

Appendix B: Test Results of Bluetooth LE

APPENDIX B: TEST RESULTS OF BLUETOOTH LE	1
APPENDIX B.1: TEST RESULTS OF 6DB BANDWIDTH.....	2
Test Result.....	2
Test Graphs.....	3
APPENDIX B.2: TEST RESULTS OF 99% BANDWIDTH.....	5
Test Result.....	5
Test Graphs.....	6
APPENDIX B.3: TEST RESULTS OF CONDUCTED POWER SPECTRAL DENSITY	8
Test Result.....	8
Test Graphs.....	9
APPENDIX B.4: TEST RESULTS OF BAND EDGE MEASUREMENTS.....	11
Test Result.....	11
Test Graphs.....	12
APPENDIX B.5: TEST RESULTS OF CONDUCTED SPURIOUS EMISSION.....	13
Test Result.....	13
Test Graphs.....	14
APPENDIX B.6: TEST RESULTS OF RADIATED SPURIOUS EMISSIONS	18
30 MHz - 1GHz	18
1GHz - 18GHz.....	20
APPENDIX B.7: TEST RESULTS OF RADIATED EMISSIONS IN RESTRICTED BANDS	32
APPENDIX B.8: TEST RESULTS OF CONDUCTED EMISSION ON AC MAINS.....	36

Appendix B.1: Test Results of 6dB Bandwidth

Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.632	2401.672	2402.304	0.5	PASS
		2440	0.652	2439.664	2440.316	0.5	PASS
		2480	0.656	2479.660	2480.316	0.5	PASS

BLE 1M Ant1 2480

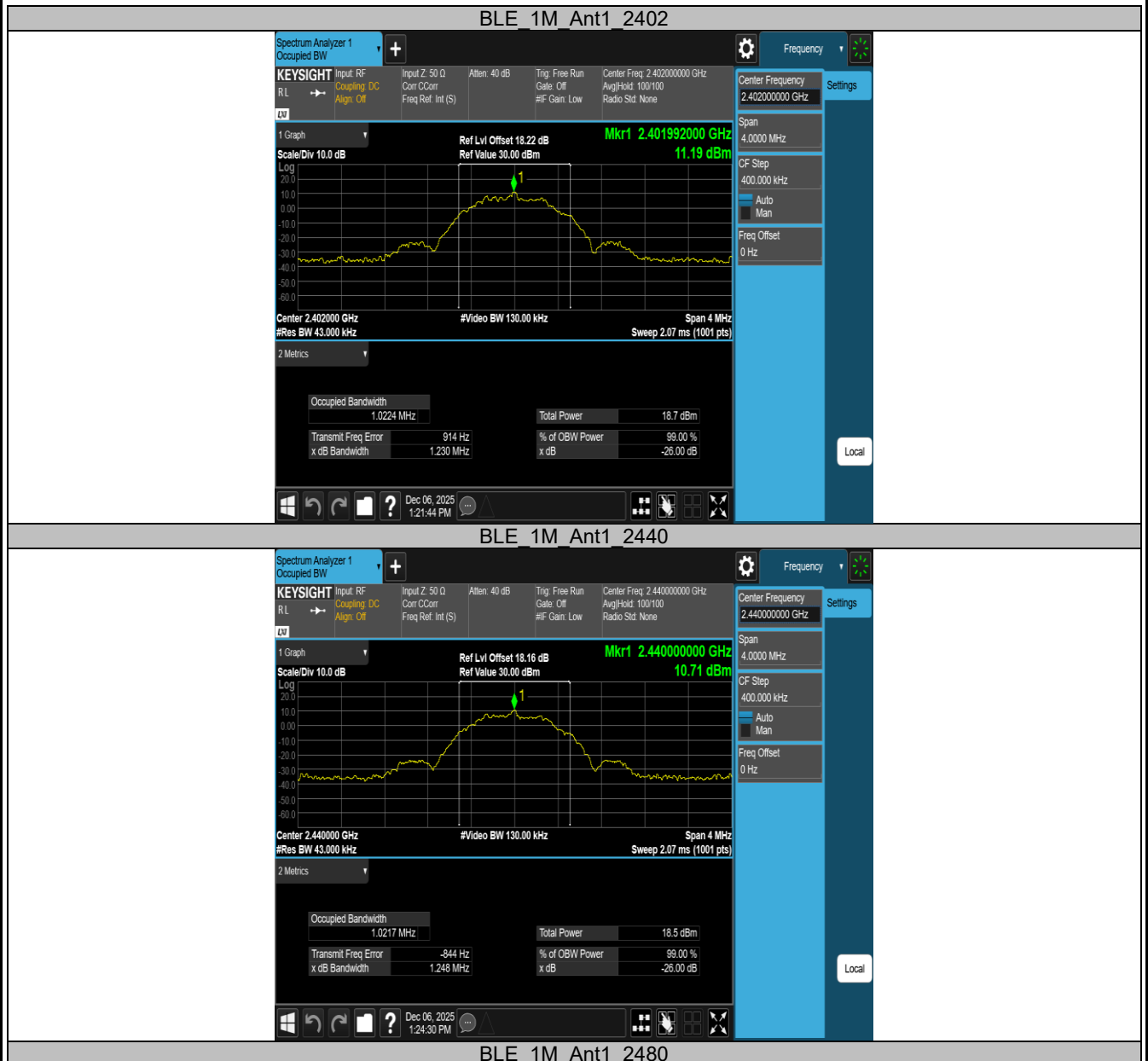


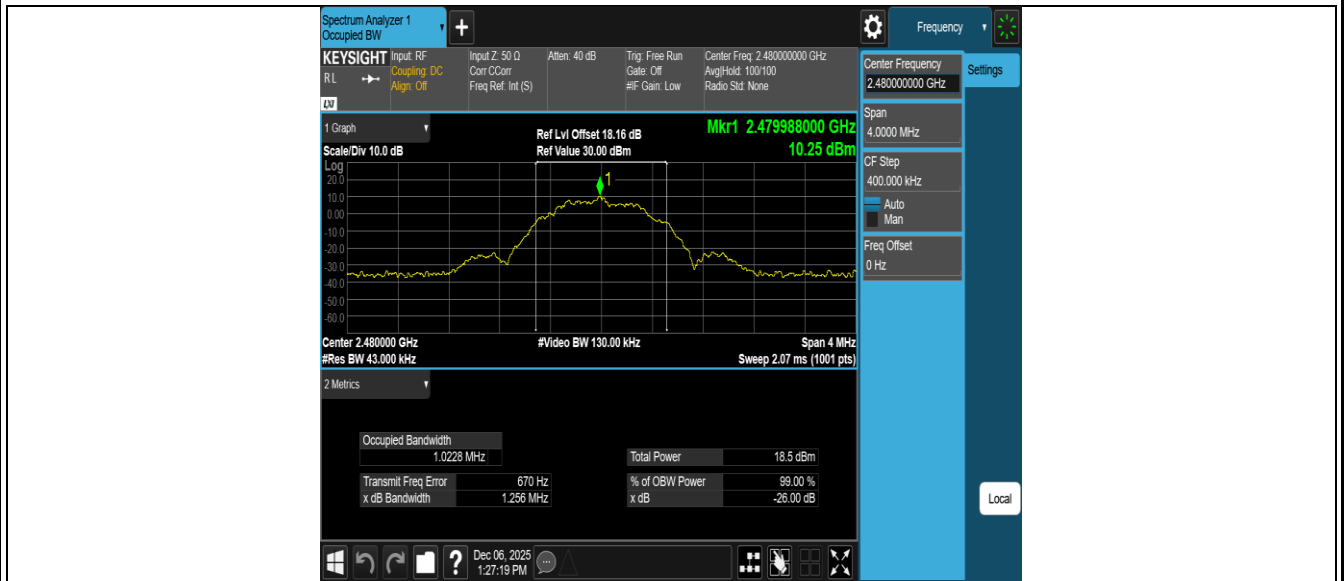
Appendix B.2: Test Results of 99% Bandwidth

Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.0224	2401.4897	2402.5121	---	PASS
		2440	1.0217	2439.4883	2440.5100	---	PASS
		2480	1.0228	2479.4893	2480.5121	---	PASS

Test Graphs



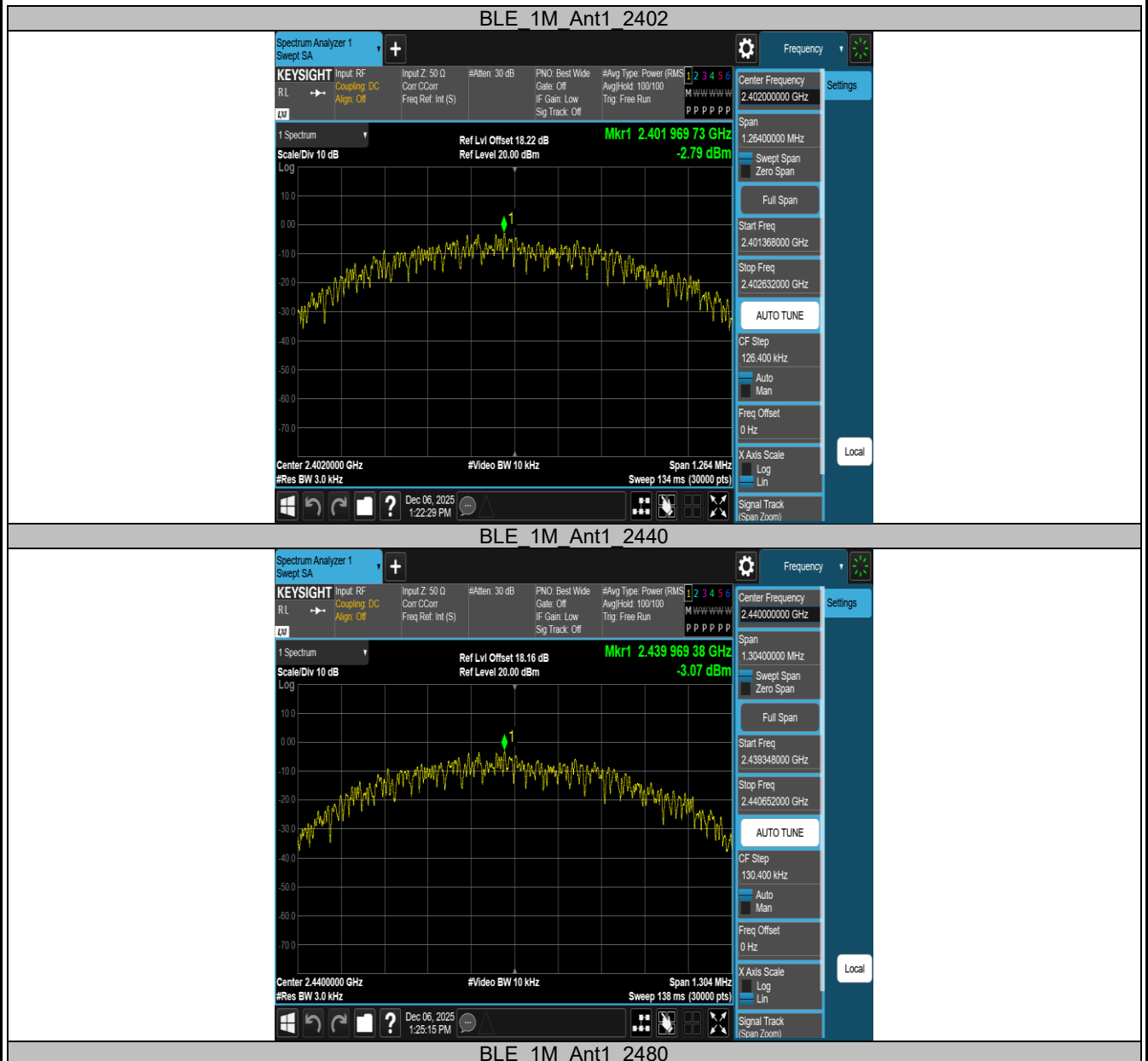


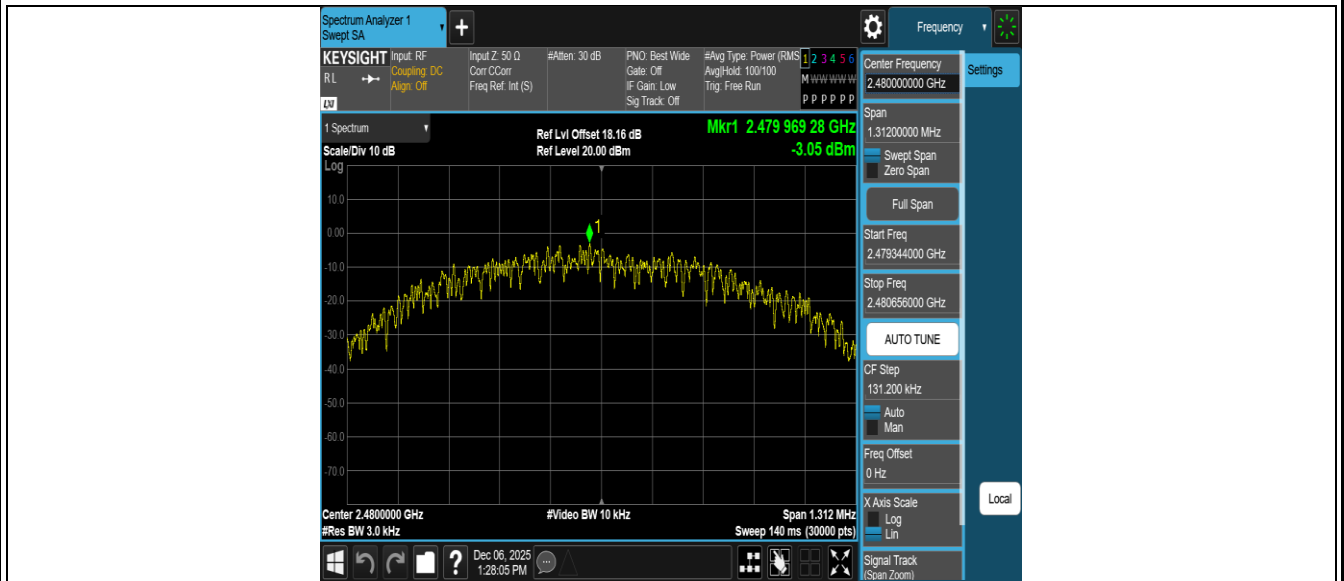
Appendix B.3: Test Results of Conducted Power Spectral Density

