

5.8 BAND EDGE MEASUREMENTS (RADIATED)

Test Requirement: FCC 47 CFR Part 15 Subpart C Section 15.205/15.209
RSS-247 Issue 3, Section 5.5

Test Method: ANSI C63.10-2013 Clause 11.13

Limits:

Radiated emissions which fall in the restricted bands, as defined in section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a).

Frequency	Limit (dB μ V/m @3m)	Remark
30 MHz-88 MHz	40.0	Quasi-peak Value
88 MHz-216 MHz	43.5	Quasi-peak Value
216 MHz-960 MHz	46.0	Quasi-peak Value
960 MHz-1 GHz	54.0	Quasi-peak Value
Above 1 GHz	54.0	Average Value
	74.0	Peak Value

Test Setup: Refer to section 4.4.1 for details.

Test Procedures:

Radiated band edge measurements at 2390 MHz and 2483.5 MHz were made with the unit transmitting in the low end of the channel range and the high end closest to the restricted bands respectively. The emissions were made on the 966 Semi-Chamber. Use (resolution bandwidth (RBW) = 1 MHz, video bandwidth (VBW) = 3 MHz for peak levels and RBW = 1 MHz and VBW = 10 Hz or 1/T for average levels).

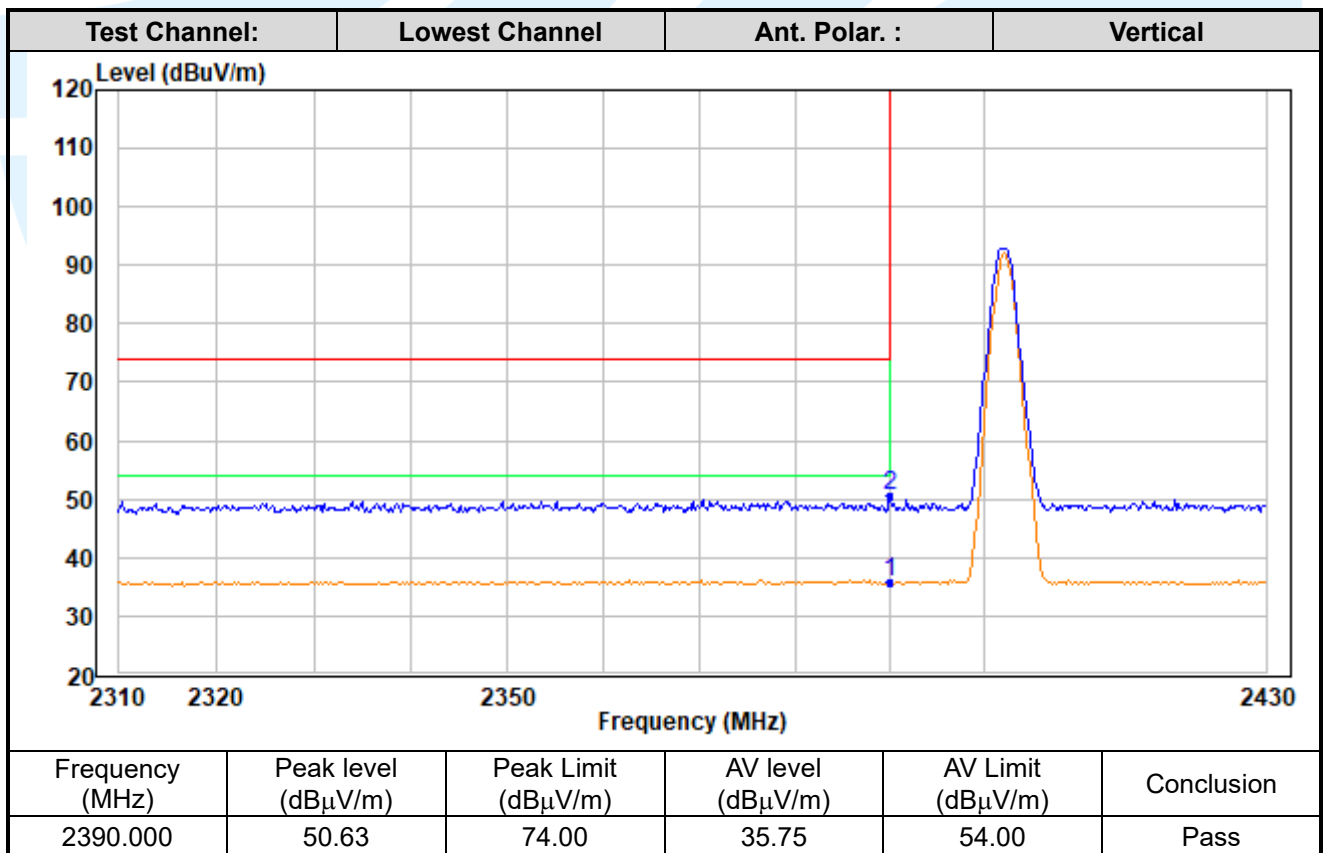
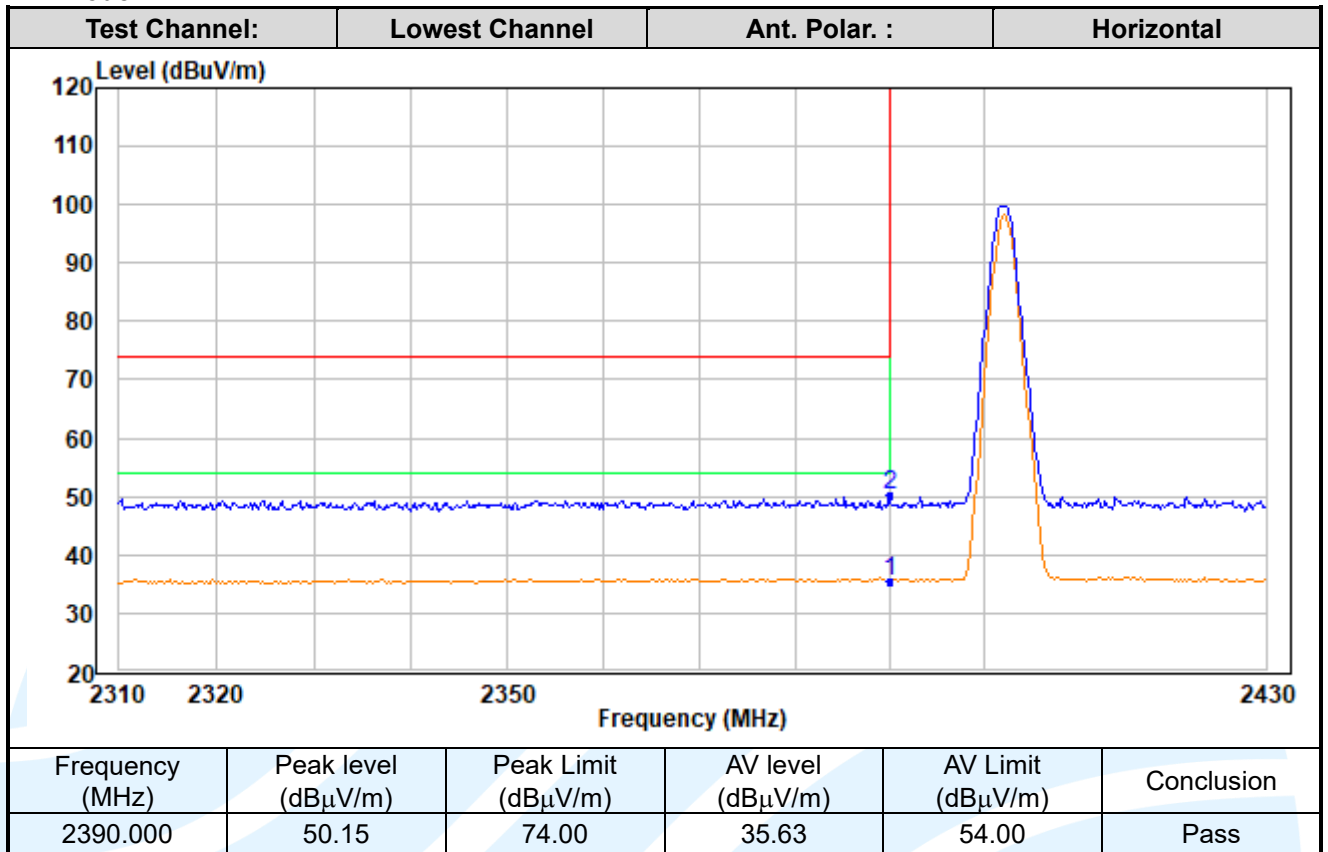
1. Use radiated spurious emission test procedure described in clause 5.10. The transmitter output (antenna port) was connected to the test receiver.
2. Set the PK and AV limit line.
3. Record the fundamental emission and emissions out of the band-edge.
4. Determine band-edge compliance as required.

Equipment Used: Refer to section 3 for details.

