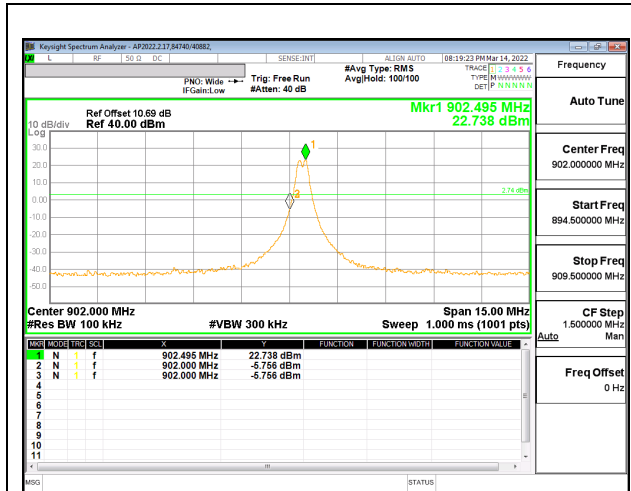
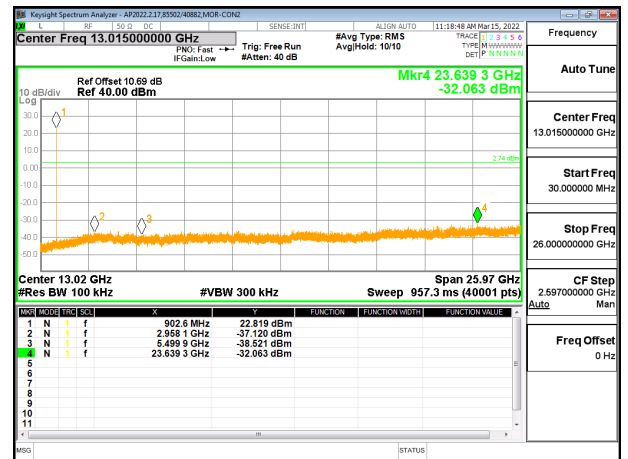


9.8.1. 35.56 kbps DATA RATE

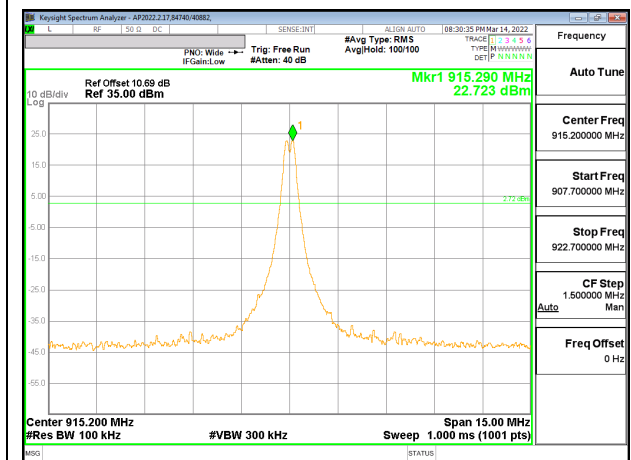
Antenna 1 SPURIOUS EMISSIONS, NON-HOPPING



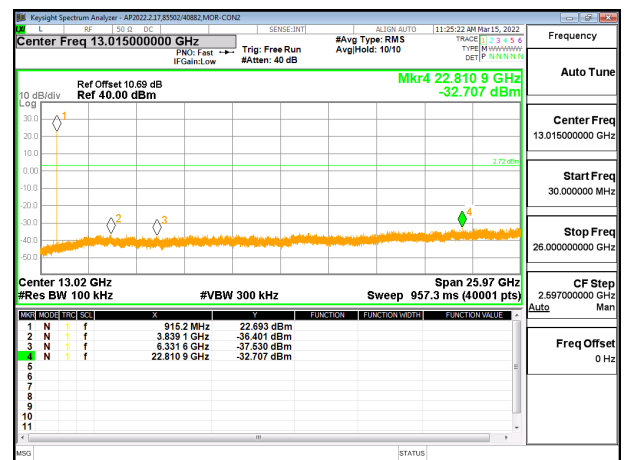
LOW CHANNEL BANDEDGE



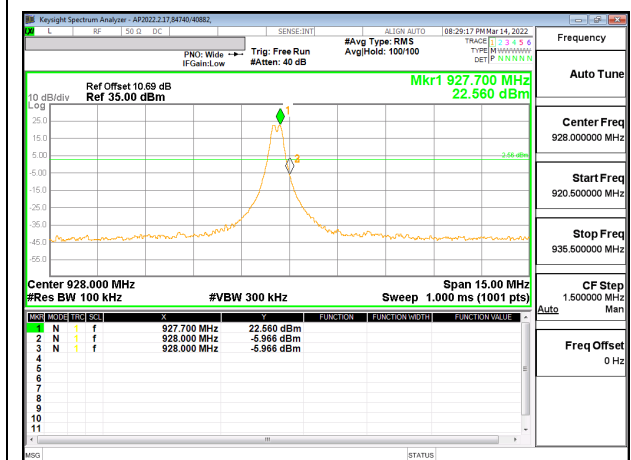
OUT-OF-BAND LOW CHANNEL



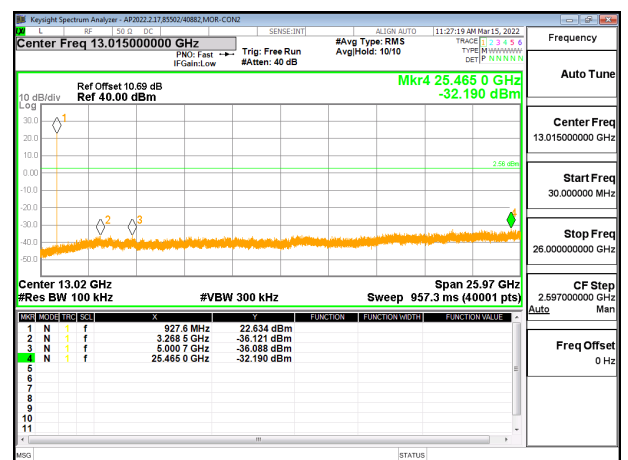
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

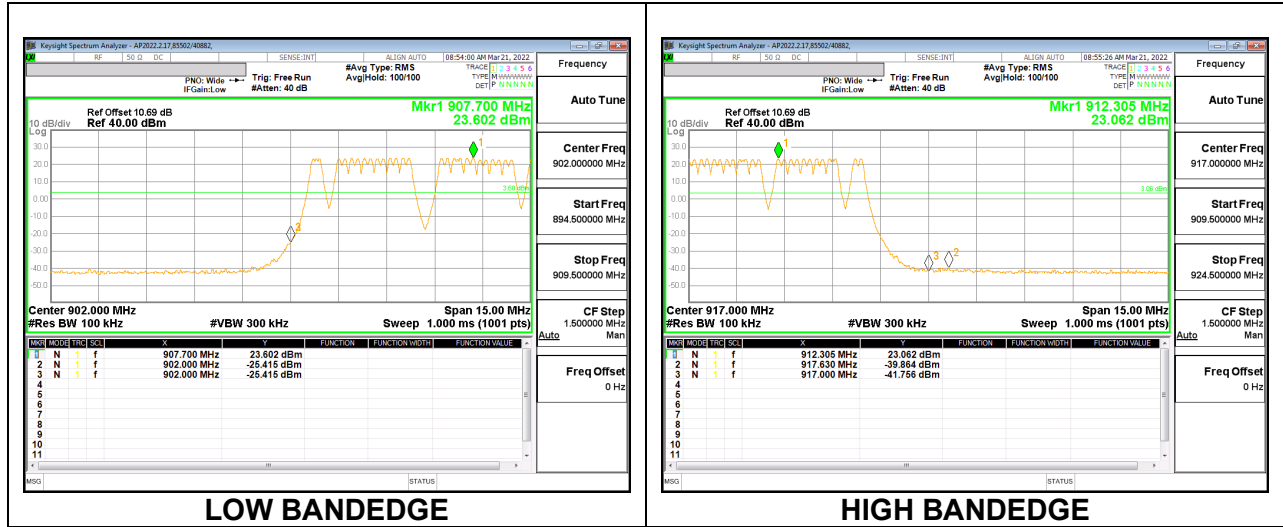


HIGH CHANNEL BANDEDGE



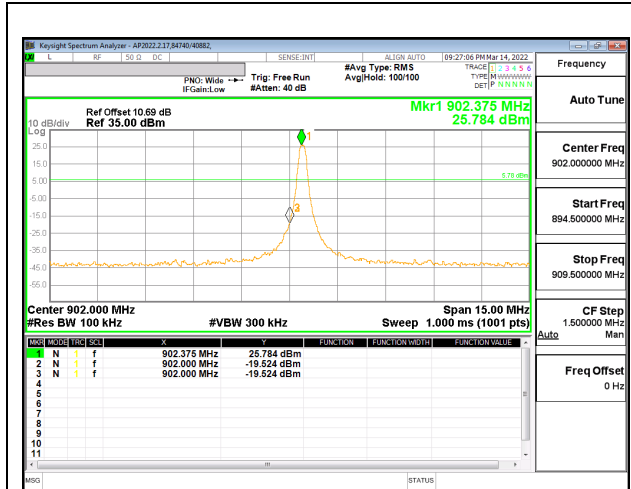
OUT-OF-BAND HIGH CHANNEL

Antenna 1 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

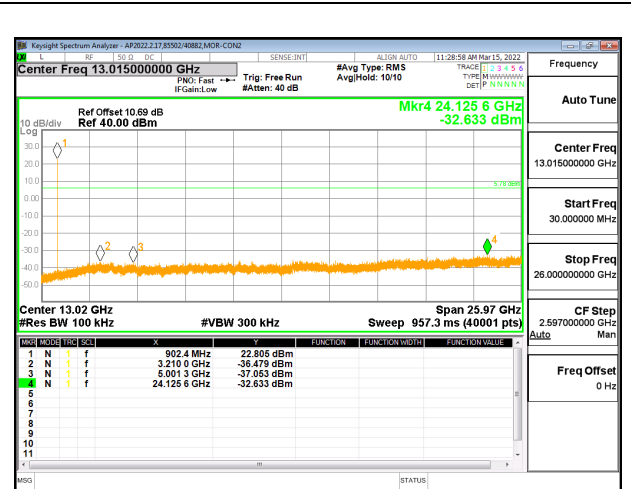


9.8.2. 50 kbps DATA RATE

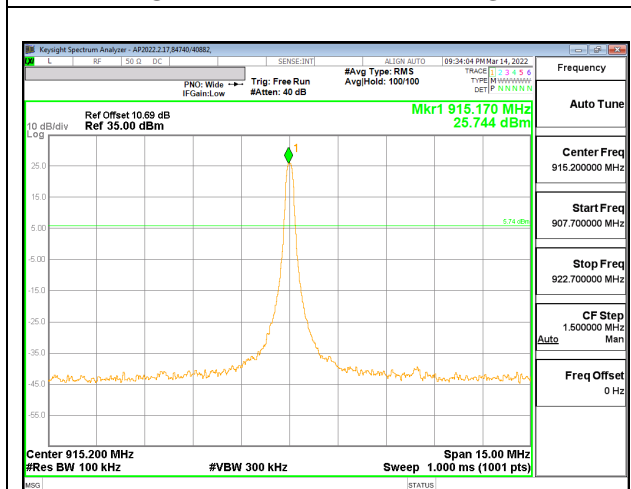
Antenna 1 SPURIOUS EMISSIONS, NON-HOPPING



