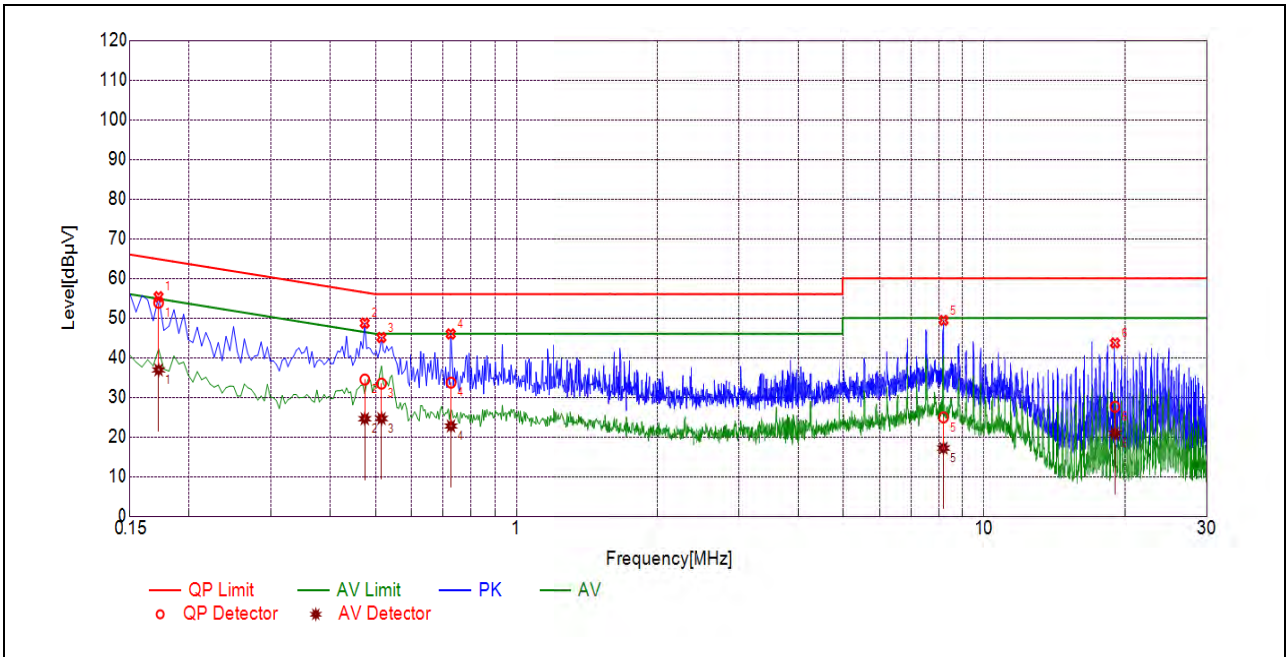
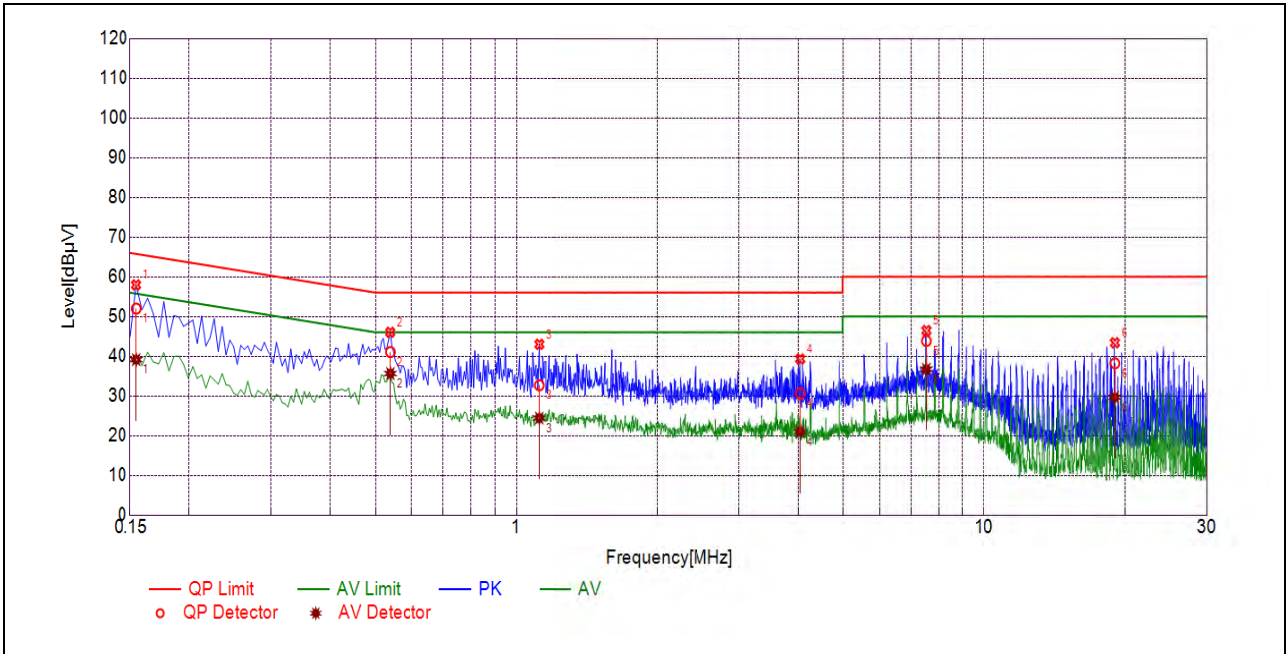


B. Test Plots:



(L Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1725	53.84	36.91	64.84	54.84	Line	PASS
2	0.4741	34.49	24.59	56.44	46.44		PASS
3	0.5145	33.47	24.64	56.00	46.00		PASS
4	0.7267	33.70	22.76	56.00	46.00		PASS
5	8.1890	24.92	17.21	60.00	50.00		PASS
6	19.0008	27.62	20.92	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	0.1546	51.99	39.12	65.75	55.75	Neutral	PASS
2	0.5374	41.05	35.63	56.00	46.00		PASS
3	1.1168	32.68	24.41	56.00	46.00		PASS
4	4.0404	30.63	21.00	56.00	46.00		PASS
5	7.5311	43.84	36.70	60.00	50.00		PASS
6	18.9921	38.20	29.66	60.00	50.00		PASS

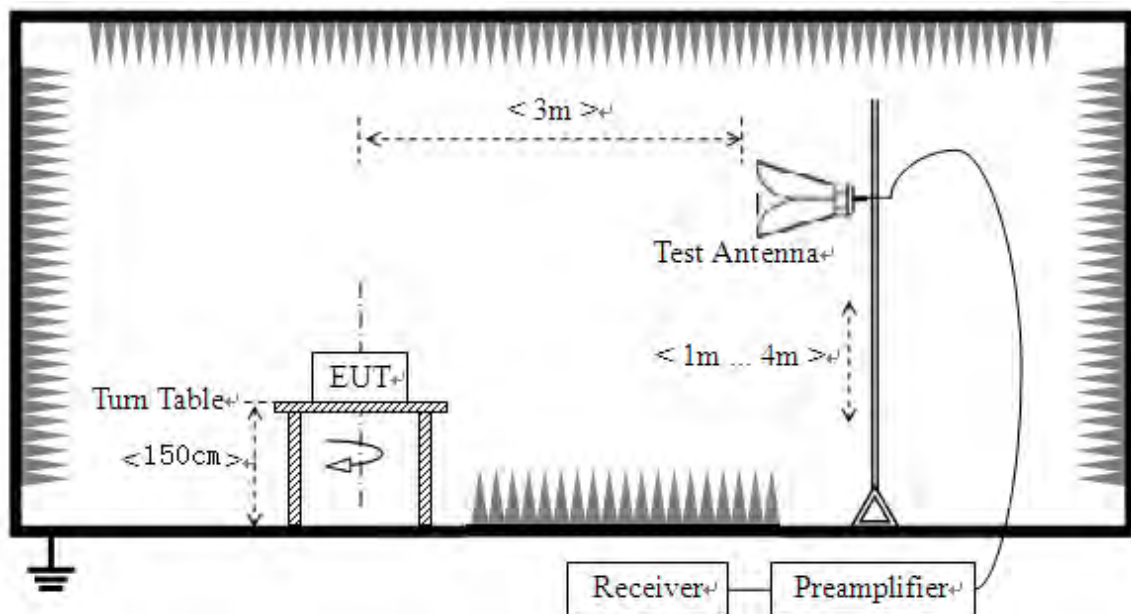
2.8. Restricted Frequency Bands

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 prove compliance

For the Test Antenna:

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



2.8.3. Test Result

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

The measurement results are obtained as below:

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

A_T : Total correction Factor except Antenna; U_R : Receiver Reading

G_{preamp} : 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.

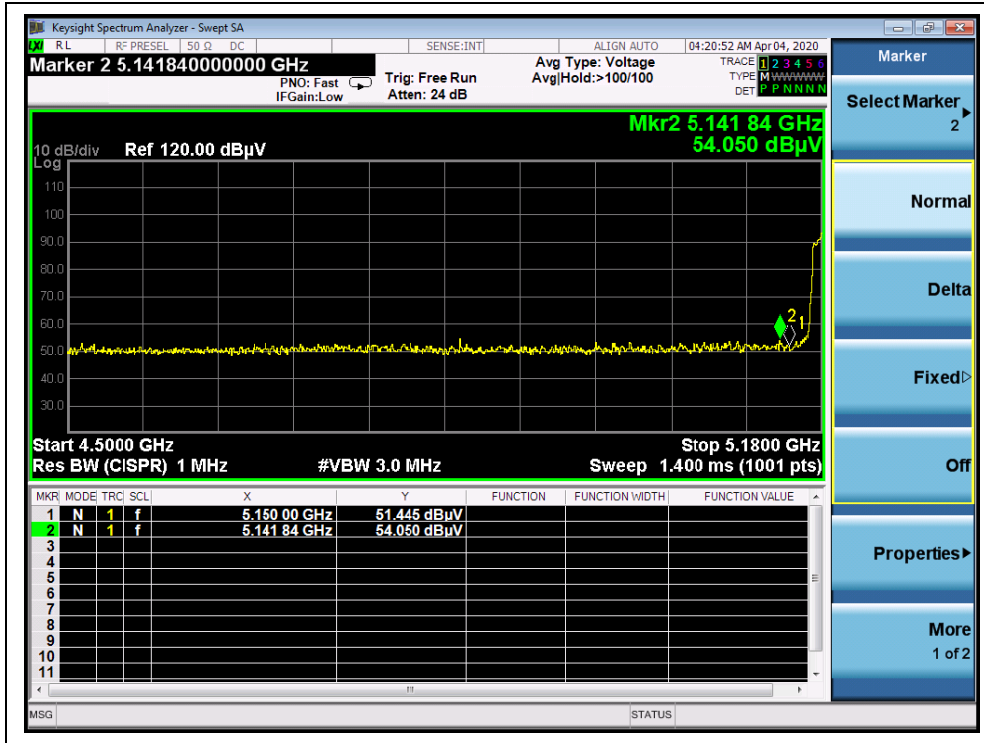
802.11a Test mode

A. Test Verdict:

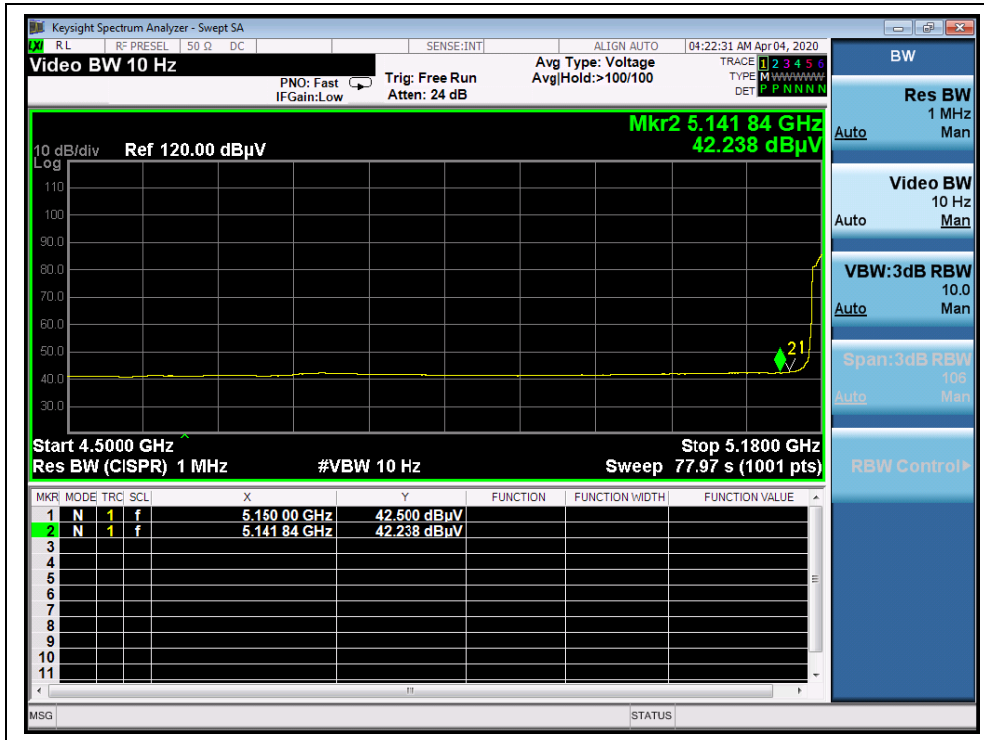
Channel	Frequency (MHz)	Detector	Receiver Reading	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dB μ V/m)	Limit (dB μ V/m)	Verdict
		PK/ AV	U_R (dB μ V)					
36	5141.84	PK	54.05	-26.92	32.20	59.33	74	PASS
36	5150.00	AV	42.50	-26.92	32.20	47.78	54	PASS
64	5351.26	PK	50.92	-26.80	32.20	56.32	74	PASS
64	5350.00	AV	40.27	-26.80	32.20	45.67	54	PASS
100	5445.80	PK	51.98	-26.64	32.20	57.54	74	PASS
100	5470.00	AV	40.92	-26.64	32.20	46.48	54	PASS
144	5755.90	PK	52.44	-26.64	32.20	58.00	68.23	PASS
144	5726.80	AV	41.53	-26.64	32.20	47.09	54	PASS



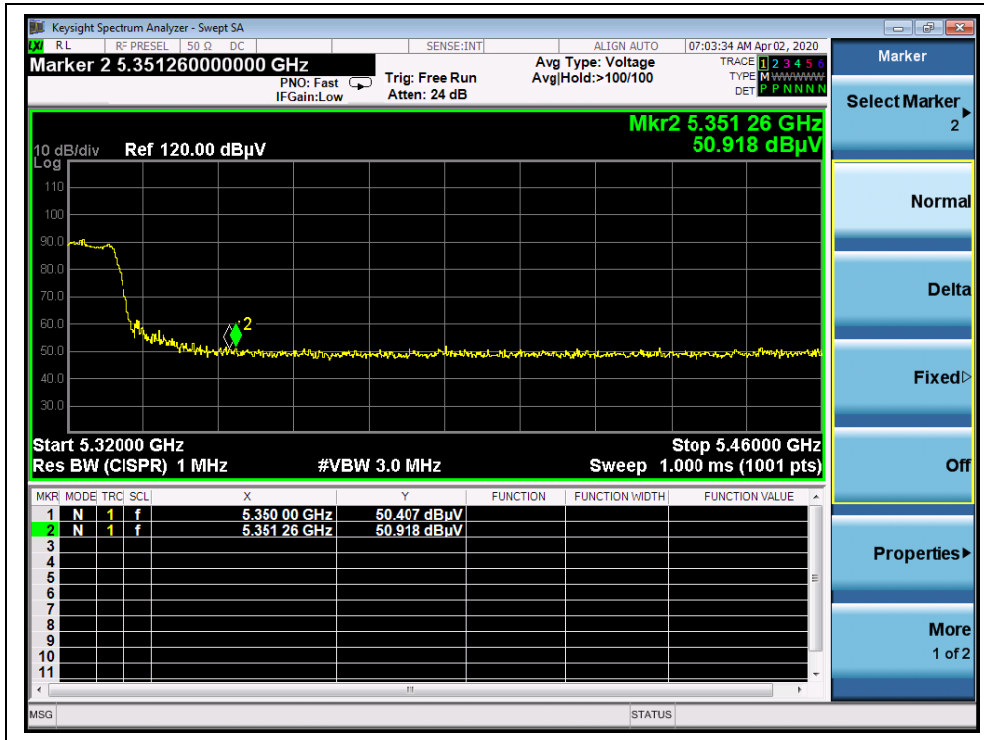
B. Test Plots:



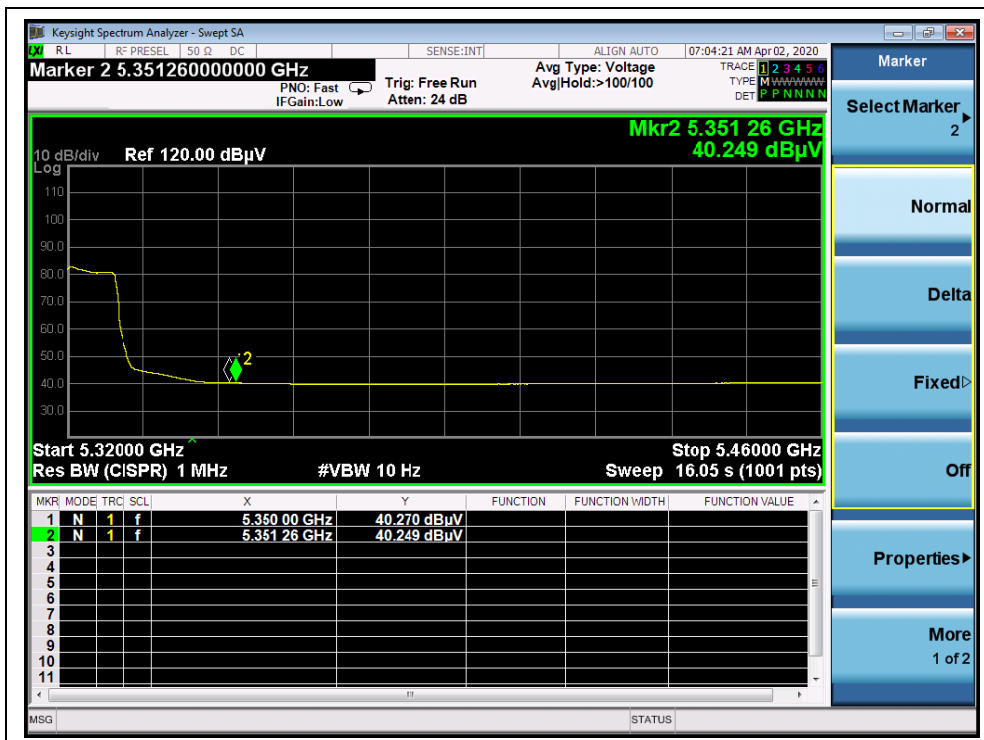
(Channel 36, PEAK,802.11a)



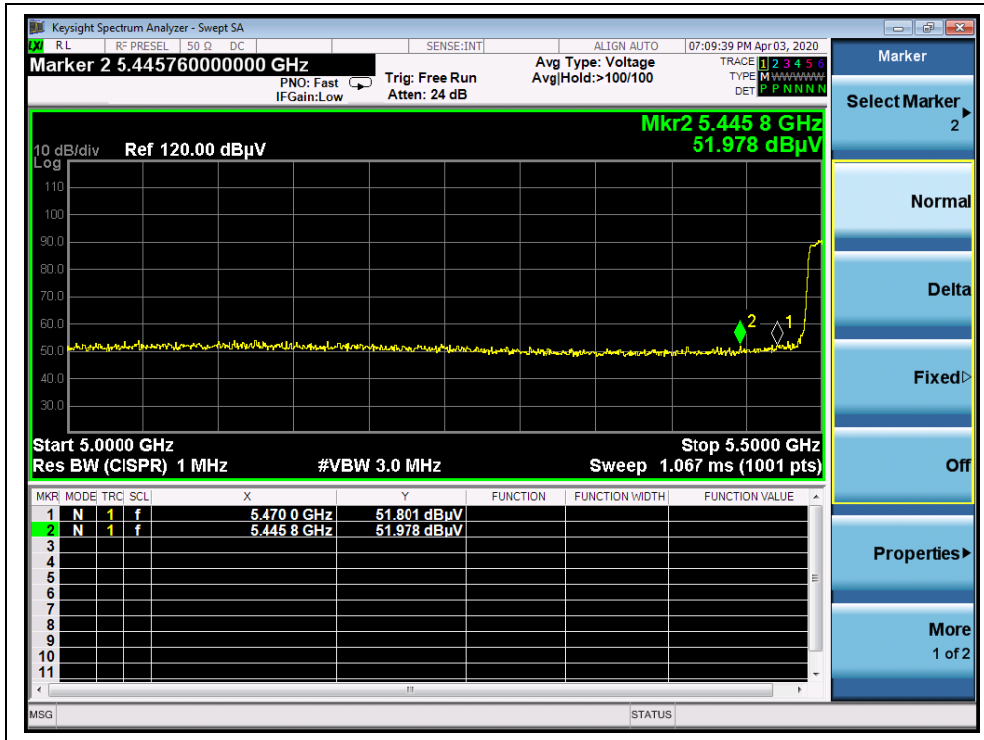
(Channel 36, AVG,802.11a)



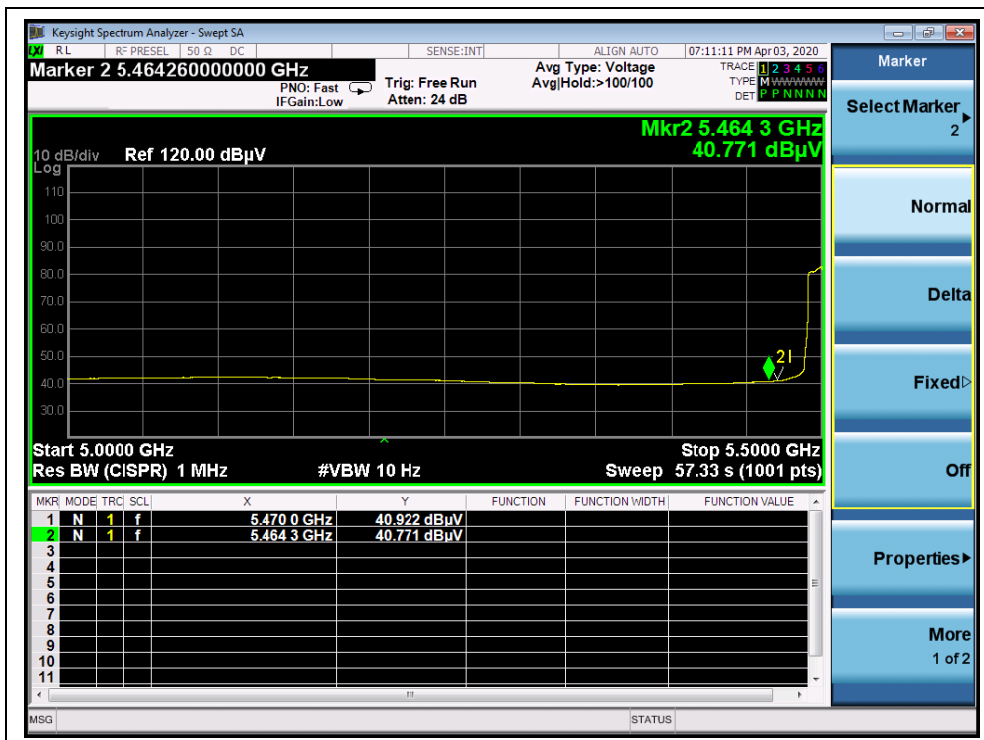
(Channel64, PEAK, 802.11a)



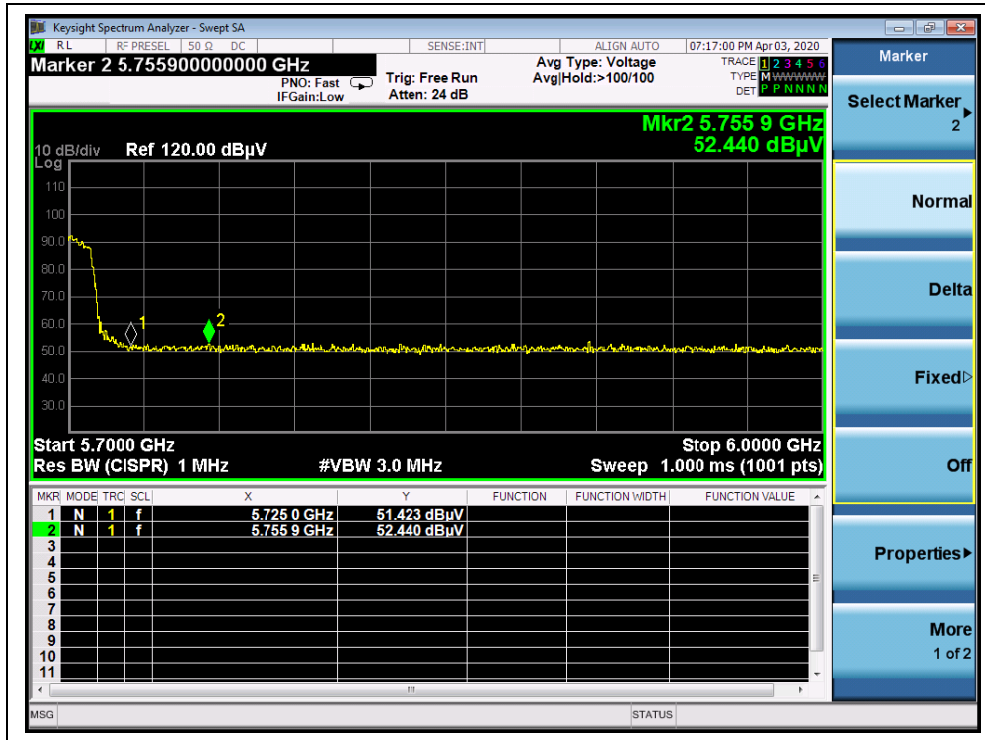
(Channel 64, AVG, 802.11a)



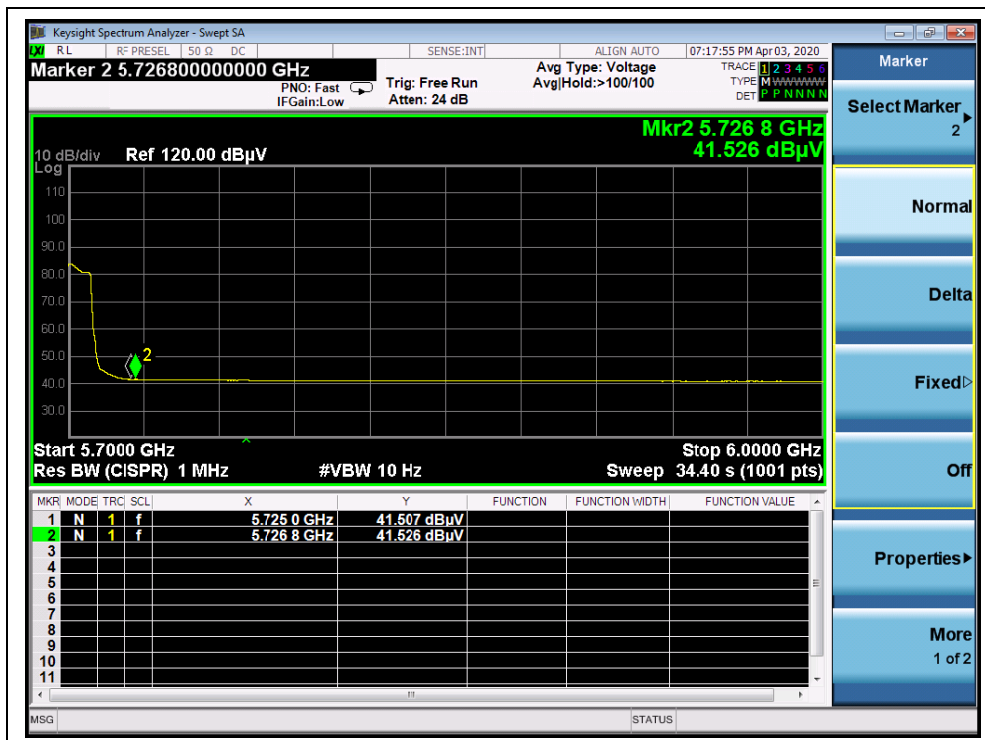
(Channel100, PEAK, 802.11a)



(Channel 100, AVG,802.11a)



(Channel144, PEAK, 802.11a)



(Channel 144, AVG,802.11a)

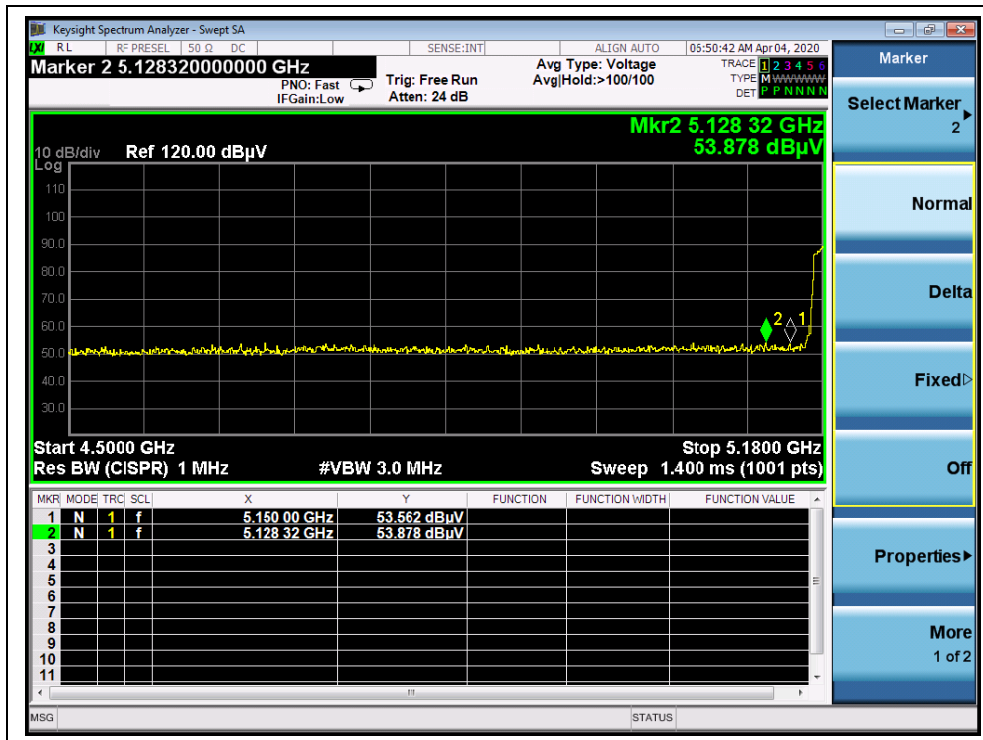


802.11n (HT20) Test mode

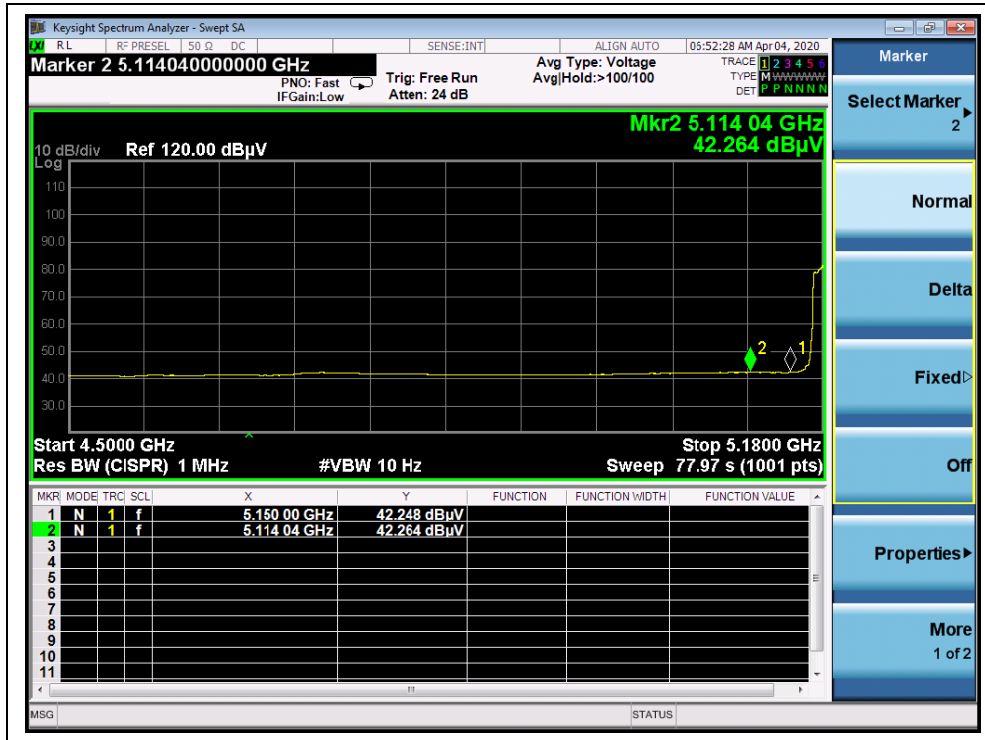
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading	A_T	A_{Factor}	Max. Emission	Limit	Verdict
		PK/ AV	U_R (dBuV)	(dB)	(dB@3m)	E (dBμV/m)	(dBμV/m)	
36	5128.32	PK	53.88	-26.92	32.20	59.16	74	PASS
36	5114.04	AV	42.26	-26.92	32.20	47.54	54	PASS
64	5352.94	PK	55.55	-26.80	32.20	60.95	74	PASS
64	5350.00	AV	42.52	-26.80	32.20	47.92	54	PASS
100	5467.50	PK	56.13	-26.64	32.20	61.69	68.23	PASS
100	5470.00	AV	42.39	-26.64	32.20	47.95	54	PASS
144	5726.80	PK	55.94	-26.64	32.20	61.50	68.23	PASS
144	5725.00	AV	42.52	-26.64	32.20	48.08	54	PASS

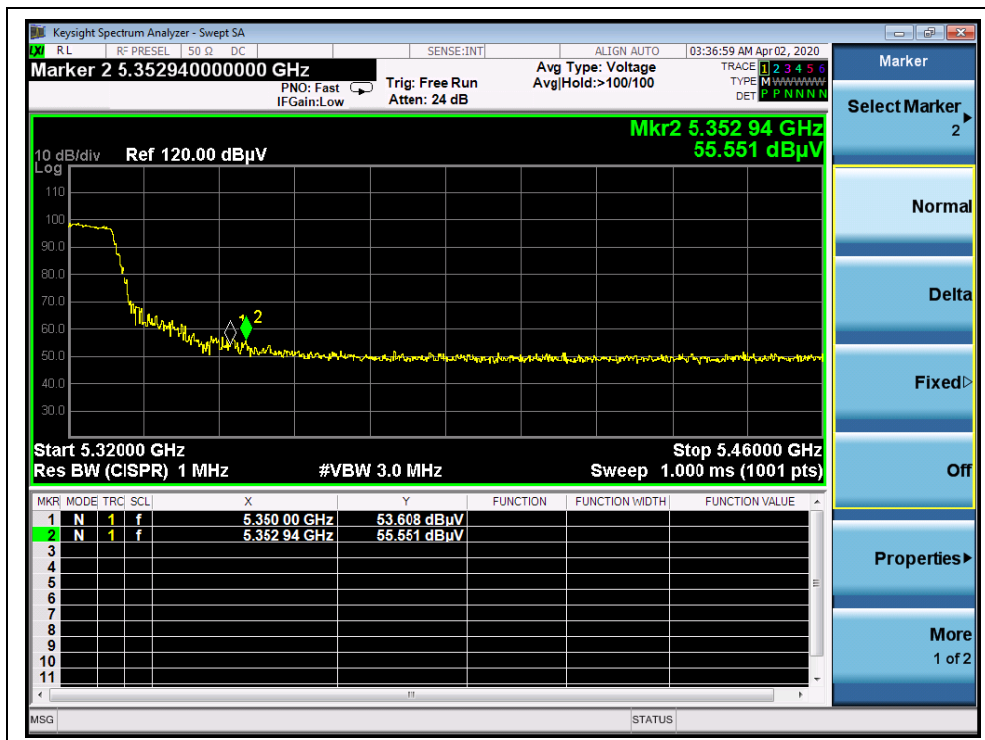
B. Test Plots:



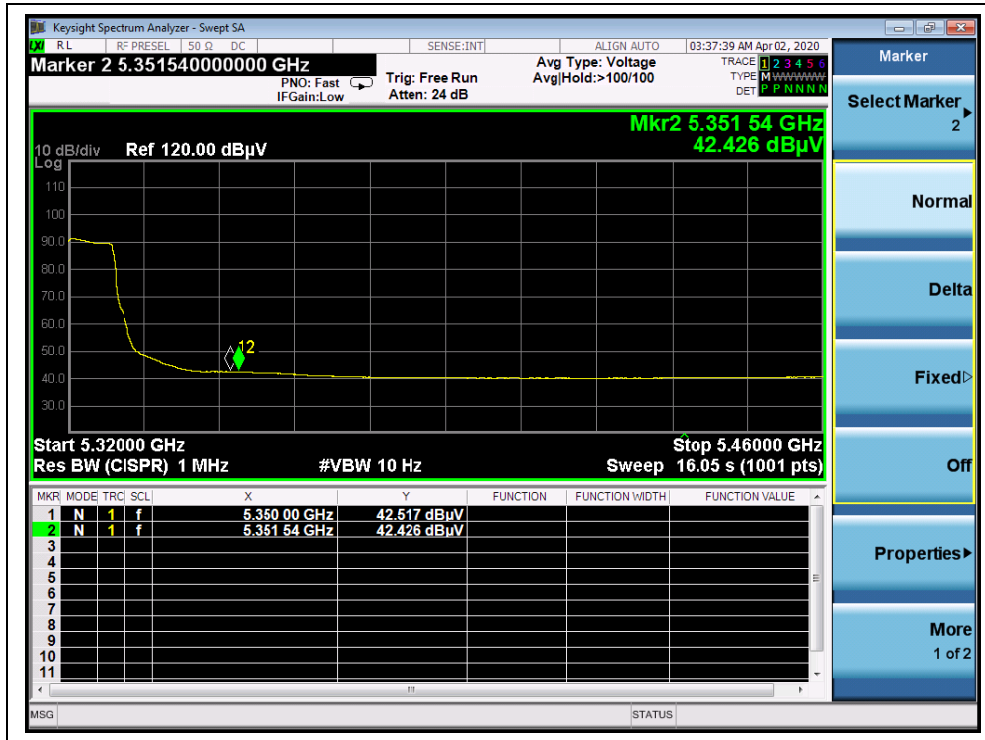
(Channel 36, PEAK,802.11n (HT20))



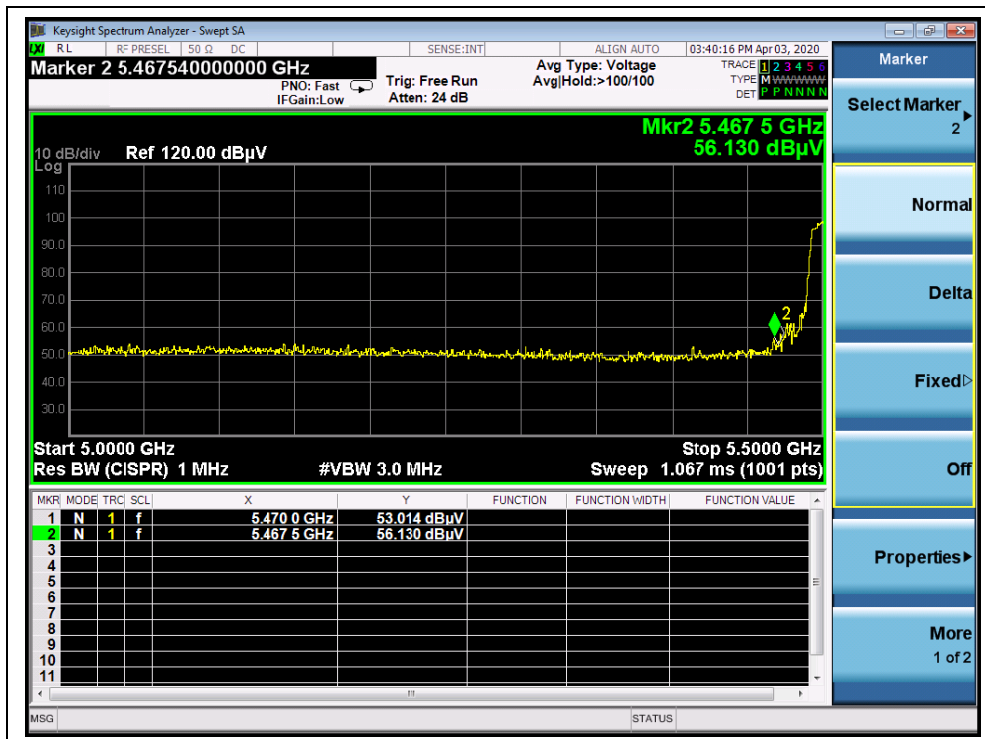
(Channel 36, AVG,802.11n (HT20))



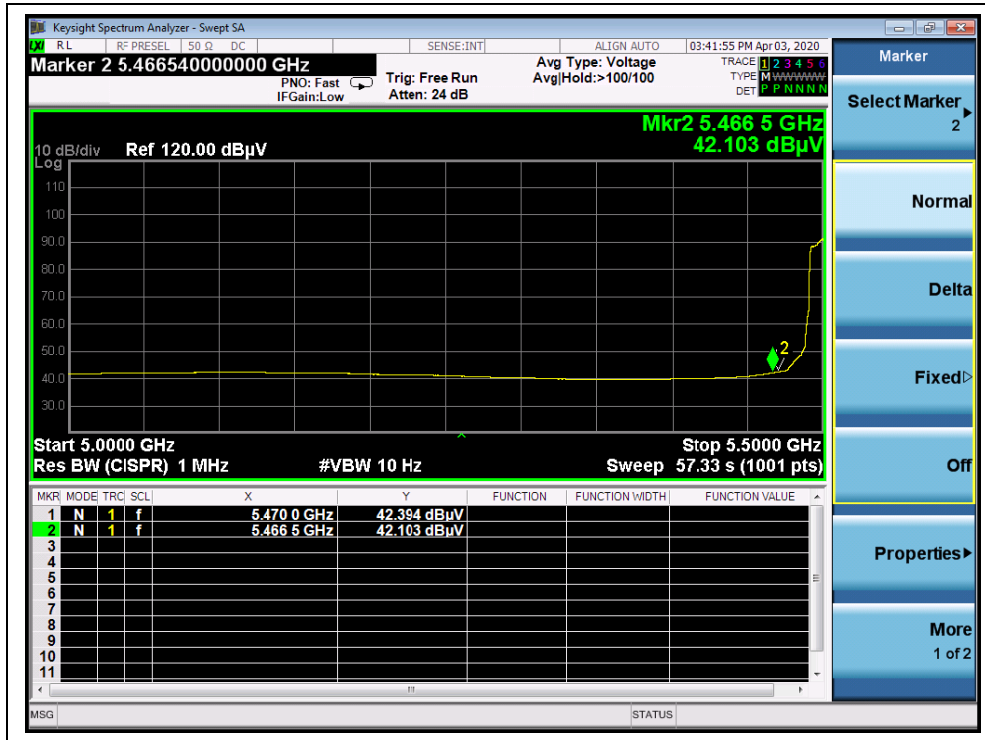
(Channel 64, PEAK,802.11n (HT20))



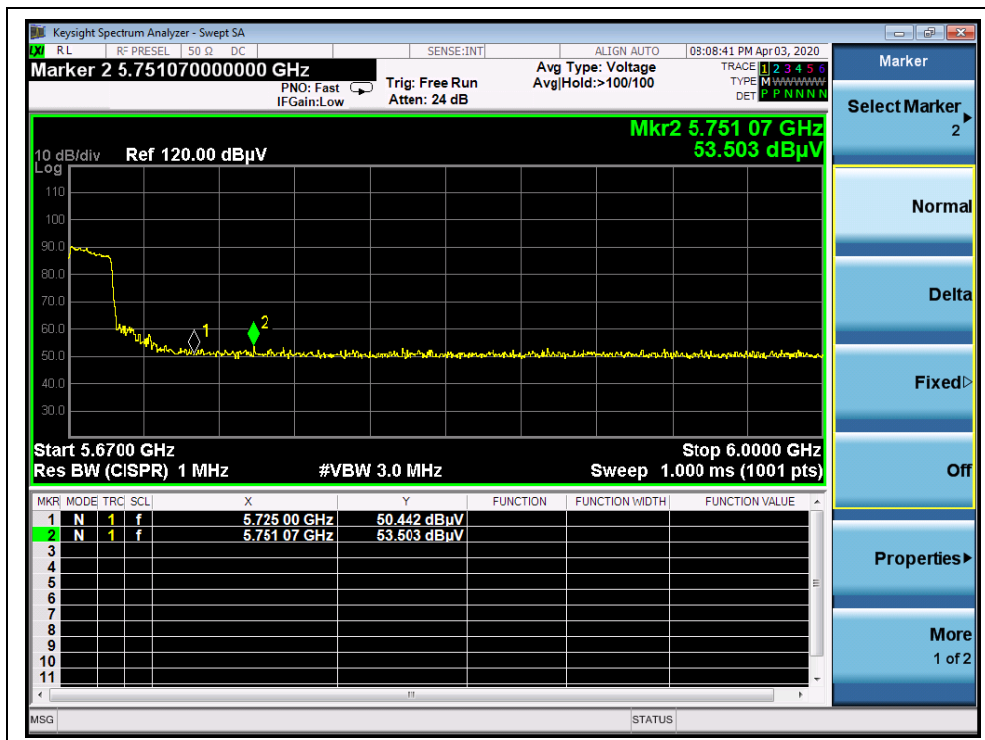
(Channel 64, AVG,802.11n (HT20))



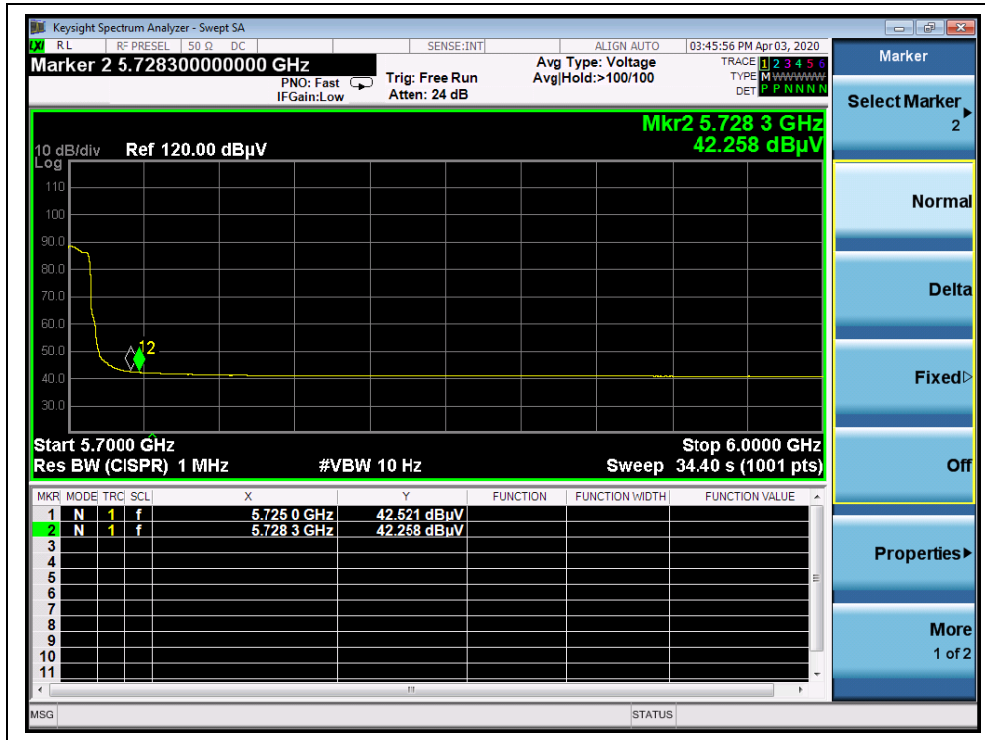
(Channel 100, PEAK,802.11n (HT20))



(Channel 100, AVG,802.11n (HT20))



(Channel 144, PEAK,802.11n (HT20))



(Channel 144, AVG,802.11n (HT20))

