

5.7 RADIATED EMISSIONS AND BAND EDGE MEASUREMENT

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (b)(1)(2)(3)(4)(6)
FCC 47 CFR Part 15 Subpart C Section 15.209/205

Test Method: KDB 789033 D02 v02r01 Section G.3, G.4, G.5, and G.6

Receiver Setup:

Frequency	RBW
0.009 MHz-0.150 MHz	200/300 kHz
0.150 MHz -30 MHz	9/10 kHz
30 MHz-1 GHz	100/120 kHz
Above 1 GHz	1 MHz

Limits:

1. Limits of Radiated Emission and Band edge Measurement

Radiated emissions that fall in the restricted bands must comply with the general emissions limits in 15.209(a) as below table. Other emissions shall be at least 20 dB below the highest level of the desired power.

Frequency	Field strength (microvolt/meter)	Limit (dB μ V/m)	Remark	Measurement distance (m)
0.009 MHz-0.490 MHz	2400/F(kHz)	--	--	300
0.490 MHz-1.705 MHz	24000/F(kHz)	--	--	30
1.705 MHz-30 MHz	30	--	--	30
30 MHz-88 MHz	100	40.0	Quasi-peak	3
88 MHz-216 MHz	150	43.5	Quasi-peak	3
216 MHz-960 MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1 GHz	500	54.0	Average	3

Remark:

- The lower limit shall apply at the transition frequencies.
- Emission level (dB μ V/m) = 20 log Emission level (uV/m).
- For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

2. Limits of Unwanted Emission Out of the Restricted Bands

Applicable To	Limit	
789033 D02 General U-NII Test Procedures New Rules v01r04	Field Strength at 3 m	
	PK: 74 (dB μ V/m)	AV: 54 (dB μ V/m)
Applicable To	EIRP Limit	Equivalent Field Strength at 3 m
FCC Part 15.407 (b)(1)	PK: -27 (dBm/MHz)	PK: 74 (dB μ V/m)
FCC Part 15.407 (b)(2)	PK: -27 (dBm/MHz)	PK: 74 (dB μ V/m)
FCC Part 15.407 (b)(3)	PK: -27 (dBm/MHz)	PK: 68.2 (dB μ V/m)
FCC Part 15.407 (b)(4)	27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;	PK: 68.2 (dB μ V/m)
	15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;	
	10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges;	

	-27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.	
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Test Setup: Refer to section 4.5.1 for details.

Test Procedures:

1. The EUT was placed on the top of a rotating table 0.8 meters (for below 1 GHz) / 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
6. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Remark:

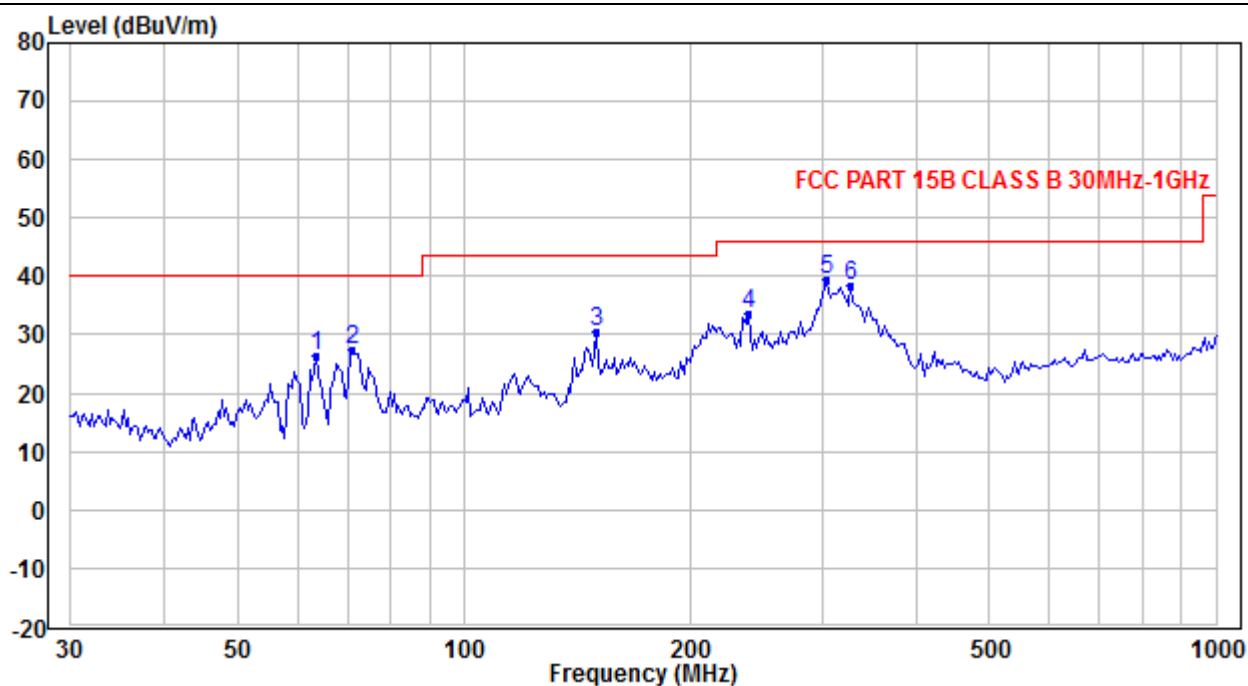
- a) The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
- b) The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
- c) The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for RMS Average (Duty cycle < 98 %) for Average detection (AV) at frequency above 1 GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
- d) The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz (Duty cycle $\geq 98 \%$) or $\geq 1/T$ (duty cycle is < 98%) for Average detection (AV) at frequency above 1 GHz.
- e) All modes of operation were investigated and the worst-case emissions are reported.

Equipment Used: Refer to section 3 for details.

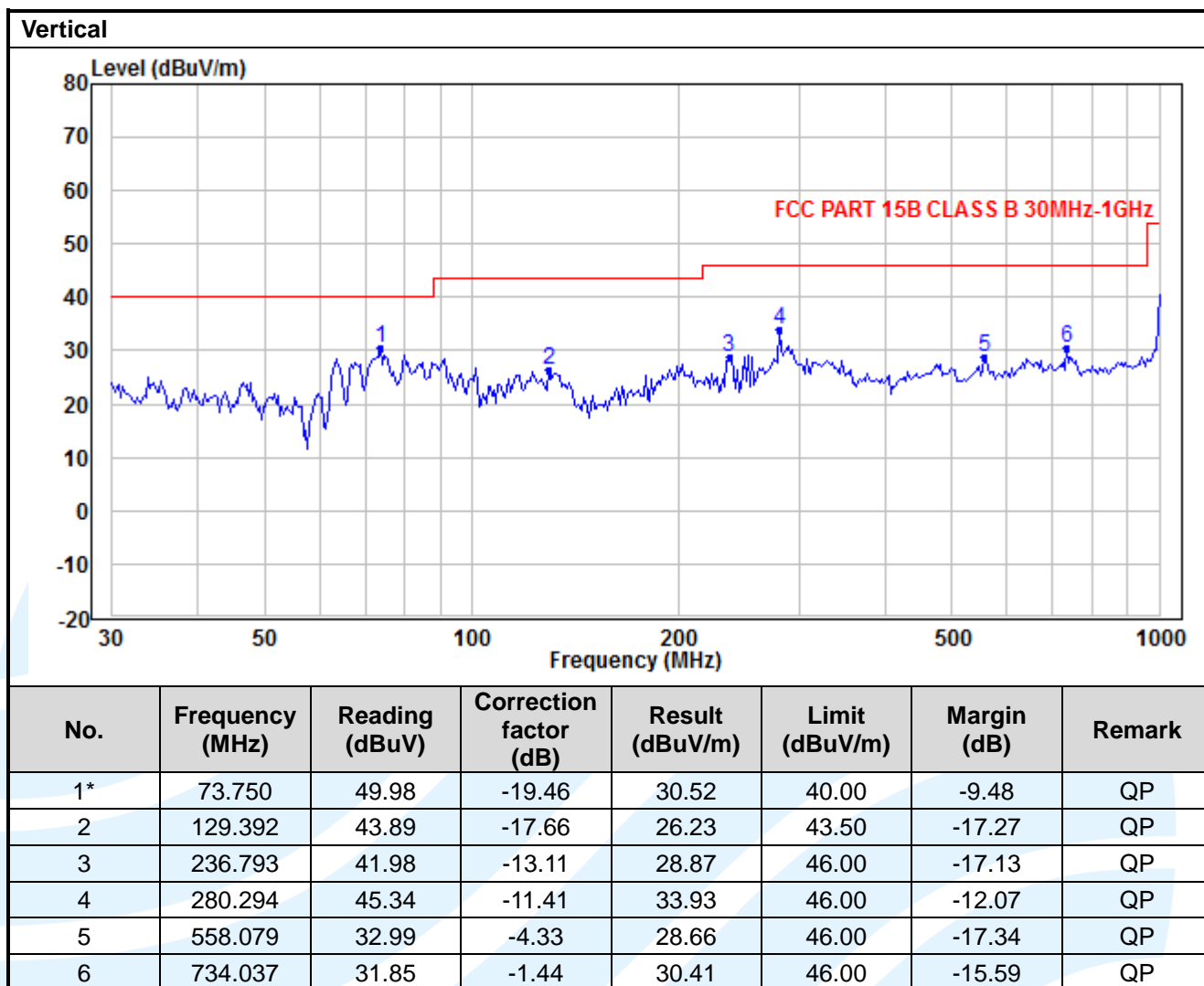
Test Result: Pass

The measurement data as follows:

Radiated Emission Test Data (9 KHz ~ 30 MHz):
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

Radiated Emission Test Data (30 MHz ~ 1 GHz):
Worst-Case Configuration
Horizontal


No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	63.631	46.68	-20.12	26.56	40.00	-13.44	QP
2	71.203	46.82	-19.55	27.27	40.00	-12.73	QP
3	149.968	47.47	-17.03	30.44	43.50	-13.06	QP
4	238.463	46.63	-13.03	33.60	46.00	-12.40	QP
5	302.819	50.21	-10.86	39.35	46.00	-6.65	QP
6	327.155	48.60	-10.27	38.33	46.00	-7.67	QP



Radiated Emission Test Data (Above 1GHz):
SISO_Chain 0_IEEE 802.11a_Channel 36

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10360.00	59.27	74.00	-14.73	Peak	Horizontal
2	10360.00	42.27	54.00	-11.73	Average	Horizontal
3	15540.00	51.20	74.00	-22.80	Peak	Horizontal
4	15540.00	38.20	54.00	-15.80	Average	Horizontal
5	10360.00	57.93	74.00	-16.07	Peak	Vertical
6	10360.00	39.93	54.00	-14.07	Average	Vertical
7	15540.00	50.96	74.00	-23.04	Peak	Vertical
8	15540.00	38.96	54.00	-15.04	Average	Vertical

SISO_Chain 0_IEEE 802.11a_Channel 44

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10440.00	60.38	74.00	-13.62	Peak	Horizontal
2	10440.00	43.38	54.00	-10.62	Average	Horizontal
3	15660.00	51.69	74.00	-22.31	Peak	Horizontal
4	15660.00	38.69	54.00	-15.31	Average	Horizontal
5	10440.00	58.97	74.00	-15.03	Peak	Vertical
6	10440.00	41.97	54.00	-12.03	Average	Vertical
7	15660.00	50.59	74.00	-23.41	Peak	Vertical
8	15660.00	38.59	54.00	-15.41	Average	Vertical

SISO_Chain 0_IEEE 802.11a_Channel 48

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10480.00	63.88	74.00	-10.12	Peak	Horizontal
2	10480.00	43.88	54.00	-10.12	Average	Horizontal
3	15720.00	51.72	74.00	-22.28	Peak	Horizontal
4	15720.00	38.72	54.00	-15.28	Average	Horizontal
5	10480.00	62.76	74.00	-11.24	Peak	Vertical
6	10480.00	42.76	54.00	-11.24	Average	Vertical
7	15720.00	51.02	74.00	-22.98	Peak	Vertical
8	15720.00	39.02	54.00	-14.98	Average	Vertical

SISO_Chain 0_IEEE 802.11a_Channel 149

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11490.00	56.99	74.00	-17.01	Peak	Horizontal
2	11490.00	40.99	54.00	-13.01	Average	Horizontal
3	17235.00	52.37	74.00	-21.63	Peak	Horizontal
4	17235.00	39.37	54.00	-14.63	Average	Horizontal
5	11490.00	64.01	74.00	-9.99	Peak	Vertical
6	11490.00	42.01	54.00	-11.99	Average	Vertical
7	17235.00	52.87	74.00	-21.13	Peak	Vertical
8	17235.00	39.87	54.00	-14.13	Average	Vertical

SISO_Chain 0_IEEE 802.11a_Channel 157

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11570.00	58.61	74.00	-15.39	Peak	Horizontal
2	11570.00	42.61	54.00	-11.39	Average	Horizontal
3	17355.00	53.31	74.00	-20.69	Peak	Horizontal
4	17355.00	41.31	54.00	-12.69	Average	Horizontal
5	11570.00	60.97	74.00	-13.03	Peak	Vertical
6	11570.00	45.97	54.00	-8.03	Average	Vertical
7	17355.00	53.78	74.00	-20.22	Peak	Vertical
8	17355.00	40.78	54.00	-13.22	Average	Vertical

SISO_Chain 0_IEEE 802.11a_Channel 165

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11650.00	55.84	74.00	-18.16	Peak	Horizontal
2	11650.00	40.84	54.00	-13.16	Average	Horizontal
3	17475.00	54.56	74.00	-19.44	Peak	Horizontal
4	17475.00	41.56	54.00	-12.44	Average	Horizontal
5	11650.00	59.35	74.00	-14.65	Peak	Vertical
6	11650.00	43.35	54.00	-10.65	Average	Vertical
7	17475.00	54.48	74.00	-19.52	Peak	Vertical
8	17475.00	41.48	54.00	-12.52	Average	Vertical

SISO_Chain 1_IIEEE 802.11a_Channel 36

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10360.00	65.09	74.00	-8.91	Peak	Horizontal
2	10360.00	45.09	54.00	-8.91	Average	Horizontal
3	15540.00	50.59	74.00	-23.41	Peak	Horizontal
4	15540.00	38.59	54.00	-15.41	Average	Horizontal
5	10360.00	65.96	74.00	-8.04	Peak	Vertical
6	10360.00	45.96	54.00	-8.04	Average	Vertical
7	15540.00	49.99	74.00	-24.01	Peak	Vertical
8	15540.00	37.99	54.00	-16.01	Average	Vertical

SISO_Chain 1_IIEEE 802.11a_Channel 44

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10440.00	68.70	74.00	-5.30	Peak	Horizontal
2	10440.00	49.70	54.00	-4.30	Average	Horizontal
3	15660.00	51.09	74.00	-22.91	Peak	Horizontal
4	15660.00	39.09	54.00	-14.91	Average	Horizontal
5	10440.00	70.66	74.00	-3.34	Peak	Vertical
6	10440.00	50.66	54.00	-3.34	Average	Vertical
7	15660.00	50.50	74.00	-23.50	Peak	Vertical
8	15660.00	38.50	54.00	-15.50	Average	Vertical

SISO_Chain 1_IIEEE 802.11a_Channel 48

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10480.00	67.05	74.00	-6.95	Peak	Horizontal
2	10480.00	48.05	54.00	-5.95	Average	Horizontal
3	15720.00	51.32	74.00	-22.68	Peak	Horizontal
4	15720.00	39.32	54.00	-14.68	Average	Horizontal
5	10480.00	68.12	74.00	-5.88	Peak	Vertical
6	10480.00	48.12	54.00	-5.88	Average	Vertical
7	15720.00	51.07	74.00	-22.93	Peak	Vertical
8	15720.00	39.07	54.00	-14.93	Average	Vertical

SISO_Chain 1_IIEEE 802.11a_Channel 149

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11490.00	62.08	74.00	-11.92	Peak	Horizontal
2	11490.00	42.08	54.00	-11.92	Average	Horizontal
3	17235.00	52.85	74.00	-21.15	Peak	Horizontal
4	17235.00	39.85	54.00	-14.15	Average	Horizontal
5	11490.00	60.71	74.00	-13.29	Peak	Vertical
6	11490.00	41.71	54.00	-12.29	Average	Vertical
7	17235.00	53.31	74.00	-20.69	Peak	Vertical
8	17235.00	40.31	54.00	-13.69	Average	Vertical

SISO_Chain 1_IIEEE 802.11a_Channel 157

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11570.00	60.95	74.00	-13.05	Peak	Horizontal
2	11570.00	43.95	54.00	-10.05	Average	Horizontal
3	17355.00	53.09	74.00	-20.91	Peak	Horizontal
4	17355.00	41.09	54.00	-12.91	Average	Horizontal
5	11570.00	57.80	74.00	-16.20	Peak	Vertical
6	11570.00	42.80	54.00	-11.20	Average	Vertical
7	17355.00	53.14	74.00	-20.86	Peak	Vertical
8	17355.00	41.14	54.00	-12.86	Average	Vertical

SISO_Chain 1_IIEEE 802.11a_Channel 165

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11650.00	61.92	74.00	-12.08	Peak	Horizontal
2	11650.00	42.92	54.00	-11.08	Average	Horizontal
3	17475.00	53.92	74.00	-20.08	Peak	Horizontal
4	17475.00	41.92	54.00	-12.08	Average	Horizontal
5	11650.00	59.92	74.00	-14.08	Peak	Vertical
6	11650.00	42.92	54.00	-11.08	Average	Vertical
7	17475.00	53.27	74.00	-20.73	Peak	Vertical
8	17475.00	41.27	54.00	-12.73	Average	Vertical

MIMO_Chain 0+1_ IEEE 802.11n-HT20_Channel 36

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10360.00	61.11	74.00	-12.89	Peak	Horizontal
2	10360.00	43.11	54.00	-10.89	Average	Horizontal
3	15540.00	51.43	74.00	-22.57	Peak	Horizontal
4	15540.00	38.43	54.00	-15.57	Average	Horizontal
5	10360.00	63.30	74.00	-10.70	Peak	Vertical
6	10360.00	43.30	54.00	-10.70	Average	Vertical
7	15540.00	50.80	74.00	-23.20	Peak	Vertical
8	15540.00	38.80	54.00	-15.20	Average	Vertical

MIMO_Chain 0+1_ IEEE 802.11n-HT20_Channel 44

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10440.00	64.15	74.00	-9.85	Peak	Horizontal
2	10440.00	47.15	54.00	-6.85	Average	Horizontal
3	15660.00	51.25	74.00	-22.75	Peak	Horizontal
4	15660.00	39.25	54.00	-14.75	Average	Horizontal
5	10440.00	65.90	74.00	-8.10	Peak	Vertical
6	10440.00	47.90	54.00	-6.10	Average	Vertical
7	15660.00	51.17	74.00	-22.83	Peak	Vertical
8	15660.00	39.17	54.00	-14.83	Average	Vertical

MIMO_Chain 0+1_ IEEE 802.11n-HT20_Channel 48

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10480.00	63.88	74.00	-10.12	Peak	Horizontal
2	10480.00	45.88	54.00	-8.12	Average	Horizontal
3	15720.00	51.68	74.00	-22.32	Peak	Horizontal
4	15720.00	39.68	54.00	-14.32	Average	Horizontal
5	10480.00	65.05	74.00	-8.95	Peak	Vertical
6	10480.00	47.05	54.00	-6.95	Average	Vertical
7	15720.00	51.40	74.00	-22.60	Peak	Vertical
8	15720.00	38.40	54.00	-15.60	Average	Vertical

MIMO_Chain 0+1_ IEEE 802.11n-HT20_Channel 149

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11490.00	59.91	74.00	-14.09	Peak	Horizontal
2	11490.00	40.91	54.00	-13.09	Average	Horizontal
3	17235.00	54.64	74.00	-19.36	Peak	Horizontal
4	17235.00	39.64	54.00	-14.36	Average	Horizontal
5	11490.00	59.90	74.00	-14.10	Peak	Vertical
6	11490.00	41.90	54.00	-12.10	Average	Vertical
7	17235.00	53.18	74.00	-20.82	Peak	Vertical
8	17235.00	39.18	54.00	-14.82	Average	Vertical

MIMO_Chain 0+1_ IEEE 802.11n-HT20_Channel 157

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11570.00	60.71	74.00	-13.29	Peak	Horizontal
2	11570.00	43.71	54.00	-10.29	Average	Horizontal
3	17355.00	54.07	74.00	-19.93	Peak	Horizontal
4	17355.00	41.07	54.00	-12.93	Average	Horizontal
5	11570.00	60.29	74.00	-13.71	Peak	Vertical
6	11570.00	44.29	54.00	-9.71	Average	Vertical
7	17355.00	53.49	74.00	-20.51	Peak	Vertical
8	17355.00	40.49	54.00	-13.51	Average	Vertical

MIMO_Chain 0+1_ IEEE 802.11n-HT20_Channel 165

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11650.00	58.67	74.00	-15.33	Peak	Horizontal
2	11650.00	41.67	54.00	-12.33	Average	Horizontal
3	17475.00	53.54	74.00	-20.46	Peak	Horizontal
4	17475.00	41.54	54.00	-12.46	Average	Horizontal
5	11650.00	59.82	74.00	-14.18	Peak	Vertical
6	11650.00	42.82	54.00	-11.18	Average	Vertical
7	17475.00	54.20	74.00	-19.80	Peak	Vertical
8	17475.00	41.20	54.00	-12.80	Average	Vertical

MIMO_Chain 0+1_ IEEE 802.11n-HT40_Channel 38

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10380.00	50.69	74.00	-23.31	Peak	Horizontal
2	10380.00	38.69	54.00	-15.31	Average	Horizontal
3	15570.00	50.17	74.00	-23.83	Peak	Horizontal
4	15570.00	39.17	54.00	-14.83	Average	Horizontal
5	10380.00	51.68	74.00	-22.32	Peak	Vertical
6	10380.00	38.68	54.00	-15.32	Average	Vertical
7	15570.00	50.80	74.00	-23.20	Peak	Vertical
8	15570.00	38.80	54.00	-15.20	Average	Vertical

MIMO_Chain 0+1_ IEEE 802.11n-HT40_Channel 46

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10460.00	61.30	74.00	-12.70	Peak	Horizontal
2	10460.00	45.30	54.00	-8.70	Average	Horizontal
3	15690.00	51.45	74.00	-22.55	Peak	Horizontal
4	15690.00	39.45	54.00	-14.55	Average	Horizontal
5	10460.00	61.19	74.00	-12.81	Peak	Vertical
6	10460.00	45.19	54.00	-8.81	Average	Vertical
7	15690.00	50.63	74.00	-23.37	Peak	Vertical
8	15690.00	39.63	54.00	-14.37	Average	Vertical

MIMO_Chain 0+1_ IEEE 802.11n-HT40_Channel 151

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11510.00	55.38	74.00	-18.62	Peak	Horizontal
2	11510.00	43.38	54.00	-10.62	Average	Horizontal
3	17265.00	52.60	74.00	-21.40	Peak	Horizontal
4	17265.00	39.60	54.00	-14.40	Average	Horizontal
5	11510.00	57.06	74.00	-16.94	Peak	Vertical
6	11510.00	44.06	54.00	-9.94	Average	Vertical
7	17265.00	53.96	74.00	-20.04	Peak	Vertical
8	17265.00	39.96	54.00	-14.04	Average	Vertical

MIMO_Chain 0+1_ IEEE 802.11n-HT40_Channel 159

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Detector
1	11590.00	55.72	74.00	-18.28	Peak	Horizontal
2	11590.00	41.72	54.00	-12.28	Average	Horizontal
3	17385.00	53.23	74.00	-20.77	Peak	Horizontal
4	17385.00	41.23	54.00	-12.77	Average	Horizontal
5	11590.00	57.19	74.00	-16.81	Peak	Vertical
6	11590.00	43.19	54.00	-10.81	Average	Vertical
7	17385.00	53.82	74.00	-20.18	Peak	Vertical
8	17385.00	40.82	54.00	-13.18	Average	Vertical

MIMO_Chain 0+1_ IEEE 802.11ac-VHT20_Channel 36

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10360.00	62.44	74.00	-11.56	Peak	Horizontal
2	10360.00	43.44	54.00	-10.56	Average	Horizontal
3	15540.00	50.88	74.00	-23.12	Peak	Horizontal
4	15540.00	38.88	54.00	-15.12	Average	Horizontal
5	10360.00	61.66	74.00	-12.34	Peak	Vertical
6	10360.00	42.66	54.00	-11.34	Average	Vertical
7	15540.00	50.76	74.00	-23.24	Peak	Vertical
8	15540.00	38.76	54.00	-15.24	Average	Vertical

MIMO_Chain 0+1_ IEEE 802.11ac-VHT20_Channel 44

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10440.00	64.46	74.00	-9.54	Peak	Horizontal
2	10440.00	46.46	54.00	-7.54	Average	Horizontal
3	15660.00	51.05	74.00	-22.95	Peak	Horizontal
4	15660.00	39.05	54.00	-14.95	Average	Horizontal
5	10440.00	67.12	74.00	-6.88	Peak	Vertical
6	10440.00	49.12	54.00	-4.88	Average	Vertical
7	15660.00	51.45	74.00	-22.55	Peak	Vertical
8	15660.00	38.45	54.00	-15.55	Average	Vertical

MIMO_Chain 0+1_ IEEE 802.11ac-VHT20_Channel 48

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10480.00	65.74	74.00	-8.26	Peak	Horizontal
2	10480.00	46.74	54.00	-7.26	Average	Horizontal
3	15720.00	52.44	74.00	-21.56	Peak	Horizontal
4	15720.00	39.44	54.00	-14.56	Average	Horizontal
5	10480.00	66.33	74.00	-7.67	Peak	Vertical
6	10480.00	47.33	54.00	-6.67	Average	Vertical
7	15720.00	51.84	74.00	-22.16	Peak	Vertical
8	15720.00	38.84	54.00	-15.16	Average	Vertical

MIMO_Chain 0+1_ IEEE 802.11ac-VHT20_Channel 149

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11490.00	59.50	74.00	-14.50	Peak	Horizontal
2	11490.00	41.50	54.00	-12.50	Average	Horizontal
3	17235.00	52.56	74.00	-21.44	Peak	Horizontal
4	17235.00	39.56	54.00	-14.44	Average	Horizontal
5	11490.00	61.23	74.00	-12.77	Peak	Vertical
6	11490.00	42.23	54.00	-11.77	Average	Vertical
7	17235.00	52.51	74.00	-21.49	Peak	Vertical
8	17235.00	39.51	54.00	-14.49	Average	Vertical

MIMO_Chain 0+1_ IEEE 802.11ac-VHT20_Channel 157

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11570.00	59.68	74.00	-14.32	Peak	Horizontal
2	11570.00	43.68	54.00	-10.32	Average	Horizontal
3	17355.00	53.09	74.00	-20.91	Peak	Horizontal
4	17355.00	41.09	54.00	-12.91	Average	Horizontal
5	11570.00	60.83	74.00	-13.17	Peak	Vertical
6	11570.00	44.83	54.00	-9.17	Average	Vertical
7	17355.00	53.23	74.00	-20.77	Peak	Vertical
8	17355.00	40.23	54.00	-13.77	Average	Vertical

MIMO_Chain 0+1_ IEEE 802.11ac-VHT20_Channel 165

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11650.00	61.01	74.00	-12.99	Peak	Horizontal
2	11650.00	42.01	54.00	-11.99	Average	Horizontal
3	17475.00	53.92	74.00	-20.08	Peak	Horizontal
4	17475.00	41.92	54.00	-12.08	Average	Horizontal
5	11650.00	59.87	74.00	-14.13	Peak	Vertical
6	11650.00	42.87	54.00	-11.13	Average	Vertical
7	17475.00	53.96	74.00	-20.04	Peak	Vertical
8	17475.00	41.96	54.00	-12.04	Average	Vertical

MIMO_Chain 0+1_ IEEE 802.11ac-VHT40_Channel 38

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10380.00	51.49	74.00	-22.51	Peak	Horizontal
2	10380.00	38.49	54.00	-15.51	Average	Horizontal
3	15570.00	51.00	74.00	-23.00	Peak	Horizontal
4	15570.00	39.00	54.00	-15.00	Average	Horizontal
5	10380.00	52.64	74.00	-21.36	Peak	Vertical
6	10380.00	38.64	54.00	-15.36	Average	Vertical
7	15570.00	50.42	74.00	-23.58	Peak	Vertical
8	15570.00	38.42	54.00	-15.58	Average	Vertical

