

Appendix B: Test Results of Bluetooth Low Energy

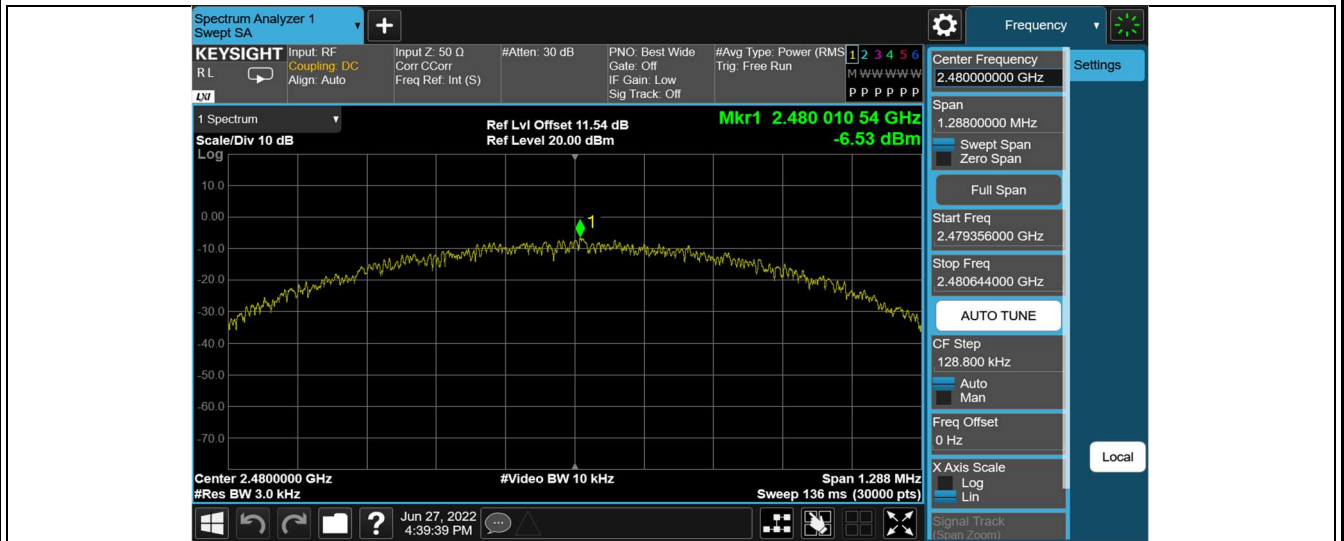
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Appendix B.1: Test Results of Conducted Power Spectral Density

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-5.81	≤8	PASS
		2440	-6.25	≤8	PASS
		2480	-6.53	≤8	PASS

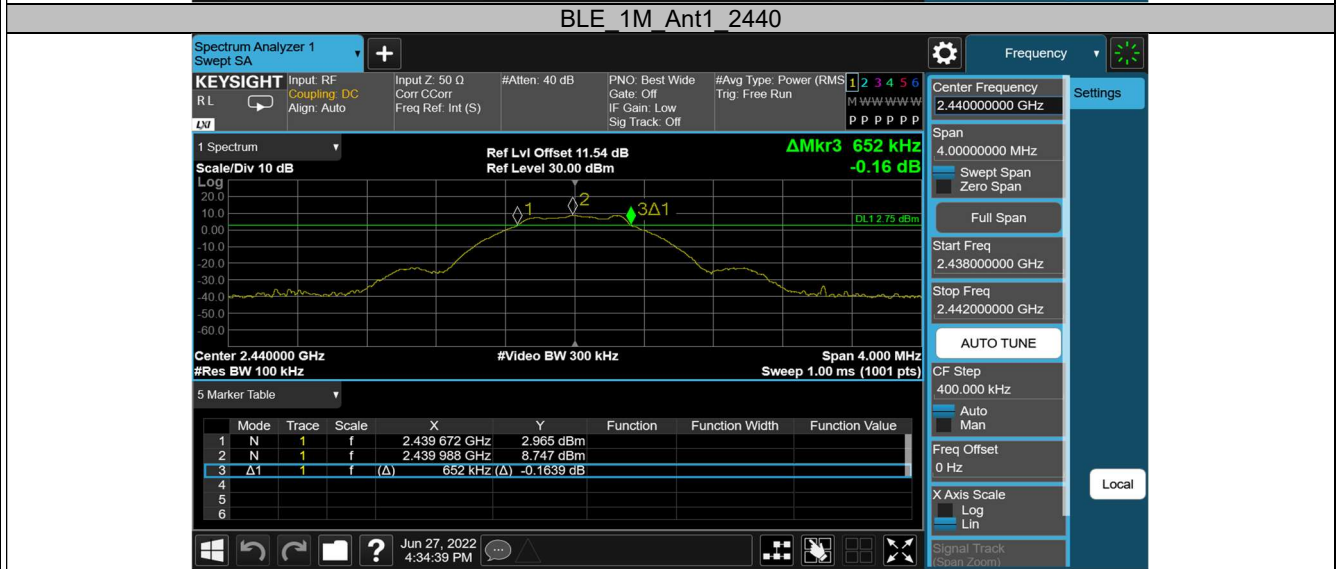
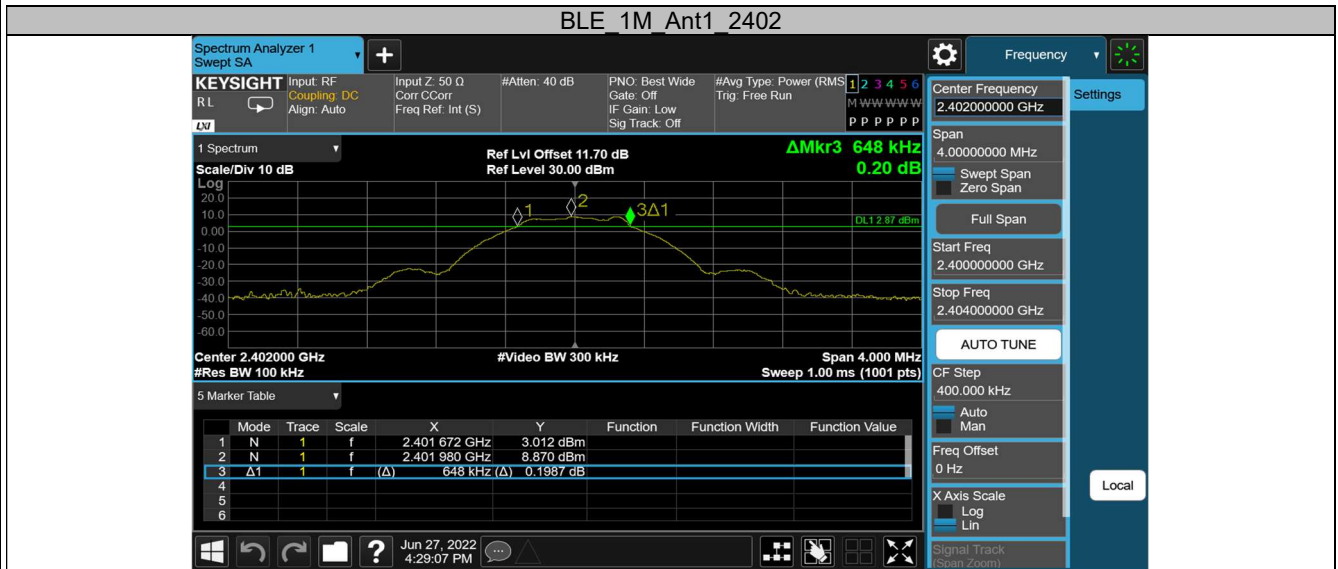


BLE 1M Ant1 2480



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	0.648	2401.672	2402.320	0.5	PASS
		2440	0.652	2439.672	2440.324	0.5	PASS
		2480	0.644	2479.676	2480.320	0.5	PASS

