

### A.3 Conducted Spurious Emissions

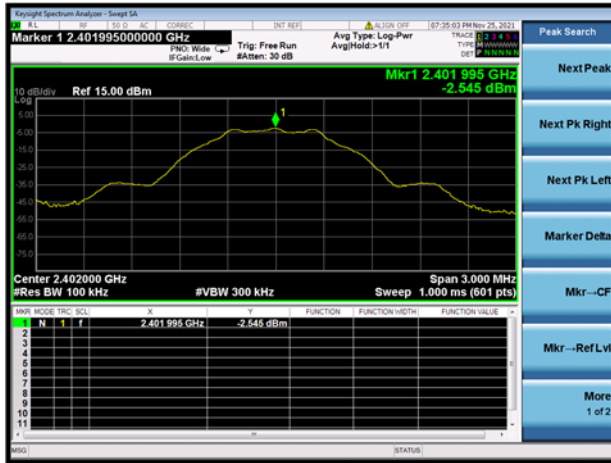
#### Test Data

GFSK (BLE 1Mbps)				
Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-34.09	-2.55	-22.55	Pass
Middle	-37.00	-3.43	-23.43	Pass
High	-36.72	-1.81	-21.81	Pass

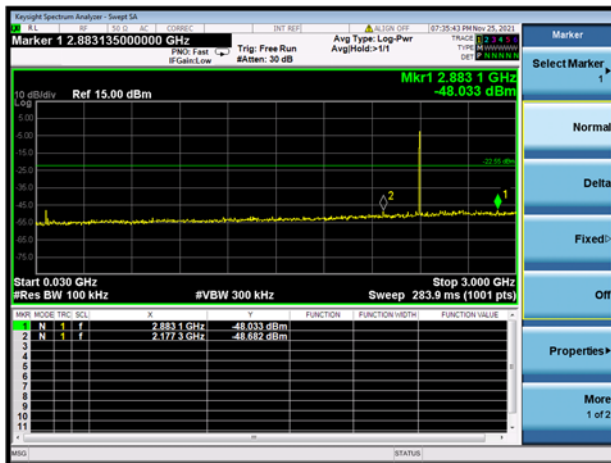
GFSK (BLE 2Mbps)				
Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-37.28	-4.74	-24.74	Pass
Middle	-37.52	-3.44	-23.44	Pass
High	-36.83	-1.82	-21.82	Pass

## Test Plots

## GFSK (BLE 1Mbps) LOW CHANNEL, CARRIER LEVEL



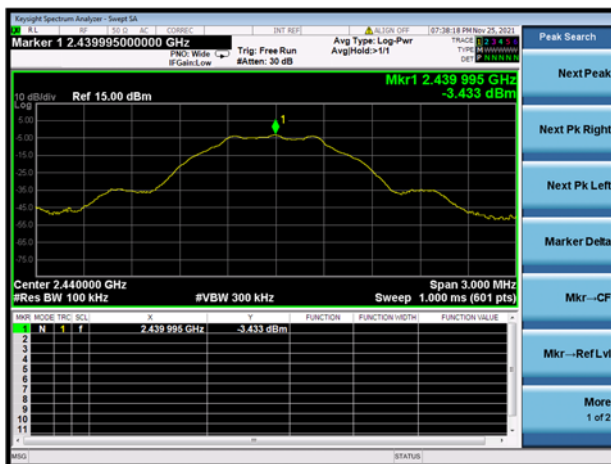
## GFSK (BLE 1Mbps) LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz

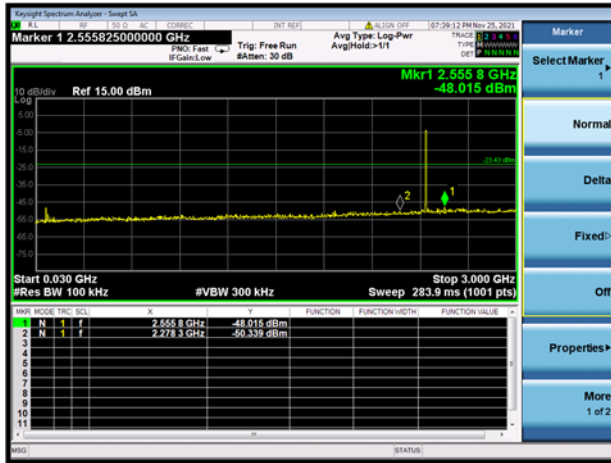
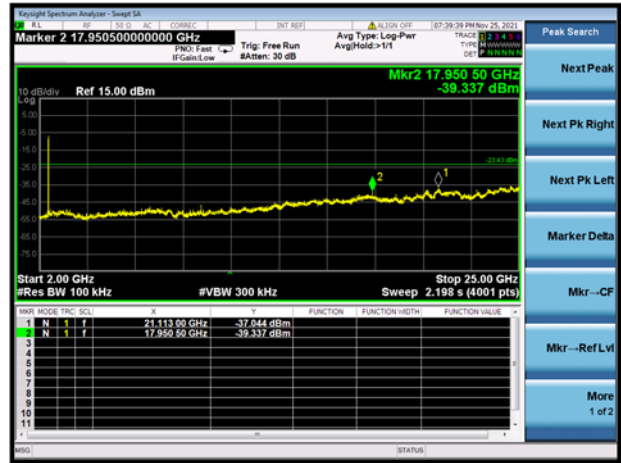
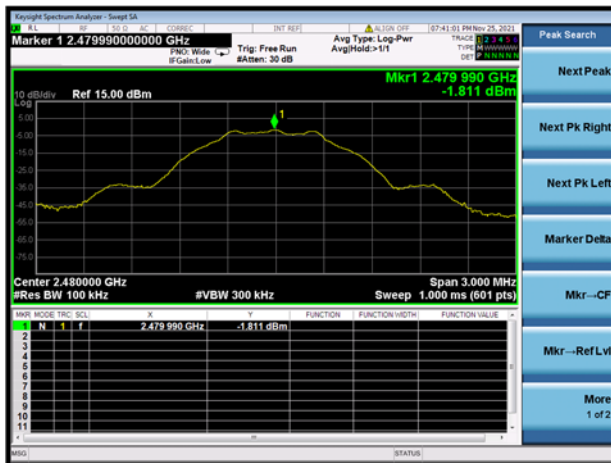
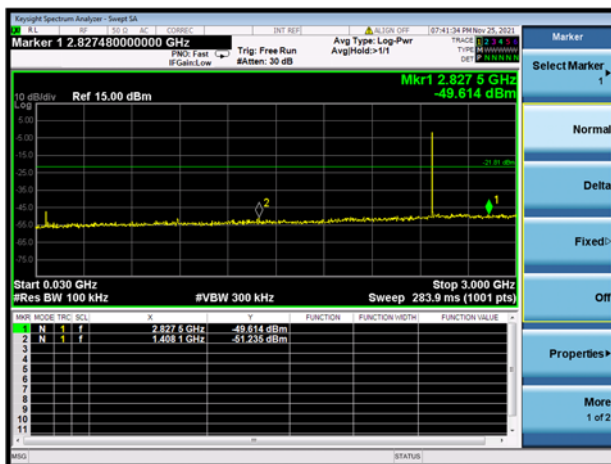


## GFSK (BLE 1Mbps) LOW CHANNEL, SPURIOUS 2 GHz ~ 25 GHz

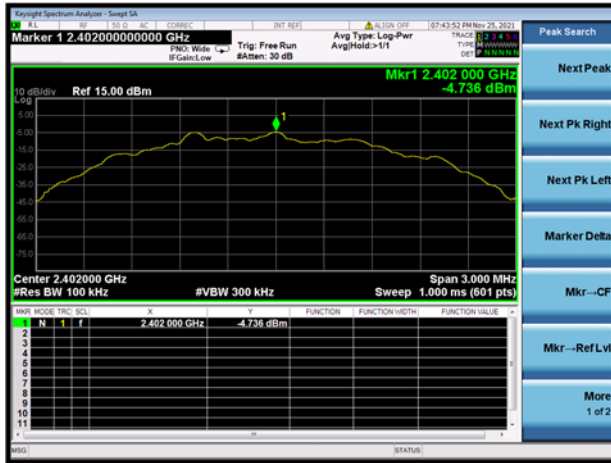


## GFSK (BLE 1Mbps) MIDDLE CHANNEL, CARRIER LEVEL

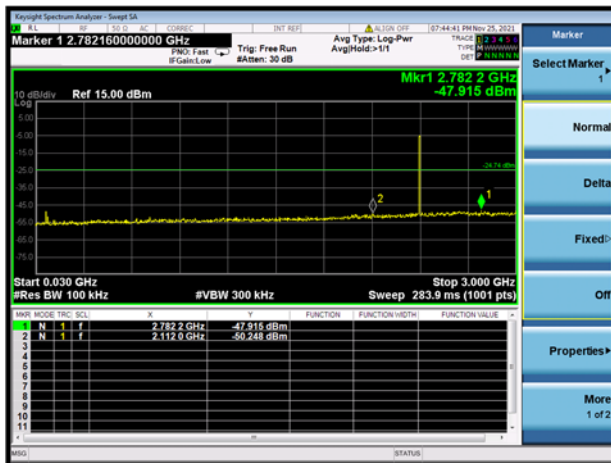


GFSK (BLE 1Mbps) MIDDLE CHANNEL,  
 SPURIOUS 30 MHz ~ 3 GHz

 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



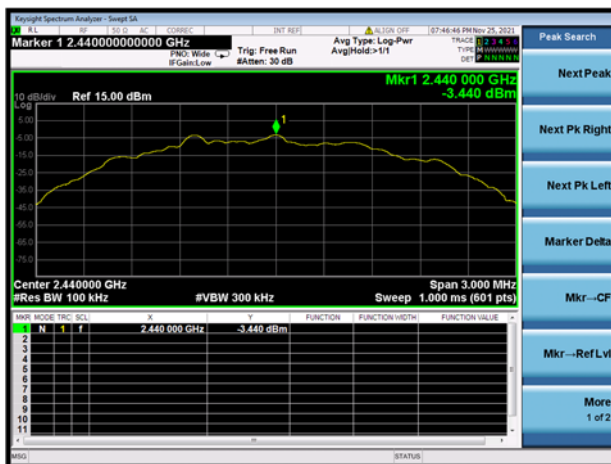
## GFSK (BLE 2Mbps) LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz

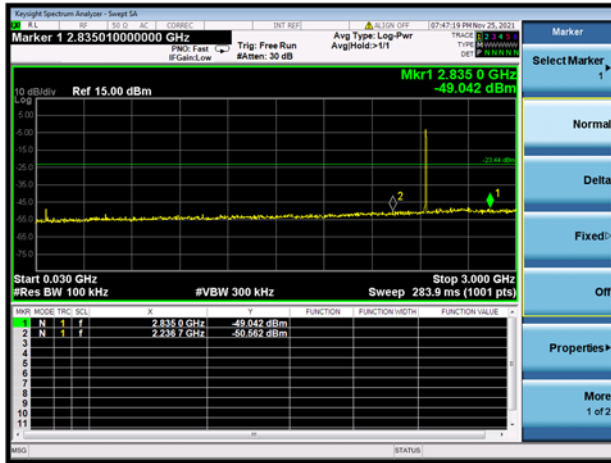


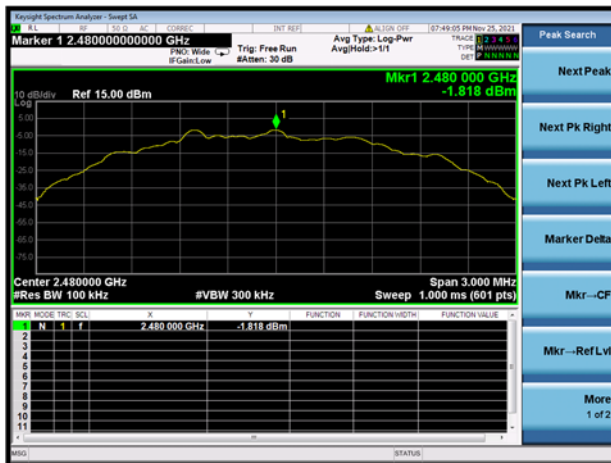
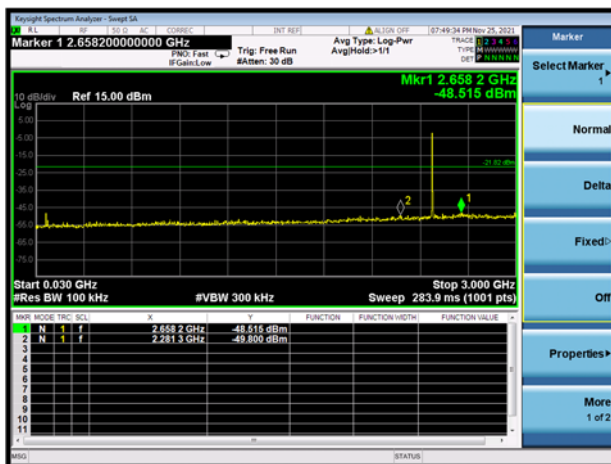
## GFSK (BLE 2Mbps) LOW CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



## 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.

### BLE 1Mbps

Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-48.60	-2.55	-22.55	Pass
High Channel	-56.96	-1.81	-21.81	Pass