MIMO_Chain 0+1_ IEEE 802.11ac-VHT40_Channel 46

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10460.00	58.17	74.00	-15.83	Peak	Horizontal
2	10460.00	43.17	54.00	-10.83	Average	Horizontal
3	15690.00	51.01	74.00	-22.99	Peak	Horizontal
4	15690.00	40.01	54.00	-13.99	Average	Horizontal
5	10460.00	61.21	74.00	-12.79	Peak	Vertical
6	10460.00	45.21	54.00	-8.79	Average	Vertical
7	15690.00	51.33	74.00	-22.67	Peak	Vertical
8	15690.00	39.33	54.00	-14.67	Average	Vertical

MIMO_Chain 0+1_ IEEE 802.11ac-VHT40_Channel 151

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11510.00	55.32	74.00	-18.68	Peak	Horizontal
2	11510.00	43.32	54.00	-10.68	Average	Horizontal
3	17265.00	53.31	74.00	-20.69	Peak	Horizontal
4	17265.00	39.31	54.00	-14.69	Average	Horizontal
5	11510.00	57.28	74.00	-16.72	Peak	Vertical
6	11510.00	44.28	54.00	-9.72	Average	Vertical
7	17265.00	52.79	74.00	-21.21	Peak	Vertical
8	17265.00	39.79	54.00	-14.21	Average	Vertical

MIMO_Chain 0+1_ IEEE 802.11ac-VHT40_Channel 159

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Detector
1	11590.00	54.75	74.00	-19.25	Peak	Horizontal
2	11590.00	41.75	54.00	-12.25	Average	Horizontal
3	17385.00	53.36	74.00	-20.64	Peak	Horizontal
4	17385.00	41.36	54.00	-12.64	Average	Horizontal
5	11590.00	57.00	74.00	-17.00	Peak	Vertical
6	11590.00	43.00	54.00	-11.00	Average	Vertical
7	17385.00	53.74	74.00	-20.26	Peak	Vertical
8	17385.00	40.74	54.00	-13.26	Average	Vertical

MIMO_Chain 0+1_IIEEE 802.11ac-VHT80_Channel 42

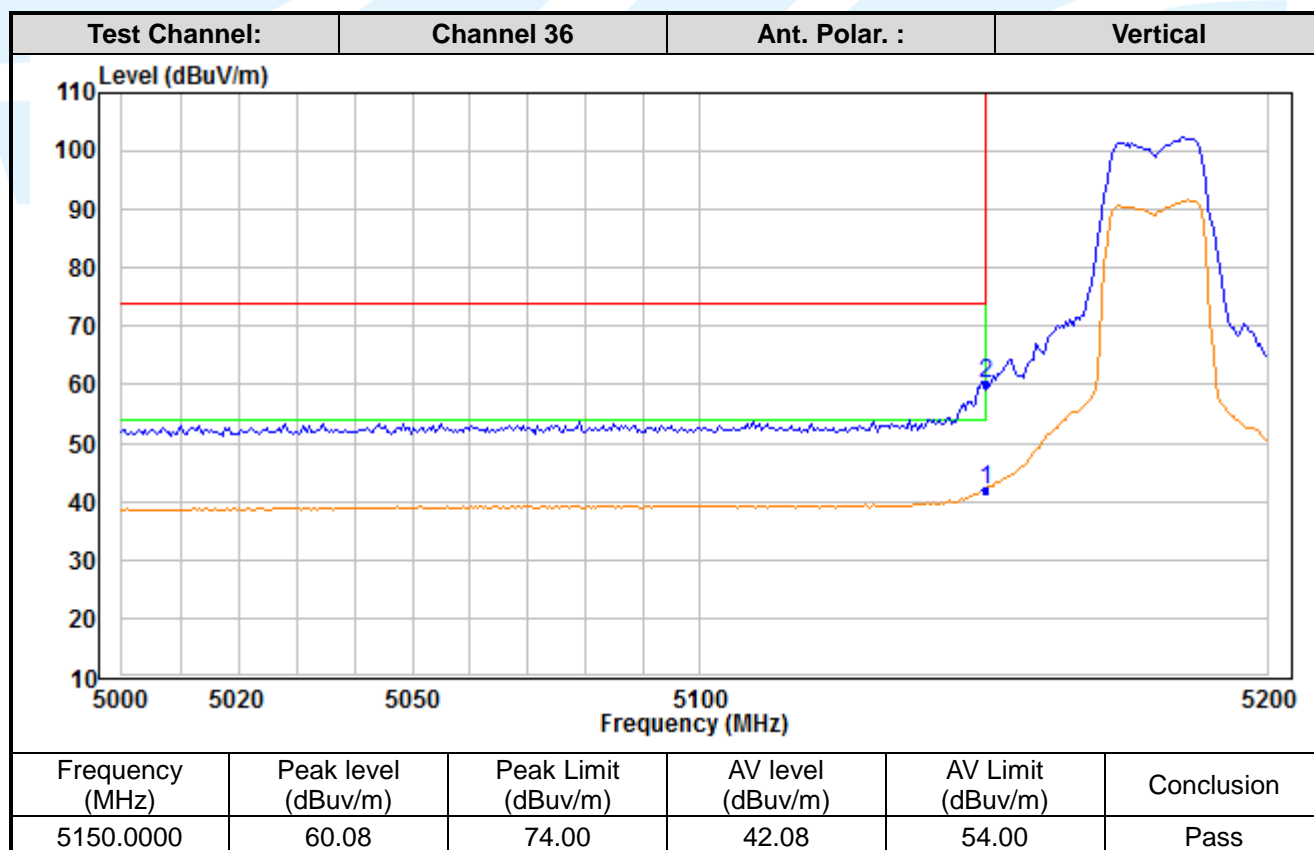
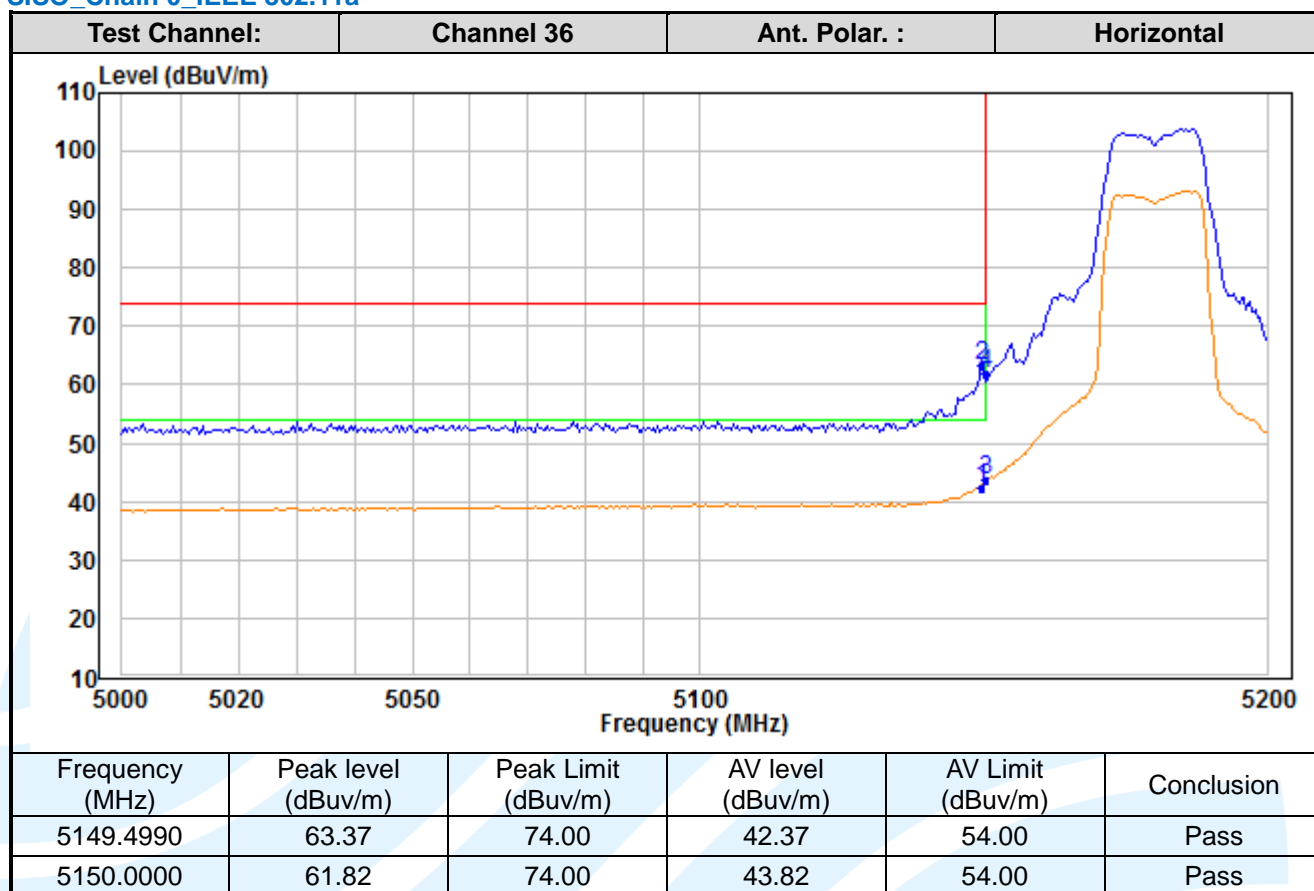
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2	10420.00	38.82	54.00	-15.18	Average	Horizontal
3	15630.00	51.65	74.00	-22.35	Peak	Horizontal
4	15630.00	38.65	54.00	-15.35	Average	Horizontal
5	10420.00	51.95	74.00	-22.05	Peak	Vertical
6	10420.00	38.95	54.00	-15.05	Average	Vertical
7	15630.00	50.72	74.00	-23.28	Peak	Vertical
8	15630.00	38.72	54.00	-15.28	Average	Vertical

MIMO_Chain 0+1_IIEEE 802.11ac-VHT80_Channel 155

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11550.00	54.75	74.00	-19.25	Peak	Horizontal
2	11550.00	40.75	54.00	-13.25	Average	Horizontal
3	17325.00	52.65	74.00	-21.35	Peak	Horizontal
4	17325.00	39.65	54.00	-14.35	Average	Horizontal
5	11550.00	54.94	74.00	-19.06	Peak	Vertical
6	11550.00	42.94	54.00	-11.06	Average	Vertical
7	17325.00	53.48	74.00	-20.52	Peak	Vertical
8	17325.00	40.48	54.00	-13.52	Average	Vertical

Band Edge Measurements (Radiated)

SISO_Chain 0_IEEE 802.11a



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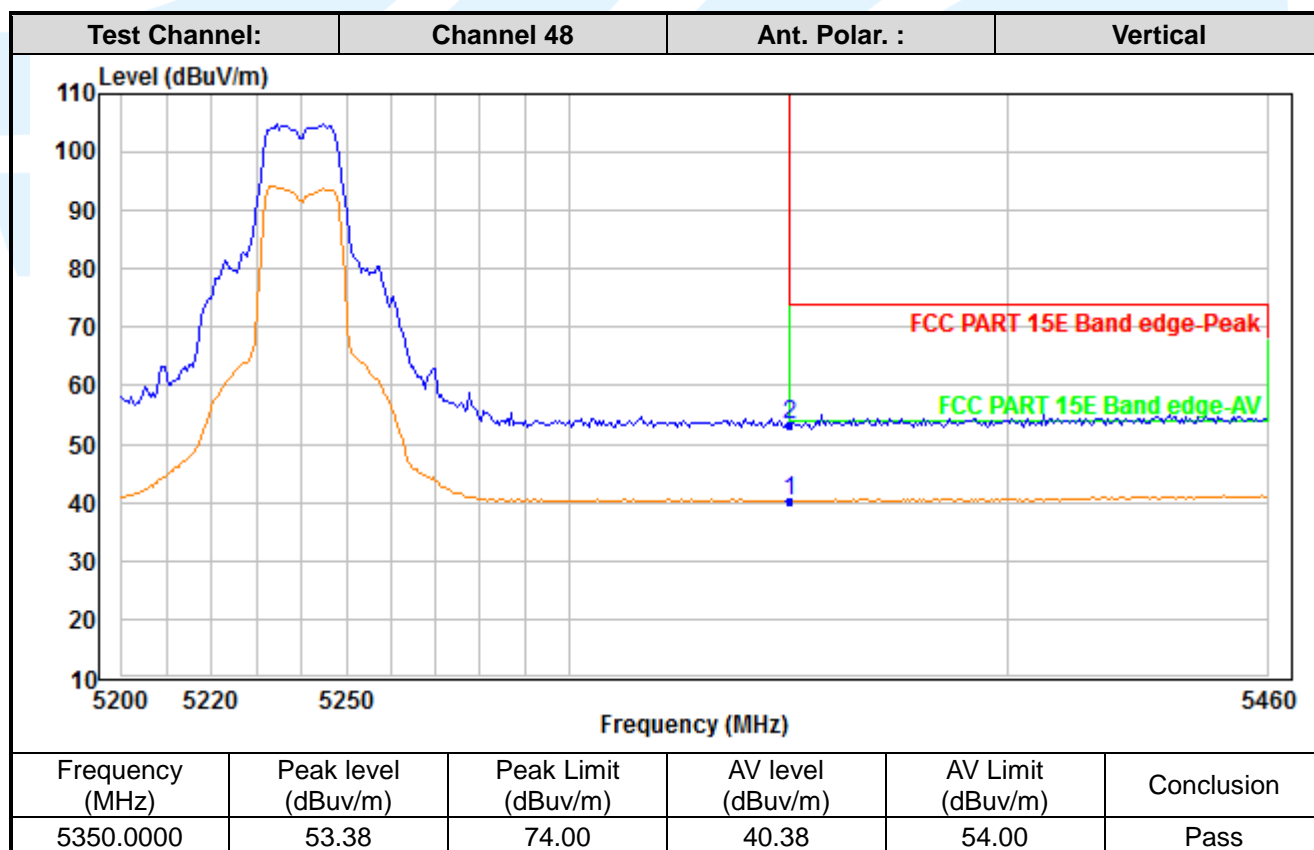
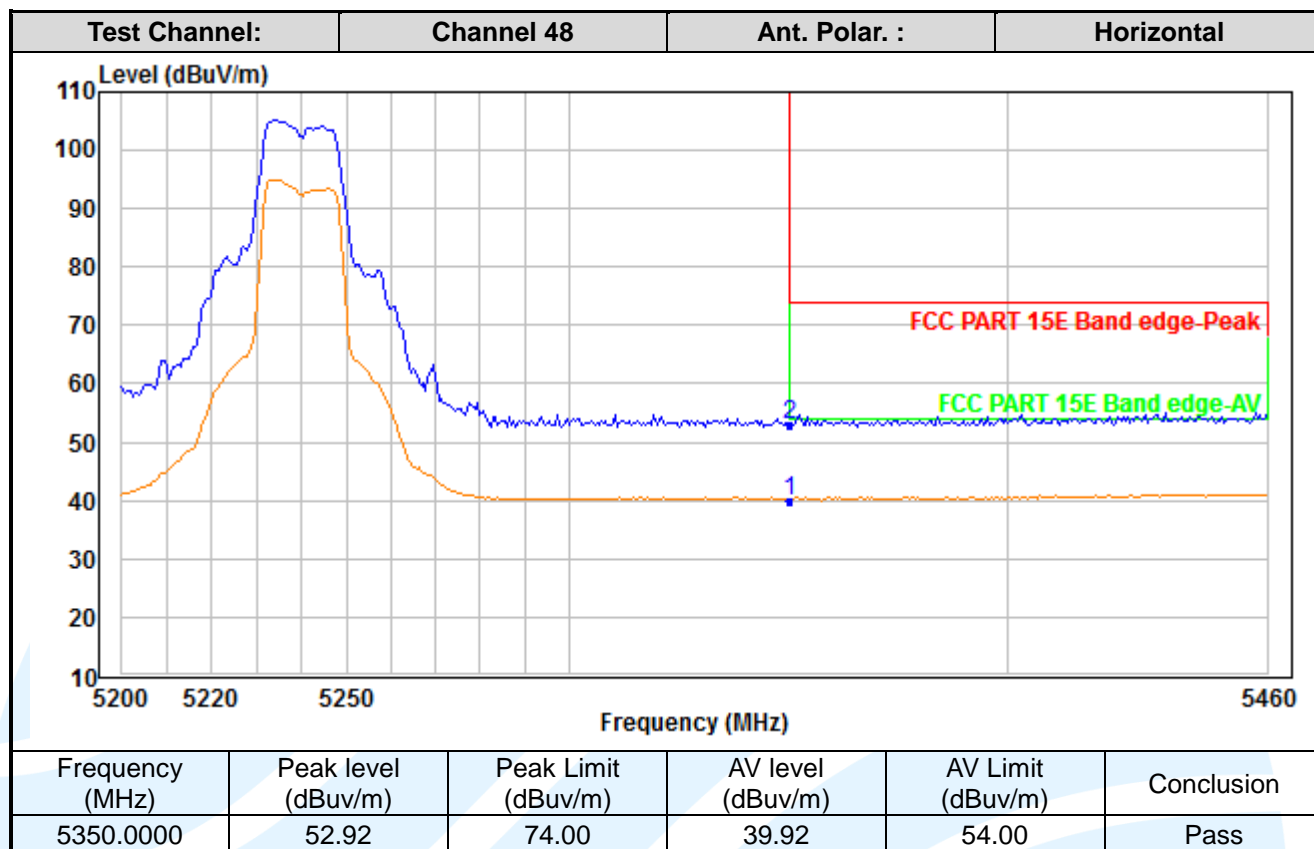
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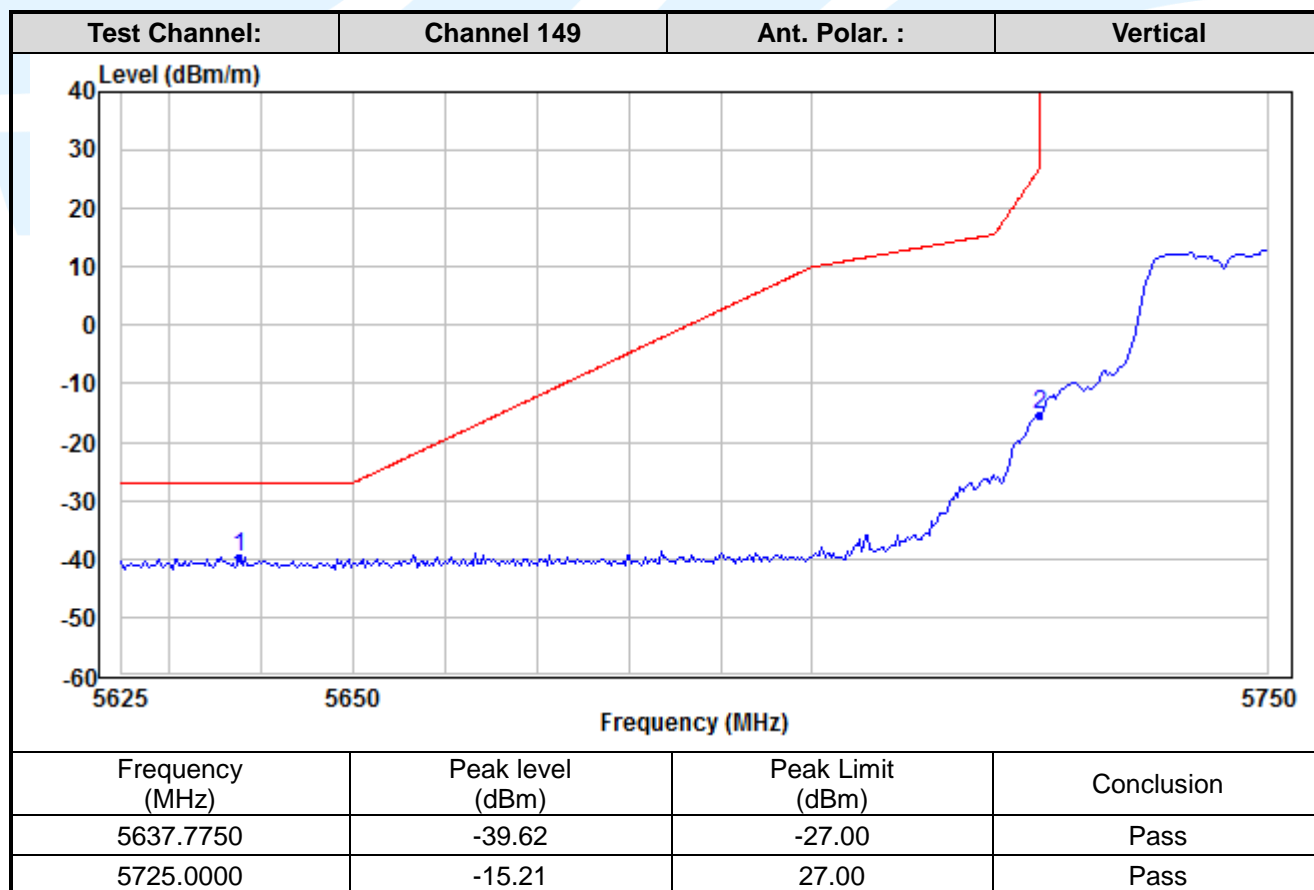
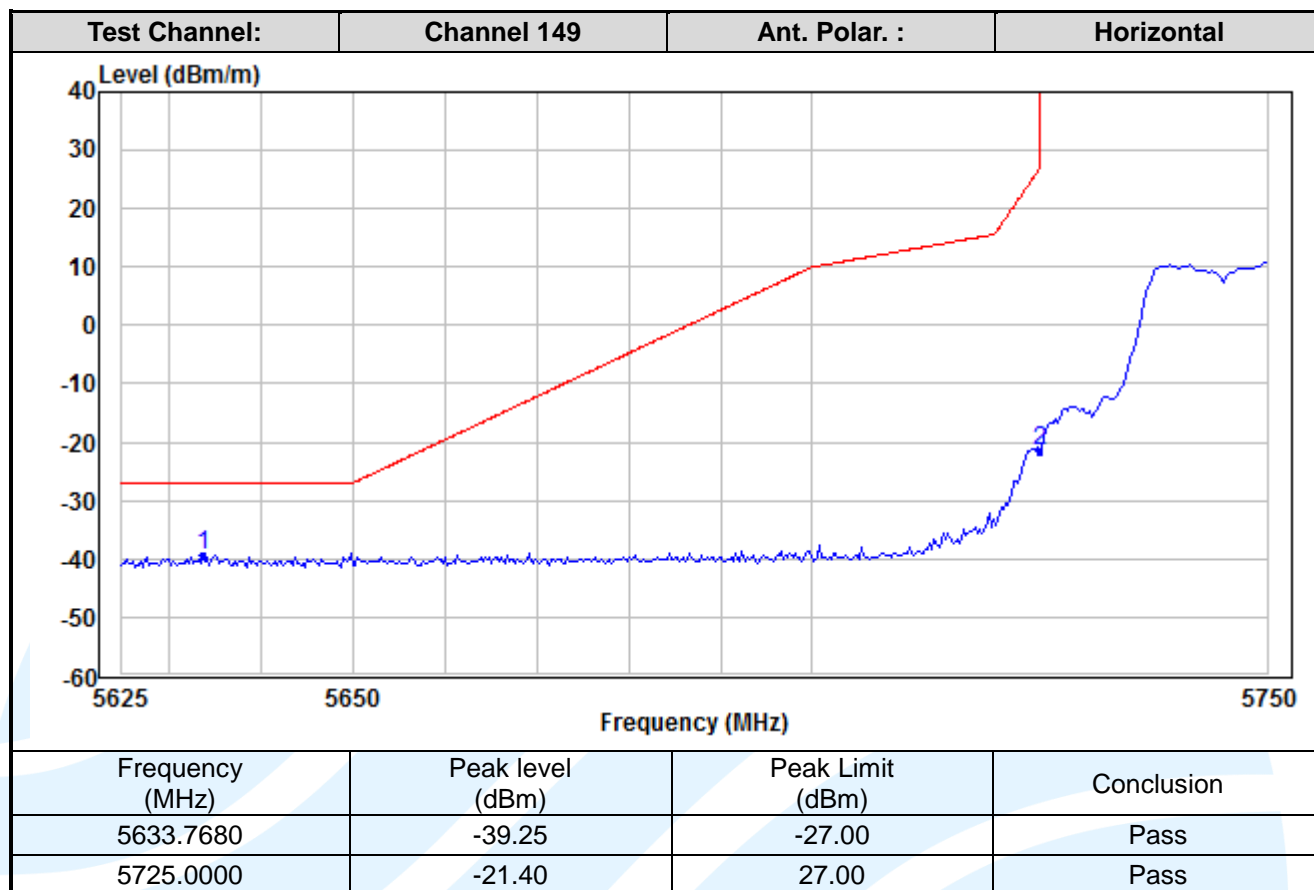
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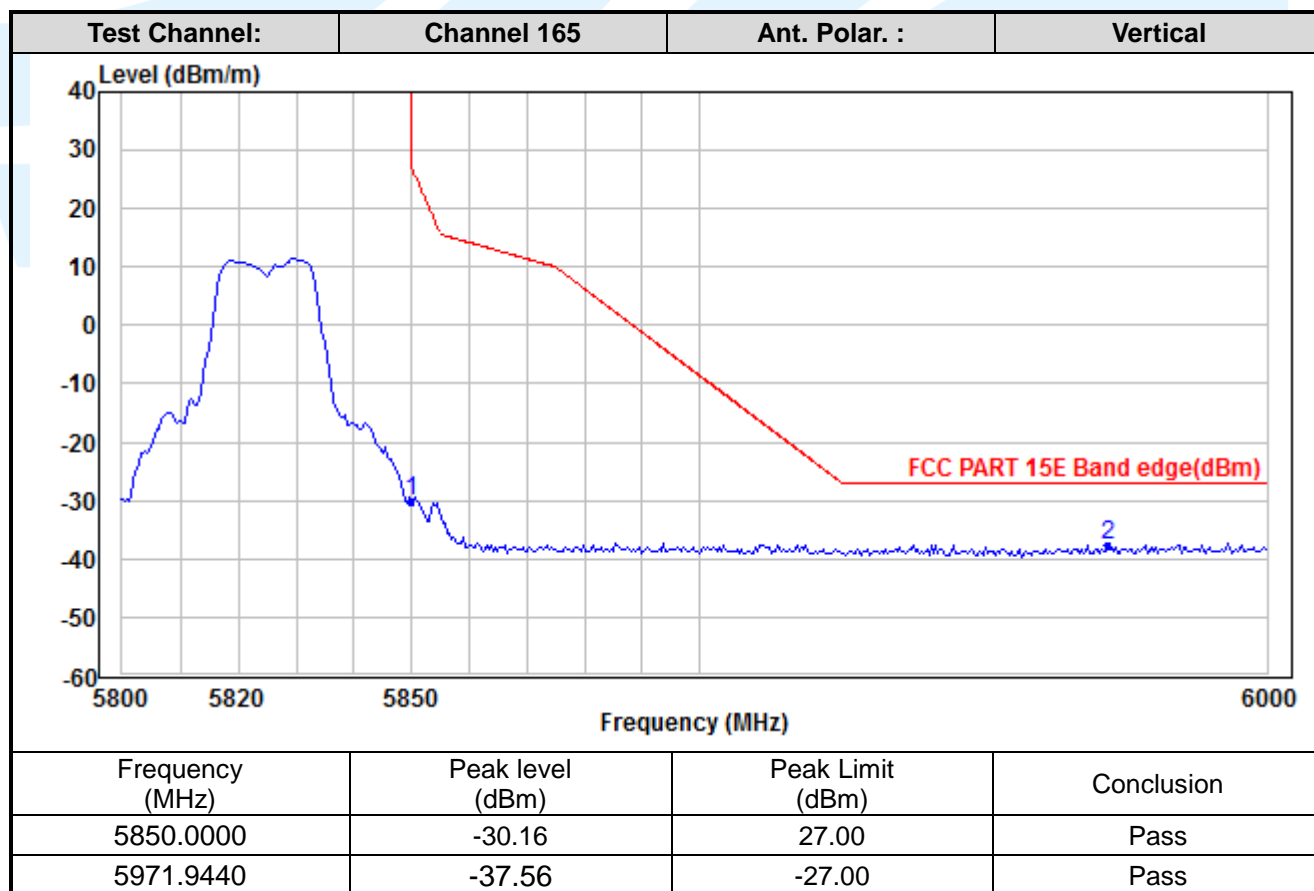
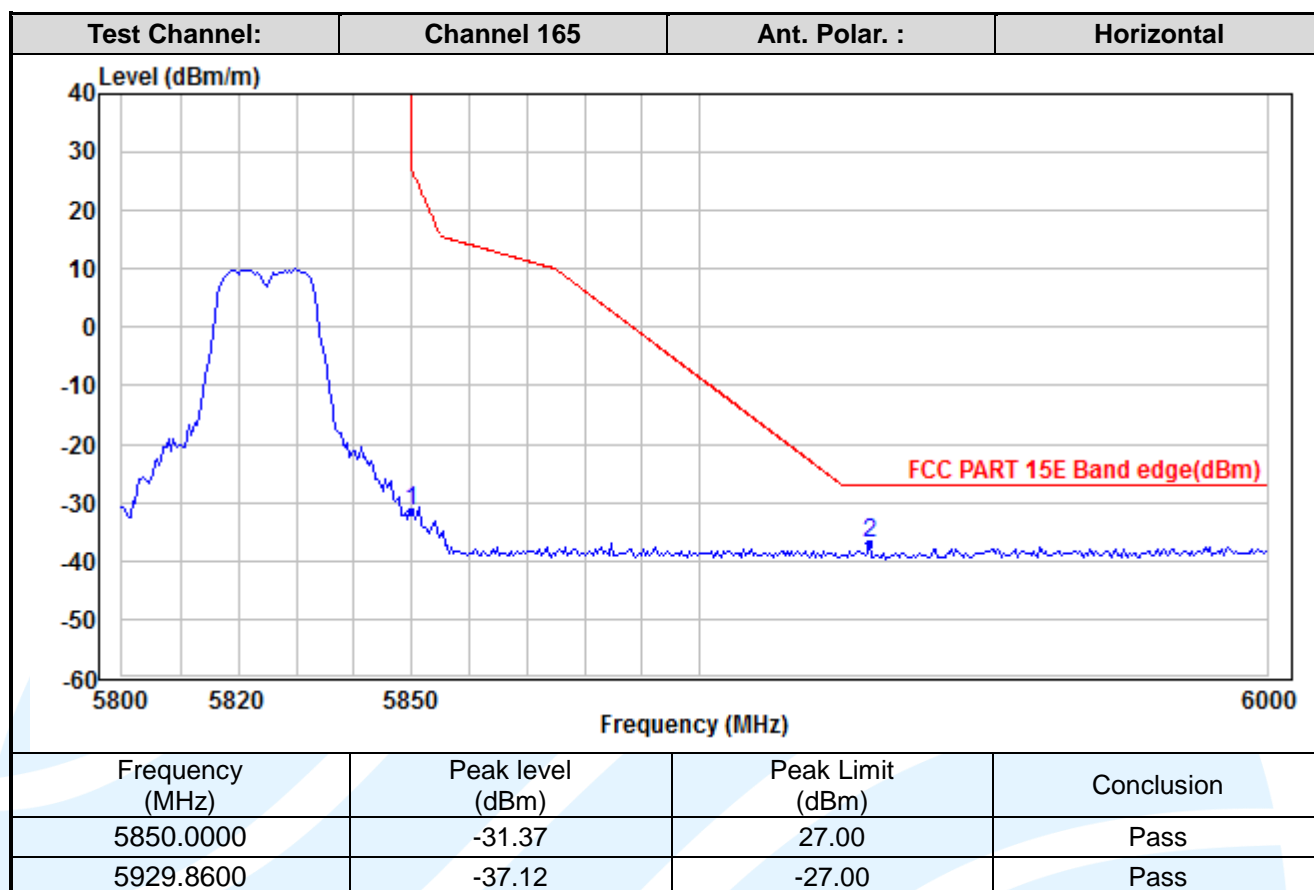
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E-mail: info@uttlab.com

