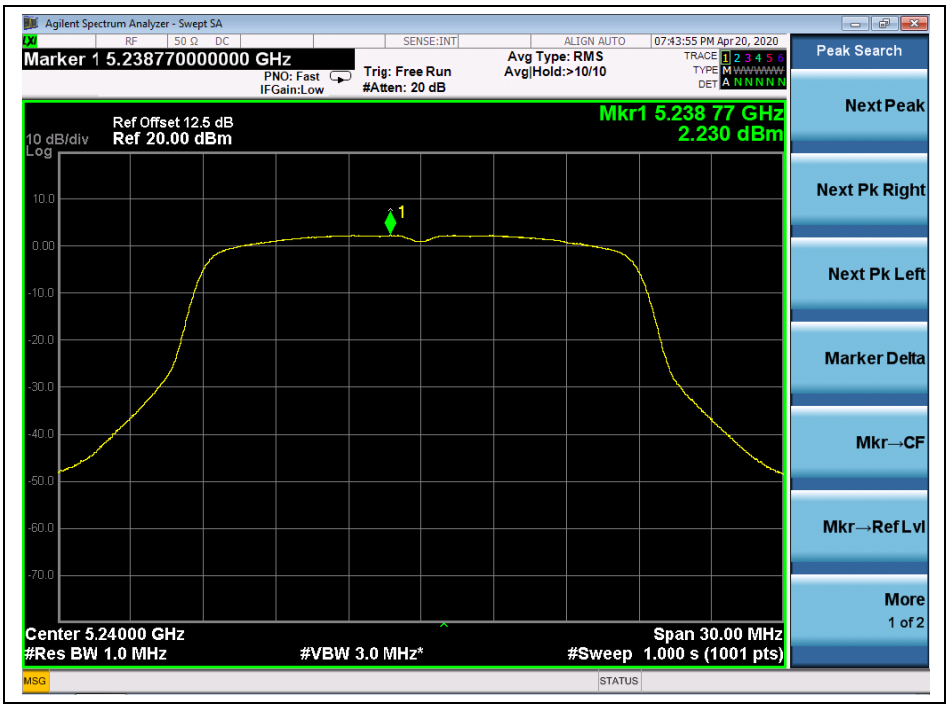
Channel	Frequency (MHz)	Measured PPSD (dBm/MHz)	Duty Factor	PPSD calibrated with duty factor (dBm/MHz)	Limit (dBm/MHz)	Verdict
36	5180	2.27	0.22	2.49	11	PASS
40	5200	2.14		2.36		
48	5240	2.23		2.45		
Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Duty Factor	PPSD calibrated with duty factor (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
149	5745	-0.62	0.22	-0.40	30	PASS
157	5785	-0.95		-0.73		
165	5825	-1.03		-0.81		

B. Test Plots



(Channel 36,5180MHz, 802.11n (HT20))

(Channel 44, 5220 MHz, 802.11n (HT20))



(Channel 48, 5240MHz, 802.11n (HT20)

(Channel 149,5745MHz, 802.11 n (HT20))

(Channel 157,5785MHz, 802.11 n (HT20))

(Channel 165,5825MHz, 802.11 n (HT20))

802.11n (HT40) Test mode

A. Test Verdict:

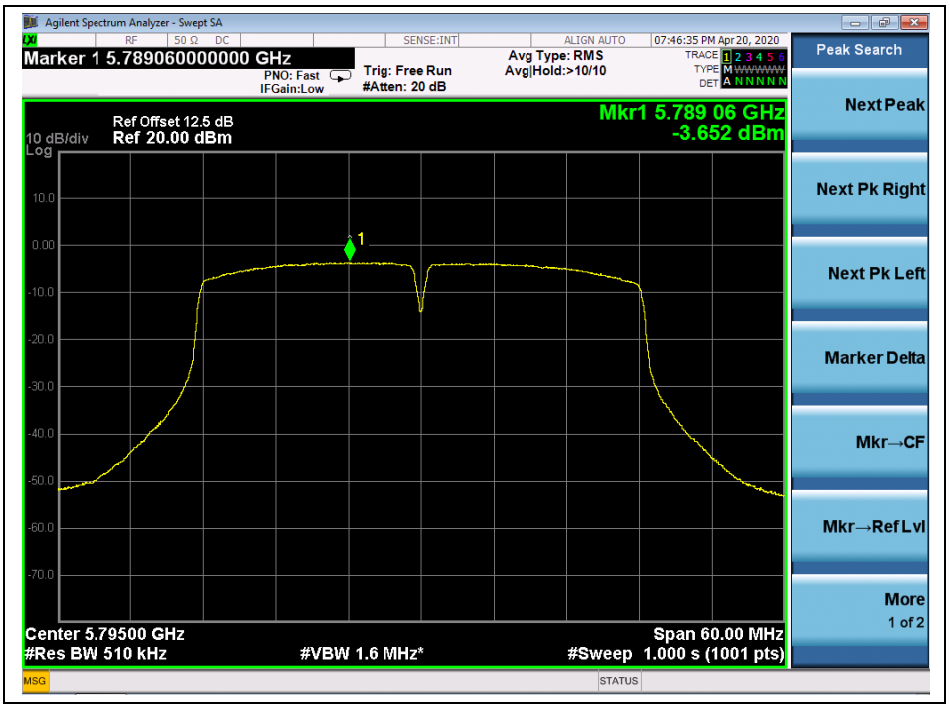
Channel	Frequency (MHz)	Measured PPSD (dBm/MHz)	Duty Factor	PPSD calibrated with duty factor (dBm/MHz)	Limit (dBm/MHz)	Verdict
38	5190	-0.40	0.41	0.01	11	PASS
46	5230	-0.32		0.09		
Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Duty Factor	PPSD calibrated with duty factor (dBm/MHz)	Limit (dBm/500KHz)	Verdict
151	5755	-3.35	0.41	-2.94	30	PASS
159	5795	-3.65		-3.24		

B. Test Plots

(Channel 38,5190MHz, 802.11n(HT40))

(Channel 46, 5230 MHz, 802.11n(HT40))

(Channel 151, 5755 MHz, 802.11n (HT40))



(Channel 159,5795MHz,802.11n(HT40))

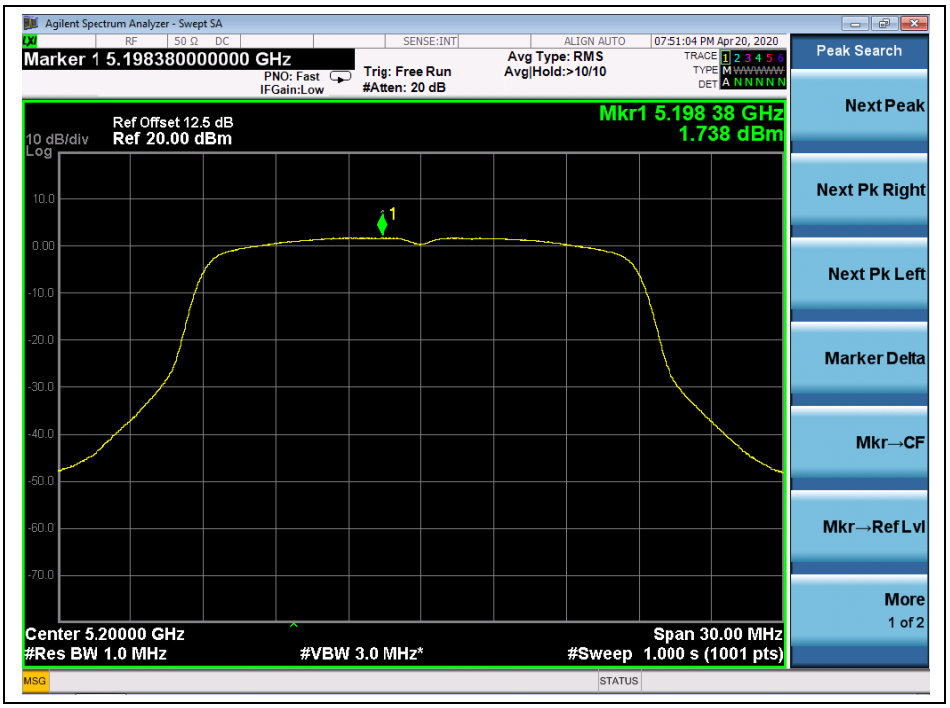
802.11ac (VHT20) Test mode

A. Test Verdict:

Channel	Frequency (MHz)	Measured PPSD (dBm/MHz)	Duty Factor	PPSD calibrated with duty factor (dBm/MHz)	Limit (dBm/MHz)	Verdict
36	5180	1.94	0.22	2.16	11	PASS
40	5200	1.74		1.96		
48	5240	1.78		2.00		
Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Duty Factor	PPSD calibrated with duty factor (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
149	5745	-1.13	0.22	-0.91	30	PASS
157	5785	-1.39		-1.17		
165	5825	-1.49		-1.27		

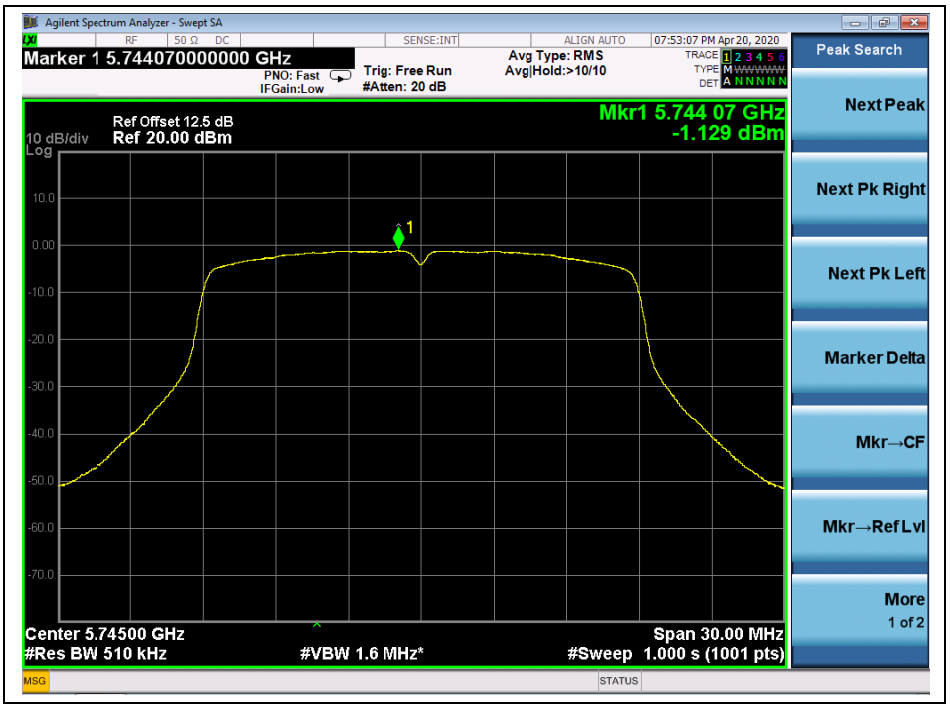
B. Test Plots

(Channel 36,5180MHz, 802.11ac (VHT20))



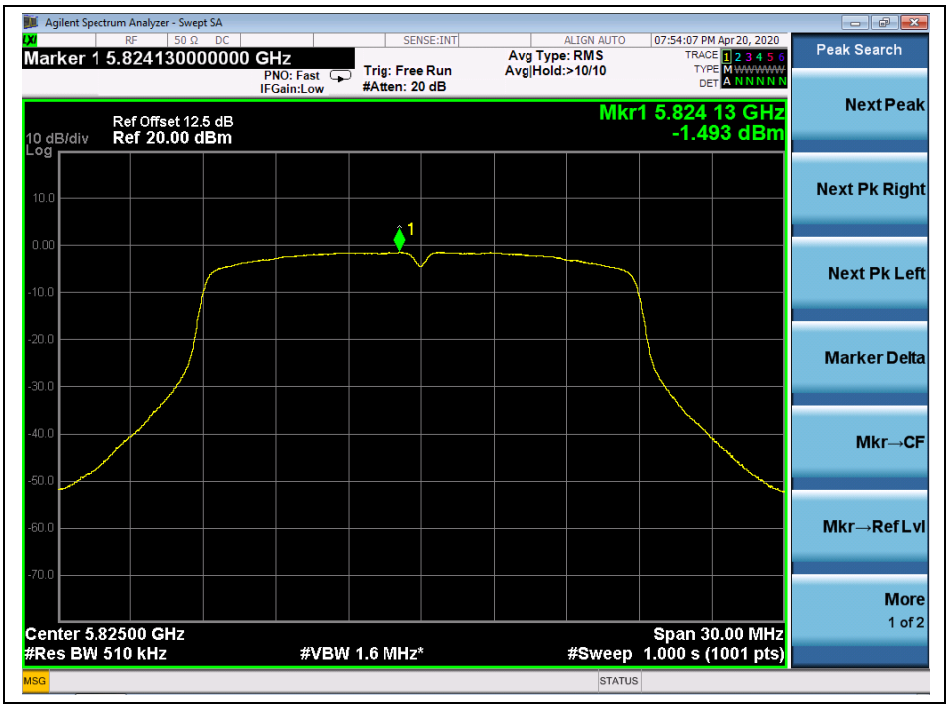
(Channel 44, 5220 MHz, 802.11ac (VHT20))

(Channel 48, 5240MHz, 802.11ac (VHT20))



(Channel 149,5745MHz, 802.11ac (VHT20))

(Channel 157,5785MHz, 802.11ac (VHT20))



(Channel 165,5825MHz, 802.11ac (VHT20))

802.11ac (VHT40) Test mode

A. Test Verdict:

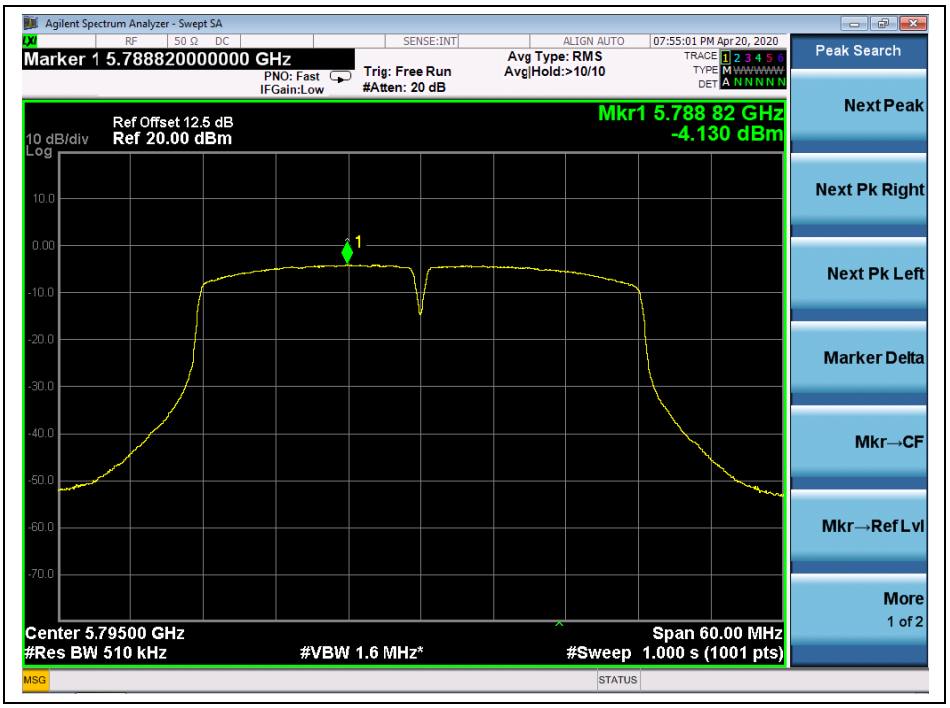
Channel	Frequency (MHz)	Measured PPSD (dBm/MHz)	Duty Factor	PPSD calibrated with duty factor (dBm/MHz)	Limit (dBm/MHz)	Verdict
38	5190	-1.06	0.39	-0.67	11	PASS
46	5230	-1.14		-0.75		
Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Duty Factor	PPSD calibrated with duty factor (dBm/MHz)	Limit (dBm/500KHz)	Verdict
151	5755	-4.33	0.39	-3.94	30	PASS
159	5795	-4.13		-3.74		

B. Test Plots

(Channel 38,5190MHz, 802.11ac (VHT40))

(Channel 46, 5230 MHz, 802.11ac (VHT40))

(Channel 151, 5755MHz, 802.11ac (VHT40))



(Channel 159, 5795MHz, 802.11ac (VHT40))

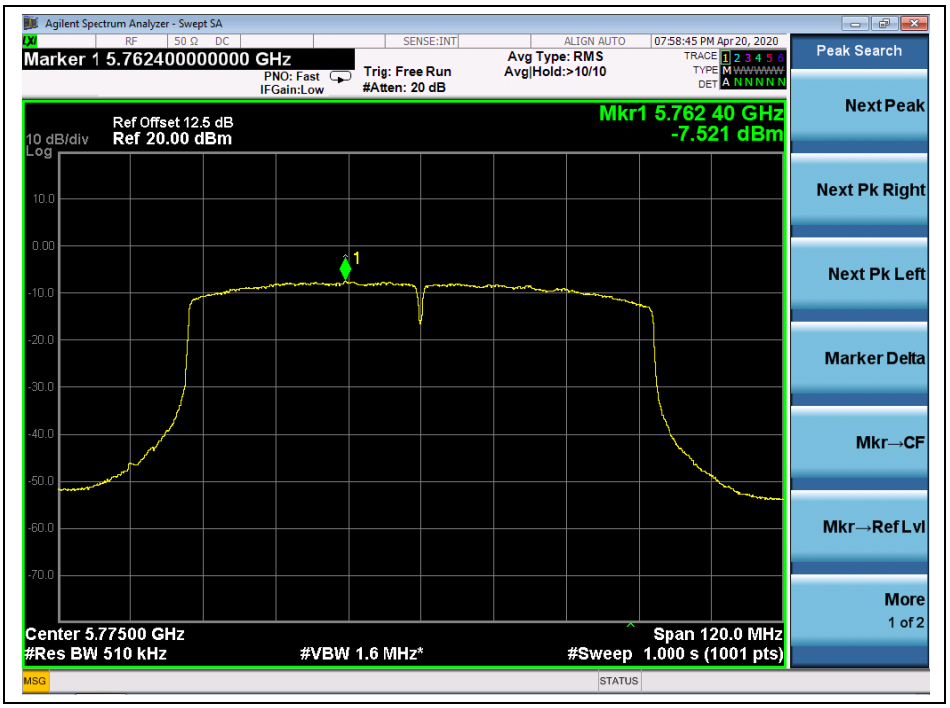
802.11ac (VHT80) Test mode

A. Test Verdict:

Channel	Frequency (MHz)	Measured PPSD (dBm/MHz)	Duty Factor	Measured PPSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
42	5210	-4.58	0.75	-3.83	11	PASS
Channel	Frequency (MHz)	Measured PPSD (dBm/500KHz)	Duty Factor	Measured PPSD (dBm/500KHz)	Limit (dBm/500KHz)	Verdict
155	5775	-7.52	0.75	-6.77	30	PASS

B. Test Plots

(Channel 42,5210MHz, 802.11ac(VHT80))



(Channel 155,5775MHz, 802.11ac(VHT80))

2.6. Frequency Stability

2.6.1. Requirement

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

2.6.2. Test Description

The EUT was placed inside of an environmental chamber as the temperature in the chamber was variedbetween 5°Cto 40°C. The temperature was incremented by 10° intervals and the unit was allowed tostabilize at each temperature before each measurement. The center frequency of the transmitting channel wasevaluated 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

U-NII-1 (Ch. 36) 5180MHz				
VOLTAGE (%)	POWER (VDC)	TEMP (°C)	Freq Dev. (Hz)	Deviation (ppm)
100%	4.0	+20(Ref)	44	0.008
100%		-30	20	0.004
100%		-20	38	0.007
100%		-10	49	0.009
100%		0	26	0.005
100%		+10	18	0.003
100%		+20	20	0.004
100%		+30	38	0.007
100%		+40	40	0.008
100%		+50	43	0.008
85%	3.4	+20	47	0.009
115%	4.6	+20	42	0.008

U-NII-3 (Ch. 149) 5745MHz				
VOLTAGE (%)	POWER (VDC)	TEMP (°C)	Freq Dev. (Hz)	Deviation (ppm)
100%	4.0	+20(Ref)	21	0.004
100%		-30	32	0.006
100%		-20	23	0.004
100%		-10	18	0.003
100%		0	33	0.006
100%		+10	42	0.007
100%		+20	22	0.004
100%		+30	49	0.009
100%		+40	51	0.009
100%		+50	25	0.004
85%	3.4	+20	41	0.007
115%	4.6	+20	36	0.006

2.7. Conducted Emission

2.7.1. 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

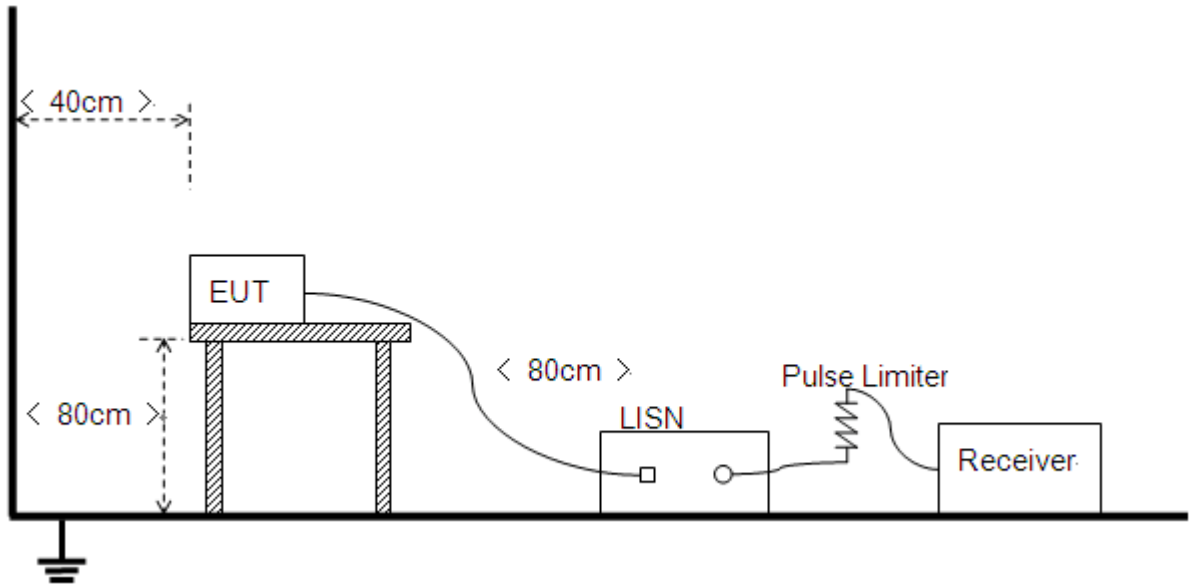
NOTE:

(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.

2.7.2. Test Description

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.

2.7.3. 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: Both of the test voltage AC 120V/60Hz and AC 230V/50Hzwere considered and tested respectively, only the results of the worst case AC 120V/60Hz were recorded in this report.

