

Appendix A: Test Results of Bluetooth Low Energy

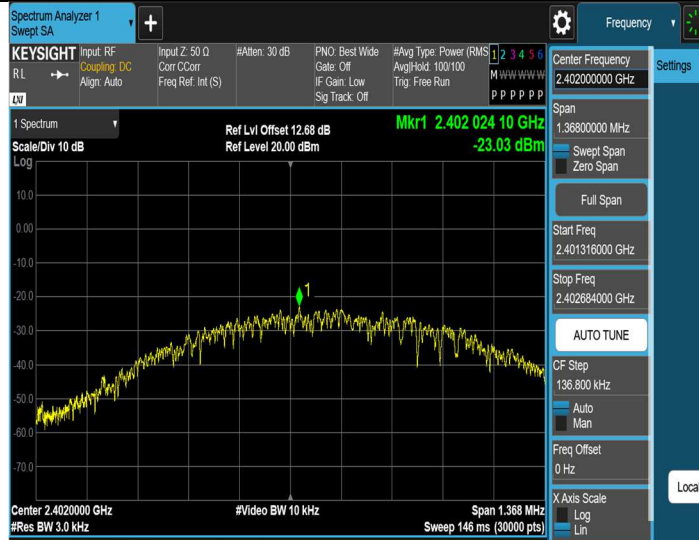
APPENDIX A: TEST RESULTS OF BLUETOOTH LOW ENERGY	1
APPENDIX A.1: TEST RESULTS OF CONDUCTED POWER SPECTRAL DENSITY	2
APPENDIX A.2: TEST RESULTS OF 6dB BANDWIDTH	4
APPENDIX A.3: TEST RESULTS OF 99% BANDWIDTH	6
APPENDIX A.4: TEST RESULTS OF CONDUCTED SPURIOUS EMISSIONS MEASURED IN 100 kHz BANDWIDTH	8
<i>Band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

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

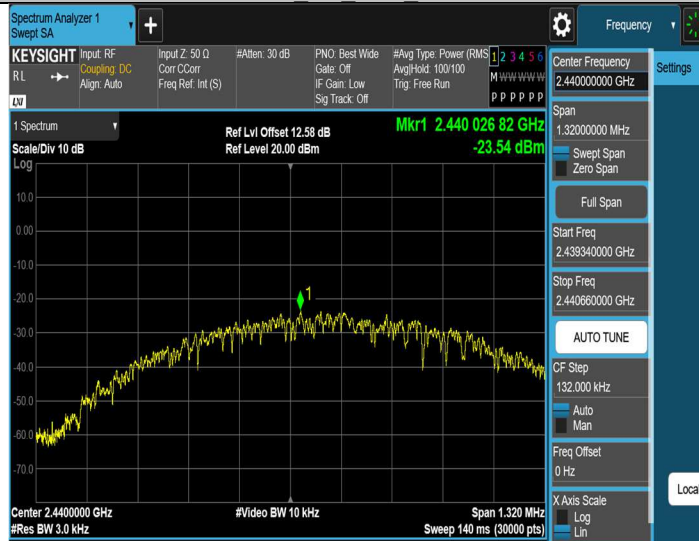
TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-23.03	≤8.00	PASS
		2440	-23.54	≤8.00	PASS
		2480	-24.21	≤8.00	PASS

