



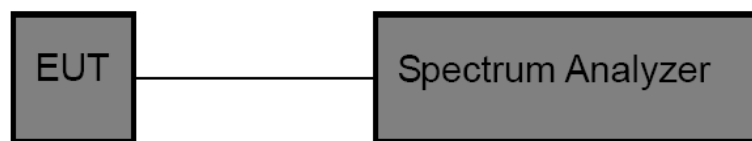
3.4. Band Edge and Spurious Emissions (Conducted)

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d) / RSS-247 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Test Configuration



Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Use the following spectrum analyzer settings:
RBW = 100 kHz, VBW \geq RBW, scan up through 10th harmonic.
Sweep = auto, Detector function = peak, Trace = max hold.
4. Measure and record the results in the test report.

Test Mode

Please refer to the clause 2.4.

**Test Result****Conducted Spurious Emission**

Test Mode	Antenna	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	7.91	7.91	---	PASS
			30~1000	7.91	-57.91	≤-22.09	PASS
			1000~26500	7.91	-27.47	≤-22.09	PASS
		2437	Reference	7.71	7.71	---	PASS
			30~1000	7.71	-58.31	≤-22.29	PASS
			1000~26500	7.71	-28.37	≤-22.29	PASS
		2462	Reference	8.03	8.03	---	PASS
			30~1000	8.03	-57.72	≤-21.97	PASS
			1000~26500	8.03	-30.40	≤-21.97	PASS
11G	Ant1	2412	Reference	-0.81	-0.81	---	PASS
			30~1000	-0.81	-58.34	≤-30.81	PASS
			1000~26500	-0.81	-44.22	≤-30.81	PASS
		2437	Reference	-2.29	-2.29	---	PASS
			30~1000	-2.29	-58.24	≤-32.29	PASS
			1000~26500	-2.29	-43.84	≤-32.29	PASS
		2462	Reference	-0.25	-0.25	---	PASS
			30~1000	-0.25	-58.55	≤-30.25	PASS
			1000~26500	-0.25	-48.03	≤-30.25	PASS
11N20SISO	Ant1	2412	Reference	-0.22	-0.22	---	PASS
			30~1000	-0.22	-58.07	≤-30.22	PASS
			1000~26500	-0.22	-45.58	≤-30.22	PASS
		2437	Reference	-0.12	-0.12	---	PASS
			30~1000	-0.12	-58.29	≤-30.12	PASS
			1000~26500	-0.12	-45.98	≤-30.12	PASS
		2462	Reference	-0.11	-0.11	---	PASS
			30~1000	-0.11	-58.72	≤-30.11	PASS
			1000~26500	-0.11	-47.17	≤-30.11	PASS
11N40SISO	Ant1	2422	Reference	-3.29	-3.29	---	PASS
			30~1000	-3.29	-58.33	≤-33.29	PASS
			1000~26500	-3.29	-46.30	≤-33.29	PASS
		2437	Reference	-3.23	-3.23	---	PASS
			30~1000	-3.23	-58.39	≤-33.23	PASS
			1000~26500	-3.23	-45.28	≤-33.23	PASS
		2452	Reference	-3.20	-3.20	---	PASS
			30~1000	-3.20	-58.14	≤-33.20	PASS
			1000~26500	-3.20	-49.41	≤-33.20	PASS

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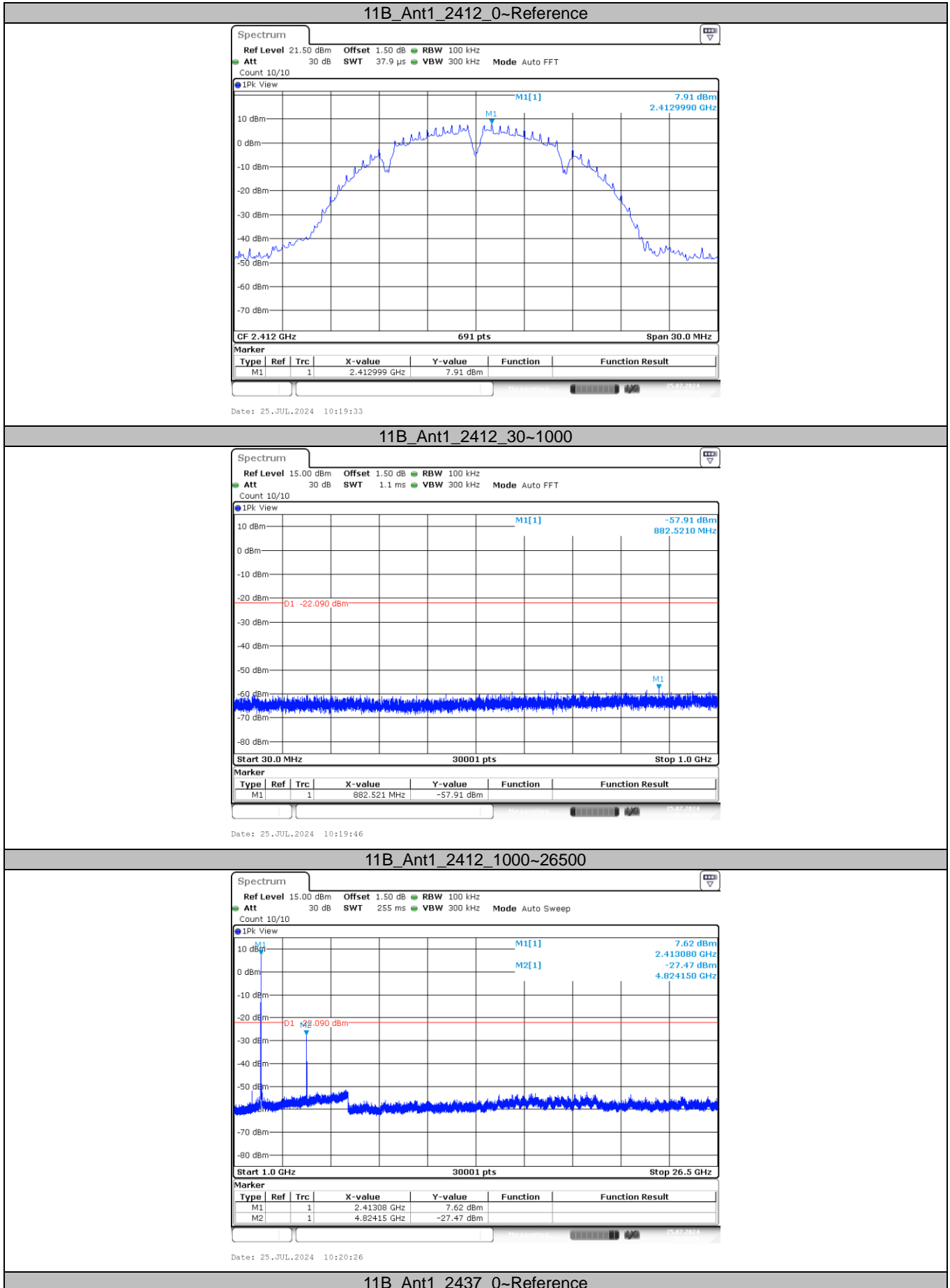
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TRF No: CTC-TR-057_A1

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Test Graphs:

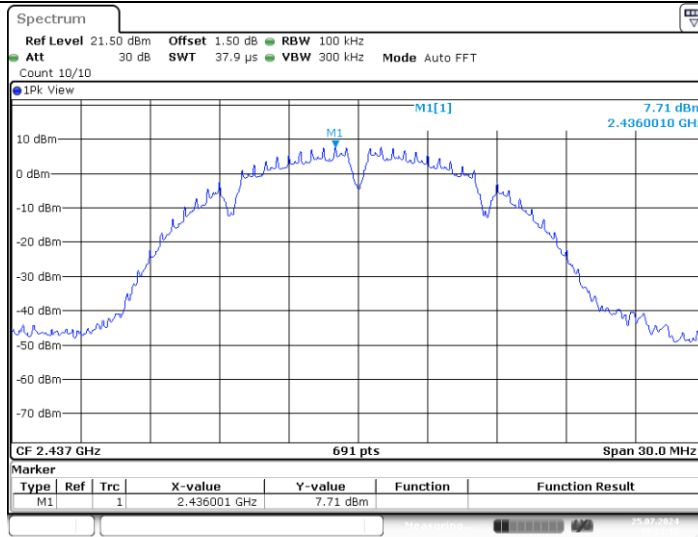


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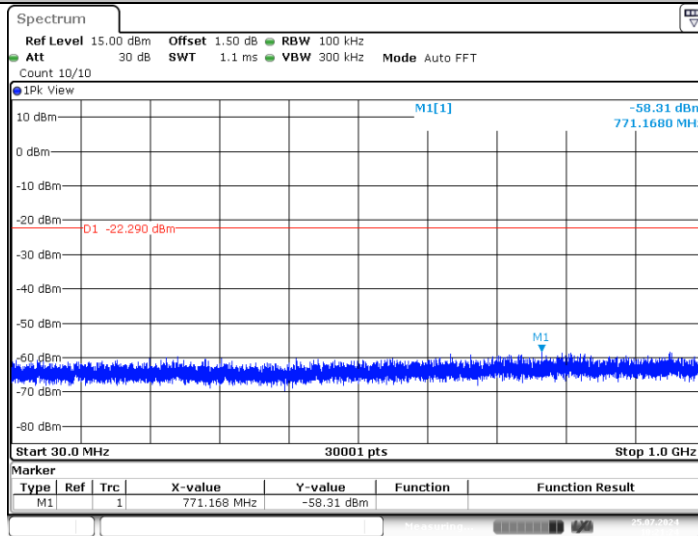
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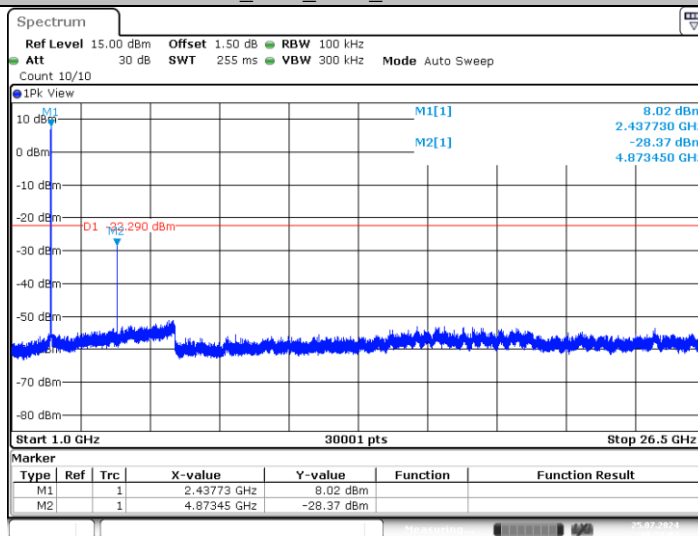
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11B_Ant1_2437_30~1000



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11B_Ant1_2437_1000~26500



Date: 25.JUL.2024 10:22:04

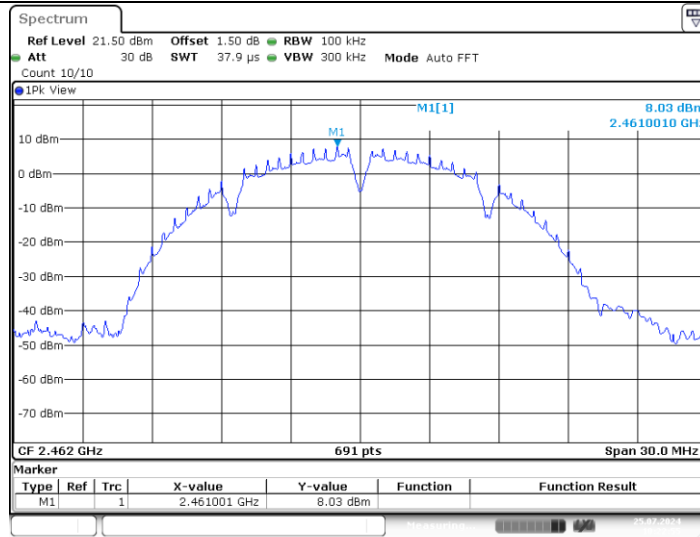
11B_Ant1_2462_0~Reference

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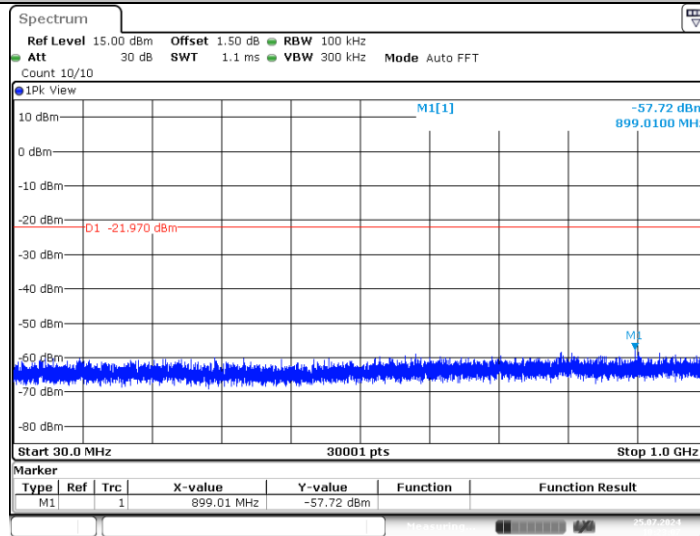
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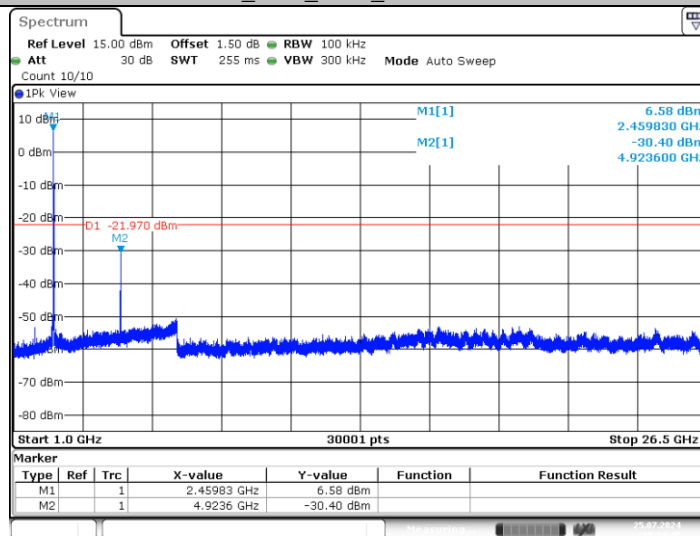
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11B_Ant1_2462_30~1000



Date: 25.JUL.2024 10:23:07

11B_Ant1_2462_1000~26500



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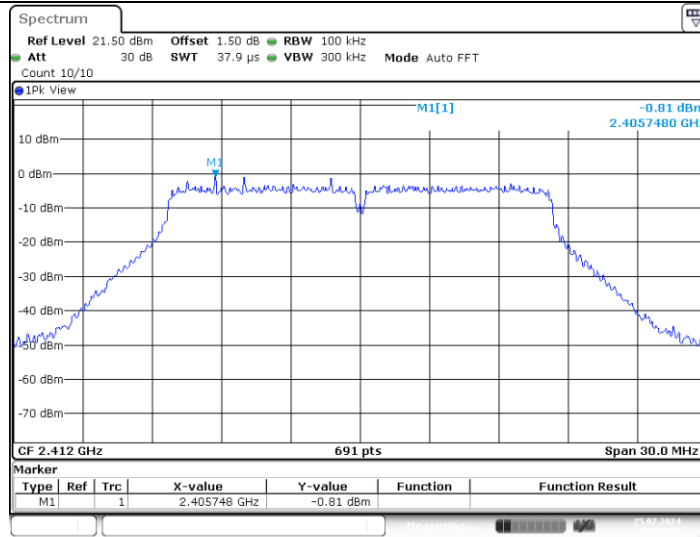
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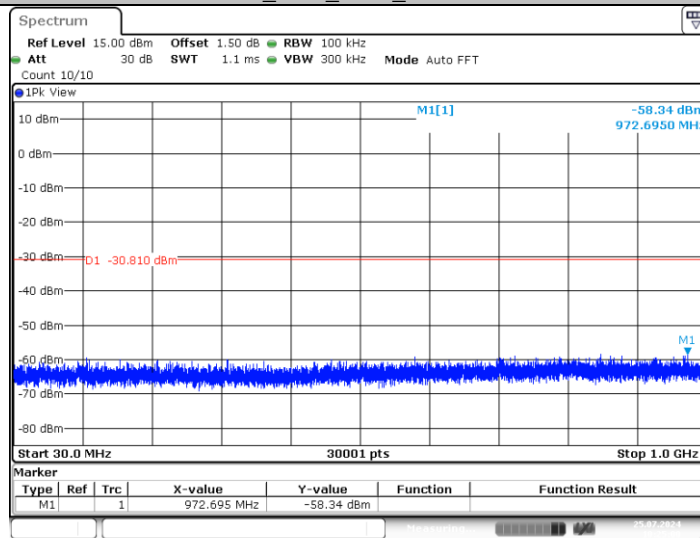
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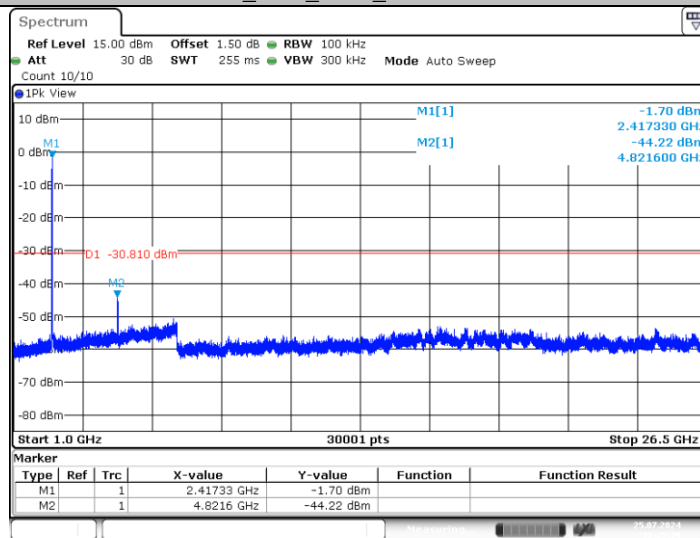
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11G_Ant1_2412_30~1000