A. Test Setup:

Test Mode:EUT+adapter+WIFI TX

Test Voltage:AC 120V/60Hz

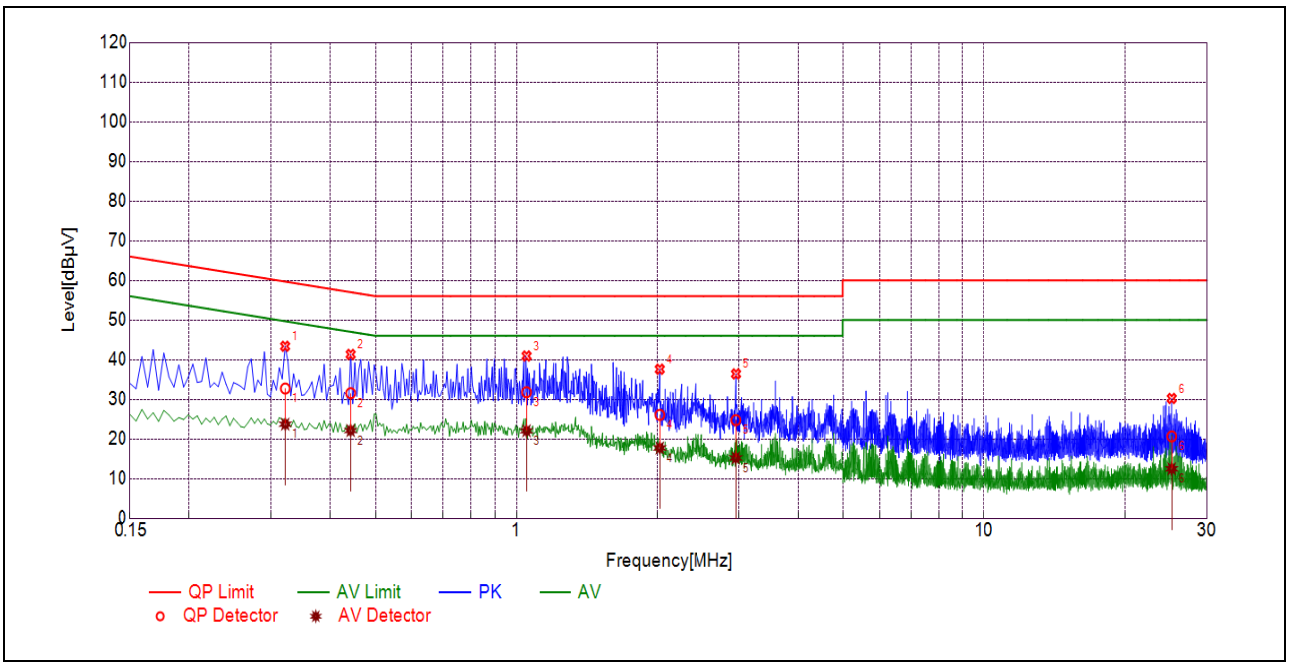
The measurement results are obtained as below:

E [dBμV] $=U_R + L_{Cable\ loss}$ [dB] + A_{Factor}

U_R: Receiver Reading

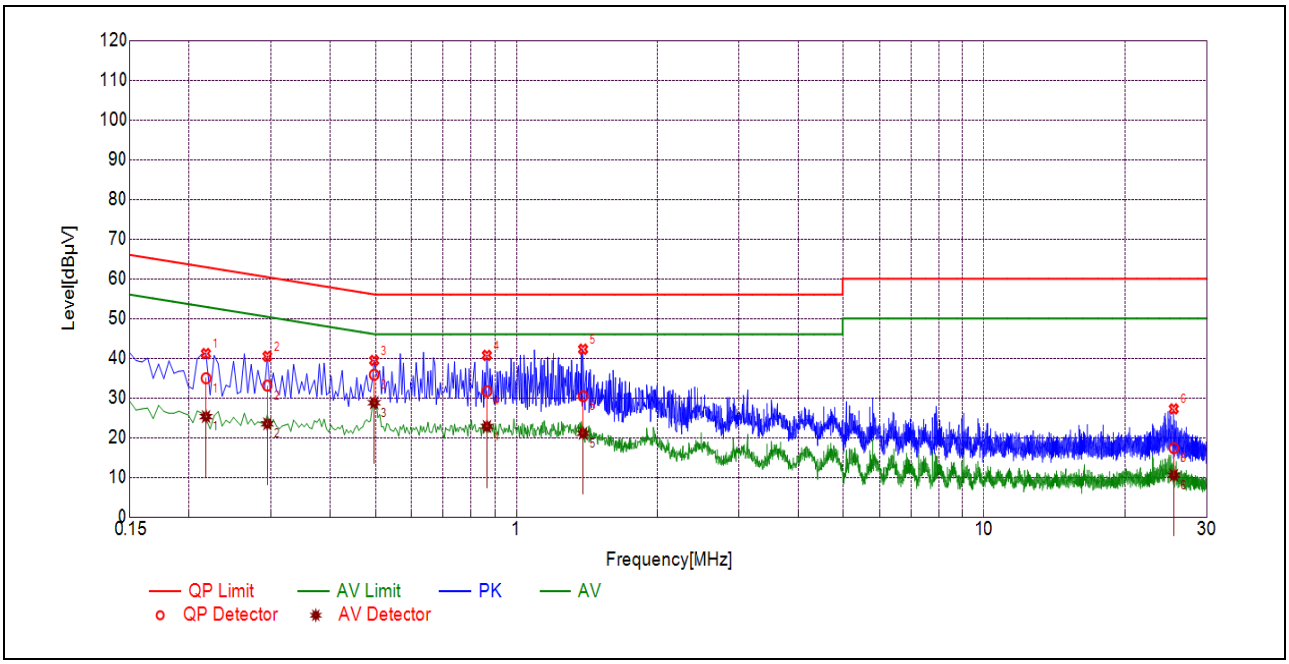
A_{Factor}: Voltage division factor of LISN

B. Test Plots:



(L Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.3212	32.73	23.73	59.68	49.68	Line	PASS
2	0.4424	31.56	22.12	57.02	47.02		PASS
3	1.0494	31.80	22.06	56.00	46.00		PASS
4	2.0265	26.08	17.73	56.00	46.00		PASS
5	2.9552	24.75	15.21	56.00	46.00		PASS
6	25.2473	20.65	12.48	60.00	50.00		PASS



(N Phase)

NO.	Fre. (MHz)	Emission Level (dBμV)		Limit (dBμV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.2176	34.96	25.30	62.91	52.91	Neutral	PASS
2	0.2939	33.10	23.48	60.41	50.41		PASS
3	0.4964	35.83	28.79	56.06	46.06		PASS
4	0.8659	31.67	22.82	56.00	46.00		PASS
5	1.3918	30.43	21.08	56.00	46.00		PASS
6	25.5169	17.34	10.53	60.00	50.00		PASS

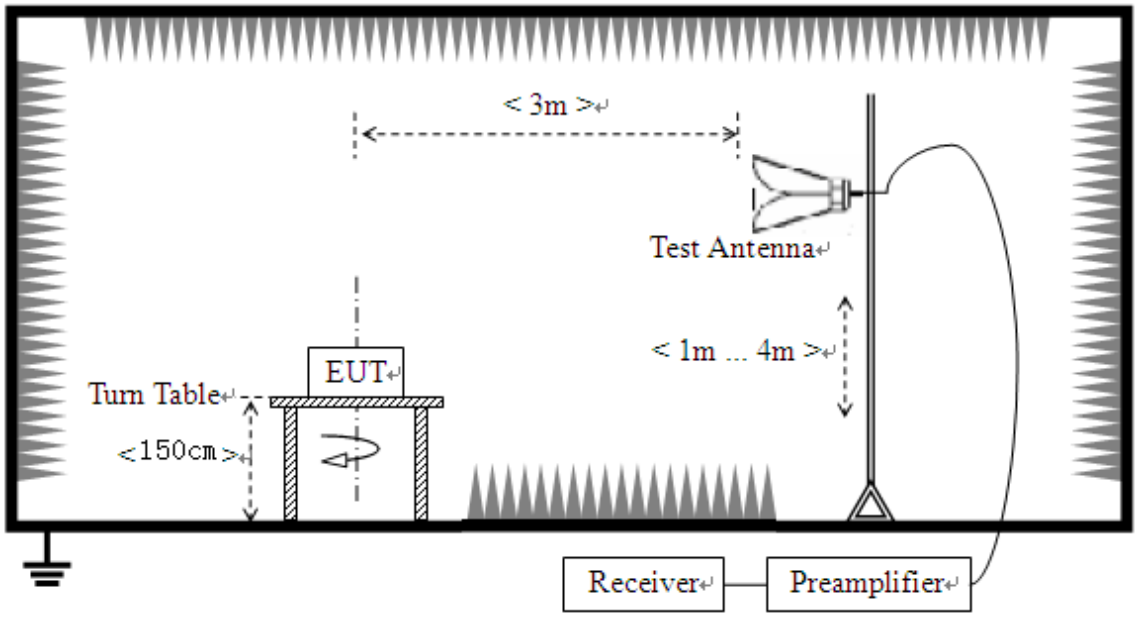
2.8. Restricted Frequency Bands

2.8.1. 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).

2.8.2. Test Description

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 provecompliance
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.

2.8.3. Test Result

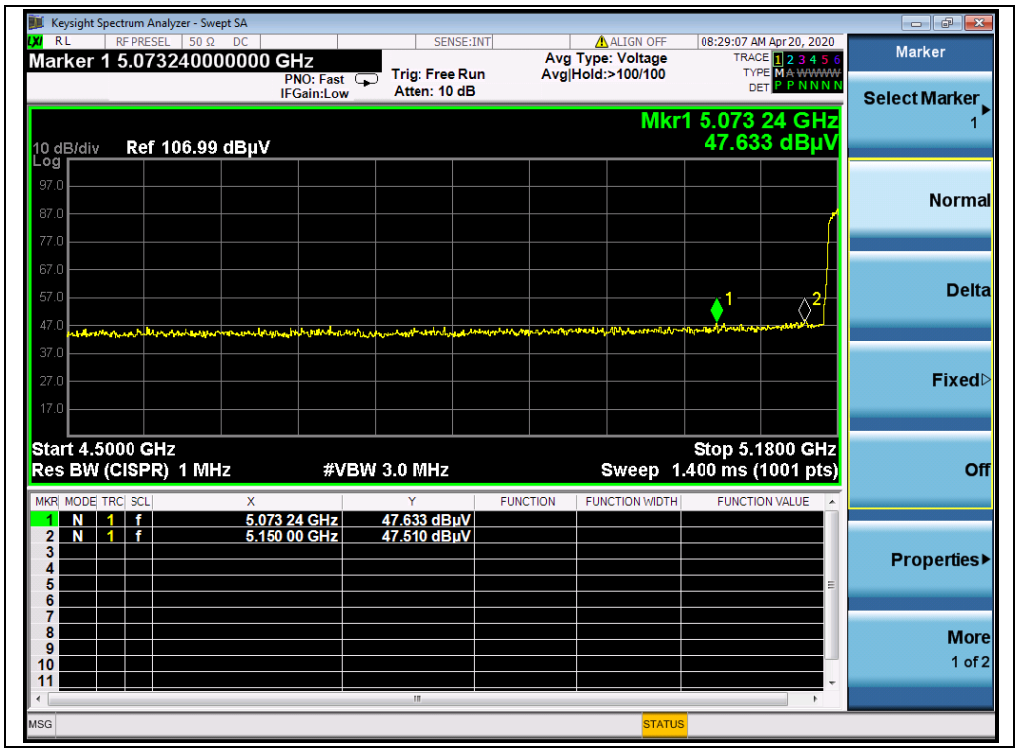
The lowest and highest channels are tested to verify Restricted Frequency Bands.
The measurement results are obtained as below:
E [dBμV/m] $=U_R + A_T + A_{Factor}$ [dB]; $A_T = L_{Cable\ loss}$ [dB]-G_{preamp} [dB]
A_T: Total correction Factor except Antenna; U_R: Receiver Reading
G_{preamp}: Preamplifier 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.

802.11n (HT20) Test mode

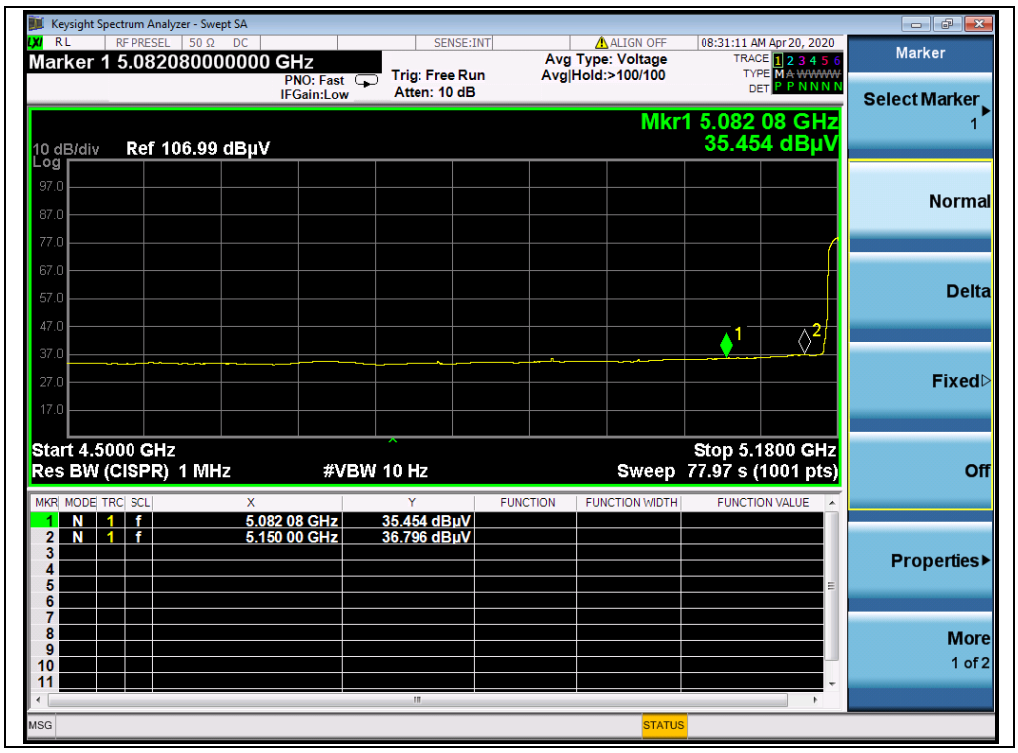
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
36	5073.24	PK	47.63	-26.92	32.20	52.91	74	PASS
36	5150.00	AV	36.80	-26.92	32.20	42.08	54	PASS
48	5363.82	PK	43.94	-26.92	32.20	49.22	74	PASS
48	5350.00	AV	33.91	-26.92	32.20	39.19	54	PASS
149	5723.00	PK	49.13	-26.23	32.20	55.10	117.67	PASS
149	5725.00	AV	40.26	-26.23	32.20	46.23	54	PASS
165	5850.00	PK	50.17	-26.23	32.20	56.14	122.23	PASS
165	5850.00	AV	41.67	-26.23	32.20	47.64	54	PASS

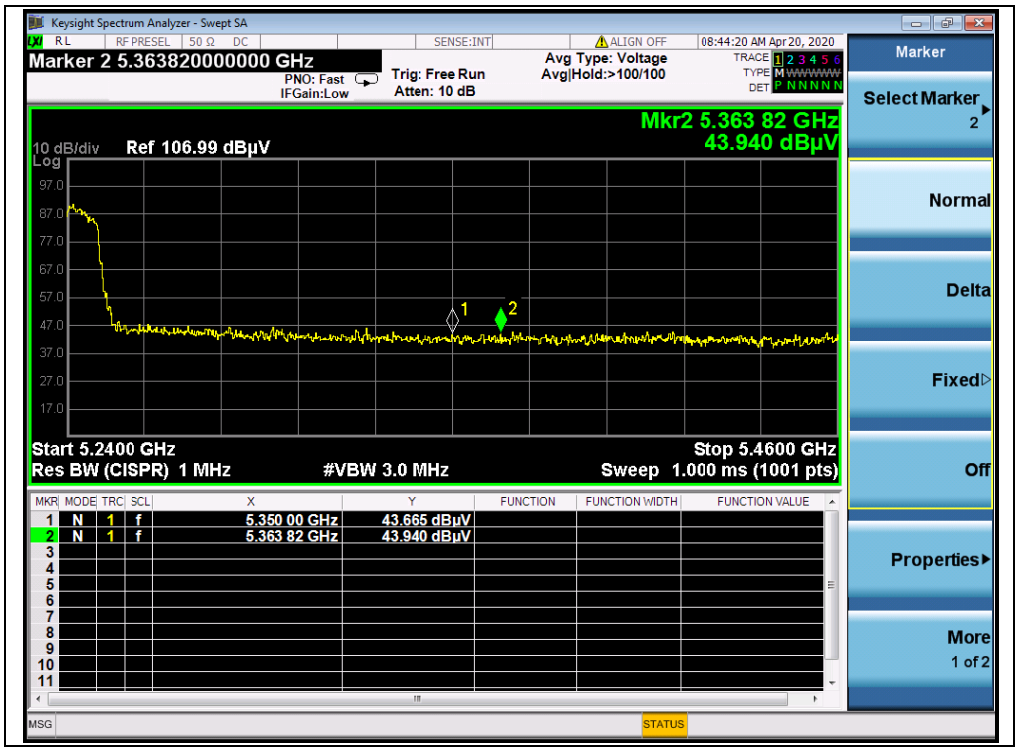
B. Test Plots:



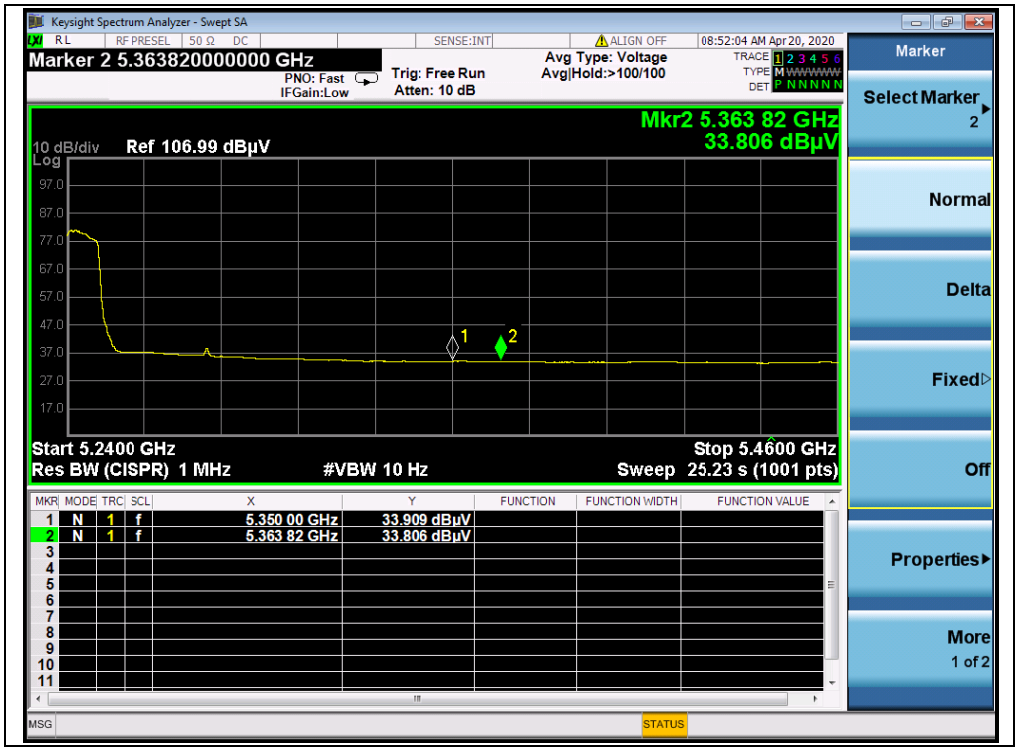
(PEAK,Channel 36,802.11n (HT20))



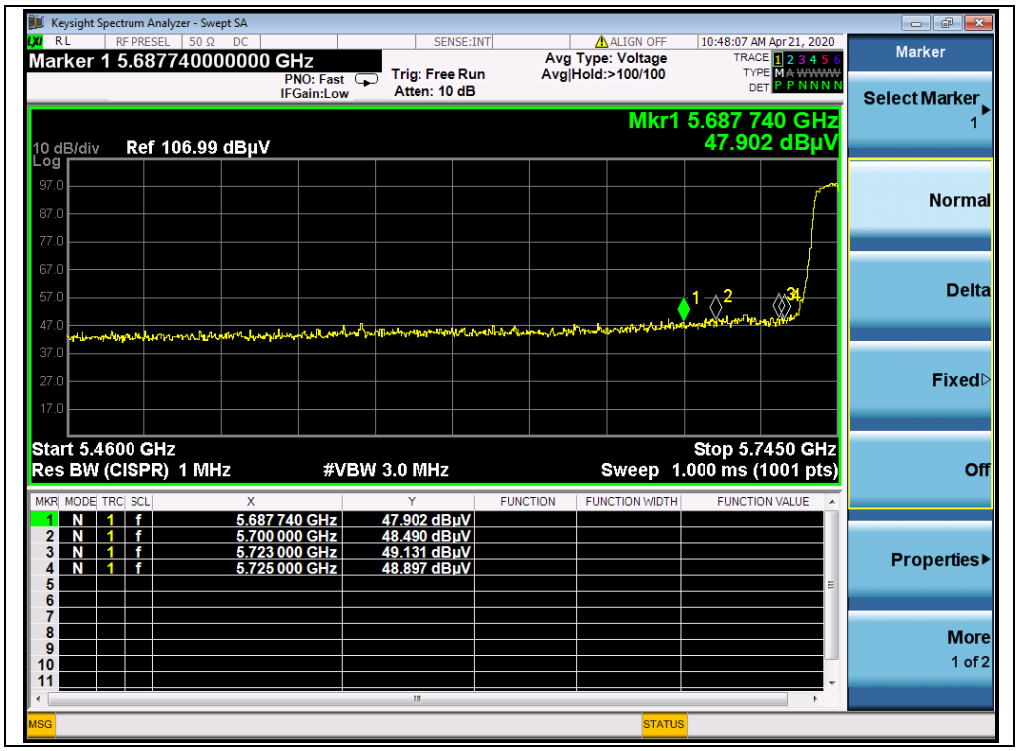
(AVG,Channel 36,802.11n (HT20))



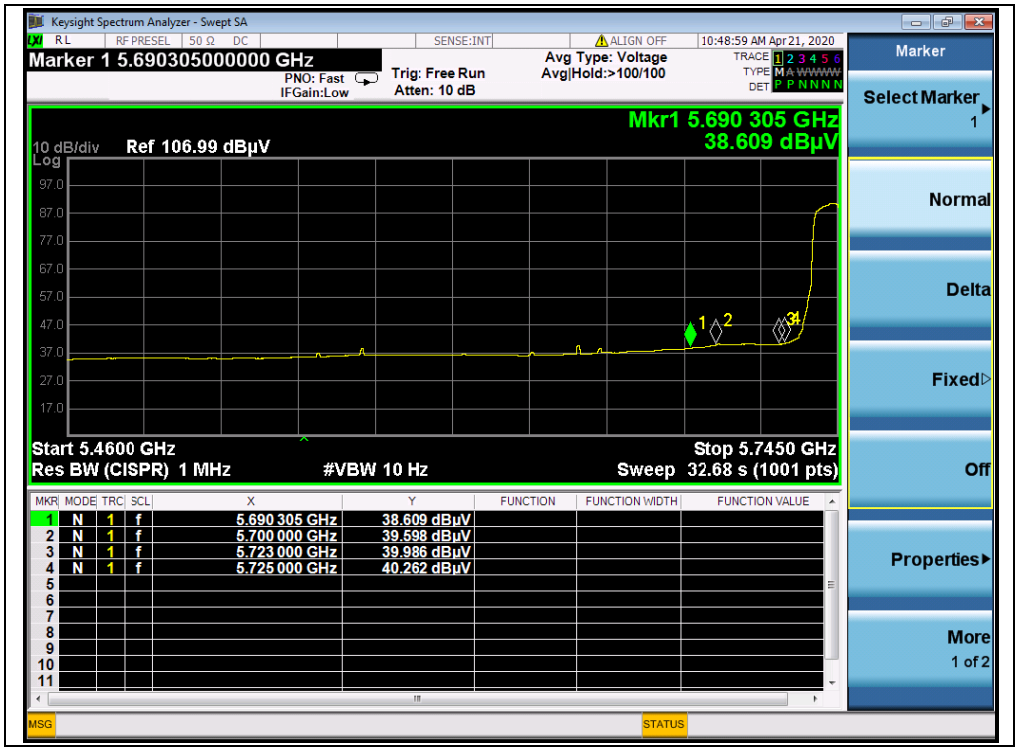
(PEAK,Channel48, 802.11n (HT20))