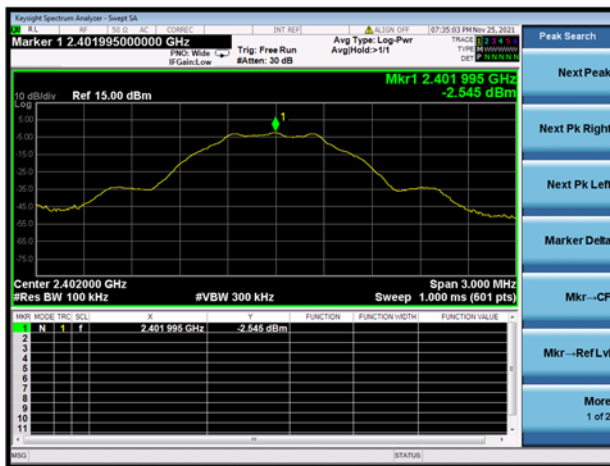
### BLE 2Mbps

Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-46.11	-4.74	-24.74	Pass
High Channel	-57.64	-1.82	-21.82	Pass

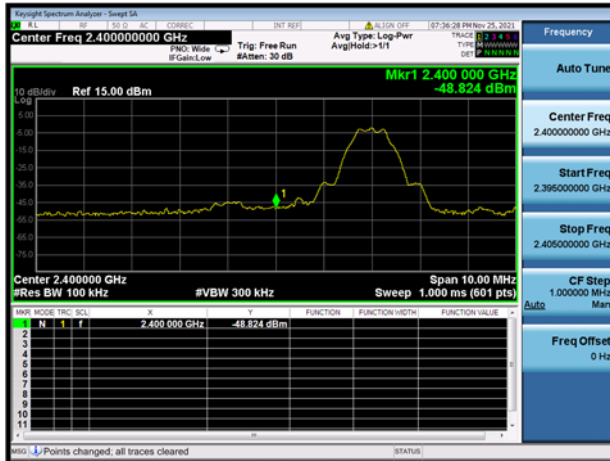
### Test Plots

#### BLE 1Mbps

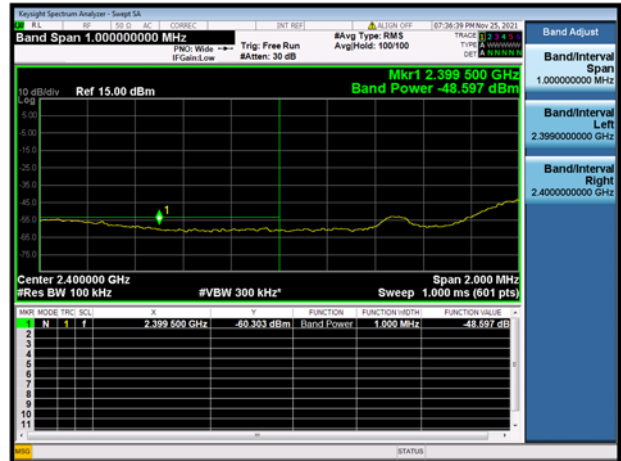
##### LOW CHANNEL, Carrier level



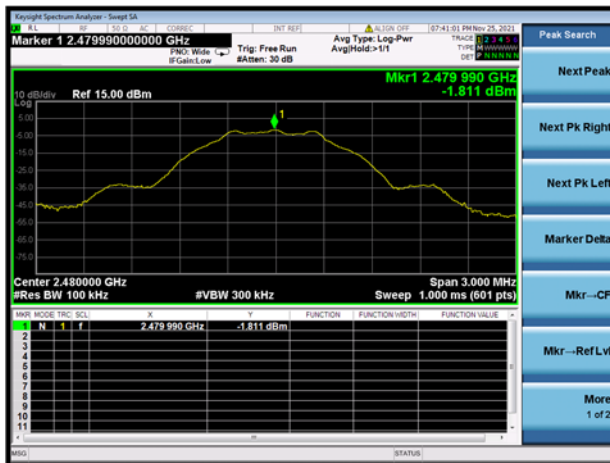
## LOW CHANNEL, Reference level



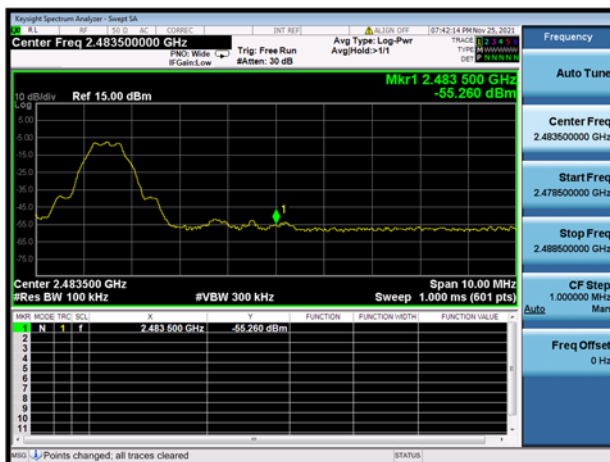
## LOW CHANNEL, Band Edge



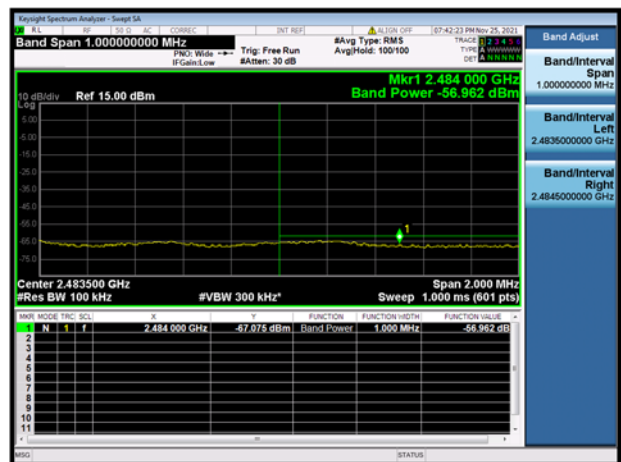
## High CHANNEL, Carrier level



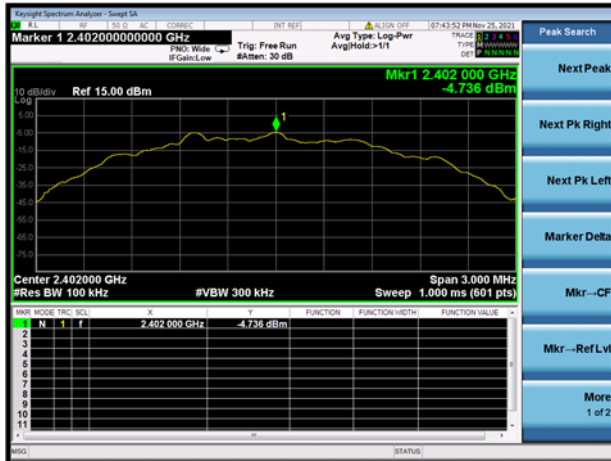
## HIGH CHANNEL, Reference level

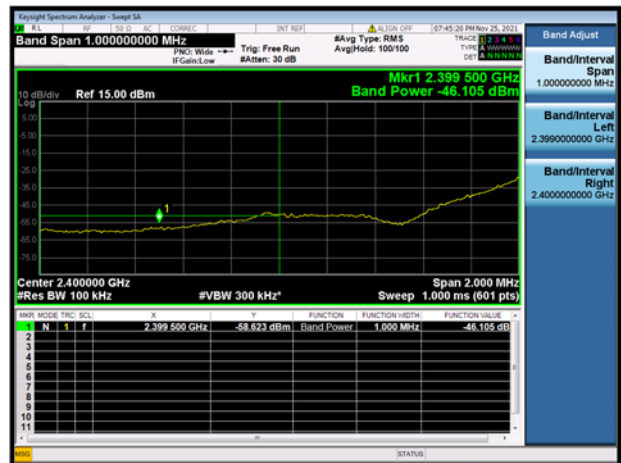
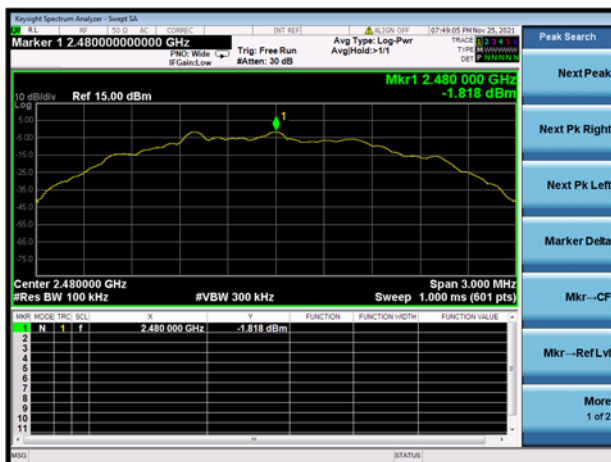


## HIGH CHANNEL, Band Edge



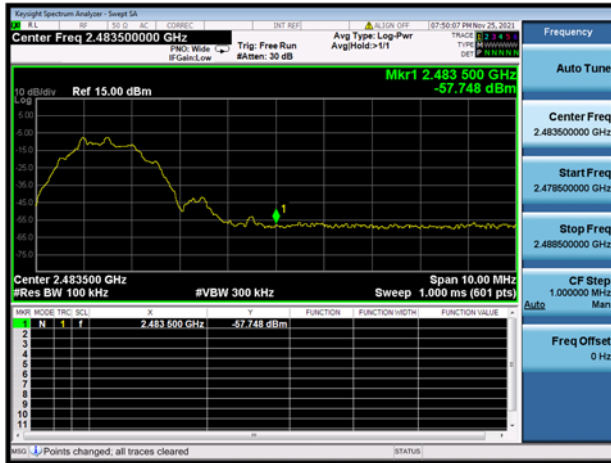


**BLE 2Mbps**
**LOW CHANNEL, Carrier level**

**LOW CHANNEL, Reference level**

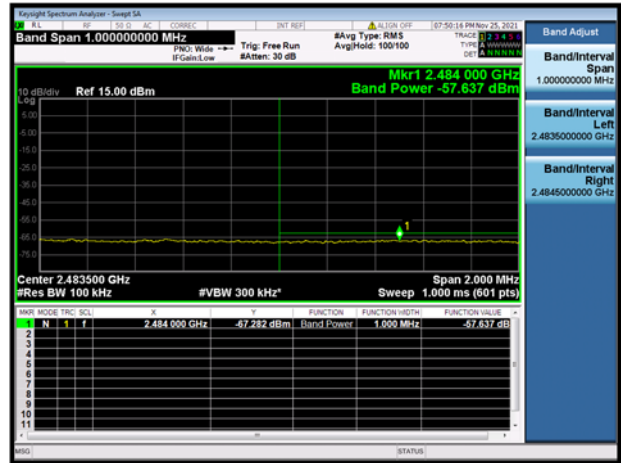
**LOW CHANNEL, Band Edge**

**High CHANNEL, Carrier level**




## HIGH CHANNEL, Reference level



## HIGH CHANNEL, Band Edge



## A.5 Conducted Emissions

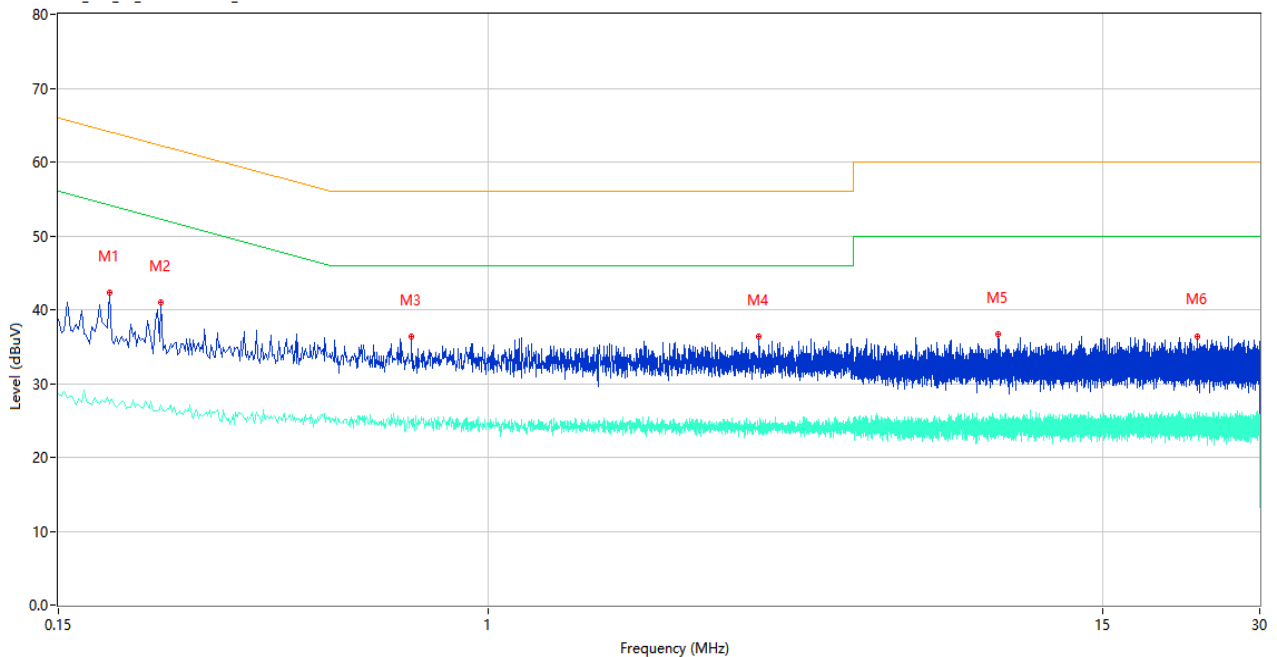
Note<sup>1</sup>: The EUT is working in the Normal link mode. All modes have been tested and normal link mode is worst.  
 Note<sup>2</sup>: Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 60 Hz and 240 VAC, 50 Hz) for which the device 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.