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11G_Ant1_2412_1000~26500



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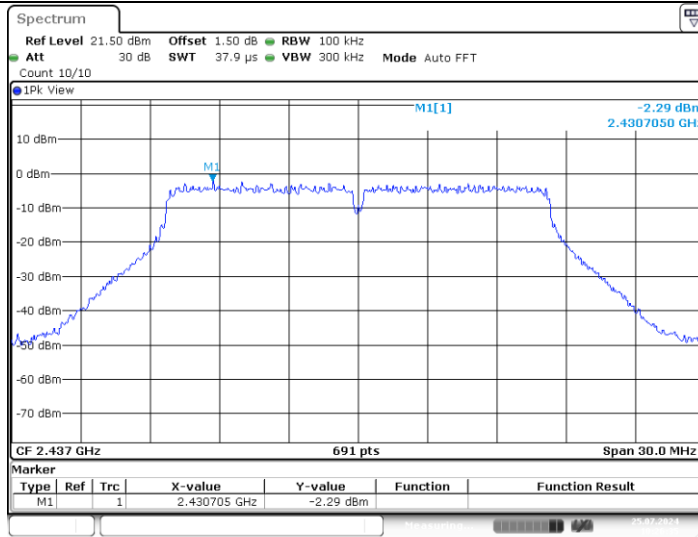
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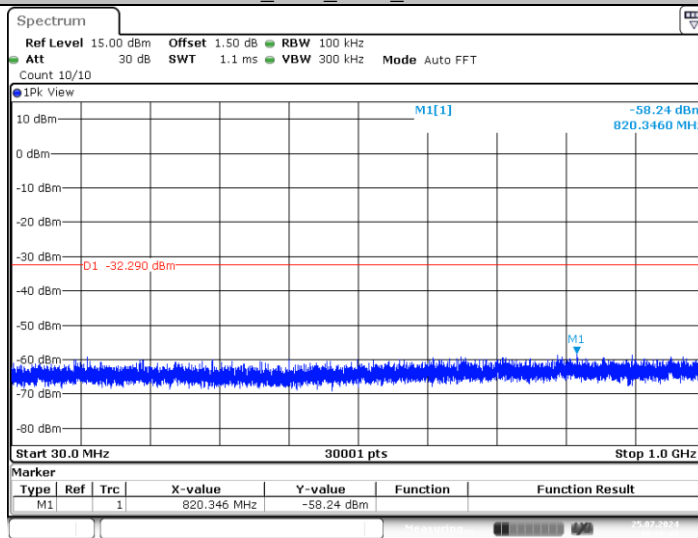
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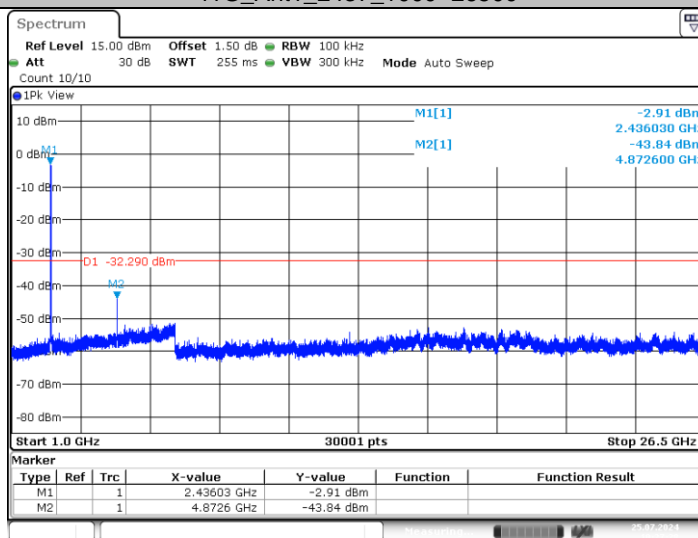
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11G_Ant1_2437_1000~26500



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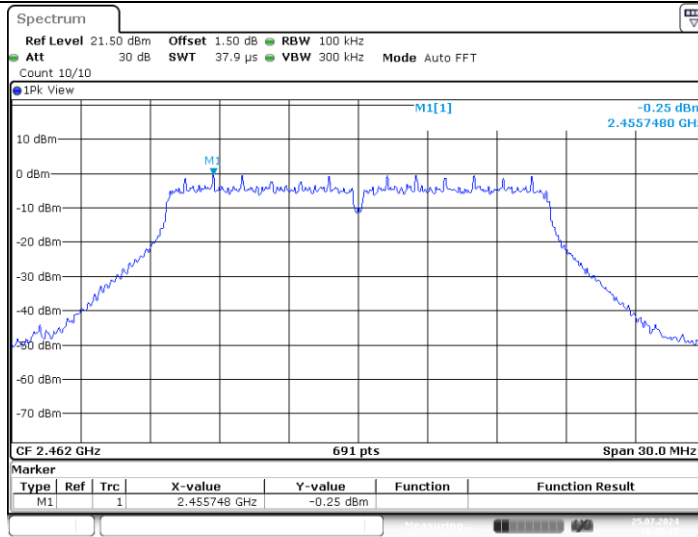
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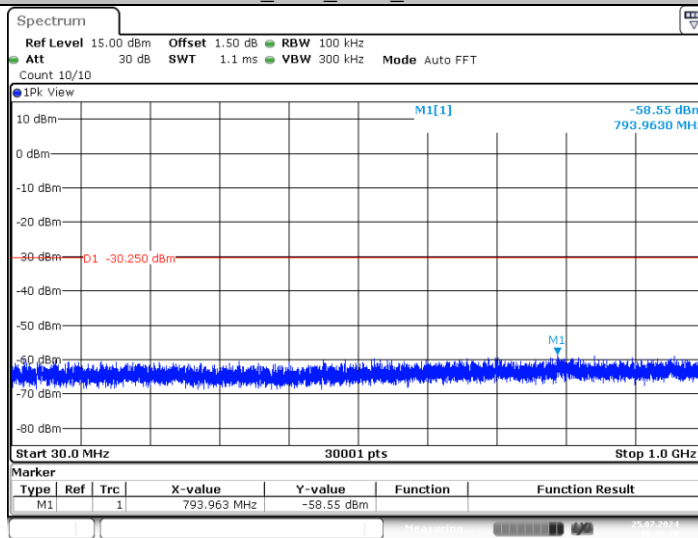
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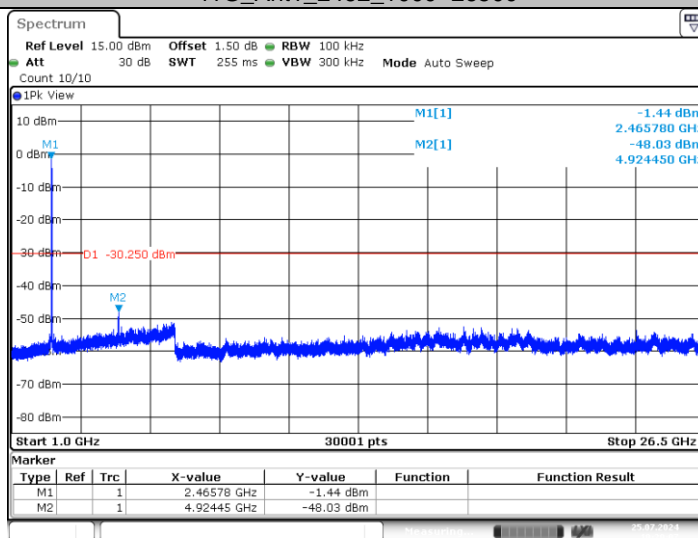
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11G_Ant1_2462_1000~26500



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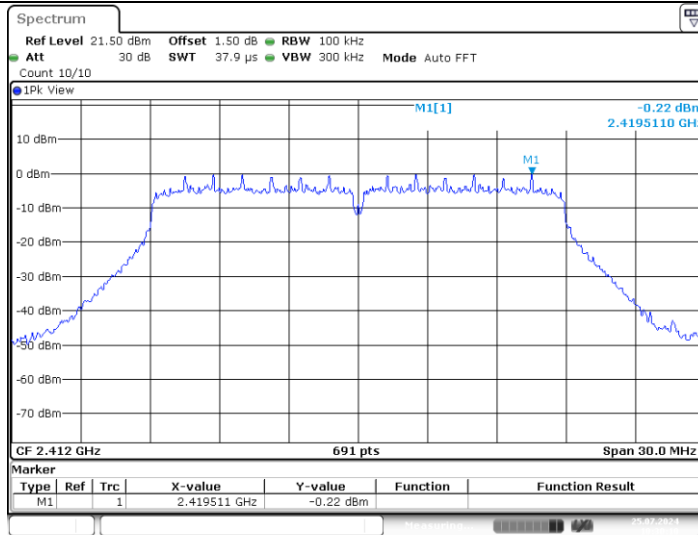
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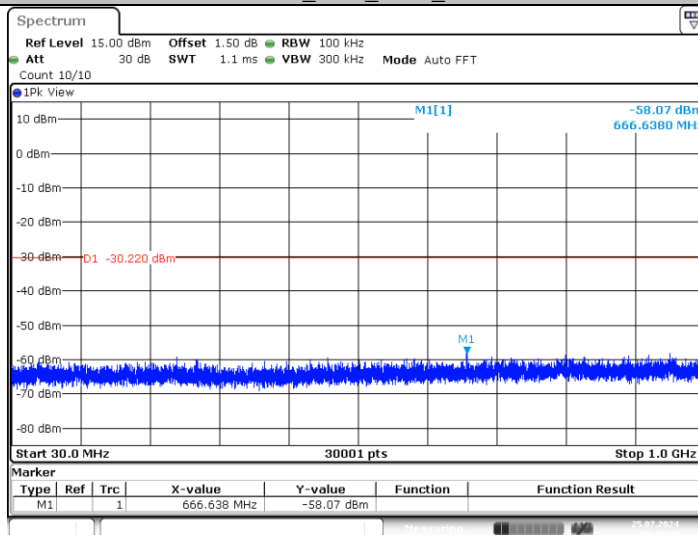
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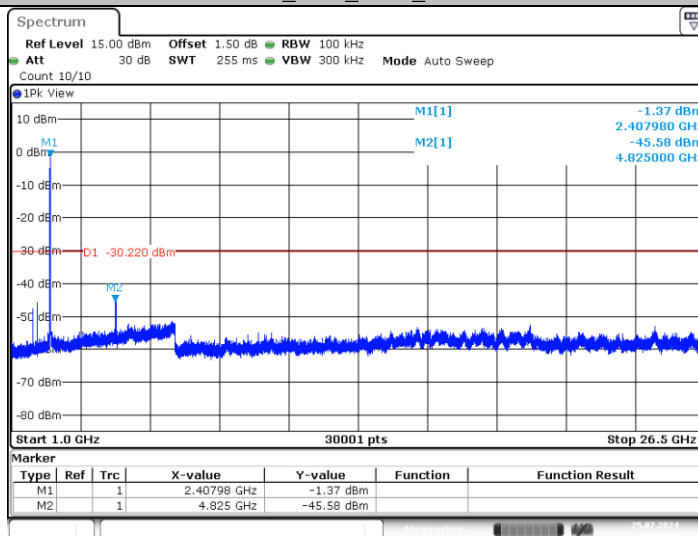
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11N20SISO_Ant1_2412_1000~26500



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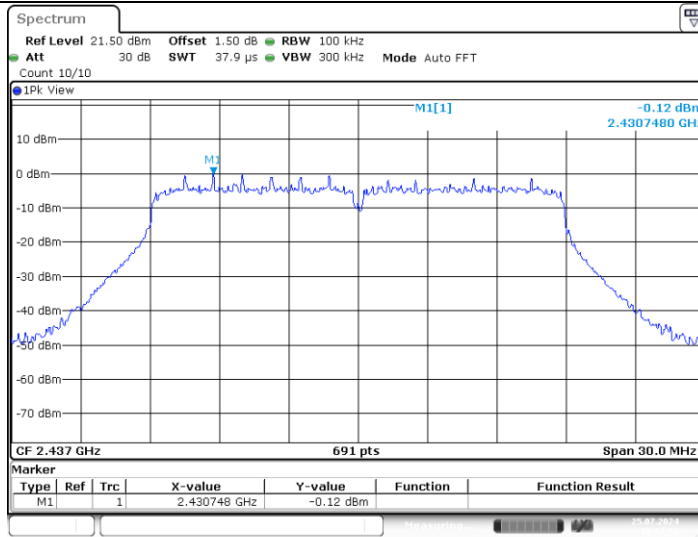
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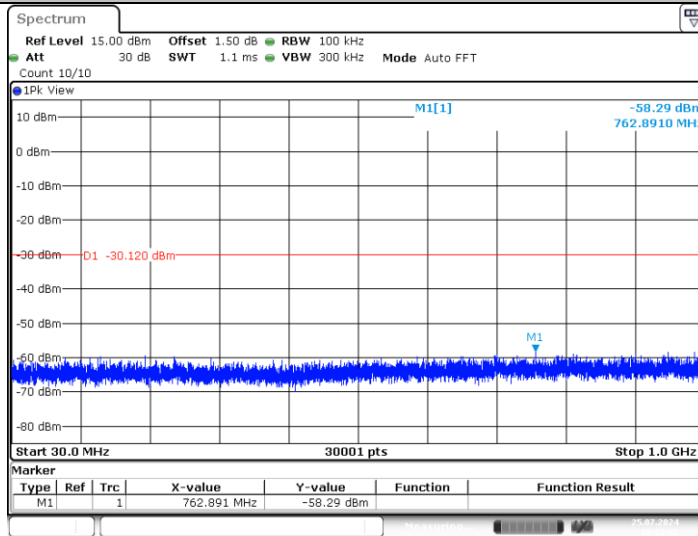
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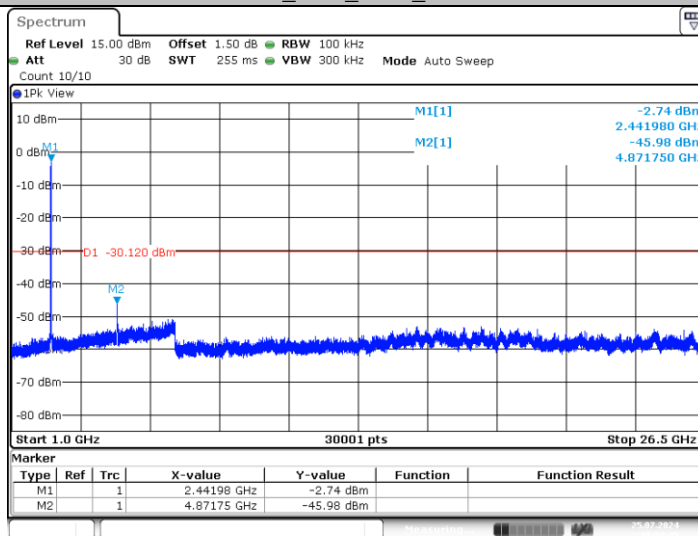
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11N20SISO_Ant1_2437_30~1000



