

RF Test Data for 2.4G Wi-Fi (Conducted Measurements)

General Description of EUT	
Product Name:	Heltec WiFi Kit LoRa Node
Test Model:	HTIT-WS
Sample ID:	RW-C-202202-0173-1-2#
Environmental Conditions	
Temperature:	23.8℃
Relative Humidity:	48%
Test Voltage:	DC 5V
Test Engineer:	Huang jian ping
Note: For a more detailed features description, please refer to the report TBR-C-202202-0173-14	

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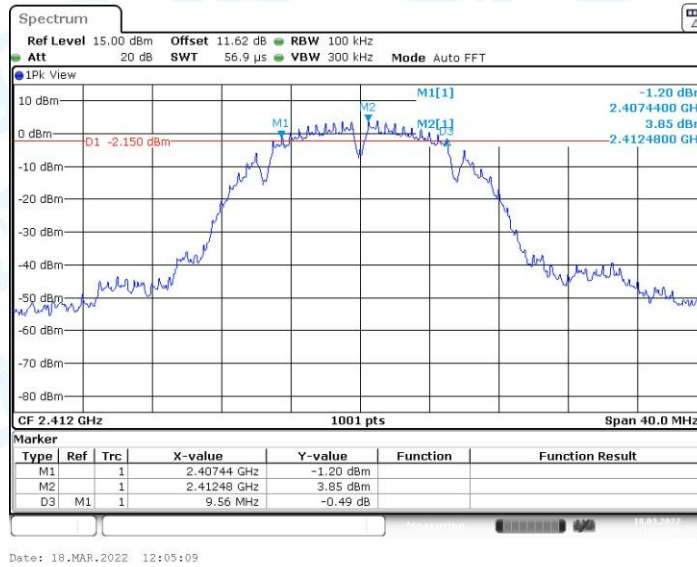
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1. DTS Bandwidth

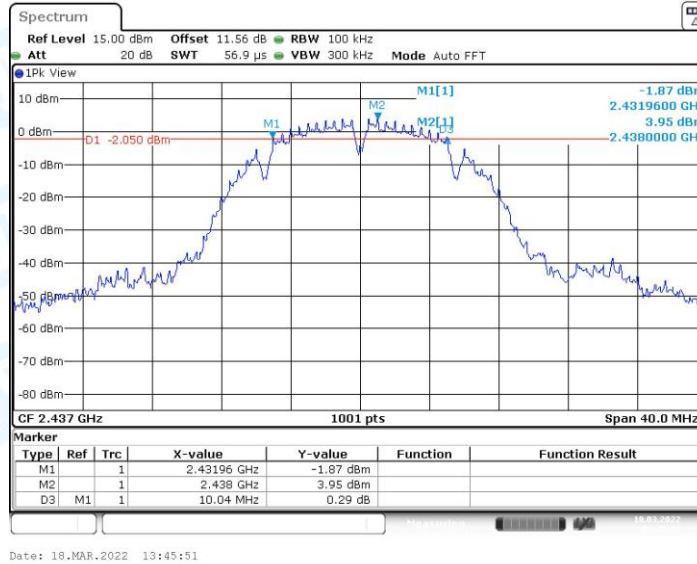
1.1. Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	9.56	2407.44	2417.00	0.5	PASS
		2437	10.04	2431.96	2442.00	0.5	PASS
		2462	10.04	2456.96	2467.00	0.5	PASS
11G	Ant1	2412	16.36	2403.80	2420.16	0.5	PASS
		2437	16.36	2428.80	2445.16	0.5	PASS
		2462	16.36	2453.80	2470.16	0.5	PASS
11N20SISO	Ant1	2412	17.56	2403.20	2420.76	0.5	PASS
		2437	17.60	2428.20	2445.80	0.5	PASS
		2462	17.60	2453.20	2470.80	0.5	PASS
11N40SISO	Ant1	2422	32.80	2405.68	2438.48	0.5	PASS
		2437	33.28	2420.36	2453.64	0.5	PASS
		2452	32.96	2435.68	2468.64	0.5	PASS

