

APPENDIX B - RADIATED EMISSION -9 KHZ TO 30 MHZ

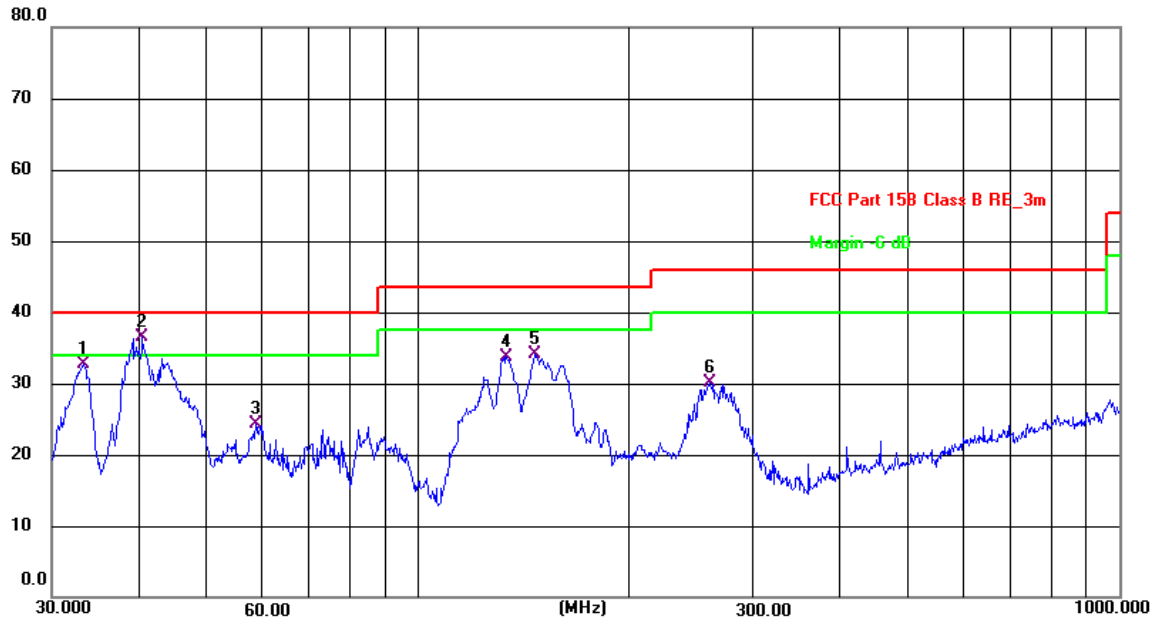
The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

APPENDIX C - RADIATED EMISSION-30 MHZ TO 1000 MHZ

Only show the worst mode:

Test Mode	TX Mode_1Mbps Channel 00	Polarization	Vertical
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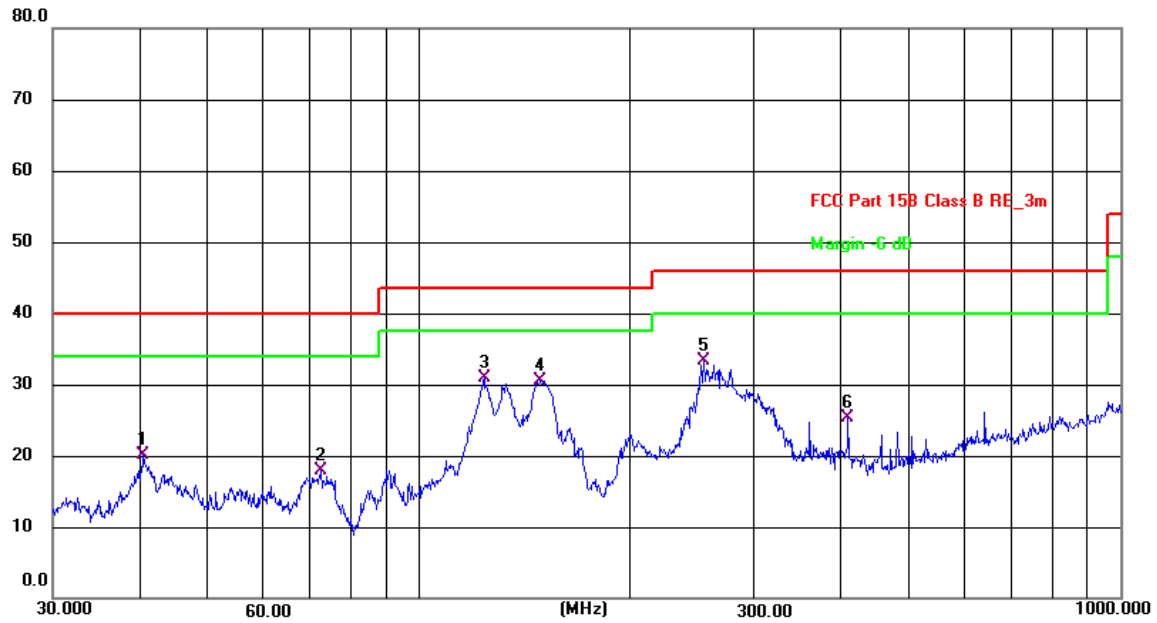


No.	Frequency (MHz)	Reading ()	Factor (dB)	Level ()	Limit ()	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	33.3279	52.07	-19.34	32.73	40.00	-7.27	QP	100	107	P	
2 *	40.4172	54.78	-18.36	36.42	40.00	-3.58	QP	100	54	P	
3	58.6126	43.02	-18.80	24.22	40.00	-15.78	QP	100	207	P	
4	133.6188	51.88	-18.21	33.67	43.50	-9.83	QP	100	20	P	
5	146.8877	51.61	-17.53	34.08	43.50	-9.42	QP	100	354	P	
6	260.1444	49.09	-18.89	30.20	46.00	-15.80	QP	100	354	P	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode	TX Mode_1Mbps Channel 00	Polarization	Horizontal
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No.	Frequency (MHz)	Reading ()	Factor (dB)	Level ()	Limit ()	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	40.4170	38.46	-18.36	20.10	40.00	-19.90	QP	200	356	P	
2	72.3375	38.45	-20.51	17.94	40.00	-22.06	QP	200	344	P	
3 *	123.6984	49.76	-18.94	30.82	43.50	-12.68	QP	200	304	P	
4	148.9624	47.91	-17.41	30.50	43.50	-13.00	QP	200	295	P	
5	254.7283	52.31	-19.04	33.27	46.00	-12.73	QP	200	238	P	
6	408.9459	39.85	-14.62	25.23	46.00	-20.77	QP	100	15	P	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

APPENDIX D - RADIATED EMISSION - ABOVE 1000 MHZ

Test Result of RADIATED EMISSION-1000MHz TO 25GHz, Only show the worst mode: GFSK 1M

Test Mode : GFSK TX Low								
N o.	Freq MHz	Polarity	Reading (dBuV/m)	Correct Factor	Result (dBuV/m)	Limit (dBuV/m)	Margin	Rem ark
1	4804	V	88.72	-27.15	61.57	74	-12.43	Peak
2	4804	V	69.63	-27.15	42.48	54	-11.52	Avg
3	7206	--	--	--		--		--
4	9608	--	--	--		--		--
5	4804	H	90.64	-27.15	63.49	74	-10.51	Peak
6	4804	H	68.72	-27.15	41.57	54	-12.43	Avg
7	7206	--	--	--		--		--
8	9608	--	--	--		--		--
Test Mode : GFSK TX Mid								
1	4880	V	90.75	-27.83	62.92	74	-11.08	Peak
2	4880	V	70.54	-27.83	42.71	54	-11.29	Avg
3	7320	--	--	--		--		--
4	9760	--	--	--		--		--
5	4880	H	91.12	-27.83	63.29	74	-10.71	Peak
6	4880	H	71.77	-27.83	43.94	54	-10.06	Avg
7	7320	--	--	--		--		--
8	9760	--	--	--		--		--
Test Mode : GFSK TX High								
1	4960	V	90.67	-28.45	62.22	74	-11.78	Peak
2	4960	V	70.02	-28.45	41.57	54	-12.43	Avg
3	7440	--	--	--		--		--
4	9920	--	--	--		--		--
5	4960	H	91.18	-28.45	62.73	74	-11.27	Peak
6	4960	H	69.78	-28.45	41.33	54	-12.67	Avg
7	7440	--	--	--		--		--
8	9920	--	--	--		--	--	--

Test Result of Radiated Spurious at Band edges

Only show the worst mode: GFSK 1M

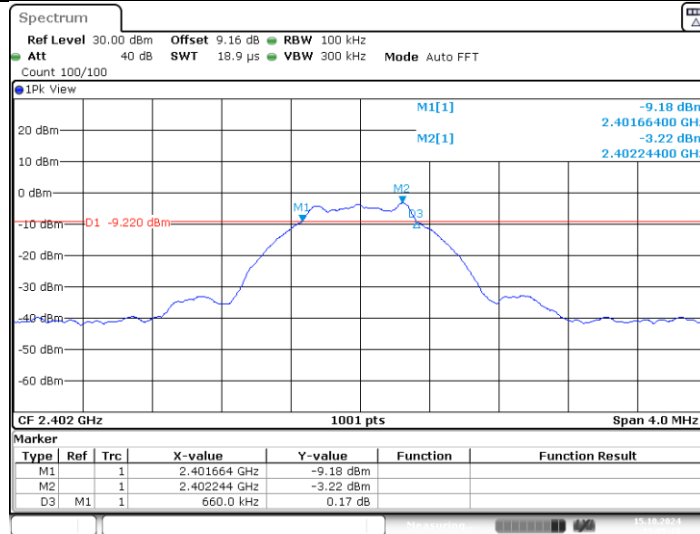
Test Results					PASS			
Frequency Range					2310MHz~2410MHz			
Test Mode					1Mbps: GFSK TX 2402MHz			
N o.	Freq MHz	Polarity	Reading (dBuV/m)	Correct Factor	Result (dBuV/m)	Limit (dBuV/m)	Margin	Remark
1	2390	H	74.61	-21.47	53.14	74.00	-20.86	Peak
2	2390	H	--	-21.47	--	54.00	--	Avg
3	2400	H	79.57	-26.12	53.45	74.00	-20.55	Peak
4	2400	H	--	-26.12	--	54.00	--	Avg
1	2390	V	75.15	-21.47	53.68	74.00	-20.32	Peak
2	2390	V	--	-21.47	--	54.00	--	Avg
3	2400	V	79.50	-26.12	53.38	74.00	-20.62	Peak
4	2400	V	--	-26.12	--	54.00	--	Avg
Test Results					PASS			
Frequency Range					2450MHz~2550MHz			
Test Mode					1Mbps: GFSK TX 2480MHz			
1	2483.5	H	78.86	-25.29	53.57	74.00	-20.43	Peak
2	2483.5	H	--	-25.29	--	54.00	--	Avg
1	2483.5	V	78.99	-25.29	53.70	74.00	-20.30	Peak
2	2483.5	V	--	-25.29	--	54.00	--	Avg
Note: 1. Means other frequency and mode comply with standard requirements and at least have 20dB margin. 2. Correct Factor=Cable Loss+ Antenna Factor-Amplifier Gain. Result=Reading + Correct Factor. Margin= Result-Limit. 3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.								