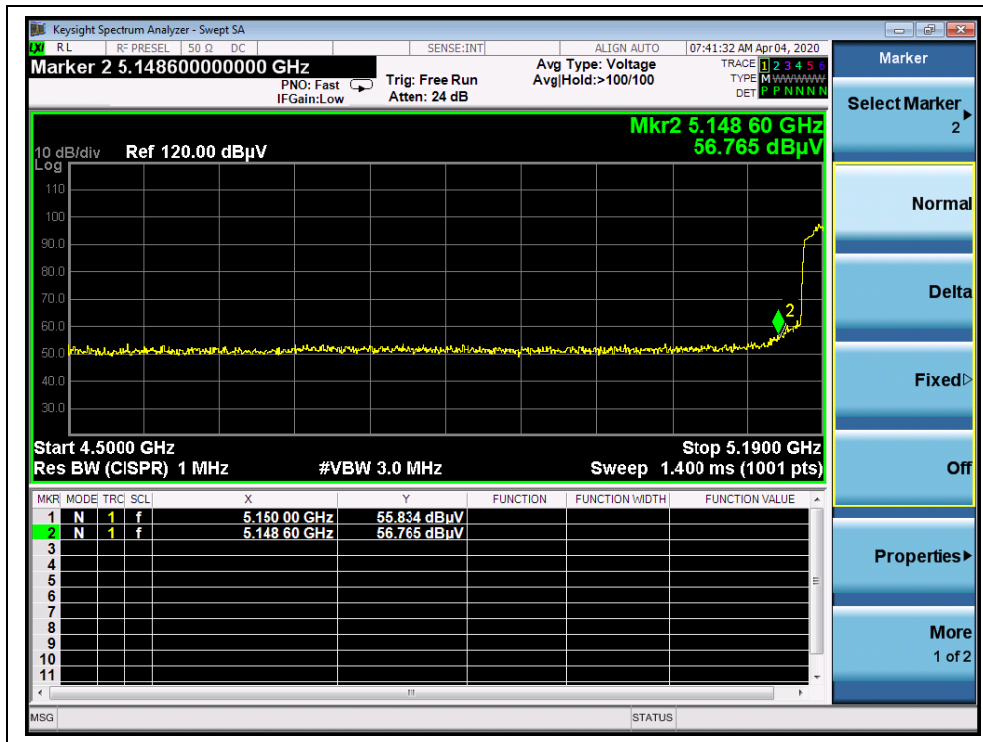


802.11n (HT40) Test mode

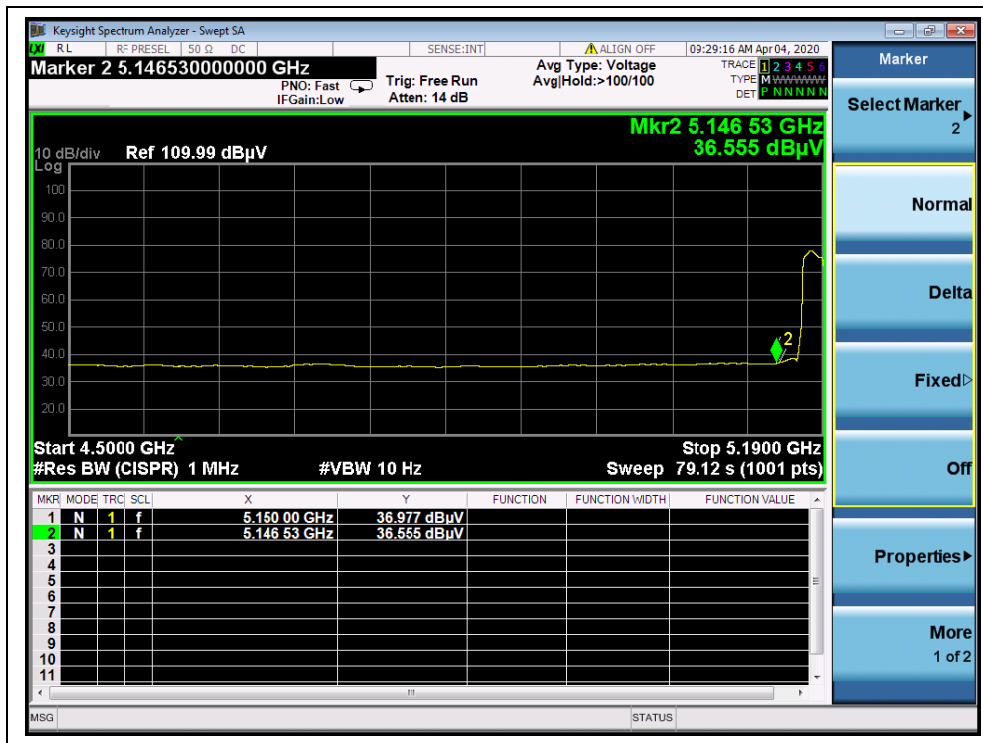
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading	A_T	A_{Factor}	Max. Emission	Limit	Verdict
		PK/ AV	U_R (dBuV)	(dB)	(dB@3m)	E (dBμV/m)	(dBμV/m)	
38	5148.60	PK	56.77	-26.92	32.20	62.05	74	PASS
38	5150.00	AV	36.98	-26.92	32.20	42.26	54	PASS
62	5351.95	PK	54.43	-26.80	32.20	59.83	74	PASS
62	5350.00	AV	42.91	-26.80	32.20	48.31	54	PASS
102	5467.33	PK	54.86	-26.64	32.20	60.42	68.23	PASS
102	5470.00	AV	43.83	-26.64	32.20	49.39	54	PASS
142	5751.07	PK	53.50	-26.64	32.20	59.06	68.23	PASS
142	5726.98	AV	41.44	-26.64	32.20	47.00	54	PASS

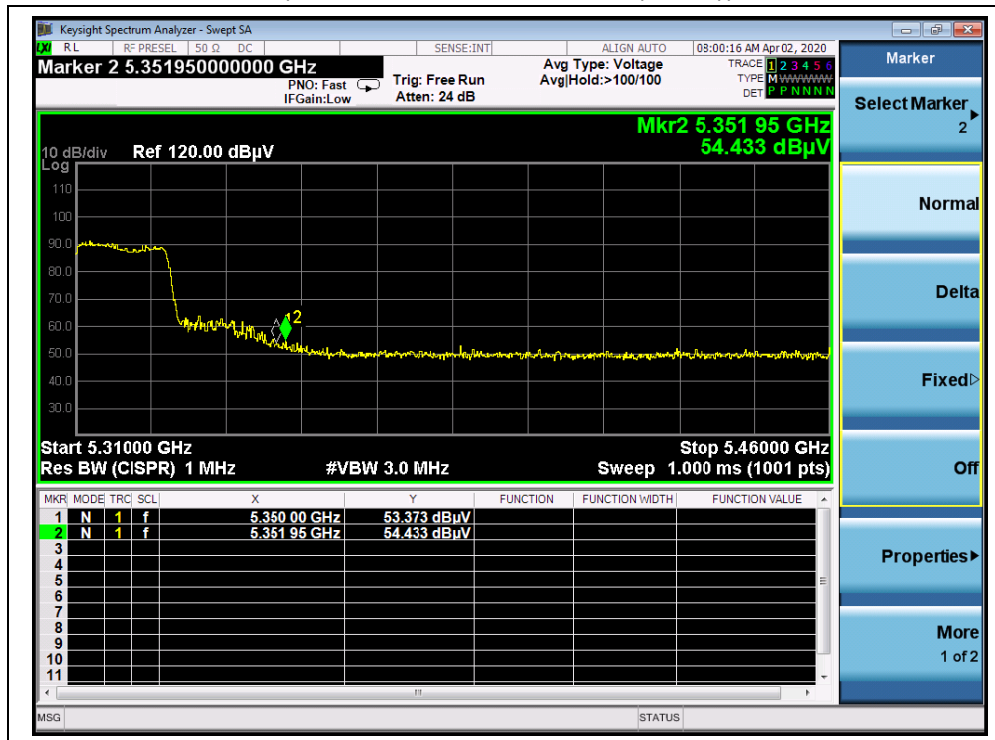
B. Test Plots:



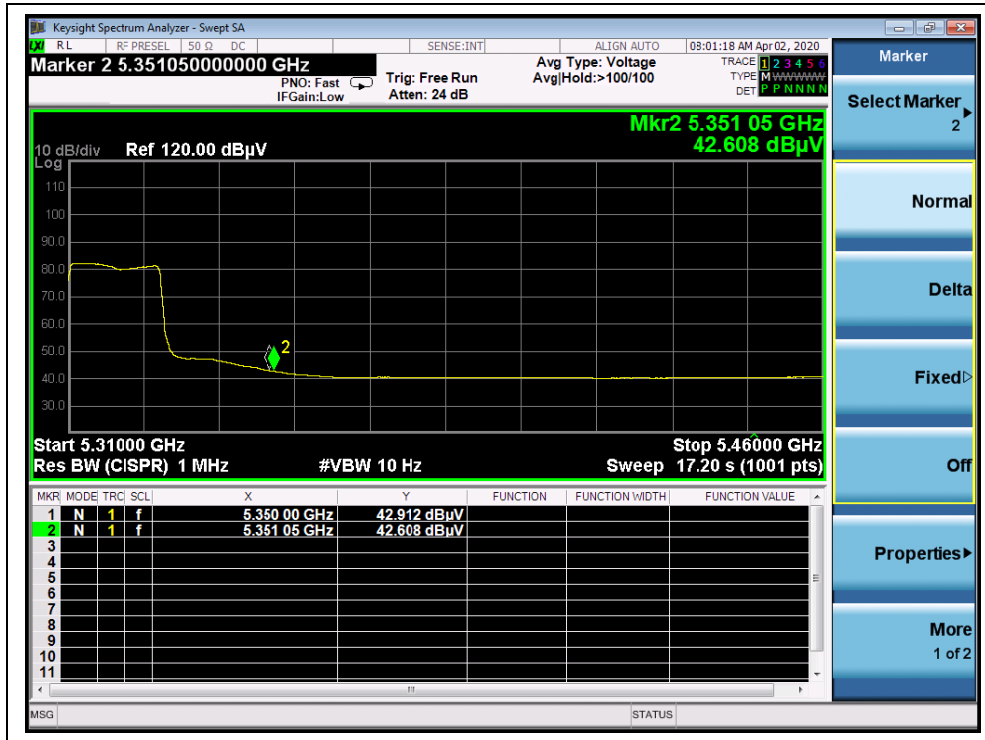
(Channel 38, PEAK,802.11n (HT40))



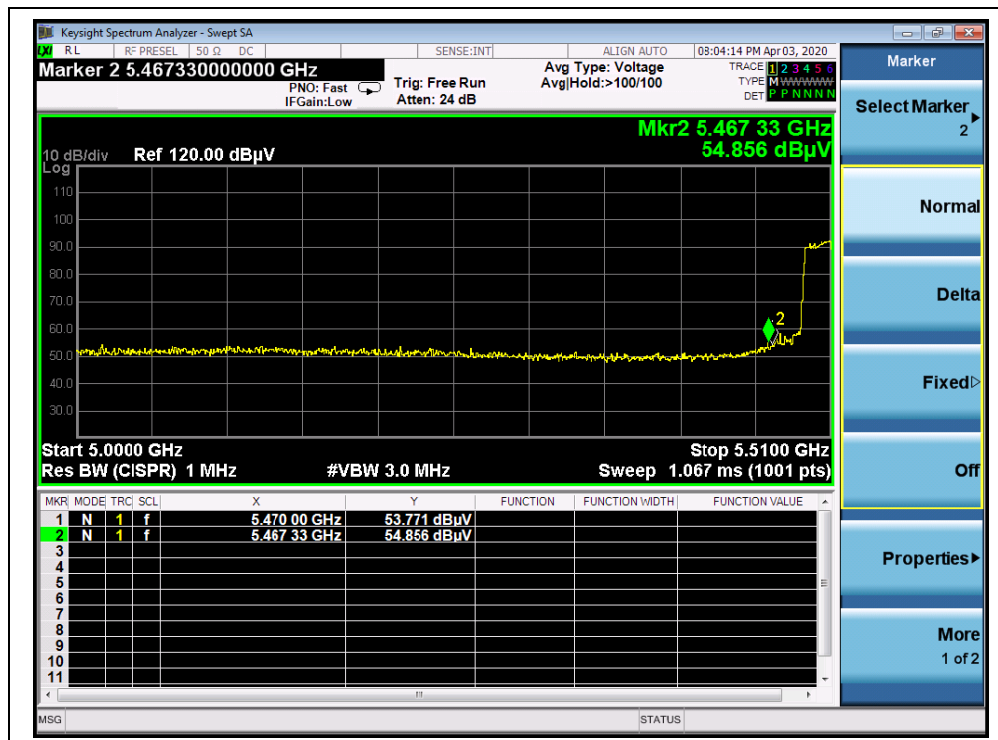
(Channel 38, AVG,802.11n (HT40))



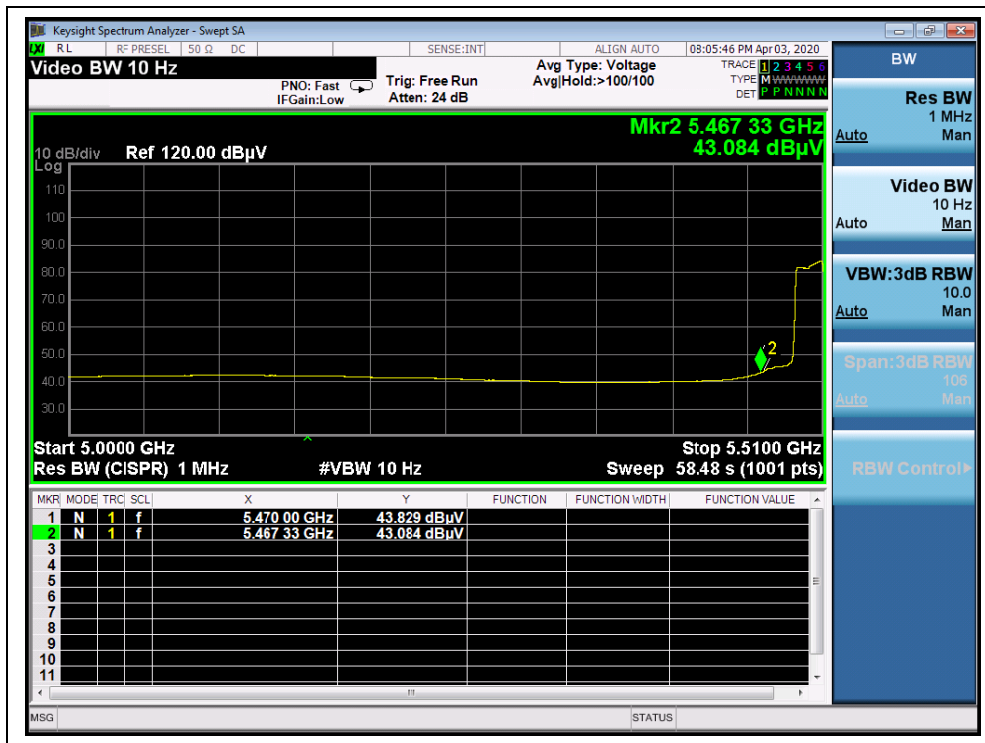
(Channel 62, PEAK,802.11n (HT40))



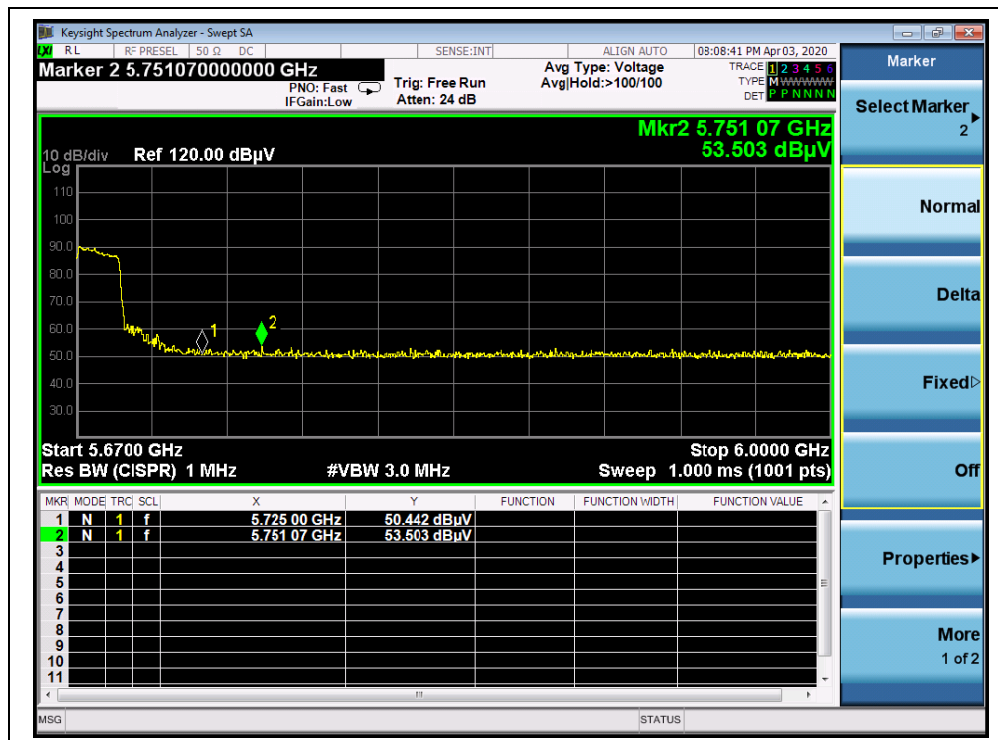
(Channel 62, AVG,802.11n (HT40))



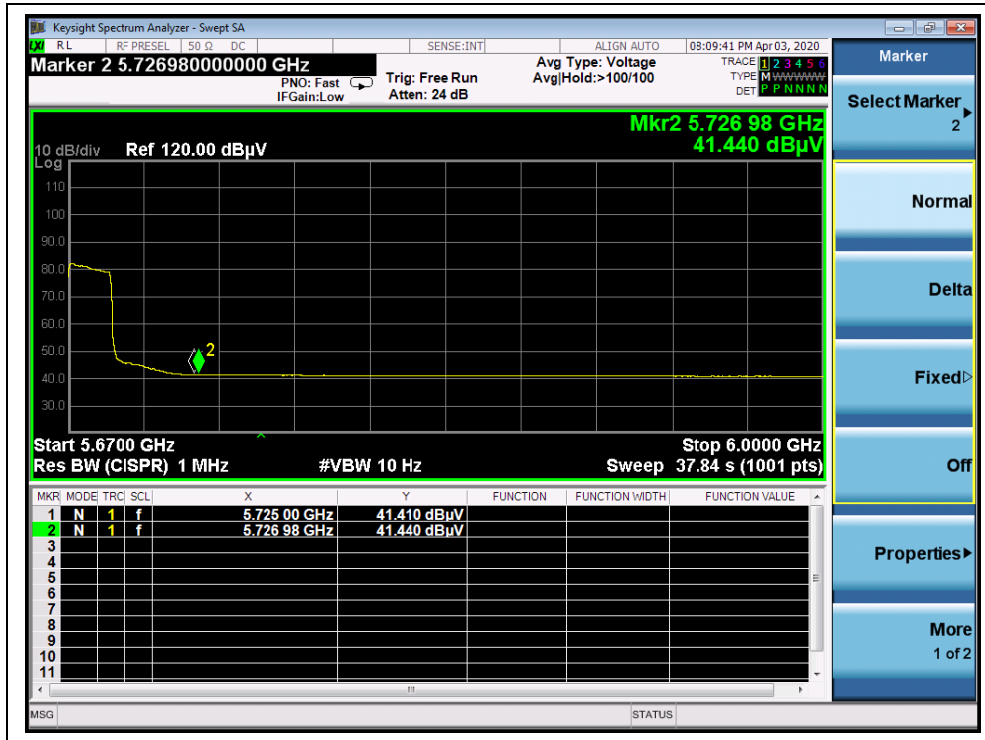
(Channel 102, PEAK,802.11n (HT40))



(Channel 102, AVG,802.11n (HT40))



(Channel 142, PEAK,802.11n (HT40))



(Channel 142, AVG,802.11n (HT40))

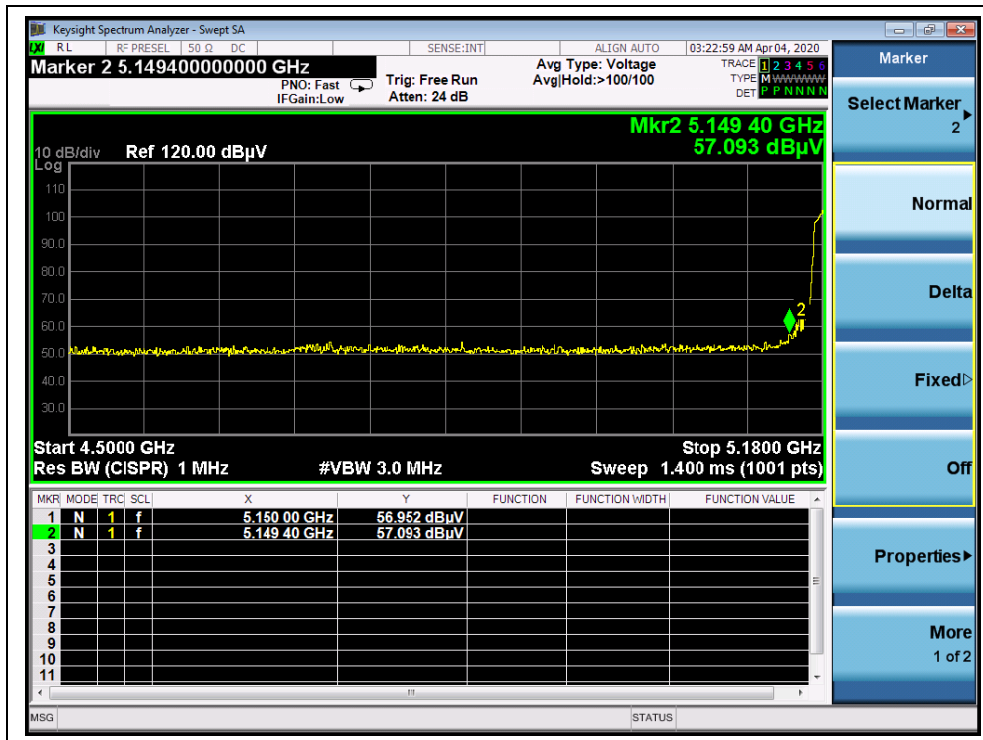


802.11ac (VHT20) Test mode

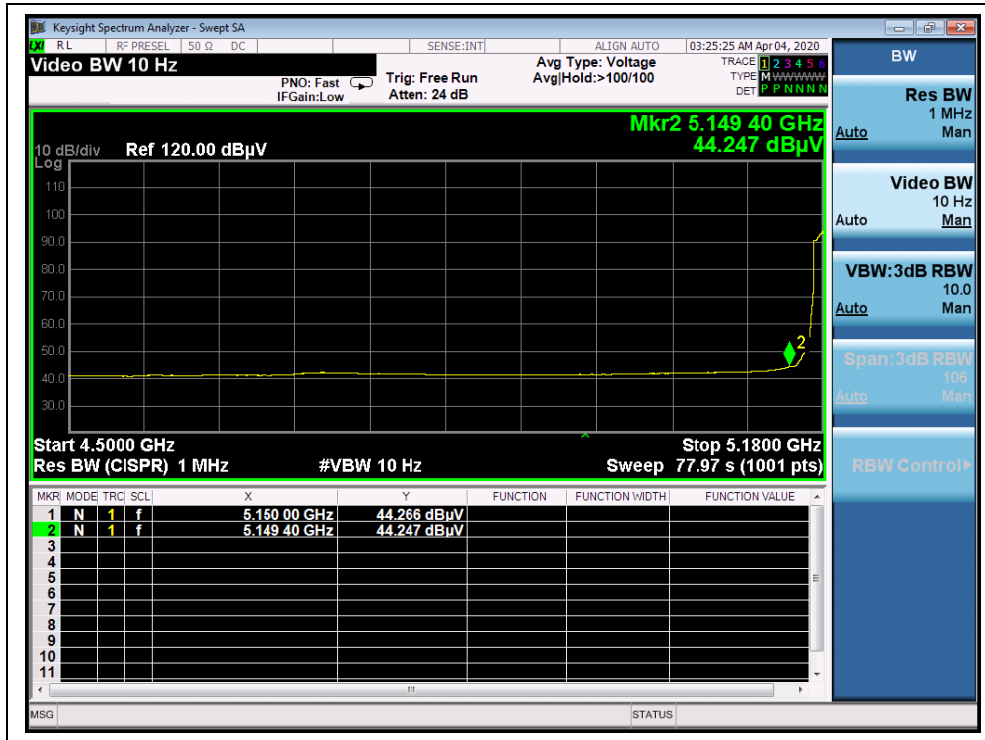
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading	A _T (dB)	A _{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV	U _R (dBuV)					
36	5149.40	PK	57.09	-26.92	32.20	62.37	74	PASS
36	5150.00	AV	44.27	-26.92	32.20	49.55	54	PASS
64	5354.34	PK	51.83	-26.80	32.20	57.23	74	PASS
64	5350.00	AV	40.36	-26.80	32.20	45.76	54	PASS
100	5468.00	PK	53.04	-26.64	32.20	58.60	68.23	PASS
100	5470.00	AV	41.95	-26.64	32.20	47.51	54	PASS
144	5733.00	PK	52.44	-26.64	32.20	58.00	68.23	PASS
144	5725.00	AV	41.84	-26.64	32.20	47.4	54	PASS

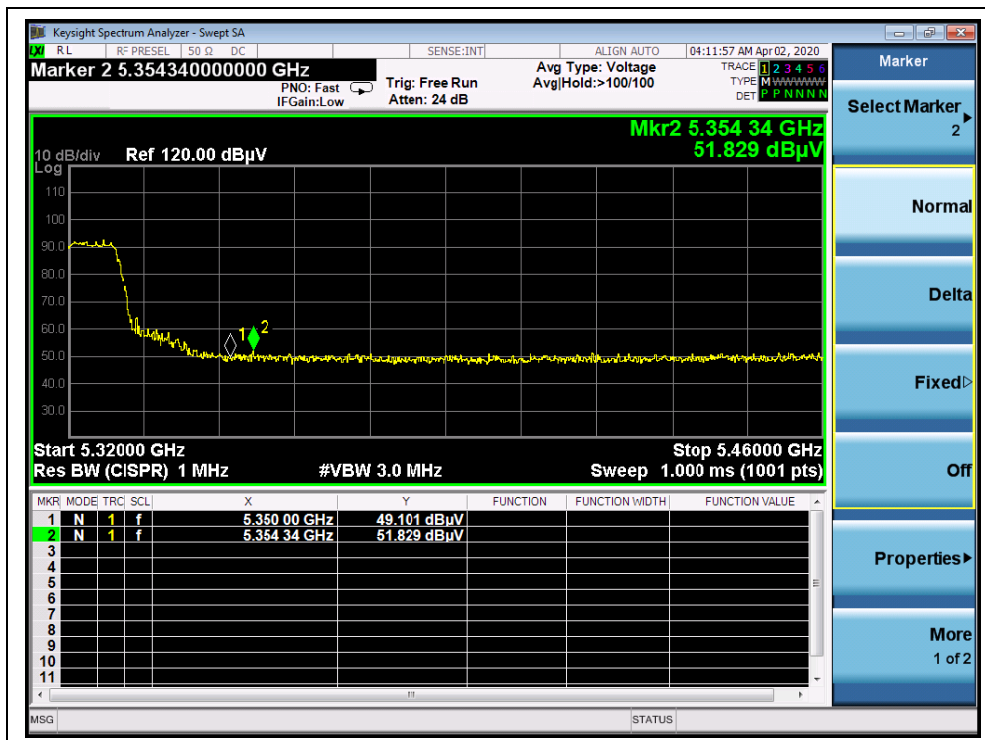
B. Test Plots:



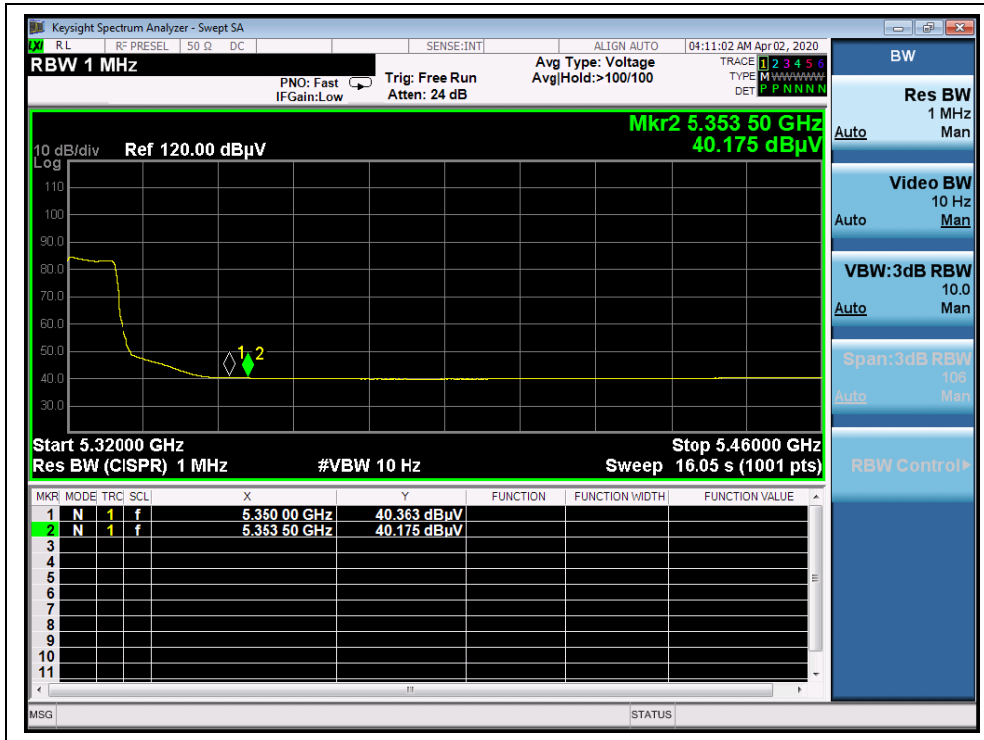
(Channel 36, PEAK,802.11ac (VHT20))



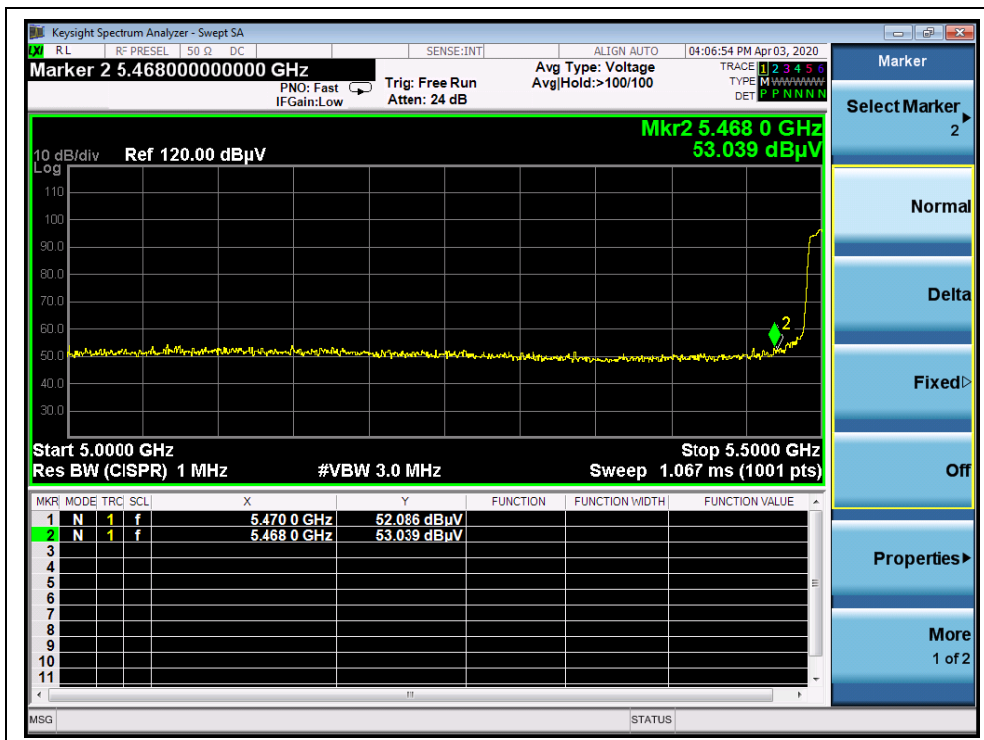
(Channel 36, AVG,802.11ac (VHT20))



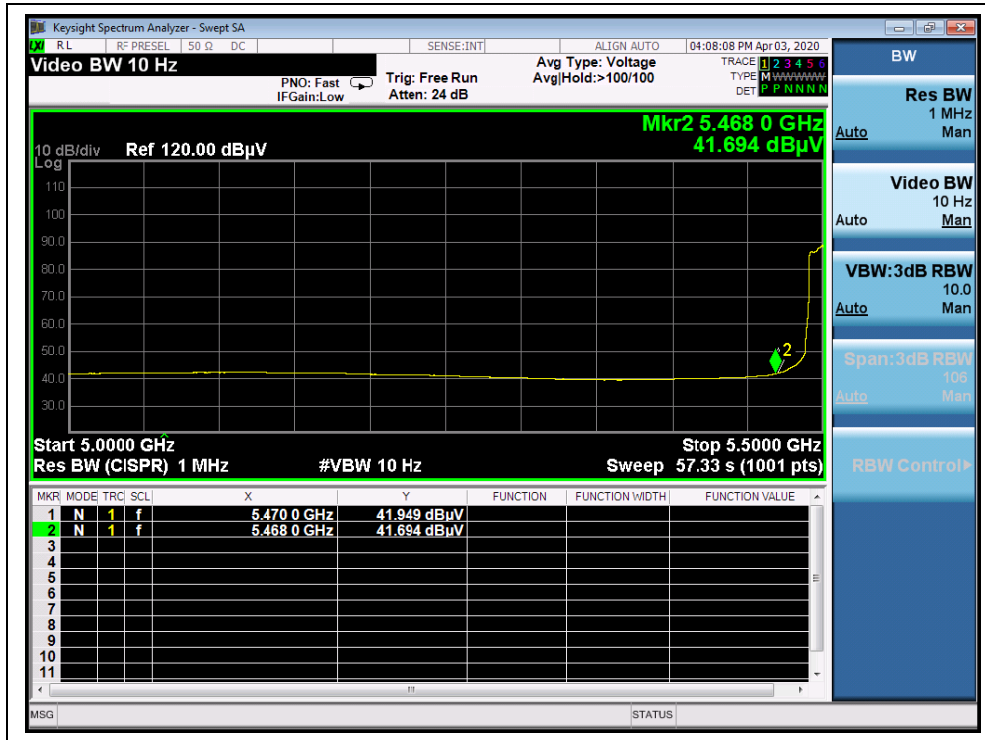
(Channel 64, PEAK,802.11ac (VHT20))



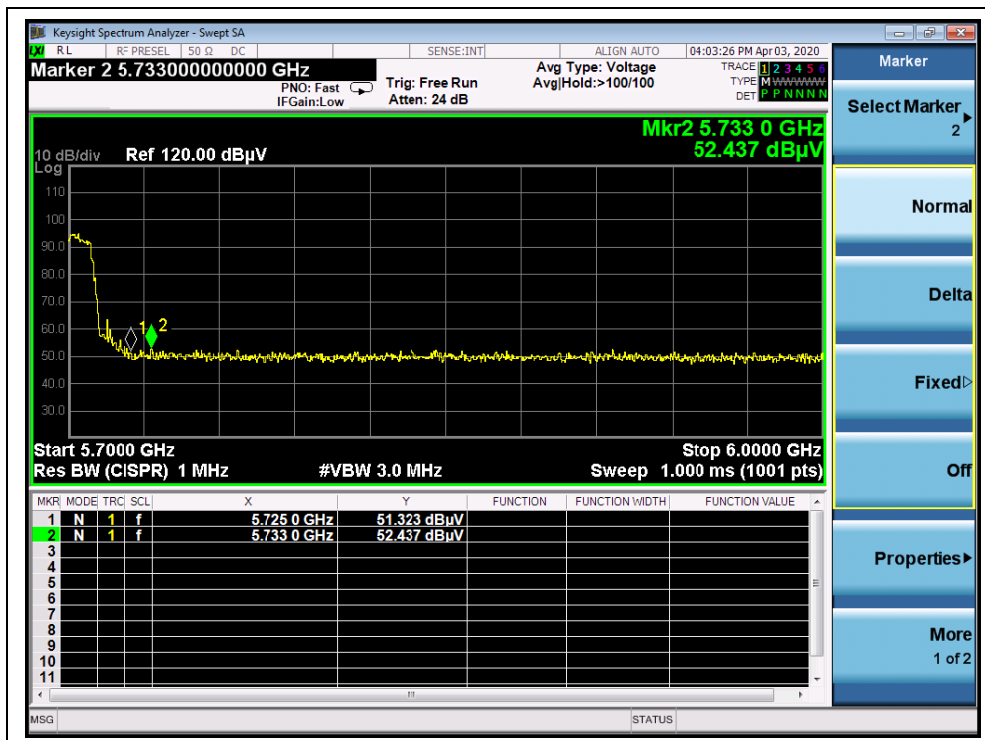
(Channel 64, AVG,802.11 ac (VHT20))



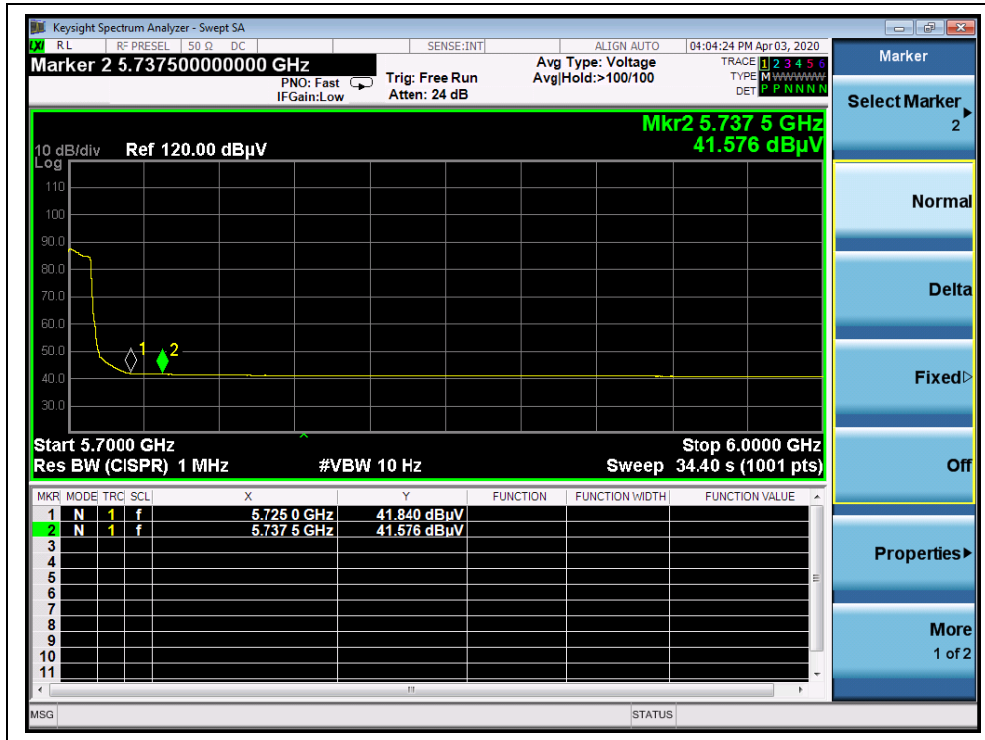
(Channel 100, PEAK,802.11ac (VHT20))



(Channel 100, AVG,802.11 ac (VHT20))



(Channel 144, PEAK,802.11ac (VHT20))



(Channel 144, AVG,802.11 ac (VHT20))

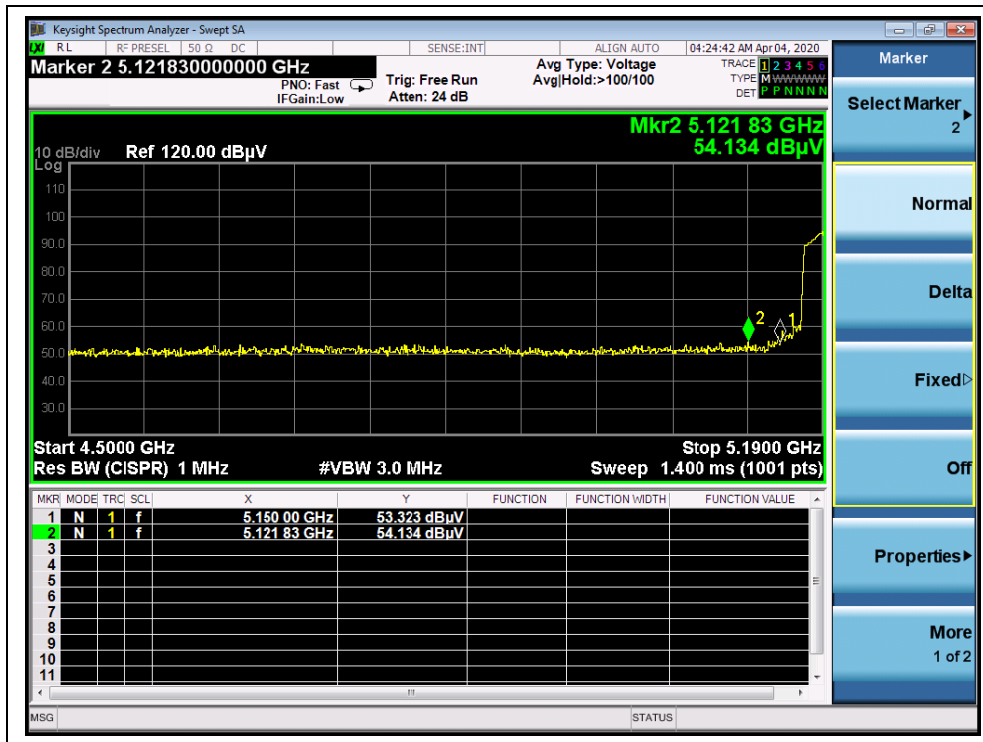


802.11ac (VHT40) Test mode

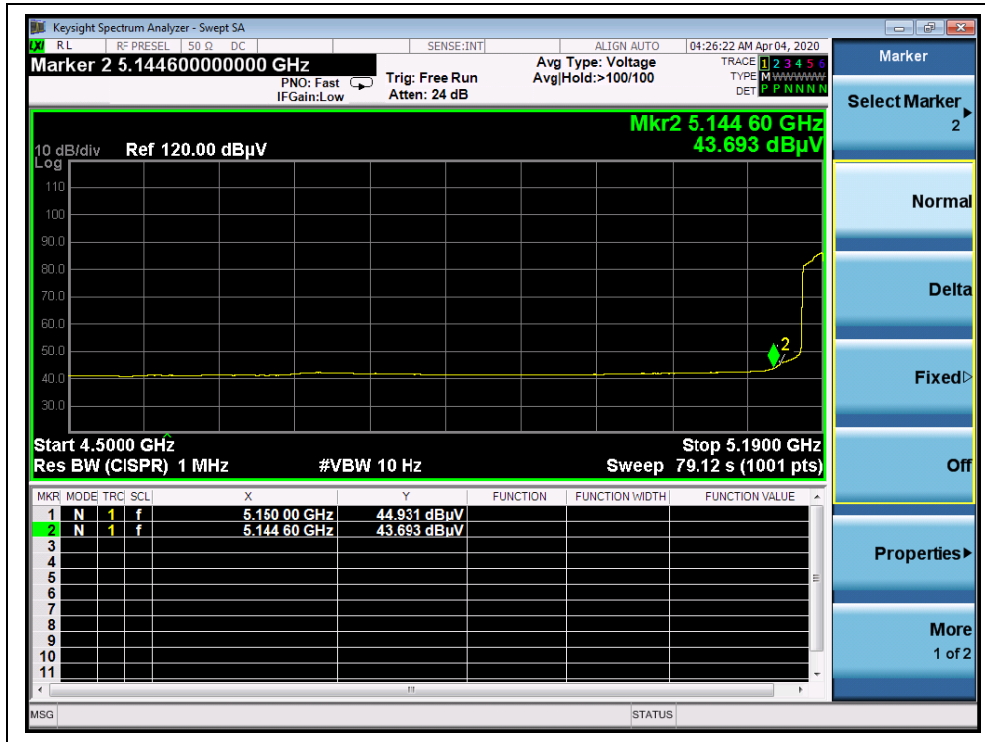
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading	A _T (dB)	A _{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV	U _R (dBuV)					
38	5121.83	PK	54.13	-26.92	32.20	59.41	74	PASS
38	5150.00	AV	44.93	-26.92	32.20	50.21	54	PASS
62	5353.90	PK	52.17	-26.80	32.20	57.57	74	PASS
62	5350.00	AV	41.74	-26.80	32.20	47.14	54	PASS
102	5469.20	PK	55.84	-26.64	32.20	61.40	68.23	PASS
102	5470.00	AV	44.96	-26.64	32.20	50.52	54	PASS
142	5739.52	PK	52.42	-26.64	32.20	57.98	68.23	PASS
142	5727.64	AV	41.54	-26.64	32.20	47.10	54	PASS

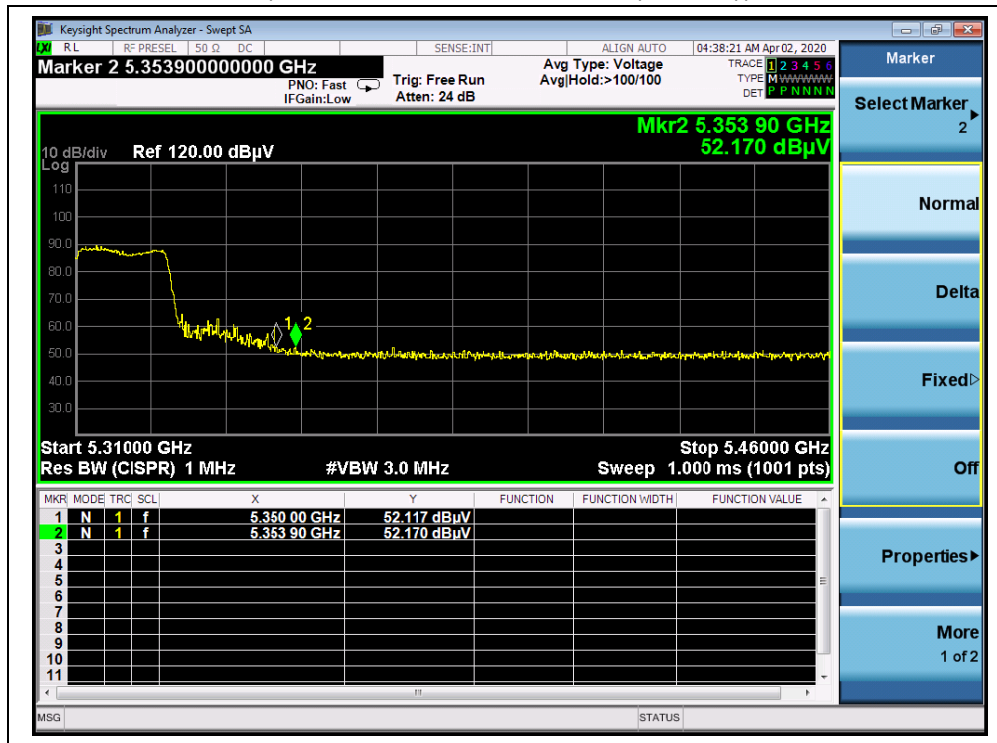
B. Test Plots:



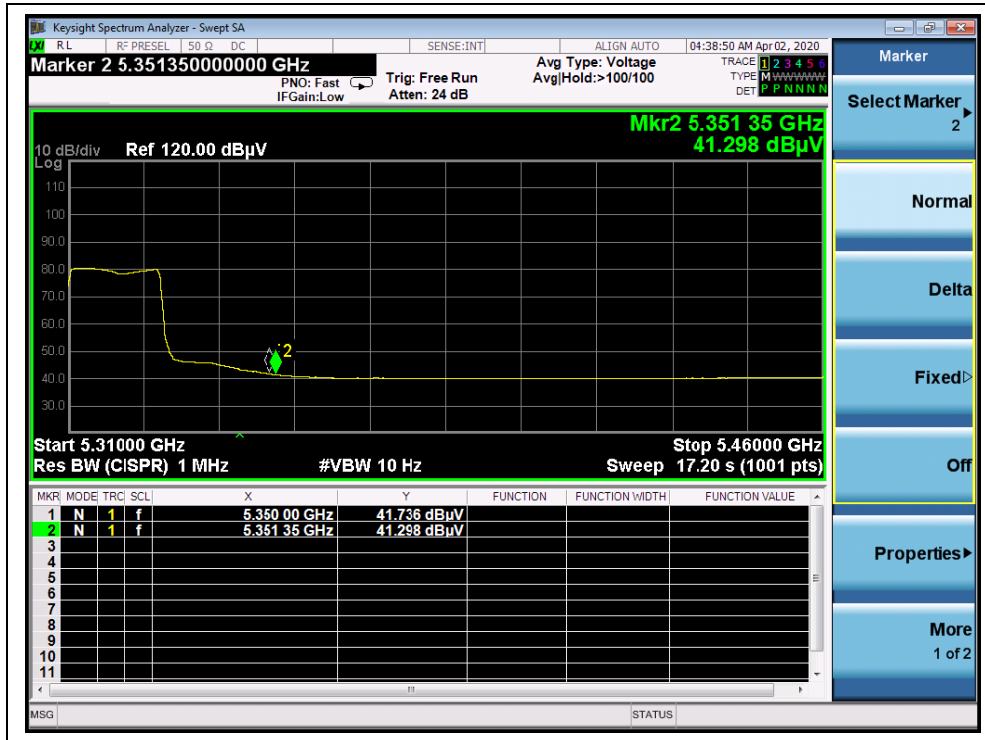
(Channel 38, PEAK,802.11ac (VHT40))



