

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

General Description of EUT	
Product Name:	SMART WATCH
Test Model:	KL2
Sample ID:	20211124-13_01-02
Environmental Conditions	
Temperature:	25°C
Relative Humidity:	55%
Test Voltage:	DC 3.7V
Test Engineer:	Huangjianping
Note: For a more detailed features description, please refer to the report TB-FCC186142	

Contents

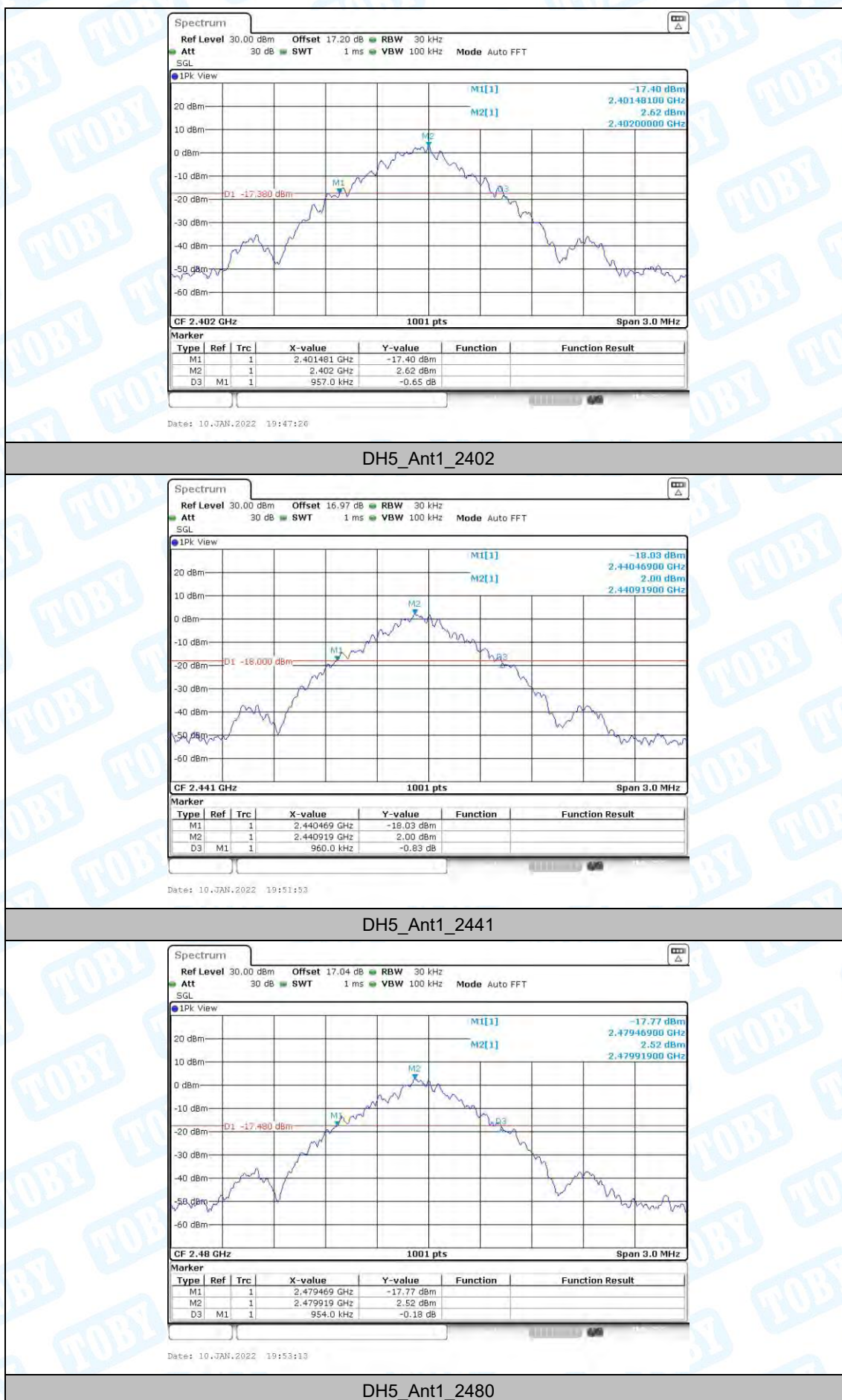
1. 20dB Emission Bandwidth.....	3
1.1. Test Result	3
1.2. Test Graphs	4
2. Occupied Channel Bandwidth.....	7
2.1. Test Result	7
2.2. Test Graphs	8
3. Maximum conducted output power	11
3.1. Test Result	11
3.2. Test Graphs	12
4. Carrier frequency separation	15
4.1. Test Result	15
4.2. Test Graphs	16
5. 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. Emissions in Restricted Bands	38
9.1. Test Result	38
9.2. Test Graphs	39

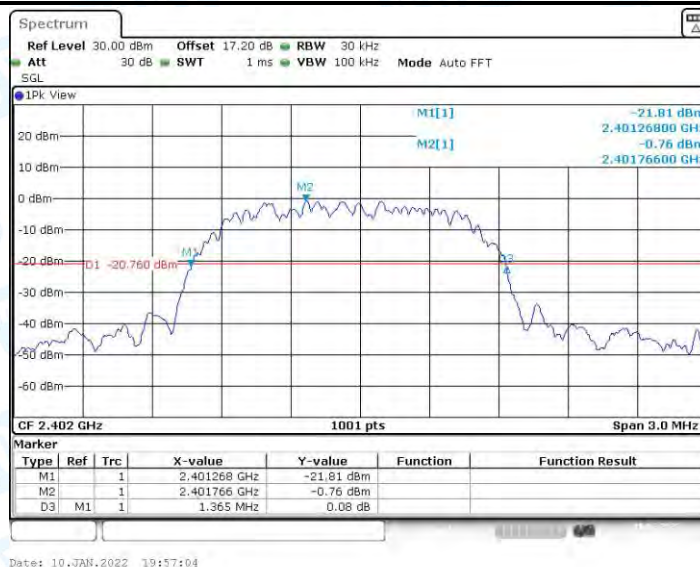
1. 20dB Emission Bandwidth

1.1. Test Result

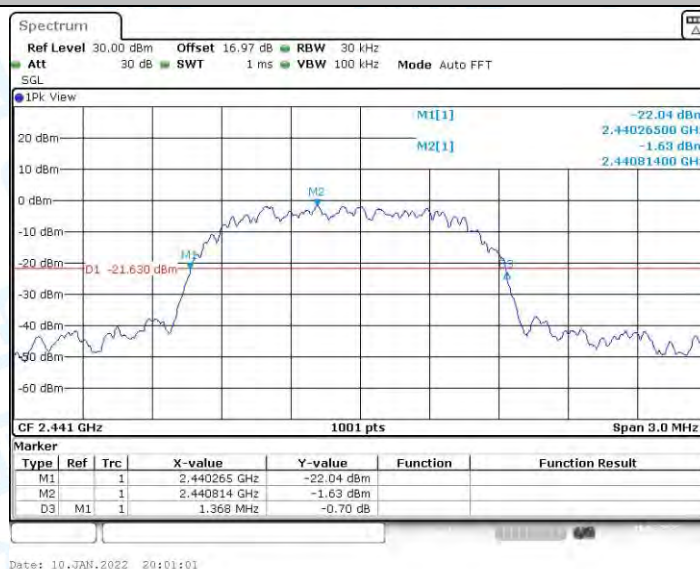
TestMode	Antenna	Channel	20db EBW[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.96	---	---
		2441	0.96	---	---
		2480	0.95	---	---
2DH5	Ant1	2402	1.36	---	---
		2441	1.37	---	---
		2480	1.35	---	---
3DH5	Ant1	2402	1.35	---	---
		2441	1.35	---	---
		2480	1.35	---	---

1.2. Test Graphs





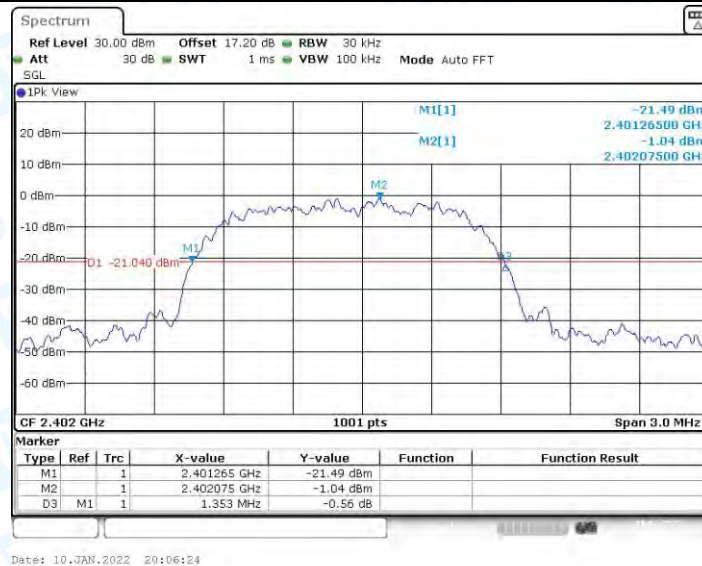
2DH5_Ant1_2402



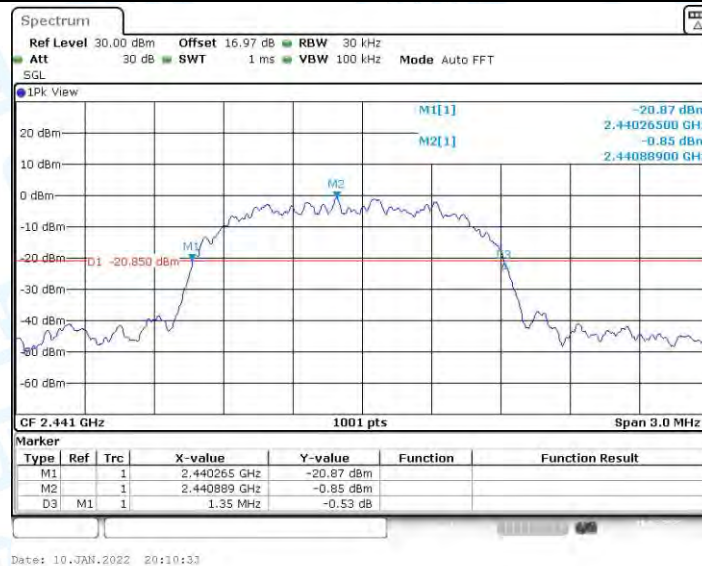
2DH5_Ant1_2441



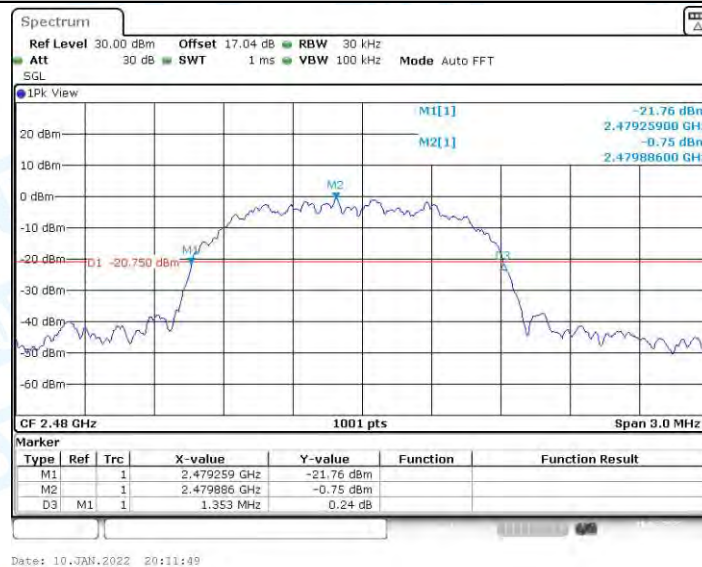
2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441



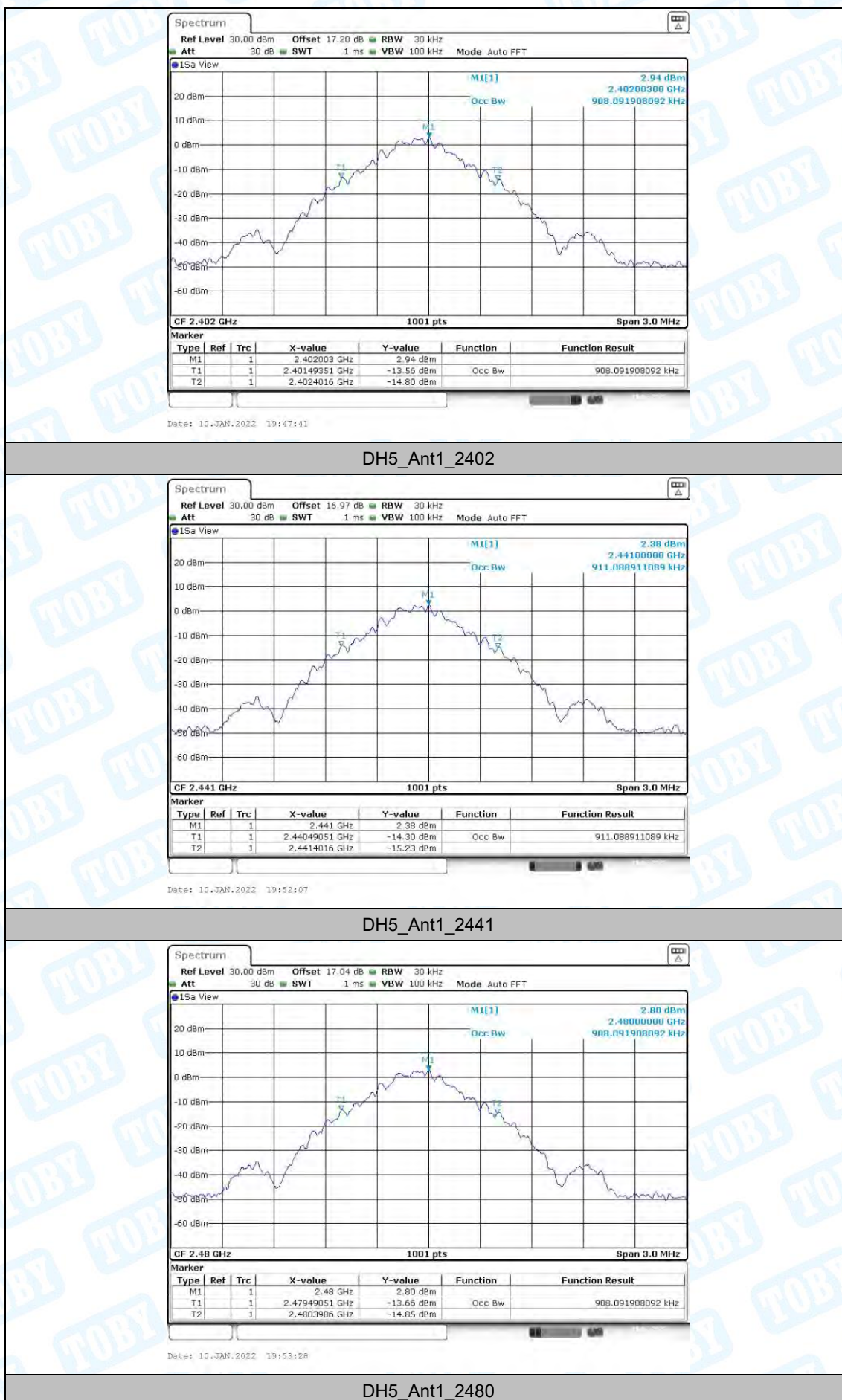
3DH5_Ant1_2480

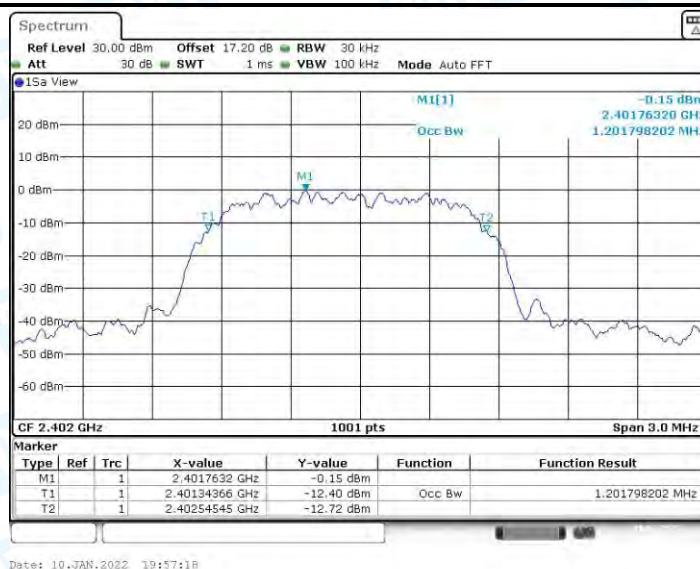
2. Occupied Channel Bandwidth

2.1. Test Result

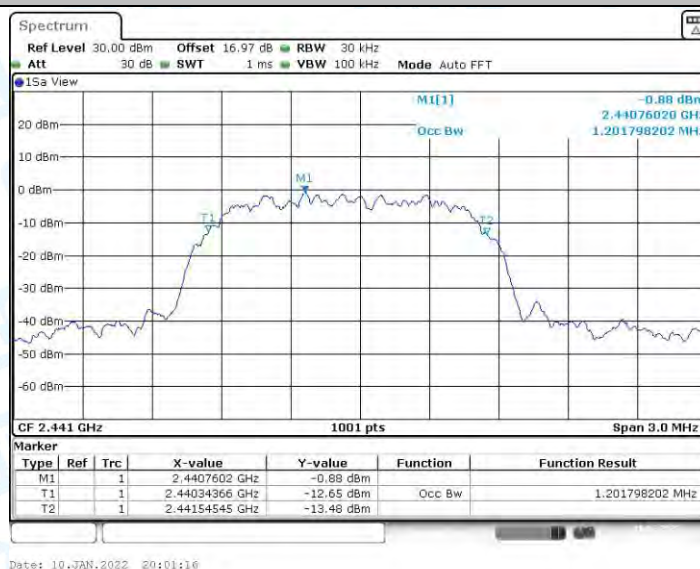
TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.908	2401.494	2402.402	---	---
		2441	0.911	2440.491	2441.402	---	---
		2480	0.908	2479.491	2480.399	---	---
2DH5	Ant1	2402	1.202	2401.344	2402.545	---	---
		2441	1.202	2440.344	2441.545	---	---
		2480	1.202	2479.341	2480.542	---	---
3DH5	Ant1	2402	1.208	2401.338	2402.545	---	---
		2441	1.205	2440.338	2441.542	---	---
		2480	1.208	2479.335	2480.542	---	---

