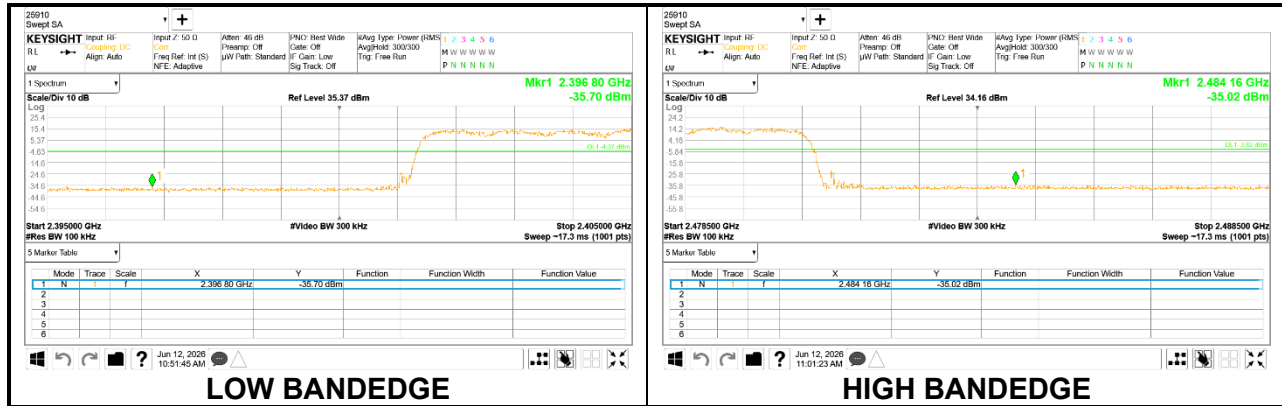
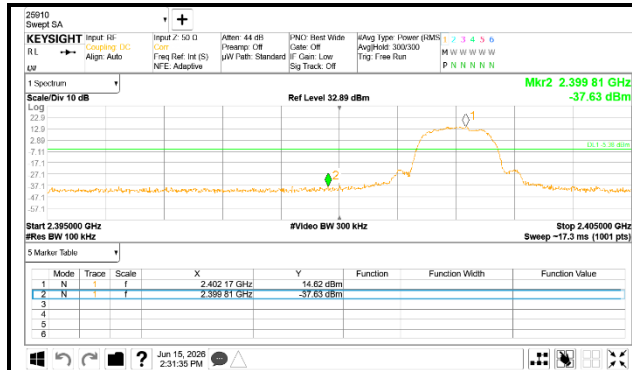


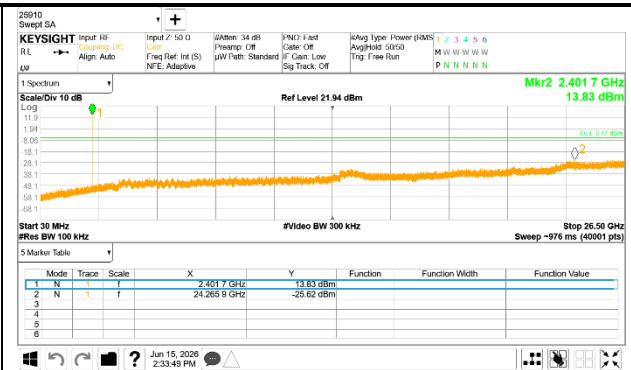
SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON – ANT1



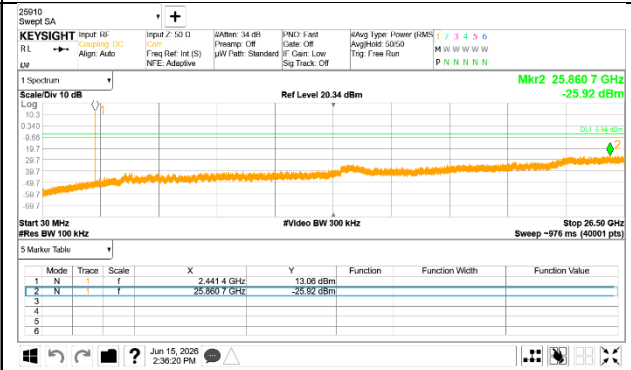
SPURIOUS EMISSIONS, NON-HOPPING – ANT2



0 CHANNEL BANDEDGE



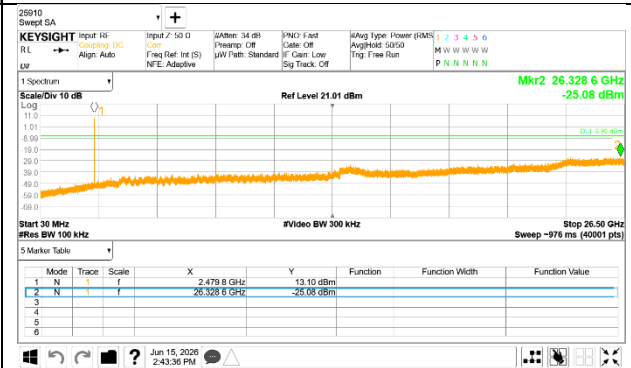
OUT-OF-BAND 0 CHANNEL



OUT-OF-BAND 39 CHANNEL

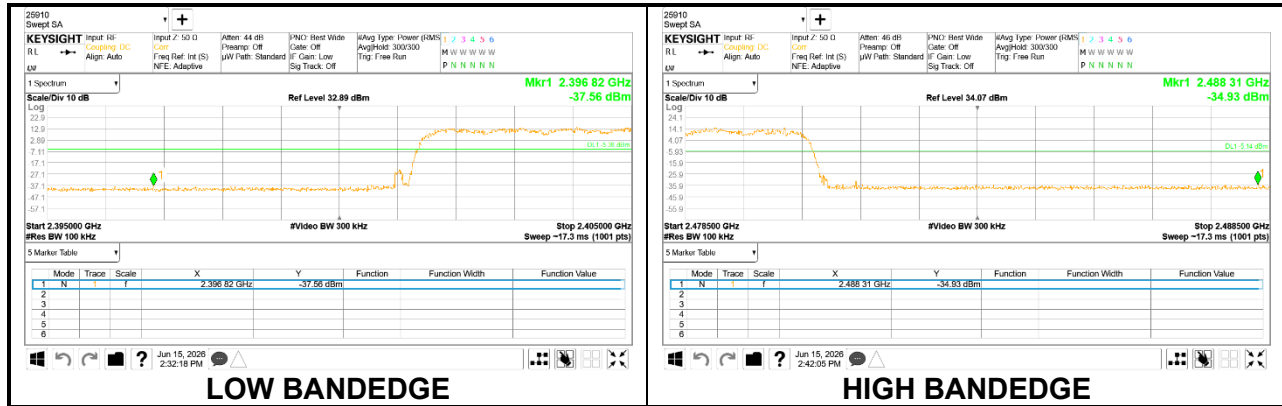


78 CHANNEL BANDEDGE



OUT-OF-BAND 78 CHANNEL

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.