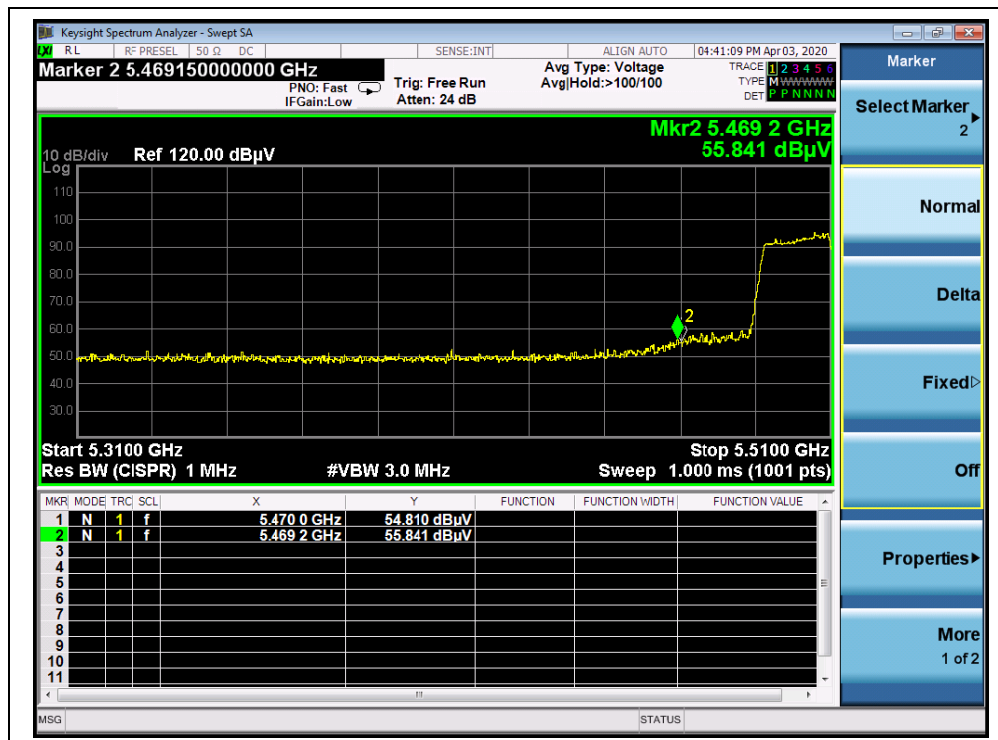
(Channel 38, AVG,802.11ac (VHT40))



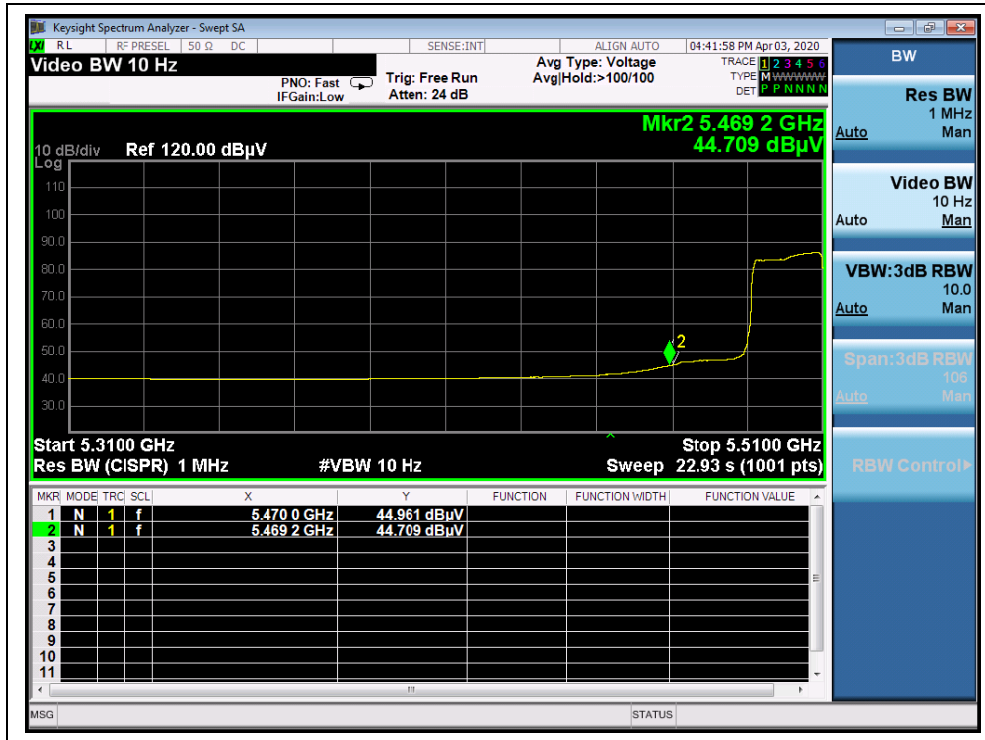
(Channel 62, PEAK,802.11ac (VHT40))



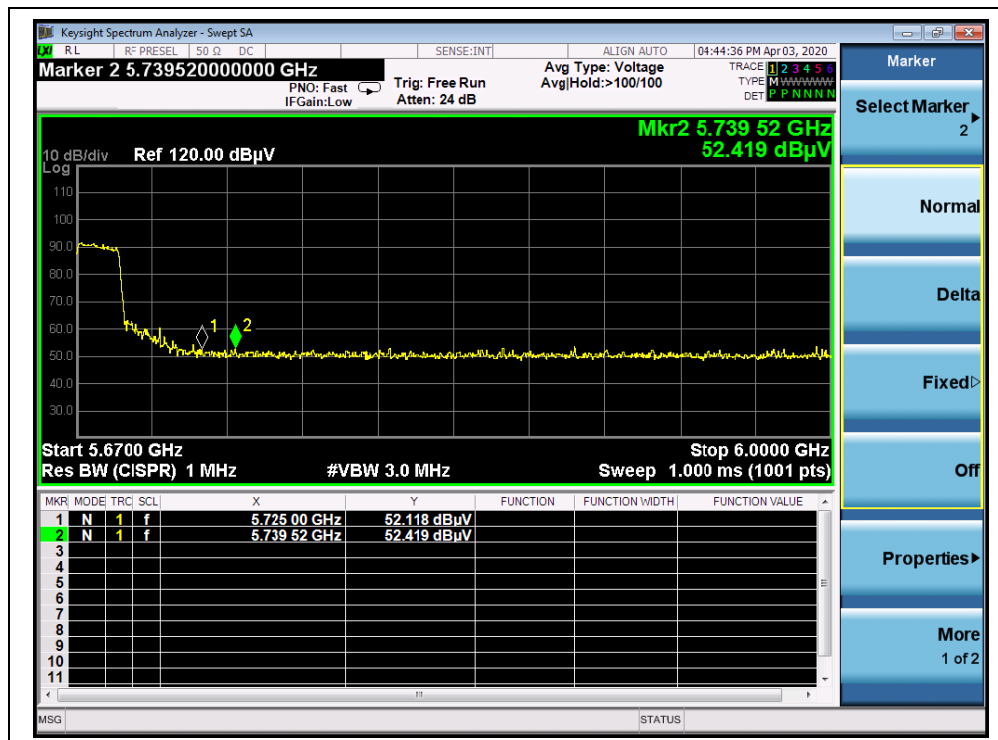
(Channel 62, AVG,802.11ac (VHT40))



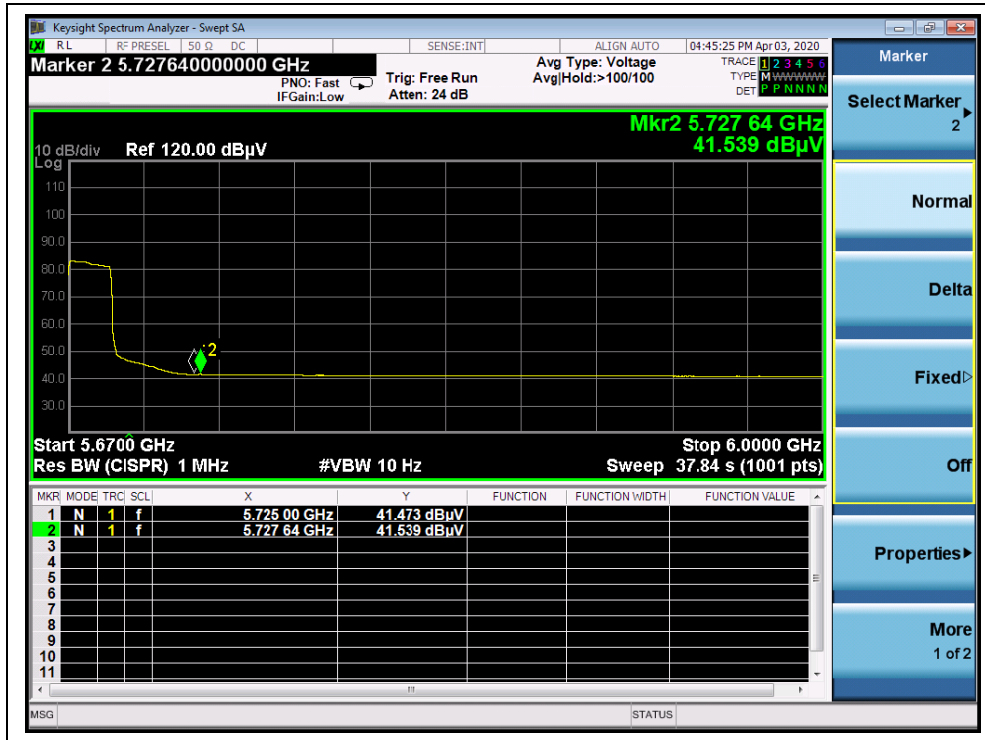
(Channel 102, PEAK,802.11ac (VHT40))



(Channel 102, AVG,802.11ac (VHT40))



(Channel 142, PEAK,802.11ac (VHT40))



(Channel 142, AVG,802.11ac (VHT40))

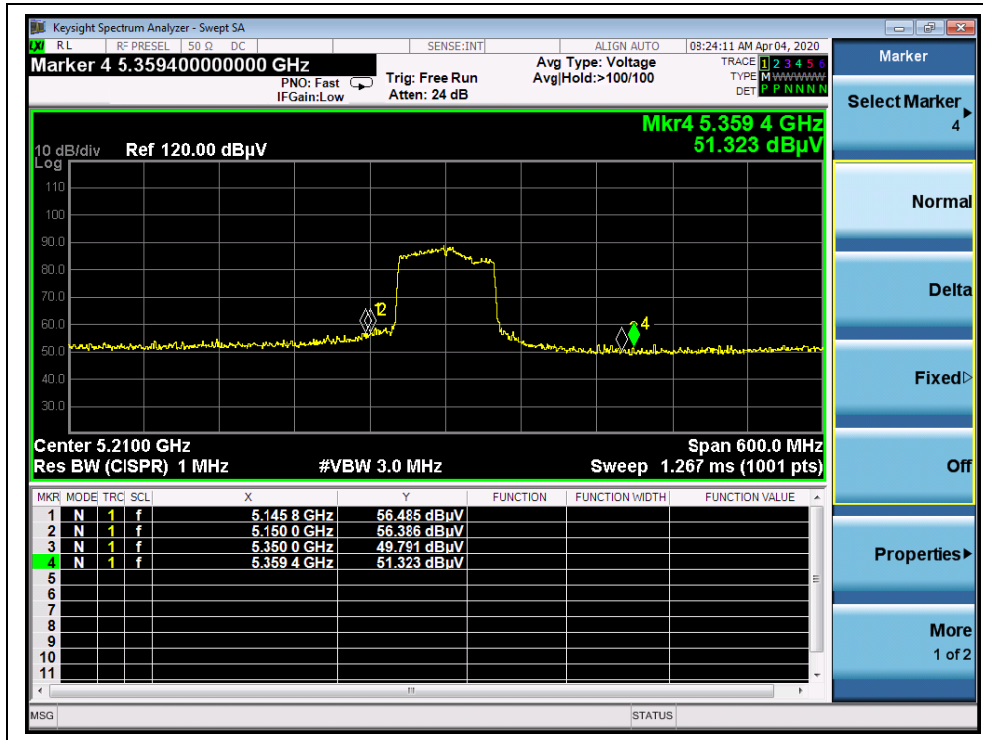


802.11ac (VHT80) Test mode

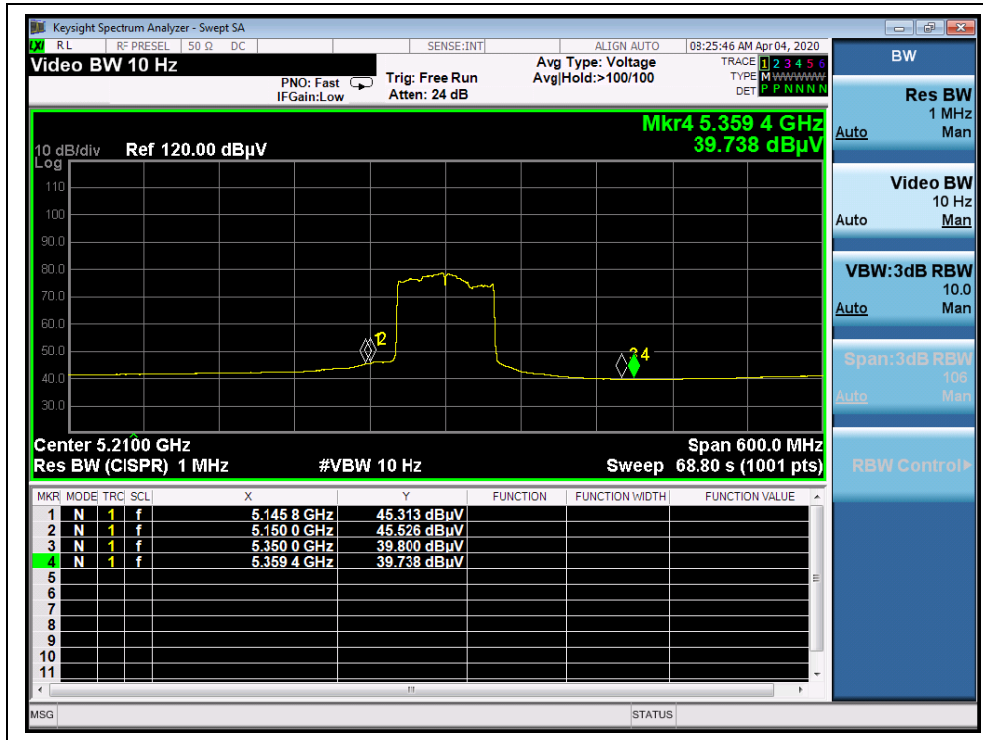
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading	A _T (dB)	A _{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV	U _R (dBuV)					
42	5145.80	PK	56.49	-26.92	32.20	61.77	74	PASS
42	5150.00	AV	45.53	-26.92	32.20	50.81	54	PASS
58	5355.20	PK	53.49	-26.80	32.20	58.89	74	PASS
58	5350.00	AV	42.19	-26.80	32.20	47.59	54	PASS
106	5456.33	PK	57.84	-26.64	32.20	63.40	74	PASS
106	5470.00	AV	36.36	-26.64	32.20	41.92	54	PASS
138	5739.04	PK	53.45	-26.64	32.20	59.01	68.23	PASS
138	5736.31	AV	41.45	-26.64	32.20	47.01	54	PASS

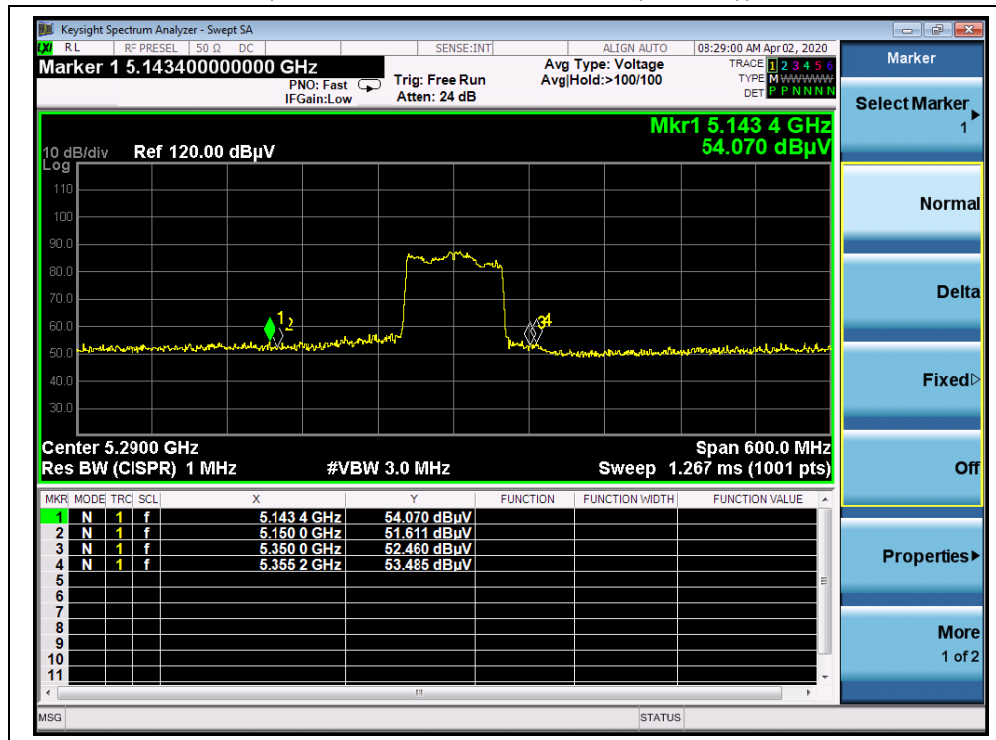
B. Test Plots:



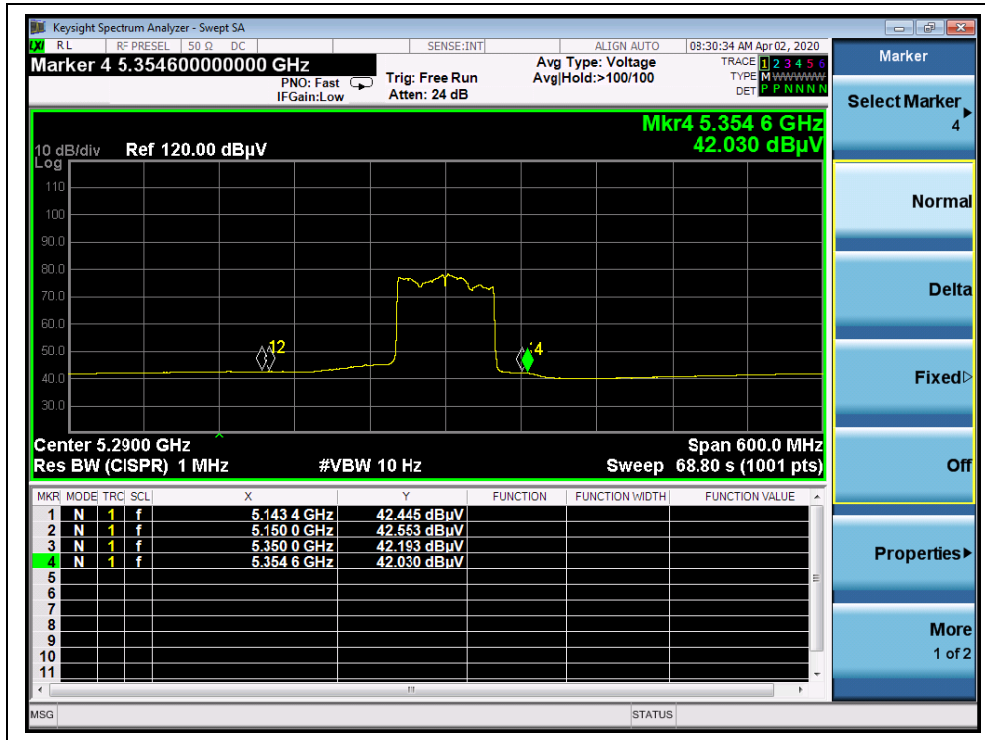
(Channel 42, PEAK,802.11ac (VHT80))



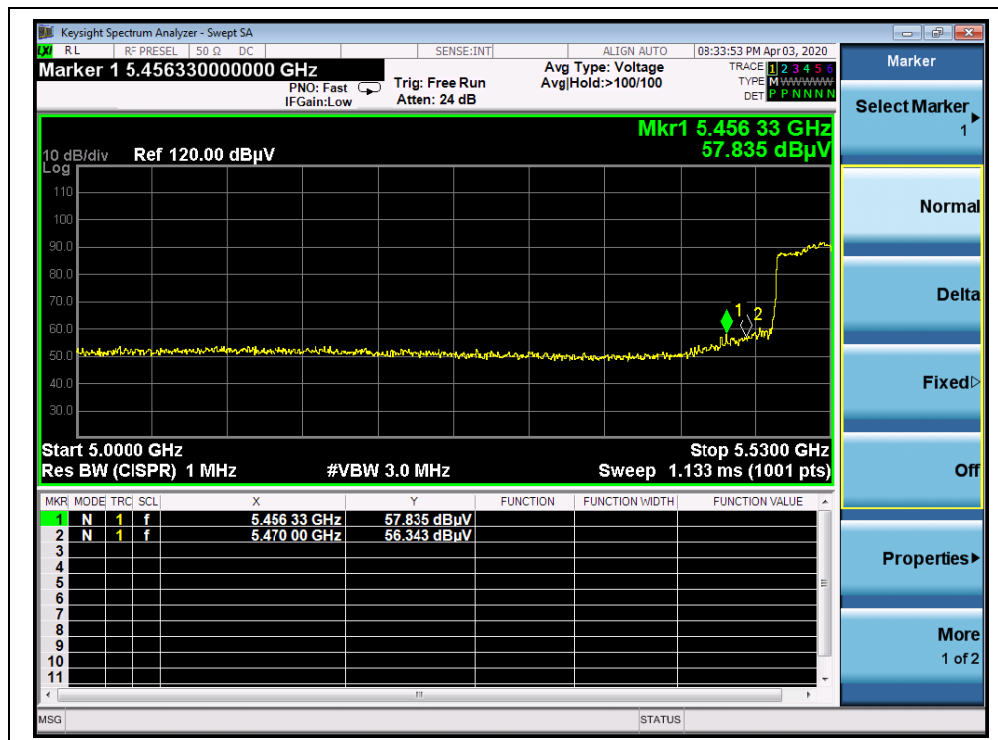
(Channel 42, AVG,802.11ac (VHT80))



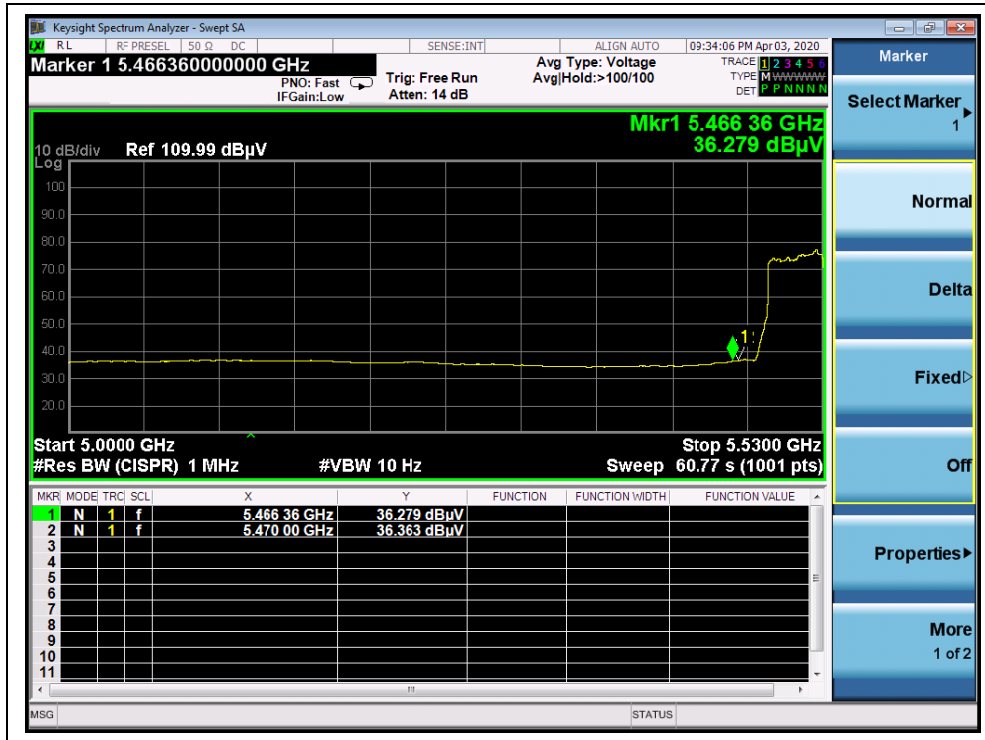
(Channel 58, PEAK,802.11ac (VHT80))



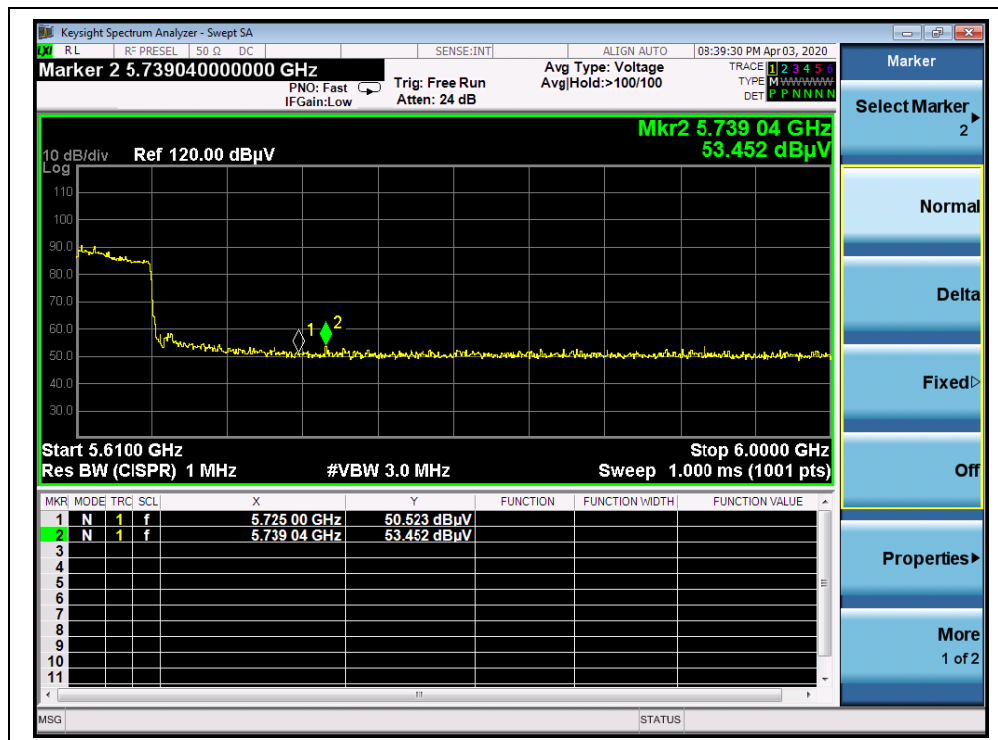
(Channel 58, AVG,802.11ac (VHT80))



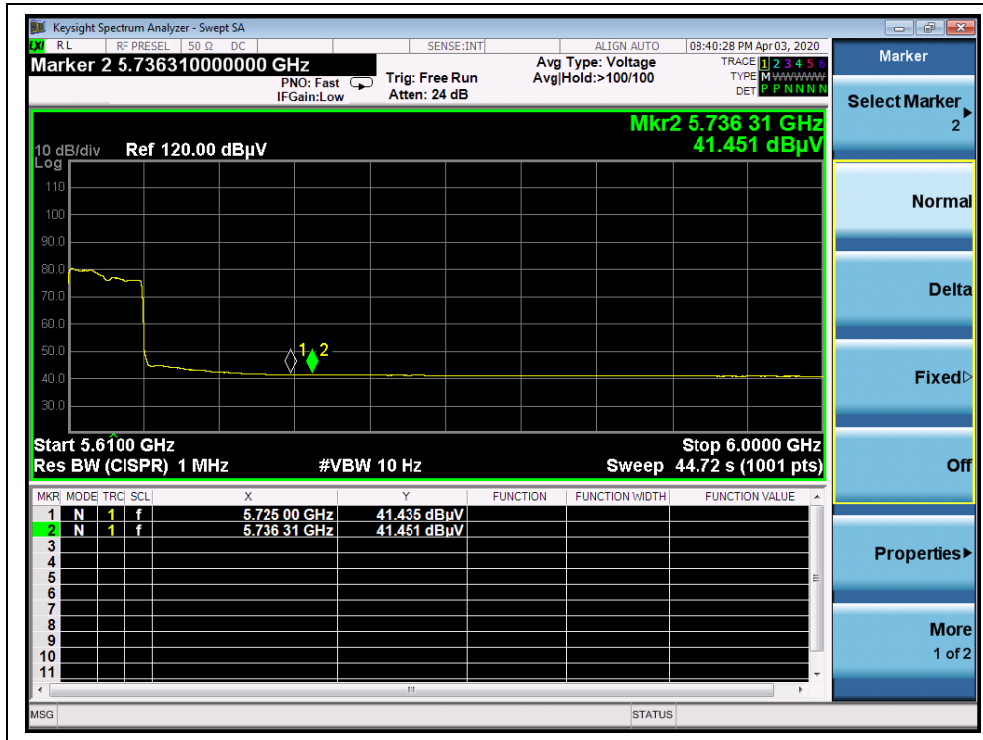
(Channel 106, PEAK,802.11ac (VHT80))



(Channel 106, AVG,802.11ac (VHT80))



(Channel 138, PEAK,802.11ac (VHT80))



(Channel 138, AVG,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);

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

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

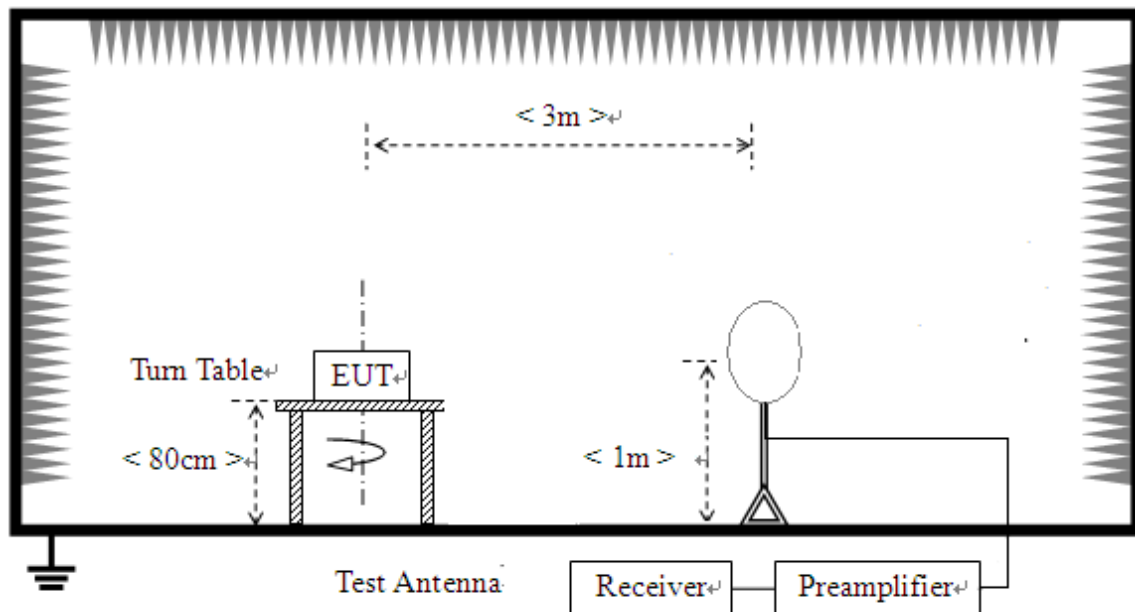
Note:

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.

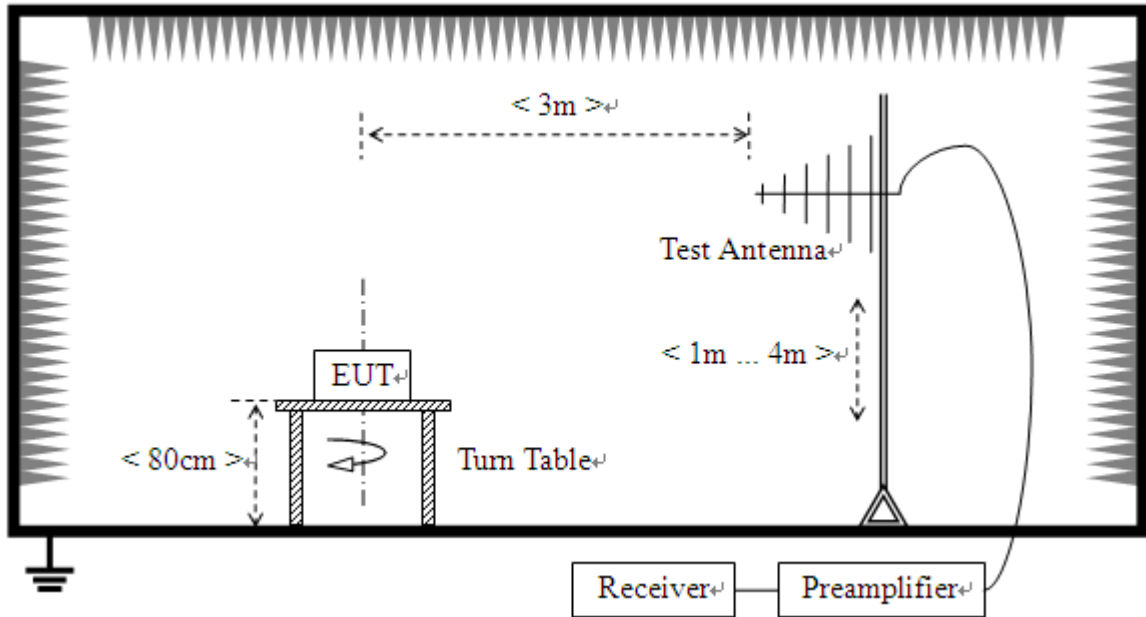
In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table)

2.9.2. Test Description**TestSetup:**

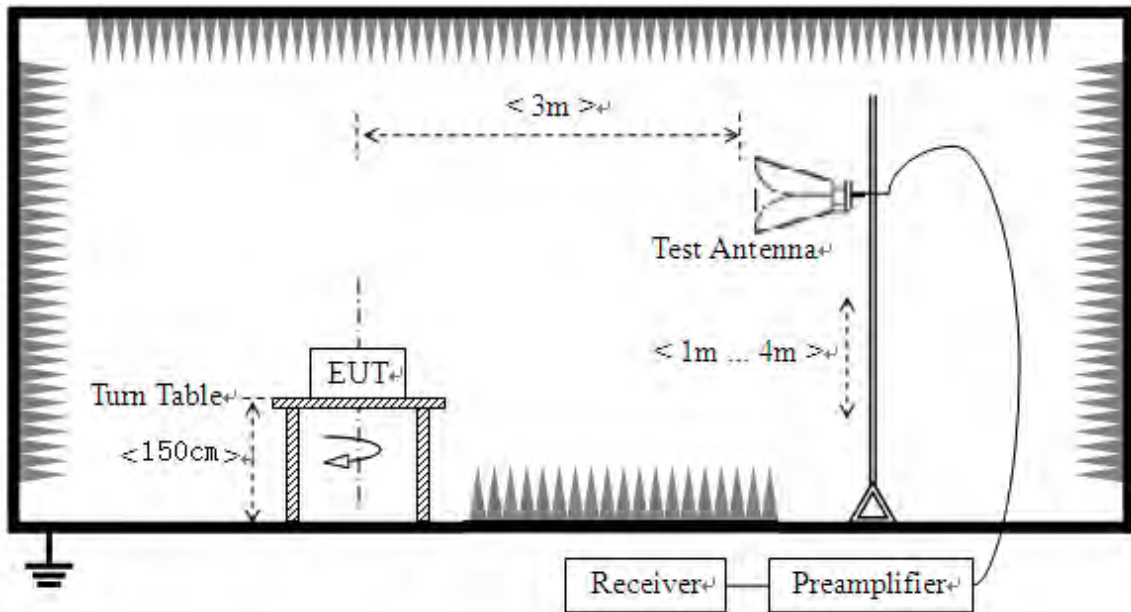
- 1) For radiated emissions from 9kHz to 30MHz



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:

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

A_T : Total correction Factor except Antenna

U_R : Receiver Reading

G_{preamp} : Preamplifier Gain

A_{Factor} : Antenna Factor at 3m

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

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.

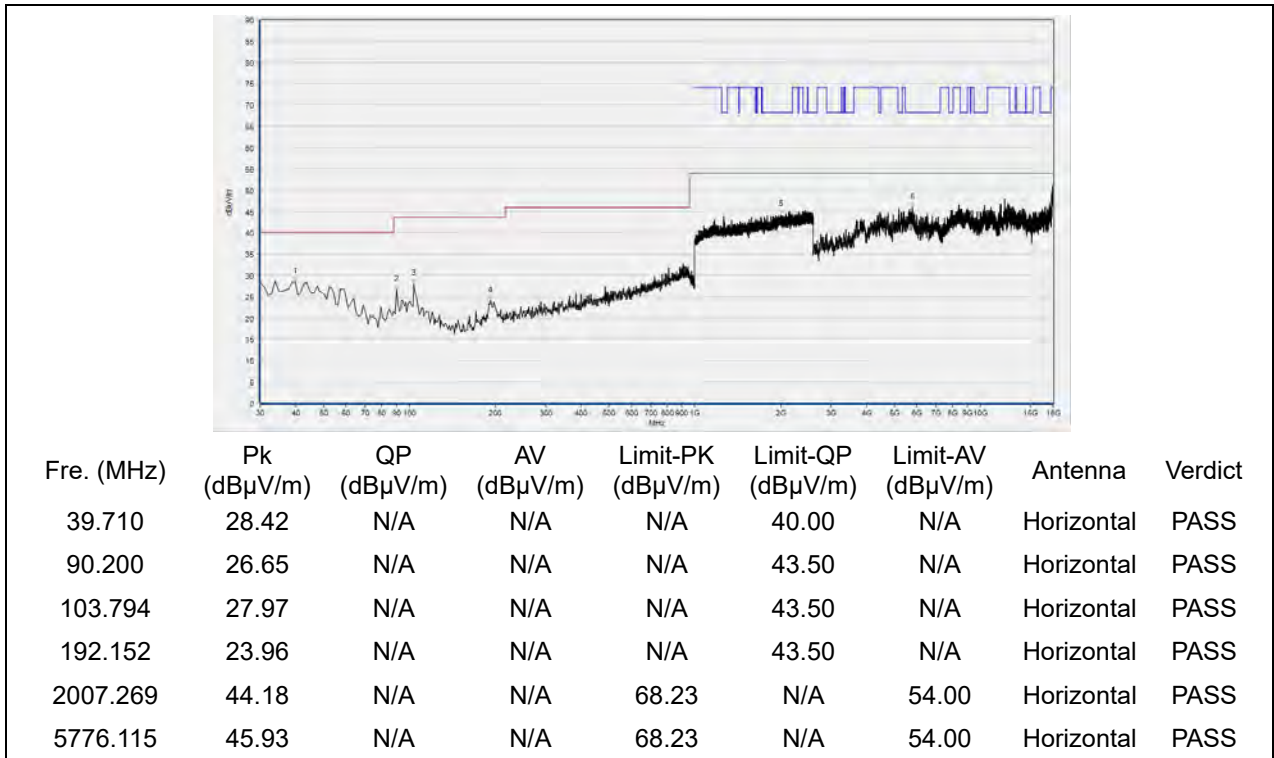
Note2: For the frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

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.

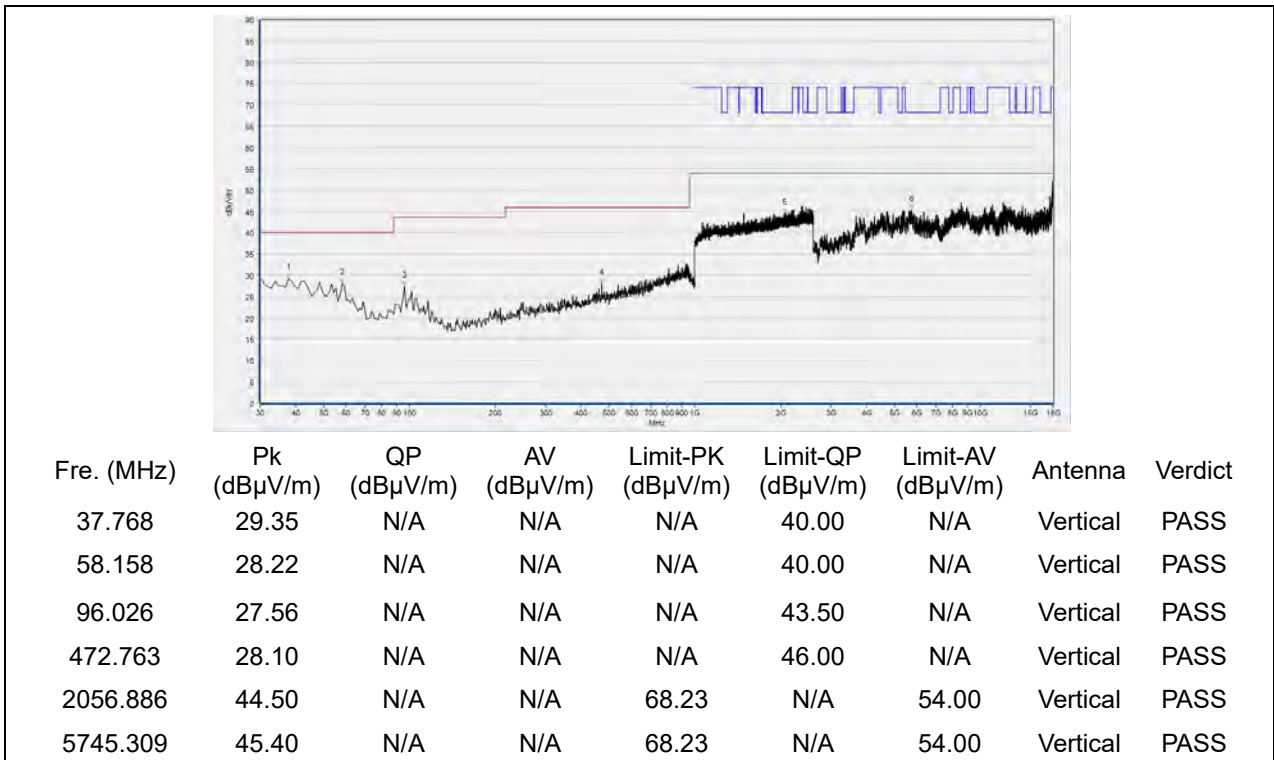


802.11a Test mode

Plots for Channel = 36

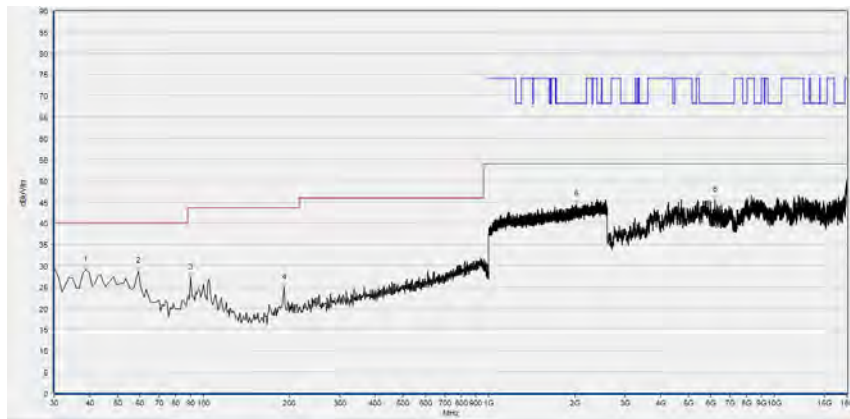


(Antenna Horizontal, 30MHz to 18GHz)



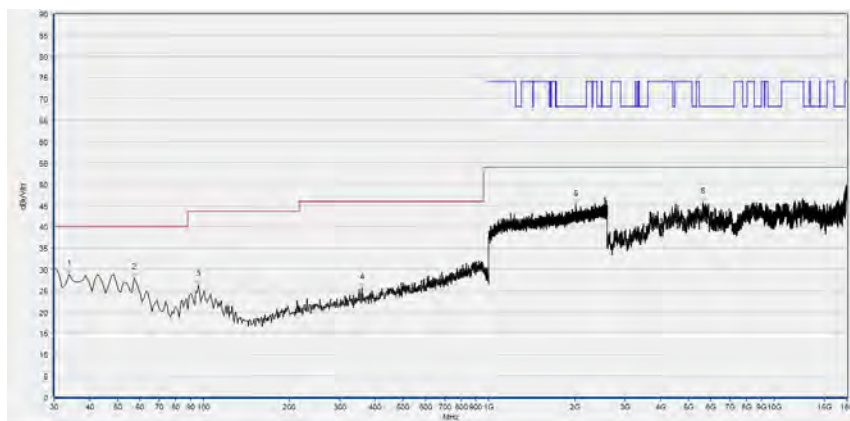
(Antenna Vertical, 30MHz to 18GHz)

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
38.739	29.00	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
59.129	28.69	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
90.200	27.21	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
192.152	24.77	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2029.677	44.33	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
6204.321	45.44	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS

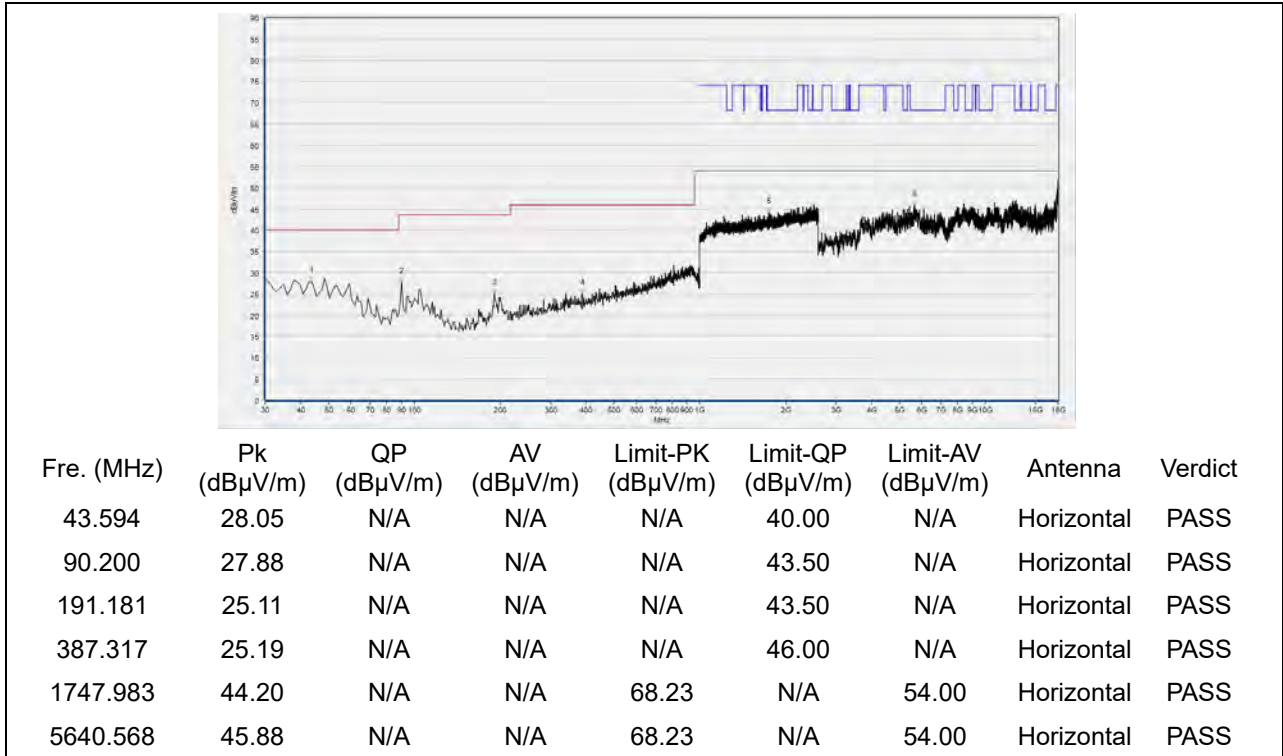
(Antenna Horizontal, 30MHz to 18GHz)