Note<sup>3</sup>: Results (dBuV) = Original reading level of Spectrum Analyzer (dBuV) + Factor (dB)

### Test Data and Plots

#### PHASE L

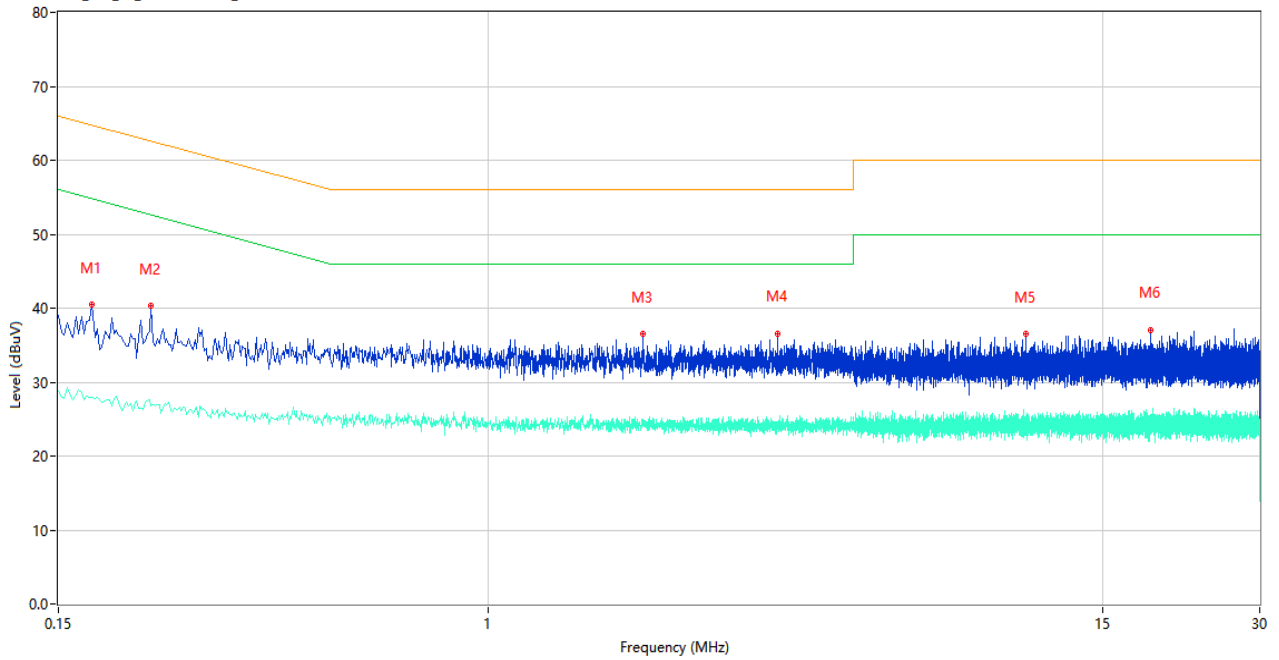
CE Test case\_FCC\_CE\_FCC PART 15B\_Class B



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.188	42.31	10.97	64.12	-21.81	Peak	L	Pass
1**	0.188	27.32	10.97	54.12	-26.80	AV	L	Pass
2	0.236	40.96	10.93	62.24	-21.28	Peak	L	Pass
2**	0.236	27.05	10.93	52.24	-25.19	AV	L	Pass
3	0.712	36.28	10.83	56.00	-19.72	Peak	L	Pass
3**	0.712	25.13	10.83	46.00	-20.87	AV	L	Pass
4	3.296	36.34	10.71	56.00	-19.66	Peak	L	Pass
4**	3.296	24.04	10.71	46.00	-21.96	AV	L	Pass
5	9.446	36.72	10.65	60.00	-23.28	Peak	L	Pass
5**	9.446	25.07	10.65	50.00	-24.93	AV	L	Pass
6	22.838	36.42	10.71	60.00	-23.58	Peak	L	Pass
6**	22.838	25.69	10.71	50.00	-24.31	AV	L	Pass

## PHASE N

CE Test case\_FCC\_CE\_FCC PART 15B\_Class B



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.174	40.43	10.98	64.77	-24.34	Peak	N	Pass
1**	0.174	27.93	10.98	54.77	-26.84	AV	N	Pass
2	0.226	40.32	10.94	62.60	-22.28	Peak	N	Pass
2**	0.226	26.76	10.94	52.60	-25.84	AV	N	Pass
3	1.974	36.56	10.75	56.00	-19.44	Peak	N	Pass
3**	1.974	24.99	10.75	46.00	-21.01	AV	N	Pass
4	3.578	36.48	10.71	56.00	-19.52	Peak	N	Pass
4**	3.578	24.04	10.71	46.00	-21.96	AV	N	Pass
5	10.708	36.59	10.66	60.00	-23.41	Peak	N	Pass
5**	10.708	24.54	10.66	50.00	-25.46	AV	N	Pass
6	18.560	36.98	10.69	60.00	-23.02	Peak	N	Pass
6**	18.560	25.26	10.69	50.00	-24.74	AV	N	Pass

## A.6 Radiated Spurious Emission

Note<sup>1</sup>: The symbol of "--" in the table which means not application.

Note<sup>2</sup>: For the test data above 1 GHz, according the ANSI C63.4-2014, 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.

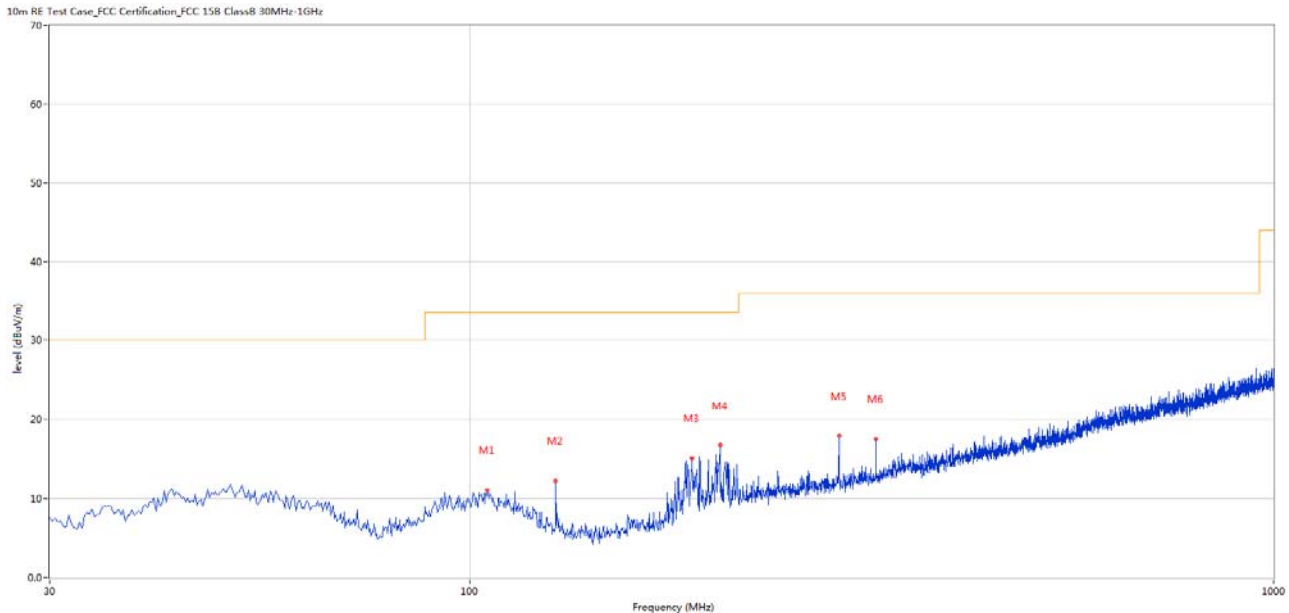
Note<sup>3</sup>: The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

Note<sup>4</sup>: The EUT is working in the Normal link mode below 1 GHz. All modes have been tested and BLE 2M-High channel mode is the worst.

Note<sup>5</sup>: Results (dBuV/m) = Original reading level of Spectrum Analyzer (dBuV/m) + Factor (dB)

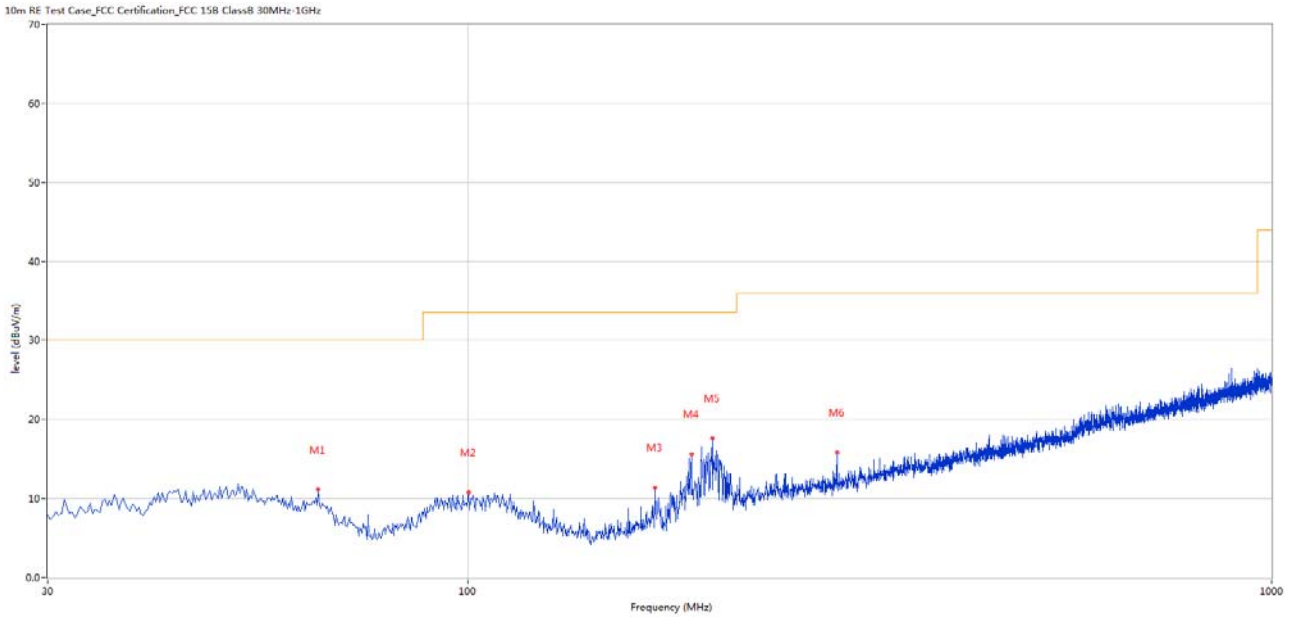
### Test Data and Plots

#### 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	105.156	11.05	-27.77	33.5	-22.45	Peak	356.00	200	Horizontal	Pass
2	127.946	12.21	-31.01	33.5	-21.29	Peak	360.00	200	Horizontal	Pass
3	189.040	15.05	-28.79	33.5	-18.45	Peak	204.00	200	Horizontal	Pass
4	204.799	16.70	-27.82	33.5	-16.80	Peak	360.00	200	Horizontal	Pass
5	287.956	17.88	-25.38	36.0	-18.12	Peak	360.00	200	Horizontal	Pass
6	319.958	17.51	-24.63	36.0	-18.49	Peak	360.00	200	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	65.154	11.16	-28.36	30.0	-18.84	Peak	73.00	200	Vertical	Pass
2	100.307	10.74	-27.97	33.5	-22.76	Peak	4.00	100	Vertical	Pass
3	171.100	11.40	-30.29	33.5	-22.10	Peak	360.00	200	Vertical	Pass
4	189.768	15.62	-28.66	33.5	-17.88	Peak	65.00	100	Vertical	Pass
5	201.405	17.61	-27.75	33.5	-15.89	Peak	161.00	100	Vertical	Pass
6	287.956	15.83	-25.38	36.0	-20.17	Peak	360.00	200	Vertical	Pass

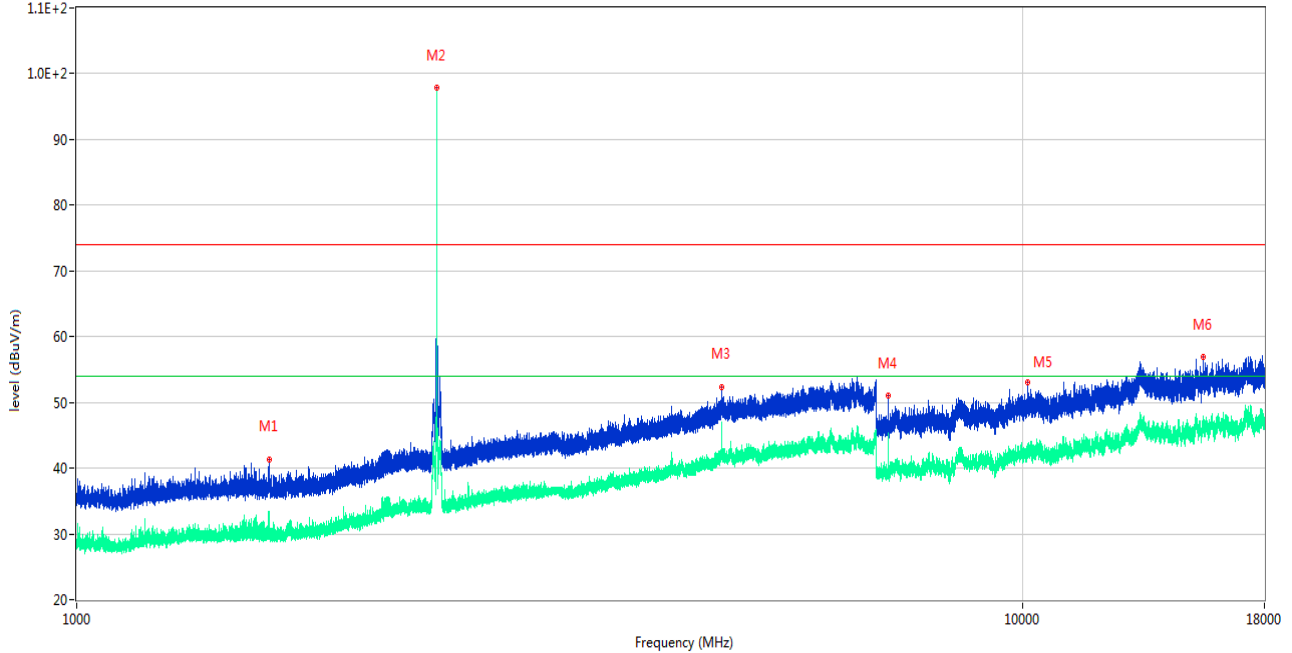
Note 1: The marked spikes near 2400 MHz with circle should be ignored because they are Fundamental signal.