$GFSK = 1/T = 1 / 0.00286s = 0.35 \text{ kHz}$.

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.

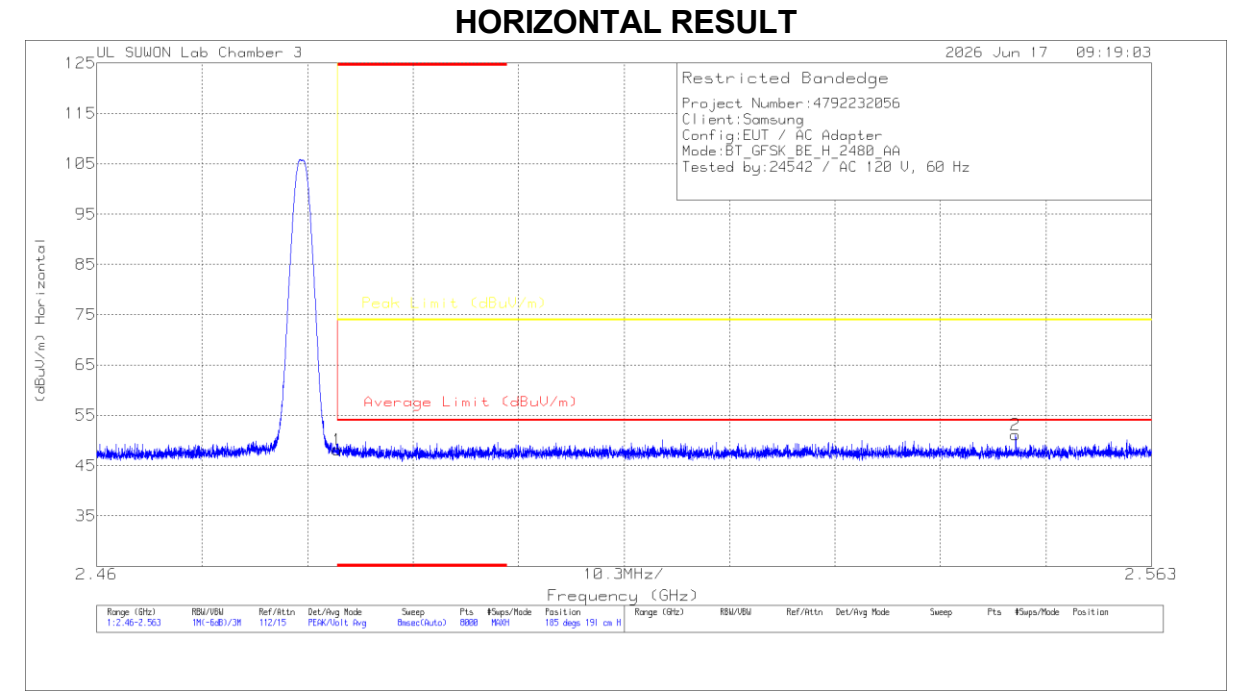
Note : Emission was pre-scanned from 9kHz to 30MHz; No emissions were detected which was at least 20dB below the specification limit (consider distance correction factor).
Per FCC part 15.31(o), test results were not reported.

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

BANDEDGE (WORST CASE: 78 CHANNEL, DUAL)



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_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	40.64	Pk	32.4	-24.9	48.14	-	-	74	-25.86	185	191	H
2	2.54974	43.48	Pk	32.4	-24.8	51.08	-	-	74	-22.92	185	191	H

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

BANEDGE TEST DATA

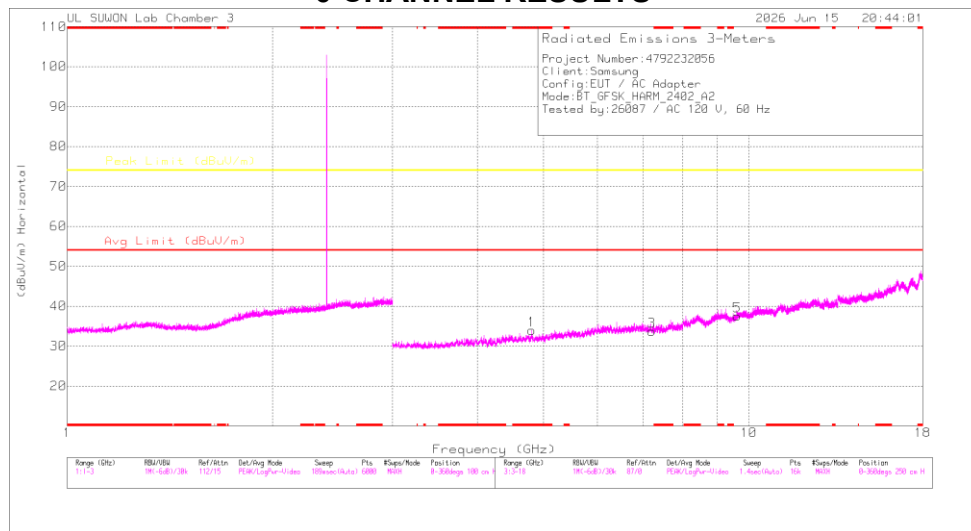
Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor [dB(1/m)]	Loss [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2402	ANT1	* 2.39	40.80	Pk	32.10	-24.90	48.00	-	-	74.00	-26.00	124	302	H
		* 2.38801	42.39	Pk	32.10	-24.90	49.59	-	-	74.00	-24.41	124	302	H
		* 2.39	39.33	Pk	32.10	-24.90	46.53	-	-	74.00	-27.47	207	318	V
		* 2.34114	42.91	Pk	32.00	-25.00	49.91	-	-	74.00	-24.09	207	318	V
2480	ANT1	* 2.4835	40.80	Pk	32.40	-24.90	48.30	-	-	74.00	-25.70	118	298	H
		2.558	42.67	Pk	32.40	-24.70	50.37	-	-	74.00	-23.63	118	298	H
		* 2.4835	39.86	Pk	32.40	-24.90	47.36	-	-	74.00	-26.64	208	299	V
		* 2.49727	43.26	Pk	32.40	-24.80	50.86	-	-	74.00	-23.14	208	299	V
2402	ANT2	* 2.39	39.34	Pk	32.10	-24.90	46.54	-	-	74.00	-27.46	210	127	H
		* 2.36239	42.25	Pk	32.00	-25.00	49.25	-	-	74.00	-24.75	210	127	H
		* 2.39	39.09	Pk	32.10	-24.90	46.29	-	-	74.00	-27.71	102	319	V
		* 2.37595	42.15	Pk	32.10	-25.00	49.25	-	-	74.00	-24.75	102	319	V
2480	ANT2	* 2.4835	39.46	Pk	32.40	-24.90	46.96	-	-	74.00	-27.04	210	120	H
		* 2.49904	42.81	Pk	32.40	-24.80	50.41	-	-	74.00	-23.59	210	120	H
		* 2.4835	39.78	Pk	32.40	-24.90	47.28	-	-	74.00	-26.72	104	267	V
		2.506	42.58	Pk	32.40	-24.80	50.18	-	-	74.00	-23.82	104	267	V
2402	Dual	* 2.39	39.65	Pk	32.10	-24.90	46.85	-	-	74.00	-27.15	190	153	H
		* 2.38573	42.24	Pk	32.10	-25.00	49.34	-	-	74.00	-24.66	190	153	H
		* 2.39	38.19	Pk	32.10	-24.90	45.39	-	-	74.00	-28.61	80	128	V
		* 2.3231	42.38	Pk	31.90	-24.90	49.38	-	-	74.00	-24.62	80	128	V
2480	Dual	* 2.4835	40.64	Pk	32.40	-24.90	48.14	-	-	74.00	-25.86	185	191	H
		2.550	43.48	Pk	32.40	-24.80	51.08	-	-	74.00	-22.92	185	191	H
		* 2.4835	39.75	Pk	32.40	-24.90	47.25	-	-	74.00	-26.75	102	231	V
		2.525	42.33	Pk	32.40	-24.80	49.93	-	-	74.00	-24.07	102	231	V