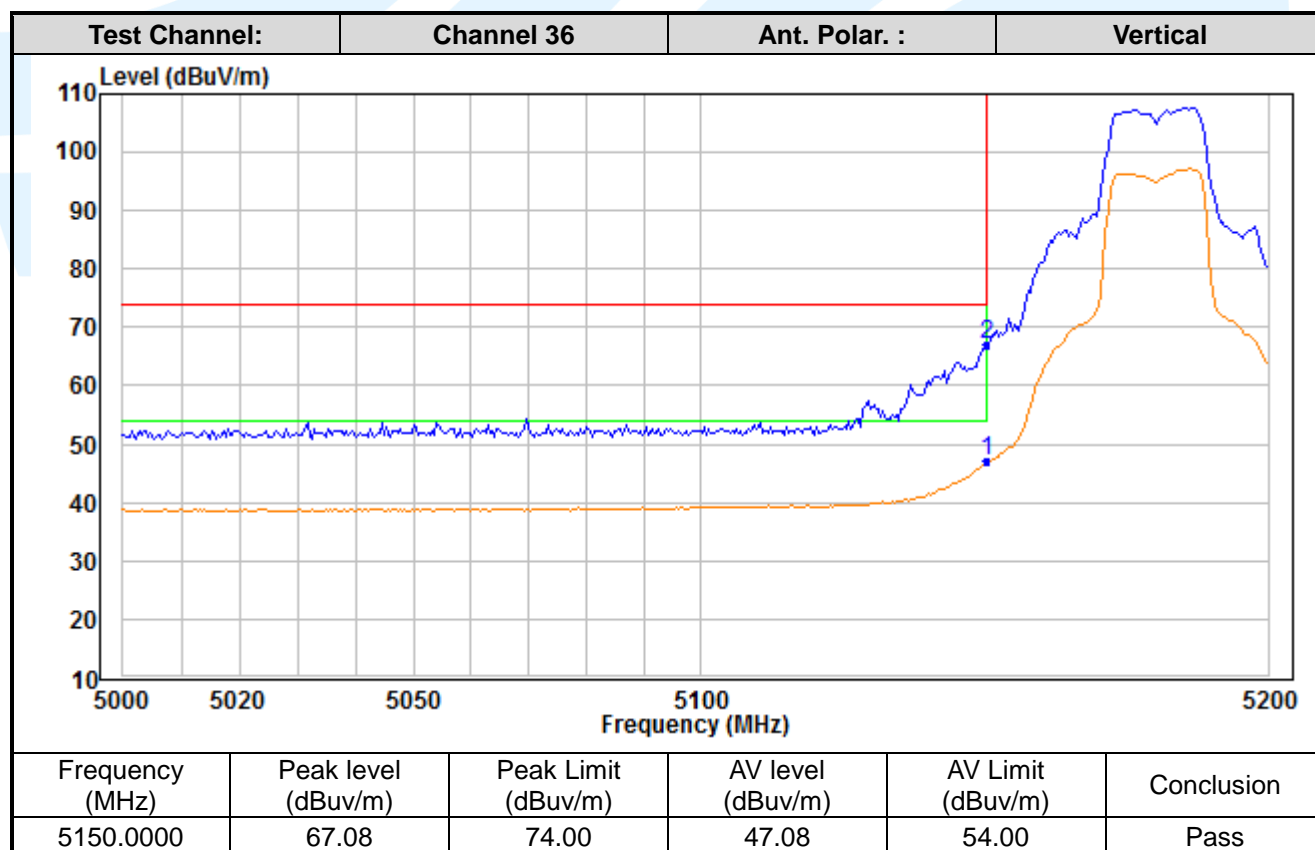
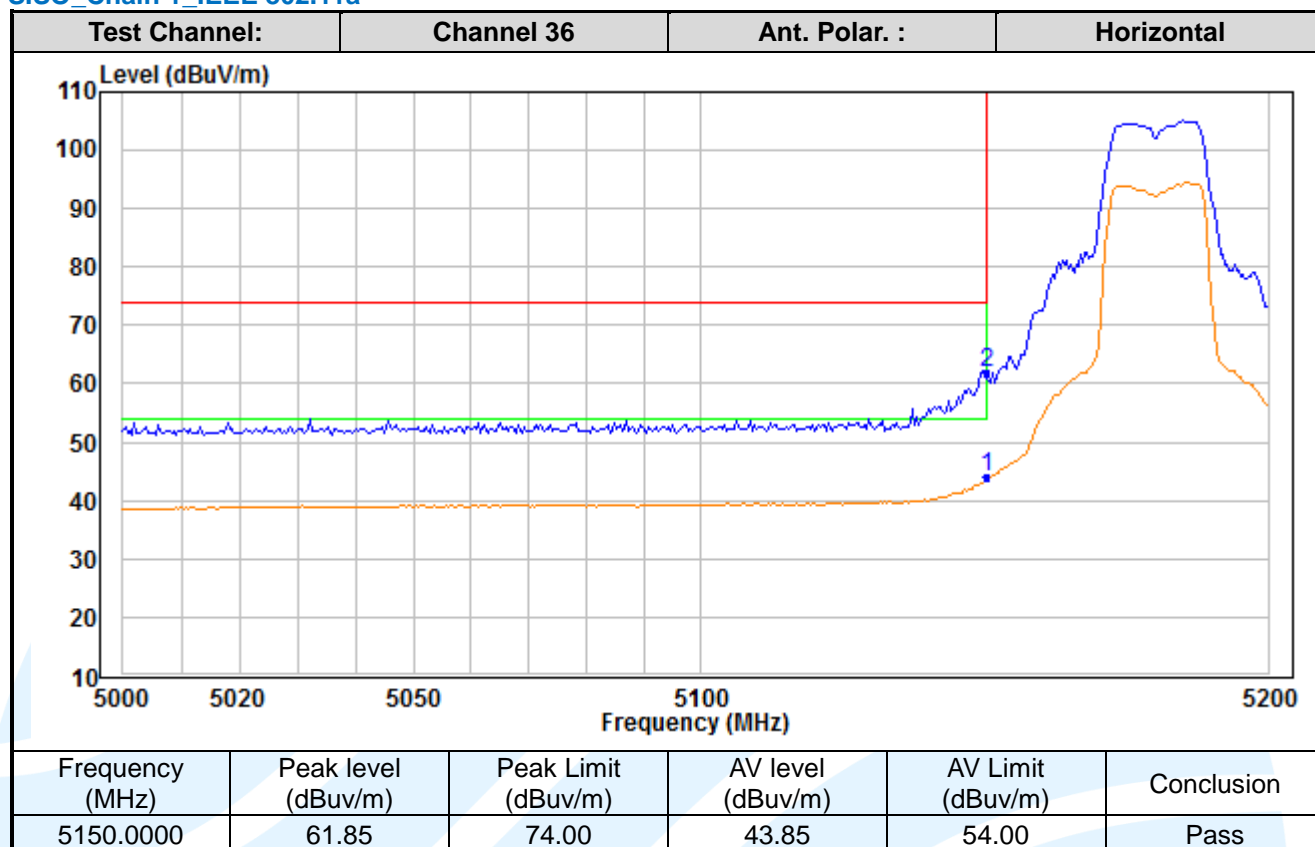
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SISO_Chain 1_JEE8 802.11a



Shenzhen UnionTrust Quality and Technology Co., Ltd.

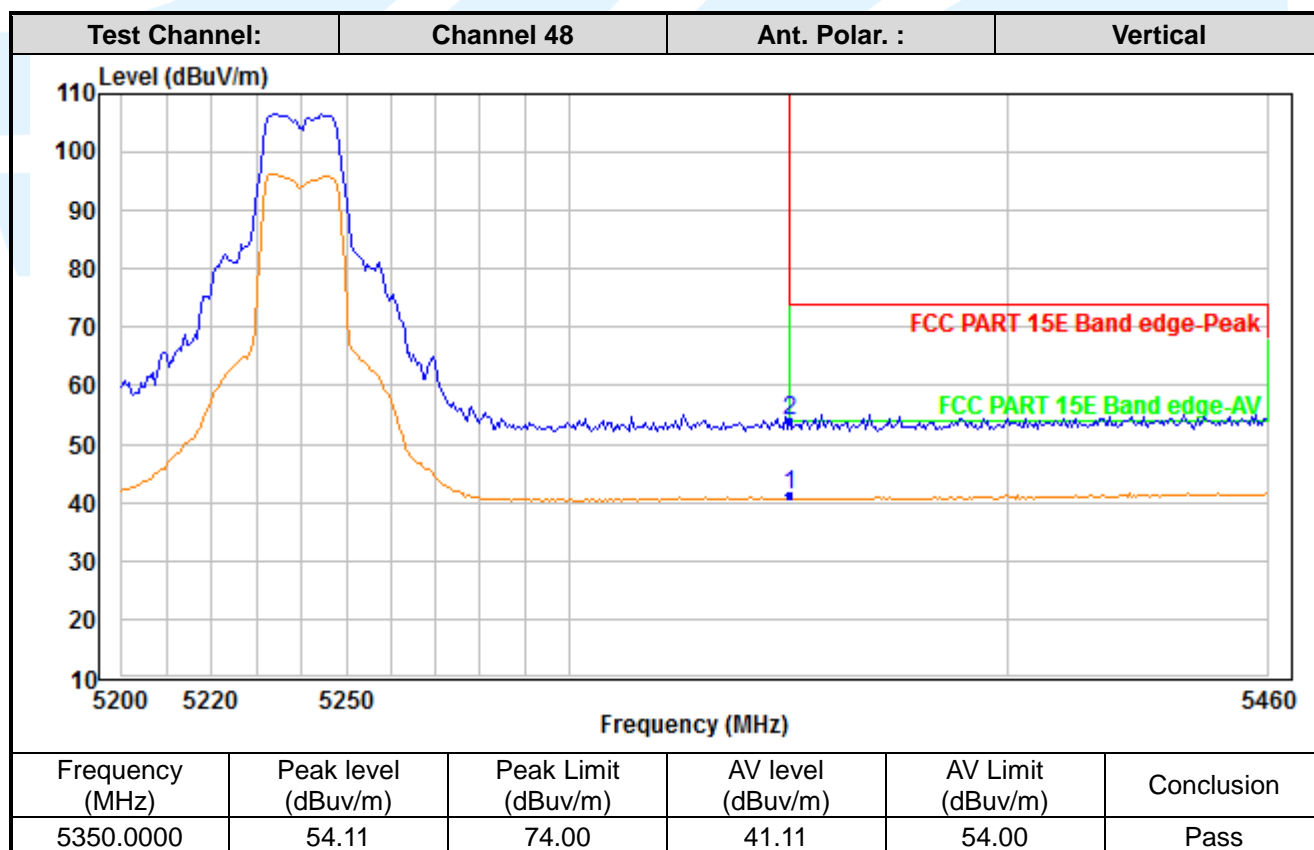
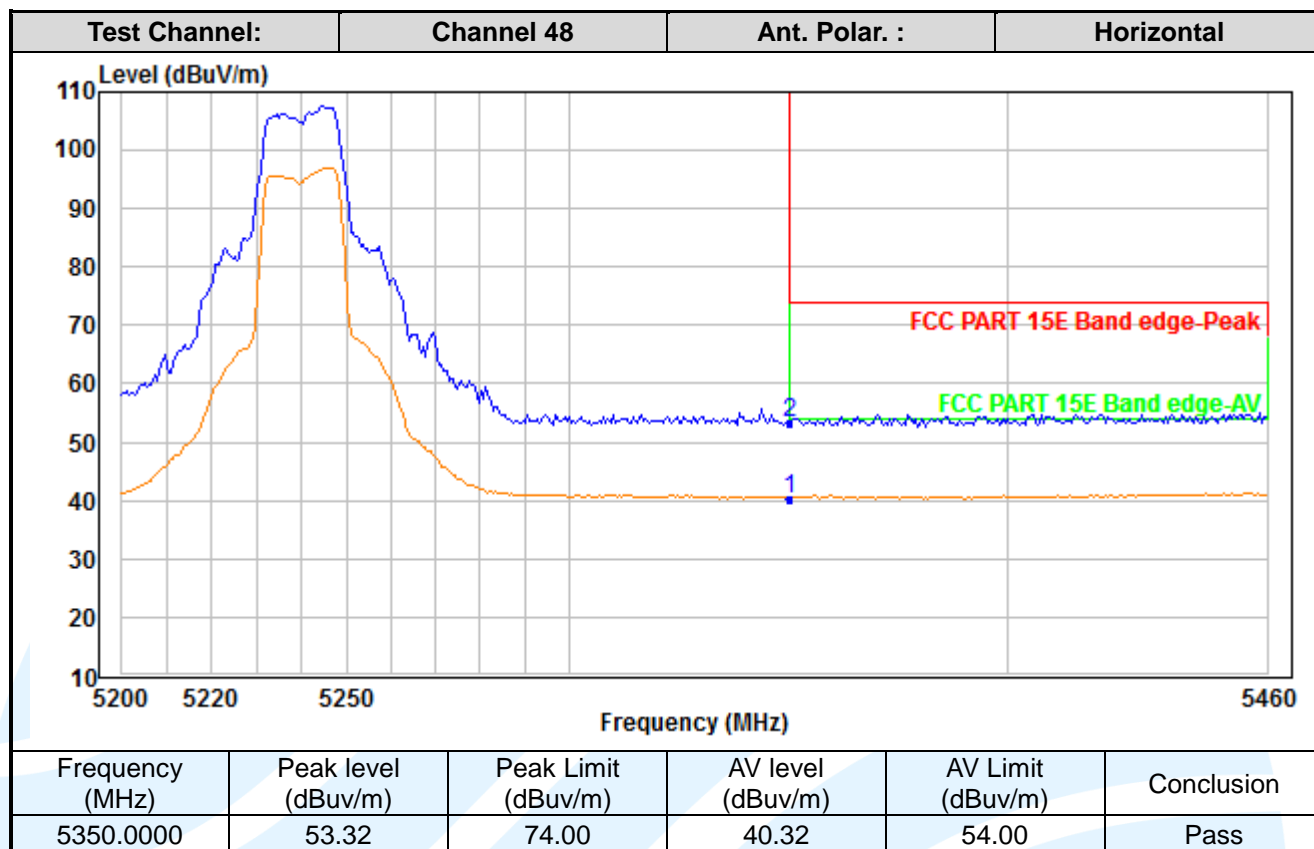
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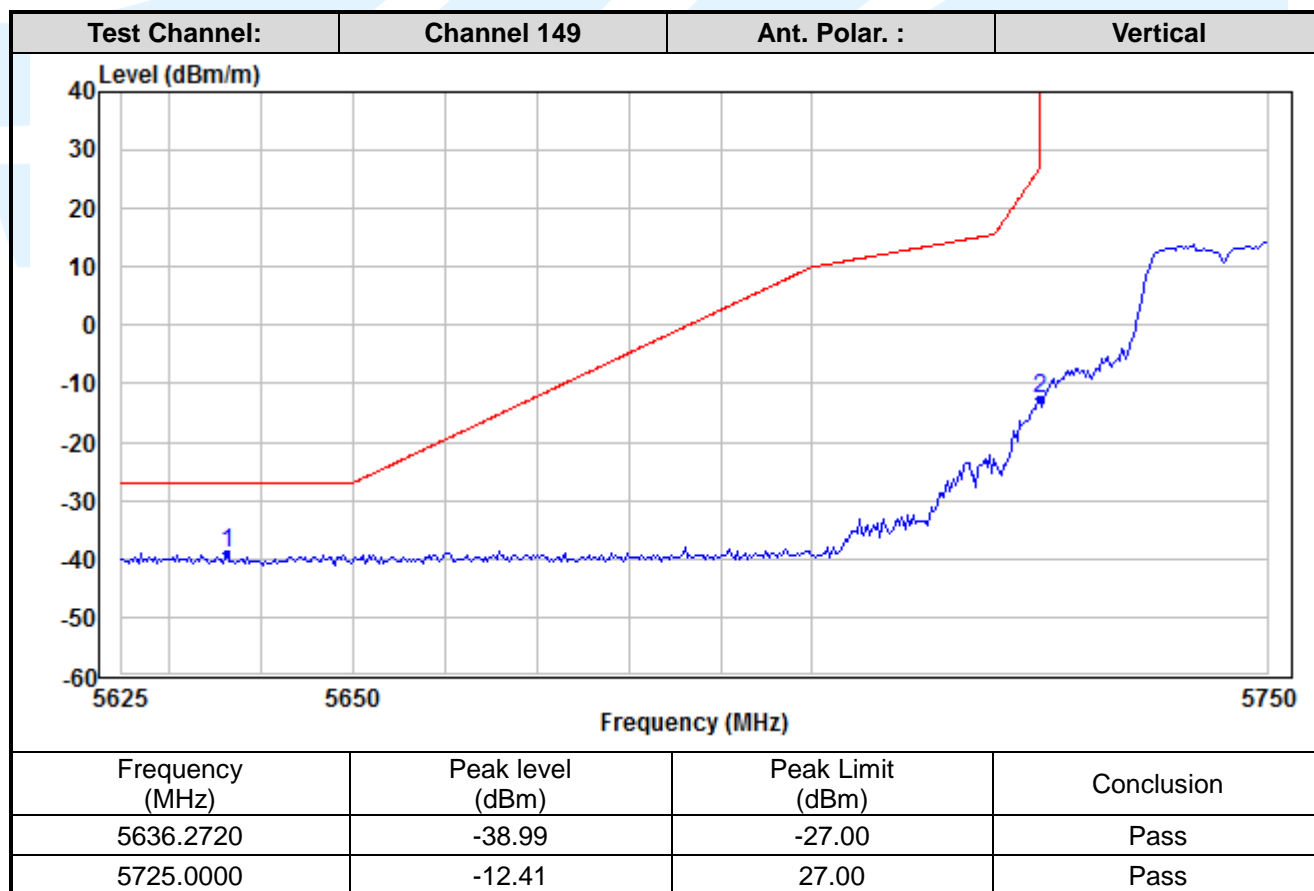
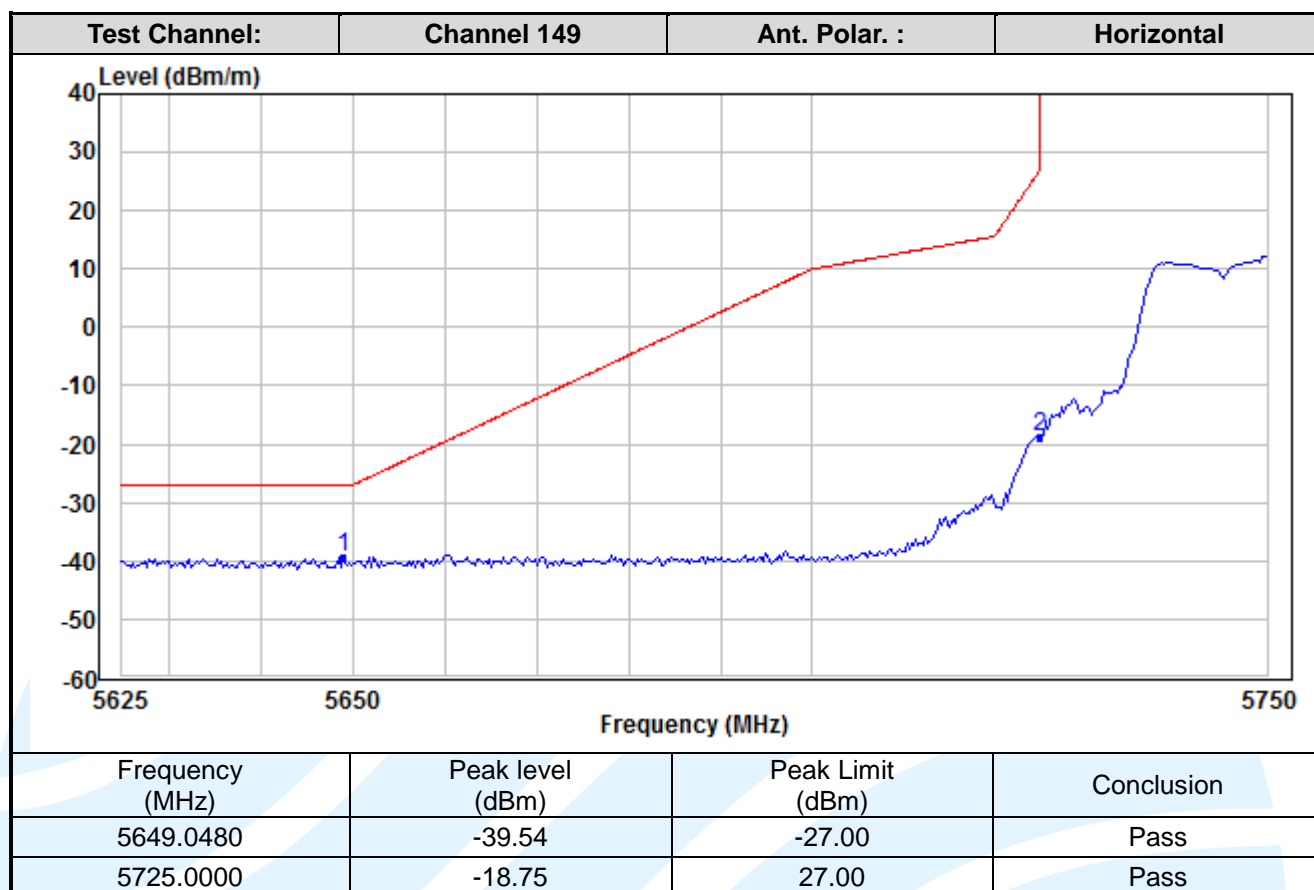
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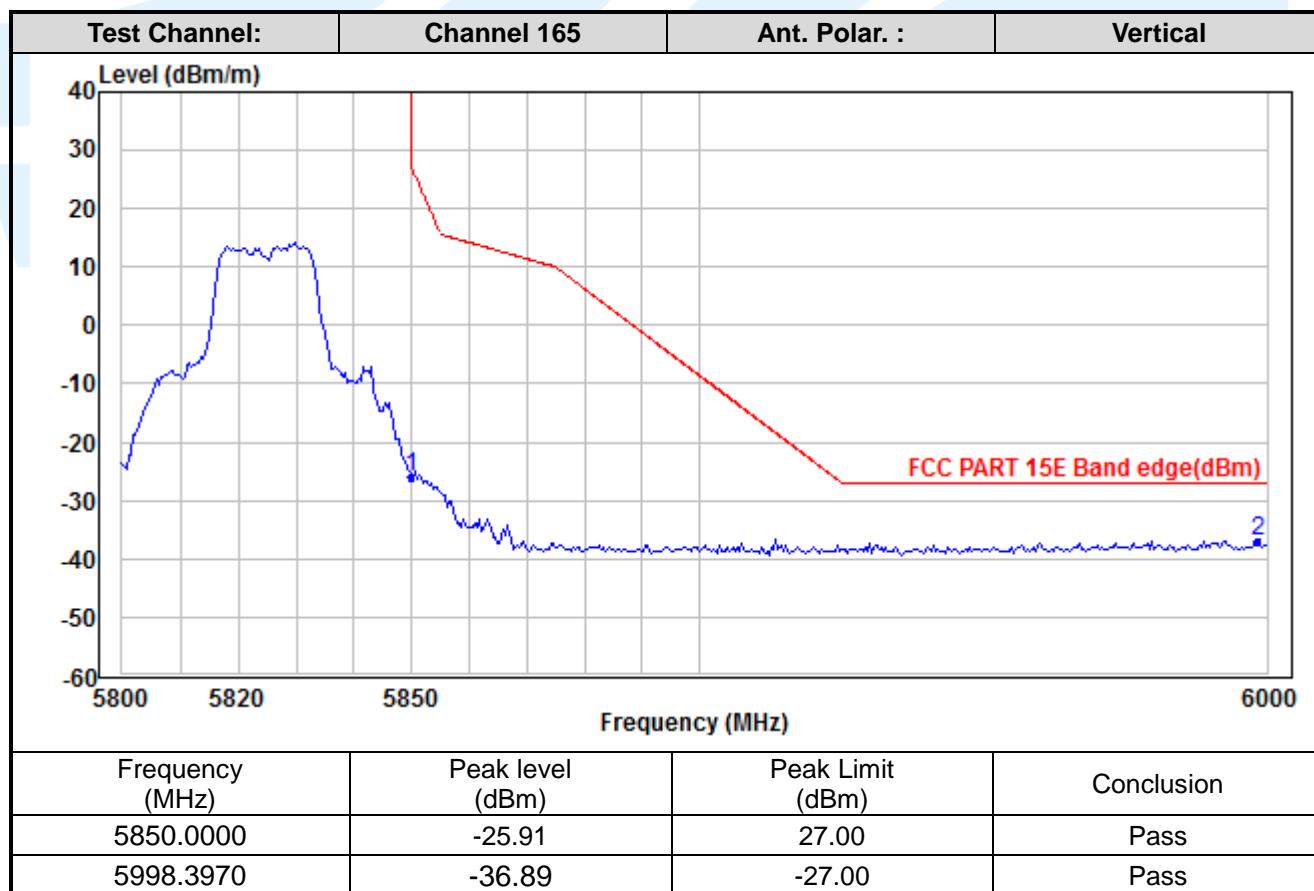
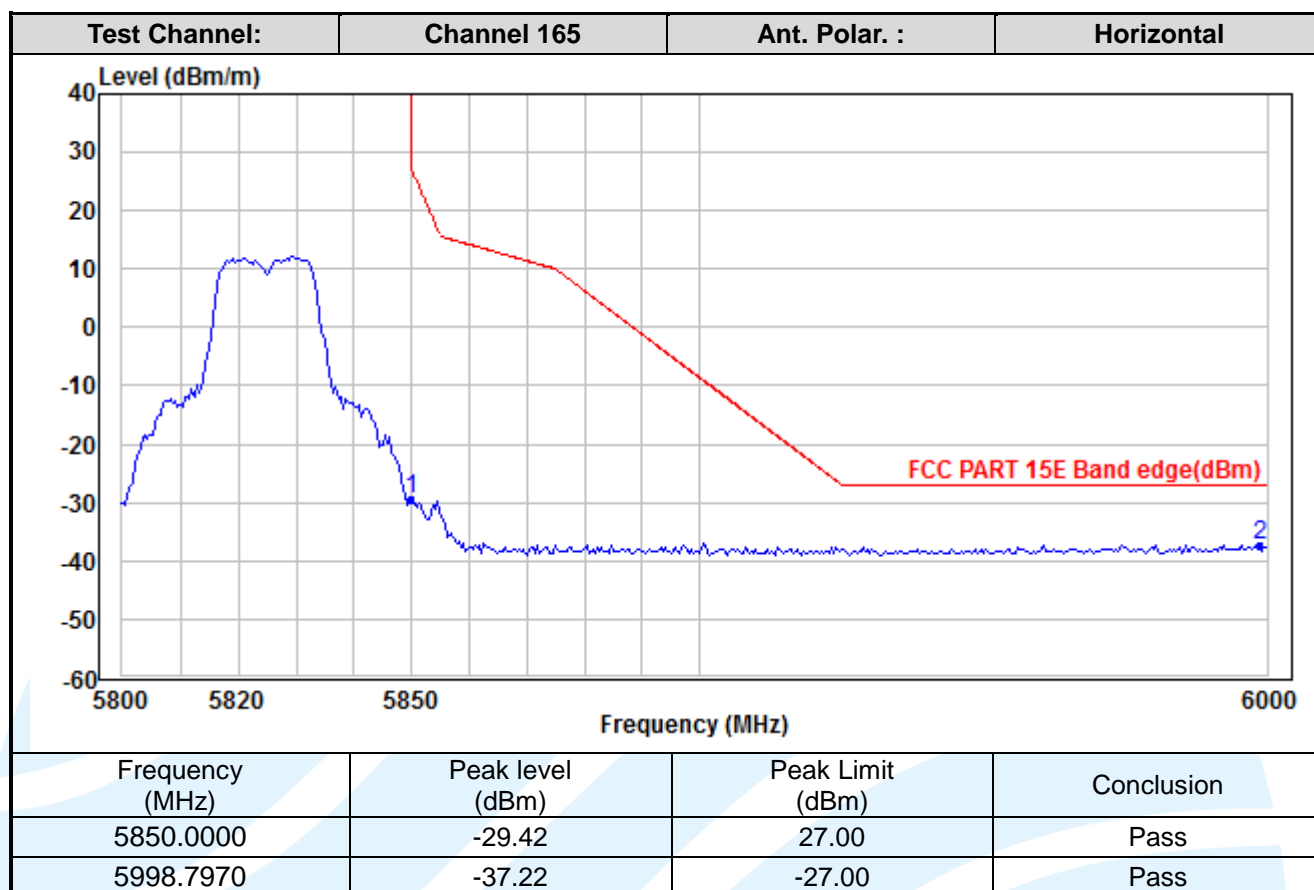
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E-mail: info@uttlab.com