Note 2: The spurious from 18GHz-25GHz is noise only, do not show on the report.

### BLE 1Mbps

#### GFSK LOW CHANNEL 1 GHz to 18 GHz, ANT H

RE Test case\_FCC Part 15C\_FCC 15.247(2.4G)\_1GHz-18GHz

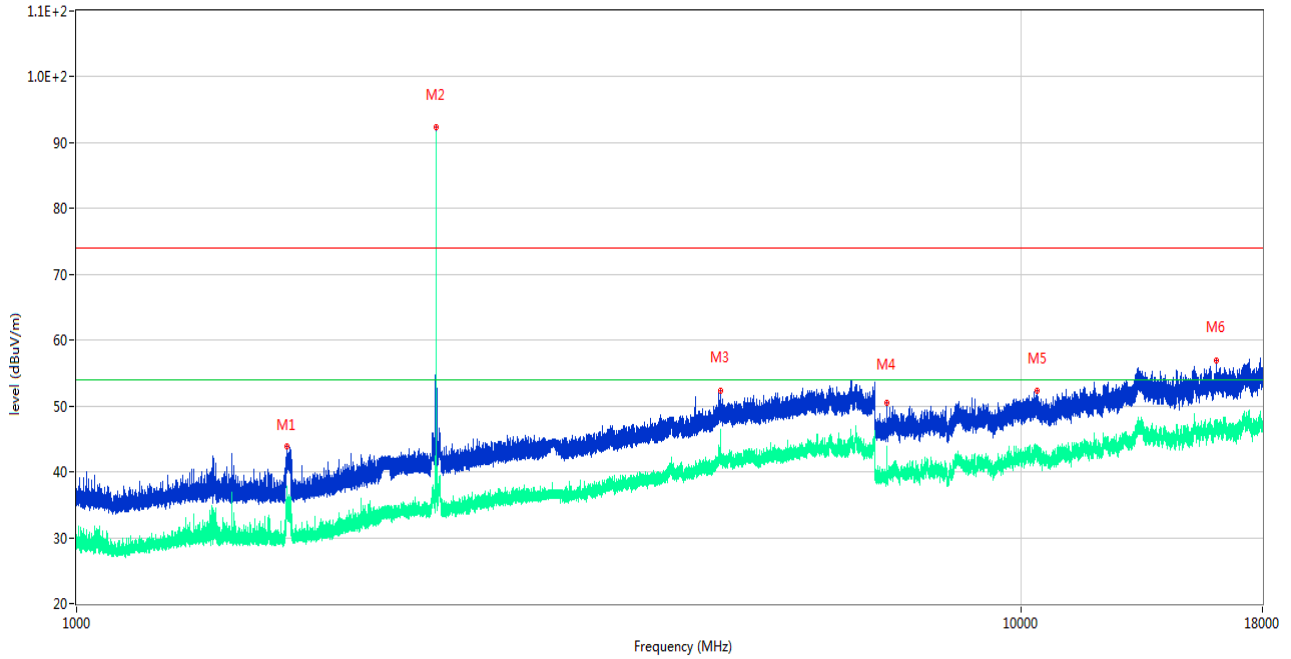


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1596.700	41.39	-17.66	74.0	-32.61	Peak	343.00	150	Horizontal	Pass
1**	1596.700	31.14	-17.66	54.0	-22.86	AV	343.00	150	Horizontal	Pass
2	2401.900	97.79	-12.26	74.0	23.79	Peak	318.00	150	Horizontal	N/A
2**	2401.900	97.35	-12.26	54.0	43.35	AV	318.00	150	Horizontal	N/A
3	4803.200	52.26	-2.68	74.0	-21.74	Peak	143.00	150	Horizontal	Pass
3**	4803.200	44.30	-2.68	54.0	-9.70	AV	143.00	150	Horizontal	Pass
4	7205.850	50.95	-4.33	74.0	-23.05	Peak	50.00	150	Horizontal	Pass
4**	7205.850	45.39	-4.33	54.0	-8.61	AV	50.00	150	Horizontal	Pass
5	10111.612	53.05	-0.02	74.0	-20.95	Peak	289.00	150	Horizontal	Pass
5**	10111.612	42.80	-0.02	54.0	-11.20	AV	289.00	150	Horizontal	Pass
6	15520.162	56.86	1.38	74.0	-17.14	Peak	281.00	150	Horizontal	Pass
6**	15520.162	46.67	1.38	54.0	-7.33	AV	281.00	150	Horizontal	Pass



## GFSK LOW CHANNEL 1 GHz to 18 GHz, ANT V

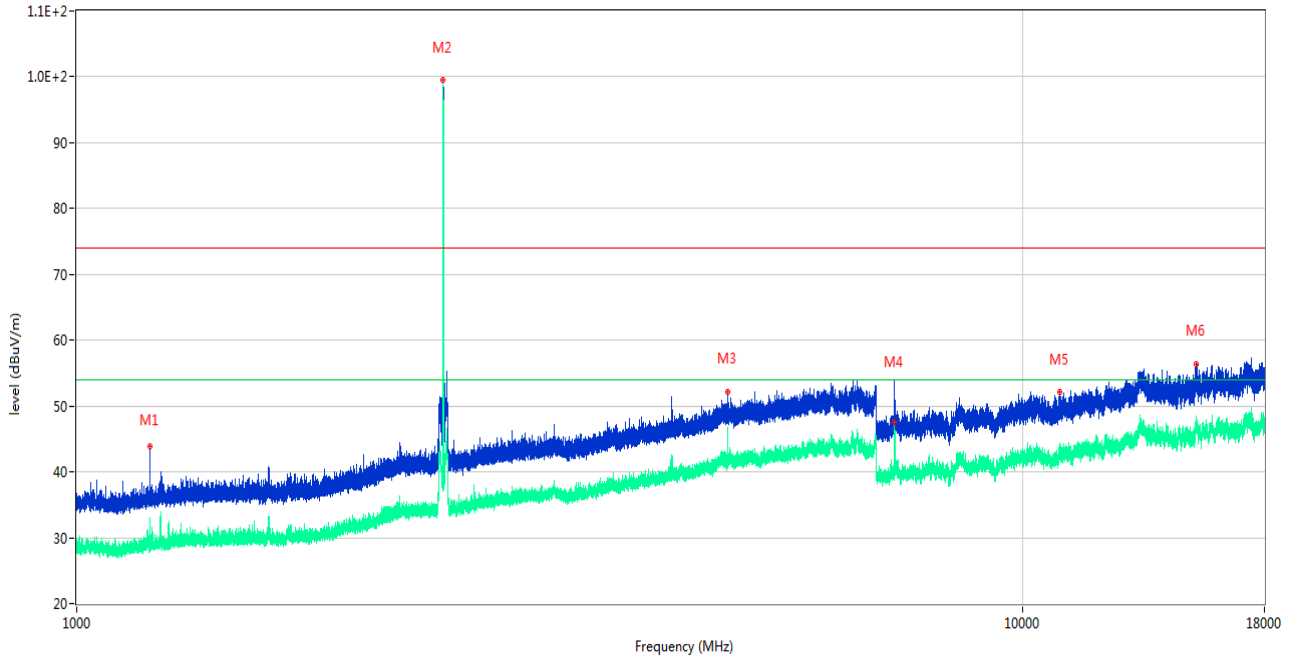
RE Test case\_FCC Part 15C\_FCC 15.247(2.4G)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1670.600	43.89	-17.53	74.0	-30.11	Peak	327.00	150	Vertical	Pass
1**	1670.600	36.22	-17.53	54.0	-17.78	AV	327.00	150	Vertical	Pass
2	2402.300	92.28	-12.27	74.0	18.28	Peak	107.00	150	Vertical	N/A
2**	2402.300	91.08	-12.27	54.0	37.08	AV	107.00	150	Vertical	N/A
3	4804.000	52.40	-2.75	74.0	-21.60	Peak	273.00	150	Vertical	Pass
3**	4804.000	46.24	-2.75	54.0	-7.76	AV	273.00	150	Vertical	Pass
4	7205.850	50.48	-4.33	74.0	-23.52	Peak	360.00	150	Vertical	Pass
4**	7205.850	43.40	-4.33	54.0	-10.60	AV	360.00	150	Vertical	Pass
5	10385.887	52.37	0.11	74.0	-21.63	Peak	360.00	150	Vertical	Pass
5**	10385.887	42.19	0.11	54.0	-11.81	AV	360.00	150	Vertical	Pass
6	16091.362	56.89	1.41	74.0	-17.11	Peak	172.00	150	Vertical	Pass
6**	16091.362	46.62	1.41	54.0	-7.38	AV	172.00	150	Vertical	Pass

## GFSK MIDDLE CHANNEL 1 GHz to 18 GHz, ANT H

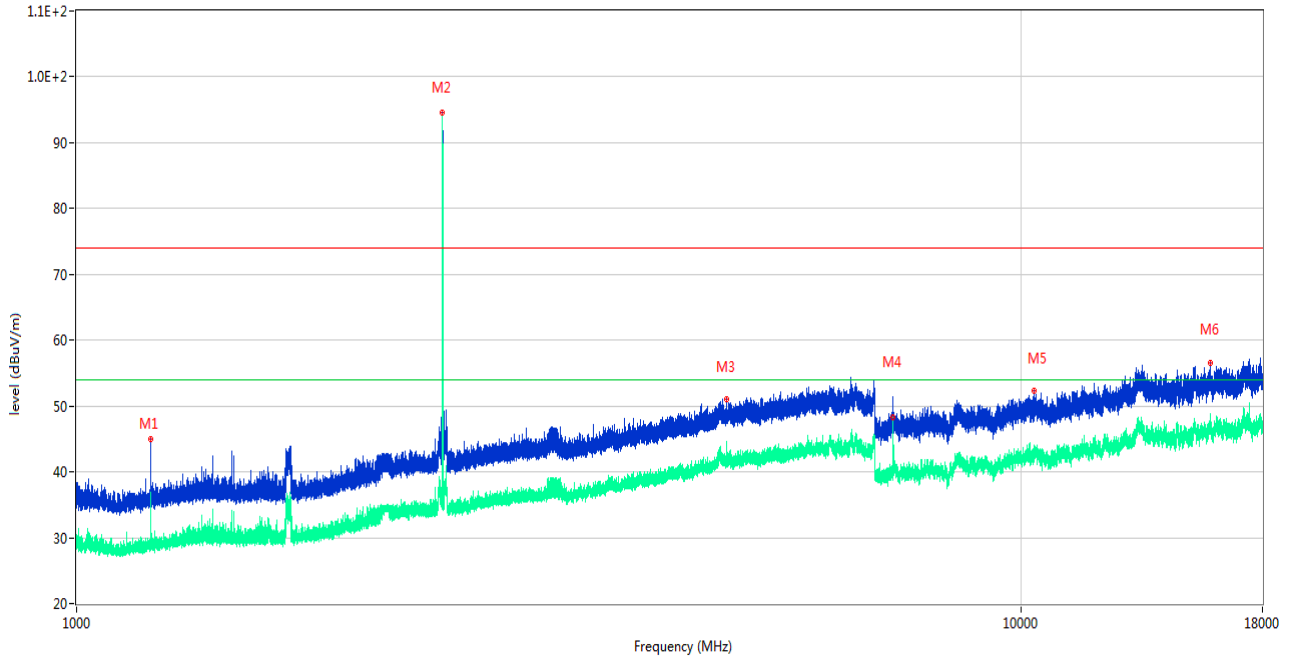
RE Test case\_FCC Part 15C\_FCC 15.247(2.4G)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1195.100	43.88	-17.89	74.0	-30.12	Peak	28.00	150	Horizontal	Pass
1**	1195.100	33.02	-17.89	54.0	-20.98	AV	28.00	150	Horizontal	Pass
2	2439.600	99.57	-12.64	74.0	25.57	Peak	28.00	150	Horizontal	N/A
2**	2439.600	97.26	-12.64	54.0	43.26	AV	28.00	150	Horizontal	N/A
3	4879.400	52.23	-3.43	74.0	-21.77	Peak	91.00	150	Horizontal	Pass
3**	4879.400	44.66	-3.43	54.0	-9.34	AV	91.00	150	Horizontal	Pass
4	7319.700	51.46	-3.68	74.0	-22.54	Peak	67.00	150	Horizontal	Pass
4**	7319.700	47.53	-3.68	54.0	-6.47	AV	67.00	150	Horizontal	Pass
5	10939.037	52.16	-0.05	74.0	-21.84	Peak	335.00	150	Horizontal	Pass
5**	10939.037	44.35	-0.05	54.0	-9.65	AV	335.00	150	Horizontal	Pass
6	15235.350	56.34	1.02	74.0	-17.66	Peak	281.00	150	Horizontal	Pass
6**	15235.350	46.82	1.02	54.0	-7.18	AV	281.00	150	Horizontal	Pass