Note1. Pk - Peak detector.

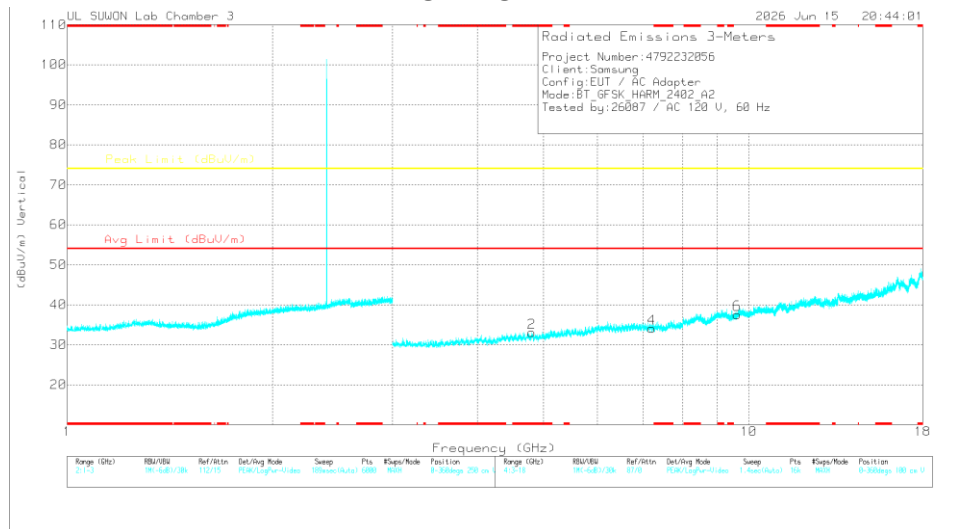
Note2. * - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band

HARMONICS AND SPURIOUS EMISSIONS(WORST CASE – ANT2)

0 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 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
* 4.80442	37.12	PKFH	34.3	-30.1	41.32	-	-	74	-32.68	58	100	H
* 4.8038	37.9	PKFH	34.3	-30.1	42.1	-	-	74	-31.9	209	106	V
7.20142	33.03	PKFH	35.8	-25.8	43.03	-	-	74	-30.97	0	100	H
7.20468	33.17	PKFH	35.8	-25.8	43.17	-	-	74	-30.83	0	100	V
9.60862	32.03	PKFH	36.7	-21.7	47.03	-	-	74	-26.97	0	100	H
9.60907	31.05	PKFH	36.7	-21.7	46.05	-	-	74	-27.95	0	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak

HARMONICS AND SPURIOUS EMISSIONS TEST DATA

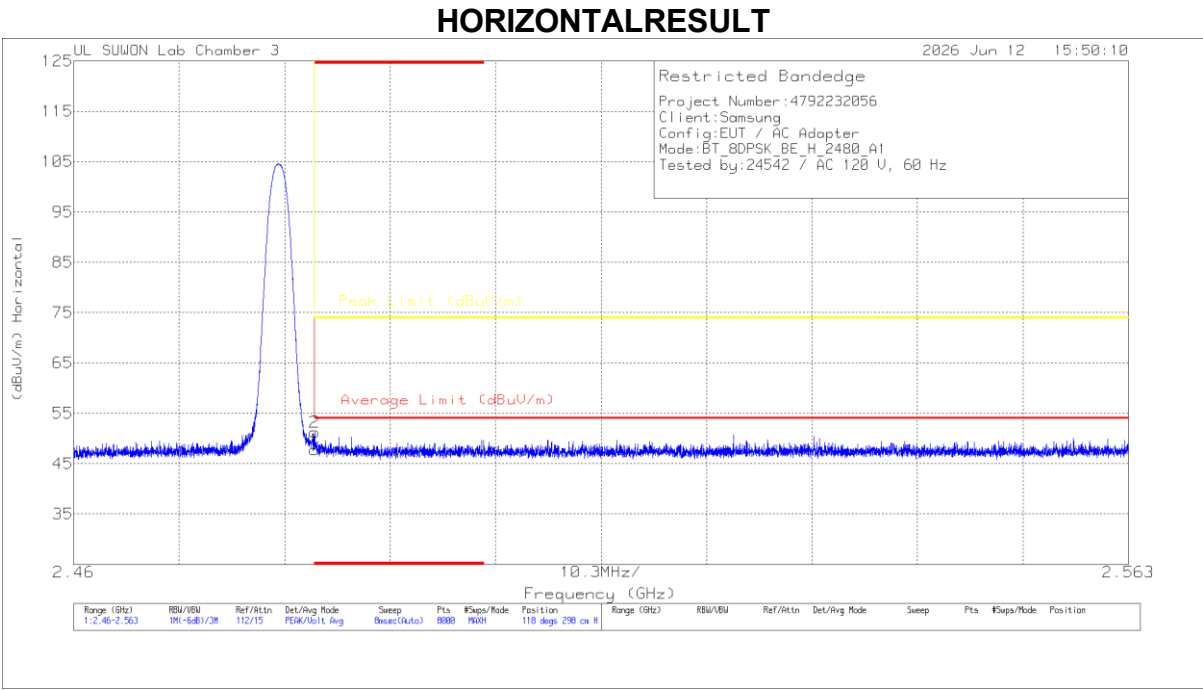
Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor [dB(1/m)]	Loss [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2402	ANT1	* 4.80367	37.94	PKFH	34.30	-30.10	42.14	-	-	74.00	-31.86	62	137	H
		* 4.80423	37.00	PKFH	34.30	-30.10	41.20	-	-	74.00	-32.80	334	100	V
		7.204	31.63	PKFH	35.80	-25.80	41.63	-	-	74.00	-32.37	0	100	H
		7.207	32.43	PKFH	35.80	-25.80	42.43	-	-	74.00	-31.57	0	100	V
		9.606	30.10	PKFH	36.70	-21.70	45.10	-	-	74.00	-28.90	0	100	H
		9.606	30.71	PKFH	36.70	-21.70	45.71	-	-	74.00	-28.29	0	100	V
2441	ANT1	* 4.88177	38.12	PKFH	34.20	-30.80	41.52	-	-	74.00	-32.48	64	146	H
		* 4.8814	37.82	PKFH	34.20	-30.80	41.22	-	-	74.00	-32.78	2	161	V
		* 7.32014	32.61	PKFH	35.80	-25.30	43.11	-	-	74.00	-30.89	0	100	H
		* 7.32094	32.65	PKFH	35.80	-25.20	43.25	-	-	74.00	-30.75	0	100	V
		9.769	29.96	PKFH	36.90	-21.40	45.46	-	-	74.00	-28.54	0	100	H
		9.763	30.31	PKFH	36.90	-21.30	45.91	-	-	74.00	-28.09	0	100	V
2480	ANT1	* 4.95986	37.43	PKFH	34.30	-30.40	41.33	-	-	74.00	-32.67	64	143	H
		* 4.96004	37.36	PKFH	34.30	-30.30	41.36	-	-	74.00	-32.64	0	168	V
		* 7.43934	32.79	PKFH	35.70	-25.00	43.49	-	-	74.00	-30.51	0	100	H
		* 7.44119	32.11	PKFH	35.70	-25.00	42.81	-	-	74.00	-31.19	0	100	V
		9.918	29.51	PKFH	37.10	-21.50	45.11	-	-	74.00	-28.89	0	100	H
		9.920	30.89	PKFH	37.10	-21.50	46.49	-	-	74.00	-27.51	0	100	V
2402	ANT2	* 4.80442	37.12	PKFH	34.30	-30.10	41.32	-	-	74.00	-32.68	58	100	H
		* 4.8038	37.90	PKFH	34.30	-30.10	42.10	-	-	74.00	-31.90	209	106	V
		7.201	33.03	PKFH	35.80	-25.80	43.03	-	-	74.00	-30.97	0	100	H
		7.205	33.17	PKFH	35.80	-25.80	43.17	-	-	74.00	-30.83	0	100	V
		9.609	32.03	PKFH	36.70	-21.70	47.03	-	-	74.00	-26.97	0	100	H
		9.609	31.05	PKFH	36.70	-21.70	46.05	-	-	74.00	-27.95	0	100	V
2441	ANT2	* 4.88211	37.74	PKFH	34.20	-30.80	41.14	-	-	74.00	-32.86	8	104	H
		* 4.88164	38.17	PKFH	34.20	-30.80	41.57	-	-	74.00	-32.43	220	178	V
		* 7.32122	32.21	PKFH	35.80	-25.20	42.81	-	-	74.00	-31.19	0	100	H
		* 7.31884	32.22	PKFH	35.80	-25.30	42.72	-	-	74.00	-31.28	0	100	V
		9.763	29.67	PKFH	36.90	-21.30	45.27	-	-	74.00	-28.73	0	100	H
		9.761	30.59	PKFH	36.90	-21.40	46.09	-	-	74.00	-27.91	0	100	V
2480	ANT2	* 4.96182	37.23	PKFH	34.30	-30.30	41.23	-	-	74.00	-32.77	6	106	H
		* 4.9557	37.88	PKFH	34.30	-30.50	41.68	-	-	74.00	-32.32	216	251	V
		* 7.44371	32.89	PKFH	35.70	-25.00	43.59	-	-	74.00	-30.41	0	100	H
		* 7.43666	32.59	PKFH	35.70	-24.90	43.39	-	-	74.00	-30.61	0	100	V
		9.918	31.19	PKFH	37.10	-21.40	46.89	-	-	74.00	-27.11	0	100	H
		9.917	31.03	PKFH	37.10	-21.40	46.73	-	-	74.00	-27.27	0	100	V
2402	DUAL	* 4.80386	38.71	PKFH	34.30	-30.10	42.91	-	-	74.00	-31.09	162	113	H
		* 4.80403	39.68	PKFH	34.30	-30.10	43.88	-	-	74.00	-30.12	0	179	V
		7.207	32.95	PKFH	35.80	-25.70	43.05	-	-	74.00	-30.95	14	100	H
		7.206	32.95	PKFH	35.80	-25.80	42.95	-	-	74.00	-31.05	30	101	V
		9.611	31.56	PKFH	36.70	-21.70	46.56	-	-	74.00	-27.44	0	100	H
		9.606	29.92	PKFH	36.70	-21.70	44.92	-	-	74.00	-29.08	0	100	V
2441	DUAL	* 4.88056	38.58	PKFH	34.20	-30.80	41.98	-	-	74.00	-32.02	58	122	H
		* 4.88194	38.36	PKFH	34.20	-30.80	41.76	-	-	74.00	-32.24	181	220	V
		* 7.32366	32.37	PKFH	35.80	-25.20	42.97	-	-	74.00	-31.03	339	100	H
		* 7.32152	32.35	PKFH	35.80	-25.20	42.95	-	-	74.00	-31.05	34	101	V
		9.762	29.72	PKFH	36.90	-21.40	45.22	-	-	74.00	-28.78	0	100	H
		9.764	31.10	PKFH	36.90	-21.30	46.70	-	-	74.00	-27.30	0	100	V
2480	DUAL	* 4.96006	38.64	PKFH	34.30	-30.30	42.64	-	-	74.00	-31.36	64	138	H
		* 4.95997	38.03	PKFH	34.30	-30.40	41.93	-	-	74.00	-32.07	209	236	V
		* 7.43753	32.44	PKFH	35.70	-24.90	43.24	-	-	74.00	-30.76	49	103	H
		* 7.44062	32.11	PKFH	35.70	-25.00	42.81	-	-	74.00	-31.19	44	101	V
		9.919	29.49	PKFH	37.10	-21.50	45.09	-	-	74.00	-28.91	0	100	H
		9.920	29.77	PKFH	37.10	-21.50	45.37	-	-	74.00	-28.63	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 8DPSK
 MODULATION
BANDEDGE (WORST CASE: 78 CHANNEL, ANT1)



