

9. Spurious Emission in Non-restricted & restricted Bands

9.1 Conducted Emission Method

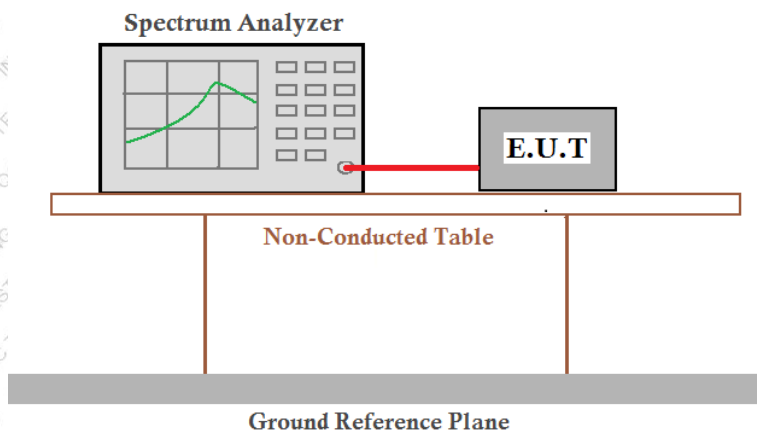
9.1.1 Applicable Standard

FCC Part15 C Section 15.247 (d)

9.1.2 Limit

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.

9.1.3 Test setup



9.1.4 Test Procedure

- Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
- Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
- Repeat above procedures until all measured frequencies were complete.

9.1.5 Test Data

Temperature	23 °C	Humidity	52 %
ATM Pressure	101.1kPa	Antenna Gain	Ant1: 1.56dBi Ant2: 1.56dBi
Test by	LBi Li	Test result	PASS

Please refer to following plots.



Band Edge:

Modulation	CH No.	Frequency (MHz)	ANT	Max Value (dBc)	Limit (dBc)	Verdict
802.11b_SISO	01	2412	1	-57.09	-20	Pass
			2	-59.32	-20	Pass
	11	2462	1	-56.74	-20	Pass
			2	-57.55	-20	Pass
802.11g_SISO	01	2412	1	-52.76	-20	Pass
			2	-58.34	-20	Pass
	11	2462	1	-52.5	-20	Pass
			2	-56.64	-20	Pass
802.11n (HT20)_SISO	01	2412	1	-52.38	-20	Pass
			2	-57.53	-20	Pass
	11	2462	1	-51.95	-20	Pass
			2	-54.64	-20	Pass
802.11n (HT40)_SISO	03	2422	1	-49.06	-20	Pass
			2	-42.54	-20	Pass
	09	2452	1	-48.04	-20	Pass
			2	-37.83	-20	Pass
802.11ax (HEW20)_SISO	01	2412	1	-55.12	-20	Pass
			2	-55.58	-20	Pass
	11	2462	1	-53.24	-20	Pass
			2	-52.85	-20	Pass
802.11ax (HEW40)_SISO	03	2422	1	-39.45	-20	Pass
			2	-42.07	-20	Pass
	09	2452	1	-33.71	-20	Pass
			2	-38.81	-20	Pass
802.11n (HT20)_MIMO	01	2412	1	-47.4	-20	Pass
			2	-56.18	-20	Pass
	11	2462	1	-51.11	-20	Pass
			2	-54.52	-20	Pass
802.11n (HT40)_MIMO	03	2422	1	-37.77	-20	Pass
			2	-46.7	-20	Pass
	09	2452	1	-39.87	-20	Pass
			2	-45	-20	Pass
802.11ax (HEW20)_MIMO	01	2412	1	-49.55	-20	Pass
			2	-56.07	-20	Pass
	11	2462	1	-49.77	-20	Pass
			2	-54.7	-20	Pass
802.11ax (HEW40)_MIMO	03	2422	1	-39.45	-20	Pass
			2	-33.71	-20	Pass
	09	2452	1	-42.07	-20	Pass
			2	-38.81	-20	Pass

Remark:

1. The MIMO mode still meets the standard limit after adding the combined gain
2. For MIMO devices refer to KDB Publication 662911 D01.

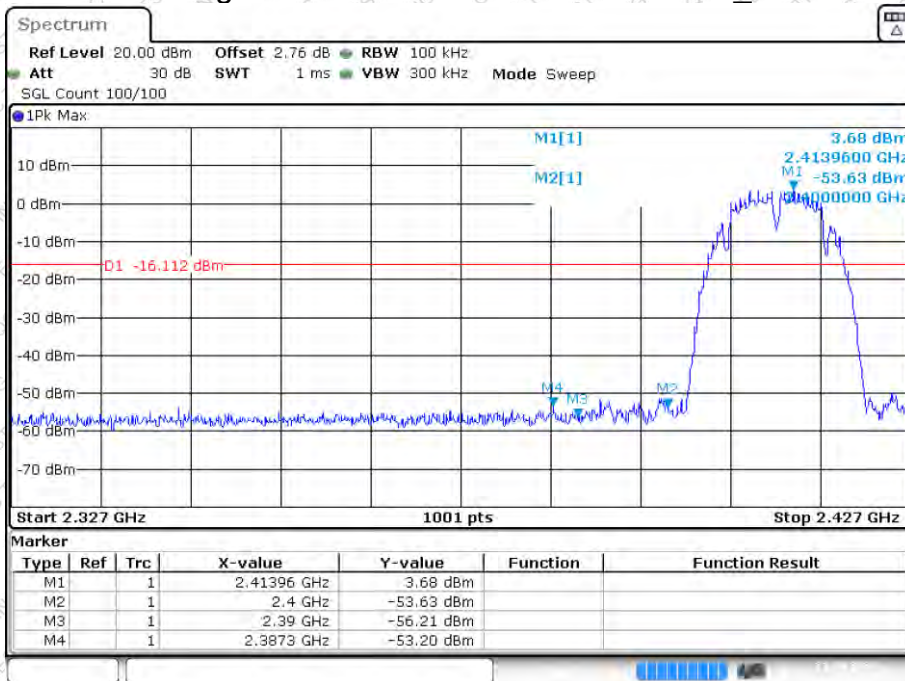


Band Edge NVNT b 2412MHz Ant1 Ref_SISO



Date: 21.OCT.2024 09:39:33

Band Edge NVNT b 2412MHz Ant1 Emission_SISO



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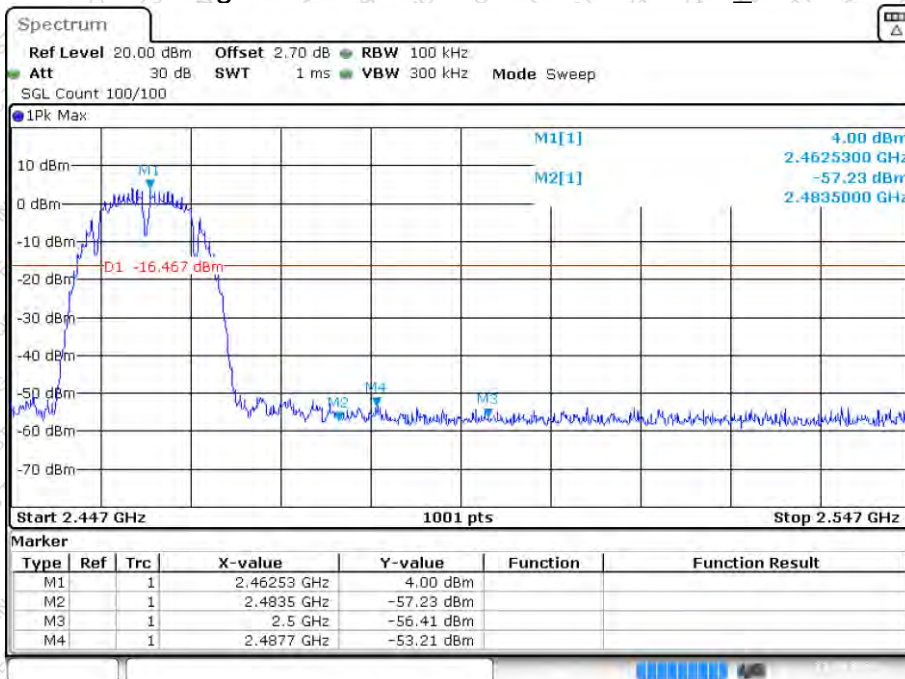


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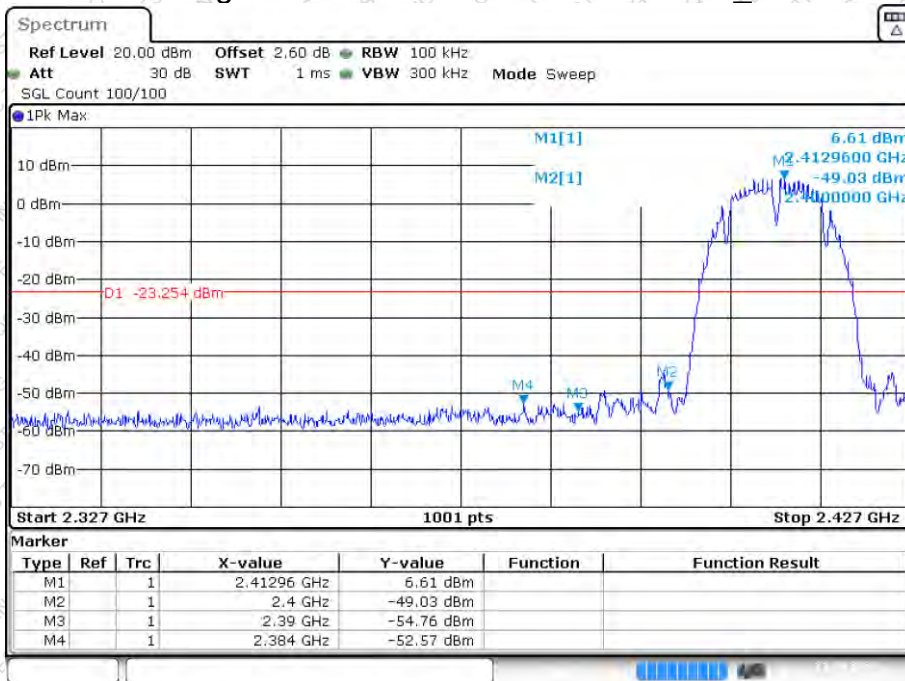


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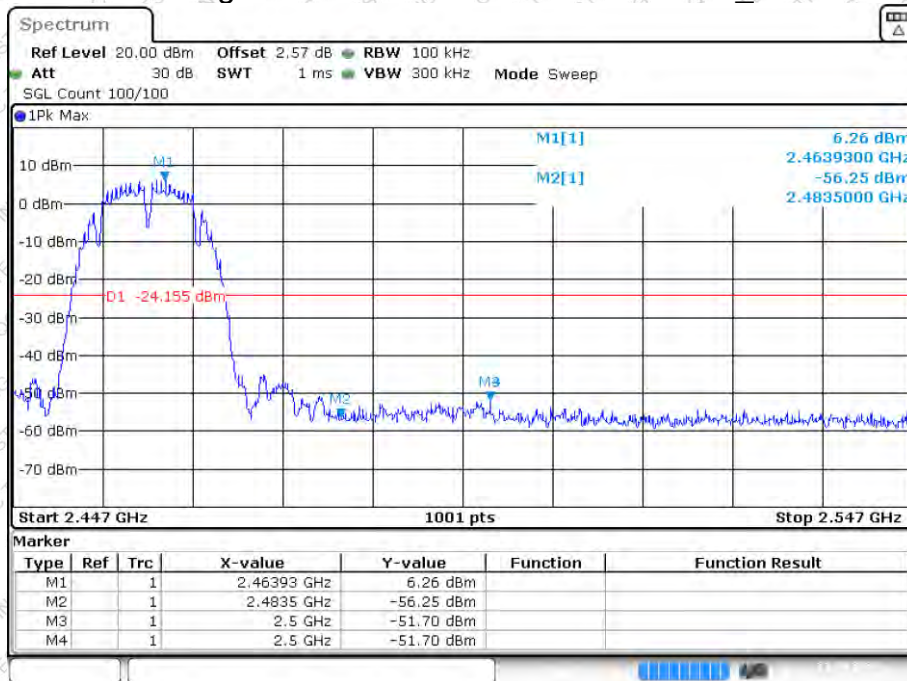


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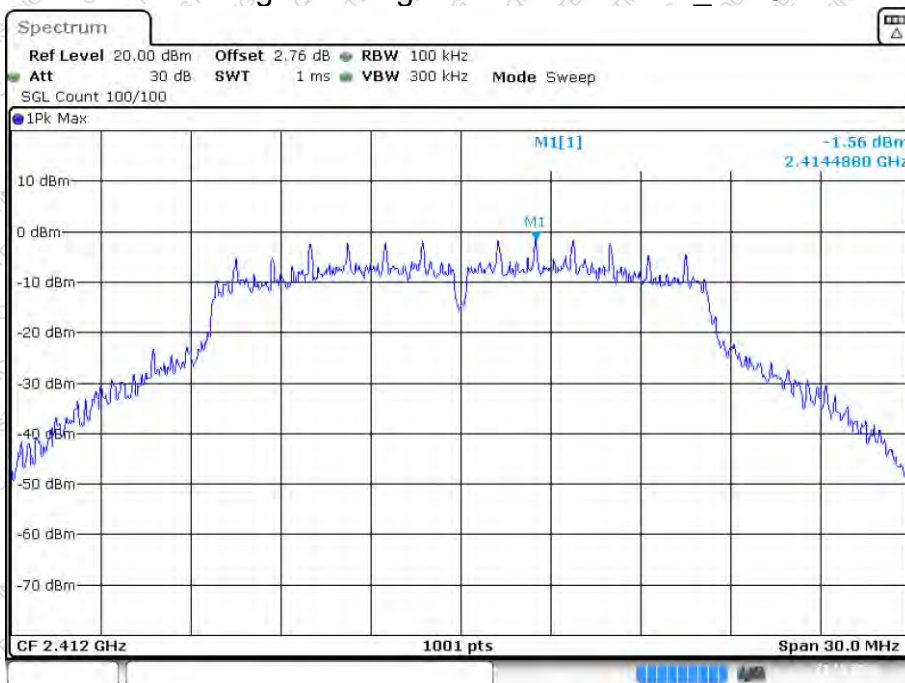
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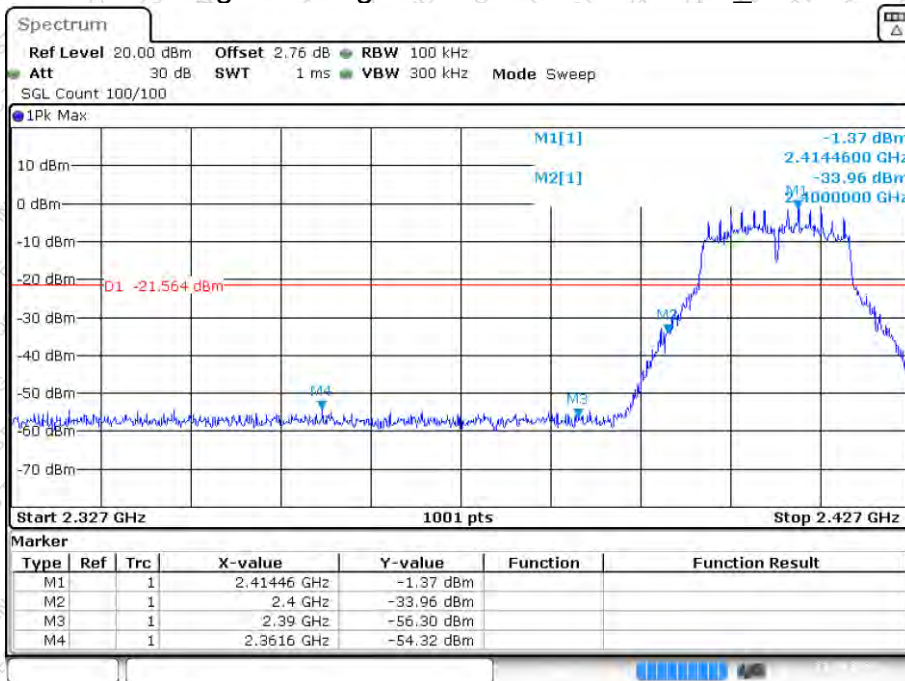


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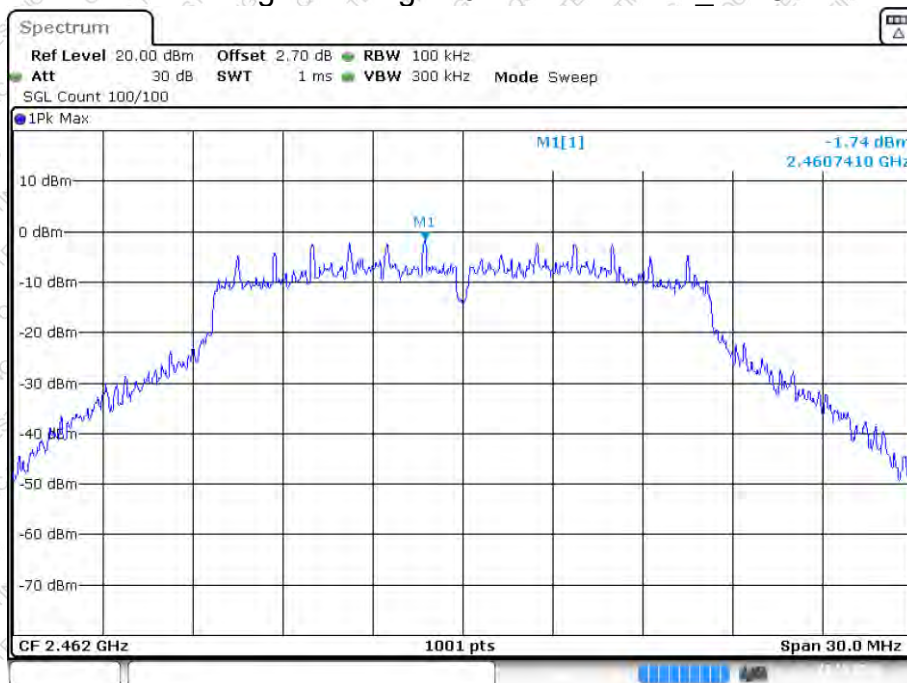
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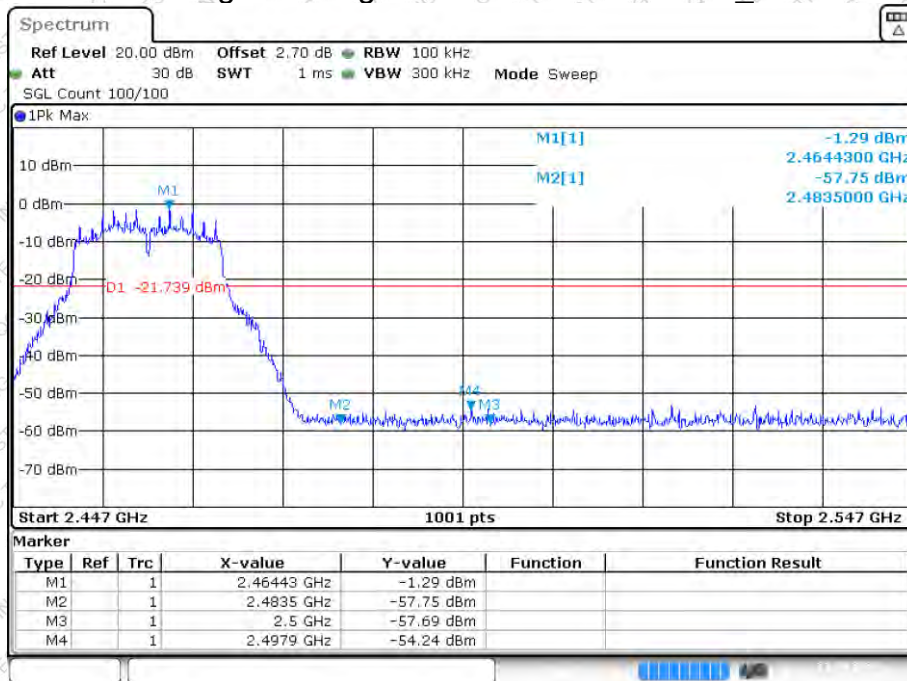


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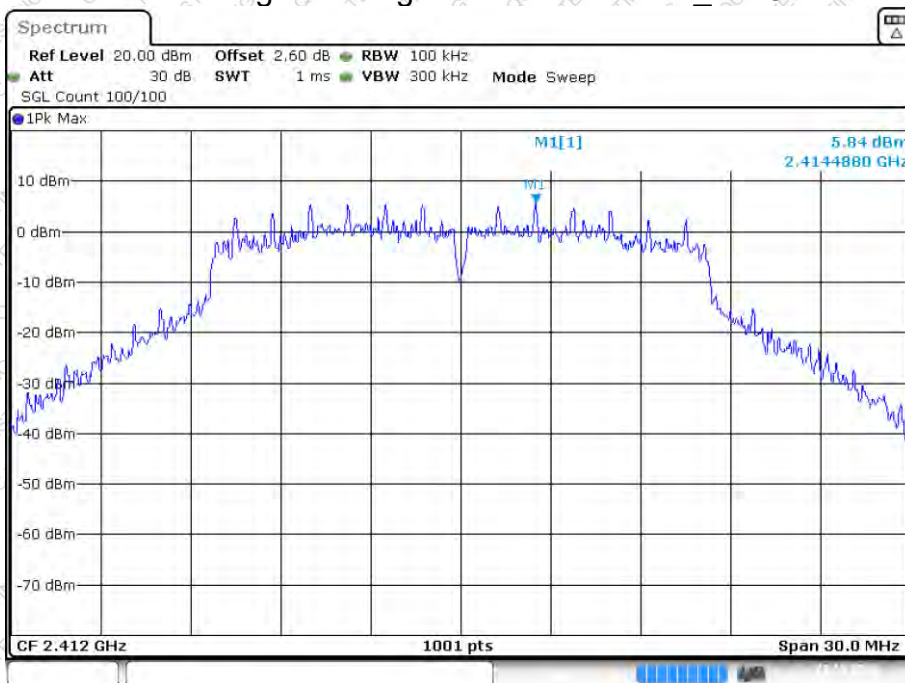
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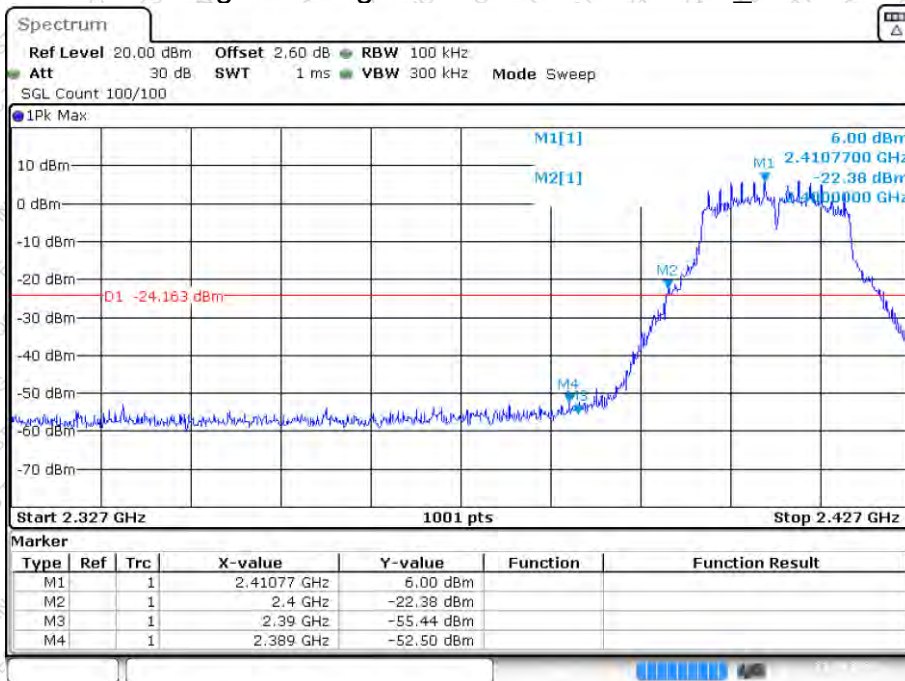


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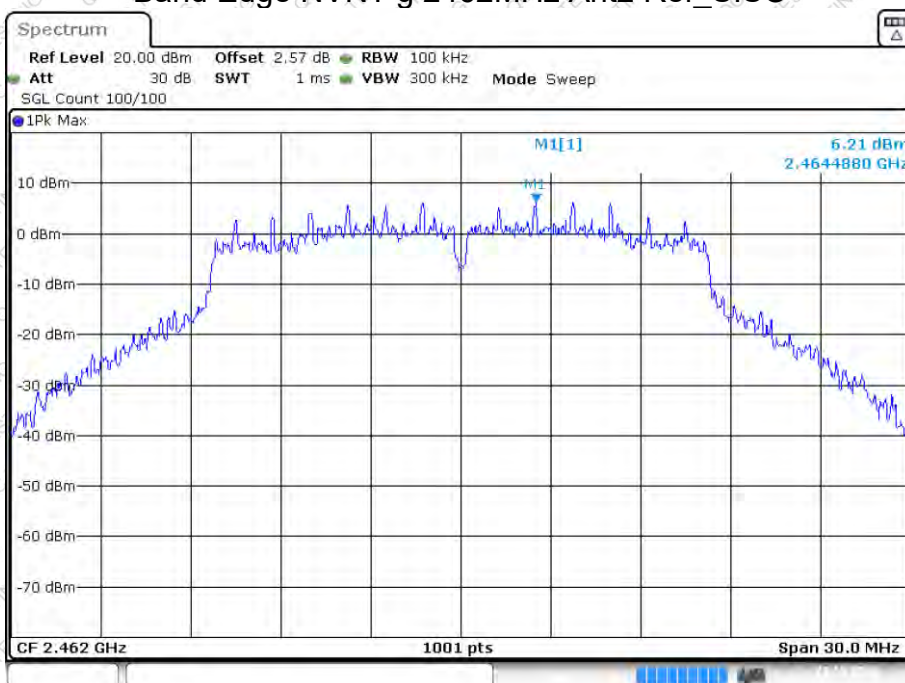
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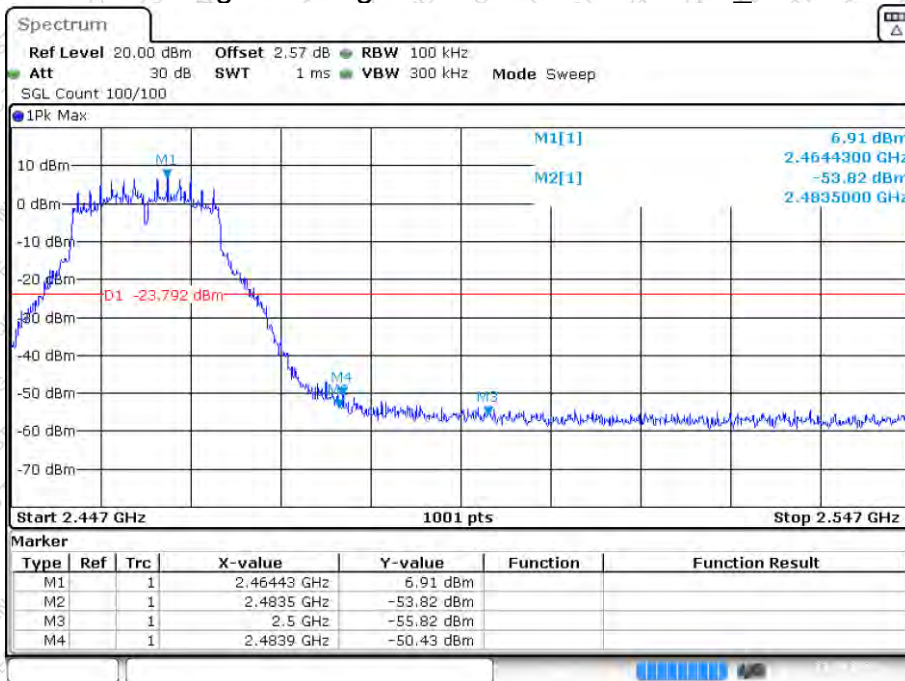