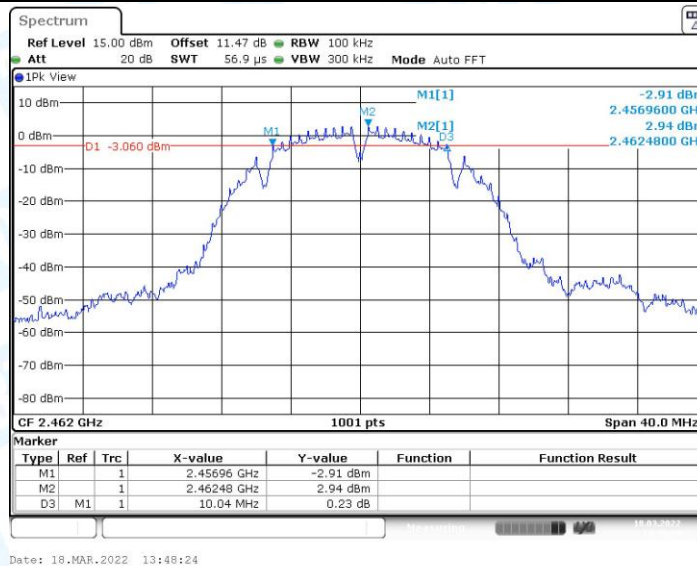
1.2. Test Graphs



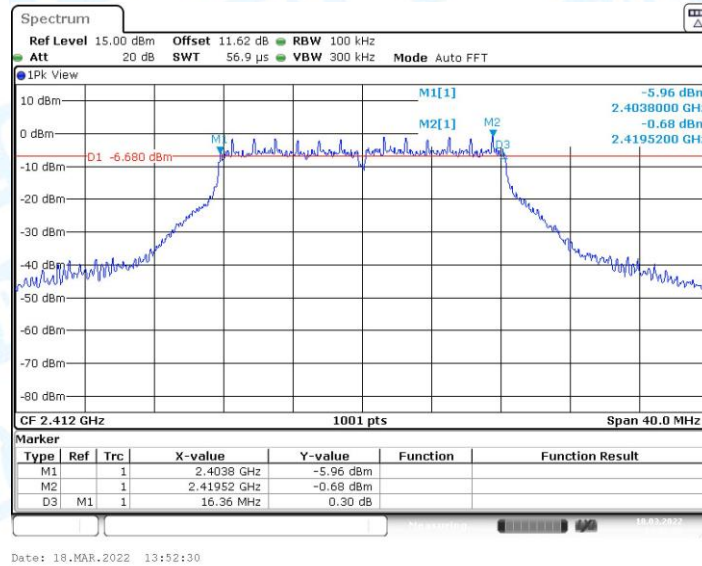
11B_Ant1_2412



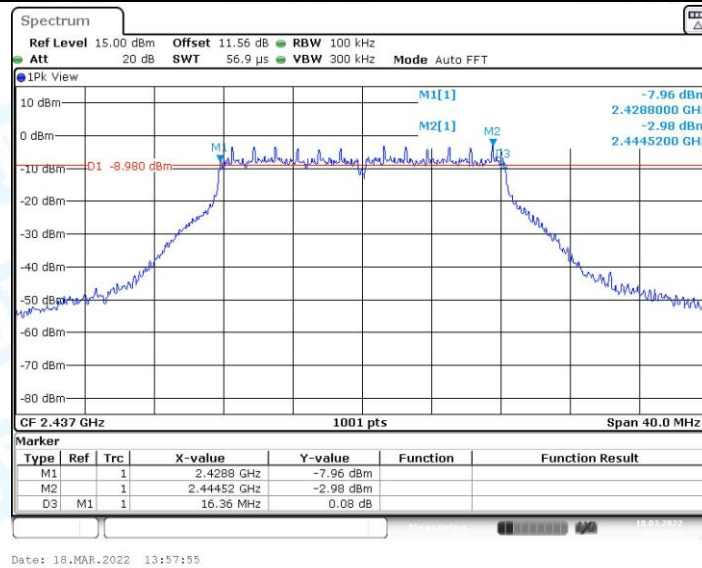
11B_Ant1_2437



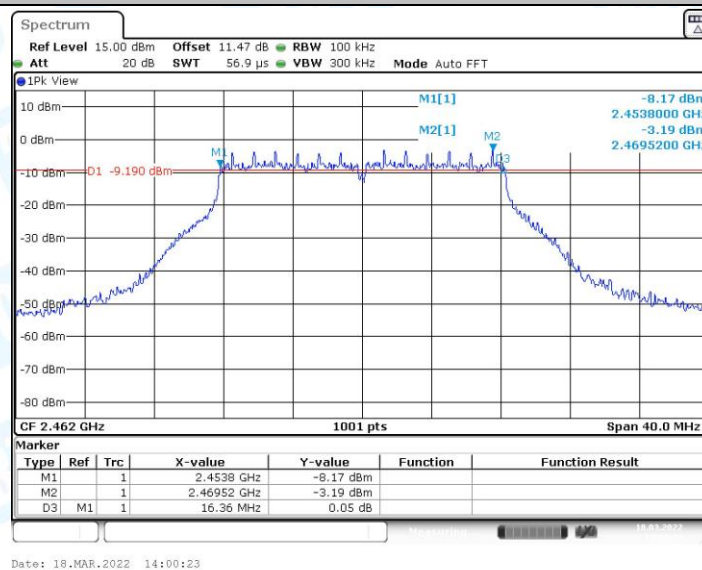
11B_Ant1_2462



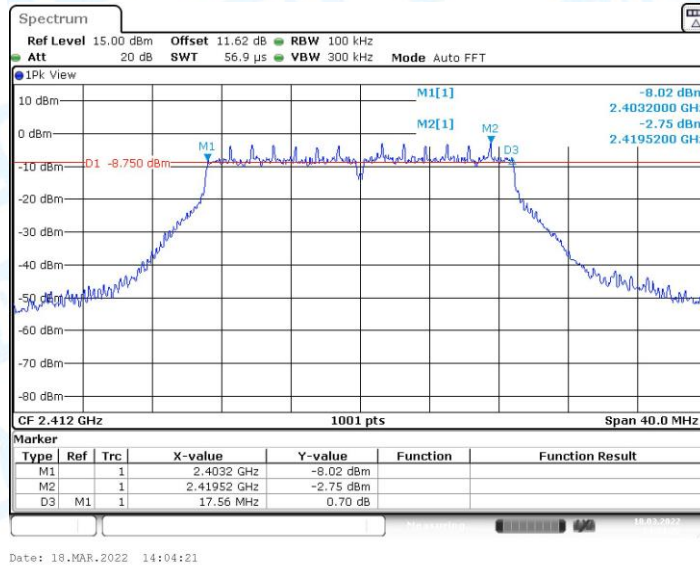
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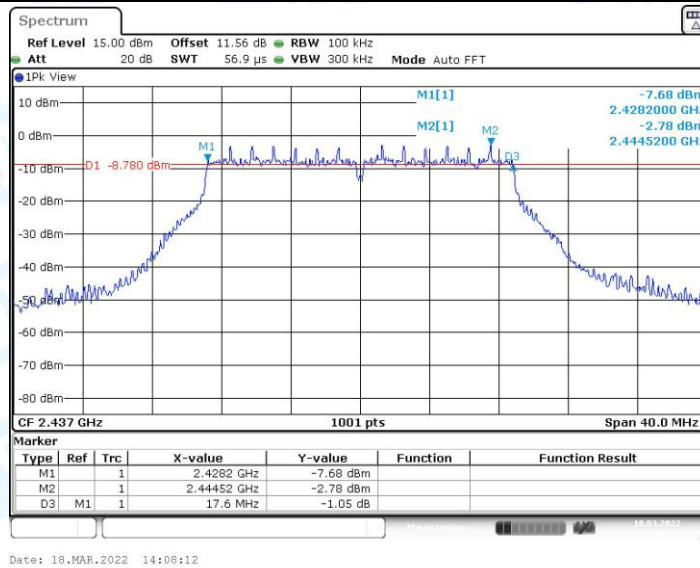
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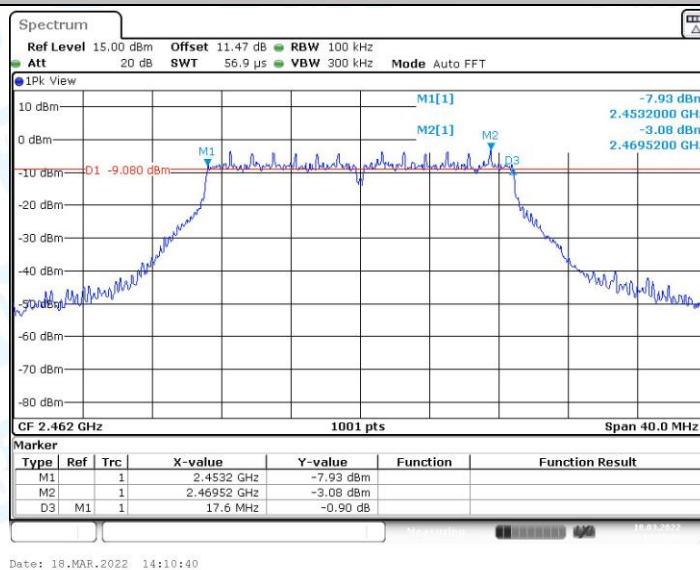
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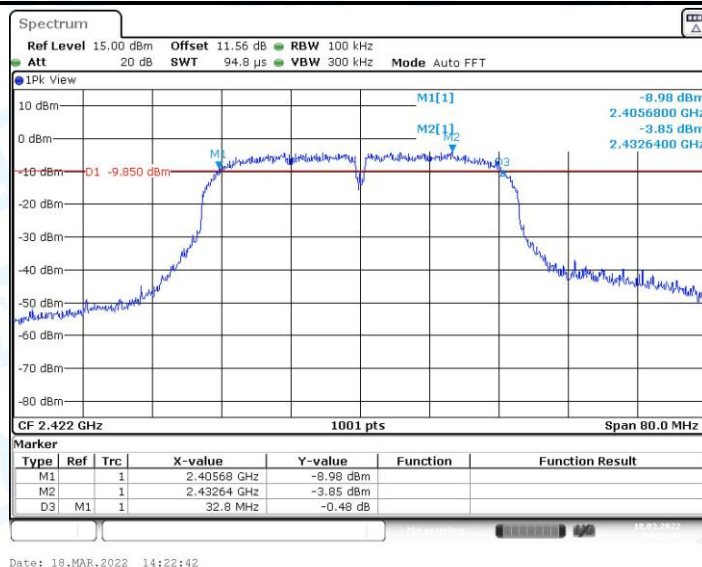
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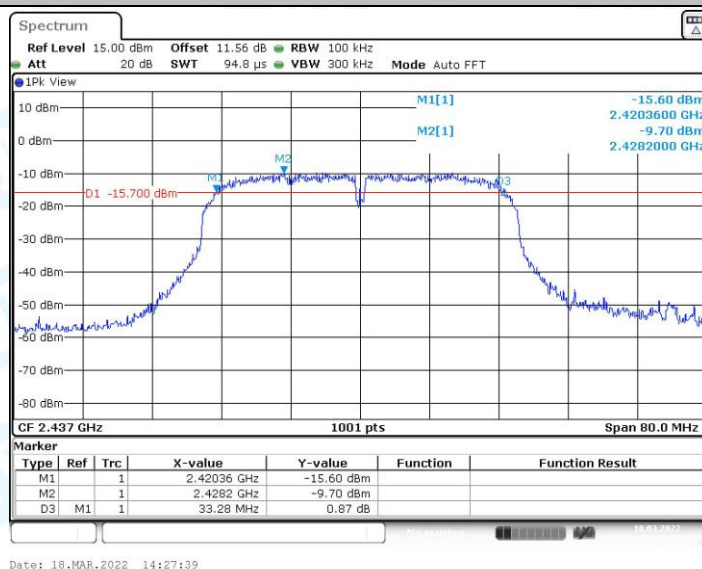
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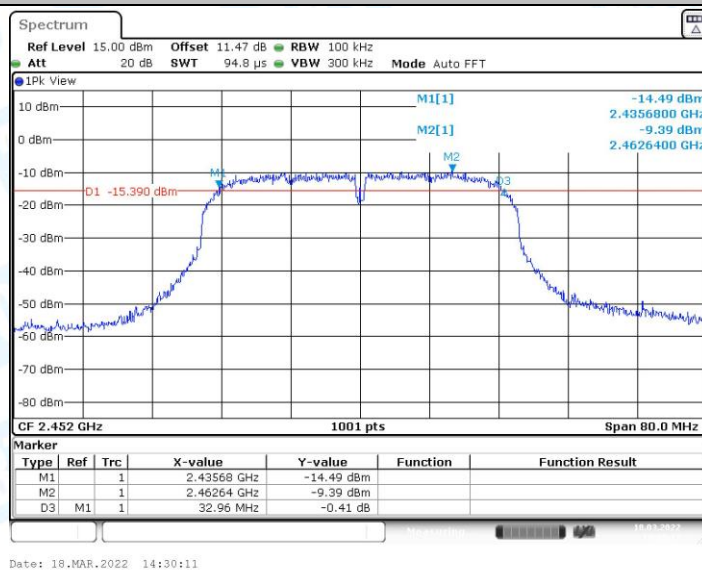
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11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



