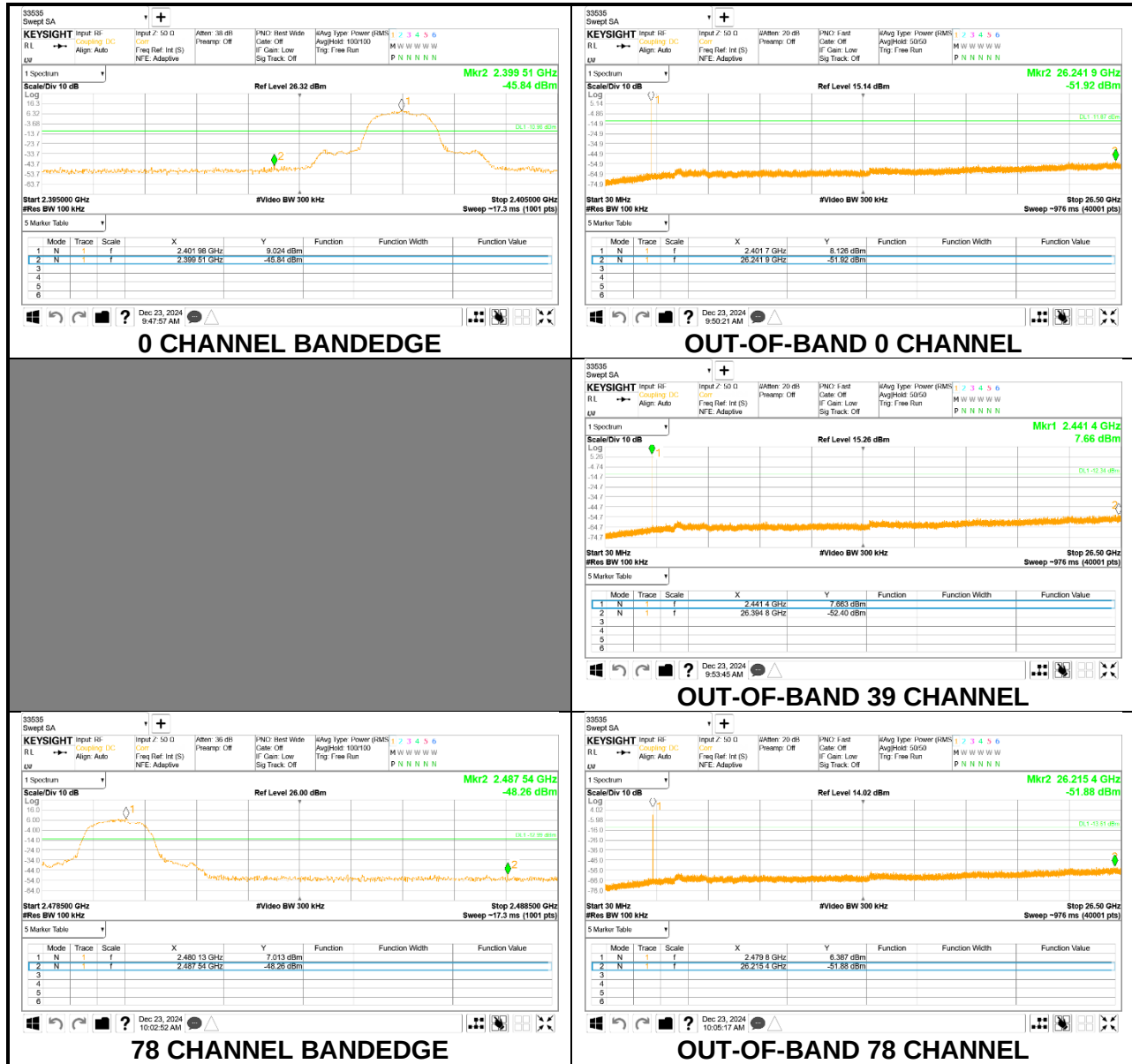
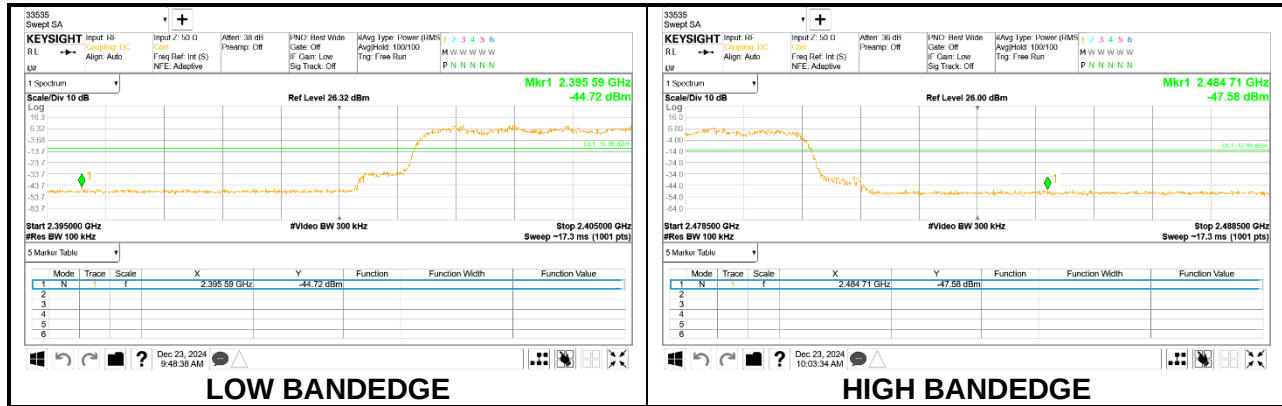


SPURIOUS EMISSIONS, NON-HOPPING – ANT2



SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON – ANT2



10. RADIATED TEST RESULTS

LIMITS

FCC §15.205 and §15.209

Limits for radiated disturbance of an intentional radiator		
Frequency range (MHz)	Limits (µV/m)	Measurement Distance (m)
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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g. §§ 15.231 and 15.241.

FCC Part 15.205 (a) : Only spurious emissions are permitted in any of the frequency bands listed below :

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1300 ~ 1427	4.5 ~ 5.15	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1435 ~ 1626.5	5.35 ~ 5.46	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~ 12.52025	149.9 ~ 150.05	1645.5 ~ 1646.5	7.25 ~ 7.75	17.7 ~ 21.4
4.125 ~ 4.128	12.57675 ~ 12.57725	156.52475 ~	1660 ~ 1710	8.025 ~ 8.5	22.01 ~ 23.12
4.17725 ~ 4.17775	13.36 ~ 13.41	156.52525	1718.8 ~ 1722.2	9.0 ~ 9.2	23.6 ~ 24.0
4.20725 ~ 4.20775	16.42 ~ 16.423	156.7 ~ 156.9	2200 ~ 2300	9.3 ~ 9.5	31.2 ~ 31.8
6.215 ~ 6.218	16.69475 ~ 16.69525	162.0125 ~	2310 ~ 2390	10.6 ~ 12.7	36.43 ~ 36.5
6.26775 ~ 6.26825	16.80425 ~ 16.80475	167.17	2483.5 ~ 2500	13.25 ~ 13.4	Above 38.6
6.31175 ~ 6.31225	25.5 ~ 25.67	167.72 ~ 173.2	2655 ~ 2900		
8.291 ~ 8.294	37.5 ~ 38.25	240 ~ 285	3260 ~ 3267		
8.362 ~ 8.366	73 ~ 74.6	322 ~ 335.4	3332 ~ 3339		
8.37625 ~ 8.38675	74.8 ~ 75.2	399.90 ~ 410	3345.8 ~ 3358		
		608 ~ 614	3600 ~ 4400		
		960 ~ 1240			

▪ FCC Part 15.205(b): The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz and 150 cm for above 1GHz. 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. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements. (Pre-scans to detect harmonic and spurious emissions, the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 kHz for peak measurements.)

For band edge measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1/T (on time) for average measurement.

$$\text{GFSK} = 1/T = 1 / 0.00288\text{s} = 347\text{Hz}.$$

The minimum VBW was 347Hz, but test receiver (ESU40) couldn't set value 347Hz. Due to this reason, testing VBW was set to 500Hz (Worst cases).

The spectrum from 1GHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.
(From 30MHz to 1GHz, test was performed with the EUT set to transmit at the channel with highest output power)

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.

Note: Emission was pre-scanned from 9kHz to 30MHz; No emissions were detected which was at least 20dB below the specification limit (consider distance correction factor).
Per FCC part 15.31(o), test results were not reported.

Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open are test site.
Therefore, sufficient tests were made to demonstrate that the alternative site produces results that correlate with the one of tests made in an open field based on KDB 414788.

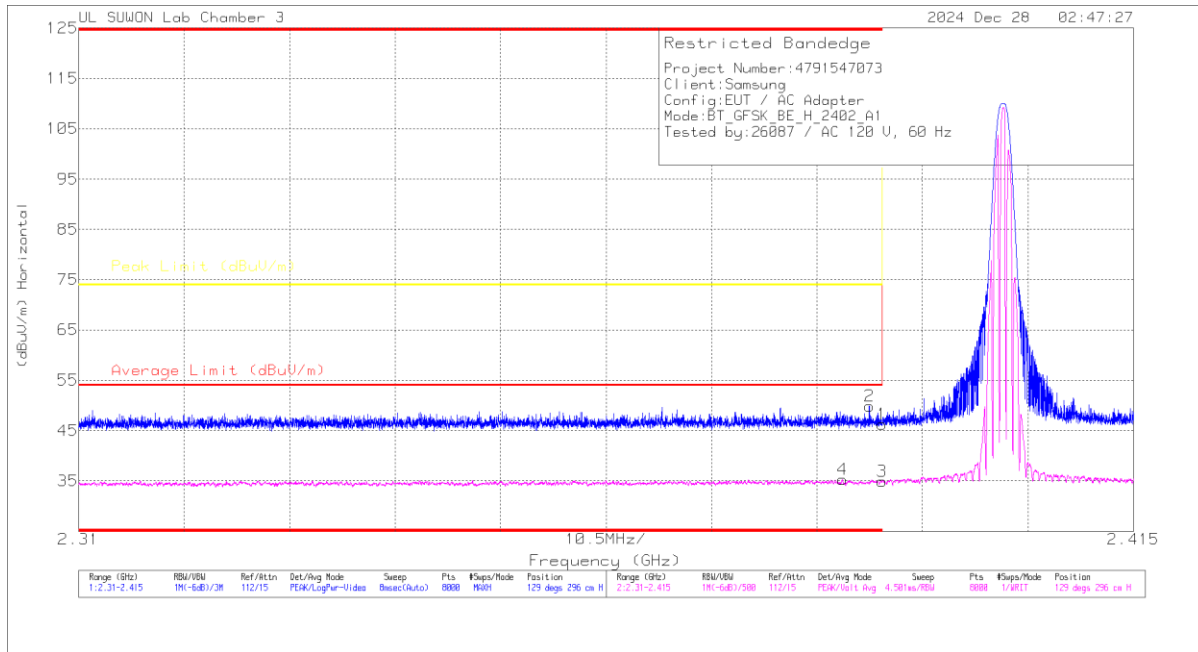
10.1. TRANSMITTER ABOVE 1 GHz

10.1.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

ANT1

BANDEDGE (0 CHANNEL)