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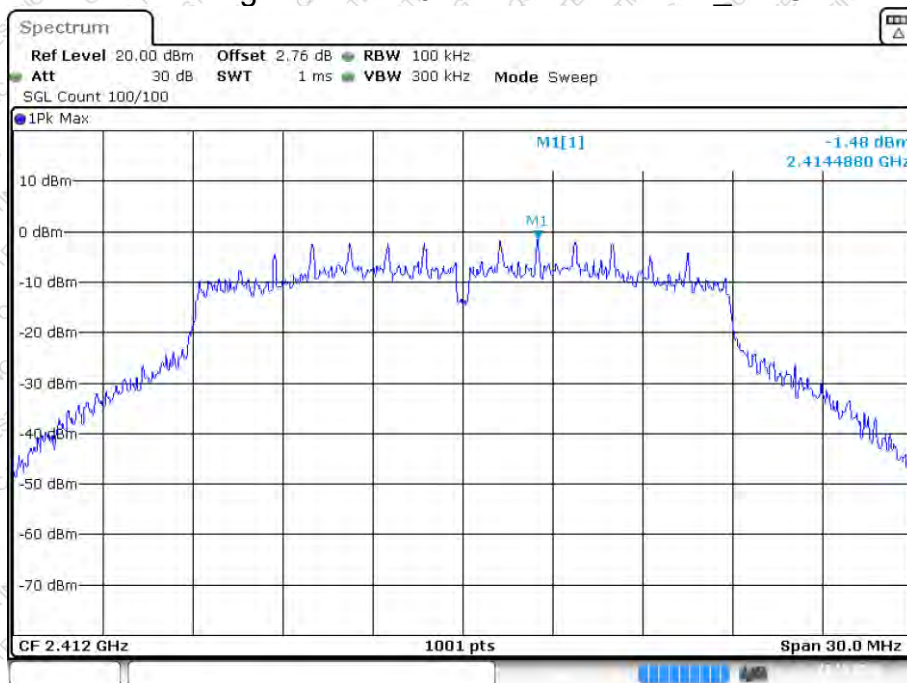
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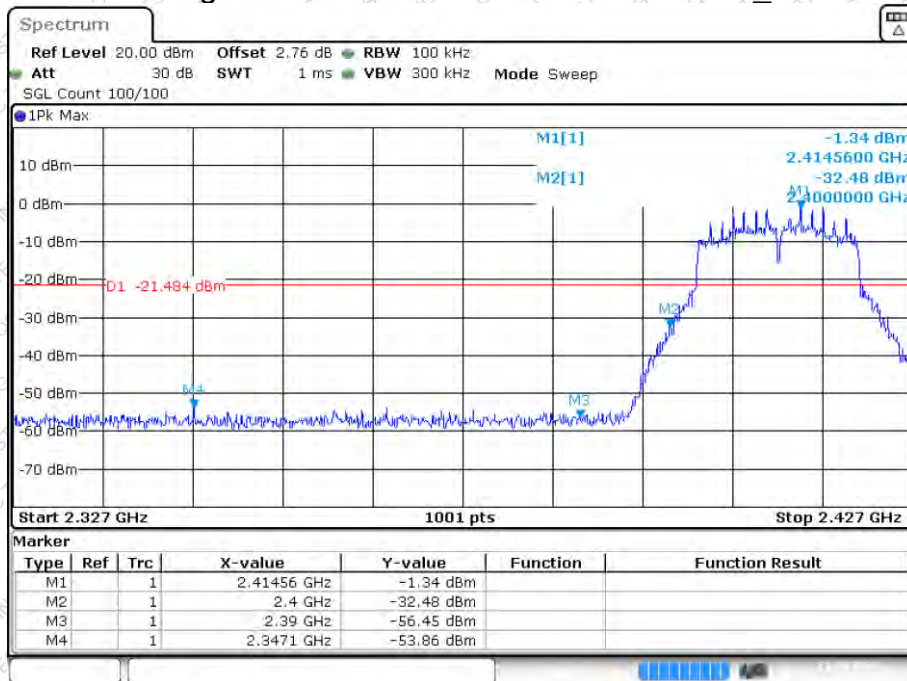


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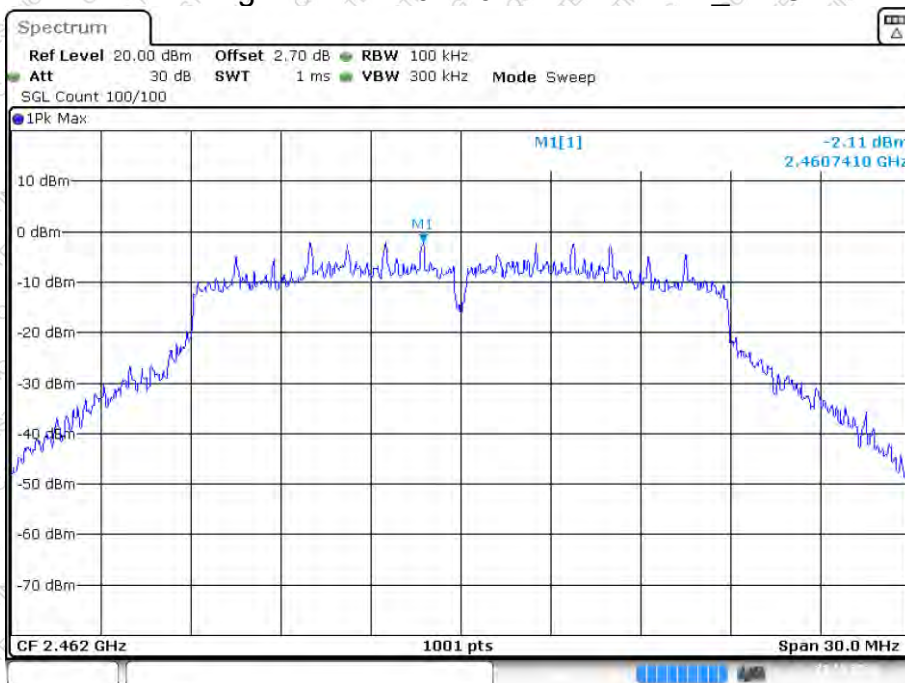
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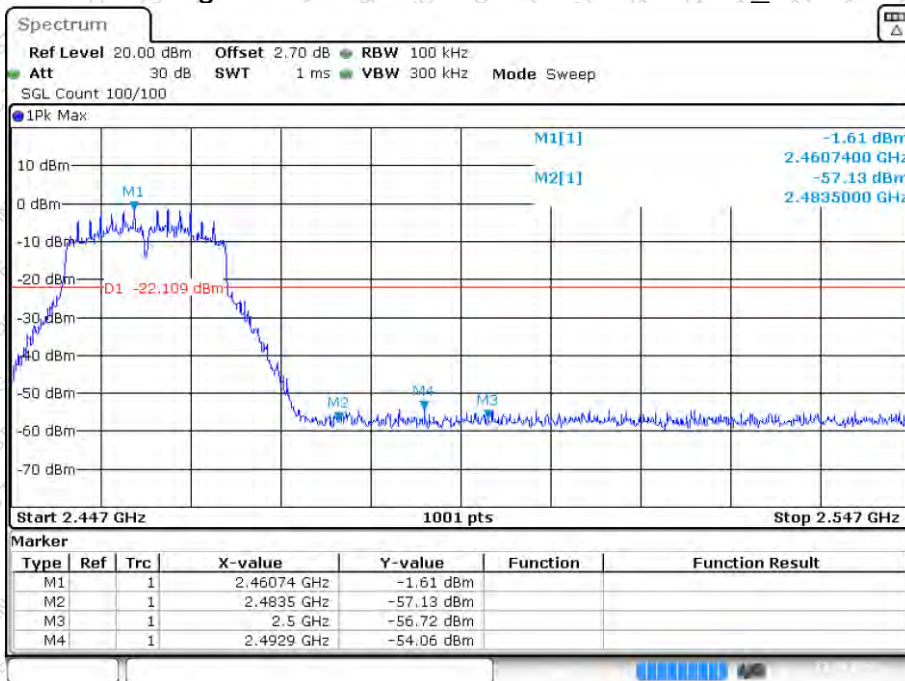


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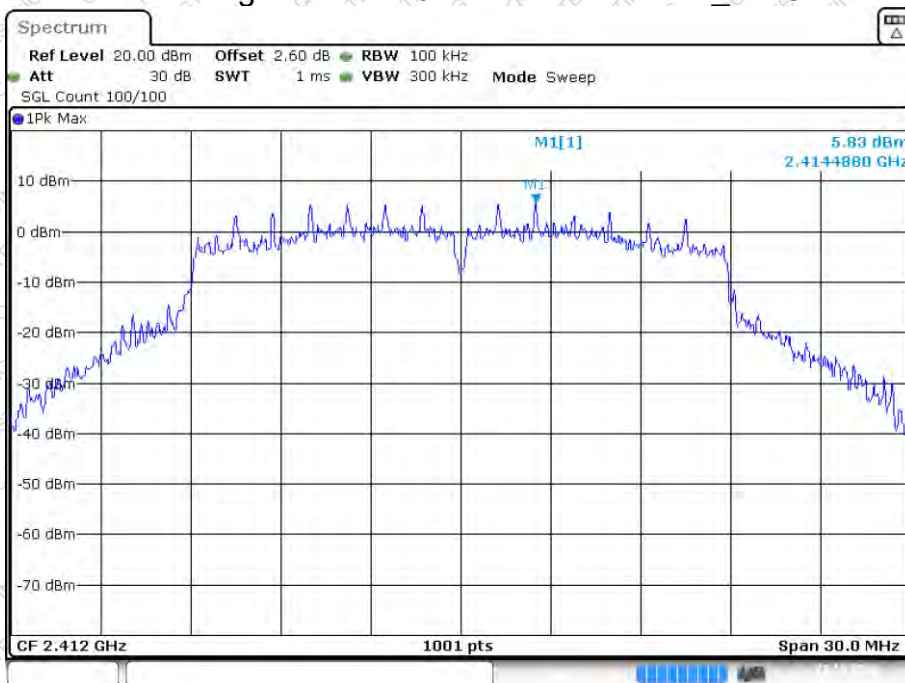
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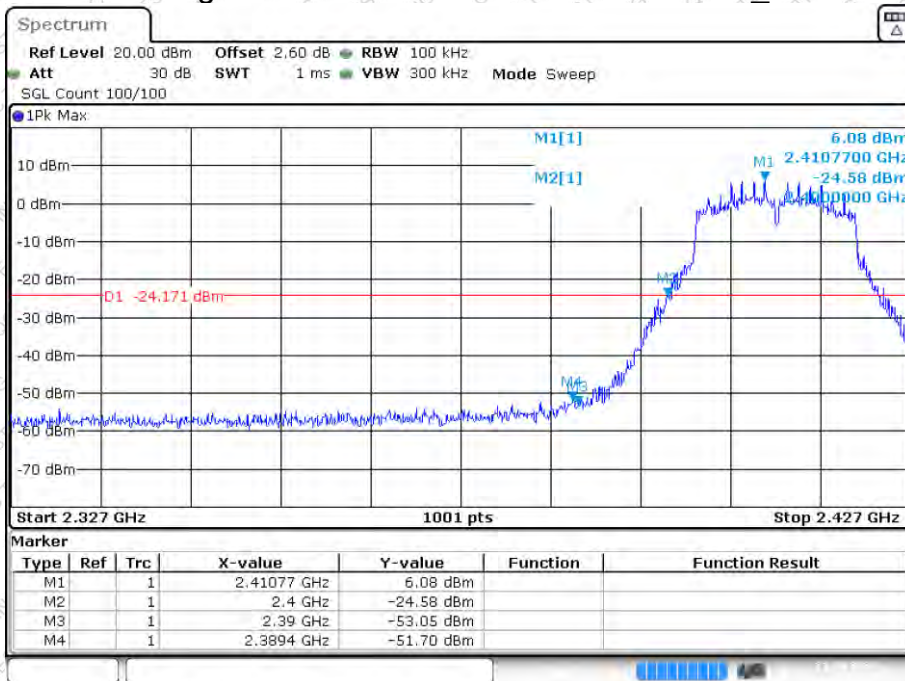


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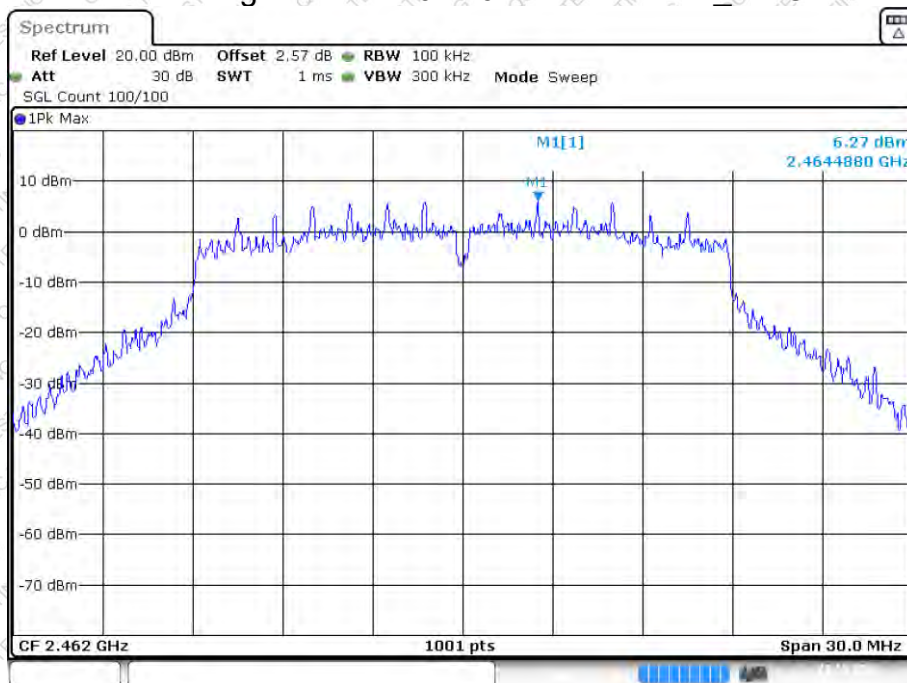
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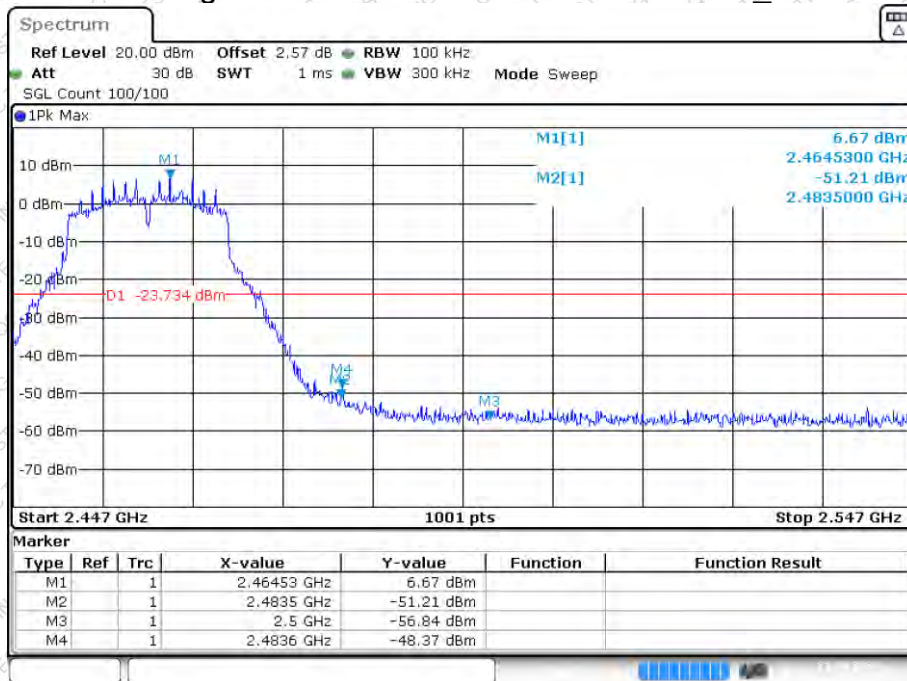


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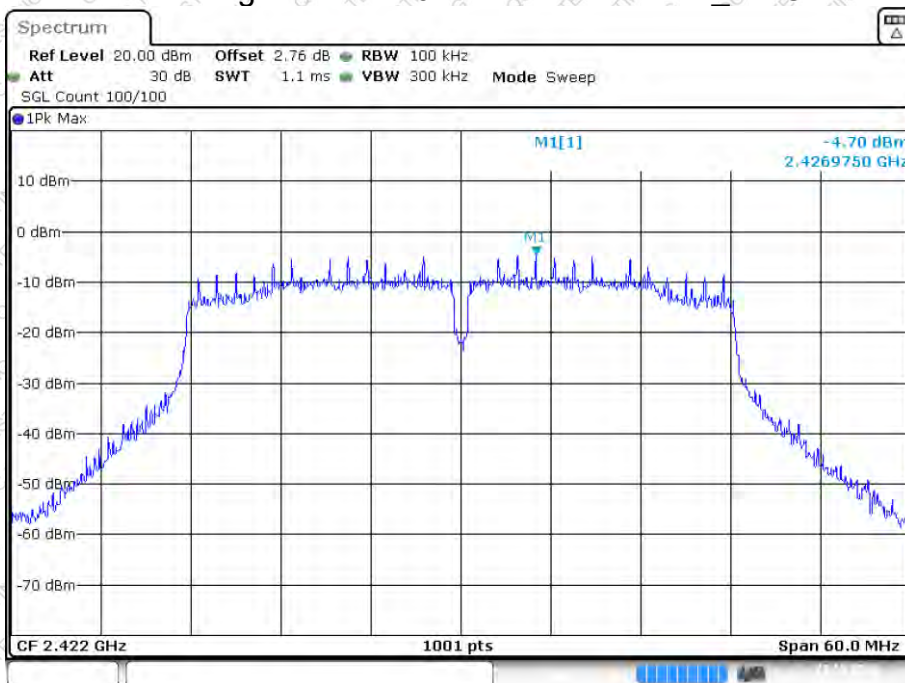
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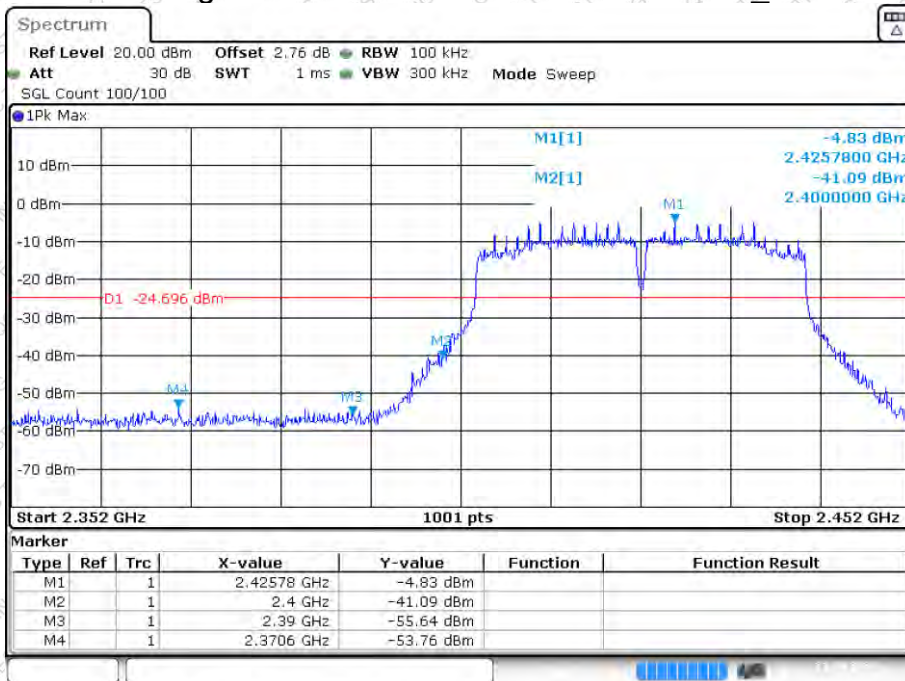


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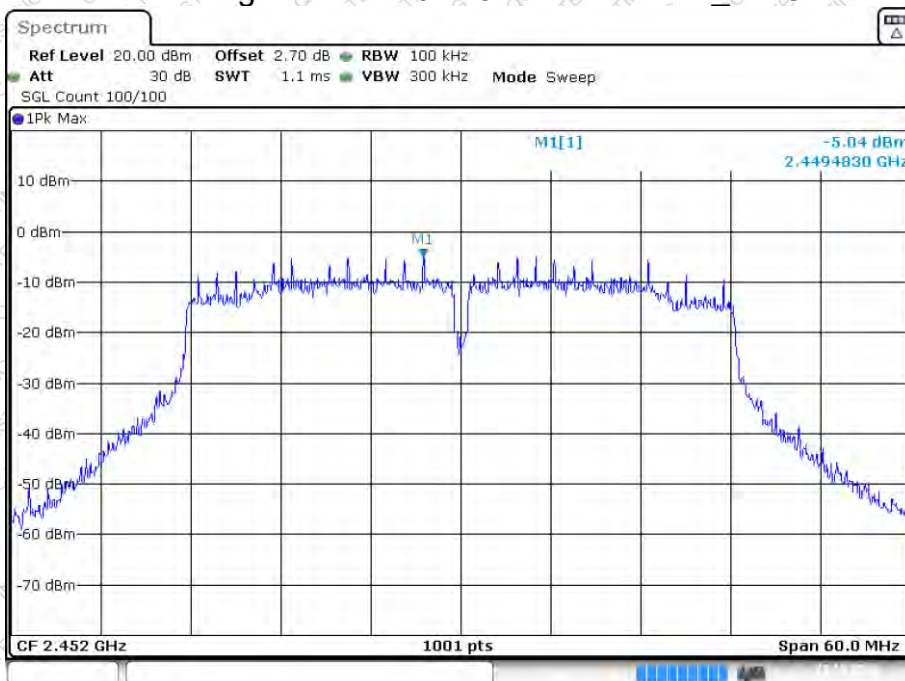
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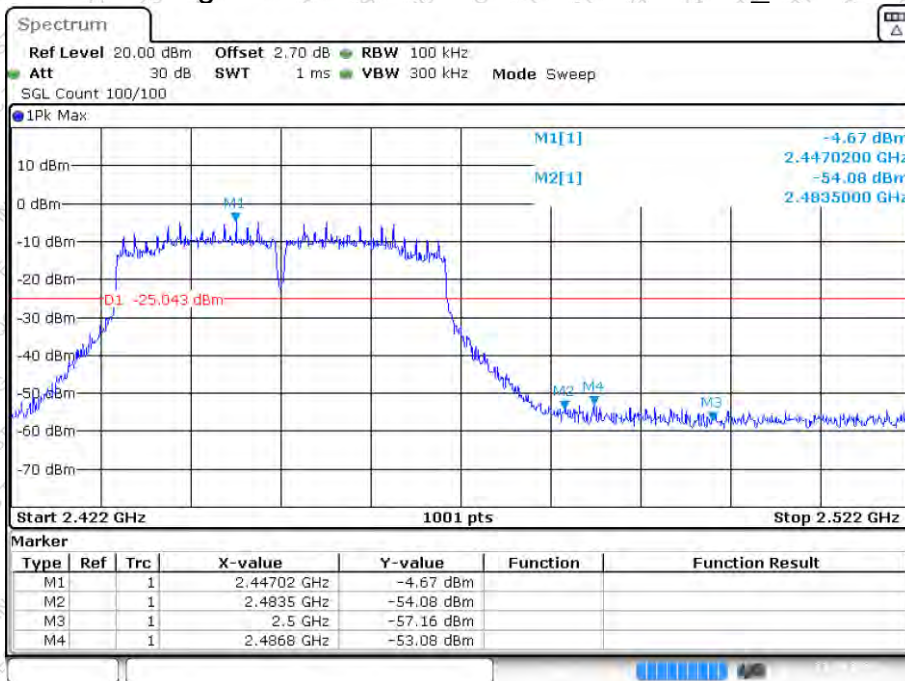


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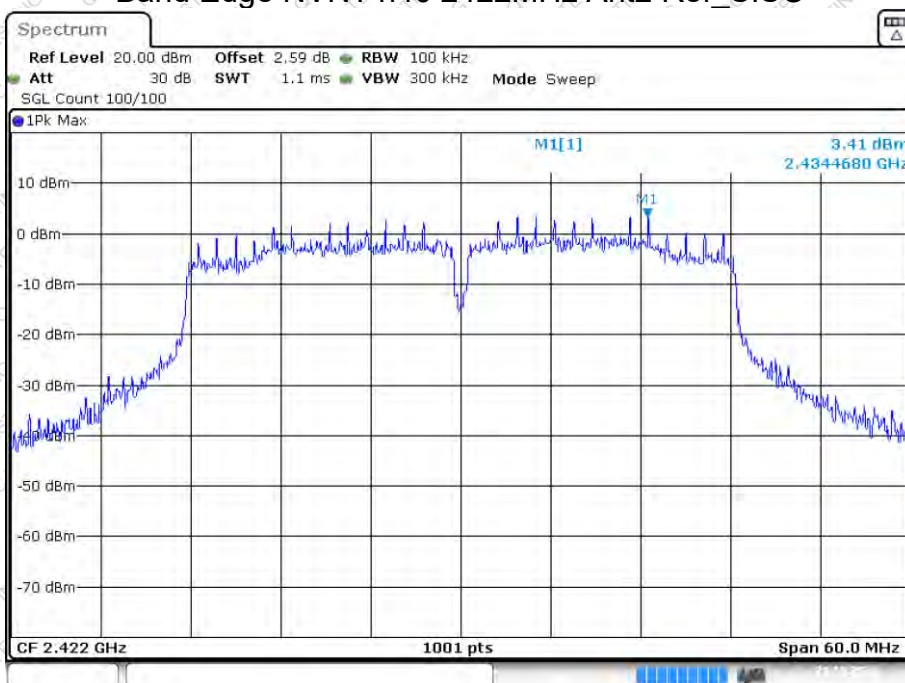
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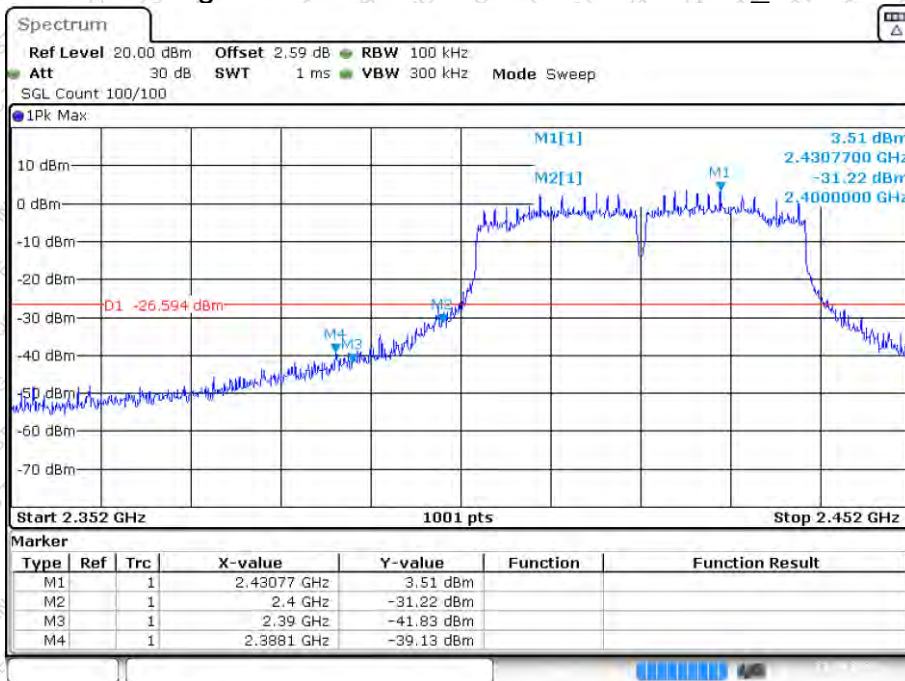


