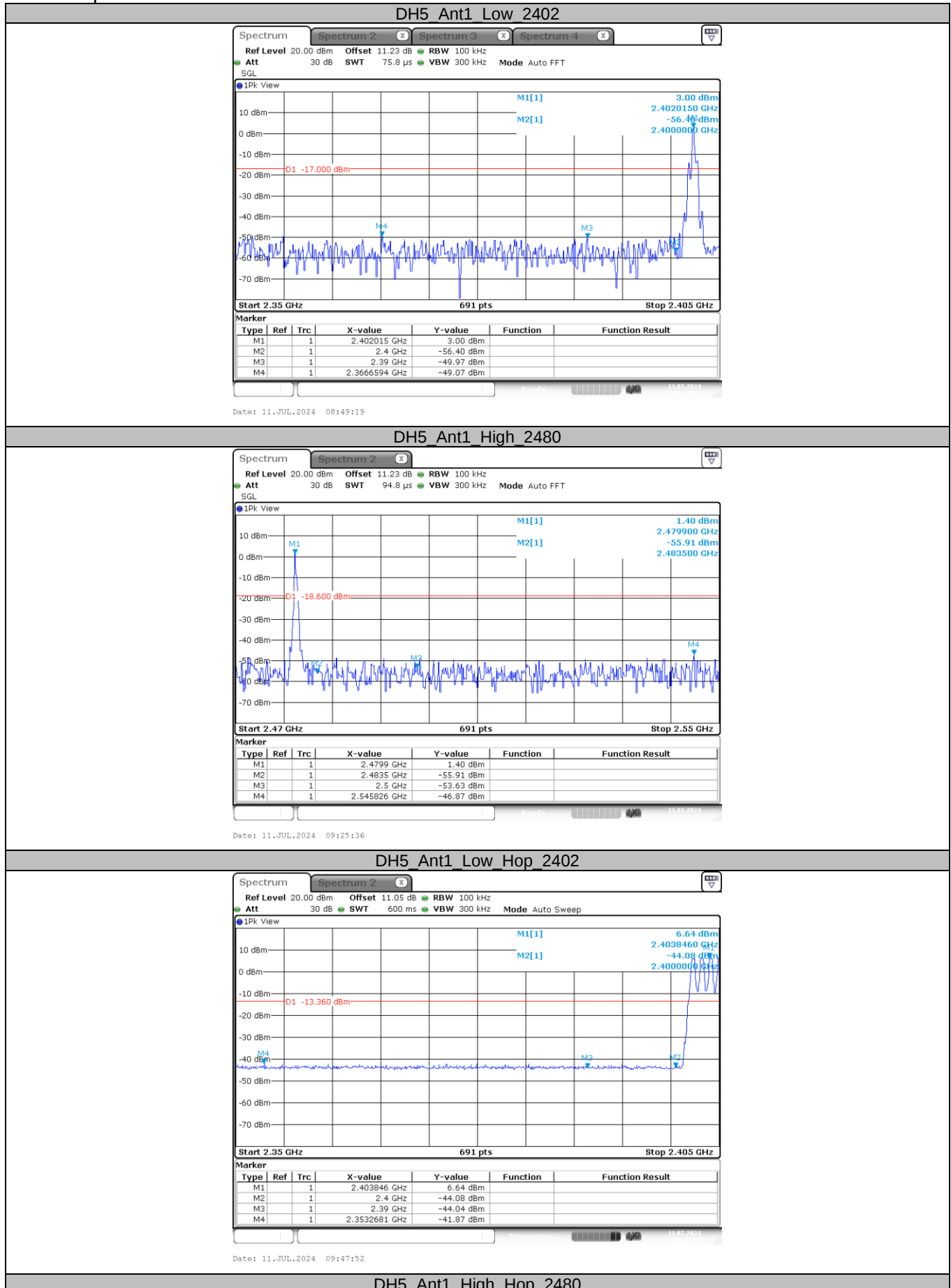




Test Graphs:



CTC Laboratories, Inc.

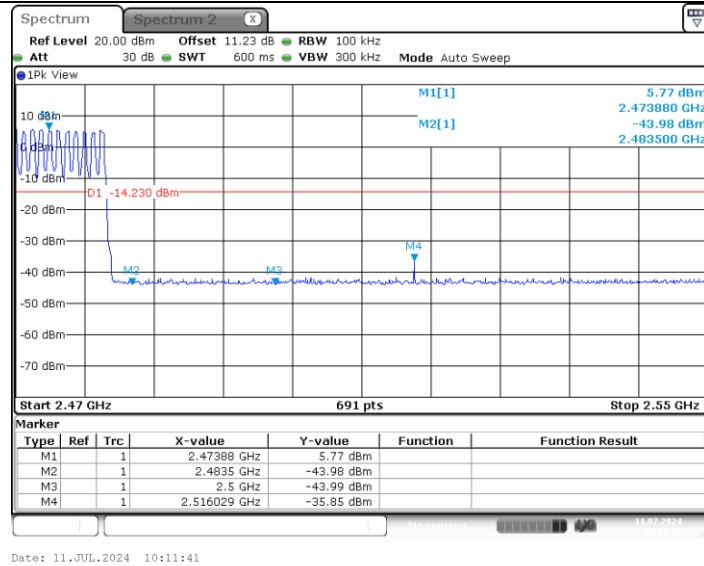
Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China

Tel.: (86)755-27521059

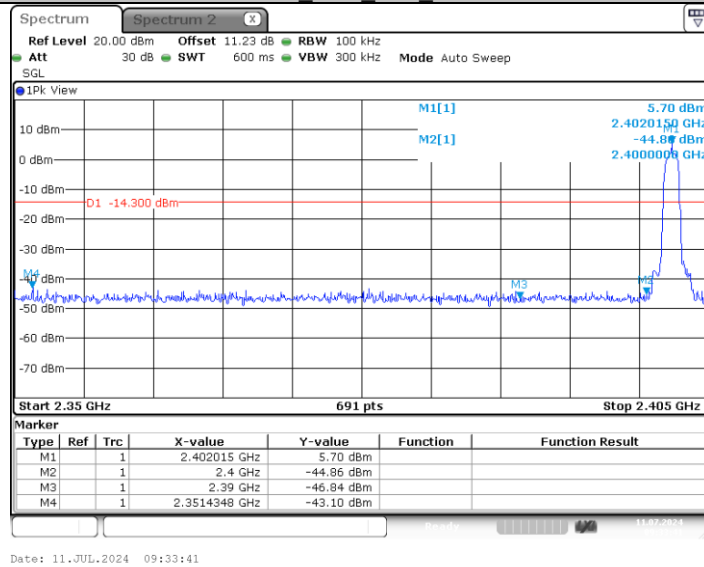
Fax: (86)755-27521011

Http://www.sz-ctc.org.cn

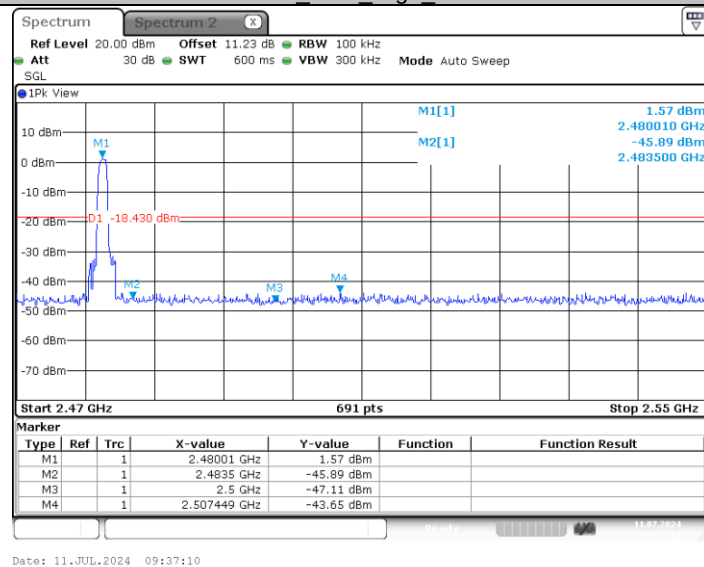
For anti-fake verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China : <http://yz.cnca.cn>



