

A.3 Conducted Spurious Emissions

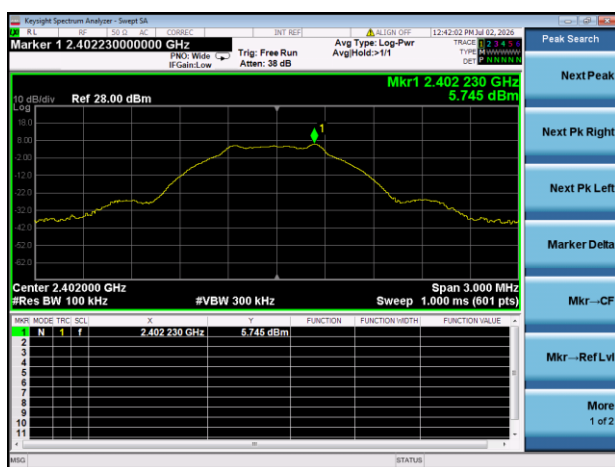
Test Data

GFSK (BLE 1Mbps)				
Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-25.23	5.75	-14.26	Pass
Middle Channel	-30.13	5.57	-14.43	Pass
High Channel	-27.41	5.44	-14.57	Pass

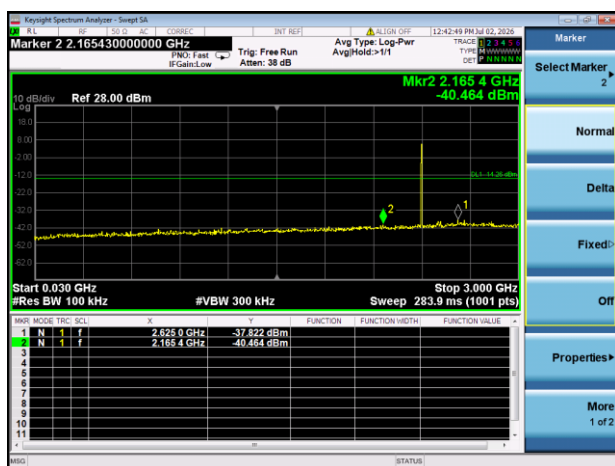
GFSK (BLE 2Mbps)				
Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-25.64	4.63	-15.37	Pass
Middle Channel	-23.56	4.19	-15.81	Pass
High Channel	-34.56	4.38	-15.62	Pass

Test Plots

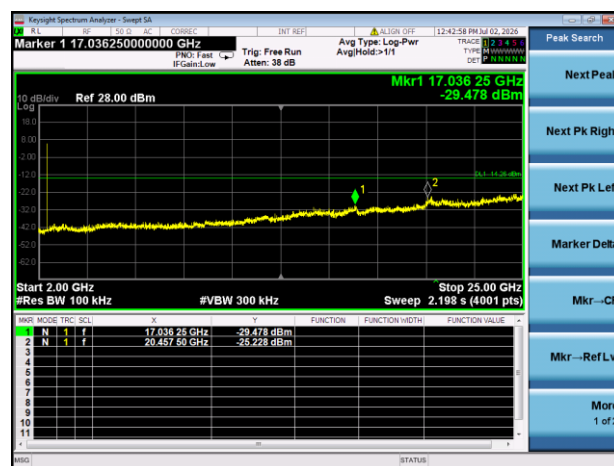
GFSK (BLE 1Mbps) LOW CHANNEL, CARRIER LEVEL



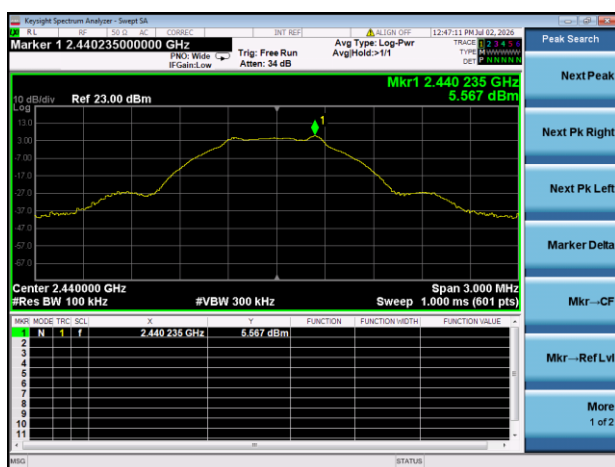
GFSK (BLE 1Mbps) LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



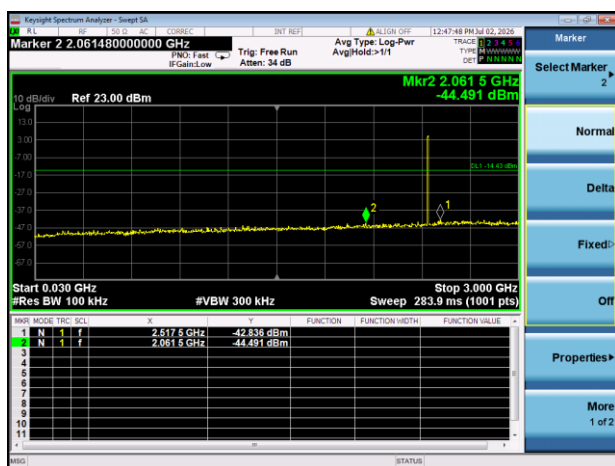
GFSK (BLE 1Mbps) LOW CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



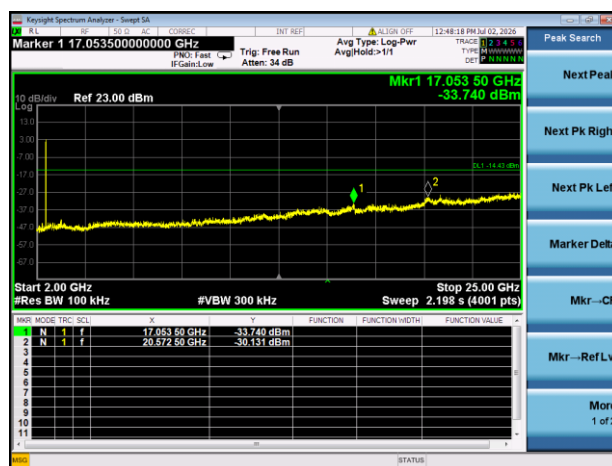
GFSK (BLE 1Mbps) MIDDLE CHANNEL, CARRIER LEVEL



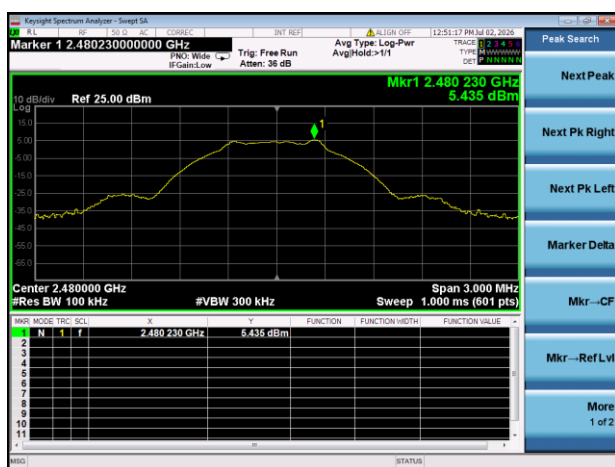
GFSK (BLE 1Mbps) MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



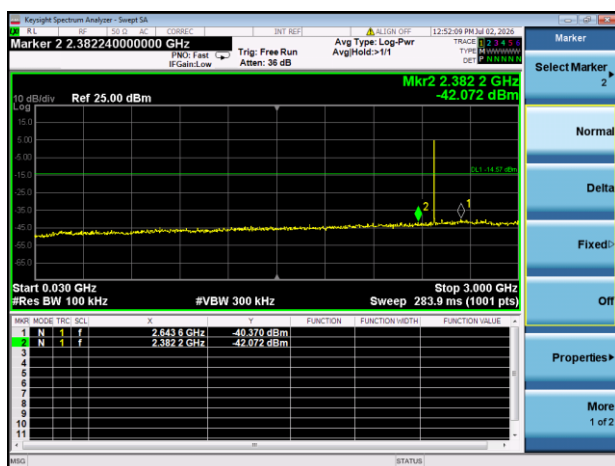
GFSK (BLE 1Mbps) MIDDLE CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



