

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	

Contents

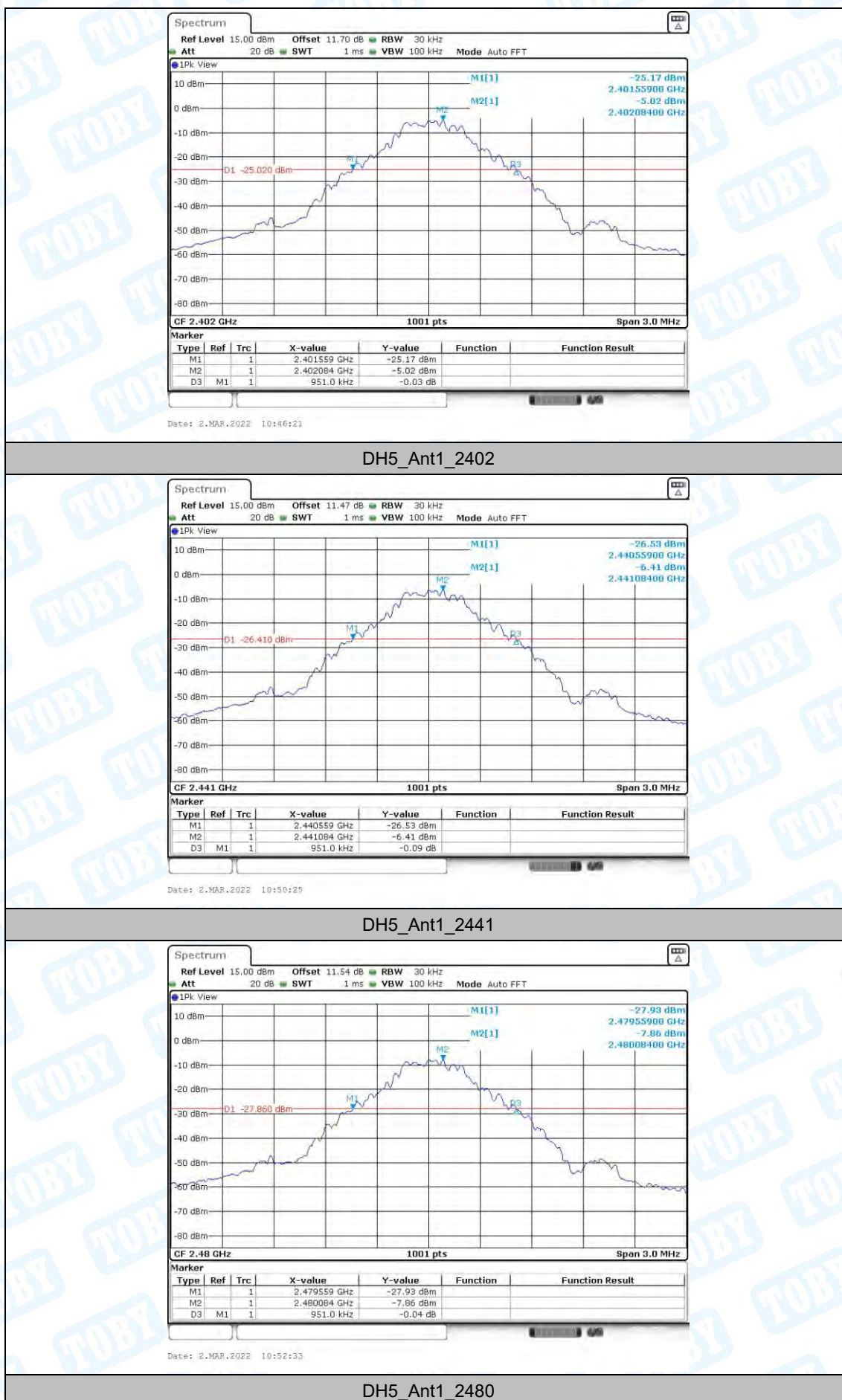
1. 20dB Emission Bandwidth.....	3
1.1.Test Result	3
1.2.Test Graphs	4
2. Occupied Channel Bandwidth.....	7
2.1.Test Result	7
2.2.Test Graphs	8
3. Maximum conducted output power	11
3.1.Test Result	11
3.2.Test Graphs	12
4. Carrier frequency separation	15
4.1.Test Result	15
4.2.Test Graphs	16
5. Time of occupancy	17
5.1.Test Result	17
5.2.Test Graphs	18
6. Number of hopping channels.....	21
6.1.Test Result	21
6.2.Test Graphs	22
7.Band edge measurements	23
7.1.Test Result	23
7.2.Test Graphs	24
8. Conducted Spurious Emission.....	28
8.1.Test Result	28
8.2.Test Graphs	29
9. Duty Cycle.....	38
9.1.Test Result	38
9.2.Test Graphs	39
10. Emissions in Restricted Bands.....	42
10.1.Test Result.....	42
10.2.Test Graphs	44