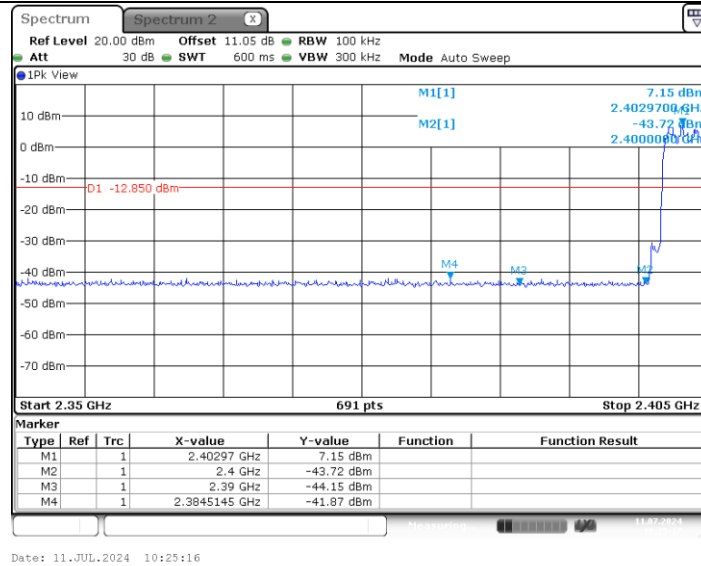
2DH5 Ant1 Low 2402



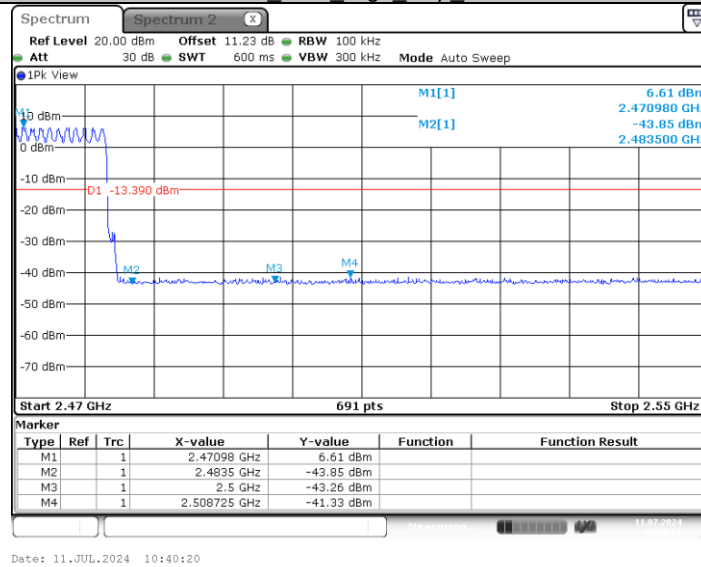
2DH5 Ant1 High 2480



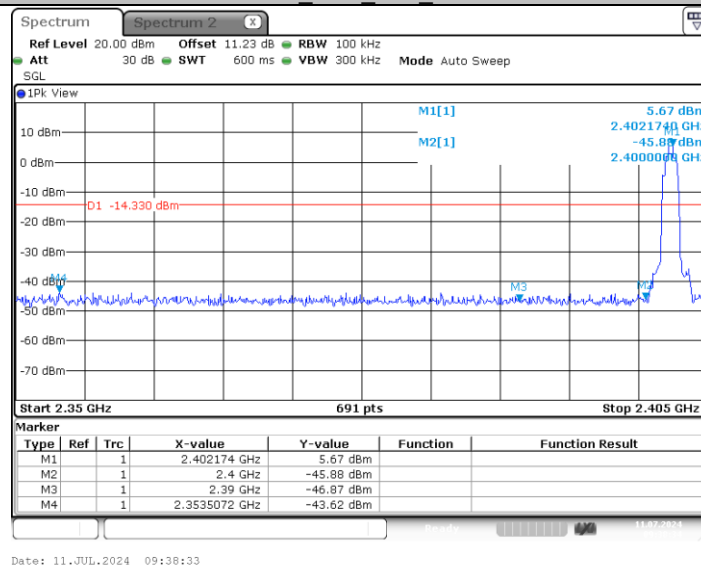
2DH5 Ant1 Low Hop 2402



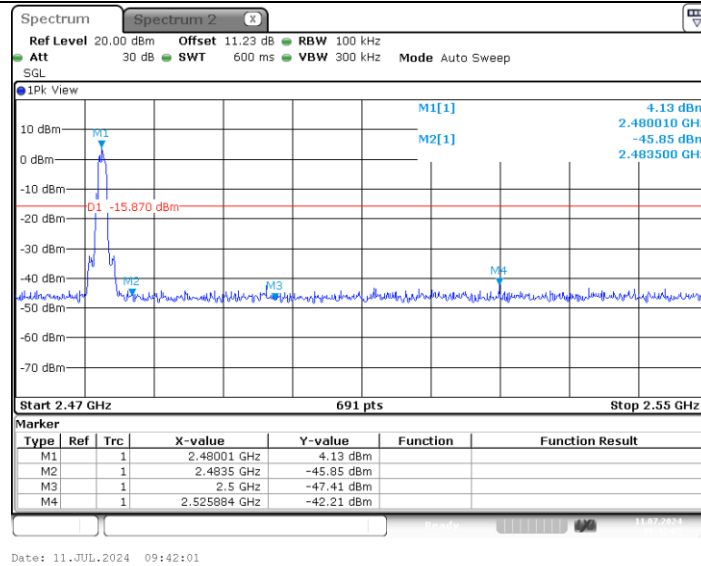
2DH5 Ant1_High_Hop_2480



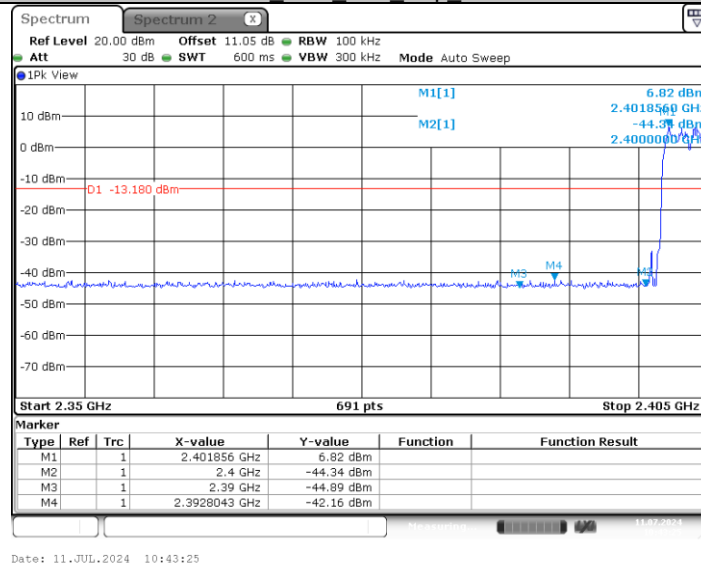
3DH5 Ant1_Low_2402



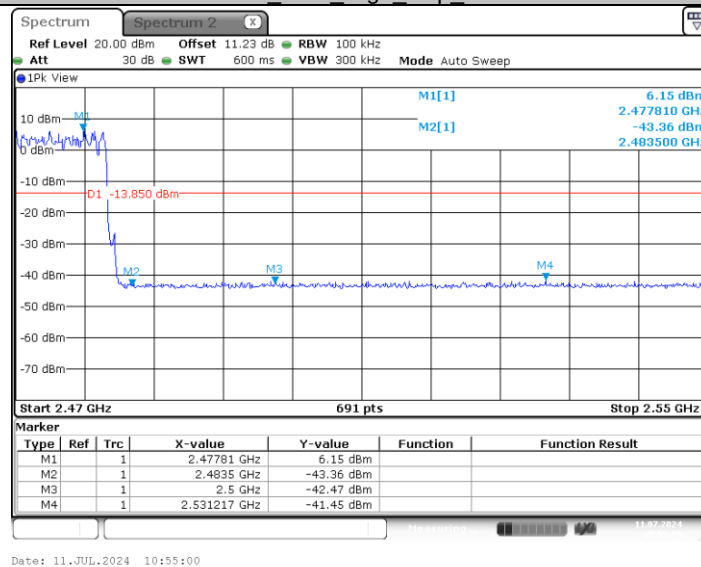
3DH5 Ant1_High_2480



3DH5 Ant1 Low Hop 2402



3DH5 Ant1 High Hop 2480



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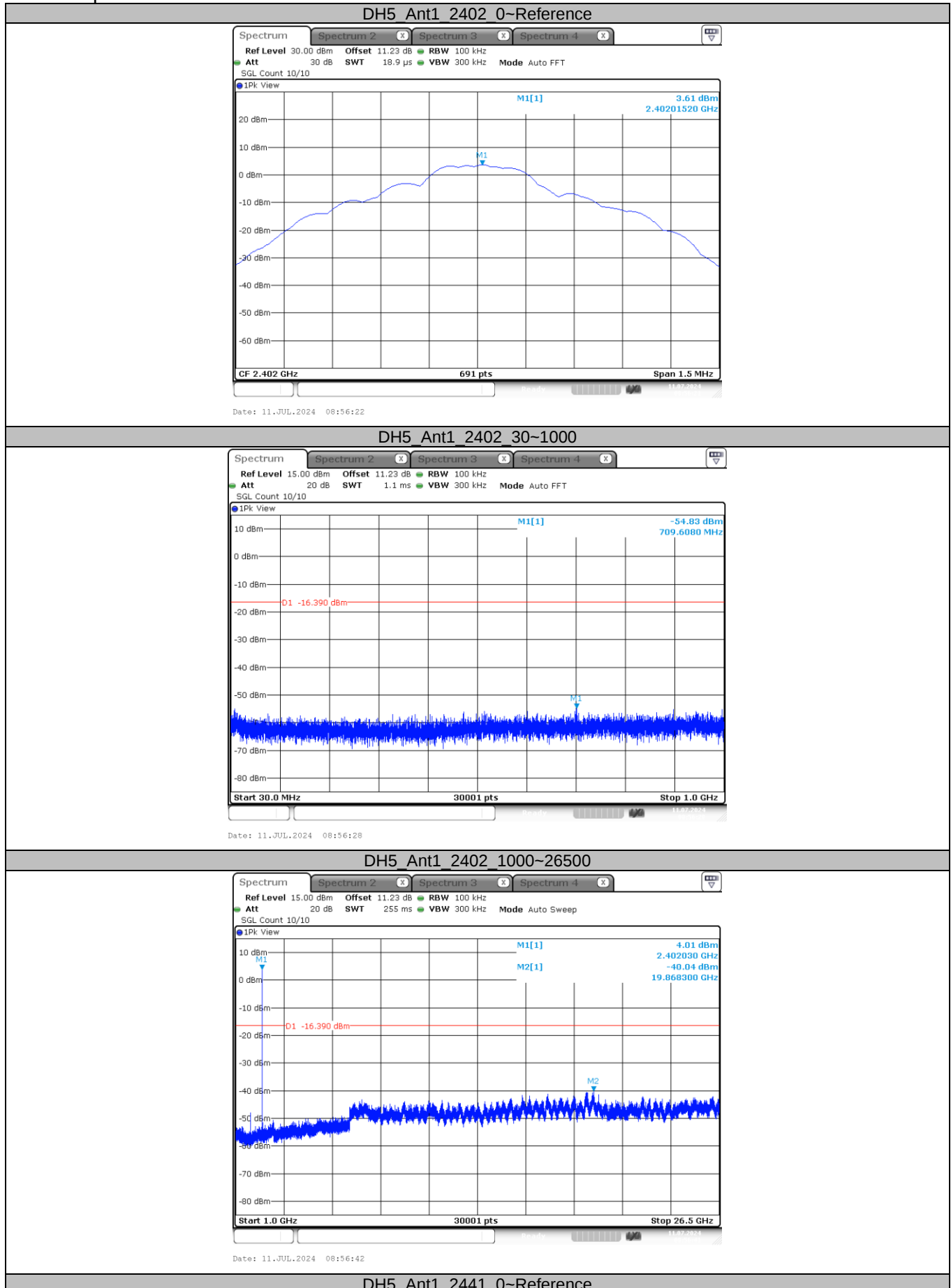


Conducted Spurious Emission

Test Mode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	3.61	3.61	---	PASS
			30~1000	3.61	-54.83	≤-16.39	PASS
			1000~26500	3.61	-40.04	≤-16.39	PASS
		2441	Reference	3.49	3.49	---	PASS
			30~1000	3.49	-55.43	≤-16.51	PASS
			1000~26500	3.49	-40.78	≤-16.51	PASS
		2480	Reference	2.92	2.92	---	PASS
			30~1000	2.92	-56.07	≤-17.08	PASS
			1000~26500	2.92	-40.38	≤-17.08	PASS
2DH5	Ant1	2402	Reference	2.15	2.15	---	PASS
			30~1000	2.15	-55.24	≤-17.85	PASS
			1000~26500	2.15	-39.34	≤-17.85	PASS
		2441	Reference	0.76	0.76	---	PASS
			30~1000	0.76	-54.47	≤-19.24	PASS
			1000~26500	0.76	-39.91	≤-19.24	PASS
		2480	Reference	0.91	0.91	---	PASS
			30~1000	0.91	-55.72	≤-19.09	PASS
			1000~26500	0.91	-40.30	≤-19.09	PASS
3DH5	Ant1	2402	Reference	0.65	0.65	---	PASS
			30~1000	0.65	-55.05	≤-19.35	PASS
			1000~26500	0.65	-39.73	≤-19.35	PASS
		2441	Reference	3.70	3.70	---	PASS
			30~1000	3.70	-54.58	≤-16.30	PASS
			1000~26500	3.70	-40.87	≤-16.30	PASS
		2480	Reference	1.09	1.09	---	PASS
			30~1000	1.09	-54.58	≤-18.91	PASS
			1000~26500	1.09	-39.49	≤-18.91	PASS



Test Graphs:



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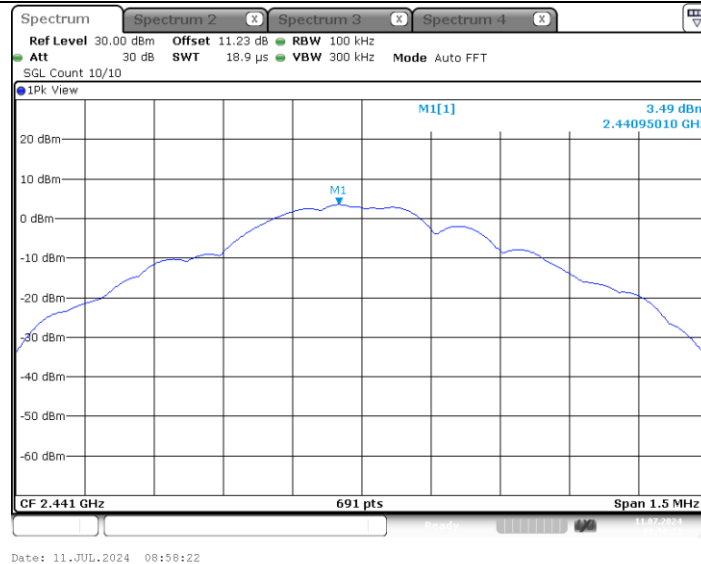
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Tel.: (86)755-27521059

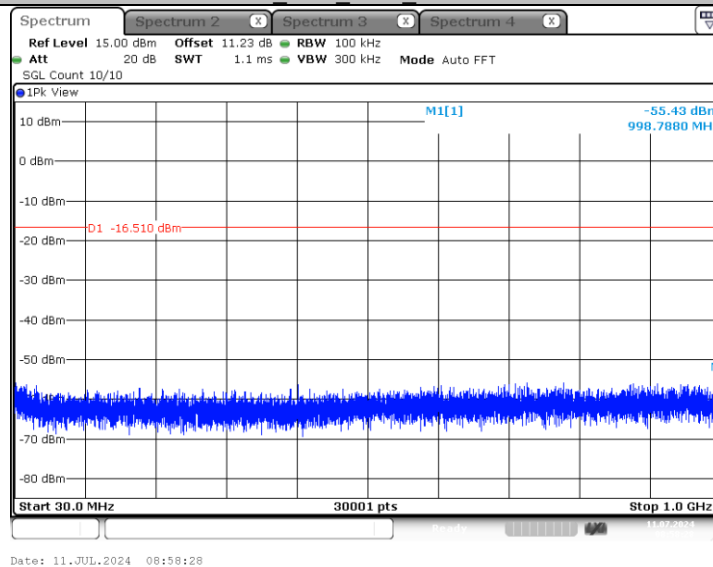
Fax: (86)755-27521011

Http://www.sz-ctc.org.cn

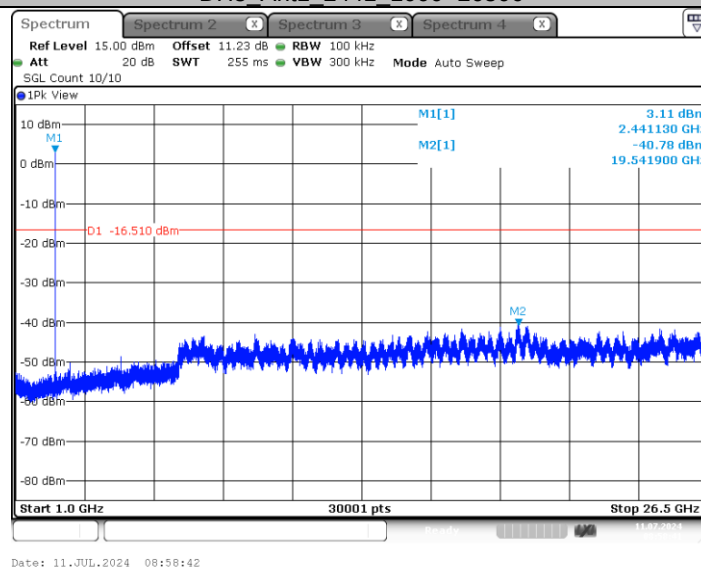
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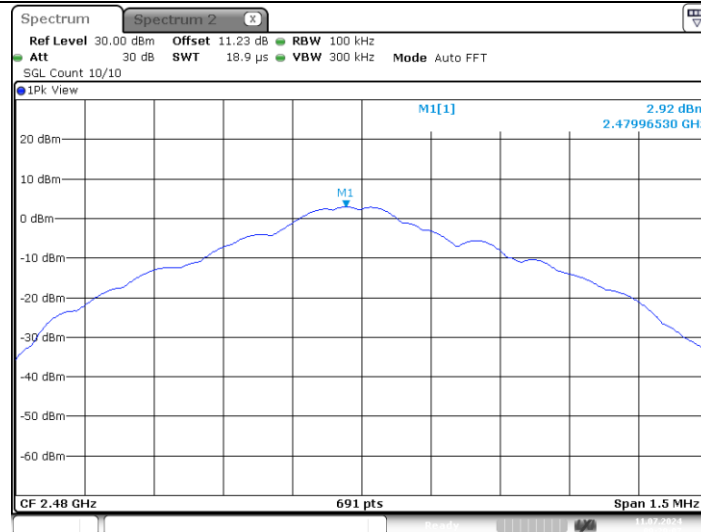
DH5 Ant1 2441 30~1000