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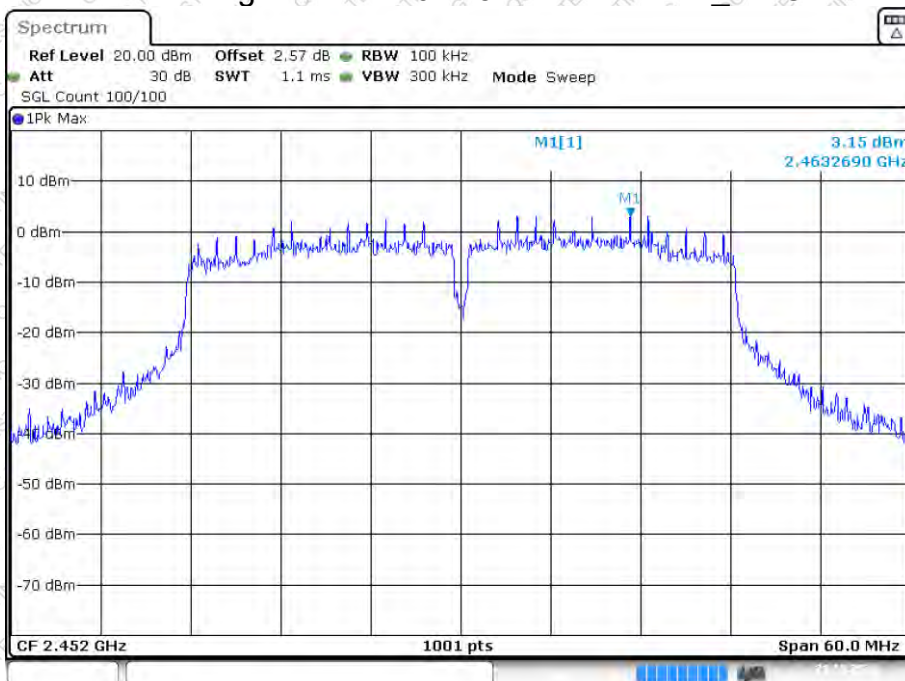
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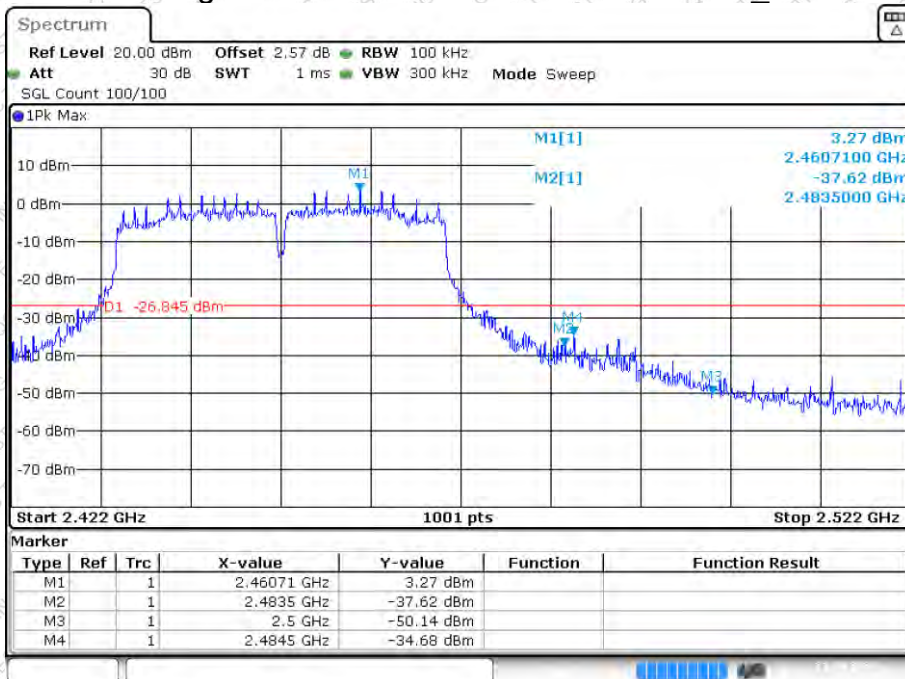


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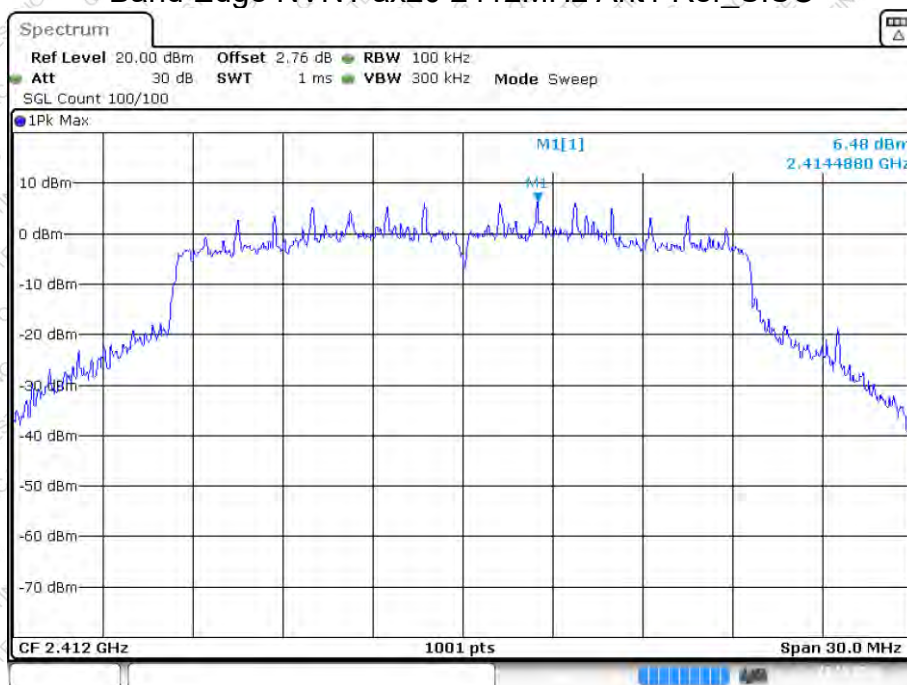
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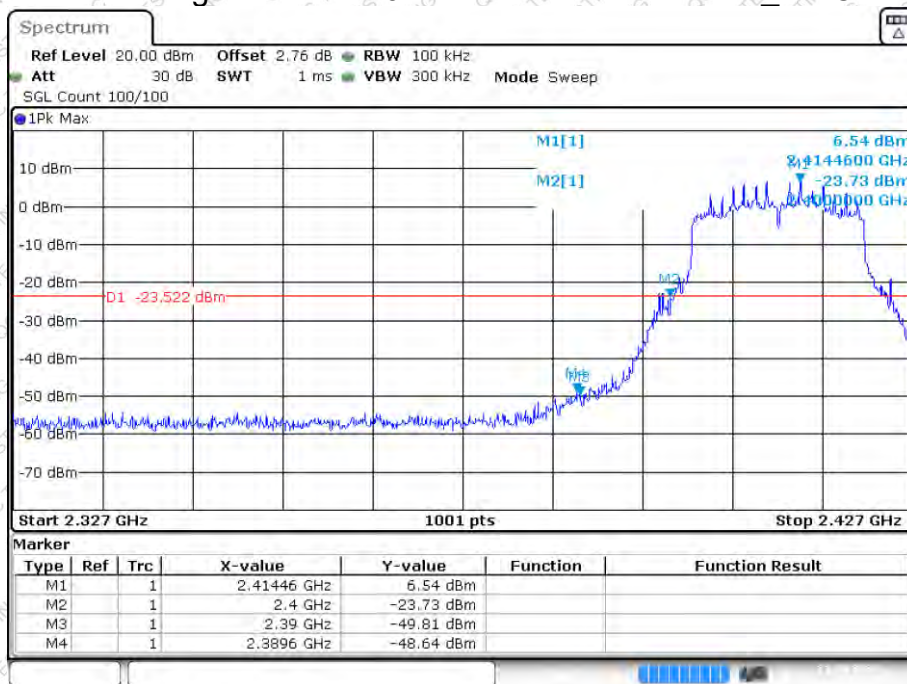


Band Edge NVNT ax20 2412MHz Ant1 Ref_SISO



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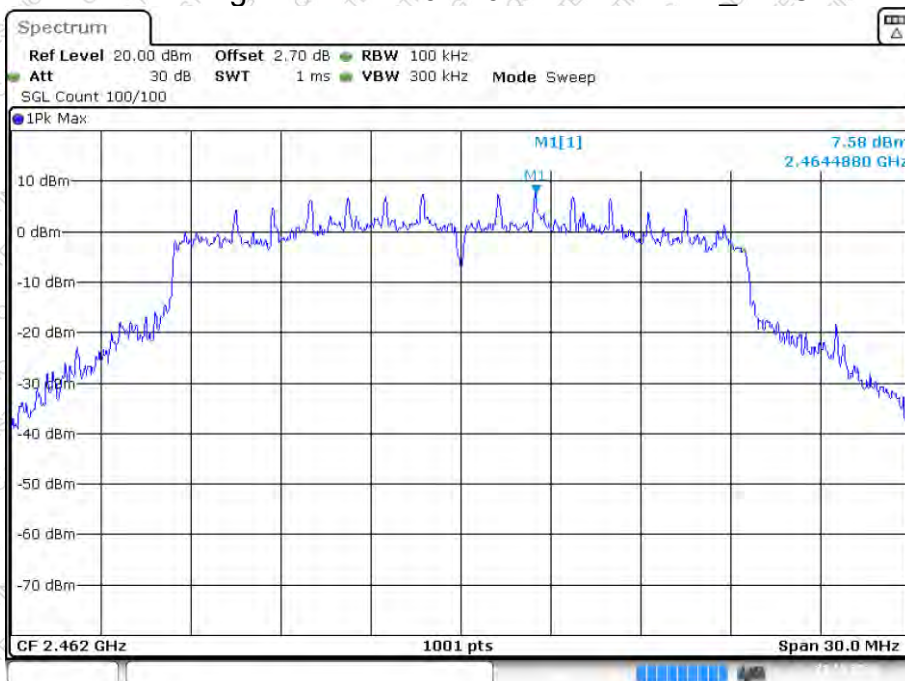
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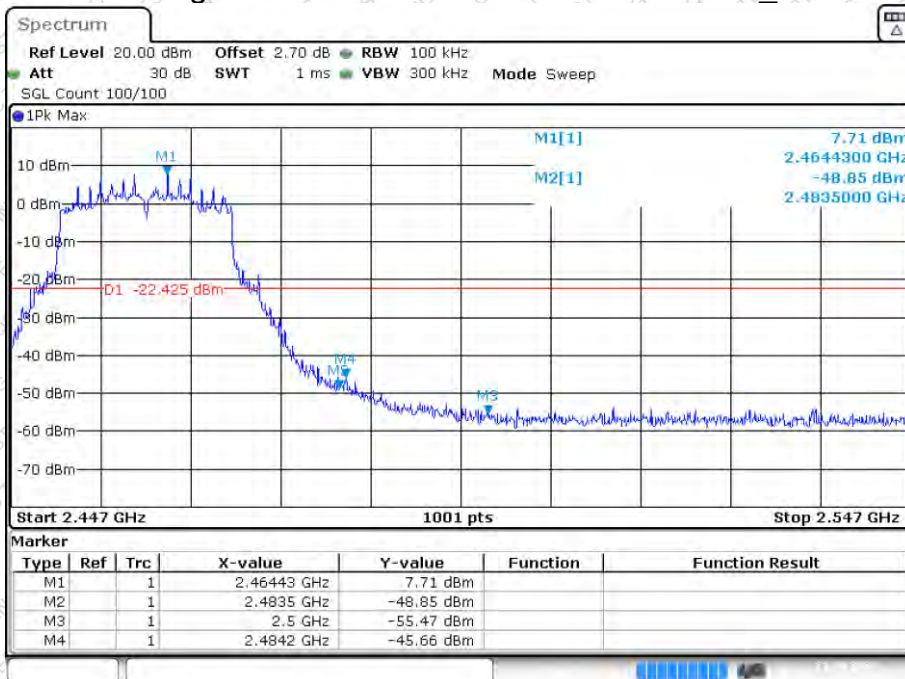


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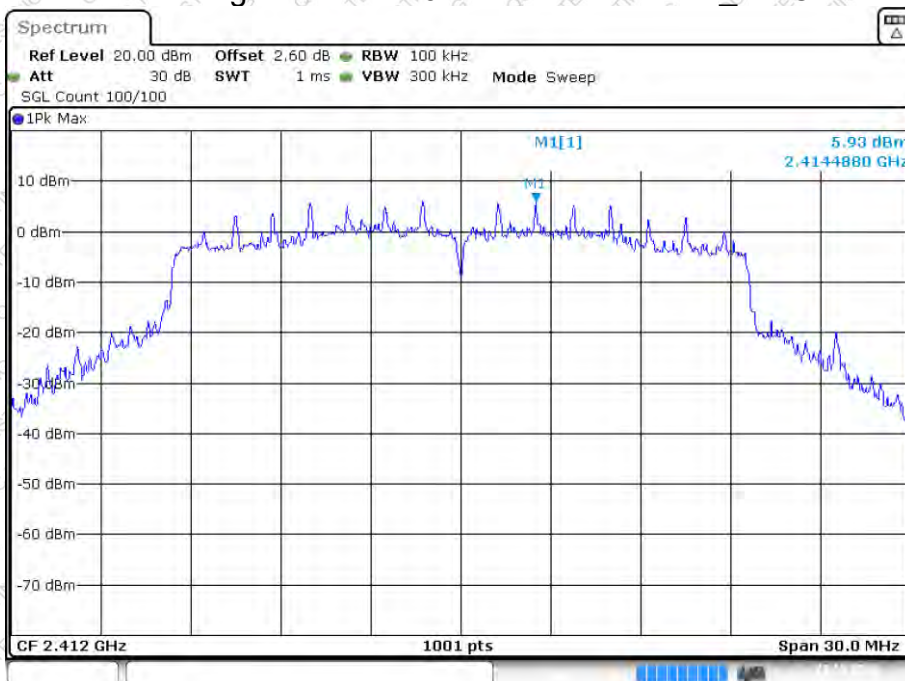
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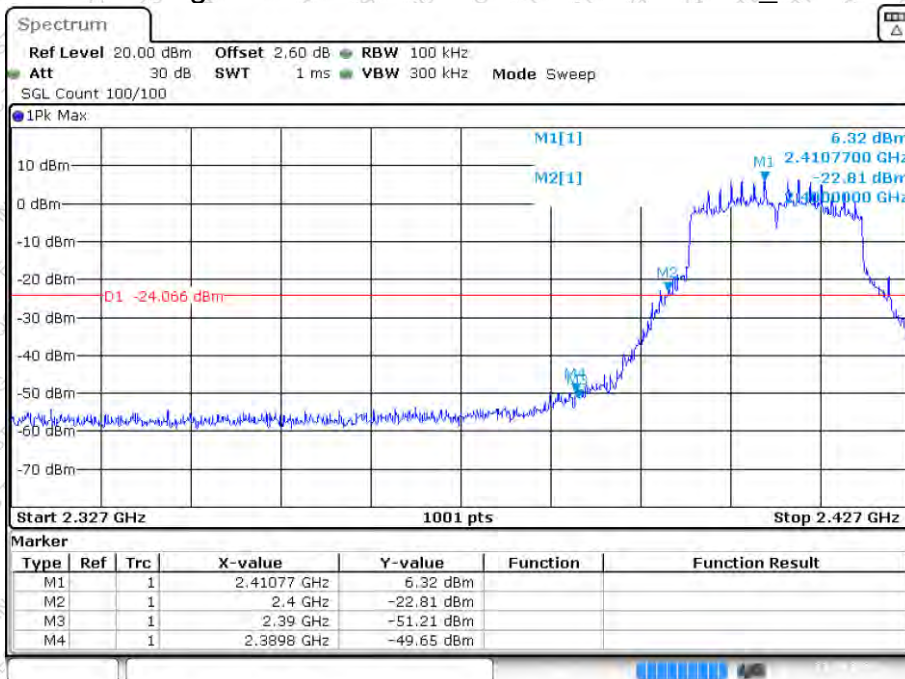


Band Edge NVNT ax20 2412MHz Ant2 Ref_SISO



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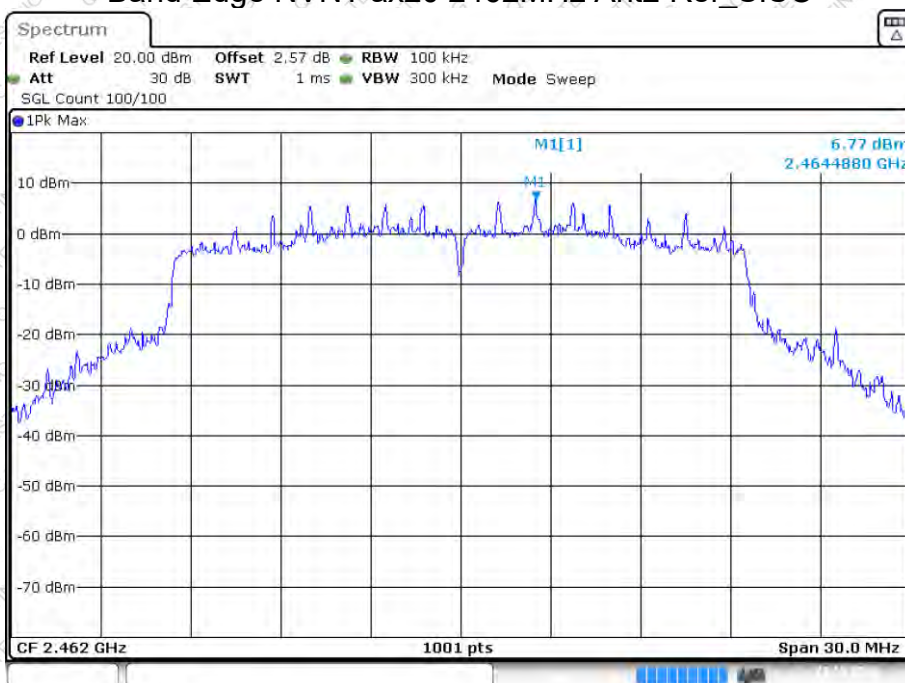
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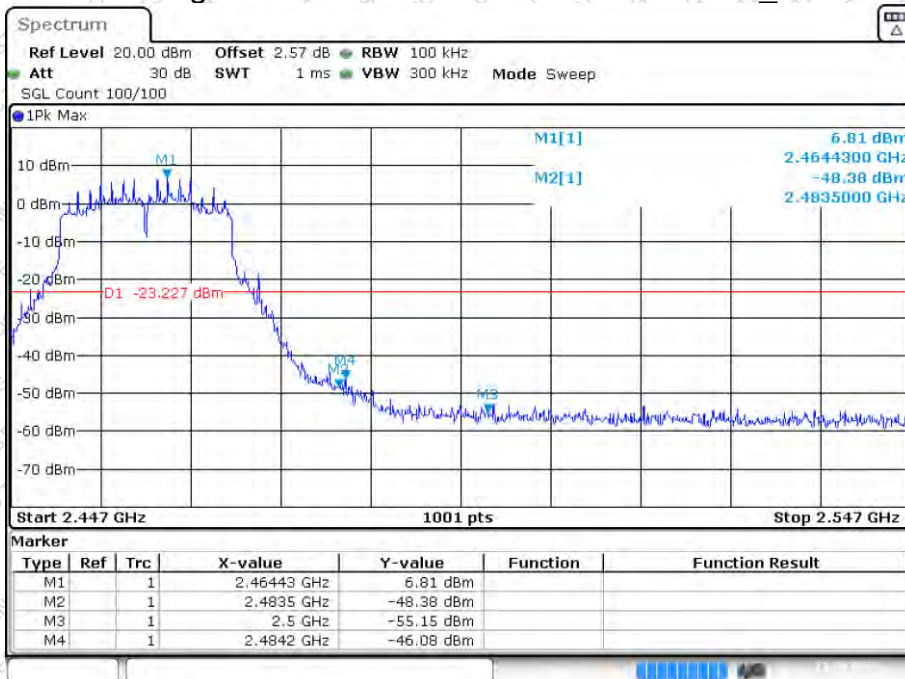


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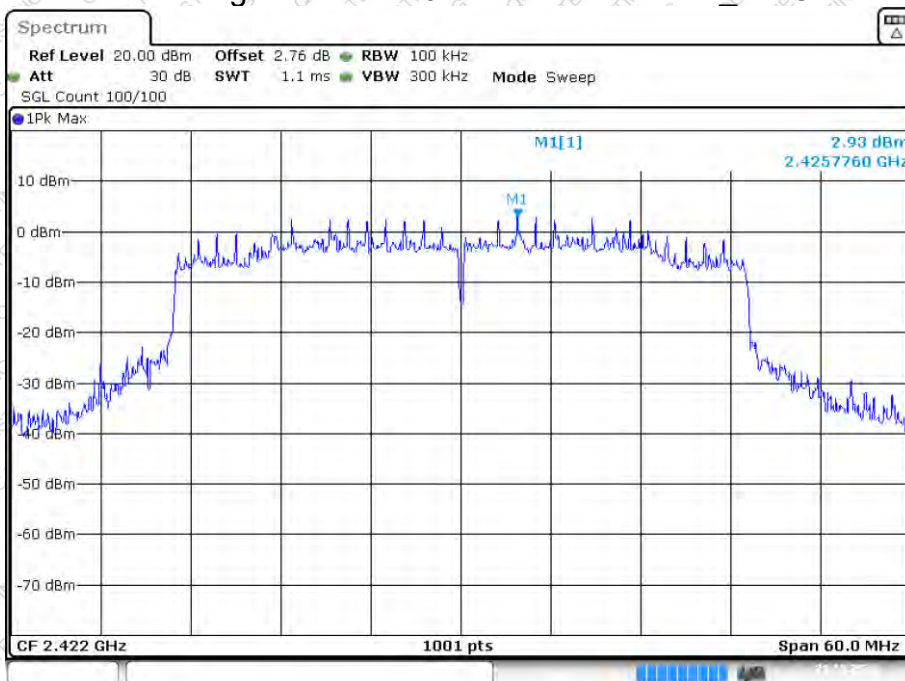
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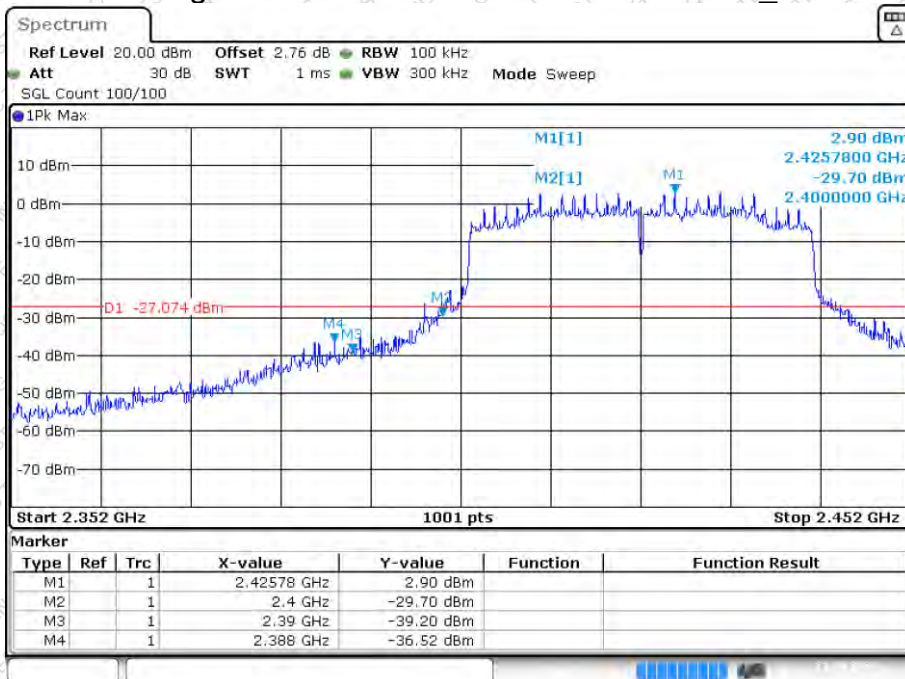