Test Result

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-2.79	≤8.00	PASS
		2440	-3.07	≤8.00	PASS
		2480	-3.05	≤8.00	PASS

Test Graphs





Appendix B.4: Test Results of Band Edge Measurements

Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	12.16	-41.67	≤ -7.84	PASS
		High	2480	11.43	-41.68	≤ -8.58	PASS

Test Graphs

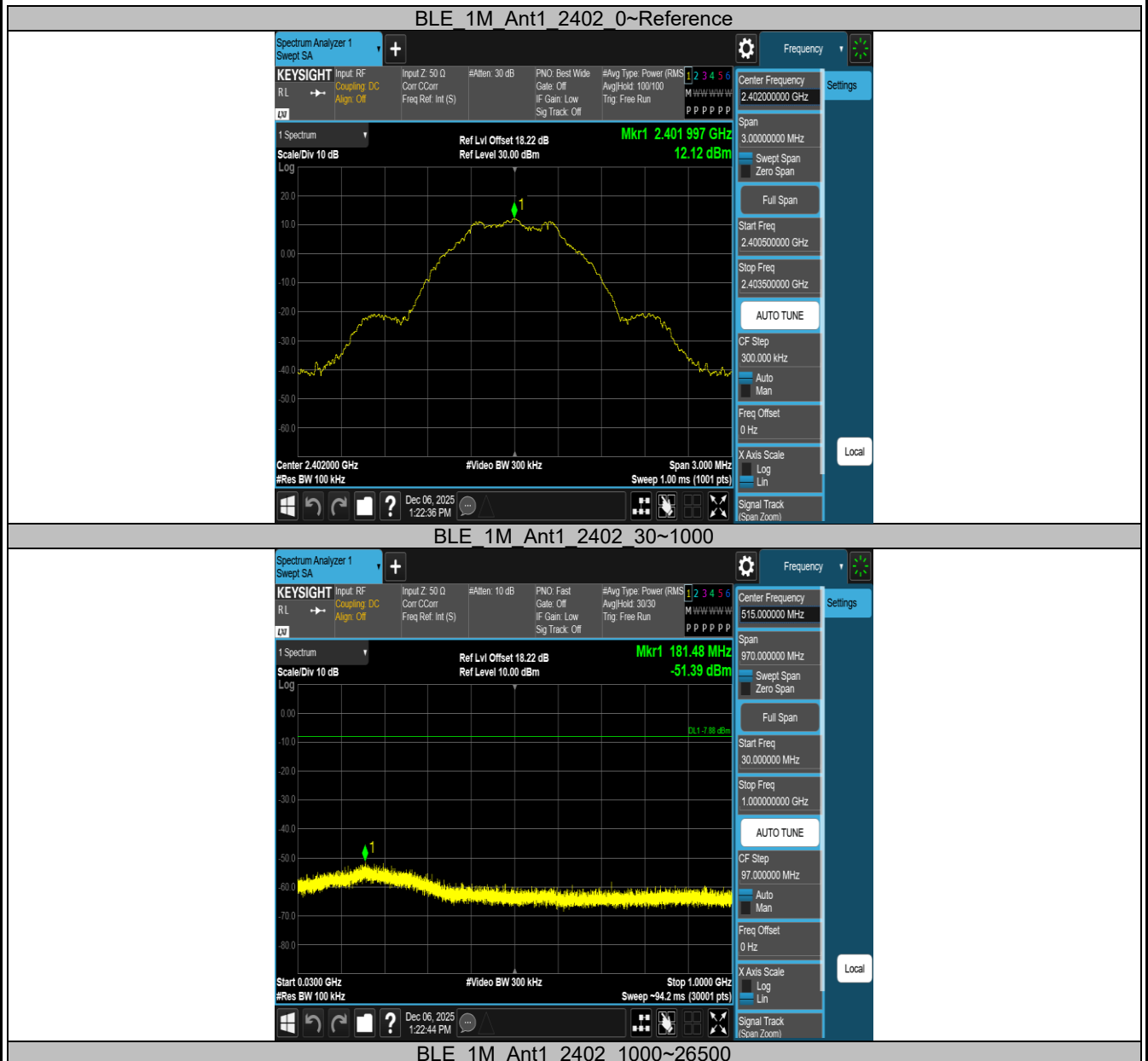


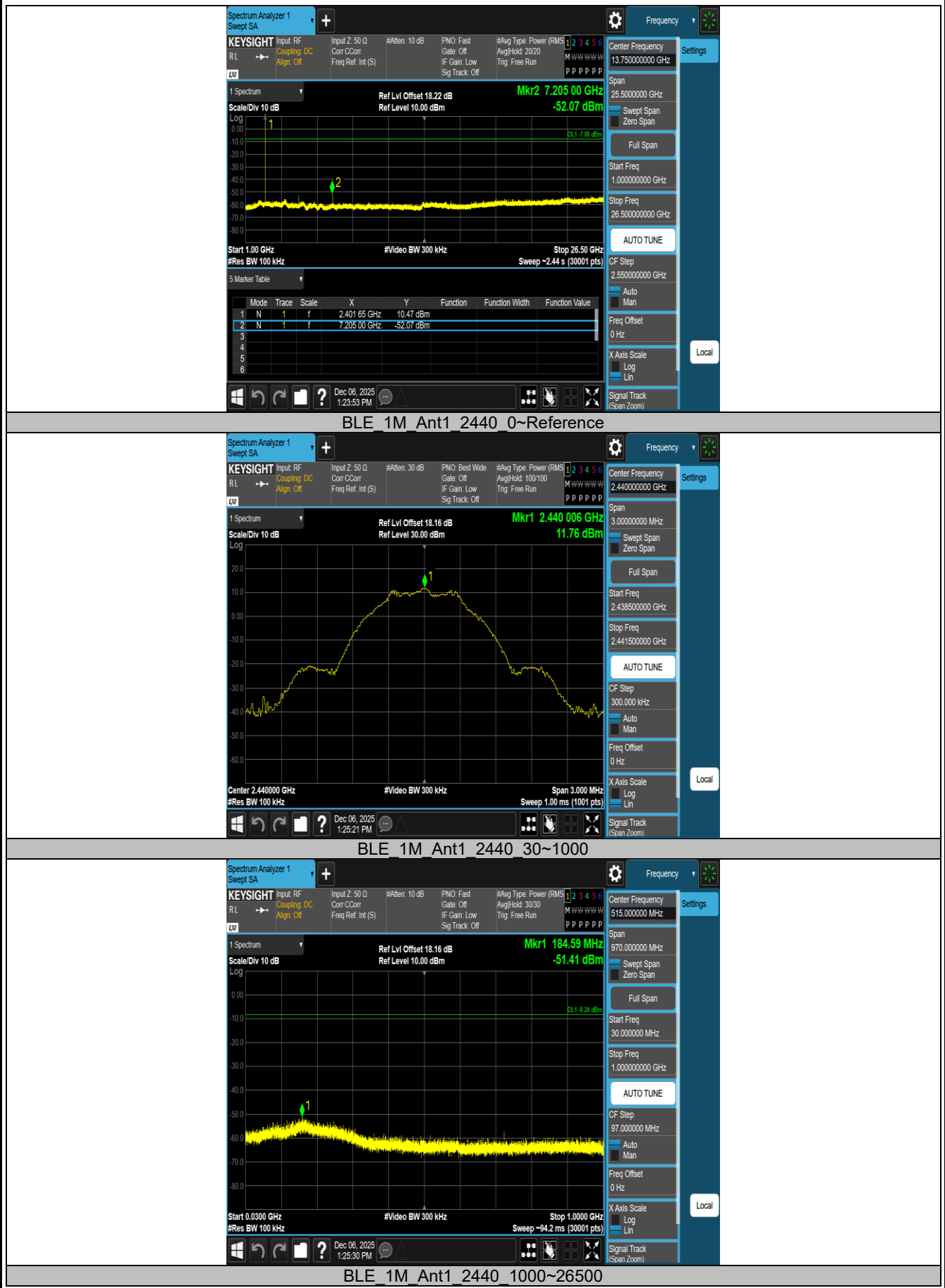
Appendix B.5: Test Results of Conducted Spurious Emission

Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	12.12	12.12	---	PASS
			30~1000	12.12	-51.39	≤-7.88	PASS
			1000~26500	12.12	-52.07	≤-7.88	PASS
		2440	Reference	11.76	11.76	---	PASS
			30~1000	11.76	-51.42	≤-8.24	PASS
			1000~26500	11.76	-52.92	≤-8.24	PASS
		2480	Reference	11.62	11.62	---	PASS
			30~1000	11.62	-50.74	≤-8.38	PASS
			1000~26500	11.62	-51.72	≤-8.38	PASS

Test Graphs









Appendix B.6: Test Results of Radiated Spurious Emissions

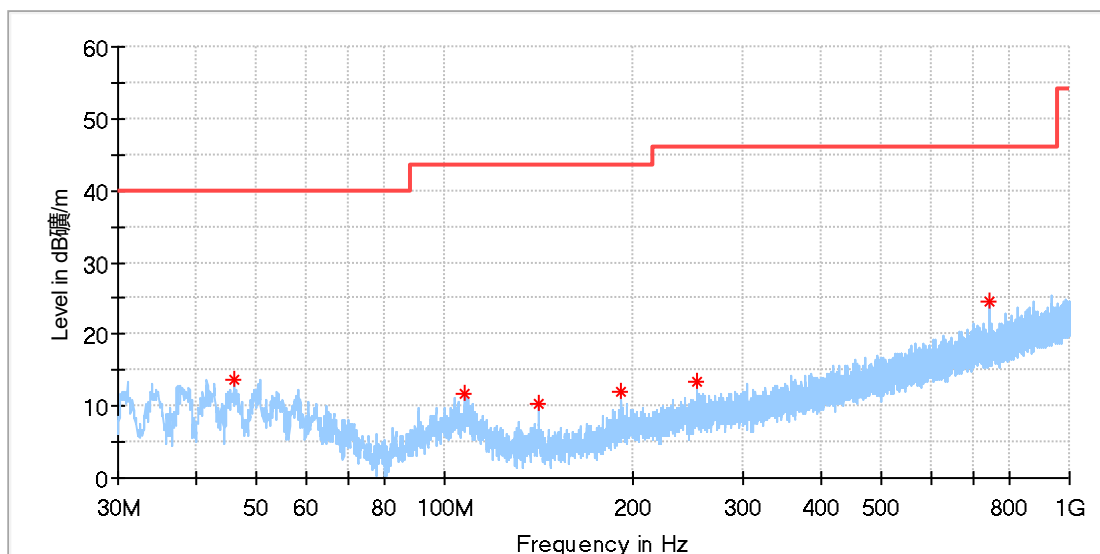
Note:

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

30 MHz - 1GHz

EUT Information

EUT Name:	ThinkPad Dual-Mode Wireless ANC Foldable Headset 8550
Model:	LB520NC
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168577723/A004140302-007
Test Voltage:	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

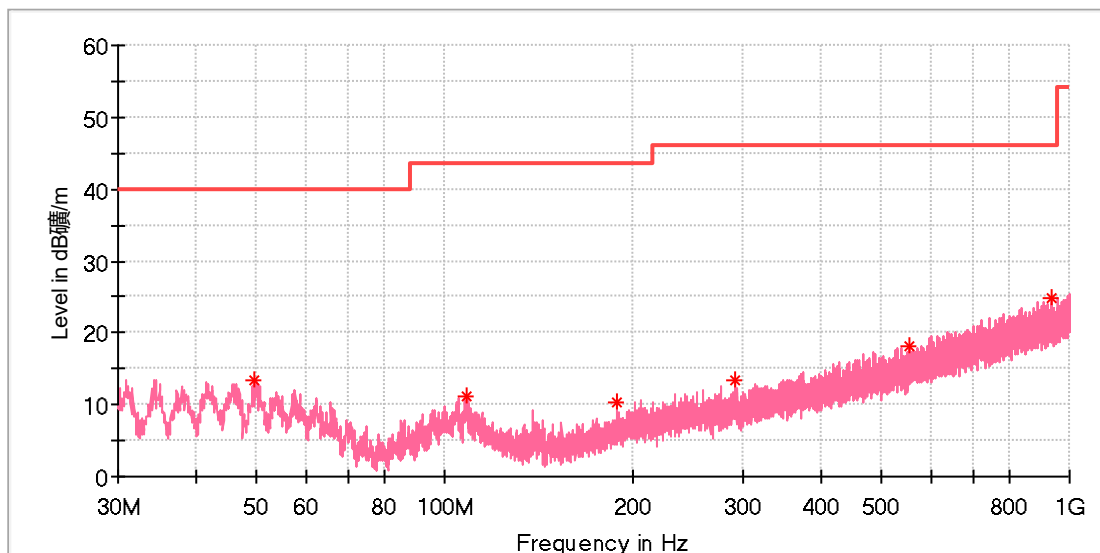
Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
45.951111	13.56	40.00	26.44	100.0	H	243.0	-18.8
107.869444	11.74	43.50	31.76	100.0	H	329.0	-19.1
141.226667	10.23	43.50	33.27	100.0	H	77.0	-22.4
191.990000	11.96	43.50	31.54	100.0	H	22.0	-19.5
253.261667	13.43	46.00	32.57	100.0	H	85.0	-17.3
742.518889	24.44	46.00	21.56	100.0	H	0.0	-7.2

Final_Result

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

EUT Information

EUT Name:	ThinkPad Dual-Mode Wireless ANC Foldable Headset 8550
Model:	LB520NC
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168577723/A004140302-007
Test Voltage:	Battery
Remark:	Temp 24 Humi:50%
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)
49.400000	13.48	40.00	26.52	100.0	V	94.0	-18.4
108.785556	11.11	43.50	32.39	100.0	V	103.0	-19.1
188.810556	10.30	43.50	33.20	100.0	V	0.0	-19.8
290.822222	13.41	46.00	32.59	100.0	V	21.0	-16.5
553.153333	18.18	46.00	27.82	100.0	V	249.0	-10.7
938.458889	24.84	46.00	21.16	100.0	V	77.0	-4.4