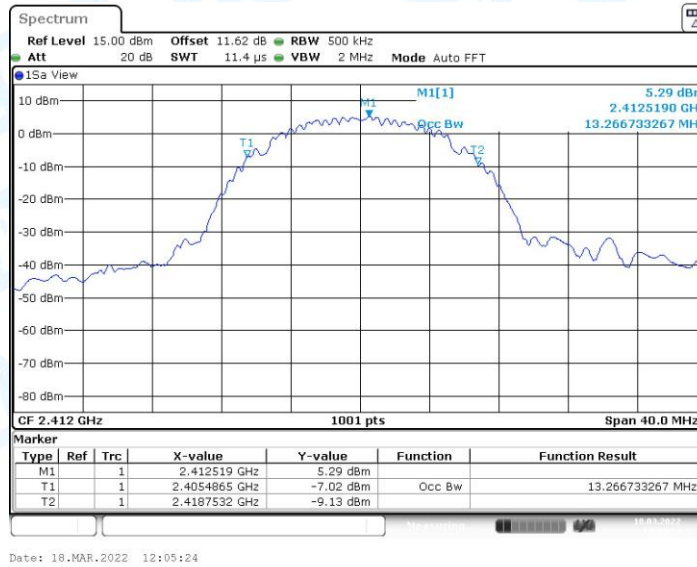
11N40SISO_Ant1_2452

2. Occupied Channel Bandwidth

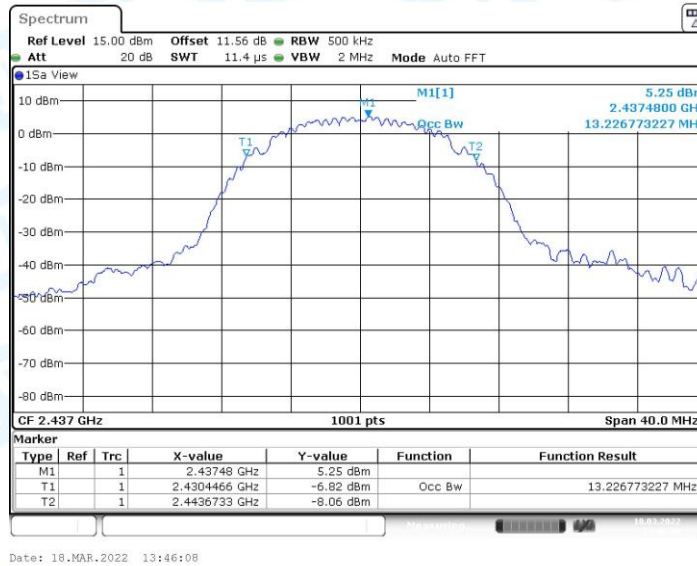
2.1. Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	13.267	2405.487	2418.753	---	---
		2437	13.227	2430.447	2443.673	---	---
		2462	13.267	2455.447	2468.713	---	---
11G	Ant1	2412	17.702	2403.169	2420.871	---	---
		2437	18.342	2428.089	2446.431	---	---
		2462	18.062	2453.089	2471.151	---	---
11N20SISO	Ant1	2412	19.261	2402.370	2421.630	---	---
		2437	18.741	2427.649	2446.391	---	---
		2462	18.621	2452.609	2471.231	---	---
11N40SISO	Ant1	2422	34.685	2404.657	2439.343	---	---
		2437	34.925	2419.577	2454.502	---	---
		2452	34.605	2434.737	2469.343	---	---

2.2. Test Graphs



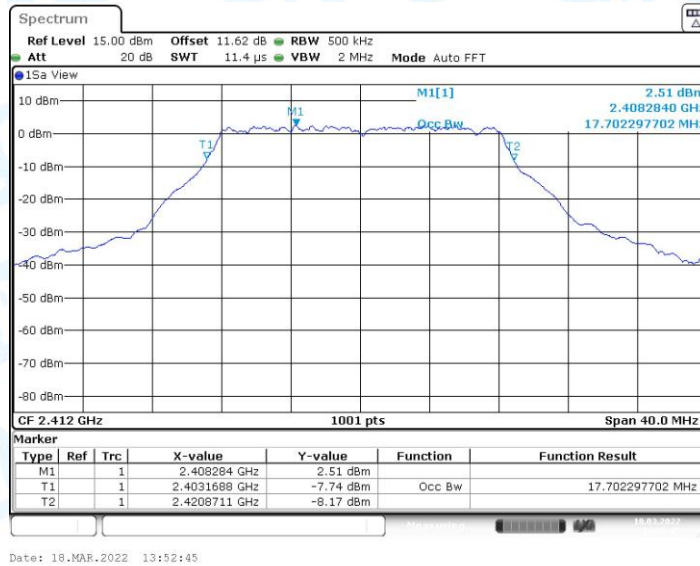
11B_Ant1_2412



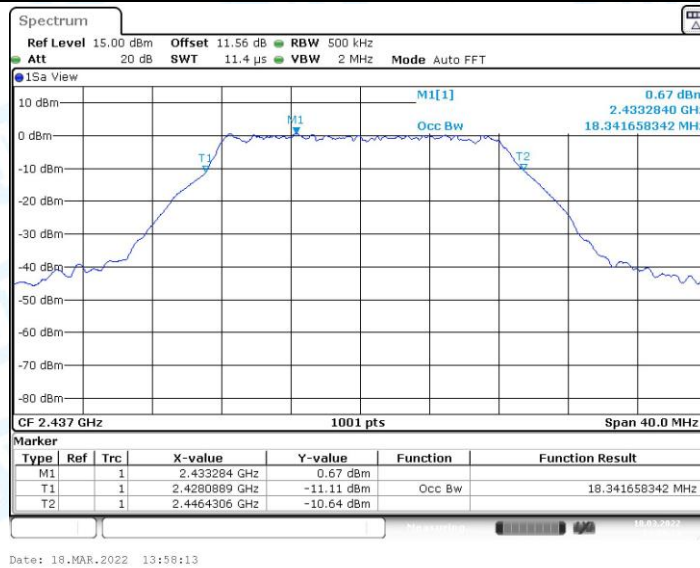
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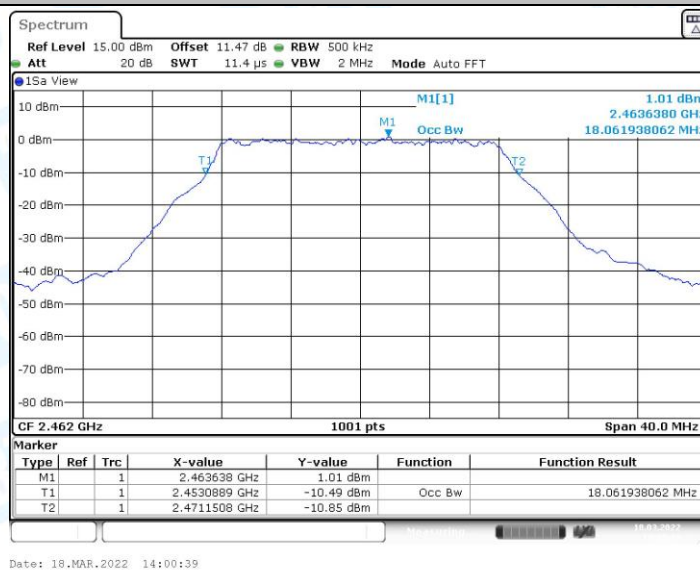
11B_Ant1_2462



