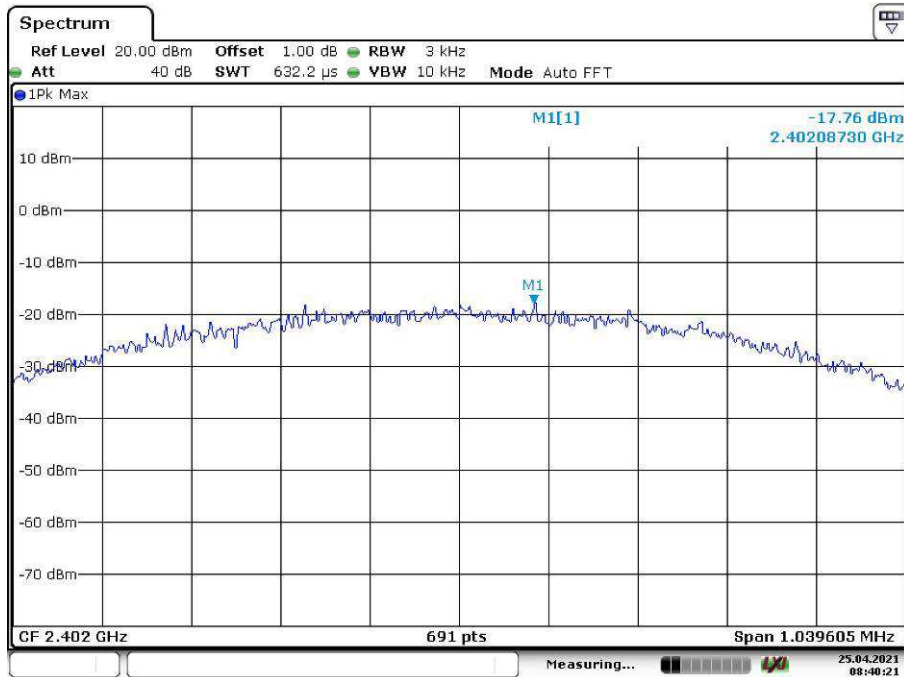


Appendix C: Test Results of Bluetooth LE

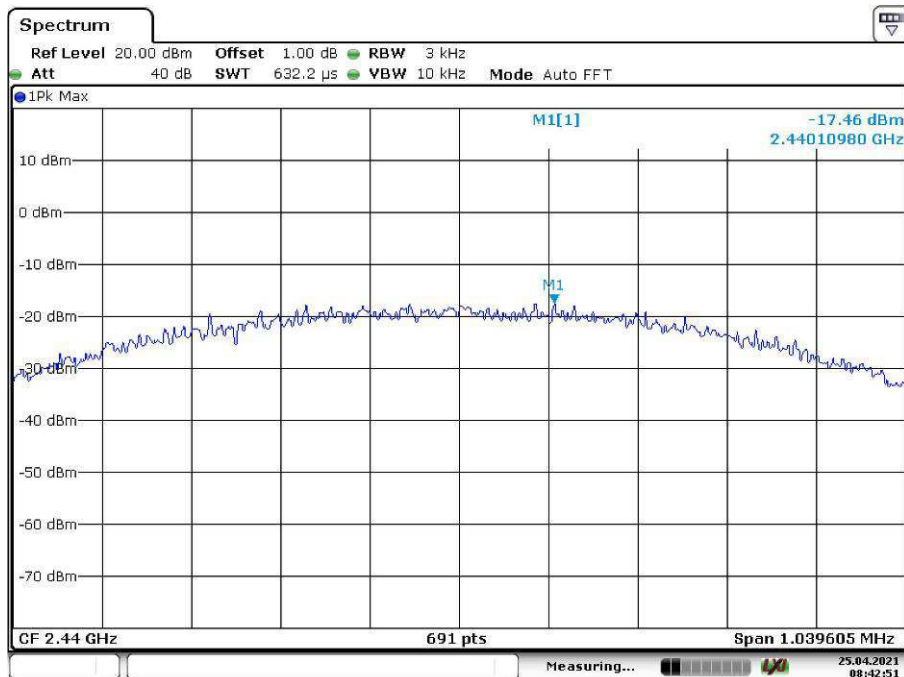
APPENDIX C: TEST RESULTS OF BLUETOOTH LE	1
APPENDIX C.1: TEST RESULTS OF CONDUCTED POWER SPECTRAL DENSITY	2
<i>GFSK(BLE) Mode, 1Mbps</i>	2
<i>GFSK(BLE) Mode, 2Mbps</i>	3
APPENDIX C.2: TEST RESULTS OF 6DB BANDWIDTH	5
<i>GFSK(BLE) Mode, 1Mbps</i>	5
<i>GFSK(BLE) Mode, 2Mbps</i>	8
APPENDIX C.3: TEST RESULTS OF 99% BANDWIDTH	11
<i>GFSK(BLE) Mode, 1Mbps</i>	11
<i>GFSK(BLE) Mode, 2Mbps</i>	14
APPENDIX C.4: TEST RESULTS OF CONDUCTED SPURIOUS EMISSIONS MEASURED IN 100 KHZ BANDWIDTH	17
<i>GFSK(BLE) Mode, 1Mbps</i>	17
<i>GFSK(BLE) Mode, 2Mbps</i>	21
APPENDIX C.5: TEST RESULTS OF RADIATED SPURIOUS EMISSIONS	25
30 MHz to 1GHz.....	25
1GHz-18GHz.....	29
APPENDIX C.6: TEST RESULTS OF RADIATED EMISSIONS IN RESTRICTED BANDS	41
APPENDIX C.7: TEST PLOTS OF CONDUCTED EMISSION ON AC MAINS	45
<i>Charging by USB cable</i>	45

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

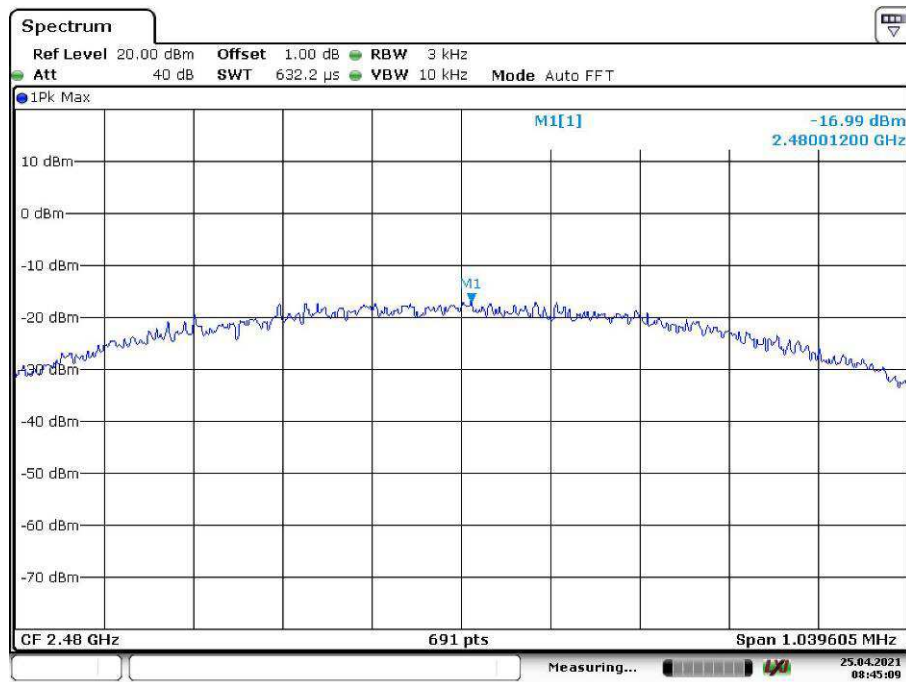
GFSK(BLE) Mode, 1Mbps



Date: 25.APR.2021 08:40:21

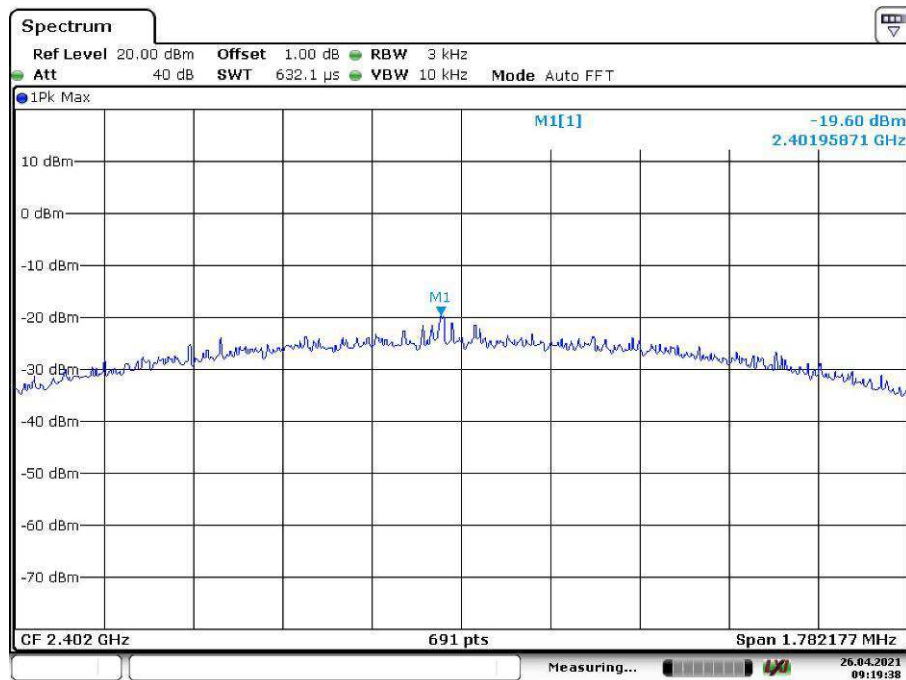


Date: 25.APR.2021 08:42:52

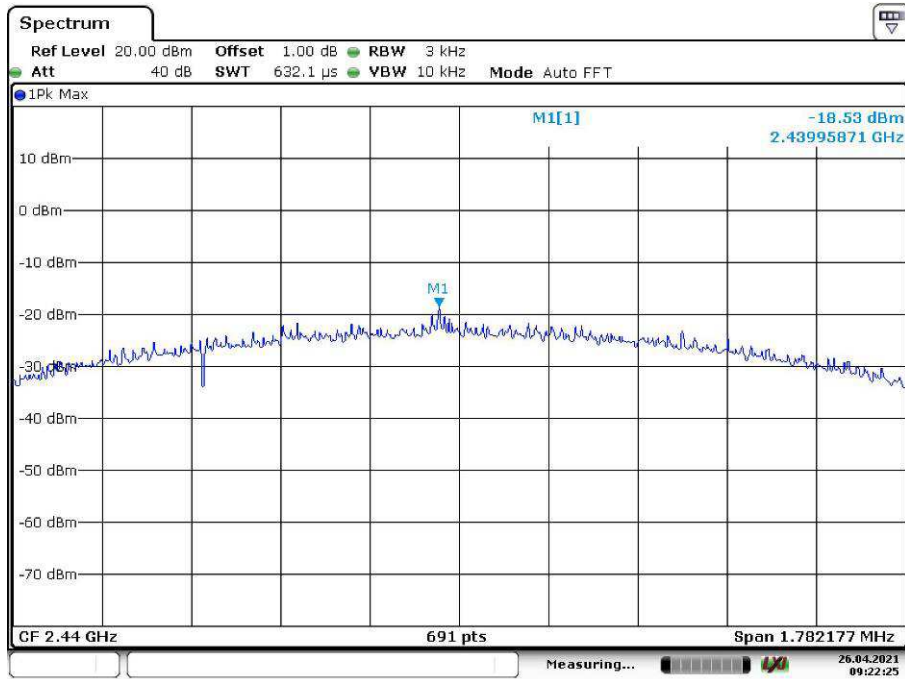


Date: 25.APR.2021 08:45:10

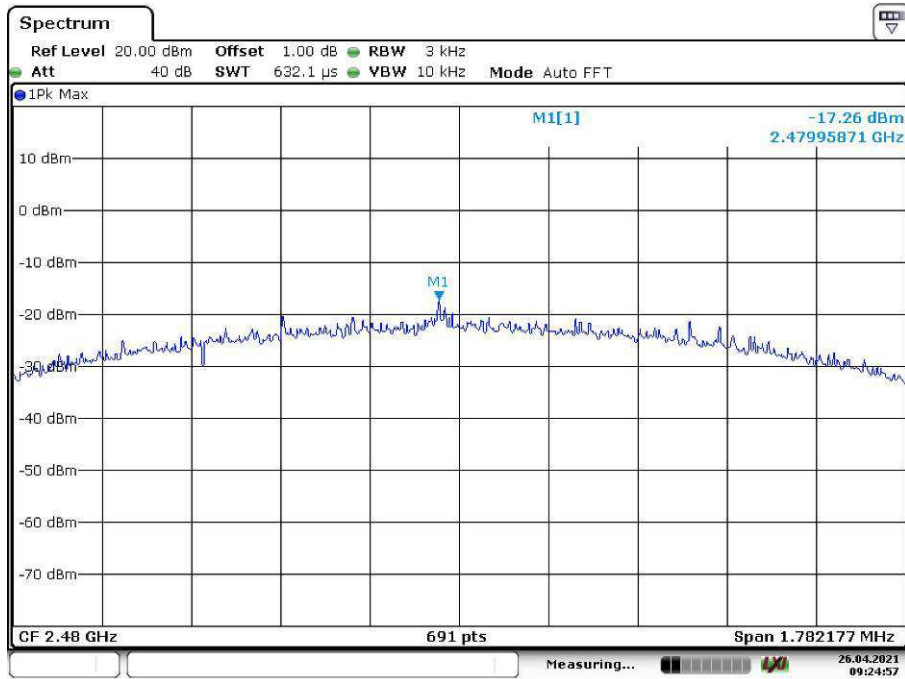
GFSK(BLE) Mode, 2Mbps



Date: 26.APR.2021 09:19:38



Date: 26.APR.2021 09:22:25



Date: 26.APR.2021 09:24:57

Appendix C.2: Test Results of 6dB Bandwidth

GFSK(BLE) Mode, 1Mbps

FCC Part 47 §15.247 2400-2483.5 MHz 2017

Minimum Emission Bandwidth 6 dB (2402 MHz; 10.000 dBm; 1 MHz)

Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

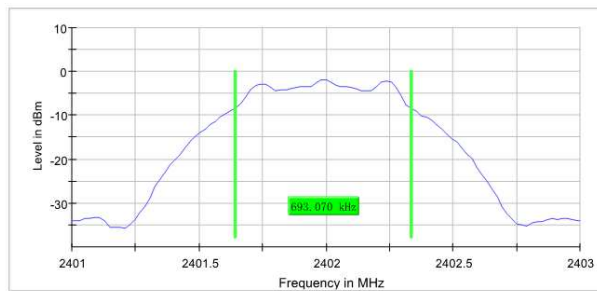
6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2402.000000	0.693070	0.500000	---	2401.643564	2402.336634

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2402.000000	-1.9	PASS

6 dB Bandwidth



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40100 GHz	2.40100 GHz
Stop Frequency	2.40300 GHz	2.40300 GHz
Span	2.000 MHz	2.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	101	~ 40
SweepTime	18.938 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	13 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.01 dB	0.50 dB

FCC Part 47 §15.247 2400-2483.5 MHz 2017

Minimum Emission Bandwidth 6 dB (2440 MHz; 10.000 dBm; 1 MHz)

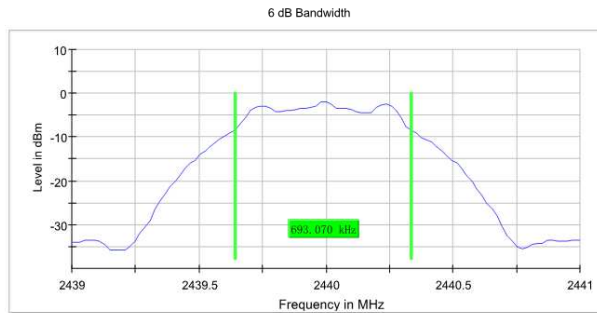
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2440.000000	0.693070	0.500000	---	2439.643564	2440.336634

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2440.000000	-1.9	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.43900 GHz	2.43900 GHz
Stop Frequency	2.44100 GHz	2.44100 GHz
Span	2.000 MHz	2.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	101	~ 40
SweepTime	18.938 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	10 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.16 dB	0.50 dB

FCC Part 47 §15.247 2400-2483.5 MHz 2017

Minimum Emission Bandwidth 6 dB (2480 MHz; 10.000 dBm; 1 MHz)

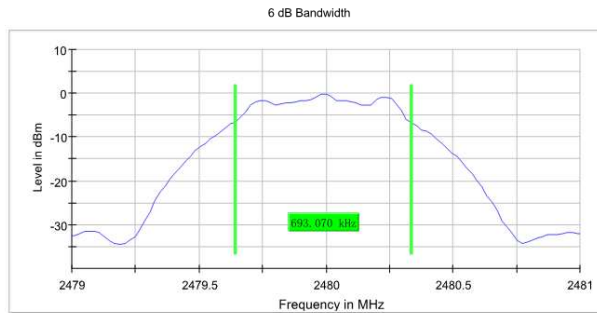
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2480.000000	0.693070	0.500000	---	2479.643564	2480.336634

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2480.000000	-0.2	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.47900 GHz	2.47900 GHz
Stop Frequency	2.48100 GHz	2.48100 GHz
Span	2.000 MHz	2.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	101	~ 40
SweepTime	18.938 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	7 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.07 dB	0.50 dB

GFSK(BLE) Mode, 2Mbps

FCC Part 47 §15.247 2400-2483.5 MHz 2017

Minimum Emission Bandwidth 6 dB (2402 MHz; 10.000 dBm; 2 MHz)

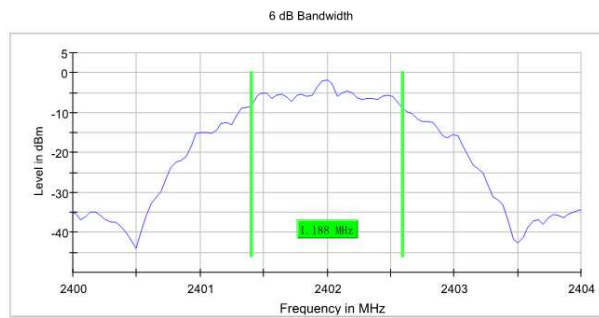
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2402.000000	1.188118	0.500000	---	2401.405941	2402.594059

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2402.000000	-1.8	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.40400 GHz	2.40400 GHz
Span	4.000 MHz	4.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	101	~ 80
SweepTime	18.938 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	12 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.12 dB	0.50 dB

FCC Part 47 §15.247 2400-2483.5 MHz 2017

Minimum Emission Bandwidth 6 dB (2440 MHz; 10.000 dBm; 2 MHz)

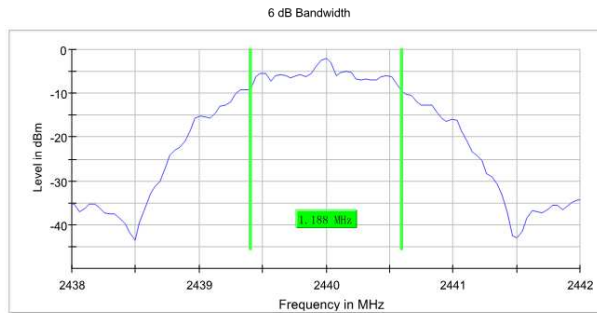
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2440.000000	1.188118	0.500000	---	2439.405941	2440.594059

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2440.000000	-2.1	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.43800 GHz	2.43800 GHz
Stop Frequency	2.44200 GHz	2.44200 GHz
Span	4.000 MHz	4.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	101	~ 80
SweepTime	18.938 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	13 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.05 dB	0.50 dB

FCC Part 47 §15.247 2400-2483.5 MHz 2017

Minimum Emission Bandwidth 6 dB (2480 MHz; 10.000 dBm; 2 MHz)

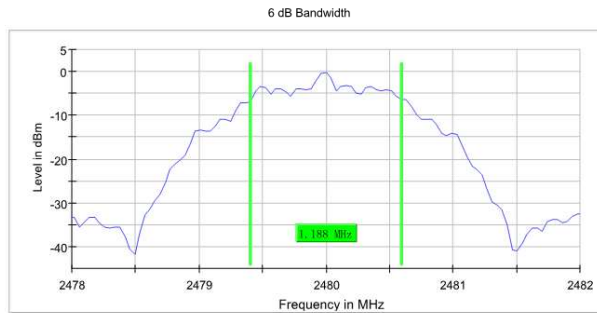
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2480.000000	1.188118	0.500000	---	2479.405941	2480.594059

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2480.000000	-0.2	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.47800 GHz	2.47800 GHz
Stop Frequency	2.48200 GHz	2.48200 GHz
Span	4.000 MHz	4.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	101	~ 80
SweepTime	18.938 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	10 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.10 dB	0.50 dB

Appendix C.3: Test Results of 99% Bandwidth

GFSK(BLE) Mode, 1Mbps

FCC Part 47 §15.247 2400-2483.5 MHz 2017

Occupied Channel Bandwidth 99% (2402 MHz; 10.000 dBm; 1 MHz)

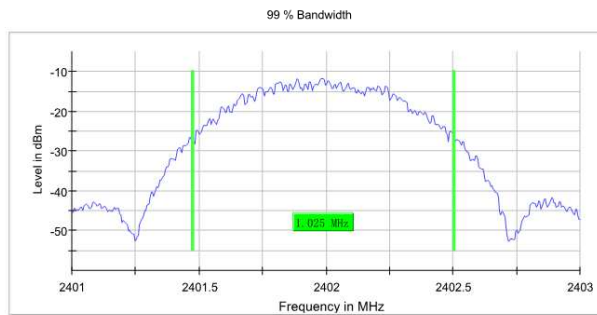
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2402.000000	1.025000	---	---	2401.477500	2402.502500

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2402.000000	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40100 GHz	2.40100 GHz
Stop Frequency	2.40300 GHz	2.40300 GHz
Span	2.000 MHz	2.000 MHz
RBW	10.000 kHz	>= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	400	~ 400
SweepTime	189.648 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	9 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.15 dB	0.30 dB

FCC Part 47 §15.247 2400-2483.5 MHz 2017

Occupied Channel Bandwidth 99% (2440 MHz; 10.000 dBm; 1 MHz)

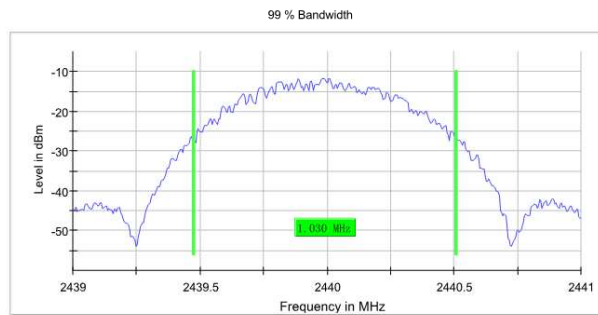
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2440.000000	1.030000	---	---	2439.477500	2440.507500

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2440.000000	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.43900 GHz	2.43900 GHz
Stop Frequency	2.44100 GHz	2.44100 GHz
Span	2.000 MHz	2.000 MHz
RBW	10.000 kHz	>= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	400	~ 400
SweepTime	189.648 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	6 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.17 dB	0.30 dB

FCC Part 47 §15.247 2400-2483.5 MHz 2017

Occupied Channel Bandwidth 99% (2480 MHz; 10.000 dBm; 1 MHz)

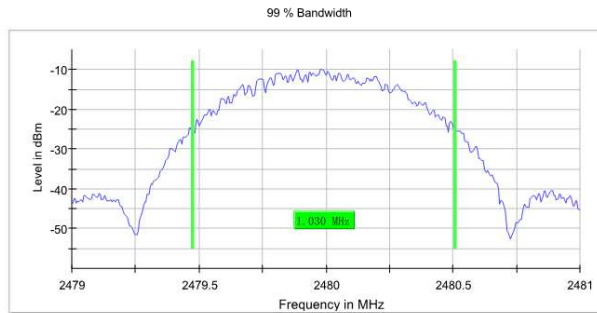
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2480.000000	1.030000	---	---	2479.477500	2480.507500

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2480.000000	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.47900 GHz	2.47900 GHz
Stop Frequency	2.48100 GHz	2.48100 GHz
Span	2.000 MHz	2.000 MHz
RBW	10.000 kHz	>= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	400	~ 400
SweepTime	189.648 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	7 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.16 dB	0.30 dB

GFSK(BLE) Mode, 2Mbps

FCC Part 47 §15.247 2400-2483.5 MHz 2017

Occupied Channel Bandwidth 99% (2402 MHz; 10.000 dBm; 2 MHz)

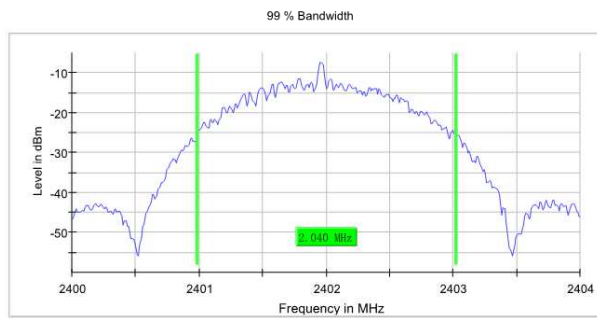
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2402.000000	2.040000	---	---	2400.985000	2403.025000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2402.000000	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.40400 GHz	2.40400 GHz
Span	4.000 MHz	4.000 MHz
RBW	20.000 kHz	>= 20.000 kHz
VBW	100.000 kHz	>= 60.000 kHz
SweepPoints	400	~ 400
SweepTime	94.824 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	7 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.10 dB	0.30 dB

FCC Part 47 §15.247 2400-2483.5 MHz 2017

Occupied Channel Bandwidth 99% (2440 MHz; 10.000 dBm; 2 MHz)

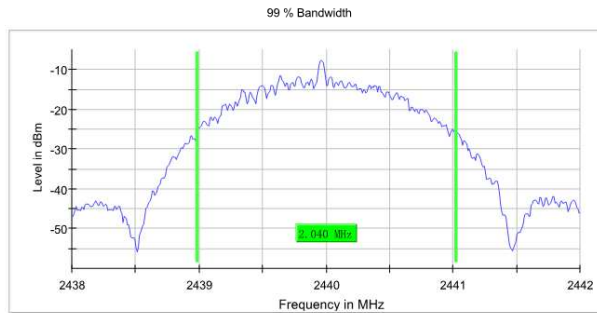
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2440.000000	2.040000	---	---	2438.985000	2441.025000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2440.000000	PASS



Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.43800 GHz	2.43800 GHz
Stop Frequency	2.44200 GHz	2.44200 GHz
Span	4.000 MHz	4.000 MHz
RBW	20.000 kHz	>= 20.000 kHz
VBW	100.000 kHz	>= 60.000 kHz
SweepPoints	400	~ 400
SweepTime	94.824 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	8 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.19 dB	0.30 dB

FCC Part 47 §15.247 2400-2483.5 MHz 2017

Occupied Channel Bandwidth 99% (2480 MHz; 10.000 dBm; 2 MHz)

