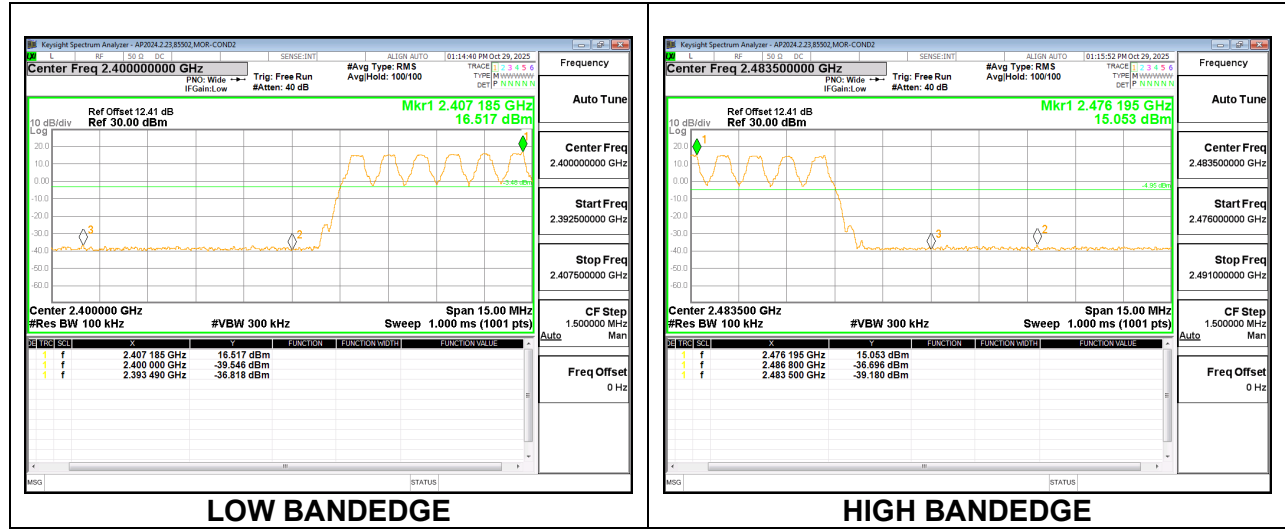
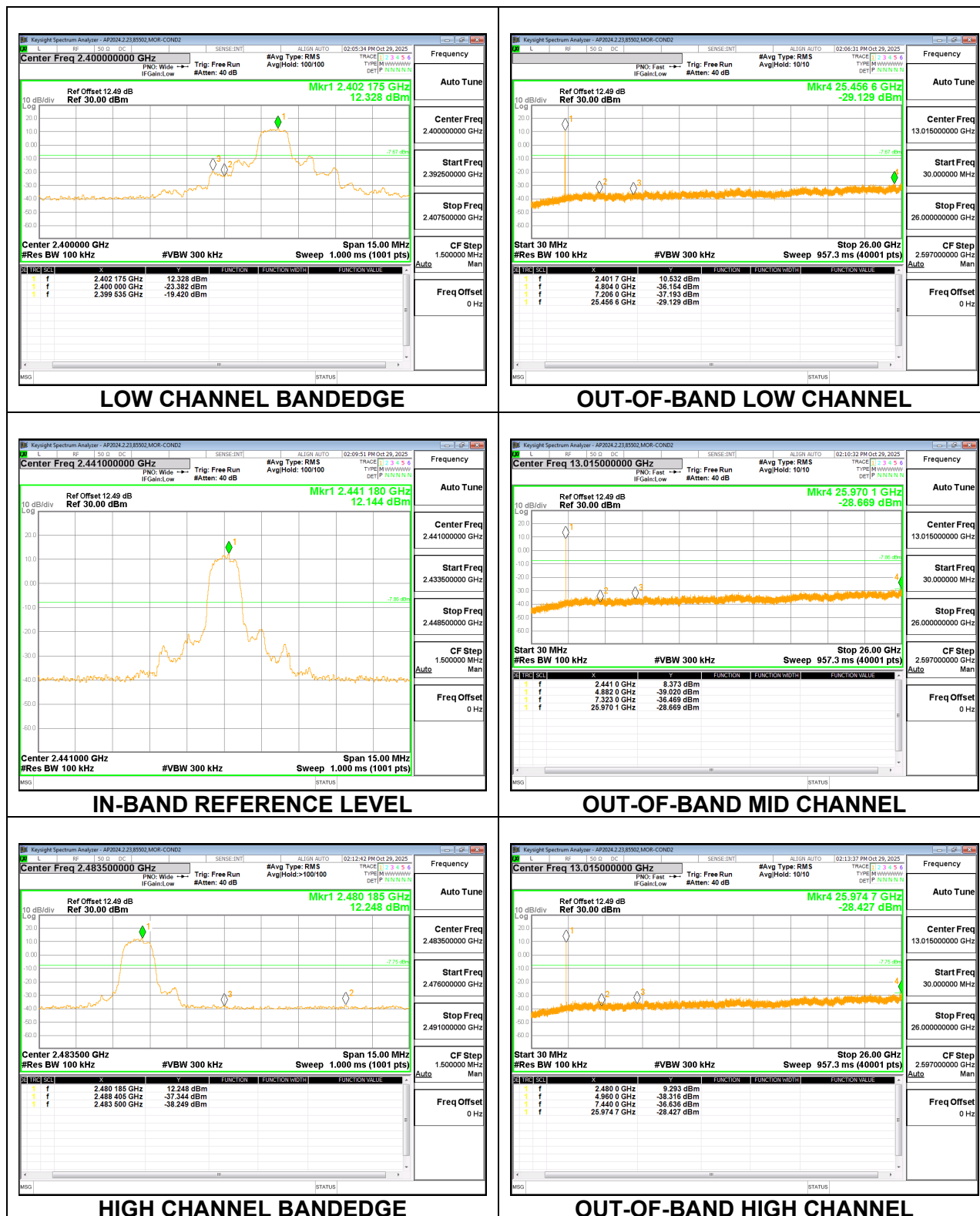


SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON C1

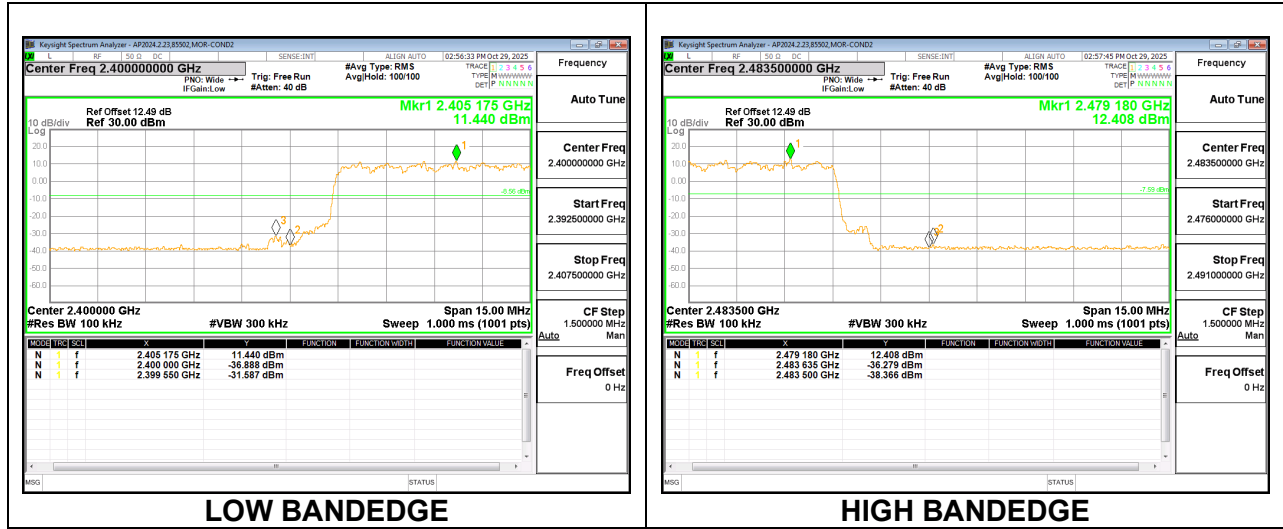


9.8.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

SPURIOUS EMISSIONS, NON-HOPPING C0



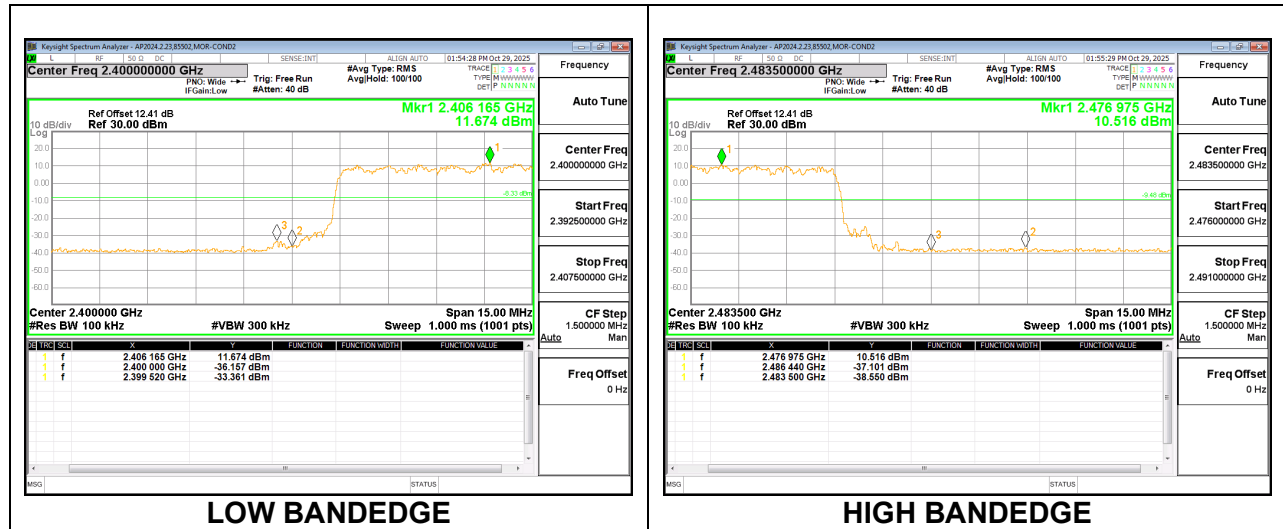
SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON C0



