

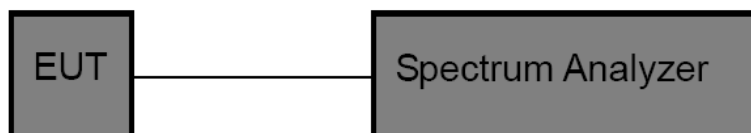


3.4. Band edge and Spurious Emissions (Conducted)

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d): 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.

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 ≥ 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.

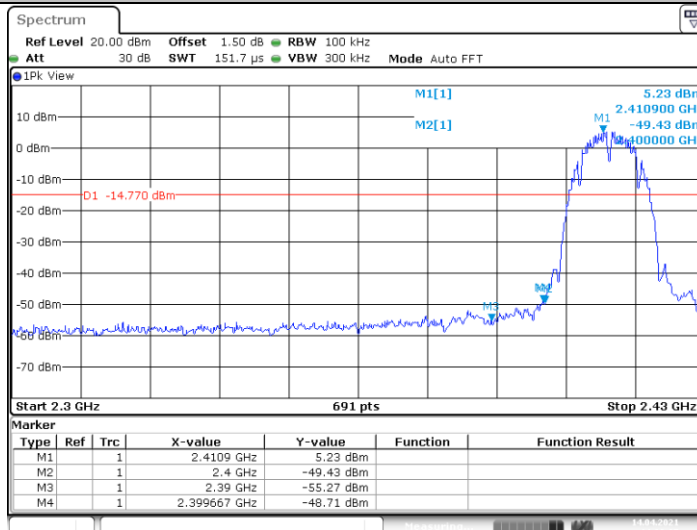
Test Result

(1) Band edge Conducted Test

Test Mode	Antenna	Ch Name	Frequency (MHz)	Ref Level[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	5.23	-48.71	<=-14.77	PASS
		High	2462	5.12	-51.15	<=-14.88	PASS
11G	Ant1	Low	2412	0.17	-37.00	<=-19.83	PASS
		High	2462	0.91	-51.21	<=-19.09	PASS
11N20SISO	Ant1	Low	2412	-0.55	-36.48	<=-20.55	PASS
		High	2462	-0.75	-49.56	<=-20.75	PASS
11N40SISO	Ant1	Low	2422	-6.98	-35.97	<=-26.98	PASS
		High	2452	-7.09	-49.05	<=-27.09	PASS

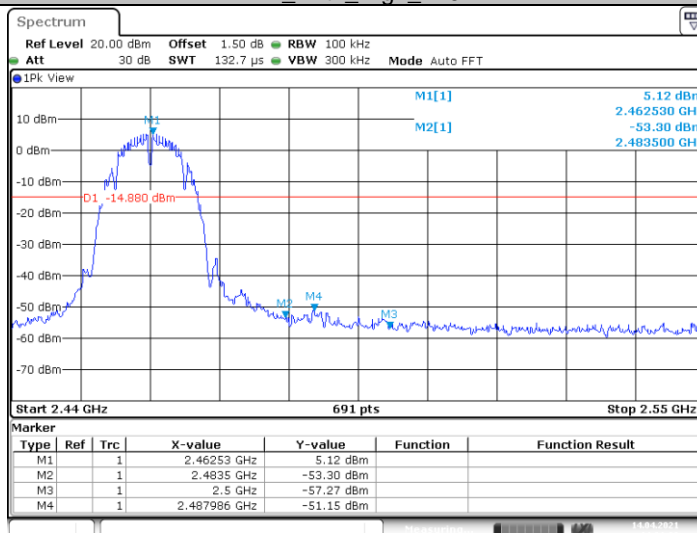


11B_Ant1_Low_2412



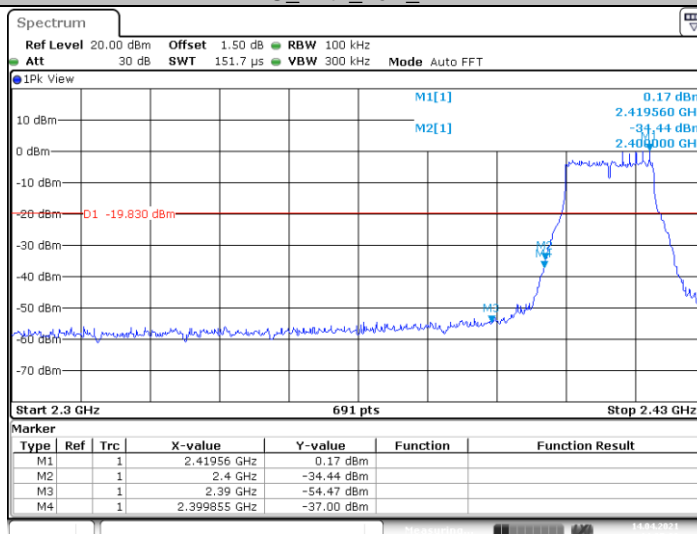
Date: 14.APR.2021 14:20:37

11B_Ant1_High_2462



Date: 14.APR.2021 14:31:30

11G_Ant1_Low_2412



Date: 14.APR.2021 14:37:05

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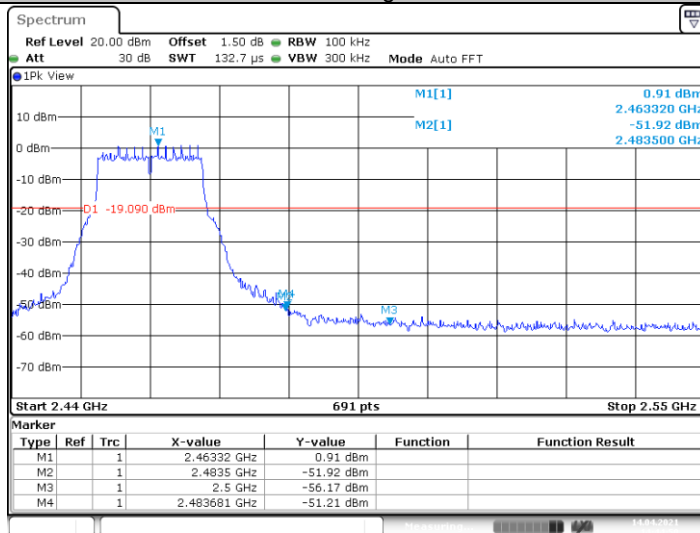
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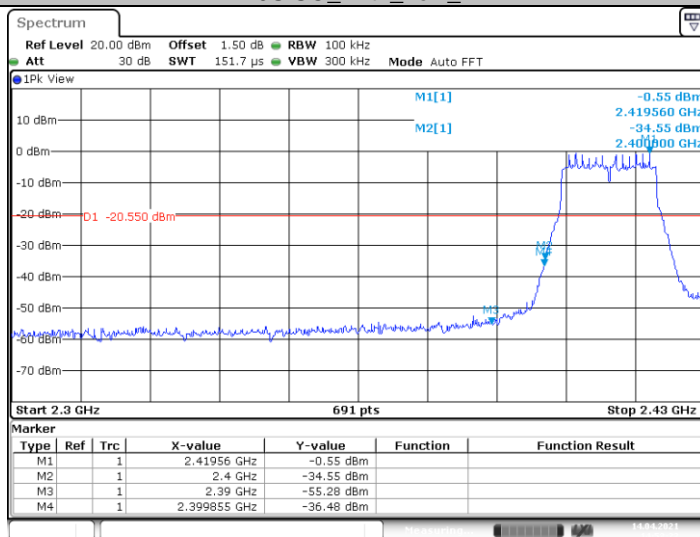


11G_Ant1_High_2462



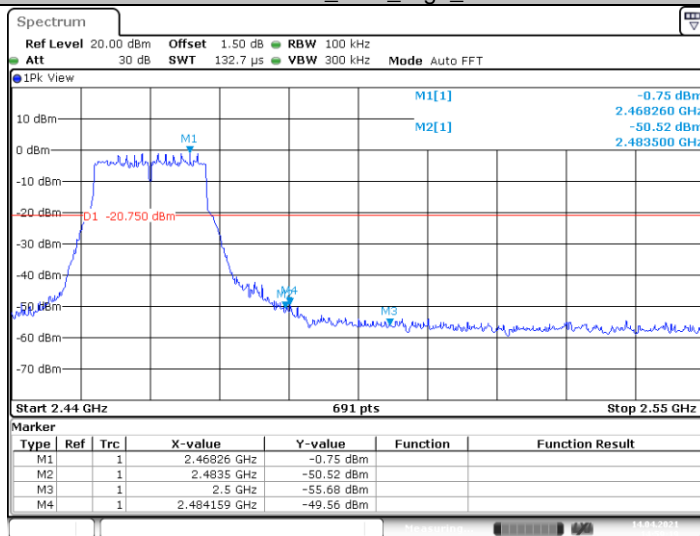
Date: 14.APR.2021 14:44:50

11N20SISO_Ant1_Low_2412



Date: 14.APR.2021 14:53:23

11N20SISO_Ant1_High_2462



Date: 14.APR.2021 14:59:19

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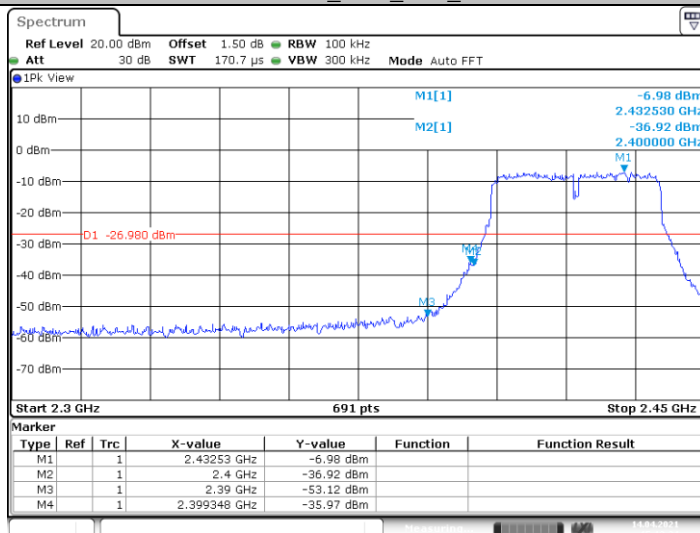
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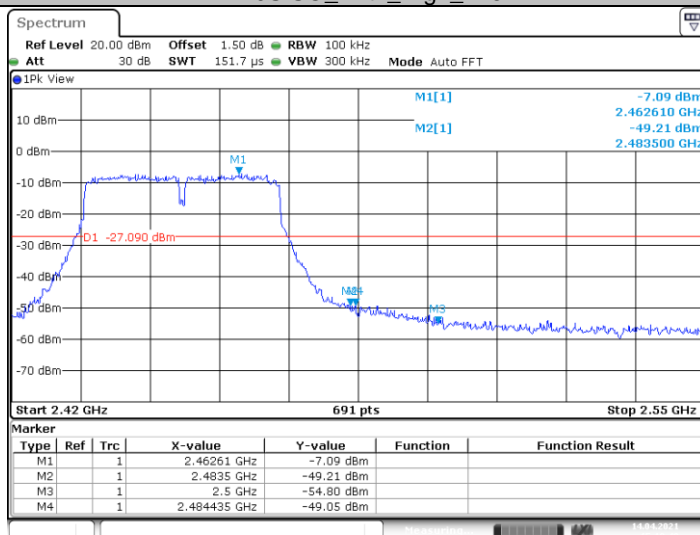


11N40SISO_Ant1_Low_2422



Date: 14.APR.2021 15:13:23

11N40SISO_Ant1_High_2452



Date: 14.APR.2021 15:19:39

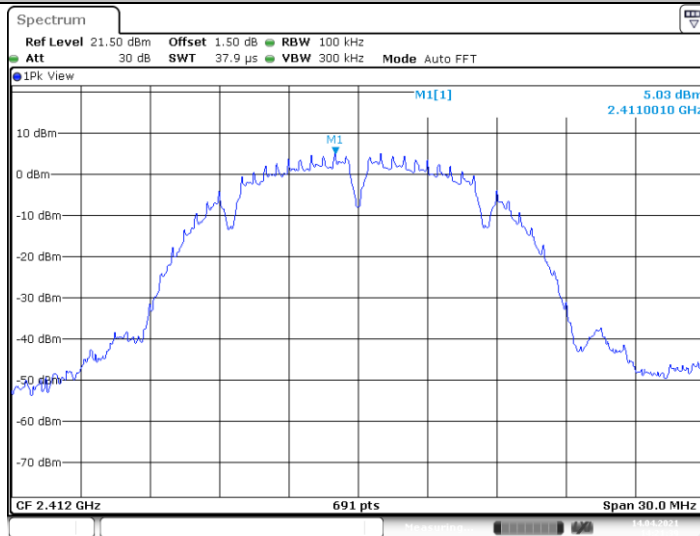


(2) Conducted Spurious Emissions Test

Test Mode	Antenna	Frequency (MHz)	Freq Range [Mhz]	Ref Level [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	5.03	5.03	---	PASS
			30~1000	30~1000	-52.87	<=-14.97	PASS
			1000~26500	1000~26500	-40.11	<=-14.97	PASS
		2437	Reference	5.07	5.07	---	PASS
			30~1000	30~1000	-50.78	<=-14.93	PASS
			1000~26500	1000~26500	-39.8	<=-14.93	PASS
		2462	Reference	4.35	4.35	---	PASS
			30~1000	30~1000	-52.33	<=-15.65	PASS
			1000~26500	1000~26500	-40.68	<=-15.65	PASS
11G	Ant1	2412	Reference	0.09	0.09	---	PASS
			30~1000	30~1000	-55.84	<=-19.91	PASS
			1000~26500	1000~26500	-32.24	<=-19.91	PASS
		2437	Reference	0.06	0.06	---	PASS
			30~1000	30~1000	-56.46	<=-19.94	PASS
			1000~26500	1000~26500	-39.13	<=-19.94	PASS
		2462	Reference	0.81	0.81	---	PASS
			30~1000	30~1000	-55.53	<=-19.19	PASS
			1000~26500	1000~26500	-40.41	<=-19.19	PASS
11N20SISO	Ant1	2412	Reference	-0.54	-0.54	---	PASS
			30~1000	30~1000	-52.19	<=-20.54	PASS
			1000~26500	1000~26500	-32.79	<=-20.54	PASS
		2437	Reference	-0.38	-0.38	---	PASS
			30~1000	30~1000	-52.02	<=-20.38	PASS
			1000~26500	1000~26500	-39.17	<=-20.38	PASS
		2462	Reference	0.28	0.28	---	PASS
			30~1000	30~1000	-56.31	<=-19.72	PASS
			1000~26500	1000~26500	-40.32	<=-19.72	PASS
11N40SISO	Ant1	2422	Reference	-6.83	-6.83	---	PASS
			30~1000	30~1000	-61.00	<=-26.83	PASS
			1000~26500	1000~26500	-33.26	<=-26.83	PASS
		2437	Reference	-7.09	-7.09	---	PASS
			30~1000	30~1000	-61.18	<=-27.09	PASS
			1000~26500	1000~26500	-43.15	<=-27.09	PASS
		2452	Reference	-6.89	-6.89	---	PASS
			30~1000	30~1000	-61.49	<=-26.89	PASS
			1000~26500	1000~26500	-43.61	<=-26.89	PASS

