

Appendix A: Test Results of Bluetooth BR & EDR

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Appendix A.1: Test Results of 20dB Bandwidth

Test Result

TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.945	2401.478	2402.423	---	PASS
		2441	1.008	2440.484	2441.492	---	PASS
		2480	0.993	2479.478	2480.471	---	PASS
3DH5	Ant1	2402	1.257	2401.349	2402.606	---	PASS
		2441	1.266	2440.343	2441.609	---	PASS
		2480	1.260	2479.346	2480.606	---	PASS

Test Graphs



Appendix A CN25CZTX 003

Prüfbericht - Produkte
Test Report - Products

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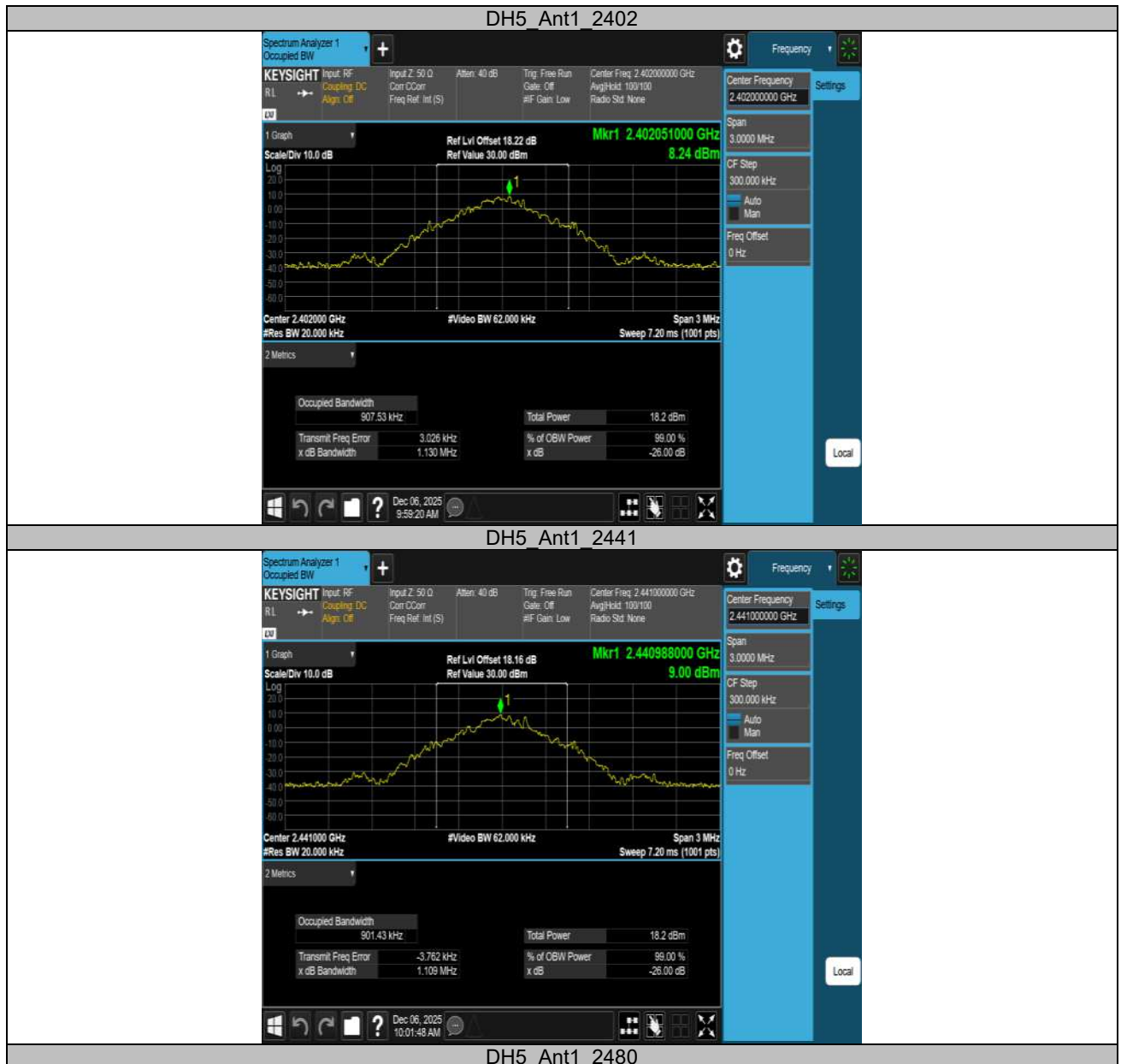


Appendix A.2: Test Results of 99% Bandwidth

Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.90753	2401.5493	2402.4568	---	PASS
		2441	0.90143	2440.5455	2441.4470	---	PASS
		2480	0.85310	2479.5627	2480.4158	---	PASS
3DH5	Ant1	2402	1.1867	2401.3900	2402.5767	---	PASS
		2441	1.2127	2440.3761	2441.5888	---	PASS
		2480	1.2120	2479.3755	2480.5875	---	PASS

Test Graphs





3DH5 Ant1 2402



3DH5 Ant1 2441



3DH5 Ant1 2480



Appendix A.3: Test Results of Carrier Frequency Separation

Test Result

TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	1.018	≥ 1.008	PASS
3DH5	Ant1	Hop	1.064	≥ 0.844	PASS