Date: 25.JUL.2024 10:33:05

11N20SISO_Ant1_2437_1000~26500



Date: 25.JUL.2024 10:33:45

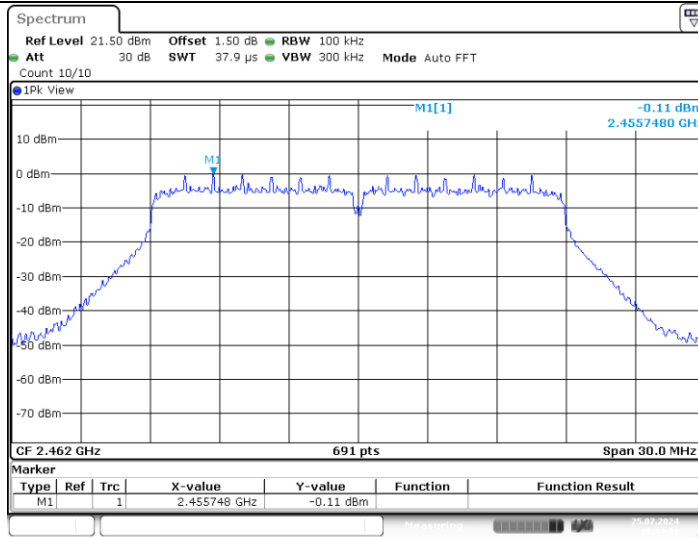
11N20SISO_Ant1_2462_0~Reference

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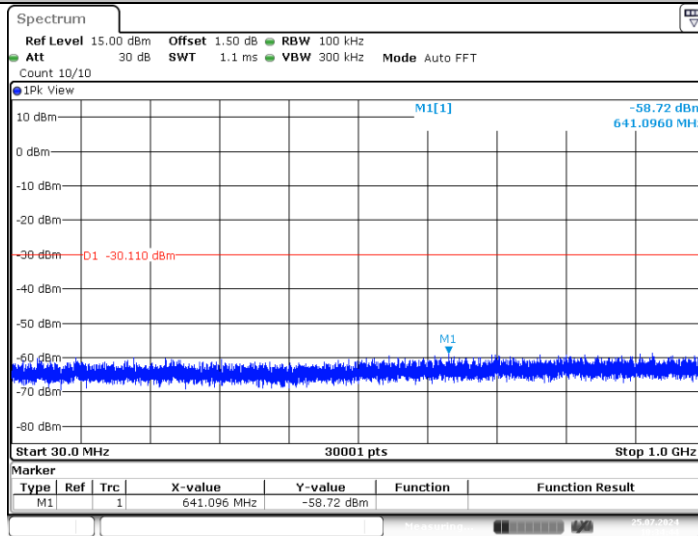
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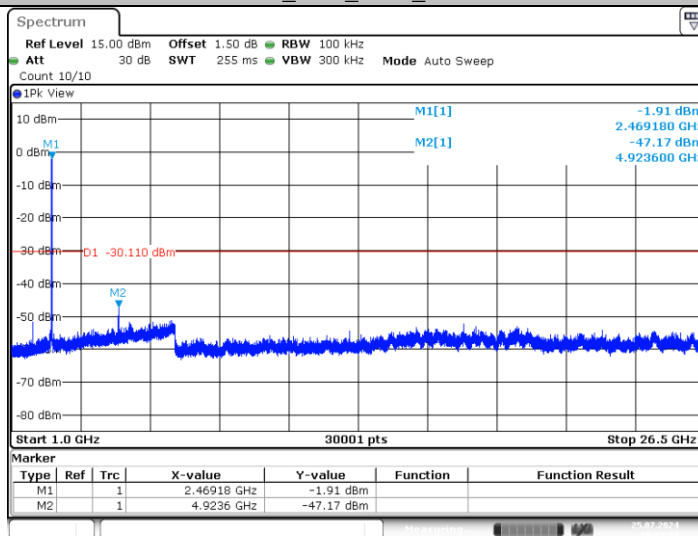
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11N20SISO_Ant1_2462_1000~26500



Date: 25.JUL.2024 10:35:24

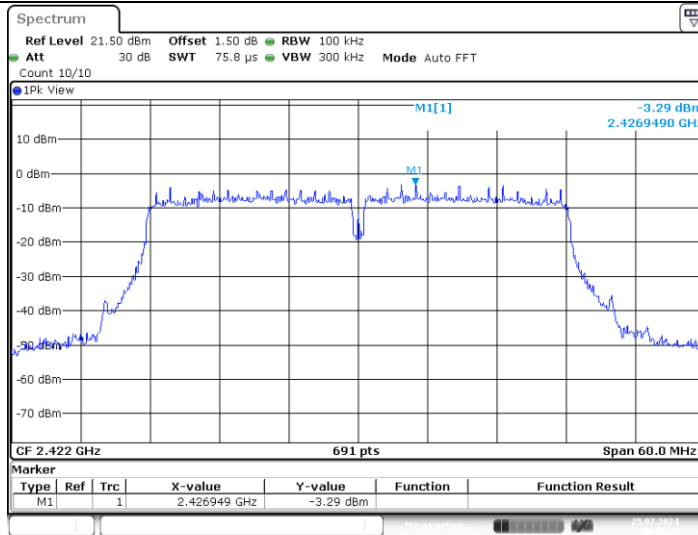
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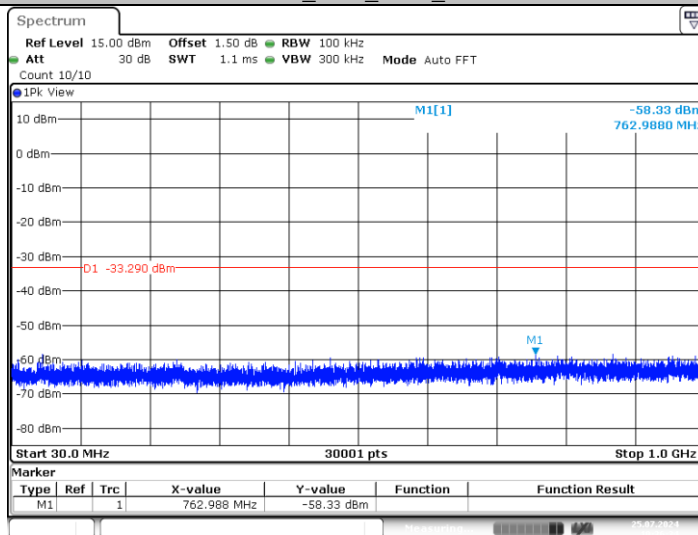
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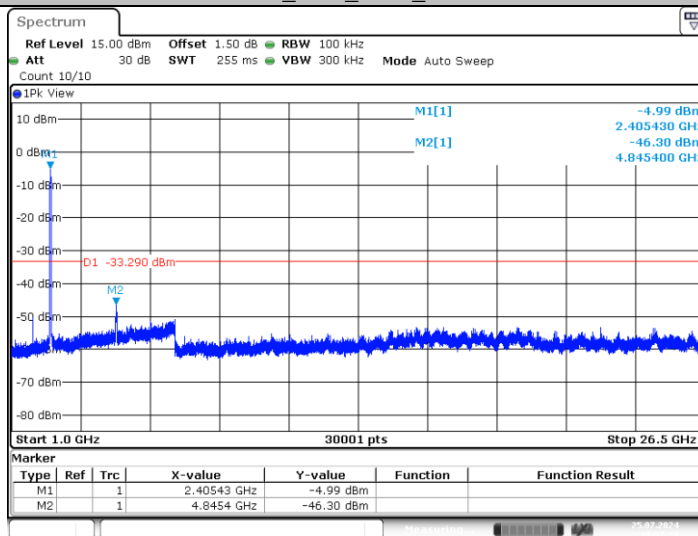
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11N40SISO_Ant1_2422_30~1000



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11N40SISO_Ant1_2422_1000~26500



Date: 25.JUL.2024 10:37:13

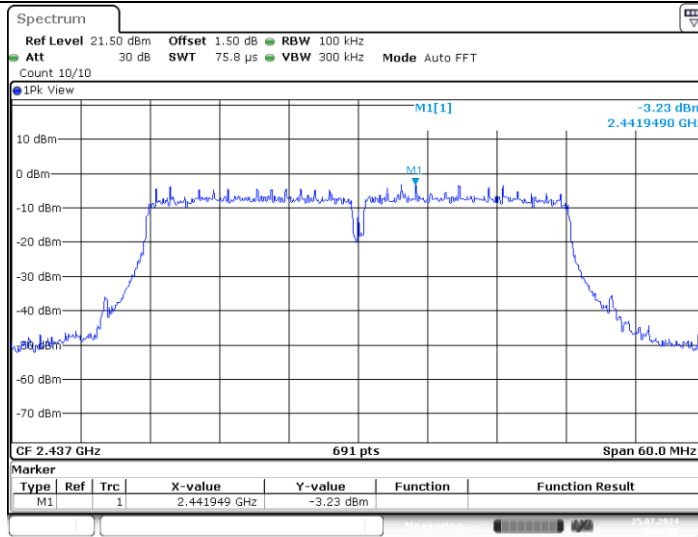
11N40SISO_Ant1_2437_0~Reference

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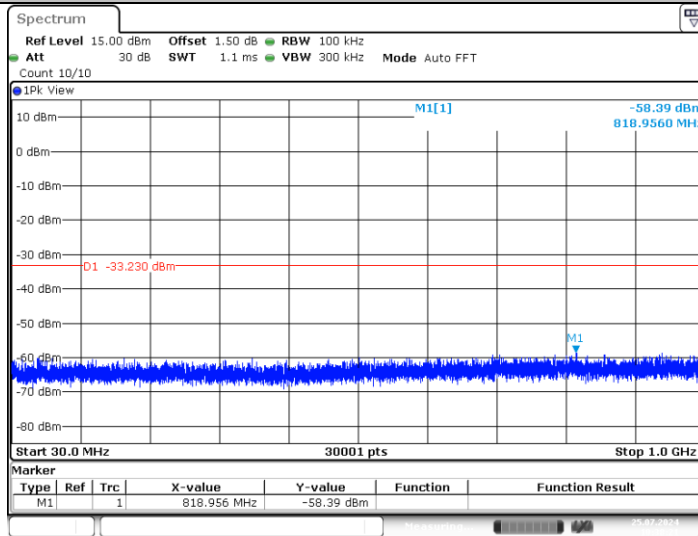
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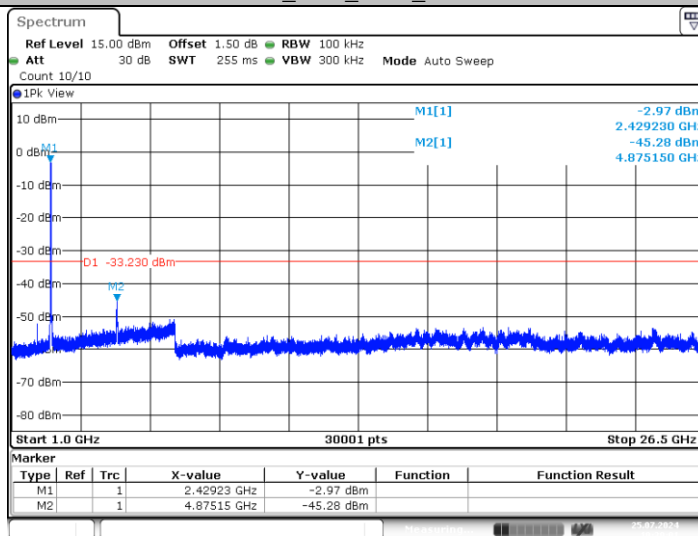
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11N40SISO_Ant1_2437_30~1000



Date: 25-JUL-2024 10:38:21

11N40SISO_Ant1_2437_1000~26500



Date: 25-JUL-2024 10:39:00

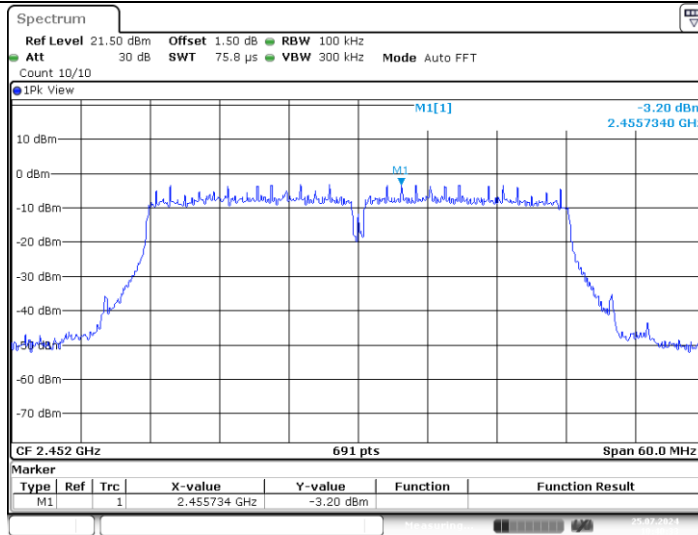
11N40SISO_Ant1_2452_0~Reference

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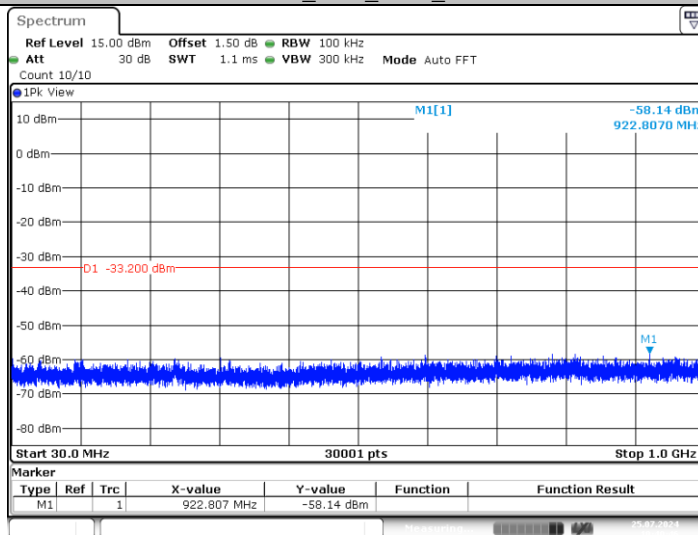
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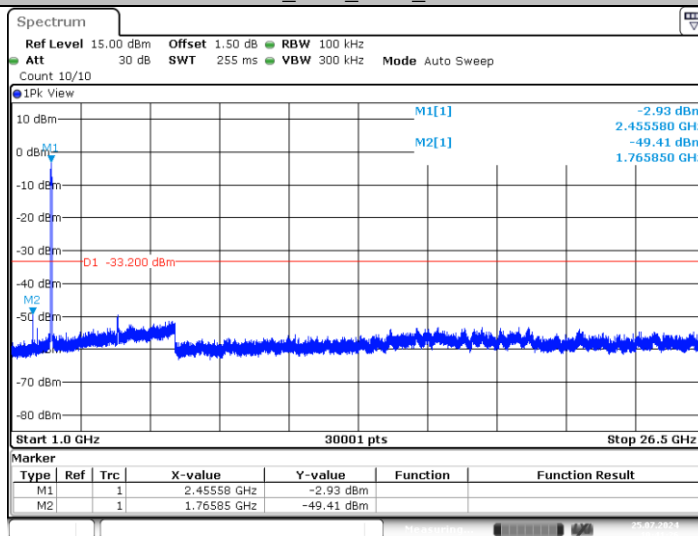
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11N40SISO_Ant1_2452_30~1000