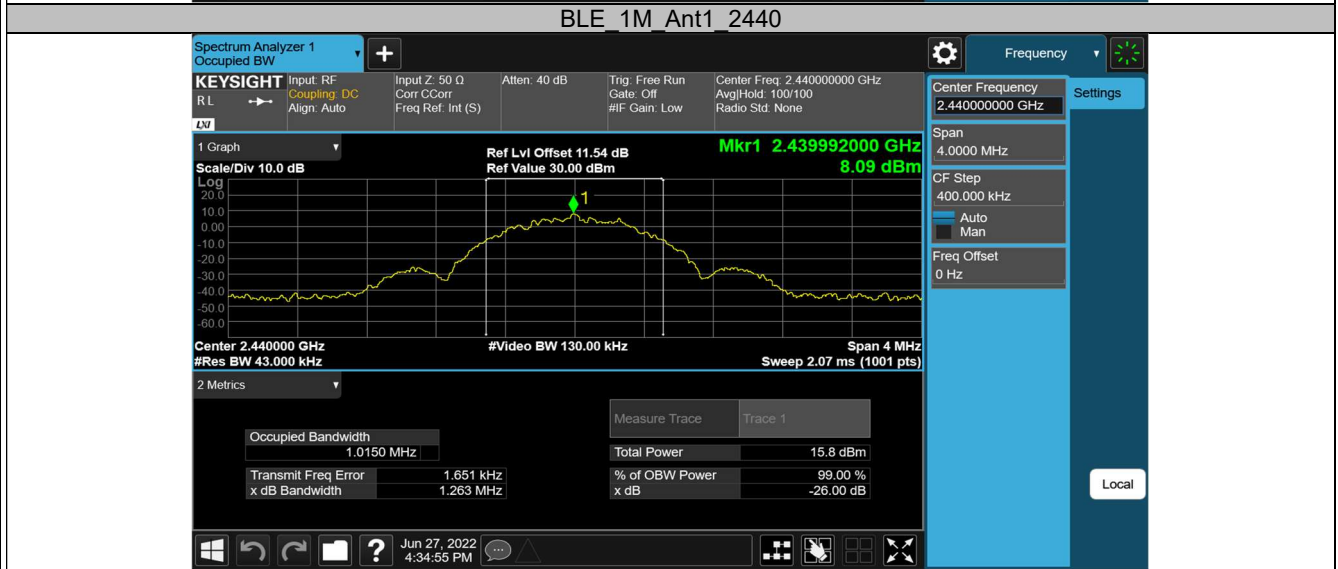
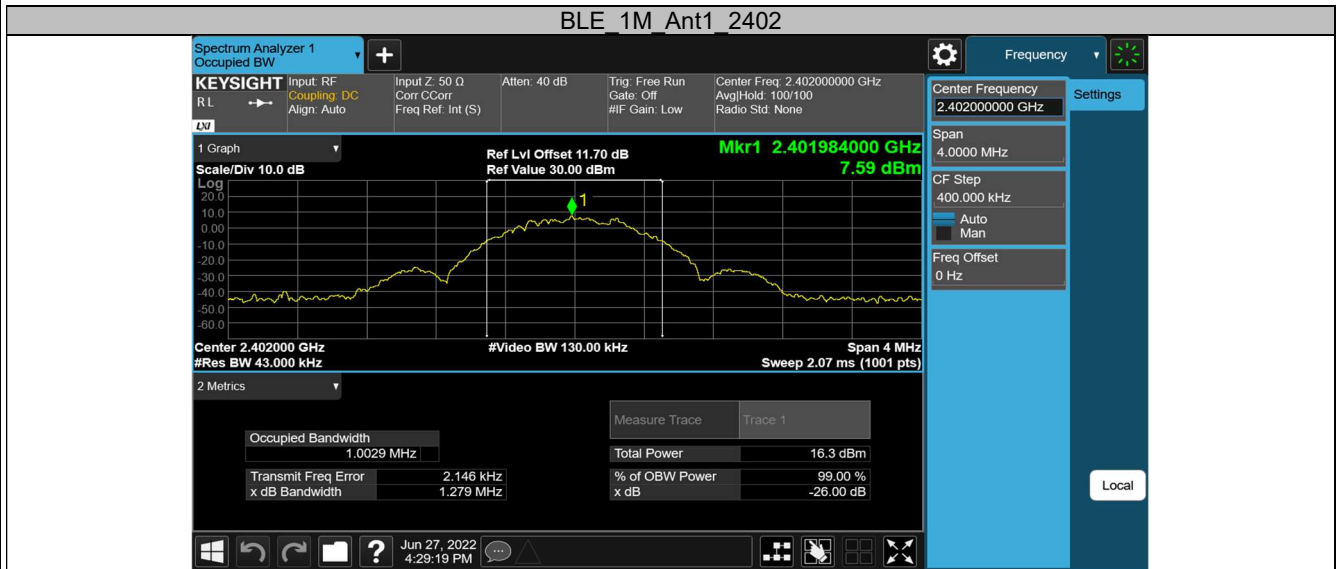


BLE 1M Ant1 2480



Appendix B.3: Test Results of 99% Bandwidth

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.0029	2401.501	2402.504	---	PASS
		2440	1.0150	2439.494	2440.509	---	PASS
		2480	1.0172	2479.495	2480.512	---	PASS



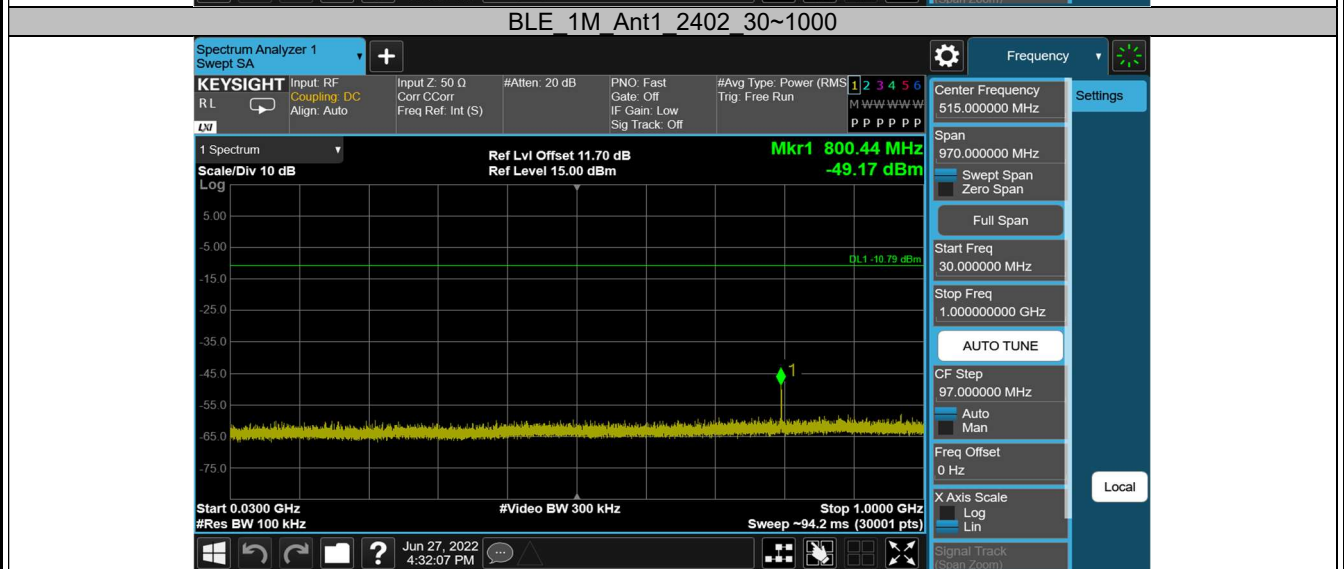
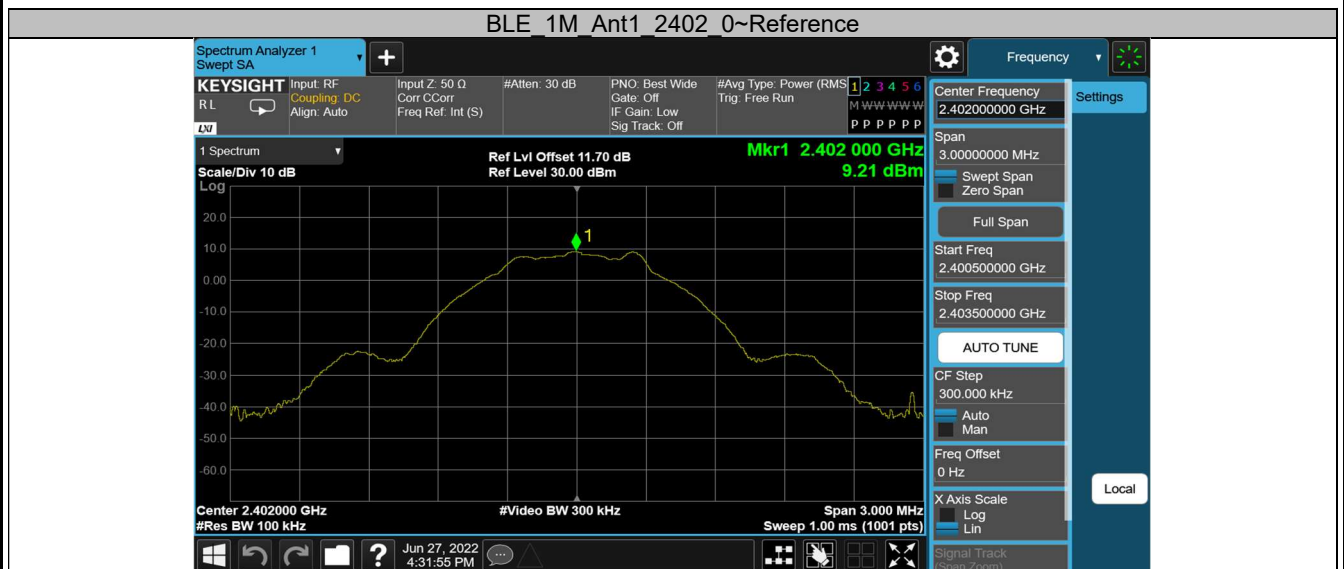
BLE 1M Ant1 2480