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





2DH5_Ant1_2402



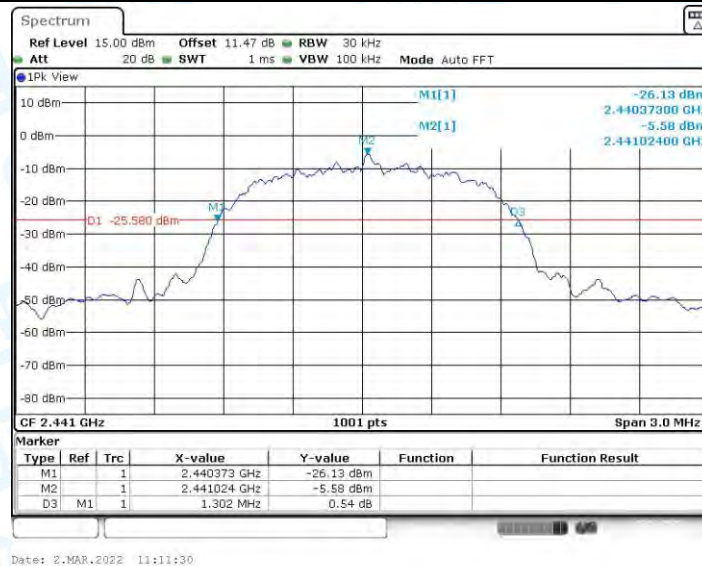
2DH5_Ant1_2441



2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441



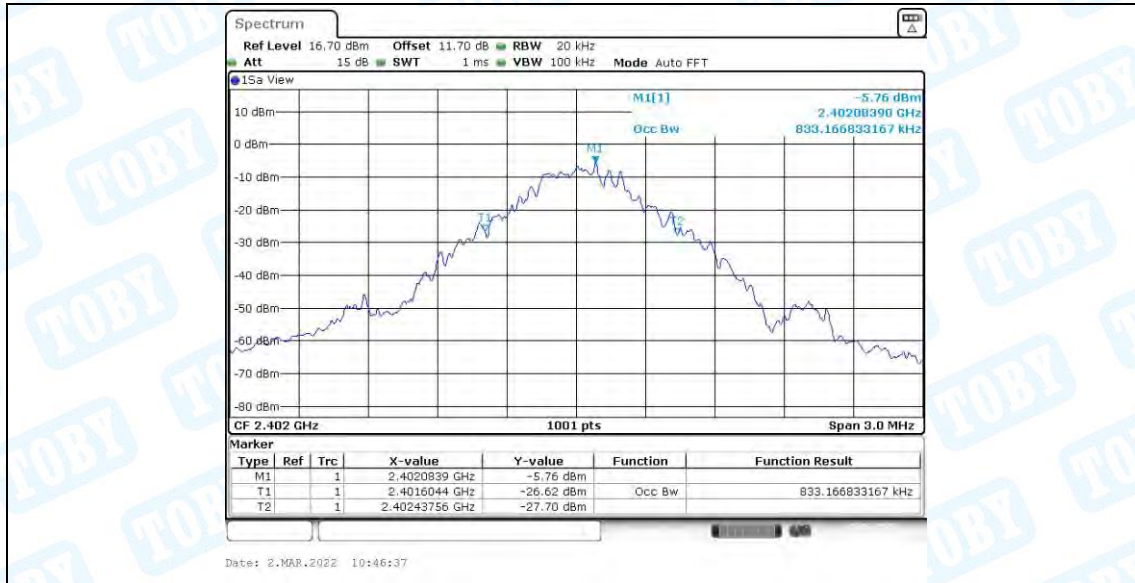
3DH5_Ant1_2480

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	---	---

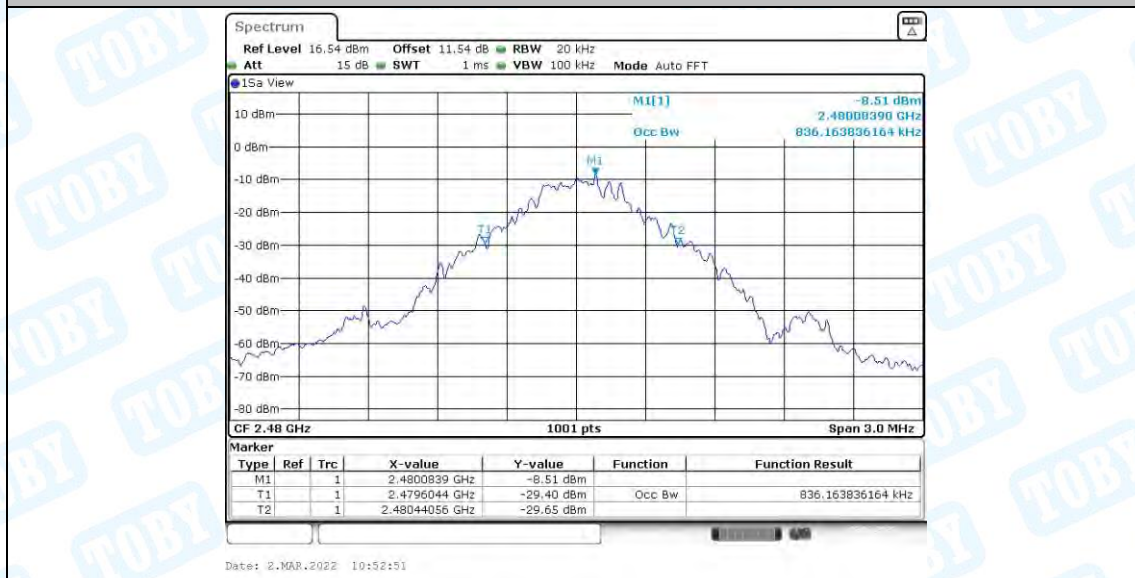
2.2. Test Graphs



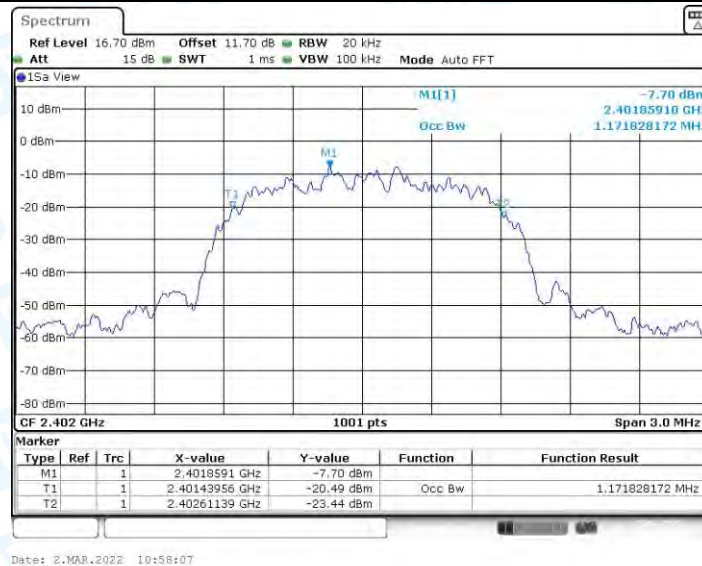
DH5_Ant1_2402



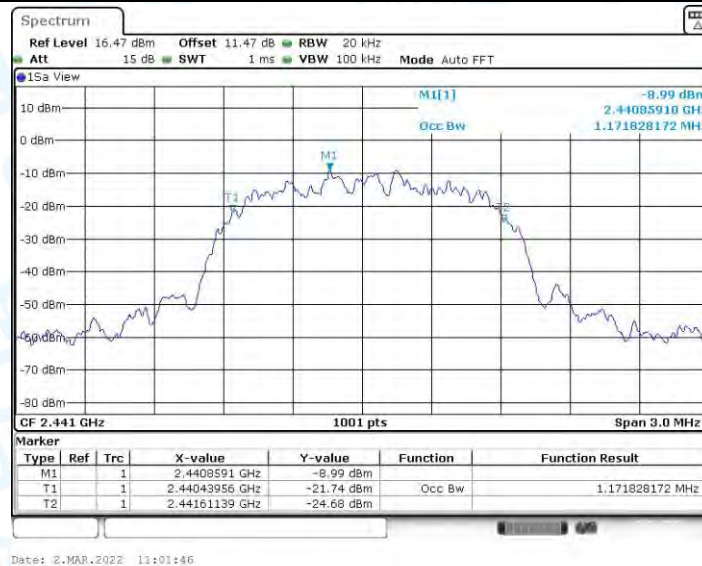
DH5_Ant1_2441



DH5_Ant1_2480



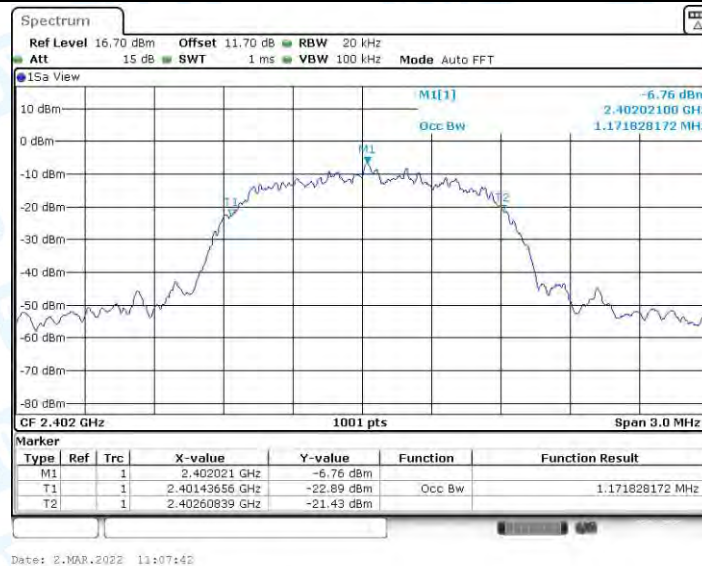
2DH5_Ant1_2402



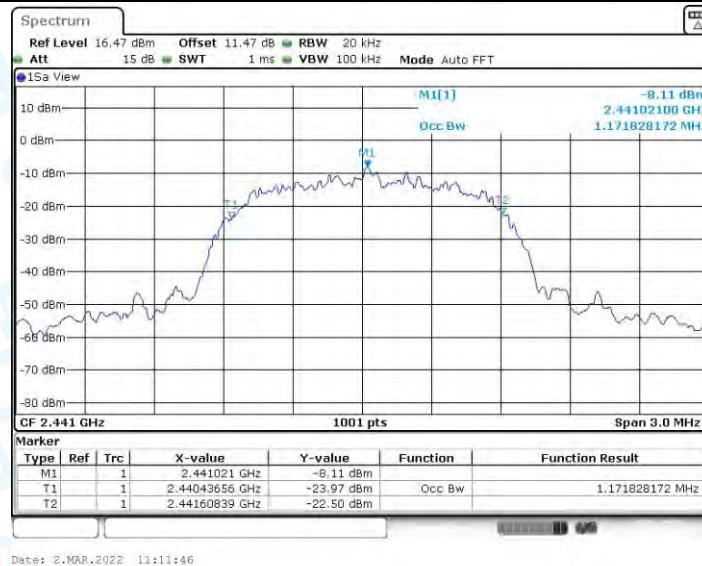
2DH5_Ant1_2441



2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480

3. Maximum conducted output power

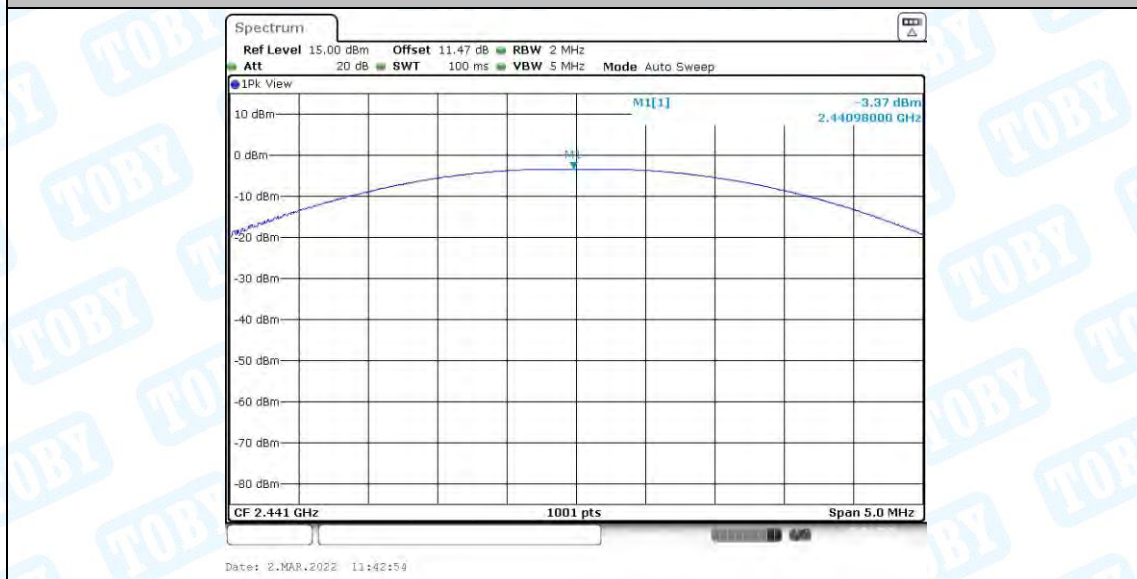
3.1. Test Result

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

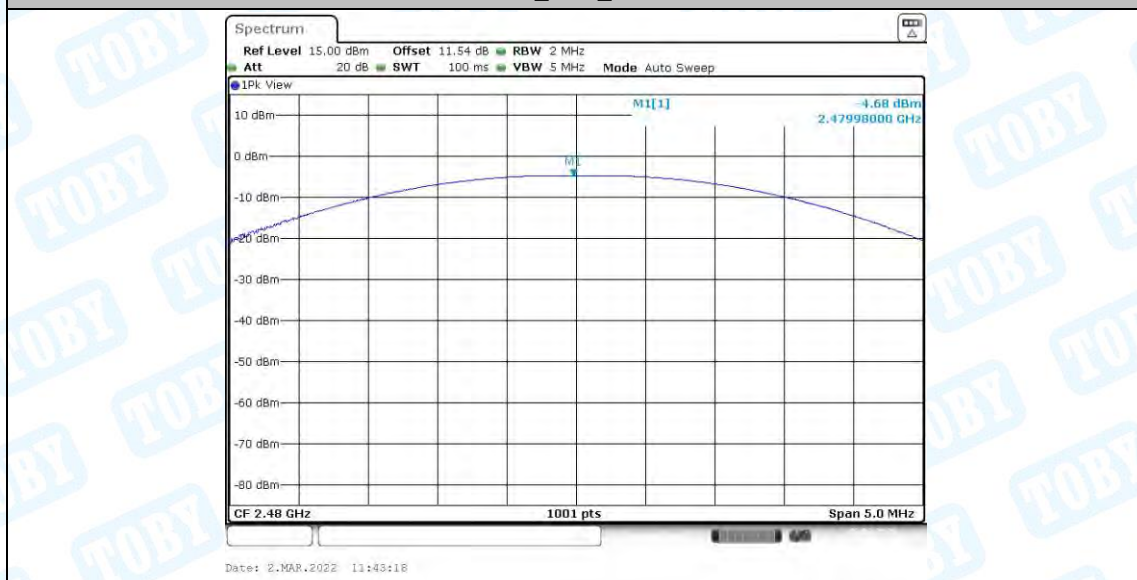
3.2.Test Graphs



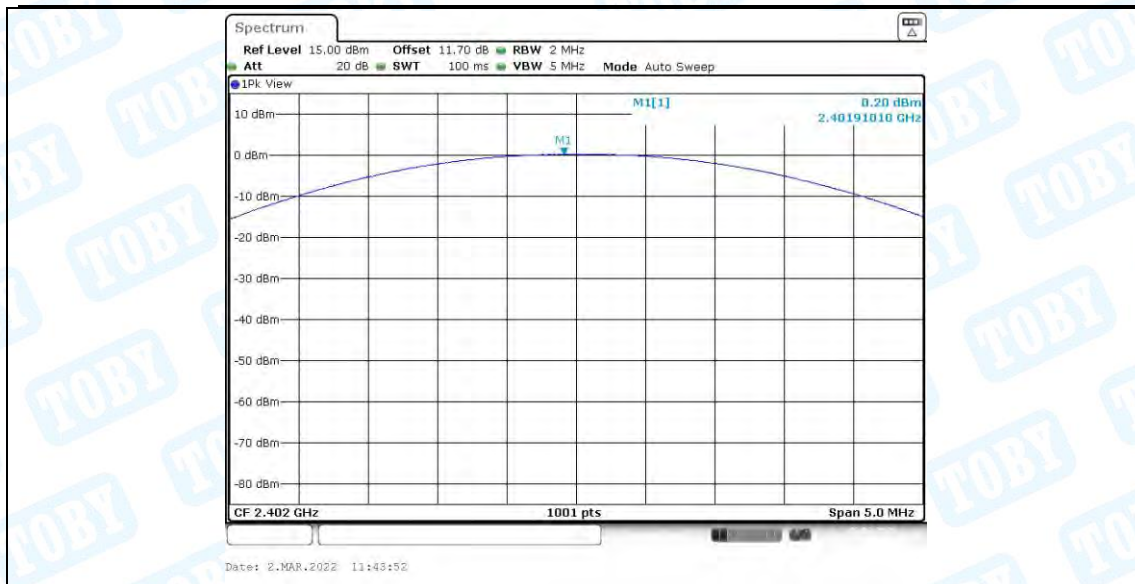
DH5_Ant1_2402



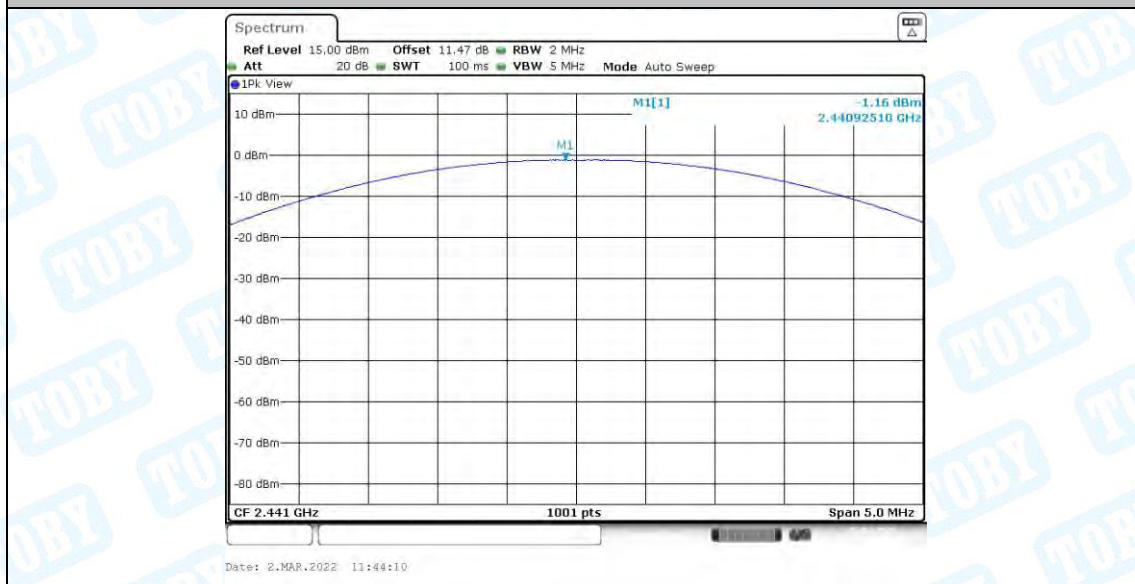
DH5_Ant1_2441



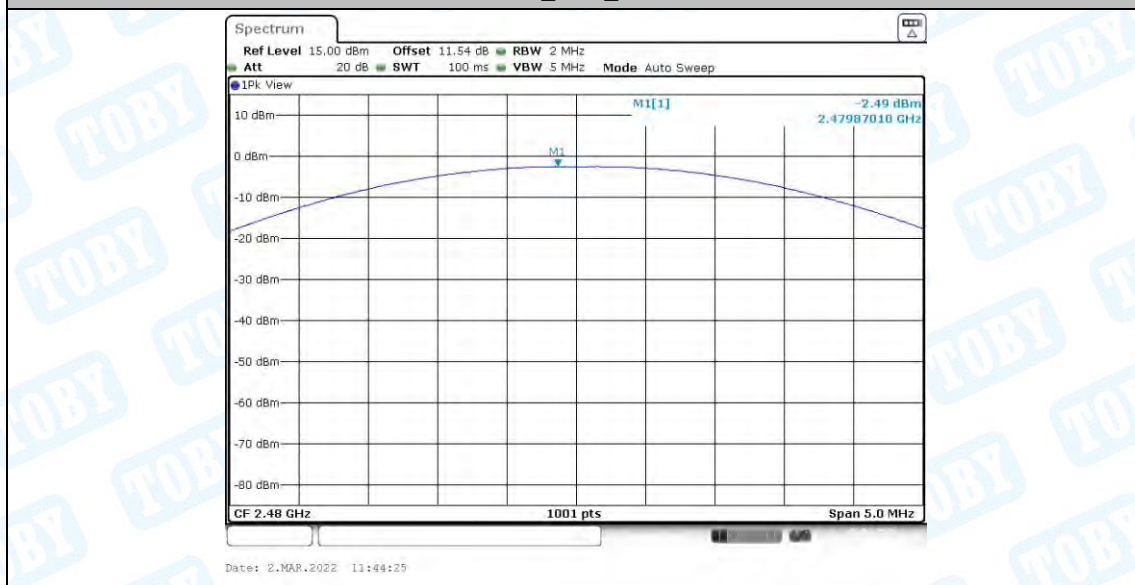
DH5_Ant1_2480



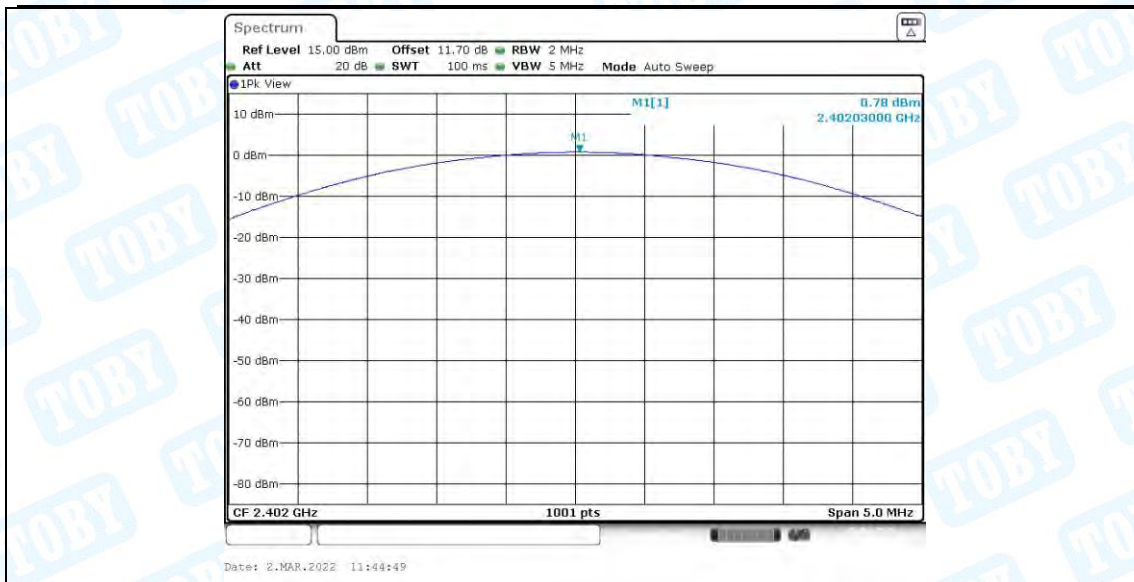
2DH5_Ant1_2402



