

FCC Appendix RF Test Data for 2.4GWIFI

FCC ID : 2BVVS-ESP32-P4-C6

Company : 4D SYSTEMS PTY LTD

EUT : 4D ESP32-P4 Series Intelligent Display Module

Model Number : ESP32-P4-C6-WiFi

Report No. : CTA26060100201

Reviewed By : Eric Wang

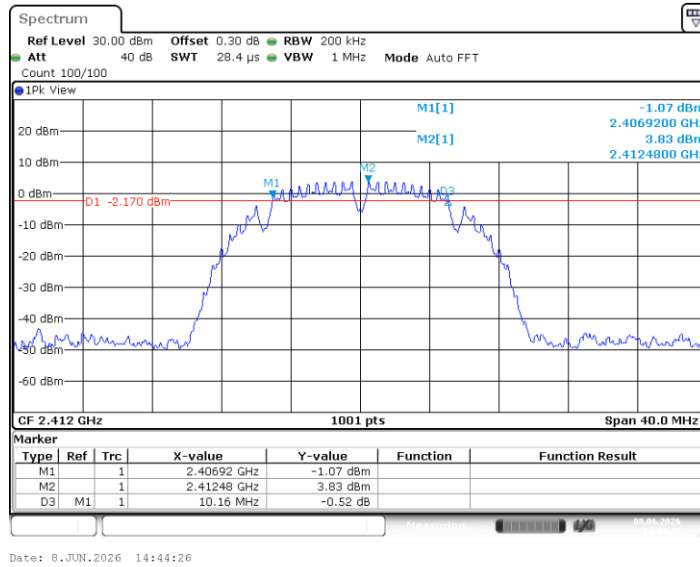
Appendix A: DTS Bandwidth

Test Result

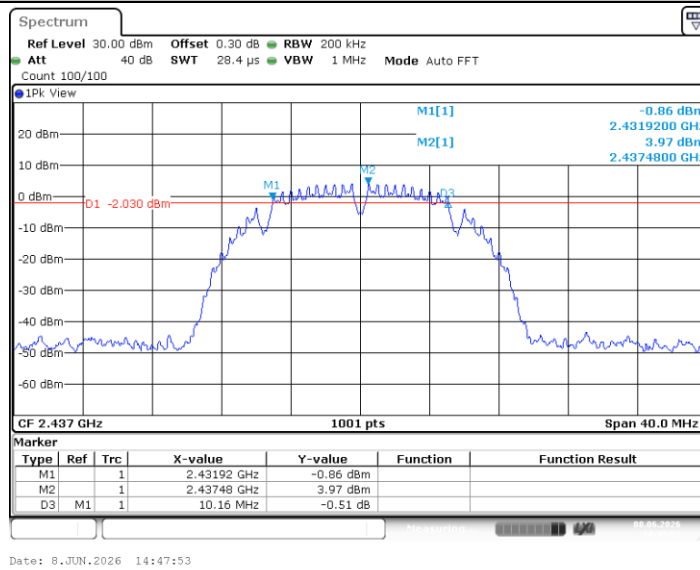
TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	10.16	2406.92	2417.08	0.5	PASS
		2437	10.16	2431.92	2442.08	0.5	PASS
		2462	10.16	2456.92	2467.08	0.5	PASS
11G	Ant1	2412	15.72	2404.00	2419.72	0.5	PASS
		2437	15.68	2429.04	2444.72	0.5	PASS
		2462	15.68	2454.28	2469.96	0.5	PASS
11N20SISO	Ant1	2412	16.32	2403.44	2419.76	0.5	PASS
		2437	15.96	2429.00	2444.96	0.5	PASS
		2462	15.20	2454.40	2469.60	0.5	PASS
11N40SISO	Ant1	2422	35.12	2404.96	2440.08	0.5	PASS
		2437	35.68	2419.24	2454.92	0.5	PASS
		2452	35.76	2434.16	2469.92	0.5	PASS

Test Graphs

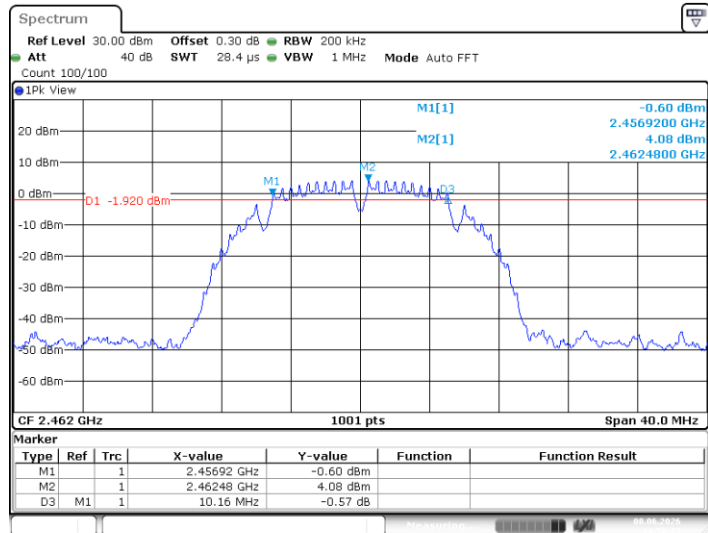
11B_Ant1_2412



11B_Ant1_2437

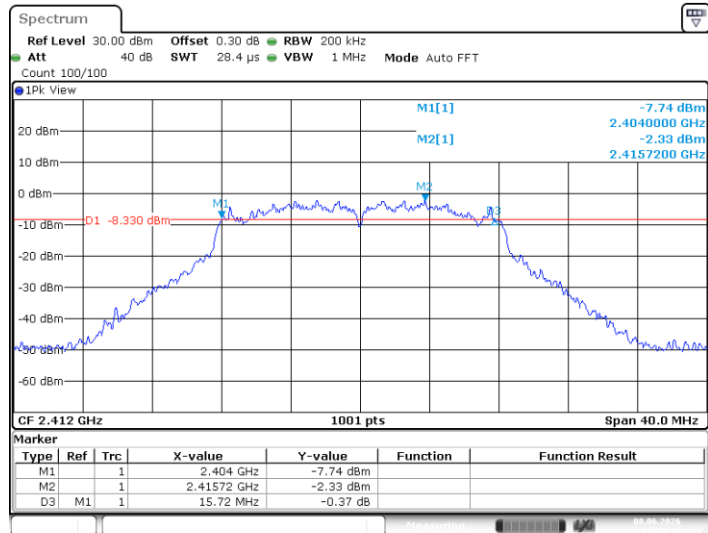


11B_Ant1_2462



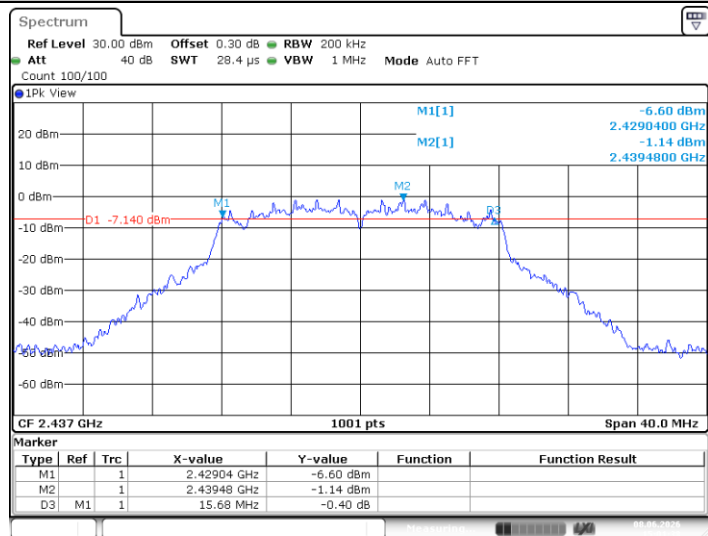
Date: 8.JUN.2026 14:50:24

11G_Ant1_2412



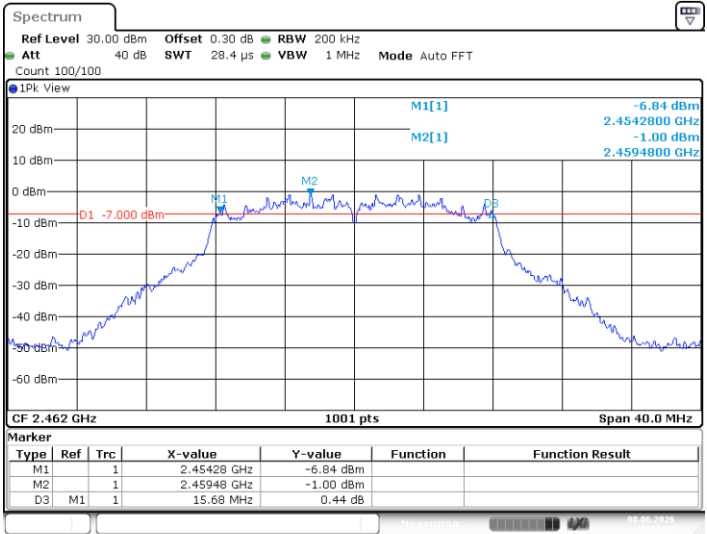
Date: 8.JUN.2026 14:54:18

11G_Ant1_2437



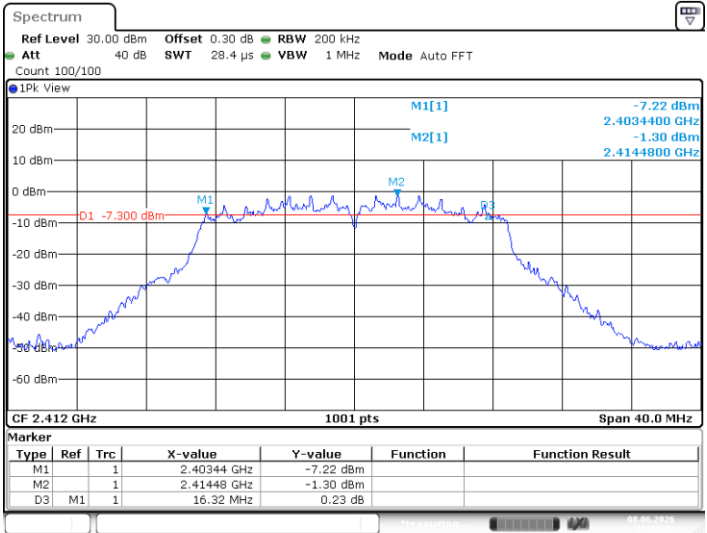
Date: 8.JUN.2026 15:01:37

11G_Ant1_2462



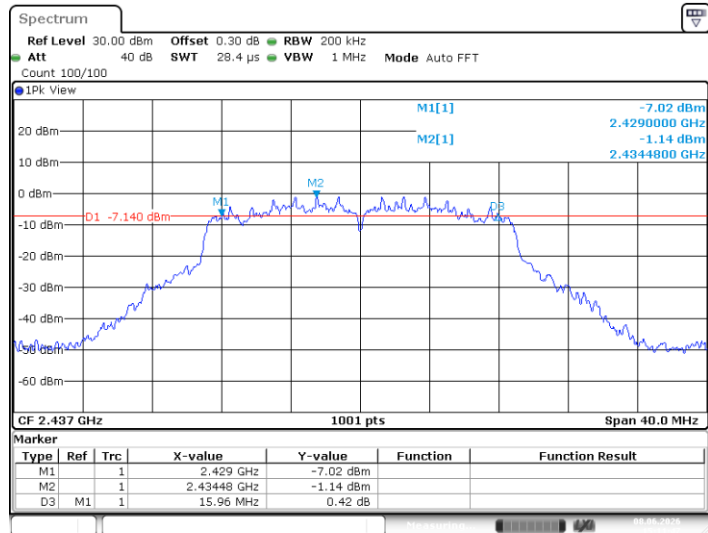
Date: 8.JUN.2026 15:03:36

11N20SISO_Ant1_2412



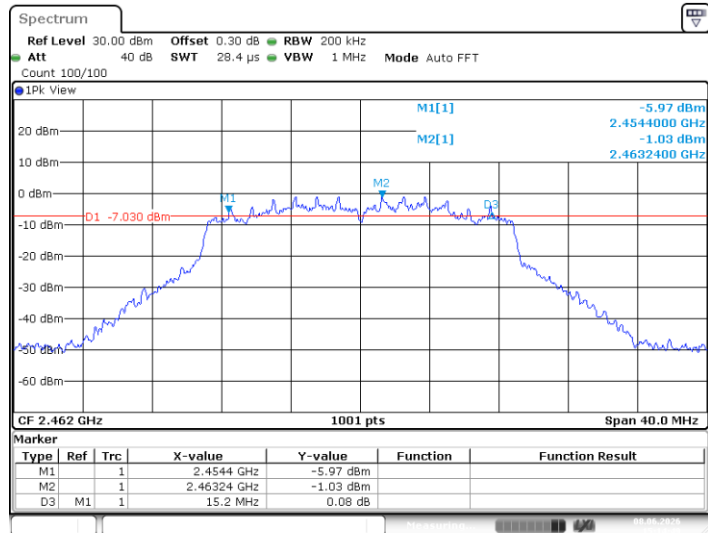
Date: 8.JUN.2026 15:08:27

11N20SISO_Ant1_2437



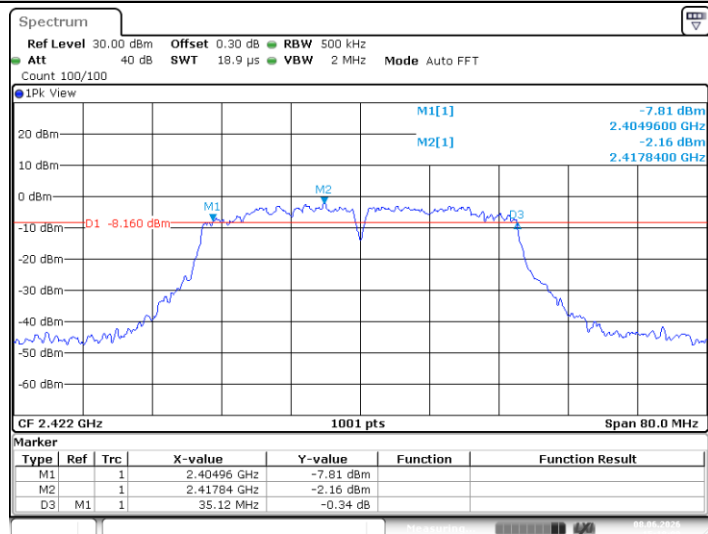
Date: 8.JUN.2026 15:11:46

11N20SISO_Ant1_2462



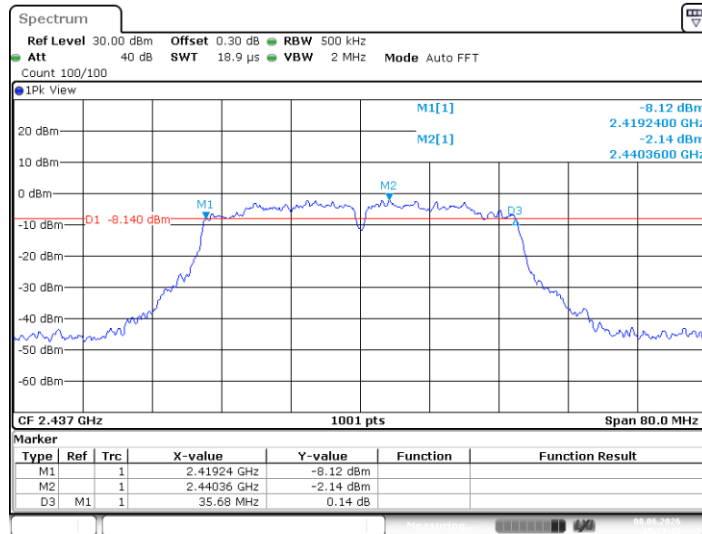
Date: 8.JUN.2026 15:14:49

11N40SISO_Ant1_2422



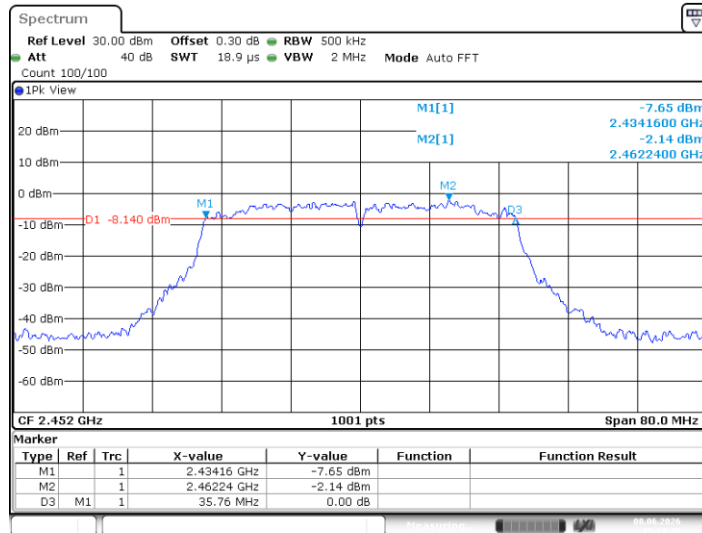
Date: 8.JUN.2026 15:18:08

11N40SISO_Ant1_2437



Date: 8.JUN.2026 15:21:22

11N40SISO_Ant1_2452



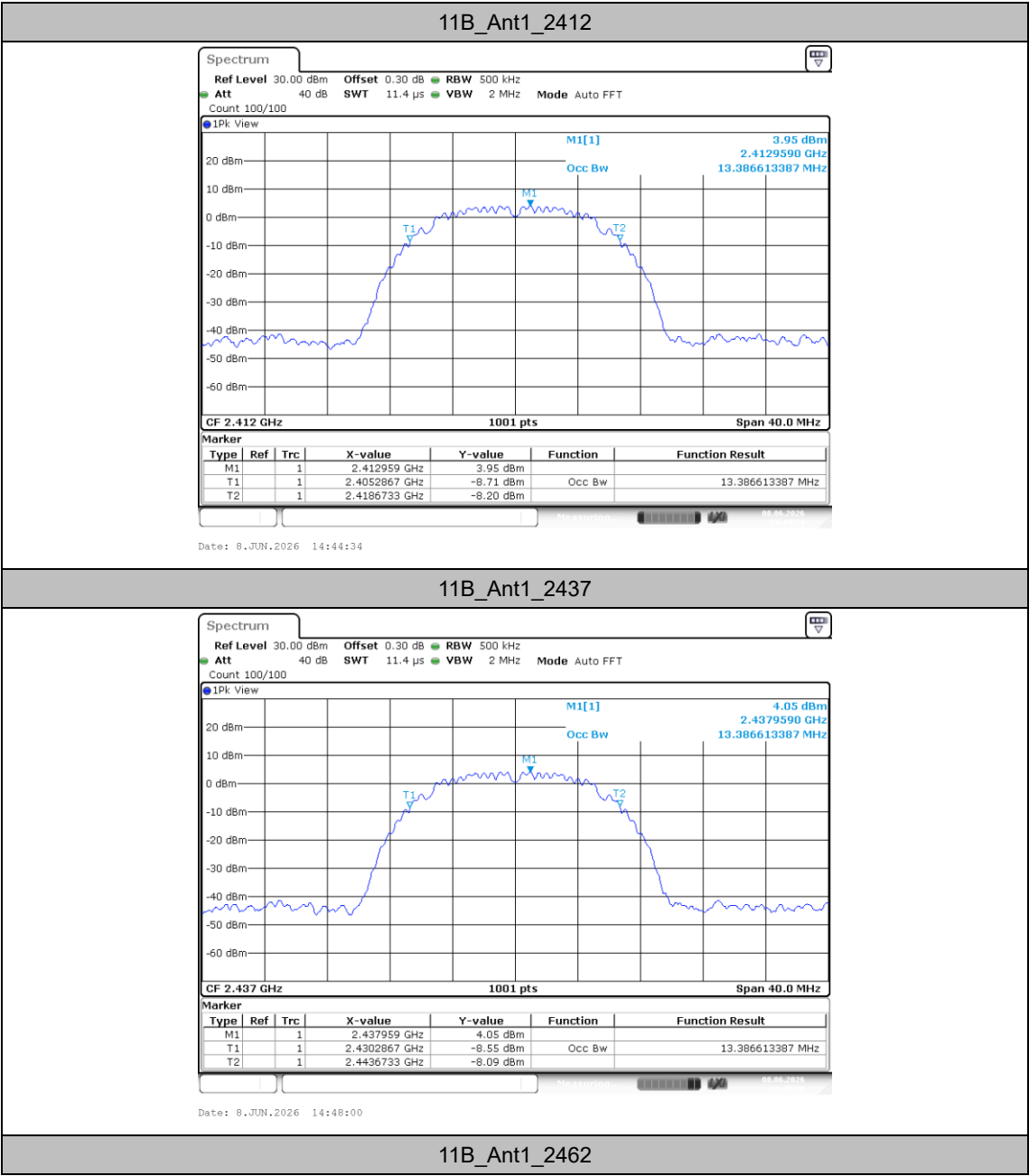
Date: 8.JUN.2026 15:23:44

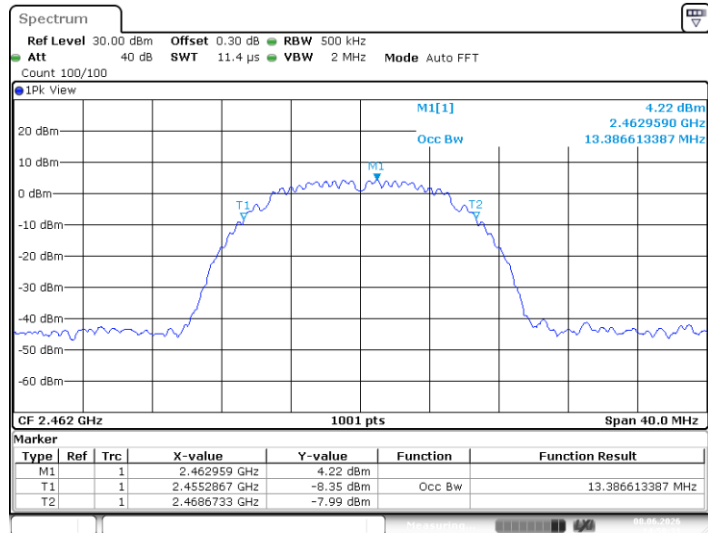
Appendix B: Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Channel Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	13.387	2405.2867	2418.6733	---	---
		2437	13.387	2430.2867	2443.6733	---	---
		2462	13.387	2455.2867	2468.6733	---	---
11G	Ant1	2412	16.583	2403.7283	2420.3117	---	---
		2437	17.023	2428.4885	2445.5115	---	---
		2462	16.863	2453.5684	2470.4316	---	---
11N20SISO	Ant1	2412	17.982	2402.9291	2420.9111	---	---
		2437	17.942	2427.9291	2445.8711	---	---
		2462	17.942	2452.9291	2470.8711	---	---
11N40SISO	Ant1	2422	36.124	2403.9381	2440.0619	---	---
		2437	36.044	2419.0180	2455.0619	---	---
		2452	36.124	2433.8581	2469.9820	---	---