Date: 25-JUL-2024 10:40:46

11N40SISO_Ant1_2452_1000~26500



Date: 25-JUL-2024 10:41:26

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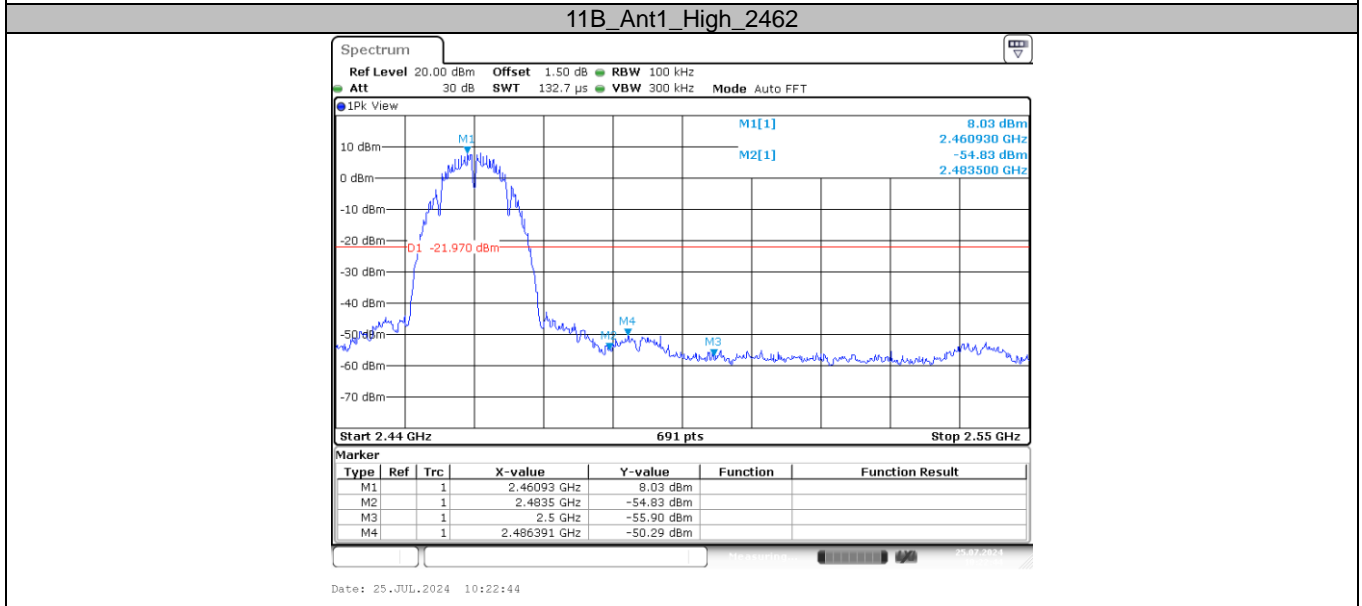
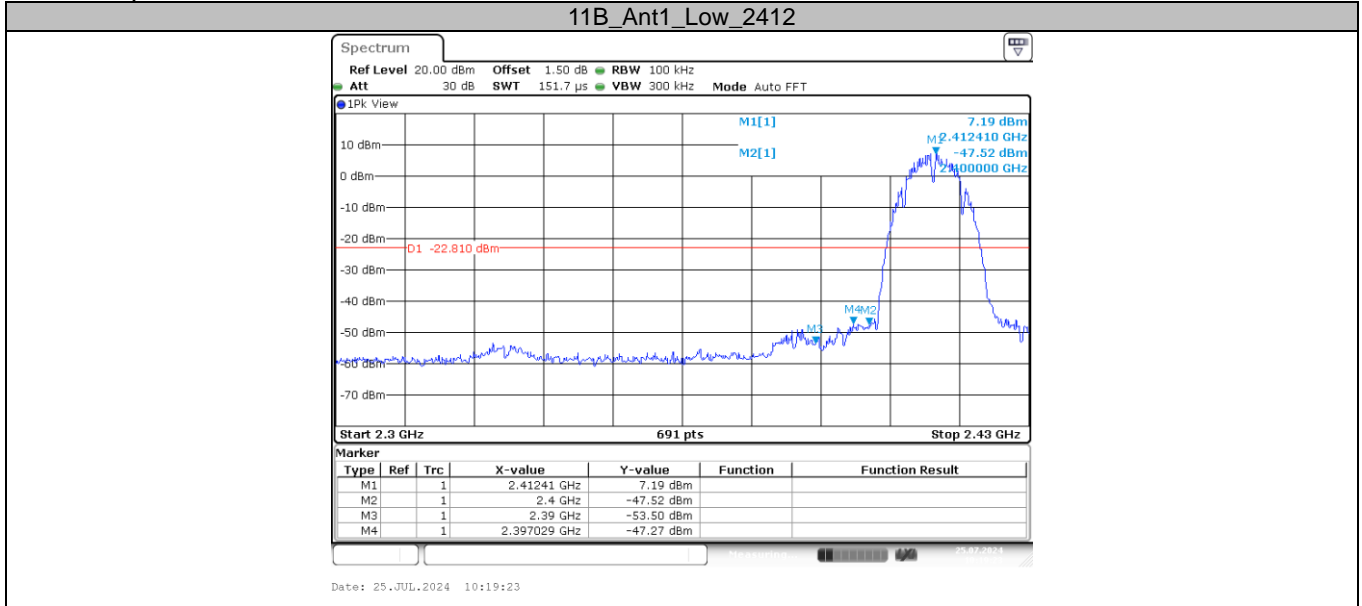
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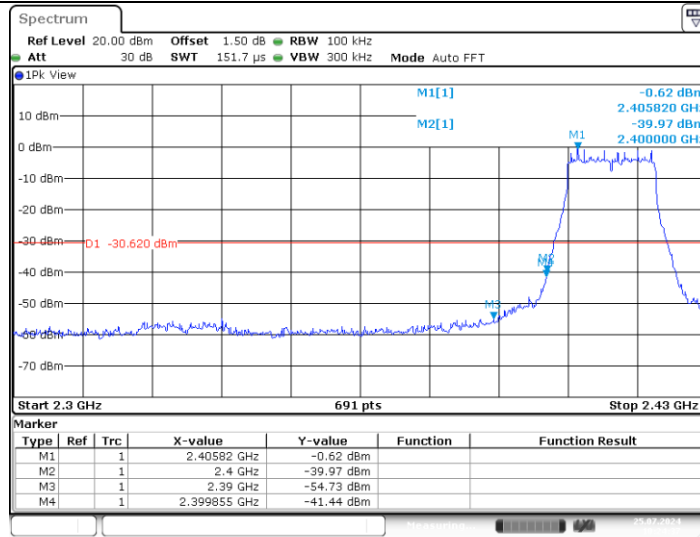
Conducted Band Edge

Test Mode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	7.19	-47.27	≤-22.81	PASS
		High	2462	8.03	-50.29	≤-21.97	PASS
11G	Ant1	Low	2412	-0.62	-41.44	≤-30.62	PASS
		High	2462	-3.10	-53.87	≤-33.10	PASS
11N20SISO	Ant1	Low	2412	-1.05	-39.49	≤-31.05	PASS
		High	2462	-2.55	-53.05	≤-32.55	PASS
11N40SISO	Ant1	Low	2422	-2.86	-41.91	≤-32.86	PASS
		High	2452	-2.98	-49.29	≤-32.98	PASS

Test Graphs:

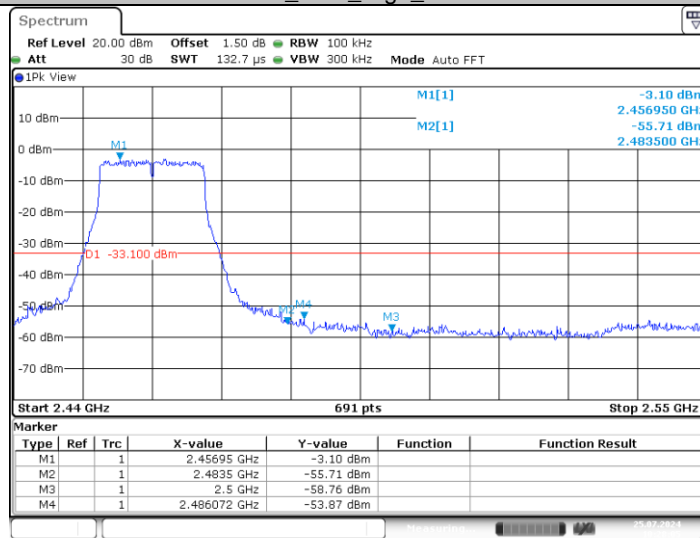


11G_Ant1_Low_2412



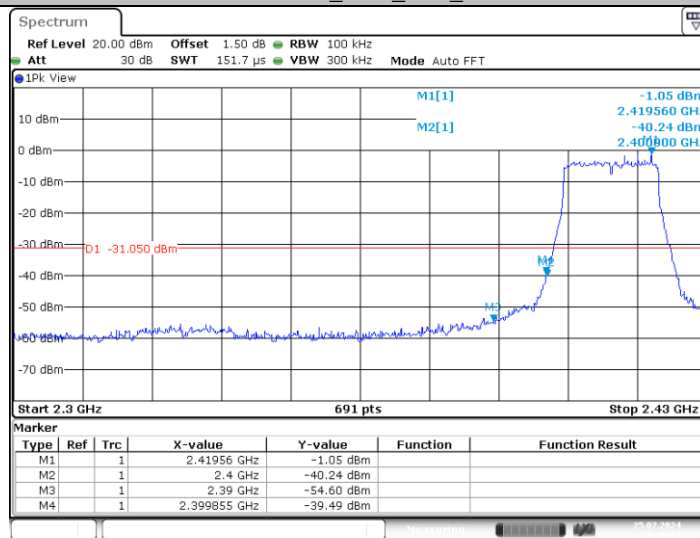
Date: 25.JUL.2024 10:24:37

11G_Ant1_High_2462



Date: 25.JUL.2024 10:28:04

11N20SISO_Ant1_Low_2412



Date: 25.JUL.2024 10:30:00

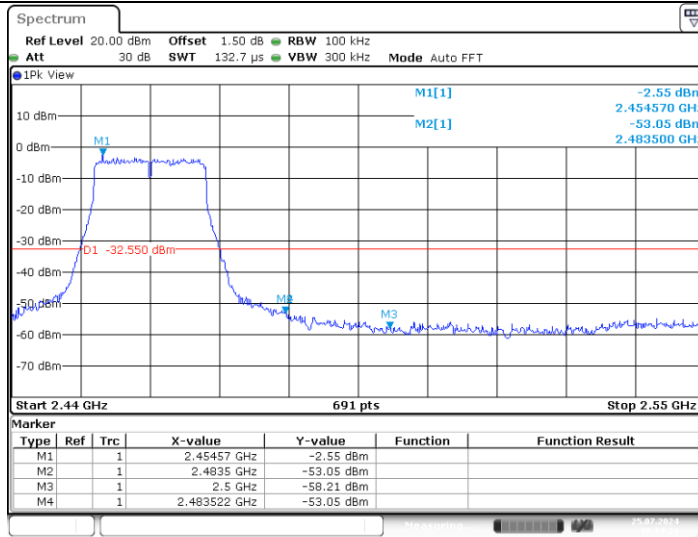
11N20SISO_Ant1_High_2462

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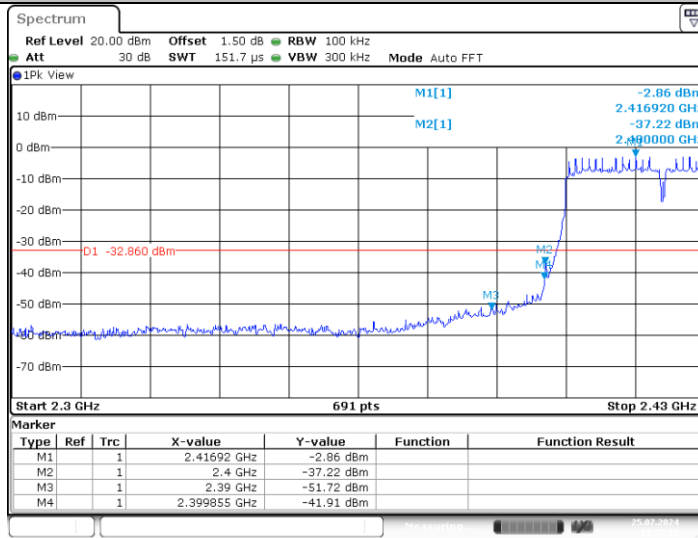
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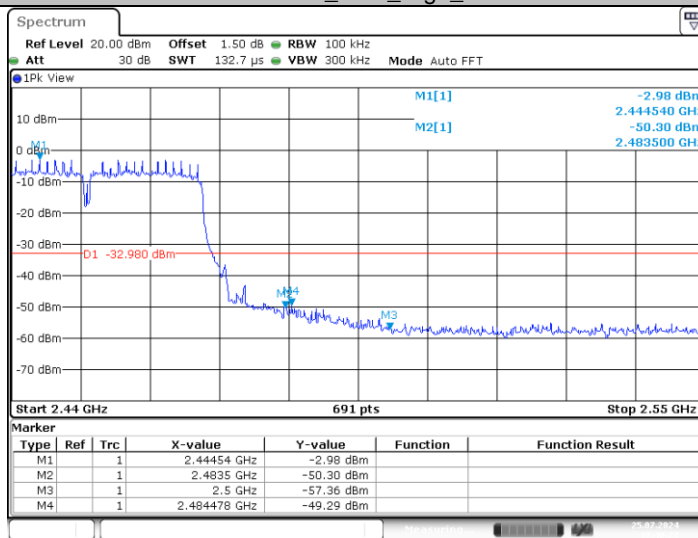
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11N40SISO_Ant1_Low_2422



11N40SISO_Ant1_High_2452



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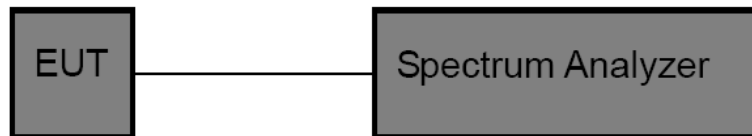
3.5. DTS Bandwidth

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2) / RSS-247 5.2 a

Test Item	Limit	Frequency Range (MHz)
DTS Bandwidth	≥ 500 kHz (6dB bandwidth)	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. DTS 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.OCB 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

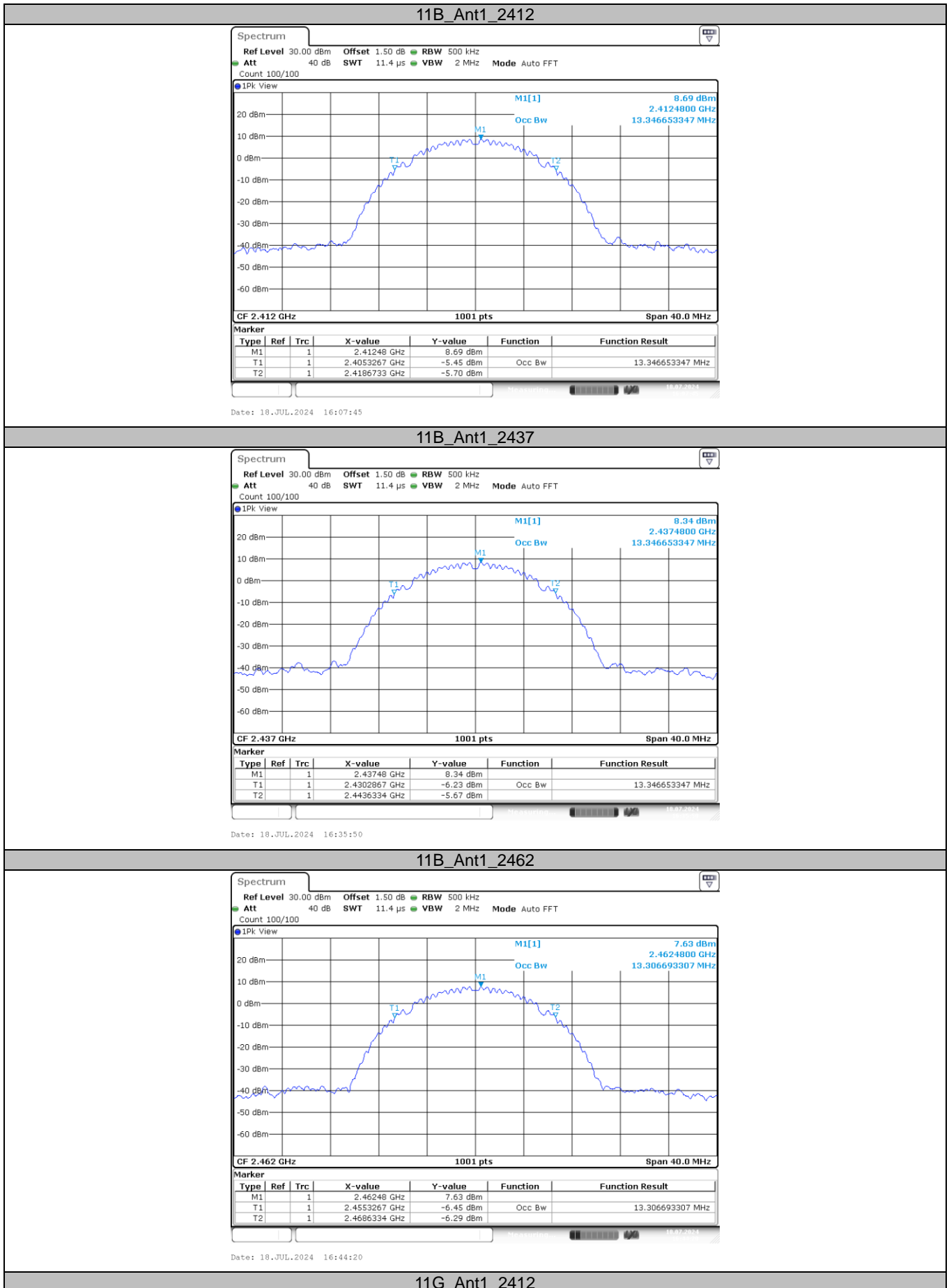
Please refer to the clause 2.4.