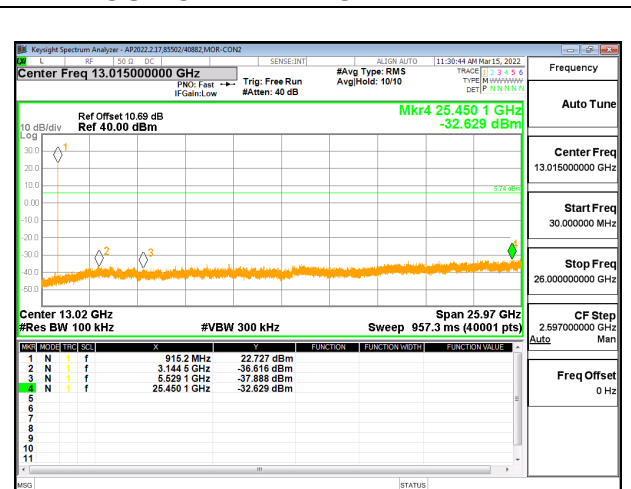
LOW CHANNEL BANDEDGE



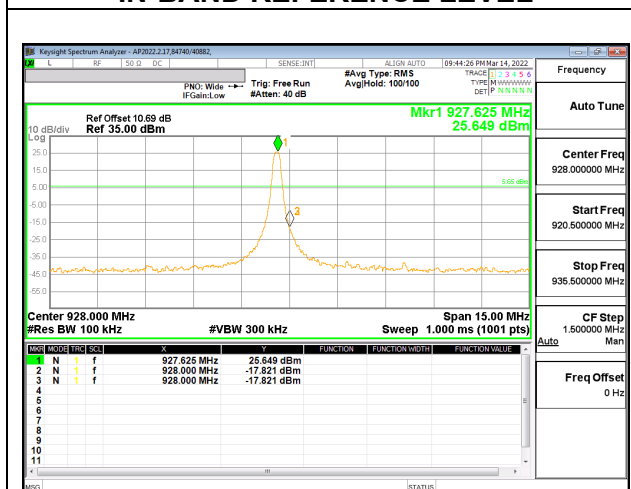
OUT-OF-BAND LOW CHANNEL



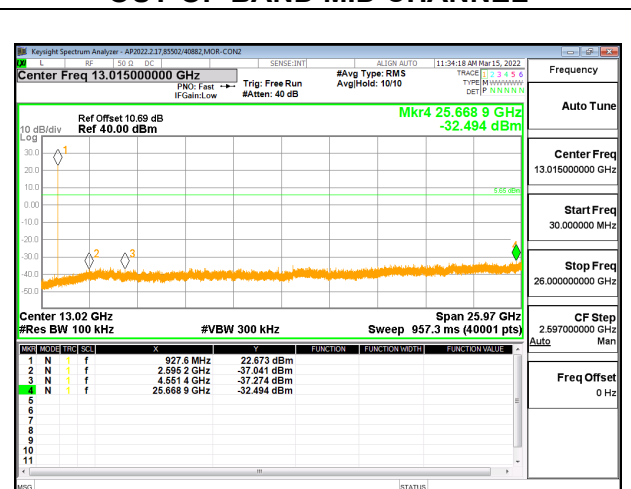
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

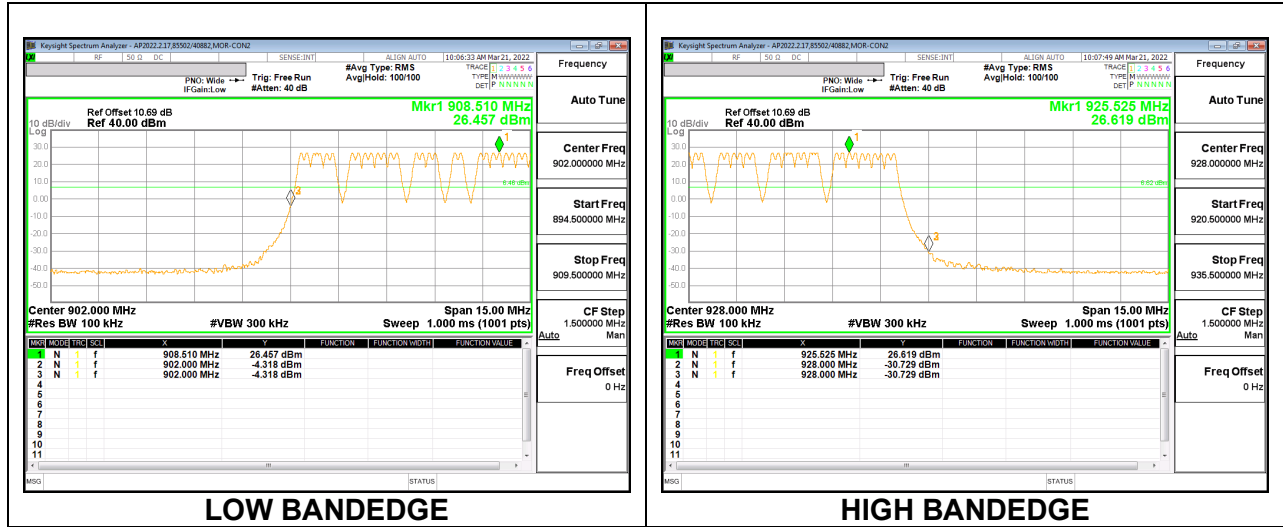


HIGH CHANNEL BANDEDGE



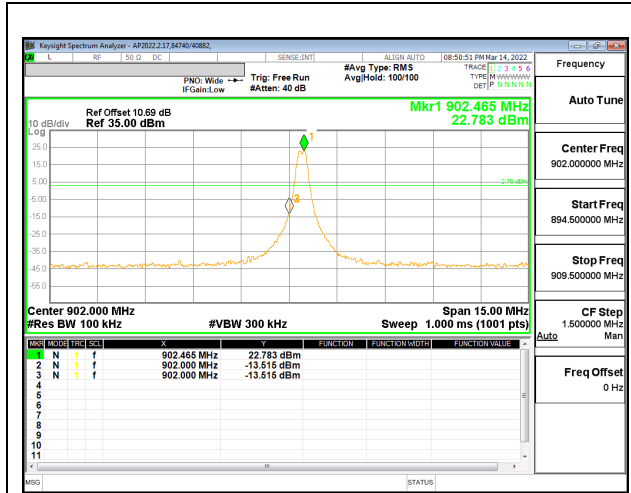
OUT-OF-BAND HIGH CHANNEL

Antenna 1 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

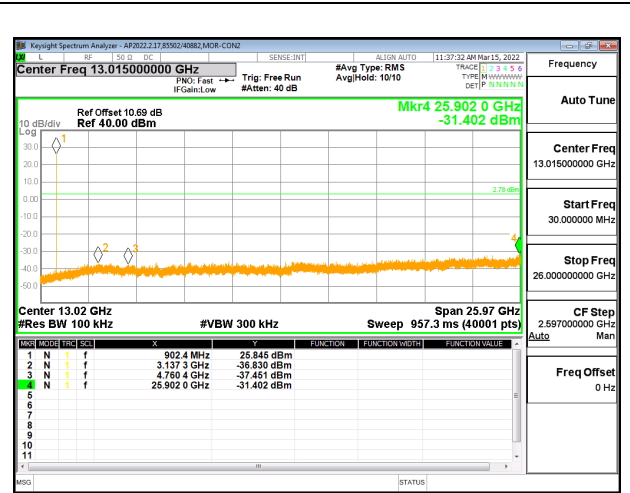


9.8.3. 142.22 kbps DATA RATE

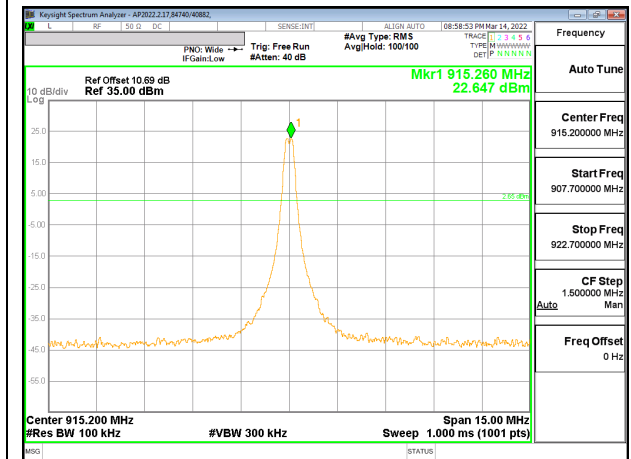
Antenna 1 SPURIOUS EMISSIONS, NON-HOPPING



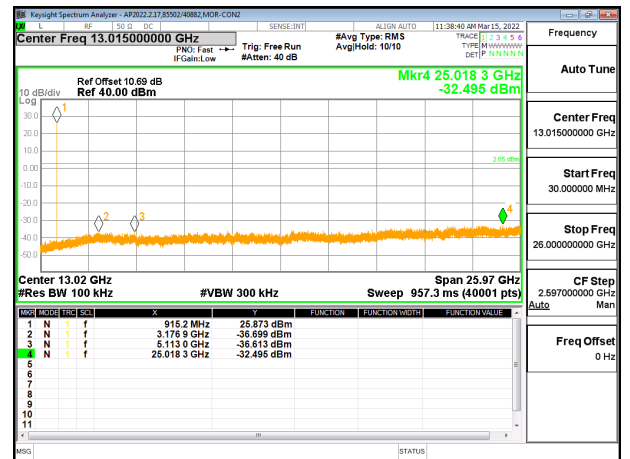
LOW CHANNEL BANDEDGE



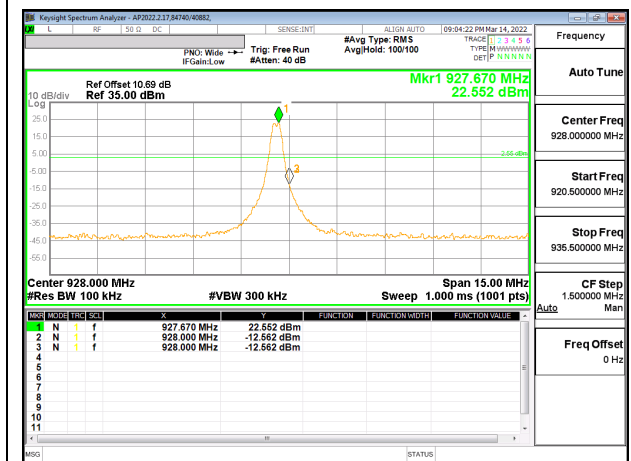
OUT-OF-BAND LOW CHANNEL



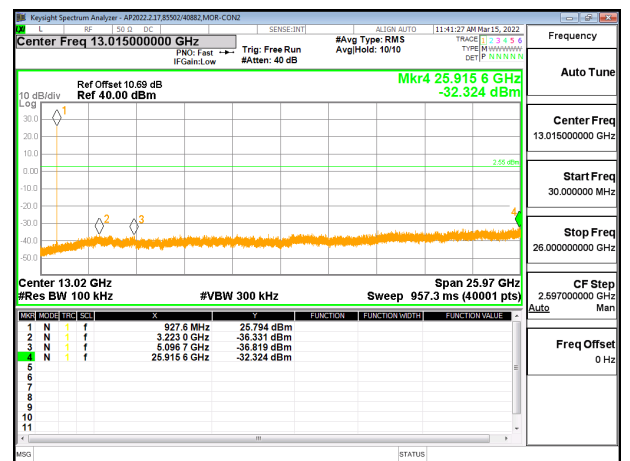
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

