

Appendix A: Test Results of Bluetooth Low Energy

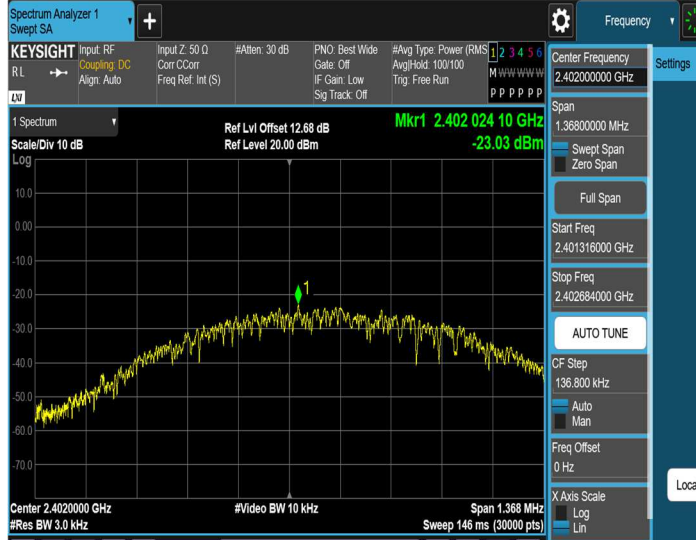
APPENDIX A: TEST RESULTS OF BLUETOOTH LOW ENERGY	1
APPENDIX A.1: TEST RESULTS OF CONDUCTED POWER SPECTRAL DENSITY	2
APPENDIX A.2: TEST RESULTS OF 6DB BANDWIDTH	4
APPENDIX A.3: TEST RESULTS OF 99% BANDWIDTH	6
APPENDIX A.4: TEST RESULTS OF CONDUCTED SPURIOUS EMISSIONS MEASURED IN 100 KHz BANDWIDTH	8
<i>Band Edge</i>	12
<i>Conducted Spurious Emission</i>	8
APPENDIX A.5: TEST RESULTS OF RADIATED SPURIOUS EMISSIONS	13
30 MHz to 1GHz	13
1GHz-18GHz	15
APPENDIX A.6: TEST RESULTS OF RADIATED EMISSIONS IN RESTRICTED BANDS	27

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

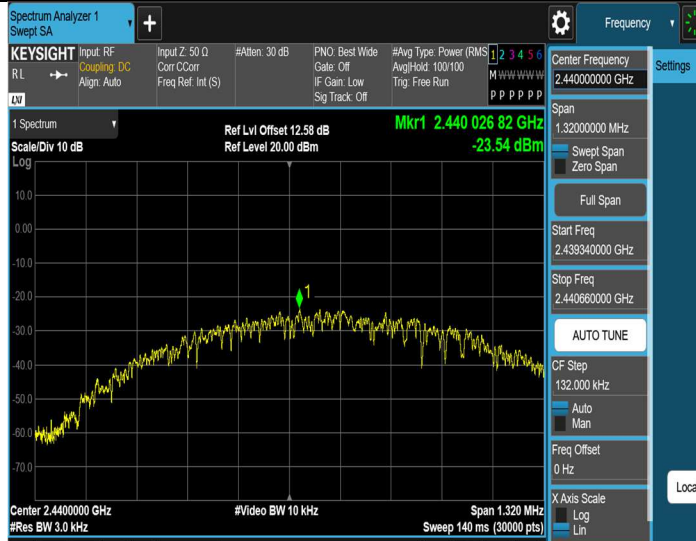
TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-23.03	≤8.00	PASS
		2440	-23.54	≤8.00	PASS
		2480	-24.21	≤8.00	PASS

Test Graphs

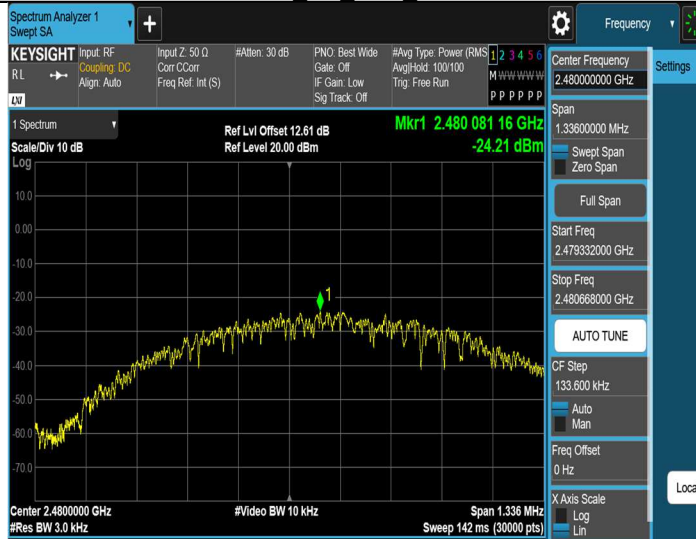
BLE 1M Ant1 2402



BLE 1M Ant1 2440



BLE 1M Ant1 2480



Appendix A.2: Test Results of 6dB Bandwidth

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.684	2401.768	2402.452	0.5	PASS
		2440	0.660	2439.792	2440.452	0.5	PASS
		2480	0.668	2479.784	2480.452	0.5	PASS