SPURIOUS EMISSIONS, NON-HOPPING C1

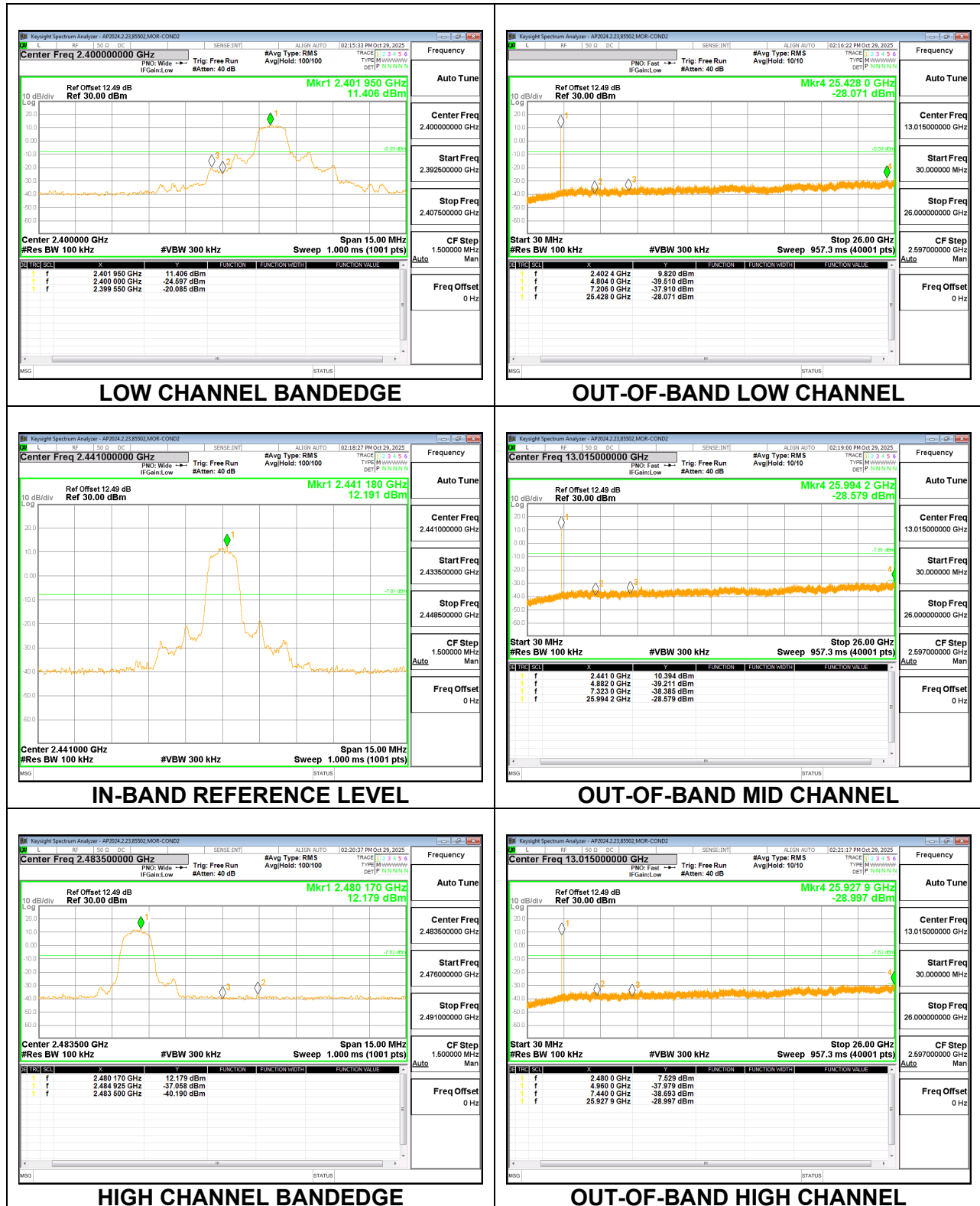


SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON C1

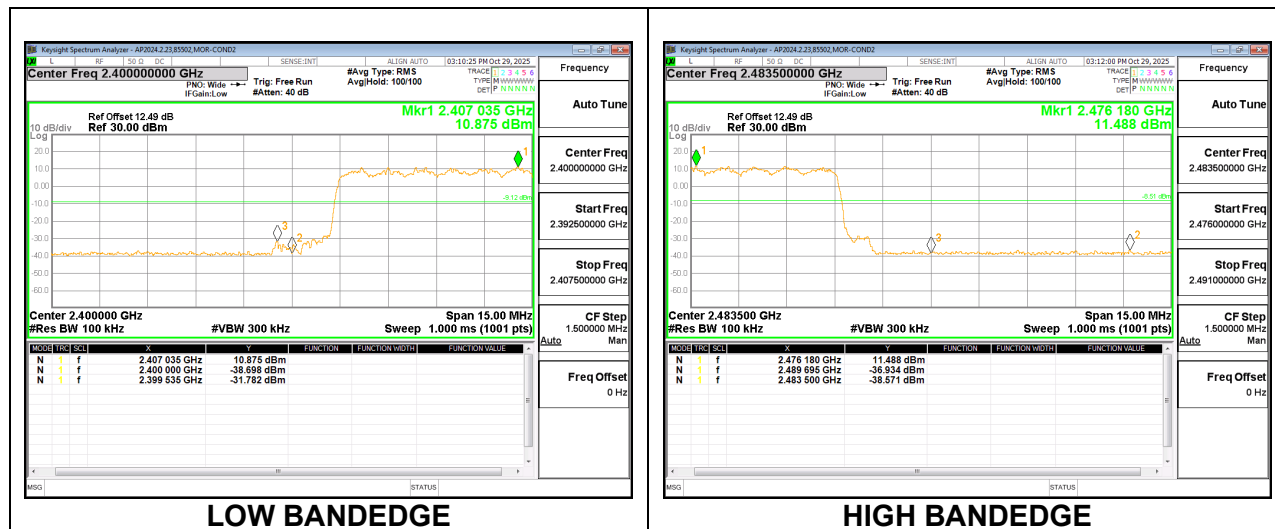


9.8.3. BLUETOOTH ENHANCED DATA RATE QPSK MODULATION

SPURIOUS EMISSIONS, NON-HOPPING C0



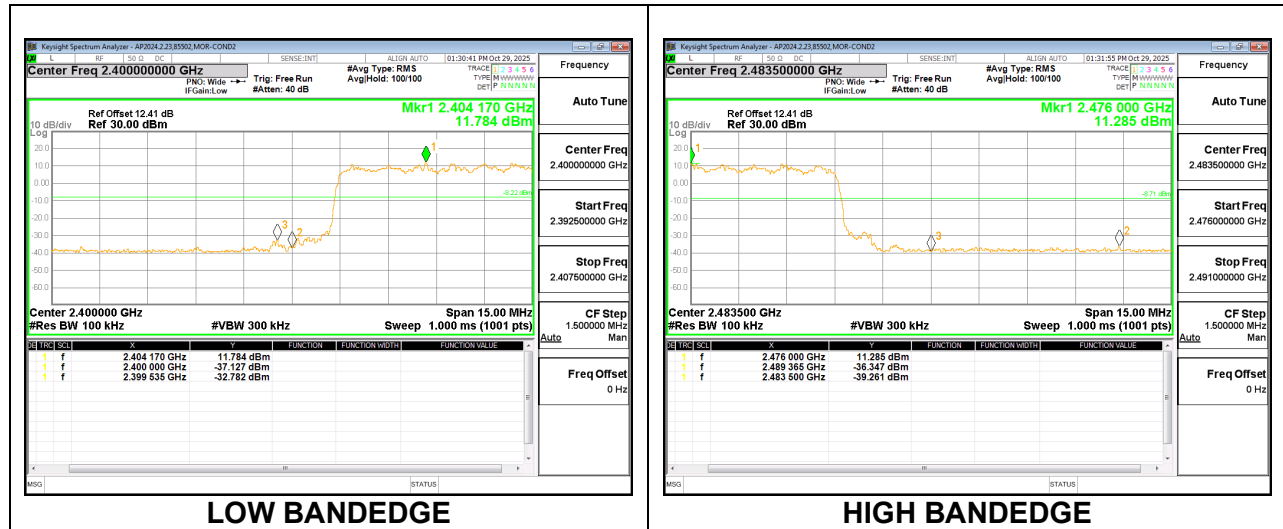
SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON C0



SPURIOUS EMISSIONS, NON-HOPPING C1



SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON C1



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

IC RSS-GEN Clause 8.9 and 8.10

Frequency Range (kHz)	Field Strength Limit (uA/m) at 3 m	Field Strength Limit (dBuV/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 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements (Where T = on time).

The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. Below 1GHz and above 18GHz emissions, 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).

Based 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.

KDB 558074 D01 15.247 Meas Guidance v05r02

Use of a duty cycle correction factor (DCCF) is permitted for calculating average radiated field strength emission levels for an FHSS device in 15.247. This DCCF can be applied when the field strength limit (e.g., within a Government Restricted band) and the conditions specified in Section 15.35(c) can be satisfied. The average radiated field strength is calculated by subtracting the DCCF from the maximum radiated field strength level as determined through measurement. The maximum radiated field strength level represents the worst-case (maximum amplitude) RMS measurement of the emission(s) during continuous transmission (i.e., not including any time intervals during which the transmitter is off or is transmitting at a reduced power level). It is also acceptable to apply the DCCF to a measurement performed with a peak detector instead of the specified RMS power averaging detector.

Note that Section 15.35(c) specifies that the DCCF shall represent the worst case (greatest duty cycle) over any 100 msec transmission period.

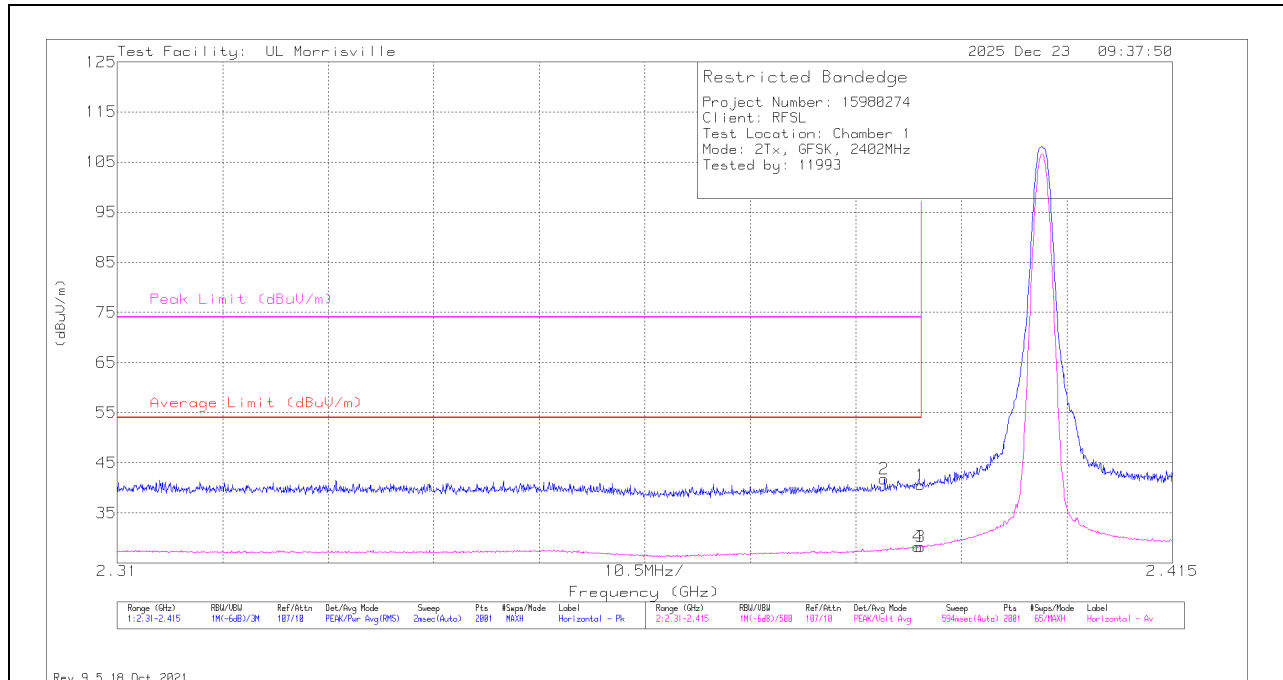
10.1. TRANSMITTER ABOVE 1 GHz

10.1.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

MIMO

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.38996	33.77	Pk	31.9	-25.1	40.57	-	-	74	-33.43	111	251	H
2	* ** 2.38634	34.98	Pk	31.9	-25.1	41.78	-	-	74	-32.22	111	251	H
3	* ** 2.38996	21.42	V1TV	31.9	-25.1	28.22	54	-25.78	-	-	111	251	H
4	* ** 2.3897	21.49	V1TV	31.9	-25.1	28.29	54	-25.71	-	-	111	251	H

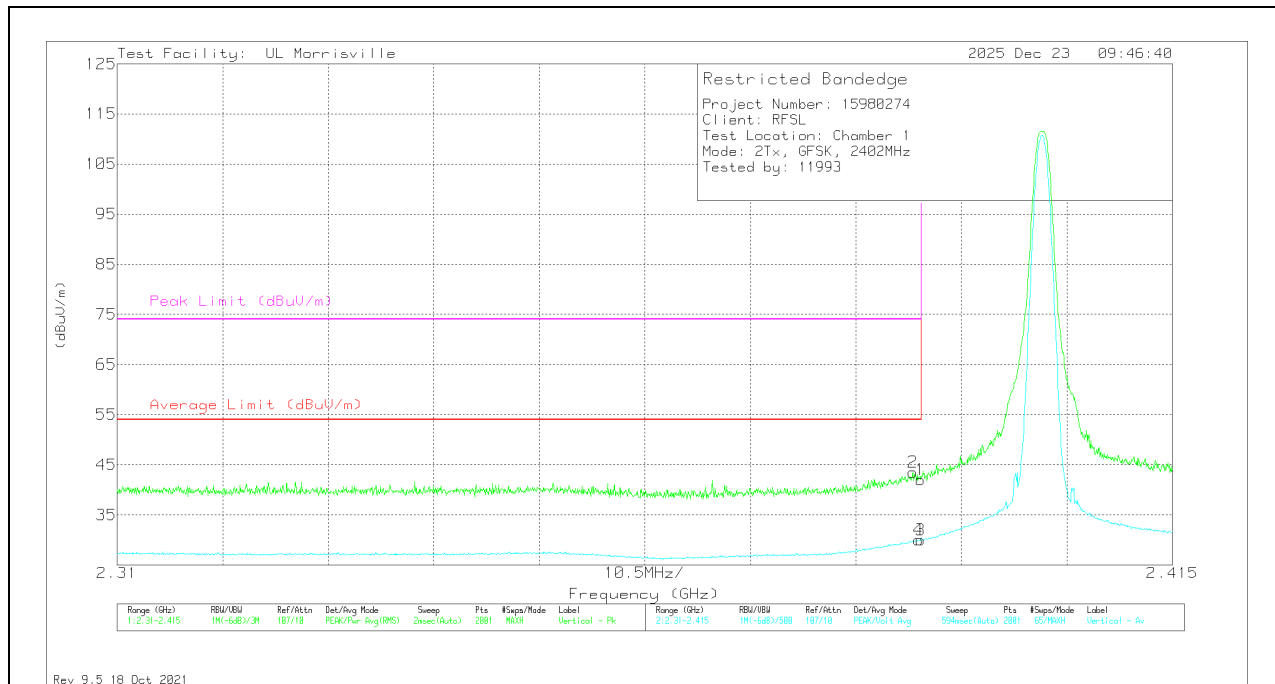
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TV: VB=1/Ton, Linear Voltage Average where Detector = Peak and Ton is packet duration

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*** 2.38996	35.19	Pk	31.9	-25.1	41.99	-	-	74	-32.01	61	236	V
2	*** 2.38917	36.68	Pk	31.9	-25.1	43.48	-	-	74	-30.52	61	236	V
3	*** 2.38996	23.16	V1TV	31.9	-25.1	29.96	54	-24.04	-	-	61	236	V
4	*** 2.38975	23.22	V1TV	31.9	-25.1	30.02	54	-23.98	-	-	61	236	V

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

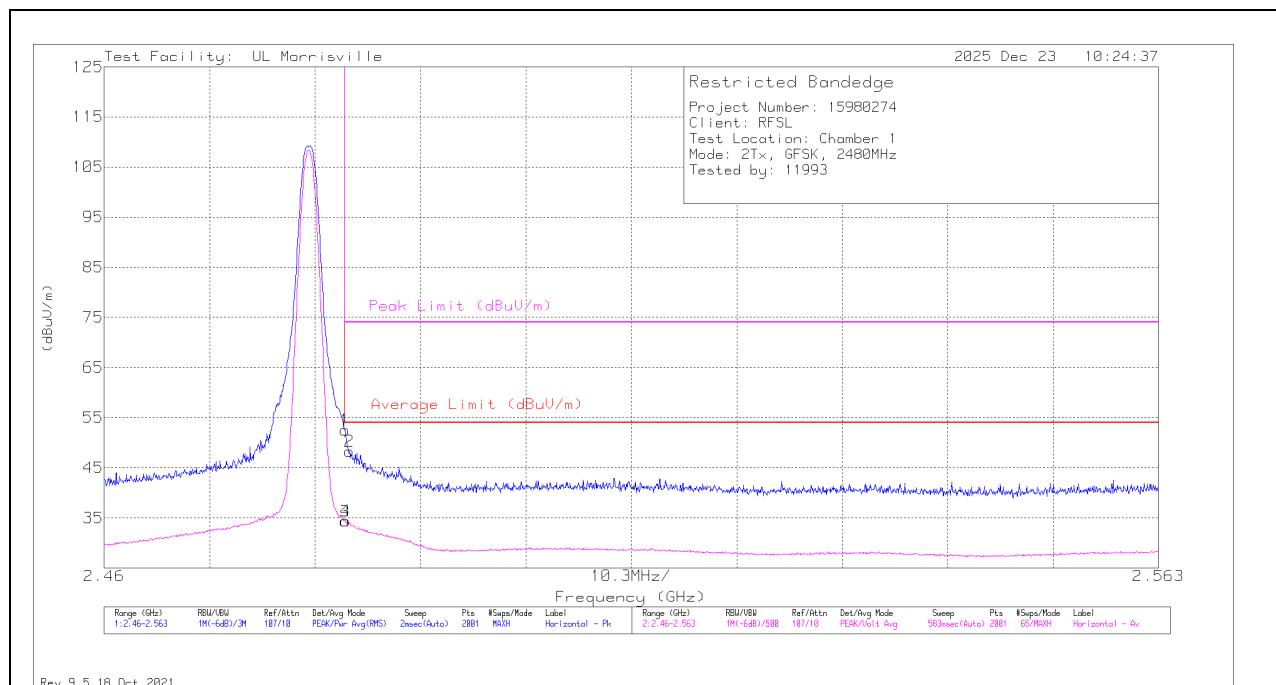
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TV: VB=1/Ton, Linear Voltage Average where Detector = Peak and Ton is packet duration

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.48354	44.76	Pk	32.2	-24.4	52.56	-	-	74	-21.44	5	133	H
2	* ** 2.48395	40.51	Pk	32.2	-24.4	48.31	-	-	74	-25.69	5	133	H
3	* ** 2.48354	26.52	V1TV	32.2	-24.4	34.32	54	-19.68	-	-	5	133	H
4	* ** 2.48359	26.56	V1TV	32.2	-24.4	34.36	54	-19.64	-	-	5	133	H