(AVG,Channel48,802.11n (HT20))



(PEAK,Channel149, 802.11n (HT20))



(AVG,Channel149,802.11n (HT20))

(PEAK,Channel165, 802.11n (HT20))

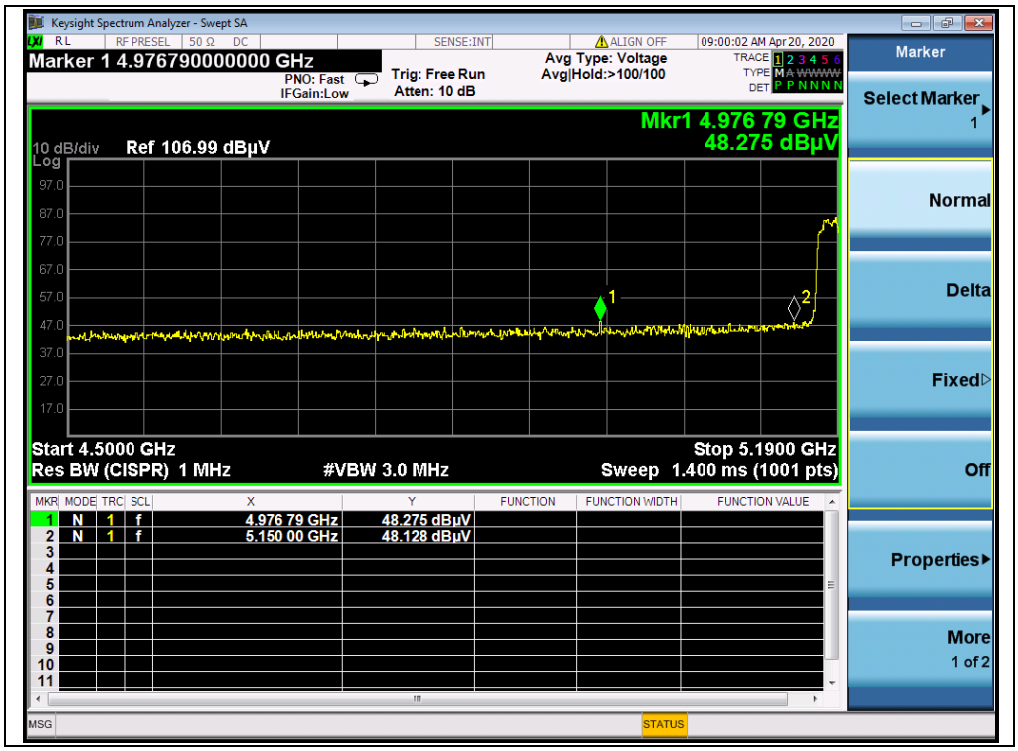
(AVG,Channel165,802.11n (HT20))

802.11n (HT40) Test mode

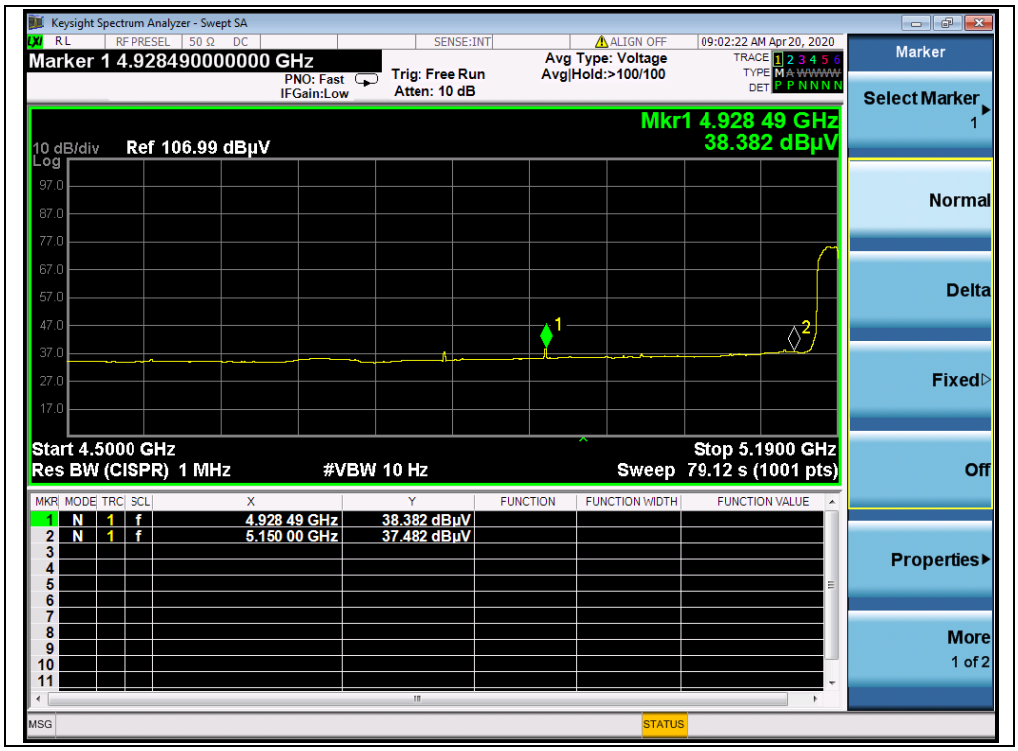
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
38	4976.79	PK	48.28	-26.92	32.20	53.56	74	PASS
38	4928.49	AV	38.38	-26.92	32.20	43.66	54	PASS
46	5355.12	PK	45.41	-26.92	32.20	50.69	74	PASS
46	5350.00	AV	33.97	-26.92	32.20	39.25	54	PASS
151	5725.00	PK	51.65	-26.23	32.20	57.62	122.23	PASS
151	5724.32	AV	42.58	-26.23	32.20	48.55	54	PASS
159	5855.00	PK	47.21	-26.23	32.20	53.18	110.83	PASS
159	5850.00	AV	39.79	-26.23	32.20	45.76	54	PASS

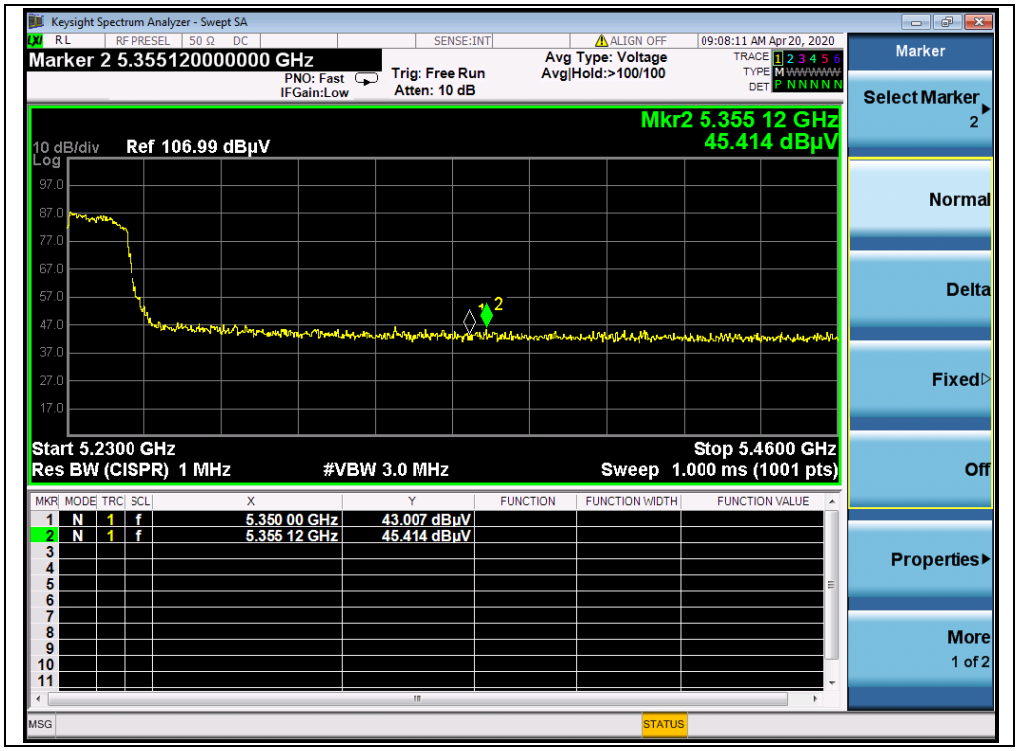
B. Test Plots:



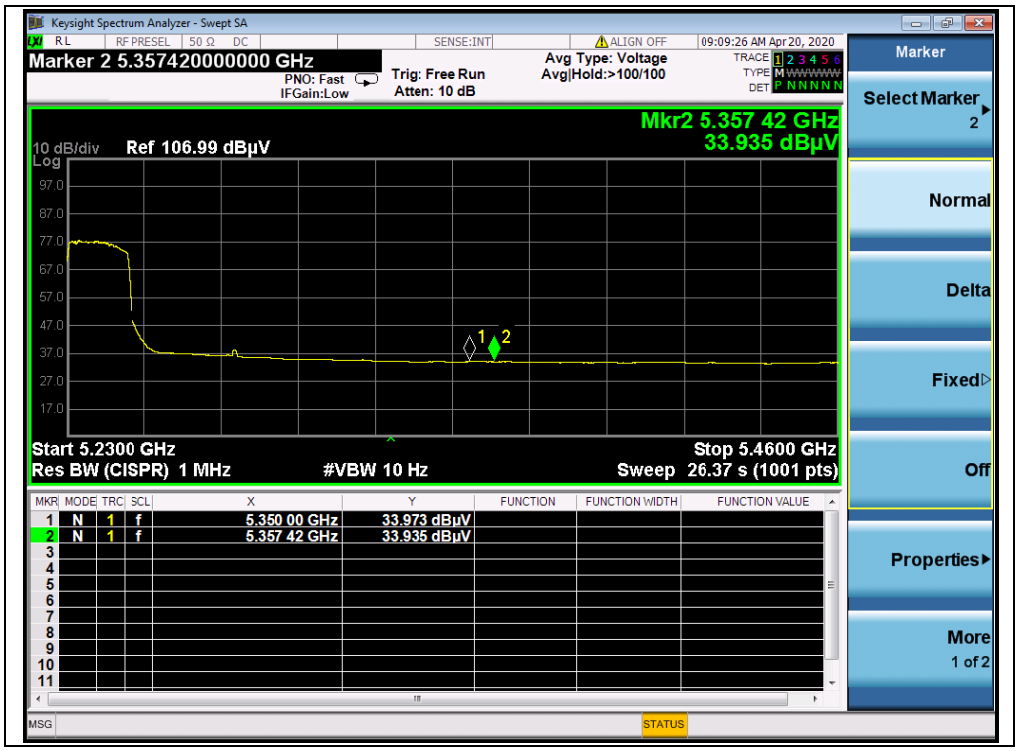
(PEAK,Channel 38,802.11n (HT40))



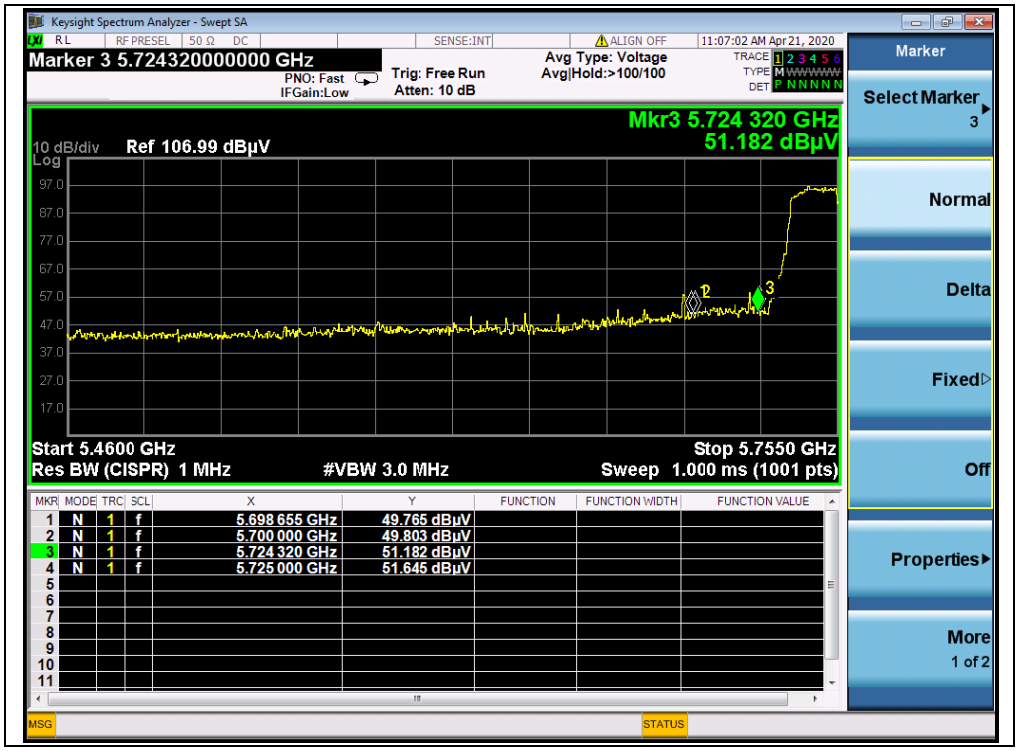
(AVG,Channel 38,802.11n (HT40))



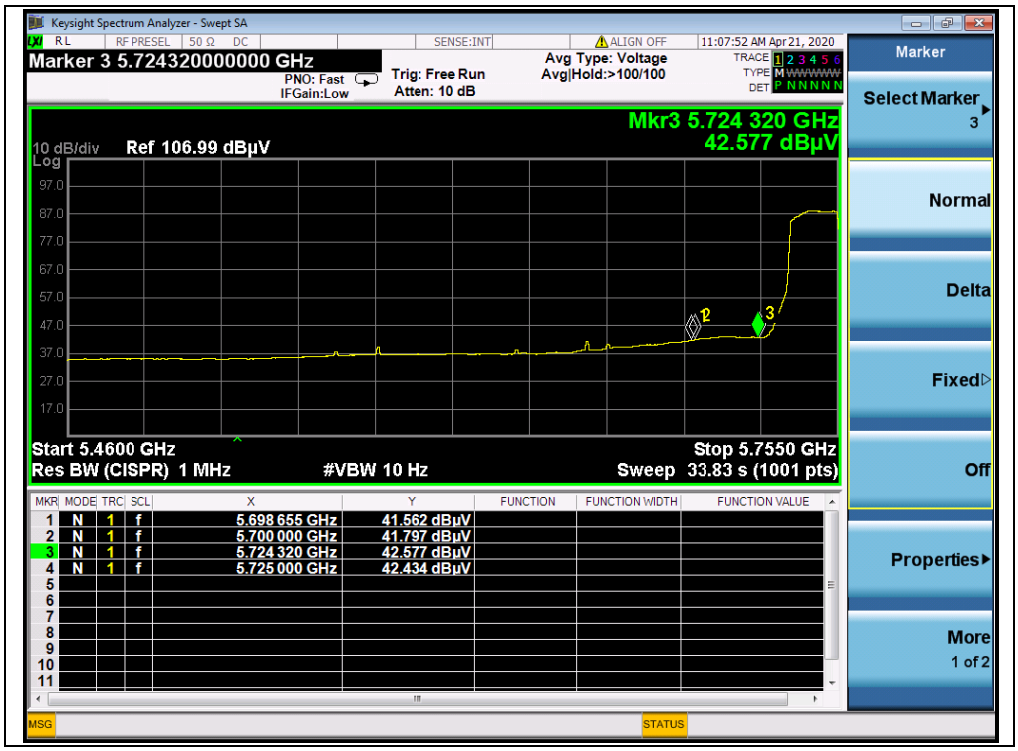
(PEAK,Channel46, 802.11n (HT40))



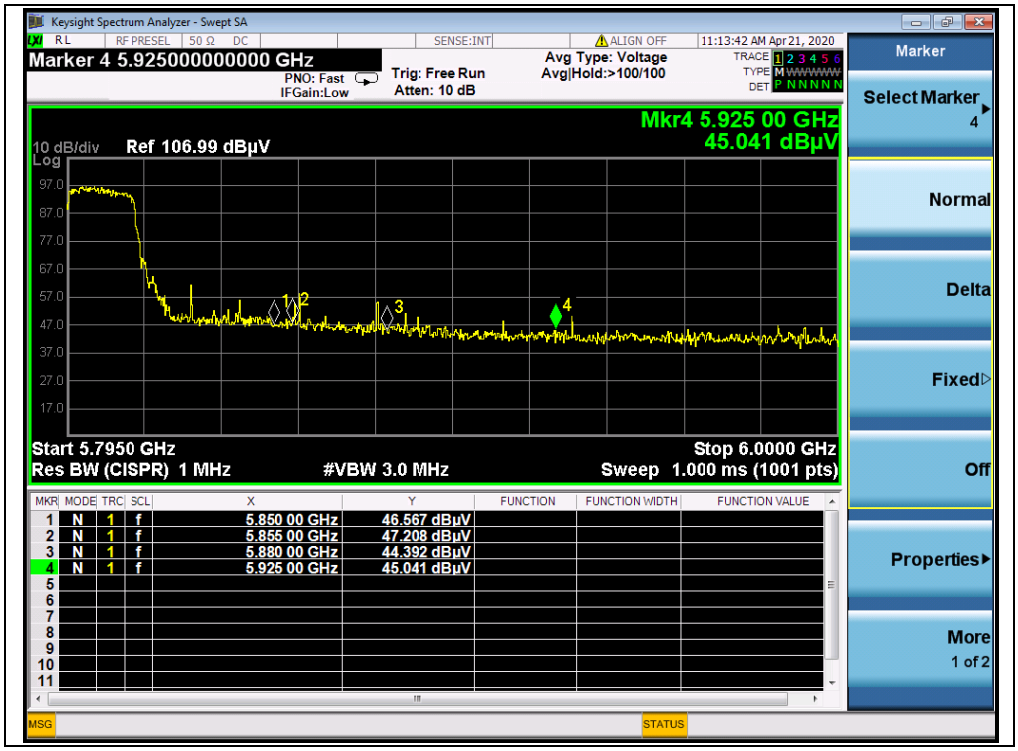
(AVG,Channel46, 802.11n (HT40))



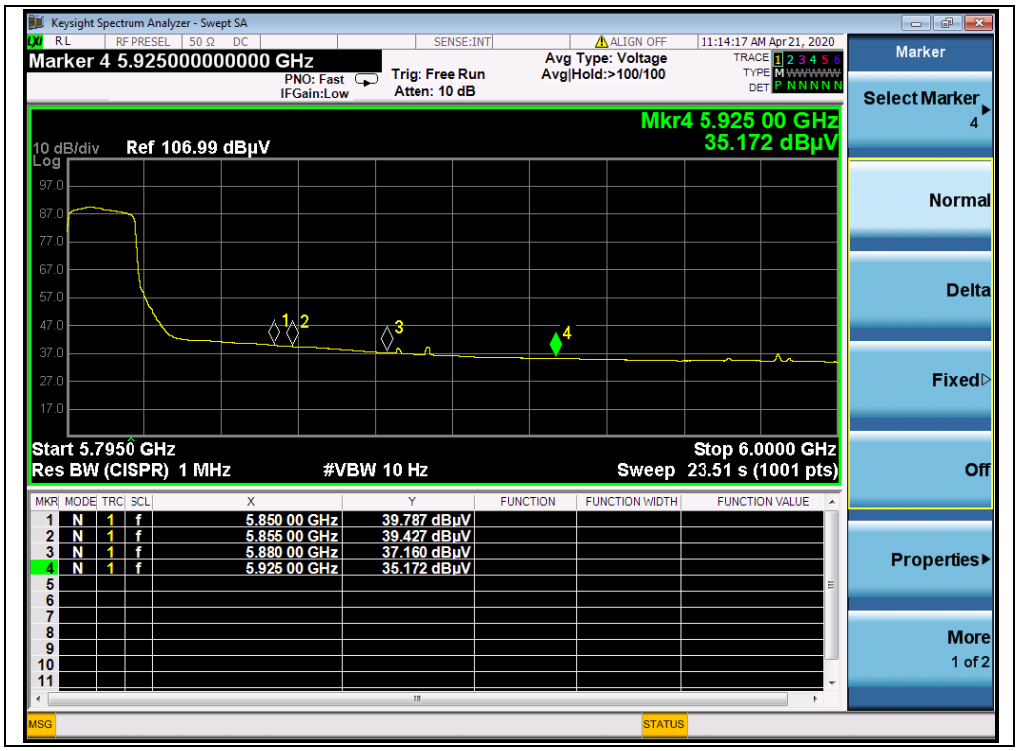
(PEAK,Channel151, 802.11n (HT40))



(AVG,Channel151, 802.11n (HT40))



(PEAK,Channel159, 802.11n (HT40))



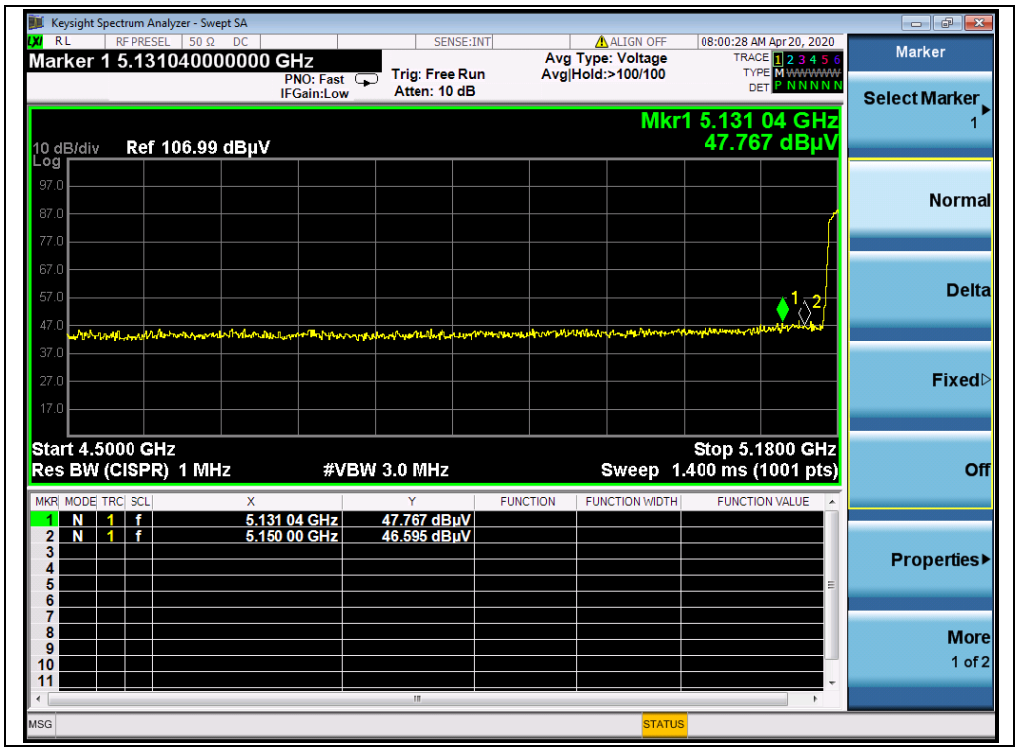
(AVG,Channel159, 802.11n (HT40))