DH5 Ant1 2441 1000~26500

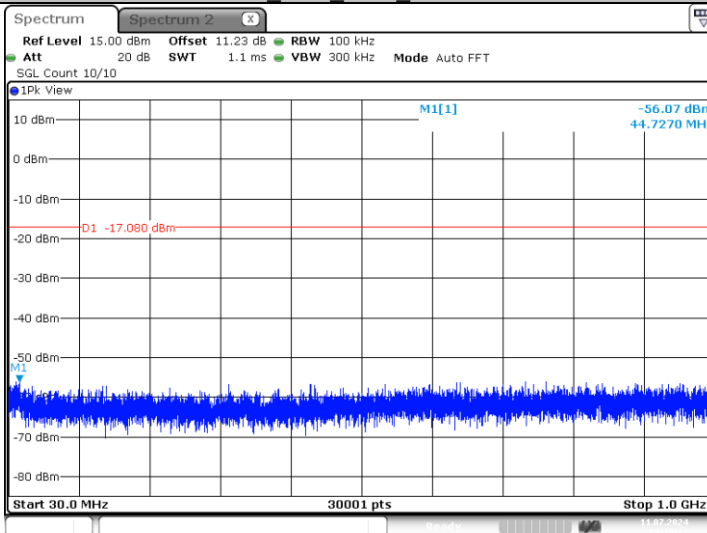


DH5 Ant1 2480 0~Reference



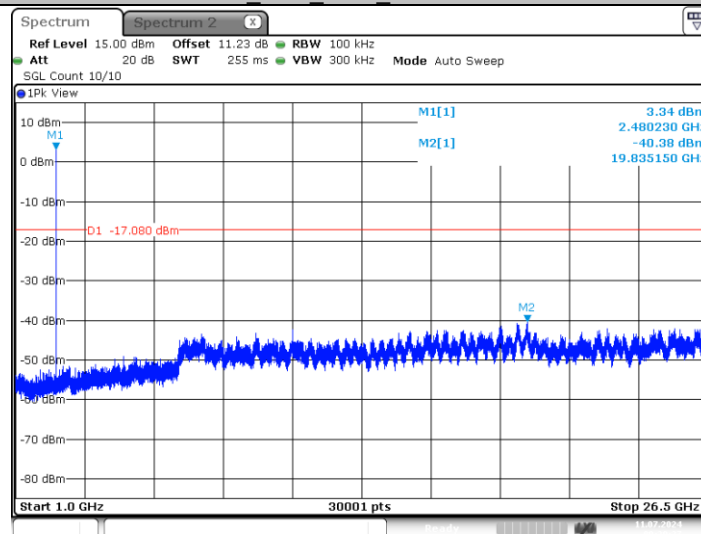
Date: 11.JUL.2024 09:29:07

DH5 Ant1_2480_30~1000



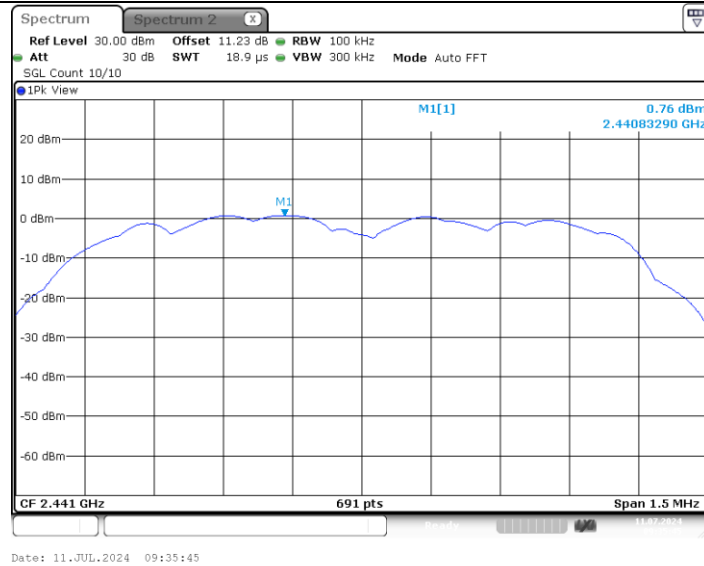
Date: 11.JUL.2024 09:29:13

DH5 Ant1_2480_1000~26500

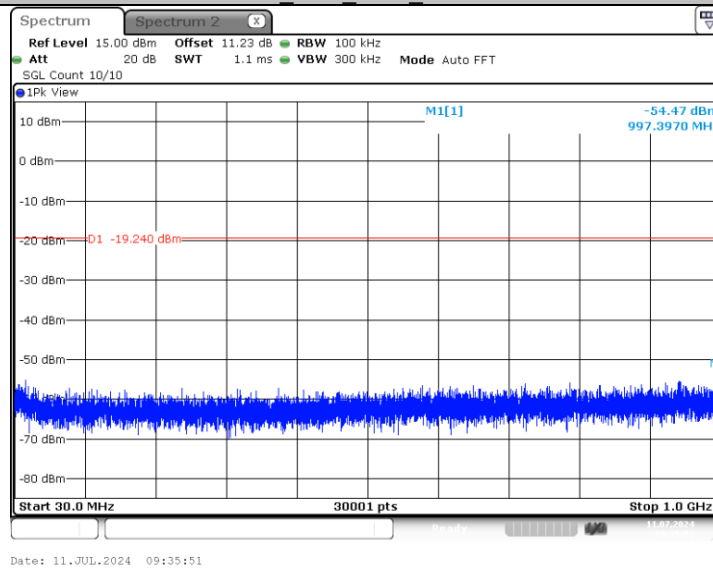


Date: 11.JUL.2024 09:29:27

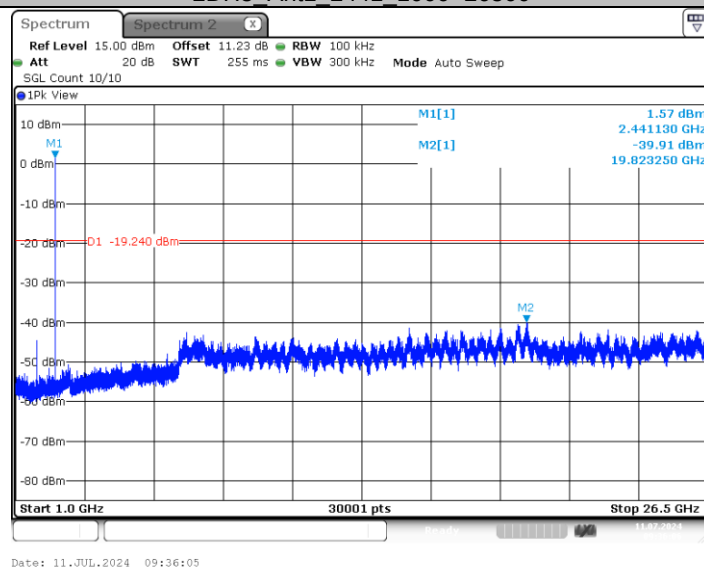
2DH5_Ant1_2402_0~Reference



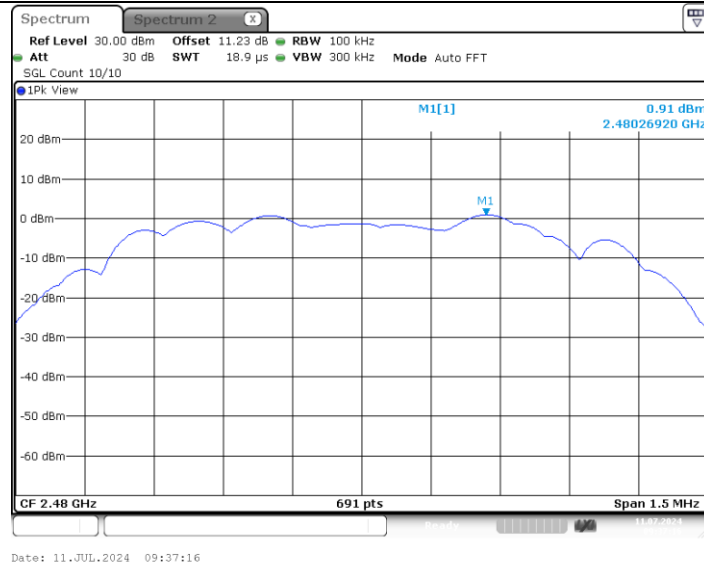
2DH5_Ant1_2441_30~1000



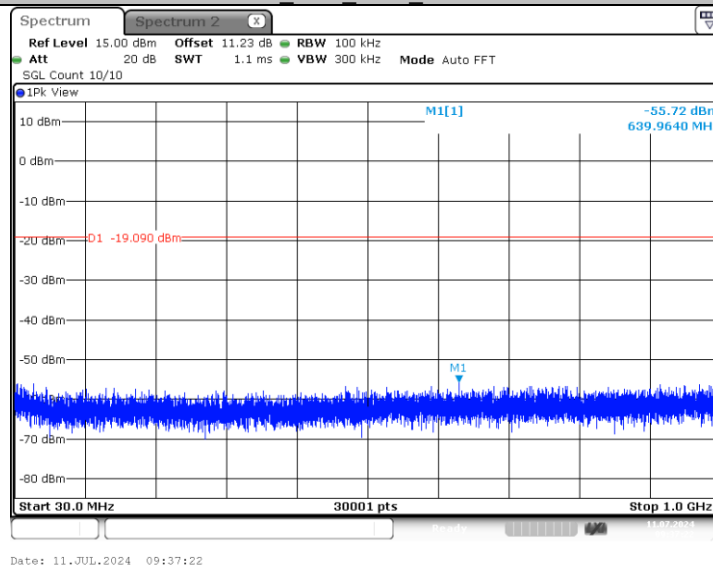
2DH5_Ant1_2441_1000~26500



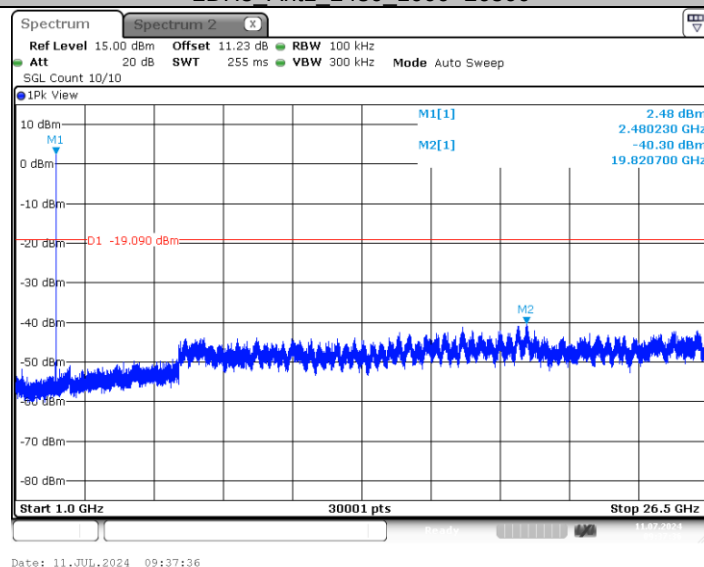
2DH5_Ant1_2480_0~Reference



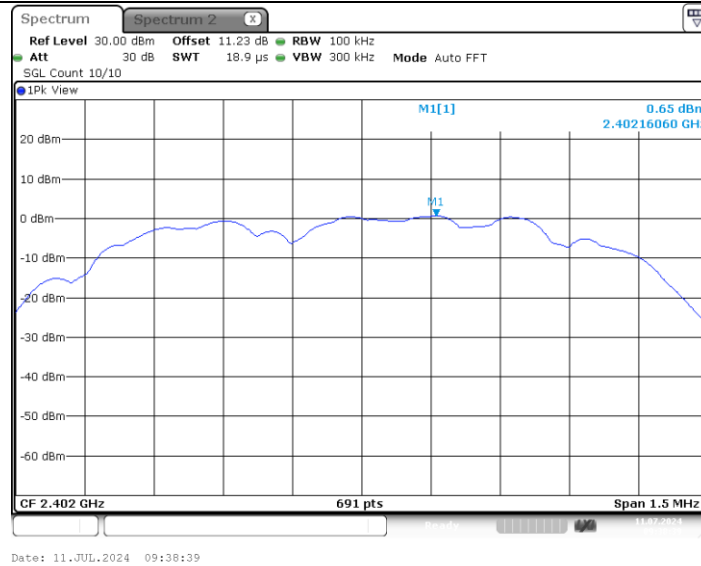
2DH5_Ant1_2480_30~1000



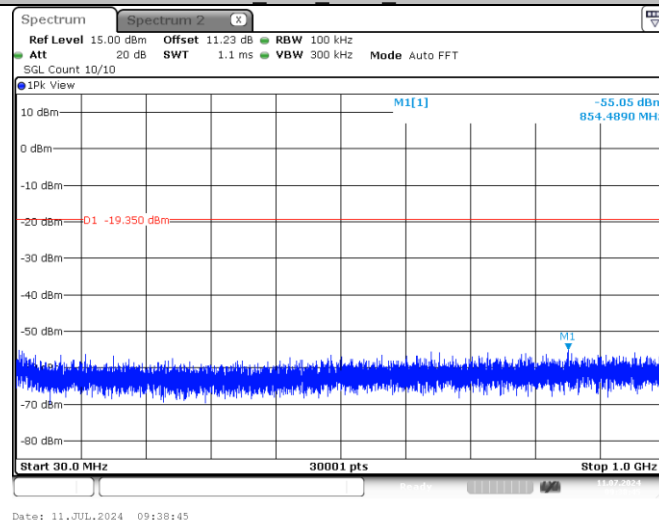
2DH5_Ant1_2480_1000~26500



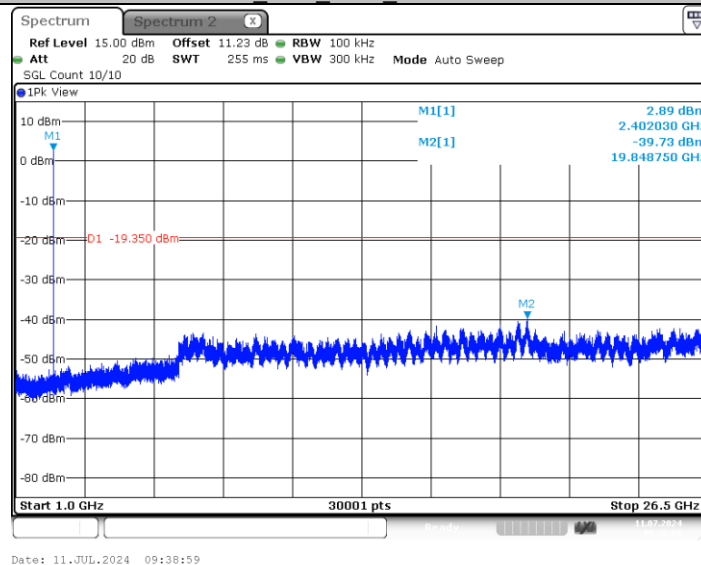
3DH5_Ant1_2402_0~Reference



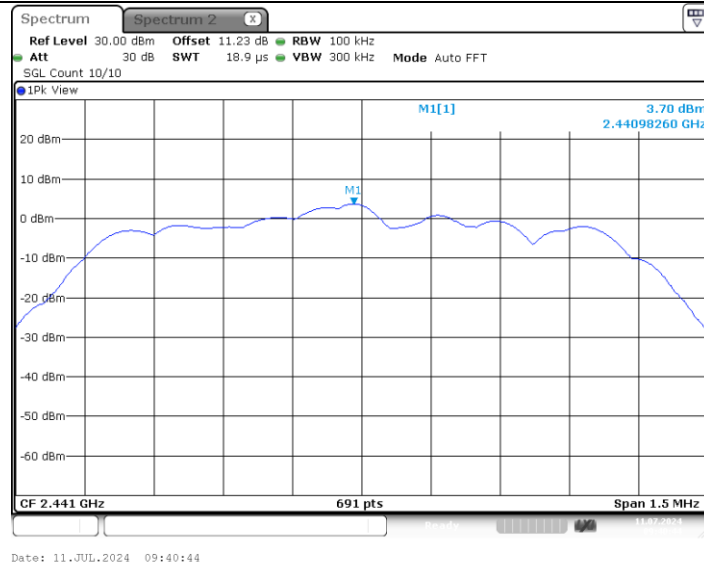
3DH5 Ant1 2402 30~1000



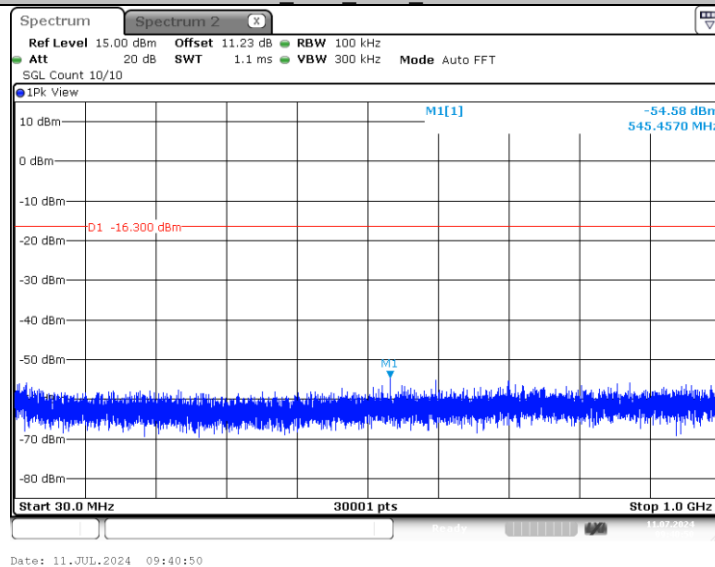
3DH5 Ant1 2402 1000~26500



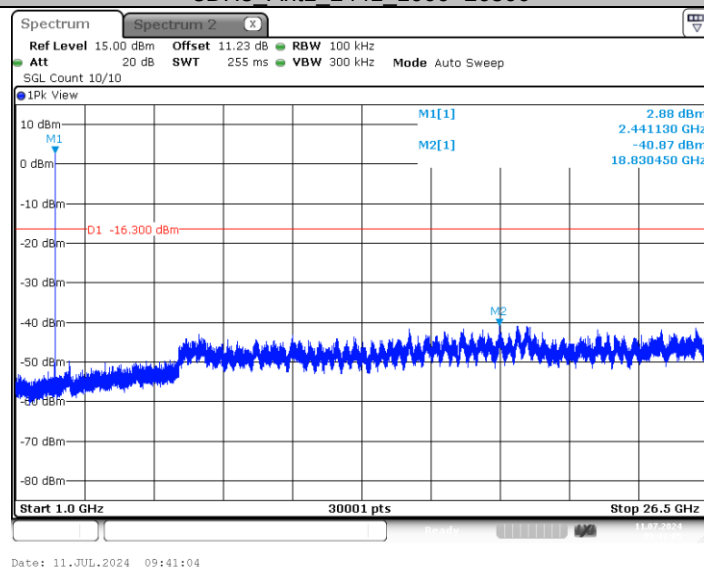
3DH5 Ant1 2441 0~Reference



3DH5 Ant1 2441 30~1000



3DH5 Ant1 2441 1000~26500



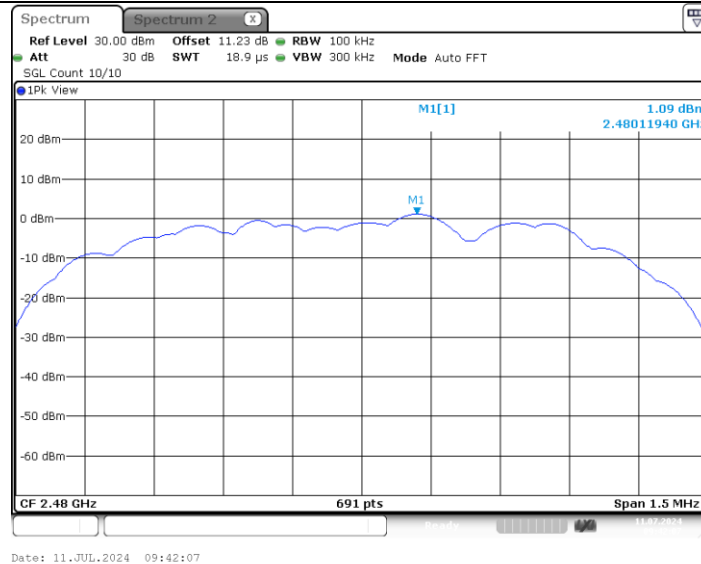
3DH5 Ant1 2480 0~Reference

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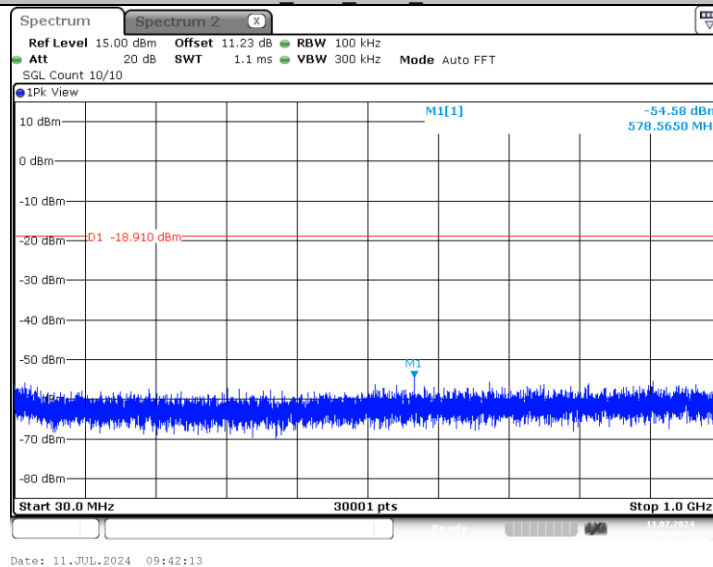
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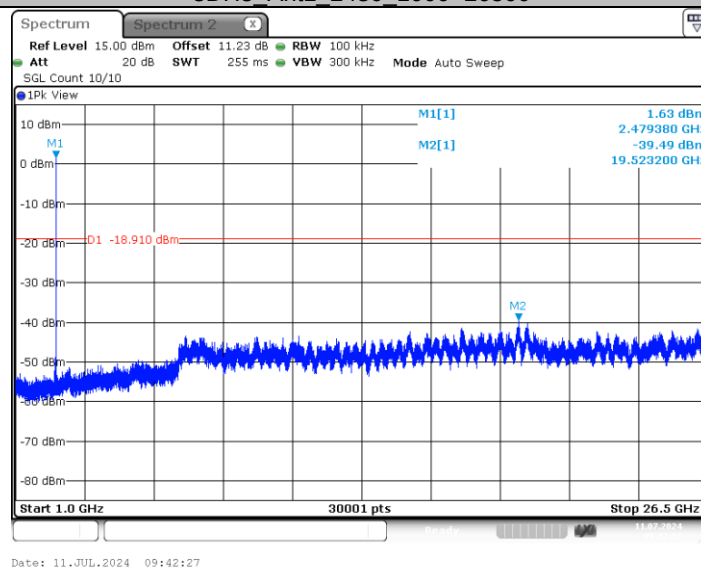
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3DH5 Ant1 2480 30~1000