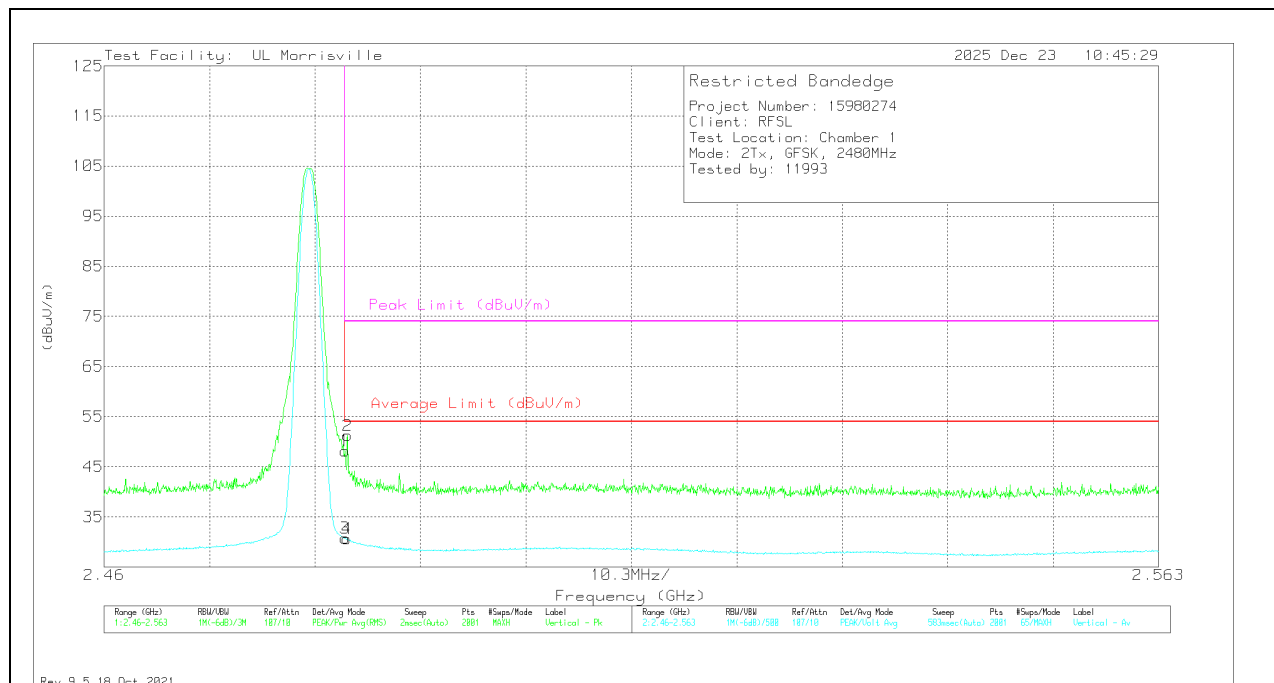
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TV: VB=1/Ton, Linear Voltage Average where Detector = Peak and Ton is packet duration

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*** 2.48354	40.31	Pk	32.2	-24.4	48.11	-	-	74	-25.89	186	194	V
2	*** 2.48379	43.42	Pk	32.2	-24.4	51.22	-	-	74	-22.78	186	194	V
3	*** 2.48354	22.94	V1TV	32.2	-24.4	30.74	54	-23.26	-	-	186	194	V
4	*** 2.48369	22.8	V1TV	32.2	-24.4	30.6	54	-23.4	-	-	186	194	V

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

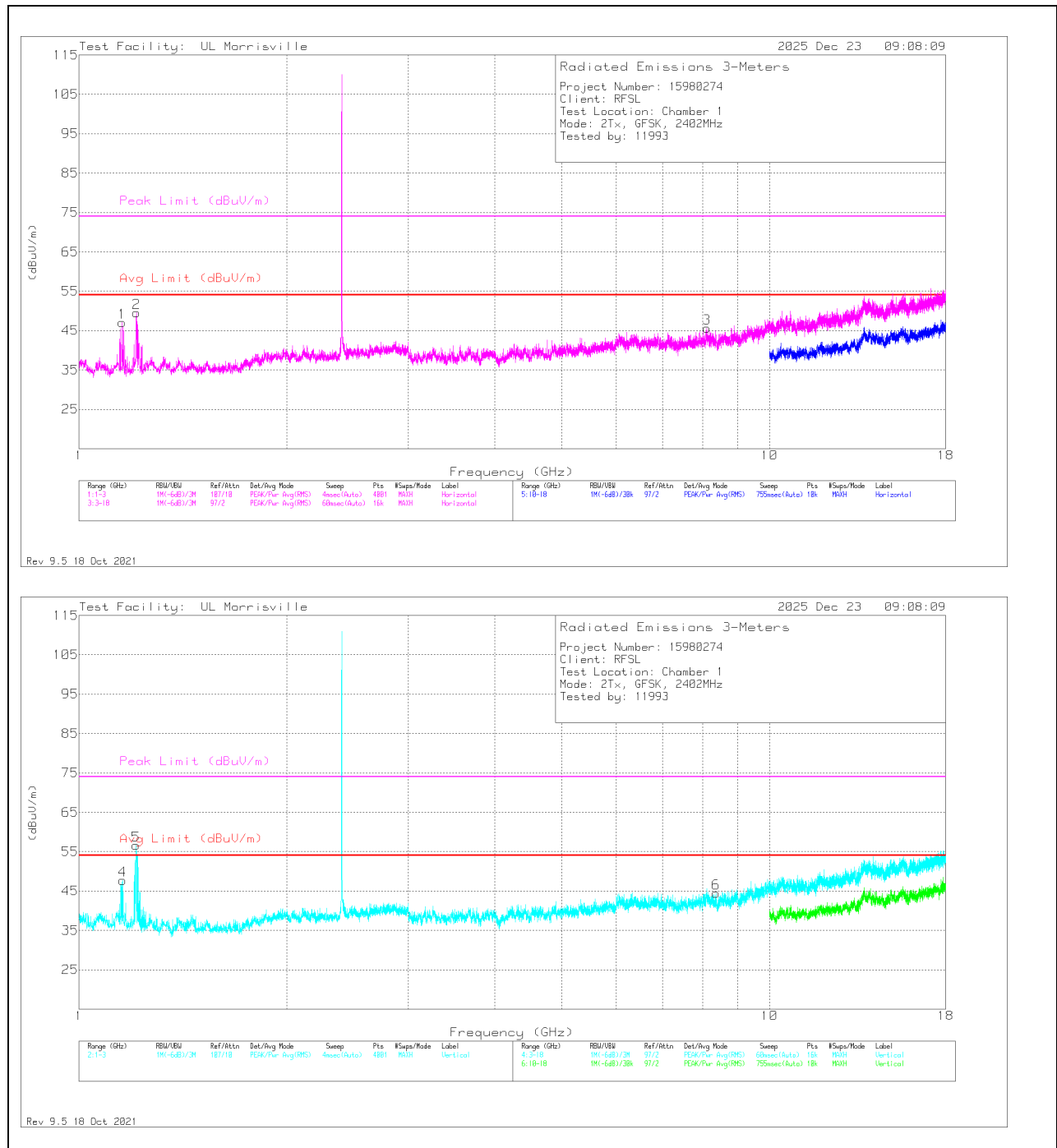
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TV: VB=1/Ton, Linear Voltage Average where Detector = Peak and Ton is packet duration

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/ Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 1.155	43.94	Pk	28.2	-25.1	47.04	54	-6.96	74	-26.96	0-360	199	H
2	* ** 1.20952	56.07	PK2	28.8	-25.2	59.67	-	-	74	-14.33	331	127	H
	* ** 1.21036	21.75	V1TV	28.8	-25.2	25.35	54	-28.65	-	-	331	127	H
4	* ** 1.156	44.44	Pk	28.3	-25	47.74	54	-6.26	74	-26.26	0-360	101	V
5	* ** 1.20991	54.08	PK2	28.8	-25.2	57.68	-	-	74	-16.32	75	200	V
	* ** 1.20902	21.92	V1TV	28.8	-25.2	25.52	54	-28.48	-	-	75	200	V
3	* ** 8.1225	51.95	Pk	35.9	-42.2	45.65	54	-8.35	74	-28.35	0-360	101	H
6	* ** 8.37281	49.84	Pk	35.8	-41.2	44.44	54	-9.56	74	-29.56	0-360	101	V

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

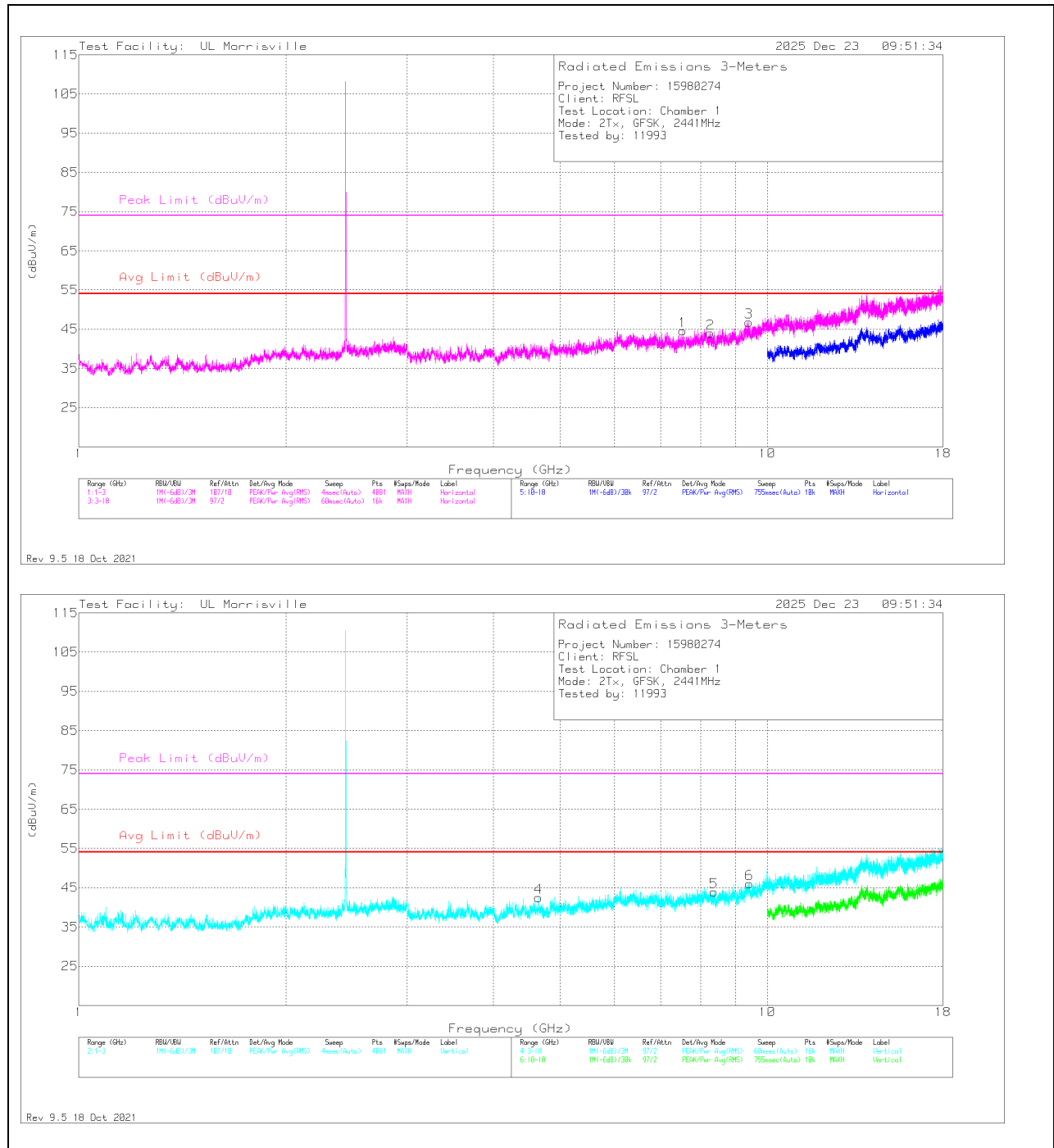
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

V1TV: VB=1/Ton, Linear Voltage Average where Detector = Peak and Ton is packet duration

MID CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 7.53281	50.95	Pk	35.5	-41.9	44.55	54	-9.45	74	-29.45	0-360	200	H
2	* ** 8.27344	50.09	Pk	35.9	-42	43.99	54	-10.01	74	-30.01	0-360	101	H
3	* ** 9.405	50.76	Pk	36.3	-40.3	46.76	54	-7.24	74	-27.24	0-360	200	H
4	* ** 4.65	54.65	Pk	33.8	-46	42.45	54	-11.55	74	-31.55	0-360	101	V
5	* ** 8.36906	49.23	Pk	35.8	-41.1	43.93	54	-10.07	74	-30.07	0-360	200	V
6	* ** 9.42375	50.9	Pk	36.3	-41.2	46	54	-8	74	-28	0-360	101	V

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

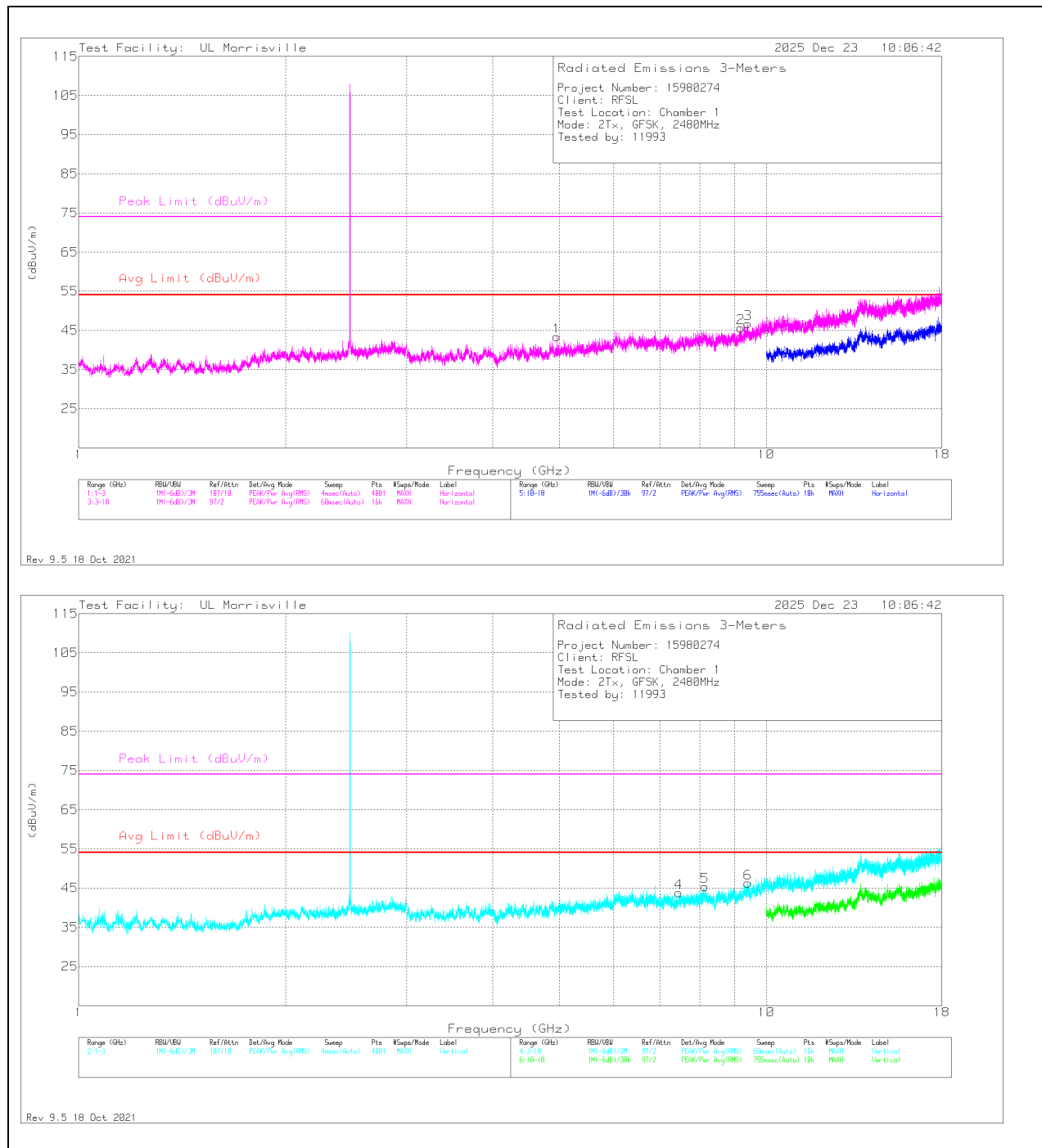
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