11G_Ant1_2412



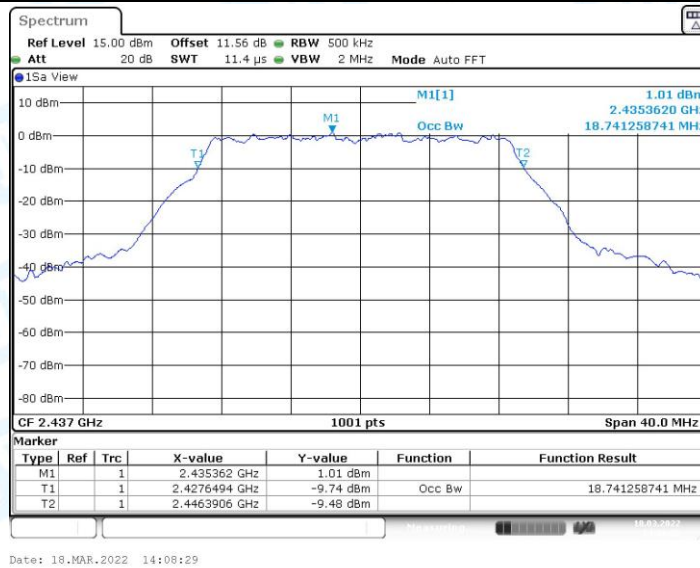
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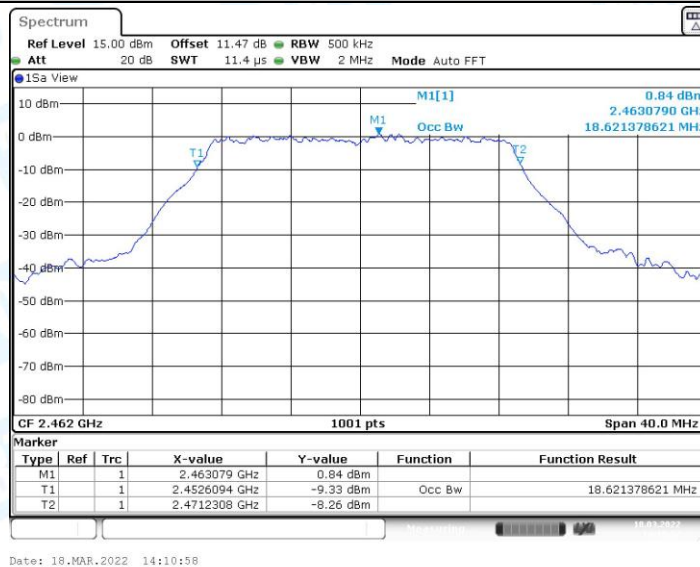
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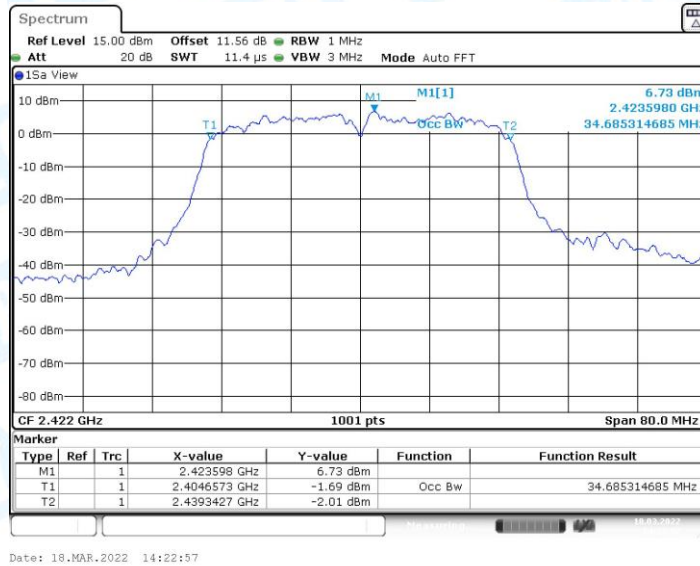
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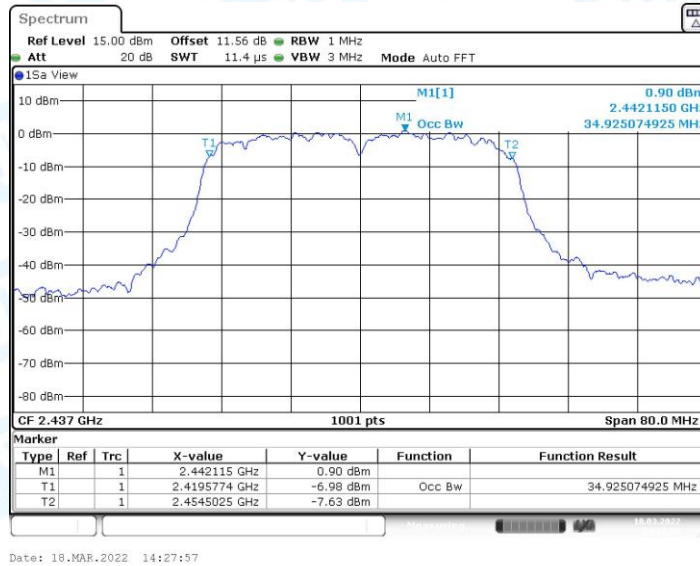
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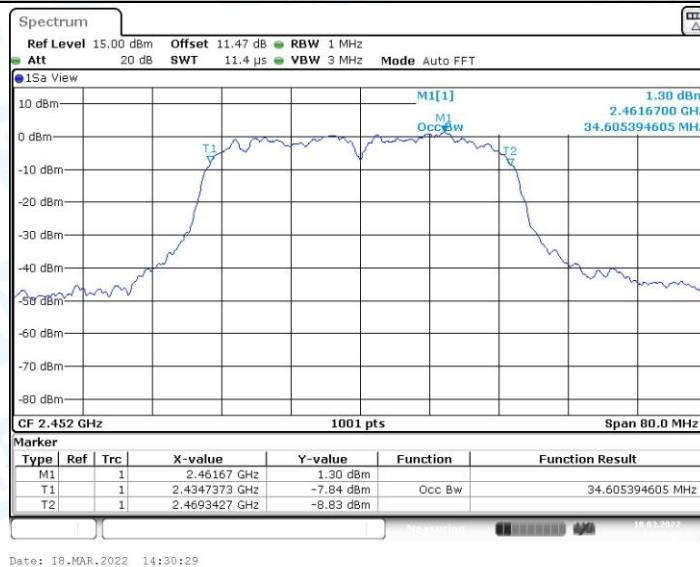
11N20SISO_Ant1_2462



11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



11N40SISO_Ant1_2452

3. Maximum conducted output power

3.1. Test Result

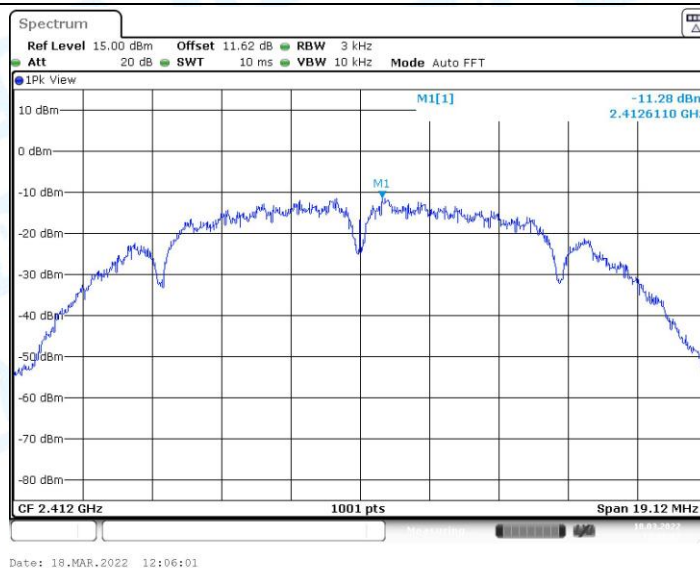
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	16.51	≤30.00	PASS
		2437	16.43	≤30.00	PASS
		2462	15.58	≤30.00	PASS
11G	Ant1	2412	16.04	≤30.00	PASS
		2437	16.21	≤30.00	PASS
		2462	16.04	≤30.00	PASS
11N20SISO	Ant1	2412	16.25	≤30.00	PASS
		2437	16.36	≤30.00	PASS
		2462	16.18	≤30.00	PASS
11N40SISO	Ant1	2422	15.63	≤30.00	PASS
		2437	15.08	≤30.00	PASS
		2452	15.03	≤30.00	PASS

