

RF Test Data for Bluetooth (BDR+EDR) (Conducted Measurements)

General Description of EUT	
Product Name:	USB-Powered Speaker, vertical computer speaker, plug-in bluetooth speaker
Test Model:	LLR064
Sample ID:	202202-0180_1-02
Environmental Conditions	
Temperature:	25℃
Relative Humidity:	55%
Test Voltage:	DC 5V
Test Engineer:	Huangjianping
Note: For a more detailed features description, please refer to the report TBR-C-202202-0180-1	

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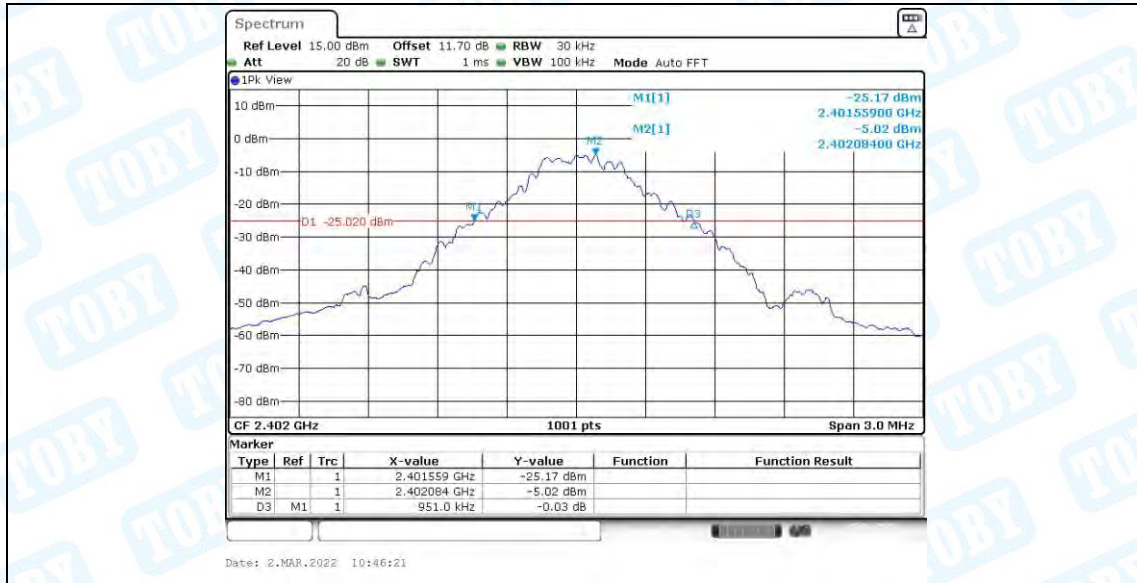
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1. 20dB Emission Bandwidth

1.1. Test Result

TestMode	Antenna	Channel	20db EBW[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.95	---	---
		2441	0.95	---	---
		2480	0.95	---	---
2DH5	Ant1	2402	1.33	---	---
		2441	1.33	---	---
		2480	1.33	---	---
3DH5	Ant1	2402	1.30	---	---
		2441	1.30	---	---
		2480	1.30	---	---

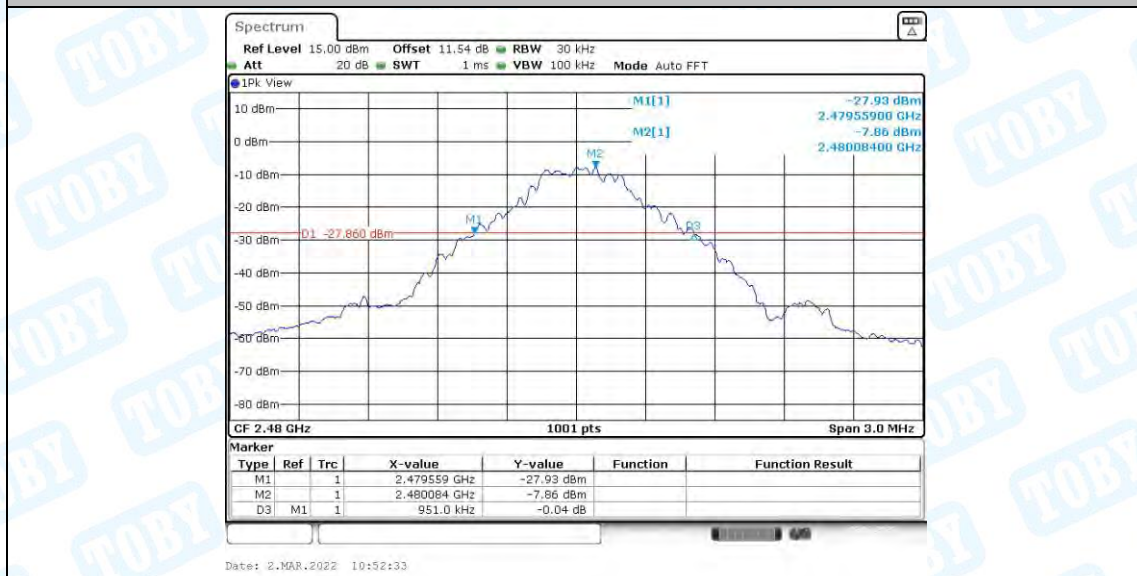
1.2.Test Graphs



DH5_Ant1_2402



DH5_Ant1_2441



DH5_Ant1_2480



2DH5_Ant1_2402



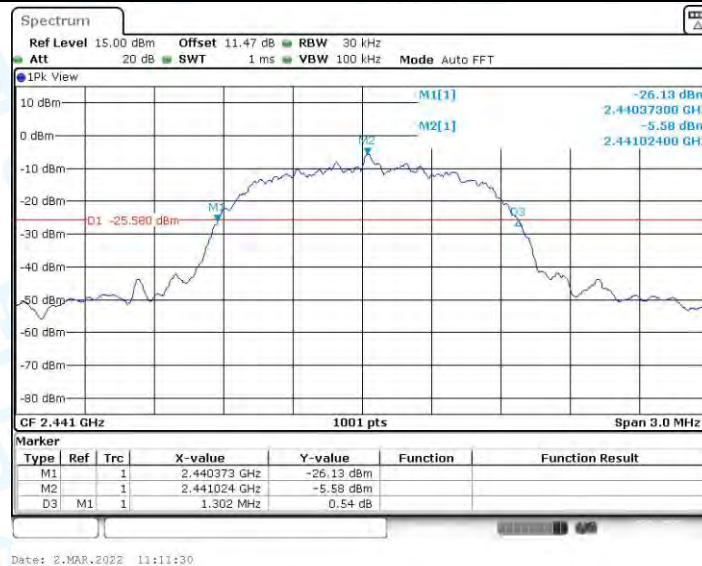
2DH5_Ant1_2441



2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441



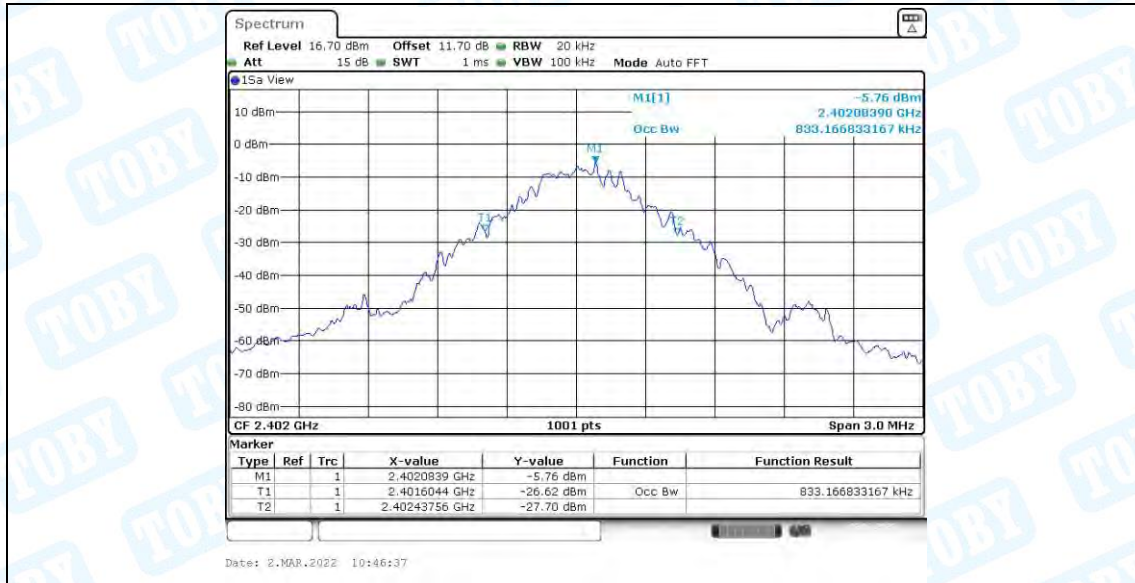
3DH5_Ant1_2480

2. Occupied Channel Bandwidth

2.1. Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.833	2401.604	2402.438	---	---
		2441	0.833	2440.604	2441.438	---	---
		2480	0.836	2479.604	2480.441	---	---
2DH5	Ant1	2402	1.172	2401.440	2402.611	---	---
		2441	1.172	2440.440	2441.611	---	---
		2480	1.169	2479.440	2480.608	---	---
3DH5	Ant1	2402	1.172	2401.437	2402.608	---	---
		2441	1.172	2440.437	2441.608	---	---
		2480	1.175	2479.437	2480.611	---	---

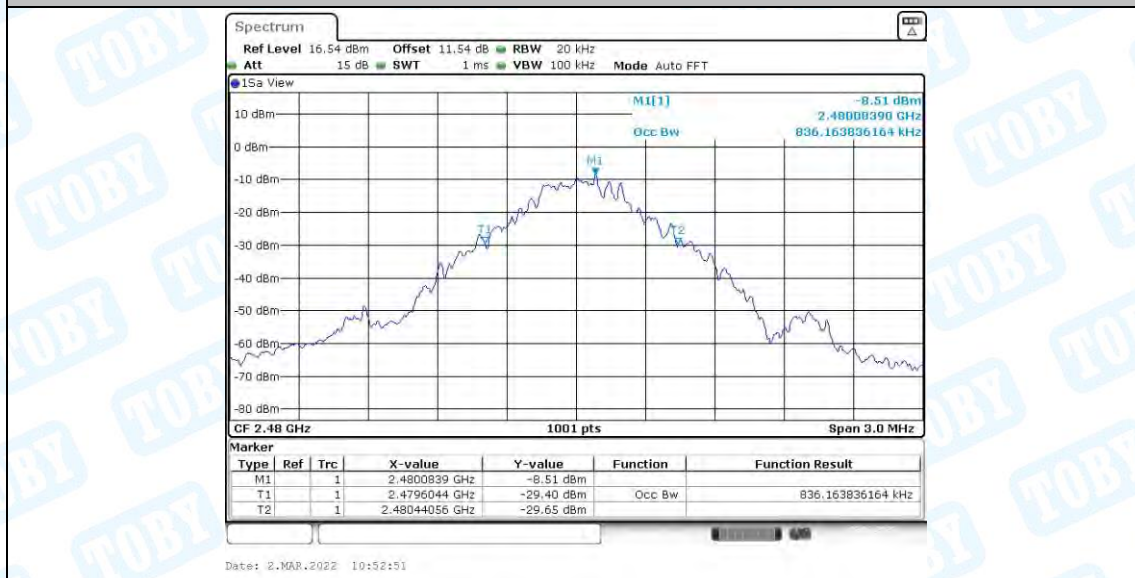
2.2. Test Graphs



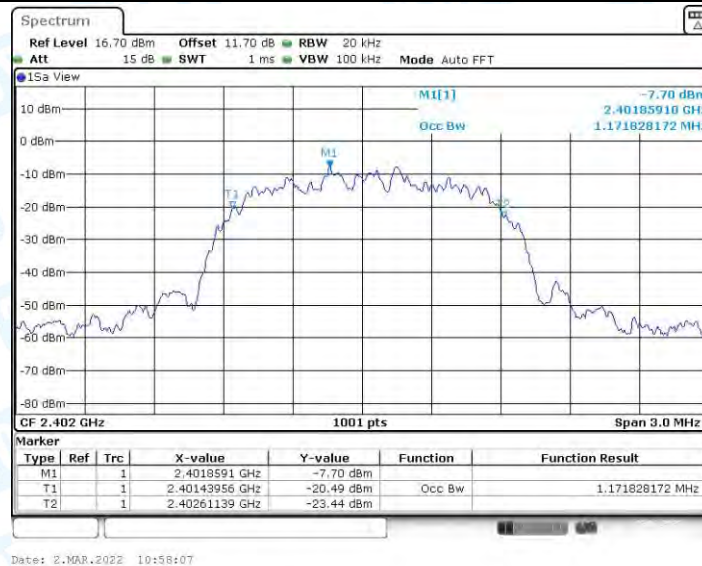
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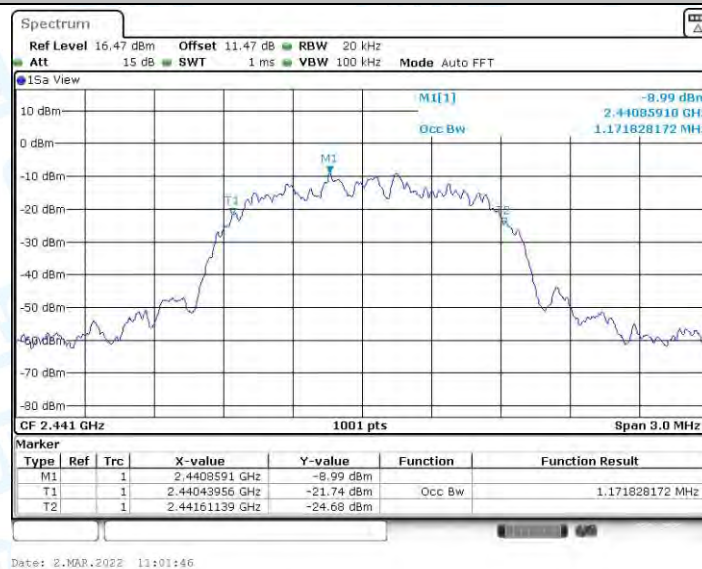
DH5_Ant1_2441



DH5_Ant1_2480



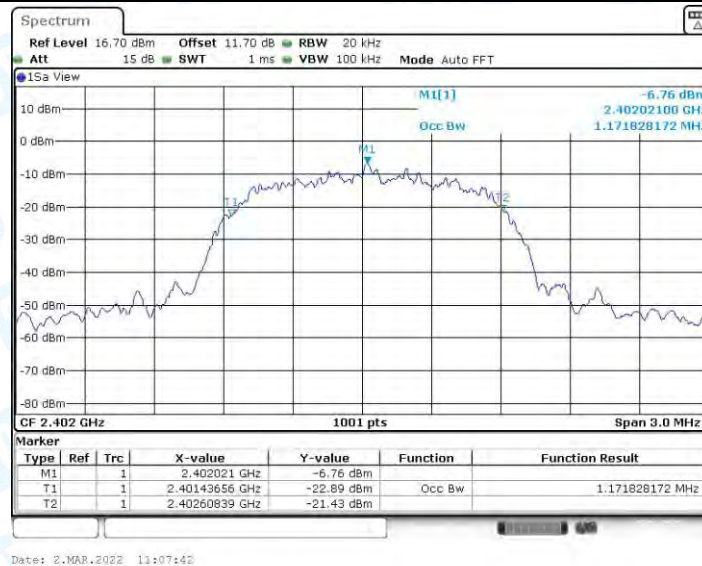
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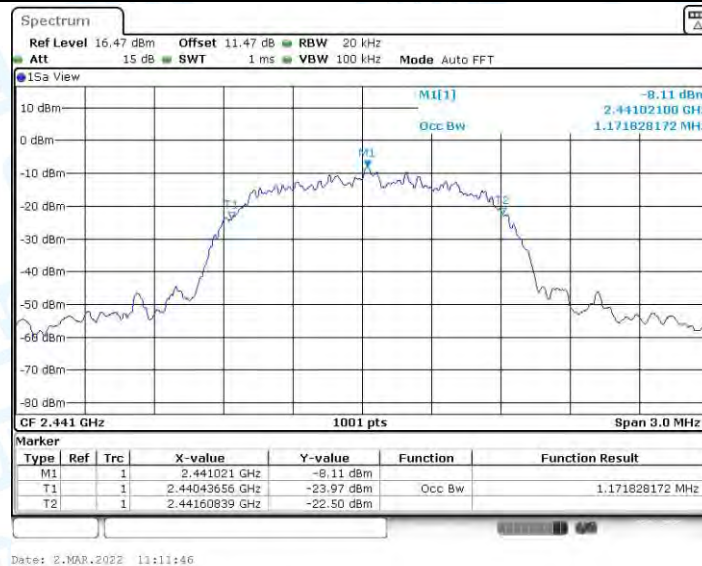
2DH5_Ant1_2441



2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480

3. Maximum conducted output power

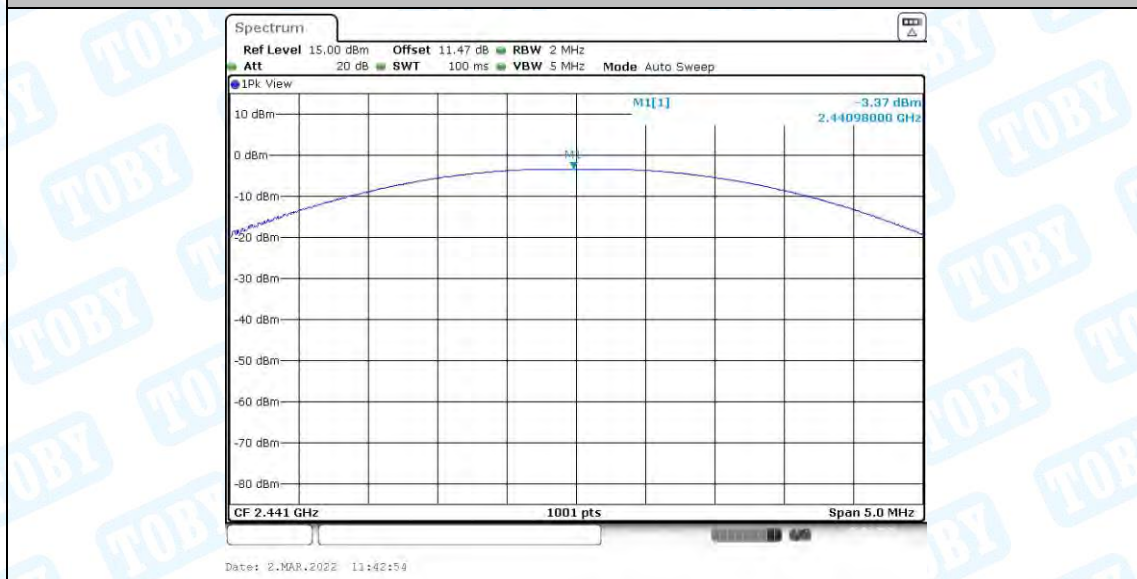
3.1. Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	-2.01	≤20.97	PASS
		2441	-3.37	≤20.97	PASS
		2480	-4.68	≤20.97	PASS
2DH5	Ant1	2402	0.2	≤20.97	PASS
		2441	-1.16	≤20.97	PASS
		2480	-2.49	≤20.97	PASS
3DH5	Ant1	2402	0.78	≤20.97	PASS
		2441	-0.56	≤20.97	PASS
		2480	-1.87	≤20.97	PASS