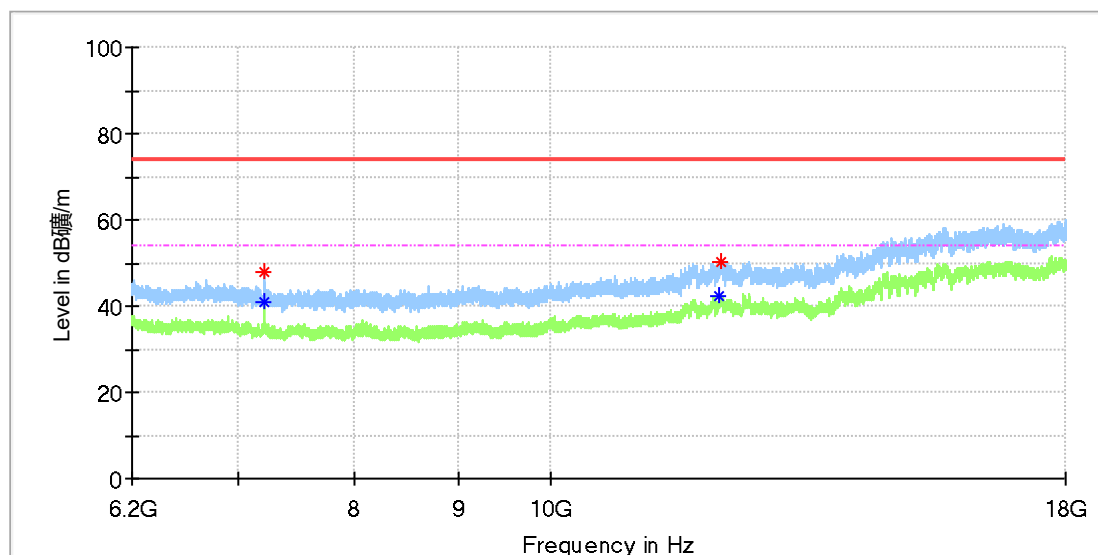
Final_Result

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

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

EUT Information

EUT Name:	ThinkPad Dual-Mode Wireless ANC Foldable Headset 8550
Model:	LB520NC
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168577723/A004140302-007
Test Voltage:	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

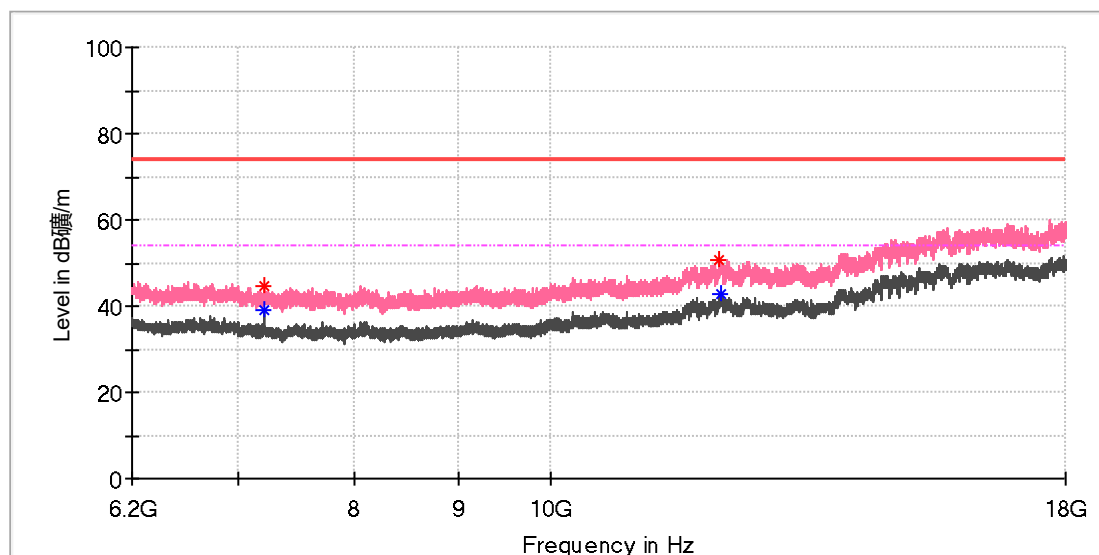
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7206.441667	47.96	---	74.00	26.04	150.0	H	316.0	8.8
7206.441667	---	41.12	54.00	12.88	150.0	H	316.0	8.8
12130.975000	---	42.33	54.00	11.67	150.0	H	281.0	16.2
12141.791667	50.38	---	74.00	23.62	150.0	H	52.0	16.5

Final Result

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

EUT Information

EUT Name:	ThinkPad Dual-Mode Wireless ANC Foldable Headset 8550
Model:	LB520NC
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168577723/A004140302-007
Test Voltage:	Battery
Remark:	Temp 24 Humi:50%
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)
7205.950000	---	38.89	54.00	15.11	150.0	V	226.0	8.8
7206.441667	44.81	---	74.00	29.19	150.0	V	42.0	8.8
12128.516667	50.68	---	74.00	23.32	150.0	V	214.0	16.2
12159.491667	---	42.69	54.00	11.31	150.0	V	169.0	16.2

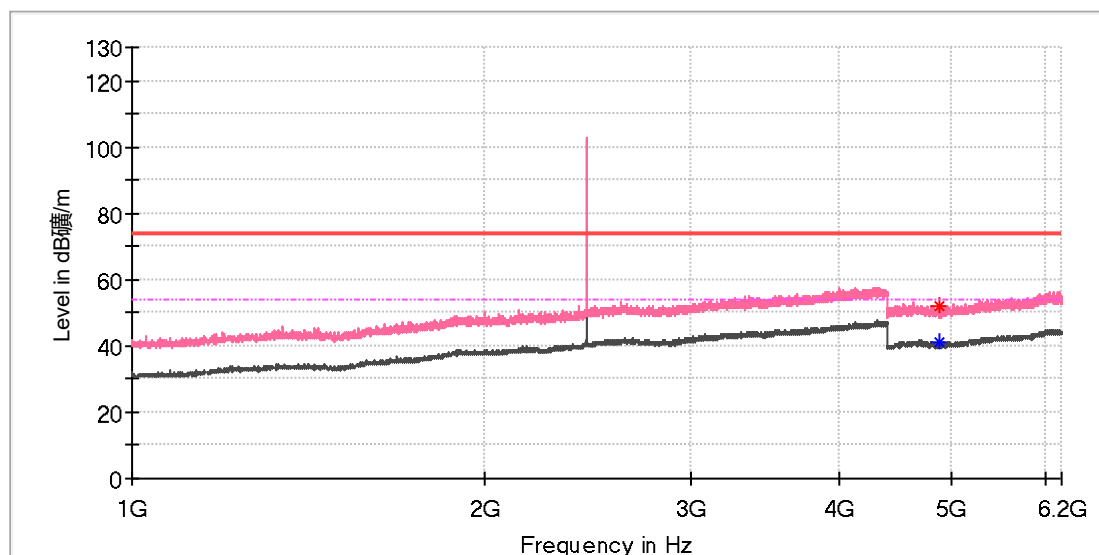
Final Result

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

EUT Information

EUT Information

EUT Name:	ThinkPad Dual-Mode Wireless ANC Foldable Headset 8550
Model:	LB520NC
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168577723/A004140302-007
Test Voltage:	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