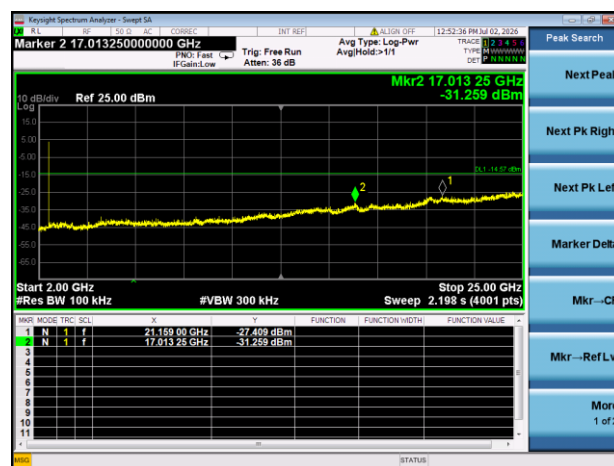
GFSK (BLE 1Mbps) HIGH CHANNEL, CARRIER LEVEL



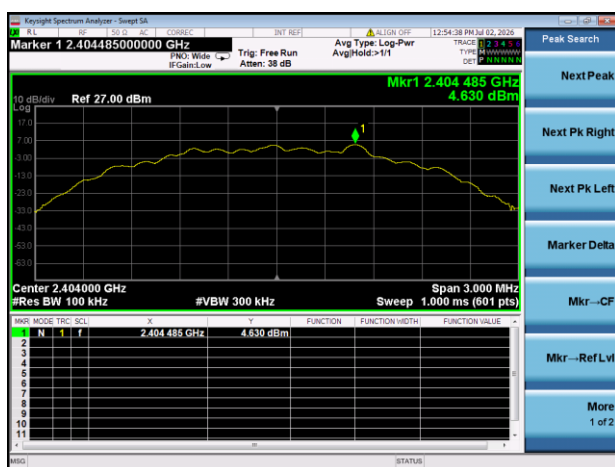
GFSK (BLE 1Mbps) HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



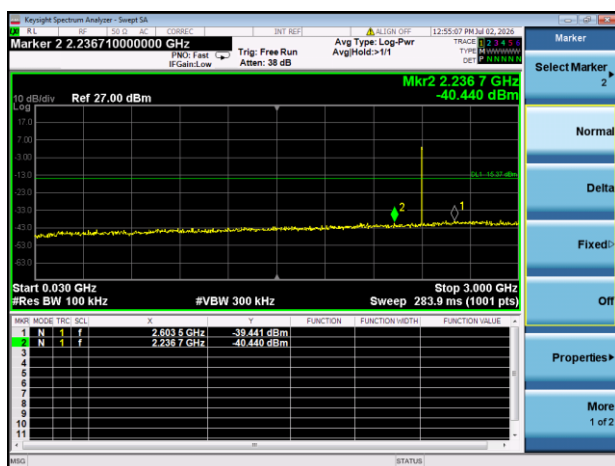
GFSK (BLE 1Mbps) HIGH CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



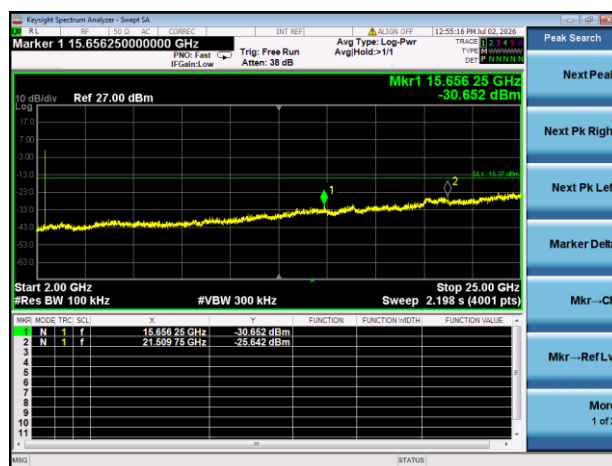
GFSK (BLE 2Mbps) LOW CHANNEL, CARRIER LEVEL



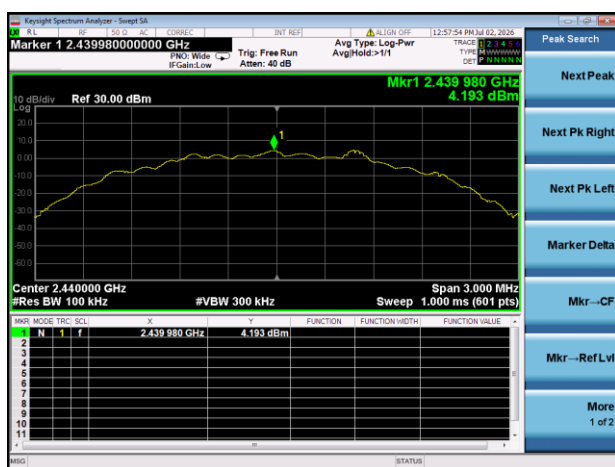
GFSK (BLE 2Mbps) LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



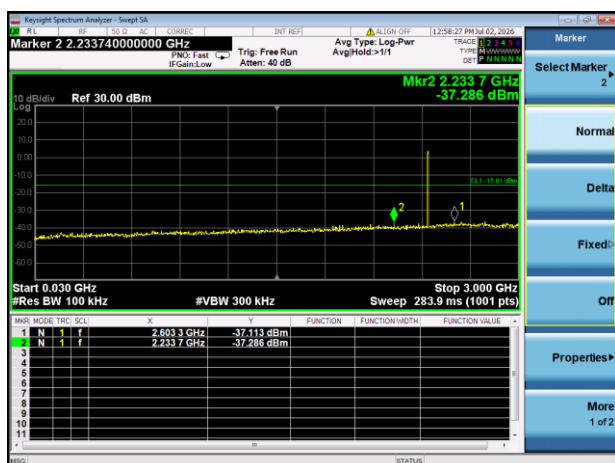
GFSK (BLE 2Mbps) LOW CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



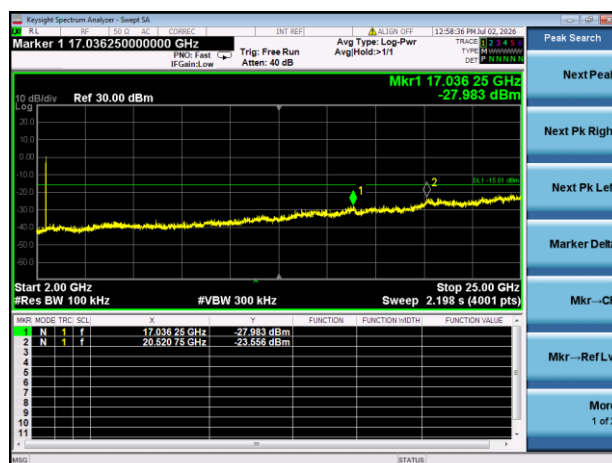
GFSK (BLE 2Mbps) MIDDLE CHANNEL, CARRIER LEVEL



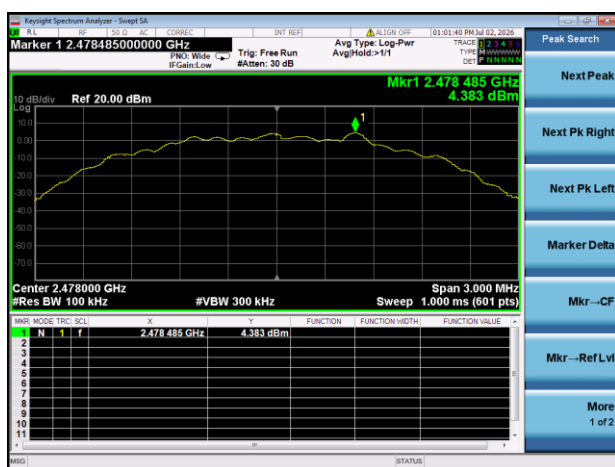
GFSK (BLE 2Mbps) MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