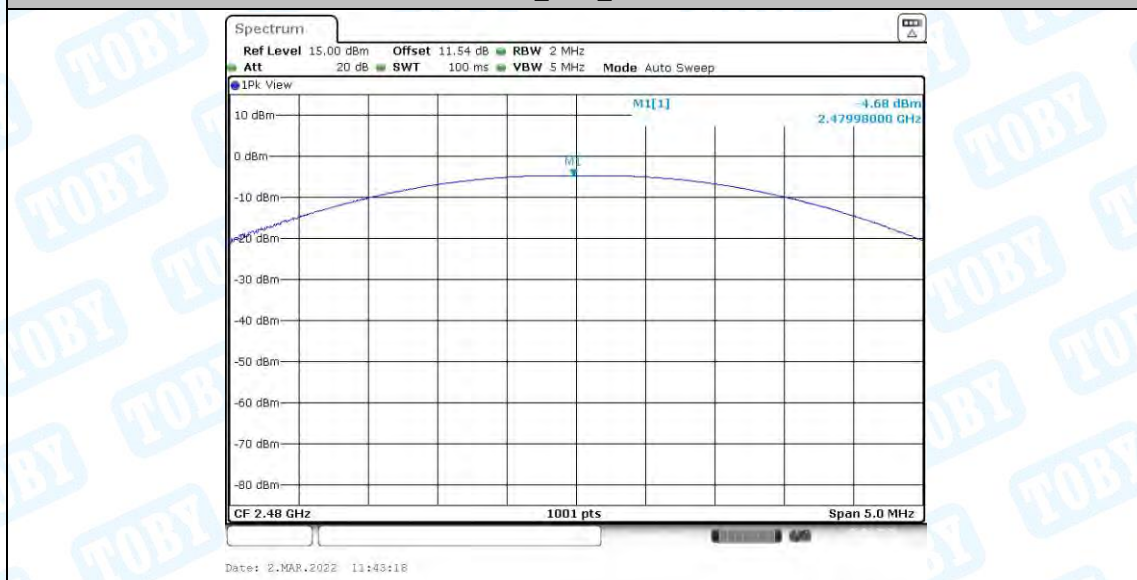
3.2.Test Graphs



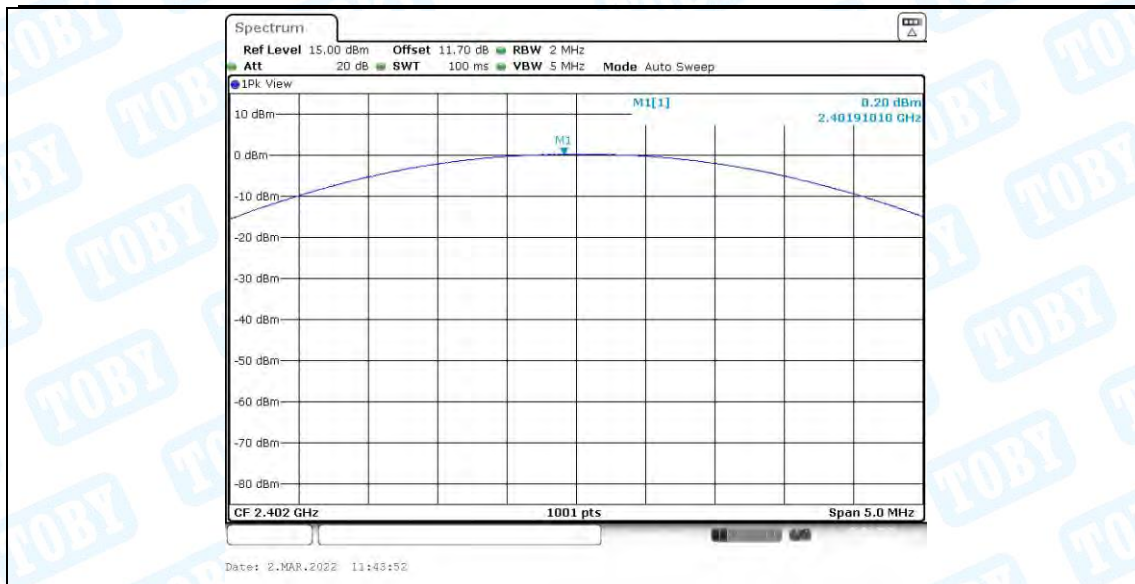
DH5_Ant1_2402



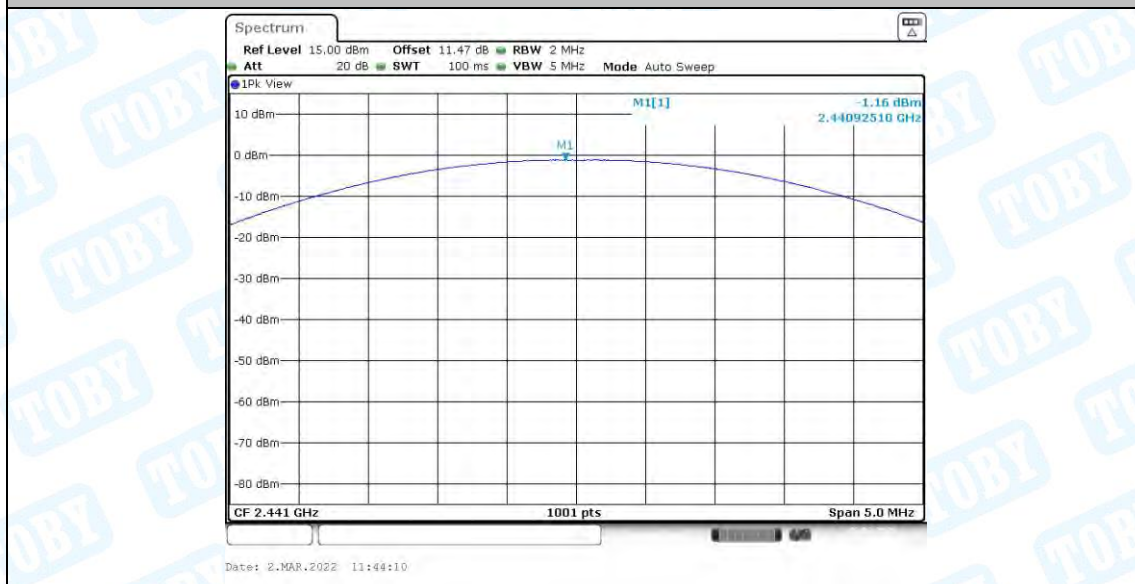
DH5_Ant1_2441



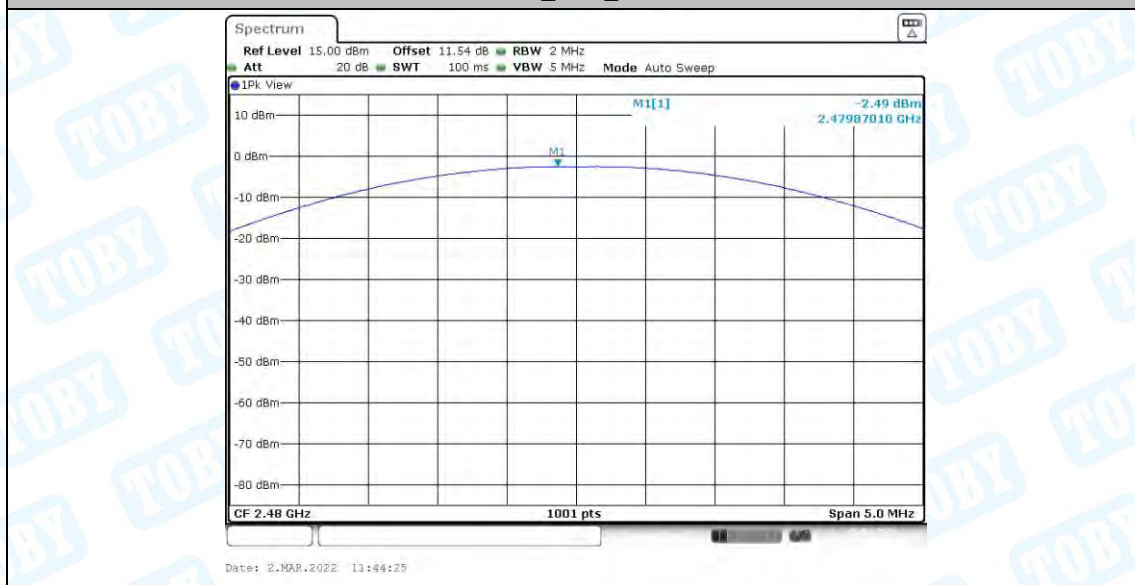
DH5_Ant1_2480



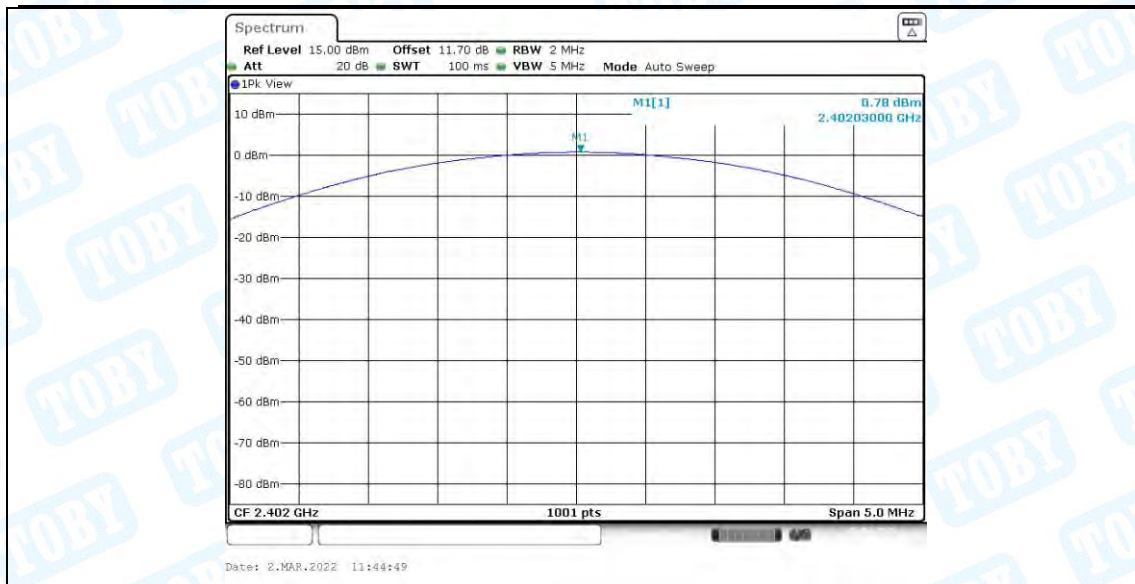
2DH5_Ant1_2402



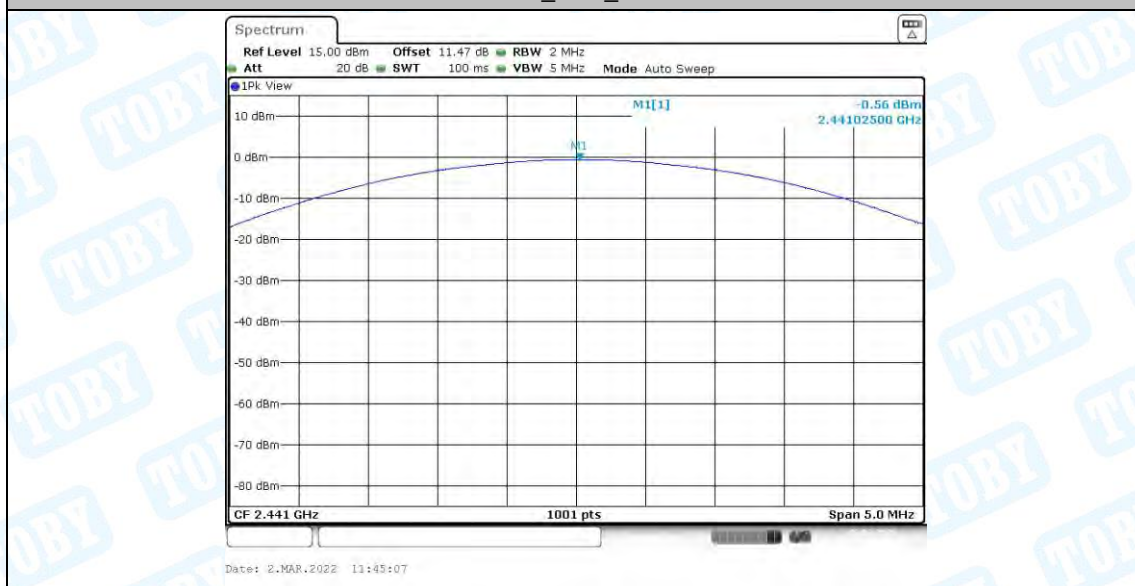
2DH5_Ant1_2441



2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480

4. Carrier frequency separation

4.1. Test Result

TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	0.681	≥ 0.633	PASS
2DH5	Ant1	Hop	1.003	≥ 0.887	PASS
3DH5	Ant1	Hop	0.872	≥ 0.867	PASS

4.2. Test Graphs

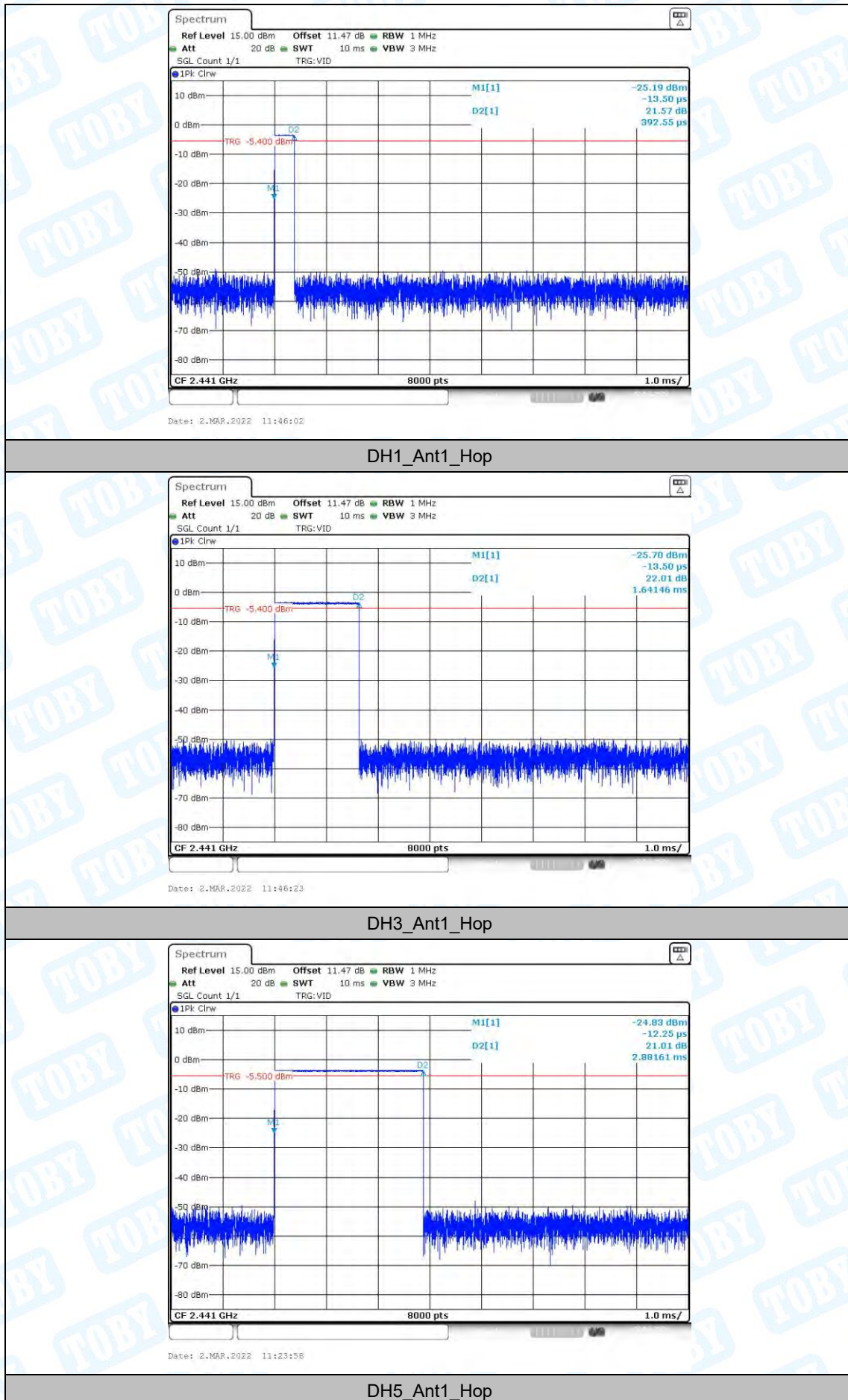


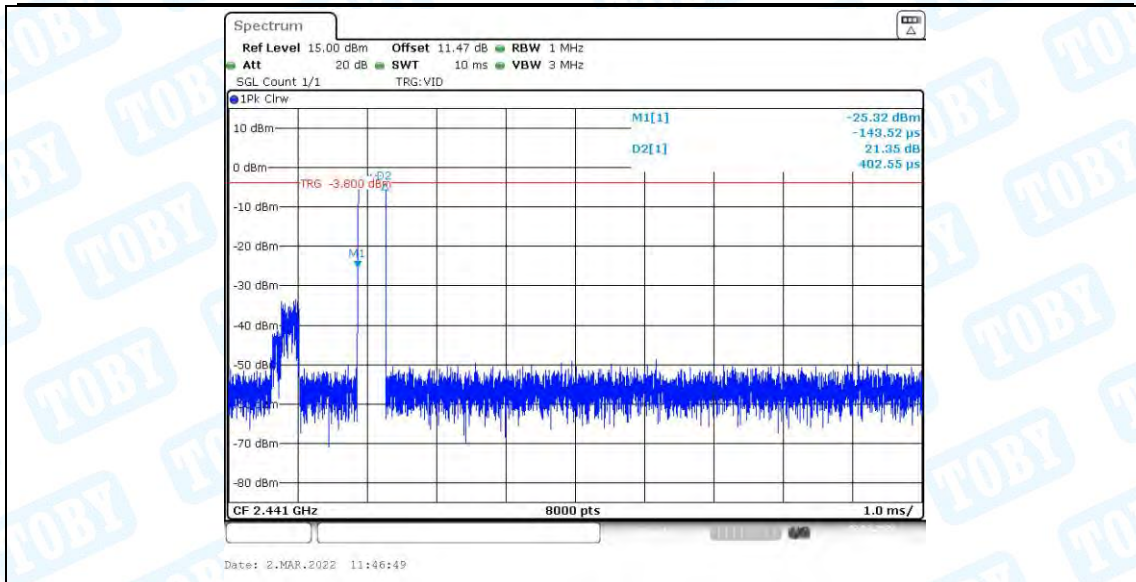
5. Time of occupancy

5.1. Test Result

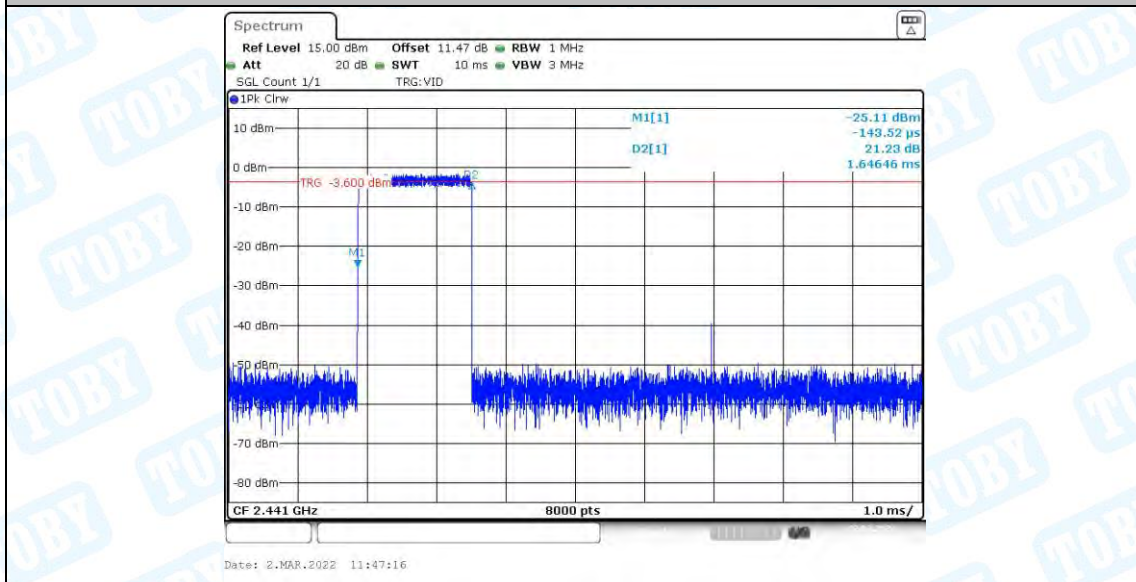
TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.39	320	0.126	≤0.4	PASS
DH3	Ant1	Hop	1.64	160	0.263	≤0.4	PASS
DH5	Ant1	Hop	2.88	106.67	0.307	≤0.4	PASS
2DH1	Ant1	Hop	0.40	320	0.129	≤0.4	PASS
2DH3	Ant1	Hop	1.65	160	0.263	≤0.4	PASS
2DH5	Ant1	Hop	2.89	106.67	0.308	≤0.4	PASS
3DH1	Ant1	Hop	0.40	320	0.129	≤0.4	PASS
3DH3	Ant1	Hop	1.65	160	0.264	≤0.4	PASS
3DH5	Ant1	Hop	2.89	106.67	0.308	≤0.4	PASS