APPENDIX E - BANDWIDTH

-6dB Bandwidth

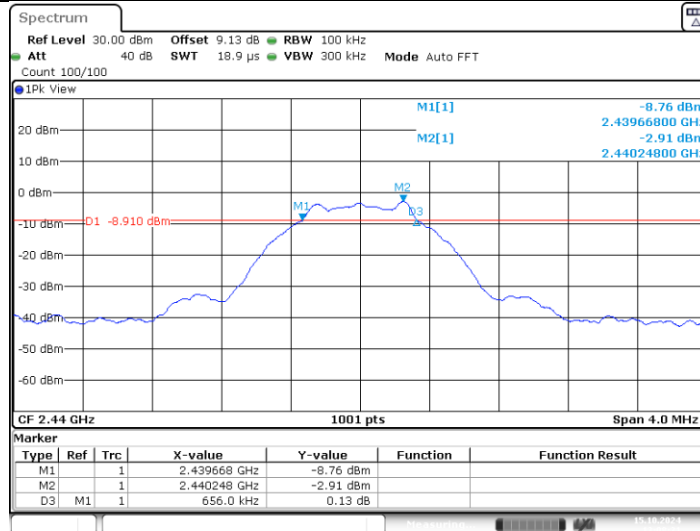
TestMode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.66	2401.66	2402.32	0.5	PASS
		2440	0.66	2439.67	2440.32	0.5	PASS
		2480	0.66	2479.67	2480.33	0.5	PASS
BLE_2M	Ant1	2402	1.14	2401.44	2402.58	0.5	PASS
		2440	1.14	2439.44	2440.58	0.5	PASS
		2480	1.14	2479.44	2480.58	0.5	PASS