4. Maximum power spectral density

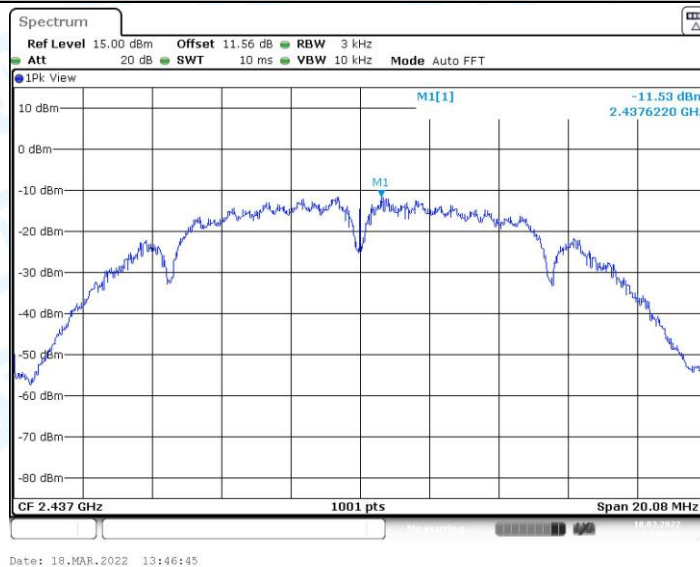
4.1. Test Result

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-11.28	≤8.00	PASS
		2437	-11.53	≤8.00	PASS
		2462	-12.22	≤8.00	PASS
11G	Ant1	2412	-17.06	≤8.00	PASS
		2437	-16.28	≤8.00	PASS
		2462	-16.32	≤8.00	PASS
11N20SISO	Ant1	2412	-16.99	≤8.00	PASS
		2437	-16.85	≤8.00	PASS
		2462	-16.67	≤8.00	PASS
11N40SISO	Ant1	2422	-19.74	≤8.00	PASS
		2437	-20	≤8.00	PASS
		2452	-19.34	≤8.00	PASS

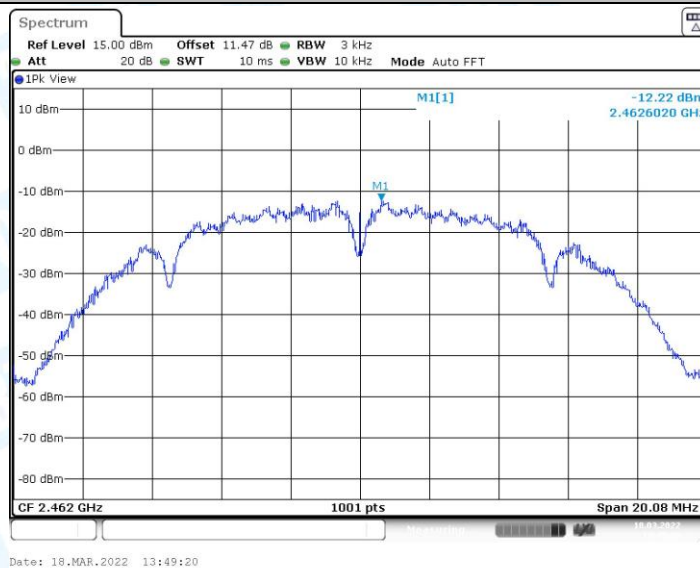
4.2. Test Graphs



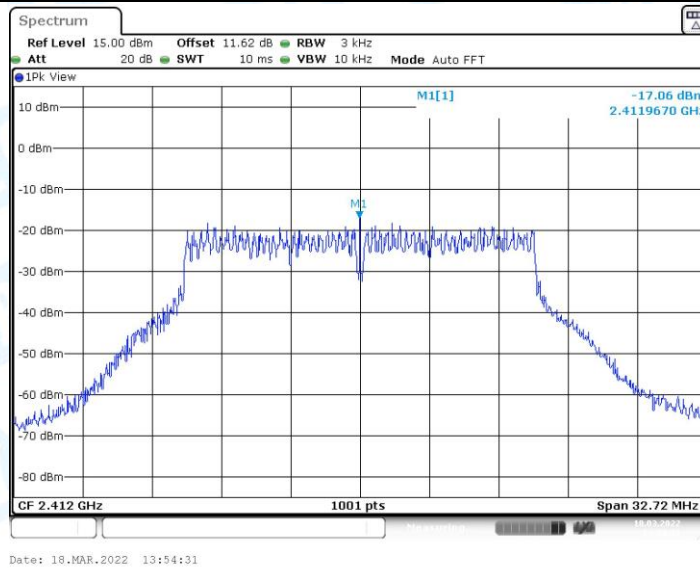
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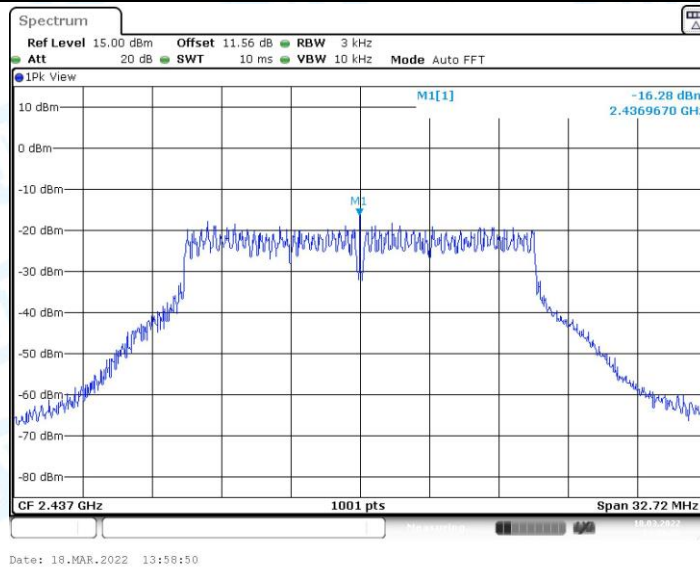
11B_Ant1_2437