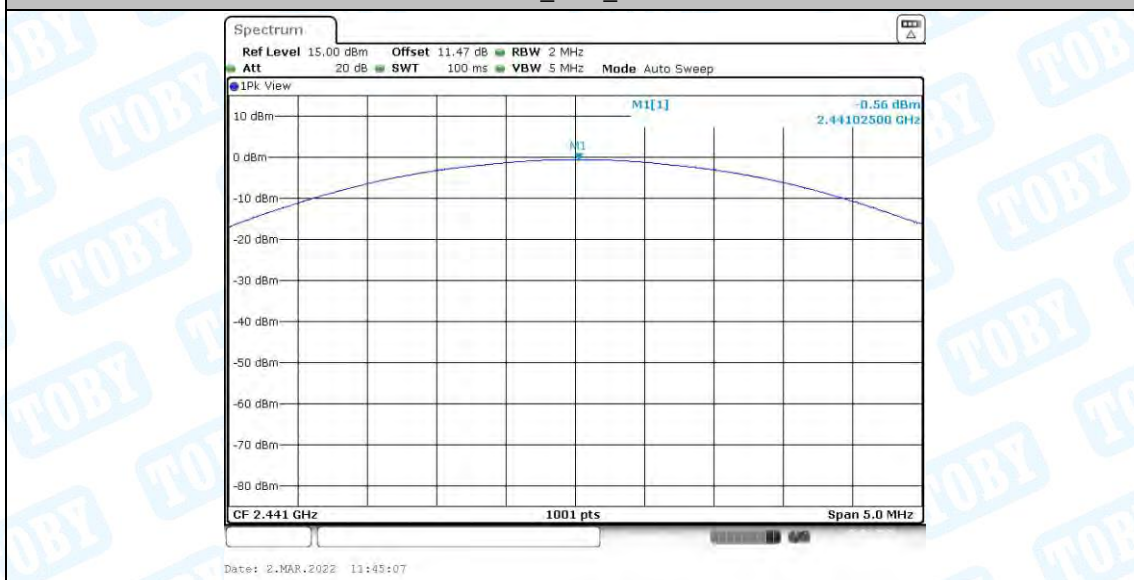
2DH5_Ant1_2441



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

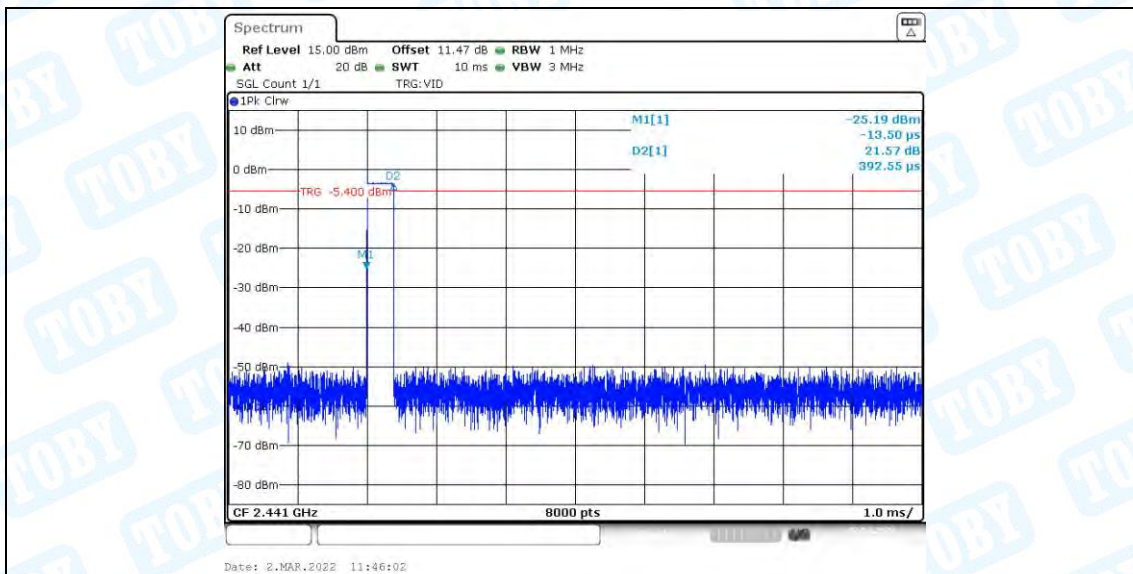


5. Time of occupancy

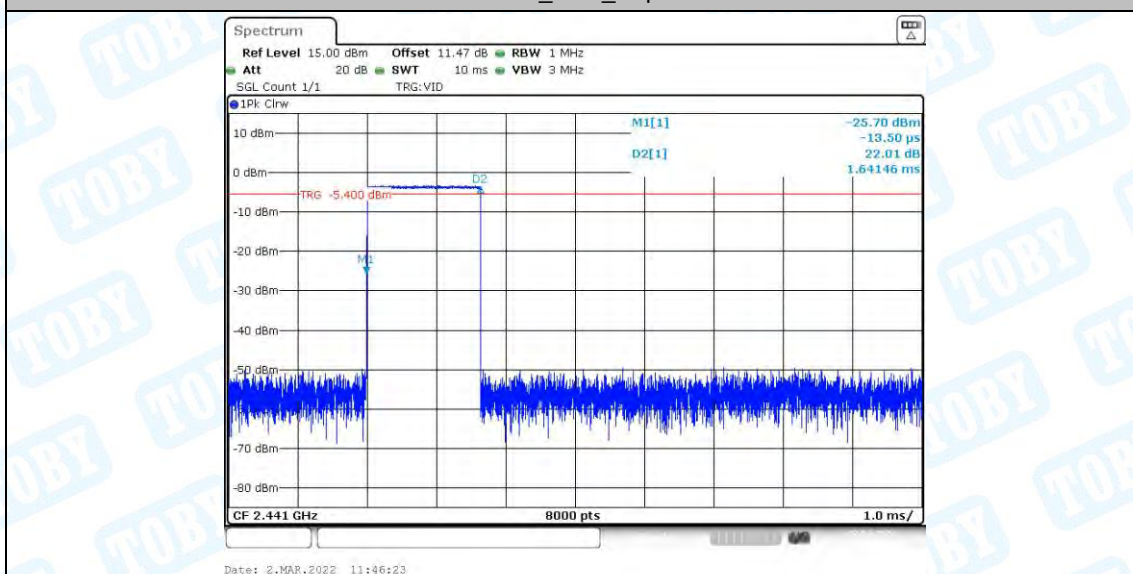
5.1. Test Result

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

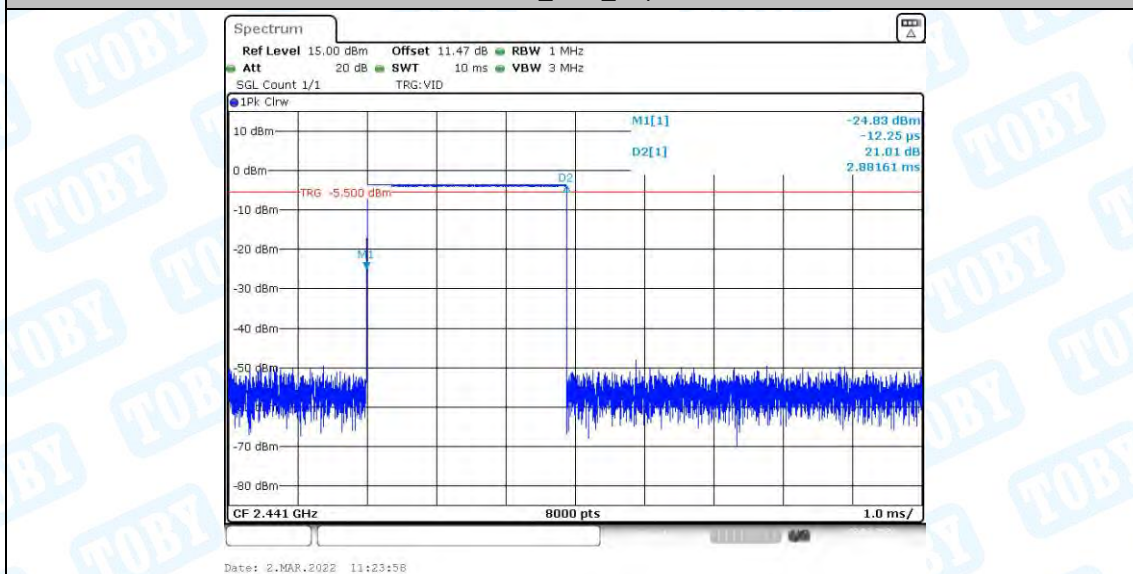
5.2. Test Graphs



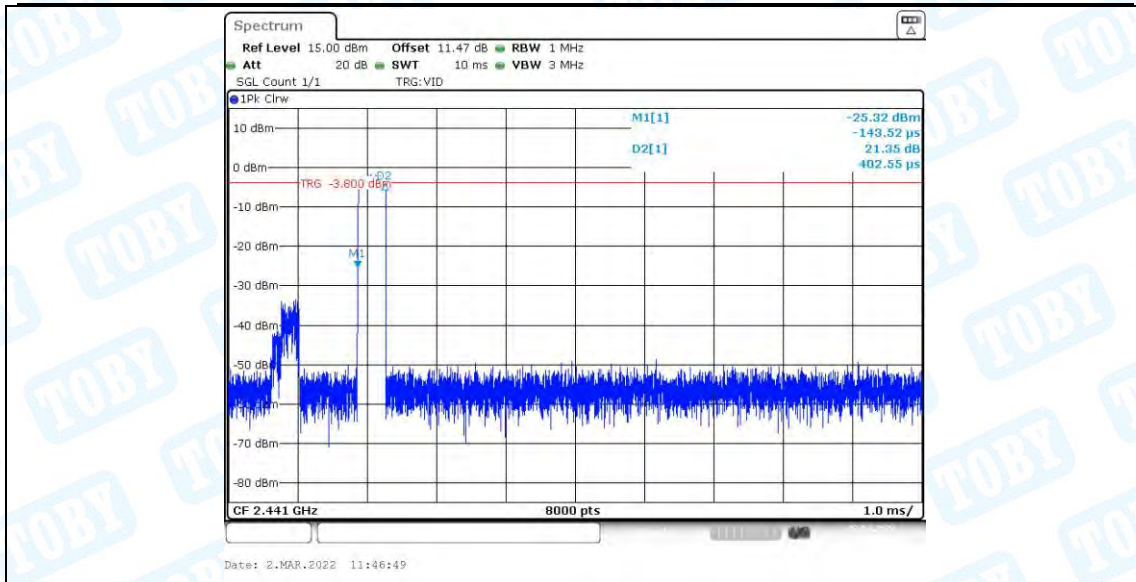
DH1_Ant1_Hop



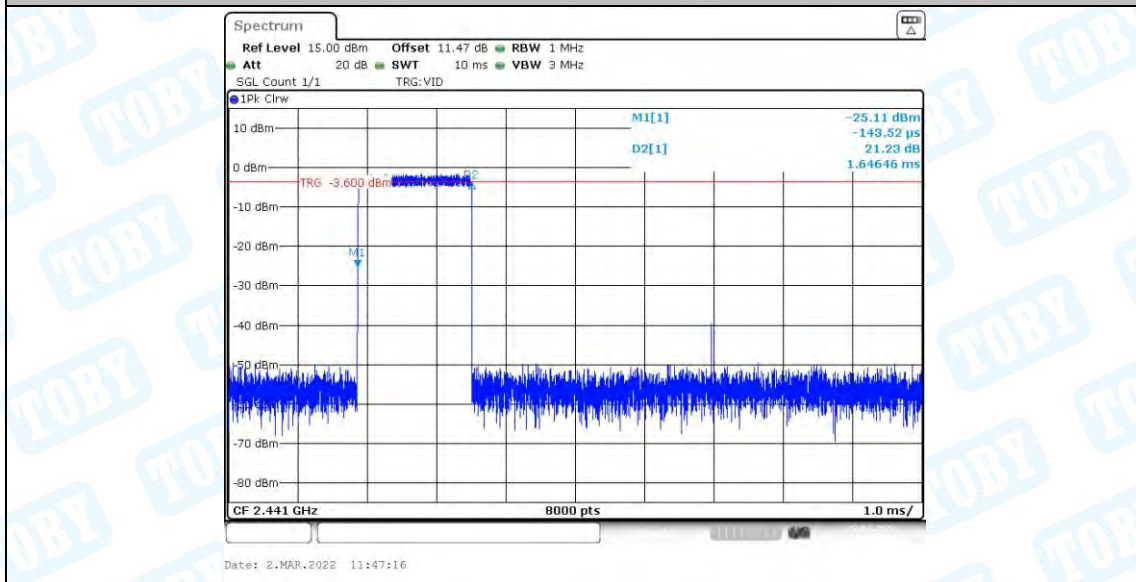
DH3_Ant1_Hop



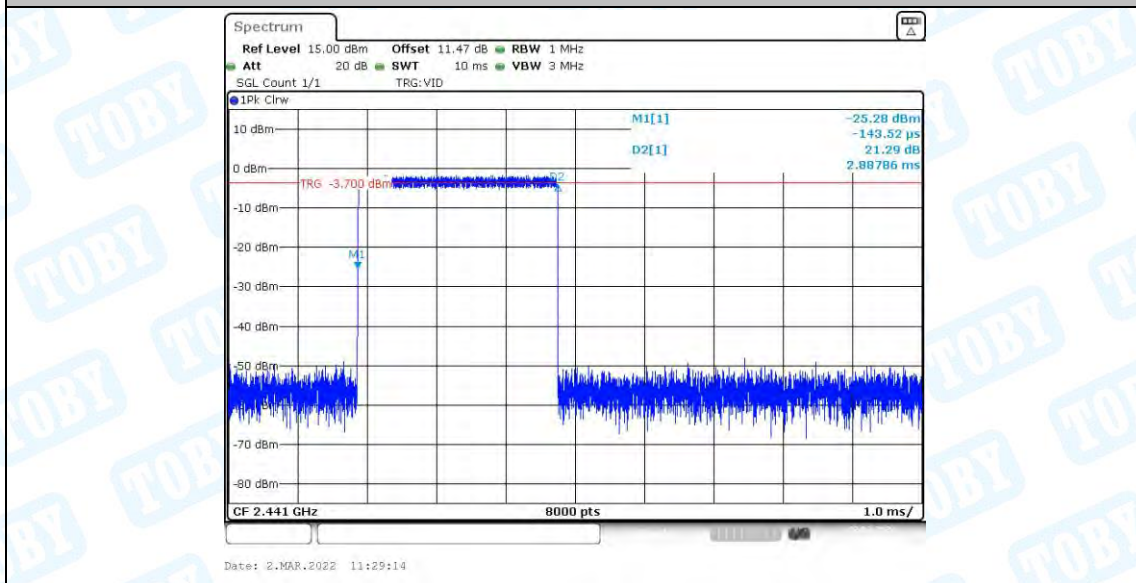
DH5_Ant1_Hop



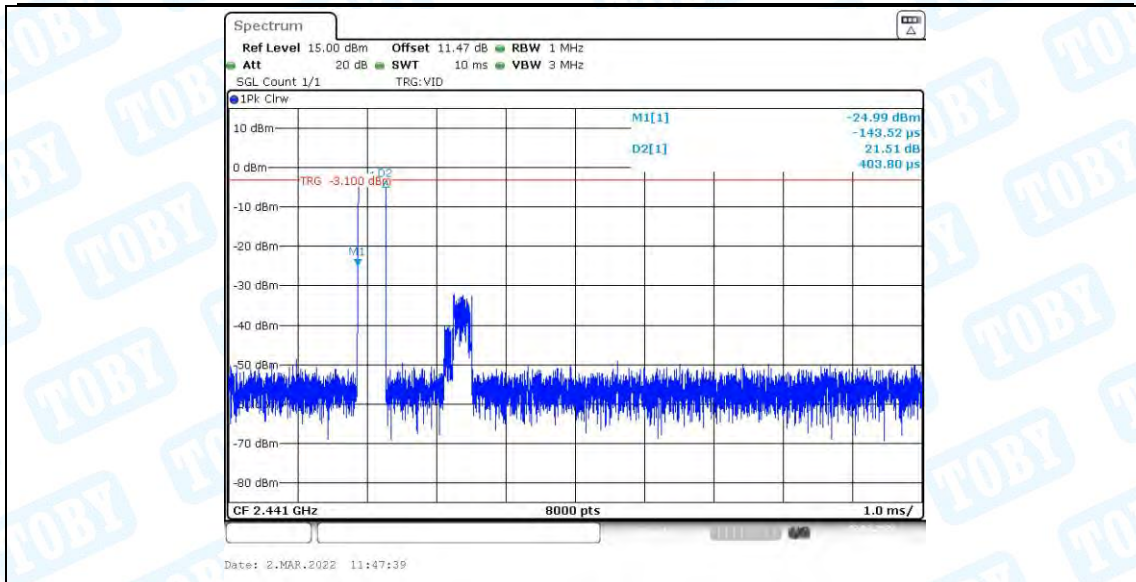
2DH1_Ant1_Hop



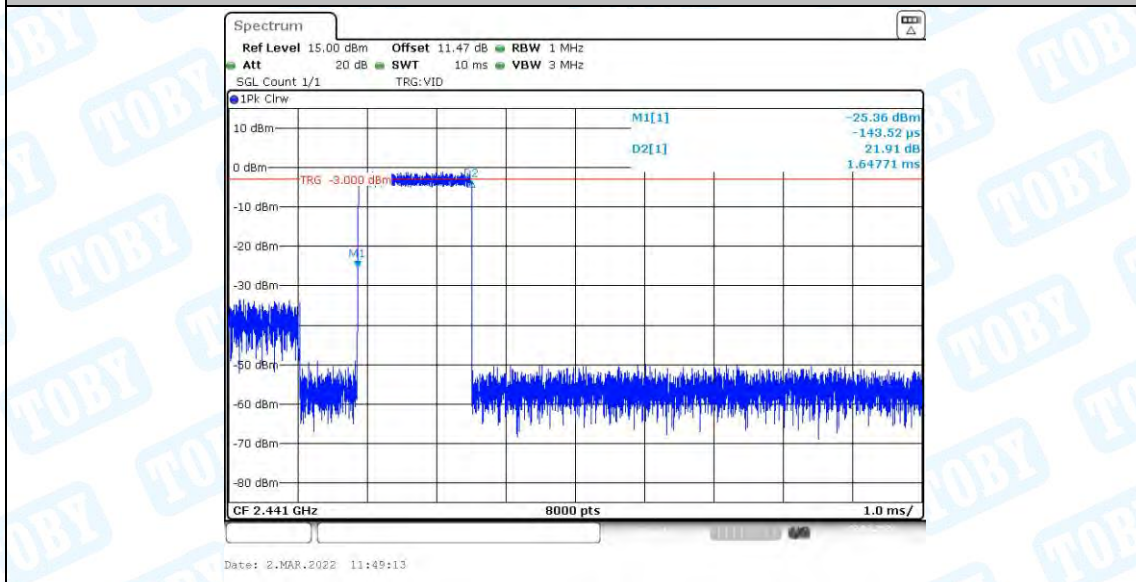
2DH3_Ant1_Hop



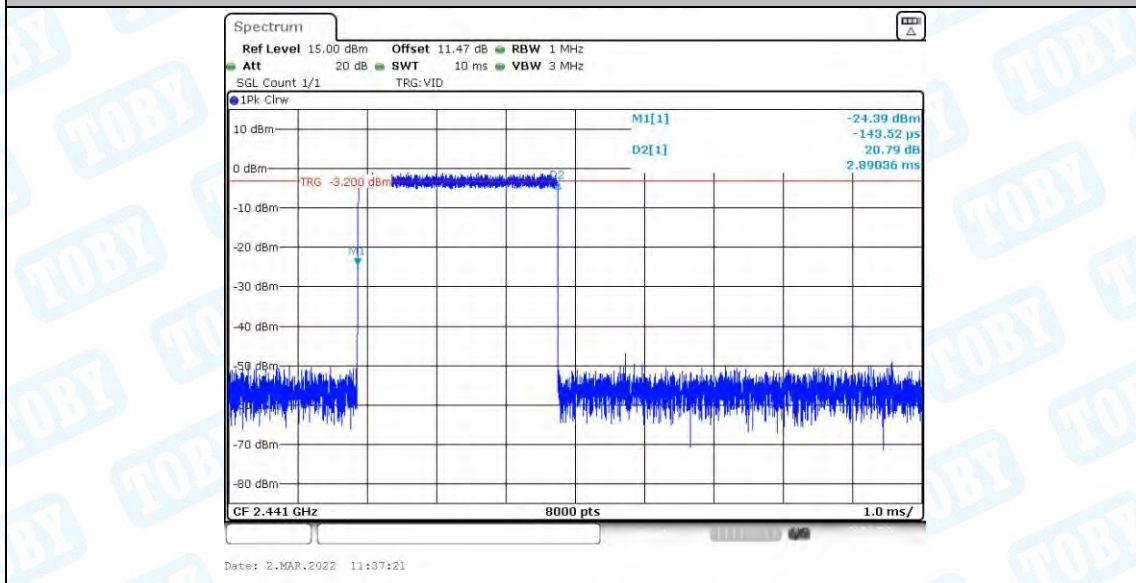
2DH5_Ant1_Hop



3DH1_Ant1_Hop



3DH3_Ant1_Hop



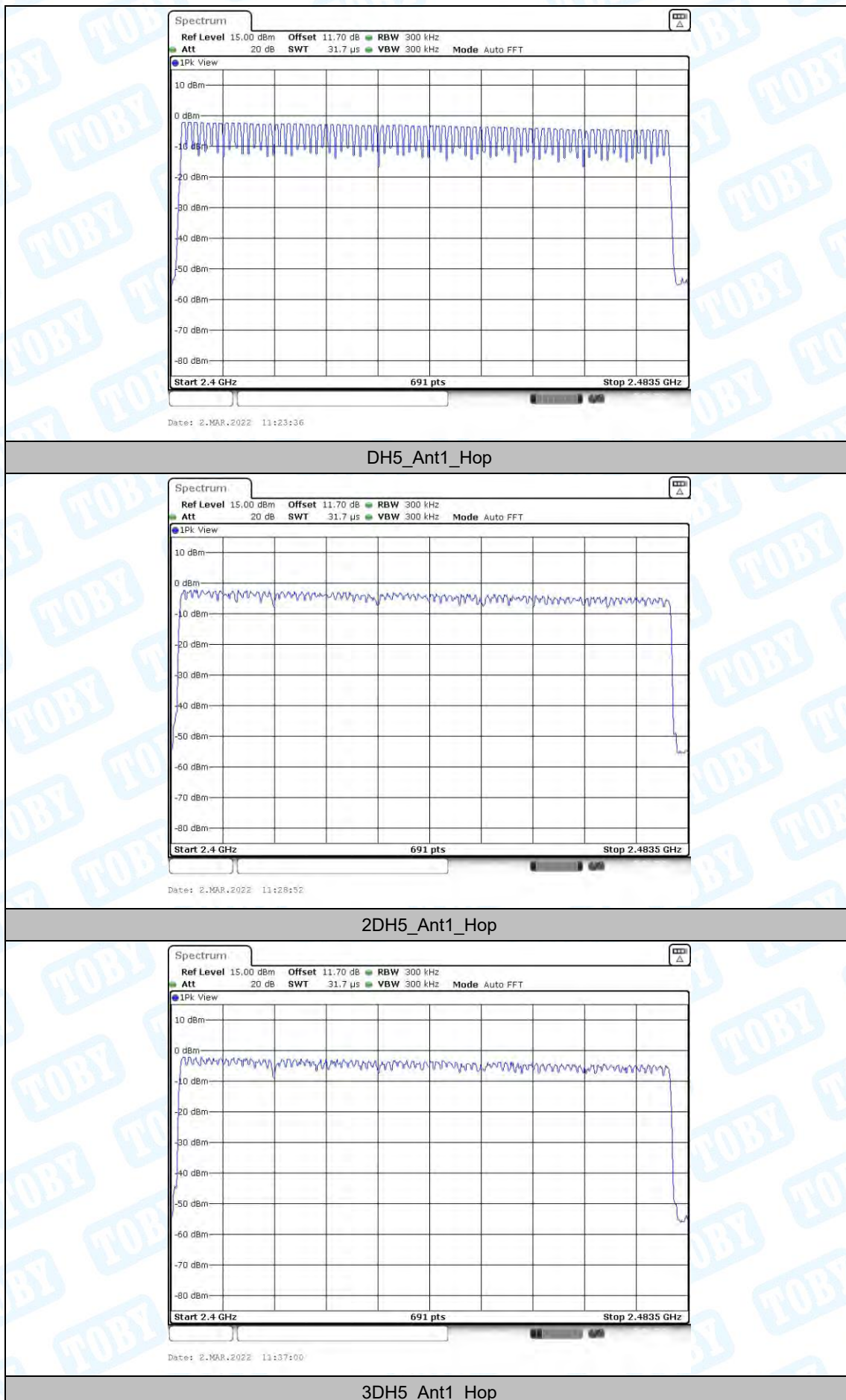
3DH5_Ant1_Hop

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

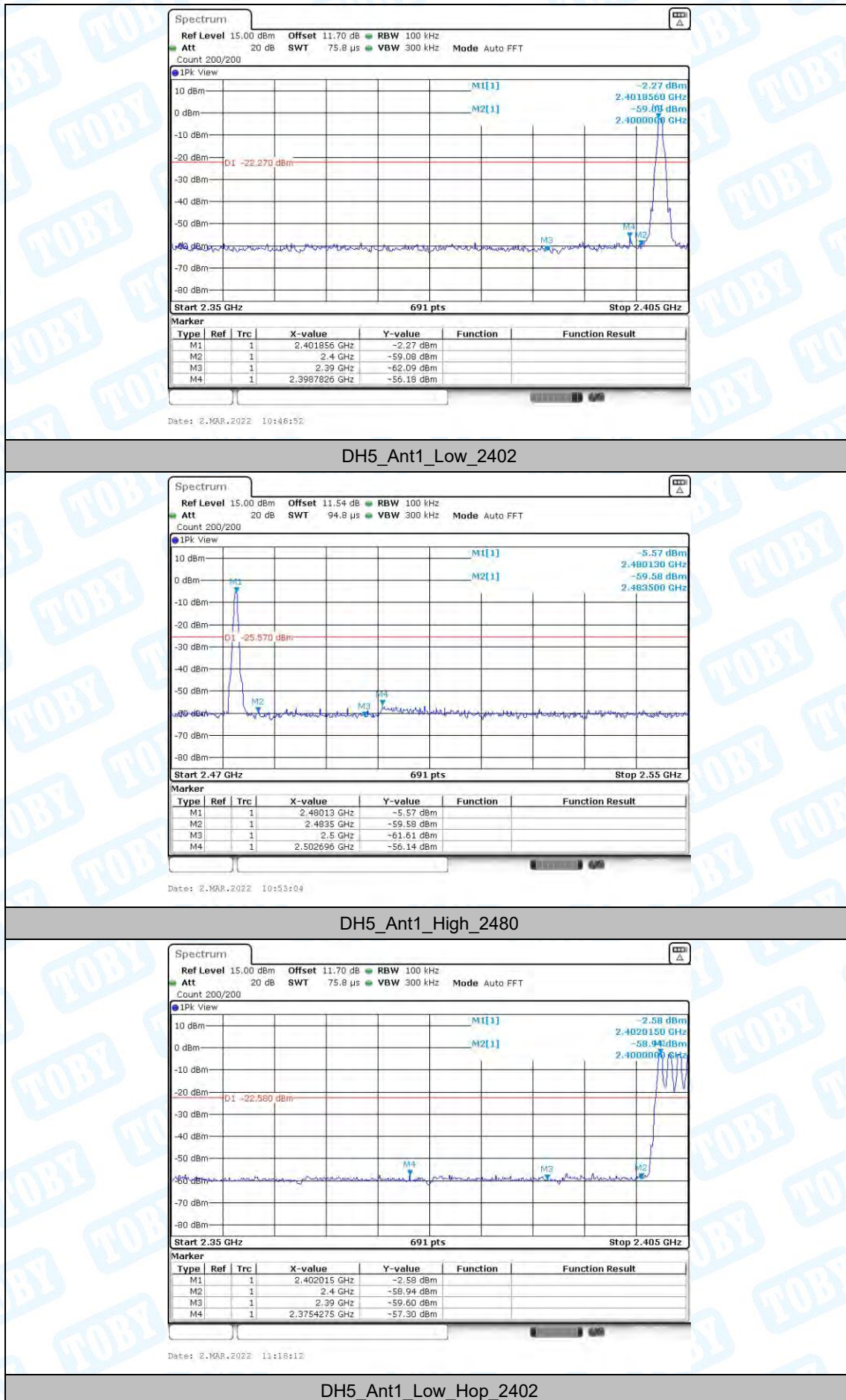


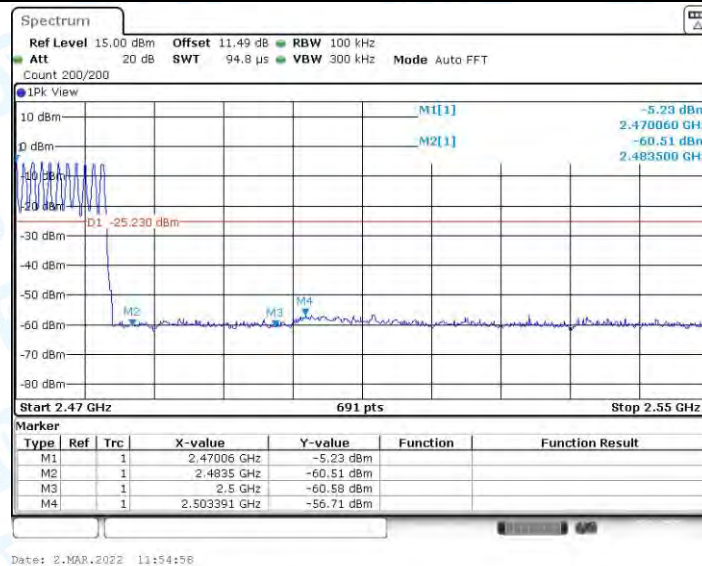
7. Band edge measurements

7.1. Test Result

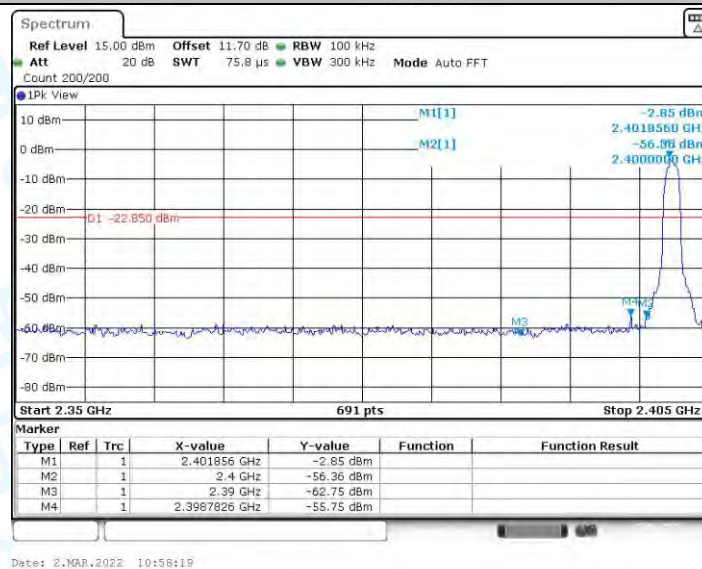
TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-2.27	-56.18	≤ -22.27	PASS
		High	2480	-5.57	-56.14	≤ -25.57	PASS