BLE_1M_Ant1_2402

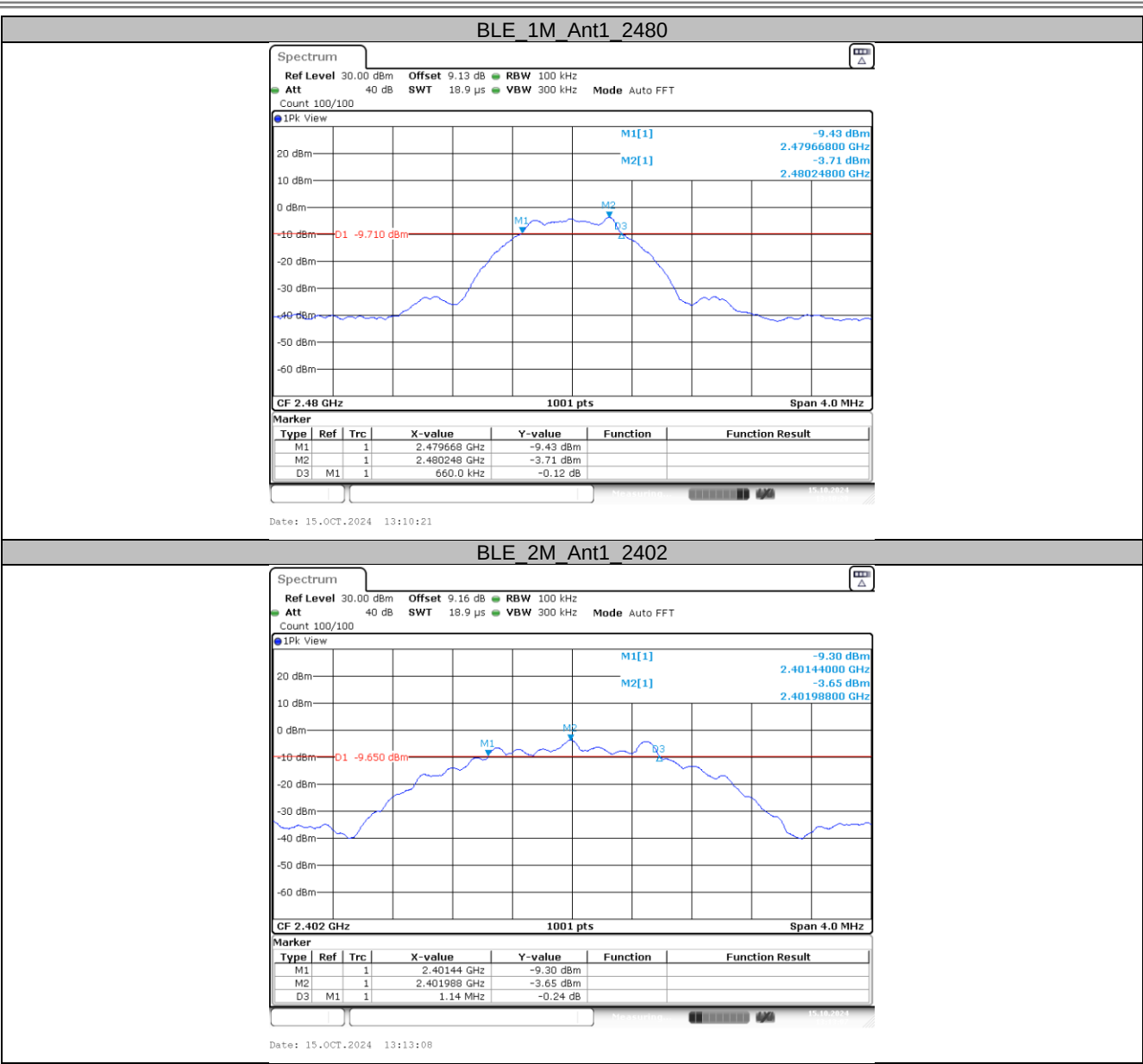


Date: 15.OCT.2024 13:05:18

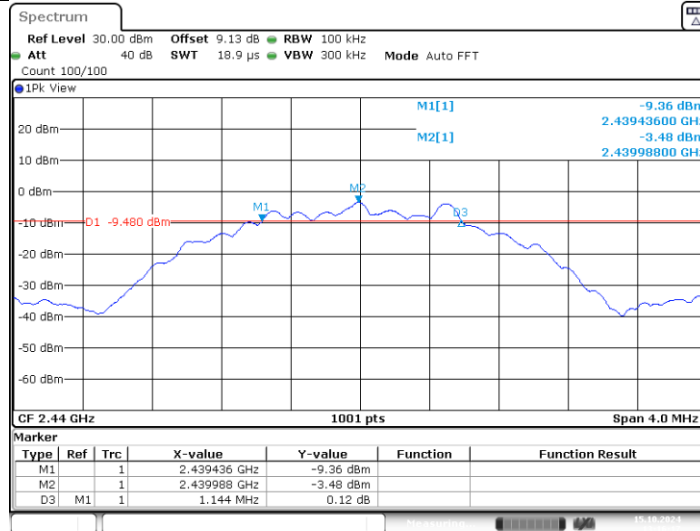
BLE_1M_Ant1_2440



Date: 15.OCT.2024 13:08:32

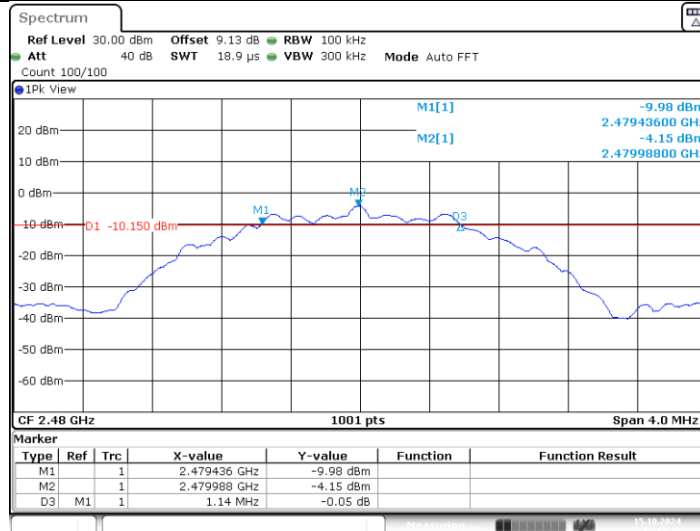


BLE 2M Ant1 2440



Date: 15.OCT.2024 13:16:18

BLE 2M Ant1 2480

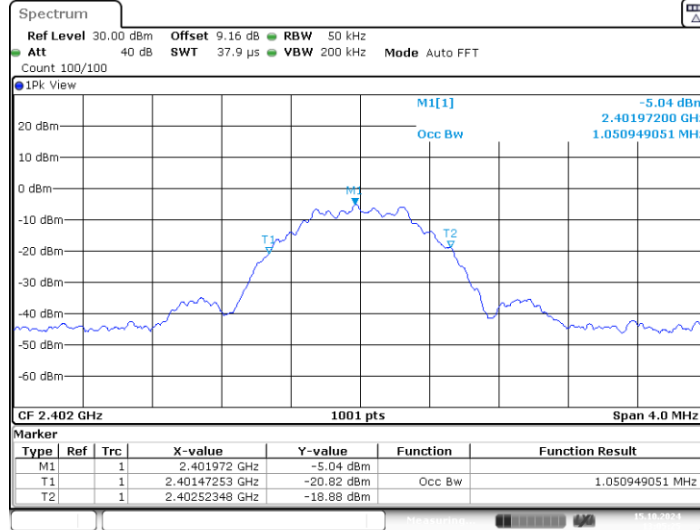


Date: 15.OCT.2024 13:17:48

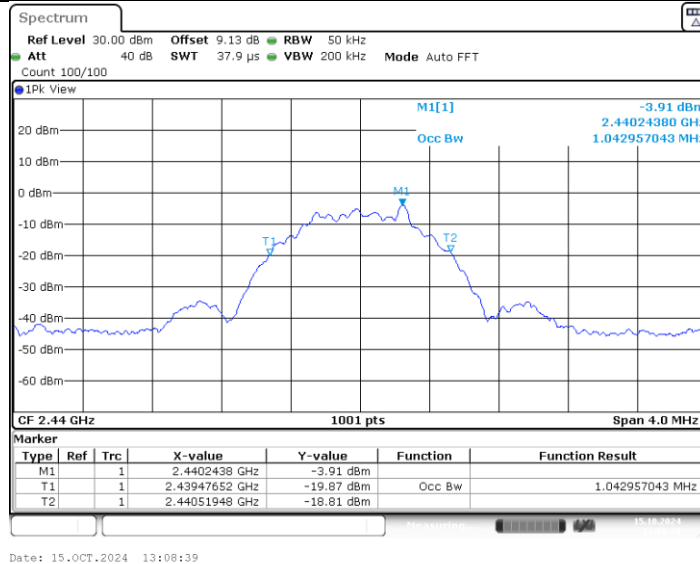
99% Occupied Bandwidth

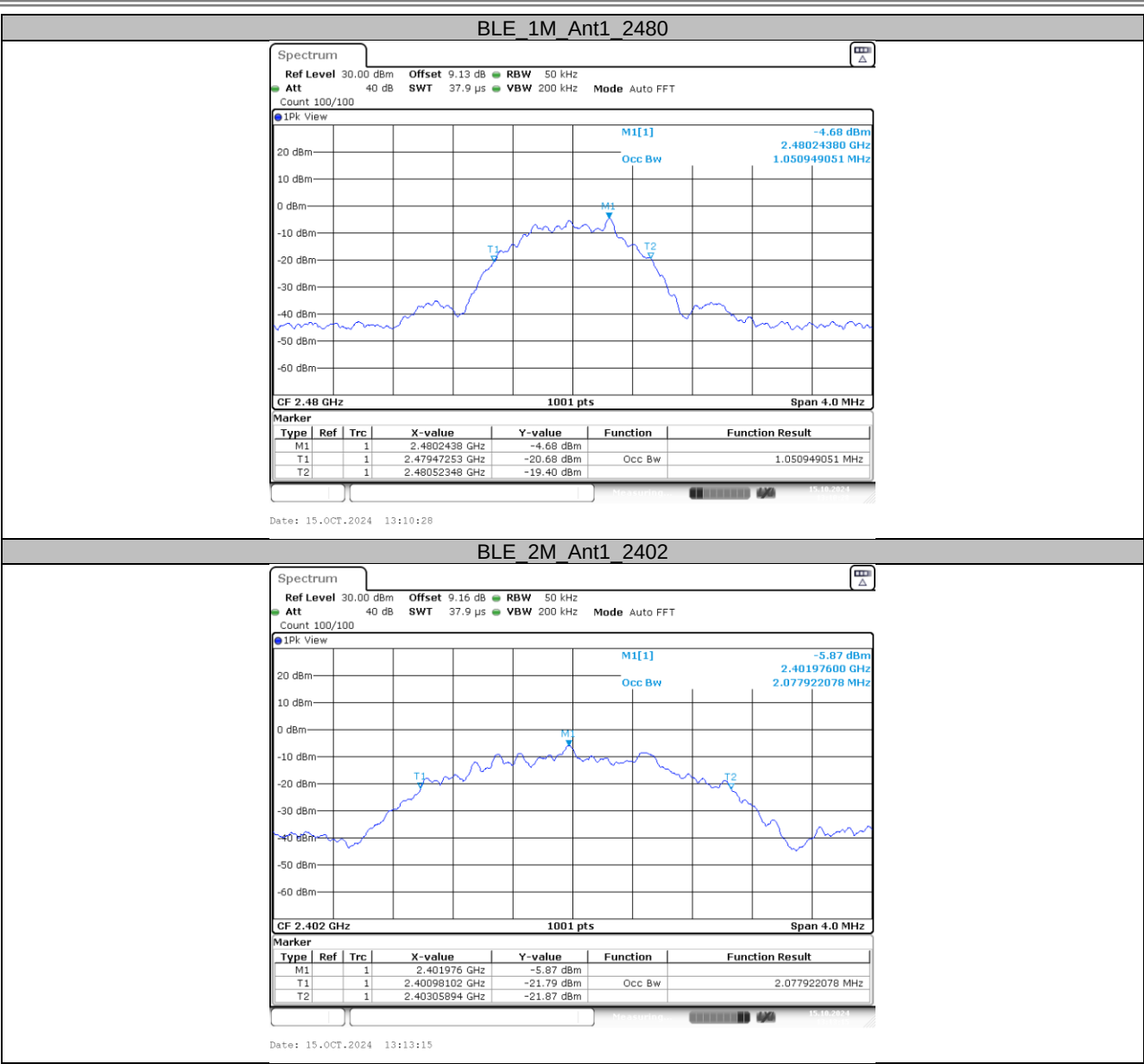
TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.051	2401.4725	2402.5235	---	---
		2440	1.043	2439.4765	2440.5195	---	---
		2480	1.051	2479.4725	2480.5235	---	---
BLE_2M	Ant1	2402	2.078	2400.9810	2403.0589	---	---
		2440	2.074	2438.9770	2441.0509	---	---
		2480	2.082	2478.9690	2481.0509	---	---

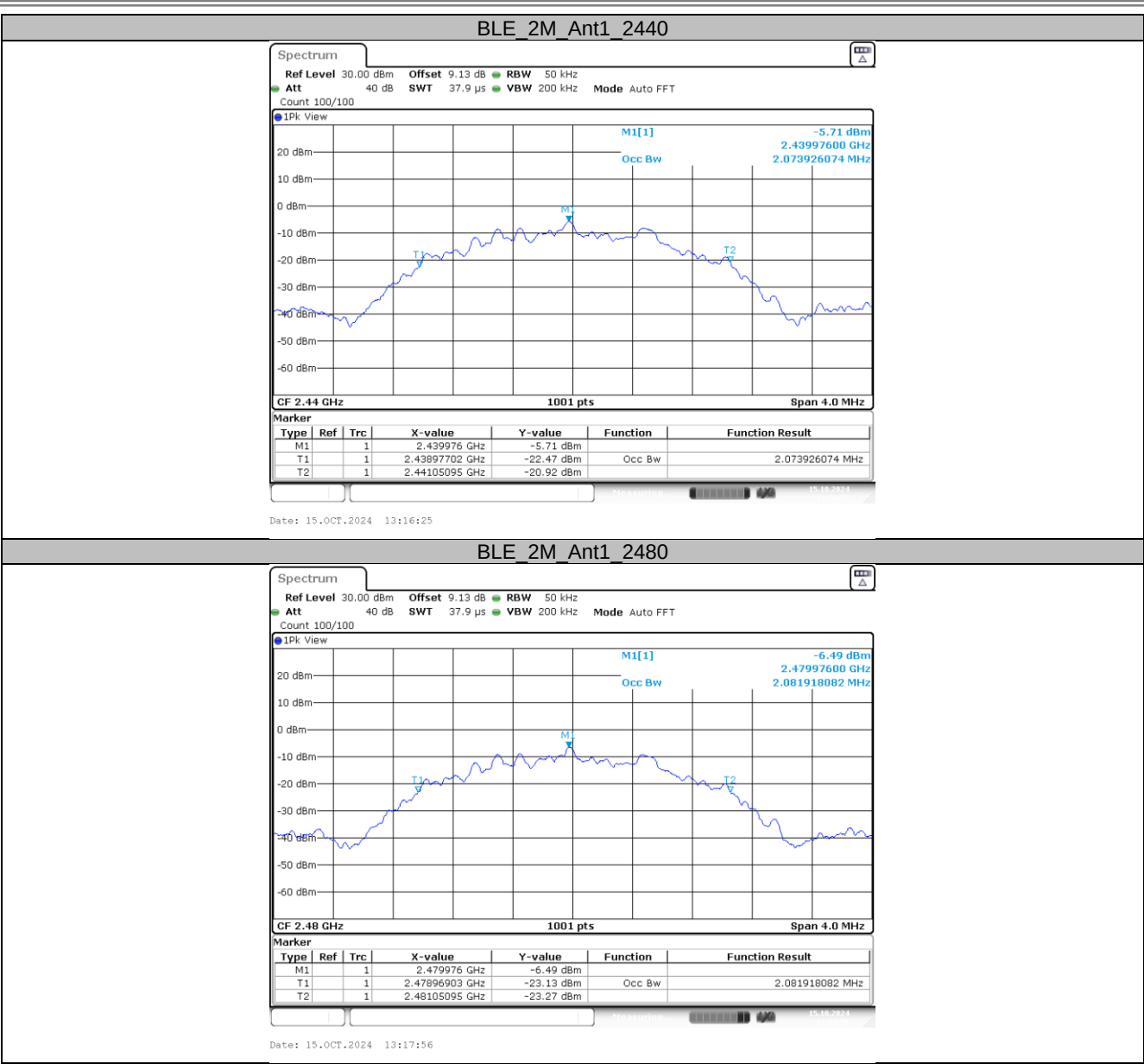
BLE 1M Ant1 2402



BLE 1M Ant1 2440



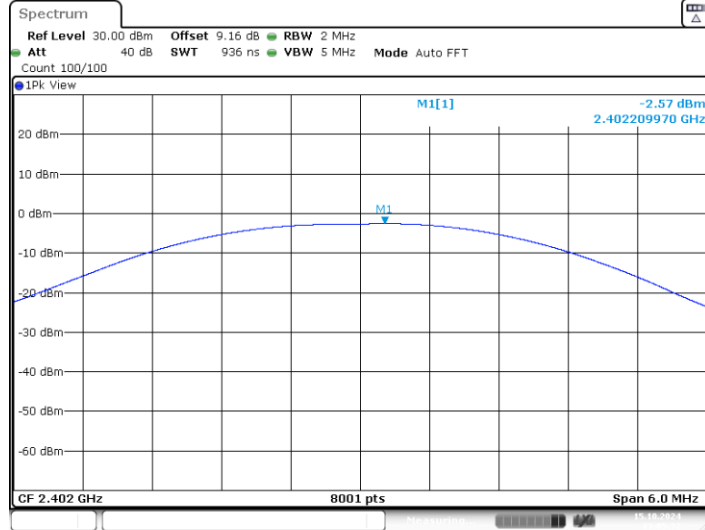




APPENDIX F - MAXIMUM OUTPUT POWER

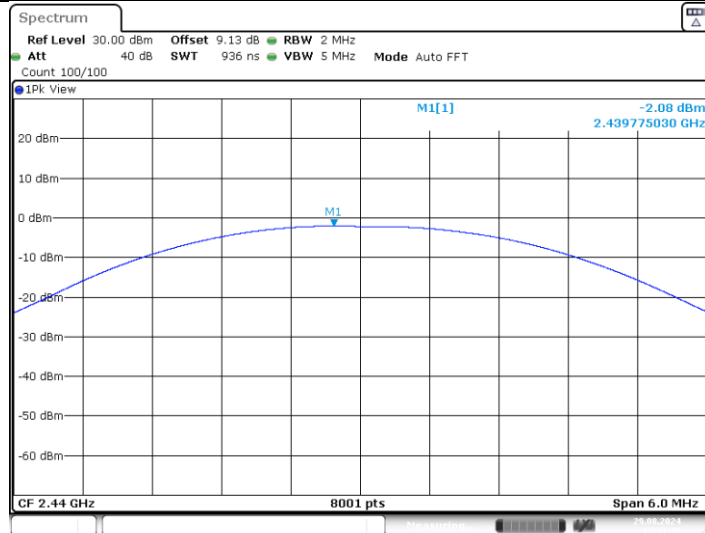
TestMode	Antenna	Freq(MHz)	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
BLE_1M	Ant1	2402	-2.57	≤30	PASS
		2440	-2.08	≤30	PASS
		2480	-3.01	≤30	PASS
BLE_2M	Ant1	2402	-2.57	≤30	PASS
		2440	-2.30	≤30	PASS
		2480	-3.07	≤30	PASS

