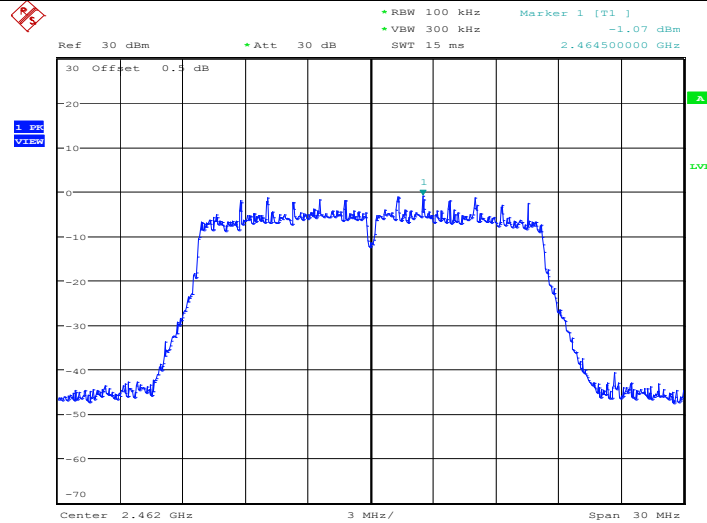


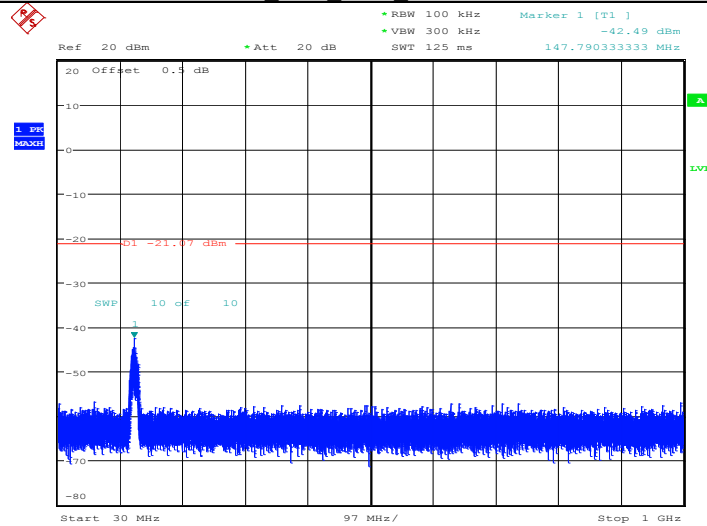


11G_Ant1_2462_0-Reference



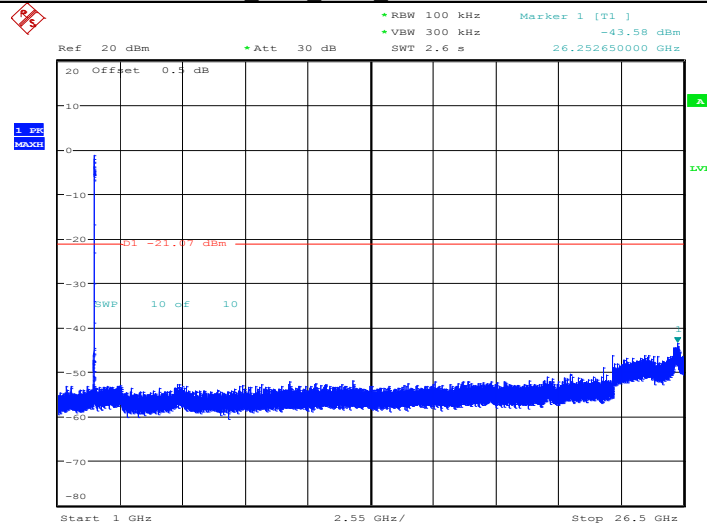
Date: 11.DEC.2020 17:28:24

11G_Ant1_2462_30-1000



Date: 11.DEC.2020 17:28:35

11G_Ant1_2462_1000-26500



Date: 11.DEC.2020 17:29:26

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Tel.: (86)755-27521059

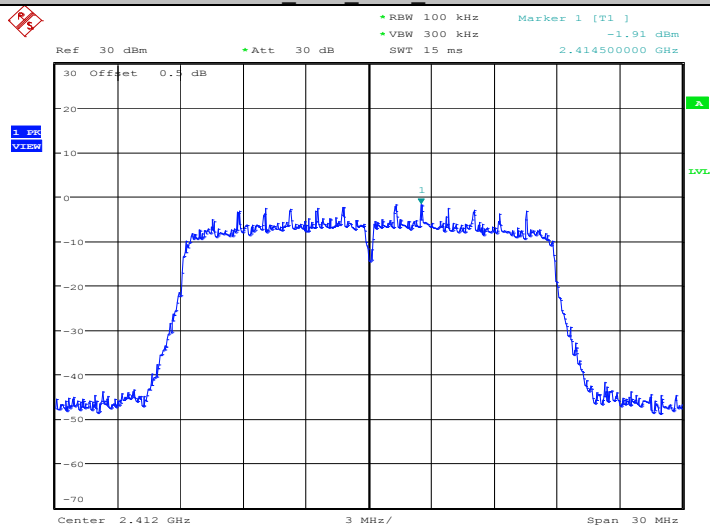
Fax: (86)755-27521011

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

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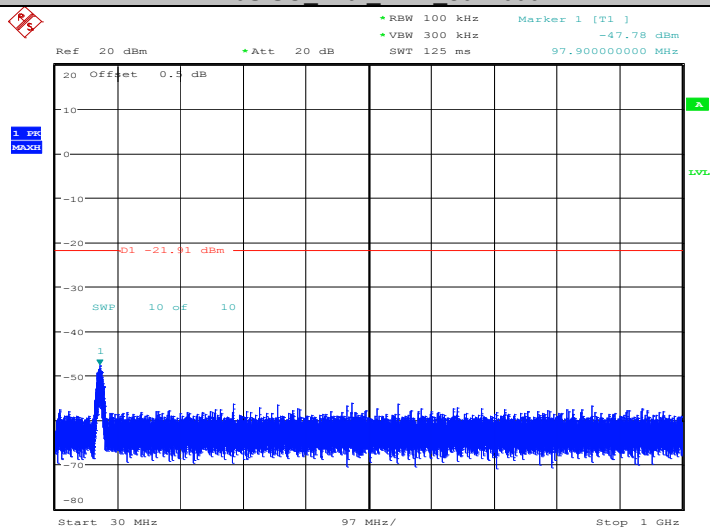


11N20SISO_Ant1_2412_0~Reference



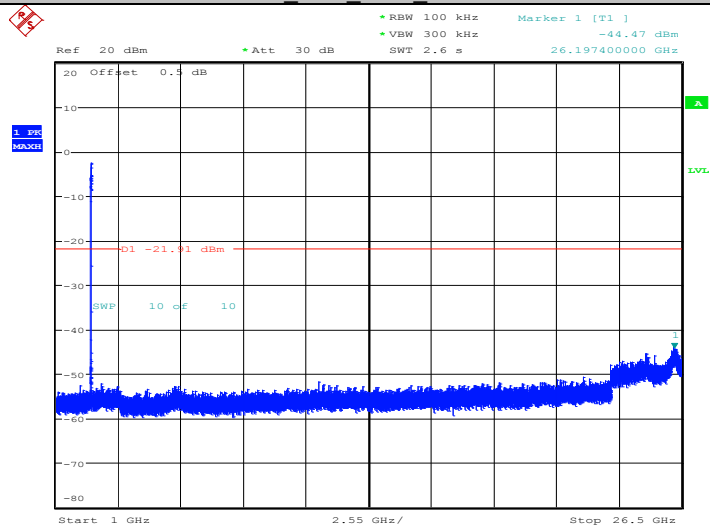
Date: 11.DEC.2020 17:46:53

11N20SISO_Ant1_2412_30~1000



Date: 11.DEC.2020 17:47:04

11N20SISO_Ant1_2412_1000~26500



Date: 11.DEC.2020 17:47:55

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Tel.: (86)755-27521059

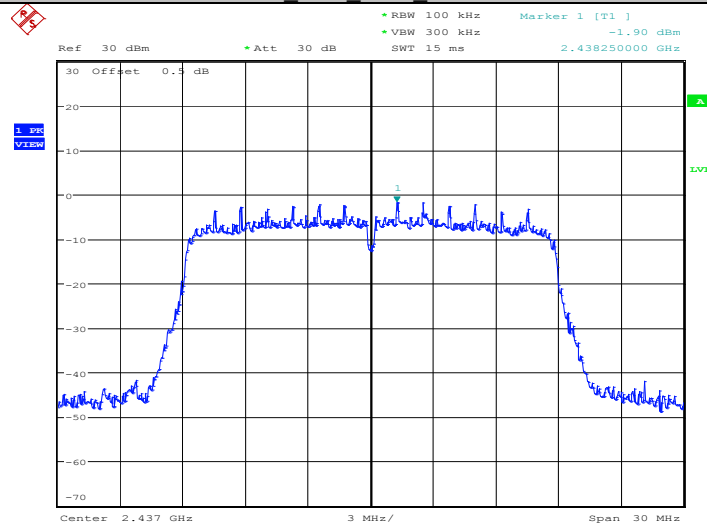
Fax: (86)755-27521011

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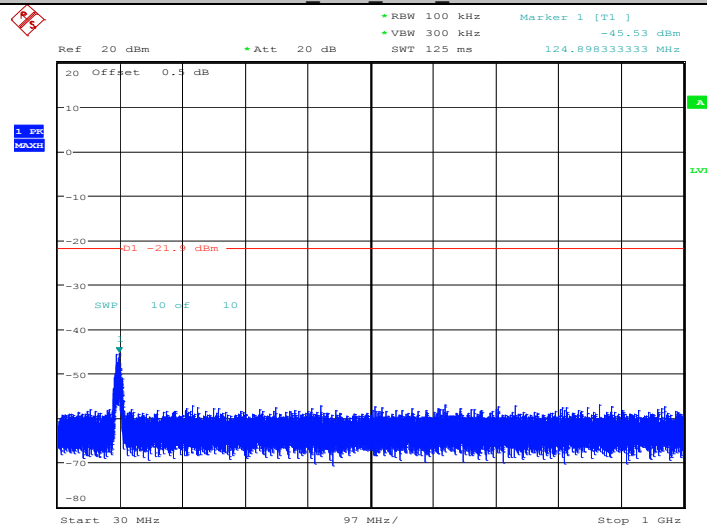