Test Graphs

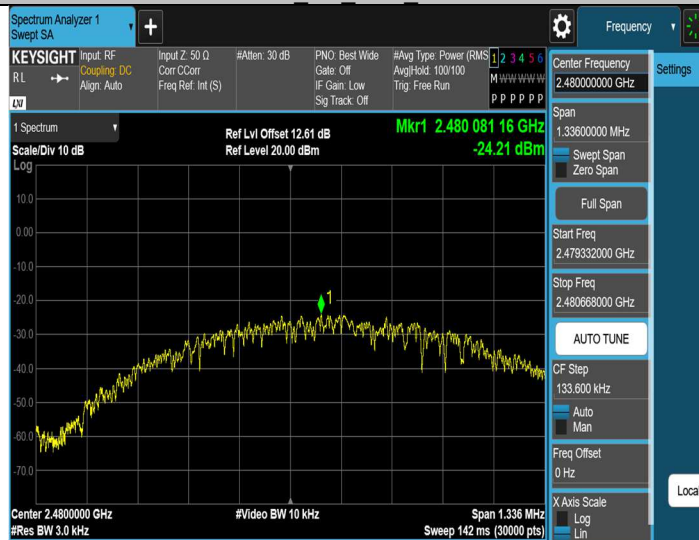
BLE 1M Ant1 2402



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

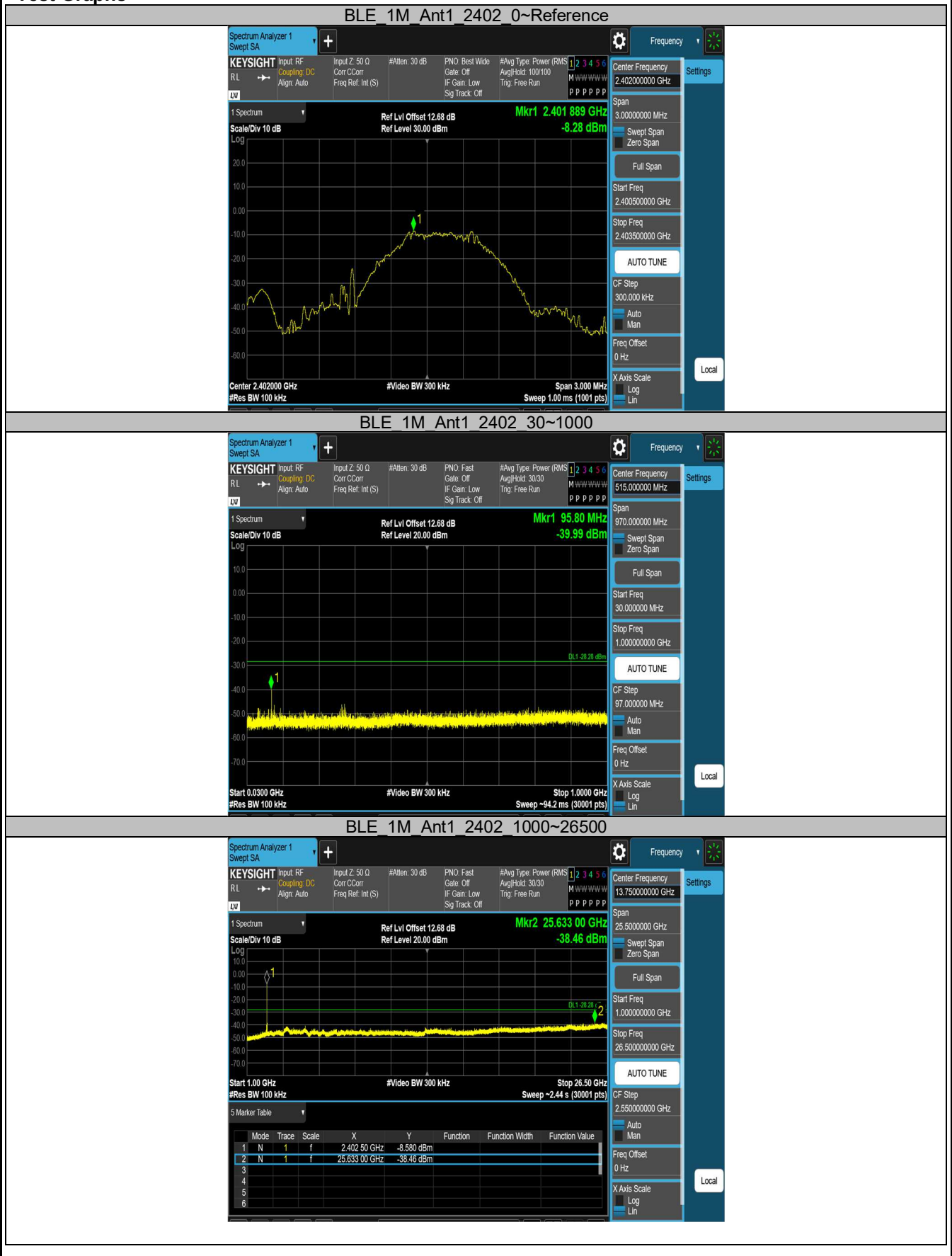


Appendix A.4: Test Results of Conducted Spurious Emissions Measured in 100 kHz Bandwidth

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







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

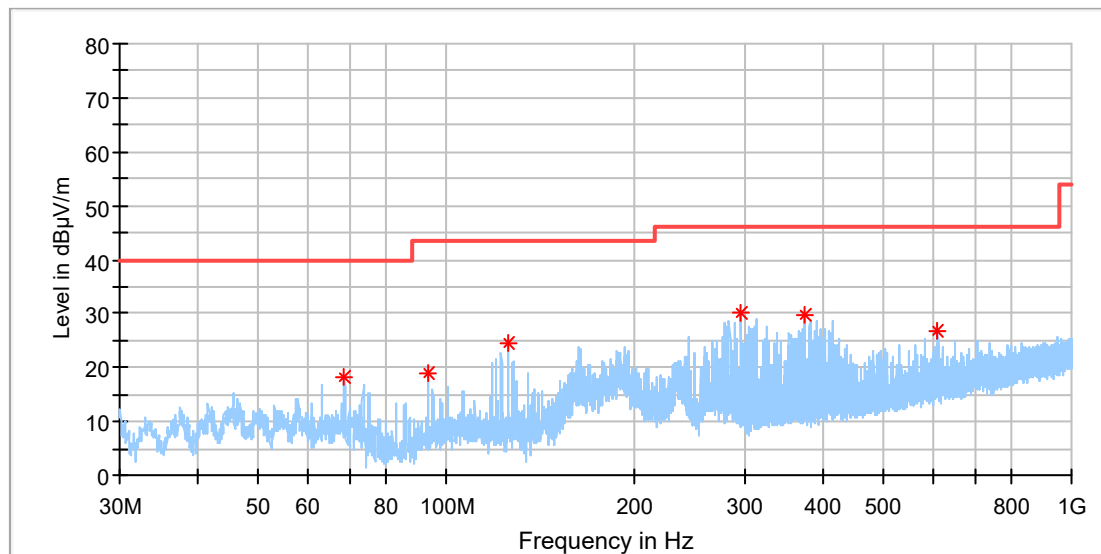
Note:

- 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

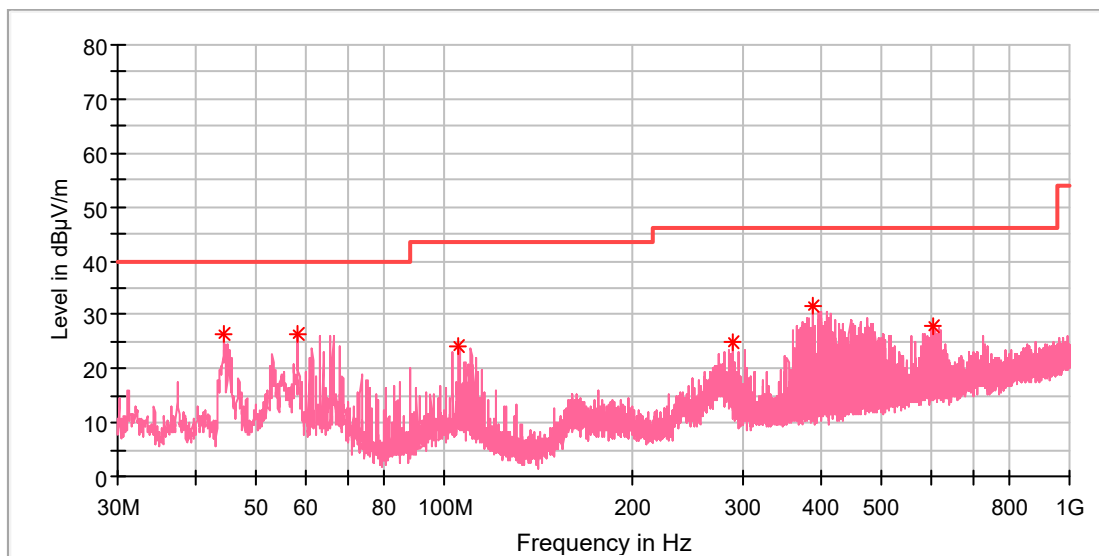
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
68.800000	18.06	40.00	21.94	100.0	H	238.0	-21.7
93.609615	18.86	43.50	24.64	100.0	H	231.0	-20.4
125.619615	24.48	43.50	19.02	100.0	H	140.0	-21.7
296.824615	30.30	46.00	15.70	100.0	H	41.0	-16.7
373.603846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