5.2. Test Graphs

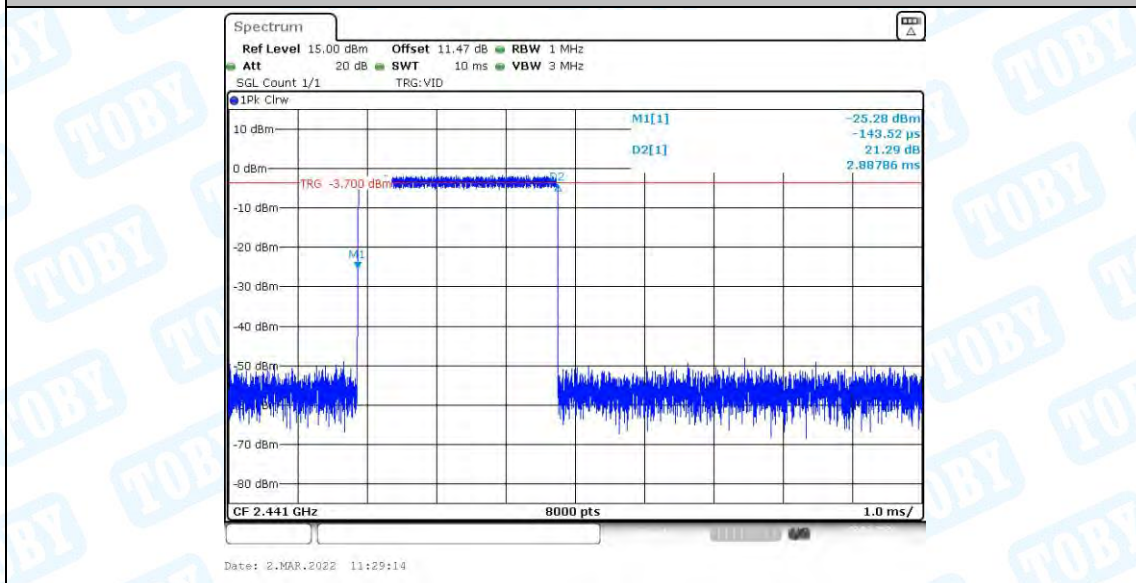




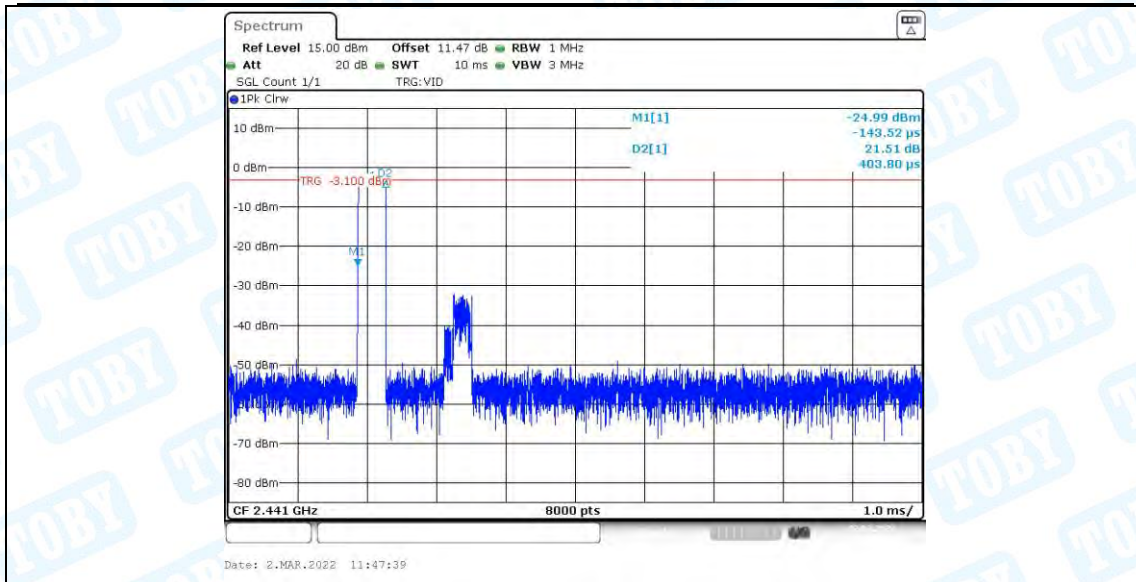
2DH1_Ant1_Hop



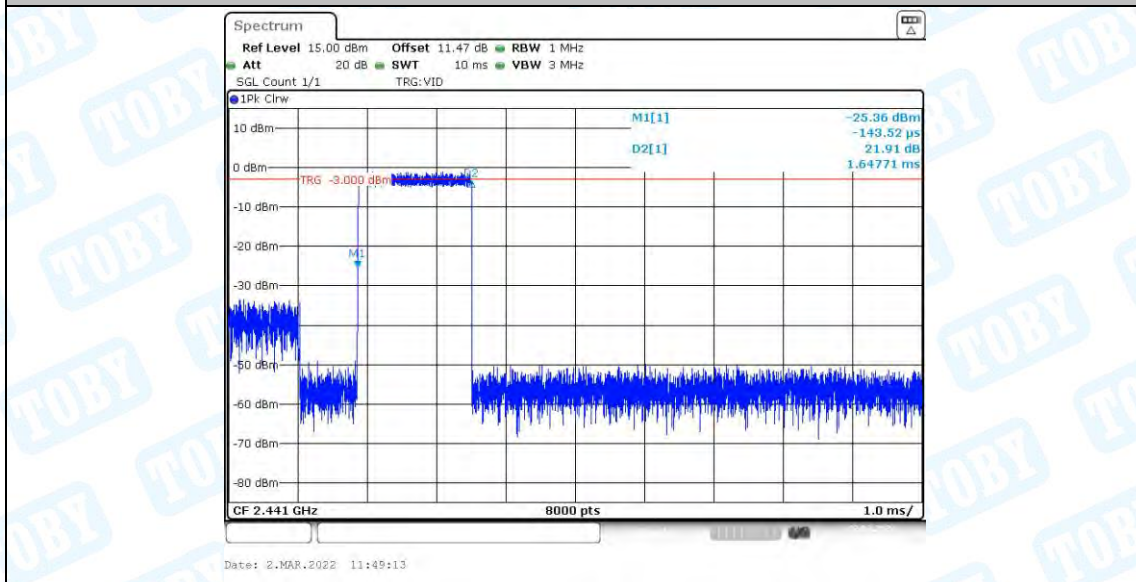
2DH3_Ant1_Hop



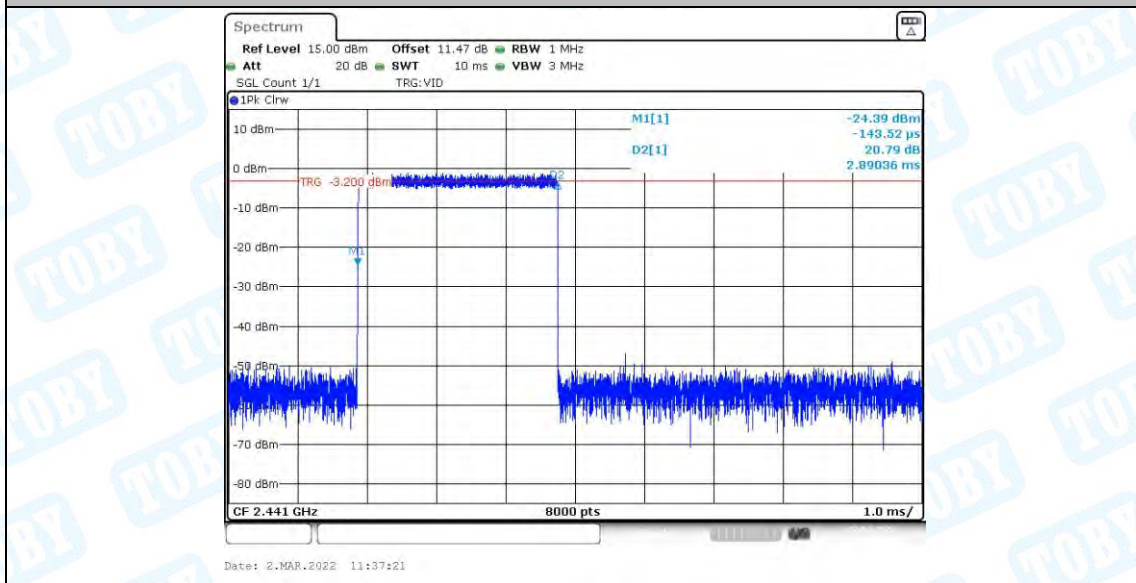
2DH5_Ant1_Hop



3DH1_Ant1_Hop



3DH3_Ant1_Hop



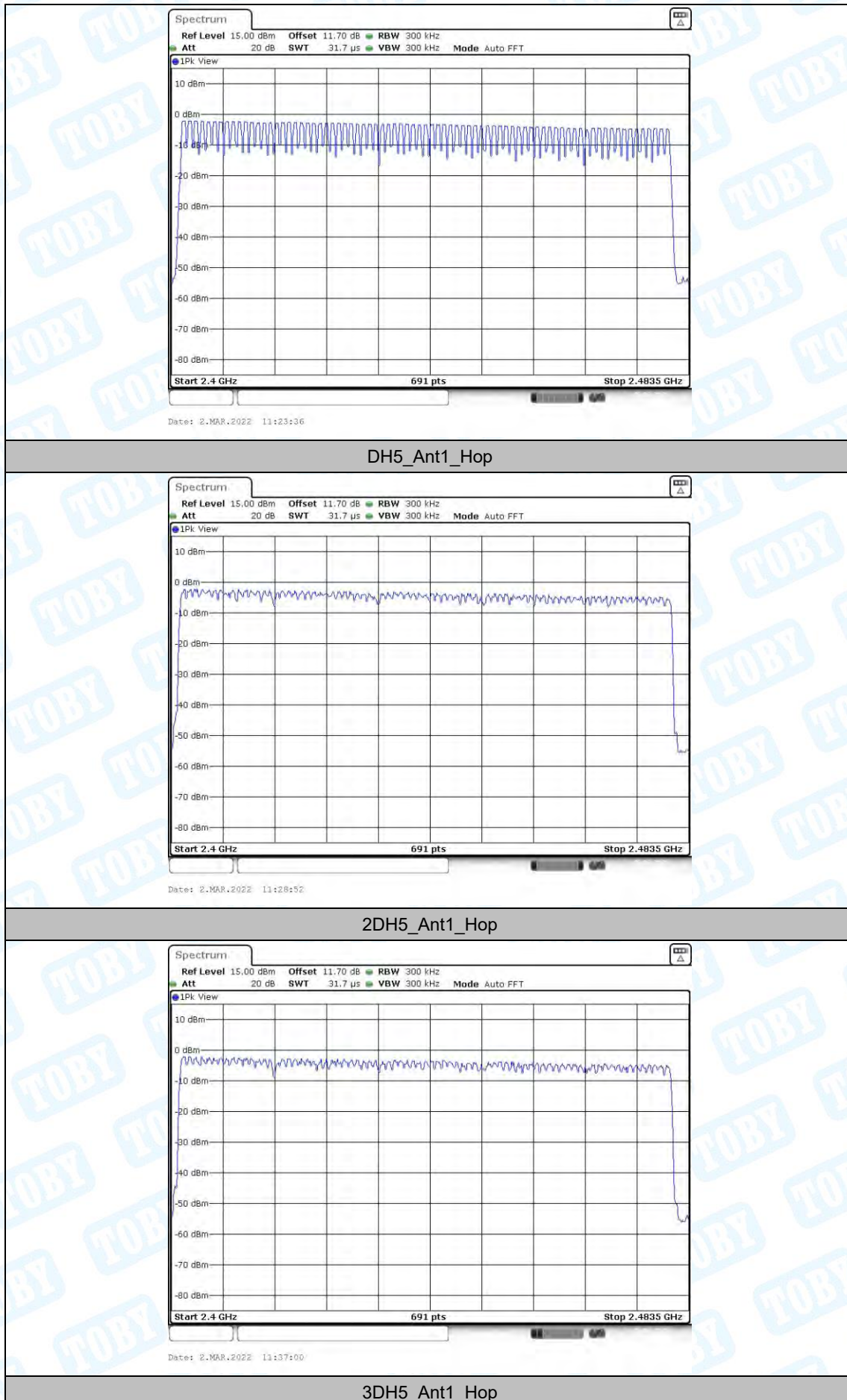
3DH5_Ant1_Hop

6. Number of hopping channels

6.1. Test Result

TestMode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

6.2.Test Graphs

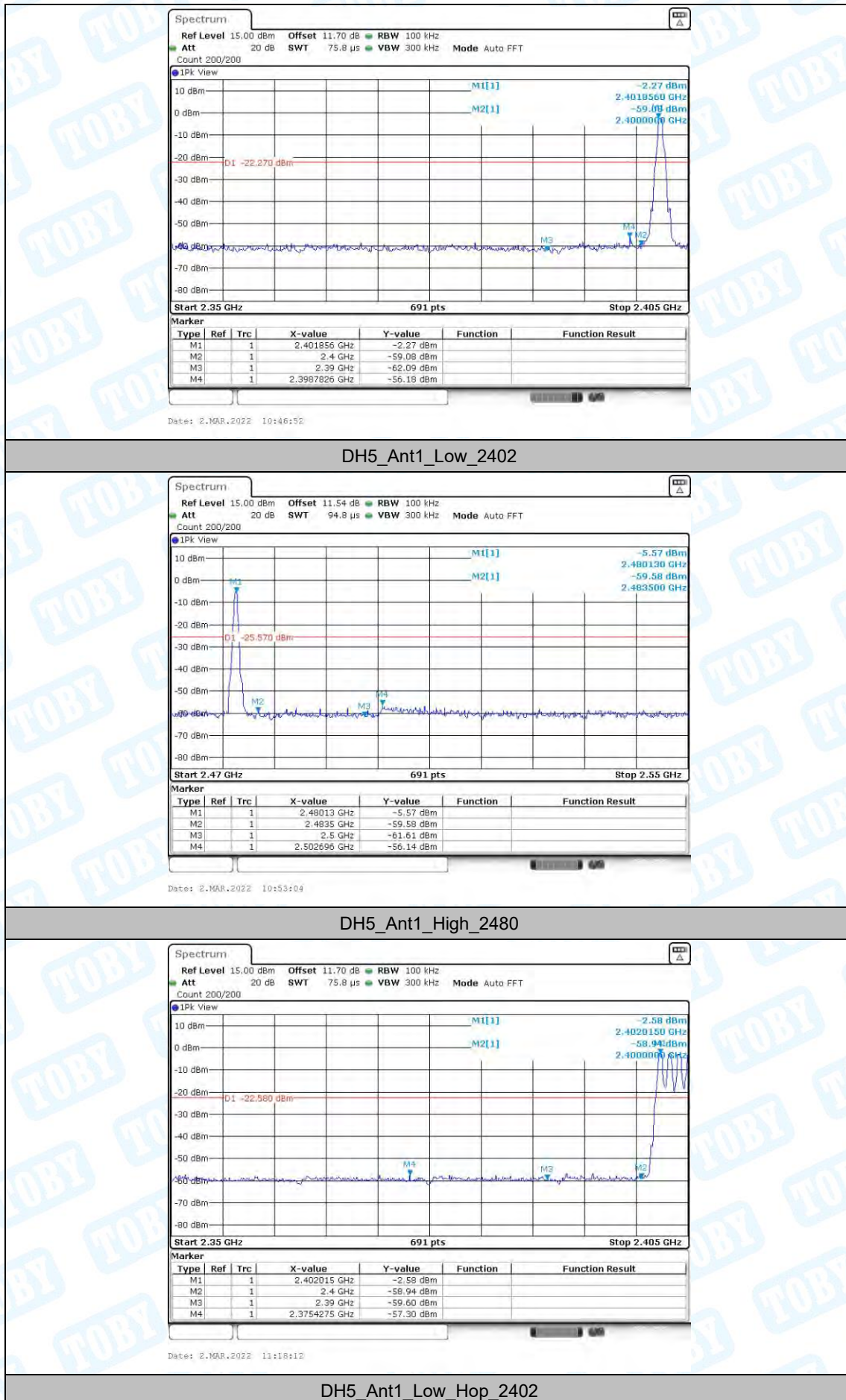


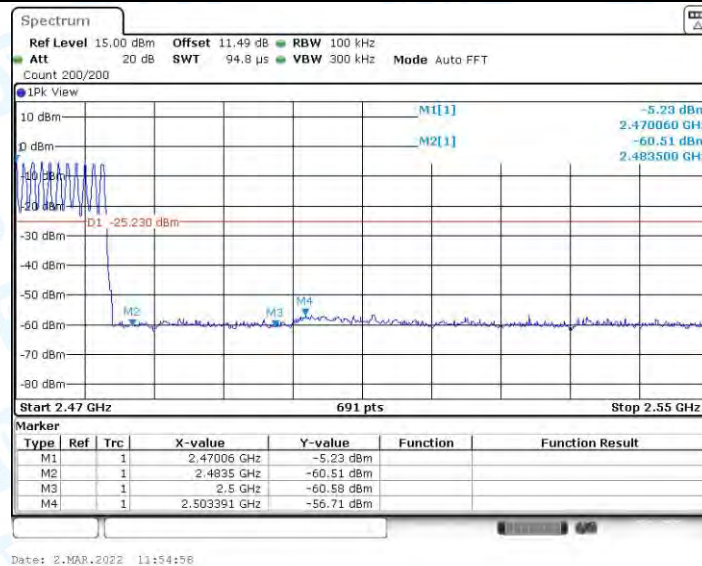
7. Band edge measurements

7.1. Test Result

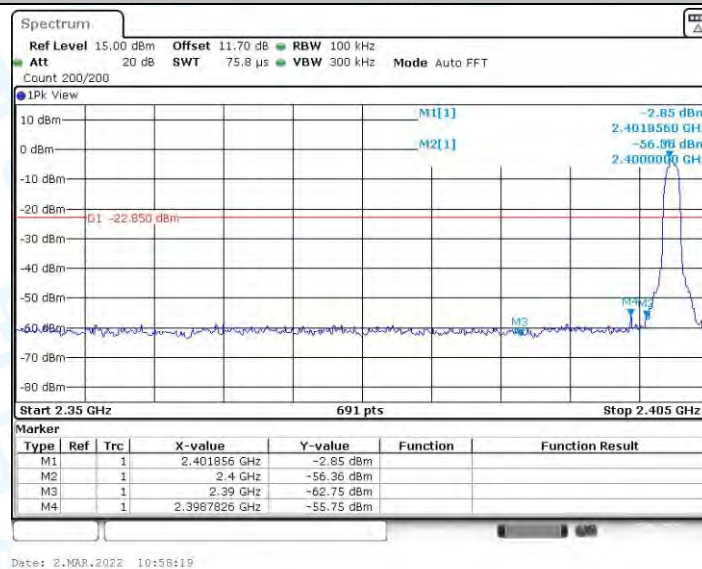
TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-2.27	-56.18	≤ -22.27	PASS
		High	2480	-5.57	-56.14	≤ -25.57	PASS
		Low	Hop_2402	-2.58	-57.3	≤ -22.58	PASS
		High	Hop_2480	-5.23	-56.71	≤ -25.23	PASS
2DH5	Ant1	Low	2402	-2.85	-55.75	≤ -22.85	PASS
		High	2480	-5.10	-56.67	≤ -25.1	PASS
		Low	Hop_2402	-3.63	-58.23	≤ -23.63	PASS
		High	Hop_2480	-5.60	-56.99	≤ -25.6	PASS
3DH5	Ant1	Low	2402	-2.08	-48.31	≤ -22.08	PASS
		High	2480	-4.79	-56.1	≤ -24.79	PASS
		Low	Hop_2402	-2.02	-57.24	≤ -22.02	PASS
		High	Hop_2480	-5.43	-56.41	≤ -25.43	PASS

7.2. Test Graphs

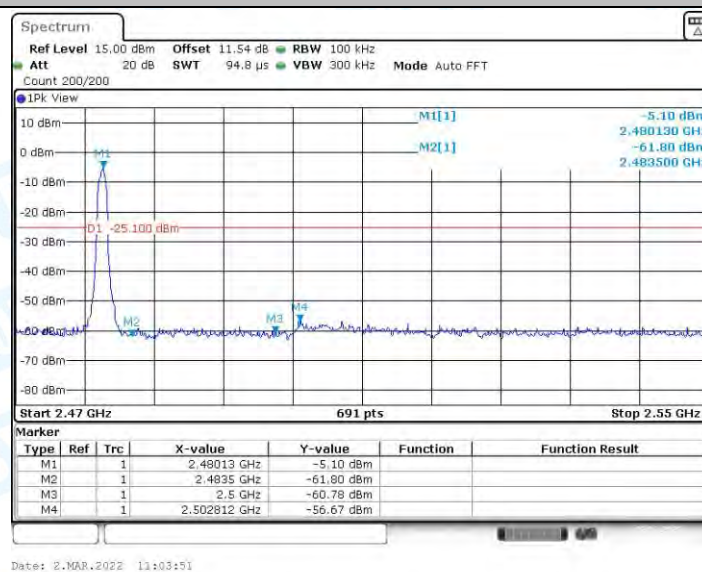




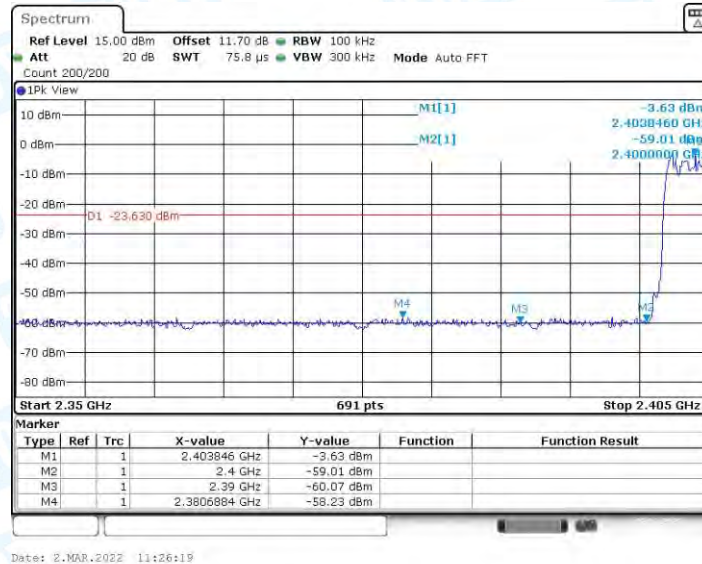
DH5_Ant1_High_Hop_2480



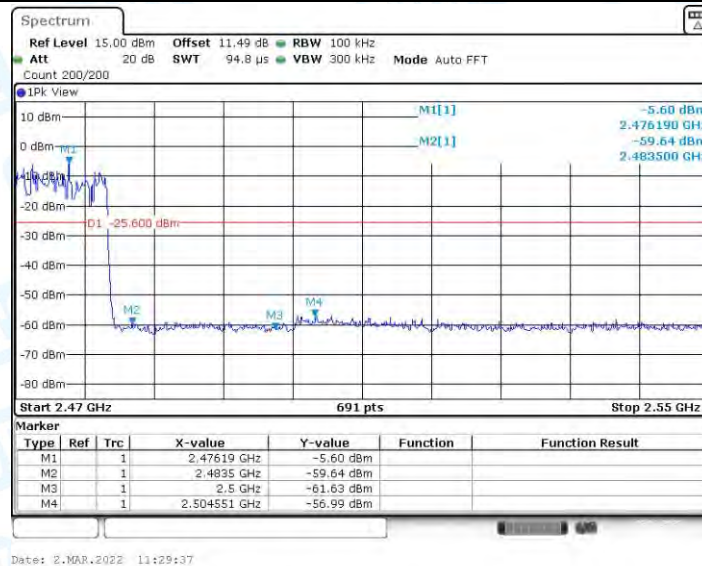
2DH5_Ant1_Low_2402



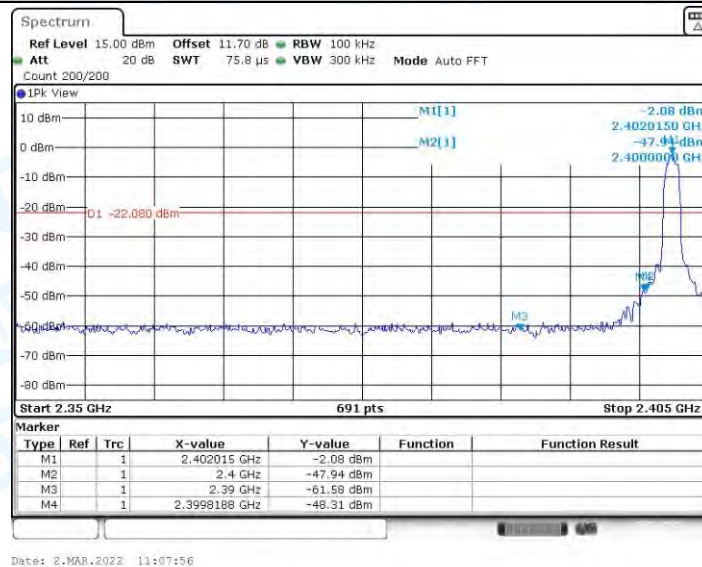
2DH5_Ant1_High_2480



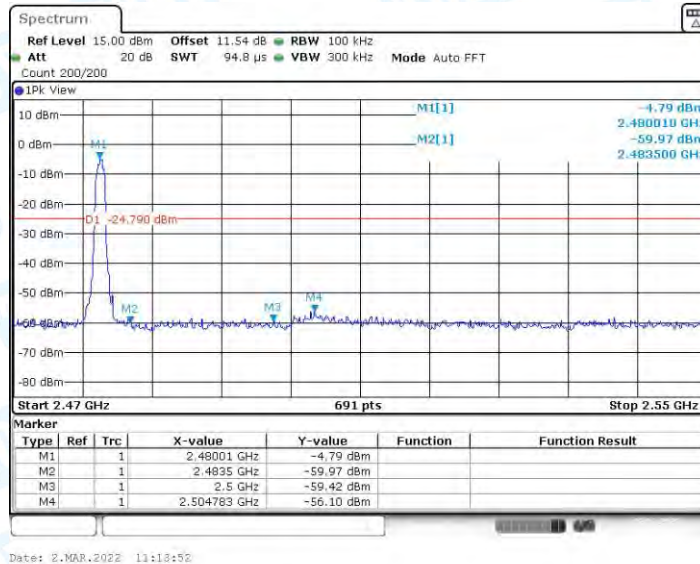
