

## Appendix B: Test Results of Bluetooth LE

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### Appendix B.1: Test Results of Conducted Power Spectral Density

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-5.5	≤8.00	PASS
		2440	-5.27	≤8.00	PASS
		2480	-5.63	≤8.00	PASS

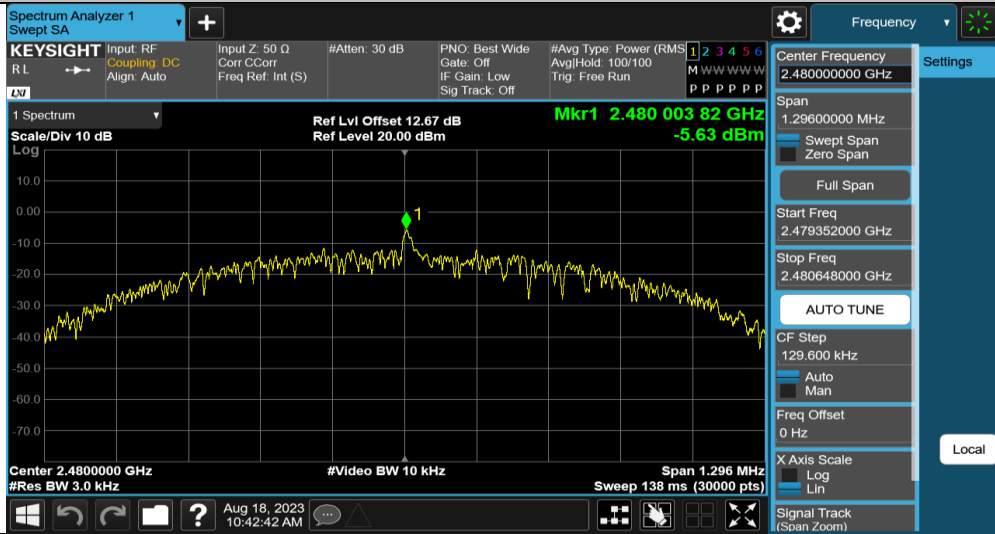
BLE\_1M\_Ant1\_2402



BLE\_1M\_Ant1\_2440

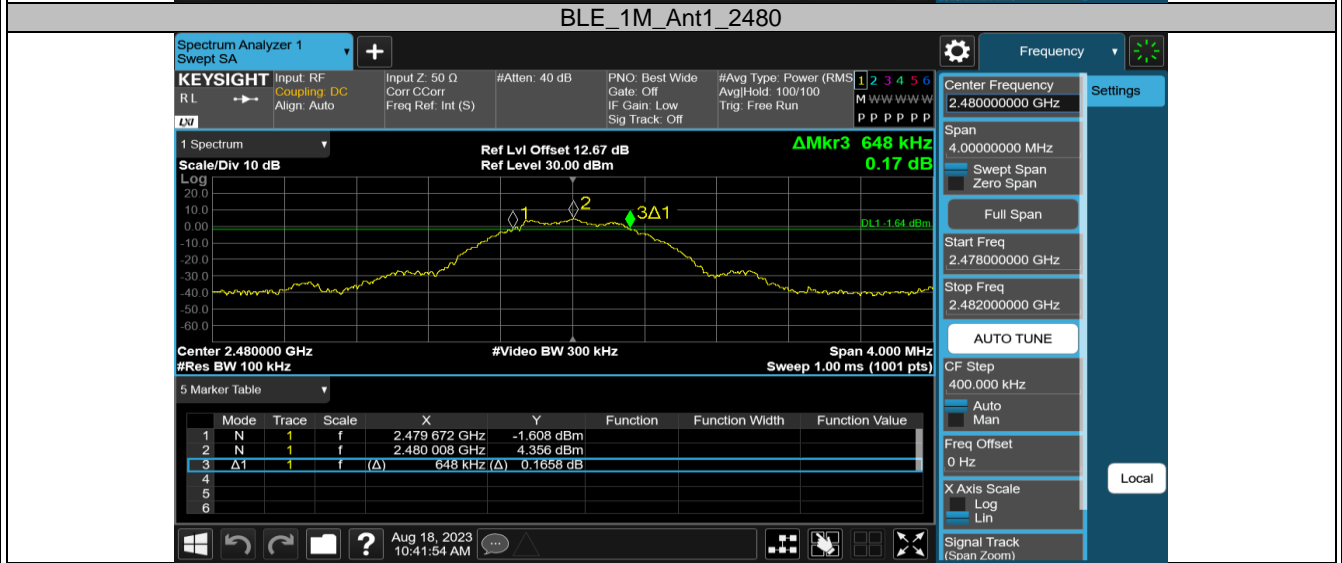
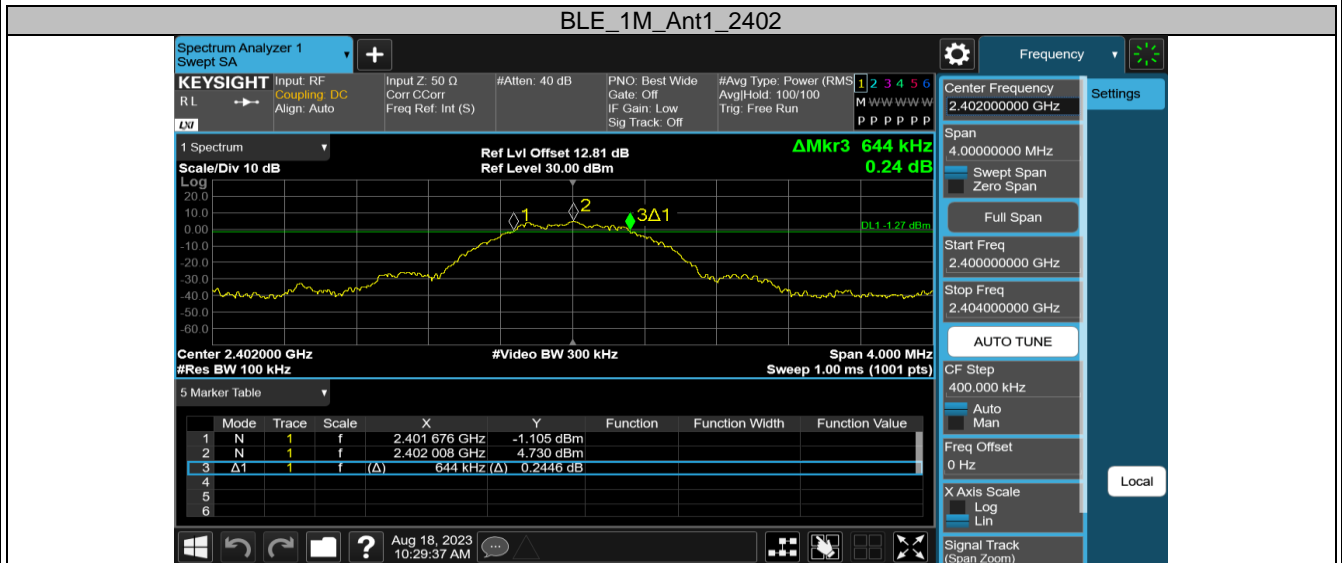