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_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	40.28	Pk	32.4	-24.9	47.78	-	-	74	-26.22	118	298	H
2	* 2.48353	43.79	Pk	32.4	-24.9	51.29	-	-	74	-22.71	118	298	H

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

BANEDGE TEST DATA

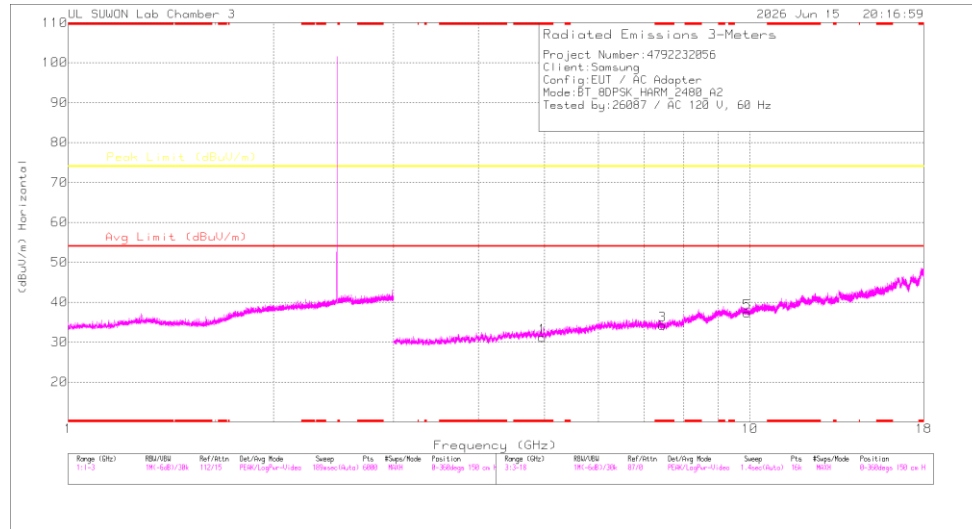
Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor [dB(1/m)]	Loss [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2402	ANT1	* 2.39	39.91	Pk	32.10	-24.90	47.11	-	-	74.00	-26.89	124	302	H
		* 2.38897	42.47	Pk	32.10	-24.90	49.67	-	-	74.00	-24.33	124	302	H
		* 2.39	39.16	Pk	32.10	-24.90	46.36	-	-	74.00	-27.64	207	318	V
		* 2.32177	42.22	Pk	31.90	-24.90	49.22	-	-	74.00	-24.78	207	318	V
2480	ANT1	* 2.4835	40.28	Pk	32.40	-24.90	47.78	-	-	74.00	-26.22	118	298	H
		* 2.48353	43.79	Pk	32.40	-24.90	51.29	-	-	74.00	-22.71	118	298	H
		* 2.4835	42.13	Pk	32.40	-24.90	49.63	-	-	74.00	-24.37	208	299	V
		2.524	42.55	Pk	32.40	-24.80	50.15	-	-	74.00	-23.85	208	299	V
2402	ANT2	* 2.39	39.13	Pk	32.10	-24.90	46.33	-	-	74.00	-27.67	210	127	H
		* 2.31949	42.95	Pk	31.90	-25.00	49.85	-	-	74.00	-24.15	210	127	H
		* 2.39	39.30	Pk	32.10	-24.90	46.50	-	-	74.00	-27.50	102	319	V
		* 2.33141	42.33	Pk	31.90	-24.90	49.33	-	-	74.00	-24.67	102	319	V
2480	ANT2	* 2.4835	40.61	Pk	32.40	-24.90	48.11	-	-	74.00	-25.89	210	120	H
		2.562	42.49	Pk	32.40	-24.60	50.29	-	-	74.00	-23.71	210	120	H
		* 2.4835	39.77	Pk	32.40	-24.90	47.27	-	-	74.00	-26.73	104	267	V
		2.518	42.57	Pk	32.40	-24.80	50.17	-	-	74.00	-23.83	104	267	V
2402	Dual	* 2.39	38.42	Pk	32.10	-24.90	45.62	-	-	74.00	-28.38	190	153	H
		* 2.32947	42.48	Pk	31.90	-24.90	49.48	-	-	74.00	-24.52	190	153	H
		* 2.39	40.35	Pk	32.10	-24.90	47.55	-	-	74.00	-26.45	80	128	V
		* 2.35568	42.75	Pk	32.00	-24.90	49.85	-	-	74.00	-24.15	80	128	V
2480	Dual	* 2.4835	40.04	Pk	32.40	-24.90	47.54	-	-	74.00	-26.46	185	191	H
		2.554	43.46	Pk	32.40	-24.80	51.06	-	-	74.00	-22.94	185	191	H
		* 2.4835	40.59	Pk	32.40	-24.90	48.09	-	-	74.00	-25.91	102	231	V
		2.523	42.17	Pk	32.40	-24.80	49.77	-	-	74.00	-24.23	102	231	V

Note1. Pk - Peak detector.

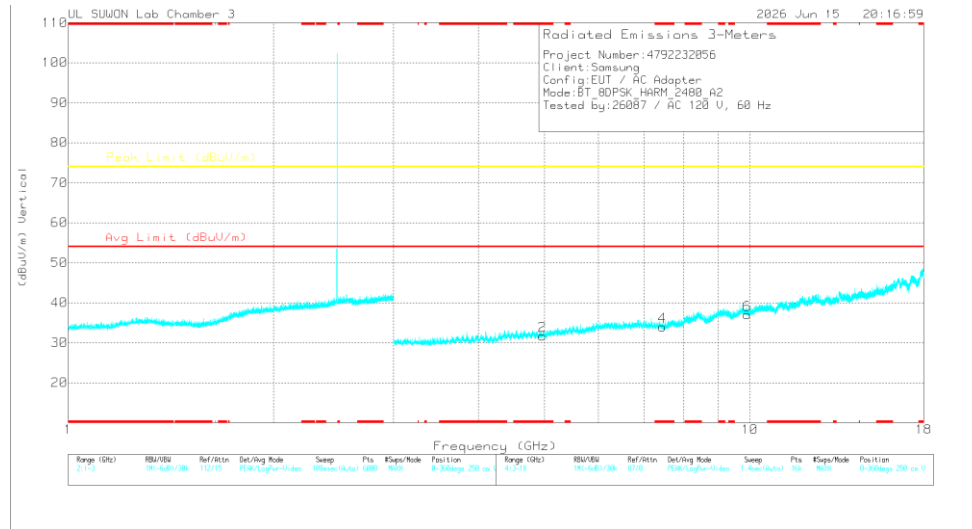
Note2. * - indicates frequency in 47 CFR Pt 15 / IC RSS-Restricted Band