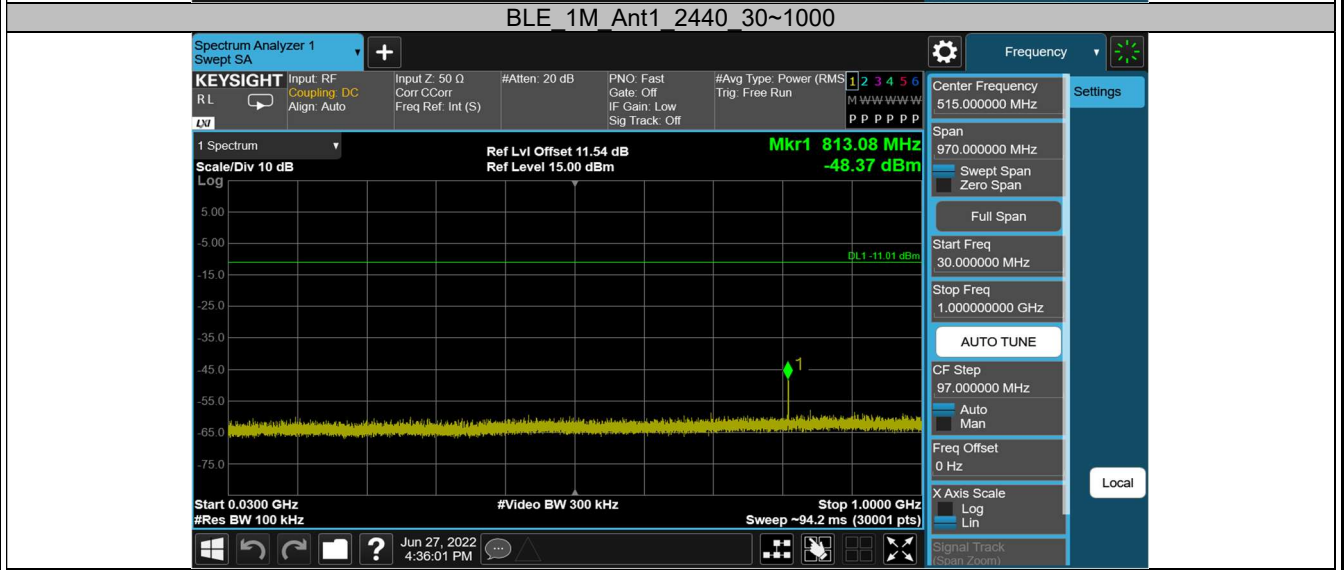
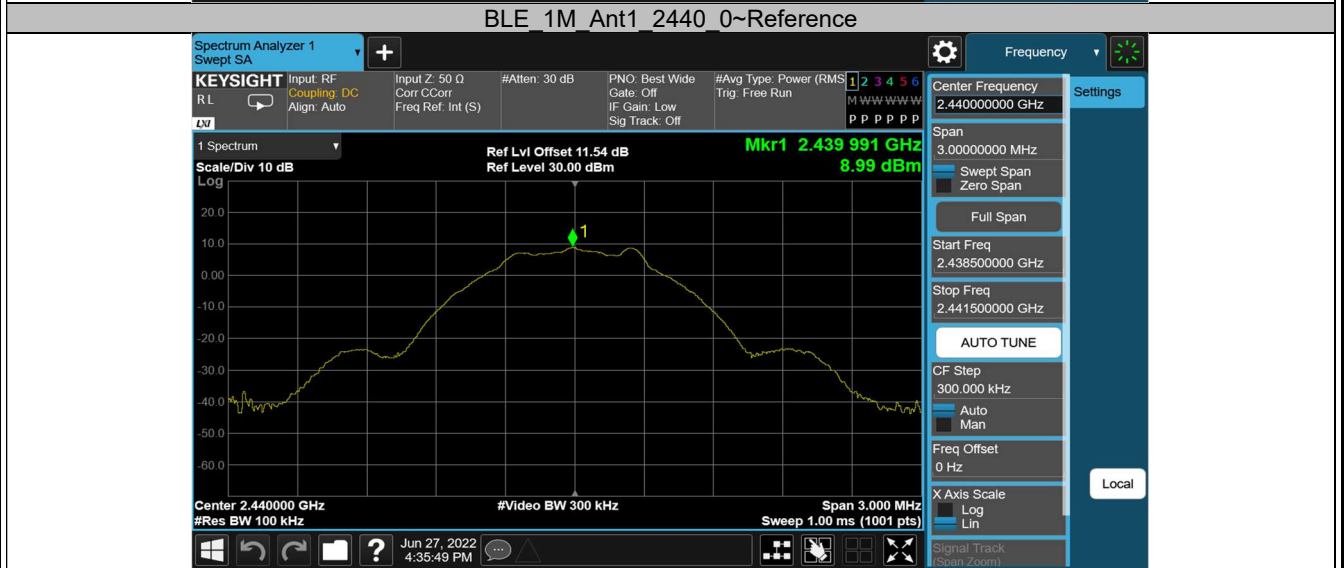
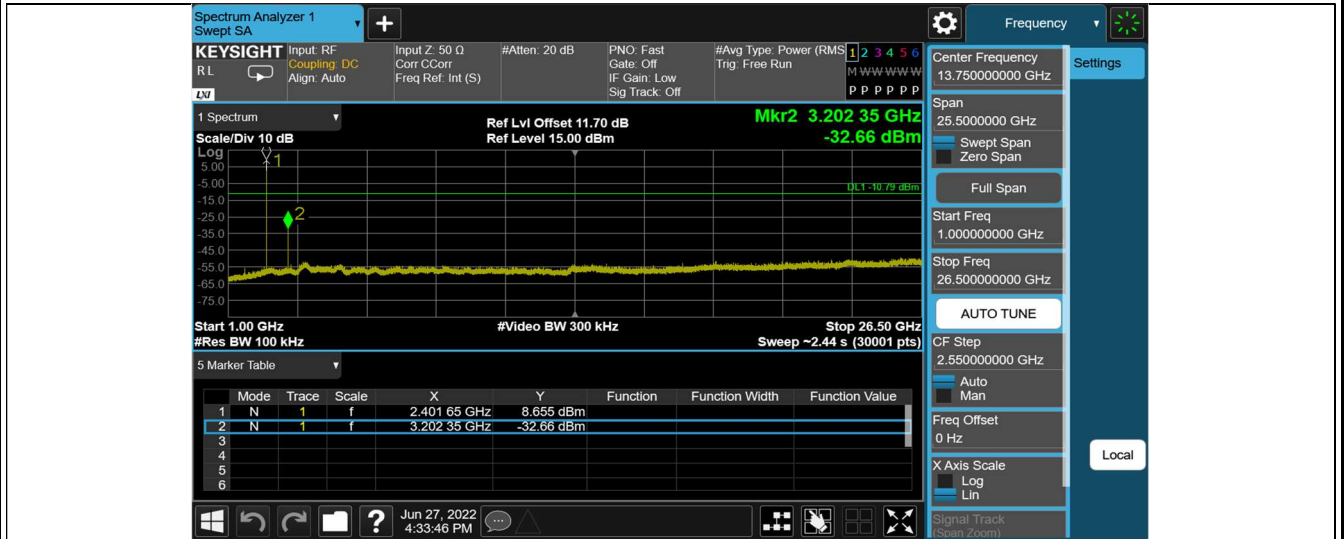
Appendix B.4: Test Results of Conducted Spurious Emissions Measured in 100 kHz Bandwidth