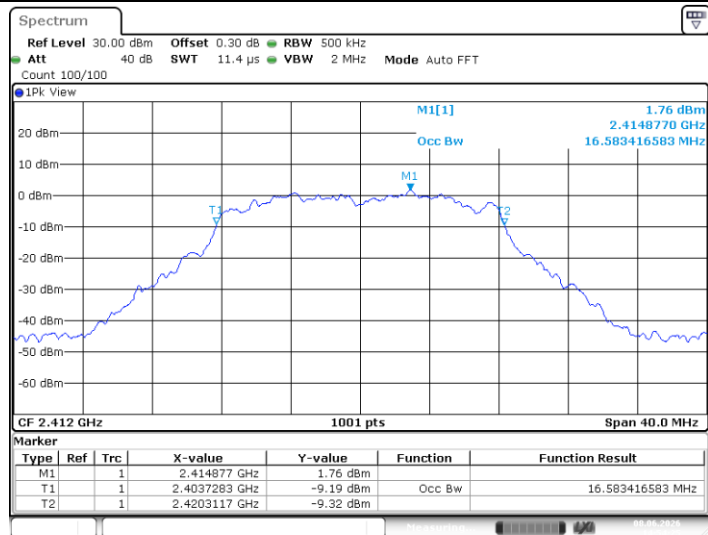
Test Graphs





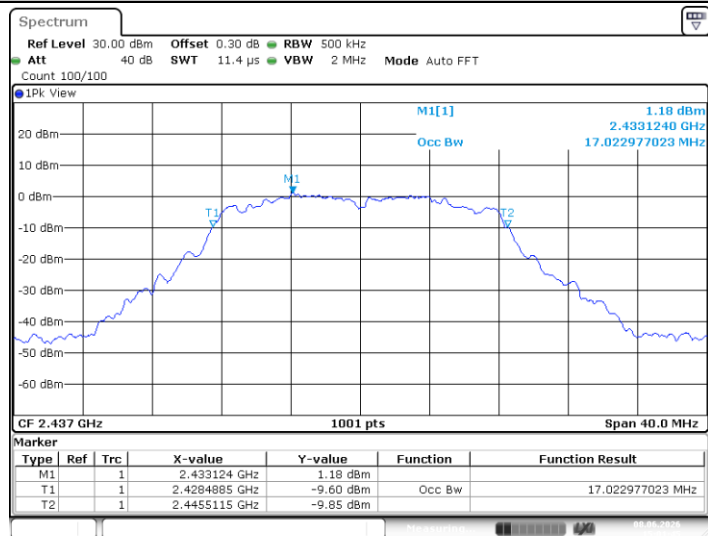
Date: 8.JUN.2026 14:50:31

11G_Ant1_2412



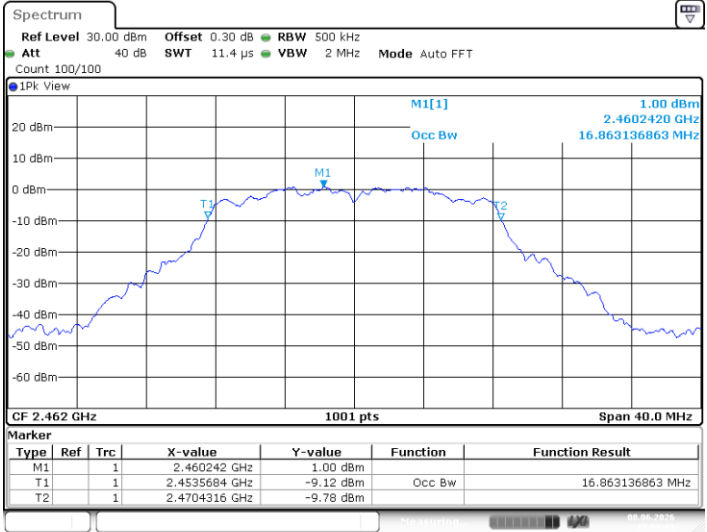
Date: 8.JUN.2026 14:54:25

11G_Ant1_2437



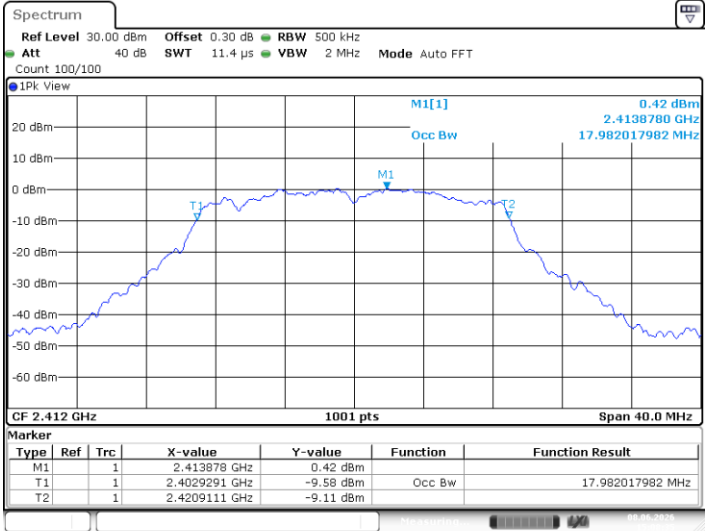
Date: 8.JUN.2026 15:01:44

11G_Ant1_2462



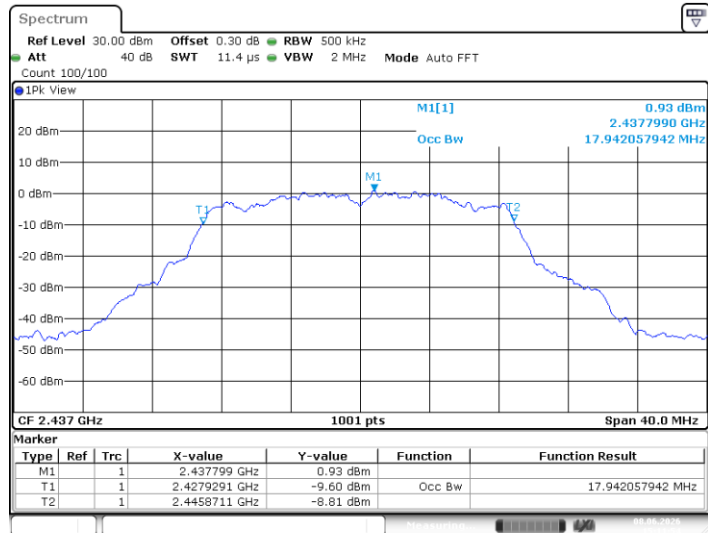
Date: 8.JUN.2026 15:03:43

11N20SISO_Ant1_2412



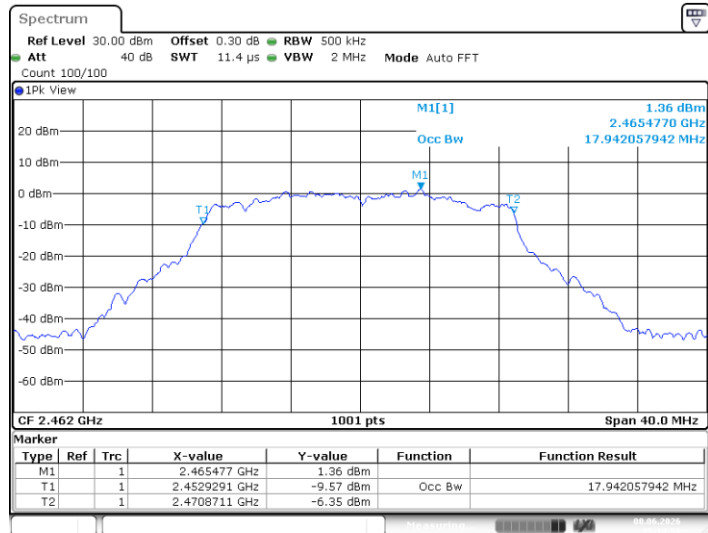
Date: 8.JUN.2026 15:08:35

11N20SISO_Ant1_2437



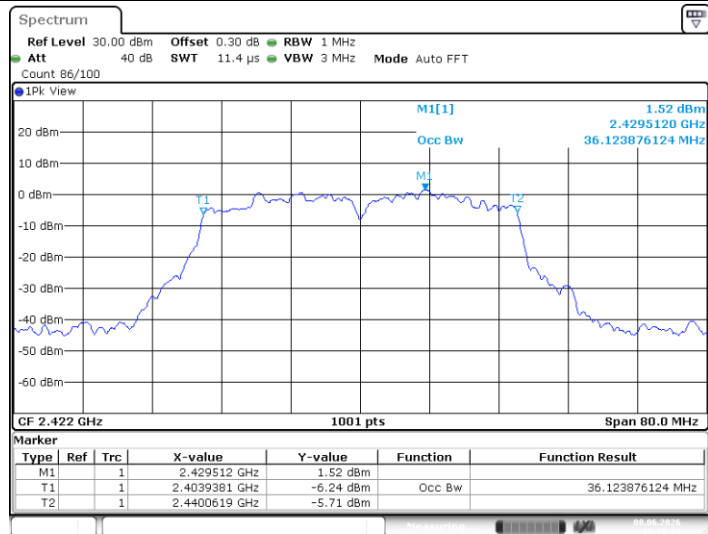
Date: 8.JUN.2026 15:11:54

11N20SISO_Ant1_2462



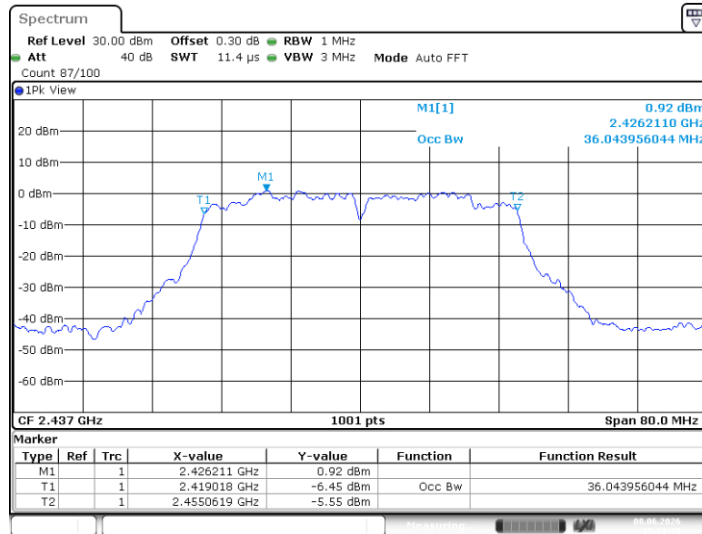
Date: 8.JUN.2026 15:14:56

11N40SISO_Ant1_2422



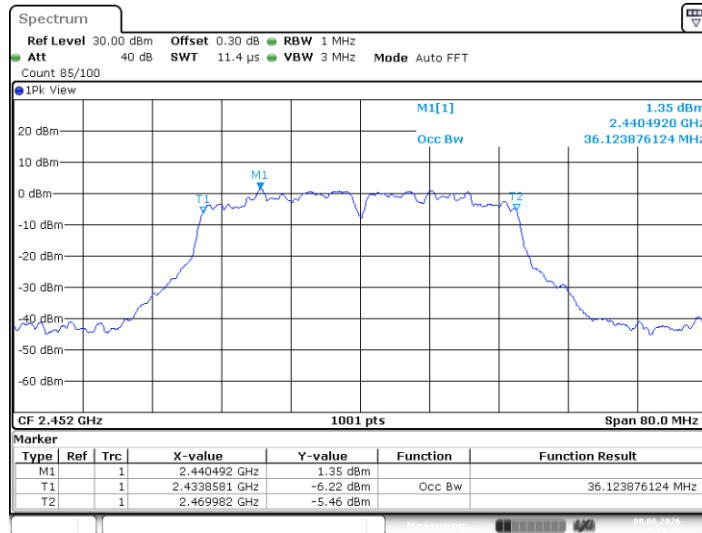
Date: 8.JUN.2026 15:18:16

11N40SISO_Ant1_2437



Date: 8.JUN.2026 15:21:29

11N40SISO_Ant1_2452



Date: 8.JUN.2026 15:23:52

Appendix C: Maximum conducted output power

Test Result

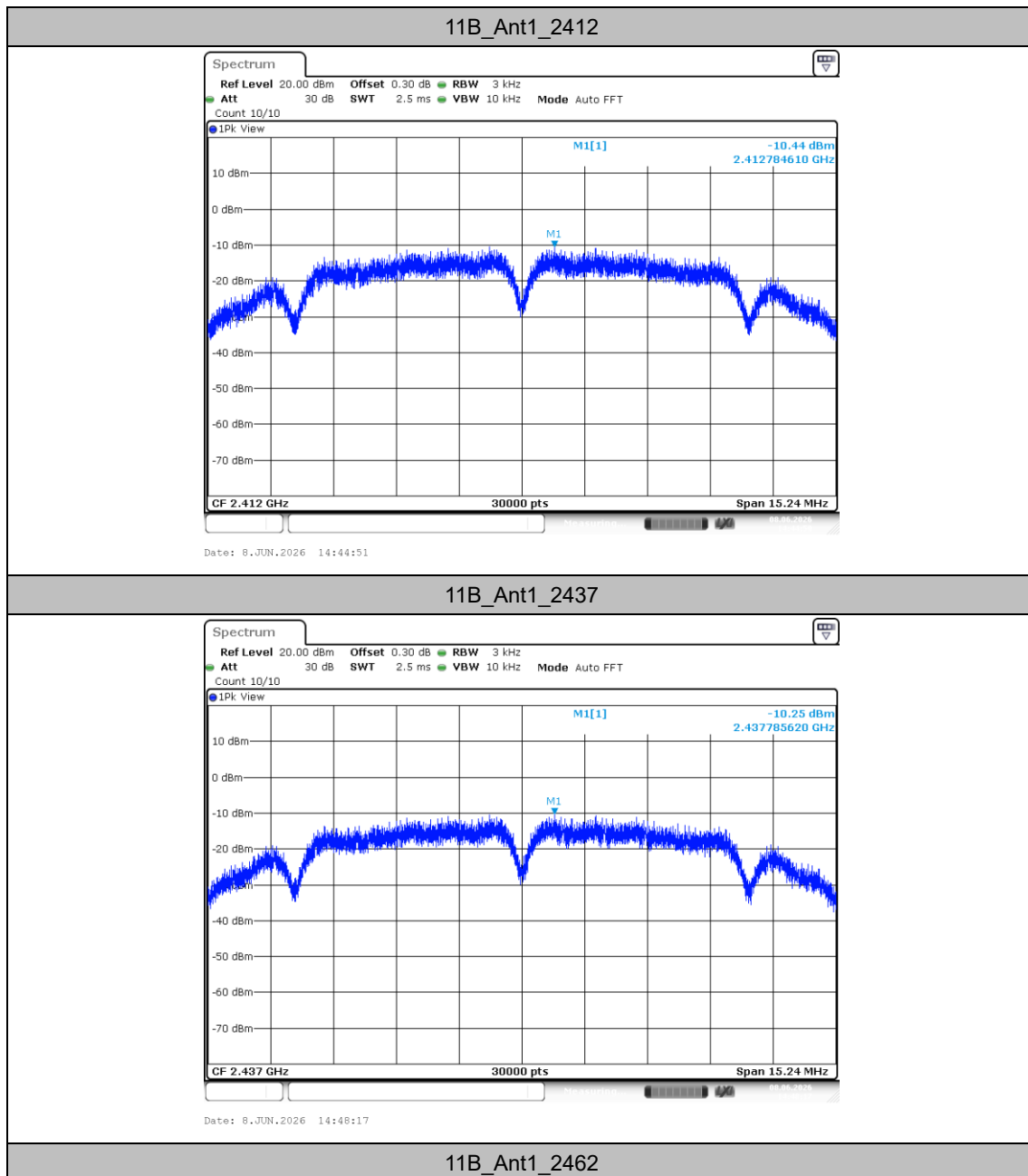
Test Mode	Antenna	Frequency[M Hz]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	15.64	≤30.00	PASS
		2437	15.74	≤30.00	PASS
		2462	15.93	≤30.00	PASS
11G	Ant1	2412	14.35	≤30.00	PASS
		2437	14.49	≤30.00	PASS
		2462	14.75	≤30.00	PASS
11N20SISO	Ant1	2412	14.24	≤30.00	PASS
		2437	14.32	≤30.00	PASS
		2462	14.37	≤30.00	PASS
11N40SISO	Ant1	2422	14.59	≤30.00	PASS
		2437	14.84	≤30.00	PASS
		2452	14.89	≤30.00	PASS

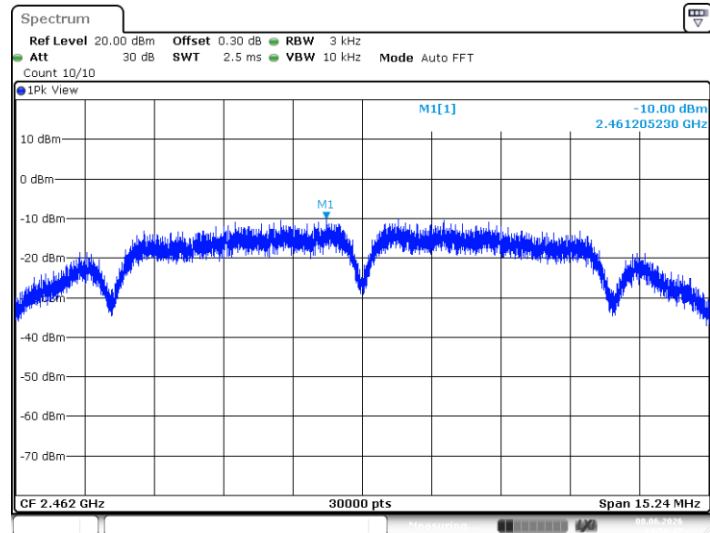
Appendix D: Maximum power spectral density