HARMONICS AND SPURIOUS EMISSIONS(WORST CASE – ANT2)

78 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 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
* 4.95996	37.03	PKFH	34.3	-30.4	40.93	-	-	74	-33.07	6	106	H
* 4.95965	37.53	PKFH	34.3	-30.4	41.43	-	-	74	-32.57	216	251	V
* 7.44056	32.4	PKFH	35.7	-25	43.1	-	-	74	-30.9	0	100	H
* 7.43856	33.2	PKFH	35.7	-24.9	44	-	-	74	-30	0	100	V
9.91738	30.57	PKFH	37.1	-21.4	46.27	-	-	74	-27.73	0	100	H
9.92164	31.16	PKFH	37.1	-21.4	46.86	-	-	74	-27.14	0	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak

HARMONICS AND SPURIOUS EMISSIONS TEST DATA

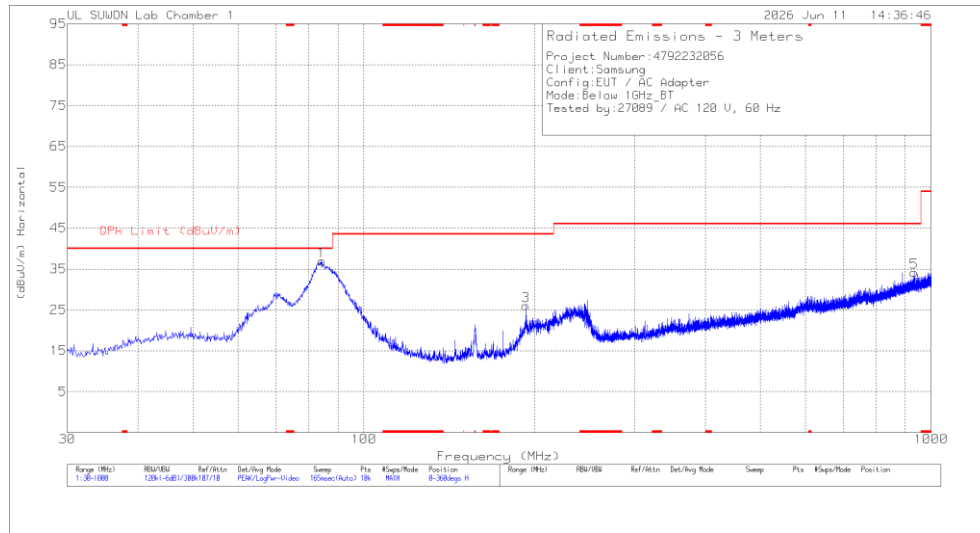
Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor [dB(1/m)]	Loss [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degr]	Height [cm]	Polarity
2402	ANT1	* 4.80424	37.51	PKFH	34.30	-30.10	41.71	-	-	74.00	-32.29	62	137	H
		* 4.80357	37.26	PKFH	34.30	-30.10	41.46	-	-	74.00	-32.54	334	100	V
		7.207	32.95	PKFH	35.80	-25.80	42.95	-	-	74.00	-31.05	0	100	H
		7.205	32.69	PKFH	35.80	-25.80	42.69	-	-	74.00	-31.31	0	100	V
		9.606	31.02	PKFH	36.70	-21.70	46.02	-	-	74.00	-27.98	0	100	H
		9.606	30.65	PKFH	36.70	-21.70	45.65	-	-	74.00	-28.35	0	100	V
2441	ANT1	* 4.88233	38.70	PKFH	34.20	-30.80	42.10	-	-	74.00	-31.90	64	146	H
		* 4.88205	38.57	PKFH	34.20	-30.80	41.97	-	-	74.00	-32.03	2	161	V
		* 7.32125	32.34	PKFH	35.80	-25.20	42.94	-	-	74.00	-31.06	0	100	H
		* 7.32371	32.65	PKFH	35.80	-25.30	43.15	-	-	74.00	-30.85	0	100	V
		9.762	31.10	PKFH	36.90	-21.40	46.60	-	-	74.00	-27.40	0	100	H
		9.762	30.34	PKFH	36.90	-21.40	45.84	-	-	74.00	-28.16	0	100	V
2480	ANT1	* 4.95998	38.94	PKFH	34.30	-30.40	42.84	-	-	74.00	-31.16	64	143	H
		* 4.95971	36.64	PKFH	34.30	-30.40	40.54	-	-	74.00	-33.46	0	168	V
		* 7.43862	32.23	PKFH	35.70	-24.90	43.03	-	-	74.00	-30.97	0	100	H
		* 7.44107	32.25	PKFH	35.70	-25.00	42.95	-	-	74.00	-31.05	0	100	V
		9.920	29.76	PKFH	37.10	-21.50	45.36	-	-	74.00	-28.64	0	100	H
		9.920	30.19	PKFH	37.10	-21.50	45.79	-	-	74.00	-28.21	0	100	V
2402	ANT2	* 4.80233	36.63	PKFH	34.30	-30.20	40.73	-	-	74.00	-33.27	58	100	H
		* 4.80431	37.21	PKFH	34.30	-30.10	41.41	-	-	74.00	-32.59	209	106	V
		7.203	33.36	PKFH	35.80	-25.80	43.36	-	-	74.00	-30.64	0	100	H
		7.204	34.25	PKFH	35.80	-25.80	44.25	-	-	74.00	-29.75	0	100	V
		9.606	31.32	PKFH	36.70	-21.70	46.32	-	-	74.00	-27.68	0	100	H
		9.608	31.49	PKFH	36.70	-21.70	46.49	-	-	74.00	-27.51	0	100	V
2441	ANT2	* 4.88149	37.34	PKFH	34.20	-30.80	40.74	-	-	74.00	-33.26	8	104	H
		* 4.87756	37.87	PKFH	34.20	-30.70	41.37	-	-	74.00	-32.63	220	178	V
		* 7.3207	32.43	PKFH	35.80	-25.20	43.03	-	-	74.00	-30.97	0	100	H
		* 7.32294	32.66	PKFH	35.80	-25.20	43.26	-	-	74.00	-30.74	0	100	V
		9.759	30.92	PKFH	36.90	-21.30	46.52	-	-	74.00	-27.48	0	100	H
		9.763	31.20	PKFH	36.90	-21.30	46.80	-	-	74.00	-27.20	0	100	V
2480	ANT2	* 4.95996	37.03	PKFH	34.30	-30.40	40.93	-	-	74.00	-33.07	6	106	H
		* 4.95965	37.53	PKFH	34.30	-30.40	41.43	-	-	74.00	-32.57	216	251	V
		* 7.44056	32.40	PKFH	35.70	-25.00	43.10	-	-	74.00	-30.90	0	100	H
		* 7.43856	33.20	PKFH	35.70	-24.90	44.00	-	-	74.00	-30.00	0	100	V
		9.917	30.57	PKFH	37.10	-21.40	46.27	-	-	74.00	-27.73	0	100	H
		9.922	31.16	PKFH	37.10	-21.40	46.86	-	-	74.00	-27.14	0	100	V
2402	DUAL	* 4.80432	37.40	PKFH	34.30	-30.10	41.60	-	-	74.00	-32.40	162	113	H
		* 4.80445	39.75	PKFH	34.30	-30.10	43.95	-	-	74.00	-30.05	0	179	V
		7.205	33.75	PKFH	35.80	-25.80	43.75	-	-	74.00	-30.25	14	100	H
		7.206	32.58	PKFH	35.80	-25.80	42.58	-	-	74.00	-31.42	30	101	V
		9.610	30.37	PKFH	36.70	-21.70	45.37	-	-	74.00	-28.63	0	100	H
		9.609	30.58	PKFH	36.70	-21.70	45.58	-	-	74.00	-28.42	0	100	V
2441	DUAL	* 4.88233	37.78	PKFH	34.20	-30.80	41.18	-	-	74.00	-32.82	58	122	H
		* 4.88164	37.95	PKFH	34.20	-30.80	41.35	-	-	74.00	-32.65	181	220	V
		* 7.32149	32.02	PKFH	35.80	-25.20	42.62	-	-	74.00	-31.38	339	100	H
		* 7.32207	32.25	PKFH	35.80	-25.20	42.85	-	-	74.00	-31.15	34	101	V
		9.763	30.23	PKFH	36.90	-21.40	45.73	-	-	74.00	-28.27	0	100	H
		9.765	30.81	PKFH	36.90	-21.30	46.41	-	-	74.00	-27.59	0	100	V
2480	DUAL	* 4.95978	38.07	PKFH	34.30	-30.40	41.97	-	-	74.00	-32.03	64	139	H
		* 4.95933	38.70	PKFH	34.30	-30.40	42.60	-	-	74.00	-31.40	209	236	V
		* 7.43824	32.85	PKFH	35.70	-24.90	43.65	-	-	74.00	-30.35	49	103	H
		* 7.44015	32.45	PKFH	35.70	-25.00	43.15	-	-	74.00	-30.85	44	101	V
		9.919	30.47	PKFH	37.10	-21.50	46.07	-	-	74.00	-27.93	0	100	H
		9.921	30.14	PKFH	37.10	-21.40	45.84	-	-	74.00	-28.16	0	100	V