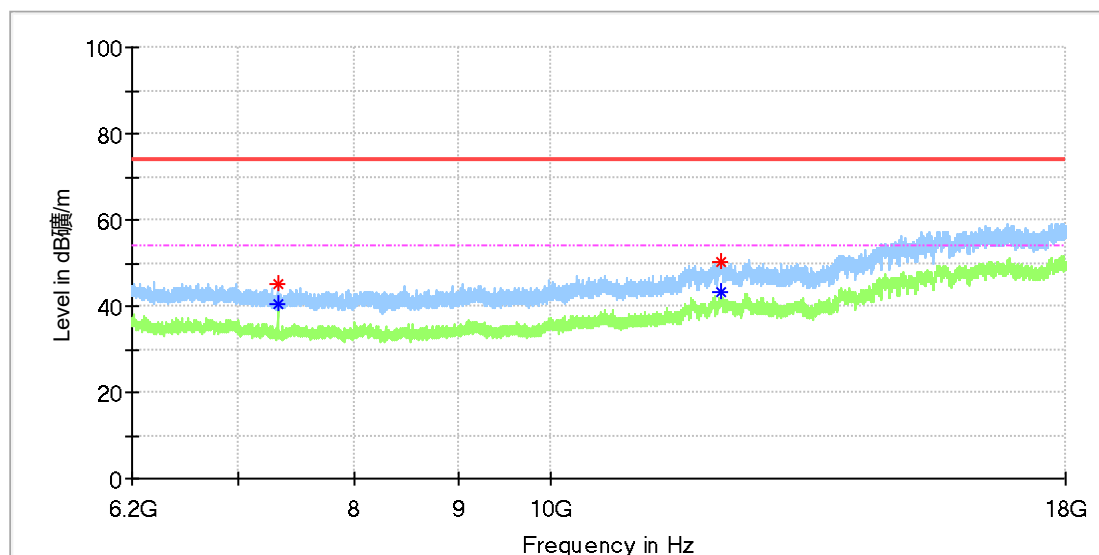
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4880.000000	---	41.34	54.00	12.66	150.0	V	280.0	13.3
4886.000000	52.04	---	74.00	21.96	150.0	V	170.0	13.3

Final Result

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

EUT Information

EUT Name:	ThinkPad Dual-Mode Wireless ANC Foldable Headset 8550
Model:	LB520NC
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168577723/A004140302-007
Test Voltage:	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

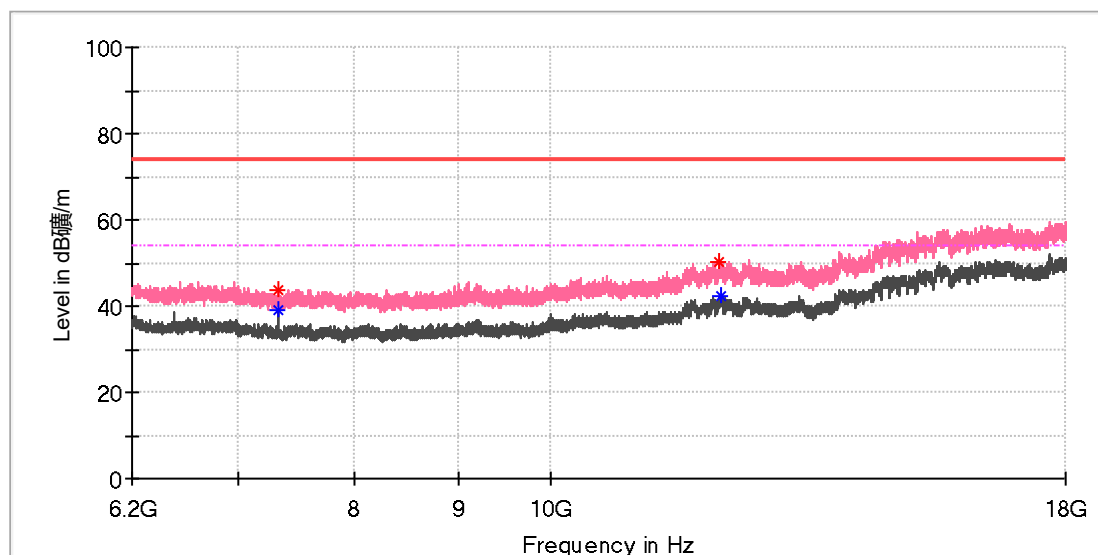
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7319.033333	45.21	---	74.00	28.79	150.0	H	301.0	8.2
7319.525000	---	40.64	54.00	13.36	150.0	H	287.0	8.2
12134.908333	---	43.30	54.00	10.70	150.0	H	228.0	16.3
12145.233333	50.22	---	74.00	23.78	150.0	H	0.0	16.6

Final Result

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

EUT Information

EUT Name:	ThinkPad Dual-Mode Wireless ANC Foldable Headset 8550
Model:	LB520NC
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168577723/A004140302-007
Test Voltage:	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

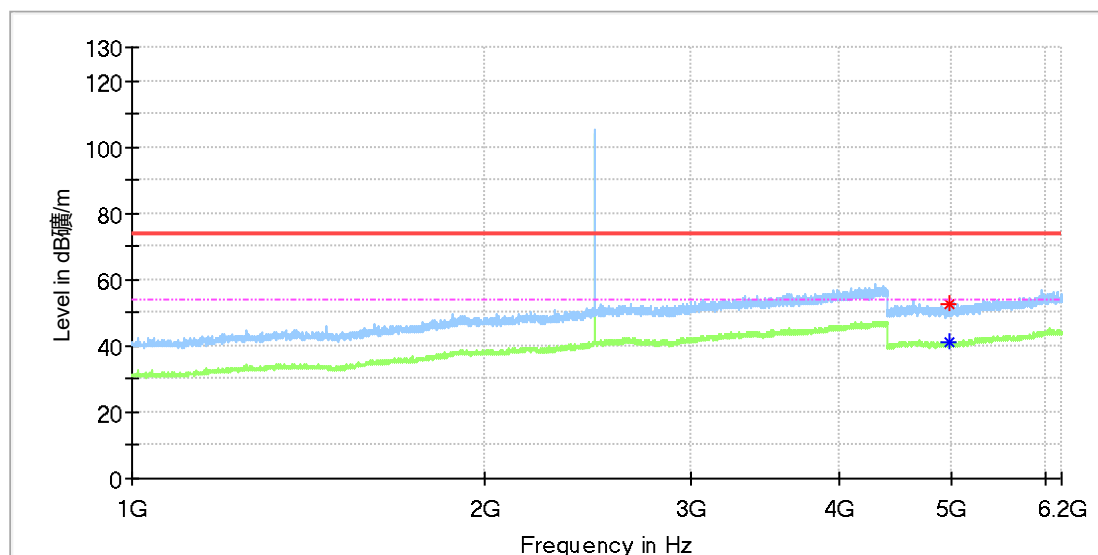
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7319.525000	43.86	---	74.00	30.14	150.0	V	69.0	8.2
7320.508333	---	38.88	54.00	15.12	150.0	V	232.0	8.2
12128.025000	50.35	---	74.00	23.65	150.0	V	355.0	16.2
12156.541667	---	42.34	54.00	11.66	150.0	V	232.0	16.4

