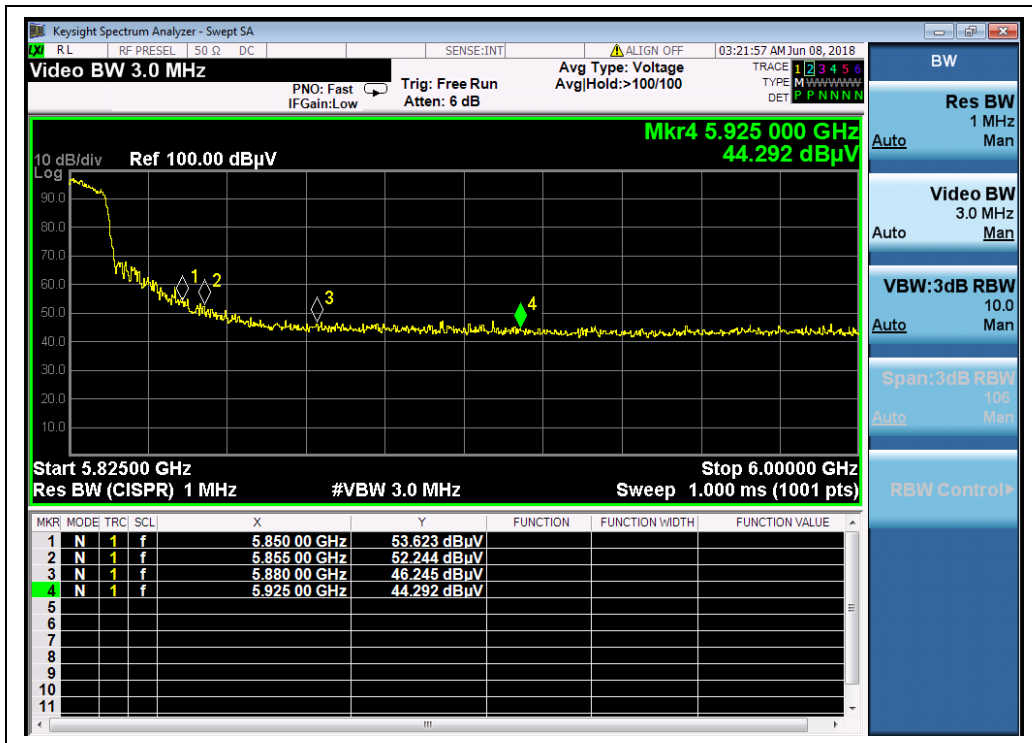


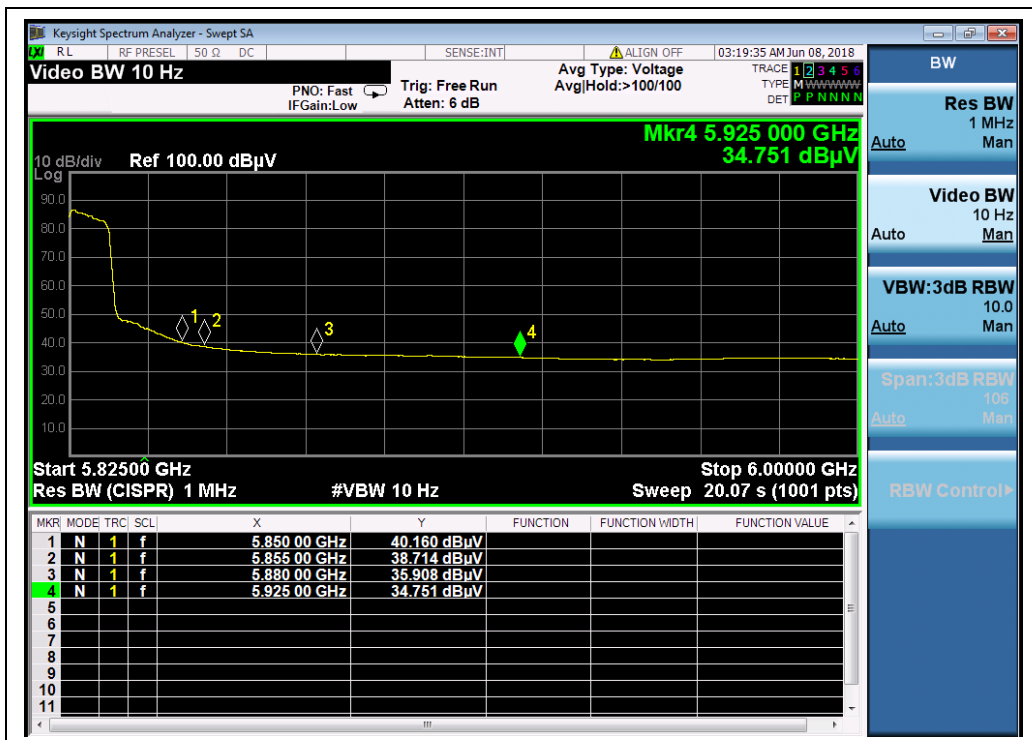
(Channel 149, PEAK, 802.11a)



(Channel 149, AVG, 802.11a)



(Channel 165, PEAK, 802.11a)

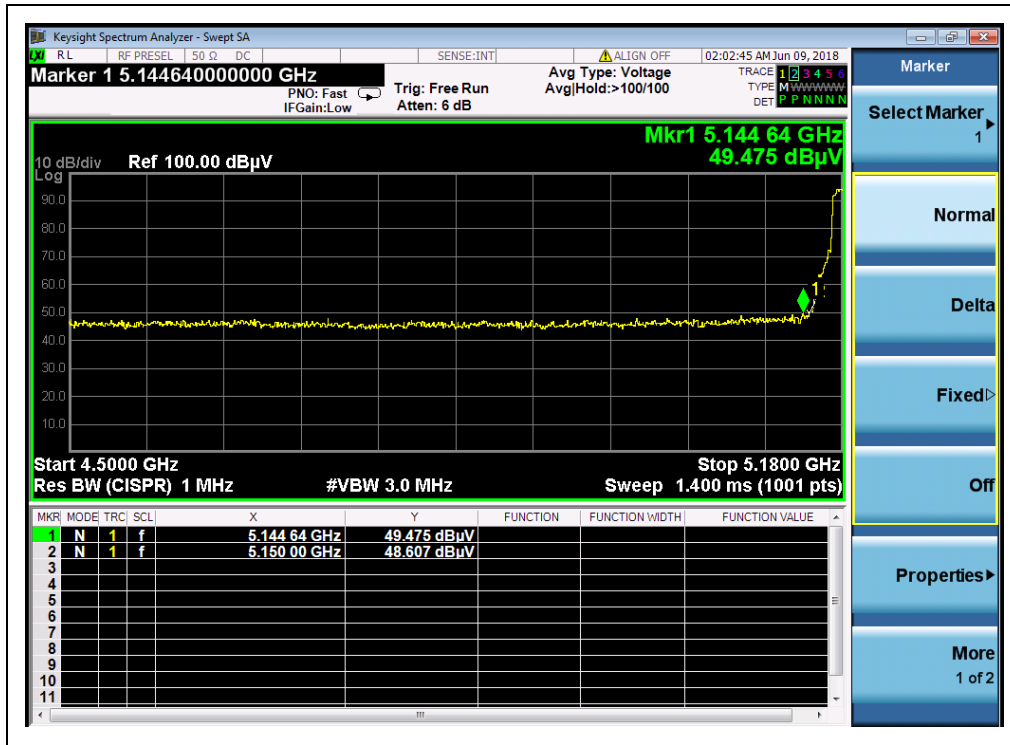


(Channel 165, AVG, 802.11a)

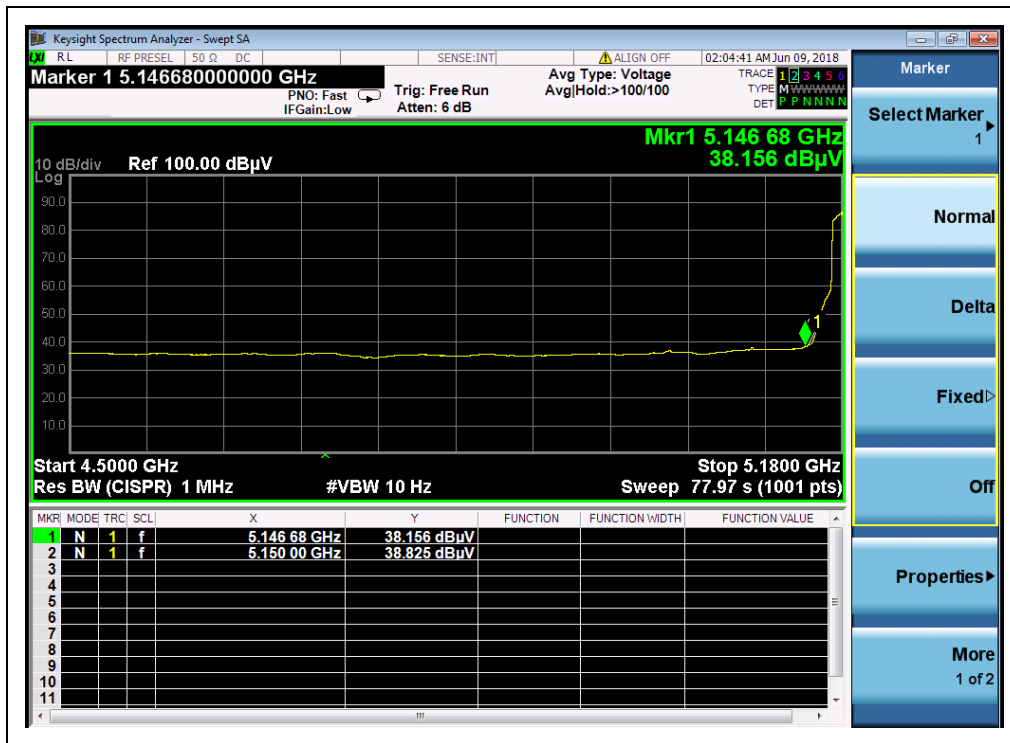
**802.11n (HT20) Test mode****A. Test Verdict:**

Channel	Frequency (MHz)	Detector	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dB μ V/m)	Limit (dB μ V/m)	Verdict
		PK/ AV						
36	5144.64	PK	49.48	-50.65	32.11	30.94	74	PASS
36	5146.68	AV	38.16	-50.65	32.11	19.62	54	PASS
64	5351.97	PK	46.04	-50.65	32.11	27.5	74	PASS
64	5351.13	AV	35.73	-50.65	32.11	17.19	54	PASS
100	5466.00	PK	45.78	-50.65	32.11	27.24	68.23	PASS
100	5466.00	AV	35.27	-50.65	32.11	16.73	54	PASS
144	5726.10	PK	58.09	-50.65	32.11	39.55	68.23	PASS
144	5725.80	AV	43.82	-50.65	32.11	25.28	54	PASS
149	5720.00	PK	56.54	-50.65	32.11	38	110.83	PASS
149	5720.00	AV	45.79	-50.65	32.11	27.25	54	PASS
165	5855.00	PK	47.84	-50.65	32.11	29.3	101.83	PASS
165	5855.00	AV	38.71	-50.65	32.11	20.17	54	PASS

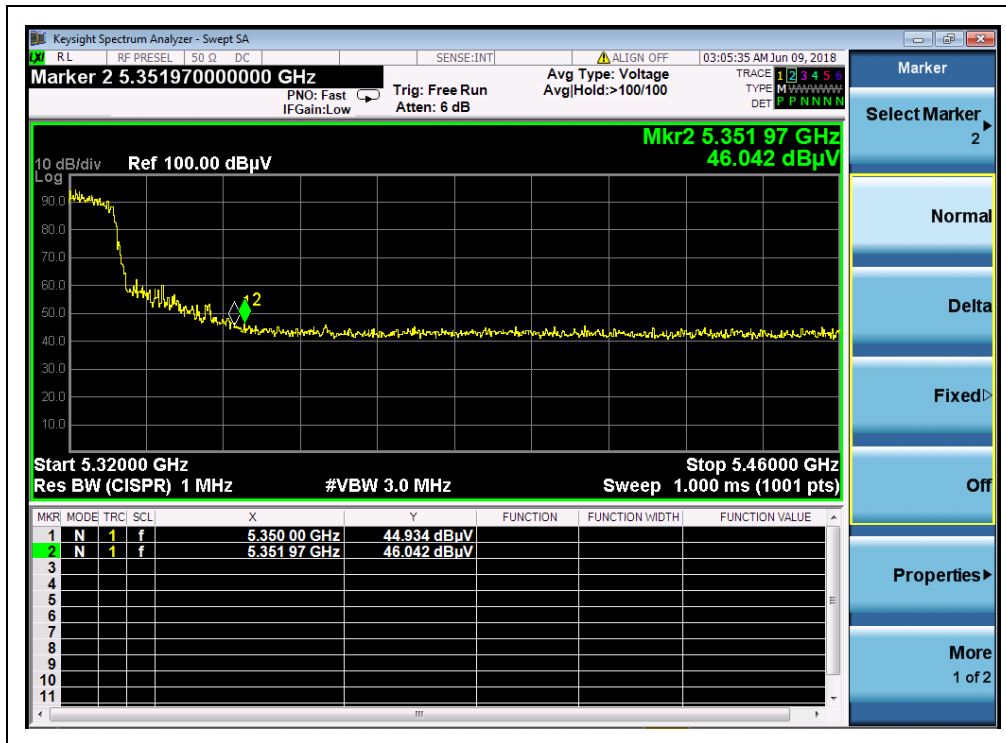
B. Test Plots:



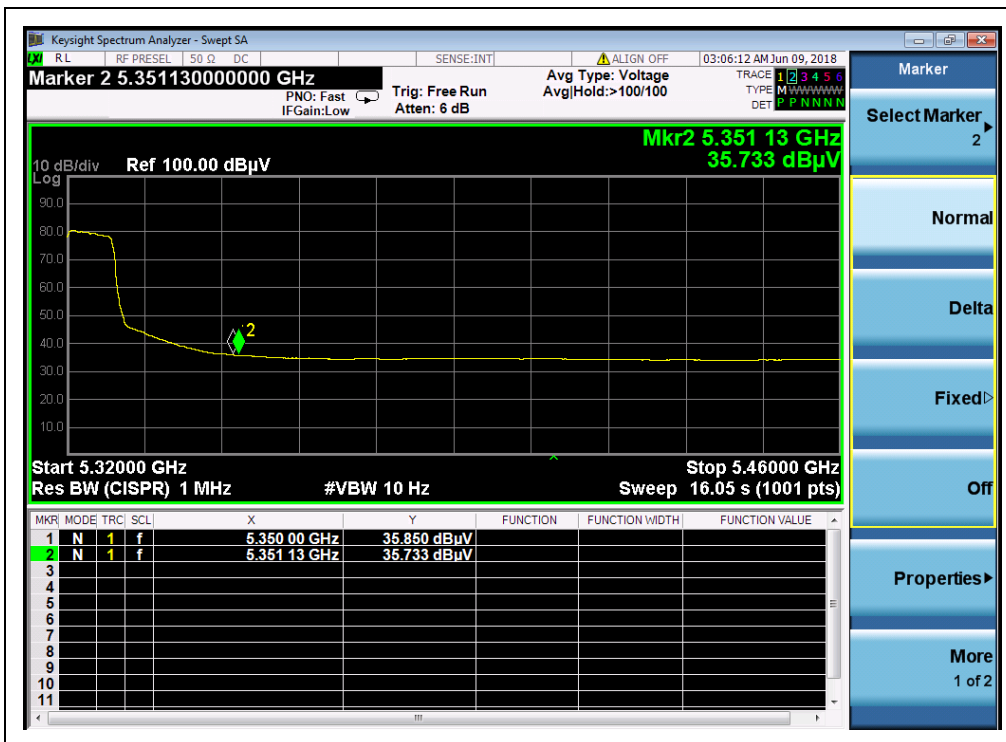
(Channel 36, PEAK, 802.11n (HT20))



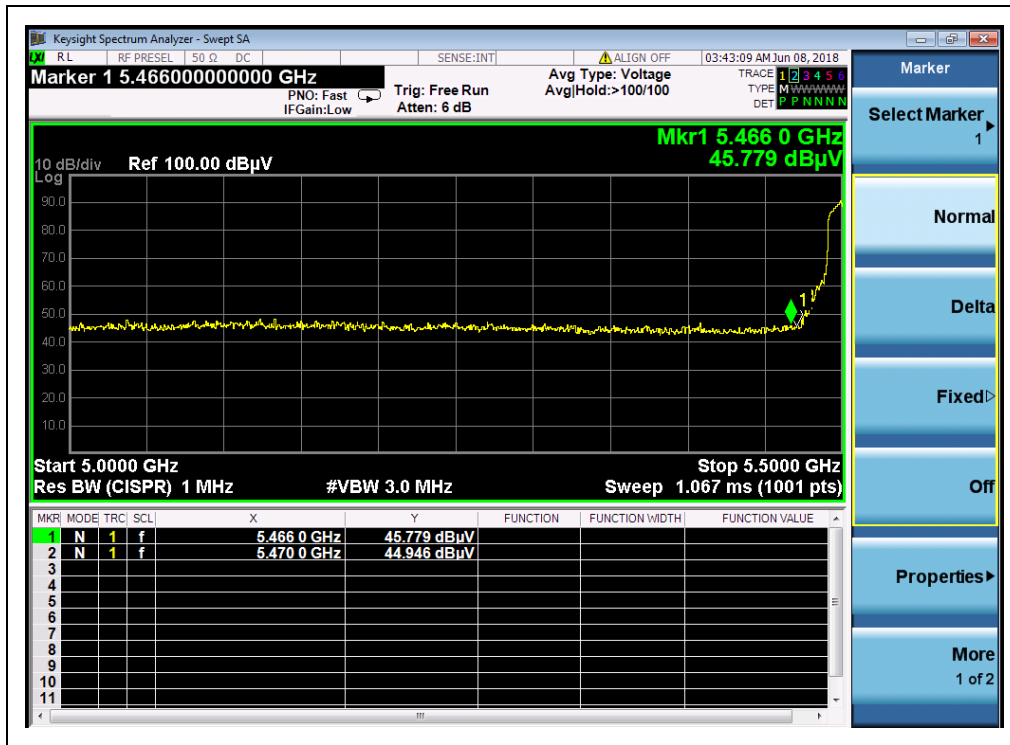
(Channel 36, AVG, 802.11 n (HT20))



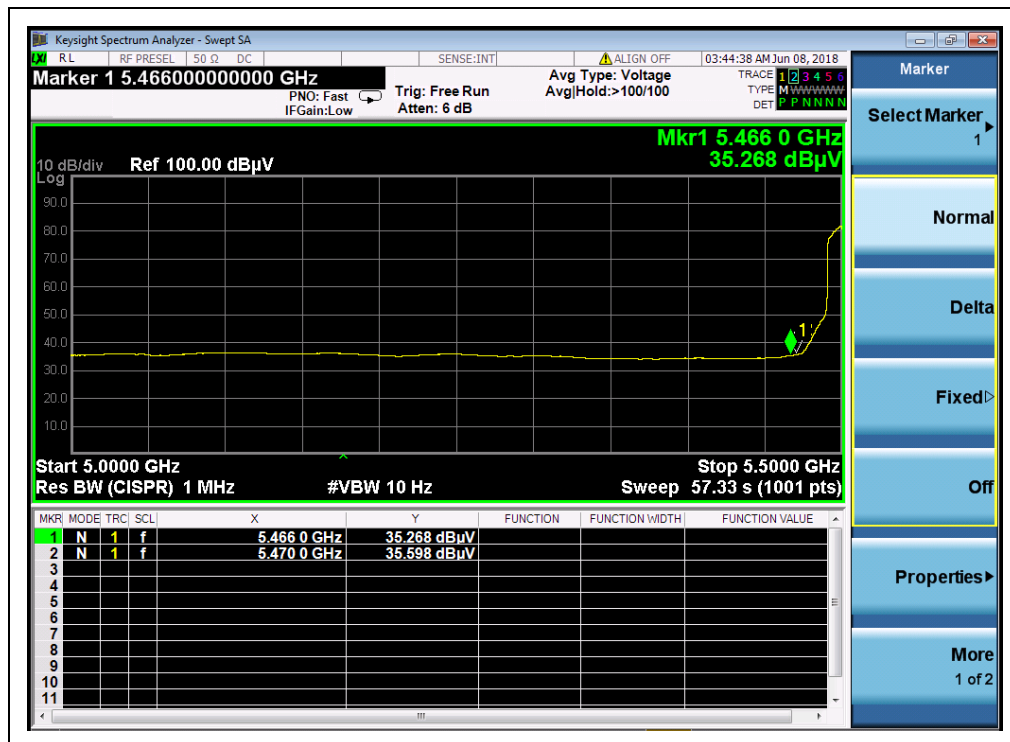
(Channel 64, PEAK, 802.11 n (HT20))



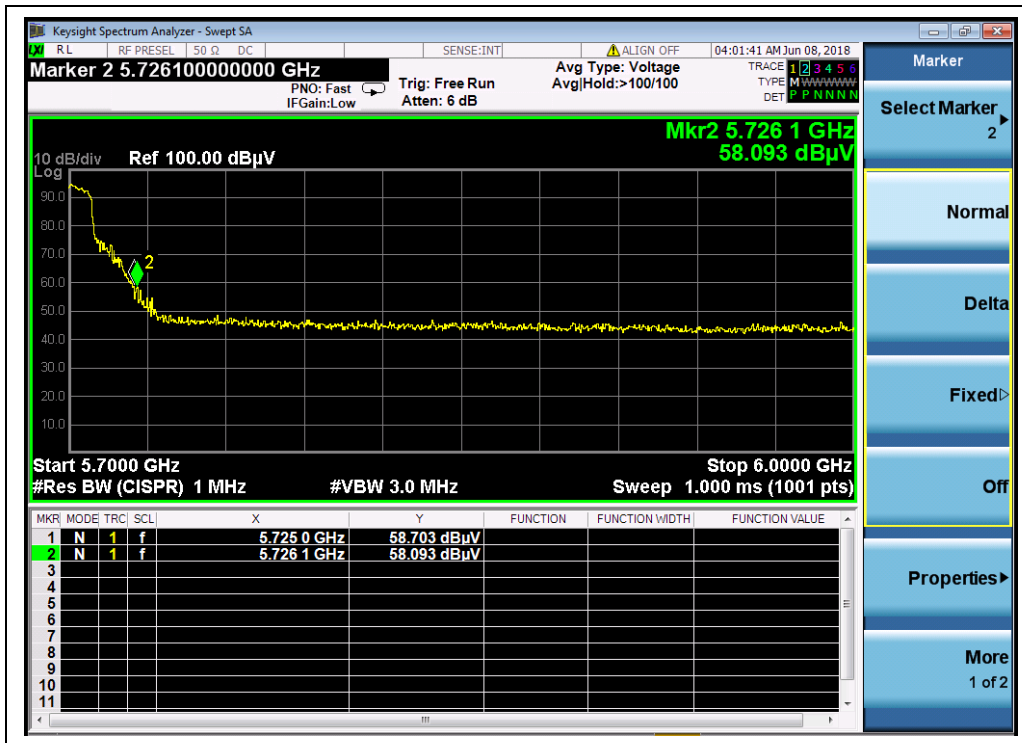
(Channel 64, AVG, 802.11n (HT20))



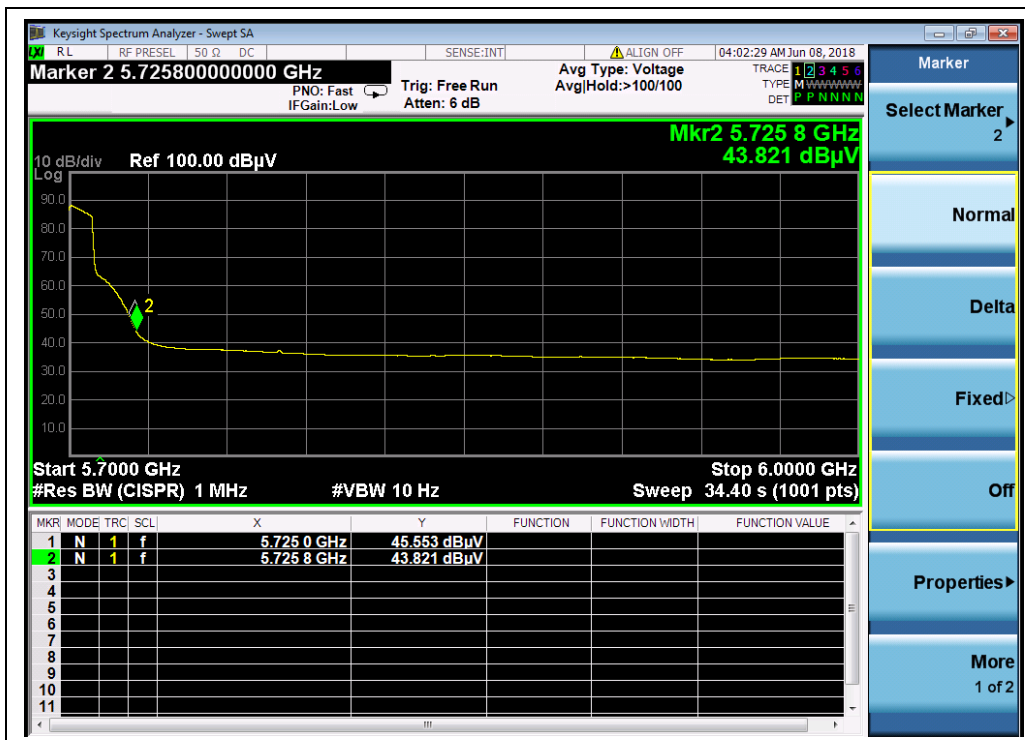
(Channel 100, PEAK, 802.11 n (HT20))



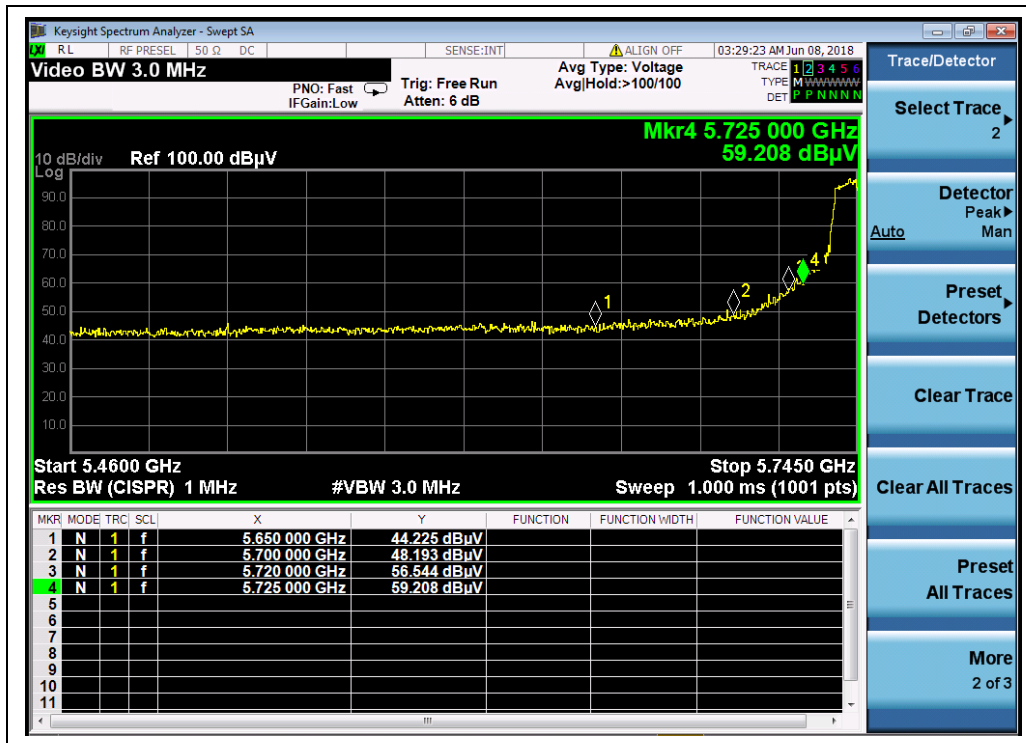
(Channel 100, AVG, 802.11n (HT20))



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



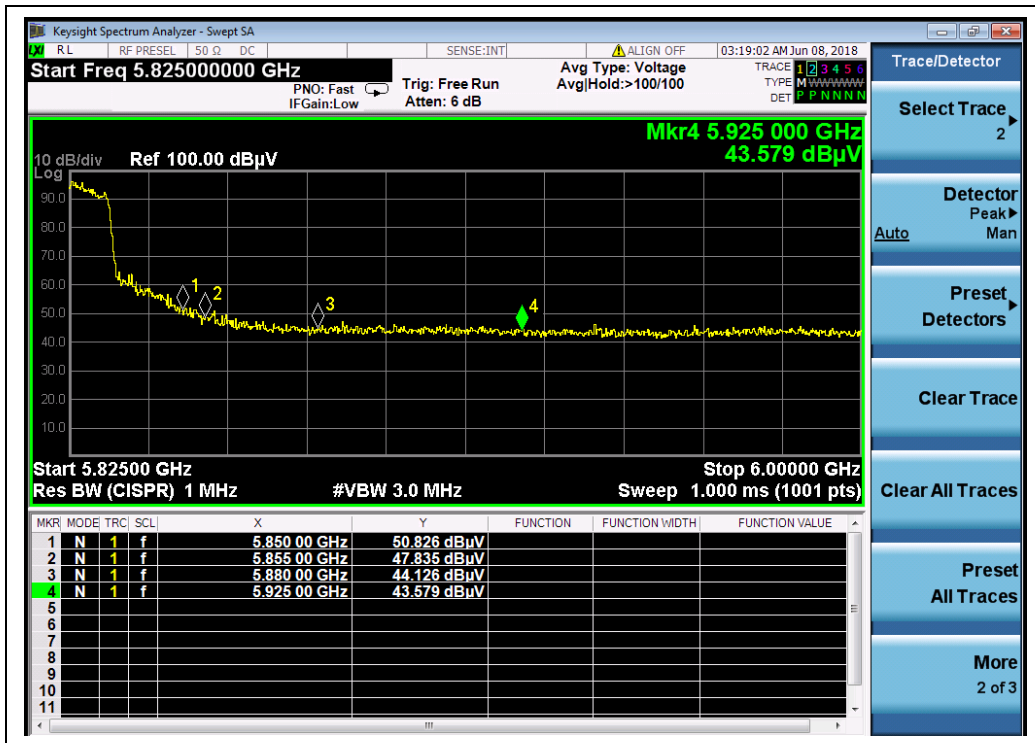
(Channel 144, AVG, 802.11n (HT20))



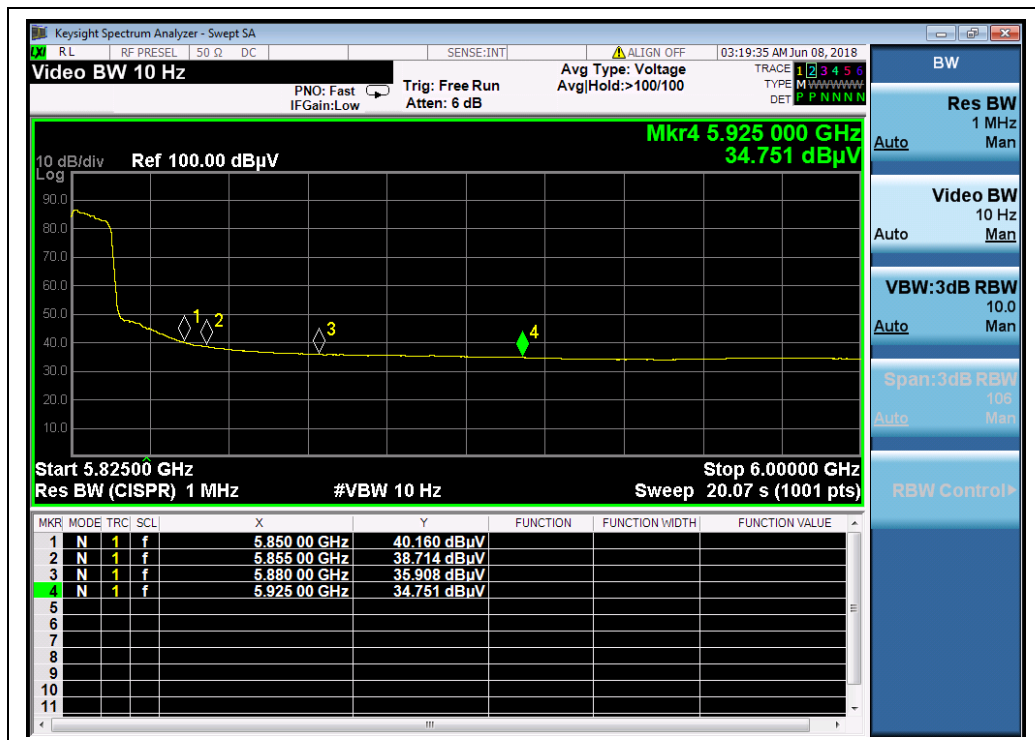
(Channel 149, PEAK, 802.11 n (HT20))