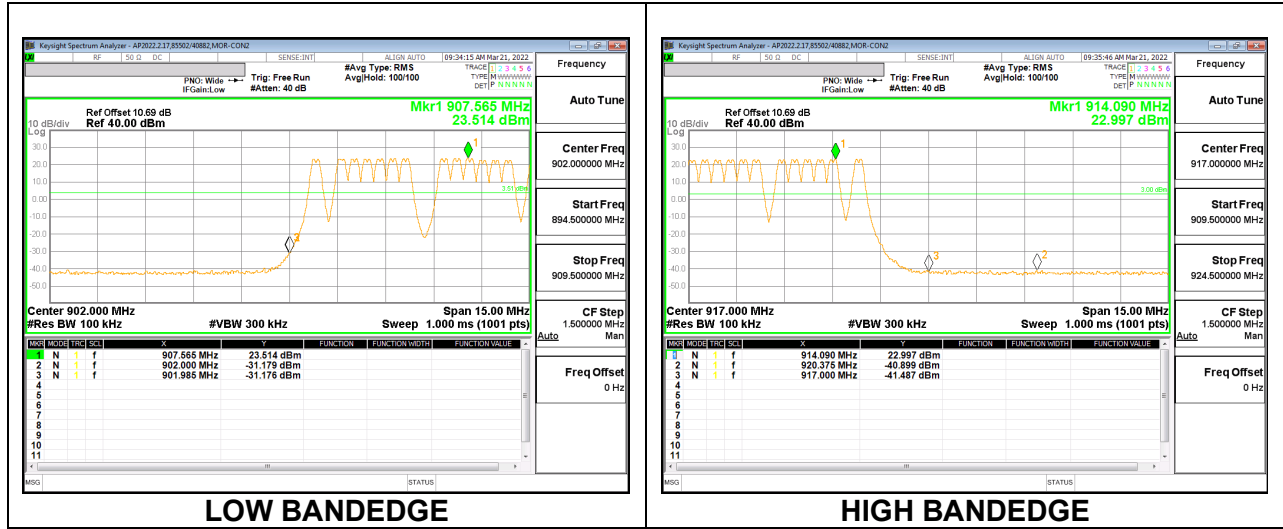


HIGH CHANNEL BANDEDGE



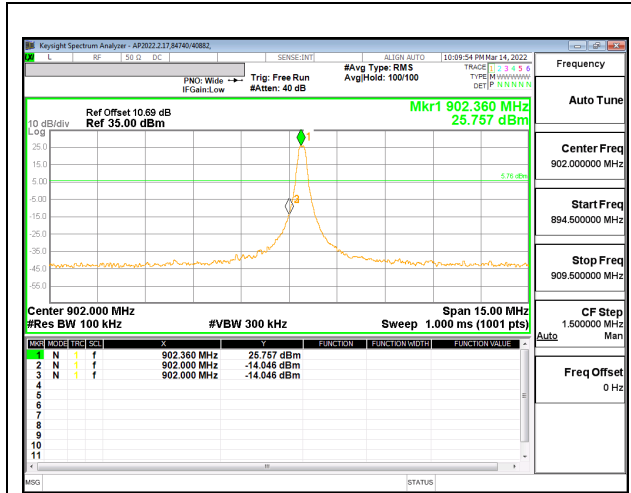
OUT-OF-BAND HIGH CHANNEL

Antenna 1 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

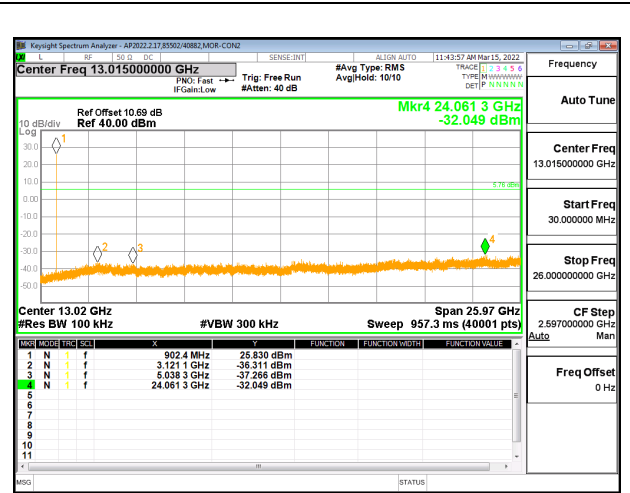


9.8.4. 150 kbps DATA RATE

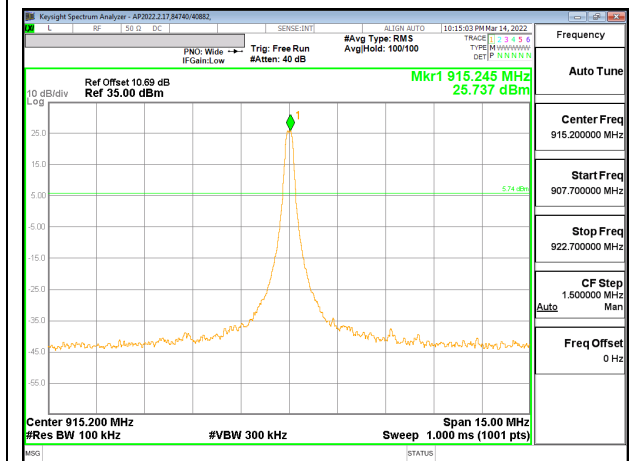
Antenna 1 SPURIOUS EMISSIONS, NON-HOPPING



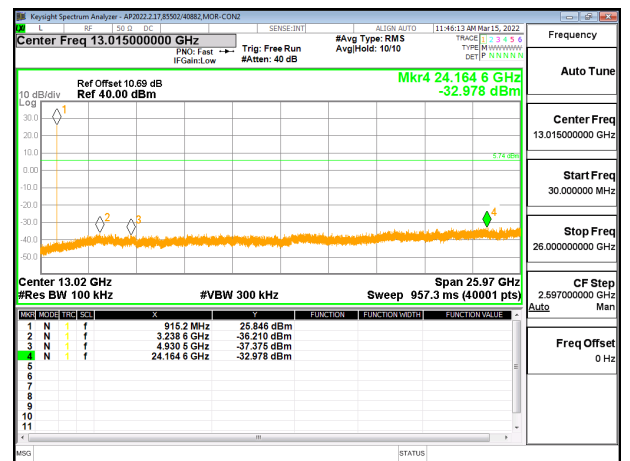
LOW CHANNEL BANDEDGE



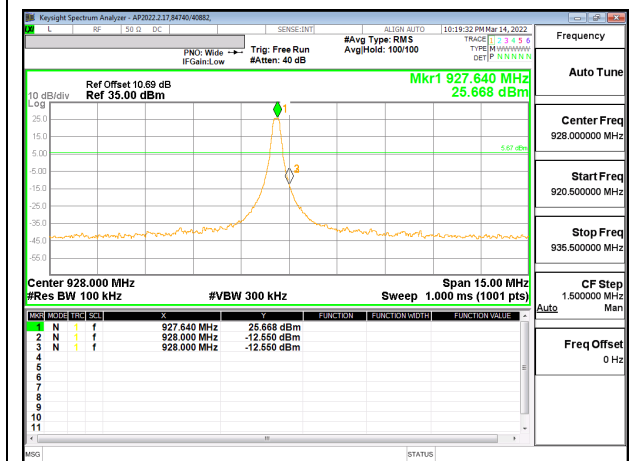
OUT-OF-BAND LOW CHANNEL



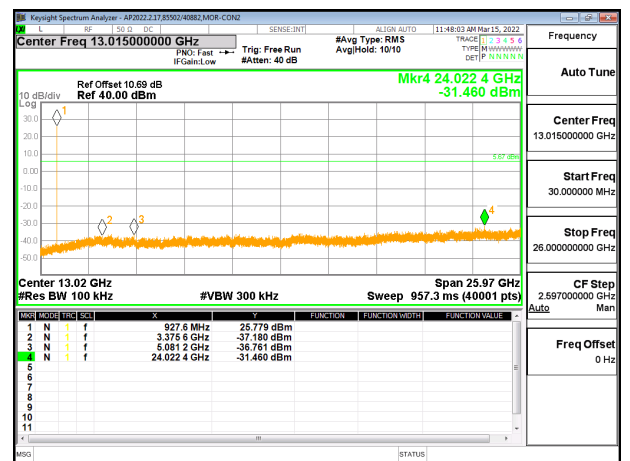
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

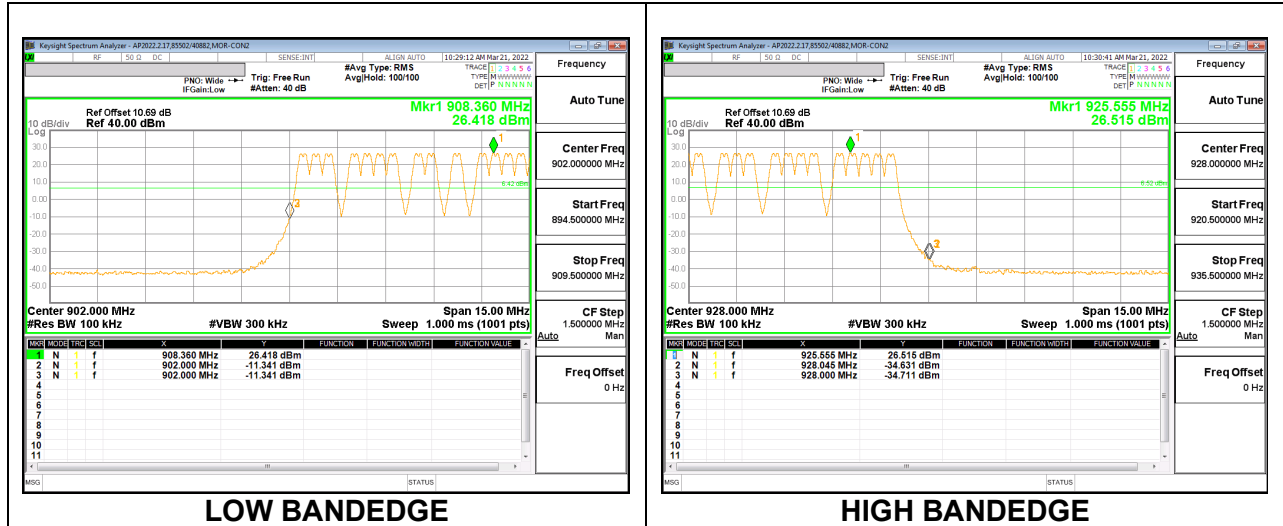


HIGH CHANNEL BANDEDGE



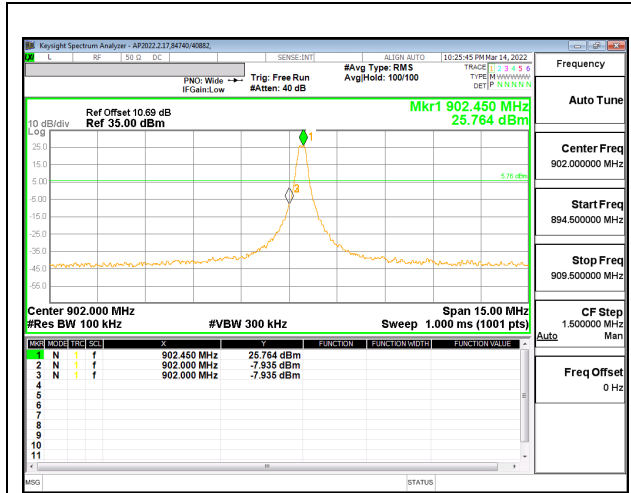
OUT-OF-BAND HIGH CHANNEL

Antenna 1 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

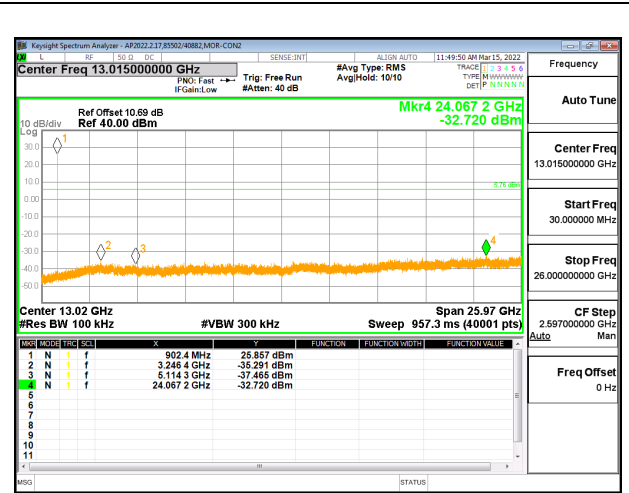


9.8.5. 200 kbps DATA RATE

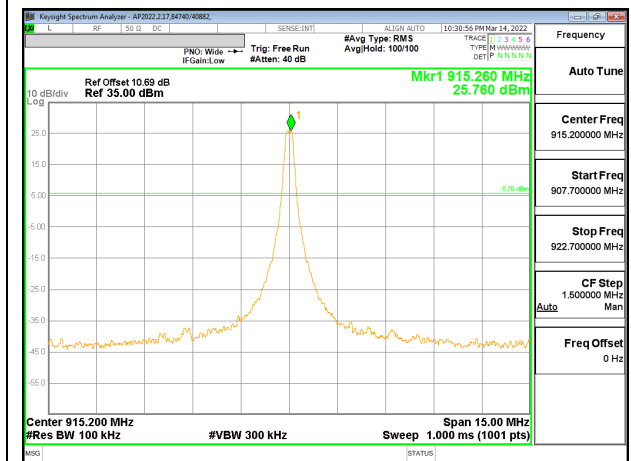
Antenna 1 SPURIOUS EMISSIONS, NON-HOPPING