2.2. Test Graphs

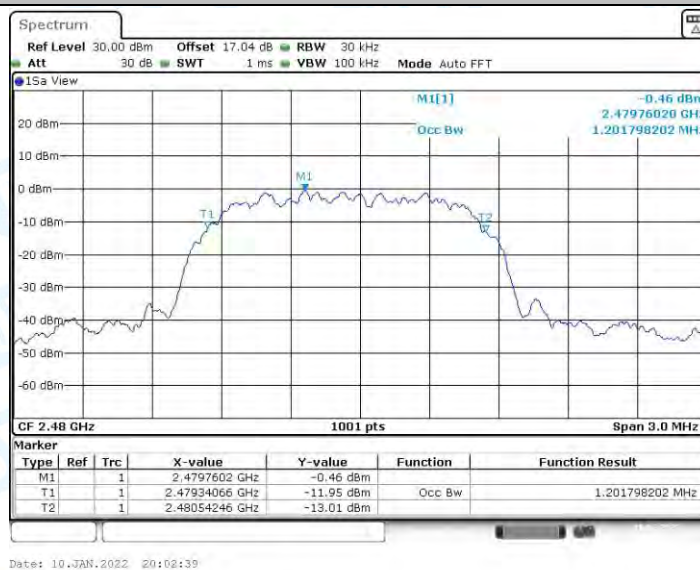




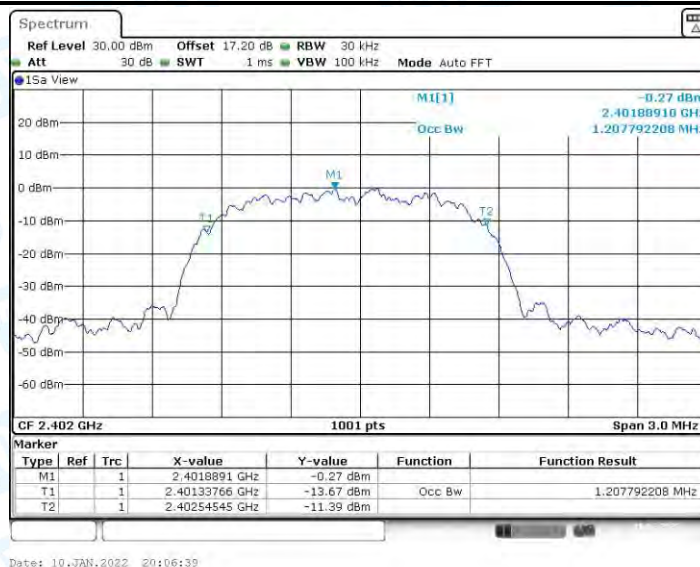
2DH5_Ant1_2402



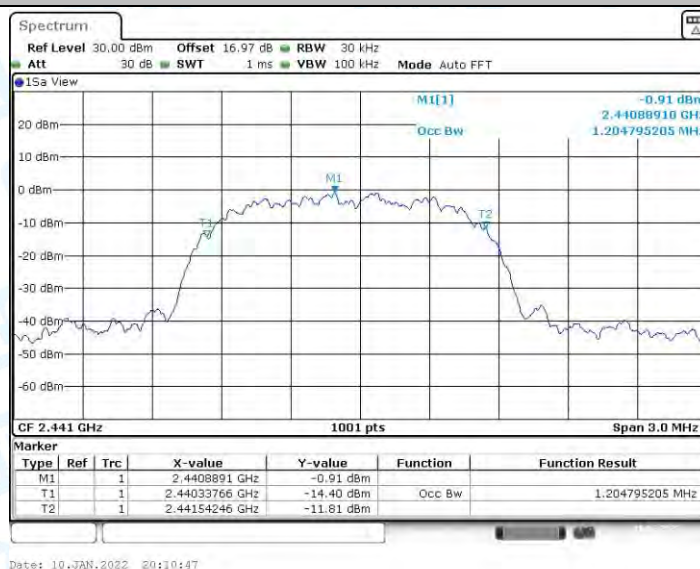
2DH5_Ant1_2441



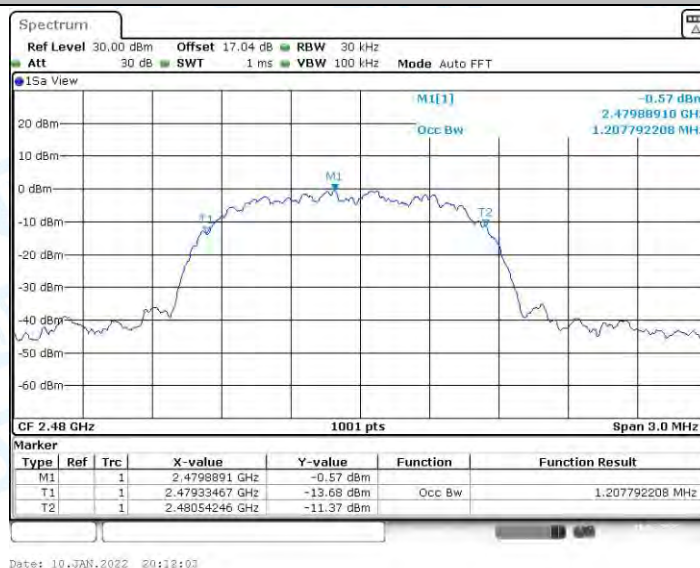
2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441



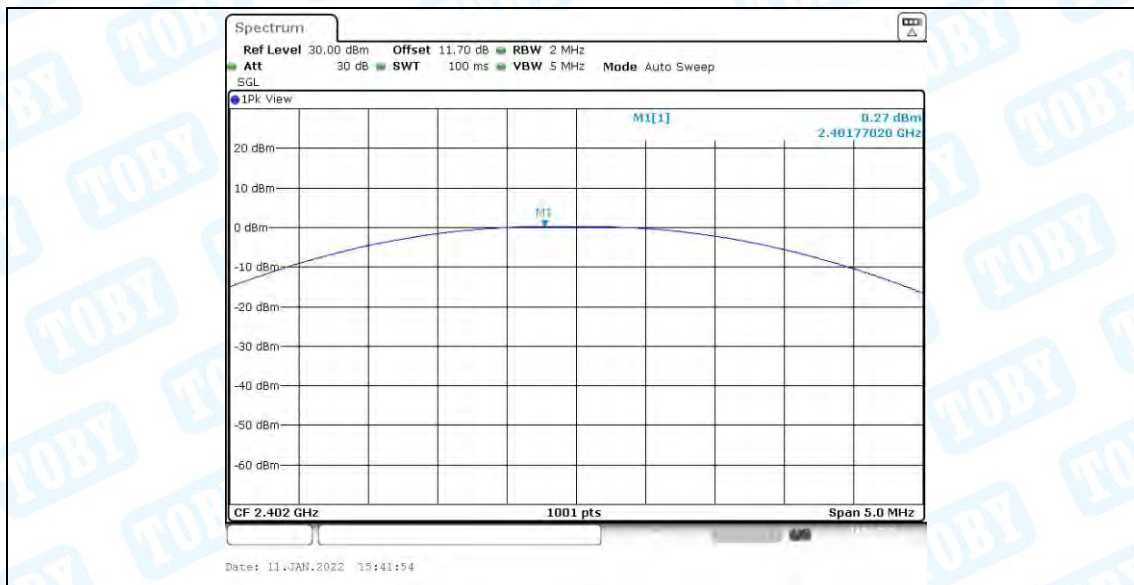
3DH5_Ant1_2480

3. Maximum conducted output power

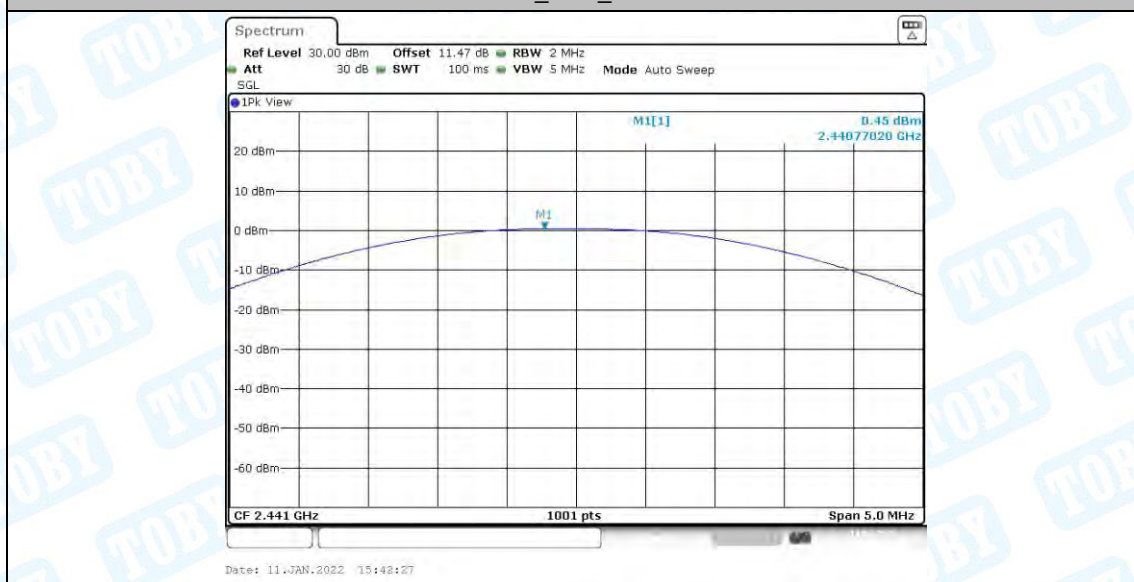
3.1. Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	0.27	≤20.97	PASS
		2441	0.45	≤20.97	PASS
		2480	-0.61	≤20.97	PASS
2DH5	Ant1	2402	3.11	≤20.97	PASS
		2441	3.04	≤20.97	PASS
		2480	1.84	≤20.97	PASS
3DH5	Ant1	2402	3.43	≤20.97	PASS
		2441	3.47	≤20.97	PASS
		2480	2.43	≤20.97	PASS

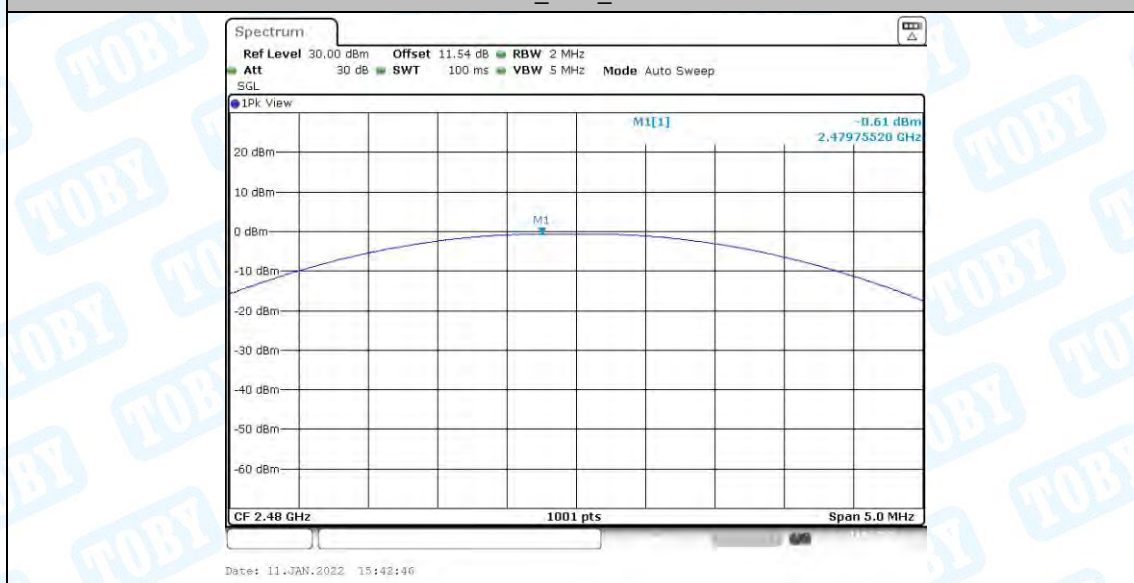
3.2.Test Graphs



DH5_Ant1_2402



DH5_Ant1_2441



DH5_Ant1_2480



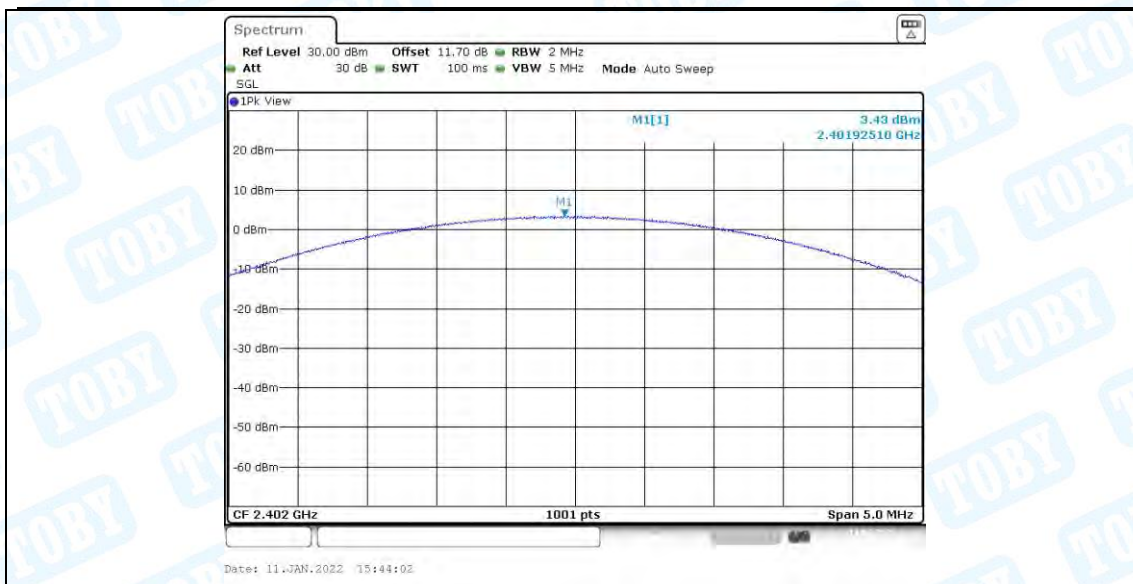
2DH5_Ant1_2402



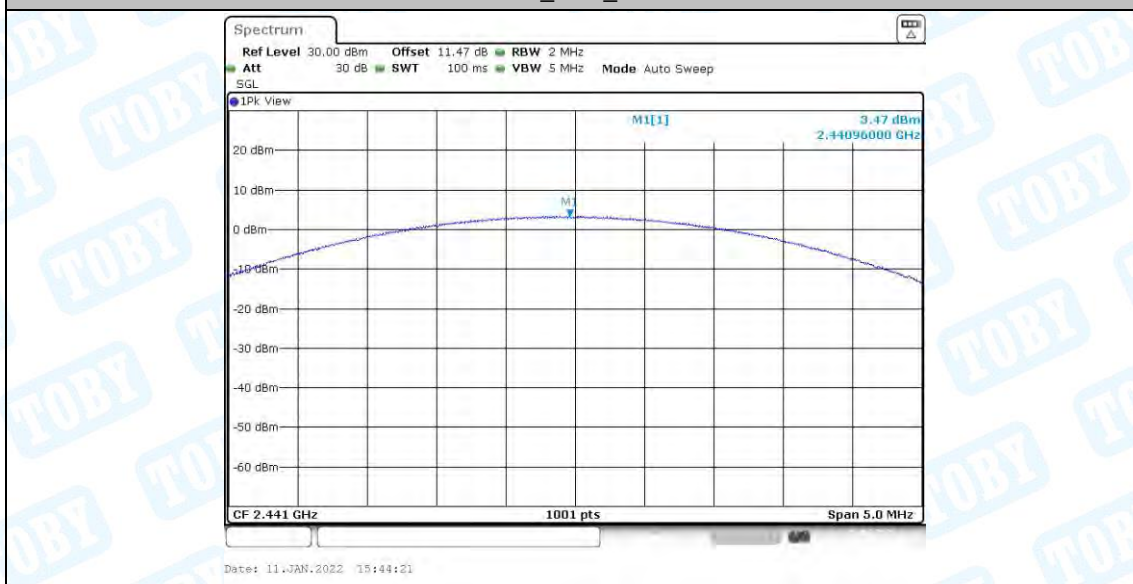
2DH5_Ant1_2441



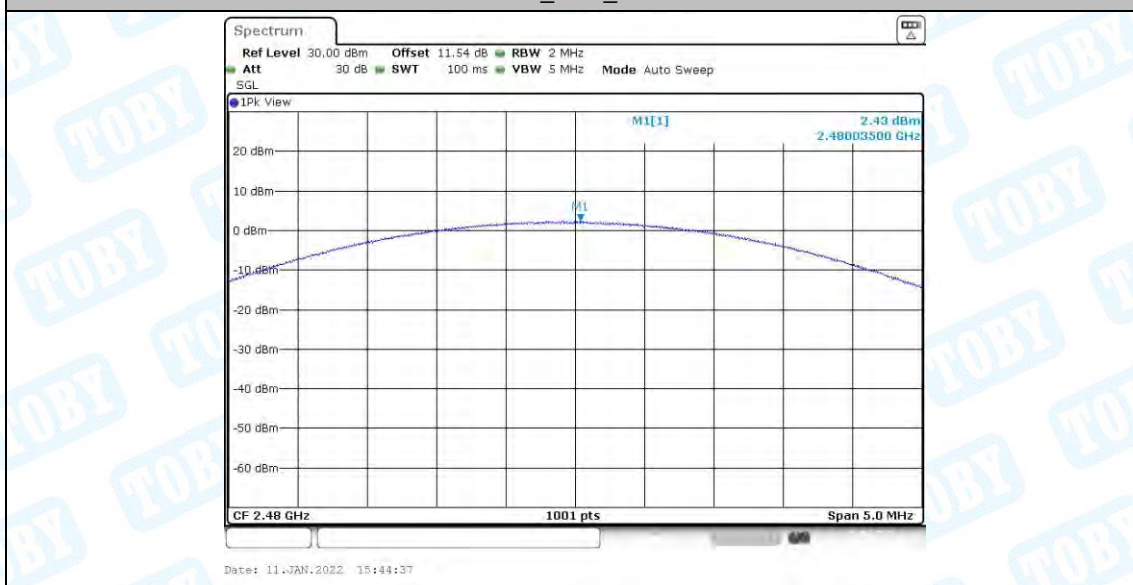
2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441