BLE\_1M\_Ant1\_2480



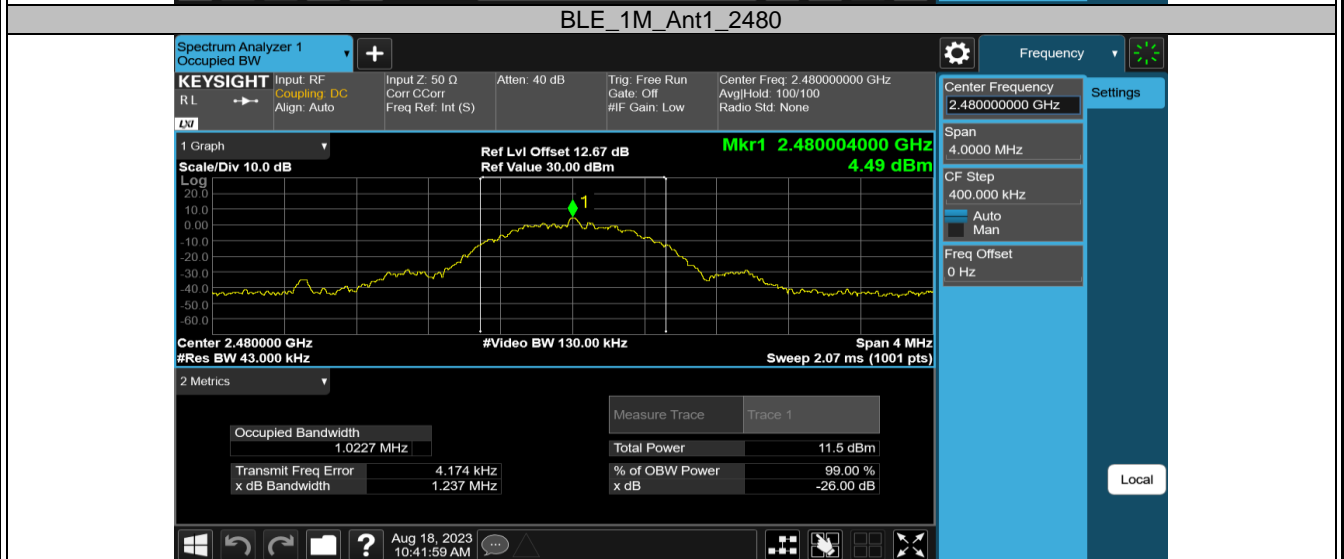
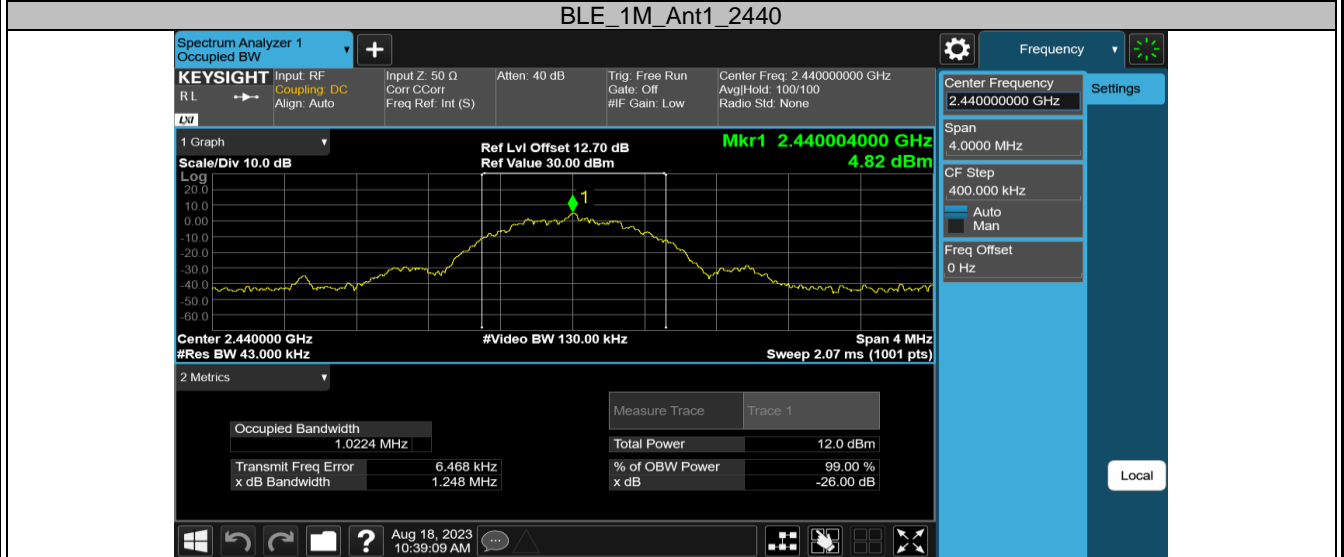
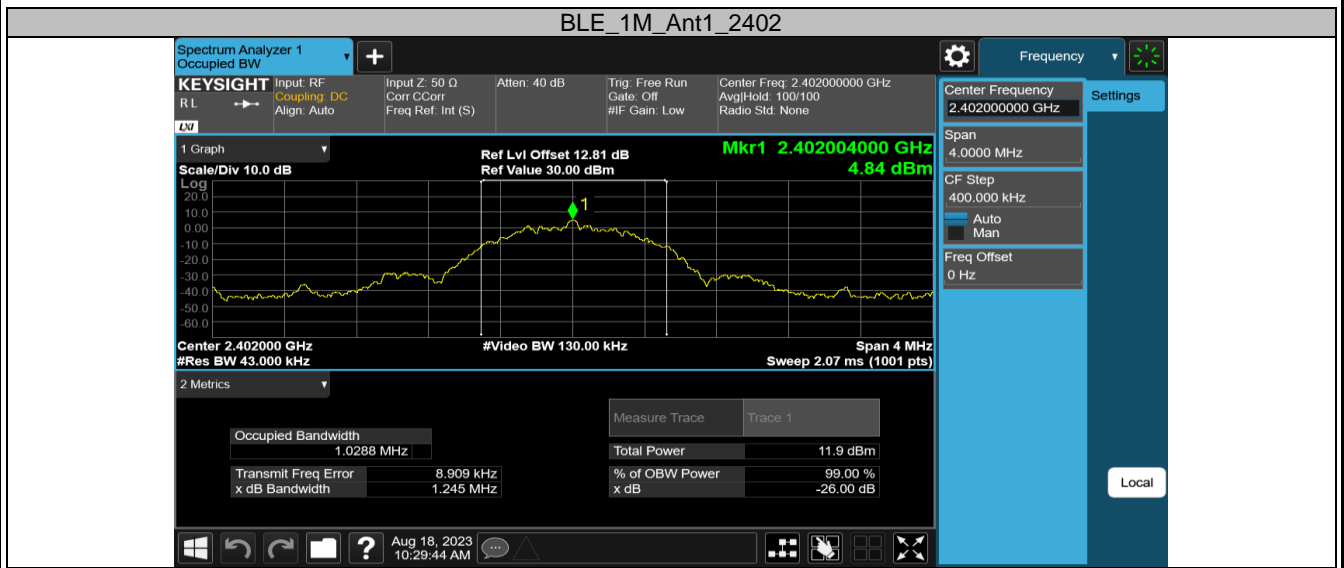
### Appendix B.2: Test Results of 6dB Bandwidth

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.644	2401.676	2402.320	0.5	PASS
		2440	0.640	2439.672	2440.312	0.5	PASS
		2480	0.648	2479.672	2480.320	0.5	PASS