802.11ac (VHT20) Test mode

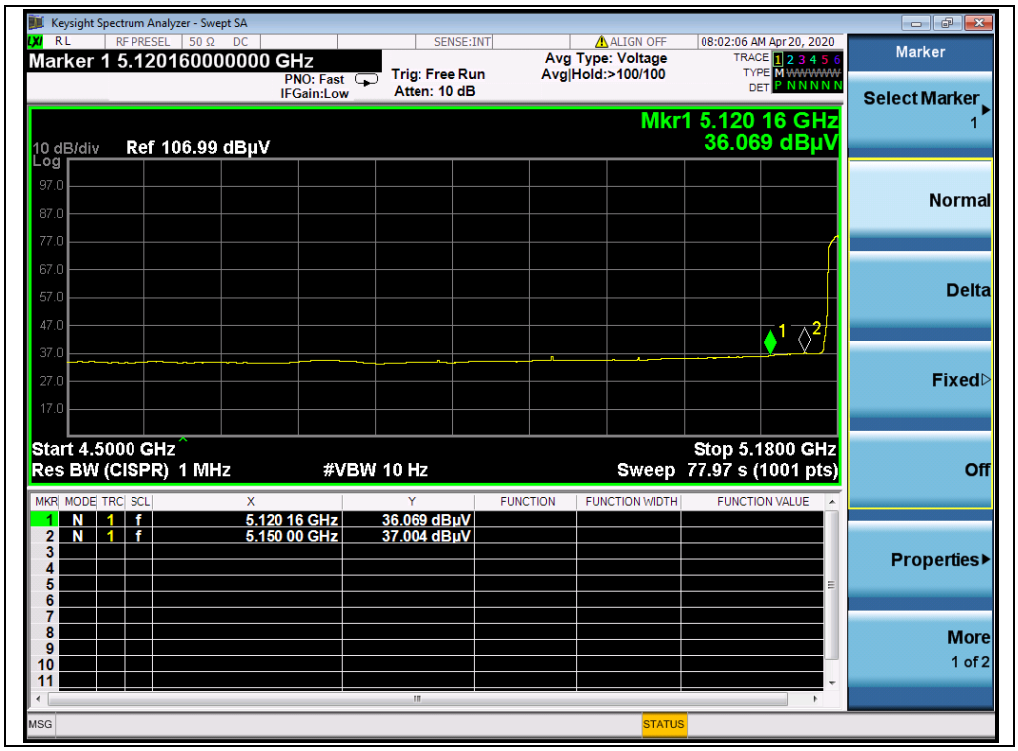
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
36	5131.04	PK	47.77	-26.92	32.20	53.05	74	PASS
36	5150.00	AV	37.00	-26.92	32.20	42.28	54	PASS
48	5360.74	PK	44.05	-26.92	32.20	49.33	74	PASS
48	5350.00	AV	33.52	-26.92	32.20	38.80	54	PASS
149	5701.40	PK	51.54	-26.23	32.20	57.51	105.62	PASS
149	5569.16	AV	41.87	-26.23	32.20	47.84	54	PASS
165	5860.53	PK	52.20	-26.23	32.20	58.17	95.34	PASS
165	5869.10	AV	42.23	-26.23	32.20	48.20	54	PASS

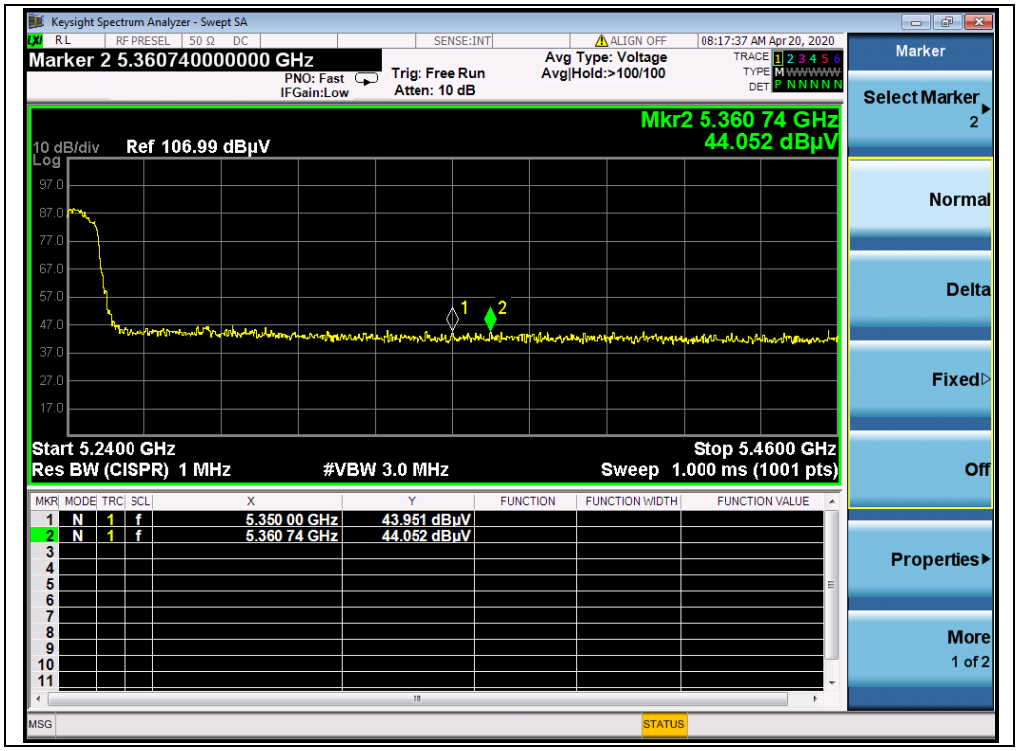
B. Test Plots:



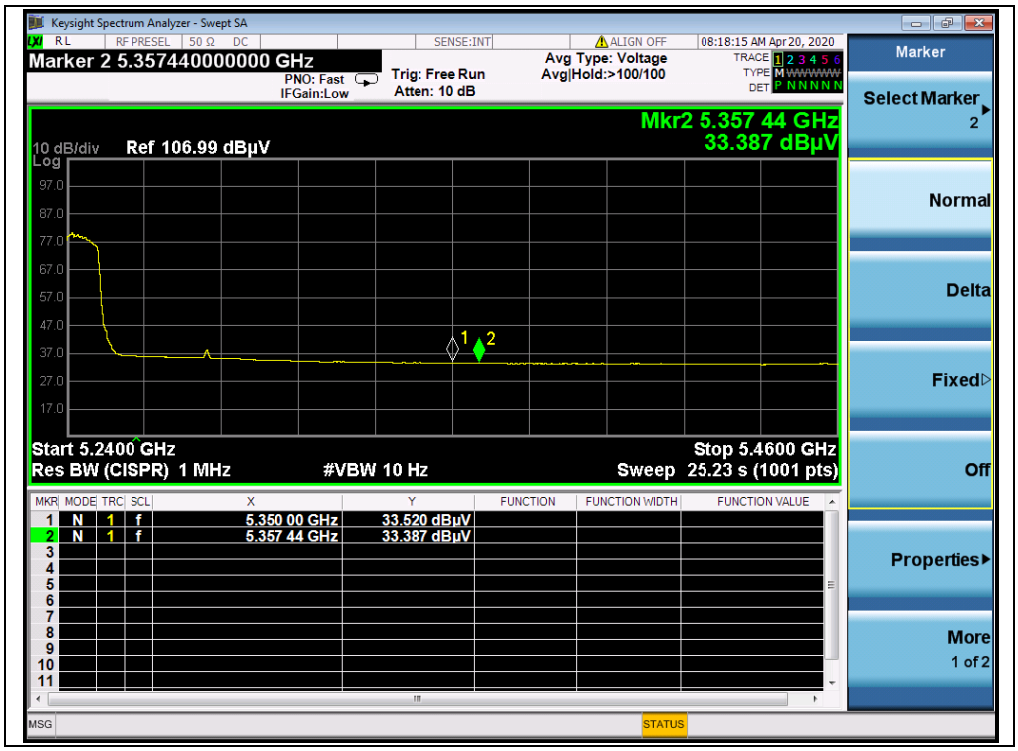
(PEAK,Channel 36,802.11ac (VHT20))



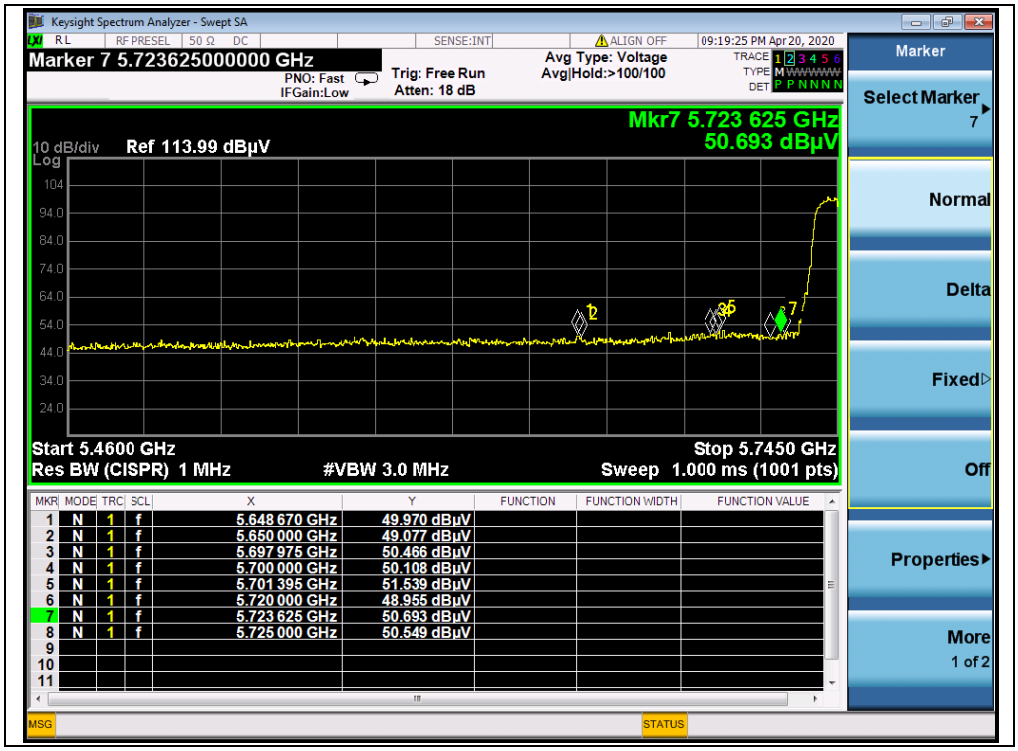
(AVG,Channel 36,802.11ac (VHT20))



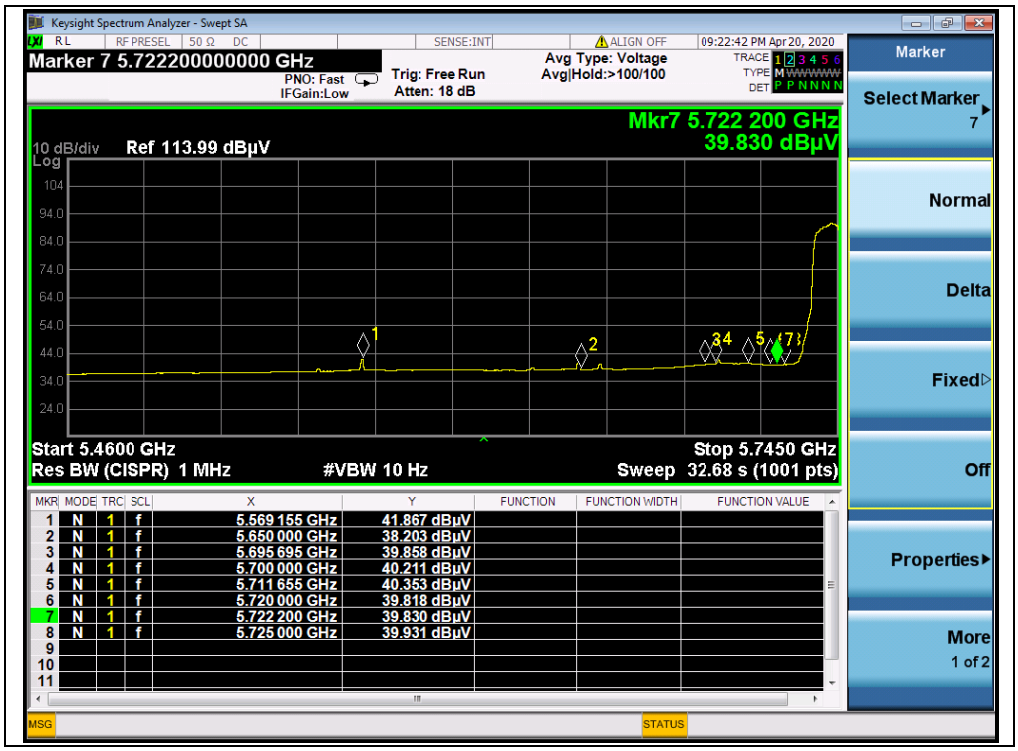
(PEAK,Channel48, 802.11ac (VHT20))



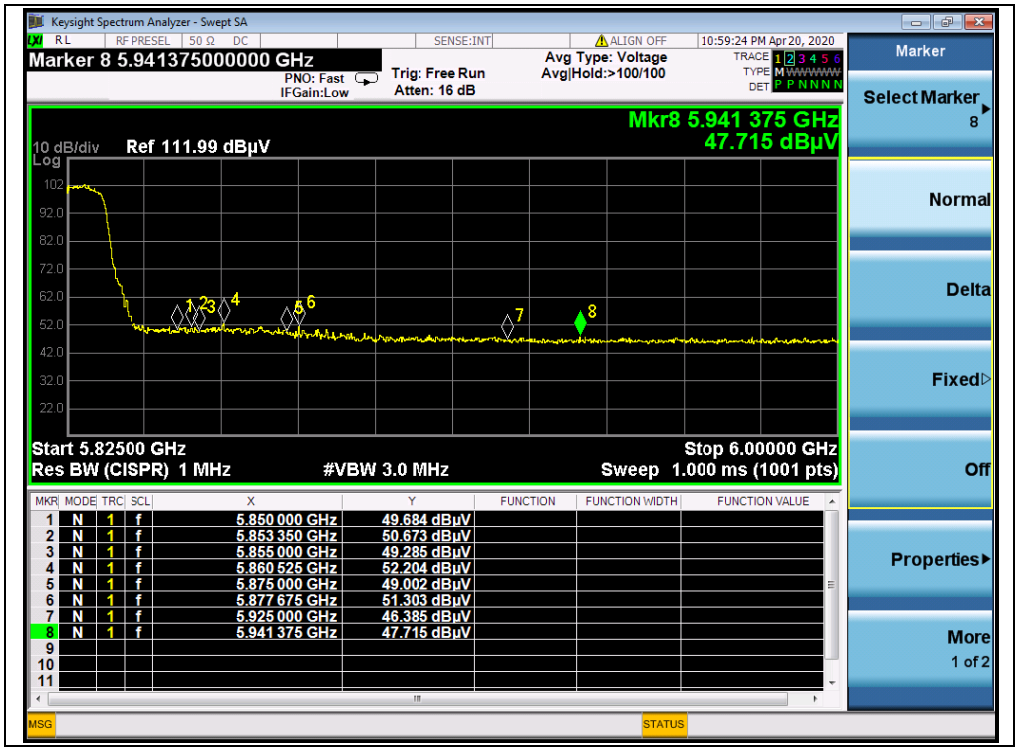
(AVG,Channel48,802.11ac (VHT20))



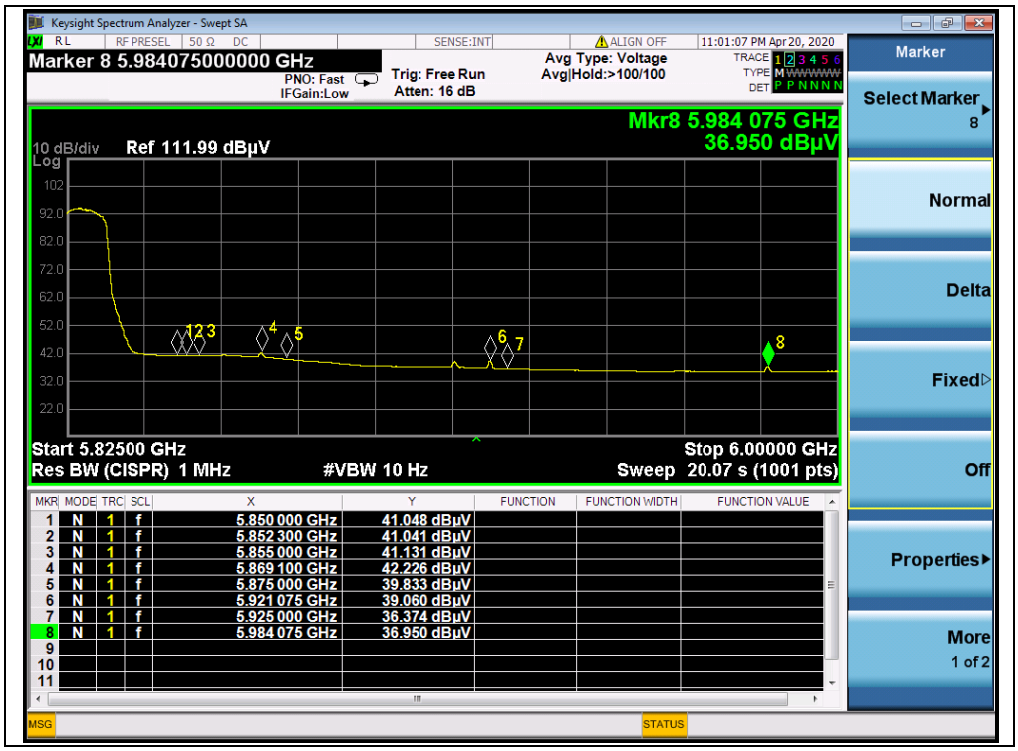
(PEAK,Channel149, 802.11ac (VHT20))



(AVG,Channel149,802.11ac (VHT20))



(PEAK,Channel165,802.11ac (VHT20))



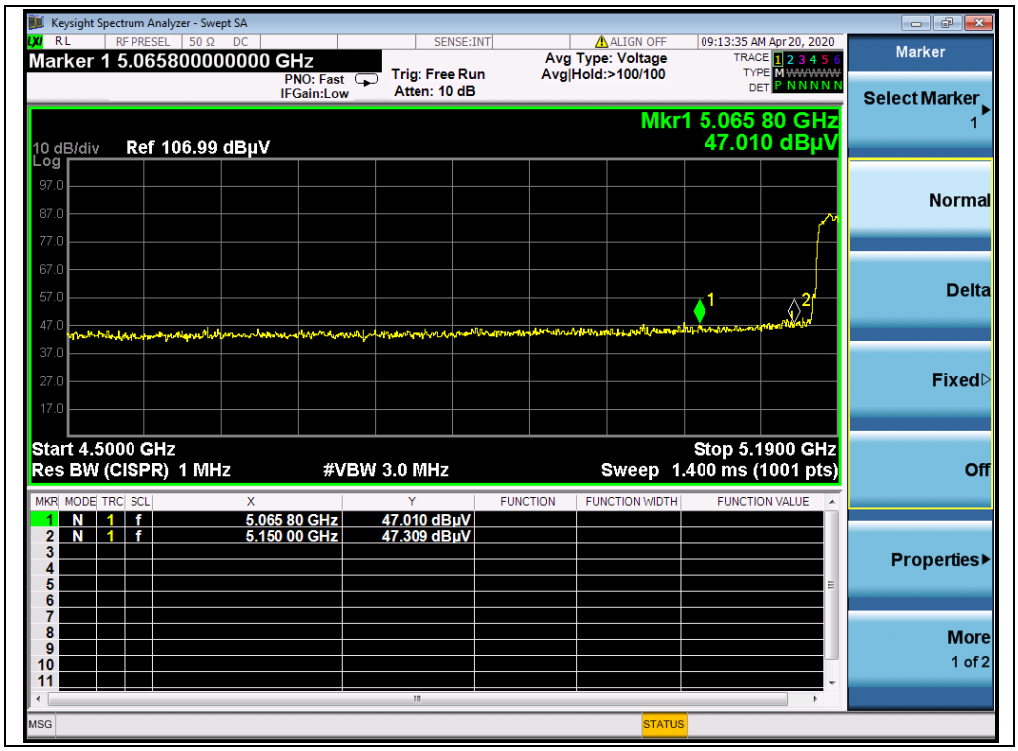
(AVG,Channel165,802.11ac (VHT20))

802.11ac (VHT40) Test mode

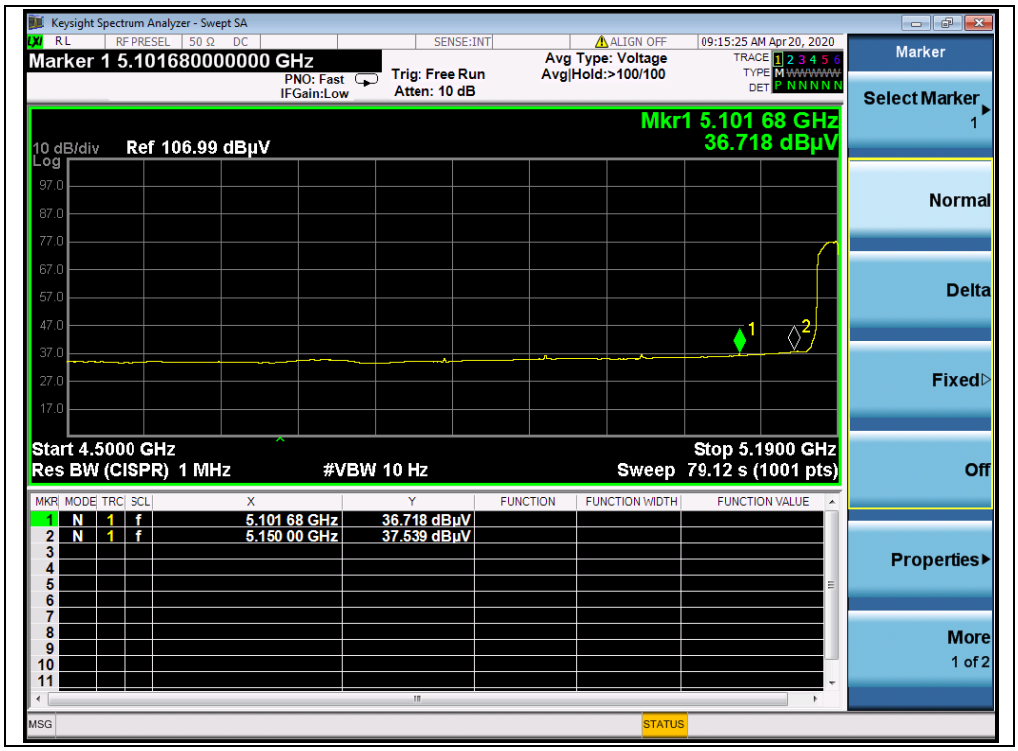
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
38	5150.00	PK	47.31	-26.92	32.20	52.59	74	PASS
38	5150.00	AV	37.54	-26.92	32.20	42.82	54	PASS
46	5350.00	PK	44.02	-26.92	32.20	49.30	74	PASS
46	5358.38	AV	33.84	-26.92	32.20	39.12	54	PASS
151	5720.68	PK	62.67	-26.23	32.20	68.64	112.38	PASS
151	5723.93	AV	42.81	-26.23	32.20	48.78	54	PASS
159	5858.63	PK	61.52	-26.23	32.20	67.49	100.66	PASS
159	5882.99	AV	41.75	-26.23	32.20	47.72	54	PASS

