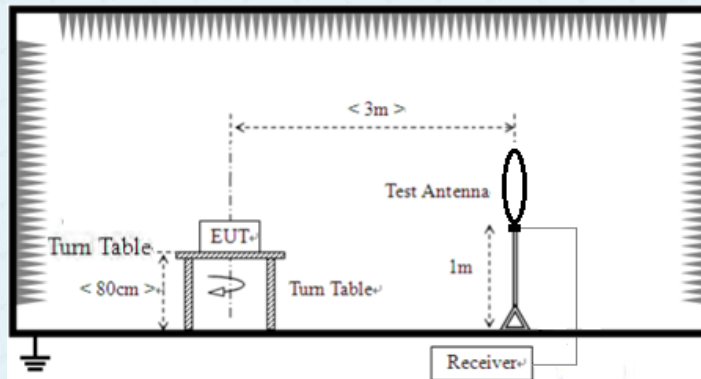


7.6.2 Radiated Emission Method

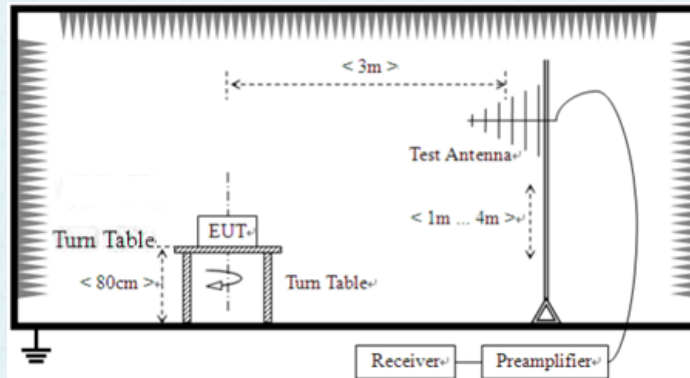
Test Requirement:	FCC Part15 C Section 15.209 RSS-247 Section 3.3 & RSS-Gen Section 8.9																												
Test Method:	ANSI C63.10:2013 & RSS-Gen																												
Test Frequency Range:	9kHz to 25GHz																												
Test site:	Measurement Distance: 3m																												
Receiver setup:	Frequency	Detector	RBW	VBW	Value																								
	9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak																								
	150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak																								
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak																								
	Above 1GHz	Peak	1MHz	3MHz	Peak																								
		Peak	1MHz	10Hz	Average																								
FCC Limit:	<table><tr><th>Frequency (MHz)</th><th>Field strength (microvolts/meter)</th><th>Measurement distance (meters)</th></tr><tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr><tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr><tr><td>1.705-30.0</td><td>30</td><td>30</td></tr><tr><td>30-88</td><td>100**</td><td>3</td></tr><tr><td>88-216</td><td>150**</td><td>3</td></tr><tr><td>216-960</td><td>200**</td><td>3</td></tr><tr><td>Above 960</td><td>500</td><td>3</td></tr></table> The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.					Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)	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
Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)																											
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																											
IC Limit:	Table 5 – General field strength limits at frequencies above 30 MHz <table><tr><th>Frequency (MHz)</th><th>Field strength (µV/m at 3 m)</th></tr><tr><td>30 – 88</td><td>100</td></tr><tr><td>88 – 216</td><td>150</td></tr><tr><td>216 – 960</td><td>200</td></tr><tr><td>Above 960</td><td>500</td></tr></table> Table 6 – General field strength limits at frequencies below 30 MHz <table><tr><th>Frequency</th><th>Magnetic field strength (H-Field) (µA/m)</th><th>Measurement distance (m)</th></tr><tr><td>9 - 490 kHz ¹</td><td>6.37/F (F in kHz)</td><td>300</td></tr><tr><td>490 - 1705 kHz</td><td>63.7/F (F in kHz)</td><td>30</td></tr><tr><td>1.705 - 30 MHz</td><td>0.08</td><td>30</td></tr></table> Note 1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.					Frequency (MHz)	Field strength (µV/m at 3 m)	30 – 88	100	88 – 216	150	216 – 960	200	Above 960	500	Frequency	Magnetic field strength (H-Field) (µA/m)	Measurement distance (m)	9 - 490 kHz ¹	6.37/F (F in kHz)	300	490 - 1705 kHz	63.7/F (F in kHz)	30	1.705 - 30 MHz	0.08	30		
Frequency (MHz)	Field strength (µV/m at 3 m)																												
30 – 88	100																												
88 – 216	150																												
216 – 960	200																												
Above 960	500																												
Frequency	Magnetic field strength (H-Field) (µA/m)	Measurement distance (m)																											
9 - 490 kHz ¹	6.37/F (F in kHz)	300																											
490 - 1705 kHz	63.7/F (F in kHz)	30																											
1.705 - 30 MHz	0.08	30																											

Test setup:

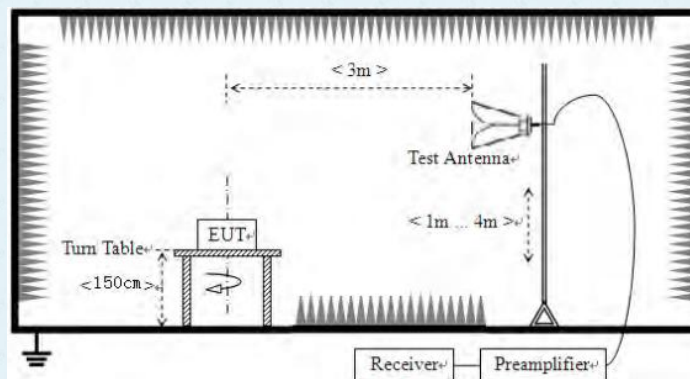
For radiated emissions from 9kHz to 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



Test Procedure:

1. The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) above the ground at a 3 meter camber. 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 antenna height 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 rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.					
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test results:	Pass					

Measurement data:

Remark:

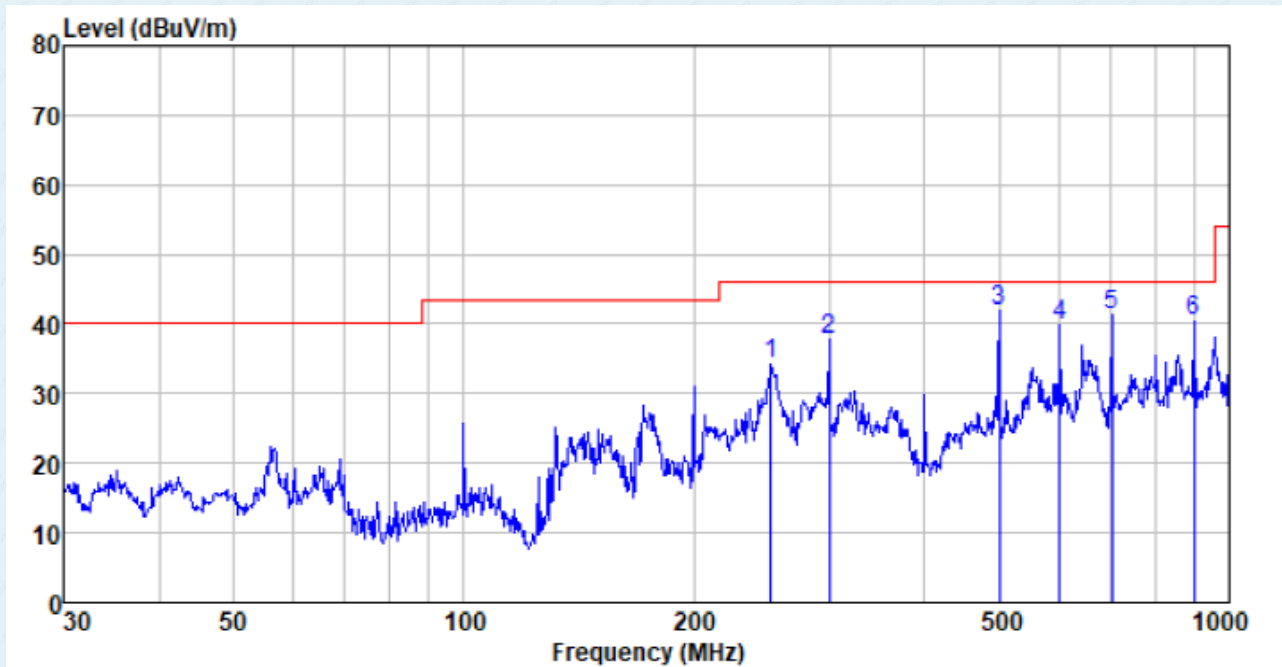
Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.
Only shown the worst case test data.