Test Graphs

BLE 1M Ant1 2402



BLE 1M Ant1 2440



BLE 1M Ant1 2480



Appendix A.3: Test Results of 99% Bandwidth

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.1960	2401.4547	2402.6507	---	---
		2440	1.1161	2439.5388	2440.6549	---	---
		2480	1.1038	2479.5574	2480.6612	---	---

Test Graphs

BLE 1M Ant1 2402



BLE 1M Ant1 2440



BLE 1M Ant1 2480



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

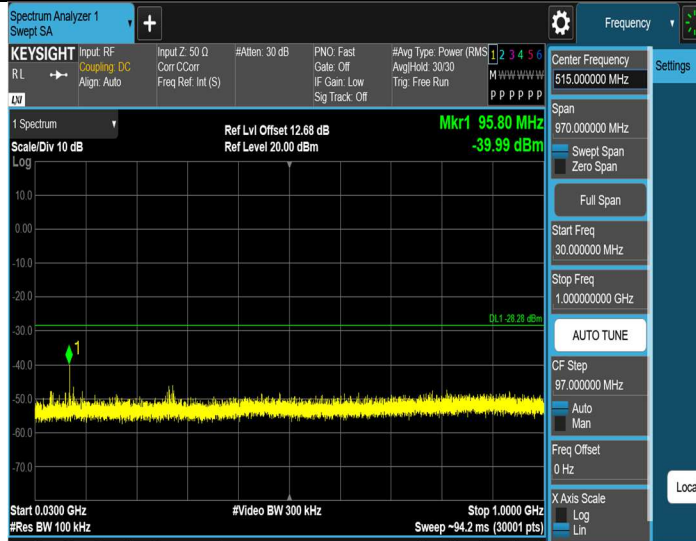
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	-8.28	-8.28	---	PASS
			30~1000	-8.28	-39.99	≤-28.28	PASS
			1000~26500	-8.28	-38.46	≤-28.28	PASS
		2440	Reference	-8.70	-8.70	---	PASS
			30~1000	-8.70	-40.71	≤-28.7	PASS
			1000~26500	-8.70	-37.68	≤-28.7	PASS
		2480	Reference	-8.91	-8.91	---	PASS
			30~1000	-8.91	-39.87	≤-28.91	PASS
			1000~26500	-8.91	-38.06	≤-28.91	PASS

Test Graphs

BLE 1M Ant1 2402 0~Reference



BLE 1M Ant1 2402 30~1000



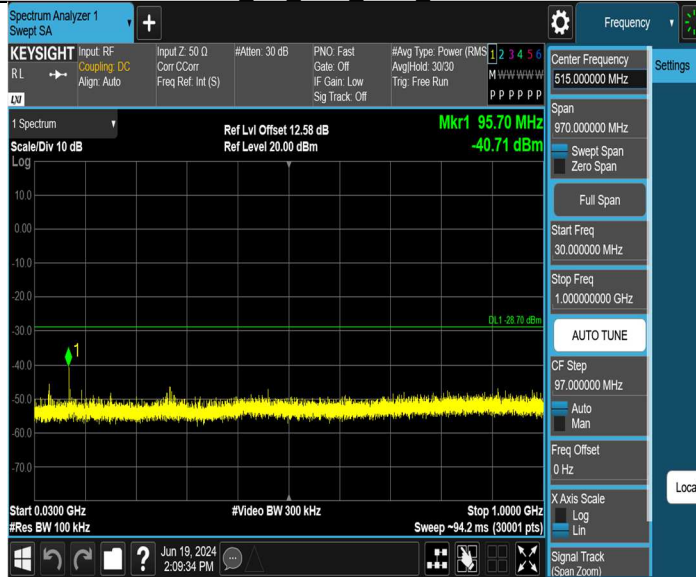
BLE 1M Ant1 2402 1000~26500



BLE 1M Ant1 2440 0~Reference



BLE 1M Ant1 2440 30~1000



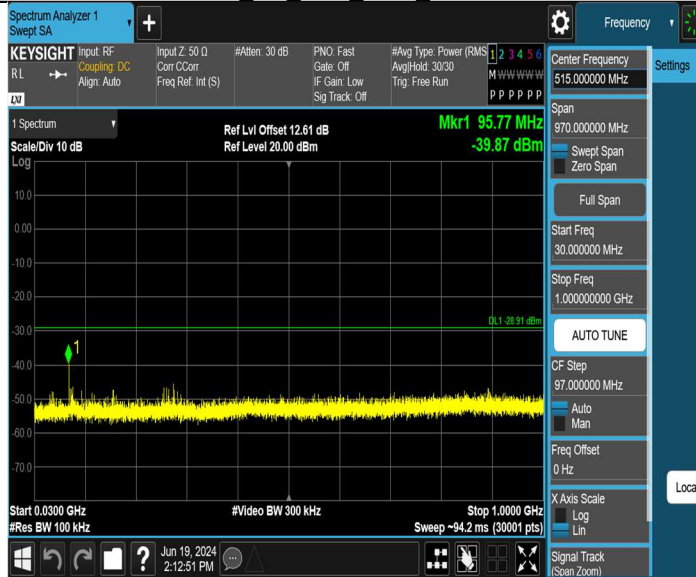
BLE 1M Ant1 2440 1000~26500



BLE 1M Ant1 2480 0~Reference



BLE 1M Ant1 2480 30~1000



BLE 1M Ant1 2480 1000~26500



Band Edge

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	-8.211	-49.62	≤-28.21	PASS
		High	2480	-8.869	-51.48	≤-28.87	PASS