Test Result: Pass

The measurement data as follows:

LE Mode:



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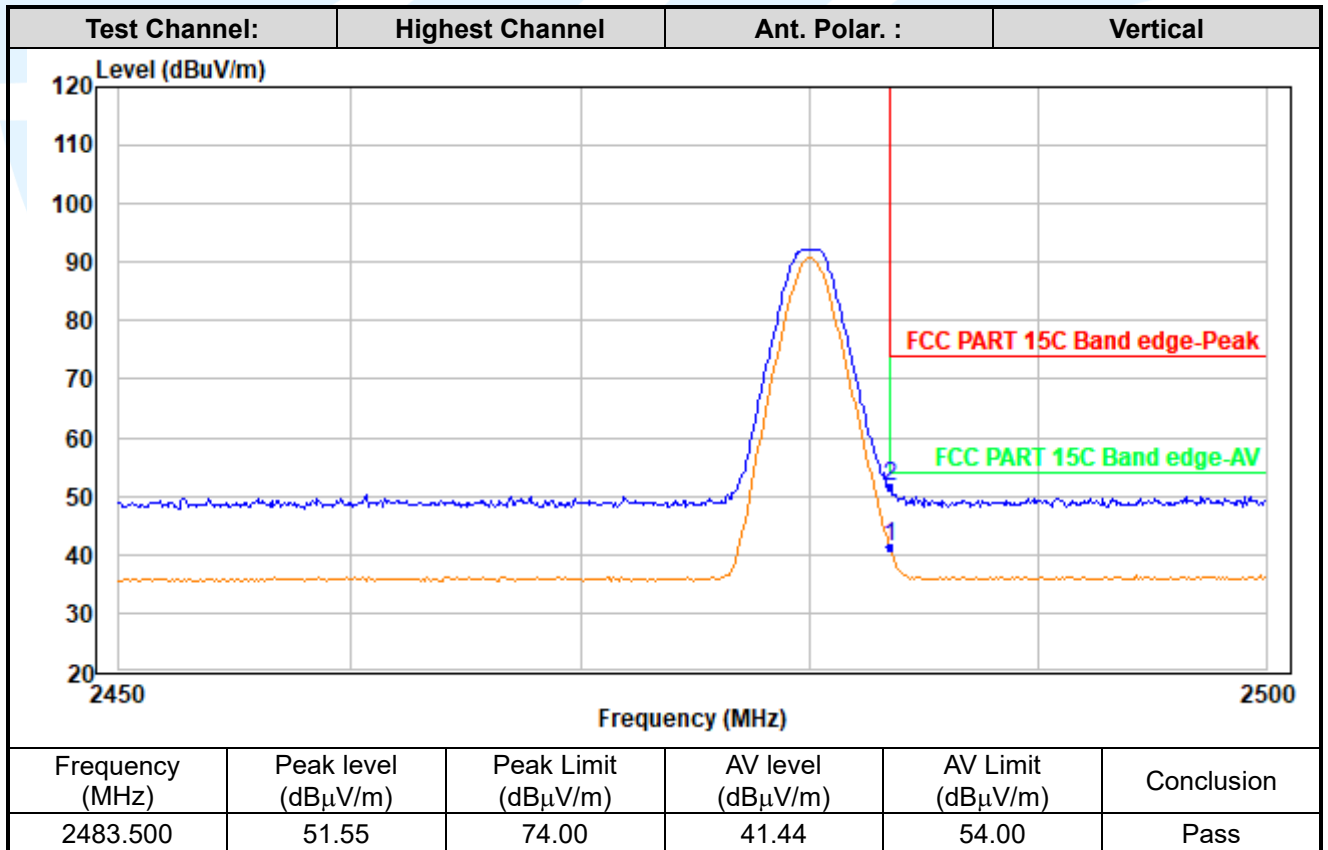
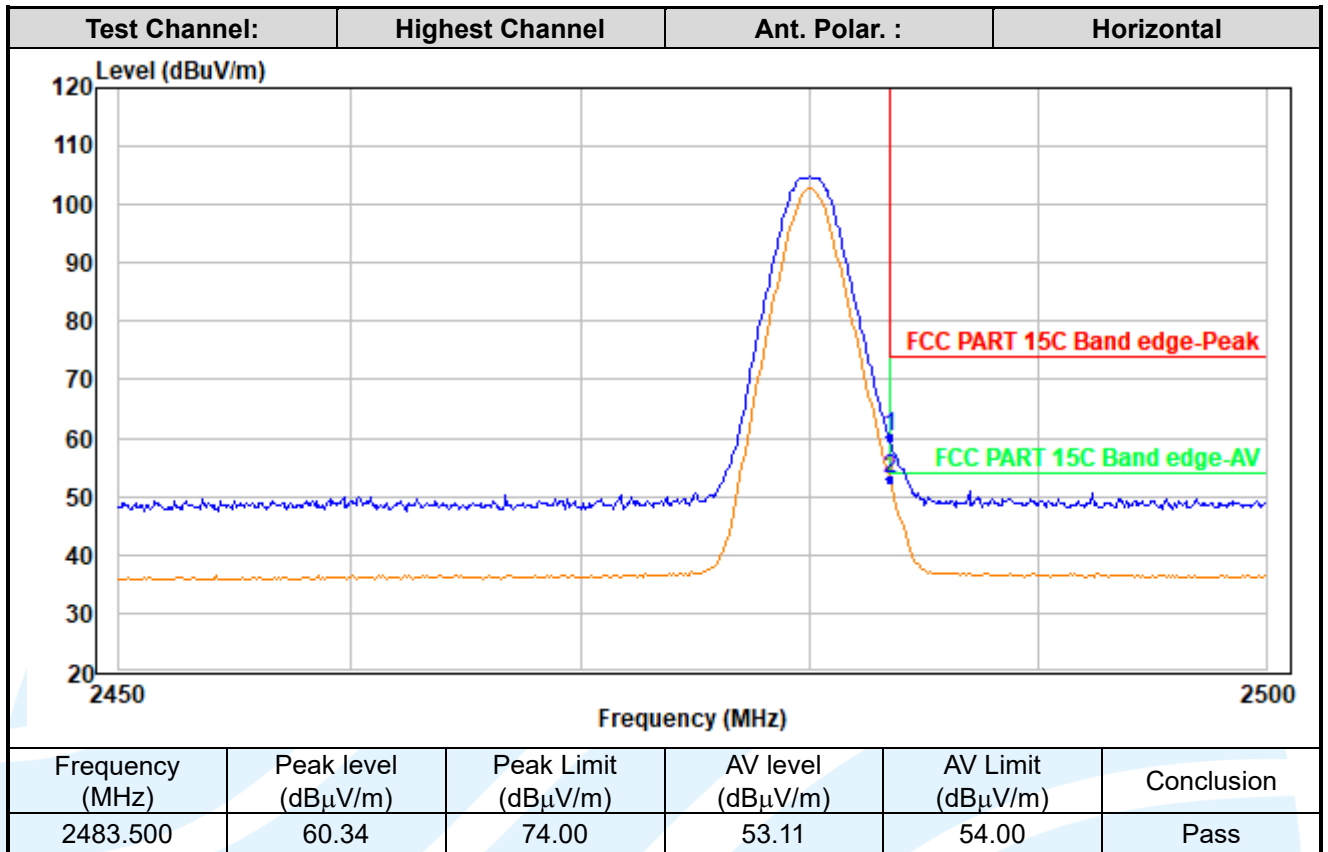
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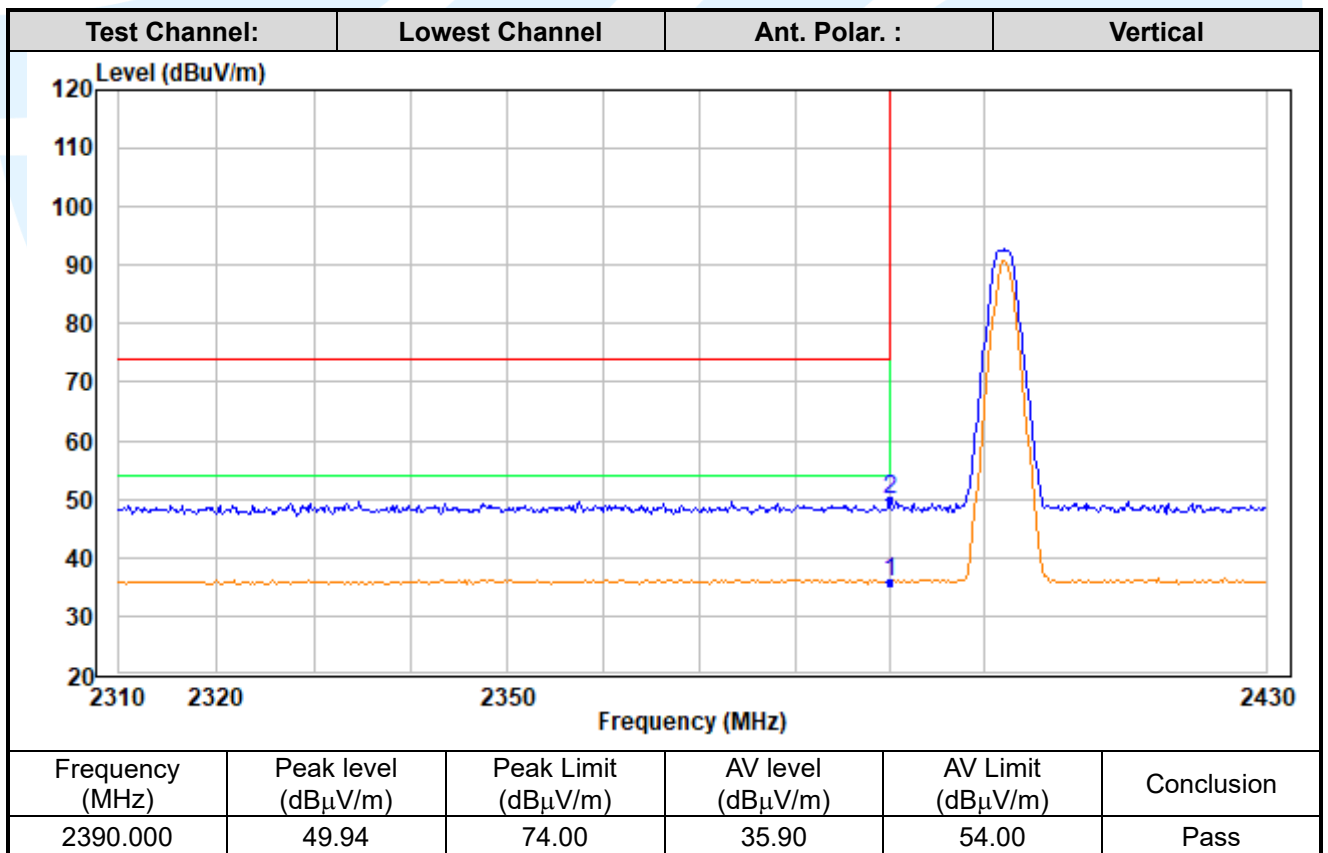
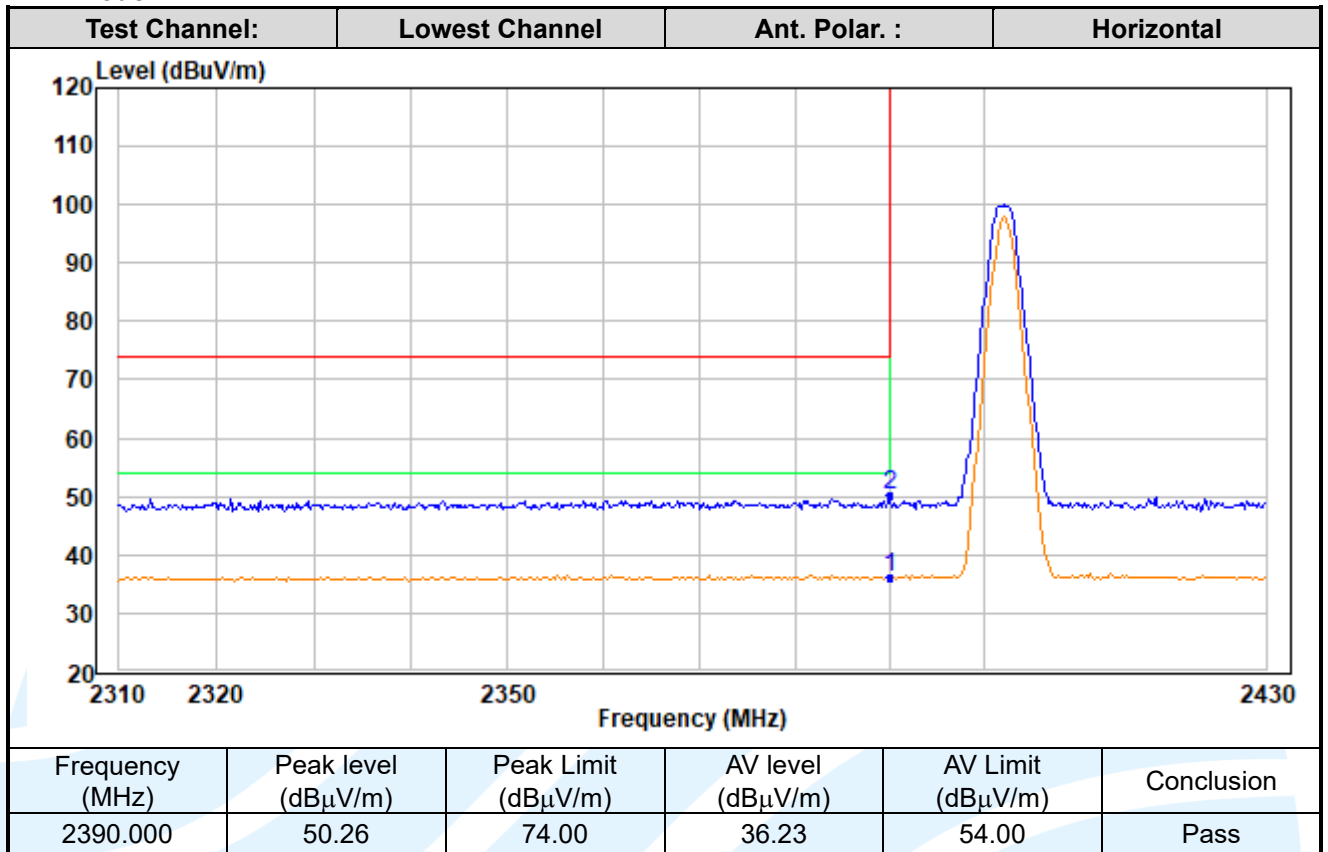
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2LE Mode:

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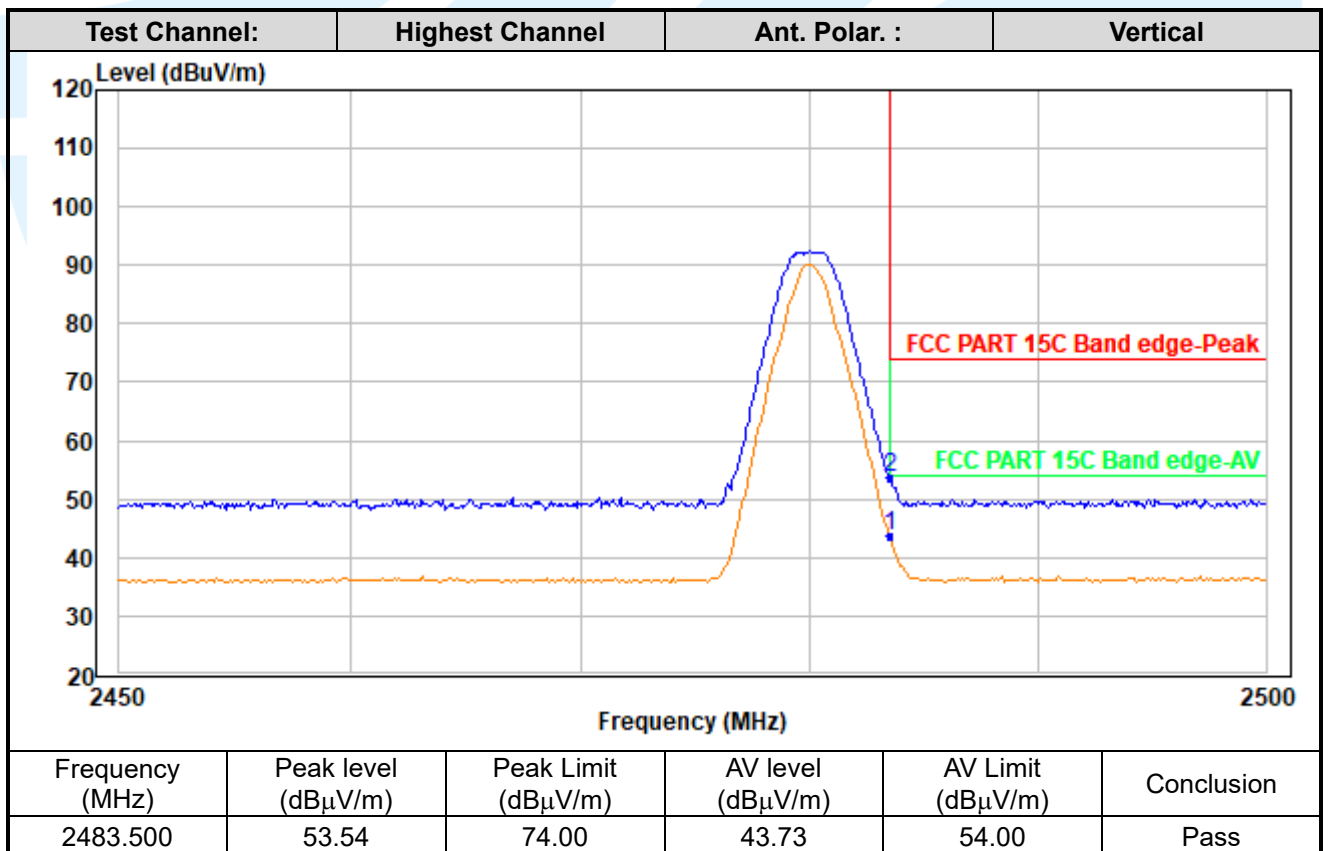
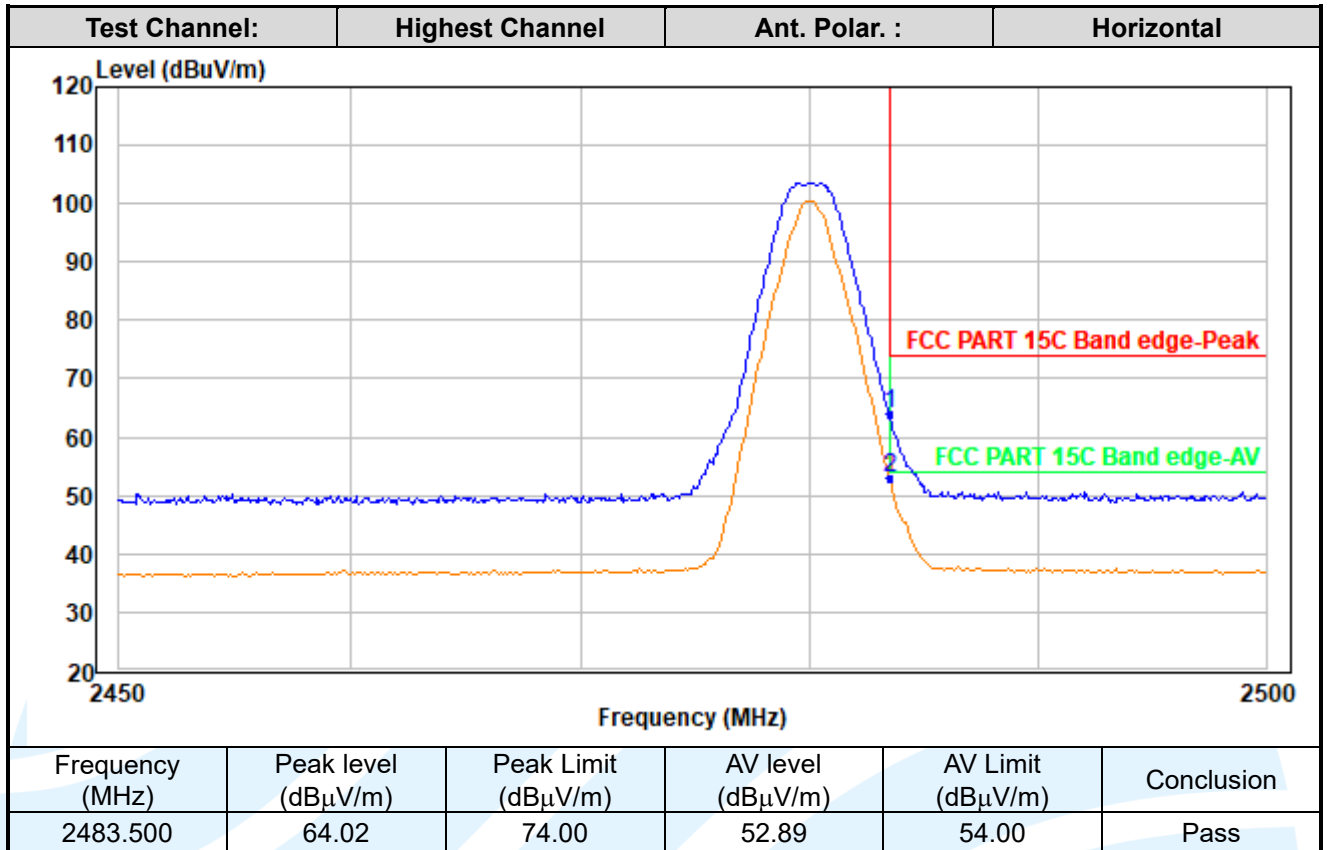
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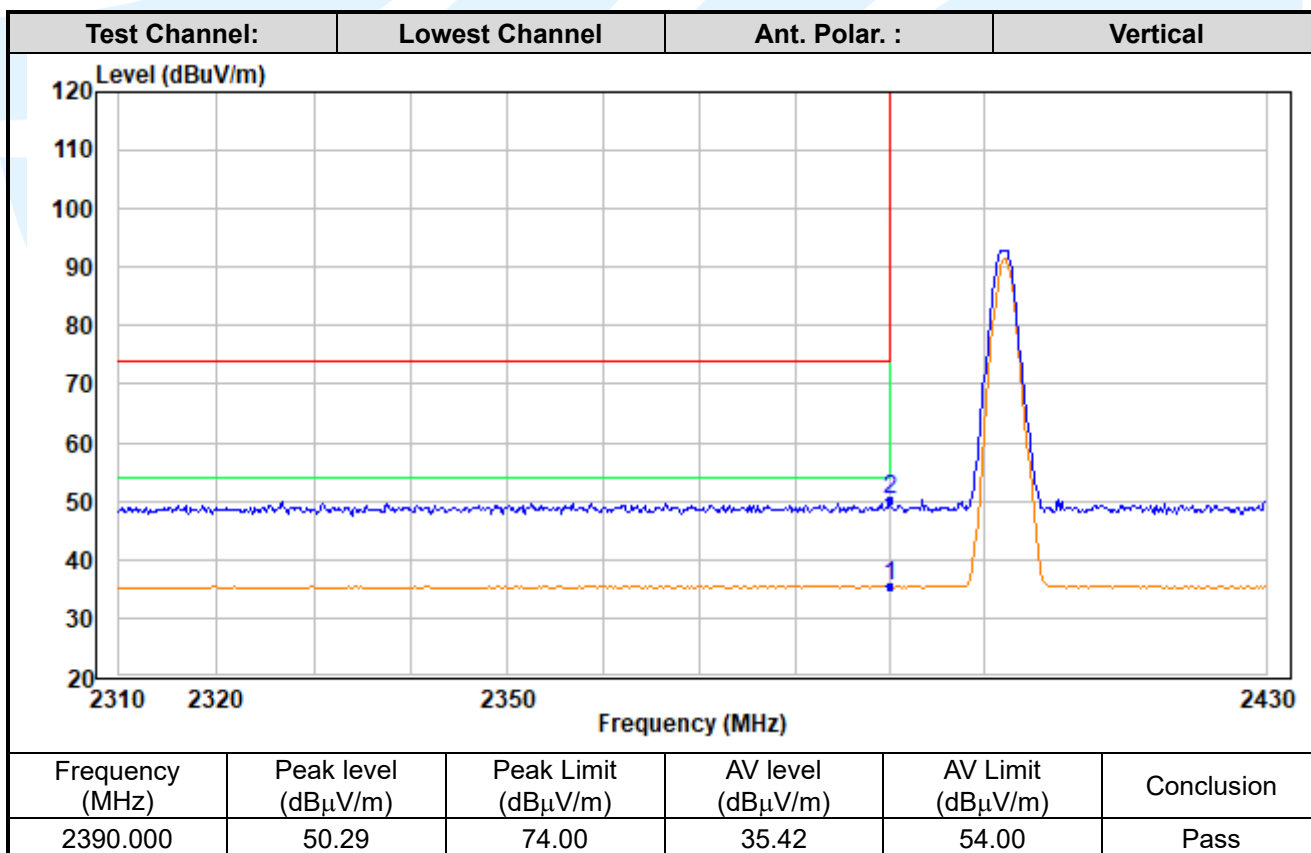
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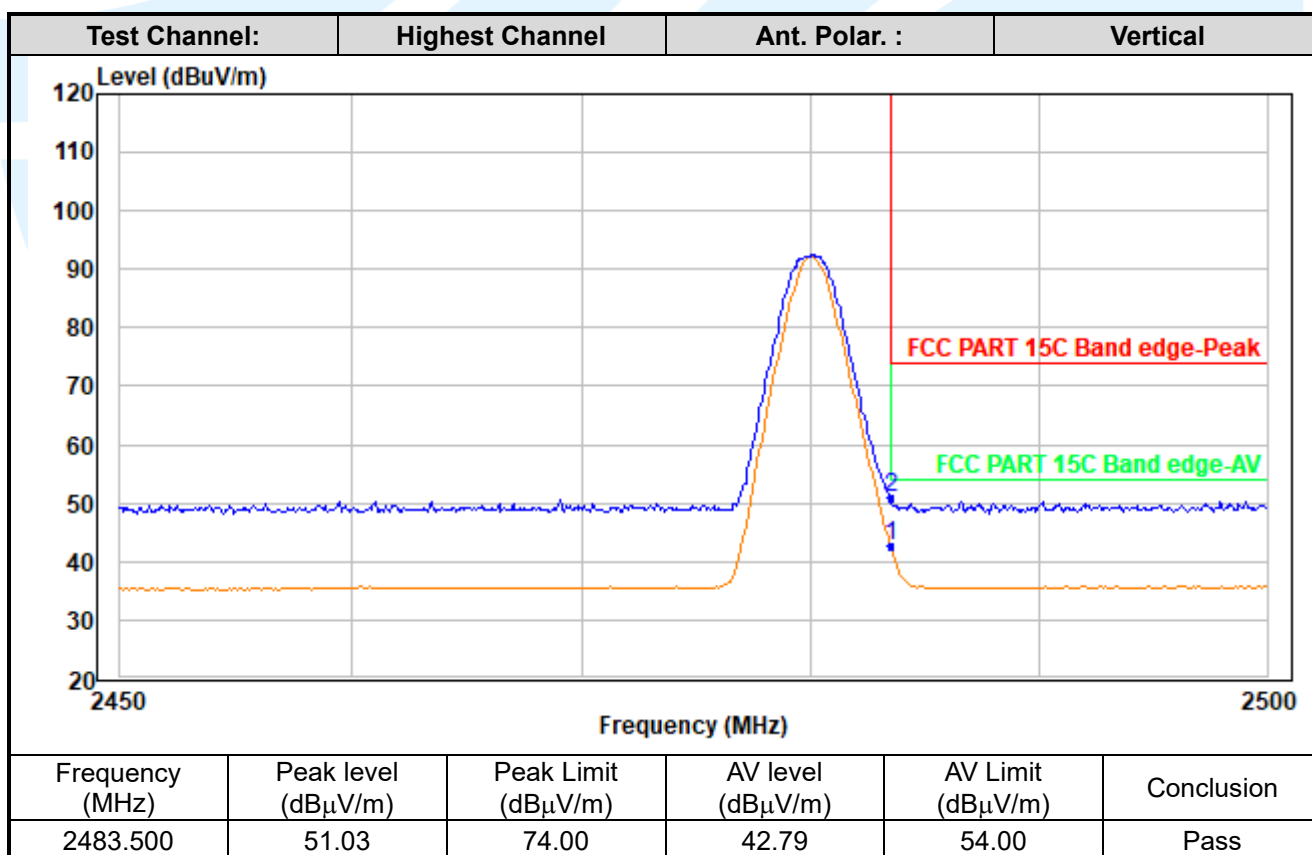
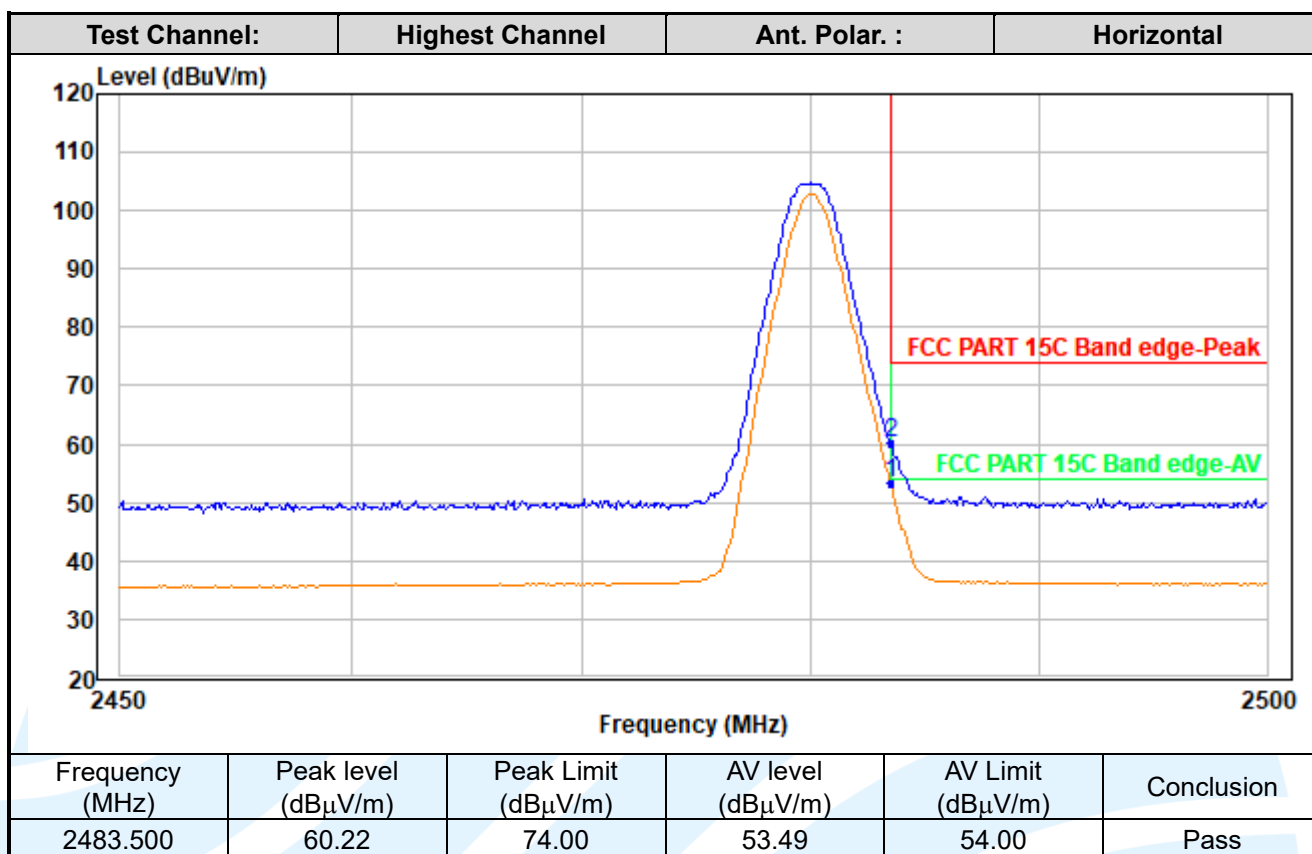
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Test Channel:	Lowest Channel	Ant. Polar. :	Horizontal		
Frequency (MHz)	Peak level (dBμV/m)	Peak Limit (dBμV/m)	AV level (dBμV/m)	AV Limit (dBμV/m)	Conclusion
2390.000	50.14	74.00	35.47	54.00	Pass