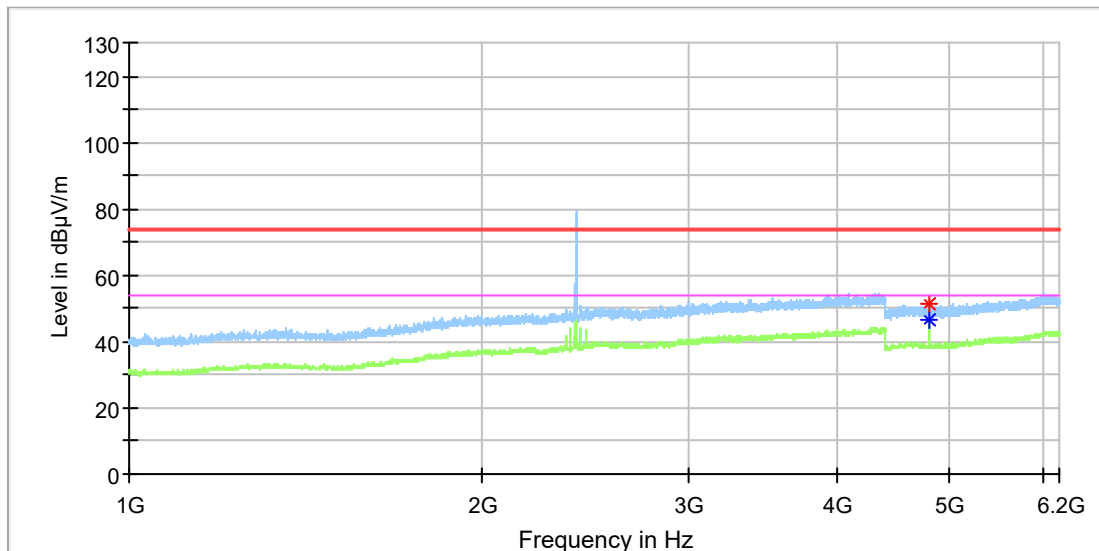
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

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

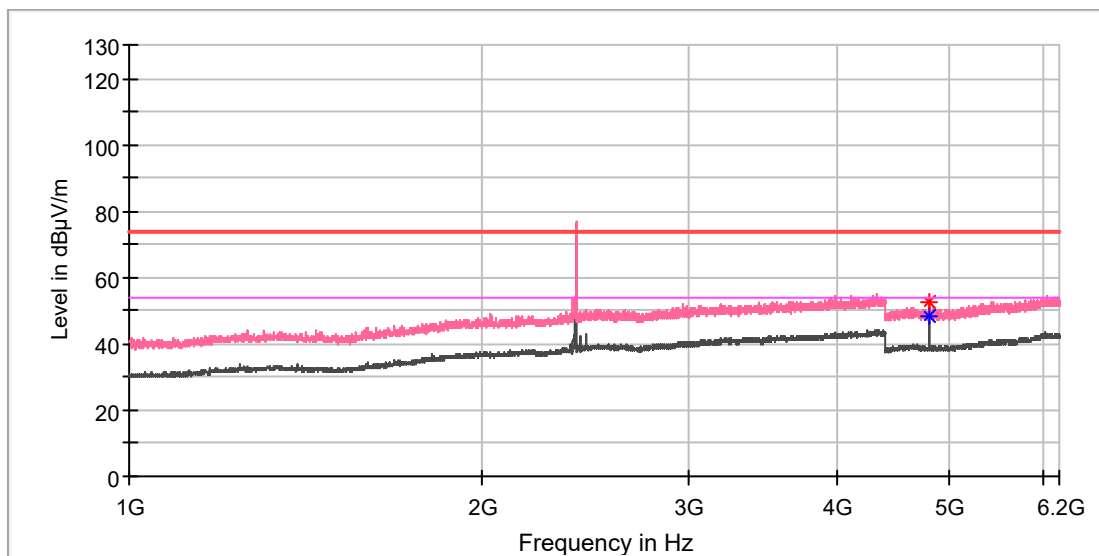
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4801.000000	51.46	---	74.00	22.54	150.0	H	338.0	11.8
4801.000000	---	46.52	54.00	7.48	150.0	H	338.0	11.8

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

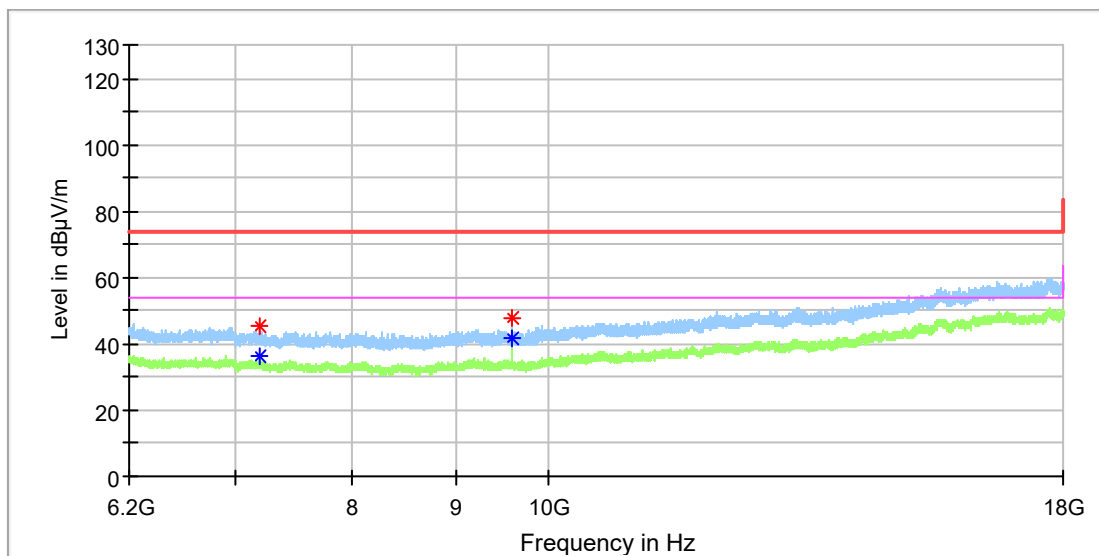
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4801.000000	52.45	---	74.00	21.55	150.0	V	309.0	11.8
4801.000000	---	48.62	54.00	5.38	150.0	V	309.0	11.8