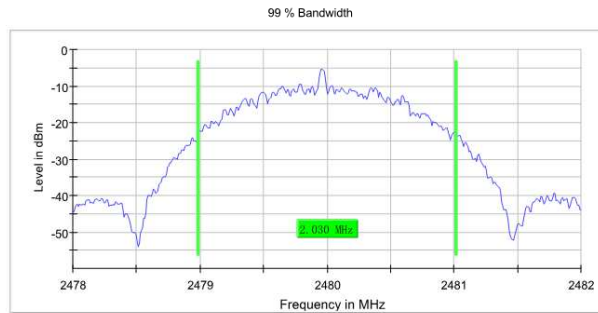
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2480.000000	2.030000	---	---	2478.985000	2481.015000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2480.000000	PASS



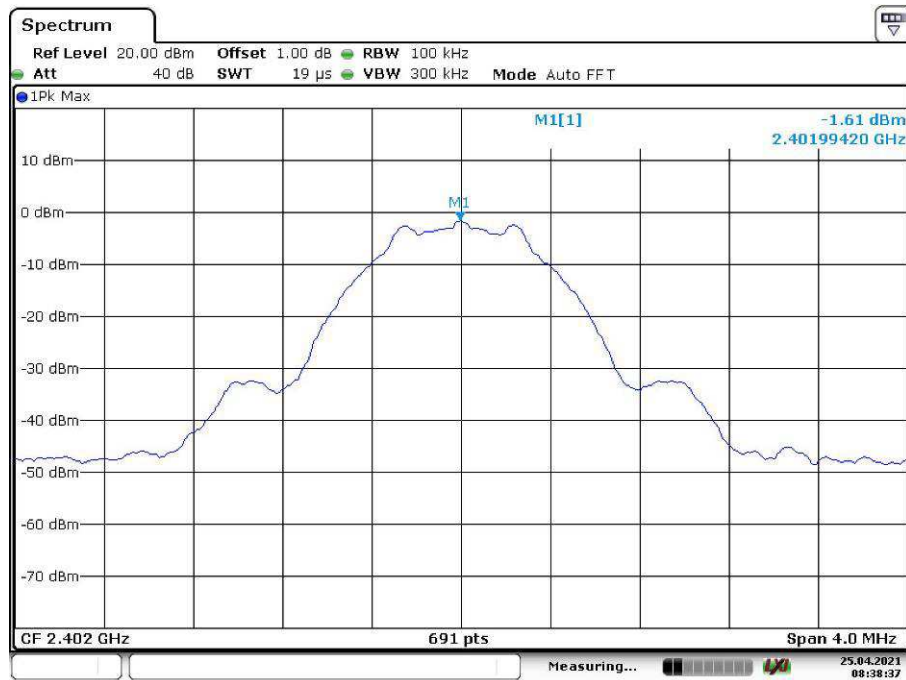
Measurement

Setting	Instrument Value	Target Value
Start Frequency	2.47800 GHz	2.47800 GHz
Stop Frequency	2.48200 GHz	2.48200 GHz
Span	4.000 MHz	4.000 MHz
RBW	20.000 kHz	>= 20.000 kHz
VBW	100.000 kHz	>= 60.000 kHz
SweepPoints	400	~ 400
SweepTime	94.824 µs	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	10 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.26 dB	0.30 dB

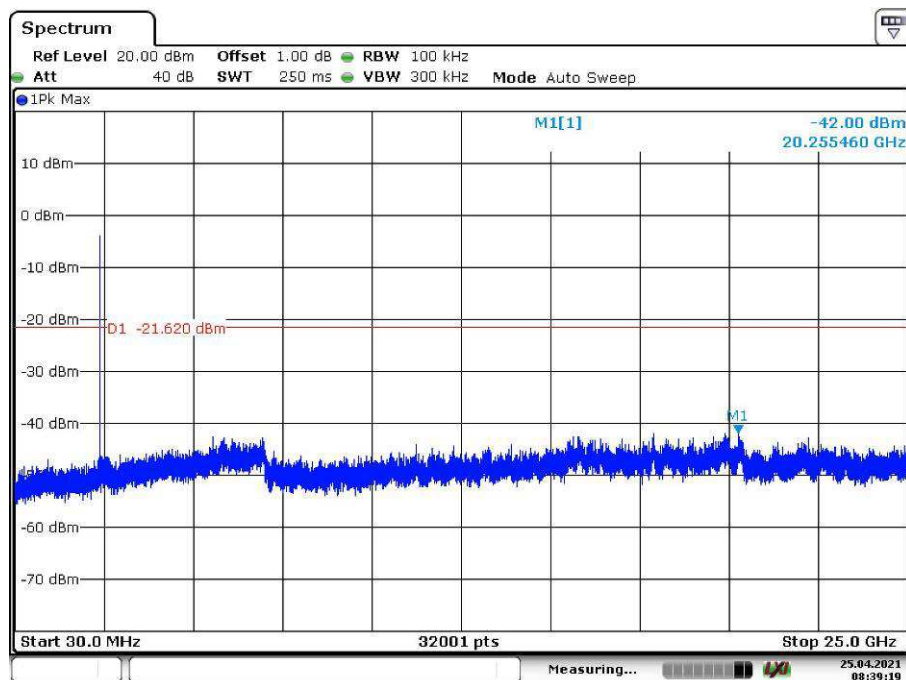
Appendix C.4: Test Results of Conducted Spurious Emissions Measured in 100 kHz Bandwidth

GFSK(BLE) Mode, 1Mbps

Low Channel:



Date: 25.APR.2021 08:38:37

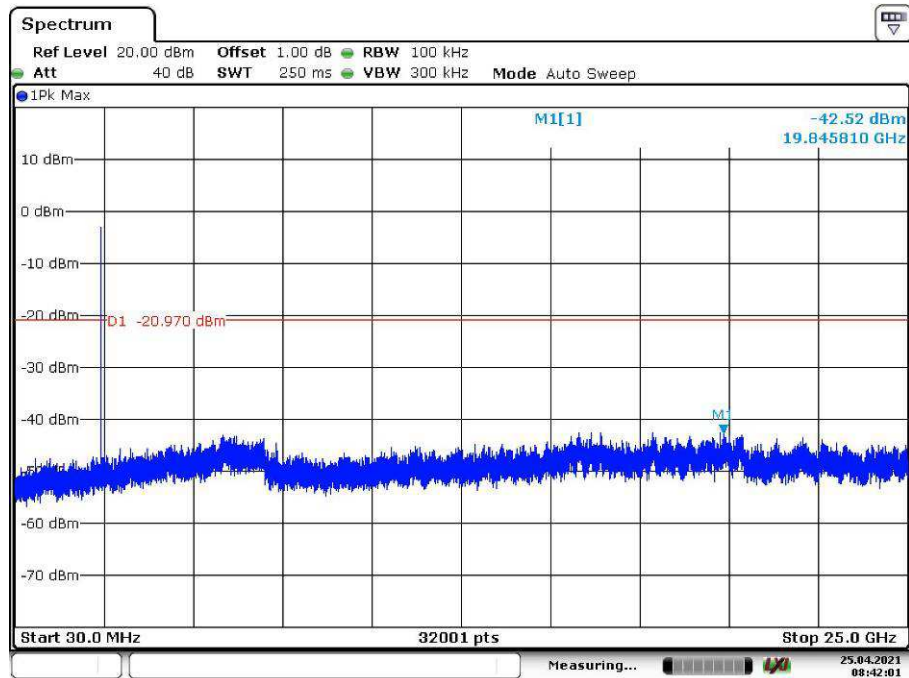


Date: 25.APR.2021 08:39:20

Middle Channel:

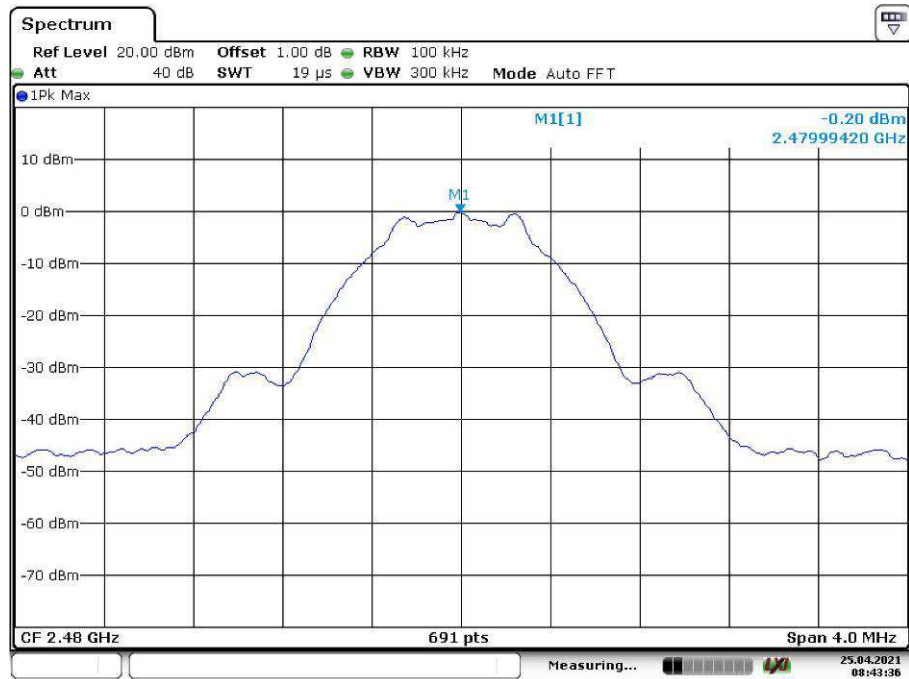


Date: 25.APR.2021 08:41:42

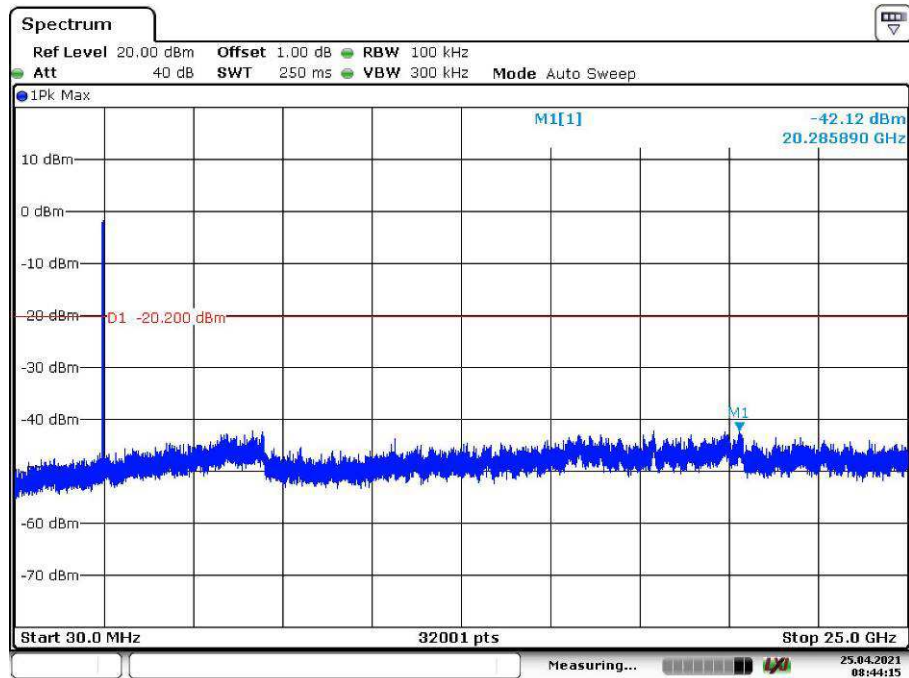


Date: 25.APR.2021 08:42:01

High Channel:

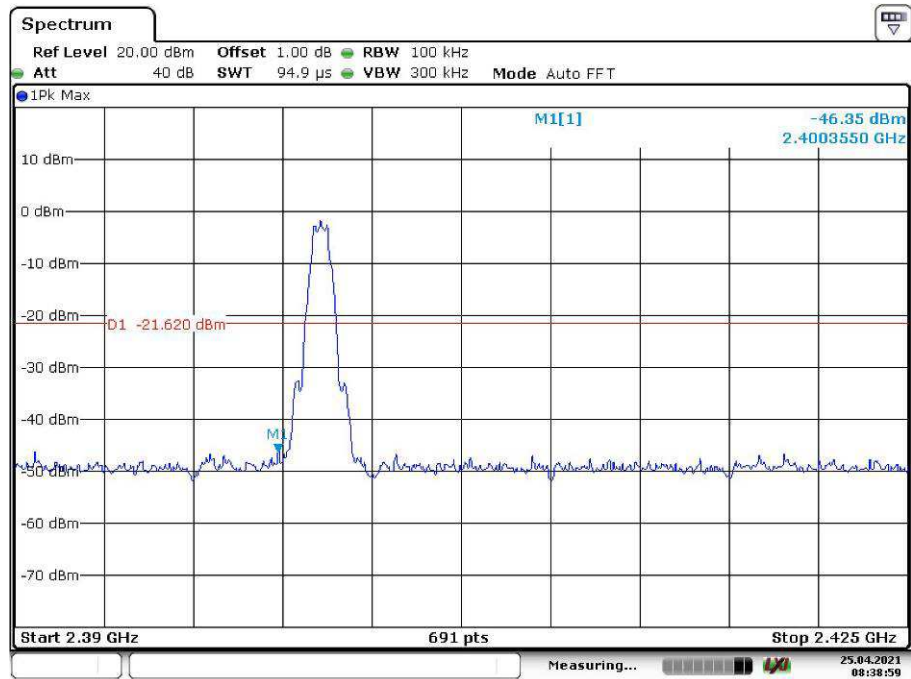


Date: 25.APR.2021 08:43:36



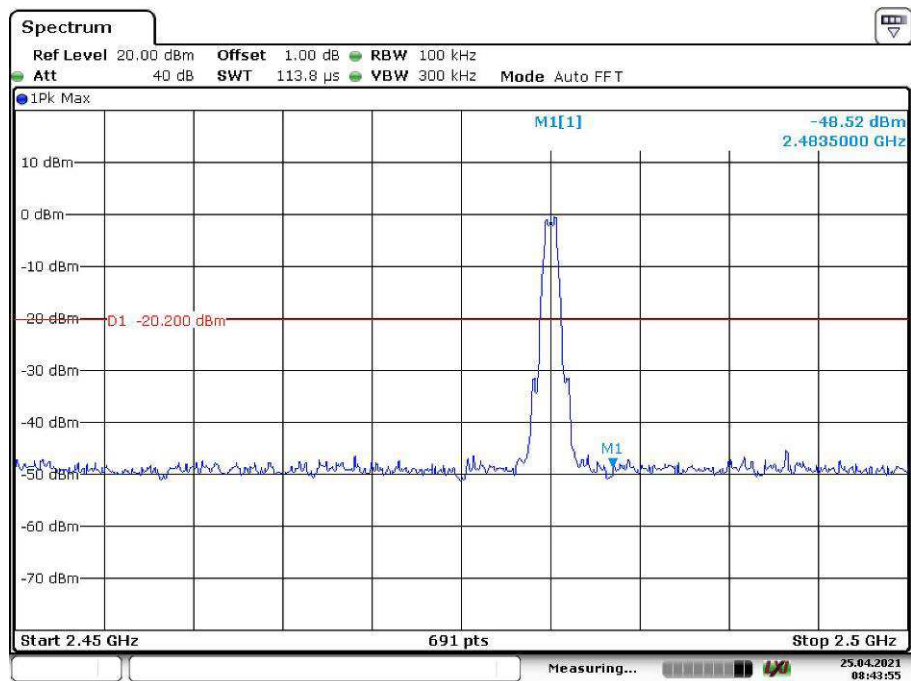
Date: 25.APR.2021 08:44:16

Band Edge, Low Channel:



Date: 25.APR.2021 08:38:59

Band Edge, High Channel:



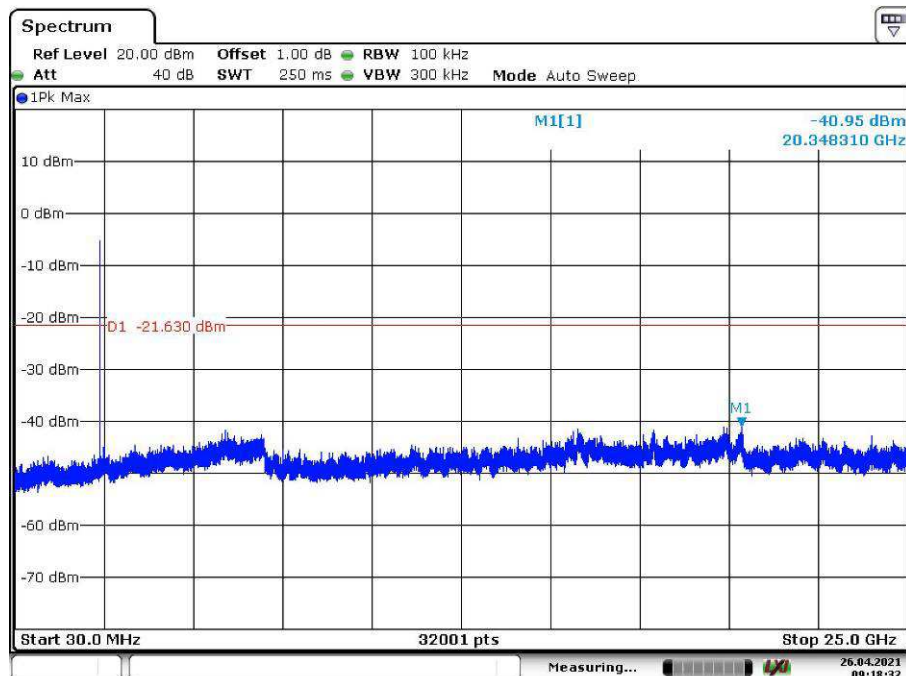
Date: 25.APR.2021 08:43:55

GFSK(BLE) Mode, 2Mbps

Low Channel:



Date: 26.APR.2021 09:17:33

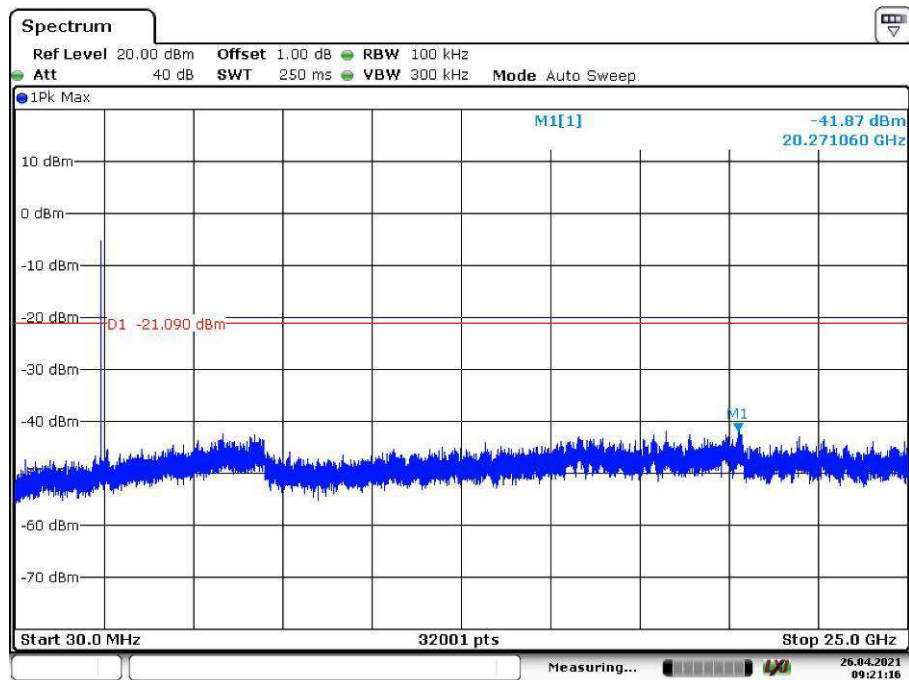


Date: 26.APR.2021 09:18:32

Middle Channel:

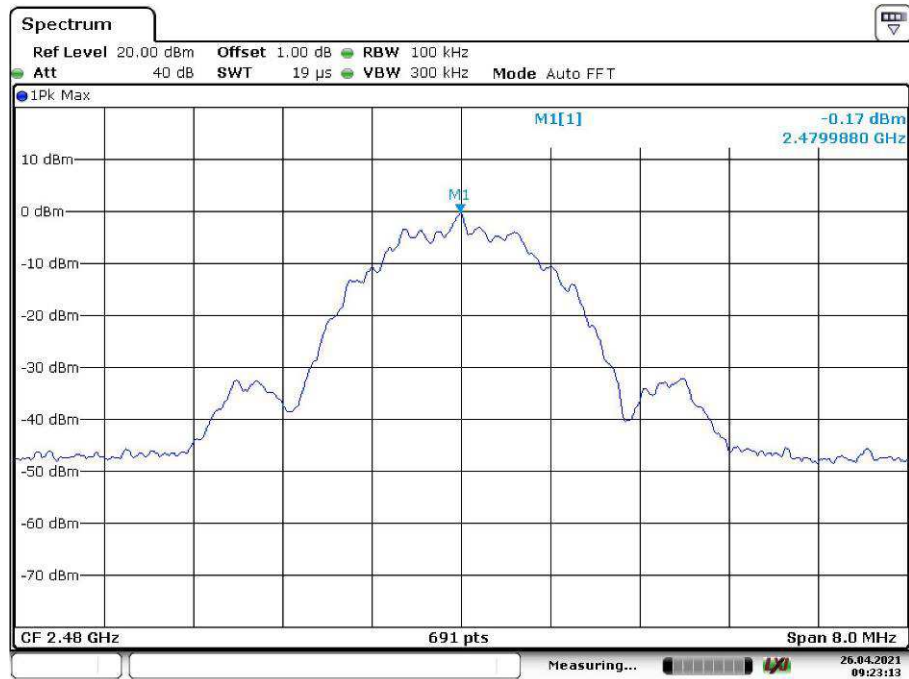


Date: 26.APR.2021 09:20:51

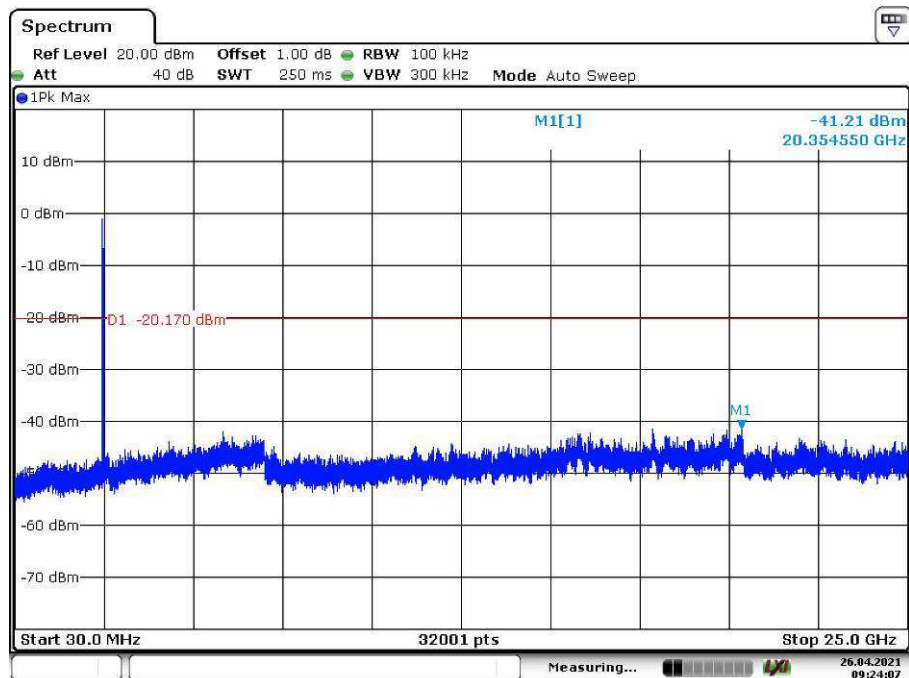


Date: 26.APR.2021 09:21:16

High Channel:

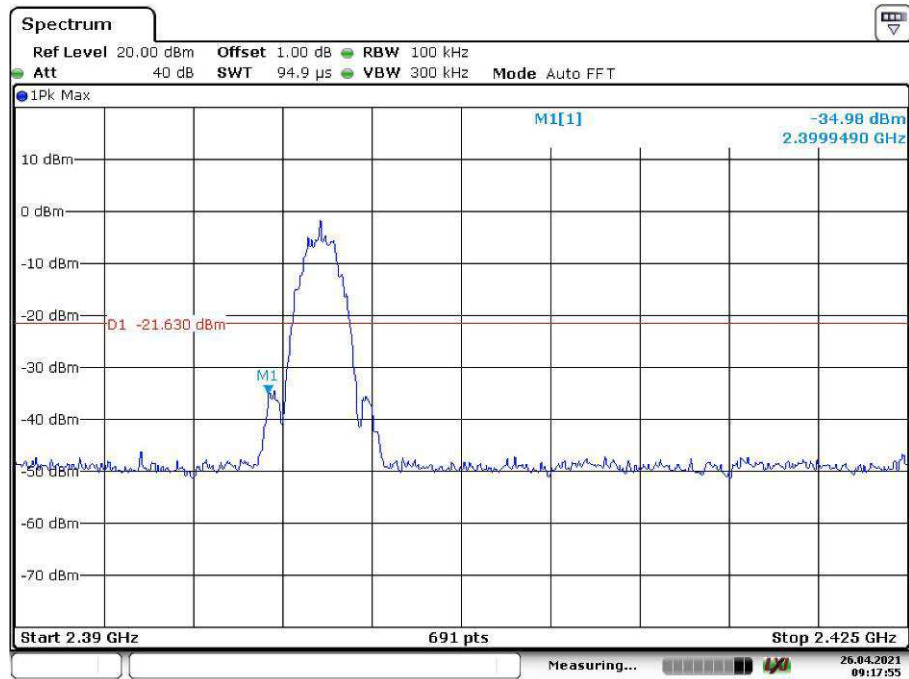


Date: 26.APR.2021 09:23:13



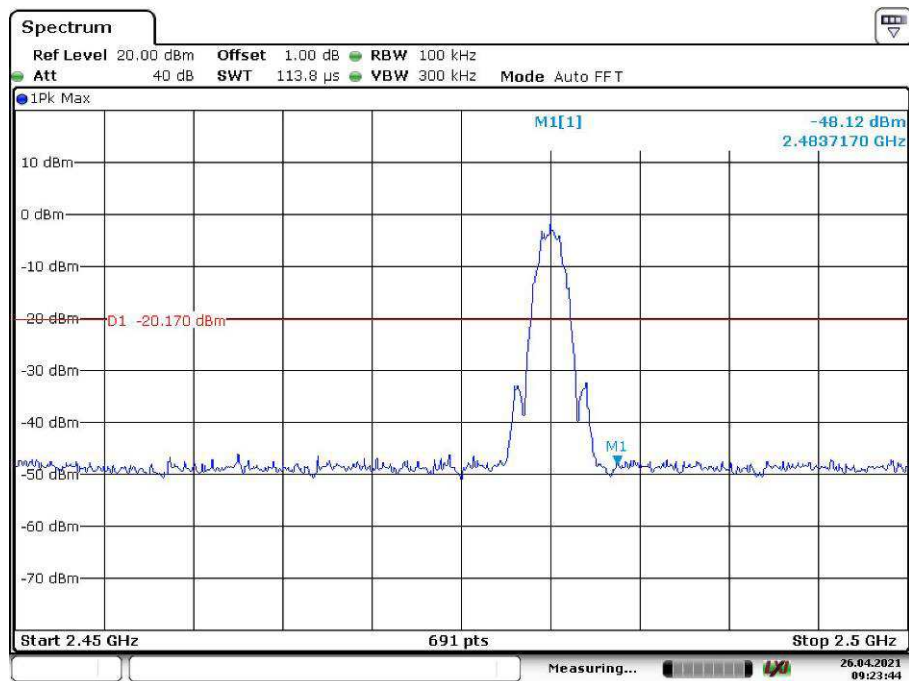
Date: 26.APR.2021 09:24:07

Band Edge, Low Channel:



Date: 26.APR.2021 09:17:55

Band Edge, High Channel:



Date: 26.APR.2021 09:23:44

Appendix C.5: Test Results of Radiated Spurious Emissions

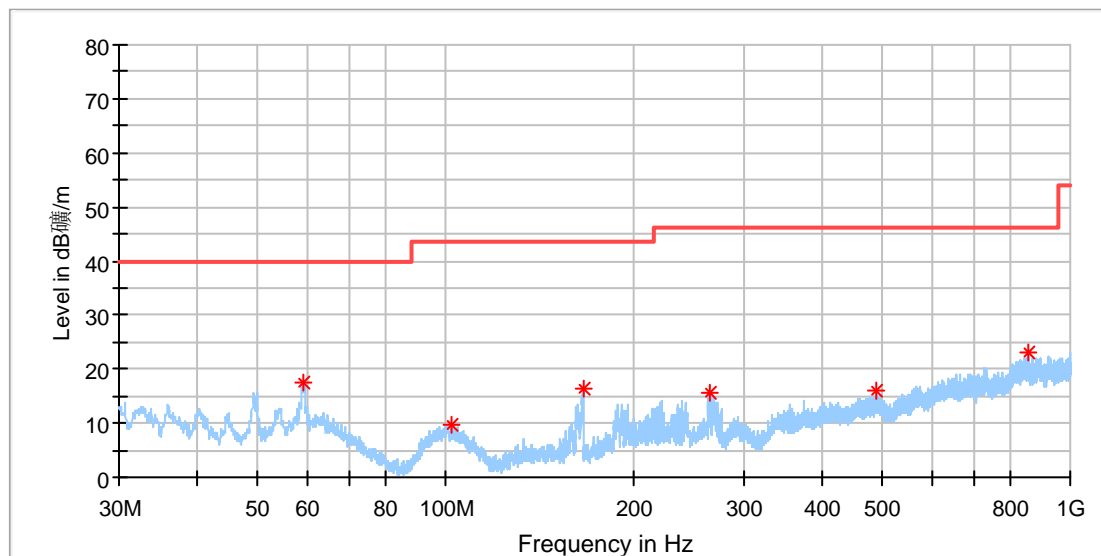
Note:

- 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:	thinkplus Walkie Talkie Earphone HW10
Model:	HW10TP
Test Mode:	BLE_Low channel
Test Voltage::	AC 120V, 60Hz
Remark:	Temp 23 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

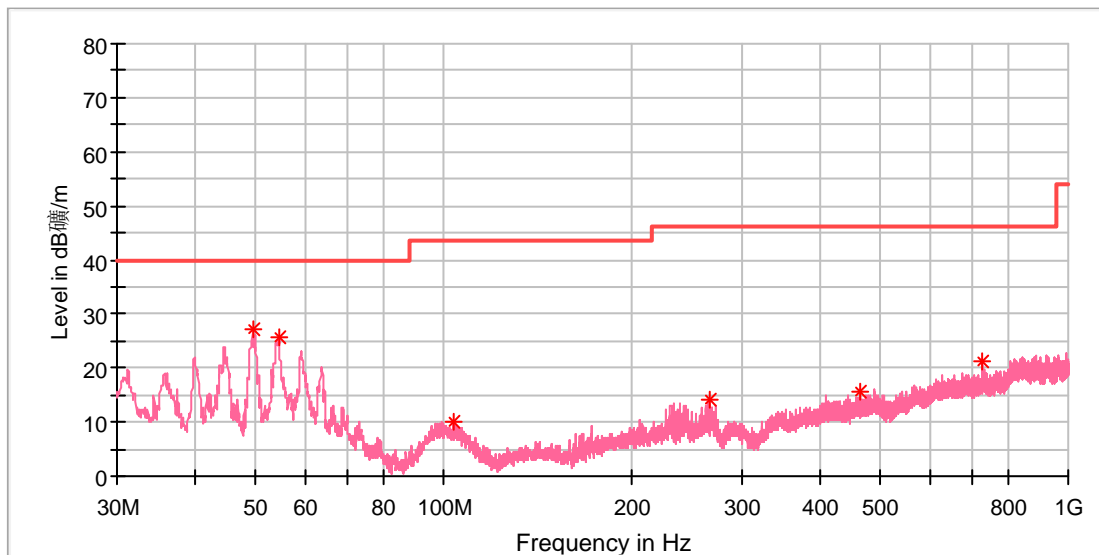


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
59.342500	17.44	40.00	22.56	100.0	H	6.0	-19.2
101.877000	9.77	43.50	33.73	100.0	H	147.0	-19.2
165.800000	16.37	43.50	27.13	100.0	H	262.0	-21.8
265.758500	15.79	46.00	30.21	100.0	H	262.0	-17.3
488.810000	16.18	46.00	29.82	100.0	H	0.0	-12.4
856.343000	23.03	46.00	22.97	100.0	H	194.0	-5.8

EUT Information

EUT Name: thinkplus Walkie Talkie Earphone HW10
 Model: HW10TP
 Test Mode: BLE_Low channel
 Test Voltage:: AC 120V, 60Hz
 Remark: Temp 23 Humi:55%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

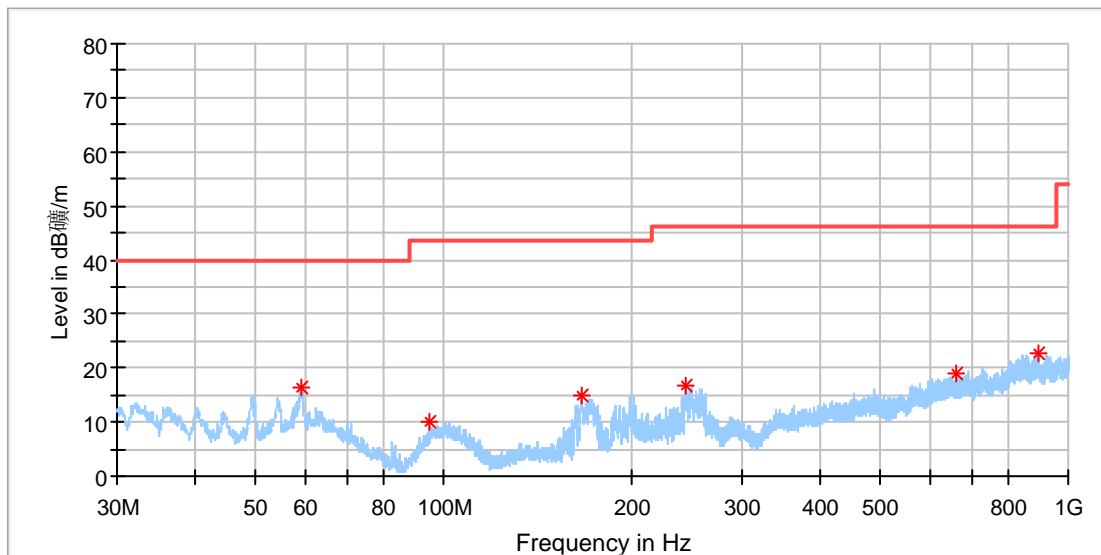


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
49.448500	27.09	40.00	12.91	100.0	V	254.0	-18.6
54.541000	25.68	40.00	14.32	100.0	V	1.0	-18.7
103.623000	10.19	43.50	33.31	100.0	V	127.0	-19.1
265.807000	14.20	46.00	31.80	100.0	V	118.0	-17.3
464.123500	15.80	46.00	30.20	100.0	V	0.0	-13.0
730.000500	21.11	46.00	24.89	100.0	V	236.0	-7.9

EUT Information

EUT Name: thinkplus Walkie Talkie Earphone HW10
 Model: HW10TP
 Test Mode: BLE_High channel
 Test Voltage:: AC 120V, 60Hz
 Remark: Temp 23 Humi:55%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

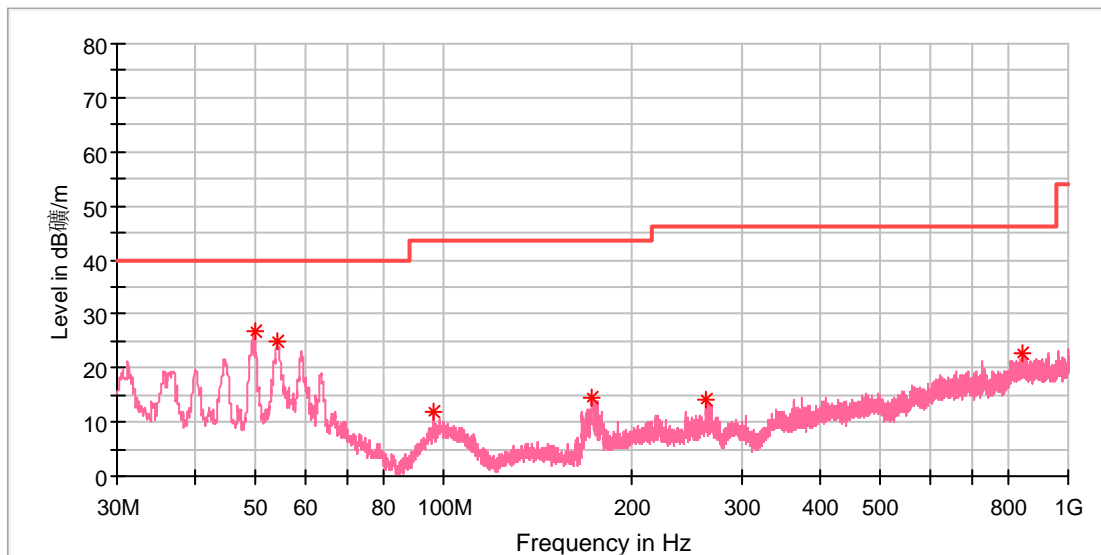


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
59.003000	16.20	40.00	23.80	100.0	H	0.0	-19.2
94.602000	10.02	43.50	33.48	100.0	H	257.0	-20.2
166.236500	14.70	43.50	28.80	100.0	H	355.0	-21.7
244.127500	16.67	46.00	29.33	100.0	H	279.0	-17.9
661.082000	18.95	46.00	27.05	100.0	H	199.0	-9.1
892.427000	22.78	46.00	23.22	100.0	H	209.0	-5.5

EUT Information

EUT Name: thinkplus Walkie Talkie Earphone HW10
 Model: HW10TP
 Test Mode: BLE_High channel
 Test Voltage:: AC 120V, 60Hz
 Remark: Temp 23 Humi:55%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical_Freqs

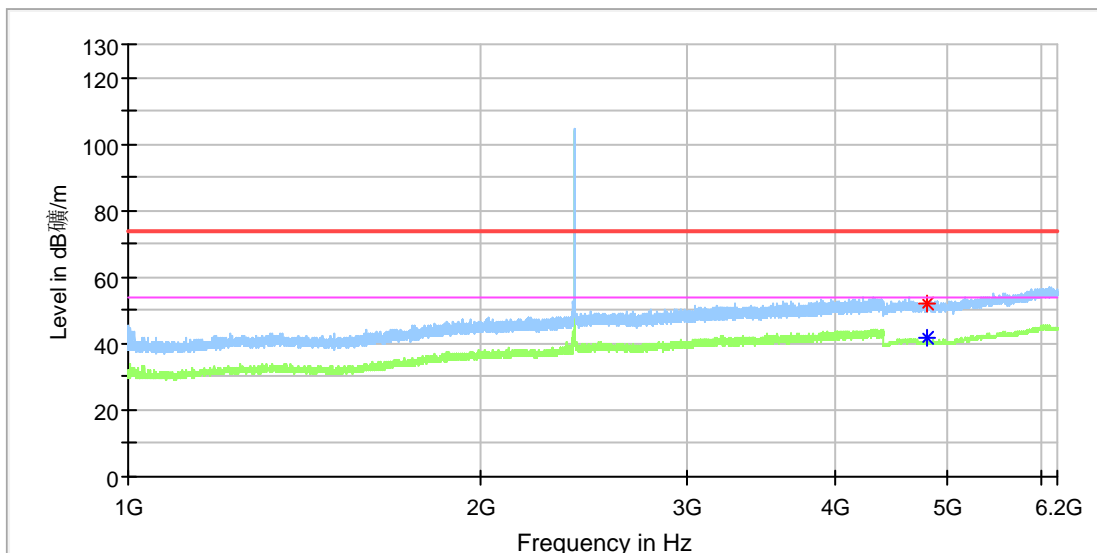
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
49.982000	26.87	40.00	13.14	100.0	V	285.0	-18.6
54.201500	24.84	40.00	15.16	100.0	V	194.0	-18.7
96.396500	11.98	43.50	31.52	100.0	V	6.0	-19.8
173.026500	14.56	43.50	28.94	100.0	V	117.0	-21.4
263.818500	14.12	46.00	31.88	100.0	V	106.0	-17.4
844.897000	22.68	46.00	23.32	100.0	V	330.0	-6.0

1GHz-18GHz

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

EUT Information

EUT Name:	thinkplus Walkie Talkie Earphone HW10
Model:	HW10TP
Test Mode:	BLE_Low channel
Test Voltage::	AC 120V, 60Hz
Remark:	Temp 23 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