3DH5 Ant1 2480 1000~26500



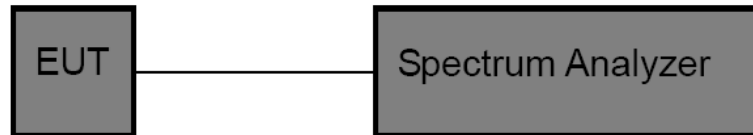


3.5. 20dB Bandwidth

Limit

N/A

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. OCB and 20dB Spectrum Setting:
 - (1) Set RBW = 1% ~ 5% occupied bandwidth.
 - (2) Set the video bandwidth (VBW) ≥ 3 RBW.
 - (3) Detector = Peak.
 - (4) Trace mode = Max hold.
 - (5) Sweep = Auto couple.

Note: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

Test Mode

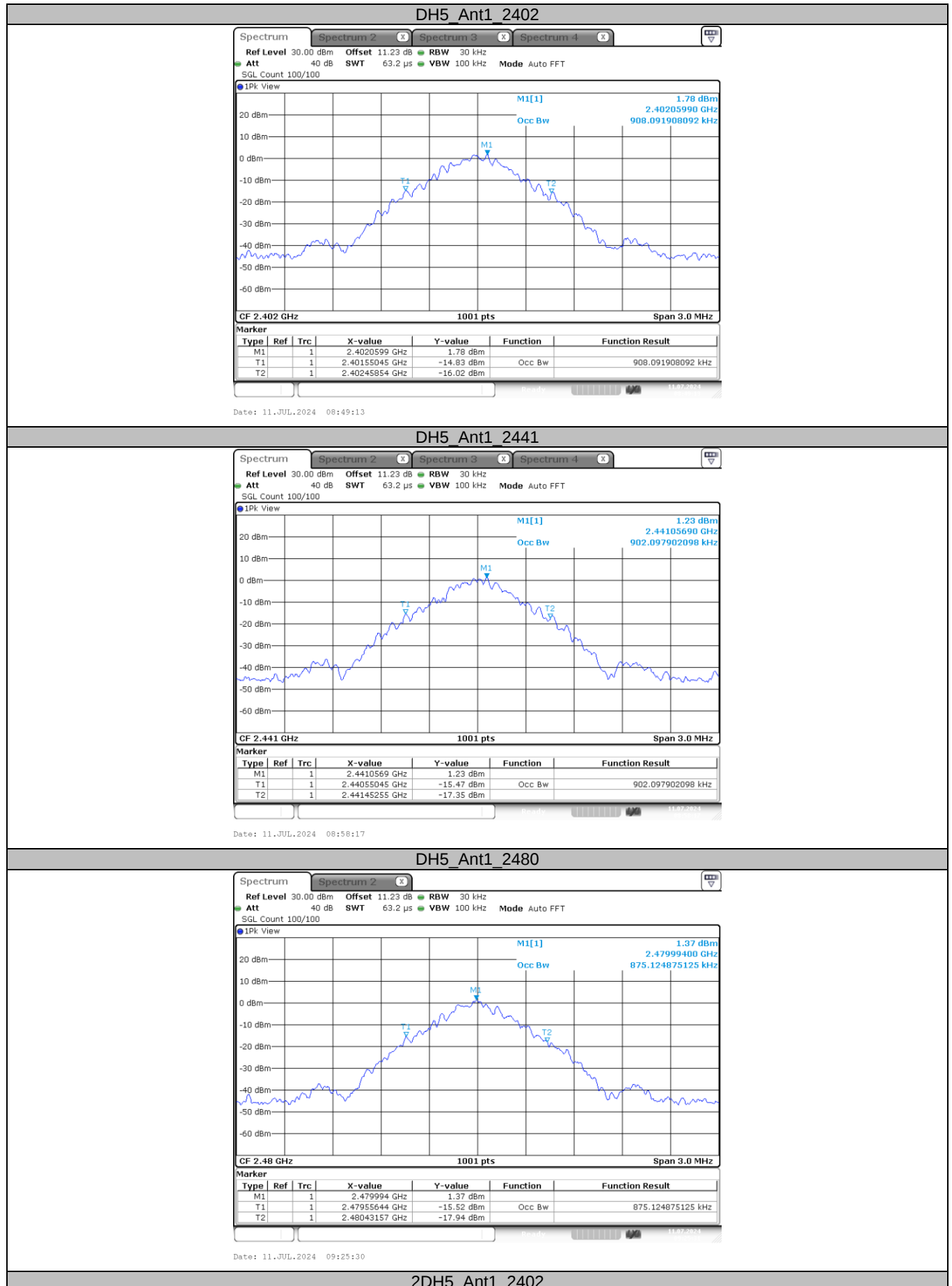
Please refer to the clause 2.4.

Test Result

Test Mode	Frequency (MHz)	99% Bandwidth (MHz)	20 dB Bandwidth (MHz)	20dB Bandwidth *2/3 (MHz)
DH5	2402	0.908	0.960	0.640
	2441	0.902	0.963	0.642
	2480	0.875	0.954	0.636
2DH5	2402	1.169	1.275	0.850
	2441	1.184	1.317	0.878
	2480	1.184	1.278	0.852
3DH5	2402	1.172	1.269	0.846
	2441	1.175	1.272	0.848
	2480	1.199	1.266	0.844



99% Bandwidth:



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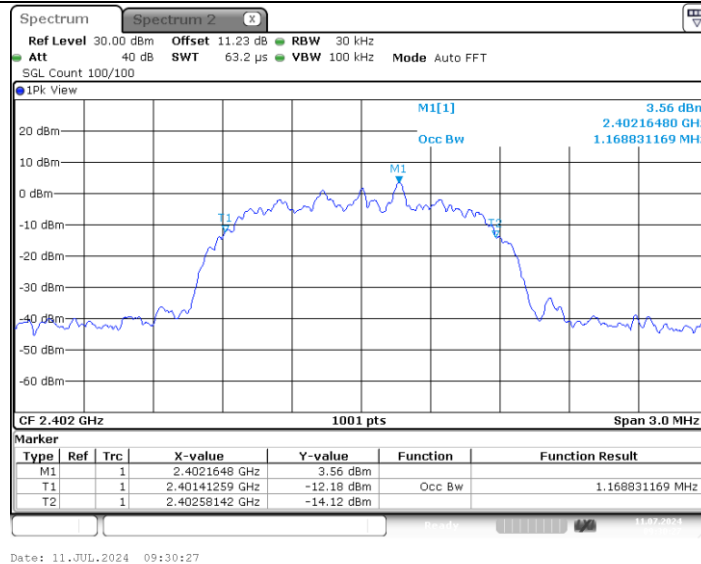
Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China

Tel.: (86)755-27521059

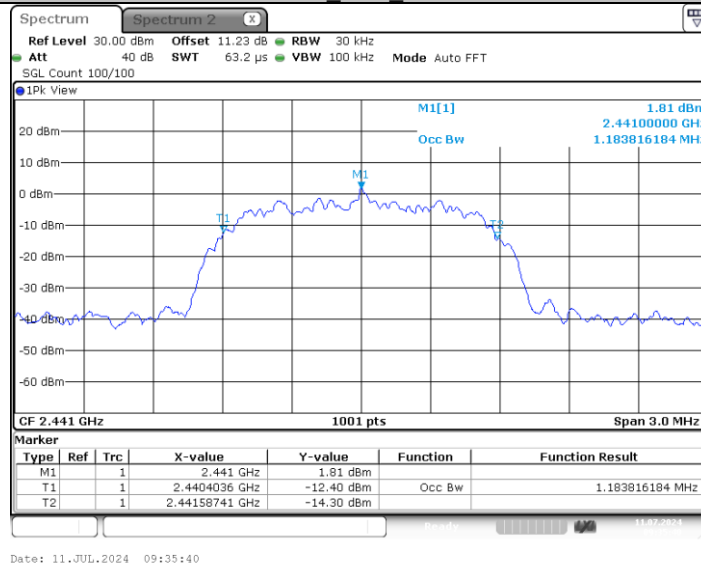
Fax: (86)755-27521011

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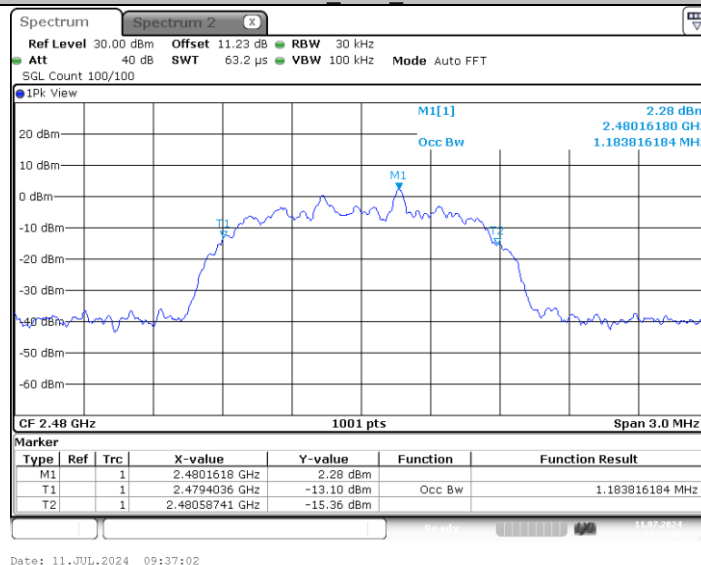
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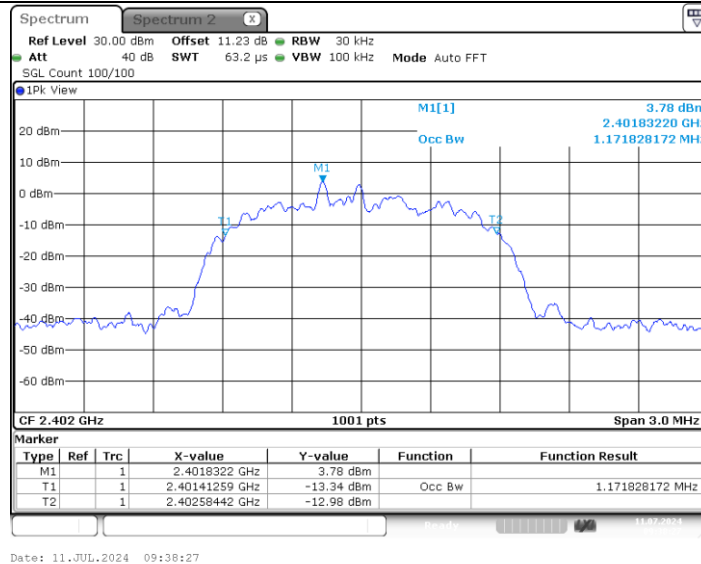
2DH5_Ant1_2441



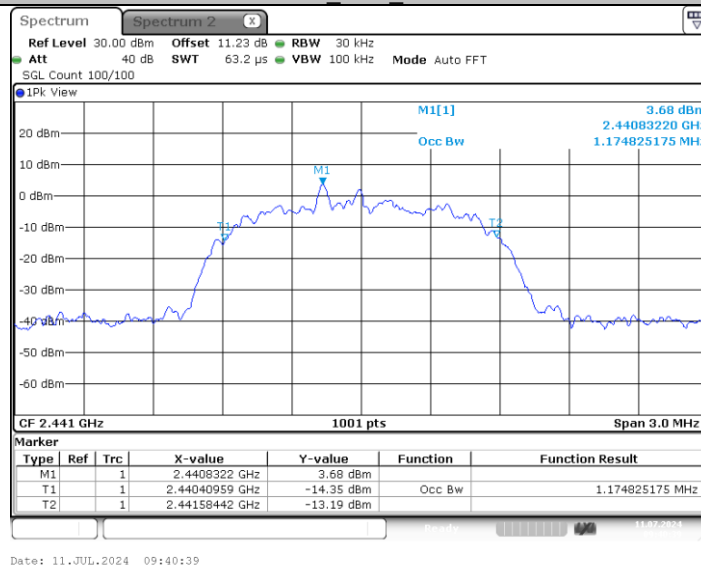
2DH5_Ant1_2480



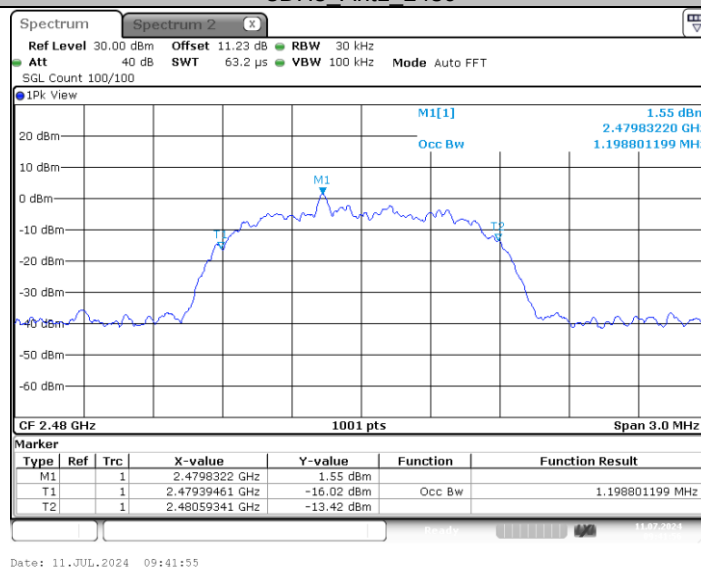
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