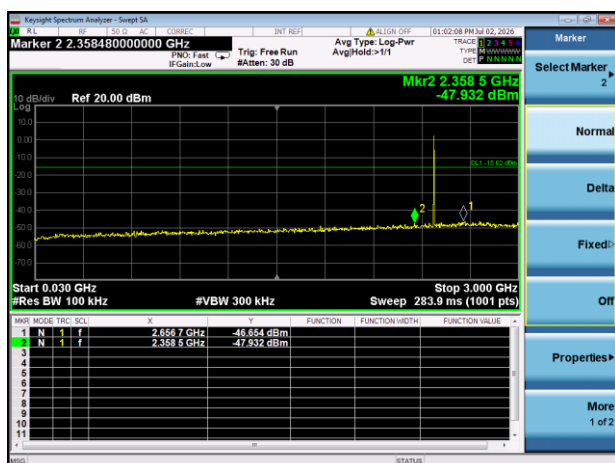
GFSK (BLE 2Mbps) MIDDLE CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



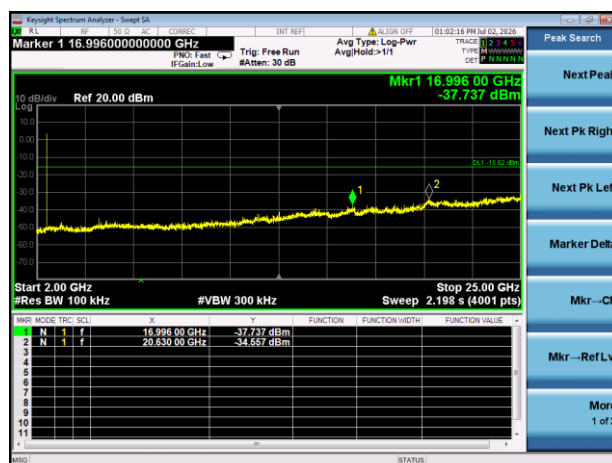
GFSK (BLE 2Mbps) HIGH CHANNEL, CARRIER LEVEL



GFSK (BLE 2Mbps) HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



GFSK (BLE 2Mbps) HIGH CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



A.4 Band Edge (Authorized-band band-edge)

Note: The lowest and highest channels are tested to verify the band edge emissions. Please refer to the following the plots for emissions values.

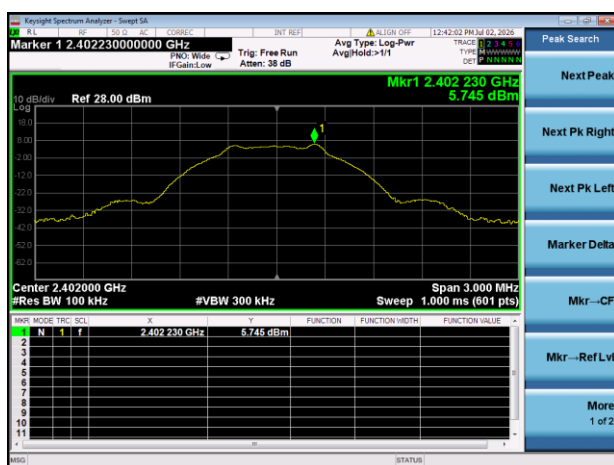
Test Data

GFSK (BLE 1Mbps)				
Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-43.70	5.75	-14.26	Pass
High Channel	-56.43	5.44	-14.57	Pass

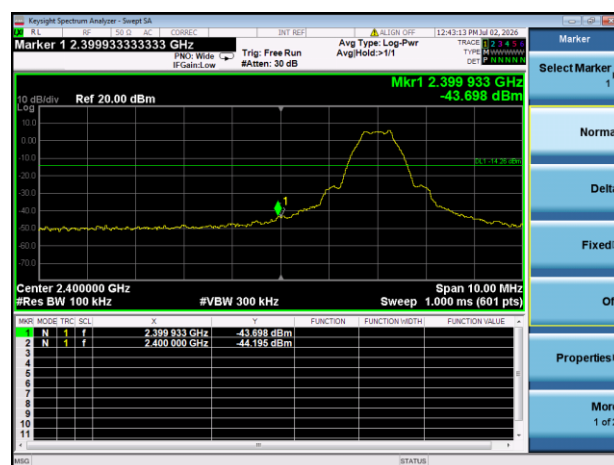
GFSK (BLE 2Mbps)				
Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-49.35	4.63	-15.37	Pass
High Channel	-55.93	4.38	-15.62	Pass

Test Plots

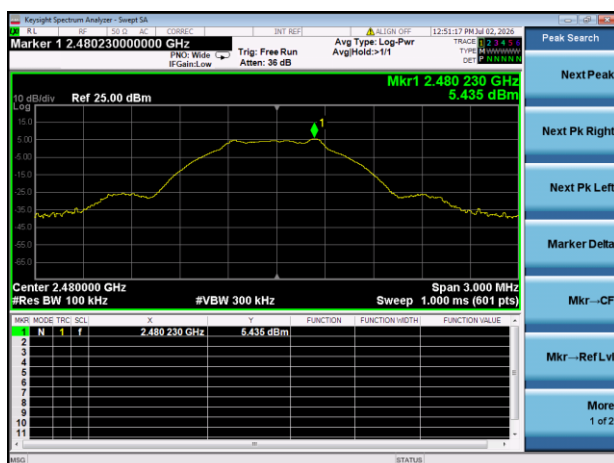
GFSK (BLE 1Mbps) LOW CHANNEL, CARRIER LEVEL



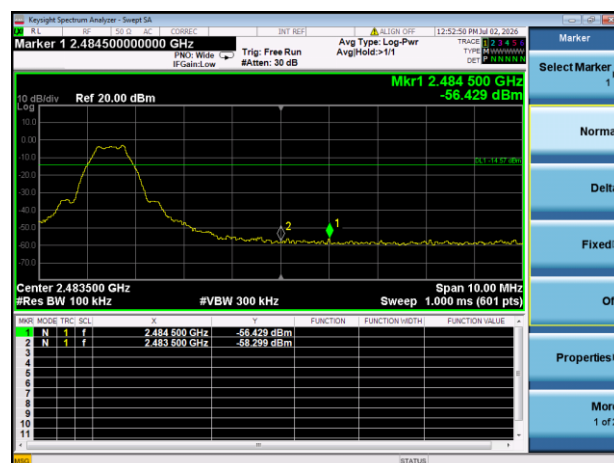
GFSK (BLE 1Mbps) LOW CHANNEL, BAND EDGE



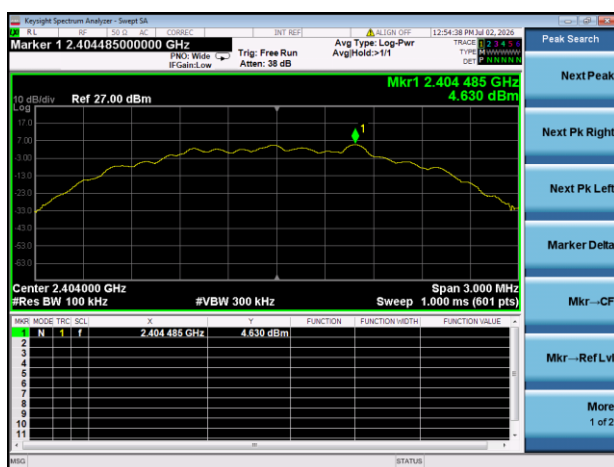
GFSK (BLE 1Mbps) HIGH CHANNEL, CARRIER LEVEL