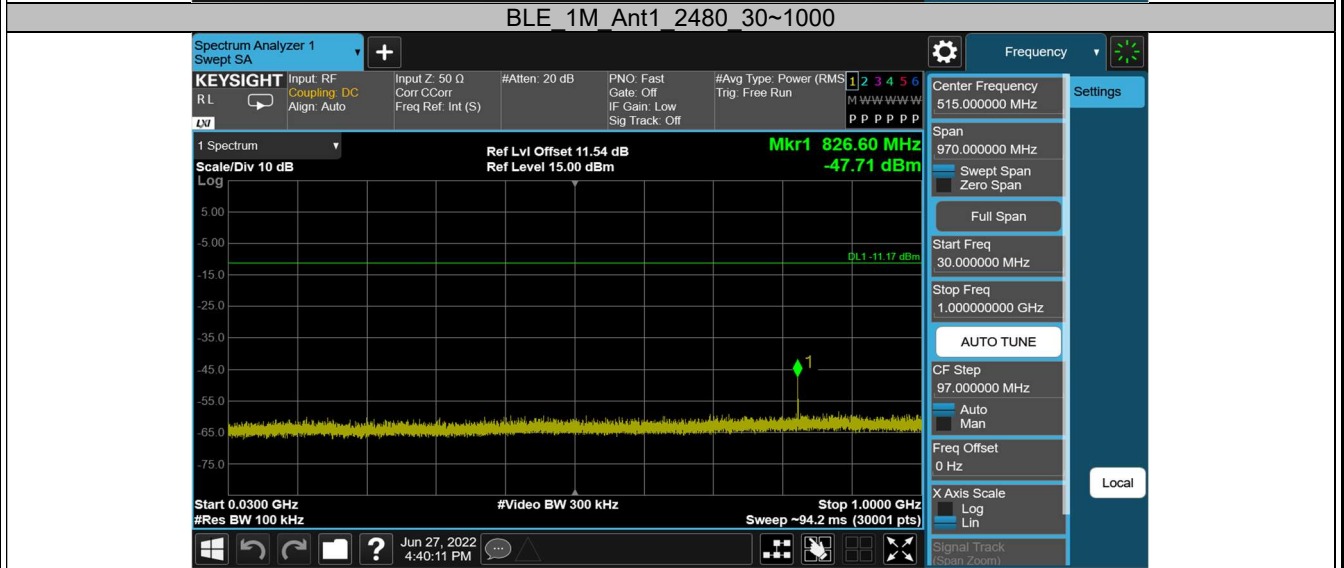
Conducted Spurious Emission

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	9.21	9.21	---	PASS
			30~1000	9.21	-49.17	≤-10.79	PASS
			1000~26500	9.21	-32.66	≤-10.79	PASS
		2440	Reference	8.99	8.99	---	PASS
			30~1000	8.99	-48.37	≤-11.01	PASS
			1000~26500	8.99	-32.74	≤-11.01	PASS
		2480	Reference	8.83	8.83	---	PASS
			30~1000	8.83	-47.71	≤-11.17	PASS
			1000~26500	8.83	-32.78	≤-11.17	PASS



BLE_1M Ant1 2402 1000~26500

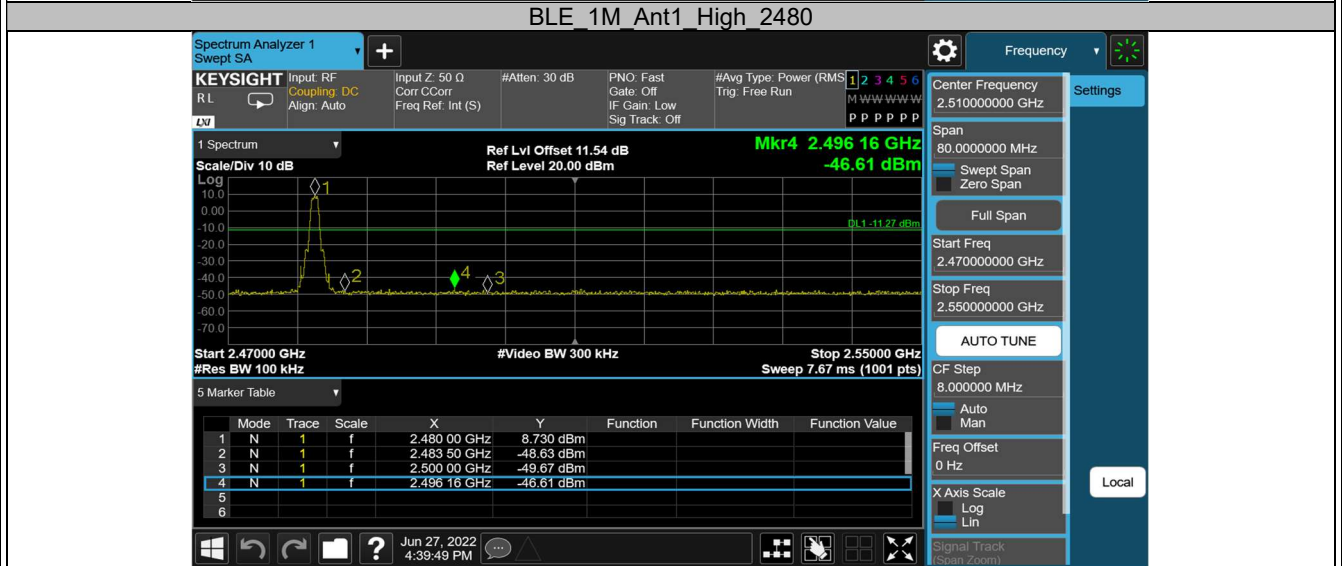
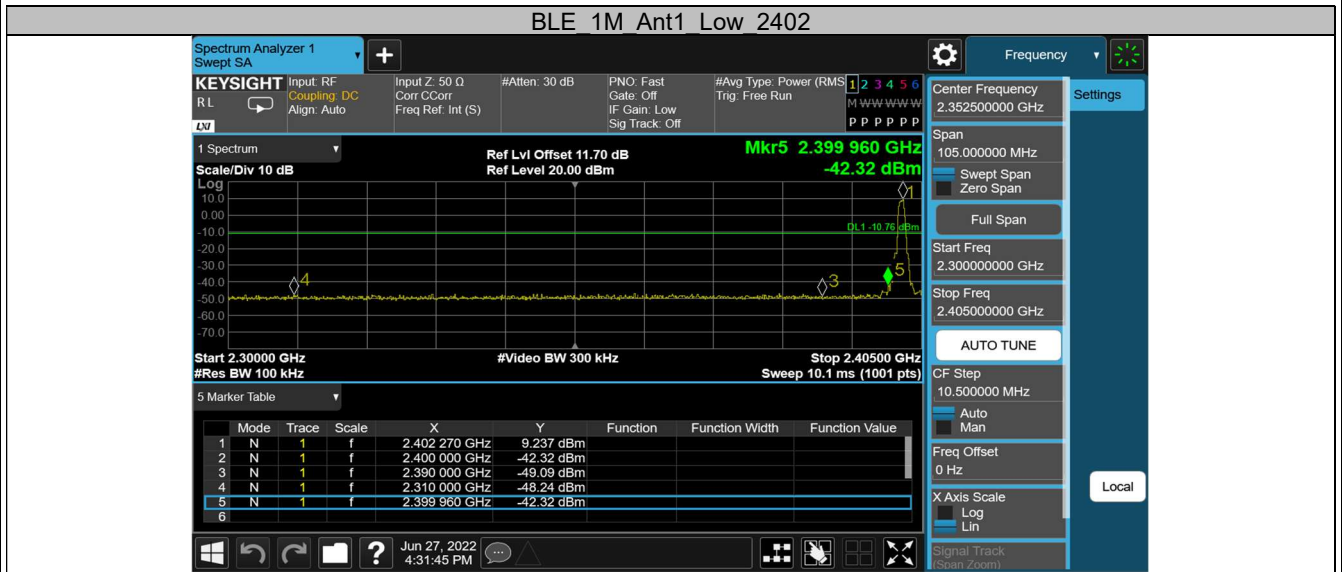






Band Edge

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	9.24	-42.32	≤-10.76	PASS
		High	2480	8.73	-46.61	≤-11.27	PASS



Appendix B.5: Test Results of Radiated Spurious Emissions

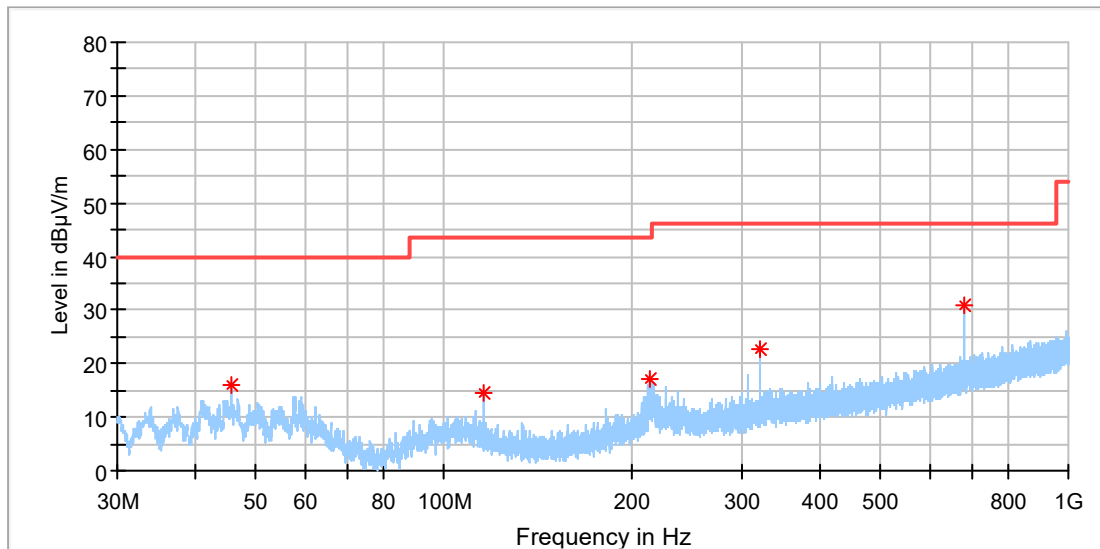
Note:

- 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 to 1GHz

EUT Information

EUT Name:	Smart Temperature and Humidity Monitoring Switch
Model:	THR320D
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168377937/A003284877-001
Test Voltage::	AC 120V, 60Hz
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical Freqs