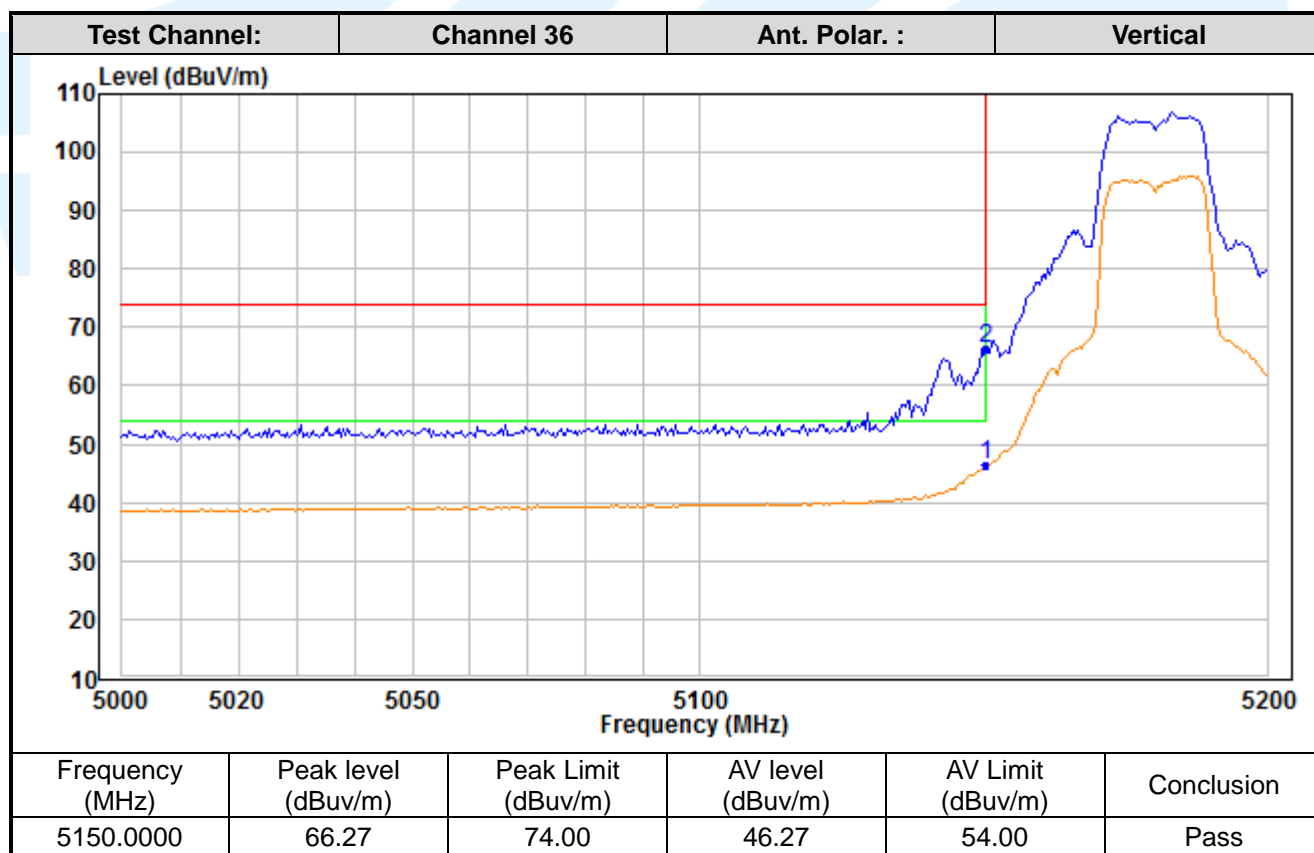
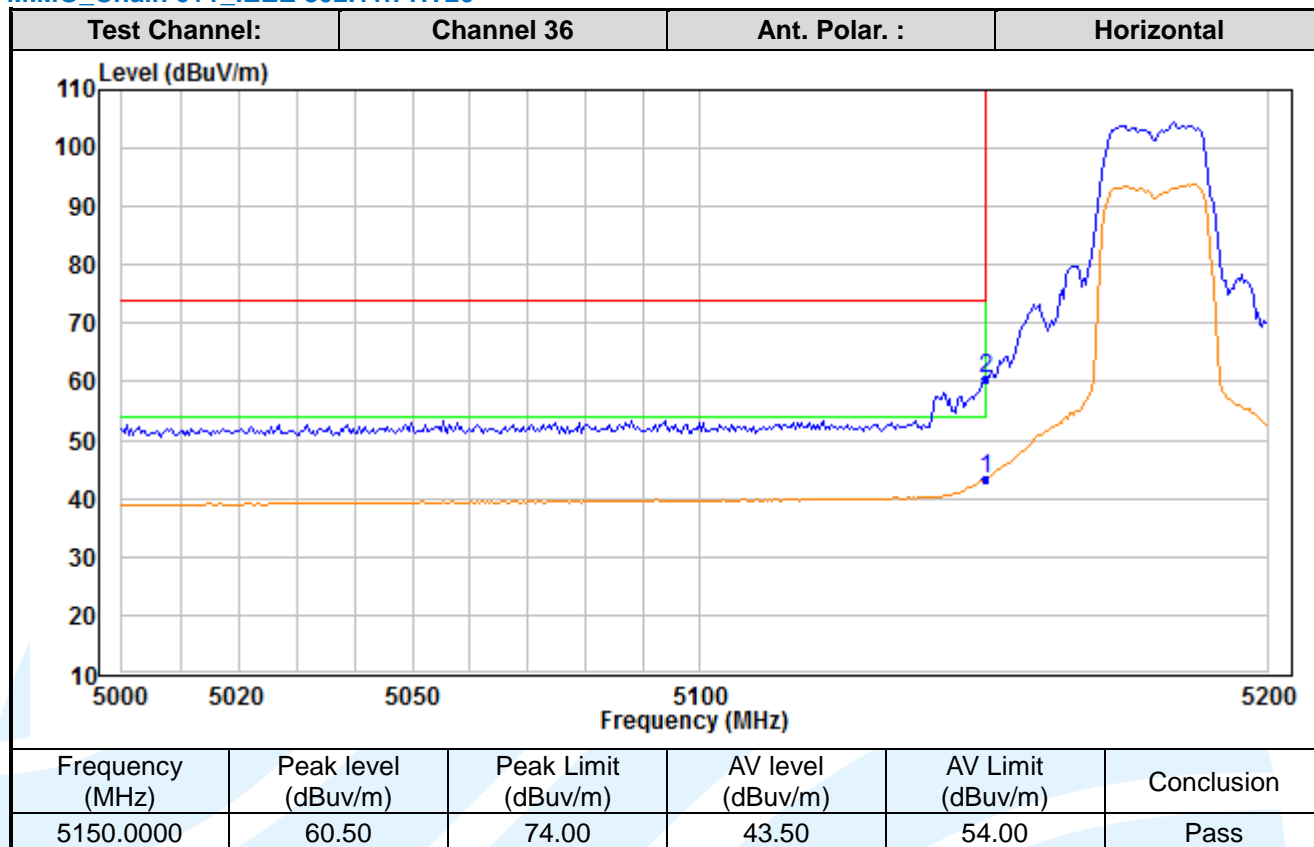
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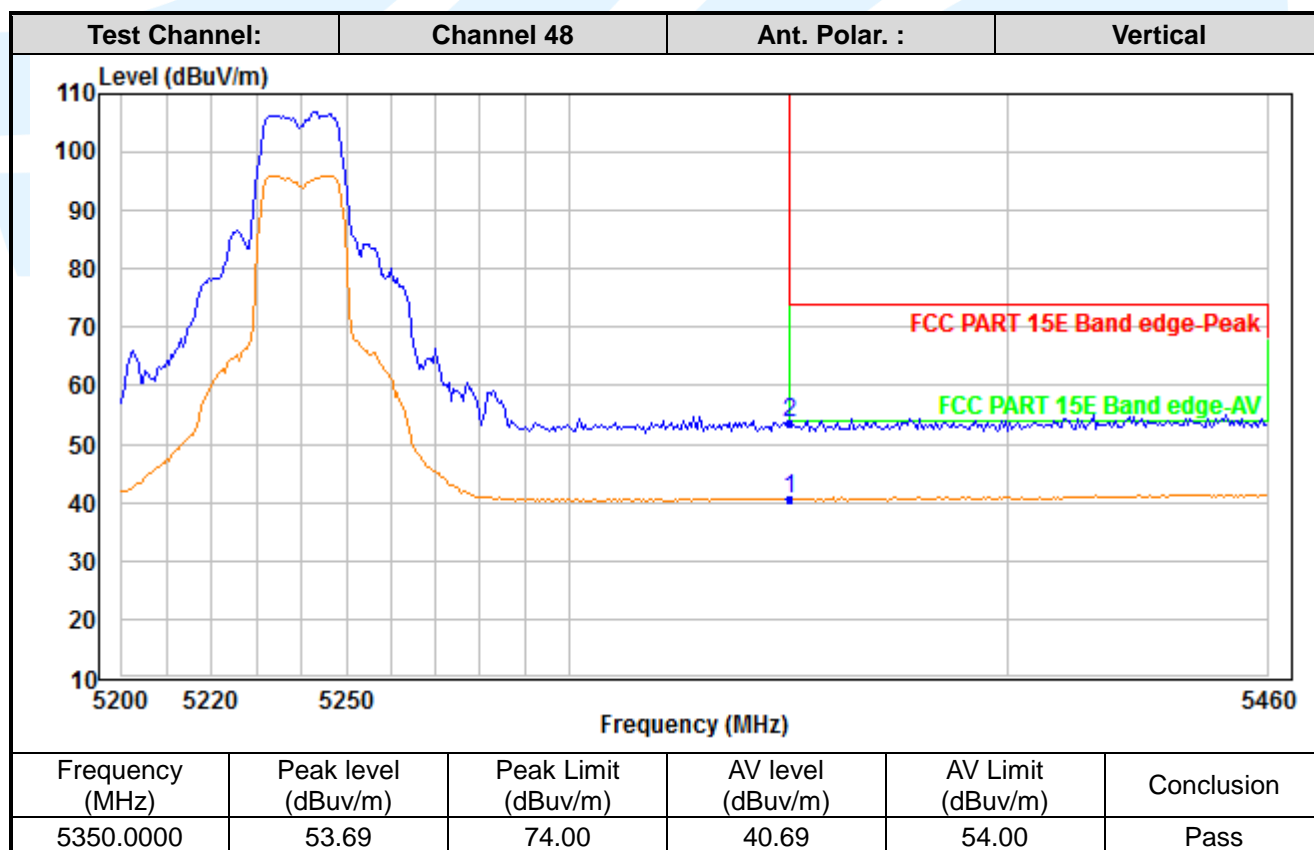
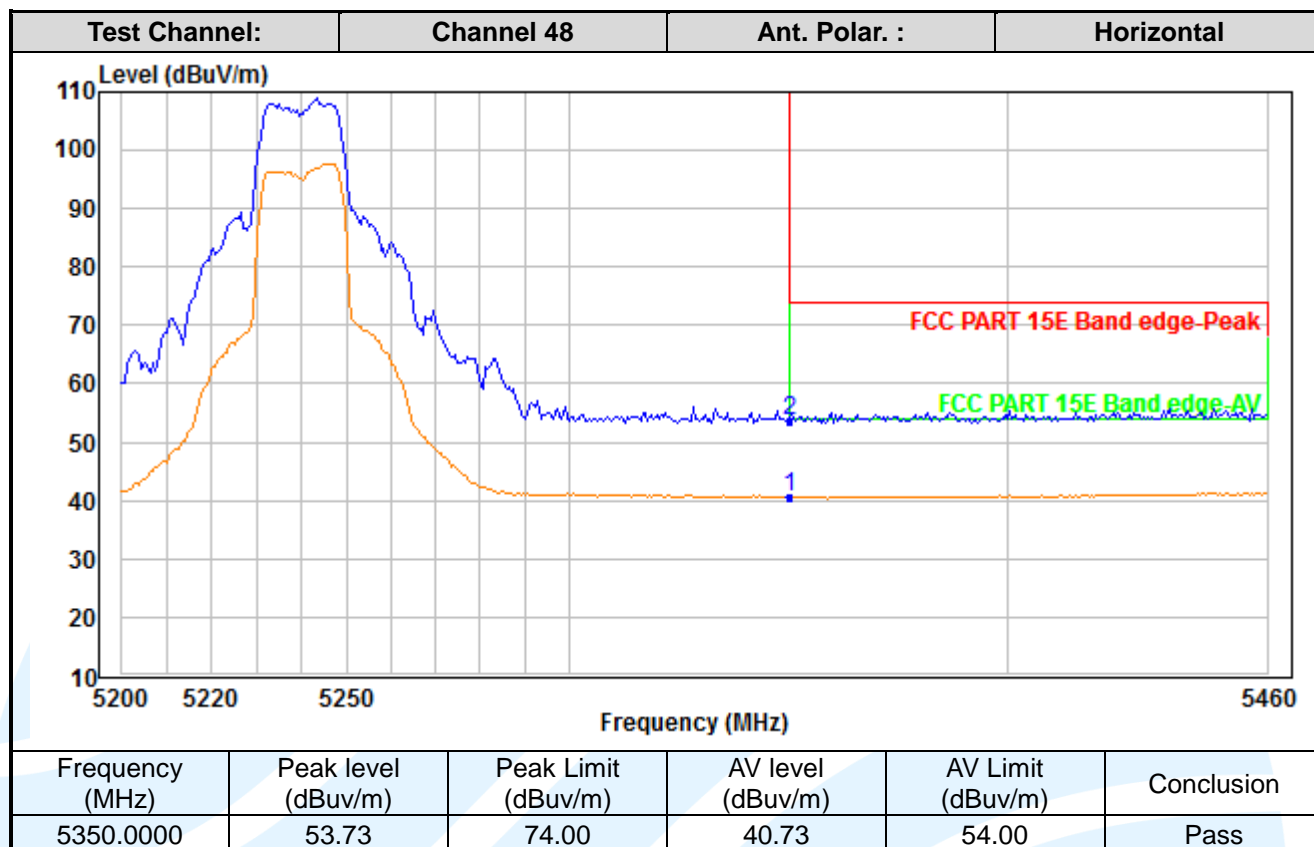


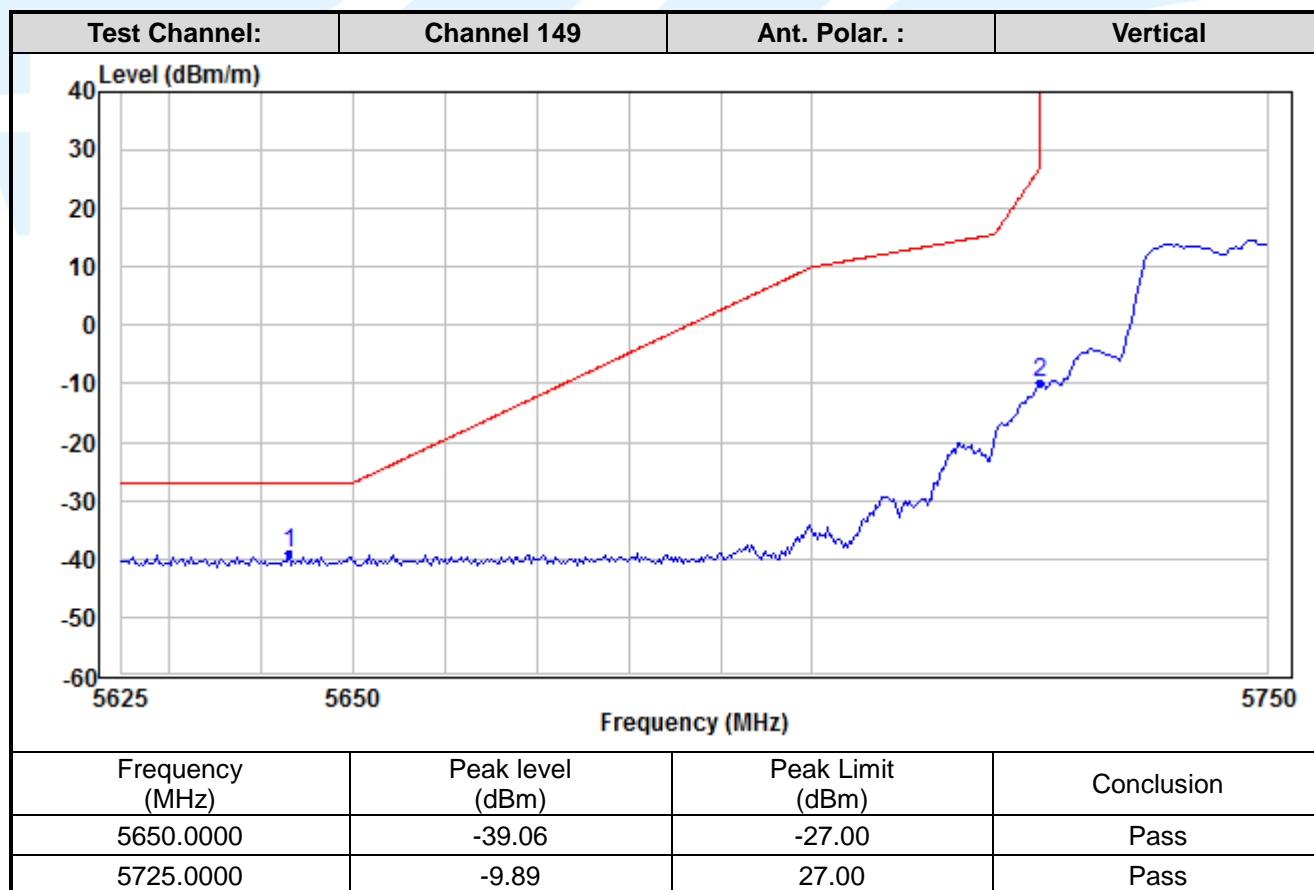
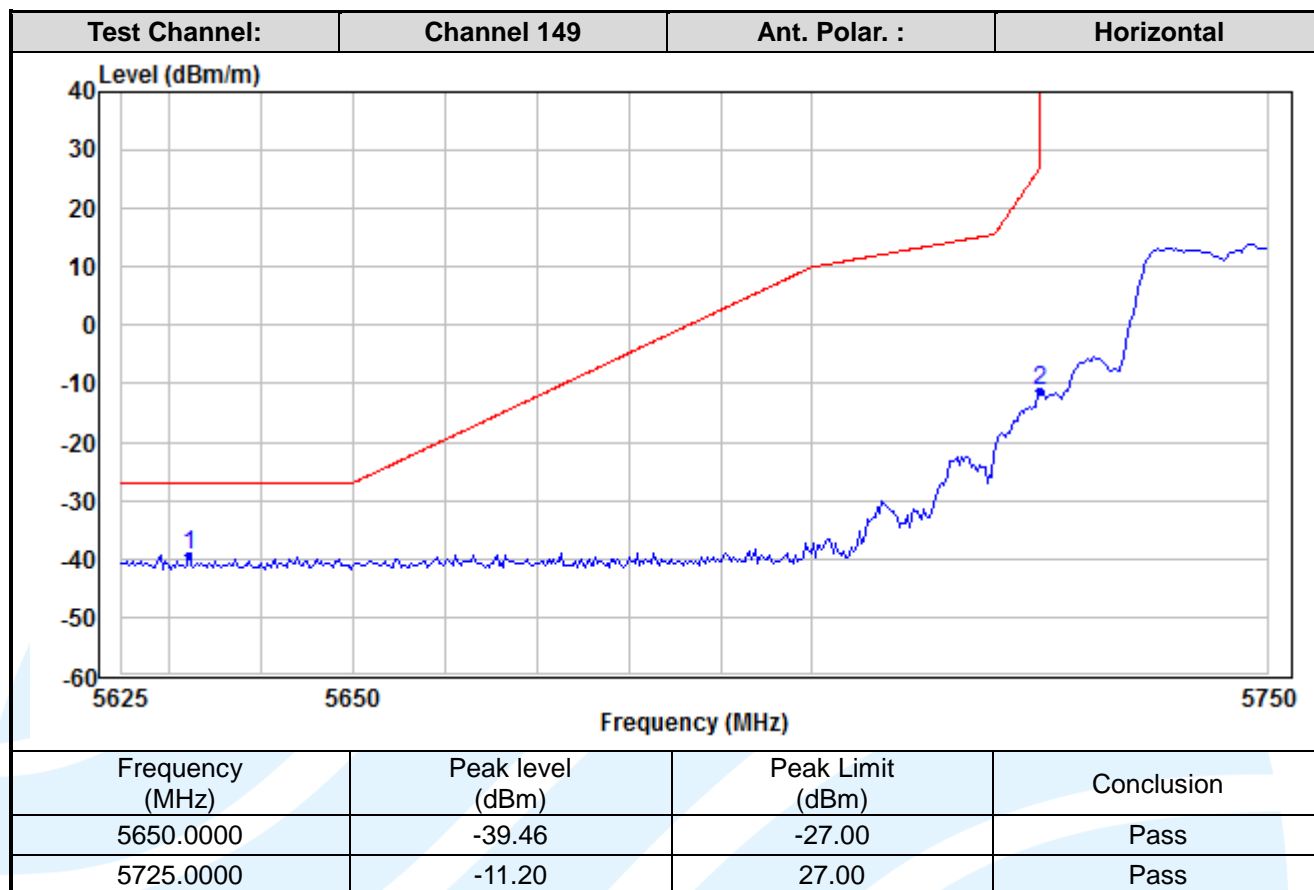