V1TV: VB=1/Ton, Linear Voltage Average where Detector = Peak and Ton is packet duration

HIGH CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.95938	54.84	Pk	34.2	-45.7	43.34	54	-10.66	74	-30.66	0-360	199	H
2	* ** 9.18469	50.64	Pk	36	-41	45.64	54	-8.36	74	-28.36	0-360	101	H
3	* ** 9.40594	50.63	Pk	36.3	-40.2	46.73	54	-7.27	74	-27.27	0-360	199	H
4	* ** 7.46344	50.1	Pk	35.5	-41.8	43.8	54	-10.2	74	-30.2	0-360	101	V
5	* ** 8.14406	50.75	Pk	35.9	-41.3	45.35	54	-8.65	74	-28.65	0-360	101	V
6	* ** 9.40313	50.32	Pk	36.3	-40.4	46.22	54	-7.78	74	-27.78	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 - KDB558074 Method: Maximum Peak

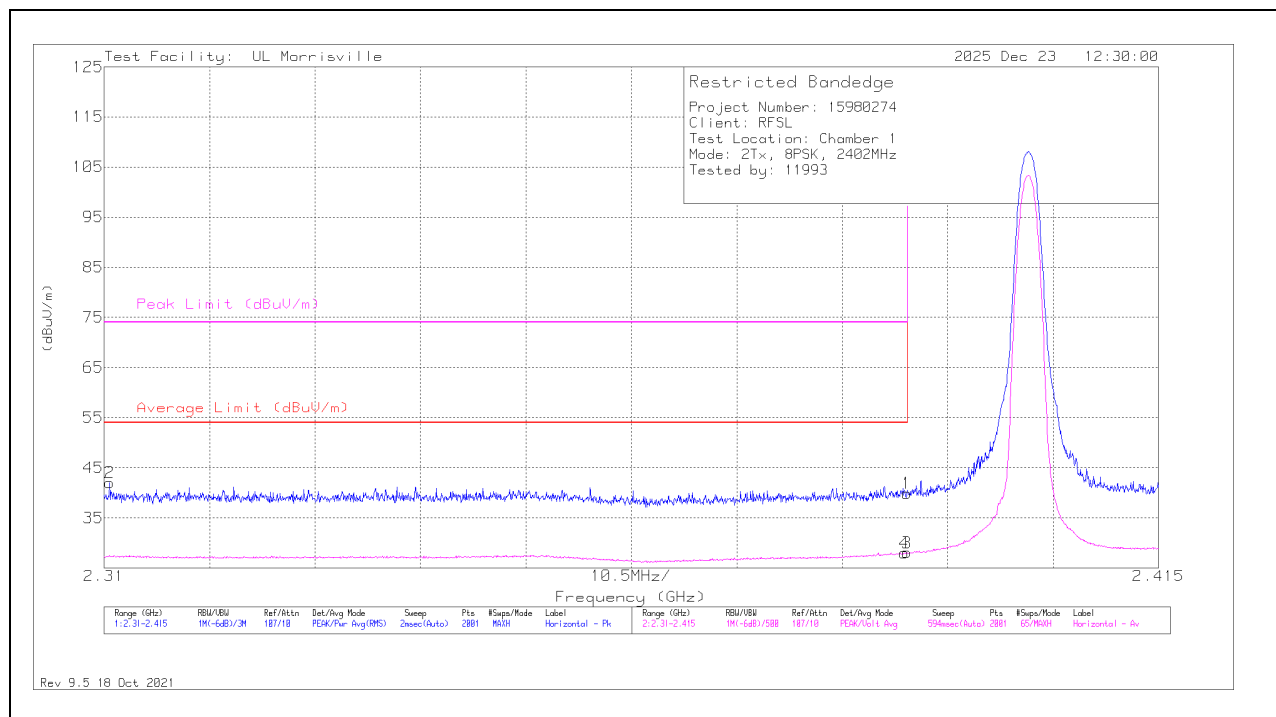
V1TV: VB=1/Ton, Linear Voltage Average where Detector = Peak and Ton is packet duration

10.1.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

MIMO

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*** 2.38996	33.06	Pk	31.9	-25.1	39.86	-	-	74	-34.14	187	189	H
2	*** 2.31053	34.97	Pk	31.7	-24.7	41.97	-	-	74	-32.03	187	189	H
3	*** 2.38996	21.26	V1TV	31.9	-25.1	28.06	54	-25.94	-	-	187	189	H
4	*** 2.3897	21.14	V1TV	31.9	-25.1	27.94	54	-26.06	-	-	187	189	H

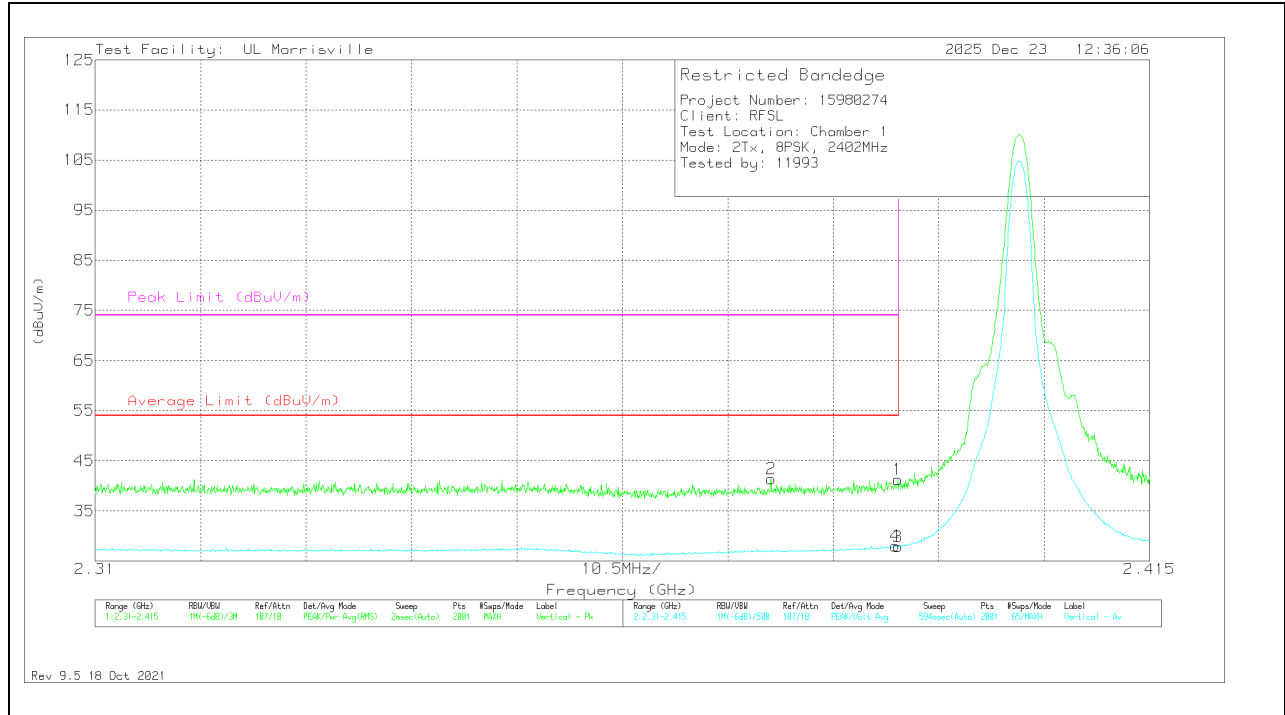
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TV: VB=1/Ton, Linear Voltage Average where Detector = Peak and Ton is packet duration

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*** 2.38996	34.46	Pk	31.9	-25.1	41.26	-	-	74	-32.74	271	139	V
2	*** 2.37731	34.81	Pk	31.9	-25.3	41.41	-	-	74	-32.59	271	139	V
3	*** 2.38996	21.02	V1TV	31.9	-25.1	27.82	54	-26.18	-	-	271	139	V
4	*** 2.3897	21.17	V1TV	31.9	-25.1	27.97	54	-26.03	-	-	271	139	V

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

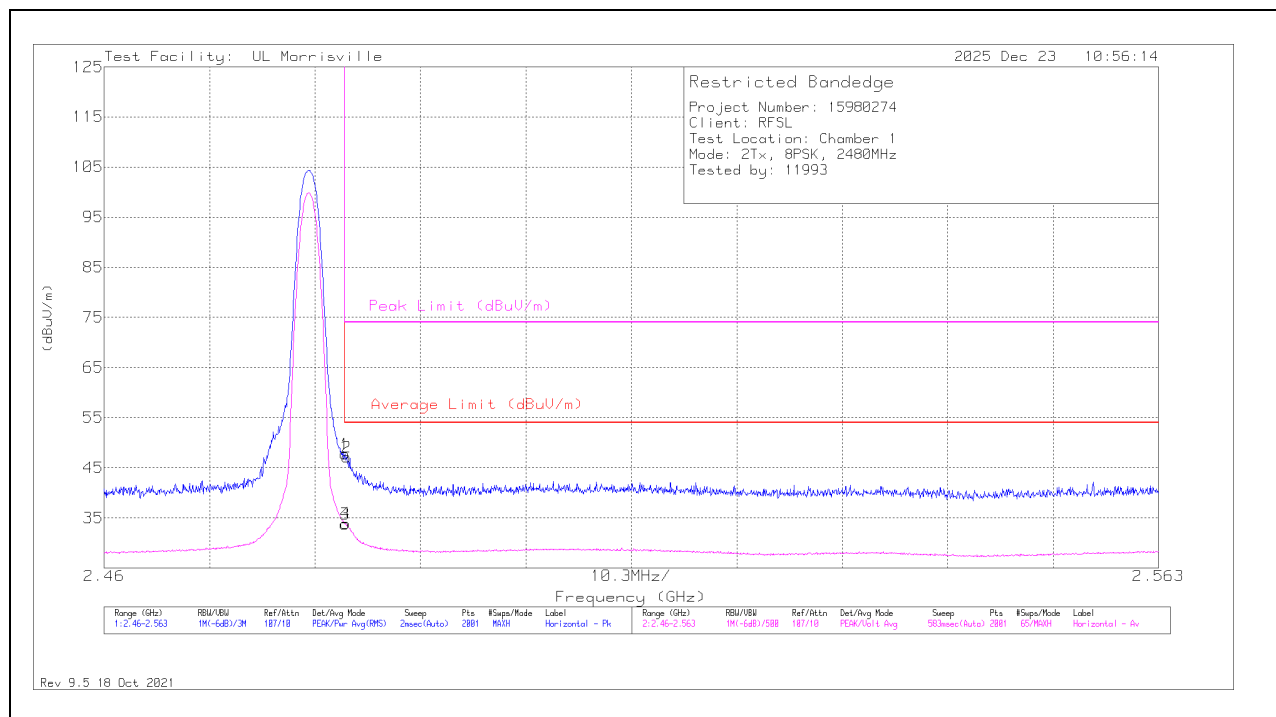
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TV: VB=1/Ton, Linear Voltage Average where Detector = Peak and Ton is packet duration

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.48354	39.92	Pk	32.2	-24.4	47.72	-	-	74	-26.28	259	161	H
2	* ** 2.48369	39.29	Pk	32.2	-24.4	47.09	-	-	74	-26.91	259	161	H
3	* ** 2.48354	25.95	V1TV	32.2	-24.4	33.75	54	-20.25	-	-	259	161	H
4	* ** 2.48359	26.03	V1TV	32.2	-24.4	33.83	54	-20.17	-	-	259	161	H

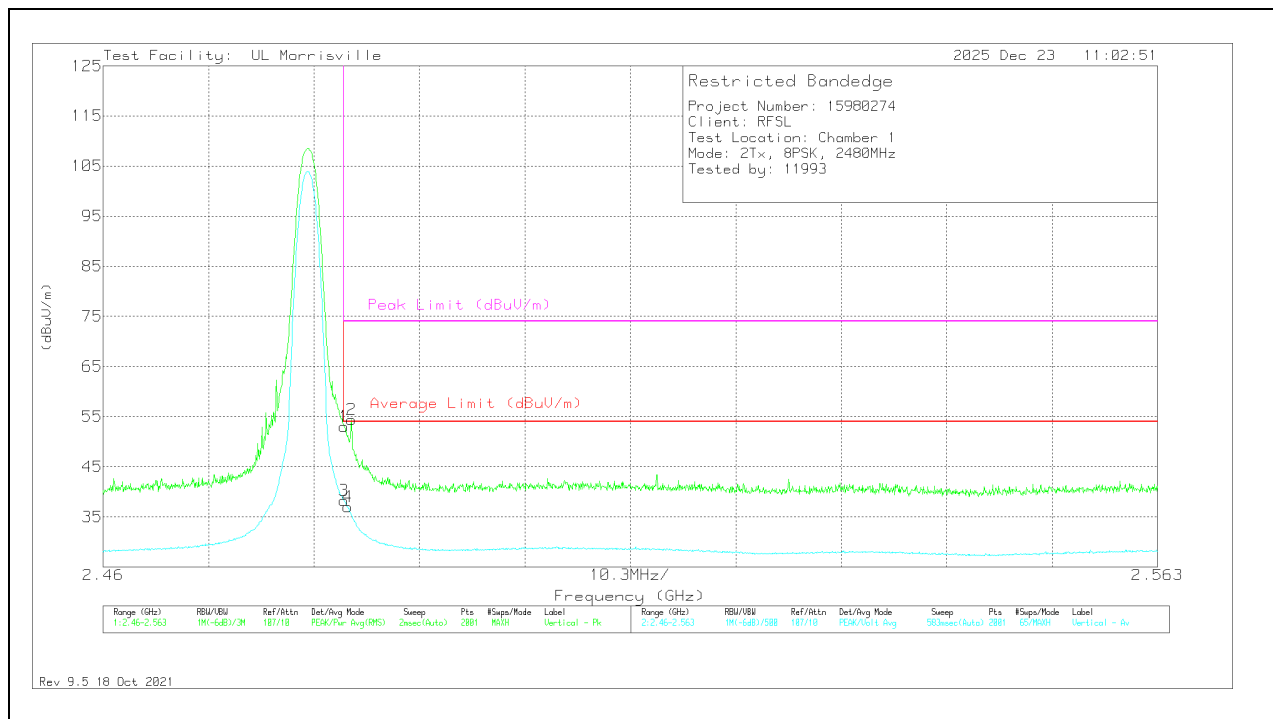
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TV: VB=1/Ton, Linear Voltage Average where Detector = Peak and Ton is packet duration