**Test Result**

Test Mode	Antenna	Channel	OCB [MHz]	DTS BW [MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	13.347	9.04	0.5	PASS
		2437	13.347	8.56	0.5	PASS
		2462	13.307	9.04	0.5	PASS
11G	Ant1	2412	17.103	16.52	0.5	PASS
		2437	17.263	16.56	0.5	PASS
		2462	17.143	16.32	0.5	PASS
11N20SISO	Ant1	2412	17.982	17.60	0.5	PASS
		2437	17.982	17.56	0.5	PASS
		2462	18.062	17.56	0.5	PASS
11N40SISO	Ant1	2422	36.284	35.68	0.5	PASS
		2437	36.204	35.68	0.5	PASS
		2452	36.204	35.92	0.5	PASS



Occupied Bandwidth:

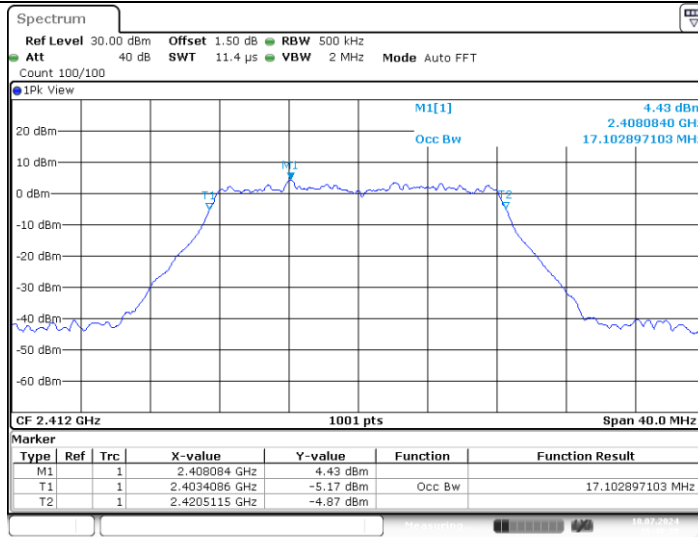


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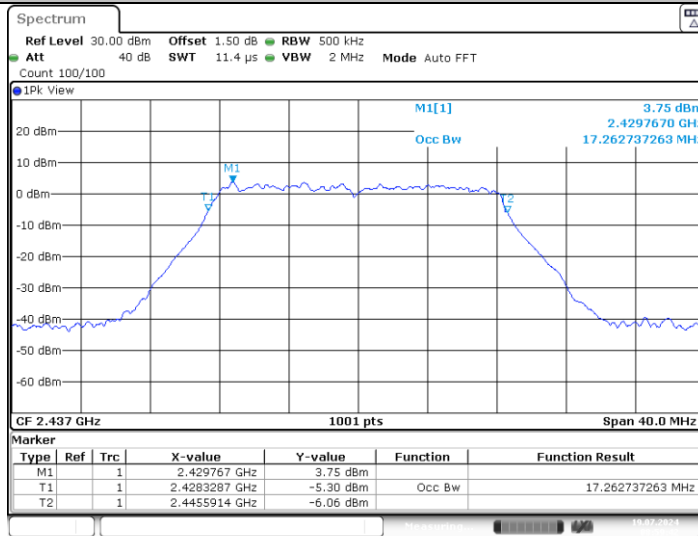
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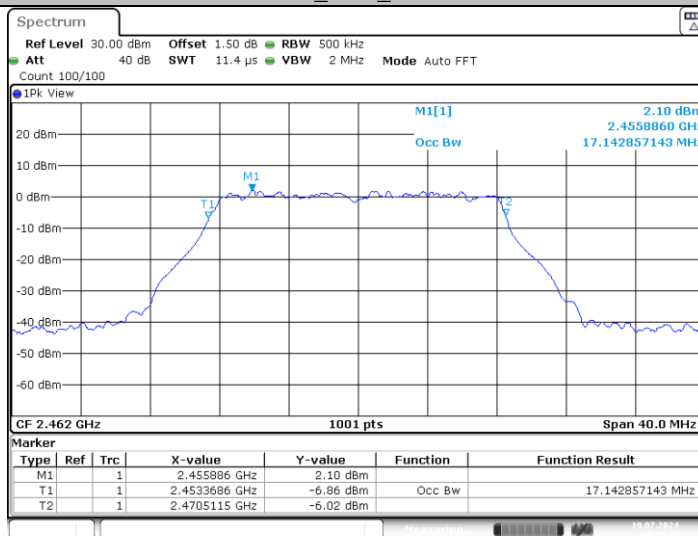
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11G_Ant1_2437



Date: 19.JUL.2024 08:59:41

11G_Ant1_2462



Date: 19.JUL.2024 09:15:17

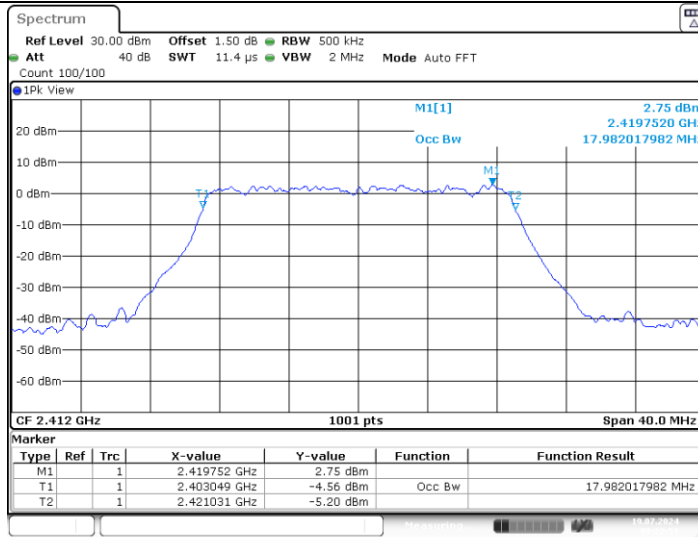
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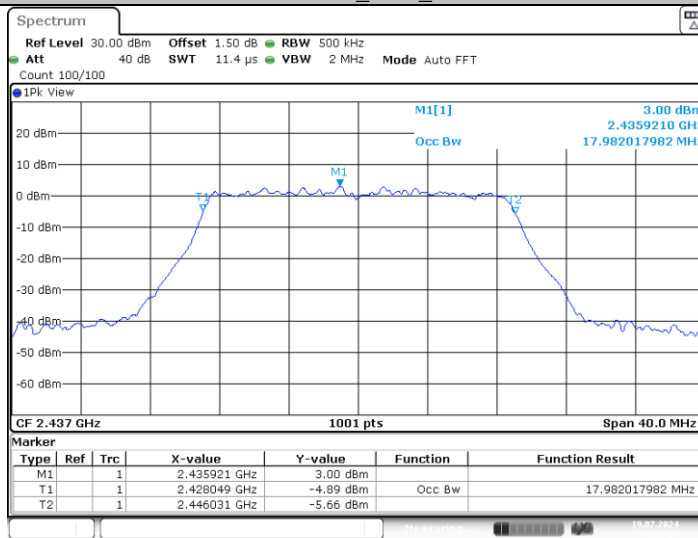
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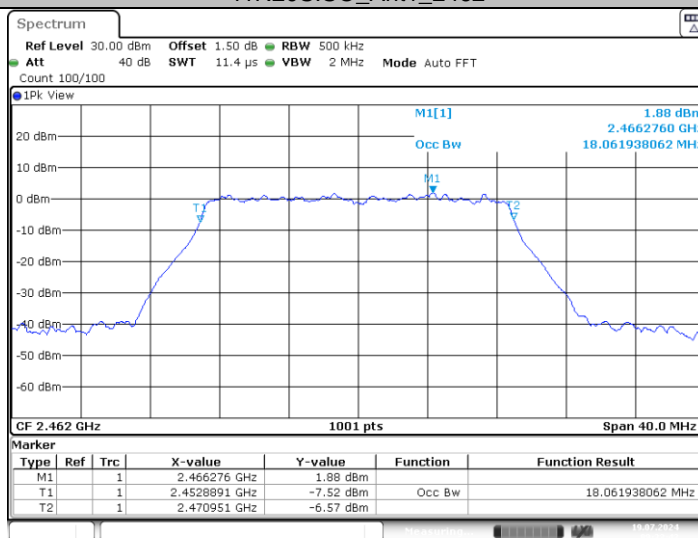
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11N20SISO_Ant1_2437



11N20SISO_Ant1_2462



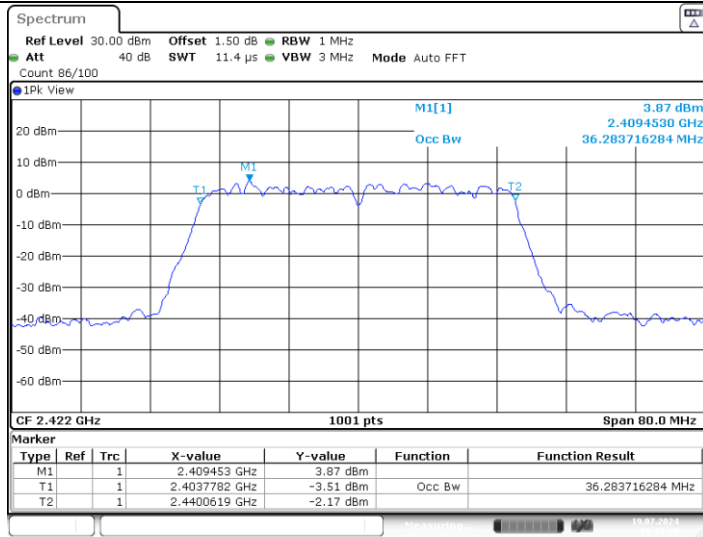
11N40SISO_Ant1_2422

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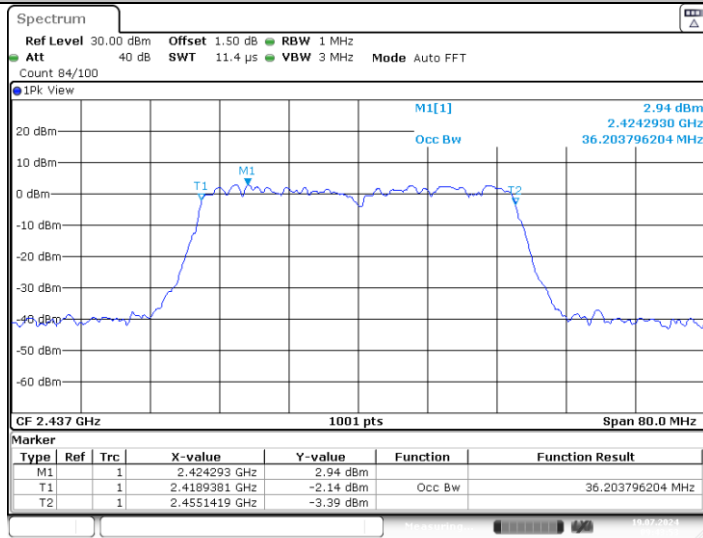
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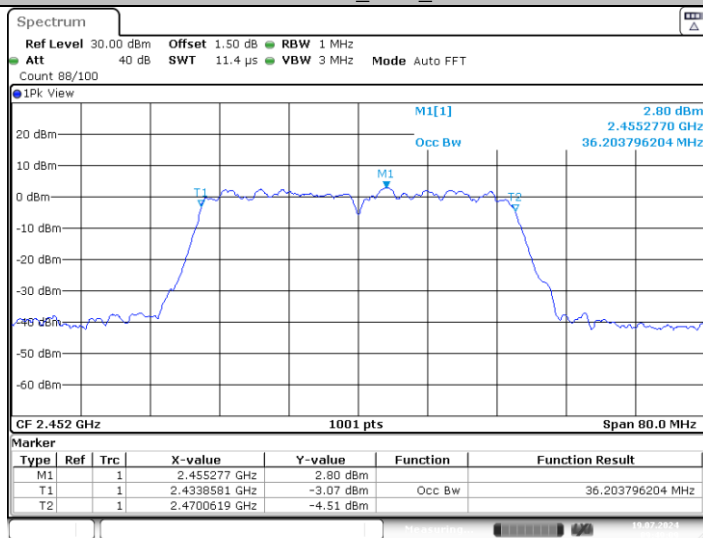
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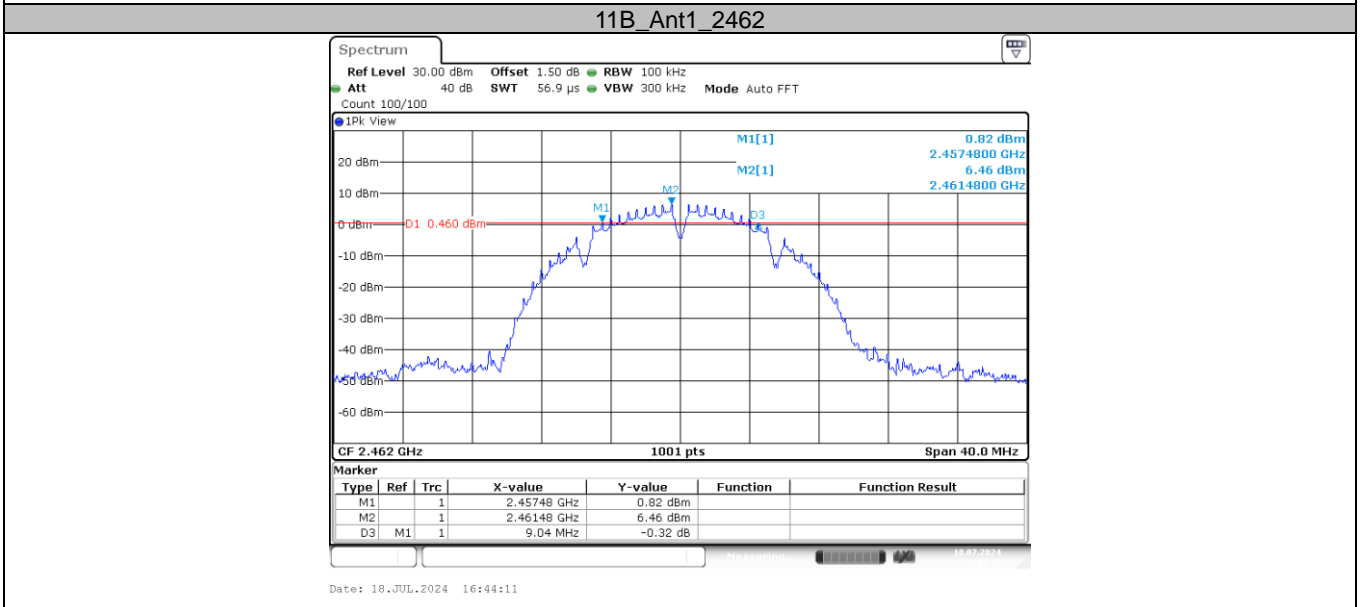
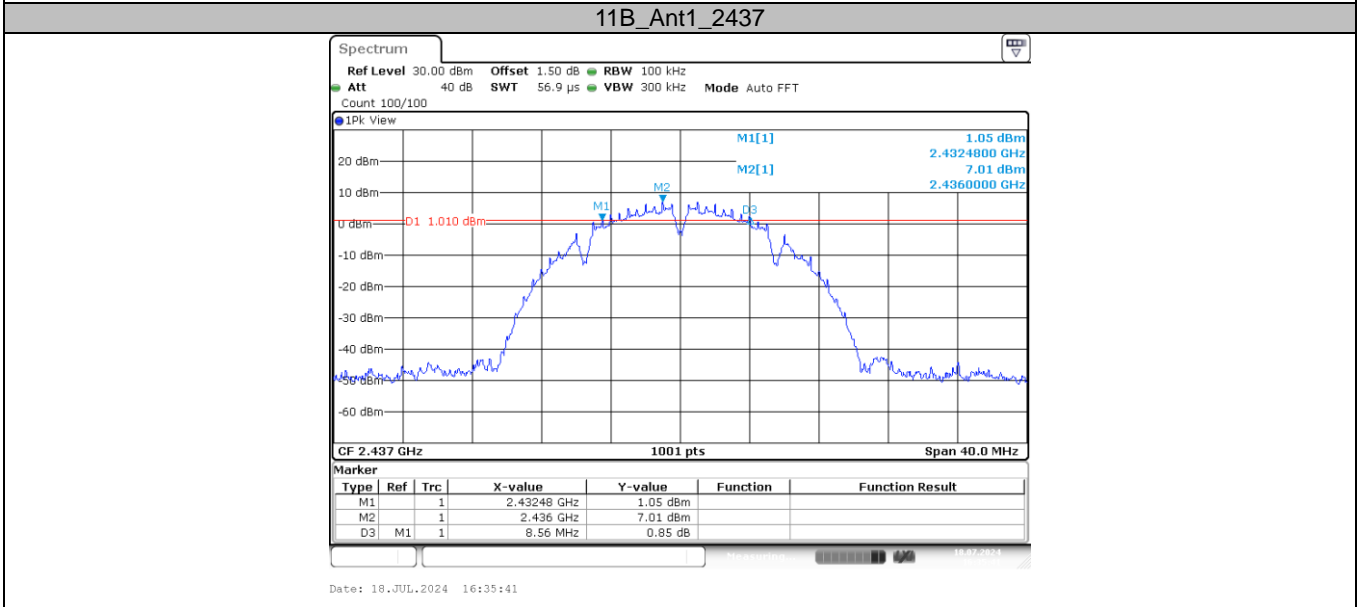
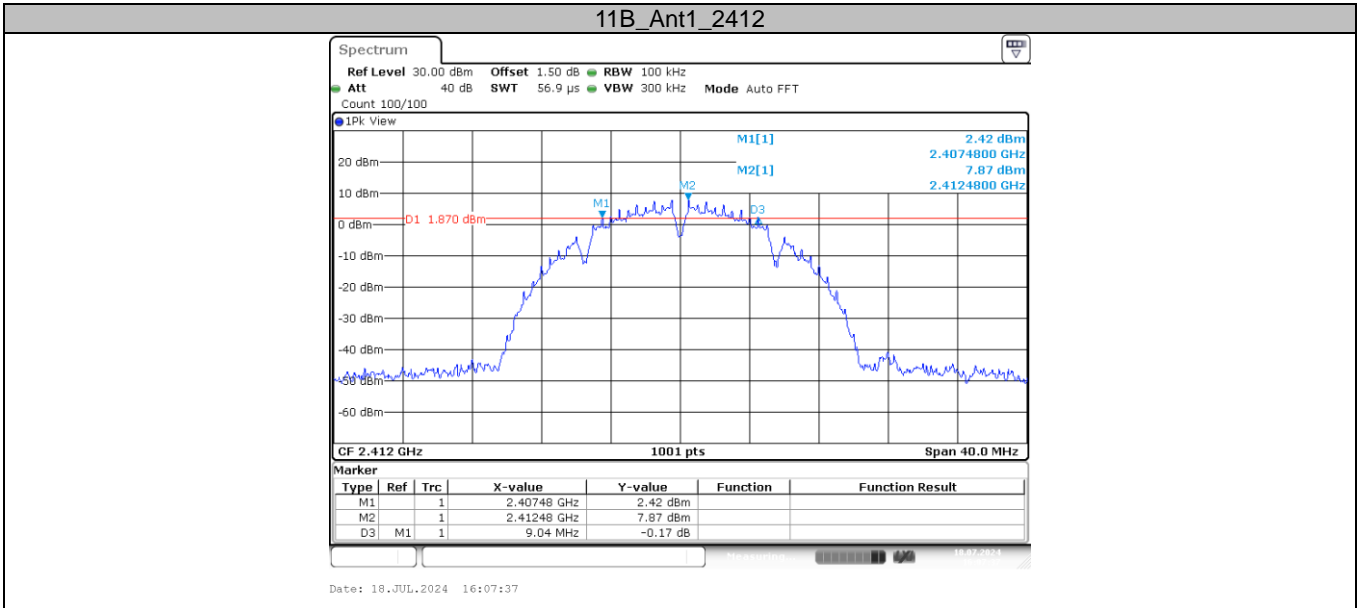
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DTS Bandwidth:



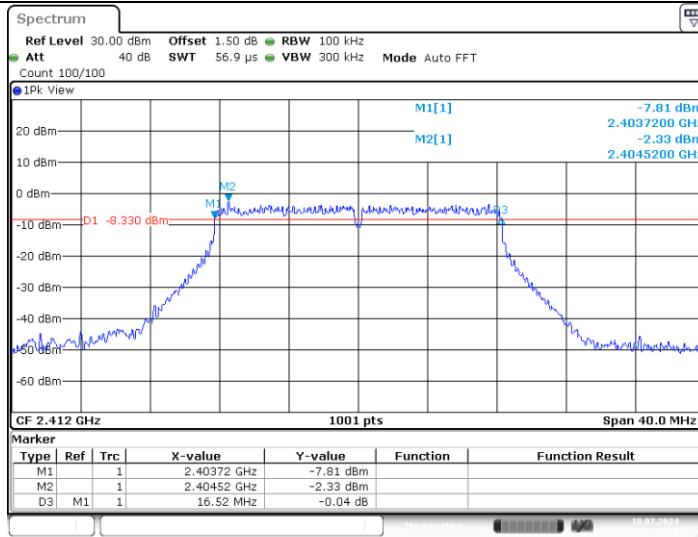
11G_Ant1_2412

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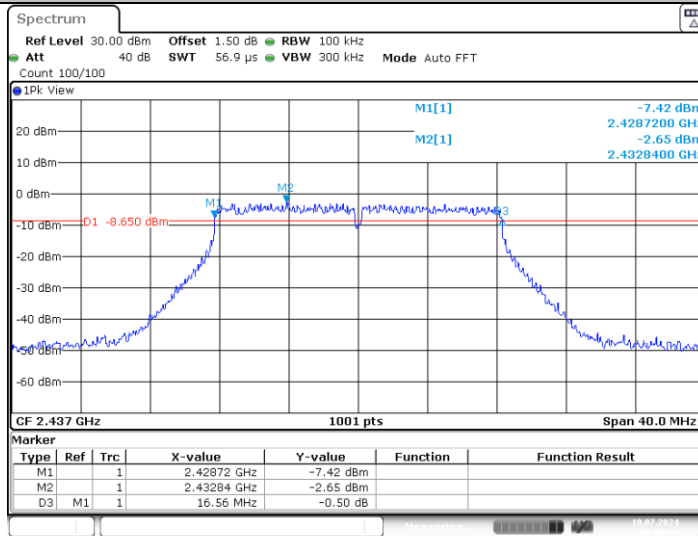
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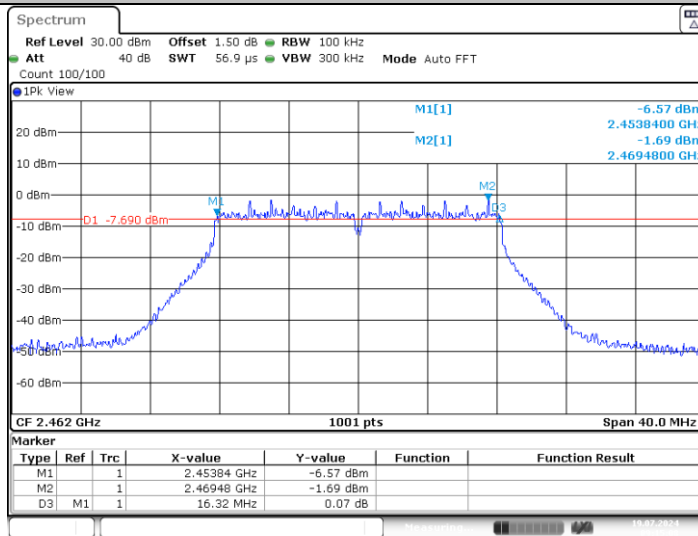
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11G_Ant1_2462



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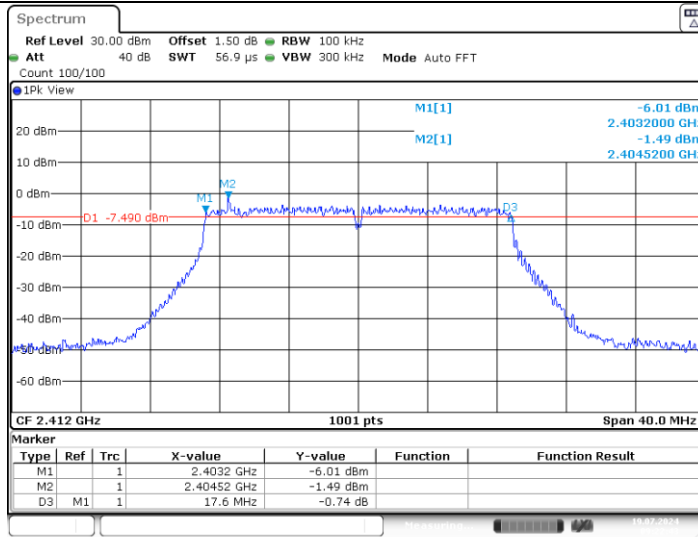
11N20SISO_Ant1_2412

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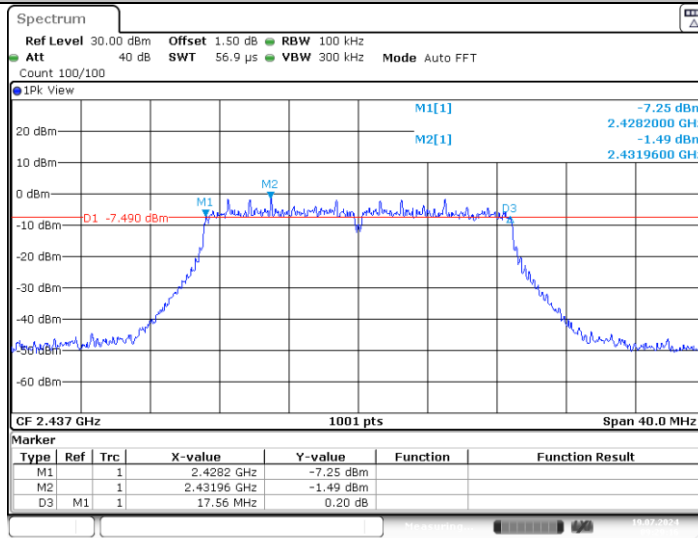
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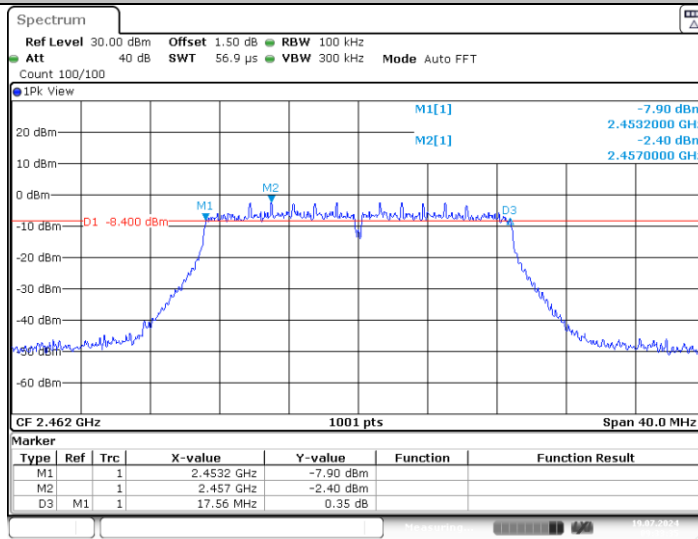
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11N20SISO_Ant1_2437



Date: 19.JUL.2024 09:29:15

11N20SISO_Ant1_2462



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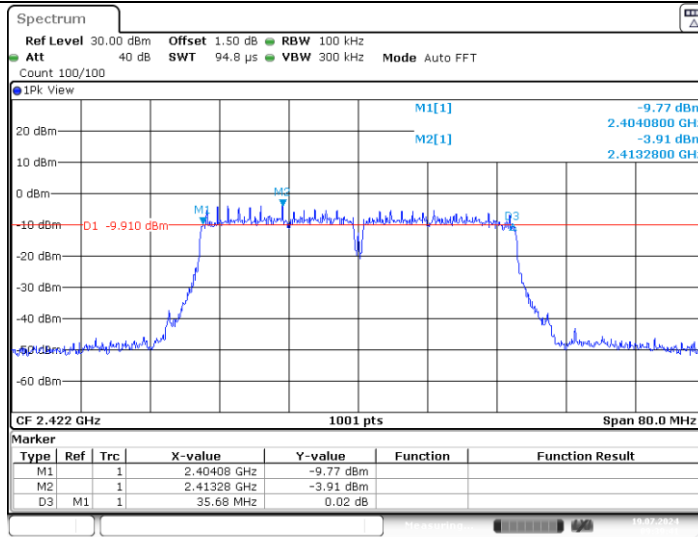
11N40SISO_Ant1_2422

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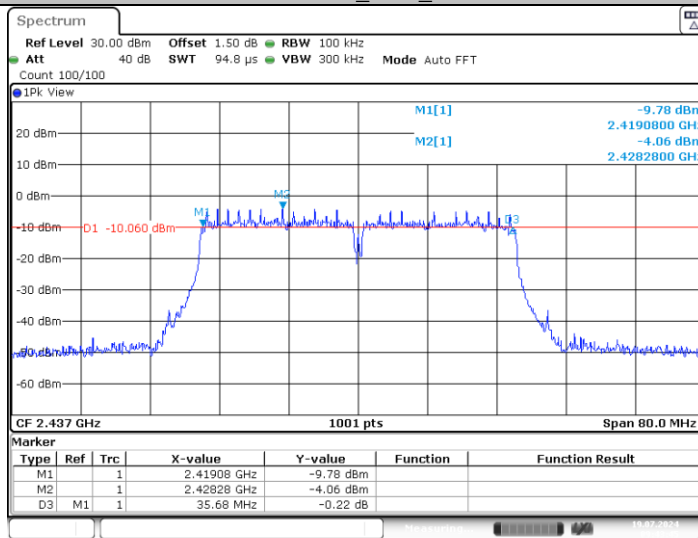
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Tel.: (86)755-27521059 Fax: (86)755-27521011 Http://www.sz-ctc.org.cn

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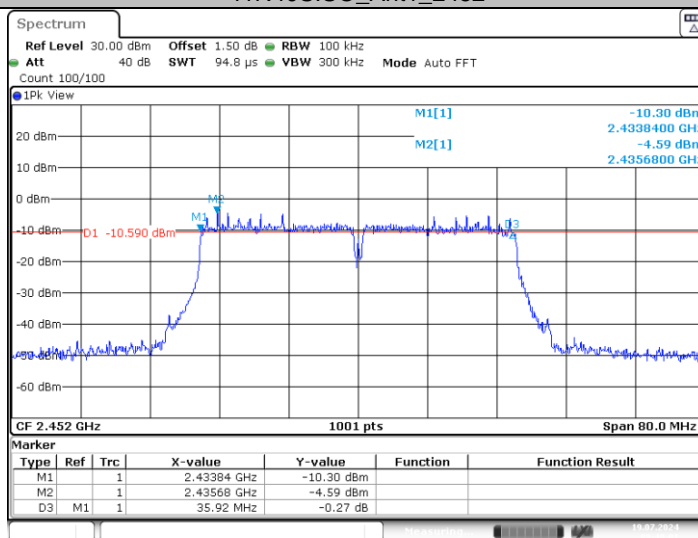
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11N40SISO_Ant1_2437



11N40SISO_Ant1_2452



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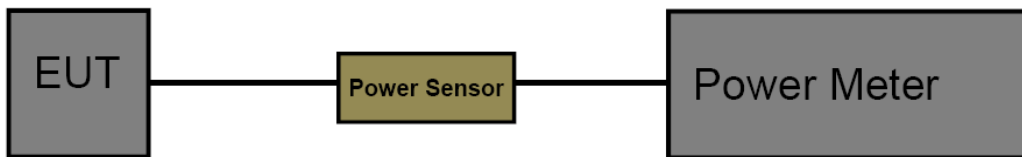
3.6. Peak Output Power

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3) / RSS-247 5.4 d

Section	Test Item	Limit	Frequency Range (MHz)
FCC CFR 47 Part15.247 (b)(3)	Maximum Conducted Output Power	1 Watt or 30dBm	2400~2483.5
ISED RSS-247 5.4 d	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 average 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	Antenna	Frequency[MHz]	Peak Output Power[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	16.55	≤30	PASS
		2437	16.12	≤30	PASS
		2462	15.49	≤30	PASS
11G	Ant1	2412	11.01	≤30	PASS
		2437	11.47	≤30	PASS
		2462	10.02	≤30	PASS
11N20SISO	Ant1	2412	11.06	≤30	PASS
		2437	10.40	≤30	PASS
		2462	10.00	≤30	PASS
11N40SISO	Ant1	2422	10.98	≤30	PASS
		2437	10.50	≤30	PASS
		2452	10.30	≤30	PASS



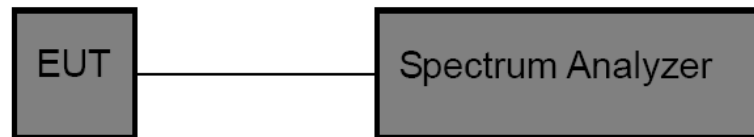
3.7. Power Spectral Density

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e) / RSS-247 5.2 b

Test Item	Limit	Frequency Range (MHz)
Power Spectral Density	8 dBm (in any 3 kHz)	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. 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 DTS channel center frequency.
Set the span to 1.5 times the DTS bandwidth.
Set the RBW to: 3 kHz.
Set the VBW to: 10 kHz.
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.