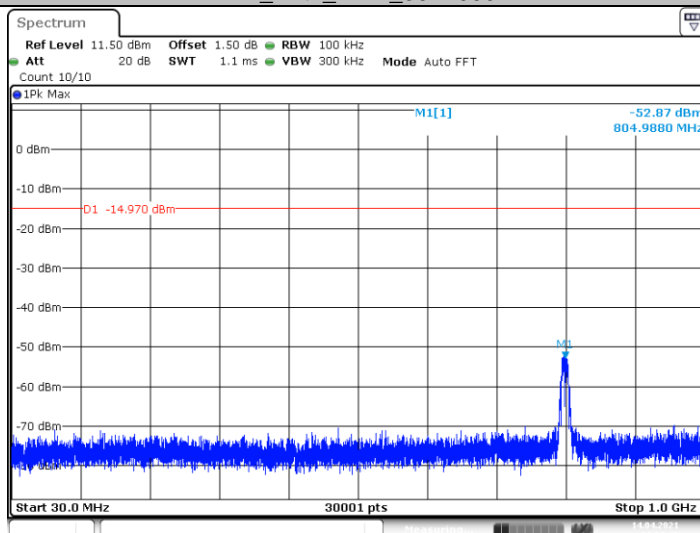


11B_Ant1_2412_0~Reference



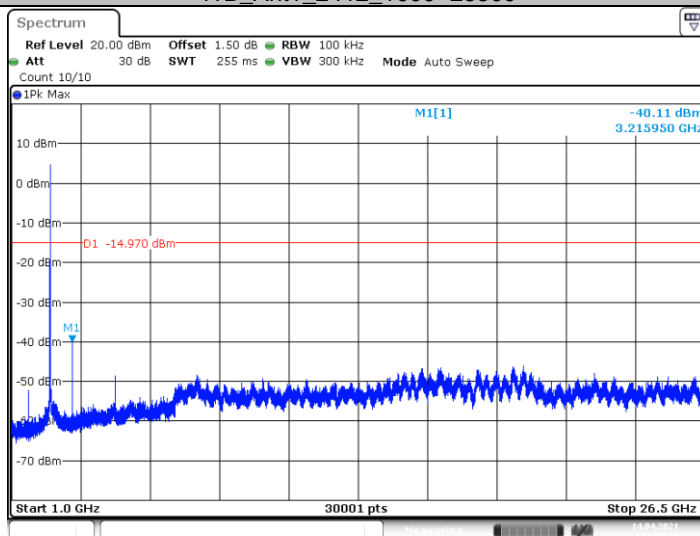
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11B_Ant1_2412_30~1000



Date: 14.APR.2021 14:21:48

11B_Ant1_2412_1000~26500



Date: 14.APR.2021 14:22:15

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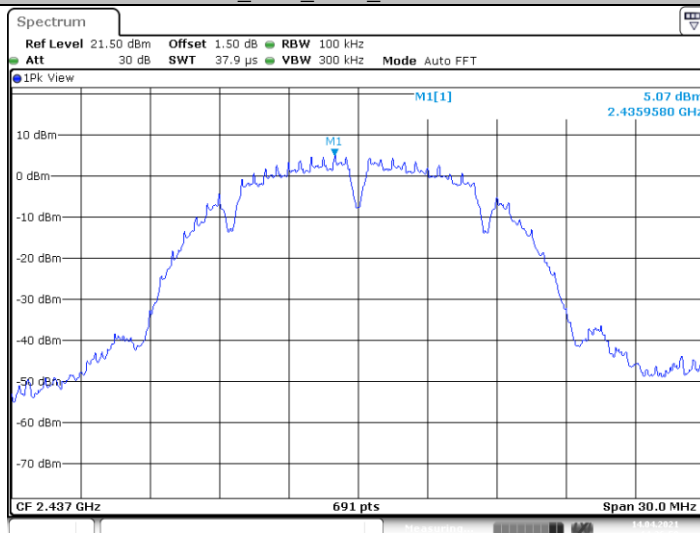
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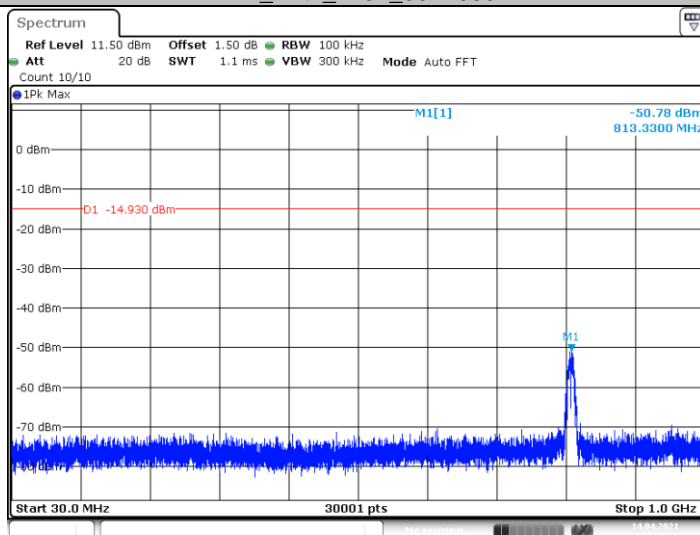


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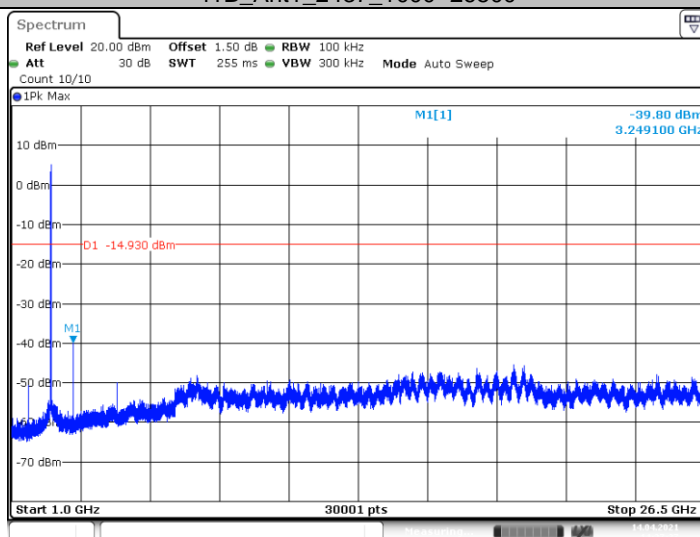
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11B_Ant1_2437_30~1000



Date: 14.APR.2021 14:27:00

11B_Ant1_2437_1000~26500



Date: 14.APR.2021 14:27:27

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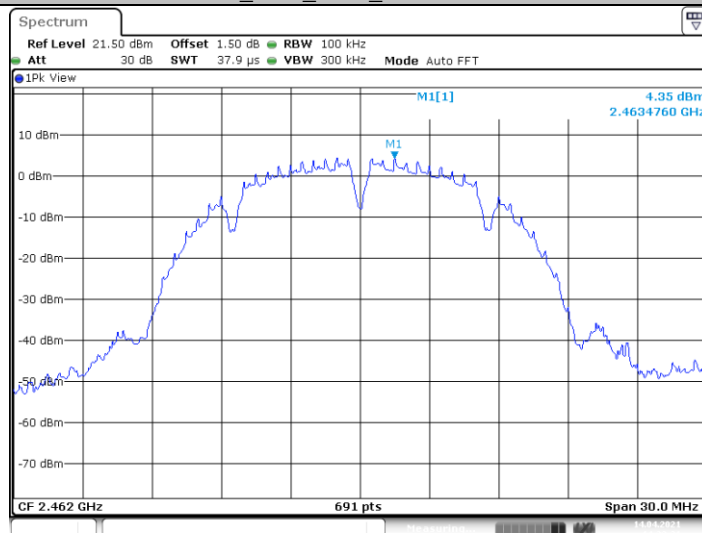
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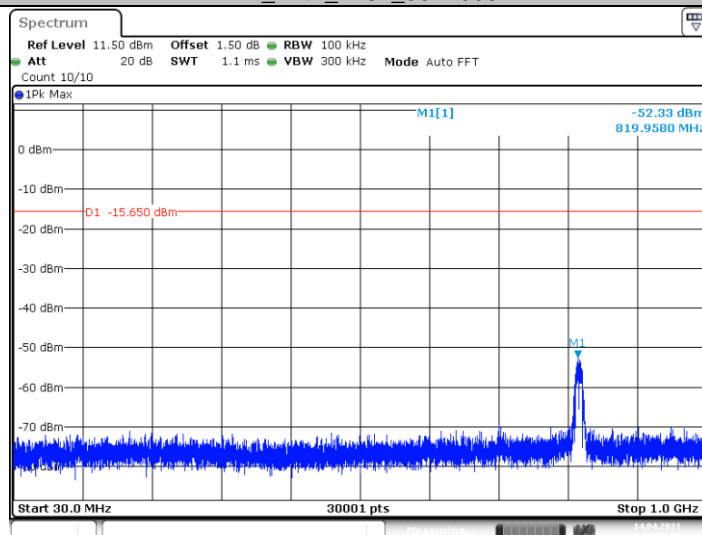


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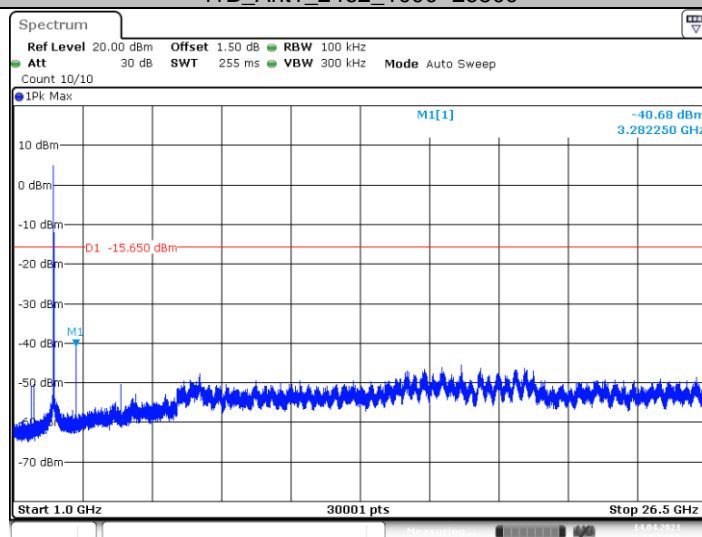
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11B_Ant1_2462_30~1000



Date: 14.APR.2021 14:32:41

11B_Ant1_2462_1000~26500



Date: 14.APR.2021 14:33:08

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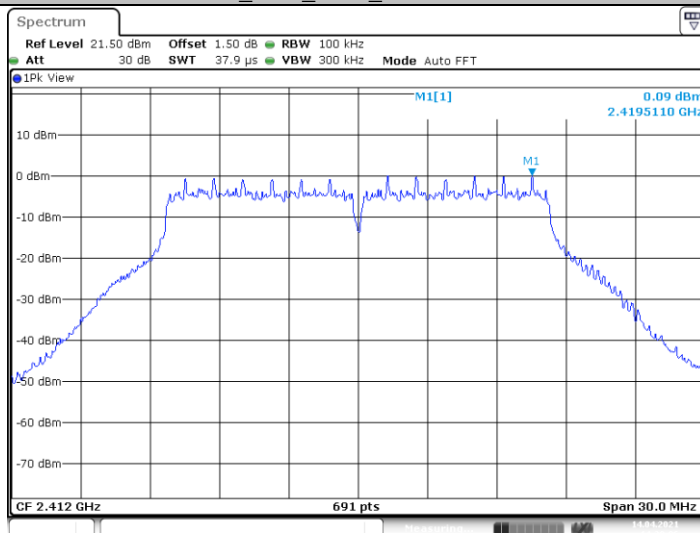
Fax: (86)755-27521011

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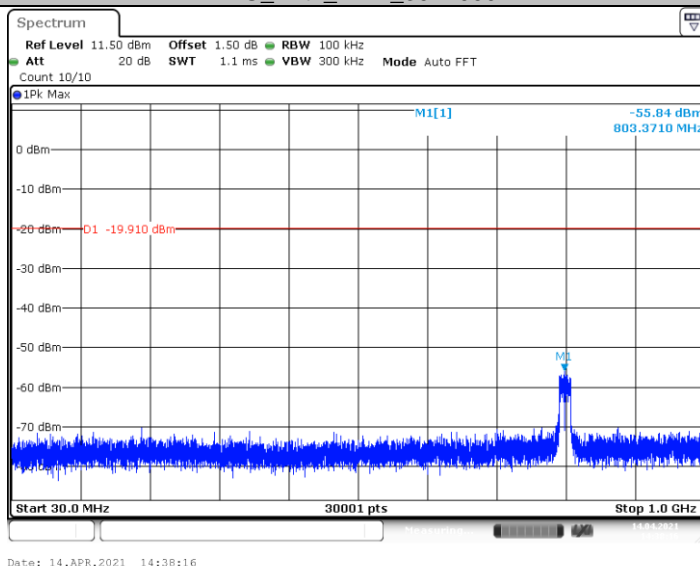
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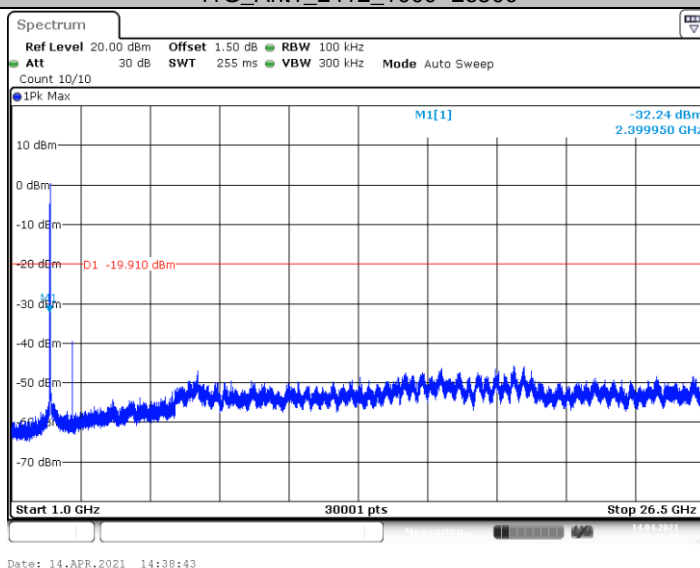
11G_Ant1_2412_0~Reference



11G_Ant1_2412_30~1000



11G_Ant1_2412_1000~26500



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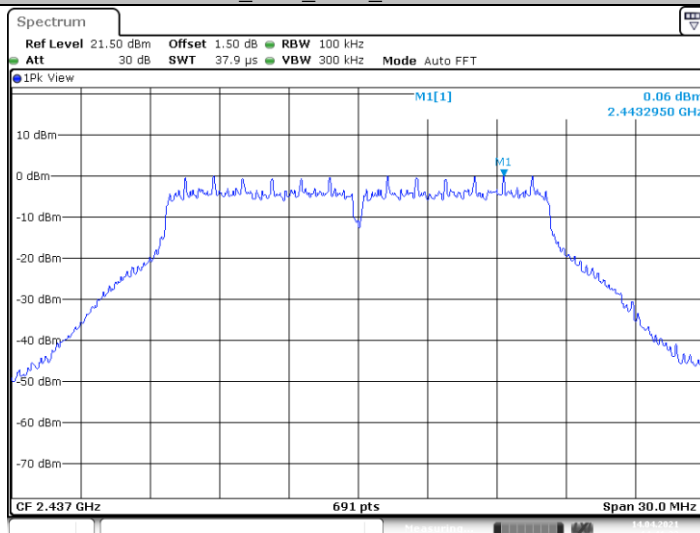
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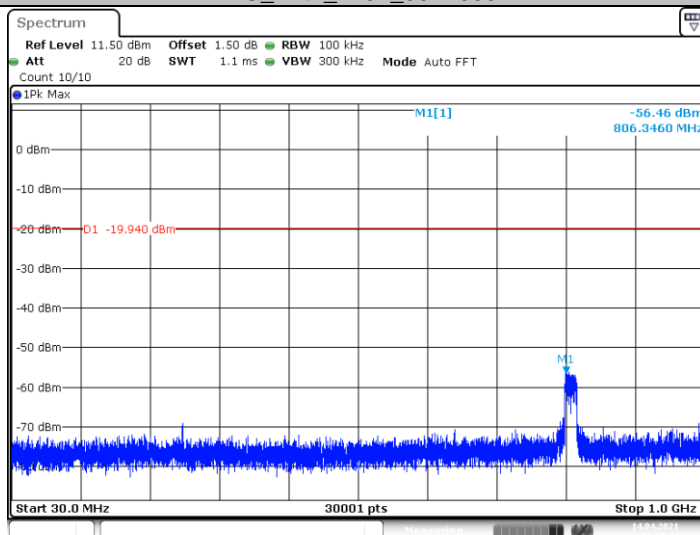