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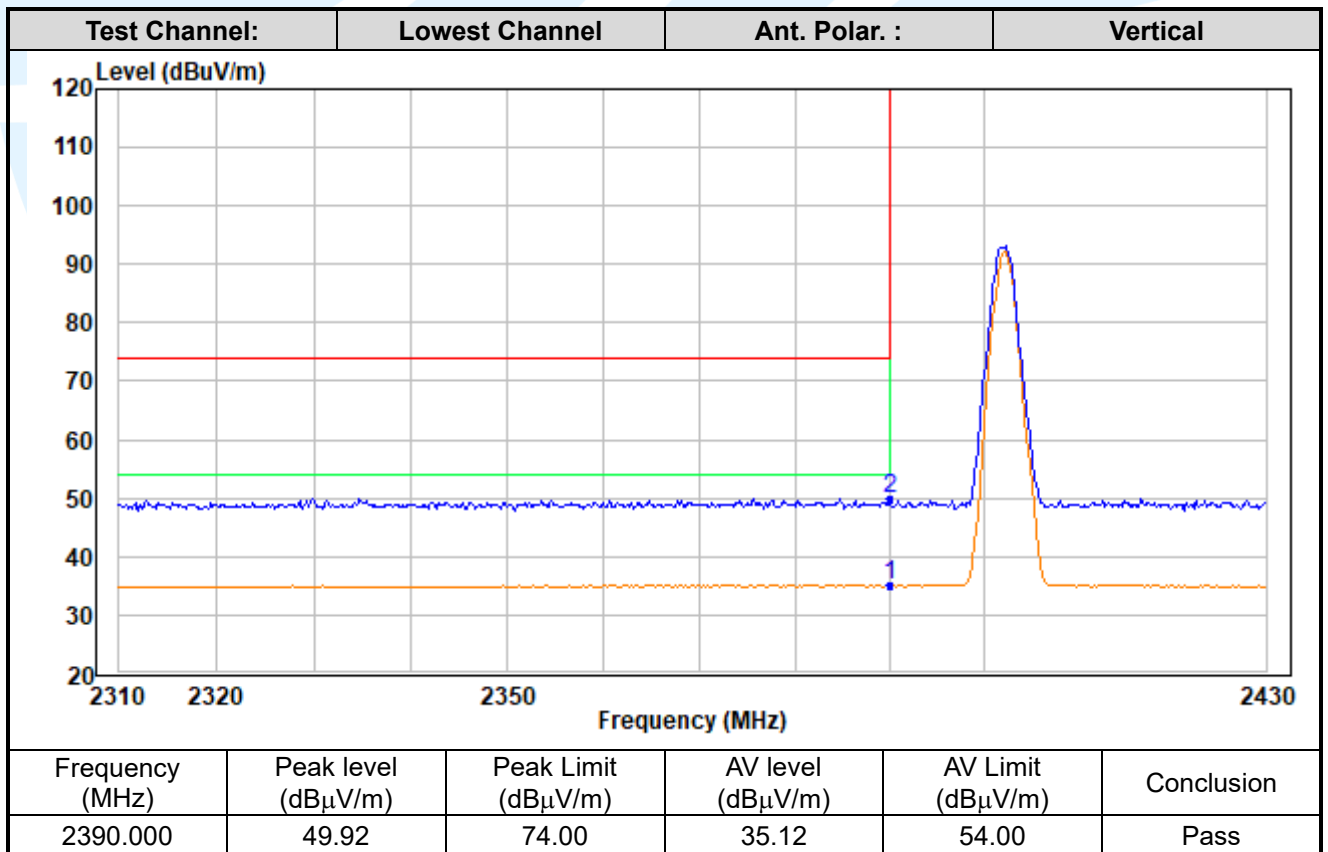
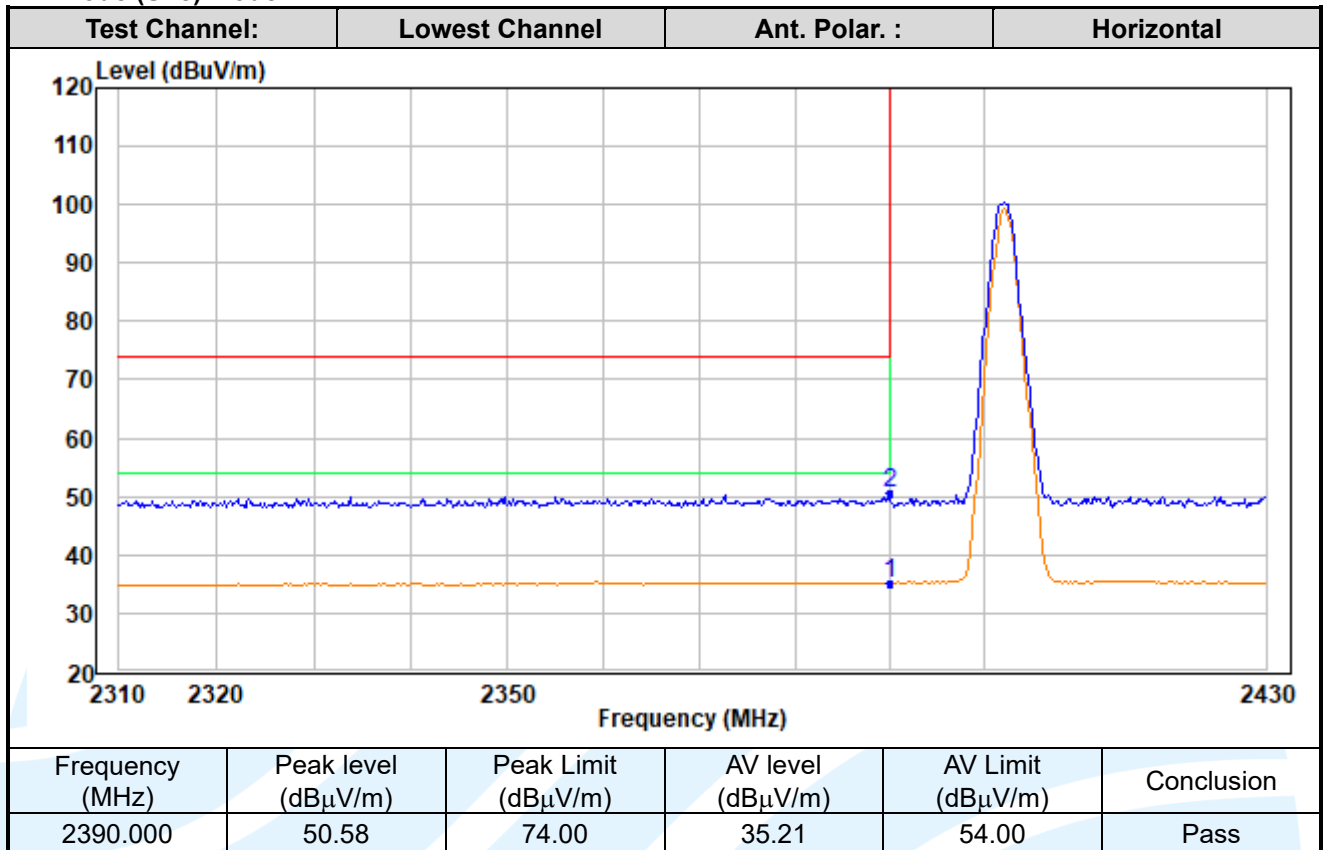
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LE Code (S=8) Mode:

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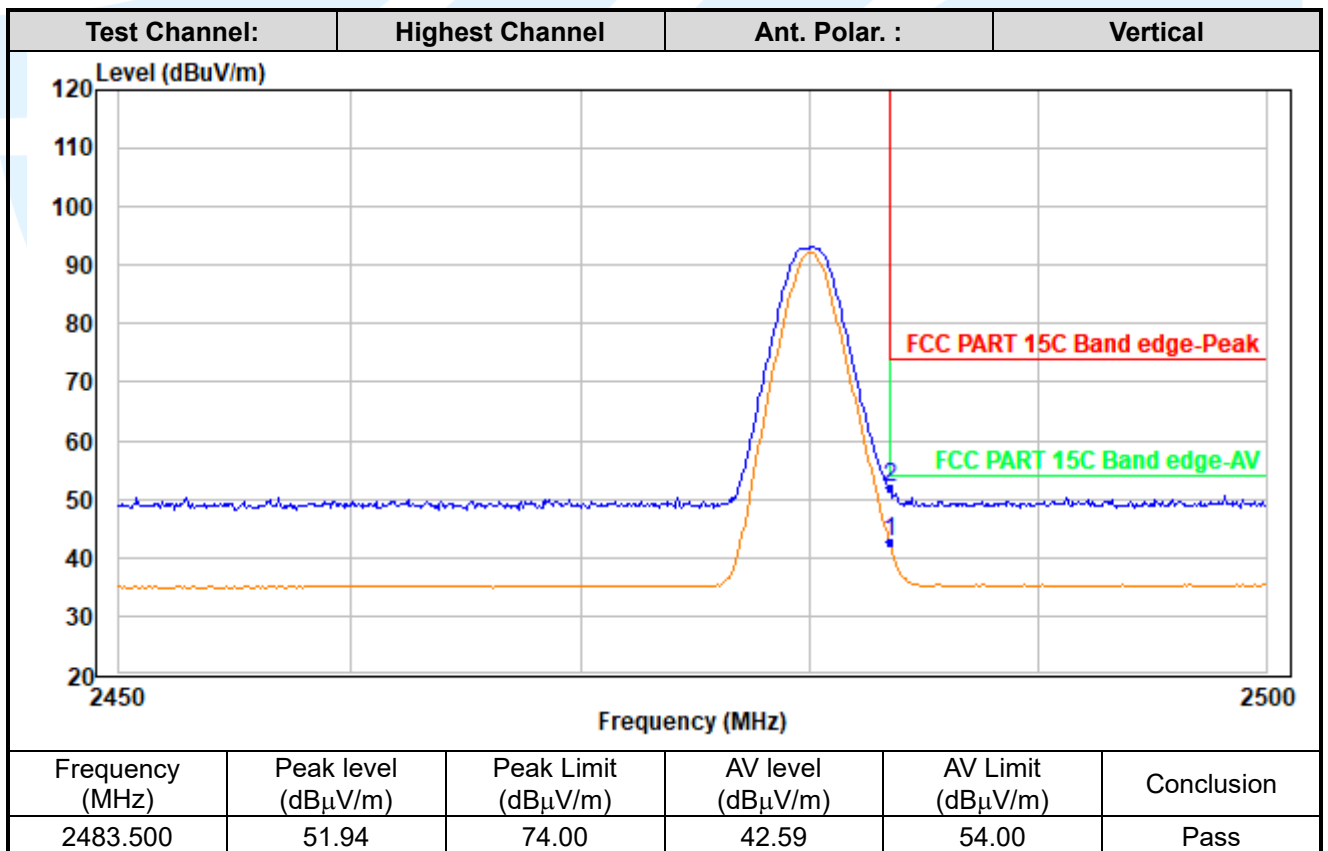
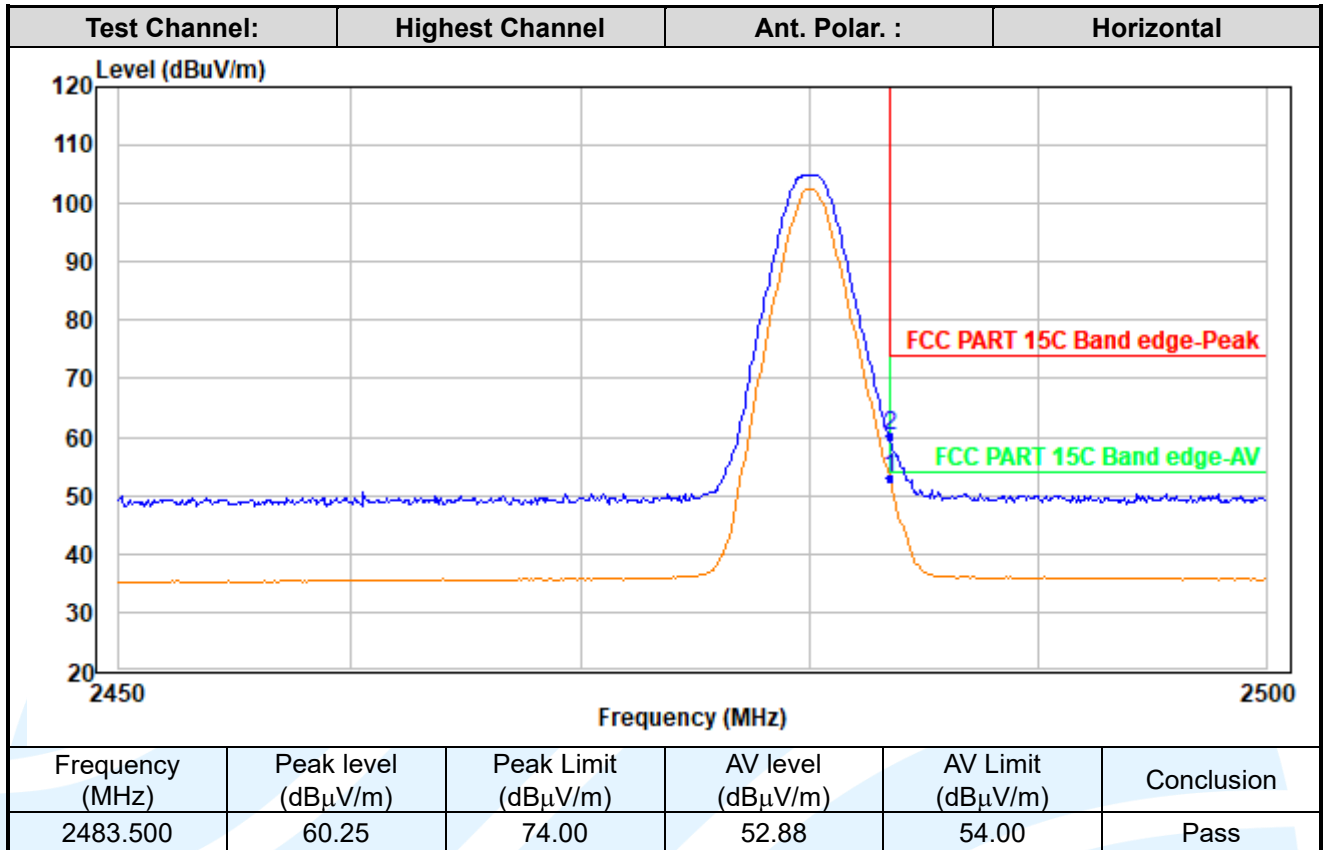
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5.9 CONDUCTED EMISSION