11N20SISO_Ant1_2437_0~Reference



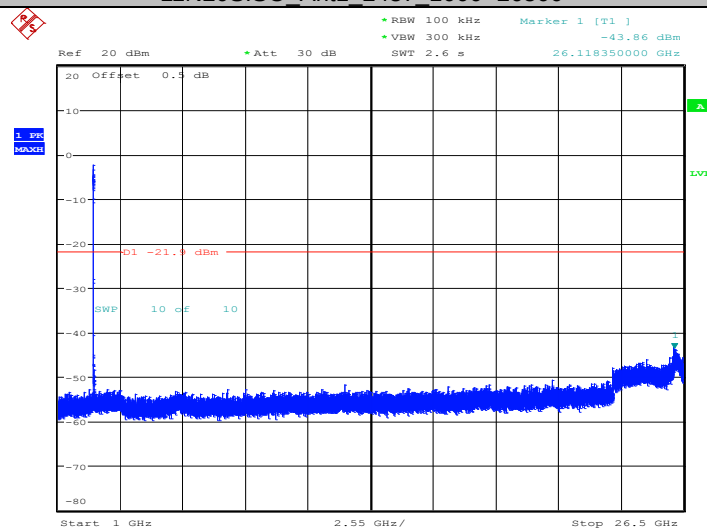
Date: 11.DEC.2020 17:32:53

11N20SISO_Ant1_2437_30~1000



Date: 11.DEC.2020 17:33:04

11N20SISO_Ant1_2437_1000~26500



Date: 11.DEC.2020 17:33:55

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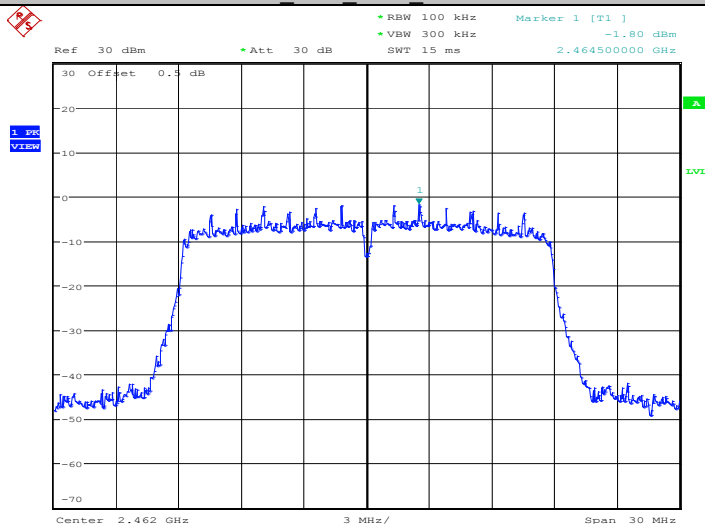
Fax: (86)755-27521011

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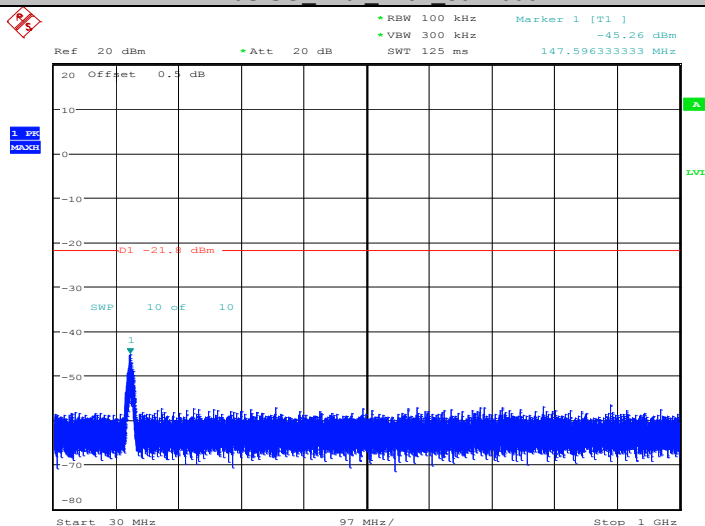


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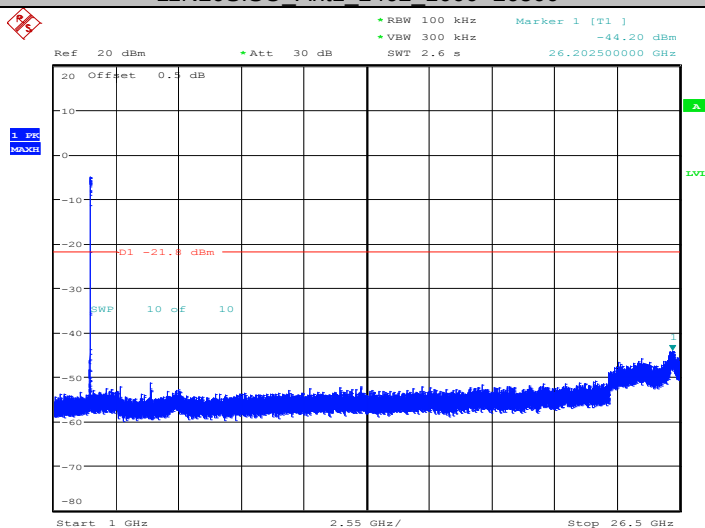
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11N20SISO_Ant1_2462_30~1000



Date: 11.DEC.2020 17:34:42

11N20SISO_Ant1_2462_1000~26500



Date: 11.DEC.2020 17:35:33

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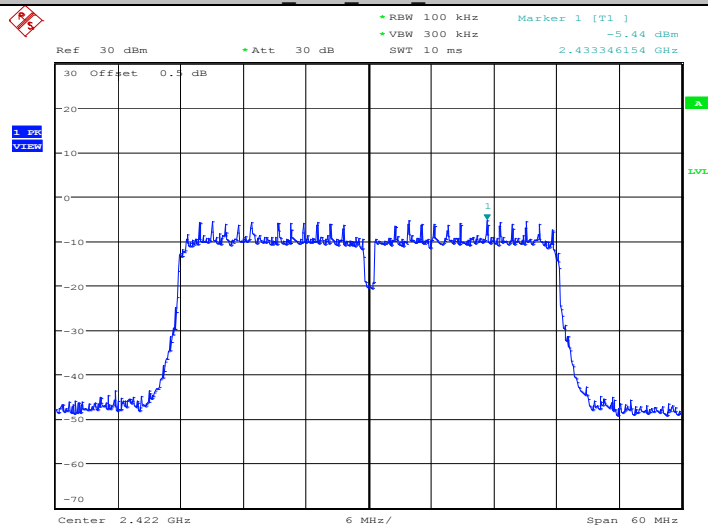
Fax: (86)755-27521011

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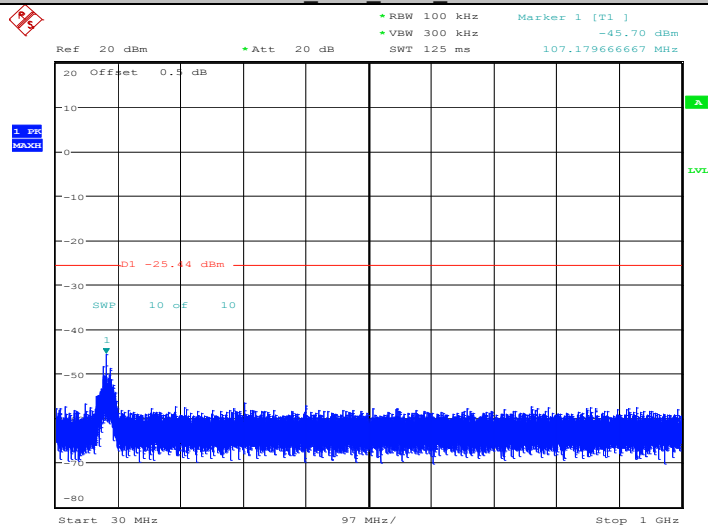


11N40SISO_Ant1_2422_0~Reference



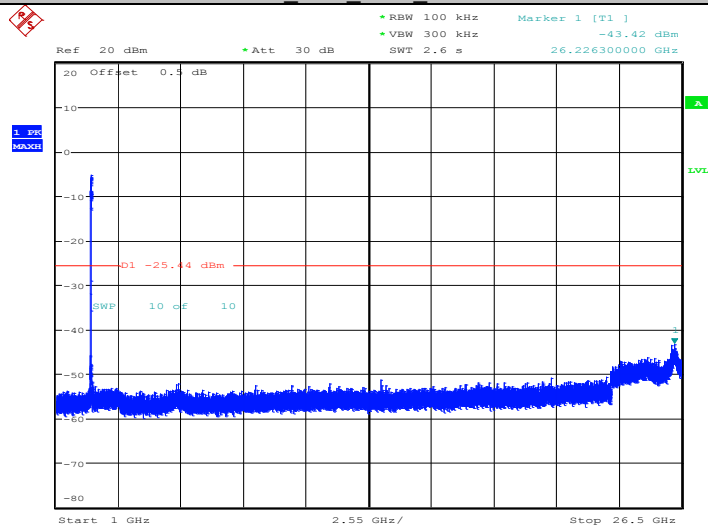
Date: 11.DEC.2020 17:36:22

11N40SISO_Ant1_2422_30~1000



Date: 11.DEC.2020 17:36:33

11N40SISO_Ant1_2422_1000~26500



Date: 11.DEC.2020 17:37:24

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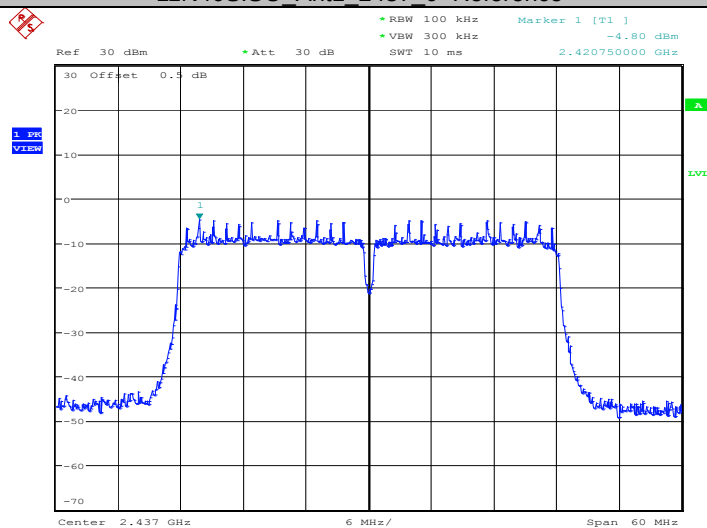
Fax: (86)755-27521011