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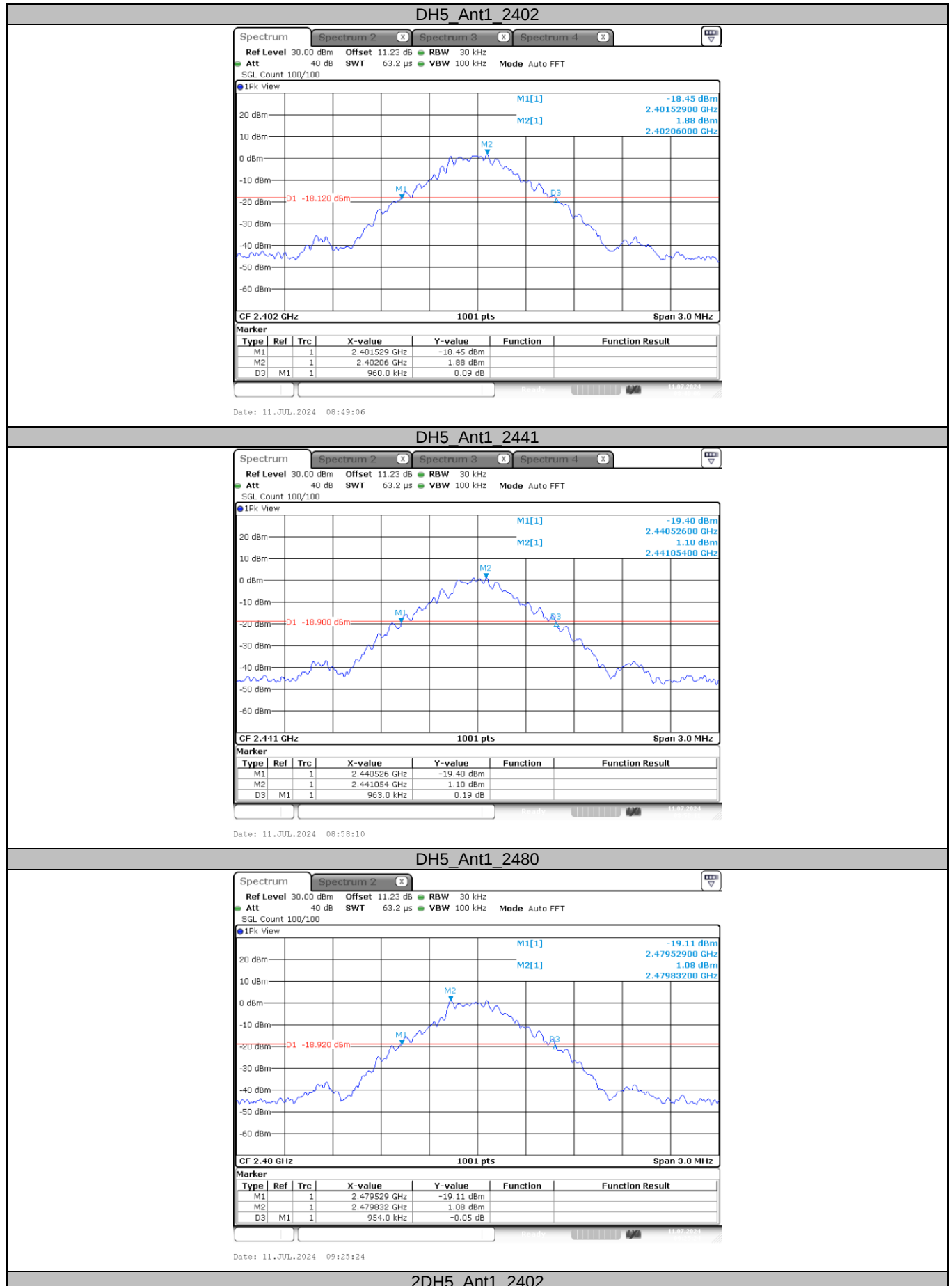
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20dB Bandwidth:



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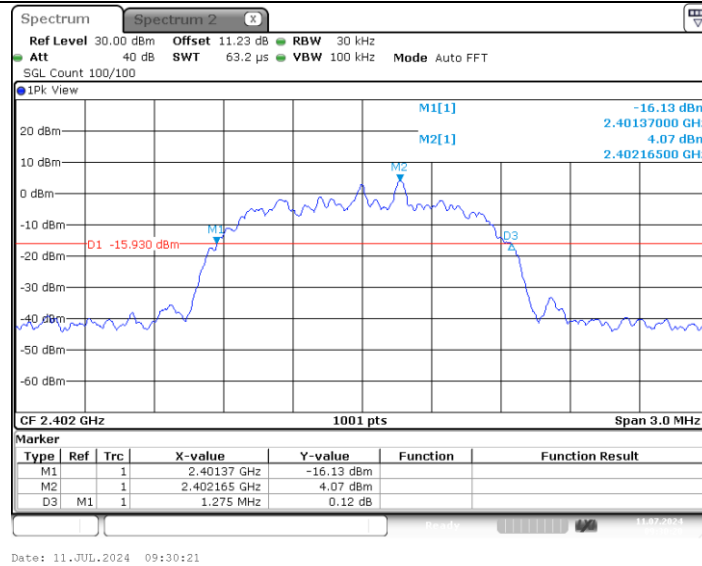
Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China

Tel.: (86)755-27521059

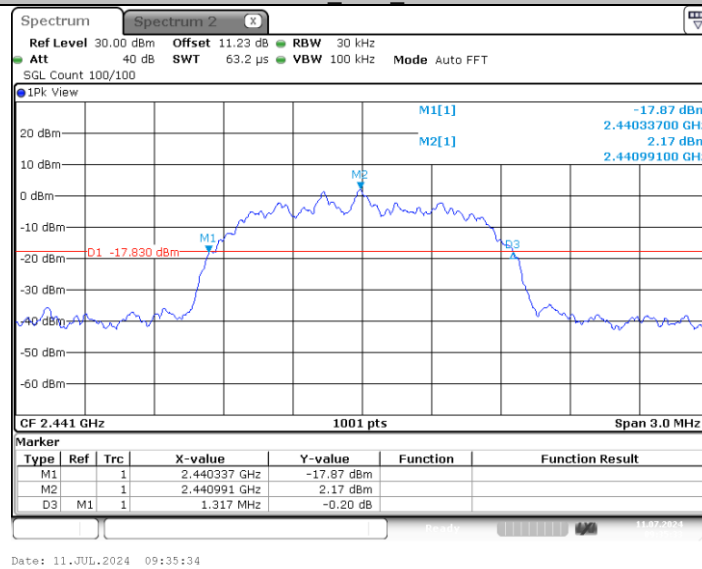
Fax: (86)755-27521011

Http://www.sz-ctc.org.cn

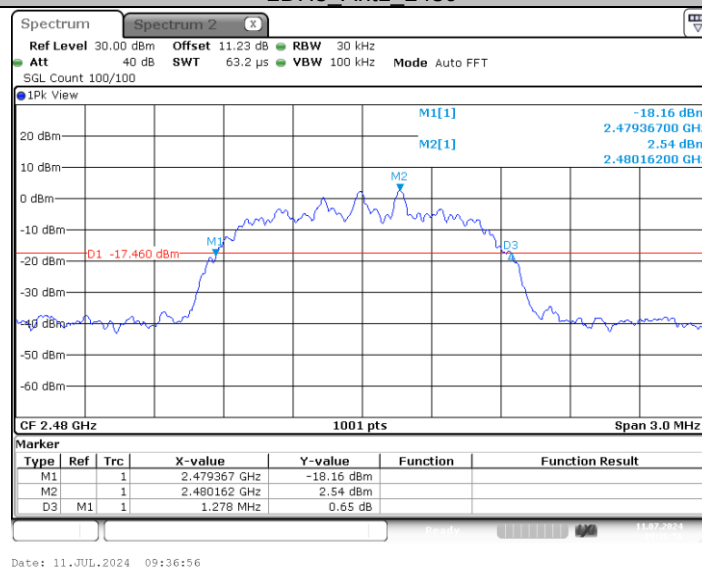
For anti-fake verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China : <http://yz.cnca.cn>



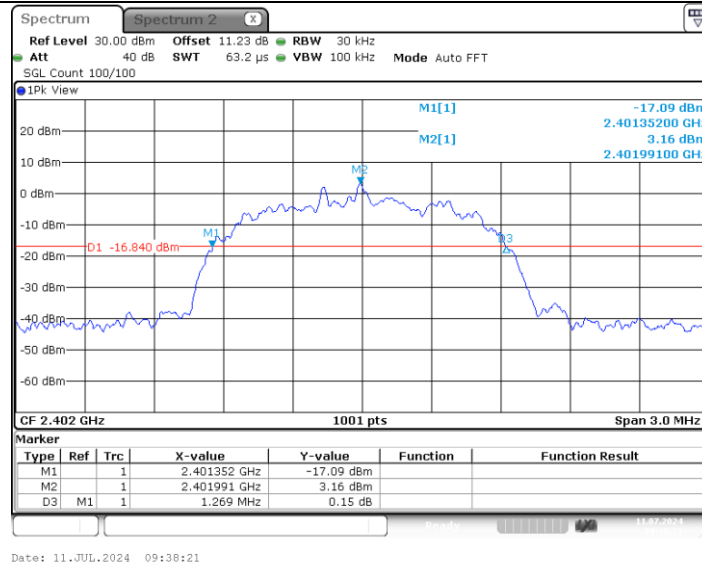
2DH5_Ant1_2441



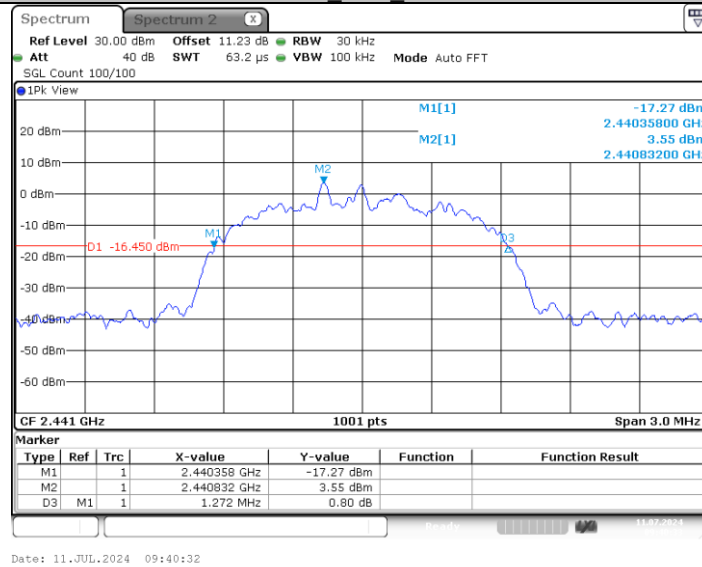
2DH5_Ant1_2480



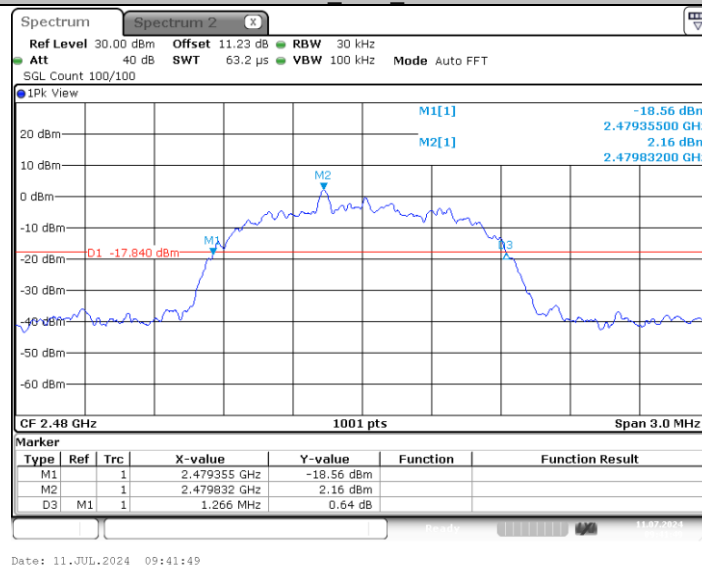
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



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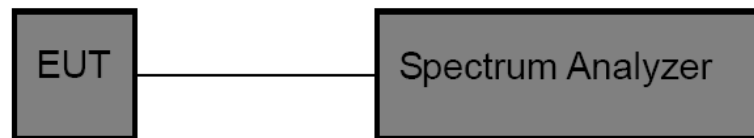
3.6. Channel Separation

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(1) / RSS-247 5.1 b

Test Item	Limit	Frequency Range (MHz)
Channel Separation	>25kHz or >two-thirds of the 20 dB bandwidth Which is greater	2400~2483.5

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
 - (1) Set RBW = 100 kHz.
 - (2) Set the video bandwidth (VBW) ≥ 3 RBW.
 - (3) Detector = Peak.
 - (4) Trace mode = Max hold.
 - (5) Sweep = Auto couple.

Test Mode

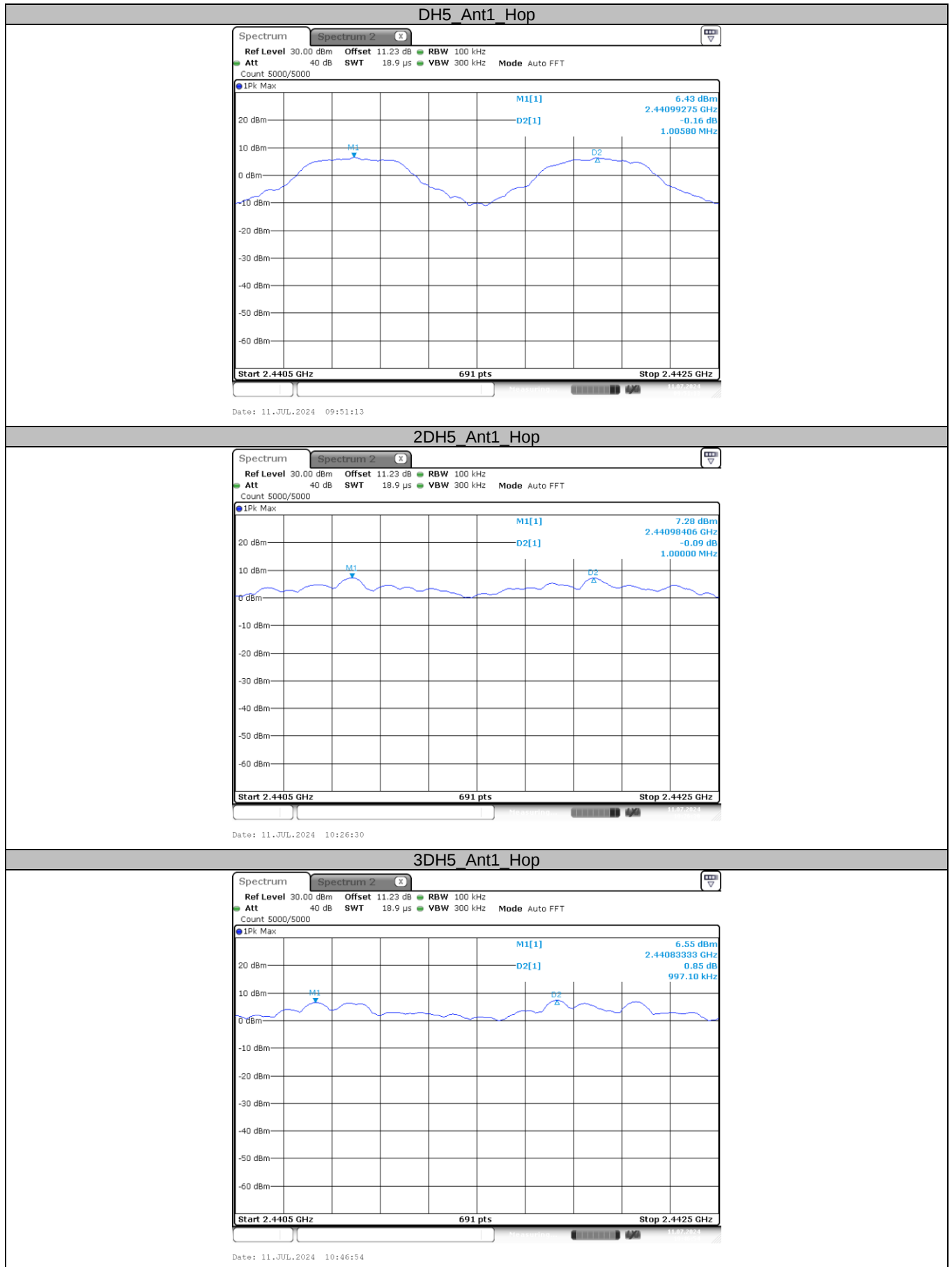
Please refer to the clause 2.4.