Test Graphs

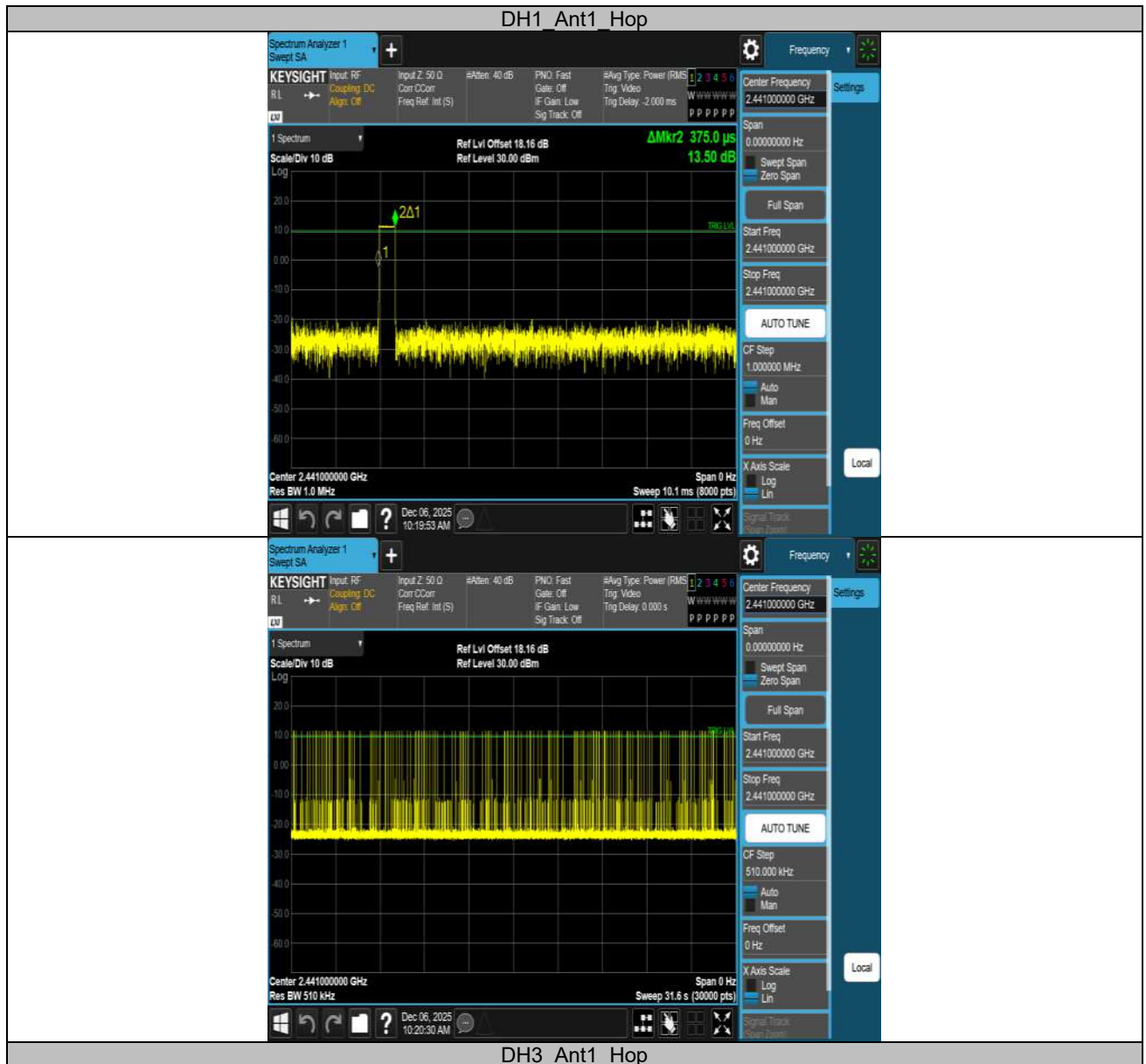


Appendix A.4: Test Results of Time of Occupancy

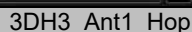
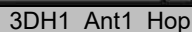
Test Result

TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.375	152	0.057	≤0.4	PASS
DH3	Ant1	Hop	1.631	95	0.155	≤0.4	PASS
DH5	Ant1	Hop	2.879	78	0.225	≤0.4	PASS
3DH1	Ant1	Hop	0.385	152	0.059	≤0.4	PASS
3DH3	Ant1	Hop	1.635	99	0.162	≤0.4	PASS
3DH5	Ant1	Hop	2.885	77	0.222	≤0.4	PASS

Test Graphs









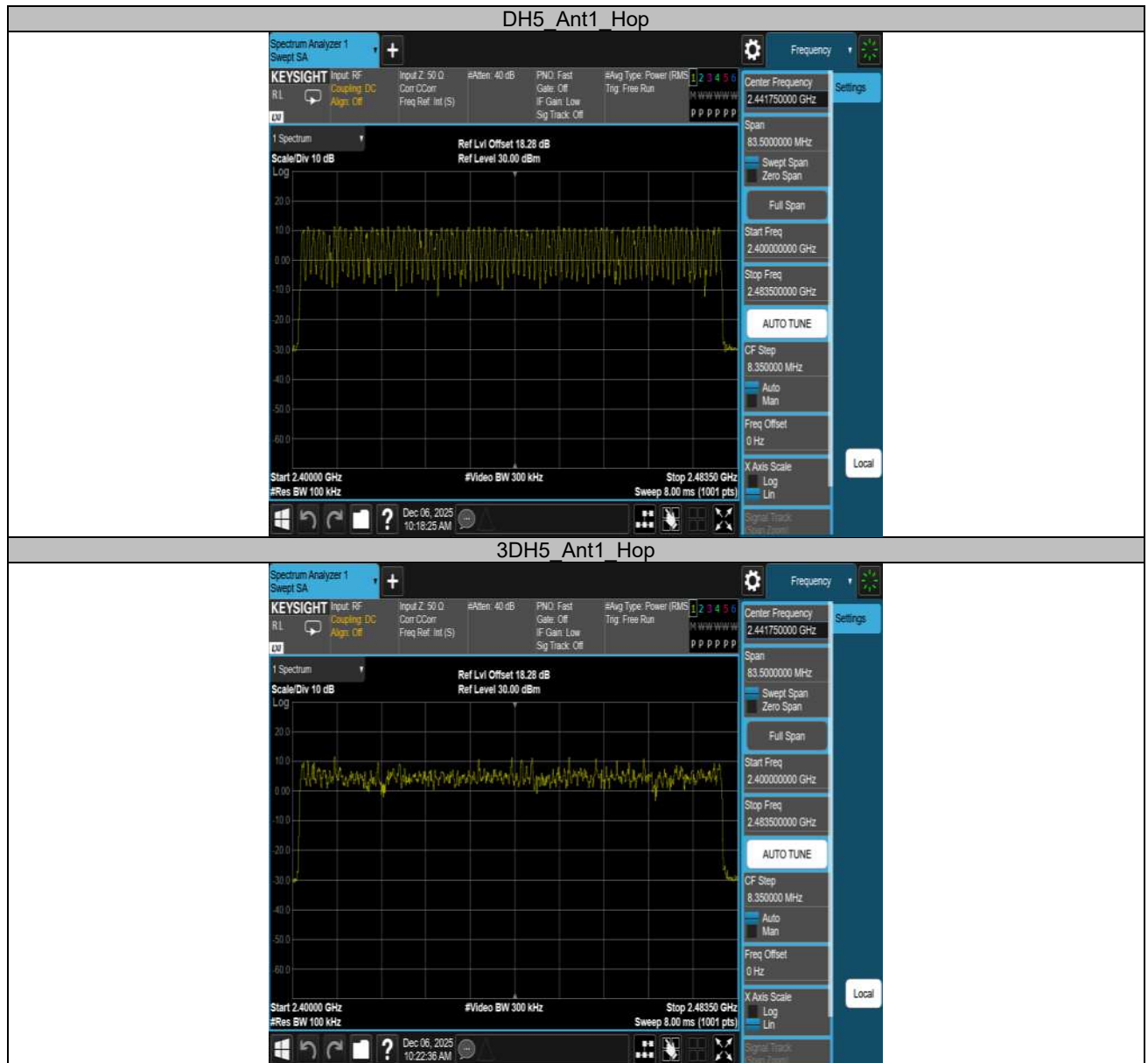


Appendix A.5: Test Results of Number of Hopping Frequency

Test Result

TestMode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

Test Graphs



Appendix A.6: Test Results of Band Edge Measurements

Test Result

TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	11.63	-41.06	≤-8.37	PASS
		High	2480	11.59	-41.19	≤-8.41	PASS
3DH5	Ant1	Low	2402	11.78	-36.69	≤-8.22	PASS
		High	2480	11.49	-40.68	≤-8.51	PASS
DH5	Ant1	Hopping	2402	11.74	-40.68	≤-8.26	PASS
		Hopping	2480	10.40	-41.18	≤-9.60	PASS
3DH5	Ant1	Hopping	2402	6.30	-38.60	≤-13.70	PASS
		Hopping	2480	7.02	-41.74	≤-12.98	PASS