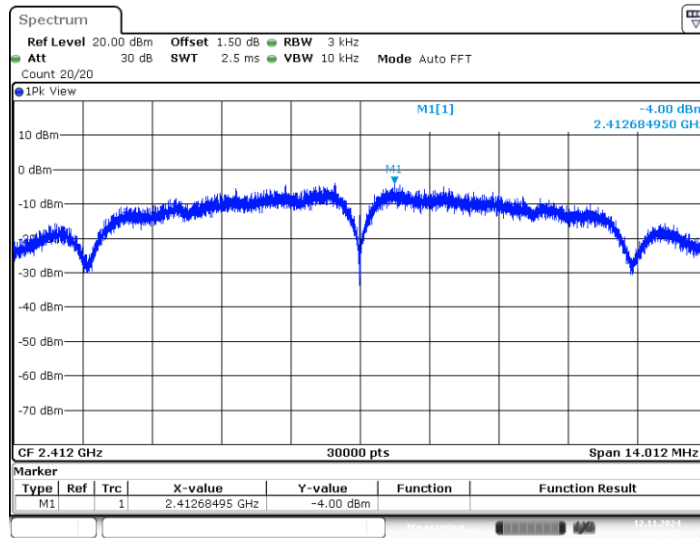
**Test Result**

Test Mode	Antenna	Frequency[MHz]	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-4.00	≤8	PASS
		2437	-3.73	≤8	PASS
		2462	-4.21	≤8	PASS
11G	Ant1	2412	-12.78	≤8	PASS
		2437	-12.55	≤8	PASS
		2462	-12.88	≤8	PASS
11N20SISO	Ant1	2412	-12.19	≤8	PASS
		2437	-13.12	≤8	PASS
		2462	-12.79	≤8	PASS
11N40SISO	Ant1	2422	-13.05	≤8	PASS
		2437	-13.12	≤8	PASS
		2452	-13.29	≤8	PASS

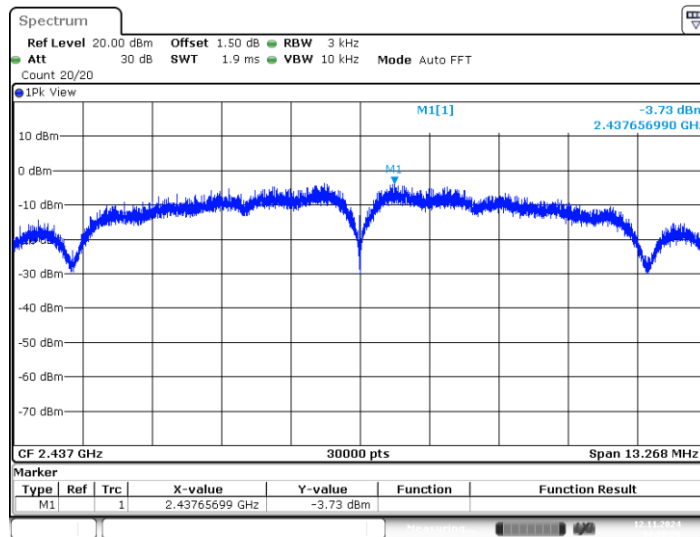


Test Graphs:

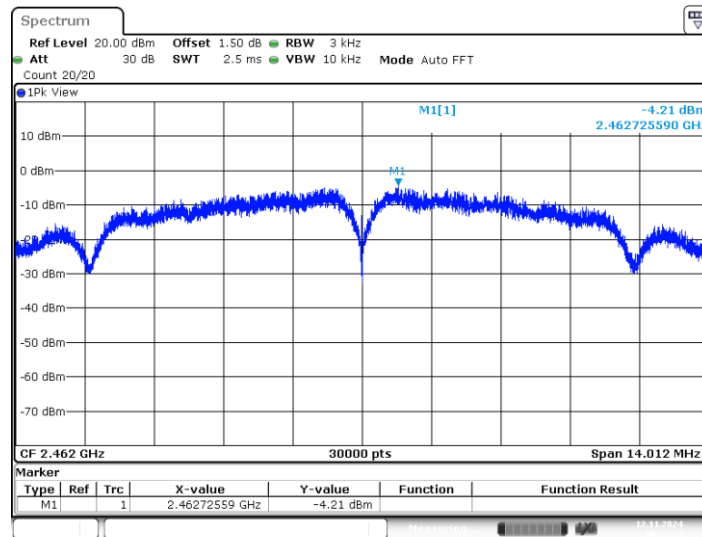
11B_Ant1_2412



11B_Ant1_2437

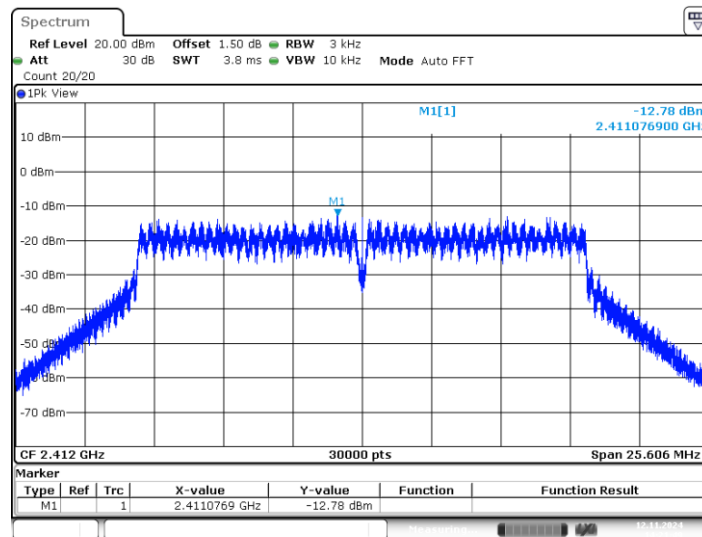


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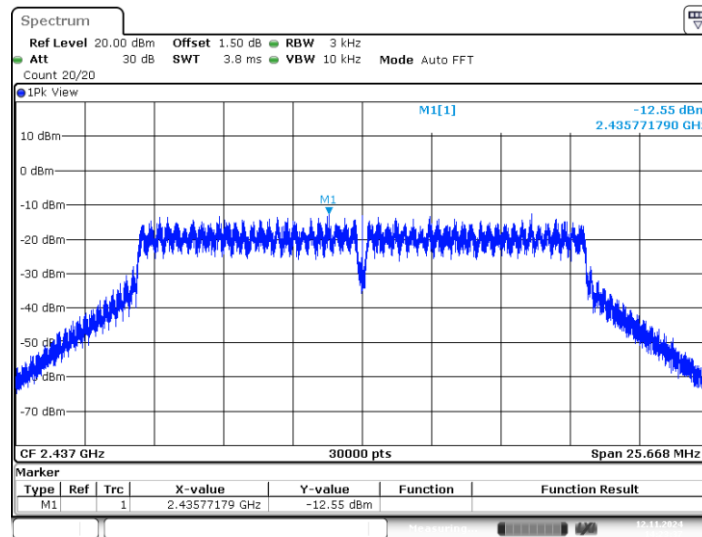
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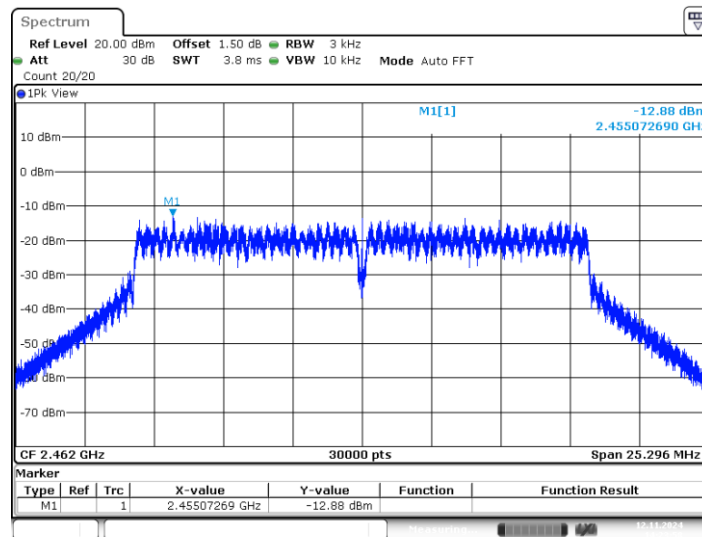
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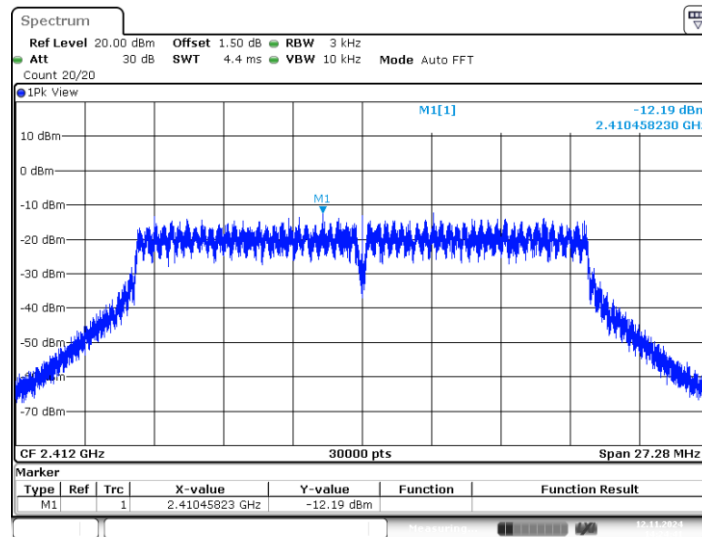
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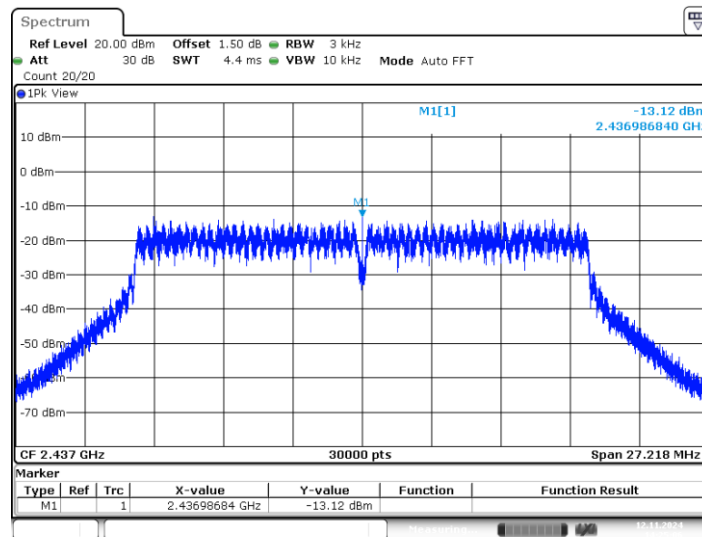
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11N20SISO_Ant1_2412



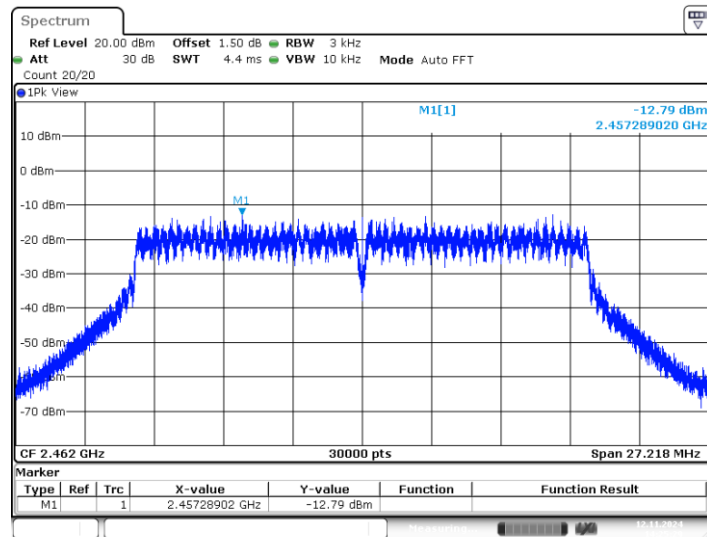
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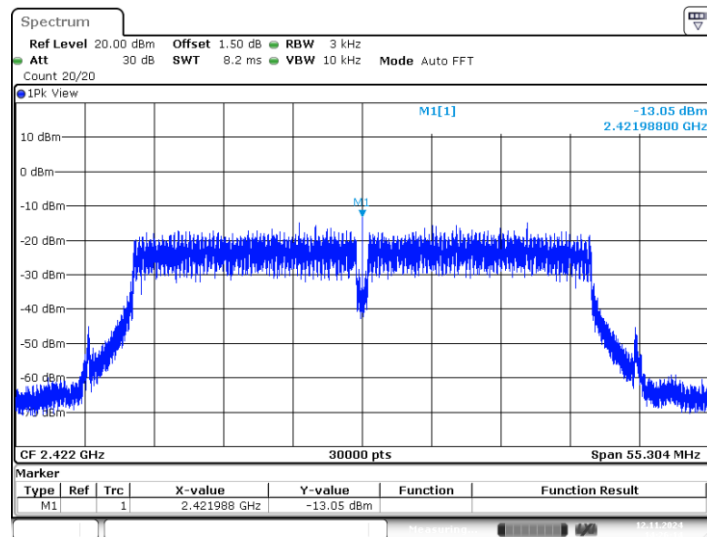
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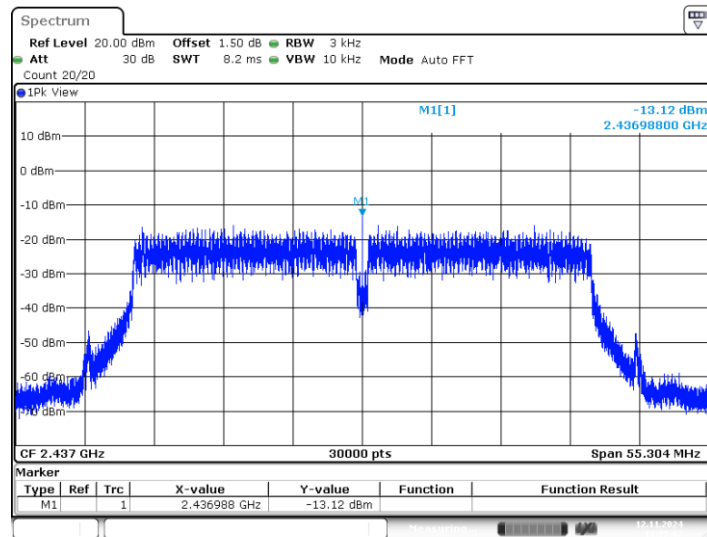
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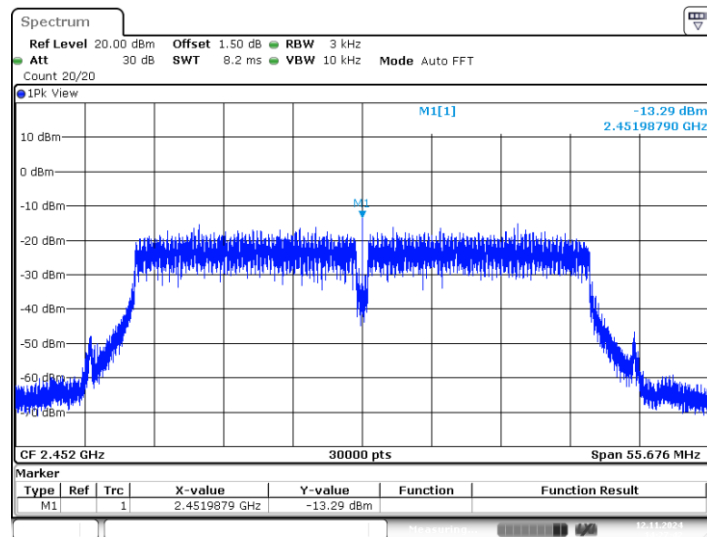
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11N40SISO_Ant1_2437



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11N40SISO_Ant1_2452



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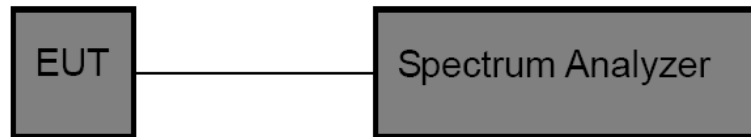


3.8. Duty Cycle

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	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T Minimum VBW (kHz)	Final Setting for VBW (kHz)
11B	2412	12.42	12.58	98.73	/	0.01
	2437	12.42	12.54	99.04	/	0.01
	2462	12.42	12.58	98.73	/	0.01
11G	2412	2.07	2.22	93.24	0.48	1
	2437	2.07	2.24	92.41	0.48	1
	2462	2.07	2.24	92.41	0.48	1
11N20SISO	2412	1.92	2.09	91.87	0.52	1
	2437	1.92	2.08	92.31	0.52	1
	2462	1.92	2.09	91.87	0.52	1
11N40SISO	2422	0.94	1.12	83.93	1.06	3
	2437	0.95	1.09	87.16	1.05	3
	2452	0.95	1.12	84.82	1.05	3