(Channel 149, AVG, 802.11n (HT20))



(Channel 165, PEAK, 802.11 n (HT20))



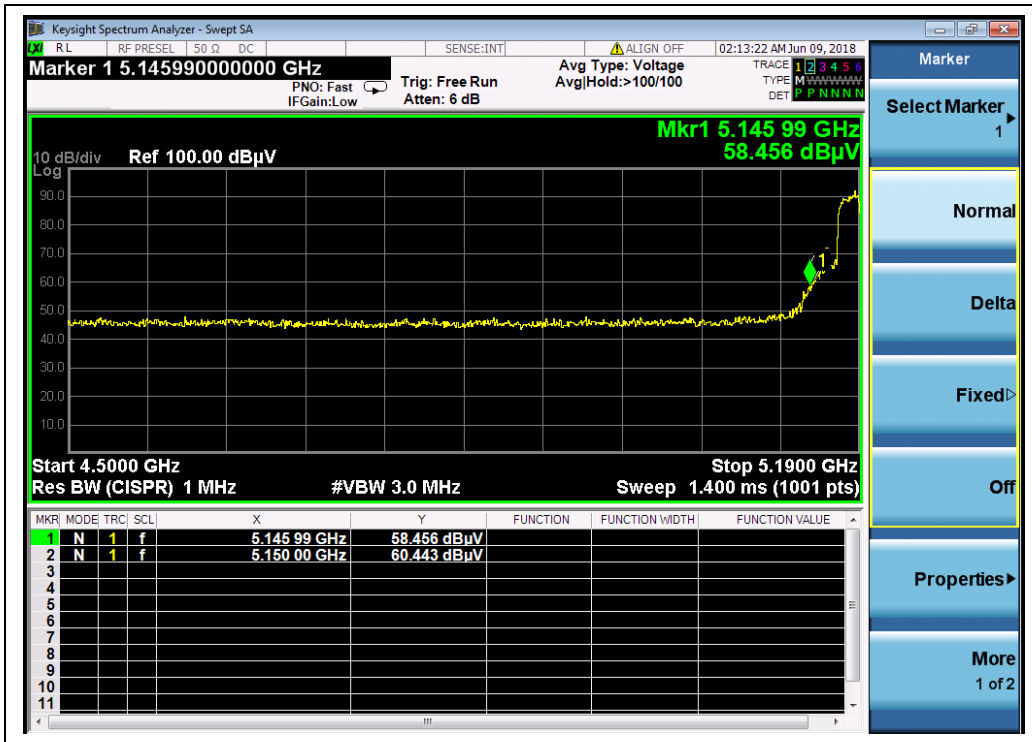
(Channel 165, AVG, 802.11n (HT20))

**802.11n (HT40) Test mode****A. Test Verdict:**

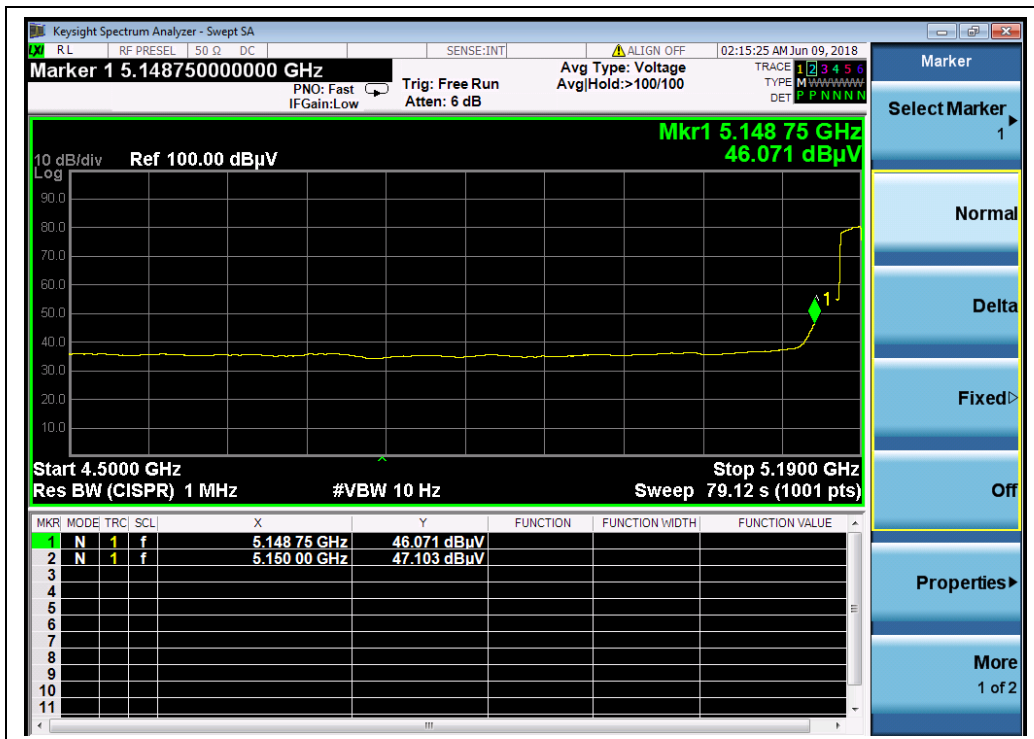
Channel	Frequency (MHz)	Detector	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dB μ V/m)	Limit (dB μ V/m)	Verdict
		PK/ AV						
38	5145.99	PK	58.46	-50.65	32.11	39.92	74	PASS
38	5148.75	AV	46.07	-50.65	32.11	27.53	54	PASS
62	5351.30	PK	53.16	-50.65	32.11	34.62	74	PASS
62	5350.85	AV	39.51	-50.65	32.11	20.97	54	PASS
102	5452.74	PK	49.48	-50.65	32.11	30.94	74	PASS
102	5466.00	AV	36.44	-50.65	32.11	17.90	54	PASS
134	5729.10	PK	52.54	-50.65	32.11	34.00	68.23	PASS
134	5728.77	AV	39.18	-50.65	32.11	20.64	54	PASS
151	5720.00	PK	62.80	-50.65	32.11	44.26	110.83	PASS
151	5720.00	AV	44.87	-50.65	32.11	26.33	54	PASS
159	5855.00	PK	46.97	-50.65	32.11	28.43	110.83	PASS
159	5855.00	AV	36.89	-50.65	32.11	18.35	54	PASS



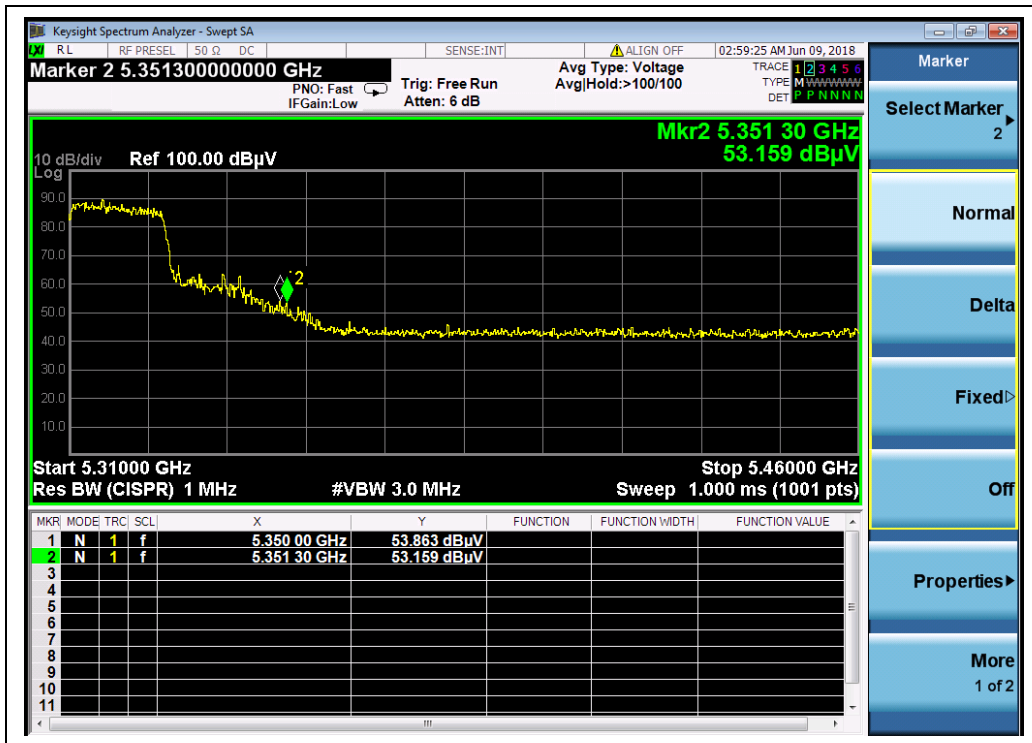
B. Test Plots:



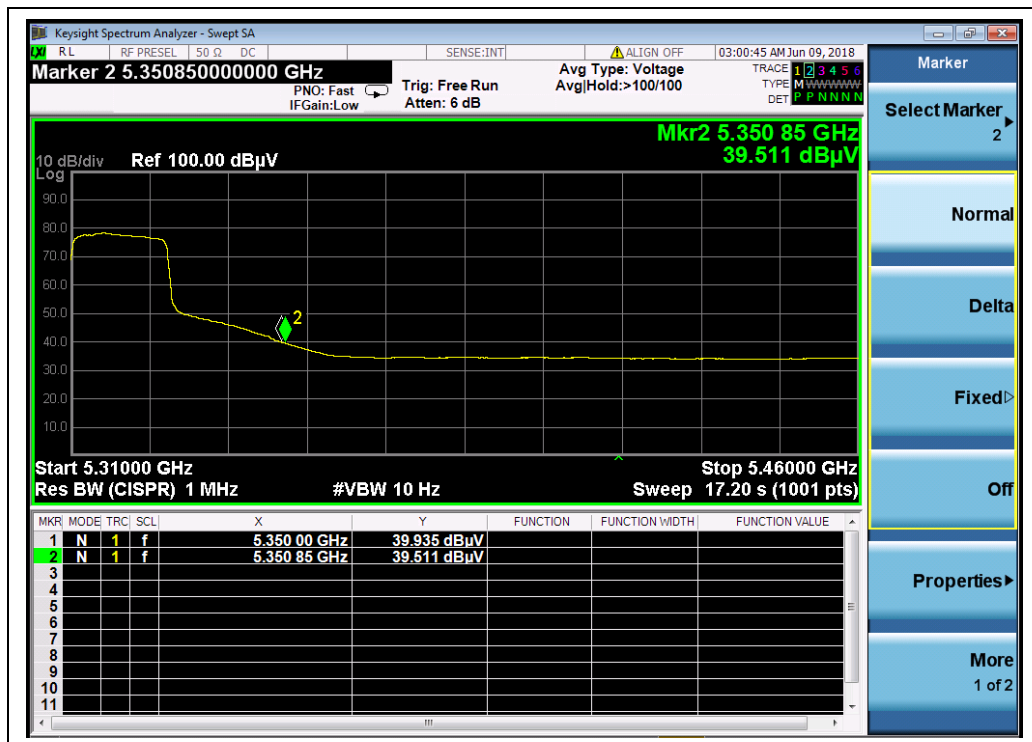
(Channel 38, PEAK, 802.11n (HT40))



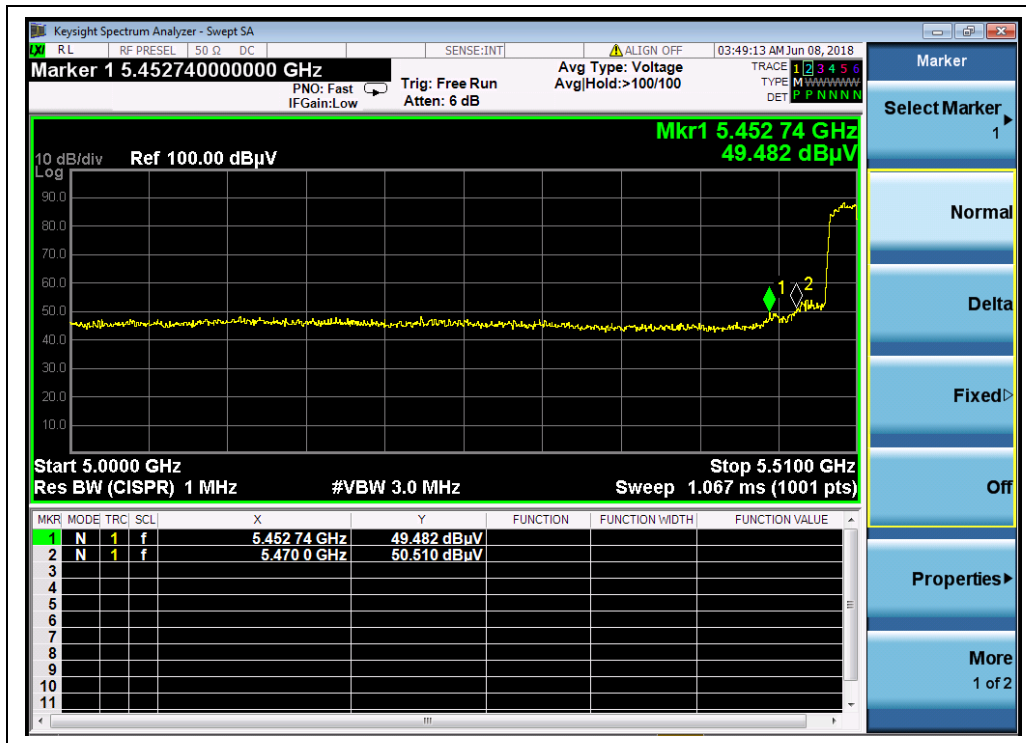
(Channel 38, AVG, 802.11n (HT40))



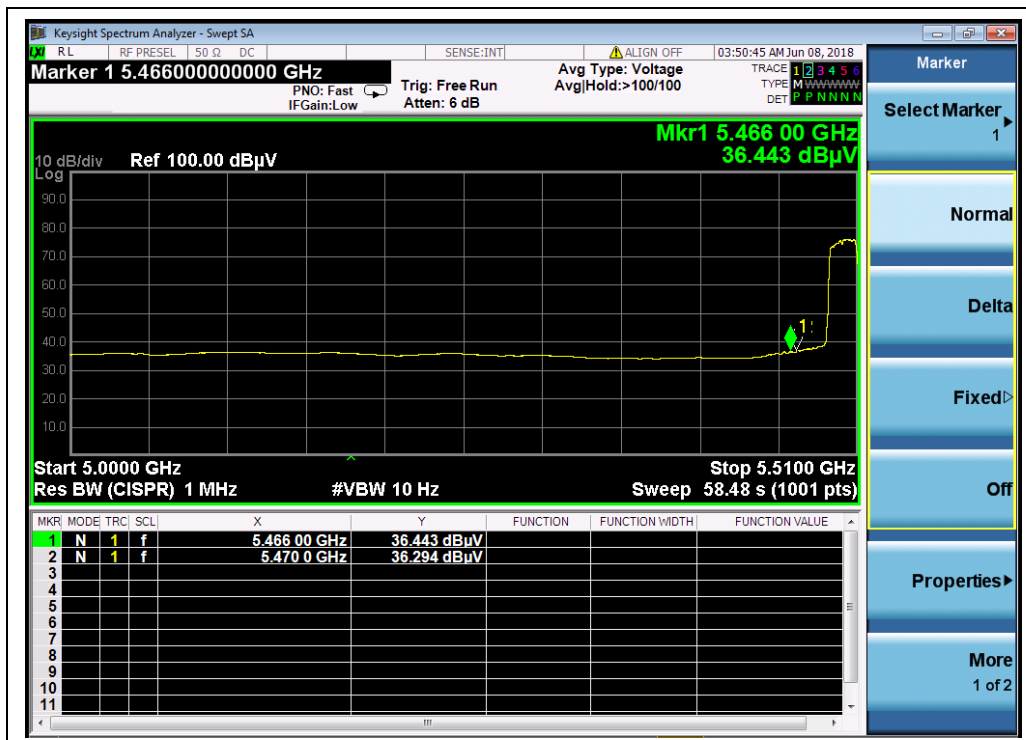
(Channel 62, PEAK, 802.11n (HT40))



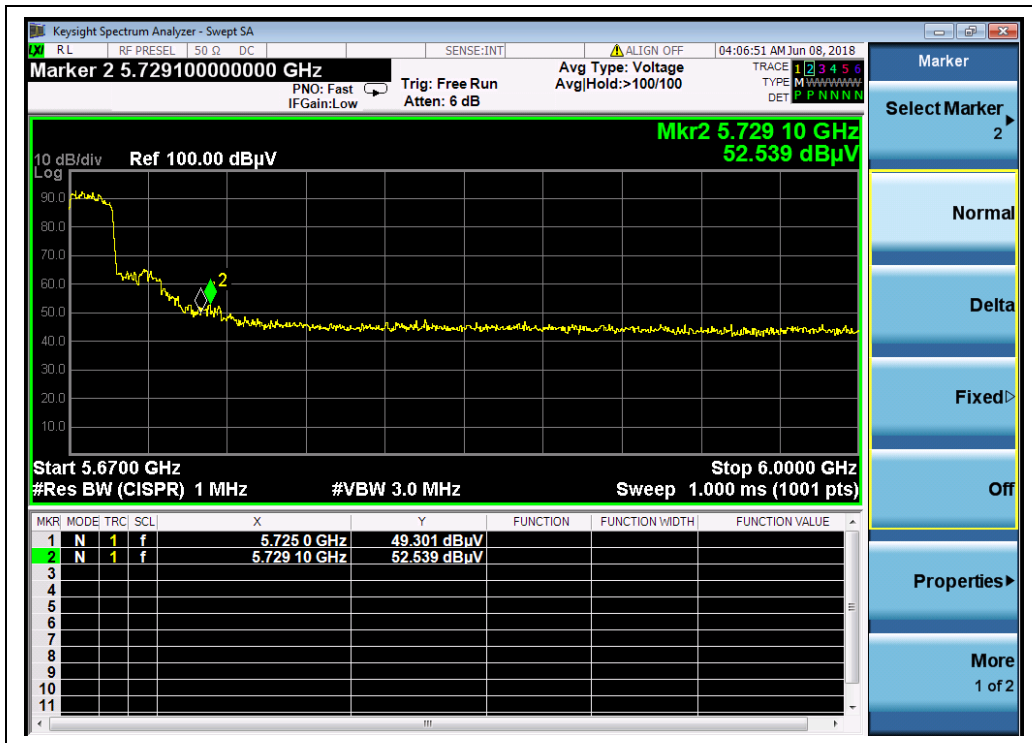
(Channel 62, AVG, 802.11n (HT40))



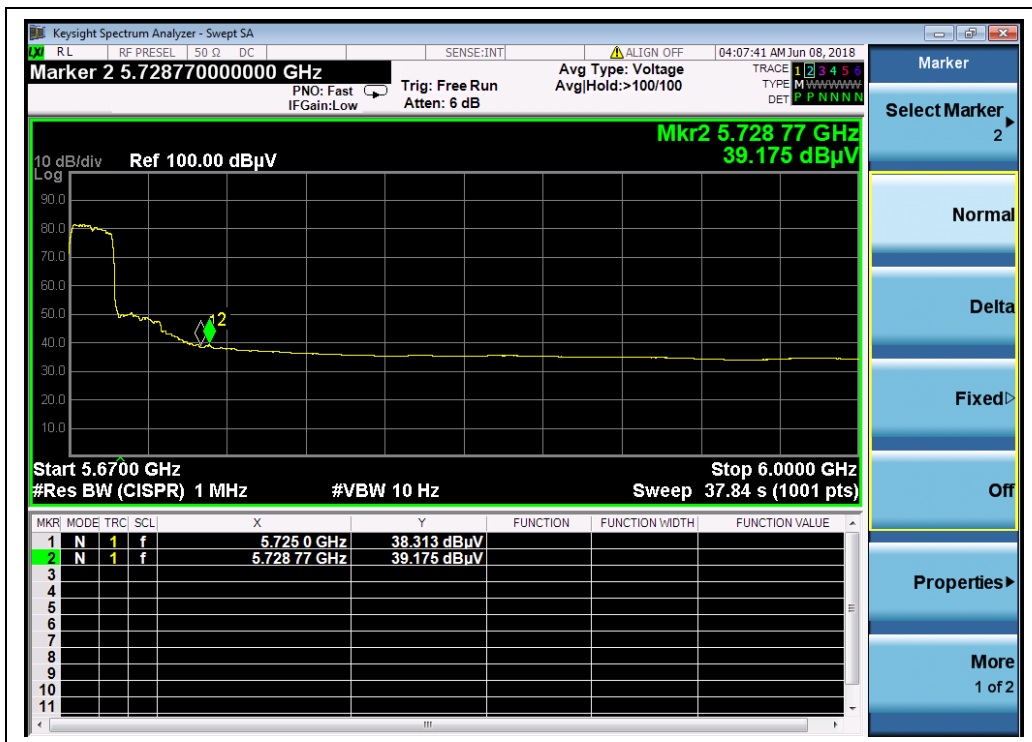
(Channel 102, PEAK, 802.11n (HT40))



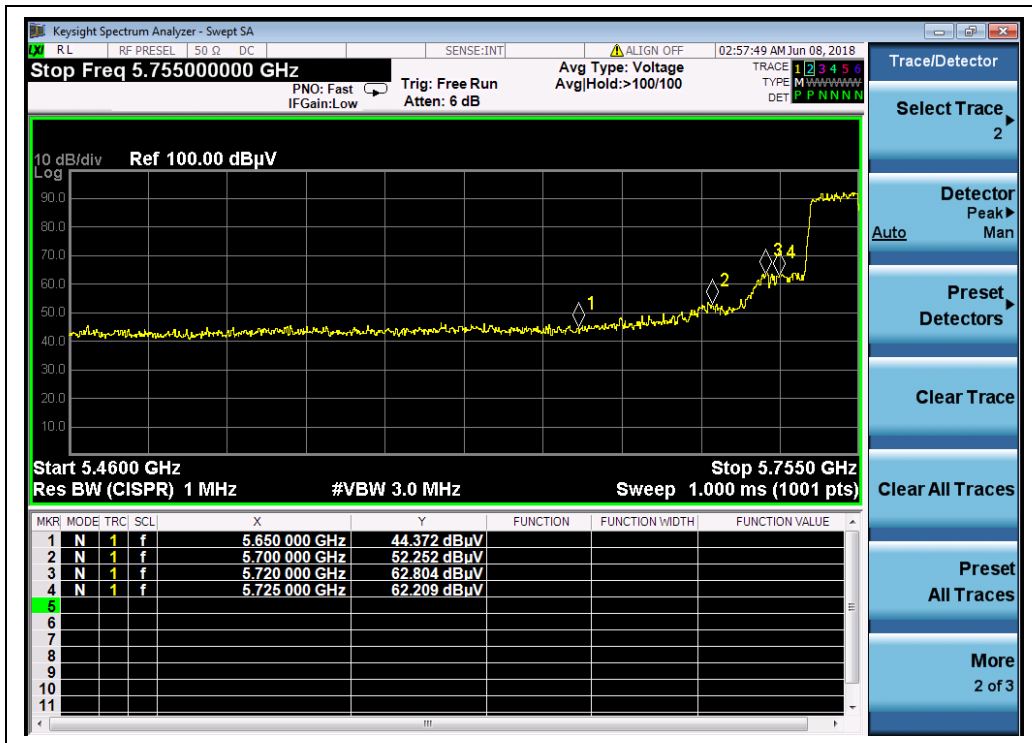
(Channel 102, AVG, 802.11n (HT40))



(Channel 134, PEAK, 802.11n (HT40))



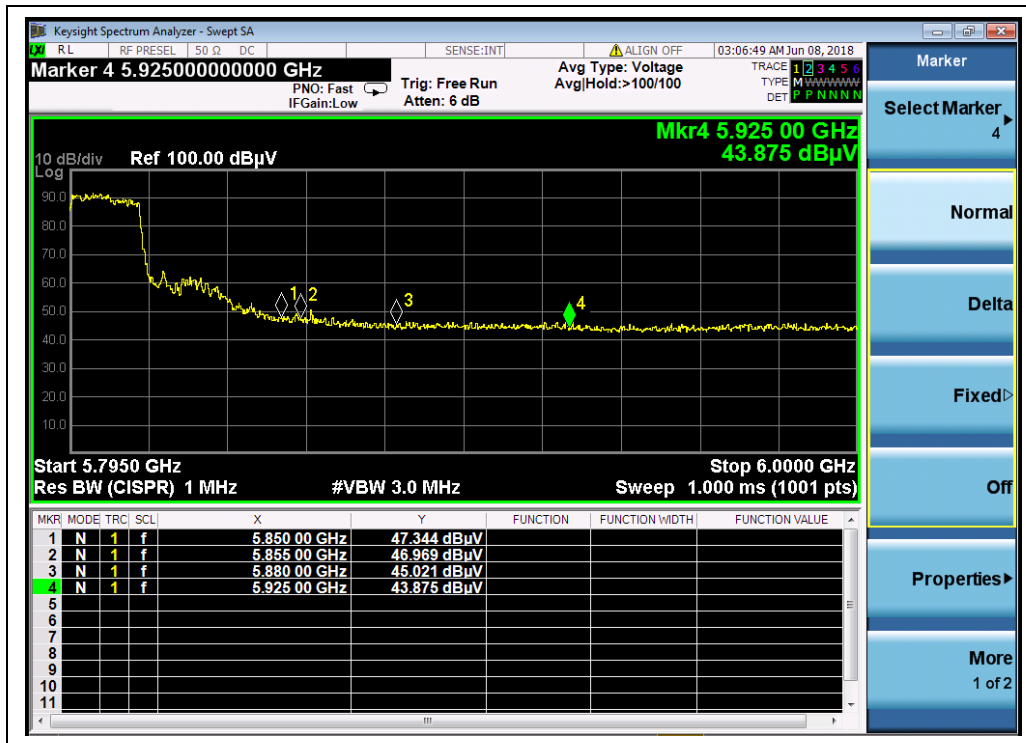
(Channel 134, AVG, 802.11n (HT40))



(Channel 151, PEAK, 802.11n (HT40))



(Channel 151, AVG, 802.11n (HT40))



(Channel 159, PEAK, 802.11n (HT40))



(Channel 159, AVG, 802.11n (HT40))



2.6. Frequency Stability

2.6.1. Requirement

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

2.6.2. Test Procedure

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between 5°C to 40°C. The temperature was incremented by 10° intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded. Data for the worst case channel is shown below.

2.6.3. Test Result

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq Dev. (Hz)	Deviation (%)
100%	3.8	+20(Ref)	5,179,999,988	-12	-0.0000002
100%		-30	5,180,000,023	23	0.0000004
100%		-20	5,180,000,011	11	0.0000002
100%		-10	5,179,999,979	-21	-0.0000004
100%		0	5,180,000,028	28	0.0000005
100%		+10	5,180,000,022	22	0.0000004
100%		+20	5,179,999,987	-13	-0.0000003
100%		+30	5,179,999,982	-18	-0.0000003
100%		+40	5,180,000,011	11	0.0000002
100%		+50	5,180,000,014	14	0.0000003
85%	3.6	+20	5,179,999,988	-12	-0.0000002
115%	4.35	+20	5,179,999,990	-10	-0.0000002



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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq Dev. (Hz)	Deviation (%)
100%	3.8	+20(Ref)	5,259,999,989	-11	-0.0000002
100%		-30	5,259,999,985	-15	-0.0000003
100%		-20	5,260,000,018	18	0.0000003
100%		-10	5,260,000,014	14	0.0000003
100%		0	5,259,999,987	-13	-0.0000002
100%		+10	5,260,000,026	26	0.0000005
100%		+20	5,260,000,014	14	0.0000003
100%		+30	5,260,000,018	18	0.0000003
100%		+40	5,259,999,985	-15	-0.0000003
100%		+50	5,260,000,023	23	0.0000004
85%	3.6	+20	5,260,000,022	22	0.0000004
115%	4.35	+20	5,259,999,988	-12	-0.0000002

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq Dev. (Hz)	Deviation (%)
100%	3.8	+20(Ref)	5,500,000,021	21	0.0000004
100%		-30	5,500,000,028	28	0.0000005
100%		-20	5,500,000,024	24	0.0000004
100%		-10	5,499,999,984	-16	-0.0000003
100%		0	5,500,000,015	15	0.0000003
100%		+10	5,499,999,992	-8	-0.0000001
100%		+20	5,500,000,017	17	0.0000003
100%		+30	5,500,000,021	21	0.0000004
100%		+40	5,499,999,979	-21	-0.0000004
100%		+50	5,500,000,014	14	0.0000003
85%	3.6	+20	5,500,000,026	26	0.0000005
115%	4.35	+20	5,499,999,982	-18	-0.0000003



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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq Dev. (Hz)	Deviation (%)
100%	3.8	+20(Ref)	5,745,000,021	21	0.0000004
100%		-30	5,744,999,985	-15	-0.0000003
100%		-20	5,745,000,021	21	0.0000004
100%		-10	5,744,999,978	-22	-0.0000004
100%		0	5,745,000,028	28	0.0000005
100%		+10	5,744,999,976	-24	-0.0000004
100%		+20	5,745,000,031	31	0.0000005
100%		+30	5,745,000,028	28	0.0000005
100%		+40	5,744,999,981	-19	-0.0000003
100%		+50	5,745,000,022	22	0.0000004
85%		3.6	+20	5,745,000,024	24
115%	4.35	+20	5,745,000,030	30	0.0000005

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

2.7. 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).

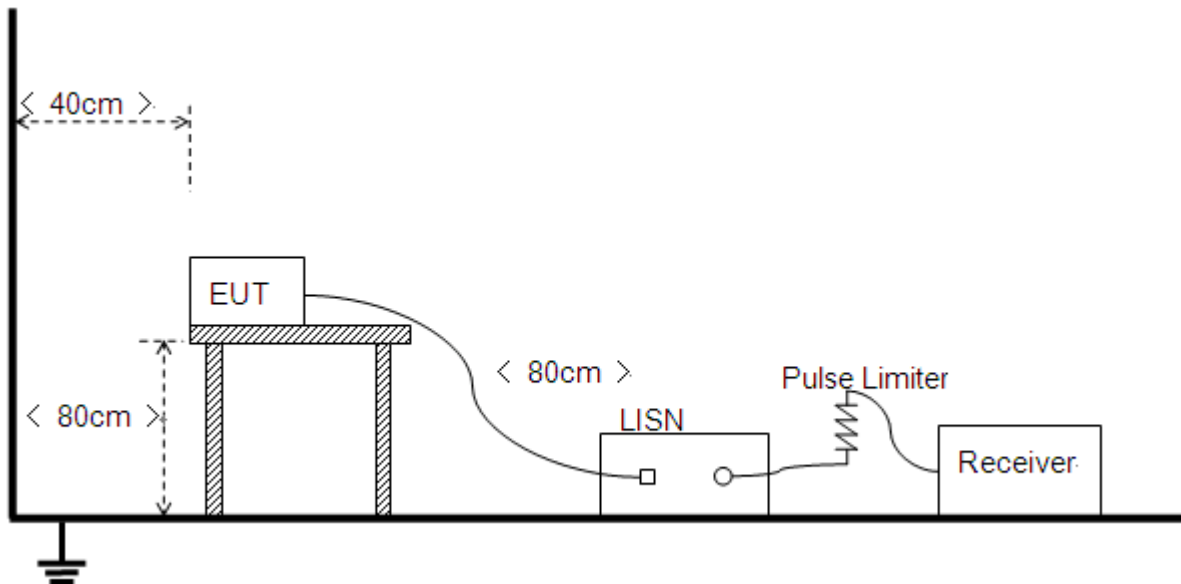
Frequency range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

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

A. Test Setup:



The Table-top EUT was placed upon a non-metallic table 0.8m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.10: 2013.