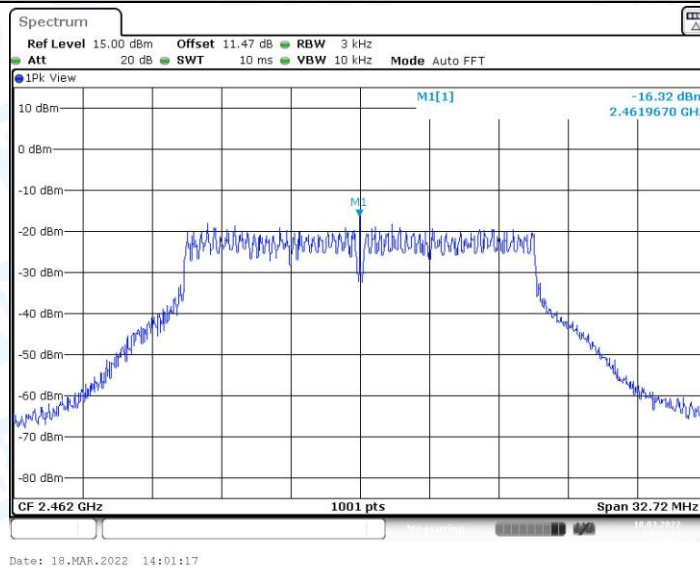
11B_Ant1_2462



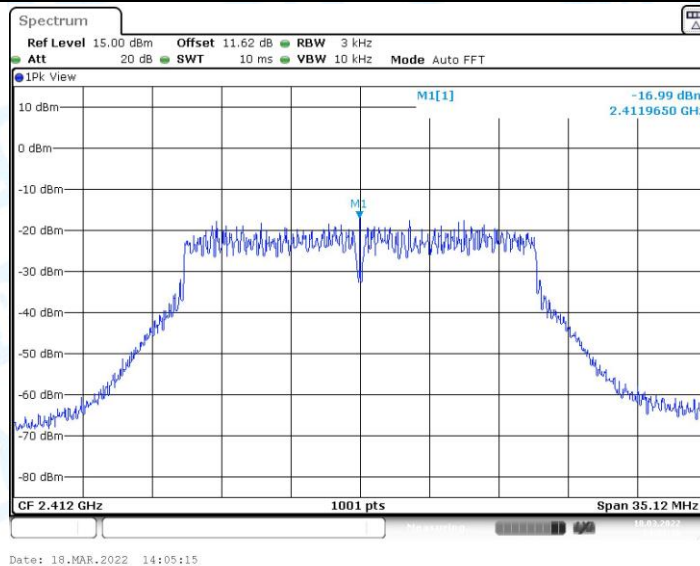
11G_Ant1_2412



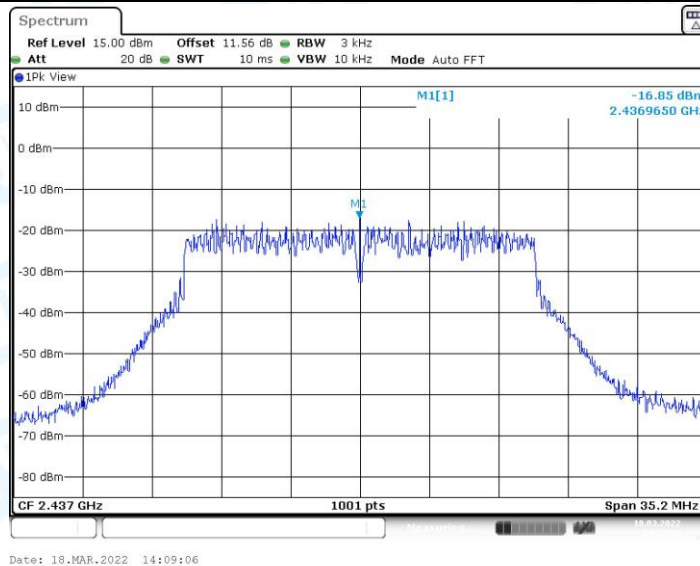
11G_Ant1_2437



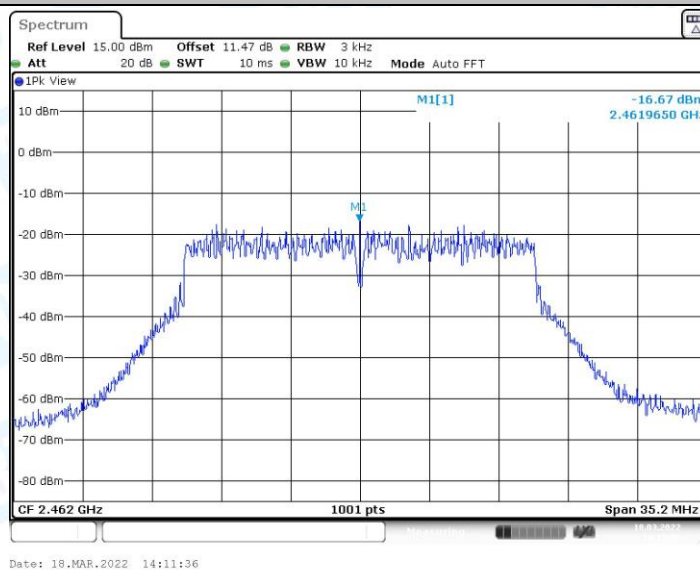
11G_Ant1_2462



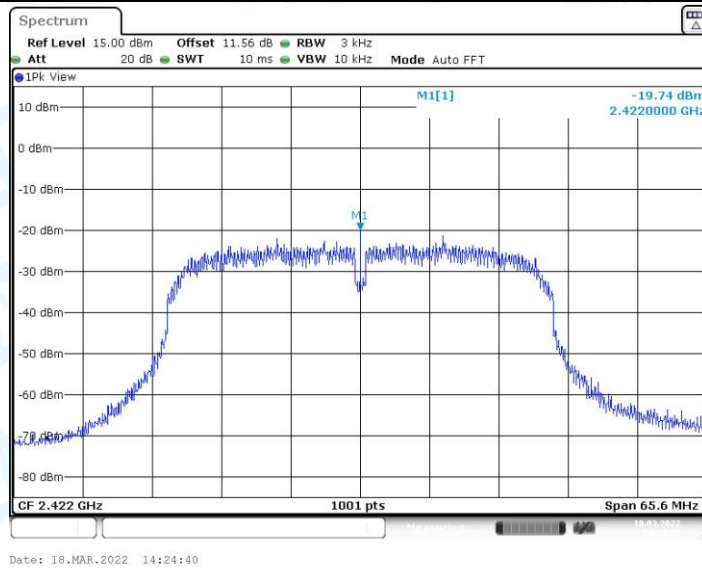
11N20SISO_Ant1_2412



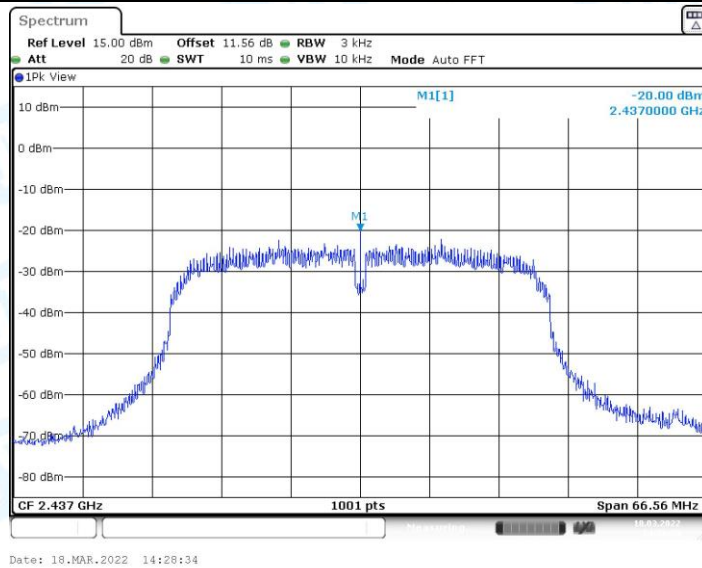
11N20SISO_Ant1_2437



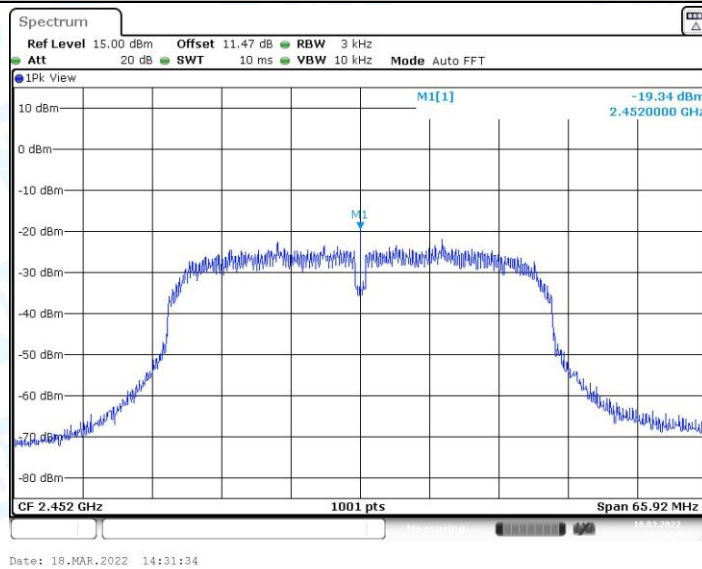
11N20SISO_Ant1_2462



11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



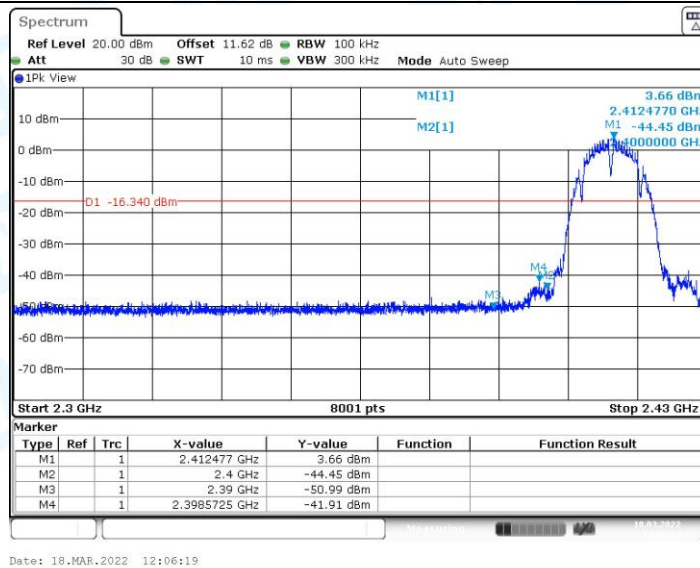
11N40SISO_Ant1_2452

5. Band edge measurements

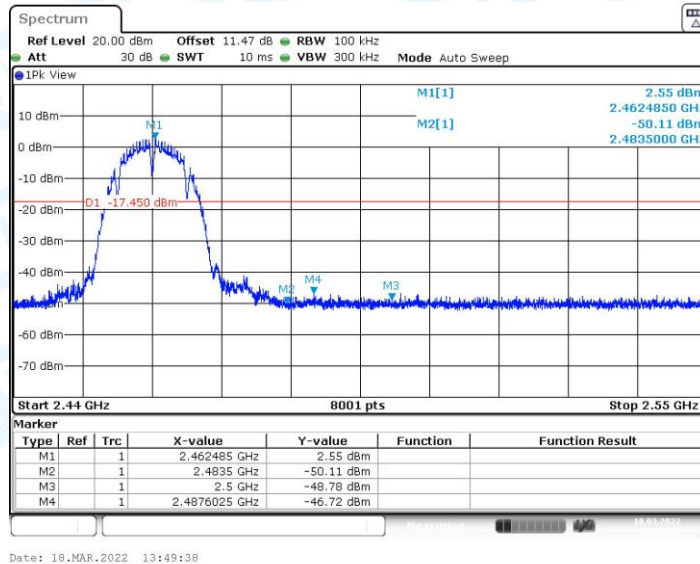
5.1. Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	3.66	-41.91	≤ -16.34	PASS
		High	2462	2.55	-46.72	≤ -17.45	PASS
11G	Ant1	Low	2412	-3.37	-38.66	≤ -23.37	PASS
		High	2462	-3.39	-46.54	≤ -23.39	PASS
11N20SISO	Ant1	Low	2412	-2.86	-36.33	≤ -22.86	PASS
		High	2462	-3.23	-46.1	≤ -23.23	PASS
11N40SISO	Ant1	Low	2422	-9.13	-44.29	≤ -29.13	PASS
		High	2452	-9.81	-46.09	≤ -29.81	PASS