Test Graphs



Appendix A.5: Test Results of Radiated Spurious Emissions

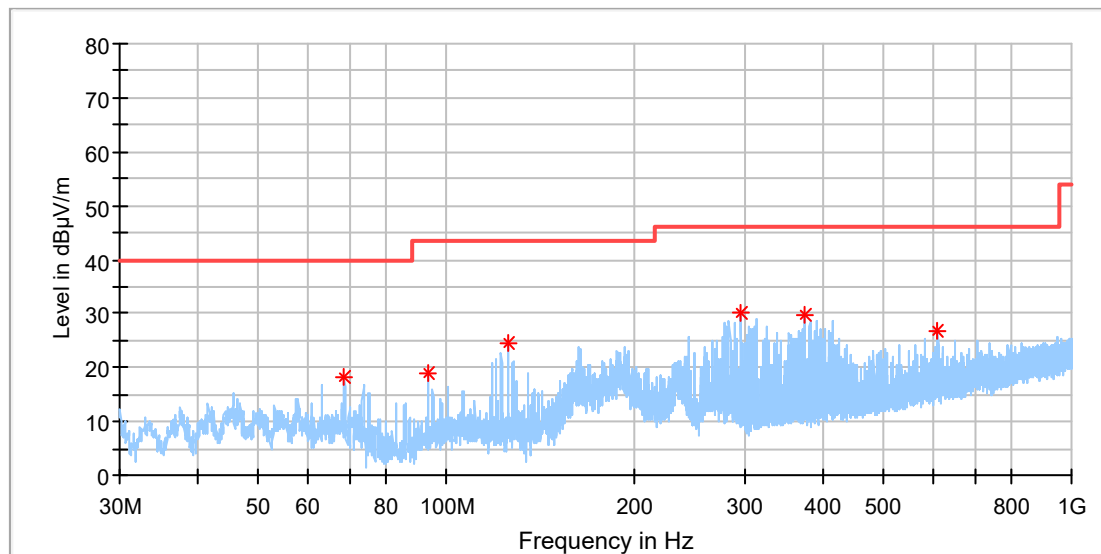
Note:

- 1) 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:	Robotic Pool Cleaner
Model:	Crab
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168474034/A003738005-003
Test Voltage::	DC 3.3V
Remark:	Temp 22 Humi:52%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical Freqs

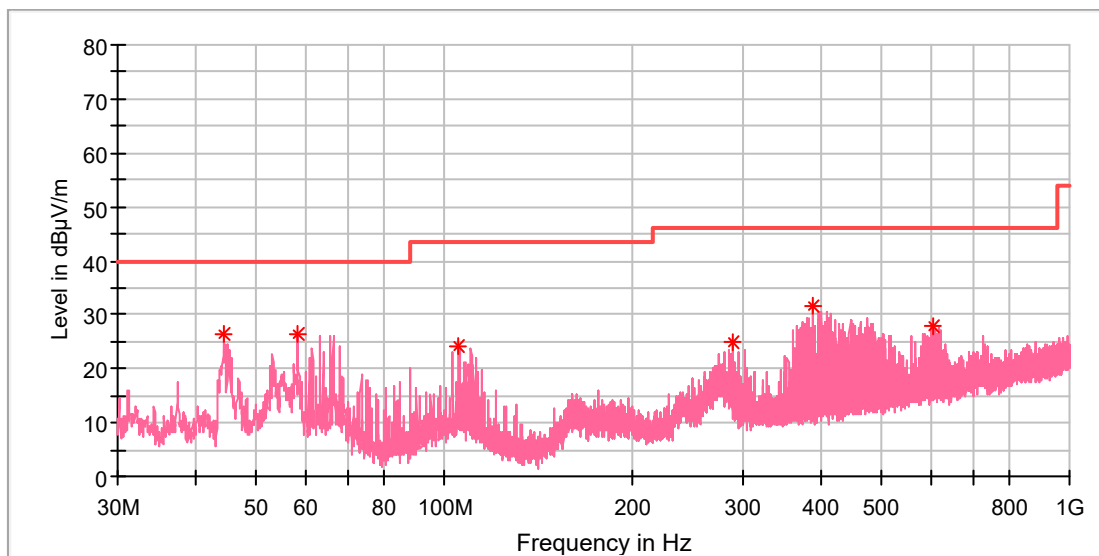
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
68.800000	18.06	40.00	21.94	100.0	H	238.0	-21.7
93.609615	18.86	43.50	24.64	100.0	H	231.0	-20.4
125.619615	24.48	43.50	19.02	100.0	H	140.0	-21.7
296.824615	30.30	46.00	15.70	100.0	H	41.0	-16.7
373.603846	29.64	46.00	16.36	100.0	H	271.0	-14.7
612.037308	26.79	46.00	19.21	100.0	H	345.0	-10.0