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.

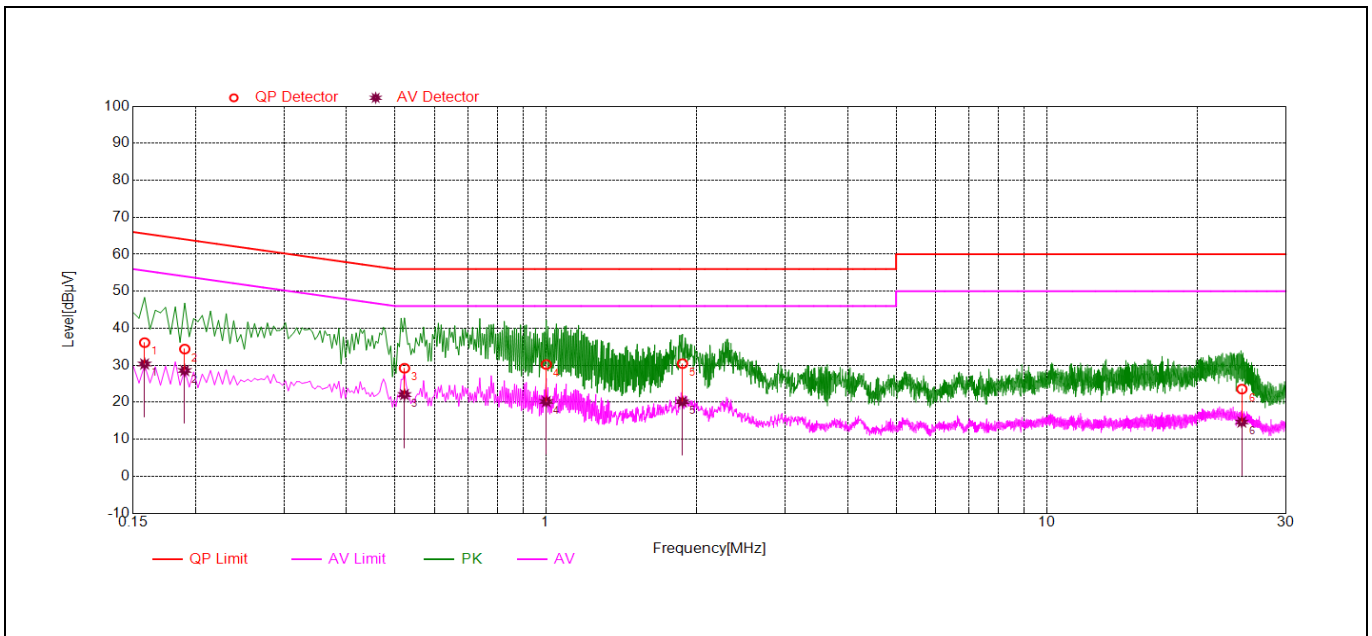
Note: Both of the test voltage AC 120V/60Hz and AC 230V/50Hz were considered and tested respectively, only the results of the worst case AC 120V/60Hz were recorded in this report.

A. Test setup:

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

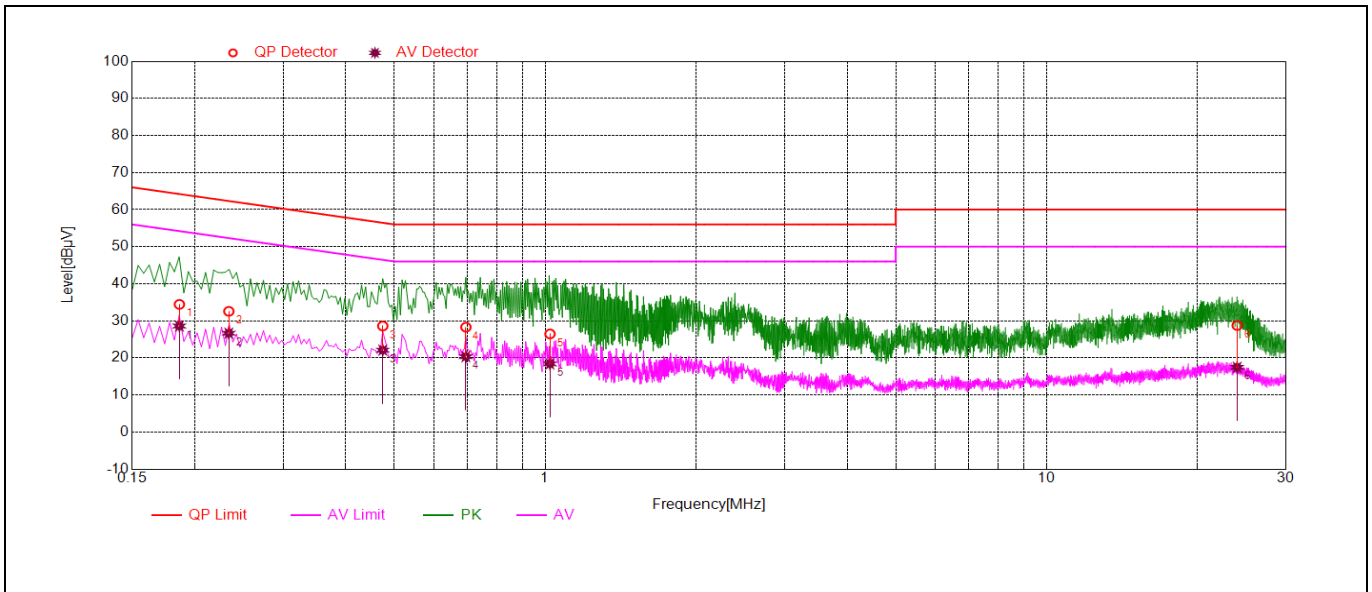
Note: The test voltage is AC 120V/60Hz.

B. Test Plots:



(Plot A: L Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.16	36.12	30.34	65.57	55.57	Line	PASS
2	0.19	34.38	28.58	64.04	54.04		PASS
3	0.52	29.20	22.08	56.00	46.00		PASS
4	1.00	30.20	20.20	56.00	46.00		PASS
5	1.87	30.45	20.15	56.00	46.00		PASS
6	24.51	23.57	14.67	60.00	50.00		PASS



(Plot B: N Phase)

NO.	Fre. (MHz)	Emission Level (dBμV)		Limit (dBμV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.19	34.44	28.60	64.21	54.21	Neutral	PASS
2	0.23	32.57	26.66	62.32	52.32		PASS
3	0.47	28.61	22.10	56.45	46.45		PASS
4	0.69	28.29	20.34	56.00	46.00		PASS
5	1.02	26.48	18.38	56.00	46.00		PASS
6	24.00	28.75	17.47	60.00	50.00		PASS



2.8. Radiated Emission

2.8.1. 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);

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

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

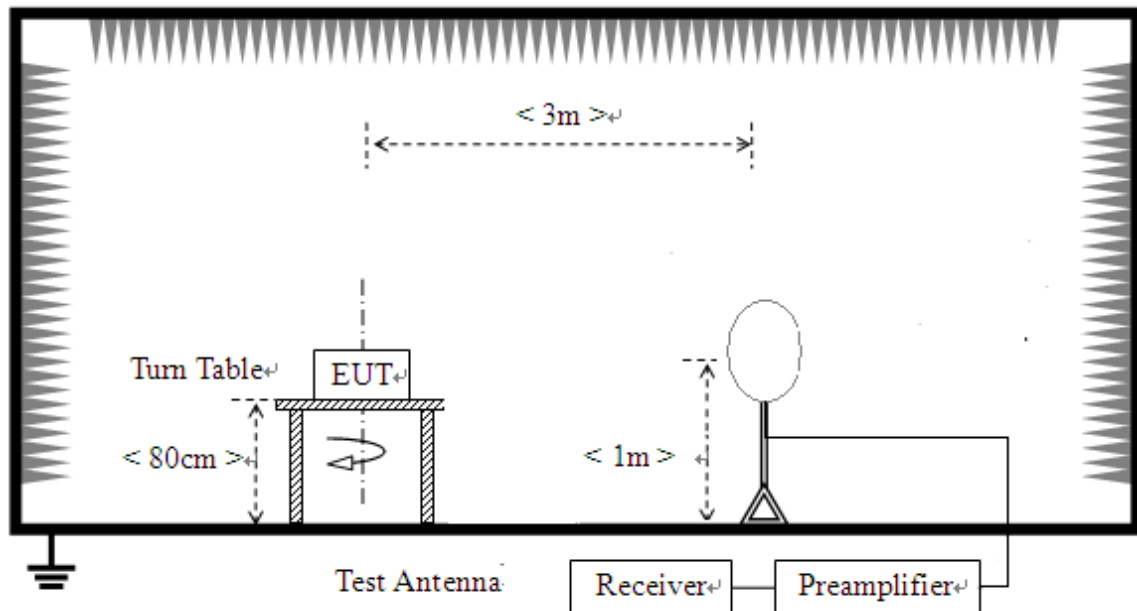
Note:

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.

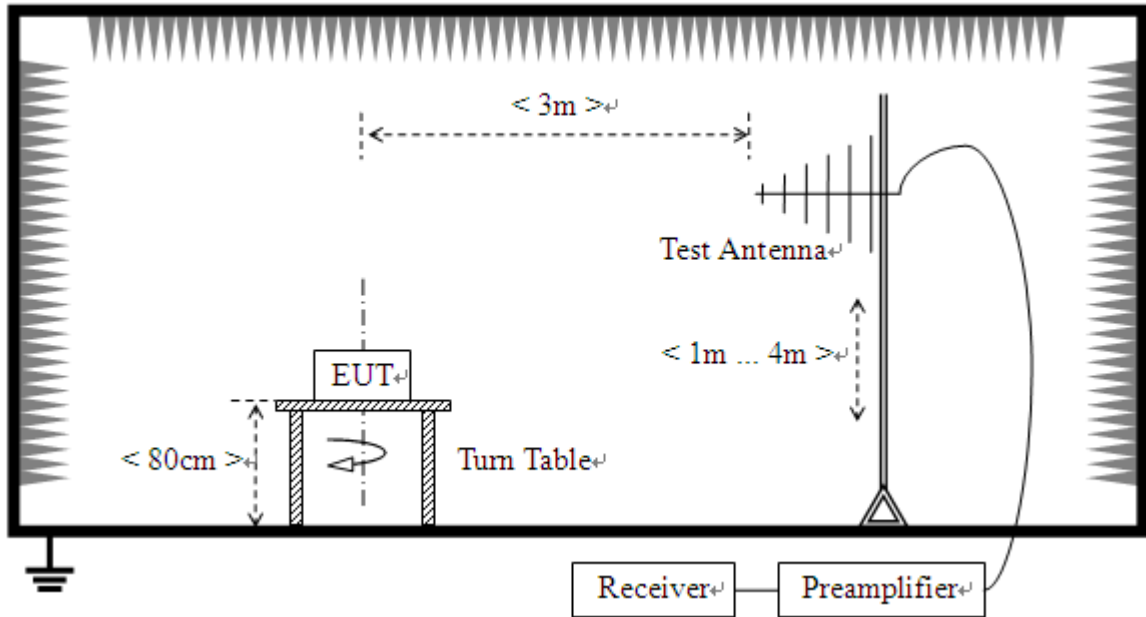
In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table)

2.8.2. Test Description**A. Test Setup:**

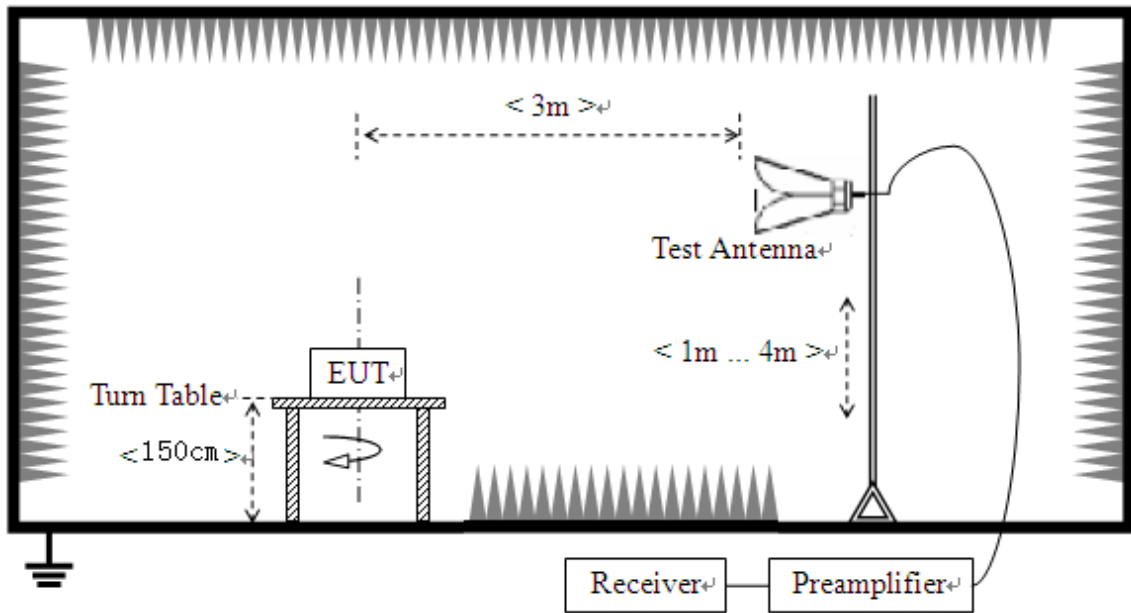
- 1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to1GHz



3) For radiated emissions above 1GHz



The RF absorbing material used on the reference ground plane and on the turntable have a maximum height (thickness) of 30 cm (12 in) and have a minimum-rated attenuation of 20 dB at all frequencies from 1 GHz to 18 GHz.

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.



2.8.3. 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.

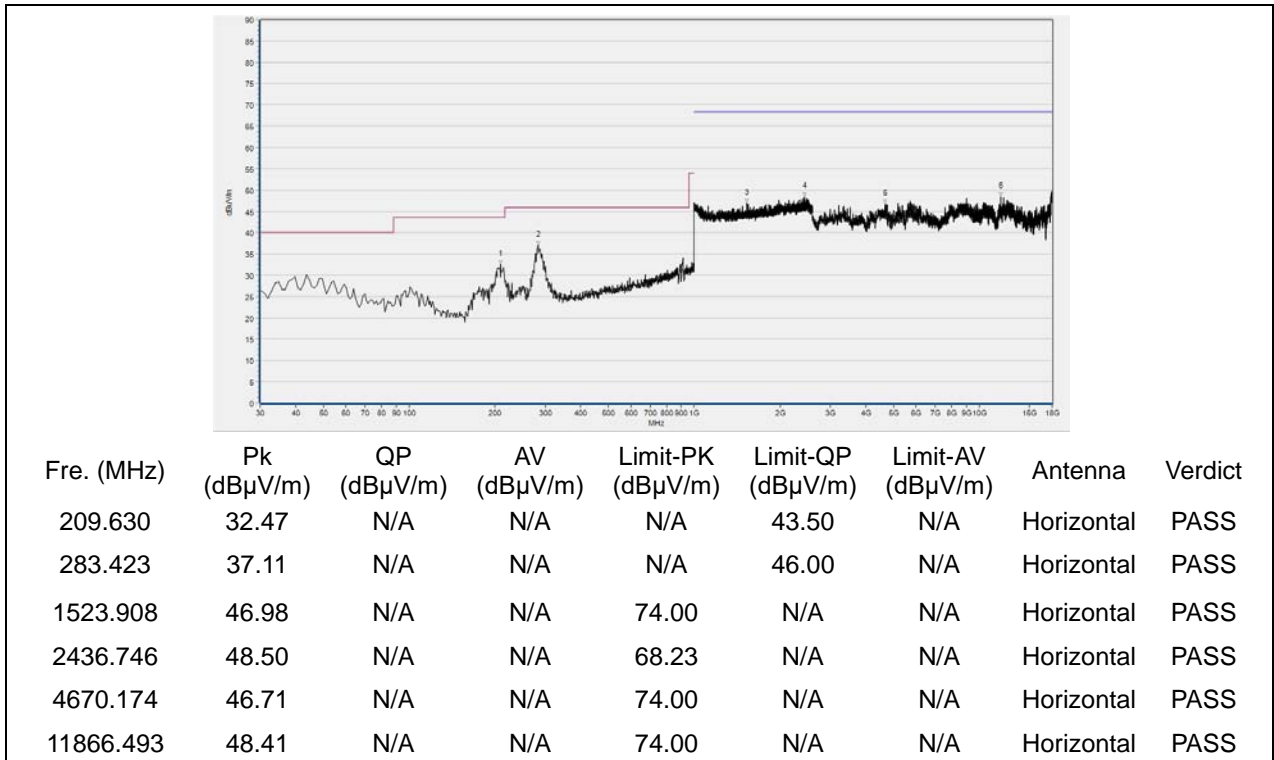
Note1: All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

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

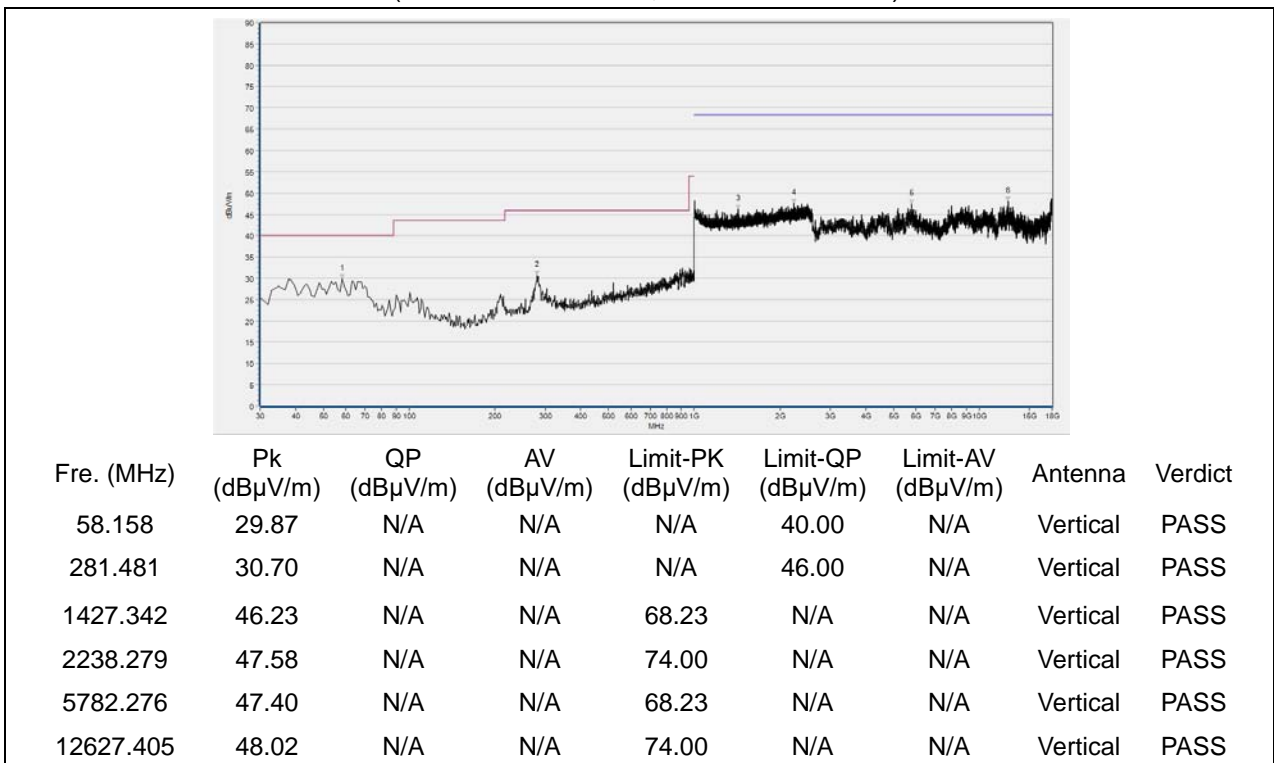
Note3: For the frequency, which started from 25GHz to 40GHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

802.11a Test mode

Plots for Channel = 36

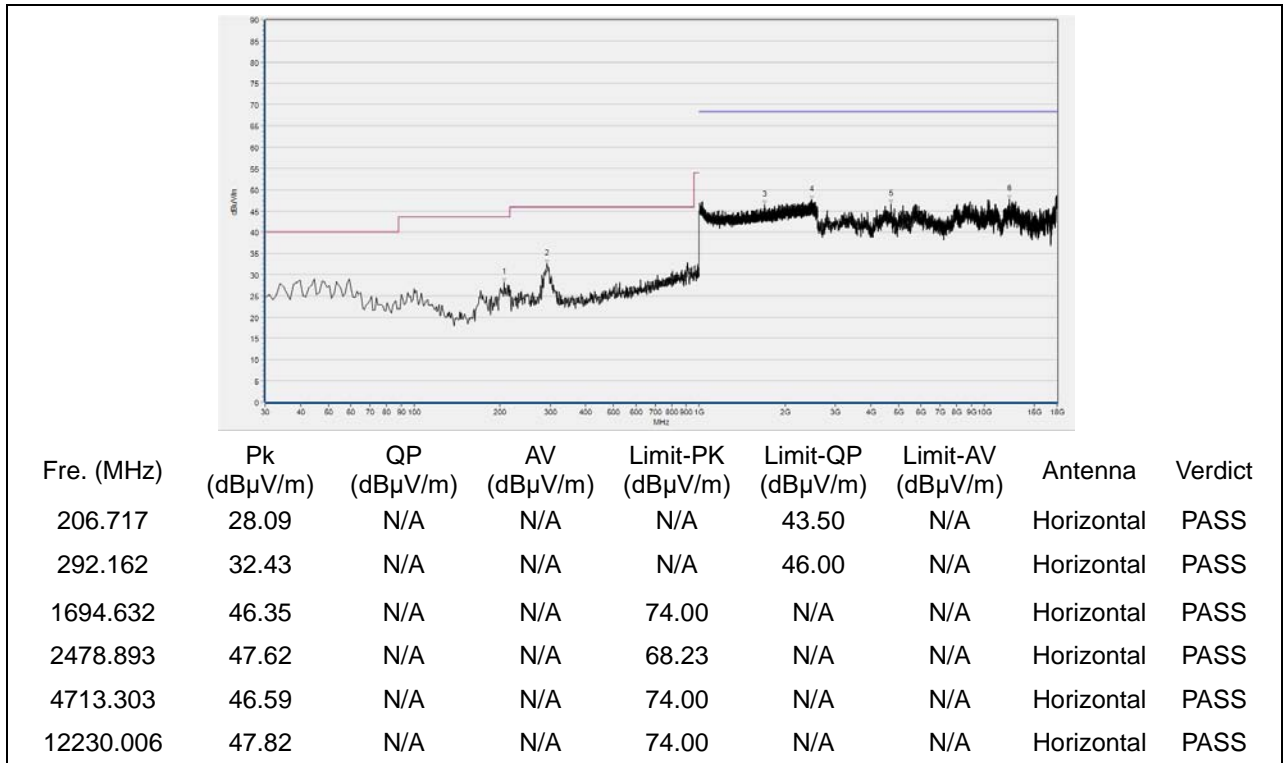


(Antenna Horizontal, 30MHz to 25GHz)

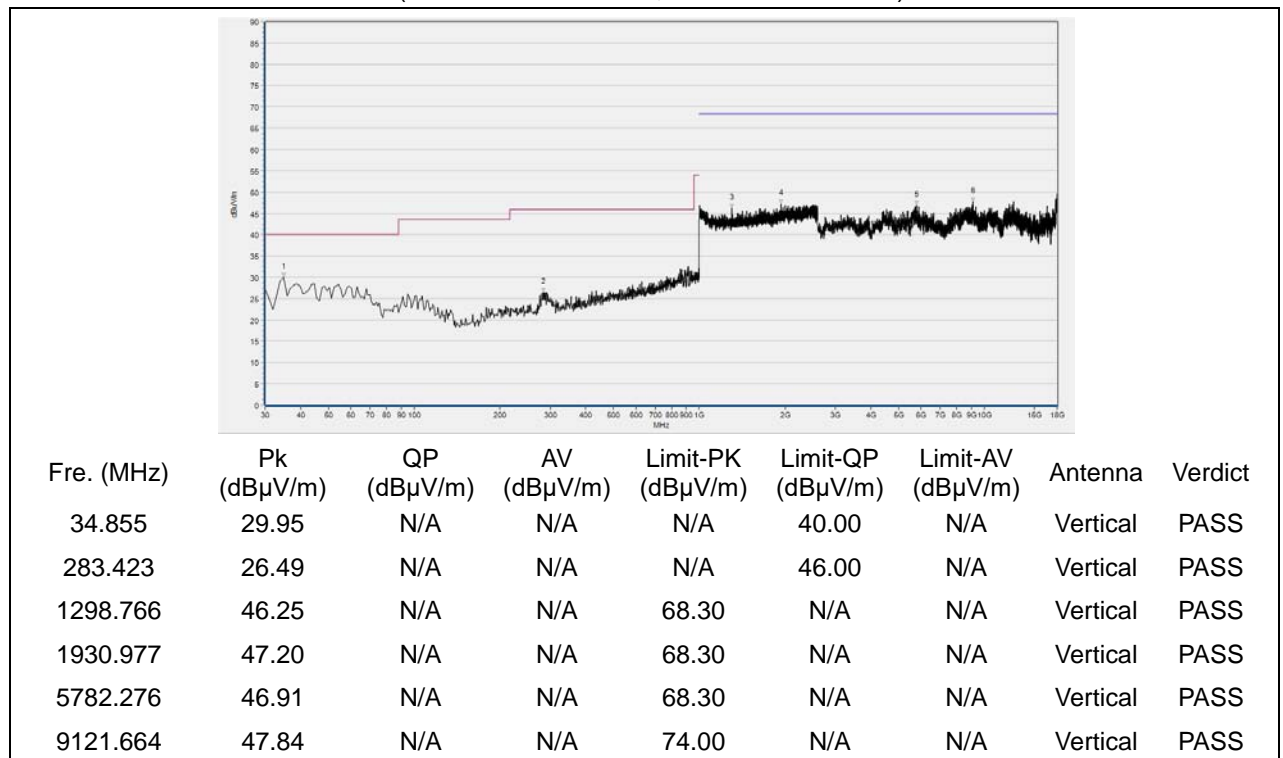


(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 44

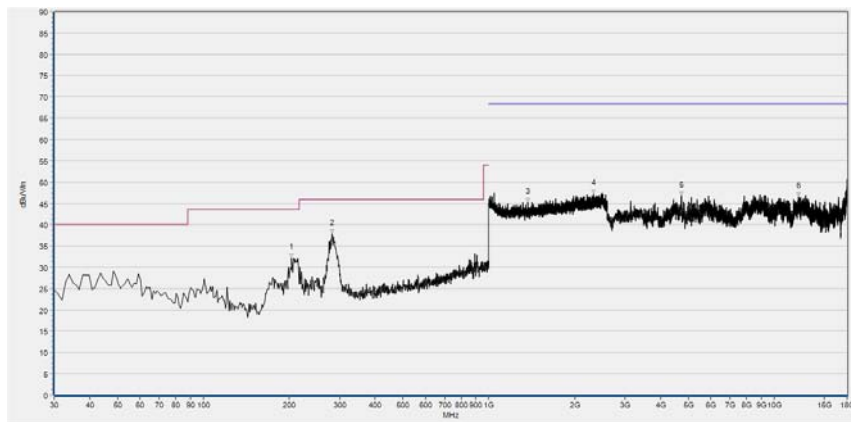


(Antenna Horizontal, 30MHz to 25GHz)



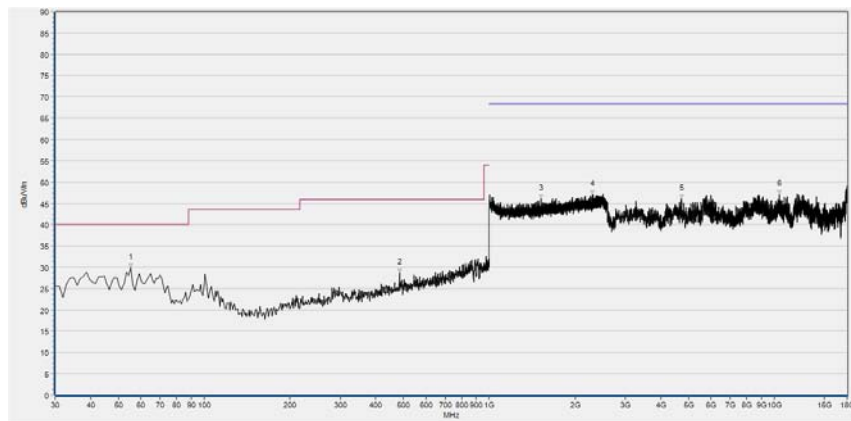
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 48



Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
203.804	32.19	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
282.452	37.93	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1370.257	45.31	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS
2322.574	47.32	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS
4722.545	46.77	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS
12168.394	46.58	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS

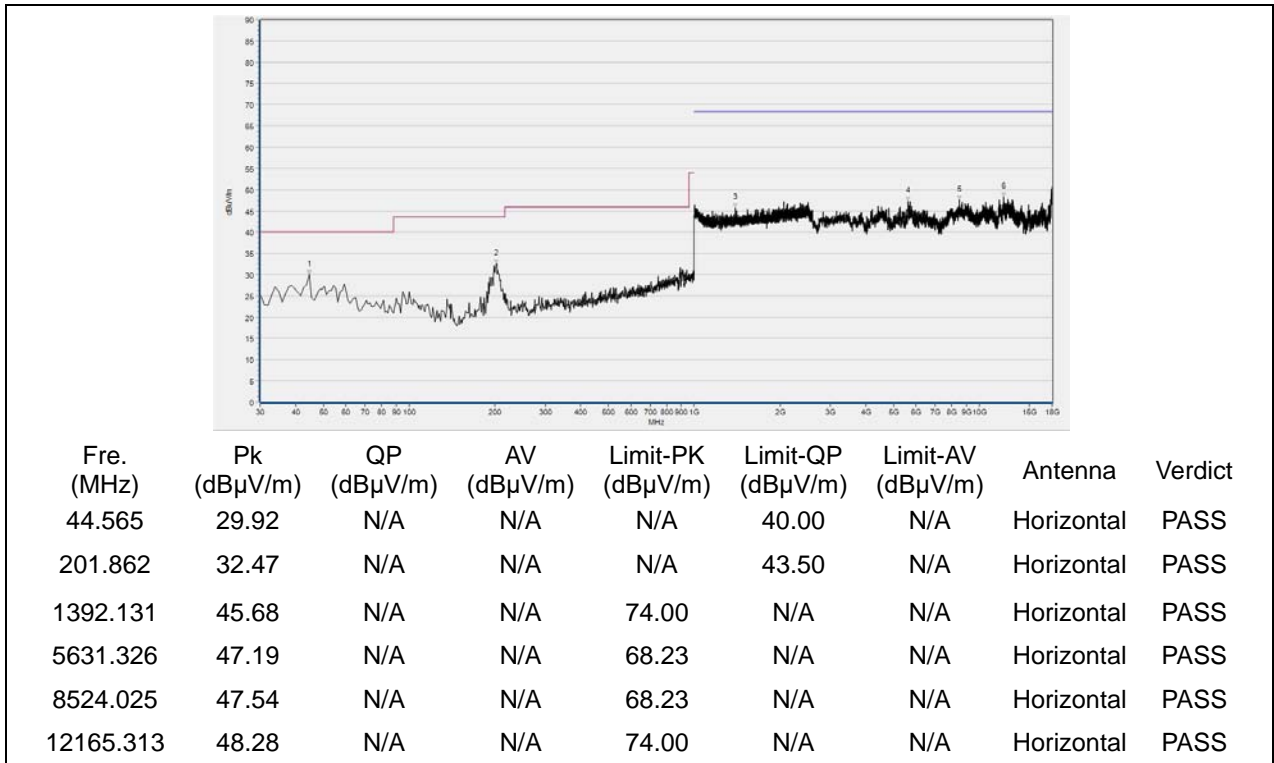
(Antenna Horizontal, 30MHz to 25GHz)