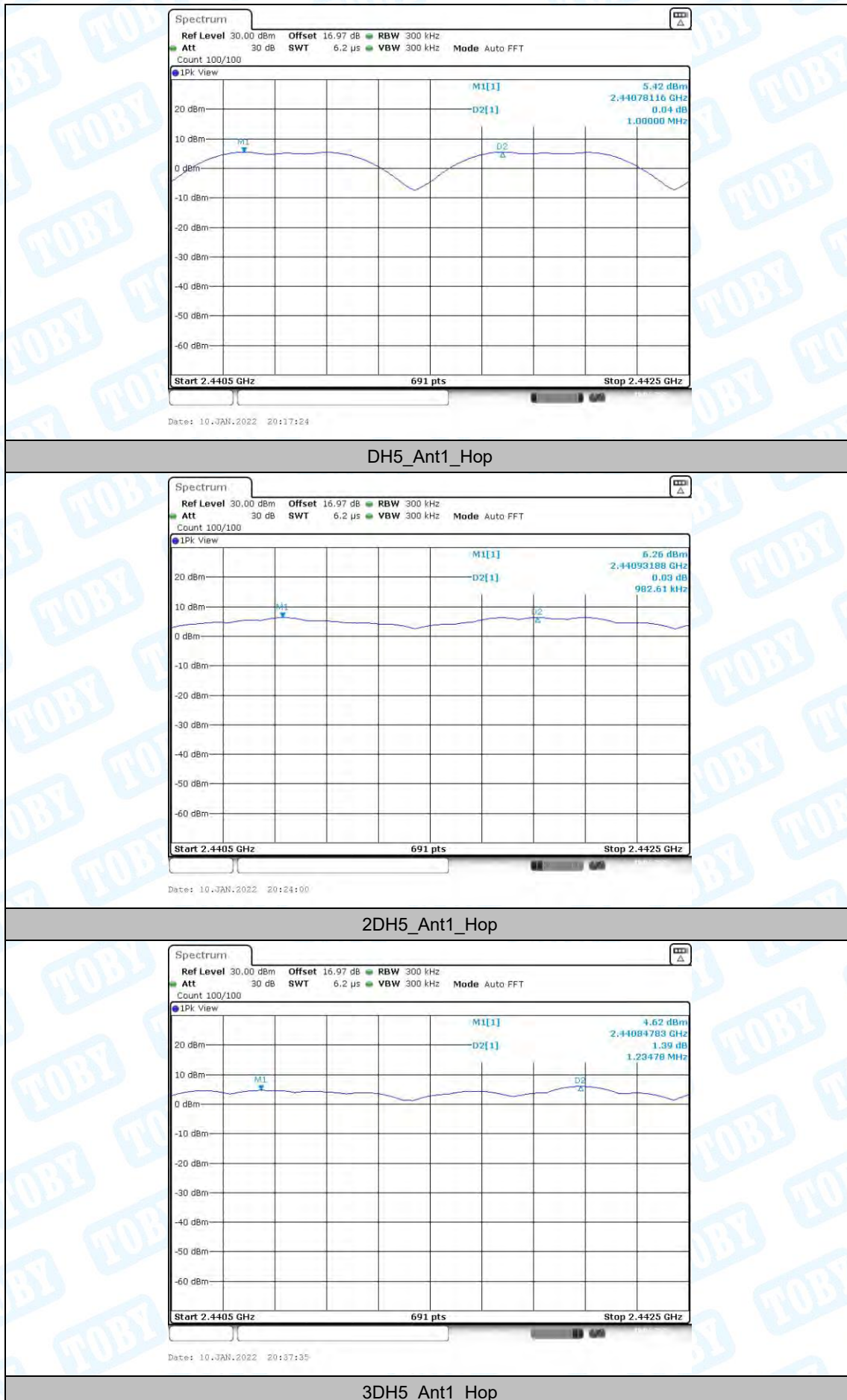
3DH5_Ant1_2480

4. Carrier frequency separation

4.1. Test Result

TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	1	≥ 0.960	PASS
2DH5	Ant1	Hop	0.983	≥ 0.913	PASS
3DH5	Ant1	Hop	1.235	≥ 0.900	PASS

4.2.Test Graphs

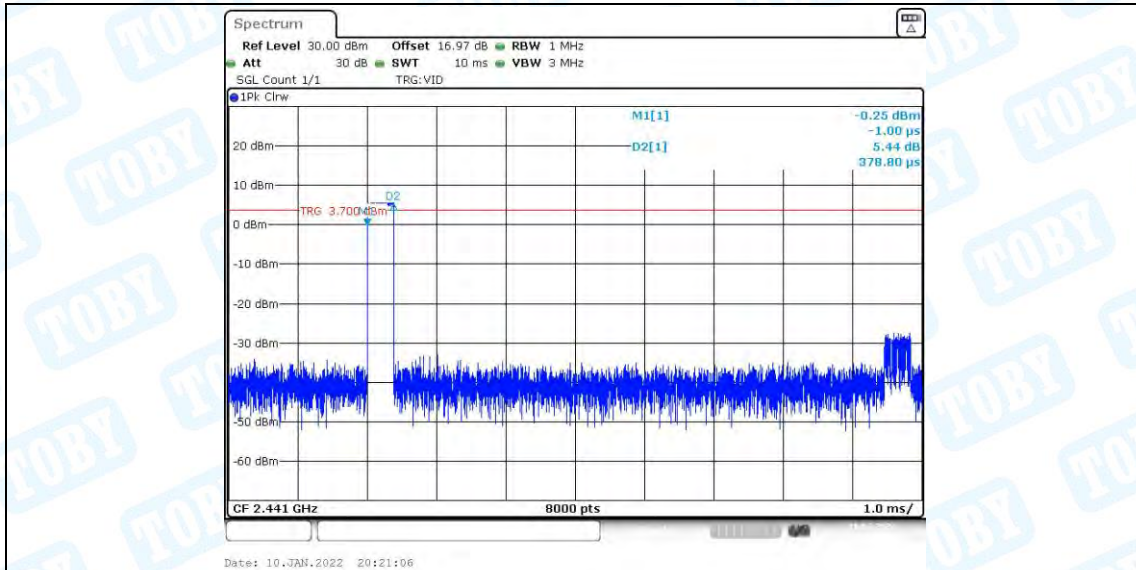


5. Time of occupancy

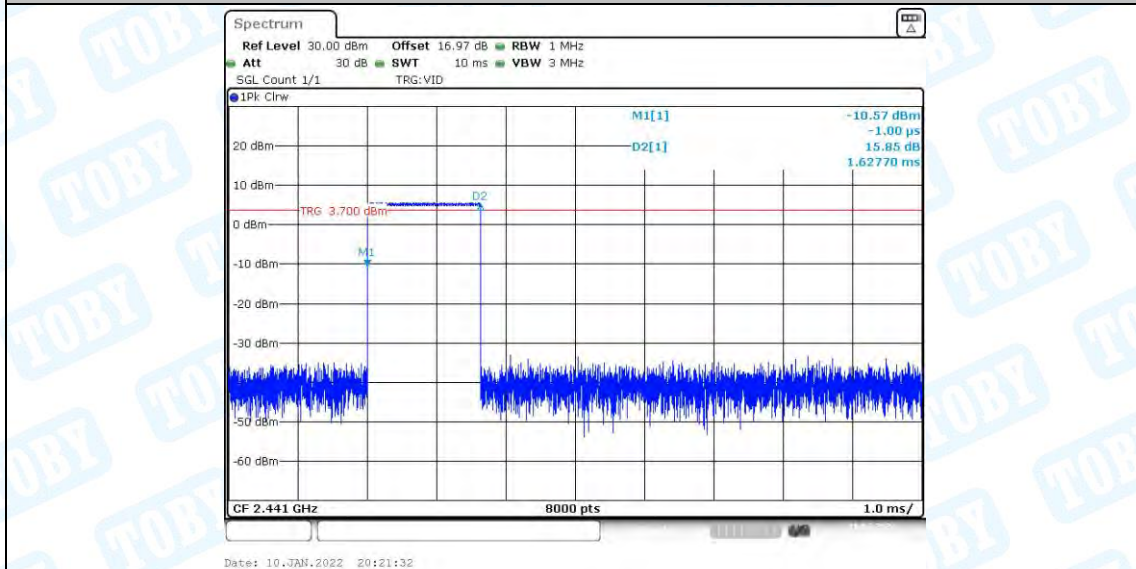
5.1. Test Result

TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.38	320	0.121	≤0.4	PASS
DH3	Ant1	Hop	1.63	160	0.26	≤0.4	PASS
DH5	Ant1	Hop	2.87	106.67	0.306	≤0.4	PASS
2DH1	Ant1	Hop	0.39	320	0.124	≤0.4	PASS
2DH3	Ant1	Hop	1.63	160	0.261	≤0.4	PASS
2DH5	Ant1	Hop	2.87	106.67	0.306	≤0.4	PASS
3DH1	Ant1	Hop	0.39	320	0.124	≤0.4	PASS
3DH3	Ant1	Hop	1.63	160	0.261	≤0.4	PASS
3DH5	Ant1	Hop	2.87	106.67	0.307	≤0.4	PASS