### Appendix B.3: Test Results of 99% Bandwidth

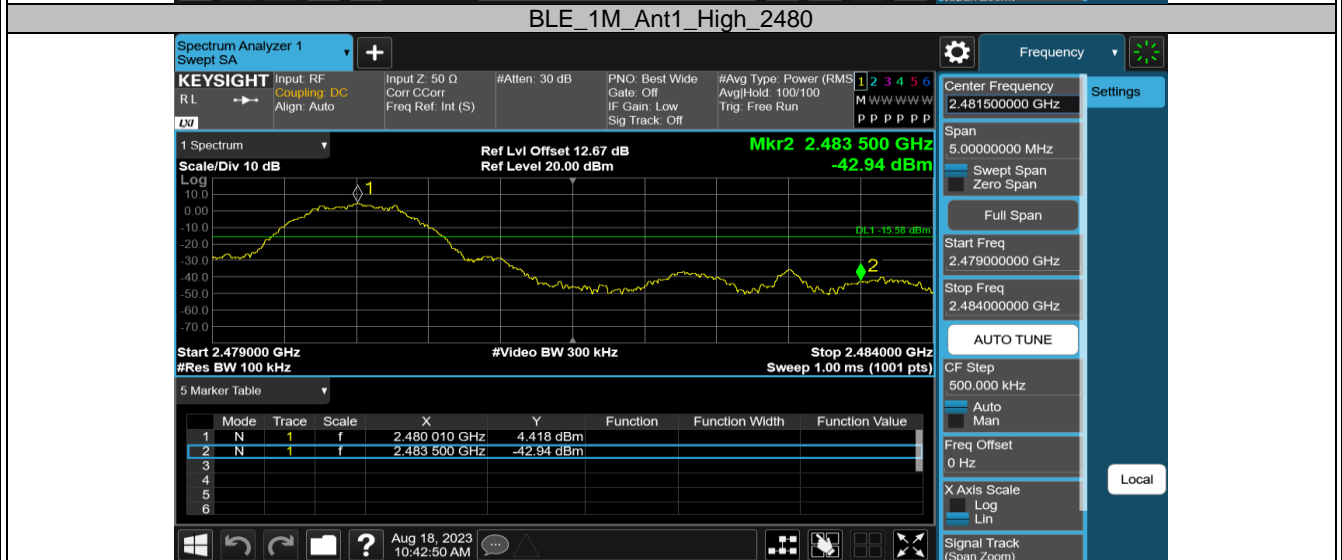
TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.0288	2401.4945	2402.5233	---	---
		2440	1.0224	2439.4953	2440.5177	---	---
		2480	1.0227	2479.4928	2480.5155	---	---



### Appendix B.4: Test Results of Conducted Spurious Emissions Measured in 100 kHz Bandwidth

Band Edge

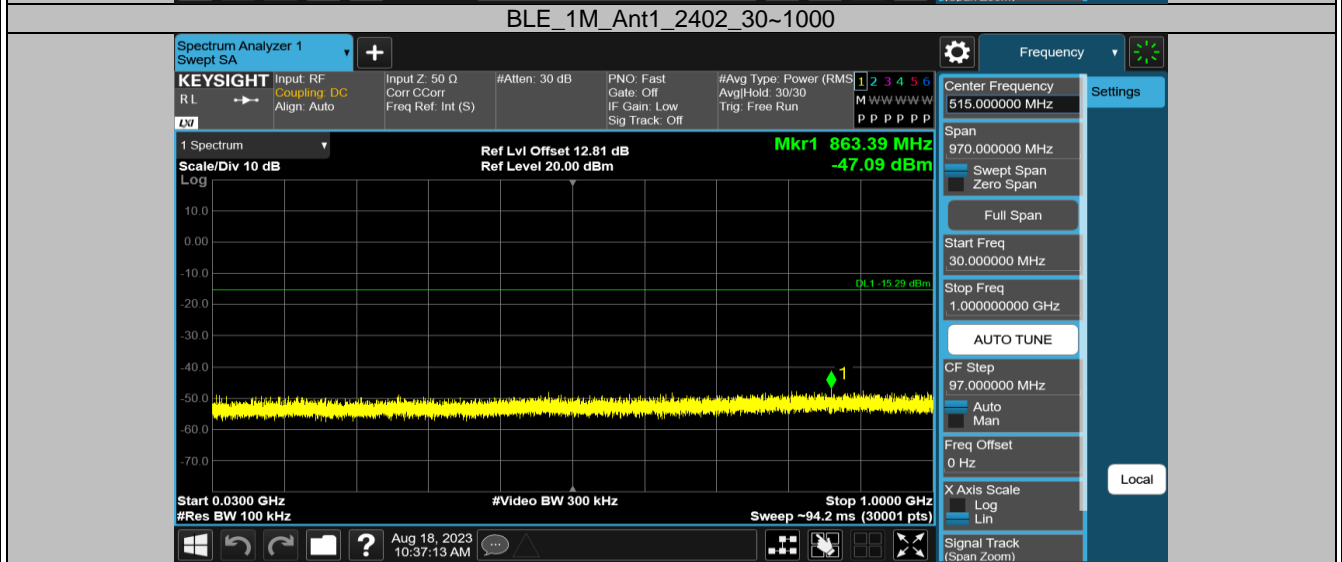
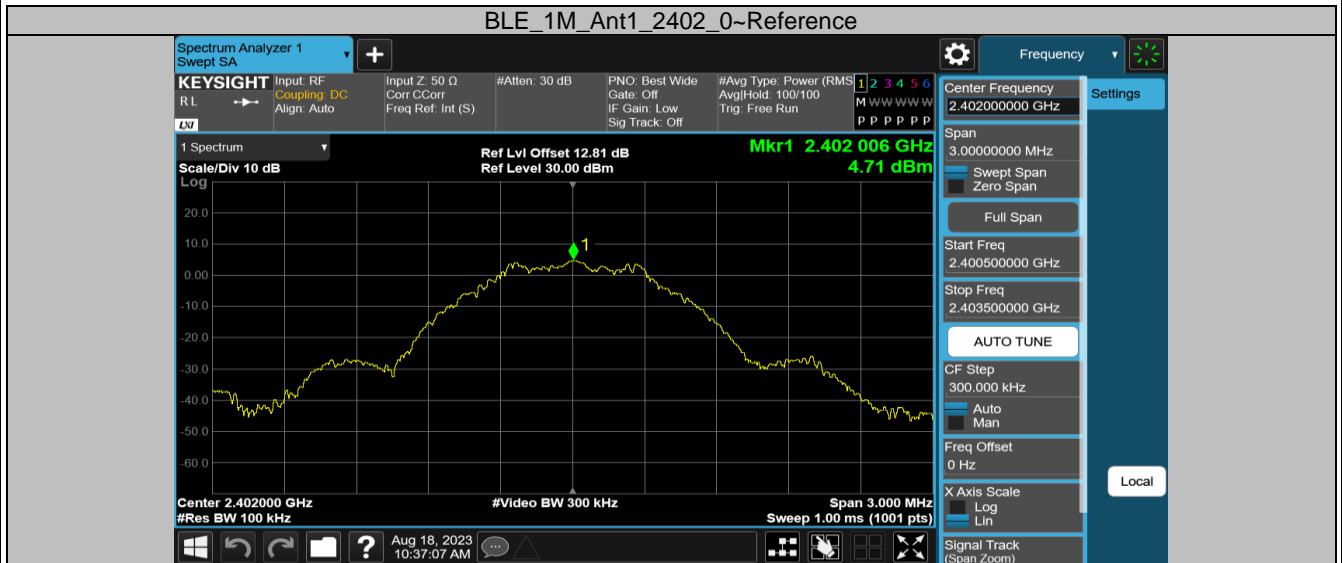
TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	4.728	-45.38	≤-15.27	PASS
		High	2480	4.418	-42.94	≤-15.58	PASS