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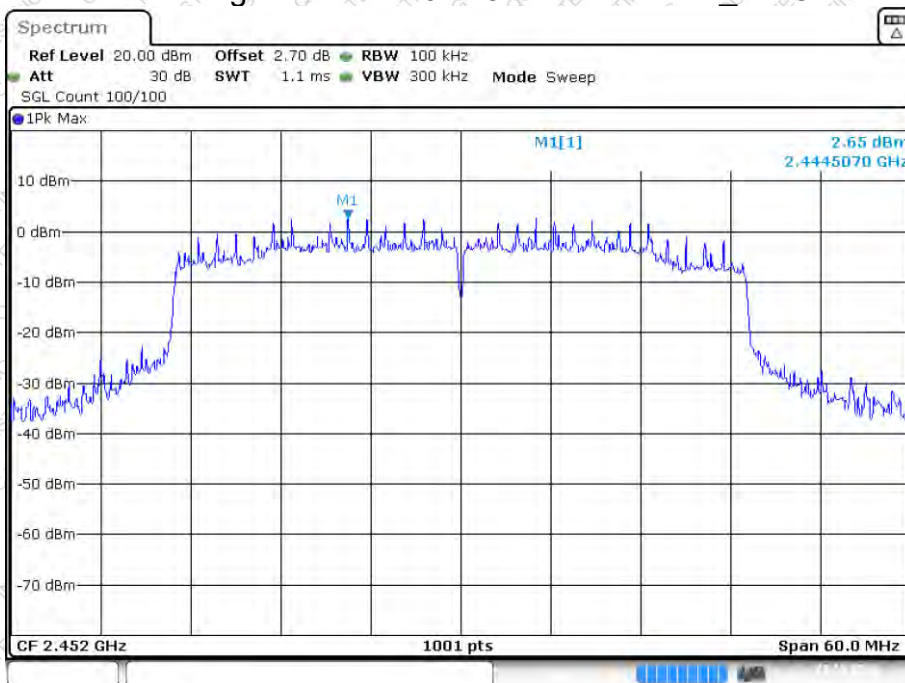
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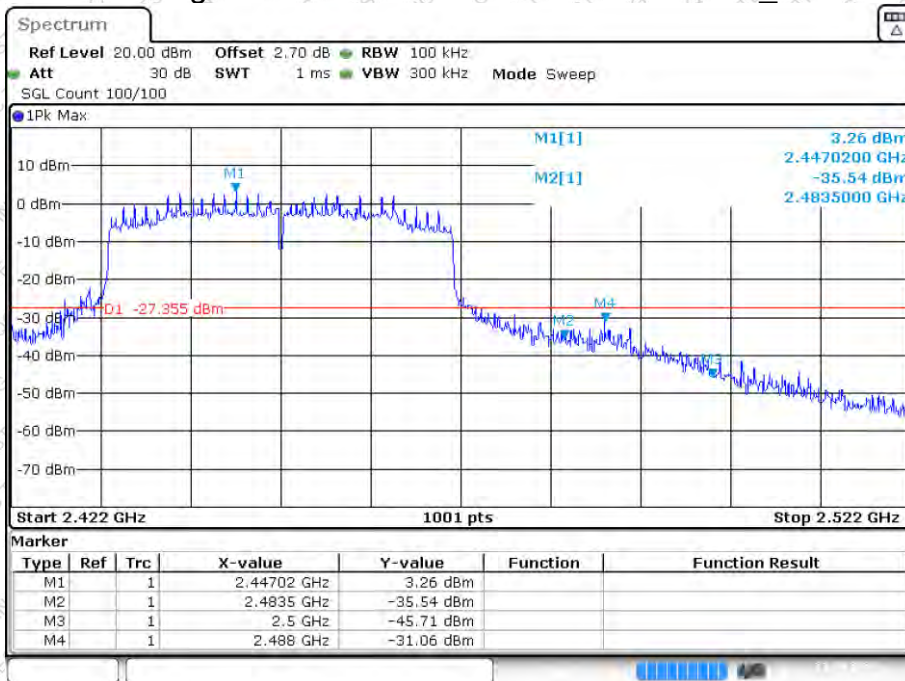


Band Edge NVNT ax40 2452MHz Ant1 Ref_SISO



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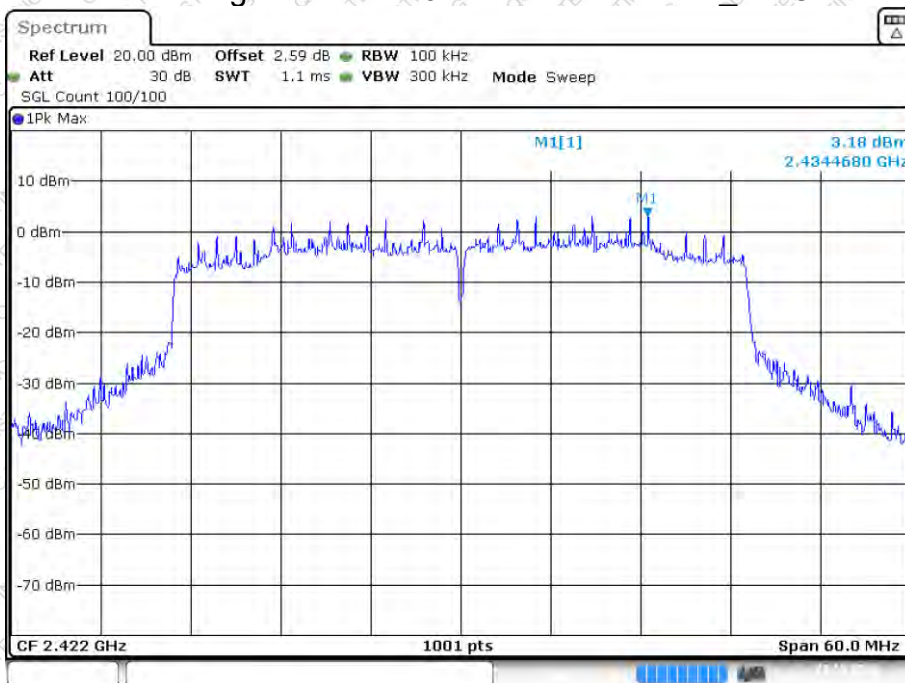
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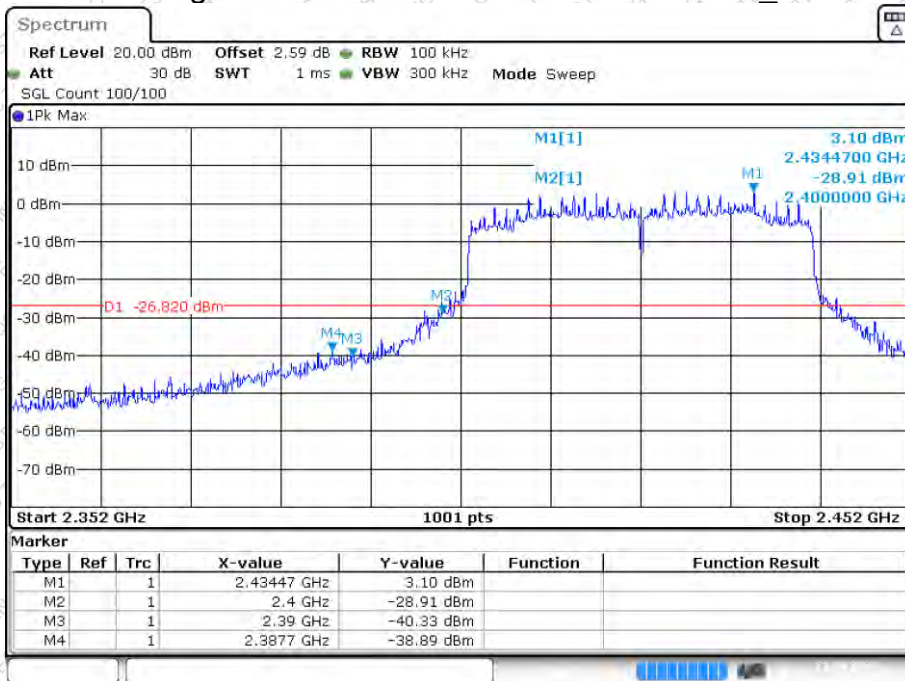


Band Edge NVNT ax40 2422MHz Ant2 Ref_SISO



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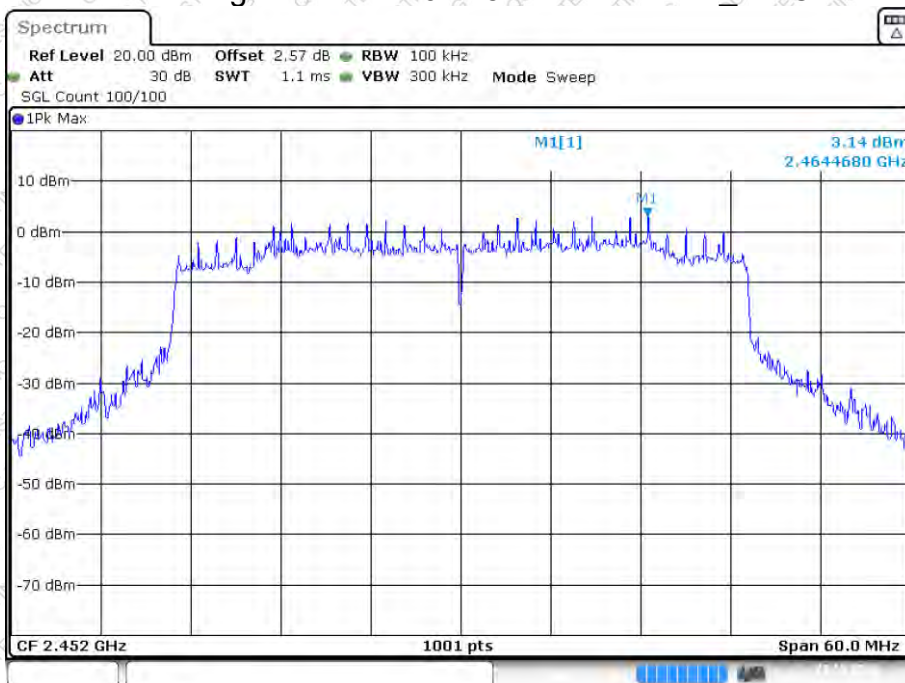
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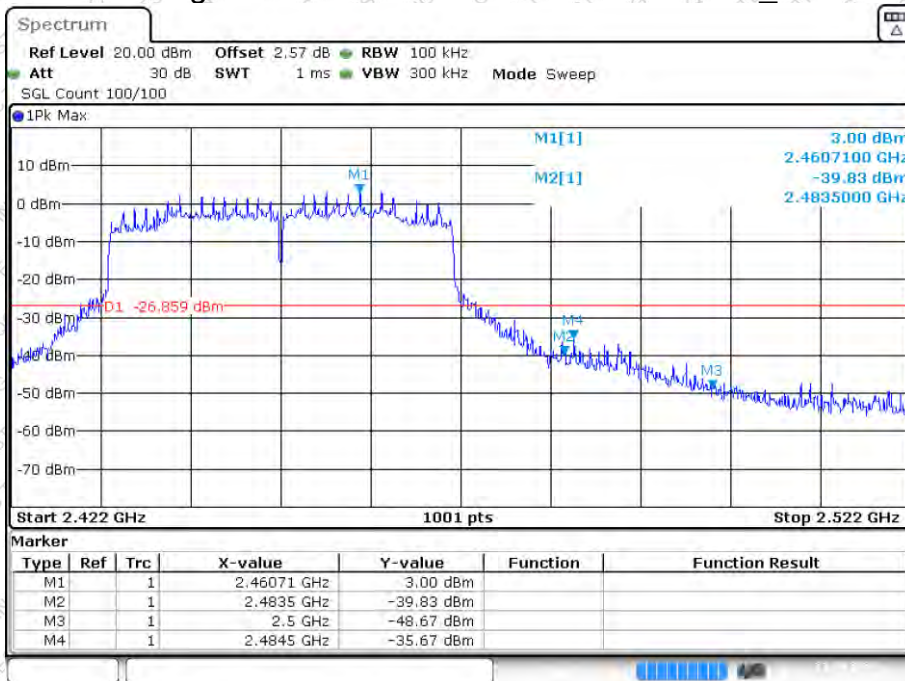


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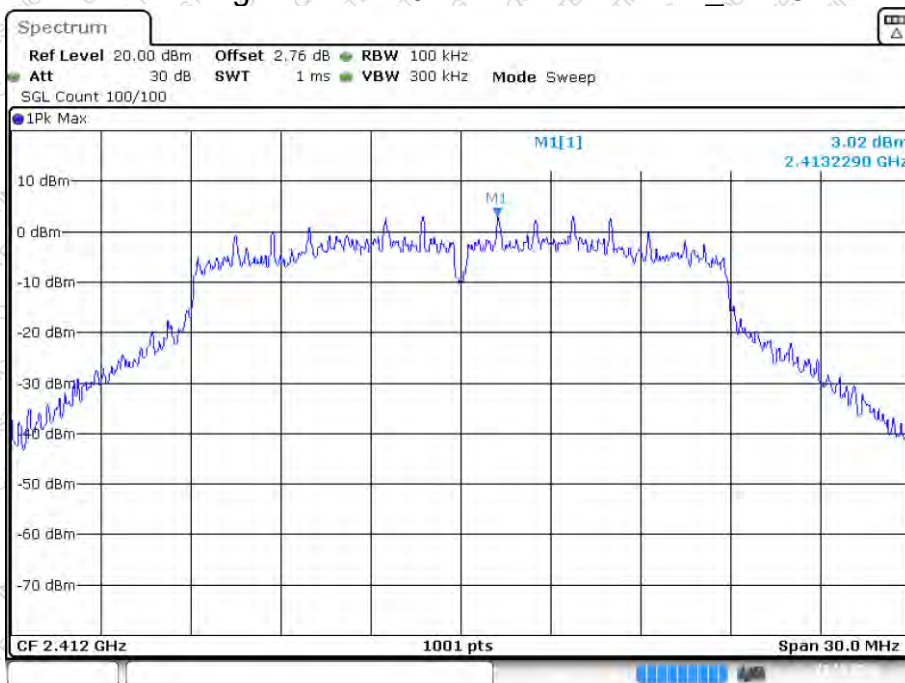
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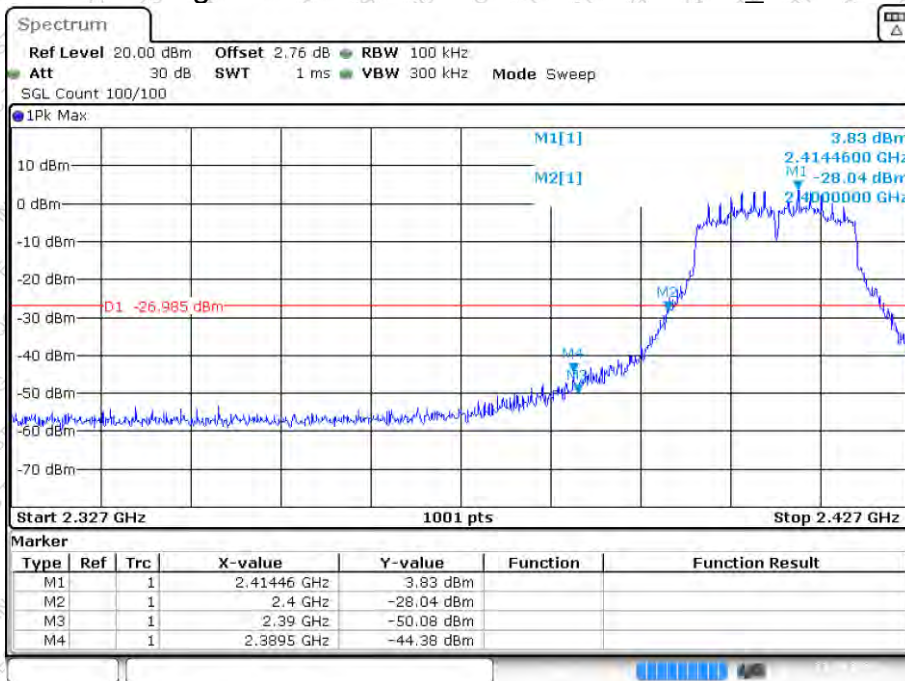


Band Edge NVNT n20 2412MHz Ant1 Ref_MIMO



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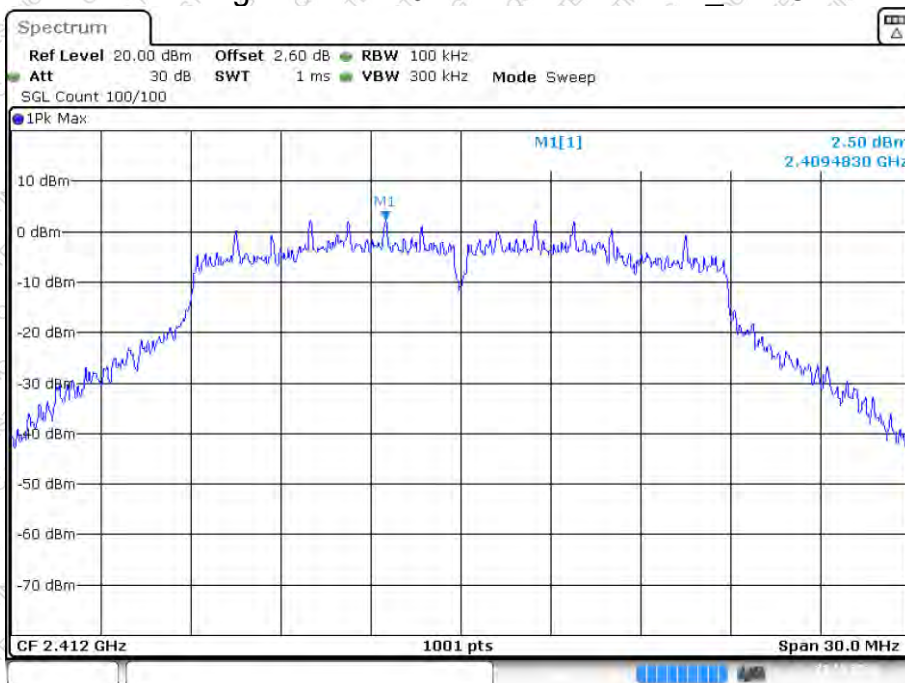
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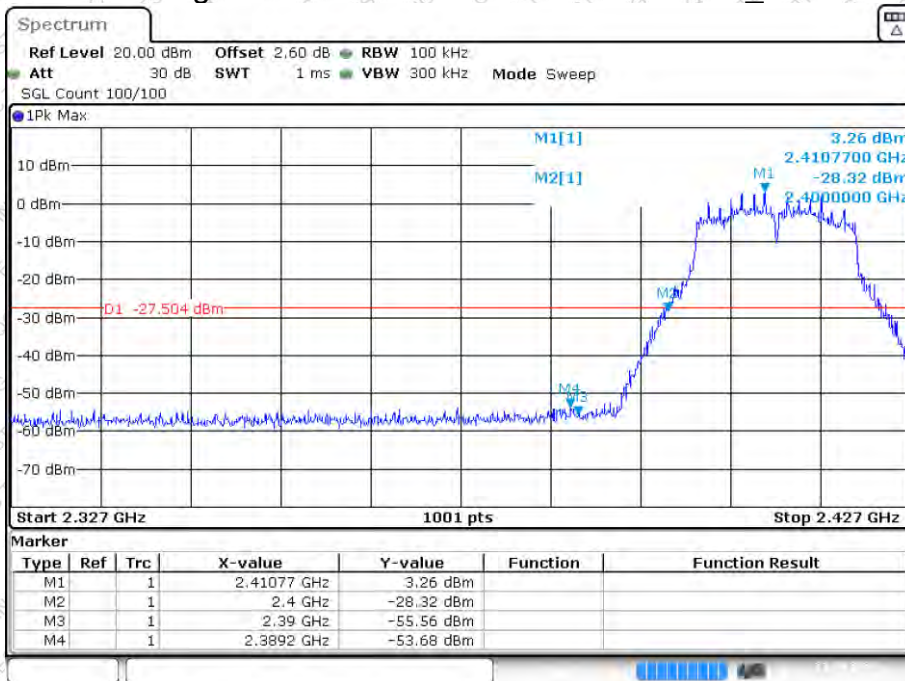


Band Edge NVNT n20 2412MHz Ant2 Ref_MIMO



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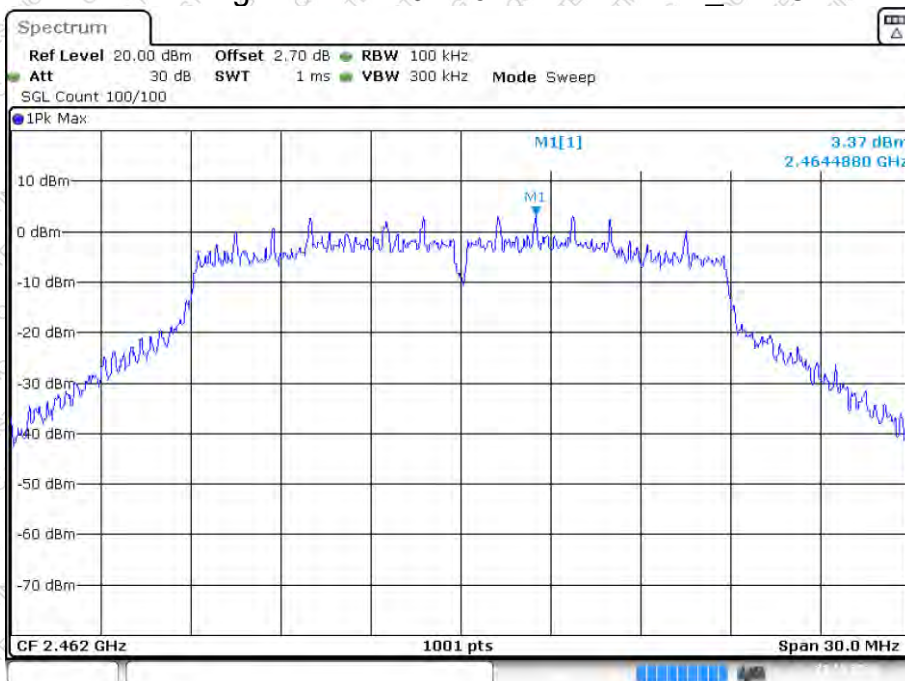
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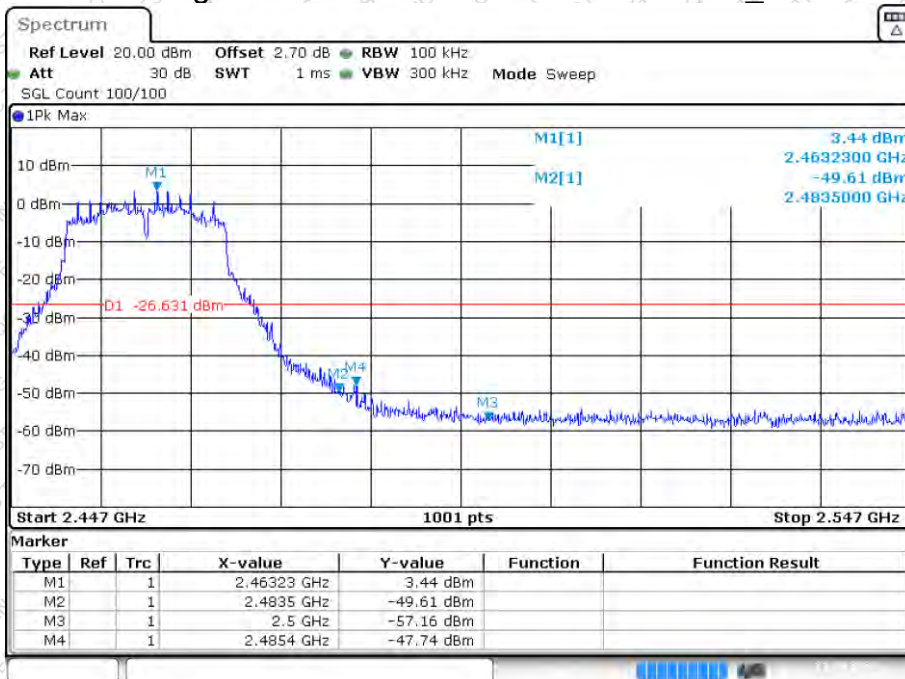


Band Edge NVNT n20 2462MHz Ant1 Ref_MIMO



Date: 21.OCT.2024 15:08:59

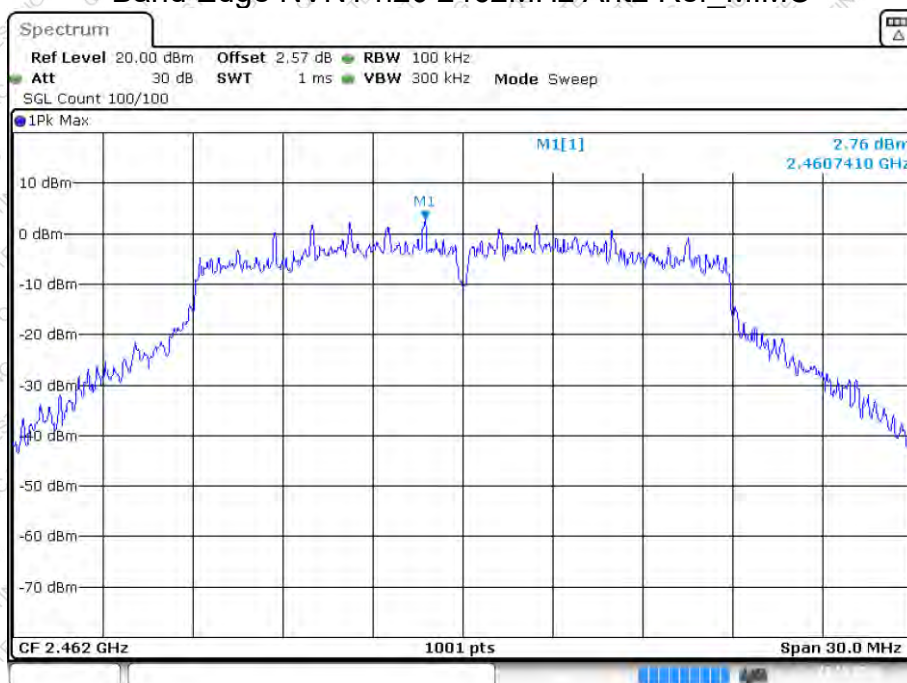
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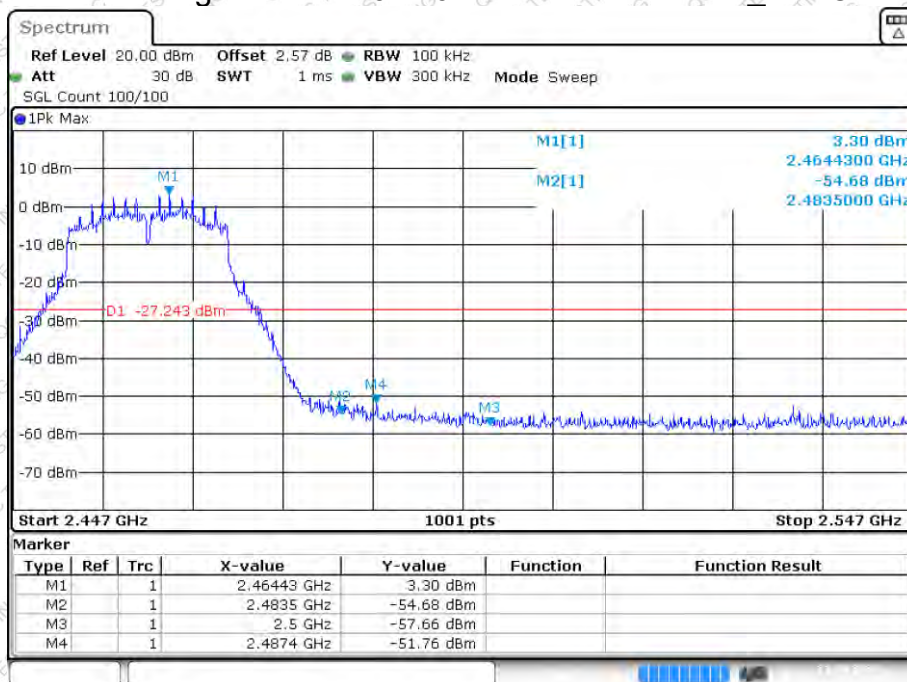