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

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

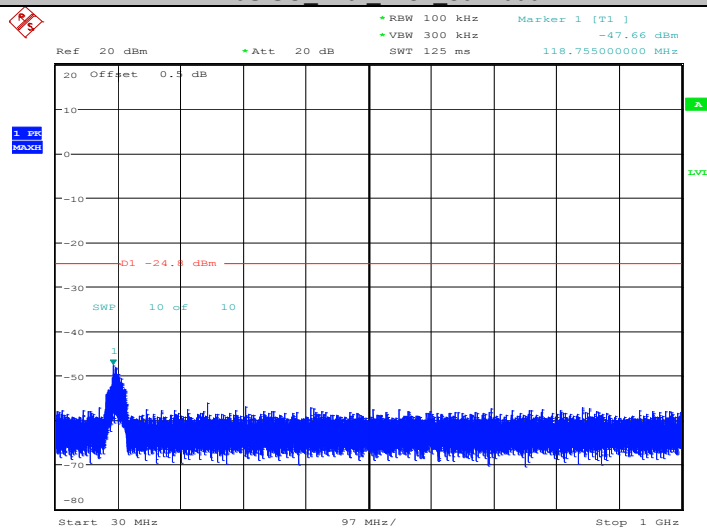


11N40SISO_Ant1_2437_0~Reference



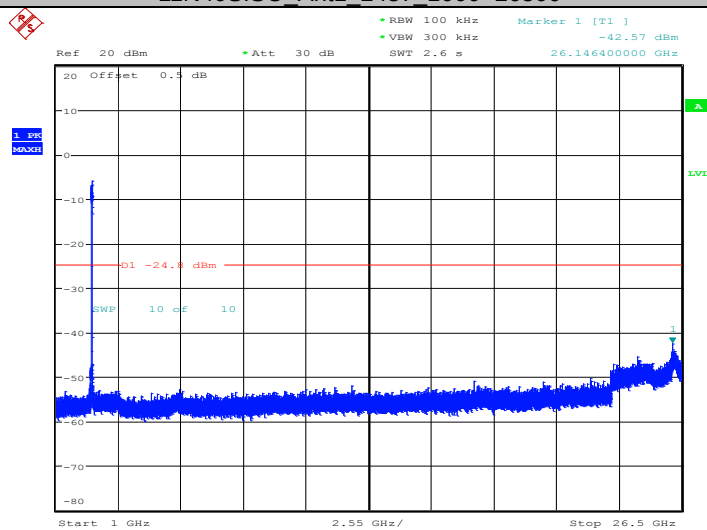
Date: 11.DEC.2020 17:38:03

11N40SISO_Ant1_2437_30~1000



Date: 11.DEC.2020 17:38:14

11N40SISO_Ant1_2437_1000~26500



Date: 11.DEC.2020 17:39:05

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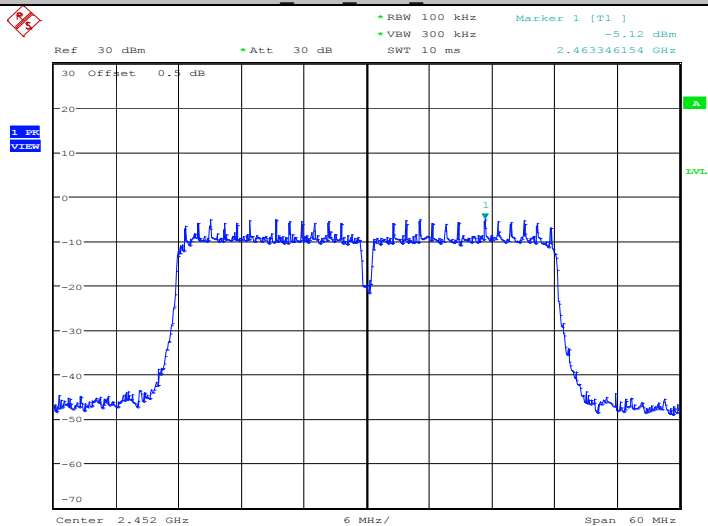
Fax: (86)755-27521011

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

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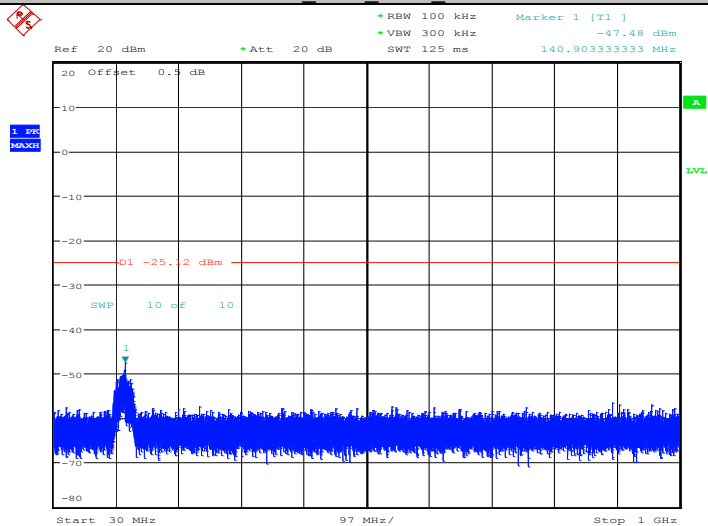


11N40SISO_Ant1_2452_0~Reference



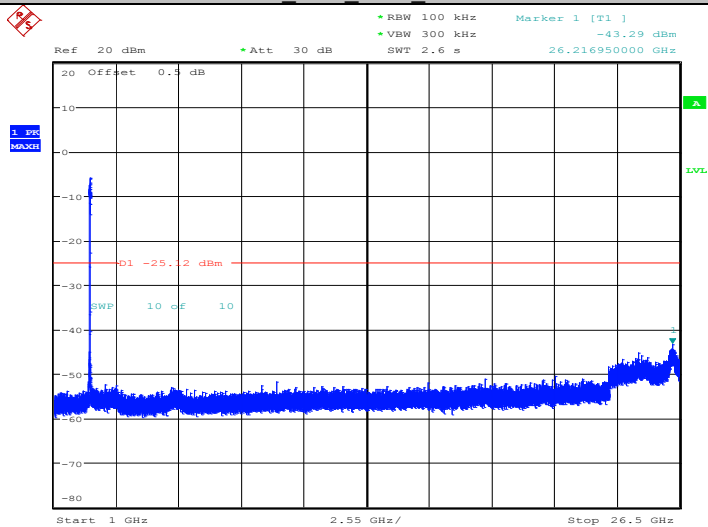
Date: 11.DEC.2020 17:39:48

11N40SISO_Ant1_2452_30~1000



Date: 11.DEC.2020 17:39:59

11N40SISO_Ant1_2452_1000~26500



Date: 11.DEC.2020 17:40:50

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3.3. Band Edge Emissions

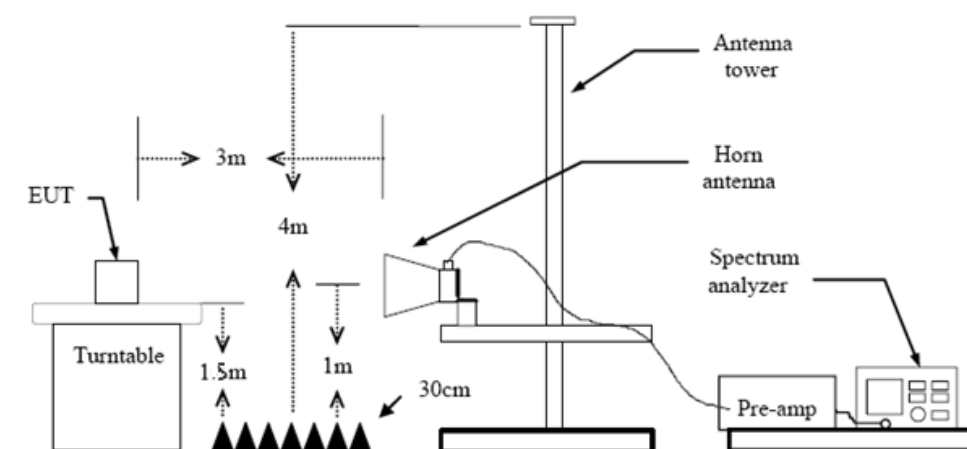
Limit

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

Restricted Frequency Band (MHz)	(dBuV/m)(at 3m)	
	Peak	Average
2310 ~2390	74	54
2483.5 ~2500	74	54

Conducted band edge limit: The highest point of the operating frequency waveform down 20dB