Test Graphs





3DH5 Ant1 High 2480



DH5 Ant1 Hopping 2402



DH5_Ant1_Hopping_2480

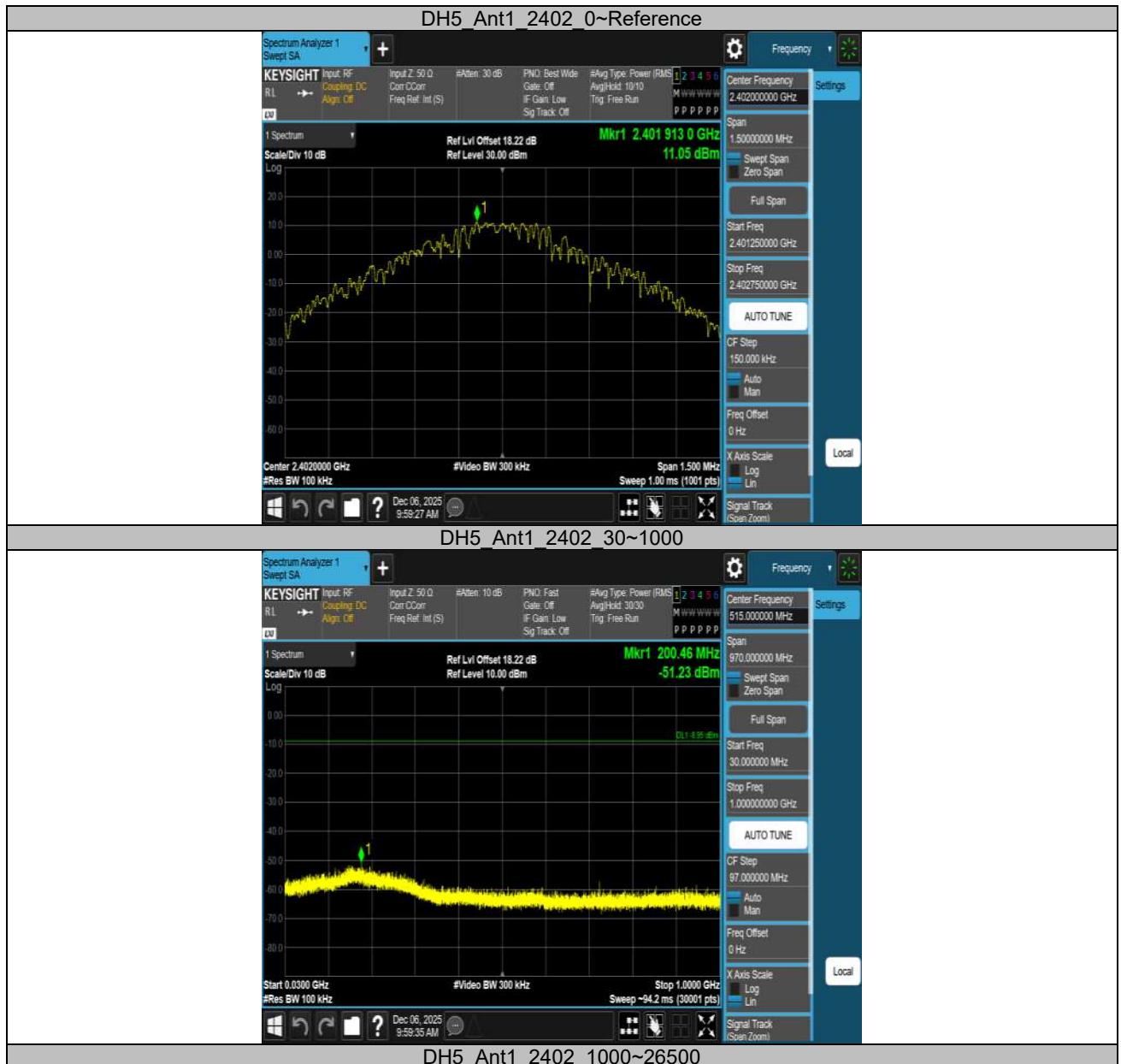


Appendix A.7: Test Results of Conducted Spurious Emission

Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	11.05	11.05	---	PASS
			30~1000	11.05	-51.23	≤-8.95	PASS
			1000~26500	11.05	-52.97	≤-8.95	PASS
		2441	Reference	10.88	10.88	---	PASS
			30~1000	10.88	-51.61	≤-9.12	PASS
			1000~26500	10.88	-52.57	≤-9.12	PASS
		2480	Reference	10.60	10.60	---	PASS
			30~1000	10.60	-51.55	≤-9.4	PASS
			1000~26500	10.60	-53.29	≤-9.4	PASS
3DH5	Ant1	2402	Reference	11.70	11.70	---	PASS
			30~1000	11.70	-51.1	≤-8.3	PASS
			1000~26500	11.70	-52.91	≤-8.3	PASS
		2441	Reference	7.41	7.41	---	PASS
			30~1000	7.41	-51.97	≤-12.59	PASS
			1000~26500	7.41	-53.35	≤-12.59	PASS
		2480	Reference	9.50	9.50	---	PASS
			30~1000	9.50	-51.72	≤-10.5	PASS
			1000~26500	9.50	-52.66	≤-10.5	PASS

