

TESTED BY

Below 18GHz

Employee IDs: 84445 / 11993

Test Dates: 2024-08-27 to 2024-08-28

Test Location: Chamber 4

Above 18GHz

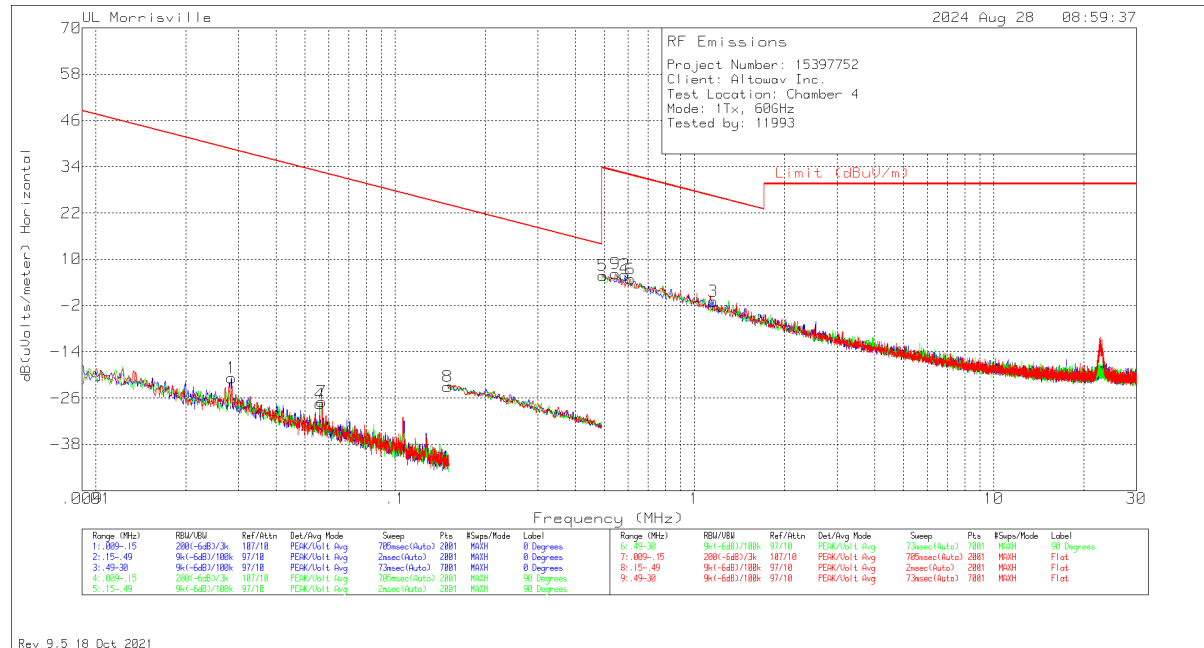
Employee IDs: 23854

Test Dates: 2024-08-26 to 2024-08-28, 2024-10-02

Test Location: Chamber 3

SPURIOUS EMISSIONS 9 kHz TO 30 MHz

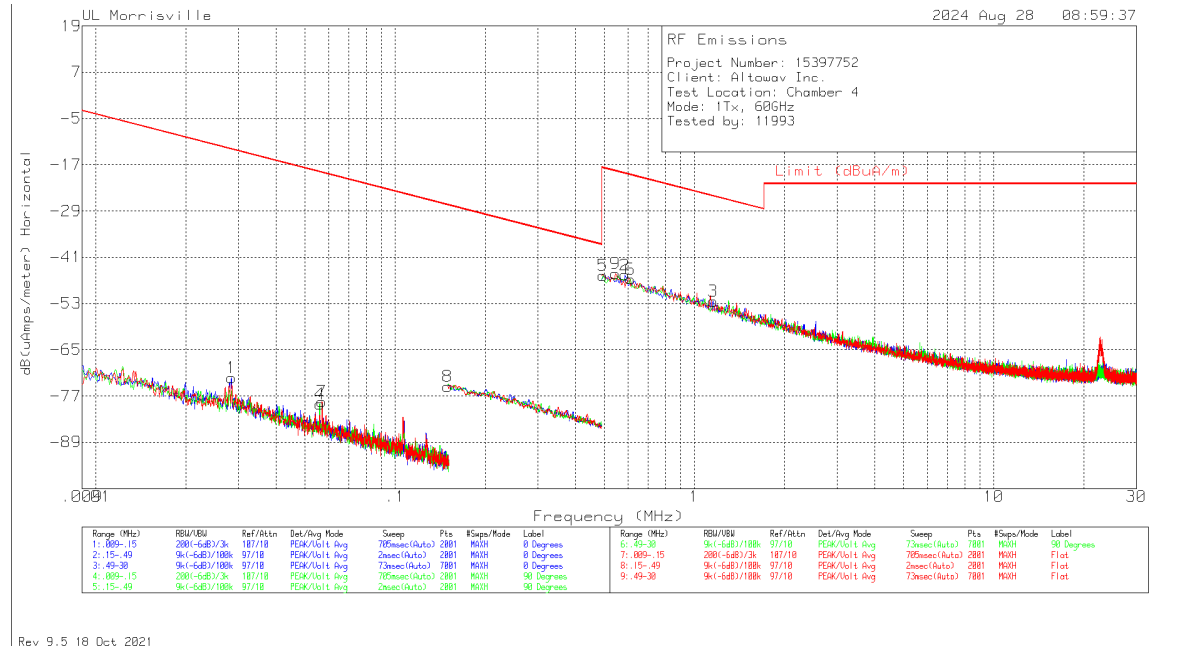
E-Field – Channel 2



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	135144 (dBuV/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Loop Angle
1	.02838	45.53	Pk	13.6	.1	-80	-20.77	38.54	-59.31	0-360	0 degs
4	.056	40.78	Pk	11.6	.1	-80	-27.52	32.64	-60.16	0-360	90 degs
7	.057	41.36	Pk	11.6	.1	-80	-26.94	32.49	-59.43	0-360	Flat
8	.15	45.81	Pk	11.1	.1	-80	-22.99	24.08	-47.07	0-360	Flat
5	.49422	34.53	Pk	11.1	.1	-40	5.73	33.73	-28	0-360	90 degs
9	.54481	35.06	Pk	11.1	.1	-40	6.26	32.88	-26.62	0-360	Flat
2	.58697	34.55	Pk	11.2	.1	-40	5.85	32.23	-26.38	0-360	0 degs
6	.61226	33.56	Pk	11.2	.1	-40	4.86	31.87	-27.01	0-360	90 degs
3	1.15613	27.48	Pk	11.4	.2	-40	-.92	26.34	-27.26	0-360	0 degs

Pk - Peak detector

H-Field – Channel 2

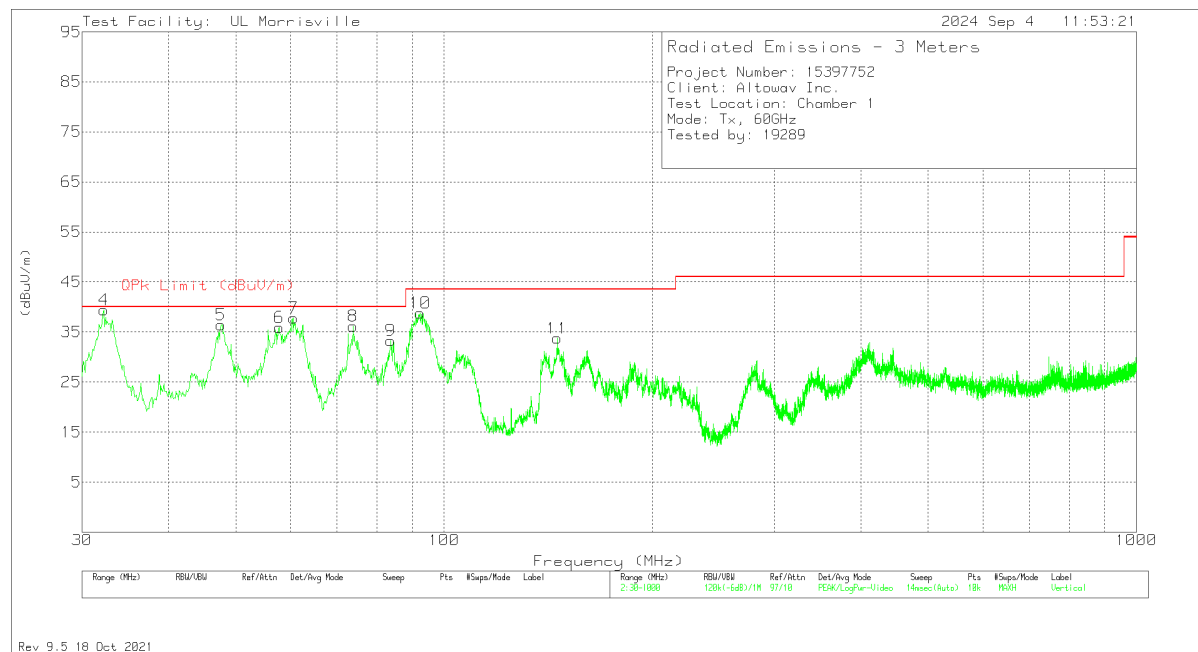
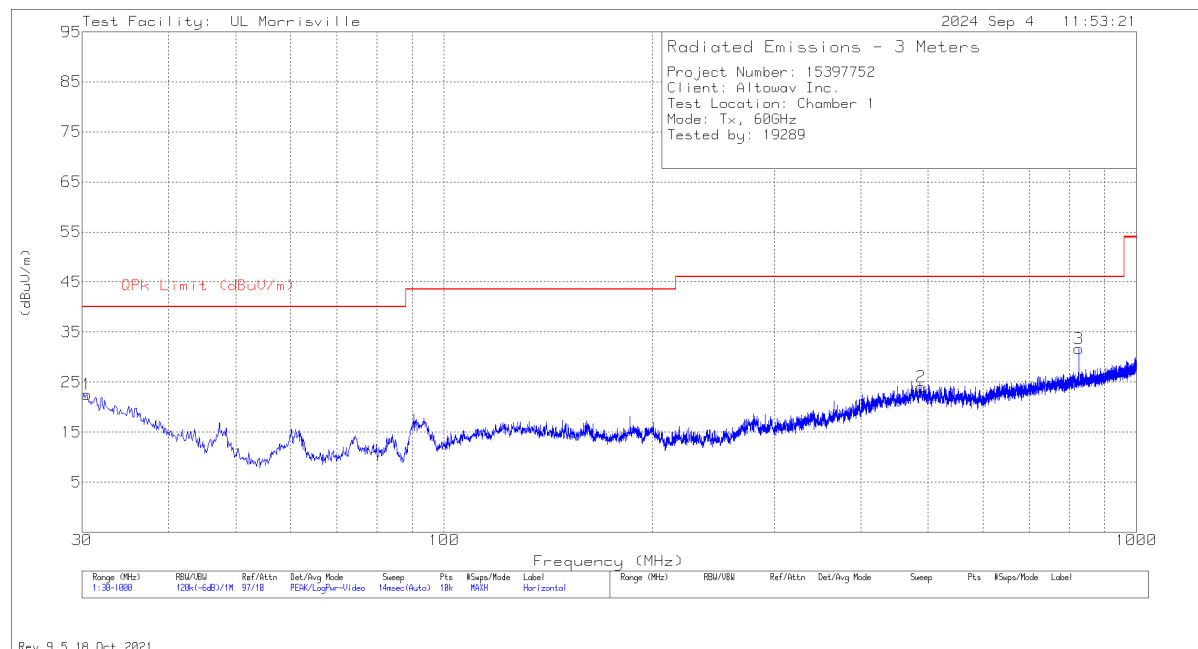


Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	135144 (dBuV/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uAmps/meter)	Limit (dBuA/m)	Margin (dB)	Azimuth (Degs)	Loop Angle
1	.02838	45.53	Pk	-37.9	.1	-80	-72.27	-12.96	-59.31	0-360	0 degs
4	.056	40.78	Pk	-39.9	.1	-80	-79.02	-18.86	-60.16	0-360	90 degs
7	.057	41.36	Pk	-39.9	.1	-80	-78.44	-19.01	-59.43	0-360	Flat
8	.15	45.81	Pk	-40.4	.1	-80	-74.49	-27.42	-47.07	0-360	Flat
5	.49422	34.53	Pk	-40.4	.1	-40	-45.77	-17.77	-28	0-360	90 degs
9	.54481	35.06	Pk	-40.4	.1	-40	-45.24	-18.62	-26.62	0-360	Flat
2	.58697	34.55	Pk	-40.3	.1	-40	-45.65	-19.27	-26.38	0-360	0 degs
6	.61226	33.56	Pk	-40.3	.1	-40	-46.64	-19.63	-27.01	0-360	90 degs
3	1.15613	27.48	Pk	-40.1	.2	-40	-52.42	-25.16	-27.26	0-360	0 degs

Pk - Peak detector

SPURIOUS EMISSIONS 30 TO 1000 MHz

Channel 2

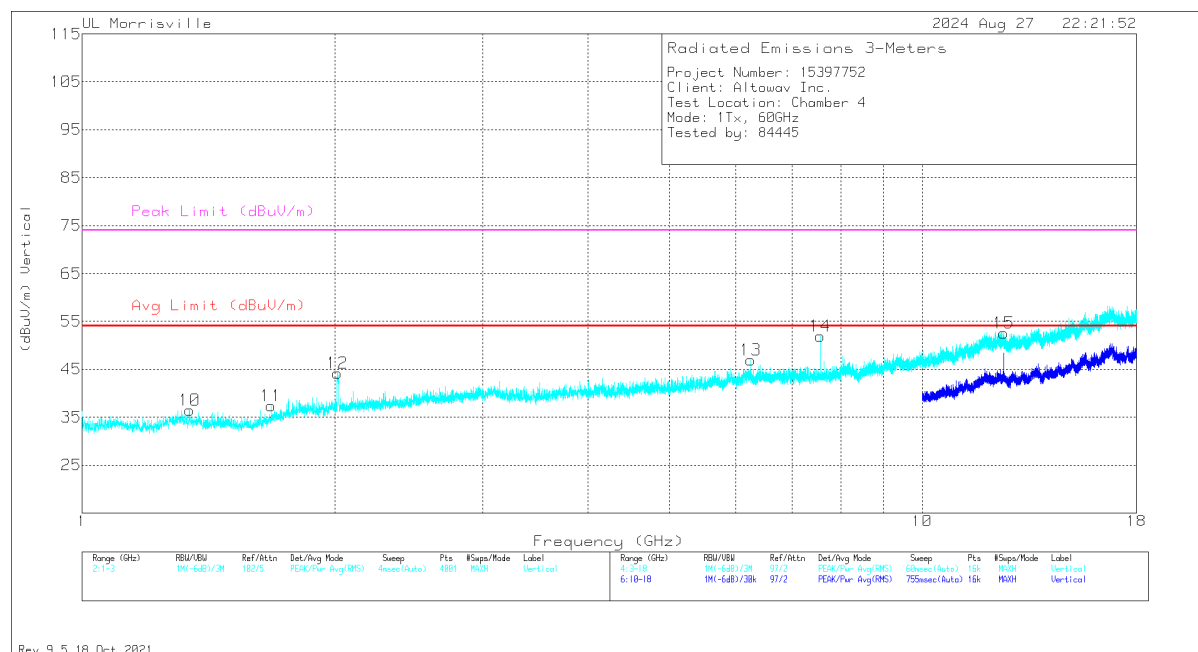
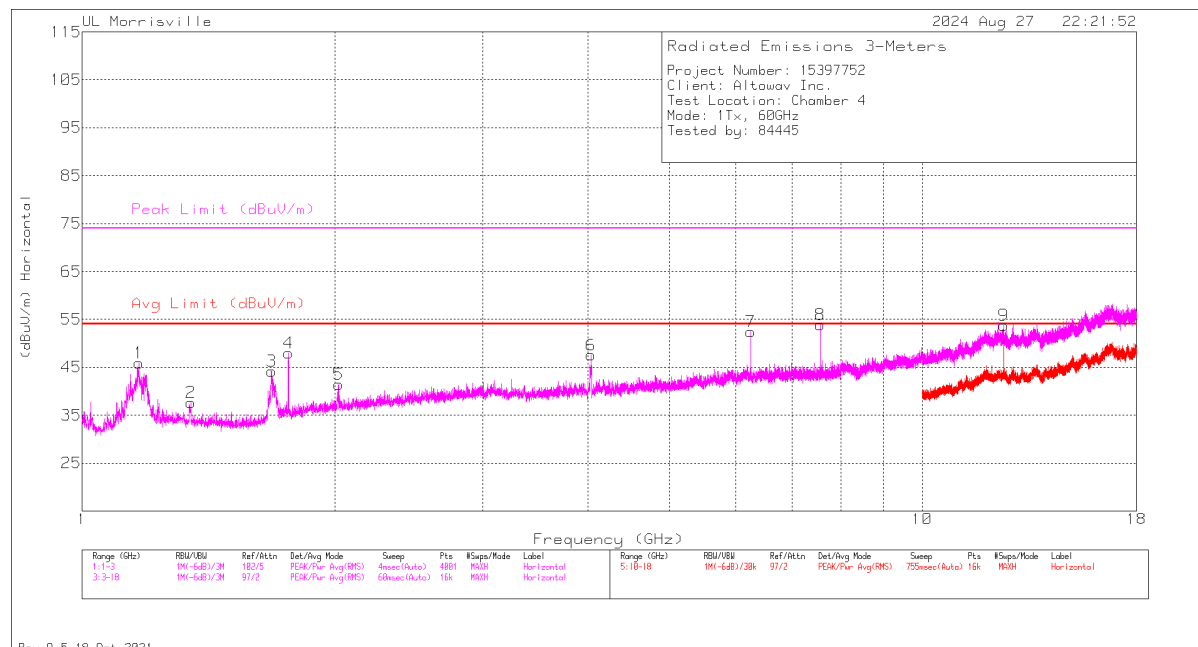


Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	90629 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30.485	27.85	Pk	26.5	-31.8	22.55	40	-17.45	0-360	101	H
4	32.1668	41.16	Qp	25.4	-32	34.56	40	-5.44	301	109	V
5	47.8288	48.61	Qp	14.8	-32	31.41	40	-8.59	330	124	V
6	58.2715	47.61	Qp	13.8	-31.3	30.11	40	-9.89	125	102	V
7	60.3891	51.35	Qp	14	-31.6	33.75	40	-6.25	99	106	V
8	74.091	48.41	Qp	14.5	-31.6	31.31	40	-8.69	104	105	V
9	83.738	50.75	Pk	13.6	-31.1	33.25	40	-6.75	0-360	100	V
10	93.233	50.7	Qp	14.8	-31.1	34.4	43.52	-9.12	260	111	V
11	145.721	45.24	Pk	19	-30.5	33.74	43.52	-9.78	0-360	100	V
2	488.228	28.63	Pk	24	-28.6	24.03	46.02	-21.99	0-360	299	H
3	825.206	31.17	Pk	27.9	-27.4	31.67	46.02	-14.35	0-360	399	H