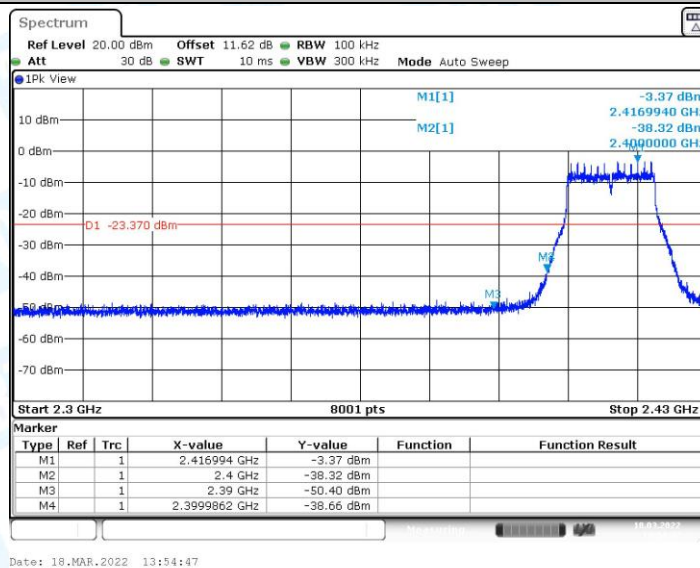
5.2. Test Graphs



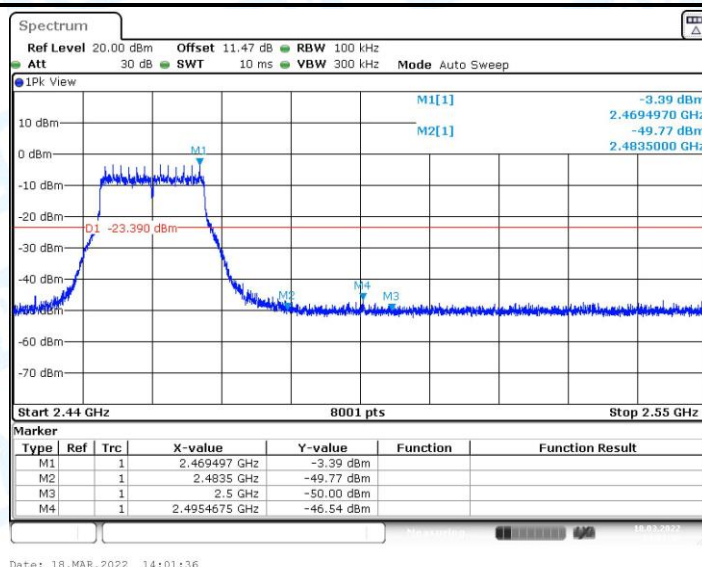
11B_Ant1_Low_2412



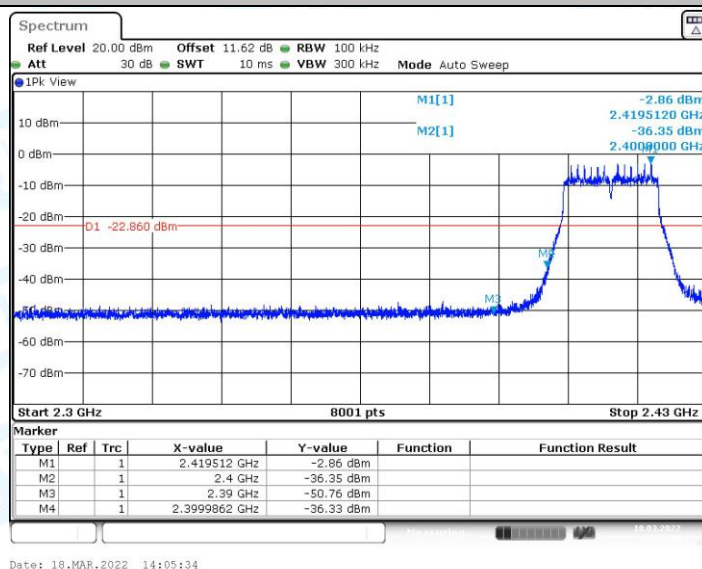
11B_Ant1_High_2462



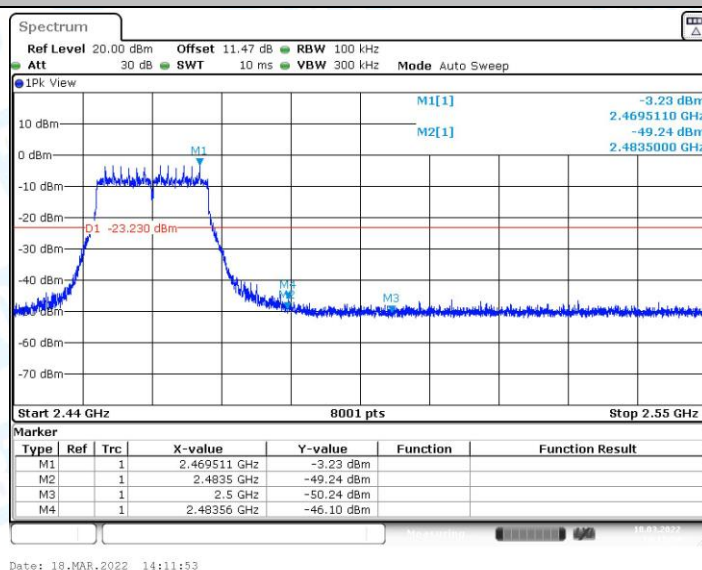
11G_Ant1_Low_2412



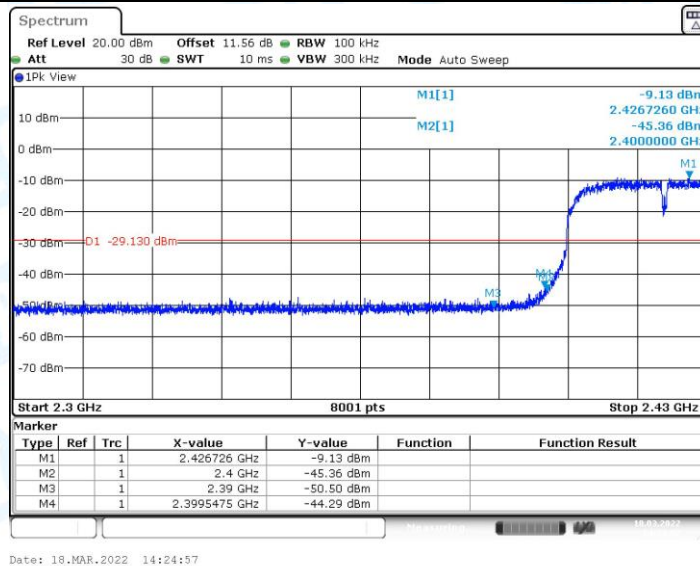
11G_Ant1_High_2462



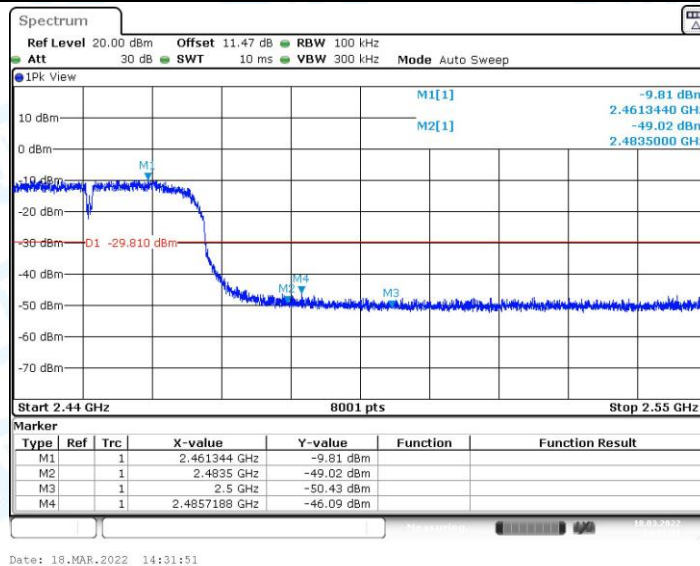
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11N20SISO_Ant1_High_2462



11N40SISO_Ant1_Low_2422



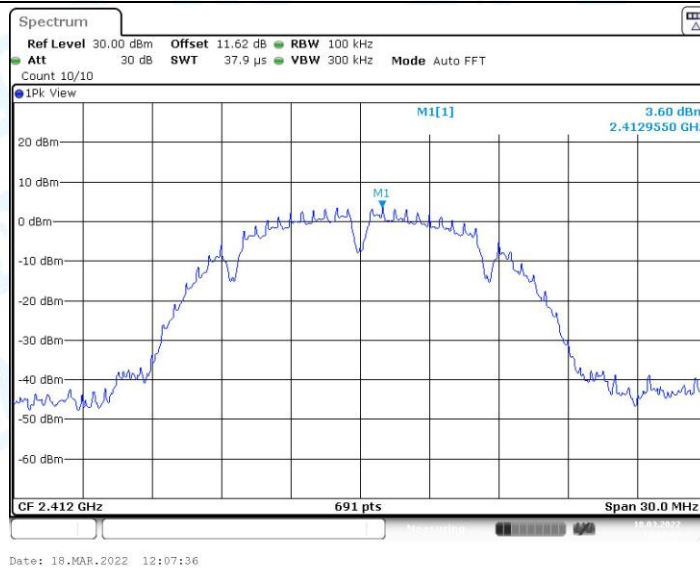
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6. Conducted Spurious Emission

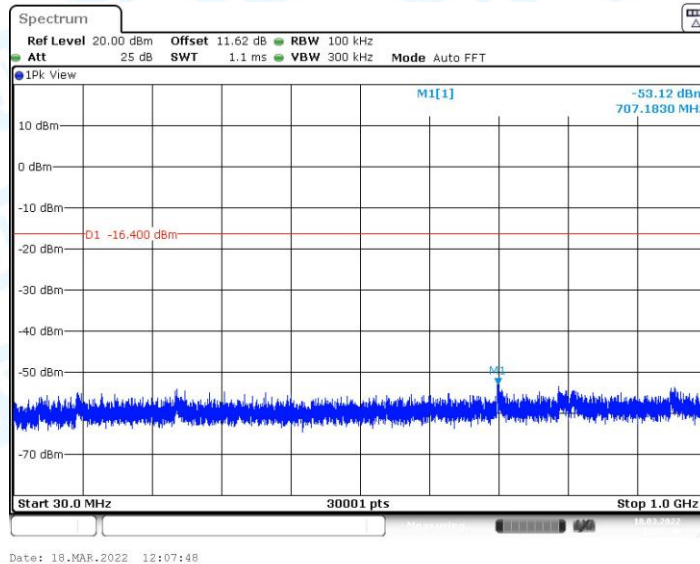
6.1. Test Result

TestMode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	3.60	3.60	---	PASS
			30~1000	3.60	-53.12	≤ -16.4	PASS
			1000~26500	3.60	-35.14	≤ -16.4	PASS
		2437	Reference	3.35	3.35	---	PASS
			30~1000	3.35	-53.27	≤ -16.65	PASS
			1000~26500	3.35	-34.37	≤ -16.65	PASS
		2462	Reference	2.44	2.44	---	PASS
			30~1000	2.44	-53.33	≤ -17.56	PASS
			1000~26500	2.44	-33.5	≤ -17.56	PASS
11G	Ant1	2412	Reference	-2.96	-2.96	---	PASS
			30~1000	-2.96	-52.28	≤ -22.96	PASS