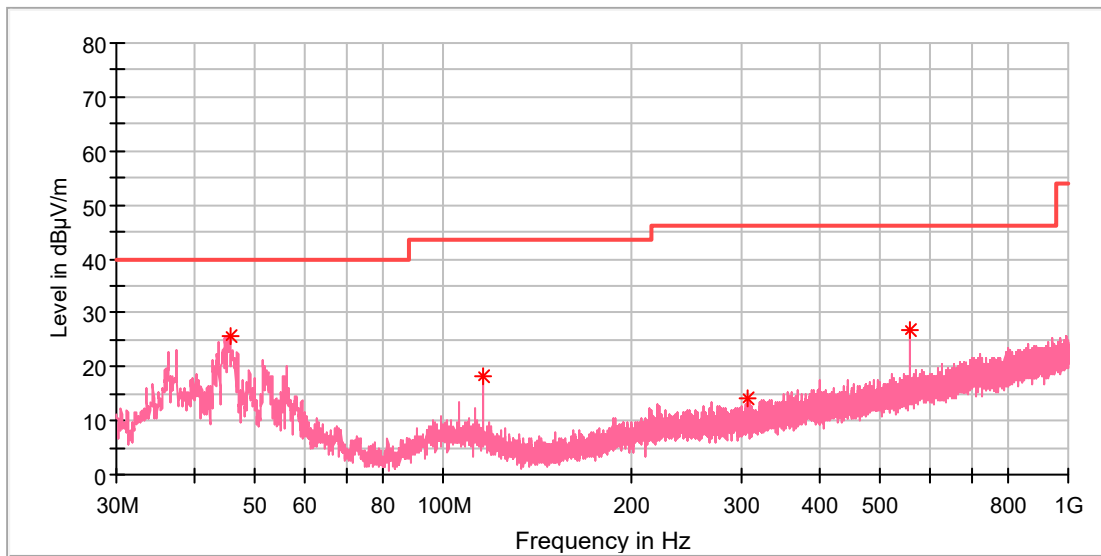
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
45.631923	15.85	40.00	24.15	100.0	H	166.0	-19.0
115.621154	14.35	43.50	29.15	100.0	H	200.0	-20.2
214.486539	17.20	43.50	26.30	100.0	H	173.0	-19.0
320.030000	22.77	46.00	23.23	100.0	H	315.0	-16.1
680.011923	31.00	46.00	15.00	100.0	H	261.0	-8.8

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

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Model:	THR320D
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168377937/A003284877-001
Test Voltage::	AC 120V, 60Hz
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)
45.631923	25.76	40.00	14.24	100.0	V	127.0	-19.0
115.621154	18.25	43.50	25.25	100.0	V	18.0	-20.2
307.233462	14.13	46.00	31.87	100.0	V	267.0	-16.5
560.030385	26.64	46.00	19.36	100.0	V	67.0	-11.0

Final_Result

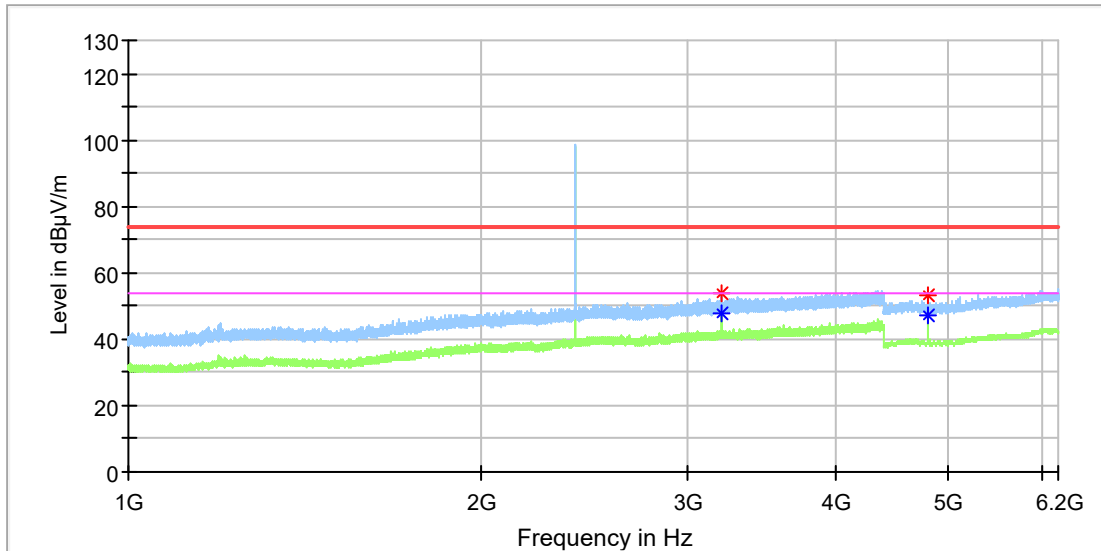
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
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1GHz-18GHz

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

EUT Information

EUT Name:	Smart Temperature and Humidity Monitoring Switch
Model:	THR320D
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168377937/A003284877-001
Test Voltage::	DC 5V via USB port from PC
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

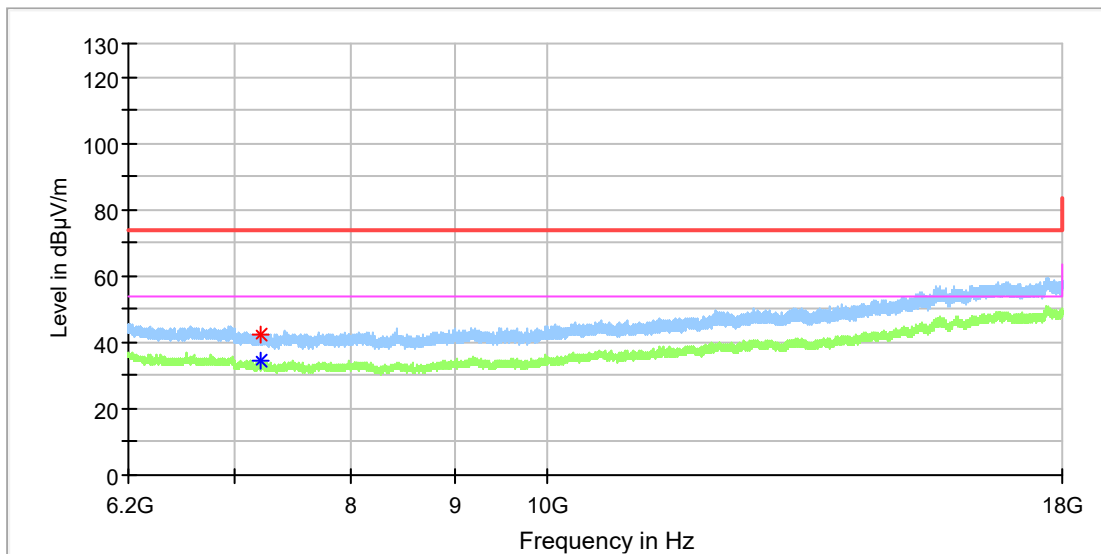
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3202.690000	---	47.94	54.00	6.06	100.0	H	0.0	8.6
3202.860000	53.59	---	74.00	20.41	100.0	H	0.0	8.6
4803.500000	53.42	---	74.00	20.58	100.0	H	257.0	11.8
4804.000000	---	47.15	54.00	6.85	100.0	H	307.0	11.8

Final_Result

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

EUT Information

EUT Name: Smart Temperature and Humidity Monitoring Switch
 Model: THR320D
 Test Mode: BLE 1M_Low channel
 Order No/Sample No: 168377937/A003284877-001
 Test Voltage:: DC 5V via USB port from PC
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical Freqs

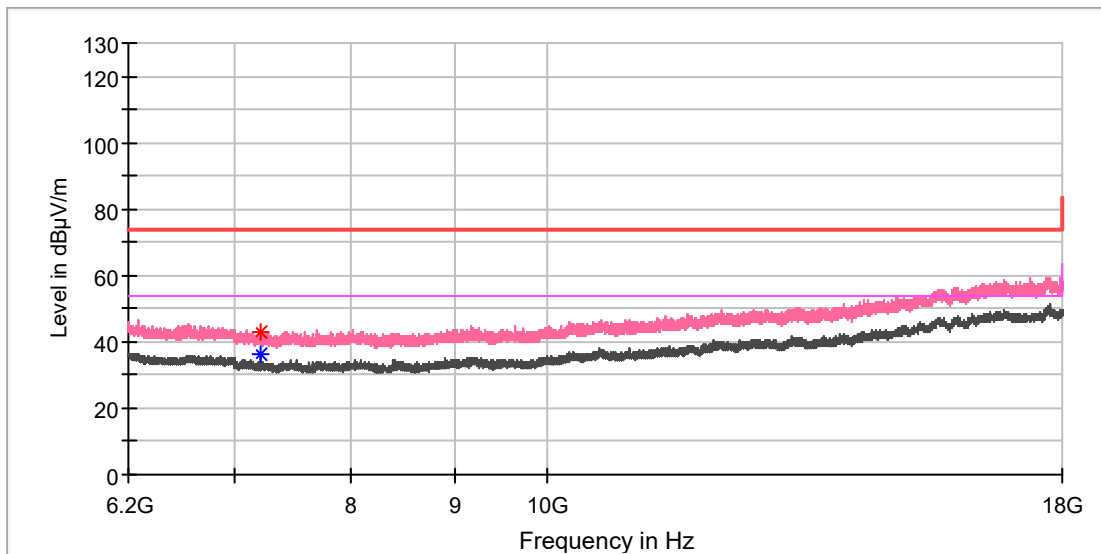
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7205.458333	---	34.56	54.00	19.44	100.0	H	280.0	8.8
7217.750000	42.37	---	74.00	31.63	100.0	H	47.0	8.7