Test Result

TestMode	Antenna	Frequency[MHz]	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-10.44	≤8.00	PASS
		2437	-10.25	≤8.00	PASS
		2462	-10.00	≤8.00	PASS
11G	Ant1	2412	-17.73	≤8.00	PASS
		2437	-15.79	≤8.00	PASS
		2462	-17.20	≤8.00	PASS
11N20SISO	Ant1	2412	-16.81	≤8.00	PASS
		2437	-16.97	≤8.00	PASS
		2462	-16.86	≤8.00	PASS
11N40SISO	Ant1	2422	-19.52	≤8.00	PASS
		2437	-18.60	≤8.00	PASS
		2452	-19.56	≤8.00	PASS

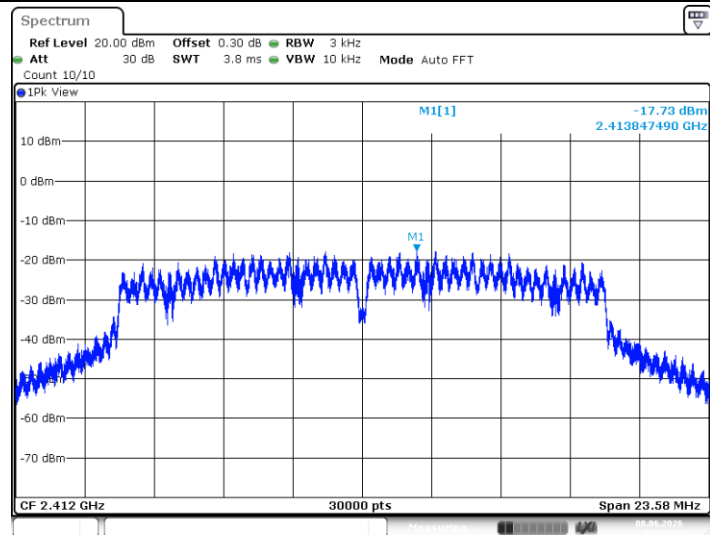
Test Graphs





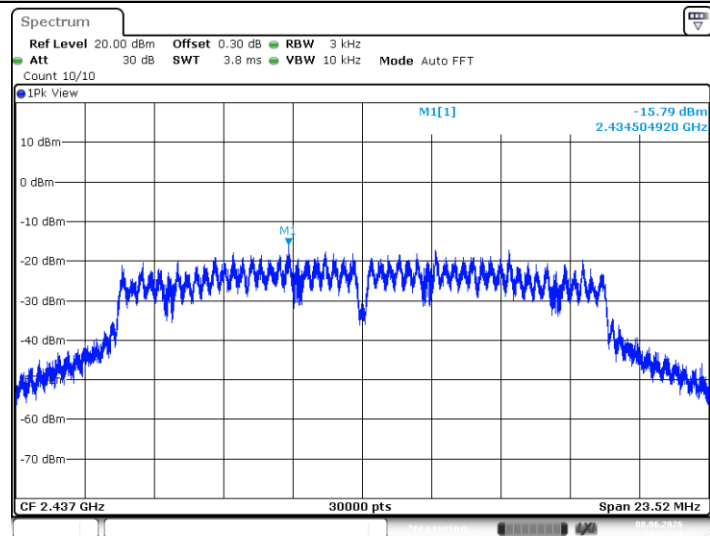
Date: 8.JUN.2026 14:50:47

11G_Ant1_2412



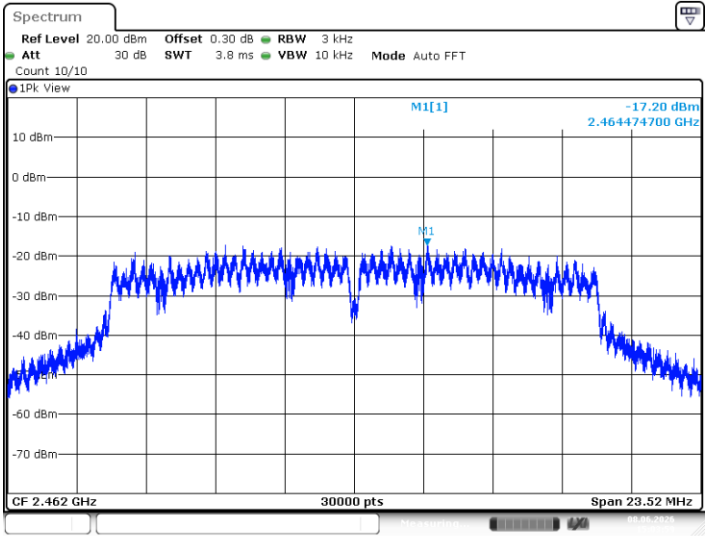
Date: 8.JUN.2026 14:54:42

11G_Ant1_2437



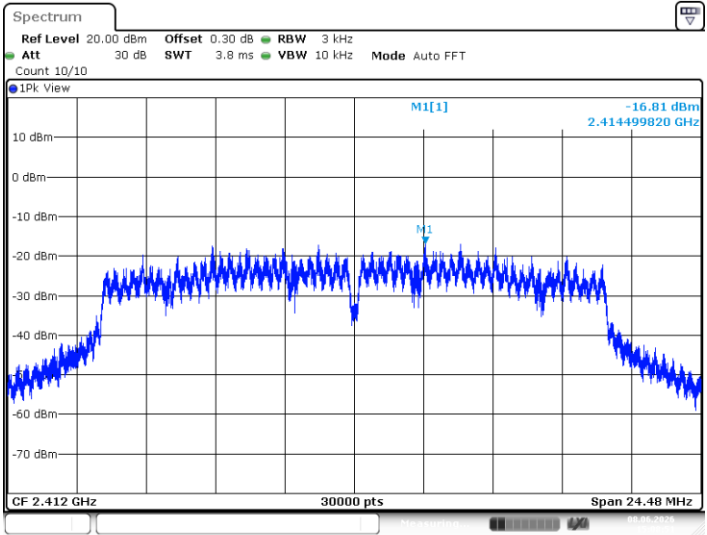
Date: 8.JUN.2026 15:02:01

11G_Ant1_2462



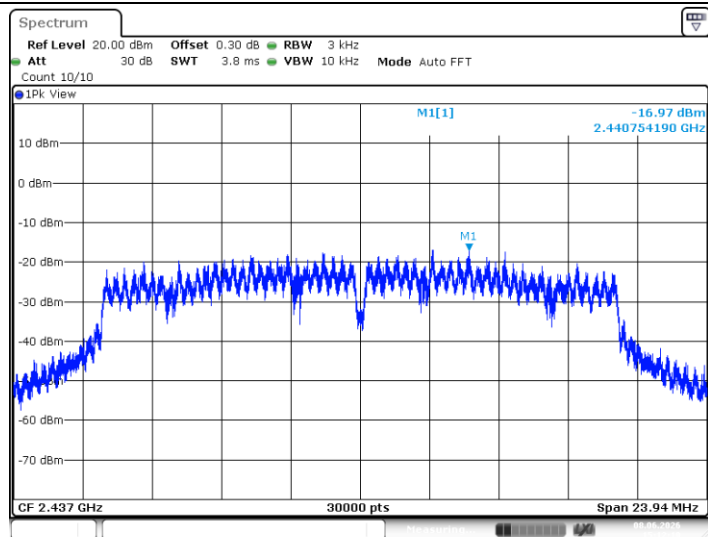
Date: 8.JUN.2026 15:04:00

11N20SISO_Ant1_2412



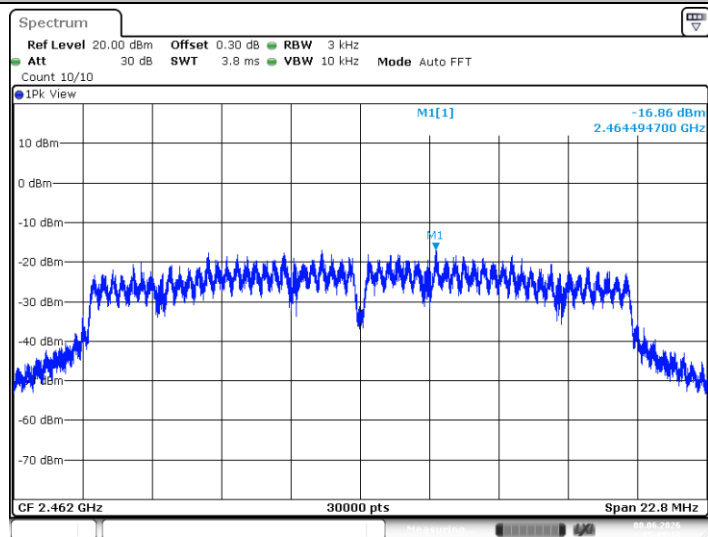
Date: 8.JUN.2026 15:08:51

11N20SISO_Ant1_2437



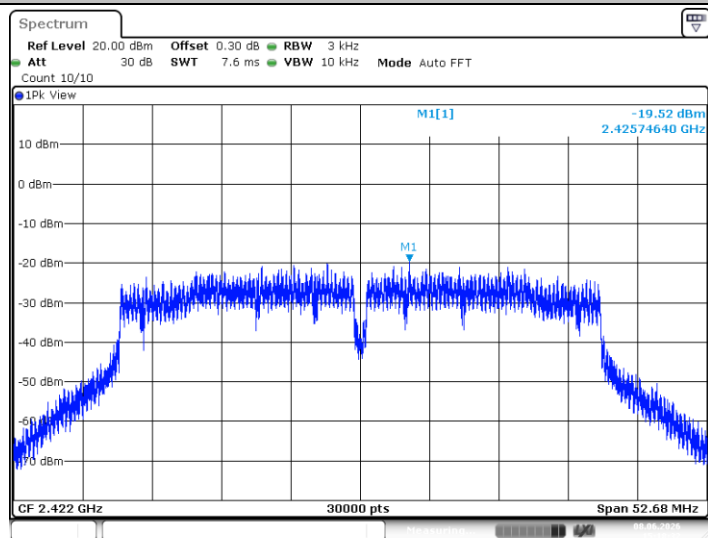
Date: 8.JUN.2026 15:12:11

11N20SISO_Ant1_2462



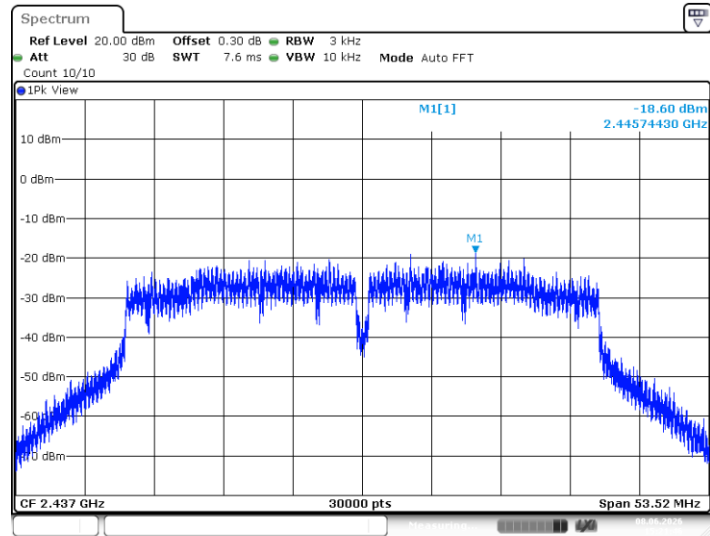
Date: 8.JUN.2026 15:15:13

11N40SISO_Ant1_2422



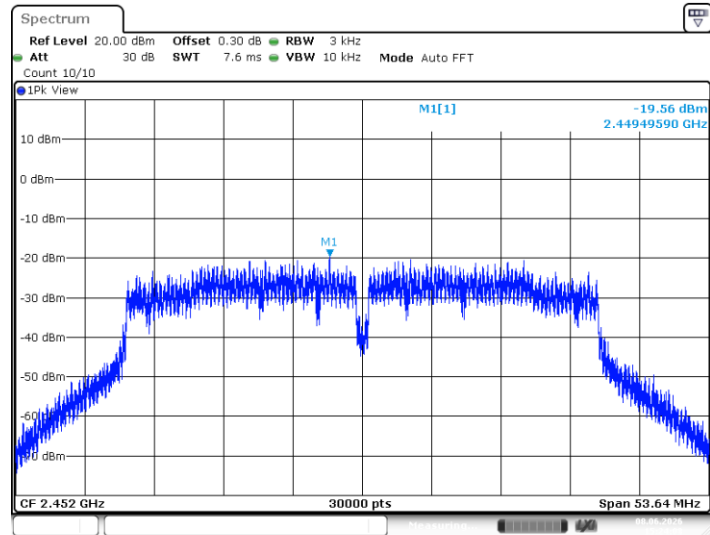
Date: 8.JUN.2026 15:18:32

11N40SISO_Ant1_2437



Date: 8.JUN.2026 15:21:46

11N40SISO_Ant1_2452



Date: 8.JUN.2026 15:24:08

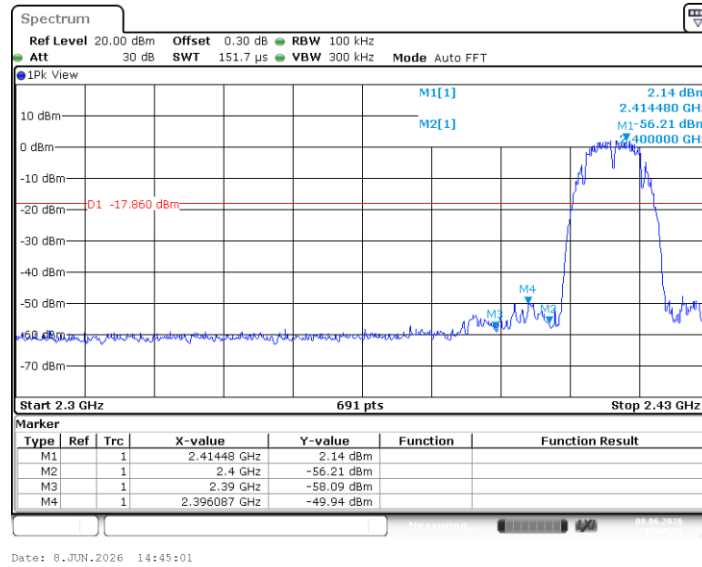
Appendix E: Band edge measurements

Test Result

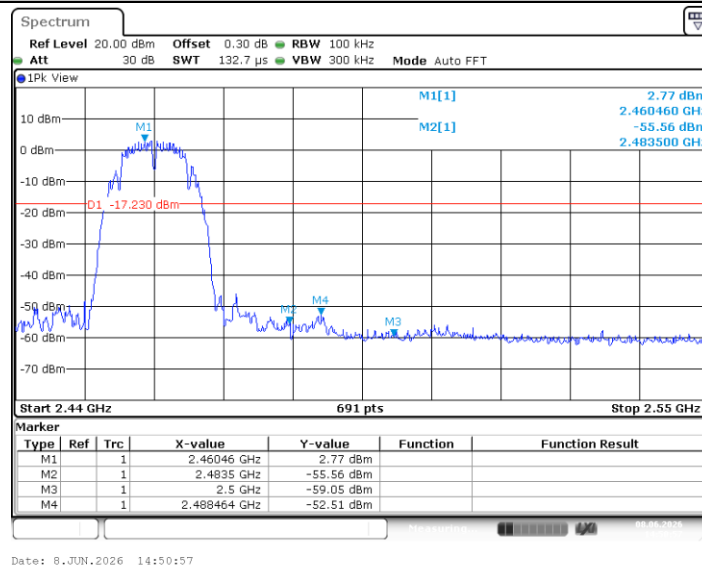
TestMode	Antenna	Channel Name	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	2.14	-49.94	≤-17.86	PASS
		High	2462	2.77	-52.51	≤-17.23	PASS
11G	Ant1	Low	2412	-2.24	-34.21	≤-22.24	PASS
		High	2462	-2.10	-57.4	≤-22.1	PASS
11N20SISO	Ant1	Low	2412	-2.42	-33.48	≤-22.42	PASS
		High	2462	-2.11	-57.29	≤-22.11	PASS
11N40SISO	Ant1	Low	2422	-5.28	-34.35	≤-25.28	PASS
		High	2452	-5.06	-57.27	≤-25.06	PASS