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_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

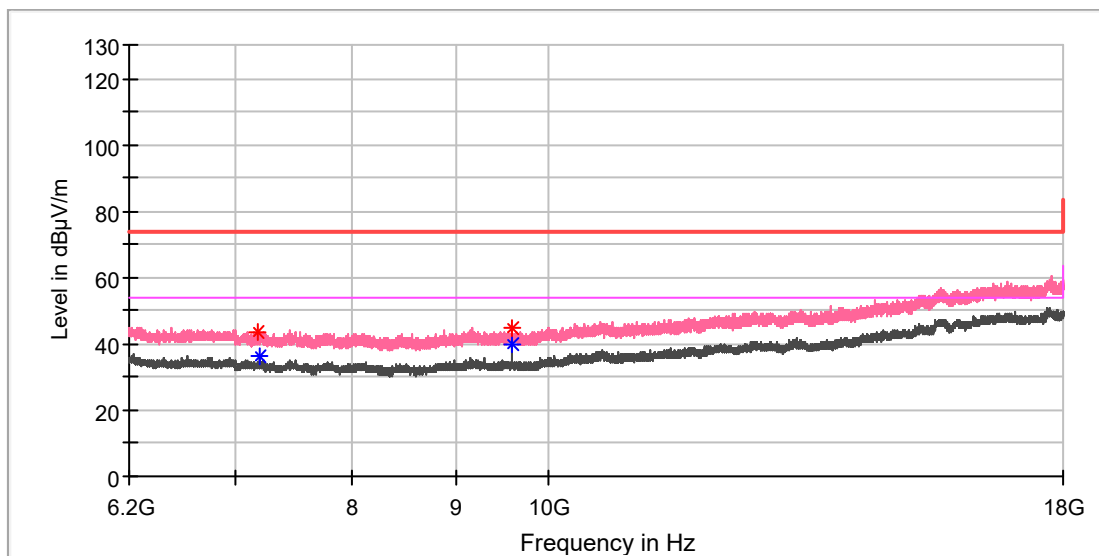
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7200.050000	45.11	---	74.00	28.89	150.0	H	80.0	8.8
7200.050000	---	36.07	54.00	17.93	150.0	H	80.0	8.8
9602.333333	47.86	---	74.00	26.14	150.0	H	315.0	10.4
9602.825000	---	41.88	54.00	12.12	150.0	H	328.0	10.4

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

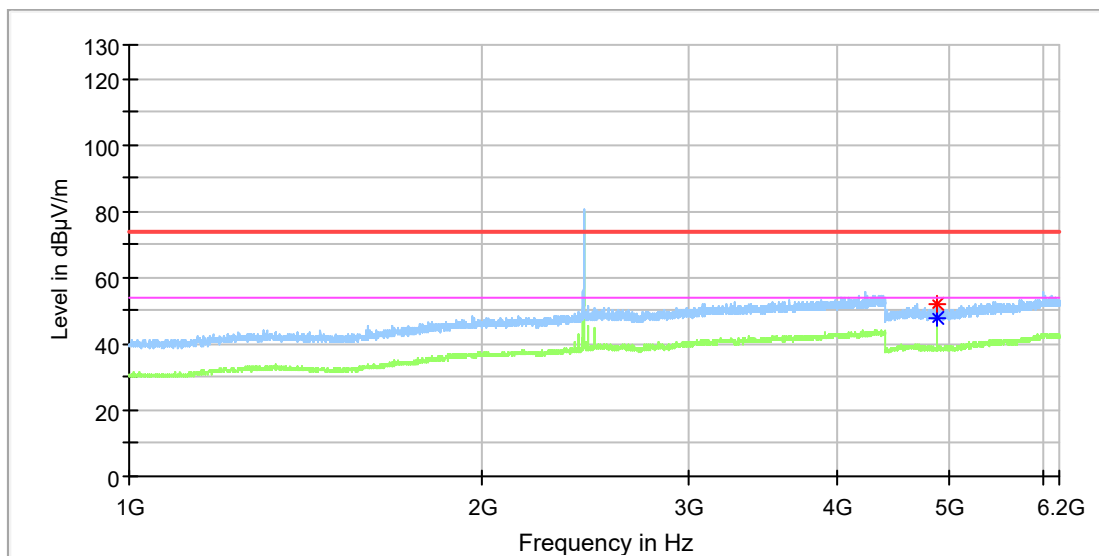
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7170.550000	43.49	---	74.00	30.51	150.0	V	192.0	8.7
7200.050000	---	36.17	54.00	17.83	150.0	V	347.0	8.8
9602.333333	---	40.09	54.00	13.91	150.0	V	322.0	10.4
9602.825000	44.99	---	74.00	29.01	150.0	V	322.0	10.4

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_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