## GFSK MIDDLE CHANNEL 1 GHz to 18 GHz, ANT V

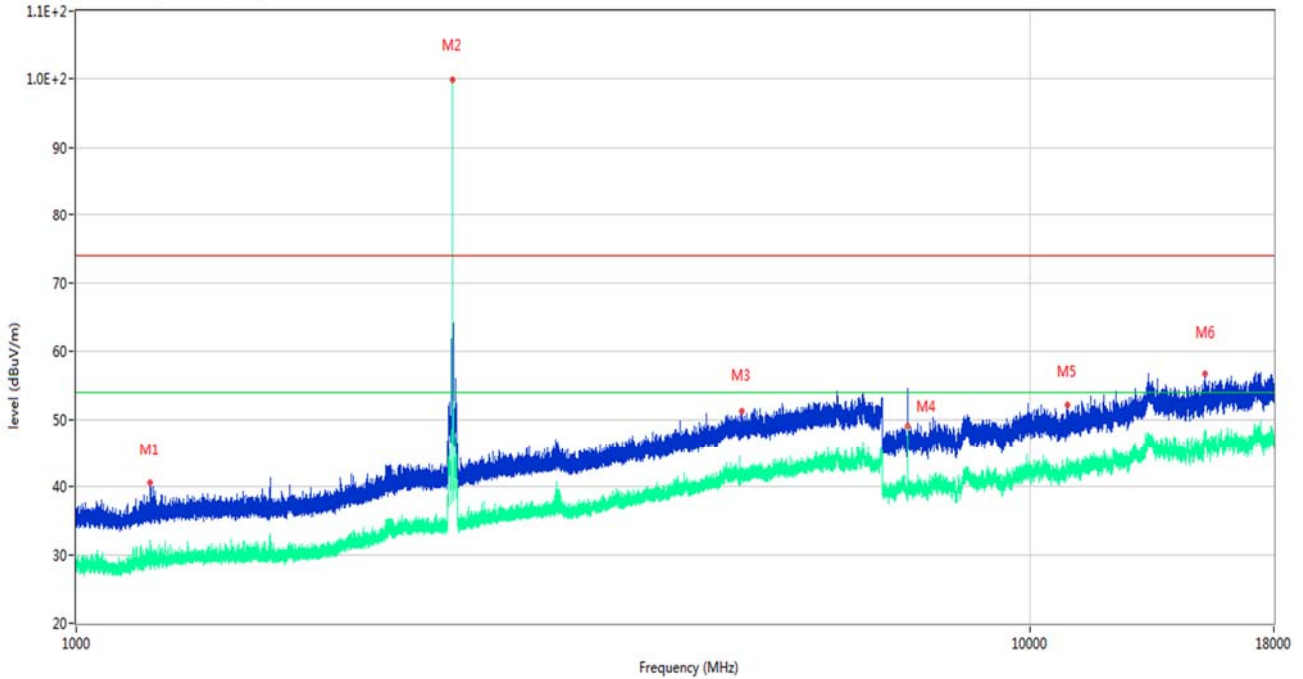
RE Test case\_FCC Part 15C\_FCC 15.247(2.4G)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1197.600	44.96	-17.88	74.0	-29.04	Peak	83.00	150	Vertical	Pass
1**	1197.600	28.00	-17.88	54.0	-26.00	AV	83.00	150	Vertical	Pass
2	2439.700	94.61	-12.64	74.0	20.61	Peak	108.00	150	Vertical	N/A
2**	2439.700	93.03	-12.64	54.0	39.03	AV	108.00	150	Vertical	N/A
3	4879.600	51.13	-3.43	74.0	-22.87	Peak	224.00	150	Vertical	Pass
3**	4879.600	42.58	-3.43	54.0	-11.42	AV	224.00	150	Vertical	Pass
4	7319.700	51.29	-3.68	74.0	-22.71	Peak	198.00	150	Vertical	Pass
4**	7319.700	48.28	-3.68	54.0	-5.72	AV	198.00	150	Vertical	Pass
5	10316.599	52.34	-0.25	74.0	-21.66	Peak	360.00	150	Vertical	Pass
5**	10316.599	43.36	-0.25	54.0	-10.64	AV	360.00	150	Vertical	Pass
6	15840.151	56.46	1.44	74.0	-17.54	Peak	49.00	150	Vertical	Pass
6**	15840.151	47.24	1.44	54.0	-6.76	AV	49.00	150	Vertical	Pass

## GFSK HIGH CHANNEL 1 GHz to 18 GHz, ANT H

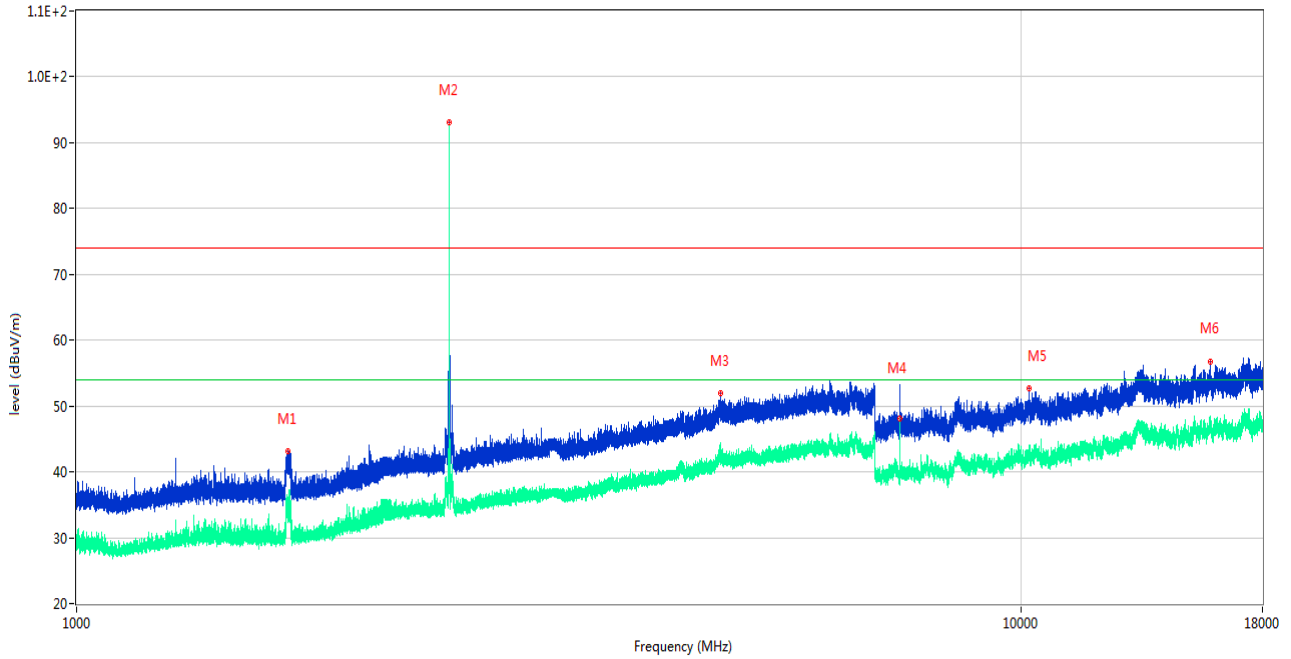
RE Test case\_FCC Part 15C\_FCC 15.247(2.4G)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1195.900	40.65	-17.92	74.0	-33.35	Peak	35.00	150	Horizontal	Pass
1**	1195.900	28.68	-17.92	54.0	-25.32	AV	35.00	150	Horizontal	Pass
2	2480.200	99.83	-12.43	74.0	25.83	Peak	35.00	150	Horizontal	N/A
2**	2480.200	99.26	-12.43	54.0	45.26	AV	35.00	150	Horizontal	N/A
3	4990.000	51.15	-2.89	74.0	-22.85	Peak	38.00	150	Horizontal	Pass
3**	4990.000	41.22	-2.89	54.0	-12.78	AV	38.00	150	Horizontal	Pass
4	7441.025	53.56	-4.30	74.0	-20.44	Peak	250.00	150	Horizontal	Pass
4**	7441.025	49.568	-4.30	54.0	-4.432	AV	250.00	150	Horizontal	Pass
5	10929.263	52.06	0.10	74.0	-21.94	Peak	13.00	150	Horizontal	Pass
5**	10929.263	43.03	0.10	54.0	-10.97	AV	13.00	150	Horizontal	Pass
6	15239.550	56.75	0.96	74.0	-17.25	Peak	219.00	150	Horizontal	Pass
6**	15239.550	47.71	0.96	54.0	-6.29	AV	219.00	150	Horizontal	Pass

## GFSK HIGH CHANNEL 1 GHz to 18 GHz, ANT V

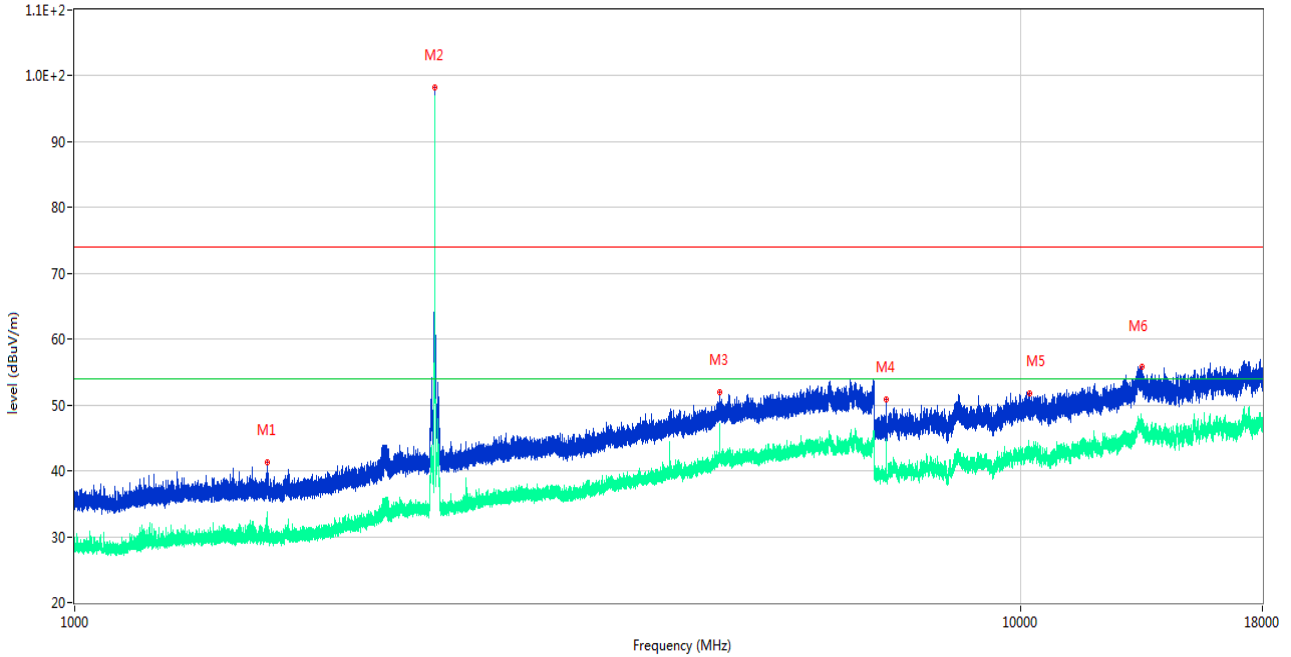
RE Test case\_FCC Part 15C\_FCC 15.247(2.4G)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1675.400	43.18	-17.41	74.0	-30.82	Peak	316.00	150	Vertical	Pass
1**	1675.400	33.11	-17.41	54.0	-20.89	AV	316.00	150	Vertical	Pass
2	2479.800	93.03	-12.43	74.0	19.03	Peak	111.00	150	Vertical	N/A
2**	2479.800	91.53	-12.43	54.0	37.53	AV	111.00	150	Vertical	N/A
3	4799.800	51.87	-2.55	74.0	-22.13	Peak	159.00	150	Vertical	Pass
3**	4799.800	42.55	-2.55	54.0	-11.45	AV	159.00	150	Vertical	Pass
4	7439.587	51.76	-4.38	74.0	-22.24	Peak	209.00	150	Vertical	Pass
4**	7439.587	48.06	-4.38	54.0	-5.94	AV	209.00	150	Vertical	Pass
5	10189.237	52.70	0.26	74.0	-21.30	Peak	209.00	150	Vertical	Pass
5**	10189.237	42.60	0.26	54.0	-11.40	AV	209.00	150	Vertical	Pass
6	15854.588	56.81	1.20	74.0	-17.19	Peak	240.00	150	Vertical	Pass
6**	15854.588	46.93	1.20	54.0	-7.07	AV	240.00	150	Vertical	Pass