Conducted Spurious Emission

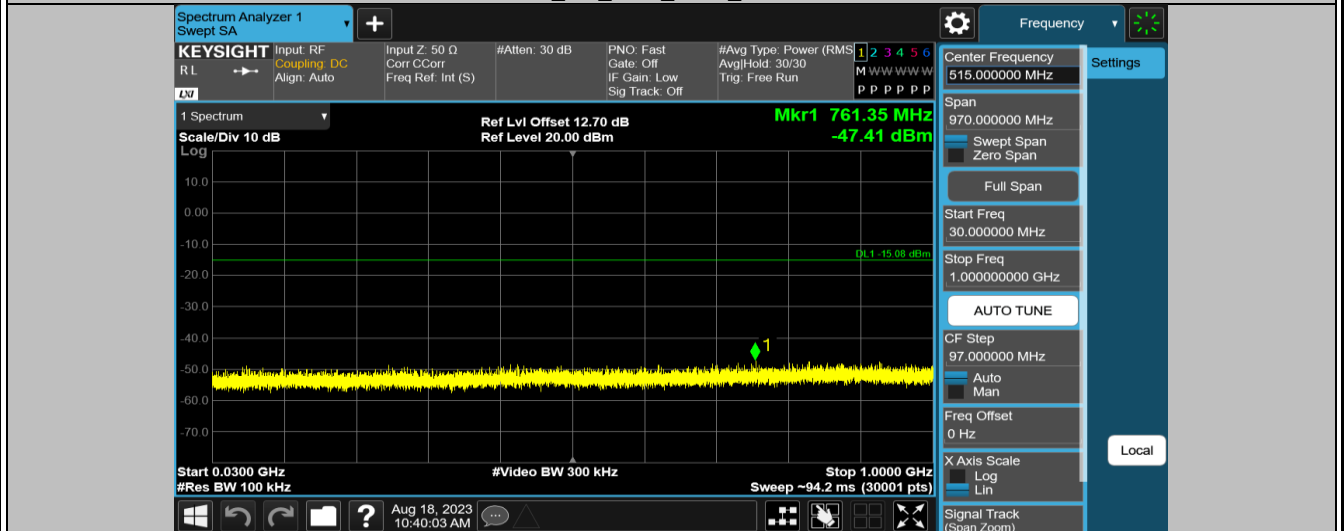
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	4.71	4.71	---	PASS
			30~1000	4.71	-47.09	≤-15.29	PASS
			1000~26500	4.71	-38.33	≤-15.29	PASS
		2440	Reference	4.92	4.92	---	PASS
			30~1000	4.92	-47.41	≤-15.08	PASS
			1000~26500	4.92	-36.97	≤-15.08	PASS
		2480	Reference	4.44	4.44	---	PASS
			30~1000	4.44	-46.21	≤-15.56	PASS
			1000~26500	4.44	-38.31	≤-15.56	PASS