2DH5_Ant1_Low_Hop_2402



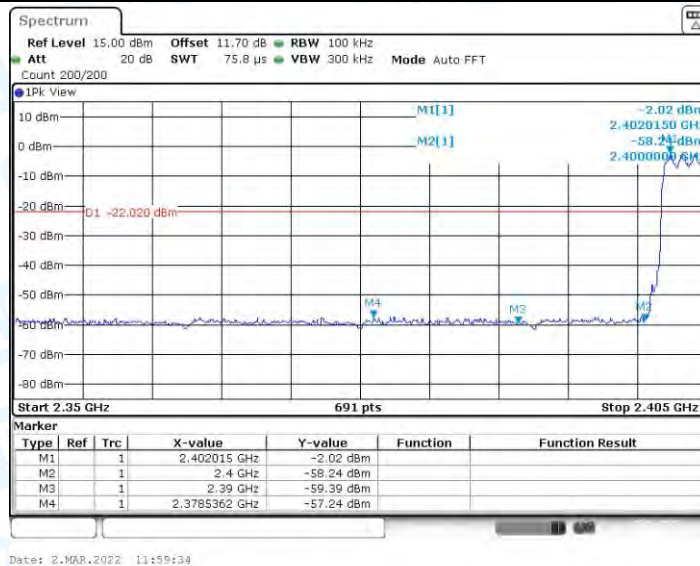
2DH5_Ant1_High_Hop_2480



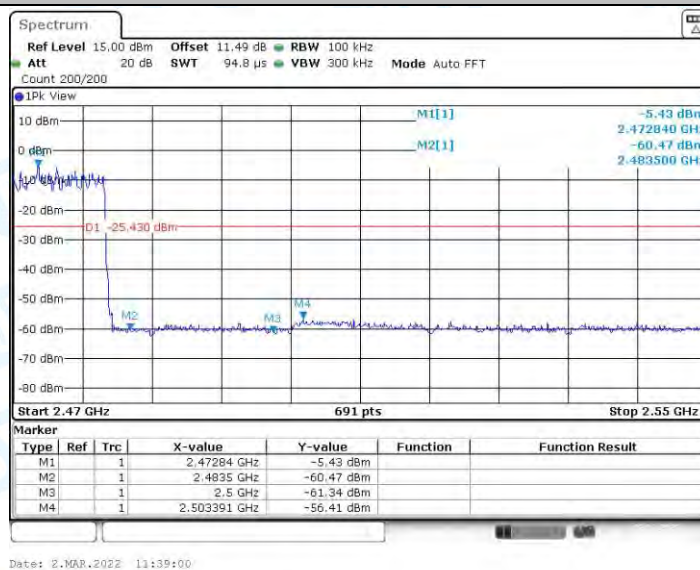
3DH5_Ant1_Low_2402



3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402



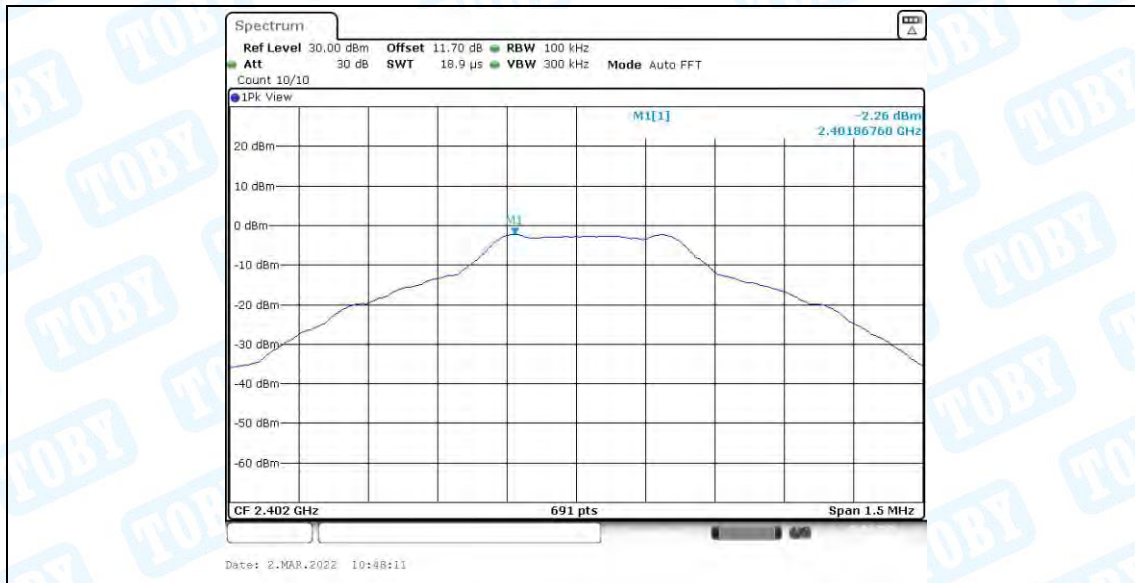
3DH5_Ant1_High_Hop_2480

8. Conducted Spurious Emission

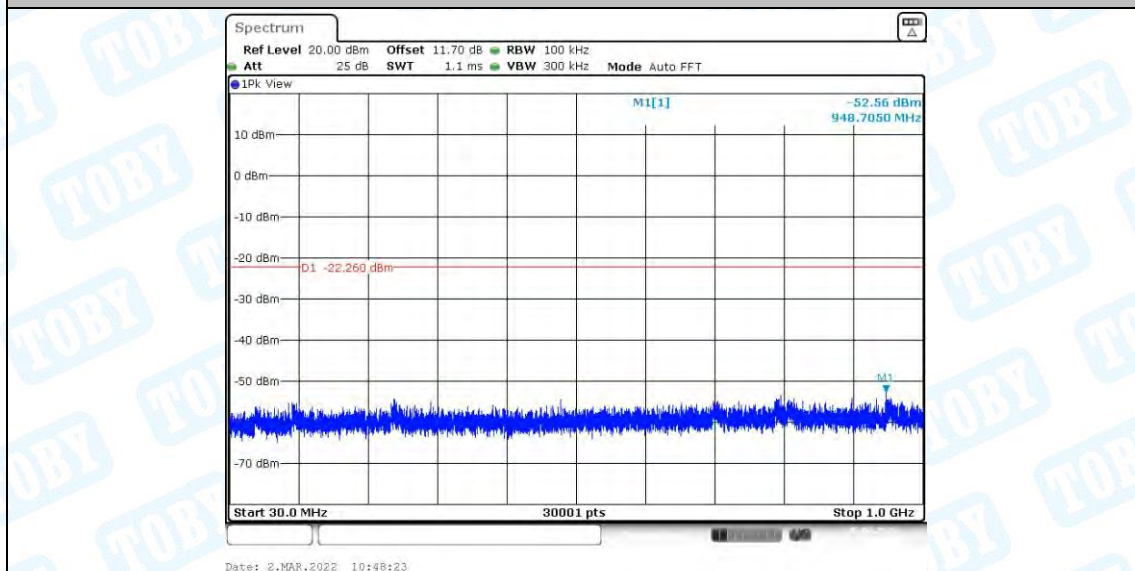
8.1. Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	-2.26	-2.26	---	PASS
			30~1000	-2.26	-52.56	≤-22.26	PASS
			1000~26500	-2.26	-46.73	≤-22.26	PASS
		2441	Reference	-3.67	-3.67	---	PASS
			30~1000	-3.67	-52.3	≤-23.67	PASS
			1000~26500	-3.67	-46.7	≤-23.67	PASS
		2480	Reference	-5.13	-5.13	---	PASS
			30~1000	-5.13	-53.52	≤-25.13	PASS
			1000~26500	-5.13	-46.98	≤-25.13	PASS
2DH5	Ant1	2402	Reference	-2.47	-2.47	---	PASS
			30~1000	-2.47	-53.09	≤-22.47	PASS
			1000~26500	-2.47	-46.99	≤-22.47	PASS
		2441	Reference	-3.84	-3.84	---	PASS
			30~1000	-3.84	-52.2	≤-23.84	PASS
			1000~26500	-3.84	-46.45	≤-23.84	PASS
		2480	Reference	-5.14	-5.14	---	PASS
			30~1000	-5.14	-51.68	≤-25.14	PASS
			1000~26500	-5.14	-45.61	≤-25.14	PASS
3DH5	Ant1	2402	Reference	-2.19	-2.19	---	PASS
			30~1000	-2.19	-52.74	≤-22.19	PASS
			1000~26500	-2.19	-47.01	≤-22.19	PASS
		2441	Reference	-3.55	-3.55	---	PASS
			30~1000	-3.55	-52.29	≤-23.55	PASS
			1000~26500	-3.55	-47.38	≤-23.55	PASS
		2480	Reference	-4.92	-4.92	---	PASS
			30~1000	-4.92	-53	≤-24.92	PASS
			1000~26500	-4.92	-46	≤-24.92	PASS