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 2.48354	45.21	Pk	32.2	-24.4	53.01	-	-	74	-20.99	276	130	V
2	* ** 2.48426	46.56	Pk	32.2	-24.4	54.36	-	-	74	-19.64	276	130	V
3	* ** 2.48354	30.49	V1TV	32.2	-24.4	38.29	54	-15.71	-	-	276	130	V
4	* ** 2.4839	29.19	V1TV	32.2	-24.4	36.99	54	-17.01	-	-	276	130	V

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

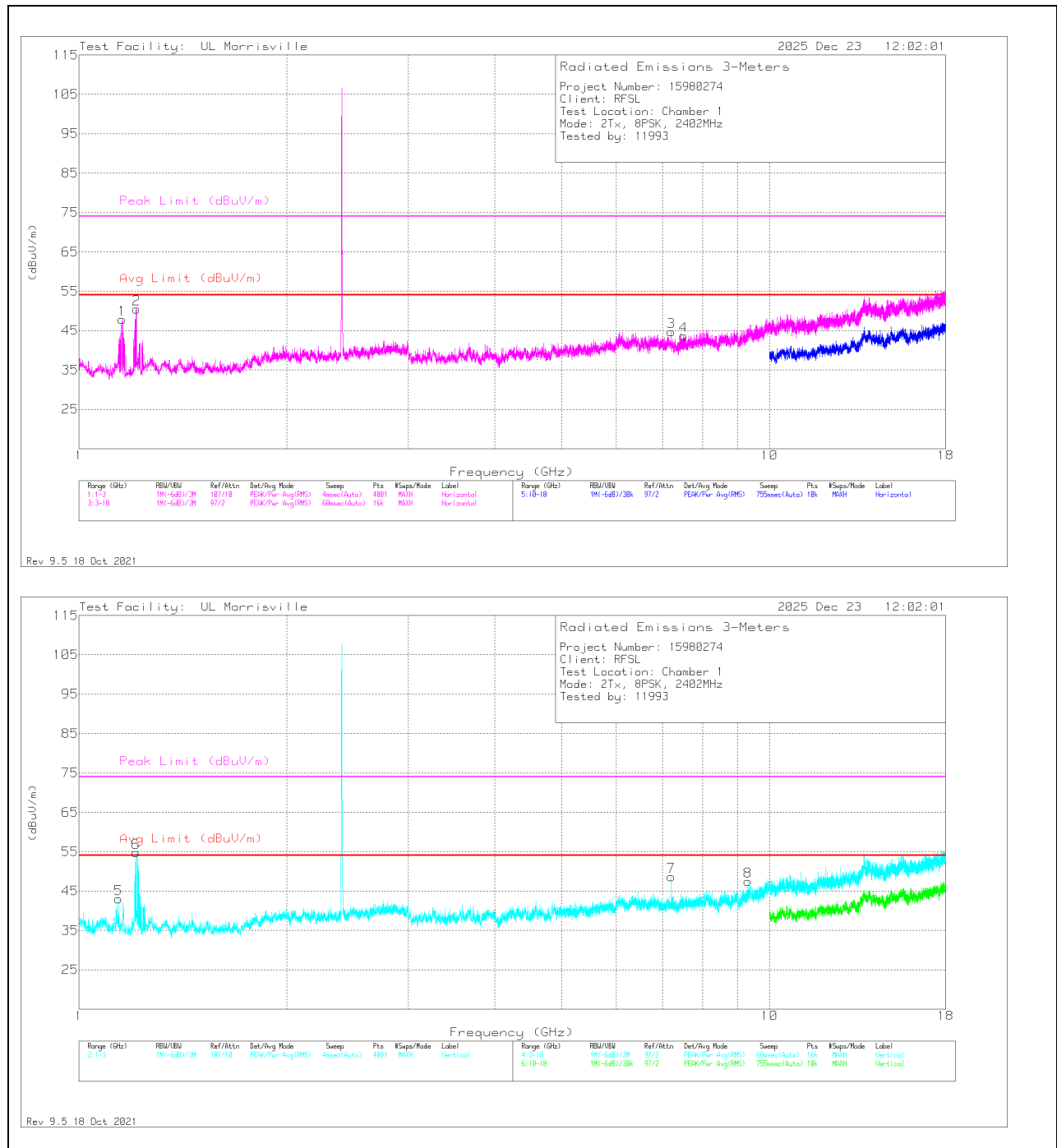
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TV: VB=1/Ton, Linear Voltage Average where Detector = Peak and Ton is packet duration

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*** 1.1555	44.64	Pk	28.2	-25	47.84	54	-6.16	74	-26.16	0-360	200	H
2	*** 1.20854	56.16	PK2	28.8	-25.3	59.66	-	-	74	-14.34	326	126	H
	*** 1.21163	21.79	V1TV	28.8	-25.2	25.39	54	-28.61	-	-	326	126	H
5	*** 1.14	40.38	Pk	28.2	-25.6	42.98	54	-11.02	74	-31.02	0-360	101	V
6	*** 1.20852	54.2	PK2	28.8	-25.3	57.7	-	-	74	-16.3	188	191	V
	*** 1.21016	21.91	V1TV	28.8	-25.2	25.51	54	-28.49	-	-	188	191	V
4	*** 7.51781	50.28	Pk	35.5	-42.1	43.68	54	-10.32	74	-30.32	0-360	101	H
8	*** 9.31406	51.72	Pk	36.1	-40.4	47.42	54	-6.58	74	-26.58	0-360	200	V
3	7.20469	51.76	Pk	35.4	-42.4	44.76	-	-	-	-	0-360	101	H
7	7.20656	55.61	Pk	35.4	-42.4	48.61	-	-	-	-	0-360	101	V

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

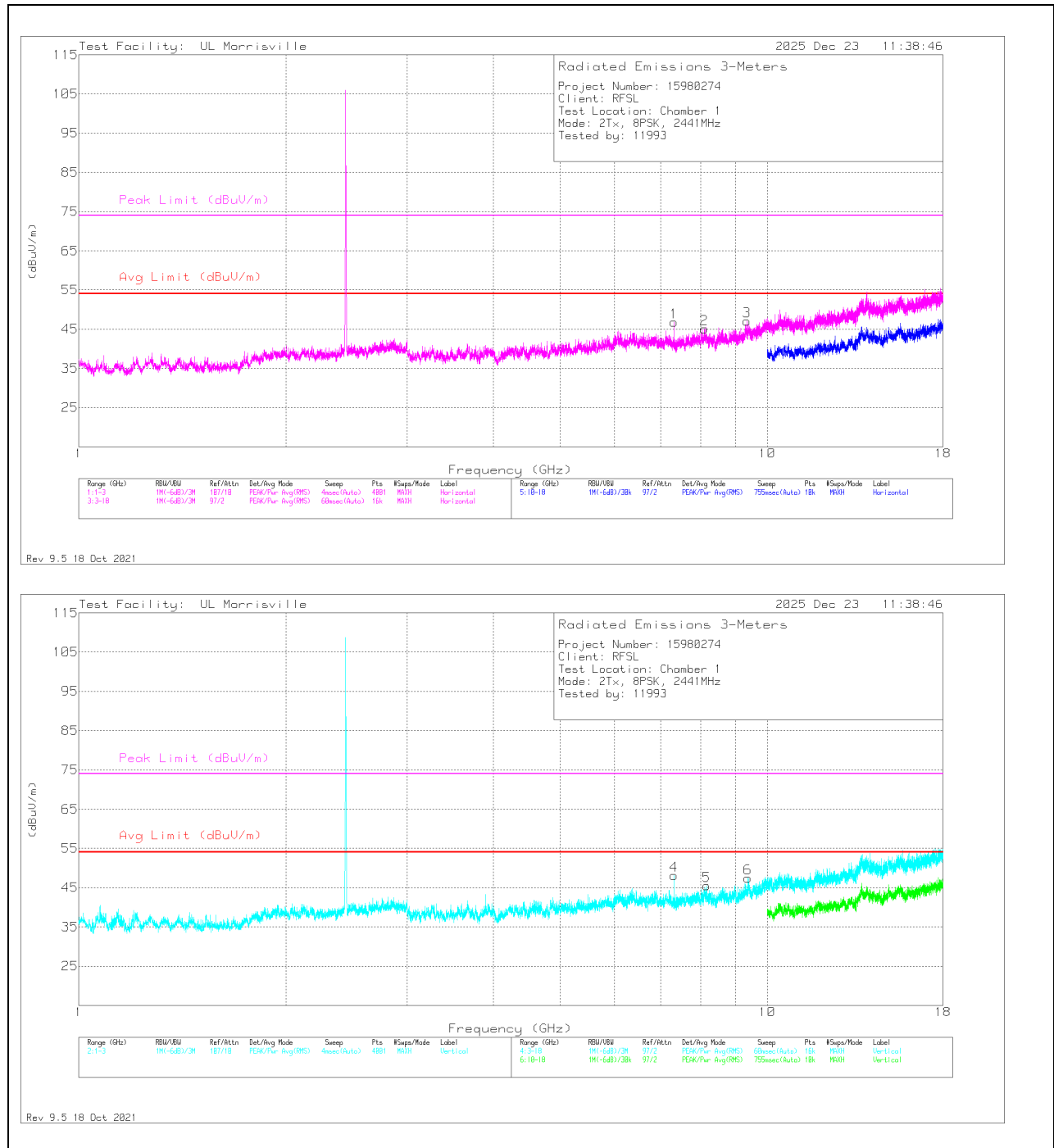
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

V1TV: VB=1/Ton, Linear Voltage Average where Detector = Peak and Ton is packet duration

MID CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 7.32375	54.89	Pk	35.4	-43.5	46.79	54	-7.21	74	-27.21	0-360	199	H
2	* ** 8.09813	50.73	Pk	35.9	-41.5	45.13	54	-8.87	74	-28.87	0-360	101	H
3	* ** 9.34688	51.67	Pk	36.2	-40.8	47.07	54	-6.93	74	-26.93	0-360	199	H
4	* ** 7.32243	59.53	PK2	35.4	-43.4	51.53	-	-	74	-22.47	335	192	V
	* ** 7.32279	47.95	V1TV	35.4	-43.4	39.95	54	-14.05	-	-	335	192	V
5	* ** 8.16469	51.77	Pk	35.9	-42.2	45.47	54	-8.53	74	-28.53	0-360	200	V
6	* ** 9.375	52.13	Pk	36.2	-40.9	47.43	54	-6.57	74	-26.57	0-360	101	V

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

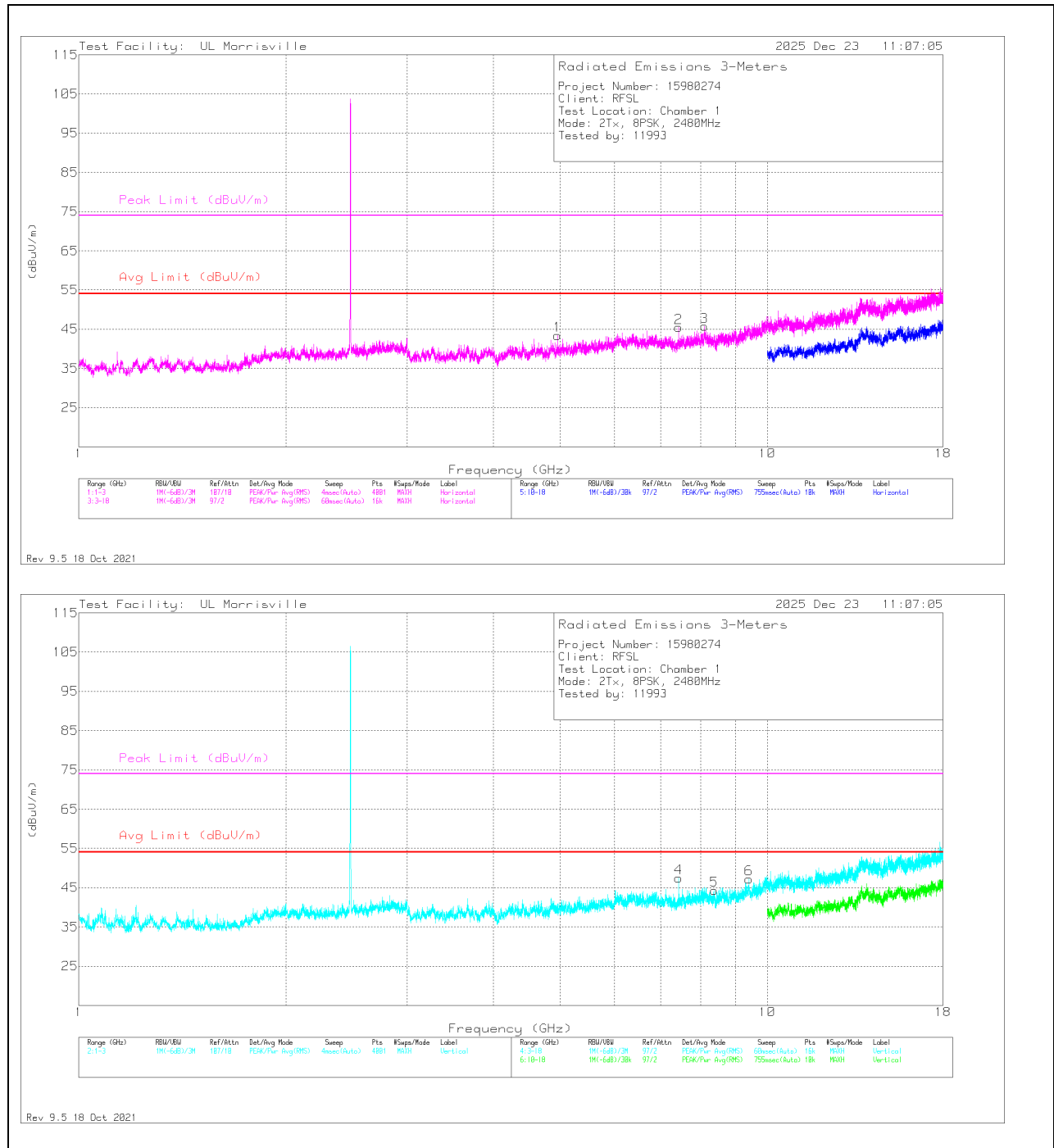
** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