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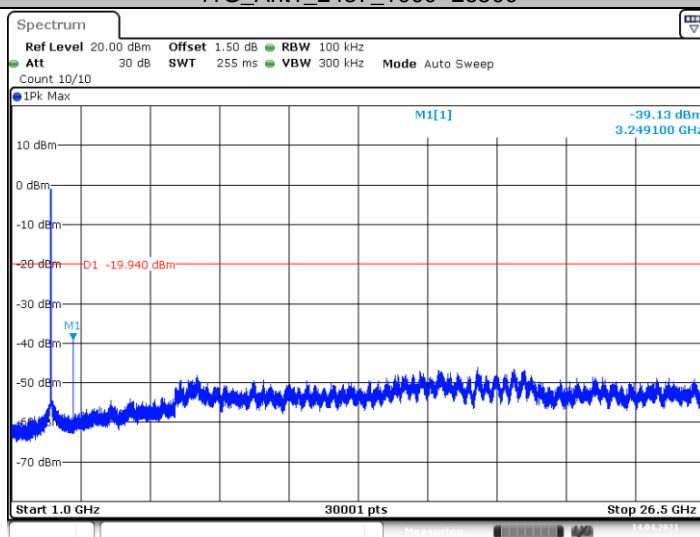
Date: 14.APR.2021 14:41:34

11G_Ant1_2437_30~1000



Date: 14.APR.2021 14:41:43

11G_Ant1_2437_1000~26500



Date: 14.APR.2021 14:42:11

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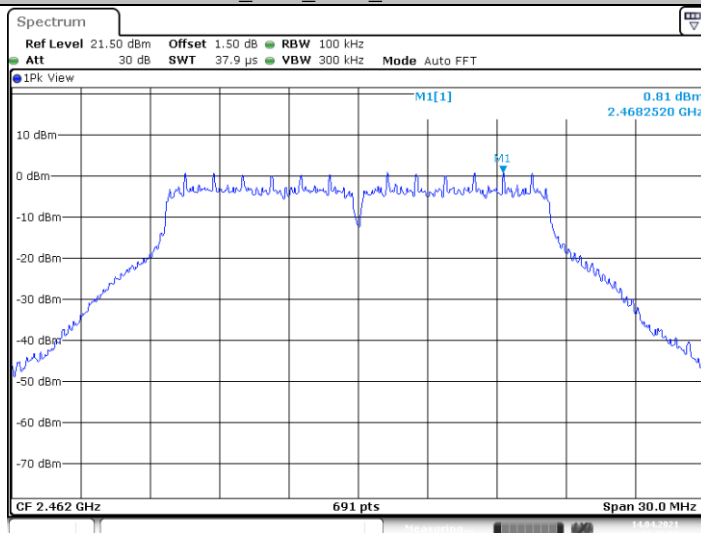
Fax: (86)755-27521011

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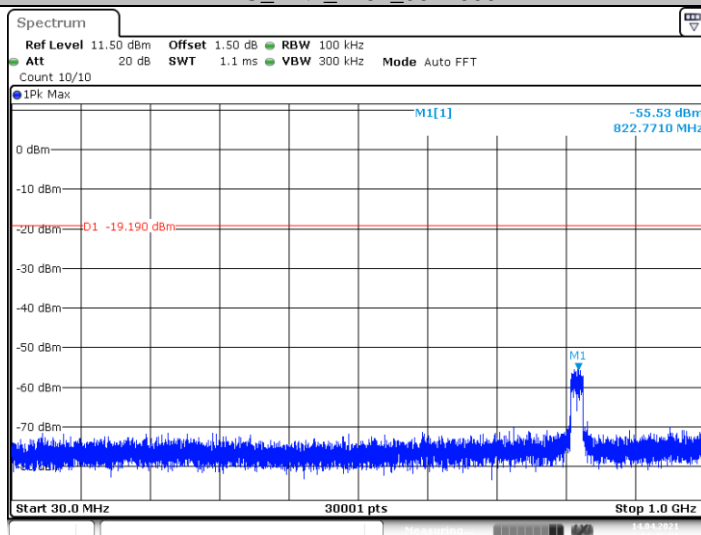


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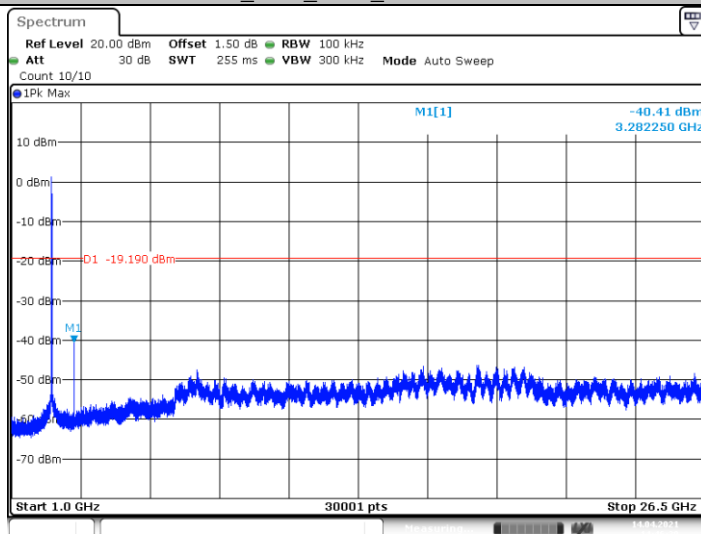
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11G_Ant1_2462_30~1000



Date: 14.APR.2021 14:46:01

11G_Ant1_2462_1000~26500



Date: 14.APR.2021 14:46:28

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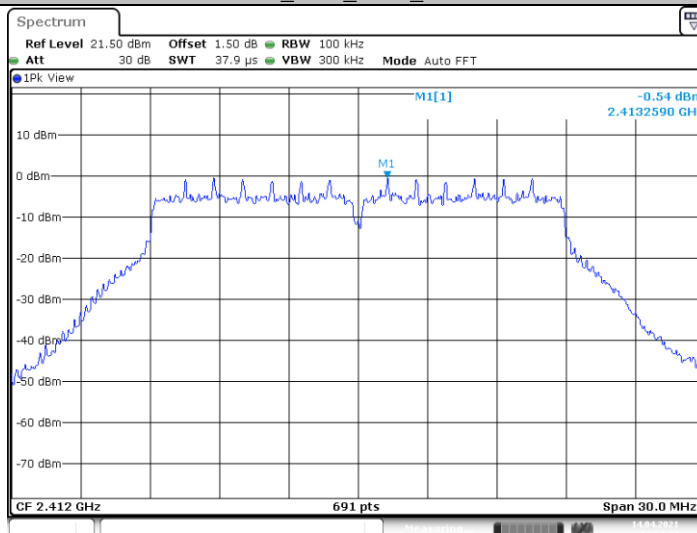
Fax: (86)755-27521011

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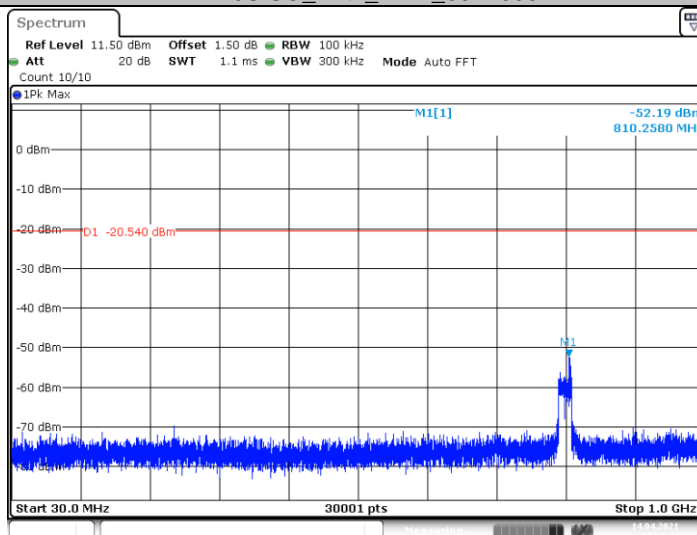


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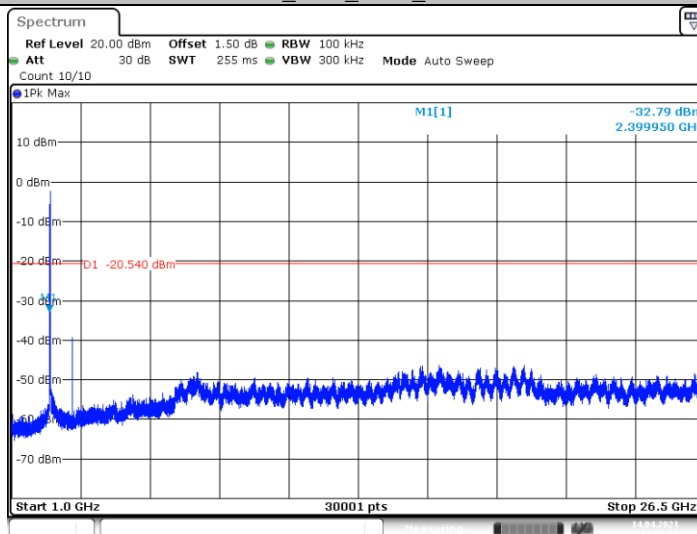
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11N20SISO_Ant1_2412_1000~26500



Date: 14.APR.2021 14:55:01

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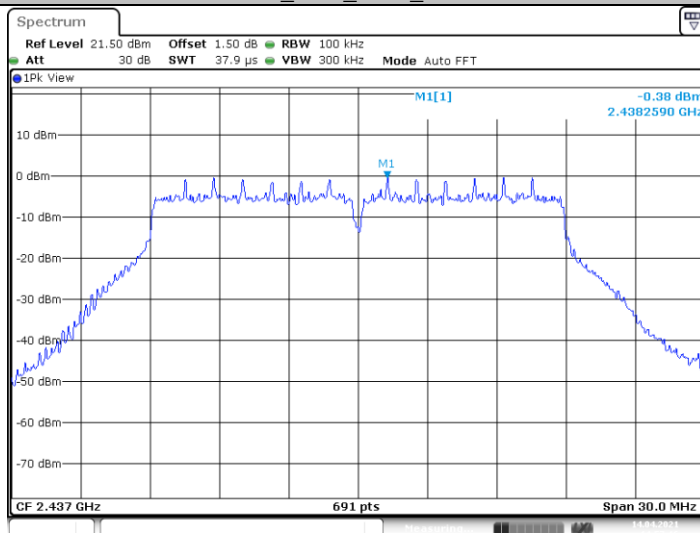
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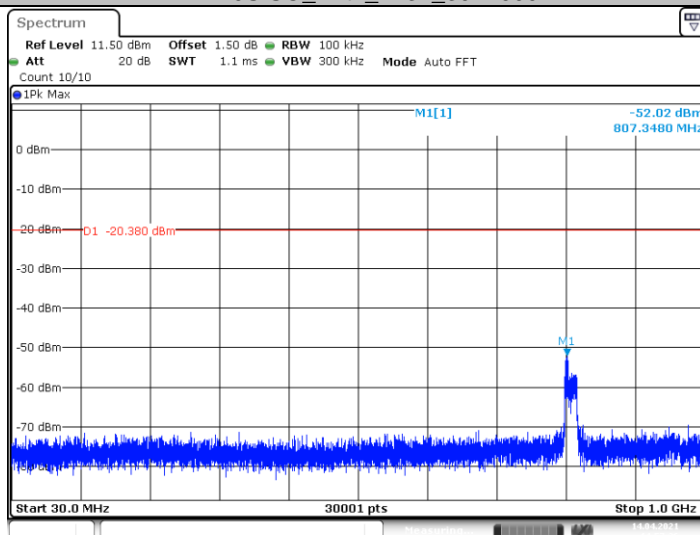


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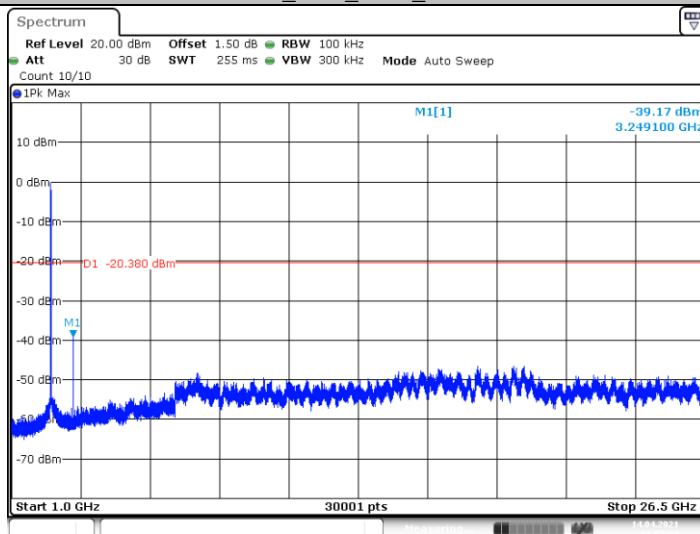
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11N20SISO_Ant1_2437_30~1000



Date: 14.APR.2021 14:57:26

11N20SISO_Ant1_2437_1000~26500



Date: 14.APR.2021 14:57:53

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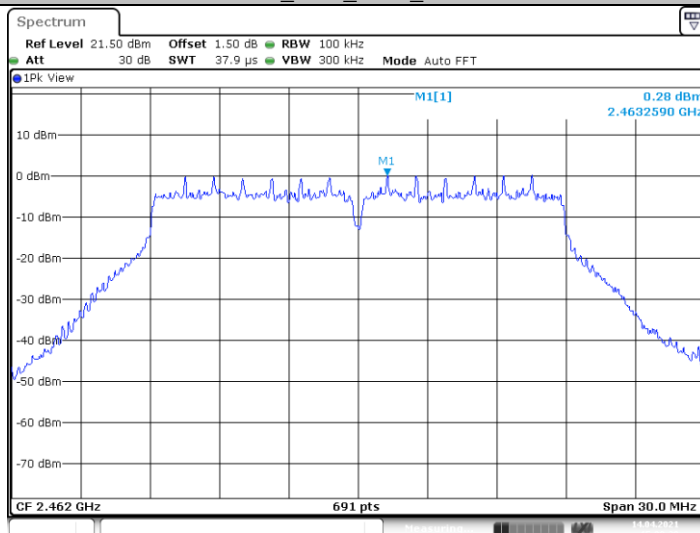
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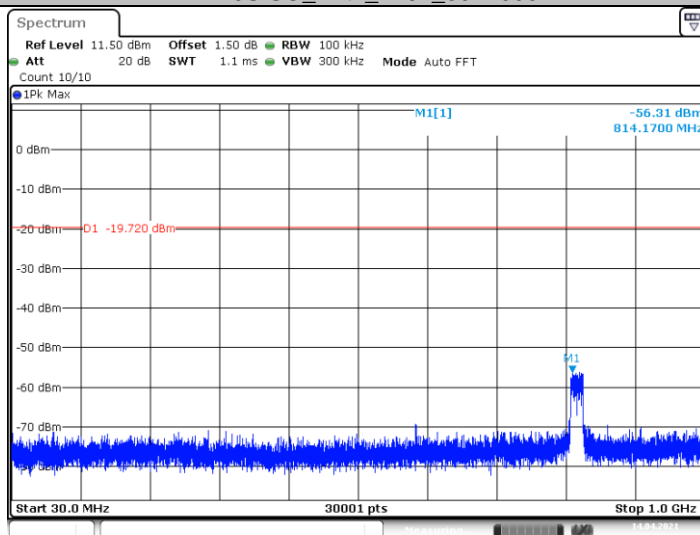