BLE_1M_Ant1_2402

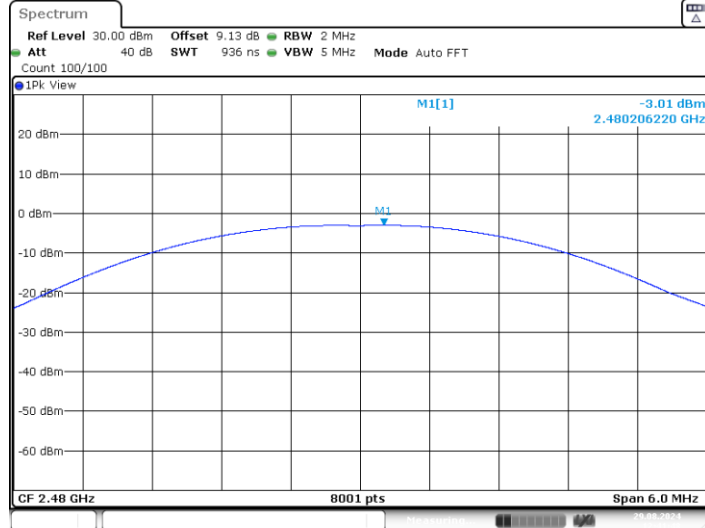


Date: 15.OCT.2024 13:05:33

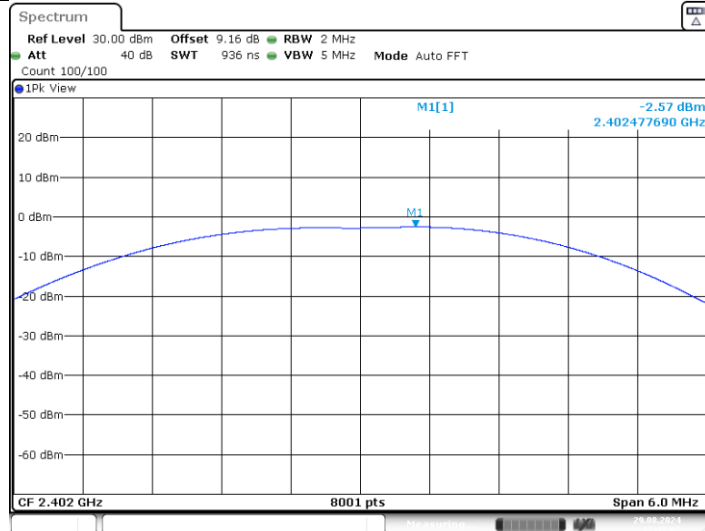
BLE_1M_Ant1_2440



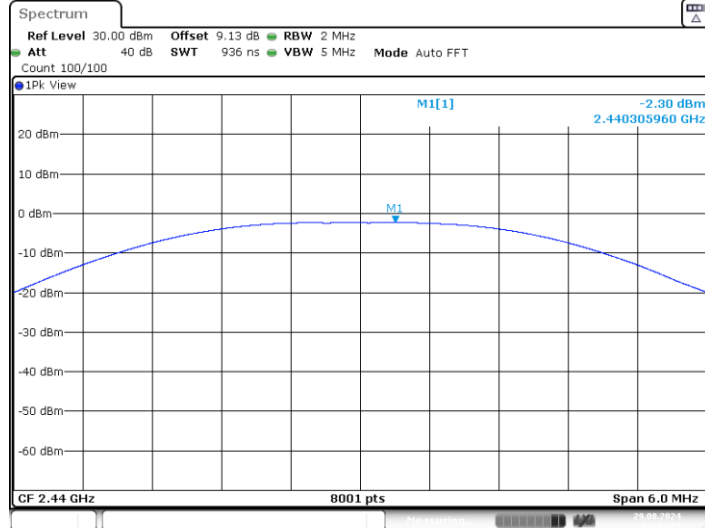
BLE 1M_Ant1_2480



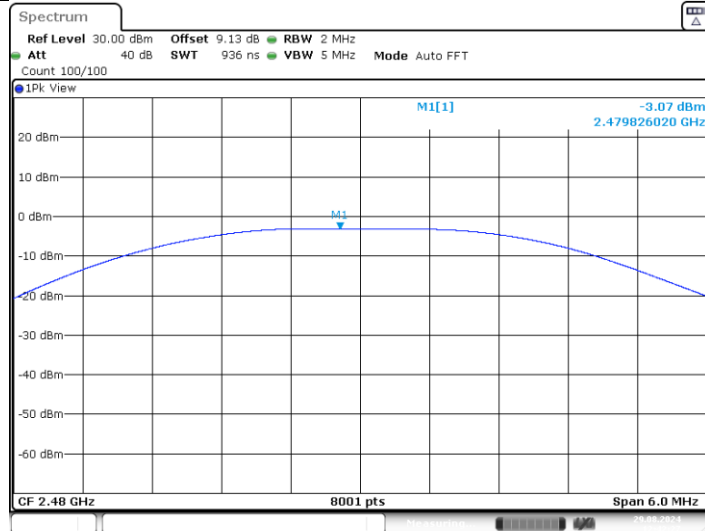
BLE 2M_Ant1_2402



BLE 2M Ant1 2440



BLE 2M Ant1 2480

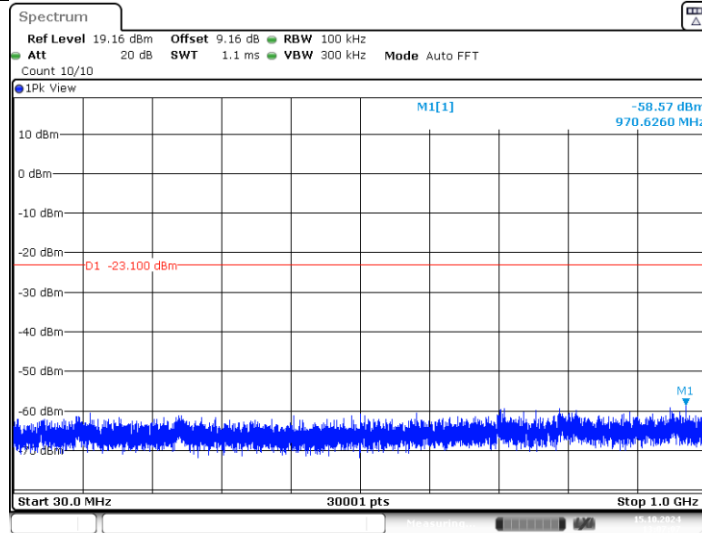


APPENDIX G - CONDUCTED SPURIOUS EMISSION

Spurious Emission

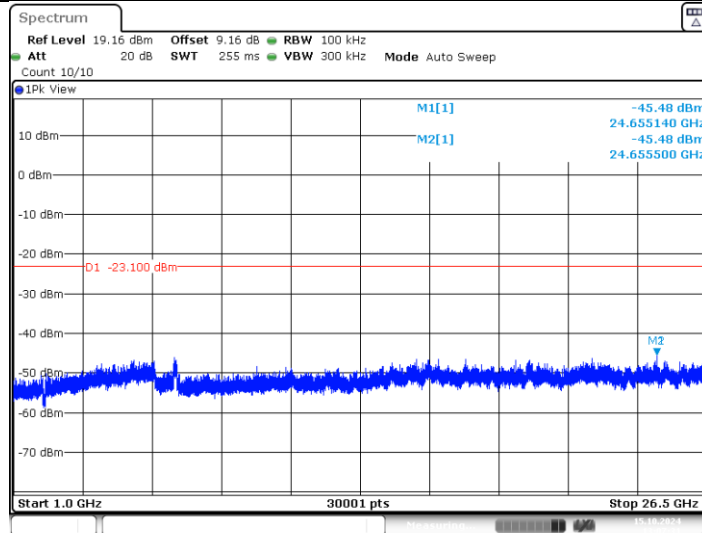
TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	30~1000	-3.10	-58.57	≤-23.1	PASS
			1000~26500	-3.10	-45.48	≤-23.1	PASS
		2440	30~1000	-2.91	-58.53	≤-22.91	PASS
			1000~26500	-2.91	-45.66	≤-22.91	PASS
		2480	30~1000	-3.69	-59.46	≤-23.69	PASS
			1000~26500	-3.69	-45.93	≤-23.69	PASS
BLE_2M	Ant1	2402	30~1000	-3.62	-58.8	≤-23.62	PASS
			1000~26500	-3.62	-45.05	≤-23.62	PASS
		2440	30~1000	-3.44	-59.05	≤-23.44	PASS
			1000~26500	-3.44	-46.24	≤-23.44	PASS
		2480	30~1000	-4.08	-58.74	≤-24.08	PASS
			1000~26500	-4.08	-46.34	≤-24.08	PASS

BLE 1M Ant1 2402_30~1000



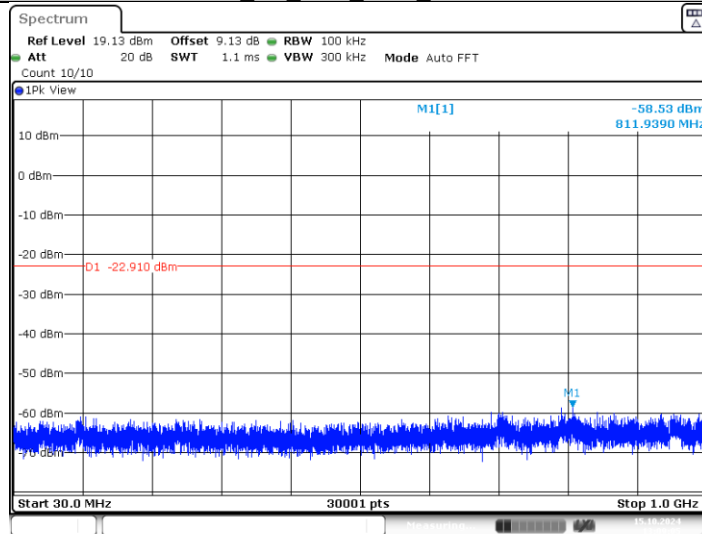
Date: 15.OCT.2024 13:07:07

BLE 1M Ant1 2402_1000~26500



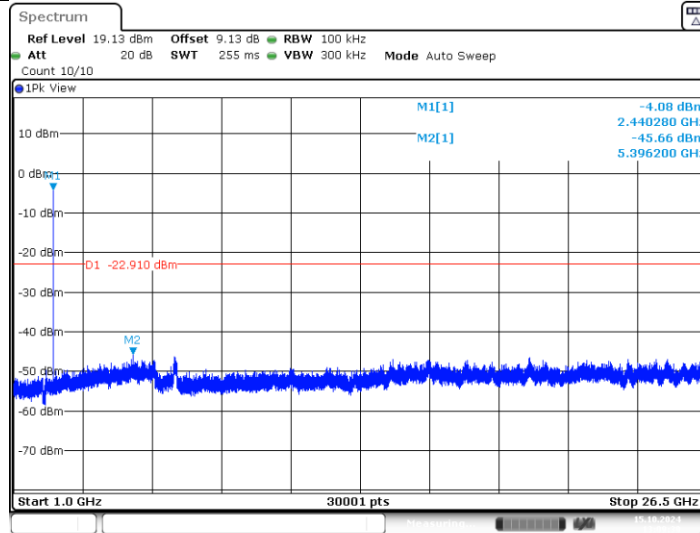
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BLE 1M Ant1 2440_30~1000