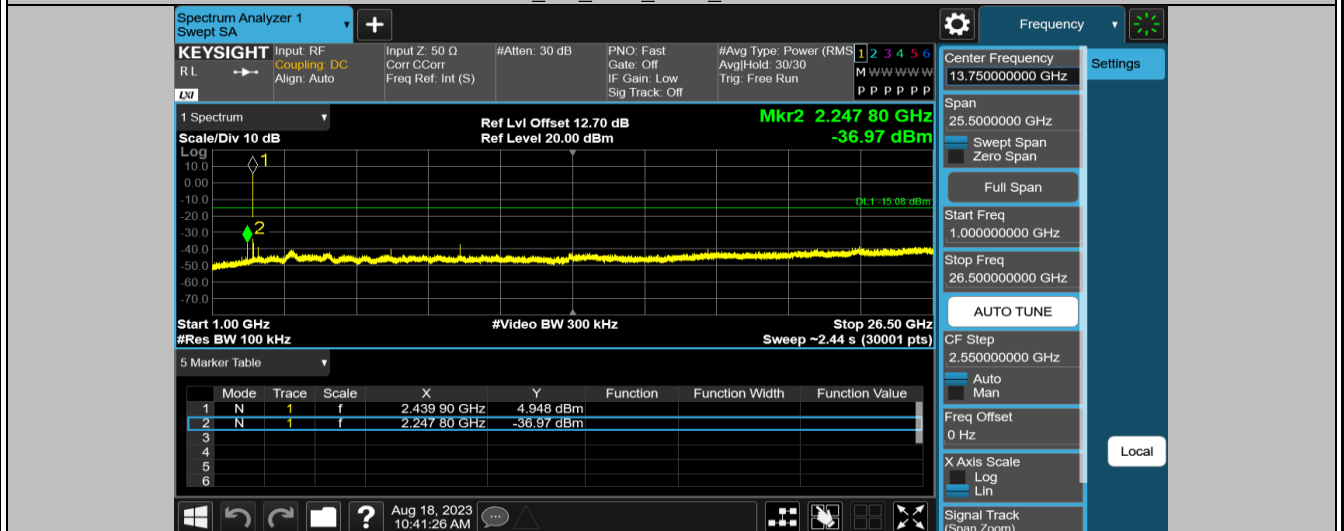
BLE\_1M\_Ant1\_2440\_0-Reference



BLE\_1M\_Ant1\_2440\_30~1000



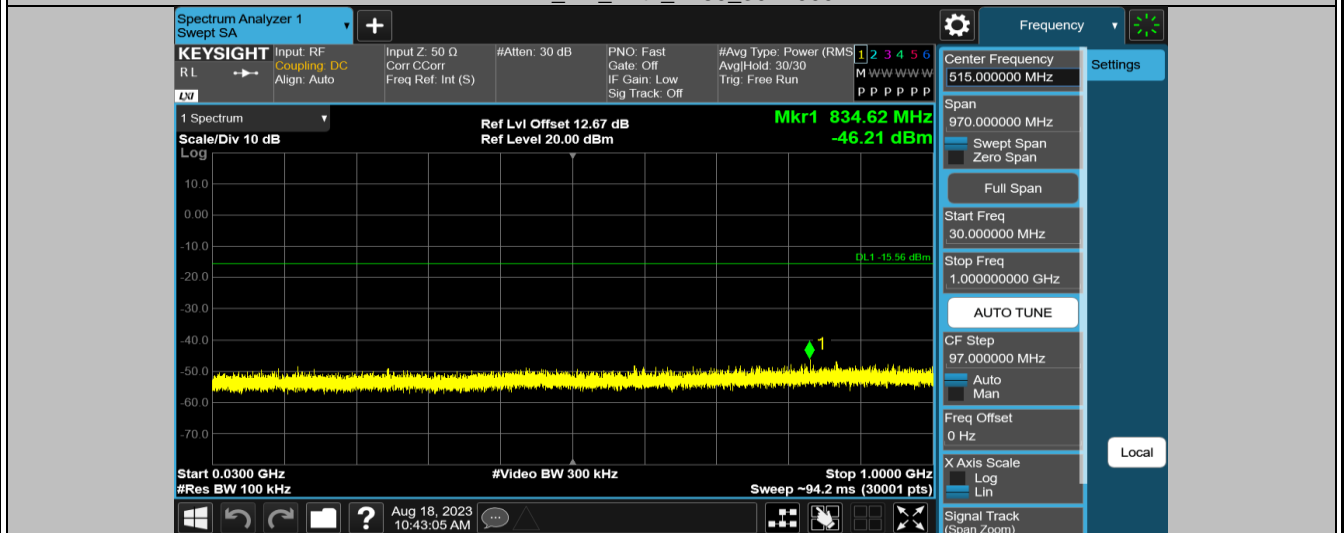
BLE\_1M\_Ant1\_2440\_1000~26500



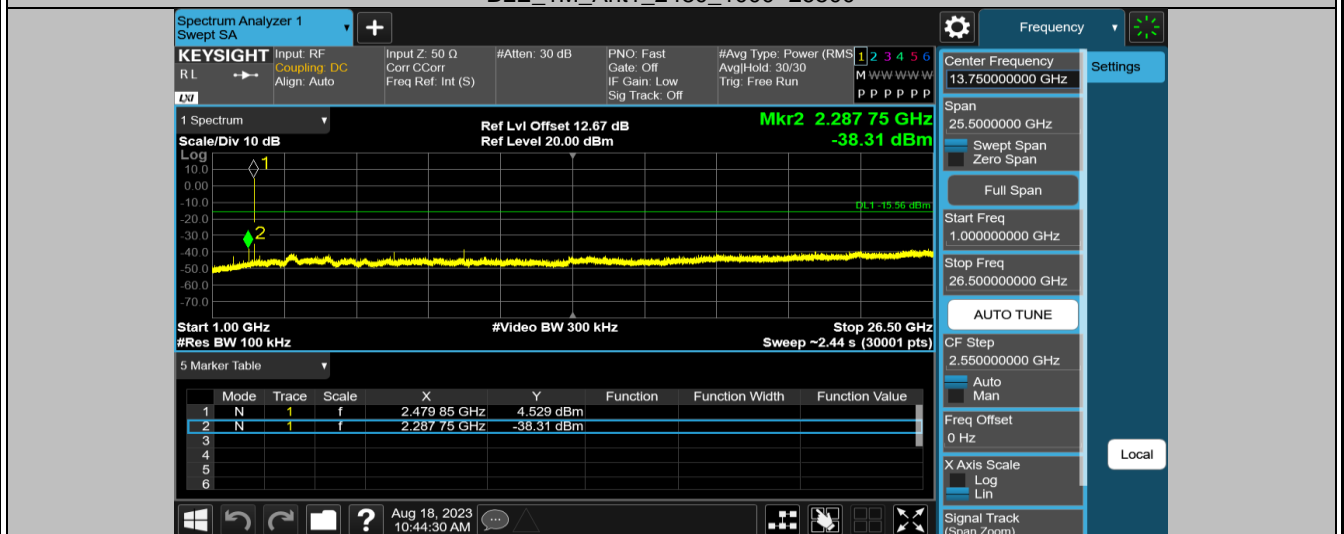
BLE\_1M\_Ant1\_2480\_0~Reference



BLE\_1M\_Ant1\_2480\_30~1000



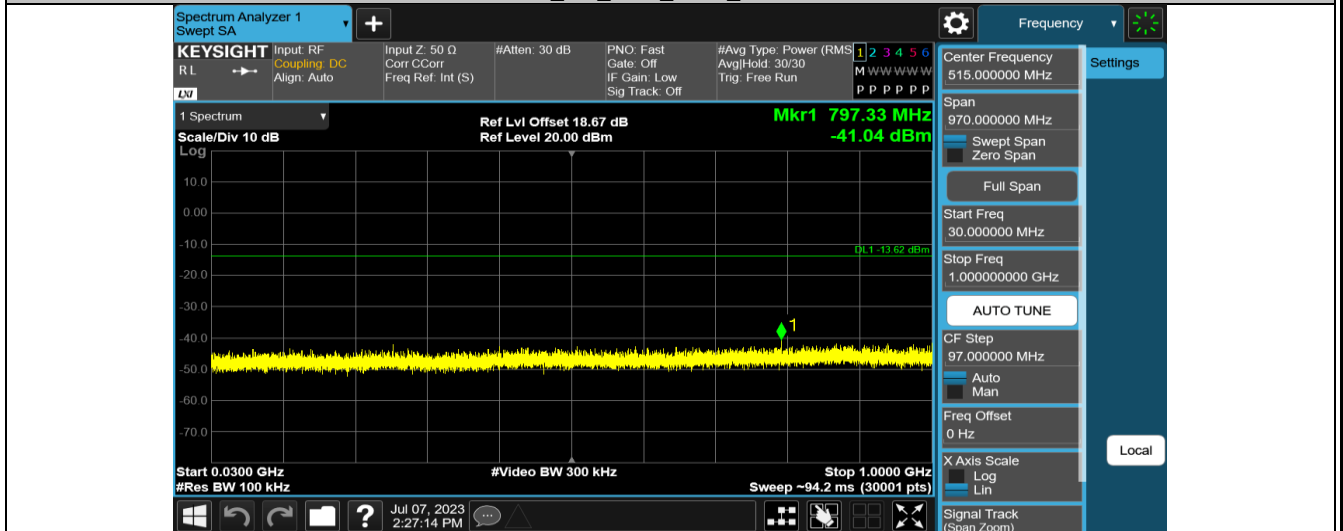
BLE\_1M\_Ant1\_2480\_1000~26500



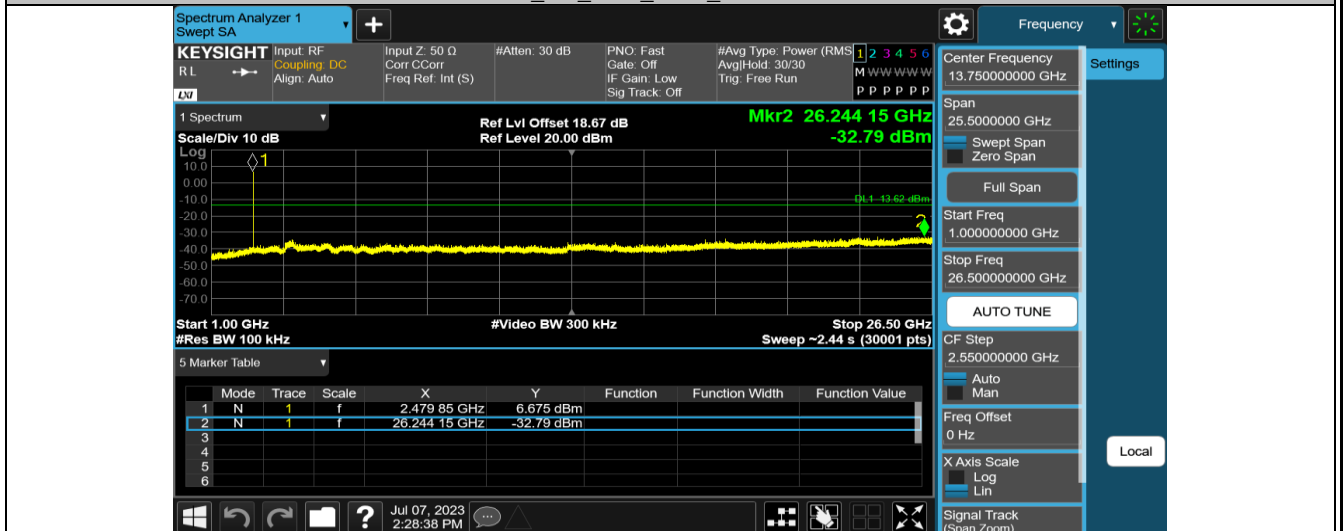
BLE\_1M\_Ant1\_2480\_0~Reference



BLE\_1M\_Ant1\_2480\_30~1000



BLE\_1M\_Ant1\_2480\_1000~26500



## Appendix B.5: Test Results of Radiated Spurious Emissions

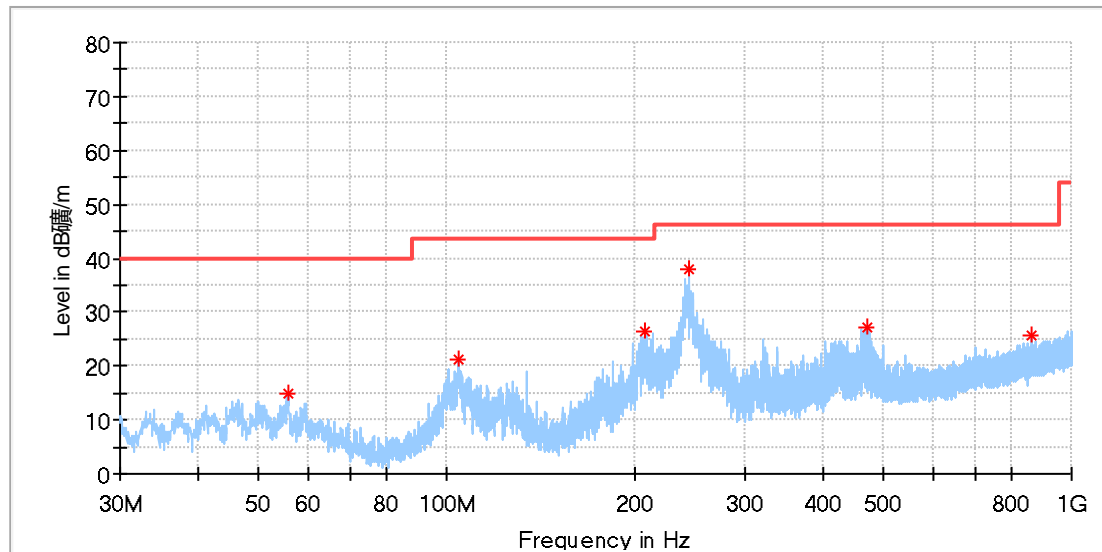
Note:

- 1) This testing was carried out on different modulations, but only the worst case was presented in this report.
- 2) Testing was carried out within frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and 18GHz - 26.5GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.