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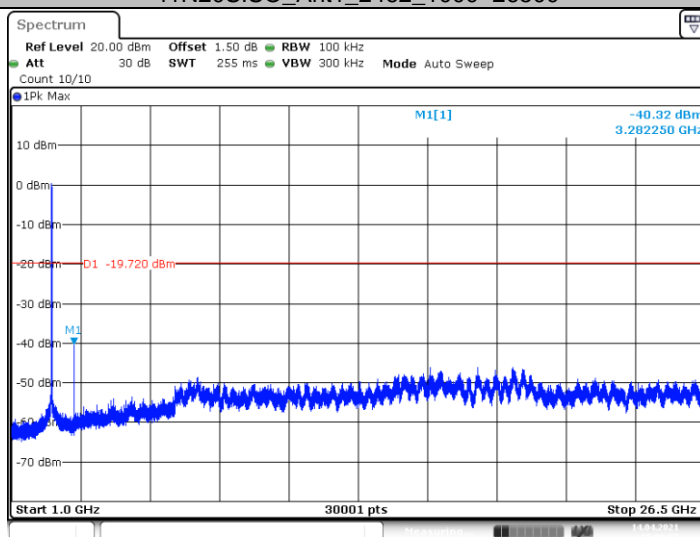
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Date: 14.APR.2021 15:00:30

11N20SISO_Ant1_2462_1000~26500



Date: 14.APR.2021 15:00:57

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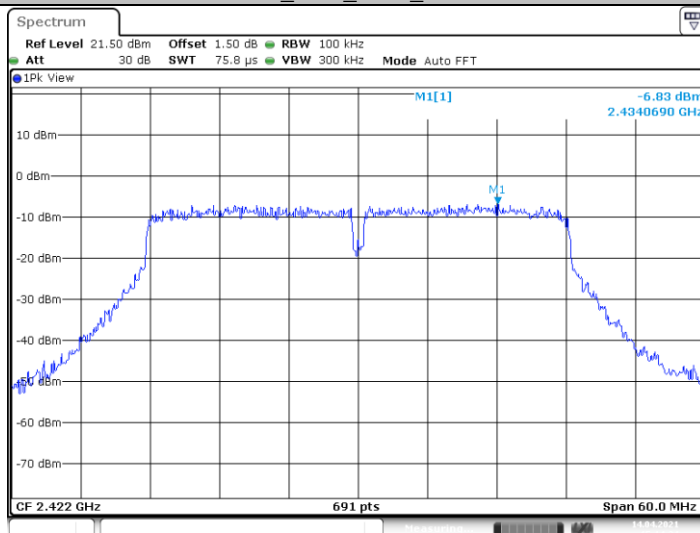
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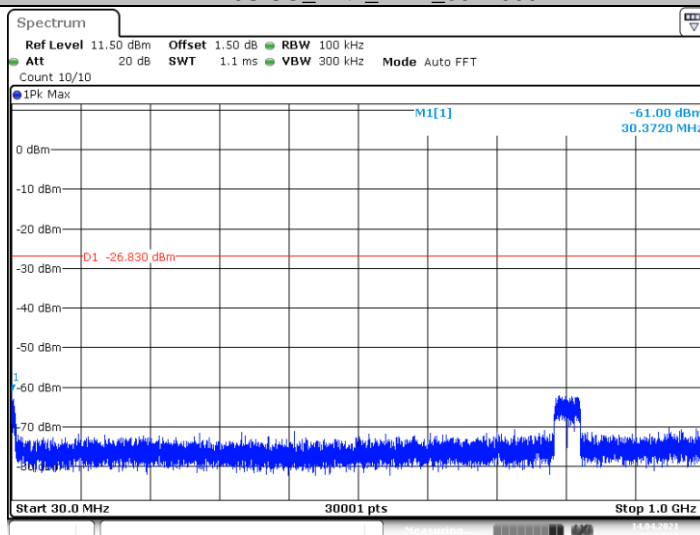


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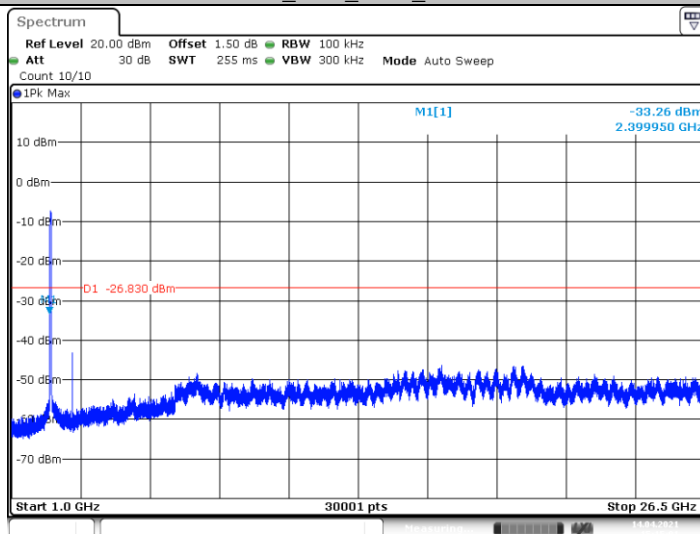
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11N40SISO_Ant1_2422_30~1000



Date: 14.APR.2021 15:14:34

11N40SISO_Ant1_2422_1000~26500



Date: 14.APR.2021 15:15:01

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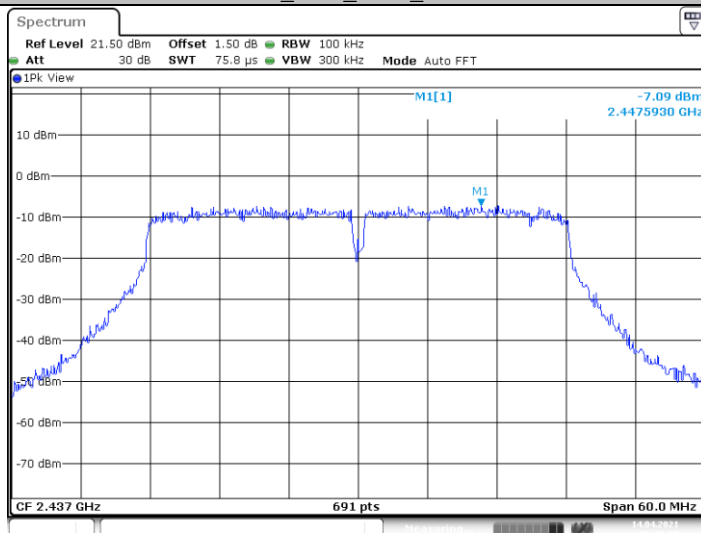
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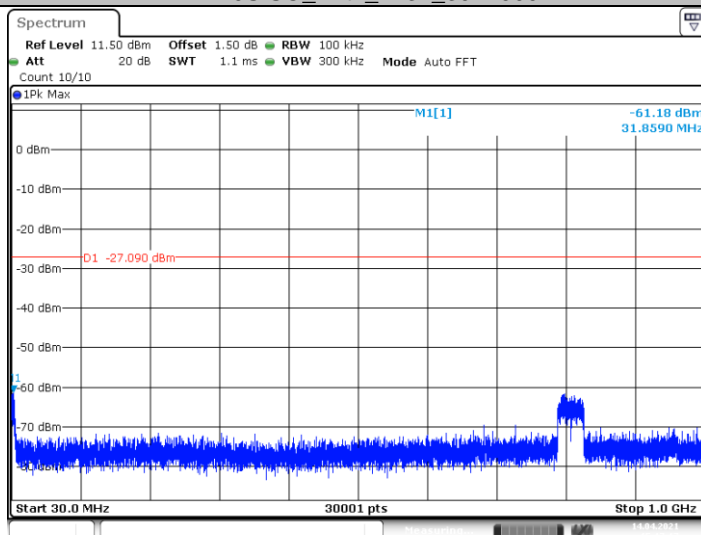
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11N40SISO Ant1 2437 0~Reference



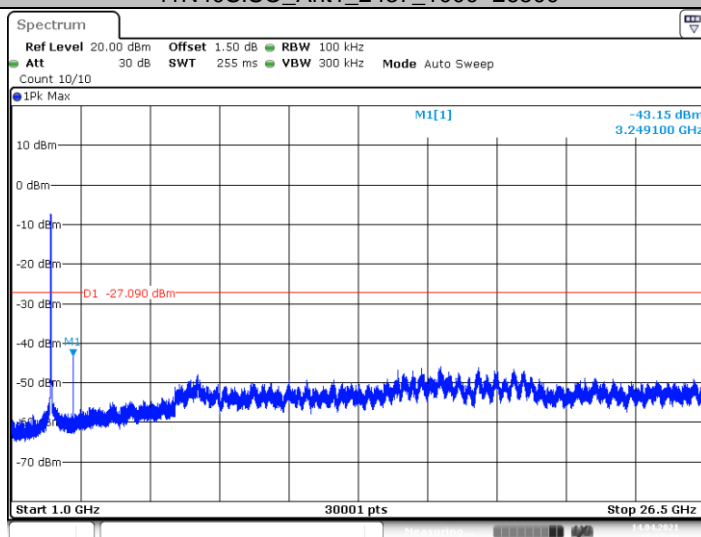
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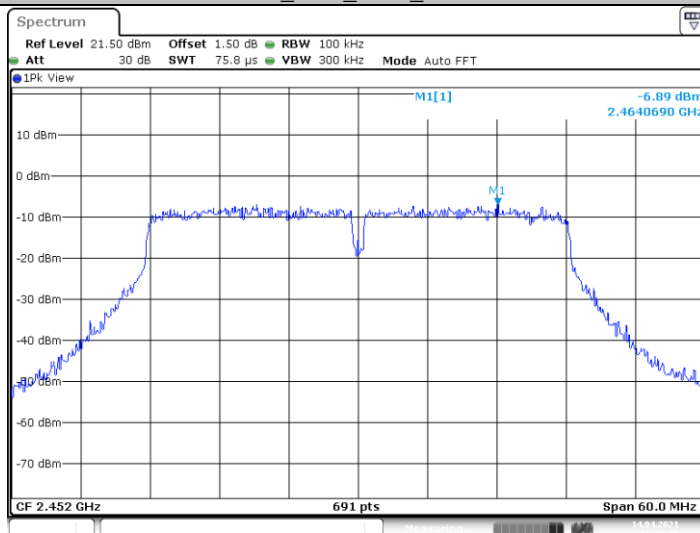
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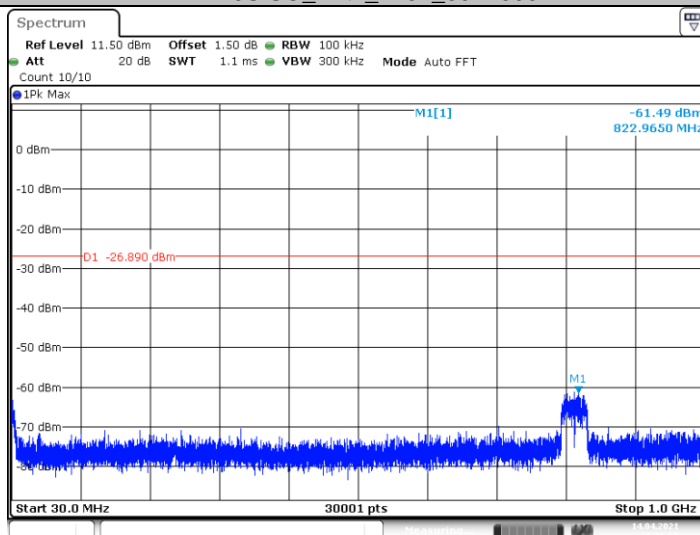


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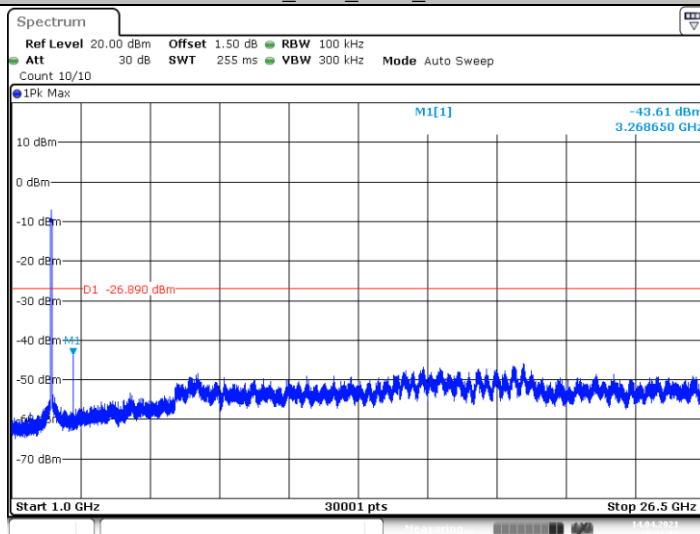
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11N40SISO_Ant1_2452_30~1000



Date: 14.APR.2021 15:20:50

11N40SISO_Ant1_2452_1000~26500



Date: 14.APR.2021 15:21:17

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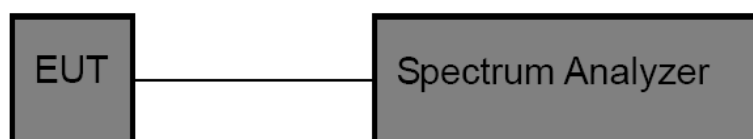
3.5. Bandwidth

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

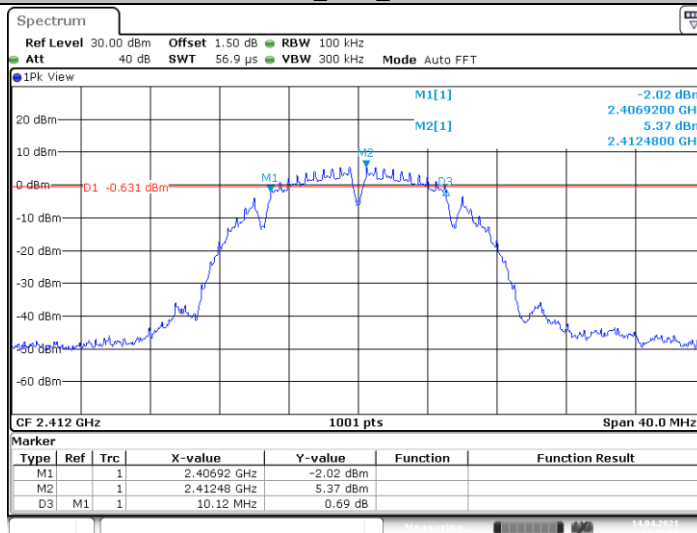
Please refer to the clause 2.4.