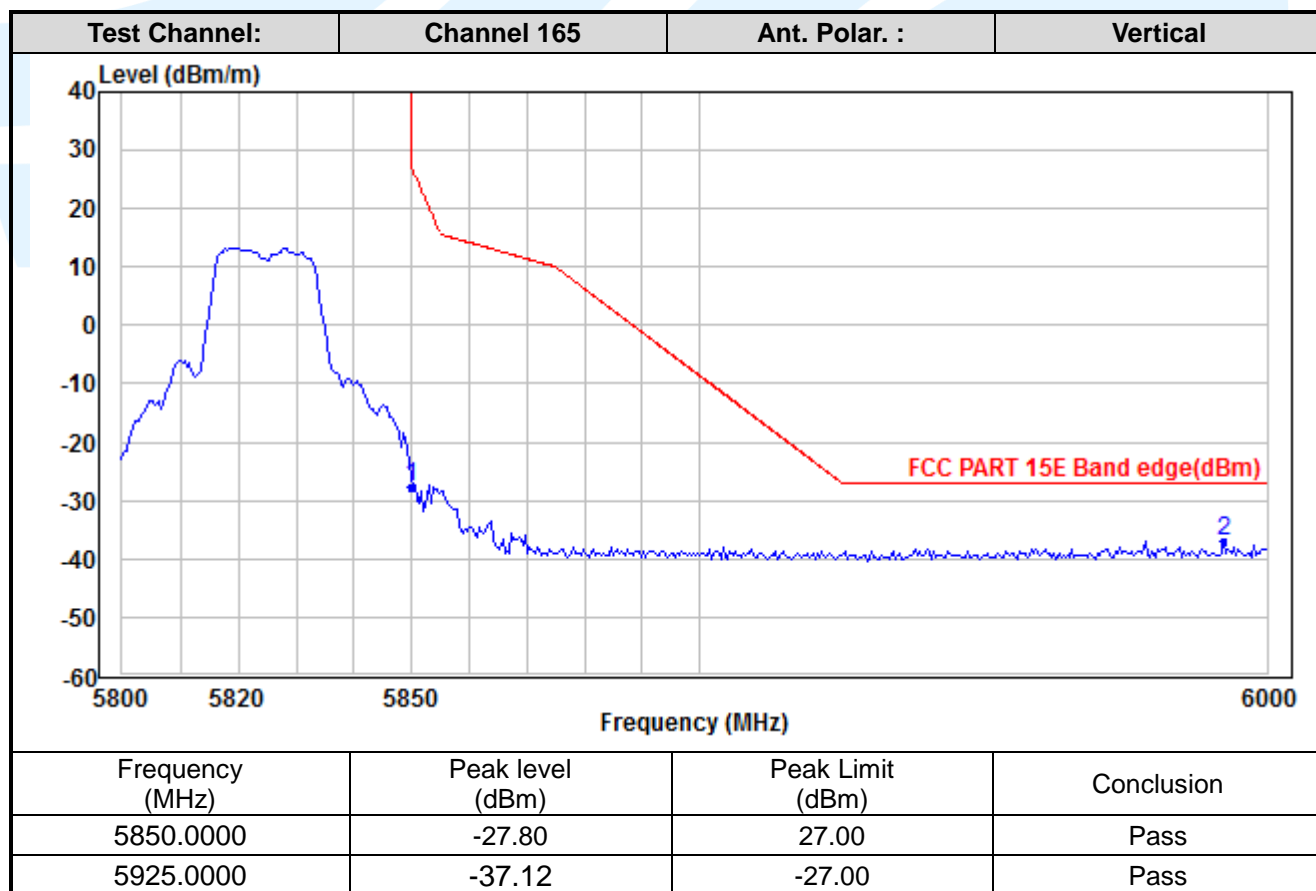
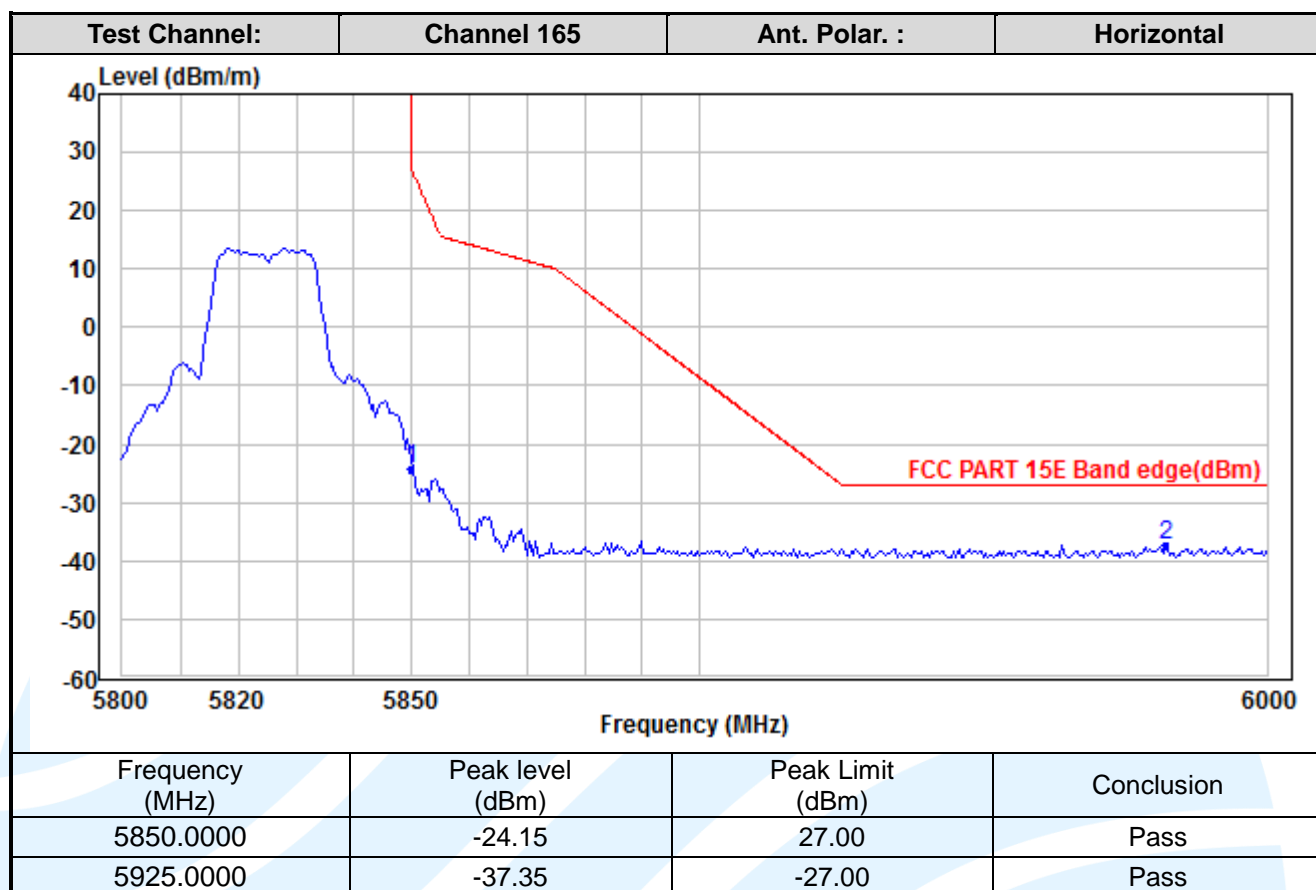


MIMO_Chain 0+1_ IEEE 802.11n-HT20

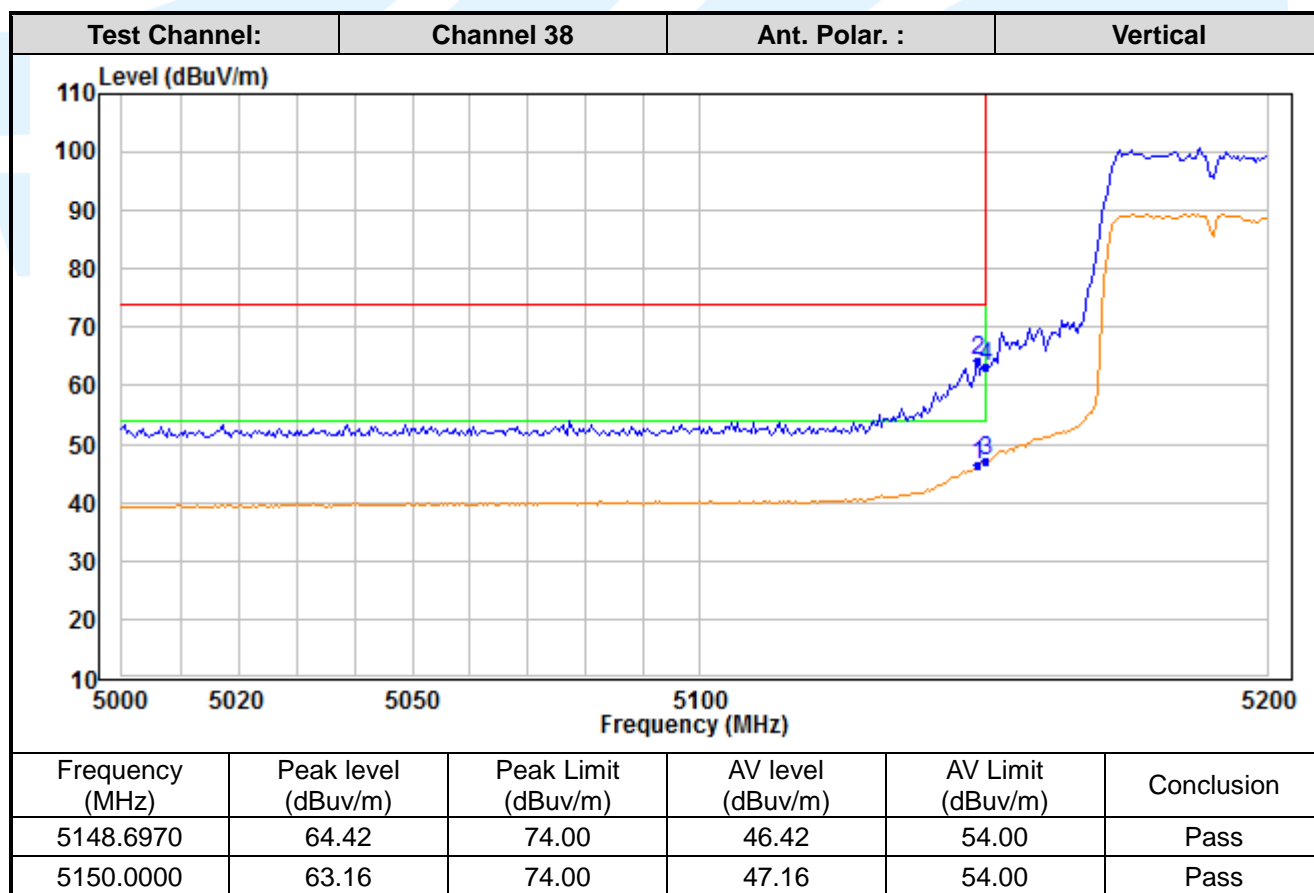
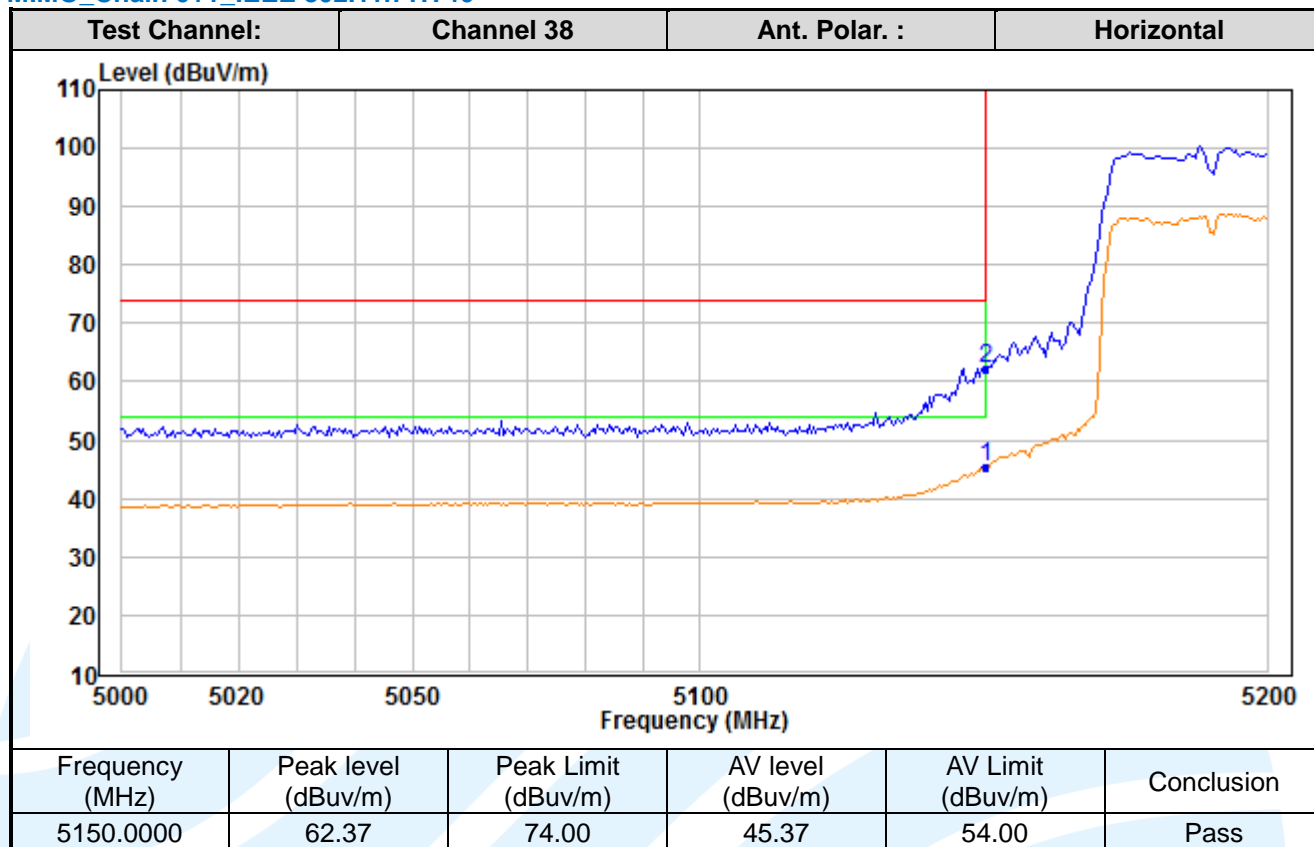


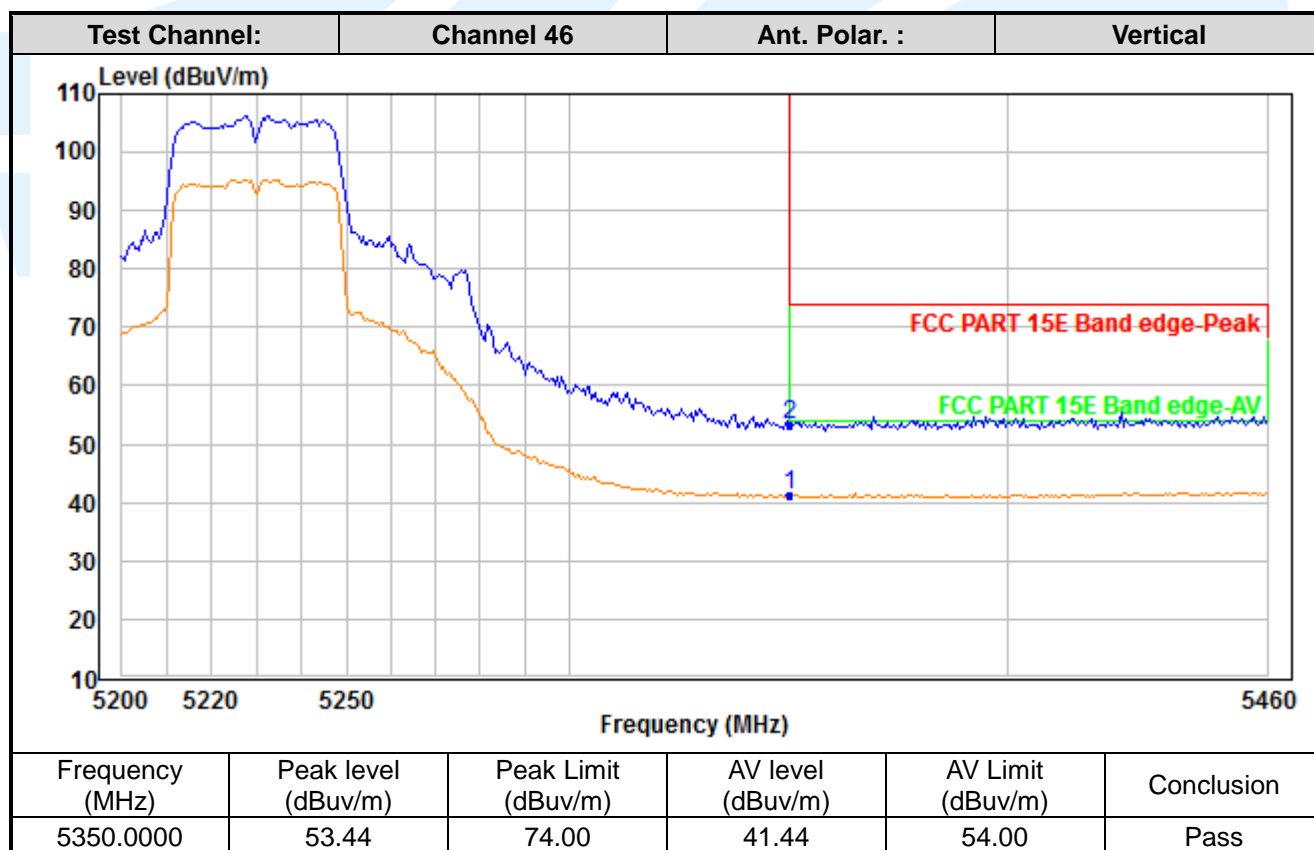
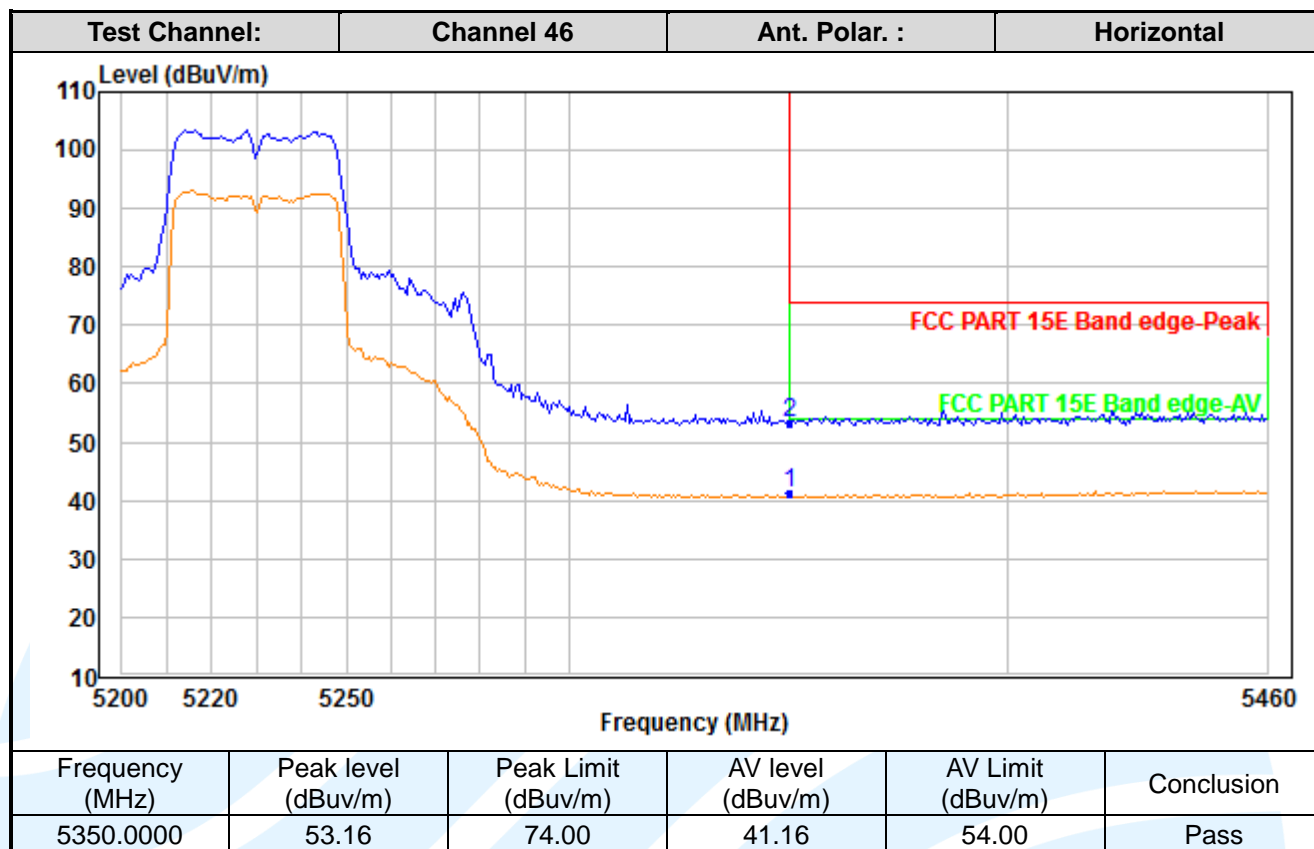


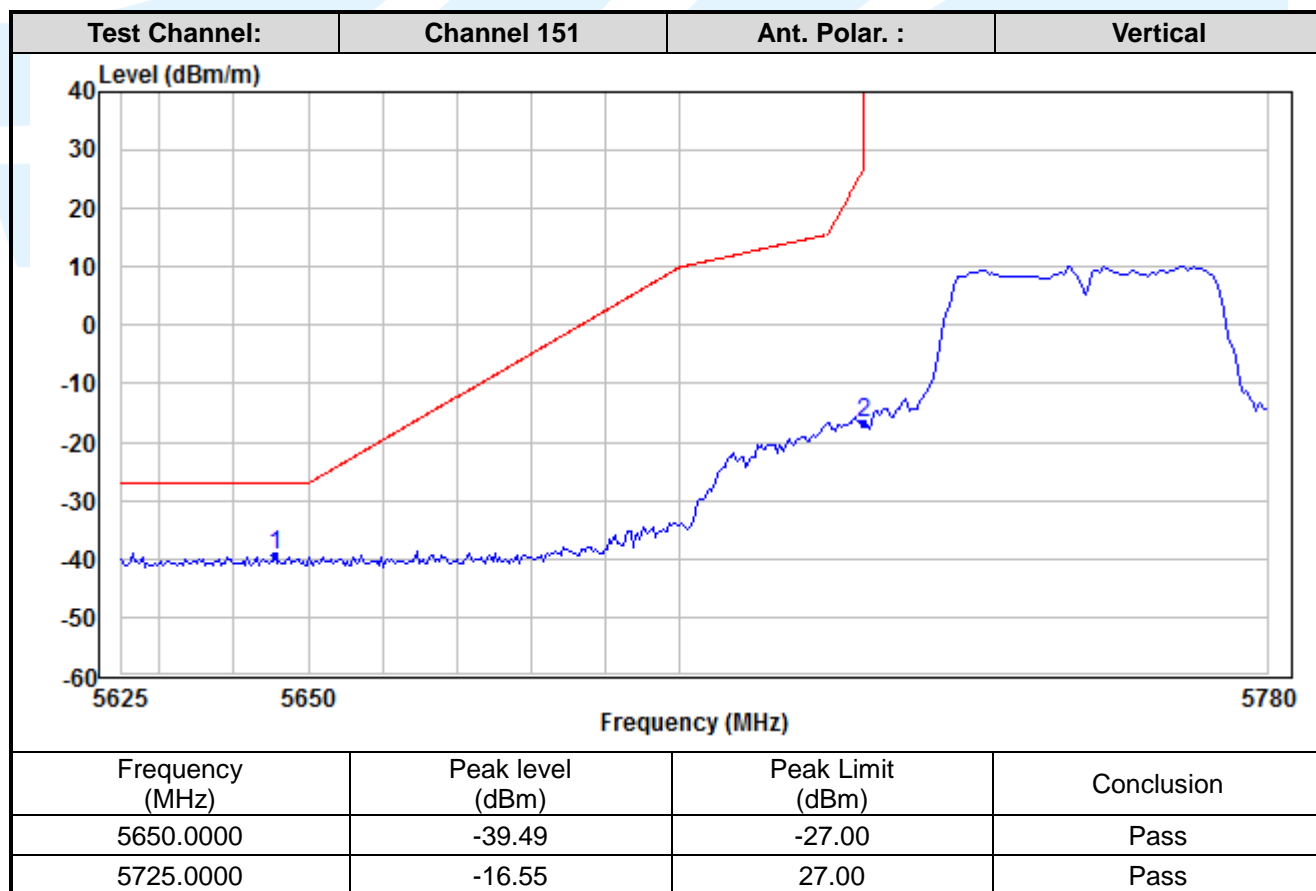
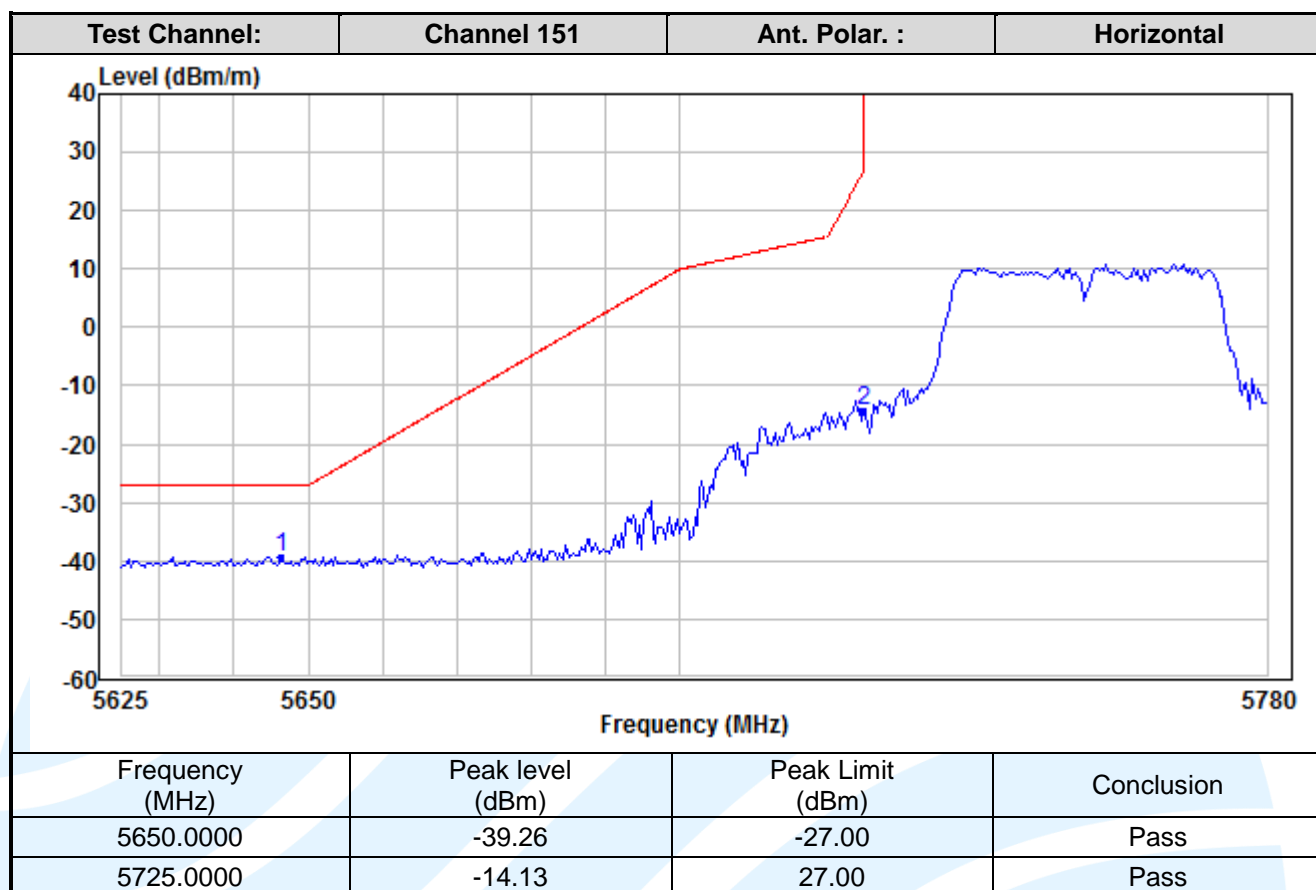