Test Graphs

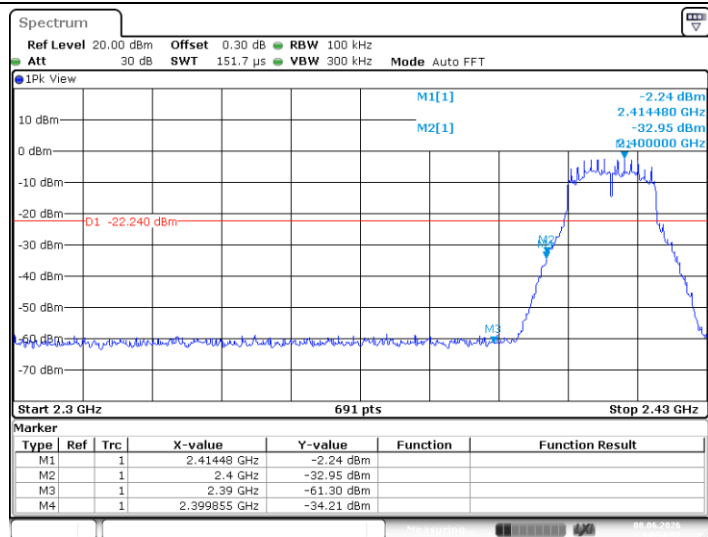
11B_Ant1_Low_2412



11B_Ant1_High_2462

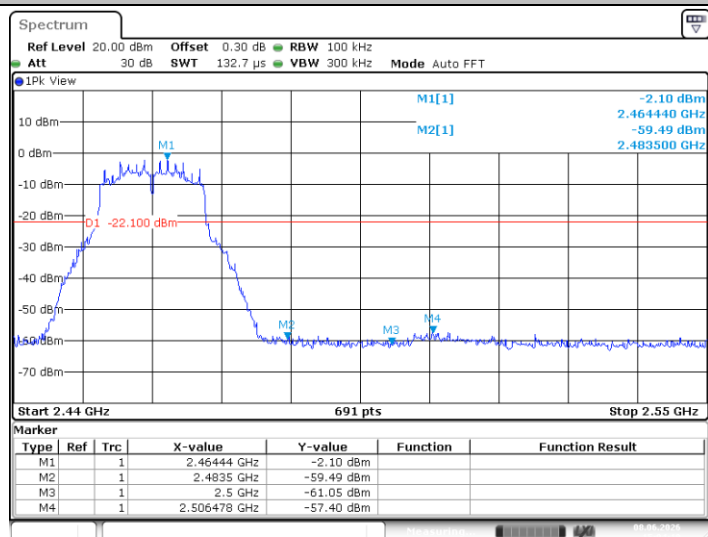


11G_Ant1_Low_2412



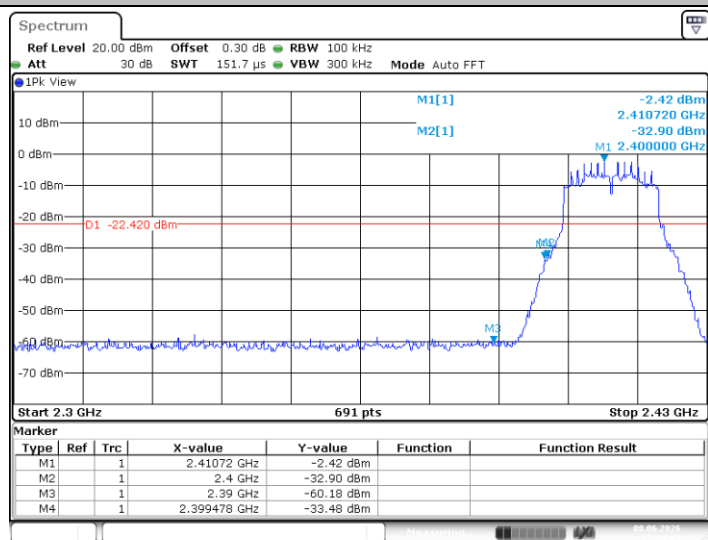
Date: 8.JUN.2026 14:54:52

11G_Ant1_High_2462



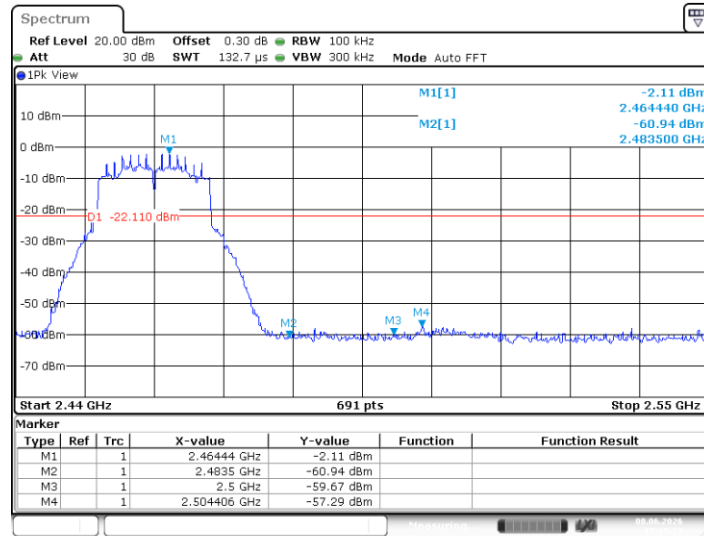
Date: 8.JUN.2026 15:04:10

11N20SISO_Ant1_Low_2412



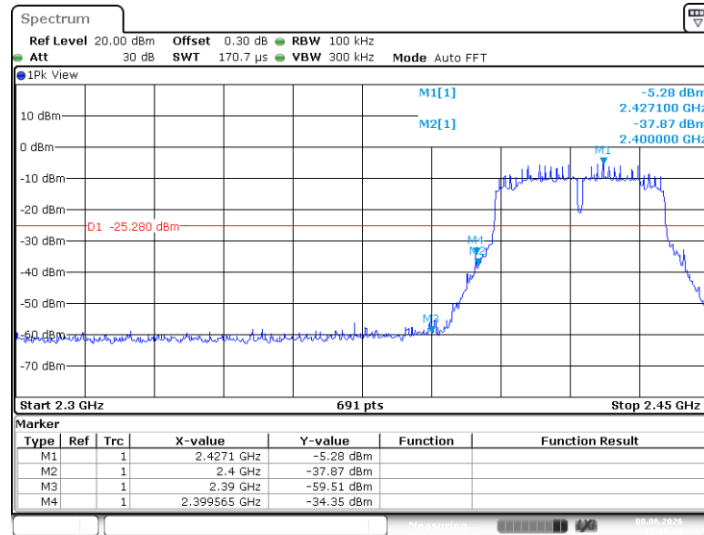
Date: 8.JUN.2026 15:09:01

11N20SISO_Ant1_High_2462



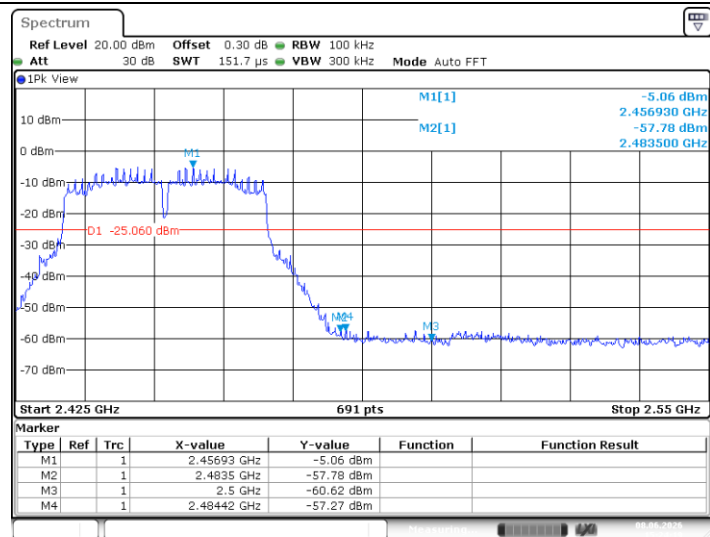
Date: 8.JUN.2026 15:15:23

11N40SISO_Ant1_Low_2422



Date: 8.JUN.2026 15:18:43

11N40SISO_Ant1_High_2452



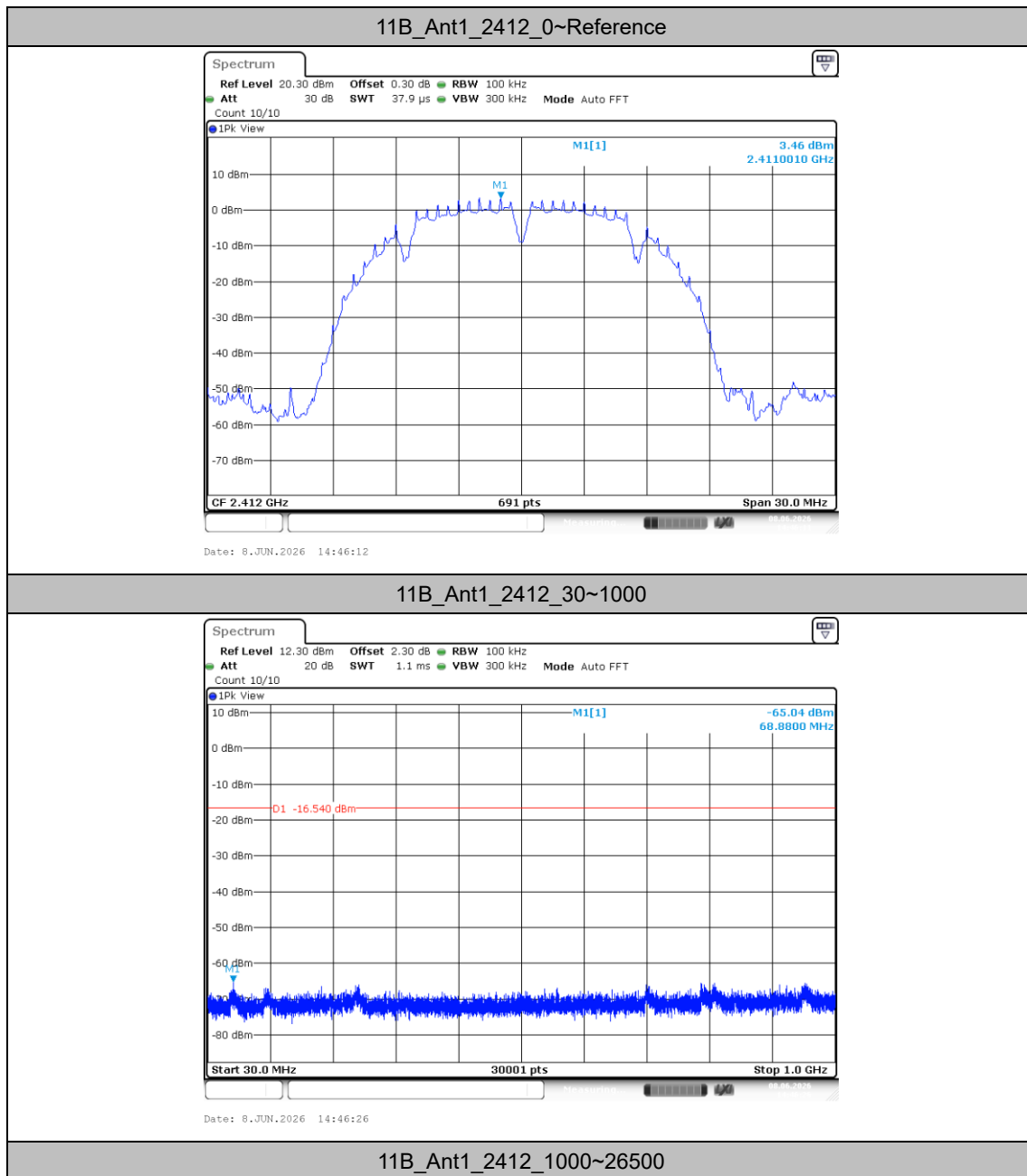
Date: 8.JUN.2026 15:24:19

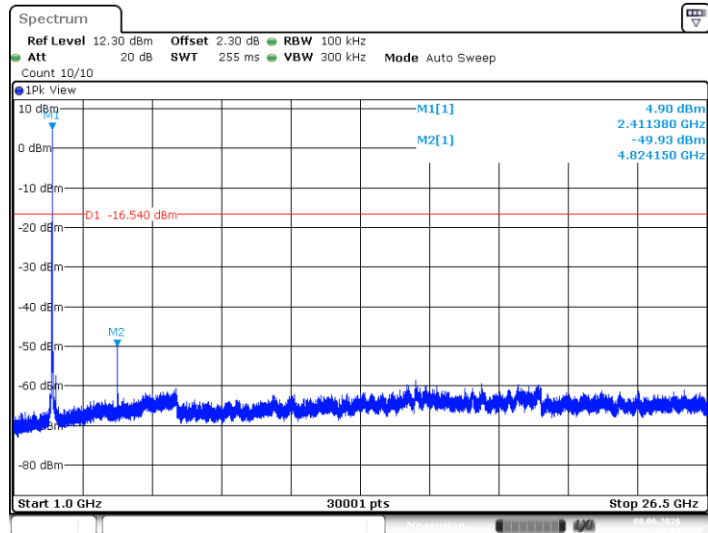
Appendix F: Conducted Spurious Emission

Test Result

TestMode	Antenna	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	3.46	3.46	---	PASS
			30~1000	3.46	-65.04	≤-16.54	PASS
			1000~26500	3.46	-49.93	≤-16.54	PASS
		2437	Reference	3.50	3.50	---	PASS
			30~1000	3.50	-61.44	≤-16.5	PASS
			1000~26500	3.50	-50.39	≤-16.5	PASS
		2462	Reference	3.62	3.62	---	PASS
			30~1000	3.62	-64.92	≤-16.38	PASS
			1000~26500	3.62	-51.86	≤-16.38	PASS
11G	Ant1	2412	Reference	-2.02	-2.02	---	PASS
			30~1000	-2.02	-65.1	≤-22.02	PASS
			1000~26500	-2.02	-56.79	≤-22.02	PASS
		2437	Reference	-1.97	-1.97	---	PASS
			30~1000	-1.97	-65.09	≤-21.97	PASS
			1000~26500	-1.97	-56.38	≤-21.97	PASS
		2462	Reference	-1.80	-1.80	---	PASS
			30~1000	-1.80	-62.14	≤-21.8	PASS
			1000~26500	-1.80	-57.27	≤-21.8	PASS
11N20SISO	Ant1	2412	Reference	-2.04	-2.04	---	PASS
			30~1000	-2.04	-64.37	≤-22.04	PASS
			1000~26500	-2.04	-57.1	≤-22.04	PASS
		2437	Reference	-2.09	-2.09	---	PASS
			30~1000	-2.09	-64.93	≤-22.09	PASS
			1000~26500	-2.09	-57.64	≤-22.09	PASS
		2462	Reference	-1.78	-1.78	---	PASS
			30~1000	-1.78	-63.47	≤-21.78	PASS
			1000~26500	-1.78	-57.07	≤-21.78	PASS
11N40SISO	Ant1	2422	Reference	-5.17	-5.17	---	PASS
			30~1000	-5.17	-62.72	≤-25.17	PASS
			1000~26500	-5.17	-59.48	≤-25.17	PASS
		2437	Reference	-4.98	-4.98	---	PASS
			30~1000	-4.98	-64.07	≤-24.98	PASS
			1000~26500	-4.98	-59.59	≤-24.98	PASS
		2452	Reference	-5.03	-5.03	---	PASS
			30~1000	-5.03	-65.12	≤-25.03	PASS
			1000~26500	-5.03	-58.75	≤-25.03	PASS