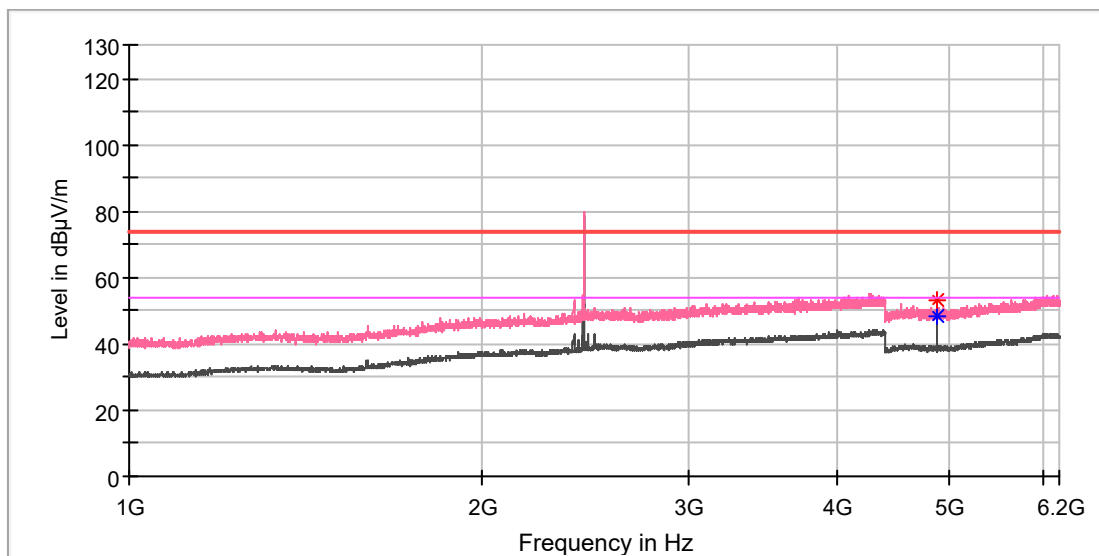
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4877.000000	52.06	---	74.00	21.94	150.0	H	109.0	11.8
4877.000000	---	47.68	54.00	6.32	150.0	H	109.0	11.8

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

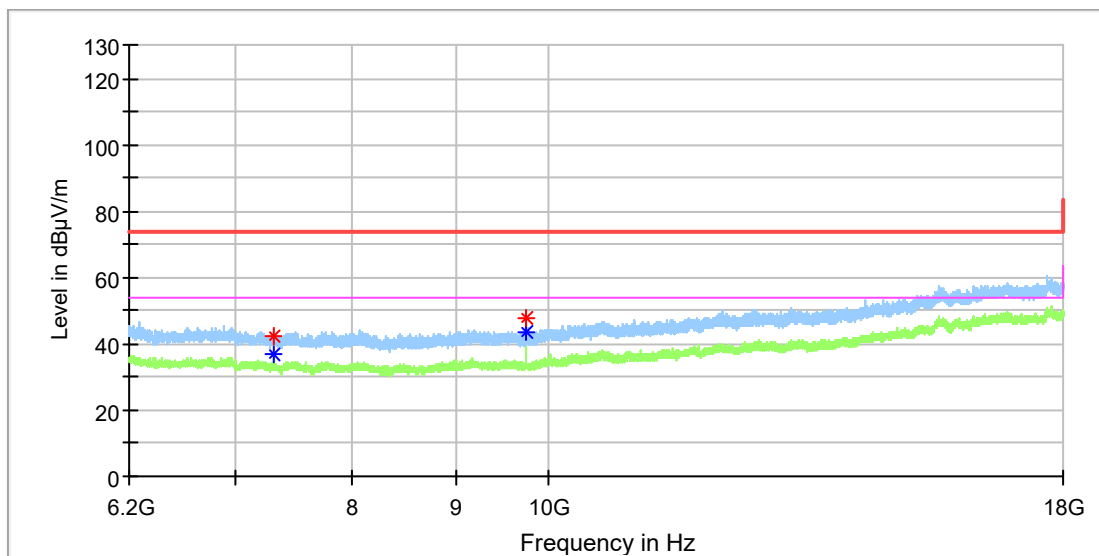
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4877.000000	52.94	---	74.00	21.06	150.0	V	332.0	11.8
4877.500000	---	48.17	54.00	5.83	150.0	V	306.0	11.8

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_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

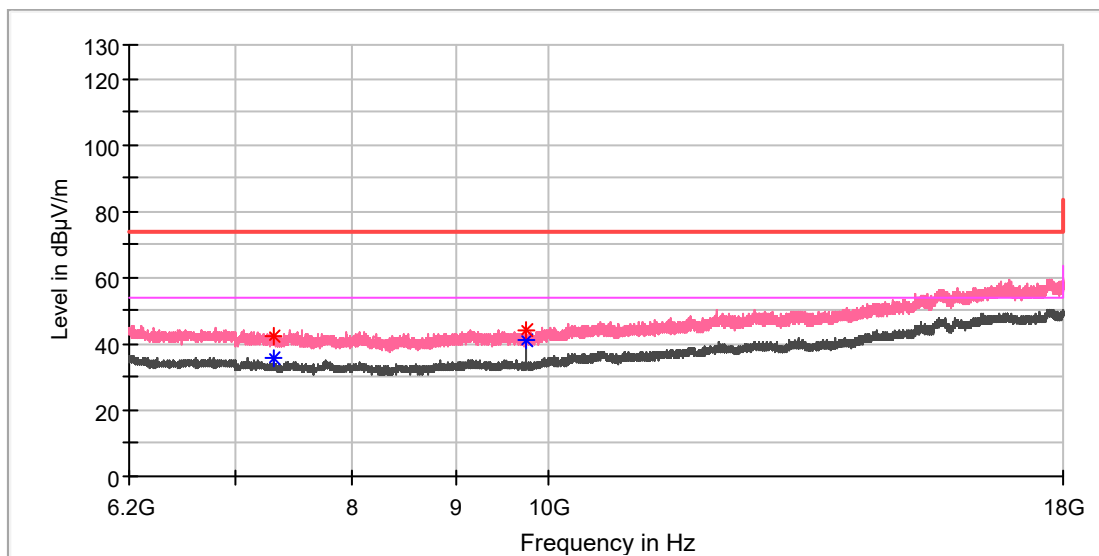
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7309.691667	42.57	---	74.00	31.43	150.0	H	343.0	8.2
7314.608333	---	36.91	54.00	17.09	150.0	H	123.0	8.2
9754.258333	---	43.61	54.00	10.39	150.0	H	320.0	10.4
9754.750000	47.50	---	74.00	26.50	150.0	H	343.0	10.4