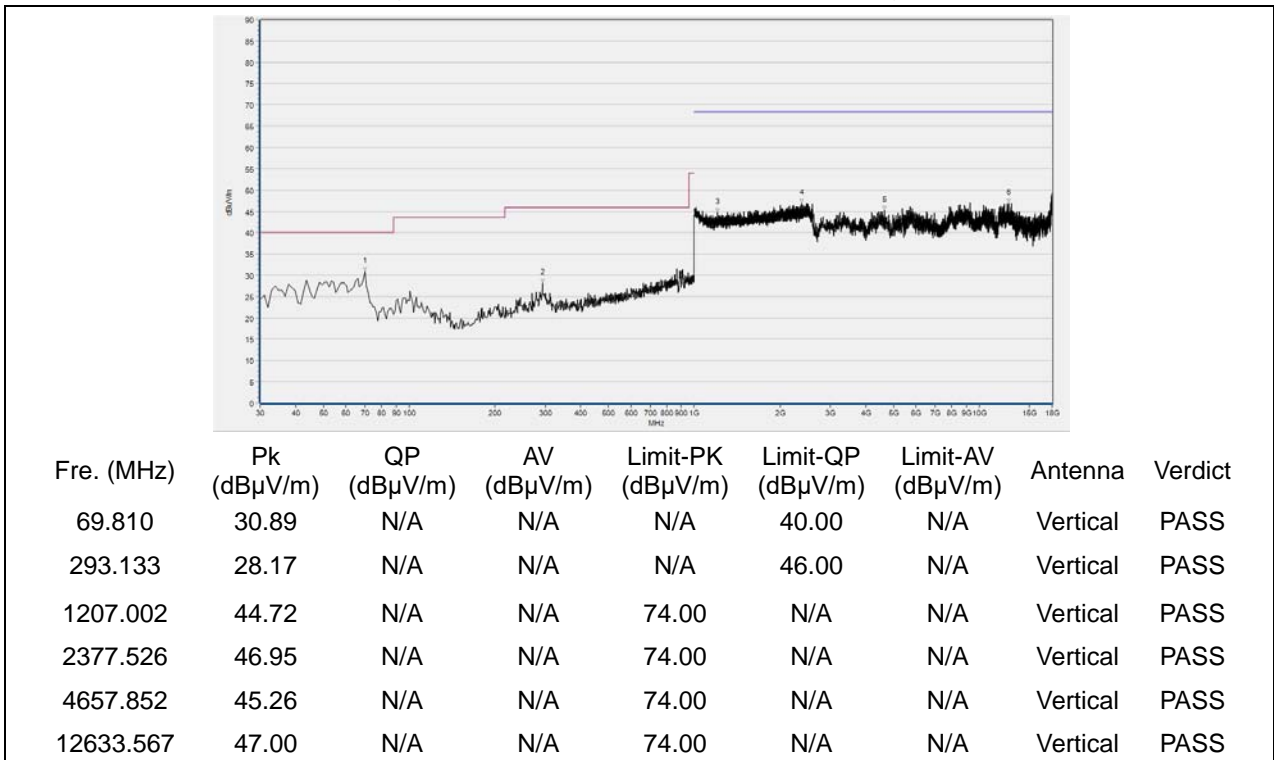
Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
55.245	29.86	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
484.414	28.66	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1518.573	46.13	N/A	N/A	74.00	N/A	N/A	Vertical	PASS
2304.435	47.08	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
4716.383	46.02	N/A	N/A	74.00	N/A	N/A	Vertical	PASS
10412.442	47.10	N/A	N/A	68.23	N/A	N/A	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 52

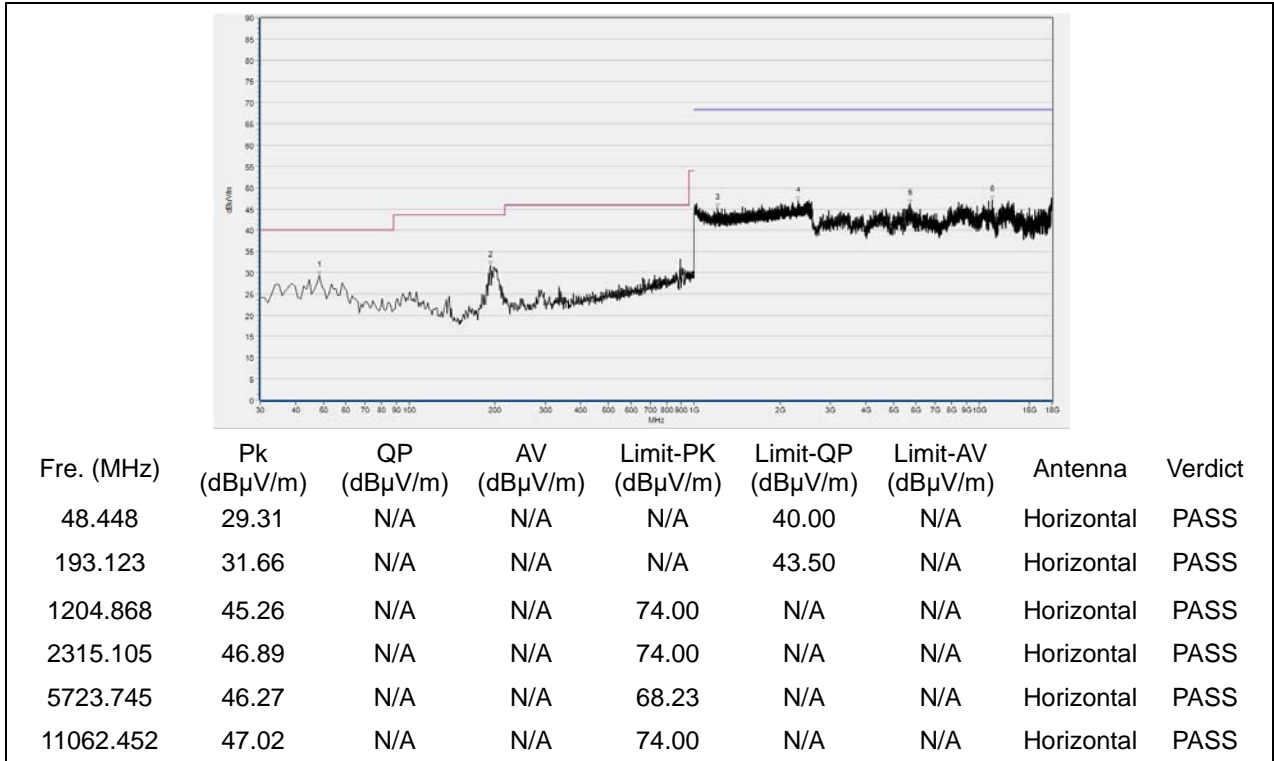


(Antenna Horizontal, 30MHz to 25GHz)

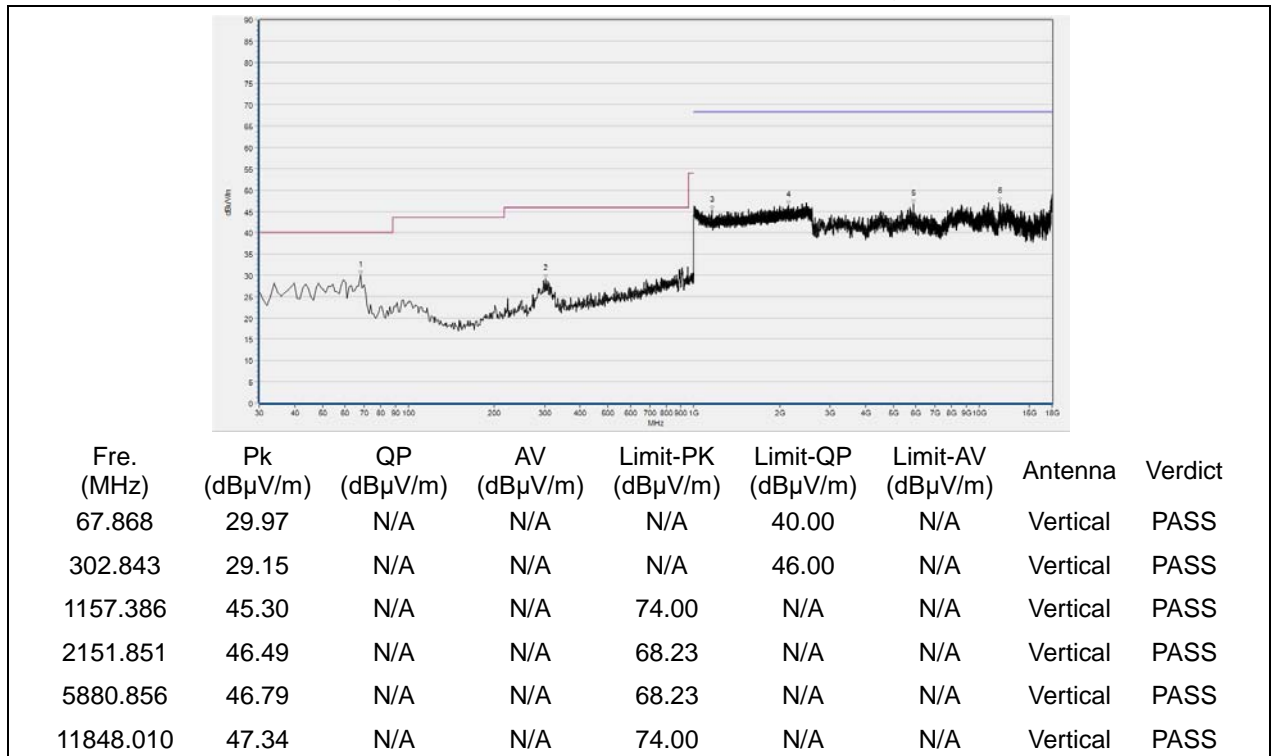


(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 60

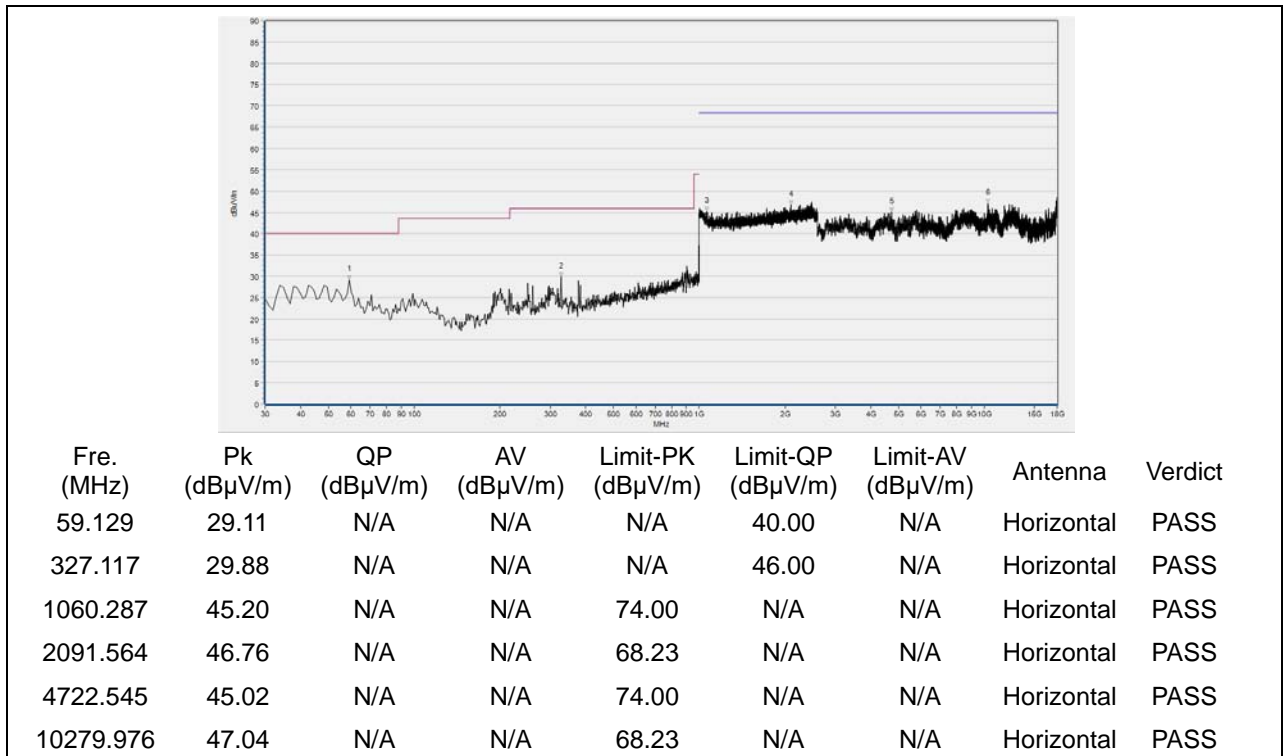


(Antenna Horizontal, 30MHz to 25GHz)

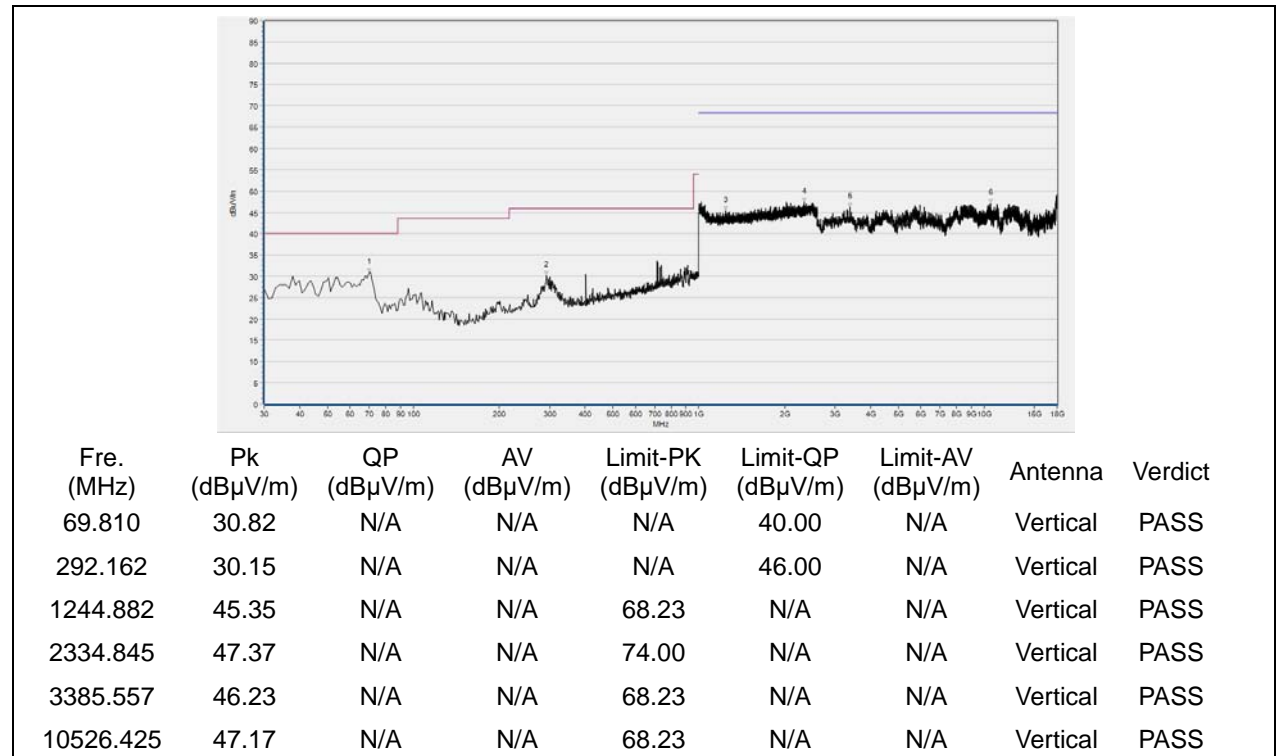


(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 64

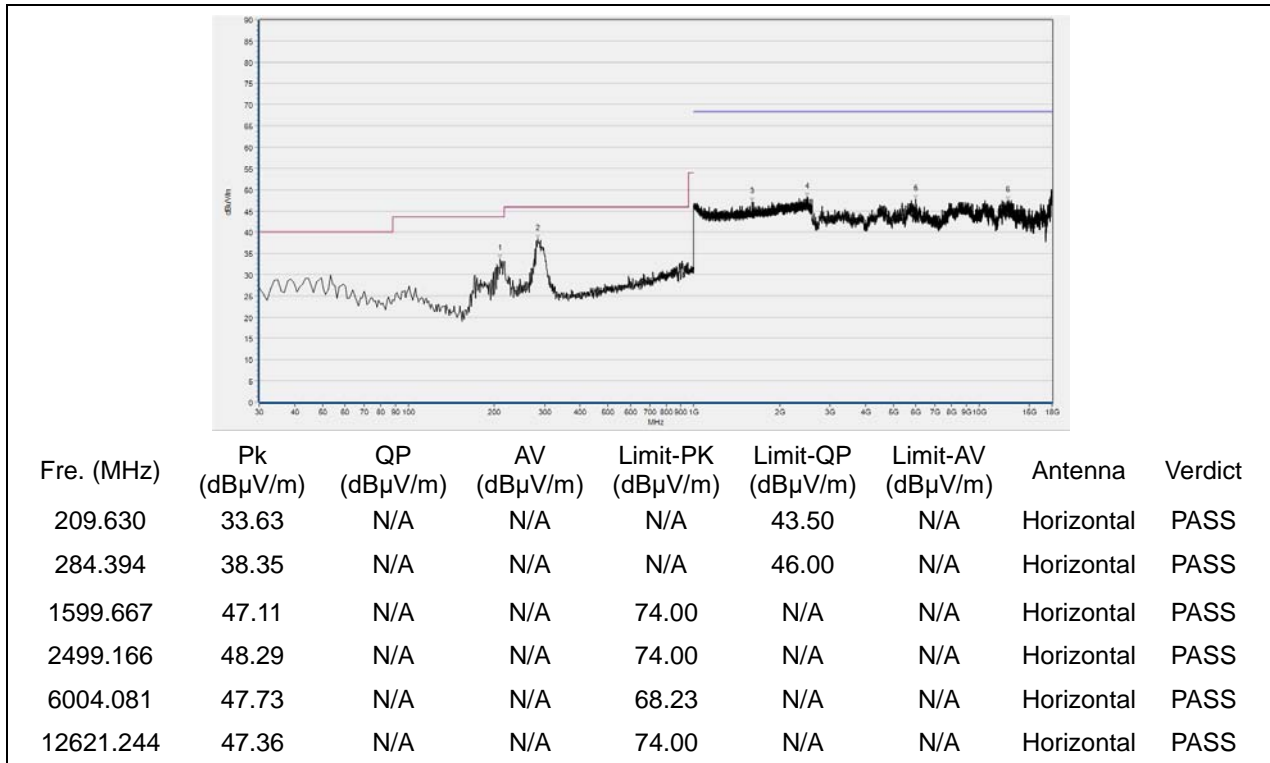


(Antenna Horizontal, 30MHz to 25GHz)

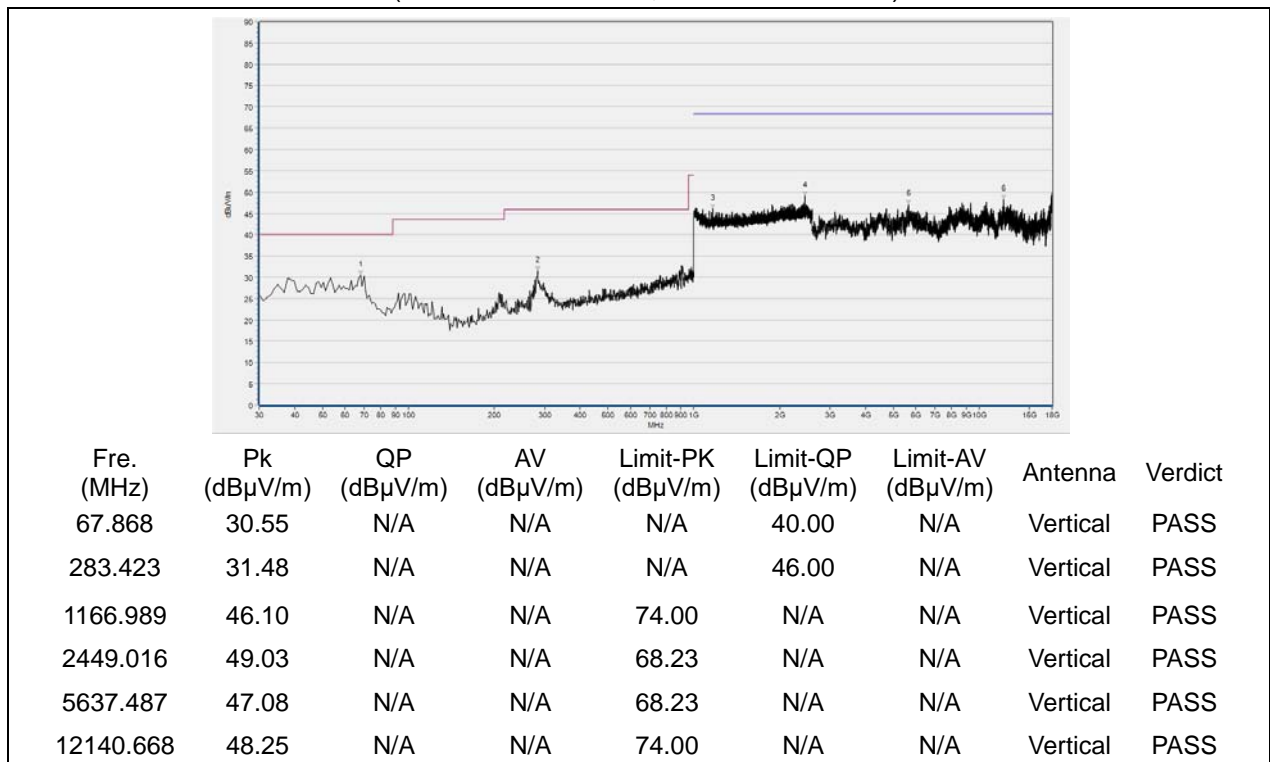


(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 100

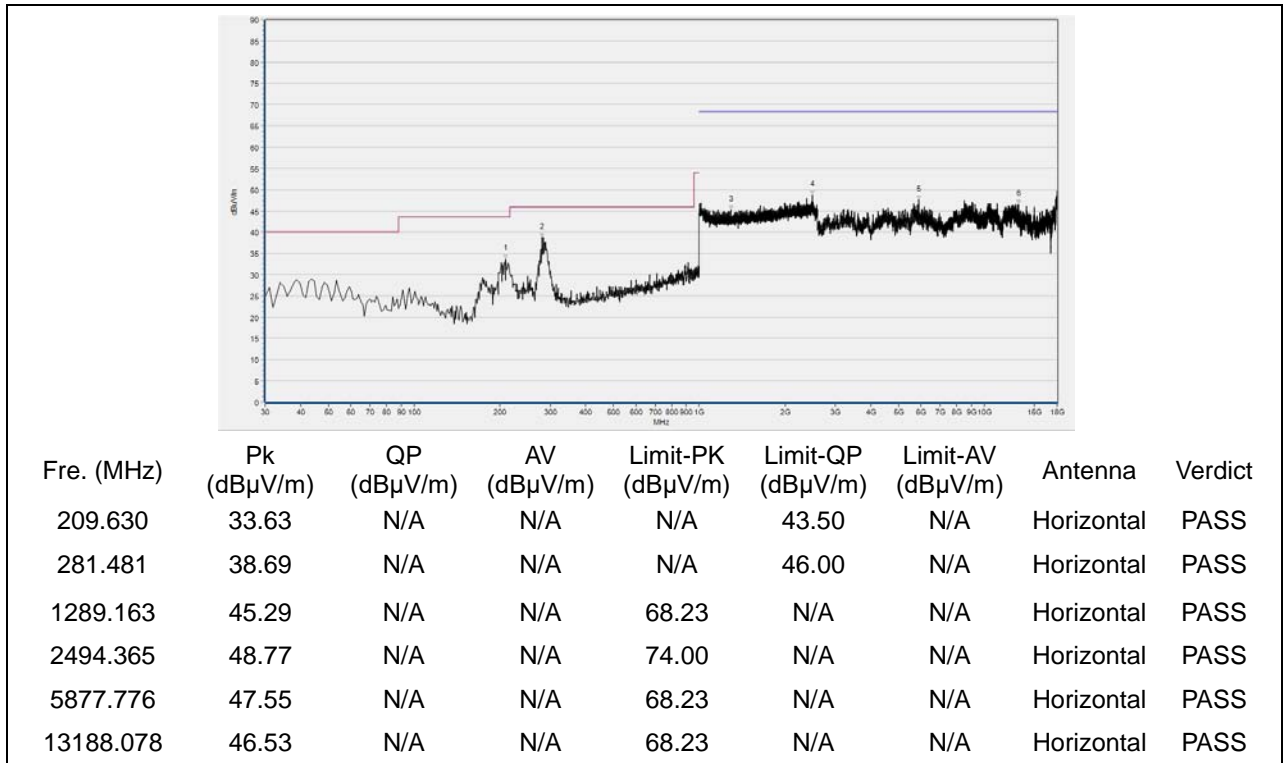


(Antenna Horizontal, 30MHz to 25GHz)

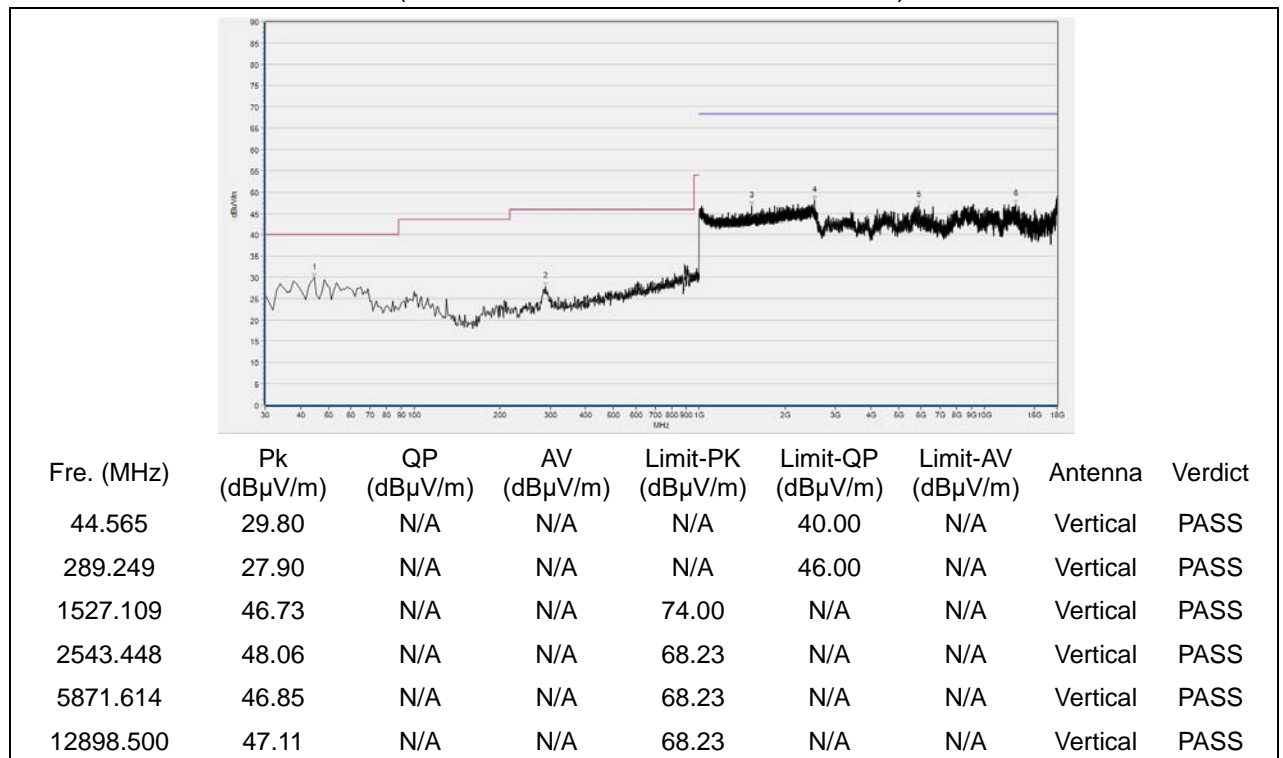


(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 120

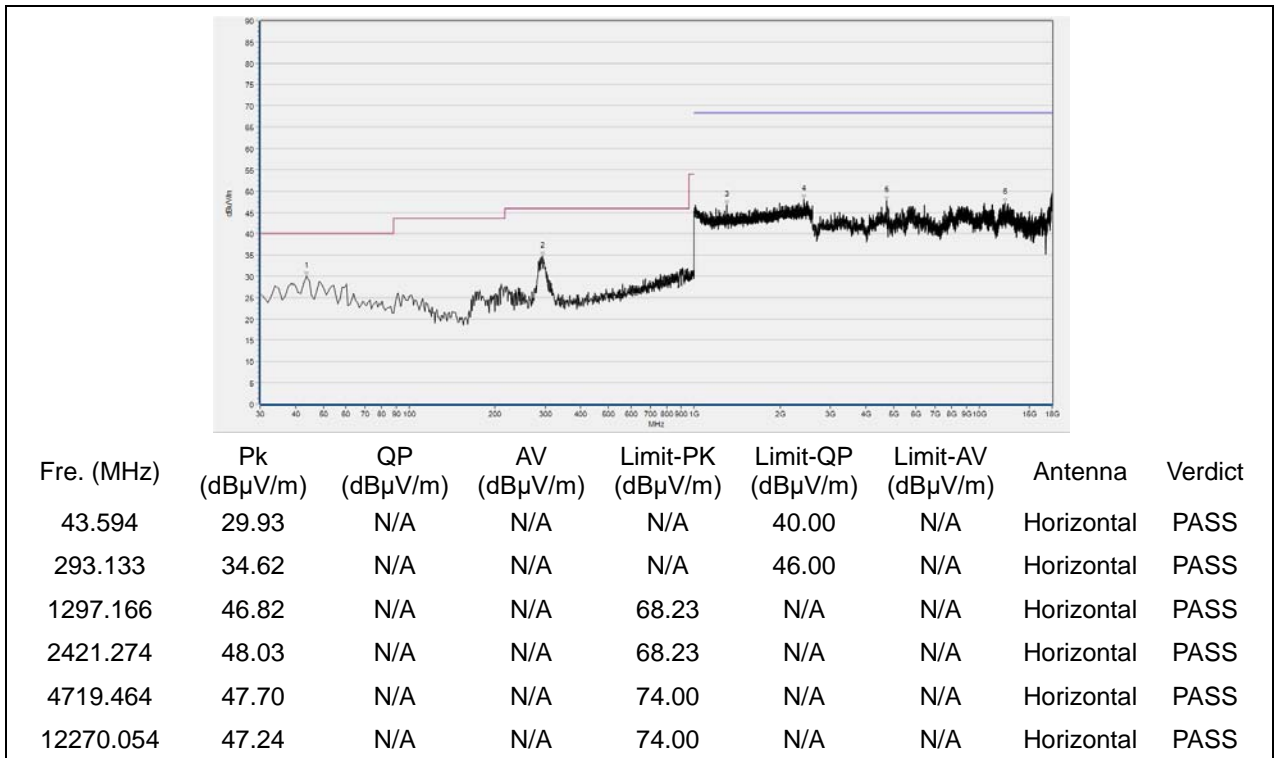


(Antenna Horizontal, 30MHz to 25GHz)