V1TV: VB=1/Ton, Linear Voltage Average where Detector = Peak and Ton is packet duration

HIGH CHANNEL RESULTS



RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	135143 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 4.95938	54.92	Pk	34.2	-45.7	43.42	54	-10.58	74	-30.58	0-360	199	H
2	* ** 7.44	52.63	Pk	35.4	-42.6	45.43	54	-8.57	74	-28.57	0-360	199	H
3	* ** 8.10844	51.19	Pk	35.9	-41.4	45.69	54	-8.31	74	-28.31	0-360	199	H
4	* ** 7.44	54.64	Pk	35.4	-42.6	47.44	54	-6.56	74	-26.56	0-360	200	V
5	* ** 8.3775	49.94	Pk	35.8	-41.4	44.34	54	-9.66	74	-29.66	0-360	200	V
6	* ** 9.40781	51.13	Pk	36.3	-40.2	47.23	54	-6.77	74	-26.77	0-360	101	V

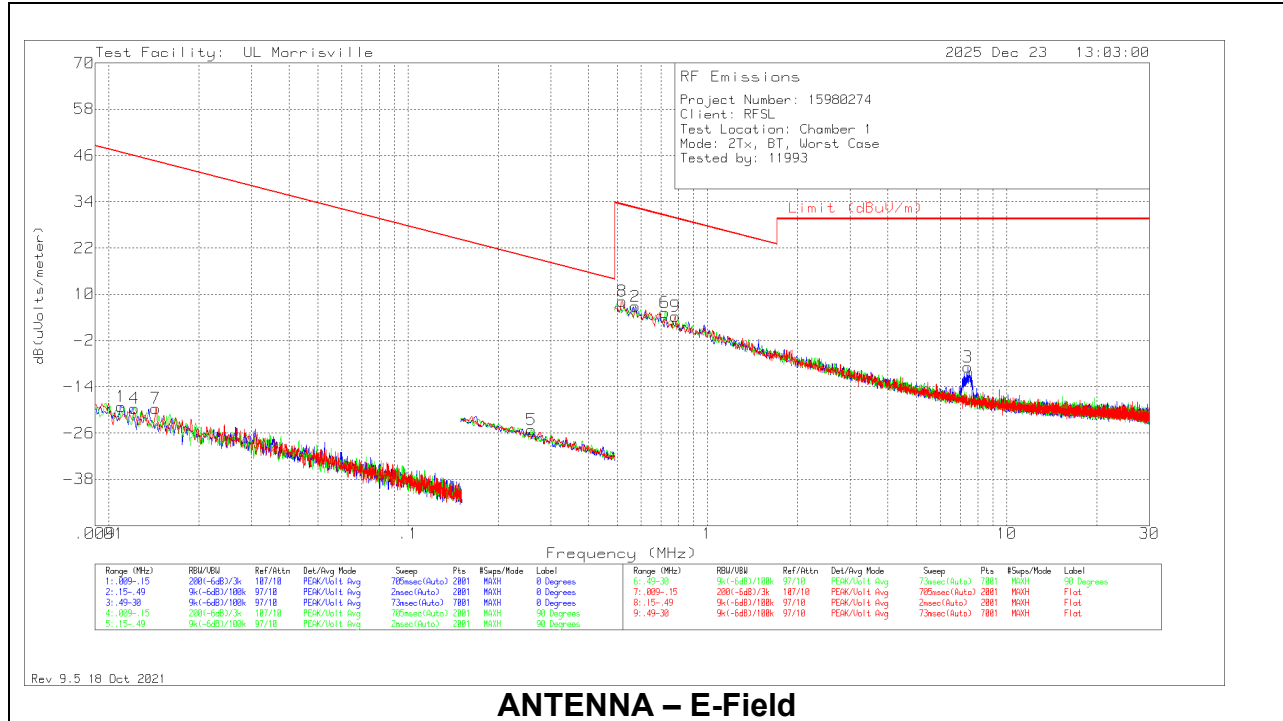
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

10.2. WORST CASE BELOW 30MHZ

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION) MIMO



ANTENNA – E-Field

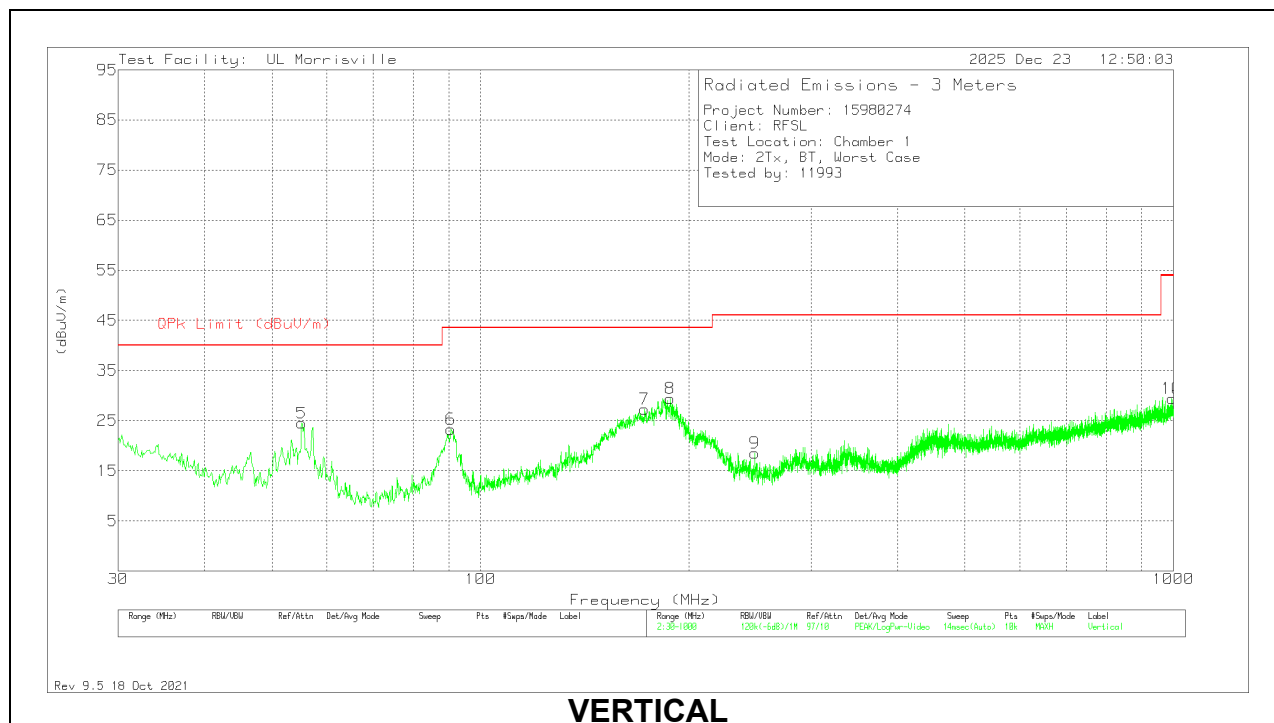
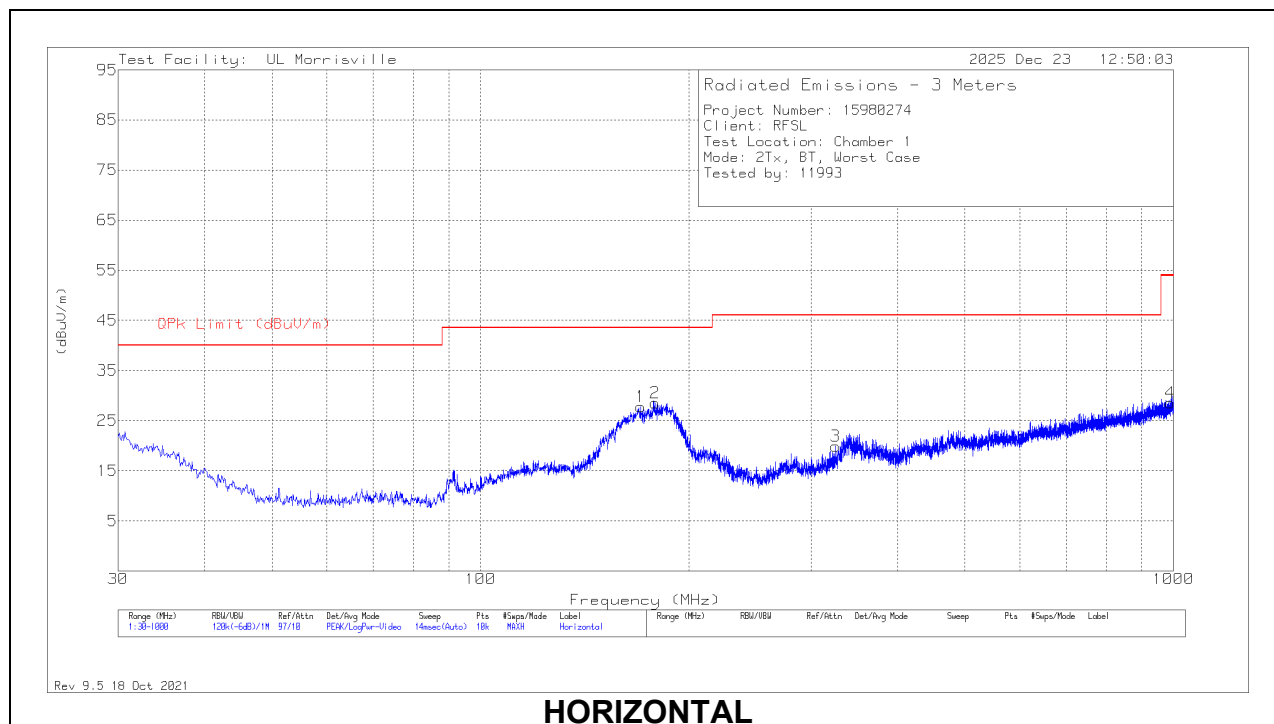
Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	ANT (dB/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uV/m)	Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Loop Angle
1	.01099	42.25	Pk	18.5	.1	-80	-19.15	46.79	-65.94	0-360	0 degs
4	.0122	42.4	Pk	17.9	.1	-80	-19.6	45.88	-65.48	0-360	90 degs
7	.01433	43.51	Pk	16.8	.1	-80	-19.59	44.48	-64.07	0-360	Flat
5	.25787	43.85	Pk	10.9	.1	-80	-25.15	19.38	-44.53	0-360	90 degs
8	.51951	37.09	Pk	11	.1	-40	8.19	33.29	-25.1	0-360	Flat
2	.57432	35.71	Pk	11	.1	-40	6.81	32.42	-25.61	0-360	0 degs
6	.72188	34.17	Pk	11	.1	-40	5.27	30.43	-25.16	0-360	90 degs
9	.7809	33.25	Pk	11	.1	-40	4.35	29.75	-25.4	0-360	Flat
3	7.41689	19.99	Pk	10.7	.4	-40	-8.91	29.54	-38.45	0-360	0 degs

Pk - Peak detector

10.3. WORST CASE BELOW 1 GHZ

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION) MIMO



Below 1GHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	90629 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 170.359	39.81	Pk	18.1	-30.1	27.81	43.52	-15.71	0-360	200	H
3	* ** 325.462	28.88	Pk	20	-29	19.88	46.02	-26.14	0-360	99	H
4	* ** 989.136	25.13	Pk	29.5	-26.1	28.53	53.97	-25.44	0-360	99	H
7	* ** 172.493	39.79	Pk	17.9	-30.4	27.29	43.52	-16.23	0-360	100	V
9	* ** 248.929	30.34	Pk	17.7	-29.5	18.54	46.02	-27.48	0-360	100	V
10	* ** 994.665	24.71	Pk	29.6	-24.9	29.41	53.97	-24.56	0-360	100	V
5	55.22	42.28	Pk	13.6	-31.4	24.48	-	-	0-360	100	V
6	90.625	39.86	Pk	14.1	-30.7	23.26	-	-	0-360	100	V
2	178.507	41.05	Pk	17.6	-30.1	28.55	-	-	0-360	200	H
8	187.819	42.15	Pk	17.7	-30.4	29.45	-	-	0-360	100	V