30 MHz - 1GHz

### EUT Information

EUT Name:	Bluetooth Module
Model:	HJ-7188
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168439516/A003537498-002
Test Voltage::	DC 3.3V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



### Critical\_Freqs

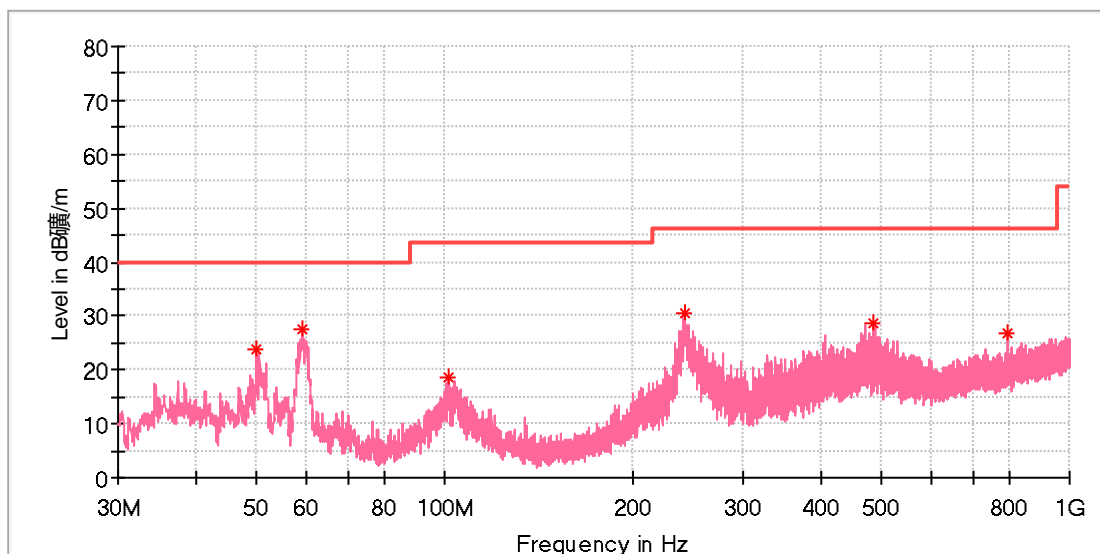
Frequency (MHz)	MaxiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
55.742308	14.97	40.00	25.03	100.0	H	181.0	-18.8
104.391539	21.38	43.50	22.12	100.0	H	250.0	-19.1
207.323462	26.34	43.50	17.16	100.0	H	291.0	-19.2
244.481923	37.87	46.00	8.13	100.0	H	291.0	-17.9
470.715769	27.08	46.00	18.92	100.0	H	26.0	-12.8
864.013462	25.86	46.00	20.14	100.0	H	300.0	-5.7

### Final\_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
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## EUT Information

EUT Name: Bluetooth Module  
 Model: HJ-7188  
 Test Mode: BLE 1M\_Mid channel  
 Order No/Sample No: 168439516/A003537498-002  
 Test Voltage:: DC 3.3V  
 Remark: Temp 23 Humi:56%  
 Test Standard: FCC 15.247  
 Tested By: Kei Zhang  
 Reviewed By: Terry Yin



## Critical\_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
49.996923	23.86	40.00	16.14	100.0	V	148.0	-18.6
59.100000	27.51	40.00	12.49	100.0	V	324.0	-19.2
101.518846	18.55	43.50	24.95	100.0	V	342.0	-19.2
241.460000	30.45	46.00	15.55	100.0	V	307.0	-18.0
486.347692	28.48	46.00	17.52	100.0	V	199.0	-12.4
796.486539	26.70	46.00	19.30	100.0	V	34.0	-6.9

## Final\_Result

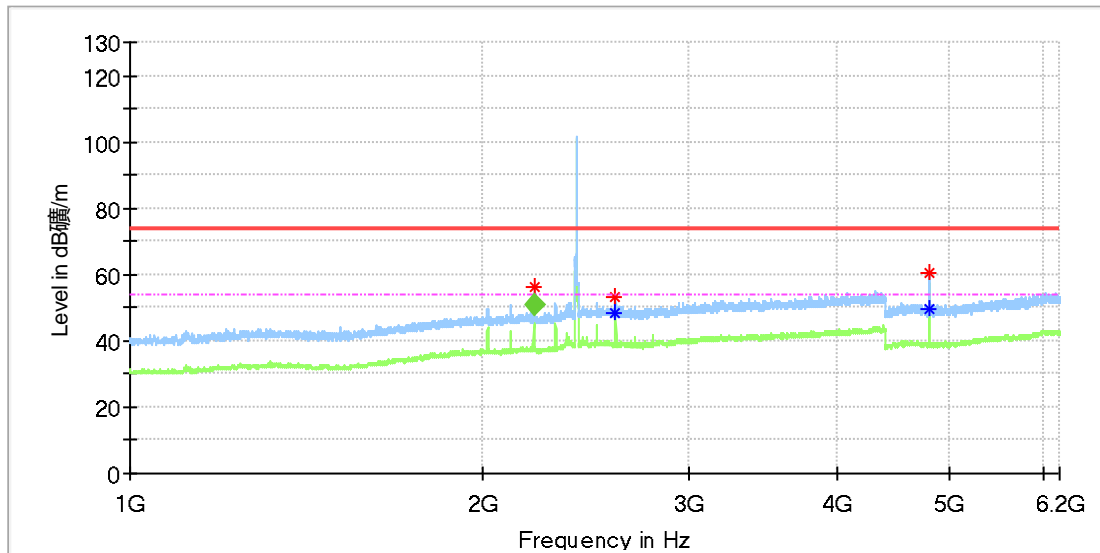
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

1GHz - 18GHz

Note: The highest waveform in the figure is Bluetooth Fundamental.