Note: Duty Cycle>98%, VBW=10Hz

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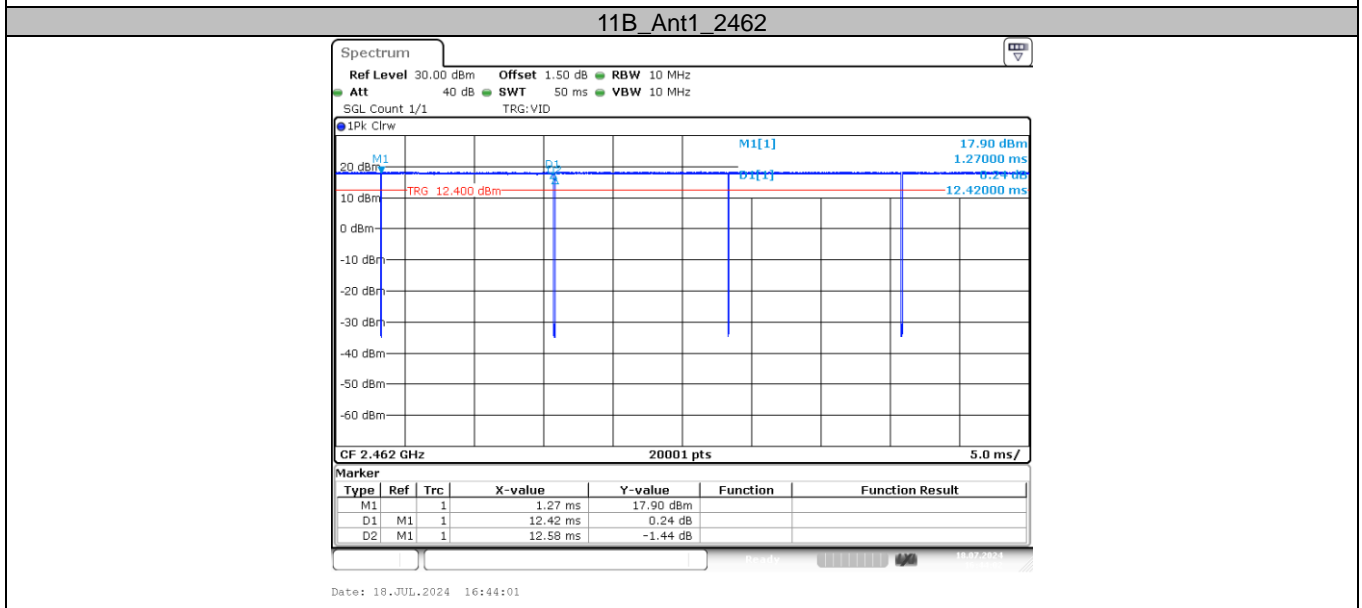
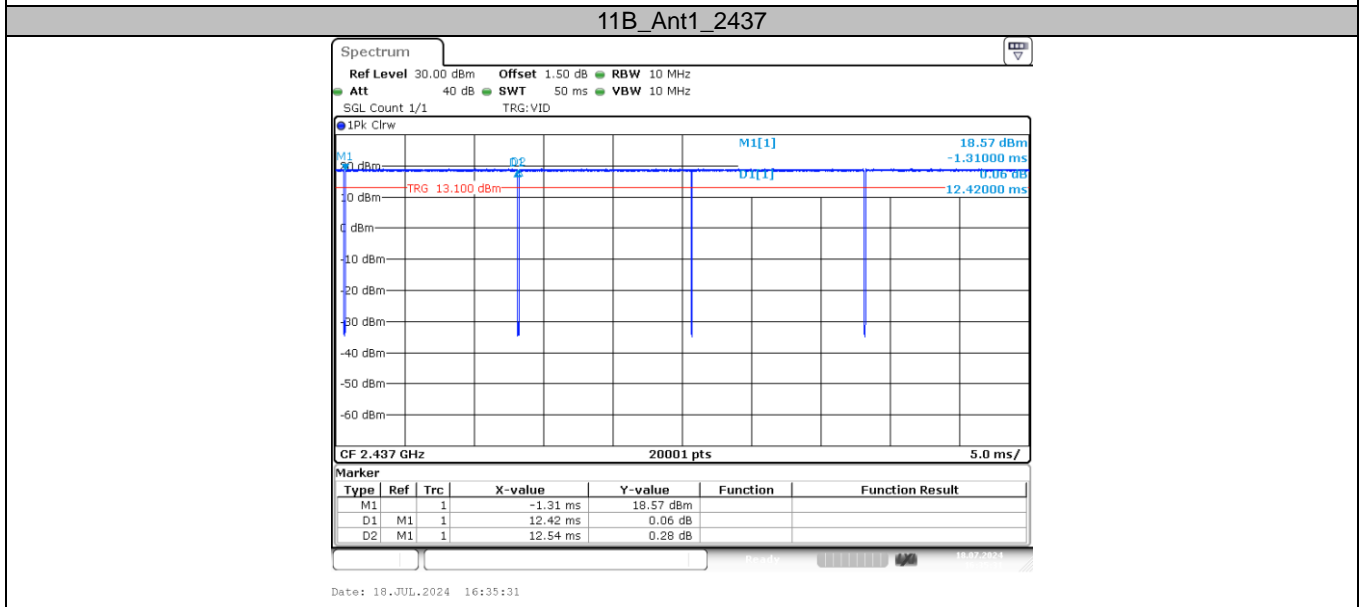
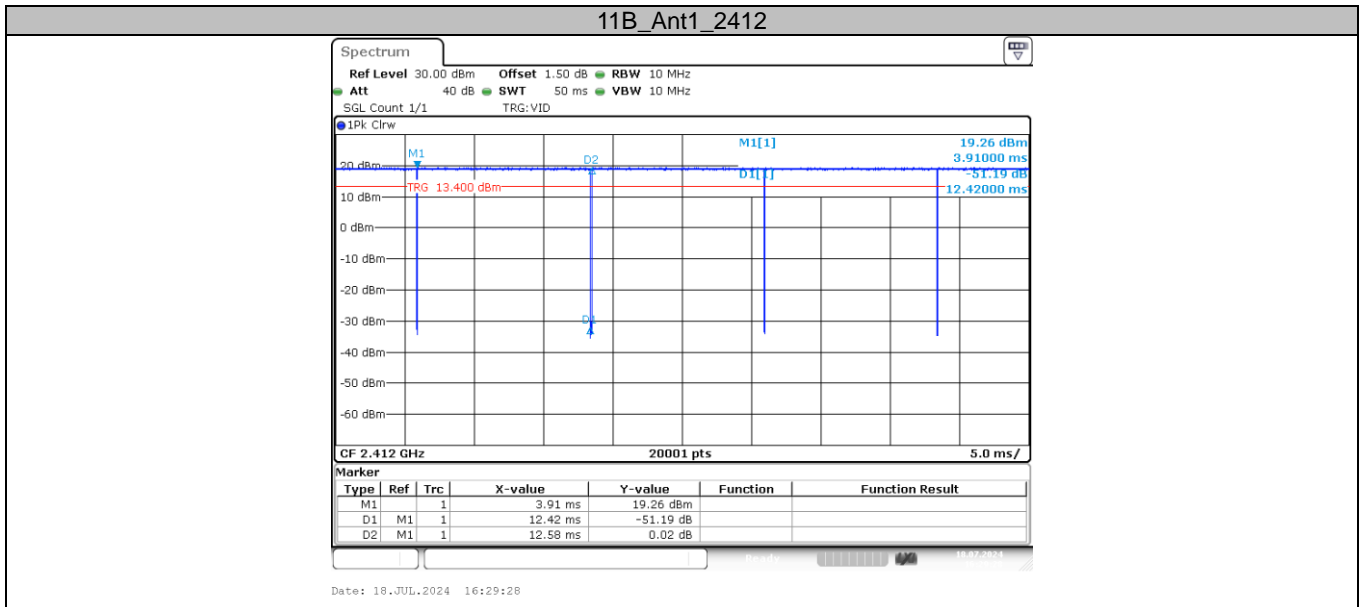
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Test Graphs:



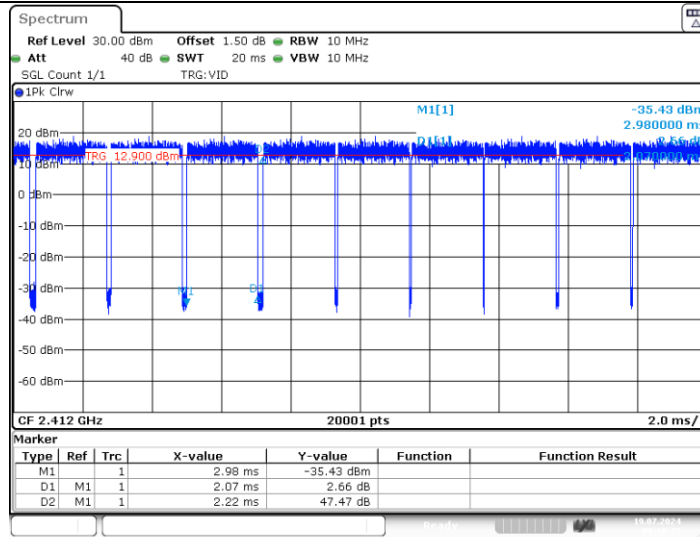
11G_Ant1_2412

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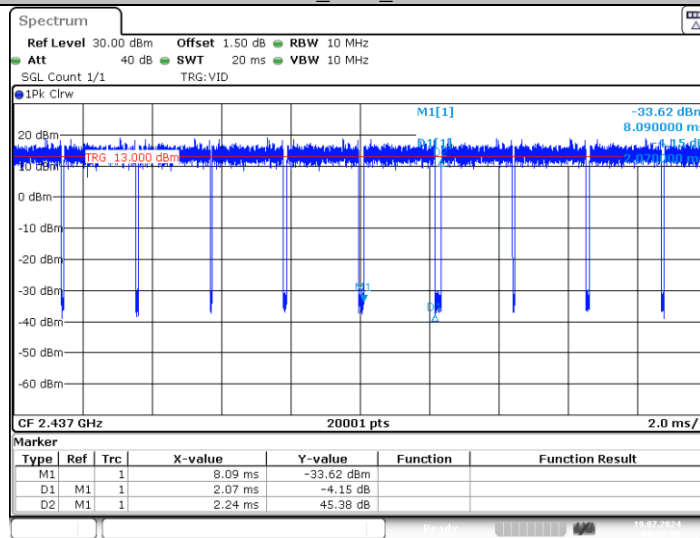
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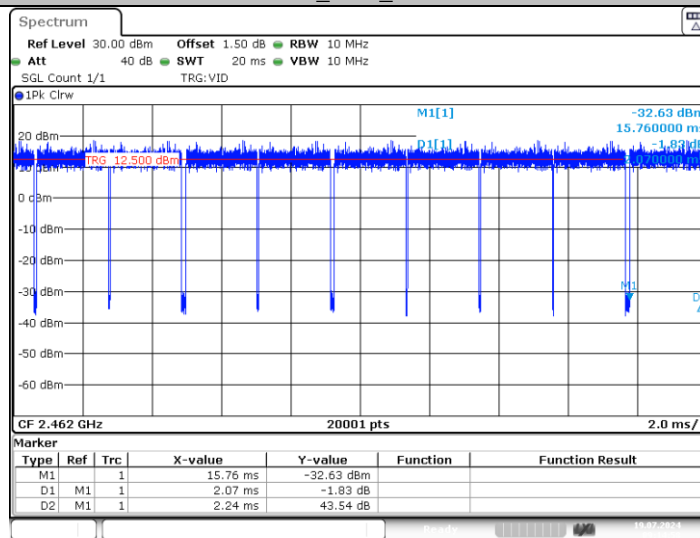
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11G_Ant1_2437



Date: 19.JUL.2024 09:03:50

11G_Ant1_2462



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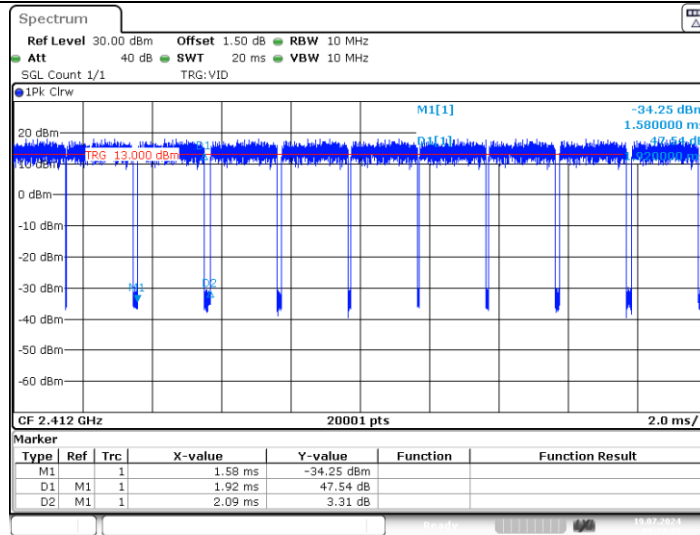
11N20SISO_Ant1_2412

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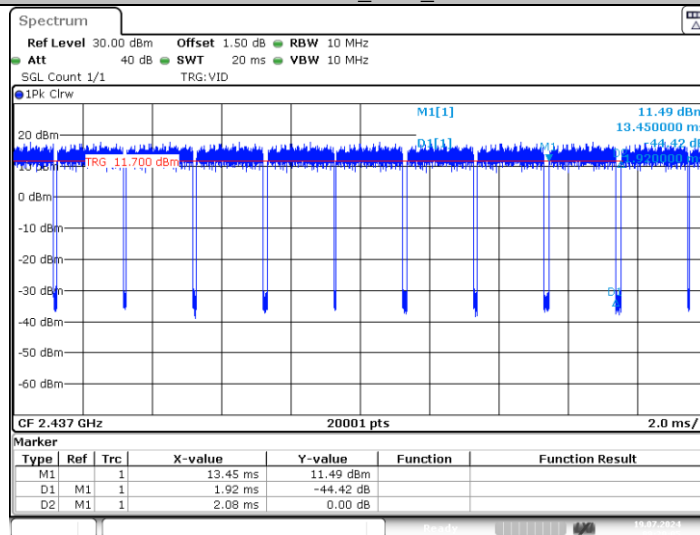
TRF No: CTC-TR-057_A1

For anti-fake verification, please visit the official website of China Inspection And Testing Society : yz.cnca.cn



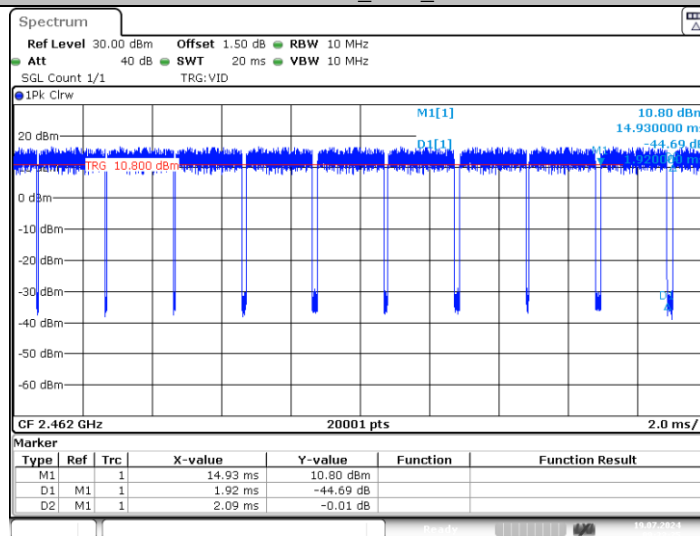
Date: 19.JUL.2024 09:22:33

11N20SISO_Ant1_2437



Date: 19.JUL.2024 09:29:05

11N20SISO_Ant1_2462



Date: 19.JUL.2024 09:33:24

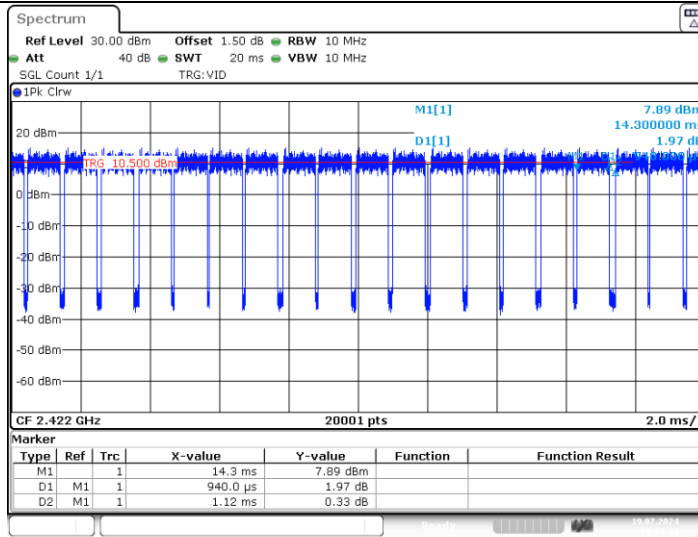
11N40SISO_Ant1_2422

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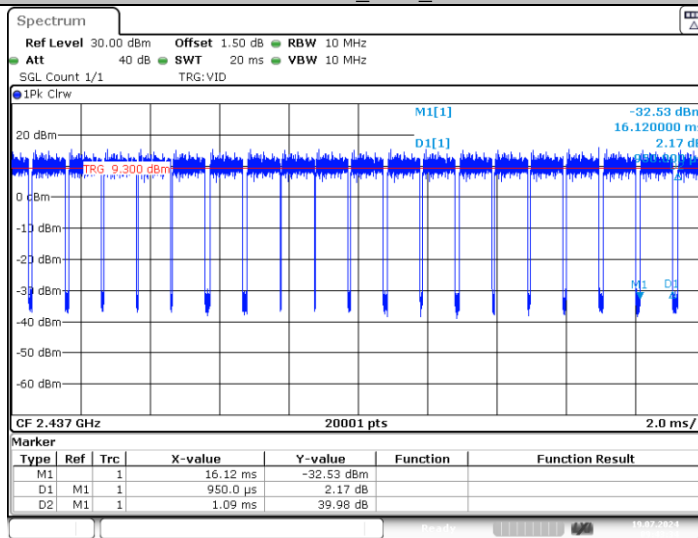
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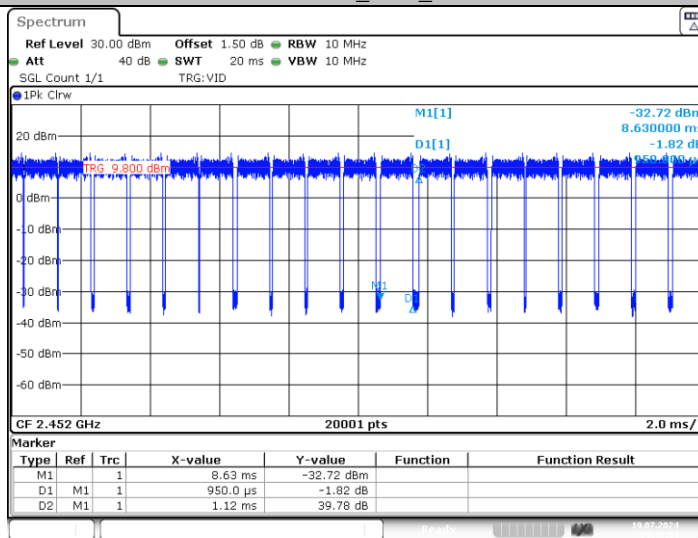
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11N40SISO_Ant1_2437



Date: 19.JUL.2024 09:43:34

11N40SISO_Ant1_2452



Date: 19.JUL.2024 09:48:51

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3.9. 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*****