Final Result

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

EUT Name: Smart Temperature and Humidity Monitoring Switch
 Model: THR320D
 Test Mode: BLE 1M_Low channel
 Order No/Sample No: 168377937/A003284877-001
 Test Voltage:: DC 5V via USB port from PC
 Remark: Temp 23 Humi:56%
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Critical_Freqs

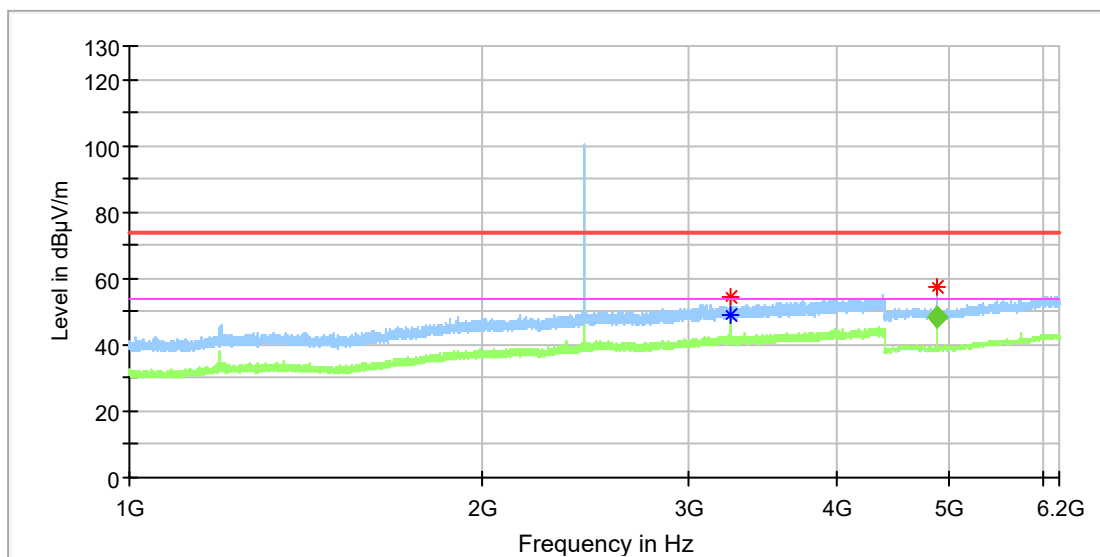
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7205.458333	43.23	---	74.00	30.77	100.0	V	165.0	8.8
7205.458333	---	36.15	54.00	17.85	100.0	V	165.0	8.8

Final_Result

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

EUT Name:	Smart Temperature and Humidity Monitoring Switch
Model:	THR320D
Test Mode:	BLE 1M_Mid channel
Order No./Sample No:	168377937/A003284877-001
Test Voltage::	DC 5V via USB port from PC
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

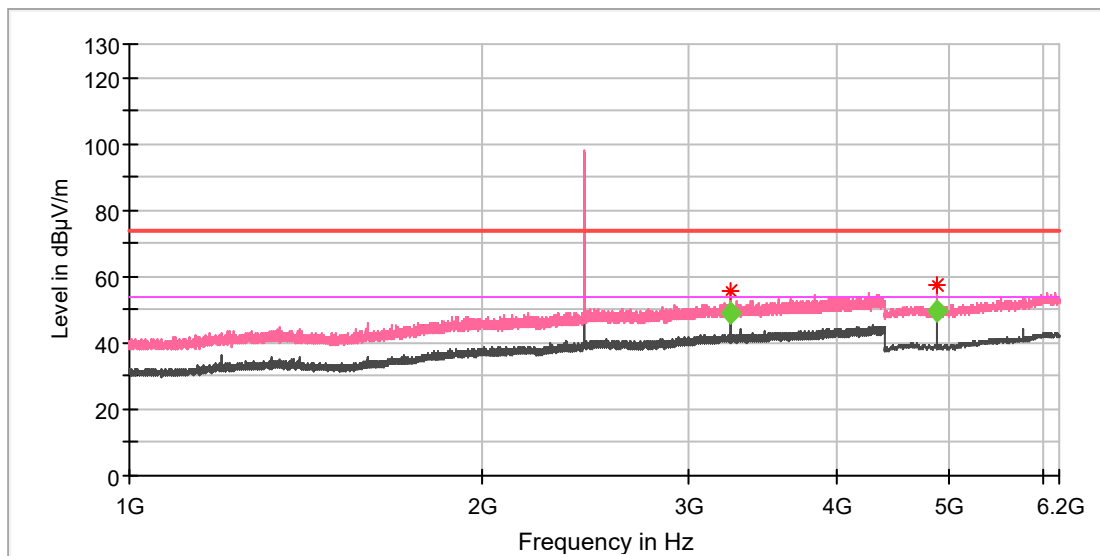
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3253.180000	---	49.21	54.00	4.79	100.0	H	0.0	8.5
3253.520000	54.23	---	74.00	19.77	100.0	H	13.0	8.5
4880.000000	57.24	---	74.00	16.76	100.0	H	302.0	11.8

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4879.852778	48.67	54.00	5.33	105.0	H	301.0	11.8

EUT Information

EUT Name:	Smart Temperature and Humidity Monitoring Switch
Model:	THR320D
Test Mode:	BLE 1M_Mid channel
Order No./Sample No:	168377937/A003284877-001
Test Voltage::	DC 5V via USB port from PC
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

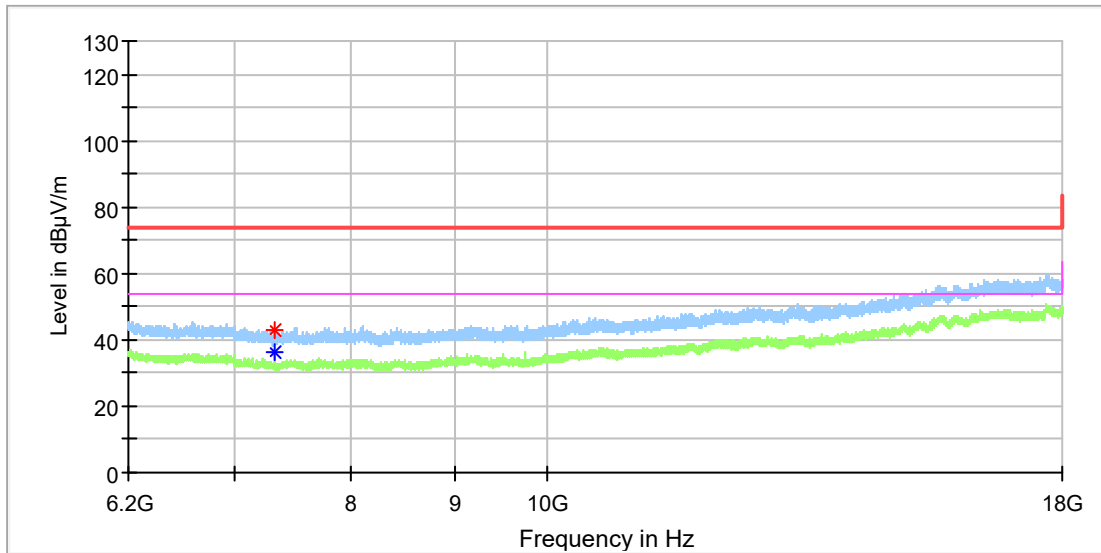
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3253.350000	55.85	---	74.00	18.15	100.0	V	0.0	8.5
4880.000000	57.54	---	74.00	16.46	100.0	V	267.0	11.8

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3253.404000	49.11	54.00	4.89	105.0	V	-2.0	8.5
4879.833333	49.79	54.00	4.21	100.0	V	262.0	11.8

EUT Information

EUT Name: Smart Temperature and Humidity Monitoring Switch
 Model: THR320D
 Test Mode: BLE 1M_Mid channel
 Order No/Sample No: 168377937/A003284877-001
 Test Voltage:: DC 5V via USB port from PC
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical_Freqs