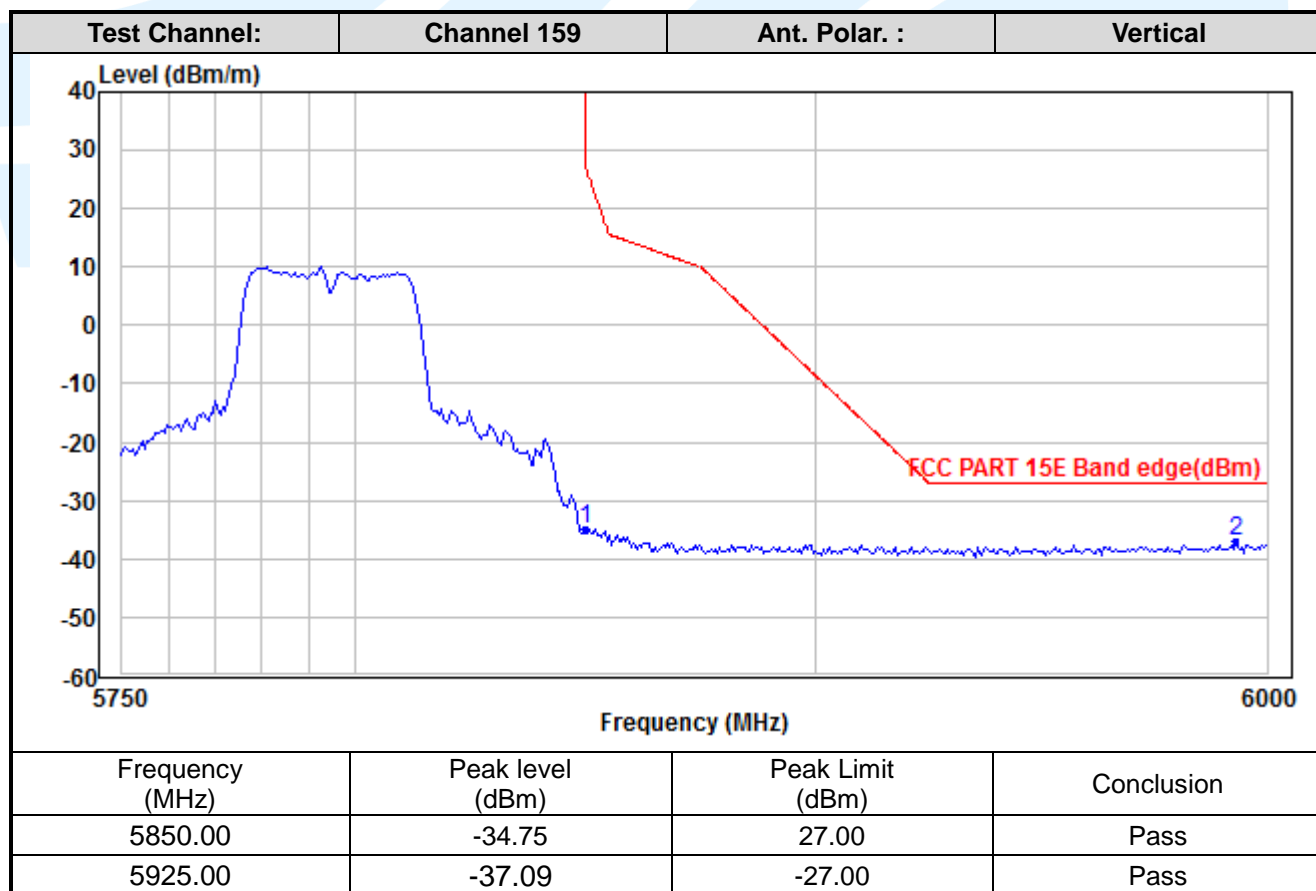
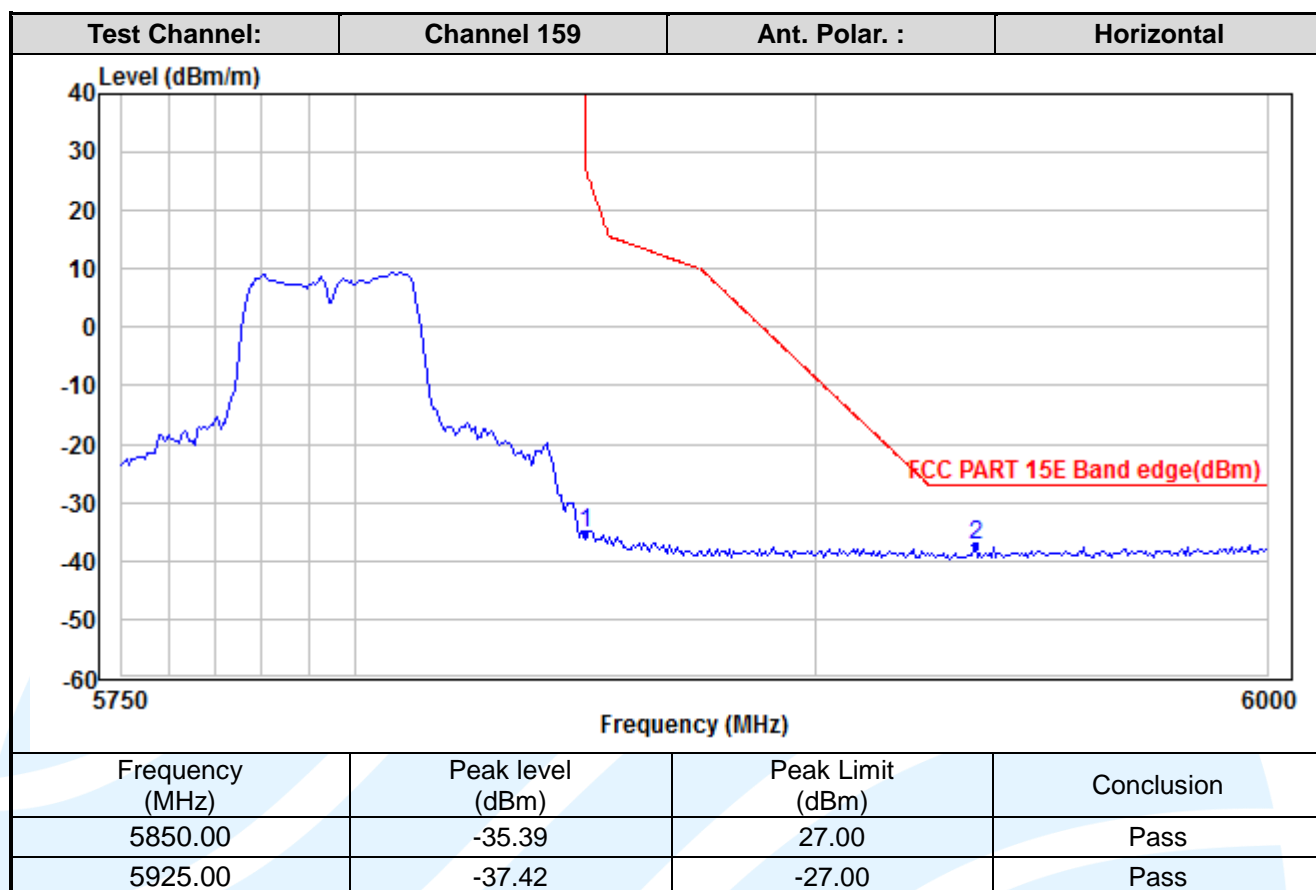


MIMO_Chain 0+1 _IEEE 802.11n-HT40

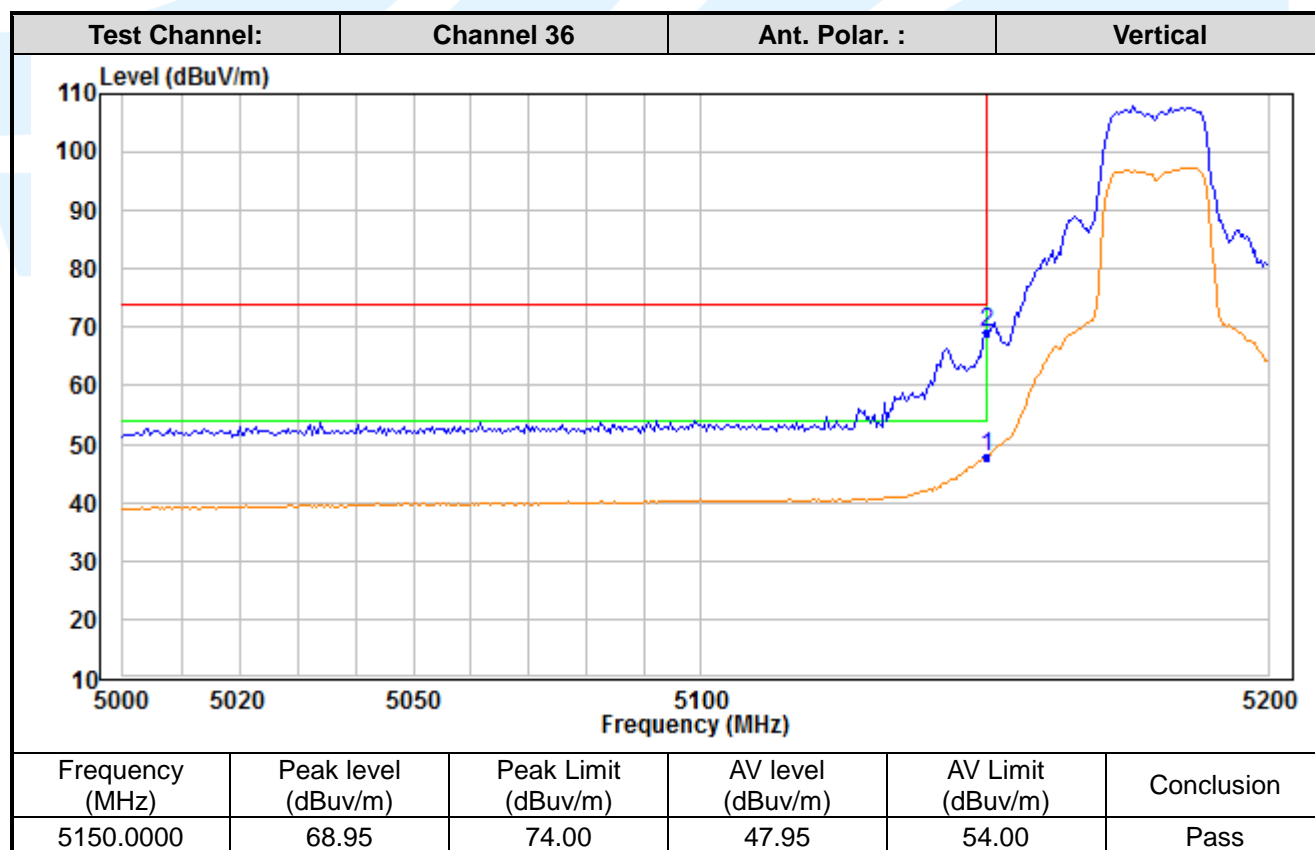
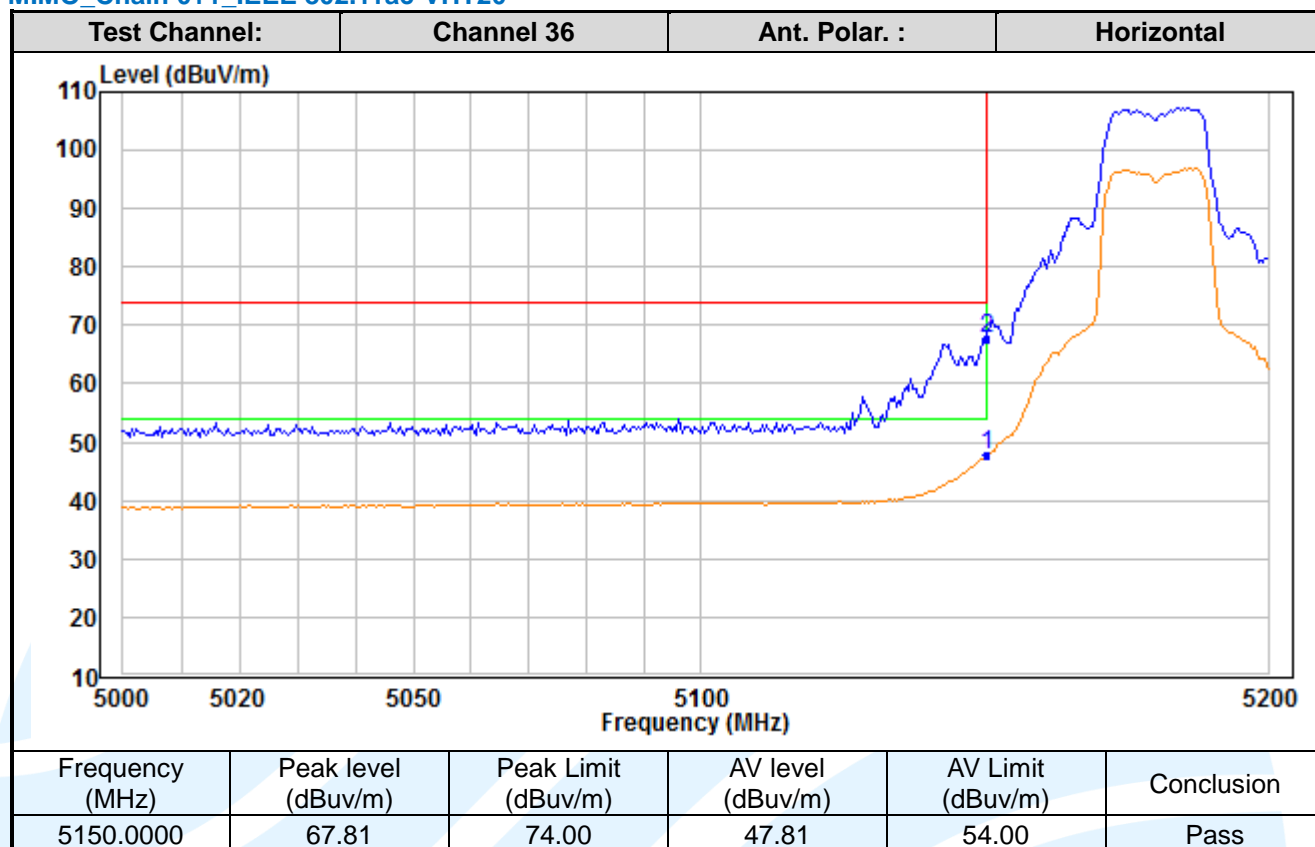


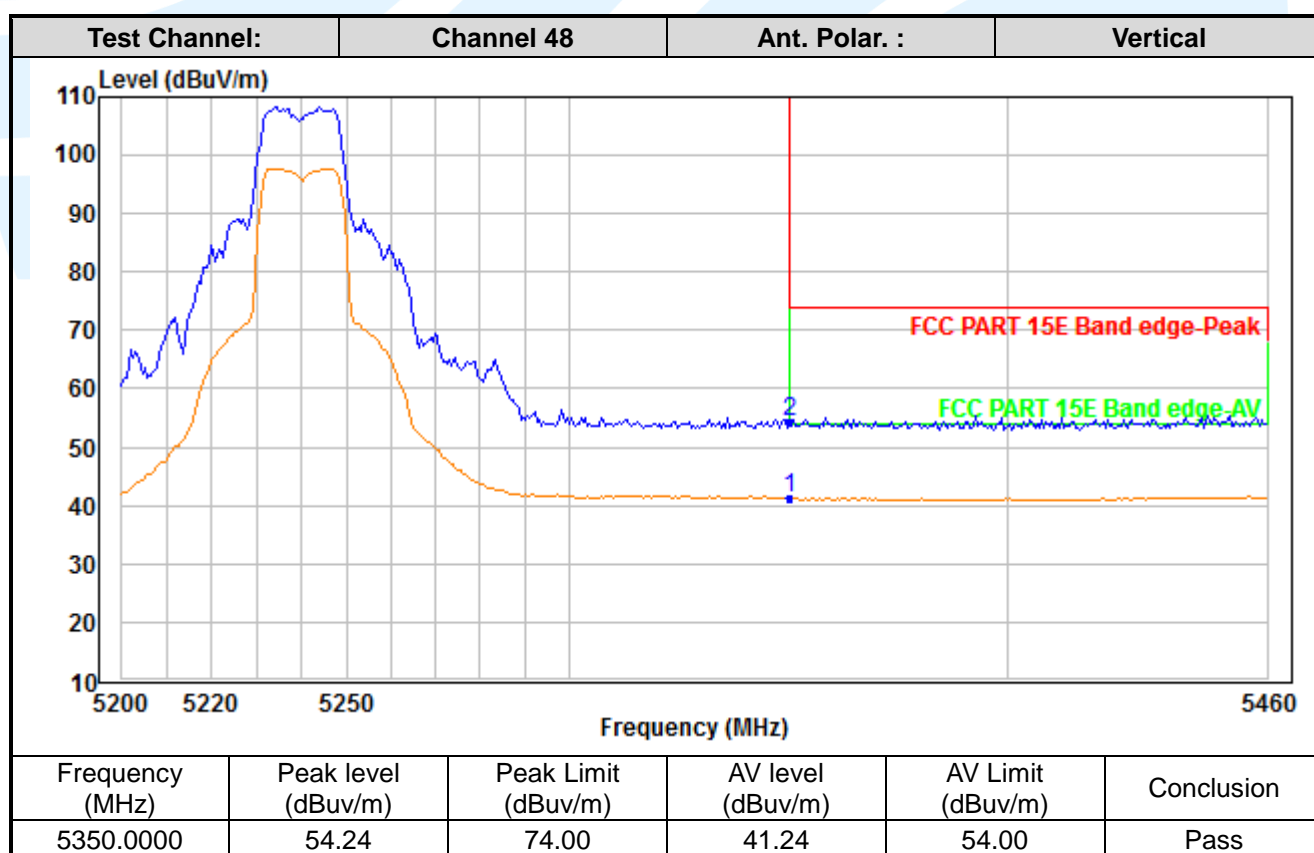
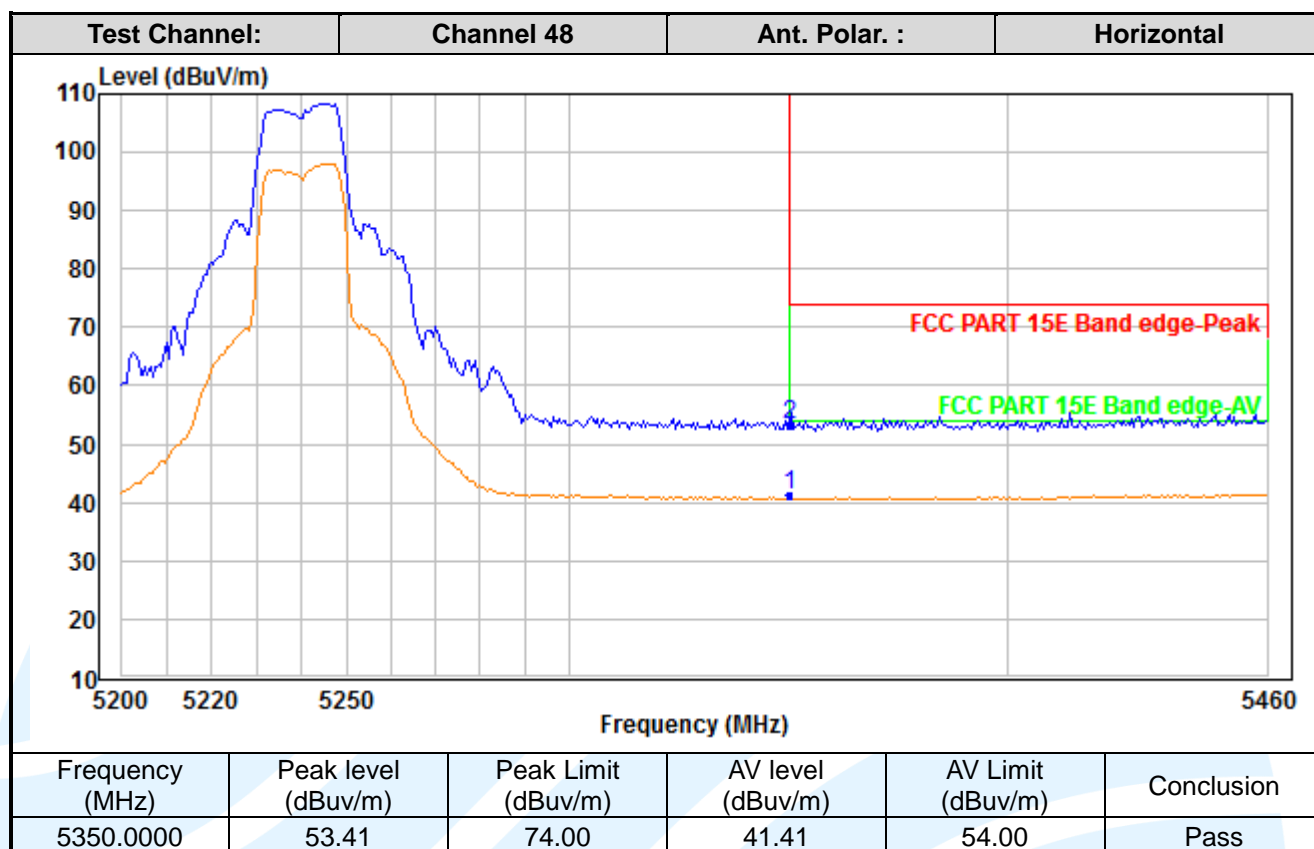


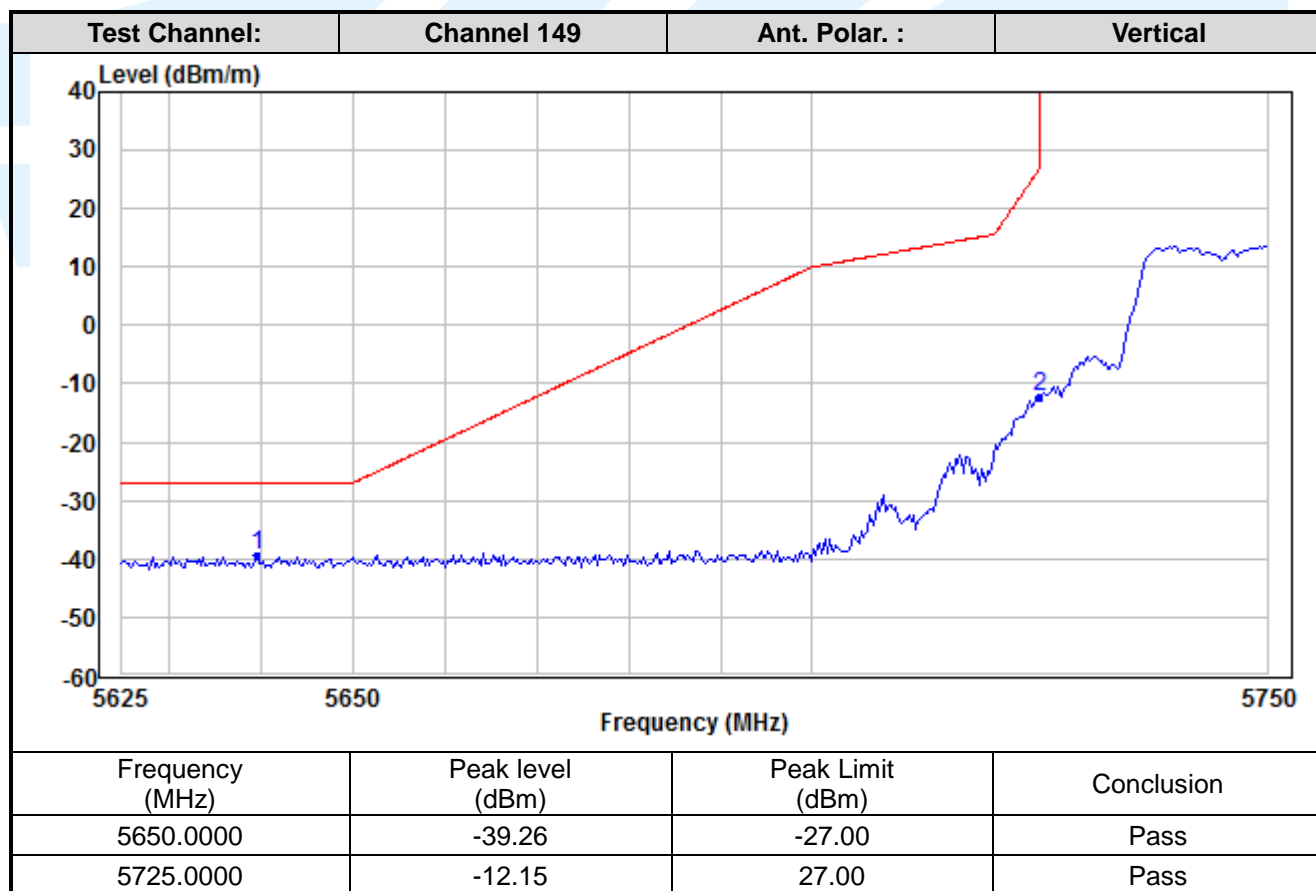
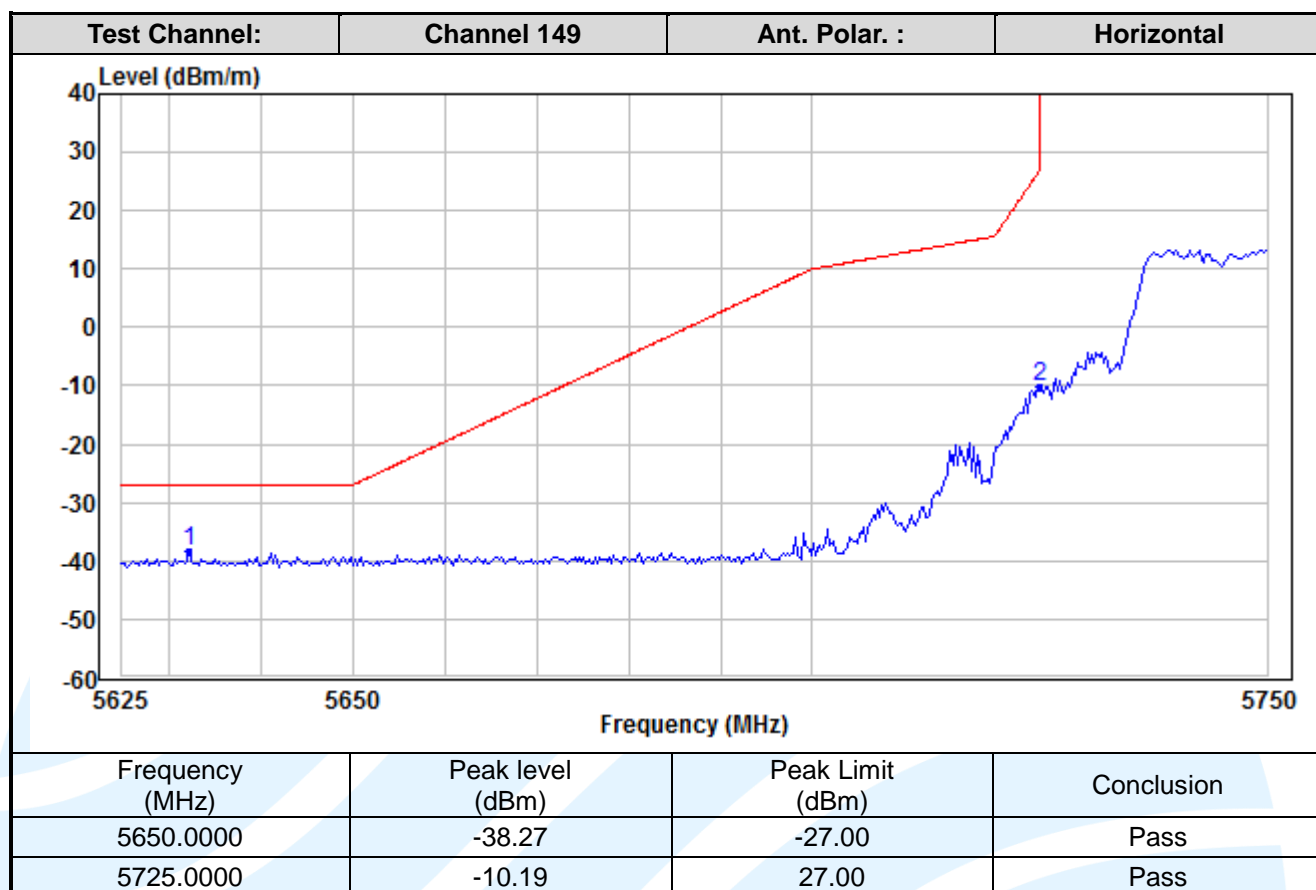