Pk - Peak detector
Qp - Quasi-Peak detector

SPURIOUS EMISSIONS 1 GHz TO 18 GHz

Channel 2

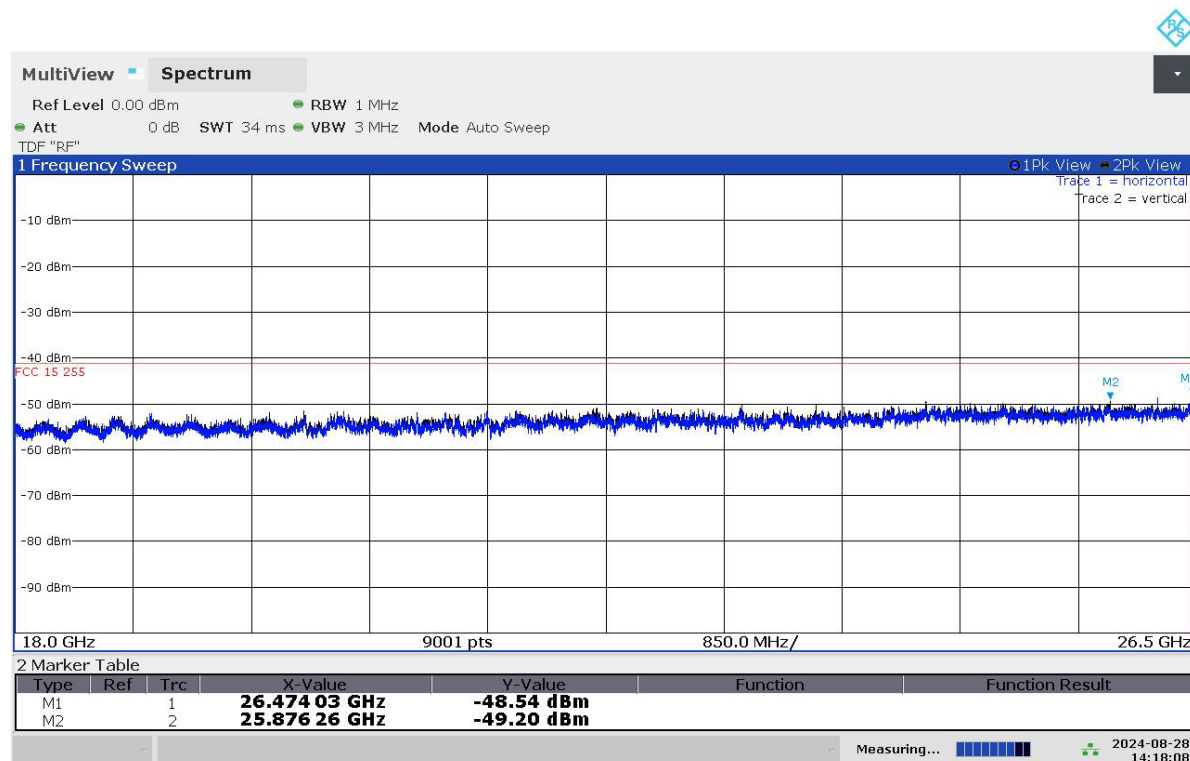


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	89509 ACF (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.169	43.04	Pk	27.7	-24.9	45.84	54	-8.16	74	-28.16	0-360	100	H
2	1.347	33.35	Pk	28.9	-24.6	37.65	54	-16.35	74	-36.35	0-360	100	H
3	1.6815	39.34	Pk	28.9	-24	44.24	54	-9.76	74	-29.76	0-360	100	H
4	1.75994	38.54	PK2	29.7	-24.1	44.14	-	-	74	-29.86	39	287	H
	1.75999	33.63	ADV	29.7	-24.1	39.23	54	-14.77	-	-	39	287	H
5	2.019	33.9	Pk	31	-23.5	41.4	54	-12.6	74	-32.6	0-360	100	H
10	1.342	31.98	Pk	29	-24.5	36.48	54	-17.52	74	-37.52	0-360	200	V
11	1.6785	32.48	Pk	28.9	-24	37.38	54	-16.62	74	-36.62	0-360	200	V
12	2.0135	36.73	Pk	31	-23.5	44.23	54	-9.77	74	-29.77	0-360	200	V
6	4.03875	46.33	Pk	33.3	-32.1	47.53	54	-6.47	74	-26.47	0-360	100	H
8	7.55996	46.78	PK2	35.7	-27.7	54.78	-	-	74	-19.22	27	180	H
	7.55996	43.71	ADV	35.7	-27.7	51.71	54	-2.29	-	-	27	180	H
9	12.50016	37.88	PK2	38.9	-21.2	55.58	-	-	74	-18.42	13	106	H
	12.50013	30.64	ADV	38.9	-21.2	48.34	54	-5.66	-	-	13	106	H
14	7.56007	44.1	PK2	35.7	-27.7	52.1	-	-	74	-21.9	60	238	V
	7.55999	38.37	ADV	35.7	-27.7	46.37	54	-7.63	-	-	60	238	V
15	12.50254	36.29	PK2	38.9	-21.2	53.99	-	-	74	-20.01	356	346	V
	12.49989	24.24	ADV	38.9	-21.2	41.94	54	-12.06	-	-	356	346	V
13	6.24938	39.34	Pk	35.4	-27.8	46.94	54	-7.06	74	-27.06	0-360	200	V

Pk - Peak detector
PK2 - Maximum Peak
ADV - Linear Voltage Average

SPURIOUS EMISSIONS 18 GHz TO 26.5 GHz

Channel 2



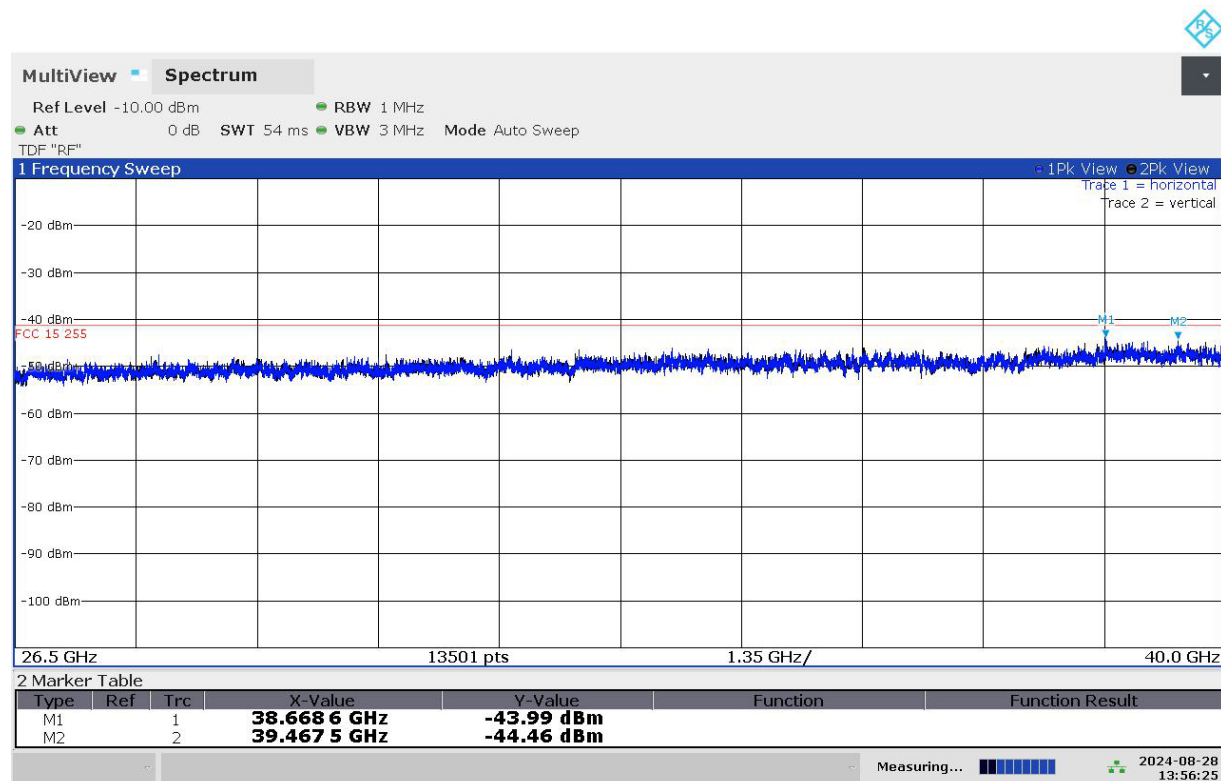
02:18:08 PM 08/28/2024

Marker	Frequency (GHz)	Det	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)	Peak Limit (dBm)	PK Margin (dB)	Polarity
1	26.474	Pk	-48.54	-41.23	-7.94	-21.23	-27.94	H
2	25.876	Pk	-49.20	-41.23	-8.29	-21.23	-28.29	V