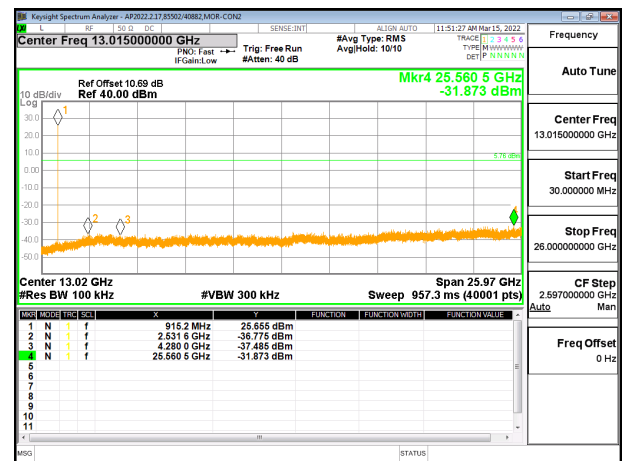
LOW CHANNEL BANDEDGE



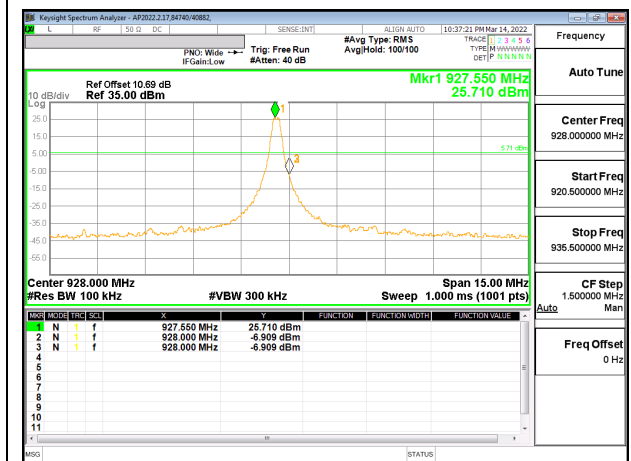
OUT-OF-BAND LOW CHANNEL



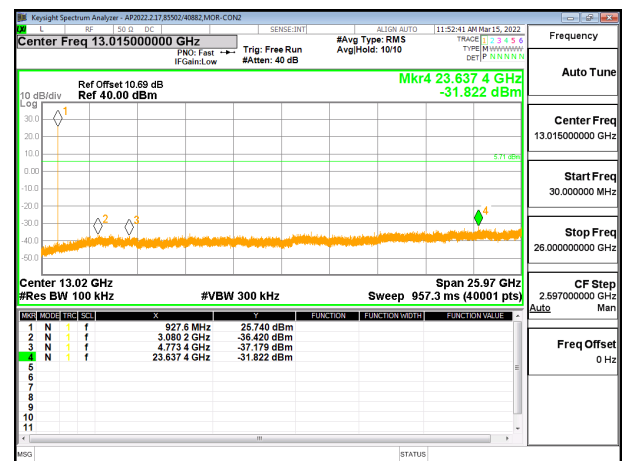
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

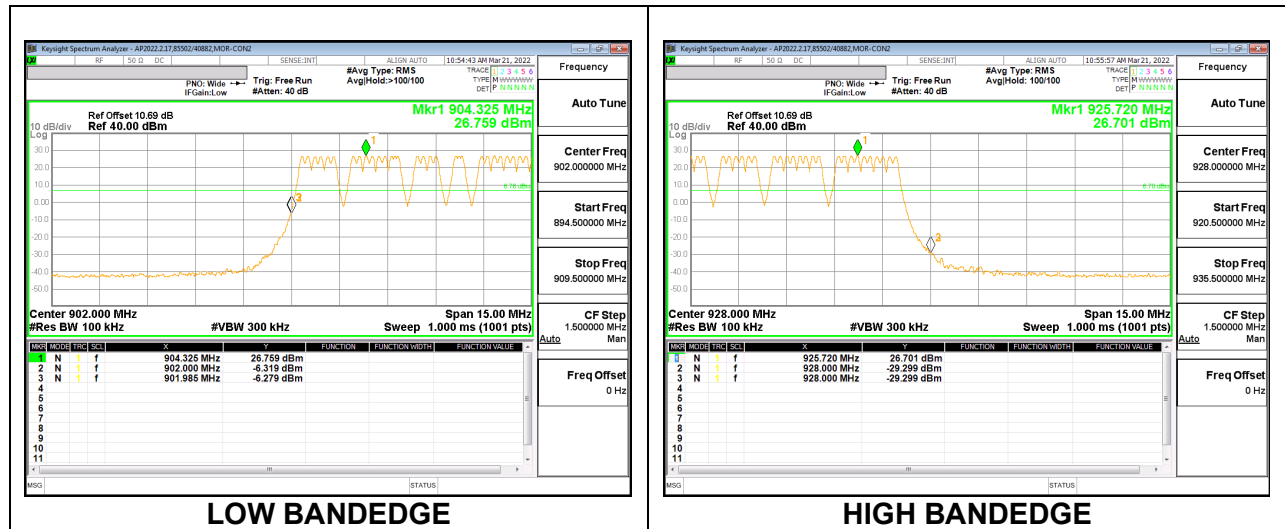


HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

Antenna 1 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



10. RADIATED TEST RESULTS

LIMITS

FCC §15.205 and §15.209

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

RSS-GEN, Section 8.9 and 8.10.

Frequency Range (MHz)	Field Strength Limit (uA/m) at 3 m	Field Strength Limit (dBuA/m) at 3 m
0.009-0.490	6.37/F(kHz) @ 300 m	-
0.490-1.705	63.7/F(kHz) @ 30 m	-
1.705 - 30	0.08 @ 30m	-
Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements in the 30-1000MHz range, 9kHz for peak and/or quasi-peak detection measurements in the 0.15-30MHz range and 200Hz for peak and/or quasi-peak detection measurements in the 9 to 150kHz range. Peak detection is used unless otherwise noted as quasi-peak or average (9-90kHz and 110-490kHz).

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements.

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and linear averaging measurements.

The spectrum from 30 MHz to 10 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the worse-case data rate. Below 30 MHz, the channel with the highest output power was tested.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

3D antenna use - For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel).

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

KDB 414788 Open Field Site(OFS) and Chamber Correlation Justification

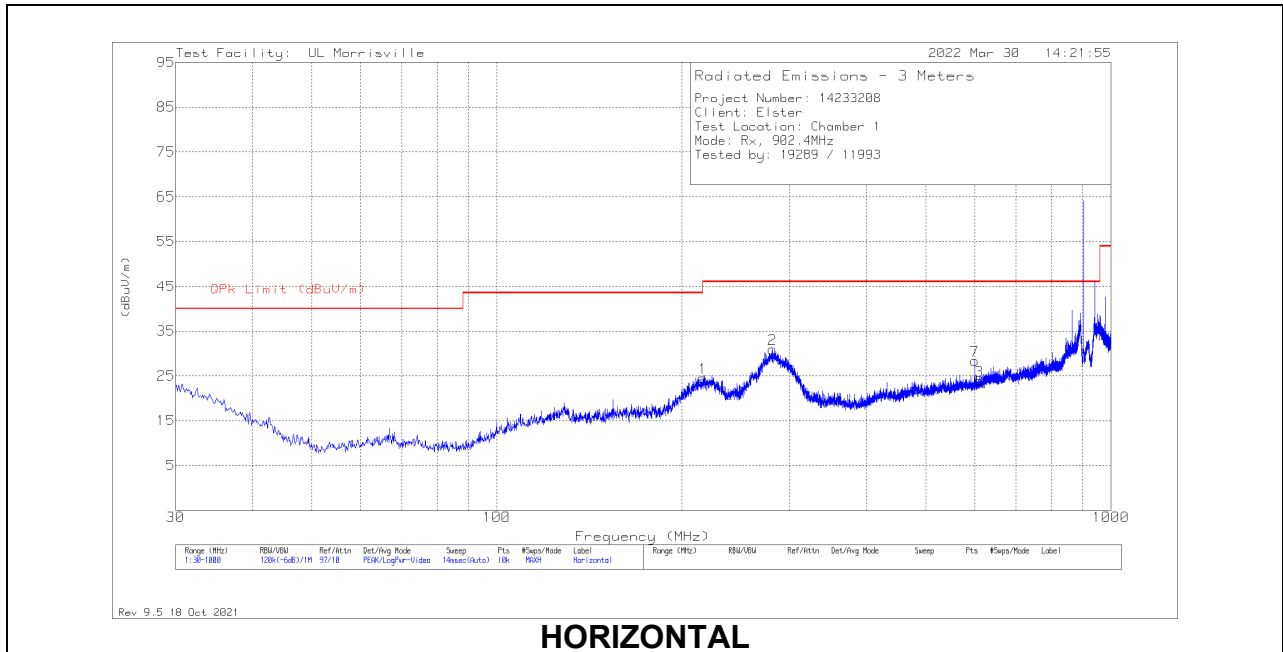
OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

10.1. TRANSMITTER BELOW 1 GHz

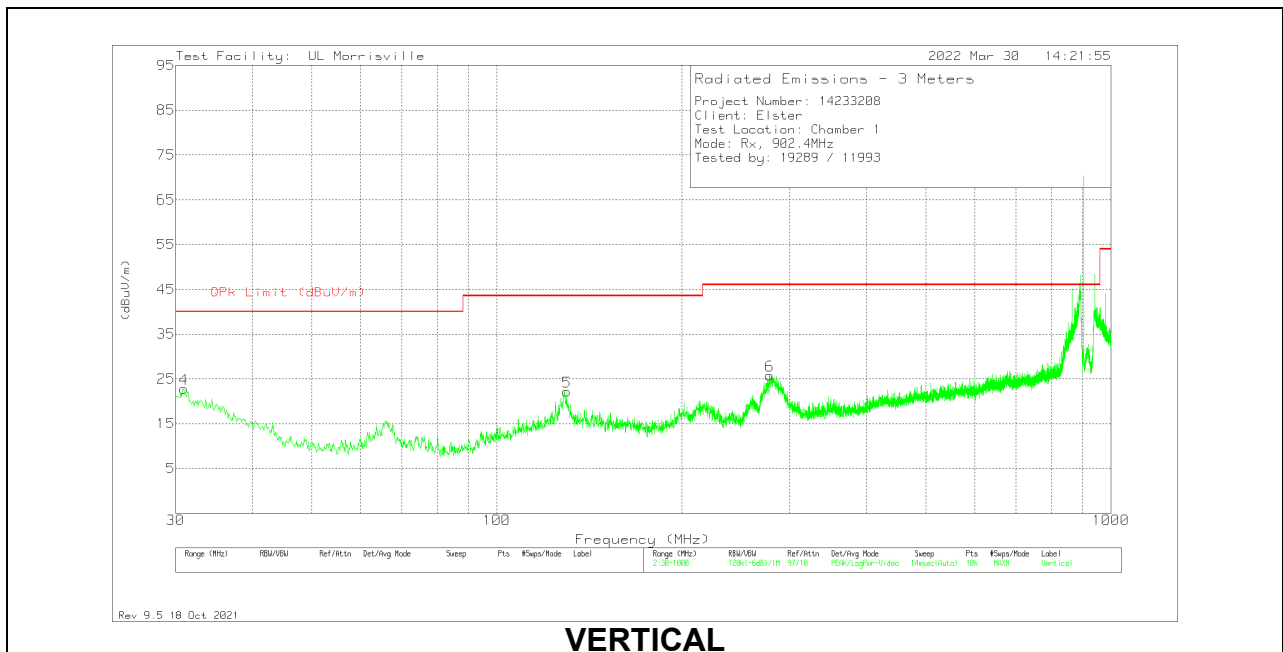
10.1.1. 50 kbps DATA RATE

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

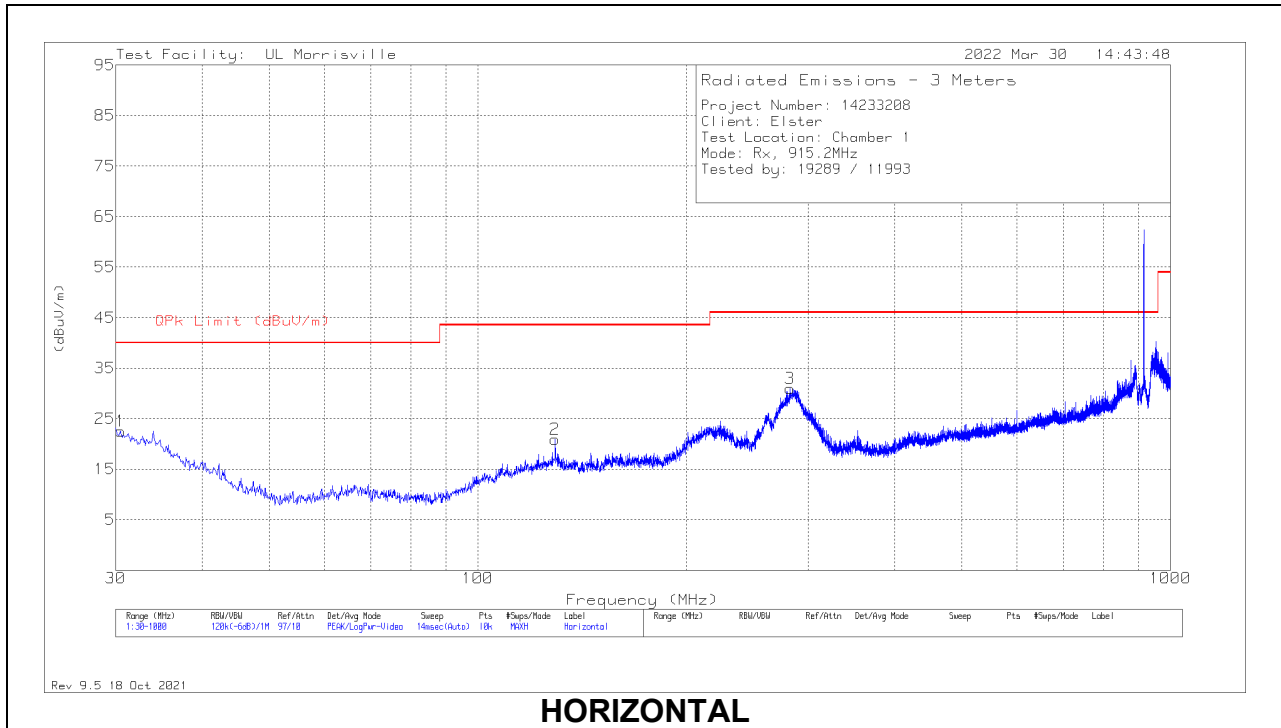
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0066 (dB/m)	Amp/Cbl/Pad (dB)	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	*** 281.036	40.01	Pk	19.3	-28.7	.3	30.91	46.02	-15.11	0-360	100	H
3	*** 610.739	25.14	Pk	24.7	-26.5	.6	23.94	46.02	-22.08	0-360	400	H
5	*** 129.91	32.37	Pk	19.6	-29.9	.1	22.17	43.52	-21.35	0-360	100	V
6	*** 278.417	34.88	Pk	19.2	-28.6	.3	25.78	46.02	-20.24	0-360	100	V
4	30.97	27.35	Pk	26.6	-31.3	.1	22.75	-	-	0-360	100	V
1	216.822	36.81	Pk	16.3	-29	.4	24.51	-	-	0-360	100	H
7	600.069	30.05	Pk	24.2	-26.5	.6	28.35	-	-	0-360	100	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