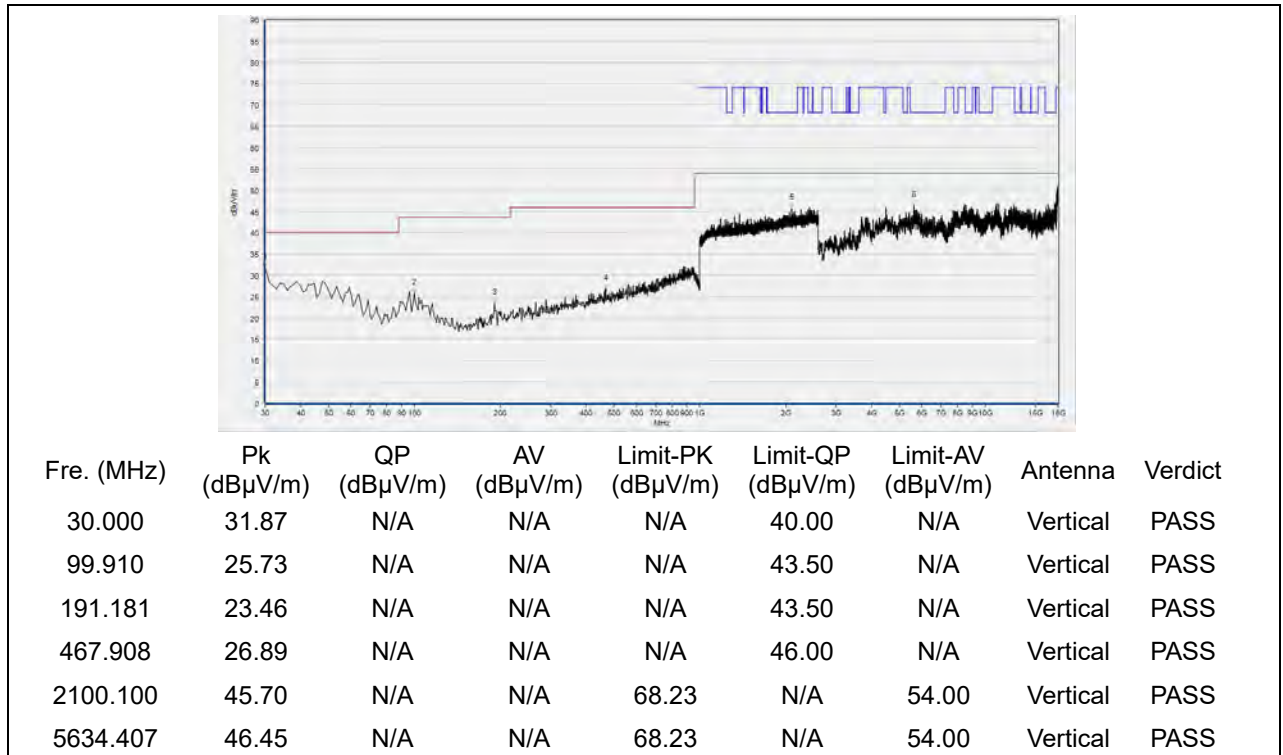
Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
33.884	28.89	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
57.187	27.93	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
96.026	26.38	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
359.159	25.69	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2016.339	45.23	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
5625.165	45.74	N/A	N/A	68.23	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 48

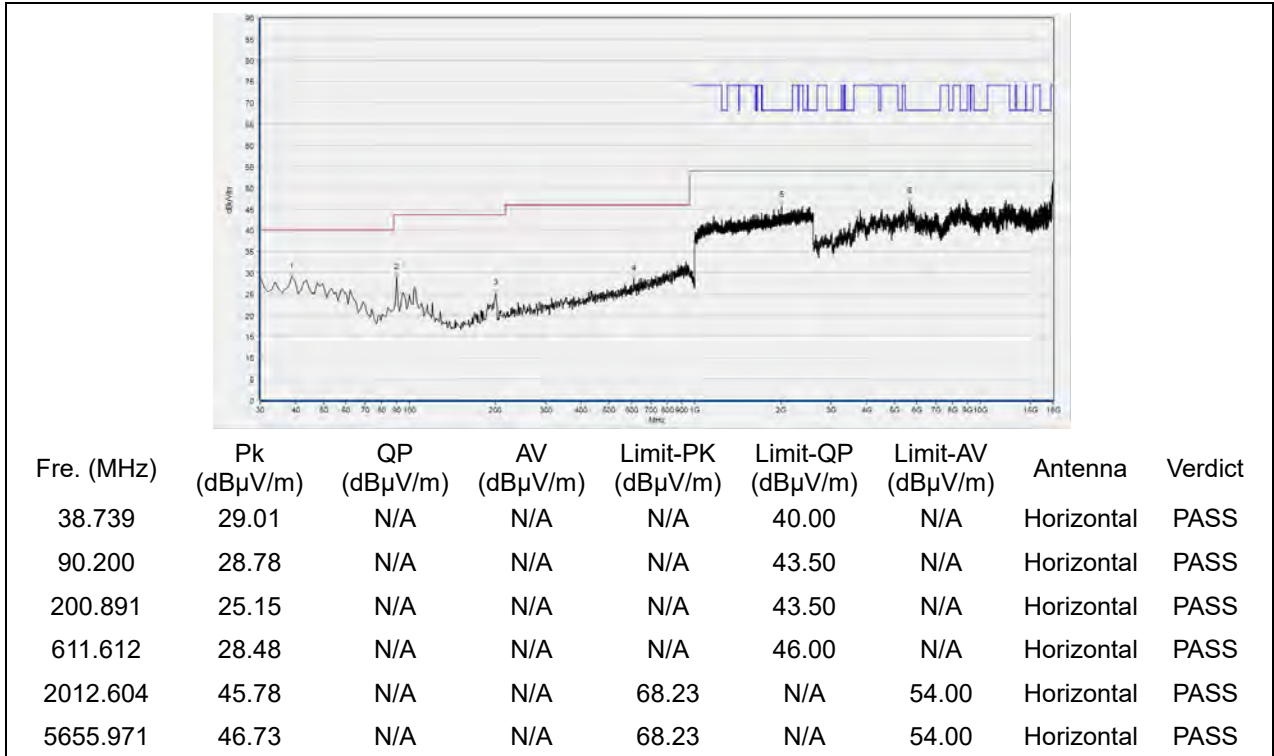


(Antenna Horizontal, 30MHz to 18GHz)

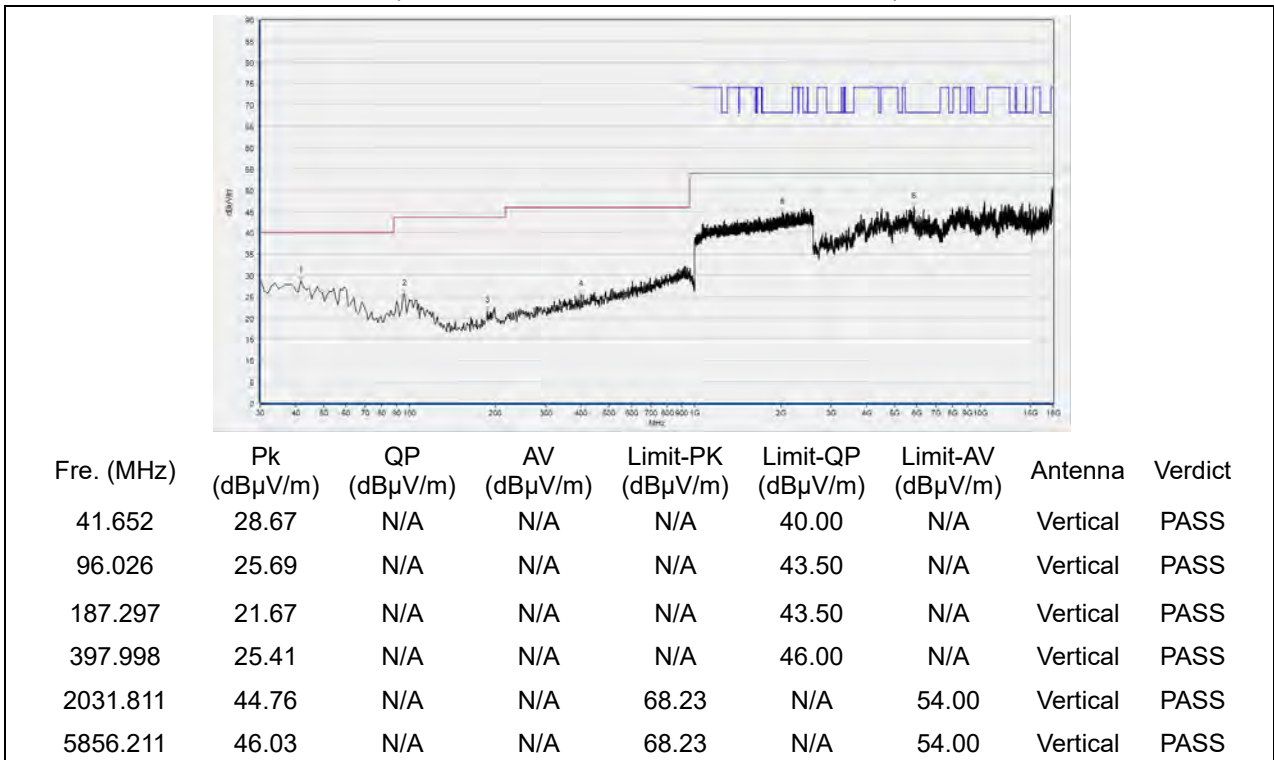


(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 52

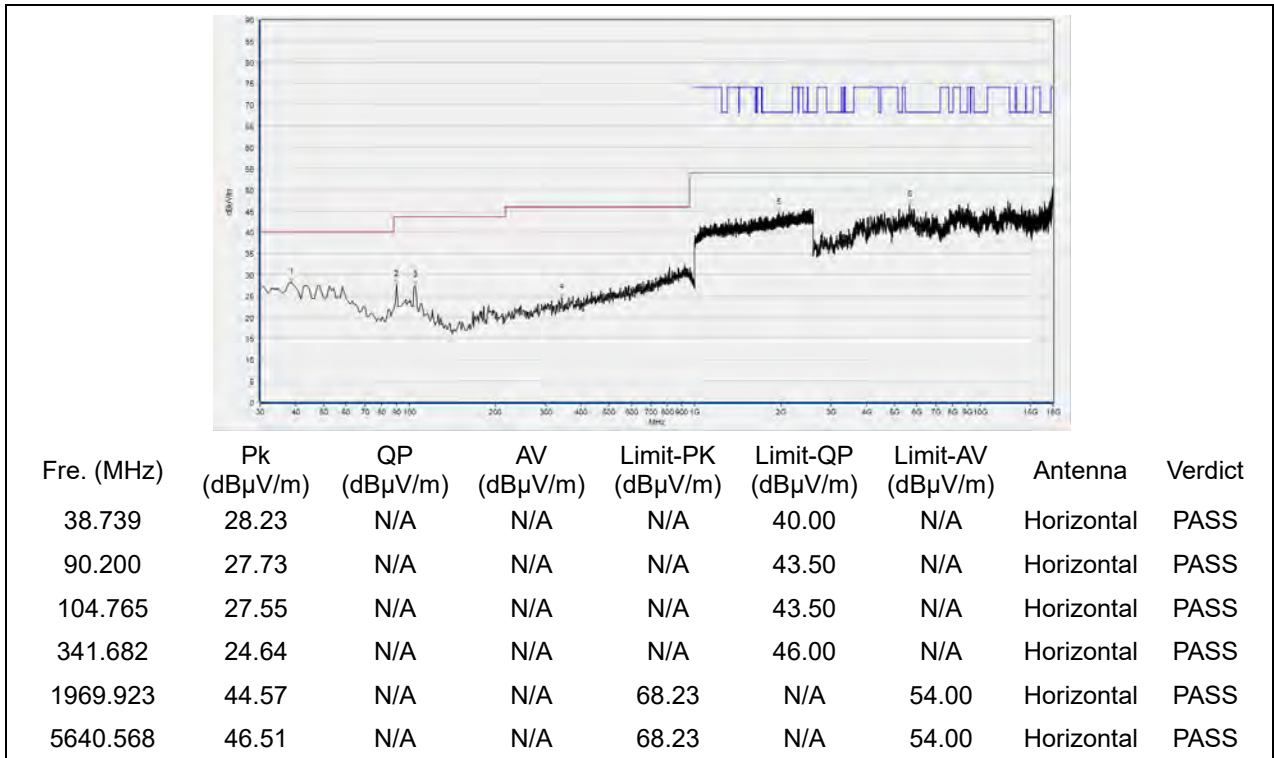


(Antenna Horizontal, 30MHz to 18GHz)

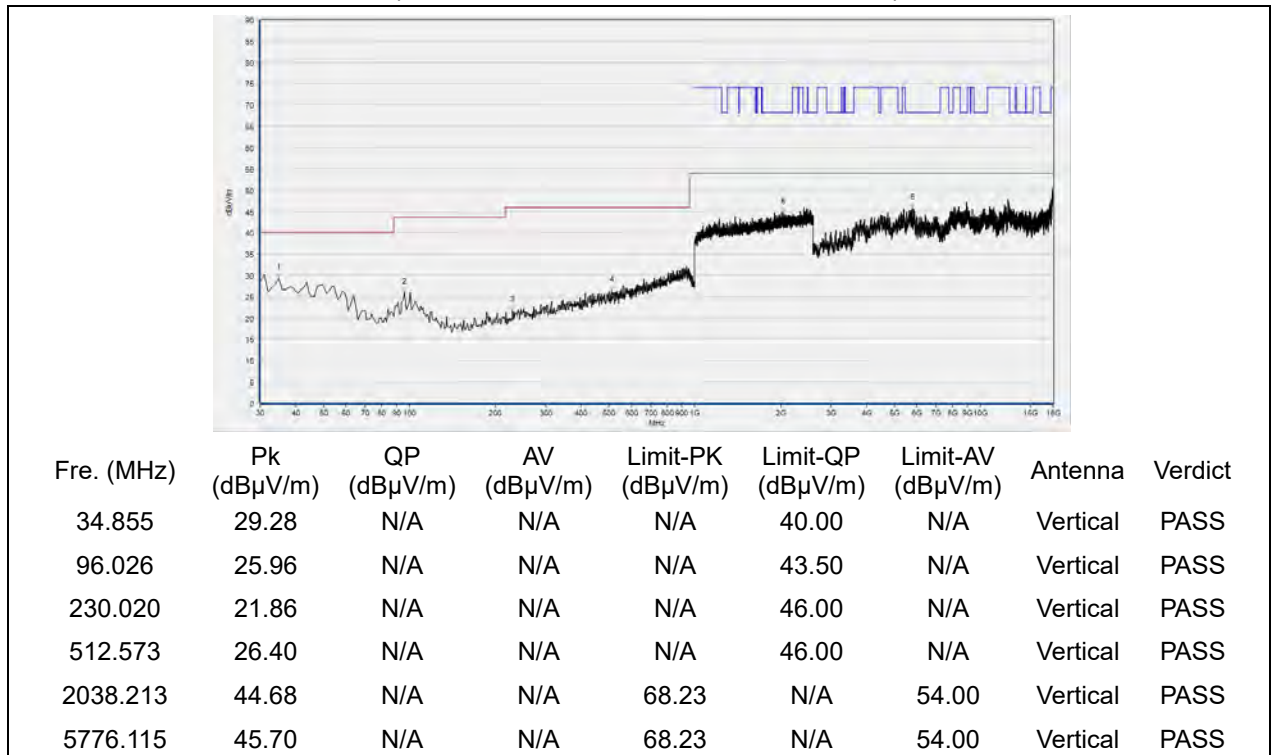


(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 60

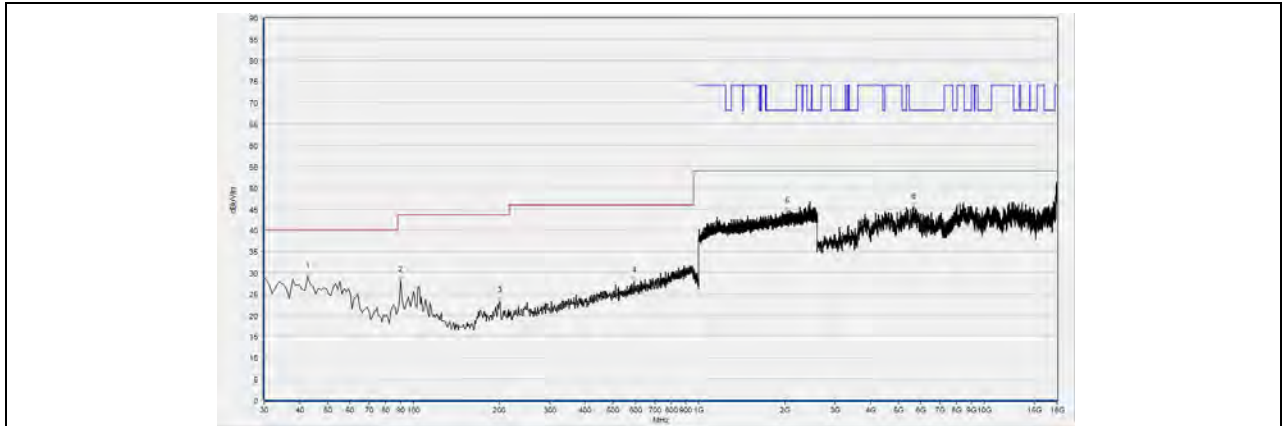


(Antenna Horizontal, 30MHz to 18GHz)



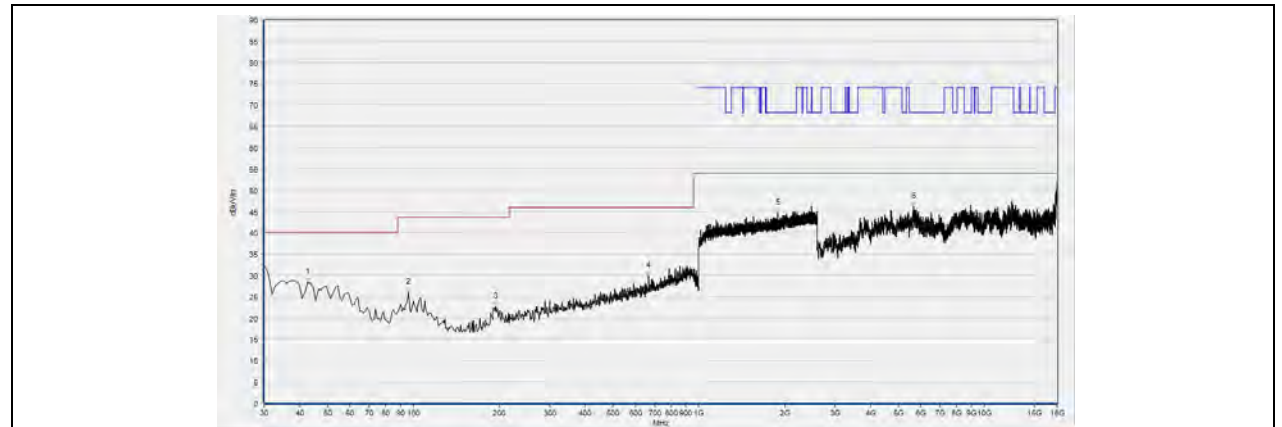
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 64



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
42.623	29.08	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
90.200	28.21	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
200.891	23.25	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
592.192	27.99	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
2040.880	44.41	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
5643.649	45.36	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS

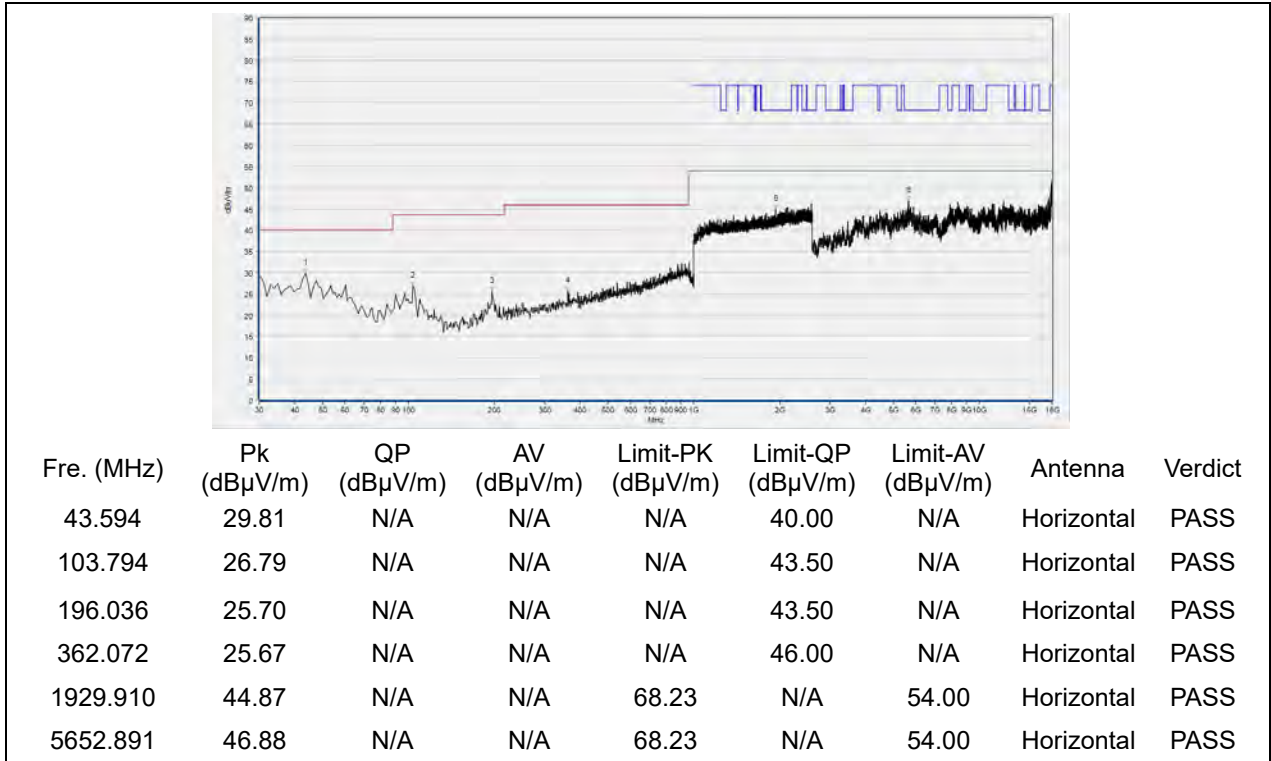
(Antenna Horizontal, 30MHz to 18GHz)



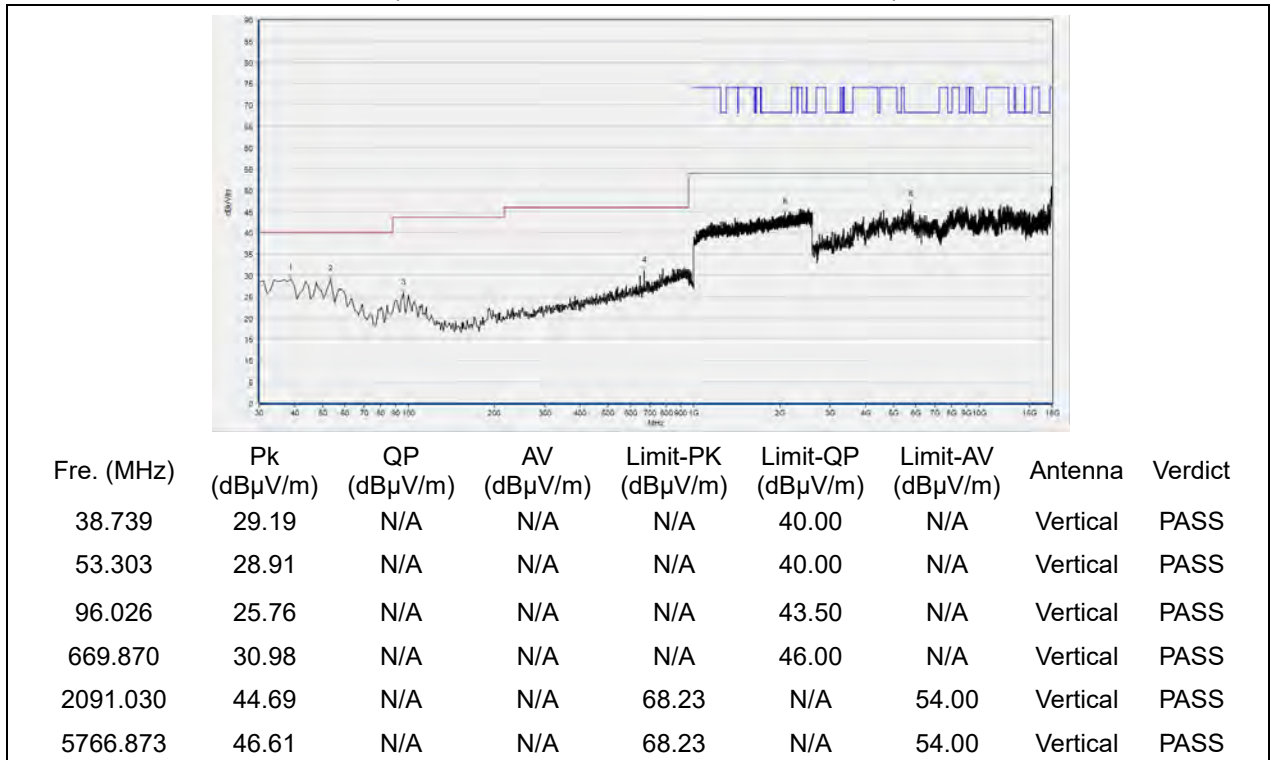
Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
42.623	28.25	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
96.026	26.04	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
194.094	22.62	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
667.928	29.87	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1894.165	44.58	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
5640.568	46.09	N/A	N/A	68.23	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 100

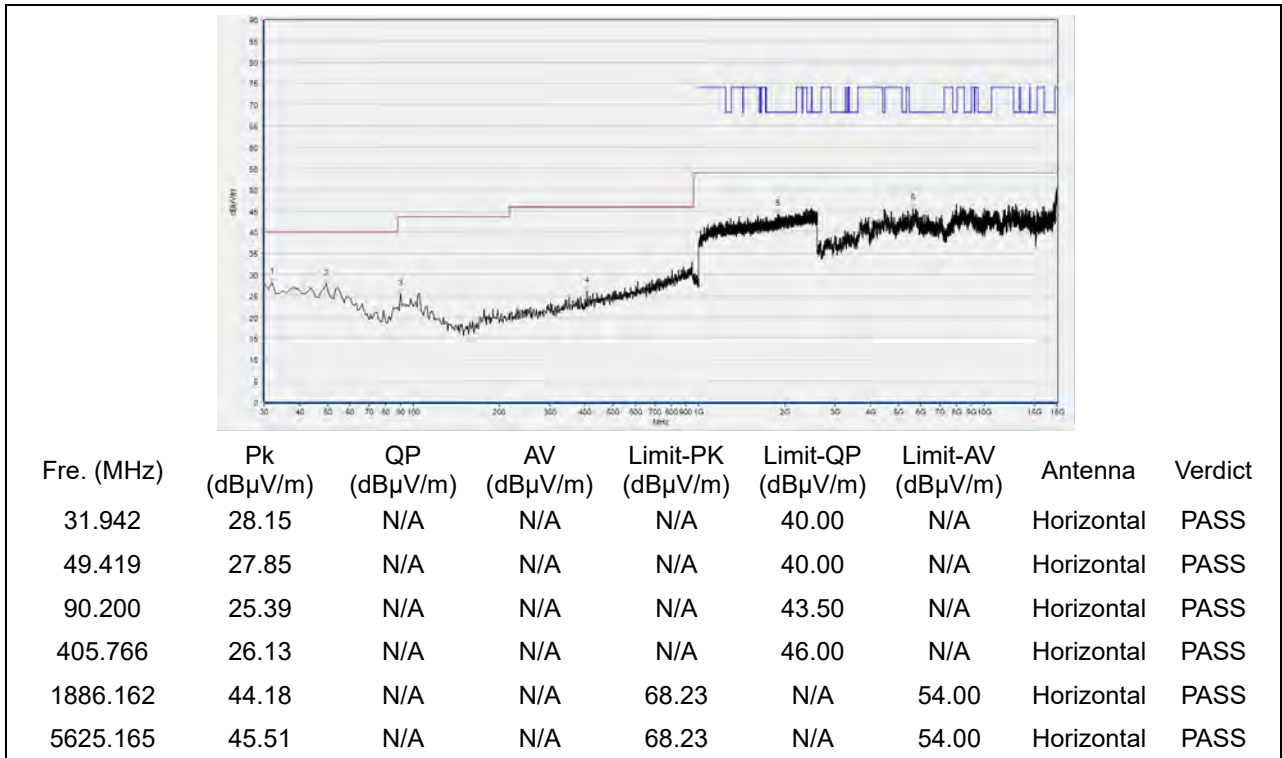


(Antenna Horizontal, 30MHz to 18GHz)

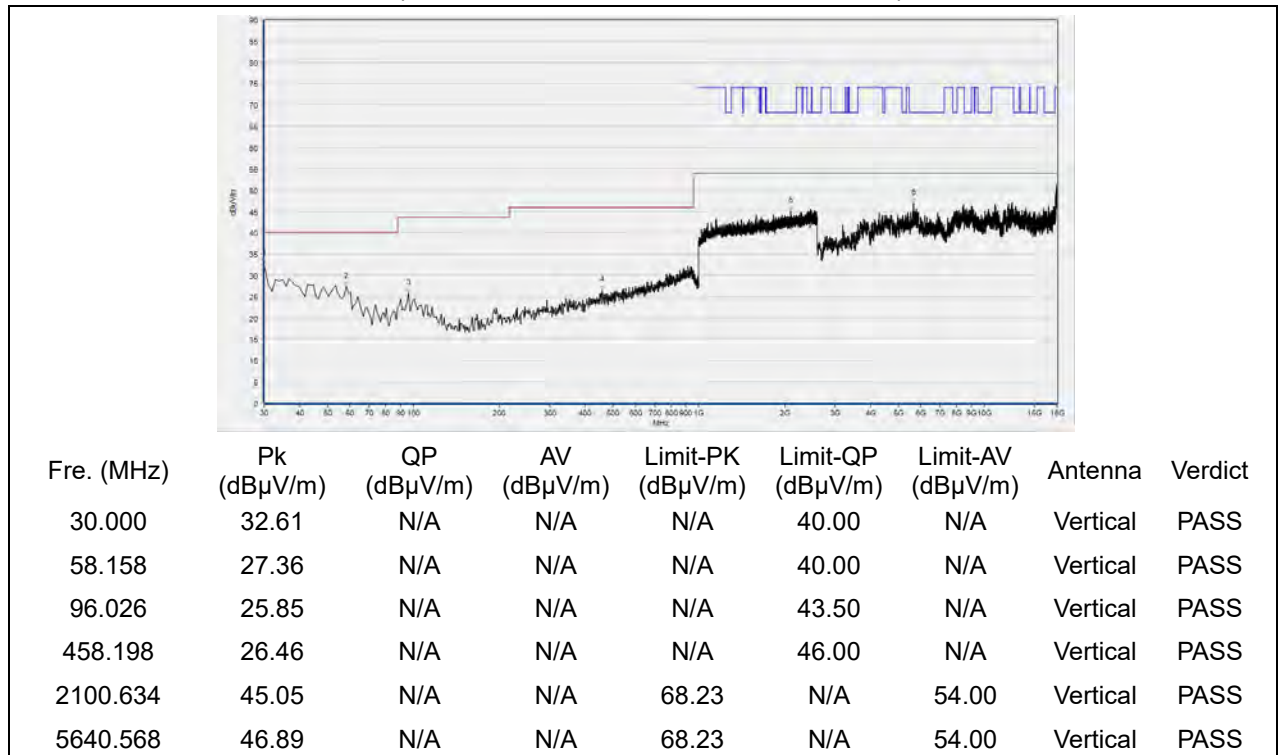


(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 120

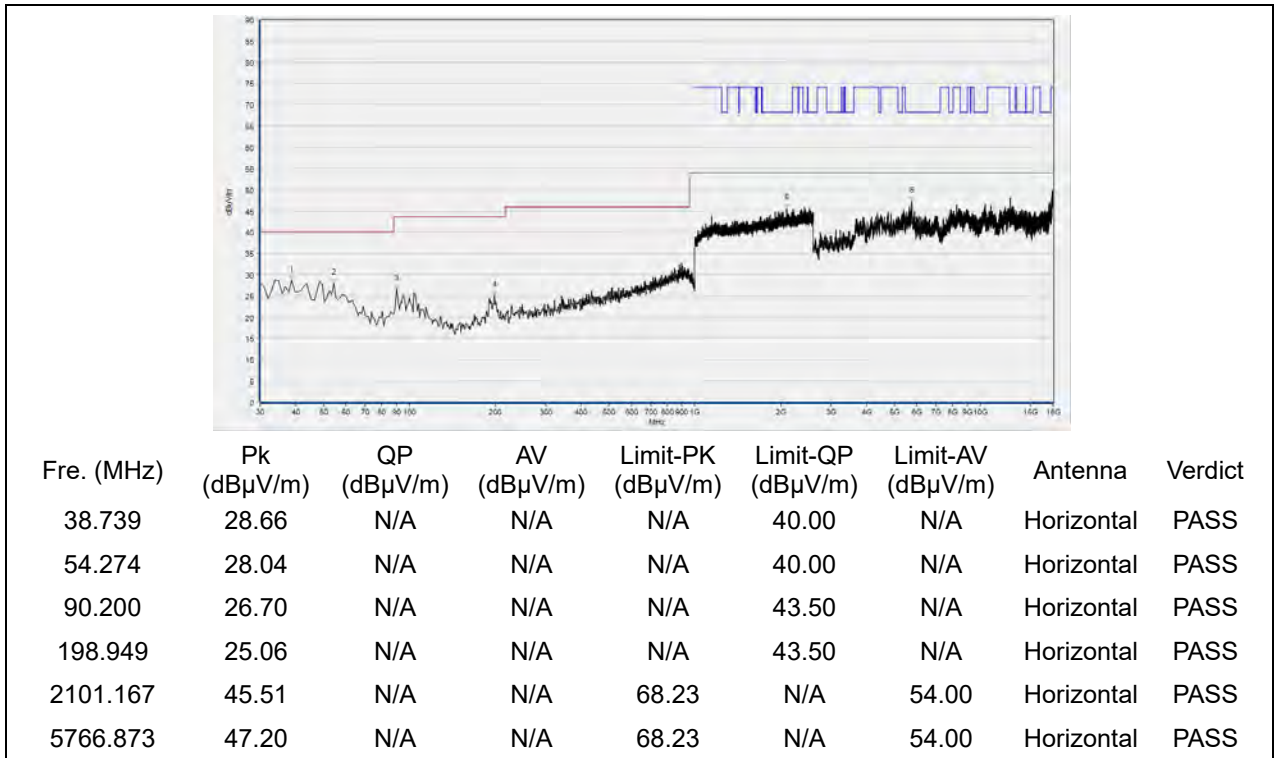


(Antenna Horizontal, 30MHz to 18GHz)

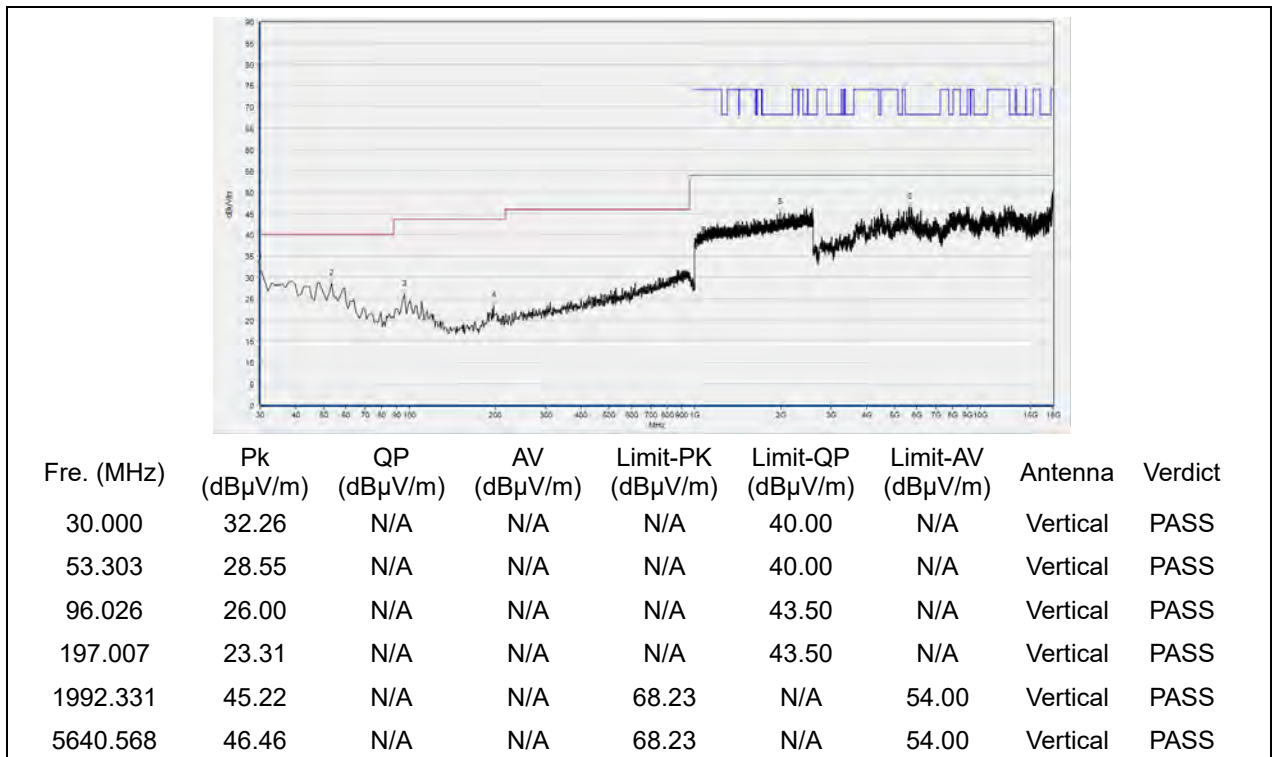


(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 144



(Antenna Horizontal, 30MHz to 18GHz)

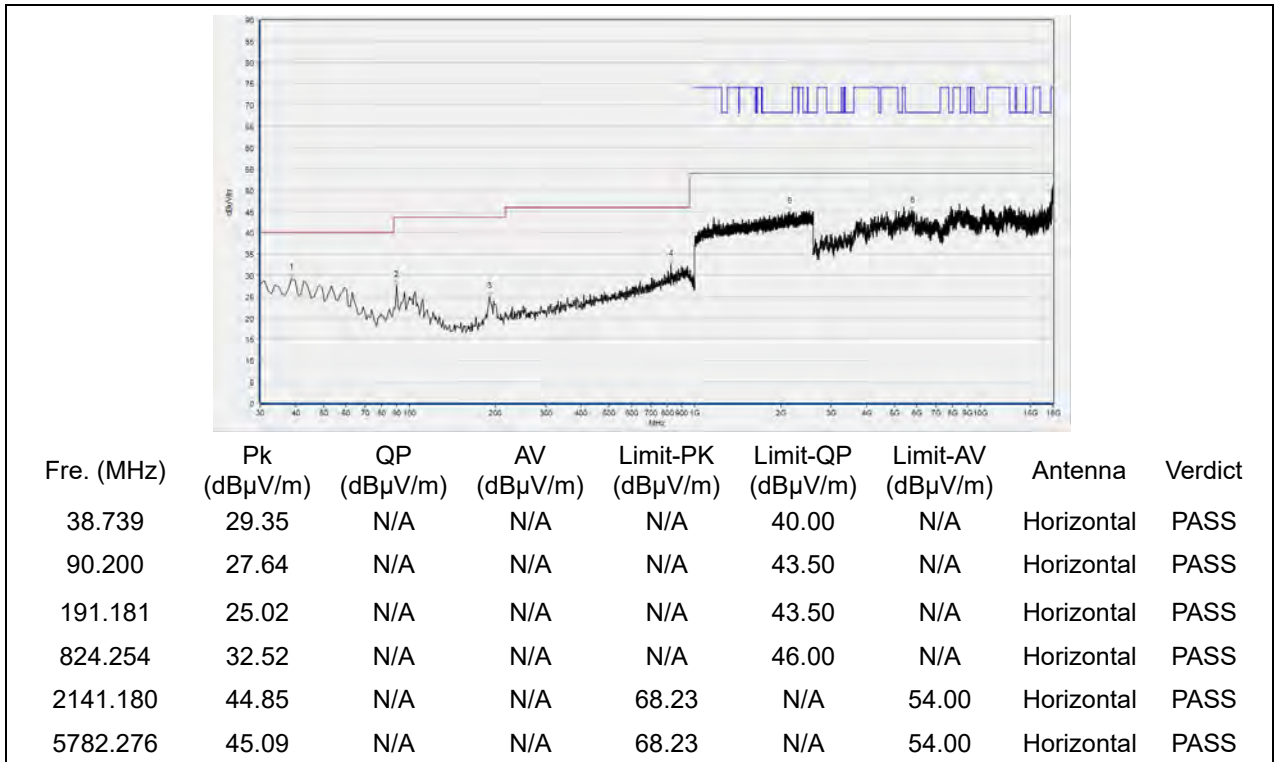


(Antenna Vertical, 30MHz to 18GHz)

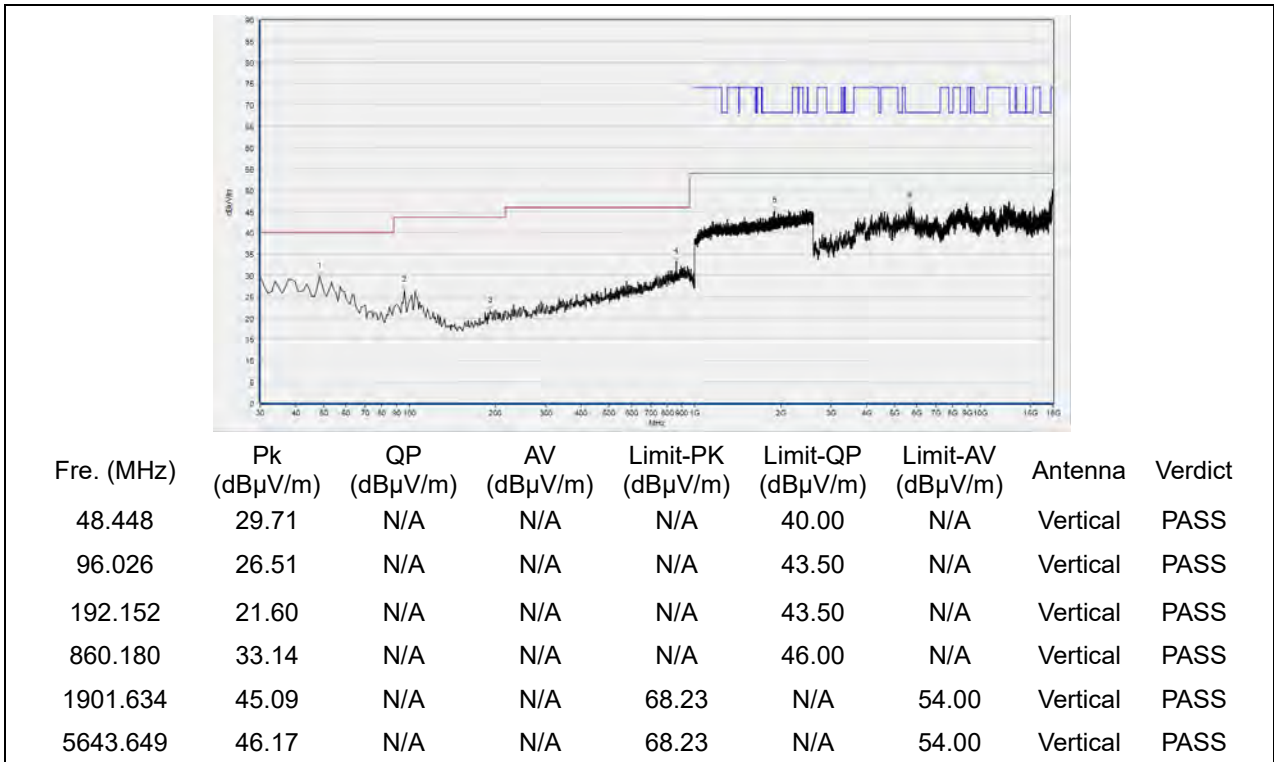


802.11n (HT20) Test mode

Plots for Channel = 36

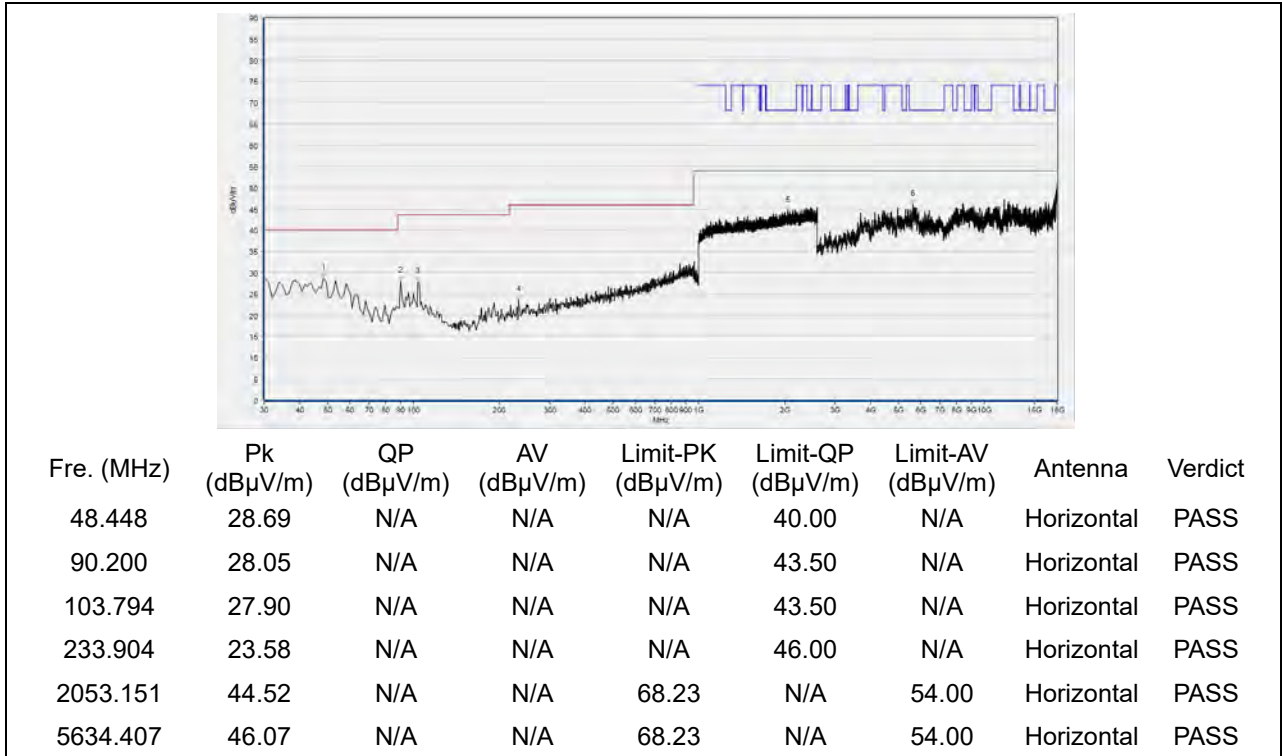


(Antenna Horizontal, 30MHz to 18GHz)