Test Configuration



Test Procedure

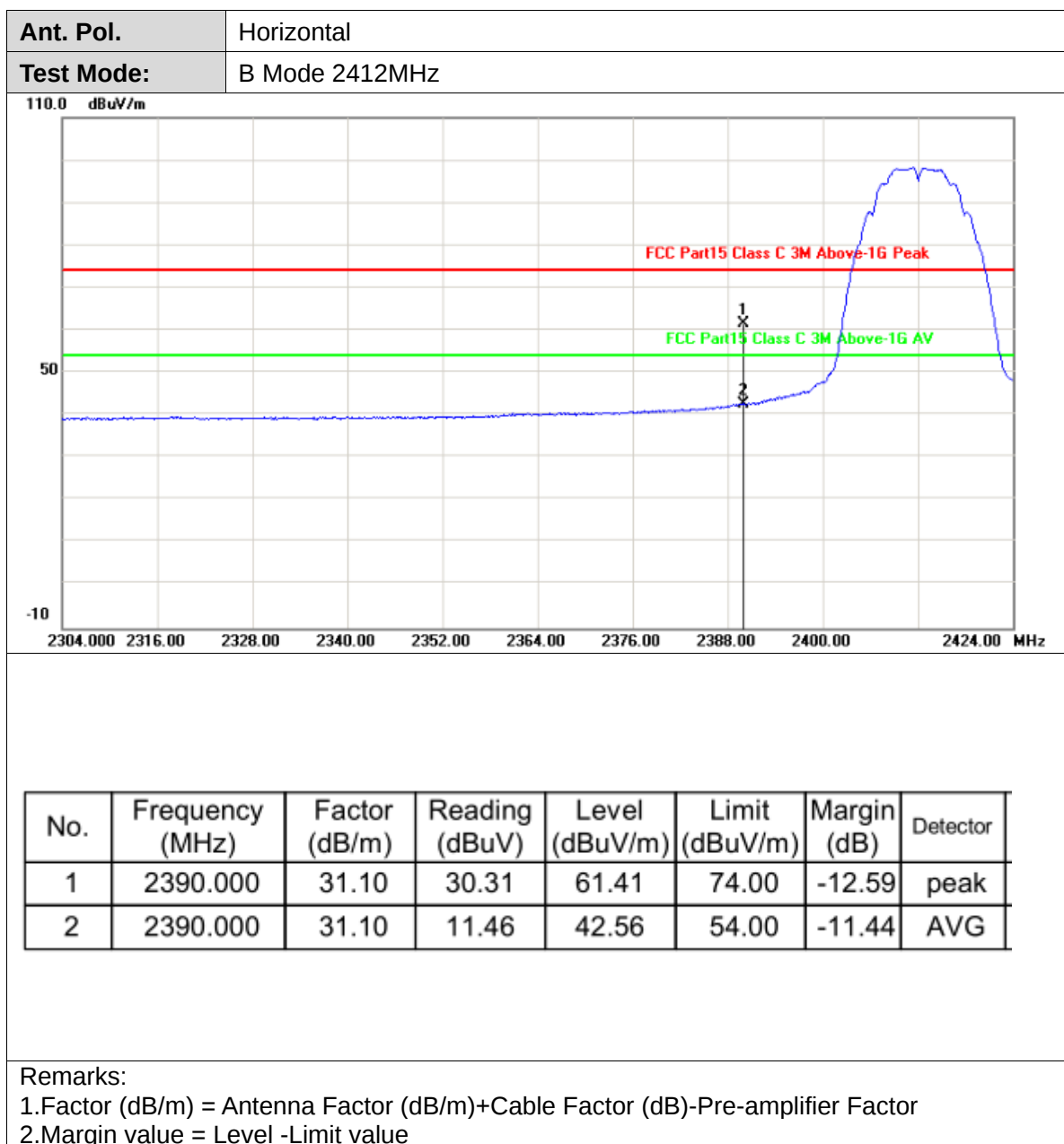
1. The EUT was setup and tested according to ANSI C63.10:2013 requirements.
2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
5. The receiver set as follow:
RBW=1MHz, VBW=3MHz Peak detector for Peak value.
RBW=1MHz, VBW see note 1 with Peak Detector for Average Value.

Note 1: For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 3.7 Duty Cycle.

Test Mode

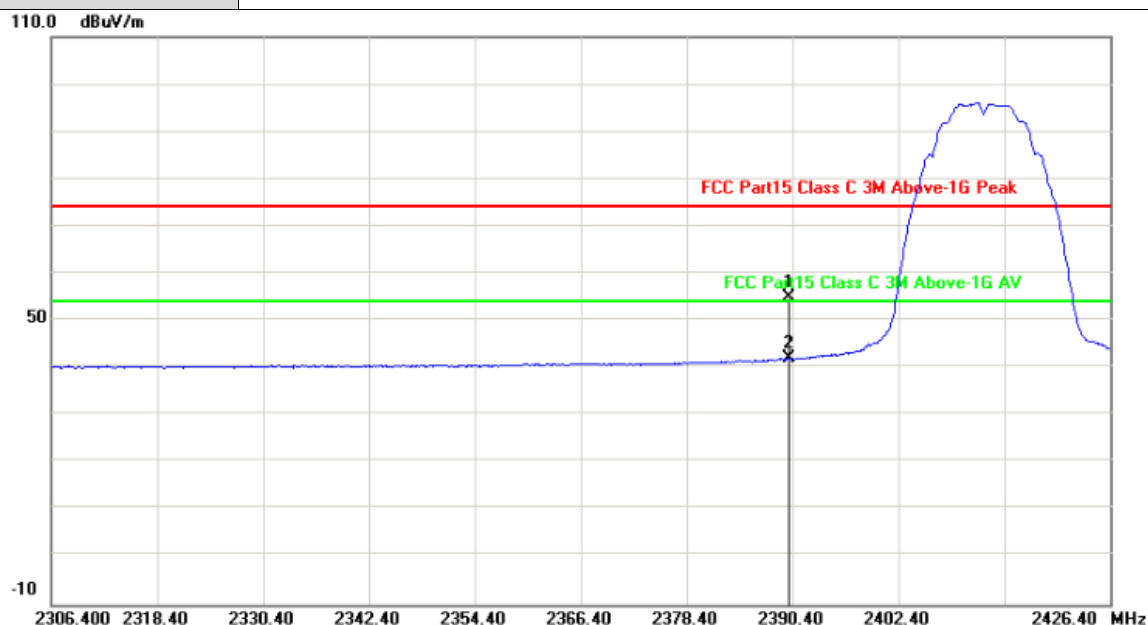
Please refer to the clause 2.3.

Test Results





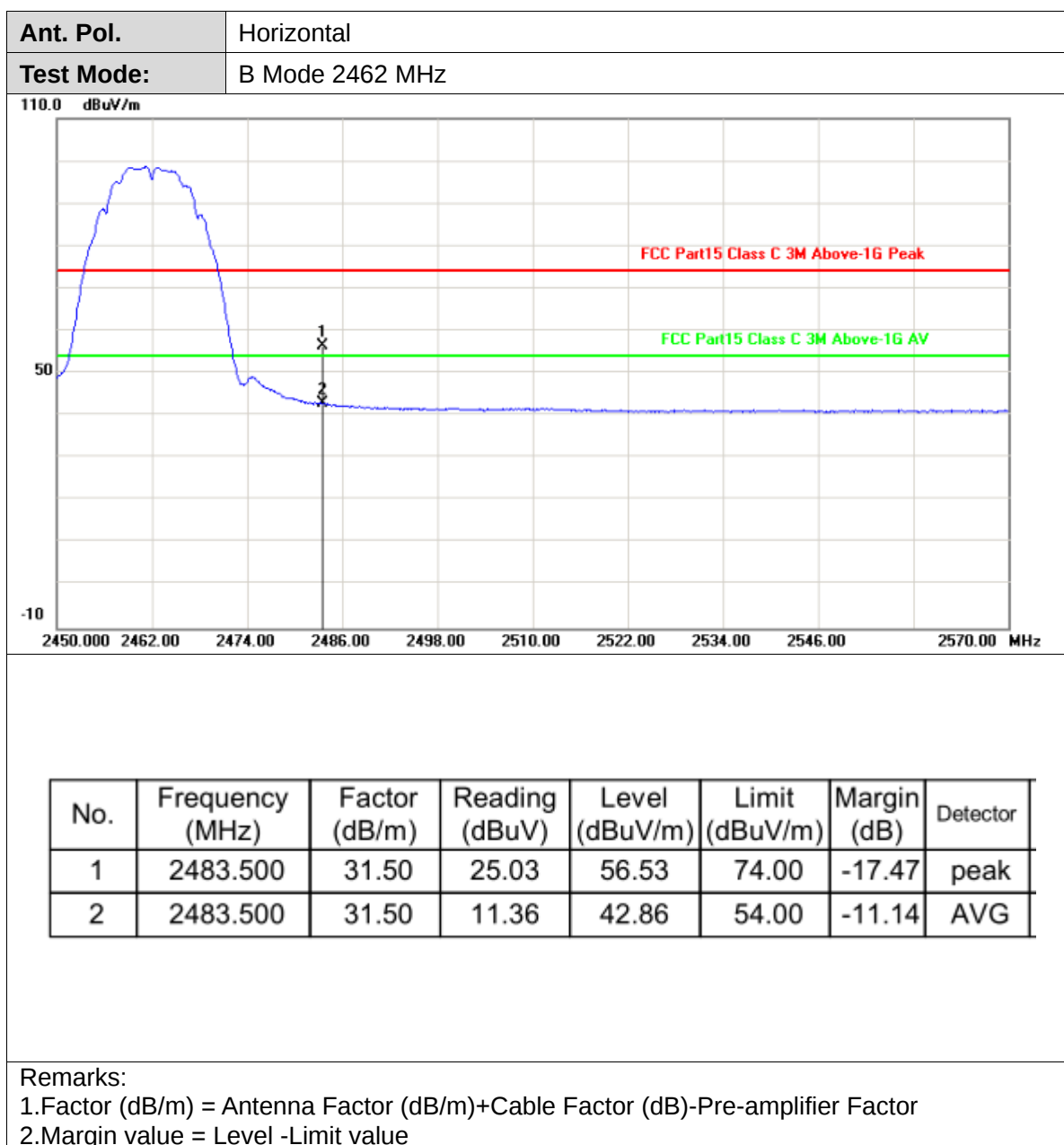
Ant. Pol.	Vertical
Test Mode:	B Mode 2412MHz