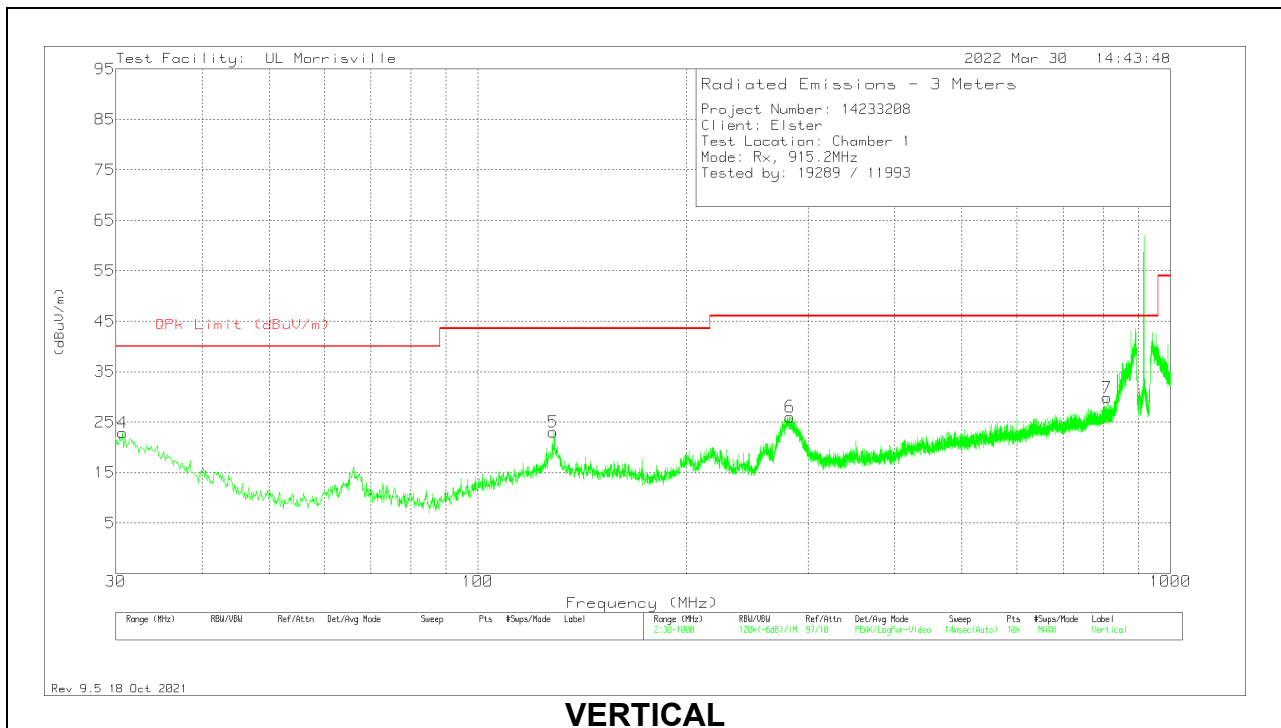
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

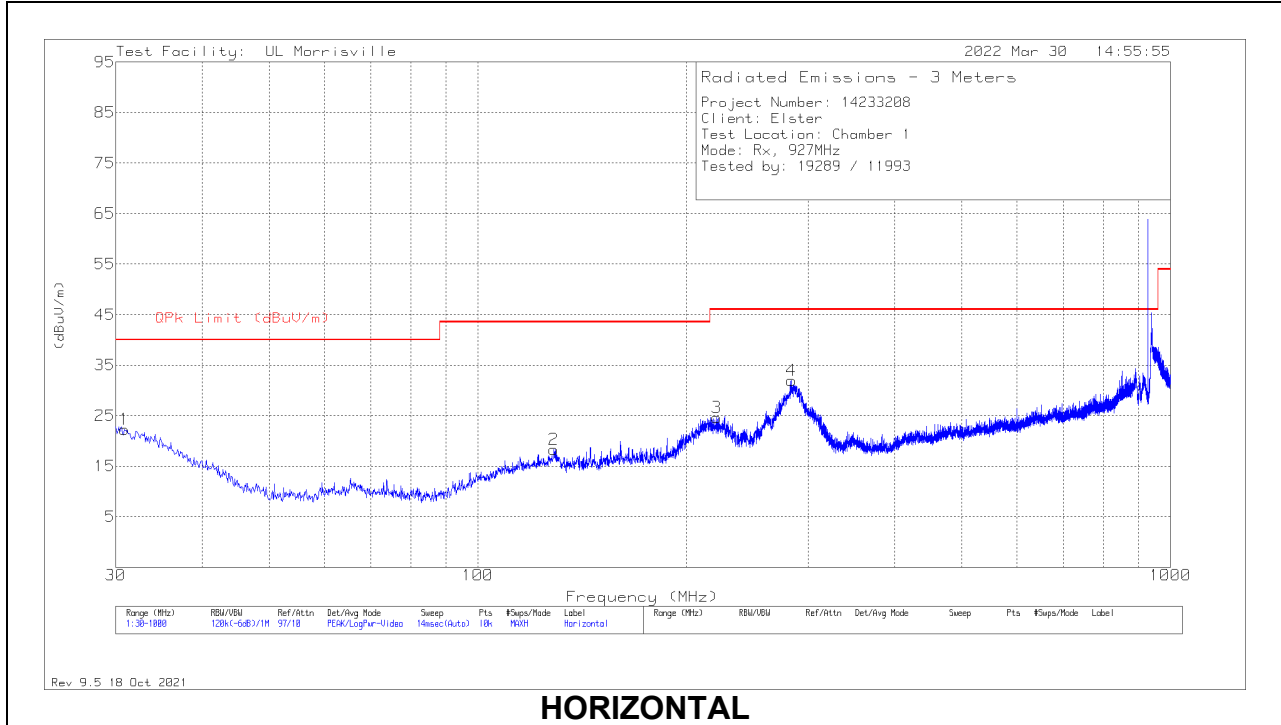
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0066 (dB/m)	Amp/Cbl/Pad (dB)	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	*** 129.328	31.22	Pk	19.6	-30	.1	20.92	43.52	-22.6	0-360	400	H
3	*** 282.491	39.91	Pk	19.3	-28.5	.3	31.01	46.02	-15.01	0-360	100	H
5	*** 128.455	33.28	Pk	19.7	-30.1	.1	22.98	43.52	-20.54	0-360	100	V
6	*** 282.006	35.06	Pk	19.3	-28.6	.3	26.06	46.02	-19.96	0-360	100	V
1	30.485	26.98	Pk	26.7	-31.2	.1	22.58	-	-	0-360	100	H
4	30.679	27.26	Pk	26.6	-31.1	.1	22.86	-	-	0-360	100	V
7	809.88	27.08	Pk	27.3	-25.1	.6	29.88	-	-	0-360	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

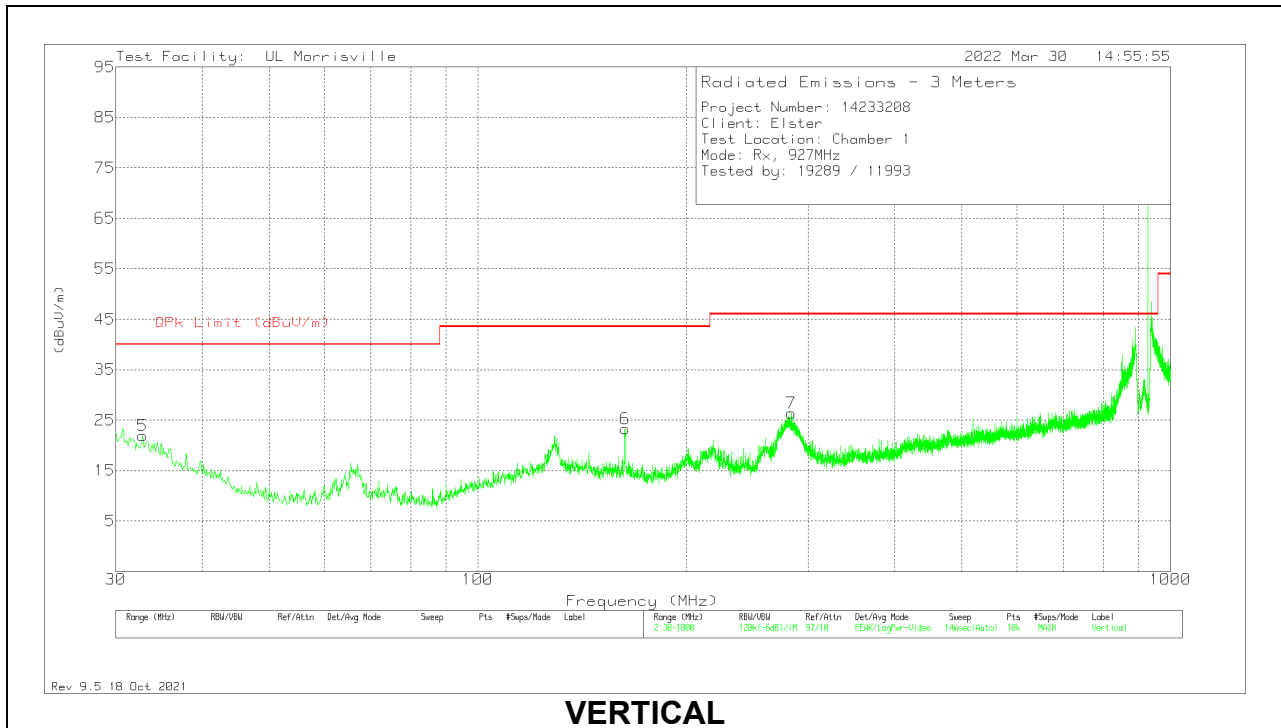
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0066 (dB/m)	Amp/Cbl/Pad (dB)	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	*** 128.746	28.65	Pk	19.6	-30	.1	18.35	43.52	-25.17	0-360	199	H
4	*** 283.752	40.8	Pk	19.3	-28.4	.3	32	46.02	-14.02	0-360	100	H
6	*** 163.084	34.72	Pk	17.8	-29.5	.3	23.32	43.52	-20.2	0-360	100	V
7	*** 283.558	35.16	Pk	19.3	-28.4	.3	26.36	46.02	-19.66	0-360	100	V
1	30.873	26.83	Pk	26.6	-31.2	.1	22.33	-	-	0-360	400	H
5	32.813	27.71	Pk	25.4	-31.3	.1	21.91	-	-	0-360	100	V
3	221.381	36.96	Pk	16.5	-29.2	.4	24.66	-	-	0-360	100	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