## EUT Information

EUT Name: Bluetooth Module  
 Model: HJ-7188  
 Test Mode: BLE 1M\_Low channel  
 Order No/Sample No: 168439516/A003537498-002  
 Test Voltage:: DC 3.3V  
 Remark: Temp 23 Humi:56%  
 Test Standard: FCC 15.247  
 Tested By: Kei Zhang  
 Reviewed By: Terry Yin



## Critical\_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2209.500000	56.32	---	74.00	17.68	150.0	H	187.0	6.3
2594.000000	53.44	---	74.00	20.56	150.0	H	333.0	7.4
2594.500000	---	48.07	54.00	5.93	150.0	H	333.0	7.4
4803.500000	60.52	---	74.00	13.48	150.0	H	158.0	11.8
4805.000000	---	49.67	54.00	4.33	150.0	H	102.0	11.8

## Final\_Result

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2210.101471	50.76	54.00	3.24	145.0	H	215.0	6.3



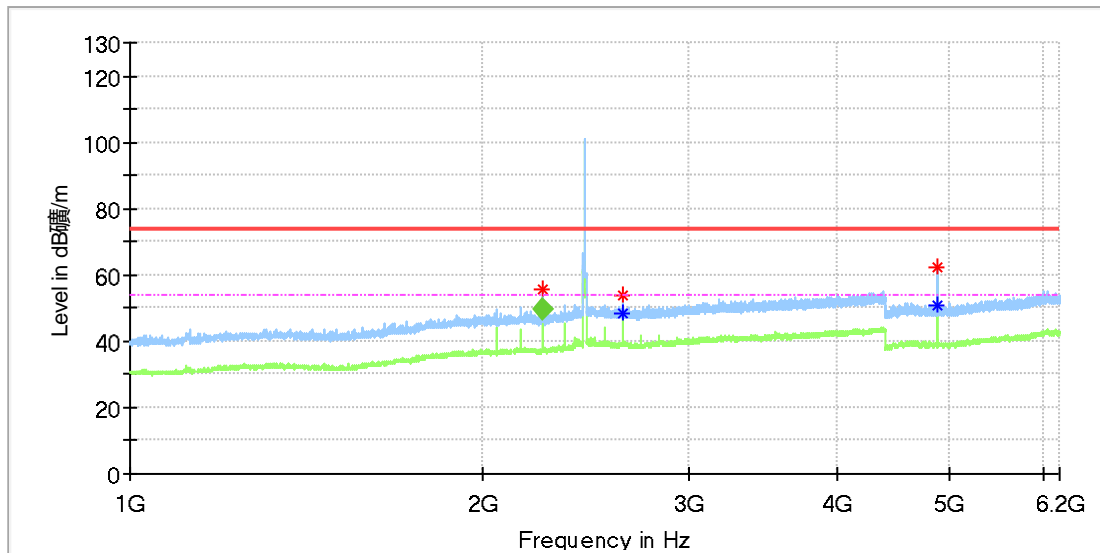






## EUT Information

EUT Name:	Bluetooth Module
Model:	HJ-7188
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168439516/A003537498-002
Test Voltage::	DC 3.3V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



## Critical\_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2247.500000	55.44	---	74.00	18.56	150.0	H	191.0	6.4
2632.000000	53.89	---	74.00	20.11	150.0	H	259.0	7.5
2632.500000	---	48.11	54.00	5.89	150.0	H	259.0	7.5
4879.500000	62.49	---	74.00	11.51	150.0	H	247.0	11.8
4881.000000	---	50.58	54.00	3.42	150.0	H	247.0	11.8

## Final\_Result

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2248.032353	49.35	54.00	4.65	145.0	H	186.0	6.4

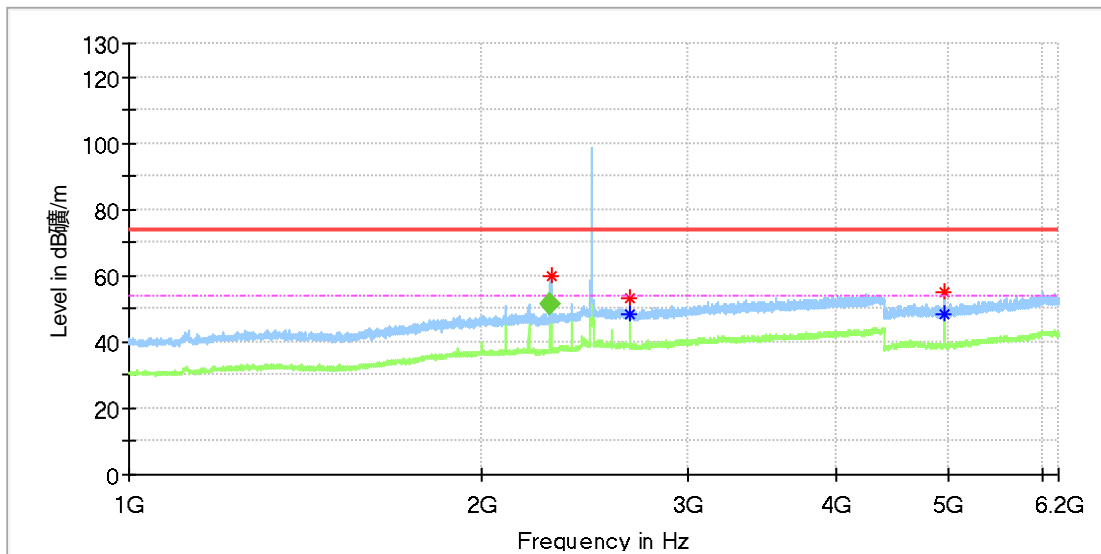






### EUT Information

EUT Name: Bluetooth Module  
 Model: HJ-7188  
 Test Mode: BLE 1M\_High channel  
 Order No/Sample No: 168439516/A003537498-002  
 Test Voltage:: DC 3.3V  
 Remark: Temp 23 Humi:56%  
 Test Standard: FCC 15.247  
 Tested By: Kei Zhang  
 Reviewed By: Terry Yin



### Critical\_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2288.500000	59.72	---	74.00	14.28	150.0	H	195.0	6.4
2672.000000	52.98	---	74.00	21.02	150.0	H	106.0	7.5
2672.000000	---	48.33	54.00	5.67	150.0	H	106.0	7.5
4960.000000	54.87	---	74.00	19.13	150.0	H	156.0	11.8
4960.500000	---	48.35	54.00	5.65	150.0	H	156.0	11.8

### Final\_Result

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2287.975000	51.47	54.00	2.53	149.0	H	190.0	6.4





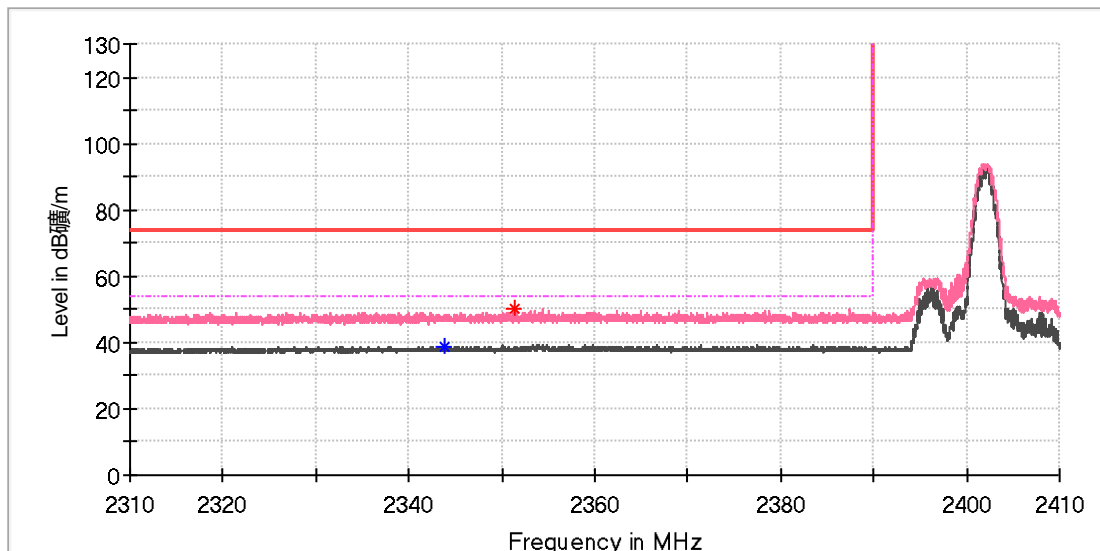




## Appendix B.6: Test Results of Radiated Emissions in Restricted Bands

### EUT Information

EUT Name:	Bluetooth Module
Model:	HJ-7188
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168439516/A003537498-002
Test Voltage::	DC 3.3V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