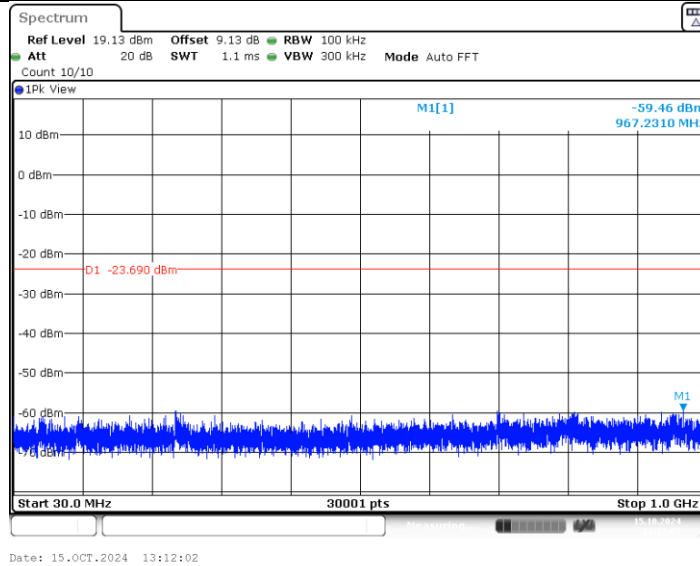


Date: 15.OCT.2024 13:09:05

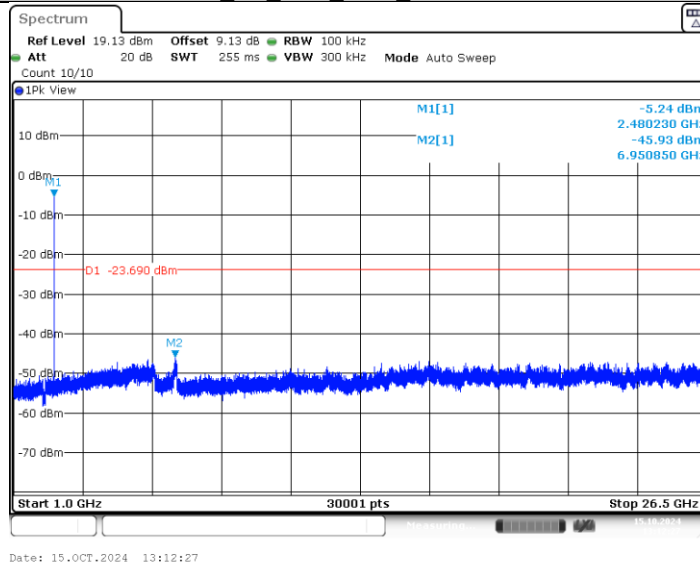
BLE_1M_Ant1_2440_1000~26500



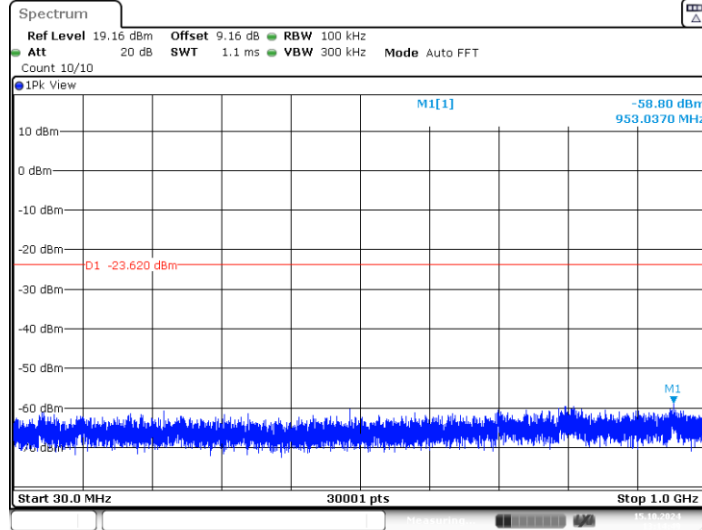
BLE_1M_Ant1_2480_30~1000



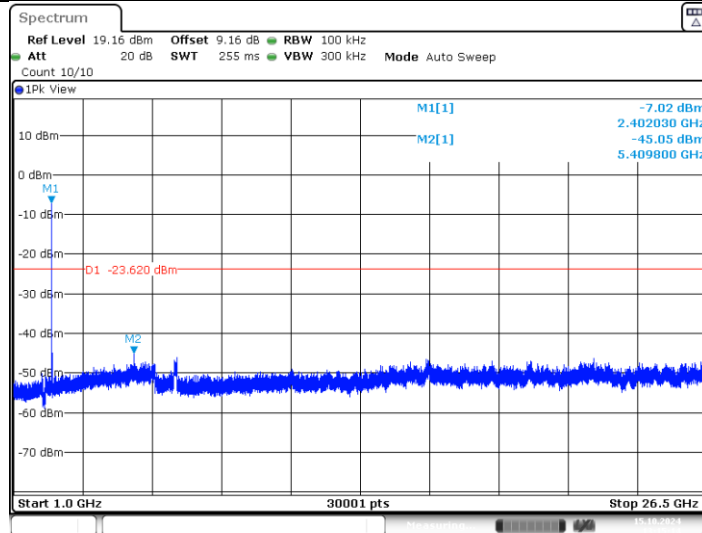
BLE_1M_Ant1_2480_1000~26500



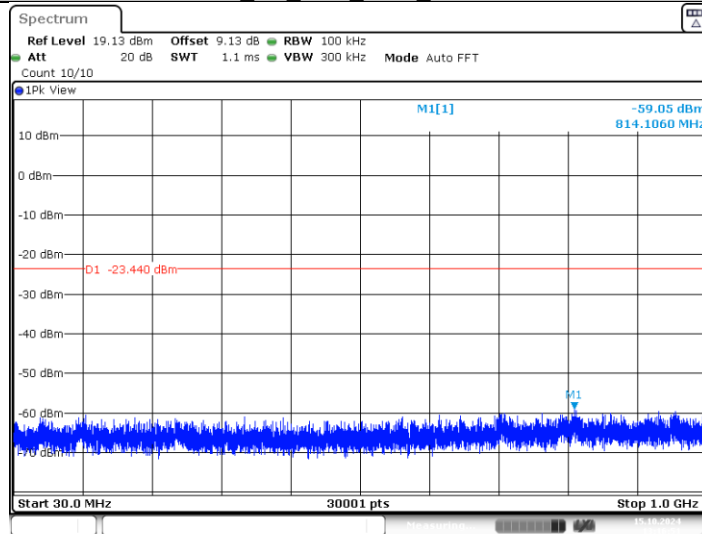
BLE_2M_Ant1_2402_30~1000



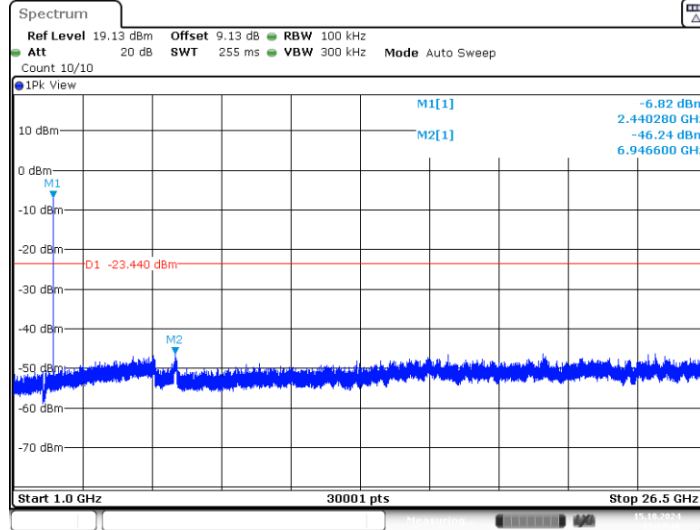
BLE_2M_Ant1_2402_1000~26500



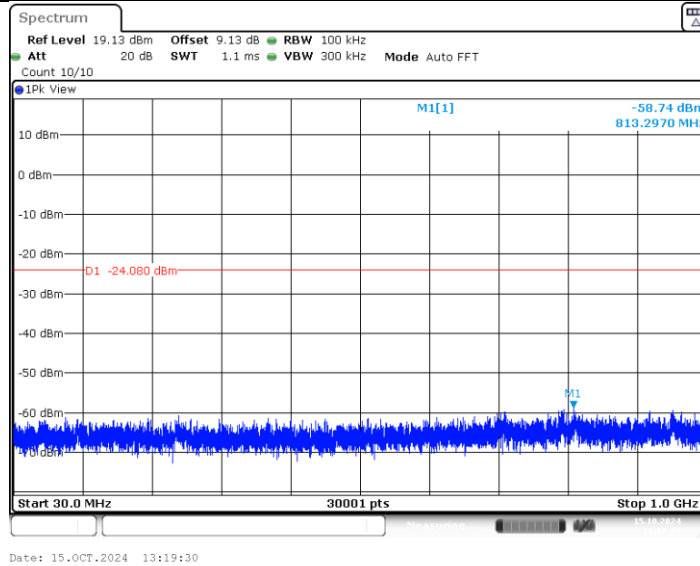
BLE_2M_Ant1_2440_30~1000



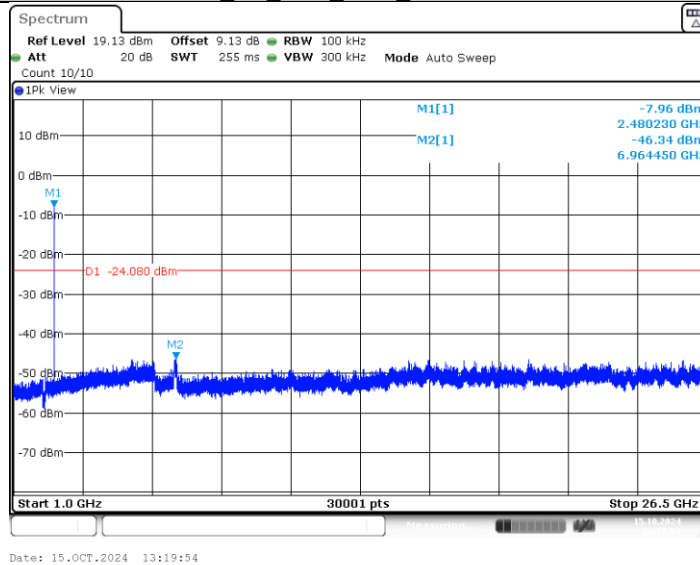
BLE 2M Ant1 2440 1000~26500



BLE 2M Ant1 2480 30~1000



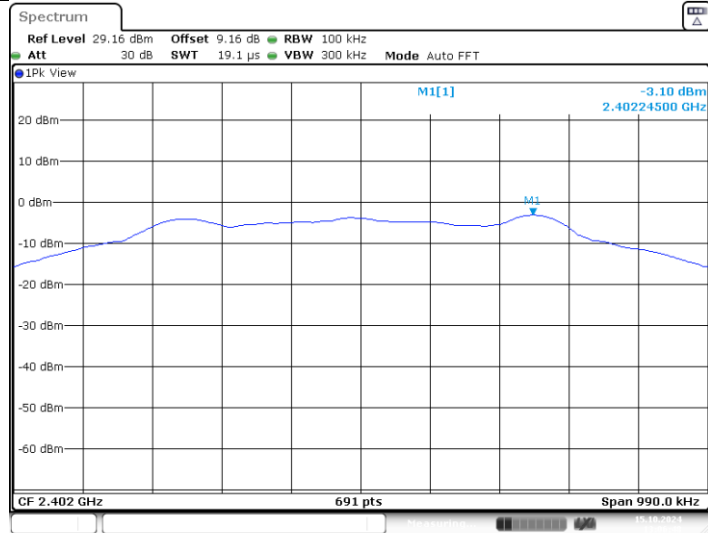
BLE 2M Ant1 2480 1000~26500



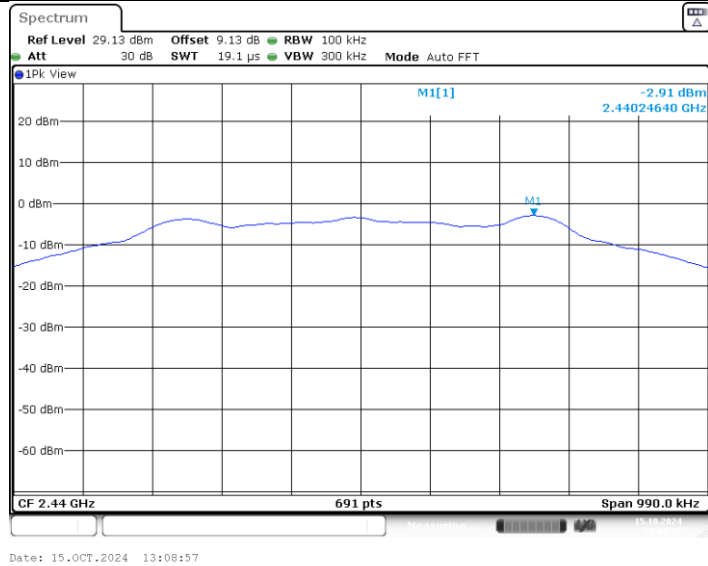
Reference level measurement

TestMode	Antenna	Freq(MHz)	Max.Point[MHz]	Result[dBm]