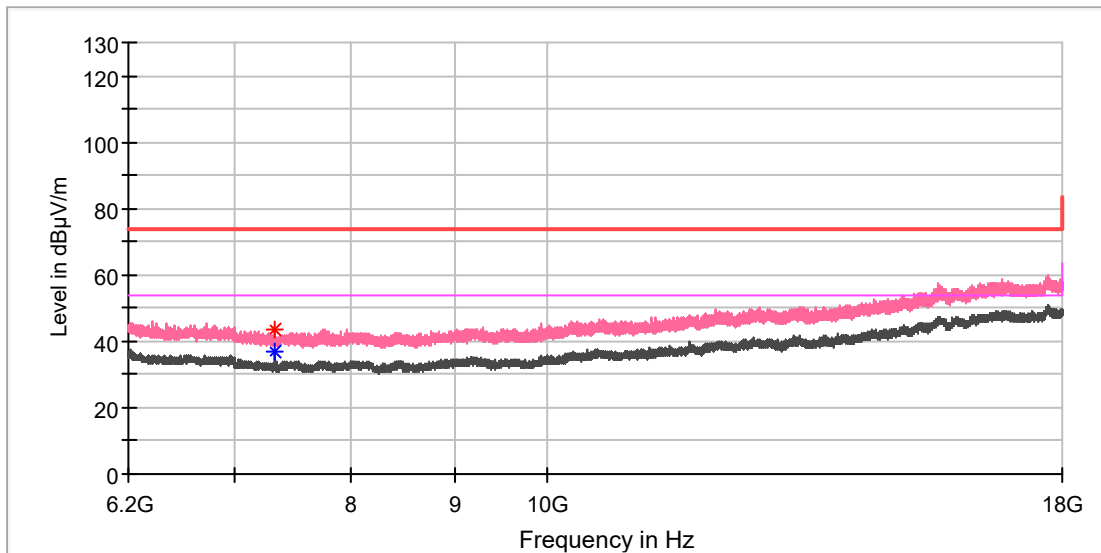
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7319.525000	42.98	---	74.00	31.02	100.0	H	45.0	8.2
7320.508333	---	36.23	54.00	17.77	100.0	H	45.0	8.2

Final_Result

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

EUT Information

EUT Name: Smart Temperature and Humidity Monitoring Switch
 Model: THR320D
 Test Mode: BLE 1M_Mid channel
 Order No/Sample No: 168377937/A003284877-001
 Test Voltage:: DC 5V via USB port from PC
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical_Freqs

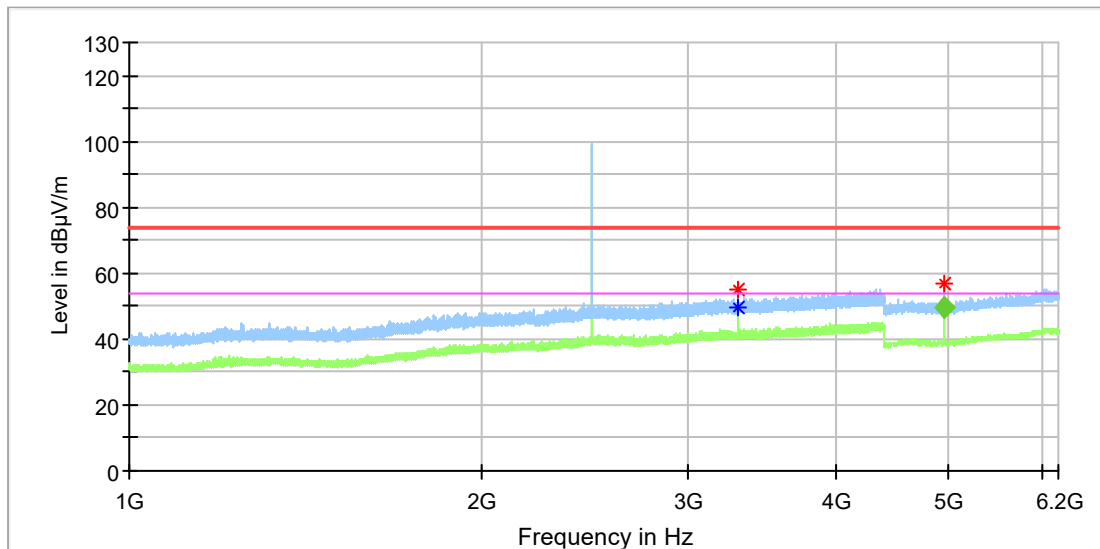
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7320.016667	43.62	---	74.00	30.38	100.0	V	348.0	8.2
7320.016667	---	36.85	54.00	17.15	100.0	V	348.0	8.2

Final_Result

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

EUT Information

EUT Name:	Smart Temperature and Humidity Monitoring Switch
Model:	THR320D
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168377937/A003284877-001
Test Voltage::	DC 5V via USB port from PC
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

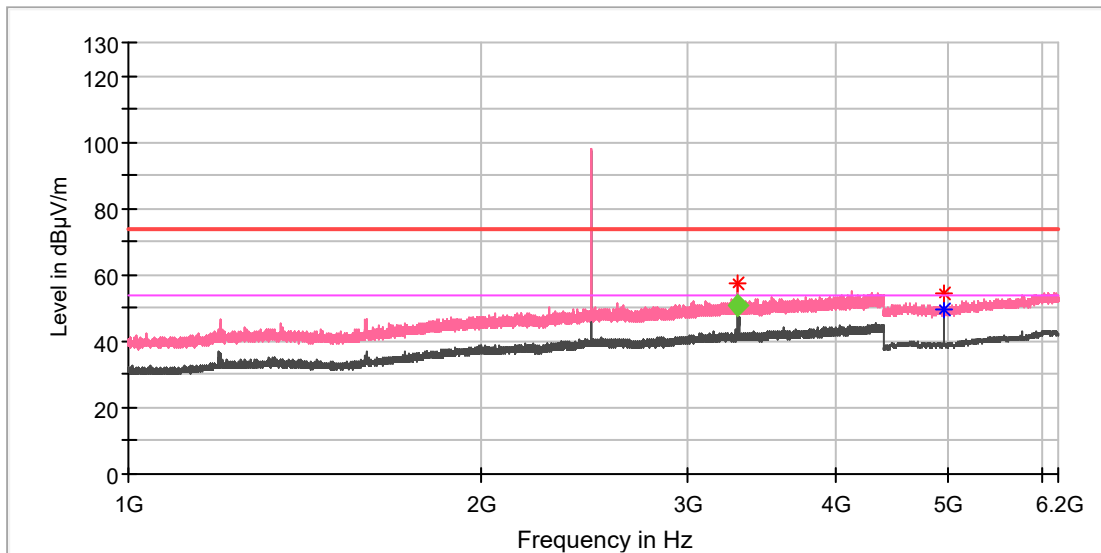
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3306.560000	---	49.79	54.00	4.21	100.0	H	0.0	8.6
3306.730000	55.20	---	74.00	18.80	100.0	H	356.0	8.6
4959.500000	56.69	---	74.00	17.31	100.0	H	20.0	11.8

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4959.977778	49.56	54.00	4.44	100.0	H	18.0	11.8

EUT Information

EUT Name: Smart Temperature and Humidity Monitoring Switch
 Model: THR320D
 Test Mode: BLE 1M_High channel
 Order No/Sample No: 168377937/A003284877-001
 Test Voltage:: DC 5V via USB port from PC
 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)
3306.730000	57.54	---	74.00	16.46	100.0	V	0.0	8.6
4960.000000	---	49.74	54.00	4.26	100.0	V	254.0	11.8
4960.500000	54.59	---	74.00	19.41	100.0	V	254.0	11.8

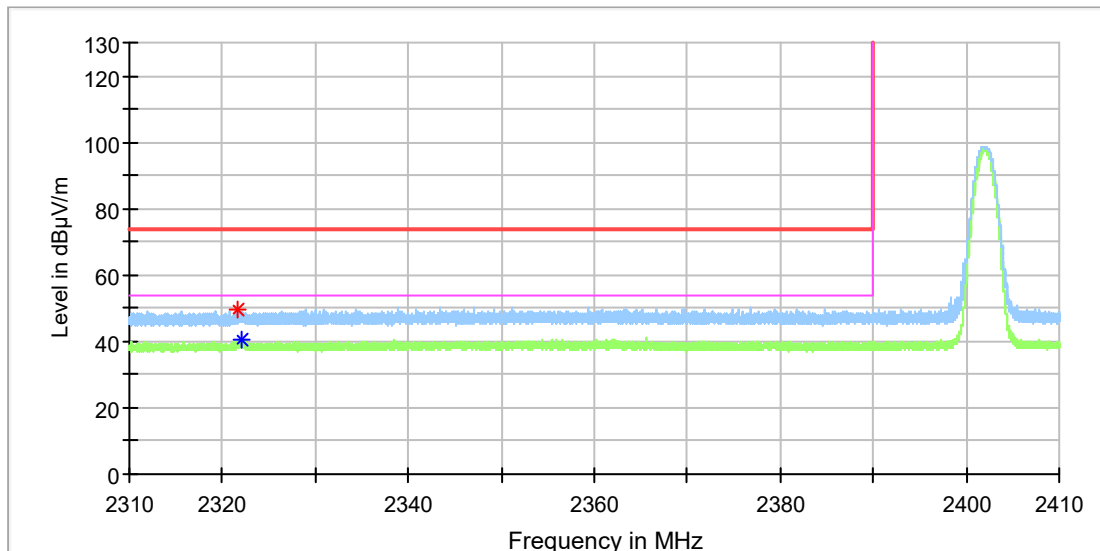
Final Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3306.676500	50.55	54.00	3.45	100.0	V	-3.0	8.6