**BLE 2Mbps**
**GFSK LOW CHANNEL 1 GHz to 18 GHz, ANT H**

RE Test case\_FCC Part 15C\_FCC 15.247(2.4G)\_1GHz-18GHz

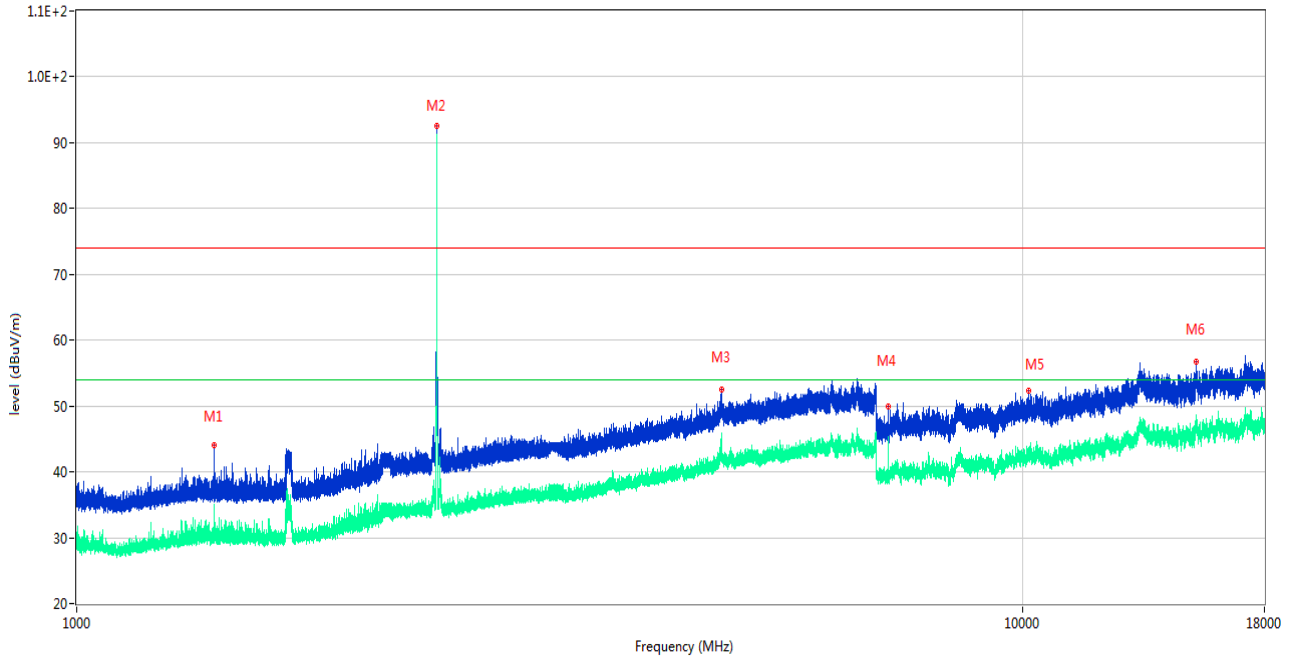


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1596.700	41.32	-17.66	74.0	-32.68	Peak	29.00	150	Horizontal	Pass
1**	1596.700	31.70	-17.66	54.0	-22.30	AV	29.00	150	Horizontal	Pass
2	2402.600	98.19	-12.27	74.0	24.19	Peak	315.00	150	Horizontal	N/A
2**	2402.600	94.96	-12.27	54.0	40.96	AV	315.00	150	Horizontal	N/A
3	4802.800	51.99	-2.64	74.0	-22.01	Peak	47.00	150	Horizontal	Pass
3**	4802.800	43.51	-2.64	54.0	-10.49	AV	47.00	150	Horizontal	Pass
4	7204.412	50.82	-4.16	74.0	-23.18	Peak	105.00	150	Horizontal	Pass
4**	7204.412	42.92	-4.16	54.0	-11.08	AV	105.00	150	Horizontal	Pass
5	10211.951	51.73	0.21	74.0	-22.27	Peak	304.00	150	Horizontal	Pass
5**	10211.951	43.28	0.21	54.0	-10.72	AV	304.00	150	Horizontal	Pass
6	13413.599	55.88	0.44	74.0	-18.12	Peak	261.00	150	Horizontal	Pass
6**	13413.599	46.50	0.44	54.0	-7.50	AV	261.00	150	Horizontal	Pass



## GFSK LOW CHANNEL 1 GHz to 18 GHz, ANT V

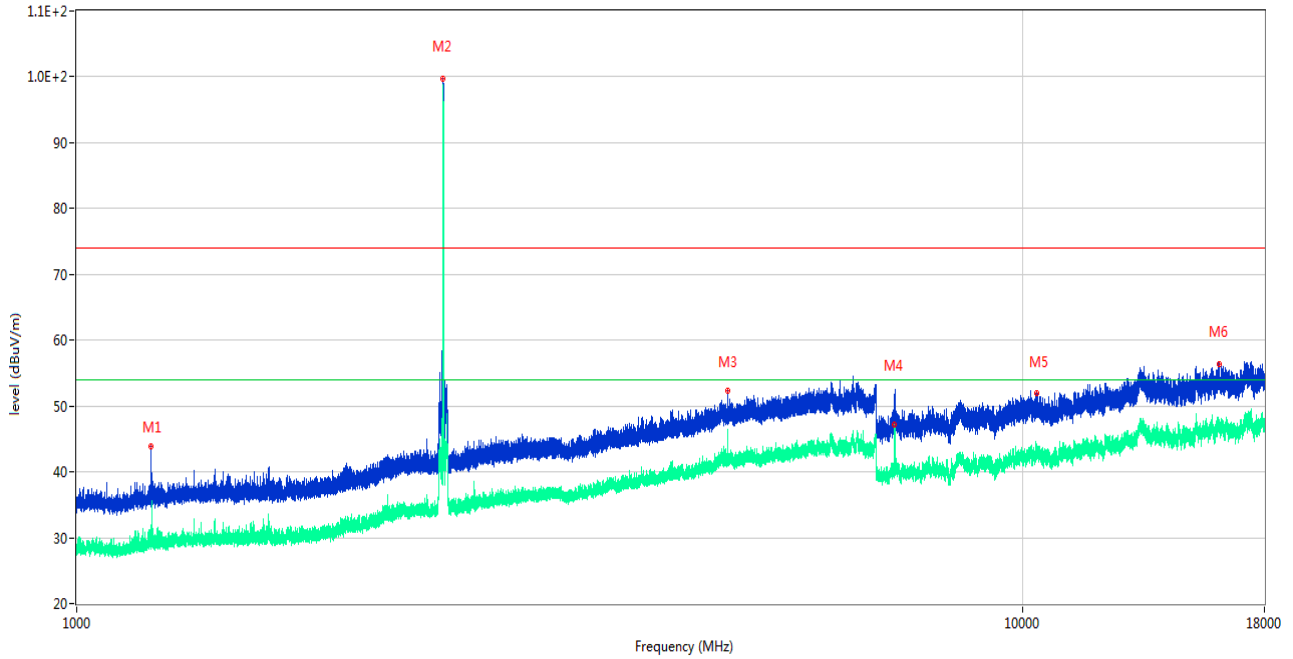
RE Test case\_FCC Part 15C\_FCC 15.247(2.4G)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1395.600	44.10	-17.51	74.0	-29.90	Peak	128.00	150	Vertical	Pass
1**	1395.600	32.02	-17.51	54.0	-21.98	AV	128.00	150	Vertical	Pass
2	2401.600	92.48	-12.26	74.0	18.48	Peak	111.00	150	Vertical	N/A
2**	2401.600	89.47	-12.26	54.0	35.47	AV	111.00	150	Vertical	N/A
3	4803.600	52.43	-2.71	74.0	-21.57	Peak	259.00	150	Vertical	Pass
3**	4803.600	43.86	-2.71	54.0	-10.14	AV	259.00	150	Vertical	Pass
4	7205.850	49.85	-4.33	74.0	-24.15	Peak	0.00	150	Vertical	Pass
4**	7205.850	41.93	-4.33	54.0	-12.07	AV	0.00	150	Vertical	Pass
5	10151.287	52.29	-0.04	74.0	-21.71	Peak	122.00	150	Vertical	Pass
5**	10151.287	43.12	-0.04	54.0	-10.88	AV	122.00	150	Vertical	Pass
6	15237.975	56.73	0.98	74.0	-17.27	Peak	179.00	150	Vertical	Pass
6**	15237.975	47.24	0.98	54.0	-6.76	AV	179.00	150	Vertical	Pass

## GFSK MIDDLE CHANNEL 1 GHz to 18 GHz, ANT H

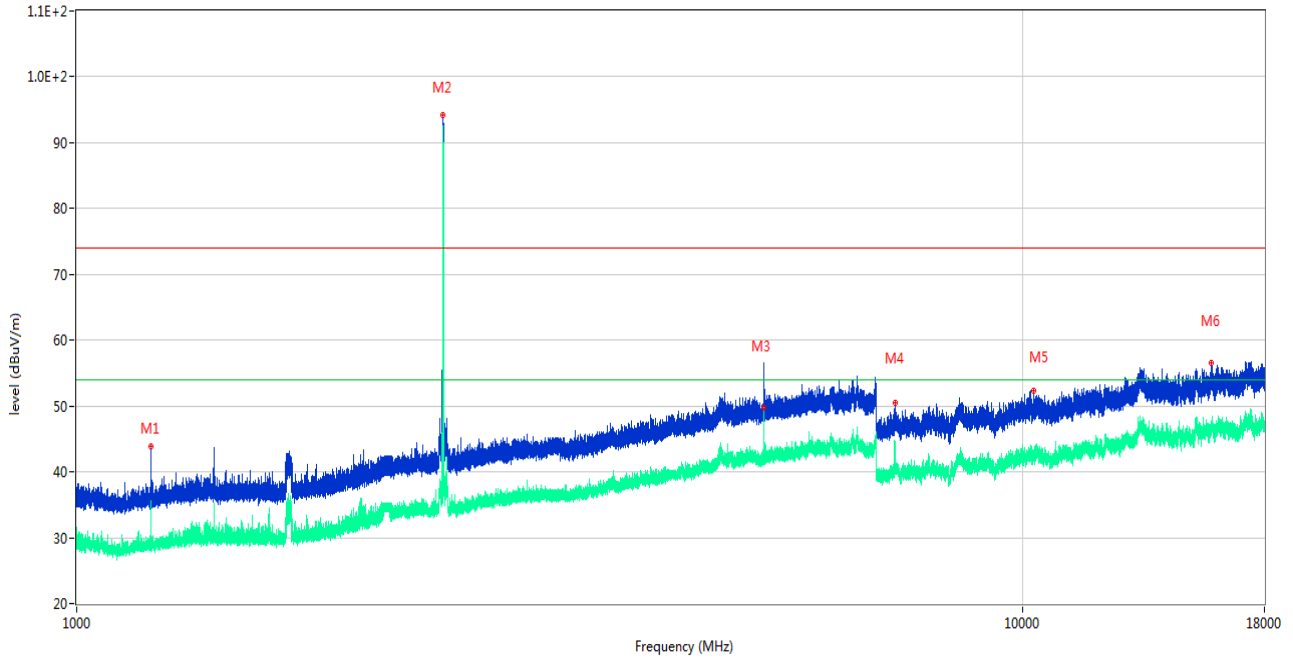
RE Test case\_FCC Part 15C\_FCC 15.247(2.4G)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1199.400	43.81	-17.82	74.0	-30.19	Peak	47.00	150	Horizontal	Pass
1**	1199.400	28.37	-17.82	54.0	-25.63	AV	47.00	150	Horizontal	Pass
2	2439.500	99.63	-12.64	74.0	25.63	Peak	31.00	150	Horizontal	N/A
2**	2439.500	96.58	-12.64	54.0	42.58	AV	31.00	150	Horizontal	N/A
3	4879.800	52.30	-3.43	74.0	-21.70	Peak	120.00	150	Horizontal	Pass
3**	4879.800	45.82	-3.43	54.0	-8.18	AV	120.00	150	Horizontal	Pass
4	7319.125	50.28	-3.67	74.0	-23.72	Peak	68.00	150	Horizontal	Pass
4**	7319.125	47.22	-3.67	54.0	-6.78	AV	68.00	150	Horizontal	Pass
5	10336.437	51.93	0.07	74.0	-22.07	Peak	87.00	150	Horizontal	Pass
5**	10336.437	42.80	0.07	54.0	-11.20	AV	87.00	150	Horizontal	Pass
6	16139.662	56.38	1.03	74.0	-17.62	Peak	135.00	150	Horizontal	Pass
6**	16139.662	46.75	1.03	54.0	-7.25	AV	135.00	150	Horizontal	Pass