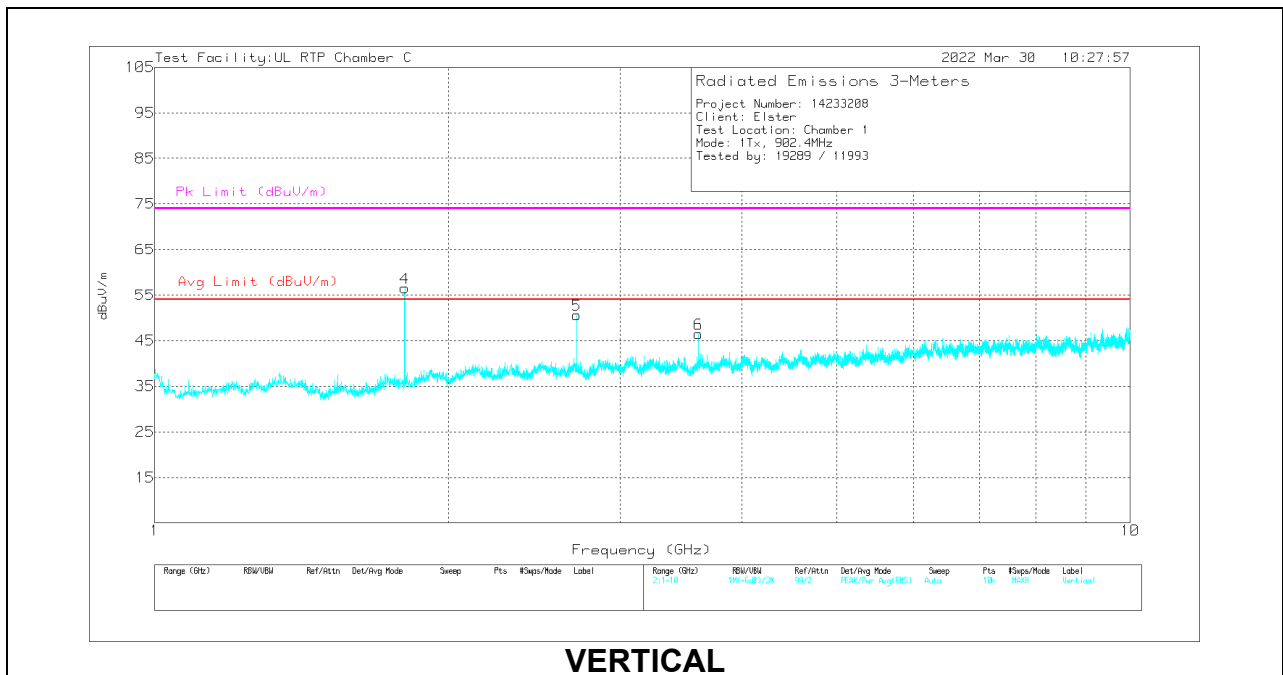
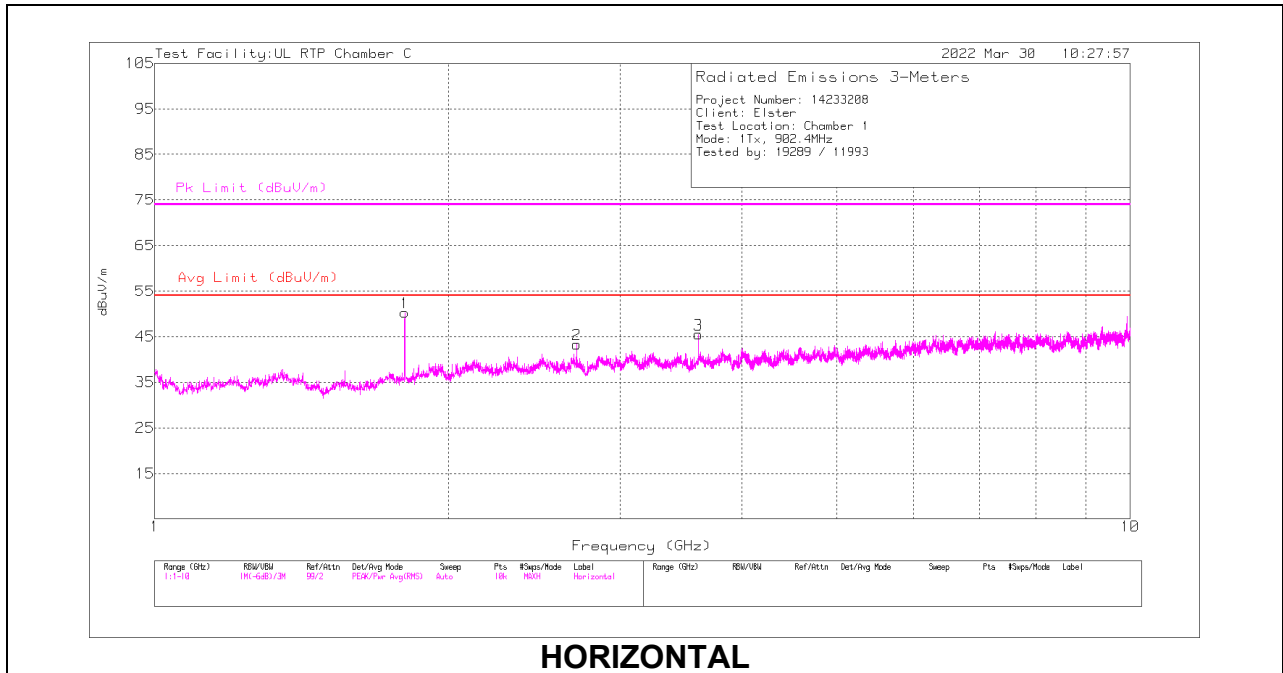
Pk - Peak detector

10.1. TRANSMITTER ABOVE 1 GHz

10.1.1. 50 kbps DATA RATE

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AT0067 (dB/m)	Amp/Cbl/ Pad (dB)	Filter (dB)	Corrected Reading dBuV/m	Avg Limit (dBuV/m)	Margin (dB)	Pk Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	*** 2.7073	44.64	Pk	32	-33.8	.5	43.34	54	-10.66	74	-30.66	0-360	200	H
3	*** 3.6091	45.19	Pk	33	-33.3	.6	45.49	54	-8.51	74	-28.51	0-360	200	H
5	*** 2.70728	55.14	PK2	32	-33.8	.5	53.84	-	-	74	-20.16	238	186	V
5	*** 2.70716	45.39	ADV	32	-33.8	.5	44.09	54	-9.91	-	-	238	186	V
6	*** 3.6091	46.17	Pk	33	-33.3	.6	46.47	54	-7.53	74	-27.53	0-360	300	V
1	1.8046	55.12	Pk	30.3	-35.5	.4	50.32	-	-	-	-	0-360	99	H
4	1.8046	61.34	Pk	30.3	-35.5	.4	56.54	-	-	-	-	0-360	200	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

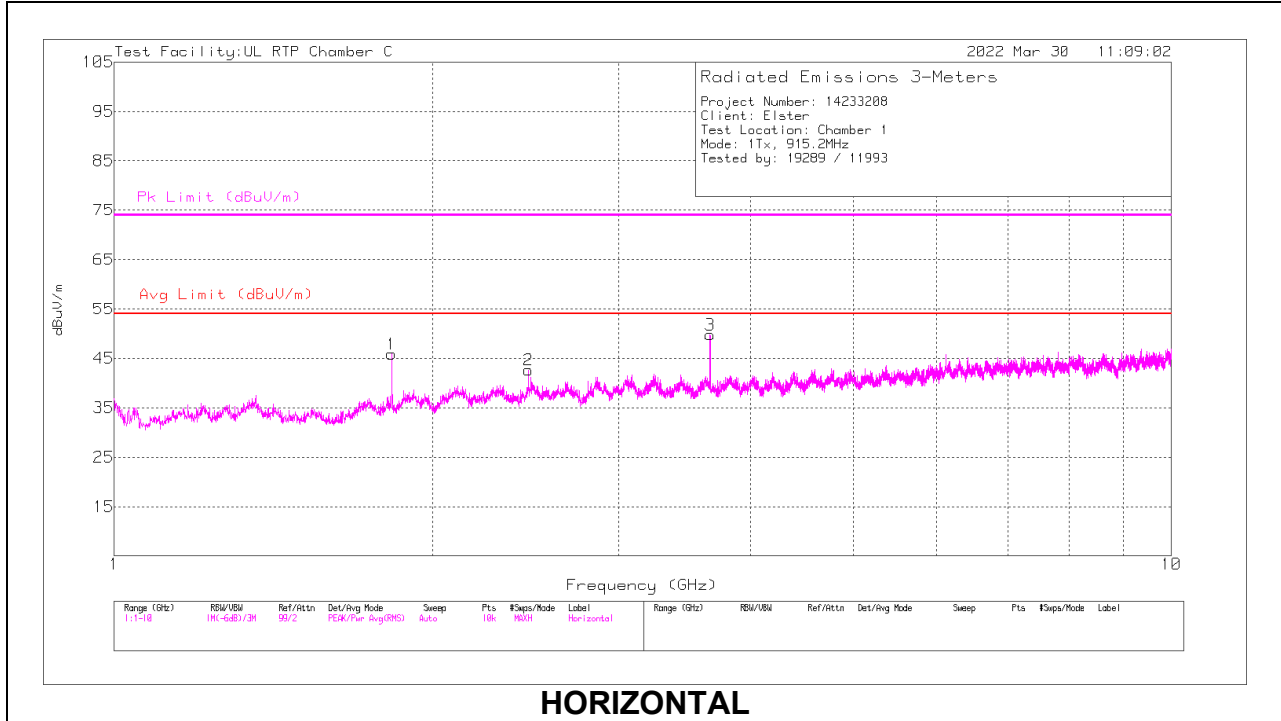
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

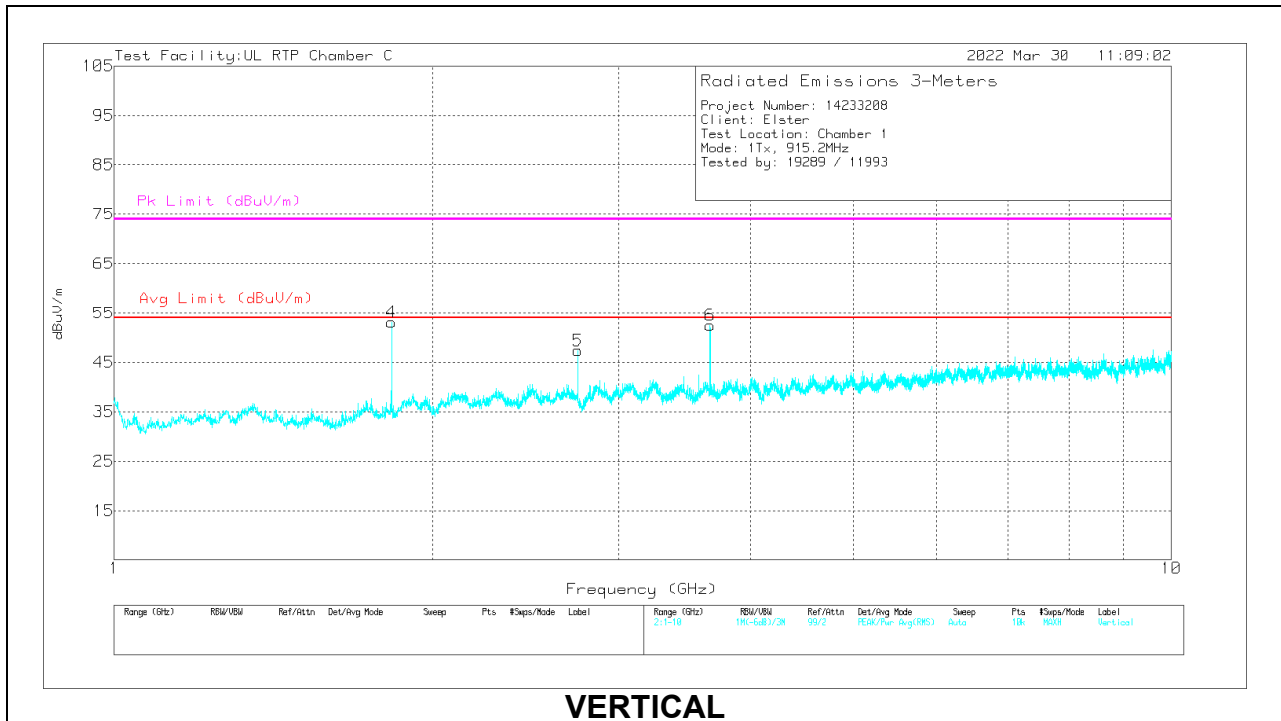
PK2 - Maximum Peak

ADV - Linear Voltage Average

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency(GHz)	MeterReading(dBuV)	Det	AT0067 (dB/m)	Amp/Cbl/Pad (dB)	Filter (dB)	CorrectedReadingdBuV/m	Avg Limit (dBuV/m)	Margin(dB)	Pk Limit (dBuV/m)	PK Margin(dB)	Azimuth(Degs)	Height(cm)	Polarity
1	** 1.8298	50.08	Pk	30.6	-35.2	.4	45.88	-	-	-	-	0-360	299	H
3	*** 3.66098	52.23	PK2	33.1	-33.1	.3	52.53	-	-	74	-21.47	357	236	H
	*** 3.66084	49.74	ADV	33.1	-33.1	.3	50.04	54	-3.96	-	-	357	236	H
4	** 1.8298	57.34	Pk	30.6	-35.2	.4	53.14	-	-	-	-	0-360	301	V
5	*** 2.7451	48.7	Pk	32.2	-33.9	.4	47.4	54	-6.6	74	-26.6	0-360	200	V
6	*** 3.66065	50.09	PK2	33.1	-33.1	.3	50.39	-	-	74	-23.61	295	268	V
	*** 3.66083	46.41	ADV	33.1	-33.1	.3	46.71	54	-7.29	-	-	295	268	V
2	2.4652	44.34	Pk	32.2	-34.3	.4	42.64	-	-	-	-	0-360	299	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