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

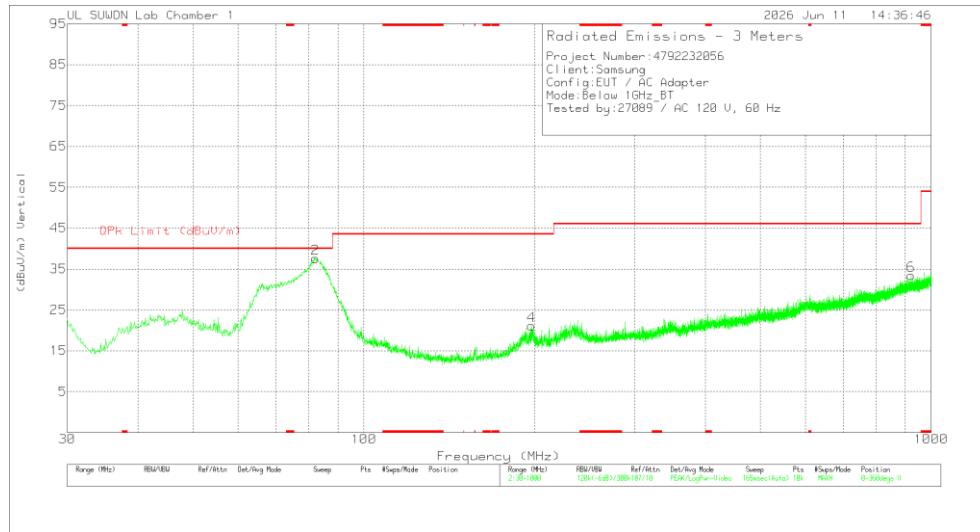
PKFH FHSS/BT RB=100k for Frequencies<1GHz / RB=1MHz for Frequencies>1GHz, VB=3 x RB, Peak

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

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 Factor (dB/m)	Below_1G_Path Loss(dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	84.32	53.73	Pk	13.6	-30.4	36.93	40	-3.07	0-360	100	H
3	192.96	38.66	Pk	16.8	-29.4	26.06	43.52	-17.46	0-360	100	H
5	932.585	31.34	Pk	28.1	-25.3	34.14	46.02	-11.88	0-360	200	H
2	82.089	55.21	Pk	12.9	-30.5	37.61	40	-2.39	0-360	200	V
4	197.519	32.99	Pk	17.5	-29.4	21.09	43.52	-22.43	0-360	200	V
6	921.139	30.73	Pk	28.1	-25.4	33.43	46.02	-12.59	0-360	300	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.