## GFSK MIDDLE CHANNEL 1 GHz to 18 GHz, ANT V

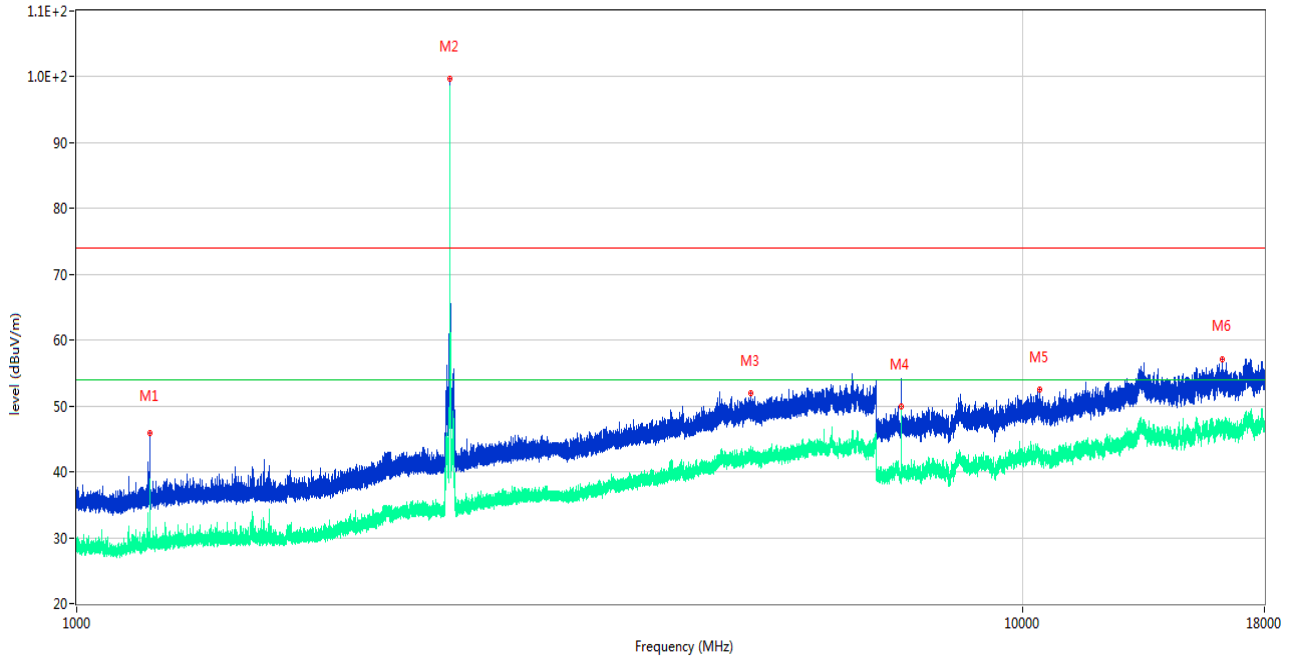
RE Test case\_FCC Part 15C\_FCC 15.247(2.4G)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1198.500	43.88	-17.82	74.0	-30.12	Peak	78.00	150	Vertical	Pass
1**	1198.500	28.84	-17.82	54.0	-25.16	AV	78.00	150	Vertical	Pass
2	2439.500	94.15	-12.64	74.0	20.15	Peak	103.00	150	Vertical	N/A
2**	2439.500	90.11	-12.64	54.0	36.11	AV	103.00	150	Vertical	N/A
3	5320.600	51.51	-2.78	74.0	-22.49	Peak	175.00	150	Vertical	Pass
3**	5320.600	49.81	-2.78	54.0	-4.19	AV	175.00	150	Vertical	Pass
4	7321.713	50.50	-3.65	74.0	-23.50	Peak	360.00	150	Vertical	Pass
4**	7321.713	43.40	-3.65	54.0	-10.60	AV	360.00	150	Vertical	Pass
5	10260.250	52.28	0.59	74.0	-21.72	Peak	212.00	150	Vertical	Pass
5**	10260.250	42.24	0.59	54.0	-11.76	AV	212.00	150	Vertical	Pass
6	15816.787	56.63	1.99	74.0	-17.37	Peak	0.00	150	Vertical	Pass
6**	15816.787	46.58	1.99	54.0	-7.42	AV	0.00	150	Vertical	Pass

## GFSK HIGH CHANNEL 1 GHz to 18 GHz, ANT H

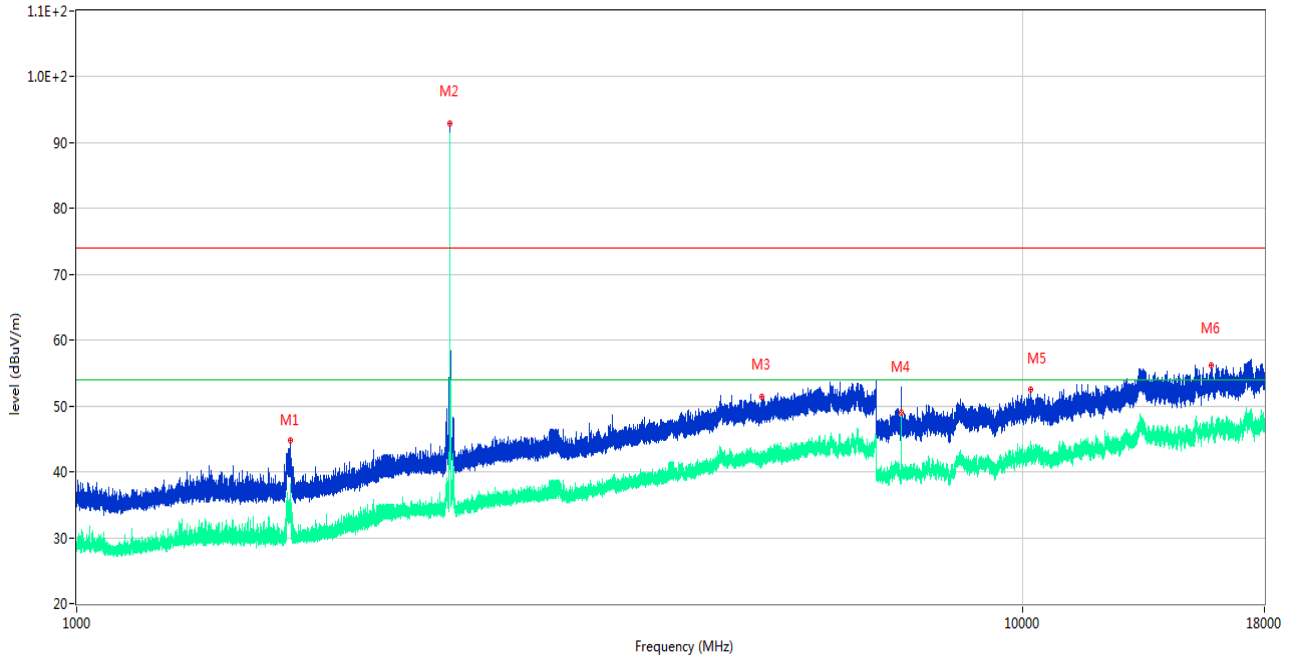
RE Test case\_FCC Part 15C\_FCC 15.247(2.4G)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1194.800	45.88	-17.88	74.0	-28.12	Peak	4.00	150	Horizontal	Pass
1**	1194.800	28.70	-17.88	54.0	-25.30	AV	4.00	150	Horizontal	Pass
2	2479.400	99.78	-12.44	74.0	25.78	Peak	28.00	150	Horizontal	N/A
2**	2479.400	97.63	-12.44	54.0	43.63	AV	28.00	150	Horizontal	N/A
3	5157.600	51.94	-2.82	74.0	-22.06	Peak	336.00	150	Horizontal	Pass
3**	5157.600	41.17	-2.82	54.0	-12.83	AV	336.00	150	Horizontal	Pass
4	7438.437	52.95	-4.34	74.0	-21.05	Peak	139.00	150	Horizontal	Pass
4**	7438.437	49.98	-4.34	54.0	-4.02	AV	139.00	150	Horizontal	Pass
5	10423.838	52.54	0.03	74.0	-21.46	Peak	282.00	150	Horizontal	Pass
5**	10423.838	43.09	0.03	54.0	-10.91	AV	282.00	150	Horizontal	Pass
6	16259.888	57.17	1.24	74.0	-16.83	Peak	0.00	150	Horizontal	Pass
6**	16259.888	46.93	1.24	54.0	-7.07	AV	0.00	150	Horizontal	Pass

## GFSK HIGH CHANNEL 1 GHz to 18 GHz, ANT V

RE Test case\_FCC Part 15C\_FCC 15.247(2.4G)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1682.800	44.83	-17.40	74.0	-29.17	Peak	313.00	150	Vertical	Pass
1**	1682.800	34.32	-17.40	54.0	-19.68	AV	313.00	150	Vertical	Pass
2	2479.600	92.83	-12.44	74.0	18.83	Peak	111.00	150	Vertical	N/A
2**	2479.600	90.24	-12.44	54.0	36.24	AV	111.00	150	Vertical	N/A
3	5297.000	51.43	-3.29	74.0	-22.57	Peak	0.00	150	Vertical	Pass
3**	5297.000	41.50	-3.29	54.0	-12.50	AV	0.00	150	Vertical	Pass
4	7439.013	50.87	-4.36	74.0	-23.13	Peak	210.00	150	Vertical	Pass
4**	7439.013	48.95	-4.36	54.0	-5.05	AV	210.00	150	Vertical	Pass
5	10184.637	52.56	0.15	74.0	-21.44	Peak	336.00	150	Vertical	Pass
5**	10184.637	42.97	0.15	54.0	-11.03	AV	336.00	150	Vertical	Pass
6	15833.588	56.12	1.46	74.0	-17.88	Peak	219.00	150	Vertical	Pass
6**	15833.588	46.92	1.46	54.0	-7.08	AV	219.00	150	Vertical	Pass

## A.7 Band Edge (Restricted-band band-edge)

Note<sup>1</sup>: The lowest and highest channels are tested to verify the band edge emissions. Please refer to the following the plots for emissions values.

Note<sup>2</sup>: The test data all are tested in the vertical and horizontal antenna which the trace is max hold. So these plots have shown the worst case.

Note<sup>3</sup>: According the ANSI C63.10-2013, 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.

Note<sup>4</sup>: The Level (dBuV/m) has been corrected by factor.

### Test Data

#### BLE 1Mbps

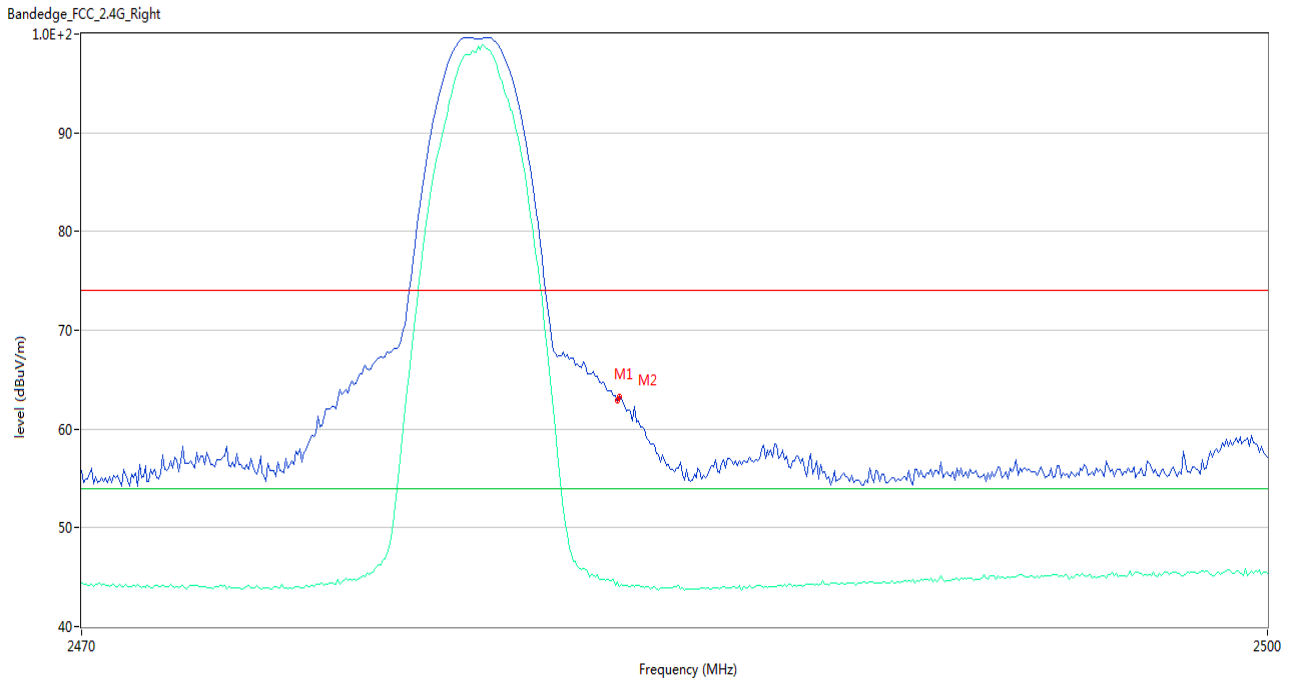
#### LOW CHANNEL



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2390.000	54.34	-0.50	74.0	-19.66	Peak	301.00	150	Horizontal	Pass
1**	2390.000	44.22	-0.50	54.0	-9.78	AV	301.00	150	Horizontal	Pass
2	2385.833	56.65	-0.60	74.0	-17.35	Peak	301.00	150	Horizontal	Pass
2**	2385.833	44.66	-0.60	54.0	-9.34	AV	301.00	150	Horizontal	Pass