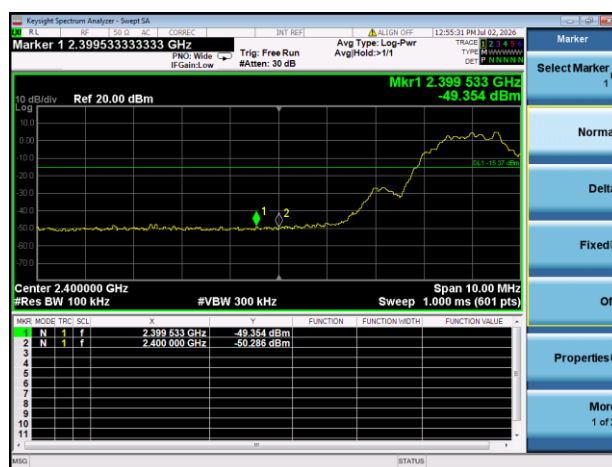
GFSK (BLE 1Mbps) HIGH CHANNEL, BAND EDGE



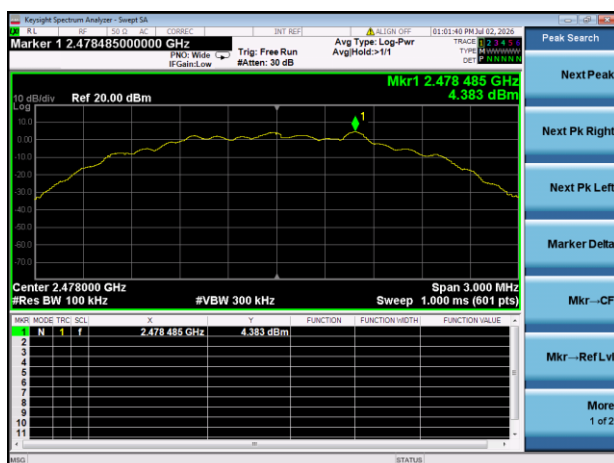
GFSK (BLE 2Mbps) LOW CHANNEL, CARRIER LEVEL



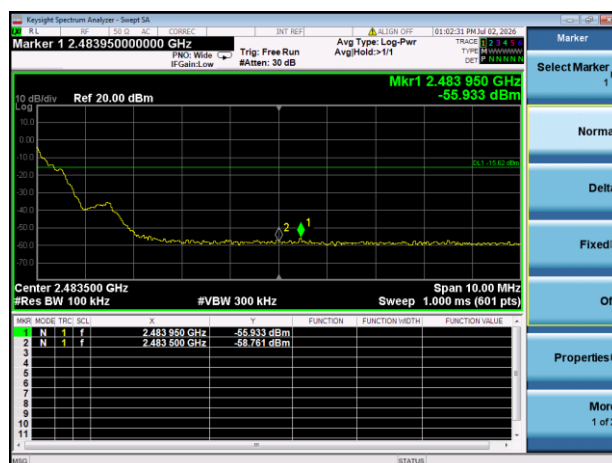
GFSK (BLE 2Mbps) LOW CHANNEL, BAND EDGE



GFSK (BLE 2Mbps) HIGH CHANNEL, CARRIER LEVEL



GFSK (BLE 2Mbps) HIGH CHANNEL, BAND EDGE



A.5 Conducted Emissions

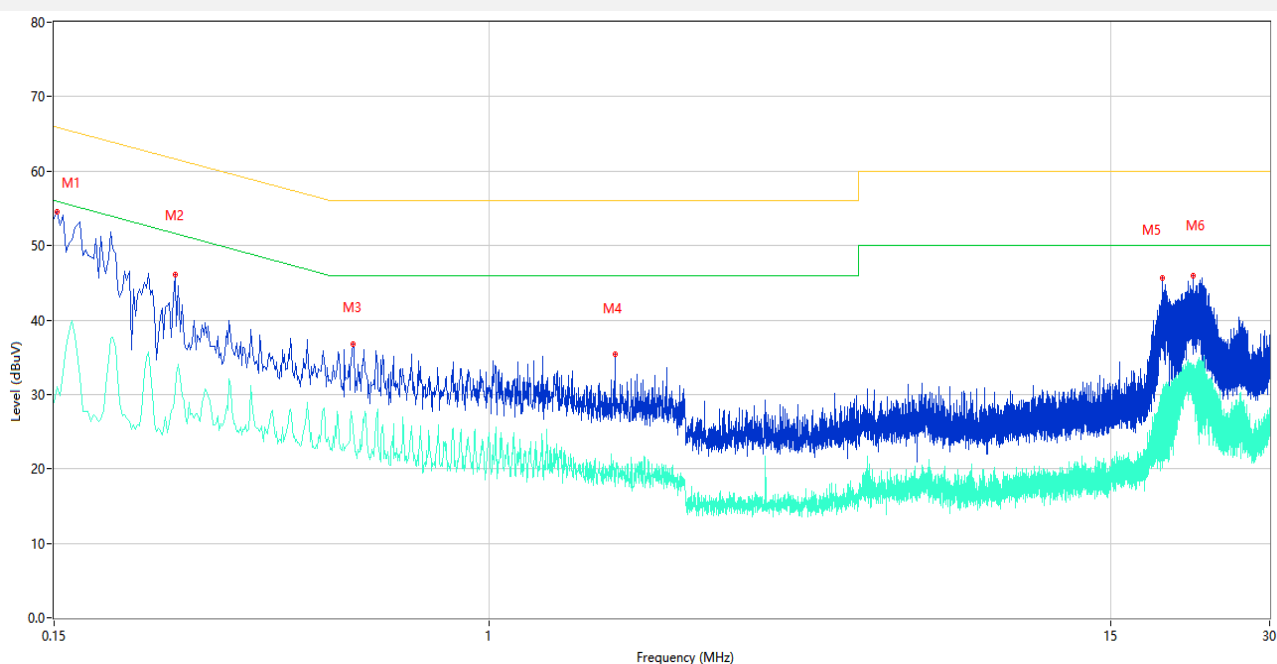
Note¹: The EUT is working in the Normal link mode. All modes have been tested and normal link mode is worst.

Note²: Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 60 Hz and 240 VAC, 50 Hz) for which the device is capable of operation. So, The configuration 120 VAC, 60 Hz and 240 VAC, 50 Hz were tested respectively, but only the worst configuration (120 VAC, 60 Hz) shown here.

Note³: Results (dBuV) = Original reading level of Spectrum Analyzer (dBuV) + Factor (dB)