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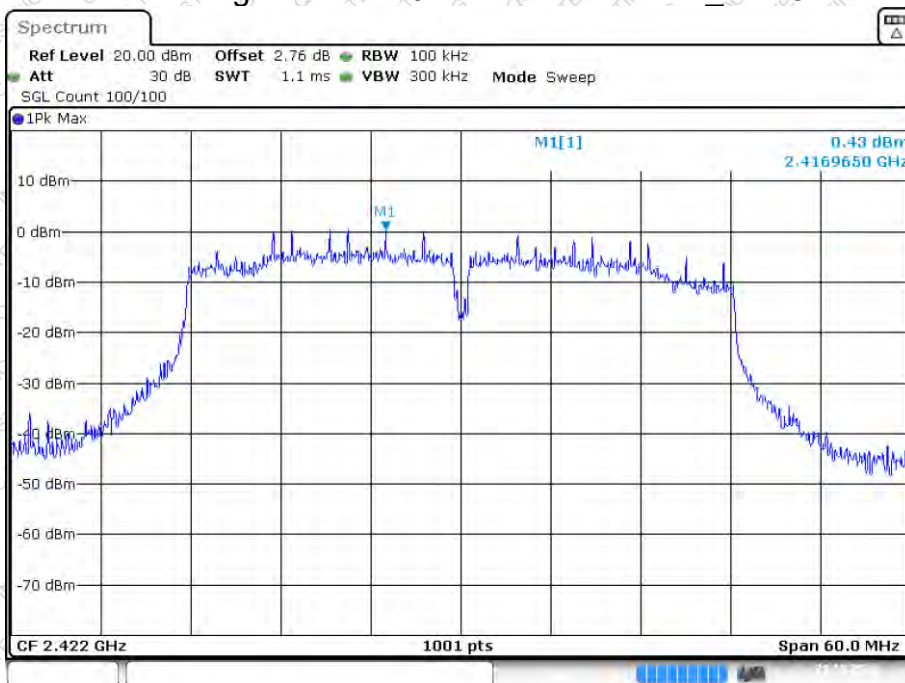
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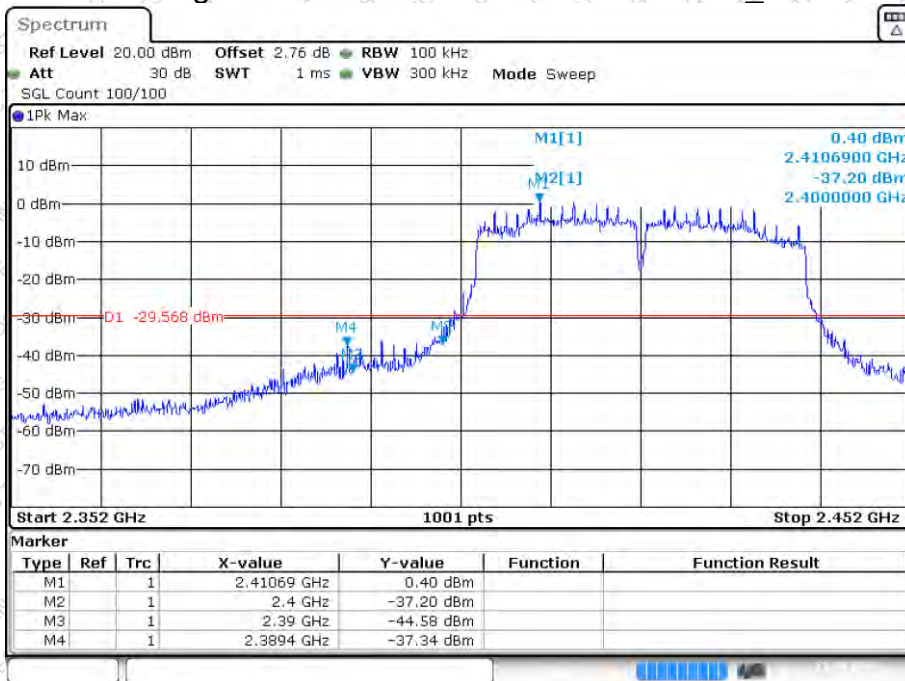


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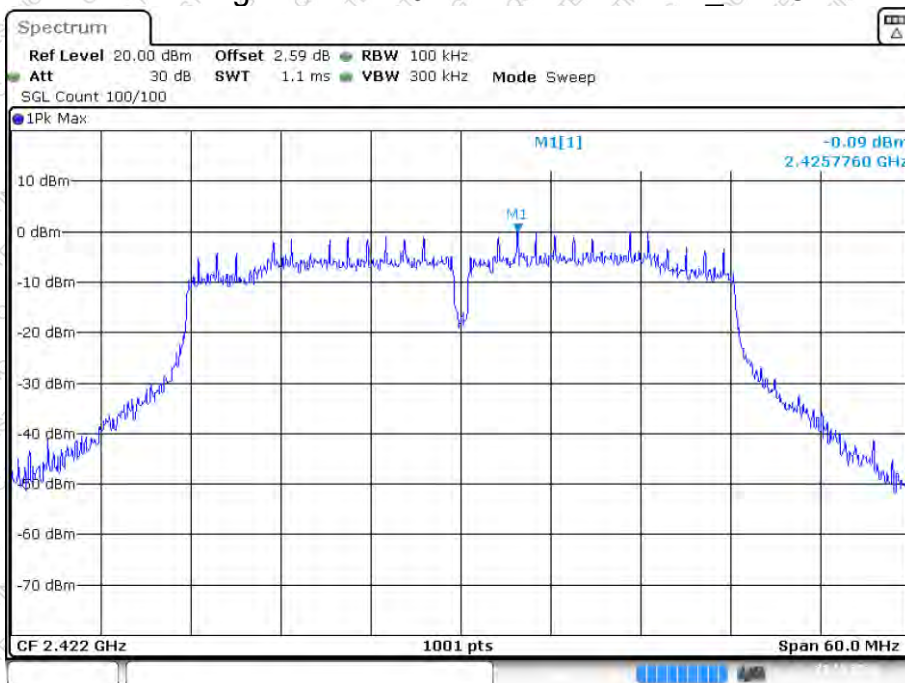
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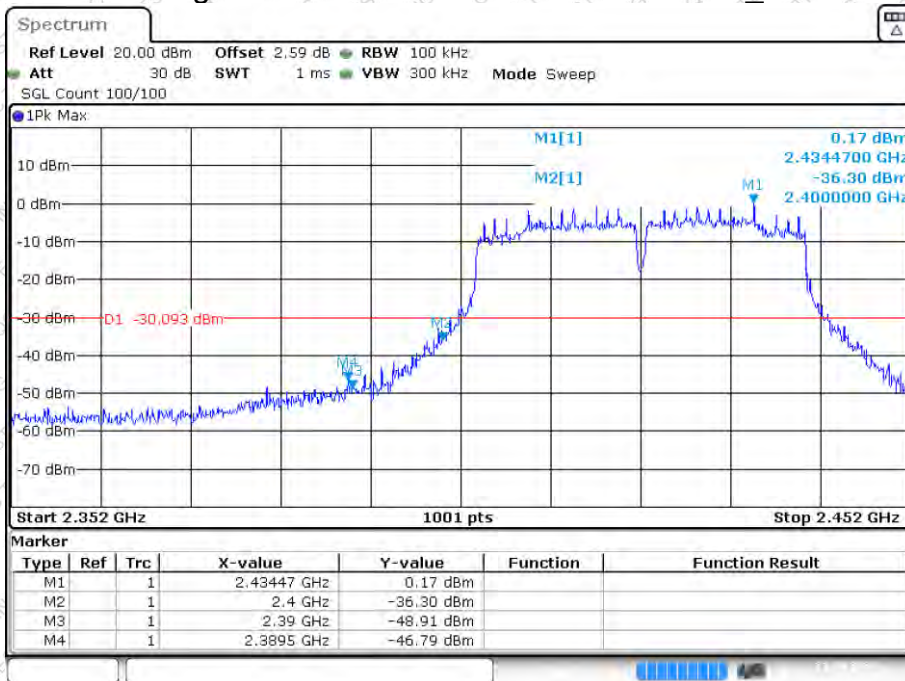


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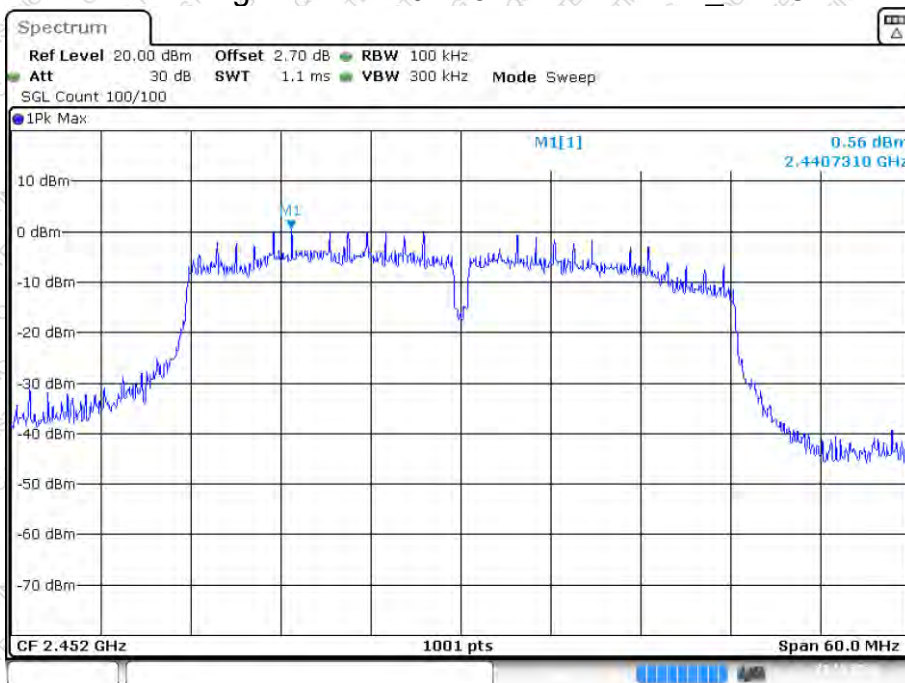
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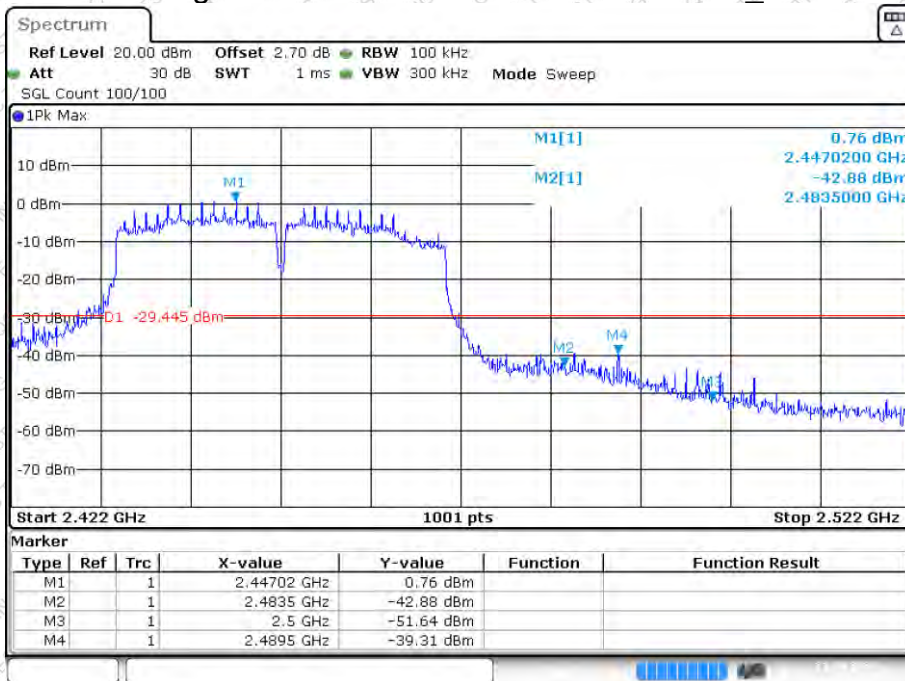


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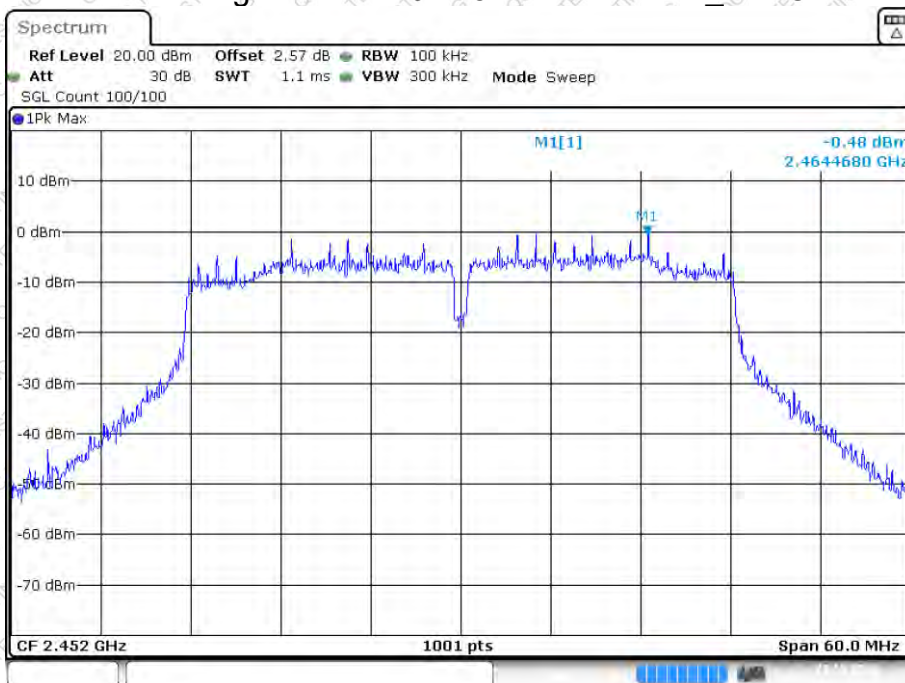
Band Edge NVNT n40 2452MHz Ant1 Emission_MIMO



Date: 21.OCT.2024 15:18:19

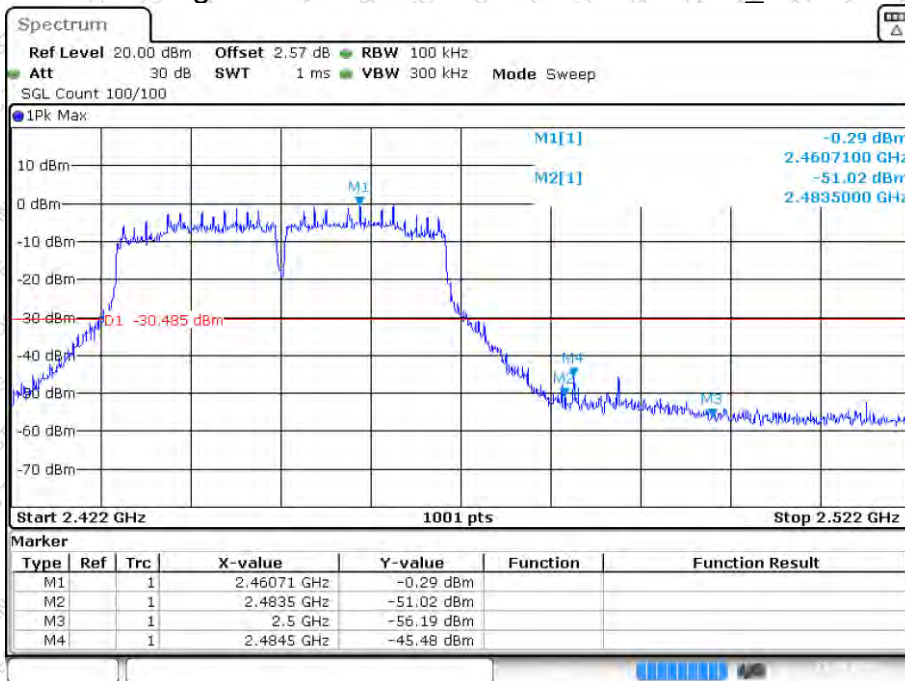


Band Edge NVNT n40 2452MHz Ant2 Ref_MIMO



Date: 21.OCT.2024 15:18:21

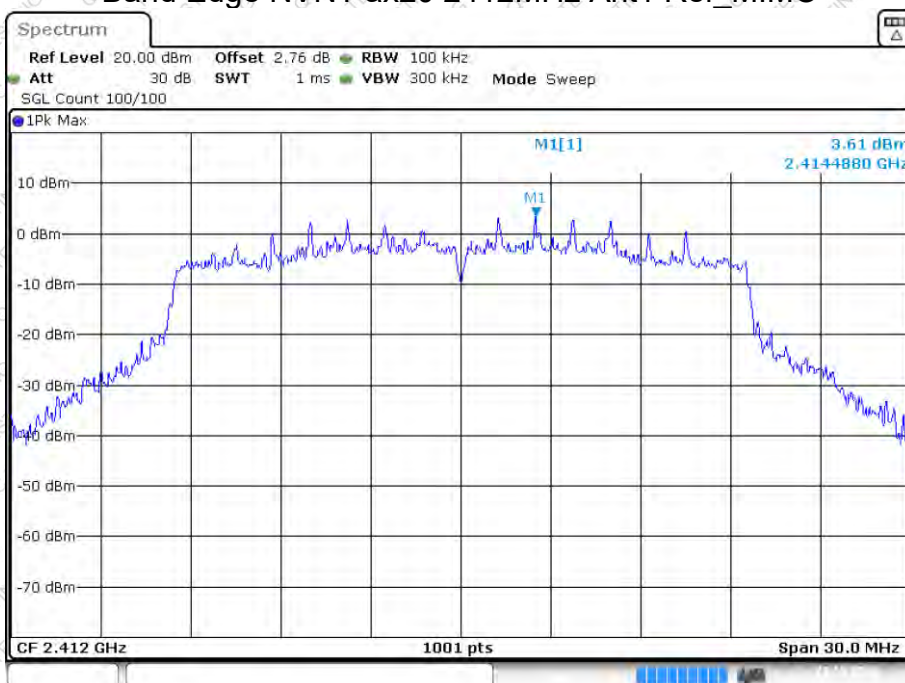
Band Edge NVNT n40 2452MHz Ant2 Emission_MIMO



Date: 21.OCT.2024 15:18:23

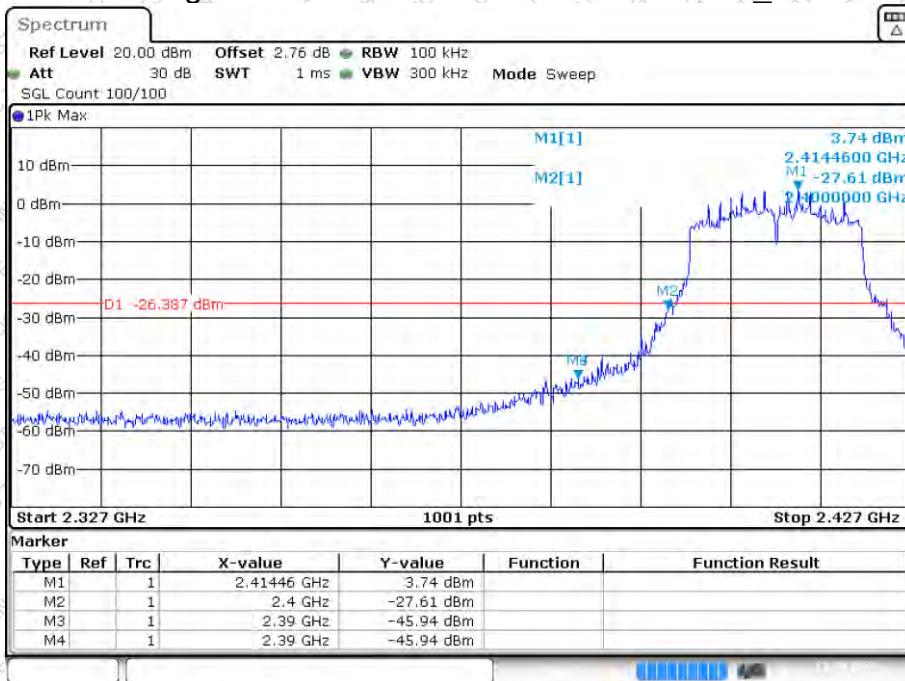


Band Edge NVNT ax20 2412MHz Ant1 Ref_MIMO



Date: 21.OCT.2024 15:36:04

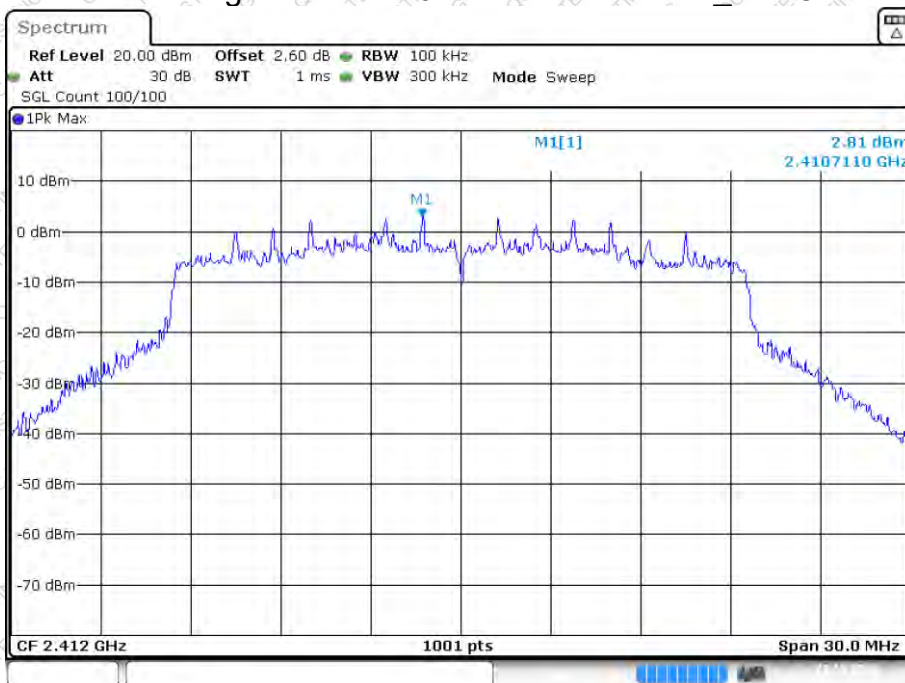
Band Edge NVNT ax20 2412MHz Ant1 Emission_MIMO



Date: 21.OCT.2024 15:36:06

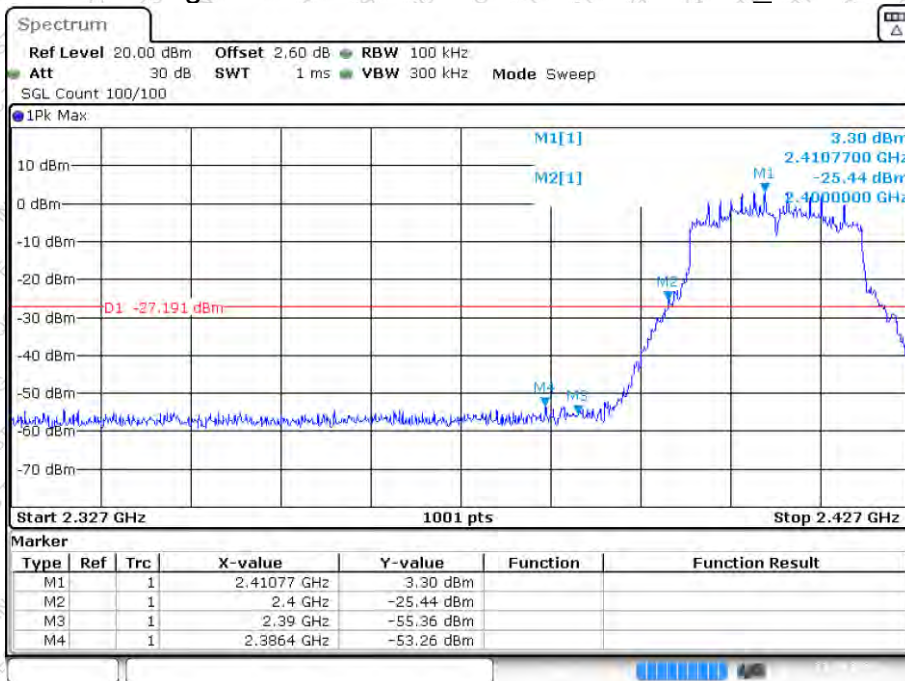


Band Edge NVNT ax20 2412MHz Ant2 Ref_MIMO



Date: 21.OCT.2024 15:36:09

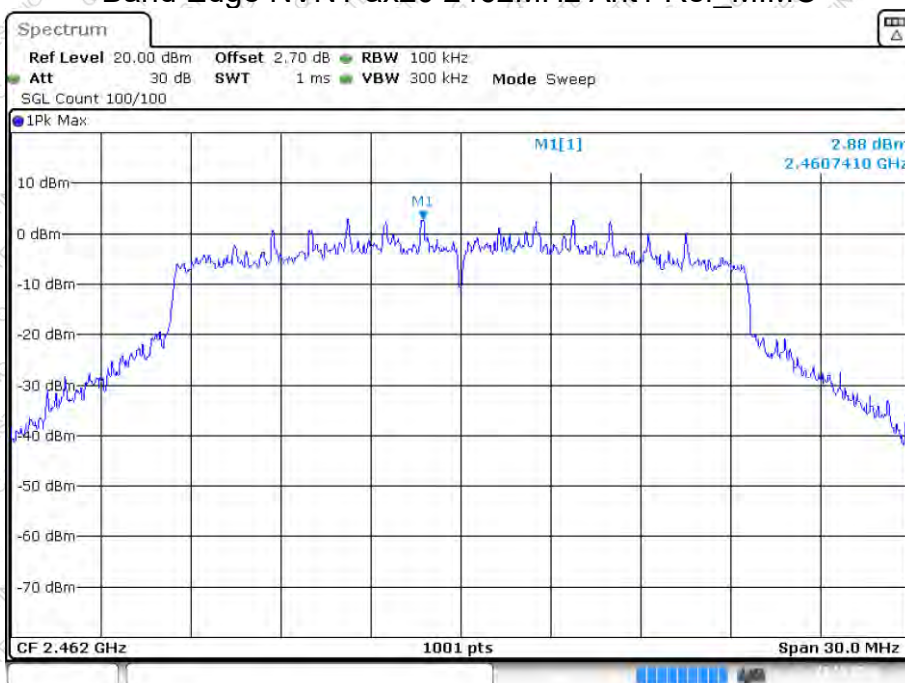
Band Edge NVNT ax20 2412MHz Ant2 Emission_MIMO