Final Result

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

EUT Information

EUT Name:	Robotic Pool Cleaner
Model:	Crab
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168474034/A003738005-003
Test Voltage::	DC 3.3V
Remark:	Temp 22 Humi:52%
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)
44.326154	26.59	40.00	13.41	100.0	V	113.0	-19.3
58.391154	26.57	40.00	13.43	100.0	V	185.0	-19.1
105.585385	24.15	43.50	19.35	100.0	V	169.0	-19.1
289.624231	24.93	46.00	21.07	100.0	V	231.0	-16.9
388.825385	31.64	46.00	14.36	100.0	V	302.0	-14.4
604.836923	27.89	46.00	18.11	100.0	V	318.0	-10.1

Final Result

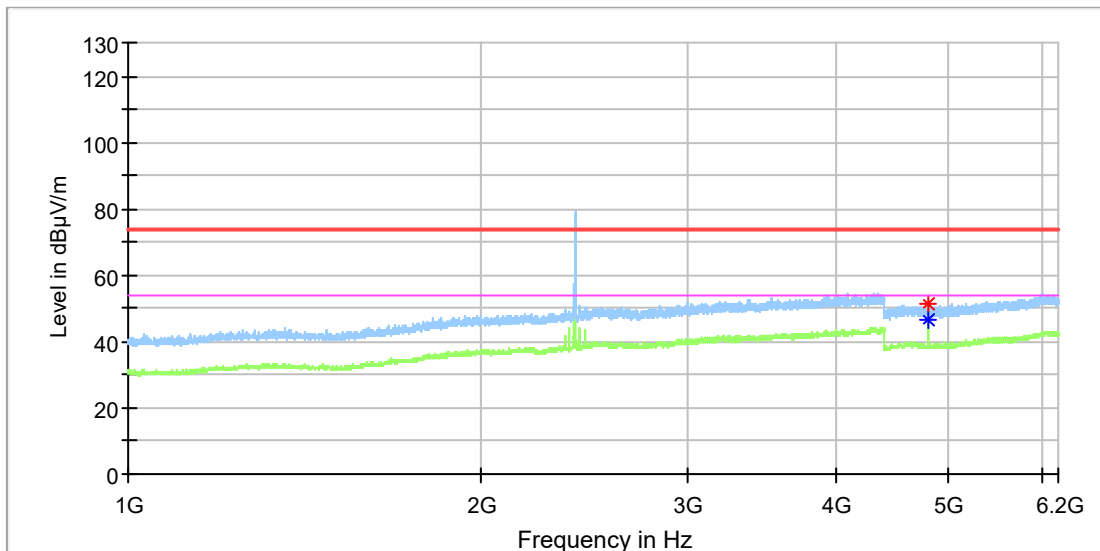
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

1GHz-18GHz

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

EUT Information

EUT Name:	Robotic Pool Cleaner
Model:	Crab
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168474034/A003738005-003
Test Voltage::	DC 3.3V
Remark:	Temp 22 Humi:52%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

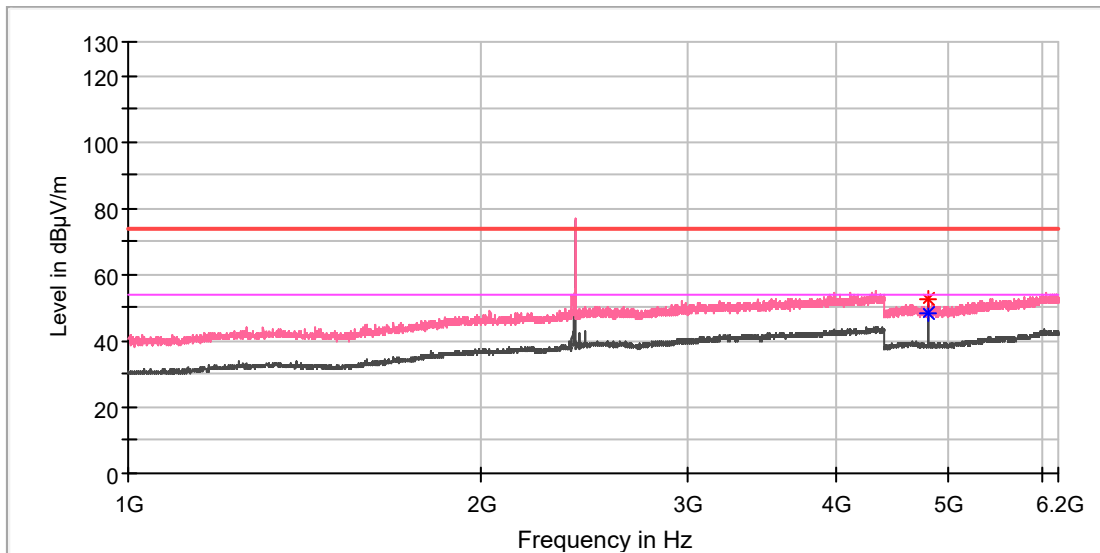
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4801.000000	51.46	---	74.00	22.54	150.0	H	338.0	11.8
4801.000000	---	46.52	54.00	7.48	150.0	H	338.0	11.8