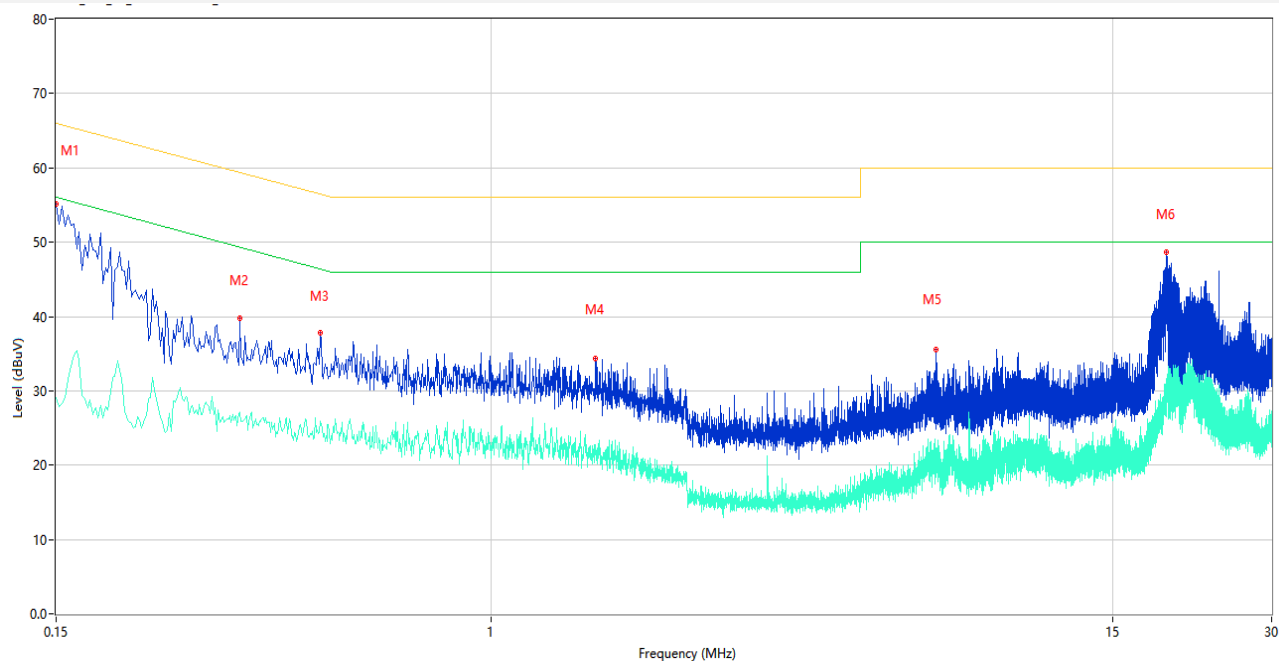
Test Data and Plots

PHASE L



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.152	54.56	10.27	65.89	11.33	Peak	L	Pass
1**	0.152	31.09	10.27	55.89	24.80	AV	L	Pass
2	0.254	46.10	10.24	61.63	15.53	Peak	L	Pass
2**	0.254	30.47	10.24	51.63	21.16	AV	L	Pass
3	0.552	36.81	10.26	56.00	19.19	Peak	L	Pass
3**	0.552	25.65	10.26	46.00	20.35	AV	L	Pass
4	1.728	35.36	10.37	56.00	20.64	Peak	L	Pass
4**	1.728	19.97	10.37	46.00	26.03	AV	L	Pass
5	18.806	45.62	13.98	60.00	14.38	Peak	L	Pass
5**	18.806	23.55	13.98	50.00	26.45	AV	L	Pass
6	21.520	45.94	14.61	60.00	14.06	Peak	L	Pass
6**	21.520	31.94	14.61	50.00	18.06	AV	L	Pass

PHASE N



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.150	55.16	10.18	66.00	10.84	Peak	N	Pass
1**	0.150	29.12	10.18	56.00	26.88	AV	N	Pass
2	0.334	39.85	10.16	59.35	19.50	Peak	N	Pass
2**	0.334	27.08	10.16	49.35	22.27	AV	N	Pass
3	0.474	37.77	10.17	56.44	18.67	Peak	N	Pass
3**	0.474	25.95	10.17	46.44	20.49	AV	N	Pass
4	1.576	34.28	10.27	56.00	21.72	Peak	N	Pass
4**	1.576	21.66	10.27	46.00	24.34	AV	N	Pass
5	6.940	35.53	11.04	60.00	24.47	Peak	N	Pass
5**	6.940	18.69	11.04	50.00	31.31	AV	N	Pass
6	19.000	48.66	14.07	60.00	11.34	Peak	N	Pass
6**	19.000	30.95	14.07	50.00	19.05	AV	N	Pass

A.6 Radiated Spurious Emission

Note¹: The symbol of “--” in the table which means not application.

Note²: For the test data above 1 GHz, according the ANSI C63.10-2020, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

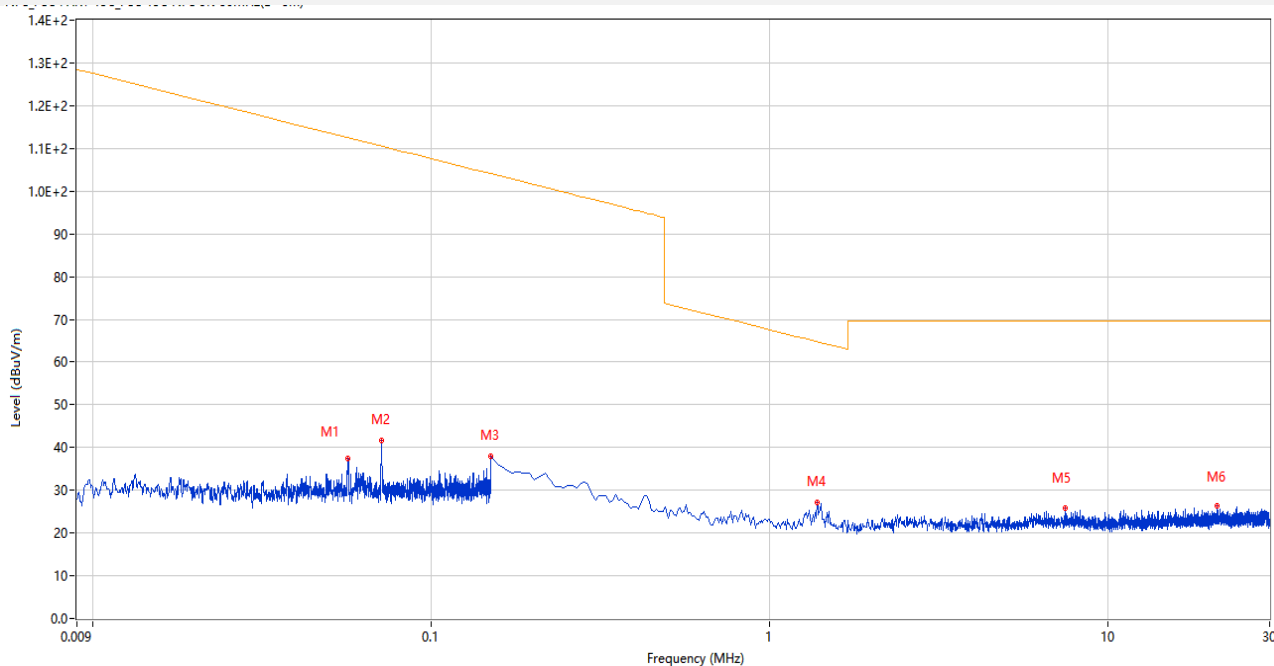
Note³: The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

Note⁴: The EUT is working in the Normal link mode below 1 GHz. All modes have been tested and BLE 1M-High channel mode is the worst.

Note⁵: Results (dBuV/m) = Original reading level of Spectrum Analyzer (dBuV/m) + Factor (dB)