Date: 21.OCT.2024 15:36:10

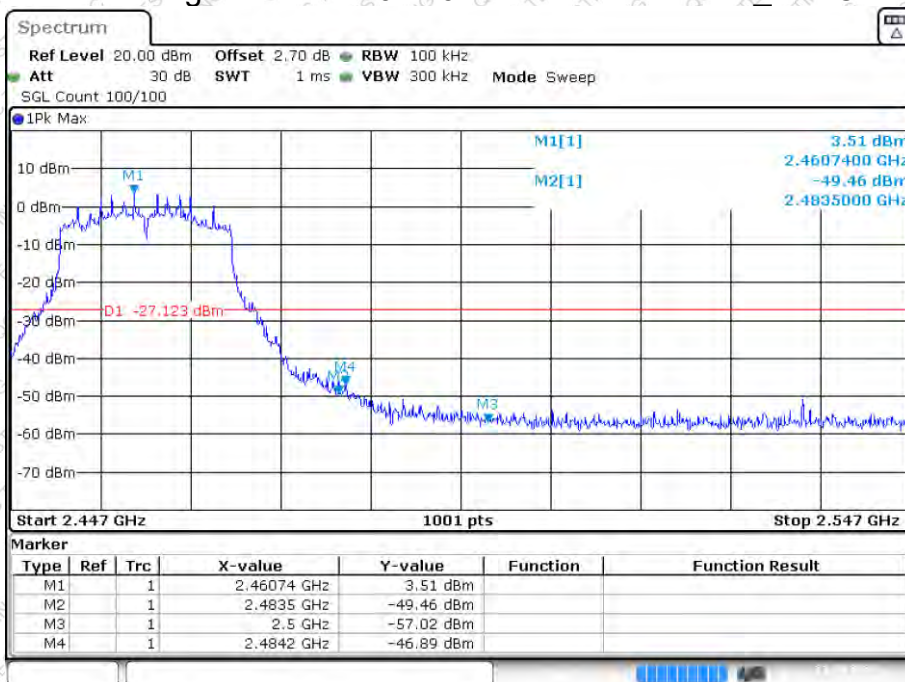


Band Edge NVNT ax20 2462MHz Ant1 Ref_MIMO



Date: 21.OCT.2024 15:45:40

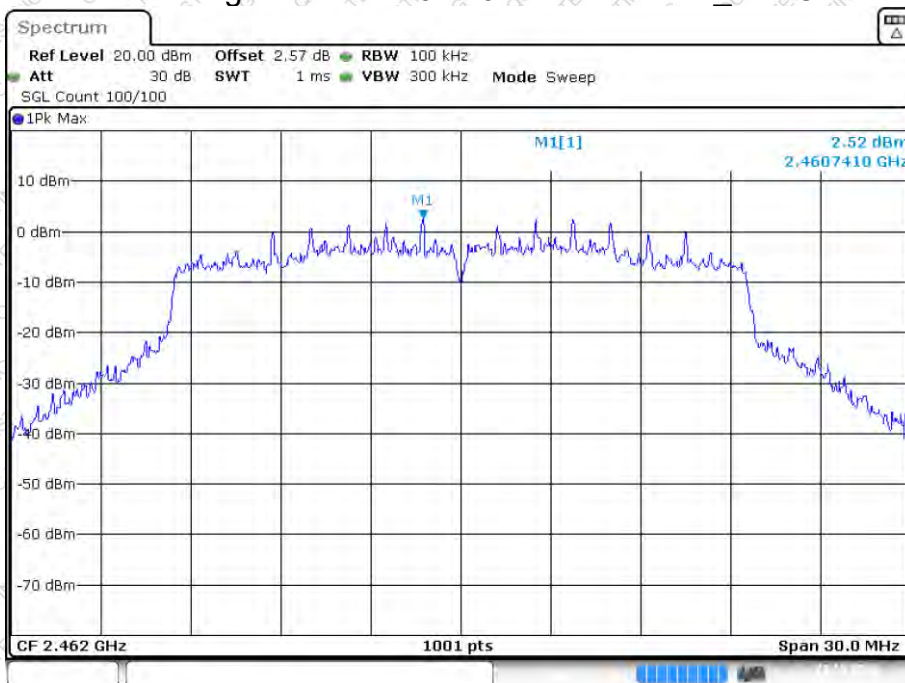
Band Edge NVNT ax20 2462MHz Ant1 Emission_MIMO



Date: 21.OCT.2024 15:45:41

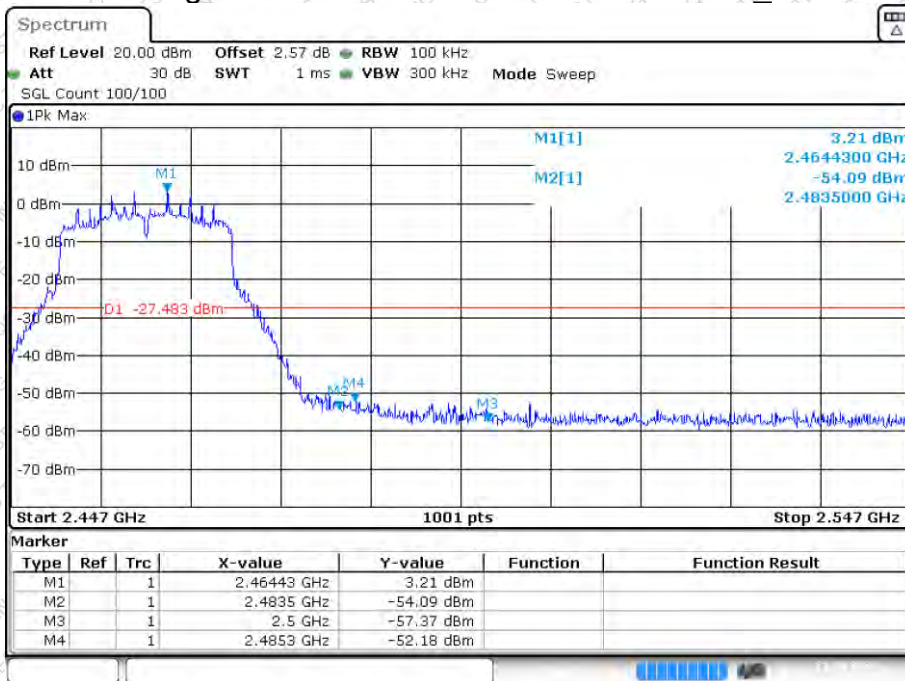


Band Edge NVNT ax20 2462MHz Ant2 Ref_MIMO



Date: 21.OCT.2024 15:45:44

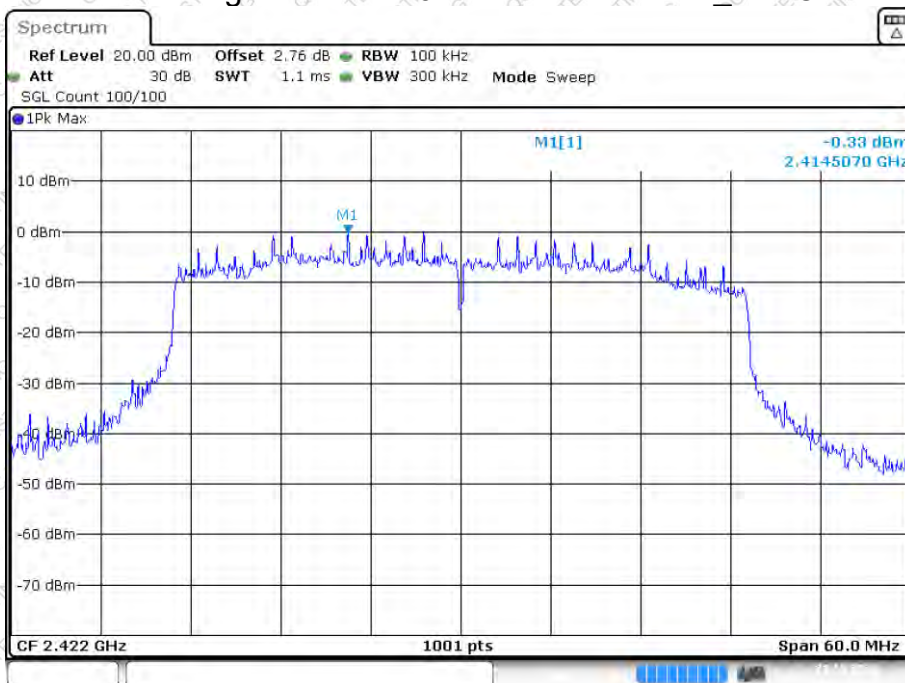
Band Edge NVNT ax20 2462MHz Ant2 Emission_MIMO



Date: 21.OCT.2024 15:45:46

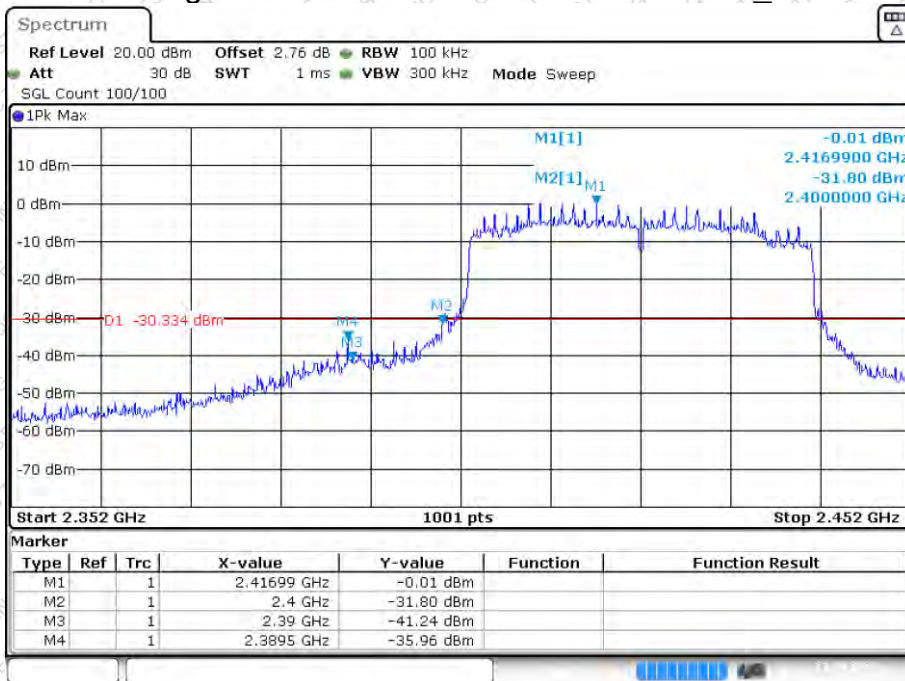


Band Edge NVNT ax40 2422MHz Ant1 Ref_MIMO



Date: 21. OCT 2024 15:48:49

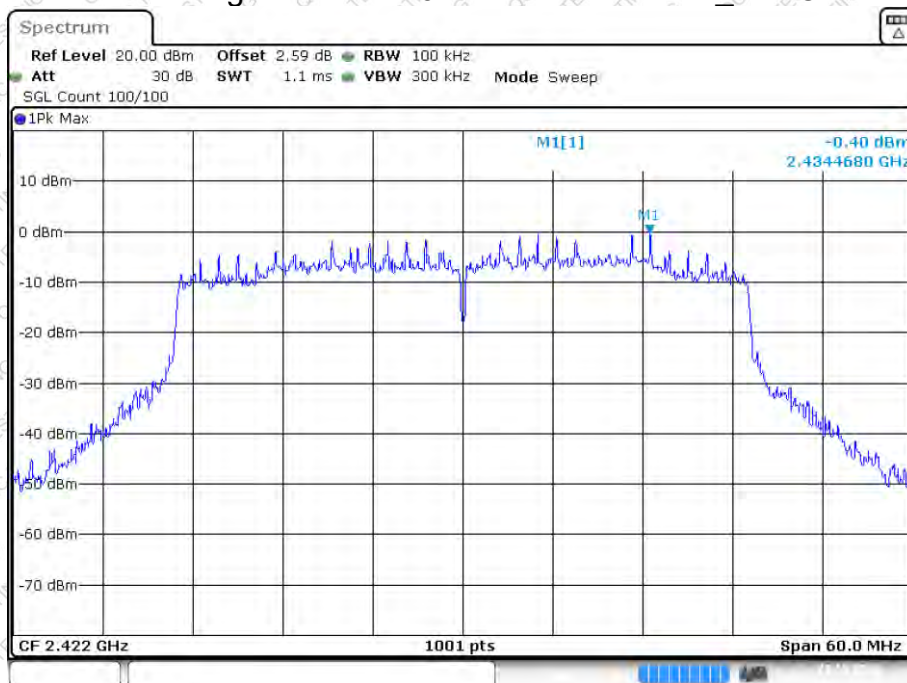
Band Edge NVNT ax40 2422MHz Ant1 Emission_MIMO



Date: 21. OCT 2024 15:48:51

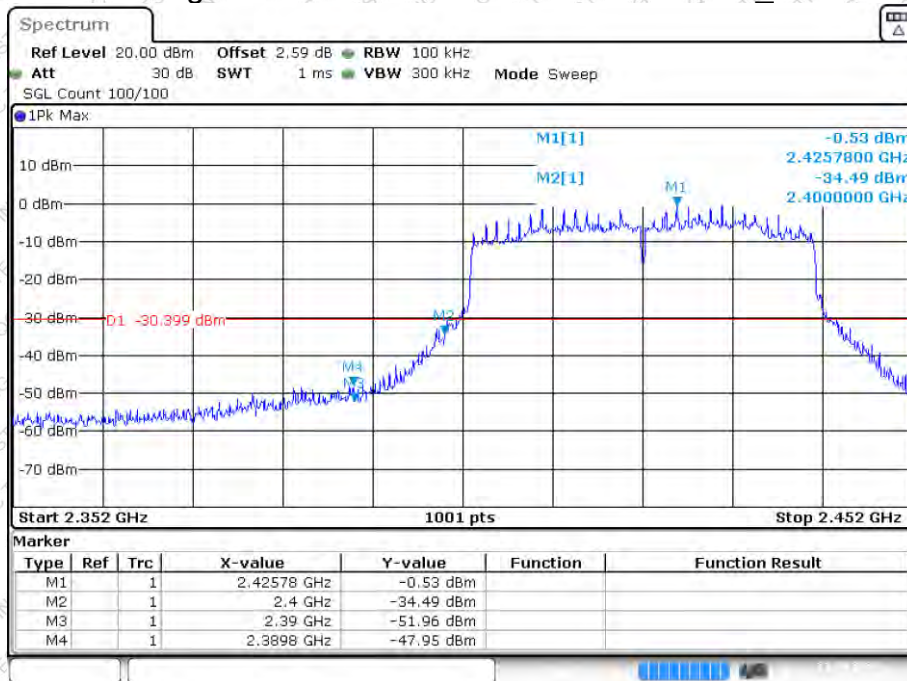


Band Edge NVNT ax40 2422MHz Ant2 Ref_MIMO



Date: 21.OCT.2024 15:48:53

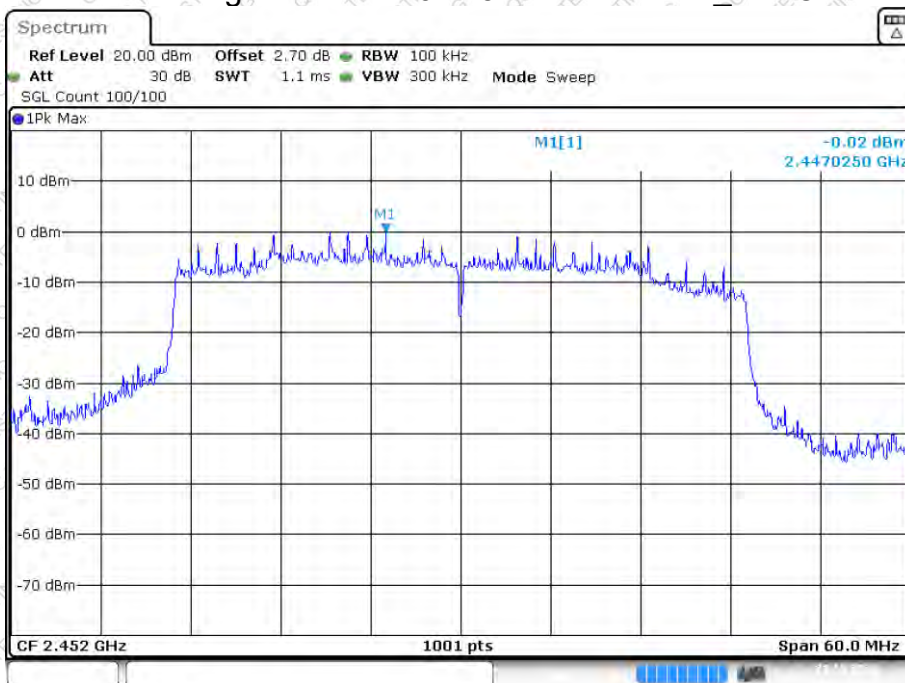
Band Edge NVNT ax40 2422MHz Ant2 Emission_MIMO



Date: 21.OCT.2024 15:48:55

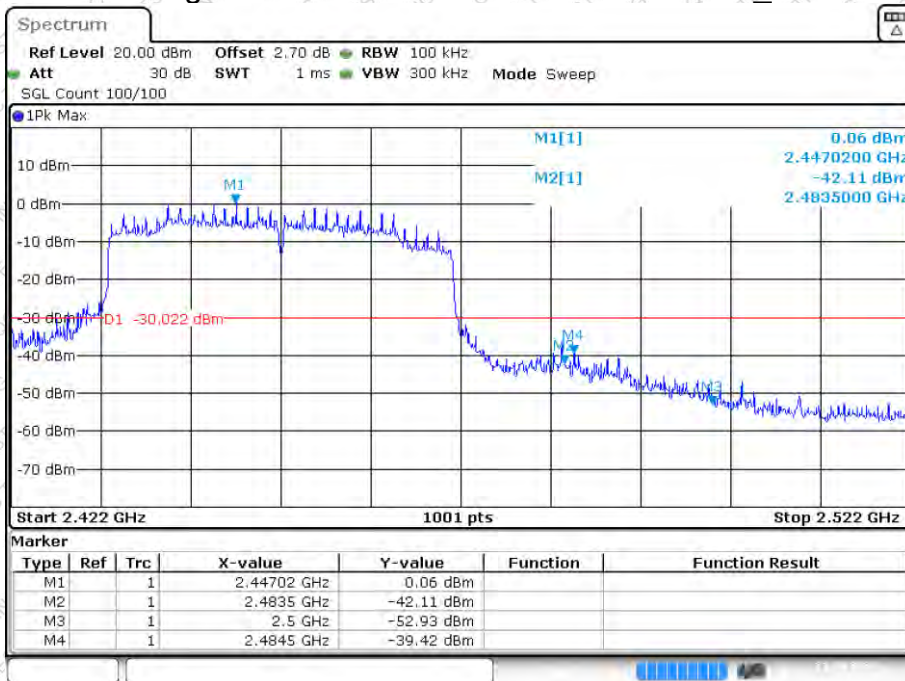


Band Edge NVNT ax40 2452MHz Ant1 Ref_MIMO



Date: 21.OCT.2024 15:57:15

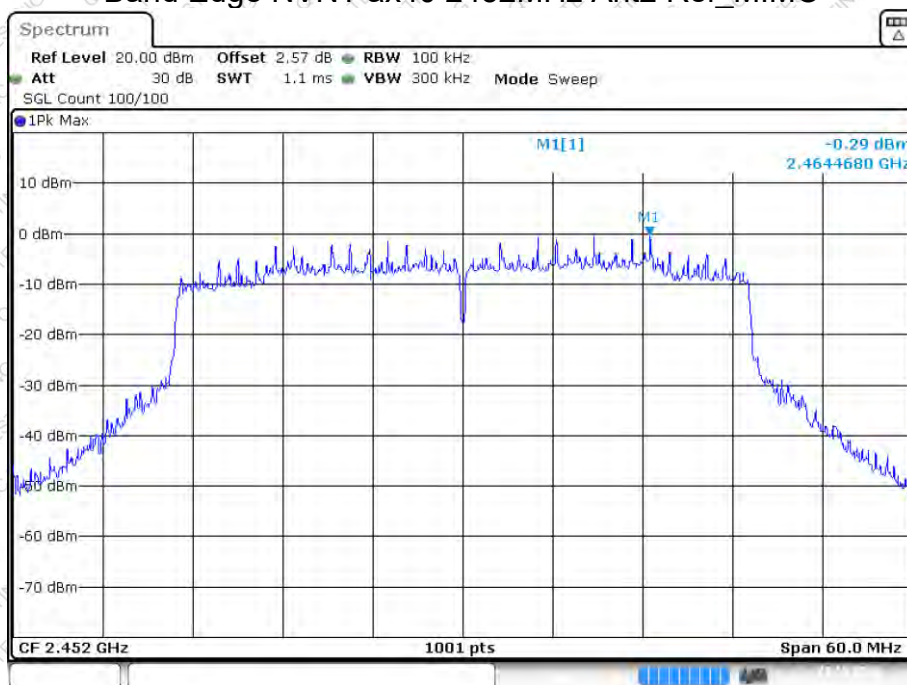
Band Edge NVNT ax40 2452MHz Ant1 Emission_MIMO



Date: 21.OCT.2024 15:57:17

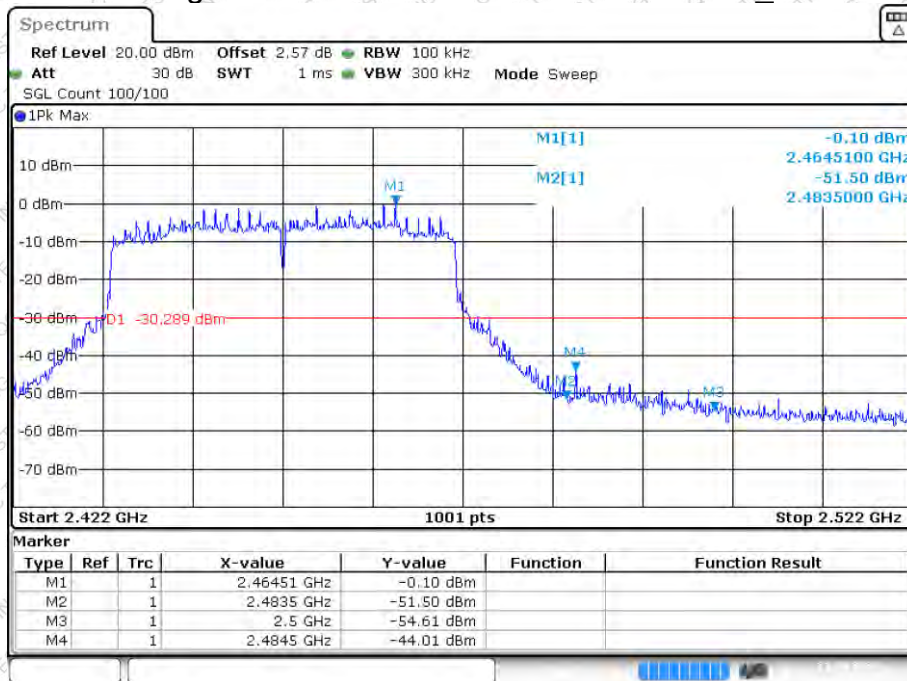


Band Edge NVNT ax40 2452MHz Ant2 Ref_MIMO



Date: 21.OCT.2024 15:57:19

Band Edge NVNT ax40 2452MHz Ant2 Emission_MIMO



Date: 21.OCT.2024 15:57:21



Conducted RF Spurious Emission

Modulation	CH No.	Frequency (MHz)	ANT	Max Value (dBc)	Limit (dBc)	Verdict
802.11b_SISO	01	2412	1	-49.44	-20	Pass
			2	-53.45	-20	Pass
	06	2437	1	-50.68	-20	Pass
			2	-52.54	-20	Pass
	11	2462	1	-49.36	-20	Pass
			2	-52.68	-20	Pass
802.11g_SISO	01	2412	1	-44.81	-20	Pass
			2	-52.27	-20	Pass
	06	2437	1	-44.74	-20	Pass
			2	-52.4	-20	Pass
	11	2462	1	-44.92	-20	Pass
			2	-53.0	-20	Pass
802.11n (HT20)_SISO	01	2412	1	-44.86	-20	Pass
			2	-52.16	-20	Pass
	06	2437	1	-44.49	-20	Pass
			2	-52.43	-20	Pass
	11	2462	1	-43.66	-20	Pass
			2	-53.76	-20	Pass
802.11n (HT40)_SISO	03	24222	1	-42.15	-20	Pass
			2	-48.85	-20	Pass
	06	2437	1	-42.25	-20	Pass
			2	-49.25	-20	Pass
	9	2452	1	-41.78	-20	Pass
			2	-49.31	-20	Pass
802.11ax (HEW20)_SISO	01	2412	1	-53.29	-20	Pass
			2	-52.39	-20	Pass
	06	2437	1	-54.25	-20	Pass
			2	-52.46	-20	Pass
	11	2462	1	-54.38	-20	Pass
			2	-53.29	-20	Pass
802.11ax (HEW40)_SISO	03	2422	1	-49.14	-20	Pass
			2	-49.64	-20	Pass
	06	2437	1	-47.46	-20	Pass
			2	-46.92	-20	Pass
	9	2452	1	-49	-20	Pass
			2	-49.77	-20	Pass
802.11n (HT20)_MIMO	01	2412	1	-48.99	-20	Pass
			2	-48.41	-20	Pass
	06	2437	1	-49.98	-20	Pass
			2	-48.55	-20	Pass
	11	2462	1	-50.41	-20	Pass
			2	-47.73	-20	Pass
802.11n (HT40)_MIMO	03	24222	1	-48.99	-20	Pass
			2	-48.41	-20	Pass
	06	2437	1	-49.98	-20	Pass
			2	-48.55	-20	Pass



	9	2452	1	-50.41	-20	Pass
			2	-47.73	-20	Pass
802.11ax (HEW20) _MIMO	01	2412	1	-48.87	-20	Pass
			2	-46.78	-20	Pass
	06	2437	1	-49.7	-20	Pass
			2	-46.81	-20	Pass
	11	2462	1	-49.36	-20	Pass
			2	-47.82	-20	Pass
802.11ax (HEW40) _MIMO	03	2422	1	-46.12	-20	Pass
			2	-45.42	-20	Pass
	06	2437	1	-45.23	-20	Pass
			2	-44.25	-20	Pass
	9	2452	1	-45.99	-20	Pass
			2	-45.78	-20	Pass

Remark:

1. The MIMO mode still meets the standard limit after adding the combined gain
2. For MIMO devices refer to KDB Publication 662911 D01.