Pk - Peak detector

SPURIOUS EMISSIONS 26.5 GHz TO 40 GHz

Channel 2



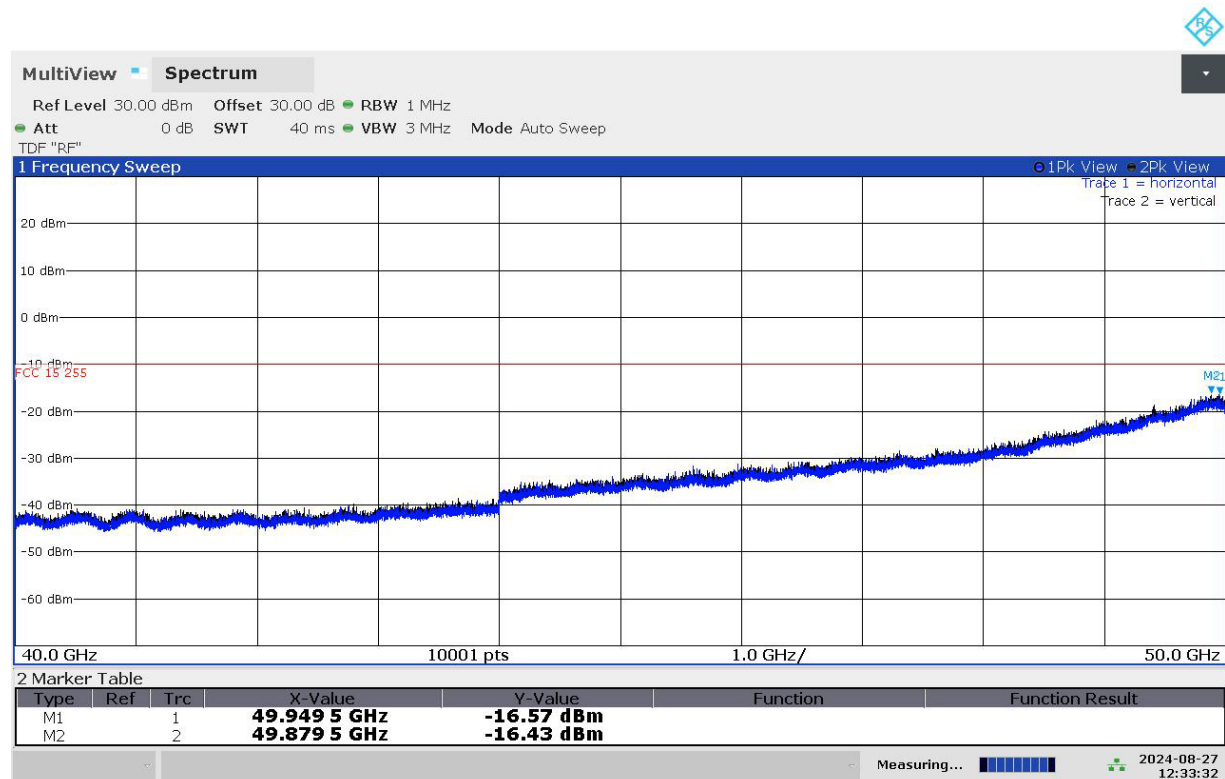
01:56:26 PM 08/28/2024

Marker	Frequency (GHz)	Det	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)	Peak Limit (dBm)	PK Margin (dB)	Polarity
1	38.67	Pk	-43.99	-41.23	-2.76	-21.23	-22.76	H
2	39.47	Pk	-44.46	-41.23	-3.23	-21.23	-23.23	V

Pk - Peak detector

SPURIOUS EMISSIONS 40 GHz TO 50 GHz

Channel 1

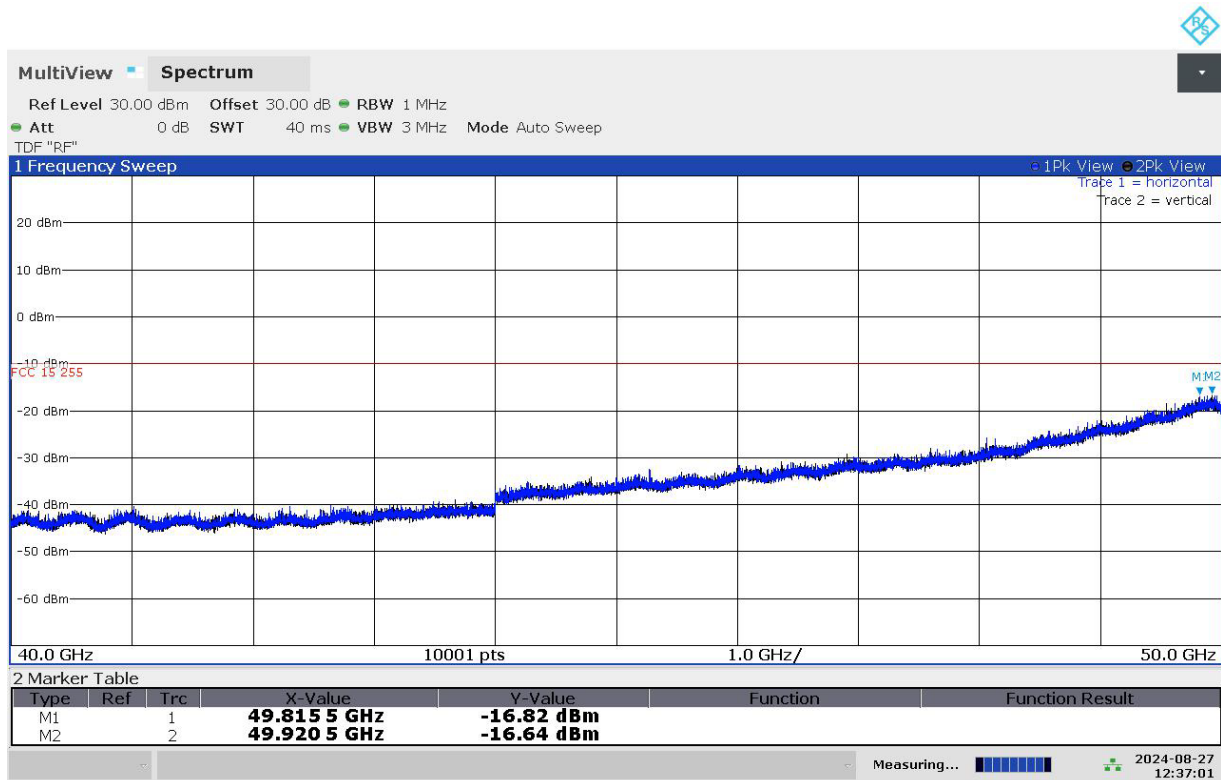


12:33:32 PM 08/27/2024

Marker	Frequency (GHz)	Det	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)	Polarity
1	49.95	Pk	-16.57	-9.92	-6.65	H
2	49.88	Pk	-16.43	-9.92	-6.51	V

Pk - Peak detector

Channel 2

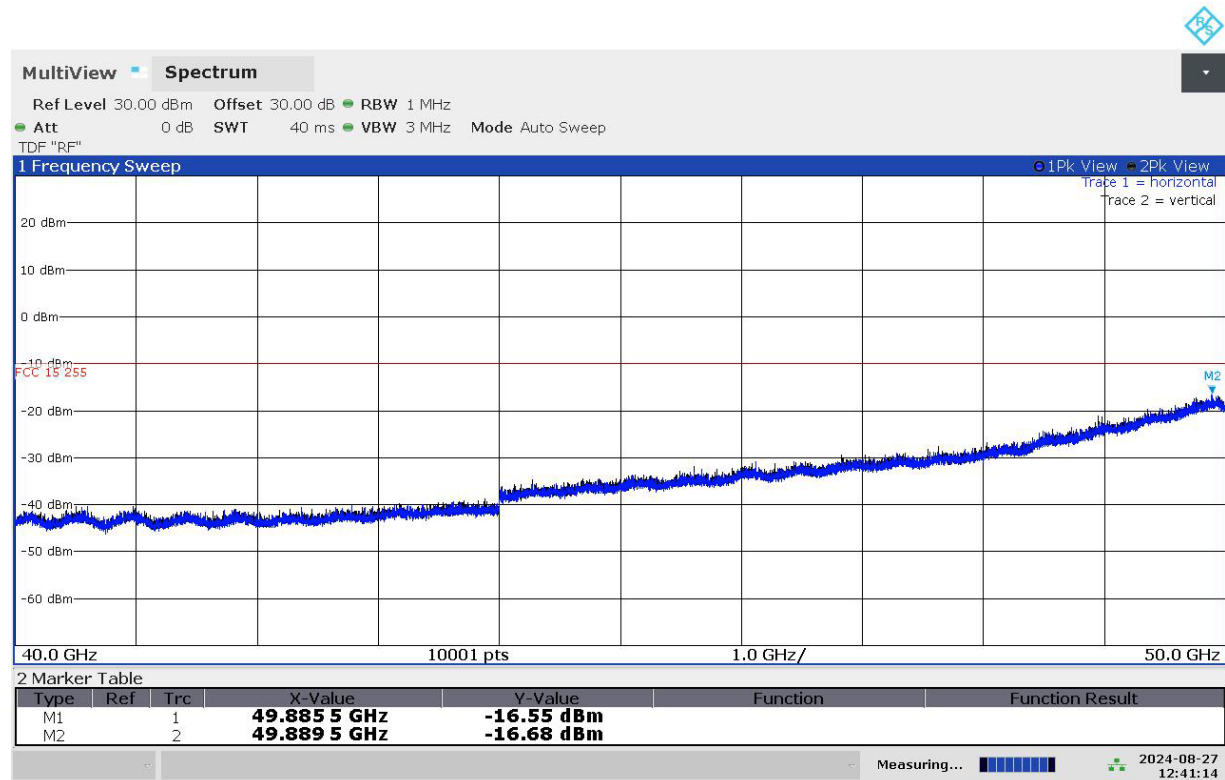


12:37:01 PM 08/27/2024

Marker	Frequency (GHz)	Det	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)	Polarity
1	49.82	Pk	-16.82	-9.92	-6.9	H
2	49.92	Pk	-16.64	-9.92	-6.72	V