HORIZONTAL RESULT



Trace Markers

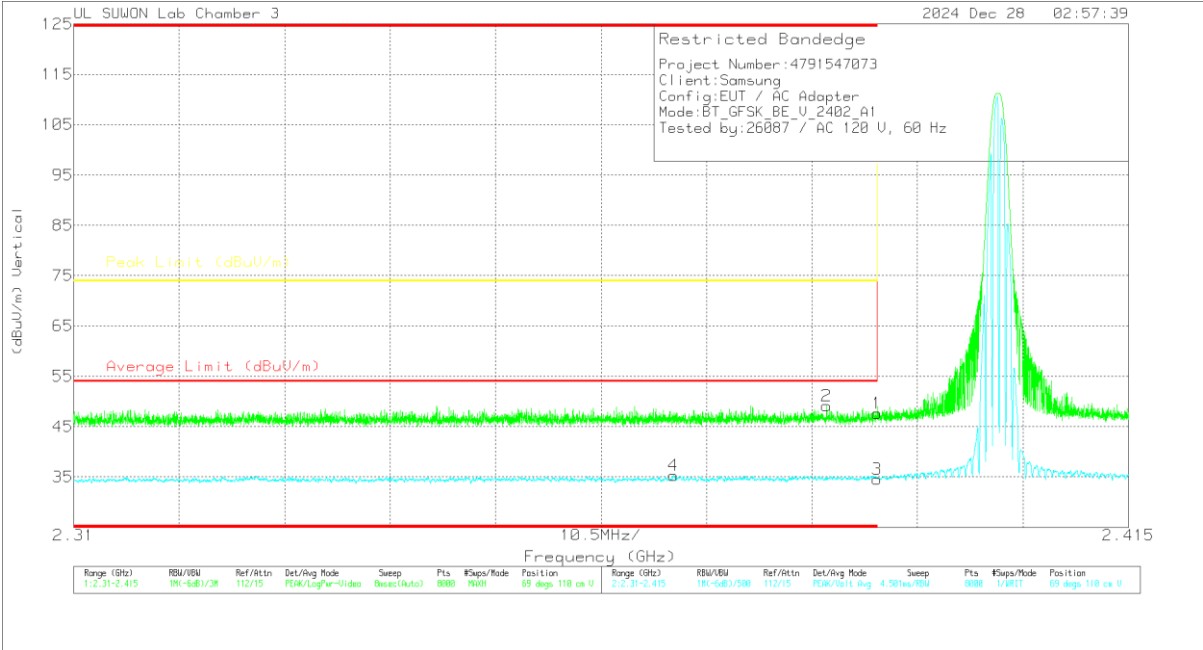
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor(dB/m)	10dB_Path Loss(dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	39.03	Pk	32.1	-24.9	46.23	-	-	74	-27.77	129	296	H
2	* 2.38871	42.81	Pk	32.1	-25	49.91	-	-	74	-24.09	129	296	H
3	* 2.39	27.74	VA1T	32.1	-24.9	34.94	54	-19.06	-	-	129	296	H
4	* 2.38602	28.18	VA1T	32.1	-25	35.28	54	-18.72	-	-	129	296	H

* - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band

PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

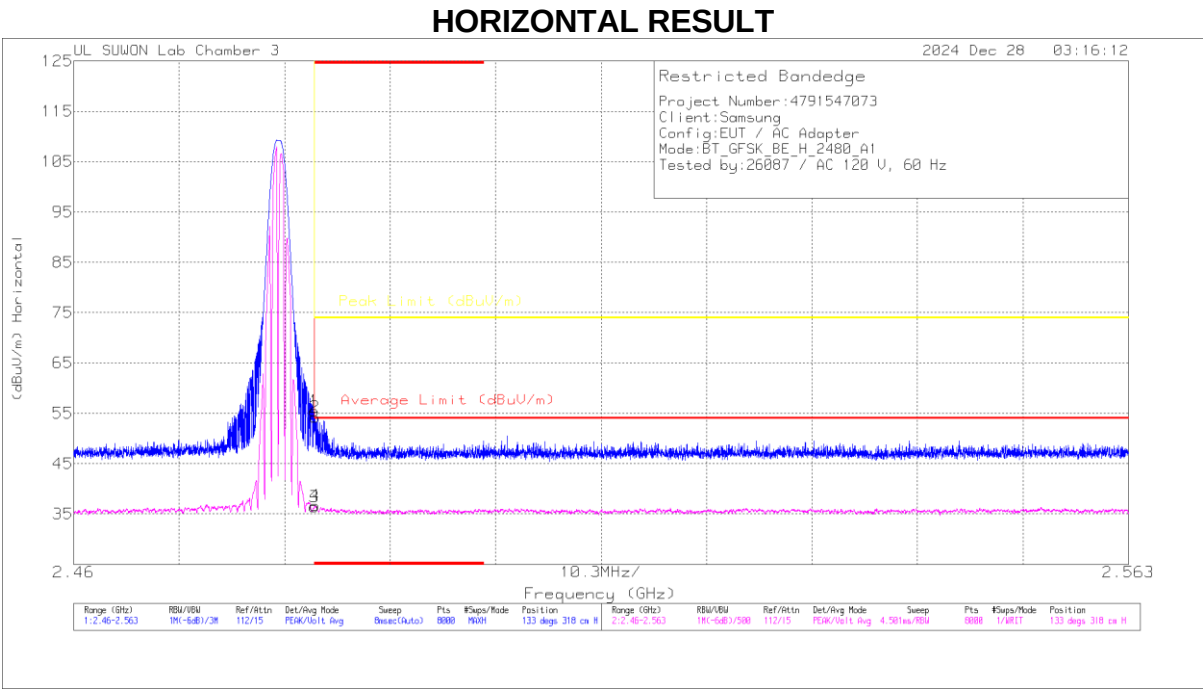


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor (dB/m)	10dB_Path 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	* 2.39	40.39	Pk	32.1	-24.9	47.59	-	-	74	-26.41	69	110	V
2	* 2.38496	42.03	Pk	32.1	-25	49.13	-	-	74	-24.87	69	110	V
3	* 2.39	27.38	VA1T	32.1	-24.9	34.58	54	-19.42	-	-	69	110	V
4	* 2.36973	28.35	VA1T	32	-25	35.35	54	-18.65	-	-	69	110	V

* - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

BANDEDGE (78 CHANNEL)

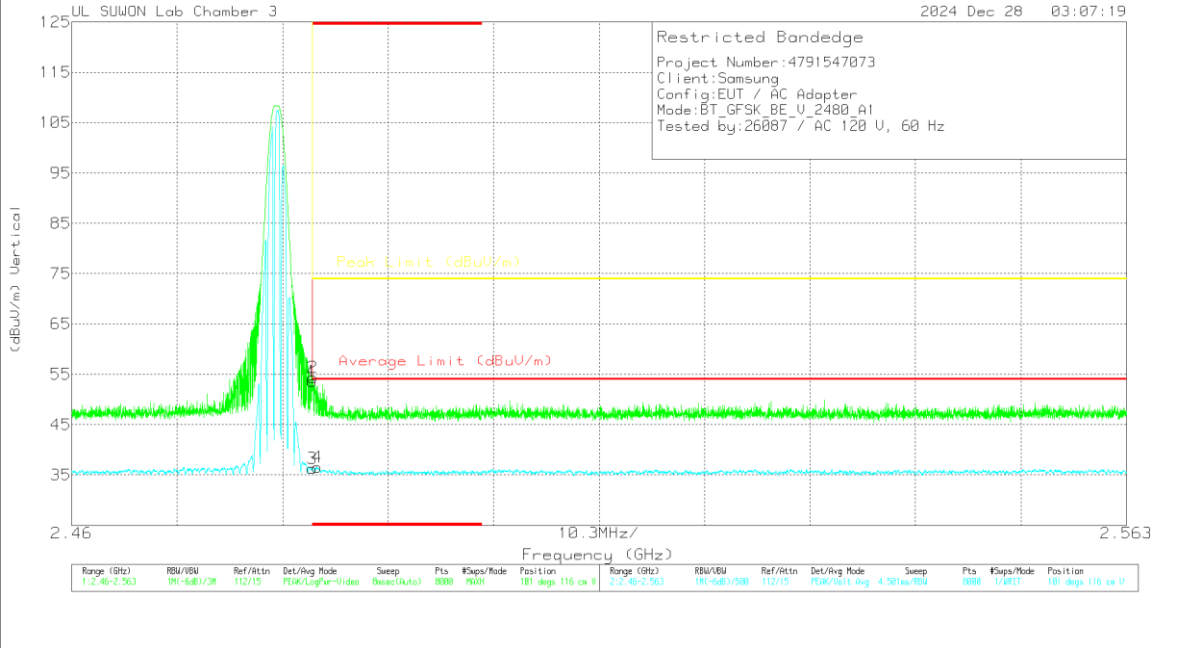


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor (dB/m)	10dB_Path 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	* 2.4835	47.94	Pk	32.4	-24.9	55.44	-	-	74	-18.56	133	318	H
2	* 2.48358	46.77	Pk	32.4	-24.9	54.27	-	-	74	-19.73	133	318	H
3	* 2.4835	28.87	VA1T	32.4	-24.9	36.37	54	-17.63	-	-	133	318	H
4	* 2.48354	29.13	VA1T	32.4	-24.9	36.63	54	-17.37	-	-	133	318	H

* - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT



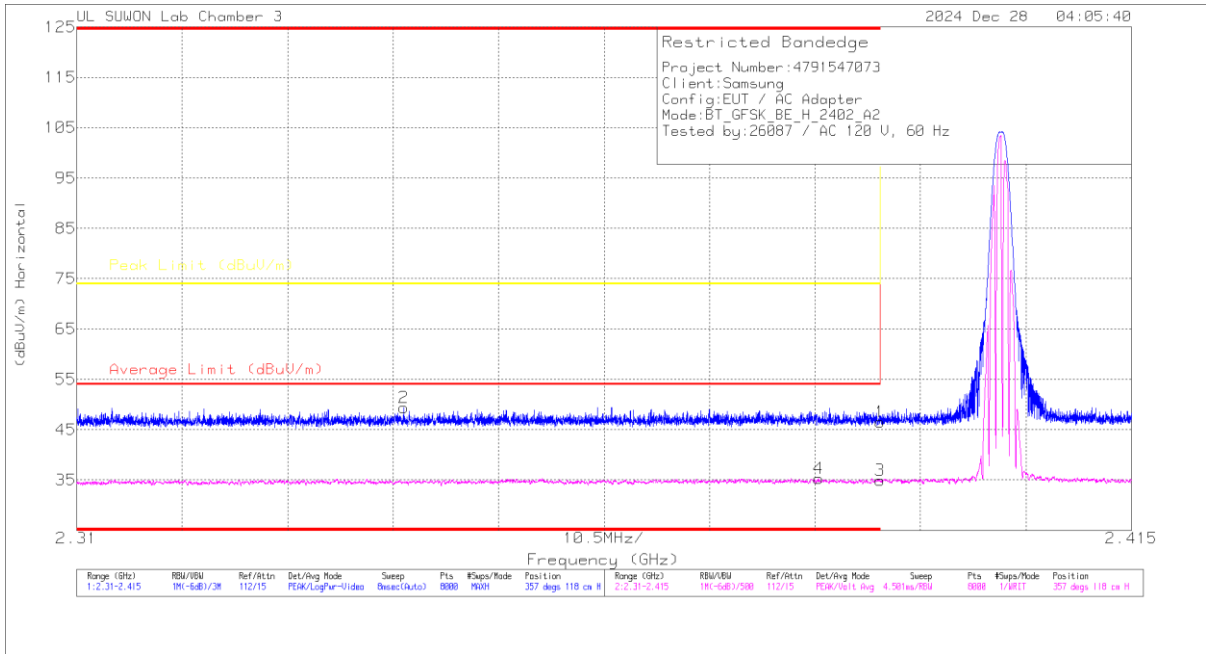
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor (dB/m)	10dB_Path 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	* 2.4835	46.1	Pk	32.4	-24.9	53.6	-	-	74	-20.4	101	116	V
2	* 2.48353	46.88	Pk	32.4	-24.9	54.38	-	-	74	-19.62	101	116	V
3	* 2.4835	28.77	VA1T	32.4	-24.9	36.27	54	-17.73	-	-	101	116	V
4	* 2.48396	29.04	VA1T	32.4	-24.9	36.54	54	-17.46	-	-	101	116	V

* - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

ANT2
BANDEDGE (0 CHANNEL)

HORIZONTAL RESULT

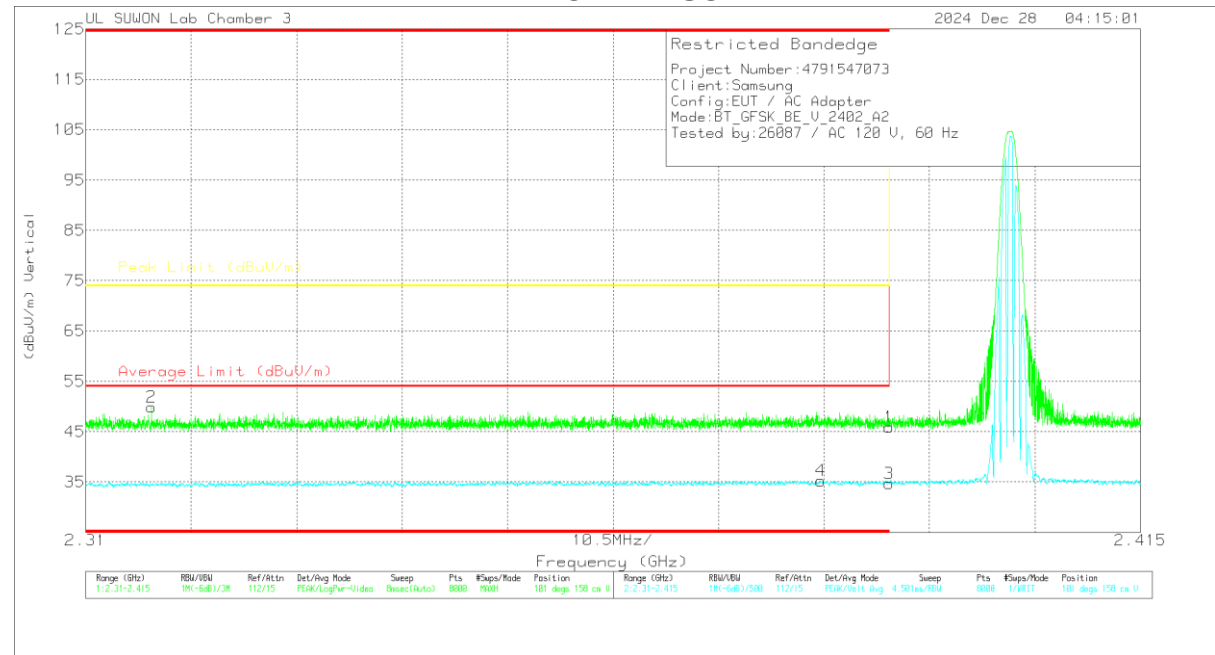


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor(dB/m)	10dB_Path 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	* 2.39	39.34	Pk	32.1	-24.9	46.54	-	-	74	-27.46	357	118	H
2	* 2.34254	42.52	Pk	32	-25.1	49.42	-	-	74	-24.58	357	118	H
3	* 2.39	27.72	VA1T	32.1	-24.9	34.92	54	-19.08	-	-	357	118	H
4	* 2.38385	28.19	VA1T	32.1	-25	35.29	54	-18.71	-	-	357	118	H

* - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT



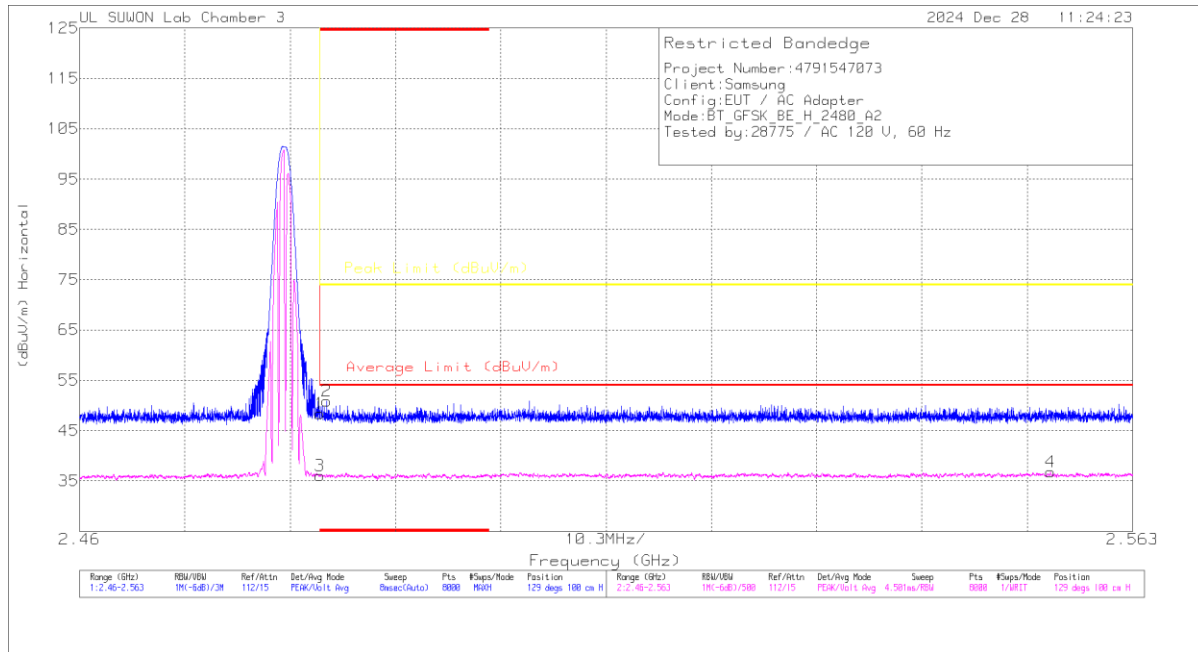
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor (dB/m)	10dB_Path 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	* 2.39	38.72	Pk	32.1	-24.9	45.92	-	-	74	-28.08	101	158	V
2	* 2.31655	42.98	Pk	31.9	-25	49.88	-	-	74	-24.12	101	158	V
3	* 2.39	27.45	VA1T	32.1	-24.9	34.65	54	-19.35	-	-	101	158	V
4	* 2.38316	28.14	VA1T	32.1	-25	35.24	54	-18.76	-	-	101	158	V

* - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

BANDEDGE (78 CHANNEL)

HORIZONTAL RESULT



Trace Markers

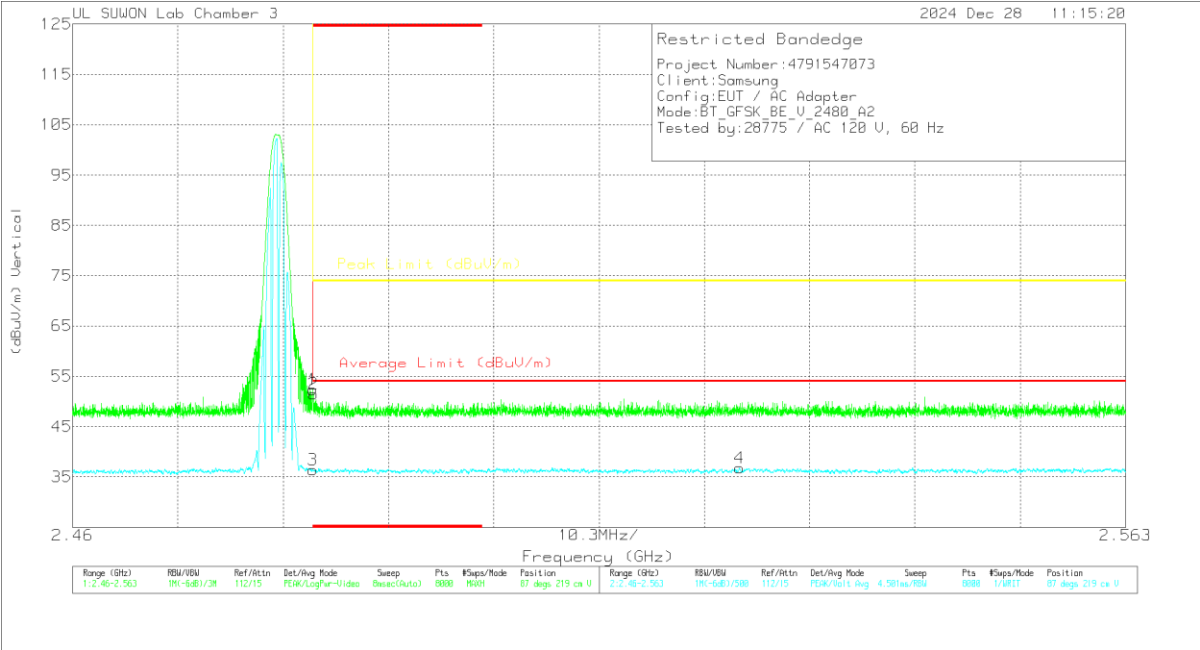
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor(dBm)	10dB_Path Loss(dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	40.94	Pk	32.4	-24.9	48.44	-	-	74	-25.56	129	100	H
2	* 2.48416	43.37	Pk	32.4	-24.9	50.87	-	-	74	-23.13	129	100	H
3	* 2.4835	28.59	VA1T	32.4	-24.9	36.09	54	-17.91	-	-	129	100	H
4	2.55499	29.04	VA1T	32.4	-24.7	36.74	54	-17.26	-	-	129	100	H

* - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT



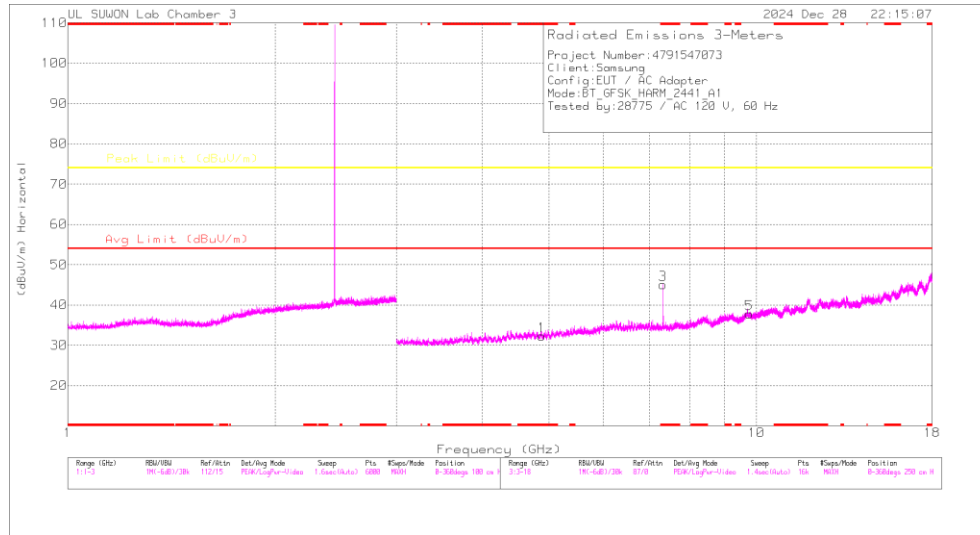
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna, 957-Factor (dB/m)	10dB_Path 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	* 2.4835	44.89	PK	32.4	-24.9	52.39	-	-	74	-21.61	87	219	V
2	* 2.48354	44.04	PK	32.4	-24.9	51.54	-	-	74	-22.46	87	219	V
3	* 2.4835	28.92	VA1T	32.4	-24.9	36.42	54	-17.58	-	-	87	219	V
4	2.52521	29.1	VA1T	32.4	-24.7	36.8	54	-17.2	-	-	87	219	V