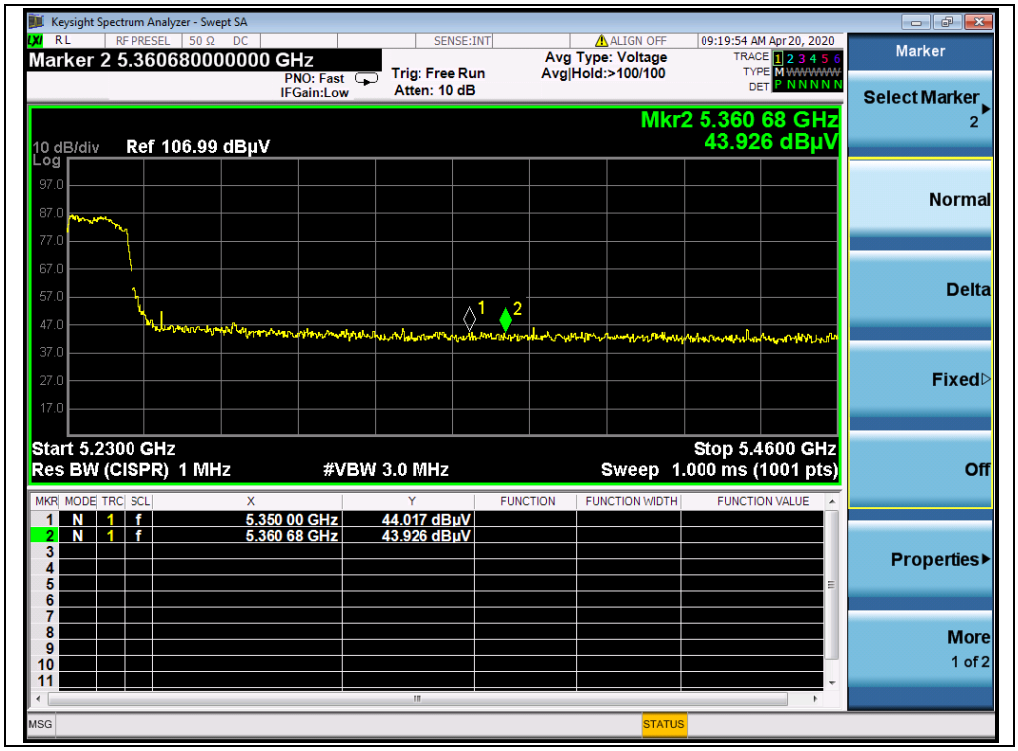
B. Test Plots:



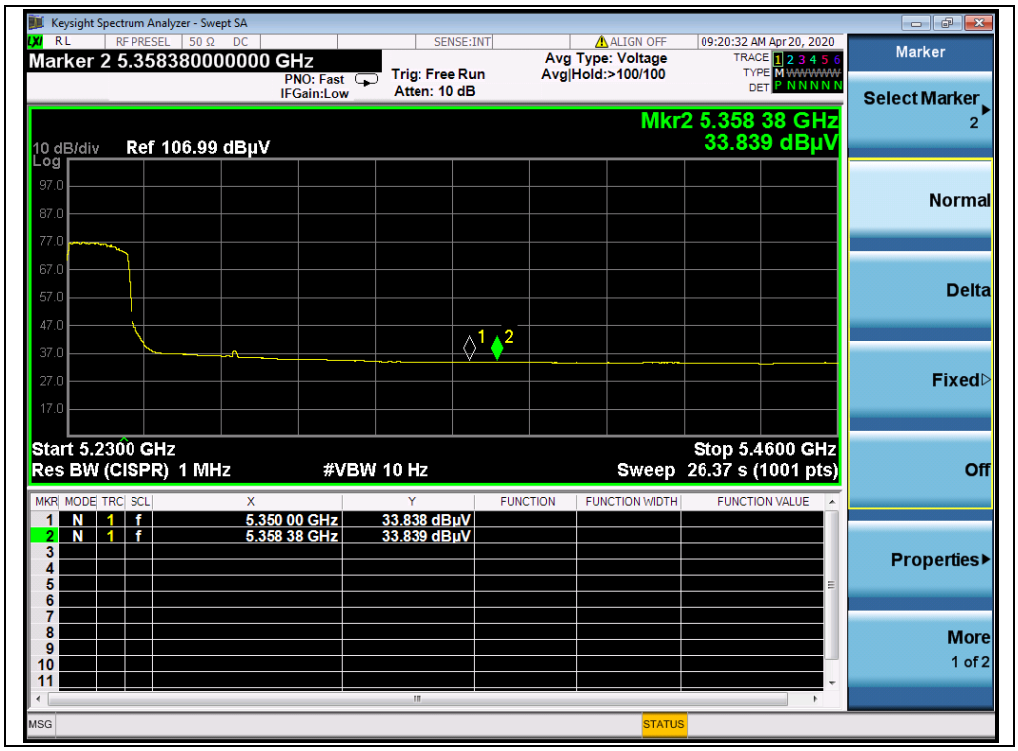
(PEAK,Channel 38, 802.11ac (VHT40))



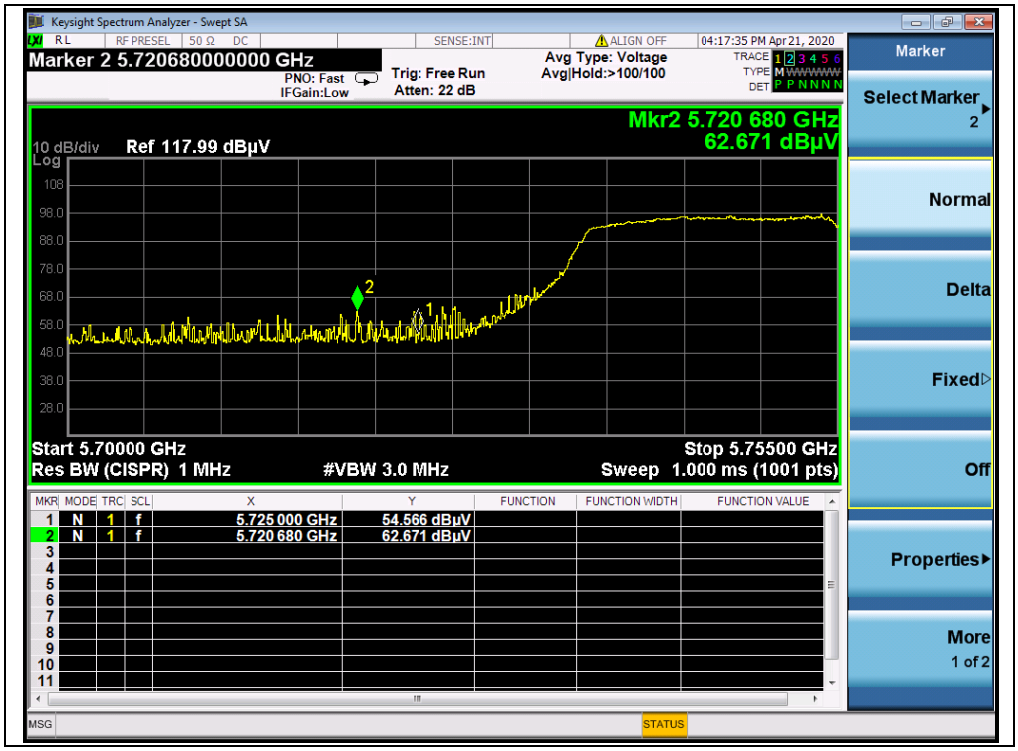
(AVG,Channel 38,802.11ac (VHT40))



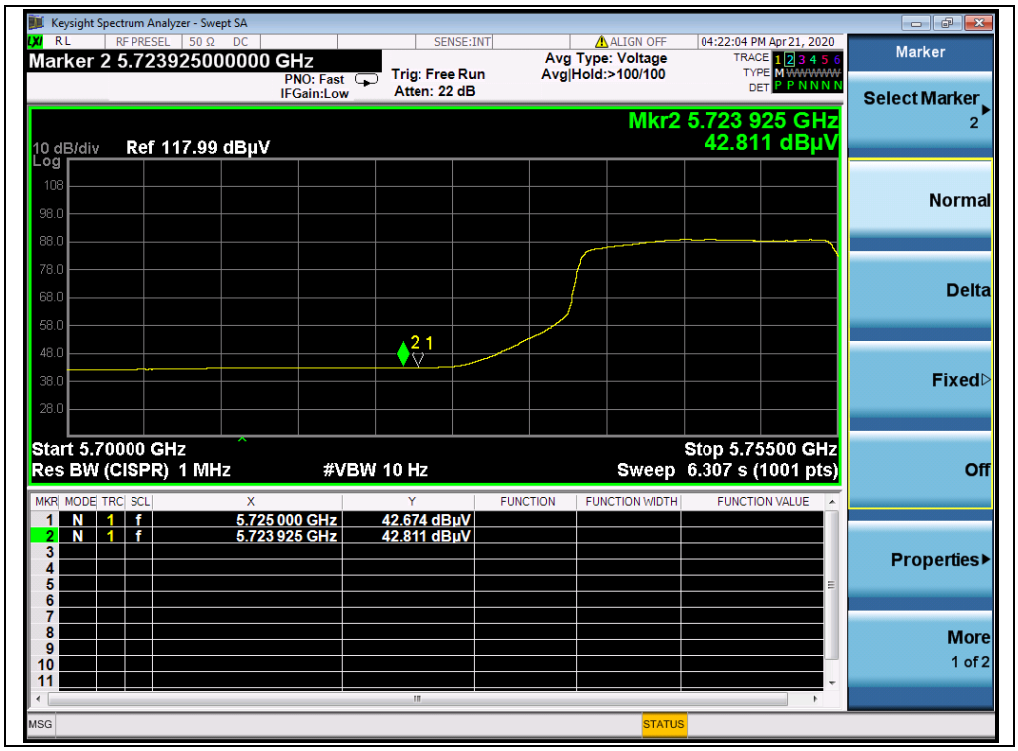
(PEAK,Channel46, 802.11ac (VHT40))



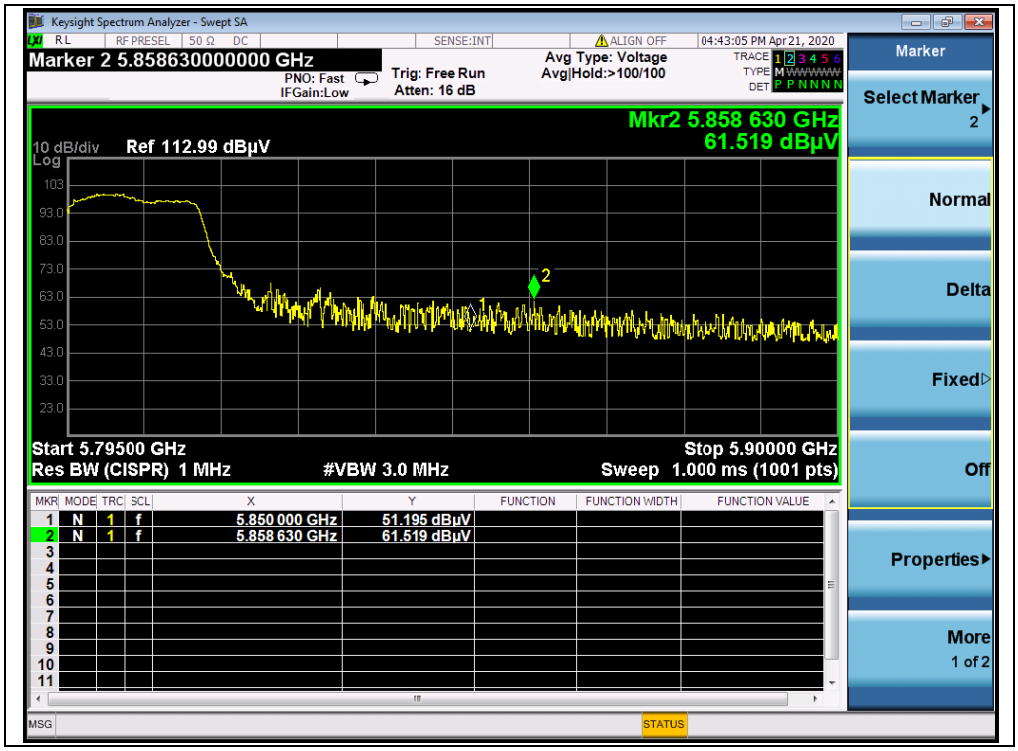
(AVG,Channel46, 802.11ac (VHT40))



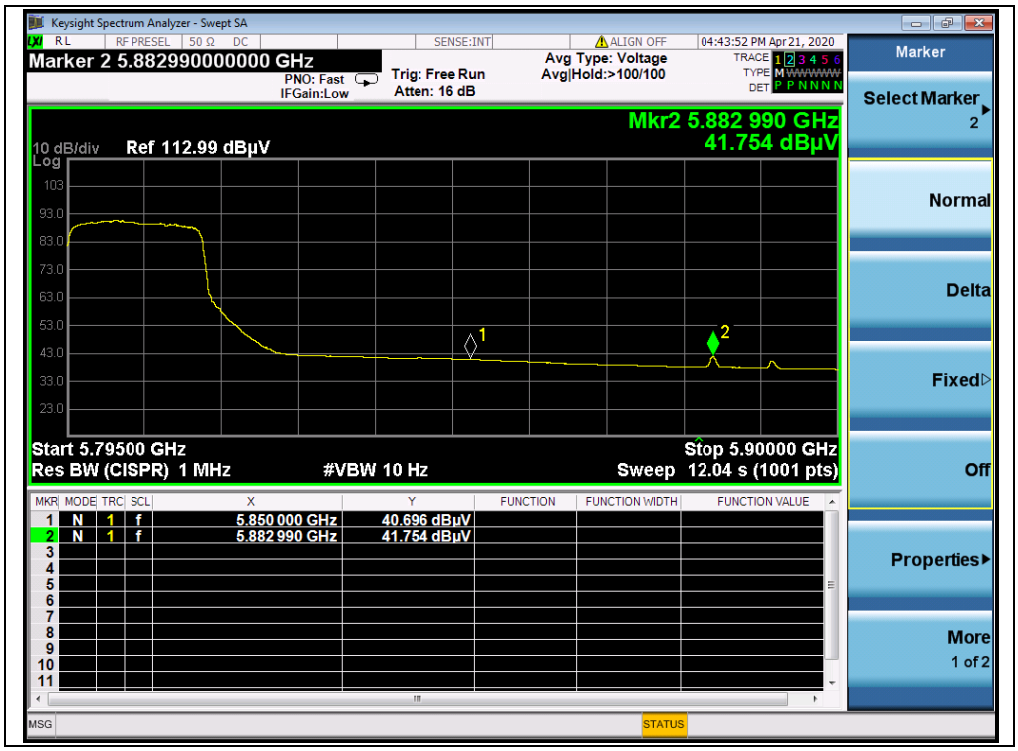
(PEAK,Channel151, 802.11ac (VHT40))



(AVG,Channel151,802.11ac (VHT40))



(PEAK,Channel159,802.11ac (VHT40))



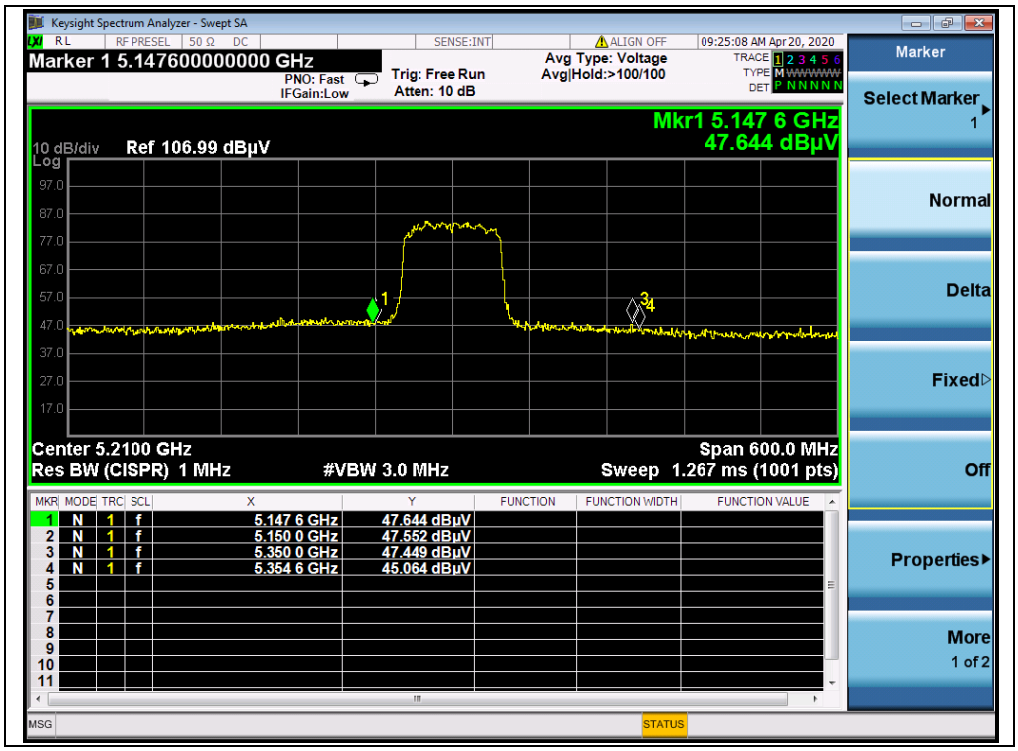
(AVG,Channel159, 802.11ac (VHT40))

802.11ac (VHT80) Test mode

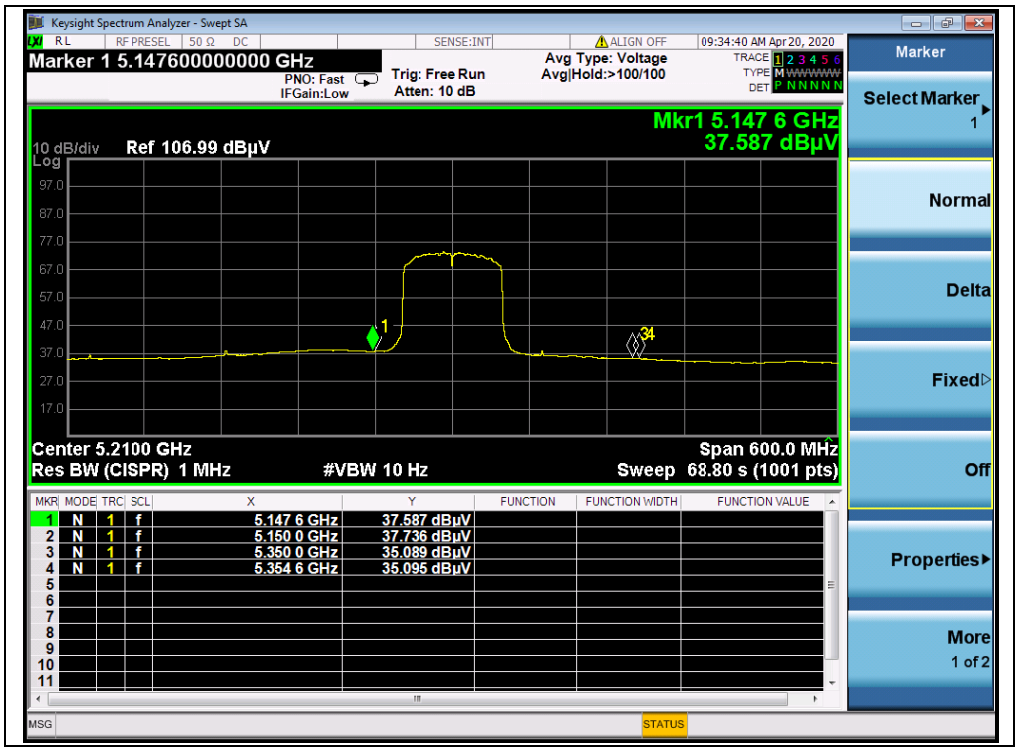
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
42	5147.60	PK	47.64	-26.92	32.20	52.92	74	PASS
42	5150.00	AV	37.74	-26.92	32.20	43.02	54	PASS
42	5350.00	PK	47.45	-26.92	32.20	52.73	74	PASS
42	5354.60	AV	35.10	-26.92	32.20	40.38	54	PASS
155	5725.00	PK	53.55	-26.23	32.20	59.52	122.23	PASS
155	5725.00	AV	43.16	-26.23	32.20	49.13	54	PASS
155	5859.40	PK	54.55	-26.23	32.20	60.52	98.51	PASS
155	5870.80	AV	42.74	-26.23	32.20	48.71	54	PASS

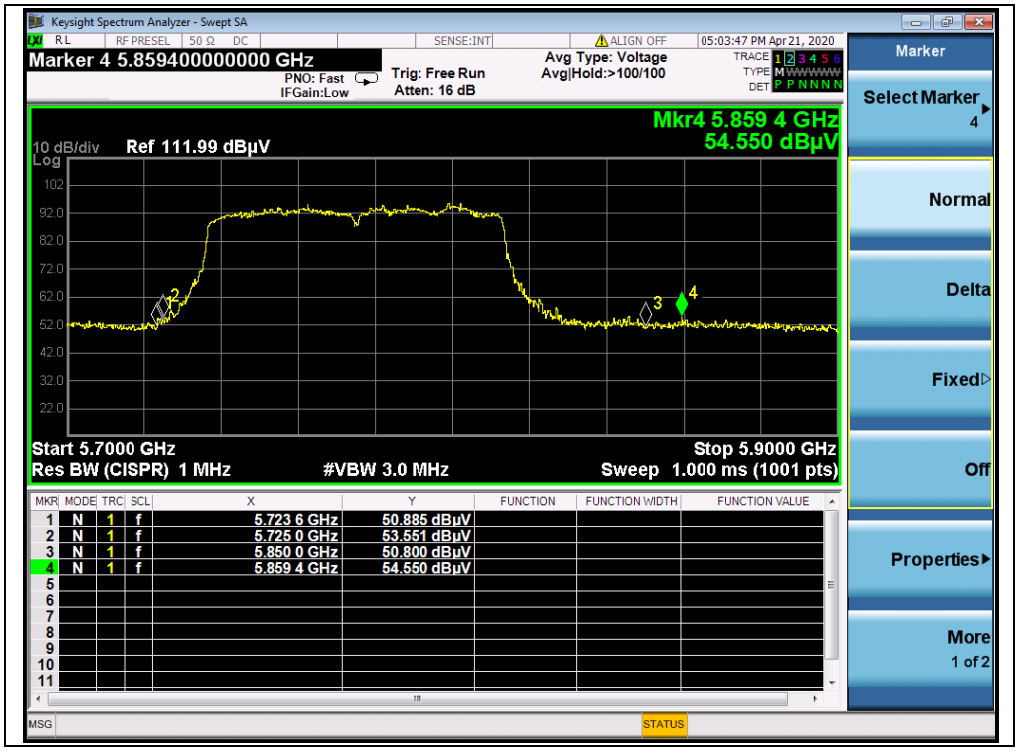
B. Test Plots:



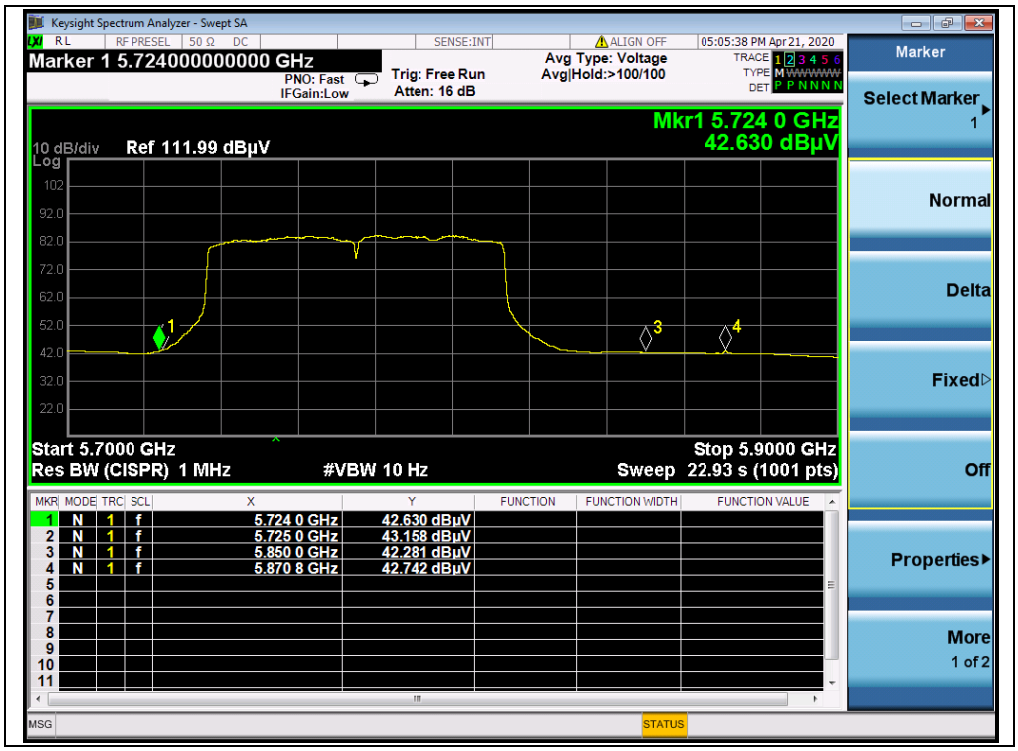
(PEAK,Channel42, 802.11ac (VHT80))



(AVG,Channel42, 802.11ac (VHT80))



(PEAK,Channel155, 802.11ac (VHT80))



(AVG,Channel155, 802.11ac (VHT80))

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:

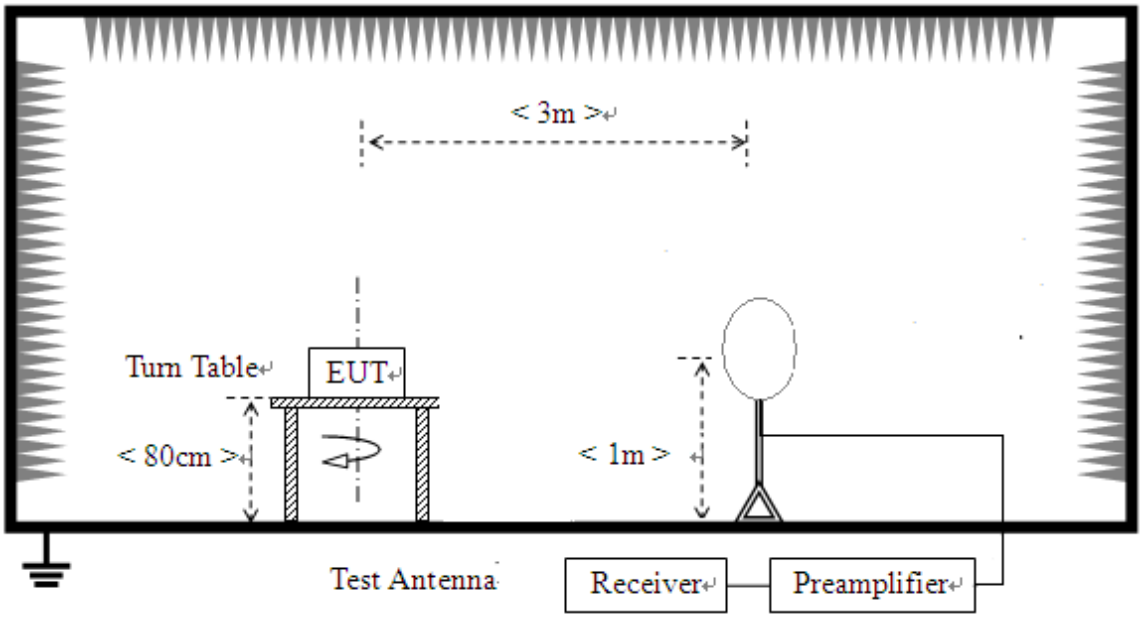
For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.