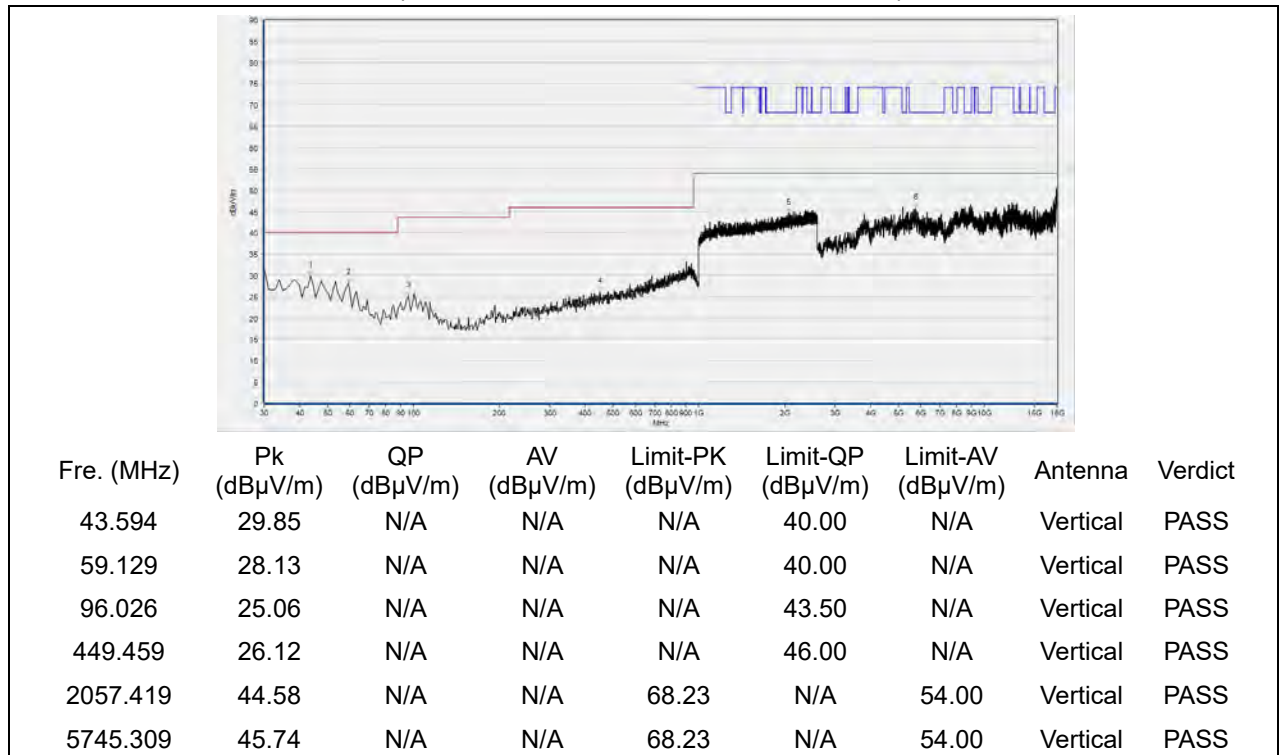


(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 44

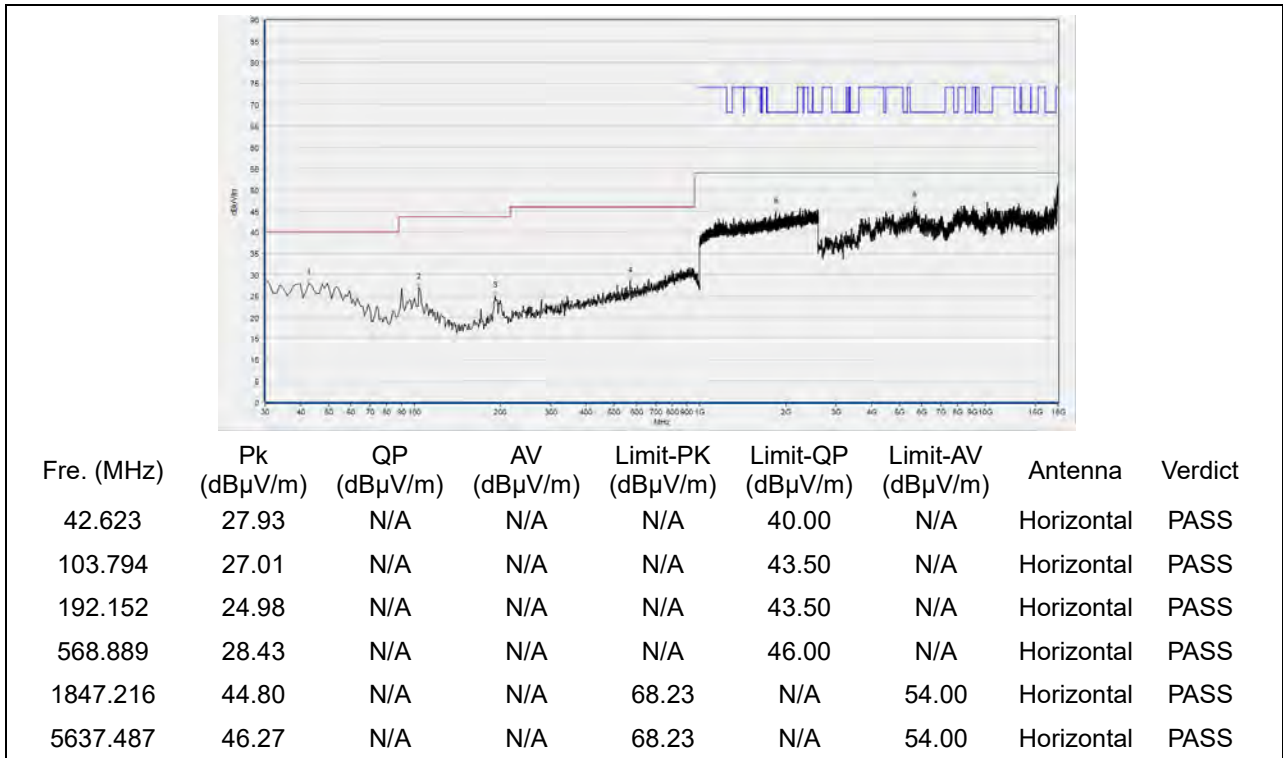


(Antenna Horizontal, 30MHz to 18GHz)

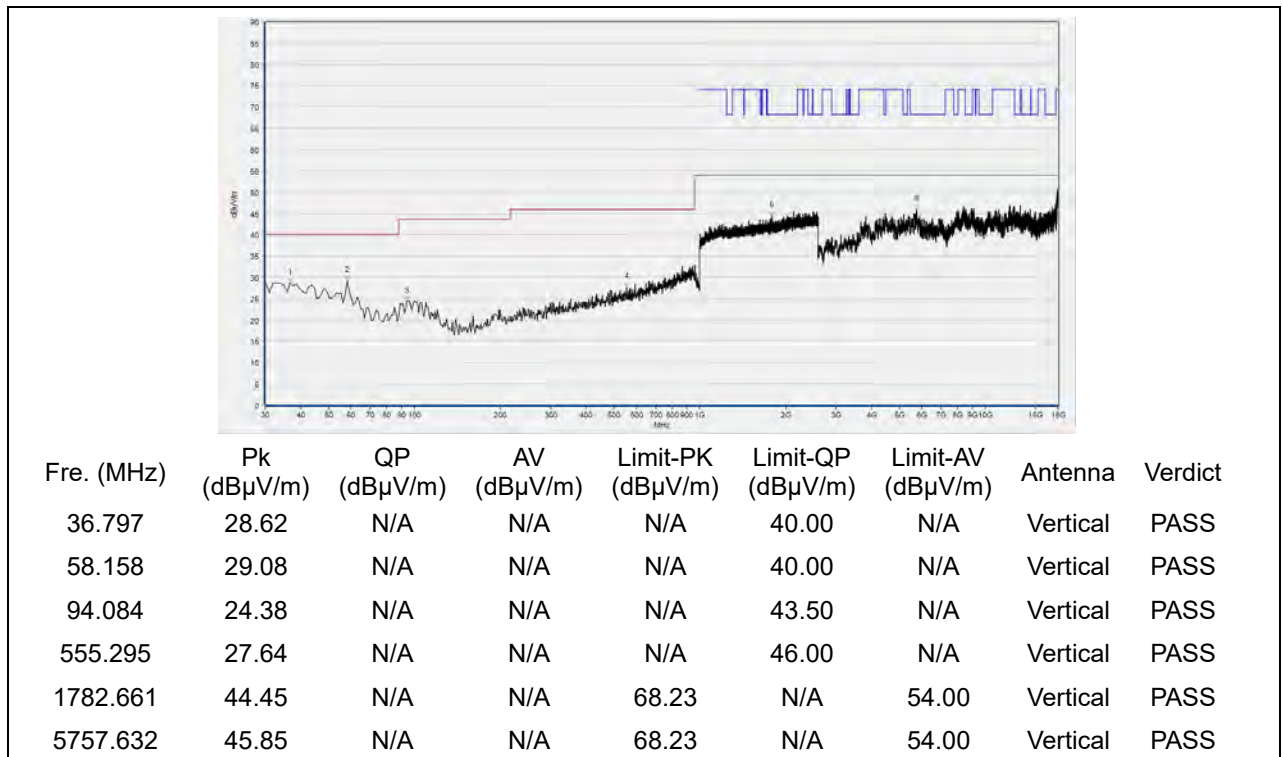


(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 48

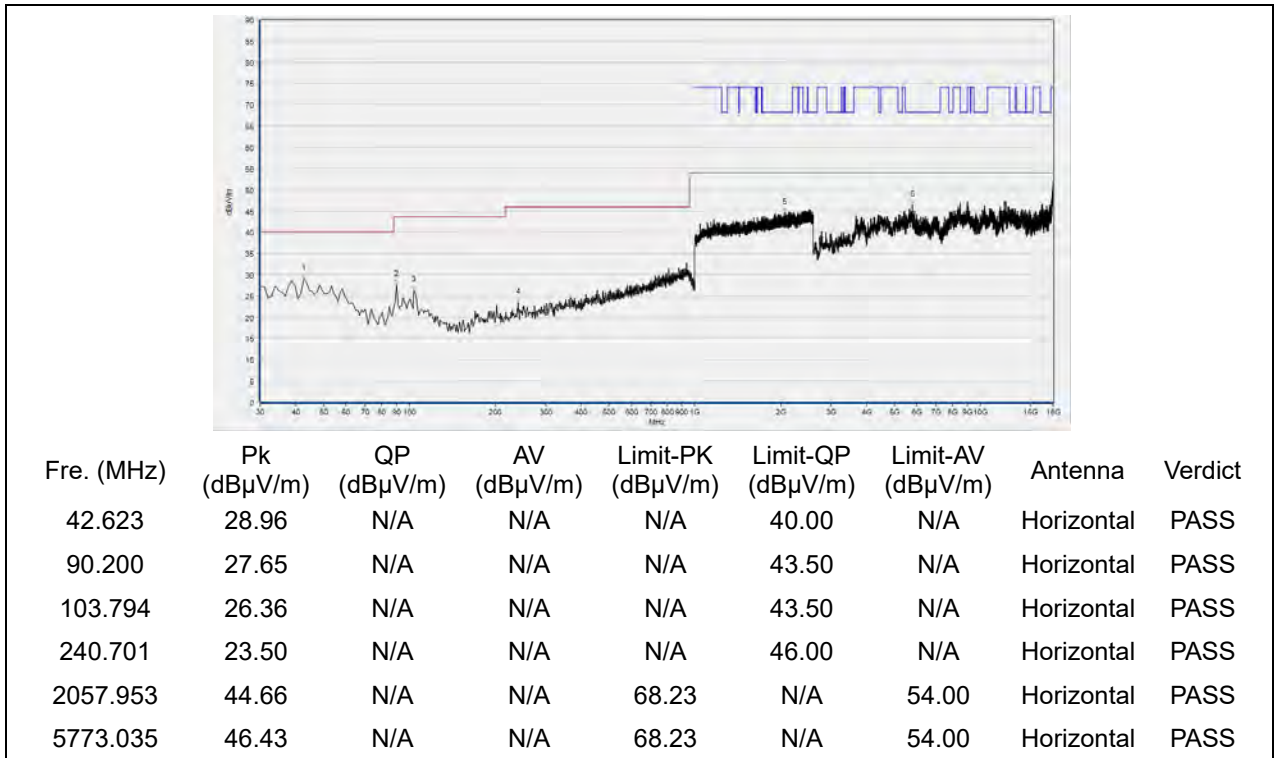


(Antenna Horizontal, 30MHz to 18GHz)

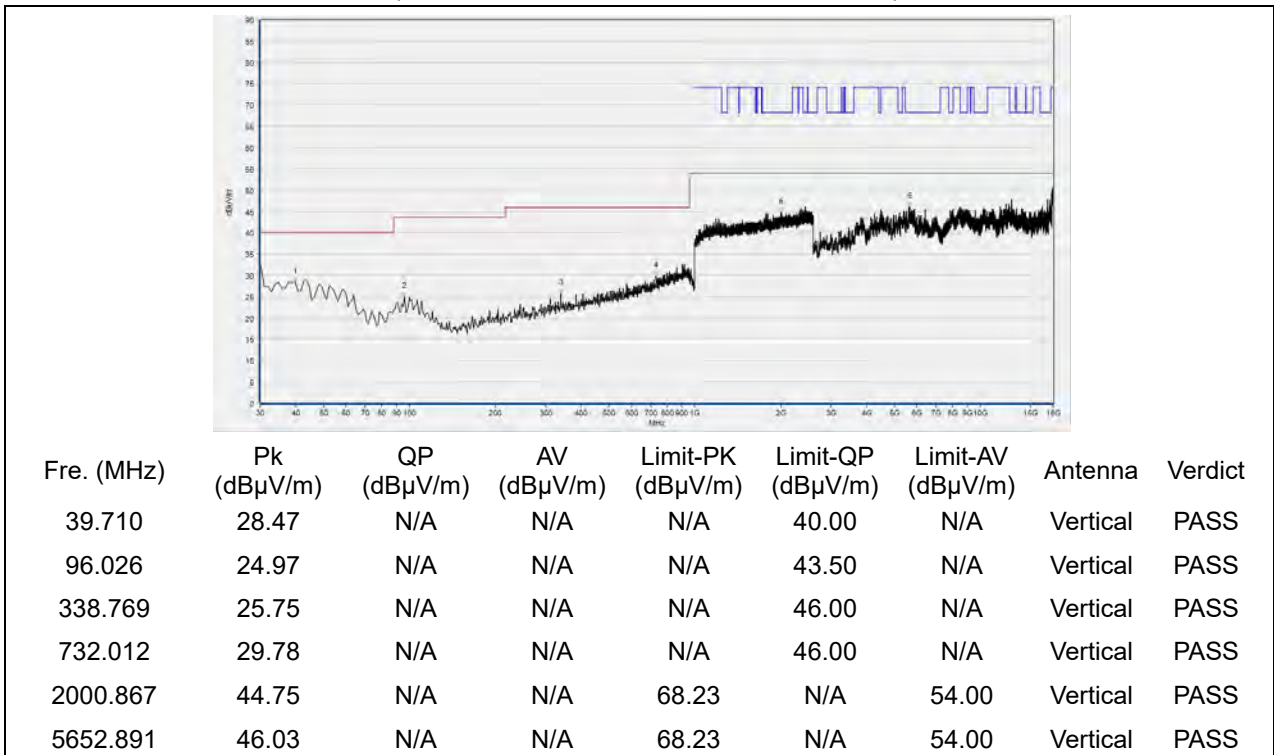


(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 52

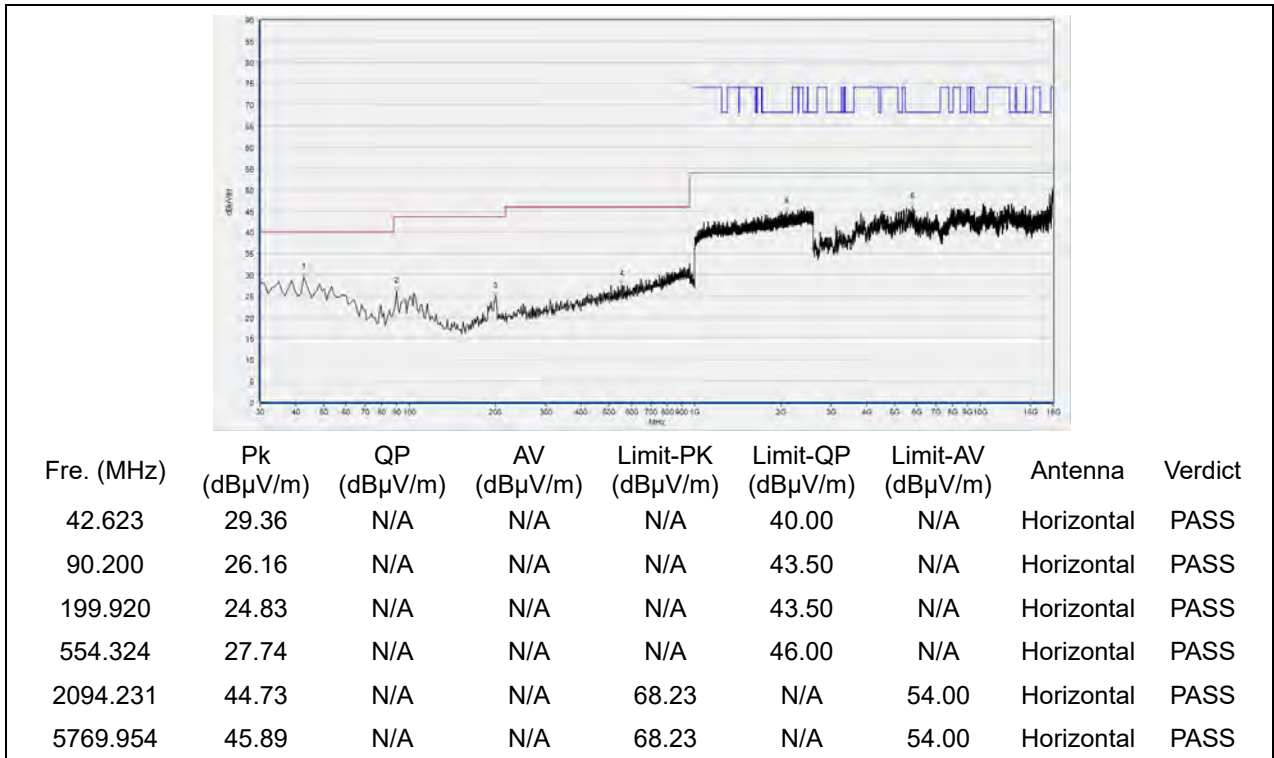


(Antenna Horizontal, 30MHz to 18GHz)

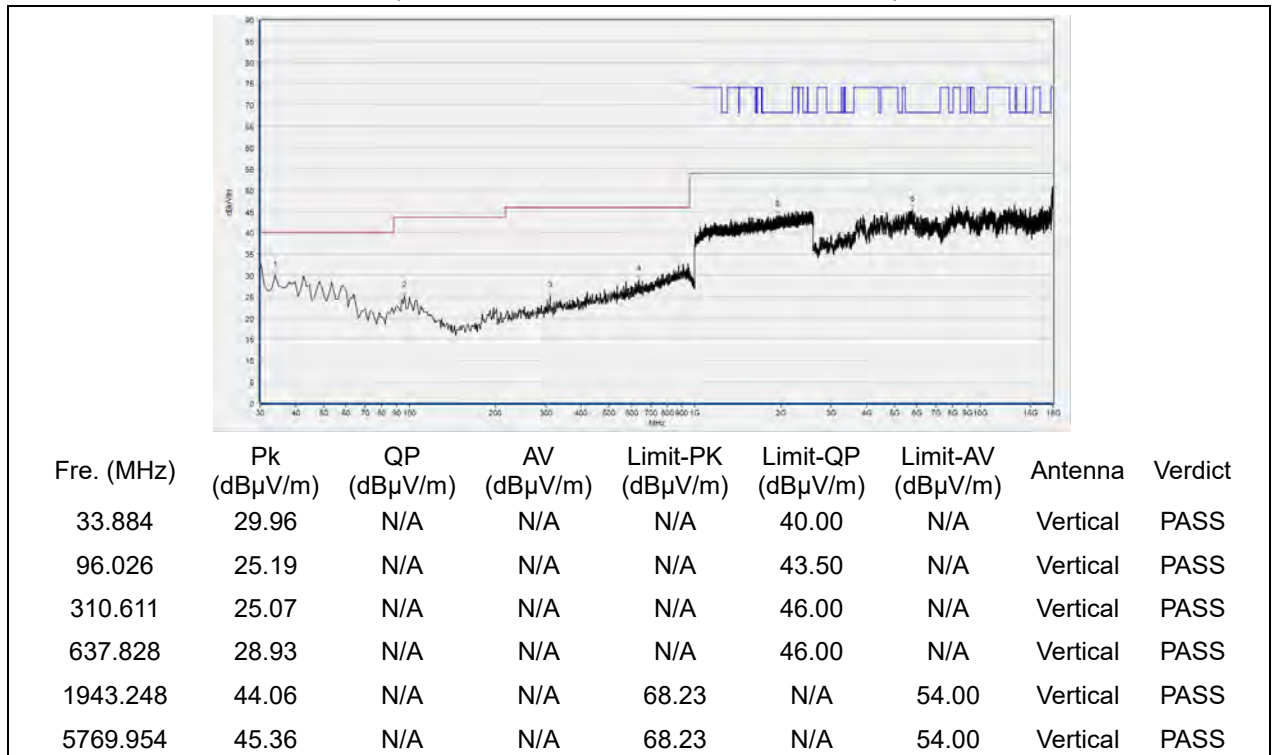


(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 60

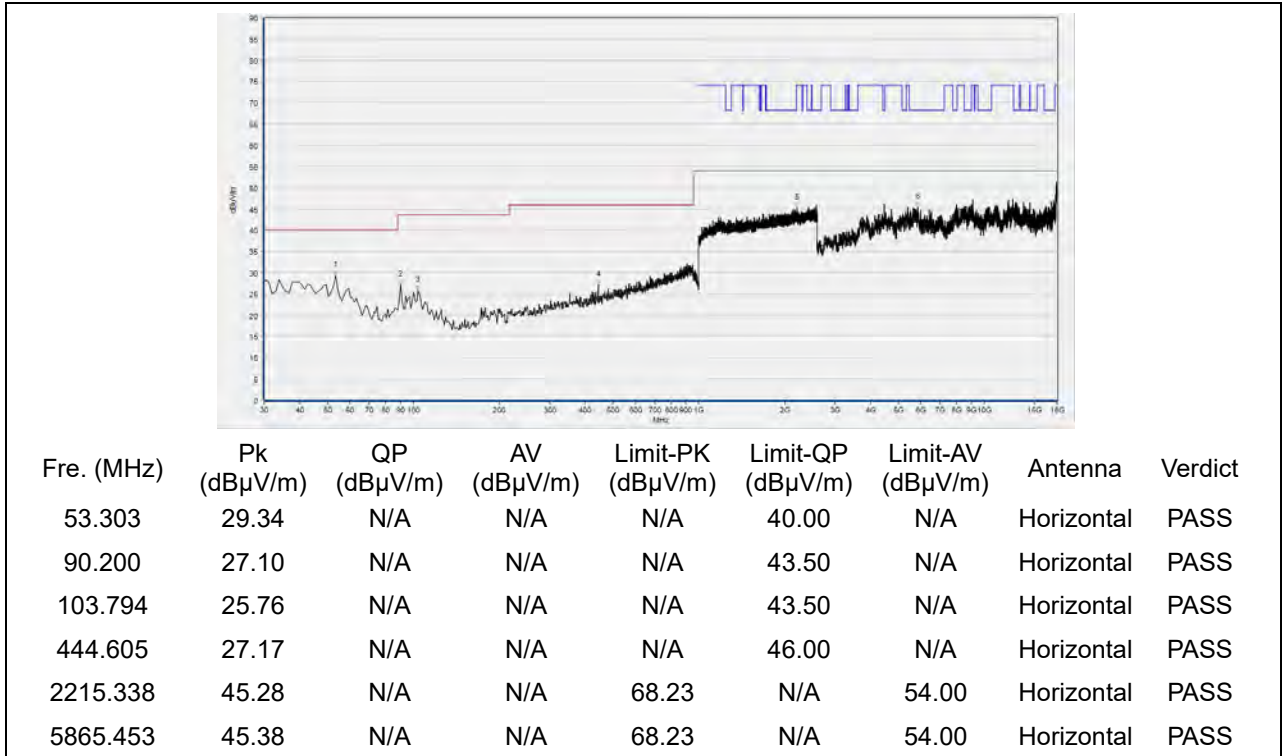


(Antenna Horizontal, 30MHz to 18GHz)

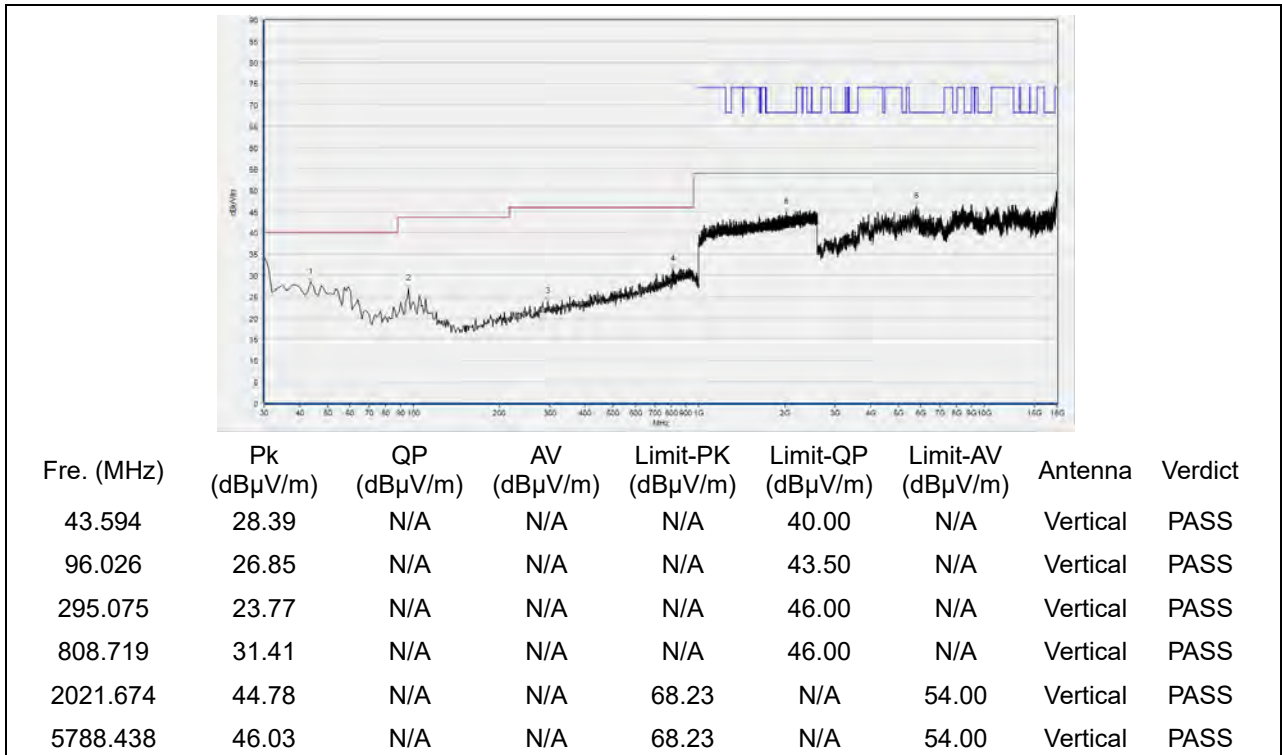


(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 64

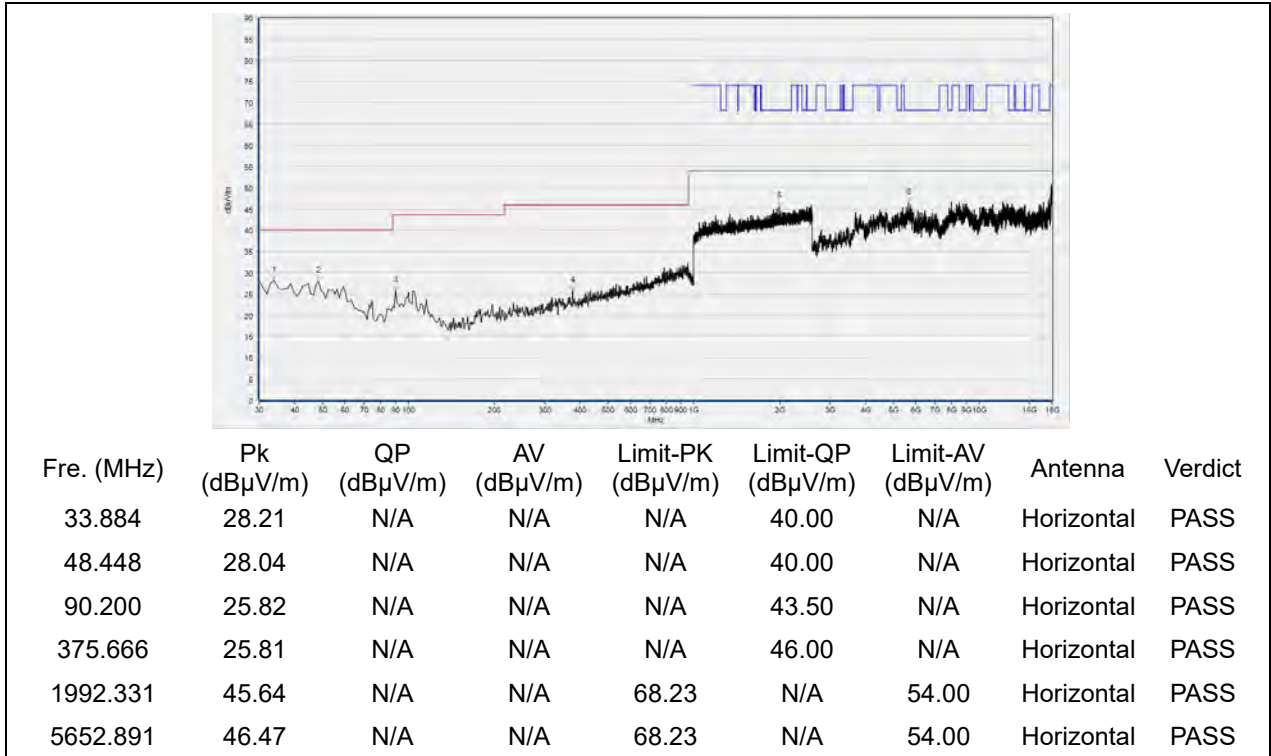


(Antenna Horizontal, 30MHz to 18GHz)

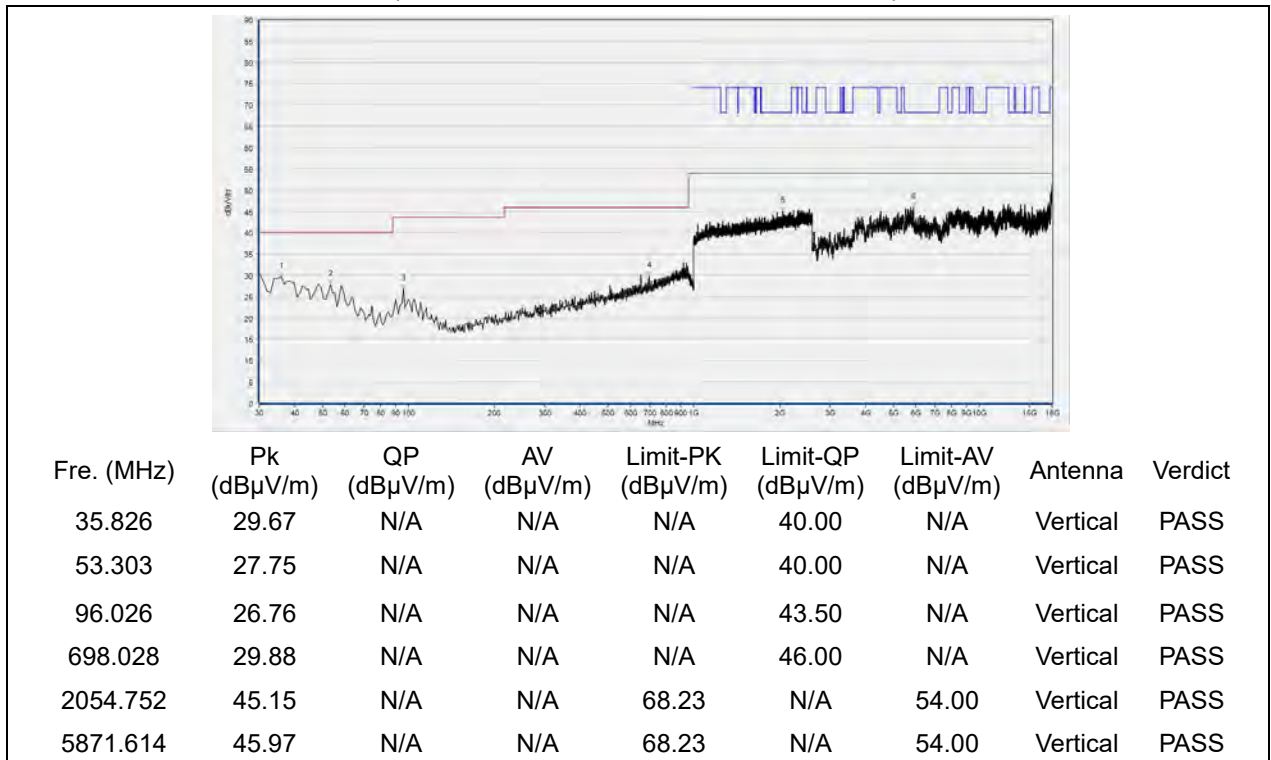


(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 100

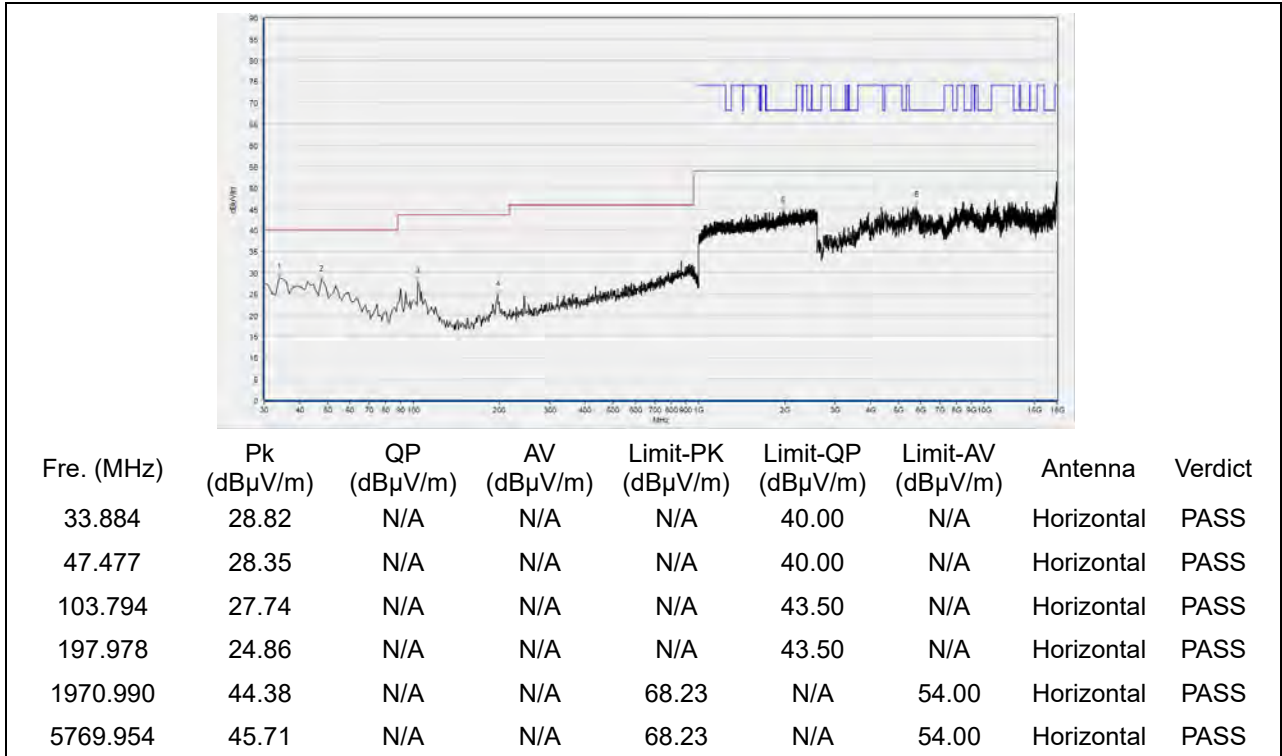


(Antenna Horizontal, 30MHz to 18GHz)

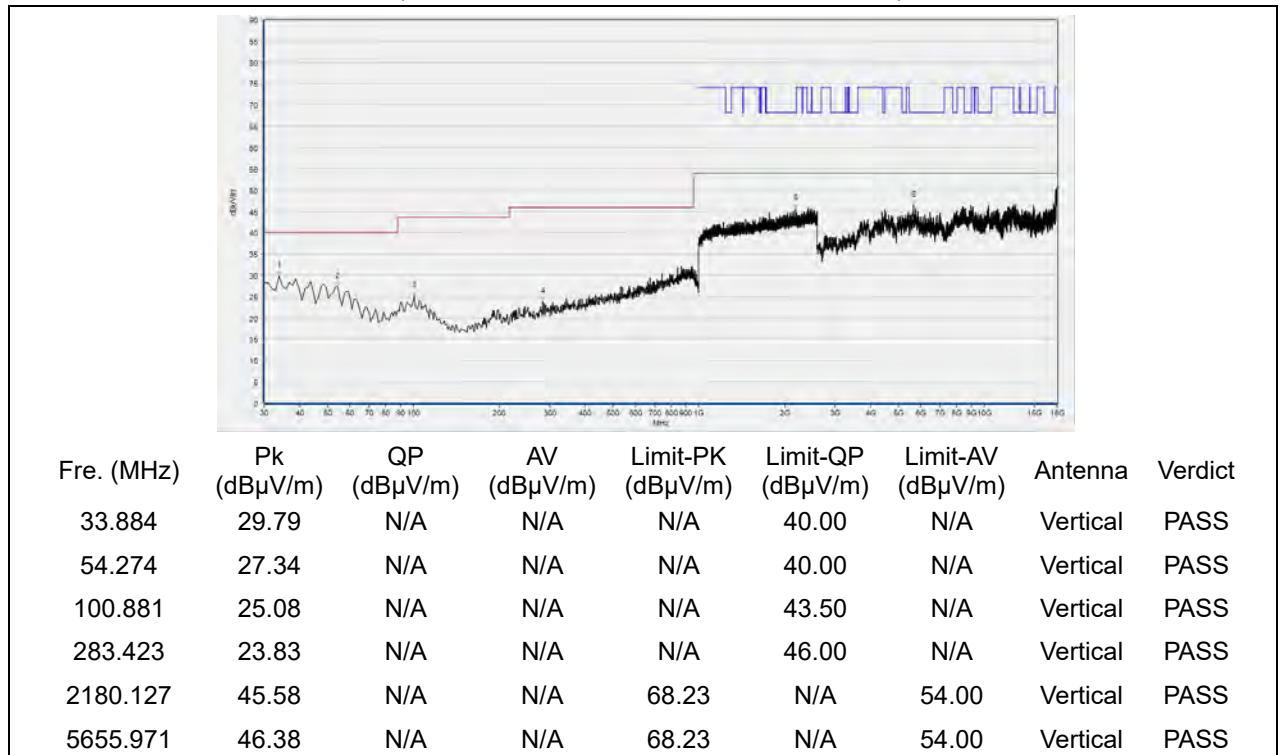


(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 120

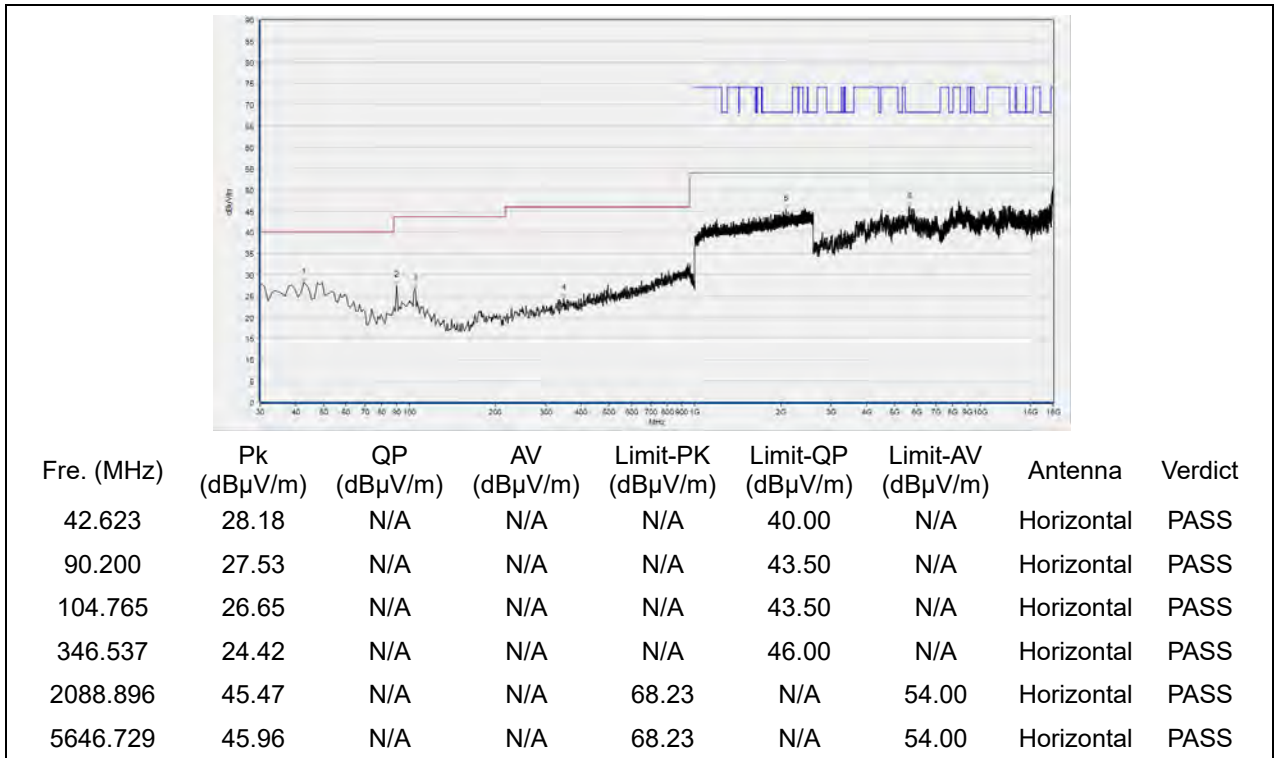


(Antenna Horizontal, 30MHz to 18GHz)

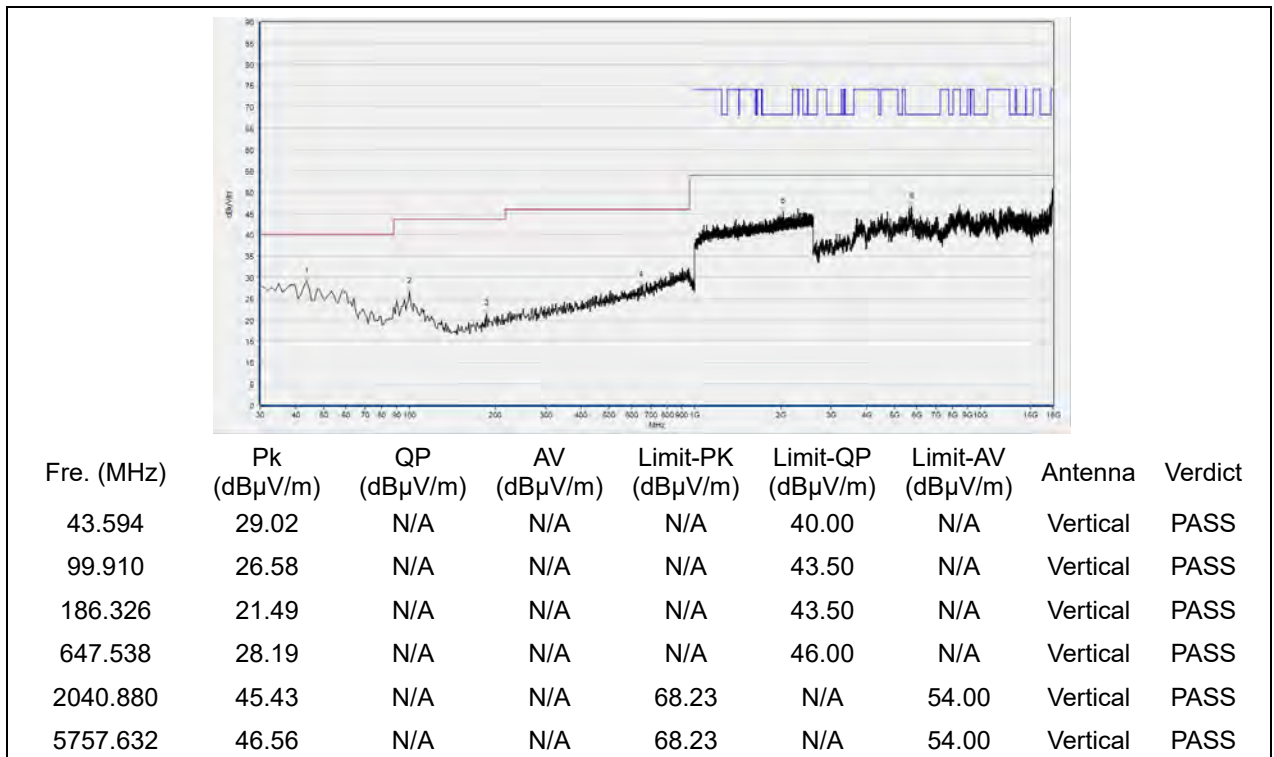


(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 144



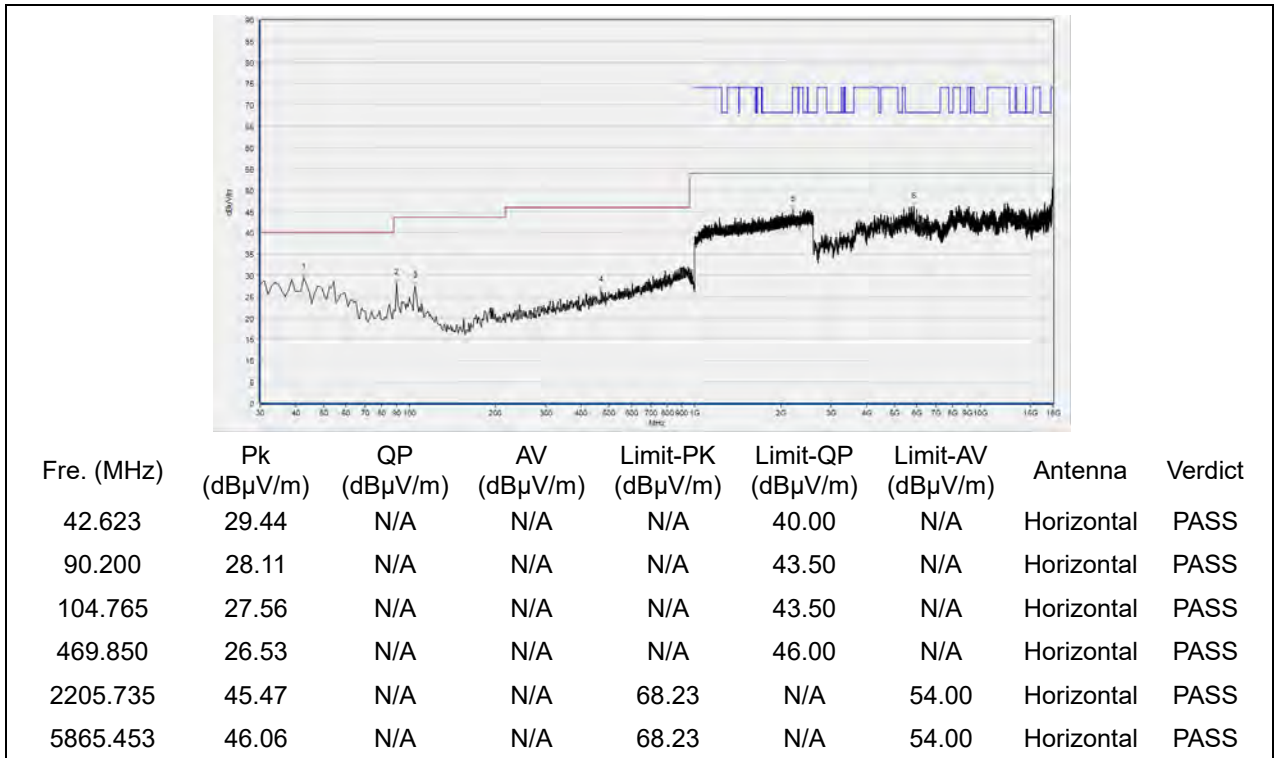
(Antenna Horizontal, 30MHz to 18GHz)



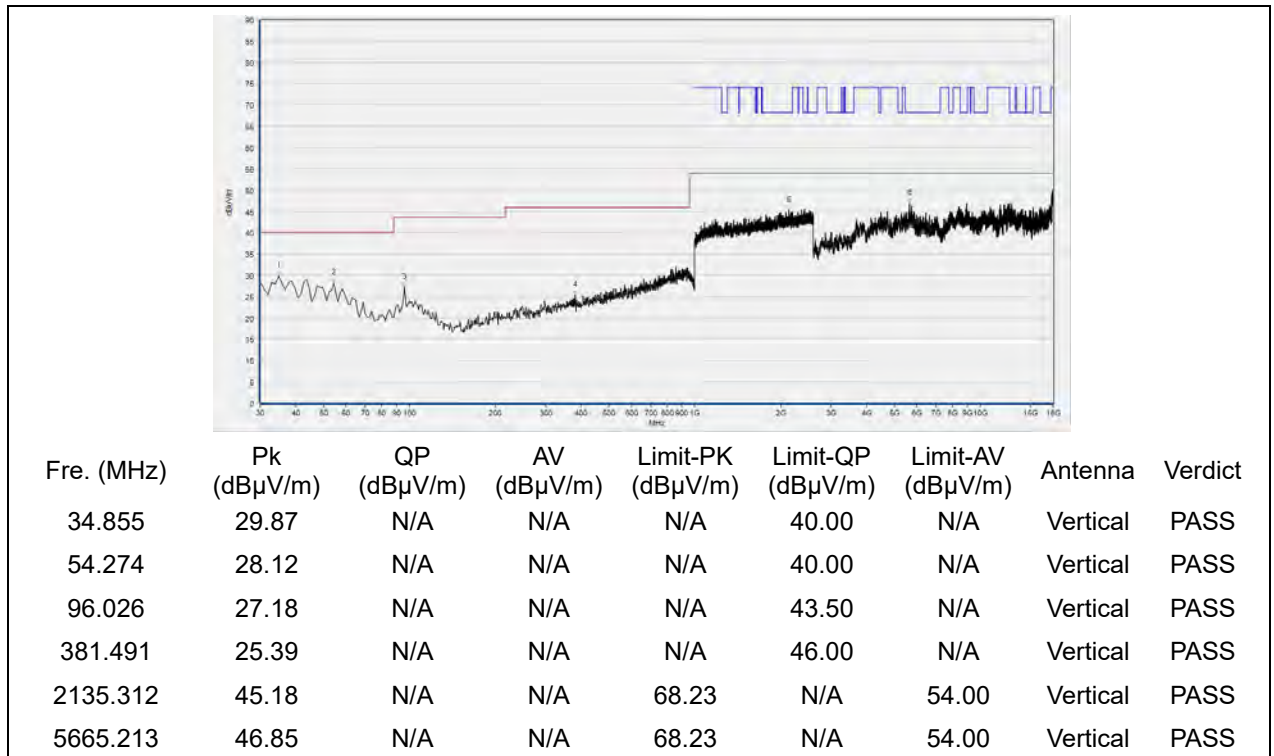
(Antenna Vertical, 30MHz to 18GHz)