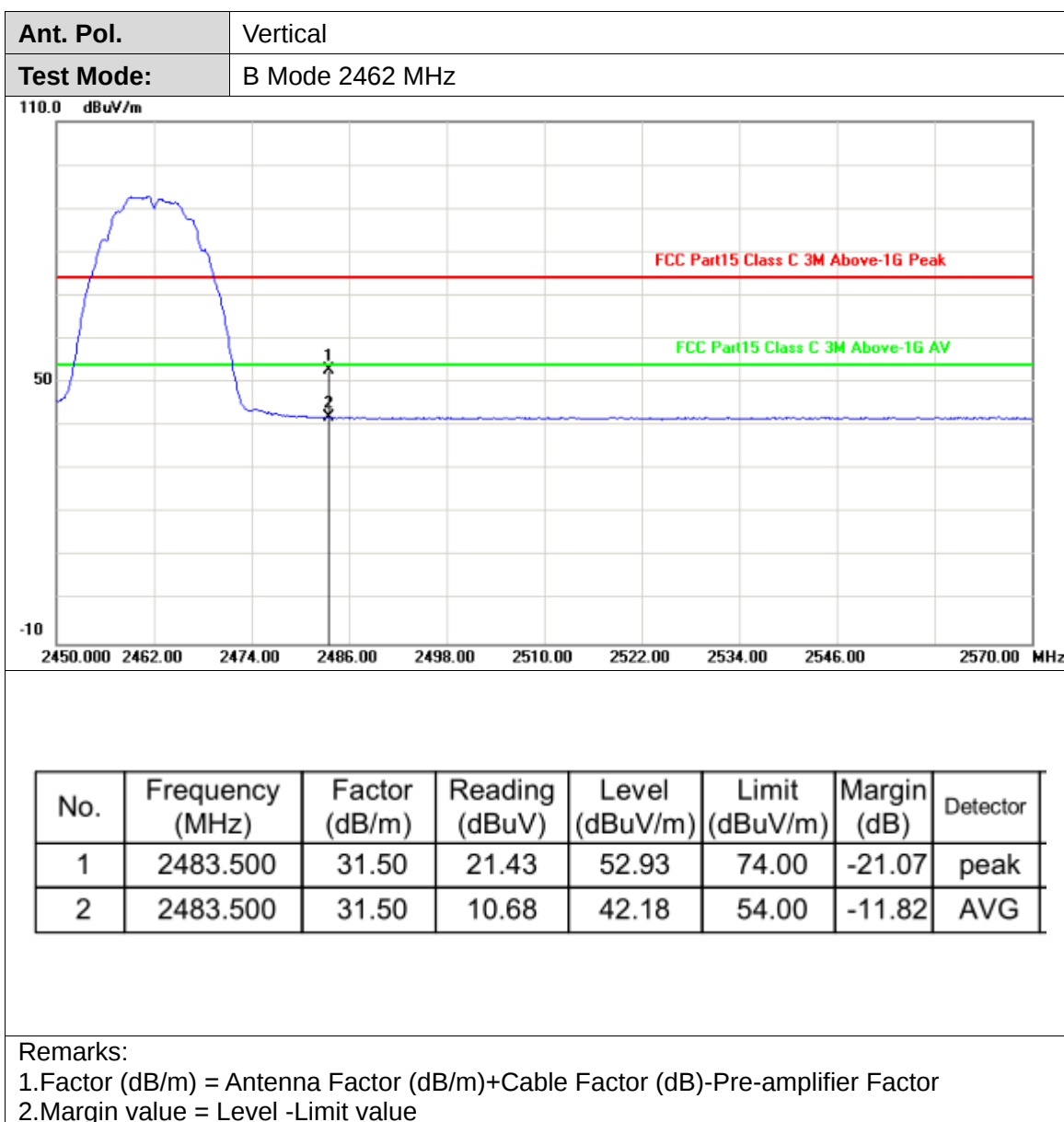


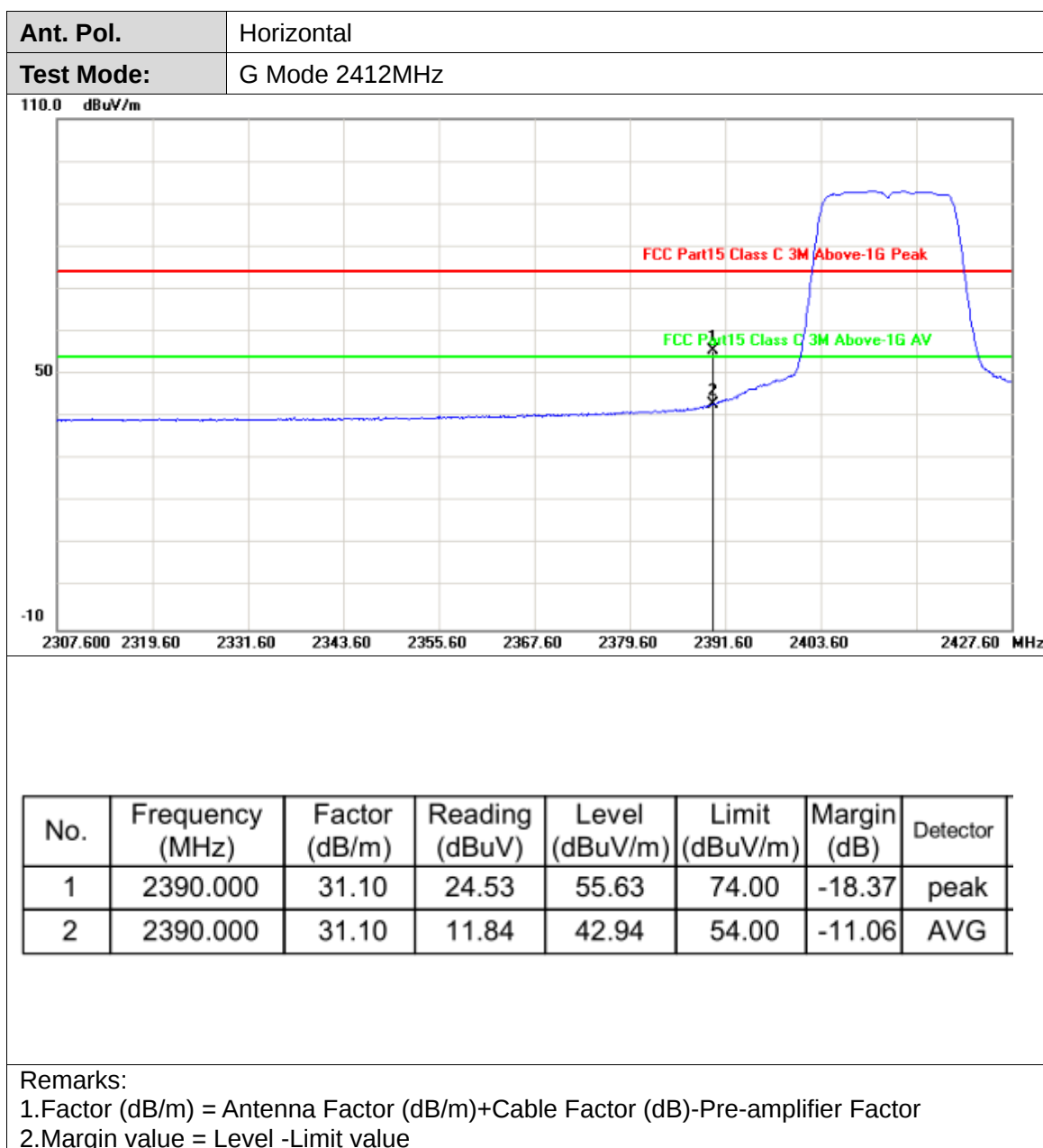
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	31.10	23.85	54.95	74.00	-19.05	peak
2	2390.000	31.10	10.85	41.95	54.00	-12.05	AVG

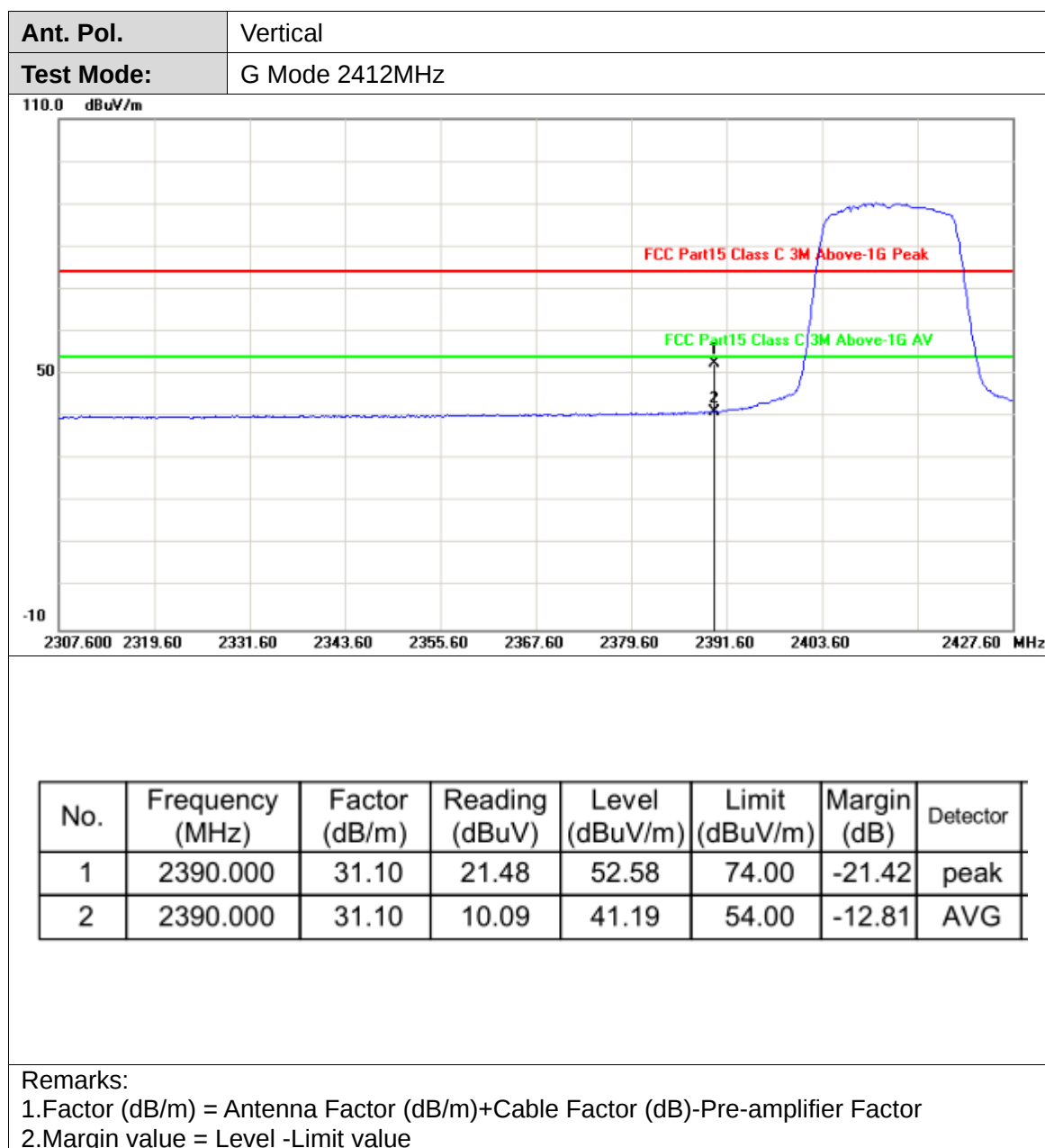
Remarks:

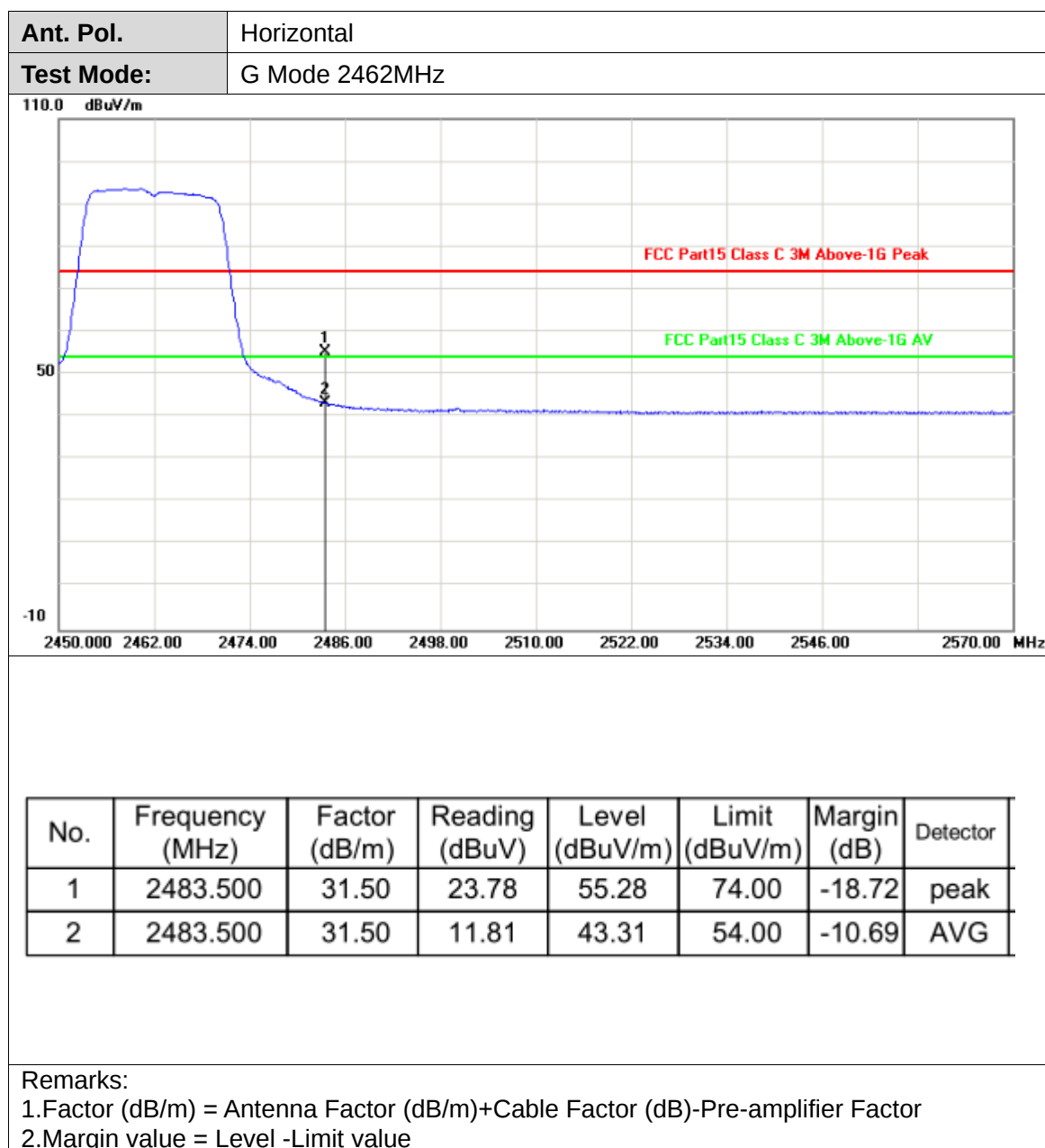
- 1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- 2.Margin value = Level -Limit value





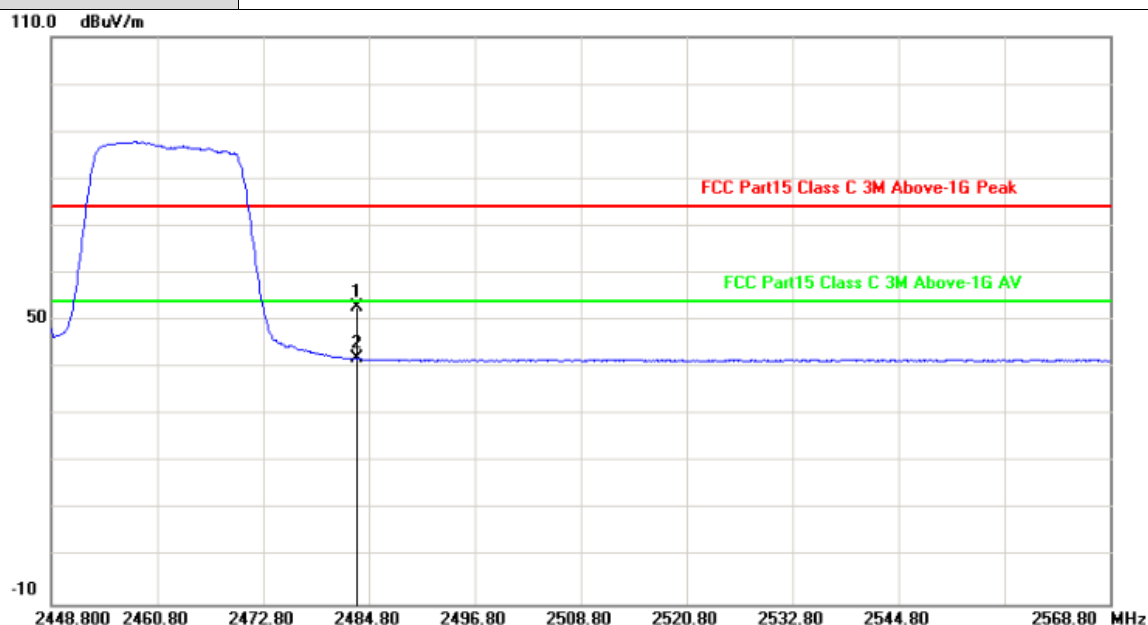








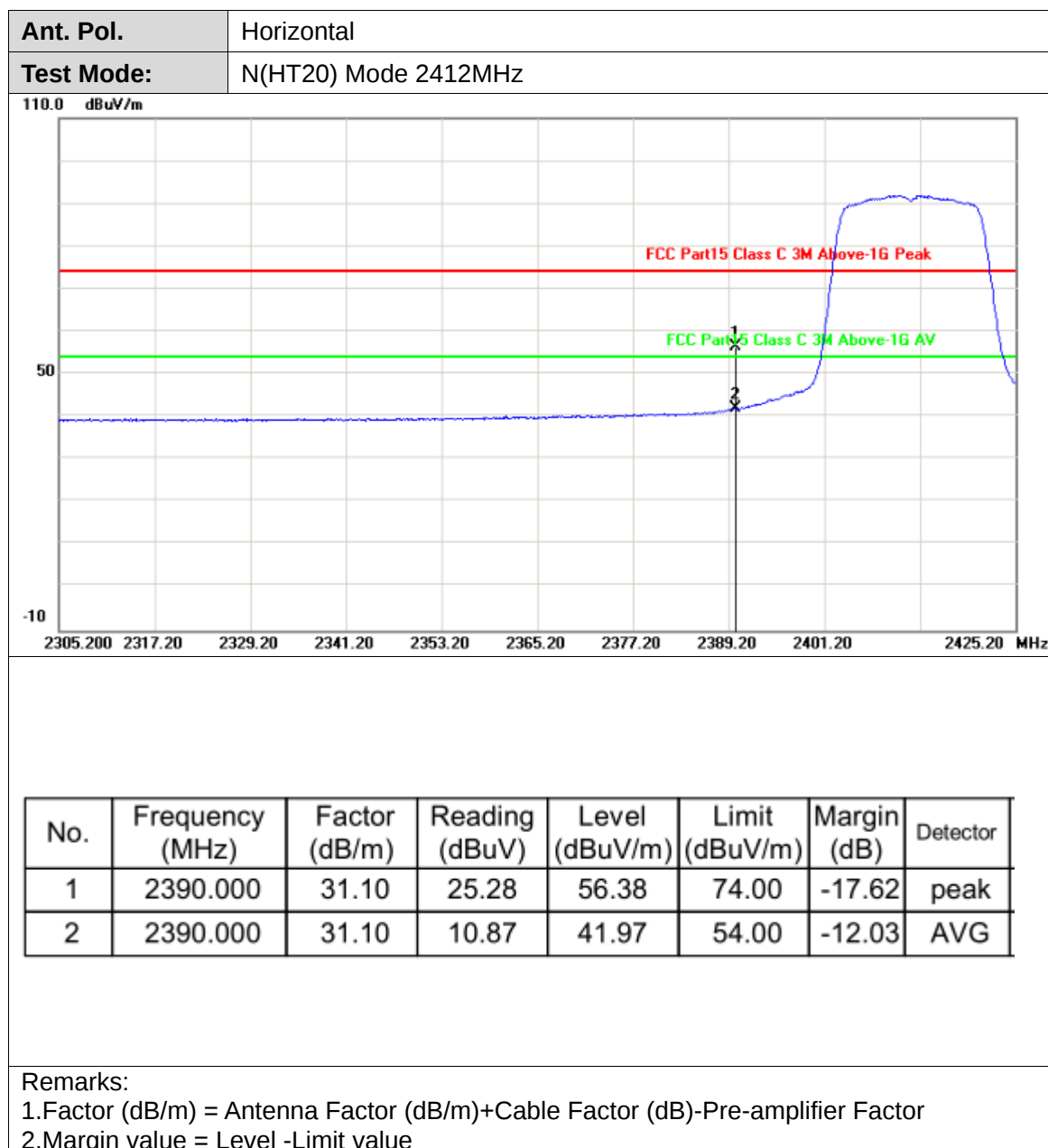
Ant. Pol.	Vertical
Test Mode:	G Mode 2462MHz



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	31.50	21.30	52.80	74.00	-21.20	peak
2	2483.500	31.50	10.51	42.01	54.00	-11.99	AVG