Final Result

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

EUT Name:	ThinkPad Dual-Mode Wireless ANC Foldable Headset 8550
Model:	LB520NC
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168577723/A004140302-007
Test Voltage:	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

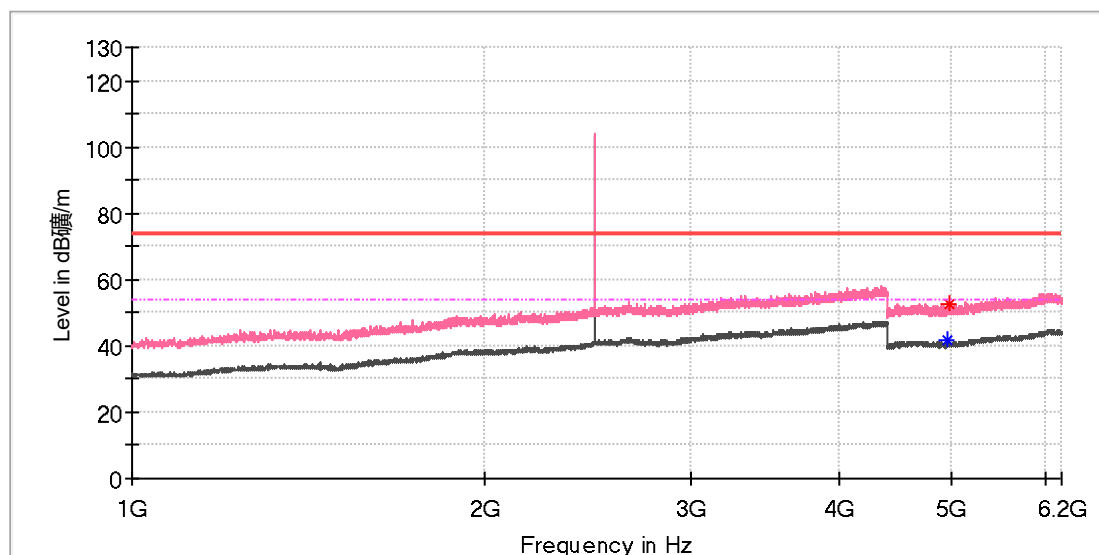
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4969.000000	---	41.05	54.00	12.95	150.0	H	82.0	13.3
4975.500000	52.46	---	74.00	21.54	150.0	H	76.0	13.3

Final Result

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

EUT Information

EUT Name:	ThinkPad Dual-Mode Wireless ANC Foldable Headset 8550
Model:	LB520NC
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168577723/A004140302-007
Test Voltage:	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

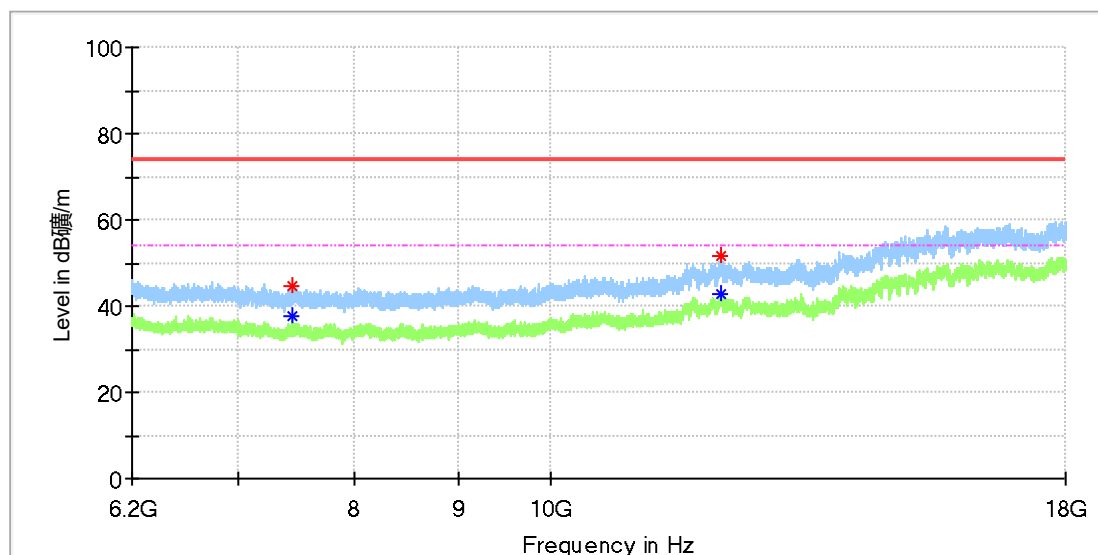
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4960.000000	---	41.65	54.00	12.35	150.0	V	209.0	13.3
4967.500000	52.51	---	74.00	21.49	150.0	V	97.0	13.3

Final Result

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

EUT Information

EUT Name:	ThinkPad Dual-Mode Wireless ANC Foldable Headset 8550
Model:	LB520NC
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168577723/A004140302-007
Test Voltage:	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical Freqs

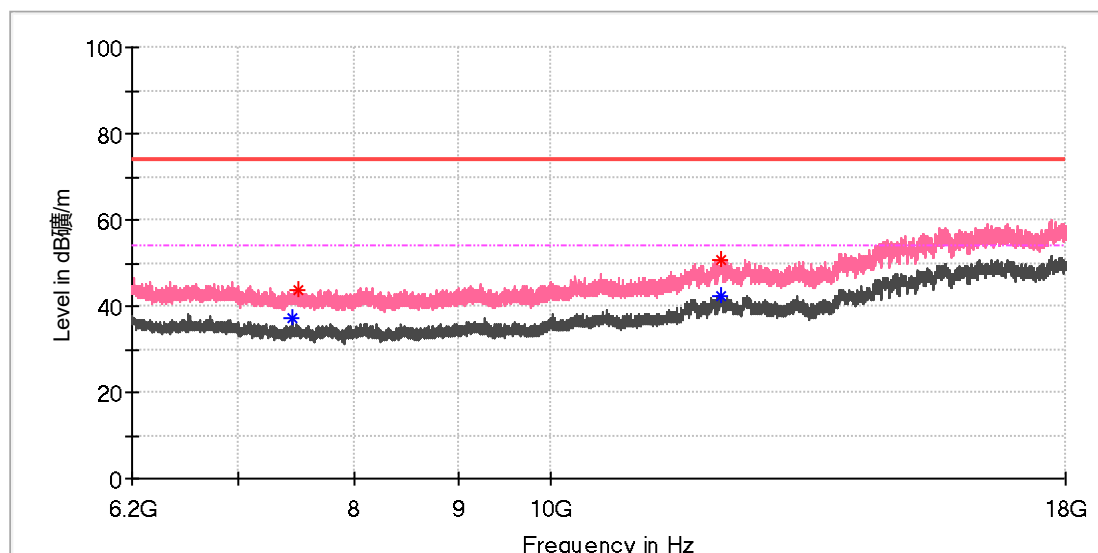
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7439.491667	44.46	---	74.00	29.54	150.0	H	305.0	8.4
7439.983333	---	37.90	54.00	16.10	150.0	H	316.0	8.4
12150.150000	---	42.92	54.00	11.08	150.0	H	0.0	16.7
12151.625000	51.56	---	74.00	22.44	150.0	H	0.0	16.6