Final_Result

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

EUT Information

EUT Name: Robotic Pool Cleaner
 Model: Crab
 Test Mode: BLE 1M_Low channel
 Order No/Sample No: 168474034/A003738005-003
 Test Voltage:: DC 3.3V
 Remark: Temp 22 Humi:52%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical_Freqs

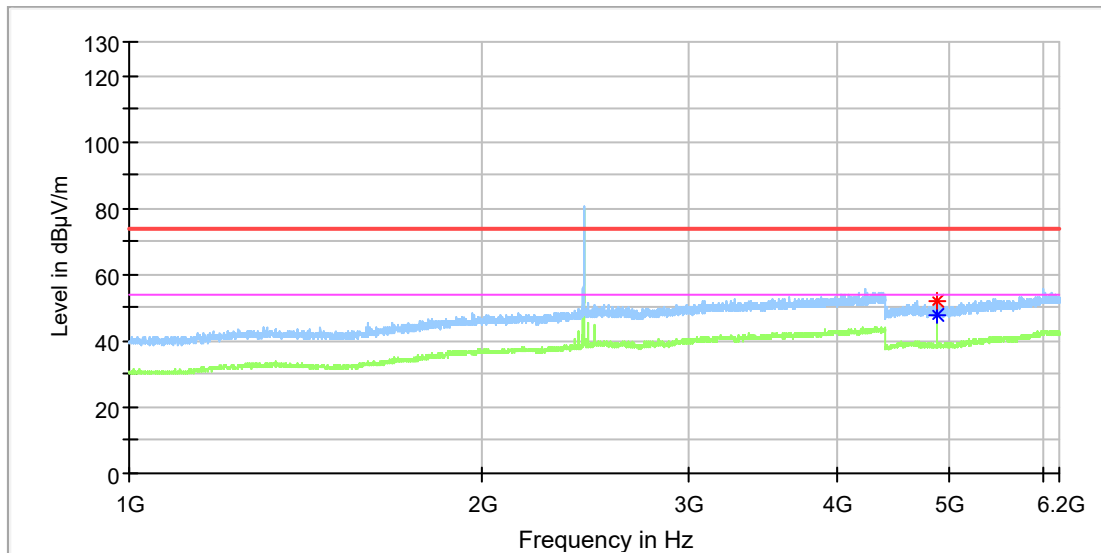
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4801.000000	52.45	---	74.00	21.55	150.0	V	309.0	11.8
4801.000000	---	48.62	54.00	5.38	150.0	V	309.0	11.8

Final_Result

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

EUT Information

EUT Name: Robotic Pool Cleaner
 Model: Crab
 Test Mode: BLE 1M_Mid channel
 Order No/Sample No: 168474034/A003738005-003
 Test Voltage:: DC 3.3V
 Remark: Temp 22 Humi:52%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical Freqs

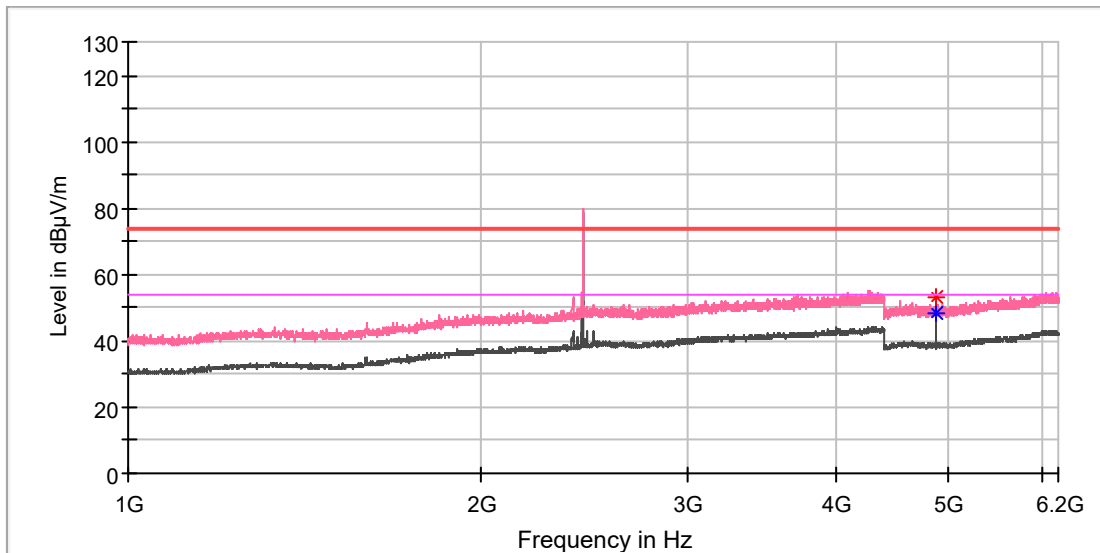
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4877.000000	52.06	---	74.00	21.94	150.0	H	109.0	11.8
4877.000000	---	47.68	54.00	6.32	150.0	H	109.0	11.8