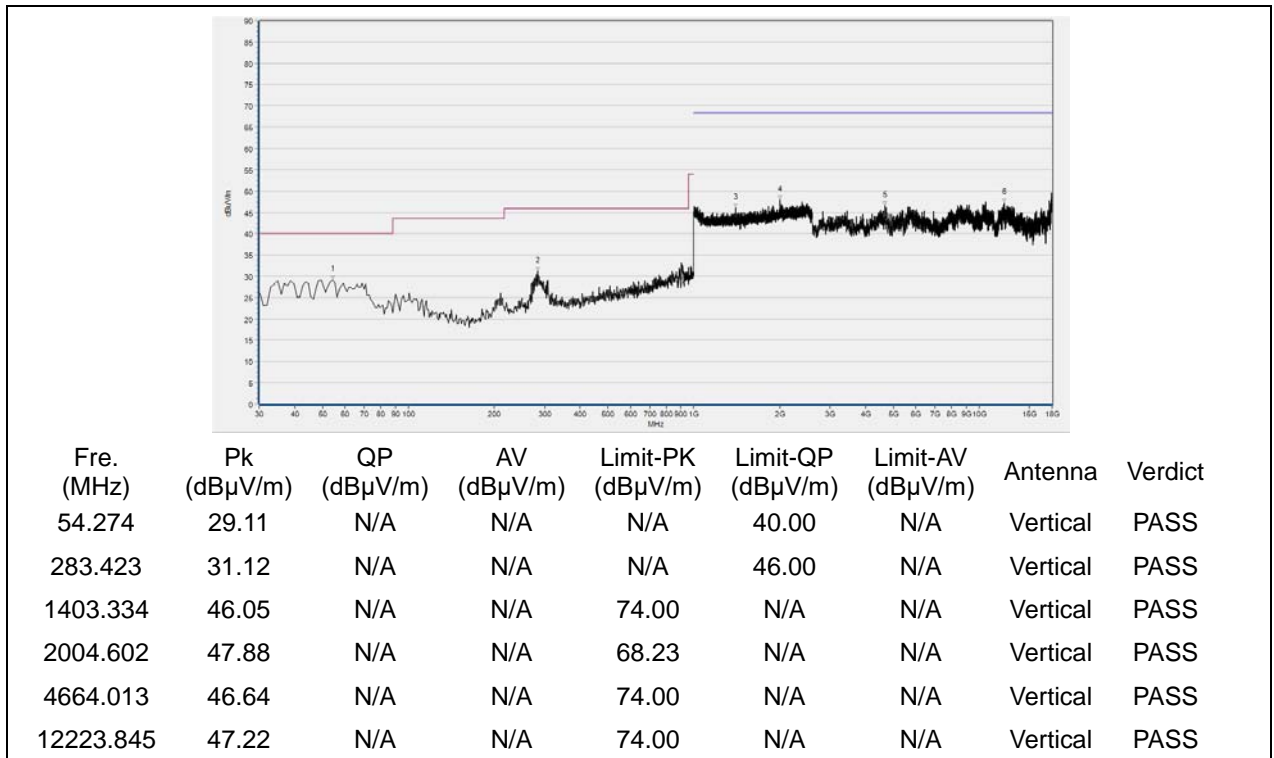


(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 144

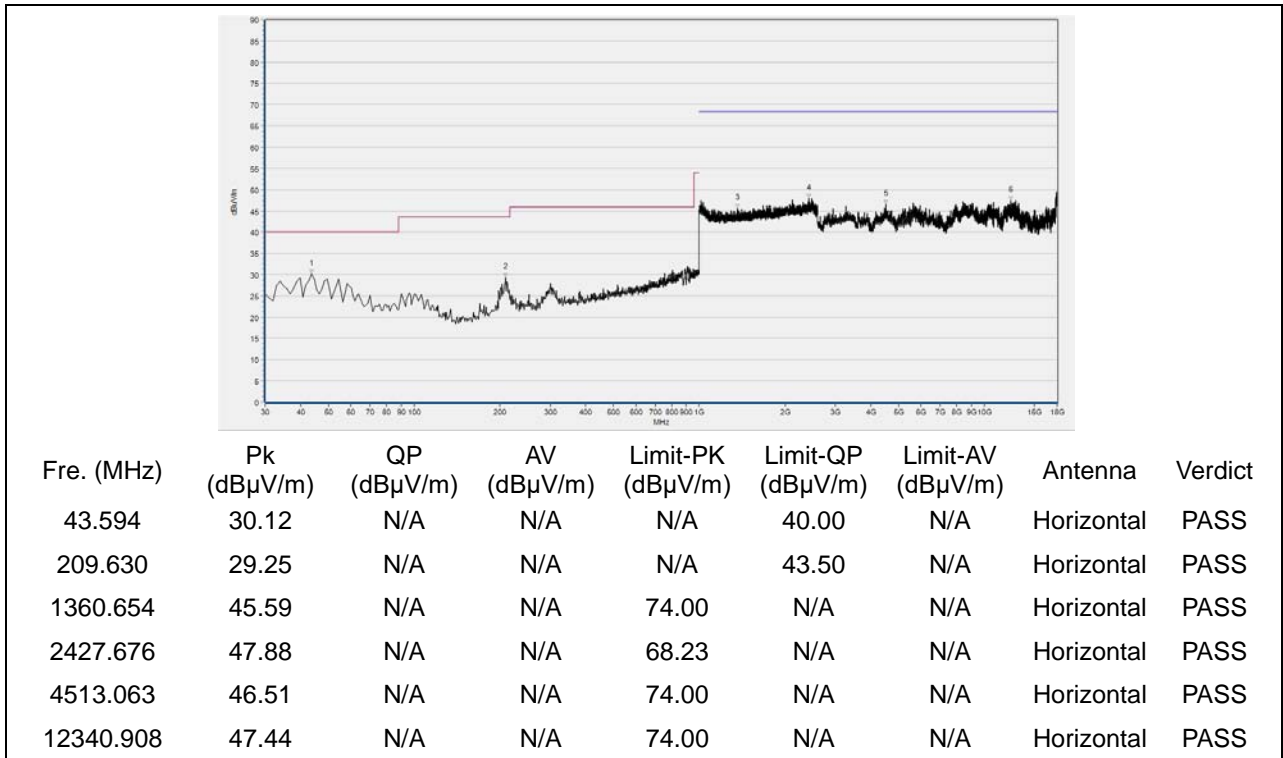


(Antenna Horizontal, 30MHz to 25GHz)

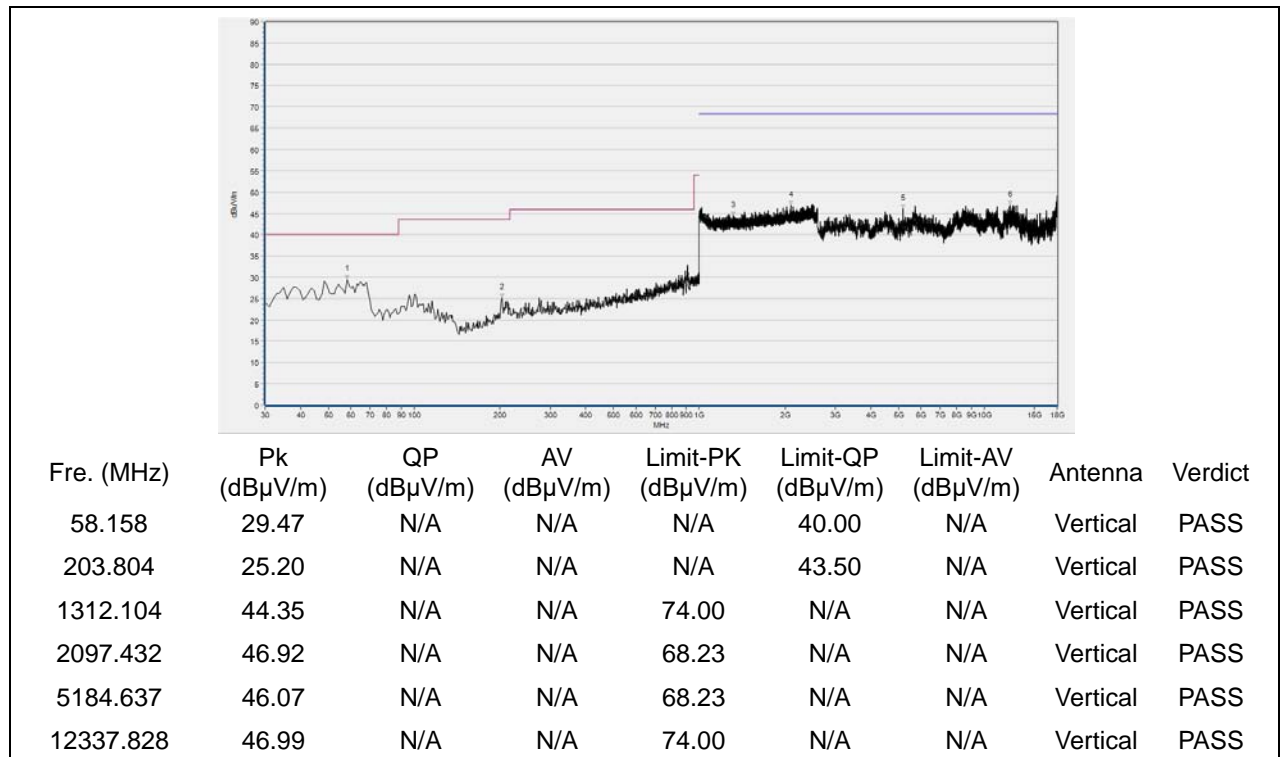


(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 149

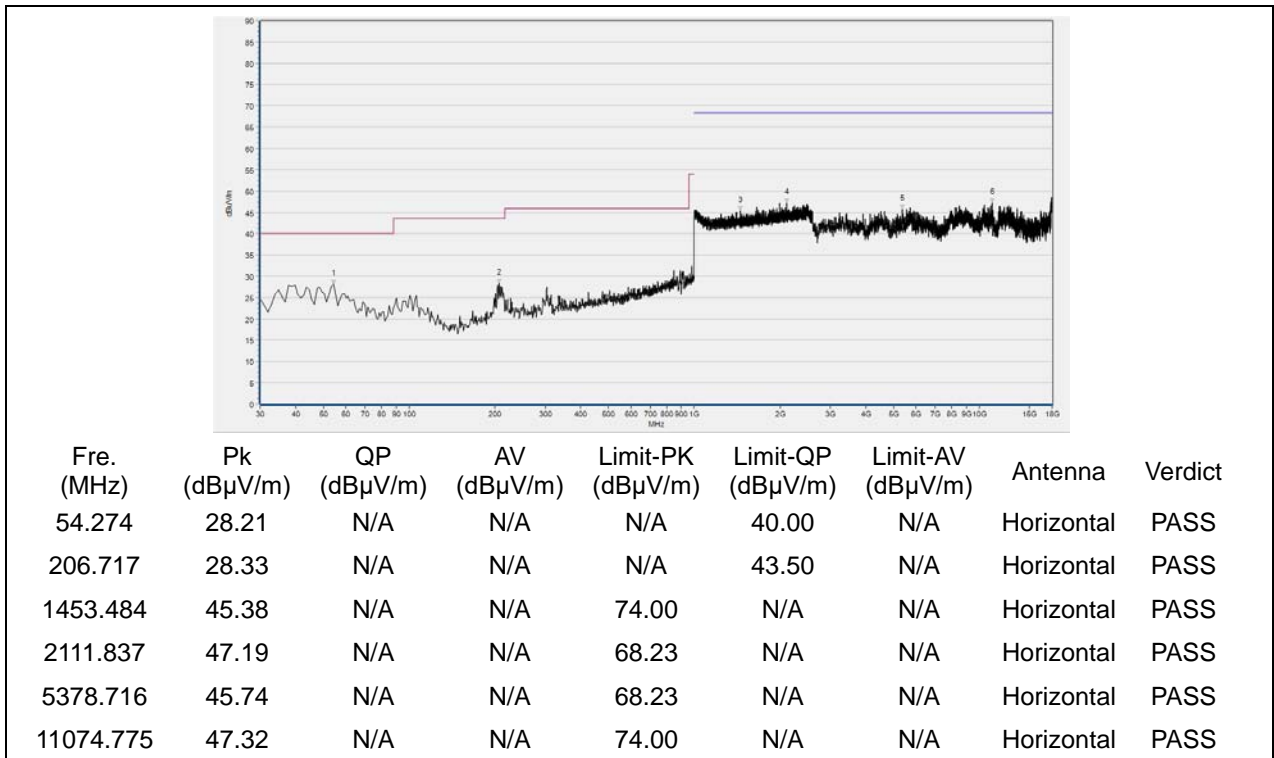


(Antenna Horizontal, 30MHz to 25GHz)

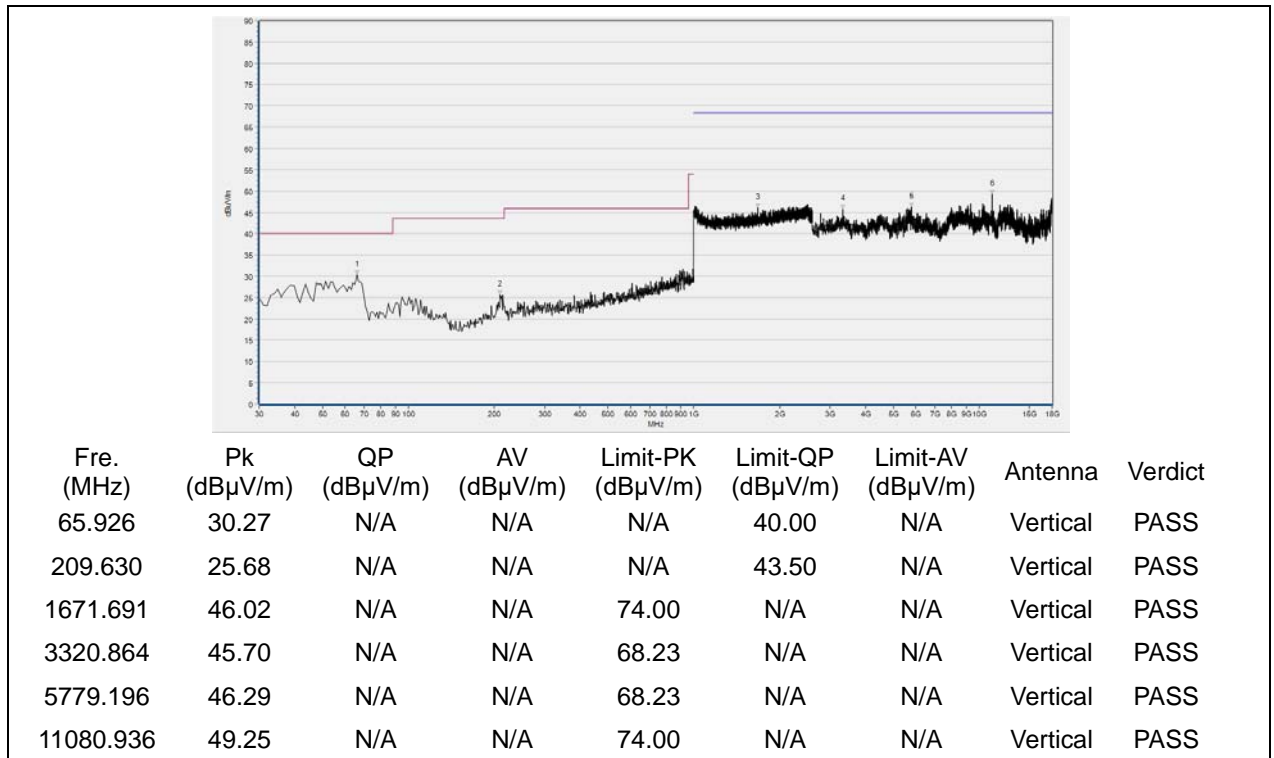


(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 157

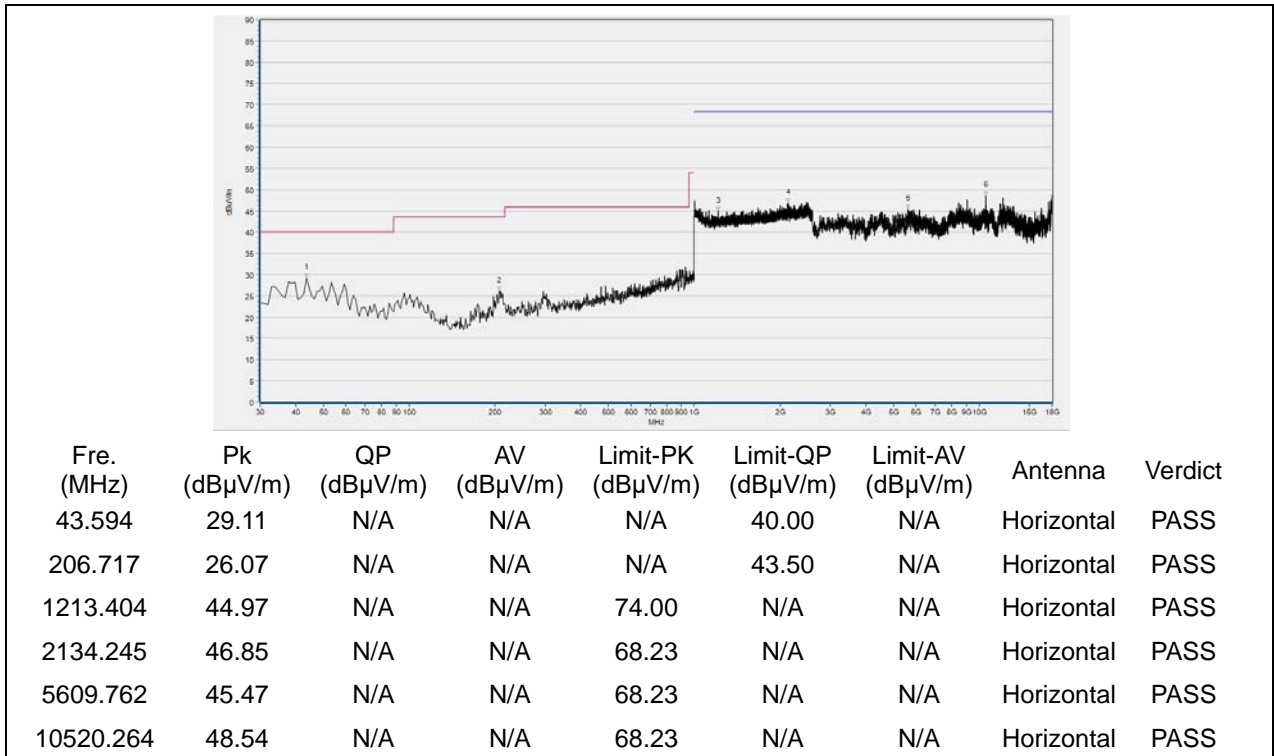


(Antenna Horizontal, 30MHz to 25GHz)

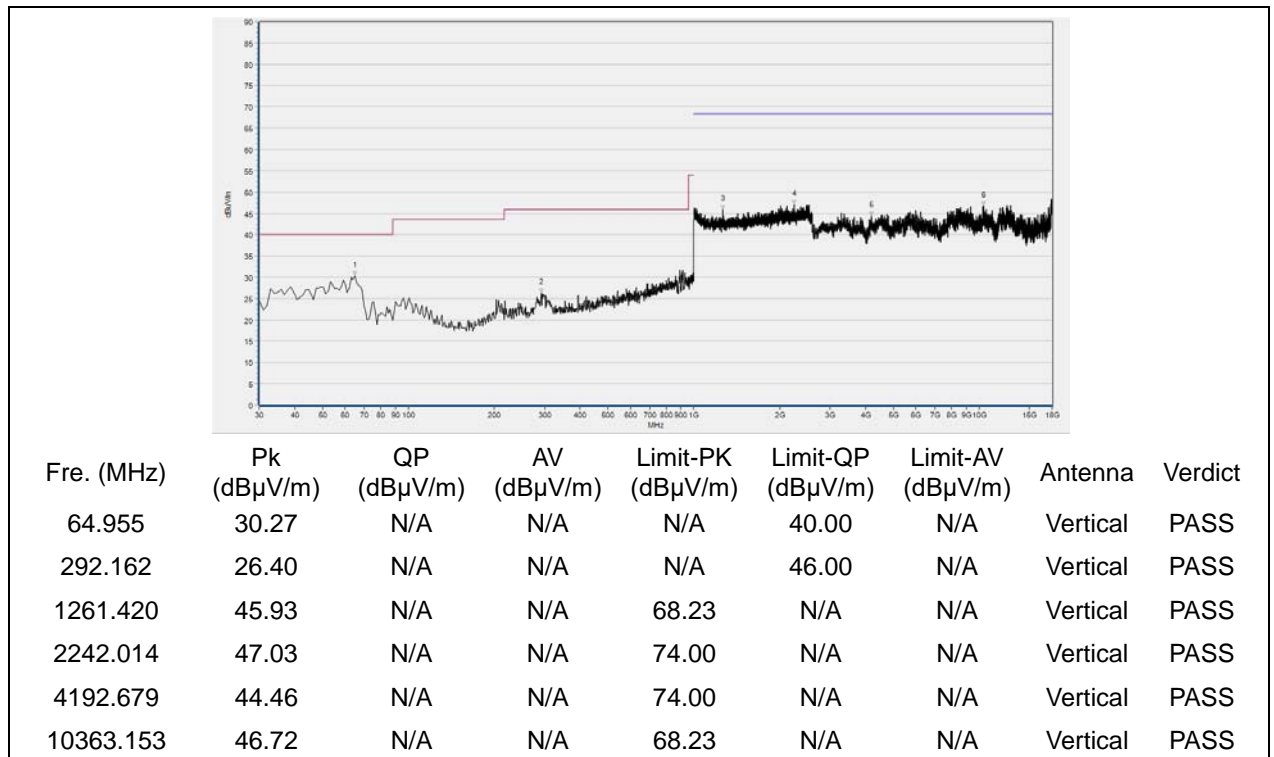


(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 165



(Antenna Horizontal, 30MHz to 25GHz)

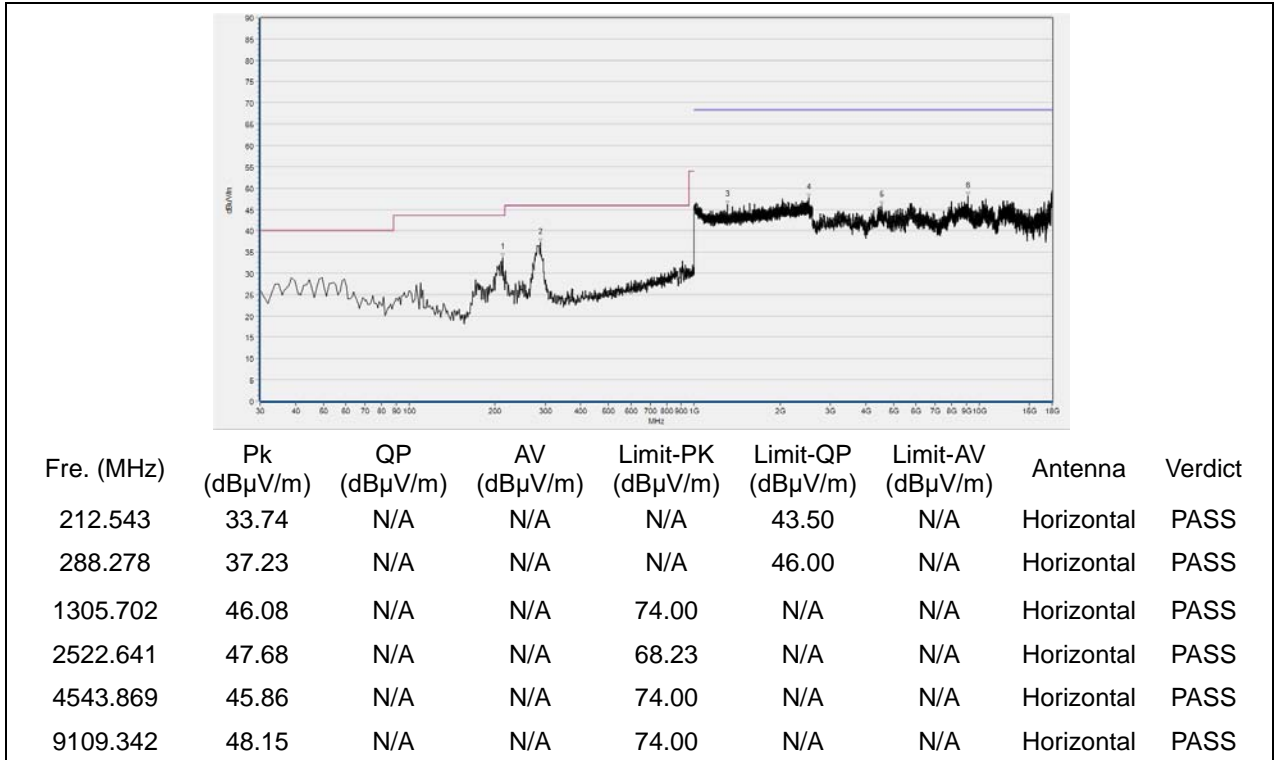


(Antenna Vertical, 30MHz to 25GHz)

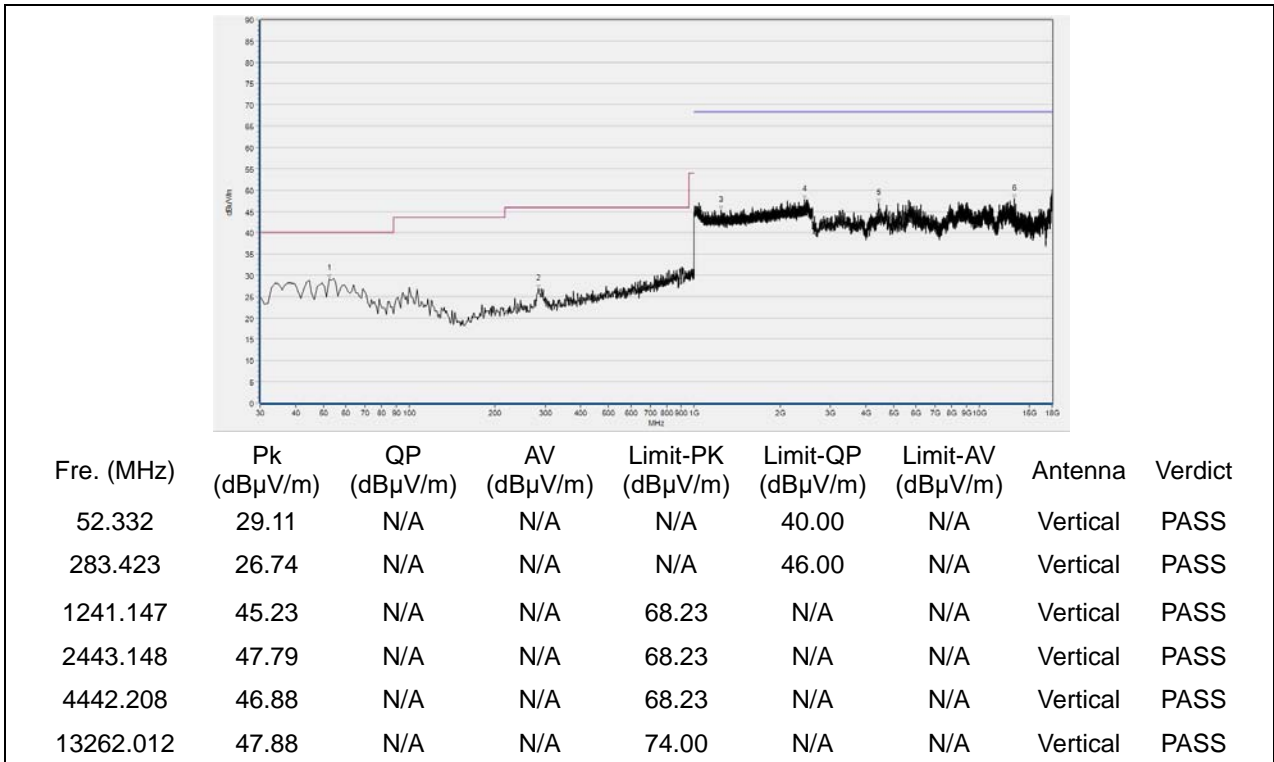


802.11n (HT20) Test mode

Plots for Channel = 36

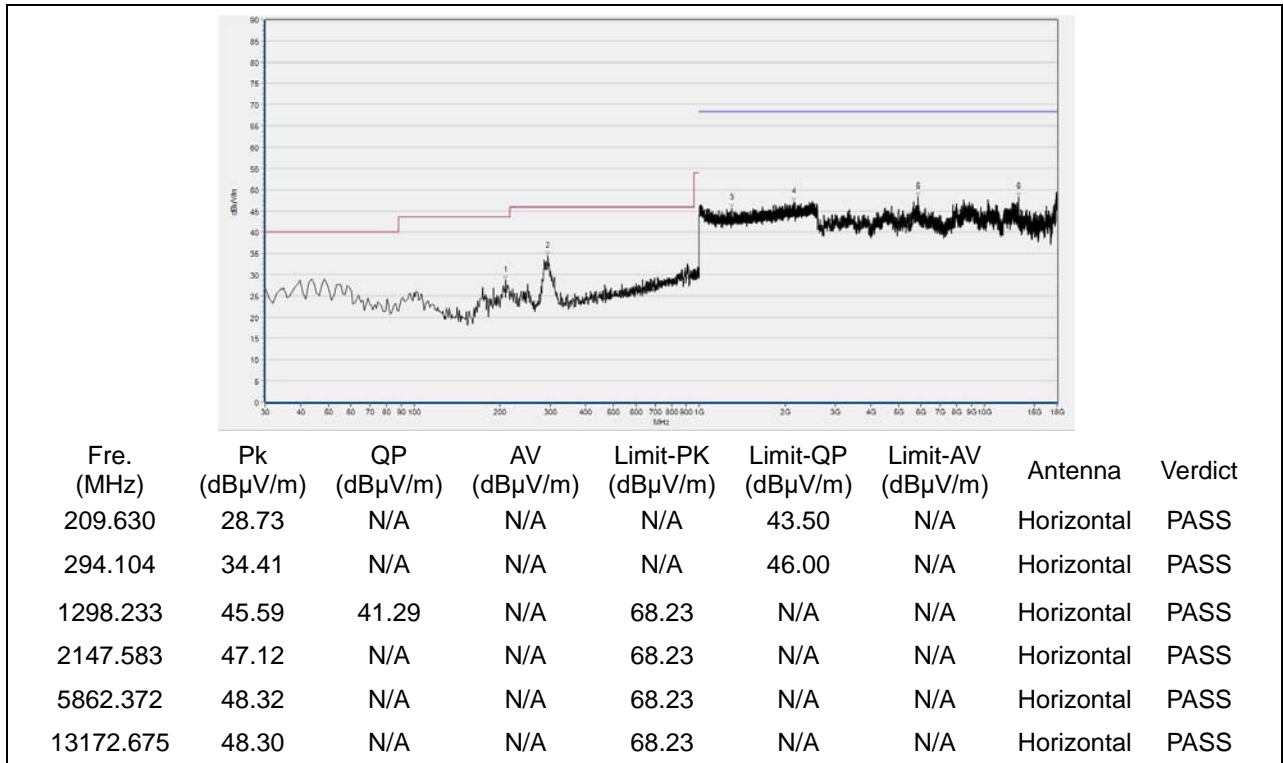


(Antenna Horizontal, 30MHz to 25GHz)