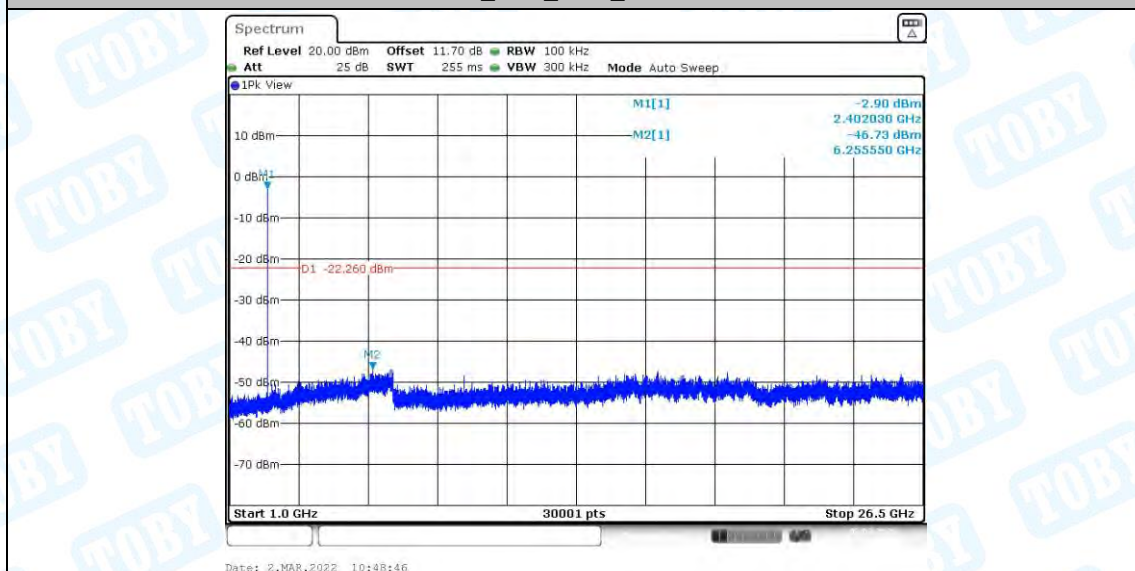
8.2.Test Graphs



DH5_Ant1_2402_0~Reference



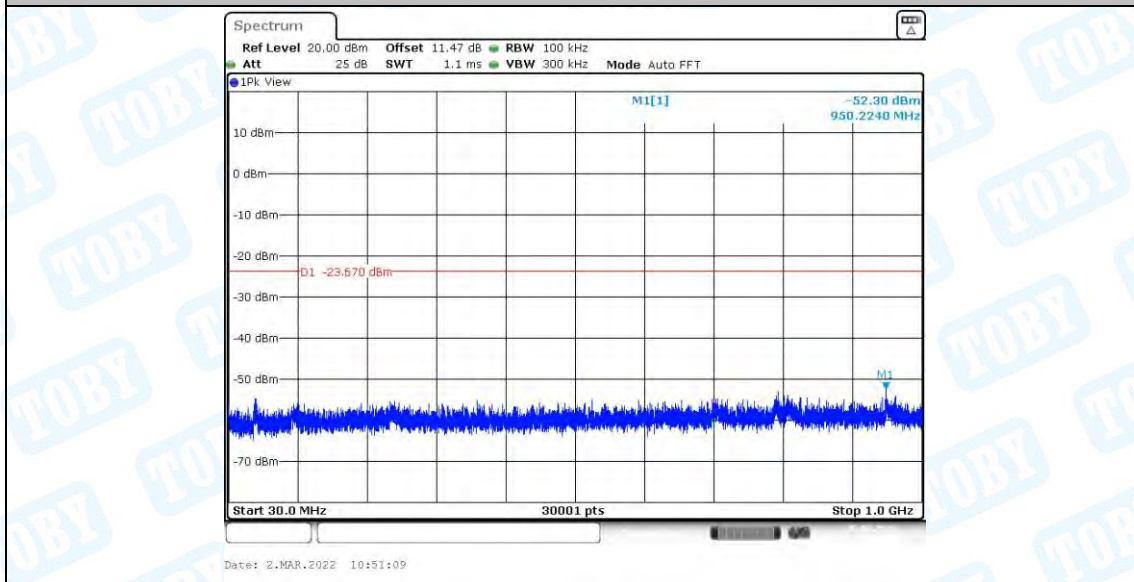
DH5_Ant1_2402_30~1000



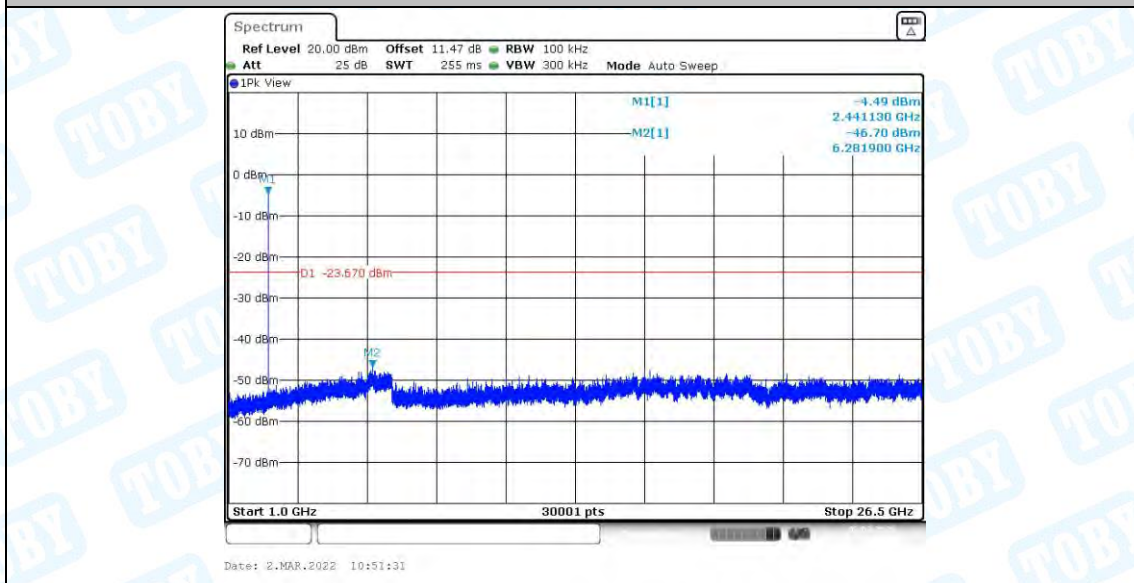
DH5_Ant1_2402_1000~26500



DH5_Ant1_2441_0~Reference



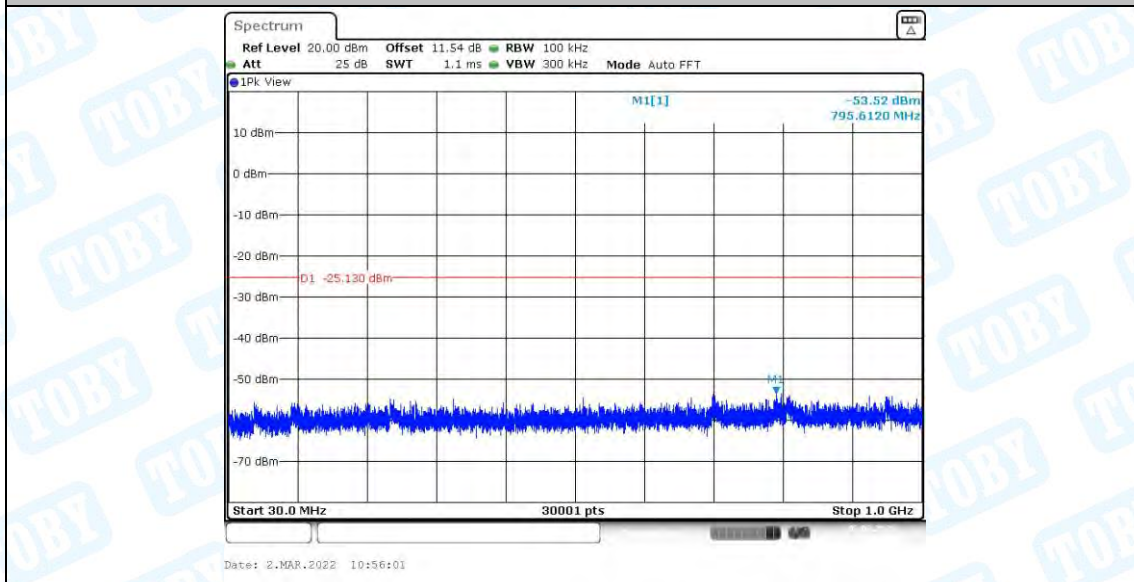
DH5_Ant1_2441_30~1000



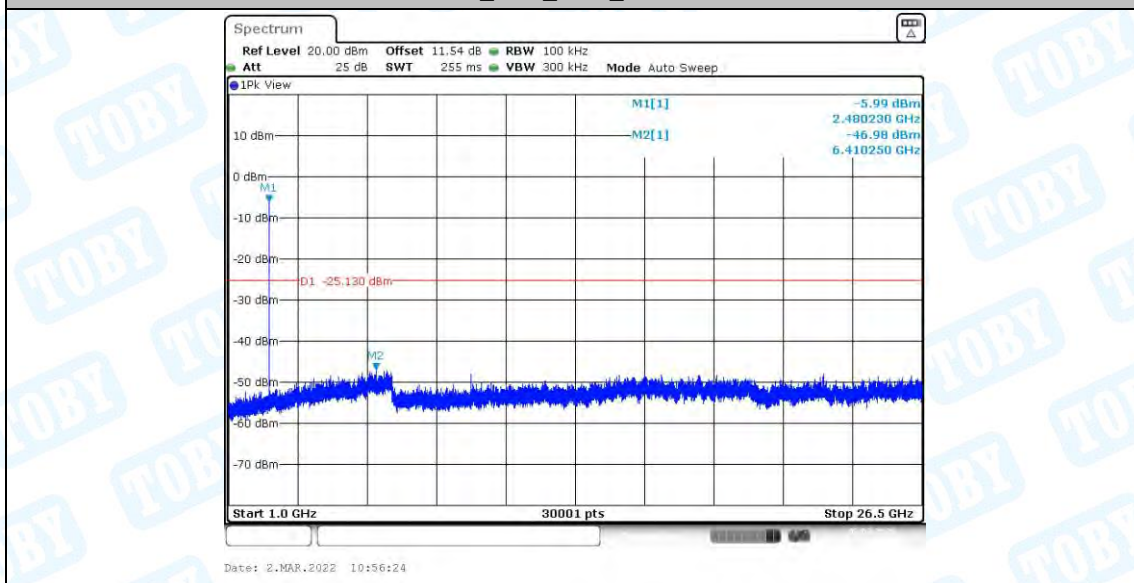
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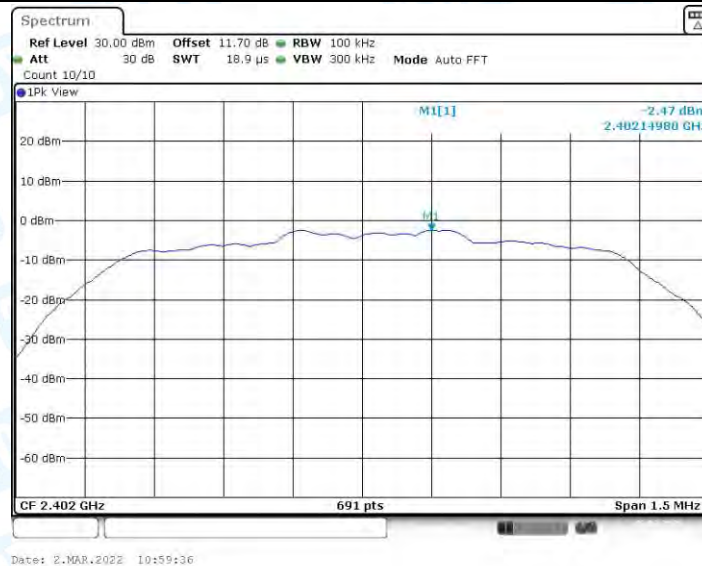
DH5_Ant1_2480_0~Reference