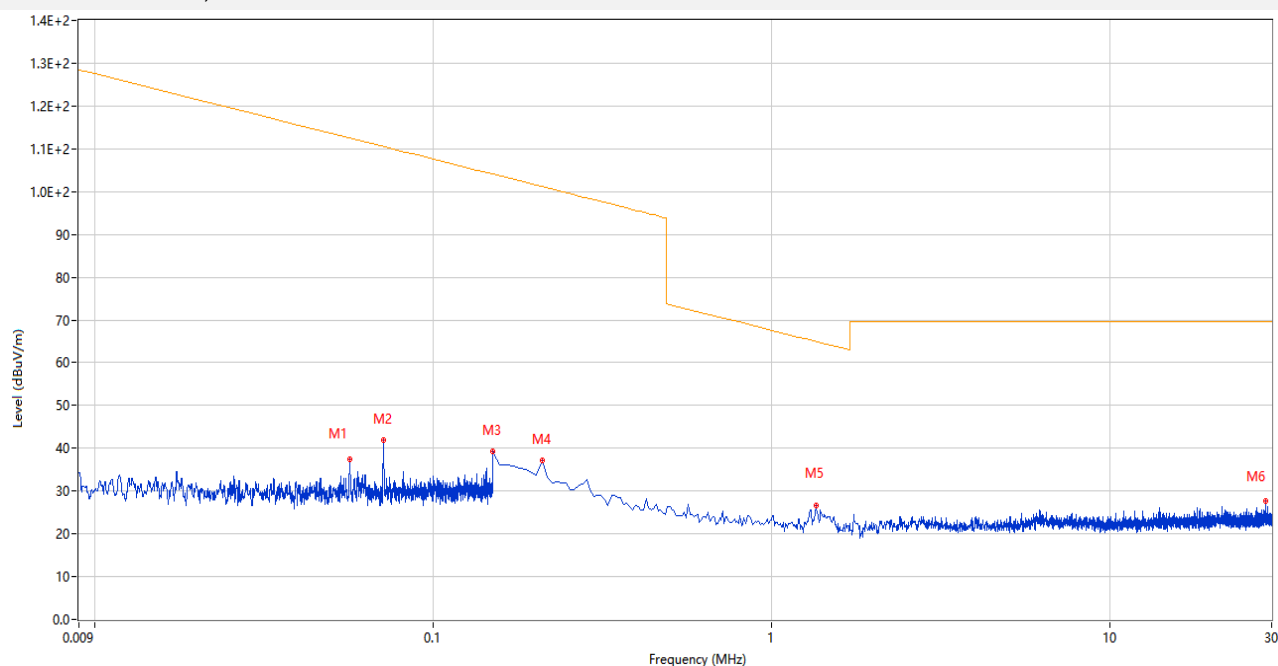
Test Data and Plots

9 KHz to 30 MHz, ANT H



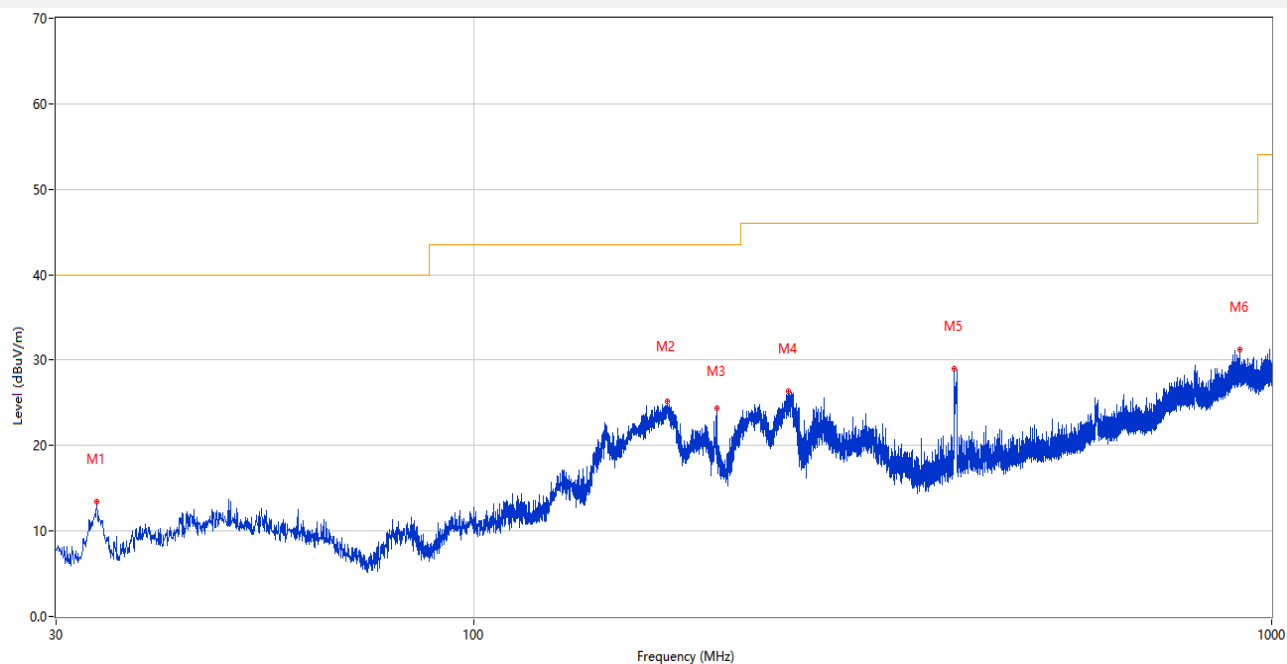
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	0.057	37.43	20.75	112.5	75.07	Peak	204.00	100	Horizontal	Pass
2	0.071	41.65	20.72	110.5	68.85	Peak	117.00	100	Horizontal	Pass
3	0.150	31.18	20.59	104.1	72.92	Peak	262.00	100	Horizontal	Pass
4	1.381	27.11	19.43	64.8	37.69	Peak	237.00	100	Horizontal	Pass
5	7.448	25.93	20.82	69.5	43.57	Peak	321.00	100	Horizontal	Pass
6	20.948	26.50	21.56	69.5	43.00	Peak	49.00	100	Horizontal	Pass

9 KHz to 30 MHz, ANT V



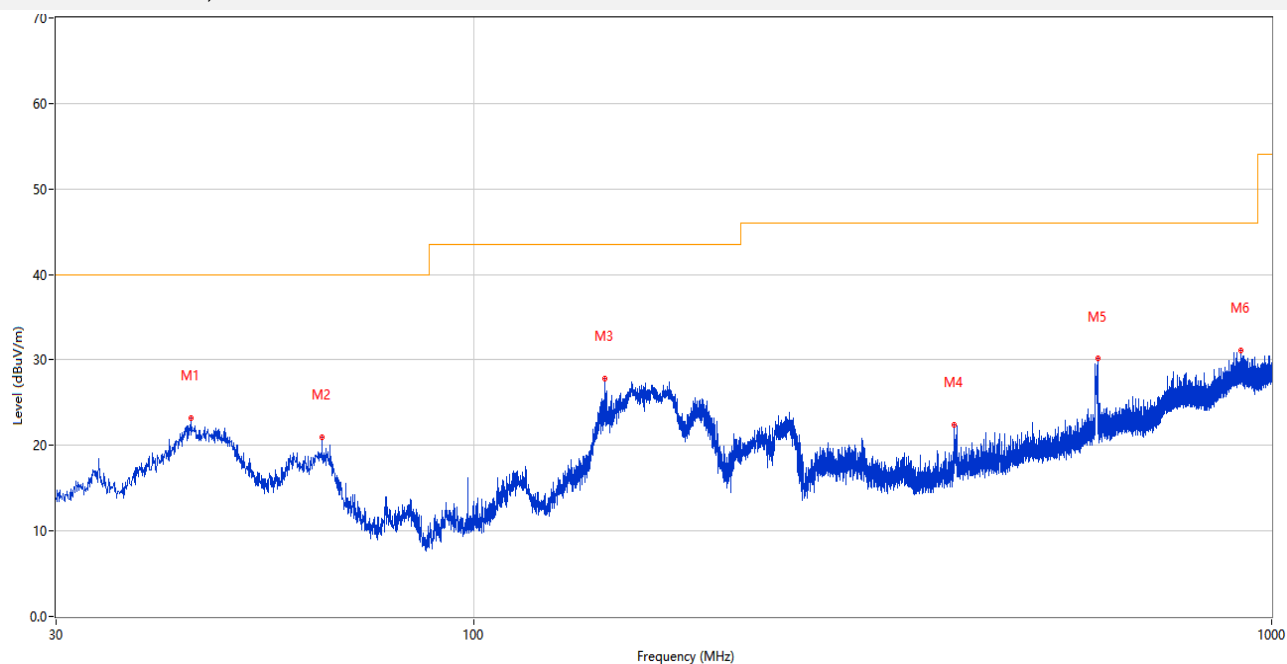
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	0.057	37.35	20.75	112.5	75.15	Peak	0.00	100	Vertical	Pass
2	0.071	41.85	20.72	110.5	68.65	Peak	188.00	100	Vertical	Pass
3	0.150	31.46	20.59	104.1	72.64	Peak	122.00	100	Vertical	Pass
4	0.210	37.12	20.50	101.2	64.08	Peak	60.00	100	Vertical	Pass
5	1.351	26.66	19.45	65.0	38.34	Peak	301.00	100	Vertical	Pass
6	28.821	27.60	21.96	69.5	41.90	Peak	206.00	100	Vertical	Pass

30 MHz to 1 GHz, ANT H



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	33.734	13.48	-28.57	40.0	26.52	Peak	54.00	100	Horizontal	Pass
2	175.112	25.22	-28.26	43.5	18.28	Peak	267.00	200	Horizontal	Pass
3	201.690	24.43	-26.43	43.5	19.07	Peak	86.00	100	Horizontal	Pass
4	248.105	26.35	-24.24	46.0	19.65	Peak	266.00	100	Horizontal	Pass
5	400.589	28.98	-20.69	46.0	17.02	Peak	234.00	100	Horizontal	Pass
6	912.409	31.23	-8.55	46.0	14.77	Peak	208.00	100	Horizontal	Pass

30 MHz to 1 GHz, ANT V



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	44.259	23.15	-25.63	40.0	16.85	Peak	8.00	100	Vertical	Pass
2	64.580	20.92	-27.18	40.0	19.08	Peak	103.00	100	Vertical	Pass
3	146.060	27.81	-29.81	43.5	15.69	Peak	352.00	100	Vertical	Pass
4	400.540	22.36	-20.69	46.0	23.64	Peak	280.00	200	Vertical	Pass
5	605.210	30.13	-15.02	46.0	15.87	Peak	329.00	100	Vertical	Pass
6	915.756	31.13	-8.54	46.0	14.87	Peak	192.00	100	Vertical	Pass

Note¹: The marked spikes near 2400 MHz with circle should be ignored because they are Fundamental signal.