Pk - Peak detector

Channel 4



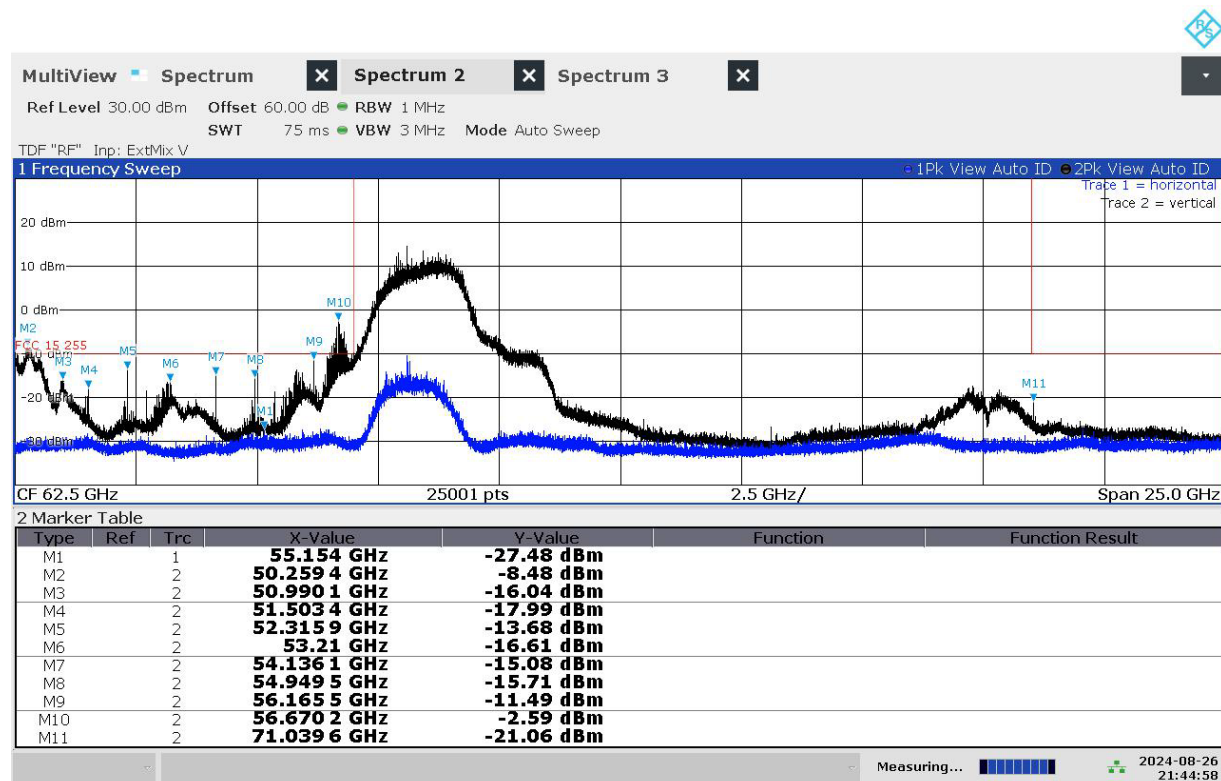
12:41:14 PM 08/27/2024

Marker	Frequency (GHz)	Det	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)	Polarity
1	49.89	Pk	-16.55	-9.92	-6.63	H
2	49.89	Pk	-16.68	-9.92	-6.76	V

Pk - Peak detector

SPURIOUS EMISSIONS 50 GHz TO 75 GHz

Channel 1



09:44:58 PM 08/26/2024

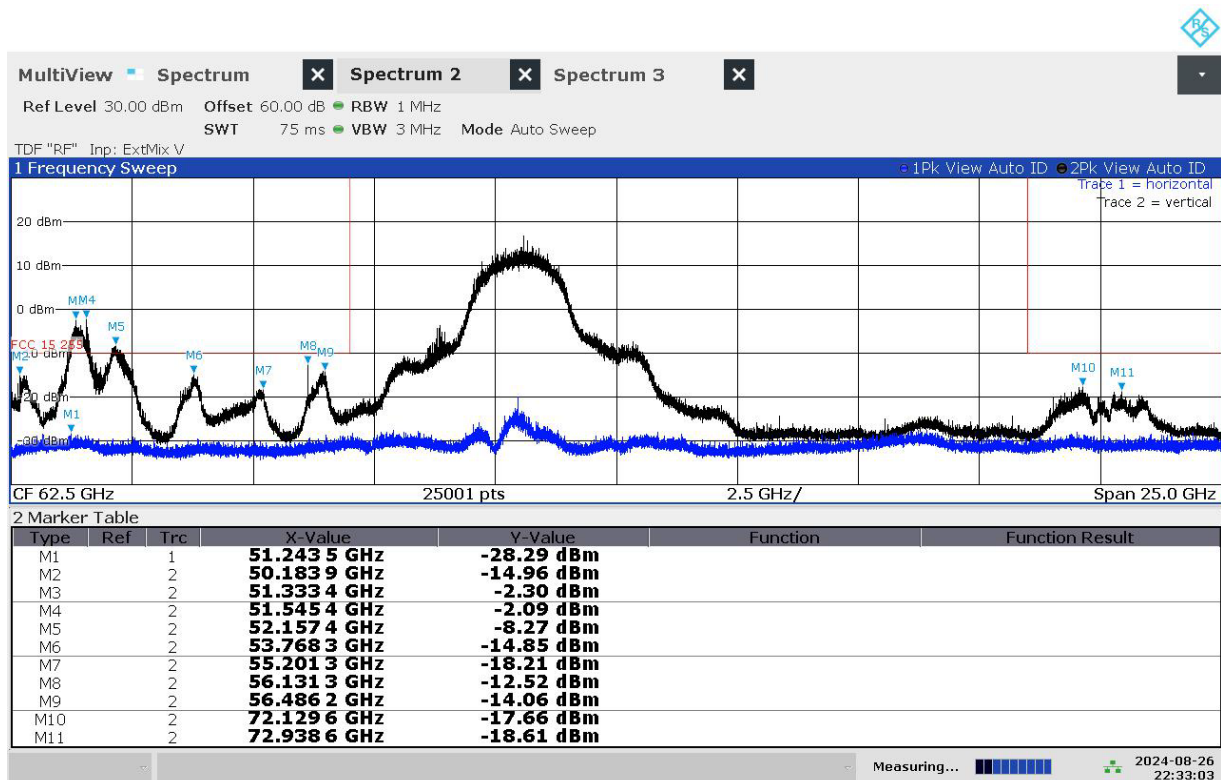
Note: The above scan is a Prescan only, using Peak Detection. Subsequent follow-up Average measurements (see table below) were made in the 50-57GHz range using a filter that rejected out the fundamental in order to show compliance to the limit in the spurious domain.

Marker	Frequency (GHz)	Det	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)	Polarity
1	55.15	Pk	-27.48	-9.92	-17.56	H
2	50.26	Avg	-16.44	-9.92	-6.52	V
3	50.99	Pk	-16.04	-9.92	-6.12	V
4	51.50	Pk	-17.99	-9.92	-8.07	V
5	52.32	Avg	-30.7	-9.92	-20.78	V
6	53.21	Pk	-16.61	-9.92	-6.69	V
7	54.14	Avg	-31.6	-9.92	-21.68	V
8	54.95	Avg	-31.19	-9.92	-21.27	V
9	56.17	Avg	-27.3	-9.92	-17.38	V
10	56.67	Avg	-18.57	-9.92	-8.65	V
11	71.04	Pk	-21.06	-9.92	-11.14	V

Pk - Peak detector

Avg – Average detector

Channel 2



10:33:04 PM 08/26/2024

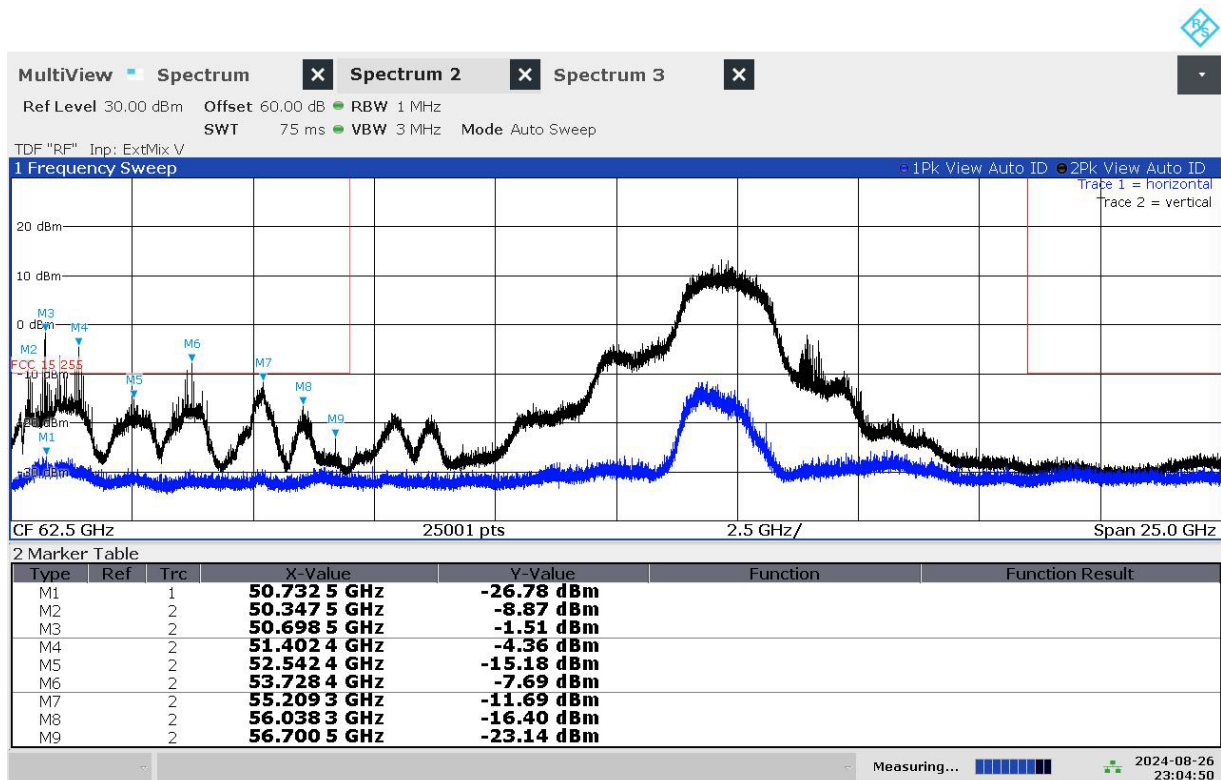
Note: The above scan is a Prescan only, using Peak Detection. Subsequent follow-up Average measurements (see table below) were made in the 50-57GHz range using a filter that rejected out the fundamental in order to show compliance to the limit in the spurious domain.