■ 9kHz~30MHz

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

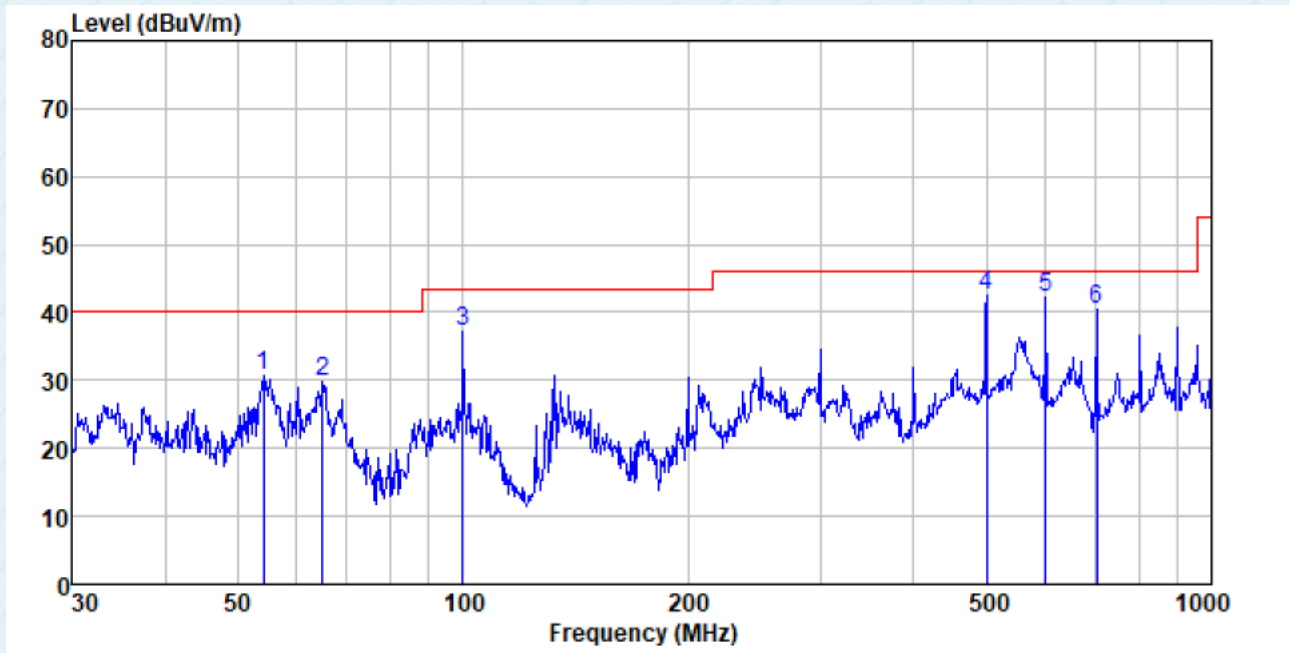
■ Below 1GHz

Horizontal:



Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detect or	Height (cm)	Azimuth (deg.)
252.063	57.29	12.22	2.14	37.38	34.27	46.00	-11.73	QP	200	0
300.367	59.21	13.60	2.36	37.42	37.75	46.00	-8.25	QP	200	0
501.179	58.84	17.30	3.31	37.51	41.94	46.00	-4.06	QP	200	0
601.427	54.27	19.50	3.73	37.54	39.96	46.00	-6.04	QP	200	0
701.761	55.07	19.66	4.09	37.63	41.19	46.00	-4.81	QP	200	0
900.147	51.05	22.30	4.85	37.60	40.57	46.00	-5.43	QP	200	0

Vertical:



Frequency (MHz)	Read Level (dBUV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBUV/m)	Limit Line (dBUV/m)	Over Limit (dB)	Detect or	Height (cm)	Azimuth (deg.)
54.071	54.29	11.88	0.81	36.24	30.74	40.00	-9.26	QP	100	0
64.887	55.90	9.34	0.90	36.38	29.76	40.00	-10.24	QP	100	0
99.878	60.45	12.20	1.19	36.72	37.12	43.50	-6.38	QP	100	0
501.179	59.42	17.30	3.31	37.51	42.52	46.00	-3.48	QP	100	0
601.427	56.45	19.50	3.73	37.54	42.14	46.00	-3.86	QP	100	0
701.761	54.18	19.66	4.09	37.63	40.30	46.00	-5.70	QP	100	0

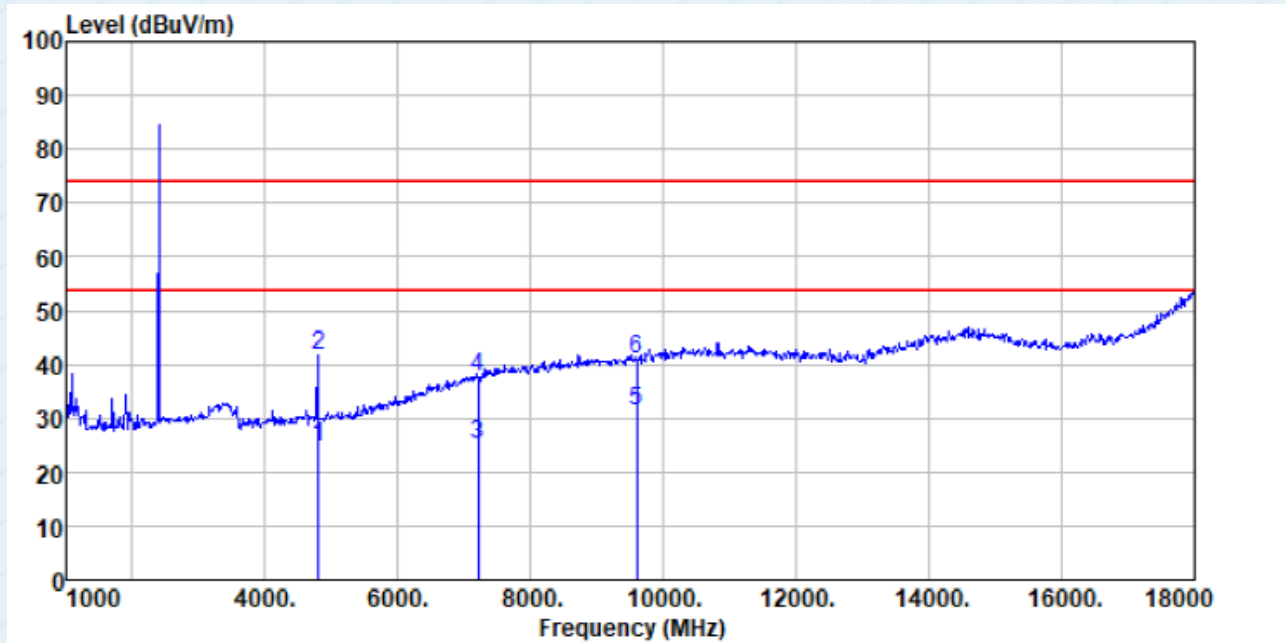
- Above 1GHz
- Unwanted Emissions in Restricted Frequency Bands

All 3 antennas were tested and found worst case at ANT 1, so only show the test result of ANT 1

ANT 1:

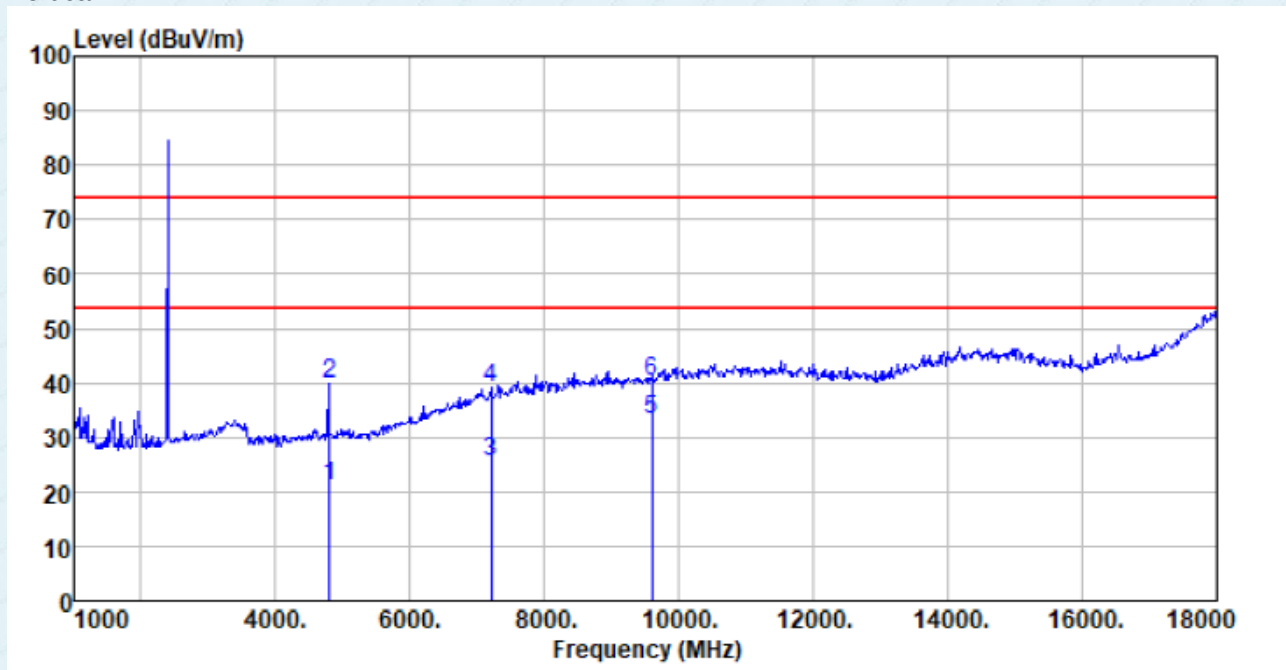
Test channel:	Lowest channel
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Horizontal:



Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detect or	Height (cm)	Azimuth (deg.)
4802.000	26.67	31.20	4.61	37.73	24.75	54.00	-29.25	AV	200	0
4802.000	43.47	31.20	4.61	37.73	41.55	74.00	-32.45	PK	200	0
7203.000	17.96	36.16	6.48	35.63	24.97	54.00	-29.03	AV	200	0
7203.000	33.49	36.16	6.48	35.63	37.50	74.00	-36.50	PK	200	0
9604.000	20.27	37.93	7.97	34.94	31.23	54.00	-22.77	AV	200	0
9604.000	29.83	37.93	7.97	34.94	40.79	74.00	-33.21	PK	200	0