		Low	Hop_2402	-2.58	-57.3	≤ -22.58	PASS
		High	Hop_2480	-5.23	-56.71	≤ -25.23	PASS
2DH5	Ant1	Low	2402	-2.85	-55.75	≤ -22.85	PASS
		High	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

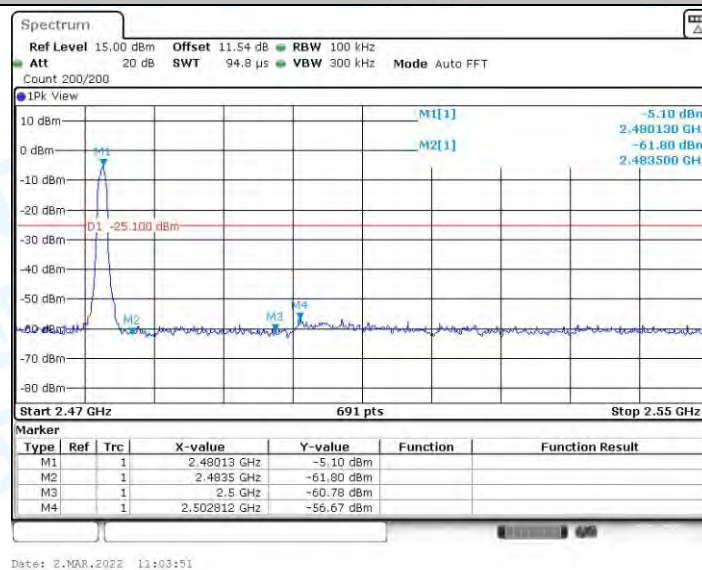




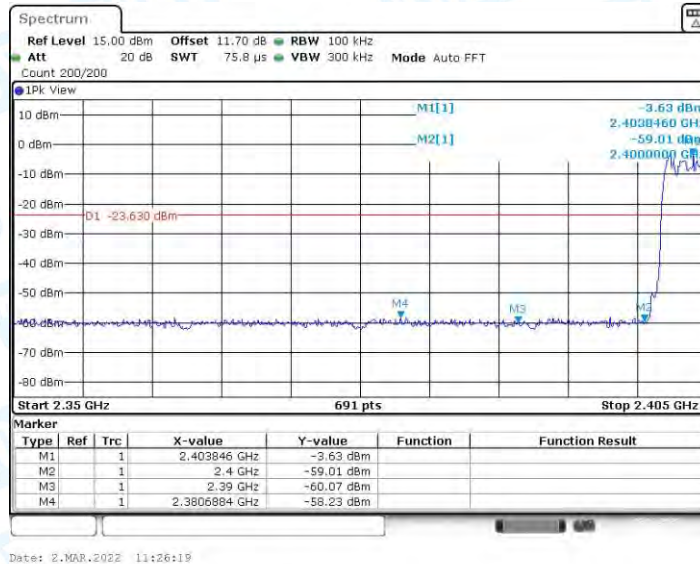
DH5_Ant1_High_Hop_2480



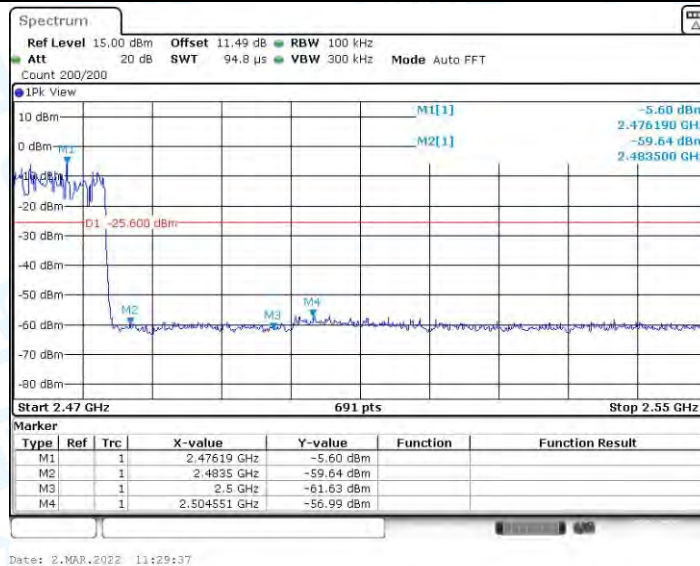
2DH5_Ant1_Low_2402



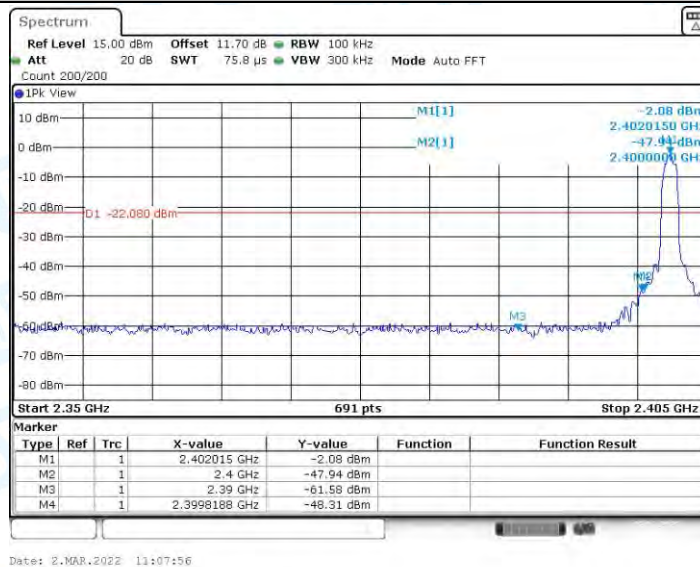
2DH5_Ant1_High_2480



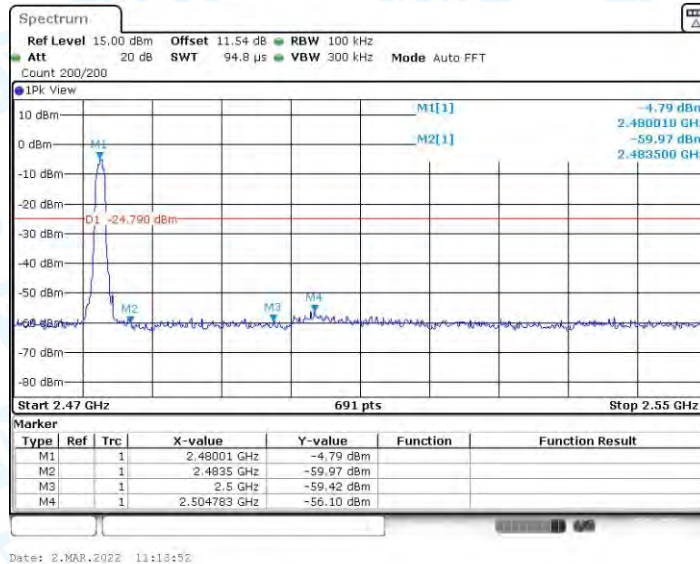
2DH5_Ant1_Low_Hop_2402



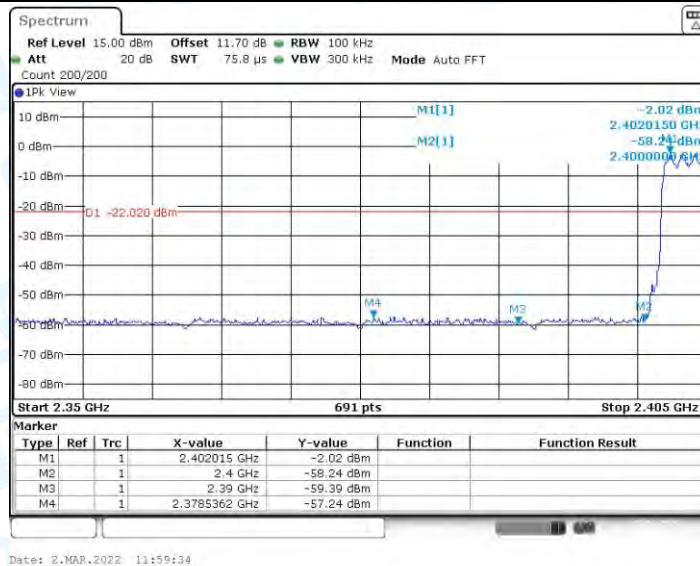
2DH5_Ant1_High_Hop_2480



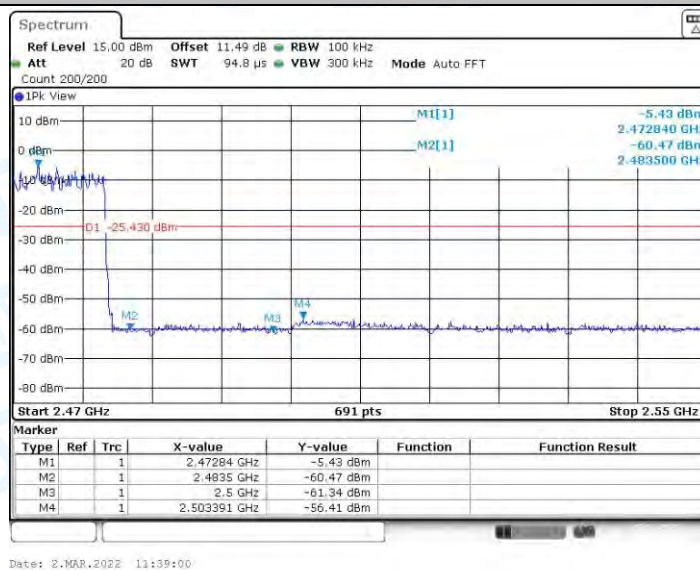
3DH5_Ant1_Low_2402



3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402



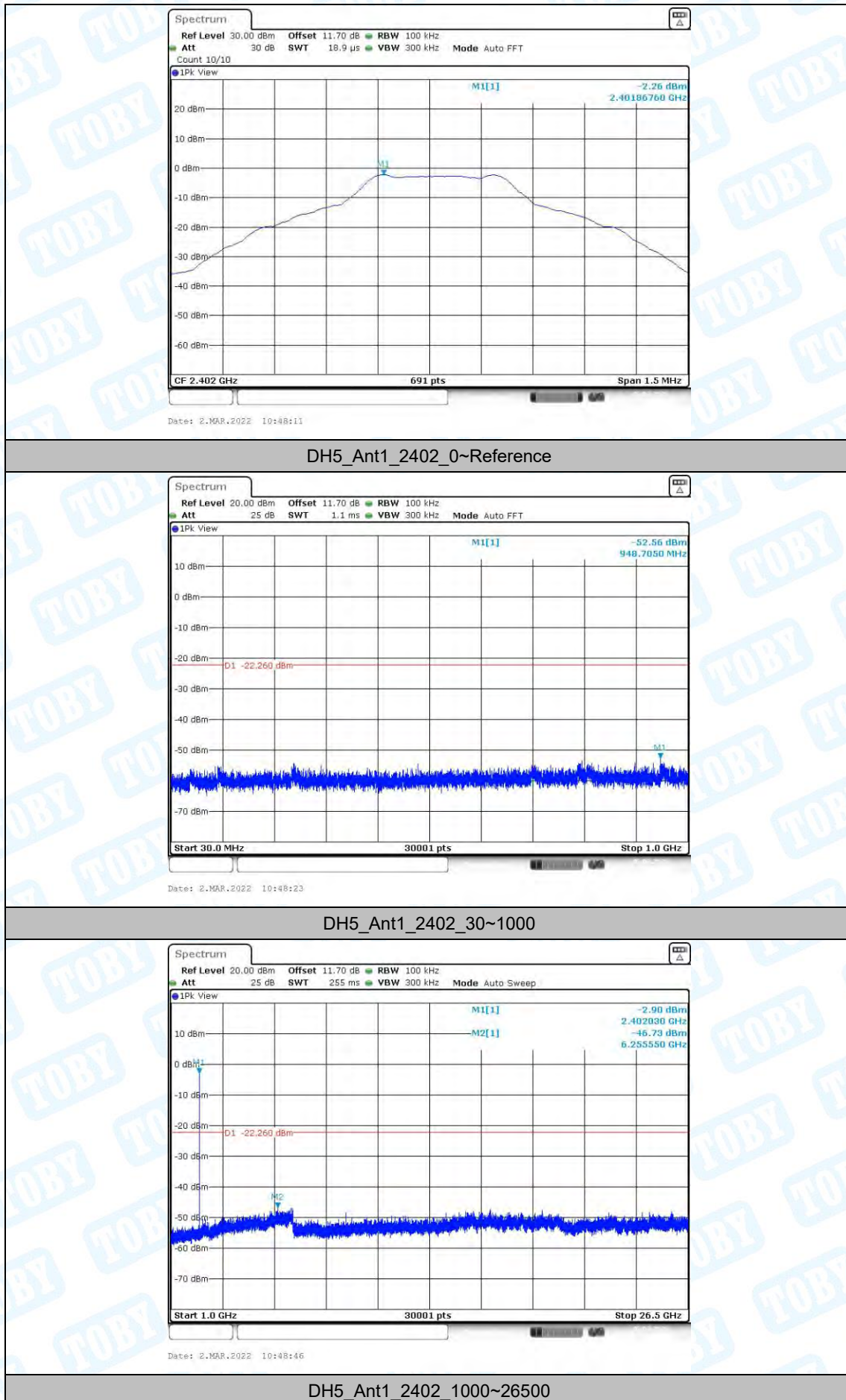
3DH5_Ant1_High_Hop_2480

8. Conducted Spurious Emission

8.1. Test Result

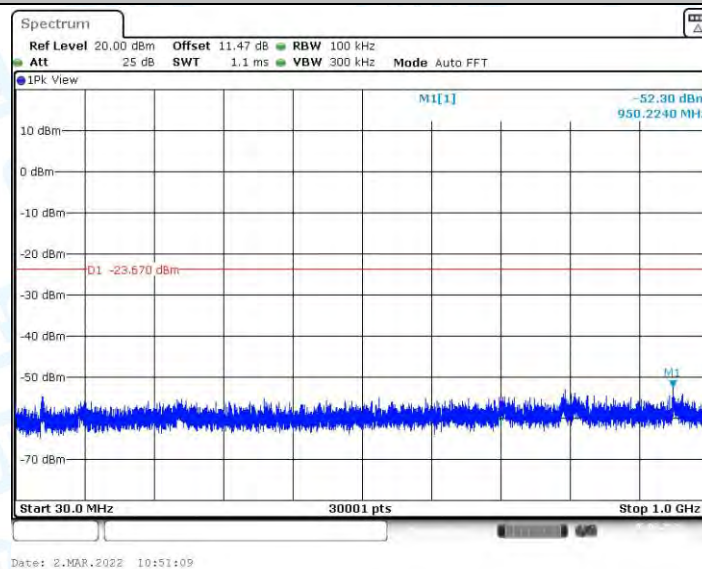
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	-2.26	-2.26	---	PASS
			30~1000	-2.26	-52.56	≤-22.26	PASS
			1000~26500	-2.26	-46.73	≤-22.26	PASS
		2441	Reference	-3.67	-3.67	---	PASS
			30~1000	-3.67	-52.3	≤-23.67	PASS
			1000~26500	-3.67	-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