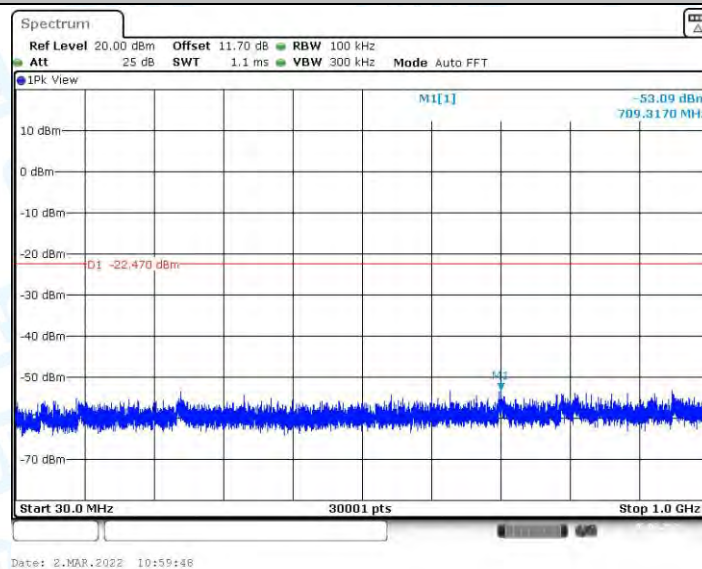
DH5_Ant1_2480_30~1000



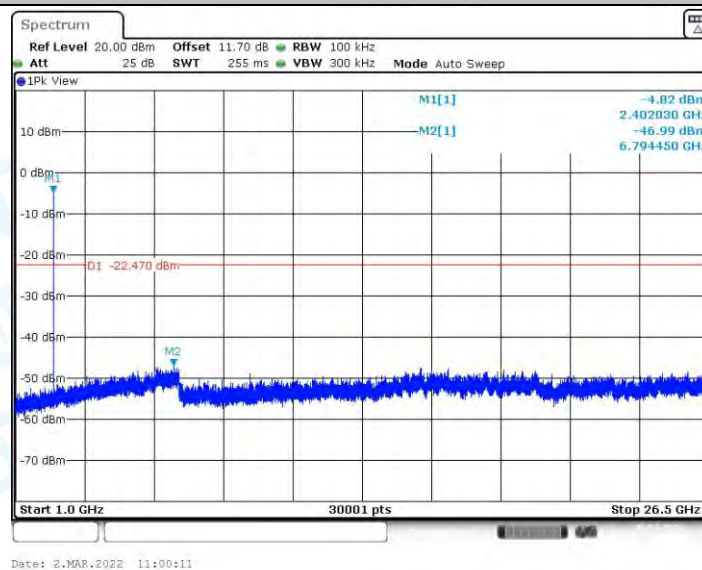
DH5_Ant1_2480_1000~26500



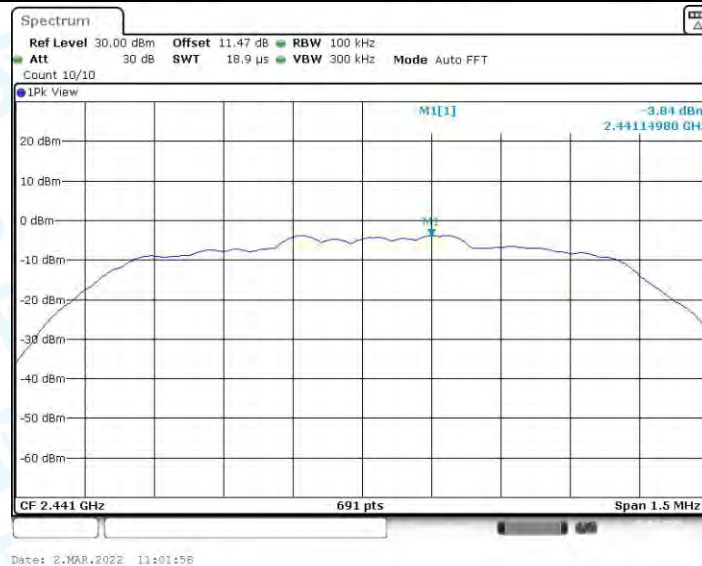
2DH5_Ant1_2402_0~Reference



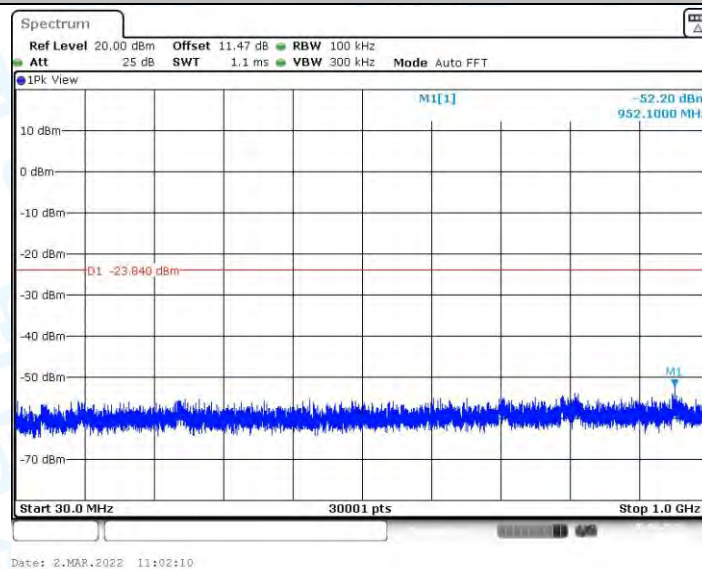
2DH5_Ant1_2402_30~1000



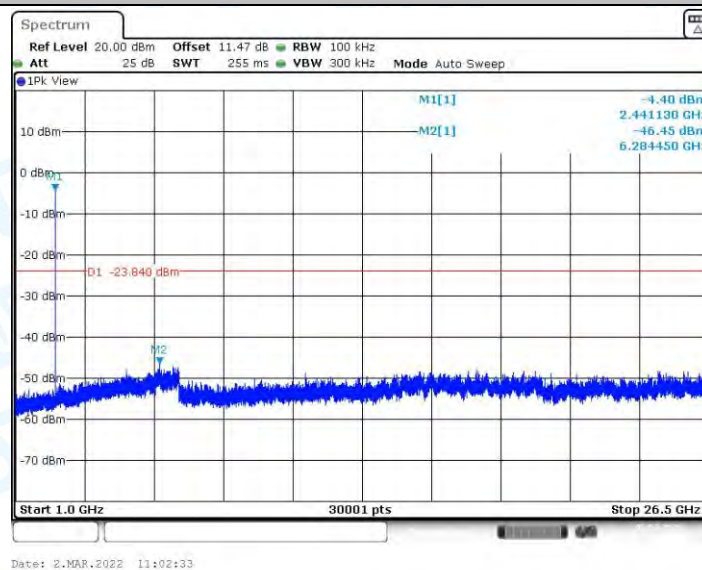
2DH5_Ant1_2402_1000~26500



2DH5_Ant1_2441_0~Reference



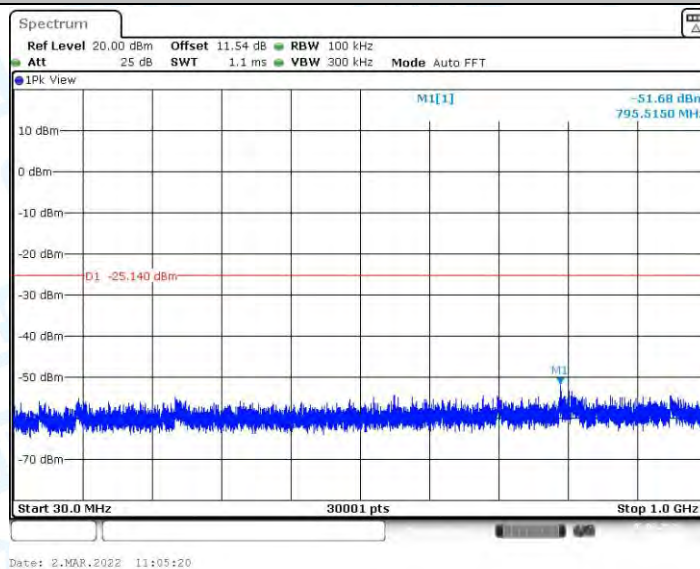
2DH5_Ant1_2441_30~1000



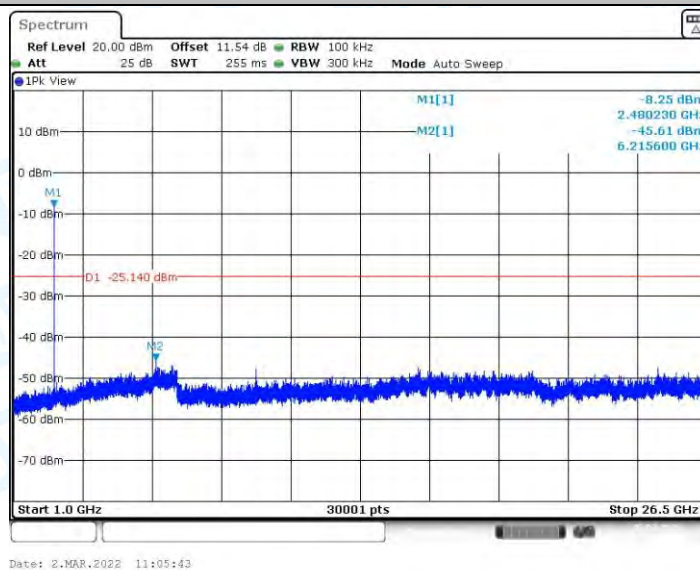
2DH5_Ant1_2441_1000~26500



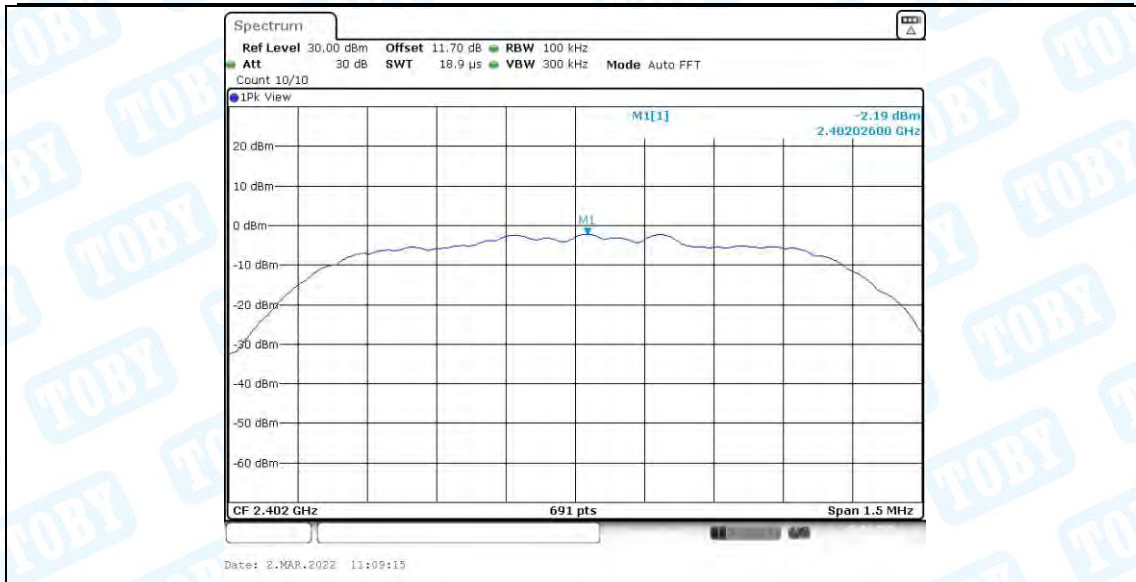
2DH5_Ant1_2480_0~Reference



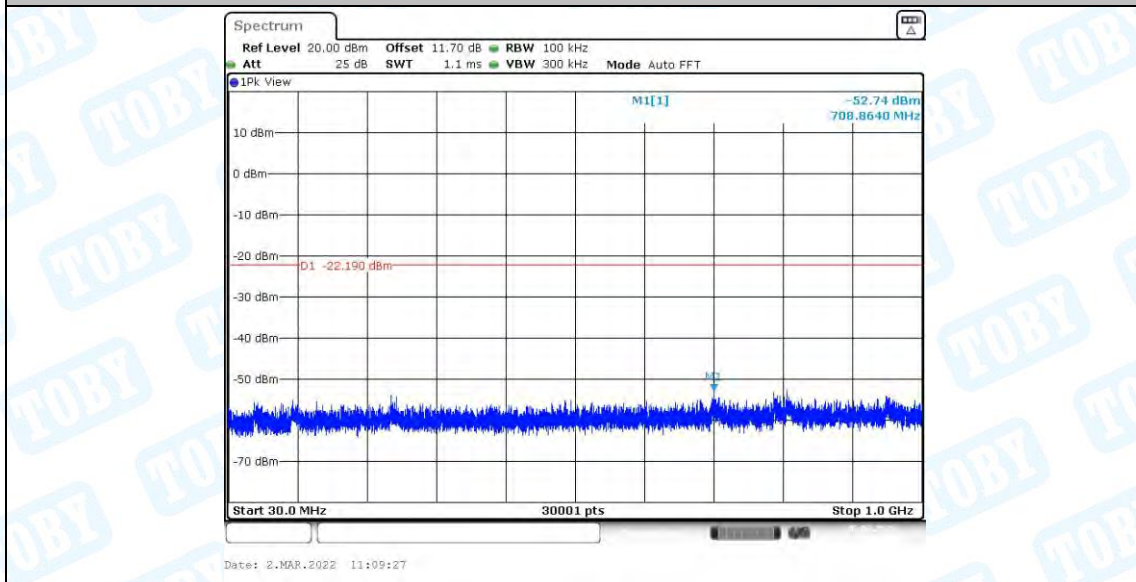
2DH5_Ant1_2480_30~1000



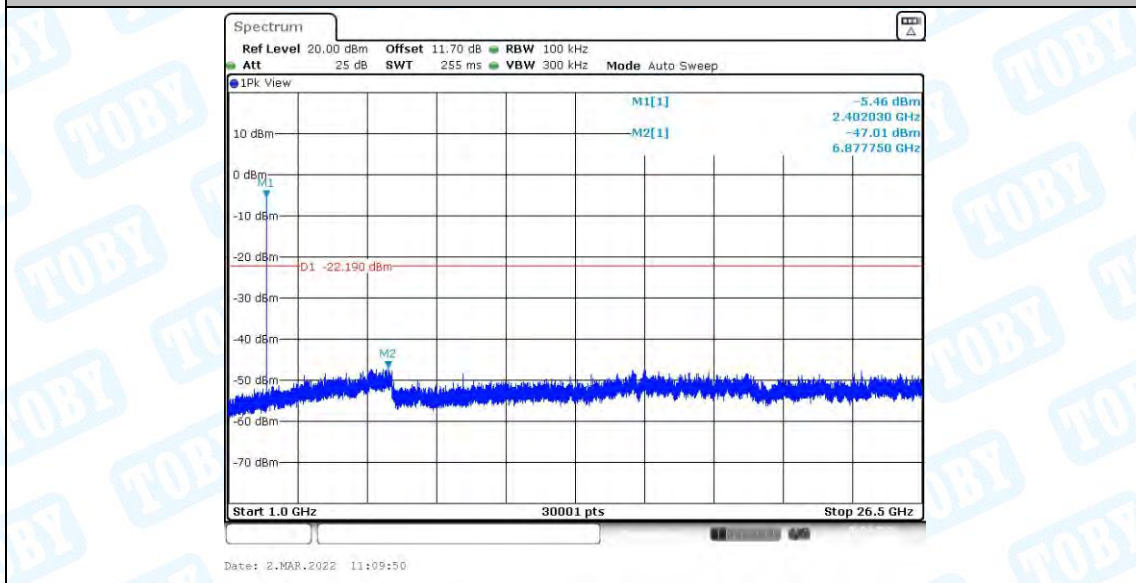
2DH5_Ant1_2480_1000~26500



3DH5_Ant1_2402_0~Reference



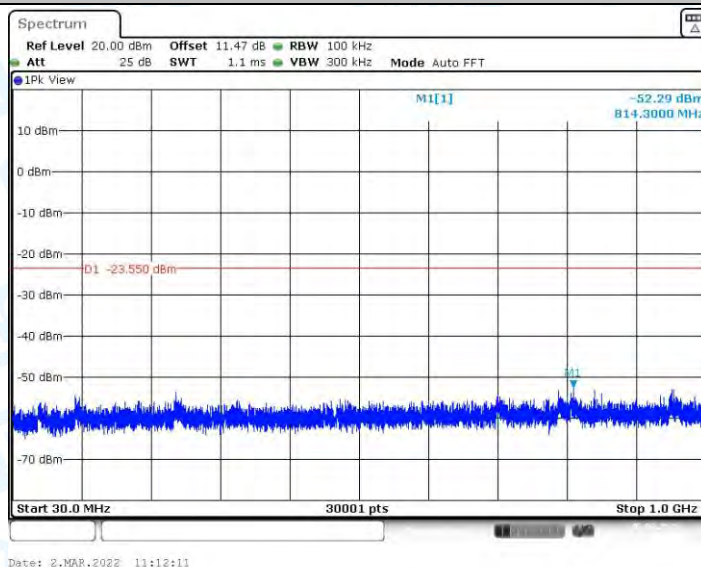
3DH5_Ant1_2402_30~1000



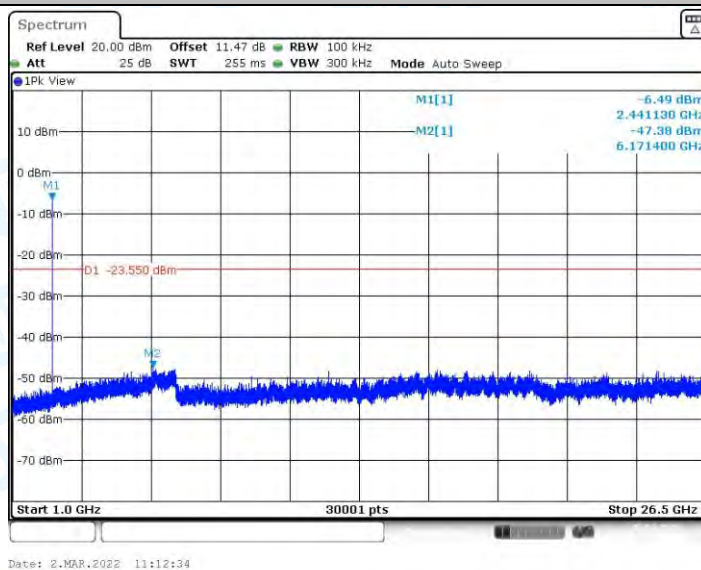
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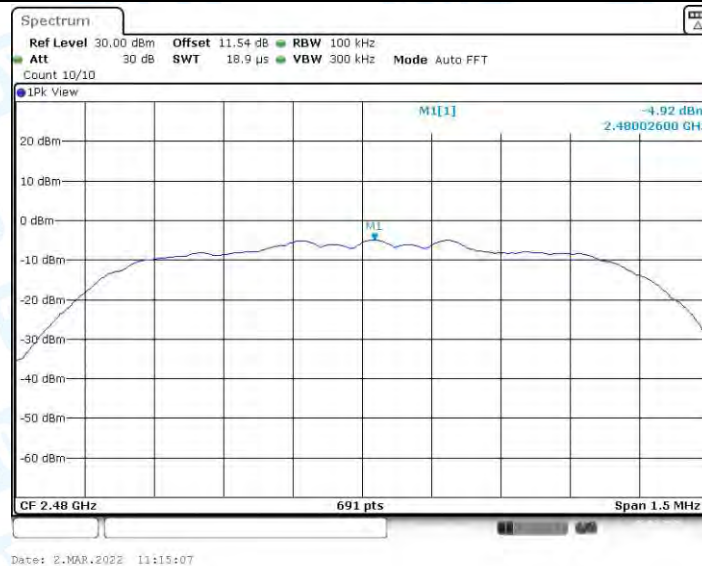
3DH5_Ant1_2441_0~Reference



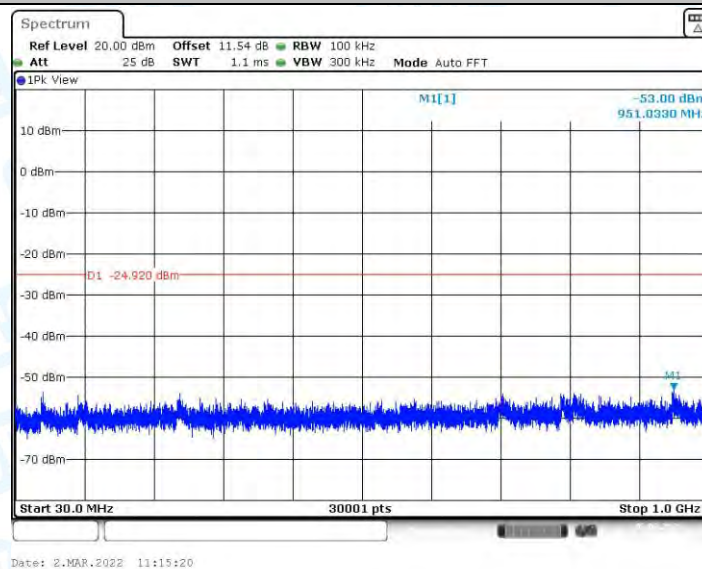
3DH5_Ant1_2441_30~1000



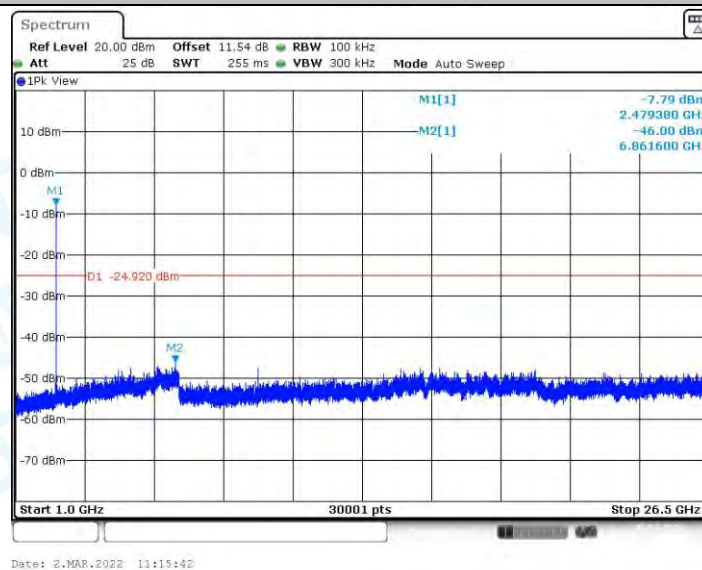
3DH5_Ant1_2441_1000~26500



3DH5_Ant1_2480_0~Reference



3DH5_Ant1_2480_30~1000



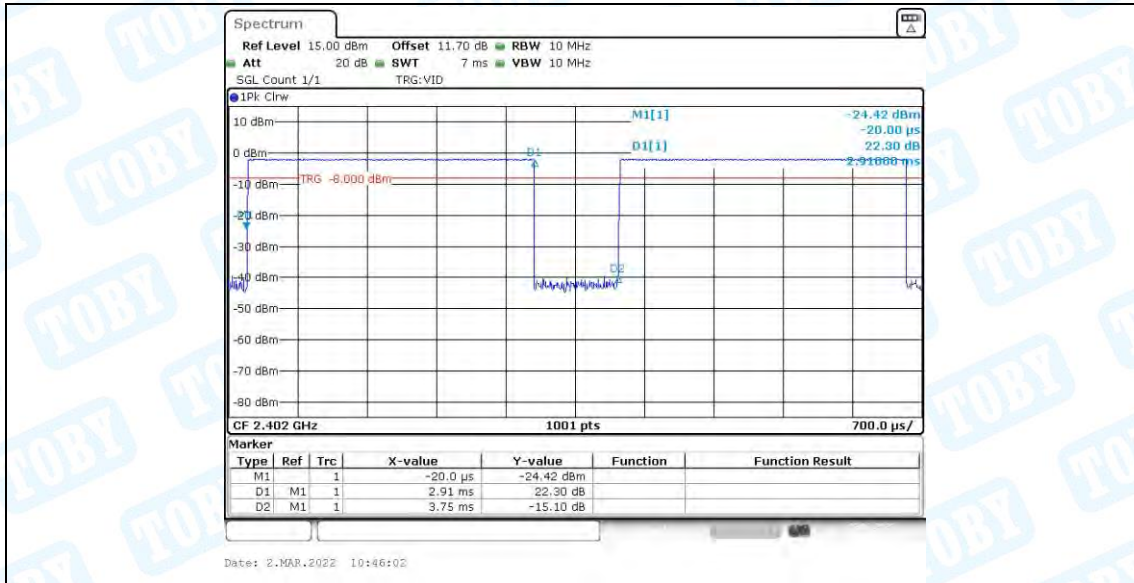
3DH5_Ant1_2480_1000~26500

9. Duty Cycle

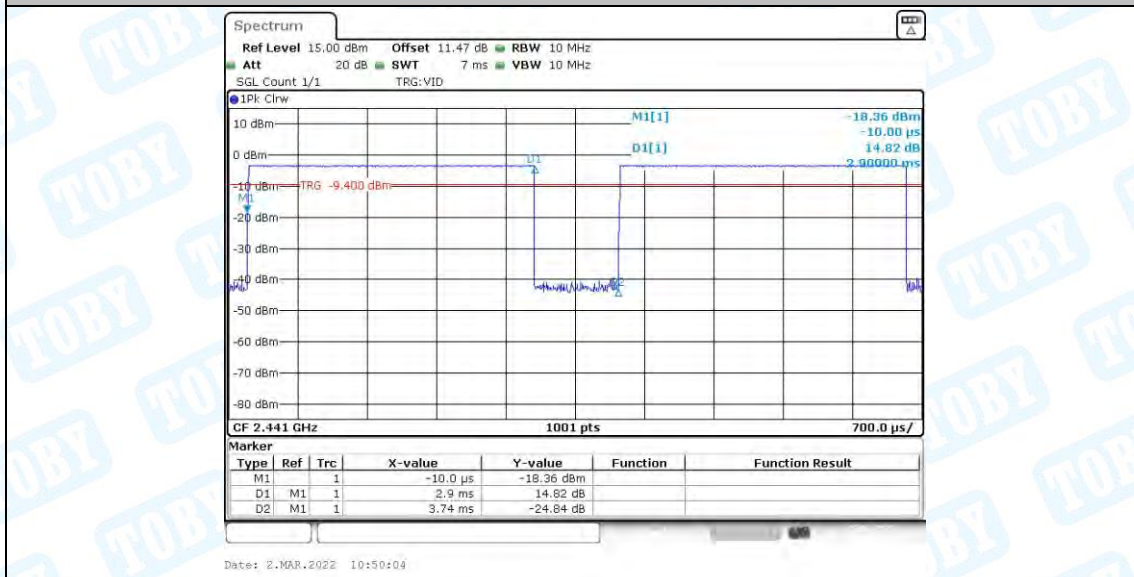
9.1. Test Result

TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Limit	Verdict
DH5	Ant1	2402	2.91	3.75	77.60	---	---
		2441	2.90	3.74	77.54	---	---
		2480	2.91	3.75	77.60	---	---
2DH5	Ant1	2402	2.90	3.75	77.33	---	---
		2441	2.90	3.74	77.54	---	---
		2480	2.91	3.75	77.60	---	---
3DH5	Ant1	2402	2.91	3.75	77.60	---	---
		2441	2.90	3.74	77.54	---	---
		2480	2.91	3.75	77.60	---	---