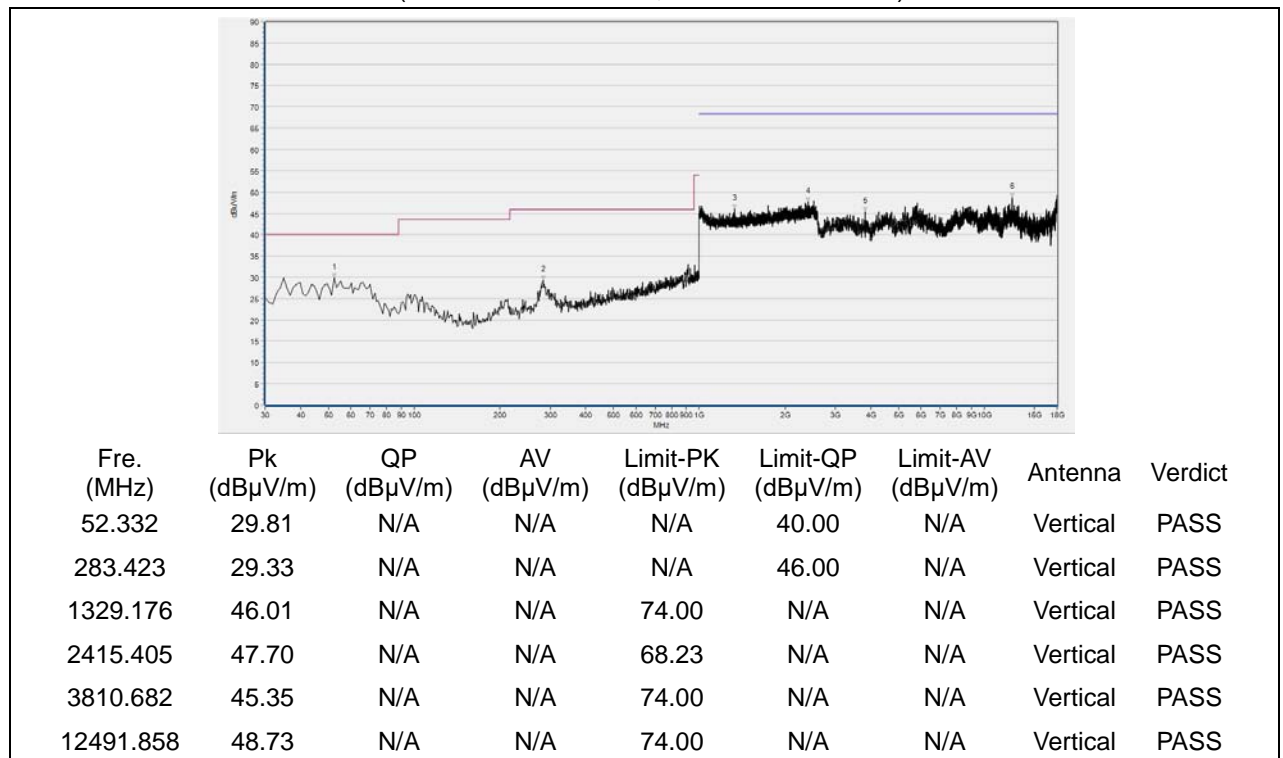


(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 44

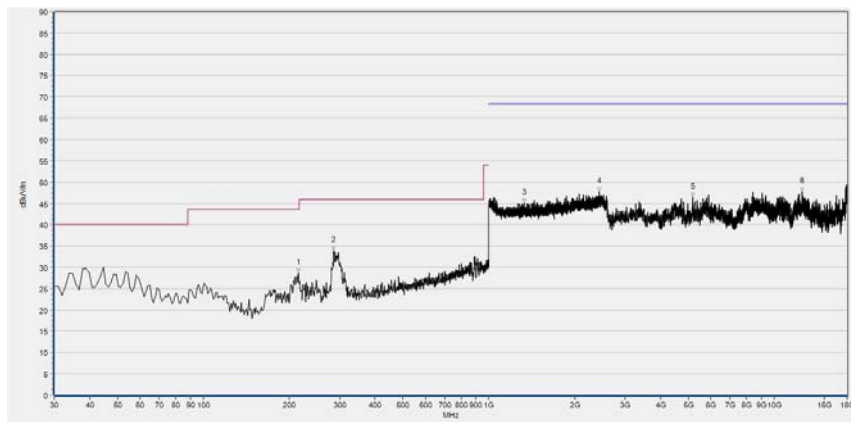


(Antenna Horizontal, 30MHz to 25GHz)



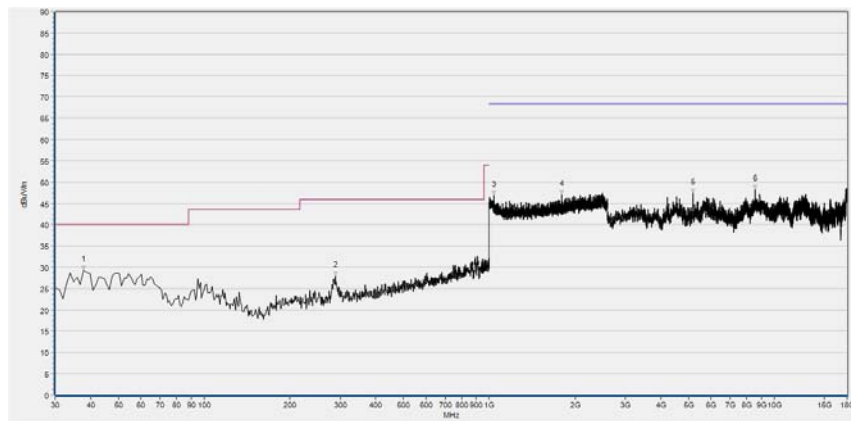
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 48



Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
215.455	28.66	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
286.336	33.84	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1332.377	45.01	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS
2440.480	47.73	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
5178.476	46.34	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
12525.745	47.81	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS

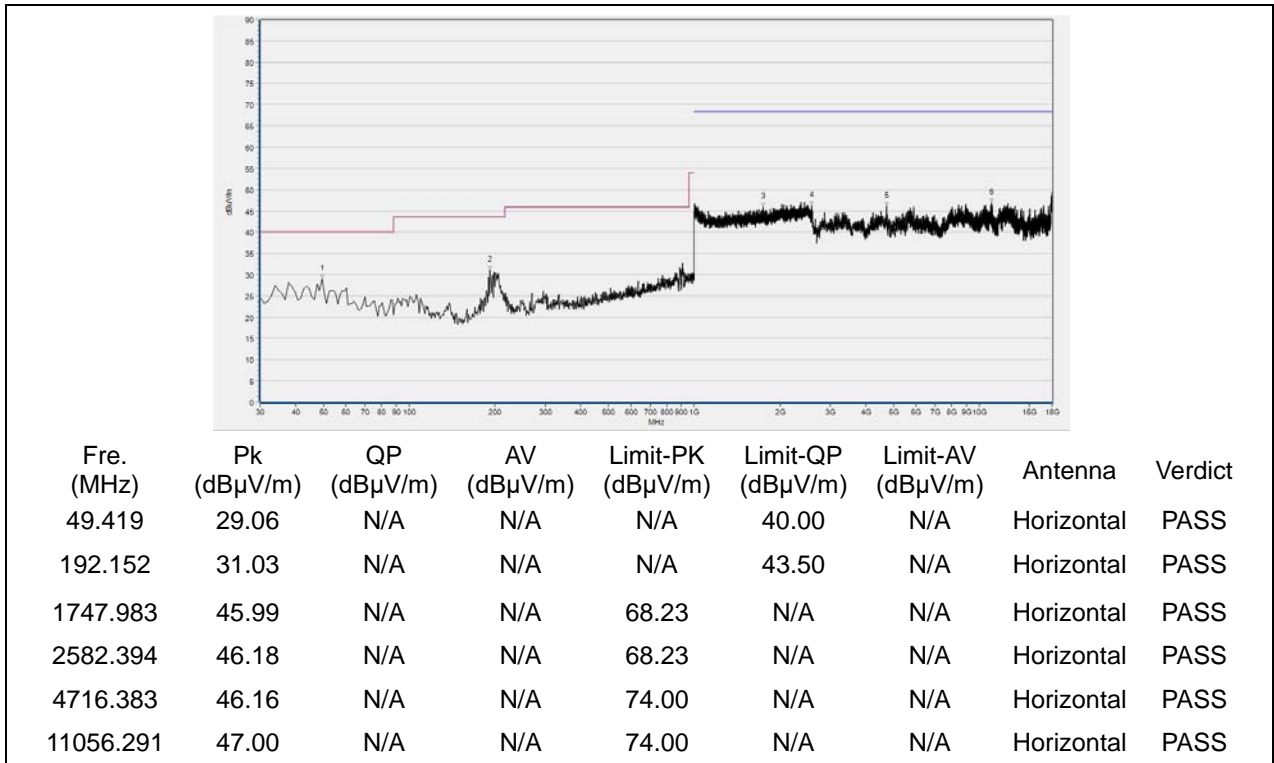
(Antenna Horizontal, 30MHz to 25GHz)



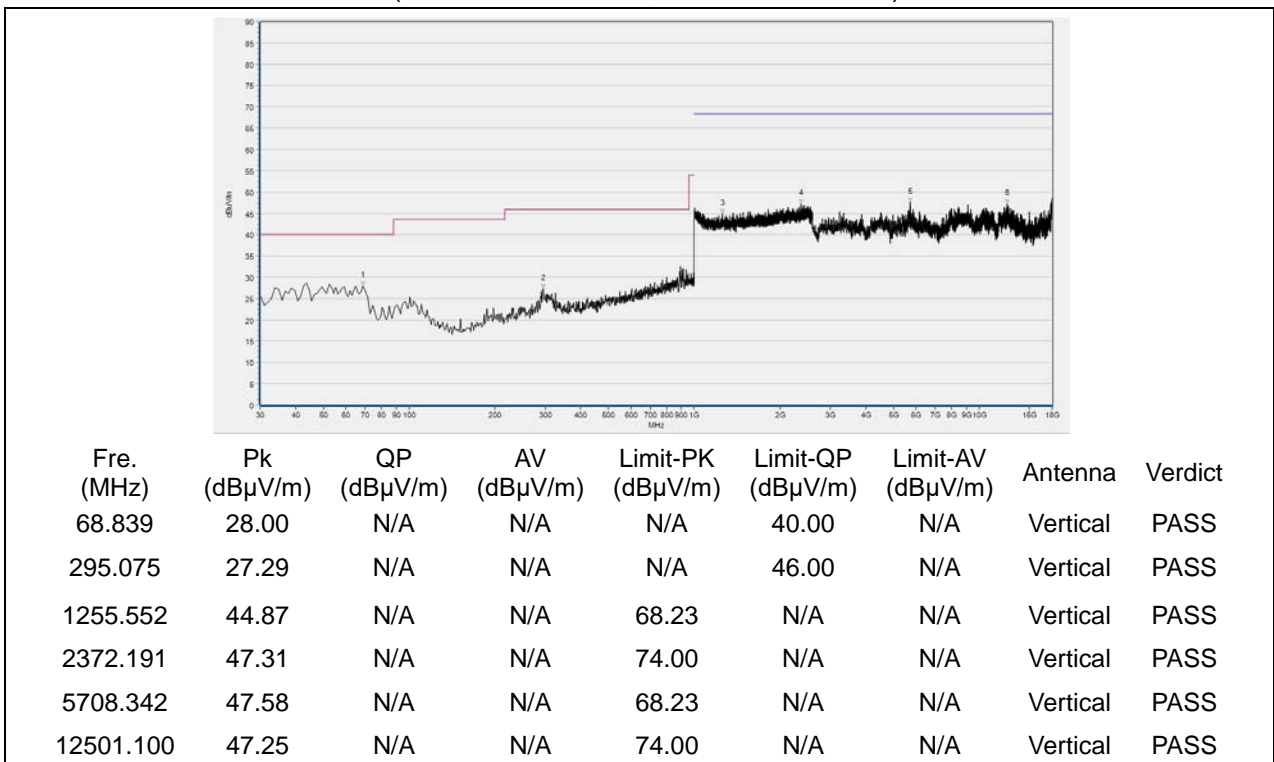
Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
37.768	29.25	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
288.278	28.03	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1036.279	47.01	N/A	N/A	74.00	N/A	N/A	Vertical	PASS
1797.066	47.15	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
5178.476	47.41	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
8539.428	48.34	N/A	N/A	68.23	N/A	N/A	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 52

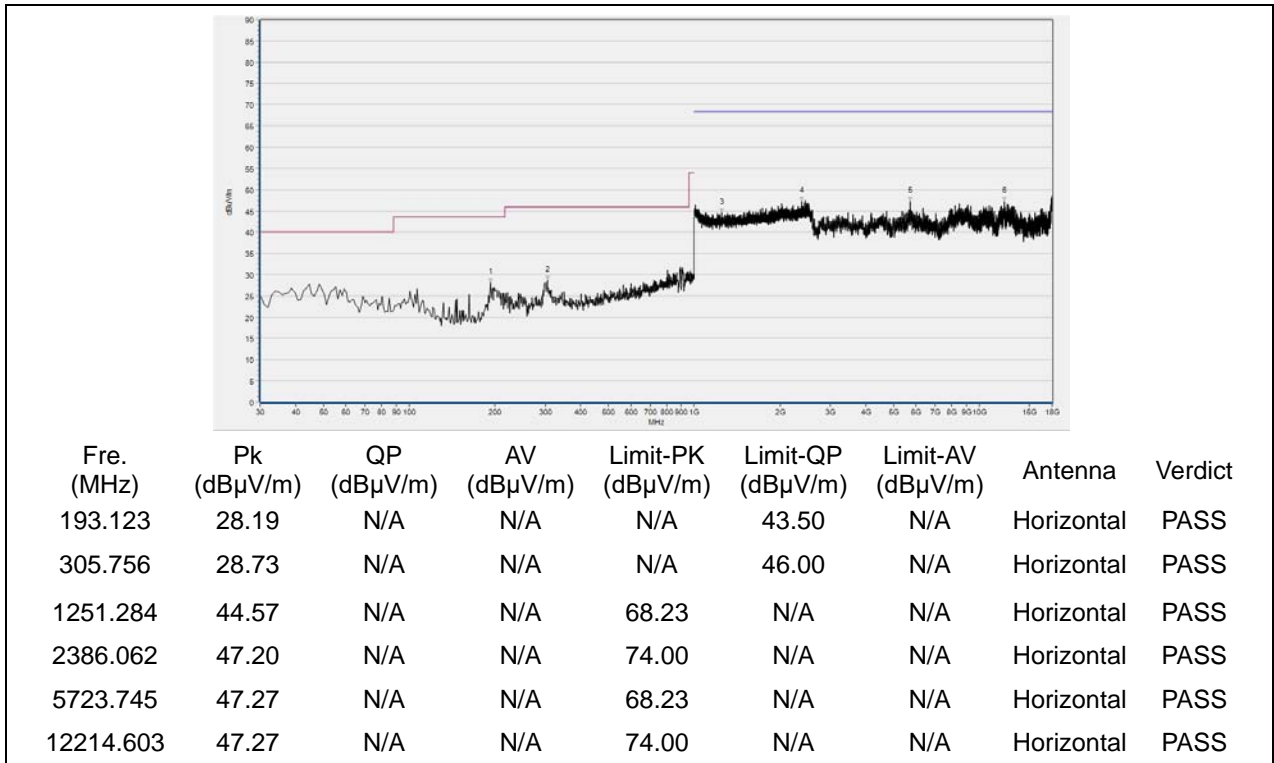


(Antenna Horizontal, 30MHz to 25GHz)

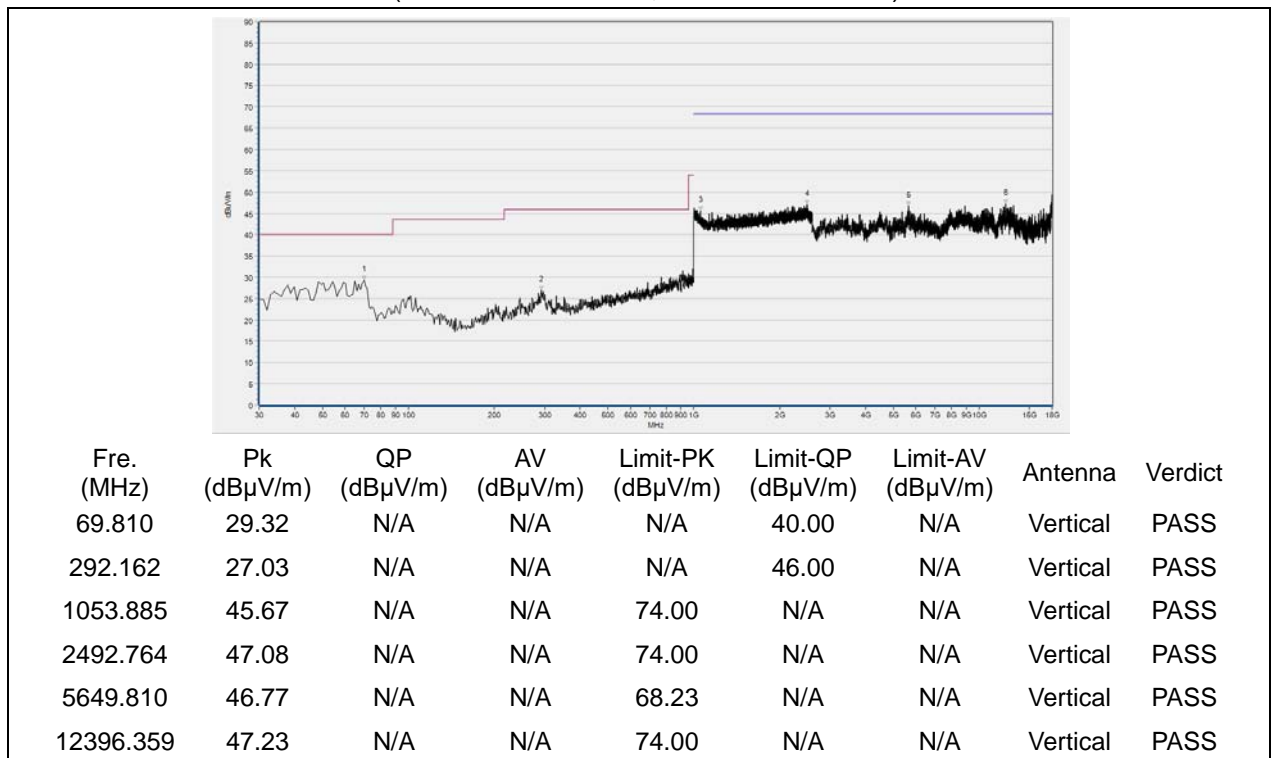


(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 60

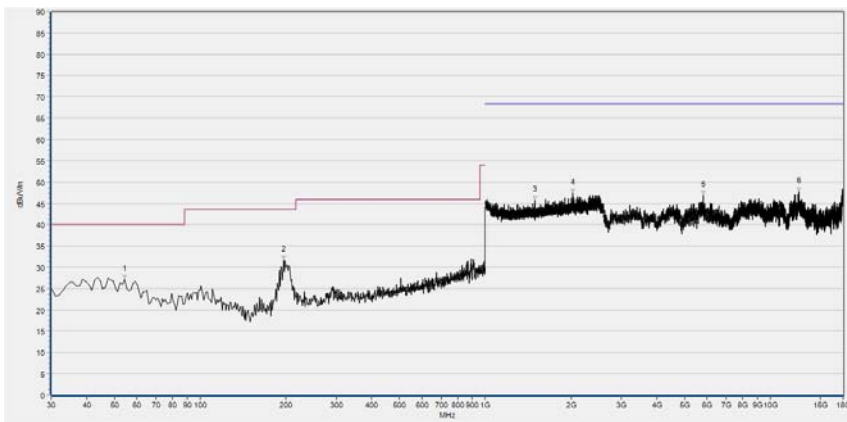


(Antenna Horizontal, 30MHz to 25GHz)



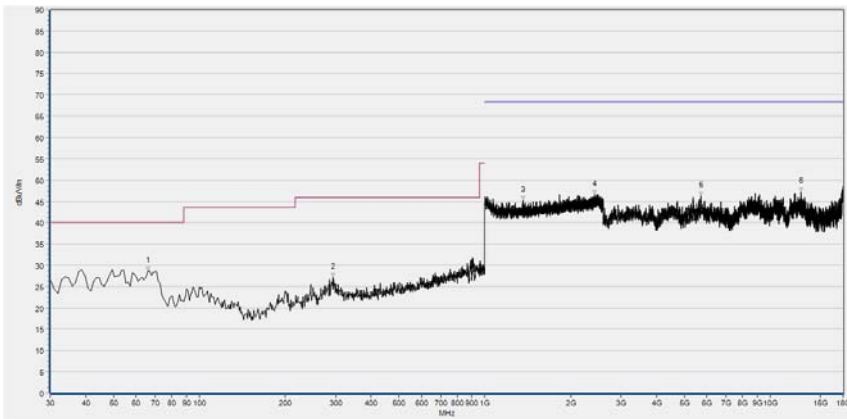
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 64



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
54.274	27.09	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
196.036	31.73	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1494.031	45.81	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS
2027.543	47.35	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
5806.921	46.96	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
12605.841	47.78	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS

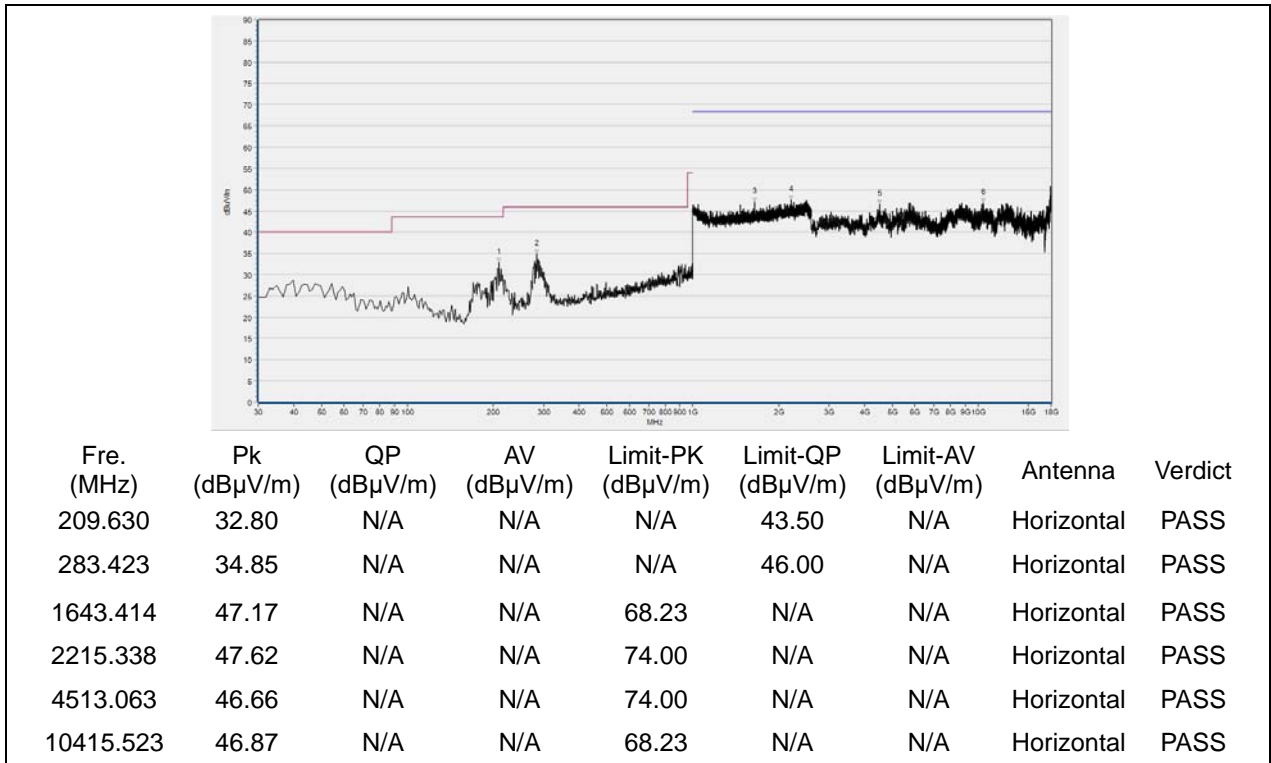
(Antenna Horizontal, 30MHz to 25GHz)



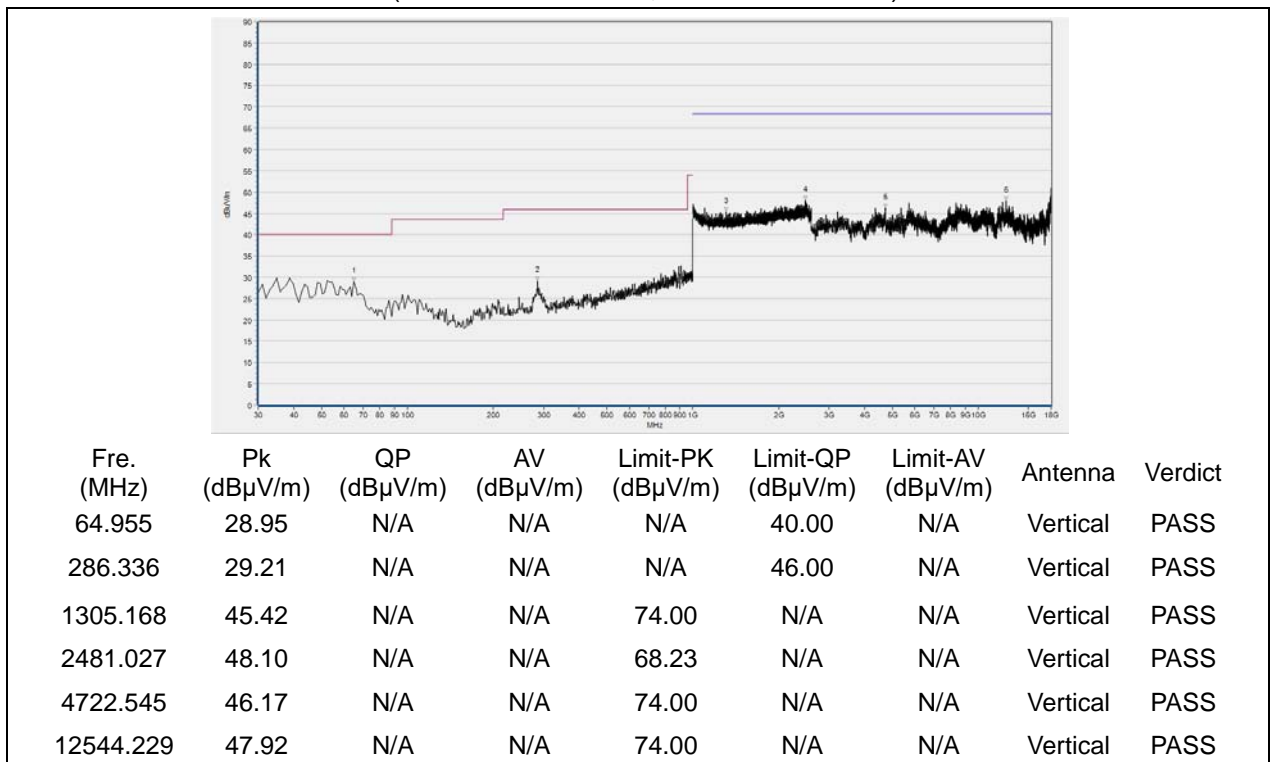
Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
65.926	28.68	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
293.133	27.18	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1364.922	45.28	N/A	N/A	74.00	N/A	N/A	Vertical	PASS
2429.276	46.51	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
5705.261	46.34	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
12799.920	47.20	N/A	N/A	68.23	N/A	N/A	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 100

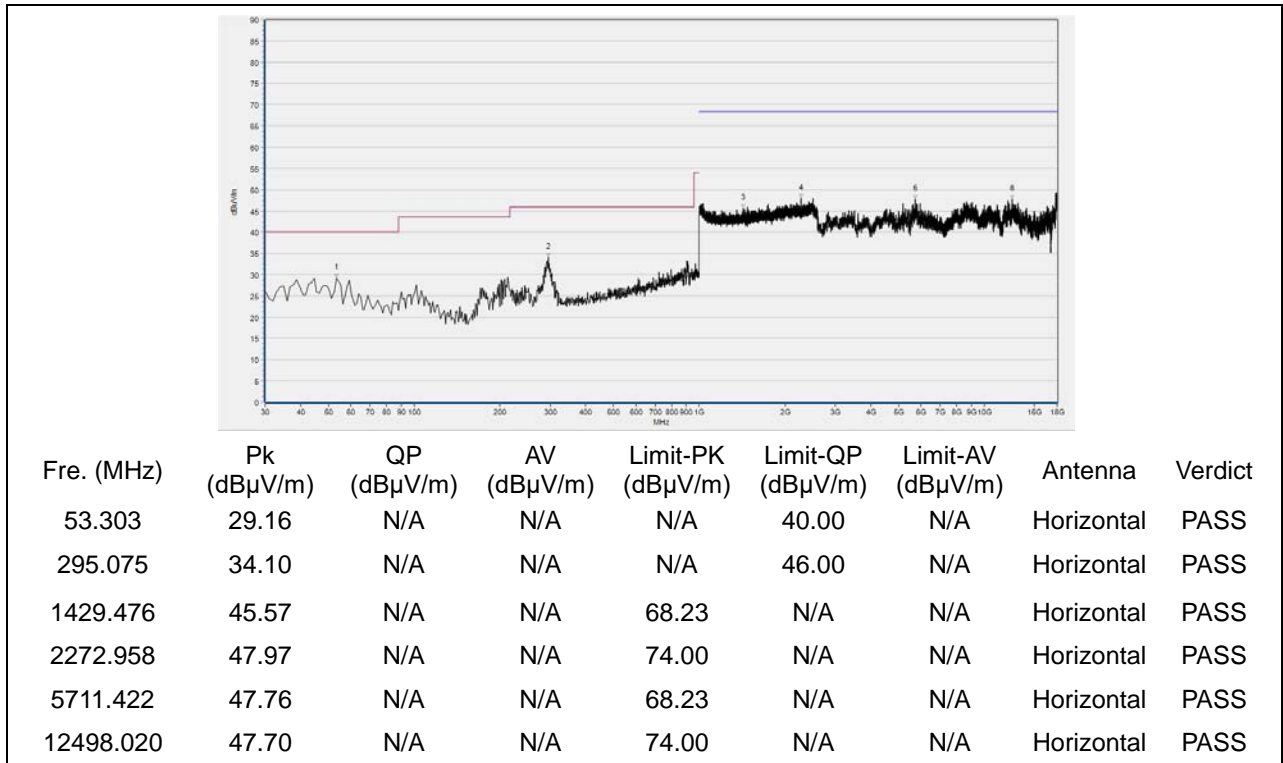


(Antenna Horizontal, 30MHz to 25GHz)