Note²: The spurious from 18GHz-25GHz is noise only, do not show on the report.

GFSK (BLE 1Mbps) LOW CHANNEL 1 GHz to 18 GHz, ANT H

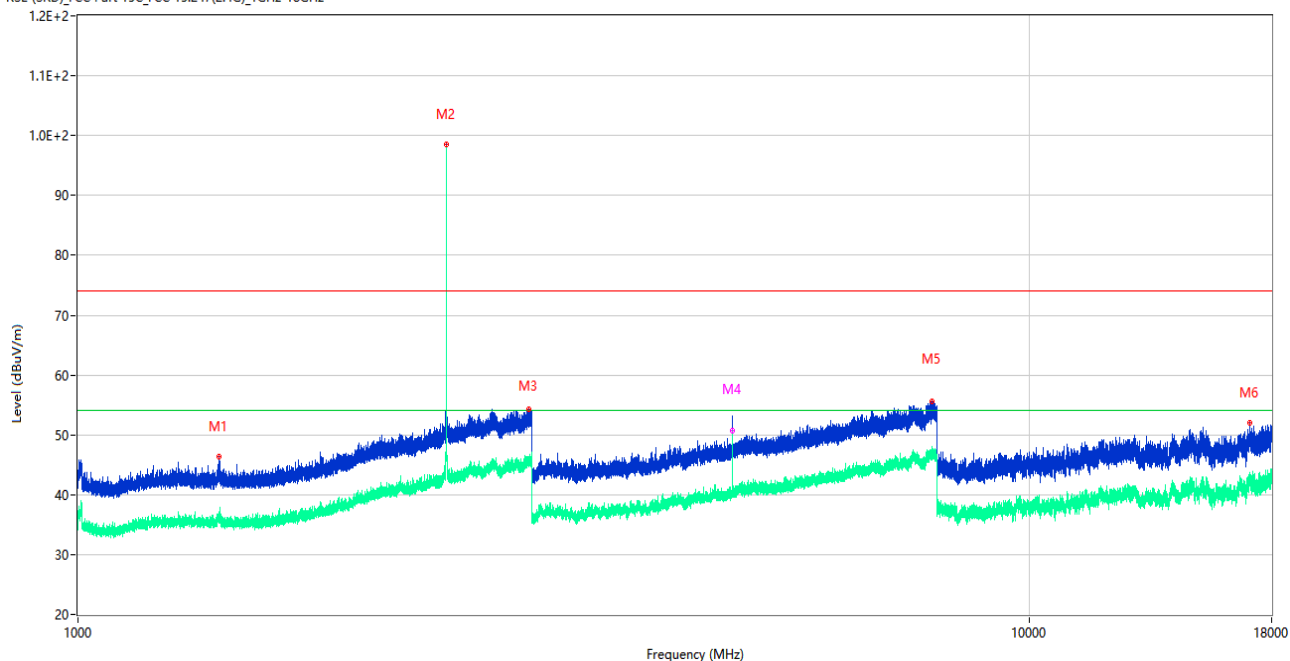
No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1008.700	45.95	74.0	28.05	Peak	199.00	400	Horizontal	Pass
1**	1008.700	37.30	54.0	16.70	AV	199.00	400	Horizontal	Pass
2	2402.200	96.76	--	--	Peak	351.00	100	Horizontal	N/A
2**	2402.200	96.43	--	--	AV	351.00	100	Horizontal	N/A
3	2972.500	54.68	74.0	19.32	Peak	208.00	200	Horizontal	Pass
3**	2972.500	46.14	54.0	7.86	AV	208.00	200	Horizontal	Pass
4	4804.500	52.13	74.0	21.87	Peak	208.00	100	Horizontal	Pass
4**	4804.500	48.44	54.0	5.56	AV	208.00	100	Horizontal	Pass
5	7924.000	55.83	74.0	18.17	Peak	328.00	100	Horizontal	Pass
5**	7924.000	47.06	54.0	6.94	AV	328.00	100	Horizontal	Pass
6	17840.927	51.71	74.0	22.29	Peak	325.00	300	Horizontal	Pass
6**	17840.927	43.30	54.0	10.70	AV	325.00	300	Horizontal	Pass

GFSK (BLE 1Mbps) LOW CHANNEL 1 GHz to 18 GHz, ANT V

No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1695.200	45.88	74.0	28.12	Peak	0.00	400	Vertical	Pass
1**	1695.200	37.33	54.0	16.67	AV	0.00	400	Vertical	Pass
2	2402.200	87.23	--	--	Peak	38.00	150	Vertical	N/A
2**	2402.200	86.77	--	--	AV	38.00	150	Vertical	N/A
3	2900.800	54.16	74.0	19.84	Peak	0.00	150	Vertical	Pass
3**	2900.800	45.17	54.0	8.83	AV	0.00	150	Vertical	Pass
4	4804.000	50.79	74.0	23.21	Peak	176.00	100	Vertical	Pass
4**	4804.000	48.32	54.0	5.68	AV	176.00	100	Vertical	Pass
5	7962.250	55.80	74.0	18.20	Peak	47.00	400	Vertical	Pass
5**	7962.250	46.14	54.0	7.86	AV	47.00	400	Vertical	Pass
6	17971.913	52.11	74.0	21.89	Peak	165.00	400	Vertical	Pass
6**	17971.913	42.99	54.0	11.01	AV	165.00	400	Vertical	Pass