BLE_1M	Ant1	2402	2402.25	-3.10
		2440	2440.25	-2.91
		2480	2480.25	-3.69
BLE_2M	Ant1	2402	2401.99	-3.62
		2440	2439.99	-3.44
		2480	2479.99	-4.08

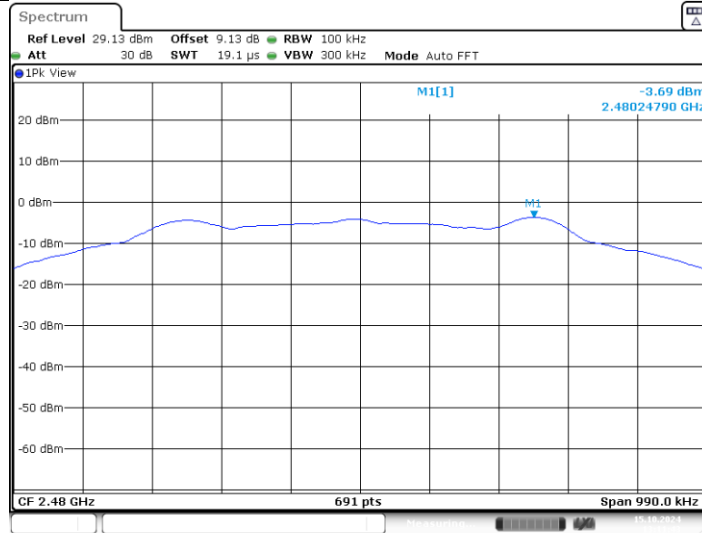
BLE 1M Ant1_2402



BLE 1M Ant1_2440

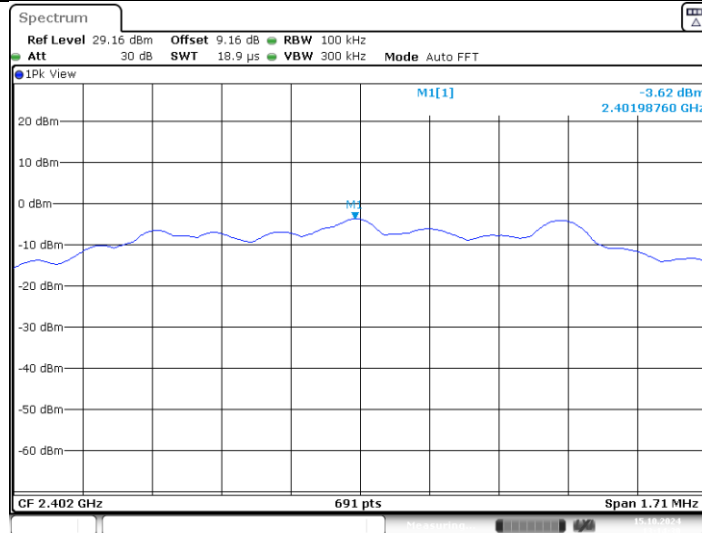


BLE_1M_Ant1_2480



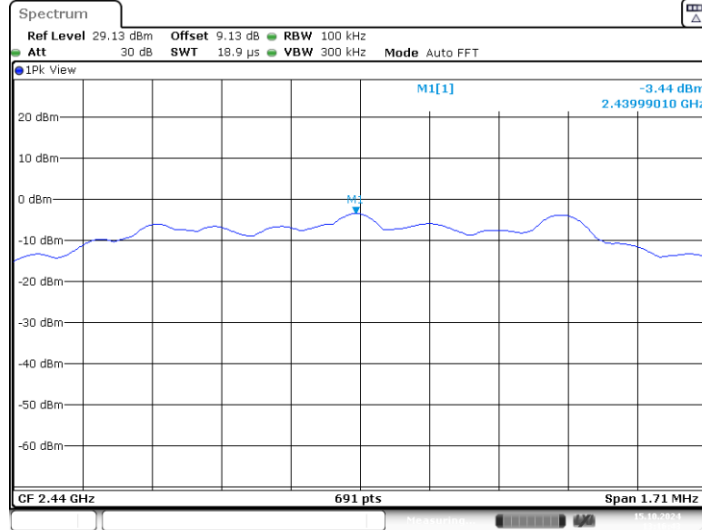
Date: 15.OCT.2024 13:11:44

BLE_2M_Ant1_2402

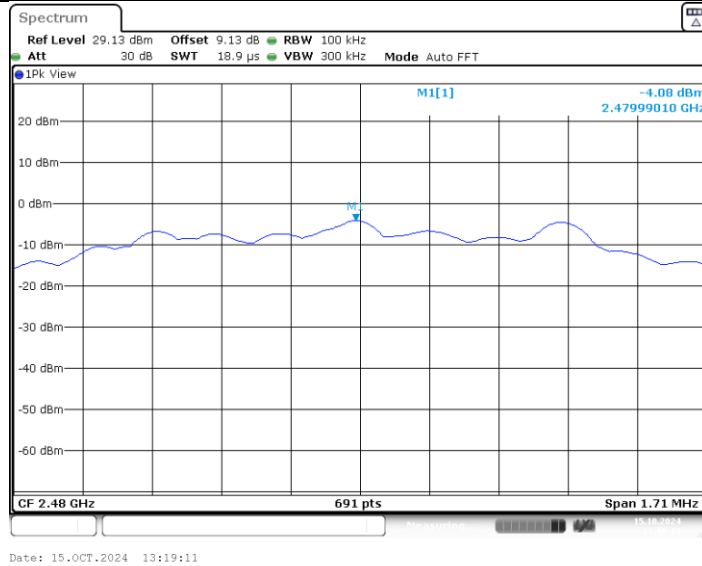


Date: 15.OCT.2024 13:14:30

BLE_2M_Ant1_2440



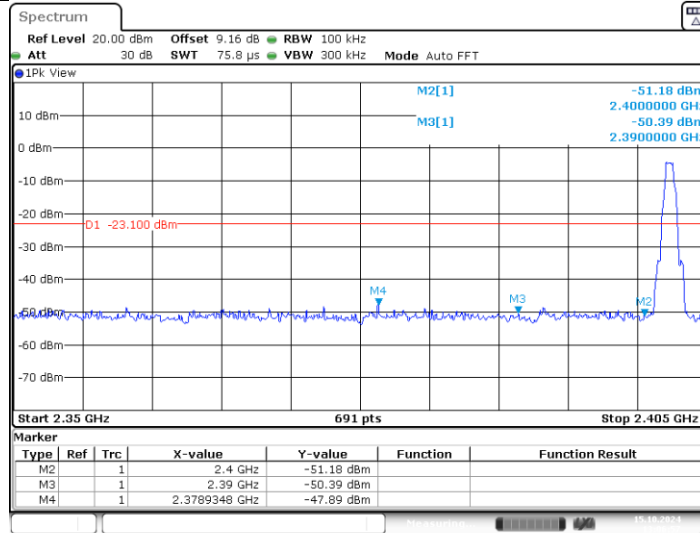
BLE_2M_Ant1_2480



Band edge measurements

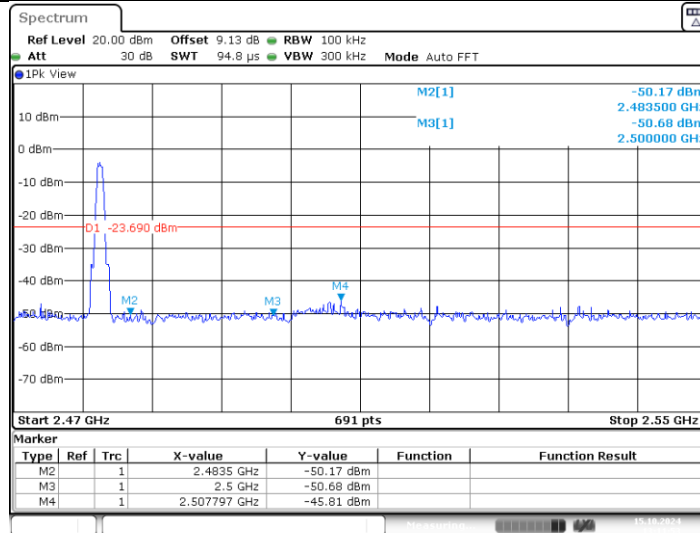
TestMode	Antenna	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	-3.10	-47.89	≤ -23.1	PASS
		High	2480	-3.69	-45.81	≤ -23.69	PASS
BLE_2M	Ant1	Low	2402	-3.62	-35.53	≤ -23.62	PASS
		High	2480	-4.08	-47.16	≤ -24.08	PASS