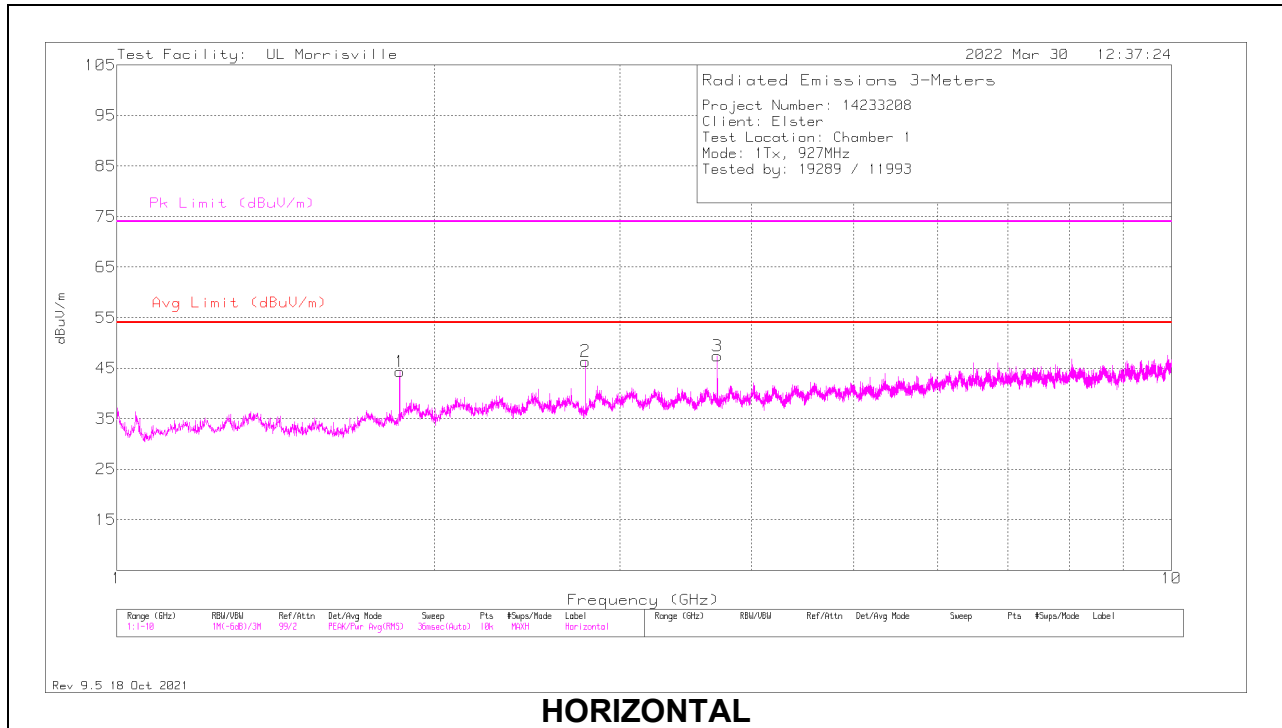
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

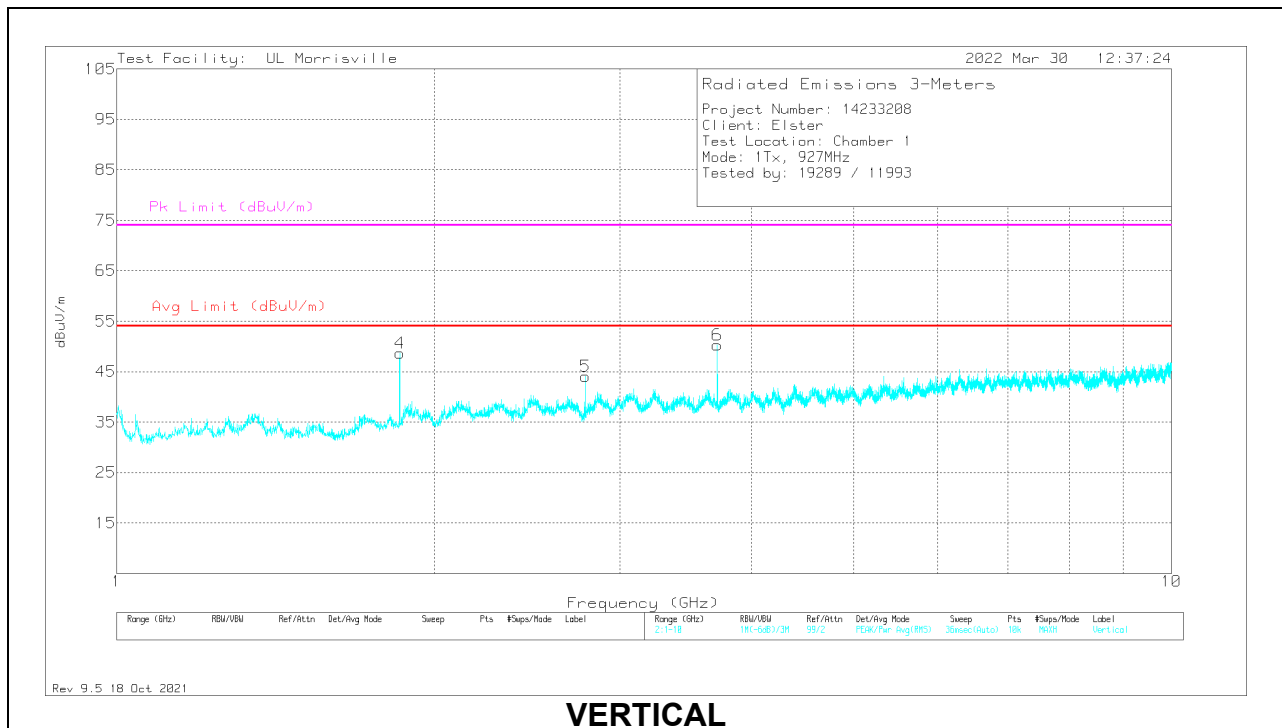
PK2 - Maximum Peak

ADV - Linear Voltage Average

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

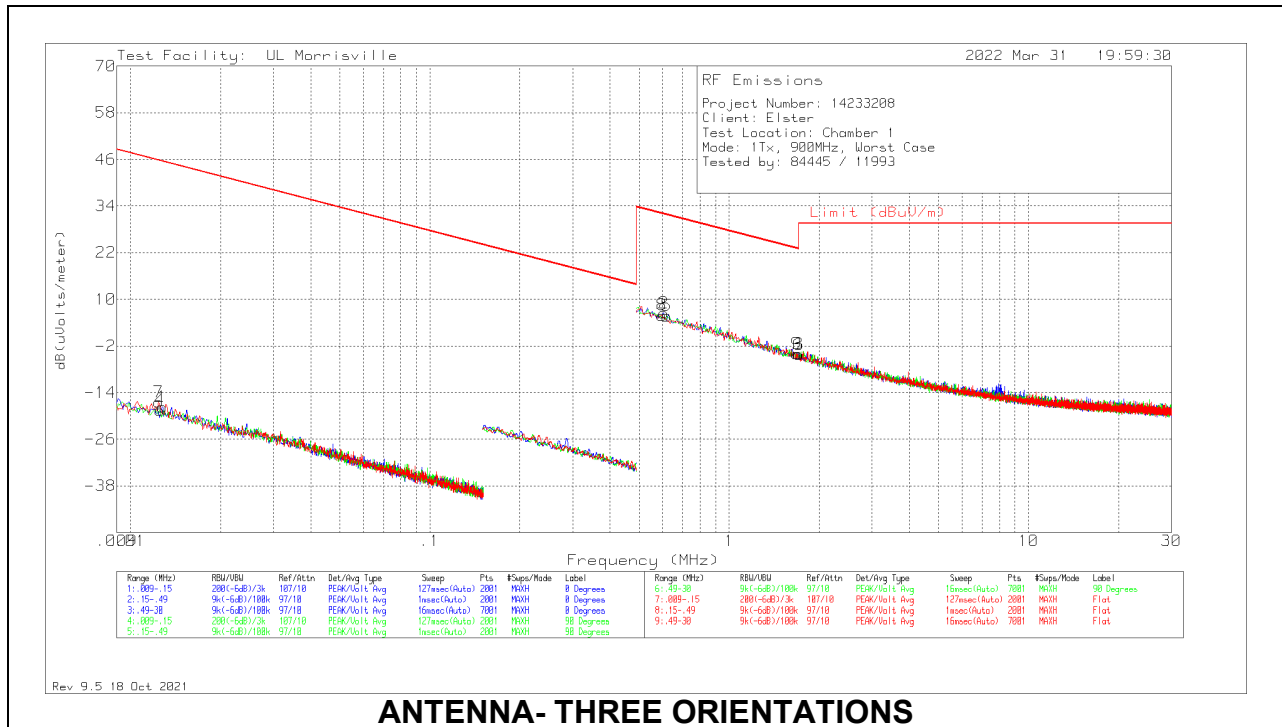
Marker	Frequency(GHz)	MeterReading(dBuV)	Det	AT0067 (dB/m)	Amp/Cbl/Pad (dB)	Filter (dB)	CorrectedReadingdBuV/m	Avg Limit (dBuV/m)	Margin(dB)	Pk Limit (dBuV/m)	PK Margin(dB)	Azimuth(Degs)	Height(cm)	Polarity
1	** 1.855	48.45	Pk	30.8	-35.3	.4	44.35	-	-	-	-	0-360	300	H
2	*** 2.7829	47.57	Pk	32.3	-34	.5	46.37	54	-7.63	74	-27.63	0-360	300	H
3	*** 3.7108	46.67	Pk	33.3	-33.1	.6	47.47	54	-6.53	74	-26.53	0-360	101	H
4	** 1.855	52.78	Pk	30.8	-35.3	.4	48.68	-	-	-	-	0-360	101	V
5	*** 2.7829	45.27	Pk	32.3	-34	.5	44.07	54	-9.93	74	-29.93	0-360	200	V
6	*** 3.71044	48.46	PK2	33.3	-33.2	.6	49.16	-	-	74	-24.84	18	385	V
	*** 3.71045	45	ADV	33.3	-33.2	.6	45.7	54	-8.3	-	-	18	385	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 ** - indicates frequency in Taiwan NCC LP0002 Restricted Band
 Pk - Peak detector
 PK2 - Maximum Peak
 ADV - Linear Voltage Average

10.2. WORST CASE BELOW 30MHZ

Note: All measurements were made at a test distance of 3 m. The measured data was extrapolated from the test distance (3m) to the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz – 30 MHz) to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were 40*Log (test distance / specification distance).