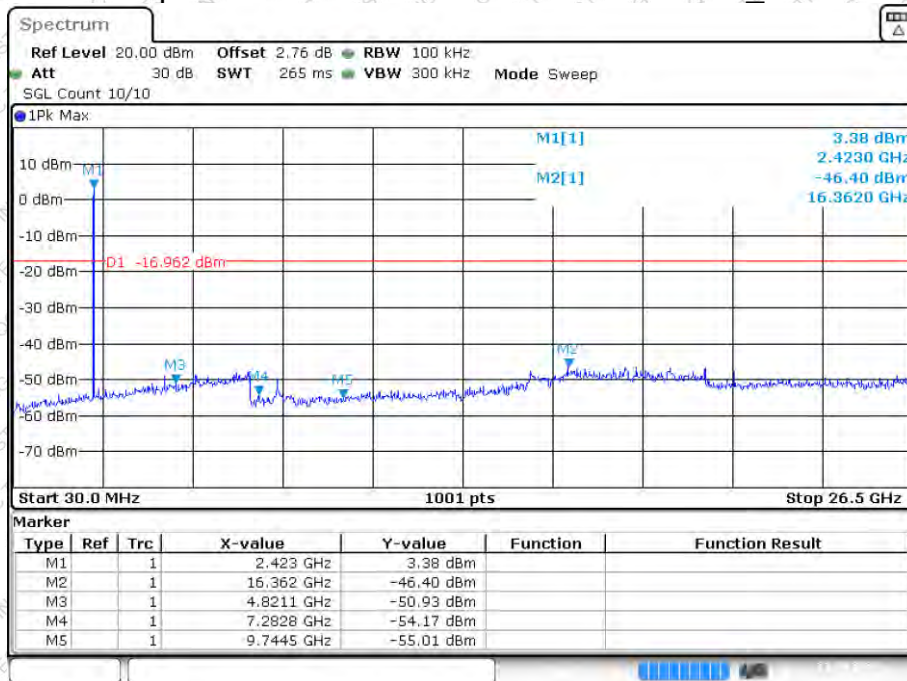


Tx. Spurious NVNT b 2412MHz Ant1 Ref_SISO



Date: 21.OCT.2024 09:39:40

Tx. Spurious NVNT b 2412MHz Ant1 Emission_SISO



Date: 21.OCT.2024 09:39:52

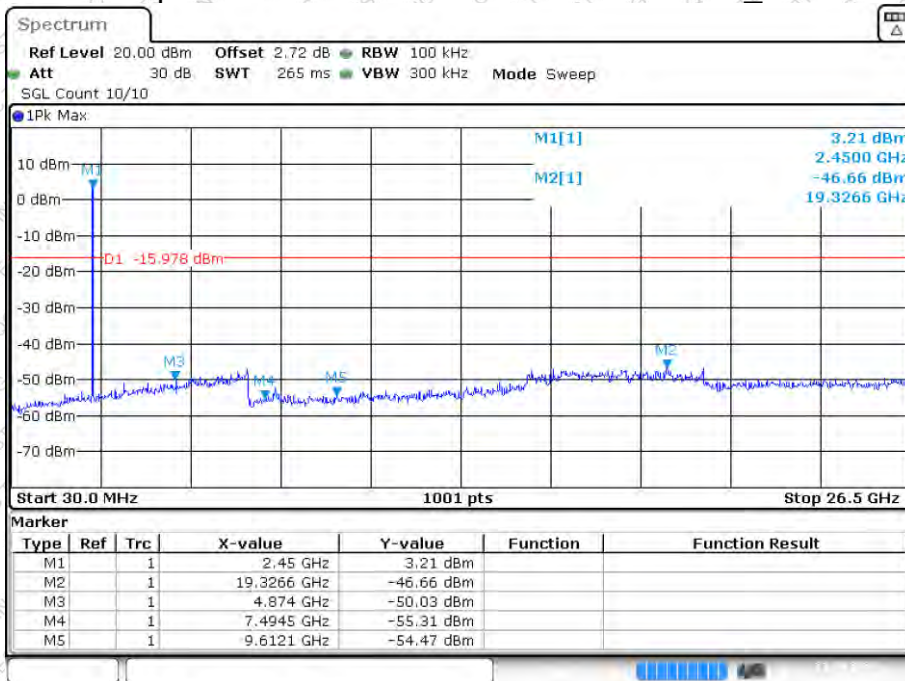


Tx. Spurious NVNT b 2437MHz Ant1 Ref_SISO



Date: 21.OCT.2024 09:41:49

Tx. Spurious NVNT b 2437MHz Ant1 Emission_SISO



Date: 21.OCT.2024 09:42:01

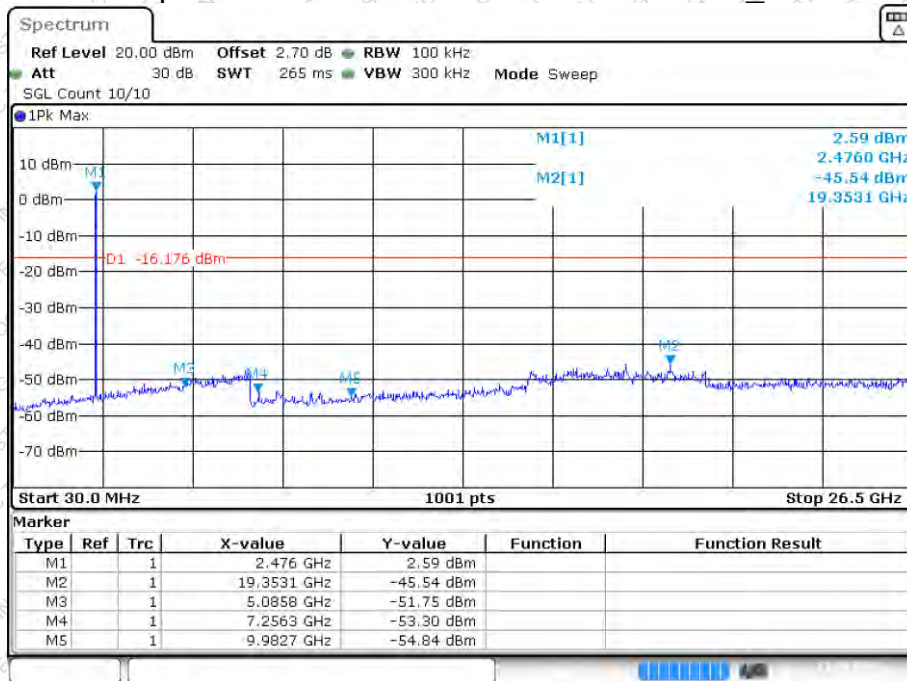


Tx. Spurious NVNT b 2462MHz Ant1 Ref_SISO



Date: 21.OCT.2024 09:45:42

Tx. Spurious NVNT b 2462MHz Ant1 Emission_SISO



Date: 21.OCT.2024 09:45:55

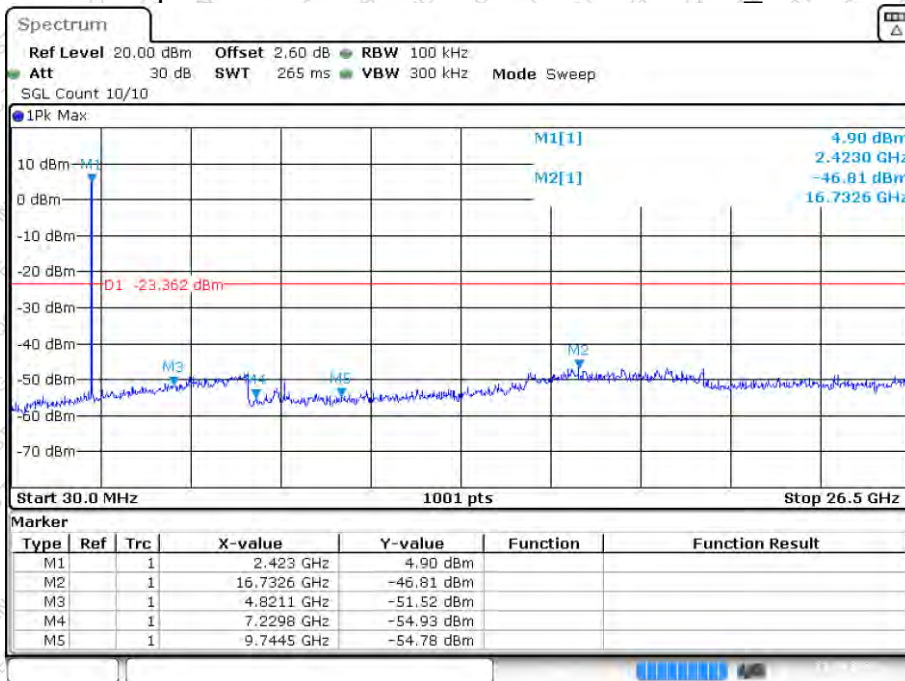


Tx. Spurious NVNT b 2412MHz Ant2 Ref_SISO



Date: 21.OCT.2024 11:08:30

Tx. Spurious NVNT b 2412MHz Ant2 Emission_SISO



Date: 21.OCT.2024 11:08:42

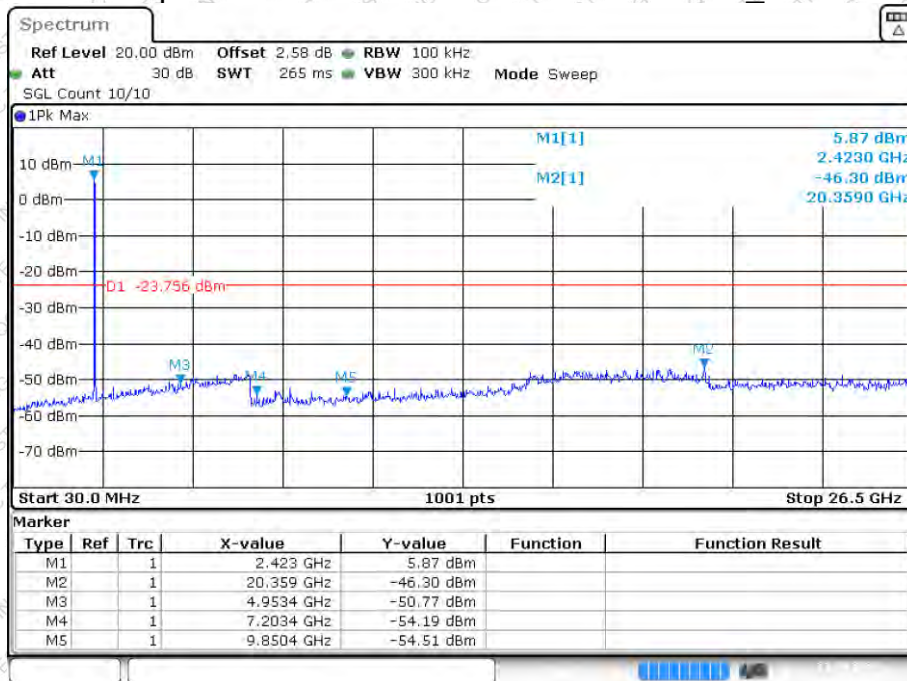


Tx. Spurious NVNT b 2437MHz Ant2 Ref_SISO



Date: 21.OCT.2024 11:09:54

Tx. Spurious NVNT b 2437MHz Ant2 Emission_SISO



Date: 21.OCT.2024 11:10:07

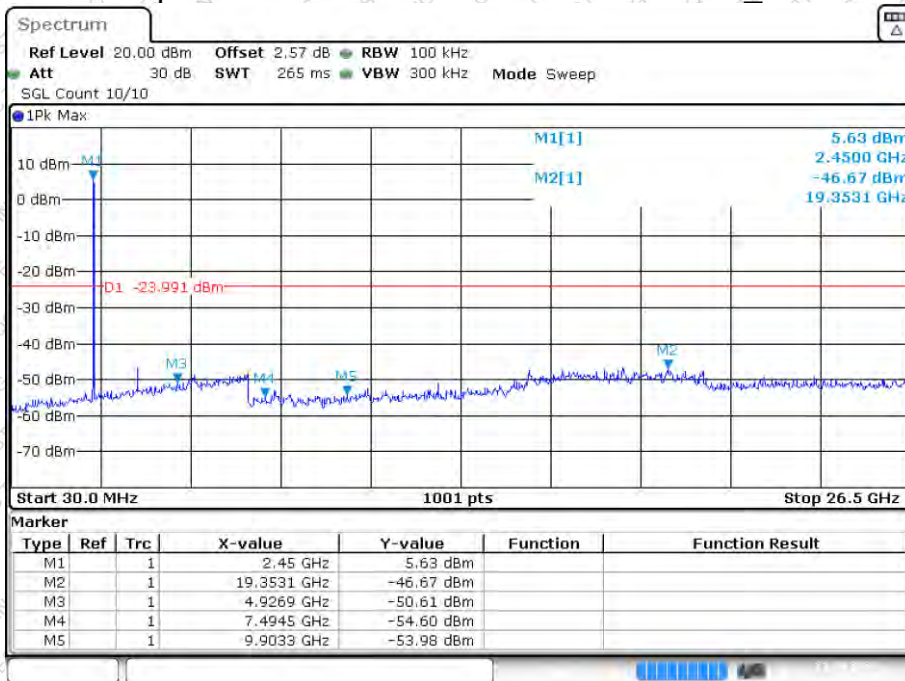


Tx. Spurious NVNT b 2462MHz Ant2 Ref_SISO



Date: 21.OCT.2024 11:11:25

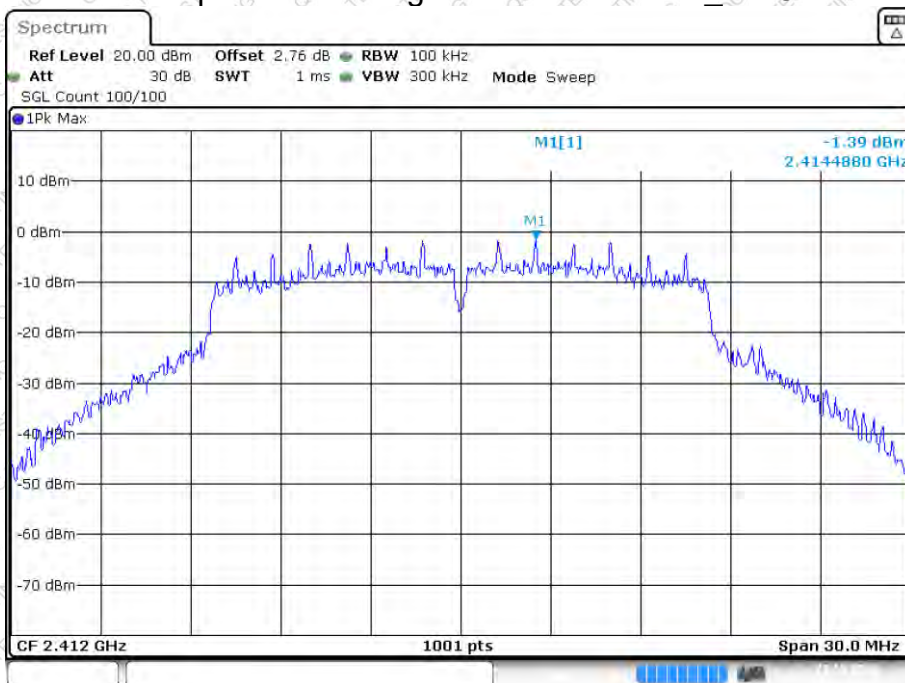
Tx. Spurious NVNT b 2462MHz Ant2 Emission_SISO



Date: 21.OCT.2024 11:11:37

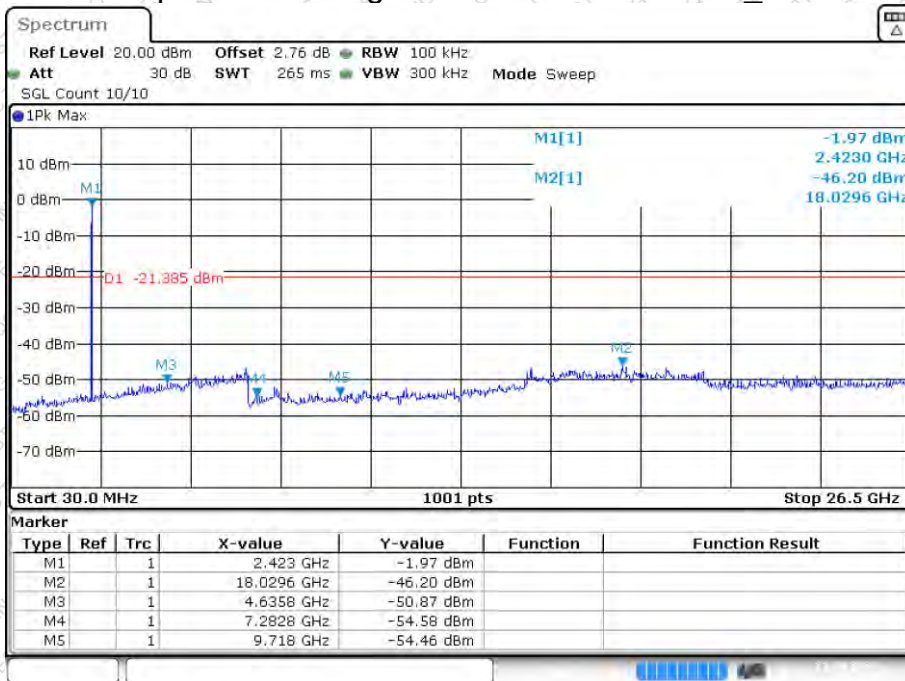


Tx. Spurious NVNT g 2412MHz Ant1 Ref_SISO



Date: 21.OCT.2024 09:53:47

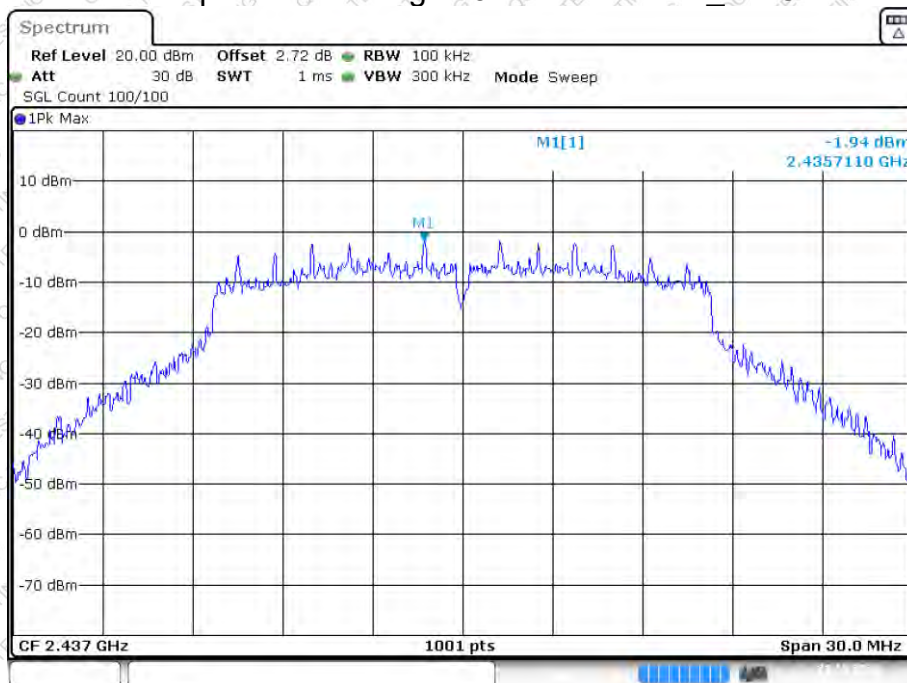
Tx. Spurious NVNT g 2412MHz Ant1 Emission_SISO



Date: 21.OCT.2024 09:53:59

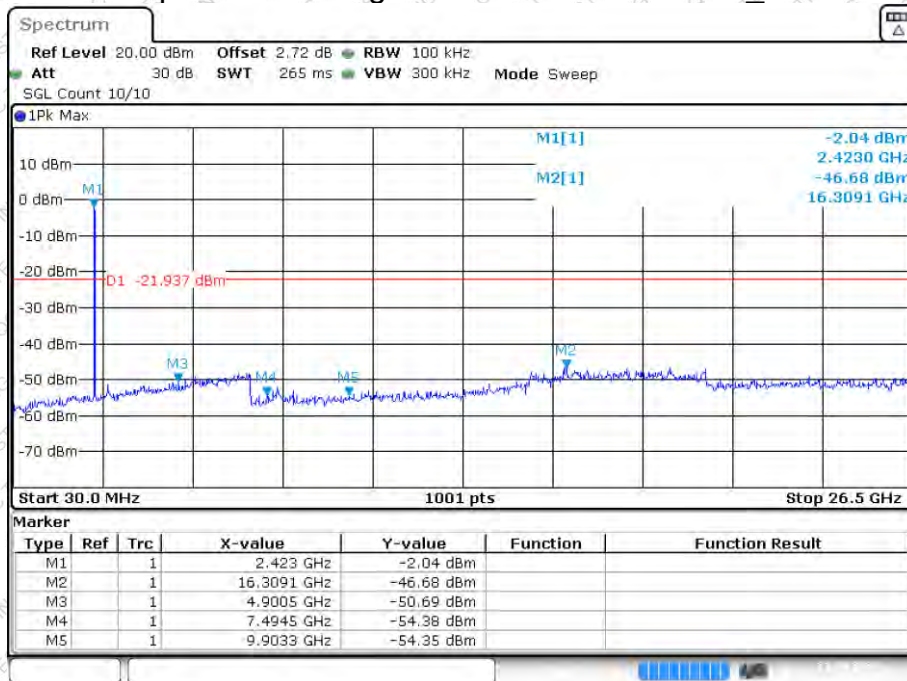


Tx. Spurious NVNT g 2437MHz Ant1 Ref_SISO



Date: 21.OCT.2024 10:03:50

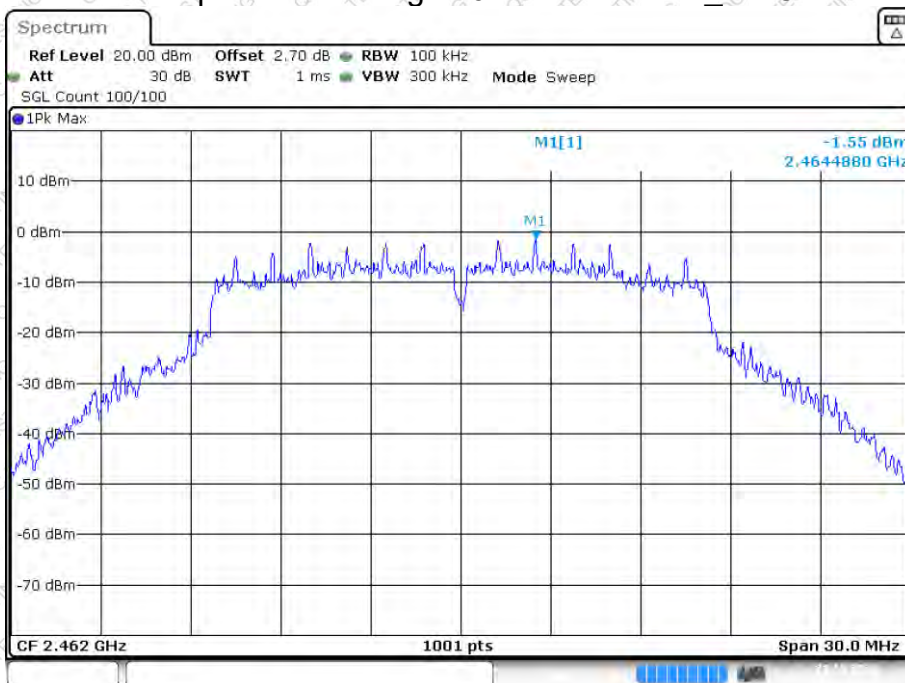
Tx. Spurious NVNT g 2437MHz Ant1 Emission_SISO



Date: 21.OCT.2024 10:04:02

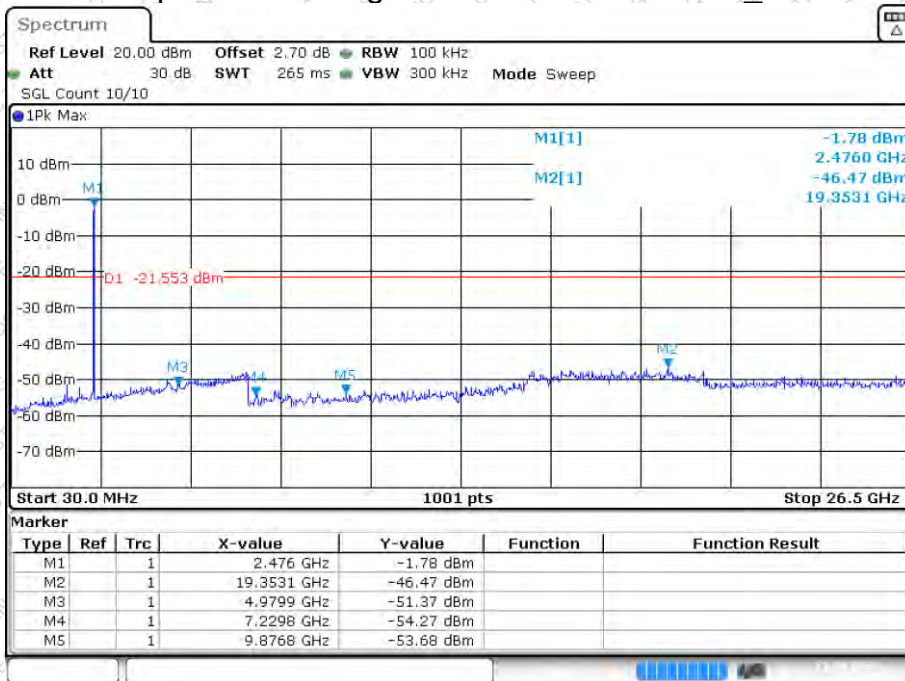


Tx. Spurious NVNT g 2462MHz Ant1 Ref_SISO



Date: 21.OCT.2024 10:01:41

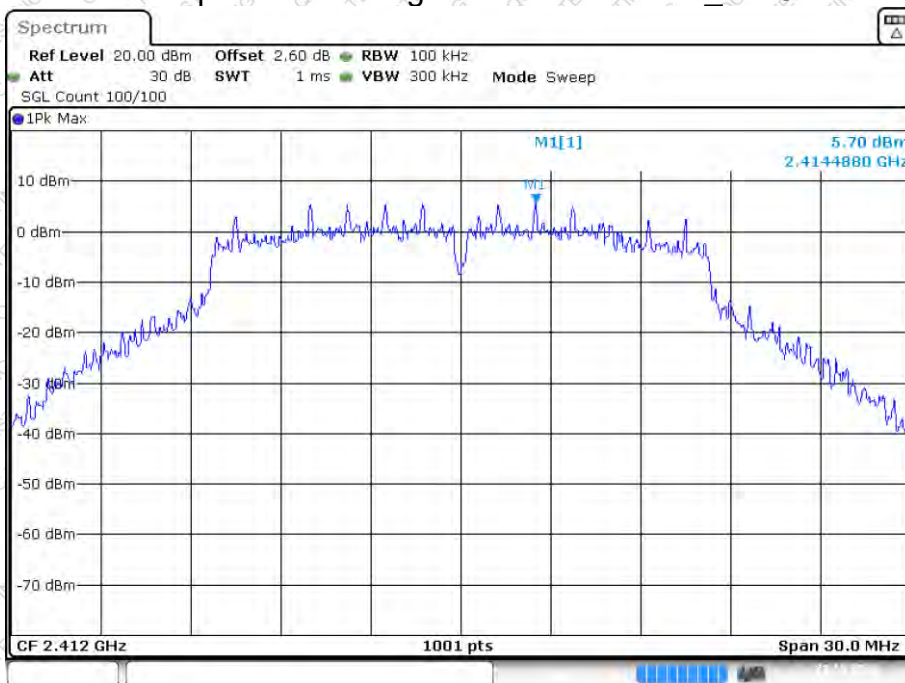
Tx. Spurious NVNT g 2462MHz Ant1 Emission_SISO