Test Graphs





DH5_Ant1_2441_0~Reference



DH5_Ant1_2441_30~1000



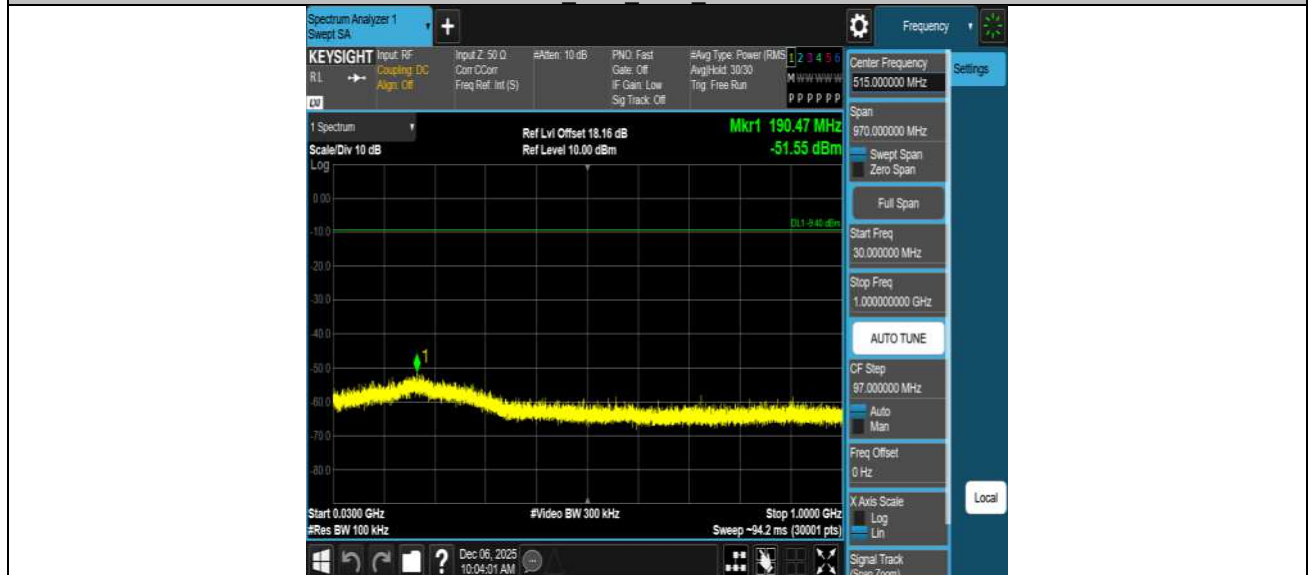
DH5_Ant1_2441_1000~26500



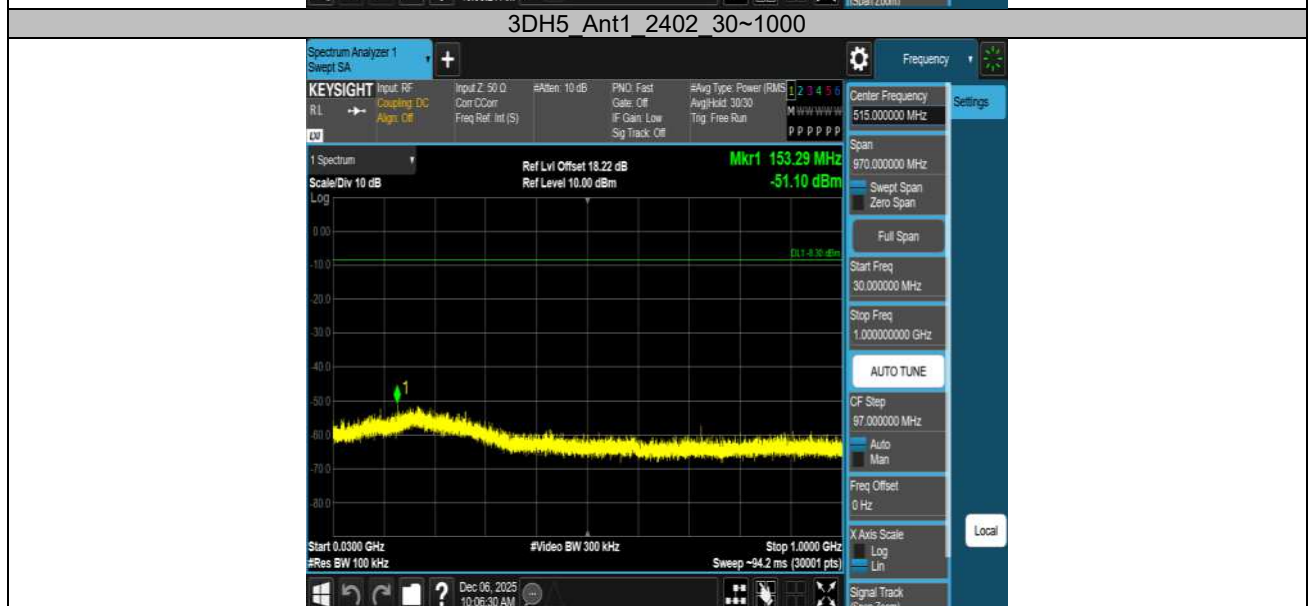
DH5_Ant1_2480_0~Reference

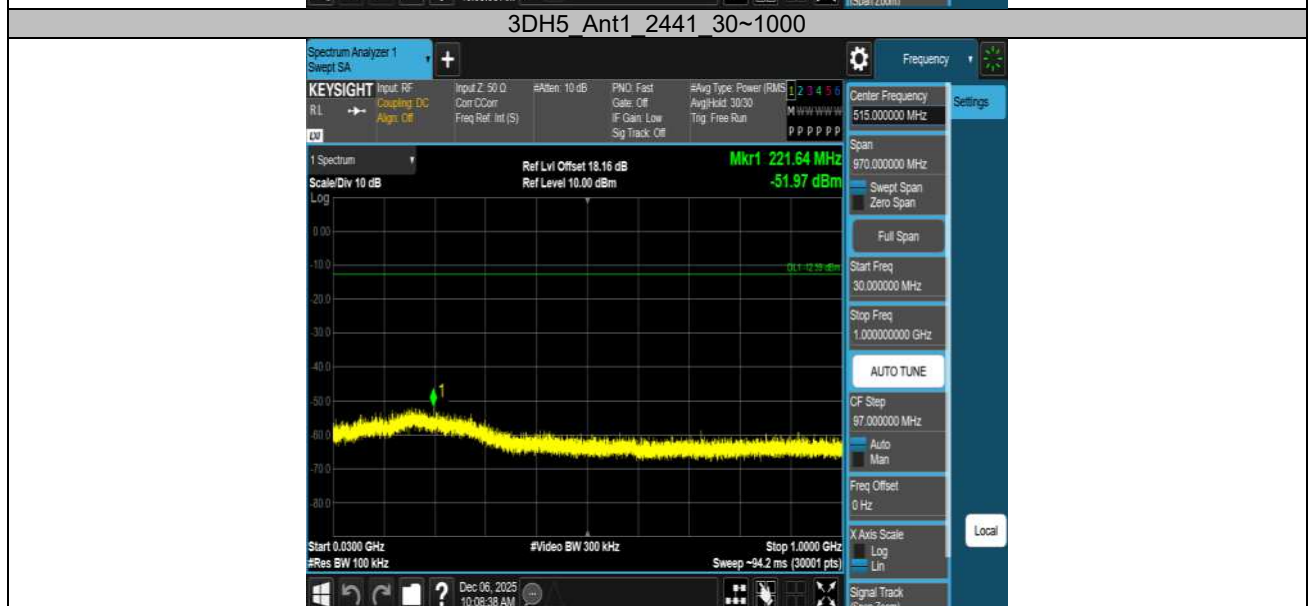


DH5_Ant1_2480_30~1000



DH5_Ant1_2480_1000~26500







3DH5_Ant1_2480_0~Reference



3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500



Appendix A.8: Test Results of Radiated Spurious Emissions

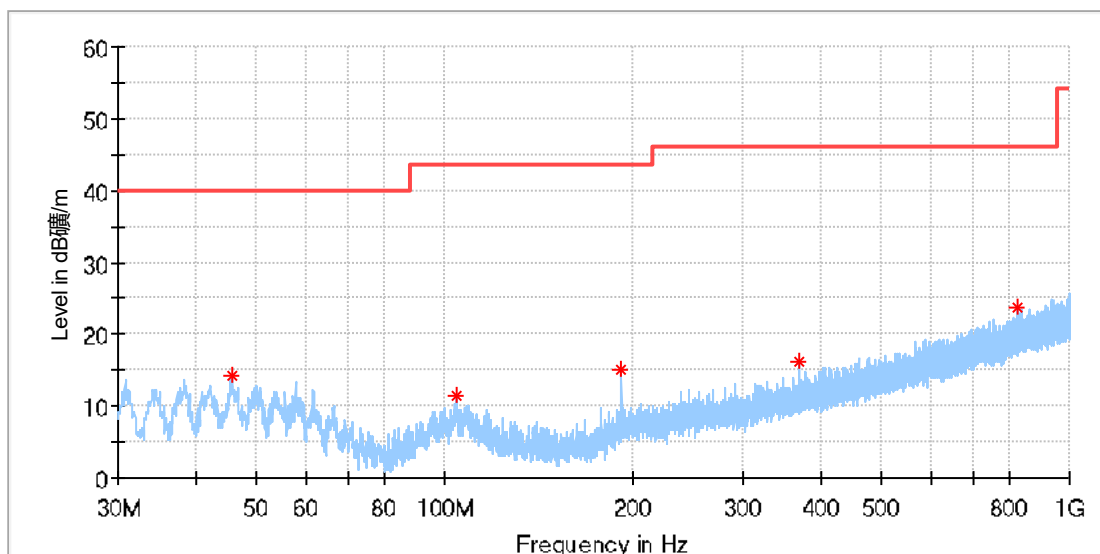
Note:

- 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:	BR DH5_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

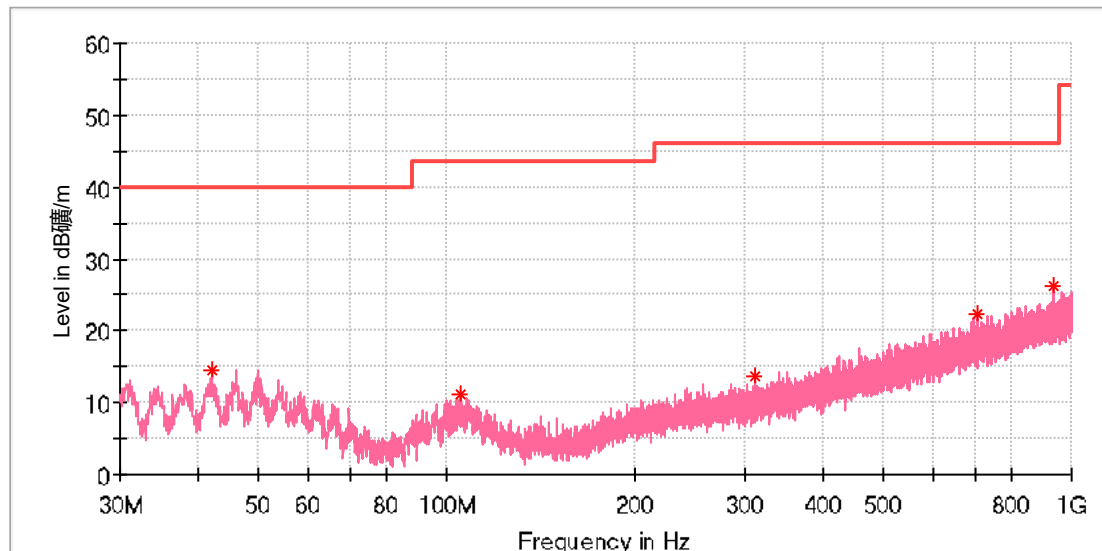
Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
45.681667	14.26	40.00	25.74	100.0	H	290.0	-18.8