**Test Result**

Test Mode	Antenna	Frequency (MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	10.120	2406.920	2417.040	≥ 0.5	PASS
		2437	10.120	2431.920	2442.040	≥ 0.5	PASS
		2462	10.120	2456.920	2467.040	≥ 0.5	PASS
11G	Ant1	2412	16.440	2403.760	2420.200	≥ 0.5	PASS
		2437	16.440	2428.760	2445.200	≥ 0.5	PASS
		2462	16.440	2453.760	2470.200	≥ 0.5	PASS
11N20SISO	Ant1	2412	17.680	2403.160	2420.840	≥ 0.5	PASS
		2437	17.680	2428.160	2445.840	≥ 0.5	PASS
		2462	17.680	2453.160	2470.840	≥ 0.5	PASS
11N40SISO	Ant1	2422	36.560	2403.680	2440.240	≥ 0.5	PASS
		2437	36.560	2418.680	2455.240	≥ 0.5	PASS
		2452	36.560	2433.680	2470.240	≥ 0.5	PASS

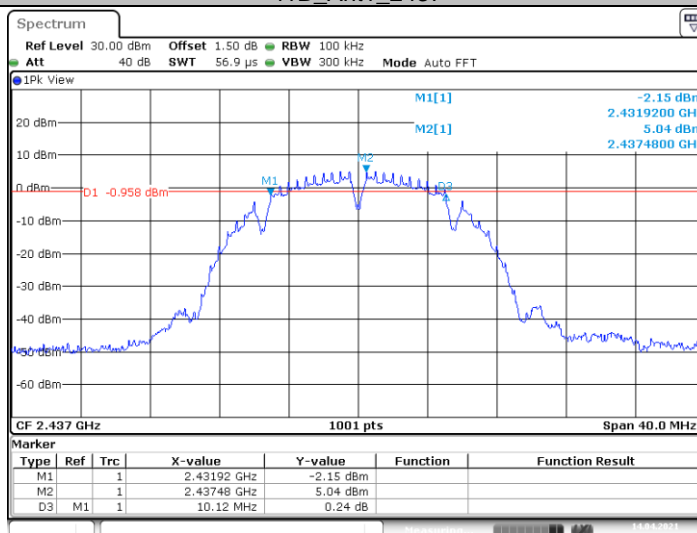


11B_Ant1_2412



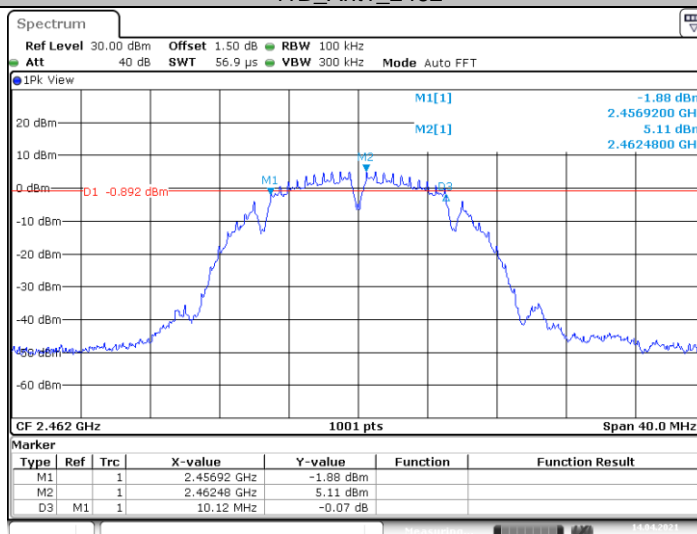
Date: 14.APR.2021 14:19:59

11B_Ant1_2437



Date: 14.APR.2021 14:26:17

11B_Ant1_2462



Date: 14.APR.2021 14:30:53

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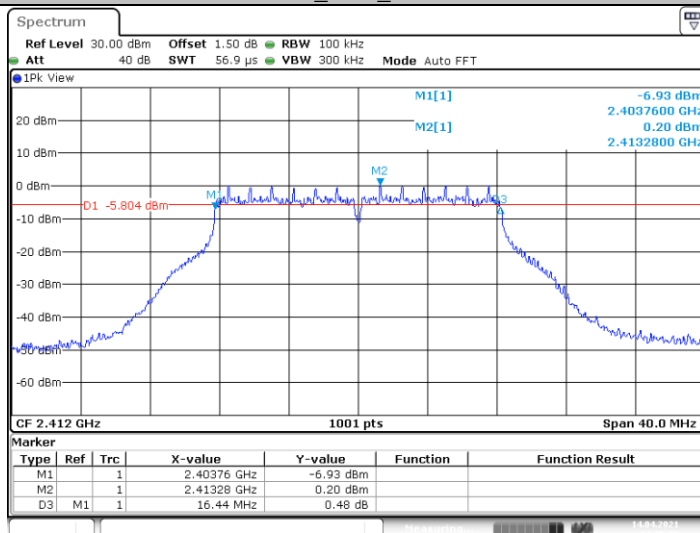
Fax: (86)755-27521011

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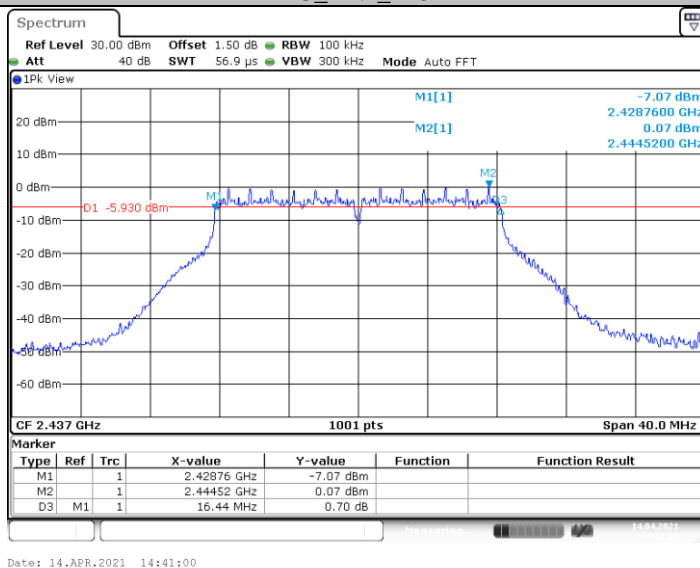
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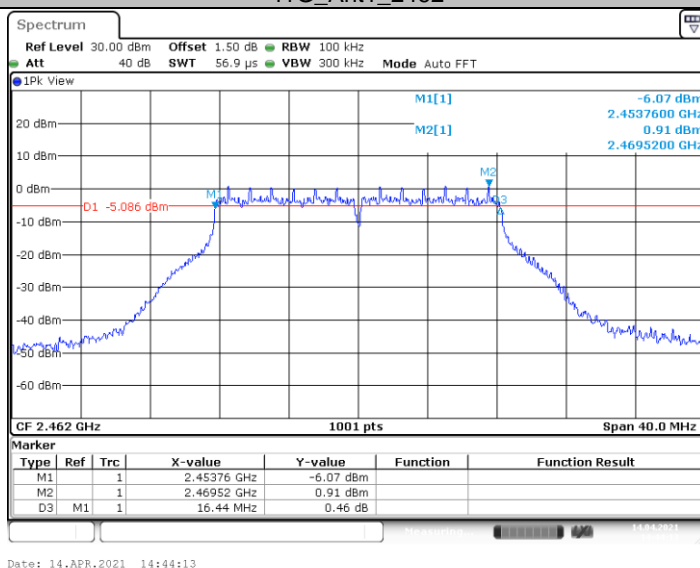
11G_Ant1_2412



11G_Ant1_2437



11G_Ant1_2462

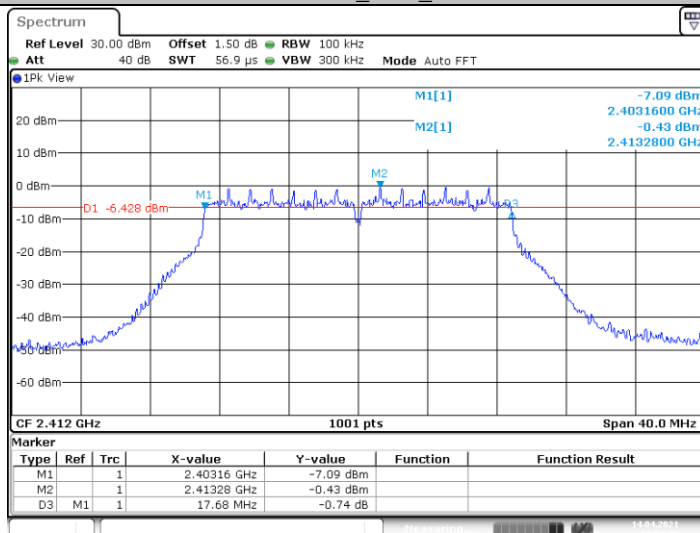


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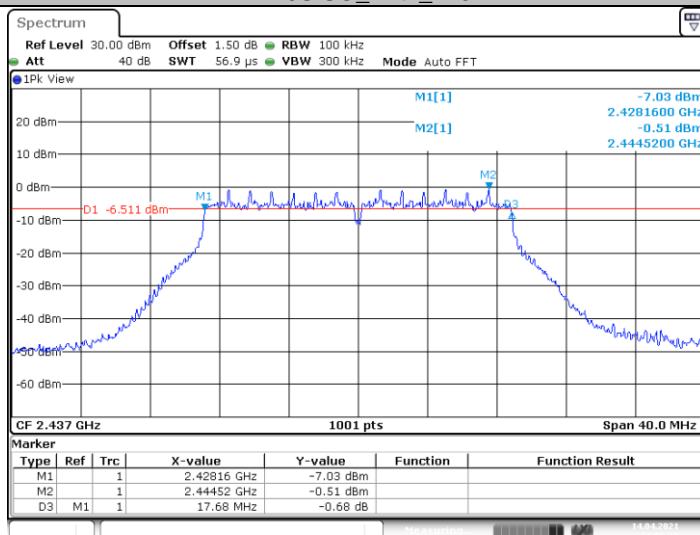


11N20SISO_Ant1_2412



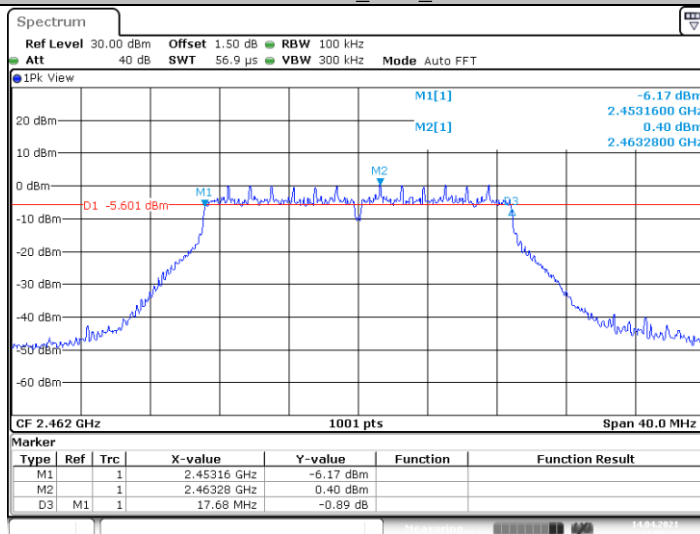
Date: 14.APR.2021 14:52:46

11N20SISO_Ant1_2437



Date: 14.APR.2021 14:56:43

11N20SISO_Ant1_2462



Date: 14.APR.2021 14:58:41

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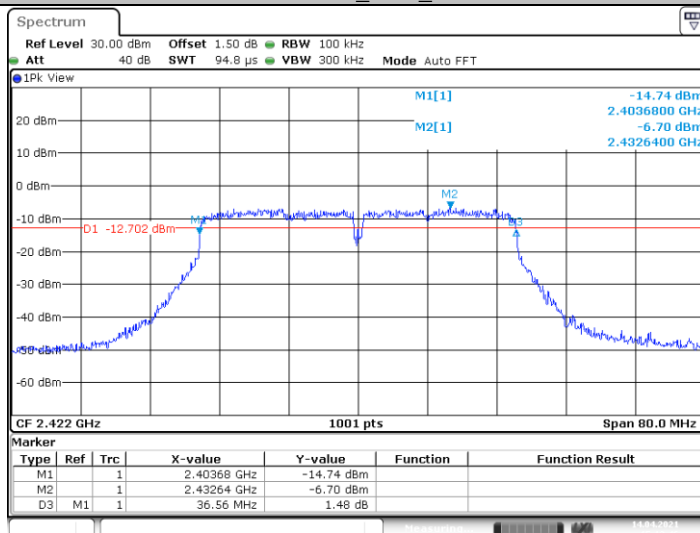
Fax: (86)755-27521011

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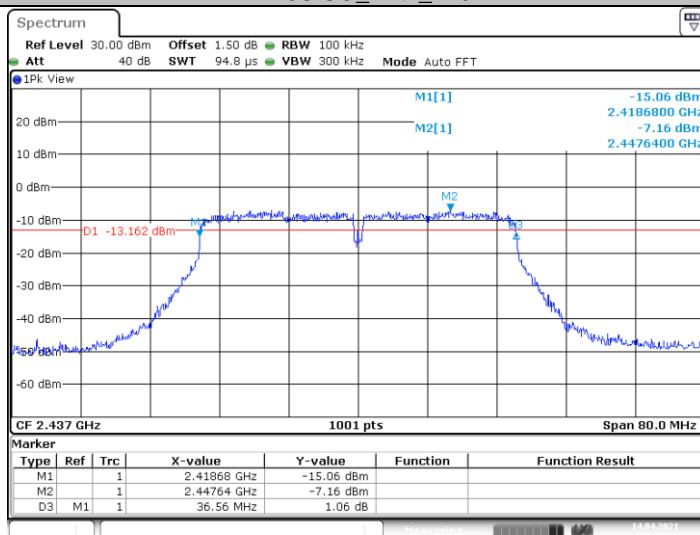


11N40SISO_Ant1_2422



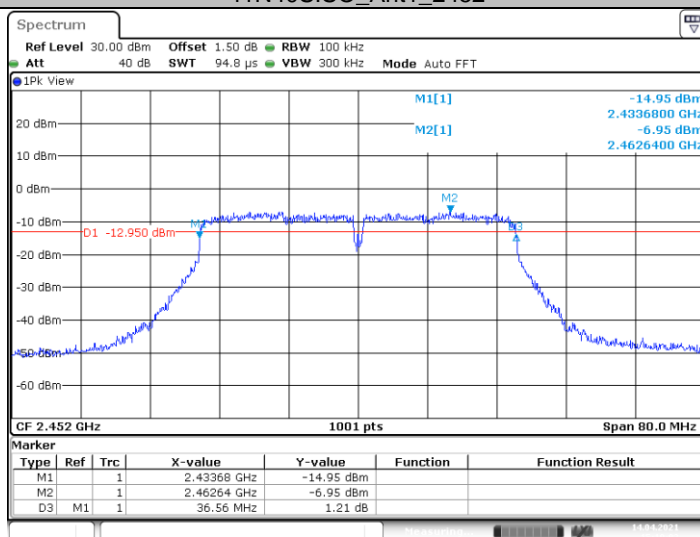
Date: 14.APR.2021 15:12:46

11N40SISO_Ant1_2437



Date: 14.APR.2021 15:16:33

11N40SISO_Ant1_2452



Date: 14.APR.2021 15:19:02

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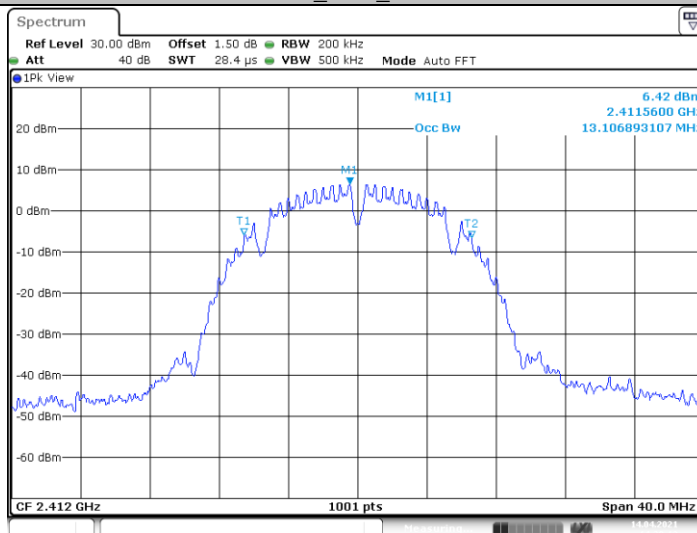
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**Test Result**

Test Mode	Antenna	Frequency (MHz)	OCB [MHz]	Verdict
11B	Ant1	2412	13.107	PASS
		2437	13.147	PASS
		2462	13.147	PASS
11G	Ant1	2412	17.862	PASS
		2437	17.982	PASS
		2462	18.102	PASS
11N20SISO	Ant1	2412	18.821	PASS
		2437	19.061	PASS
		2462	19.221	PASS
11N40SISO	Ant1	2422	36.364	PASS
		2437	36.523	PASS
		2452	36.364	PASS