### Critical\_Freqs

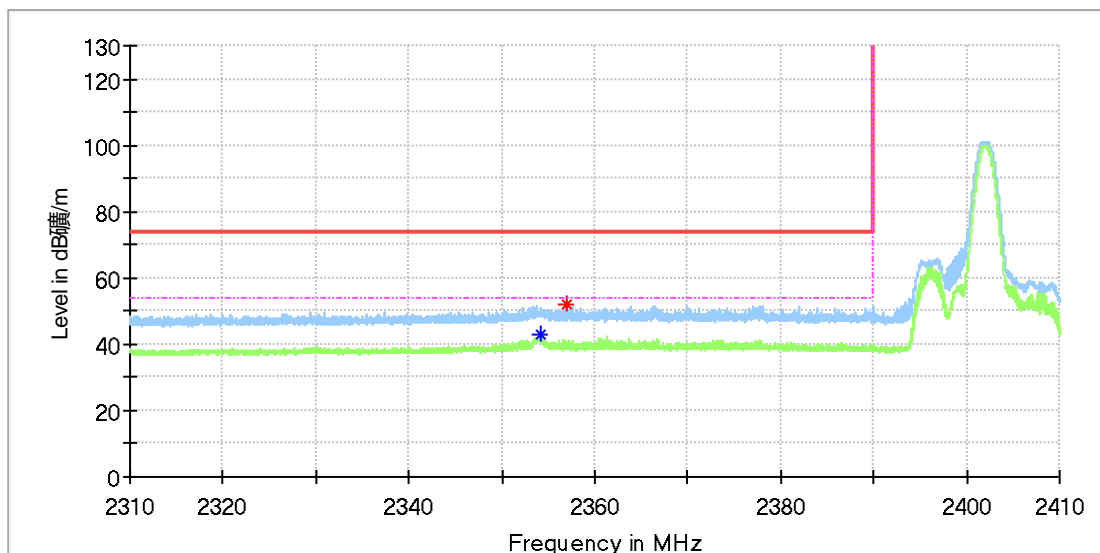
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2343.750000	---	38.95	54.00	15.05	150.0	V	318.0	6.9
2351.485294	50.32	---	74.00	23.68	150.0	V	287.0	6.9

### Final\_Result

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

## EUT Information

EUT Name:	Bluetooth Module
Model:	HJ-7188
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168439516/A003537498-002
Test Voltage::	DC 3.3V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



## Critical\_Freqs

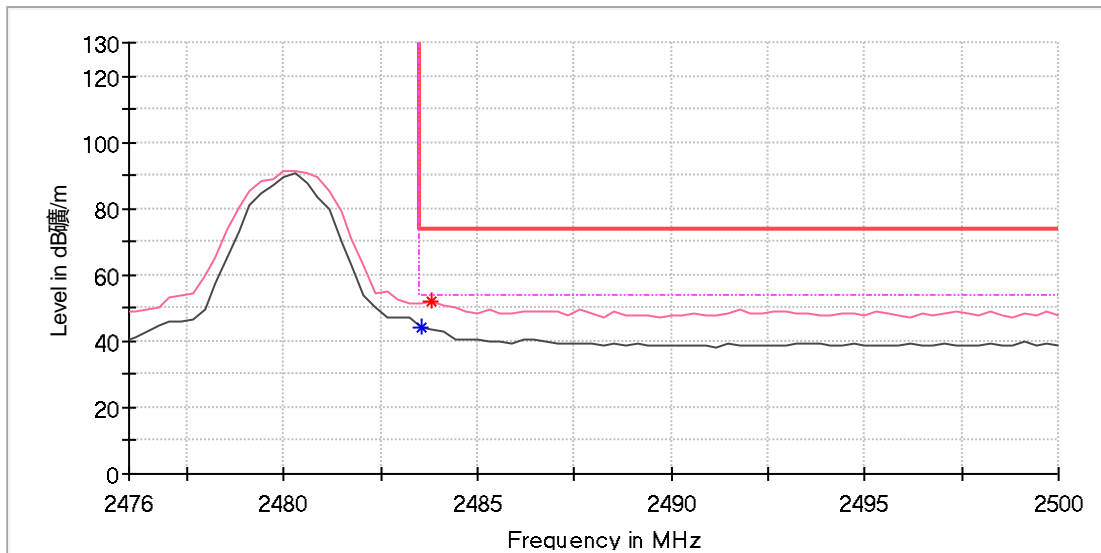
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2354.161765	---	43.22	54.00	10.78	150.0	H	261.0	6.9
2356.897059	51.70	---	74.00	22.30	150.0	H	233.0	6.9

## Final\_Result

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

### EUT Information

EUT Name: Bluetooth Module  
 Model: HJ-7188  
 Test Mode: BLE 1M\_High channel  
 Order No/Sample No: 168439516/A003537498-002  
 Test Voltage:: DC 3.3V  
 Remark: Temp 23 Humi:56%  
 Test Standard: FCC 15.247  
 Tested By: Kei Zhang  
 Reviewed By: Terry Yin



### Critical\_Freqs

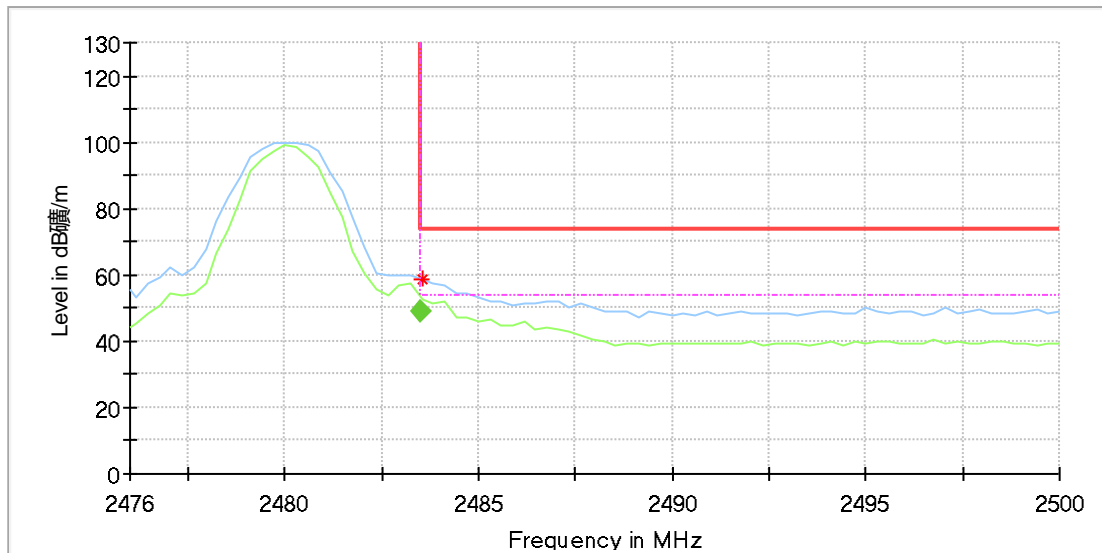
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.529412	---	44.37	54.00	9.63	150.0	V	294.0	7.4
2483.823529	51.72	---	74.00	22.28	150.0	V	72.0	7.4

### Final\_Result

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

### EUT Information

EUT Name:	Bluetooth Module
Model:	HJ-7188
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168439516/A003537498-002
Test Voltage::	DC 3.3V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



### Critical\_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.529412	58.35	---	74.00	15.65	150.0	H	232.0	7.4

### Final\_Result

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.508088	48.91	54.00	5.09	145.0	H	231.0	7.4