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

EUT Information

EUT Name:	Smart Temperature and Humidity Monitoring Switch
Model:	THR320D
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168377937/A003284877-001
Test Voltage::	DC 5V via USB port from PC
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical Freqs

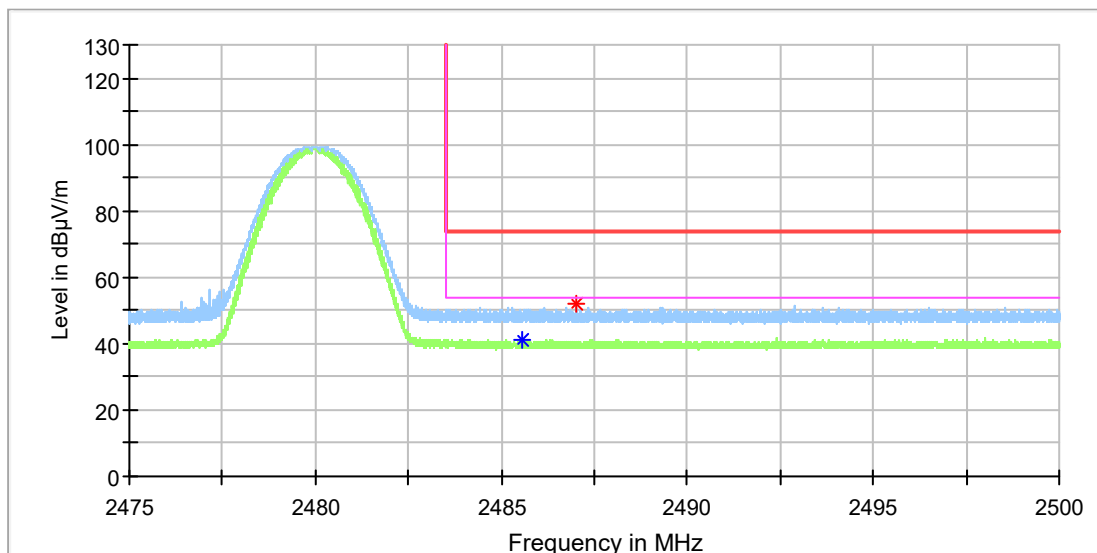
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2321.535000	49.78	---	74.00	24.22	100.0	H	172.0	6.6
2322.095000	---	40.25	54.00	13.75	100.0	H	330.0	6.6

Final Result

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

EUT Information

EUT Name:	Smart Temperature and Humidity Monitoring Switch
Model:	THR320D
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168377937/A003284877-001
Test Voltage::	DC 5V via USB port from PC
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)
2485.537500	---	41.04	54.00	12.96	100.0	H	343.0	7.4
2487.005000	52.06	---	74.00	21.94	100.0	H	142.0	7.4

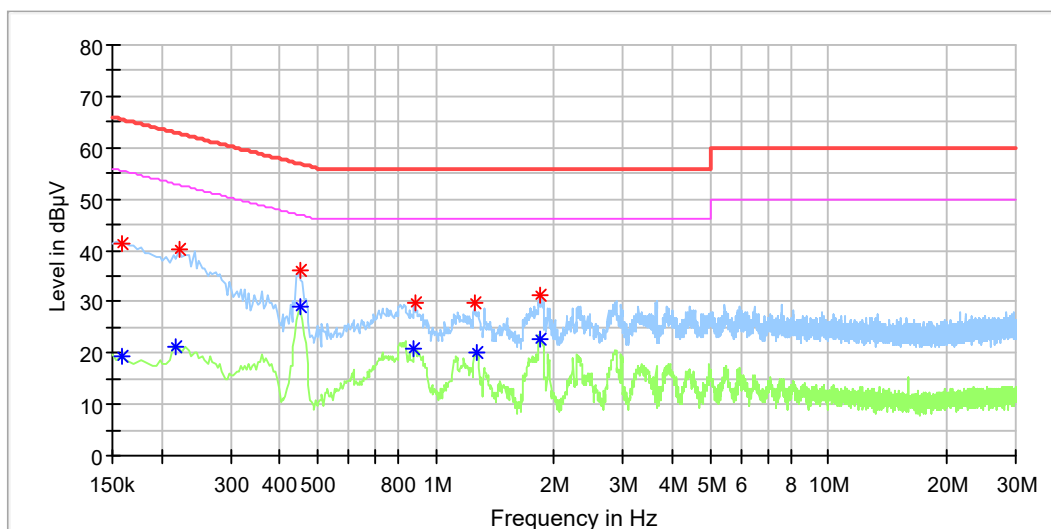
Final Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
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Appendix B.7: Test Results of Conducted Emission

EUT Information

EUT Name:	Smart Temperature and Humidity Monitoring Switch
Order Number:	168377937 15
Model:	THR 320D
Test Mode:	BLE mode
Test Voltage:	AC 120V/60Hz
Test By:/Review By:	Steve Lan/Gary Chen
Remark:	SR1

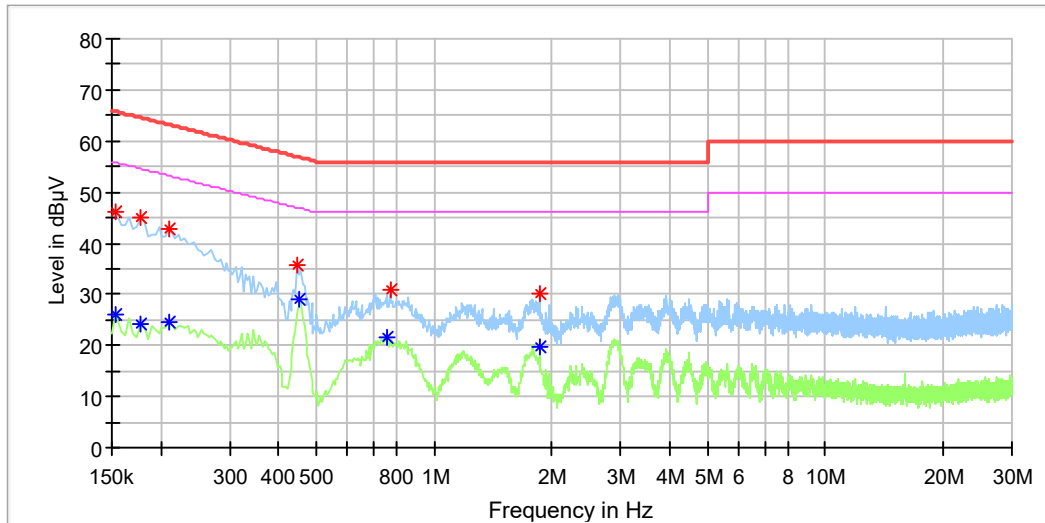


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.158000	---	19.45	55.57	36.12	L1	9.9
0.158000	41.38	---	65.57	24.19	L1	9.9
0.218000	---	21.26	52.90	31.64	L1	9.9
0.222000	40.26	---	62.74	22.49	L1	9.9
0.450000	35.96	---	56.88	20.92	L1	9.9
0.450000	---	29.01	46.88	17.86	L1	9.9
0.882000	---	21.00	46.00	25.00	L1	10.0
0.886000	29.80	---	56.00	26.20	L1	10.0
1.258000	29.67	---	56.00	26.33	L1	10.1
1.270000	---	20.18	46.00	25.82	L1	10.1
1.834000	31.12	---	56.00	24.88	L1	10.1
1.834000	---	22.67	46.00	23.33	L1	10.1

EUT Information

EUT Name:	Monitoring Switch
Order Number:	168377937 15
Model:	THR 320D
Test Mode:	BLE mode
Test Voltage:	AC 120V/60Hz
Test By:/Review By:	Steve Lan/Gary Chen
Remark:	SR1



Critical Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.154000	---	25.99	55.78	29.79	N	9.8
0.154000	45.96	---	65.78	19.82	N	9.8
0.178000	---	24.34	54.58	30.24	N	9.8
0.178000	45.10	---	64.58	19.48	N	9.8
0.210000	---	24.42	53.21	28.79	N	9.8
0.210000	42.89	---	63.21	20.32	N	9.8
0.446000	35.88	---	56.95	21.07	N	9.8
0.454000	---	28.98	46.80	17.82	N	9.8
0.754000	---	21.49	46.00	24.51	N	9.8
0.774000	30.75	---	56.00	25.25	N	9.8
1.862000	---	19.55	46.00	26.45	N	9.8
1.862000	29.97	---	56.00	26.03	N	9.8