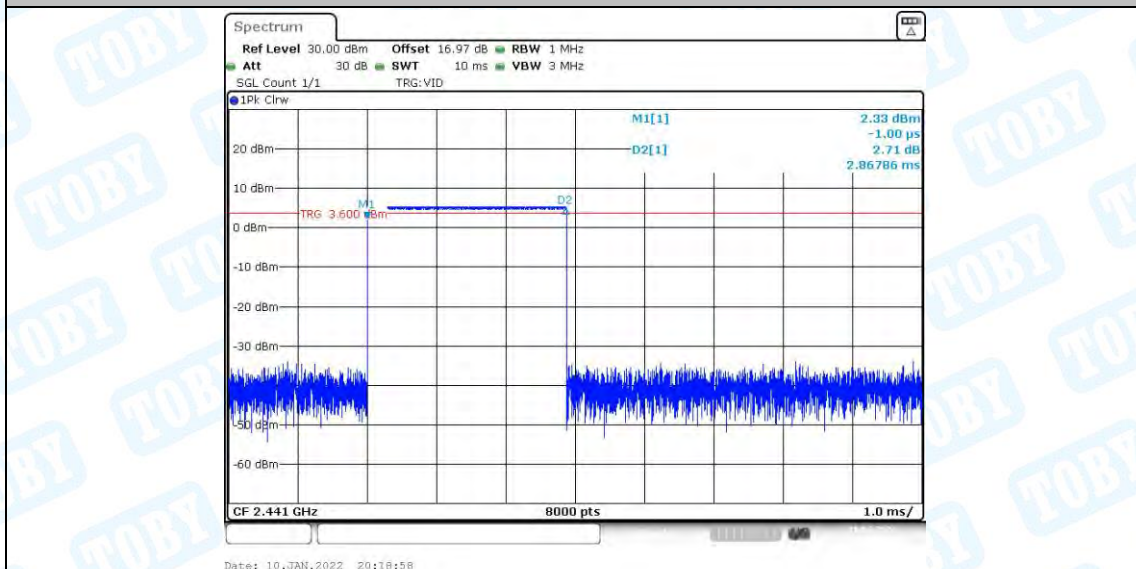
5.2.Test Graphs



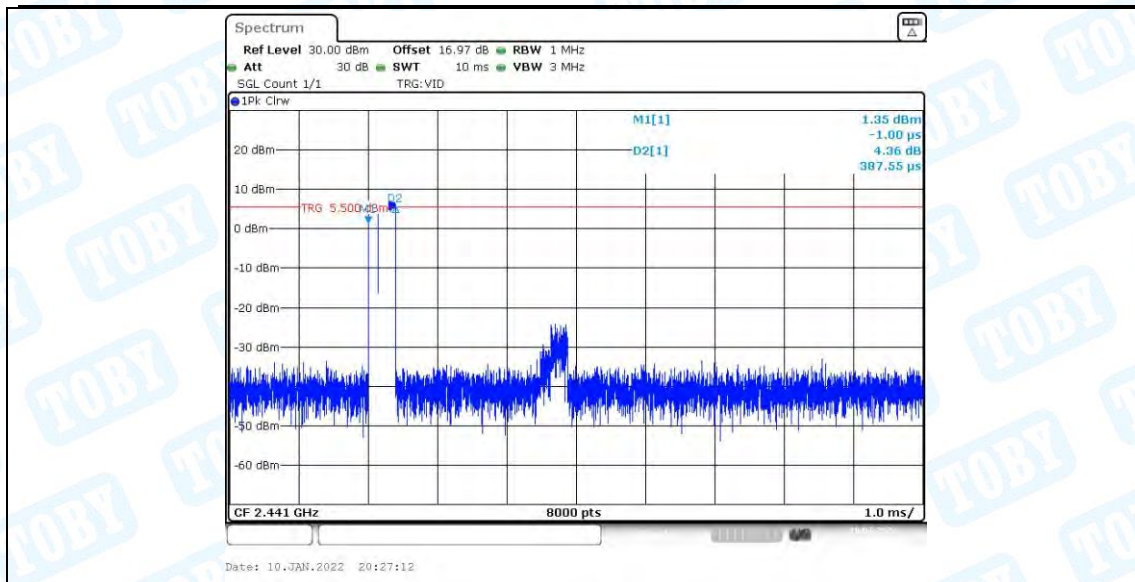
DH1_Ant1_Hop



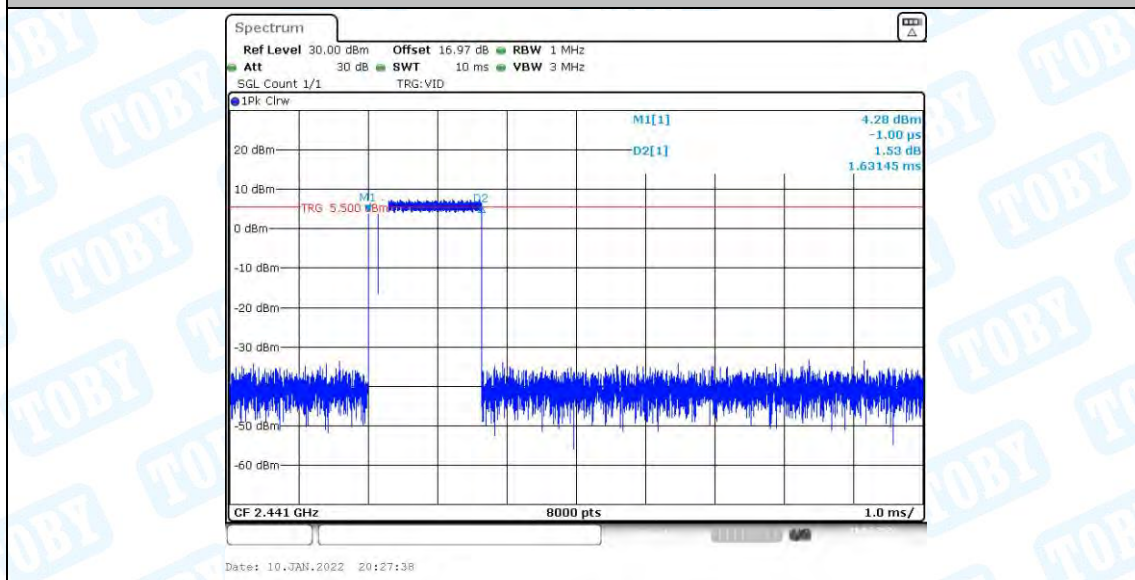
DH3_Ant1_Hop



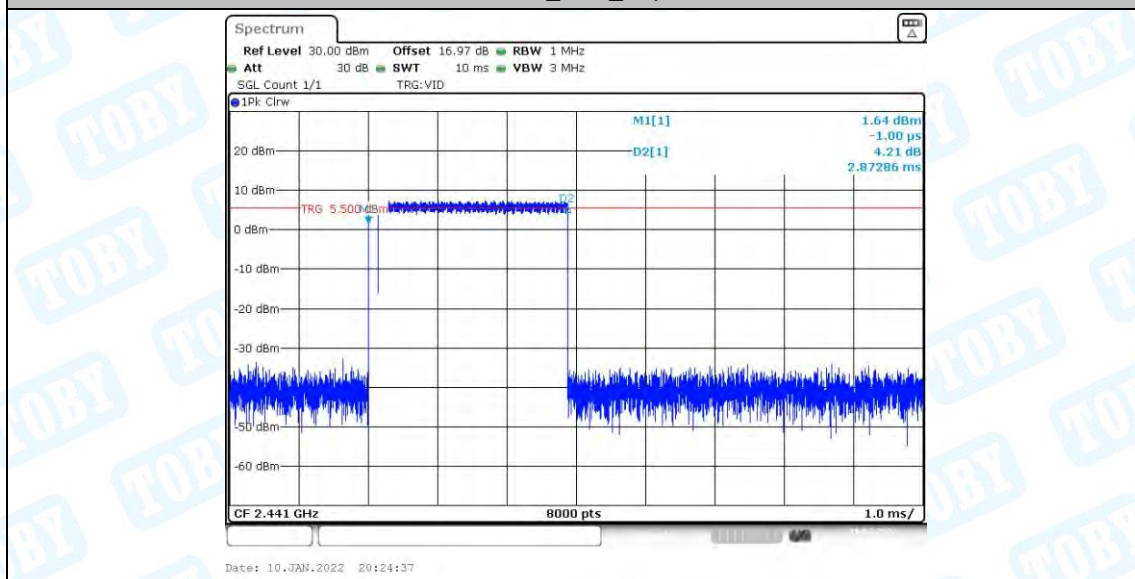
DH5_Ant1_Hop



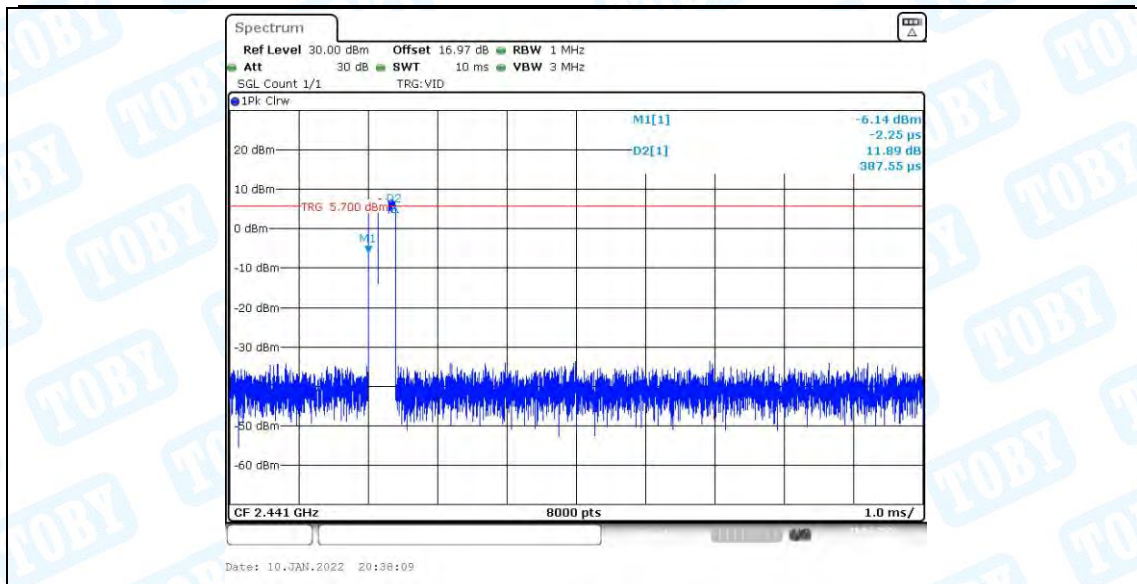
2DH1_Ant1_Hop



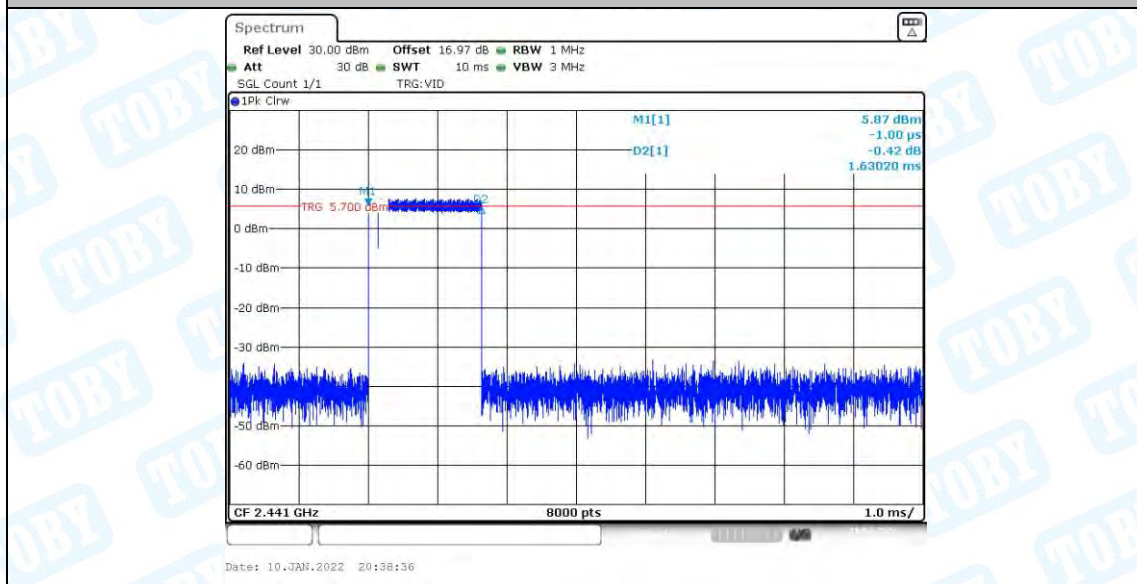
2DH3_Ant1_Hop



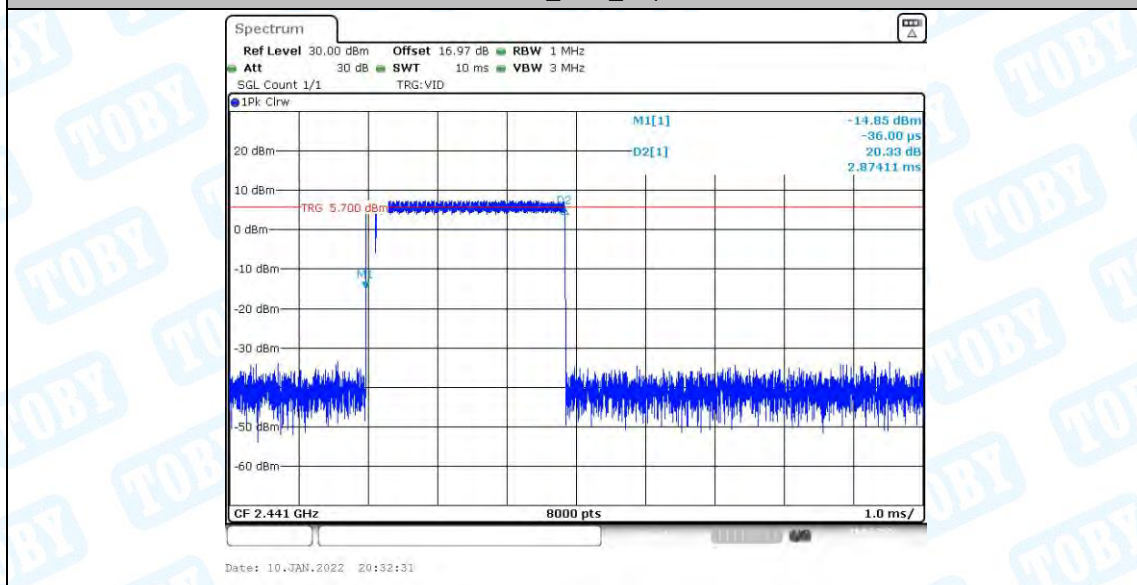
2DH5_Ant1_Hop



3DH1_Ant1_Hop



3DH3_Ant1_Hop



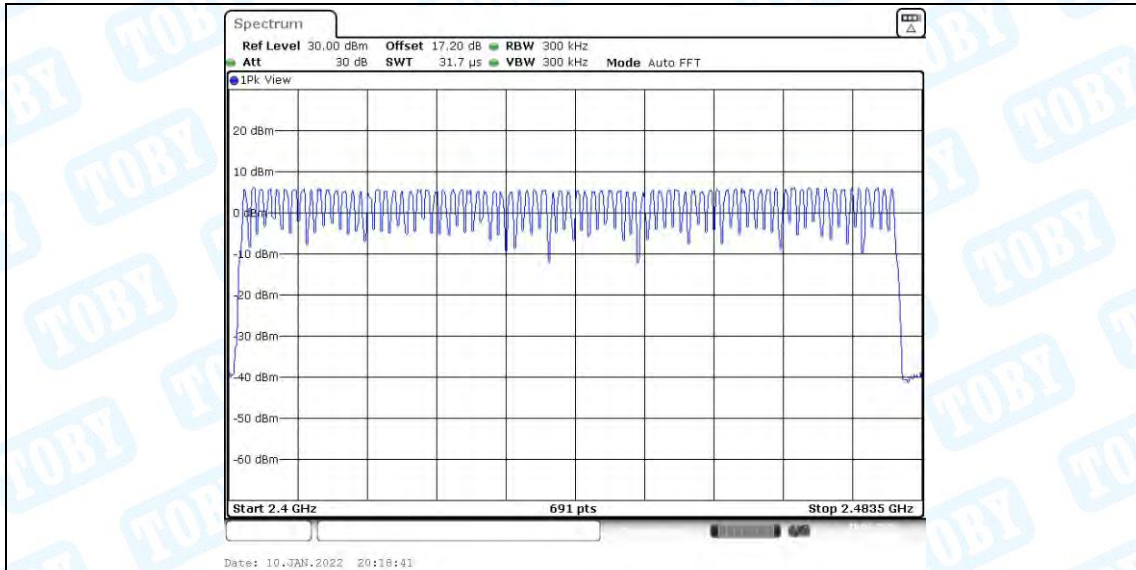
3DH5_Ant1_Hop

6. Number of hopping channels

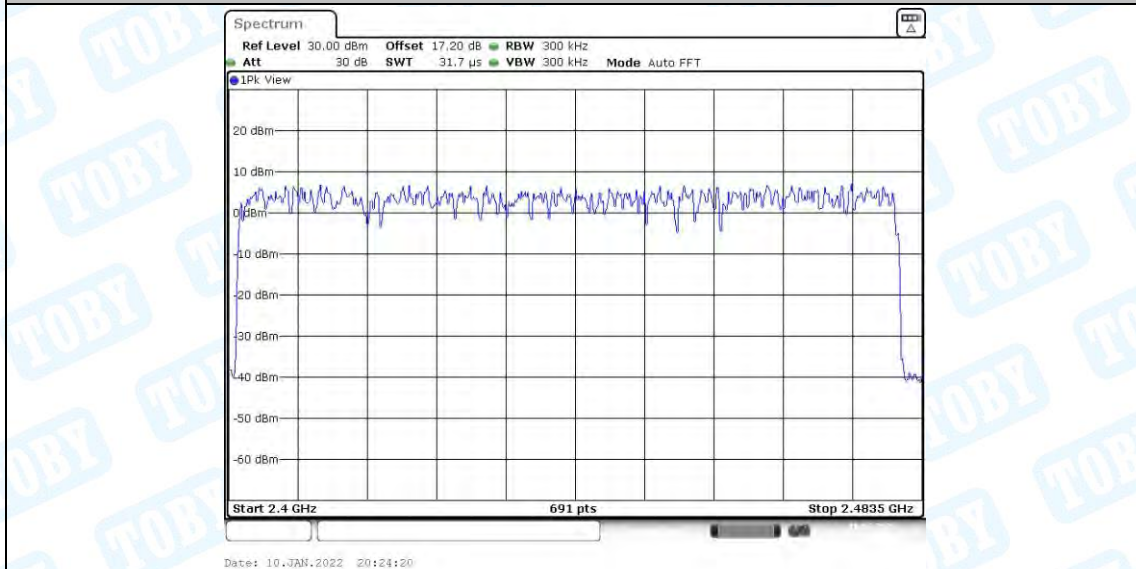
6.1. Test Result

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

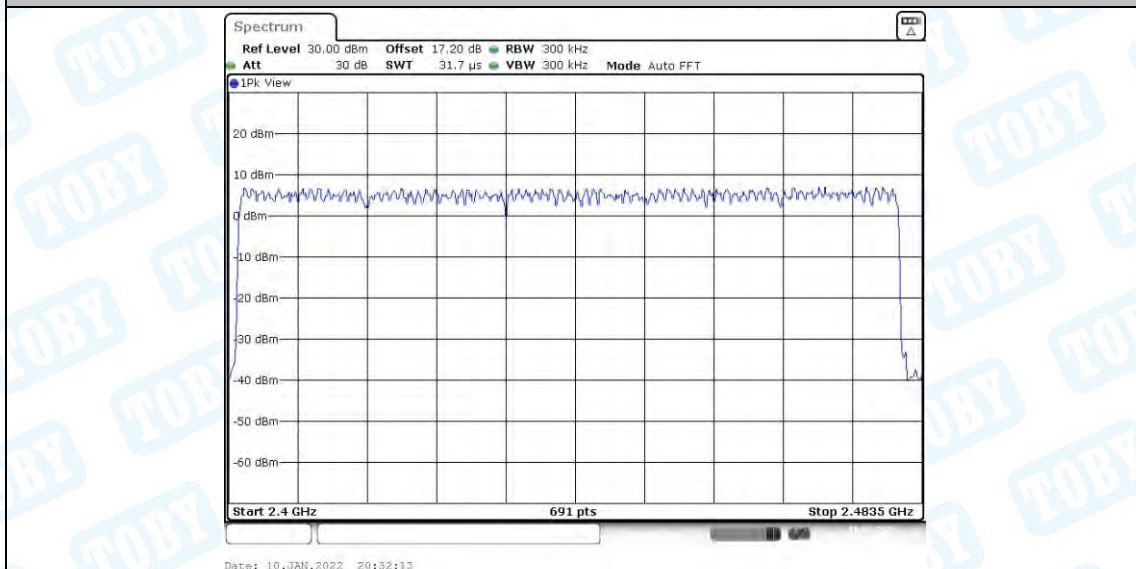
6.2.Test Graphs



DH5_Ant1_Hop



2DH5_Ant1_Hop



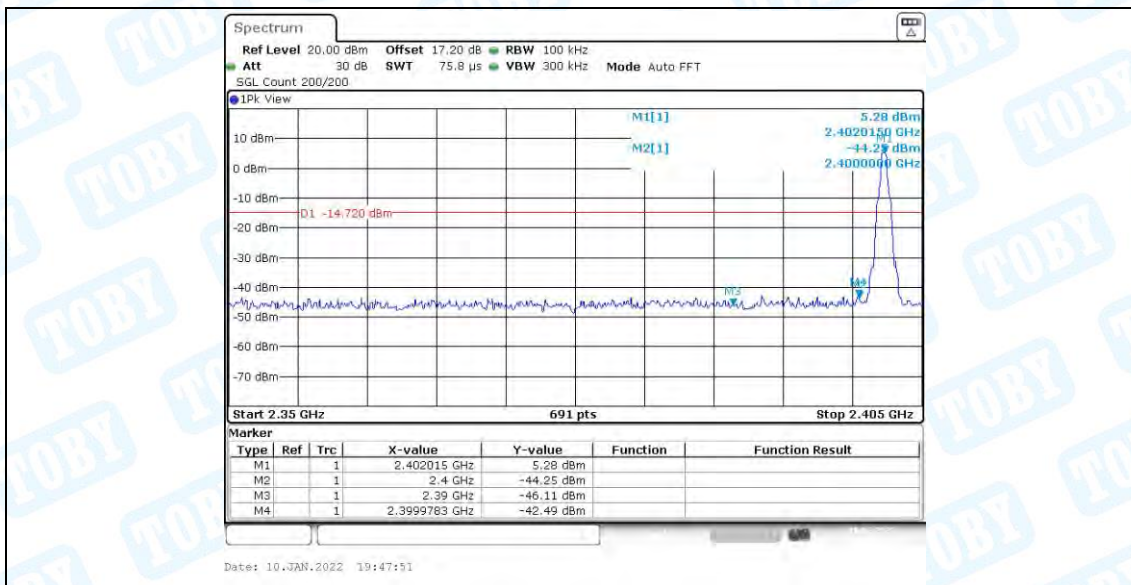
3DH5_Ant1_Hop

7. Band edge measurements

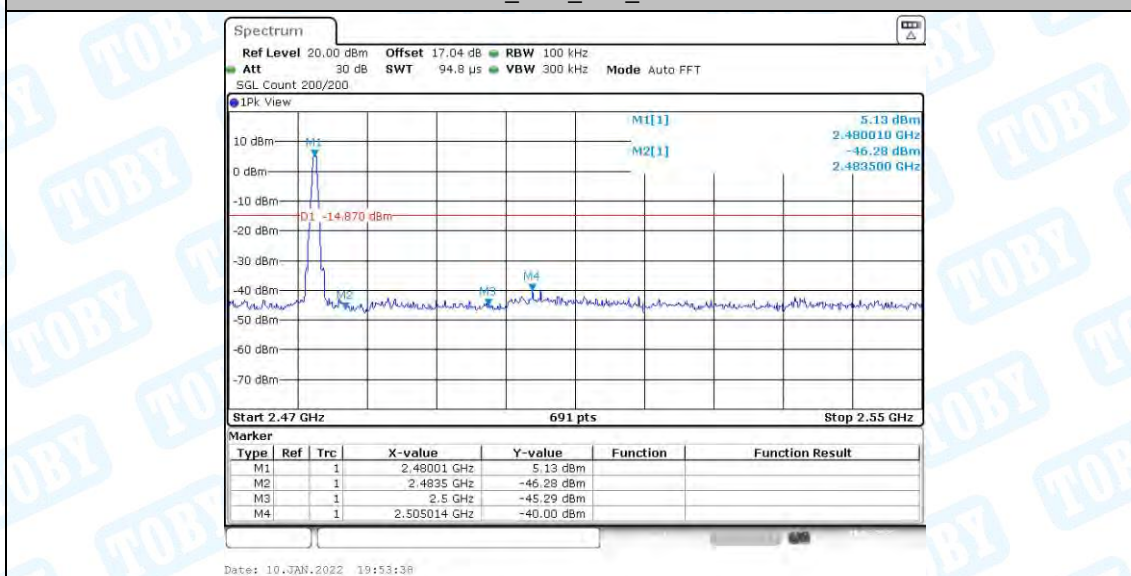
7.1. Test Result

TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	5.28	-42.49	≤ -14.72	PASS
		High	2480	5.13	-40	≤ -14.87	PASS
		Low	Hop_2402	5.10	-42.53	≤ -14.9	PASS
		High	Hop_2480	4.93	-41.4	≤ -15.07	PASS
2DH5	Ant1	Low	2402	3.99	-42.61	≤ -16.01	PASS
		High	2480	4.17	-41.11	≤ -15.83	PASS
		Low	Hop_2402	2.18	-42.96	≤ -17.82	PASS
		High	Hop_2480	5.04	-41.44	≤ -14.96	PASS
3DH5	Ant1	Low	2402	3.71	-43.03	≤ -16.29	PASS
		High	2480	3.72	-41.22	≤ -16.28	PASS
		Low	Hop_2402	4.15	-42.51	≤ -15.85	PASS
		High	Hop_2480	5.15	-41.21	≤ -14.85	PASS