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)

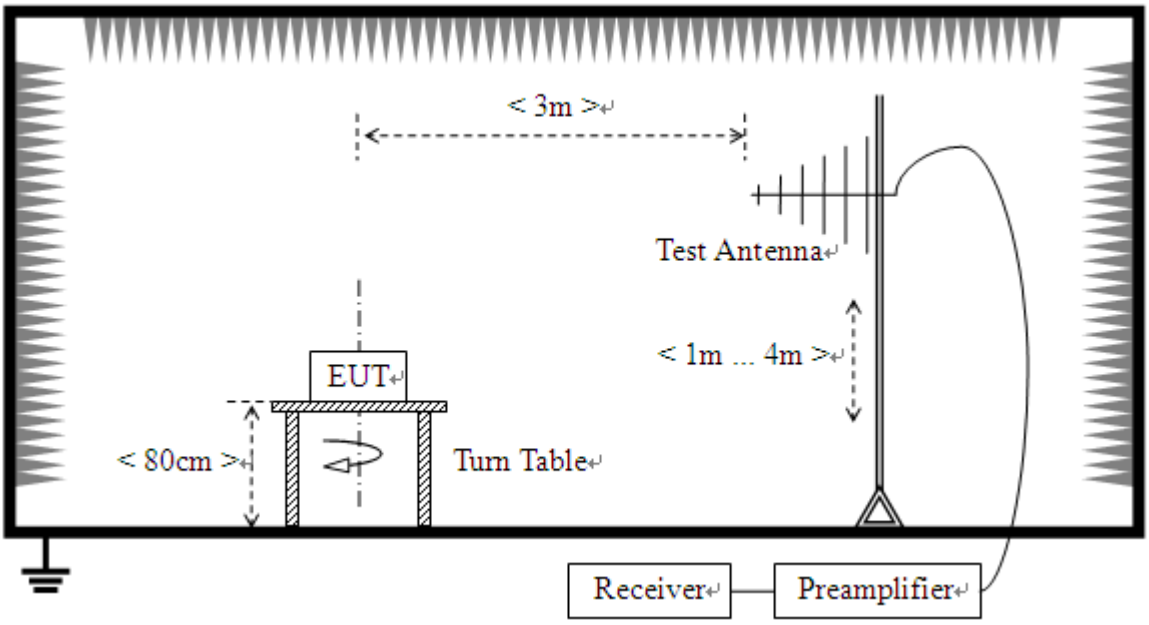
2.9.2. Test Description

Test Setup:

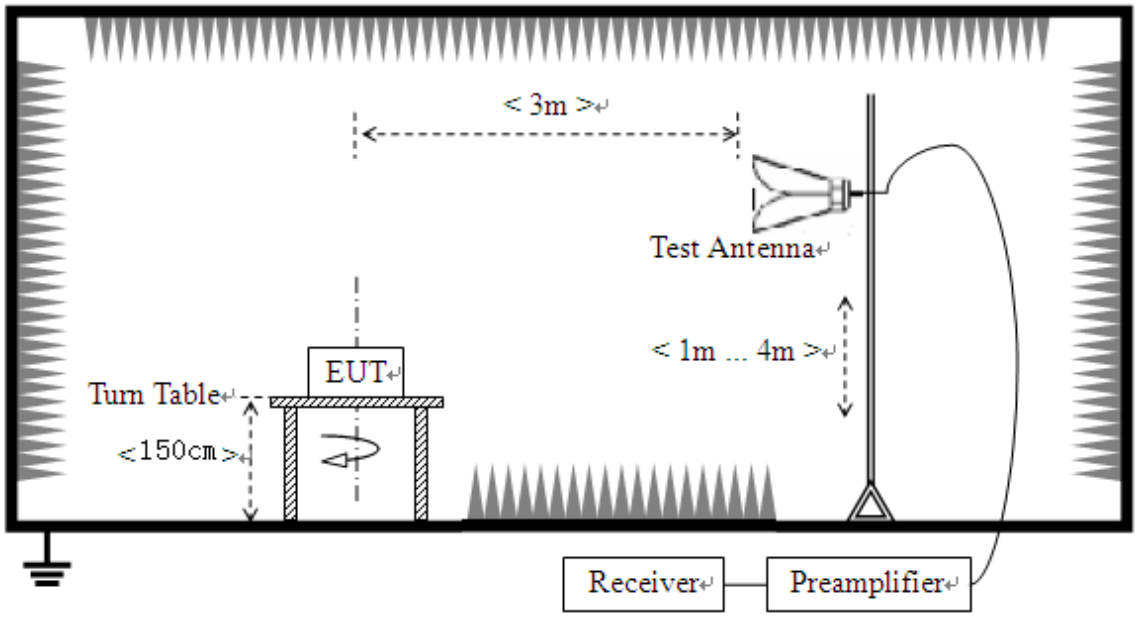
1) For radiated emissions from 9kHz to 30MHz



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.

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 [dBμV/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.

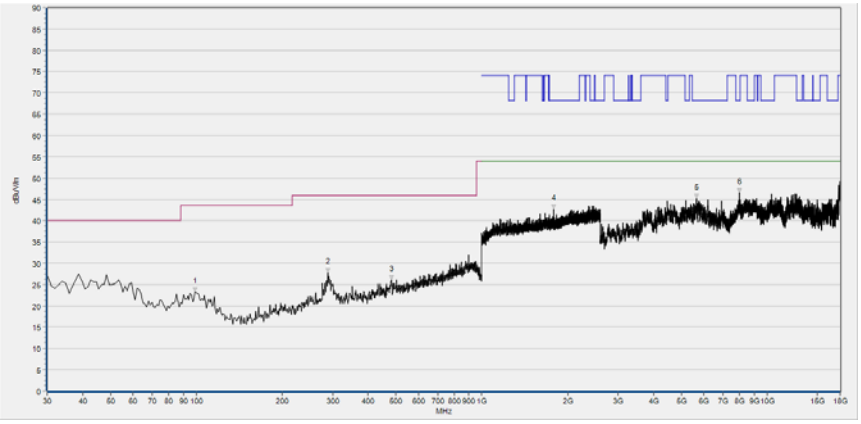
Note1: All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Note2: For the frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

Note3: For the frequency, which started from 18GHz to 40GHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

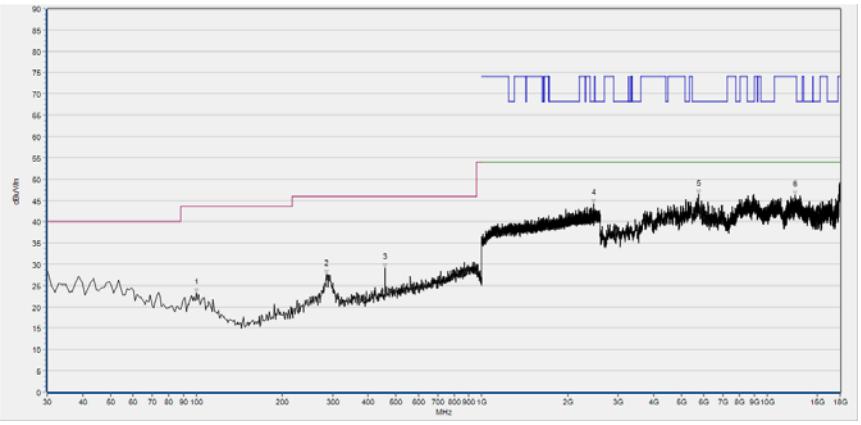
802.11n (HT20) Test mode

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
98.939	23.28	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
288.278	27.79	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
482.472	26.17	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1787.996	42.79	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
5649.810	45.27	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
7997.239	46.64	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS

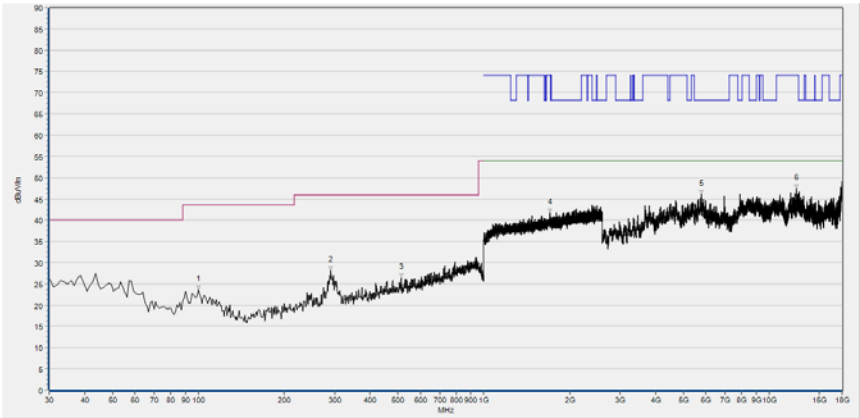
(Antenna Horizontal, 30MHz to 18GHz)



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
99.910	23.28	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
285.365	27.62	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
458.198	29.10	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2466.089	44.25	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
5736.067	46.41	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
12531.906	46.27	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

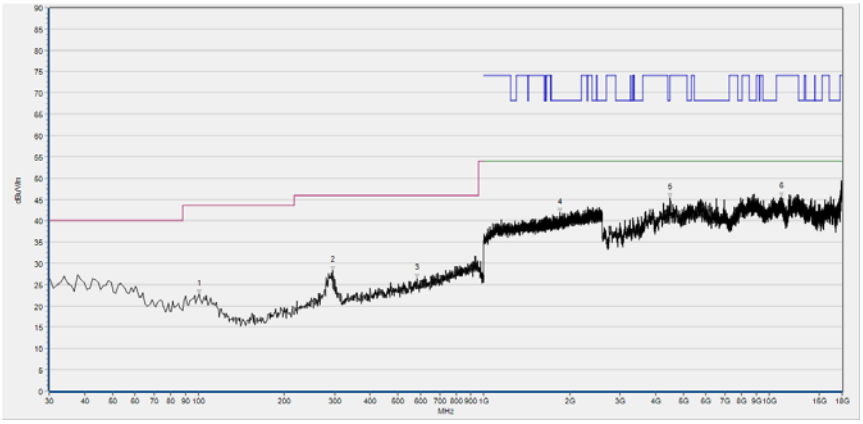
(Antenna Vertical, 30MHz to 18GHz)

Plots 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
99.910	23.59	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
291.191	28.10	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
513.544	26.51	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1706.369	41.81	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5797.680	46.04	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
12467.213	47.38	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

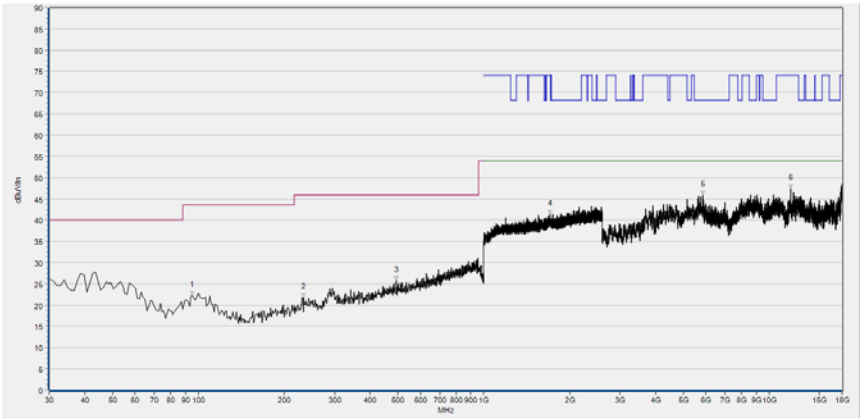
(Antenna Horizontal, 30MHz to 18GHz)



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
100.881	22.81	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
295.075	28.35	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
584.424	26.55	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1844.015	41.92	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
4488.418	45.41	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
11010.082	45.59	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

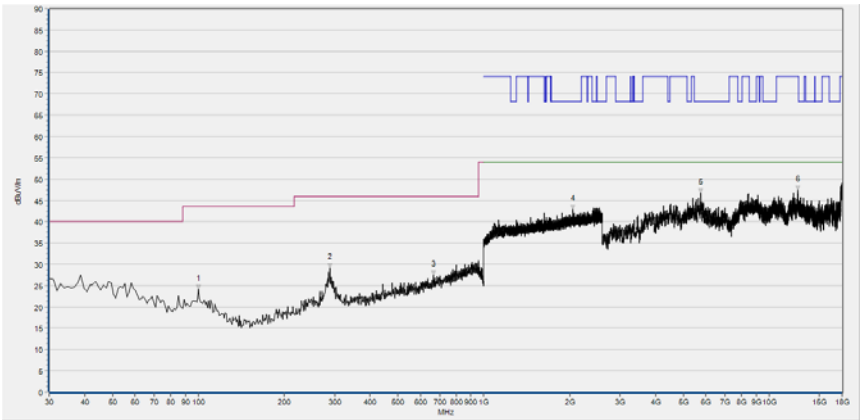
(Antenna Vertical, 30MHz to 18GHz)

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
95.055	22.21	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
233.904	21.81	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
494.124	25.84	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1706.369	41.47	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5843.889	45.91	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
11875.735	47.42	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

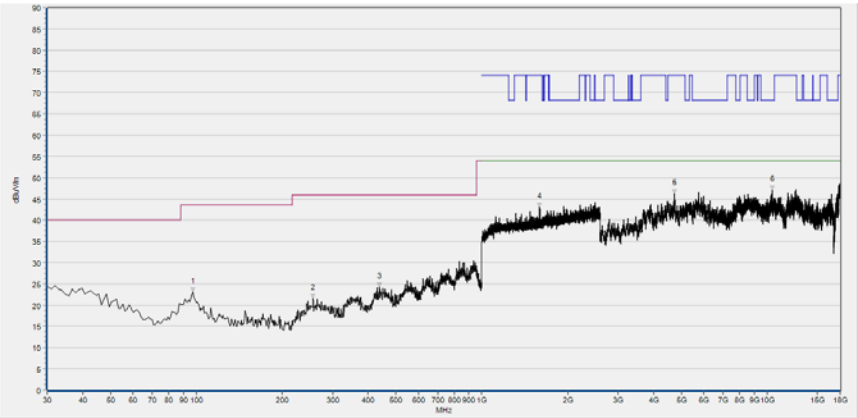
(Antenna Horizontal, 30MHz to 18GHz)



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
99.910	24.18	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
289.249	29.09	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
665.015	27.55	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2048.883	42.94	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
5766.873	46.70	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
12562.713	47.42	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

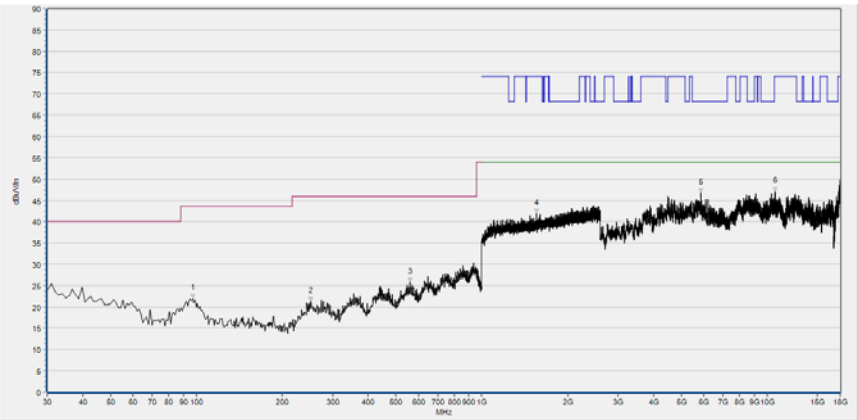
(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 149



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
96.997	23.21	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
256.236	21.54	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
437.808	24.26	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1592.731	43.03	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4725.625	46.18	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10437.087	47.03	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS

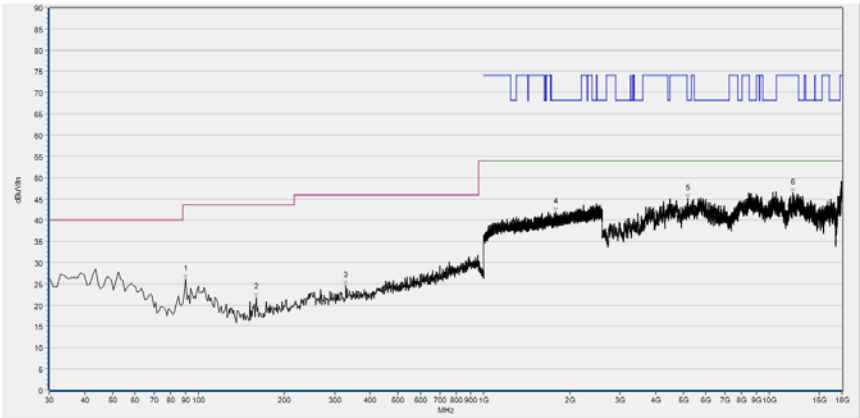
(Antenna Horizontal, 30MHz to 18GHz)



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
96.997	22.01	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
251.381	21.24	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
559.179	25.77	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1555.919	41.98	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5865.453	46.80	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
10680.456	47.05	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

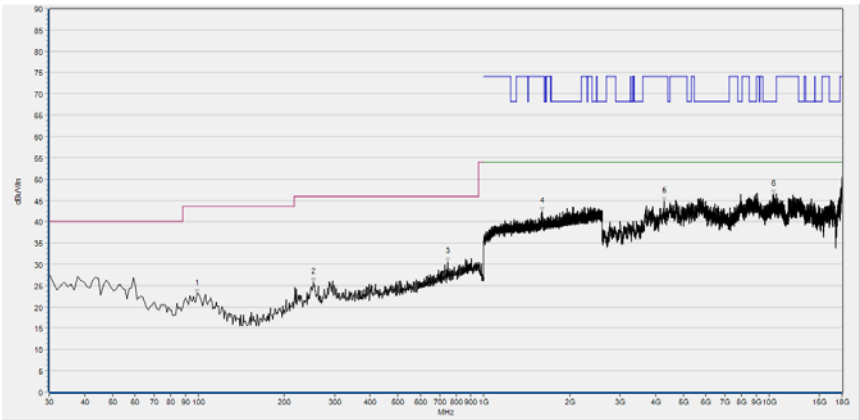
(Antenna Vertical, 30MHz to 18GHz)

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
90.200	26.15	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
159.139	21.73	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
328.088	24.64	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1781.060	41.82	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
5181.556	45.09	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
12079.056	46.43	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

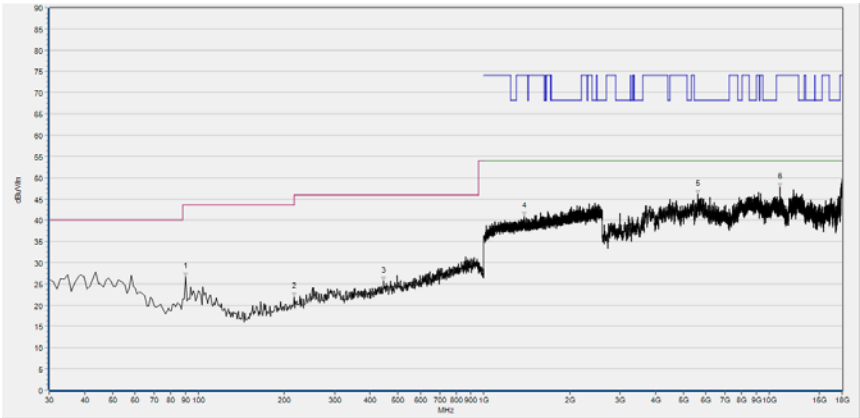
(Antenna Horizontal, 30MHz to 18GHz)



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
98.939	23.17	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
252.352	25.79	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
748.519	30.50	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1598.066	42.38	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4275.855	44.81	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10347.750	46.39	N/A	N/A	68.23	N/A	54.00	Vertical	PASS

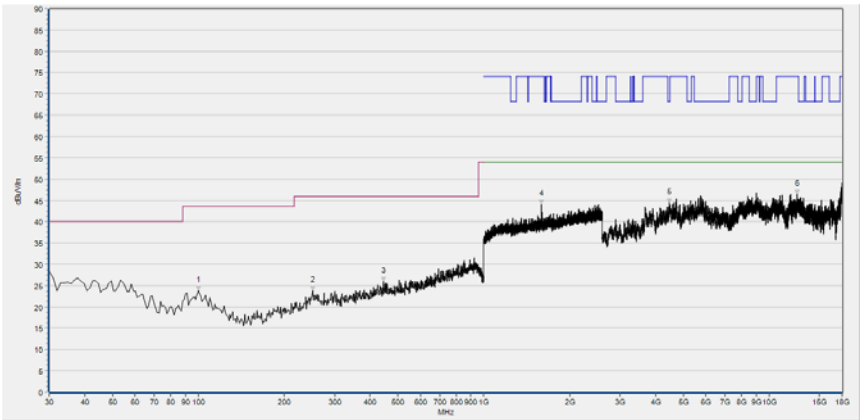
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 165