802.11n (HT40) Test mode

Plots for Channel = 38

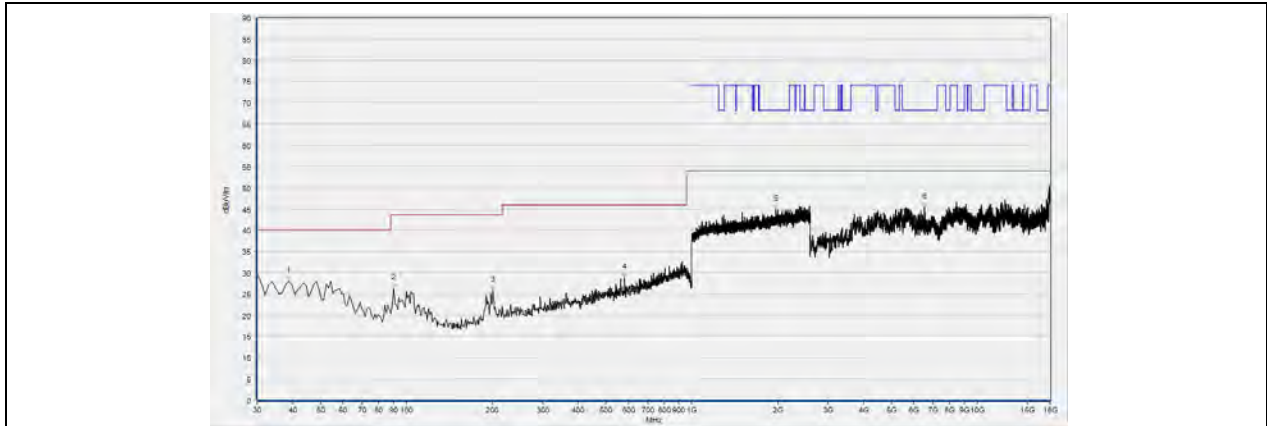


(Antenna Horizontal, 30MHz to 18GHz)



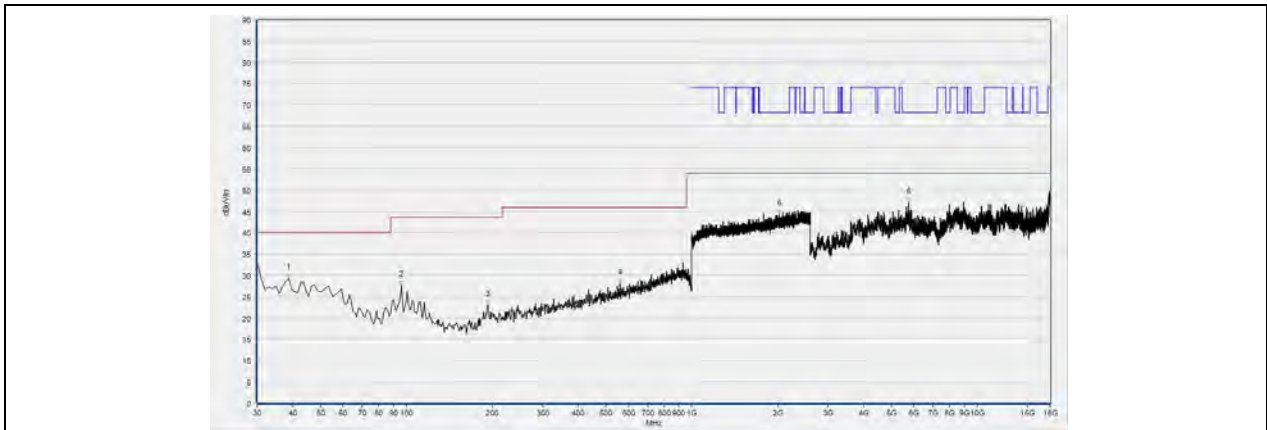
(Antenna Vertical, 30MHz to 18GHz)

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
38.739	28.00	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
90.200	26.36	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
200.891	25.82	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
581.512	28.76	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1972.591	44.95	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
6524.705	45.42	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS

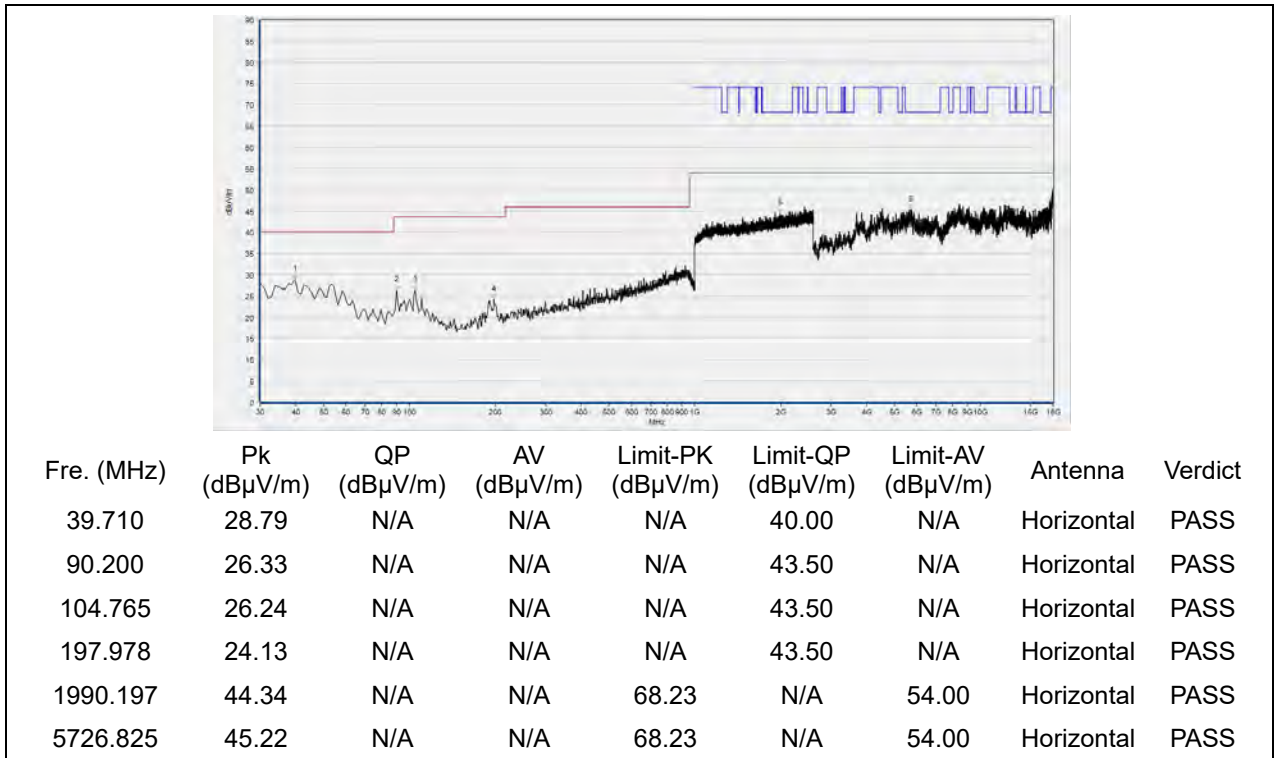
(Antenna Horizontal, 30MHz to 18GHz)



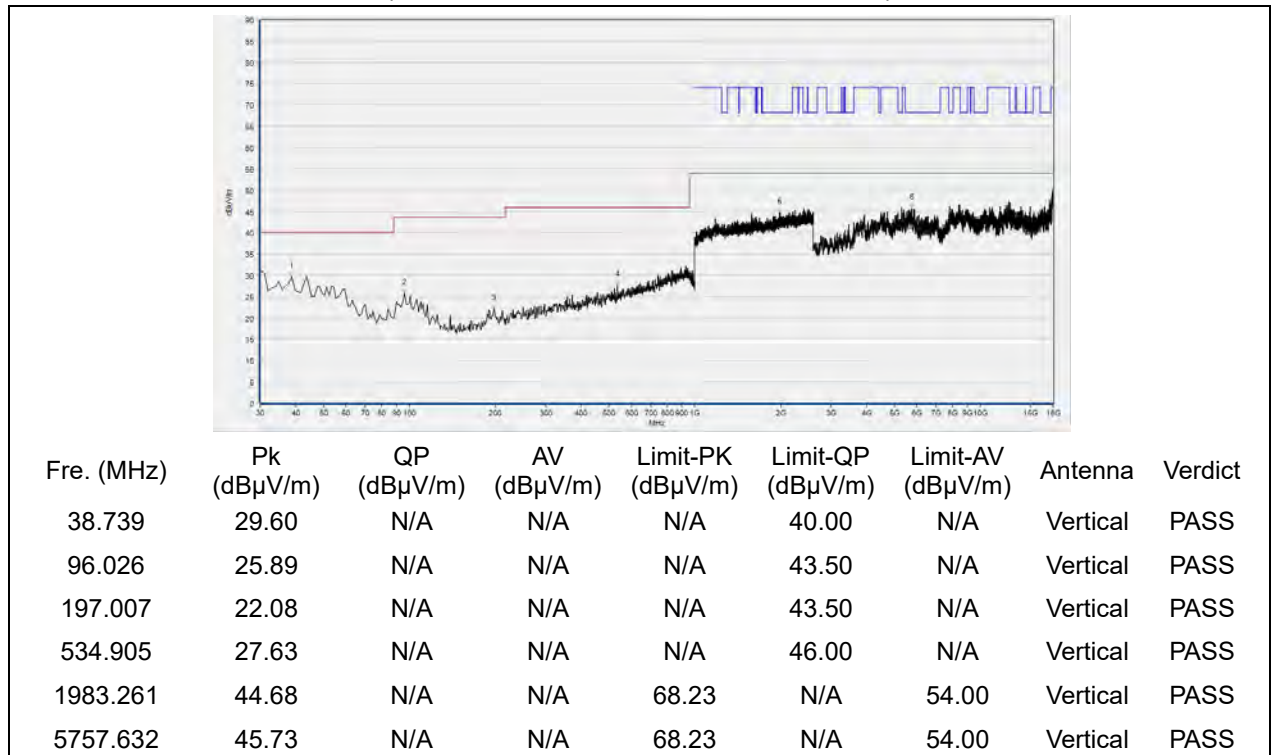
Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
38.739	29.30	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
96.026	27.62	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
193.123	23.06	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
561.121	28.10	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2027.009	44.41	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
5754.551	47.08	N/A	N/A	68.23	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 54

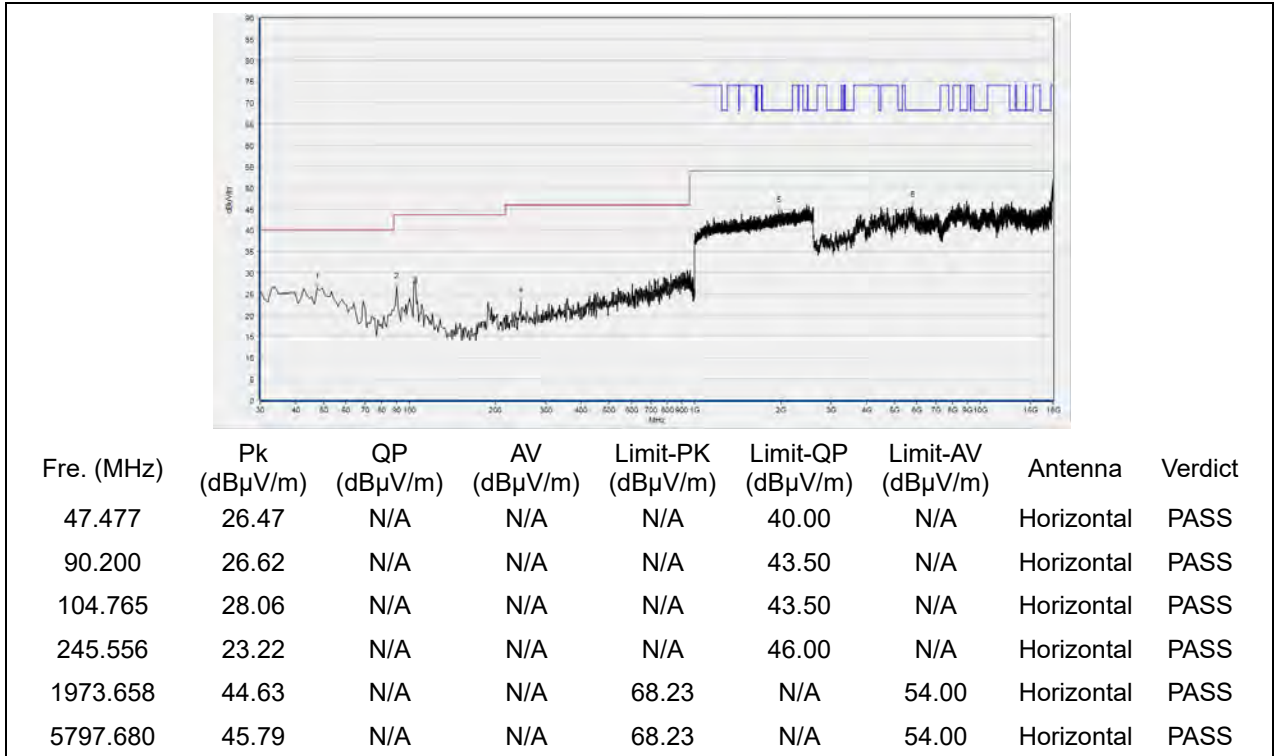


(Antenna Horizontal, 30MHz to 18GHz)

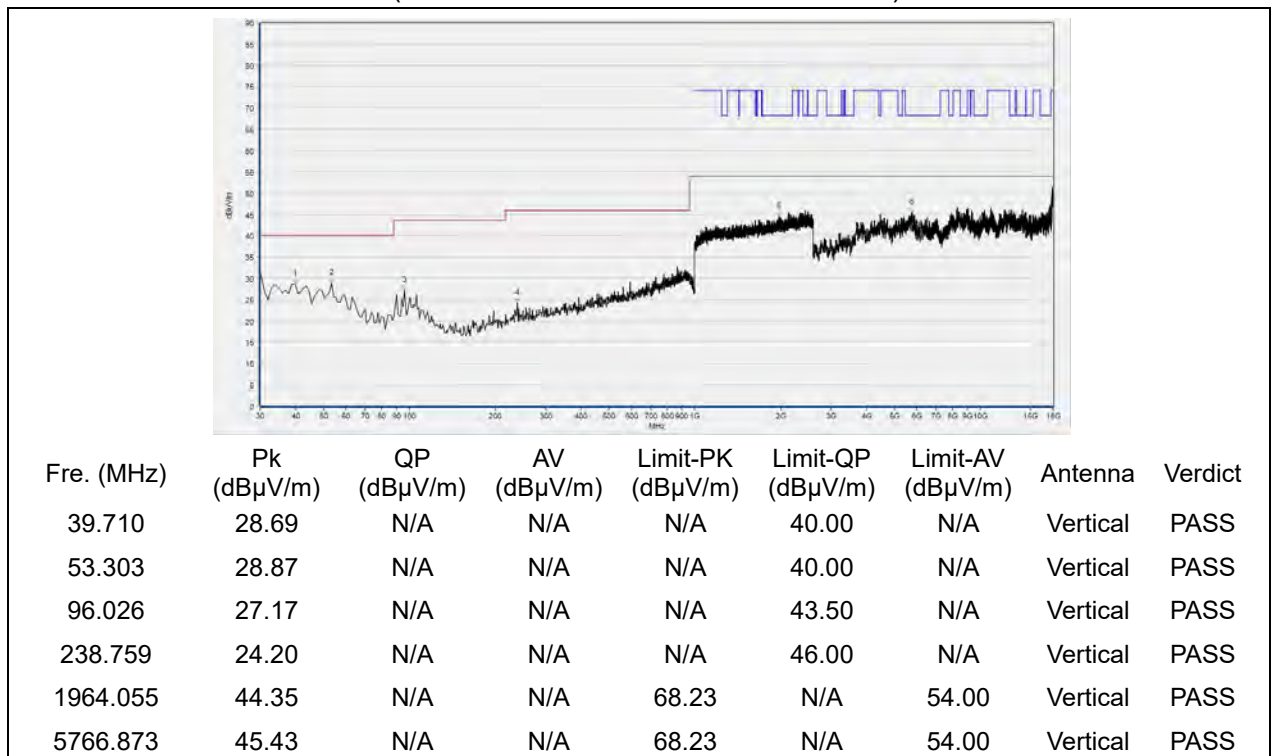


(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 62

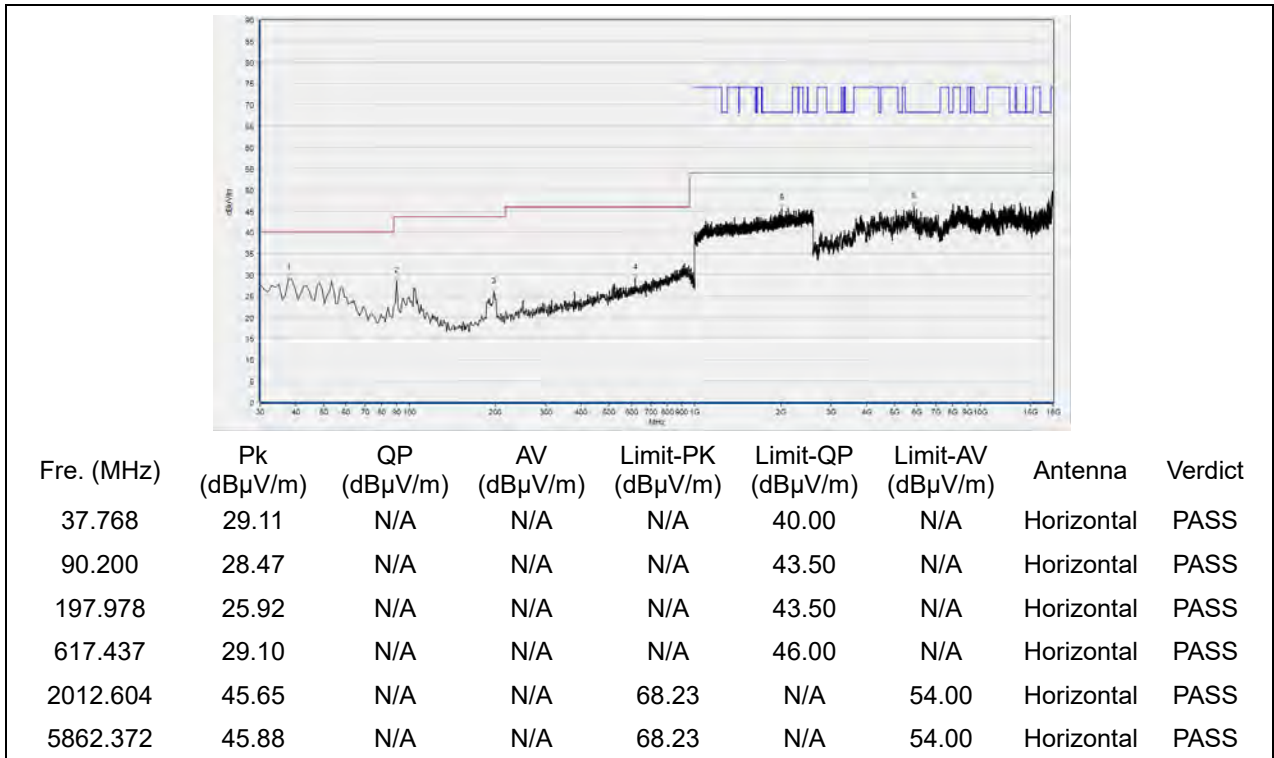


(Antenna Horizontal, 30MHz to 18GHz)

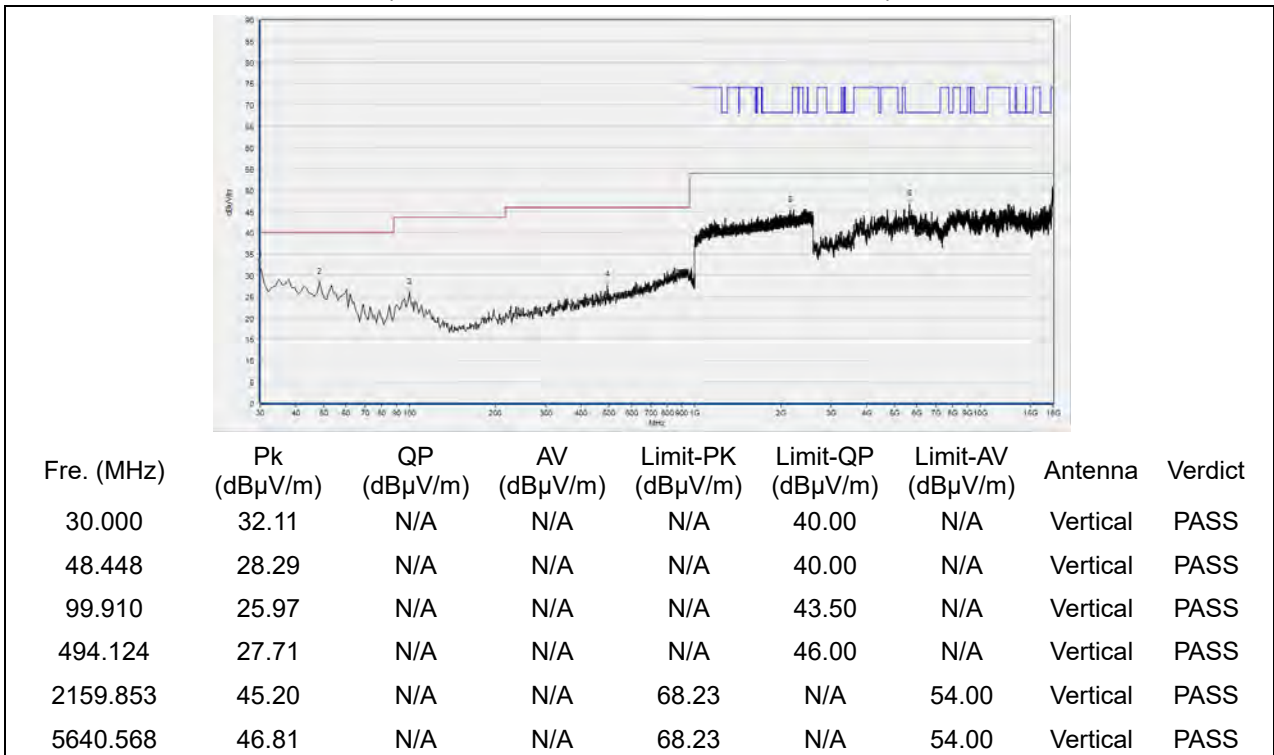


(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 102

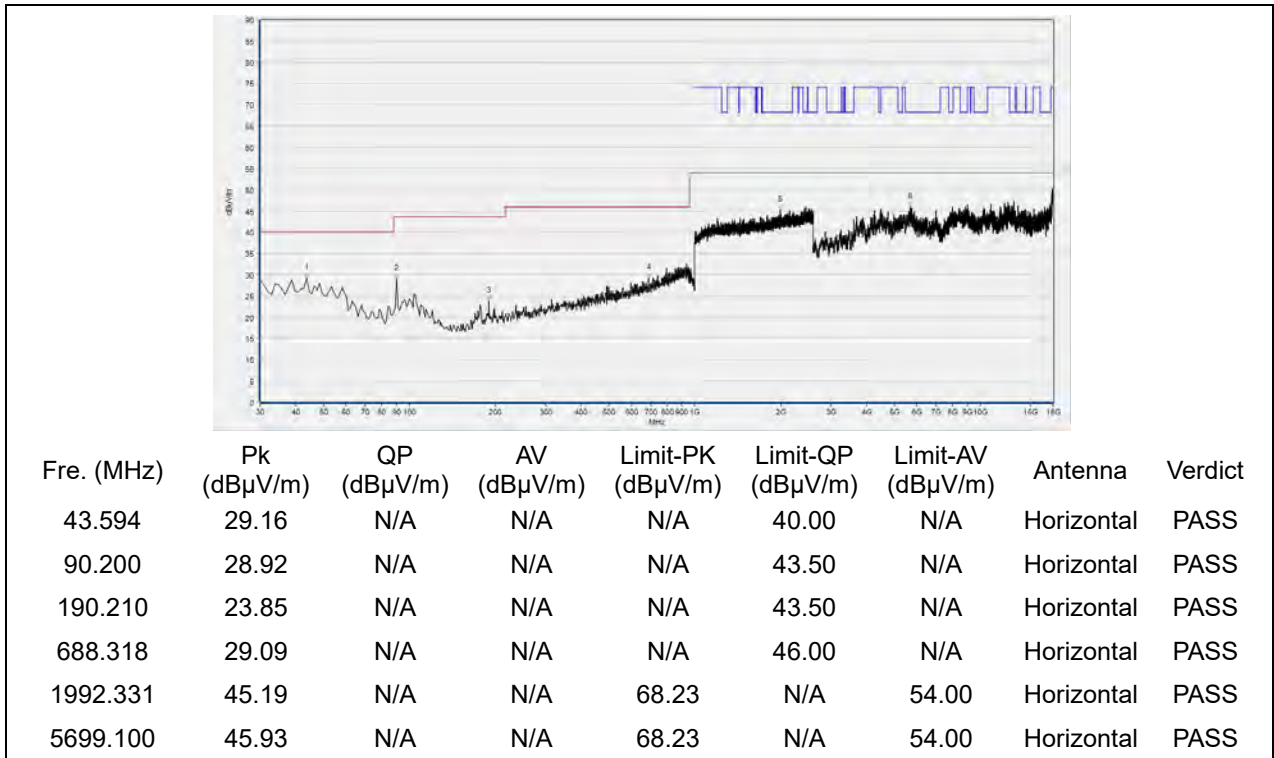


(Antenna Horizontal, 30MHz to 18GHz)

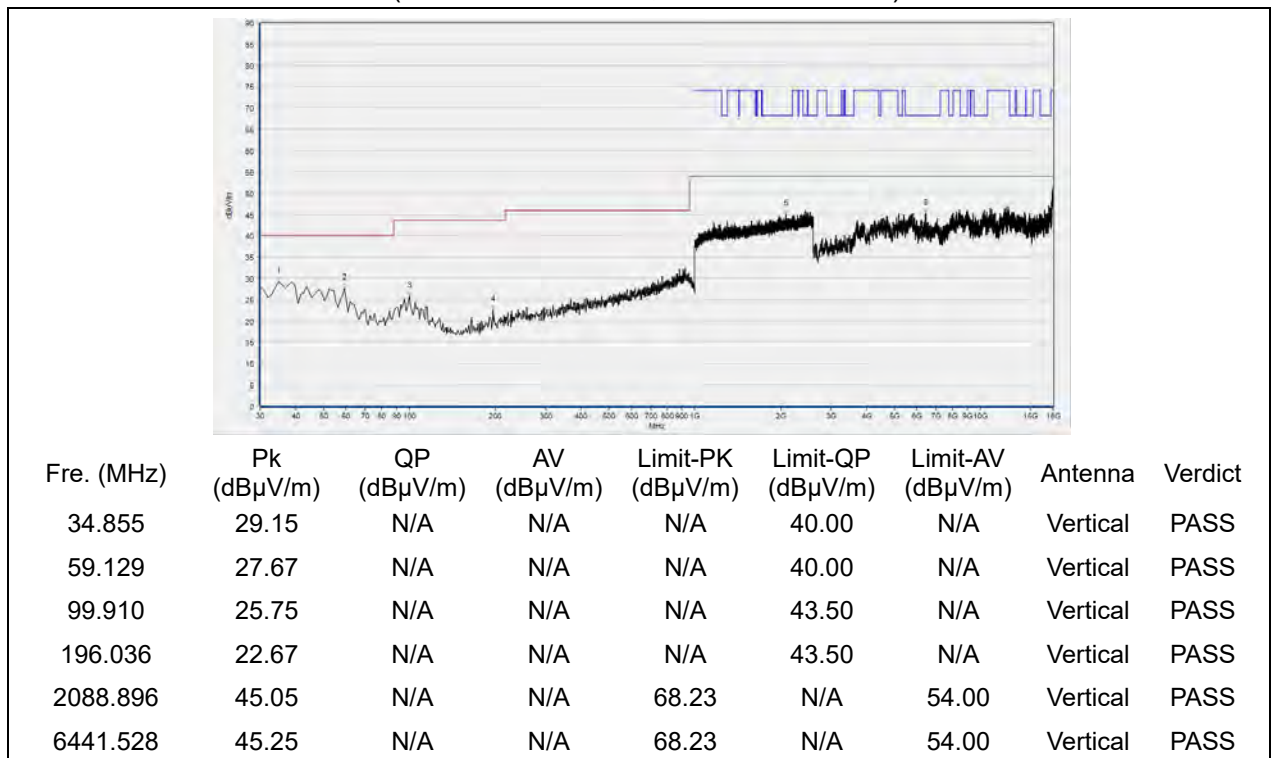


(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 126

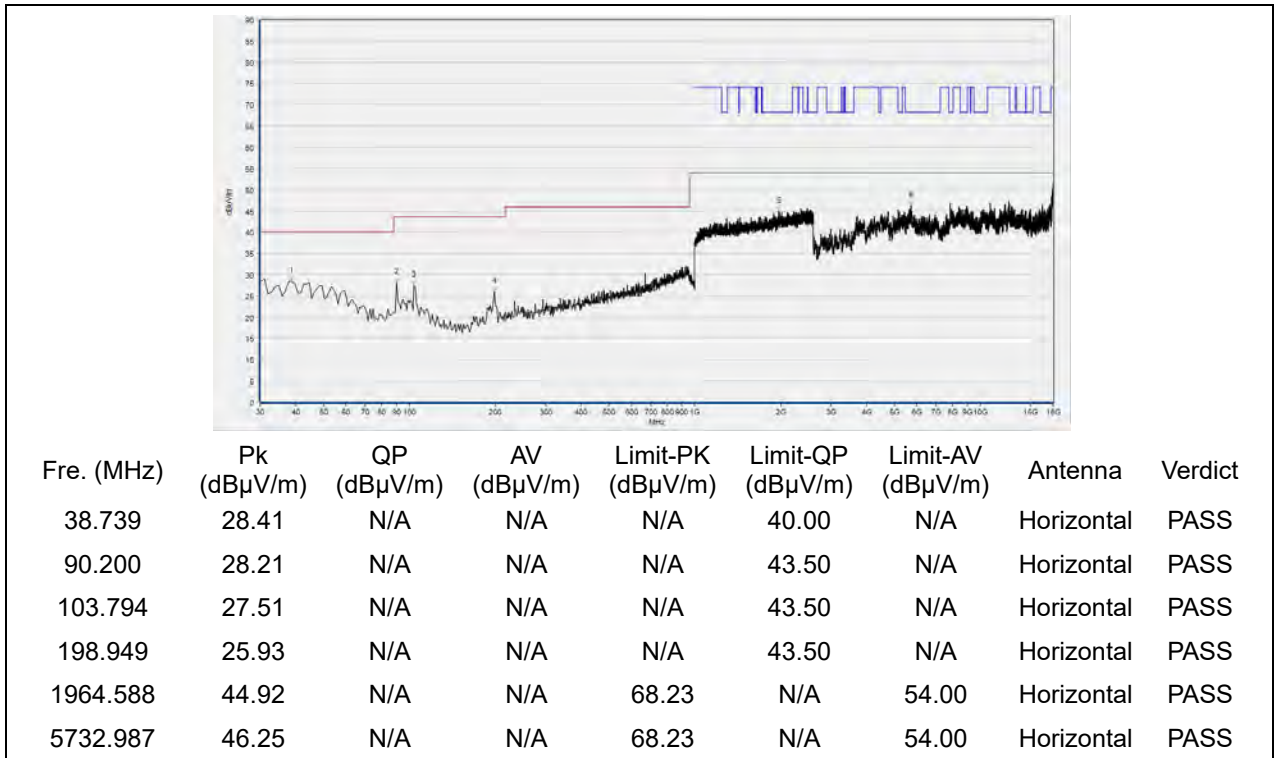


(Antenna Horizontal, 30MHz to 18GHz)

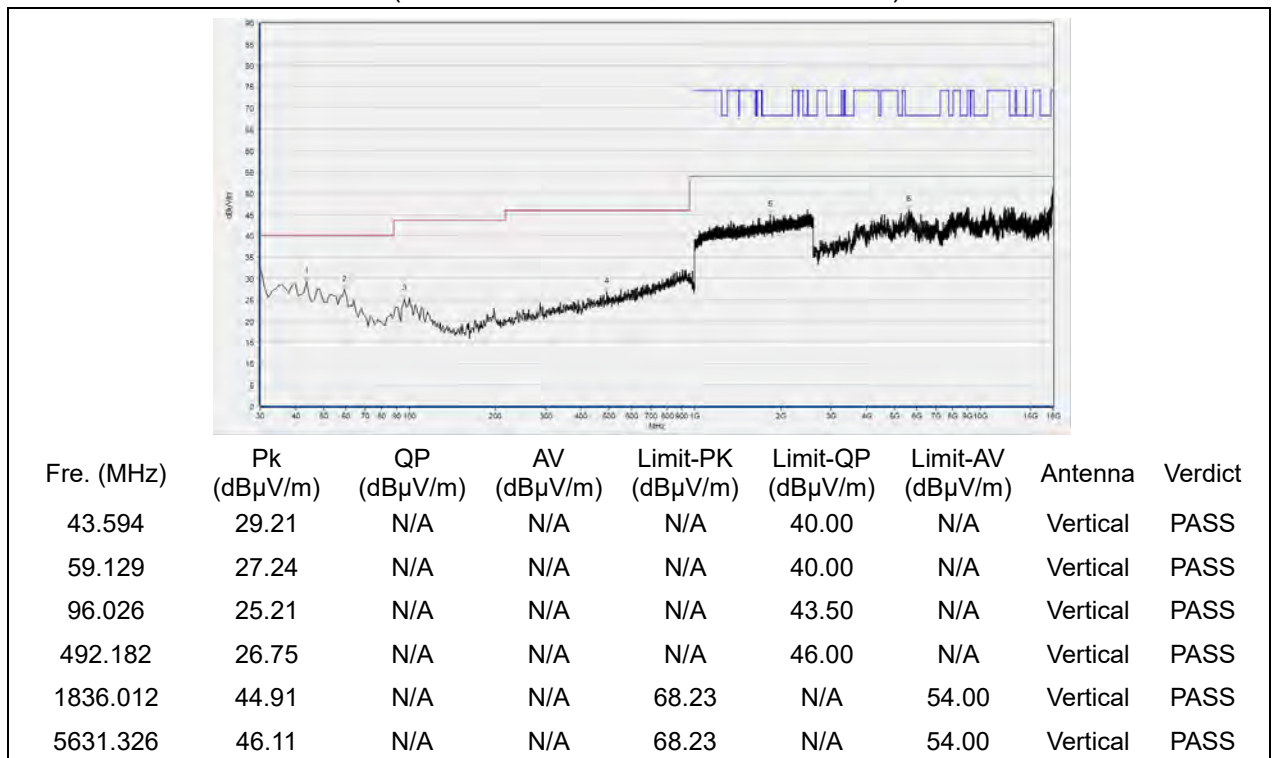


(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 142



(Antenna Horizontal, 30MHz to 18GHz)

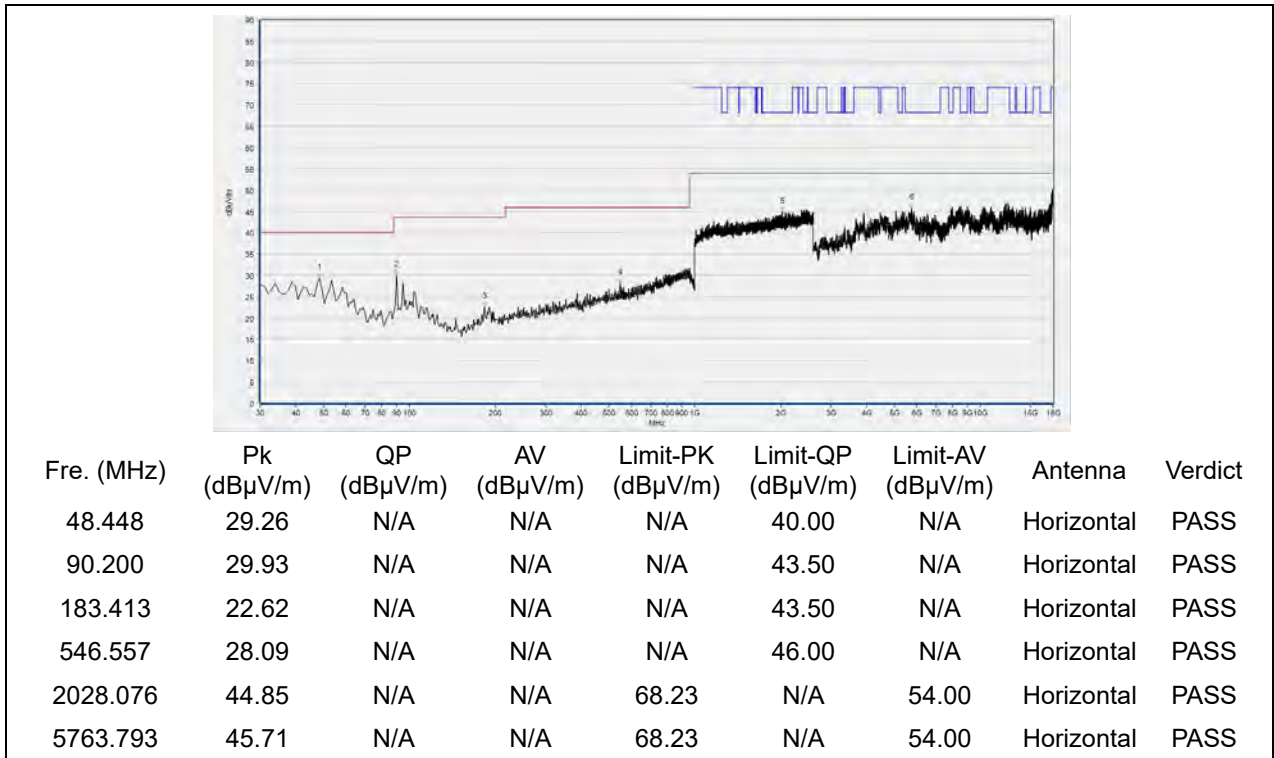


(Antenna Vertical, 30MHz to 18GHz)

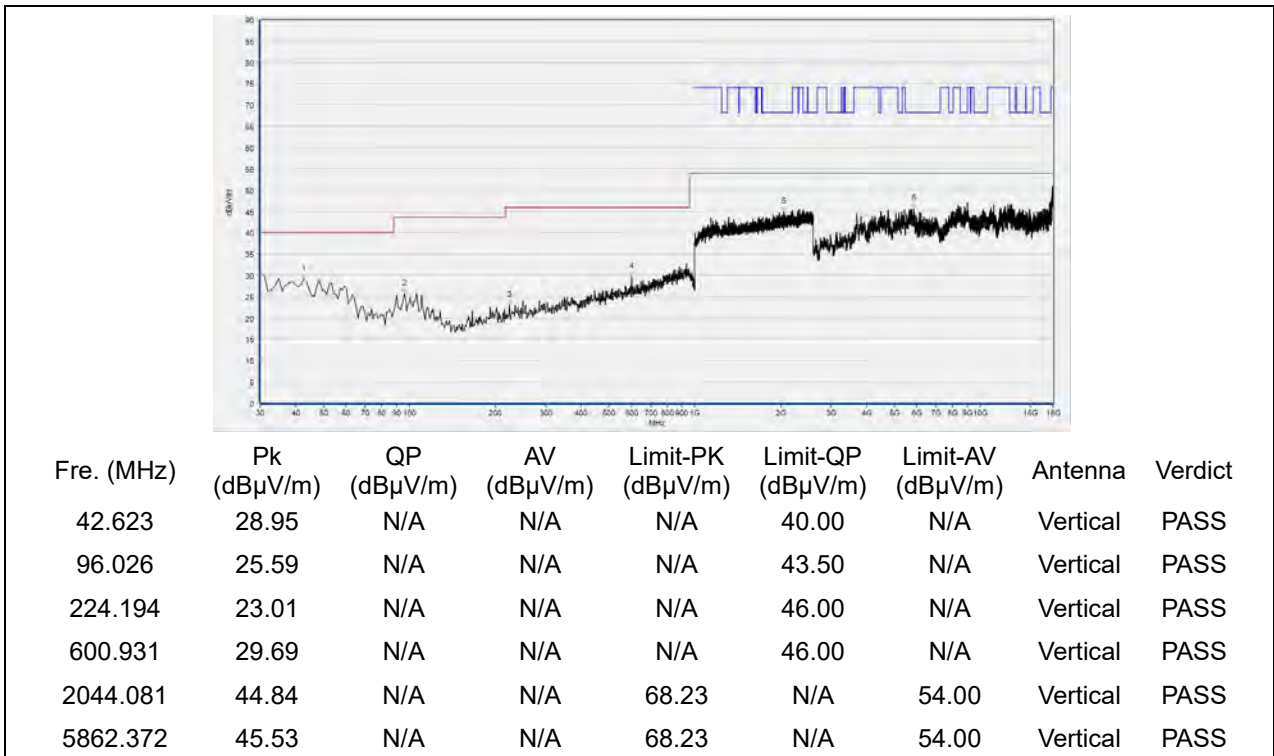


802.11ac (VHT20) Test mode

Plots for Channel = 36

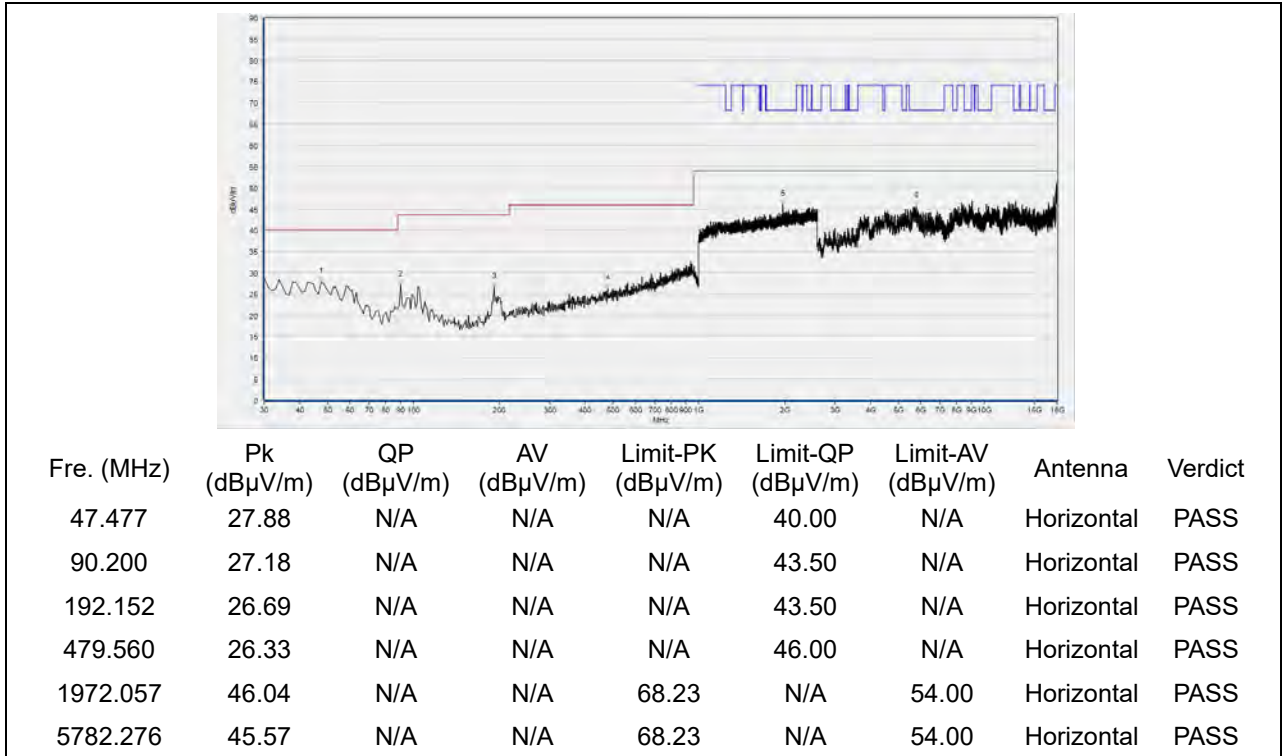


(Antenna Horizontal, 30MHz to 18GHz)

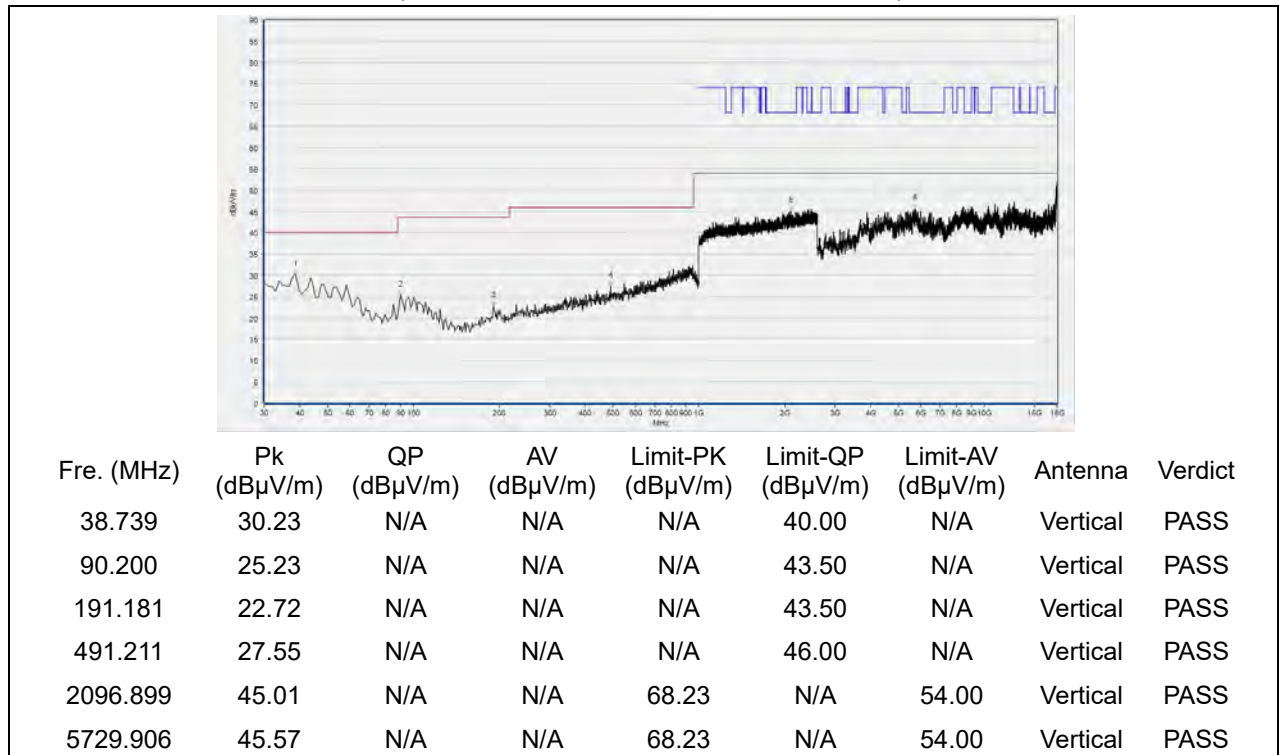


(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 44

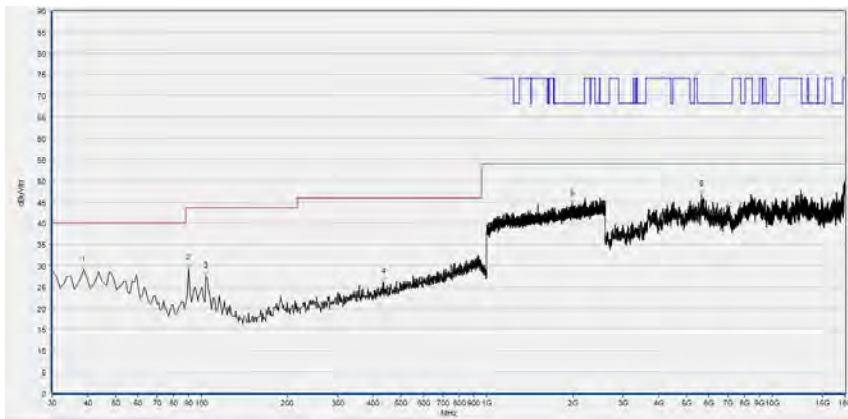


(Antenna Horizontal, 30MHz to 18GHz)