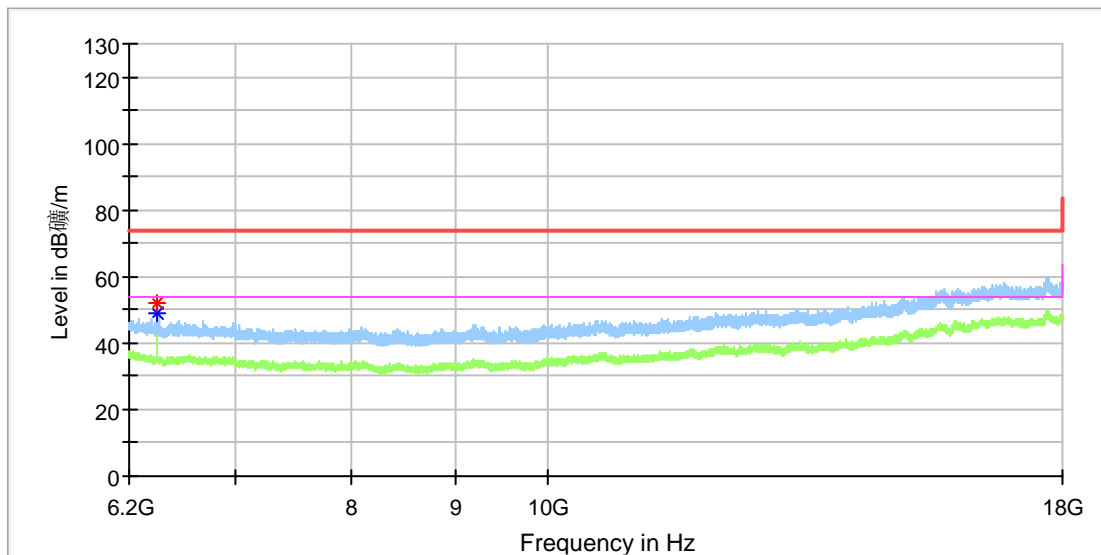


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4803.500000	51.82	---	74.00	22.18	100.0	H	101.0	11.8
4804.000000	---	41.86	54.00	12.14	100.0	H	359.0	11.8

EUT Information

EUT Name: thinkplus Walkie Talkie Earphone HW10
 Model: HW10TP
 Test Mode: BLE_Low channel
 Test Voltage:: AC 120V, 60Hz
 Remark: Temp 23 Humi:55%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

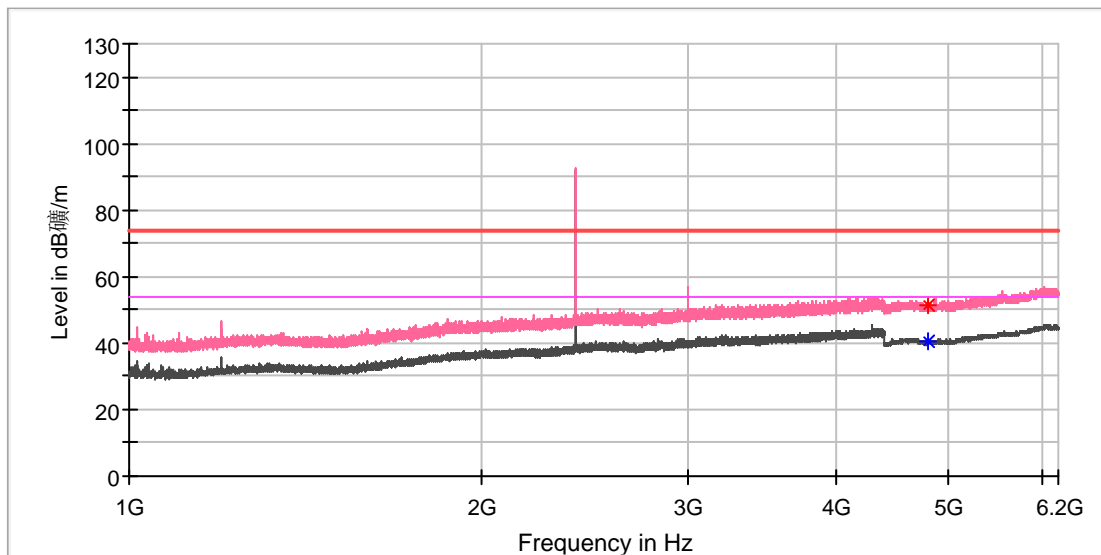


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
6405.025000	---	49.09	54.00	4.91	100.0	H	66.0	8.9
6405.516667	51.87	---	74.00	22.13	100.0	H	66.0	8.9

EUT Information

EUT Name: thinkplus Walkie Talkie Earphone HW10
 Model: HW10TP
 Test Mode: BLE_Low channel
 Test Voltage:: AC 120V, 60Hz
 Remark: Temp 23 Humi:55%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

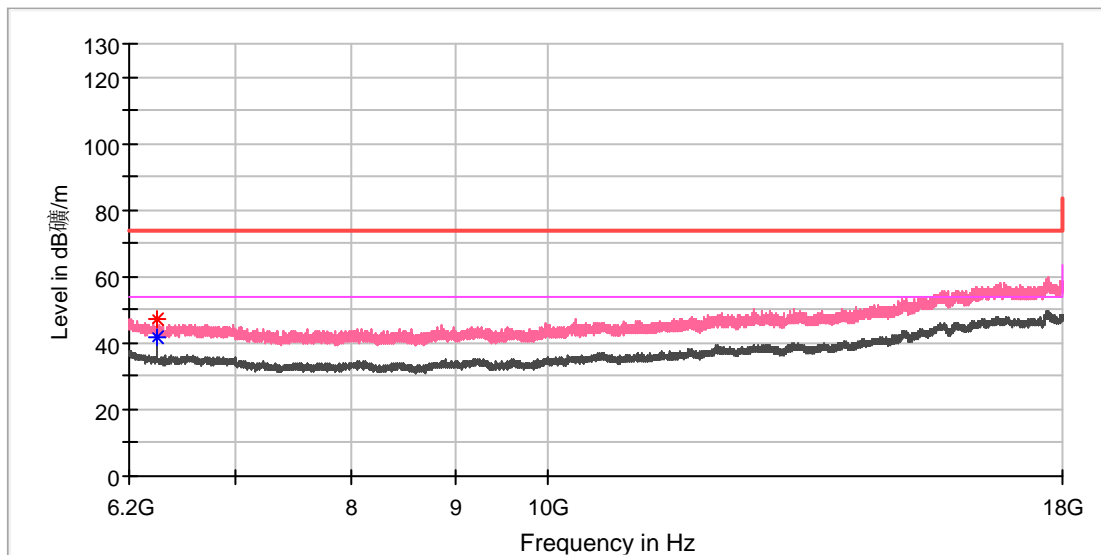


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4801.000000	51.51	---	74.00	22.49	100.0	V	322.0	11.8
4802.500000	---	40.54	54.00	13.46	100.0	V	195.0	11.8

EUT Information

EUT Name: thinkplus Walkie Talkie Earphone HW10
 Model: HW10TP
 Test Mode: BLE_Low channel
 Test Voltage:: AC 120V, 60Hz
 Remark: Temp 23 Humi:55%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

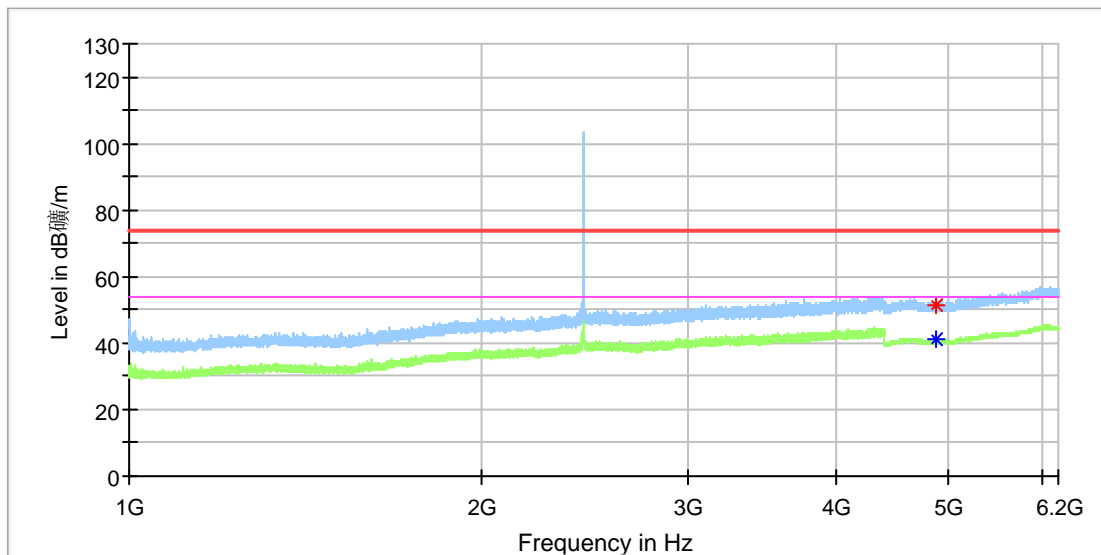


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
6405.025000	---	41.46	54.00	12.54	100.0	V	340.0	8.9
6405.025000	47.12	---	74.00	26.88	100.0	V	340.0	8.9

EUT Information

EUT Name: thinkplus Walkie Talkie Earphone HW10
 Model: HW10TP
 Test Mode: BLE_Mid channel
 Test Voltage:: AC 120V, 60Hz
 Remark: Temp 23 Humi:55%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

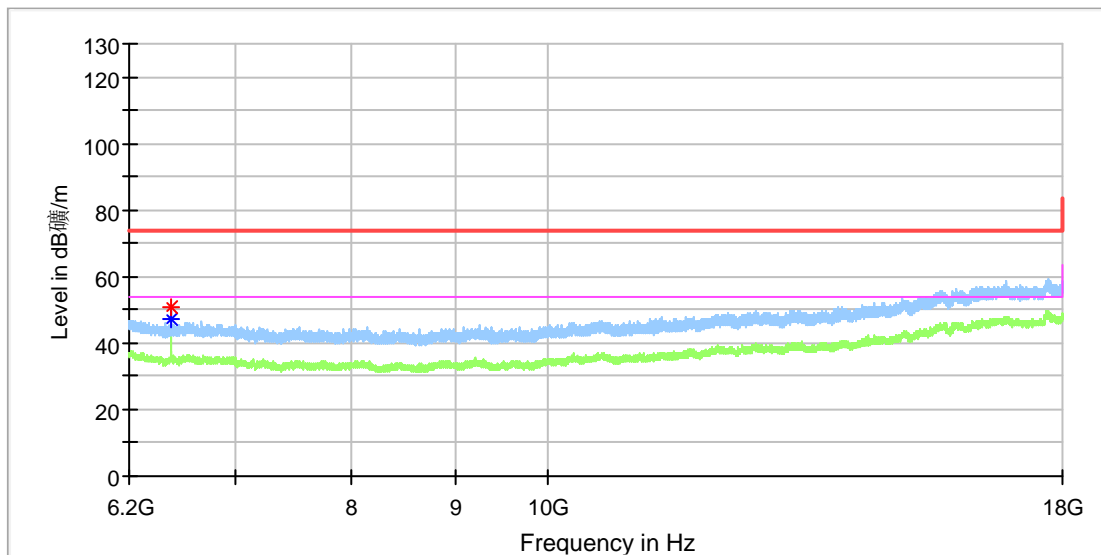


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4876.500000	51.59	---	74.00	22.41	100.0	H	352.0	11.8
4880.500000	---	41.12	54.00	12.88	100.0	H	104.0	11.8

EUT Information

EUT Name: thinkplus Walkie Talkie Earphone HW10
 Model: HW10TP
 Test Mode: BLE_Mid channel
 Test Voltage:: AC 120V, 60Hz
 Remark: Temp 23 Humi:55%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

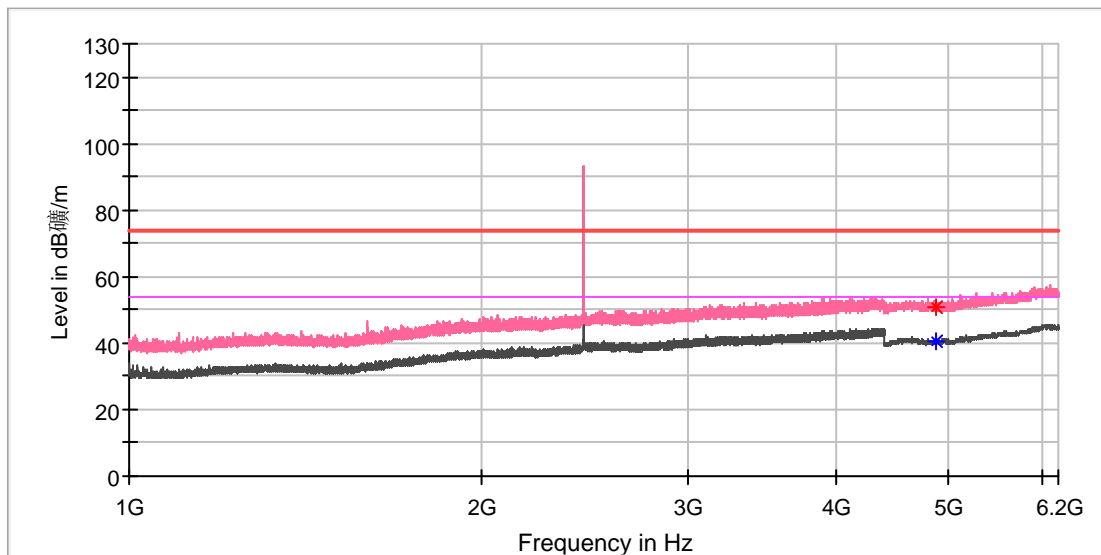


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
6506.308333	50.84	---	74.00	23.16	100.0	H	266.0	8.8
6506.308333	---	47.45	54.00	6.55	100.0	H	266.0	8.8

EUT Information

EUT Name: thinkplus Walkie Talkie Earphone HW10
 Model: HW10TP
 Test Mode: BLE_Mid channel
 Test Voltage:: AC 120V, 60Hz
 Remark: Temp 23 Humi:55%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