Final Result

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

EUT Information

EUT Name: Robotic Pool Cleaner
 Model: Crab
 Test Mode: BLE 1M_Mid channel
 Order No/Sample No: 168474034/A003738005-003
 Test Voltage:: DC 3.3V
 Remark: Temp 22 Humi:52%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical Freqs

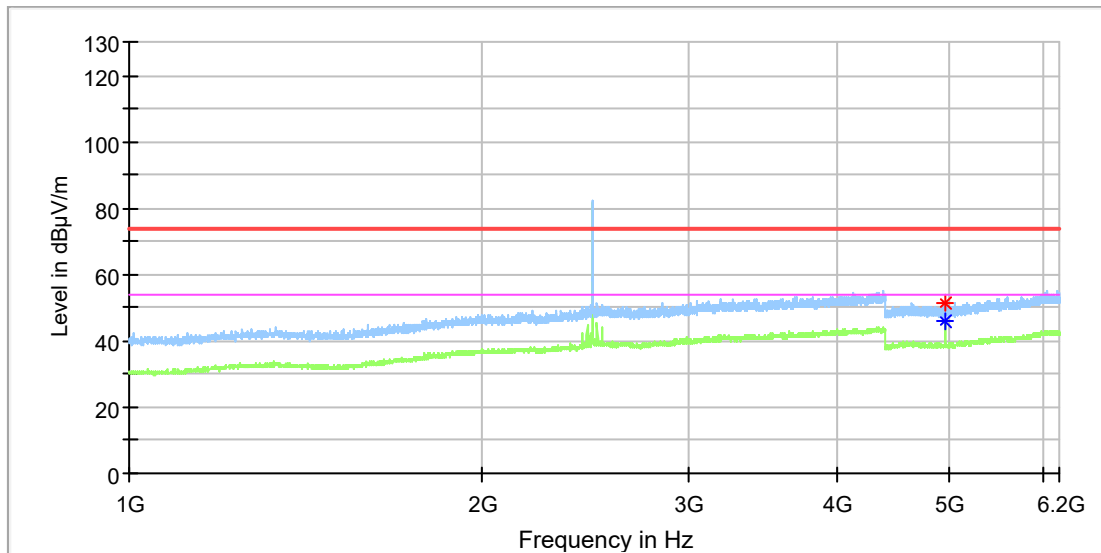
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4877.000000	52.94	---	74.00	21.06	150.0	V	332.0	11.8
4877.500000	---	48.17	54.00	5.83	150.0	V	306.0	11.8

Final Result

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

EUT Information

EUT Name: Robotic Pool Cleaner
 Model: Crab
 Test Mode: BLE 1M_High channel
 Order No/Sample No: 168474034/A003738005-003
 Test Voltage:: DC 3.3V
 Remark: Temp 22 Humi:52%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical Freqs

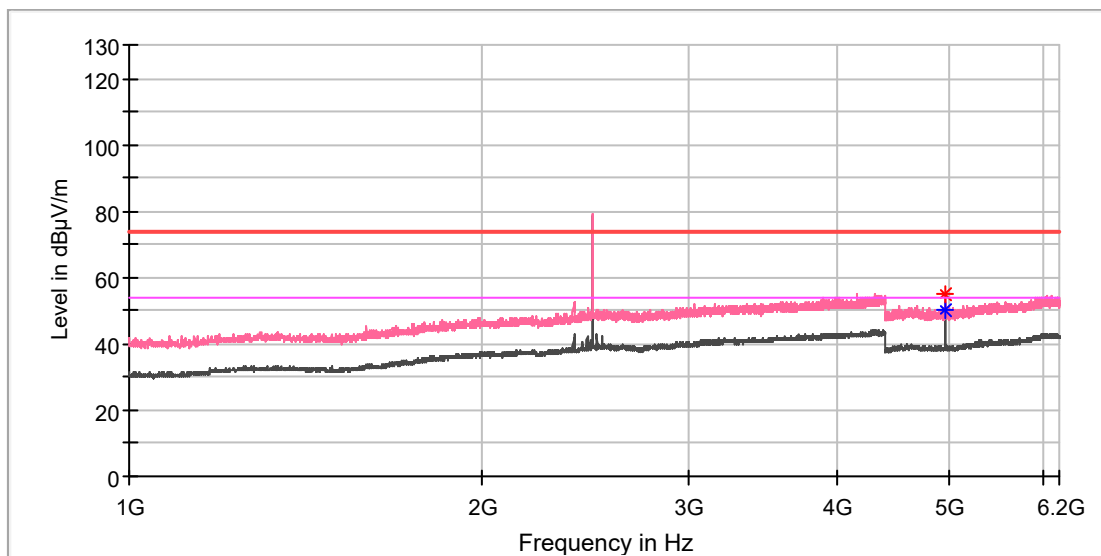
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4957.000000	---	46.21	54.00	7.79	150.0	H	340.0	11.8
4957.500000	51.60	---	74.00	22.40	150.0	H	109.0	11.8