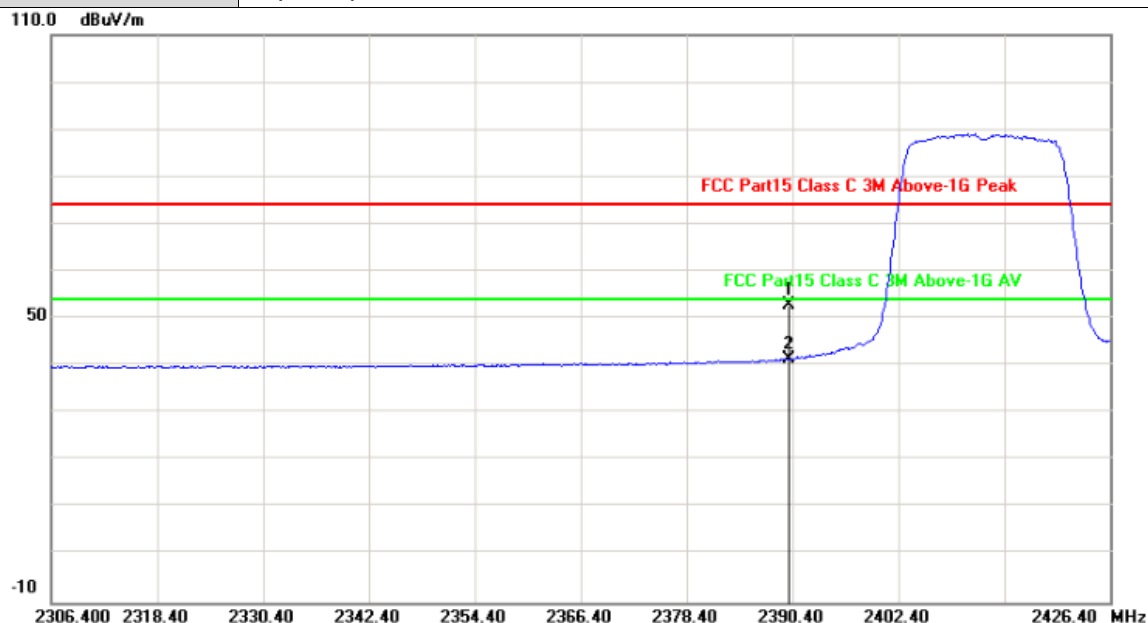
Remarks:

- 1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- 2.Margin value = Level -Limit value





Ant. Pol.	Vertical
Test Mode:	N(HT20) Mode 2412MHz



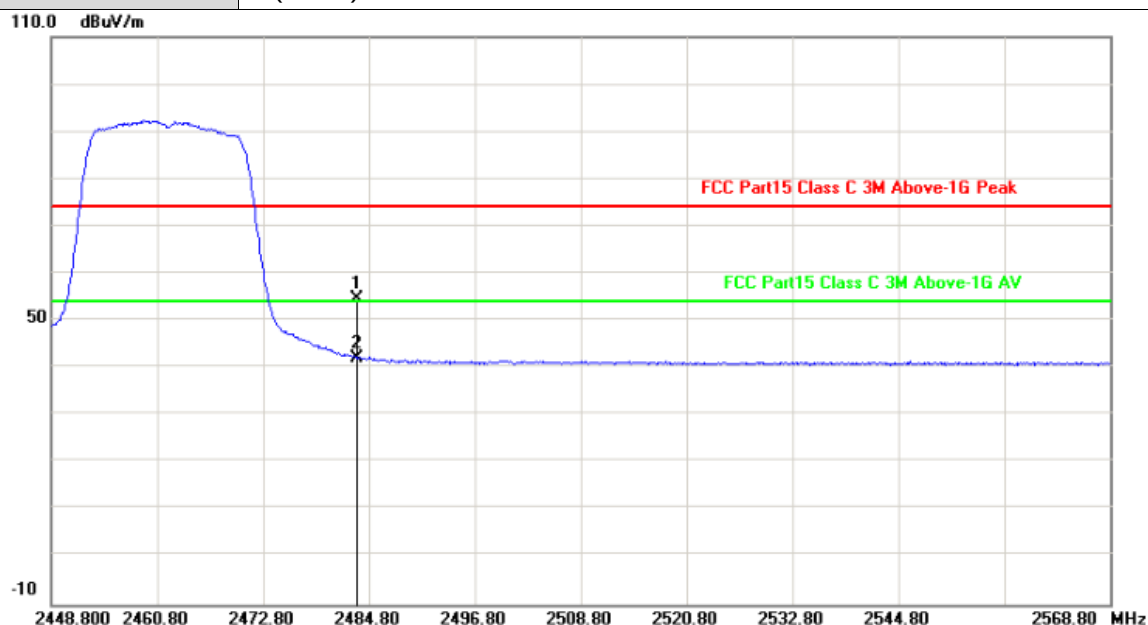
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	31.10	21.67	52.77	74.00	-21.23	peak
2	2390.000	31.10	10.33	41.43	54.00	-12.57	AVG

Remarks:

- 1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- 2.Margin value = Level -Limit value



Ant. Pol.	Horizontal
Test Mode:	N(HT20) Mode 2462MHz



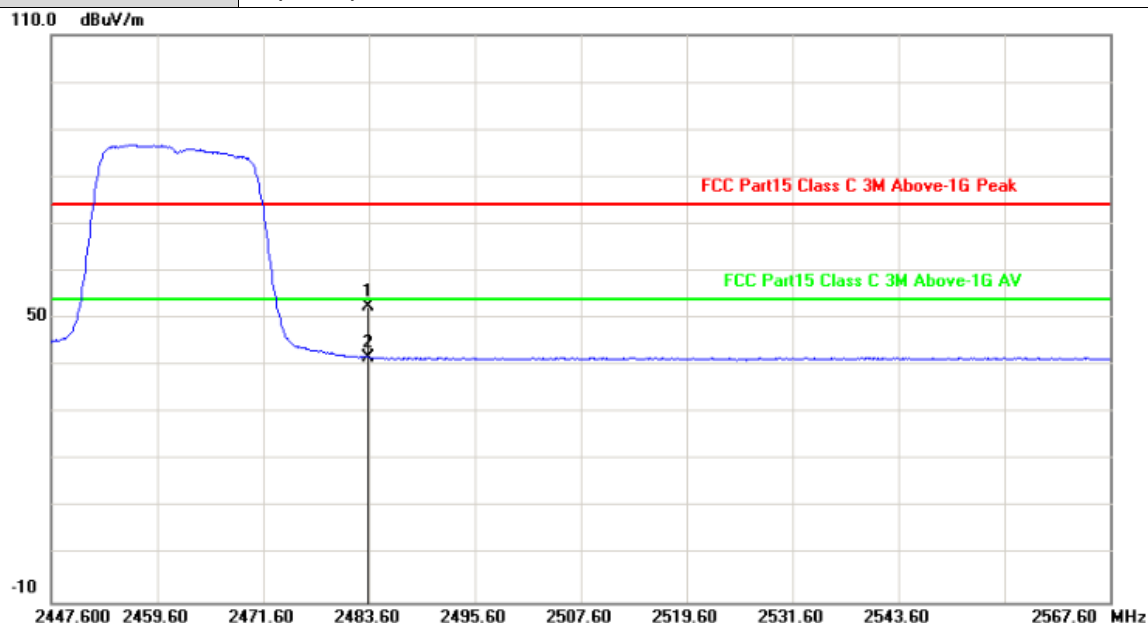
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	31.50	23.09	54.59	74.00	-19.41	peak
2	2483.500	31.50	10.66	42.16	54.00	-11.84	AVG

Remarks:

- 1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- 2.Margin value = Level -Limit value



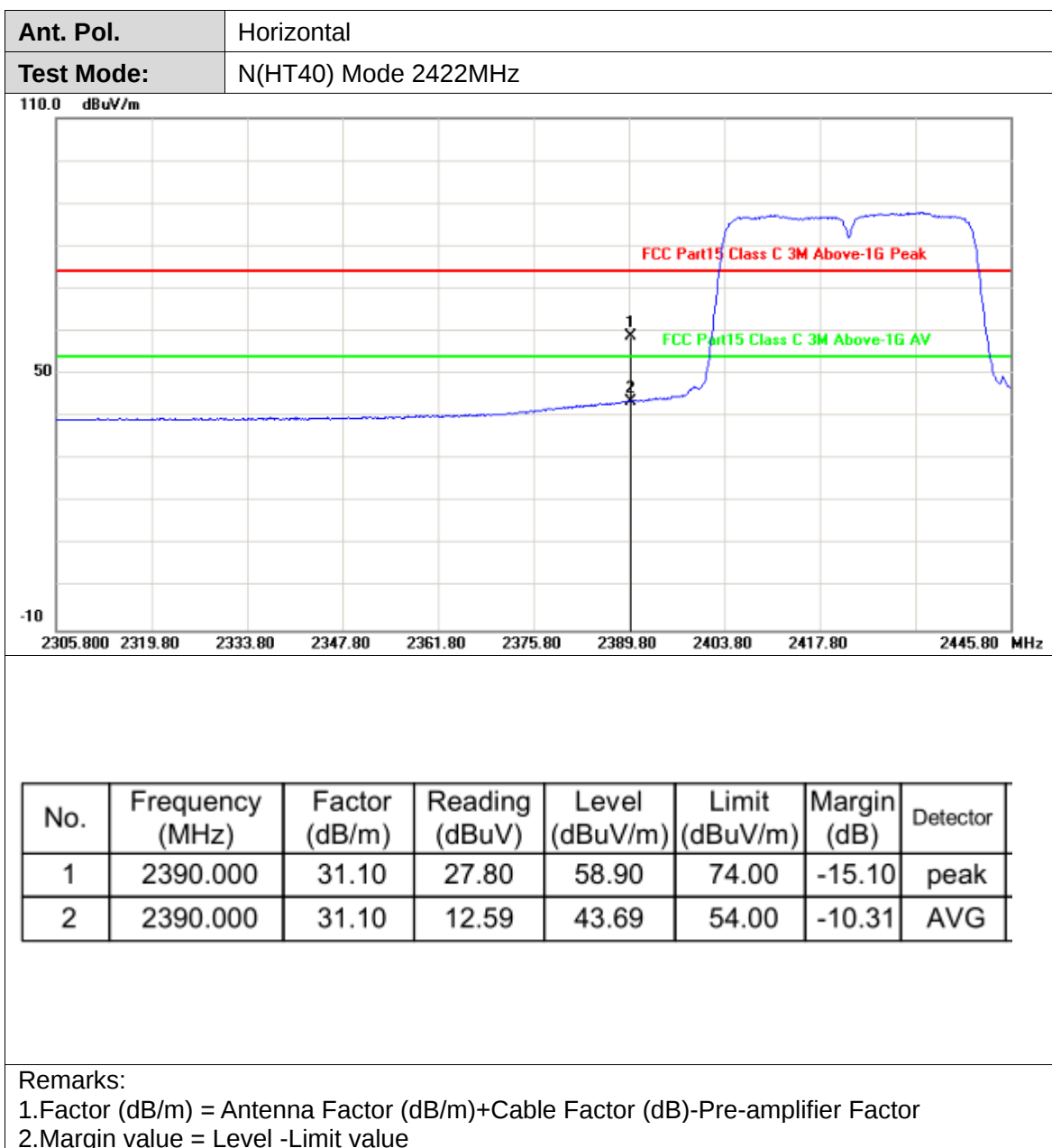
Ant. Pol.	Vertical
Test Mode:	N(HT20) Mode 2462MHz