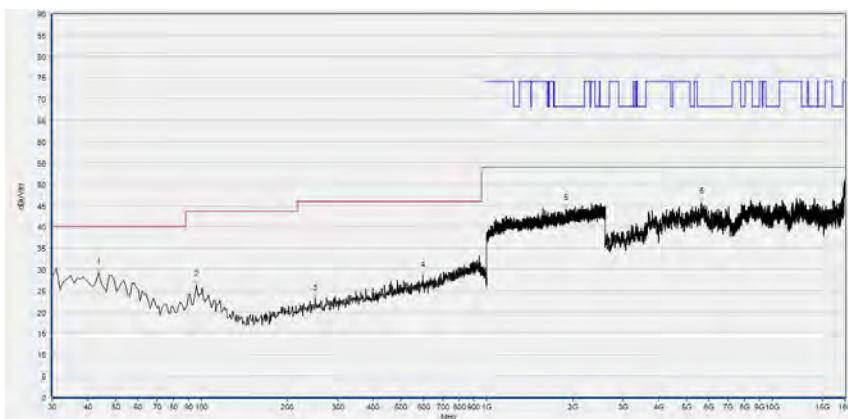
(Antenna Vertical, 30MHz to 18GHz)

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
38.739	29.04	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
90.200	29.30	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
103.794	27.49	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
434.895	26.08	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1991.797	44.40	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
5643.649	46.77	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS

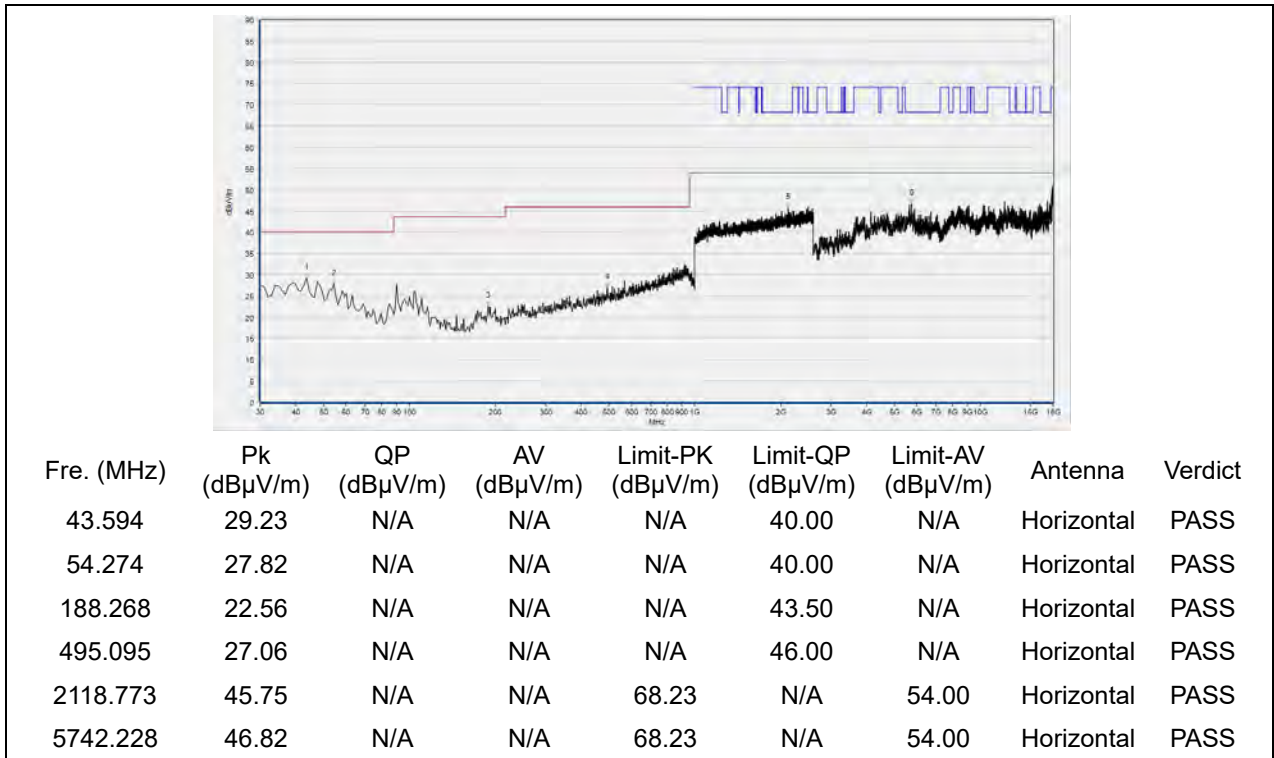
(Antenna Horizontal, 30MHz to 18GHz)



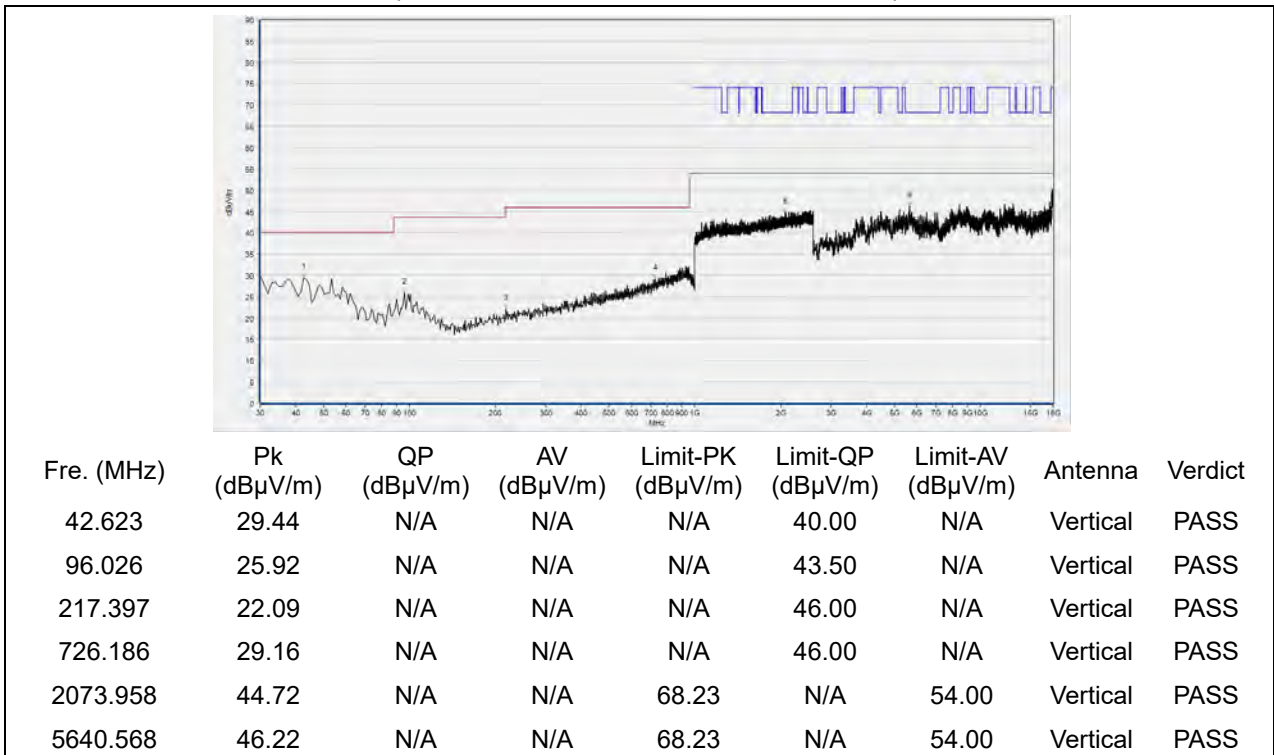
Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
43.594	29.21	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
96.026	26.39	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
250.410	23.06	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
597.047	28.52	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1894.165	44.31	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
5646.729	45.72	N/A	N/A	68.23	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 52

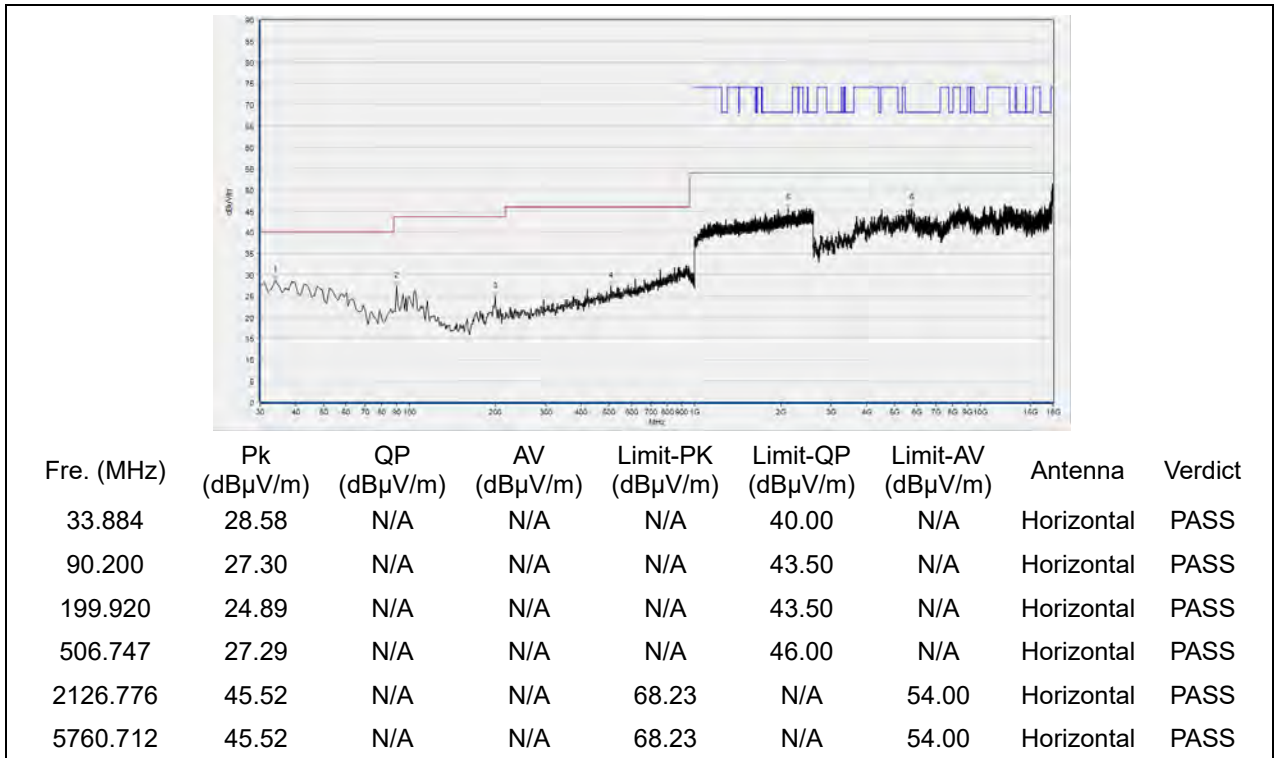


(Antenna Horizontal, 30MHz to 18GHz)

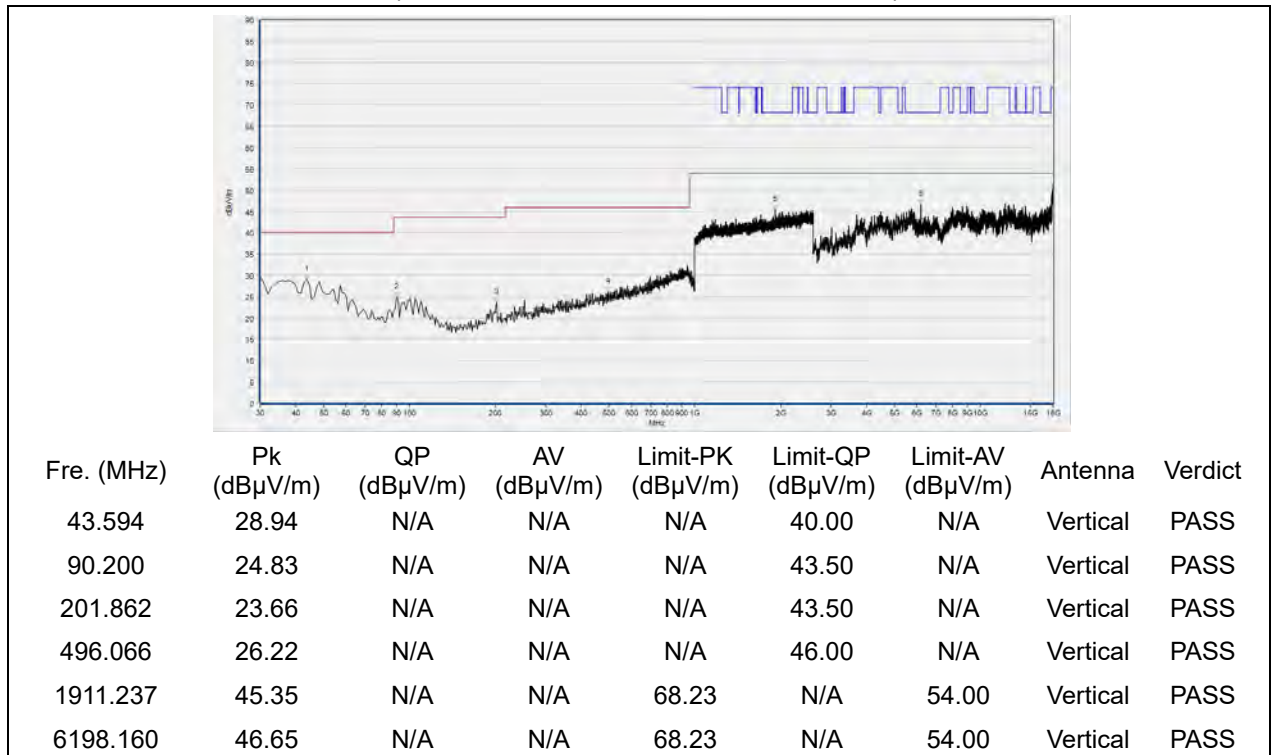


(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 60

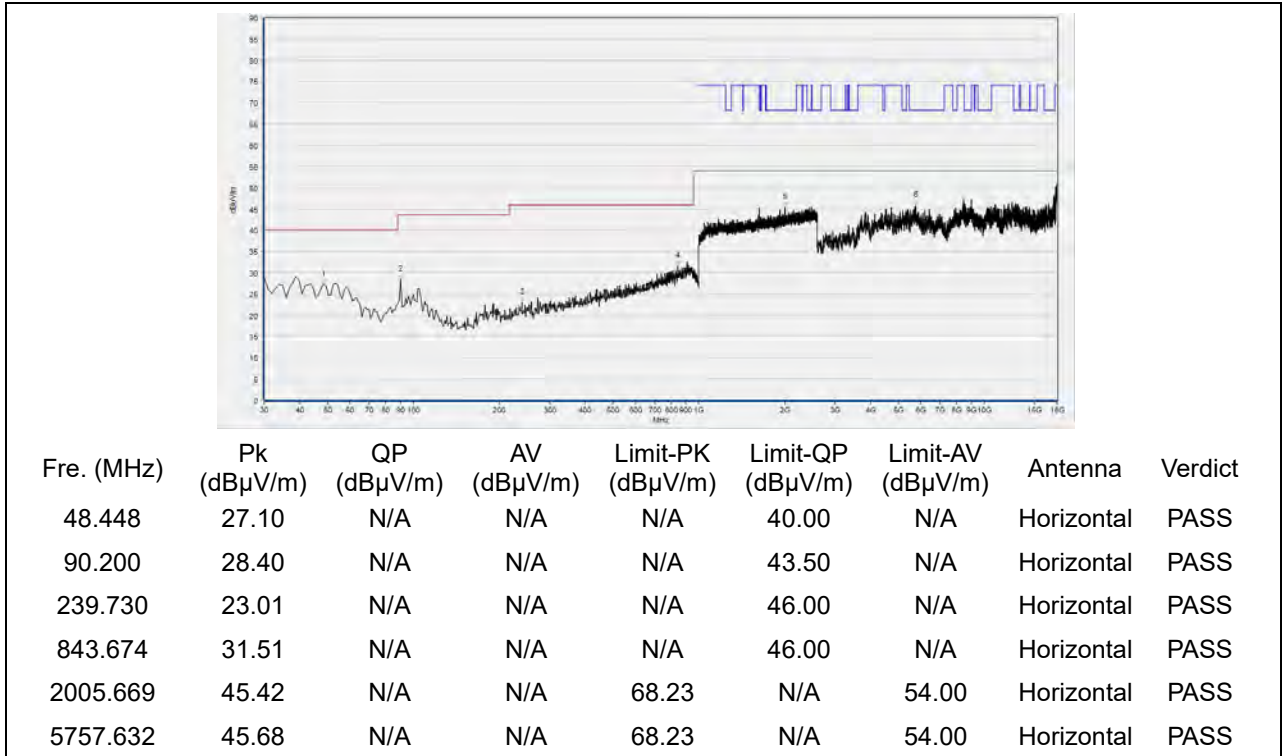


(Antenna Horizontal, 30MHz to 18GHz)

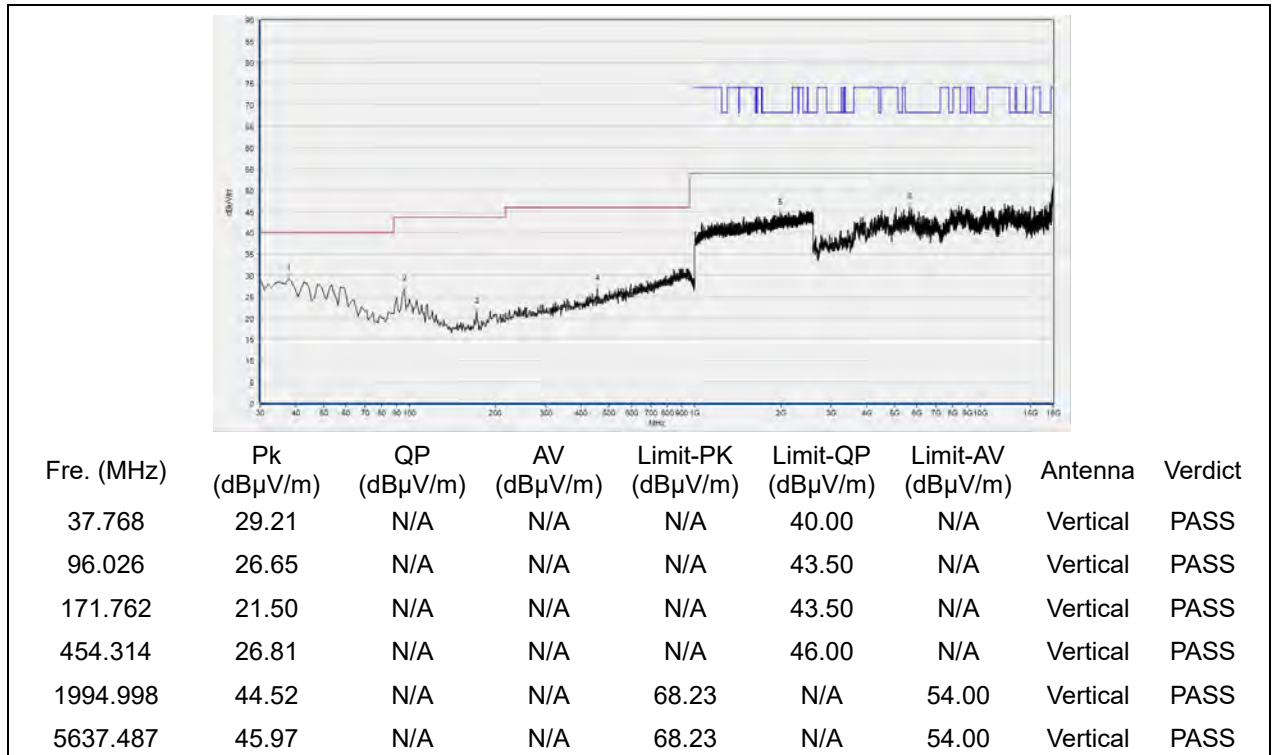


(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 64

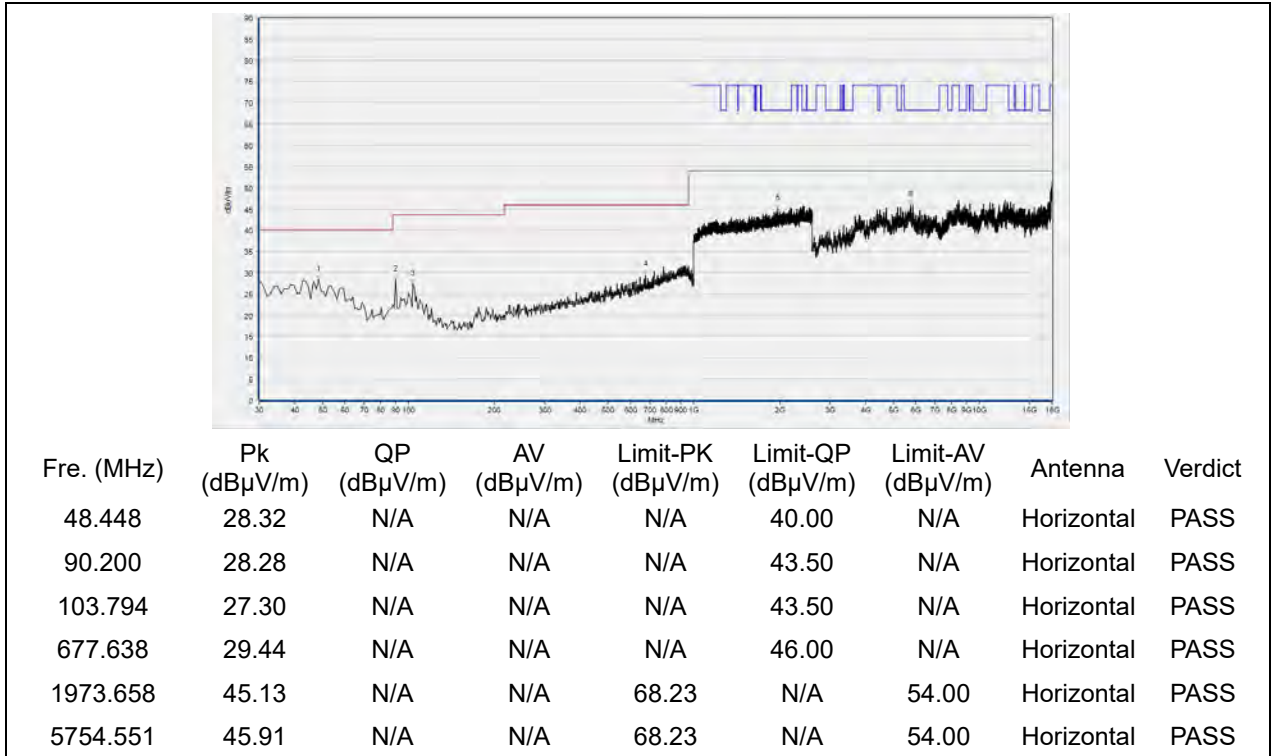


(Antenna Horizontal, 30MHz to 18GHz)

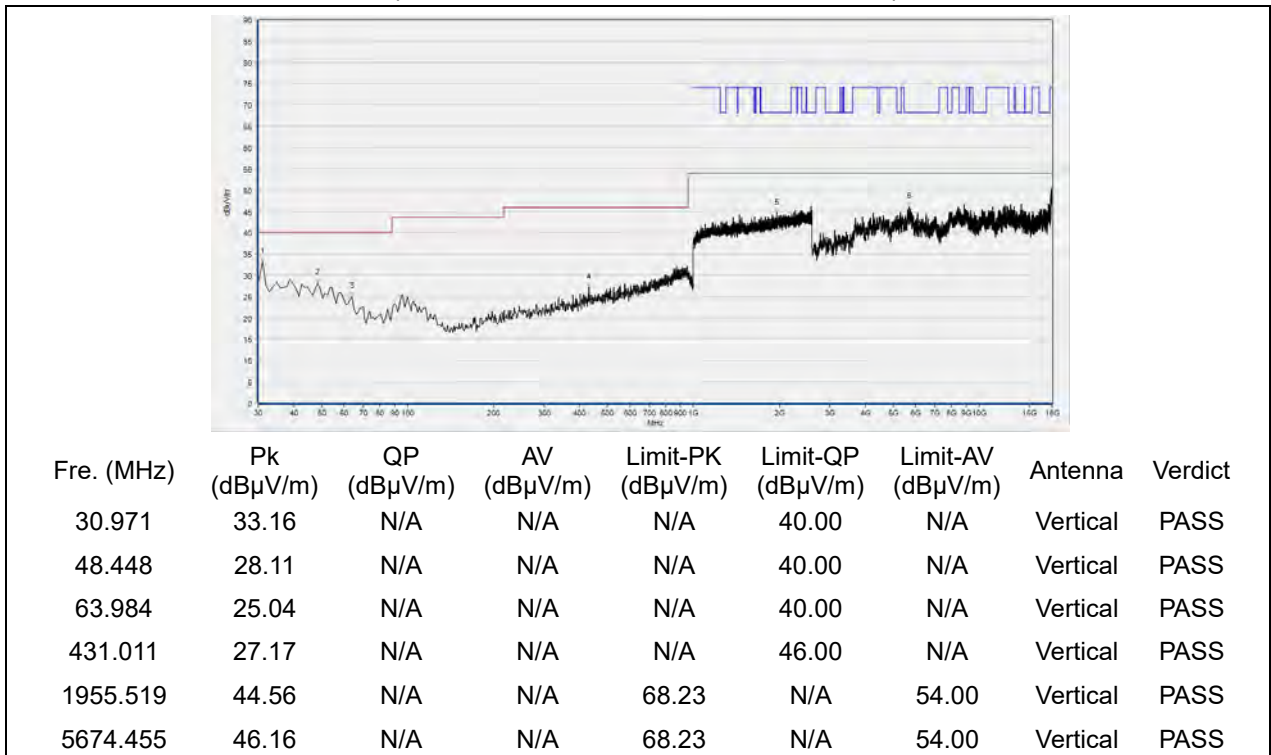


(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 100

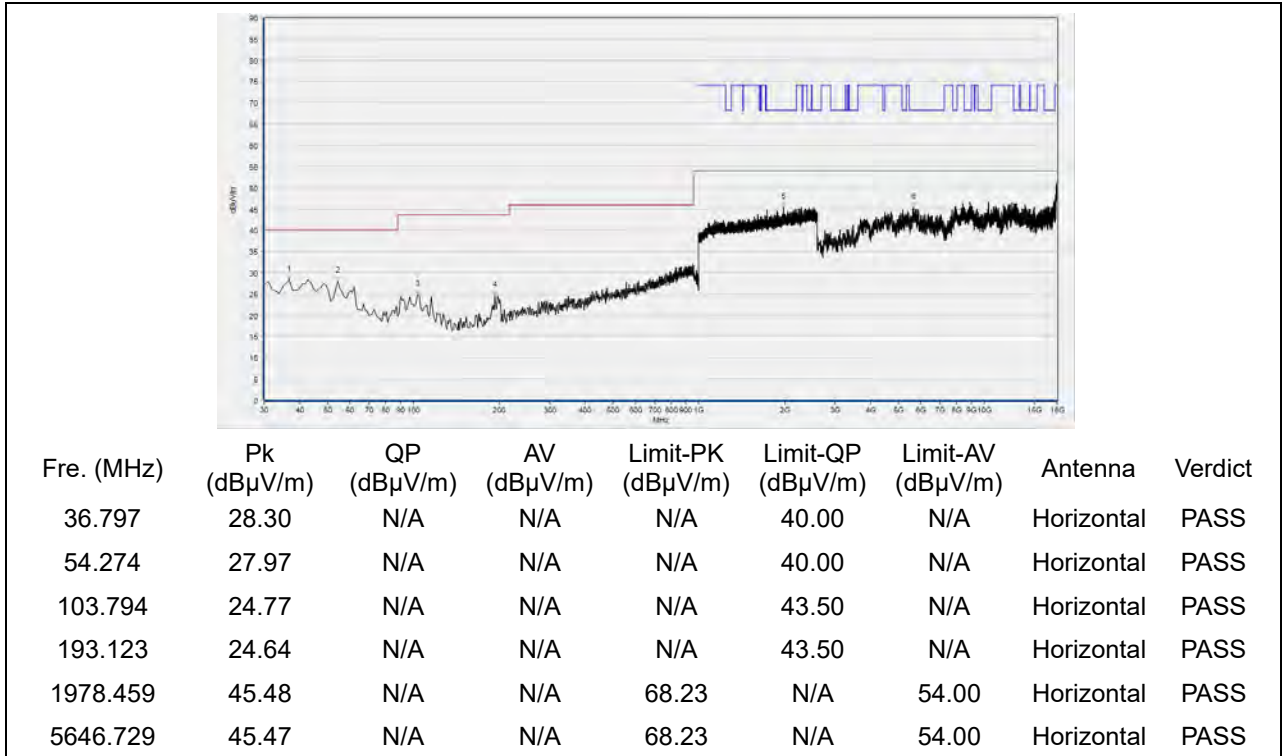


(Antenna Horizontal, 30MHz to 18GHz)

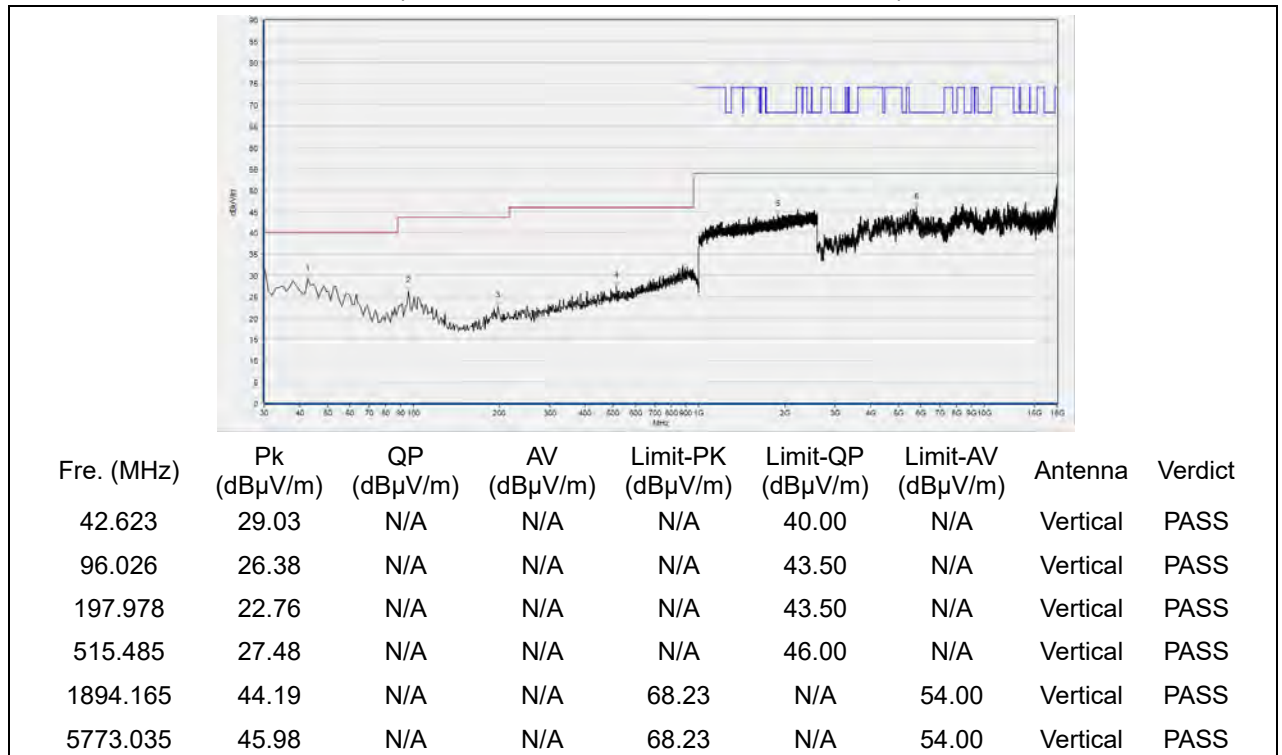


(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 120

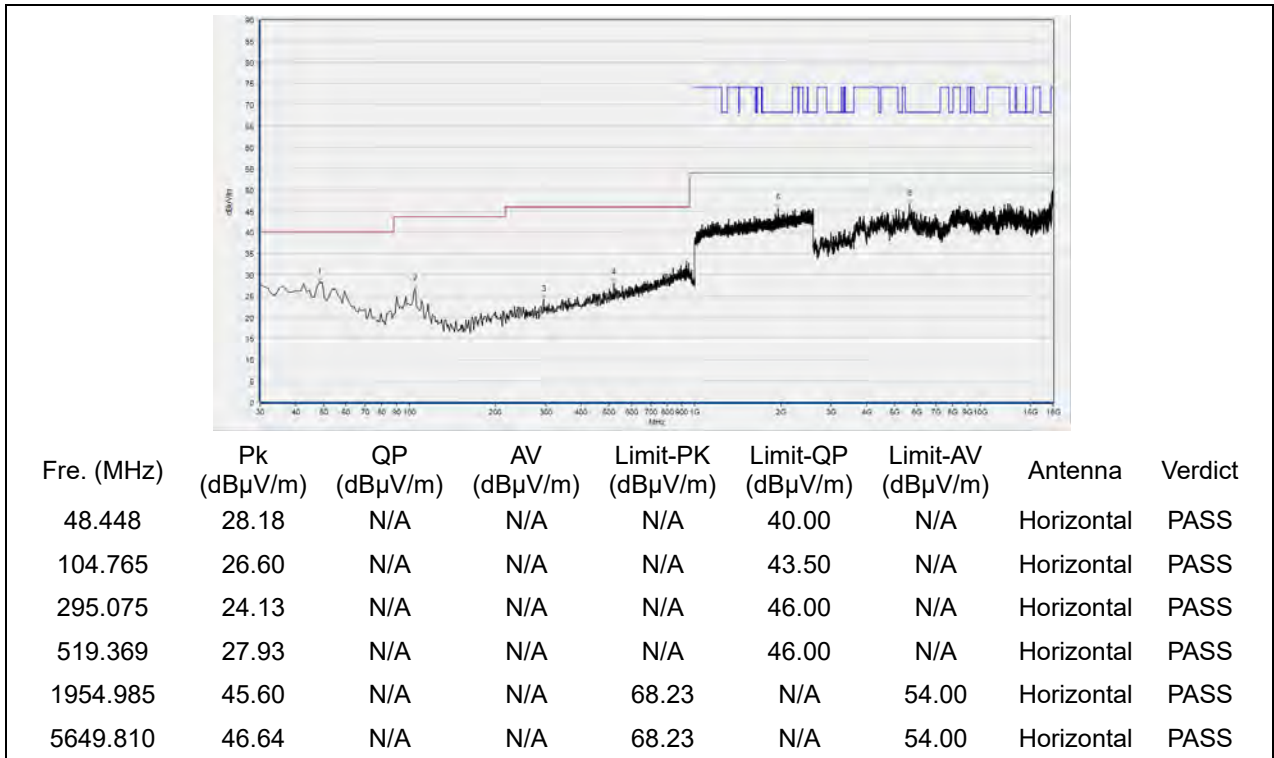


(Antenna Horizontal, 30MHz to 18GHz)

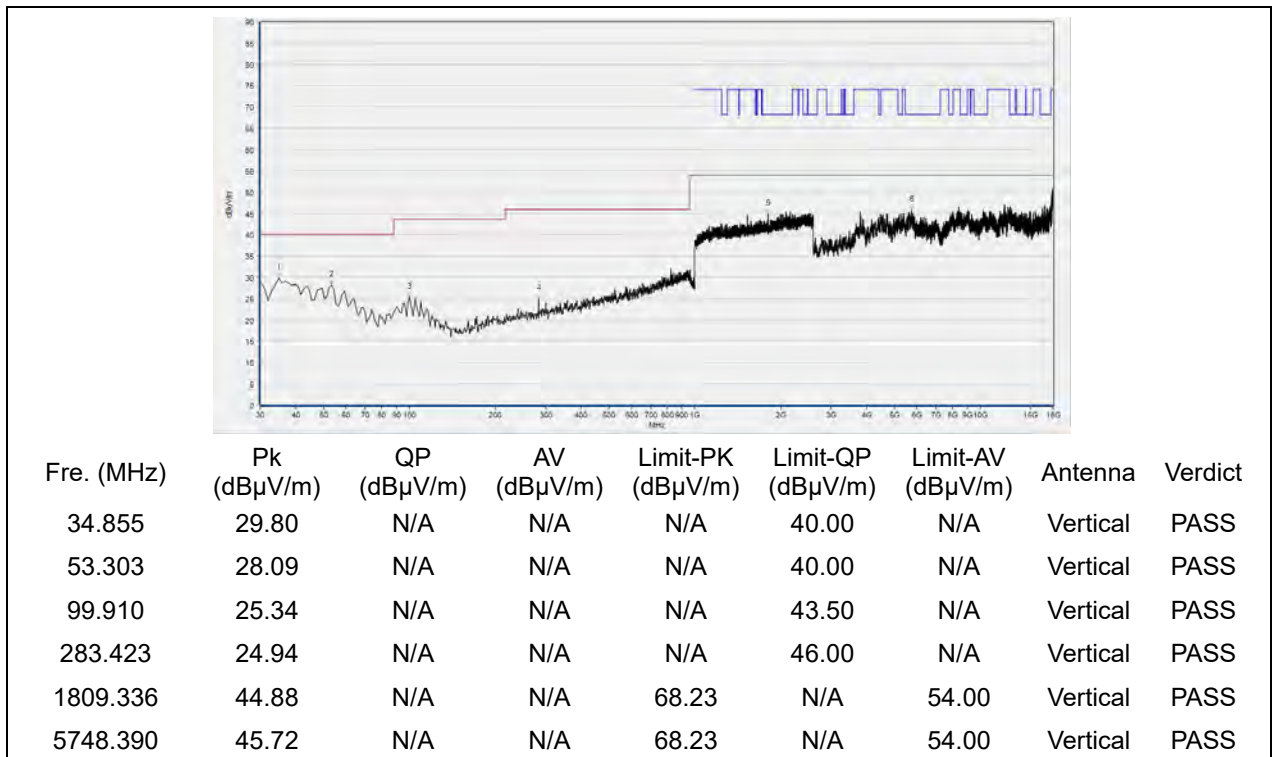


(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 144



(Antenna Horizontal, 30MHz to 18GHz)

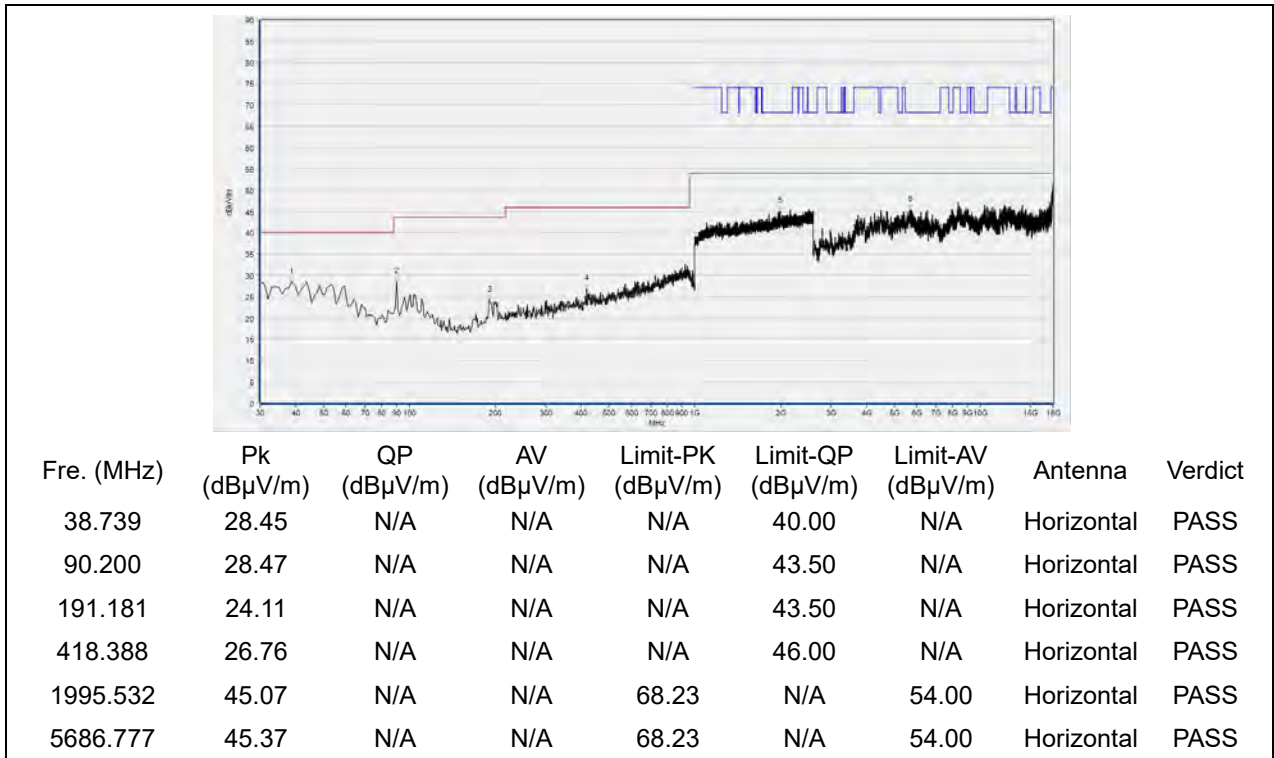


(Antenna Vertical, 30MHz to 18GHz)

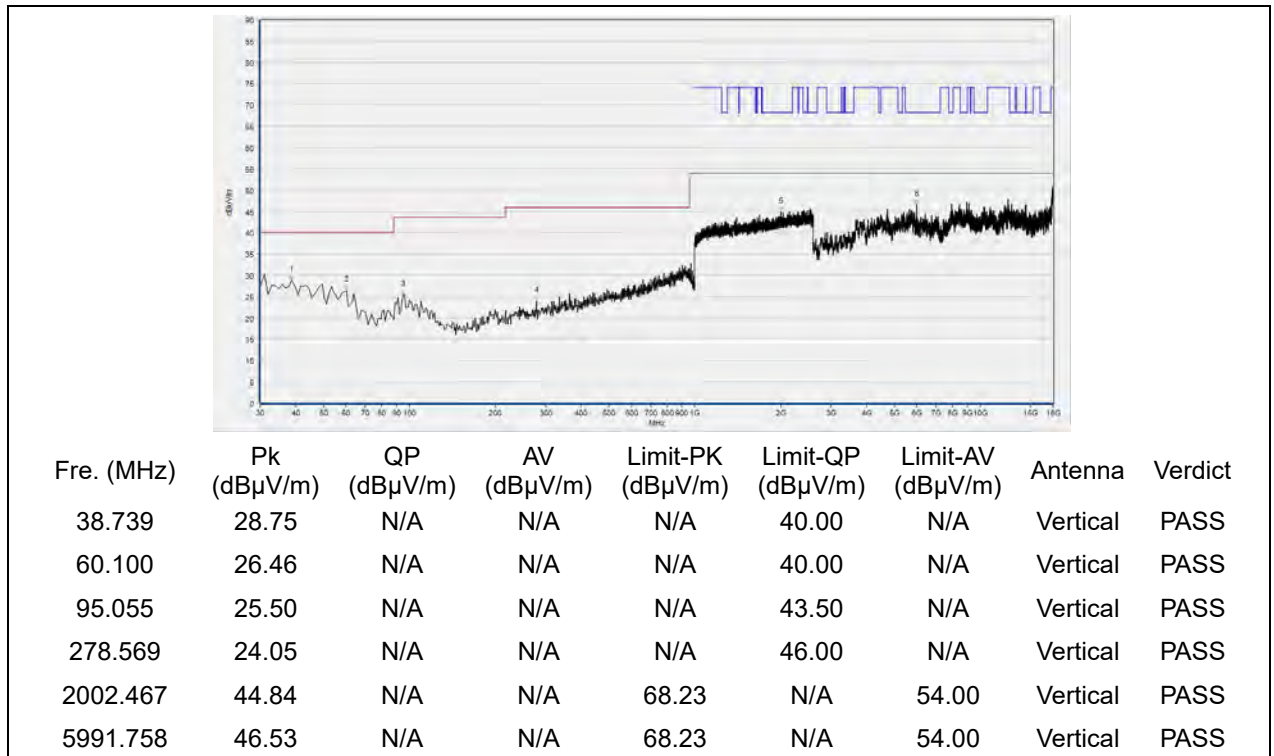


802.11ac (VHT40) Test mode

Plots for Channel = 38

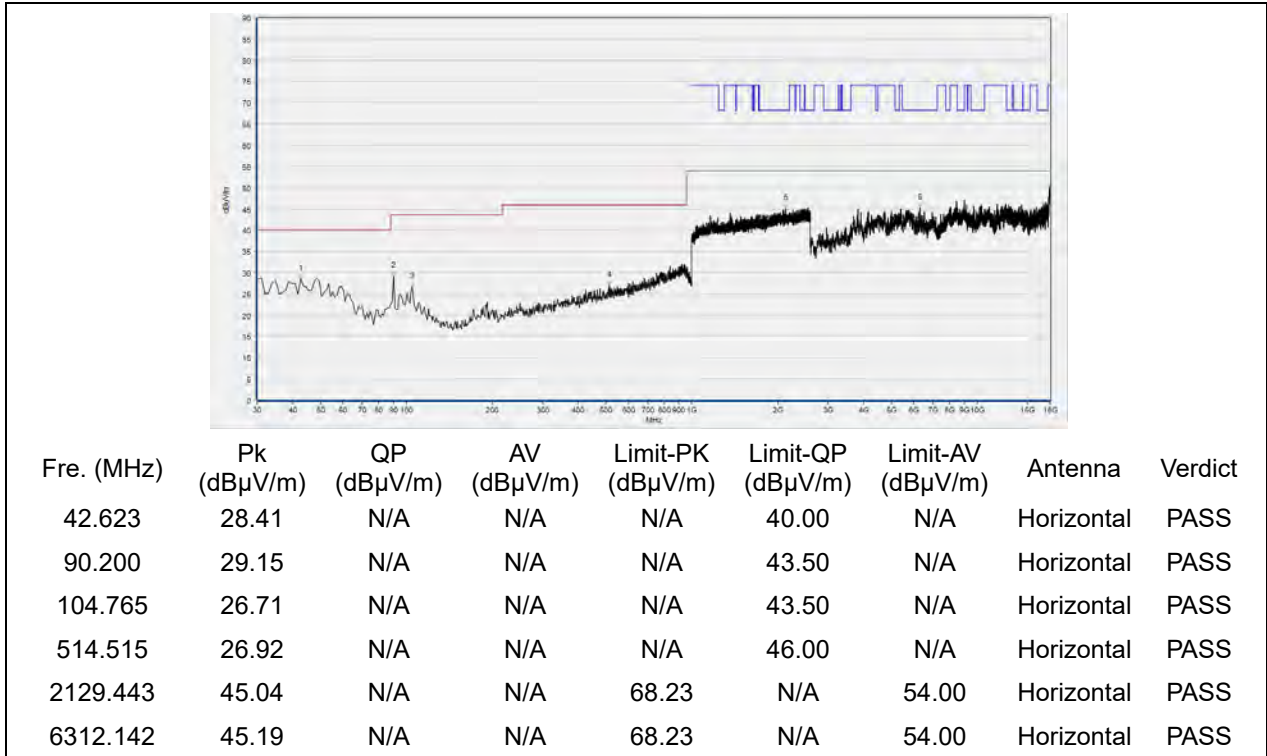


(Antenna Horizontal, 30MHz to 18GHz)