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION) – E-Field



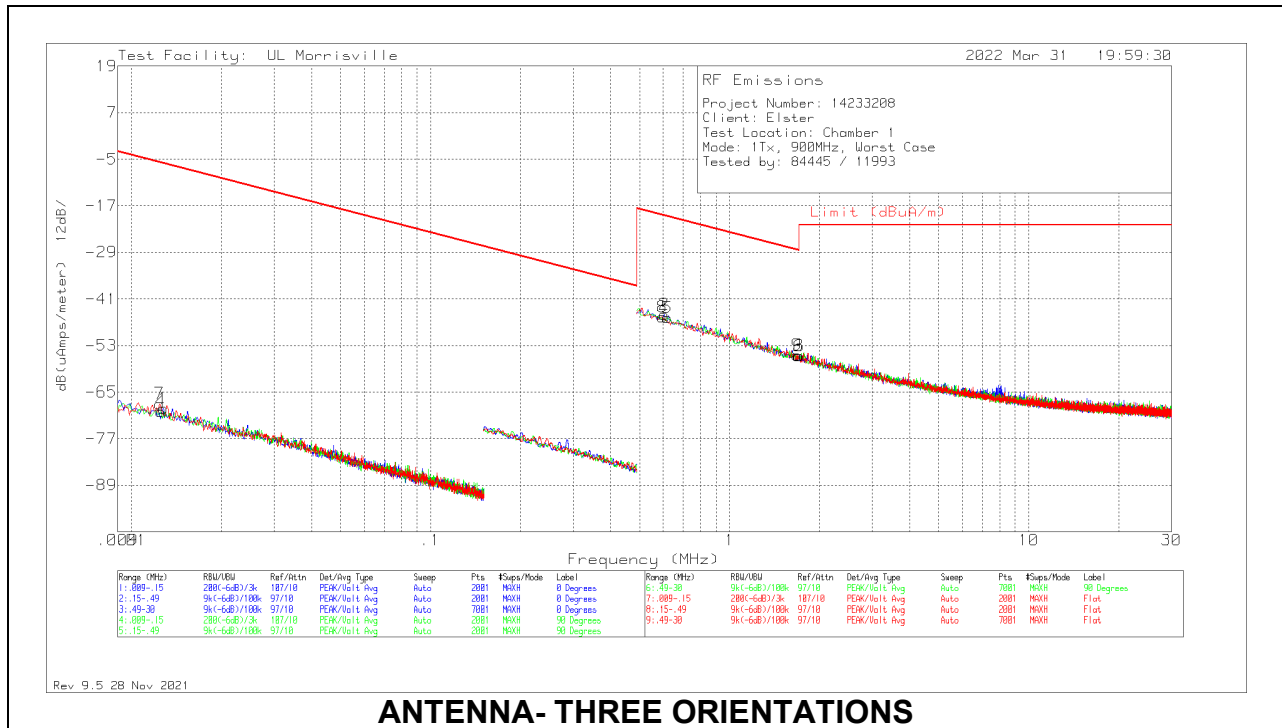
ANTENNA- THREE ORIENTATIONS

Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 (dB/m)	Amp/Cbl/Pad (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	QP/AV Limit (dBuV/m)	PK Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Loop Angle
7	.01241	45.99	Pk	17.4	.1	-80	-16.51	45.73	65.73	-62.24	0-360	Flat
4	.01255	44.08	Pk	17.3	.1	-80	-18.52	45.63	65.63	-64.15	0-360	90 degs
1	.01276	44.96	Pk	17.2	.1	-80	-17.74	45.49	65.49	-63.23	0-360	0 degs
8	.5954	34.51	Pk	11.2	.2	-40	5.91	32.11	-	-26.2	0-360	Flat
2	.60383	35.13	Pk	11.2	.2	-40	6.53	31.99	-	-25.46	0-360	0 degs
5	.6207	34.35	Pk	11.2	.2	-40	5.75	31.75	-	-26	0-360	90 degs
9	1.67891	24.29	Pk	11.4	.3	-40	-4.01	23.1	-	-27.11	0-360	Flat
3	1.69999	24.22	Pk	11.4	.3	-40	-4.08	23	-	-27.08	0-360	0 degs
6	1.70842	24.1	Pk	11.4	.3	-40	-4.2	29.54	-	-33.74	0-360	90 degs

Pk - Peak detector

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION) – H-Field



ANTENNA- THREE ORIENTATIONS

Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 (dB/m)	Amp/Cbl/Pad (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uAmps/meter)	QPK/AV Limit (dBuA/m)	PK Limit (dBuA/m)	Margin (dB)	Azimuth (Degs)	Height (cm)
7	.0124	45.99	Pk	-34.1	.1	-80	-68.01	-5.77	14.23	-62.24	0-360	404
4	.0126	44.08	Pk	-34.2	.1	-80	-70.02	-5.87	14.22	-64.15	0-360	404
1	.0128	44.96	Pk	-34.3	.1	-80	-69.24	-6.01	13.99	-63.23	0-360	404
8	.5954	34.51	Pk	-40.3	.2	-40	-45.59	-19.39	-	-26.2	0-360	404
2	.6038	35.13	Pk	-40.3	.2	-40	-44.97	-19.51	-	-25.46	0-360	404
5	.6207	34.35	Pk	-40.3	.2	-40	-45.75	-19.75	-	-26	0-360	404
9	1.6789	24.29	Pk	-40.1	.3	-40	-55.51	-28.4	-	-27.11	0-360	404
3	1.7	24.22	Pk	-40.1	.3	-40	-55.58	-28.5	-	-27.08	0-360	404
6	1.7084	24.1	Pk	-40.1	.3	-40	-55.7	-21.96	-	-33.74	0-360	404

Pk - Peak detector

11. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

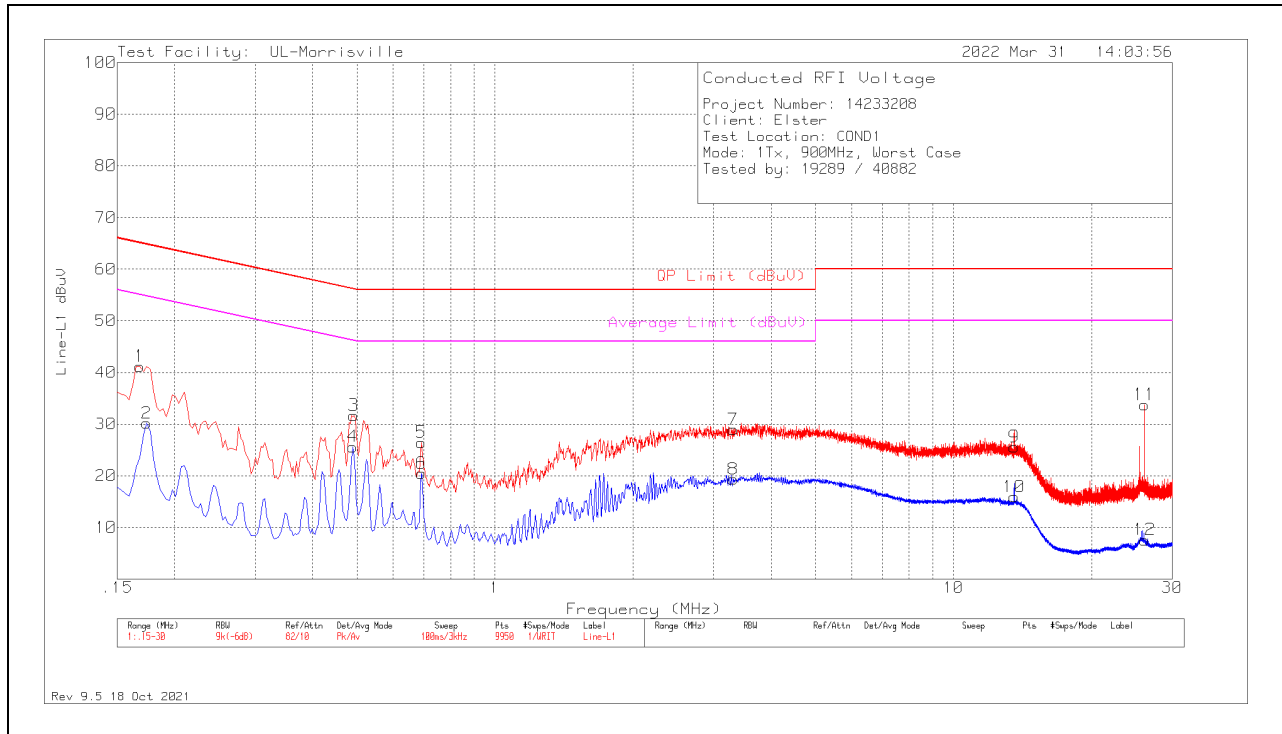
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

11.1.1. AC Power Line Host

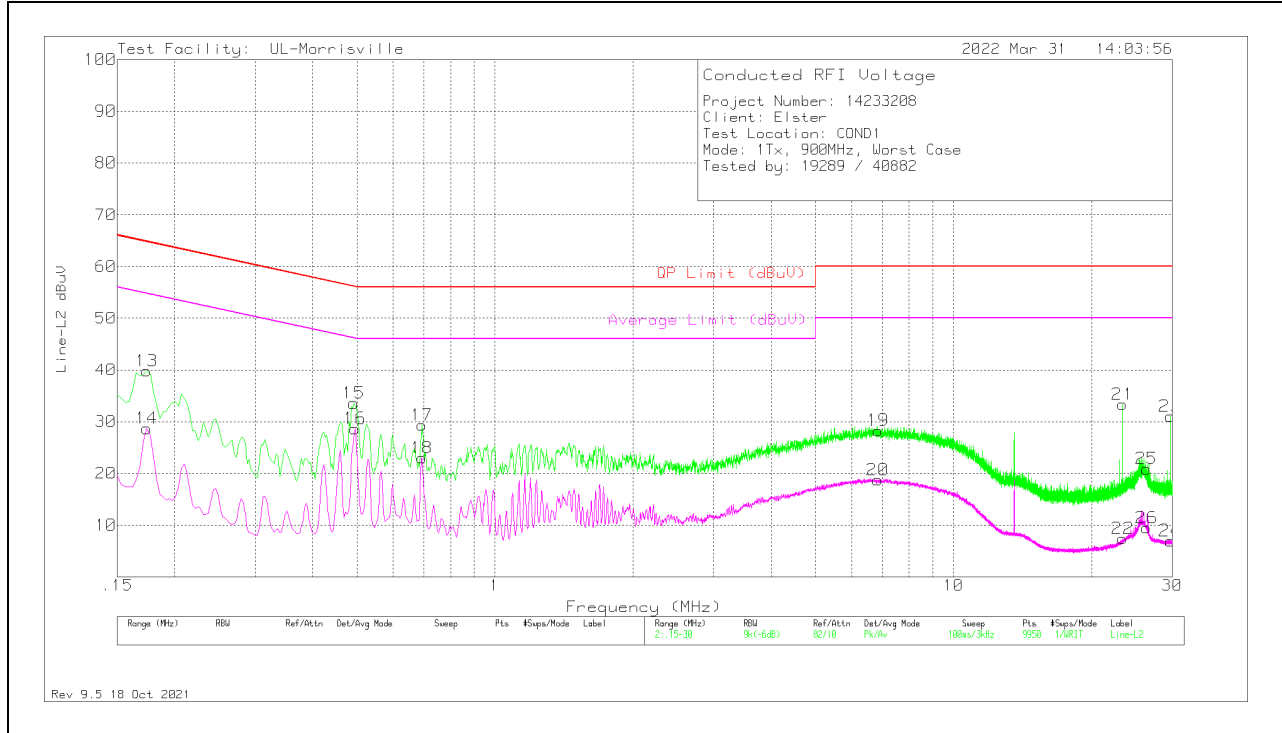
LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
1	.168	31.19	Pk	.2	9.8	41.19	65.06	-23.87	-	-
2	.174	20.18	Av	.2	9.8	30.18	-	-	54.77	-24.59
4	.489	15.82	Av	0	9.8	25.62	-	-	46.18	-20.56
3	.492	21.89	Pk	0	9.8	31.69	56.13	-24.44	-	-
5	.69	16.62	Pk	0	9.8	26.42	56	-29.58	-	-
6	.69	10.69	Av	0	9.8	20.49	-	-	46	-25.51
7	3.309	19.06	Pk	0	9.9	28.96	56	-27.04	-	-
8	3.309	9.45	Av	0	9.9	19.35	-	-	46	-26.65
9	13.566	15.37	Pk	.1	10.1	25.57	60	-34.43	-	-
10	13.566	5.73	Av	.1	10.1	15.93	-	-	50	-34.07
12	26.118	-2.91	Av	.3	10.2	7.59	-	-	50	-42.41
11	26.121	23.26	Pk	.3	10.2	33.76	60	-26.24	-	-

Pk - Peak detector
 Av - Average detection

LINE 2 RESULTS



Range 2: Line-L2 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
13	.174	29.81	Pk	.2	9.8	39.81	64.77	-24.96	-	-
14	.174	18.69	Av	.2	9.8	28.69	-	-	54.77	-26.08
15	.492	23.76	Pk	0	9.8	33.56	56.13	-22.57	-	-
16	.495	18.84	Av	0	9.8	28.64	-	-	46.08	-17.44
17	.693	19.54	Pk	0	9.8	29.34	56	-26.66	-	-
18	.693	13.2	Av	0	9.8	23	-	-	46	-23
20	6.837	8.62	Av	.1	10	18.72	-	-	50	-31.28
19	6.846	18.18	Pk	.1	10	28.28	60	-31.72	-	-
21	23.4	22.96	Pk	.2	10.2	33.36	60	-26.64	-	-
22	23.4	-3.01	Av	.2	10.2	7.39	-	-	50	-42.61
25	26.361	10.38	Pk	.3	10.2	20.88	60	-39.12	-	-
26	26.37	-1.02	Av	.3	10.2	9.48	-	-	50	-40.52
23	29.682	20.44	Pk	.3	10.3	31.04	60	-28.96	-	-
24	29.691	-3.66	Av	.3	10.3	6.94	-	-	50	-43.06

Pk - Peak detector
 Av - Average detection

12. SETUP PHOTOS

Please refer to R14233208-EP1 for setup photos

END OF TEST REPORT