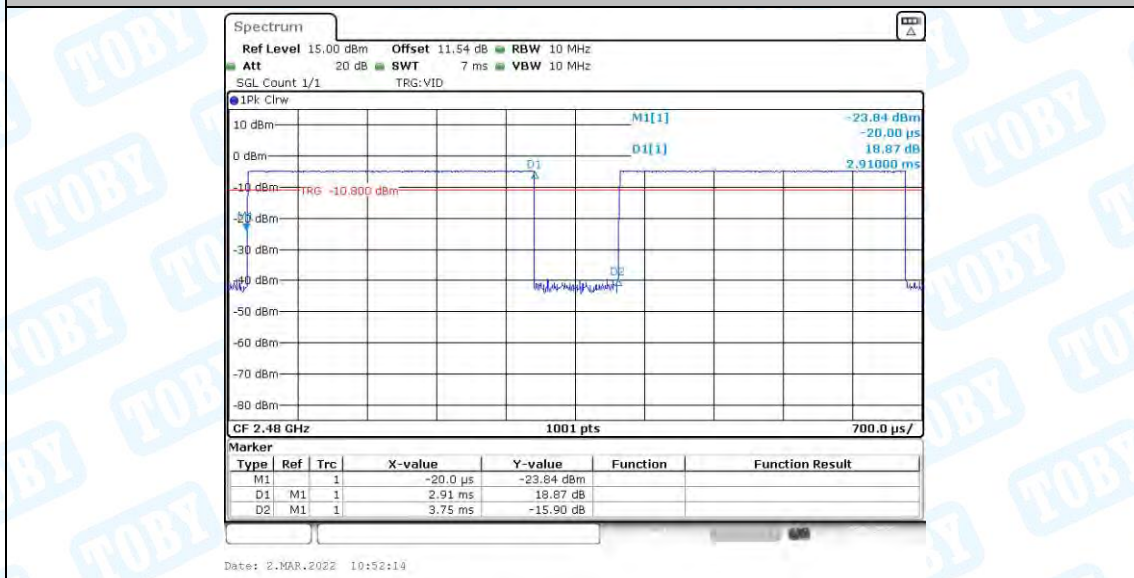
9.2.Test Graphs



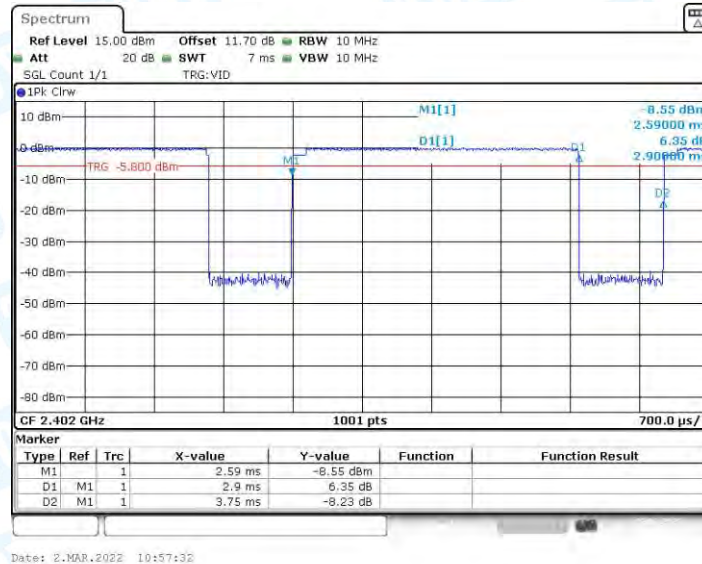
DH5_Ant1_2402



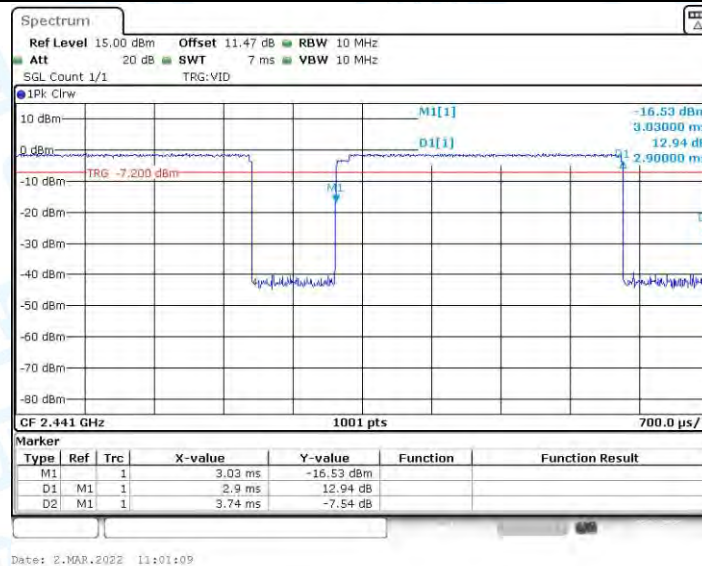
DH5_Ant1_2441



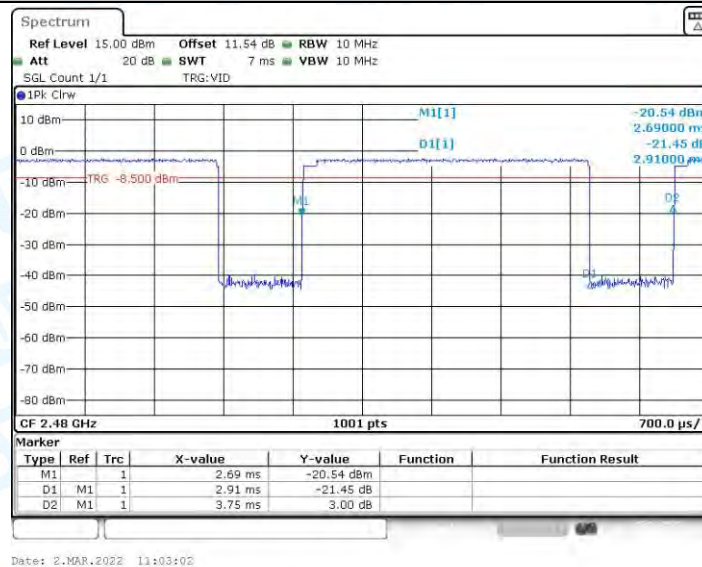
DH5_Ant1_2480



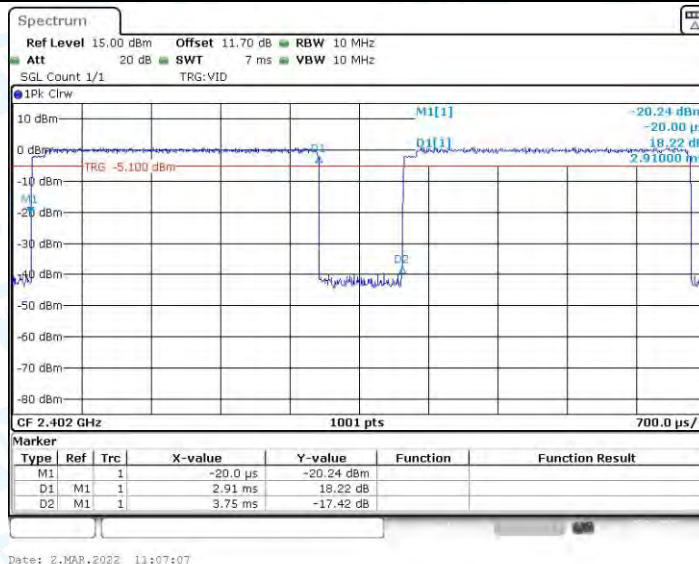
2DH5_Ant1_2402



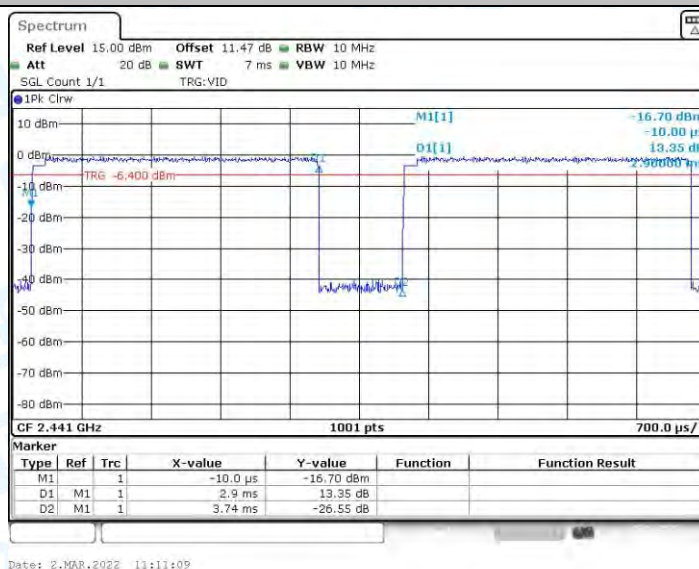
2DH5_Ant1_2441



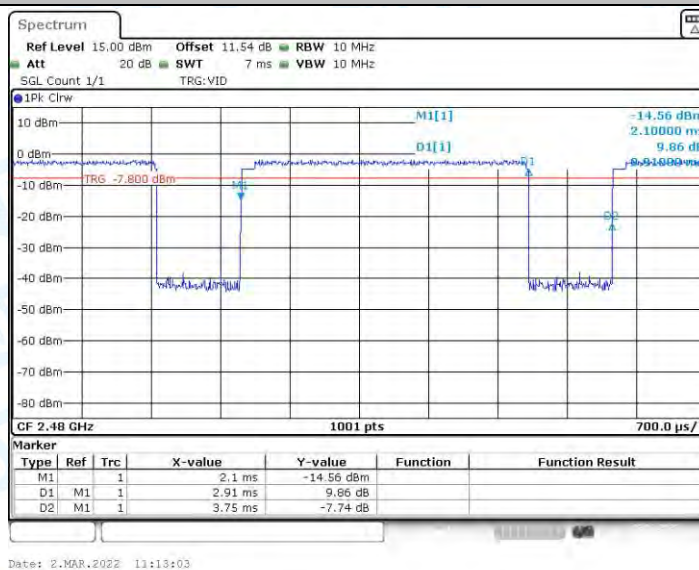
2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480

10. Emissions in Restricted Bands

10.1. Test Result

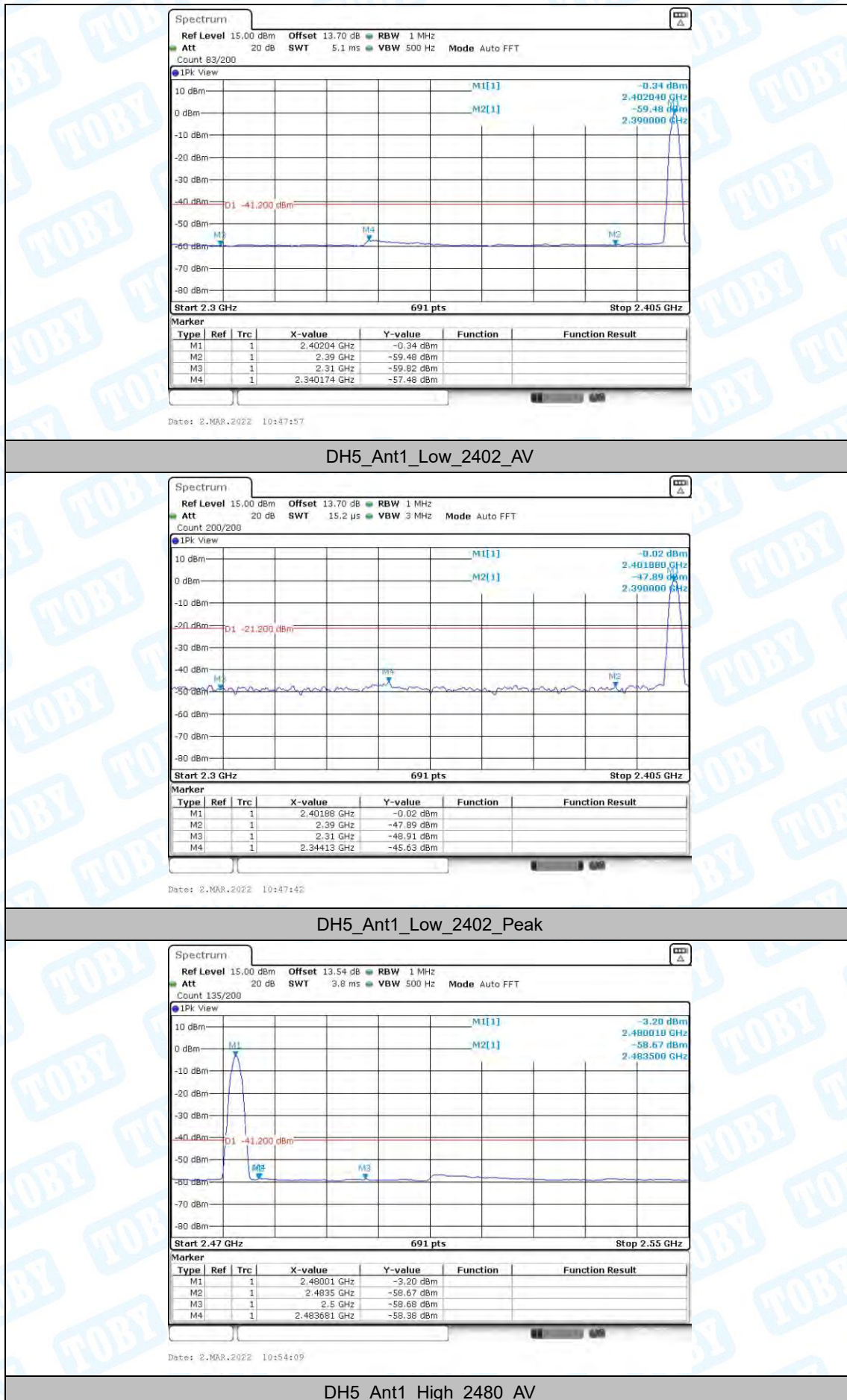
TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	AV	2310.000	-59.82	≤-41.20	PASS
				AV	2340.174	-57.48	≤-41.20	PASS
				AV	2390.000	-59.48	≤-41.20	PASS
				Peak	2310.000	-48.91	≤-21.20	PASS
				Peak	2344.130	-45.63	≤-21.20	PASS
				Peak	2390.000	-47.89	≤-21.20	PASS
		High	2480	AV	2483.500	-58.67	≤-41.20	PASS
				AV	2483.681	-58.38	≤-41.20	PASS
				AV	2500.000	-58.68	≤-41.20	PASS
				Peak	2483.500	-49.98	≤-21.20	PASS
				Peak	2484.493	-46.97	≤-21.20	PASS
				Peak	2500.000	-49.29	≤-21.20	PASS
		Low	Hop_240 2	Peak	2310.000	-49.09	≤-21.20	PASS
				Peak	2340.022	-45.91	≤-21.20	PASS
				Peak	2390.000	-48.9	≤-21.20	PASS
		High	Hop_248 0	Peak	2483.500	-50.61	≤-21.20	PASS
				Peak	2500.000	-46.73	≤-21.20	PASS
2DH5	Ant1	Low	2402	AV	2310.000	-59.86	≤-41.20	PASS
				AV	2341.543	-57.48	≤-41.20	PASS
				AV	2390.000	-59.7	≤-41.20	PASS
				Peak	2310.000	-47.27	≤-21.20	PASS
				Peak	2366.196	-46.06	≤-21.20	PASS
				Peak	2390.000	-48.25	≤-21.20	PASS
		High	2480	AV	2483.500	-58.89	≤-41.20	PASS
				AV	2484.493	-58.62	≤-41.20	PASS
				AV	2500.000	-58.97	≤-41.20	PASS
				Peak	2483.500	-50.2	≤-21.20	PASS
				Peak	2499.101	-45.75	≤-21.20	PASS
				Peak	2500.000	-47.87	≤-21.20	PASS
		Low	Hop_240 2	Peak	2310.000	-49.36	≤-21.20	PASS
				Peak	2369.696	-45.67	≤-21.20	PASS
				Peak	2390.000	-49.42	≤-21.20	PASS
		High	Hop_248 0	Peak	2483.500	-50.33	≤-21.20	PASS
				Peak	2490.754	-45.14	≤-21.20	PASS
				Peak	2500.000	-48.21	≤-21.20	PASS
3DH5	Ant1	Low	2402	AV	2310.000	-59.88	≤-41.20	PASS
				AV	2341.543	-57.31	≤-41.20	PASS
				AV	2390.000	-59.61	≤-41.20	PASS
				Peak	2310.000	-48.45	≤-21.20	PASS
				Peak	2343.674	-45.94	≤-21.20	PASS
				Peak	2390.000	-48.36	≤-21.20	PASS

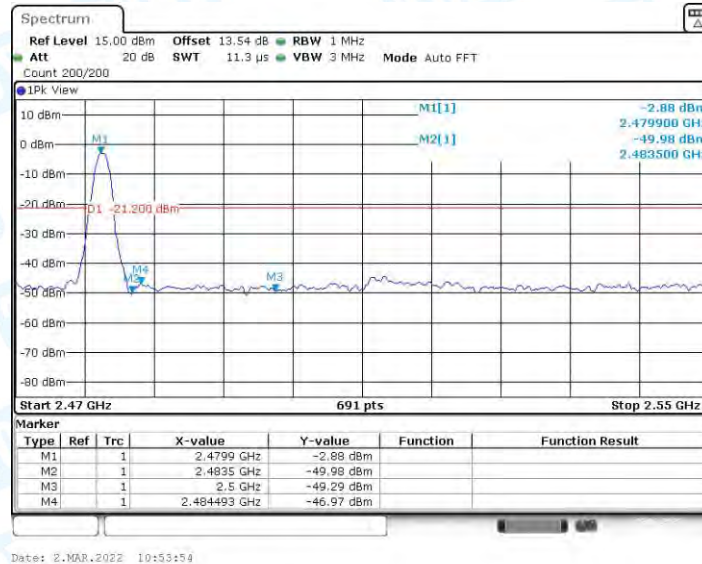
		High	2480	AV	2483.500	-58.82	≤ -41.20	PASS
				AV	2483.913	-58.46	≤ -41.20	PASS
				AV	2500.000	-59.1	≤ -41.20	PASS
				Peak	2483.500	-49.22	≤ -21.20	PASS
				Peak	2484.725	-46.81	≤ -21.20	PASS
				Peak	2500.000	-48.52	≤ -21.20	PASS
		Low	Hop_240 2	Peak	2310.000	-48.87	≤ -21.20	PASS
				Peak	2343.065	-45.87	≤ -21.20	PASS
				Peak	2390.000	-48.6	≤ -21.20	PASS
		High	Hop_248 0	Peak	2483.500	-49.94	≤ -21.20	PASS
				Peak	2496.087	-46.77	≤ -21.20	PASS
				Peak	2500.000	-47.39	≤ -21.20	PASS