Final Result

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

EUT Information

EUT Name: Robotic Pool Cleaner
 Model: Crab
 Test Mode: BLE 1M_High channel
 Order No/Sample No: 168474034/A003738005-003
 Test Voltage:: DC 3.3V
 Remark: Temp 22 Humi:52%
 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)
4957.000000	54.93	---	74.00	19.07	150.0	V	328.0	11.8
4957.500000	---	50.47	54.00	3.53	150.0	V	328.0	11.8

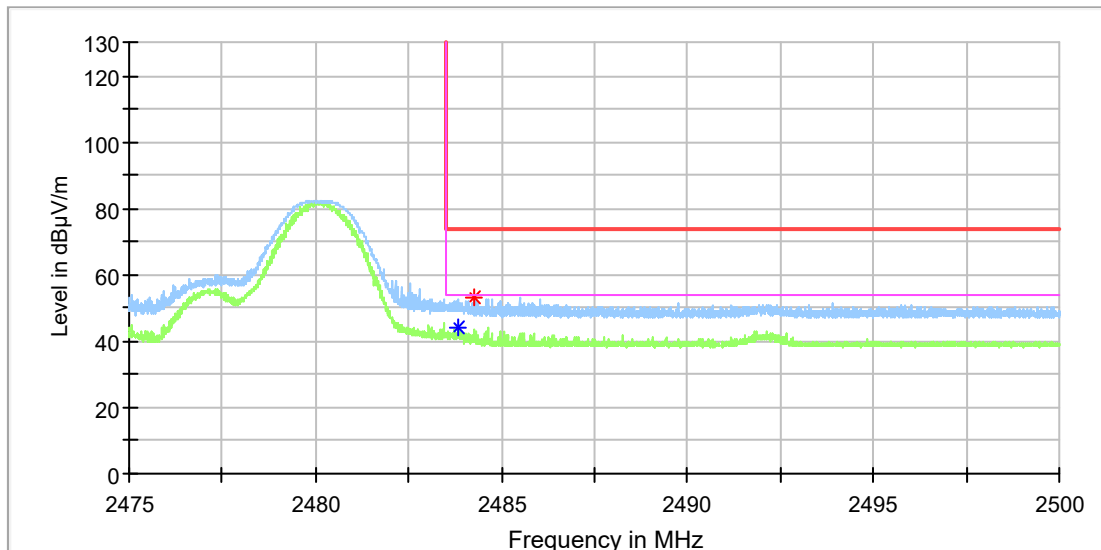
Final Result

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

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

EUT Information

EUT Name:	Robotic Pool Cleaner
Model:	Crab
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168474034/A003738005-003
Test Voltage::	DC 3.3V
Remark:	Temp 22 Humi:52%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical Freqs

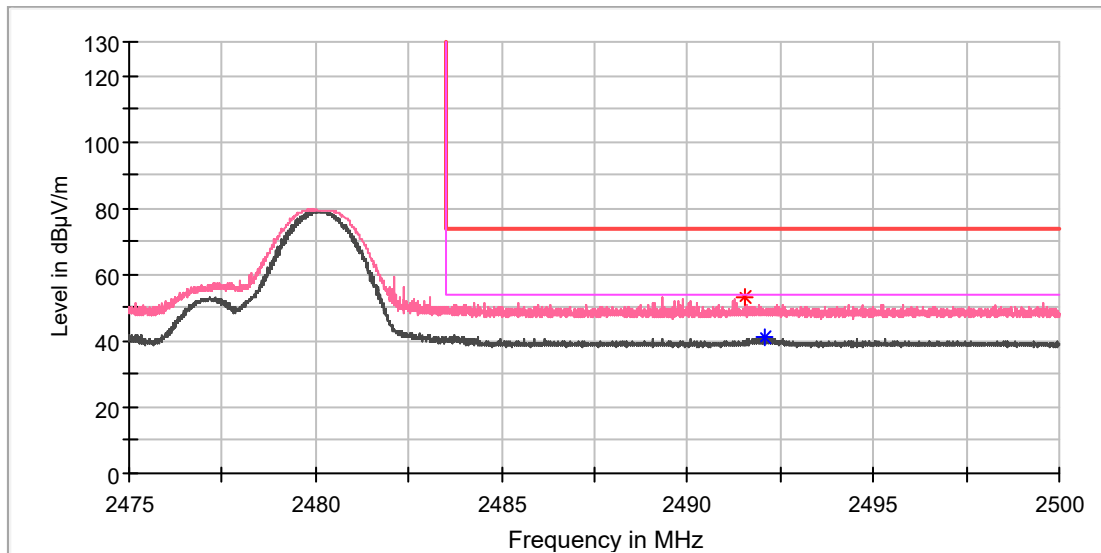
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.830882	---	43.98	54.00	10.02	150.0	H	0.0	7.4
2484.272059	53.12	---	74.00	20.88	150.0	H	341.0	7.4

Final Result

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

EUT Information

EUT Name: Robotic Pool Cleaner
 Model: Crab
 Test Mode: BLE 1M_High channel
 Order No/Sample No: 168474034/A003738005-003
 Test Voltage:: DC 3.3V
 Remark: Temp 22 Humi:52%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical Freqs