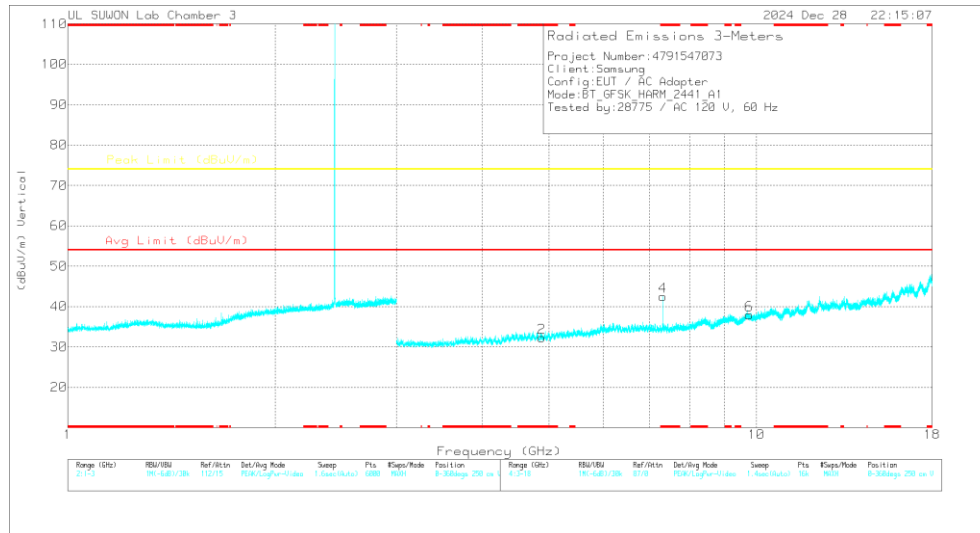
* - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HARMONICS AND SPURIOUS EMISSIONS (WORST CASE – ANT 1)

39 CHANNEL RESULTS



HORIZONTAL



VERTICAL

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957 Factor(dB/m)	3GHz_HP Path Loss(dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.88281	38.41	PKFH	34.2	-30.6	42.01	-	-	74	-31.99	129	110	H
* 4.88189	26.28	VA1T	34.2	-30.6	29.88	54	-24.12	-	-	129	110	H
* 4.88223	38.02	PKFH	34.2	-30.6	41.62	-	-	74	-32.38	182	111	V
* 4.88205	26.47	VA1T	34.2	-30.6	30.07	54	-23.93	-	-	182	111	V
* 7.32282	39.66	PKFH	35.8	-25	50.46	-	-	74	-23.54	221	103	H
* 7.3228	31.98	VA1T	35.8	-25	42.78	54	-11.22	-	-	221	103	H
* 7.32244	37.83	PKFH	35.8	-25	48.63	-	-	74	-25.37	128	113	V
* 7.323	30.22	VA1T	35.8	-25	41.02	54	-12.98	-	-	128	113	V
9.75631	30.55	PKFH	36.9	-21.3	46.15	-	-	74	-27.85	0	100	H
9.76088	31.14	PKFH	36.9	-21.2	46.84	-	-	74	-27.16	0	100	V

* - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band

PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HARMONICS AND SPURIOUS EMISSIONS TEST DATA

Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor [dB/m]	Loss [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2402	ANT1	* 4.8039	38.52	PKFH	34.30	-29.80	43.02	-	-	74.00	-30.98	122	115	H
		* 4.80396	26.91	VA1T	34.30	-29.80	31.41	54.00	-22.59	-	-	122	115	H
		* 4.80462	37.86	PKFH	34.30	-29.80	42.36	-	-	74.00	-31.64	187	104	V
		* 4.80408	26.71	VA1T	34.30	-29.80	31.21	54.00	-22.79	-	-	187	104	V
		7.206	40.32	PKFH	35.80	-25.70	50.42	-	-	74.00	-23.58	220	104	H
		7.206	38.96	PKFH	35.80	-25.70	49.06	-	-	74.00	-24.94	130	127	V
		9.601	30.66	PKFH	36.70	-21.70	45.66	-	-	74.00	-28.34	0	100	H
		9.602	30.07	PKFH	36.70	-21.70	45.07	-	-	74.00	-28.93	0	100	V
2441	ANT1	* 4.88281	38.41	PKFH	34.20	-30.60	42.01	-	-	74.00	-31.99	129	110	H
		* 4.88189	26.28	VA1T	34.20	-30.60	29.88	54.00	-24.12	-	-	129	110	H
		* 4.88223	38.02	PKFH	34.20	-30.60	41.62	-	-	74.00	-32.38	182	111	V
		* 4.88205	26.47	VA1T	34.20	-30.60	30.07	54.00	-23.93	-	-	182	111	V
		* 7.32282	39.66	PKFH	35.80	-25.00	50.46	-	-	74.00	-23.54	221	103	H
		* 7.3228	31.98	VA1T	35.80	-25.00	42.78	54.00	-11.22	-	-	221	103	H
		* 7.32244	37.83	PKFH	35.80	-25.00	48.63	-	-	74.00	-25.37	128	113	V
		* 7.323	30.22	VA1T	35.80	-25.00	41.02	54.00	-12.98	-	-	128	113	V
		9.756	30.55	PKFH	36.90	-21.30	46.15	-	-	74.00	-27.85	0	100	H
		9.761	31.14	PKFH	36.90	-21.30	46.84	-	-	74.00	-27.16	0	100	V
		* 4.95979	37.70	PKFH	34.30	-30.40	41.60	-	-	74.00	-32.40	120	121	H
		* 4.96003	26.53	VA1T	34.30	-30.40	30.43	54.00	-23.57	-	-	120	121	H
2480	ANT1	* 4.95688	37.32	PKFH	34.30	-30.30	41.32	-	-	74.00	-32.68	227	357	V
		* 4.96019	25.07	VA1T	34.30	-30.40	28.97	54.00	-25.03	-	-	227	357	V
		* 7.43974	35.01	PKFH	35.70	-25.00	45.71	-	-	74.00	-28.29	224	228	H
		* 7.44	26.31	VA1T	35.70	-25.00	37.01	54.00	-16.99	-	-	224	228	H
		* 7.43952	34.47	PKFH	35.70	-25.00	45.17	-	-	74.00	-28.83	130	101	V
		* 7.43992	23.93	VA1T	35.70	-25.00	34.63	54.00	-19.37	-	-	130	101	V
		9.916	30.21	PKFH	37.10	-21.30	46.01	-	-	74.00	-27.99	0	100	H
		9.914	29.62	PKFH	37.10	-21.40	45.32	-	-	74.00	-28.68	0	100	V
Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor [dB/m]	Loss [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2402	ANT2	* 4.80652	37.11	PKFH	34.30	-29.80	41.61	-	-	74.00	-32.39	124	100	H
		* 4.8042	24.76	VA1T	34.30	-29.80	29.26	54.00	-24.74	-	-	124	100	H
		* 4.80444	36.99	PKFH	34.30	-29.80	41.49	-	-	74.00	-32.51	186	137	V
		* 4.80398	25.11	VA1T	34.30	-29.80	29.61	54.00	-24.39	-	-	186	137	V
		7.200	32.96	PKFH	35.80	-25.70	43.06	-	-	74.00	-30.94	128	100	H
		7.210	33.82	PKFH	35.80	-25.80	43.82	-	-	74.00	-30.18	32	100	V
		9.609	31.28	PKFH	36.70	-21.70	46.28	-	-	74.00	-27.72	0	100	H
		9.613	30.26	PKFH	36.70	-21.70	45.26	-	-	74.00	-28.74	0	100	V
2441	ANT2	* 4.87341	37.28	PKFH	34.20	-30.50	40.98	-	-	74.00	-33.02	112	171	H
		* 4.88204	25.28	VA1T	34.20	-30.60	28.88	54.00	-25.12	-	-	112	171	H
		* 4.87583	38.53	PKFH	34.20	-30.40	42.33	-	-	74.00	-31.67	112	109	V
		* 4.88188	24.70	VA1T	34.20	-30.60	28.30	54.00	-25.70	-	-	112	109	V
		* 7.32897	32.77	PKFH	35.80	-25.00	43.57	-	-	74.00	-30.43	125	100	H
		* 7.32274	20.14	VA1T	35.80	-25.00	30.94	54.00	-23.06	-	-	125	100	H
		* 7.32744	32.25	PKFH	35.80	-25.00	43.05	-	-	74.00	-30.95	125	103	V
		* 7.32366	20.06	VA1T	35.80	-25.00	30.86	54.00	-23.14	-	-	125	103	V
		9.767	30.18	PKFH	36.90	-21.30	45.78	-	-	74.00	-28.22	0	100	H
		9.760	30.73	PKFH	36.90	-21.30	46.33	-	-	74.00	-27.67	0	100	V
		* 4.96427	36.80	PKFH	34.30	-30.30	40.80	-	-	74.00	-33.20	230	100	H
		* 4.95156	24.00	VA1T	34.30	-30.40	27.90	54.00	-26.10	-	-	230	100	H
2480	ANT2	* 4.95626	37.06	PKFH	34.30	-30.30	41.06	-	-	74.00	-32.94	13	390	V
		* 4.95057	23.94	VA1T	34.30	-30.40	27.84	54.00	-26.16	-	-	13	390	V
		* 7.43836	32.29	PKFH	35.70	-25.00	42.99	-	-	74.00	-31.01	130	106	H
		* 7.4401	19.72	VA1T	35.70	-25.00	30.42	54.00	-23.58	-	-	130	106	H
		* 7.43886	32.16	PKFH	35.70	-25.00	42.86	-	-	74.00	-31.14	278	108	V
		* 7.44478	19.55	VA1T	35.70	-25.10	30.15	54.00	-23.95	-	-	278	108	V
		9.915	29.92	PKFH	37.10	-21.30	45.72	-	-	74.00	-28.28	0	100	H
		9.913	31.10	PKFH	37.10	-21.40	46.80	-	-	74.00	-27.20	0	100	V

* - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band

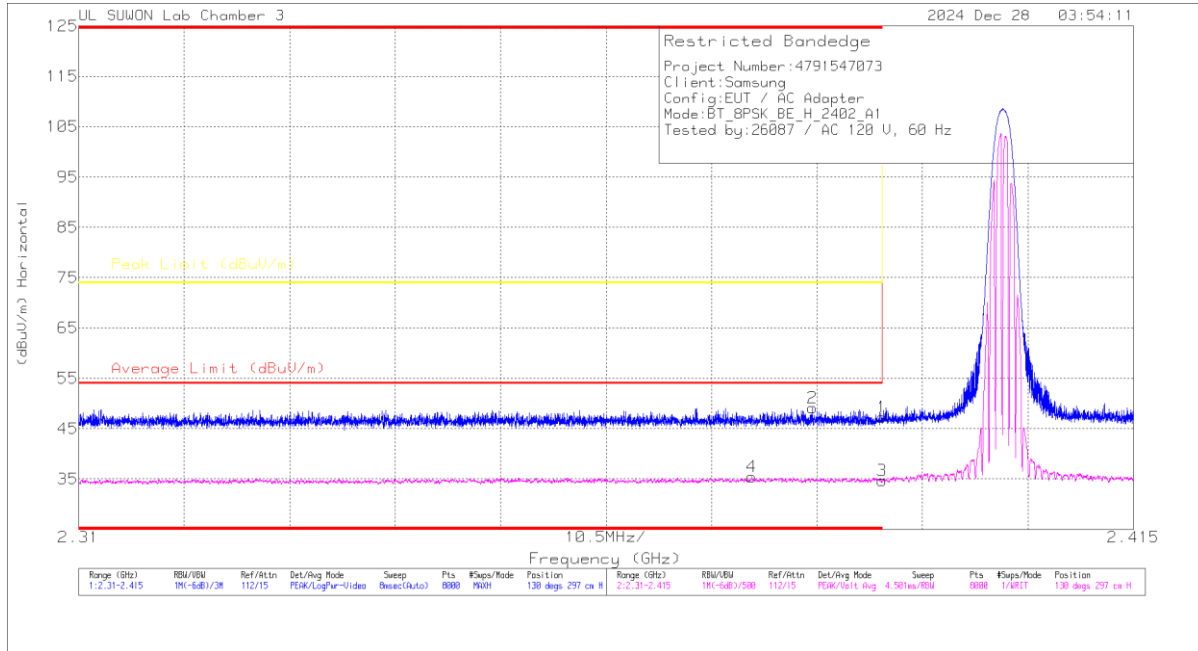
PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