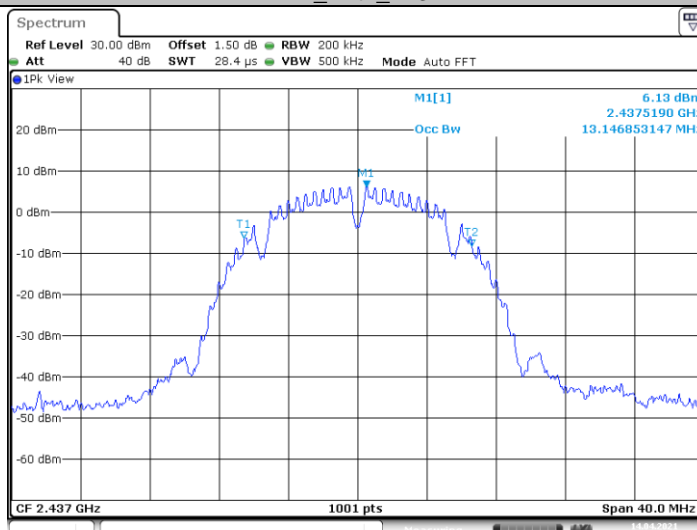


11B_Ant1_2412



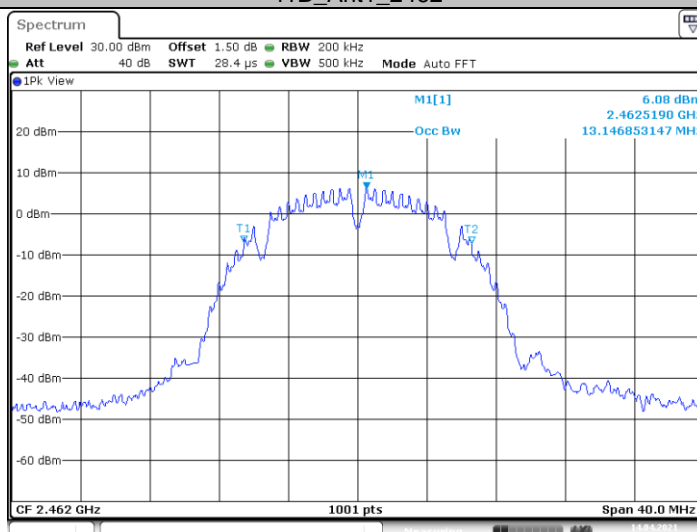
Date: 14.APR.2021 14:20:11

11B_Ant1_2437



Date: 14.APR.2021 14:26:28

11B_Ant1_2462



Date: 14.APR.2021 14:31:05

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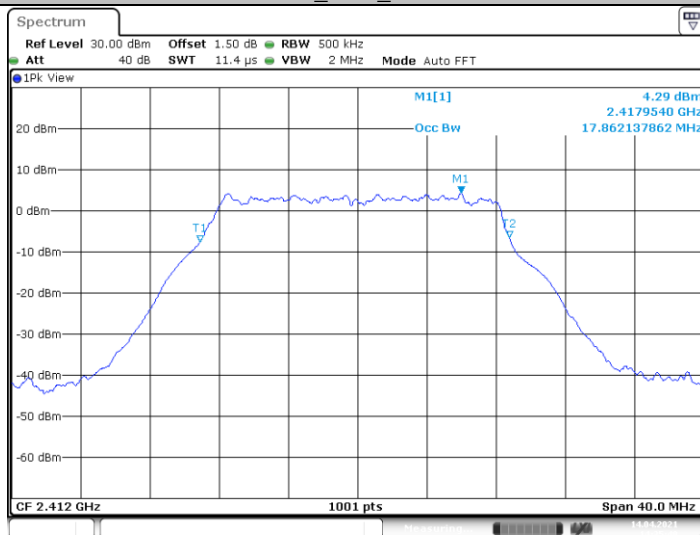
Fax: (86)755-27521011

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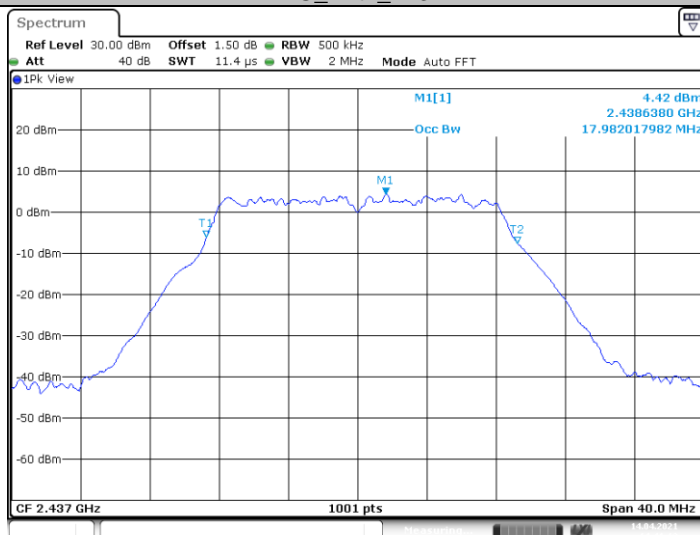


11G_Ant1_2412



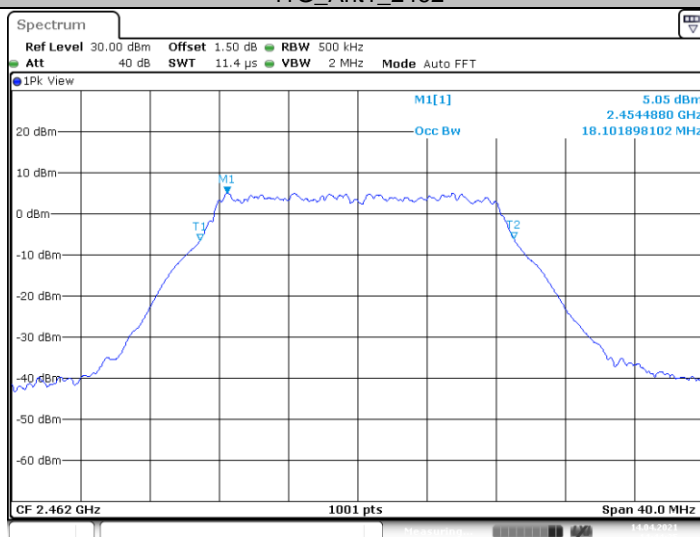
Date: 14.APR.2021 14:35:40

11G_Ant1_2437



Date: 14.APR.2021 14:41:12

11G_Ant1_2462



Date: 14.APR.2021 14:44:25

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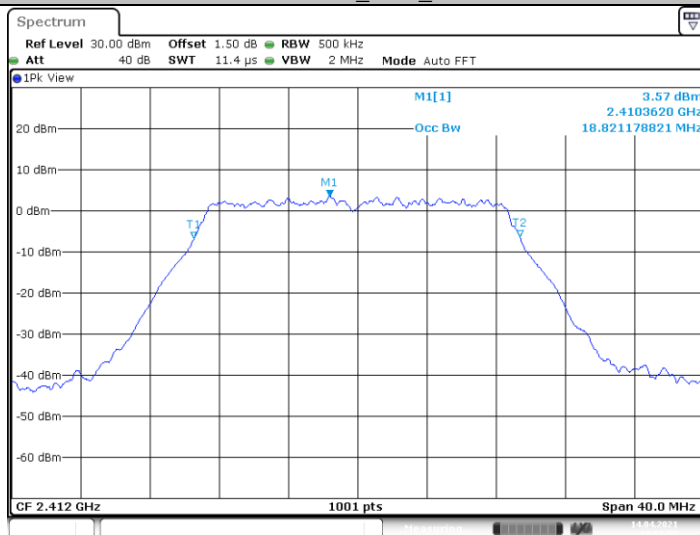
Fax: (86)755-27521011

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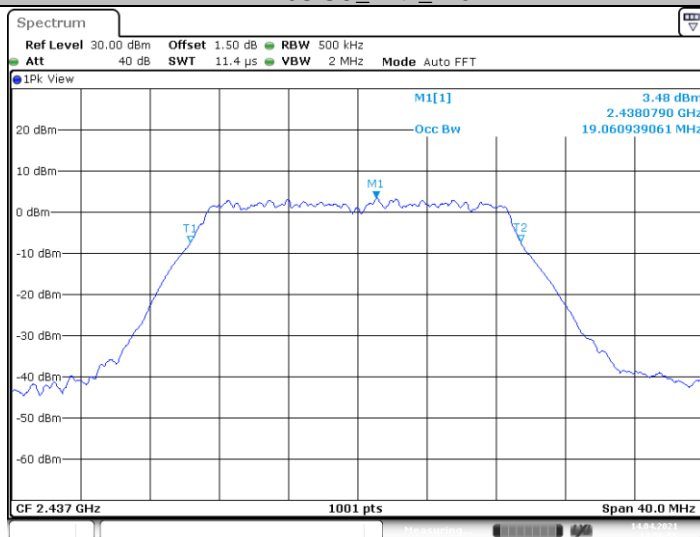


11N20SISO_Ant1_2412



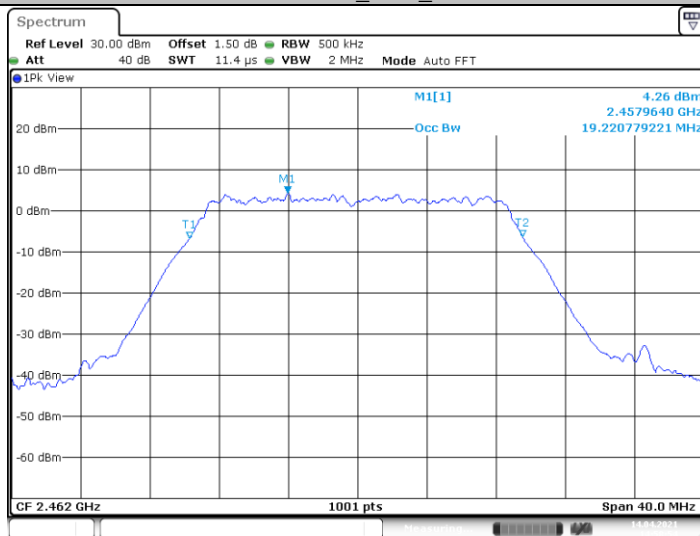
Date: 14.APR.2021 14:52:58

11N20SISO_Ant1_2437



Date: 14.APR.2021 14:56:55

11N20SISO_Ant1_2462



Date: 14.APR.2021 14:58:54

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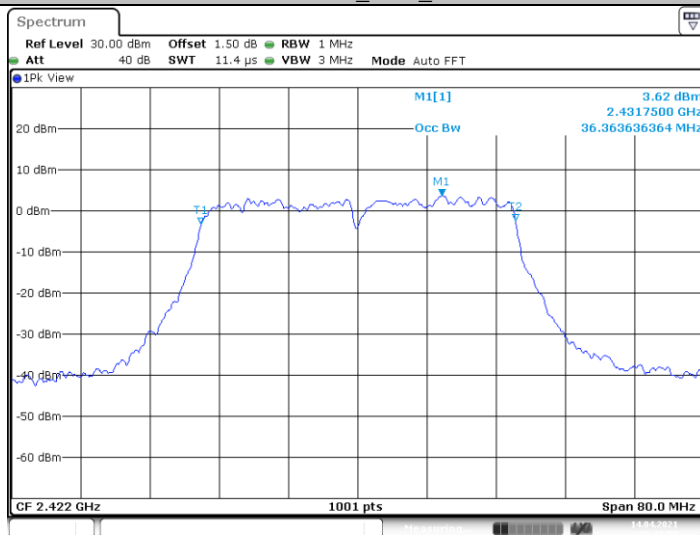
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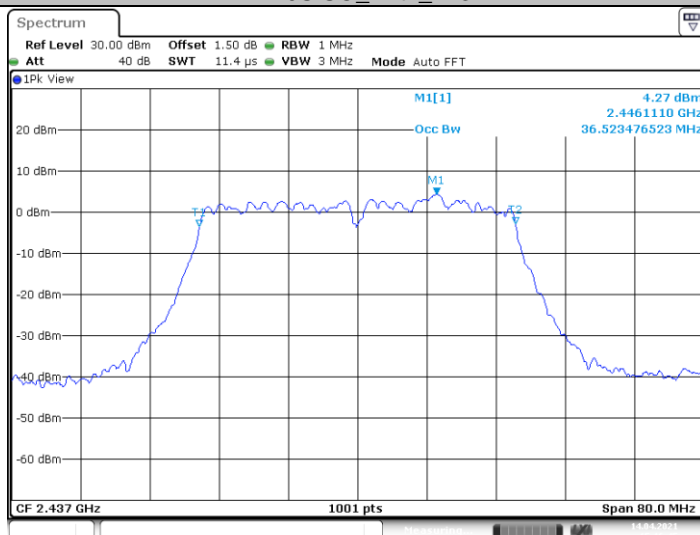


11N40SISO_Ant1_2422



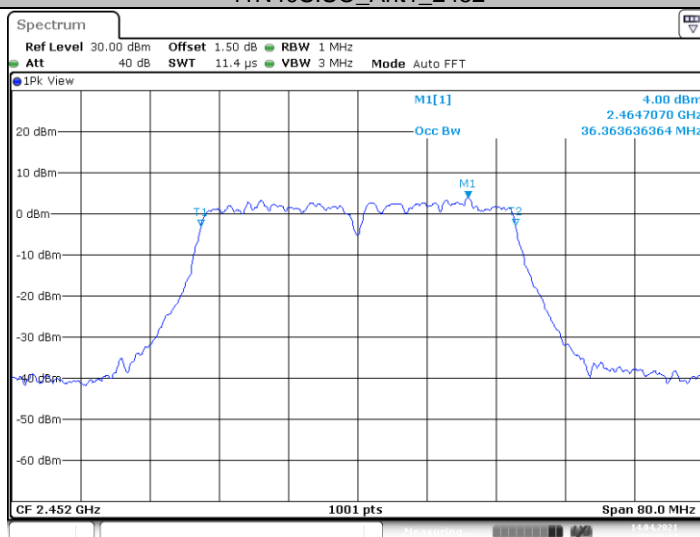
Date: 14.APR.2021 15:12:58

11N40SISO_Ant1_2437



Date: 14.APR.2021 15:16:45

11N40SISO_Ant1_2452



Date: 14.APR.2021 15:19:14

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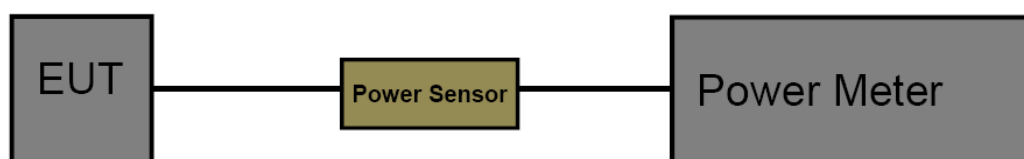
3.6. Peak Output Power

Limit

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

Section	Test Item	Limit	Frequency Range(MHz)
CFR 47 FCC 15.247(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 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.
4. Record the measurement data.

Test Mode

Please refer to the clause 2.4.

Test Result

Test Mode	Antenna	Frequency (MHz)	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	17.66	<=30	PASS
		2437	17.43	<=30	PASS
		2462	17.52	<=30	PASS
11G	Ant1	2412	18.54	<=30	PASS
		2437	18.53	<=30	PASS
		2462	19.43	<=30	PASS
11N20SISO	Ant1	2412	18.03	<=30	PASS
		2437	18.04	<=30	PASS
		2462	18.80	<=30	PASS
11N40SISO	Ant1	2422	17.30	<=30	PASS
		2437	16.86	<=30	PASS
		2452	17.03	<=30	PASS



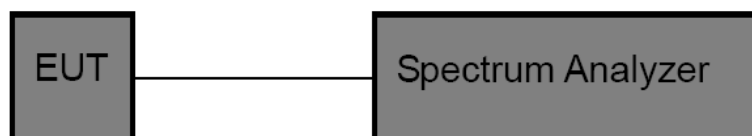
3.7. Power Spectral Density

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	8dBm(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: PK
Sweep time: Auto
Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

Test Mode

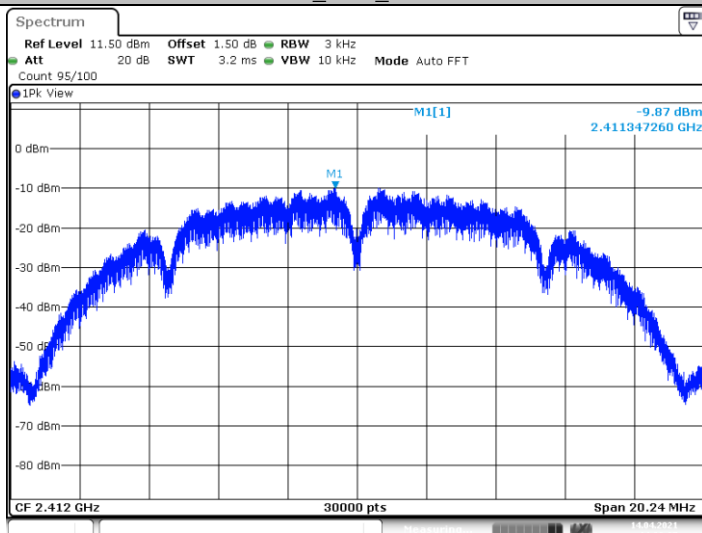
Please refer to the clause 2.4.