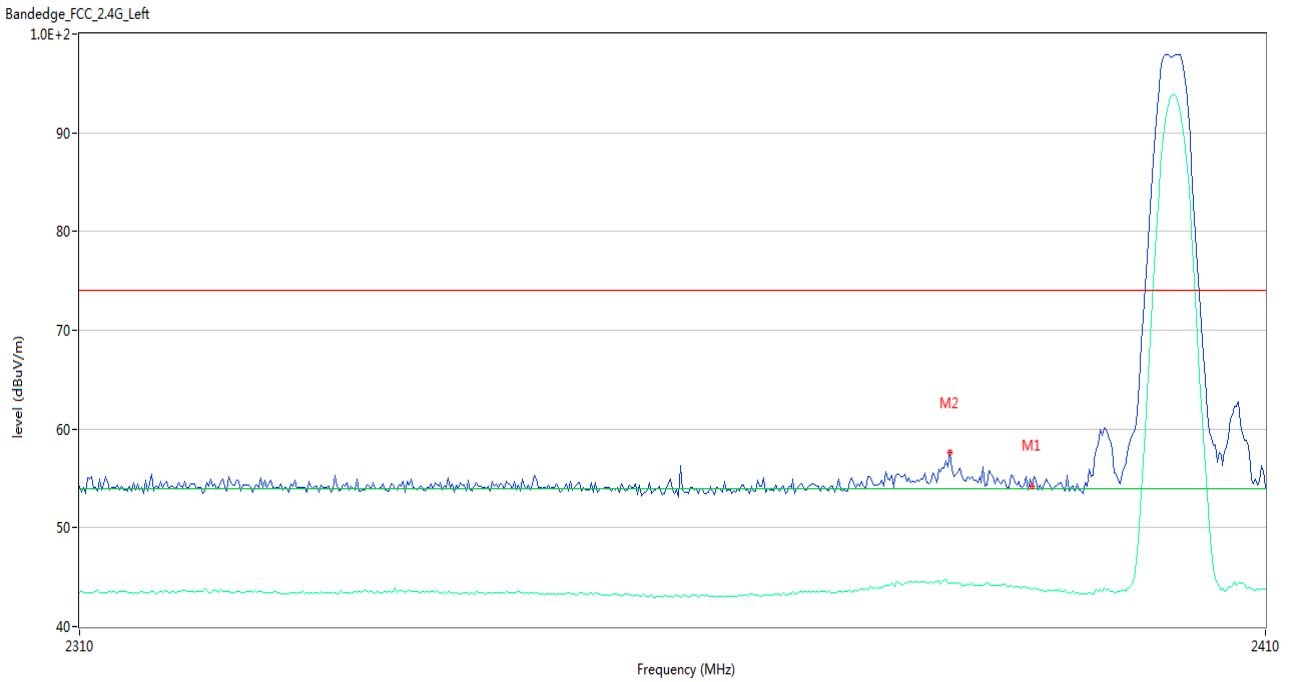
## HIGH CHANNEL



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.500	62.85	-0.36	74.0	-11.15	Peak	66.00	150	Horizontal	Pass
1**	2483.500	44.54	-0.36	54.0	-9.46	AV	66.00	150	Horizontal	Pass
2	2483.550	63.29	-0.36	74.0	-10.71	Peak	27.00	150	Horizontal	Pass
2**	2483.550	44.06	-0.36	54.0	-9.94	AV	27.00	150	Horizontal	Pass

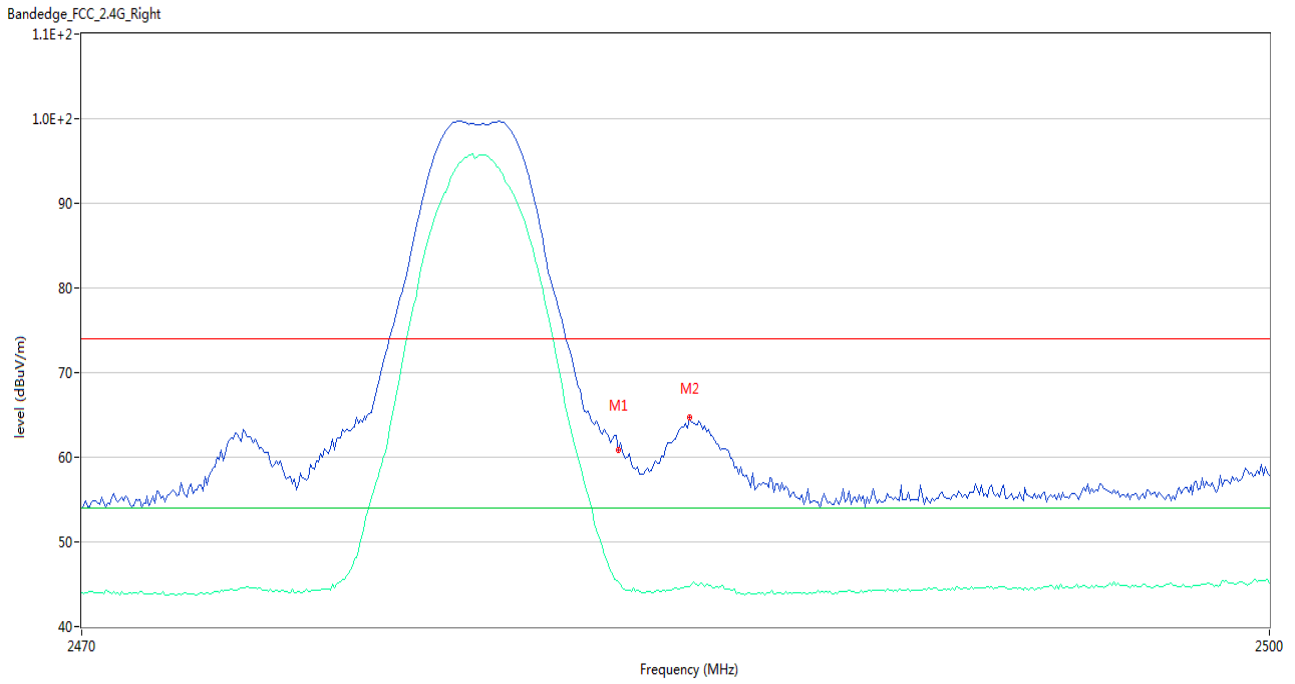
**BLE 2Mbps**

**LOW CHANNEL**



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2390.000	54.16	-0.50	74.0	-19.84	Peak	12.00	150	Horizontal	Pass
1**	2390.000	43.69	-0.50	54.0	-10.31	AV	12.00	150	Horizontal	Pass
2	2383.000	57.68	-0.62	74.0	-16.32	Peak	321.00	150	Horizontal	Pass
2**	2383.000	44.46	-0.62	54.0	-9.54	AV	321.00	150	Horizontal	Pass

## HIGH CHANNEL



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.500	60.91	-0.36	74.0	-13.09	Peak	70.00	150	Horizontal	Pass
1**	2483.500	45.25	-0.36	54.0	-8.75	AV	70.00	150	Horizontal	Pass
2	2485.300	64.72	-0.34	74.0	-9.28	Peak	28.00	150	Horizontal	Pass
2**	2485.300	44.78	-0.34	54.0	-9.22	AV	28.00	150	Horizontal	Pass

## A.8 Power Spectral Density (PSD)

### Test Data

#### BLE 1Mbps

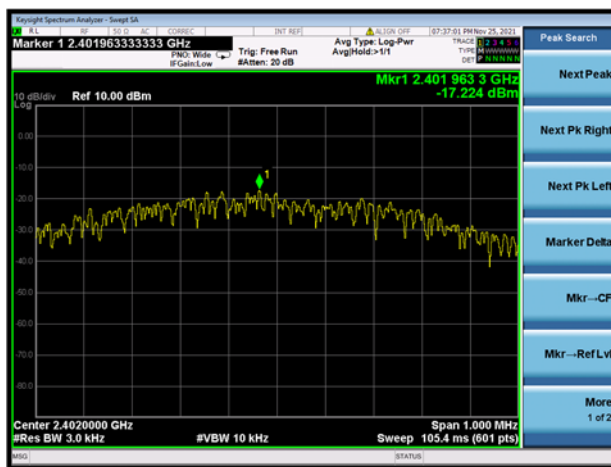
Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
Low Channel	-17.22	8	Pass
Middle Channel	-18.13	8	Pass
High Channel	-16.88	8	Pass

#### BLE 2Mbps

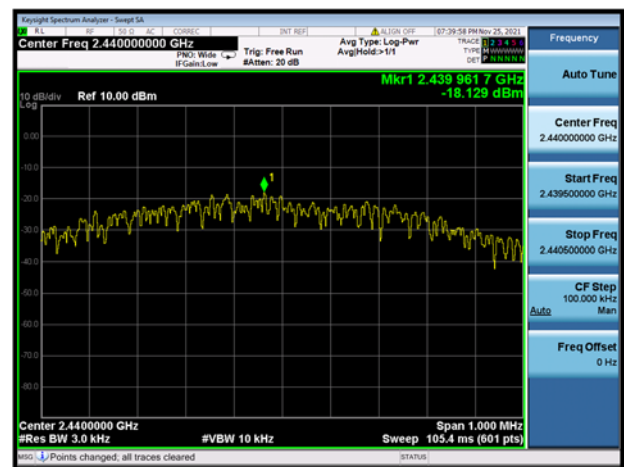
Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
Low Channel	-22.65	8	Pass
Middle Channel	-21.47	8	Pass
High Channel	-19.81	8	Pass

### Test plots

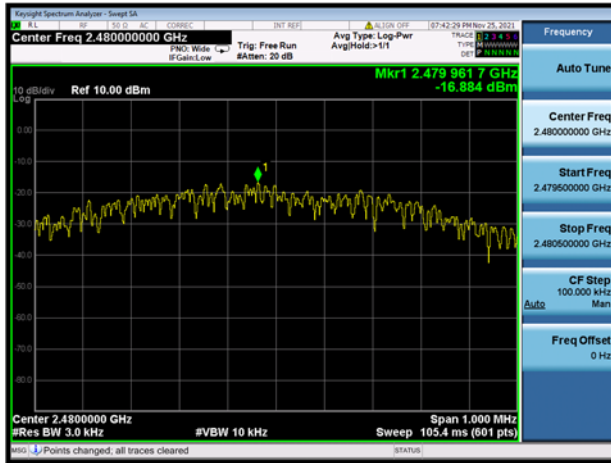
GFSK (BLE 1Mbps) LOW CHANNEL



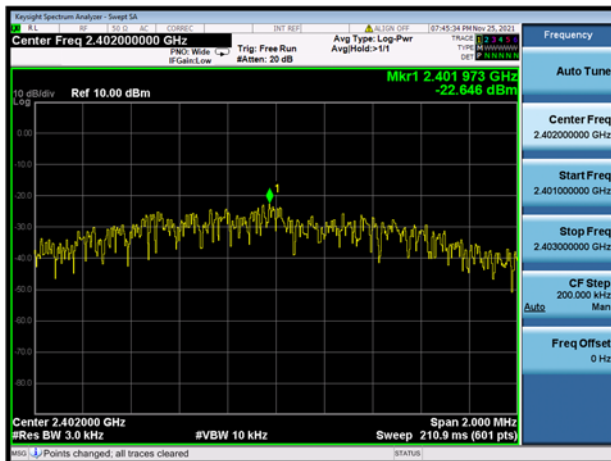
GFSK (BLE 1Mbps) MIDDLE CHANNEL



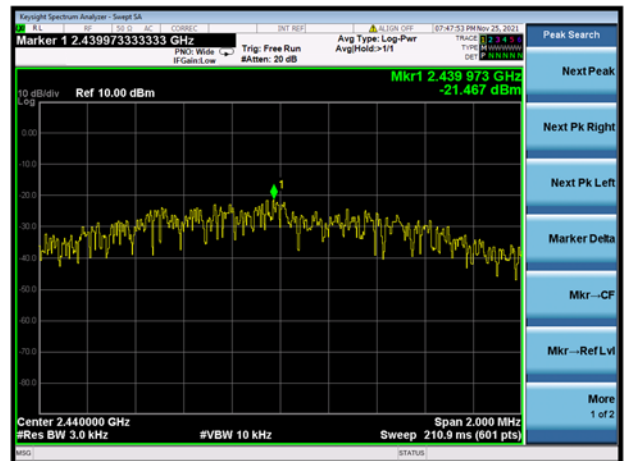
GFSK (BLE 1Mbps) HIGH CHANNEL



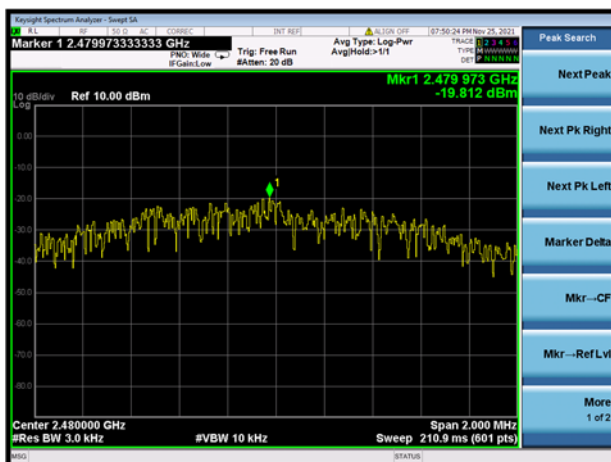
GFSK (BLE 1Mbps) LOW CHANNEL



GFSK (BLE 1Mbps) MIDDLE CHANNEL



GFSK (BLE 1Mbps) HIGH CHANNEL



## **ANNEX B TEST SETUP PHOTOS**

Please refer the document "BL-SZ21B0649-AR.PDF".

## **ANNEX C EUT EXTERNAL PHOTOS**

Please refer the document "BL-SZ21B0649-AW.PDF".

## **ANNEX D EUT INTERNAL PHOTOS**

Please refer the document "BL-SZ21B0649-AI.PDF".

--END OF REPORT--