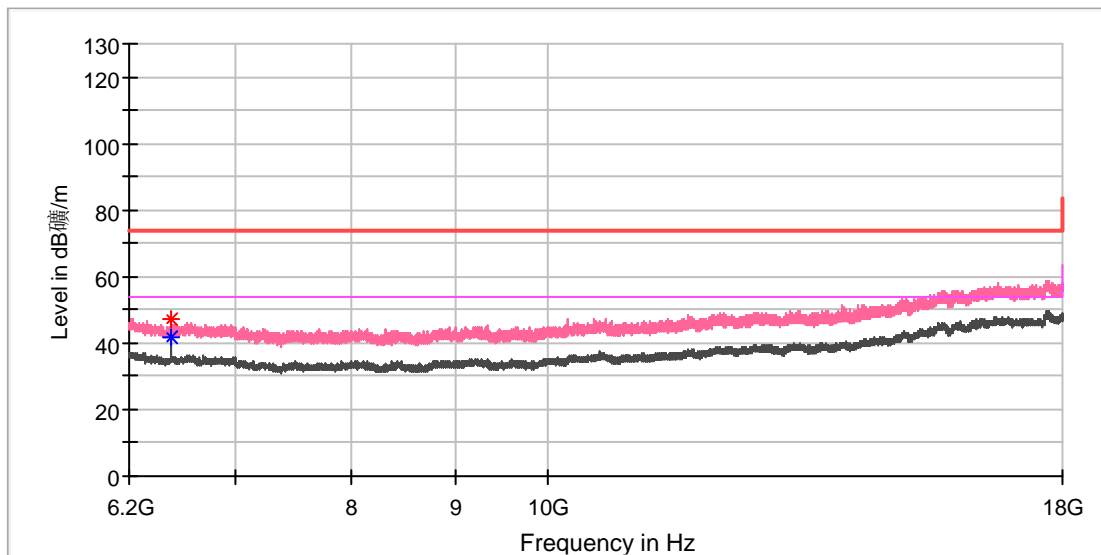


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4879.500000	---	40.34	54.00	13.66	100.0	V	278.0	11.8
4884.000000	50.86	---	74.00	23.14	100.0	V	358.0	11.8

EUT Information

EUT Name: thinkplus Walkie Talkie Earphone HW10
 Model: HW10TP
 Test Mode: BLE_Mid channel
 Test Voltage:: AC 120V, 60Hz
 Remark: Temp 23 Humi:55%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

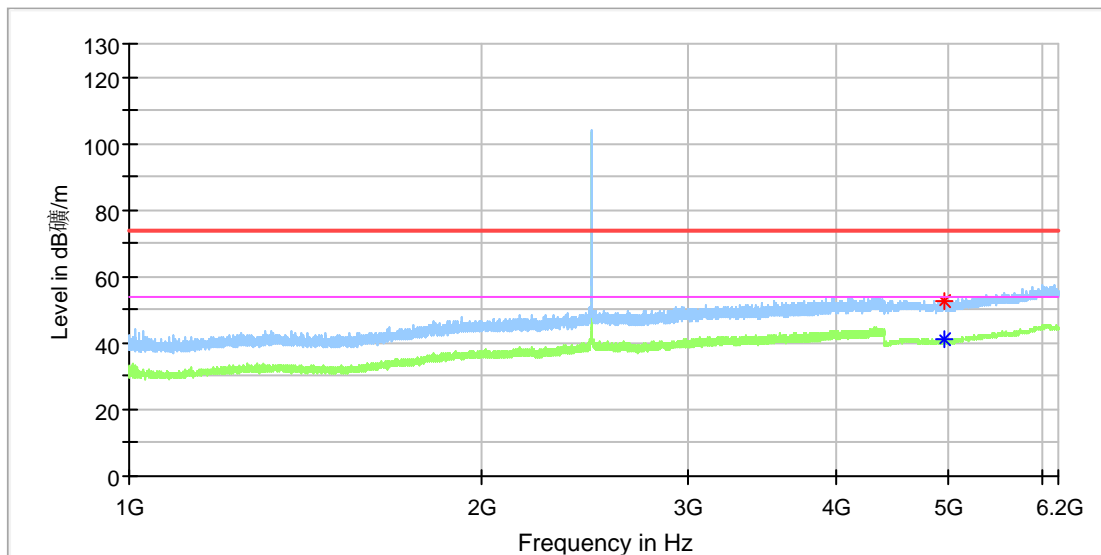


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
6506.308333	47.03	---	74.00	26.97	100.0	V	267.0	8.8
6506.308333	---	41.89	54.00	12.11	100.0	V	267.0	8.8

EUT Information

EUT Name: thinkplus Walkie Talkie Earphone HW10
 Model: HW10TP
 Test Mode: BLE_High channel
 Test Voltage:: AC 120V, 60Hz
 Remark: Temp 23 Humi:55%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

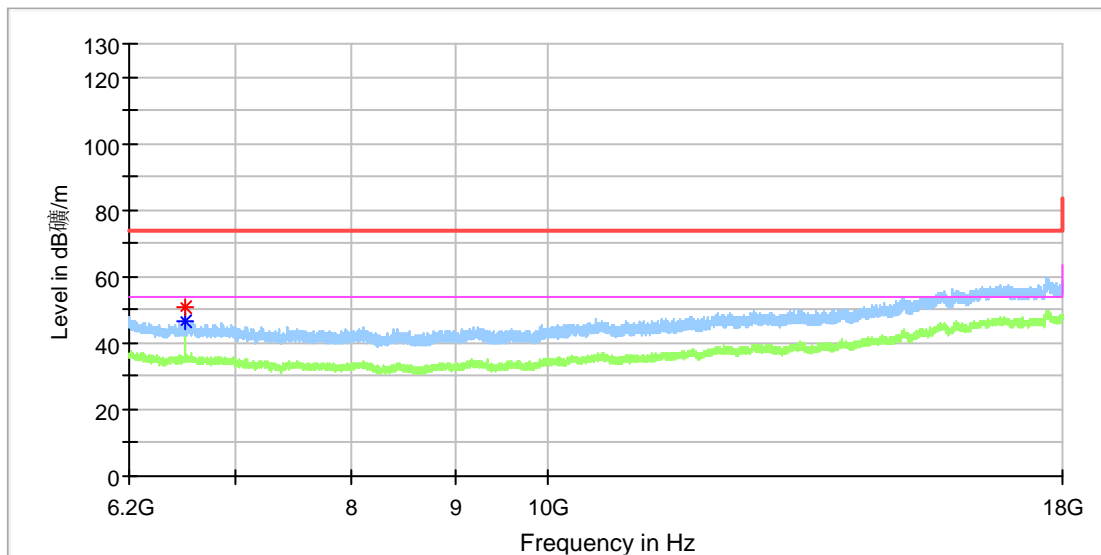


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4958.000000	52.62	---	74.00	21.38	100.0	H	72.0	11.8
4960.000000	---	41.16	54.00	12.84	100.0	H	128.0	11.8

EUT Information

EUT Name: thinkplus Walkie Talkie Earphone HW10
 Model: HW10TP
 Test Mode: BLE_High channel
 Test Voltage:: AC 120V, 60Hz
 Remark: Temp 23 Humi:55%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

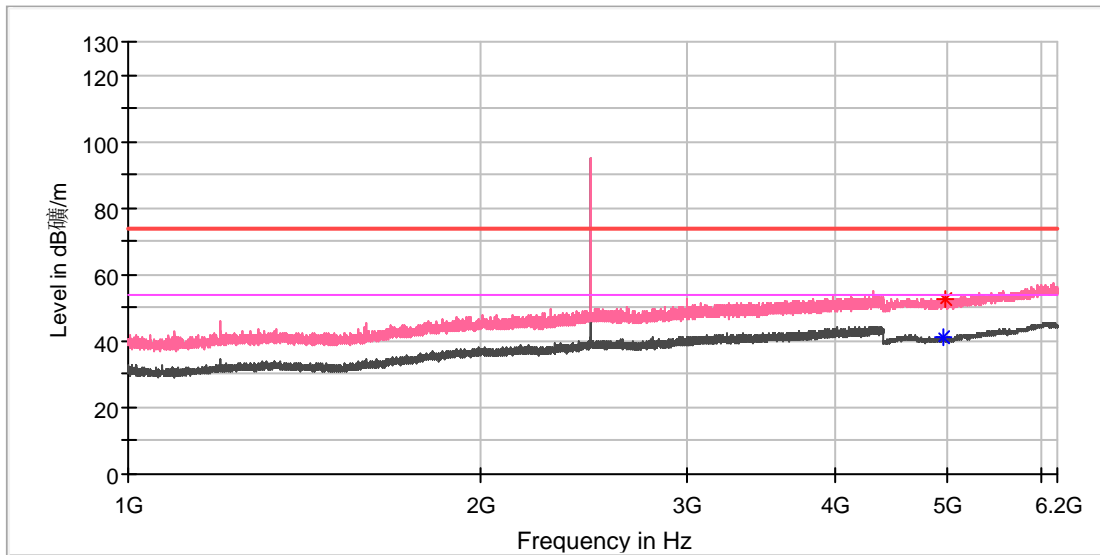


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
6613.000000	---	46.54	54.00	7.46	100.0	H	75.0	8.8
6613.000000	50.72	---	74.00	23.28	100.0	H	75.0	8.8

EUT Information

EUT Name: thinkplus Walkie Talkie Earphone HW10
 Model: HW10TP
 Test Mode: BLE_High channel
 Test Voltage:: AC 120V, 60Hz
 Remark: Temp 23 Humi:55%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

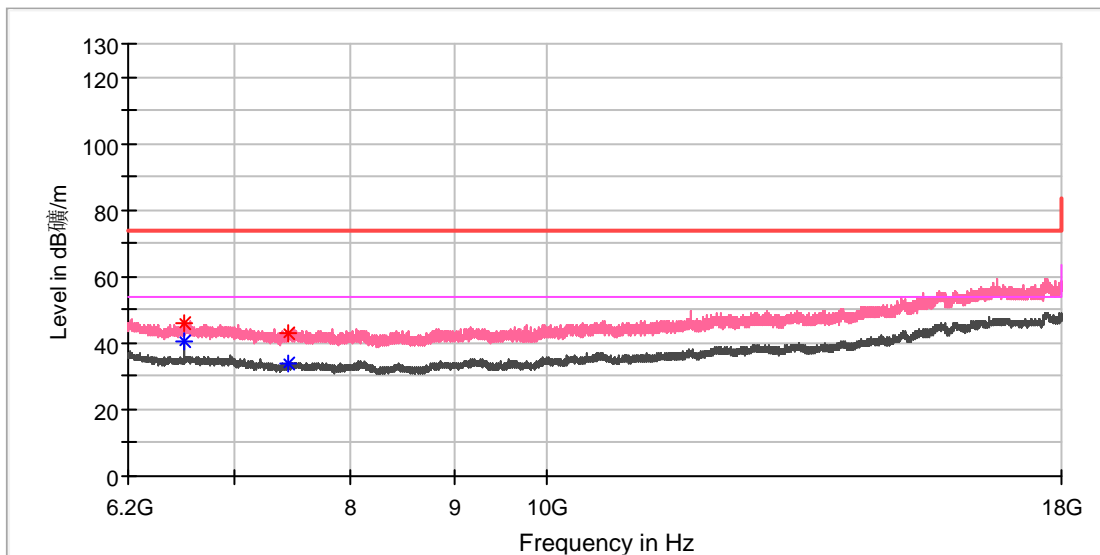


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4957.500000	---	41.03	54.00	12.97	100.0	V	282.0	11.8
4969.500000	52.42	---	74.00	21.58	100.0	V	352.0	11.8

EUT Information

EUT Name: thinkplus Walkie Talkie Earphone HW10
 Model: HW10TP
 Test Mode: BLE_High channel
 Test Voltage:: AC 120V, 60Hz
 Remark: Temp 23 Humi:55%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



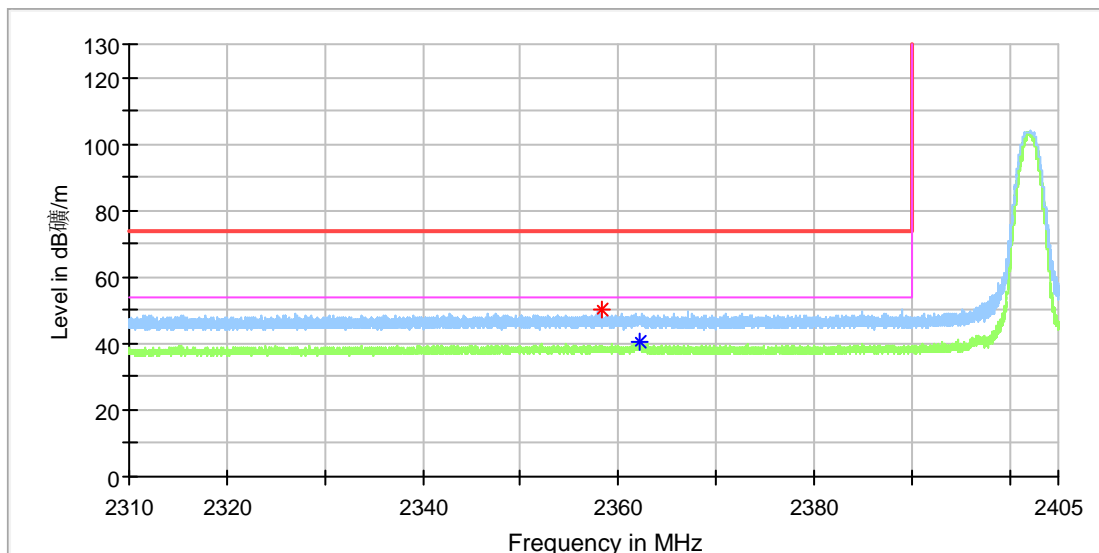
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
6613.491667	46.14	---	74.00	27.86	100.0	V	341.0	8.8
6613.491667	---	40.77	54.00	13.23	100.0	V	341.0	8.8
7442.441667	---	33.60	54.00	20.40	100.0	V	328.0	8.4
7447.850000	43.19	---	74.00	30.81	100.0	V	314.0	8.5