Test Result

Test Mode	Antenna	Frequency (MHz)	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-9.87	<=8	PASS
		2437	-9.90	<=8	PASS
		2462	-10.05	<=8	PASS
11G	Ant1	2412	-14.77	<=8	PASS
		2437	-14.61	<=8	PASS
		2462	-13.72	<=8	PASS
11N20SISO	Ant1	2412	-15.07	<=8	PASS
		2437	-14.97	<=8	PASS
		2462	-14.36	<=8	PASS
11N40SISO	Ant1	2422	-19.88	<=8	PASS
		2437	-20.50	<=8	PASS
		2452	-19.79	<=8	PASS

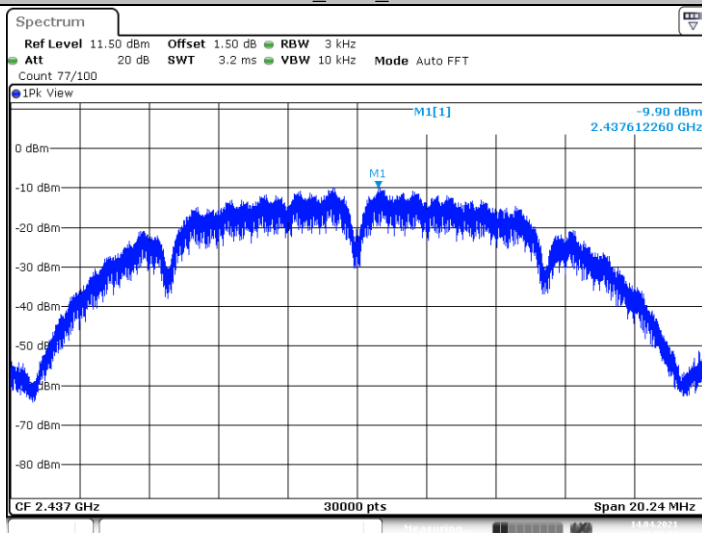


11B_Ant1_2412



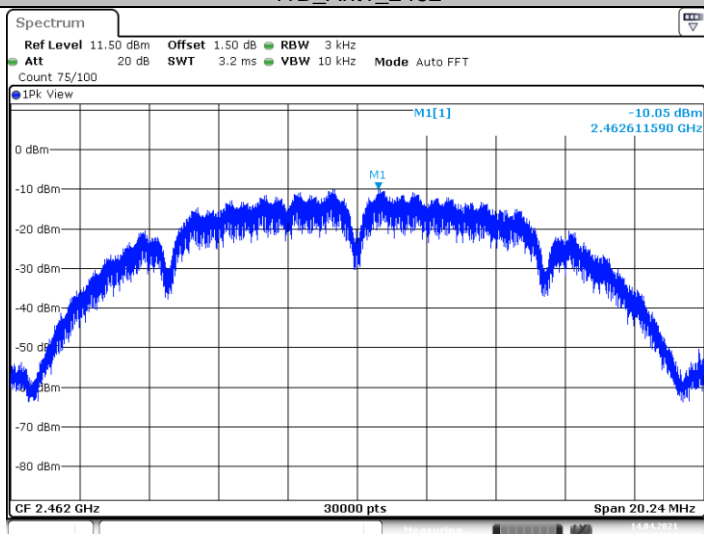
Date: 14.APR.2021 14:20:26

11B_Ant1_2437



Date: 14.APR.2021 14:26:43

11B_Ant1_2462



Date: 14.APR.2021 14:31:20

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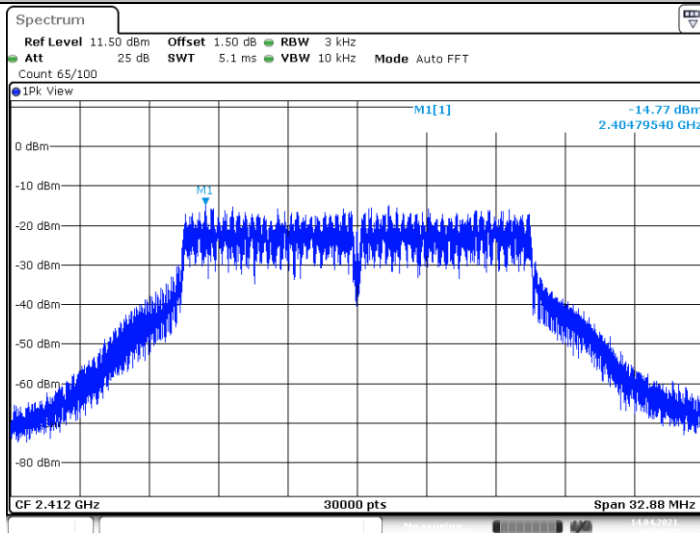
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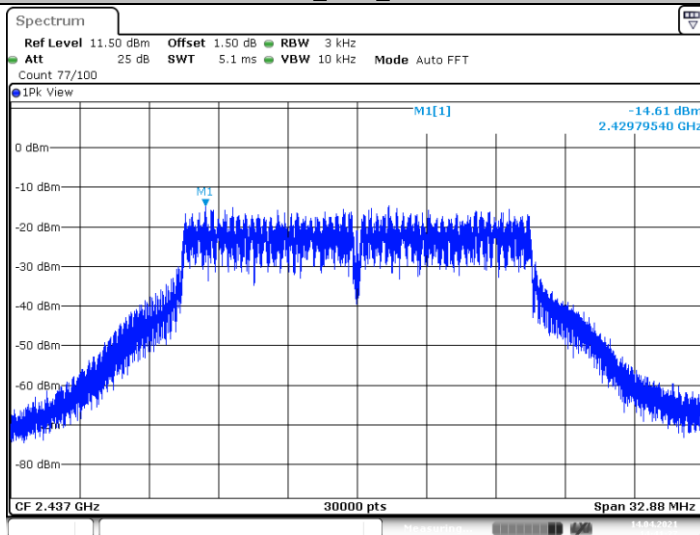


11G_Ant1_2412



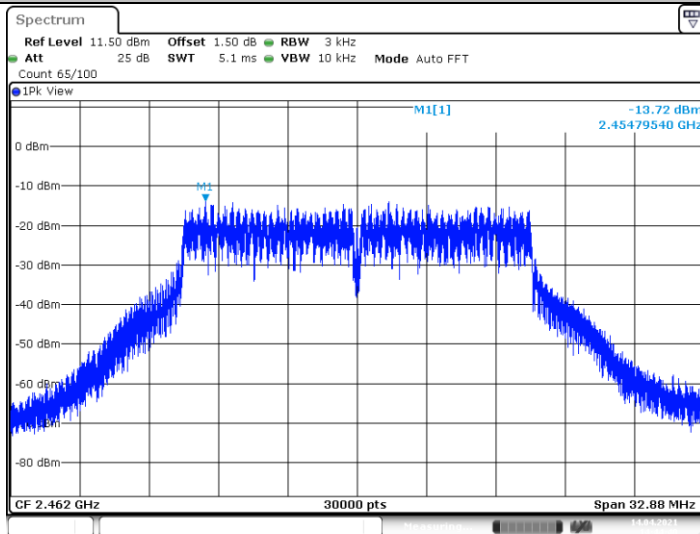
Date: 14.APR.2021 14:36:54

11G_Ant1_2437



Date: 14.APR.2021 14:41:27

11G_Ant1_2462



Date: 14.APR.2021 14:44:40

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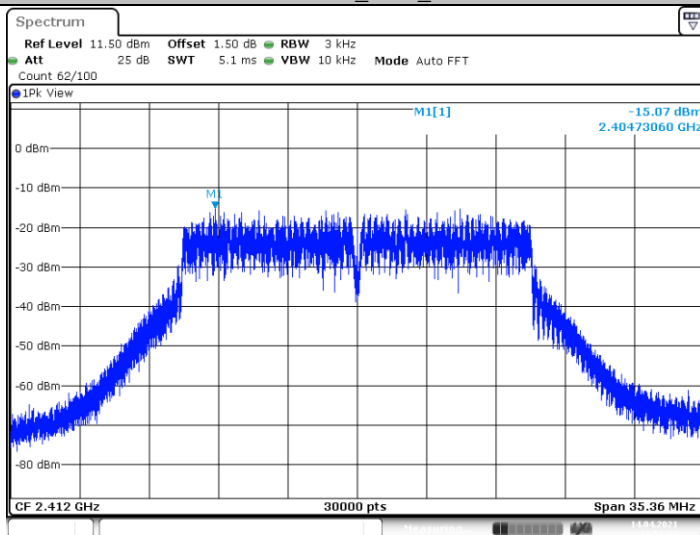
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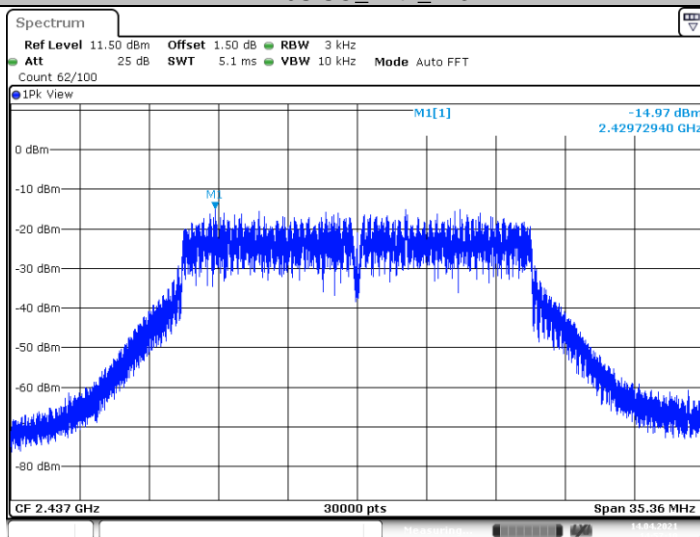


11N20SISO_Ant1_2412



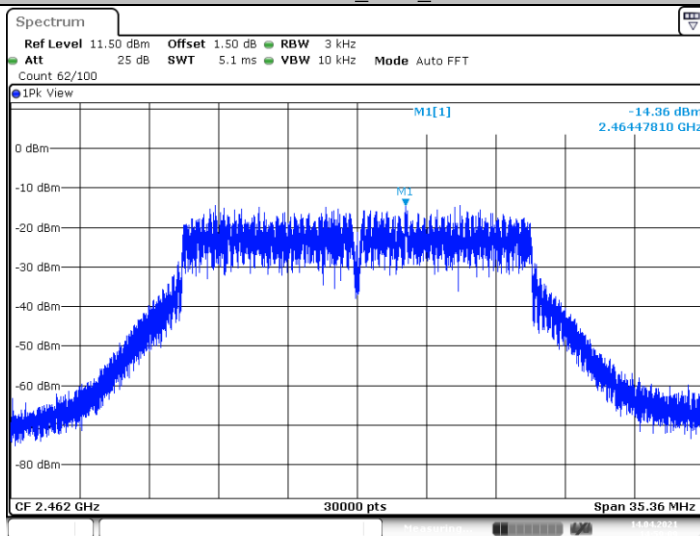
Date: 14.APR.2021 14:53:13

11N20SISO_Ant1_2437



Date: 14.APR.2021 14:57:10

11N20SISO_Ant1_2462



Date: 14.APR.2021 14:59:09

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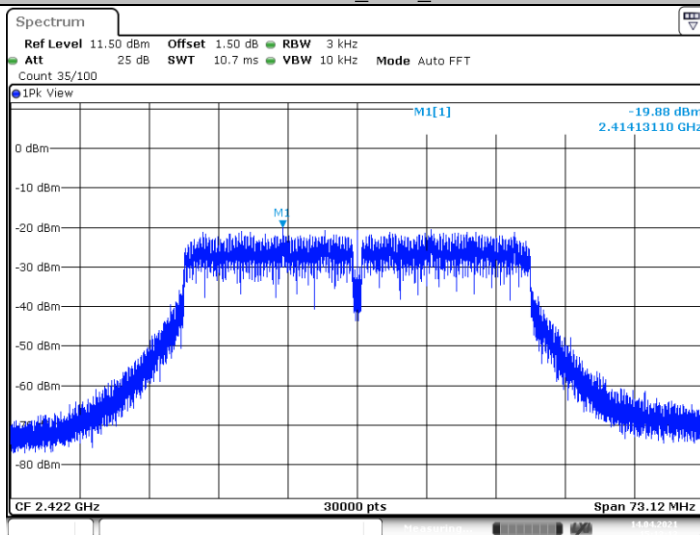
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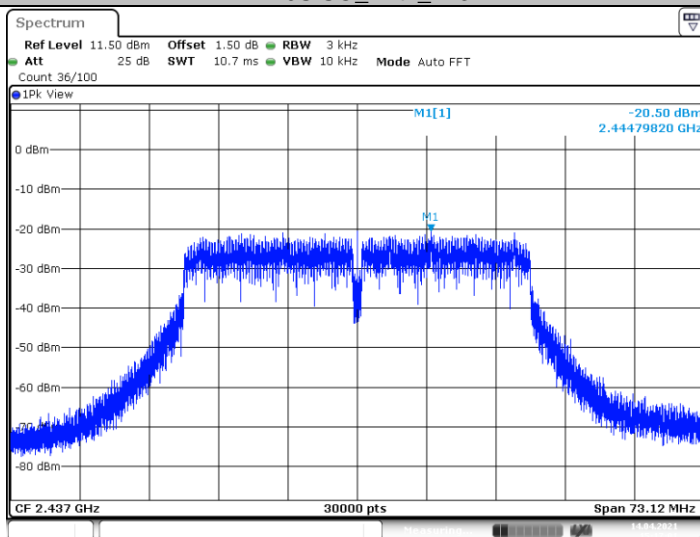


11N40SISO_Ant1_2422



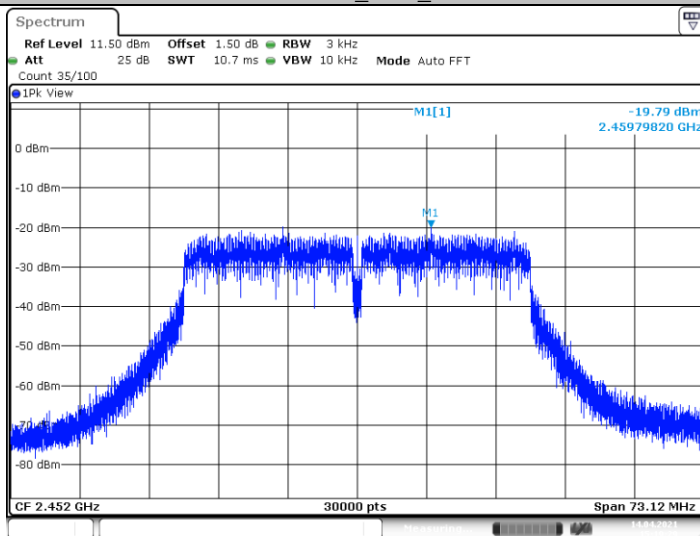
Date: 14.APR.2021 15:13:13

11N40SISO_Ant1_2437



Date: 14.APR.2021 15:17:00

11N40SISO_Ant1_2452



Date: 14.APR.2021 15:19:29

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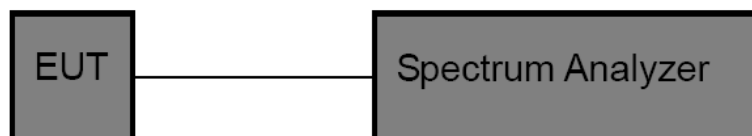
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3.8. Duty Cycle

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 DTS 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

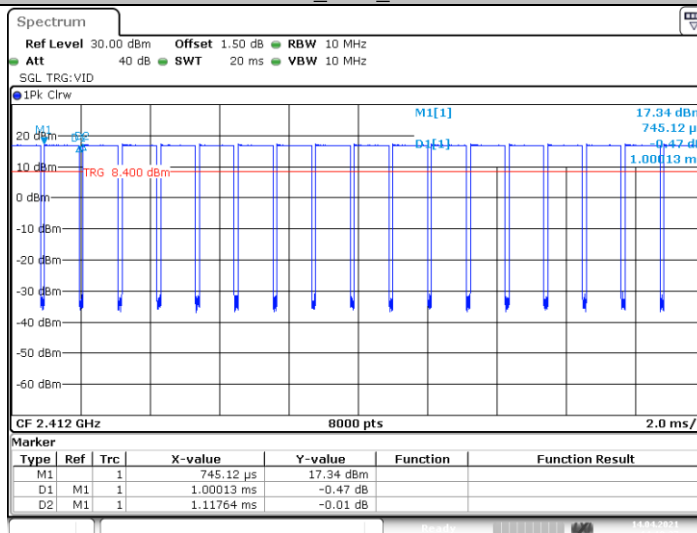
Please refer to the clause 2.4.