Test Result

Test Mode	Frequency (MHz)	Result (MHz)	Limit (MHz)	Verdict
DH5	Hop	1.006	≥ 0.642	PASS
2DH5	Hop	1.000	≥ 0.878	PASS
3DH5	Hop	0.997	≥ 0.848	PASS



Test Graphs:



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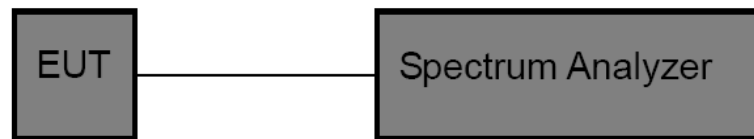
3.7. Number of Hopping Channel

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(iii) / RSS-247 5.1 d

Section	Test Item	Limit
15.247 (a)(iii) RSS-247 5.1 d	Number of Hopping Channel	≥ 15

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
 - (1) Peak Detector: RBW=100 kHz, VBW $\geq$ RBW, Sweep time= Auto.

Test Mode

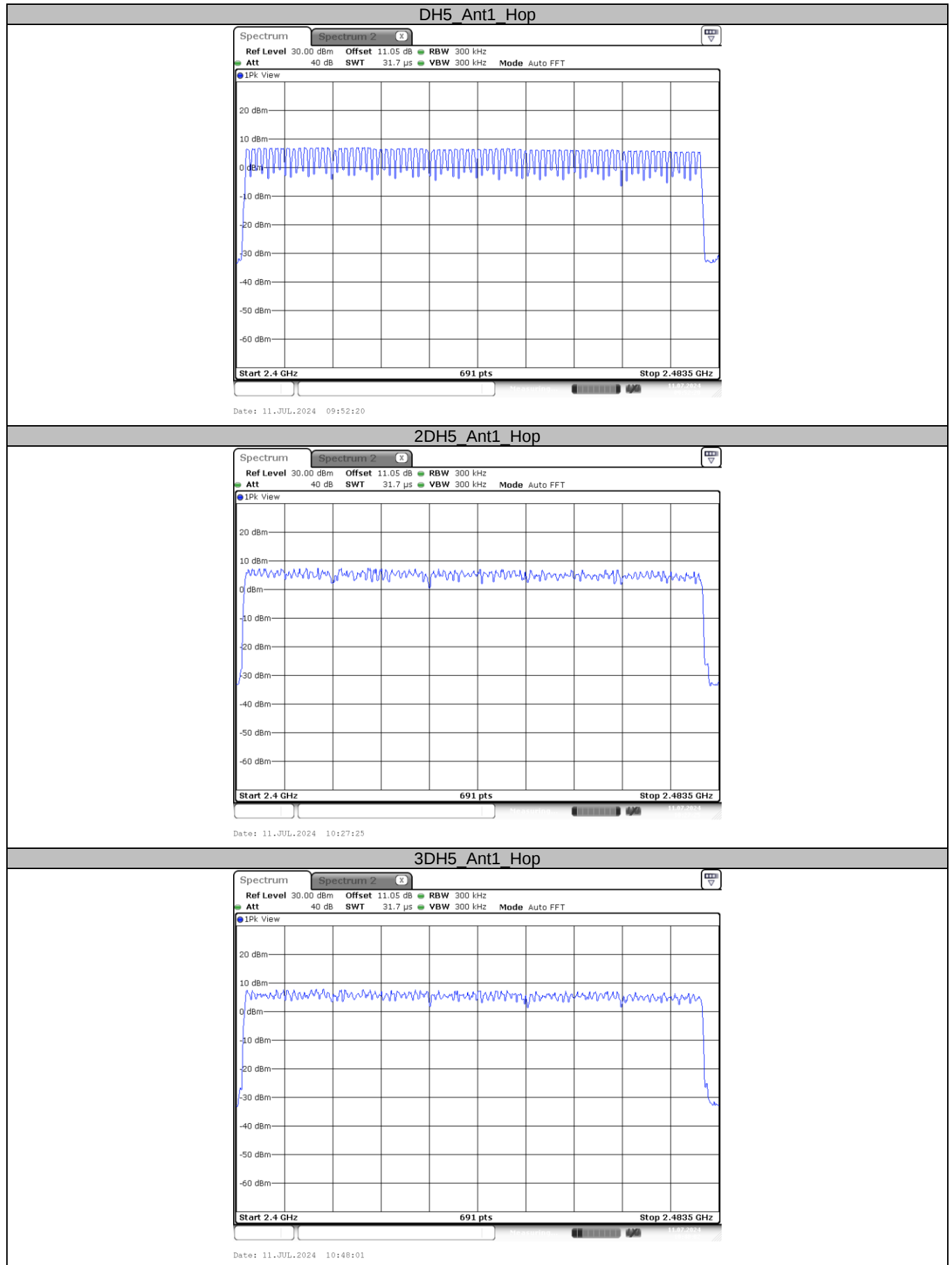
Please refer to the clause 2.4.

Test Result

Test Mode	Frequency (MHz)	Result [Num]	Limit [Num]	Verdict
DH5	Hop	79	≥ 15	PASS
2DH5	Hop	79	≥ 15	PASS
3DH5	Hop	79	≥ 15	PASS



Test Graphs:



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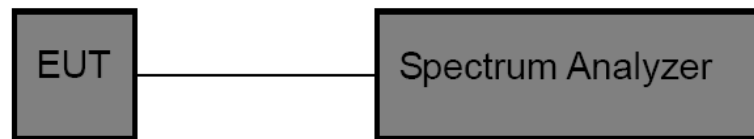
3.8. Dwell Time

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(iii) / RSS-247 5.1 d

Section	Test Item	Limit
15.247 (a)(iii) RSS-247 5.1 d	Average Time of Occupancy	0.4 sec

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
 - (1) Spectrum Setting: RBW=1MHz, VBW $\geq$ RBW.
 - (2) Use video trigger with the trigger level set to enable triggering only on full pulses.
 - (3) Sweep Time is more than once pulse time.
 - (4) Set the center frequency on any frequency would be measure and set the frequency span to zero.
 - (5) Measure the maximum time duration of one single pulse.
 - (6) Set the EUT for packet transmitting.

Test Mode

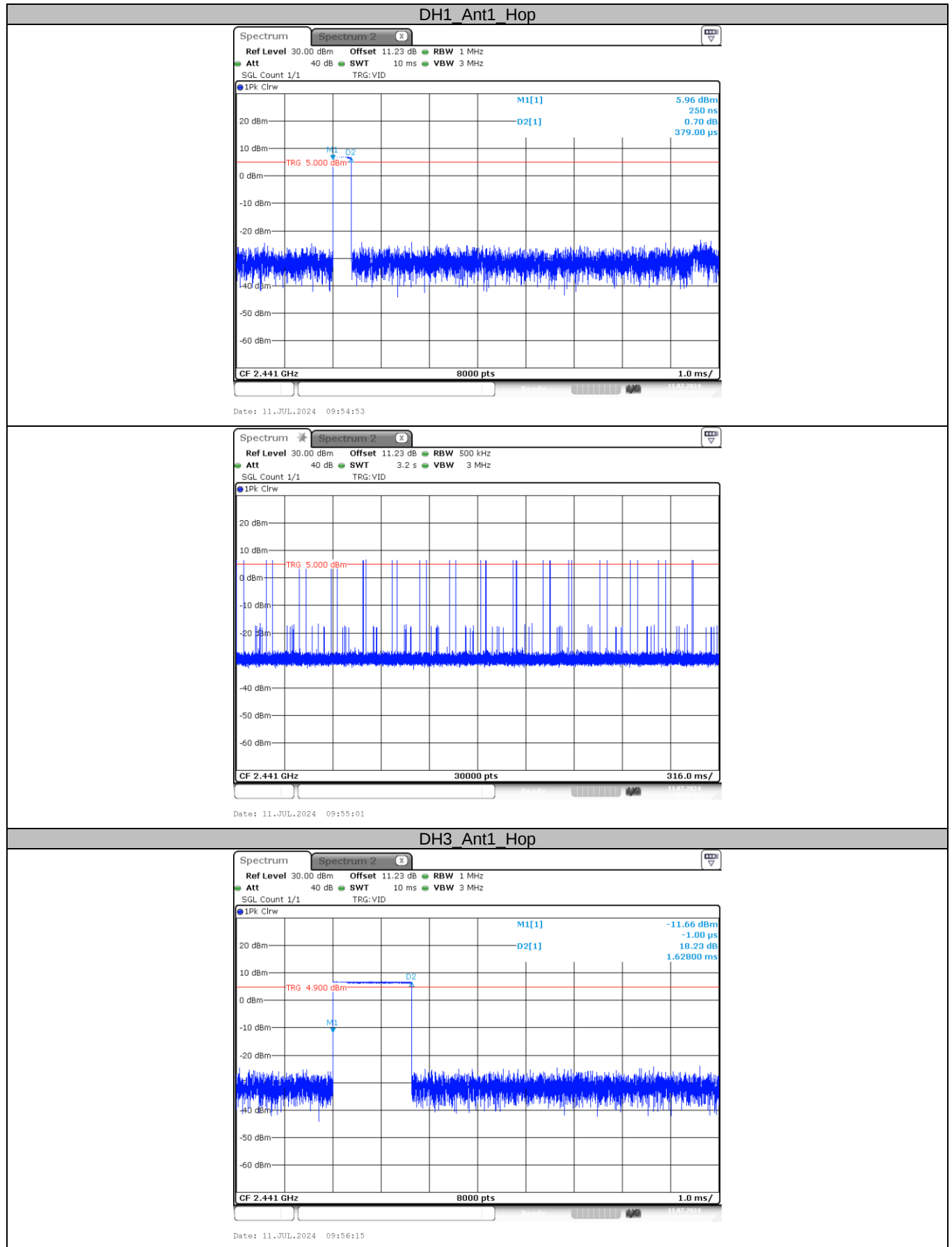
Please refer to the clause 2.4.

Test Result

Modulation	Packet	Freq(MHz)	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (s)	Limit (s)	Result
GFSK	DH1	Hop	0.379	320	0.121	≤ 0.4	PASS
	DH3	Hop	1.628	160	0.260	≤ 0.4	PASS
	DH5	Hop	2.868	120	0.344	≤ 0.4	PASS
$\pi/4$ DQPSK	2-DH1	Hop	0.388	330	0.128	≤ 0.4	PASS
	2-DH3	Hop	1.633	170	0.278	≤ 0.4	PASS
	2-DH5	Hop	2.873	80	0.230	≤ 0.4	PASS
8DPSK	3-DH1	Hop	0.388	330	0.128	≤ 0.4	PASS
	3-DH3	Hop	1.631	180	0.294	≤ 0.4	PASS
	3-DH5	Hop	2.875	80	0.230	≤ 0.4	PASS



Test plot as follows:



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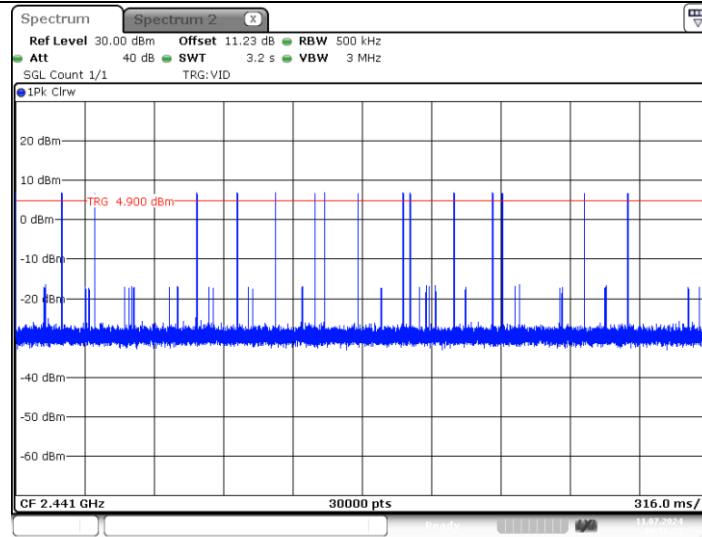
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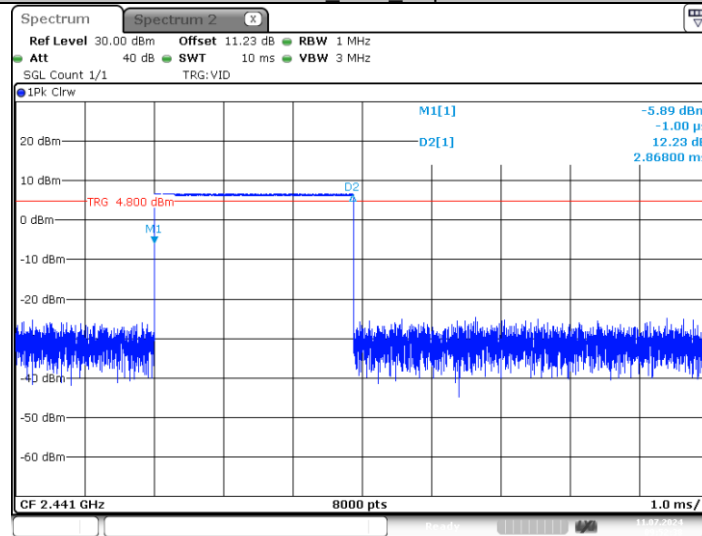
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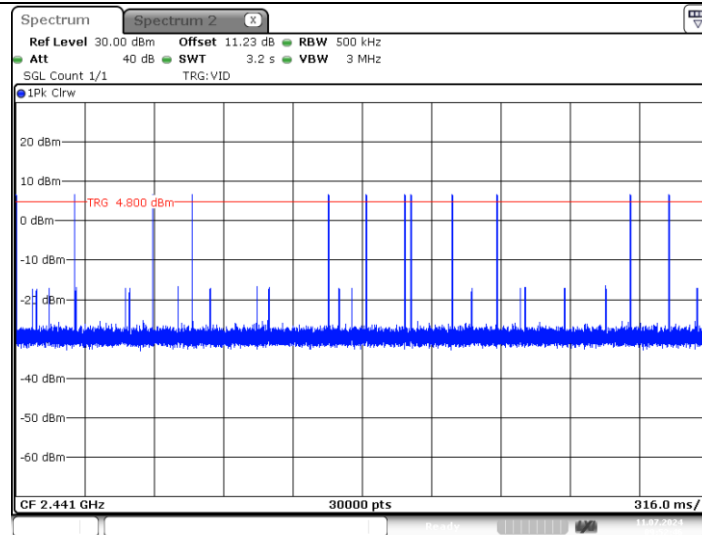