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

EUT Information

EUT Name:	thinkplus Walkie Talkie Earphone HW10
Model:	HW10TP
Test Mode:	BLE_Low channel
Test Voltage::	AC 120V, 60Hz
Remark:	Temp 23 Humi:55%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

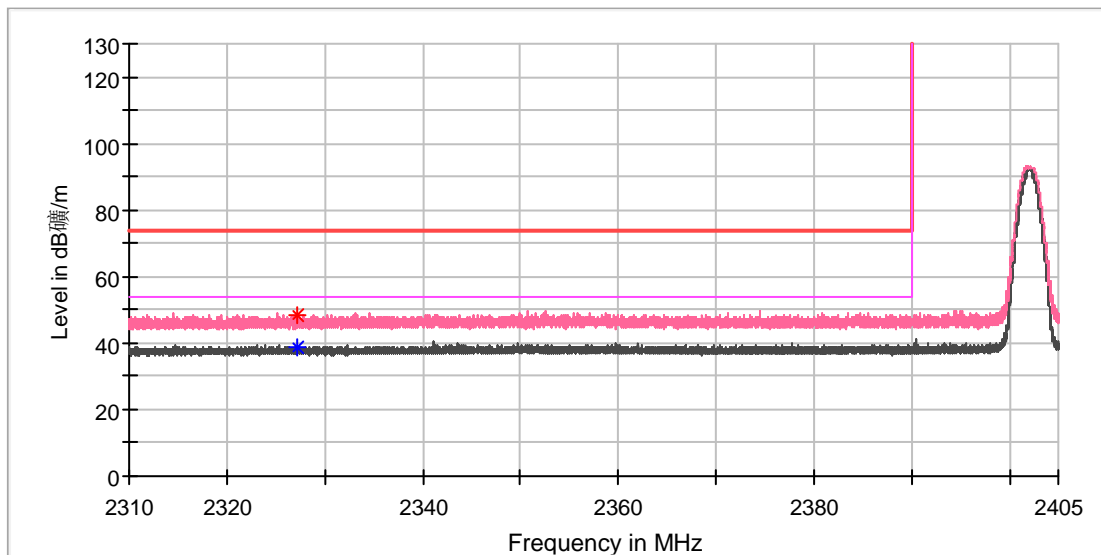


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2358.383500	50.25	---	74.00	23.75	100.0	H	151.0	6.9
2362.136000	---	40.28	54.00	13.72	100.0	H	194.0	6.9

EUT Information

EUT Name: thinkplus Walkie Talkie Earphone HW10
 Model: HW10TP
 Test Mode: BLE_Low channel
 Test Voltage:: AC 120V, 60Hz
 Remark: Temp 23 Humi:55%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

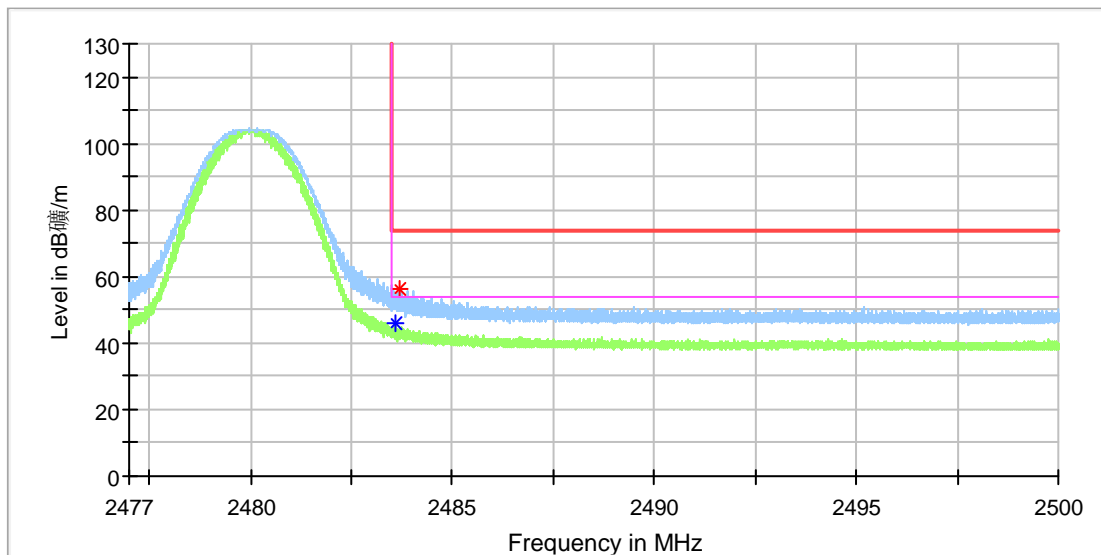


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2327.166500	---	38.50	54.00	15.50	100.0	V	189.0	6.7
2327.299500	48.64	---	74.00	25.36	100.0	V	246.0	6.7

EUT Information

EUT Name: thinkplus Walkie Talkie Earphone HW10
 Model: HW10TP
 Test Mode: BLE_High channel
 Test Voltage:: AC 120V, 60Hz
 Remark: Temp 23 Humi:55%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

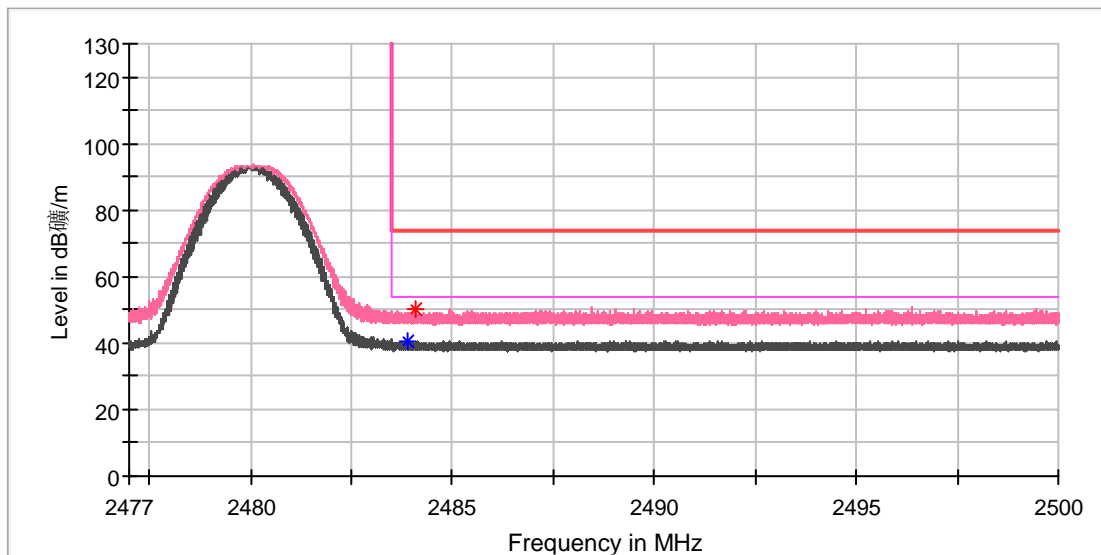


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.594100	---	45.73	54.00	8.27	100.0	H	74.0	7.4
2483.684950	56.45	---	74.00	17.55	100.0	H	84.0	7.4

EUT Information

EUT Name: thinkplus Walkie Talkie Earphone HW10
 Model: HW10TP
 Test Mode: BLE_High channel
 Test Voltage:: AC 120V, 60Hz
 Remark: Temp 23 Humi:55%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical Freqs

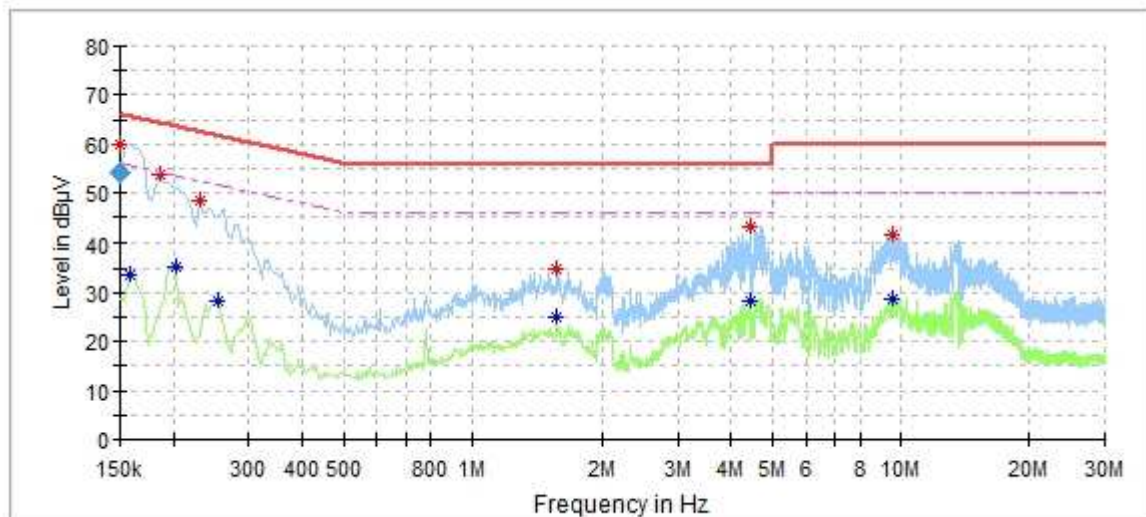
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.901150	---	40.47	54.00	13.53	100.0	V	122.0	7.4
2484.080550	49.97	---	74.00	24.03	100.0	V	253.0	7.4

Appendix C.7: Test Plots of Conducted Emission on AC Mains

Charging by USB cable

EUT Information

EUT Name:	thinkplus Walkie Talkie Earphone HW10
Order No.:	168311733
Model:	HW10TP
Test Mode:	Charing by USB Cable
Test Voltage:	AC 120V, 60Hz
Test By:	Mac Xie
Review By:	Gary Chen
Remark:	SR1

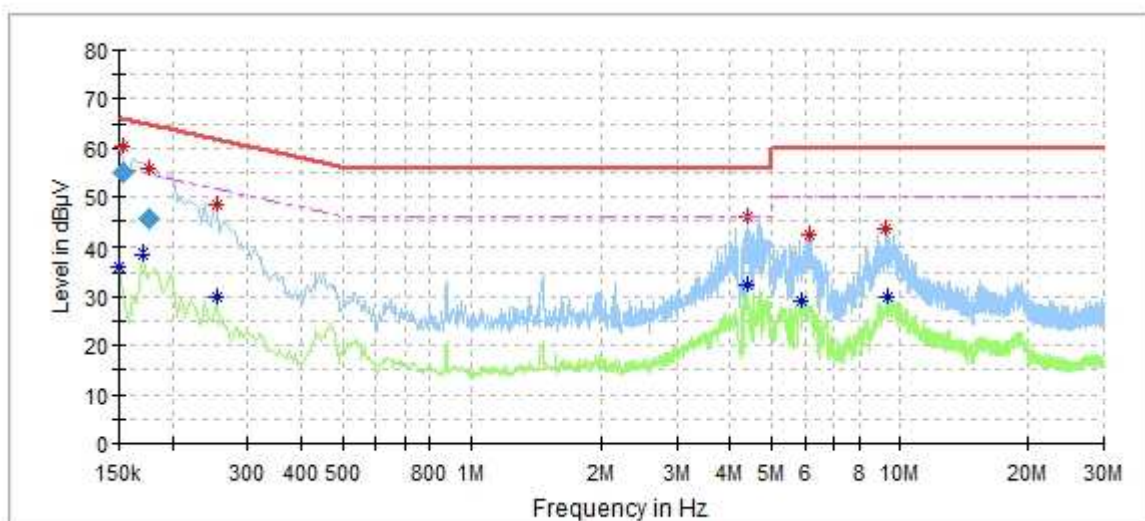


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.150000	59.77	---	65.57	5.80	L1	9.6
0.158000	---	33.80	55.57	21.76	L1	9.6
0.186000	53.62	---	64.21	10.60	L1	9.6
0.202000	---	35.32	53.53	18.21	L1	9.6
0.230000	48.49	---	62.45	13.96	L1	9.6
0.254000	---	28.48	51.63	23.15	L1	9.6
1.564000	---	25.15	46.00	20.85	L1	9.7
1.568000	35.03	---	56.00	20.97	L1	9.7
4.452000	43.14	---	56.00	12.86	L1	9.8
4.452000	---	28.22	46.00	17.78	L1	9.8
9.584000	41.57	---	60.00	18.43	L1	10.0
9.584000	---	28.83	50.00	21.17	L1	10.0

EUT Information

EUT Name: thinkplus Walkie Talkie Earphone HW10
 Order No.: 168311733
 Model: HW10TP
 Test Mode: Charging by USB Cable
 Test Voltage: AC 120V, 60Hz
 Test By: Mac Xie
 Review By: Gary Chen
 Remark: SR1



Critical Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.150000	---	36.24	56.00	19.76	N	9.6
0.154000	60.27	---	66.00	5.73	N	9.6
0.170000	---	38.45	54.96	16.51	N	9.6
0.176500	55.67	---	64.39	8.73	N	9.6
0.254000	48.37	---	61.63	13.26	N	9.6
0.254000	---	30.03	51.63	21.60	N	9.6
4.372000	---	32.40	46.00	13.60	N	9.8
4.400000	45.82	---	56.00	10.18	N	9.8
5.856000	---	28.98	50.00	21.02	N	10.0
6.156000	42.45	---	60.00	17.55	N	10.0
9.300000	43.29	---	60.00	16.71	N	10.0
9.304000	---	30.05	50.00	19.95	N	10.0