**Test Result**

Test Mode	Antenna	Frequency (MHz)	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T Minimum VBW (kHz)	Final setting For VBW (kHz)
11B	Ant1	2412	1.00	1.12	89.49	1.00	2.00
		2437	1.00	1.12	89.49	1.00	2.00
		2462	1.00	1.12	89.49	1.00	2.00
11G	Ant1	2412	0.61	0.68	89.71	1.64	2.00
		2437	0.61	0.68	89.54	1.64	2.00
		2462	0.61	0.68	89.54	1.64	2.00
11N20SISO	Ant1	2412	0.61	0.68	89.65	1.64	2.00
		2437	0.61	0.68	89.81	1.64	2.00
		2462	0.61	0.68	89.63	1.64	2.00
11N40SISO	Ant1	2422	0.64	0.69	93.27	1.56	2.00
		2437	0.64	0.69	93.27	1.56	2.00
		2452	0.64	0.69	93.27	1.56	2.00

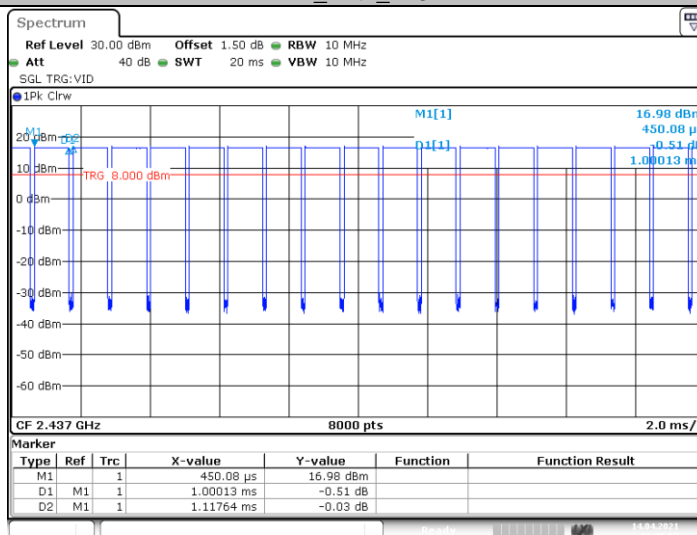


11B_Ant1_2412



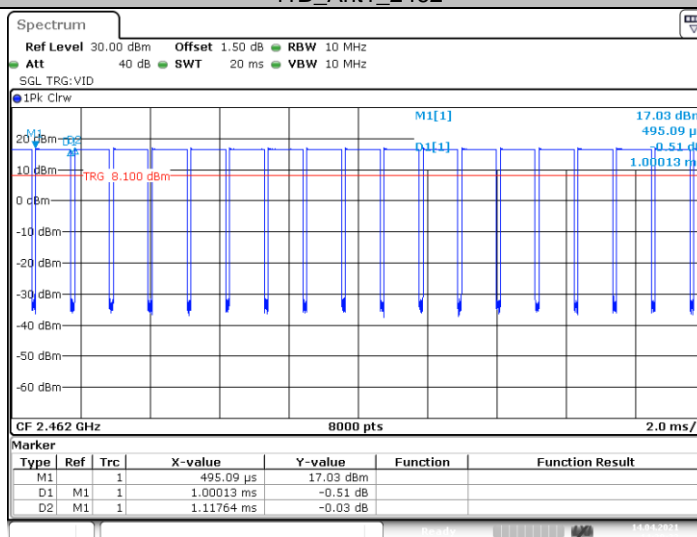
Date: 14.APR.2021 14:19:38

11B_Ant1_2437



Date: 14.APR.2021 14:25:55

11B_Ant1_2462



Date: 14.APR.2021 14:30:31

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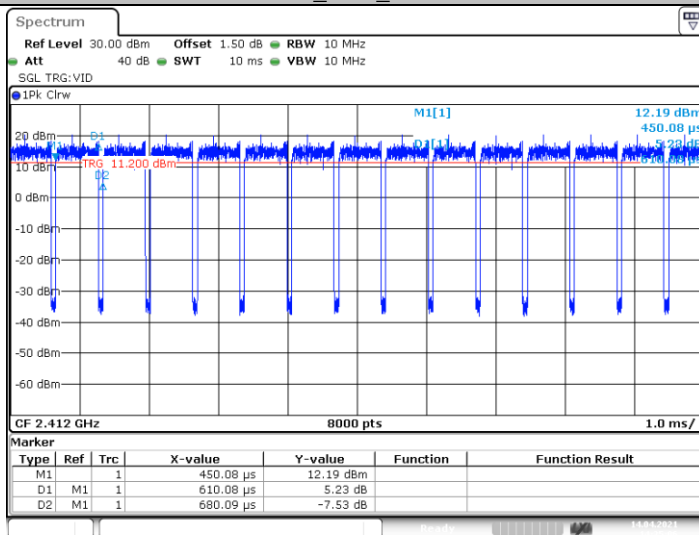
Fax: (86)755-27521011

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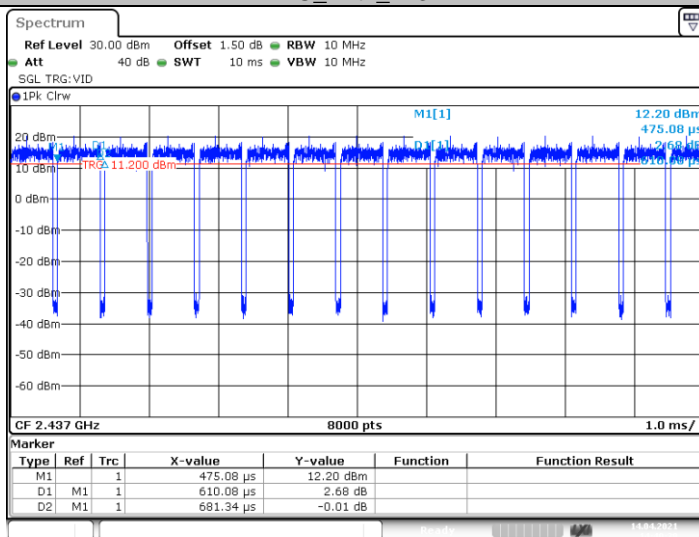


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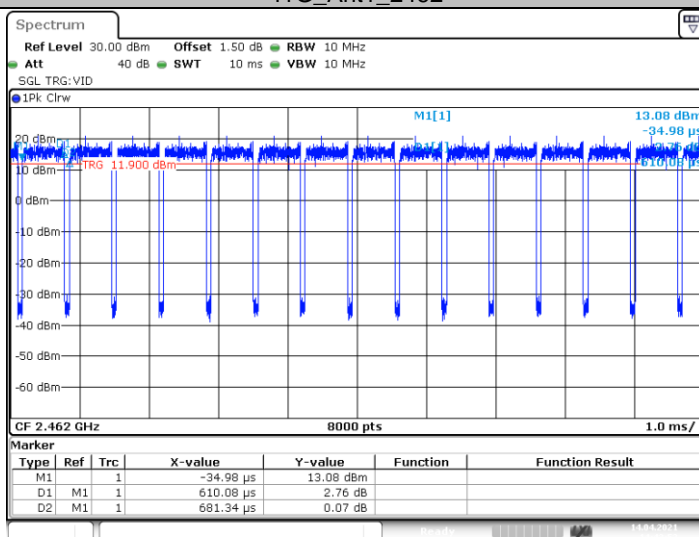
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11G_Ant1_2437



Date: 14.APR.2021 14:40:38

11G_Ant1_2462



Date: 14.APR.2021 14:43:51

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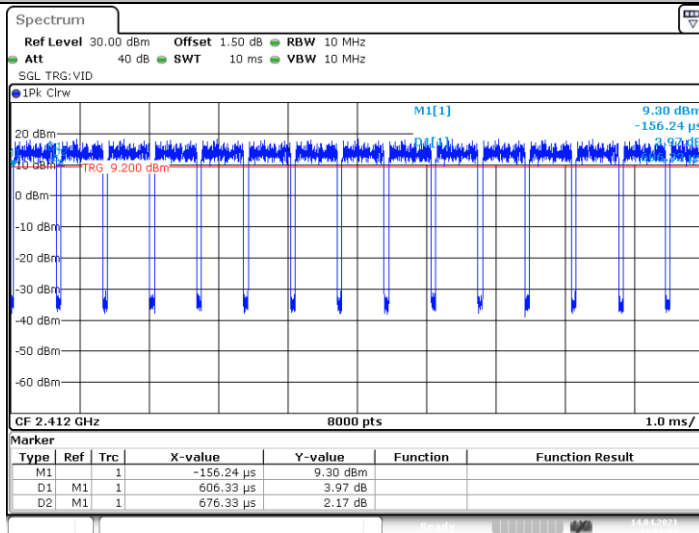
Fax: (86)755-27521011

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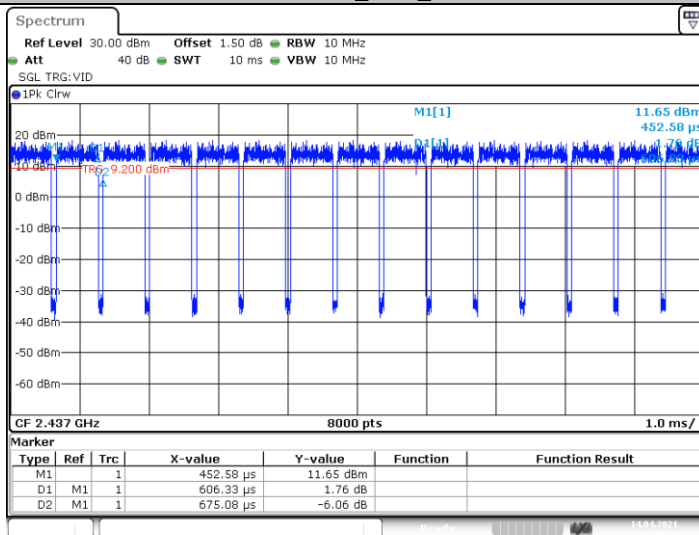


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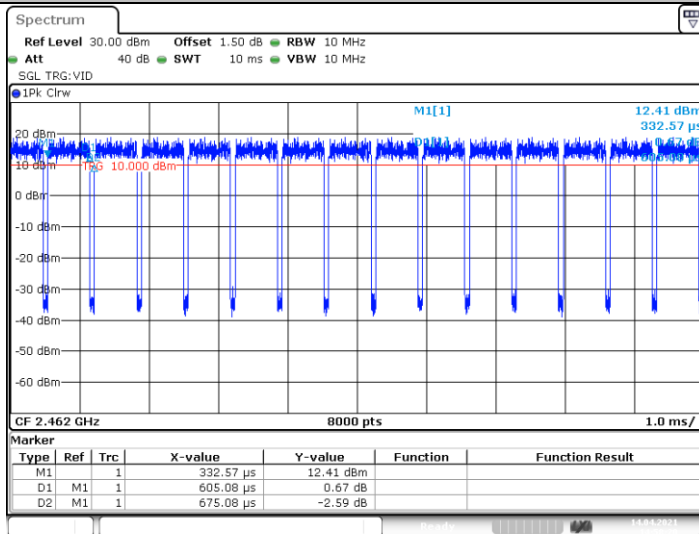
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11N20SISO_Ant1_2462



Date: 14.APR.2021 14:58:20

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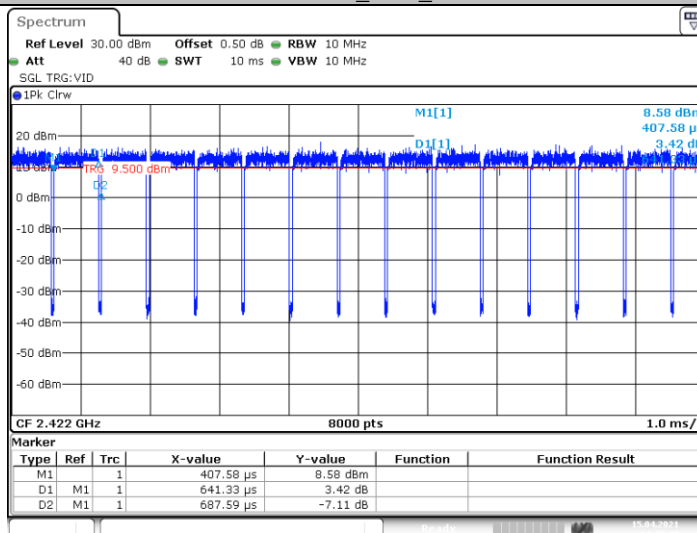
Fax: (86)755-27521011

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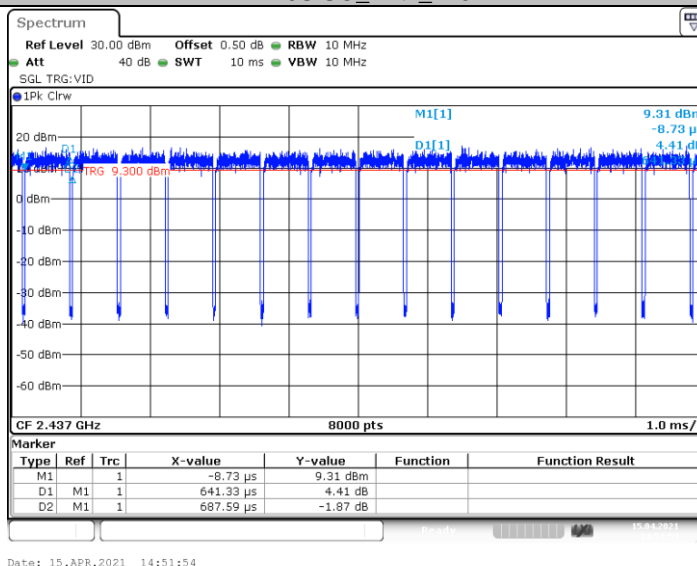
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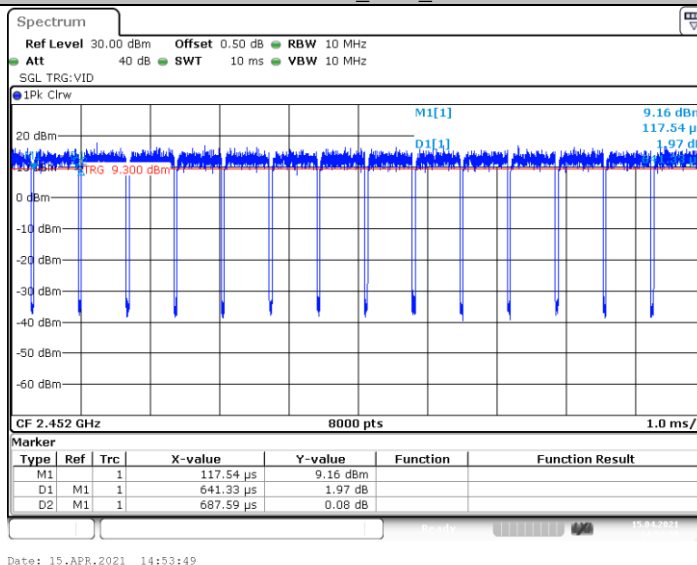
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11N40SISO_Ant1_2452



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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

Note: The test result is PASS, because the directional gain of the antenna less than 6dBi, please refer to the EUT internal photographs antenna photo.

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