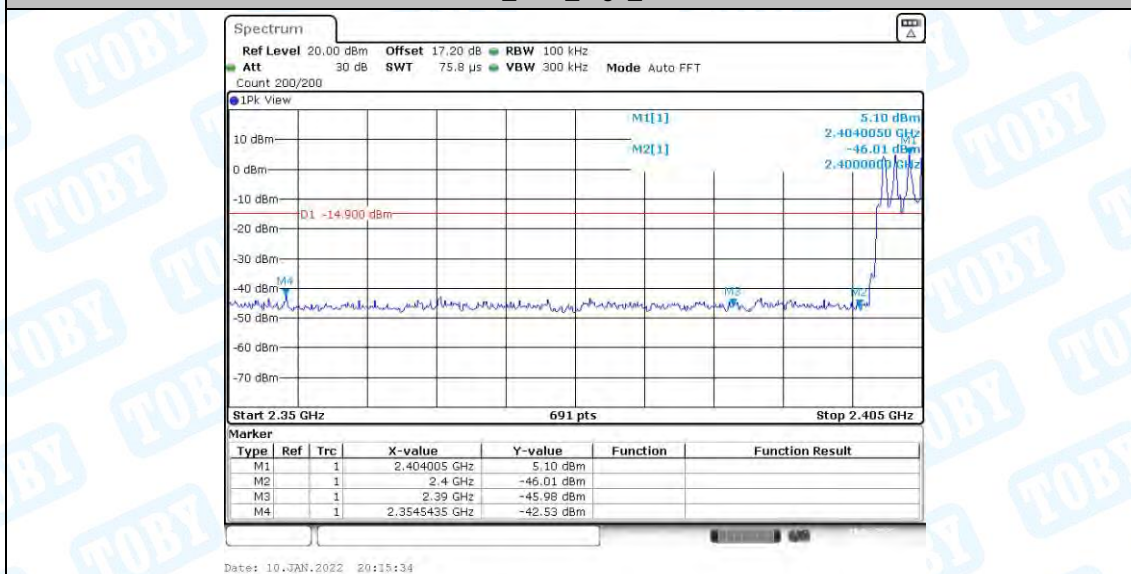
7.2.Test Graphs



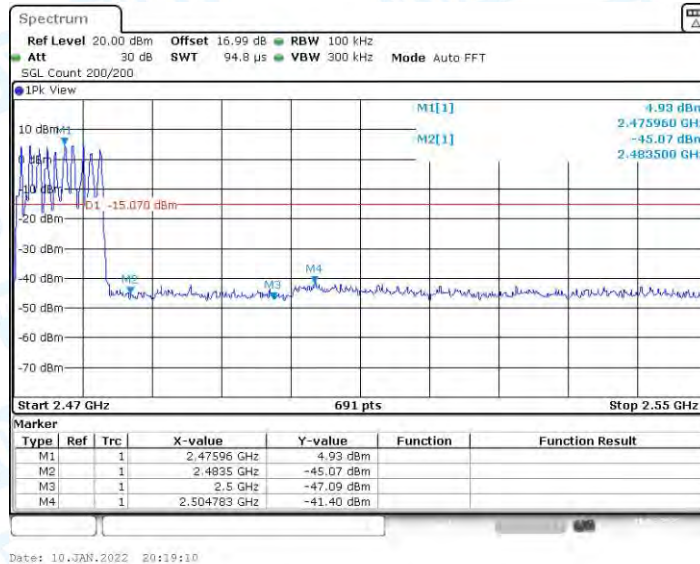
DH5_Ant1_Low_2402



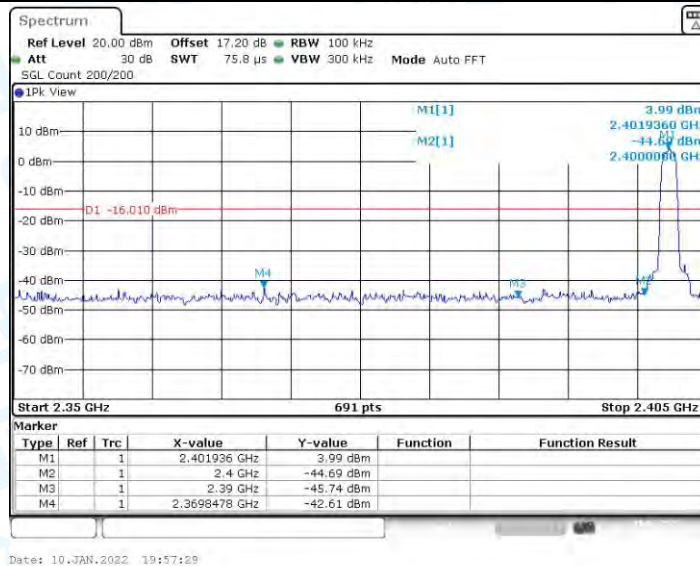
DH5_Ant1_High_2480



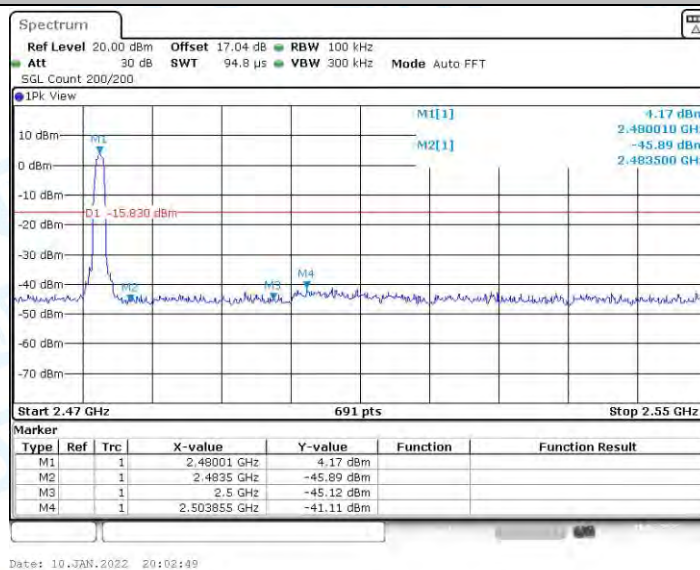
DH5_Ant1_Low_Hop_2402



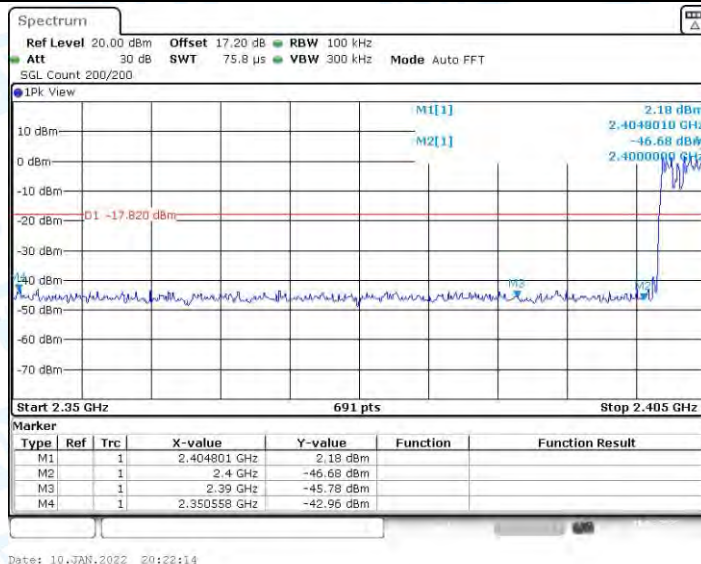
DH5_Ant1_High_Hop_2480



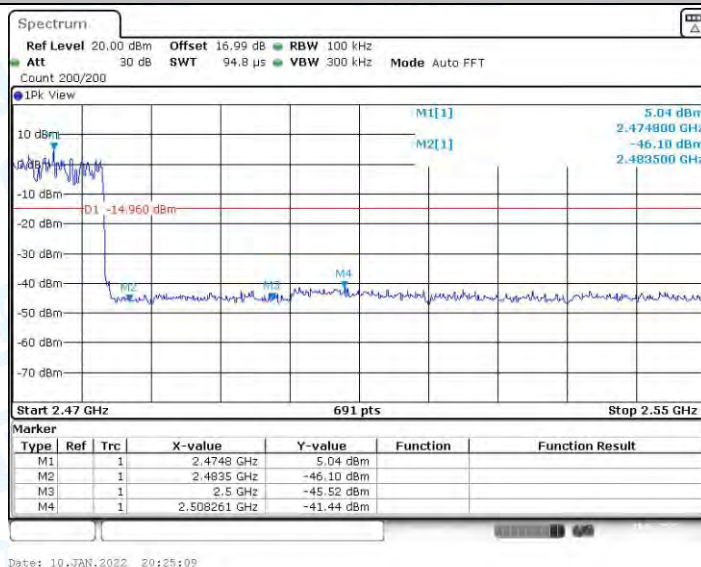
2DH5_Ant1_Low_2402



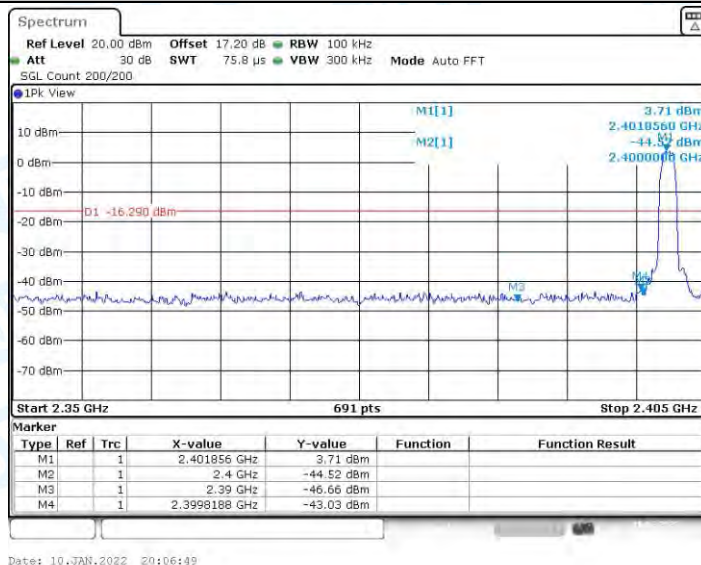
2DH5_Ant1_High_2480



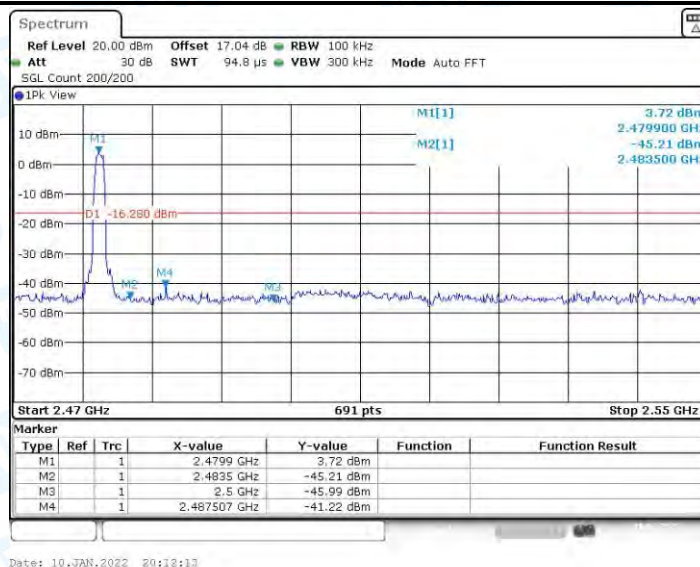
2DH5_Ant1_Low_Hop_2402



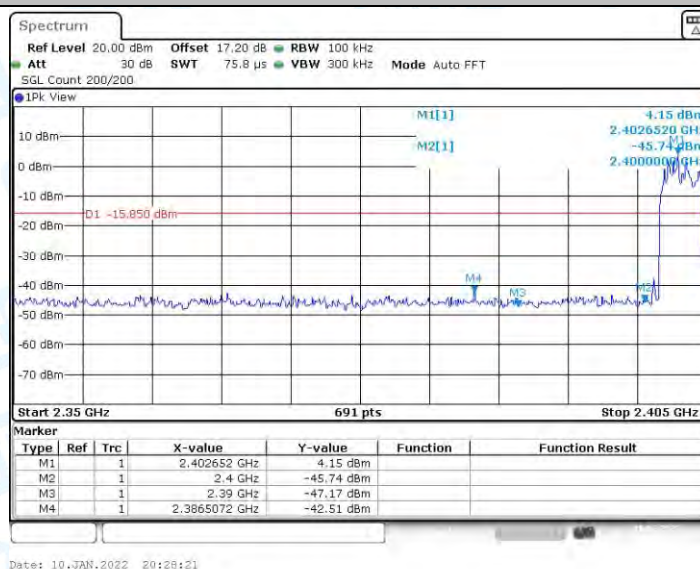
2DH5_Ant1_High_Hop_2480



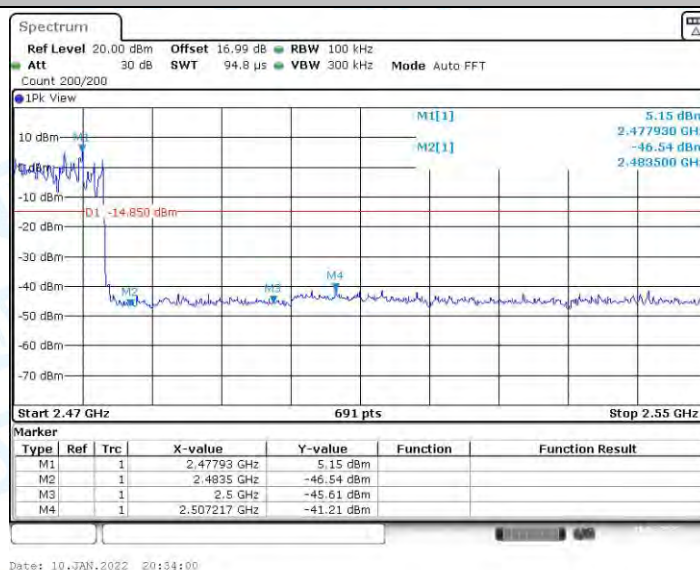
3DH5_Ant1_Low_2402



3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480

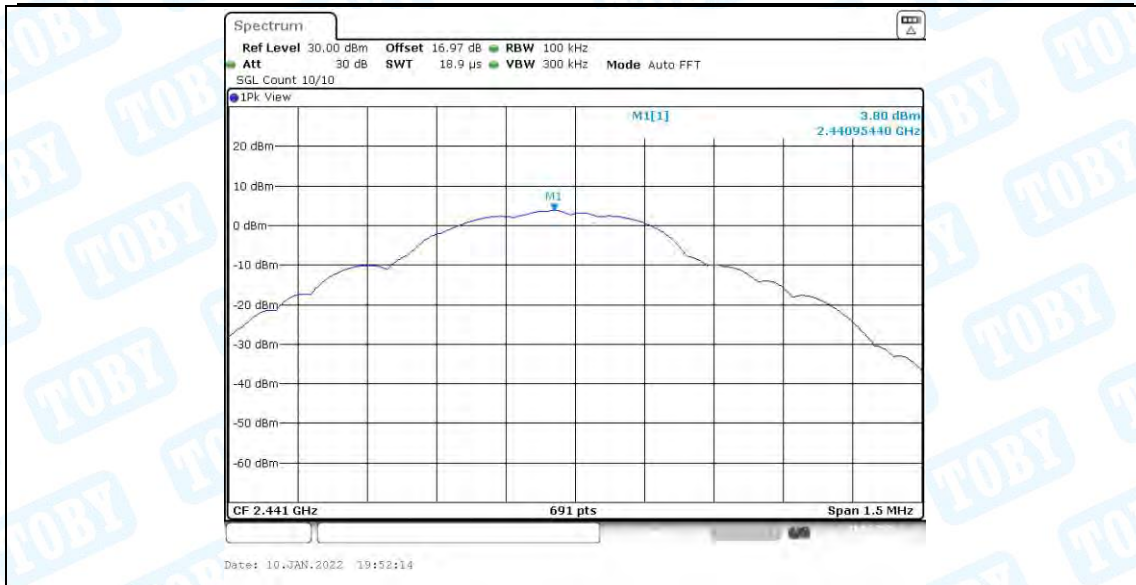
8. Conducted Spurious Emission

8.1. Test Result

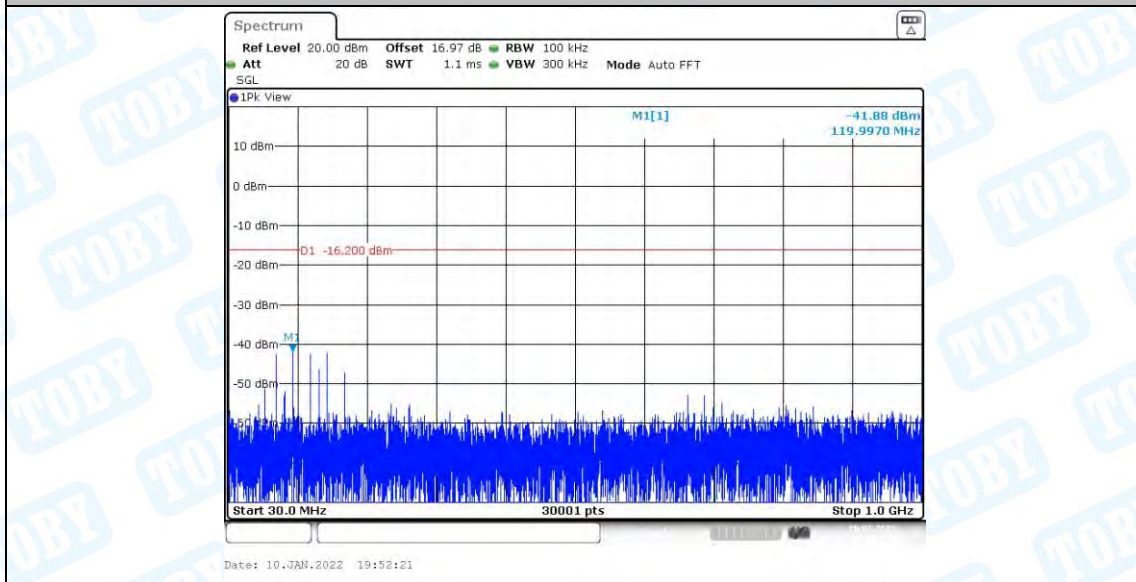
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	4.78	4.78	---	PASS
			30~1000	4.78	-42.86	≤-15.22	PASS
			1000~26500	4.78	-45.19	≤-15.22	PASS
		2441	Reference	3.80	3.80	---	PASS
			30~1000	3.80	-41.88	≤-16.2	PASS
			1000~26500	3.80	-45.63	≤-16.2	PASS
		2480	Reference	5.04	5.04	---	PASS
			30~1000	5.04	-41.98	≤-14.96	PASS
			1000~26500	5.04	-45.56	≤-14.96	PASS
2DH5	Ant1	2402	Reference	2.54	2.54	---	PASS
			30~1000	2.54	-41.25	≤-17.46	PASS
			1000~26500	2.54	-44.82	≤-17.46	PASS
		2441	Reference	1.31	1.31	---	PASS
			30~1000	1.31	-40.78	≤-18.69	PASS
			1000~26500	1.31	-45.55	≤-18.69	PASS
		2480	Reference	2.25	2.25	---	PASS
			30~1000	2.25	-41.98	≤-17.75	PASS
			1000~26500	2.25	-44.79	≤-17.75	PASS
3DH5	Ant1	2402	Reference	2.29	2.29	---	PASS
			30~1000	2.29	-42.87	≤-17.71	PASS
			1000~26500	2.29	-44.21	≤-17.71	PASS
		2441	Reference	2.04	2.04	---	PASS
			30~1000	2.04	-41.68	≤-17.96	PASS
			1000~26500	2.04	-45.32	≤-17.96	PASS
		2480	Reference	2.87	2.87	---	PASS
			30~1000	2.87	-42.5	≤-17.13	PASS
			1000~26500	2.87	-45.27	≤-17.13	PASS