Test Requirement: 47 CFR Part 15C Section 15.207
RSS-Gen Issue 5, Section 8.8

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 50Ω/50μH + 5Ω 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.

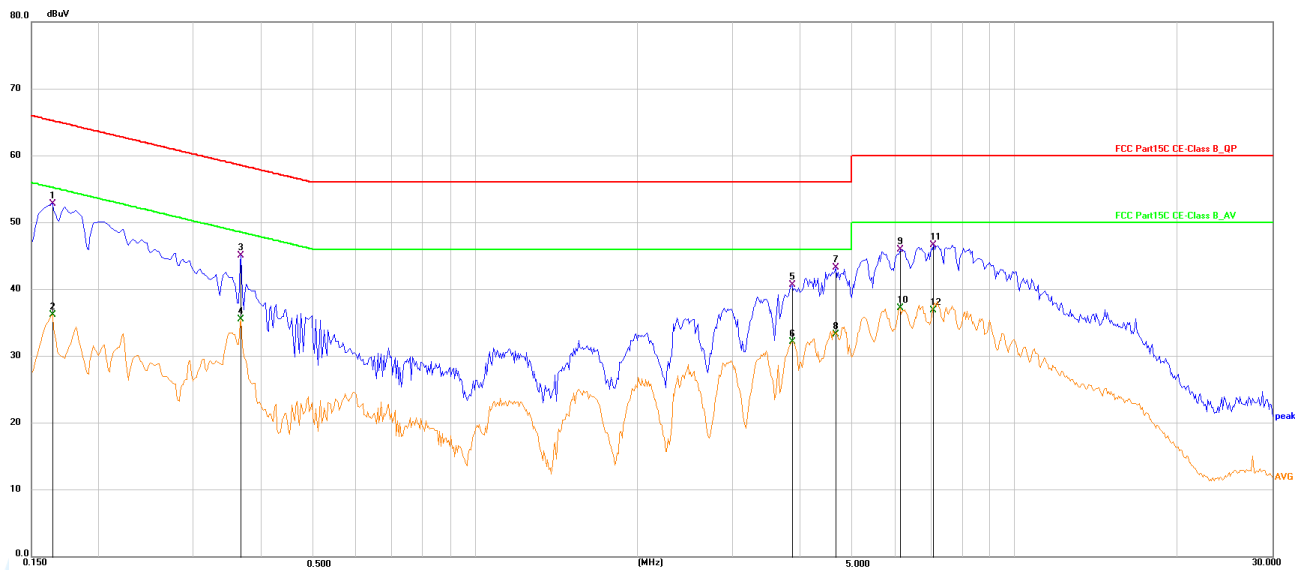
Test Result: Pass

The worst measurement data as follows:

Quasi Peak and Average:

Mode: BT Link

Live Line



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.1641	42.61	10.19	52.80	65.25	-12.45	QP
2	0.1641	25.99	10.19	36.18	55.25	-19.07	AVG
3	0.3673	34.88	10.15	45.03	58.56	-13.53	QP
4	0.3673	25.38	10.15	35.53	48.56	-13.03	AVG
5	3.8603	30.39	10.23	40.62	56.00	-15.38	QP
6	3.8603	21.87	10.23	32.10	46.00	-13.90	AVG
7	4.6469	32.97	10.23	43.20	56.00	-12.80	QP
8	4.6469	23.00	10.23	33.23	46.00	-12.77	AVG
9	6.1209	35.58	10.38	45.96	60.00	-14.04	QP
10	6.1209	26.76	10.38	37.14	50.00	-12.86	AVG
11	7.0622	36.16	10.50	46.66	60.00	-13.34	QP
12	7.0622	26.32	10.50	36.82	50.00	-13.18	AVG