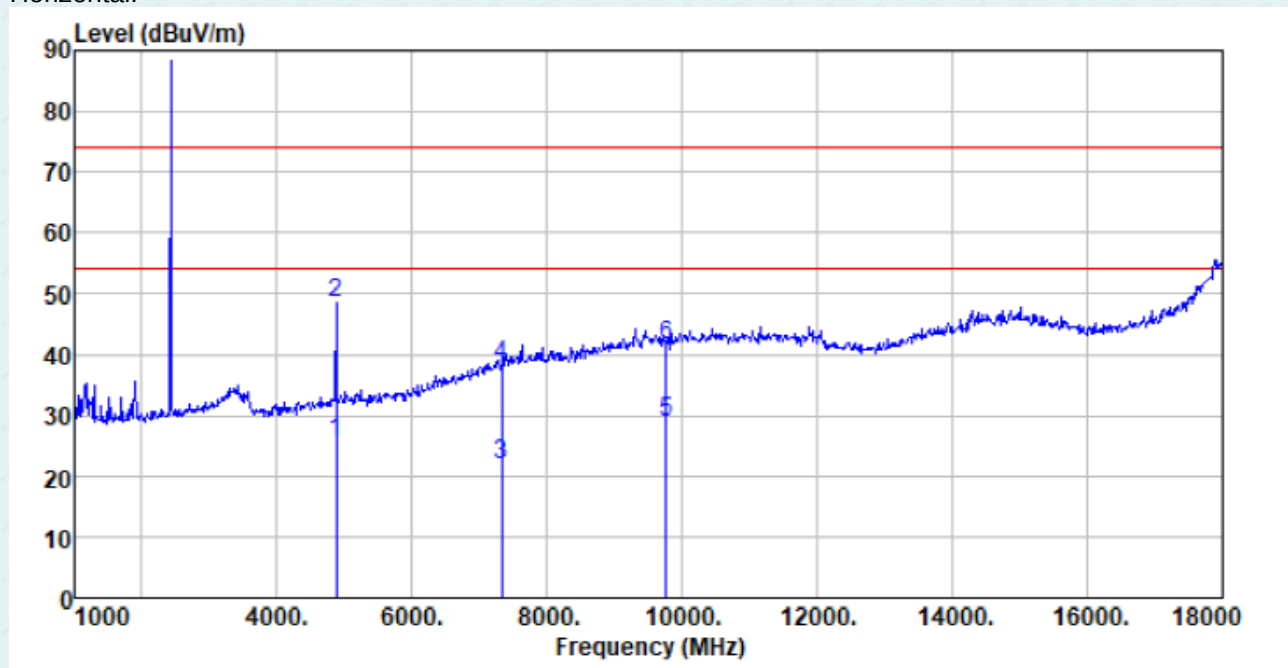
Vertical:



Frequency (MHz)	Read Level (dBUV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBUV/m)	Limit Line (dBUV/m)	Over Limit (dB)	Detect or	Height (cm)	Azimuth (deg.)
4802.000	23.11	31.20	4.61	37.73	21.19	54.00	-32.81	AV	200	0
4802.000	41.91	31.20	4.61	37.73	39.99	74.00	-34.01	PK	200	0
7203.000	18.28	36.16	6.48	35.63	25.29	54.00	-28.71	AV	200	0
7203.000	31.13	36.16	6.48	35.63	39.14	74.00	-34.86	PK	200	0
9604.000	22.25	37.93	7.97	34.94	33.21	54.00	-20.79	AV	200	0
9604.000	29.43	37.93	7.97	34.94	40.39	74.00	-33.61	PK	200	0

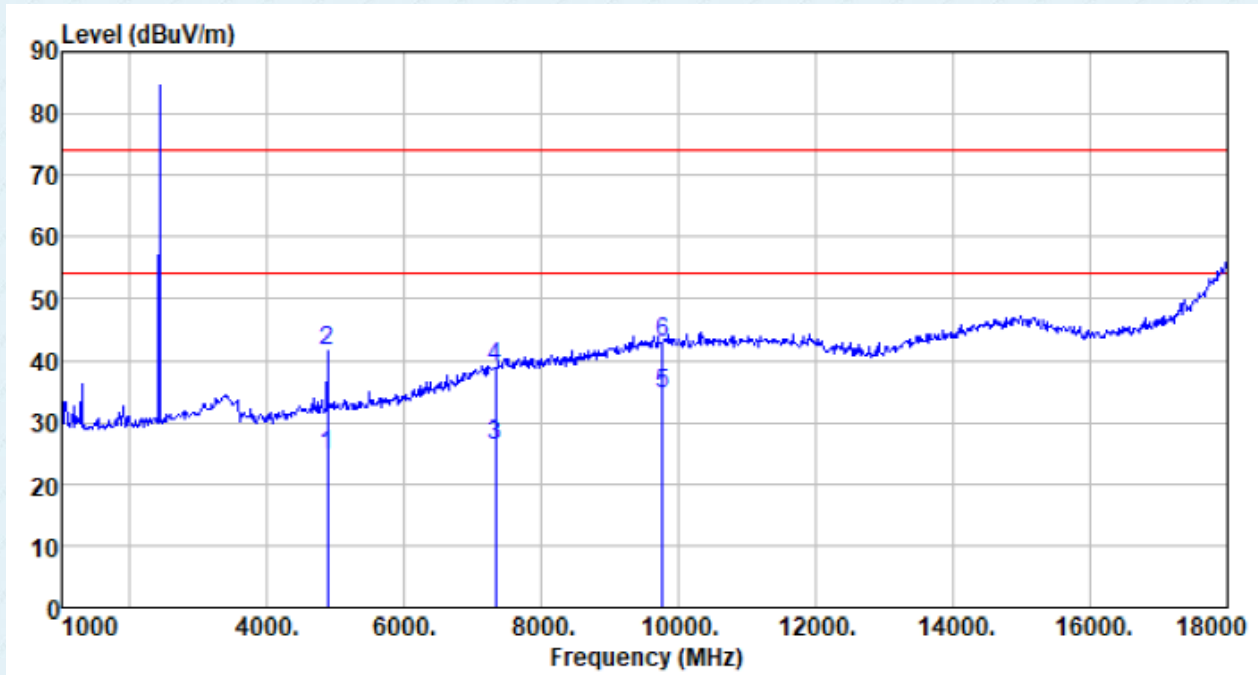
Test channel:	Middle
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Horizontal:



Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detect or	Height (cm)	Azimuth (deg.)
4880.000	26.60	32.04	4.69	37.75	25.58	54.00	-28.42	AV	200	0
4880.000	49.67	32.04	4.69	37.75	48.65	74.00	-25.35	PK	200	0
7320.000	14.65	36.10	6.63	35.60	21.78	54.00	-32.22	AV	200	0
7320.000	30.92	36.10	6.63	35.60	38.05	74.00	-35.95	PK	200	0
9760.000	17.60	38.30	8.03	35.03	28.90	54.00	-25.10	AV	200	0
9760.000	30.32	38.30	8.03	35.03	41.62	74.00	-32.38	PK	200	0

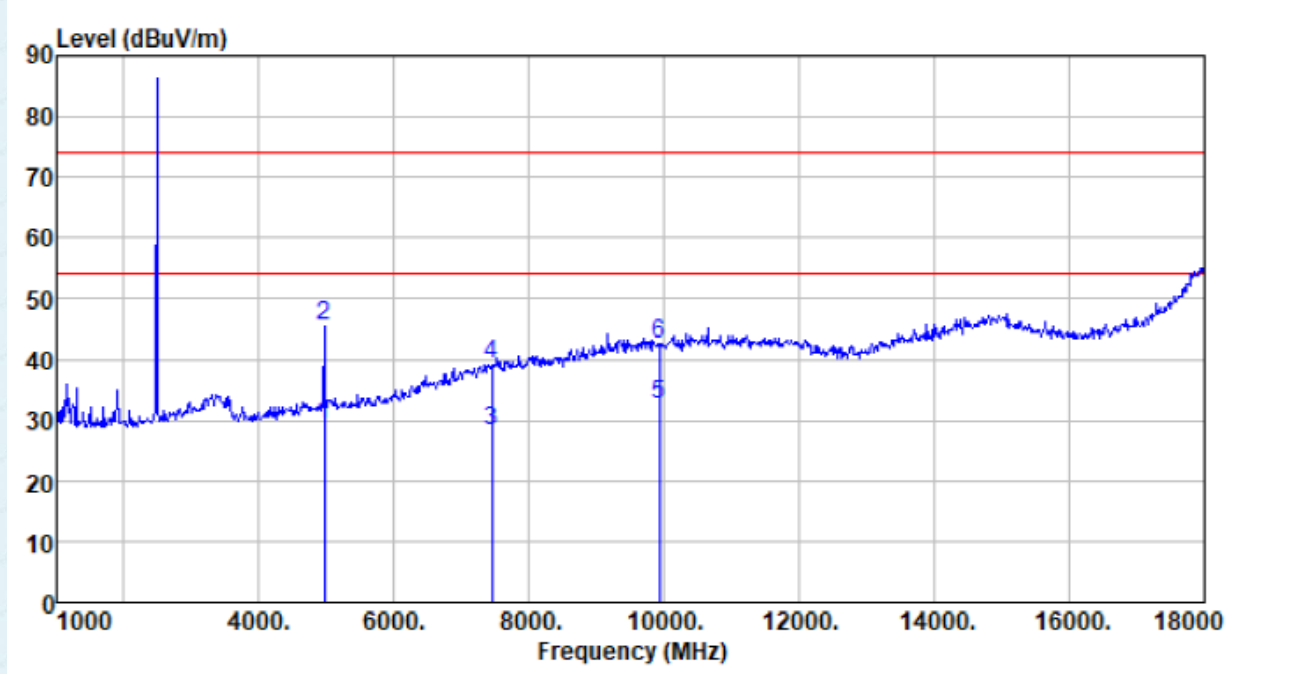
Vertical:



Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detect or	Height (cm)	Azimuth (deg.)
4880.000	25.55	32.04	4.69	37.75	24.53	54.00	-29.47	AV	200	0
4880.000	42.59	32.04	4.69	37.75	41.57	74.00	-32.43	PK	200	0
7320.000	19.20	36.10	6.63	35.60	26.33	54.00	-27.67	AV	200	0
7320.000	31.75	36.10	6.63	35.60	38.88	74.00	-35.12	PK	200	0
9760.000	23.33	38.30	8.03	35.03	34.63	54.00	-19.37	AV	200	0
9760.000	31.38	38.30	8.03	35.03	42.68	74.00	-31.32	PK	200	0

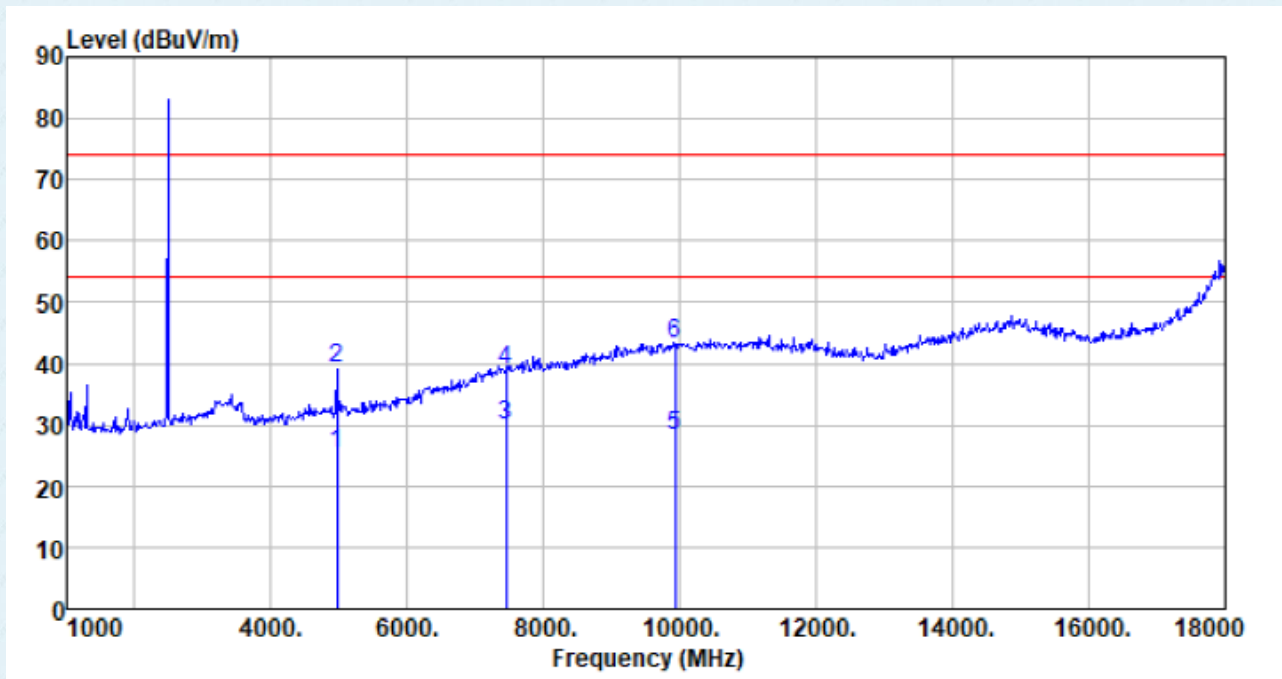
Test channel:	Highest
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Horizontal:



Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detect or	Height (cm)	Azimuth (deg.)
4960.000	30.05	32.32	4.79	37.78	29.27	54.00	-24.73	AV	200	0
4960.000	46.20	32.21	4.79	37.78	45.42	74.00	-28.58	PK	200	0
7440.000	20.63	36.43	6.77	35.56	28.27	54.00	-25.73	AV	200	0
7440.000	31.45	36.43	6.77	35.56	39.09	74.00	-34.91	PK	200	0
9920.000	21.17	38.37	8.09	35.14	32.49	54.00	-21.51	AV	200	0
9920.000	31.23	38.37	8.09	35.14	42.55	74.00	-31.45	PK	200	0

Vertical:



Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detect or	Height (cm)	Azimuth (deg.)
4960.000	26.17	32.32	4.79	37.78	25.39	54.00	-28.61	AV	200	0
4960.000	39.98	32.21	4.79	37.78	39.20	74.00	-34.80	PK	200	0
7440.000	22.19	36.43	6.77	35.56	29.83	54.00	-24.17	AV	200	0
7440.000	31.31	36.43	6.77	35.56	38.95	74.00	-35.05	PK	200	0
9920.000	16.90	38.37	8.09	35.14	28.22	54.00	-25.78	AV	200	0
9920.000	31.94	38.37	8.09	35.14	43.26	74.00	-30.74	PK	200	0

Remarks:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

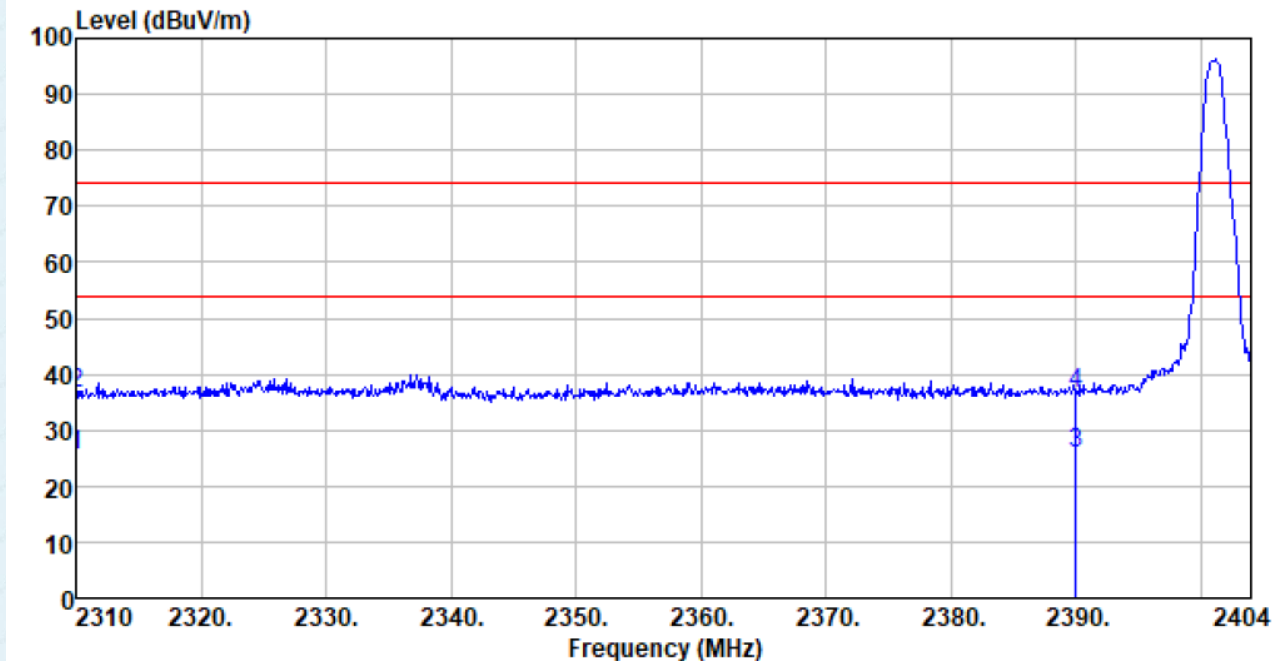
■ Unwanted Emissions in Non-restricted Frequency Bands

All of the restriction bands were tested, and only the data of worst case was exhibited.