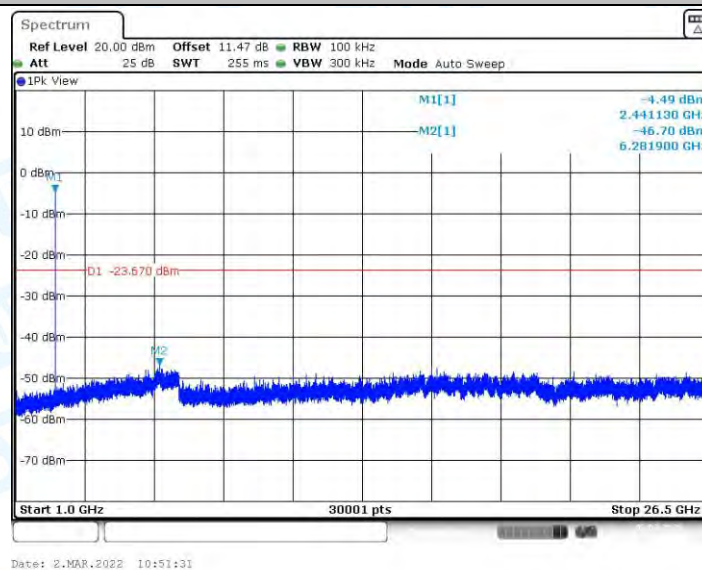




DH5_Ant1_2441_0~Reference



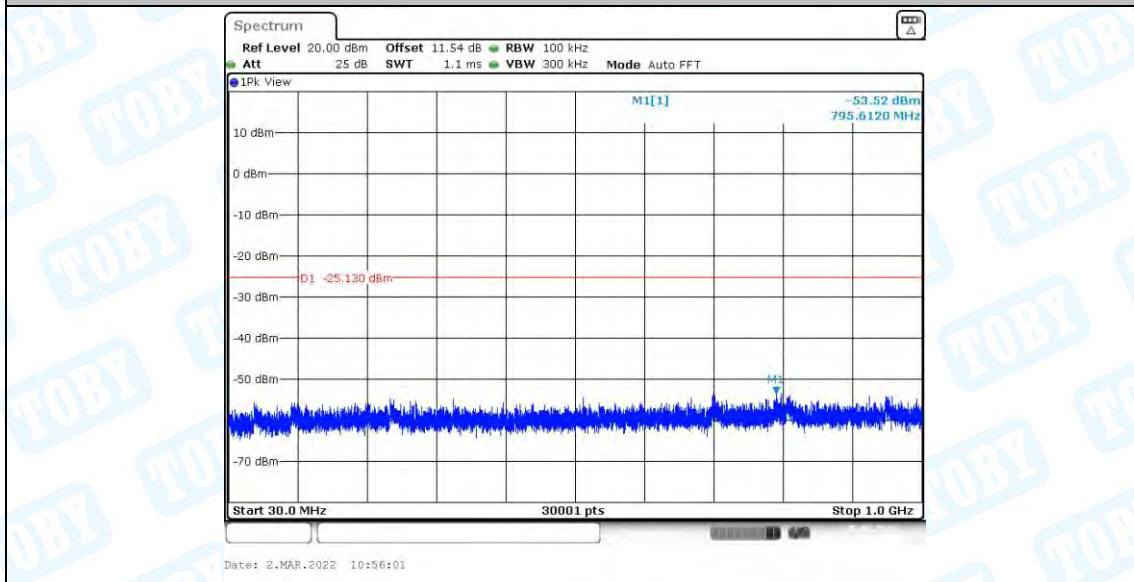
DH5_Ant1_2441_30~1000



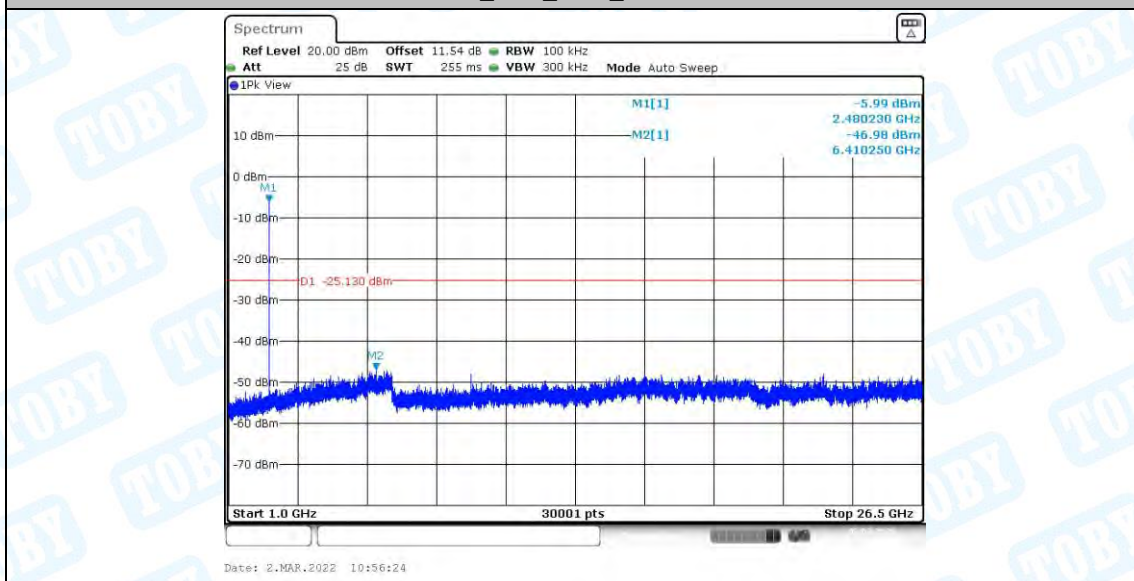
DH5_Ant1_2441_1000~26500



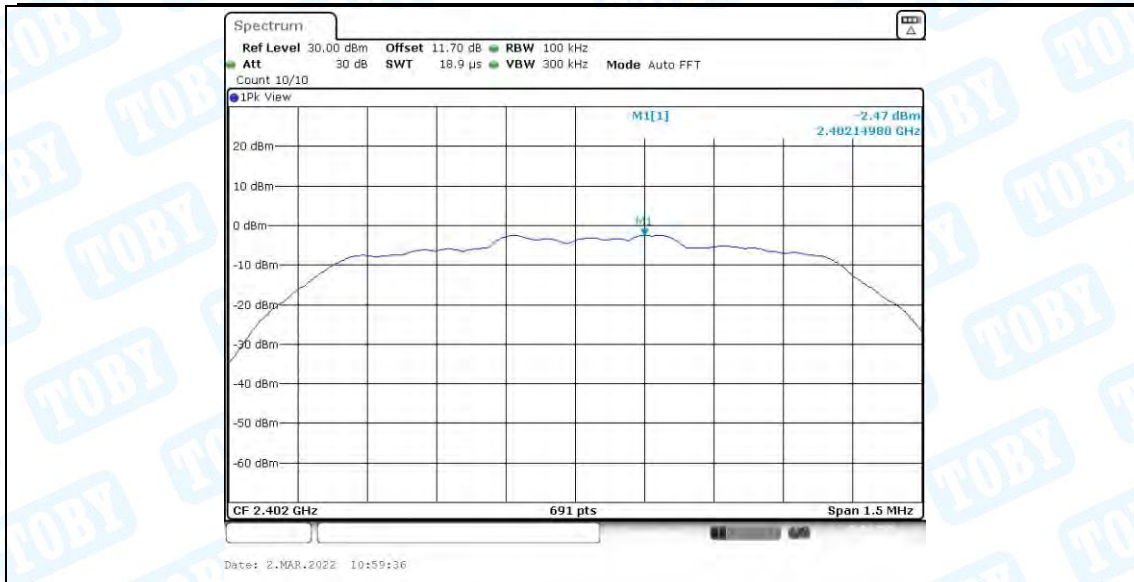
DH5_Ant1_2480_0~Reference



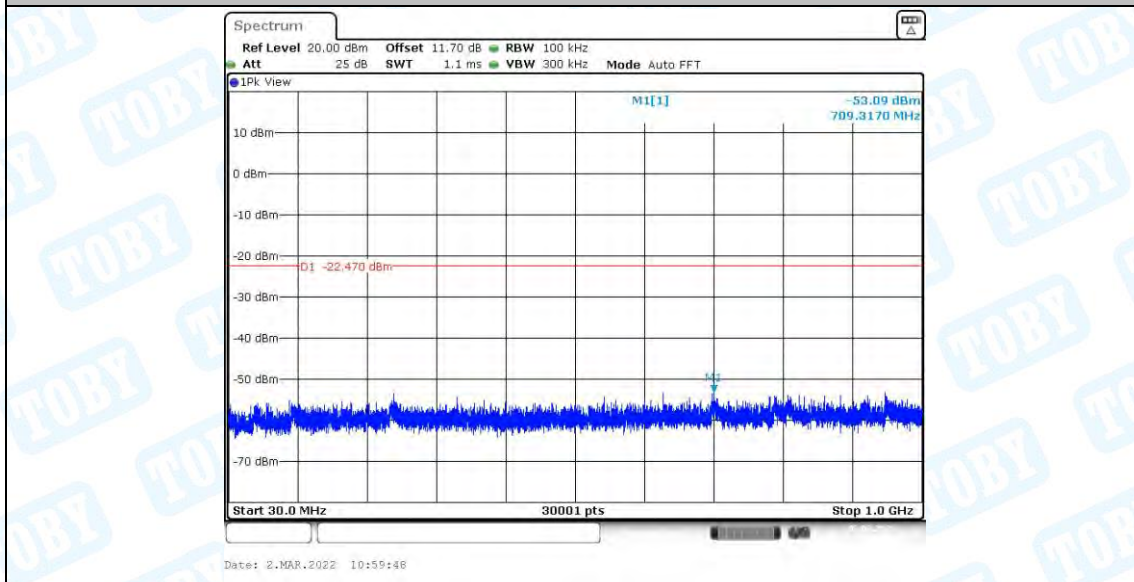
DH5_Ant1_2480_30~1000



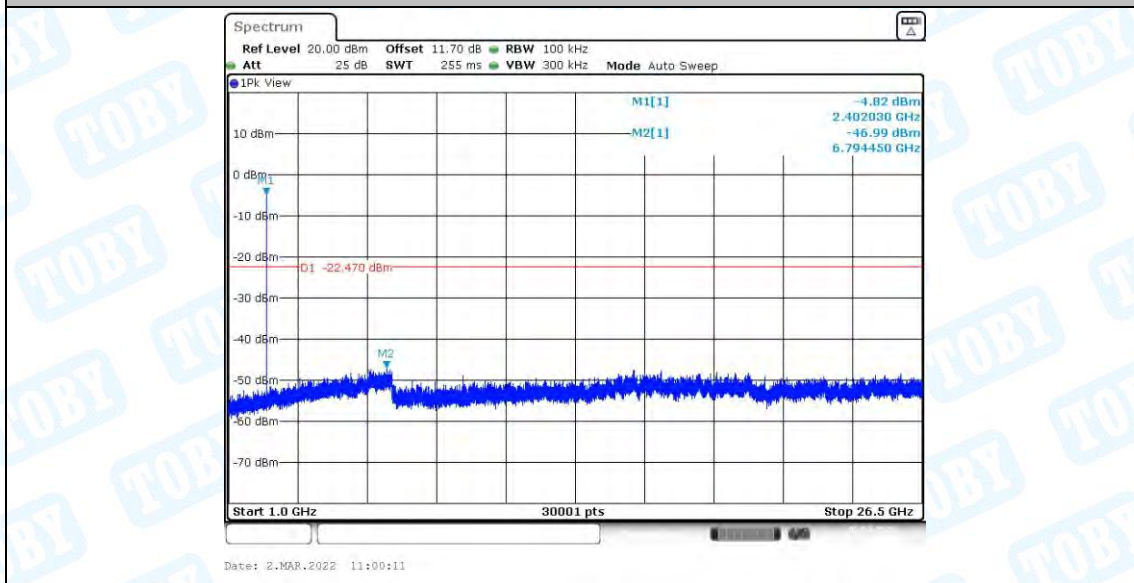
DH5_Ant1_2480_1000~26500



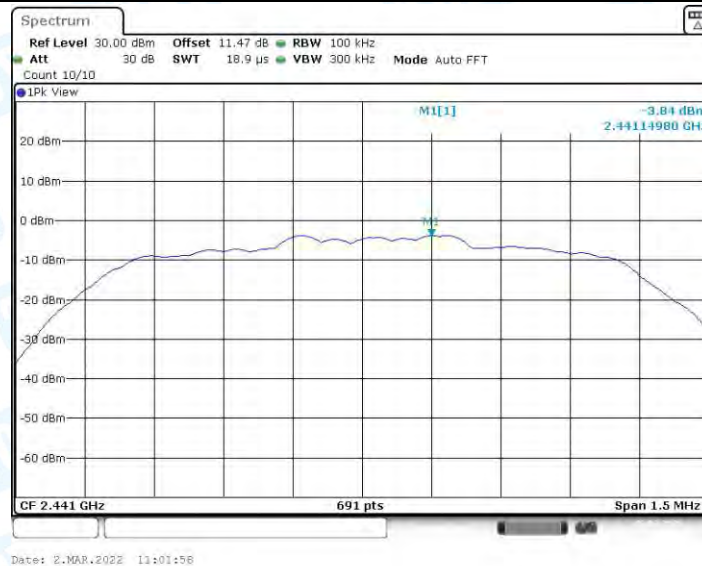
2DH5_Ant1_2402_0~Reference



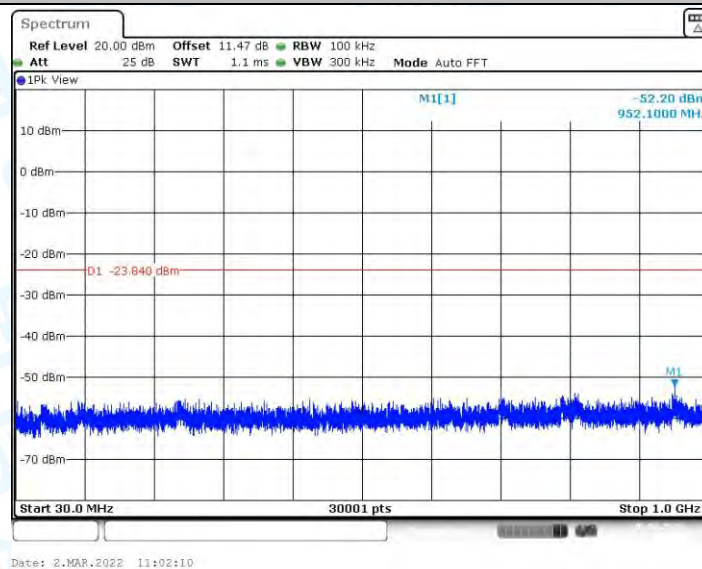
2DH5_Ant1_2402_30~1000



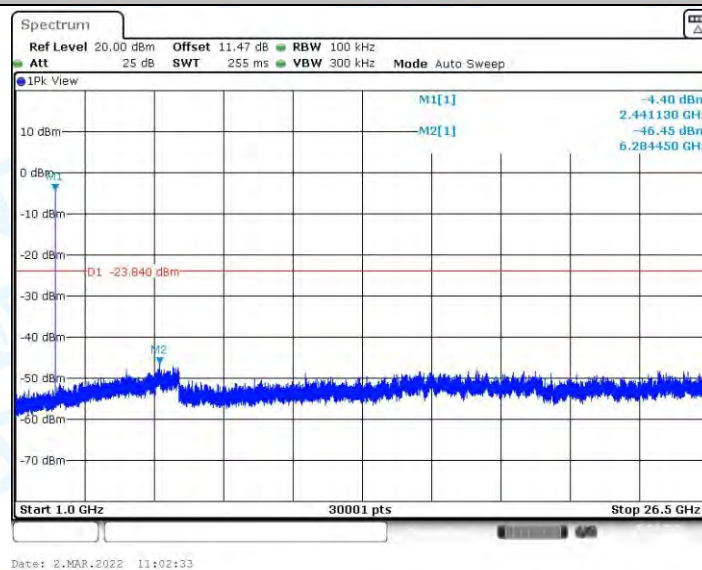
2DH5_Ant1_2402_1000~26500



2DH5_Ant1_2441_0~Reference



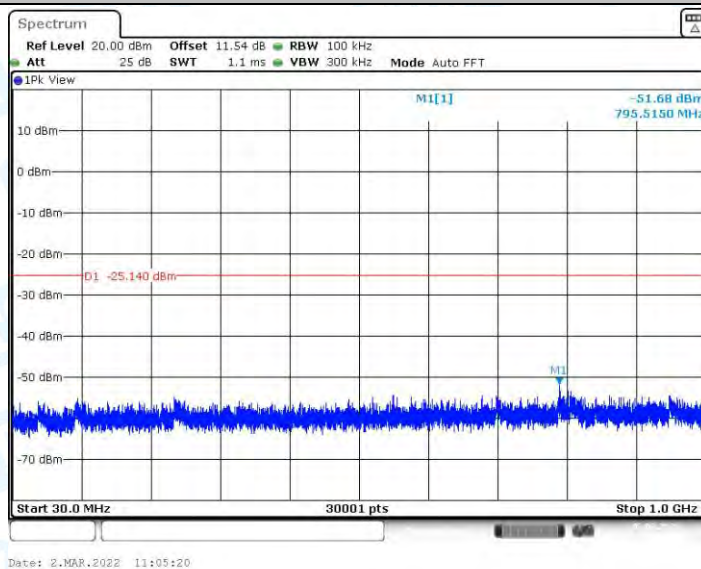
2DH5_Ant1_2441_30~1000



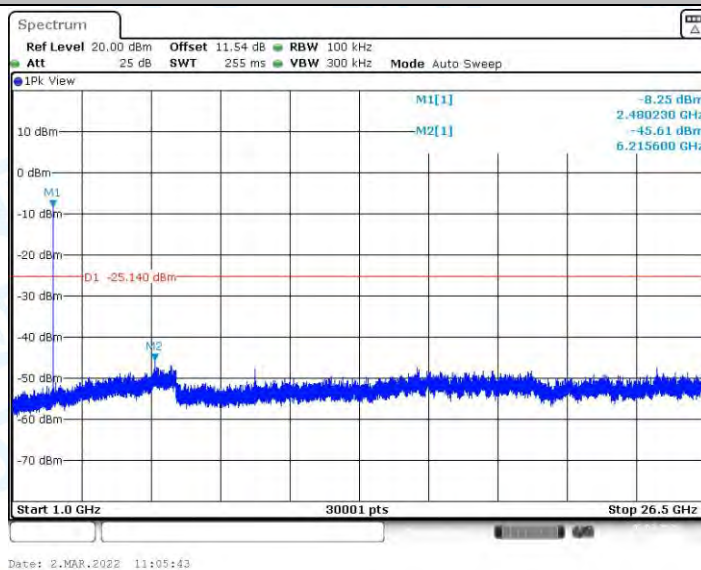
2DH5_Ant1_2441_1000~26500



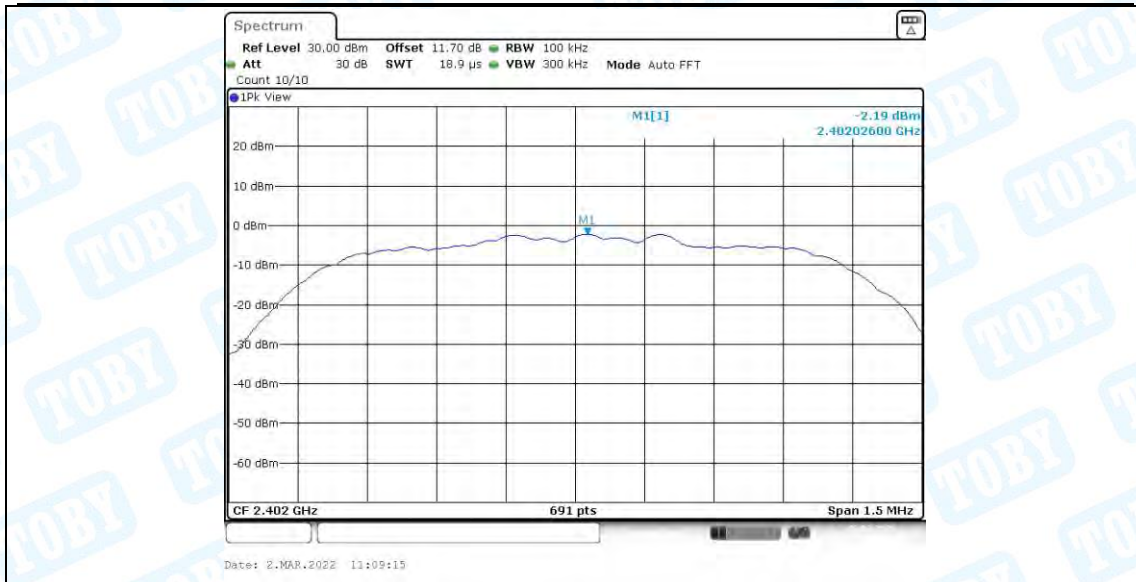
2DH5_Ant1_2480_0~Reference



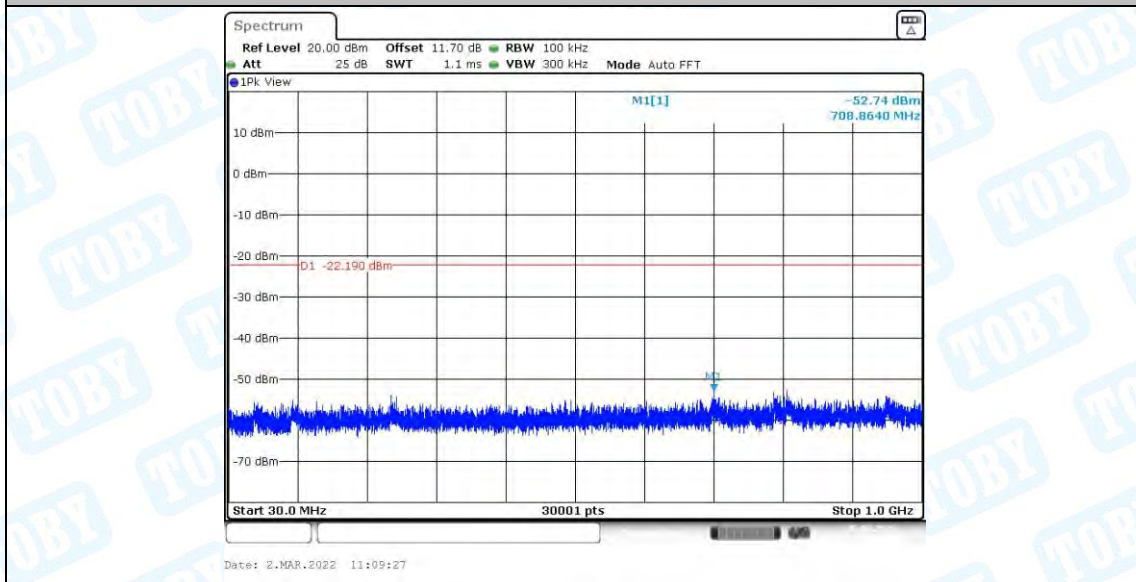
2DH5_Ant1_2480_30~1000



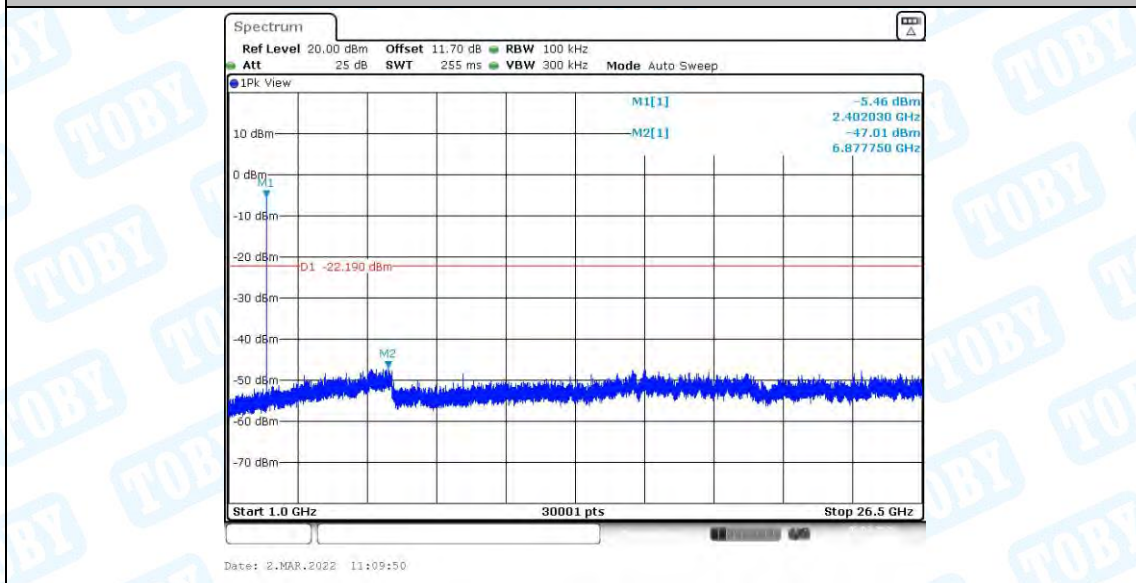
2DH5_Ant1_2480_1000~26500