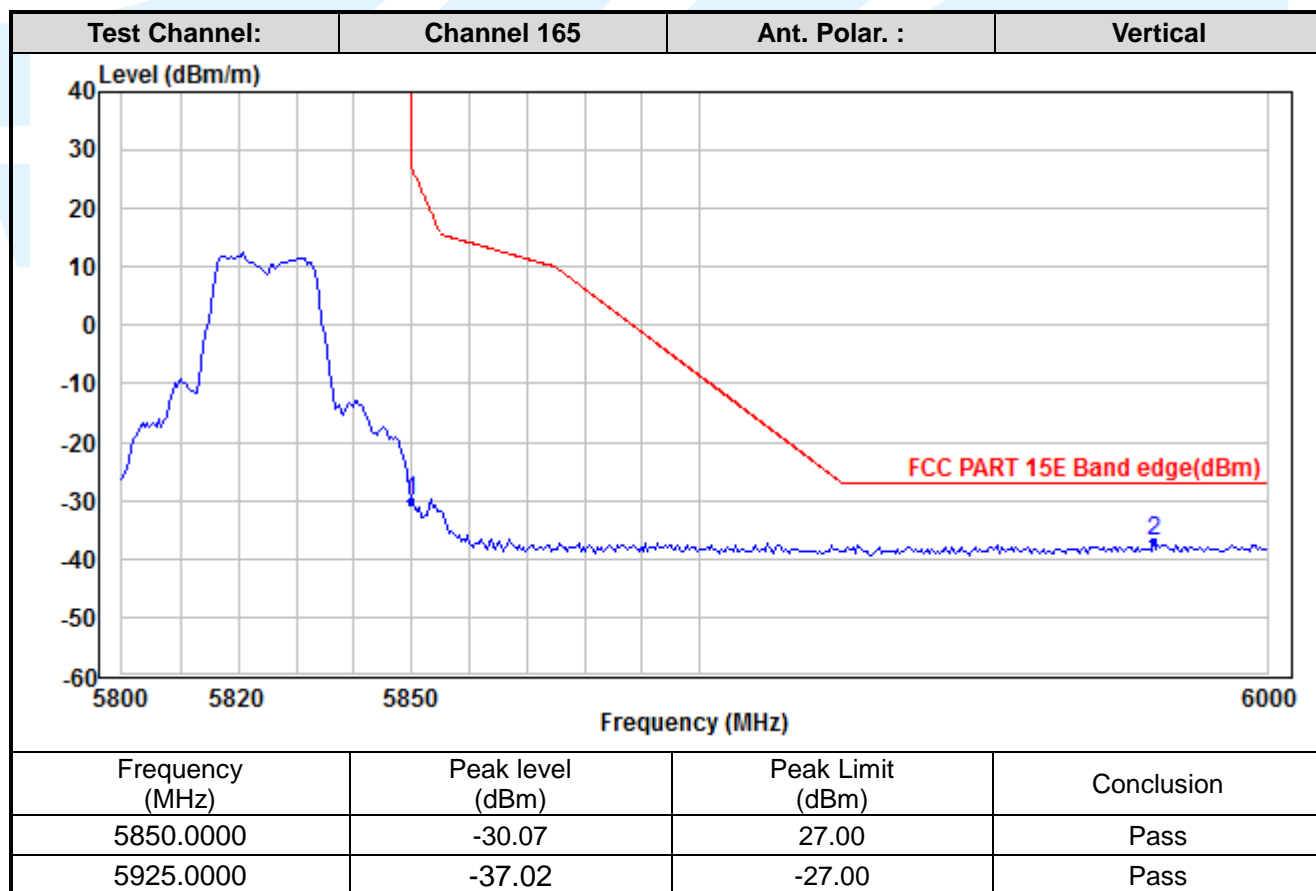
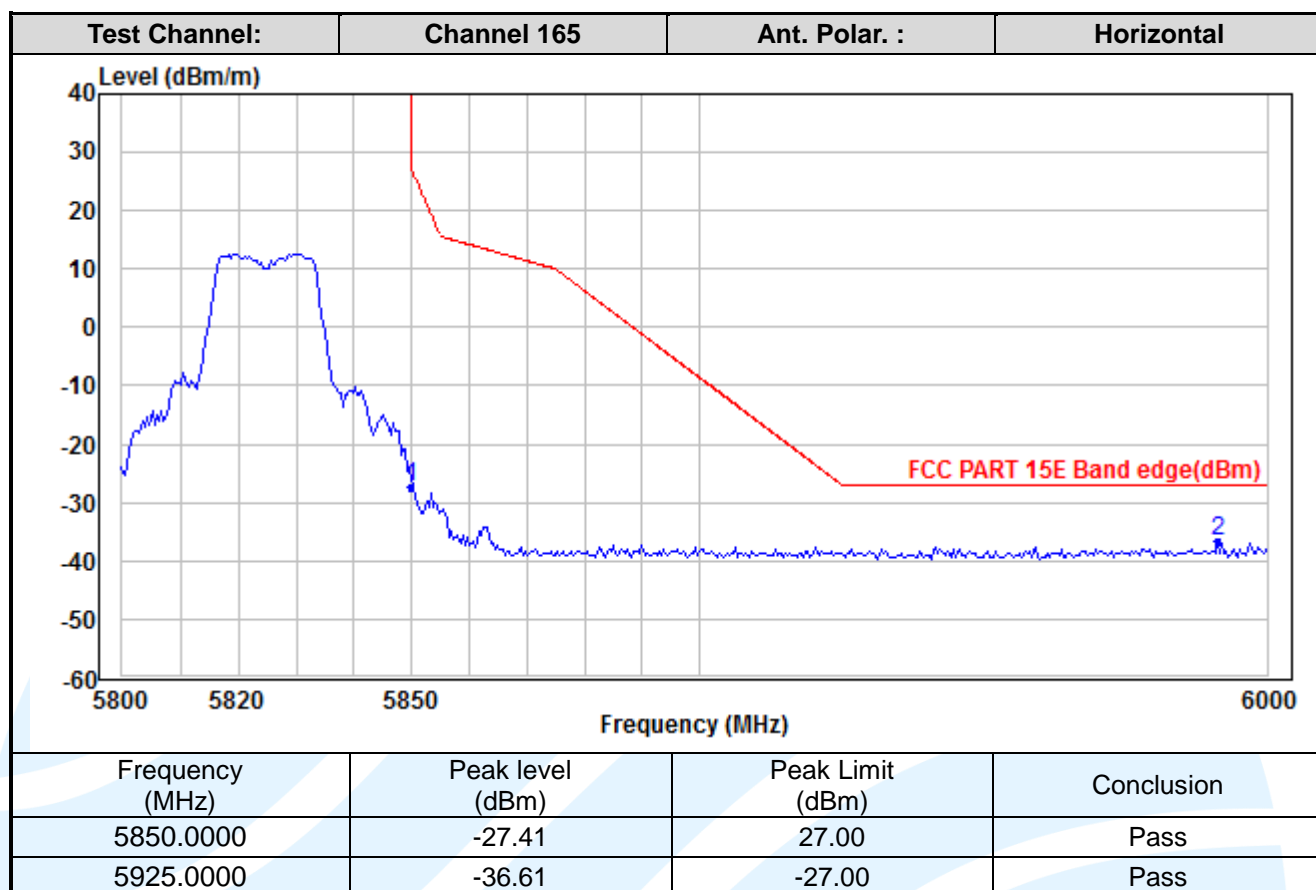


MIMO_Chain 0+1_ IEEE 802.11ac-VHT20

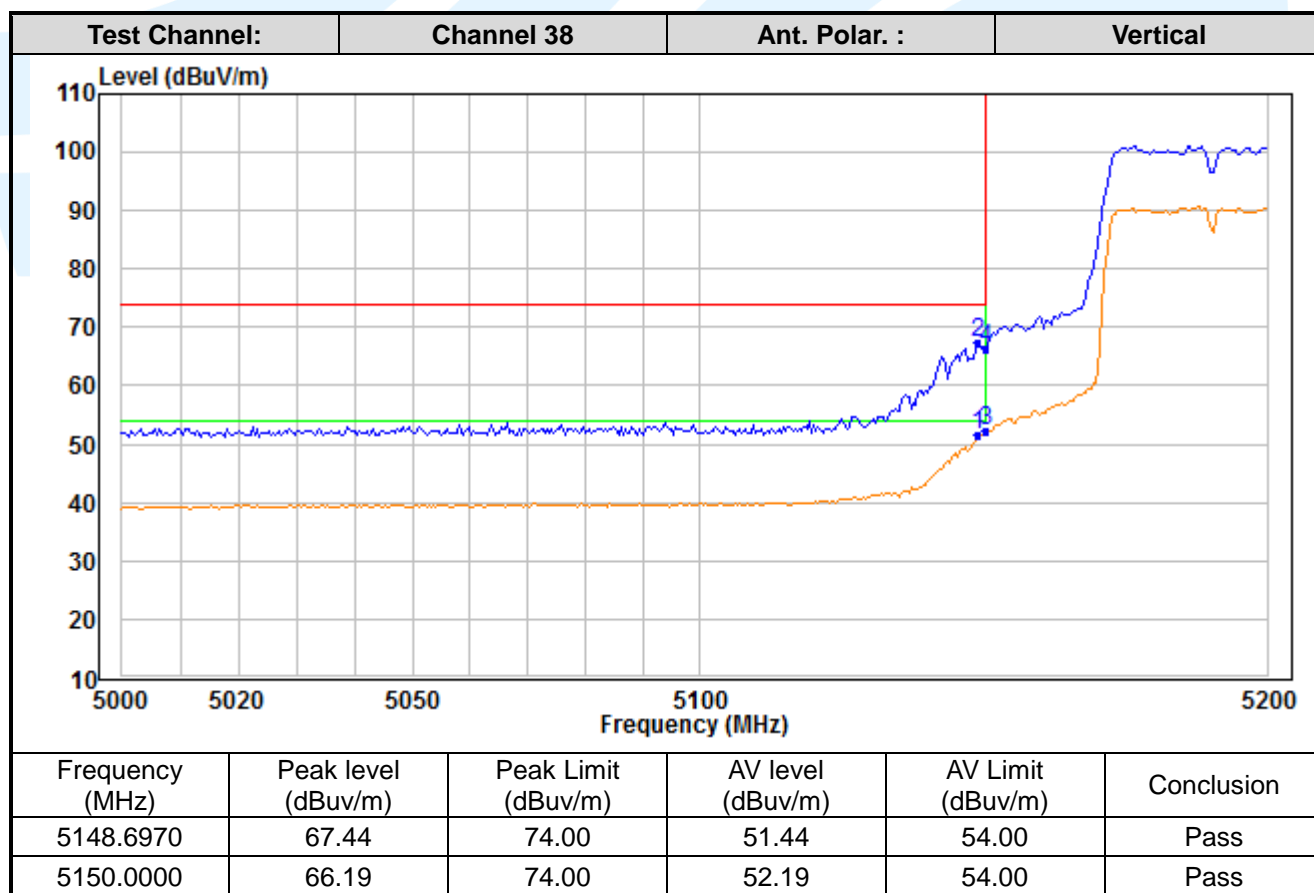
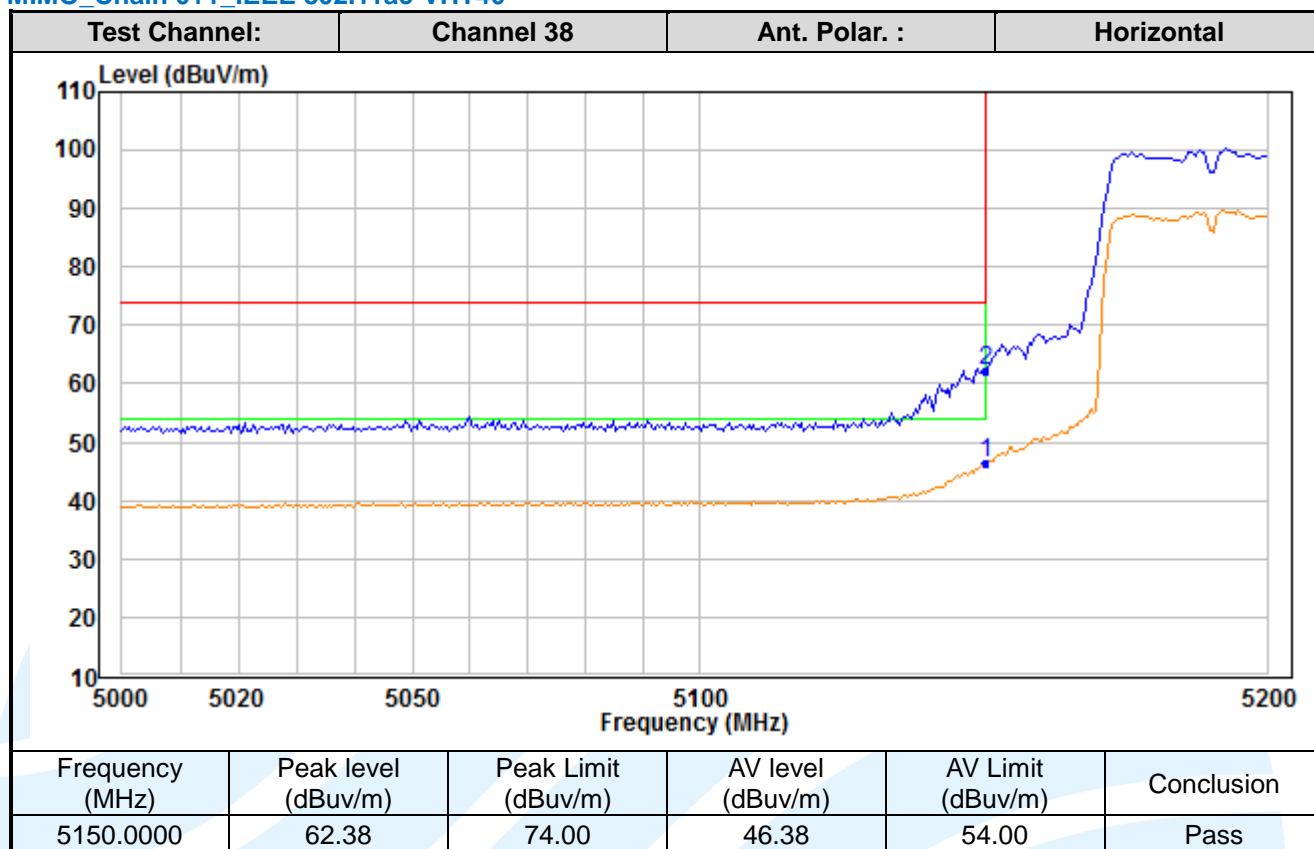


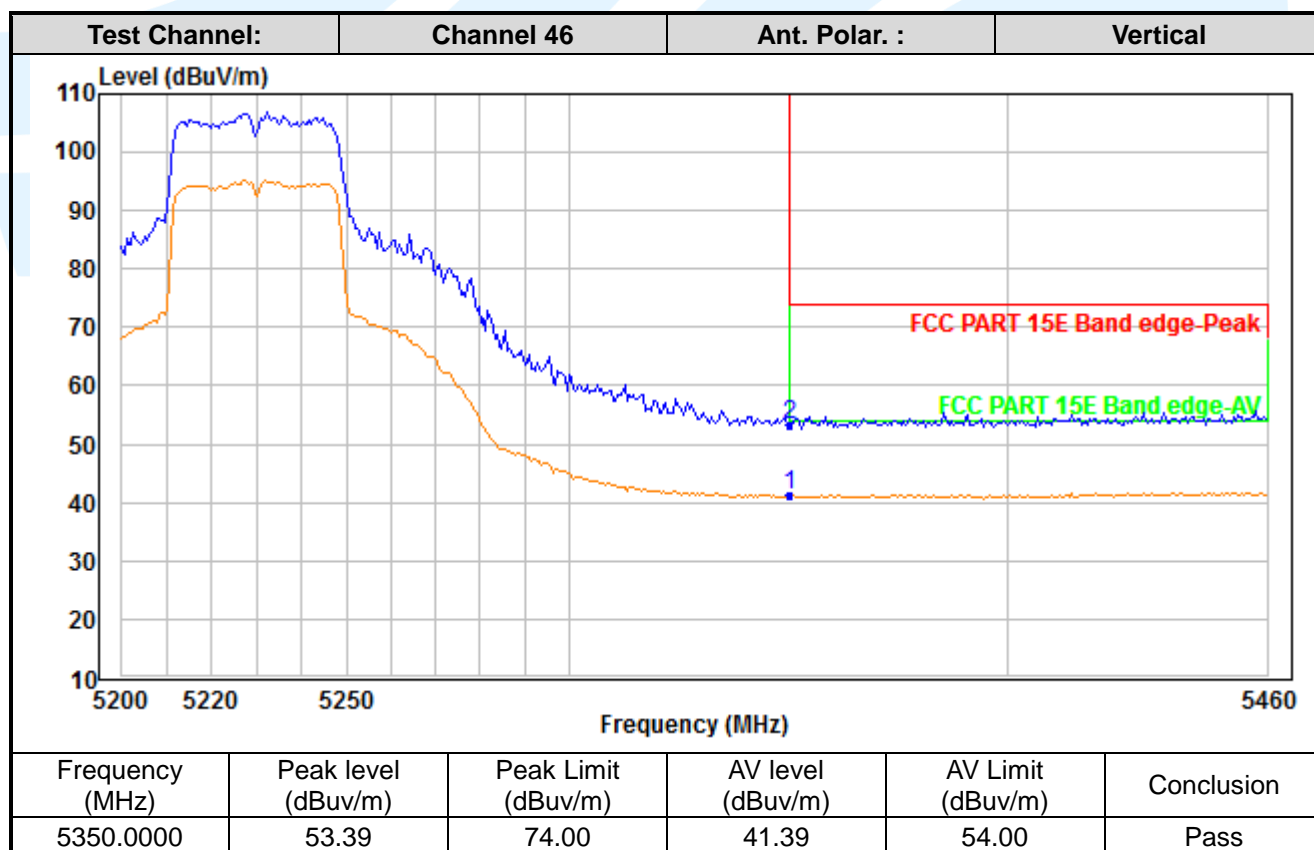
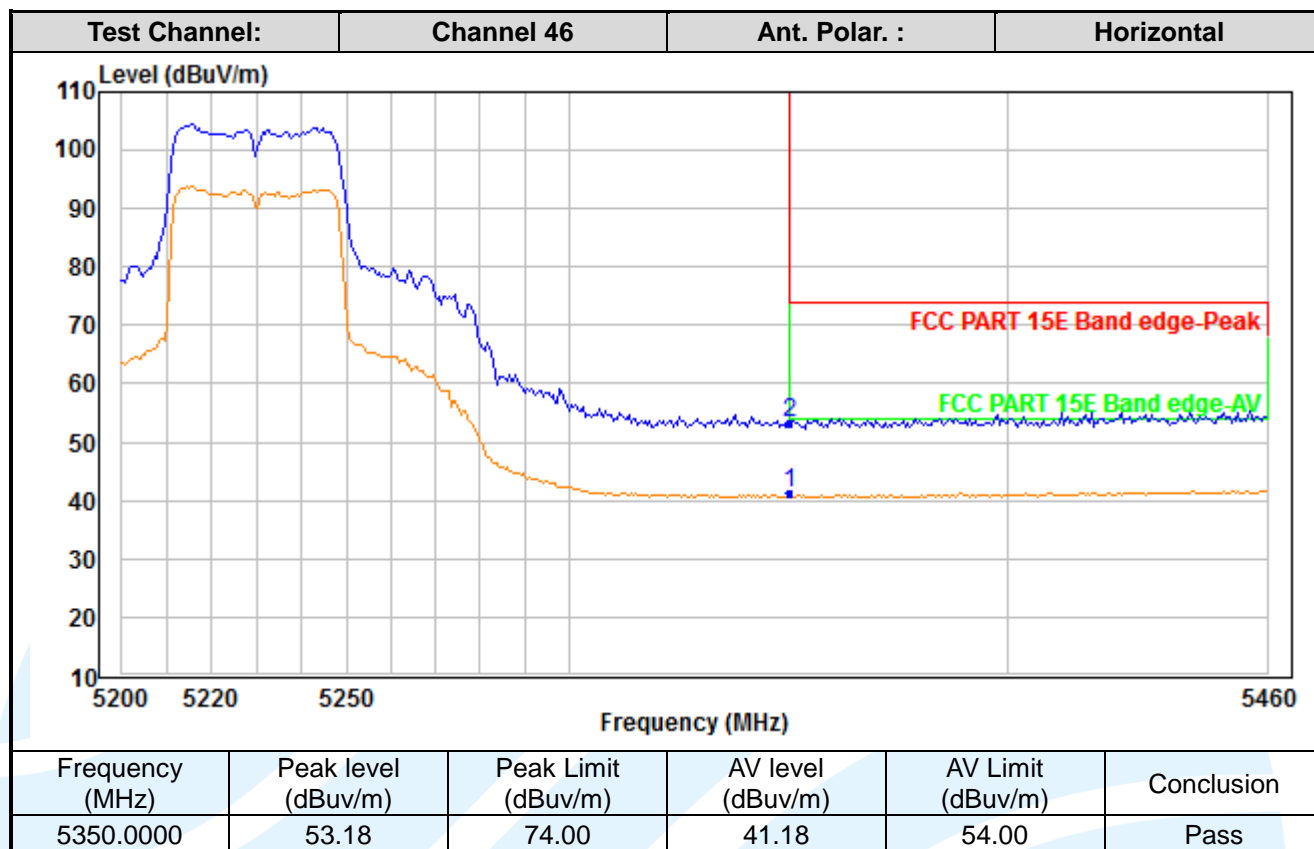


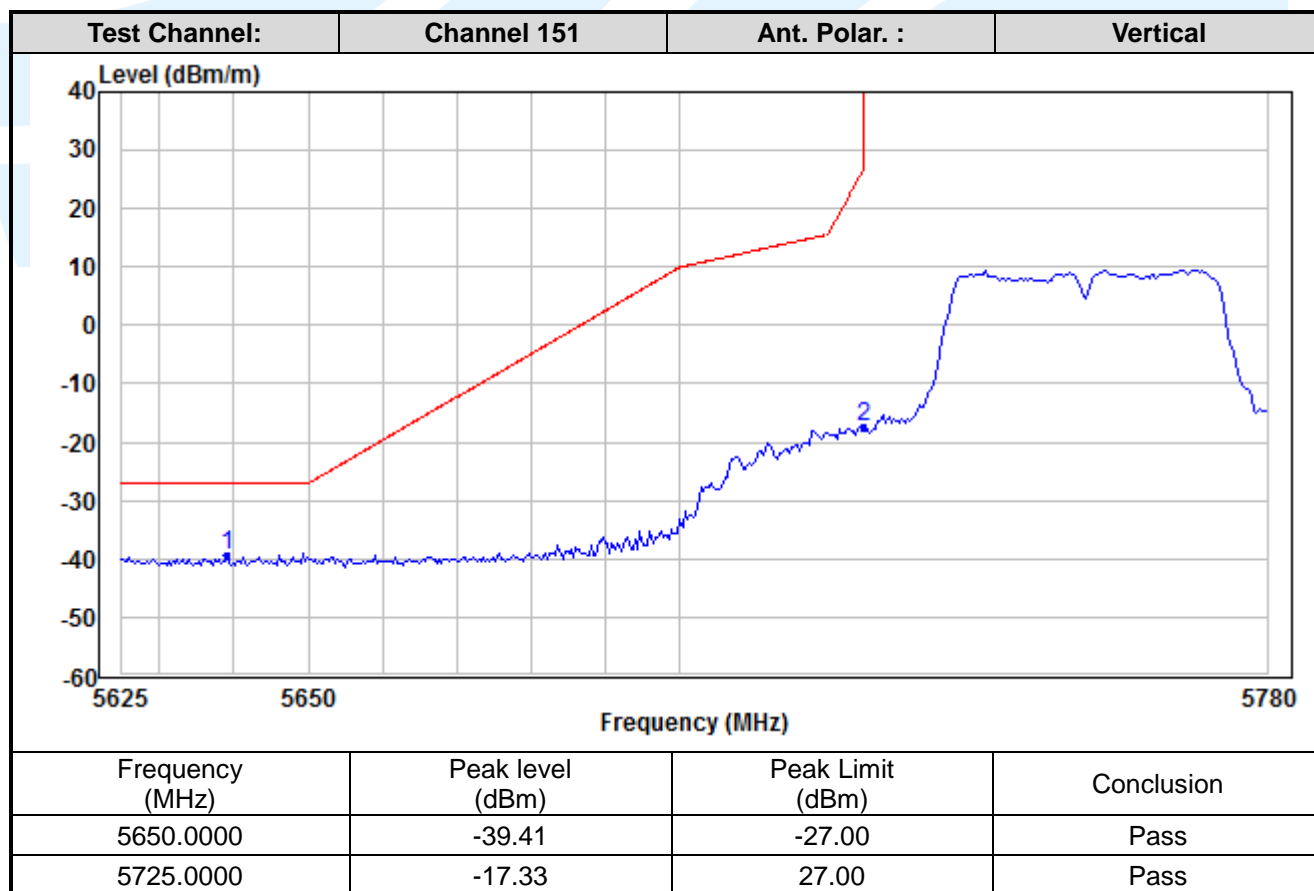
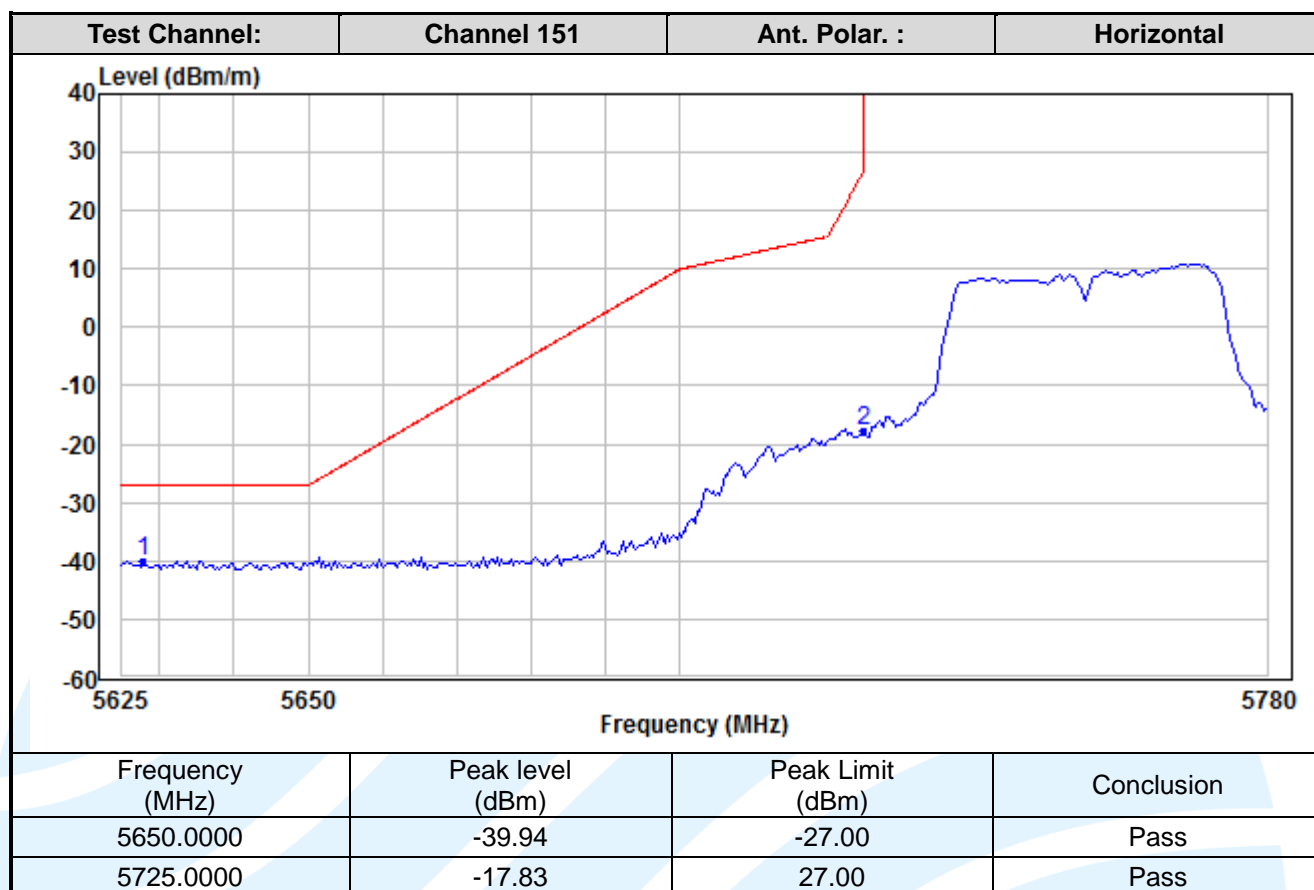