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_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

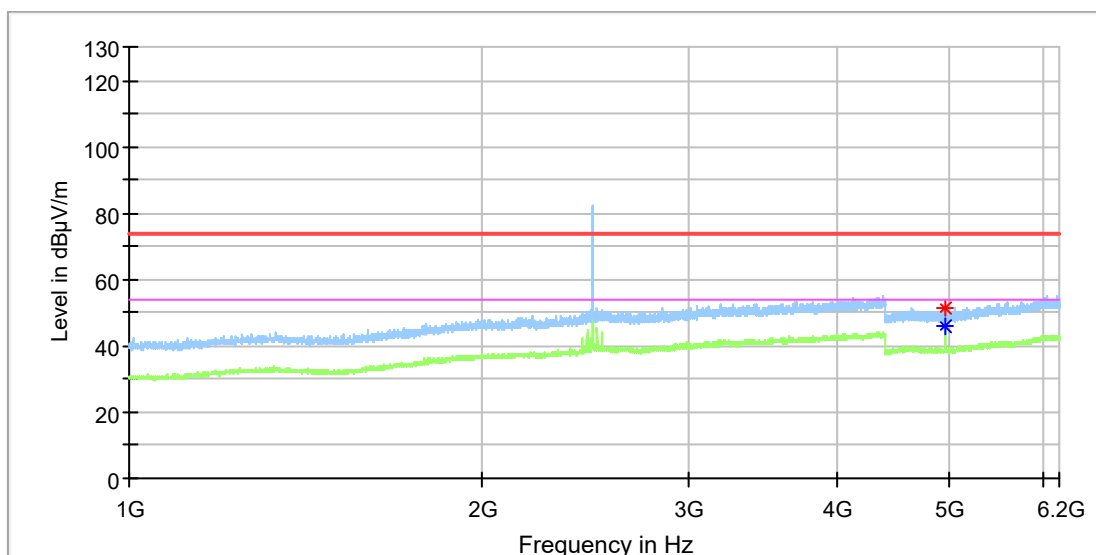
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7314.116667	---	35.71	54.00	18.29	150.0	V	167.0	8.2
7317.066667	42.41	---	74.00	31.59	150.0	V	202.0	8.2
9754.258333	---	40.86	54.00	13.14	150.0	V	327.0	10.4
9754.750000	44.38	---	74.00	29.62	150.0	V	0.0	10.4

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

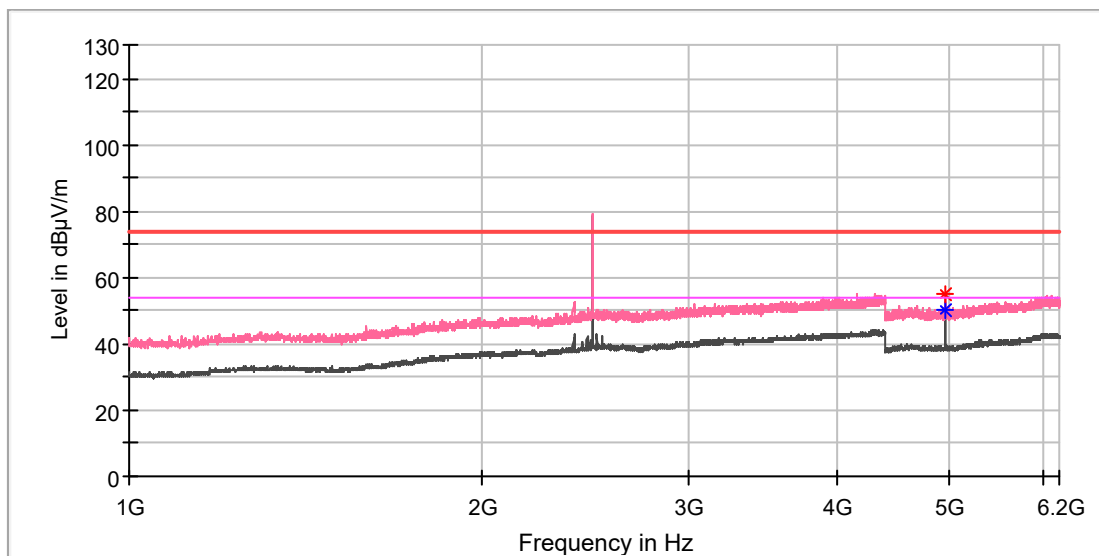
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4957.000000	---	46.21	54.00	7.79	150.0	H	340.0	11.8
4957.500000	51.60	---	74.00	22.40	150.0	H	109.0	11.8

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

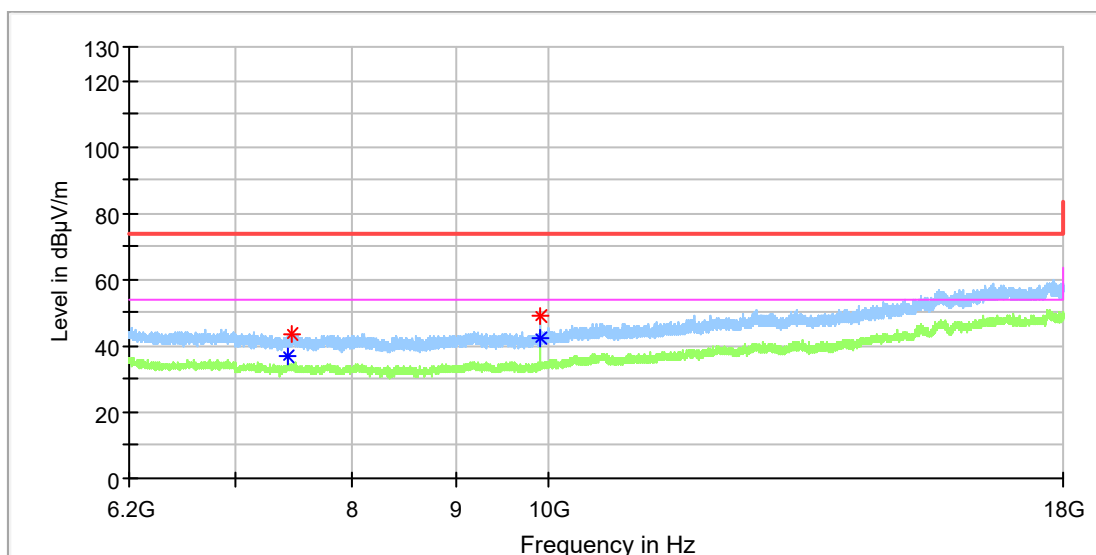
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4957.000000	54.93	---	74.00	19.07	150.0	V	328.0	11.8
4957.500000	---	50.47	54.00	3.53	150.0	V	328.0	11.8