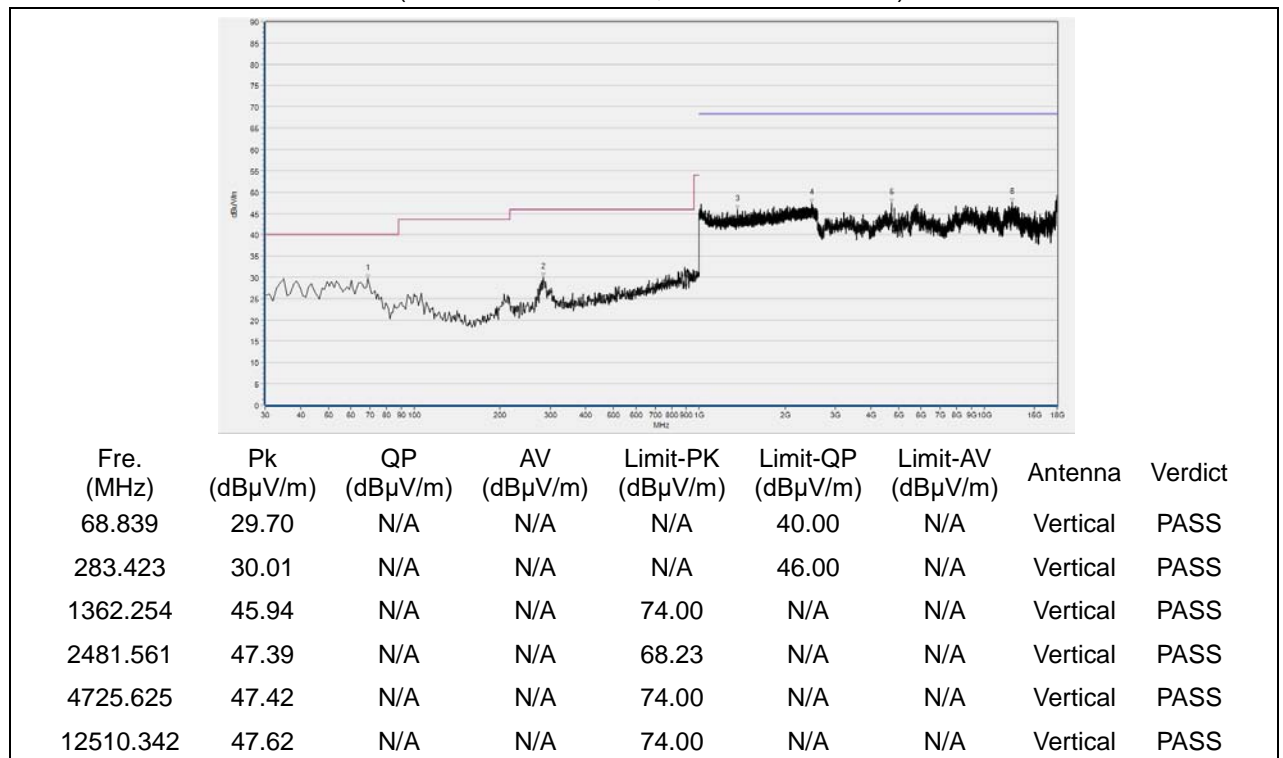


(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 120

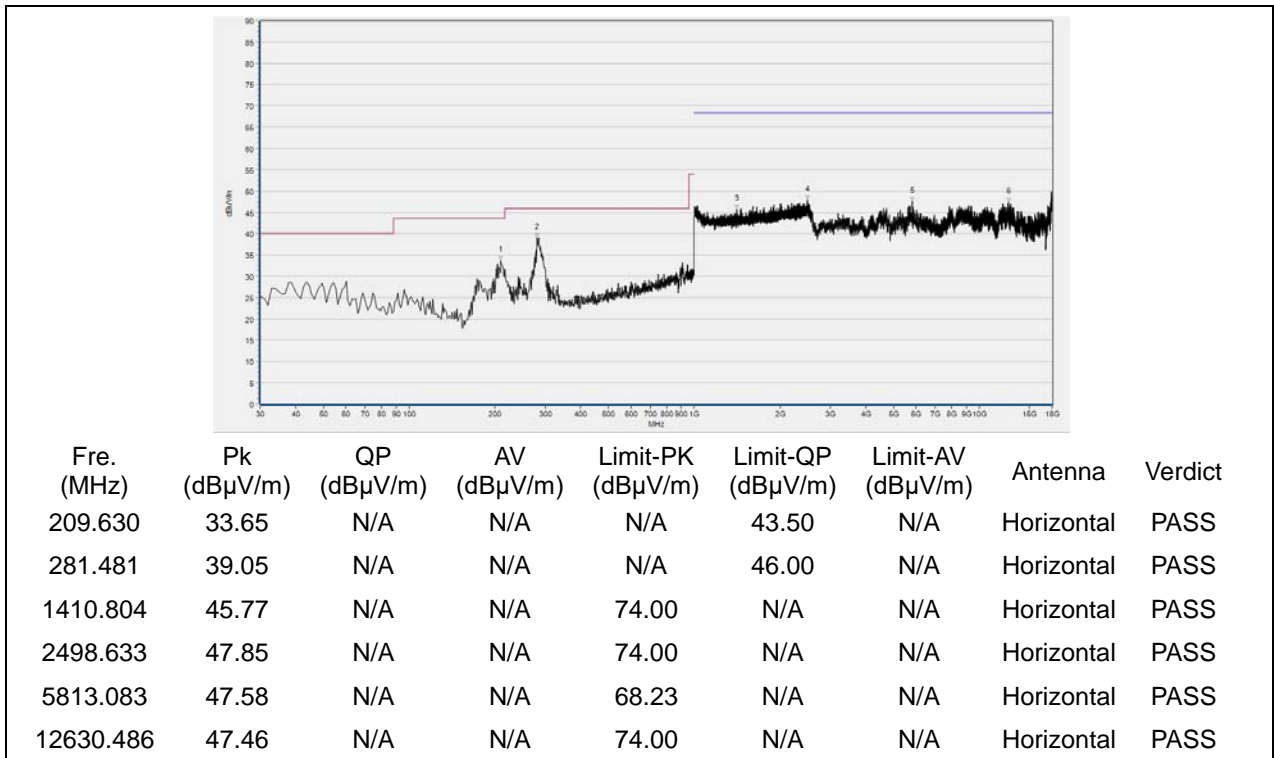


(Antenna Horizontal, 30MHz to 25GHz)

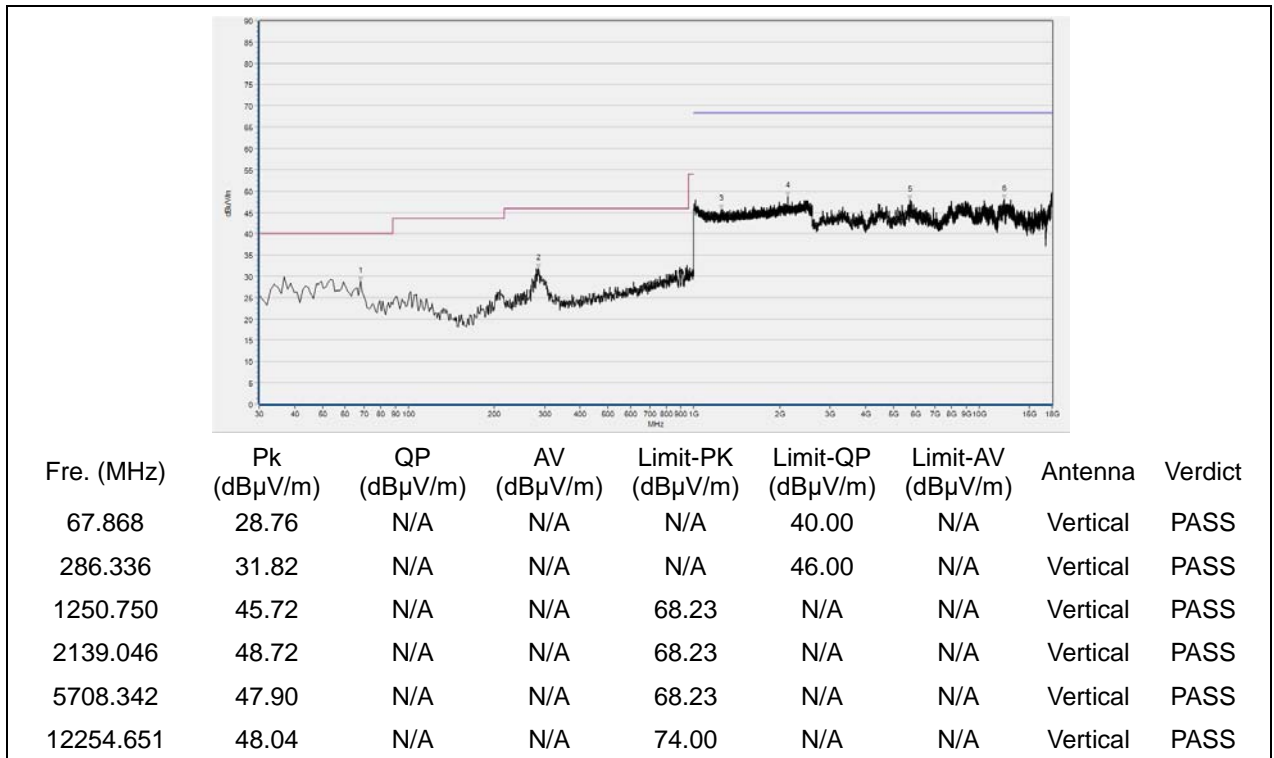


(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 144

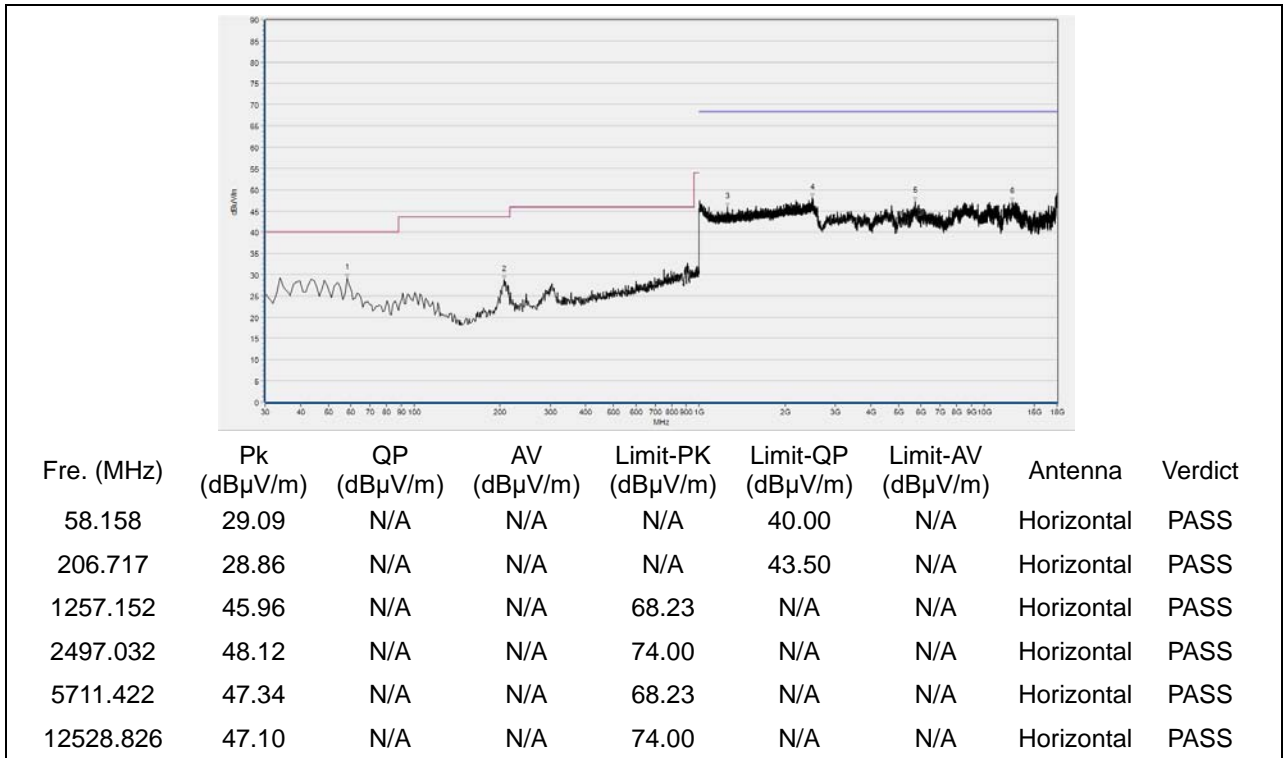


(Antenna Horizontal, 30MHz to 25GHz)

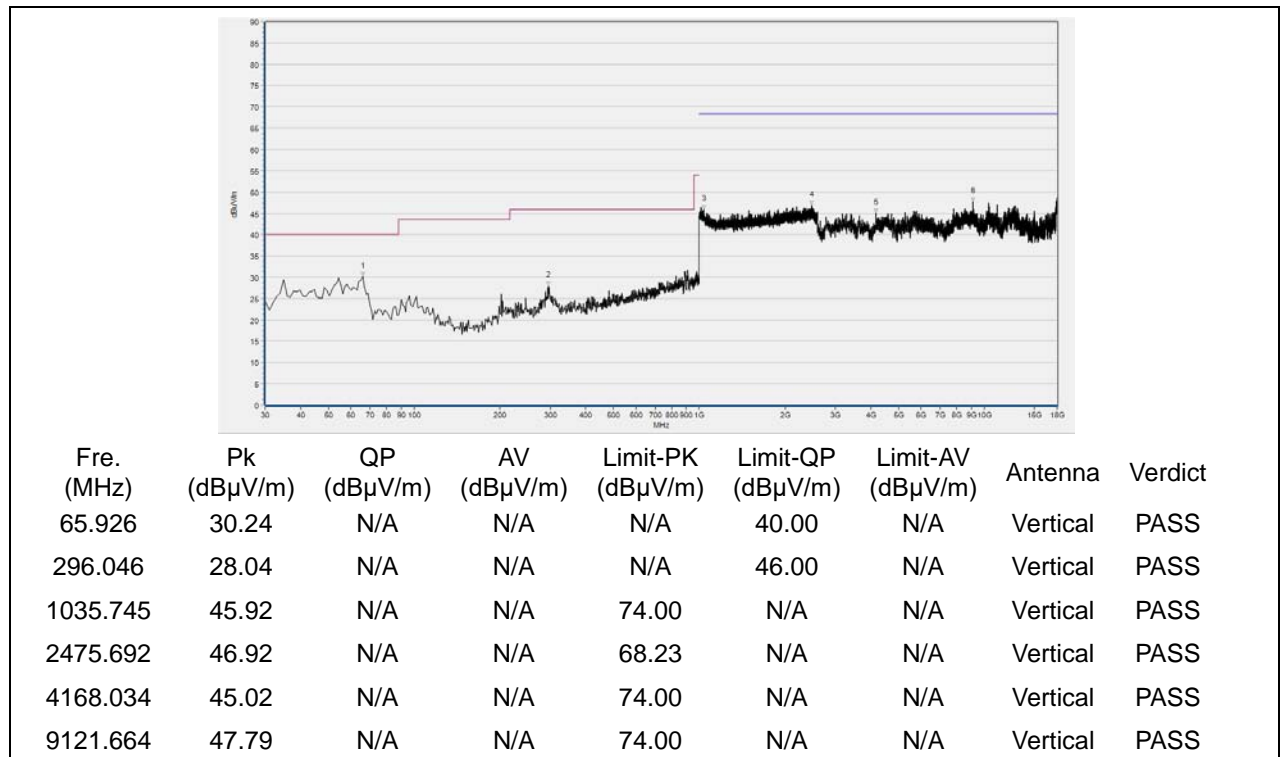


(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 149

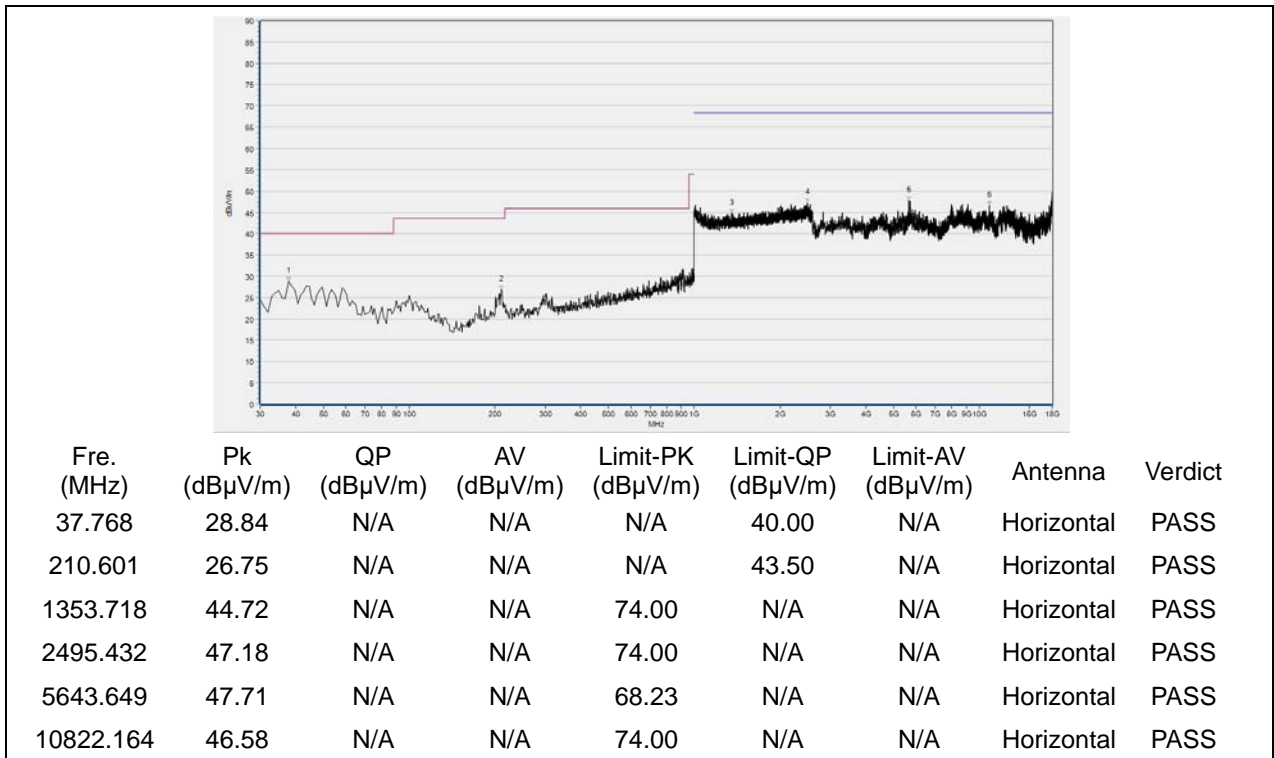


(Antenna Horizontal, 30MHz to 25GHz)

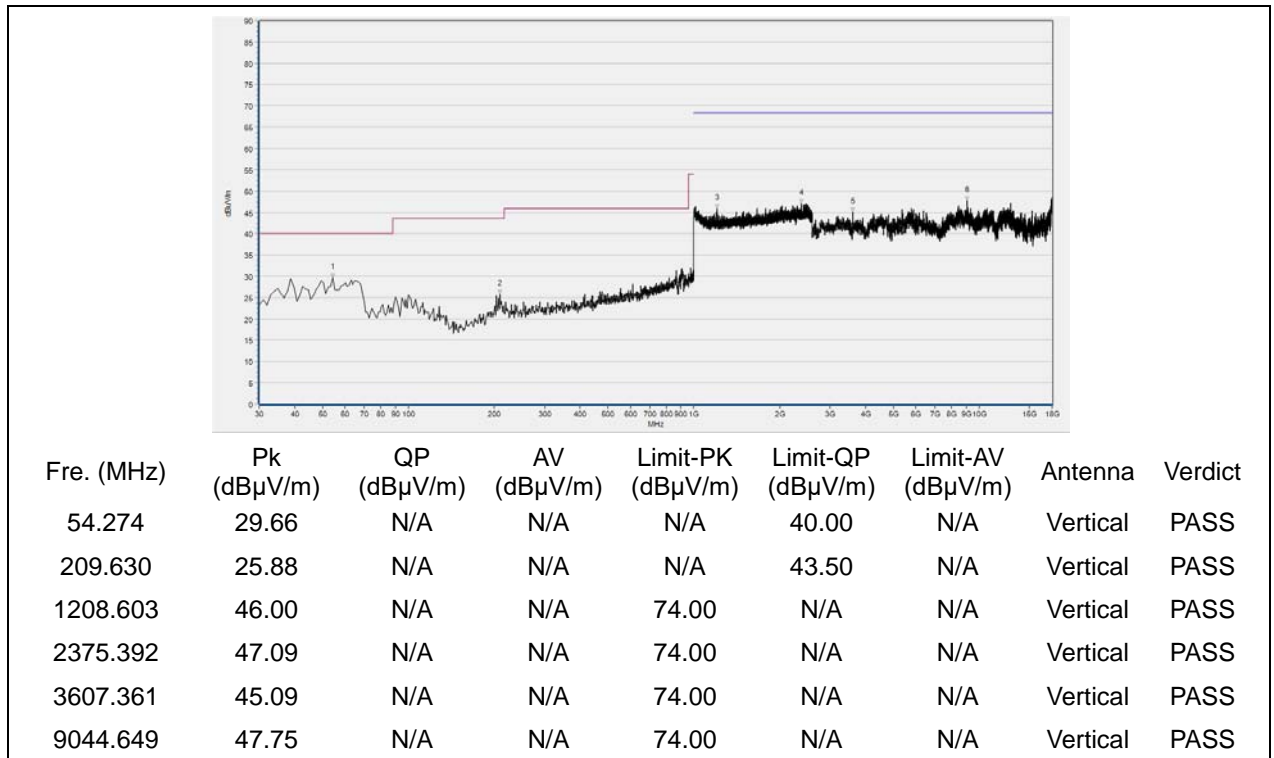


(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 157

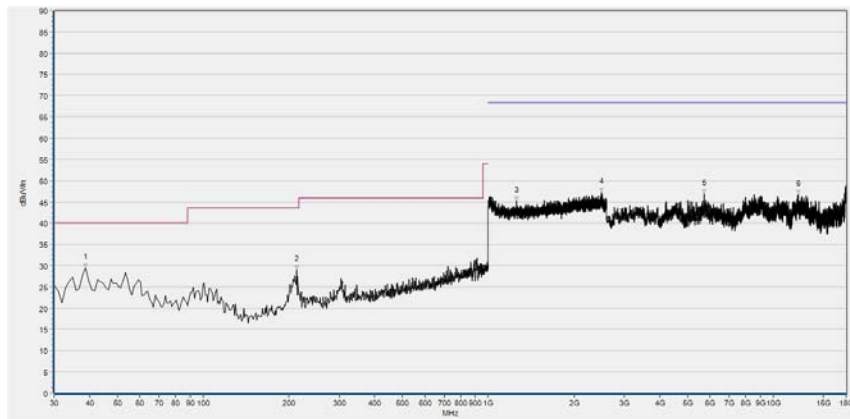


(Antenna Horizontal, 30MHz to 25GHz)



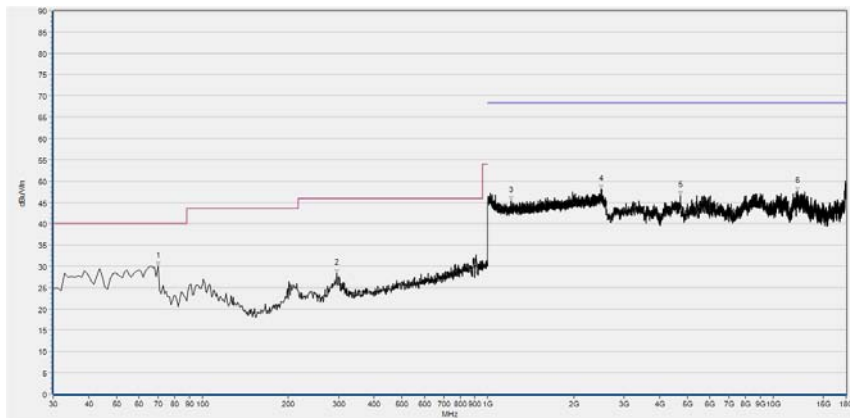
(Antenna Vertical, 30MHz to 25GHz)

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
38.739	29.48	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
212.543	28.92	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1256.085	45.32	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
2499.166	47.29	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS
5717.584	46.90	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
12226.925	46.73	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



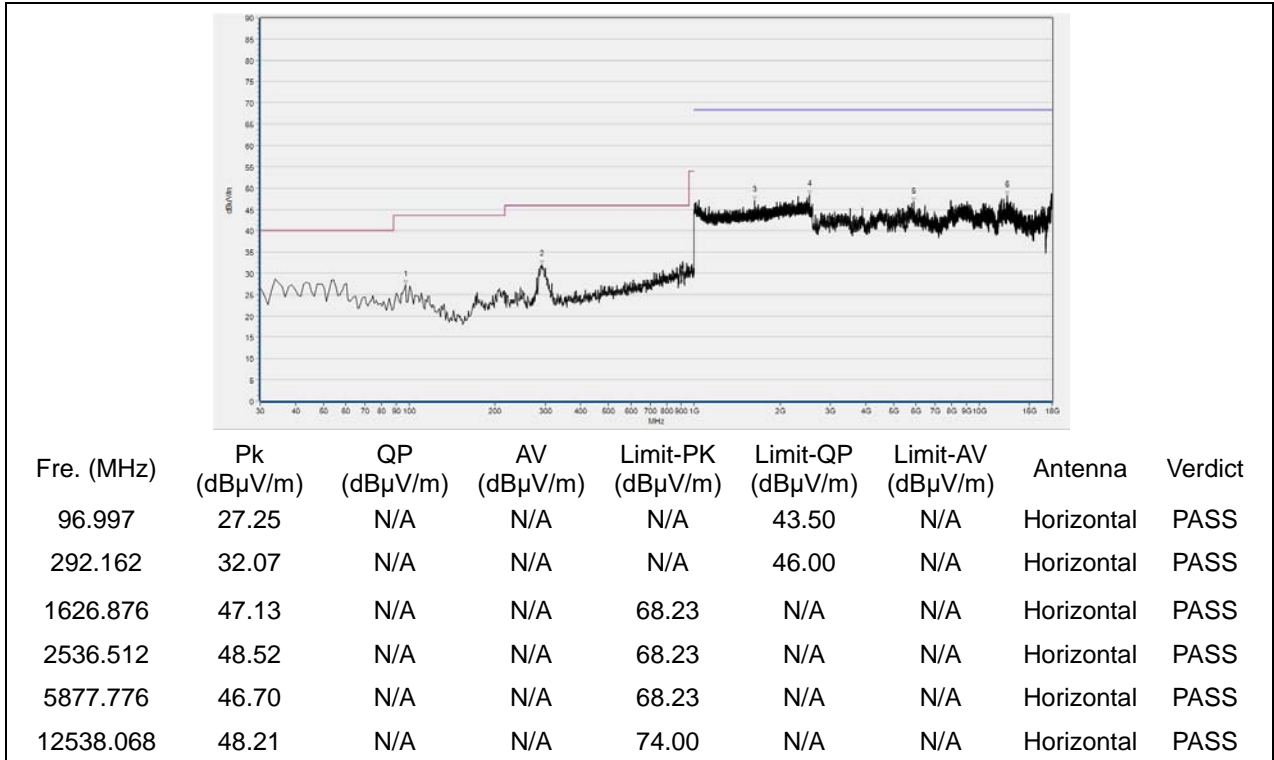
Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
69.810	29.95	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
295.075	28.34	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1204.335	45.34	N/A	N/A	74.00	N/A	N/A	Vertical	PASS
2499.700	48.07	N/A	N/A	74.00	N/A	N/A	Vertical	PASS
4719.464	46.61	N/A	N/A	74.00	N/A	N/A	Vertical	PASS
12149.910	47.64	N/A	N/A	74.00	N/A	N/A	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

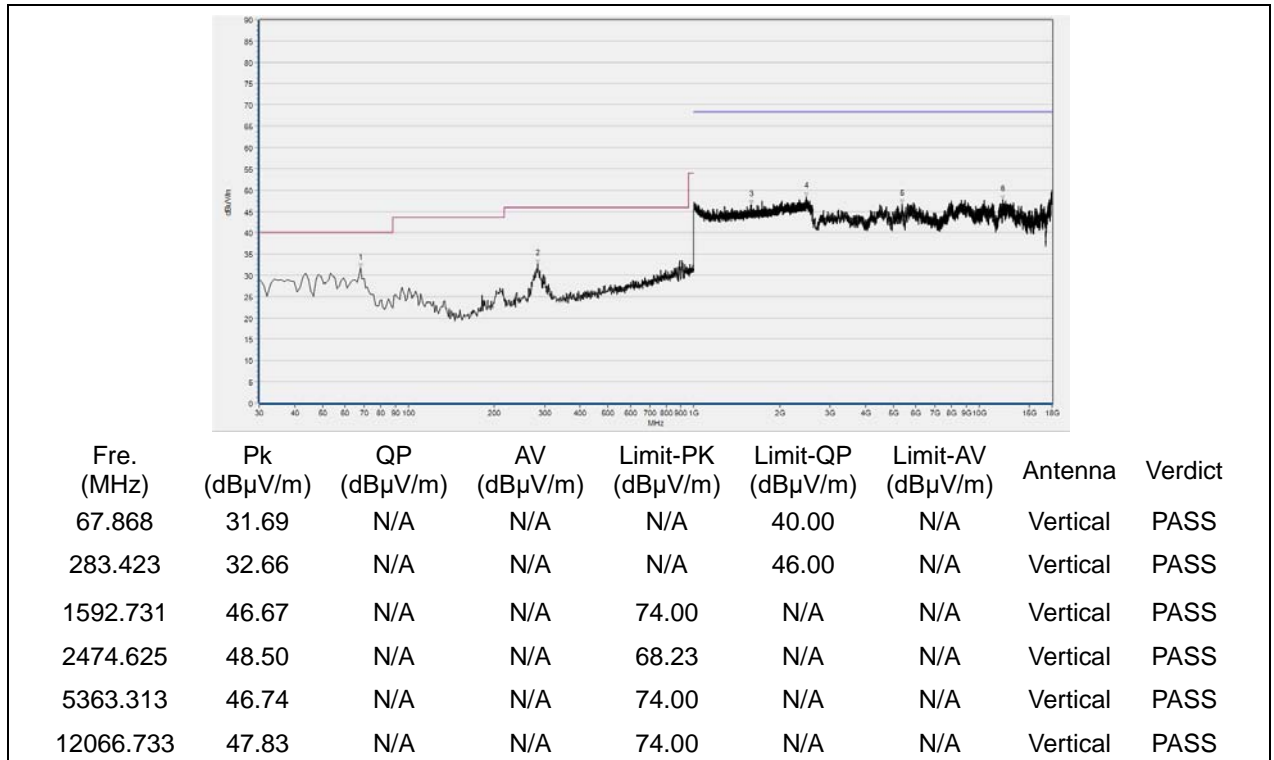


802.11n (HT40) Test mode

Plots for Channel = 38

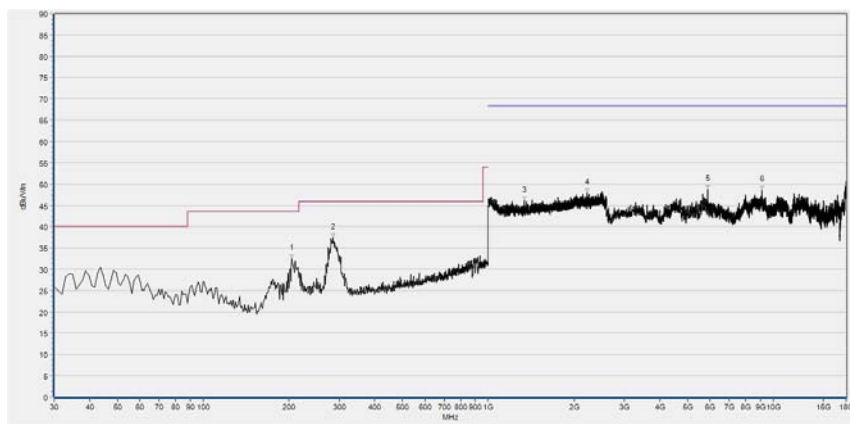


(Antenna Horizontal, 30MHz to 25GHz)