Marker	Frequency (GHz)	Det	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)	Polarity
1	51.24	Pk	-28.29	-9.92	-18.37	H
2	50.18	Avg	-22.72	-9.92	-12.8	V
3	51.33	Avg	-11.23	-9.92	-1.31	V
4	51.55	Avg	-14.26	-9.92	-4.34	V
5	52.16	Avg	-17.14	-9.92	-7.22	V
6	53.77	Avg	-24.14	-9.92	-14.22	V
7	55.20	Avg	-25.51	-9.92	-15.59	V
8	56.13	Avg	-24	-9.92	-14.08	V
9	56.49	Avg	-22.72	-9.92	-12.8	V
10	72.13	Pk	-17.66	-9.92	-7.74	V
11	72.94	Pk	-18.61	-9.92	-8.69	V

Pk - Peak detector

Avg – Average detector

Channel 4



11:04:51 PM 08/26/2024

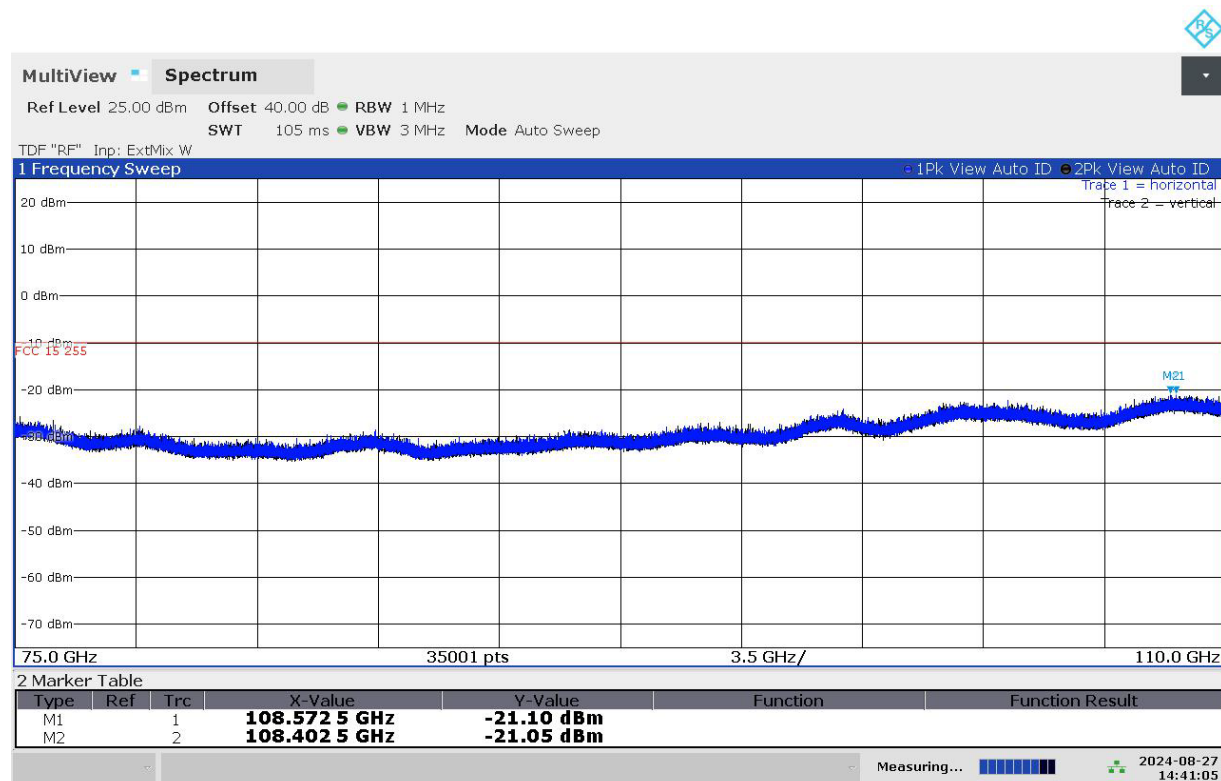
Note: The above scan is a Prescan only, using Peak Detection. Subsequent follow-up Average measurements (see table below) were made in the 50-57GHz range using a filter that rejected out the fundamental in order to show compliance to the limit in the spurious domain.

Marker	Frequency (GHz)	Det	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)	Polarity
1	50.73	Pk	-26.78	-9.92	-16.86	H
2	50.35	Avg	-15.45	-9.92	-5.53	V
3	50.70	Avg	-15.92	-9.92	-6	V
4	51.40	Avg	-13.38	-9.92	-3.46	V
5	52.54	Avg	-22.65	-9.92	-12.73	V
6	53.73	Avg	-21.88	-9.92	-11.96	V
7	55.21	Avg	-20.32	-9.92	-10.4	V
8	56.04	Pk	-16.40	-9.92	-6.48	V
9	56.70	Pk	-23.14	-9.92	-13.22	V

Pk - Peak detector
Avg – Average detector

SPURIOUS EMISSIONS 75 GHz TO 110 GHz

Channel 1

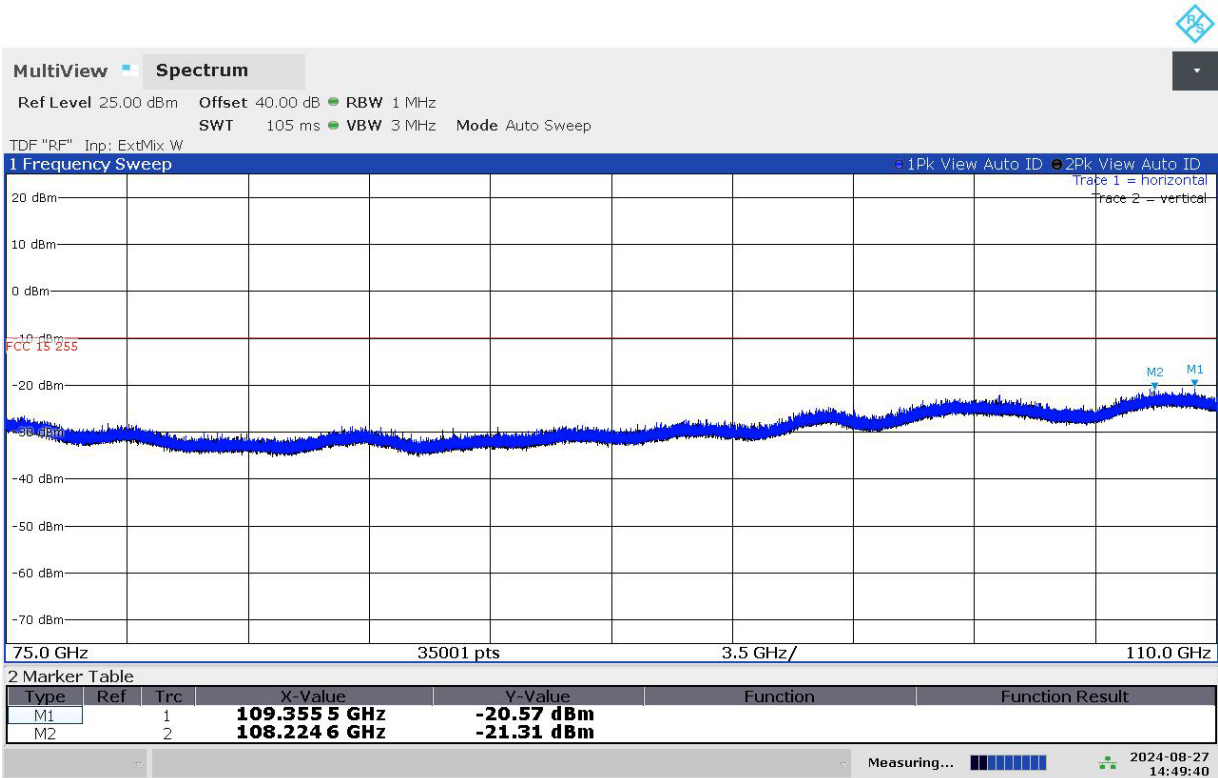


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Marker	Frequency (GHz)	Det	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)	Polarity
1	108.57	Pk	-21.10	-9.92	-11.18	H
2	108.40	Pk	-21.05	-9.92	-11.13	V

Pk - Peak detector

Channel 2

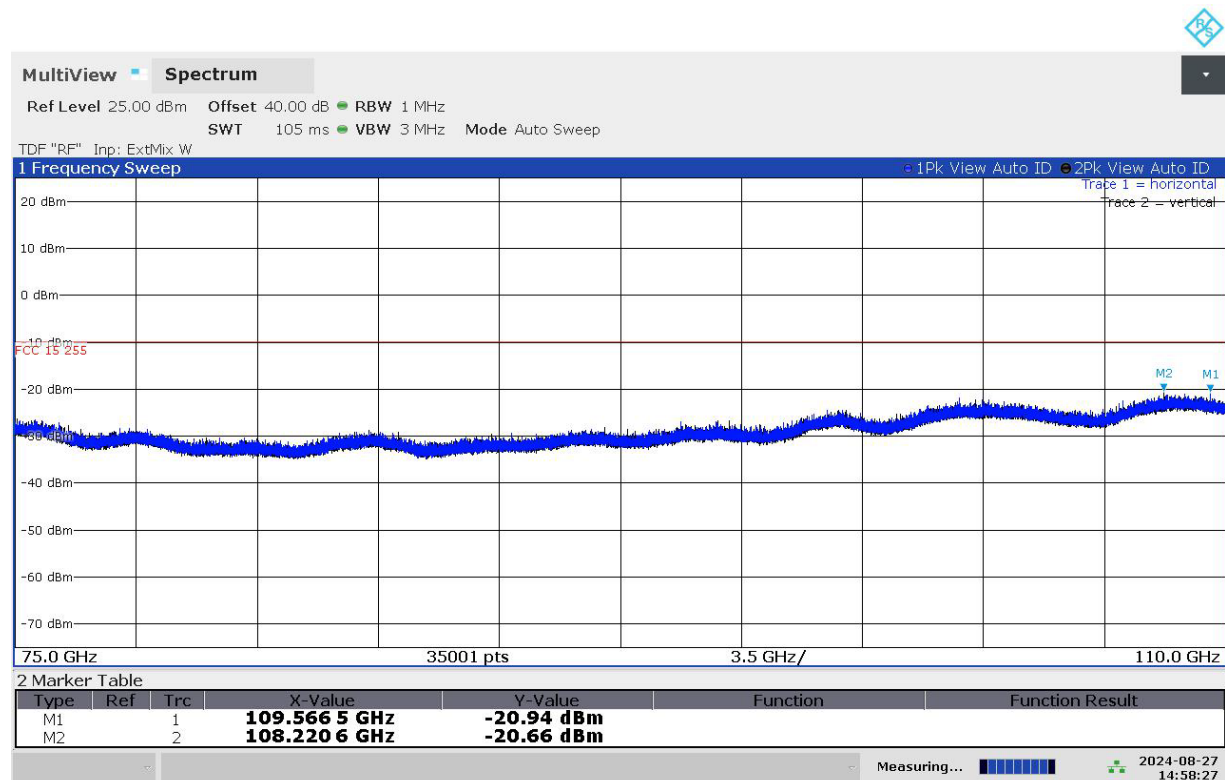


02:49:40 PM 08/27/2024

Marker	Frequency (GHz)	Det	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)	Polarity
1	109.36	Pk	-20.57	-9.92	-10.65	H
2	108.22	Pk	-21.31	-9.92	-11.39	V