ANT 1:

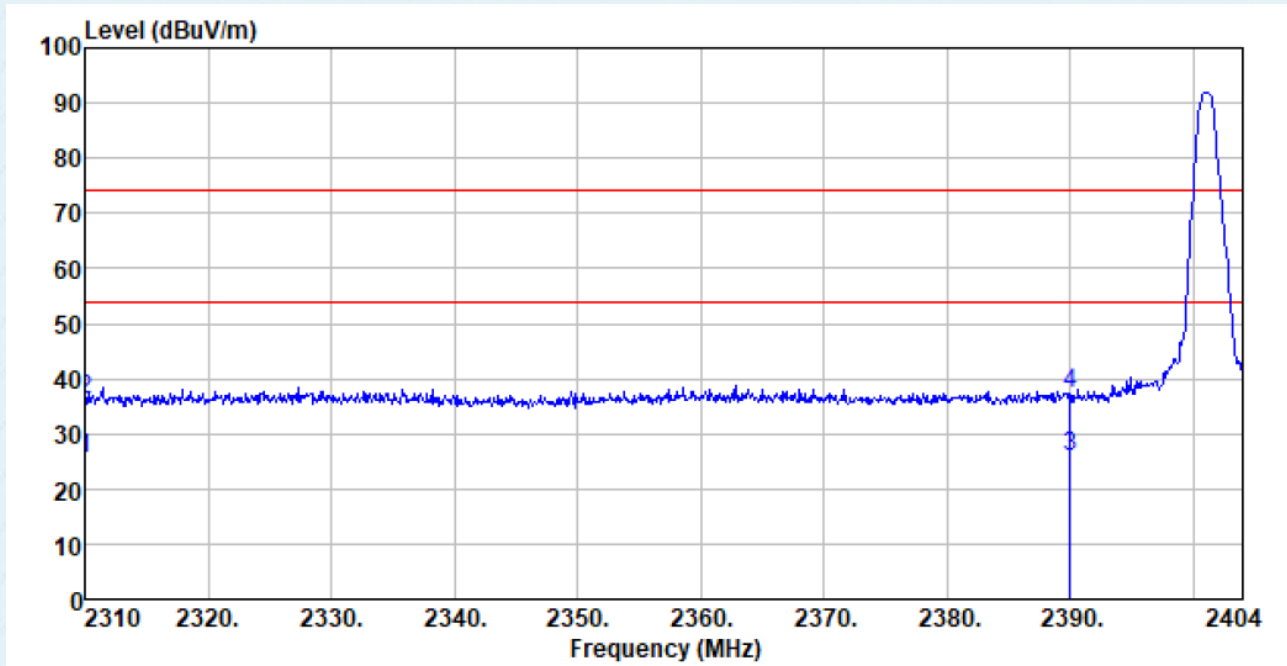
Test channel:	Lowest channel
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Horizontal:



Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detect or	Height (cm)	Azimuth (deg.)
2310.000	32.19	27.14	2.81	36.79	25.35	54.00	-28.65	AV	173	248
2310.000	43.29	27.14	2.81	36.79	36.45	74.00	-37.55	PK	173	248
2390.000	32.39	27.37	2.91	36.85	25.82	54.00	-28.18	AV	173	248
2390.000	43.16	27.37	2.91	36.85	36.59	74.00	-37.41	PK	173	248

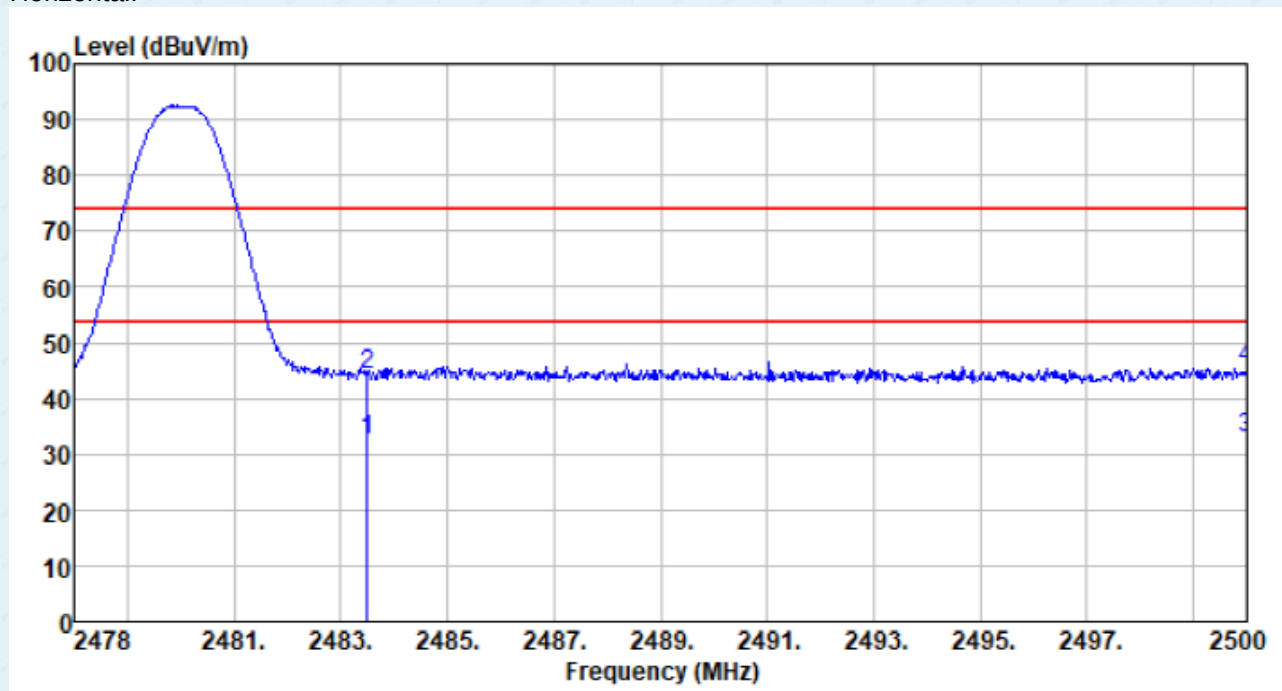
Vertical:



Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detect or	Height (cm)	Azimuth (deg.)
2310.000	32.13	27.14	2.81	36.79	25.29	54.00	-28.71	AV	167	224
2310.000	42.93	27.14	2.81	36.79	36.09	74.00	-37.91	PK	167	224
2390.000	32.22	27.37	2.91	36.85	25.65	54.00	-28.35	AV	167	224
2390.000	43.93	27.37	2.91	36.85	37.36	74.00	-36.64	PK	167	224

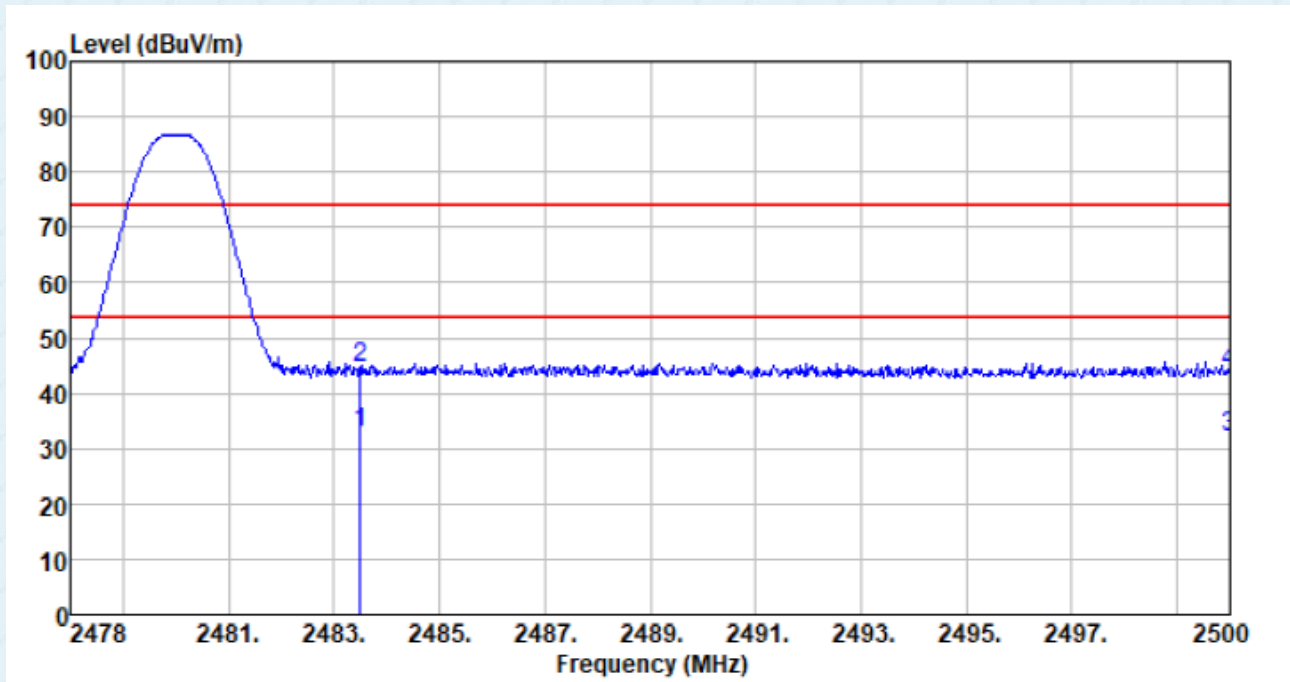
Test channel:	Highest channel
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Horizontal:



Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detect or	Height (cm)	Azimuth (deg.)
2483.500	32.20	27.26	2.99	30.12	32.33	54.00	-21.67	AV	173	248
2483.500	44.21	27.26	2.99	30.12	44.34	74.00	-29.66	PK	173	248
2500.000	32.77	27.30	3.01	30.13	32.95	54.00	-21.05	AV	173	248
2500.000	45.36	27.30	3.01	30.13	45.54	74.00	-28.46	PK	173	248

Vertical:

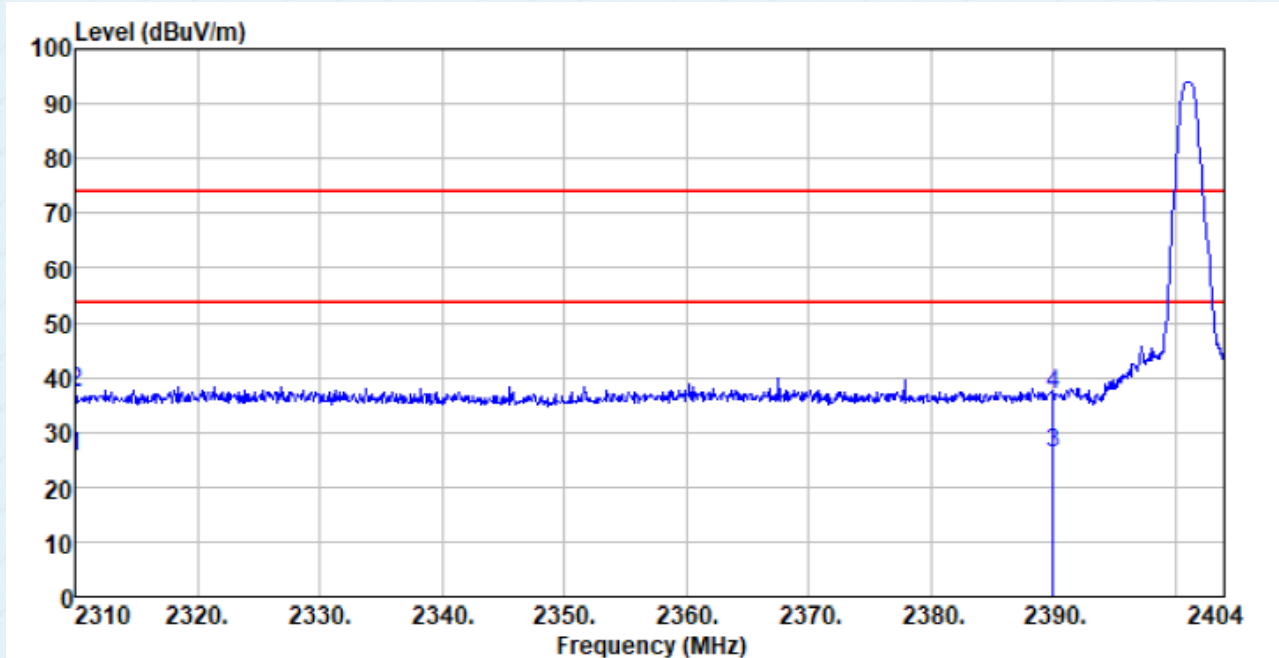


Frequency (MHz)	Read Level (dBUV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBUV/m)	Limit Line (dBUV/m)	Over Limit (dB)	Detect or	Height (cm)	Azimuth (deg.)
2483.500	32.85	27.26	2.99	30.12	32.98	54.00	-21.02	AV	167	224
2483.500	44.47	27.26	2.99	30.12	44.60	74.00	-29.40	PK	167	224
2500.000	32.04	27.30	3.01	30.13	32.22	54.00	-21.78	AV	167	224
2500.000	43.63	27.30	3.01	30.13	43.81	74.00	-30.19	PK	167	224

ANT 2:

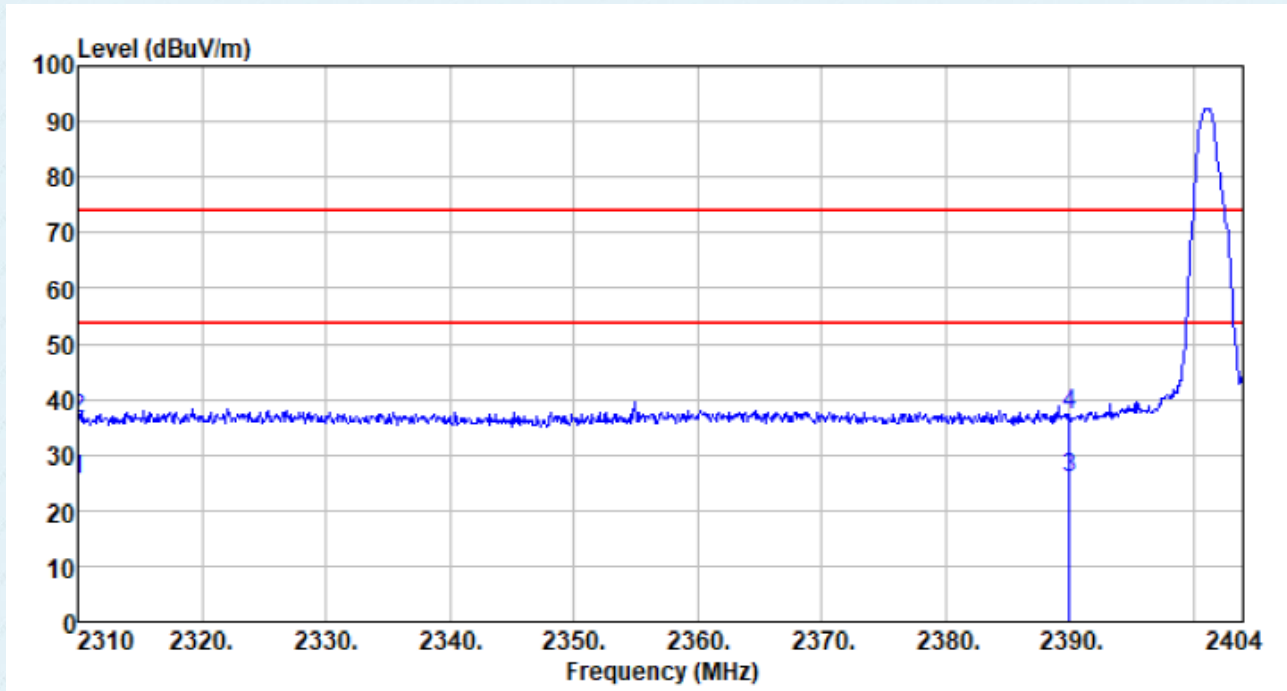
Test channel:	Lowest channel
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Horizontal:



Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detect or	Height (cm)	Azimuth (deg.)
2310.000	32.18	27.14	2.81	36.79	25.34	54.00	-28.66	AV	155	149
2310.000	44.17	27.14	2.81	36.79	37.33	74.00	-36.67	PK	155	149
2390.000	32.85	27.37	2.91	36.85	26.28	54.00	-27.72	AV	155	149
2390.000	43.62	27.37	2.91	36.85	37.05	74.00	-36.95	PK	155	149

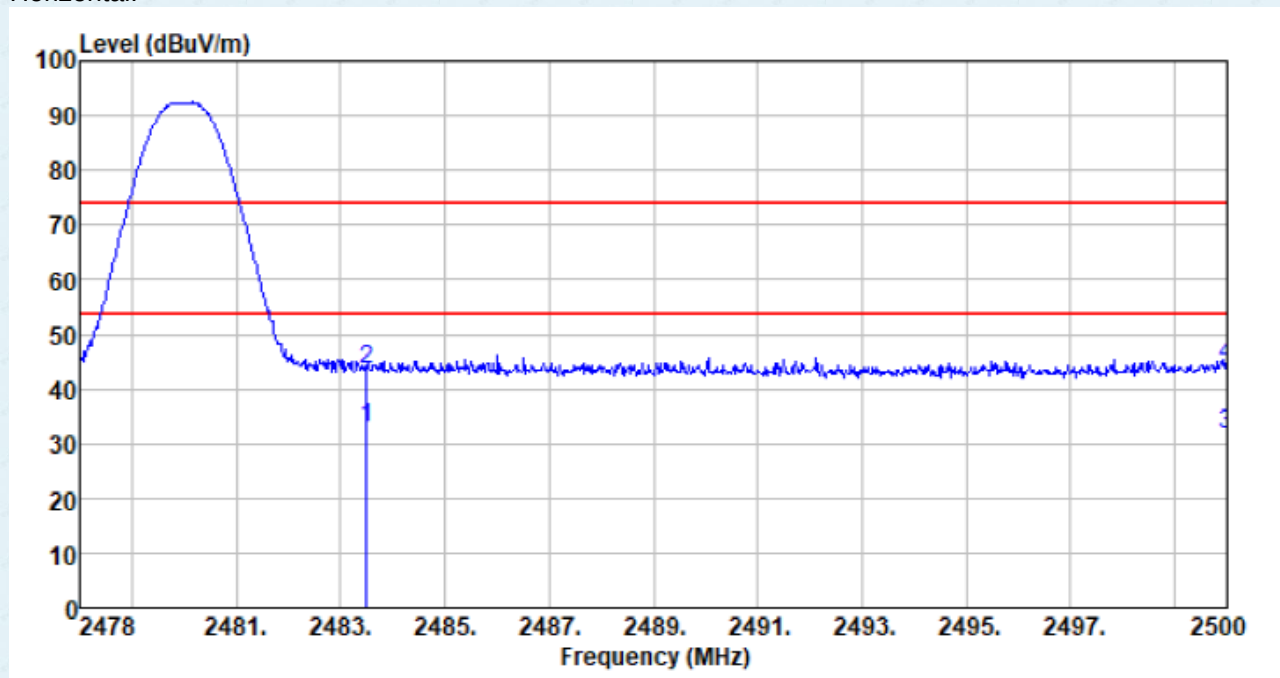
Vertical:



Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detect or	Height (cm)	Azimuth (deg.)
2310.000	32.17	27.14	2.81	36.79	25.33	54.00	-28.67	AV	172	108
2310.000	43.22	27.14	2.81	36.79	36.38	74.00	-37.62	PK	172	108
2390.000	32.22	27.37	2.91	36.85	25.65	54.00	-28.35	AV	172	108
2390.000	43.83	27.37	2.91	36.85	37.26	74.00	-36.74	PK	172	108