Date: 11.JUL.2024 09:56:23

DH5_Ant1_Hop

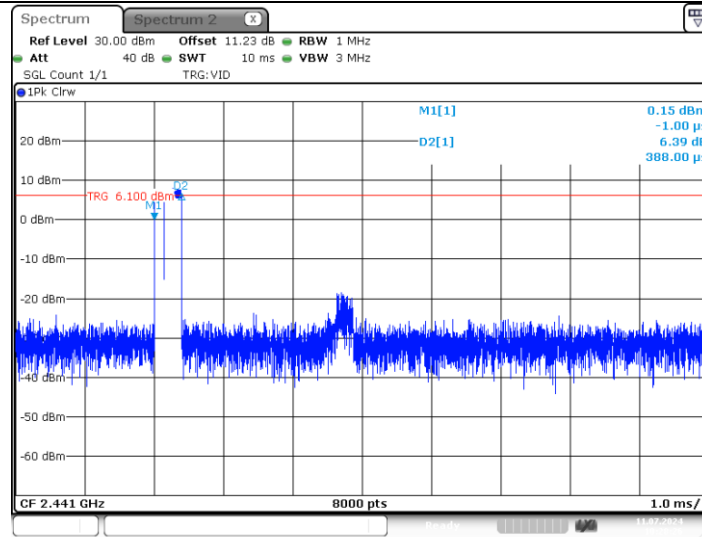


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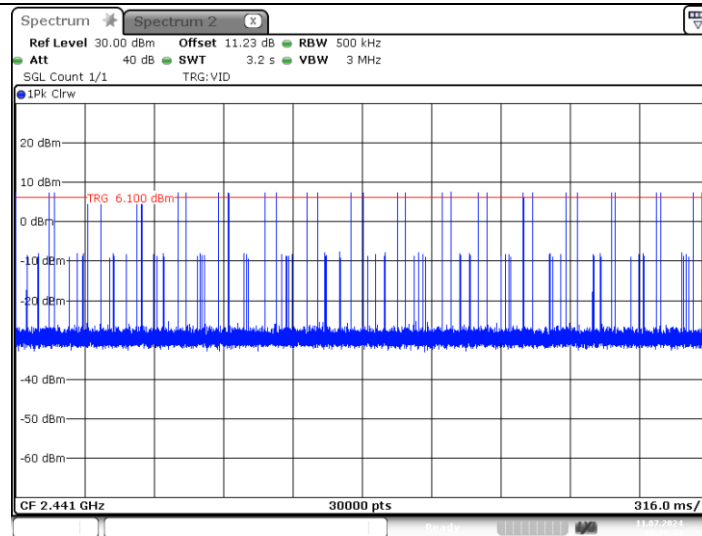


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2DH1_Ant1_Hop

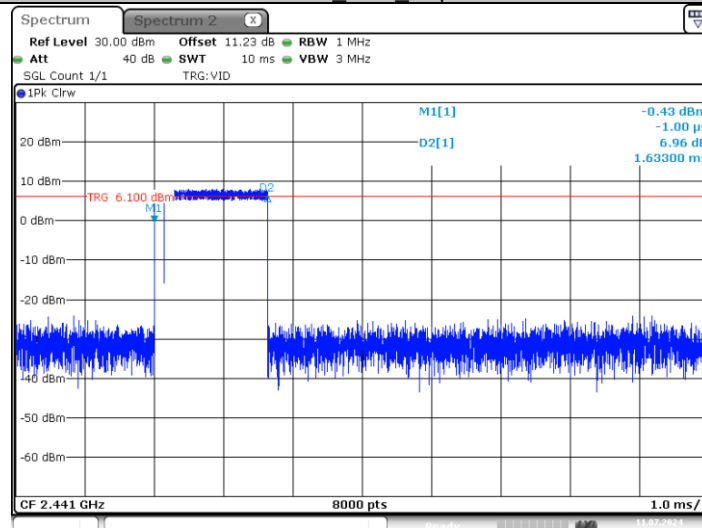


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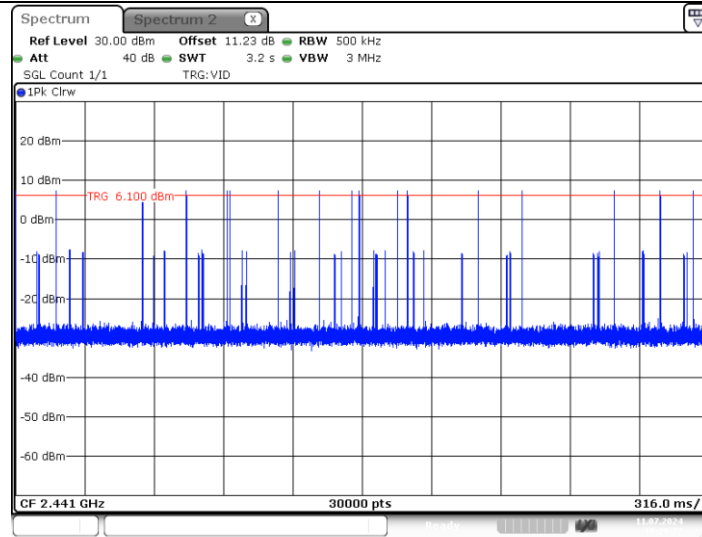


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2DH3_Ant1_Hop

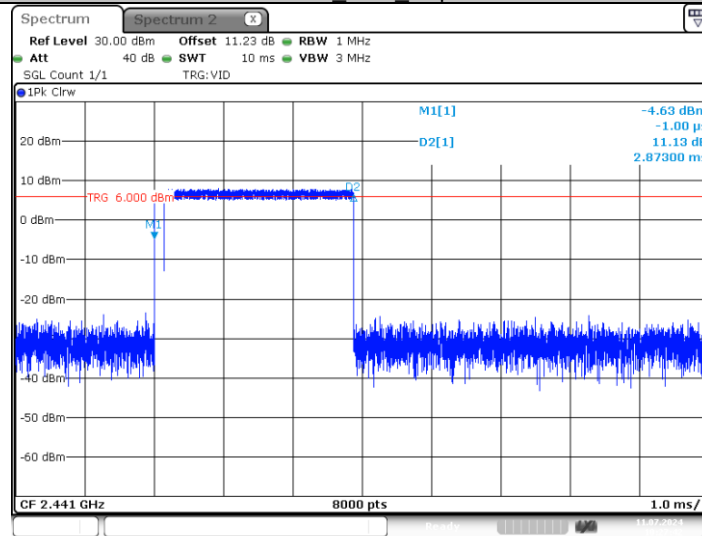


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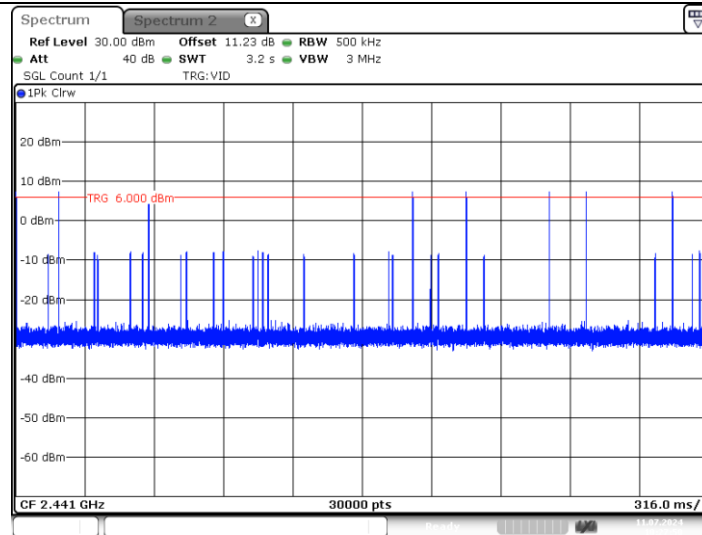


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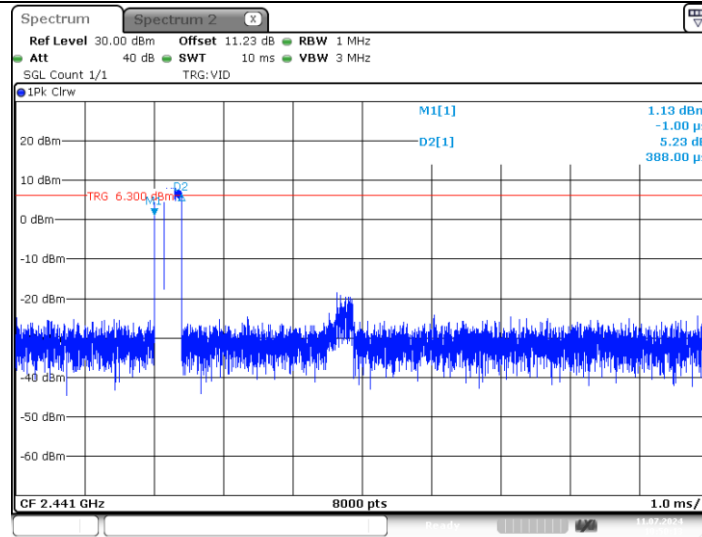


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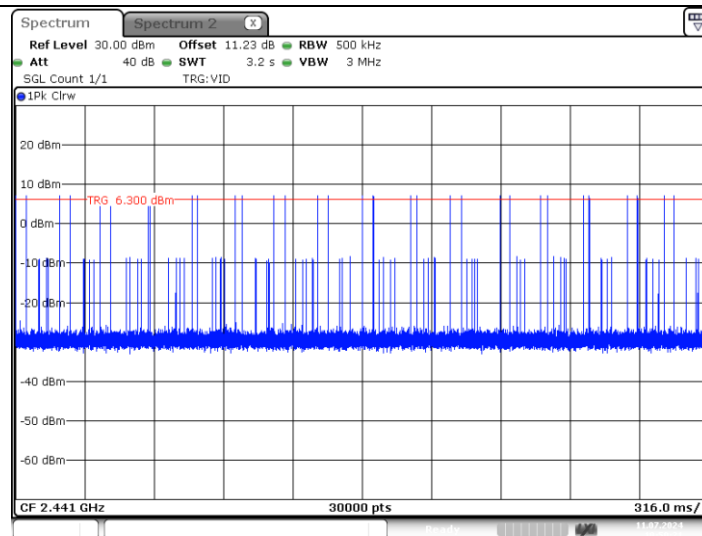


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3DH1_Ant1_Hop

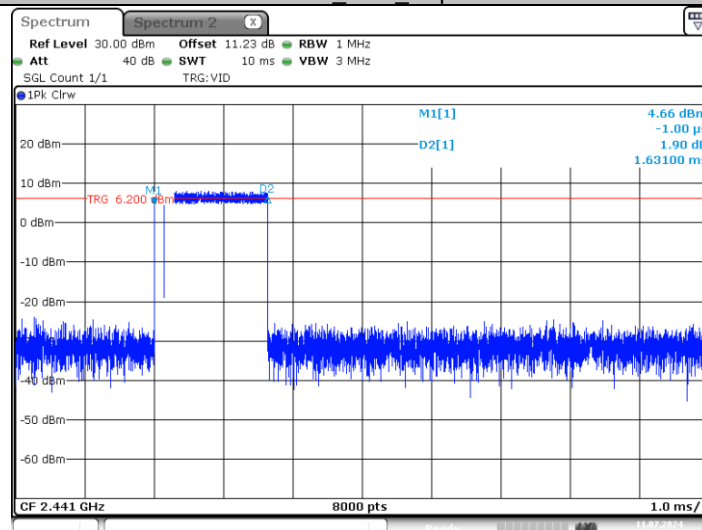


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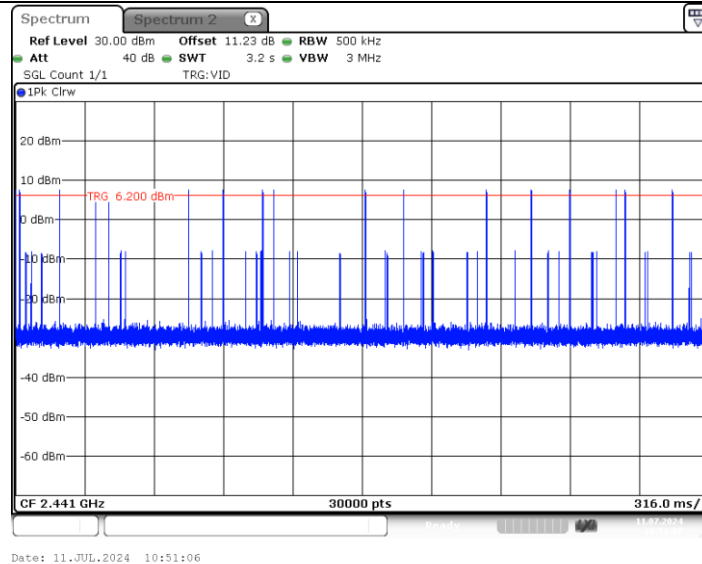


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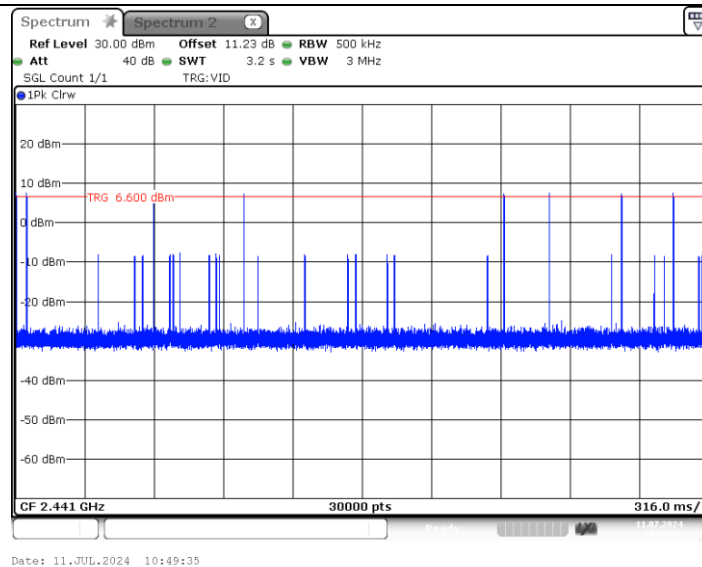
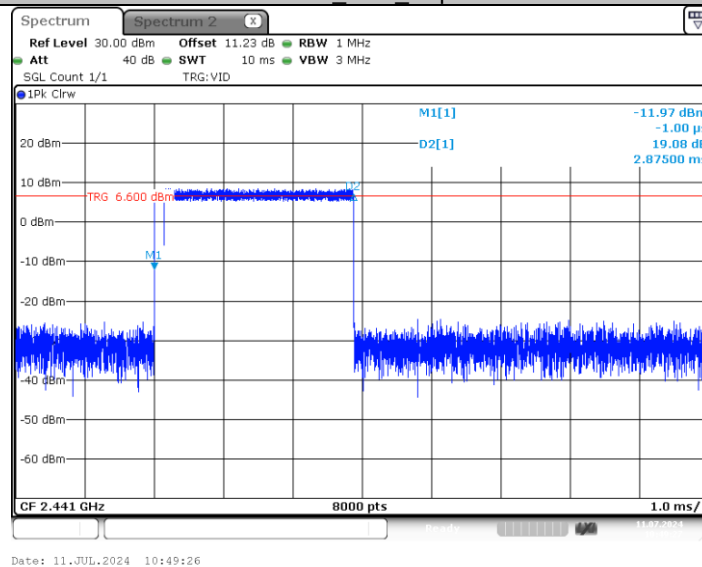
3DH3_Ant1_Hop



Date: 11.JUL.2024 10:50:58



3DH5_Ant1_Hop



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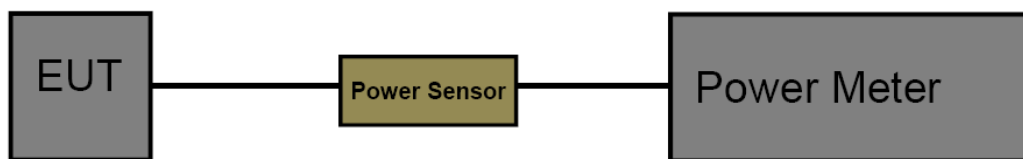
3.9. Peak Output Power

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(1) / RSS-247 5.4 b

Section	Test Item	Limit	Frequency Range (MHz)
FCC CFR 47 Part 15.247 (b)(1)	Maximum Conducted Output Power	Hopping Channels ≥ 75 , Power $< 1\text{W}$ (30dBm); Others $< 125\text{mW}$ (21dBm)	2400~2483.5
ISED RSS-247 5.4 b	EIRP	4 Watt or 36dBm	2400~2483.5

Test Configuration



Test Procedure

1. The maximum conducted output power may be measured using a broadband Peak RF power meter.
2. Peak power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor.
3. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.
Record the measurement data.