Note:

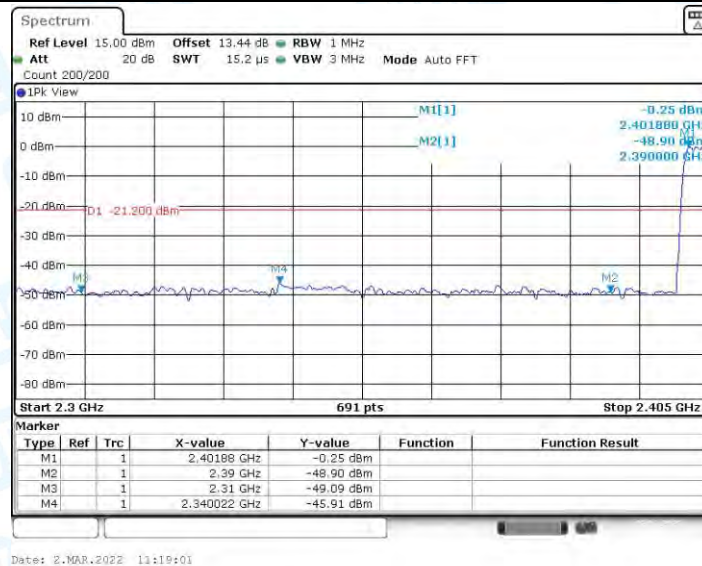
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

10.2. Test Graphs

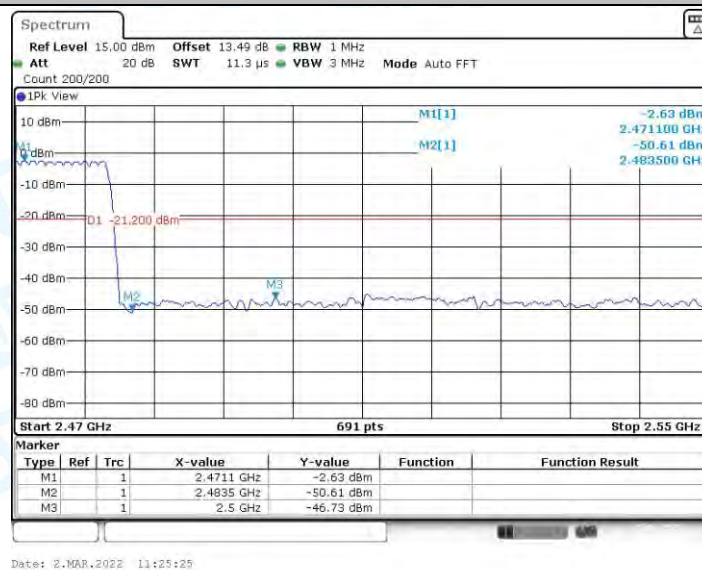




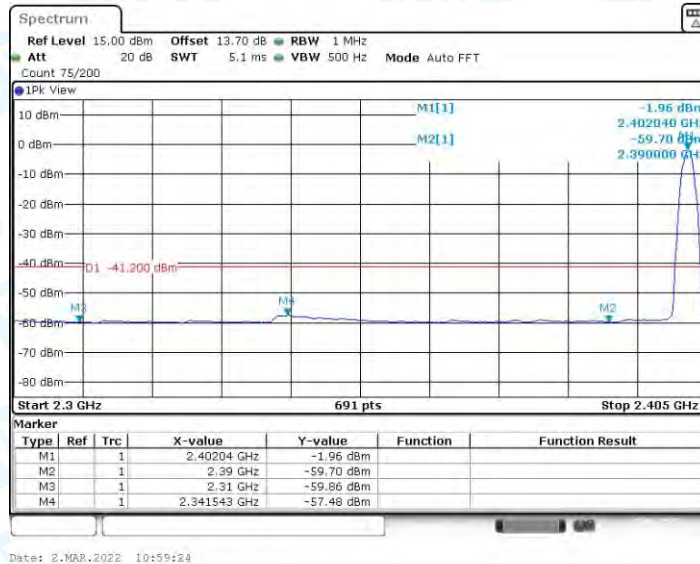
DH5_Ant1_High_2480_Peak



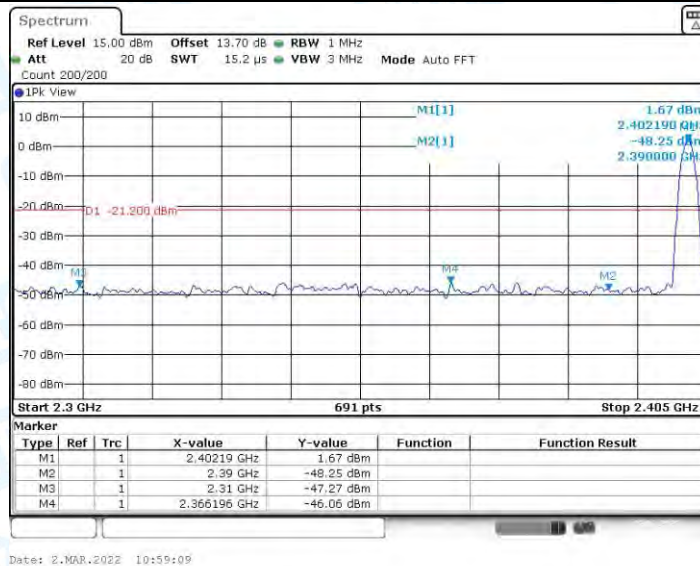
DH5_Ant1_Low_Hop_2402_Peak



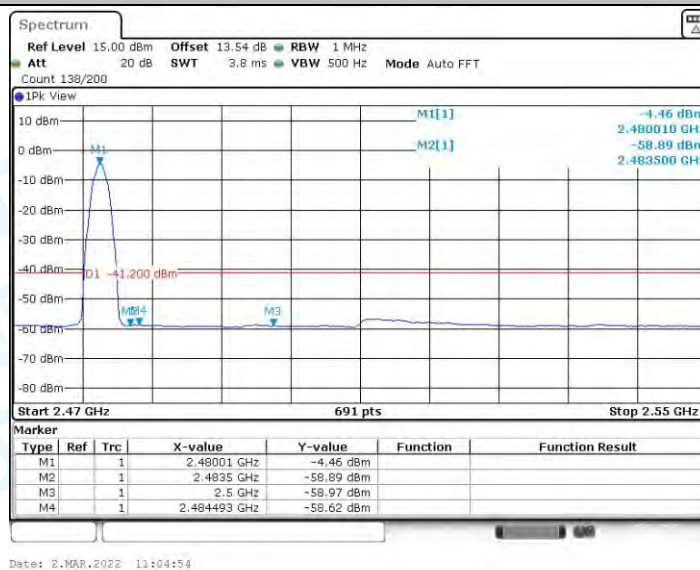
DH5_Ant1_High_Hop_2480_Peak



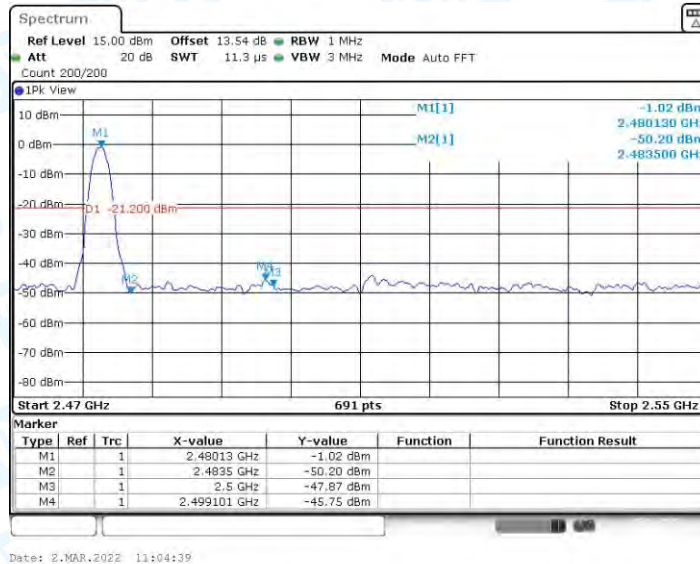
2DH5_Ant1_Low_2402_AV



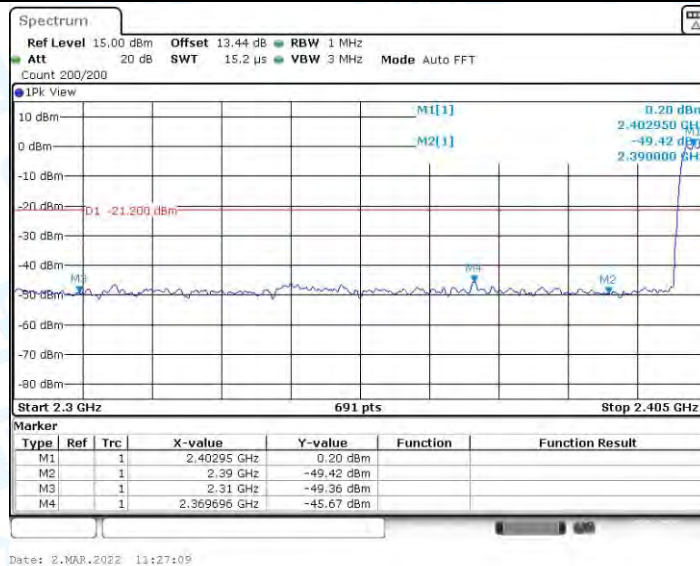
2DH5_Ant1_Low_2402_Peak



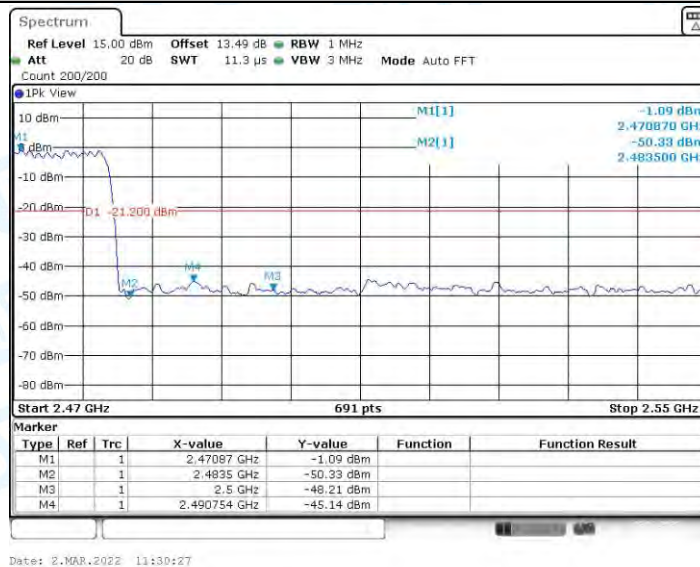
2DH5_Ant1_High_2480_AV



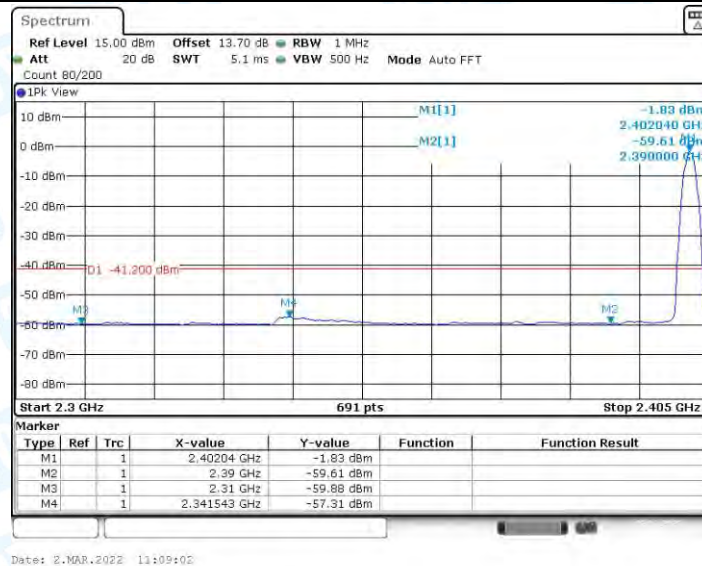
2DH5_Ant1_High_2480_Peak



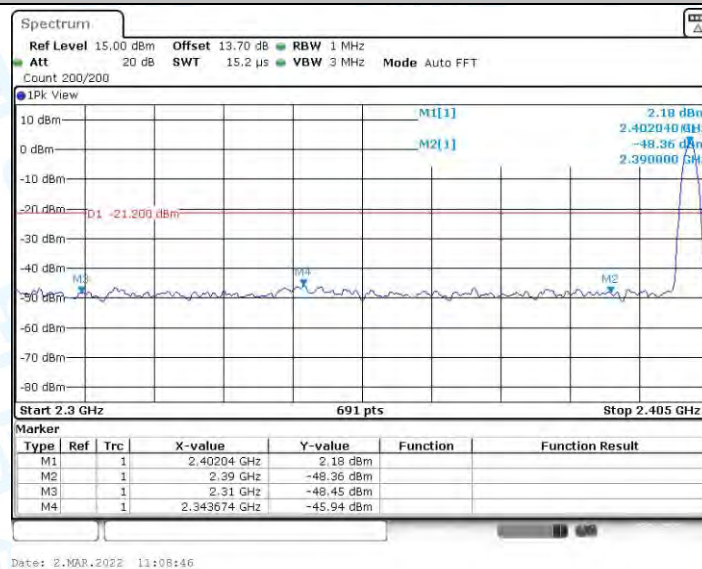
2DH5_Ant1_Low_Hop_2402_Peak



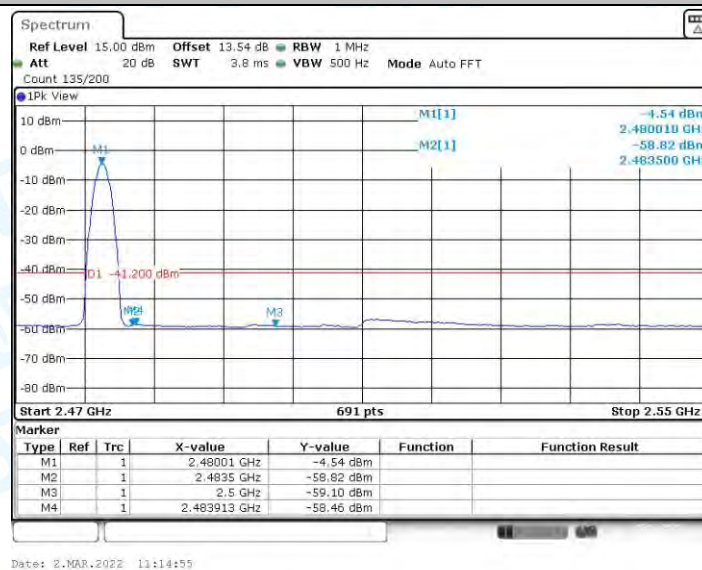
2DH5_Ant1_High_Hop_2480_Peak



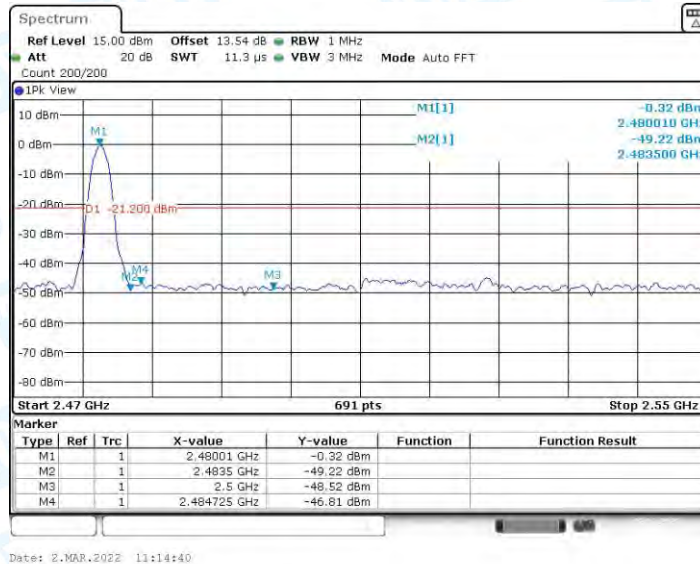
3DH5_Ant1_Low_2402_AV



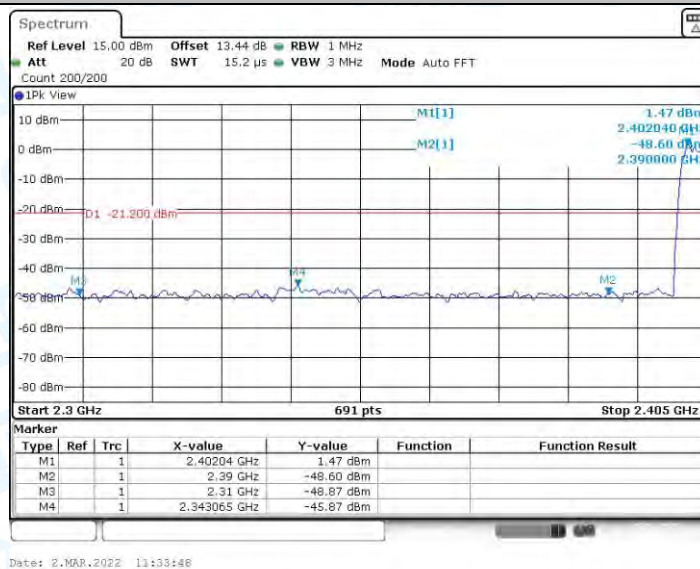
3DH5_Ant1_Low_2402_Peak



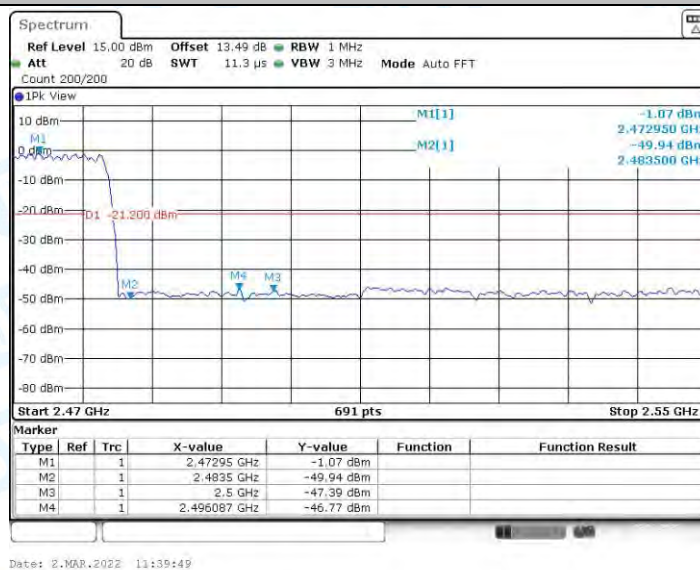
3DH5_Ant1_High_2480_AV



3DH5_Ant1_High_2480_Peak



3DH5_Ant1_Low_Hop_2402_Peak



3DH5_Ant1_High_Hop_2480_Peak

-----End of the report-----