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
90.200	26.59	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
216.426	21.88	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
445.576	25.69	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1387.329	40.86	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5615.923	46.11	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
10896.099	47.85	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

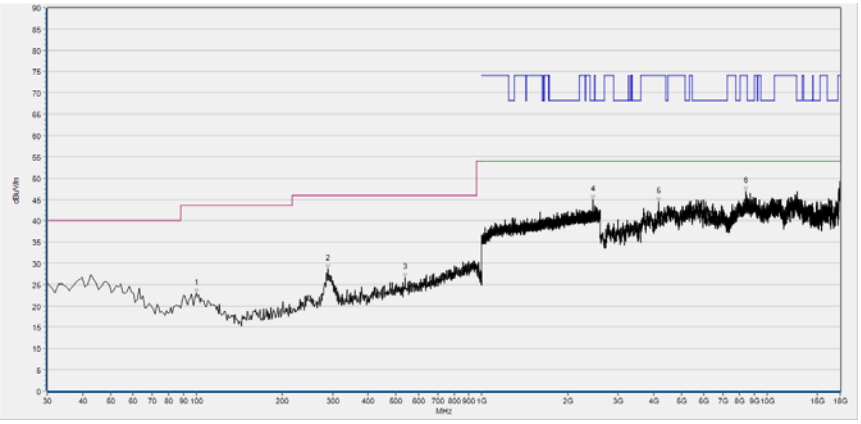


Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
99.910	23.82	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
251.381	23.74	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
444.605	25.96	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1593.264	44.10	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4473.015	44.45	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
12522.665	46.50	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

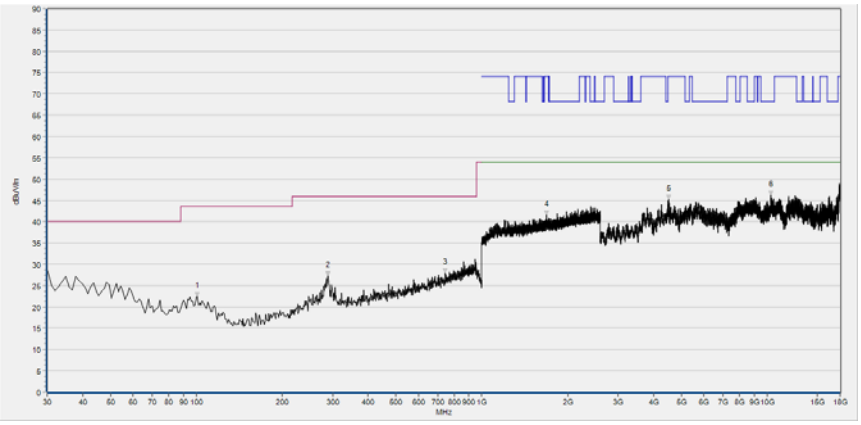
802.11n (HT40) Test mode

Plots for Channel = 38



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
99.910	23.04	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
289.249	28.64	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
539.760	26.60	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2454.351	44.84	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
4158.792	44.36	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8422.364	46.90	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

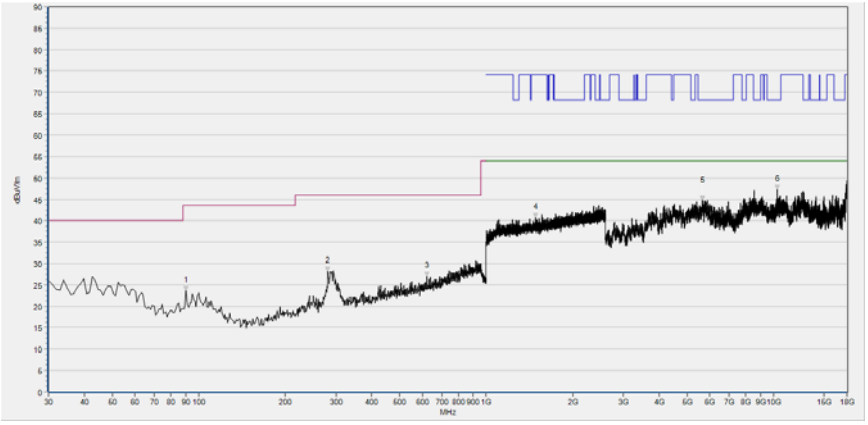
(Antenna Horizontal, 30MHz to 18GHz)



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
100.881	22.40	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
289.249	27.29	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
744.635	28.04	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1682.894	41.58	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4516.143	45.25	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10316.943	46.19	N/A	N/A	68.23	N/A	54.00	Vertical	PASS

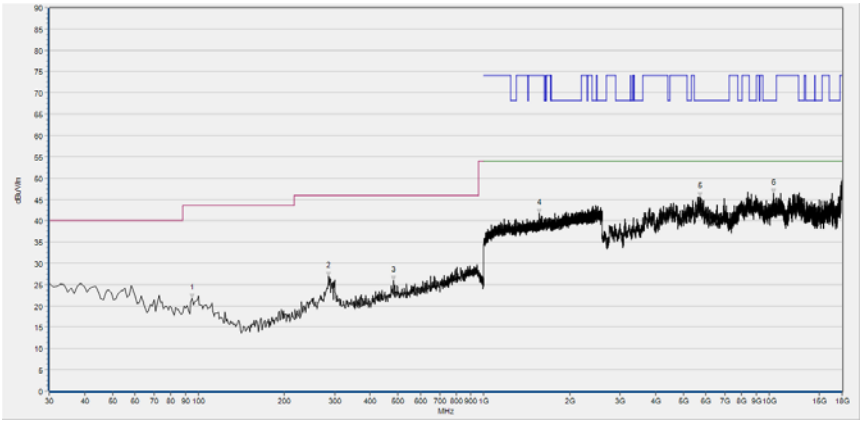
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 46



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
90.200	23.70	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
281.481	28.22	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
621.321	26.91	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1481.761	40.66	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5646.729	44.70	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
10267.654	47.20	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS

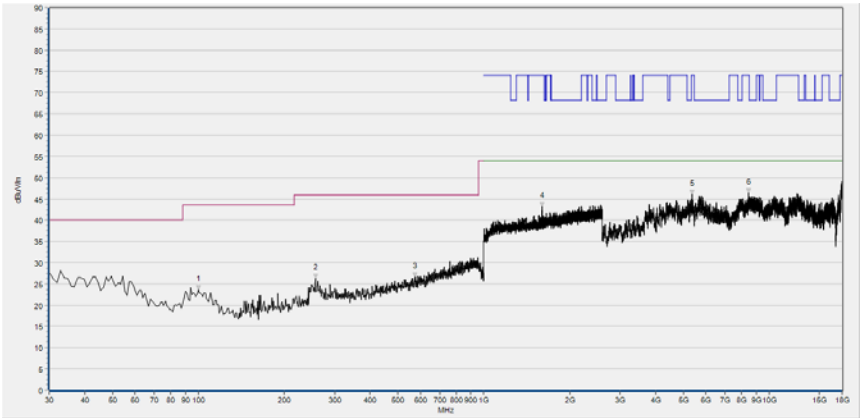
(Antenna Horizontal, 30MHz to 18GHz)



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
95.055	21.76	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
286.336	27.03	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
482.472	25.99	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1565.522	41.65	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5723.745	45.53	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
10360.072	46.45	N/A	N/A	68.23	N/A	54.00	Vertical	PASS

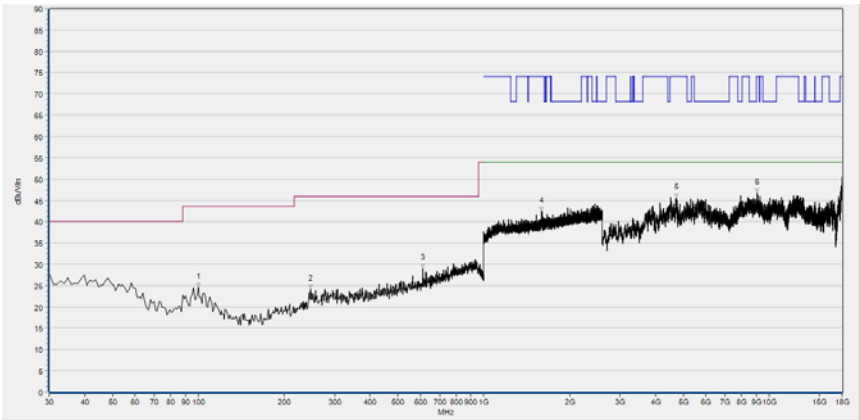
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 151



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
99.910	23.56	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
257.207	26.37	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
573.744	26.58	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1598.066	43.20	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5360.232	46.05	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8462.412	46.50	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

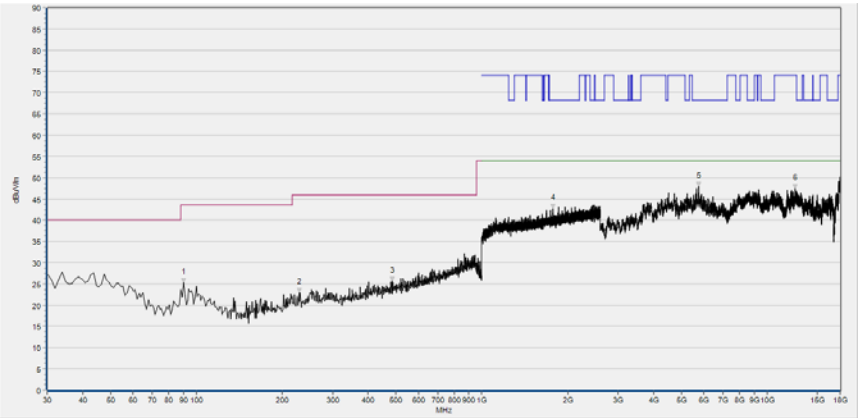
(Antenna Horizontal, 30MHz to 18GHz)



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
99.910	24.63	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
247.497	24.18	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
612.583	28.93	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1594.865	42.47	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4734.867	45.50	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
9056.971	46.73	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

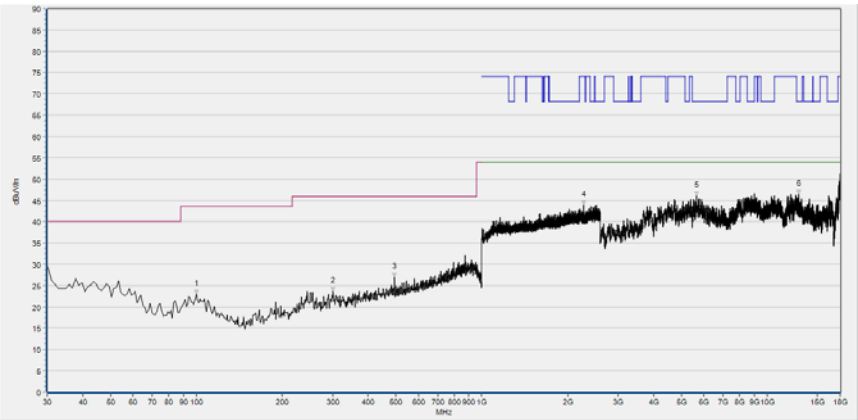
(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 159



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
90.200	25.37	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
229.049	22.98	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
484.414	25.58	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1771.991	42.81	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
5745.309	47.90	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
12531.906	47.36	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

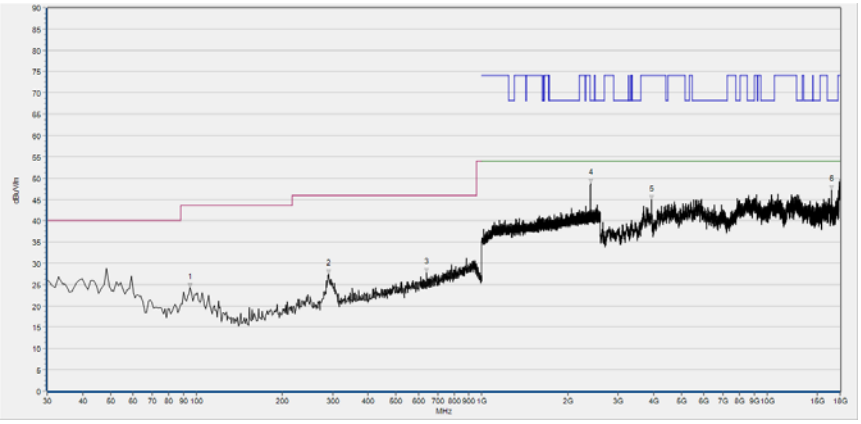


Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
99.910	23.00	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
300.901	23.62	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
495.095	26.91	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2267.623	43.94	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5646.729	46.03	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
12889.258	46.47	N/A	N/A	68.23	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

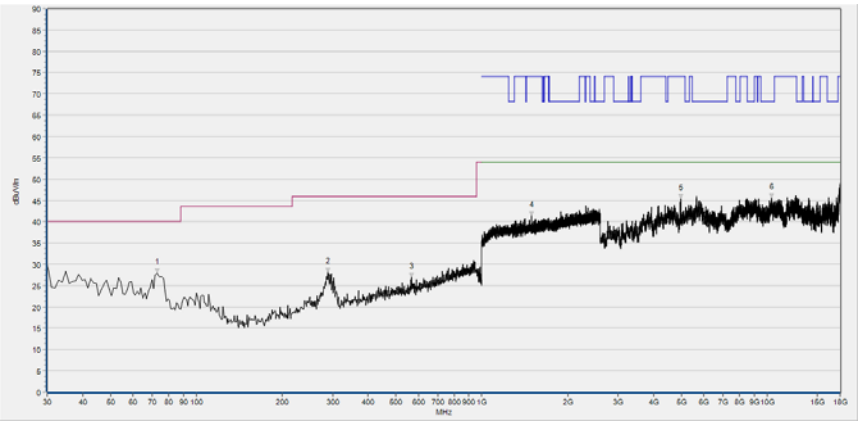
802.11ac (VHT20) Test mode

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
95.055	24.34	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
291.191	27.51	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
641.712	27.77	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2402.067	48.71	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
3924.665	44.86	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
16813.963	47.32	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS

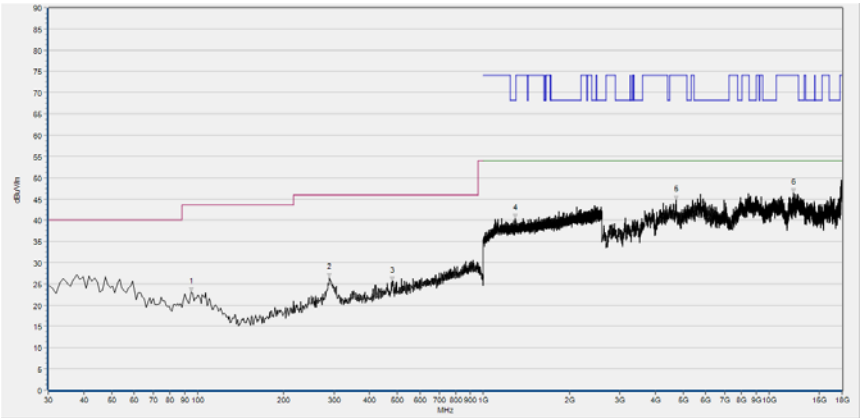
(Antenna Horizontal, 30MHz to 18GHz)



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
72.723	28.00	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
288.278	28.11	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
567.918	26.93	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1490.297	41.45	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4975.155	45.43	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10356.991	45.58	N/A	N/A	68.23	N/A	54.00	Vertical	PASS

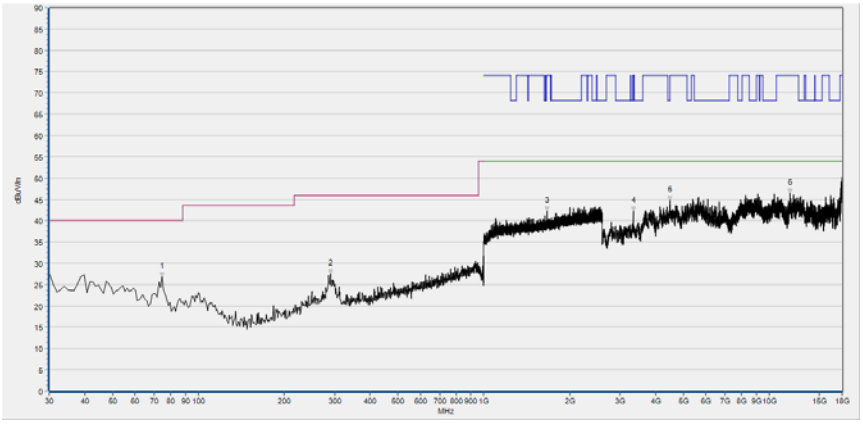
(Antenna Vertical, 30MHz to 18GHz)

Plots 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
95.055	23.08	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
289.249	26.55	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
480.531	25.56	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1294.498	40.43	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
4716.383	44.83	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12146.829	46.50	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

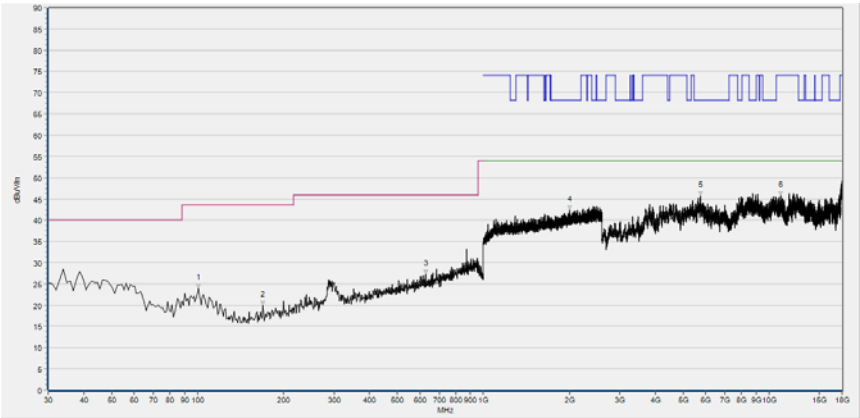
(Antenna Horizontal, 30MHz to 18GHz)



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
74.665	26.88	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
290.220	27.49	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1662.621	42.21	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3336.267	42.32	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4476.095	44.83	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
11851.090	46.42	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

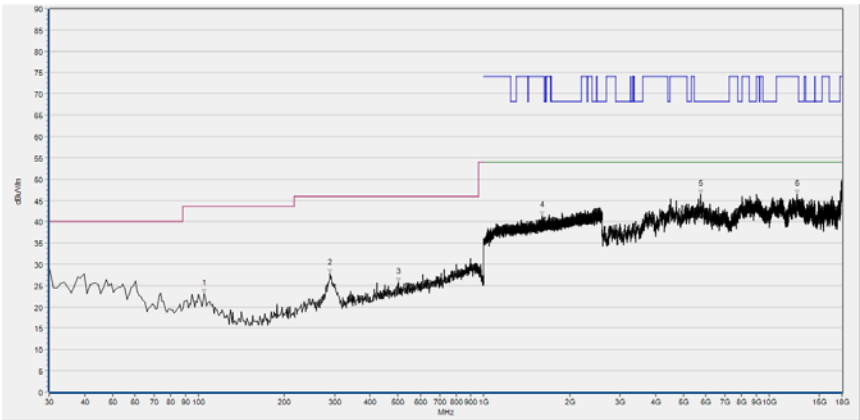
(Antenna Vertical, 30MHz to 18GHz)

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
100.881	24.03	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
168.849	19.94	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
628.118	27.38	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2000.867	42.39	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
5757.632	45.69	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
10994.679	45.70	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

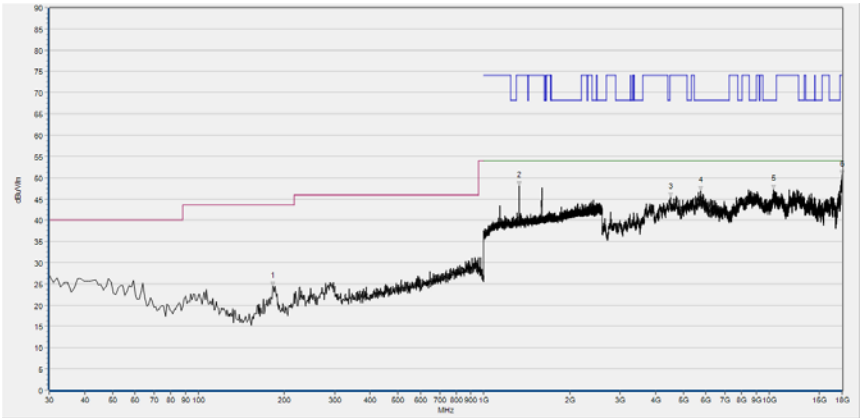
(Antenna Horizontal, 30MHz to 18GHz)



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
104.765	23.20	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
289.249	27.75	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
502.863	25.76	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1598.066	41.32	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5742.228	46.42	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
12525.745	46.35	N/A	N/A	68.23	N/A	54.00	Vertical	PASS

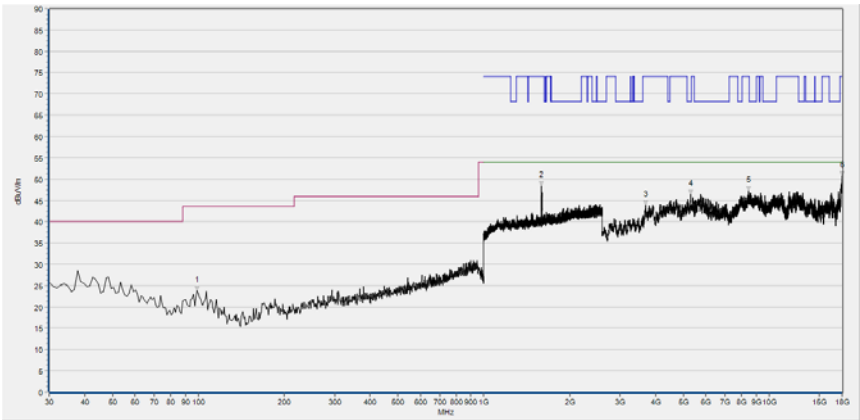
(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 149



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	24.51	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1330.243	48.15	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4506.901	45.39	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5763.793	46.87	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
10360.072	47.31	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
17993.839	50.61	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

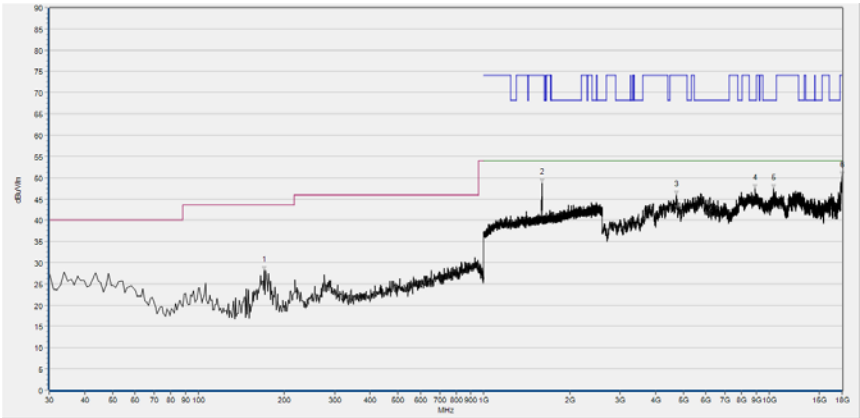
(Antenna Horizontal, 30MHz to 18GHz)



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
98.939	23.80	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1590.063	48.41	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3690.538	43.86	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5295.539	46.41	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
8437.768	47.29	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
17981.516	50.80	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