Date: 21.OCT.2024 10:01:53

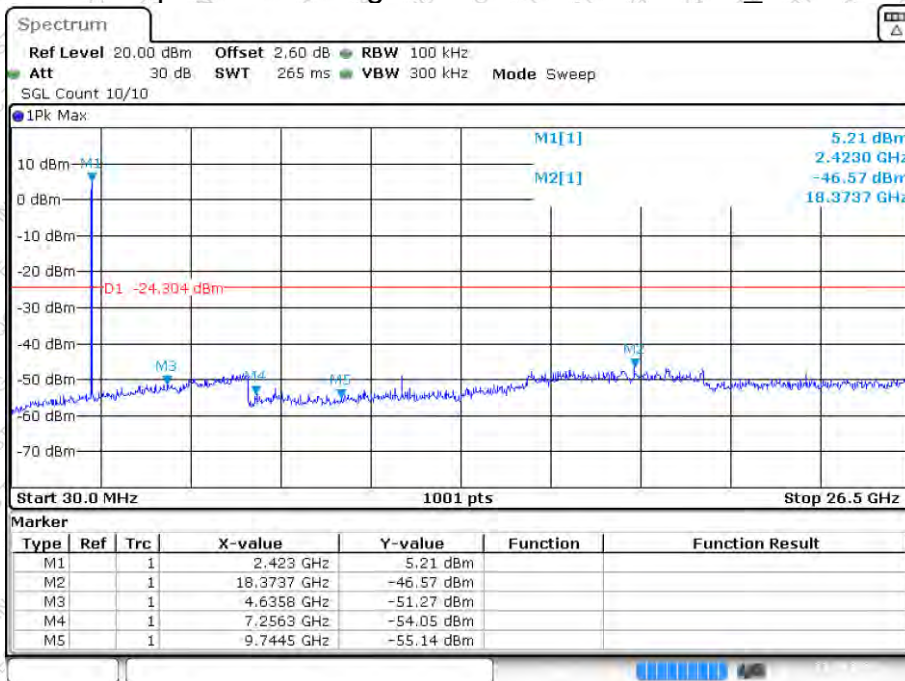


Tx. Spurious NVNT g 2412MHz Ant2 Ref_SISO



Date: 21.OCT.2024 11:16:51

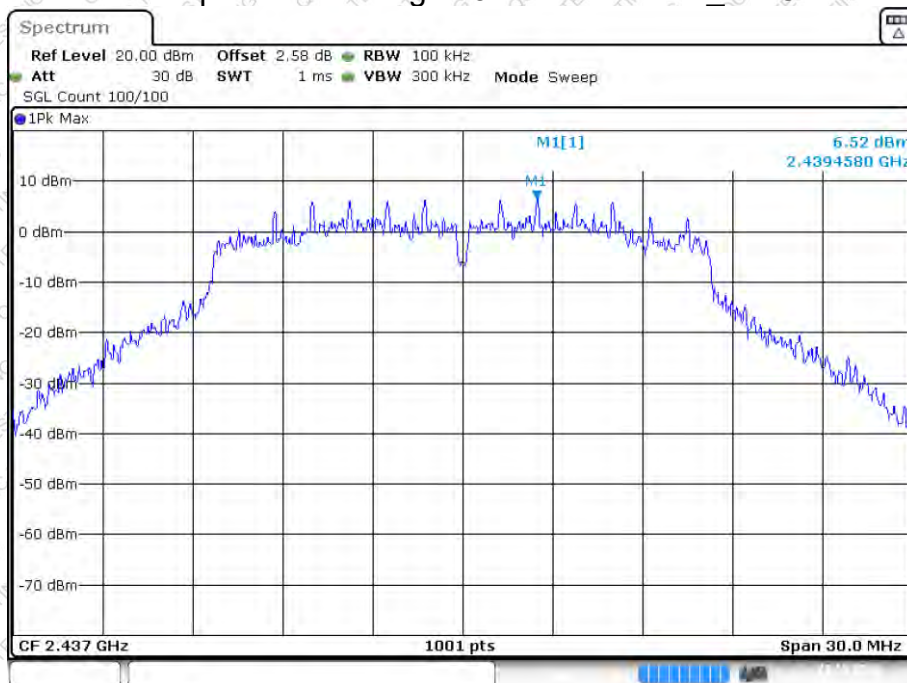
Tx. Spurious NVNT g 2412MHz Ant2 Emission_SISO



Date: 21.OCT.2024 11:17:03

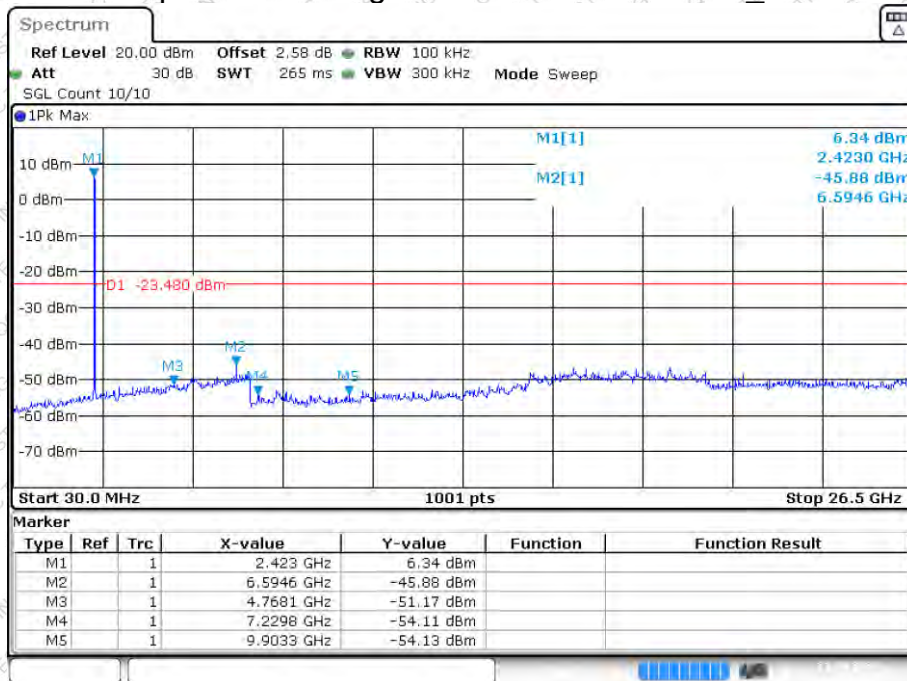


Tx. Spurious NVNT g 2437MHz Ant2 Ref_SISO



Date: 21.OCT.2024 11:20:54

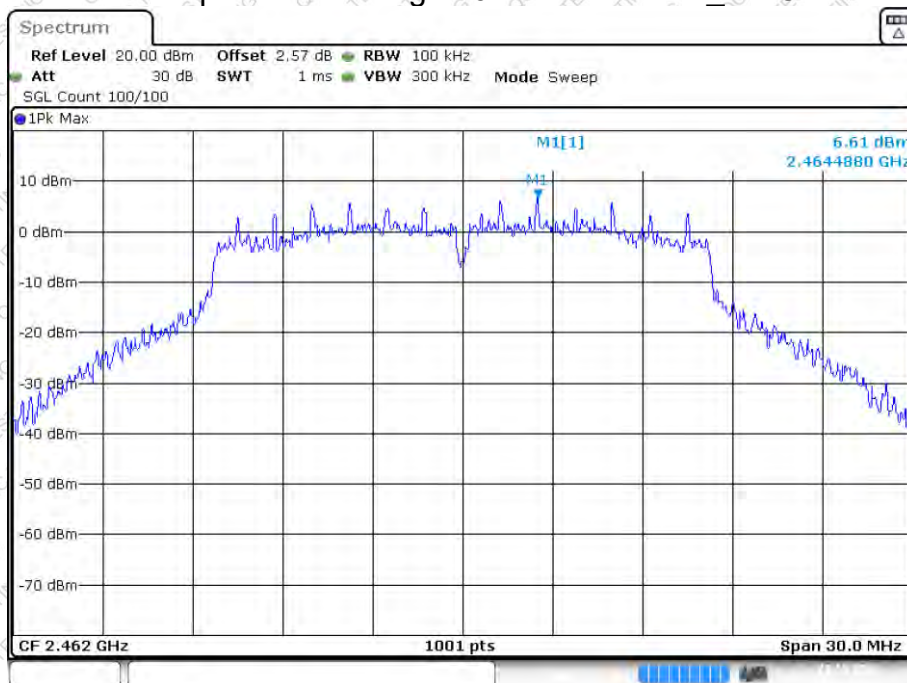
Tx. Spurious NVNT g 2437MHz Ant2 Emission_SISO



Date: 21.OCT.2024 11:21:07

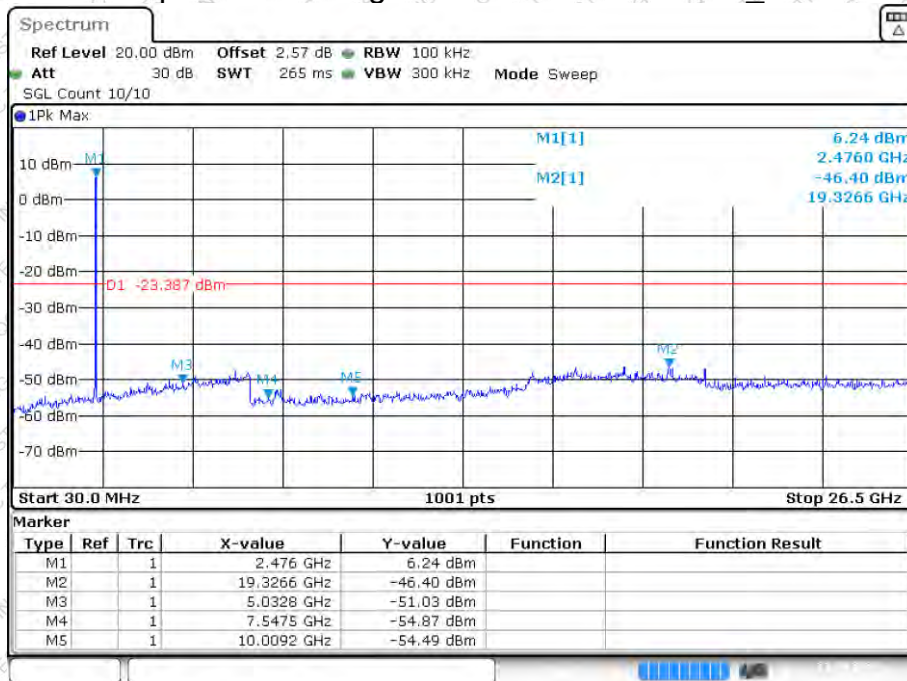


Tx. Spurious NVNT g 2462MHz Ant2 Ref_SISO



Date: 21.OCT.2024 11:23:56

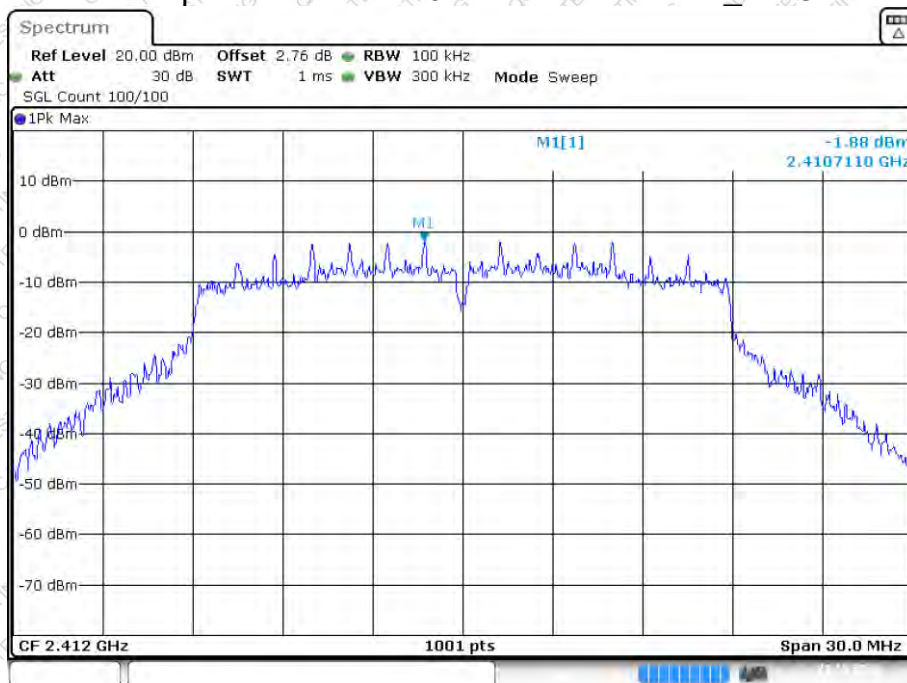
Tx. Spurious NVNT g 2462MHz Ant2 Emission_SISO



Date: 21.OCT.2024 11:24:09

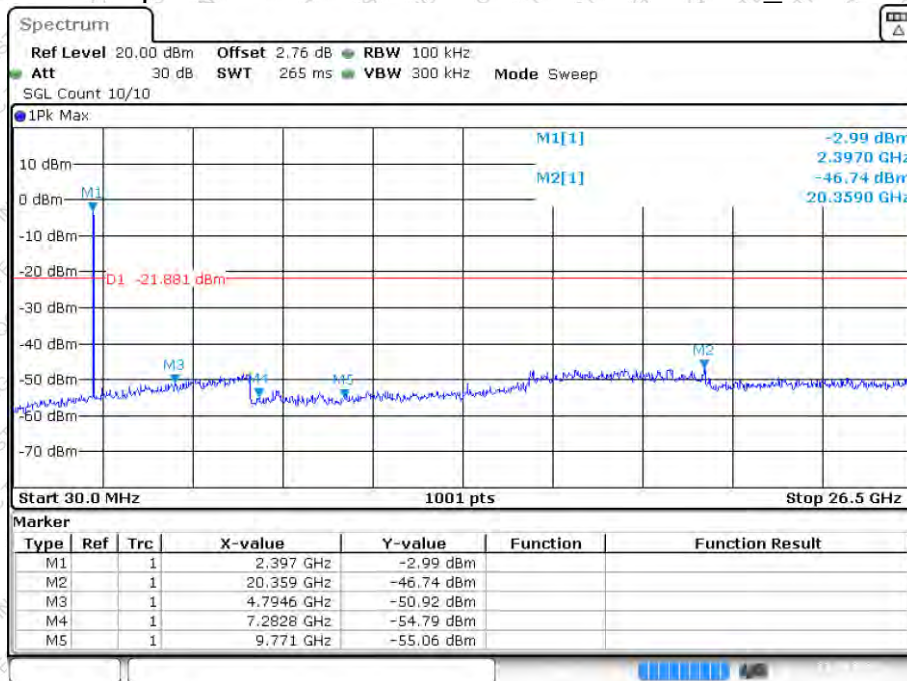


Tx. Spurious NVNT n20 2412MHz Ant1 Ref_SISO



Date: 21.OCT.2024 10:07:25

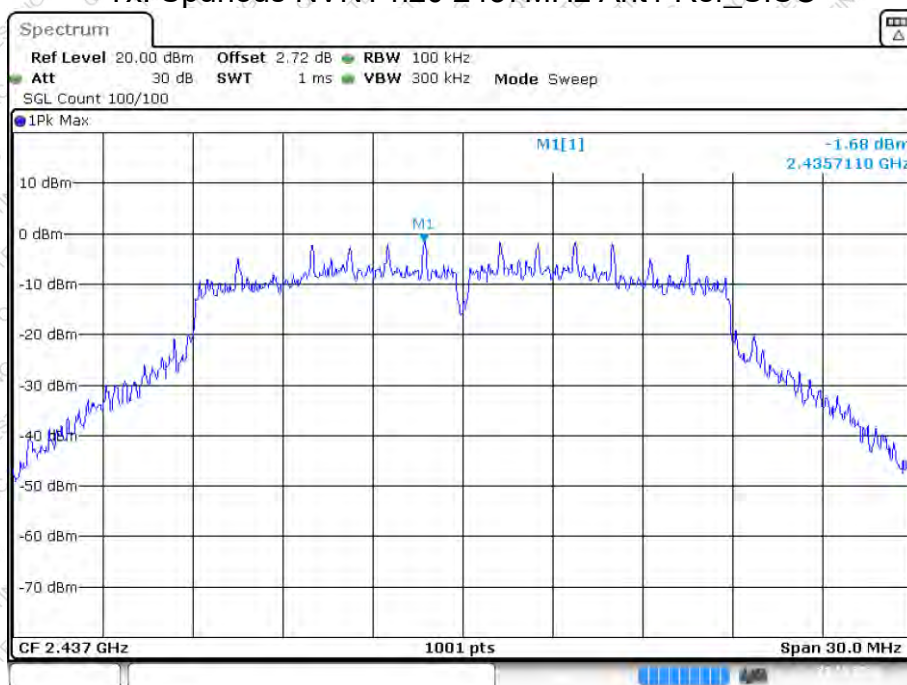
Tx. Spurious NVNT n20 2412MHz Ant1 Emission_SISO



Date: 21.OCT.2024 10:07:38

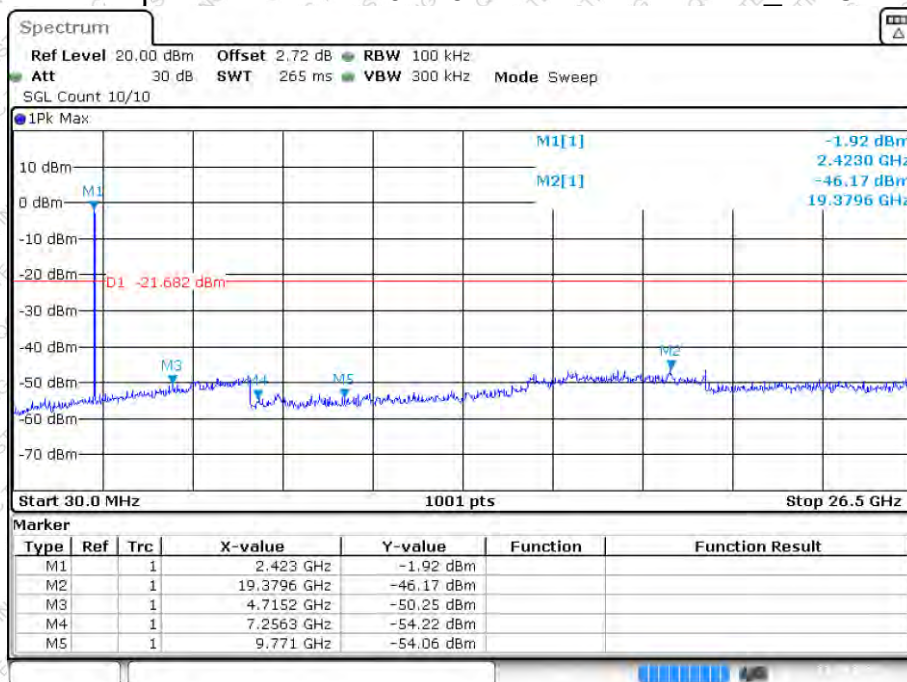


Tx. Spurious NVNT n20 2437MHz Ant1 Ref_SISO



Date: 21.OCT.2024 10:10:00

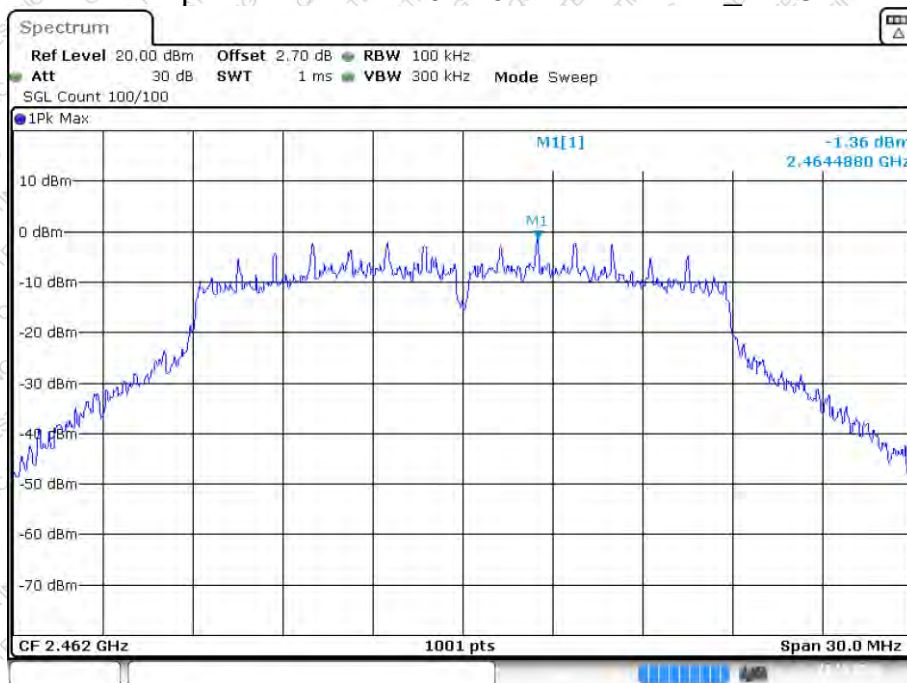
Tx. Spurious NVNT n20 2437MHz Ant1 Emission_SISO



Date: 21.OCT.2024 10:10:12

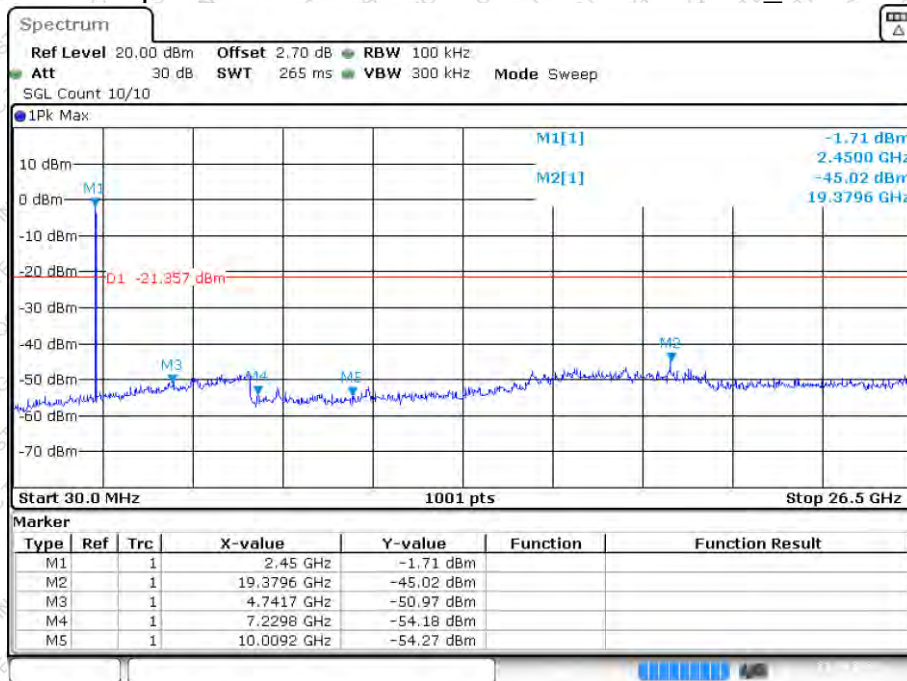


Tx. Spurious NVNT n20 2462MHz Ant1 Ref_SISO



Date: 21.OCT.2024 10:12:54

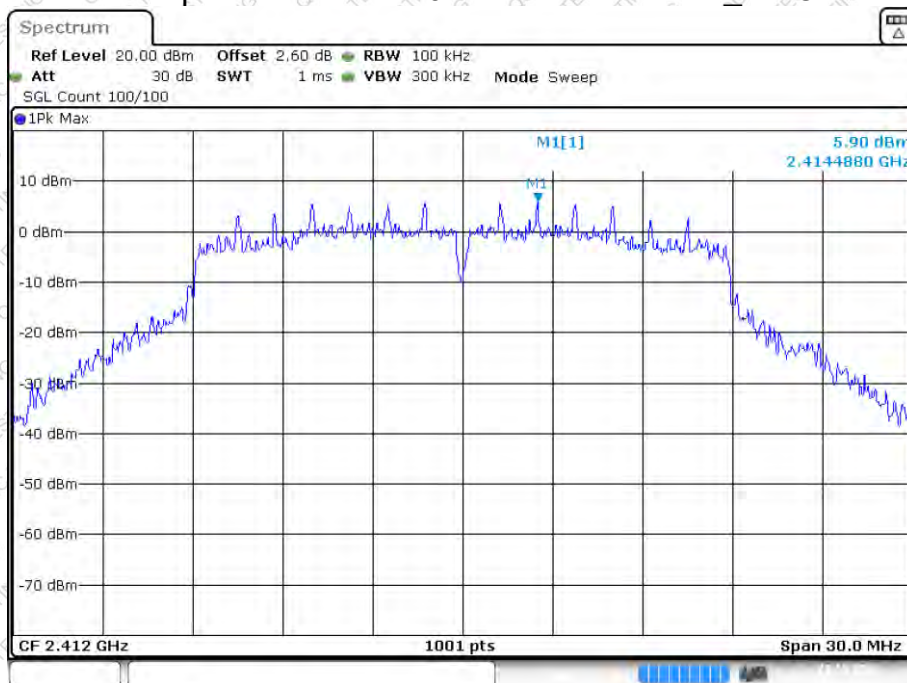
Tx. Spurious NVNT n20 2462MHz Ant1 Emission_SISO



Date: 21.OCT.2024 10:13:06

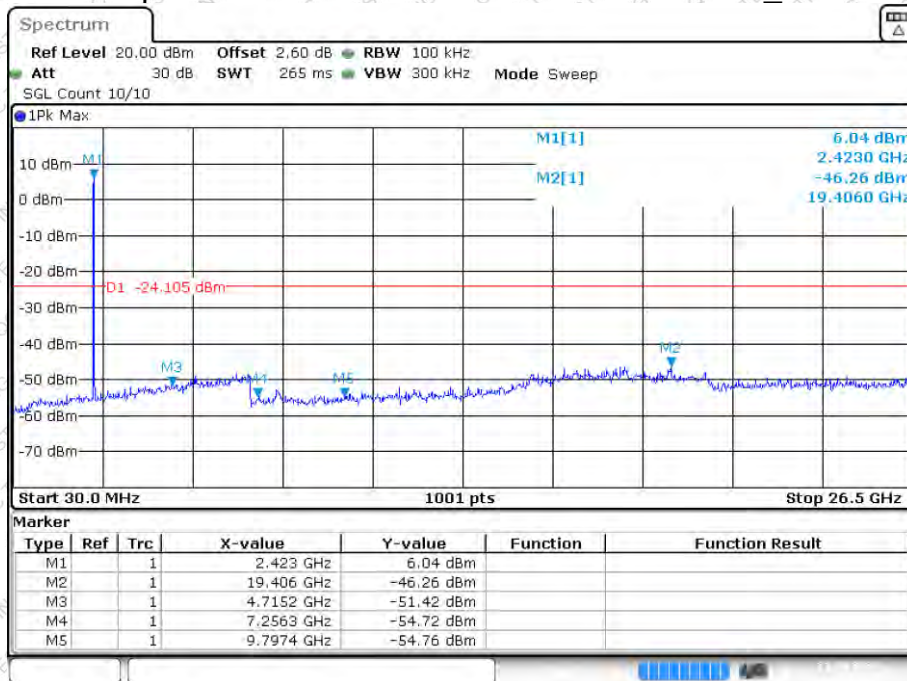


Tx. Spurious NVNT n20 2412MHz Ant2 Ref_SISO



Date: 21.OCT.2024 11:27:06

Tx. Spurious NVNT n20 2412MHz Ant2 Emission_SISO



Date: 21.OCT.2024 11:27:18