			1000~26500	-2.96	-41.53	≤ -22.96	PASS
		2437	Reference	-3.14	-3.14	---	PASS
			30~1000	-3.14	-52.57	≤ -23.14	PASS
			1000~26500	-3.14	-41.7	≤ -23.14	PASS
		2462	Reference	-3.20	-3.20	---	PASS
			30~1000	-3.20	-53.45	≤ -23.2	PASS
			1000~26500	-3.20	-43.6	≤ -23.2	PASS
11N20SISO	Ant1	2412	Reference	-2.81	-2.81	---	PASS
			30~1000	-2.81	-53.89	≤ -22.81	PASS
			1000~26500	-2.81	-40.47	≤ -22.81	PASS
		2437	Reference	-2.91	-2.91	---	PASS
			30~1000	-2.91	-53.75	≤ -22.91	PASS
			1000~26500	-2.91	-41.69	≤ -22.91	PASS
		2462	Reference	-3.05	-3.05	---	PASS
			30~1000	-3.05	-53.23	≤ -23.05	PASS
			1000~26500	-3.05	-42.94	≤ -23.05	PASS
11N40SISO	Ant1	2422	Reference	-9.22	-9.22	---	PASS
			30~1000	-9.22	-53.16	≤ -29.22	PASS
			1000~26500	-9.22	-43.47	≤ -29.22	PASS
		2437	Reference	-9.84	-9.84	---	PASS
			30~1000	-9.84	-52.78	≤ -29.84	PASS
			1000~26500	-9.84	-42.99	≤ -29.84	PASS
		2452	Reference	-10.00	-10.00	---	PASS
			30~1000	-10.00	-53.47	≤ -30	PASS
			1000~26500	-10.00	-44.34	≤ -30	PASS

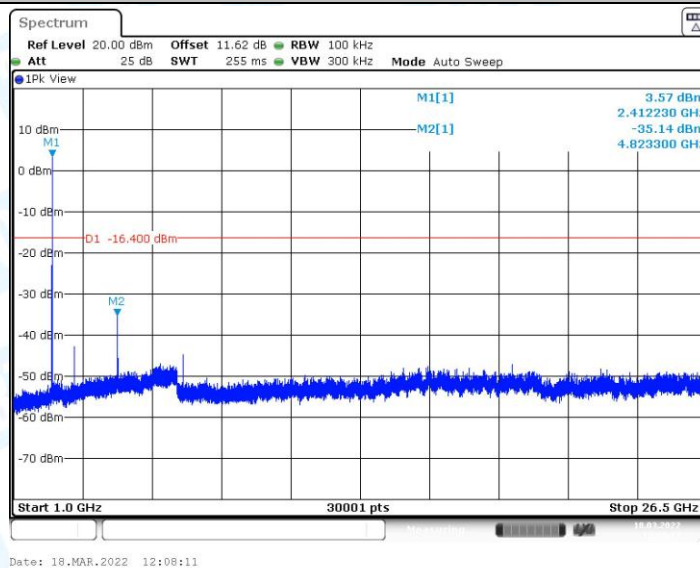
6.2. Test Graphs



11B_Ant1_2412_0~Reference



11B_Ant1_2412_30~1000



11B_Ant1_2412_1000~26500