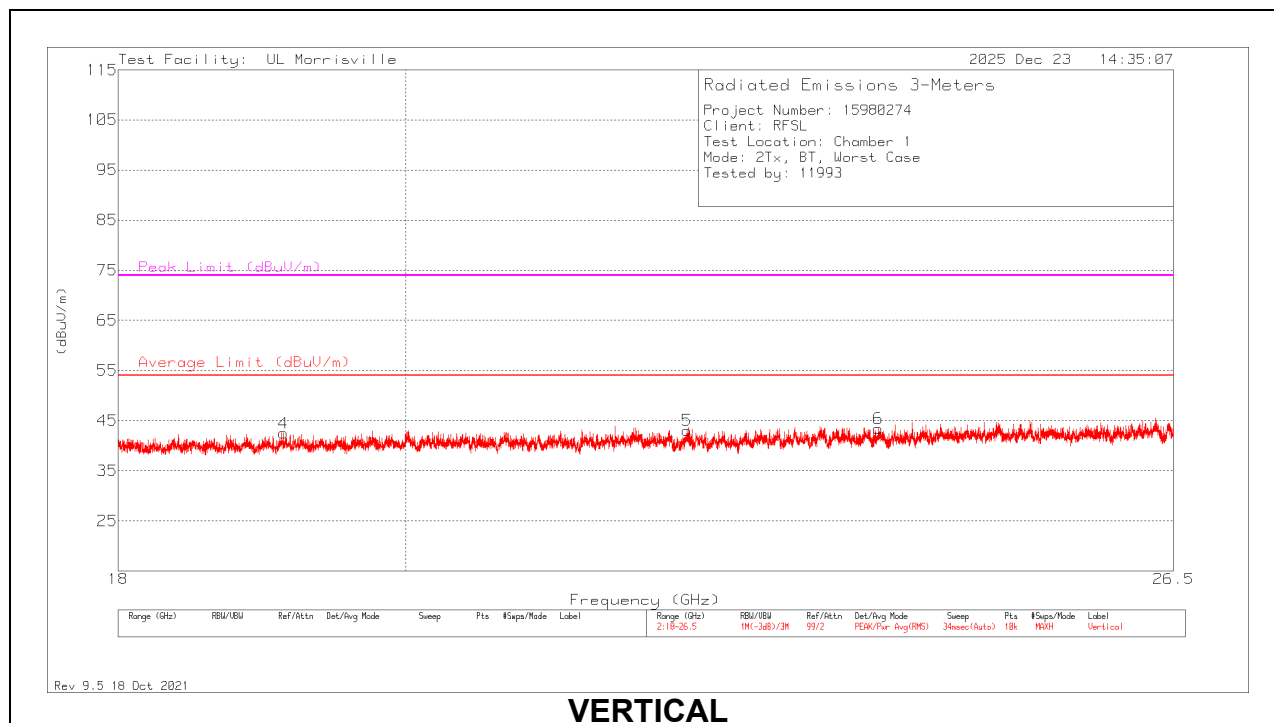
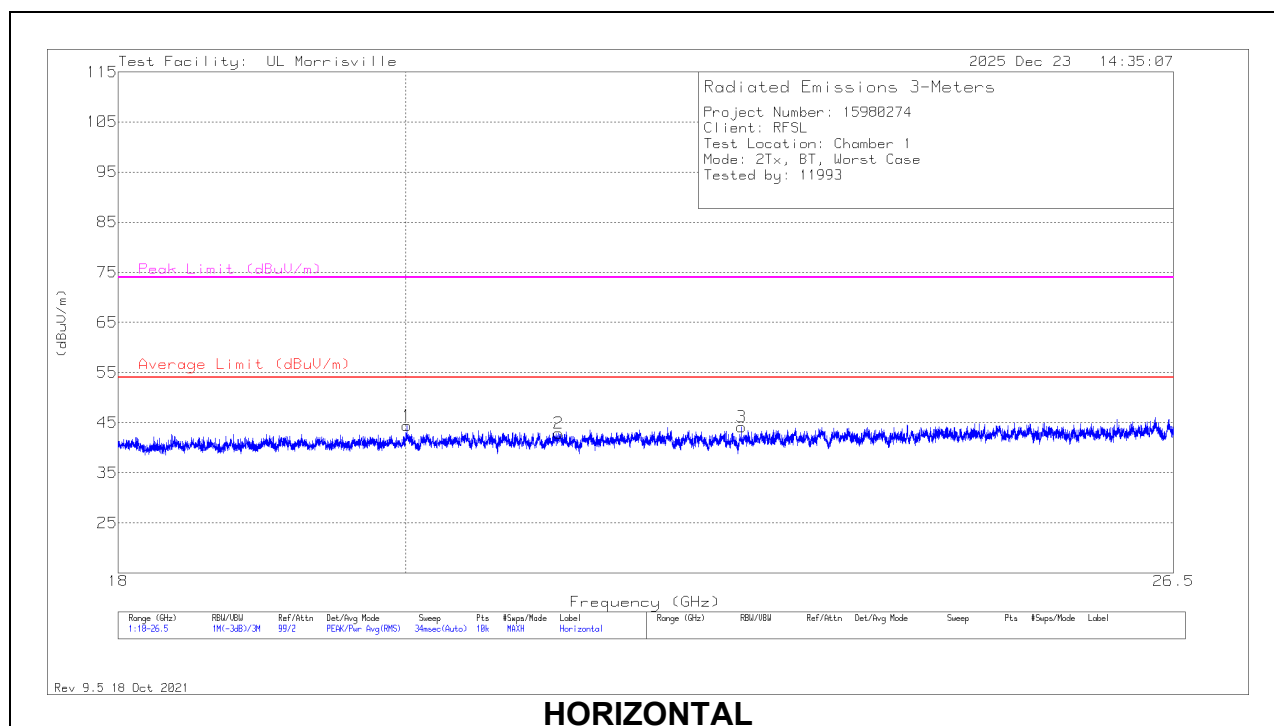
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

** - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

10.4. WORST CASE 18-26 GHZ

SPURIOUS EMISSIONS 18-26 GHz (WORST-CASE CONFIGURATION) MIMO



18 – 26GHz Data

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	91186 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* ** 20.00875	50.37	Pk	32.6	-38.6	44.37	54	-9.63	74	-29.63	0-360	300	H
2	* ** 21.15467	49.36	Pk	32.8	-39.3	42.86	54	-11.14	74	-31.14	0-360	101	H
3	* ** 22.61936	50.65	Pk	33.4	-39.9	44.15	54	-9.85	74	-29.85	0-360	300	H
4	* ** 19.12551	49.77	Pk	32.5	-39.8	42.47	54	-11.53	74	-31.53	0-360	200	V
5	* ** 22.17222	48.94	Pk	33.4	-39.3	43.04	54	-10.96	74	-30.96	0-360	200	V
6	* ** 23.78313	49.12	Pk	34	-39.7	43.42	54	-10.58	74	-30.58	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

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.

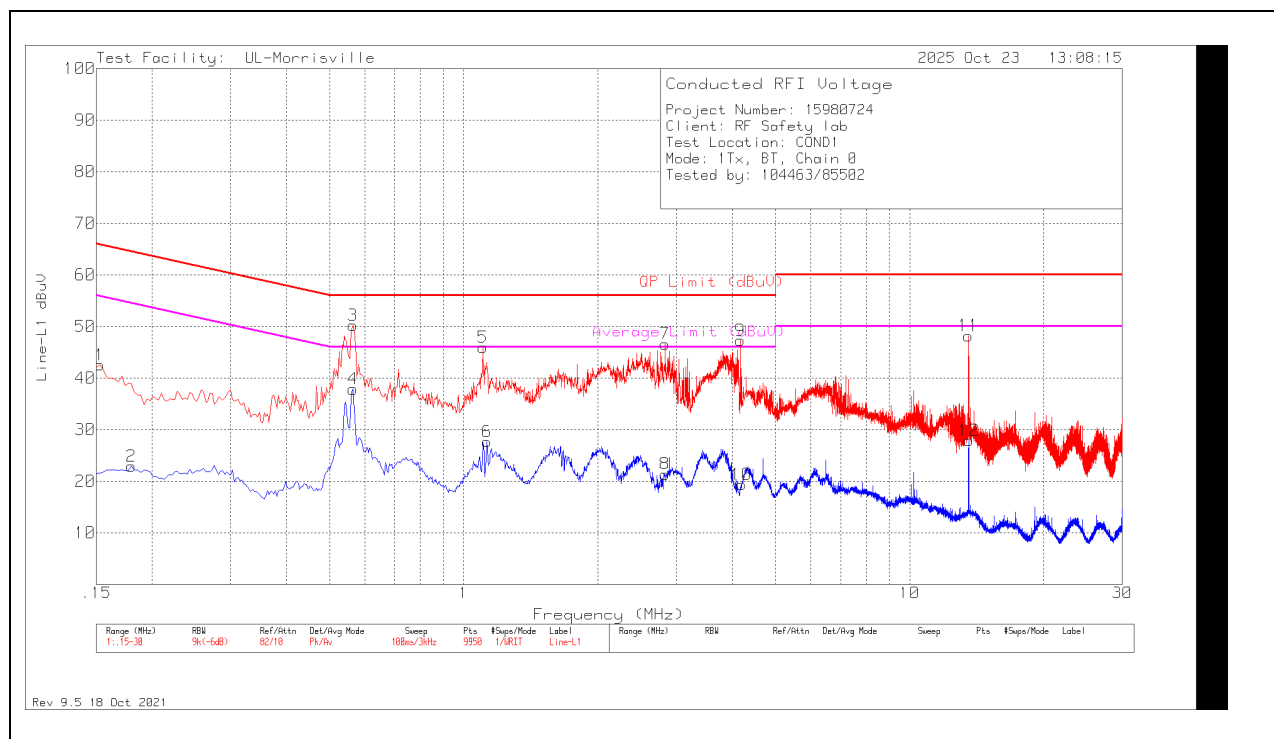
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

11.1.1. AC Power Line C0

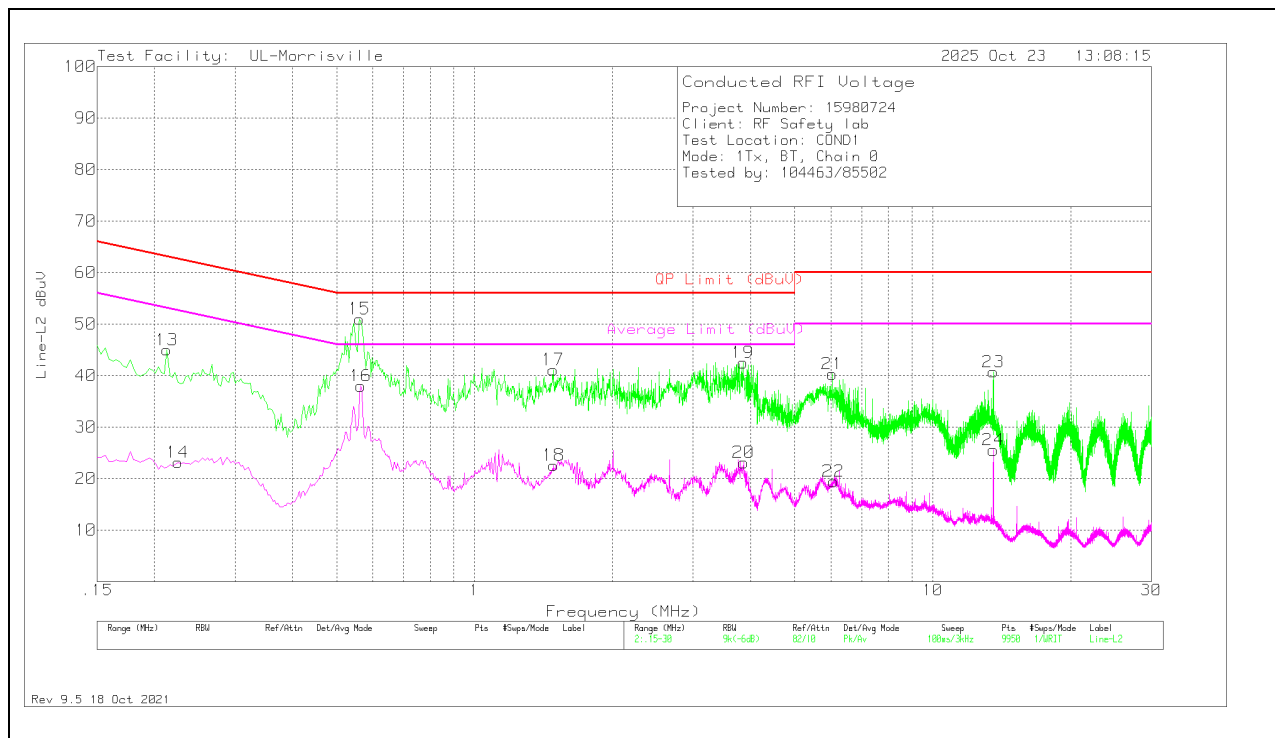
LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VDF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
1	.153	32.62	Pk	.2	9.7	42.52	65.84	-23.32	-	-
2	.18	12.98	Av	.2	9.7	22.88	-	-	54.49	-31.61
3	.56054	35.44	Qp	0	9.7	45.14	56	-10.86	-	-
4	.564	28.15	Av	0	9.7	37.85	-	-	46	-8.15
5	1.104	36.23	Pk	0	9.7	45.93	56	-10.07	-	-
6	1.128	17.94	Av	0	9.7	27.64	-	-	46	-18.36
7	2.829	36.92	Pk	0	9.7	46.62	56	-9.38	-	-
8	2.829	11.67	Av	0	9.7	21.37	-	-	46	-24.63
9	4.179	37.59	Pk	0	9.7	47.29	56	-8.71	-	-
10	4.194	9.66	Av	0	9.7	19.36	-	-	46	-26.64
11	13.557	38.29	Pk	.1	9.8	48.19	60	-11.81	-	-
12	13.563	17.97	Av	.1	9.8	27.87	-	-	50	-22.13

Pk - Peak detector
Av - Average detection
Qp - Quasi-Peak detector
Ca - CISPR average detection

LINE 2 RESULTS

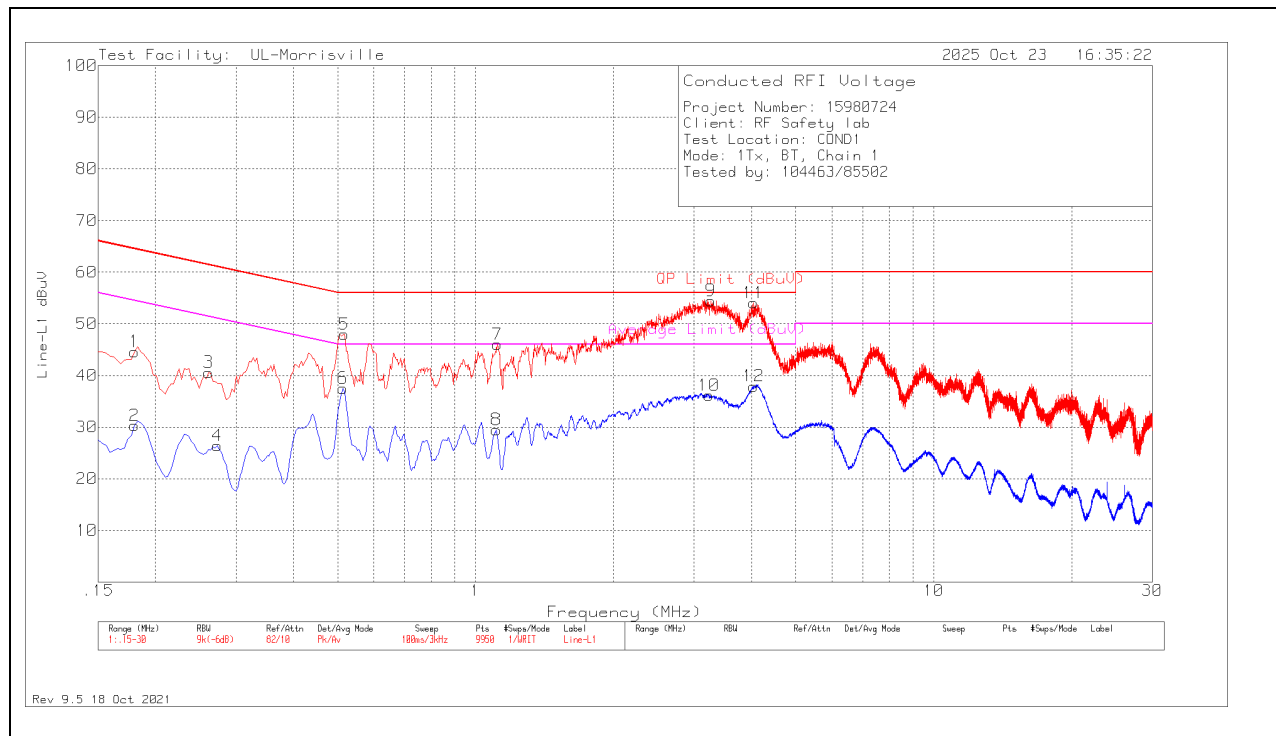


Range 2: Line-L2 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VDF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
13	.213	35.15	Pk	.1	9.7	44.95	63.09	-18.14	-	-
14	.225	13.33	Av	.1	9.7	23.13	-	-	52.63	-29.5
15	.56071	34.5	Qp	0	9.7	44.2	56	-11.8	-	-
16	.564	28.28	Av	0	9.7	37.98	-	-	46	-8.02
17	1.485	31.42	Pk	0	9.7	41.12	56	-14.88	-	-
18	1.488	12.86	Av	0	9.7	22.56	-	-	46	-23.44
19	3.852	32.8	Pk	0	9.7	42.5	56	-13.5	-	-
20	3.864	13.4	Av	0	9.7	23.1	-	-	46	-22.9
21	6.033	30.6	Pk	0	9.7	40.3	60	-19.7	-	-
22	6.069	9.74	Av	0	9.7	19.44	-	-	50	-30.56
23	13.563	30.78	Pk	.1	9.8	40.68	60	-19.32	-	-
24	13.563	15.64	Av	.1	9.8	25.54	-	-	50	-24.46