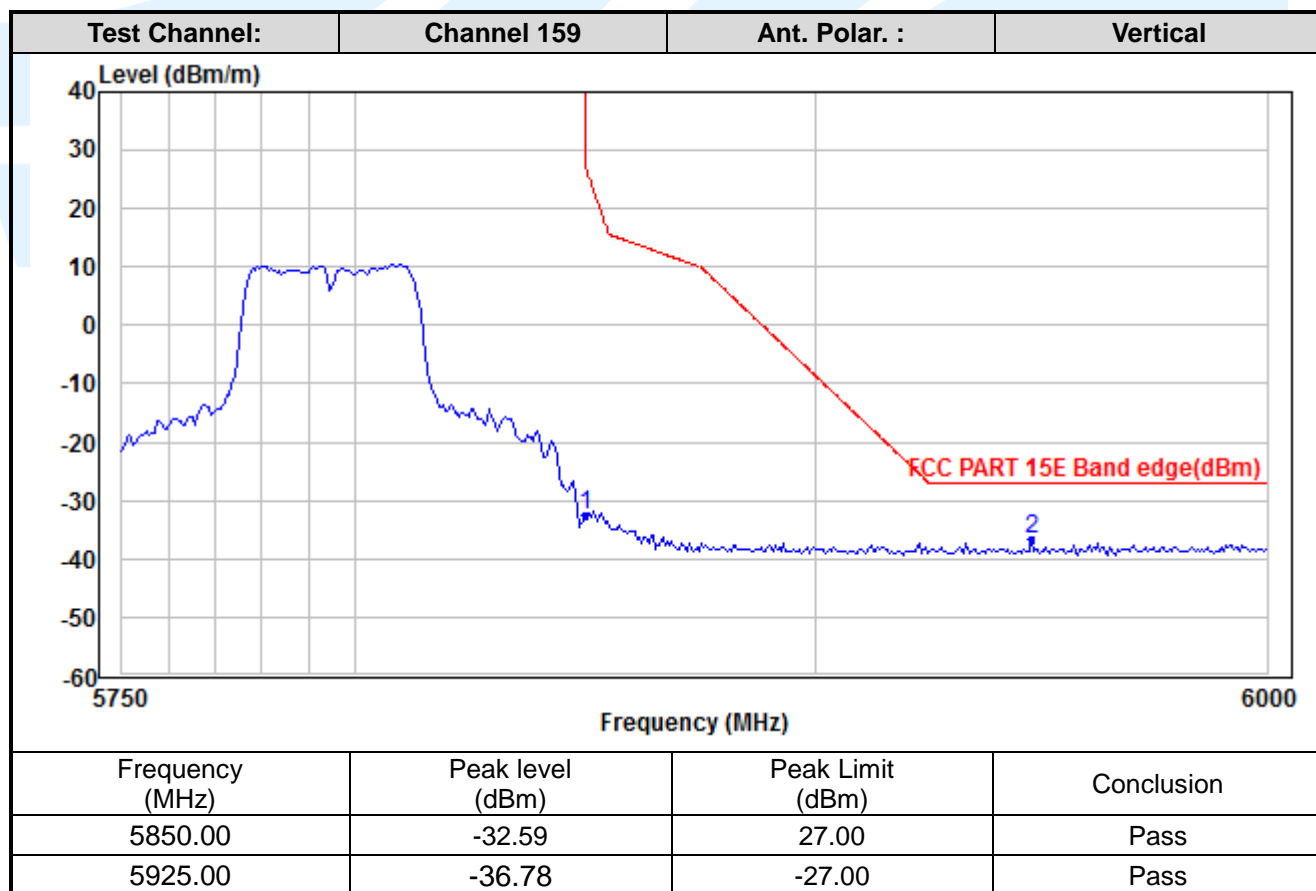
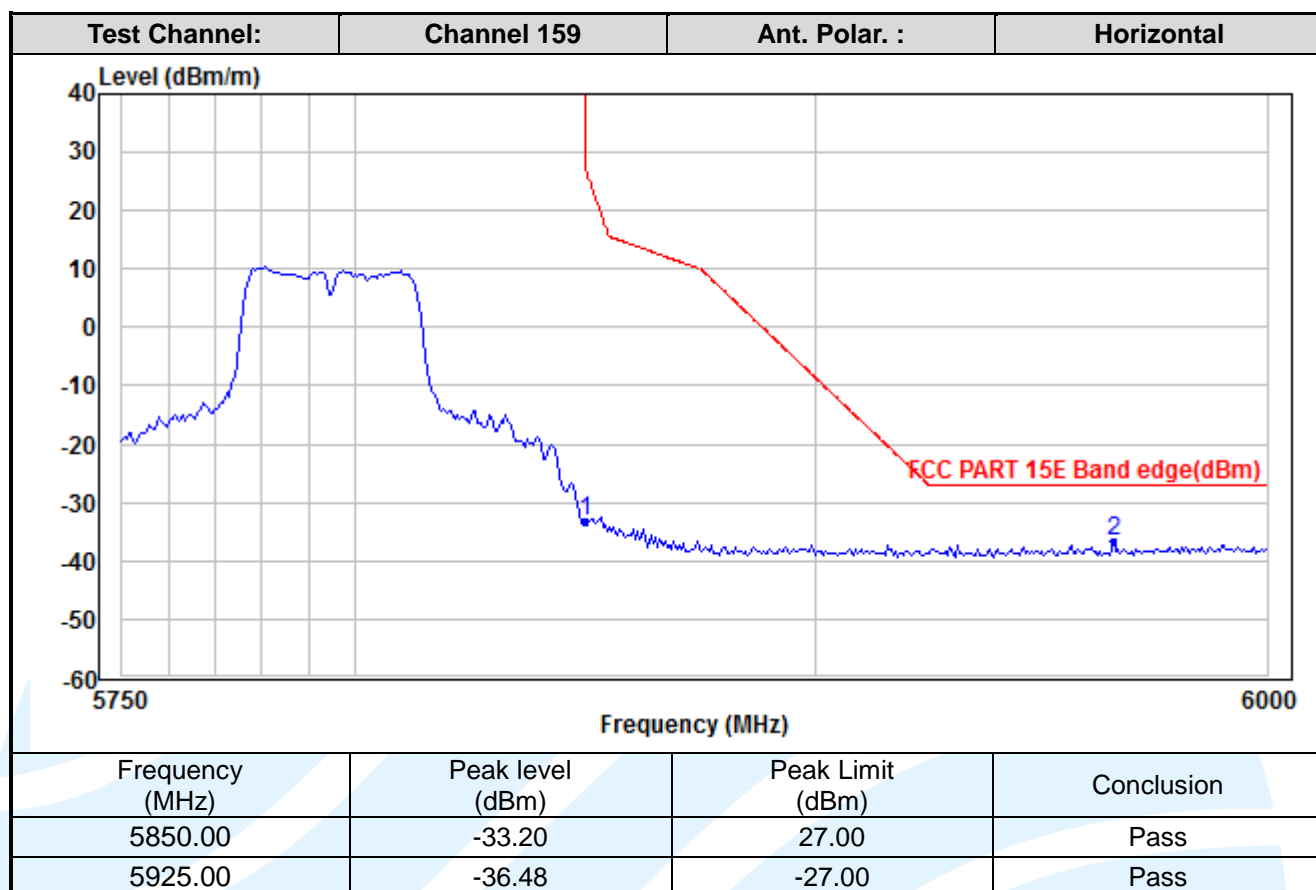


MIMO_Chain 0+1_ IEEE 802.11ac-VHT40

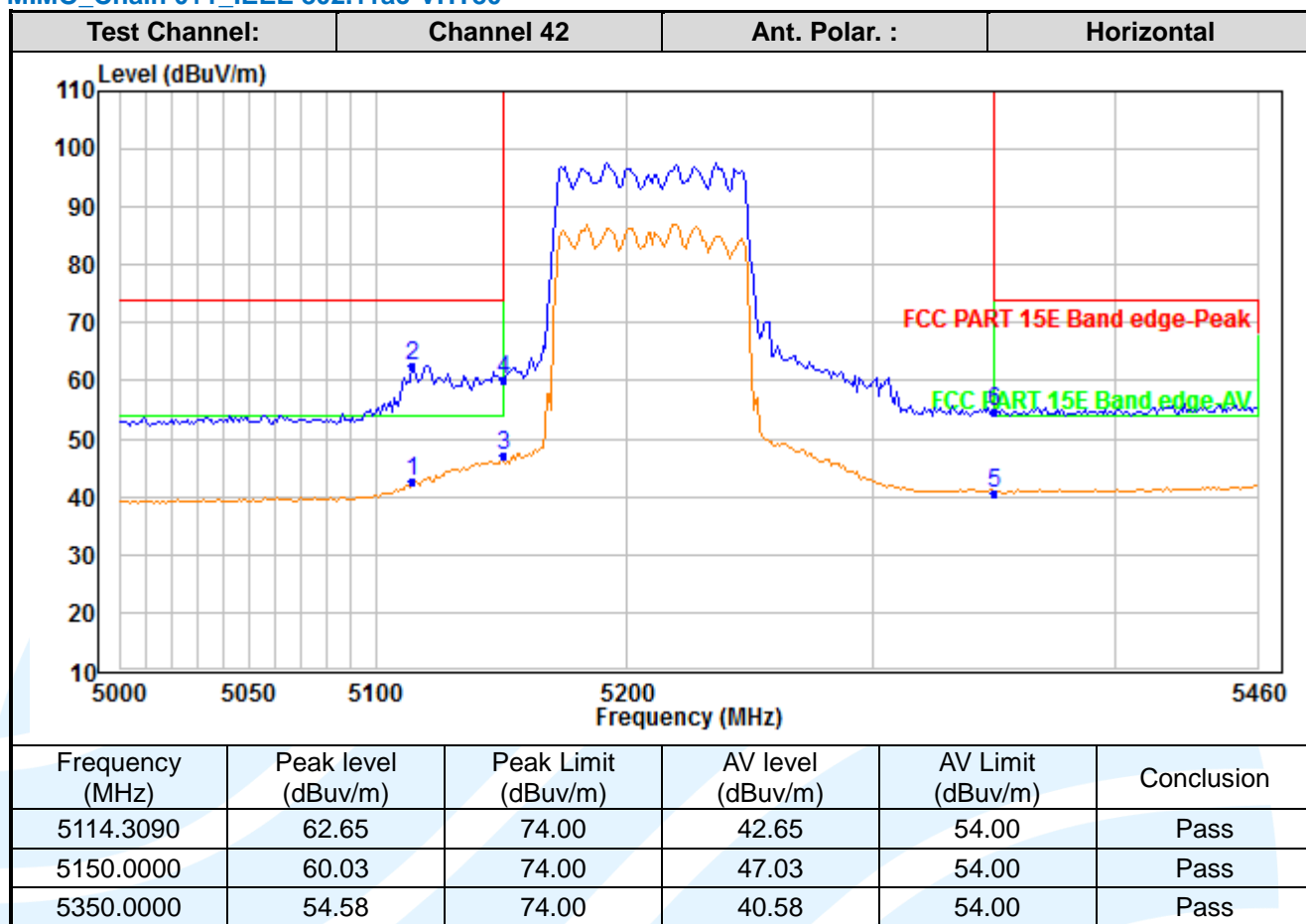


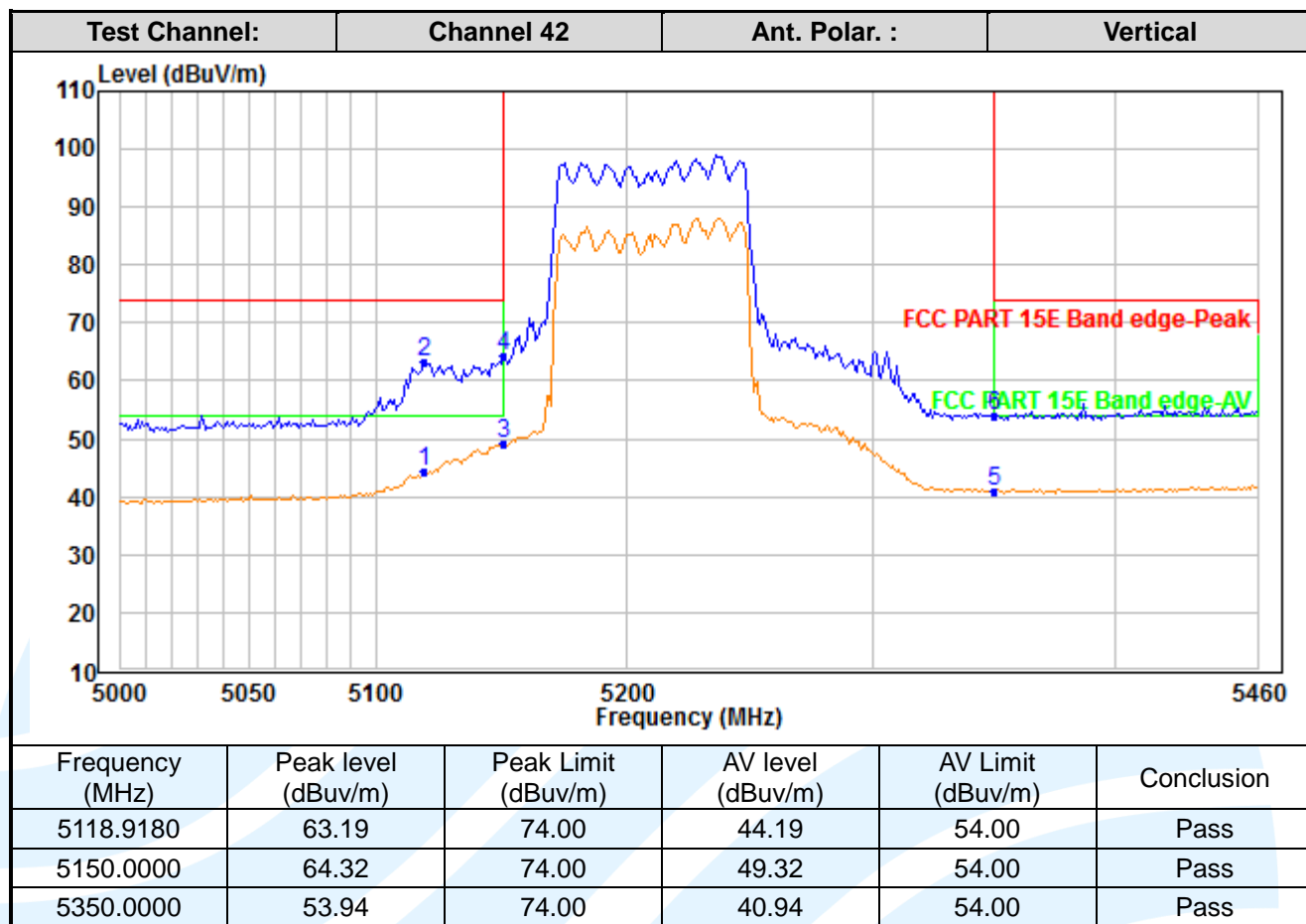


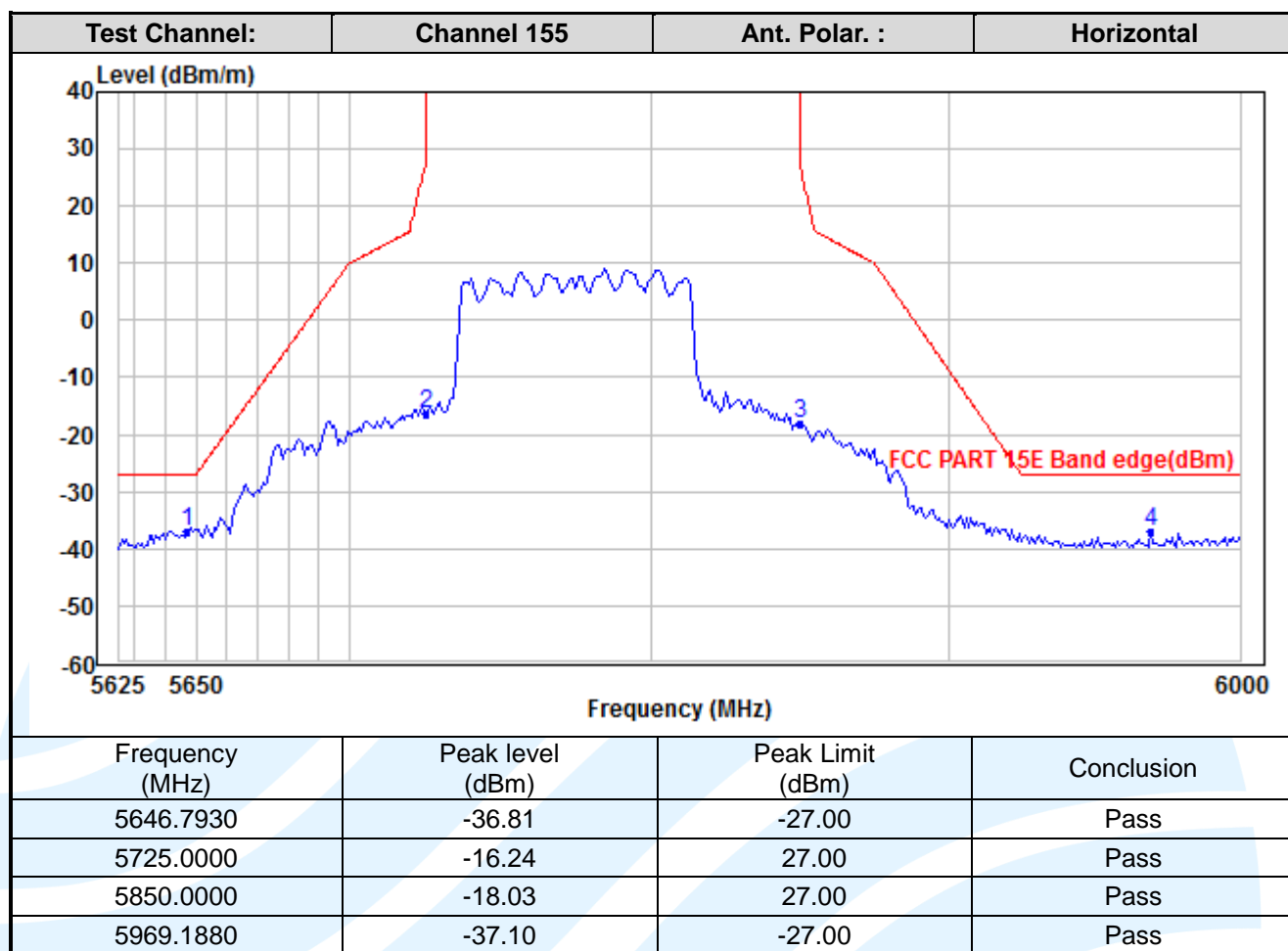


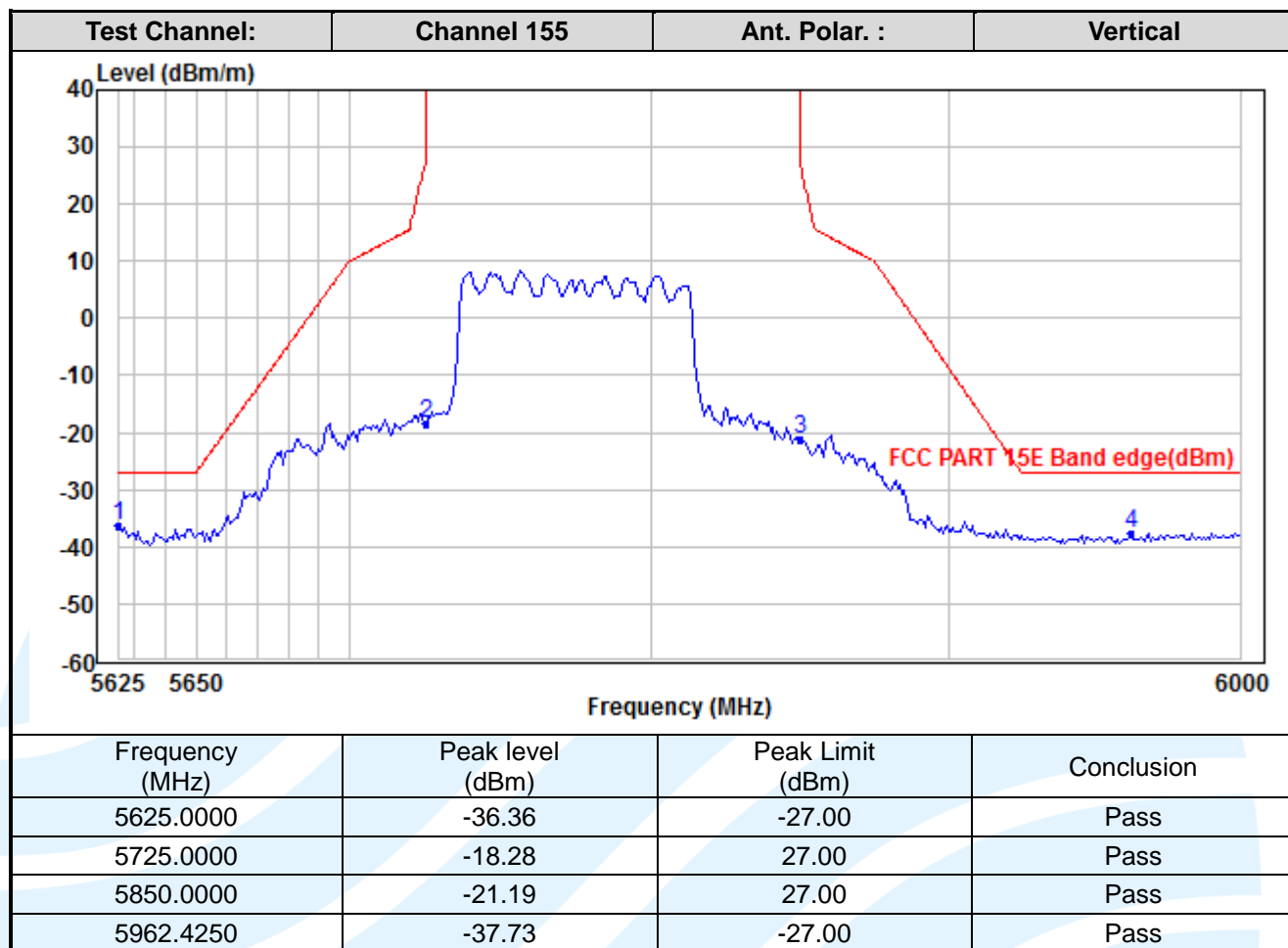


MIMO_Chain 0+1_ IEEE 802.11ac-VHT80









5.8 AC POWER LINE CONDUCTED EMISSION

Test Requirement: FCC 47 CFR Part 15 Subpart C Section 15.207

Test Method: ANSI C63.10-2013 Section 6.2

Limits:

Frequency range (MHz)	Limits (dB(μV))	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

Remark:

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

Test Setup: Refer to section 4.4.2 for details.

Test Procedures:

Test frequency range :150KHz-30MHz

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Equipment Used: Refer to section 3 for details.

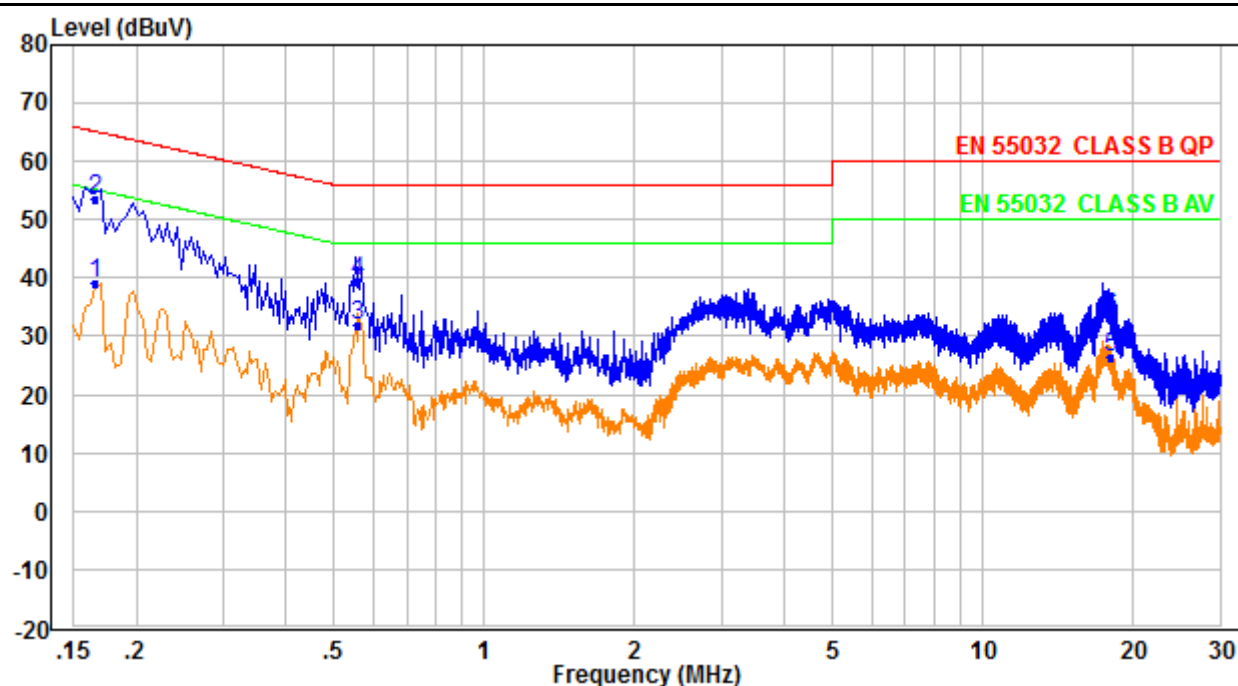
Test Result: Pass

The measurement data as follows:

Quasi Peak and Average:

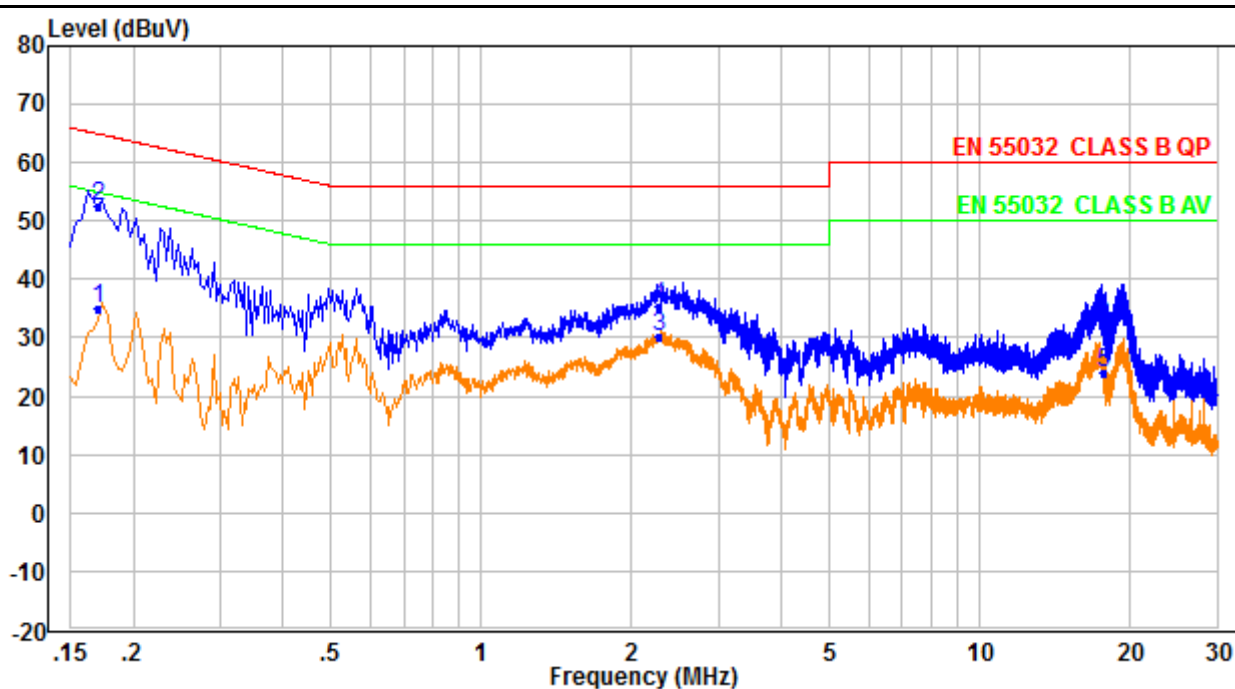
Mode: WIFI Link

Live Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.165	28.90	10.18	39.08	55.22	-16.14	Average
2	0.165	43.40	10.18	53.58	65.22	-11.64	QP
3	0.555	21.50	10.25	31.75	46.00	-14.25	Average
4	0.555	29.30	10.25	39.55	56.00	-16.45	QP
5	18.052	14.10	12.46	26.56	50.00	-23.44	Average
6	18.052	20.80	12.46	33.26	60.00	-26.74	QP

Neutral Line



No.	Frequency (MHz)	Reading (dBUV)	Correction factor (dB)	Result (dBUV)	Limit (dBUV)	Margin (dB)	Remark
1	0.169	24.70	10.22	34.92	54.99	-20.07	Average
2	0.169	42.40	10.22	52.62	64.99	-12.37	QP
3	2.281	19.70	10.49	30.19	46.00	-15.81	Average
4	2.281	24.70	10.49	35.19	56.00	-20.81	QP
5	17.838	11.50	12.47	23.97	50.00	-26.03	Average
6	17.838	19.50	12.47	31.97	60.00	-28.03	QP

Remark:

1. An initial pre-scan was performed on the Phase and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

APPENDIX 1 PHOTOS OF TEST SETUP

See test photos attached in Appendix 1 for the actual connections between Product and support equipment.

APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

*** End of Report ***

The test report is effective only with both signature and specialized stamp. The result(s) shown in this report refer only to the sample(s) tested. Without written approval of UnionTrust, this report can't be reproduced except in full.