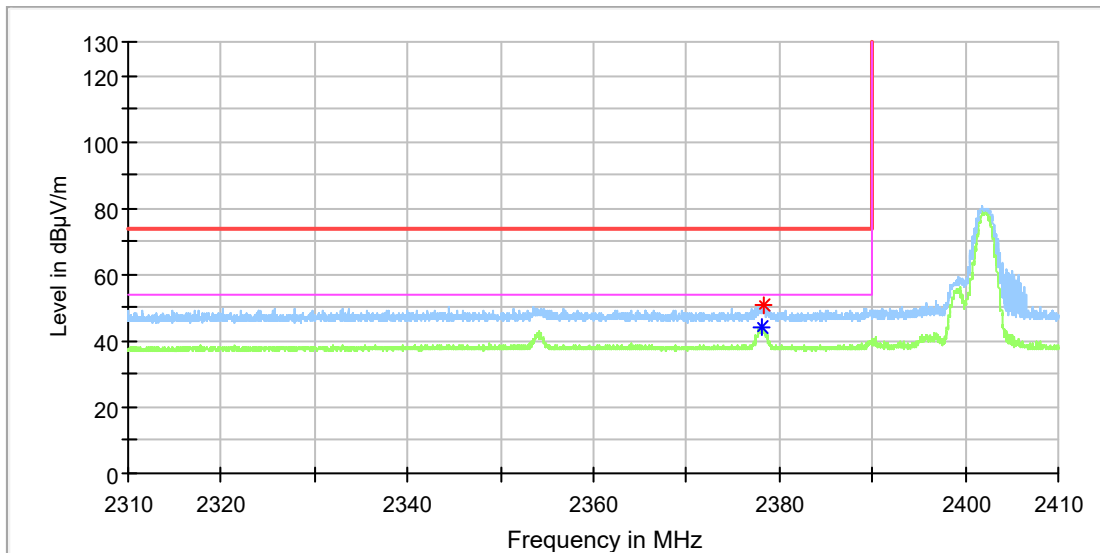
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2491.529412	53.06	---	74.00	20.94	150.0	V	286.0	7.4
2492.073529	---	41.26	54.00	12.74	150.0	V	0.0	7.4

Final Result

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

EUT Information

EUT Name: Robotic Pool Cleaner
 Model: Crab
 Test Mode: BLE 1M_Low channel
 Order No/Sample No: 168474034/A003738005-003
 Test Voltage:: DC 3.3V
 Remark: Temp 22 Humi:52%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical Freqs

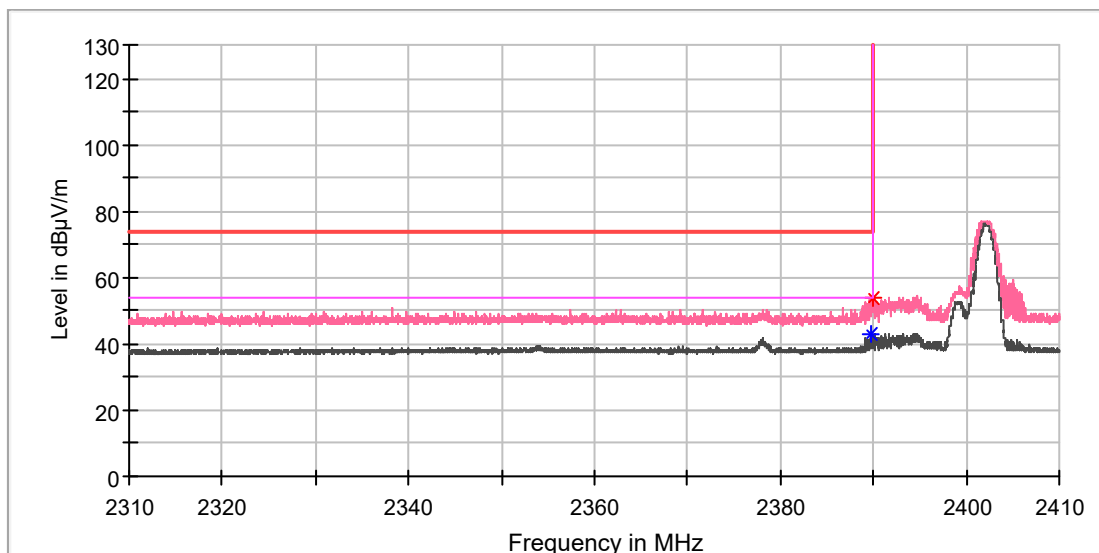
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2378.000000	---	44.24	54.00	9.76	150.0	H	273.0	6.9
2378.323529	50.78	---	74.00	23.22	150.0	H	273.0	6.9

Final Result

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

EUT Information

EUT Name: Robotic Pool Cleaner
 Model: Crab
 Test Mode: BLE 1M_Low channel
 Order No/Sample No: 168474034/A003738005-003
 Test Voltage:: DC 3.3V
 Remark: Temp 22 Humi:52%
 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)
2389.838235	---	43.06	54.00	10.94	150.0	V	270.0	7.0
2389.897059	53.65	---	74.00	20.35	150.0	V	264.0	7.0

Final Result

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