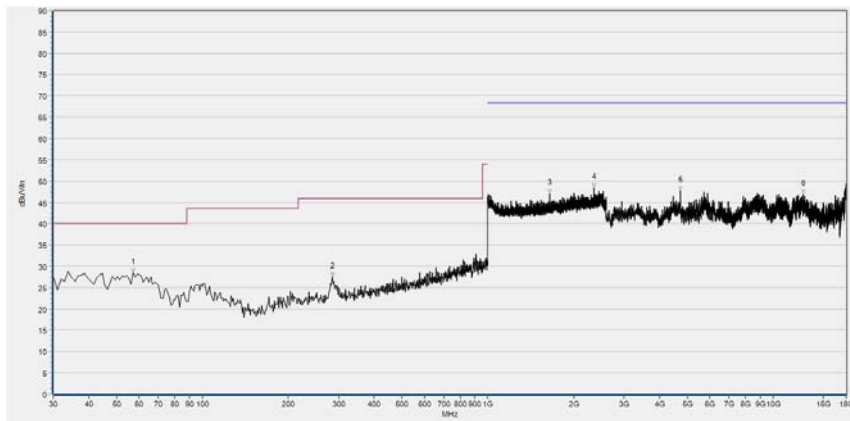
(Antenna Vertical, 30MHz to 25GHz)

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
204.775	32.52	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
285.365	37.30	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1338.780	46.17	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS
2224.408	47.85	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS
5877.776	48.71	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
9109.342	48.57	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS

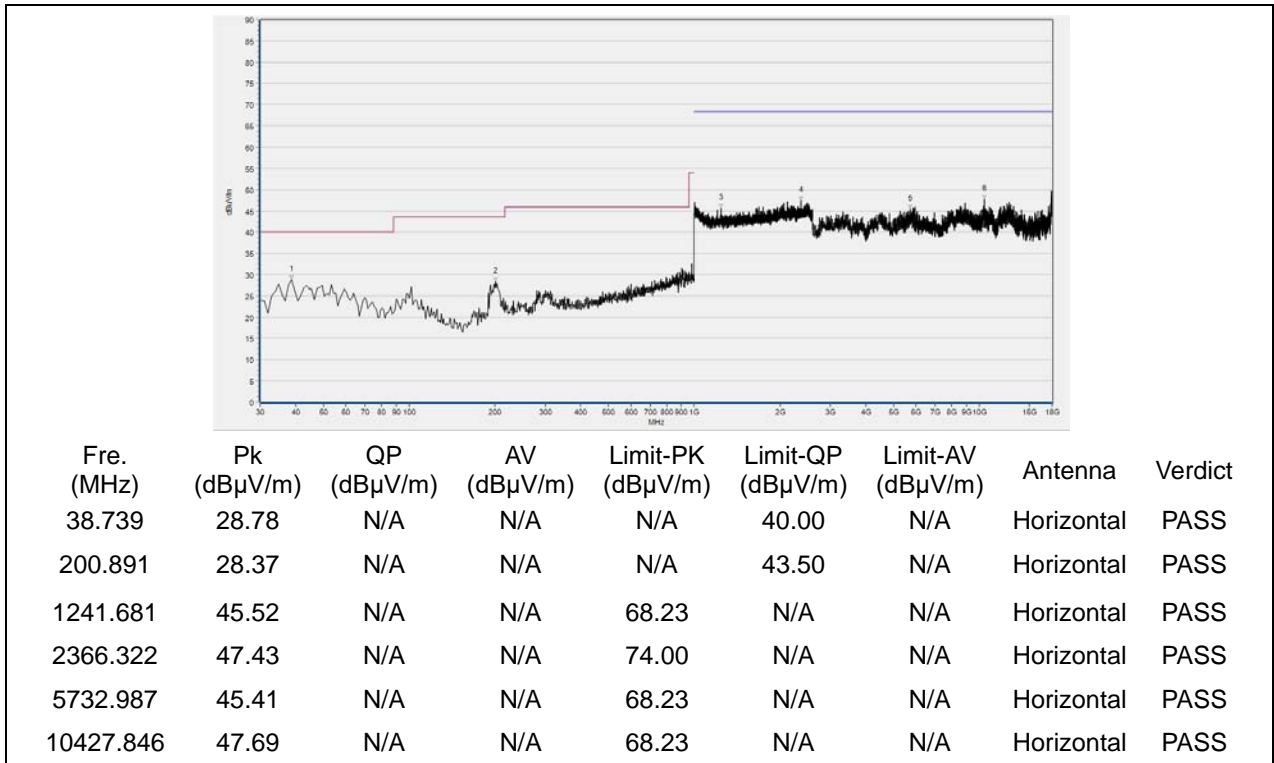
(Antenna Horizontal, 30MHz to 25GHz)



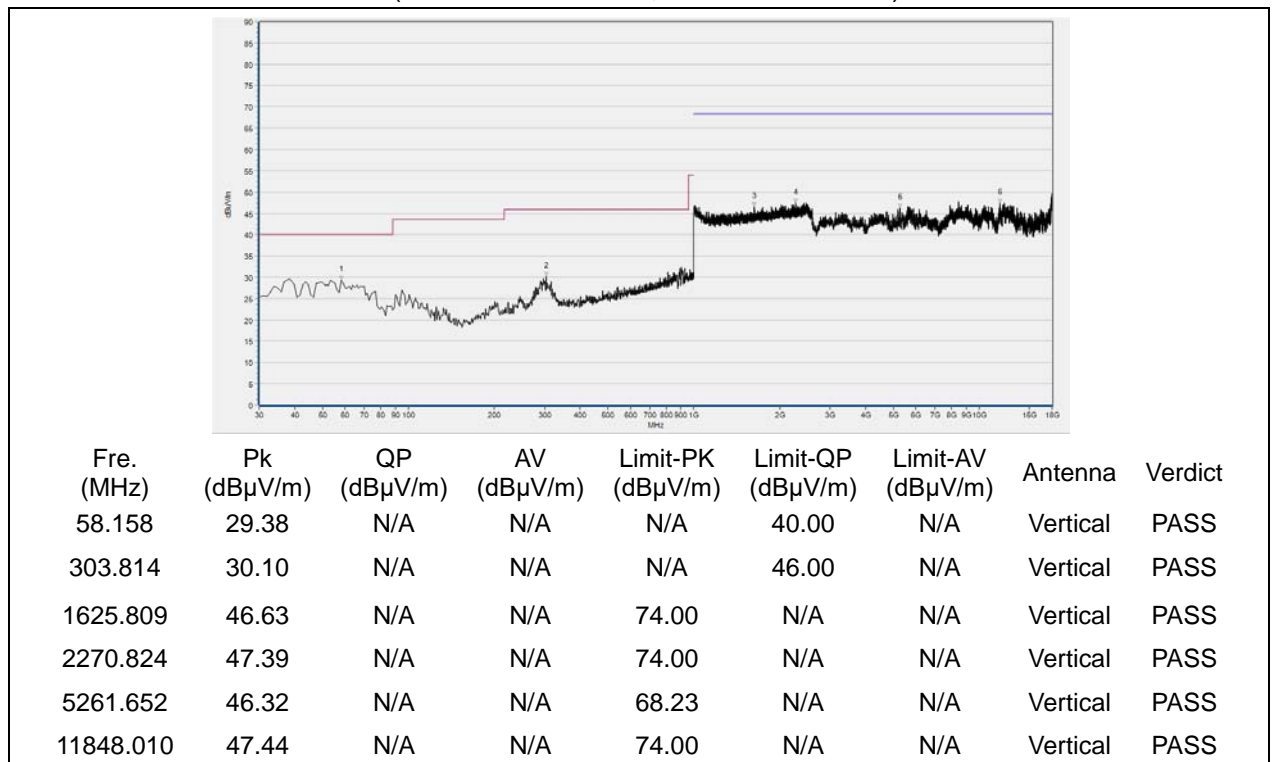
Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
57.187	28.43	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
285.365	27.53	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1650.884	47.03	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
2349.250	48.42	N/A	N/A	74.00	N/A	N/A	Vertical	PASS
4725.625	47.80	N/A	N/A	74.00	N/A	N/A	Vertical	PASS
57.187	28.43	N/A	N/A	68.23	N/A	N/A	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 54

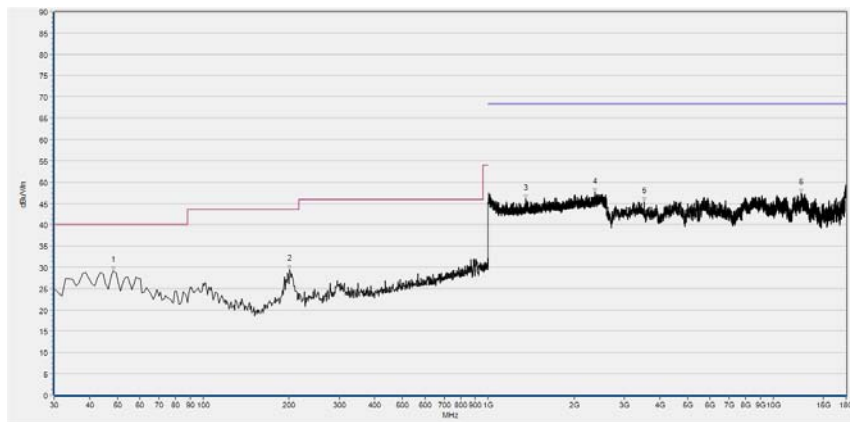


(Antenna Horizontal, 30MHz to 25GHz)



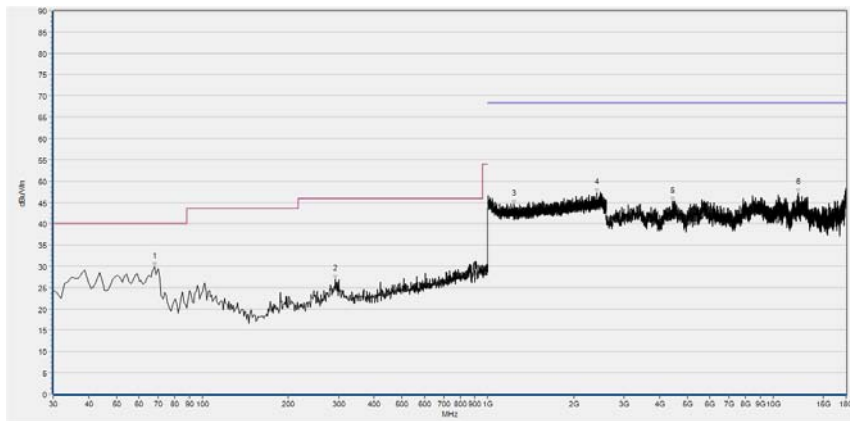
(Antenna Vertical, 30MHz to 25GHz)

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
48.448	29.19	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
200.891	29.54	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1355.318	46.15	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS
2360.987	47.53	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS
3521.104	45.41	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
12516.503	47.47	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS

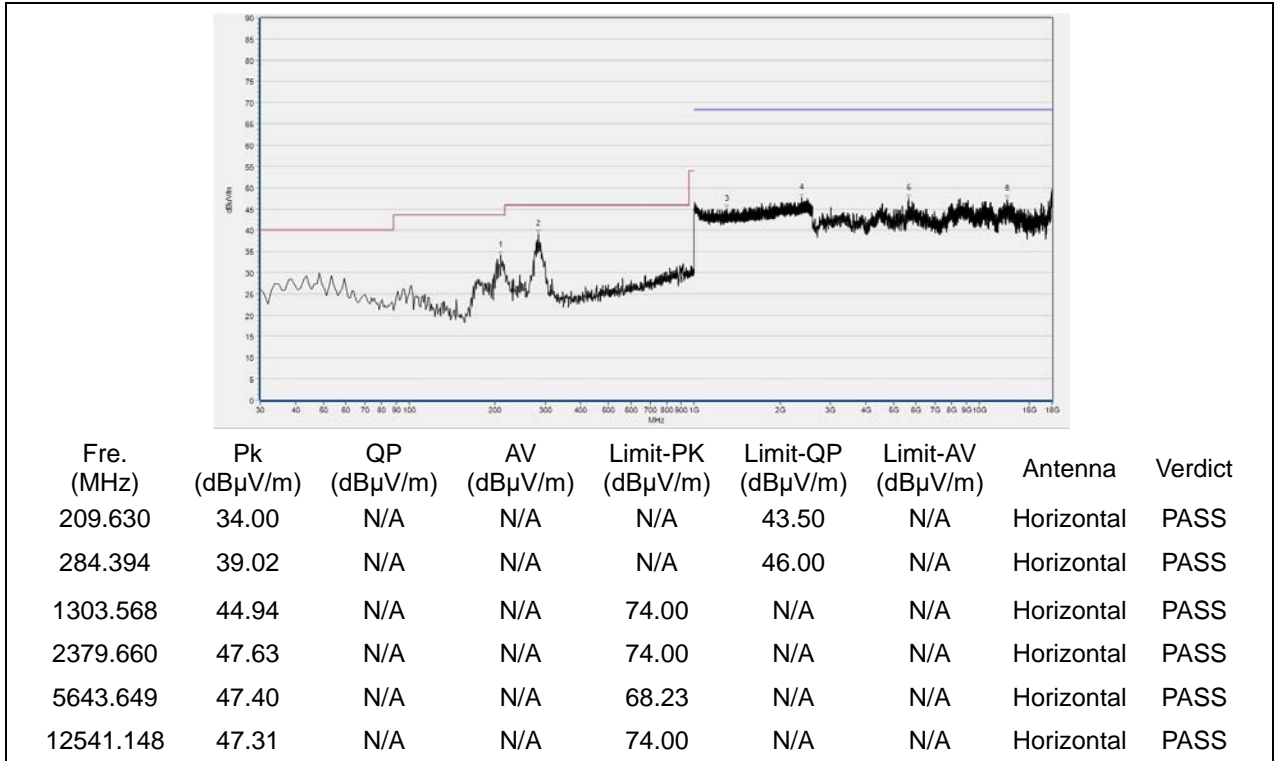
(Antenna Horizontal, 30MHz to 25GHz)



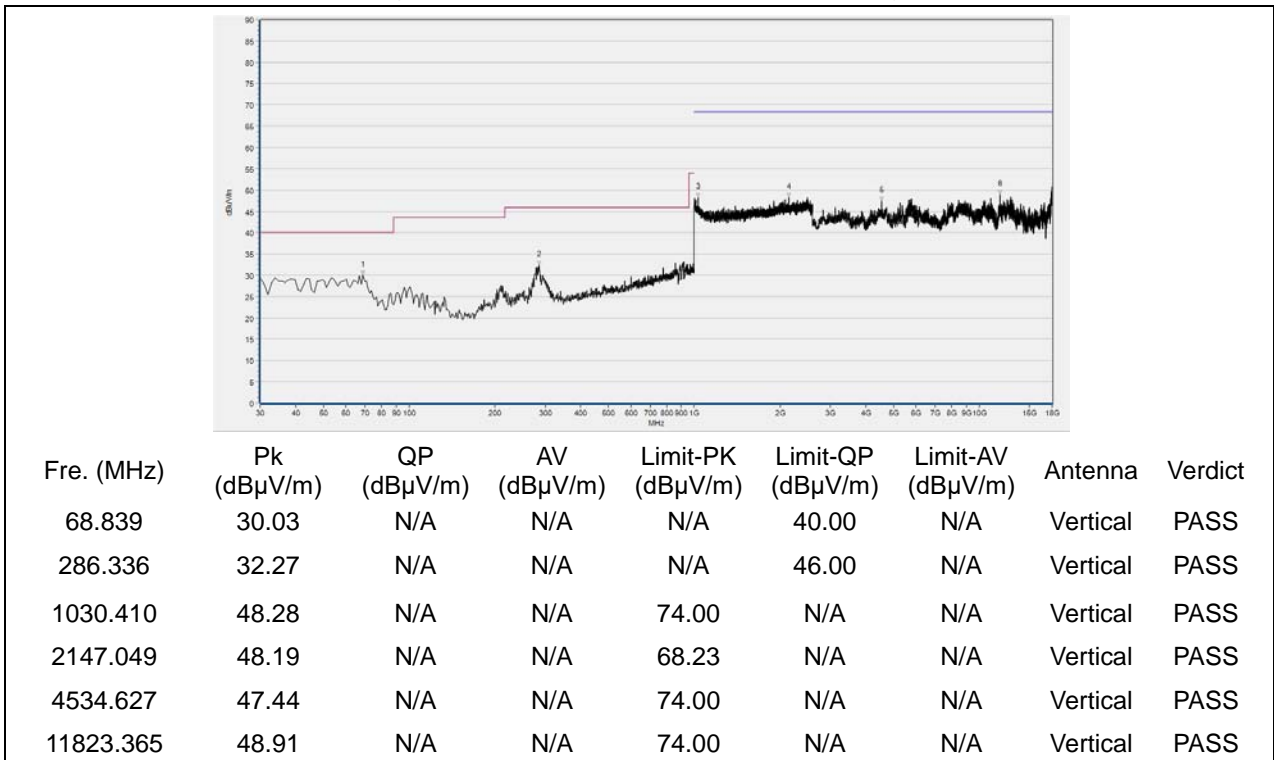
Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
67.868	29.77	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
292.162	26.94	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1233.678	44.52	N/A	N/A	74.00	N/A	N/A	Vertical	PASS
2405.268	47.30	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
4442.208	45.28	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
12217.684	47.31	N/A	N/A	74.00	N/A	N/A	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 102

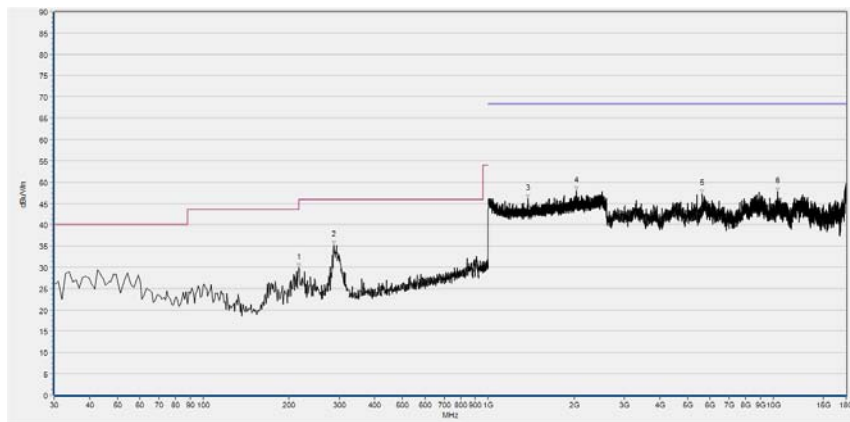


(Antenna Horizontal, 30MHz to 25GHz)



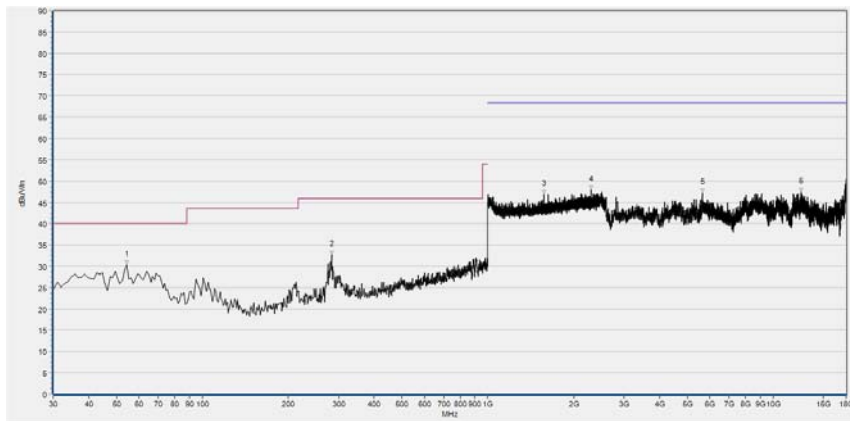
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 126



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
216.426	29.76	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
287.307	35.15	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1380.927	46.01	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS
2042.481	47.88	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
5634.407	47.27	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
10344.669	47.78	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS

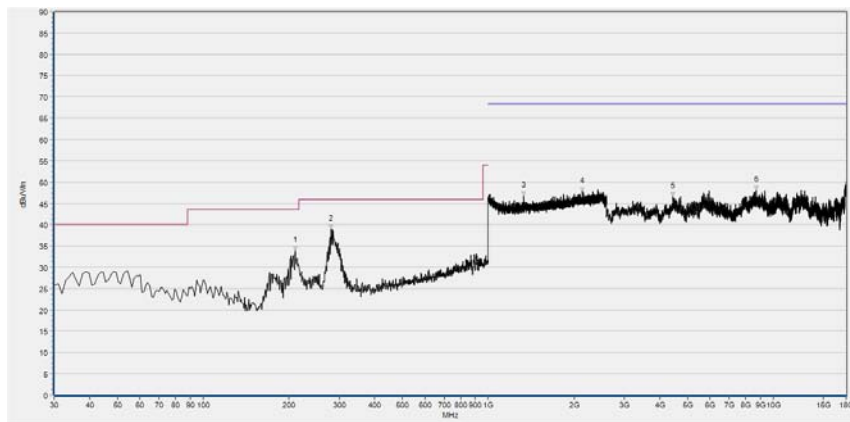
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
54.274	30.37	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
283.423	32.66	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1575.125	46.93	N/A	N/A	74.00	N/A	N/A	Vertical	PASS
2302.834	47.91	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
5637.487	47.22	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
12538.068	47.38	N/A	N/A	74.00	N/A	N/A	Vertical	PASS

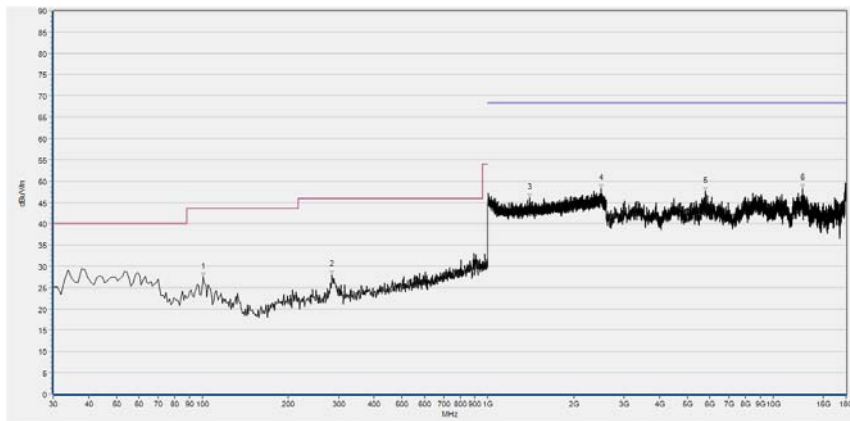
(Antenna Vertical, 30MHz to 25GHz)

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
210.601	33.87	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
281.481	38.84	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1330.243	46.69	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS
2140.113	47.78	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
4448.370	46.51	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
8724.265	48.07	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS

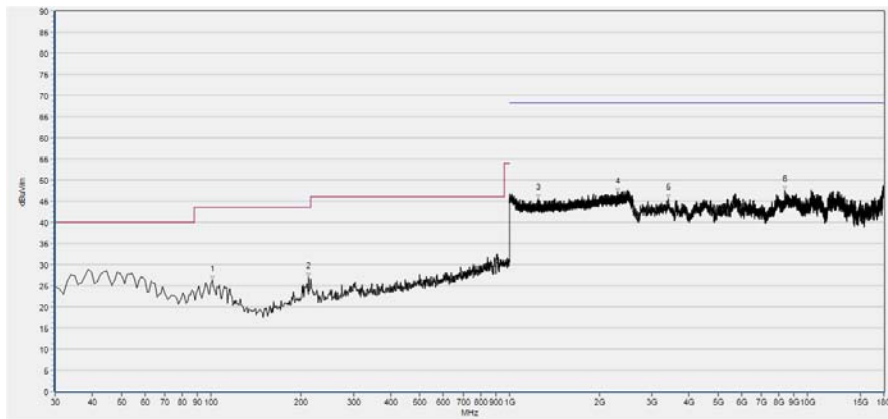
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
100.881	27.55	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
284.394	28.03	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1398.533	46.10	N/A	N/A	74.00	N/A	N/A	Vertical	PASS
2498.633	48.28	N/A	N/A	74.00	N/A	N/A	Vertical	PASS
5776.115	47.60	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
12692.098	48.25	N/A	N/A	74.00	N/A	N/A	Vertical	PASS

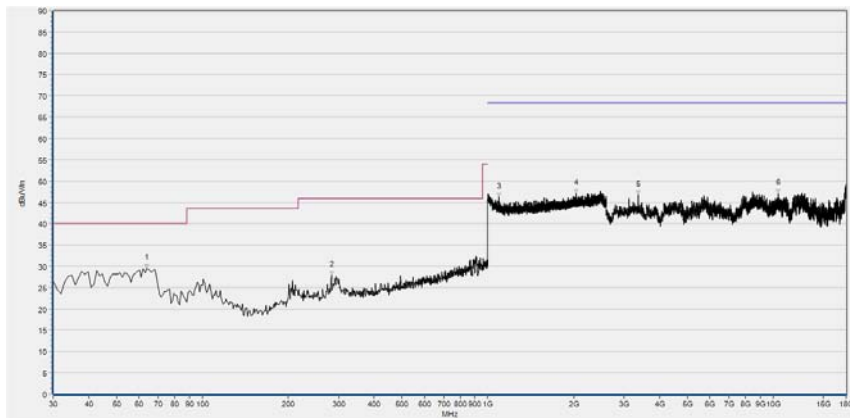
(Antenna Vertical, 30MHz to 25GHz)

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
100.881	26.23	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
212.543	26.88	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1248.083	45.54	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
2310.837	47.02	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS
3407.121	45.60	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
8391.558	47.51	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS

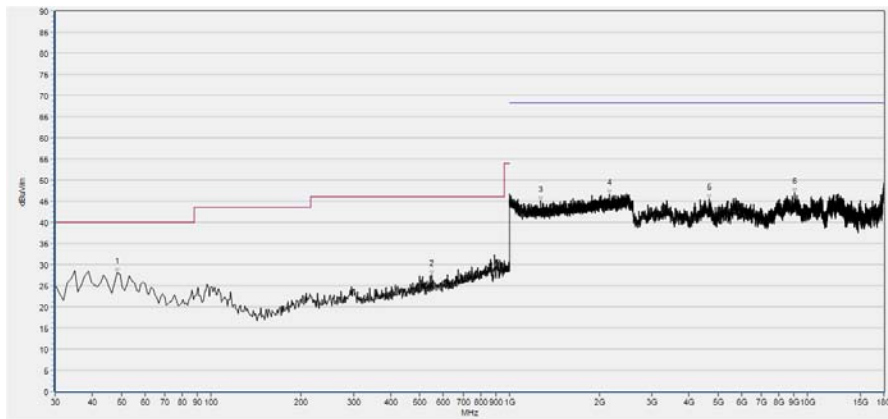
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
63.984	29.52	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
283.423	27.74	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1092.831	46.20	N/A	N/A	74.00	N/A	N/A	Vertical	PASS
2040.347	47.15	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
3370.154	46.70	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
10427.846	47.12	N/A	N/A	68.23	N/A	N/A	Vertical	PASS

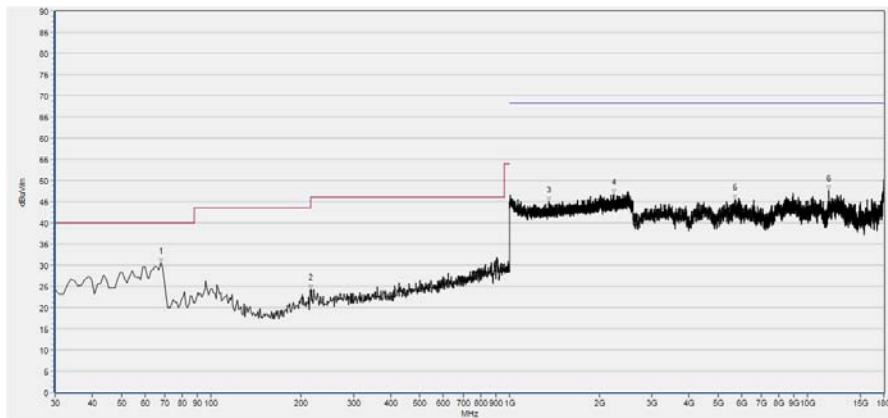
(Antenna Vertical, 30MHz to 25GHz)

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
48.448	27.98	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
550.440	27.45	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1271.024	45.01	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
2166.789	46.64	N/A	N/A	68.23	N/A	N/A	Horizontal	PASS
4660.932	45.61	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS
9050.810	46.92	N/A	N/A	74.00	N/A	N/A	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
67.868	30.50	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
215.455	24.32	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1354.785	44.94	N/A	N/A	74.00	N/A	N/A	Vertical	PASS
2241.480	46.79	N/A	N/A	74.00	N/A	N/A	Vertical	PASS
5711.422	45.50	N/A	N/A	68.23	N/A	N/A	Vertical	PASS
11789.478	47.72	N/A	N/A	74.00	N/A	N/A	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)



2.9. Automatically discontinue transmission requirement

2.9.1. Requirement

According to 15.407(c), the device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signalling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met

2.9.2. Result

The EUT will automatically discontinue transmission in case of either absence of information to transmit or operational failure.

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	$\pm 2.22\text{dB}$
Power spectral density (PSD)	$\pm 2.22\text{dB}$
Bandwidth	$\pm 5\%$
Restricted Frequency Bands	$\pm 5\%$
Radiated Emission	$\pm 2.95\text{dB}$
Conducted Emission	$\pm 2.44\text{dB}$

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

Company Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Department:	Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, Guangdong Province, P. R. China
Responsible Test Lab Manager:	Mr. Su Feng
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.



4. Test Equipments Utilized

4.1 Conducted Test Equipments

Equipment	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
Power Splitter	NW521	1506A	Weinschel	2018.04.17	2019.04.16
Attenuator 1	(N/A)	10dB	Resnet	2018.04.17	2019.04.16
Attenuator 2	(N/A)	3dB	Resnet	2018.04.17	2019.04.16
EXA Signal Analyzer	MY53470836	N9010A	Agilent	2017.12.03	2018.12.02
USB Wideband Power Sensor	MY54210011	U2021XA	Agilent	2018.04.17	2019.04.16
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	(N/A)	HUT705P	CHONGQING HANBA EXPERIMENTAL EQUIPMENT CO.,LTD	2018.04.17	2019.04.16

4.2 Conducted Emission Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
Receiver	MY56400093	N9038A	KEYSIGHT	2017.07.13	2018.07.12
LISN	812744	NSLK 8127	Schwarzbeck	2018.05.08	2019.05.07
Pulse Limiter (20dB)	9391	VTSD 9561-D	Schwarzbeck	2018.05.08	2019.05.07
Coaxial cable(BNC) (30MHz-26GHz)	CB01	EMC01	Morlab	N/A	N/A

4.3 Auxiliary Test Equipment

Equipment Name	Model No.	Brand Name	Manufacturer	Cal.Date	Cal. Due
Computer	T430i	Think Pad	Lenovo	N/A	N/A

**4.4 Radiated Test Equipments**

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
Receiver	MY54130016	N9038A	Agilent	2018.05.08	2019.05.07
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2018.05.08	2019.05.07
Test Antenna - Horn	9170C-531	BBHA9170	Schwarzbeck	2017.09.13	2018.09.12
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2018.03.03	2019.03.02
Test Antenna - Horn	01774	BBHA 9120D	Schwarzbeck	2017.09.13	2018.09.12
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	2018.05.08	2019.05.07
18-26.5GHz pre-Amplifier	MA03	TS-PR18	Rohde& Schwarz	2018.05.08	2019.05.07
26GHz -40GHz pre-Amplifier	MA05	BBV9721	Rohde& Schwarz	2018.05.08	2019.05.07
Anechoic Chamber	N/A	9m*6m*6m	CRT	2017.11.19	2020.11.18

END OF REPORT