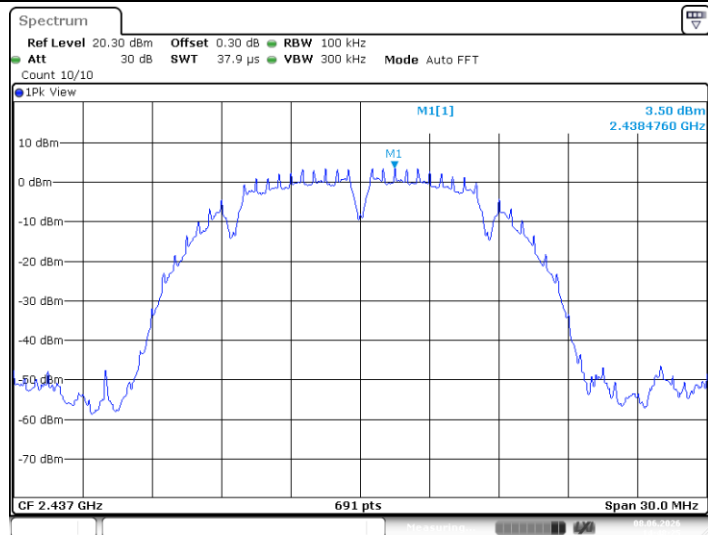
Test Graphs





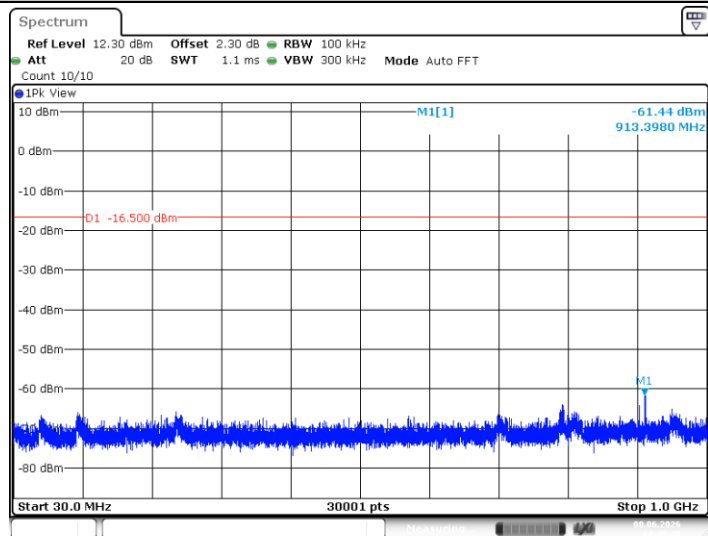
Date: 8.JUN.2026 14:47:04

11B_Ant1_2437_0~Reference



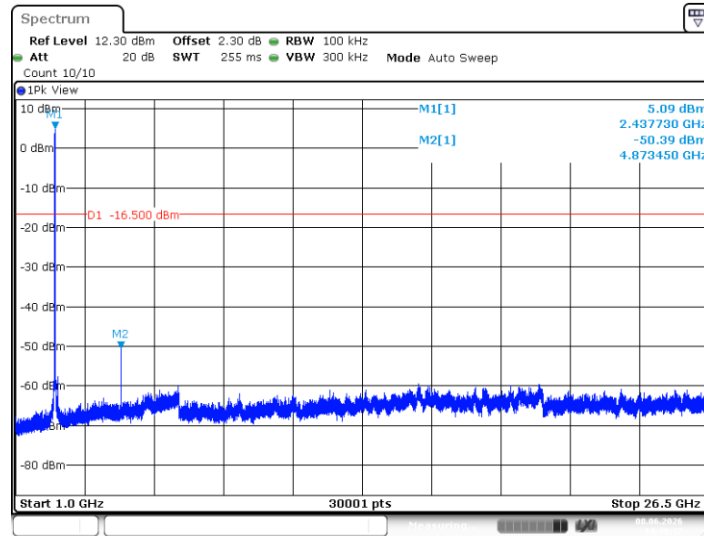
Date: 8.JUN.2026 14:48:26

11B_Ant1_2437_30~1000



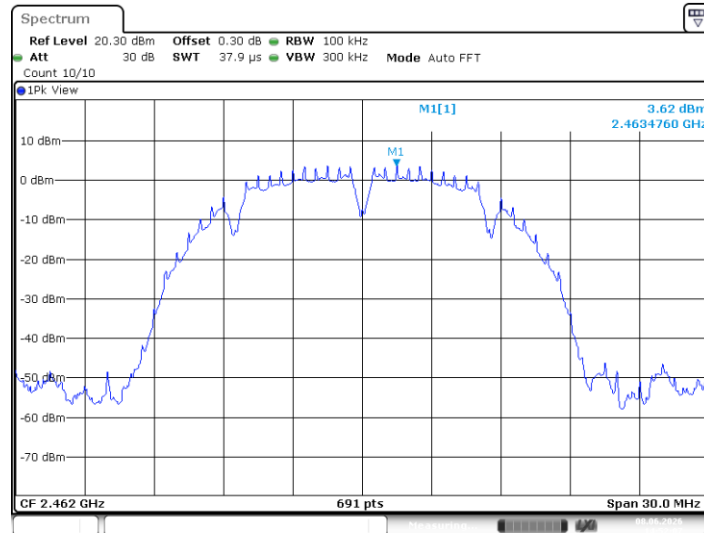
Date: 8.JUN.2026 14:48:40

11B_Ant1_2437_1000~26500



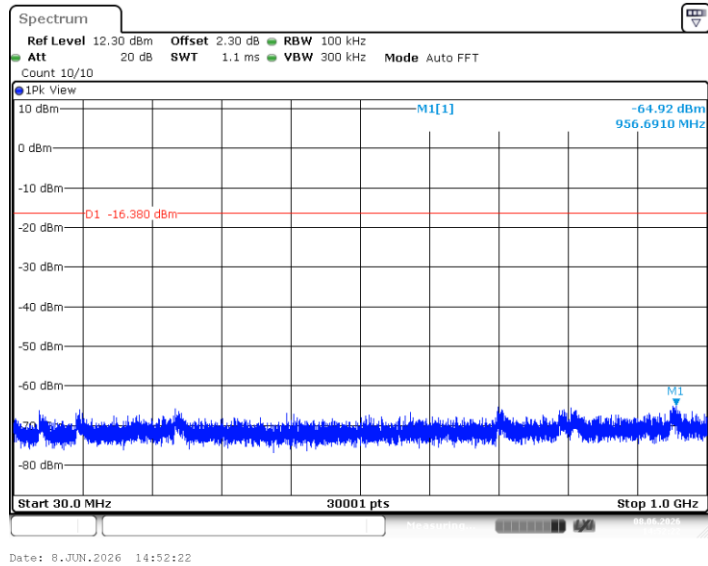
Date: 8.JUN.2026 14:49:18

11B_Ant1_2462_0~Reference

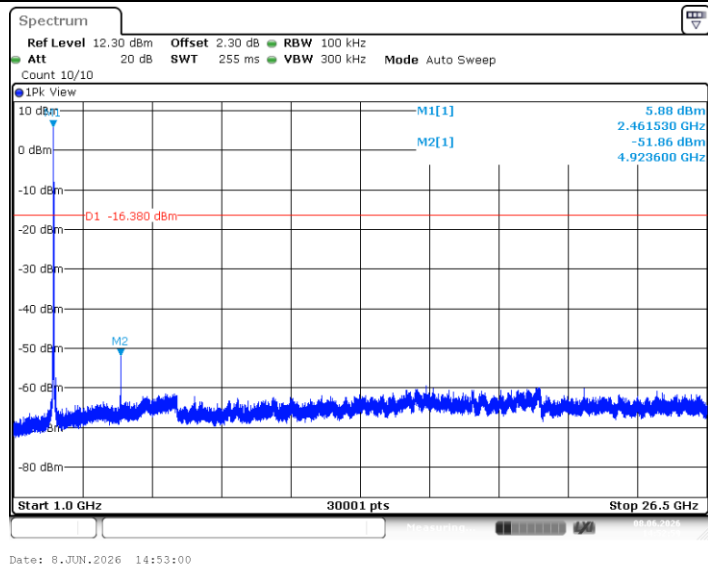


Date: 8.JUN.2026 14:52:08

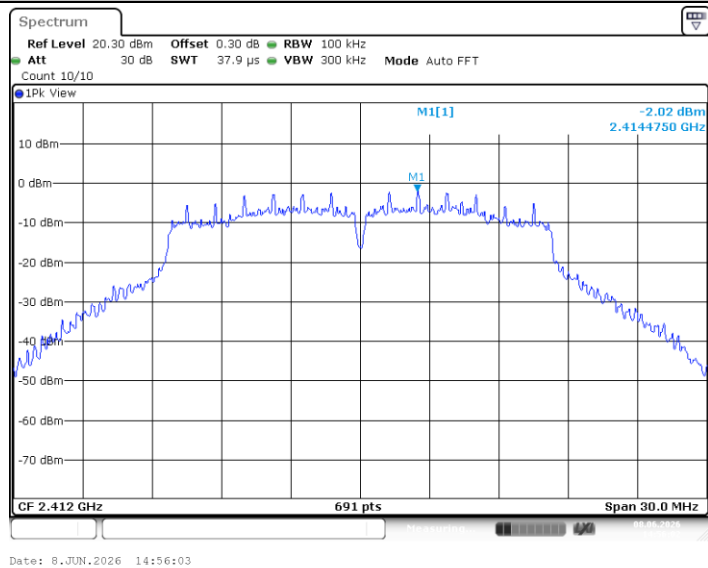
11B_Ant1_2462_30~1000



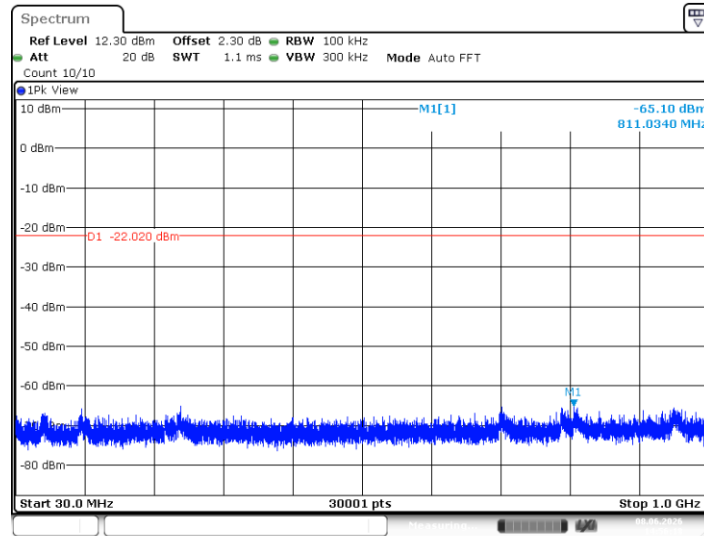
11B_Ant1_2462_1000~26500



11G_Ant1_2412_0~Reference

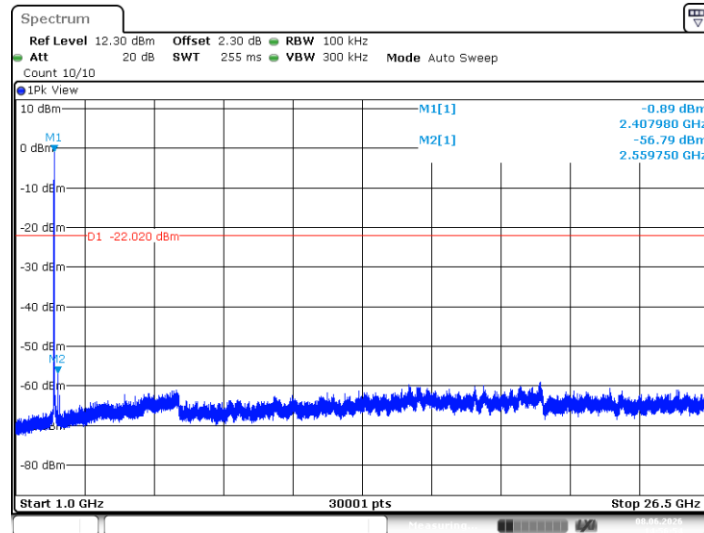


11G_Ant1_2412_30~1000



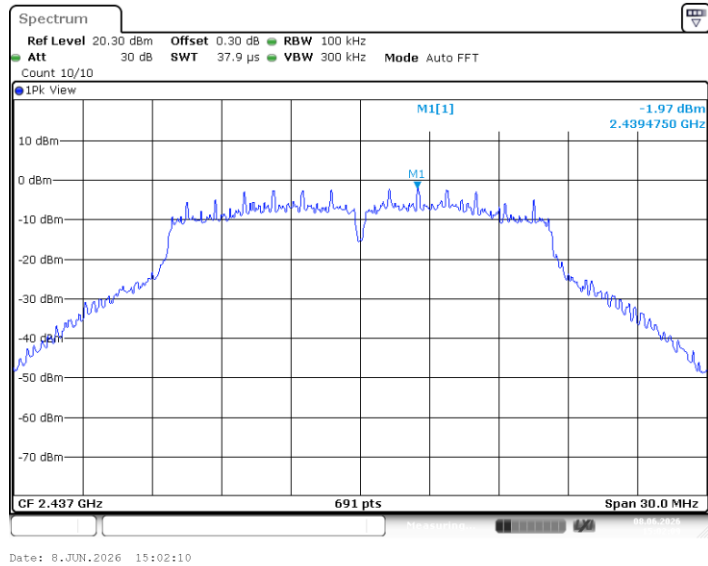
Date: 8.JUN.2026 14:56:17

11G_Ant1_2412_1000~26500

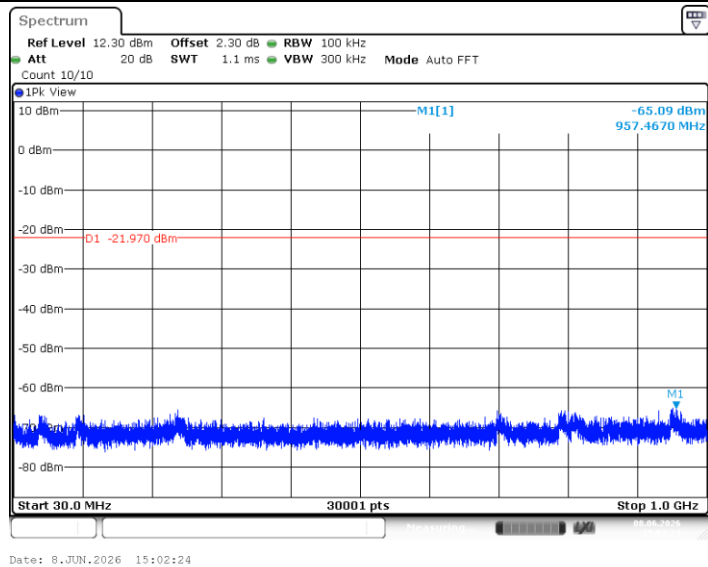


Date: 8.JUN.2026 14:56:55

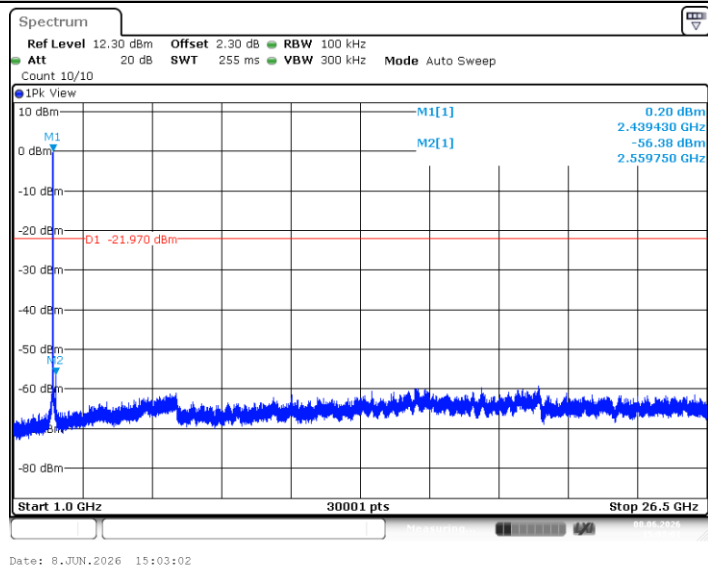
11G_Ant1_2437_0~Reference



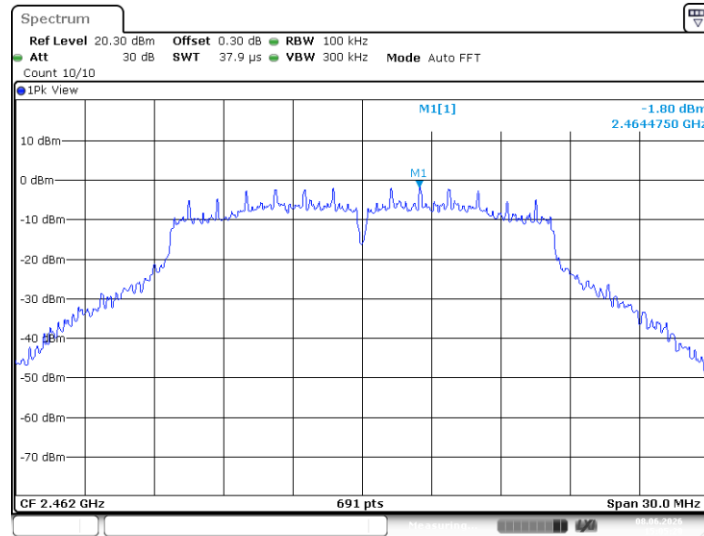
11G_Ant1_2437_30~1000



11G_Ant1_2437_1000~26500

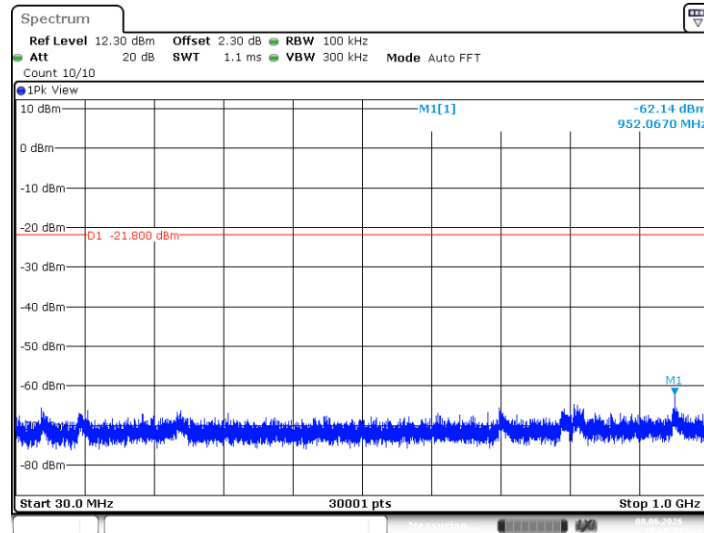


11G_Ant1_2462_0~Reference



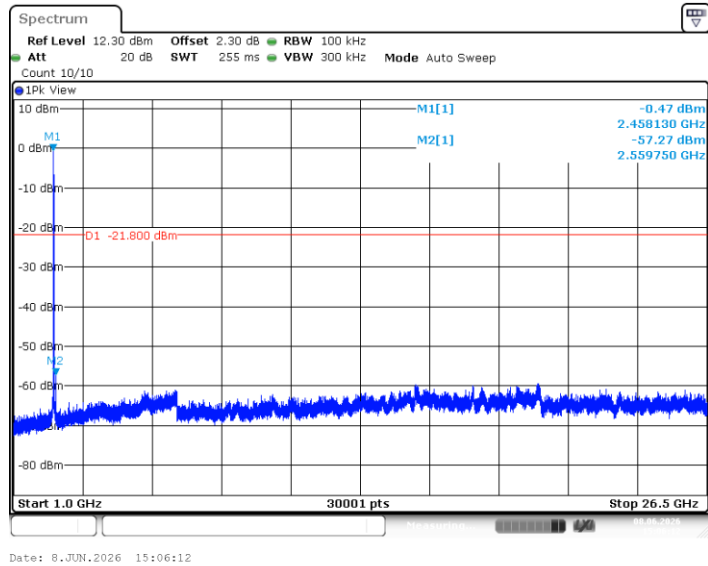
Date: 8.JUN.2026 15:05:20

11G_Ant1_2462_30~1000

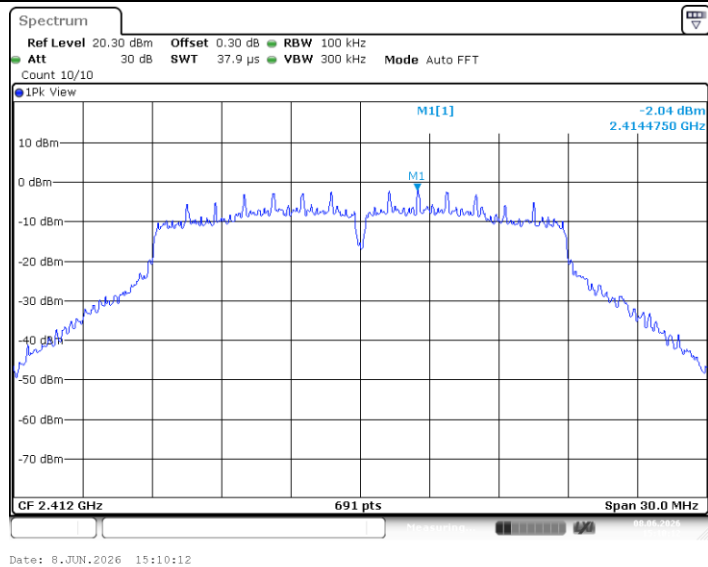


Date: 8.JUN.2026 15:05:35

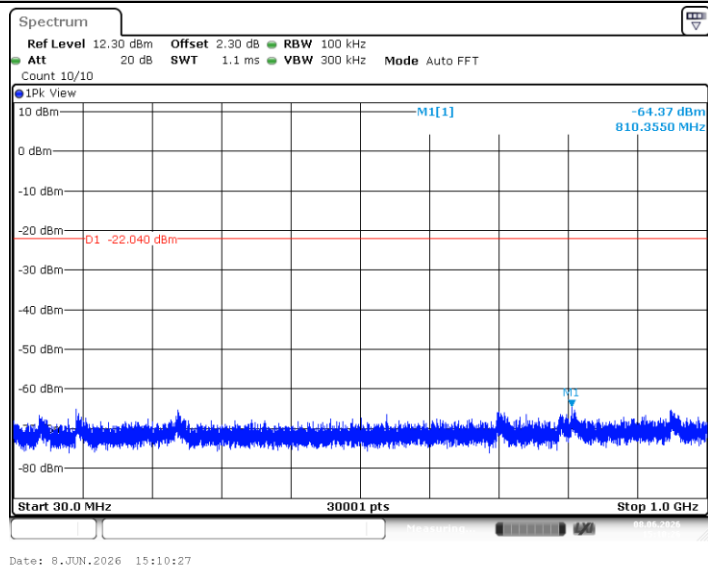
11G_Ant1_2462_1000~26500



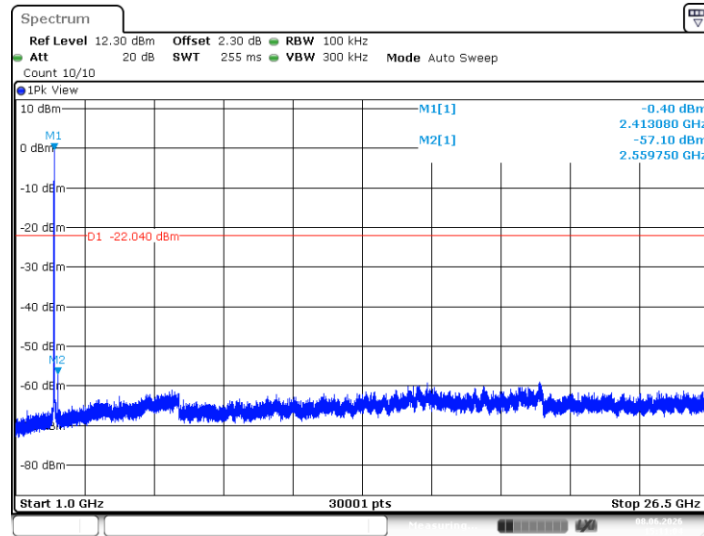
11N20SISO_Ant1_2412_0~Reference



11N20SISO_Ant1_2412_30~1000

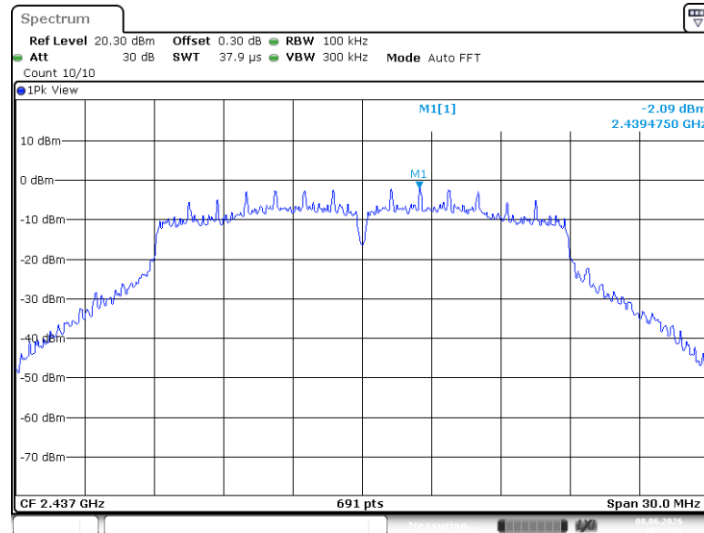


11N20SISO_Ant1_2412_1000~26500



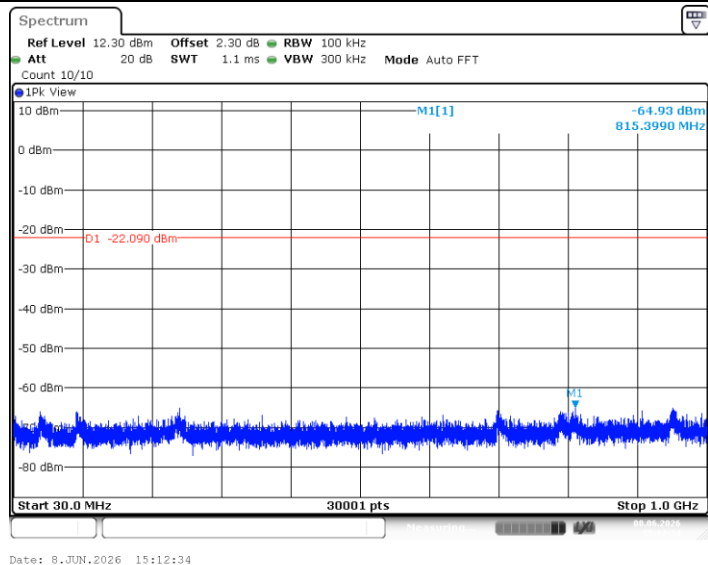
Date: 8.JUN.2026 15:11:04

11N20SISO_Ant1_2437_0~Reference

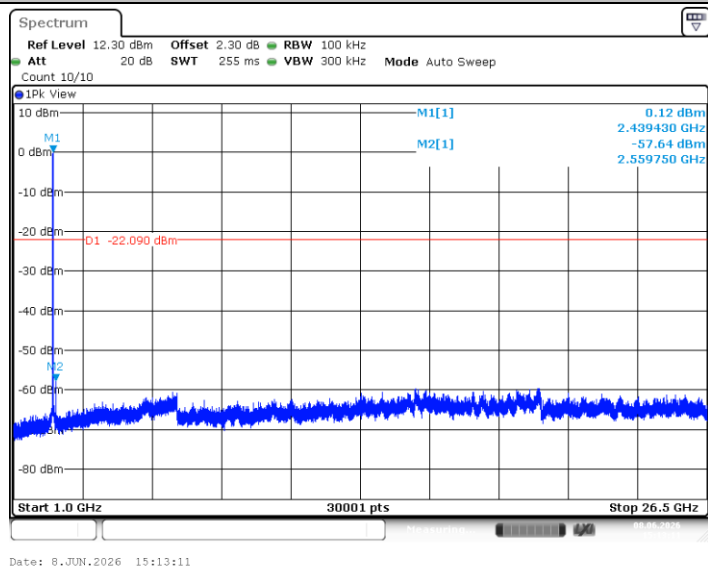


Date: 8.JUN.2026 15:12:19