104.743889	11.55	43.50	31.95	100.0	H	187.0	-18.9
191.990000	15.14	43.50	28.36	100.0	H	359.0	-19.5
370.092778	16.12	46.00	29.88	100.0	H	239.0	-14.4
824.214444	23.60	46.00	22.40	100.0	H	36.0	-5.7

Final Result

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

EUT Name: ThinkPad Dual-Mode Wireless ANC Foldable Headset 8550
Model: LB520NC
Test Mode: BR DH5_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)
42.071111	14.52	40.00	25.48	100.0	V	0.0	-19.7
105.282778	11.04	43.50	32.46	100.0	V	244.0	-18.9
310.653333	13.67	46.00	32.33	100.0	V	357.0	-16.0
708.083889	22.19	46.00	23.81	100.0	V	221.0	-7.8
938.458889	26.28	46.00	19.72	100.0	V	160.0	-4.4

Final Result

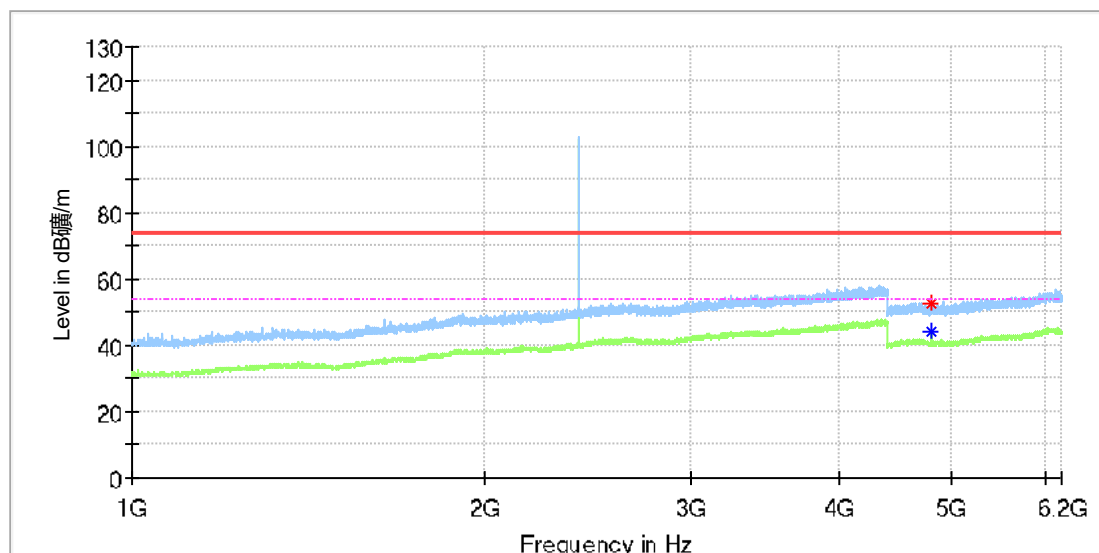
Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