BLE 1M Ant1 Low 2402



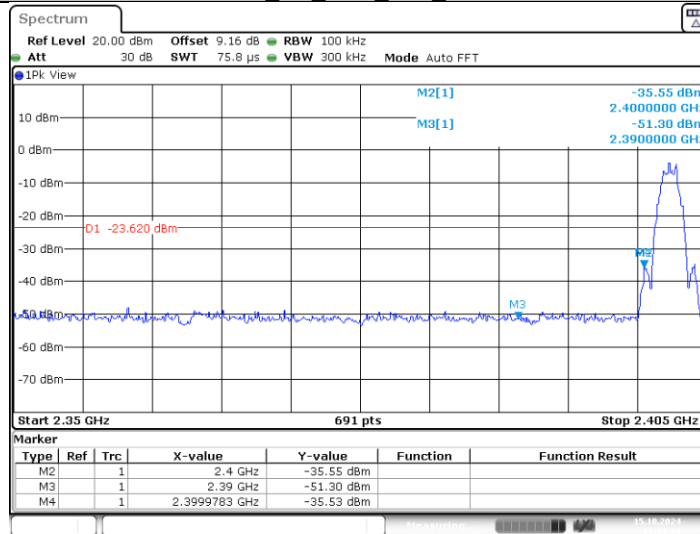
Date: 15.OCT.2024 13:06:57

BLE 1M Ant1 High 2480

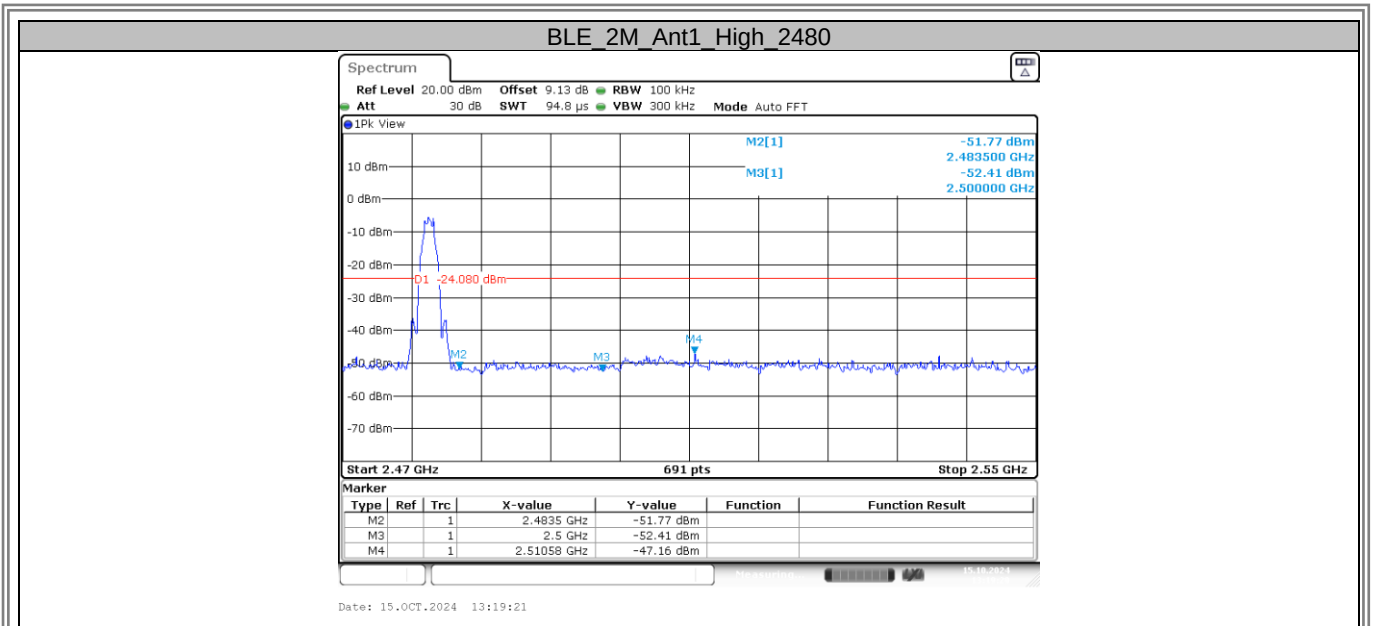


Date: 15.OCT.2024 13:11:53

BLE 2M Ant1 Low 2402



Date: 15.OCT.2024 13:14:40

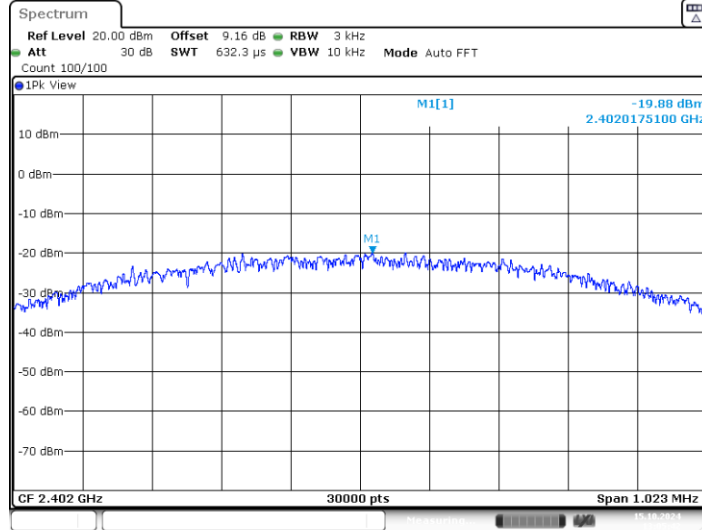


APPENDIX H- POWER SPECTRAL DENSITY

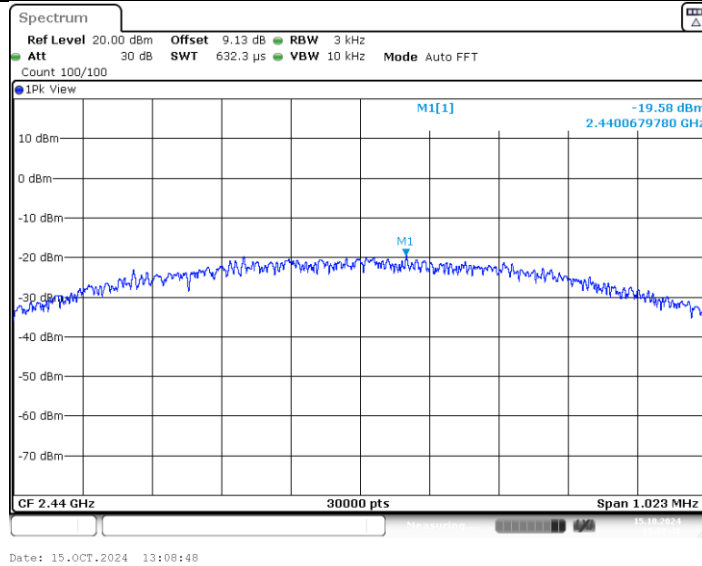
Power Spectral Density

TestMode	Antenna	Freq(MHz)	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-19.88	≤8.00	PASS
		2440	-19.58	≤8.00	PASS
		2480	-20.40	≤8.00	PASS
BLE_2M	Ant1	2402	-21.93	≤8.00	PASS
		2440	-21.62	≤8.00	PASS
		2480	-22.34	≤8.00	PASS