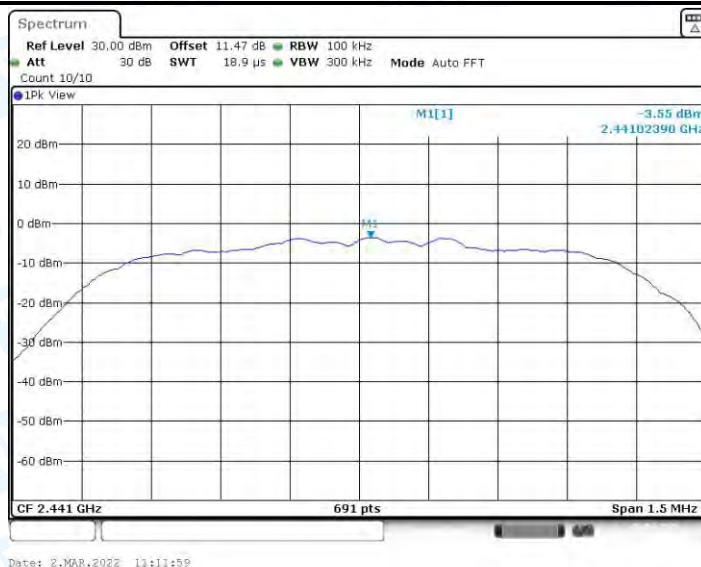
3DH5_Ant1_2402_0~Reference



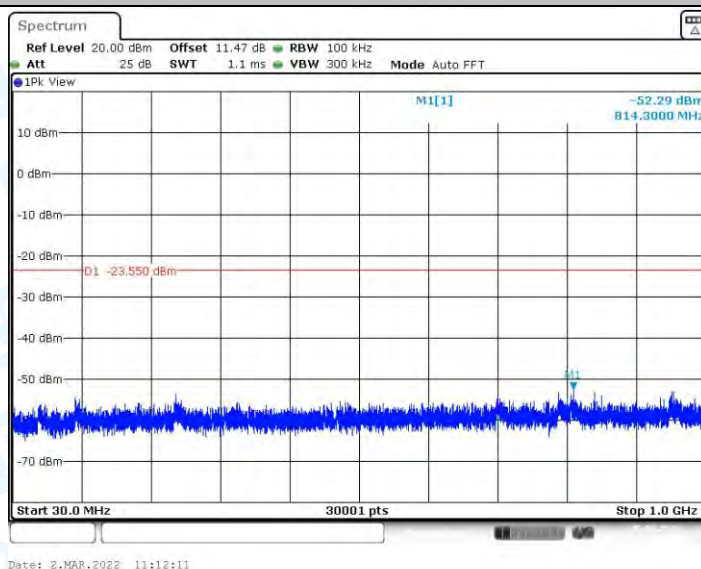
3DH5_Ant1_2402_30~1000



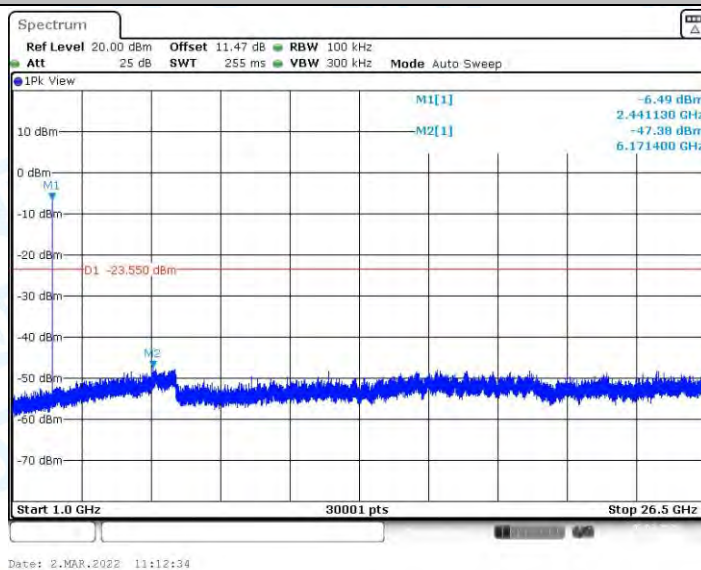
3DH5_Ant1_2402_1000~26500



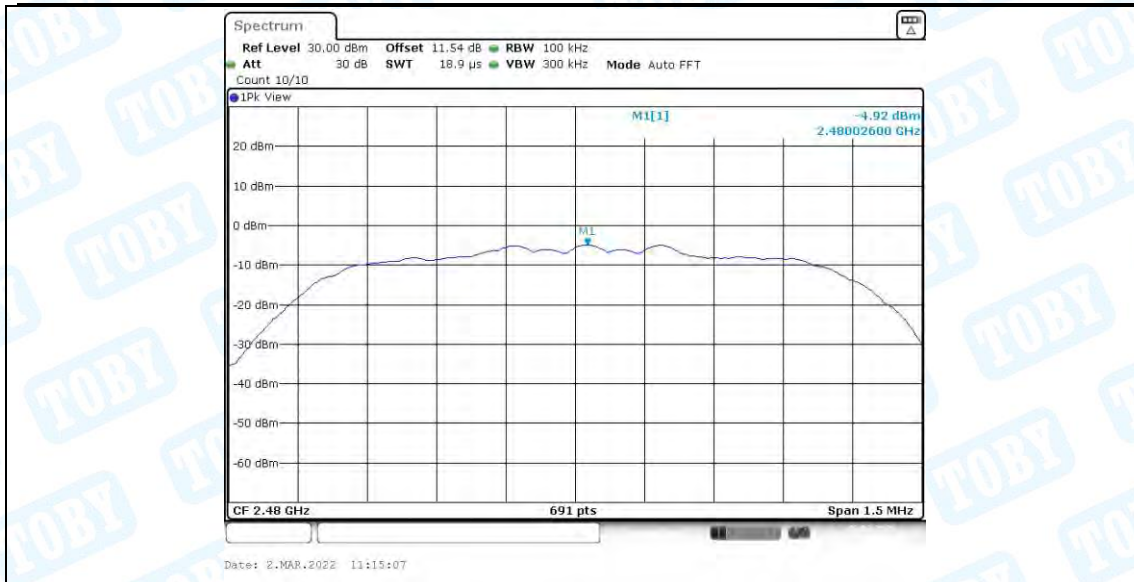
3DH5_Ant1_2441_0~Reference



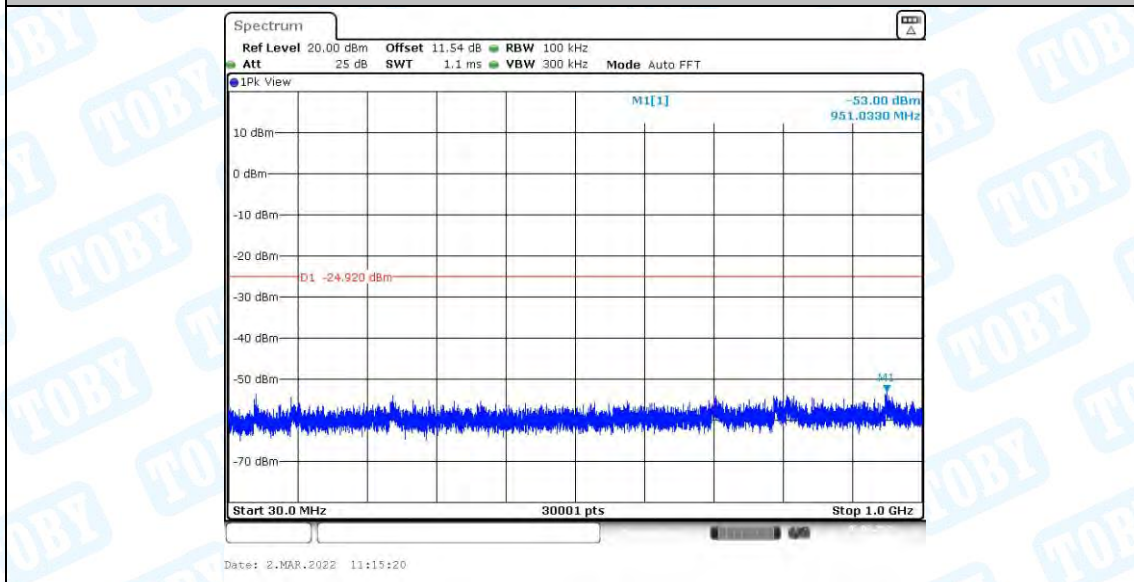
3DH5_Ant1_2441_30~1000



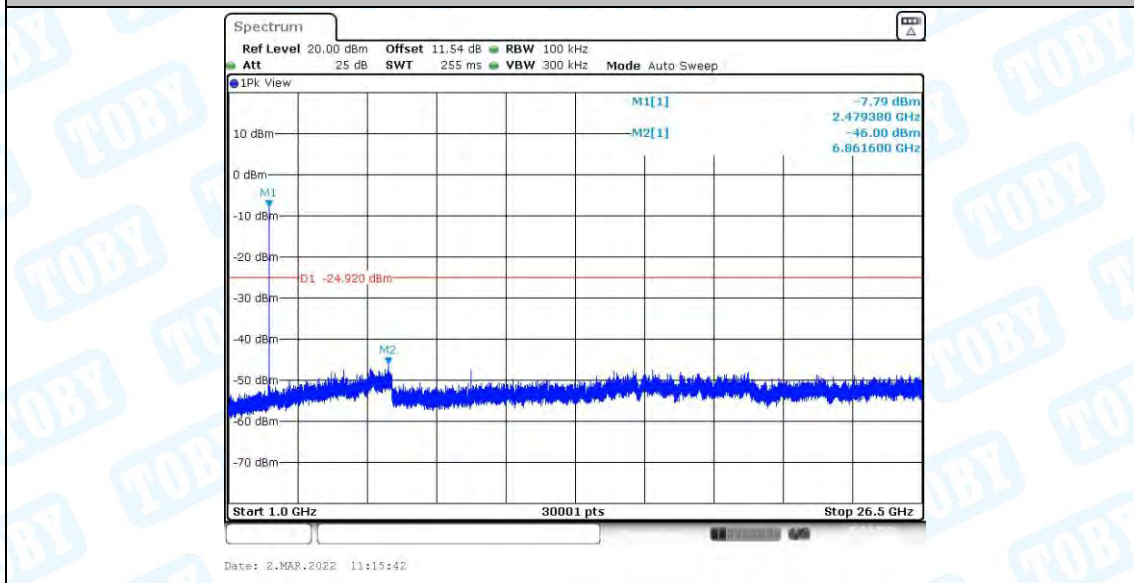
3DH5_Ant1_2441_1000~26500



3DH5_Ant1_2480_0~Reference



3DH5_Ant1_2480_30~1000



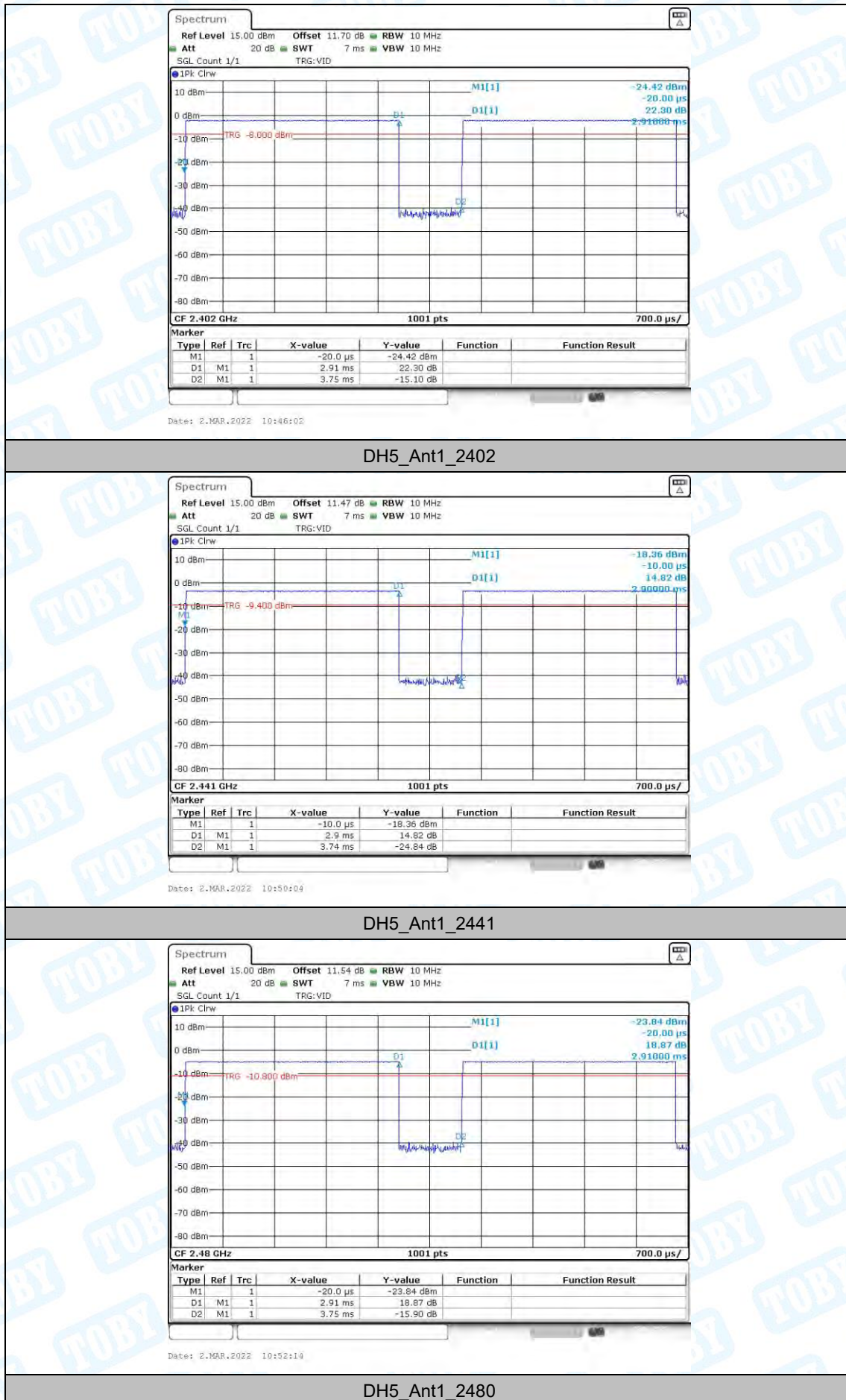
3DH5_Ant1_2480_1000~26500

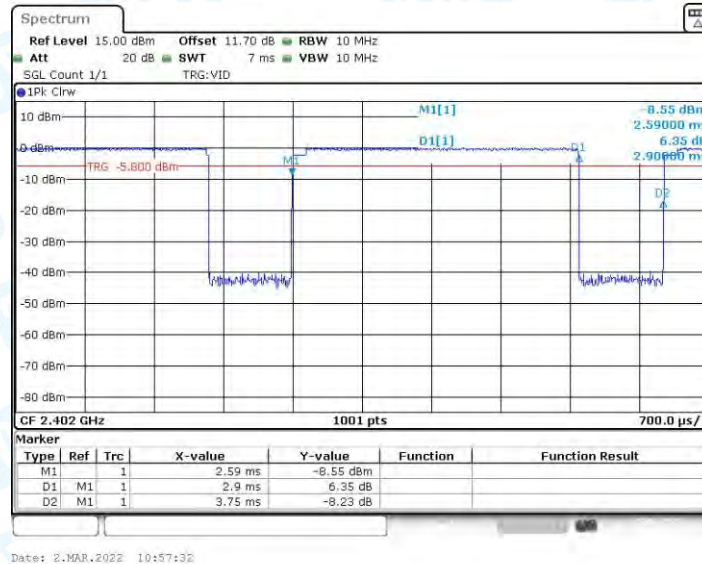
9. Duty Cycle

9.1. Test Result

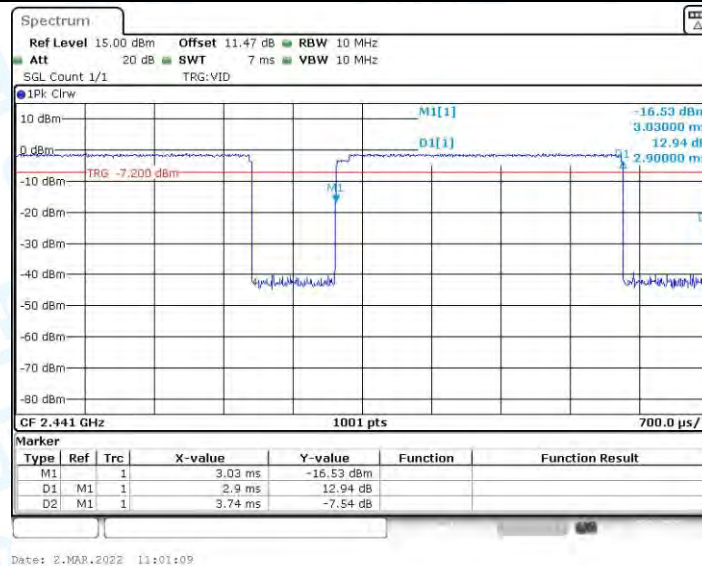
TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Limit	Verdict
DH5	Ant1	2402	2.91	3.75	77.60	---	---
		2441	2.90	3.74	77.54	---	---
		2480	2.91	3.75	77.60	---	---
2DH5	Ant1	2402	2.90	3.75	77.33	---	---
		2441	2.90	3.74	77.54	---	---
		2480	2.91	3.75	77.60	---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

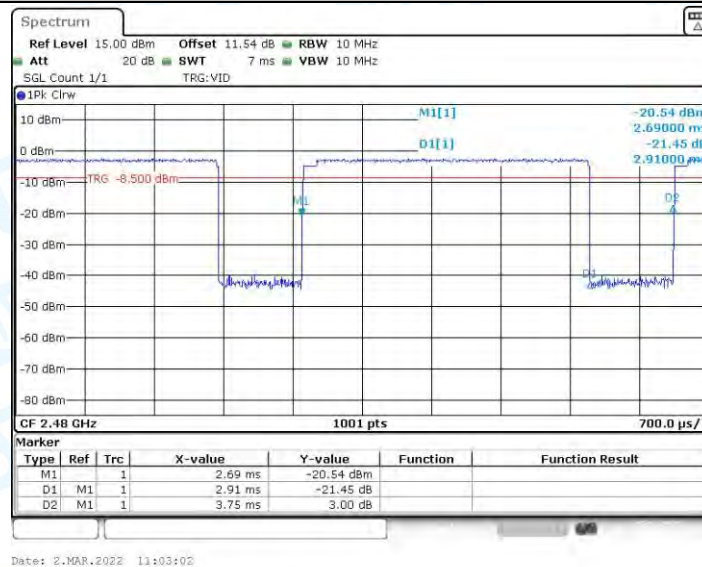