Final_Result

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

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

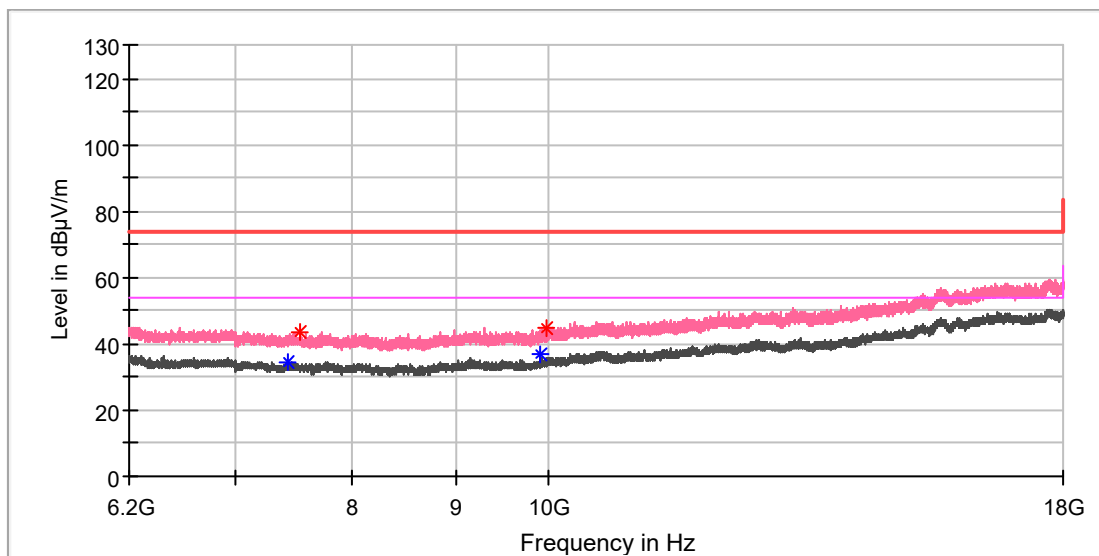
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7434.083333	---	37.12	54.00	16.88	150.0	H	353.0	8.4
7466.041667	43.38	---	74.00	30.62	150.0	H	0.0	8.6
9914.541667	49.01	---	74.00	24.99	150.0	H	329.0	10.8
9915.033333	---	42.55	54.00	11.45	150.0	H	340.0	10.8

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)
7434.575000	---	34.63	54.00	19.37	150.0	V	343.0	8.4
7523.075000	43.81	---	74.00	30.19	150.0	V	2.0	8.7
9914.541667	---	37.16	54.00	16.84	150.0	V	217.0	10.8
9973.541667	44.53	---	74.00	29.47	150.0	V	47.0	11.0