1GHz - 18GHz

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

EUT Information

EUT Name:	ThinkPad Dual-Mode Wireless ANC Foldable Headset 8550
Model:	LB520NC
Test Mode:	BR DH5_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

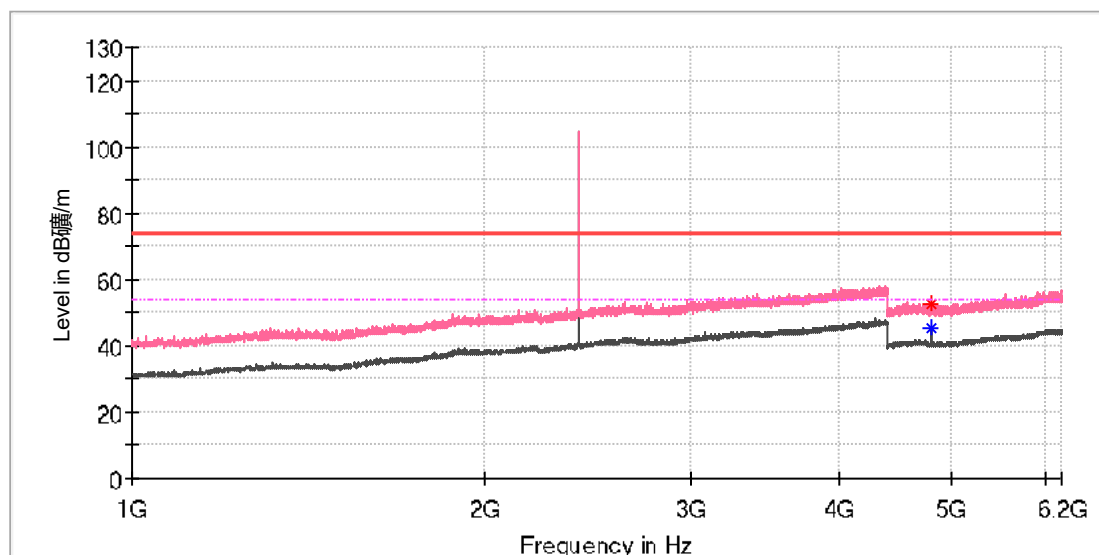
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4804.000000	---	44.00	54.00	10.00	150.0	H	332.0	13.3
4805.500000	52.43	---	74.00	21.57	150.0	H	28.0	13.3

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:	BR DH5_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

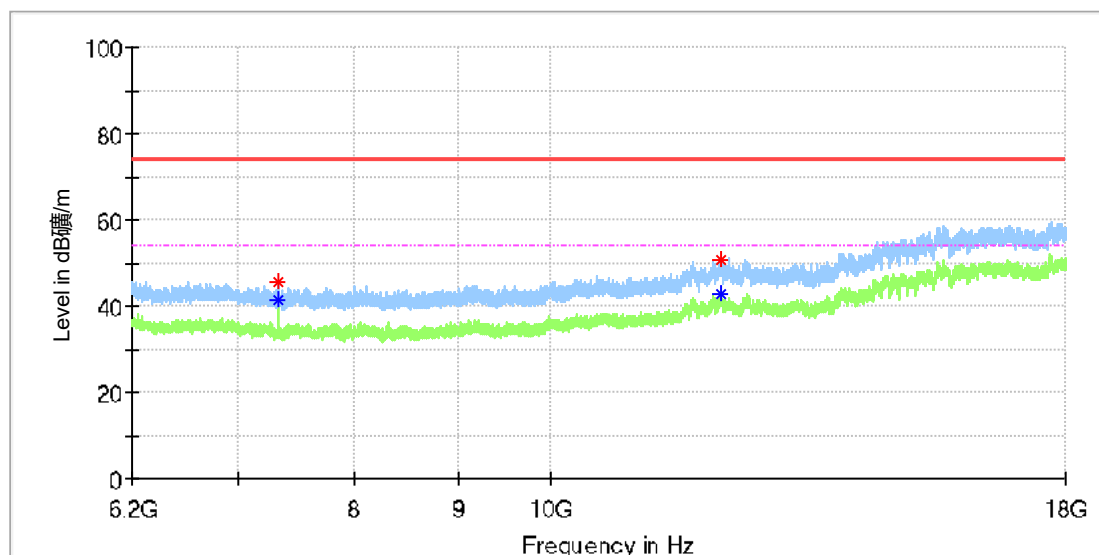
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4803.500000	---	45.40	54.00	8.60	150.0	V	236.0	13.3
4804.000000	52.45	---	74.00	21.55	150.0	V	222.0	13.3

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:	BR DH5_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

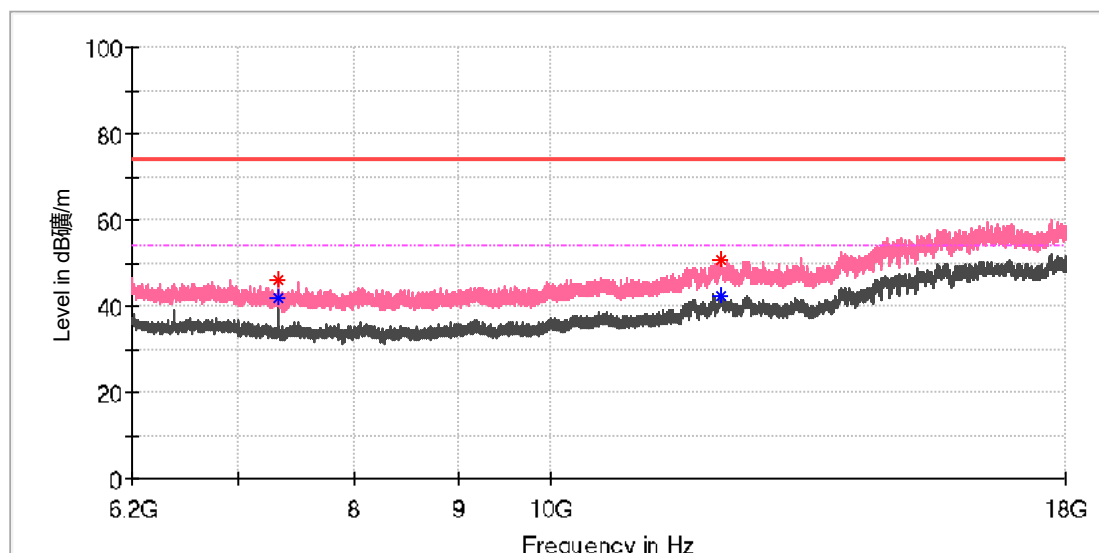
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7322.475000	45.70	---	74.00	28.30	150.0	H	295.0	8.2
7322.966667	---	41.23	54.00	12.77	150.0	H	295.0	8.2
12145.725000	---	42.84	54.00	11.16	150.0	H	197.0	16.6
12153.100000	50.82	---	74.00	23.18	150.0	H	77.0	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:	BR DH5_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