10.1.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

ANT1

BANDEDGE (0 CHANNEL)

HORIZONTAL RESULT



Trace Markers

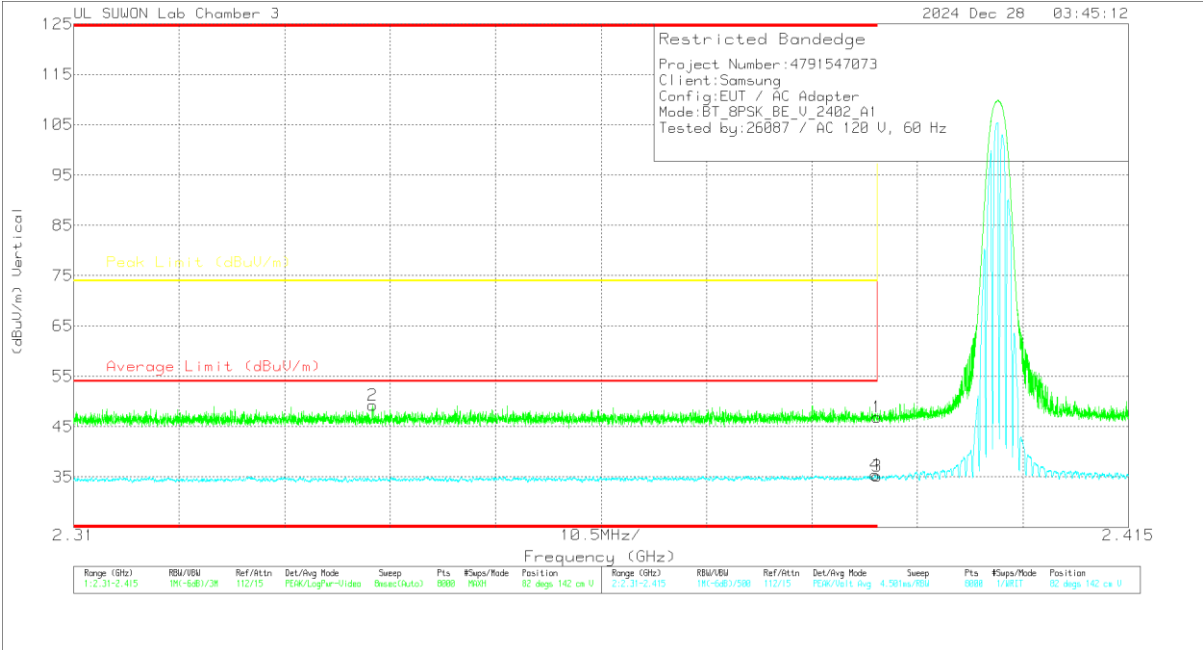
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor(dB/m)	10dB_Path Loss(dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.06	Pk	32.1	-24.9	47.26	-	-	74	-26.74	130	297	H
2	* 2.38305	42.01	Pk	32.1	-25	49.11	-	-	74	-24.89	130	297	H
3	* 2.39	27.42	VA1T	32.1	-24.9	34.62	54	-19.38	-	-	130	297	H
4	* 2.37701	28.31	VA1T	32.1	-25	35.41	54	-18.59	-	-	130	297	H

* - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

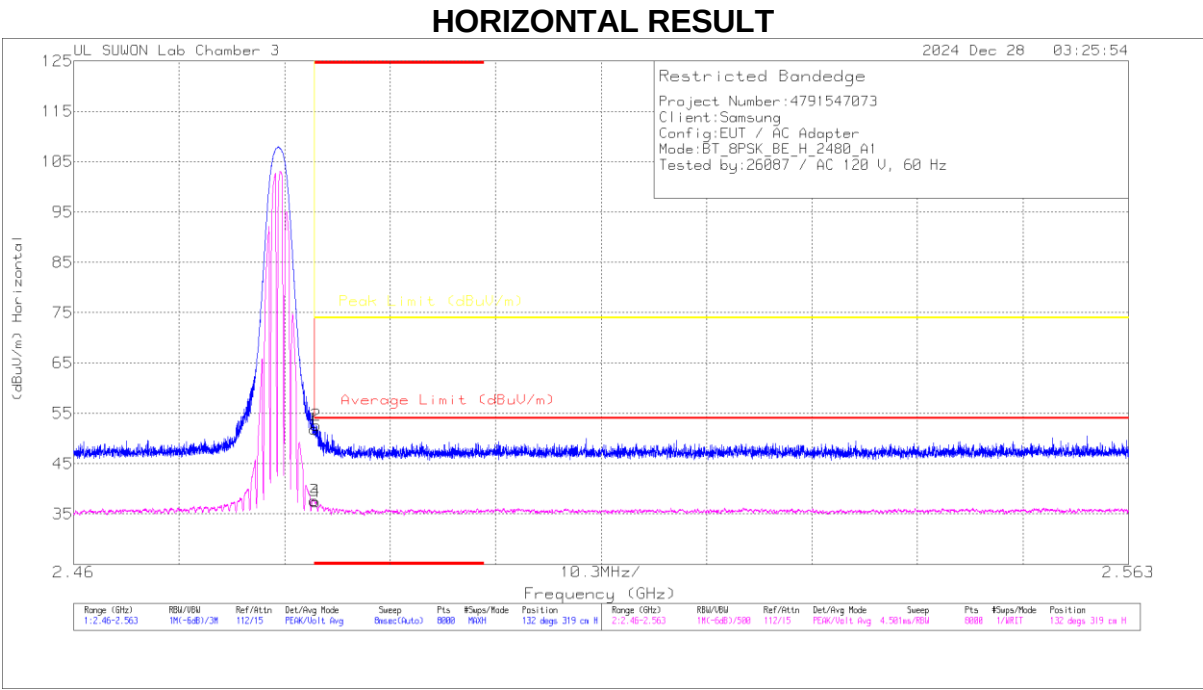


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor (dB/m)	10dB_Path 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	* 2.39	39.74	Pk	32.1	-24.9	46.94	-	-	74	-27.06	82	142	V
2	* 2.33973	42.37	Pk	32	-25.1	49.27	-	-	74	-24.73	82	142	V
3	* 2.39	27.98	VA1T	32.1	-24.9	35.18	54	-18.82	-	-	82	142	V
4	* 2.38977	28.2	VA1T	32.1	-24.9	35.4	54	-18.6	-	-	82	142	V

* - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

BANDEDGE (78 CHANNEL)

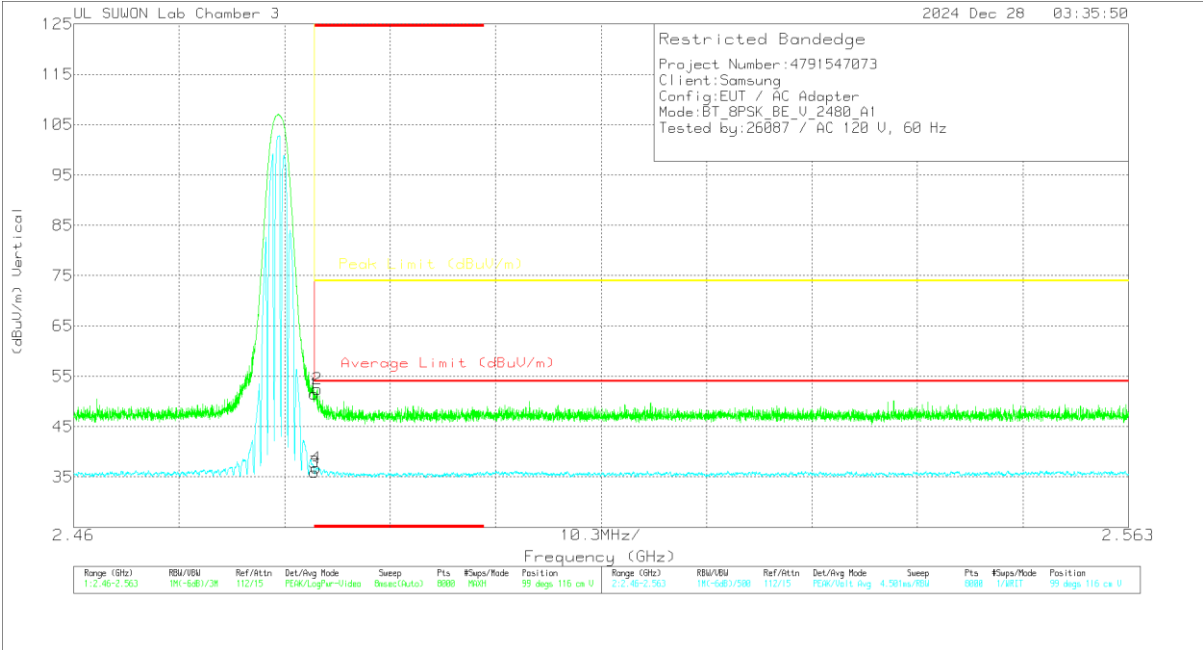


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor(dB/m)	10dB_Path 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	* 2.4835	44.39	Pk	32.4	-24.9	51.89	-	-	74	-22.11	132	319	H
2	* 2.48368	45.11	Pk	32.4	-24.9	52.61	-	-	74	-21.39	132	319	H
3	* 2.4835	30.14	VA1T	32.4	-24.9	37.64	54	-16.36	-	-	132	319	H
4	* 2.48363	29.98	VA1T	32.4	-24.9	37.48	54	-16.52	-	-	132	319	H

* - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

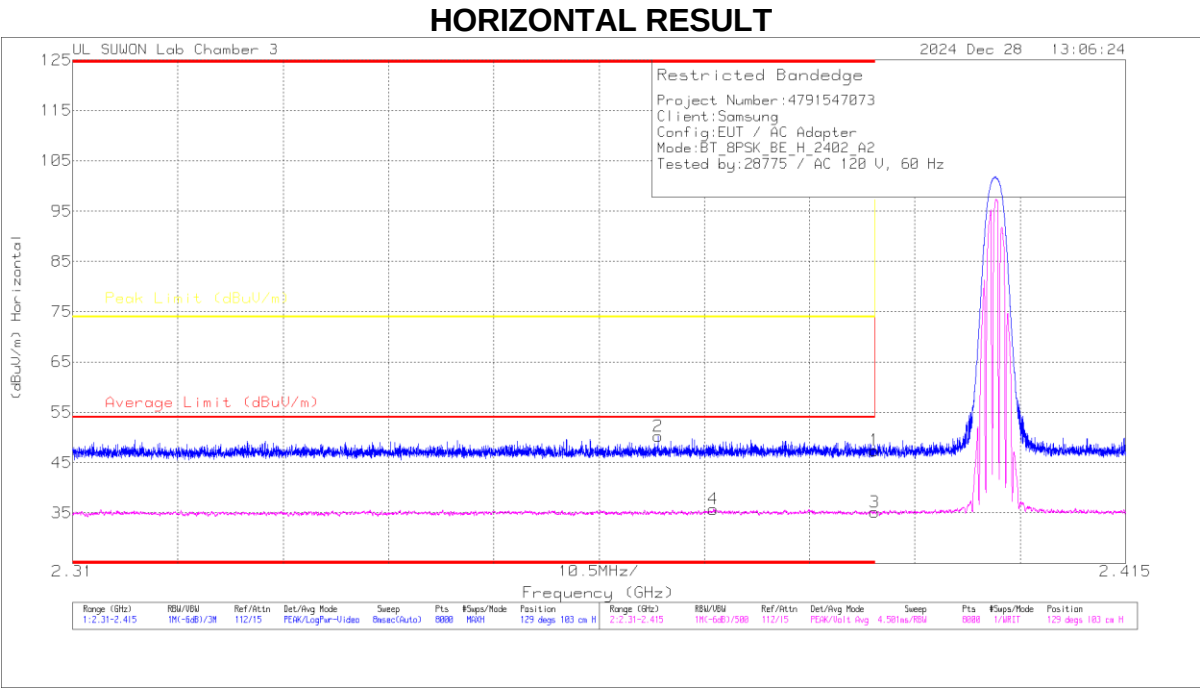


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor (dB/m)	10dB_Path 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	* 2.4835	44.05	Pk	32.4	-24.9	51.55	-	-	74	-22.45	99	116	V
2	* 2.48378	44.94	Pk	32.4	-24.9	52.44	-	-	74	-21.56	99	116	V
3	* 2.4835	28.45	VA1T	32.4	-24.9	35.95	54	-18.05	-	-	99	116	V
4	* 2.48367	29.33	VA1T	32.4	-24.9	36.83	54	-17.17	-	-	99	116	V

* - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

ANT2
BANDEDGE (0 CHANNEL)

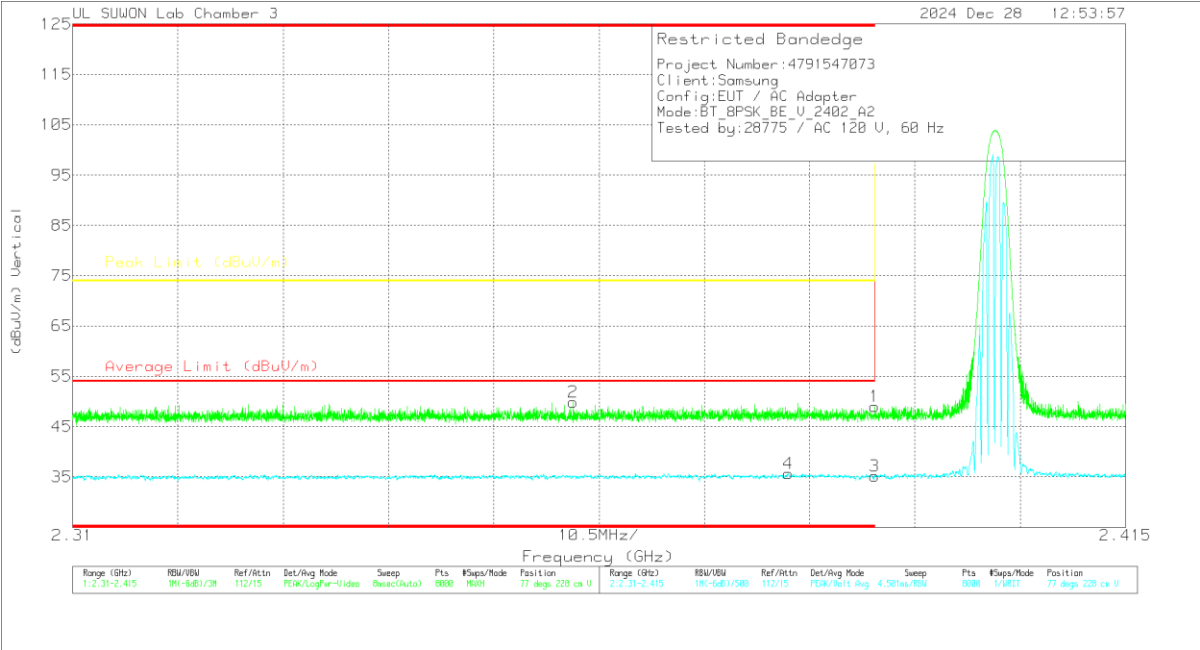


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor (dB/m)	10dB_Path 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	* 2.39	40.25	Pk	32.1	-24.9	47.45	-	-	74	-26.55	129	103	H
2	* 2.3684	43.26	Pk	32	-25	50.26	-	-	74	-23.74	129	103	H
3	* 2.39	27.97	VA1T	32.1	-24.9	35.17	54	-18.83	-	-	129	103	H
4	* 2.3739	28.74	VA1T	32	-25	35.74	54	-18.26	-	-	129	103	H

* - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT

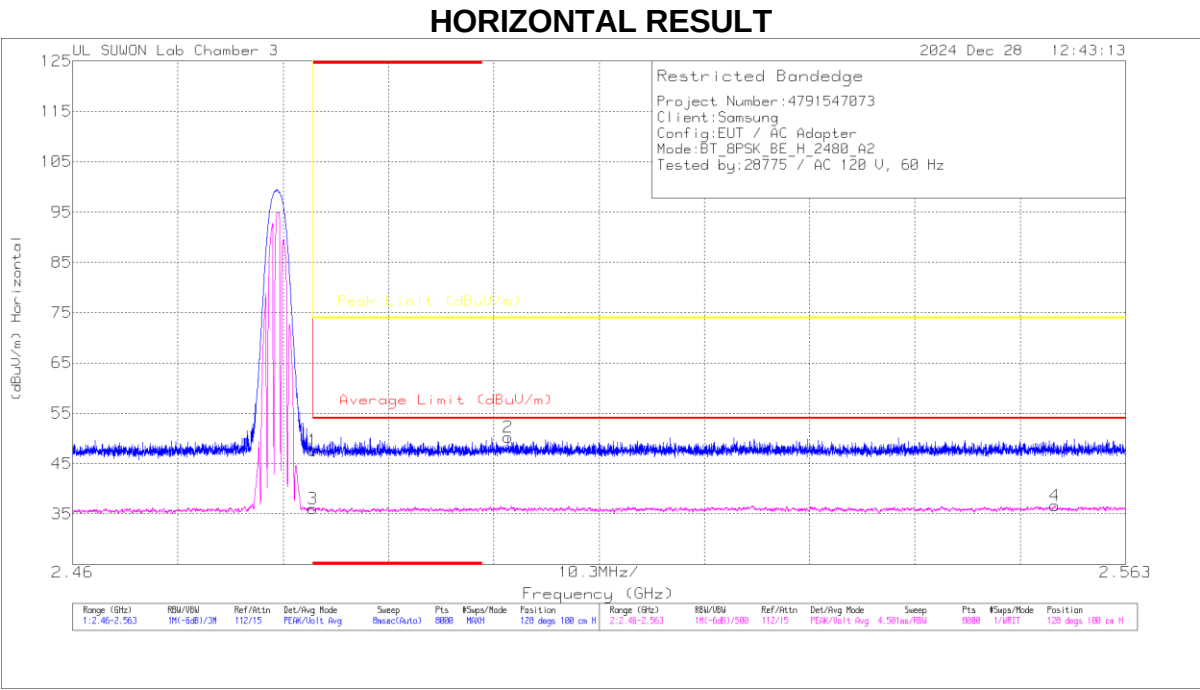


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna, 957-Factor (dB/m)	10dB_Path 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	* 2.39	41.81	PK	32.1	-24.9	49.01	-	-	74	-24.99	77	228	V
2	* 2.35994	42.93	PK	32	-25.1	49.83	-	-	74	-24.17	77	228	V
3	* 2.39	28.02	VA1T	32.1	-24.9	35.22	54	-18.78	-	-	77	228	V
4	* 2.38138	28.6	VA1T	32.1	-25	35.7	54	-18.3	-	-	77	228	V

* - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

BANDEDGE (78 CHANNEL)

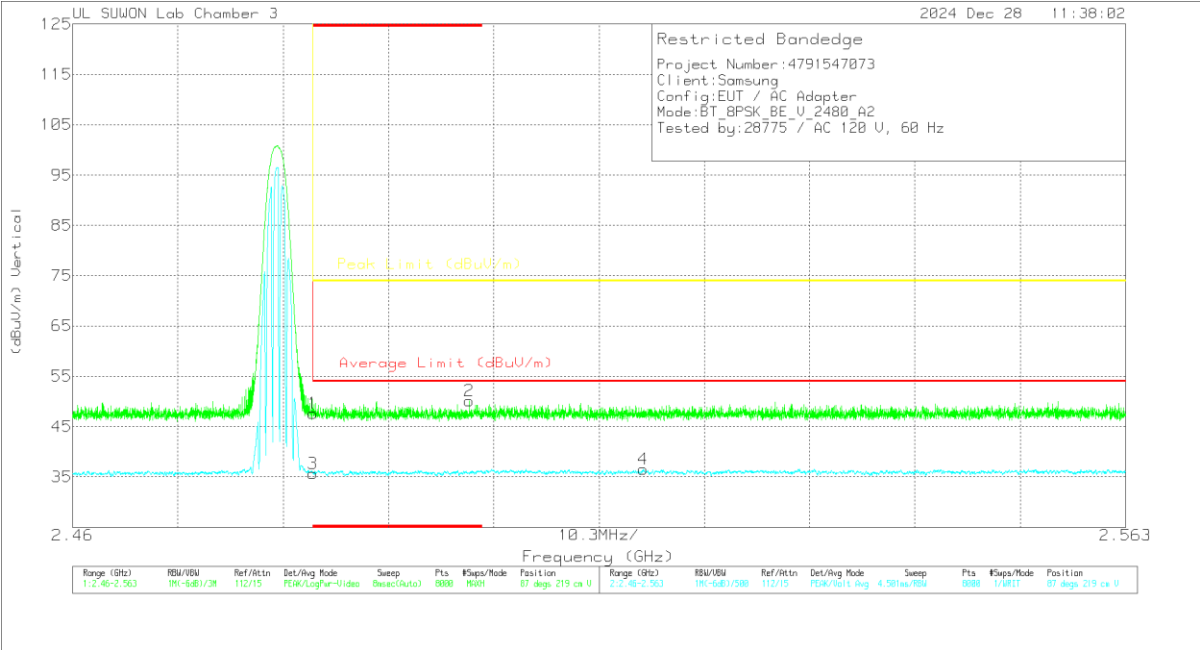


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor(dB/m)	10dB_Path 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	* 2.4835	40.16	Pk	32.4	-24.9	47.66	-	-	74	-26.34	128	100	H
2	2.50261	42.53	Pk	32.4	-24.7	50.23	-	-	74	-23.77	128	100	H
3	* 2.4835	28.59	VA1T	32.4	-24.9	36.09	54	-17.91	-	-	128	100	H
4	2.55609	28.98	VA1T	32.4	-24.7	36.68	54	-17.32	-	-	128	100	H

* - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band
PK - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT



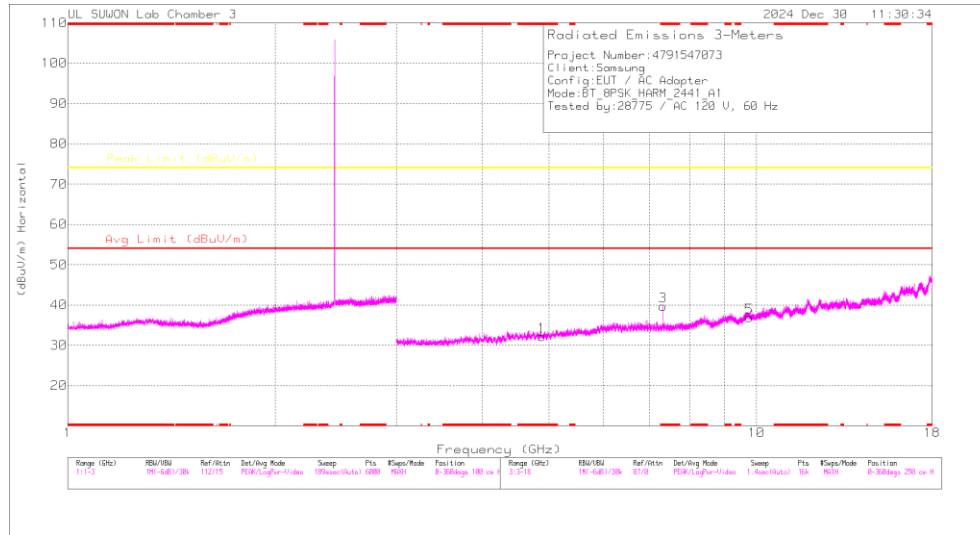
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor(dB/m)	10dB_Path 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	* 2.4835	40.09	Pk	32.4	-24.9	47.59	-	-	74	-26.41	87	219	V
2	* 2.49881	42.67	Pk	32.4	-24.9	50.17	-	-	74	-23.83	87	219	V
3	* 2.4835	28.18	VA1T	32.4	-24.9	35.68	54	-18.32	-	-	87	219	V
4	2.51583	28.88	VA1T	32.4	-24.7	36.58	54	-17.42	-	-	87	219	V

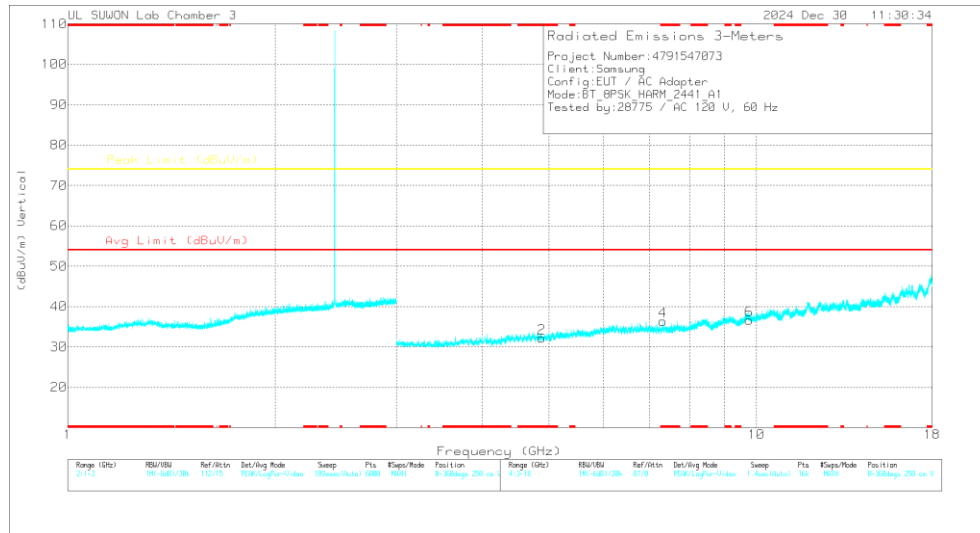
* - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HARMONICS AND SPURIOUS EMISSIONS (WORST CASE – ANT 1)

39 CHANNEL RESULTS



HORIZONTAL



VERTICAL

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957 Factor(dB/m)	3GHz_HP Path Loss(dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.87689	37.57	PKFH	34.2	-30.5	41.27	-	-	74	-32.73	119	139	H
* 4.88248	24.76	VA1T	34.2	-30.6	28.36	54	-25.64	-	-	119	139	H
* 4.8808	37.12	PKFH	34.2	-30.6	40.72	-	-	74	-33.28	194	125	V
* 4.88196	25.03	VA1T	34.2	-30.6	28.63	54	-25.37	-	-	194	125	V
* 7.32314	35.42	PKFH	35.8	-25	46.22	-	-	74	-27.78	225	106	H
* 7.32328	23.83	VA1T	35.8	-25	34.63	54	-19.37	-	-	225	106	H
* 7.32282	34.77	PKFH	35.8	-25	45.57	-	-	74	-28.43	130	113	V
* 7.32296	22.72	VA1T	35.8	-25	33.52	54	-20.48	-	-	130	113	V
9.76296	30.68	PKFH	36.9	-21.2	46.38	-	-	74	-27.62	0	100	H
9.76774	31.02	PKFH	36.9	-21.3	46.62	-	-	74	-27.38	0	100	V

* - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band

PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

HARMONICS AND SPURIOUS EMISSIONS TEST DATA

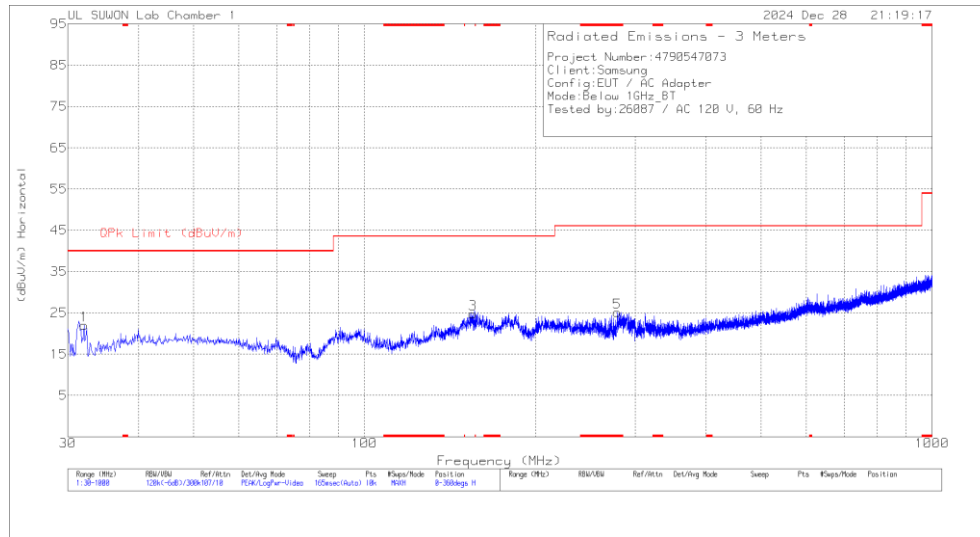
Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor [dB/m]	Loss [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2402	ANT1	* 4.80334	36.83	PKFH	34.30	-29.80	41.33	-	-	74.00	-32.67	128	101	H
		* 4.804	24.52	VA1T	34.30	-29.80	29.02	54.00	-24.98	-	-	128	101	H
		* 4.80324	37.15	PKFH	34.30	-29.80	41.65	-	-	74.00	-32.35	189	106	V
		* 4.80392	24.48	VA1T	34.30	-29.80	28.98	54.00	-25.02	-	-	189	106	V
		7.206	36.35	PKFH	35.80	-25.70	46.45	-	-	74.00	-27.55	225	109	H
		7.206	34.66	PKFH	35.80	-25.70	44.76	-	-	74.00	-29.24	133	110	V
		9.607	30.65	PKFH	36.70	-21.70	45.65	-	-	74.00	-28.35	0	100	H
		9.606	31.22	PKFH	36.70	-21.60	46.32	-	-	74.00	-27.68	0	100	V
2441	ANT1	* 4.87689	37.57	PKFH	34.20	-30.50	41.27	-	-	74.00	-32.73	119	139	H
		* 4.88248	24.76	VA1T	34.20	-30.60	28.36	54.00	-25.64	-	-	119	139	H
		* 4.8808	37.12	PKFH	34.20	-30.60	40.72	-	-	74.00	-33.28	194	125	V
		* 4.88196	25.03	VA1T	34.20	-30.60	28.63	54.00	-25.37	-	-	194	125	V
		* 7.32314	35.42	PKFH	35.80	-25.00	46.22	-	-	74.00	-27.78	225	106	H
		* 7.32328	23.83	VA1T	35.80	-25.00	34.63	54.00	-19.37	-	-	225	106	H
		* 7.32282	34.77	PKFH	35.80	-25.00	45.57	-	-	74.00	-28.43	130	113	V
		* 7.32296	22.72	VA1T	35.80	-25.00	33.52	54.00	-20.48	-	-	130	113	V
		9.763	30.68	PKFH	36.90	-21.20	46.38	-	-	74.00	-27.62	0	100	H
		9.768	31.02	PKFH	36.90	-21.30	46.62	-	-	74.00	-27.38	0	100	V
2480	ANT1	* 4.96016	37.69	PKFH	34.30	-30.40	41.59	-	-	74.00	-32.41	123	101	H
		* 4.95982	24.20	VA1T	34.30	-30.40	28.10	54.00	-25.90	-	-	123	101	H
		* 4.96875	37.04	PKFH	34.30	-30.10	41.24	-	-	74.00	-32.76	224	316	V
		* 4.96028	24.00	VA1T	34.30	-30.30	28.00	54.00	-26.00	-	-	224	316	V
		* 7.4394	32.17	PKFH	35.70	-25.00	42.87	-	-	74.00	-31.13	224	220	H
		* 7.44026	20.54	VA1T	35.70	-25.00	31.24	54.00	-22.76	-	-	224	220	H
		* 7.43842	32.48	PKFH	35.70	-25.00	43.18	-	-	74.00	-30.82	125	100	V
		* 7.43984	20.17	VA1T	35.70	-25.00	30.87	54.00	-23.13	-	-	125	100	V
		9.929	30.17	PKFH	37.20	-21.30	46.07	-	-	74.00	-27.93	0	100	H
		9.930	30.74	PKFH	37.20	-21.30	46.64	-	-	74.00	-27.36	0	100	V
Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor [dB/m]	Loss [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2402	ANT2	* 4.81373	37.73	PKFH	34.30	-29.90	42.13	-	-	74.00	-31.87	0	100	H
		* 4.79703	36.88	PKFH	34.30	-29.80	41.38	-	-	74.00	-32.62	0	100	V
		7.198	32.68	PKFH	35.80	-25.70	42.78	-	-	74.00	-31.22	0	100	H
		7.206	33.37	PKFH	35.80	-25.70	43.47	-	-	74.00	-30.53	0	100	V
		9.611	30.06	PKFH	36.70	-21.70	45.06	-	-	74.00	-28.94	0	100	H
		9.617	30.46	PKFH	36.70	-21.60	45.56	-	-	74.00	-28.44	0	100	V
2441	ANT2	* 4.88371	37.14	PKFH	34.20	-30.60	40.74	-	-	74.00	-33.26	0	100	H
		* 4.88846	37.07	PKFH	34.20	-30.70	40.57	-	-	74.00	-33.43	0	100	V
		* 7.31938	34.06	PKFH	35.80	-25.20	44.66	-	-	74.00	-29.34	0	100	H
		* 7.31546	32.58	PKFH	35.80	-25.10	43.28	-	-	74.00	-30.72	0	100	V
		9.757	30.13	PKFH	36.90	-21.30	45.73	-	-	74.00	-28.27	0	100	H
		9.760	30.23	PKFH	36.90	-21.20	45.93	-	-	74.00	-28.07	0	100	V
2480	ANT2	* 4.95472	37.79	PKFH	34.30	-30.40	41.69	-	-	74.00	-32.31	0	100	H
		* 4.95059	37.01	PKFH	34.30	-30.40	40.91	-	-	74.00	-33.09	0	100	V
		* 7.44854	32.67	PKFH	35.70	-25.00	43.37	-	-	74.00	-30.63	0	100	H
		* 7.43436	32.47	PKFH	35.70	-25.00	43.17	-	-	74.00	-30.83	0	100	V
		9.916	30.78	PKFH	37.10	-21.20	46.68	-	-	74.00	-27.32	0	100	H
		9.924	29.72	PKFH	37.10	-21.40	45.42	-	-	74.00	-28.58	0	100	V

* - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band

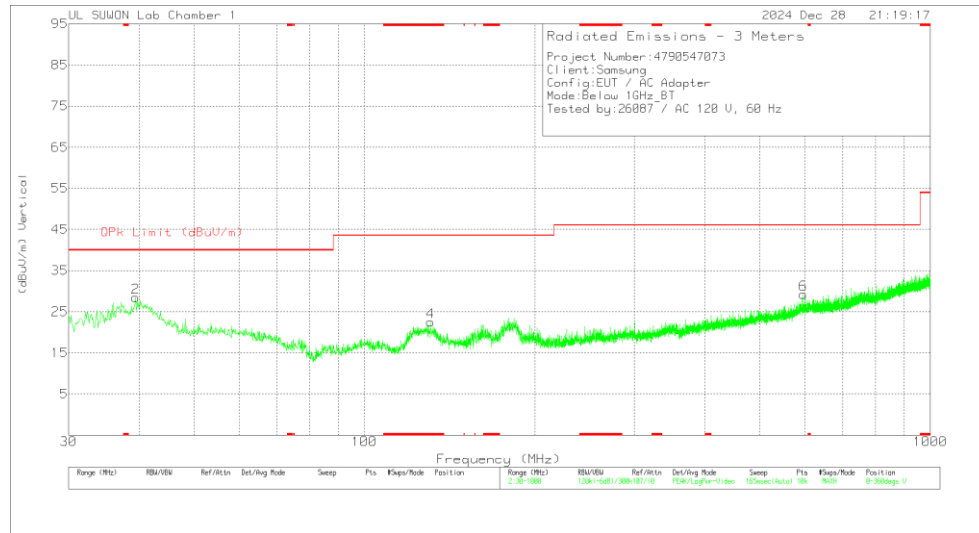
PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

10.2. WORST CASE BELOW 1 GHz

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



HORIZONTAL



VERTICAL

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Antenna Correction Factor (dB/m)	Path Loss (dB)	Corrected Reading (dBuV/m)	OPK Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	32.037	37.56	Pk	15.6	-31.2	21.96	40	-18.04	0-360	200	H
3	155.227	40.38	Pk	14	-29.6	24.78	43.52	-18.74	0-360	100	H
5	* 278.708	35.16	Pk	18.6	-28.7	25.06	46.02	-20.96	0-360	100	H
2	39.409	41.2	Pk	18.3	-31	28.5	40	-11.5	0-360	200	V
4	* 130.88	38.26	Pk	14.1	-29.9	22.46	43.52	-21.06	0-360	200	V
6	596.383	31.39	Pk	25	-27.2	29.19	46.02	-16.83	0-360	400	V

Pk - Peak detector

11. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

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 C63.10:2020.

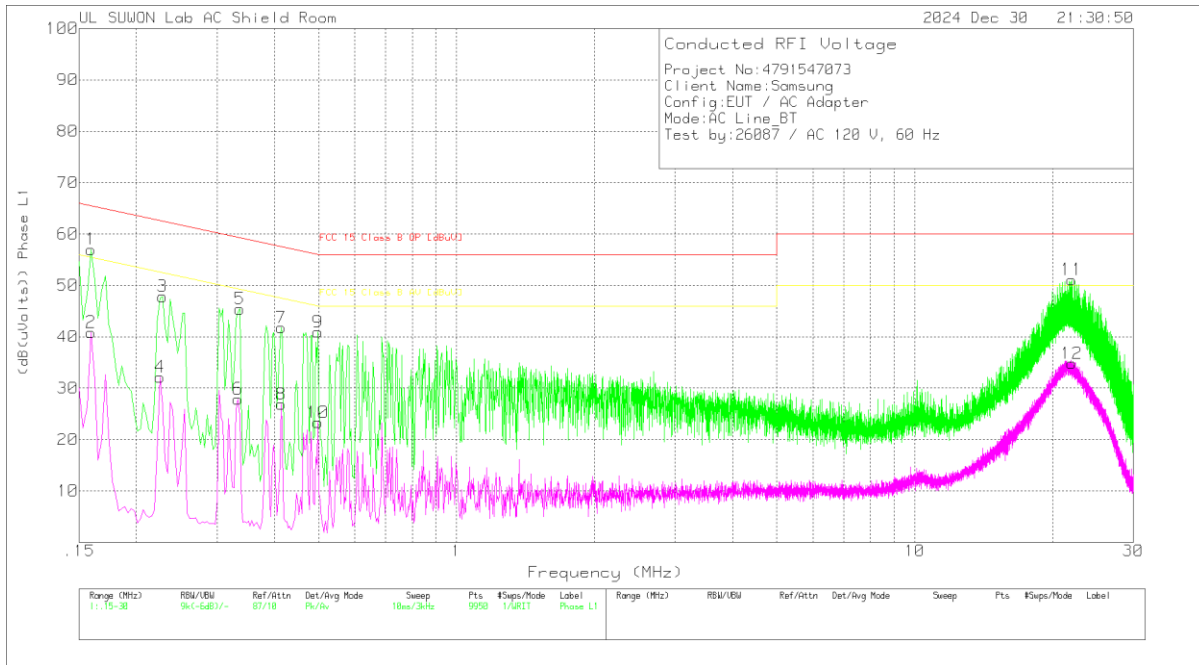
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

11.1. AC Power Line

LINE 1 RESULTS



Trace Markers

Range 1: Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_Wit h EX_L1 [dB]	Cable Loss [dB]	Corrected Reading [dBuV]	FCC 15 Class B QP [dBuV]	Margin (dB)	FCC 15 Class B AV [dBuV]	Margin (dB)
1	.159	47.1	Pk	9.8	.1	57	65.52	-8.52	-	-
2	.159	30.95	Av	9.8	.1	40.85	-	-	55.52	-14.67
3	.228	38.05	Pk	9.7	.1	47.85	62.52	-14.67	-	-
4	.225	22.36	Av	9.7	.1	32.16	-	-	52.63	-20.47
5	.336	35.51	Pk	9.8	.1	45.41	59.3	-13.89	-	-
6	.333	18.1	Av	9.7	.1	27.9	-	-	49.38	-21.48
7	.414	31.89	Pk	9.8	.1	41.79	57.57	-15.78	-	-
8	.414	16.97	Av	9.8	.1	26.87	-	-	47.57	-20.7
9	.498	30.93	Pk	9.9	.1	40.93	56.03	-15.1	-	-
10	.498	13.3	Av	9.9	.1	23.3	-	-	46.03	-22.73
11	22.002	40.53	Pk	10.3	.3	51.13	60	-8.87	-	-
12	22.02	24.2	Av	10.3	.3	34.8	-	-	50	-15.2

Pk - Peak detector

Av - Average detection

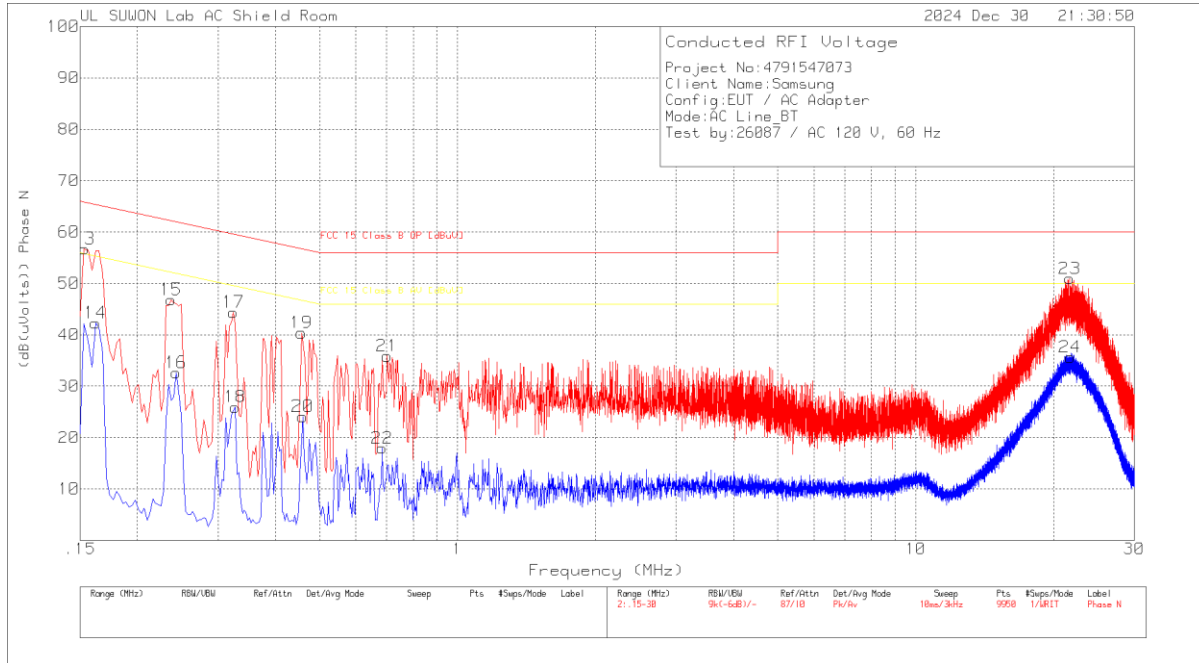
Quasi-Peak Emissions

Range 1: Phase L1 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	101836_Wit h EX_L1 [dB]	Cable Loss [dB]	Corrected Reading [dBuV]	FCC 15 Class B QP [dBuV]	Margin (dB)	FCC 15 Class B AV [dBuV]	Margin (dB)
.15825	44.78	Qp	9.8	.1	54.68	65.56	-10.88	-	-
22.0022	30.8	Qp	10.3	.3	41.4	60	-18.6	-	-

Qp - Quasi-Peak detector

LINE 2 RESULTS



Trace Markers

Range 2: Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_Wit h EX_N [dB]	Cable Loss [dB]	Corrected Reading [dBuV]	FCC 15 Class B QP [dBuV]	Margin (dB)	FCC 15 Class B AV [dBuV]	Margin (dB)
13	.153	46.81	Pk	9.8	.1	56.71	65.84	-9.13	-	-
14	.162	32.3	Av	9.9	.1	42.3	-	-	55.36	-13.06
15	.237	37.02	Pk	9.7	.1	46.82	62.2	-15.38	-	-
16	.243	22.83	Av	9.7	.1	32.63	-	-	51.99	-19.36
17	.324	34.6	Pk	9.7	.1	44.4	59.6	-15.2	-	-
18	.327	16.15	Av	9.7	.1	25.95	-	-	49.53	-23.58
19	.456	30.49	Pk	9.8	.1	40.39	56.77	-16.38	-	-
20	.459	14.19	Av	9.8	.1	24.09	-	-	46.71	-22.62
21	.702	25.98	Pk	9.8	.1	35.88	56	-20.12	-	-
22	.684	8.02	Av	9.8	.1	17.92	-	-	46	-28.08
23	21.681	40.34	Pk	10.3	.3	50.94	60	-9.06	-	-
24	21.72	25.03	Av	10.3	.3	35.63	-	-	50	-14.37

Pk - Peak detector

Av - Average detection

Quasi-Peak Emissions

Range 2: Phase N .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	101836_Wit h EX_N [dB]	Cable Loss [dB]	Corrected Reading [dBuV]	FCC 15 Class B QP [dBuV]	Margin (dB)	FCC 15 Class B AV [dBuV]	Margin (dB)
.15375	44.83	Qp	9.8	.1	54.73	65.79	-11.06	-	-
21.6812	33.84	Qp	10.3	.3	44.44	60	-15.56	-	-

Qp - Quasi-Peak detector

END OF TEST REPORT