Pk - Peak detector

Channel 4



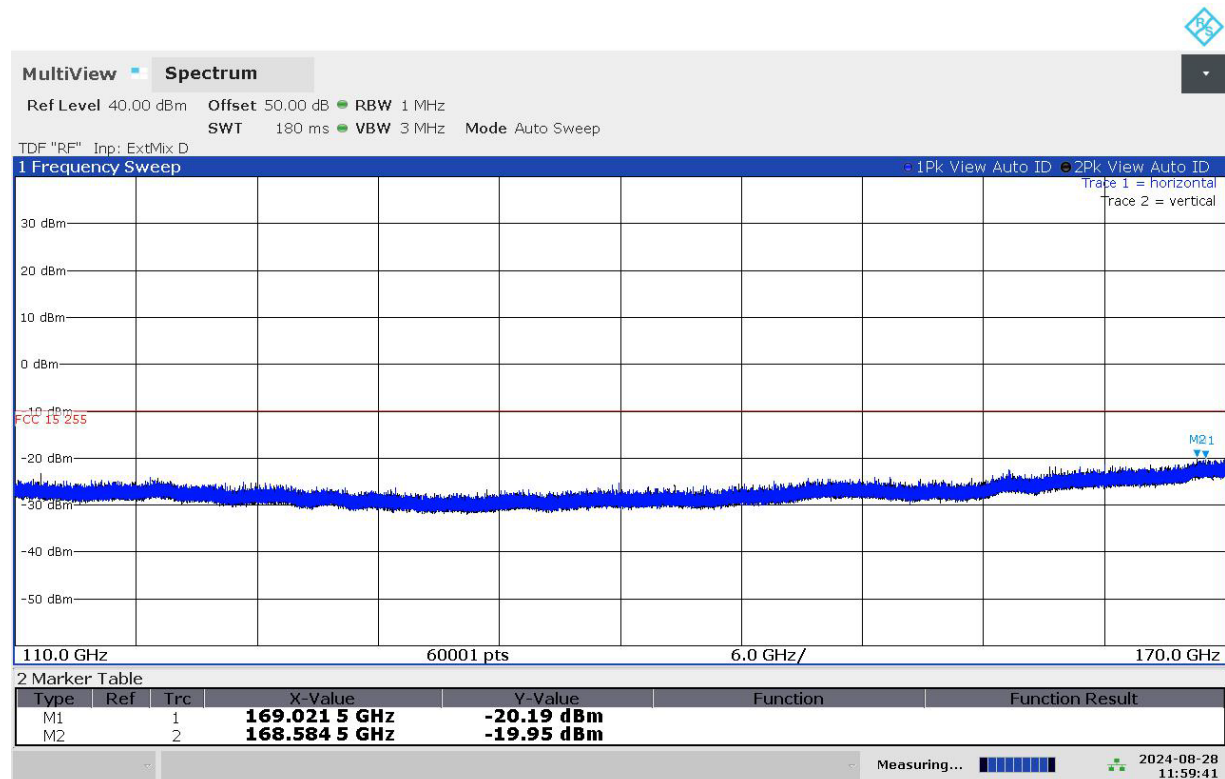
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Marker	Frequency (GHz)	Det	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)	Polarity
1	109.57	Pk	-20.94	-9.92	-11.02	H
2	108.22	Pk	-20.66	-9.92	-10.74	V

Pk - Peak detector

SPURIOUS EMISSIONS 110 GHz TO 170 GHz

Channel 2



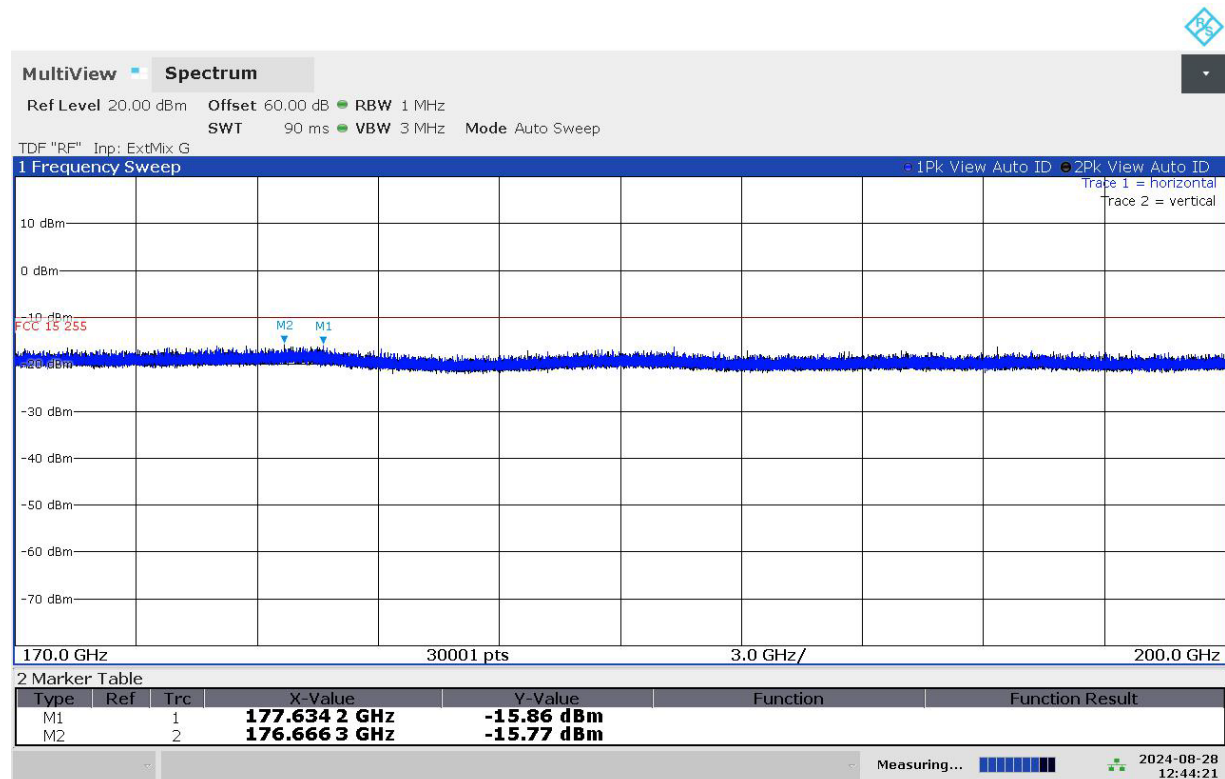
11:59:41 AM 08/28/2024

Marker	Frequency (GHz)	Det	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)	Polarity
1	169.02	Pk	-20.19	-9.92	-10.27	H
2	168.58	Pk	-19.95	-9.92	-10.03	V

Pk - Peak detector

SPURIOUS EMISSIONS 170 GHz TO 200 GHz

Channel 2



12:44:21 PM 08/28/2024

Marker	Frequency (GHz)	Det	Corrected Reading (dBm)	Avg Limit (dBm)	Margin (dB)	Polarity
1	177.63	Pk	-15.86	-9.92	-5.94	H
2	176.67	Pk	-15.77	-9.92	-5.85	V

Pk - Peak detector

9.7. AC MAINS LINE CONDUCTED EMISSIONS

REQUIREMENT

§15.207

RSS-GEN, Section 7.2.2

Frequency range (MHz)	Limits (dBµV)	
	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
Notes: 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 MHz to 0.50 MHz.		

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 C63.10.

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 lines.