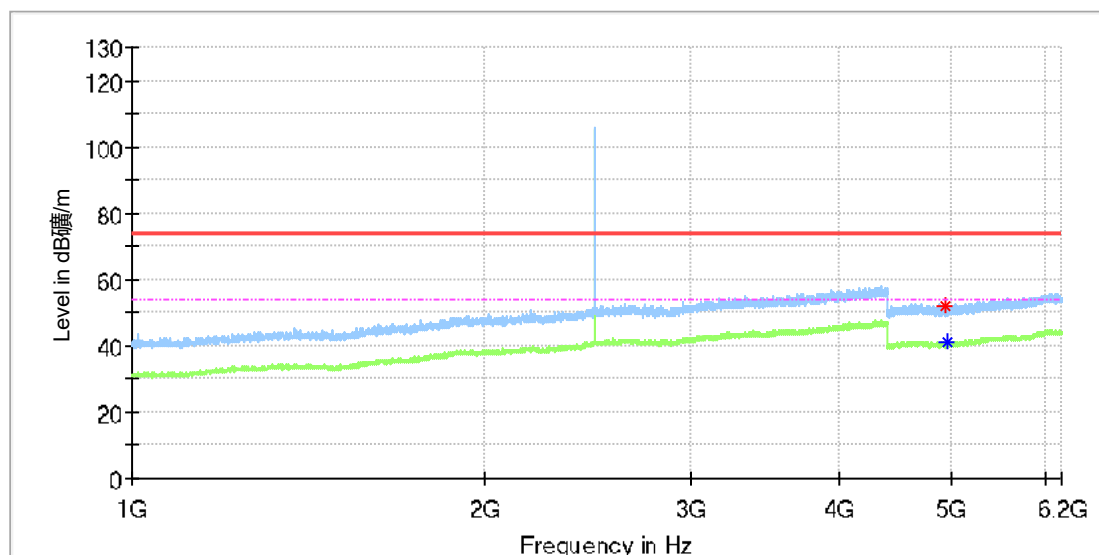
Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7322.475000	45.82	---	74.00	28.18	150.0	V	227.0	8.2
7322.475000	---	42.08	54.00	11.92	150.0	V	227.0	8.2
12135.891667	50.85	---	74.00	23.15	150.0	V	315.0	16.4
12148.675000	---	42.41	54.00	11.59	150.0	V	102.0	16.7

Final Result

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

EUT Name:	ThinkPad Dual-Mode Wireless ANC Foldable Headset 8550
Model:	LB520NC
Test Mode:	BR DH5_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

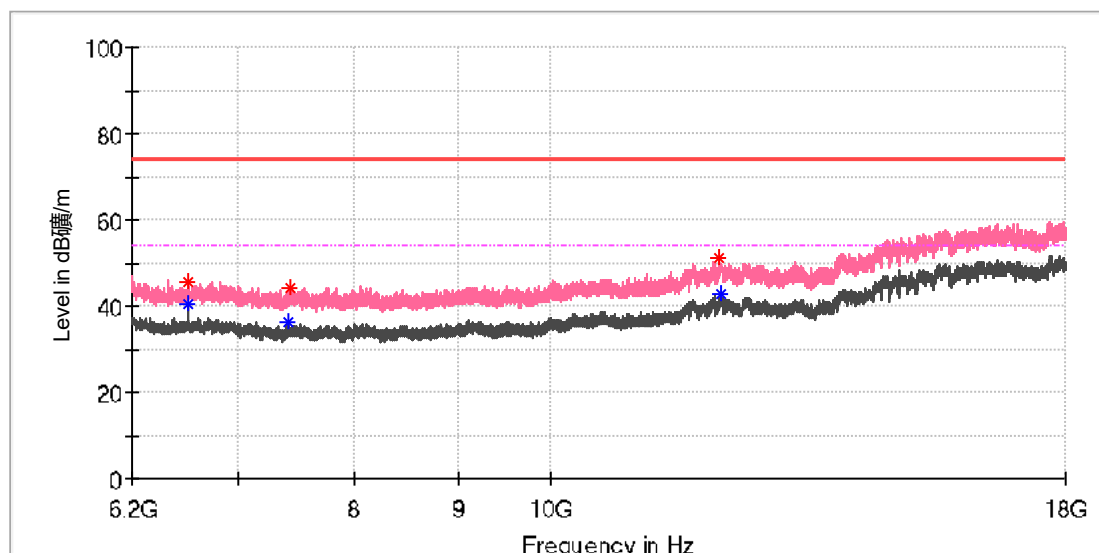


Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4942.500000	51.94	---	74.00	22.06	150.0	H	313.0	13.3
4949.500000	---	41.14	54.00	12.86	150.0	H	170.0	13.3

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:	BR DH5_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



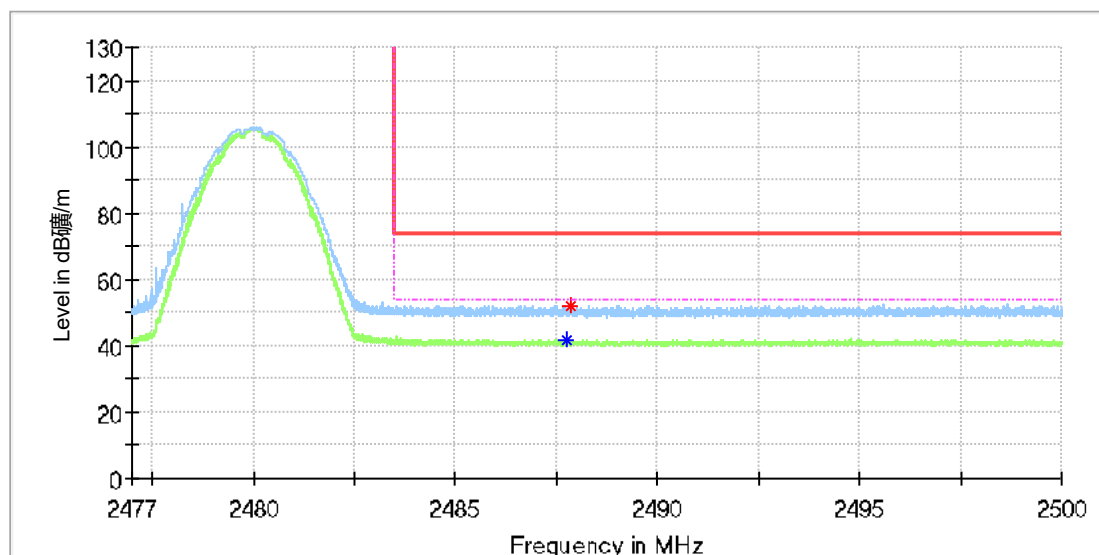
Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
6608.575000	45.61	---	74.00	28.39	150.0	V	210.0	8.8
6613.000000	---	40.49	54.00	13.51	150.0	V	323.0	8.8
7417.366667	---	36.20	54.00	17.80	150.0	V	311.0	8.3
7425.725000	44.22	---	74.00	29.78	150.0	V	301.0	8.4
12110.816667	51.29	---	74.00	22.71	150.0	V	333.0	15.7
12156.541667	---	42.86	54.00	11.14	150.0	V	311.0	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)
---	---	---	---	---	---		---	---