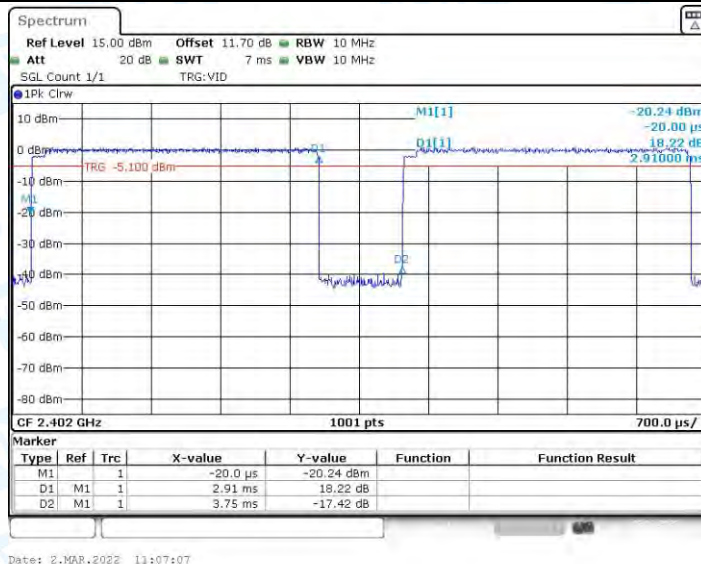
2DH5_Ant1_2402



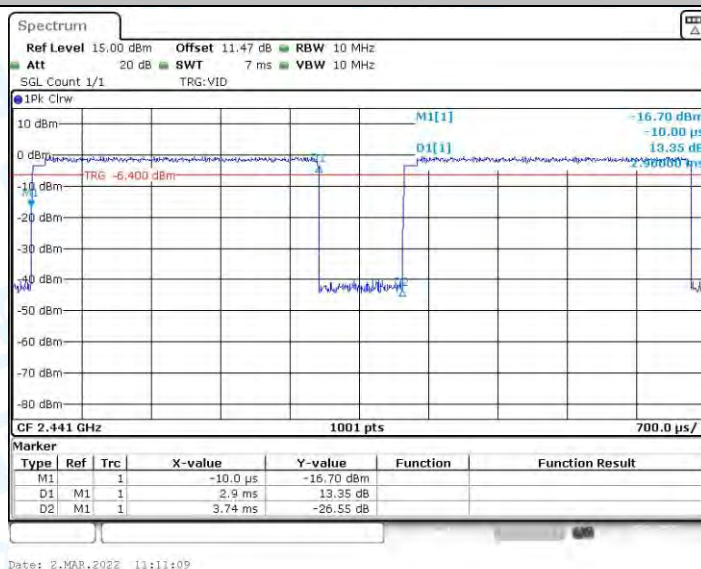
2DH5_Ant1_2441



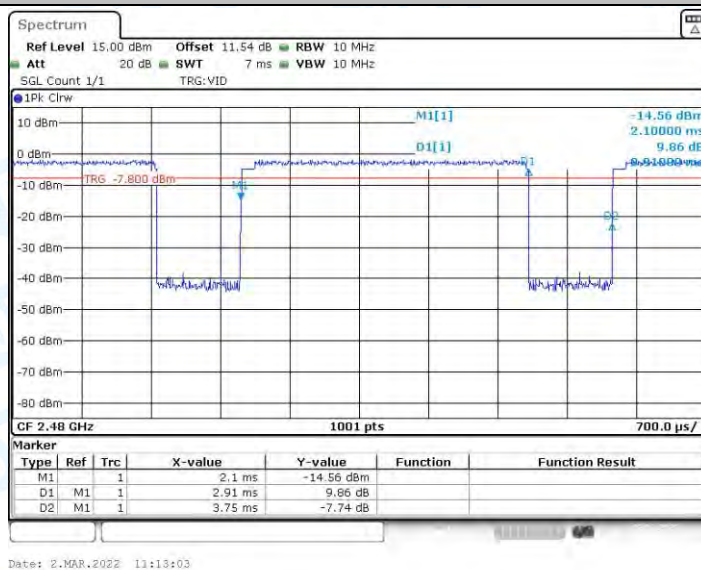
2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480

10. Emissions in Restricted Bands

10.1. Test Result

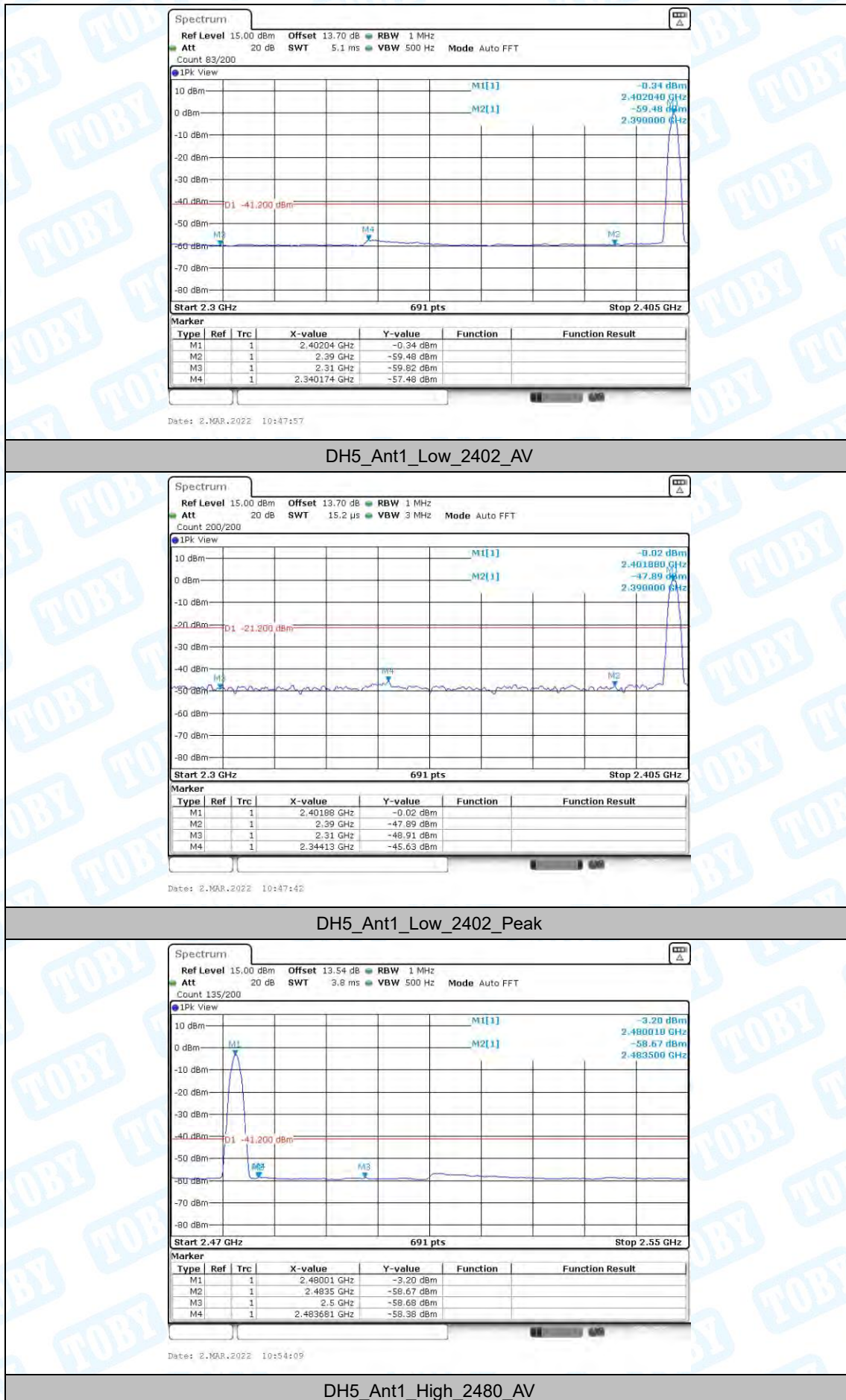
TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	AV	2310.000	-59.82	≤-41.20	PASS
				AV	2340.174	-57.48	≤-41.20	PASS
				AV	2390.000	-59.48	≤-41.20	PASS
				Peak	2310.000	-48.91	≤-21.20	PASS
				Peak	2344.130	-45.63	≤-21.20	PASS
				Peak	2390.000	-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

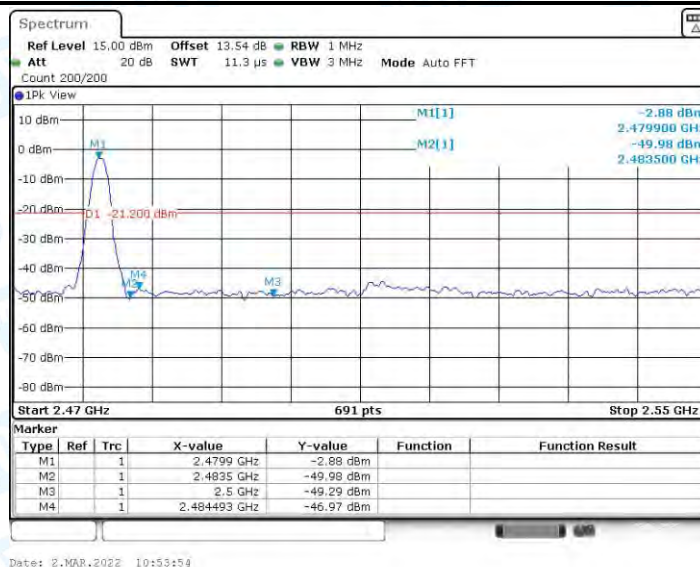
		High	2480	AV	2483.500	-58.82	≤ -41.20	PASS
				AV	2483.913	-58.46	≤ -41.20	PASS
				AV	2500.000	-59.1	≤ -41.20	PASS
				Peak	2483.500	-49.22	≤ -21.20	PASS
				Peak	2484.725	-46.81	≤ -21.20	PASS
				Peak	2500.000	-48.52	≤ -21.20	PASS
		Low	Hop_240 2	Peak	2310.000	-48.87	≤ -21.20	PASS
				Peak	2343.065	-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:

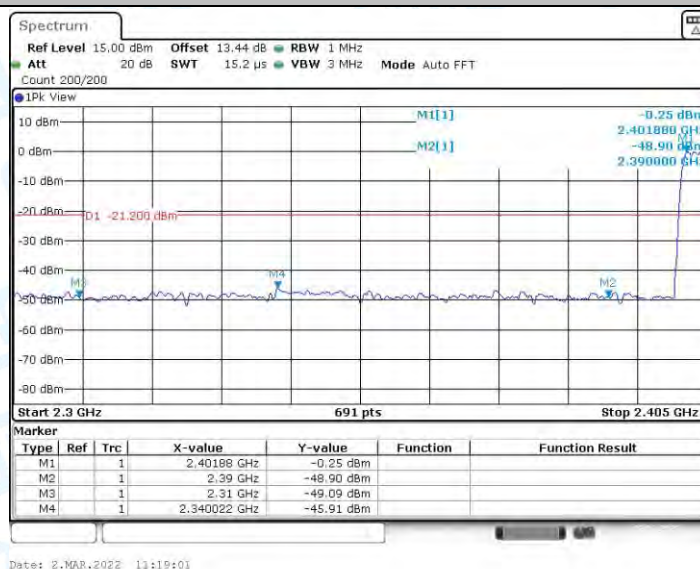
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

10.2. Test Graphs

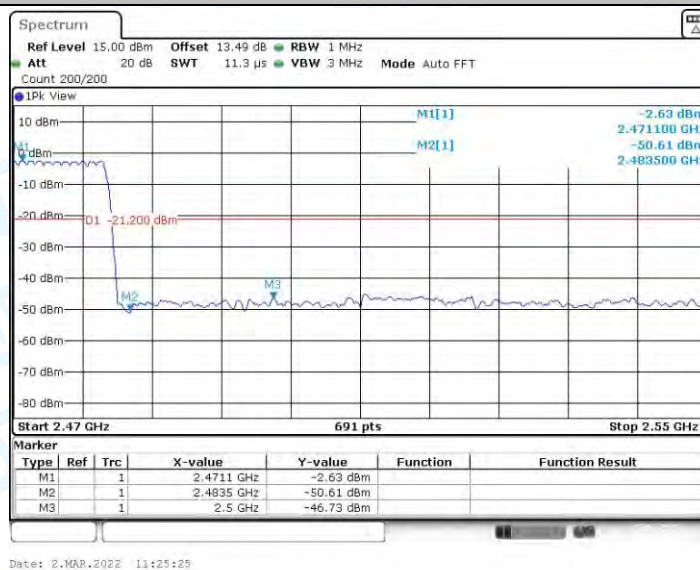




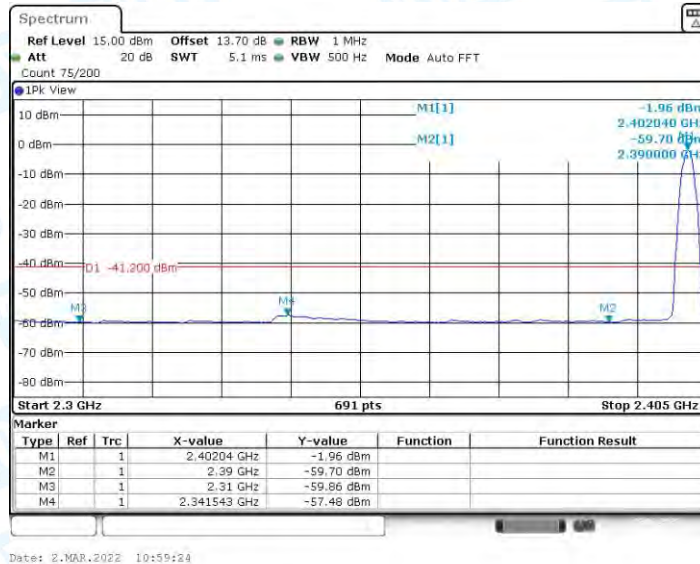
DH5_Ant1_High_2480_Peak



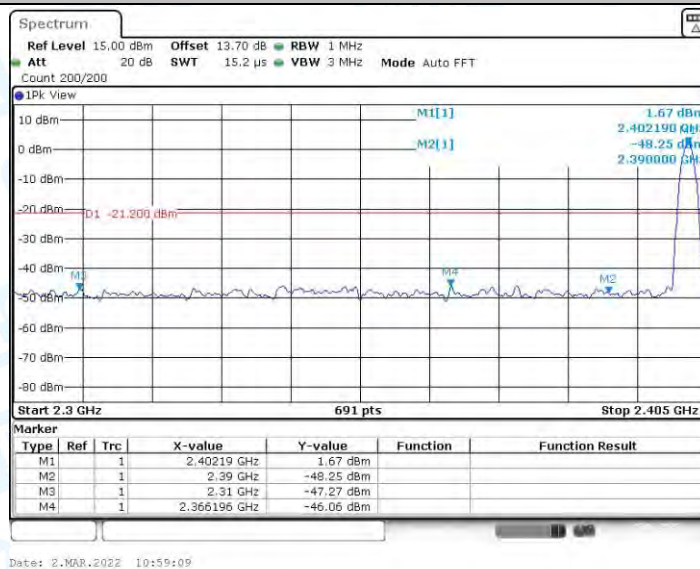
DH5_Ant1_Low_Hop_2402_Peak



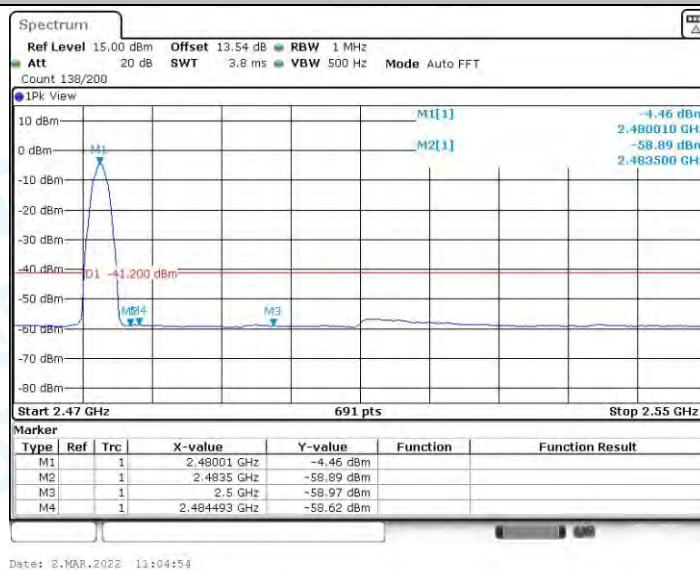
DH5_Ant1_High_Hop_2480_Peak



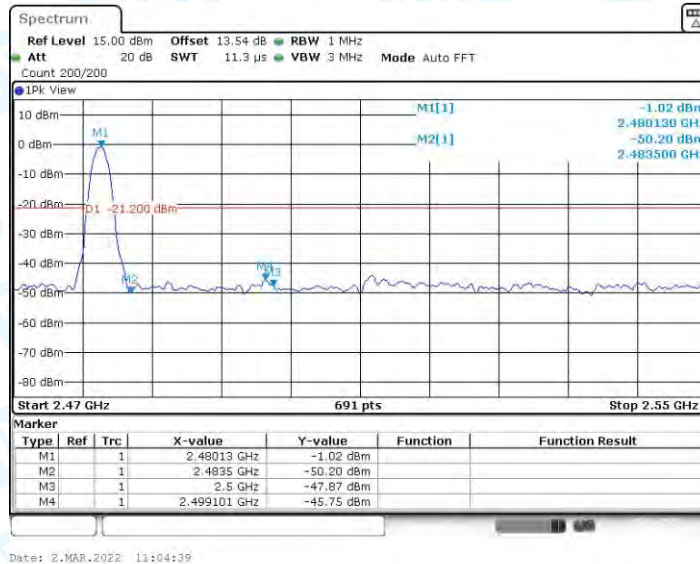
2DH5_Ant1_Low_2402_AV



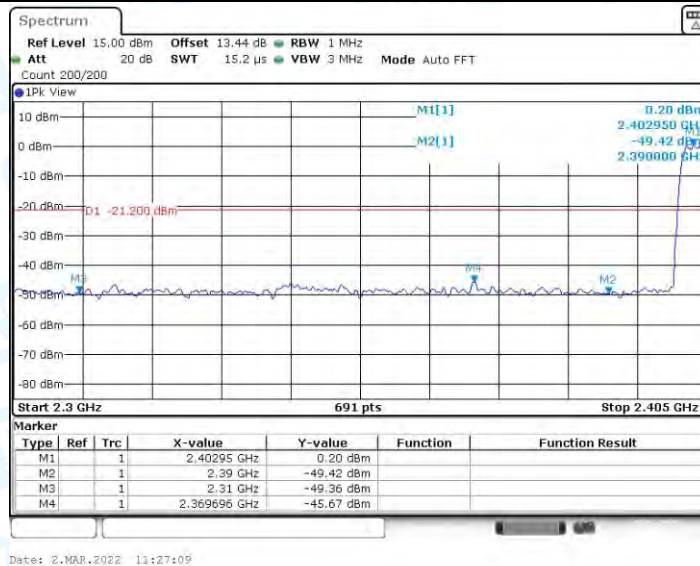
2DH5_Ant1_Low_2402_Peak



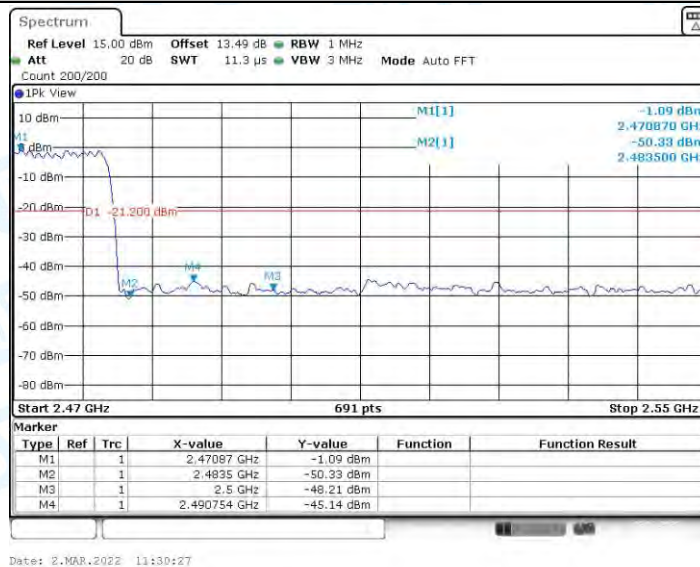
2DH5_Ant1_High_2480_AV



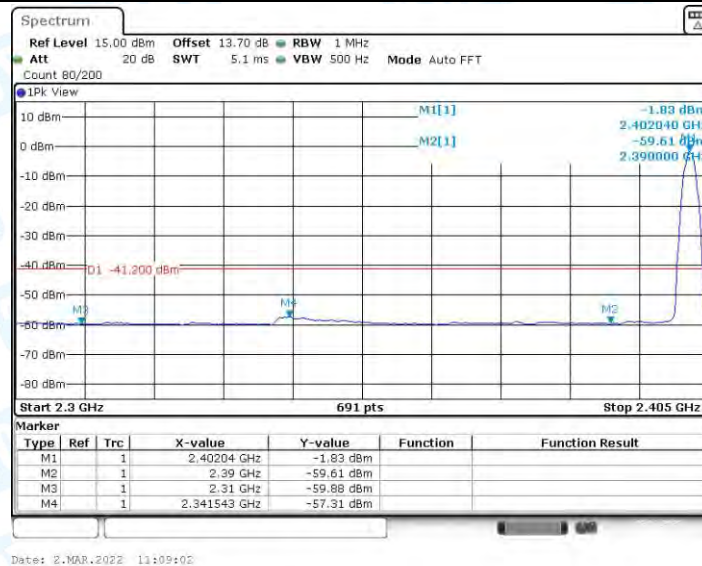
2DH5_Ant1_High_2480_Peak



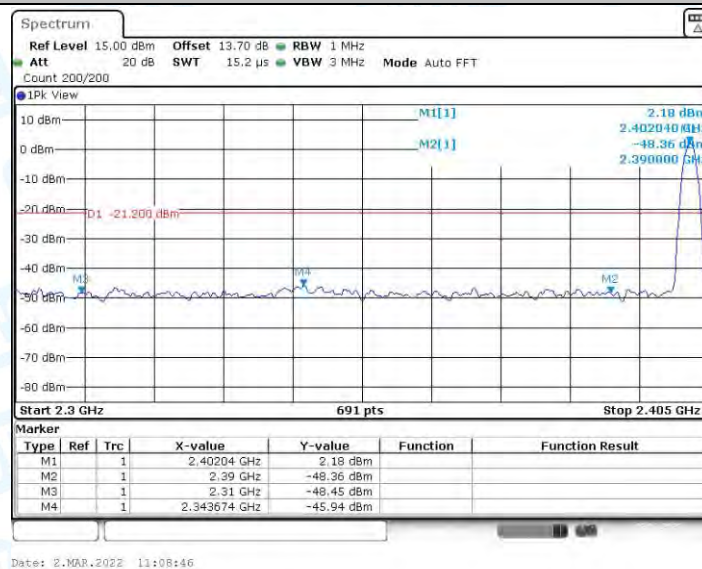
2DH5_Ant1_Low_Hop_2402_Peak



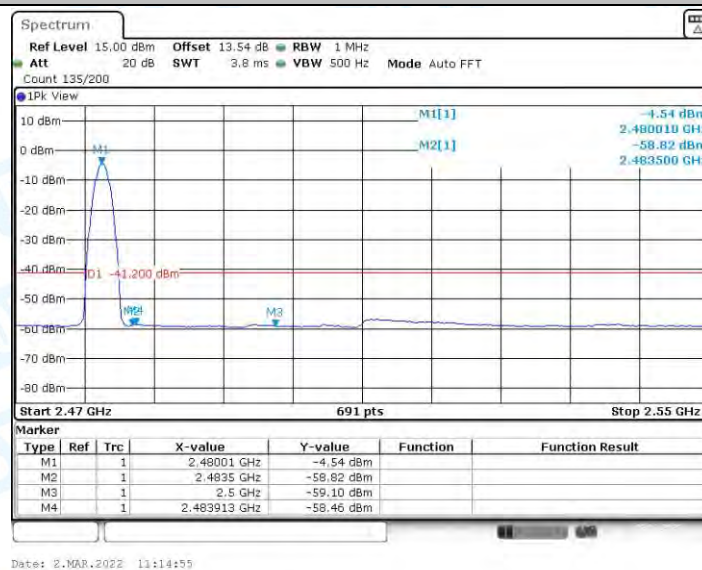
2DH5_Ant1_High_Hop_2480_Peak



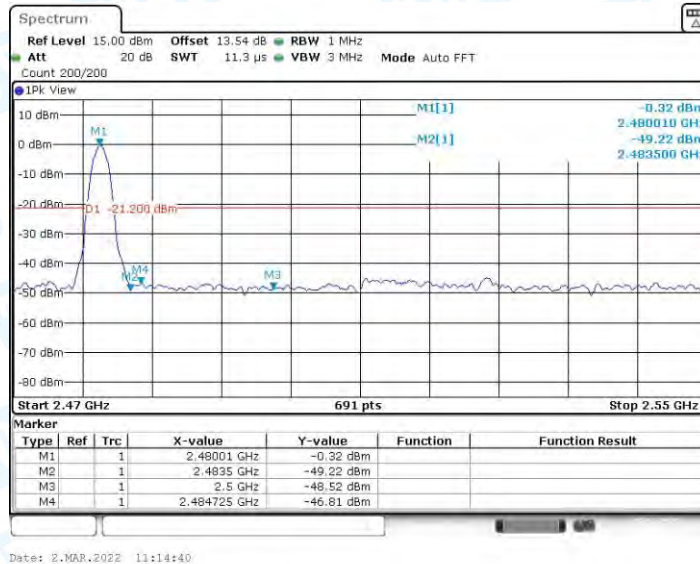
3DH5_Ant1_Low_2402_AV



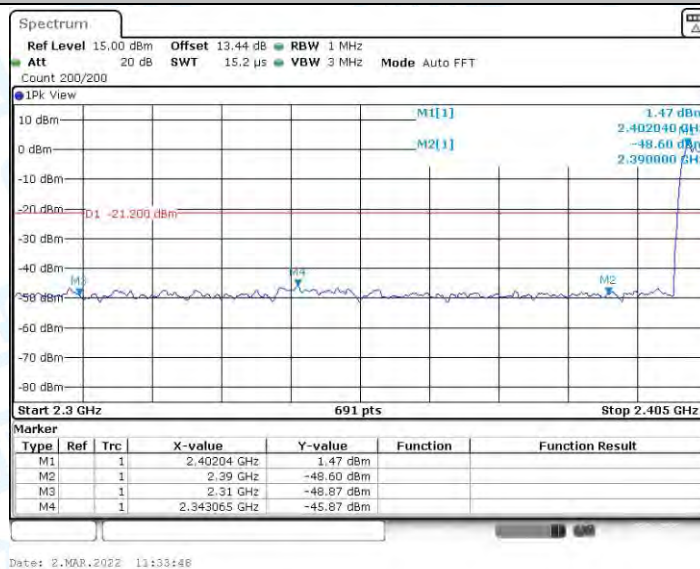
3DH5_Ant1_Low_2402_Peak



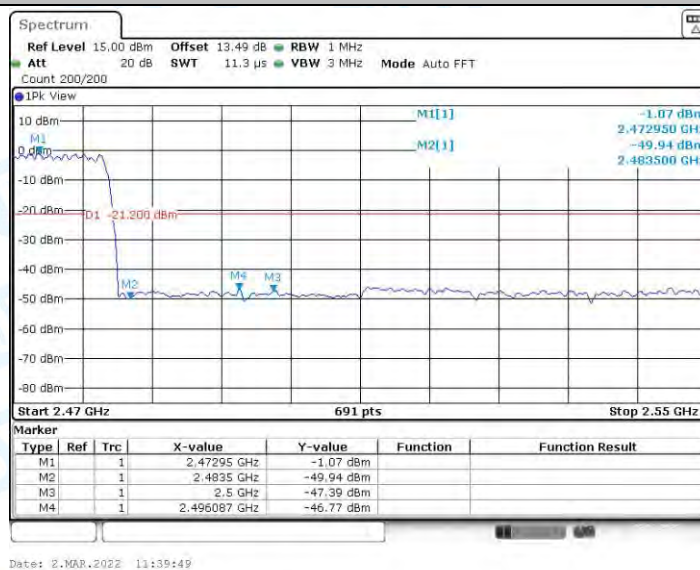
3DH5_Ant1_High_2480_AV



3DH5_Ant1_High_2480_Peak



3DH5_Ant1_Low_Hop_2402_Peak



3DH5_Ant1_High_Hop_2480_Peak

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