Pk - Peak detector
Av - Average detection
Qp - Quasi-Peak detector
Ca - CISPR average detection

11.1.2. AC Power Line C1

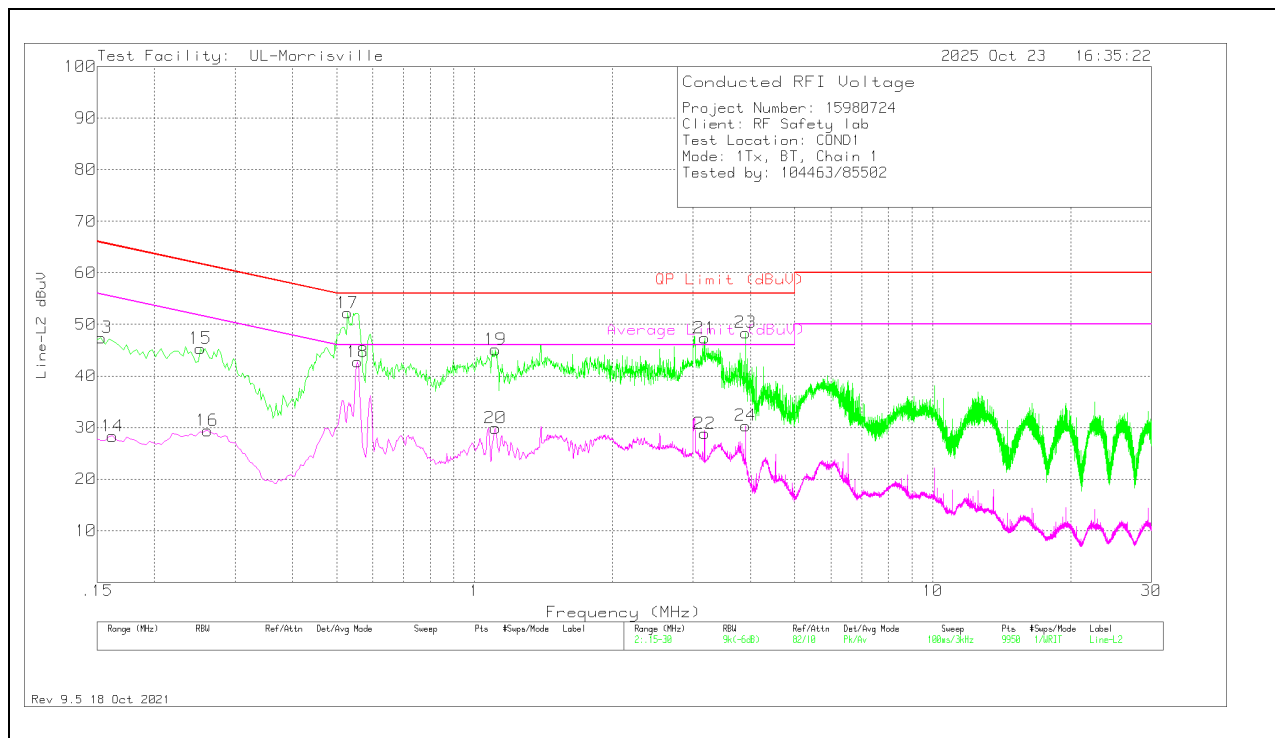
LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VDF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
1	.18	34.68	Pk	.2	9.7	44.58	64.49	-19.91	-	-
2	.18	20.41	Av	.2	9.7	30.31	-	-	54.49	-24.18
3	.261	30.78	Pk	.1	9.7	40.58	61.4	-20.82	-	-
4	.273	16.6	Av	.1	9.7	26.4	-	-	51.03	-24.63
6	.513	27.83	Av	0	9.7	37.53	-	-	46	-8.47
5	.516	38.26	Pk	0	9.7	47.96	56	-8.04	-	-
8	1.11	19.79	Av	0	9.7	29.49	-	-	46	-16.51
7	1.116	36.31	Pk	0	9.7	46.01	56	-9.99	-	-
10	3.231	26.46	Av	0	9.7	36.16	-	-	46	-9.84
9	3.26998	21.15	Qp	0	9.7	30.85	56	-25.15	-	-
12	4.041	28.22	Av	0	9.7	37.92	-	-	46	-8.08
11	4.05152	25.42	Qp	0	9.7	35.12	56	-20.88	-	-

Pk - Peak detector
Av - Average detection
Qp - Quasi-Peak detector
Ca - CISPR average detection

LINE 2 RESULTS

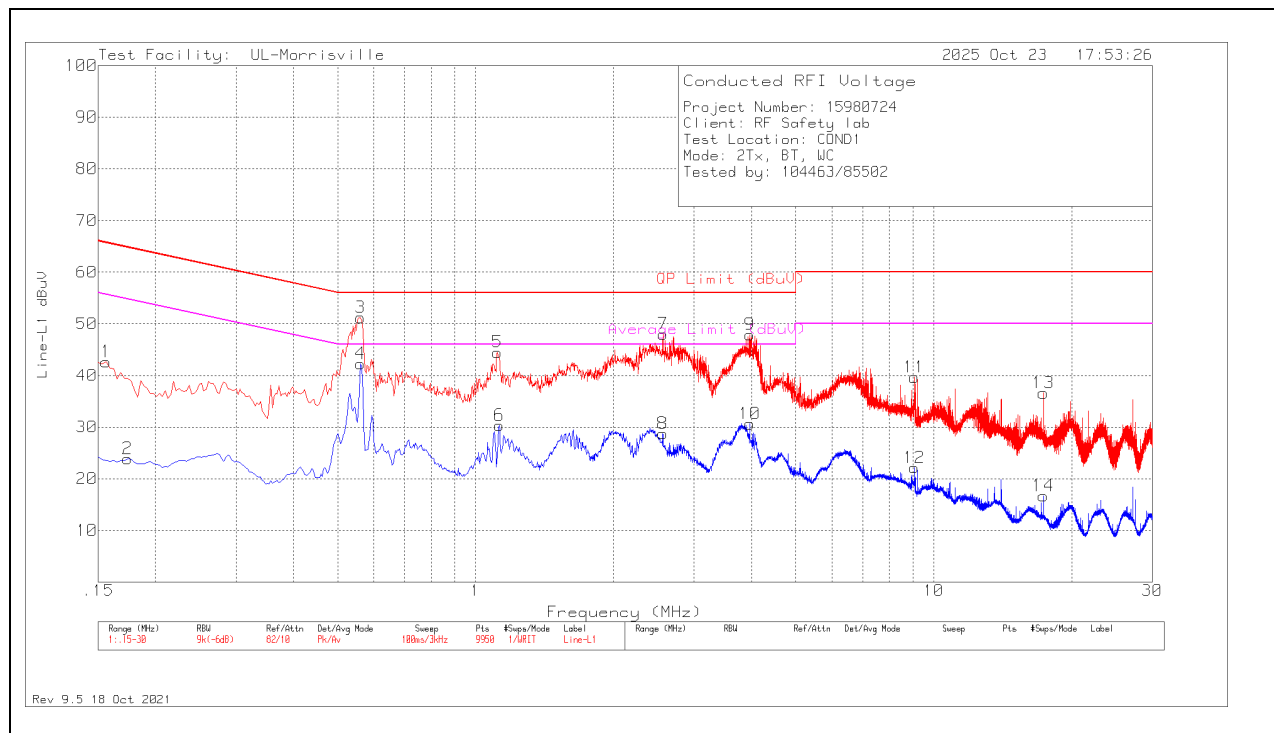


Range 2: Line-L2 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VDF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
13	.153	37.52	Pk	.2	9.7	47.42	65.84	-18.42	-	-
14	.162	18.42	Av	.2	9.7	28.32	-	-	55.36	-27.04
15	.252	35.53	Pk	.1	9.7	45.33	61.69	-16.36	-	-
16	.261	19.61	Av	.1	9.7	29.41	-	-	51.4	-21.99
17	.53945	38.19	Qp	0	9.7	47.89	56	-8.11	-	-
18	.55968	29.05	Ca	0	9.7	38.75	-	-	46	-7.25
19	1.11	35.42	Pk	0	9.7	45.12	56	-10.88	-	-
20	1.11	20.2	Av	0	9.7	29.9	-	-	46	-16.1
21	3.177	37.64	Pk	0	9.7	47.34	56	-8.66	-	-
22	3.177	19.14	Av	0	9.7	28.84	-	-	46	-17.16
24	3.903	20.67	Av	0	9.7	30.37	-	-	46	-15.63
23	3.906	38.7	Pk	0	9.7	48.4	56	-7.6	-	-

Pk - Peak detector
Av - Average detection
Qp - Quasi-Peak detector
Ca - CISPR average detection

11.1.3. AC Power Line MIMO

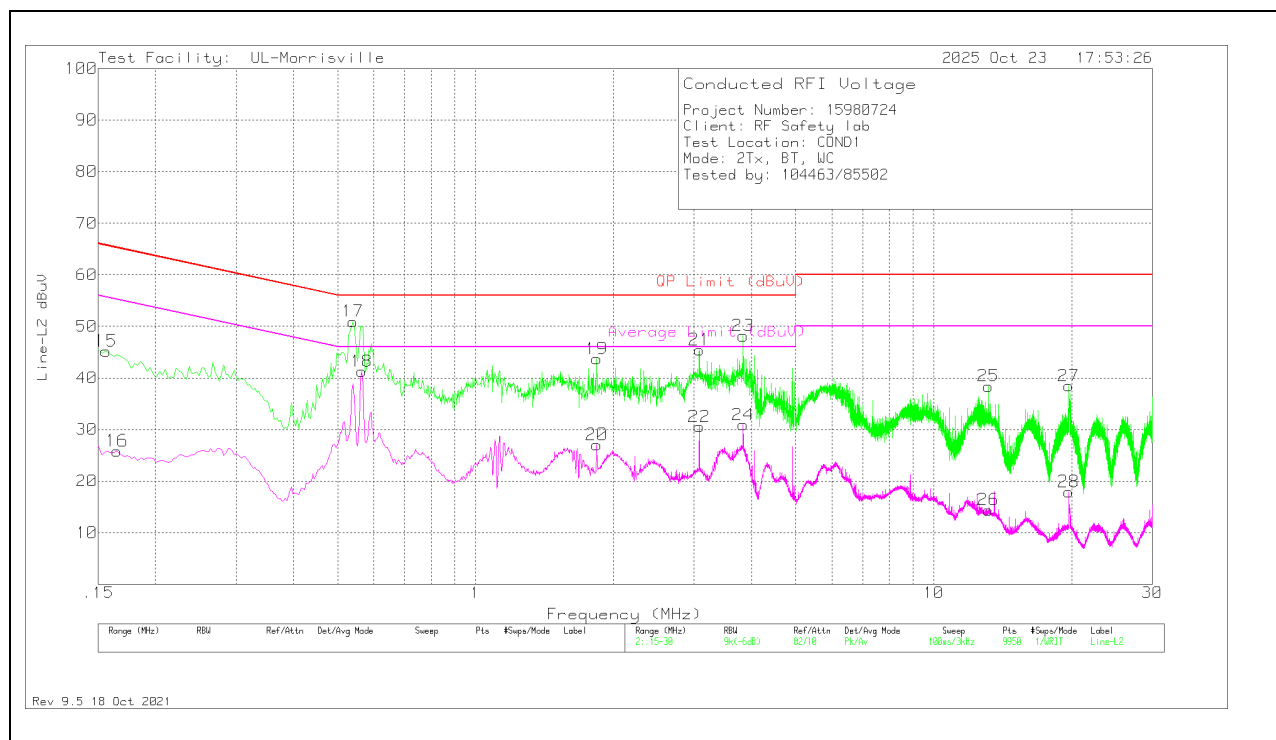
LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VDF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
1	.156	32.76	Pk	.2	9.7	42.66	65.67	-23.01	-	-
2	.174	14	Av	.2	9.7	23.9	-	-	54.77	-30.87
3	.56269	38.3	Qp	0	9.7	48	56	-8	-	-
4	.55528	21.53	Ca	0	9.7	31.23	-	-	46	-14.77
5	1.116	34.8	Pk	0	9.7	44.5	56	-11.5	-	-
6	1.125	20.64	Av	0	9.7	30.34	-	-	46	-15.66
7	2.565	38.33	Pk	0	9.7	48.03	56	-7.97	-	-
8	2.562	19.04	Av	0	9.7	28.74	-	-	46	-17.26
9	3.969	38.21	Pk	0	9.7	47.91	56	-8.09	-	-
10	3.969	20.93	Av	0	9.7	30.63	-	-	46	-15.37
11	9.072	29.85	Pk	.1	9.7	39.65	60	-20.35	-	-
12	9.066	12.34	Av	.1	9.7	22.14	-	-	50	-27.86
13	17.352	26.7	Pk	.1	9.8	36.6	60	-23.4	-	-
14	17.352	6.8	Av	.1	9.8	16.7	-	-	50	-33.3

Pk - Peak detector
Av - Average detection
Qp - Quasi-Peak detector
Ca - CISPR average detection

LINE 2 RESULTS



Range 2: Line-L2 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VDF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
15	.156	35.29	Pk	.2	9.7	45.19	65.67	-20.48	-	-
16	.165	15.95	Av	.2	9.7	25.85	-	-	55.21	-29.36
17	.55627	34.91	Qp	0	9.7	44.61	56	-11.39	-	-
18	.55493	21.37	Ca	0	9.7	31.07	-	-	46	-14.93
19	1.839	34.01	Pk	0	9.7	43.71	56	-12.29	-	-
20	1.839	17.33	Av	0	9.7	27.03	-	-	46	-18.97
21	3.081	35.74	Pk	0	9.7	45.44	56	-10.56	-	-
22	3.078	20.83	Av	0	9.7	30.53	-	-	46	-15.47
23	3.837	38.47	Pk	0	9.7	48.17	56	-7.83	-	-
24	3.837	21.22	Av	0	9.7	30.92	-	-	46	-15.08
25	13.155	28.51	Pk	.1	9.8	38.41	60	-21.59	-	-
26	13.155	4.51	Av	.1	9.8	14.41	-	-	50	-35.59
27	19.704	28.45	Pk	.2	9.8	38.45	60	-21.55	-	-
28	19.704	7.9	Av	.2	9.8	17.9	-	-	50	-32.1

Pk - Peak detector
Av - Average detection
Qp - Quasi-Peak detector
Ca - CISPR average detection

12. SETUP PHOTOS

Please refer to R15980274-EP1c for setup photos

END OF TEST REPORT