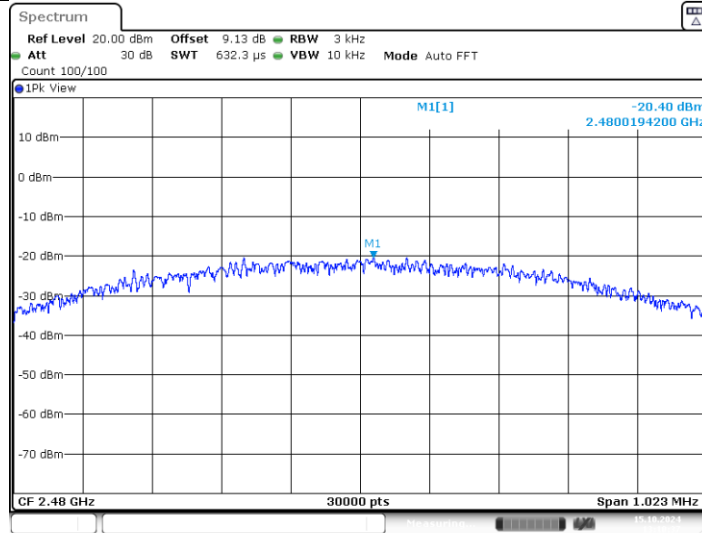
BLE_1M_Ant1_2402



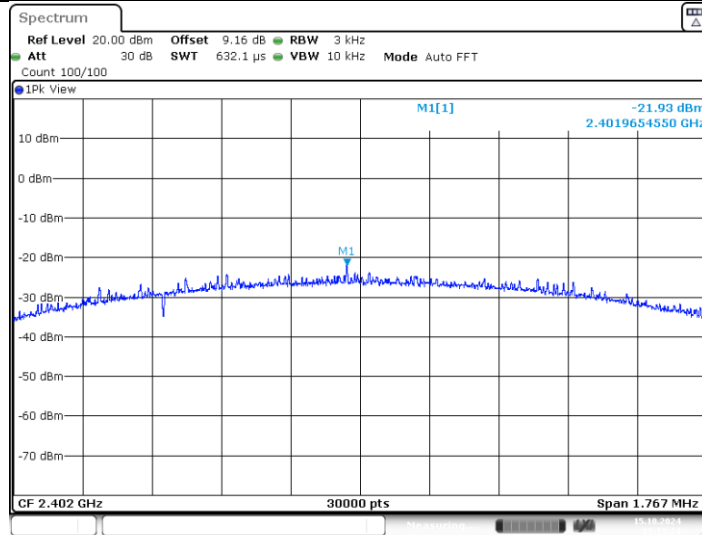
BLE_1M_Ant1_2440



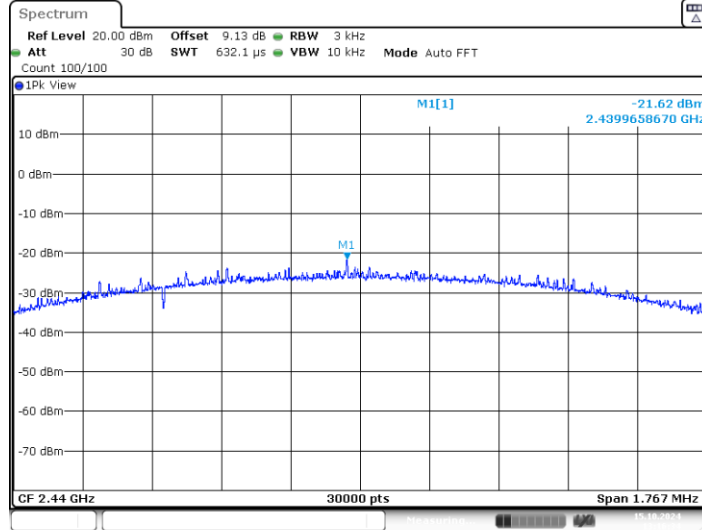
BLE_1M_Ant1_2480



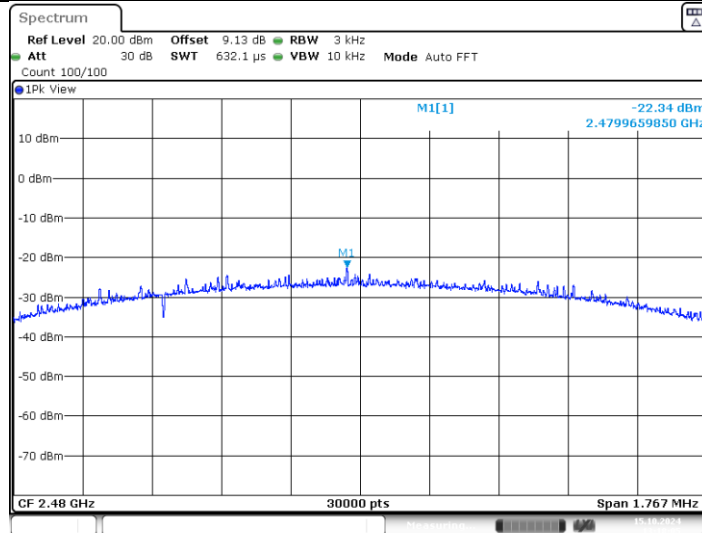
BLE_2M_Ant1_2402



BLE 2M Ant1 2440



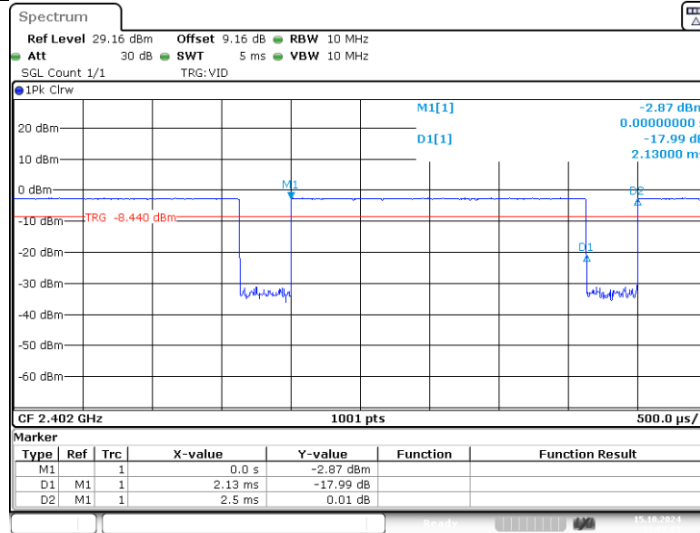
BLE 2M Ant1 2480



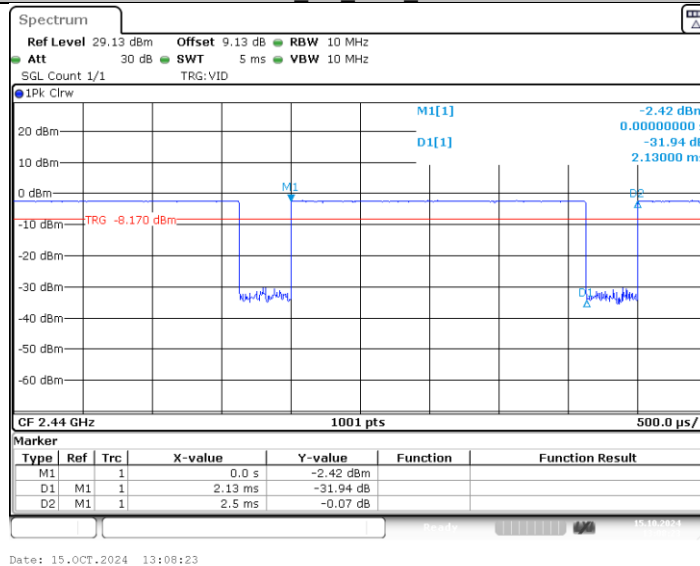
APPENDIX I DUTY CYCLE

TestMode	Antenna	Freq(MHz)	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
BLE_1M	Ant1	2402	2.13	2.50	0.8520	85.20	0.70	---	---
		2440	2.13	2.50	0.8520	85.20	0.70	---	---
		2480	2.13	2.50	0.8520	85.20	0.70	---	---
BLE_2M	Ant1	2402	1.07	1.88	0.5691	56.91	2.45	---	---
		2440	1.07	1.88	0.5691	56.91	2.45	---	---
		2480	1.07	1.88	0.5691	56.91	2.45	---	---

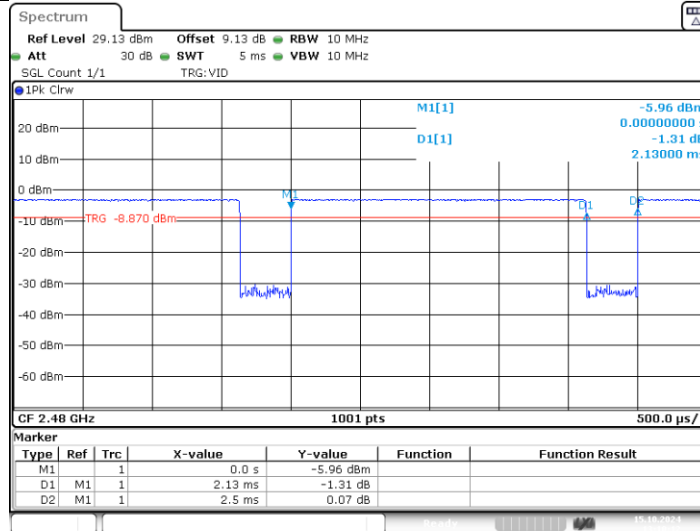
BLE 1M Ant1 2402



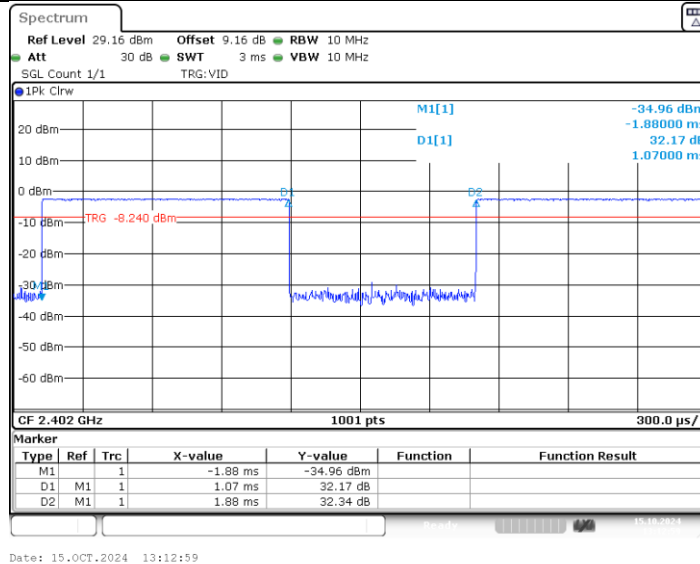
BLE 1M Ant1 2440

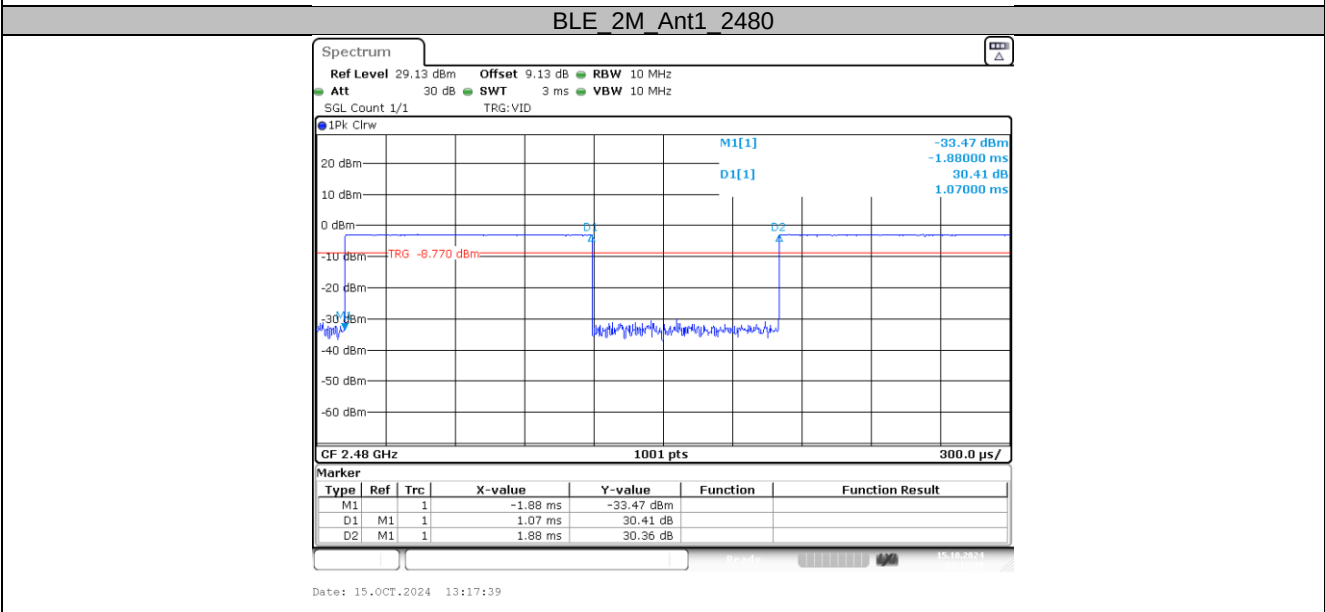
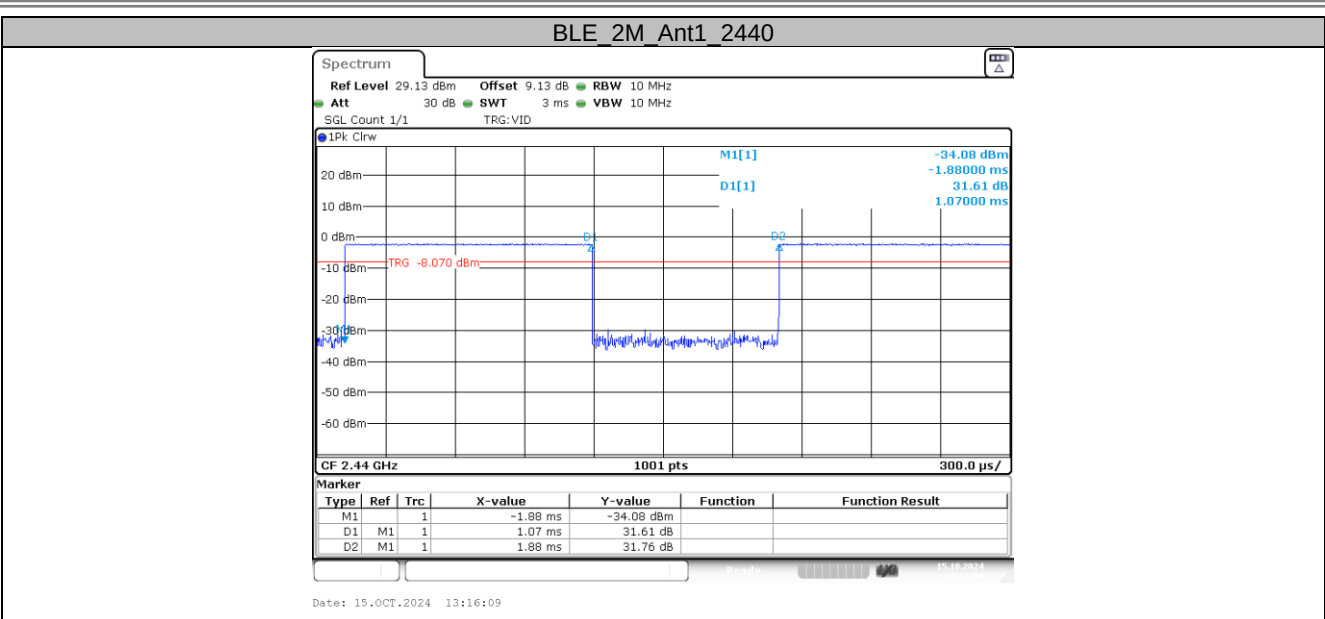


BLE 1M Ant1_2480



BLE 2M Ant1_2402





End of Test Report