GFSK (BLE 1Mbps) MIDDLE CHANNEL 1 GHz to 18 GHz, ANT H

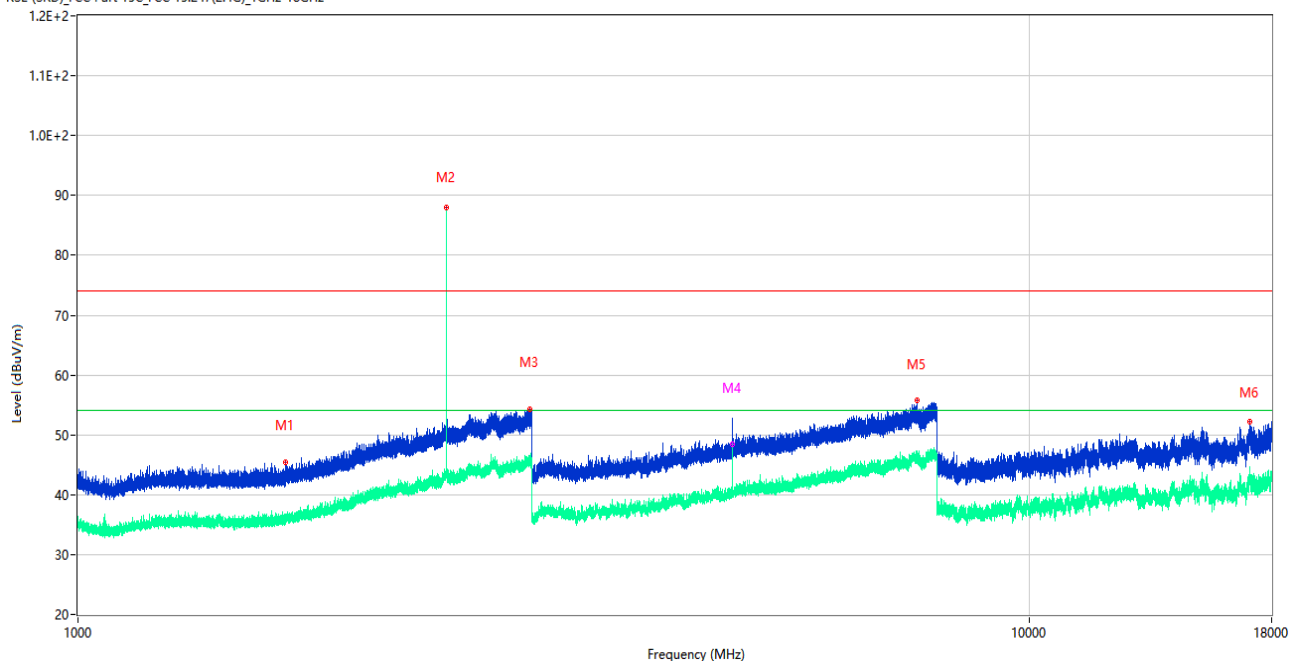
RSE (SRD)_FCC Part 15C_FCC 15.247(2.4G)_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1406.900	46.40	74.0	27.60	Peak	28.00	300	Horizontal	Pass
1**	1406.900	36.35	54.0	17.65	AV	28.00	300	Horizontal	Pass
2	2439.800	98.56	--	--	Peak	348.00	200	Horizontal	N/A
2**	2439.800	97.87	--	--	AV	348.00	200	Horizontal	N/A
3	2979.600	54.31	74.0	19.69	Peak	344.00	200	Horizontal	Pass
3**	2979.600	44.89	54.0	9.11	AV	344.00	200	Horizontal	Pass
4	4879.750	52.36	74.0	21.64	Peak	207.00	100	Horizontal	Pass
4**	4879.750	50.6	54.0	3.40	AV	207.00	100	Horizontal	Pass
5	7917.500	55.55	74.0	18.45	Peak	37.00	100	Horizontal	Pass
5**	7917.500	46.88	54.0	7.12	AV	37.00	100	Horizontal	Pass
6	17083.088	52.04	74.0	21.96	Peak	52.00	100	Horizontal	Pass
6**	17083.088	43.00	54.0	11.00	AV	52.00	100	Horizontal	Pass

GFSK (BLE 1Mbps) MIDDLE CHANNEL 1 GHz to 18 GHz, ANT V

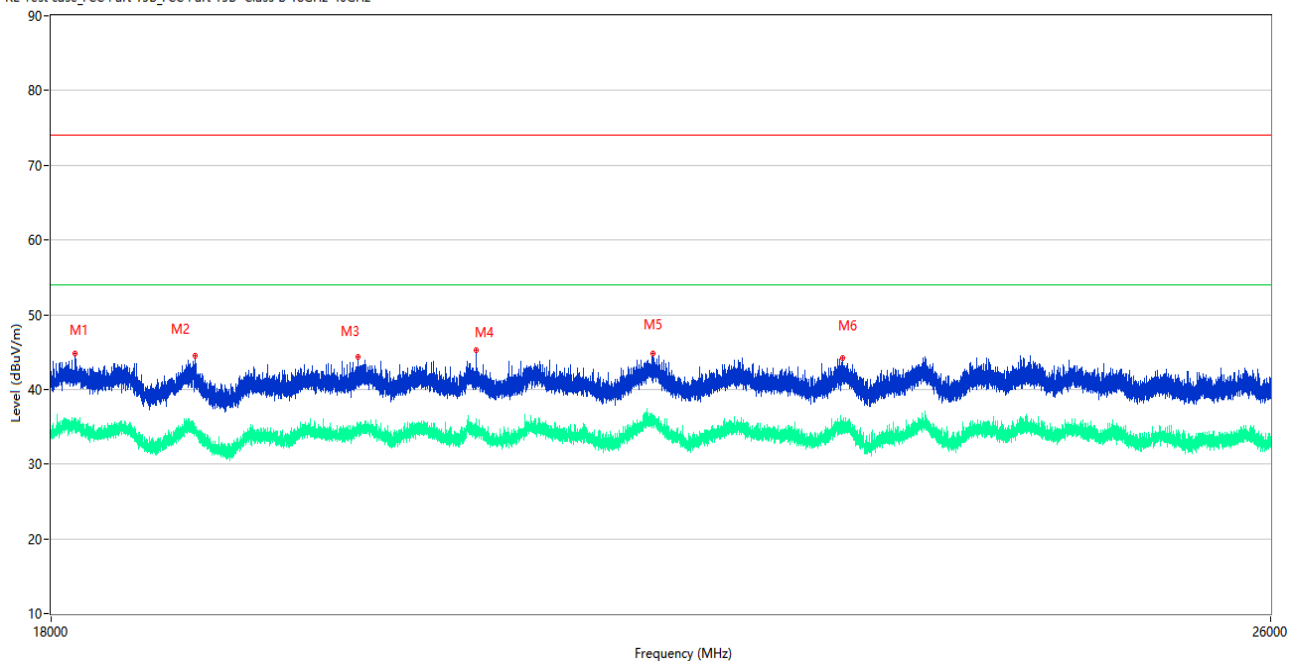
RSE (SRD)_FCC Part 15C_FCC 15.247(2.4G)_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1652.600	45.35	74.0	28.65	Peak	1.00	100	Vertical	Pass
1**	1652.600	36.17	54.0	17.83	AV	1.00	100	Vertical	Pass
2	2440.200	87.98	--	--	Peak	261.00	150	Vertical	N/A
2**	2440.200	87.51	--	--	AV	261.00	150	Vertical	N/A
3	2984.800	54.27	74.0	19.73	Peak	282.00	200	Vertical	Pass
3**	2984.800	45.08	54.0	8.92	AV	282.00	200	Vertical	Pass
4	4879.750	51.55	74.0	22.45	Peak	168.00	100	Vertical	Pass
4**	4879.750	48.35	54.0	5.65	AV	168.00	100	Vertical	Pass
5	7628.250	55.69	74.0	18.31	Peak	47.00	200	Vertical	Pass
5**	7628.250	45.90	54.0	8.10	AV	47.00	200	Vertical	Pass
6	17079.937	52.17	74.0	21.83	Peak	121.00	200	Vertical	Pass
6**	17079.937	42.54	54.0	11.46	AV	121.00	200	Vertical	Pass

GFSK (BLE 1Mbps) MIDDLE CHANNEL 18 GHz to 26 GHz, ANT H

RE Test case_FCC Part 15B_FCC Part 15B Class B 18GHz-40GHz



No.	Frequency (MHz)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	18128.802	44.78	74.0	29.22	Peak	124.00	200	Horizontal	Pass
1**	18128.802	35.17	54.0	18.83	AV	124.00	200	Horizontal	Pass
2	18799.600	44.44	74.0	29.56	Peak	91.00	100	Horizontal	Pass
2**	18799.600	34.87	54.0	19.13	AV	91.00	100	Horizontal	Pass
3	19746.802	44.29	74.0	29.71	Peak	354.00	100	Horizontal	Pass
3**	19746.802	34.66	54.0	19.34	AV	354.00	100	Horizontal	Pass
4	20459.600	45.32	74.0	28.68	Peak	121.00	100	Horizontal	Pass
4**	20459.600	35.99	54.0	18.01	AV	121.00	100	Horizontal	Pass
5	21584.400	44.74	74.0	29.26	Peak	354.00	100	Horizontal	Pass
5**	21584.400	35.77	54.0	18.23	AV	354.00	100	Horizontal	Pass
6	22855.199	44.17	74.0	29.83	Peak	176.00	200	Horizontal	Pass
6**	22855.199	35.73	54.0	18.27	AV	176.00	200	Horizontal	Pass