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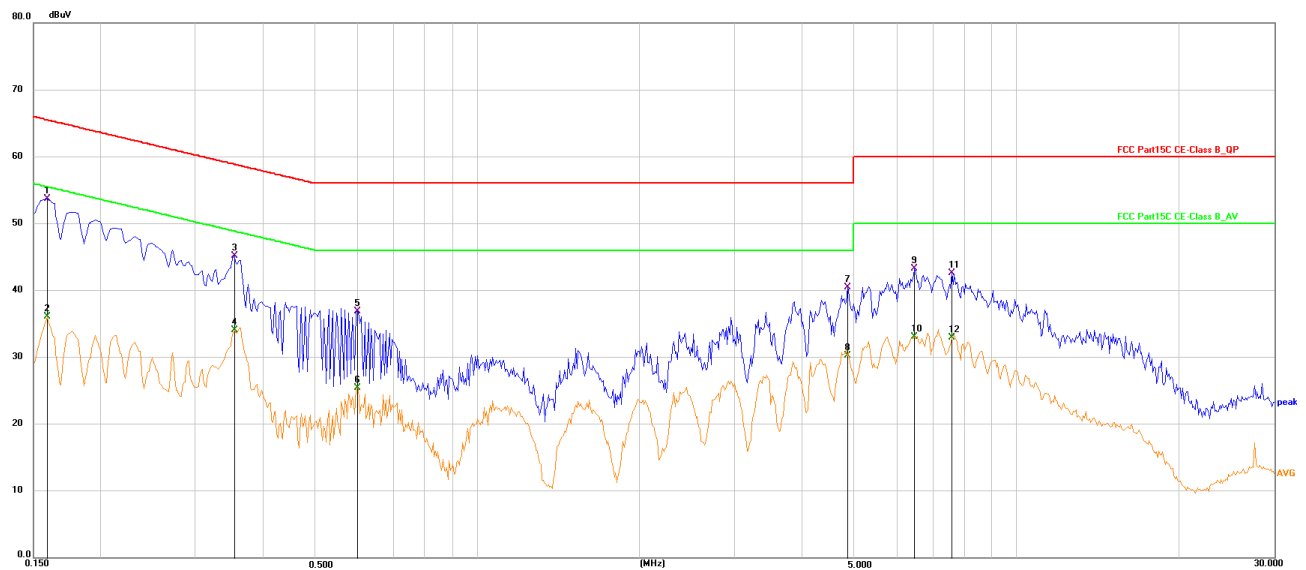
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Neutral Line



No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.1590	43.49	10.17	53.66	65.52	-11.86	QP
2	0.1590	25.87	10.17	36.04	55.52	-19.48	AVG
3	0.3524	35.05	10.15	45.20	58.91	-13.71	QP
4	0.3524	23.87	10.15	34.02	48.91	-14.89	AVG
5	0.5980	26.57	10.27	36.84	56.00	-19.16	QP
6	0.5980	15.17	10.27	25.44	46.00	-20.56	AVG
7	4.8570	30.15	10.27	40.42	56.00	-15.58	QP
8	4.8570	19.98	10.27	30.25	46.00	-15.75	AVG
9	6.4725	32.94	10.30	43.24	60.00	-16.76	QP
10	6.4725	22.78	10.30	33.08	50.00	-16.92	AVG
11	7.5975	32.26	10.30	42.56	60.00	-17.44	QP
12	7.5975	22.66	10.30	32.96	50.00	-17.04	AVG

Remark:

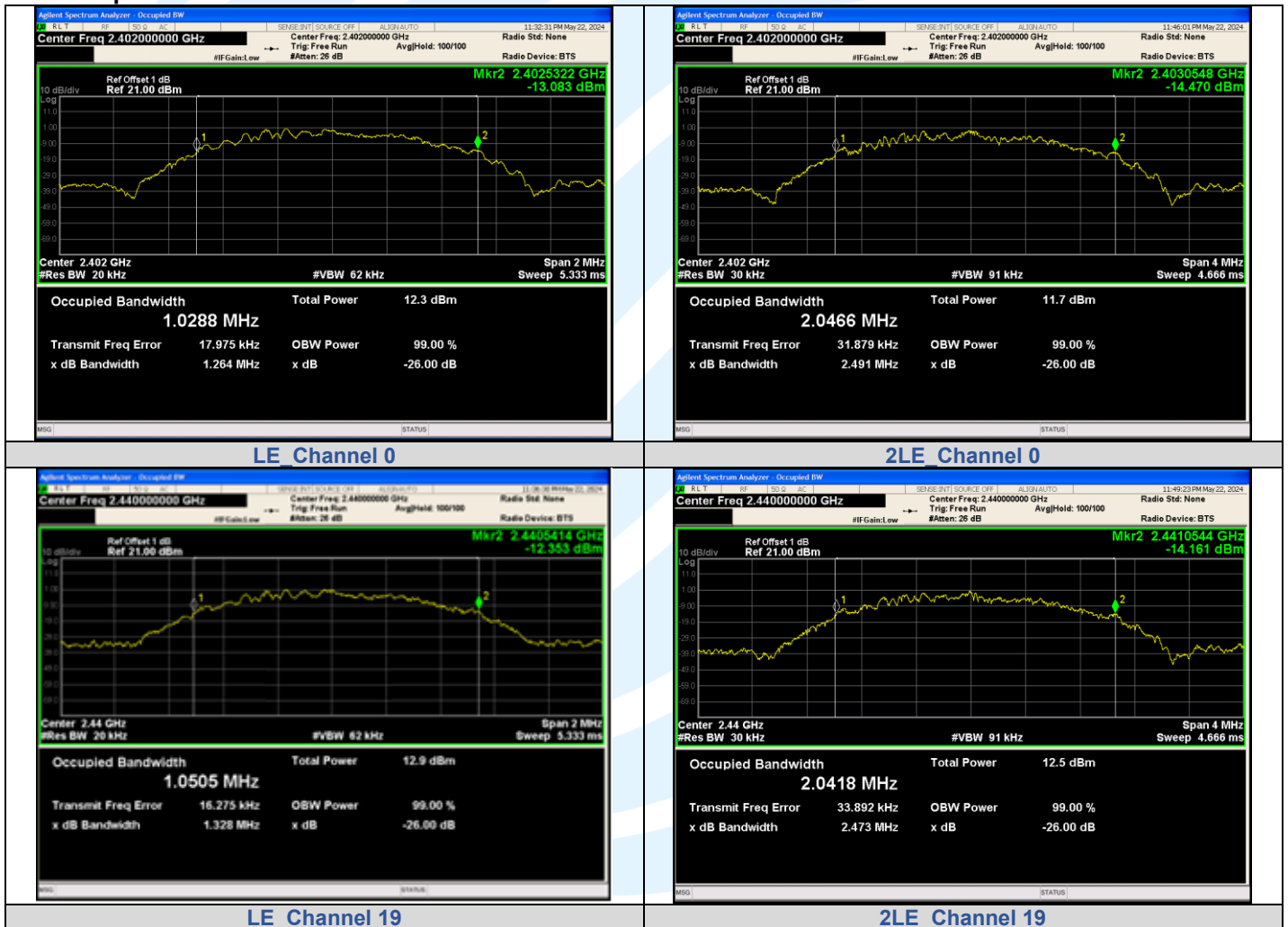
1. Correct Factor = LISN Factor + Cable Loss + Pulse Limiter Factor, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result - Limit
4. An initial pre-scan was performed on the Phase and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

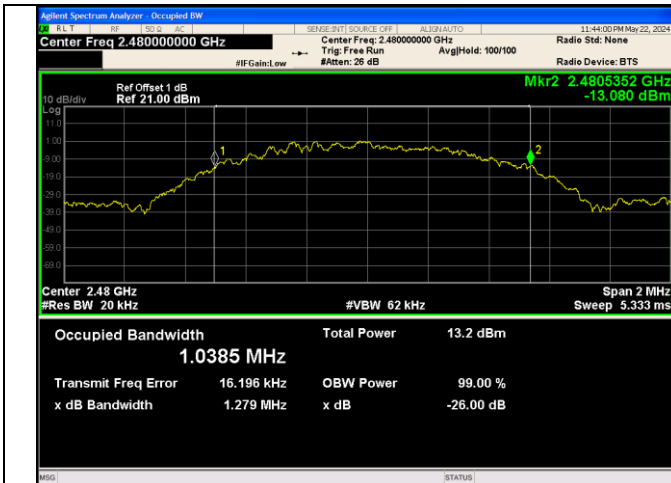
APPENDIX A RF TEST DATA

A.1 99% BANDWIDTH

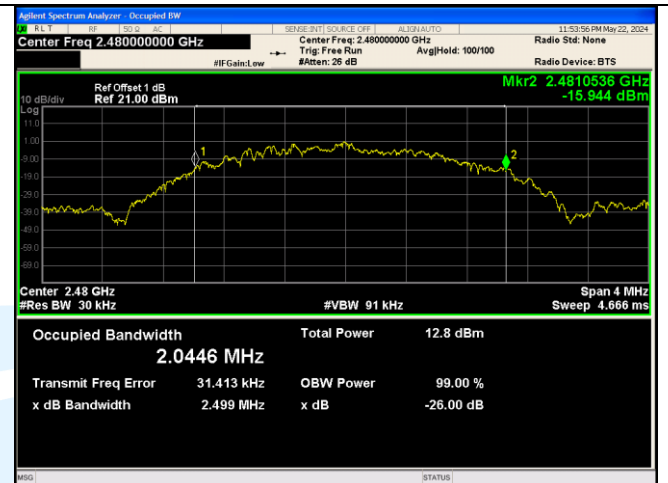
Mode	Channel	99% BW (MHz)
LE	0	1.0288
LE	19	1.0505
LE	39	1.0385
2LE	0	2.0466
2LE	19	2.0418
2LE	39	2.0446
LE Coded (S=2)	0	1.0110
LE Coded (S=2)	19	1.0343
LE Coded (S=2)	39	1.0211
LE Coded (S=8)	0	1.0454
LE Coded (S=8)	19	1.0673
LE Coded (S=8)	39	1.0577