8.2.Test Graphs

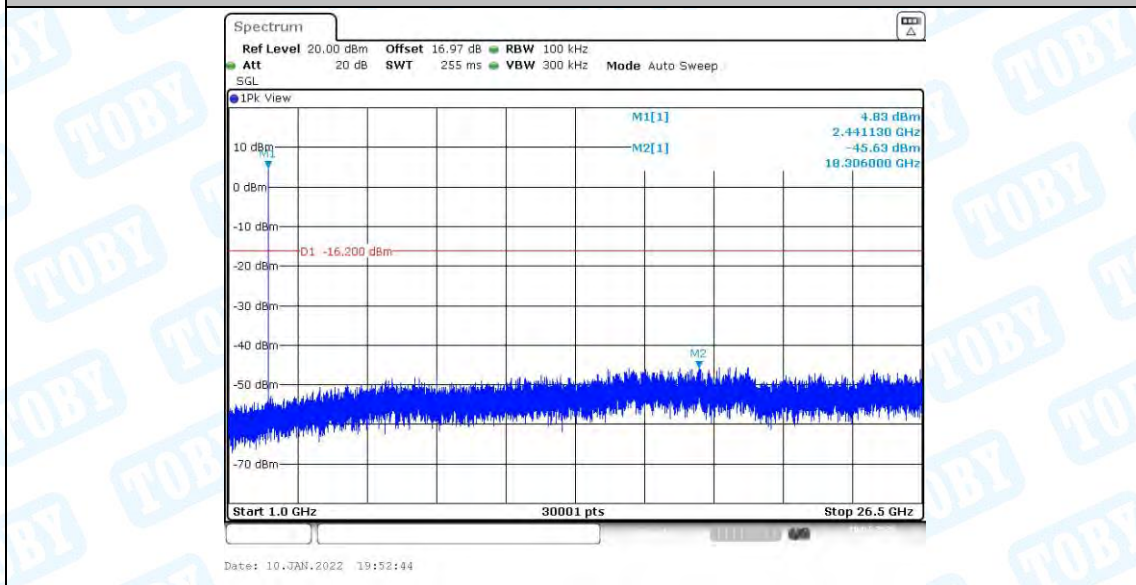




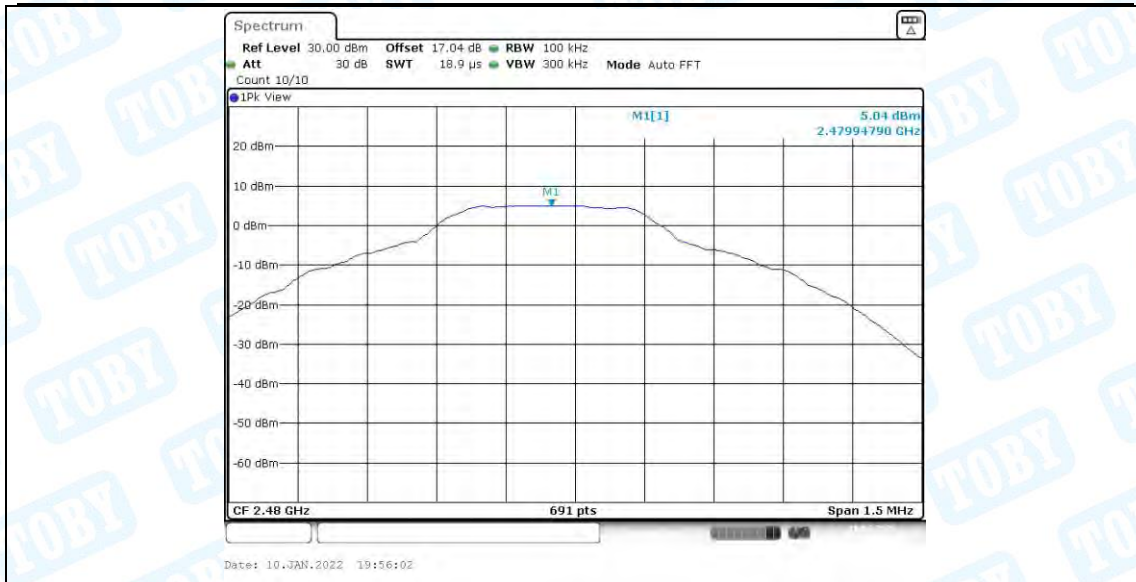
DH5_Ant1_2441_0~Reference



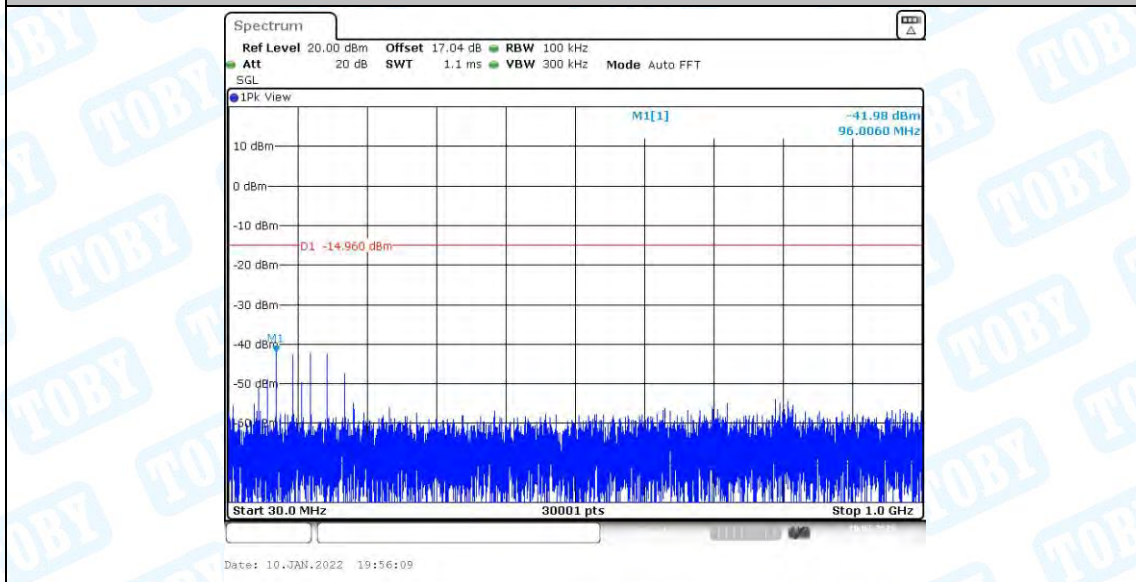
DH5_Ant1_2441_30~1000



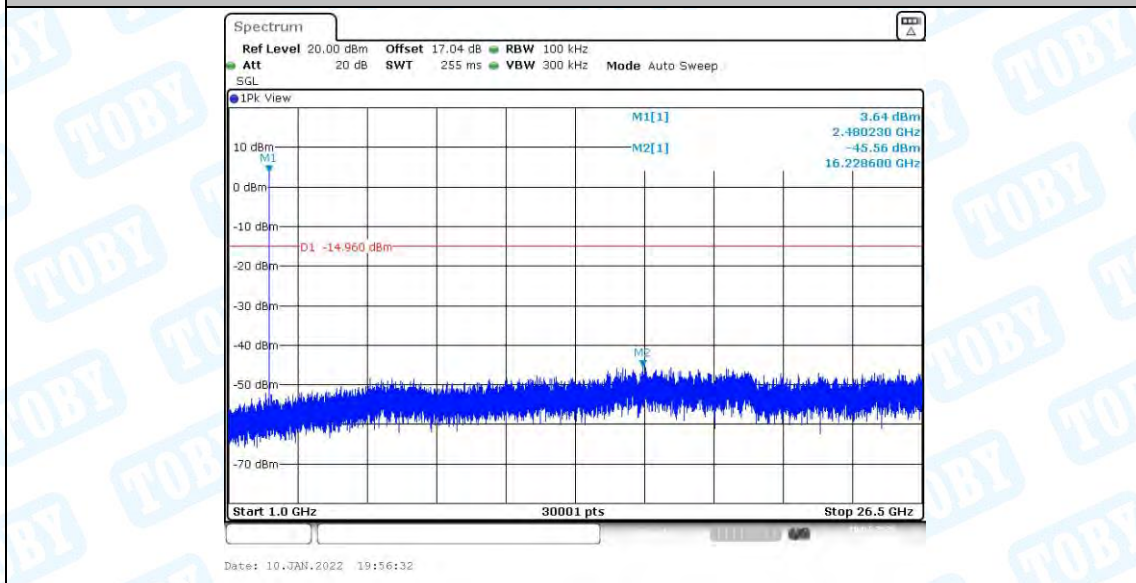
DH5_Ant1_2441_1000~26500



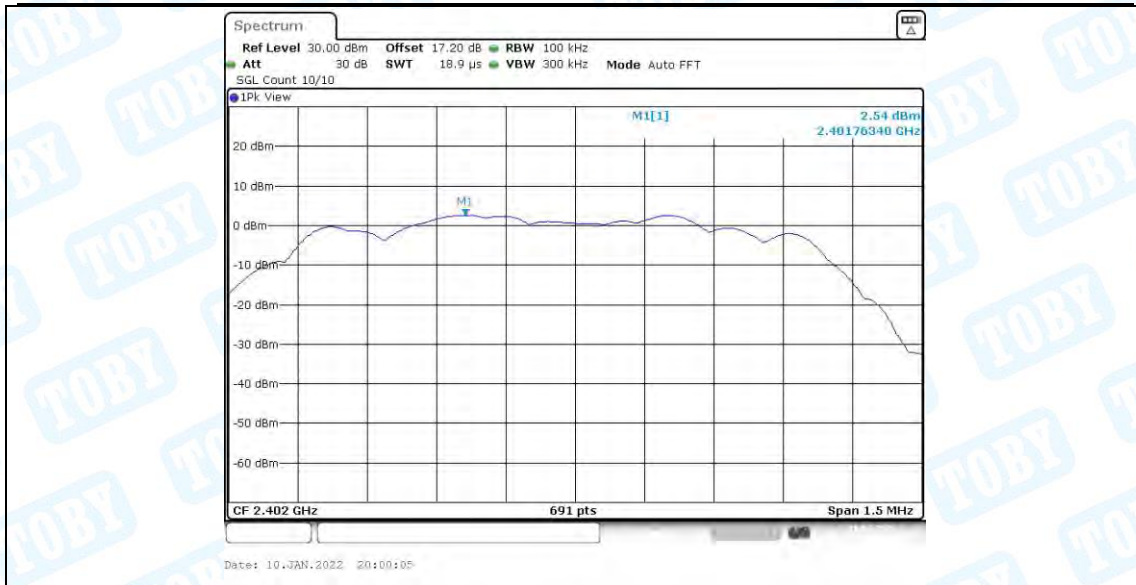
DH5_Ant1_2480_0~Reference



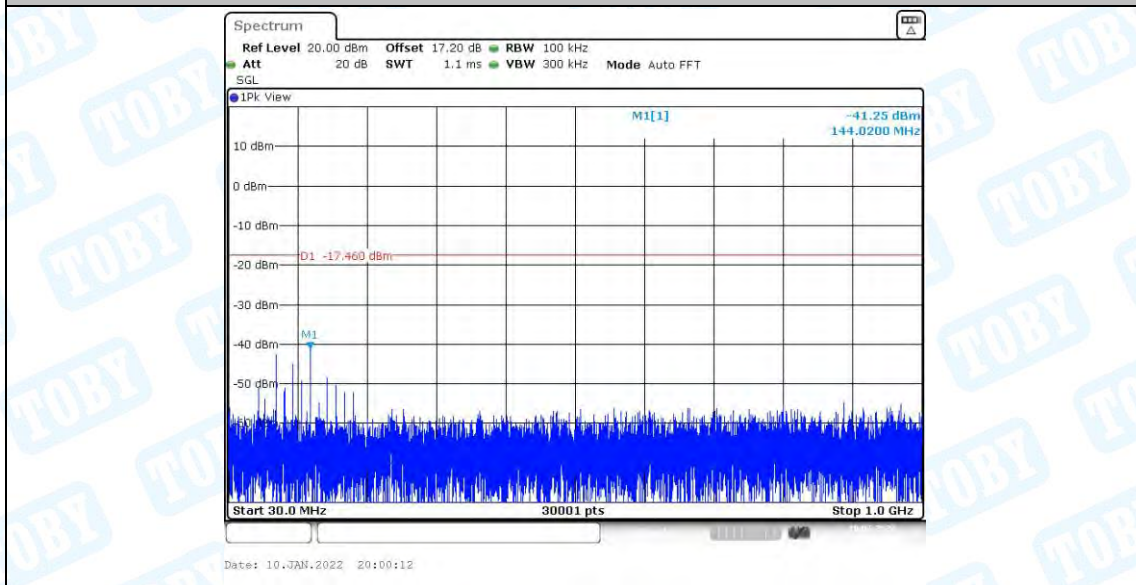
DH5_Ant1_2480_30~1000



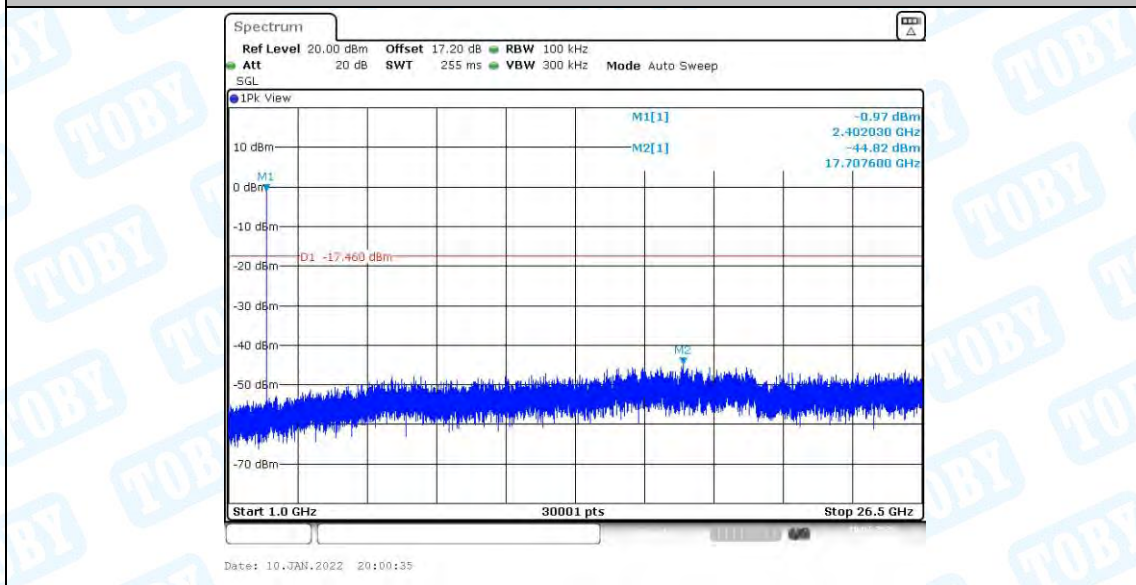
DH5_Ant1_2480_1000~26500



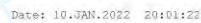
2DH5_Ant1_2402_0~Reference



2DH5_Ant1_2402_30~1000



2DH5_Ant1_2402_1000~26500



Spectrum

Ref Level 20.00 dBm Offset 16.97 dB RBW 100 kHz
 Att 20 dB SWT 1.1 ms VBW 300 kHz Mode Auto FFT
 SGL

1PK View

M1[1] -40.78 dBm 119.9970 MHz

D1 -18.690 dBm

Start 30.0 MHz 30001 pts Stop 1.0 GHz

Date: 10.JAN.2022 20:01:30

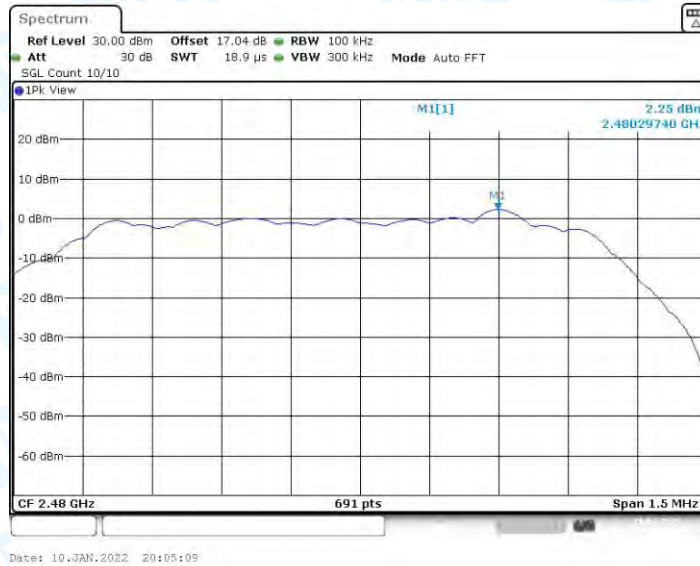
The screenshot shows the Spectrum Analyzer interface. The top panel displays the following settings:

- Ref Level:** 20.00 dBm
- Offset:** 16.97 dB
- RBW:** 100 kHz
- Att:** 20 dB
- SWT:** 255 ms
- VBW:** 300 kHz
- Mode:** Auto Sweep
- SGL:** (checked)

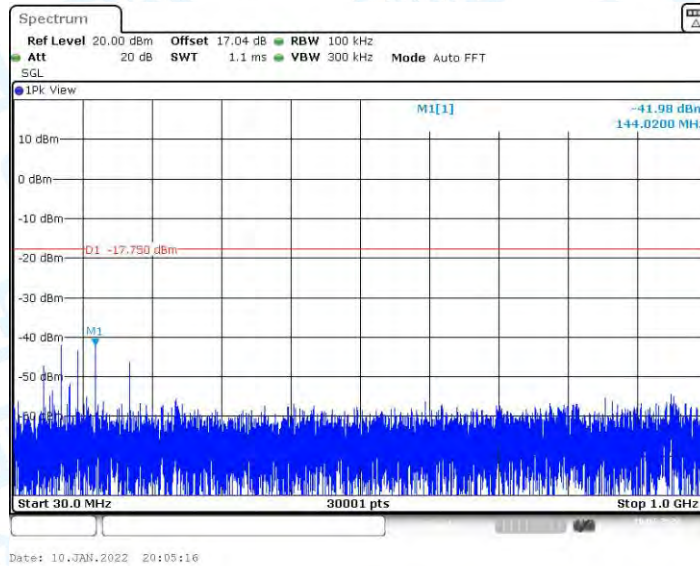
The main display area shows the **1Pk View** of the spectrum. The vertical axis represents power in dBm, ranging from -70 dBm to 10 dBm. The horizontal axis represents frequency, with markers at **Start 1.0 GHz** and **Stop 26.5 GHz**. A blue trace shows a noisy signal floor around -50 dBm. A red horizontal line is drawn at -18.690 dBm, labeled **D1 -18.690 dBm**. Several measurement points are visible:

- M1:** A peak at approximately 0 dBm.
- M1[1]:** A measurement at 0.52 dBm.
- M2:** A measurement at approximately -45.55 dBm.
- M2[1]:** A measurement at 17.685500 GHz.