EUT Name:	ThinkPad Dual-Mode Wireless ANC Foldable Headset 8550
Model:	LB520NC
Test Mode:	BR DH5_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

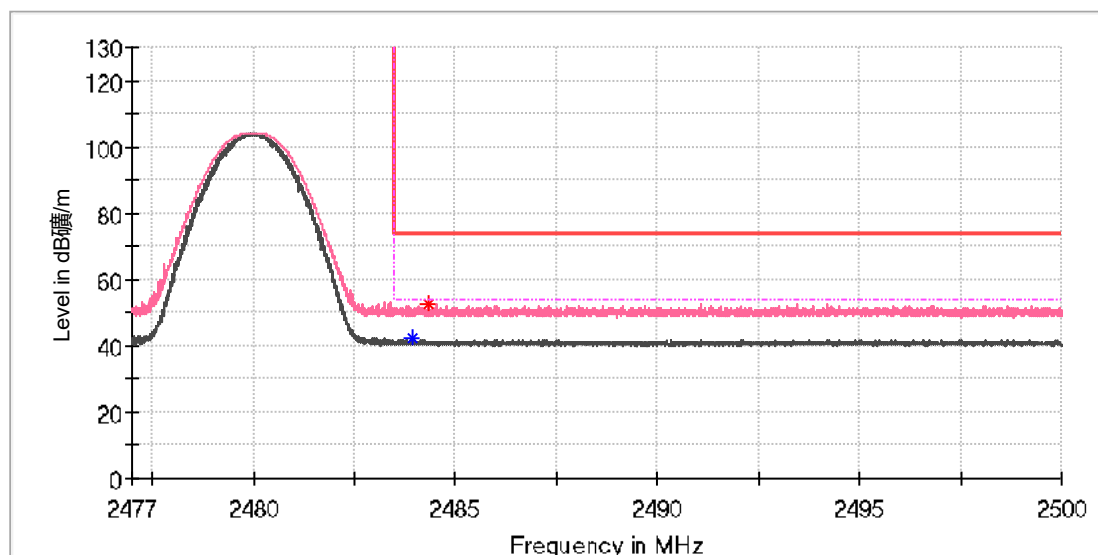


Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2487.749118	---	41.95	54.00	12.05	150.0	H	170.0	9.0
2487.837059	52.04	---	74.00	21.96	150.0	H	16.0	9.0

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:	BR DH5_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)
2483.954118	---	42.50	54.00	11.50	150.0	V	209.0	9.0
2484.322794	52.71	---	74.00	21.29	150.0	V	188.0	9.0

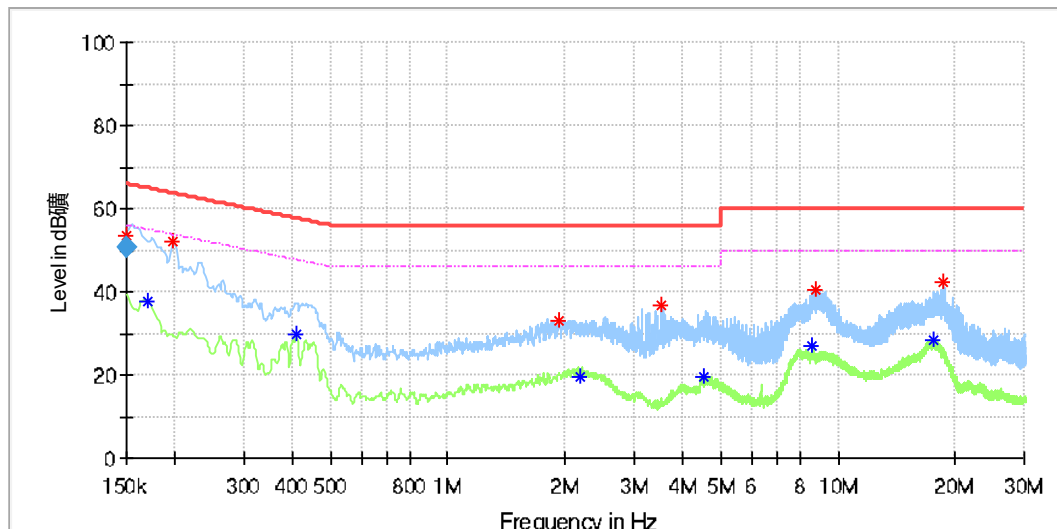
Final Result

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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Appendix A.10: 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

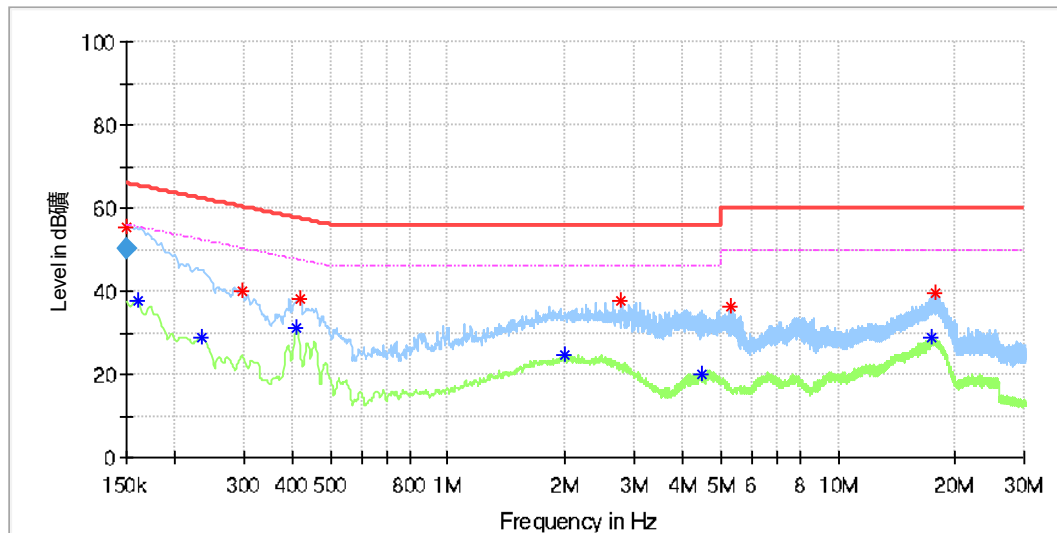
Frequency (MHz)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.15	53.71	---	65.73	12.02	L1	10.24
0.17	---	37.47	54.97	17.49	L1	10.24
0.20	52.01	---	63.69	11.68	L1	10.24
0.41	---	29.88	47.68	17.80	L1	10.25
1.92	33.22	---	56.00	22.78	L1	10.31
2.18	---	19.75	46.00	26.25	L1	10.31
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