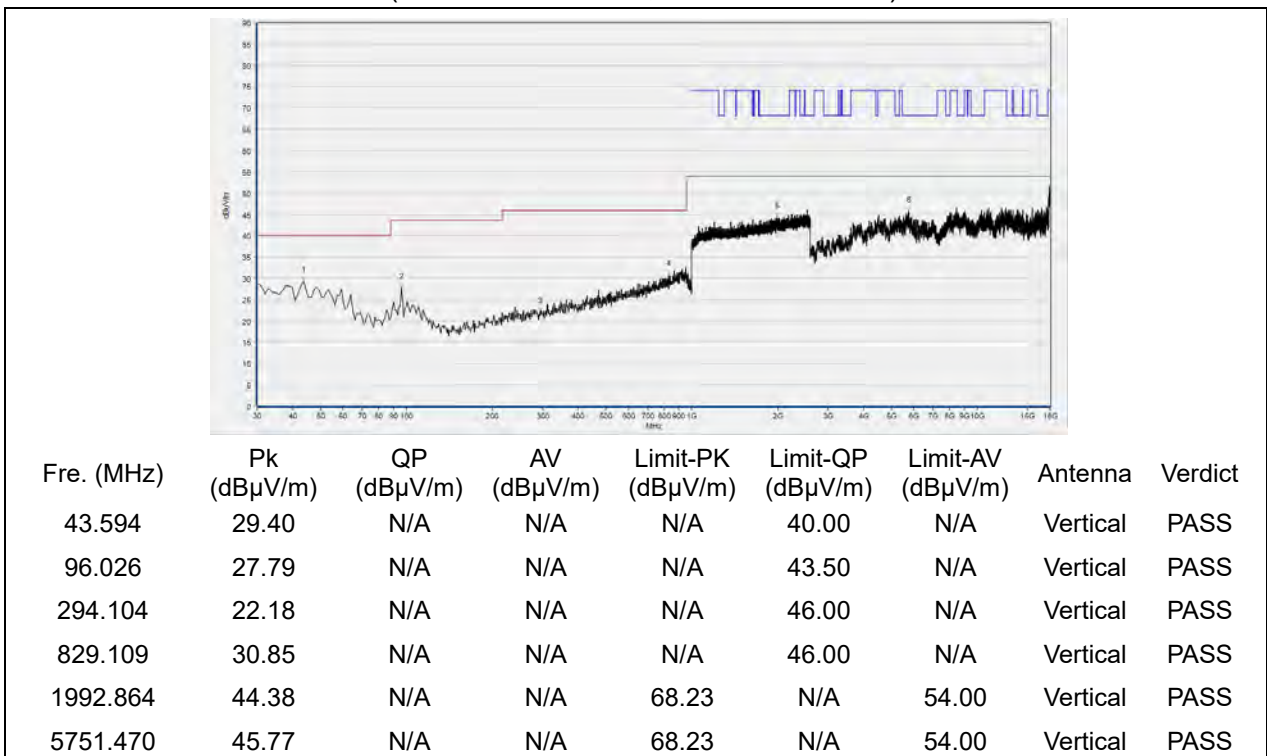


(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 46

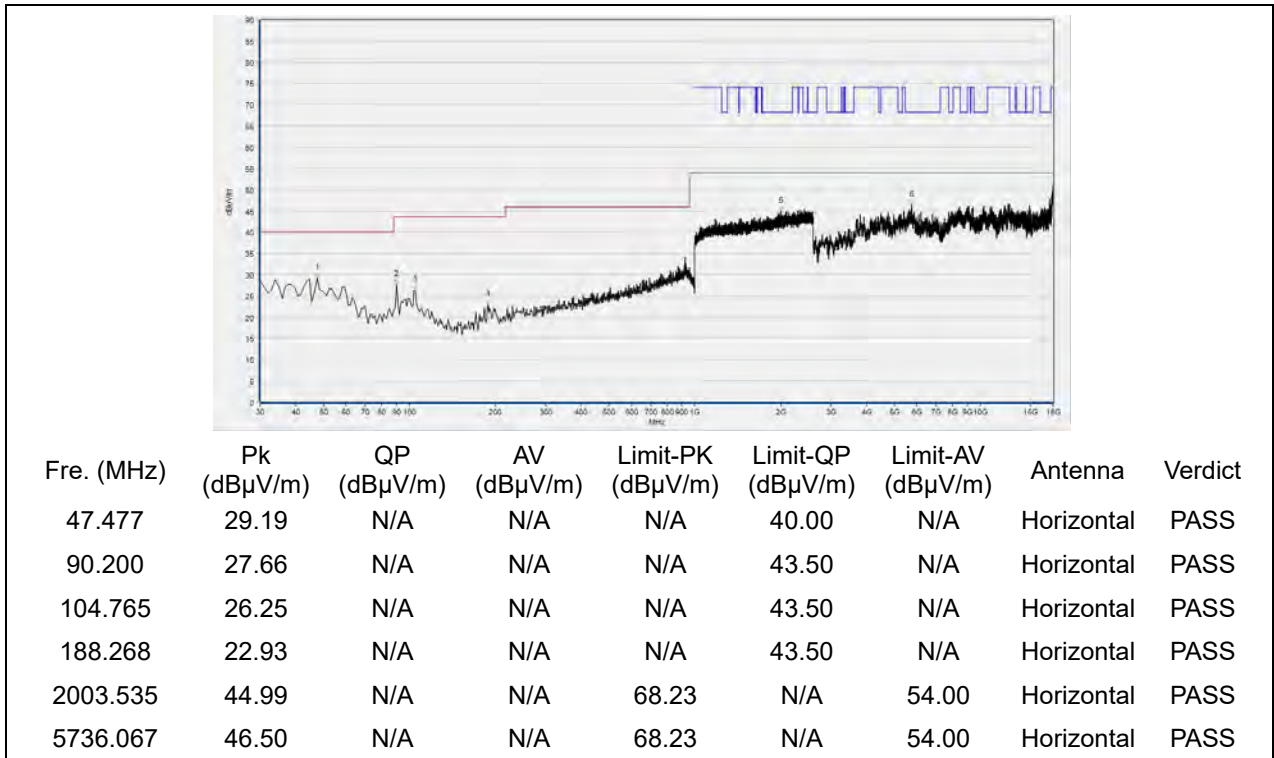


(Antenna Horizontal, 30MHz to 18GHz)

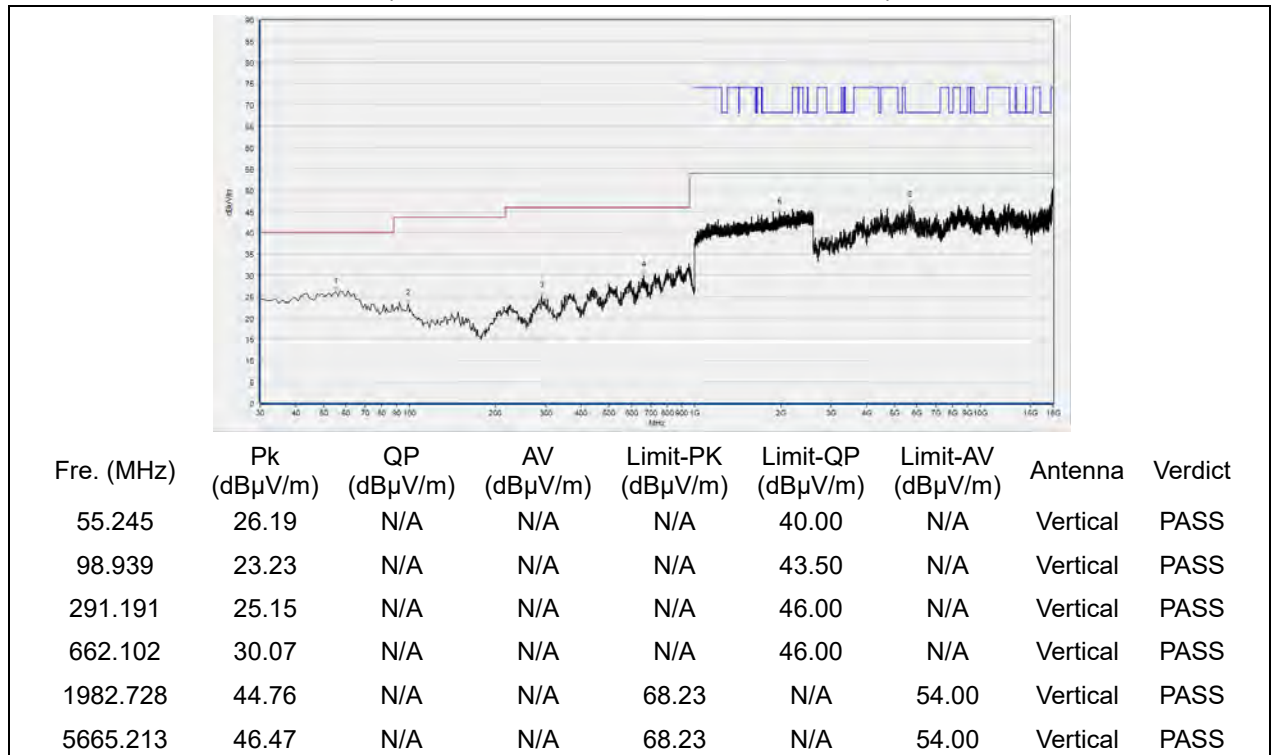


(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 54

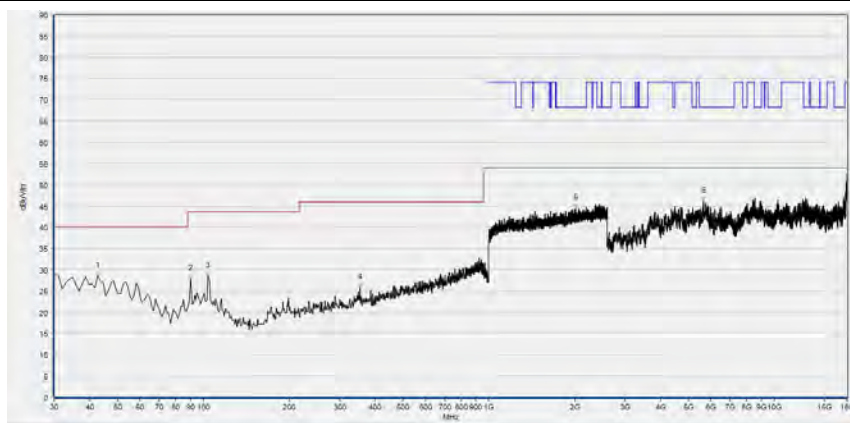


(Antenna Horizontal, 30MHz to 18GHz)



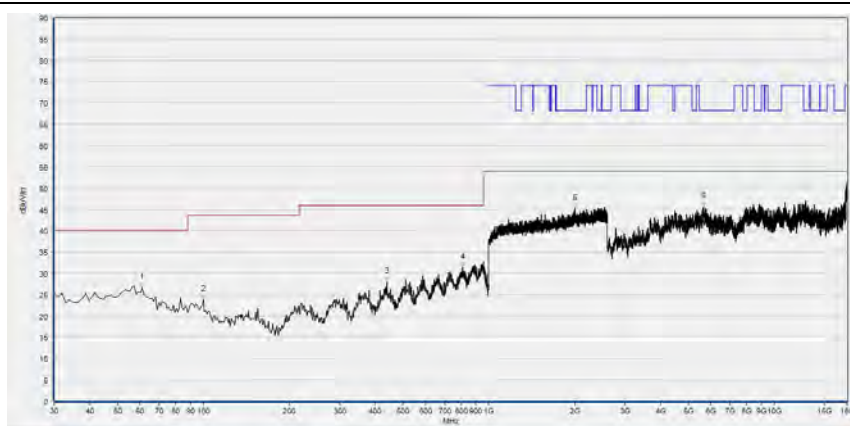
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 62



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
42.623	28.57	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
90.200	27.82	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
103.794	28.48	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
354.304	25.87	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2015.805	44.48	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
5659.052	46.12	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS

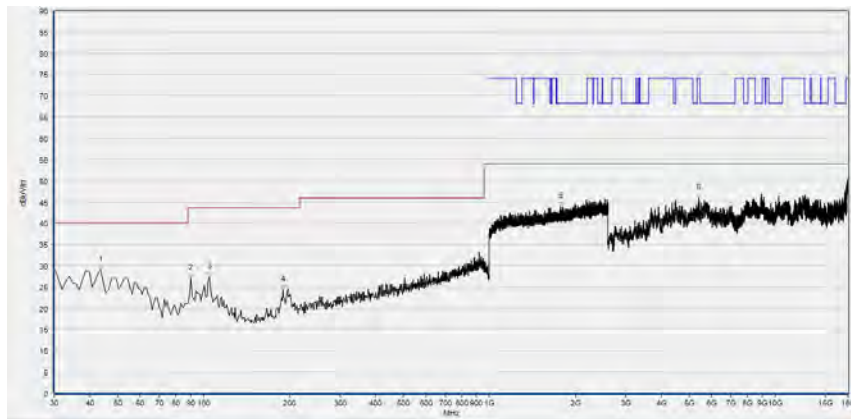
(Antenna Horizontal, 30MHz to 18GHz)



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
61.071	26.71	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
99.910	23.74	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
438.779	27.94	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
808.719	31.31	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2002.467	45.23	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
5643.649	45.59	N/A	N/A	68.23	N/A	54.00	Vertical	PASS

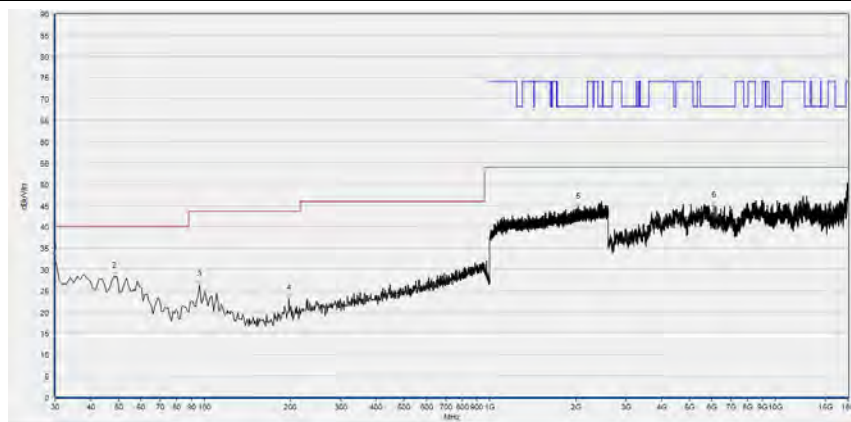
(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 102



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
43.594	29.03	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
90.200	26.91	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
104.765	27.28	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
189.239	24.38	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1777.326	43.86	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
5412.603	45.90	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS

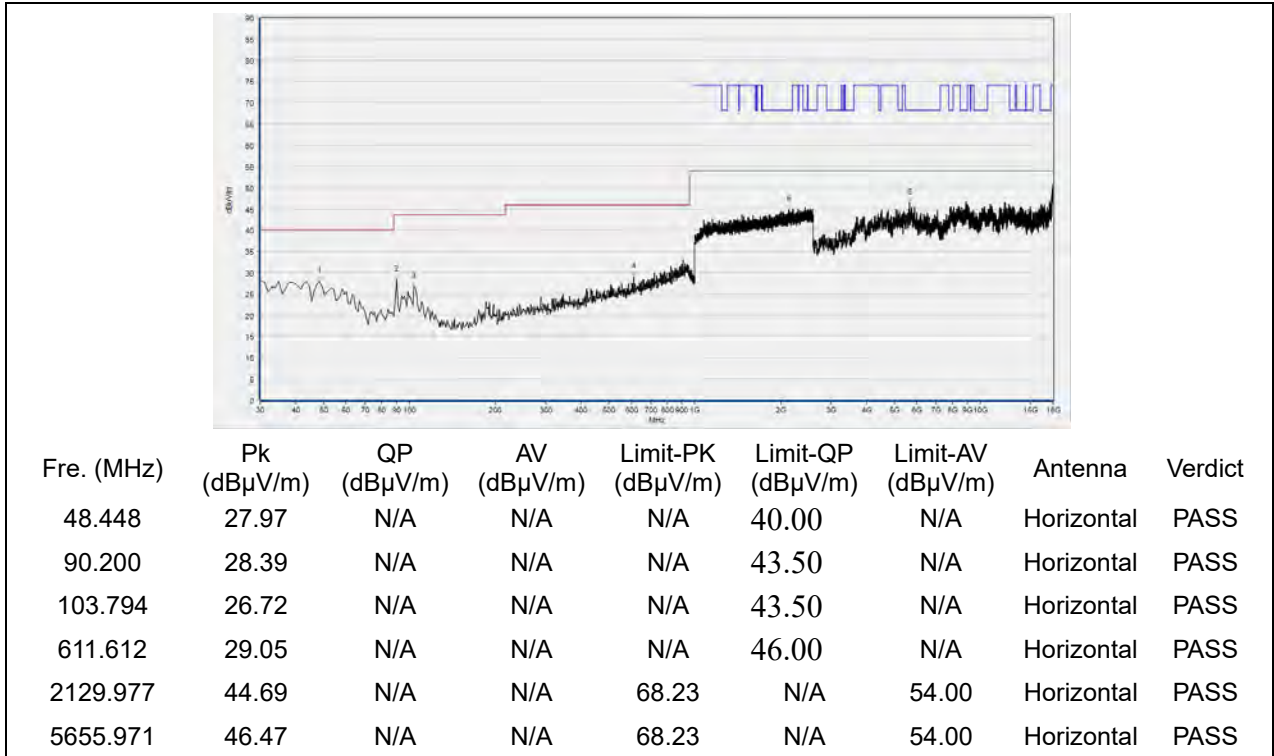
(Antenna Horizontal, 30MHz to 18GHz)



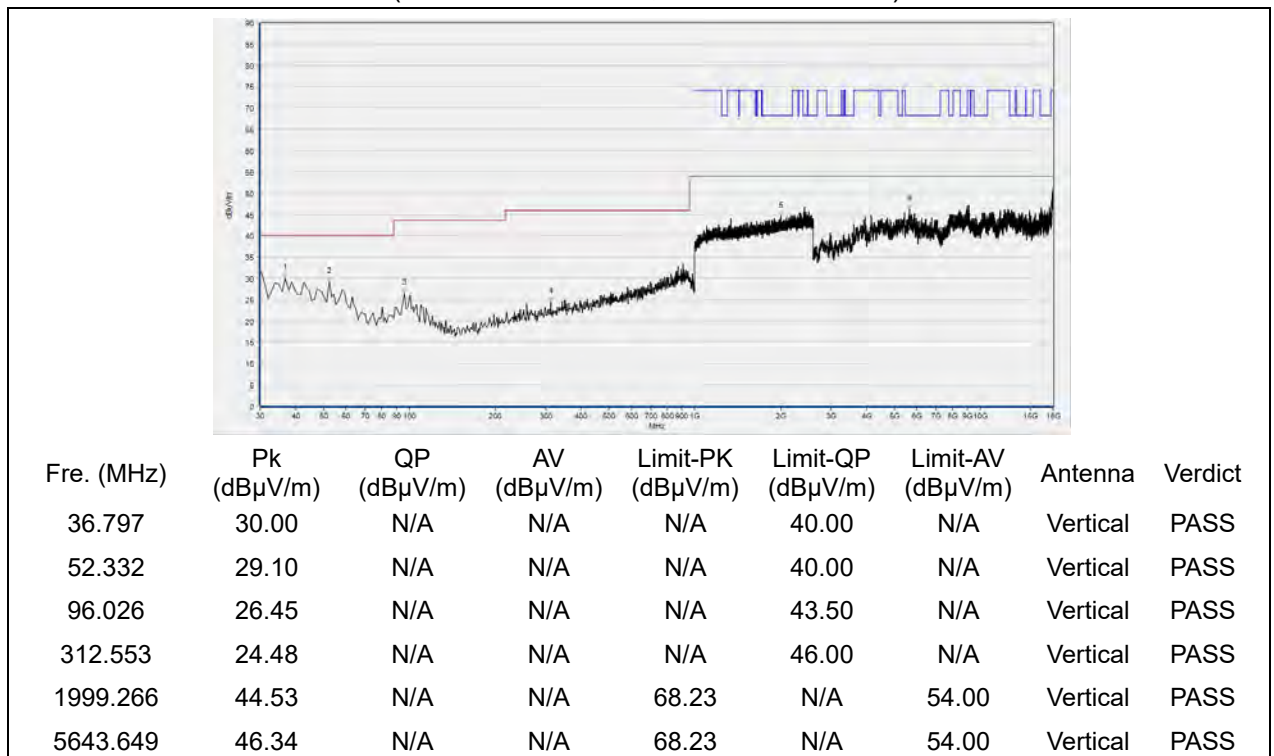
Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
30.000	32.66	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
48.448	28.29	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
96.026	26.29	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
197.978	23.21	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2036.079	44.53	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
6087.257	44.84	N/A	N/A	68.23	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 126

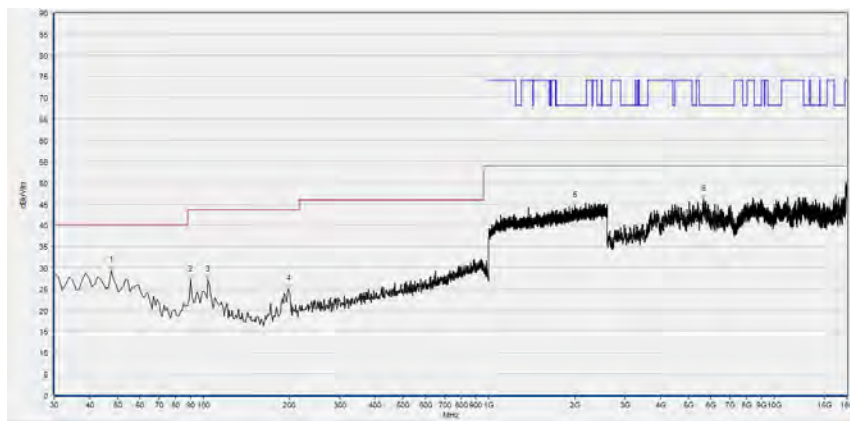


(Antenna Horizontal, 30MHz to 18GHz)



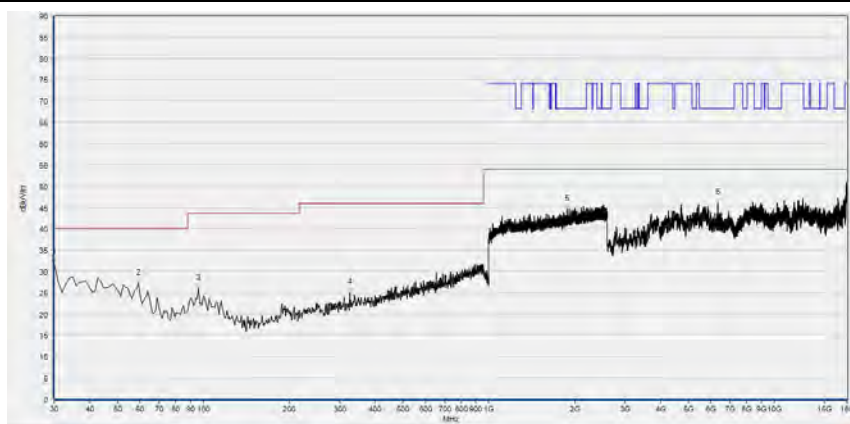
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 142



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
47.477	29.31	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
90.200	27.12	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
103.794	27.21	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
198.949	24.89	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2002.467	44.55	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
5637.487	46.13	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

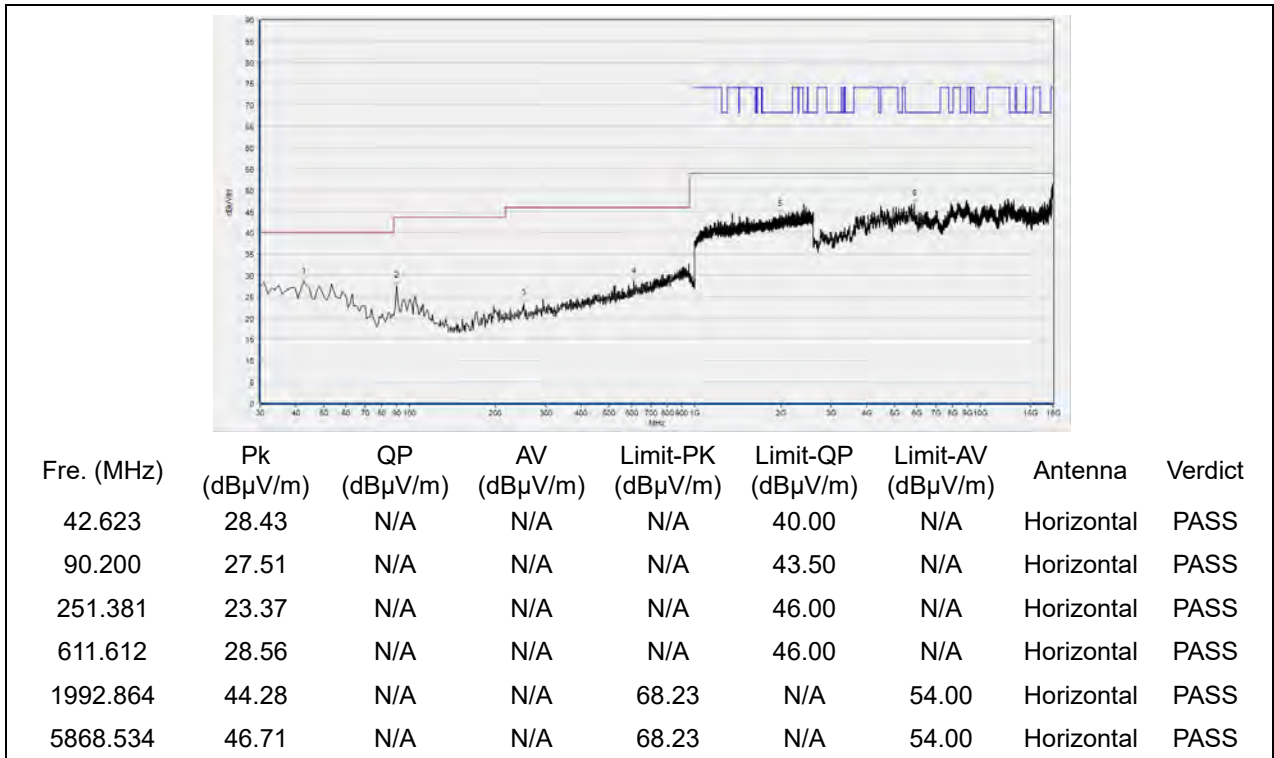


Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
30.000	31.94	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
59.129	27.07	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
96.026	26.06	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
325.175	24.92	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1878.693	44.51	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
6330.626	46.02	N/A	N/A	68.23	N/A	54.00	Vertical	PASS

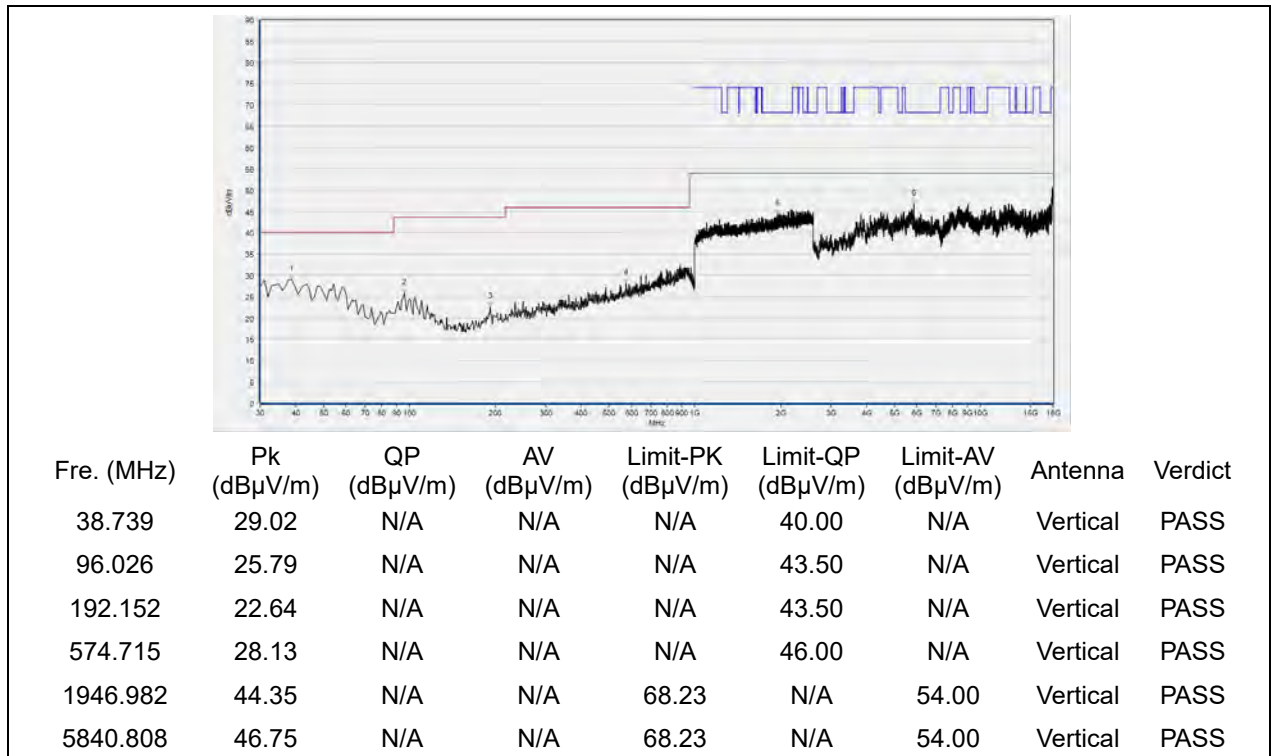
(Antenna Vertical, 30MHz to 18GHz)

802.11ac (VHT80) Test mode

Plots for Channel = 42

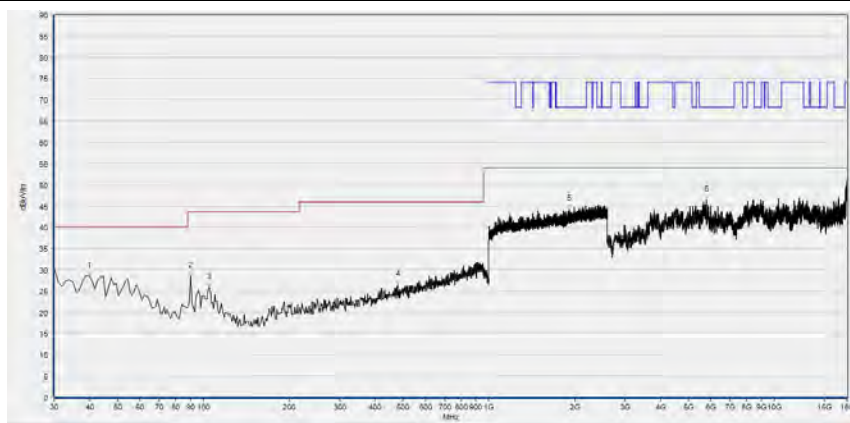


(Antenna Horizontal, 30MHz to 18GHz)



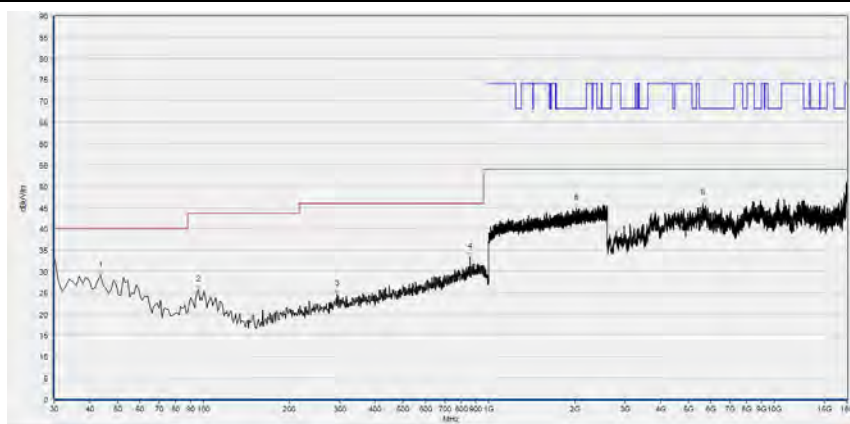
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 58



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
39.710	28.43	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
90.200	28.51	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
104.765	25.89	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
478.589	26.45	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1913.905	44.32	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS
5769.954	46.35	N/A	N/A	68.23	N/A	54.00	Horizontal	PASS

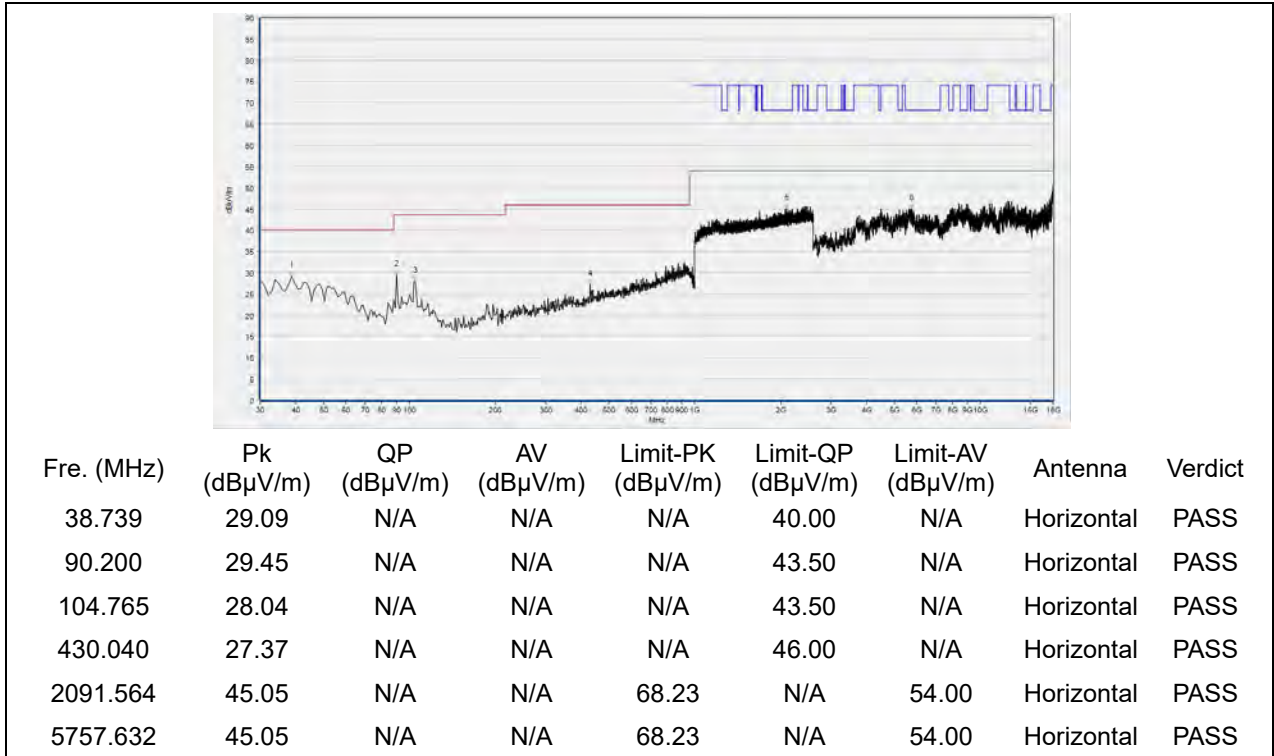
(Antenna Horizontal, 30MHz to 18GHz)



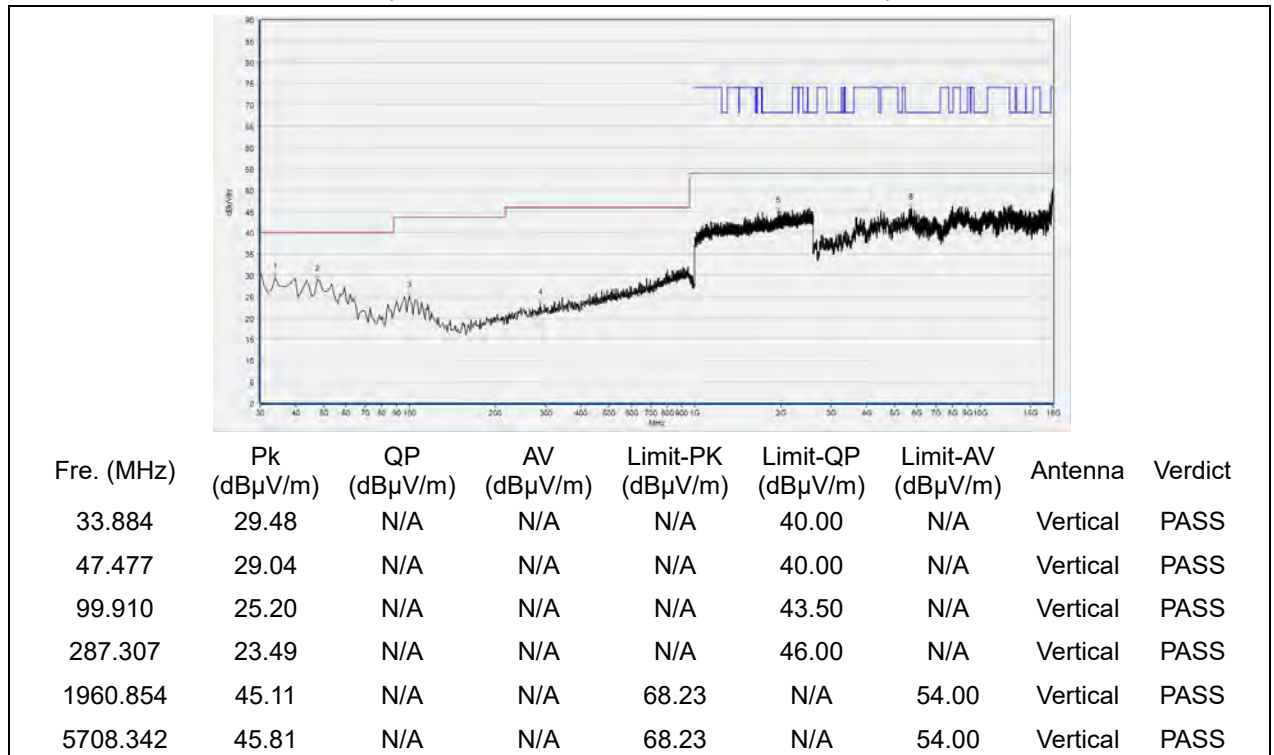
Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
43.594	28.94	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
96.026	25.70	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
294.104	24.65	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
860.180	33.42	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2023.274	44.71	N/A	N/A	68.23	N/A	54.00	Vertical	PASS
5631.326	45.90	N/A	N/A	68.23	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 106

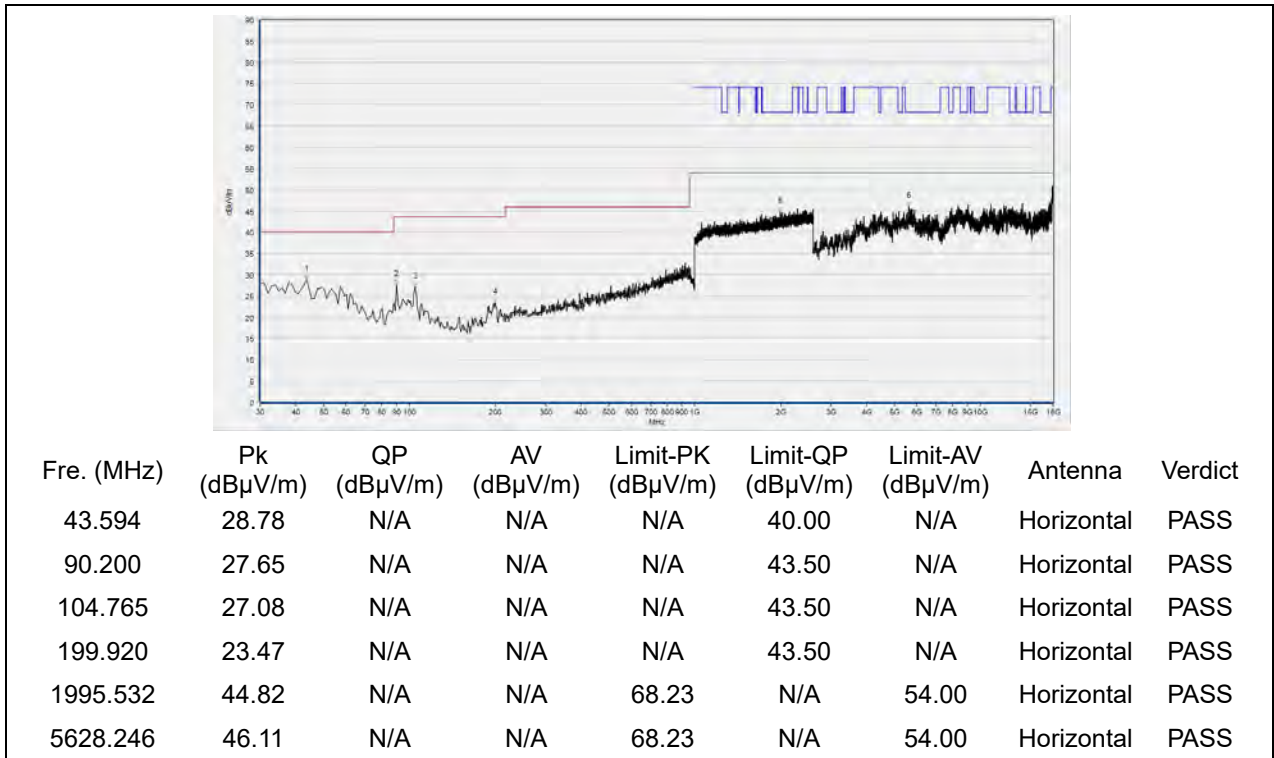


(Antenna Horizontal, 30MHz to 18GHz)

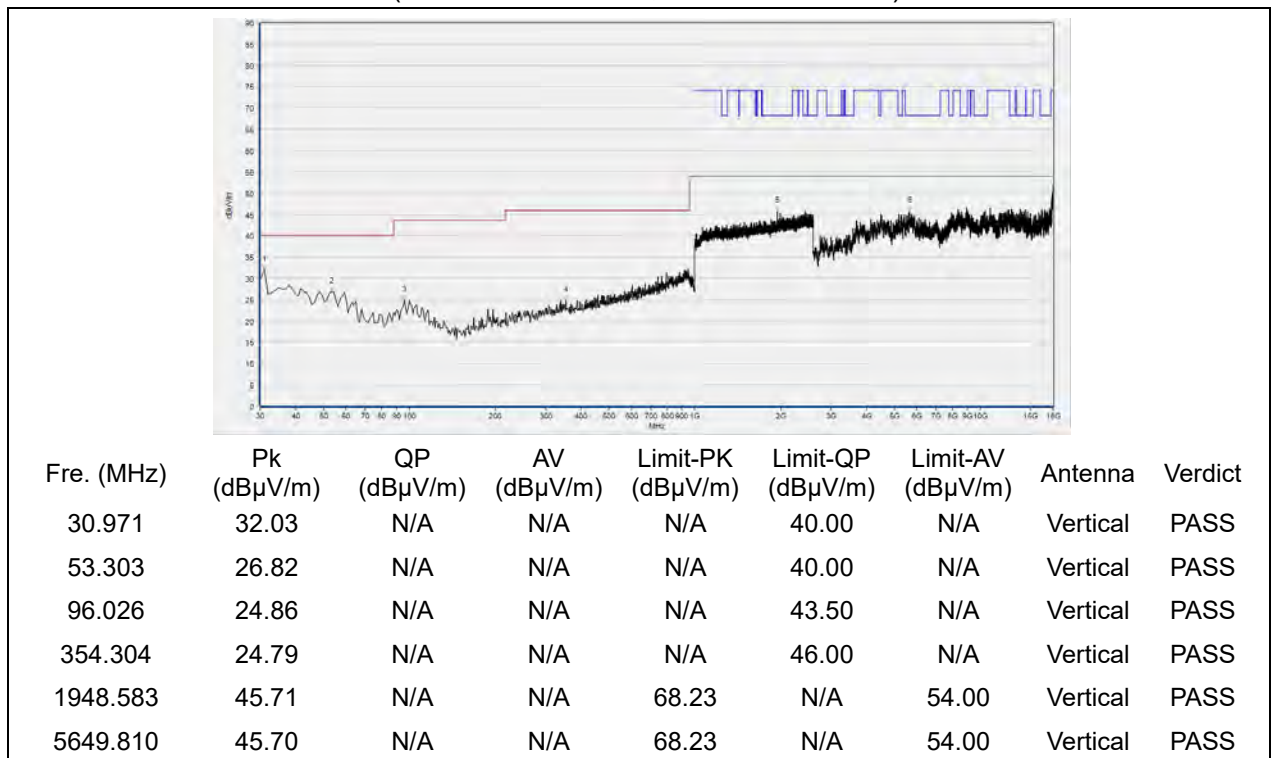


(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 122

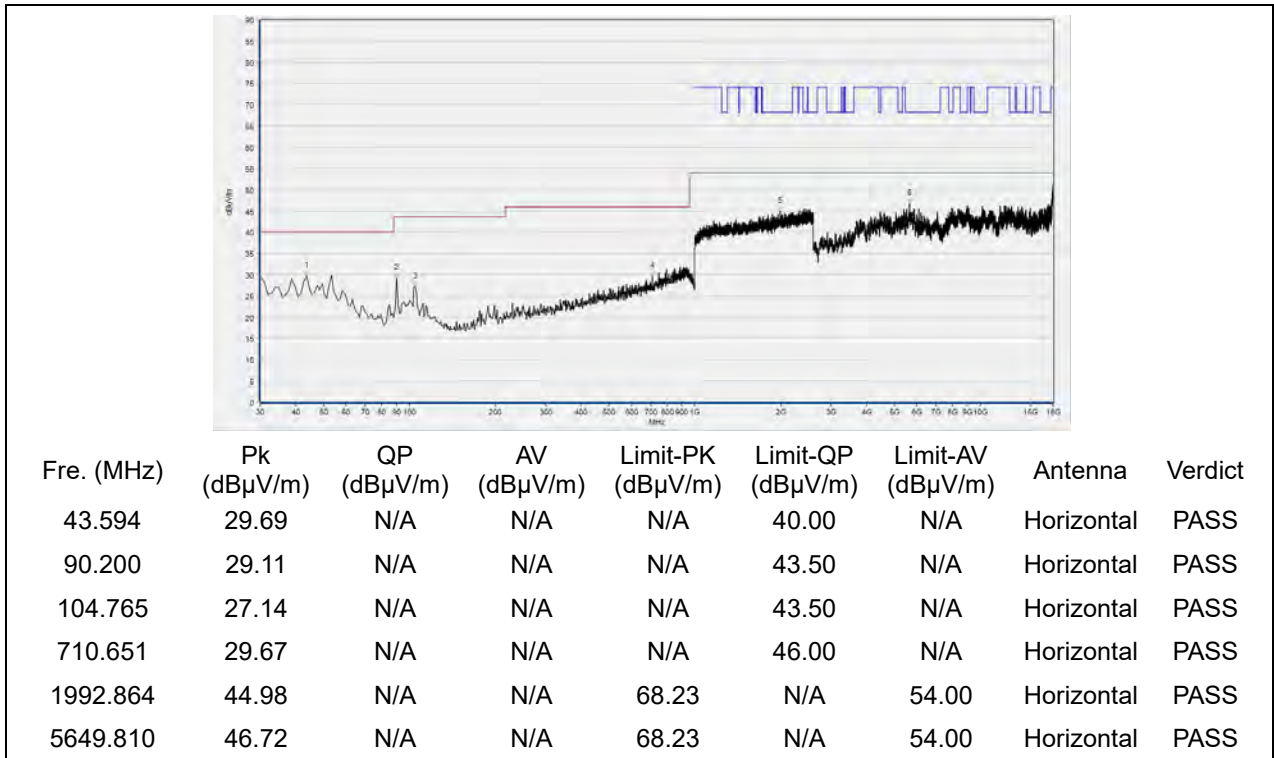


(Antenna Horizontal, 30MHz to 18GHz)

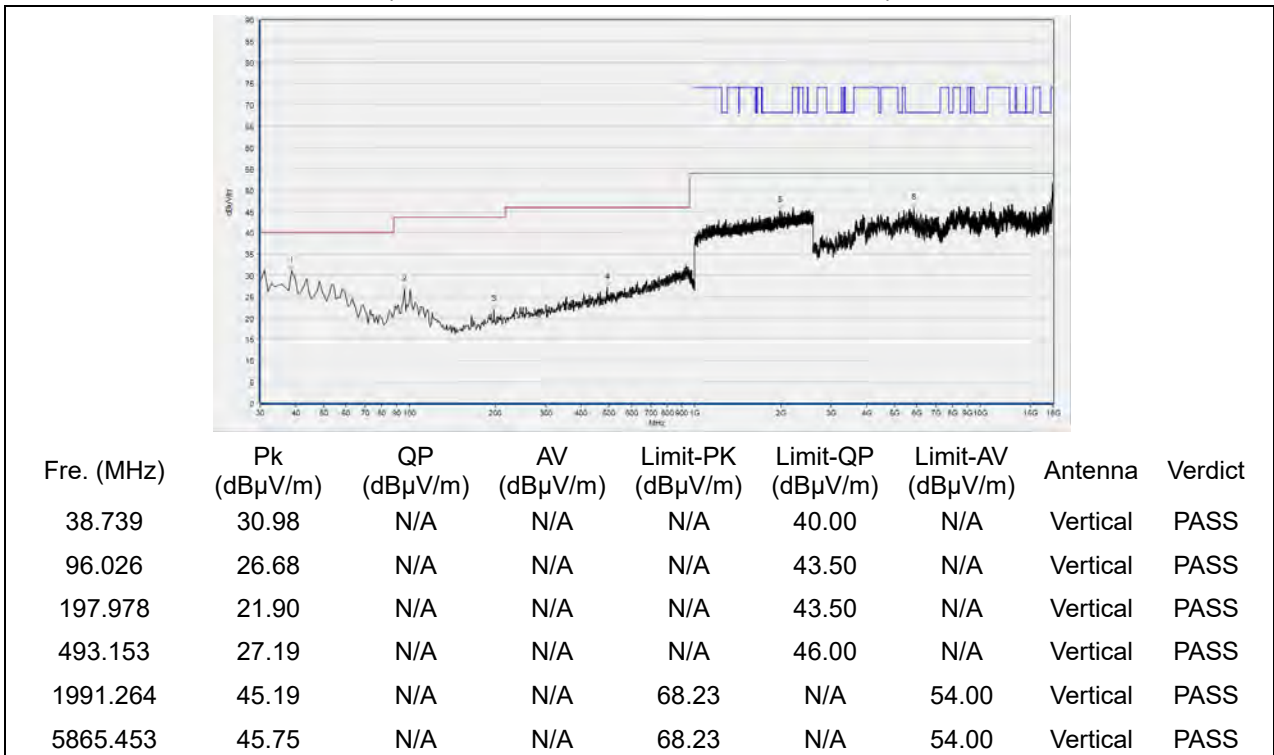


(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 138



(Antenna Horizontal, 30MHz to 18GHz)



(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 C63.10-2013 and 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 Analyzer	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
ADAPTER	OKXTTW	LA45NM14 0	DELL	N/A	N/A

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



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

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