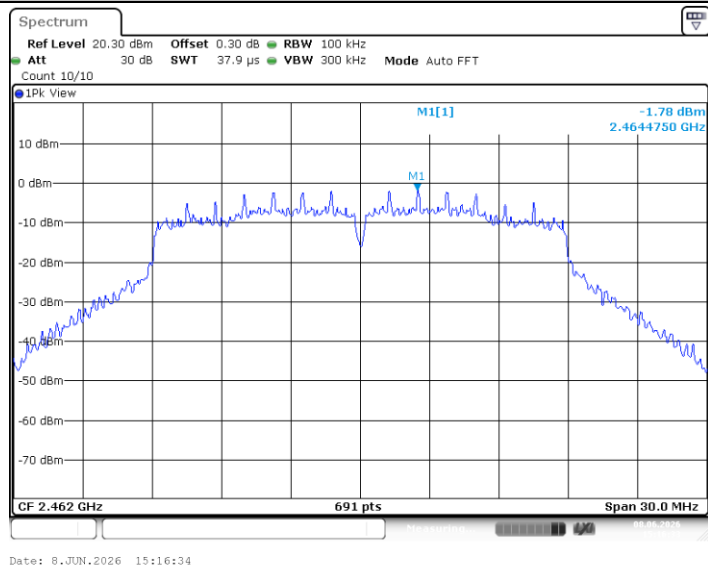
11N20SISO_Ant1_2437_30~1000



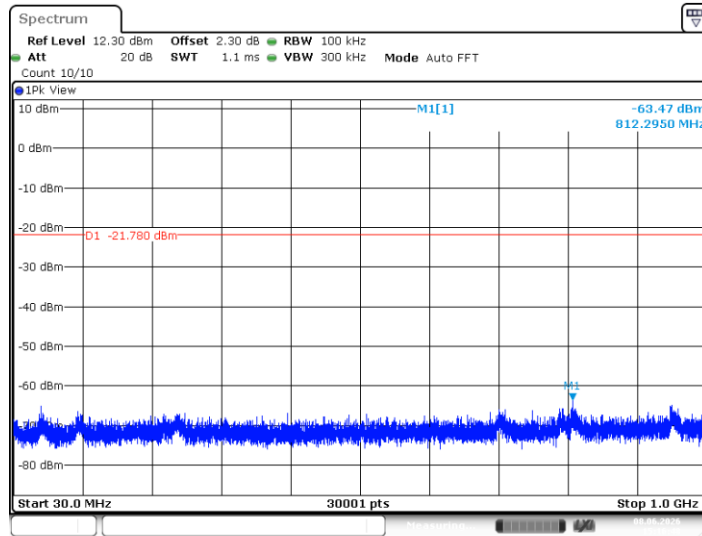
11N20SISO_Ant1_2437_1000~26500



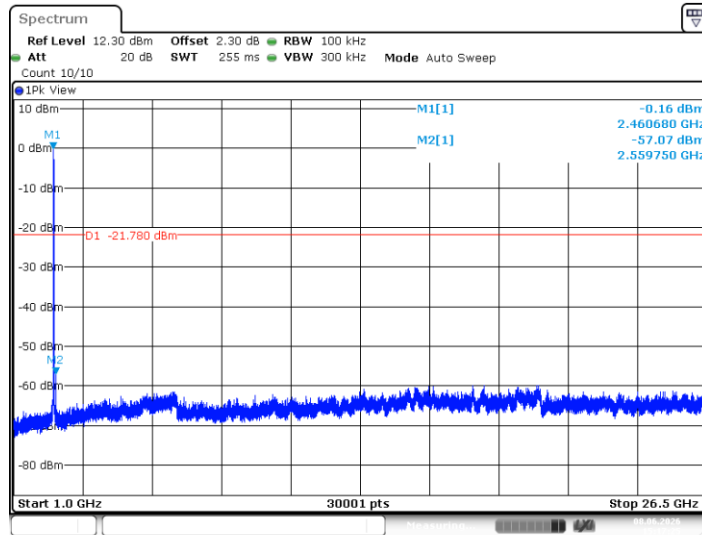
11N20SISO_Ant1_2462_0~Reference



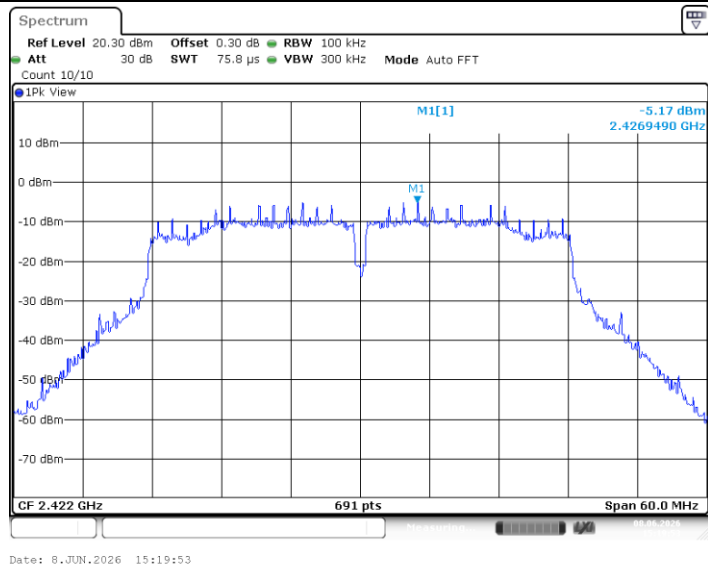
11N20SISO_Ant1_2462_30~1000



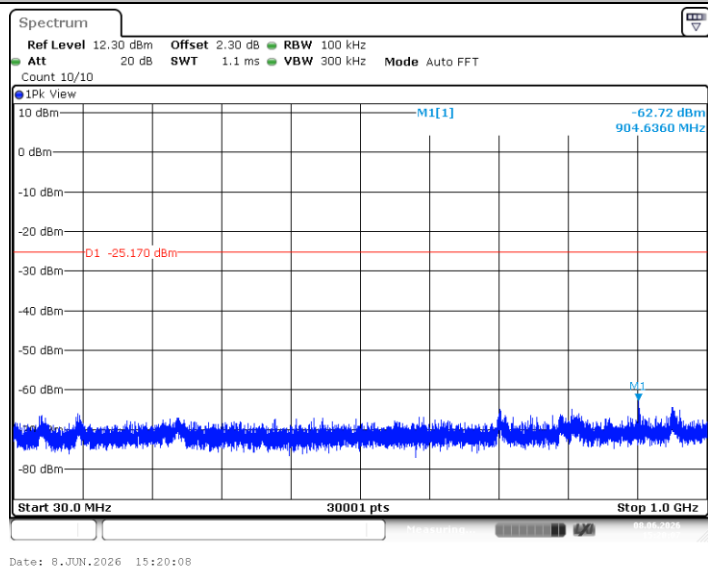
11N20SISO_Ant1_2462_1000~26500



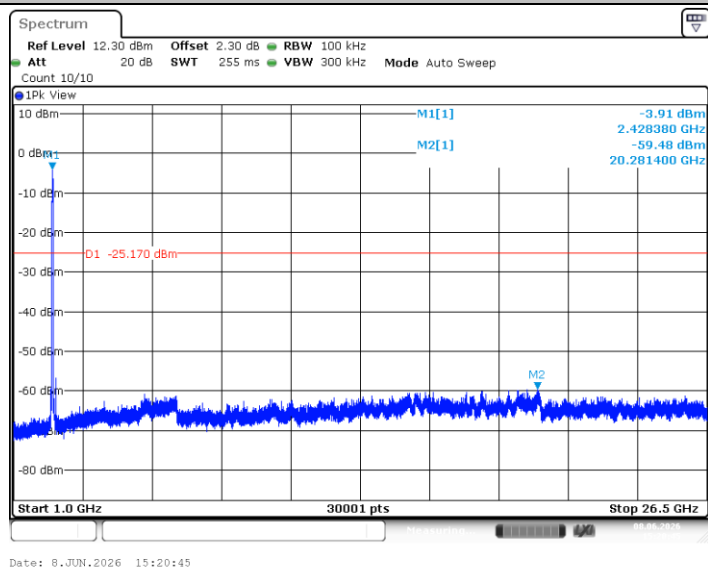
11N40SISO_Ant1_2422_0~Reference



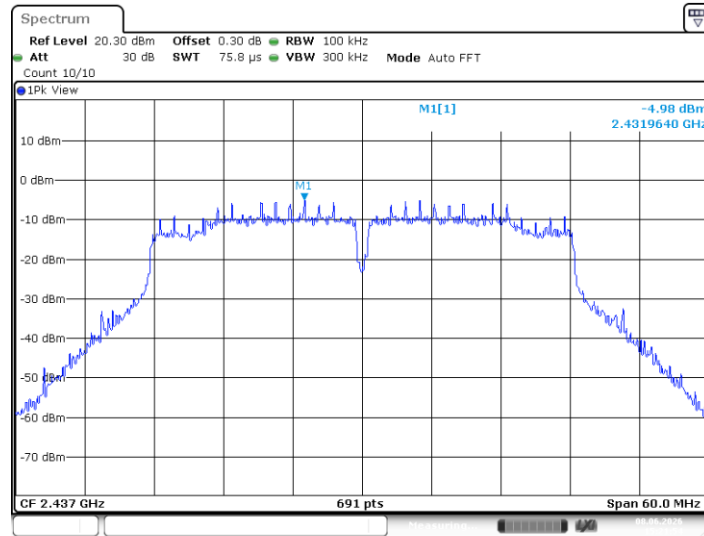
11N40SISO_Ant1_2422_30~1000



11N40SISO_Ant1_2422_1000~26500

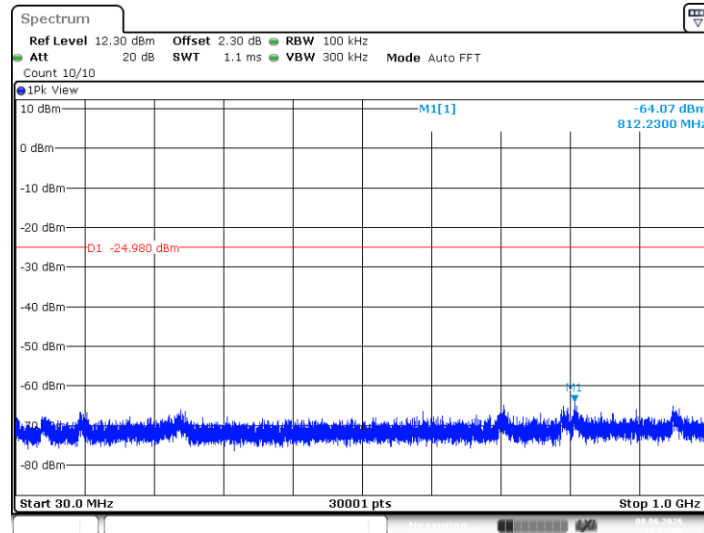


11N40SISO_Ant1_2437_0~Reference



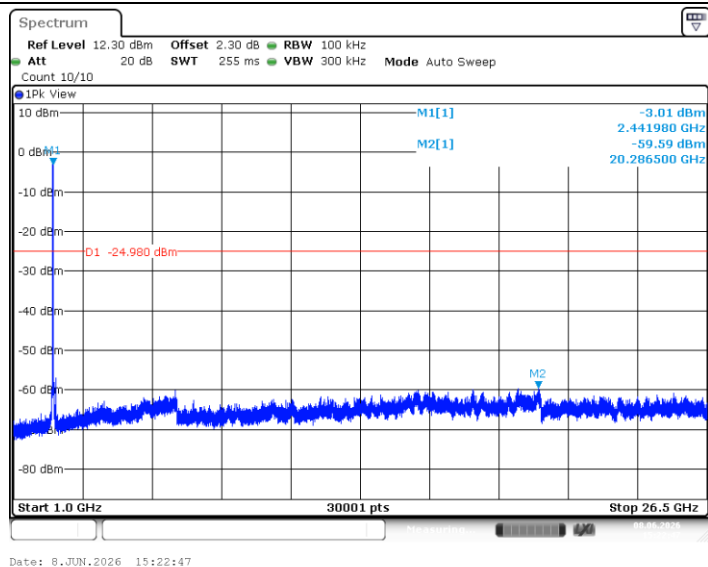
Date: 8.JUN.2026 15:21:55

11N40SISO_Ant1_2437_30~1000

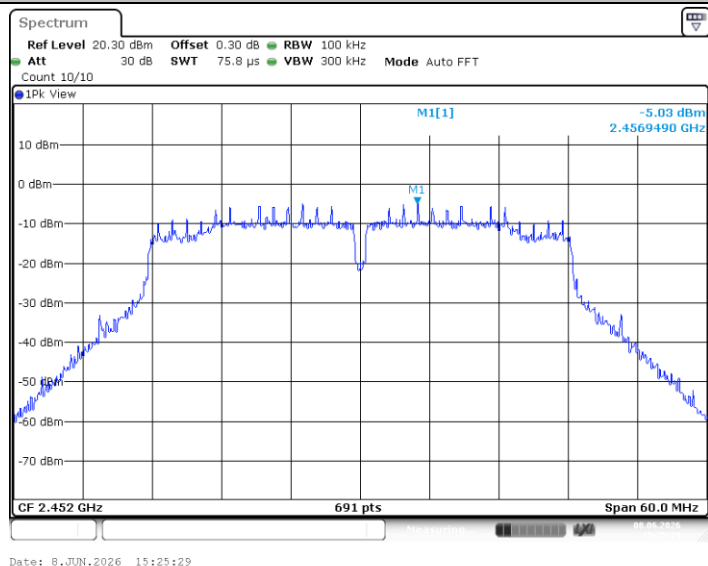


Date: 8.JUN.2026 15:22:09

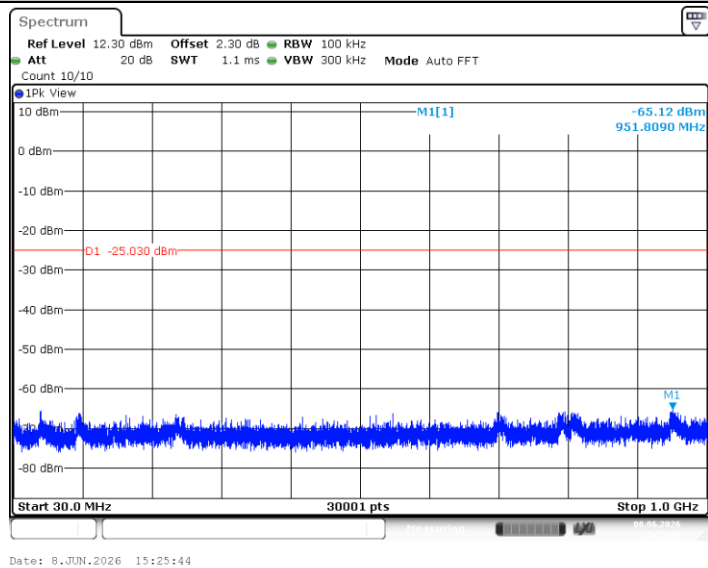
11N40SISO_Ant1_2437_1000~26500



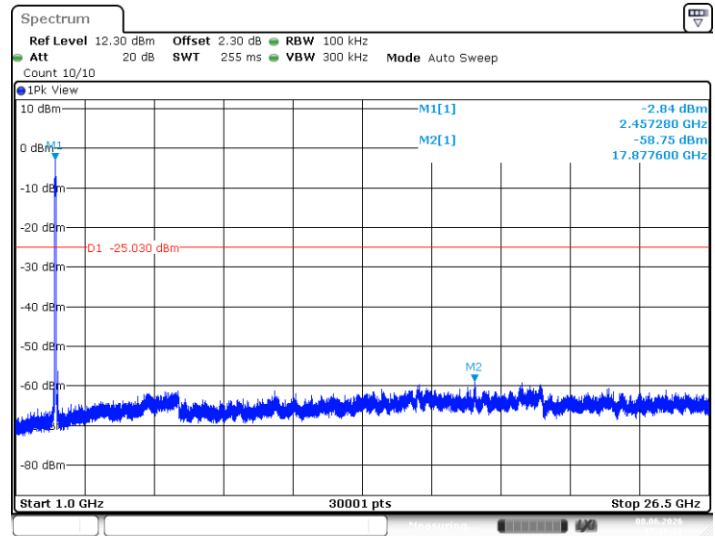
11N40SISO_Ant1_2452_0~Reference



11N40SISO_Ant1_2452_30~1000



11N40SISO_Ant1_2452_1000~26500



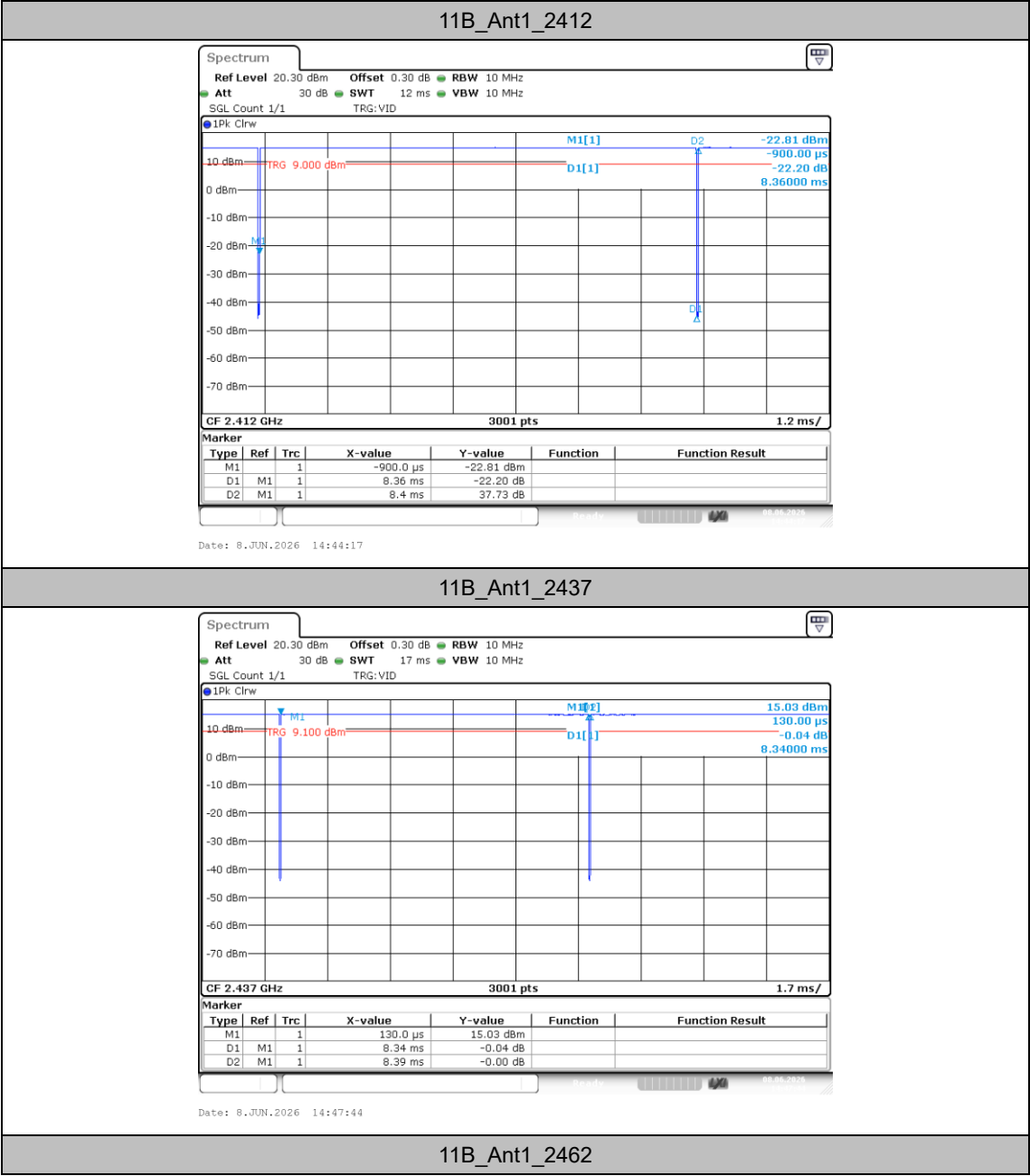
Date: 8.JUN.2026 15:26:21

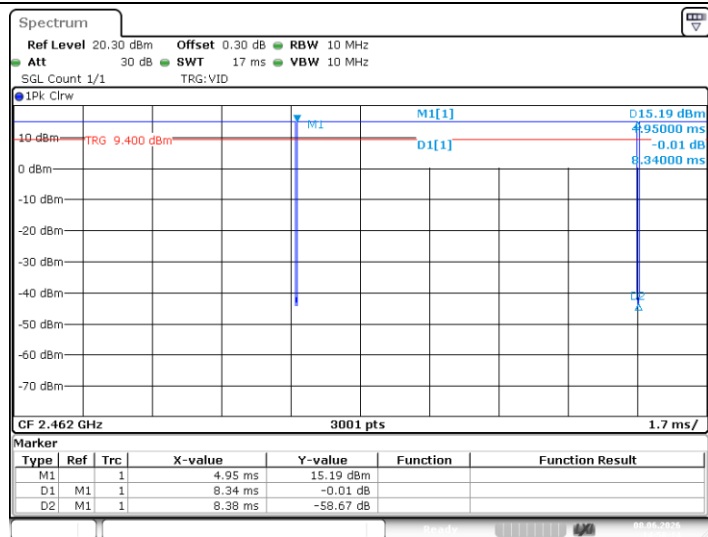
Appendix G: Duty Cycle

Test Result

TestMode	Antenna	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	DC Factor [dB]	T Factor [dB]
11B	Ant1	2412	8.36	8.40	99.52	0.02	0.12
		2437	8.34	8.39	99.40	0.03	0.12
		2462	8.34	8.38	99.52	0.02	0.12
11G	Ant1	2412	0.15	0.19	78.95	1.03	6.67
		2437	0.14	0.19	73.68	1.33	7.14
		2462	0.15	0.20	75.00	1.25	6.67
11N20SISO	Ant1	2412	0.18	0.22	81.82	0.87	5.56
		2437	0.18	0.23	78.26	1.06	5.56
		2462	0.17	0.22	77.27	1.12	5.88
11N40SISO	Ant1	2422	0.18	0.23	78.26	1.06	5.56
		2437	0.18	0.23	78.26	1.06	5.56
		2452	0.18	0.23	78.26	1.06	5.56