Final Result

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

EUT Information

EUT Name:	ThinkPad Dual-Mode Wireless ANC Foldable Headset 8550
Model:	LB520NC
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168577723/A004140302-007
Test Voltage:	Battery
Remark:	Temp 24 Humi:50%
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)
7439.000000	---	37.37	54.00	16.63	150.0	V	222.0	8.4
7495.541667	43.81	---	74.00	30.19	150.0	V	355.0	8.7
12135.400000	---	42.44	54.00	11.56	150.0	V	233.0	16.3
12136.875000	50.70	---	74.00	23.30	150.0	V	210.0	16.4

Final Result

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

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
100.000000	100.000000	100.000000	100.000000	100.000000	100.000000		100.000000	

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

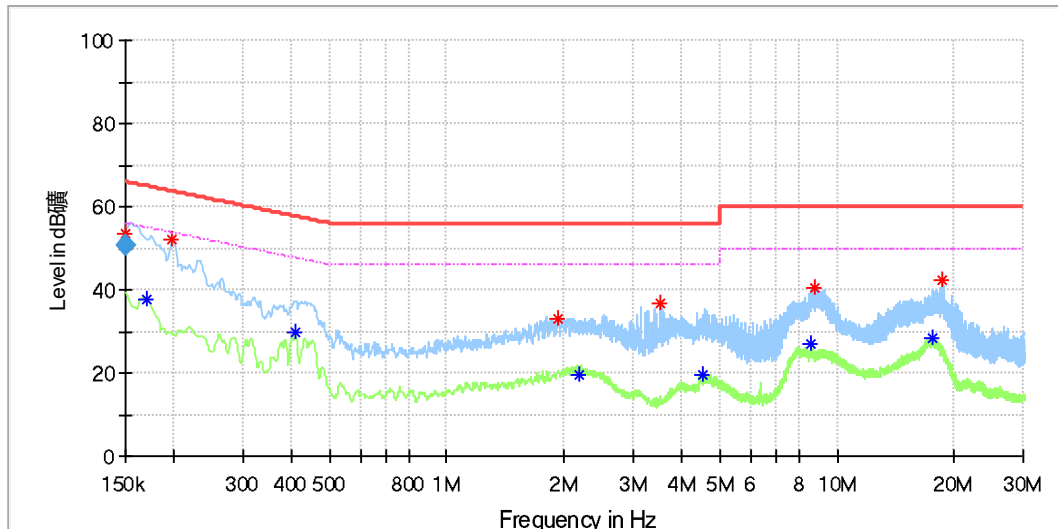
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---	---		---	---

EUT Information

Appendix B.8: Test Results of Conducted Emission on AC Mains

EUT Information

EUT Name:	ThinkPad Dual-Mode Wireless ANC Foldable Headset 8550
Order Number:	168577723_ItemXX
Model:	LB520NC
Test Mode:	BT+MIC +Charging
Test Voltage:	AC 120V 60Hz
Test Standard:	FCC Part 15
Test By:/Review By:	Brain Zhang / Murphy Chen
Tem./Hum./Pressure:	24.3°C/51.5%/101kPa
Remark:	SR2



Critical Freqs

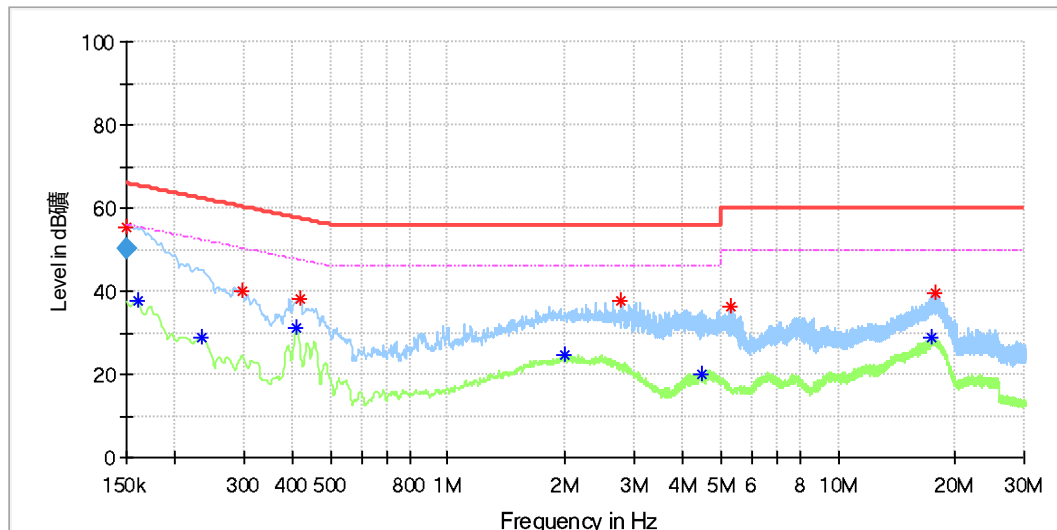
Frequency (MHz)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.15	53.71	---	65.73	12.02	L1	10.24
0.17	---	37.47	54.97	17.49	L1	10.24
0.20	52.01	---	63.69	11.68	L1	10.24
0.41	---	29.88	47.68	17.80	L1	10.25
1.92	33.22	---	56.00	22.78	L1	10.31
2.18	---	19.75	46.00	26.25	L1	10.31
3.52	36.80	---	56.00	19.20	L1	10.35
4.55	---	19.40	46.00	26.60	L1	10.40
8.58	---	26.88	50.00	23.12	L1	10.59
8.76	40.49	---	60.00	19.51	L1	10.60
17.49	---	28.38	50.00	21.62	L1	10.95
18.56	42.27	---	60.00	17.73	L1	11.03

Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.15	50.74	---	66.00	15.26	1000.00	9.00	L1	10.23

EUT Information

EUT Name: ThinkPad Dual-Mode Wireless ANC Foldable Headset 8550
Order Number: 168577723_ItemXX
Model: LB520NC
Test Mode: BT+MIC +Charging
Test Voltage: AC 120V 60Hz
Test Standard: FCC Part 15
Test By:/Review By: Brain Zhang / Murphy Chen
Tem./Hum./Pressure: 24.3°C/51.5%/101kPa
Remark: SR2



Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.15	55.22	---	65.30	10.08	N	10.25
0.16	---	37.84	55.47	17.63	N	10.25
0.23	---	28.89	52.35	23.45	N	10.25
0.30	39.98	---	60.36	20.37	N	10.26
0.41	---	31.05	47.64	16.59	N	10.26
0.42	38.10	---	57.51	19.41	N	10.26
2.00	---	24.51	46.00	21.49	N	10.31
2.79	37.55	---	56.00	18.45	N	10.33
4.49	---	20.17	46.00	25.83	N	10.41
5.31	36.50	---	60.00	23.50	N	10.45
17.34	---	29.05	50.00	20.95	N	10.93
17.84	39.36	---	60.00	20.64	N	10.96

Final_Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.15	50.18	---	66.00	15.82	1000.00	9.00	N	10.25