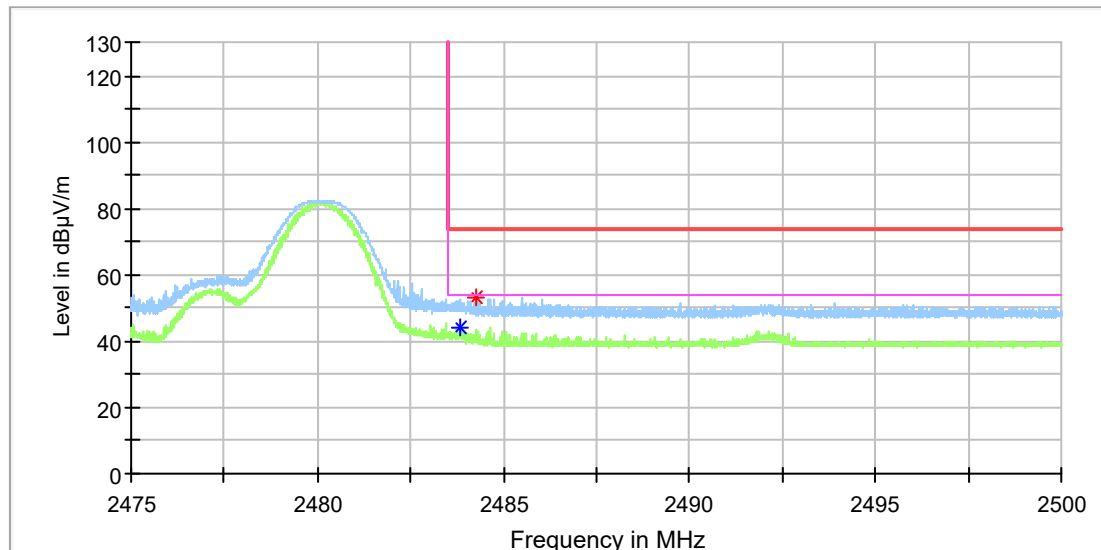
Final_Result

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

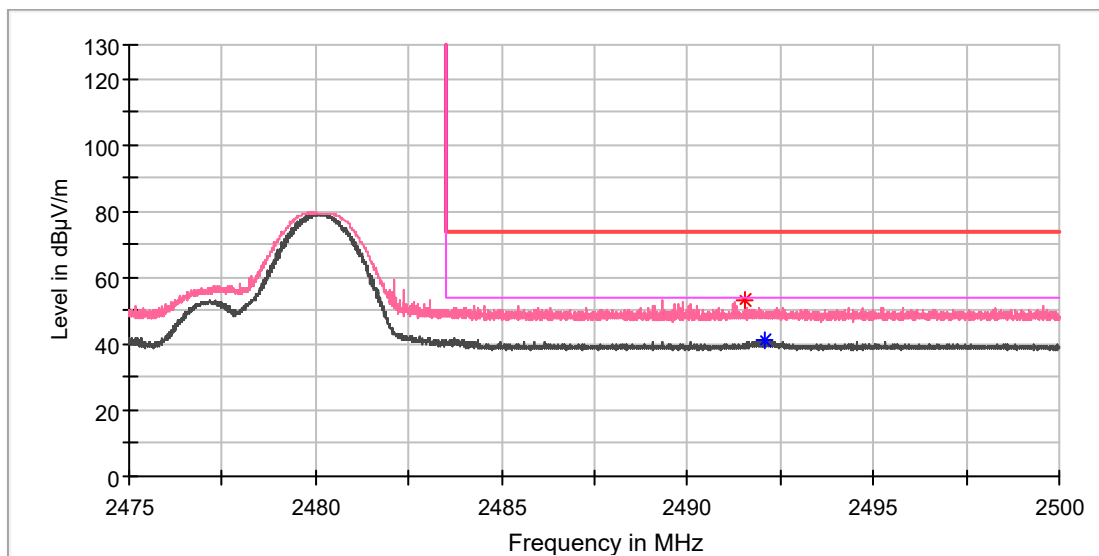
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.830882	---	43.98	54.00	10.02	150.0	H	0.0	7.4
2484.272059	53.12	---	74.00	20.88	150.0	H	341.0	7.4

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

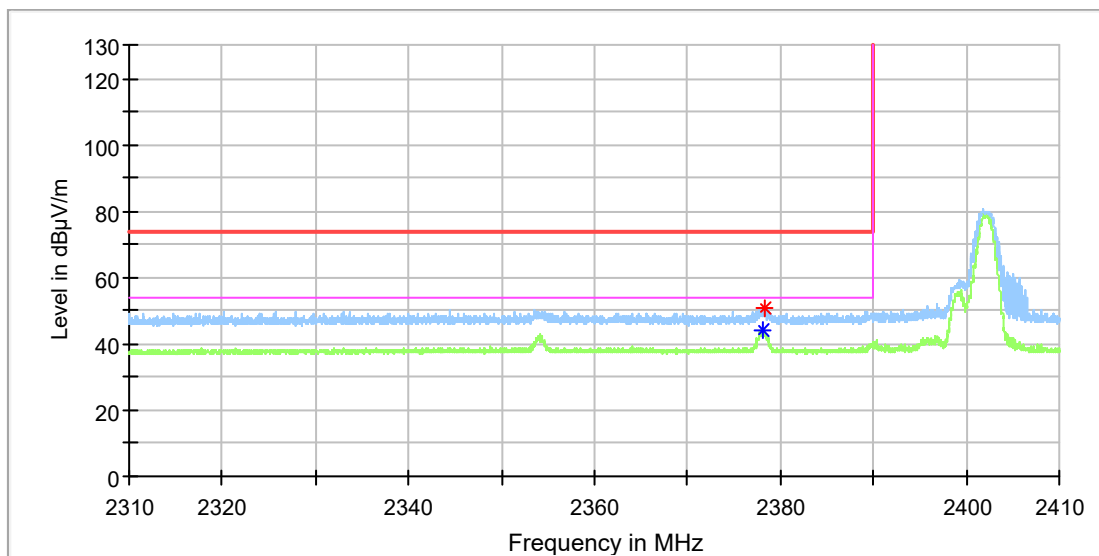
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2491.529412	53.06	---	74.00	20.94	150.0	V	286.0	7.4
2492.073529	---	41.26	54.00	12.74	150.0	V	0.0	7.4

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

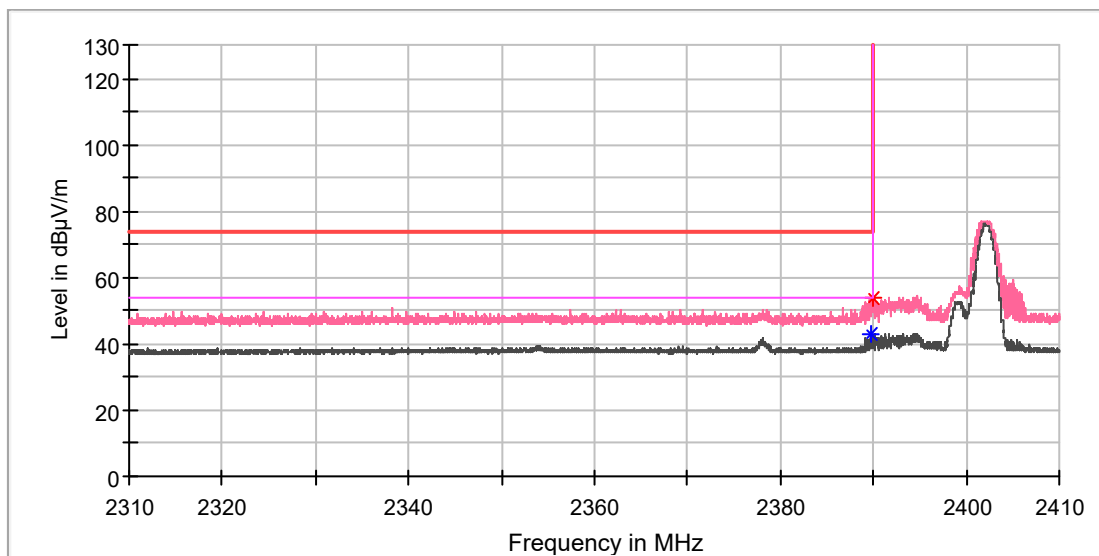
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2378.000000	---	44.24	54.00	9.76	150.0	H	273.0	6.9
2378.323529	50.78	---	74.00	23.22	150.0	H	273.0	6.9

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)
---	---	---	---	---		---	---