Test Mode

Please refer to the clause 2.4.

**Test Result**

Test Mode	Frequency(MHz)	Peak Output Power[dBm]	Limit[dBm]	Verdict
DH5	2402	6.06	≤30	PASS
	2441	5.82	≤30	PASS
	2480	4.81	≤30	PASS
2DH5	2402	9.86	≤30	PASS
	2441	9.45	≤30	PASS
	2480	8.29	≤30	PASS
3DH5	2402	10.24	≤30	PASS
	2441	9.47	≤30	PASS
	2480	8.18	≤30	PASS

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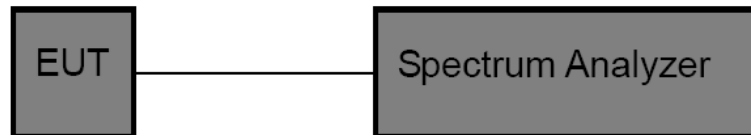


3.10. Duty Cycle

Limit

None, for report purposes only.

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.
3. Spectrum Setting:
Set analyzer center frequency to test channel center frequency.
Set the span to 0Hz.
Set the RBW to 10MHz.
Set the VBW to 10MHz.
Detector: Peak.
Sweep time: Auto.
Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

Test Mode

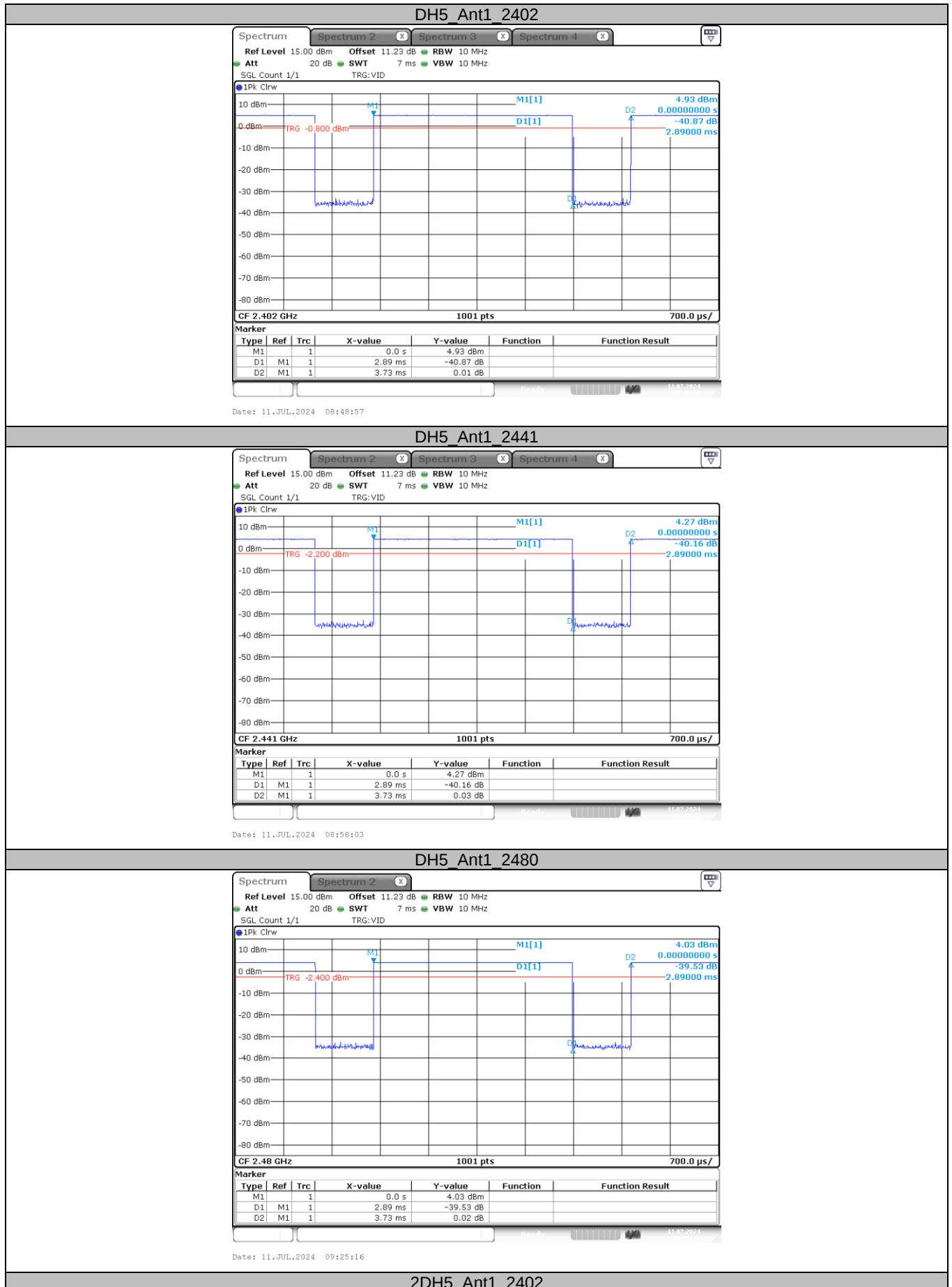
Please refer to the clause 2.4.

Test Result

Test Mode	Freq(MHz)	ON Time [ms]	Period [ms]	Duty Cycle [%]	1/T Minimum VBW (kHz)	Final Setting for VBW (kHz)
DH5	2402	2.89	3.73	77.48	0.35	1
	2441	2.89	3.73	77.48	0.35	1
	2480	2.89	3.73	77.48	0.35	1
2DH5	2402	2.90	3.74	77.54	0.34	1
	2441	2.89	3.74	77.27	0.35	1
	2480	2.90	3.74	77.54	0.34	1
3DH5	2402	2.89	3.74	77.27	0.35	1
	2441	2.89	3.73	77.48	0.35	1
	2480	2.89	3.75	77.07	0.35	1



Test Graphs:



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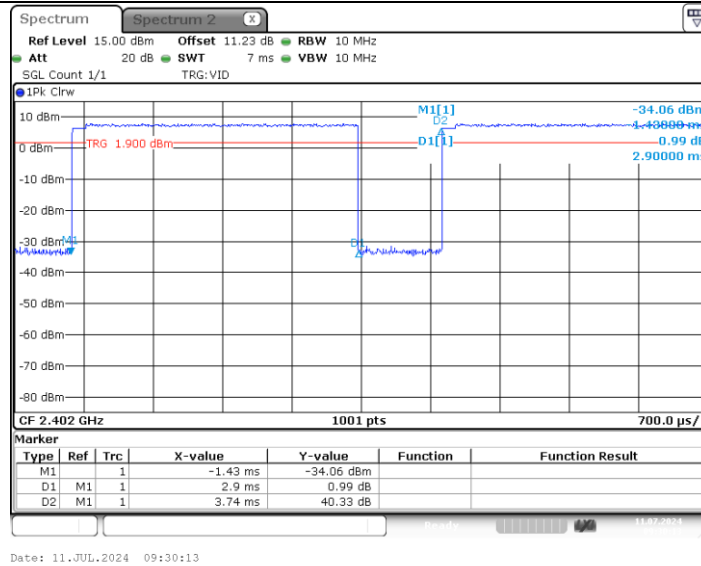
Room 101 Building B, No. 7, Lanqing 1st Road, Luhua Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China

Tel.: (86)755-27521059

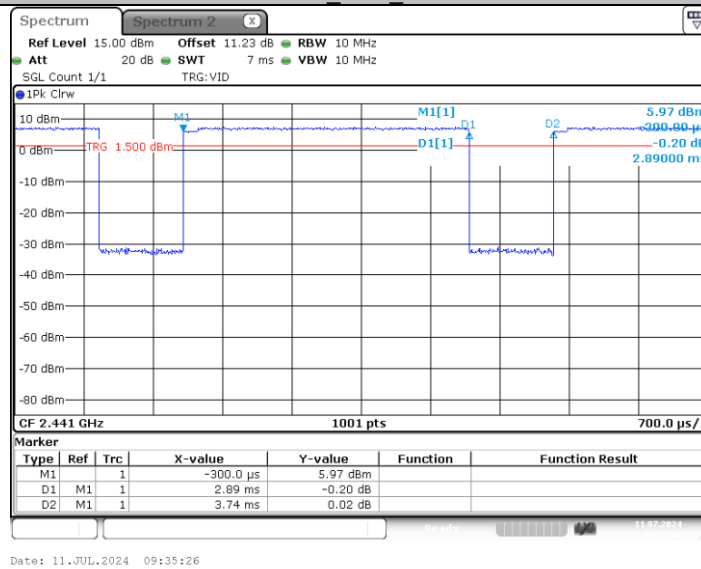
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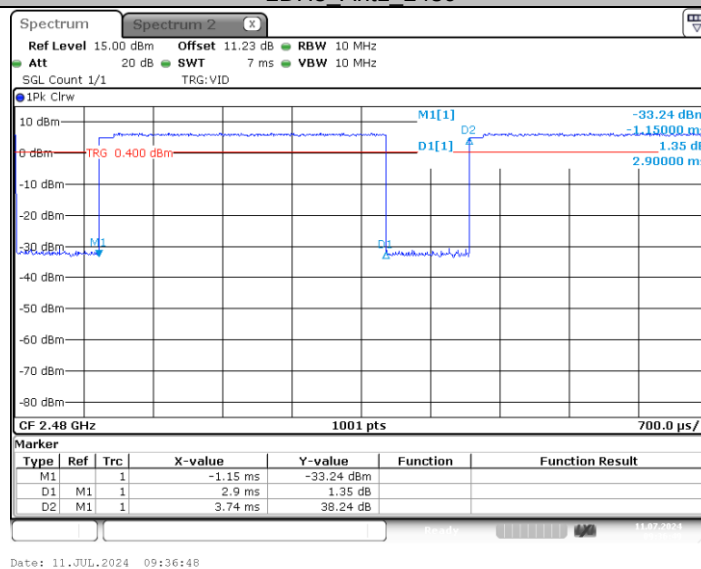
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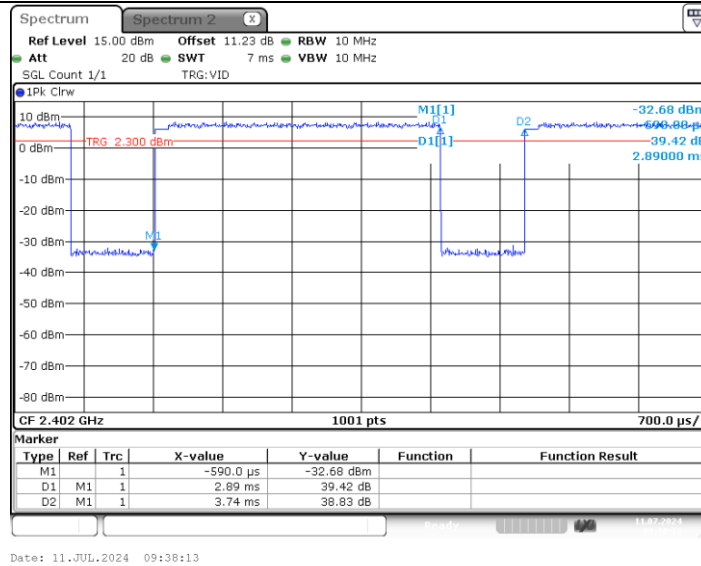
2DH5_Ant1_2441



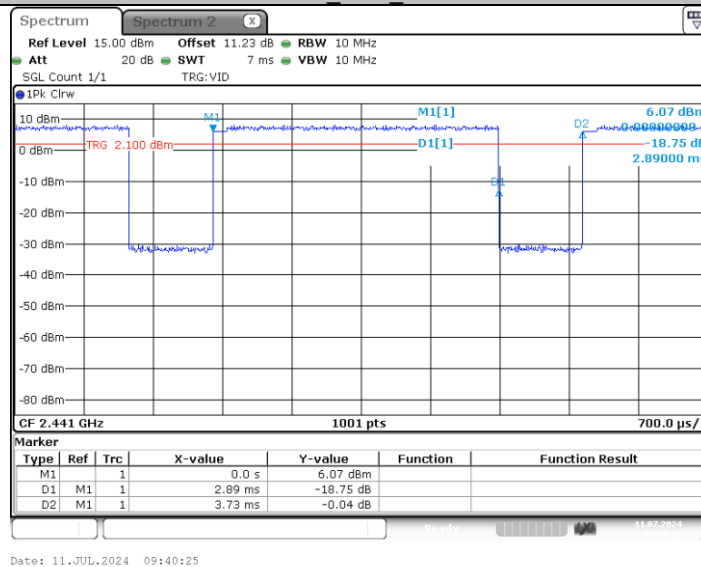
2DH5_Ant1_2480



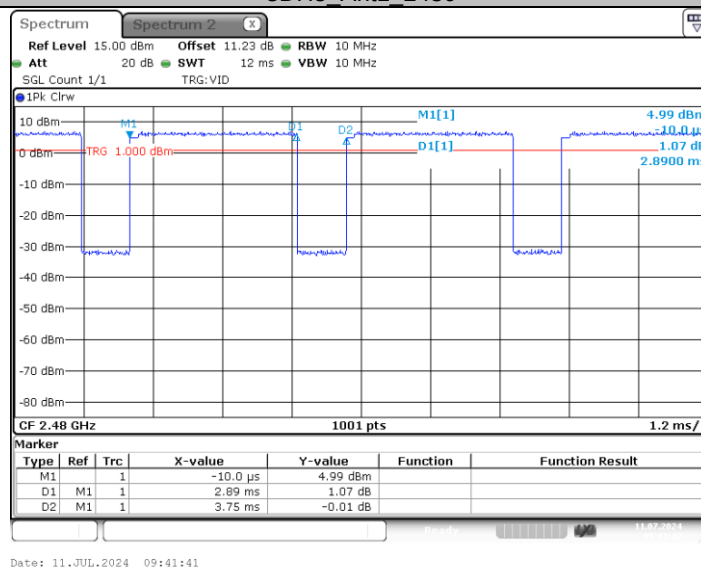
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



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3.11. Antenna Requirement

Requirement

FCC CFR Title 47 Part 15 Subpart C Section 15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i)

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

Test Result

The directional gain of the antenna is less than 6dBi, please refer to the EUT internal photographs antenna photo.

*****THE END*****