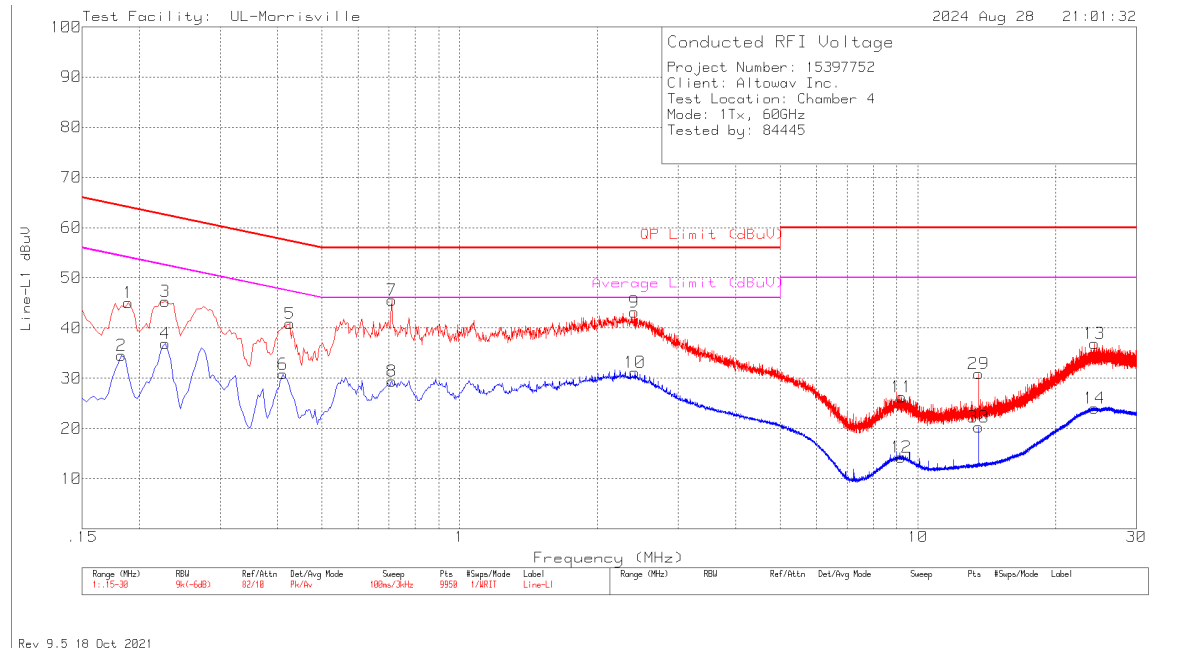
TESTED BY

Employee IDs: 84445

Test Dates: 2024-08-28

Test Location: Conducted 1

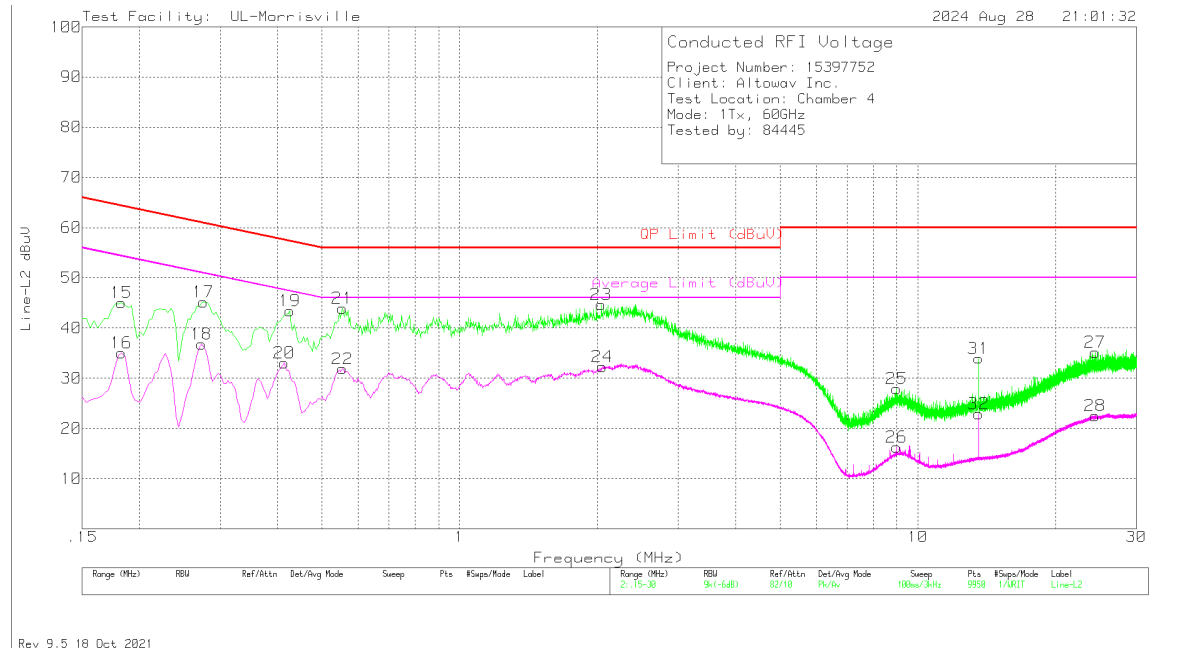
LINE 1 RESULTS



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)
2	.183	24.55	Av	.2	9.8	34.55	-	-	54.35	-19.8
1	.189	35.07	Pk	.2	9.8	45.07	64.08	-19.01	-	-
3	.228	35.42	Pk	.1	9.8	45.32	62.52	-17.2	-	-
4	.228	26.98	Av	.1	9.8	36.88	-	-	52.52	-15.64
6	.411	20.94	Av	.1	9.8	30.84	-	-	47.63	-16.79
5	.426	30.97	Pk	.1	9.8	40.87	57.33	-16.46	-	-
7	.711	35.74	Pk	0	9.8	45.54	56	-10.46	-	-
8	.711	19.58	Av	0	9.8	29.38	-	-	46	-16.62
9	2.406	33.39	Pk	0	9.8	43.19	56	-12.81	-	-
10	2.415	21.33	Av	0	9.8	31.13	-	-	46	-14.87
12	9.201	4.13	Av	.1	10	14.23	-	-	50	-35.77
11	9.207	16.13	Pk	.1	10	26.23	60	-33.77	-	-
29	13.563	20.77	Pk	.1	10	30.87	60	-29.13	-	-
30	13.563	10.2	Av	.1	10	20.3	-	-	50	-29.7
13	24.261	26.43	Pk	.3	10.2	36.93	60	-23.07	-	-
14	24.288	13.48	Av	.3	10.2	23.98	-	-	50	-26.02

Pk - Peak detector
Av - 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	.183	35.03	Pk	.2	9.8	45.03	64.35	-19.32	-	-
16	.183	25.09	Av	.2	9.8	35.09	-	-	54.35	-19.26
18	.273	26.92	Av	.1	9.8	36.82	-	-	51.03	-14.21
17	.276	35.33	Pk	.1	9.8	45.23	60.94	-15.71	-	-
20	.414	23.12	Av	.1	9.8	33.02	-	-	47.57	-14.55
19	.426	33.52	Pk	.1	9.8	43.42	57.33	-13.91	-	-
21	.555	34.09	Pk	0	9.8	43.89	56	-12.11	-	-
22	.555	22.05	Av	0	9.8	31.85	-	-	46	-14.15
23	2.037	34.9	Pk	0	9.8	44.7	56	-11.3	-	-
24	2.049	22.5	Av	0	9.8	32.3	-	-	46	-13.7
25	8.979	17.77	Pk	.1	10	27.87	60	-32.13	-	-
26	8.985	6.12	Av	.1	10	16.22	-	-	50	-33.78
31	13.563	23.87	Pk	.1	10	33.97	60	-26.03	-	-
32	13.563	12.83	Av	.1	10	22.93	-	-	50	-27.07
27	24.357	24.7	Pk	.3	10.2	35.2	60	-24.8	-	-
28	24.369	11.99	Av	.3	10.2	22.49	-	-	50	-27.51

Pk - Peak detector

Av - Average detection

9.8. FREQUENCY STABILITY

REQUIREMENT

FCC

§15.255 (f)

Fundamental emissions must be contained within the frequency bands specified in this section during all conditions of operation. Equipment is presumed to operate over the temperature range -20 to + 50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

ISED

RSS-210 Clause J.6

Fundamental emissions shall be contained within the frequency bands specified in this annex during all conditions of operation when tested at the temperature and voltage variations specified for the frequency stability measurement in RSS-Gen.

TEST PROCEDURE

ANSI C63.10-2020 Clause 9.5

The radio module is placed in an environmental chamber, with power furnished by an adjustable source. The occupied bandwidth is measured at each condition and compared with the reference condition.

The EUT is typically powered from a PoE injector that is sold with the EUT. The input voltage range of the PoE is 100-240Vac.

TESTED BY

Employee IDs: 23854 / 84445

Test Dates: 2024-08-29

Test Location: Conducted 1

RESULTS

Nominal Frequency:	58.32	GHz				
Voltage Range:	100-240	Vac				
Nominal Voltage:	120	Vac				
Temperature (°C)	Voltage (V)	99% Bandwidth (GHz)	F_{low} Limit (GHz)	F_{low} (GHz)	F_{high} (GHz)	F_{high} Limit (GHz)
-20	120	2.430	57	57.22	59.65	71
-10	120	2.358	57	57.26	59.62	71
0	120	2.225	57	57.32	59.55	71
10	120	2.501	57	57.21	59.71	71
20	120	2.383	57	57.39	59.77	71
20	102	2.608	57	57.14	59.75	71
20	276	2.662	57	57.10	59.76	71
30	120	2.458	57	57.26	59.72	71
40	120	2.515	57	57.25	59.76	71
50	120	2.769	57	57.00	59.77	71

Nominal Frequency:	64.8	GHz				
Voltage Range:	100-240	Vac				
Nominal Voltage:	120	Vac				
Temperature (°C)	Voltage (V)	99% Bandwidth (GHz)	F_{low} Limit (GHz)	F_{low} (GHz)	F_{high} (GHz)	F_{high} Limit (GHz)
-20	120	2.515	57	63.37	65.89	71
-10	120	2.521	57	63.39	65.91	71
0	120	2.540	57	63.37	65.91	71
10	120	2.548	57	63.37	65.92	71
20	120	2.534	57	63.36	65.89	71
20	102	2.504	57	63.31	65.81	71
20	276	2.502	57	63.32	65.82	71
30	120	2.635	57	63.31	65.94	71
40	120	2.631	57	63.31	65.94	71
50	120	2.590	57	63.34	65.93	71

9.9. GROUP INSTALLATION

REQUIREMENT

FCC

§15.255 (h)

Any transmitter that has received the necessary FCC equipment authorization under the rules of this chapter may be mounted in a group installation for simultaneous operation with one or more other transmitter(s) that have received the necessary FCC equipment authorization, without any additional equipment authorization. However, no transmitter operating under the provisions of this section may be equipped with external phase-locking inputs that permit beam-forming arrays to be realized.

ISED

RSS-210 Clause J.7

Any transmitter that is certified under this annex may be mounted in a group installation for simultaneous operation with one or more certified transmitters, without any additional equipment authorization. However, no transmitter operating under the provisions of this annex shall be equipped with external phase-locking inputs that permit beam-forming arrays to be realized.

RESULTS

The EUT does not have any external phase locking inputs for beam forming.

10. SETUP PHOTOS

Please refer to report R15397752-EP1 for setup photos.

END OF TEST REPORT