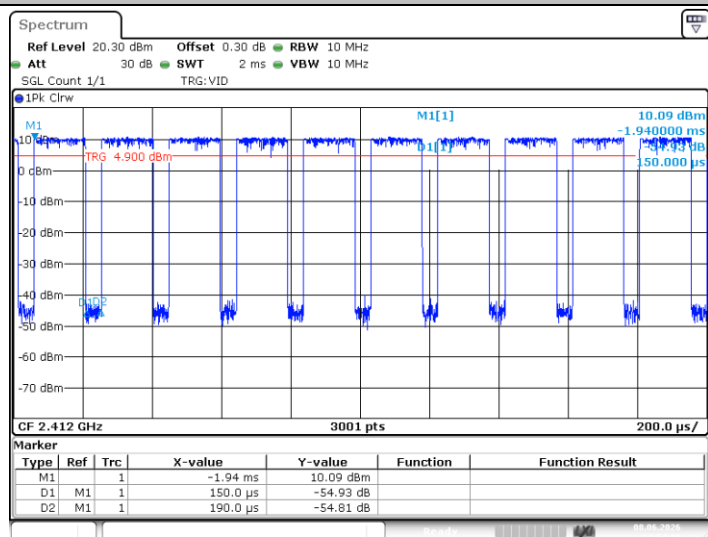
Test Graphs





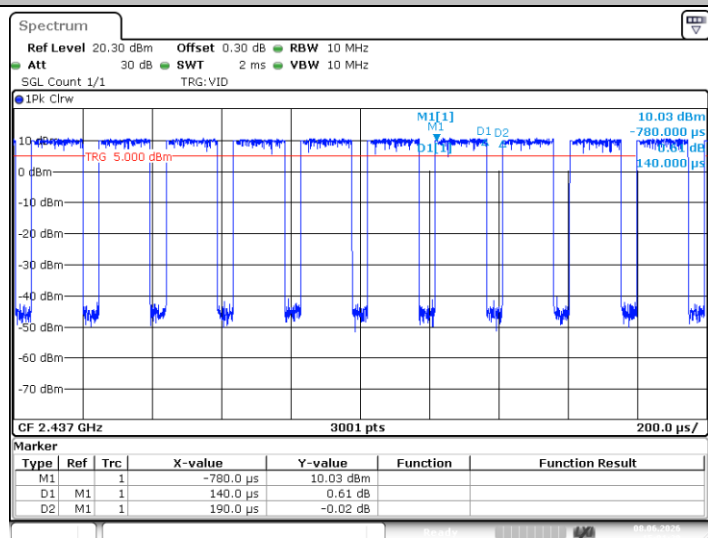
Date: 8.JUN.2026 14:50:15

11G_Ant1_2412



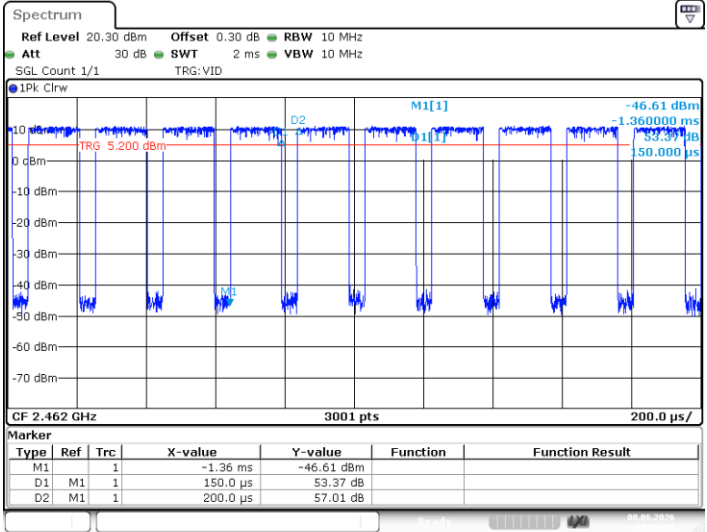
Date: 8.JUN.2026 14:54:09

11G_Ant1_2437



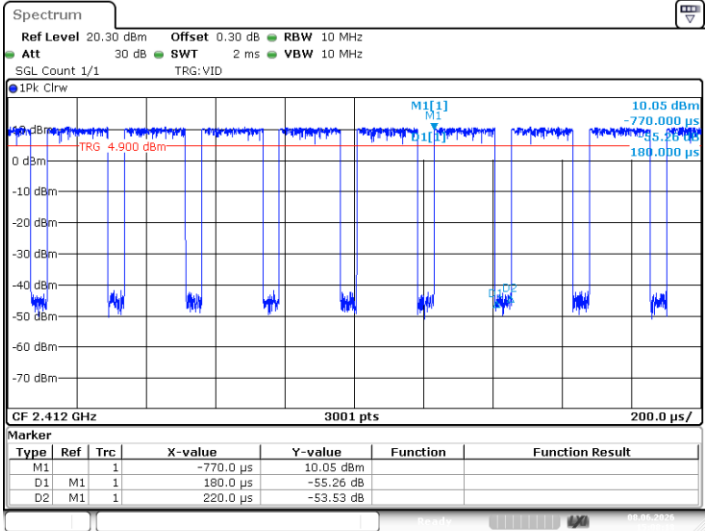
Date: 8.JUN.2026 15:01:28

11G_Ant1_2462



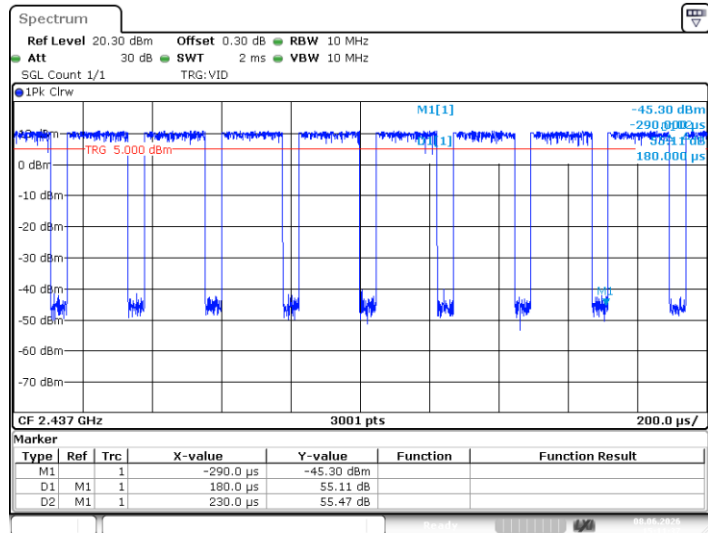
Date: 8.JUN.2026 15:03:27

11N20SISO_Ant1_2412



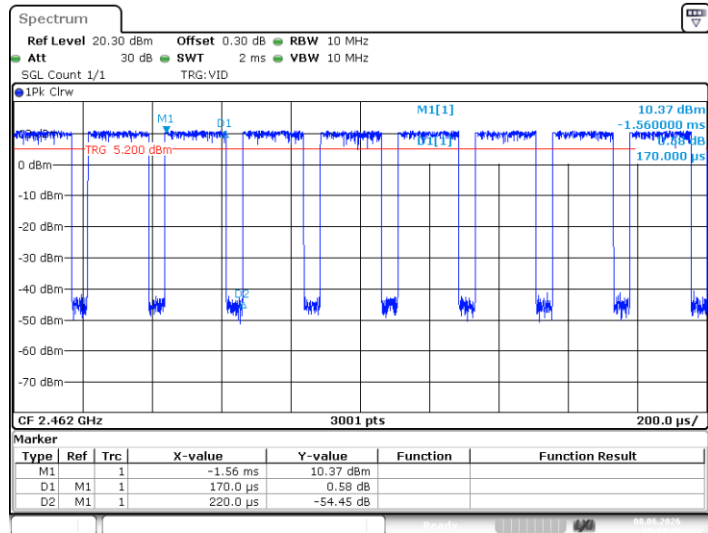
Date: 8.JUN.2026 15:08:18

11N20SISO_Ant1_2437



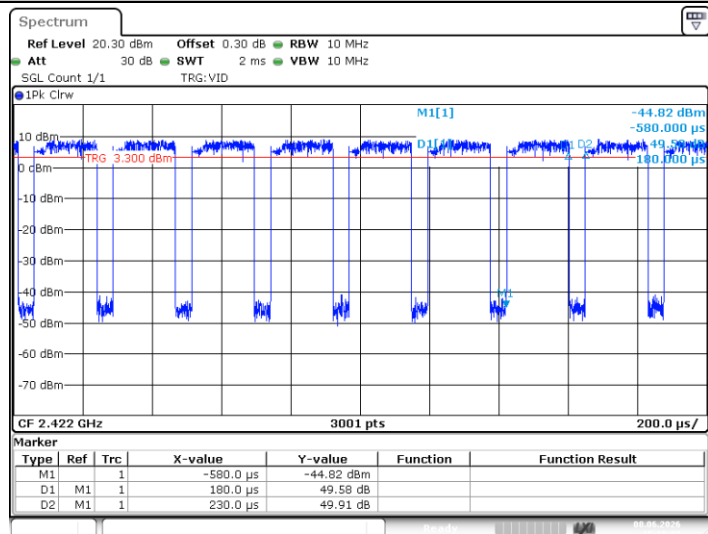
Date: 8.JUN.2026 15:11:38

11N20SISO_Ant1_2462



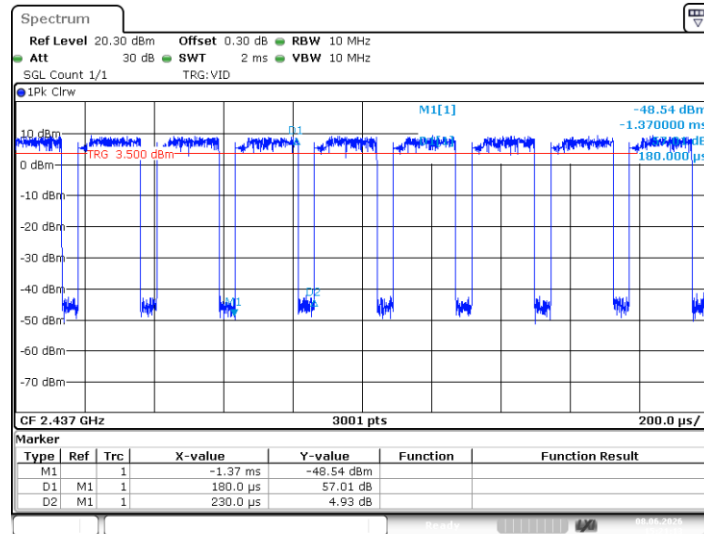
Date: 8.JUN.2026 15:14:40

11N40SISO_Ant1_2422



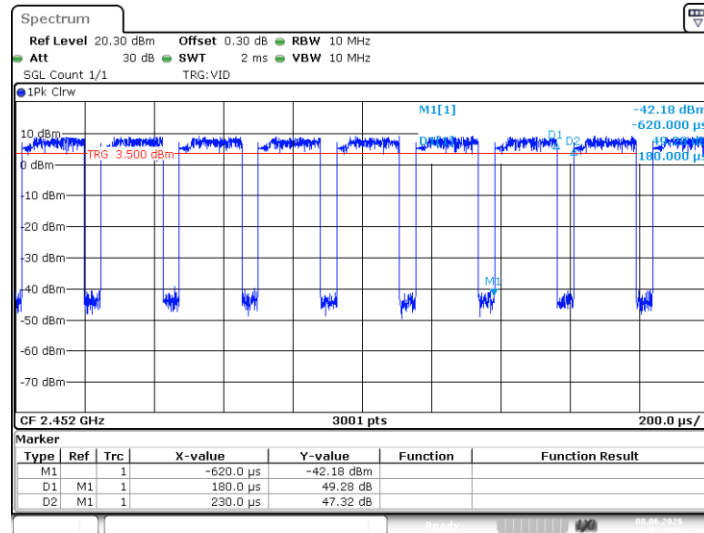
Date: 8.JUN.2026 15:18:00

11N40SISO_Ant1_2437



Date: 8.JUN.2026 15:21:13

11N40SISO_Ant1_2452



Date: 8.JUN.2026 15:23:35

Appendix H: Emissions in Restricted Bands

Test Result

TestMod e	Antenn a	ChNam e	Frequen cy[MHz]	Detector	Freq [MHz]	Result [dBm]	Gain [dB]	DC Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
11B	Ant1	Low	2412	AV	2310.000	-59.7	2.00	0.02	37.52	≤54	PASS
				AV	2386.101	-52.33	2.00	0.02	44.89	≤54	PASS
				AV	2390.000	-55.97	2.00	0.02	41.25	≤54	PASS
				Peak	2310.000	-48.82	2.00	0.00	48.38	≤74	PASS
				Peak	2385.725	-42.77	2.00	0.00	54.43	≤74	PASS
				Peak	2390.000	-45.81	2.00	0.00	51.39	≤74	PASS
		High	2462	AV	2483.500	-55.01	2.00	0.02	42.21	≤54	PASS
				AV	2487.826	-53.01	2.00	0.02	44.21	≤54	PASS
				AV	2500.000	-58	2.00	0.02	39.22	≤54	PASS
				Peak	2483.500	-45.43	2.00	0.00	51.77	≤74	PASS
				Peak	2488.623	-43.8	2.00	0.00	53.40	≤74	PASS
				Peak	2500.000	-46.6	2.00	0.00	50.60	≤74	PASS
11G	Ant1	Low	2412	AV	2310.000	-59.91	2.00	1.03	38.32	≤54	PASS
				AV	2340.130	-57.93	2.00	1.03	40.30	≤54	PASS
				AV	2390.000	-59.29	2.00	1.03	38.94	≤54	PASS
				Peak	2310.000	-48.45	2.00	0.00	48.75	≤74	PASS
				Peak	2340.319	-45.88	2.00	0.00	51.32	≤74	PASS
				Peak	2390.000	-47.84	2.00	0.00	49.36	≤74	PASS
		High	2462	AV	2483.500	-58.87	2.00	1.25	39.58	≤54	PASS
				AV	2483.522	-58.87	2.00	1.25	39.58	≤54	PASS
				AV	2500.000	-59.57	2.00	1.25	38.88	≤54	PASS
				Peak	2483.500	-47.02	2.00	0.00	50.18	≤74	PASS
				Peak	2489.899	-46.86	2.00	0.00	50.34	≤74	PASS
				Peak	2500.000	-48.16	2.00	0.00	49.04	≤74	PASS
11N20SI SO	Ant1	Low	2412	AV	2310.000	-59.95	2.00	0.87	38.12	≤54	PASS
				AV	2339.942	-57.92	2.00	0.87	40.15	≤54	PASS
				AV	2390.000	-59.19	2.00	0.87	38.88	≤54	PASS
				Peak	2310.000	-49.09	2.00	0.00	48.11	≤74	PASS
				Peak	2339.754	-46.7	2.00	0.00	50.50	≤74	PASS
				Peak	2390.000	-48.51	2.00	0.00	48.69	≤74	PASS
		High	2462	AV	2483.500	-58.89	2.00	1.12	39.43	≤54	PASS
				AV	2483.522	-58.89	2.00	1.12	39.43	≤54	PASS
				AV	2500.000	-59.53	2.00	1.12	38.79	≤54	PASS
				Peak	2483.500	-47.83	2.00	0.00	49.37	≤74	PASS
				Peak	2487.507	-47.23	2.00	0.00	49.97	≤74	PASS
				Peak	2500.000	-48.67	2.00	0.00	48.53	≤74	PASS

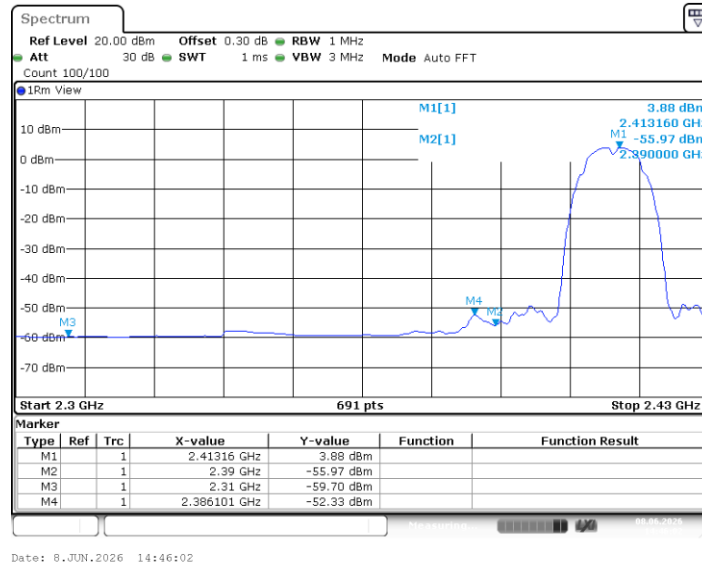
11N40SI SO	Ant1	Low	2422	AV	2310.000	-59.92	2.00	1.06	38.34	≤54	PASS
				AV	2389.565	-57.73	2.00	1.06	40.53	≤54	PASS
				AV	2390.000	-57.8	2.00	1.06	40.46	≤54	PASS
				Peak	2310.000	-49.46	2.00	0.00	47.74	≤74	PASS
				Peak	2388.478	-45.87	2.00	0.00	51.33	≤74	PASS
				Peak	2390.000	-46.09	2.00	0.00	51.11	≤74	PASS
		High	2452	AV	2483.500	-58.04	2.00	1.06	40.22	≤54	PASS
				AV	2483.514	-58.04	2.00	1.06	40.22	≤54	PASS
				AV	2500.000	-59.3	2.00	1.06	38.96	≤54	PASS
				Peak	2483.500	-46.76	2.00	0.00	50.44	≤74	PASS
				Peak	2486.775	-46.68	2.00	0.00	50.52	≤74	PASS
				Peak	2500.000	-48.34	2.00	0.00	48.86	≤74	PASS