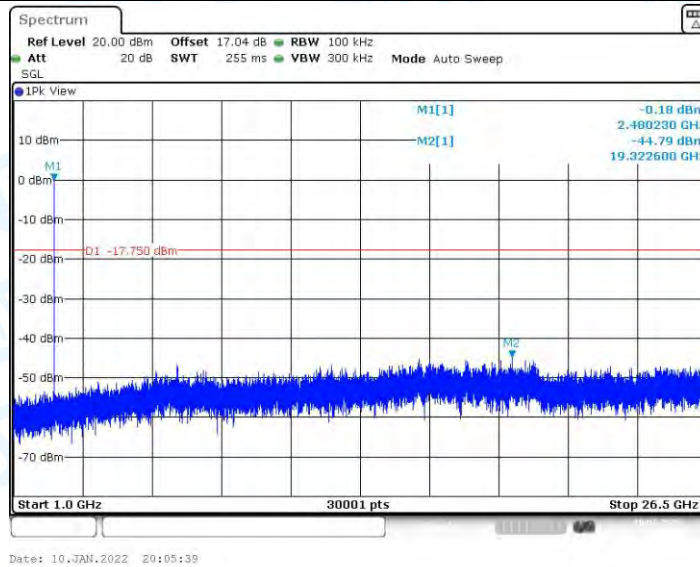
TB-RF-074-1.0



2DH5_Ant1_2480_0~Reference



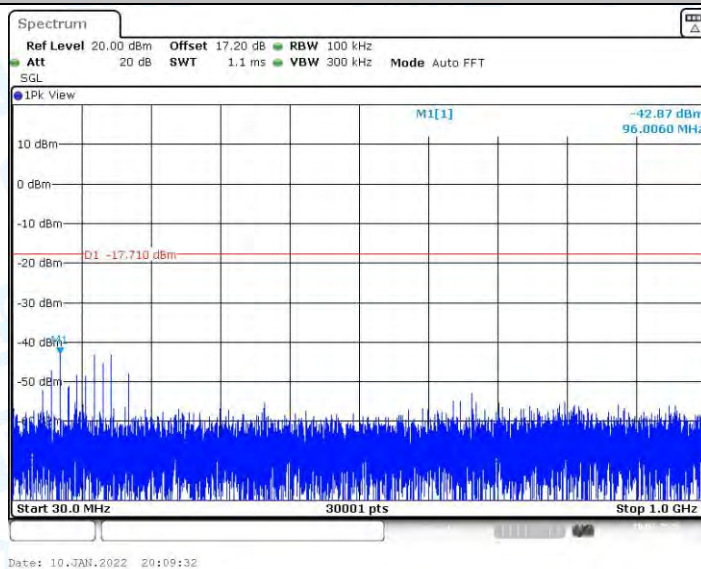
2DH5_Ant1_2480_30~1000



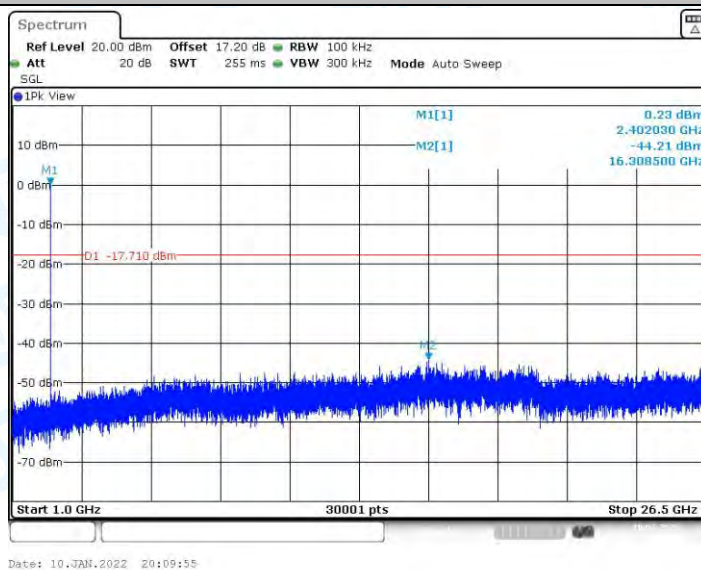
2DH5_Ant1_2480_1000~26500



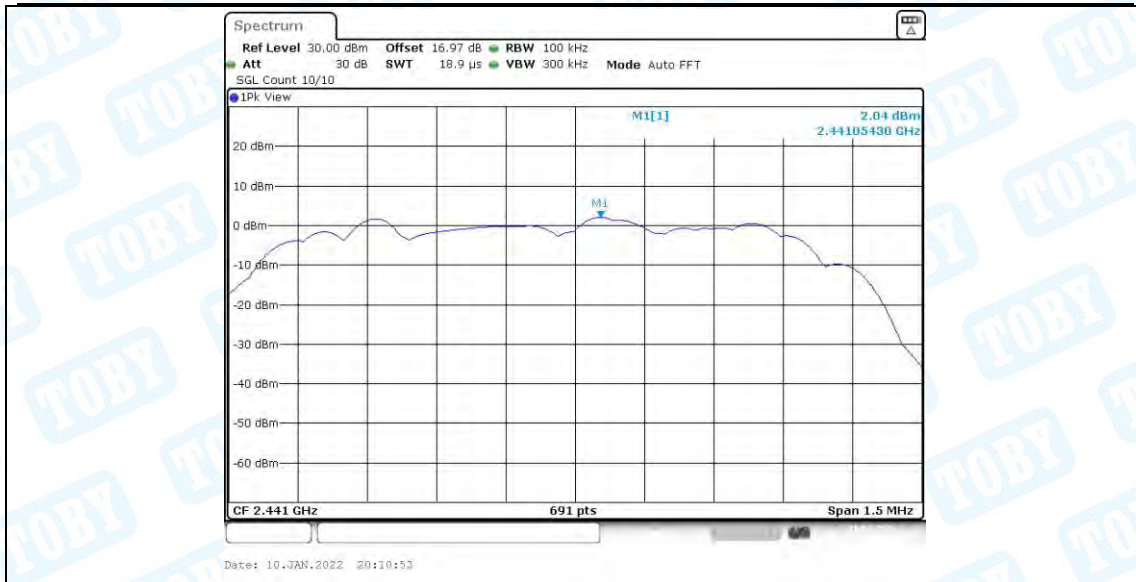
3DH5_Ant1_2402_0~Reference



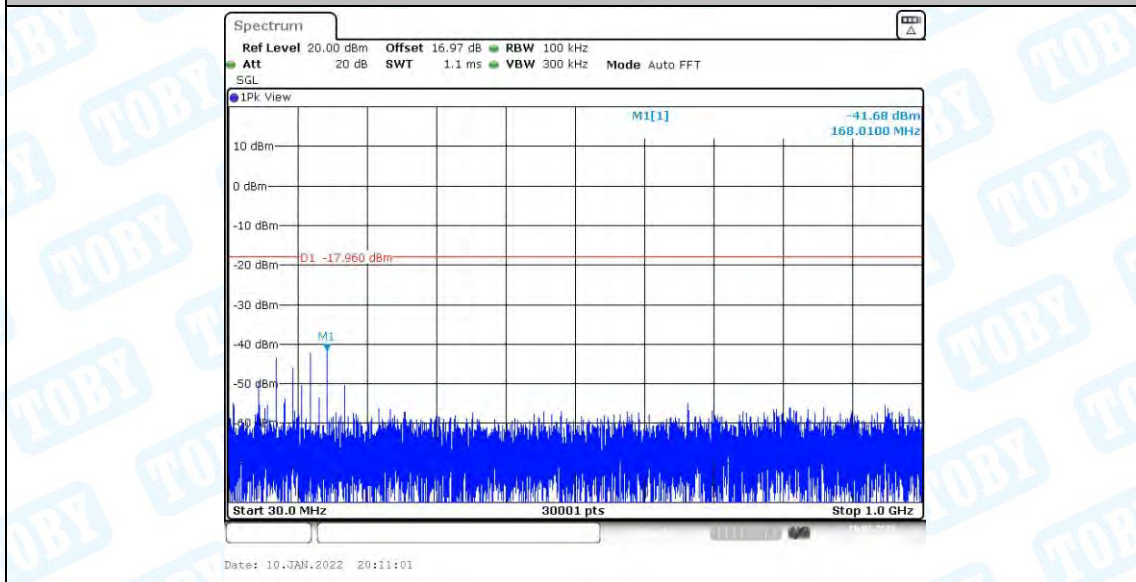
3DH5_Ant1_2402_30~1000



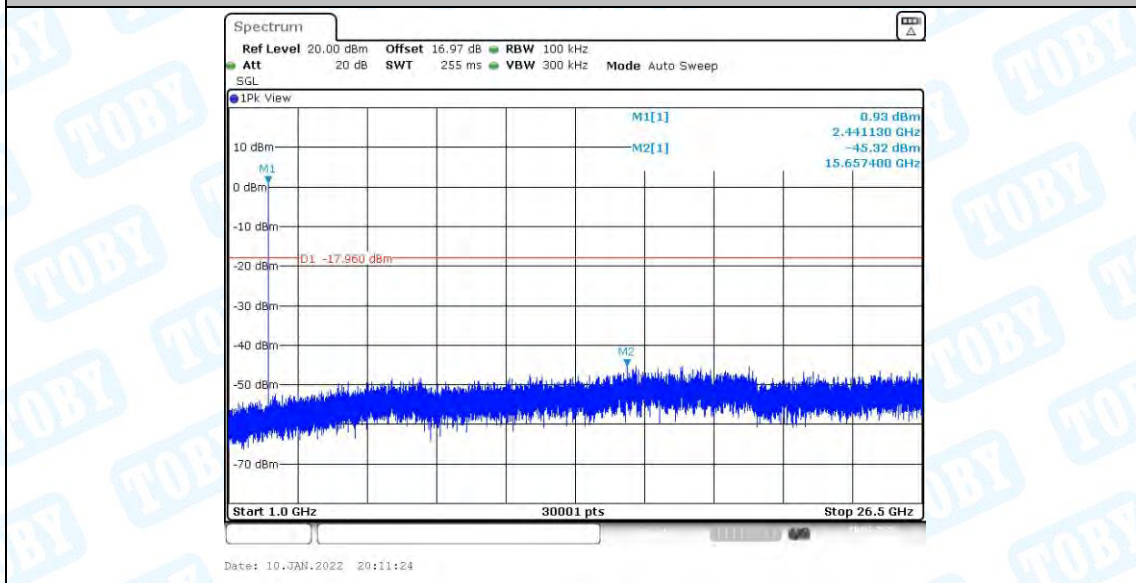
3DH5_Ant1_2402_1000~26500



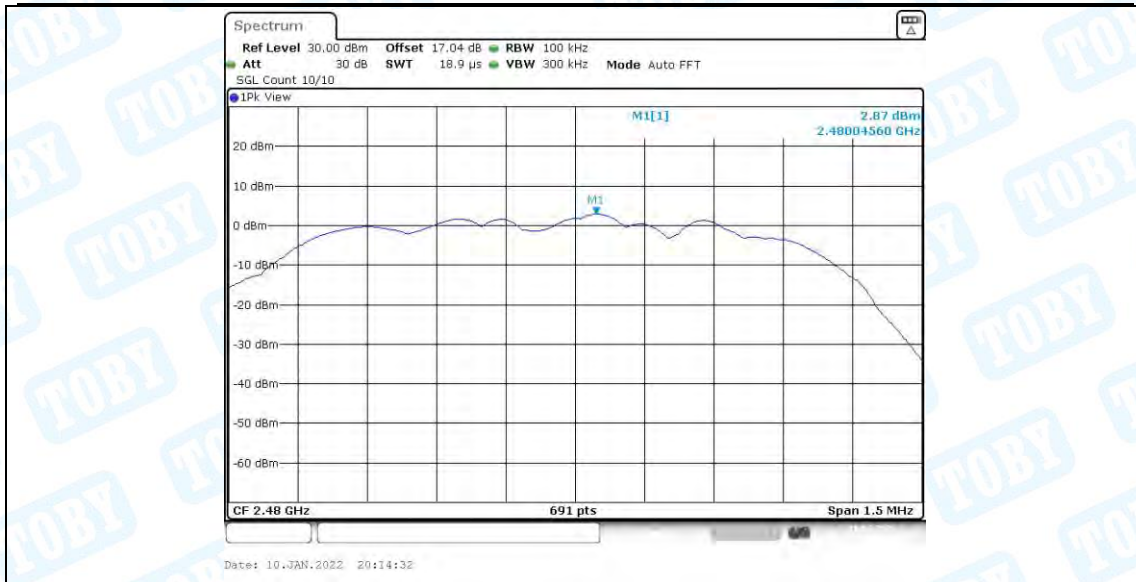
3DH5_Ant1_2441_0~Reference



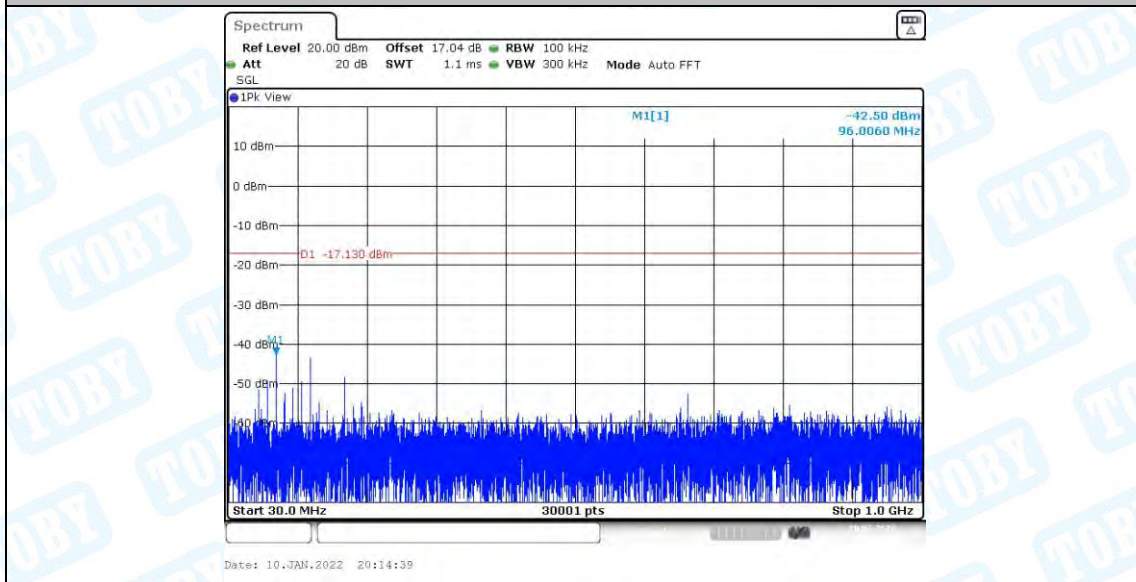
3DH5_Ant1_2441_30~1000



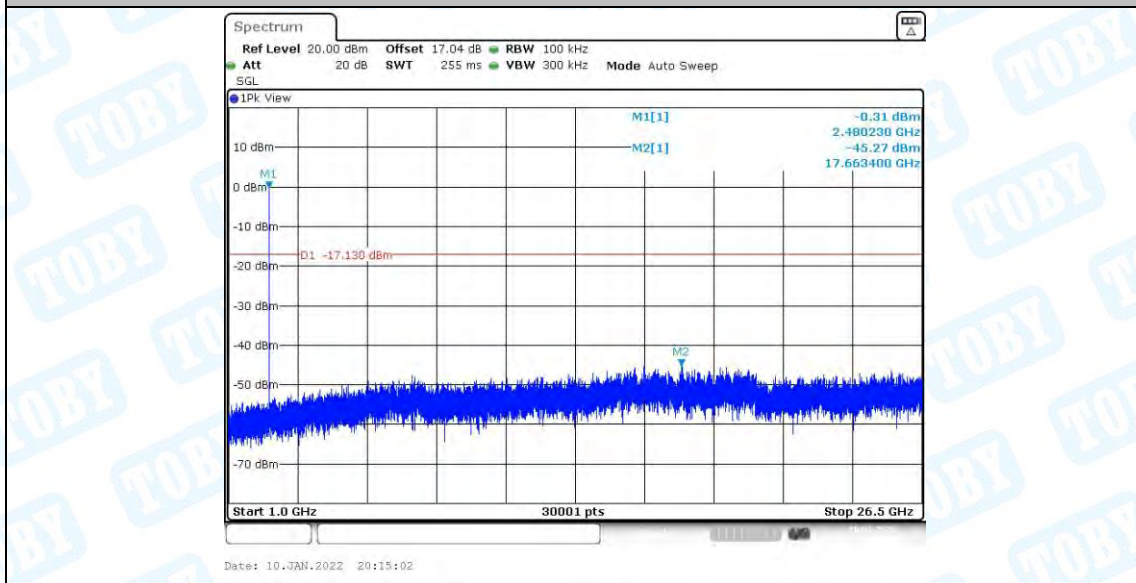
3DH5_Ant1_2441_1000~26500



3DH5_Ant1_2480_0~Reference



3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500

9. Emissions in Restricted Bands

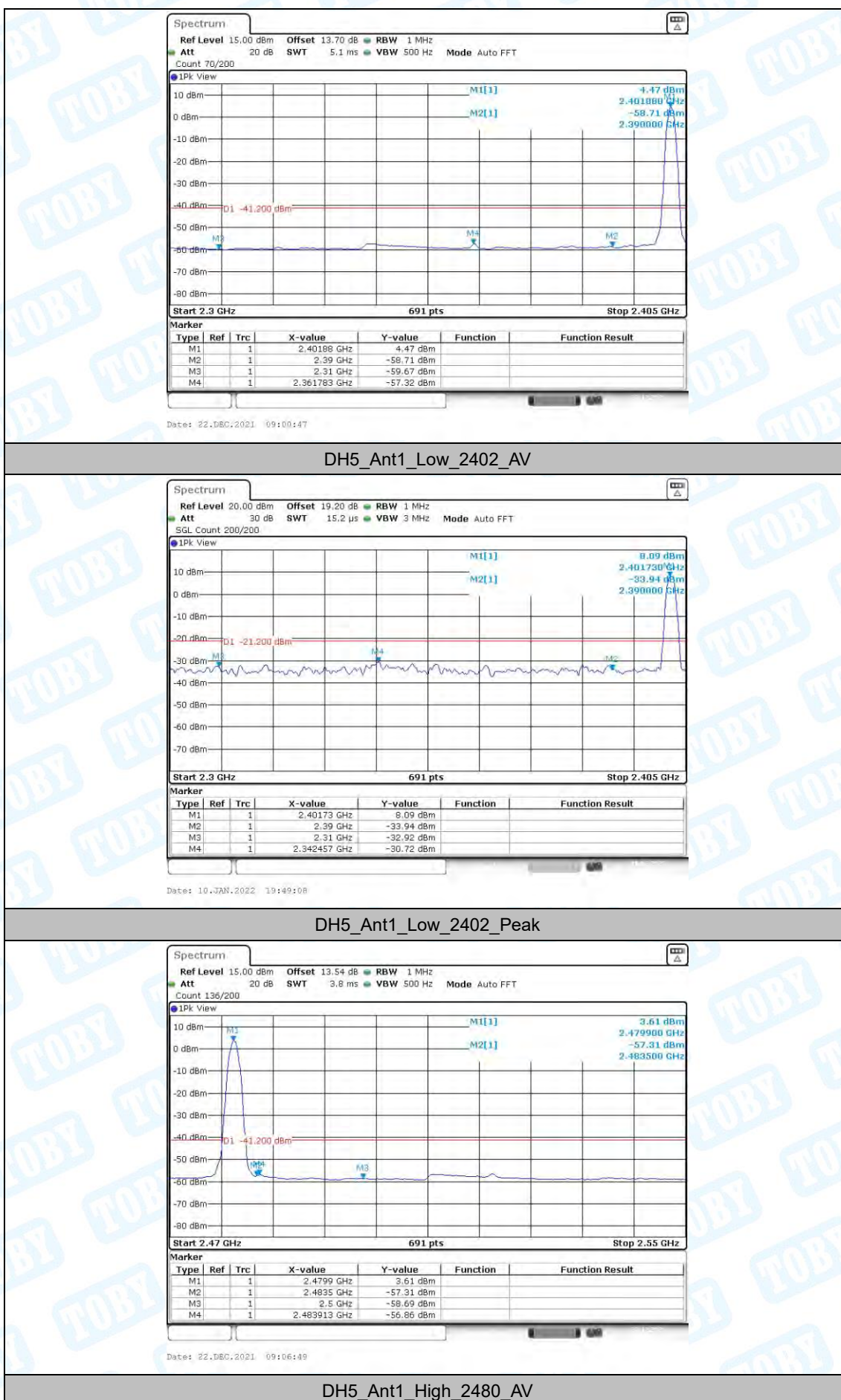
9.1. Test Result

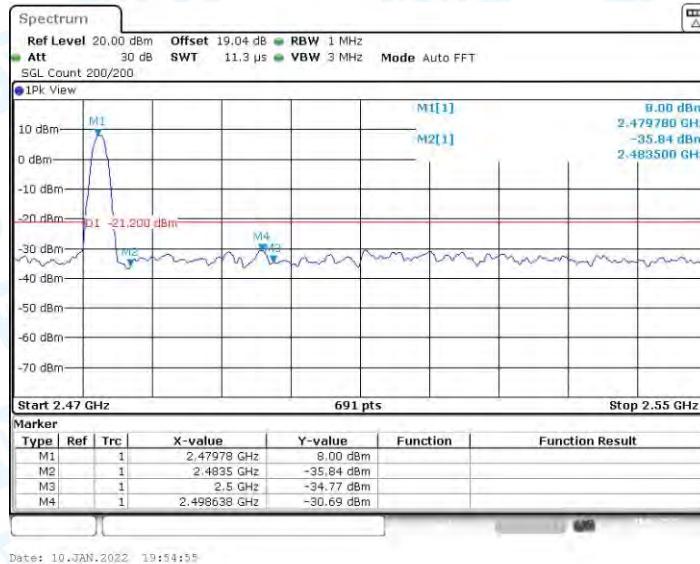
TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	AV	2310.000	-59.67	≤-41.20	PASS
				AV	2361.783	-57.32	≤-41.20	PASS
				AV	2390.000	-58.71	≤-41.20	PASS
				Peak	2310.000	-32.92	≤-21.20	PASS
				Peak	2342.457	-30.72	≤-21.20	PASS
				Peak	2390.000	-33.94	≤-21.20	PASS
		High	2480	AV	2483.500	-57.31	≤-41.20	PASS
				AV	2483.913	-56.86	≤-41.20	PASS
				AV	2500.000	-58.69	≤-41.20	PASS
				Peak	2483.500	-35.84	≤-21.20	PASS
				Peak	2498.638	-30.69	≤-21.20	PASS
				Peak	2500.000	-34.77	≤-21.20	PASS
2DH5	Ant1	Low	2402	AV	2483.500	-57.31	≤-41.20	PASS
				AV	2483.913	-56.86	≤-41.20	PASS
				AV	2500.000	-58.69	≤-41.20	PASS
				Peak	2310.000	-34.16	≤-21.20	PASS
				Peak	2342.913	-30.8	≤-21.20	PASS
				Peak	2390.000	-33.6	≤-21.20	PASS
		High	2480	AV	2483.500	-57.26	≤-41.20	PASS
				AV	2483.913	-56.75	≤-41.20	PASS
				AV	2500.000	-58.64	≤-41.20	PASS
				Peak	2483.500	-35.76	≤-21.20	PASS
				Peak	2499.681	-30.24	≤-21.20	PASS
				Peak	2500.000	-30.83	≤-21.20	PASS
3DH5	Ant1	Low	2402	AV	2310.000	-59.6	≤-41.20	PASS
				AV	2340.326	-57.26	≤-41.20	PASS
				AV	2390.000	-58.58	≤-41.20	PASS
				Peak	2310.000	-34.29	≤-21.20	PASS
				Peak	2387.348	-30.26	≤-21.20	PASS
				Peak	2390.000	-34.96	≤-21.20	PASS
		High	2480	AV	2483.500	-57.26	≤-41.20	PASS
				AV	2483.913	-56.92	≤-41.20	PASS
				AV	2500.000	-58.77	≤-41.20	PASS
				Peak	2483.500	-34.89	≤-21.20	PASS
				Peak	2495.971	-31.21	≤-21.20	PASS
				Peak	2500.000	-34.43	≤-21.20	PASS