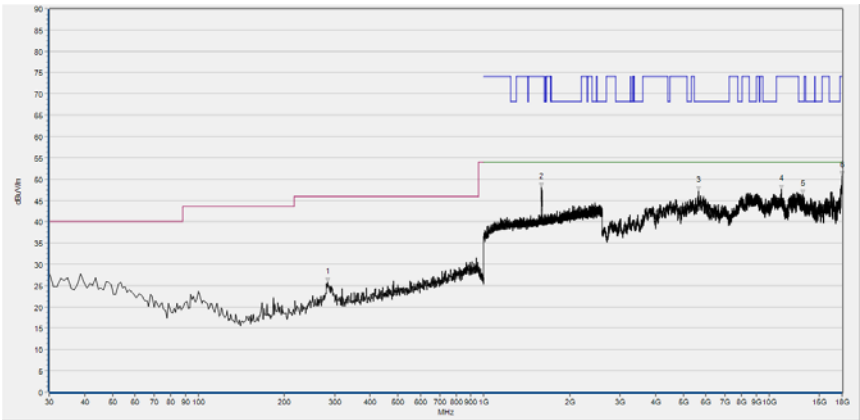
(Antenna Vertical, 30MHz to 18GHz)

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
169.820	28.10	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1596.465	48.79	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4719.464	45.98	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8933.747	47.36	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
10360.072	47.40	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
17972.274	50.47	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

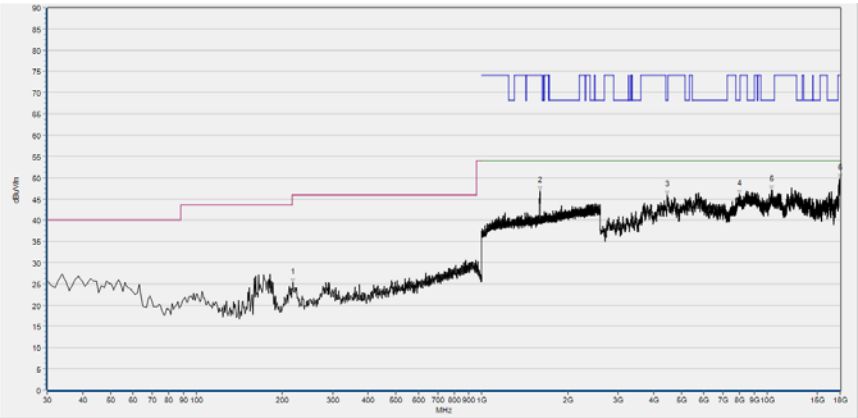
(Antenna Horizontal, 30MHz to 18GHz)



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
283.423	25.80	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1592.731	48.14	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5652.891	47.27	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
11016.243	47.67	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
13086.417	46.41	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
17978.436	50.72	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

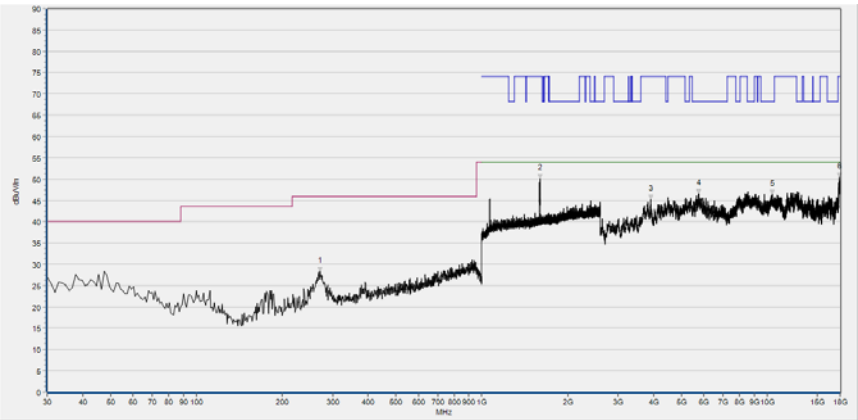
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 165



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
218.368	25.23	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1596.465	46.92	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4460.692	45.87	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
7975.675	46.01	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
10360.072	47.16	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
17969.194	49.79	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

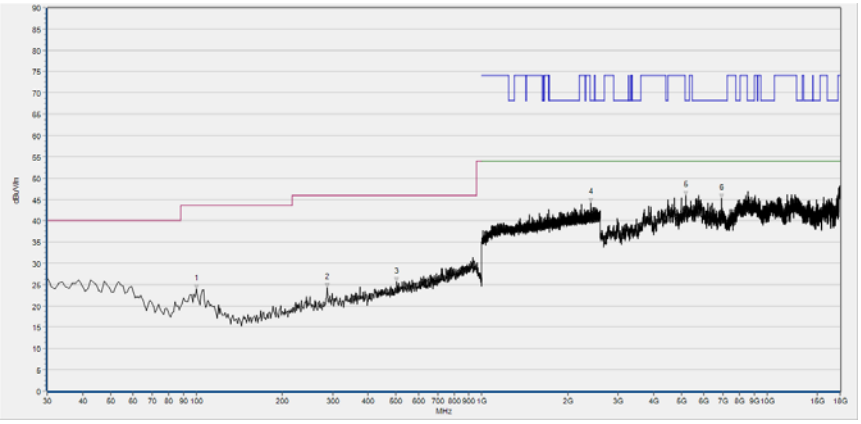


Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
271.772	28.31	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1596.999	50.03	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3900.020	45.30	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5751.470	46.52	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
10397.039	46.44	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
17941.468	50.42	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

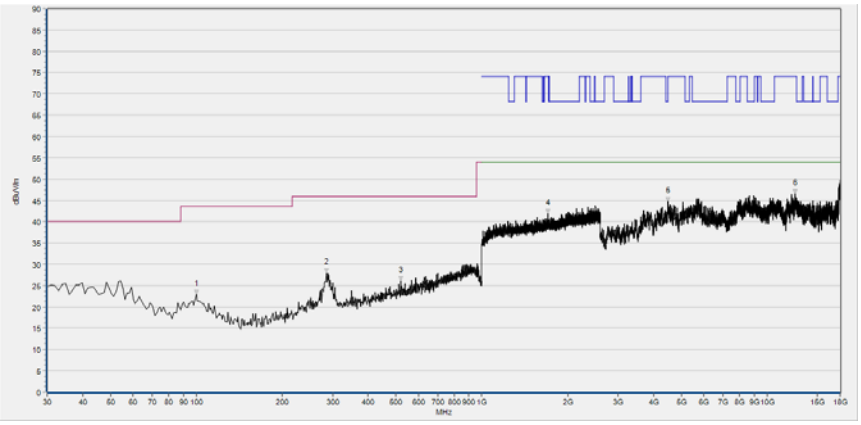
802.11ac (VHT40) Test mode

Plots for Channel = 38



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
99.910	23.95	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
287.307	24.32	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
502.863	25.58	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2412.738	44.28	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
5181.556	45.88	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
6919.024	45.28	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS

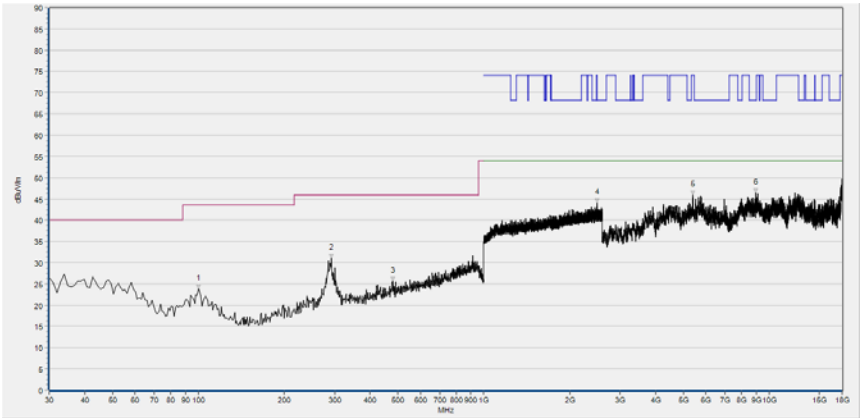
(Antenna Horizontal, 30MHz to 18GHz)



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
99.910	23.00	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
286.336	27.93	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
520.340	26.09	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1706.369	41.86	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4479.176	44.67	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
12534.987	46.53	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

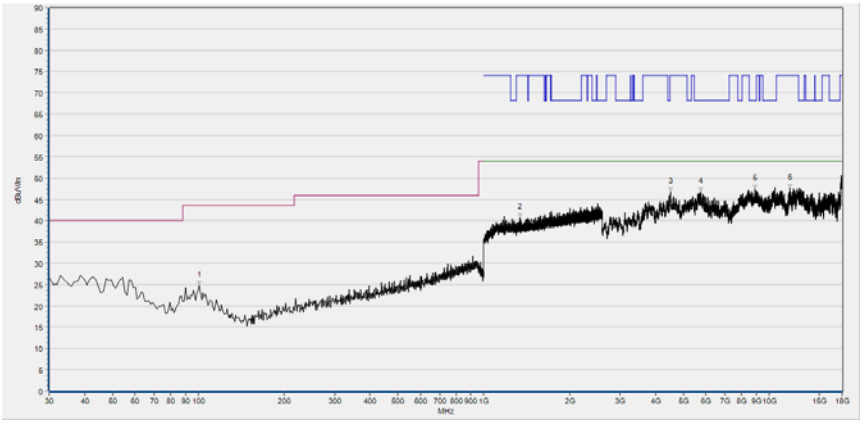
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 46



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
99.910	23.81	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
292.162	30.97	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
480.531	25.58	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2493.298	44.13	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5403.361	45.93	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8986.117	46.36	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS

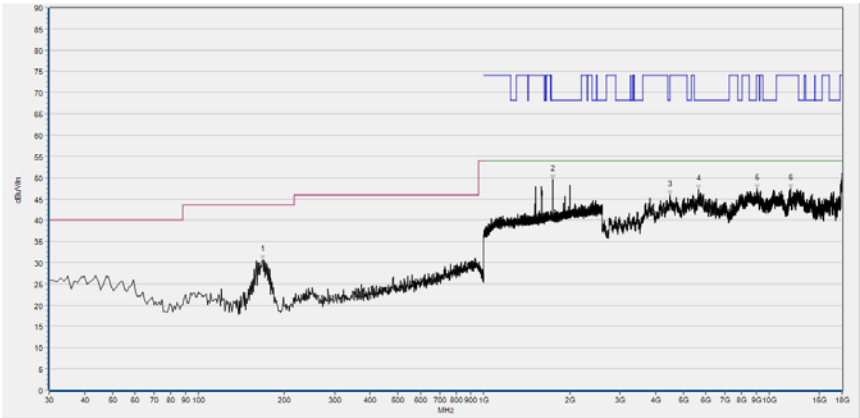
(Antenna Horizontal, 30MHz to 18GHz)



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
100.881	24.78	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1337.179	40.67	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4503.821	46.70	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5760.712	46.84	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
8918.344	47.50	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
11848.010	47.68	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

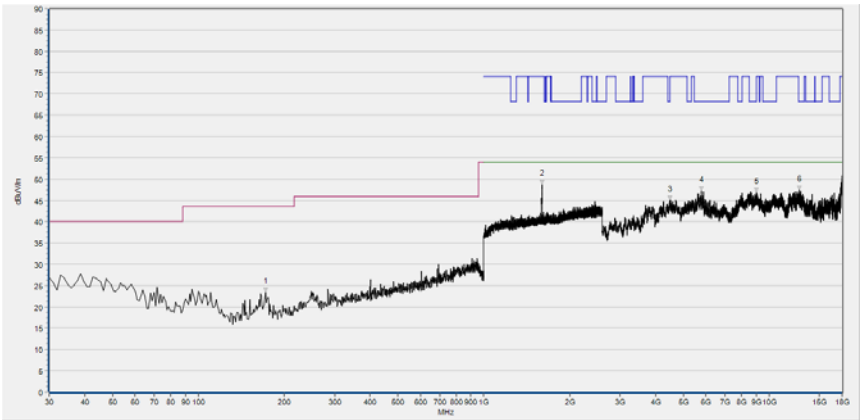
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 151



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
167.878	30.63	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1745.849	49.67	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
4497.660	45.85	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
5640.568	47.24	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
9053.891	47.44	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
11869.574	47.35	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

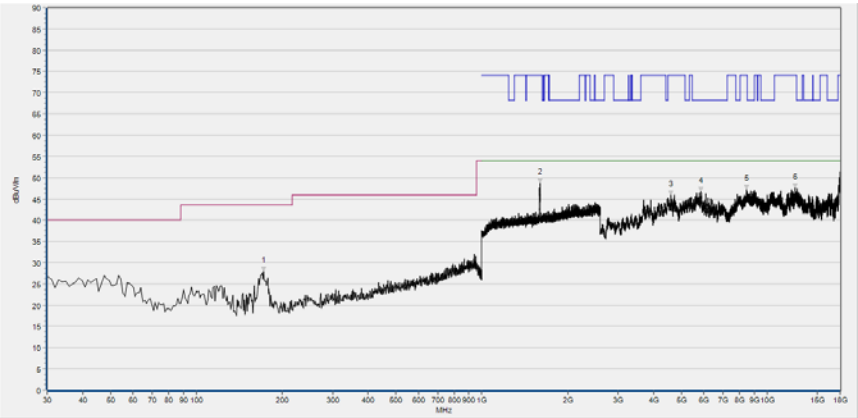
(Antenna Horizontal, 30MHz to 18GHz)



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
171.762	23.43	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1596.999	48.82	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4482.256	45.06	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
5776.115	47.26	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
9038.488	46.96	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12735.227	47.43	N/A	N/A	68.23	N/A	54.00	Vertical	PASS

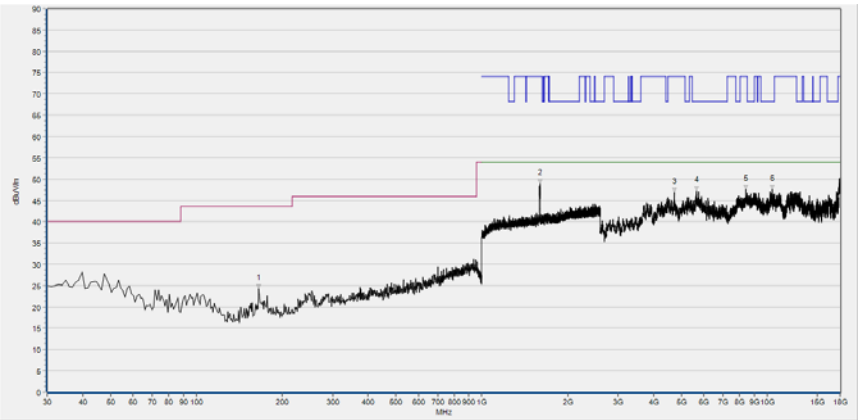
(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 159



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
171.762	27.98	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1599.667	48.75	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4605.481	45.97	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5865.453	46.79	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
8450.090	47.24	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12510.342	47.52	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

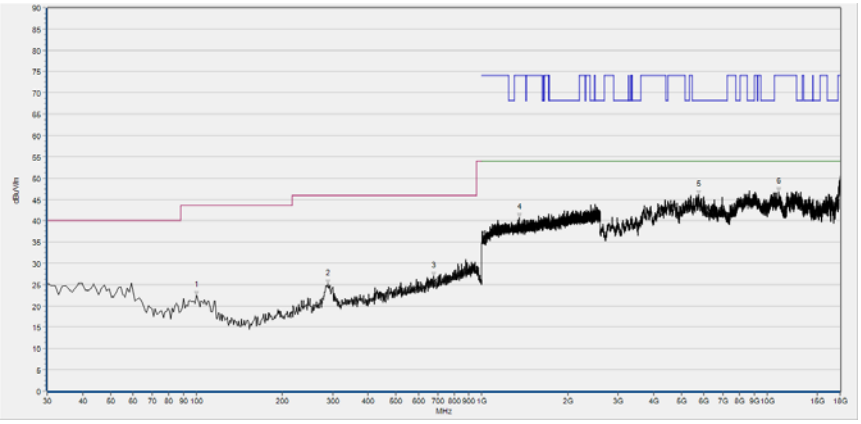


Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
164.965	24.35	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1598.600	48.96	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4716.383	46.87	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5637.487	47.33	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
8428.526	47.58	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10424.765	47.63	N/A	N/A	68.23	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

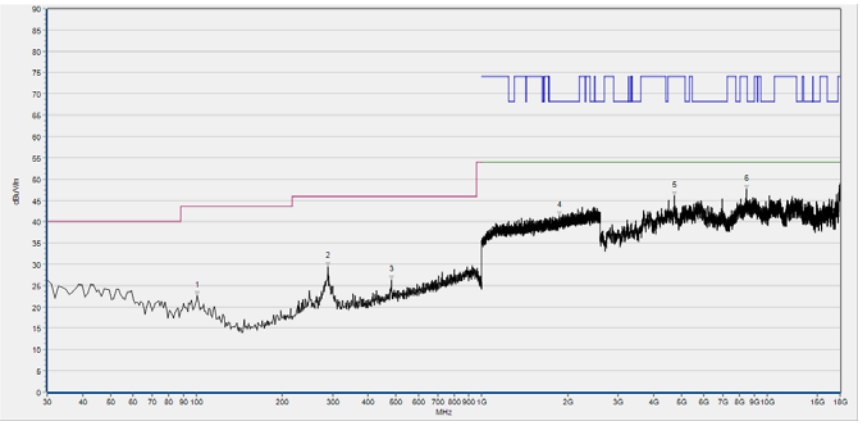
802.11ac (VHT80) Test mode

Plot for Channel = 42



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
99.910	22.47	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
288.278	25.10	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
679.580	27.03	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1353.718	40.69	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5760.712	46.14	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
10979.276	46.71	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

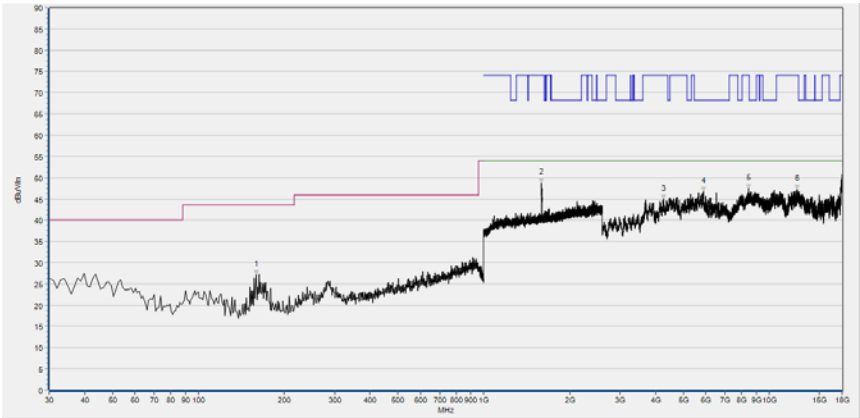
(Antenna Horizontal, 30MHz to 18GHz)



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
100.881	22.66	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
289.249	29.51	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
482.472	26.31	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1865.889	41.34	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
4719.464	46.04	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8437.768	47.59	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

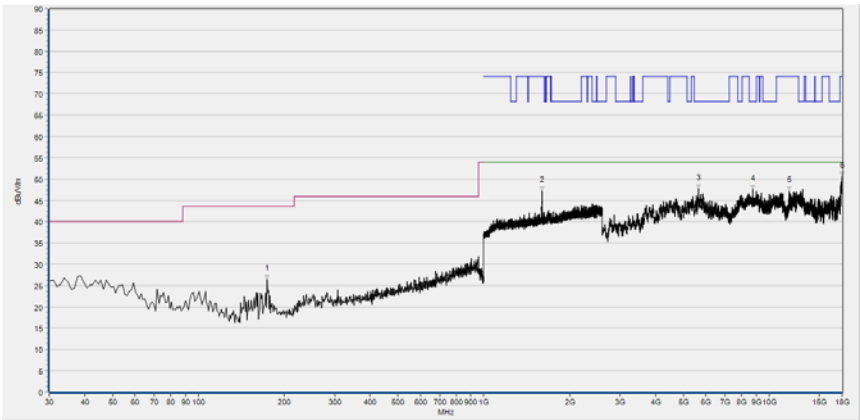
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 155



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
159.139	27.21	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1593.798	48.74	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4269.694	44.87	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5871.614	46.69	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
8459.332	47.46	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12488.778	47.28	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)



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
173.704	26.40	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1599.667	47.26	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5637.487	47.75	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
8773.555	47.55	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
11740.188	47.26	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
17953.791	50.69	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

Annex A Test Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for test performed on the EUT as specified in CISPR 16-1-2:

Test items	Uncertainty
Peak Output Power	±2.22dB
Power spectral density (PSD)	±2.22dB
Bandwidth	±5%
Restricted Frequency Bands	±5%
Radiated Emission	±2.95dB
Conducted Emission	±2.44dB

This uncertainty represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2

Annex B Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
Laboratory Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

3. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL.3, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10-2013and CISPR Publication 22; the FCC designation number is CN1192, the test firm registration number is 226174.

4. Test Equipments Utilized

4.1 Conducted Test Equipments

Equipment	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
Attenuator 1	(N/A)	10dB	Resnet	N/A	N/A
EXA Signal Analzyer	MY53470836	N9010A	Agilent	2020.04.01	2021.03.31
USB Wideband Power Sensor	MY54210011	U2021XA	Agilent	2020.04.01	2021.03.31
RF cable (30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
Coaxial cable	CB02	RF02	Morlab	N/A	N/A
SMA connector	CN01	RF03	HUBER-SUHNER	N/A	N/A
Temperature Chamber	12108015	DTL-003S101	YOMA	2020.01.08	2021.01.07
Computer	T430i	Think Pad	Lenovo	N/A	N/A

4.2 Conducted Emission Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
Receiver	MY56400093	N9038A	KEYSIGHT	2020.03.26	2021.03.25
LISN	812744	NSLK 8127	Schwarzbeck	2020.03.26	2021.03.25
Pulse Limiter (20dB)	9391	VTSD 9561-D	Schwarzbeck	2019.05.08	2020.05.09
Coaxial cable(BNC)	CB01	EMC01	Morlab	N/A	N/A
Adaptor$_{Note}$	N/A	NBS65A12 0500M2	N/A	N/A	N/A
Note: The equipment is provided by applicant.					

4.3 List of Software Used

Description	Manufacturer	Software Version
Test system	Tonscend	V2.6
Power Panel	Agilent	V3.8
MORLAB EMCR V1.2	MORLAB	V1.0

4.4 Radiated Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal.Due
Receiver	MY54130016	N9038A	Agilent	2019.07.29	2020.07.28
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2019.05.24	2022.05.23
Test Antenna - Horn	9170C-531	BBHA9170	Schwarzbeck	2019.05.24	2022.05.23
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2019.02.14	2022.02.13
Test Antenna - Horn	01774	BBHA 9120D	Schwarzbeck	2019.05.24	2022.05.23
Coaxial cable (N male) (9KHz-30MHz)	CB04	EMC04	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-26GHz)	CB02	EMC02	Morlab	N/A	N/A
Coaxial cable(N male) (30MHz-26GHz)	CB03	EMC03	Morlab	N/A	N/A
Coaxial cable(N male) (30MHz-40GHz)	CB05	EMC05	Morlab	N/A	N/A
1-18GHz pre-Amplifier	MA02	TS-PR18	Rohde& Schwarz	2019.05.08	2020.05.09
18-26.5GHz pre-Amplifier	MA03	TS-PR18	Rohde& Schwarz	2019.05.08	2020.05.09
26GHz -40GHz pre-Amplifier	MA05	BBV9721	Rohde& Schwarz	2019.05.08	2020.05.09
Notch Filter	N/A	WRCG-5150-5350	Wainwright	2019.12.01	2020.11.30
Notch Filter	N/A	WRCG-5470-5725	Wainwright	2019.12.01	2020.11.30
Notch Filter	N/A	WRCG-5725-5850	Wainwright	2019.12.01	2020.11.30

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal.Due
Anechoic Chamber	N/A	9m*6m*6m	CRT	2020.01.06	2023.01.05

END OF REPORT