Test Graphs

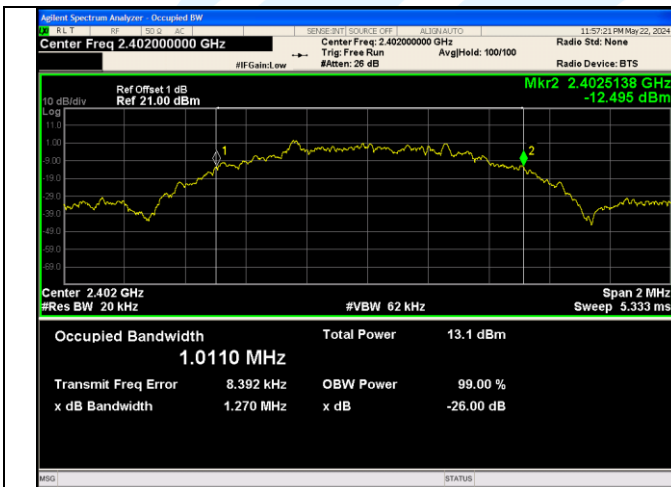




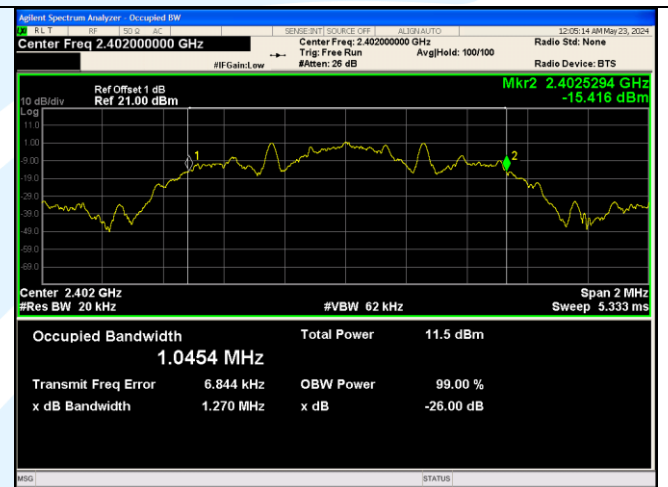
LE_Channel 39



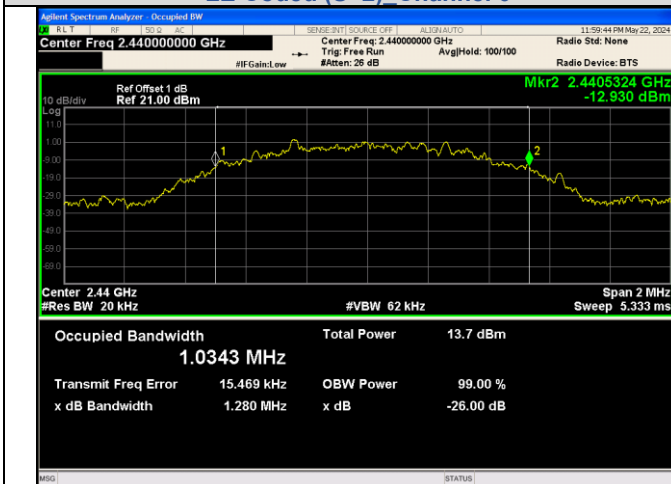
2LE_Channel 39



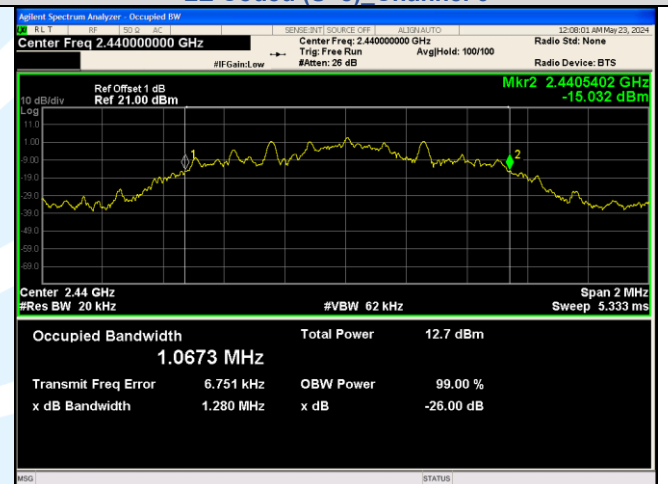
LE Coded (S=2)_Channel 0



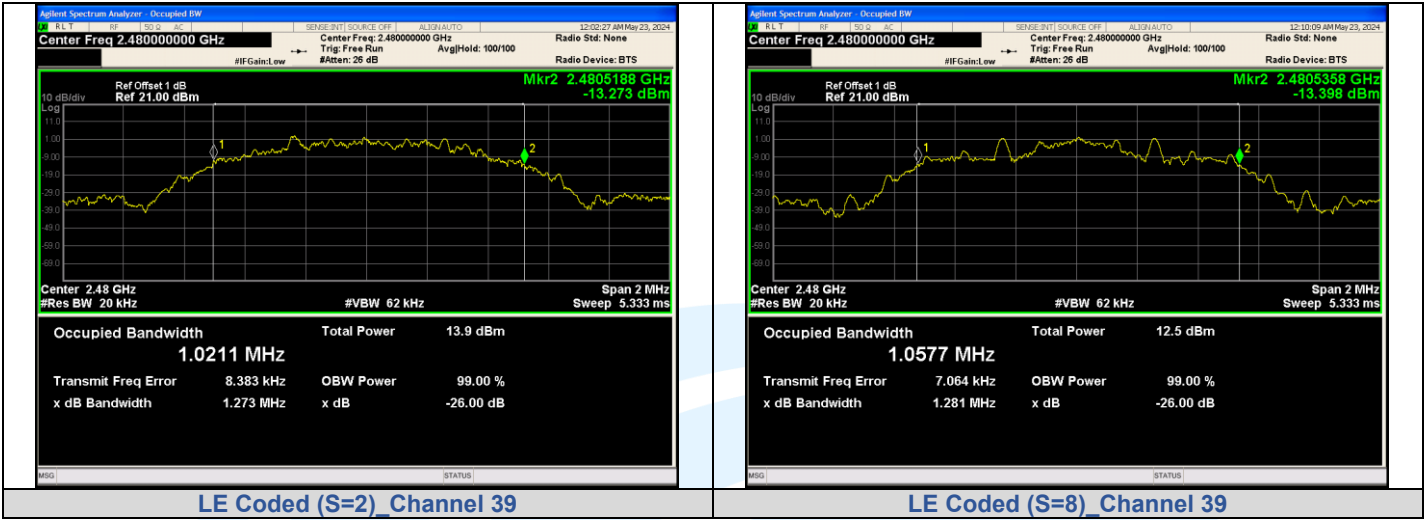
LE Coded (S=8)_Channel 0



LE Coded (S=2)_Channel 19



LE Coded (S=8)_Channel 19



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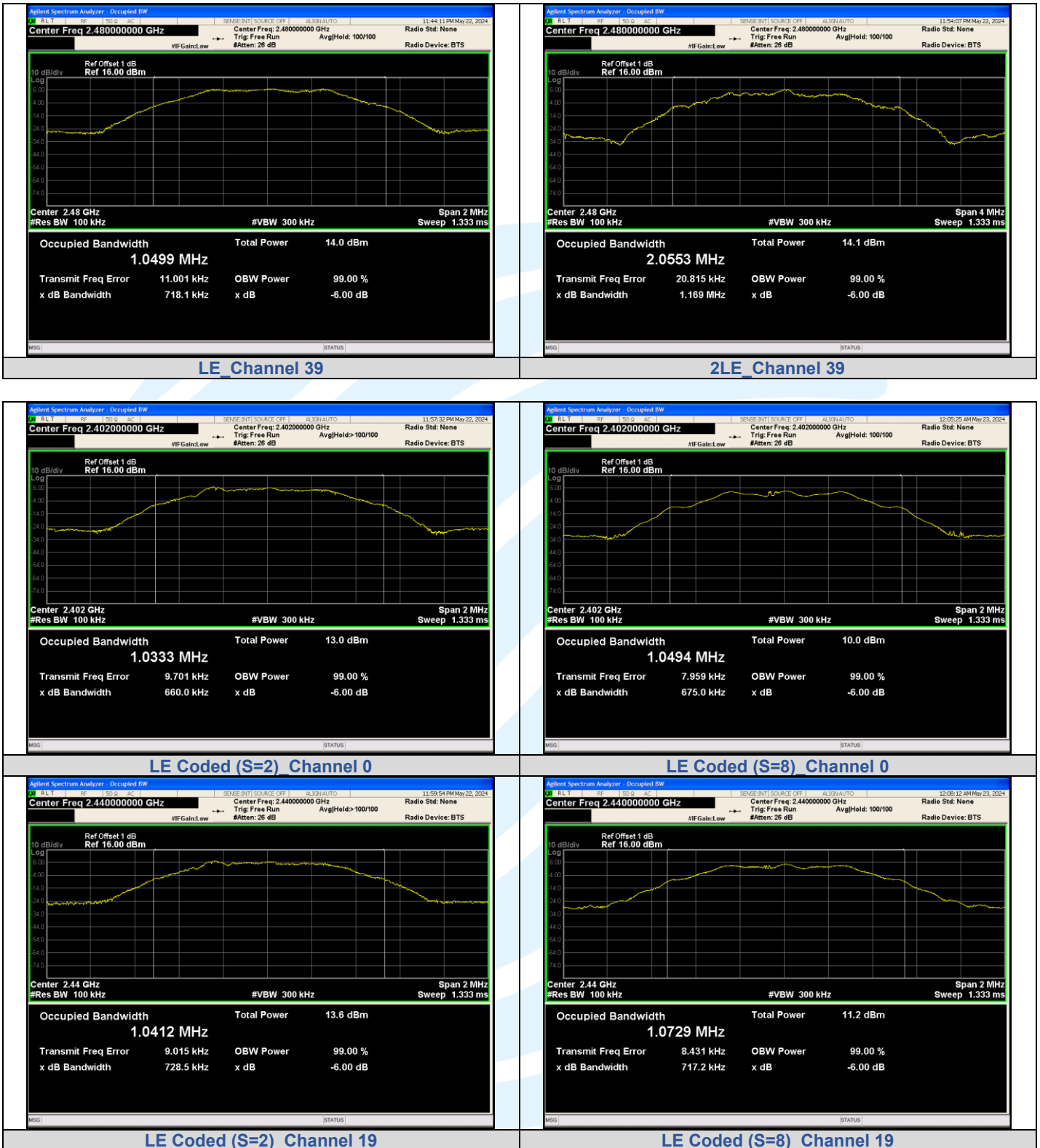
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A.2 6DB BANDWIDTH

Mode	Channel	Center Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
LE	0	2402	0.6987	0.5	PASS
	19	2440	0.7266		PASS
	39	2480	0.7181		PASS
2LE	0	2402	1.170		PASS
	19	2440	1.184		PASS
	39	2480	1.169		PASS
LE Coded (S=2)	0	2402	0.6600		PASS
	19	2440	0.7285		PASS
	39	2480	0.7007		PASS
LE Coded (S=8)	0	2402	0.6750		PASS
	19	2440	0.7172		PASS
	39	2480	0.6723		PASS

Test Graphs







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