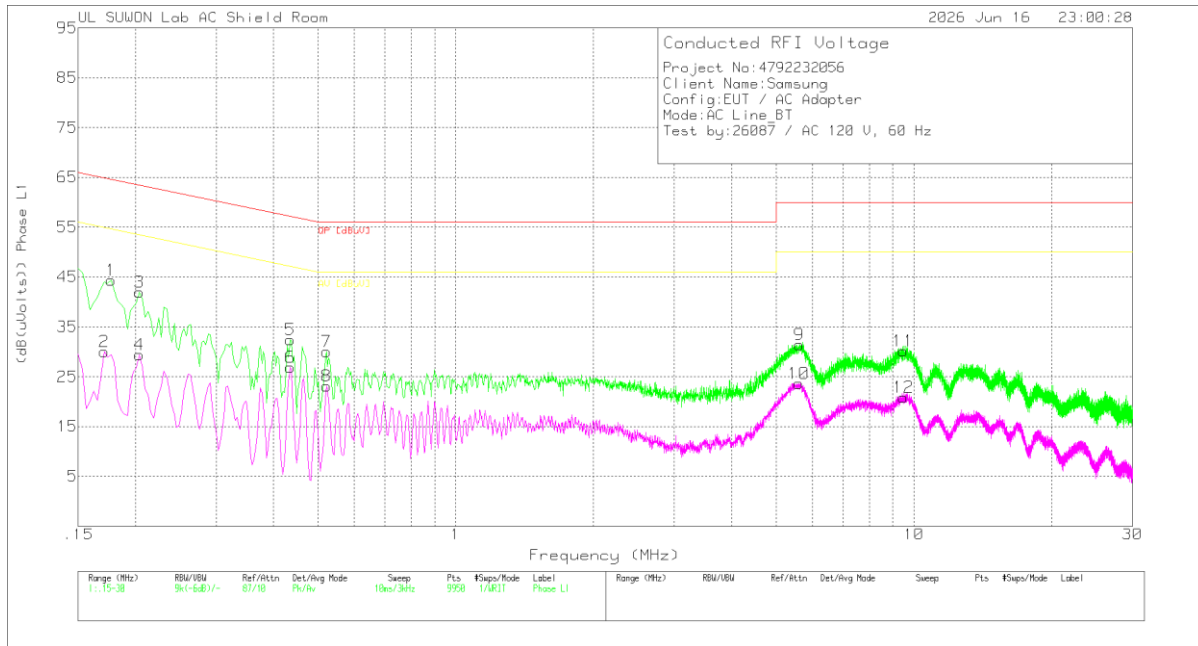
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

11.1. AC Power Line

LINE 1 RESULTS



Trace Markers

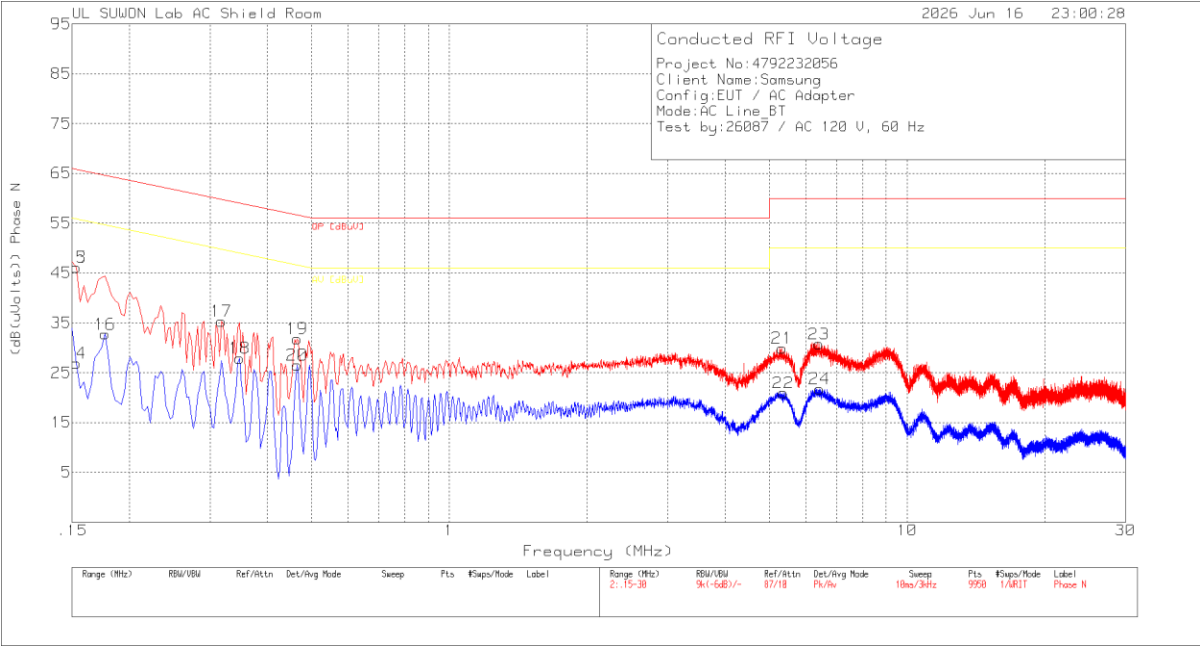
Range 1: Phase L1 .15 - 30MHz

Marker	Frequency [MHz]	Meter Reading [dBuV]	Det	101836_Wit h EX_N [dB]	Cable Loss [dB]	Corrected Reading [dBuV]	FCC 15 Class B QP [dBuV]	Margin [dB]	FCC 15 Class B AV [dBuV]	Margin [dB]
1	.177	34.24	Pk	10	.1	44.34	64.63	-20.29	-	-
2	.171	19.91	Av	10	.1	30.01	-	-	54.91	-24.9
3	.204	32.05	Pk	9.8	.1	41.95	63.45	-21.5	-	-
4	.204	19.56	Av	9.8	.1	29.46	-	-	53.45	-23.99
5	.435	22.52	Pk	9.8	.1	32.42	57.16	-24.74	-	-
6	.435	16.98	Av	9.8	.1	26.88	-	-	47.16	-20.28
7	.522	20	Pk	9.9	.1	30	56	-26	-	-
8	.522	13.18	Av	9.9	.1	23.18	-	-	46	-22.82
9	5.619	21.41	Pk	9.8	.2	31.41	60	-28.59	-	-
10	5.613	13.66	Av	9.8	.2	23.66	-	-	50	-26.34
11	9.48	20.06	Pk	9.9	.2	30.16	60	-29.84	-	-
12	9.495	10.81	Av	9.9	.2	20.91	-	-	50	-29.09

Pk - Peak detector

Av - Average detection

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	36.27	Pk	9.8	.1	46.17	65.84	-19.67	-	-
14	.153	16.98	Av	9.8	.1	26.88	-	-	55.84	-28.96
15	.153	36.27	Pk	9.8	.1	46.17	65.84	-19.67	-	-
16	.177	22.64	Av	10	.1	32.74	-	-	54.63	-21.89
17	.318	25.56	Pk	9.7	.1	35.36	59.76	-24.4	-	-
18	.348	17.96	Av	9.8	.1	27.86	-	-	49.01	-21.15
19	.465	21.9	Pk	9.8	.1	31.8	56.6	-24.8	-	-
20	.465	16.67	Av	9.8	.1	26.57	-	-	46.6	-20.03
21	5.334	19.89	Pk	9.8	.2	29.89	60	-30.11	-	-
22	5.358	10.94	Av	9.8	.2	20.94	-	-	50	-29.06
23	6.426	20.74	Pk	9.8	.2	30.74	60	-29.26	-	-
24	6.435	11.7	Av	9.8	.2	21.7	-	-	50	-28.3

Pk - Peak detector

Av - Average detection

END OF TEST REPORT