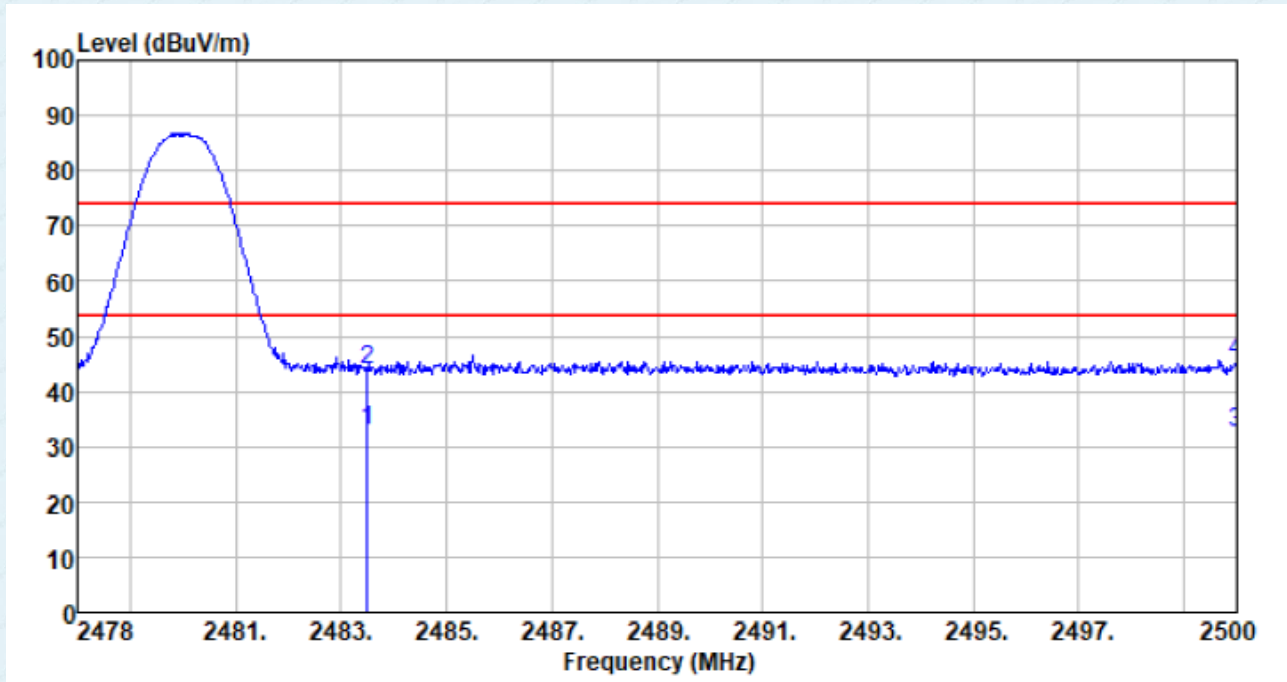
Test channel:	Highest channel
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Horizontal:



Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detect or	Height (cm)	Azimuth (deg.)
2483.500	32.89	27.26	2.99	30.12	33.02	54.00	-20.98	AV	155	149
2483.500	43.59	27.26	2.99	30.12	43.72	74.00	-30.28	PK	155	149
2500.000	31.56	27.30	3.01	30.13	31.74	54.00	-22.26	AV	155	149
2500.000	43.96	27.30	3.01	30.13	44.14	74.00	-29.86	PK	155	149

Vertical:

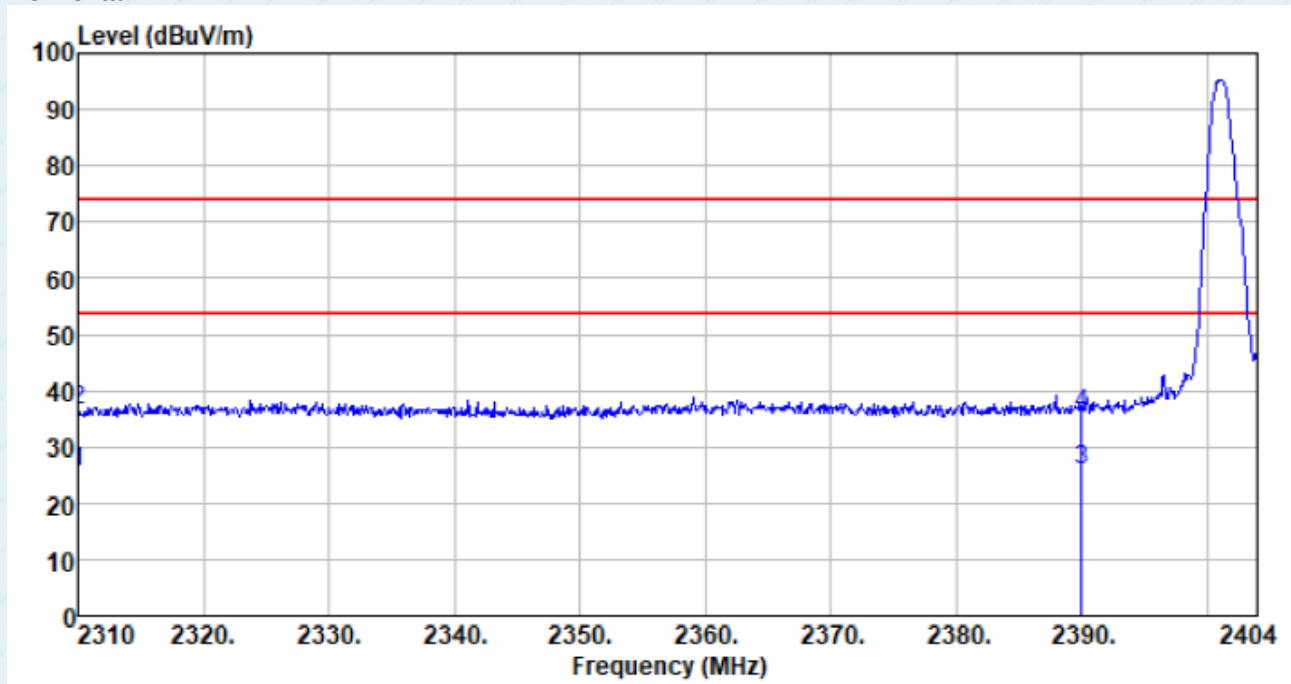


Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detect or	Height (cm)	Azimuth (deg.)
2483.500	32.60	27.26	2.99	30.12	32.73	54.00	-21.27	AV	172	108
2483.500	43.88	27.26	2.99	30.12	44.01	74.00	-29.99	PK	172	108
2500.000	32.47	27.30	3.01	30.13	32.65	54.00	-21.35	AV	172	108
2500.000	45.08	27.30	3.01	30.13	45.26	74.00	-28.74	PK	172	108

ANT 3:

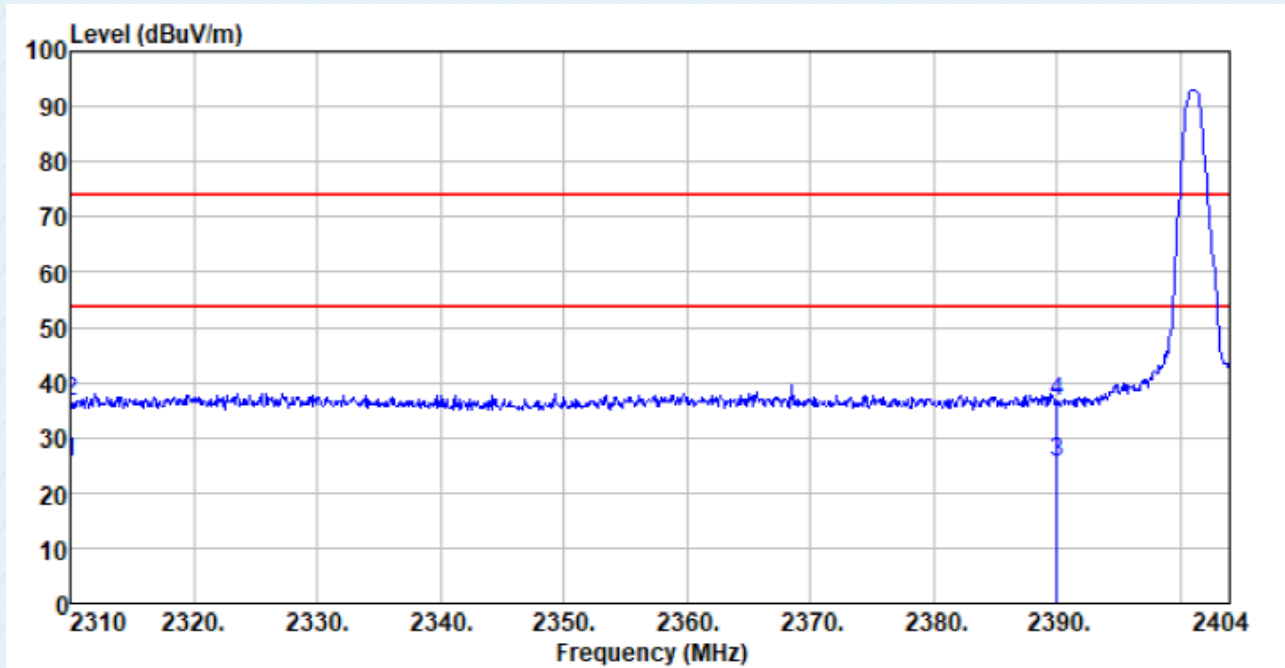
Test channel:	Lowest channel
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Horizontal:



Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detect or	Height (cm)	Azimuth (deg.)
2310.000	32.18	27.14	2.81	36.79	25.34	54.00	-28.66	AV	138	118
2310.000	43.29	27.14	2.81	36.79	36.45	74.00	-37.55	PK	138	118
2390.000	32.35	27.37	2.91	36.85	25.78	54.00	-28.22	AV	138	118
2390.000	42.44	27.37	2.91	36.85	35.87	74.00	-38.13	PK	138	118

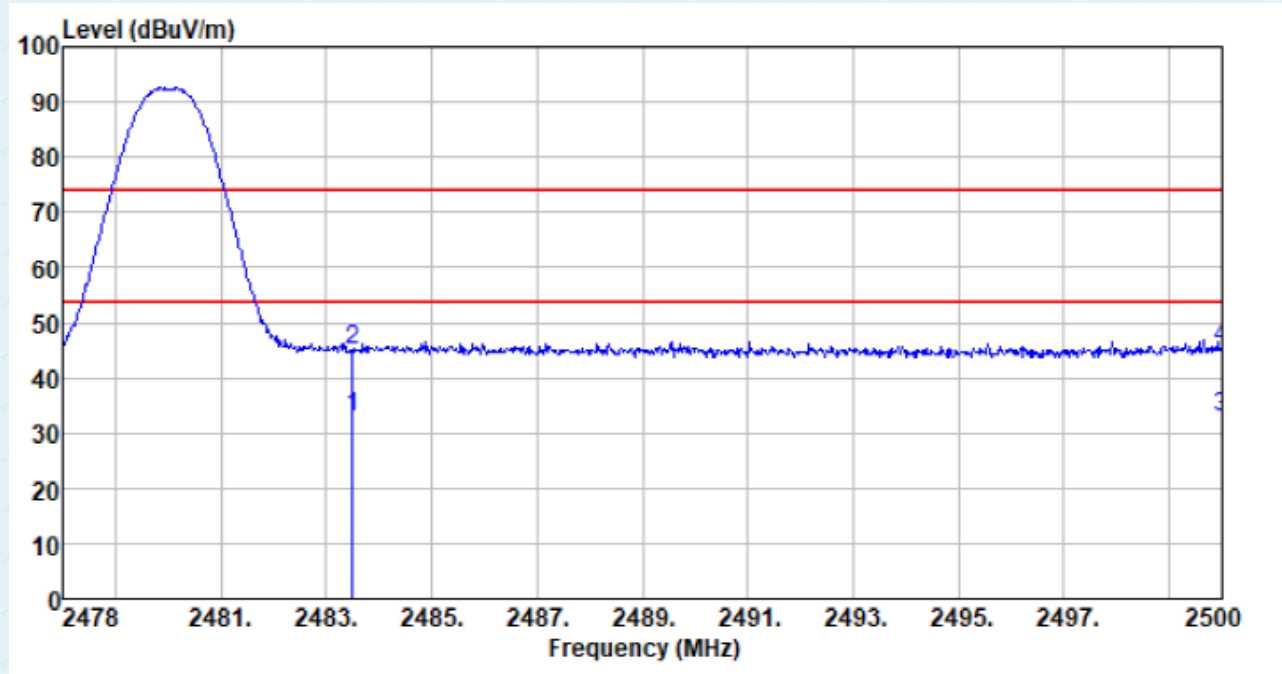
Vertical:



Frequency (MHz)	Read Level (dBUV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBUV/m)	Limit Line (dBUV/m)	Over Limit (dB)	Detect or	Height (cm)	Azimuth (deg.)
2310.000	32.16	27.14	2.81	36.79	25.32	54.00	-28.68	AV	184	213
2310.000	43.40	27.14	2.81	36.79	36.56	74.00	-37.44	PK	184	213
2390.000	32.18	27.37	2.91	36.85	25.61	54.00	-28.39	AV	184	213
2390.000	43.16	27.37	2.91	36.85	36.59	74.00	-37.41	PK	184	213

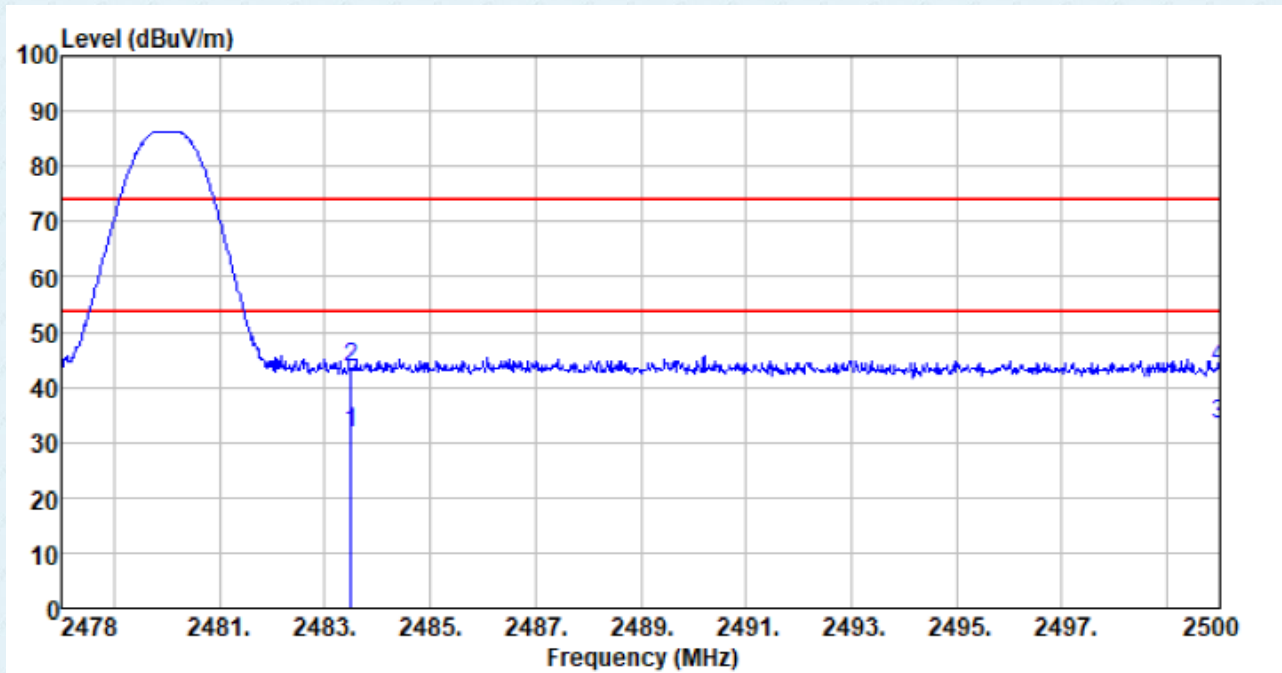
Test channel:	Highest channel
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Horizontal:



Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detect or	Height (cm)	Azimuth (deg.)
2483.500	32.84	27.26	2.99	30.12	32.97	54.00	-21.03	AV	138	118
2483.500	44.73	27.26	2.99	30.12	44.86	74.00	-29.14	PK	138	118
2500.000	32.77	27.30	3.01	30.13	32.95	54.00	-21.05	AV	138	118
2500.000	45.36	27.30	3.01	30.13	45.54	74.00	-28.46	PK	138	118

Vertical:

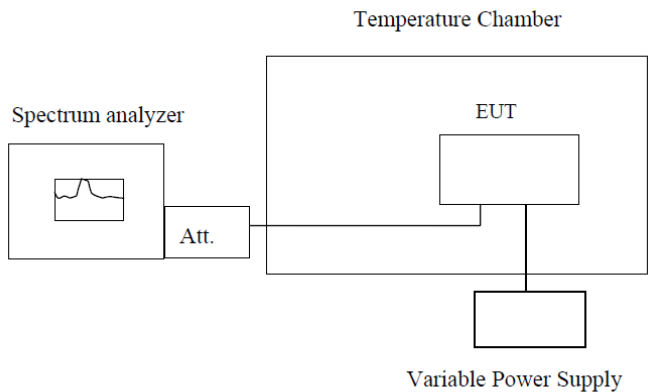


Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detect or	Height (cm)	Azimuth (deg.)
2483.500	31.52	27.26	2.99	30.12	31.65	54.00	-22.35	AV	184	213
2483.500	43.26	27.26	2.99	30.12	43.39	74.00	-30.61	PK	184	213
2500.000	33.01	27.30	3.01	30.13	33.19	54.00	-20.81	AV	184	213
2500.000	43.31	27.30	3.01	30.13	43.49	74.00	-30.51	PK	184	213

Remark:

Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

7.7 Frequency Stability

Test Requirement:	RSS-Gen Section 6.11& Section 8.11
Test Method:	ANSI C63.10: 2013 & RSS-Gen
Limit:	Manufactures of 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
Test Procedure:	The EUT was setup to ANSI C63.10, 2013; tested to 2.1055 for compliance to RSS-Gen requirements.
Test setup:	 Note : Measurement setup for testing on Antenna connector
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Remark: Set the EUT transmits at un-modulation mode to test frequency stability.

Measurement data:

Test Mode	Frequency (MHz)	TX Type	ANT	Measured Frequency (MHz)		Verdict
				Test Result	Limit	
1	2401	SISO	1	2401.01	2400-2483.5	PASS
	2440	SISO	1	2440.01	2400-2483.5	PASS
	2480	SISO	1	2480.00	2400-2483.5	PASS

8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

-----End-----