Note:

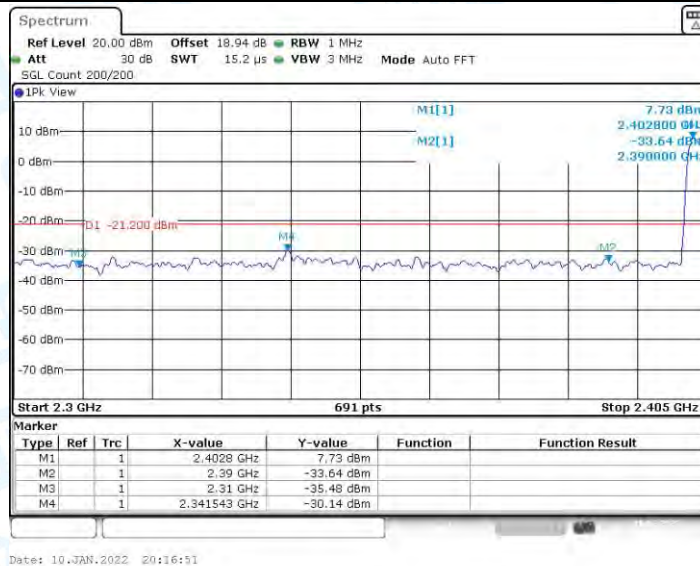
- The Antenna Gain is compensated in the graph.
- The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

9.2. Test Graphs

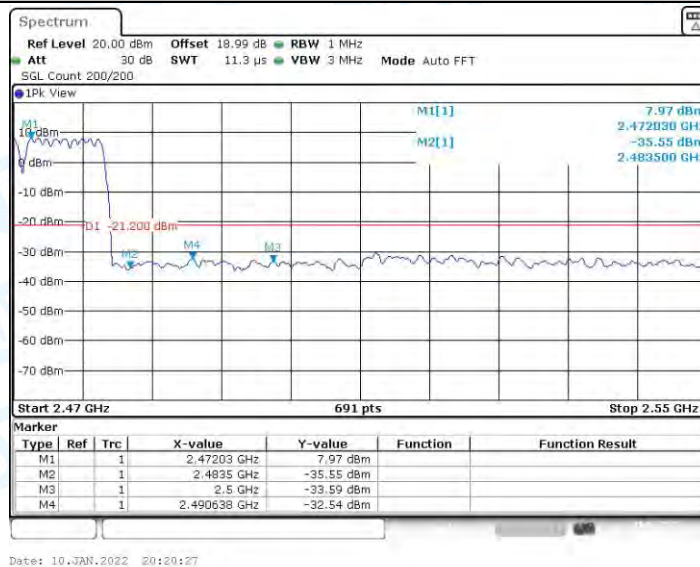




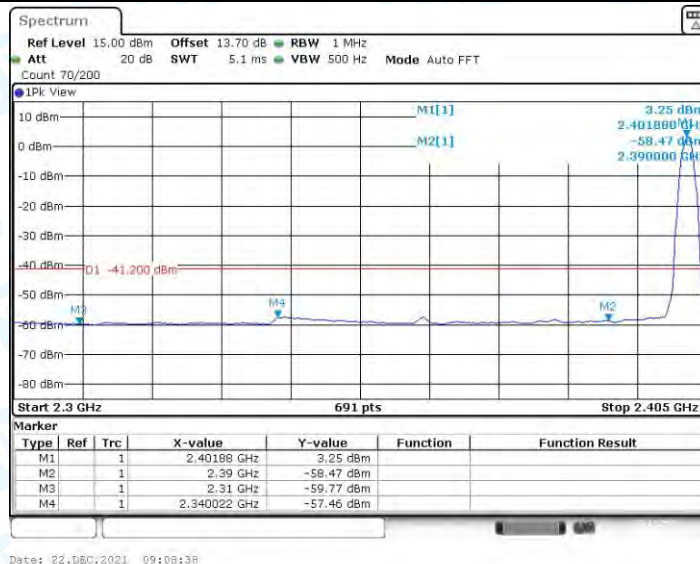
DH5_Ant1_High_2480_Peak



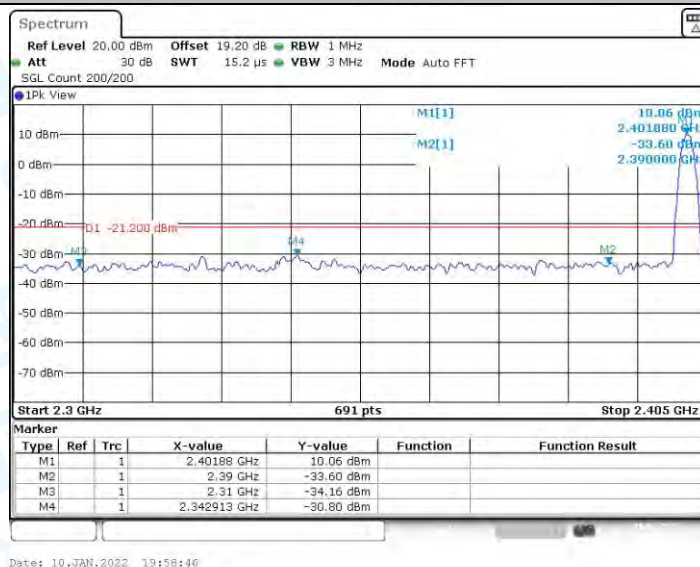
DH5_Ant1_Low_Hop_2402_Peak



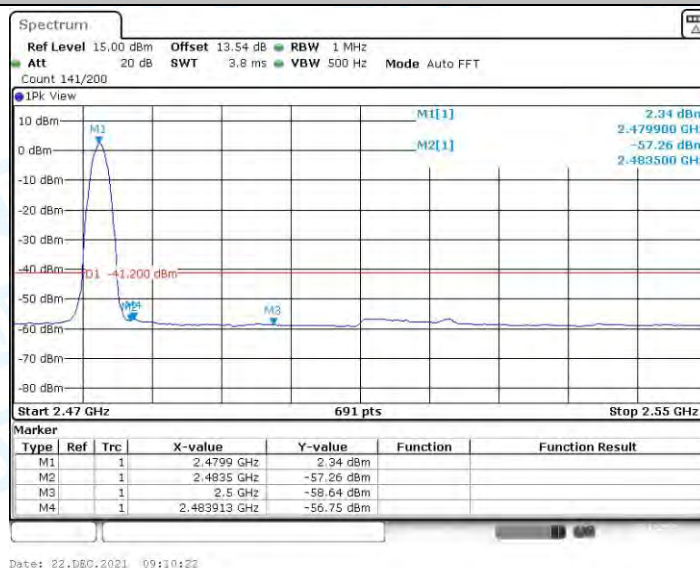
DH5_Ant1_High_Hop_2480_Peak



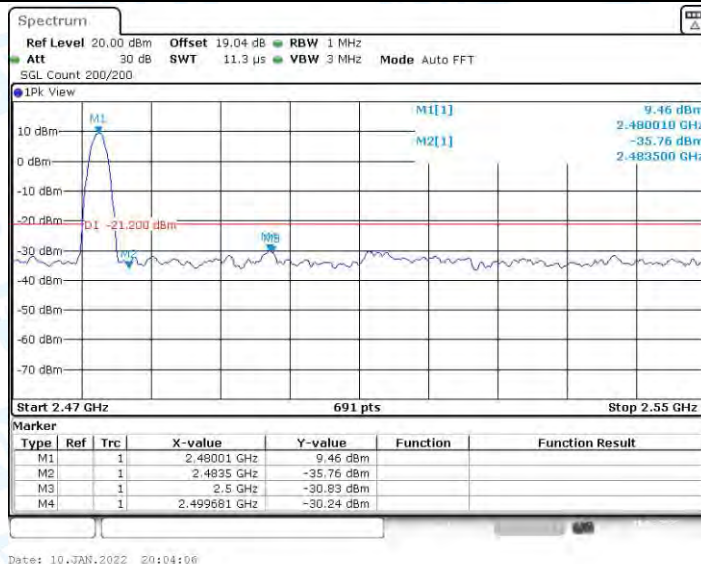
2DH5_Ant1_Low_2402_AV



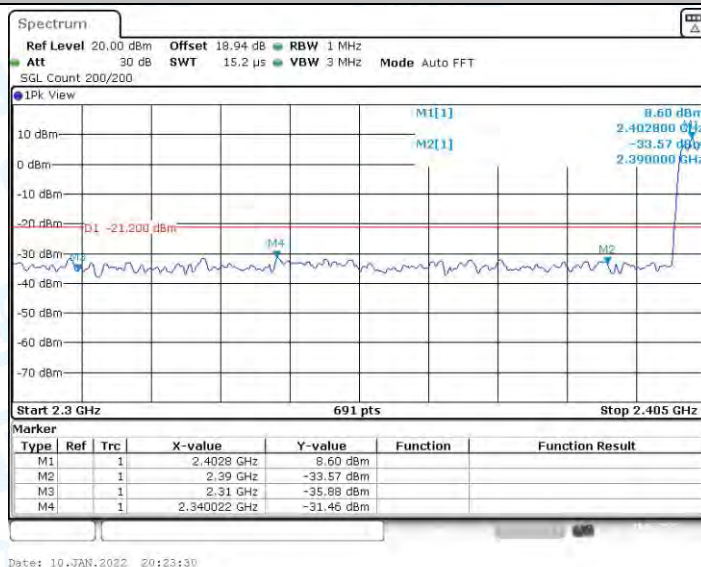
2DH5_Ant1_Low_2402_Peak



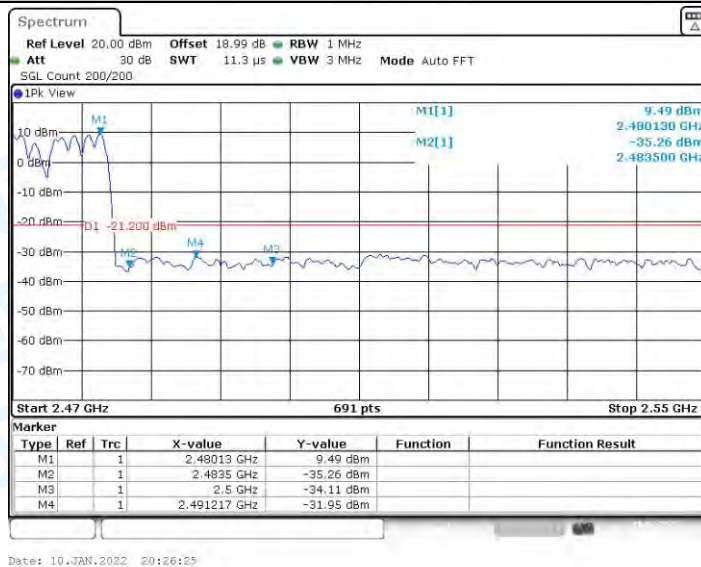
2DH5_Ant1_High_2480_AV



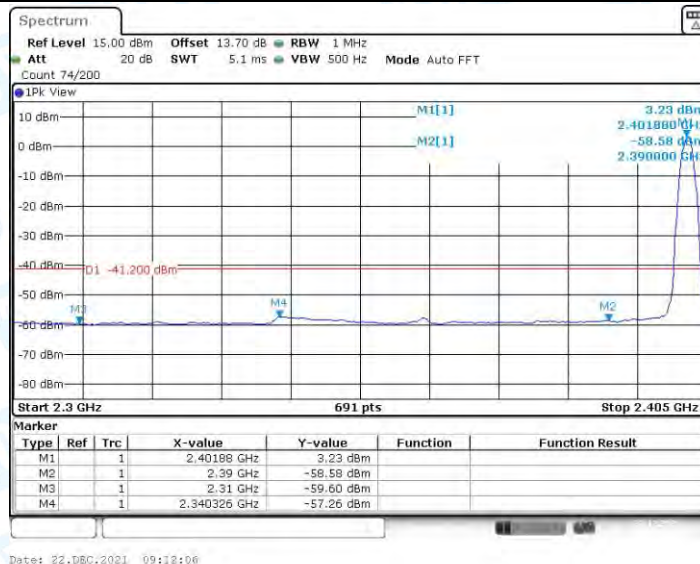
2DH5_Ant1_High_2480_Peak



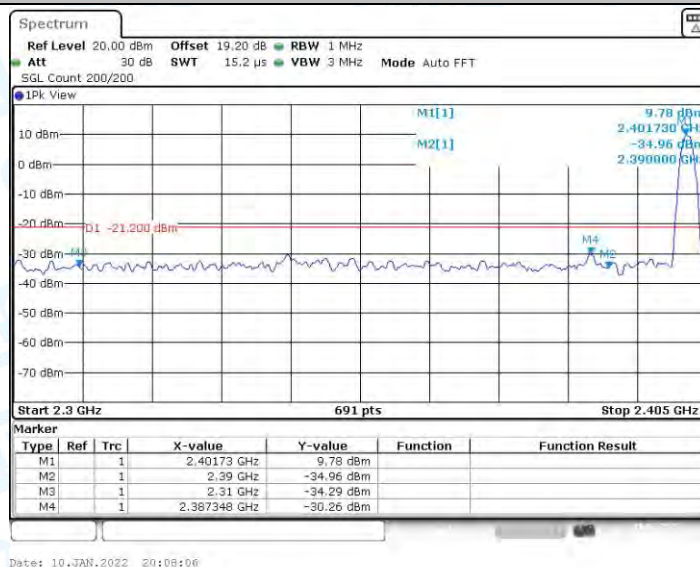
2DH5_Ant1_Low_Hop_2402_Peak



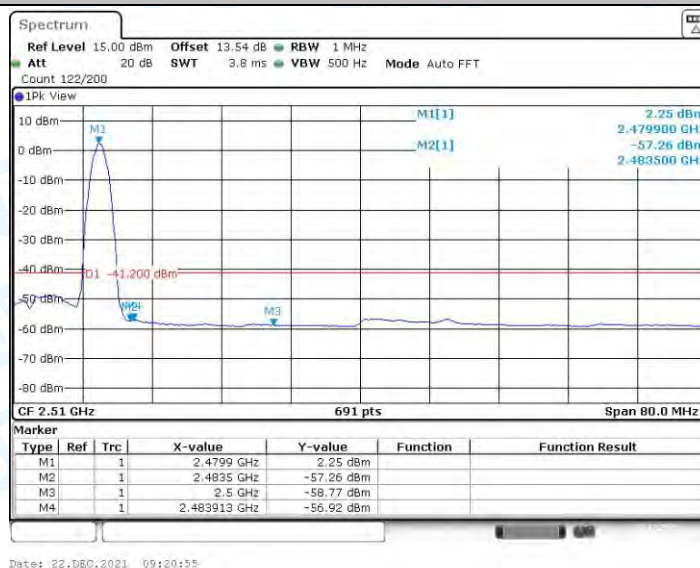
2DH5_Ant1_High_Hop_2480_Peak



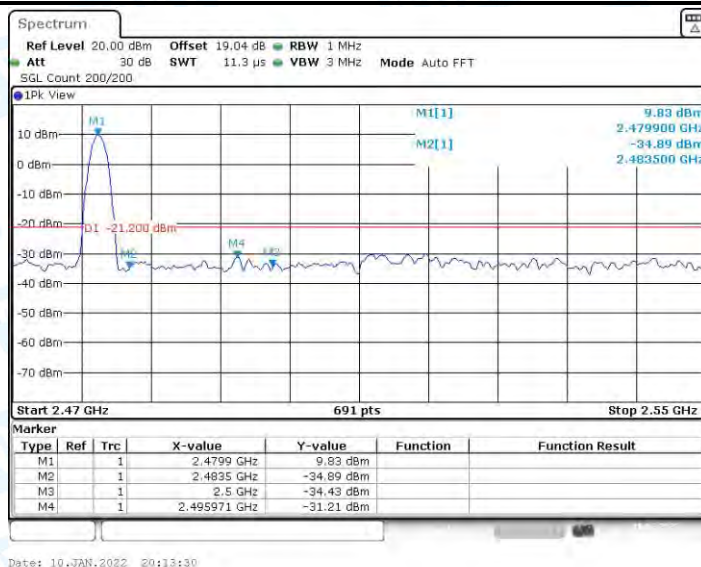
3DH5_Ant1_Low_2402_AV



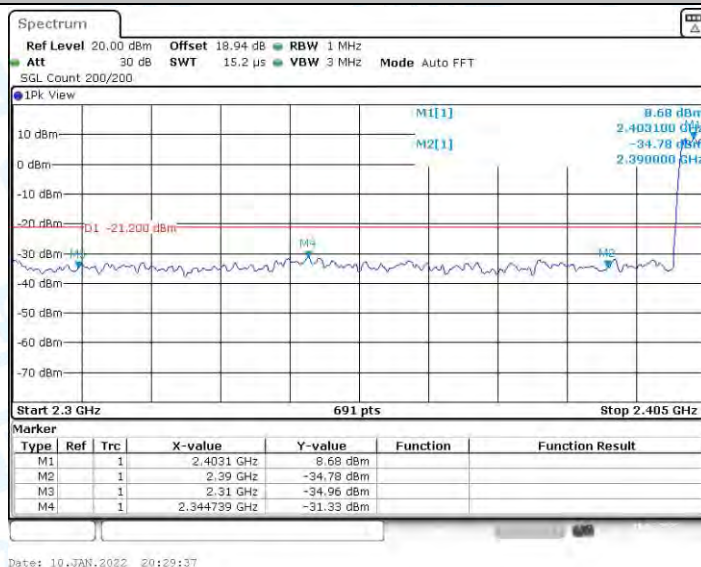
3DH5_Ant1_Low_2402_Peak



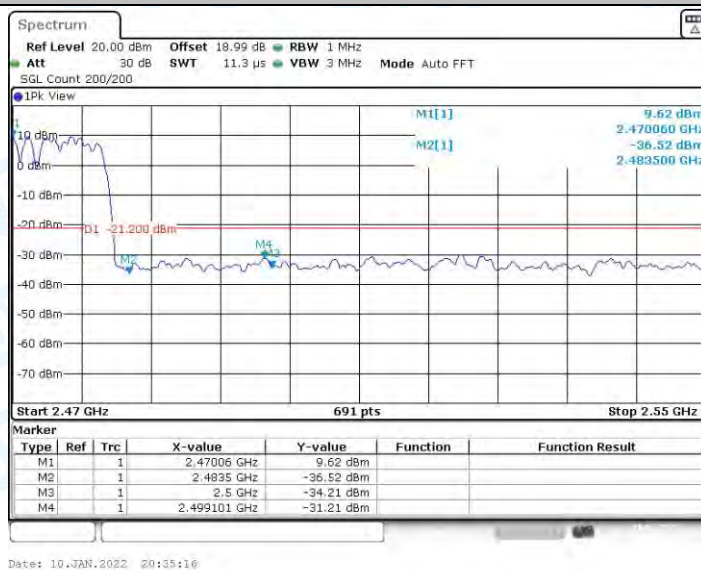
3DH5_Ant1_High_2480_AV



3DH5_Ant1_High_2480_Peak



3DH5_Ant1_Low_Hop_2402_Peak



3DH5_Ant1_High_Hop_2480_Peak

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