Note:

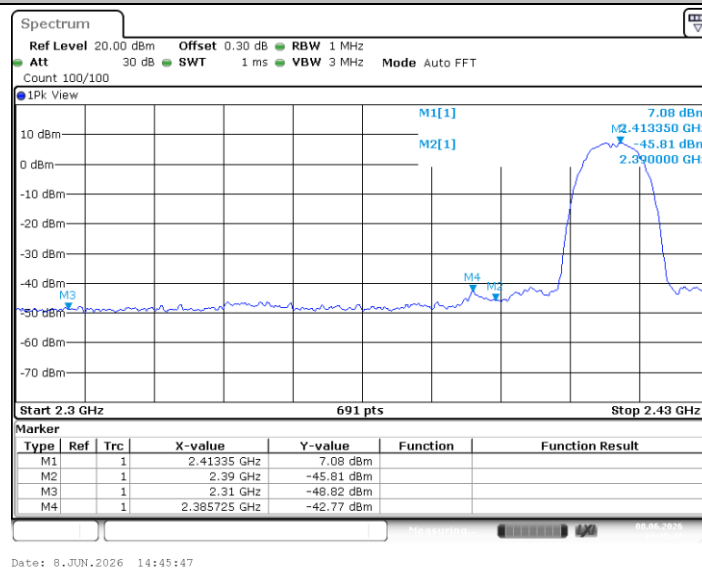
1. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

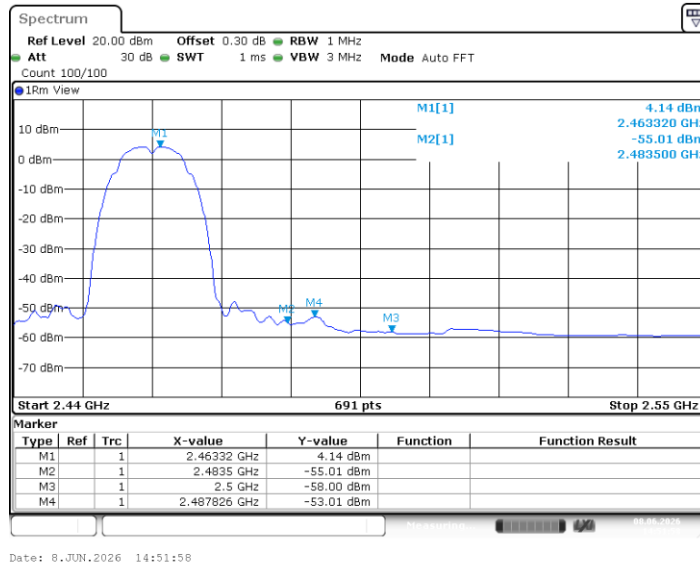
11B_Ant1_Low_2412_AV



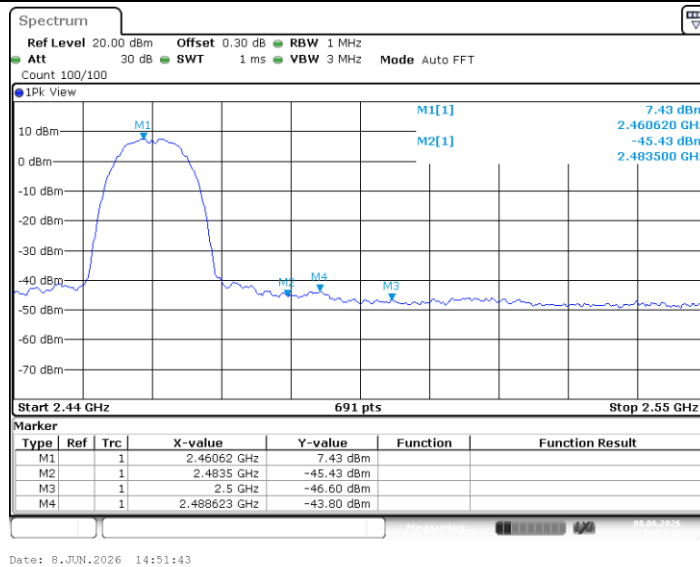
11B_Ant1_Low_2412_Peak



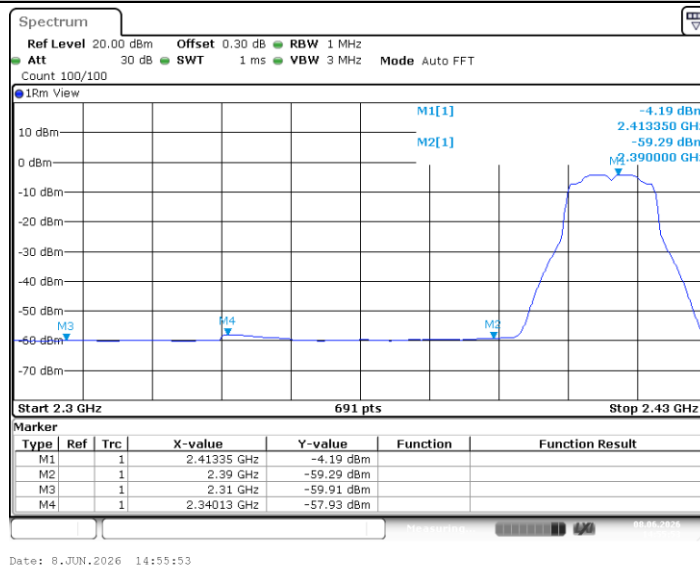
11B_Ant1_High_2462_AV



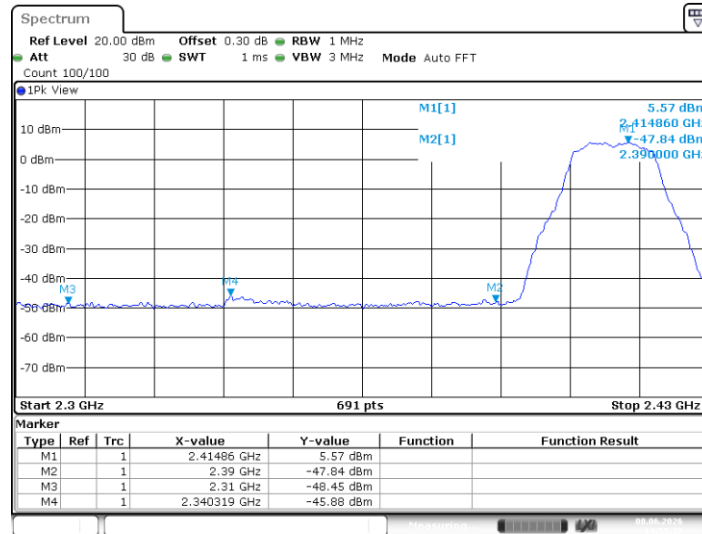
11B_Ant1_High_2462_Peak



11G_Ant1_Low_2412_AV

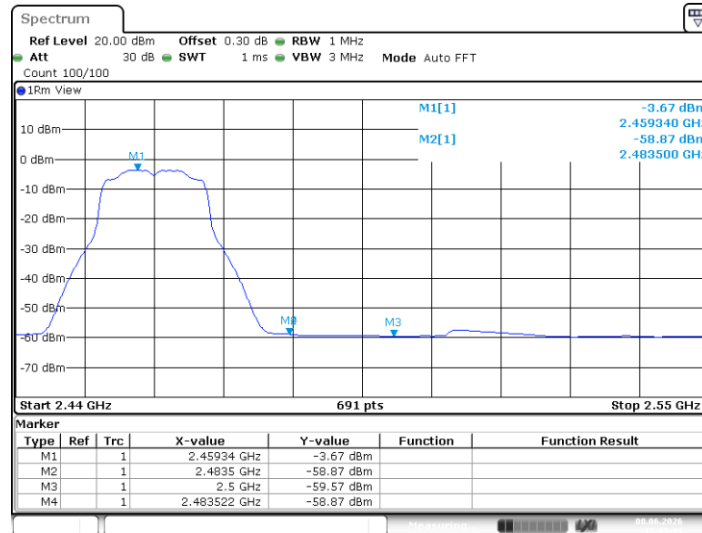


11G_Ant1_Low_2412_Peak



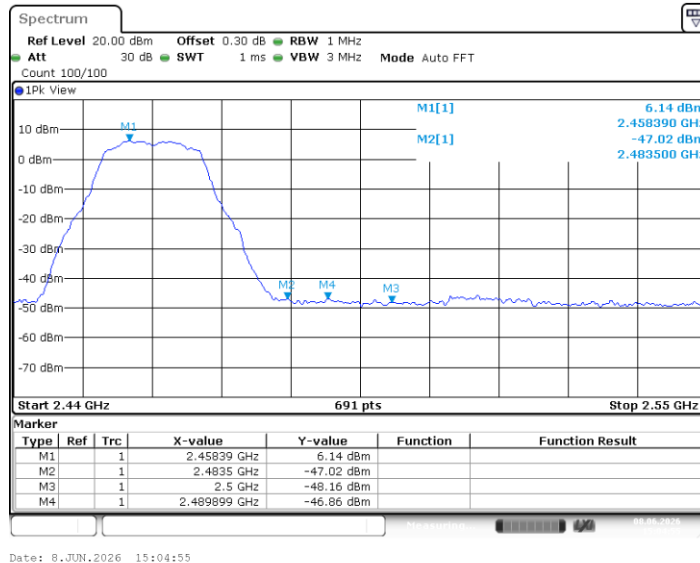
Date: 8.JUN.2026 14:55:38

11G_Ant1_High_2462_AV

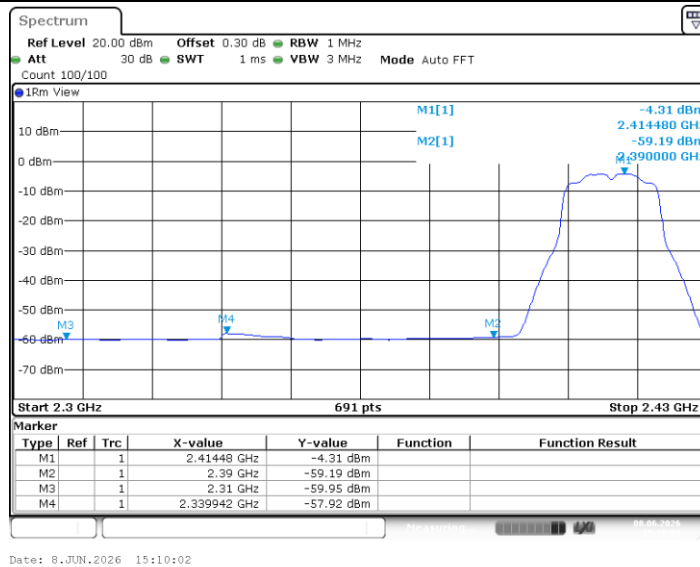


Date: 8.JUN.2026 15:05:11

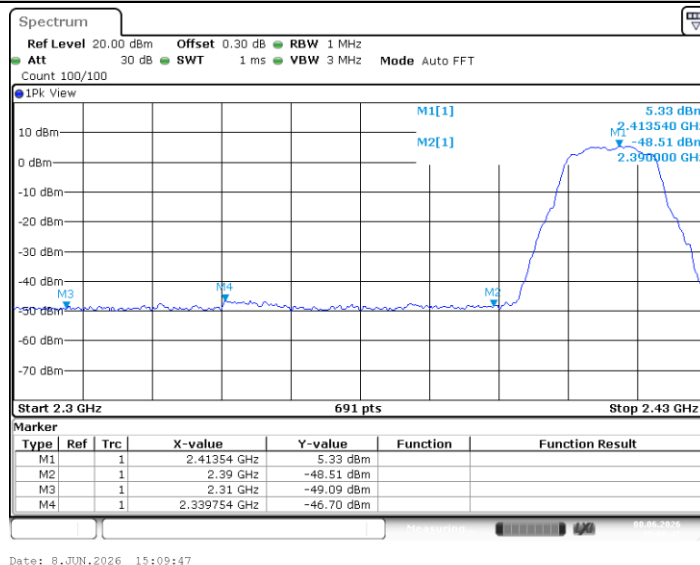
11G_Ant1_High_2462_Peak



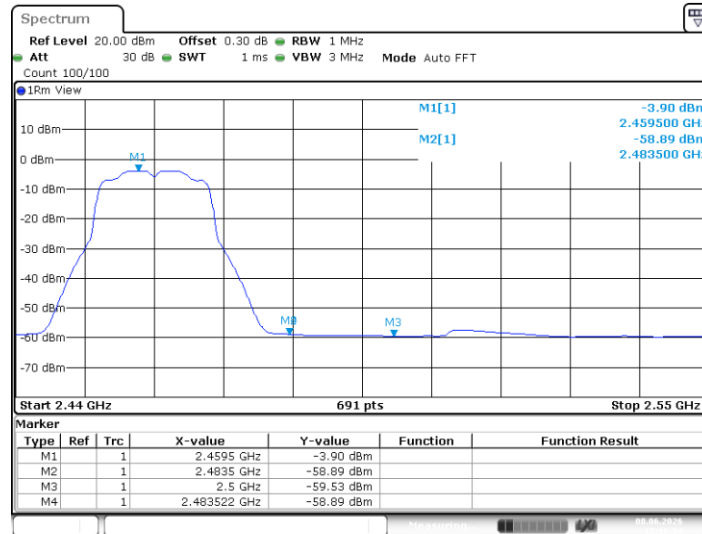
11N20SISO_Ant1_Low_2412_AV



11N20SISO_Ant1_Low_2412_Peak

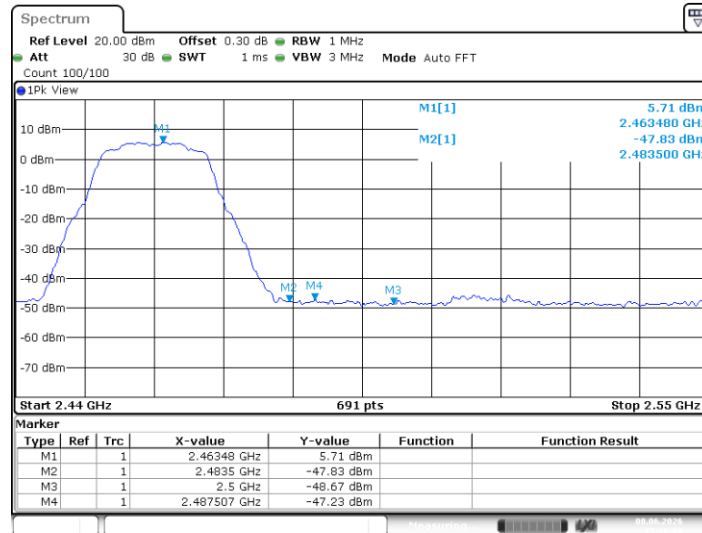


11N20SISO_Ant1_High_2462_AV



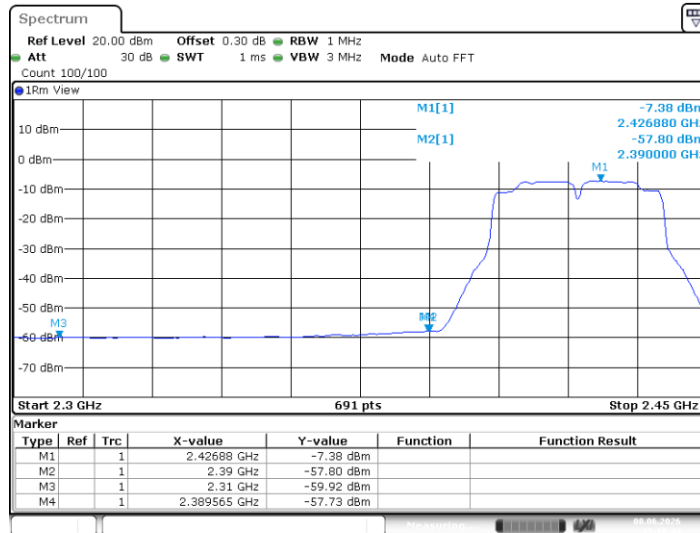
Date: 8.JUN.2026 15:16:24

11N20SISO_Ant1_High_2462_Peak



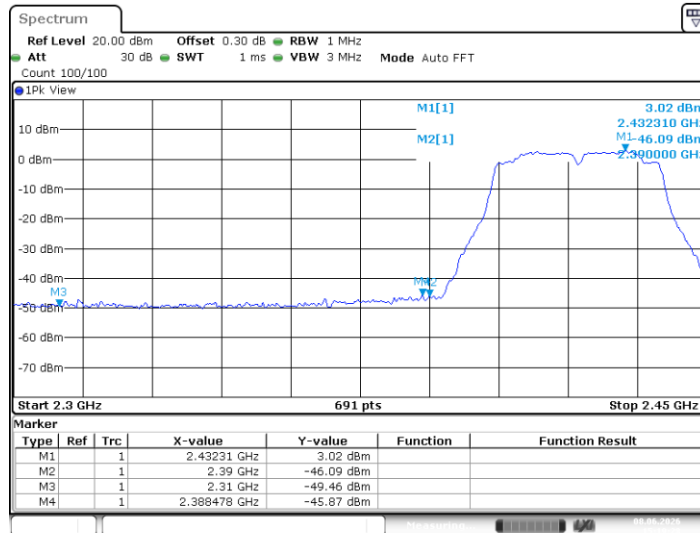
Date: 8.JUN.2026 15:16:09

11N40SISO_Ant1_Low_2422_AV



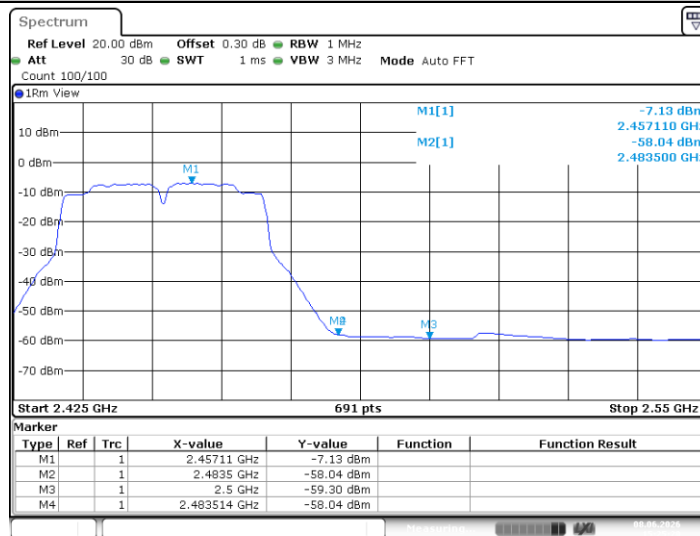
Date: 8.JUN.2026 15:19:44

11N40SISO_Ant1_Low_2422_Peak



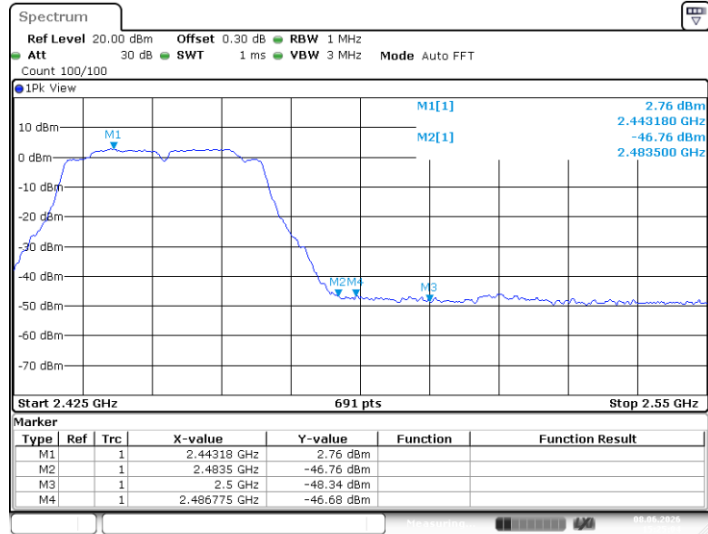
Date: 8.JUN.2026 15:19:28

11N40SISO_Ant1_High_2452_AV



Date: 8.JUN.2026 15:25:20

11N40SISO_Ant1_High_2452_Peak



Date: 8.JUN.2026 15:25:04