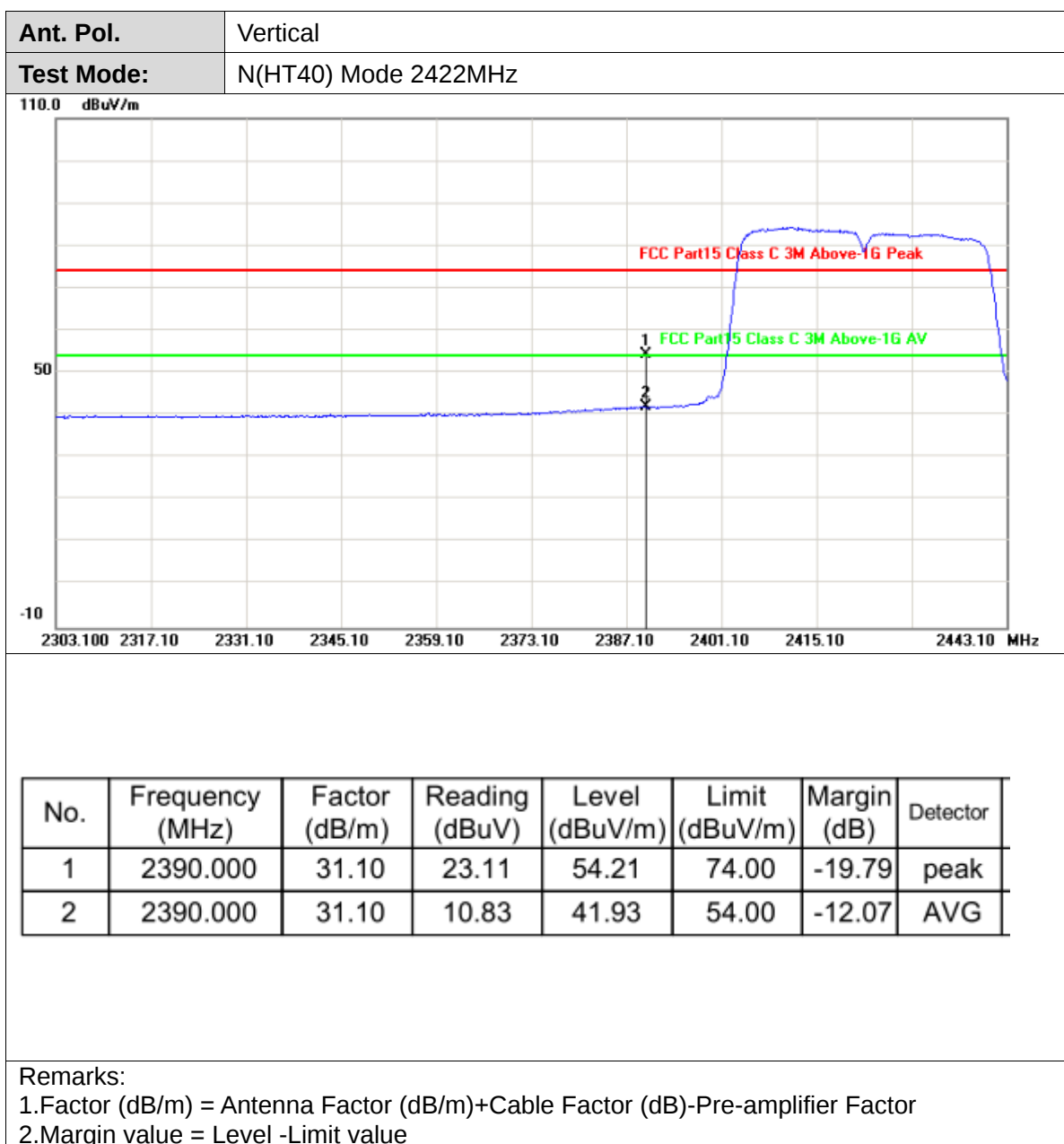


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	31.50	21.08	52.58	74.00	-21.42	peak
2	2483.500	31.50	10.37	41.87	54.00	-12.13	AVG

Remarks:

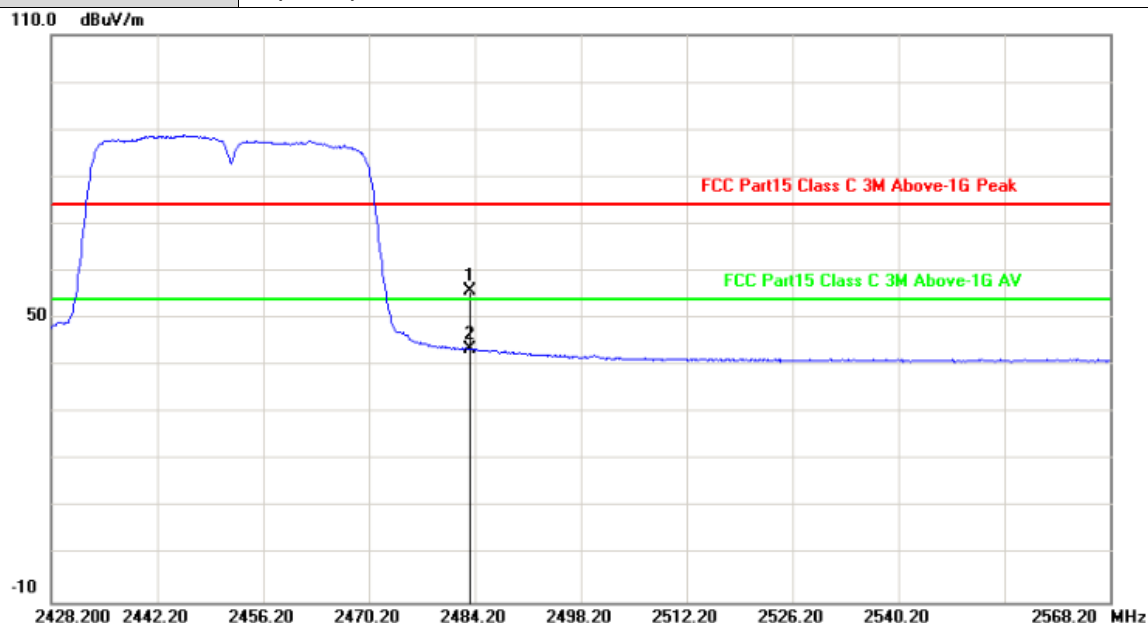
- Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- Margin value = Level -Limit value







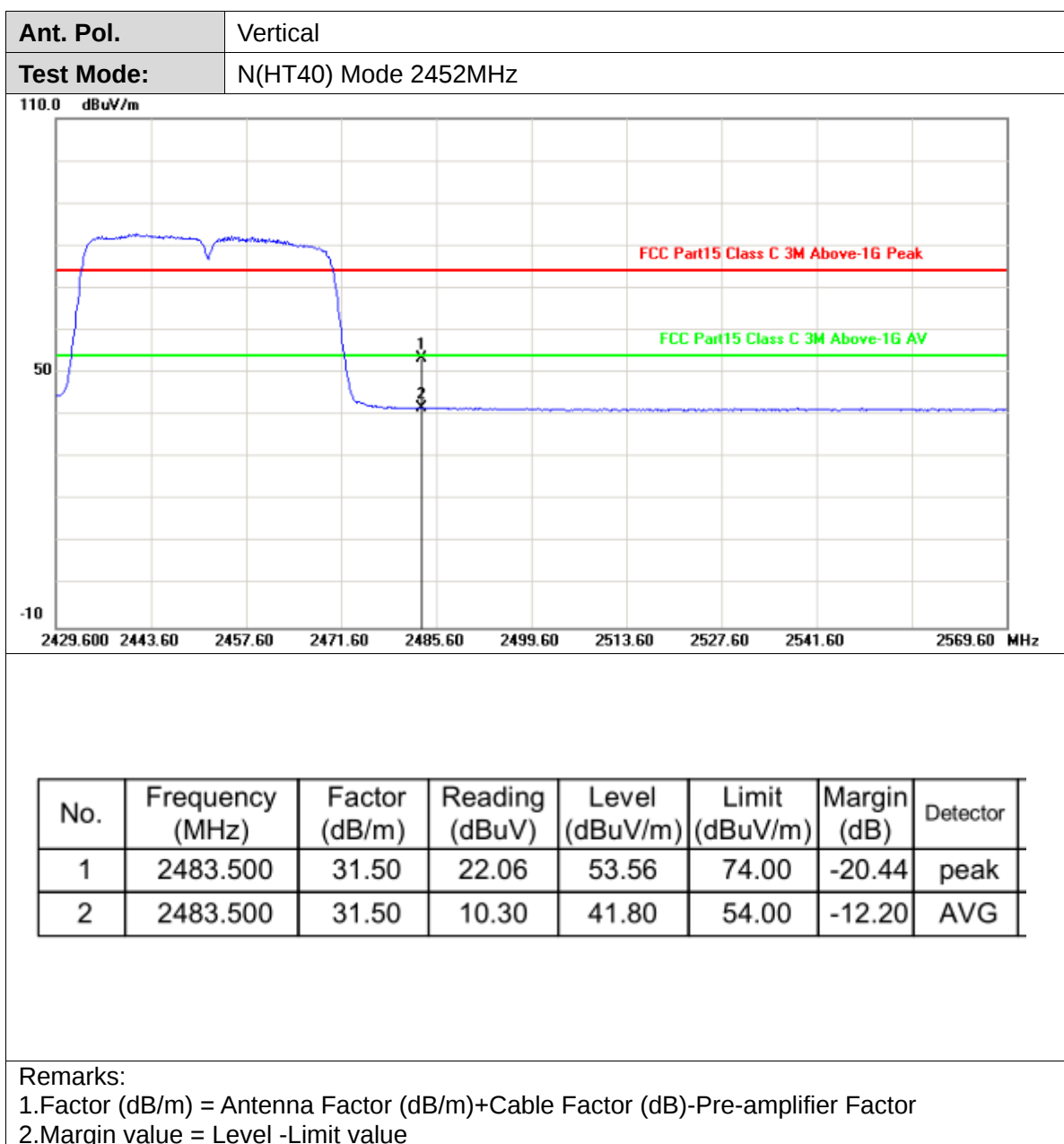
Ant. Pol.	Horizontal
Test Mode:	N(HT40) Mode 2452MHz



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483.500	31.50	24.43	55.93	74.00	-18.07	peak
2	2483.500	31.50	11.99	43.49	54.00	-10.51	AVG

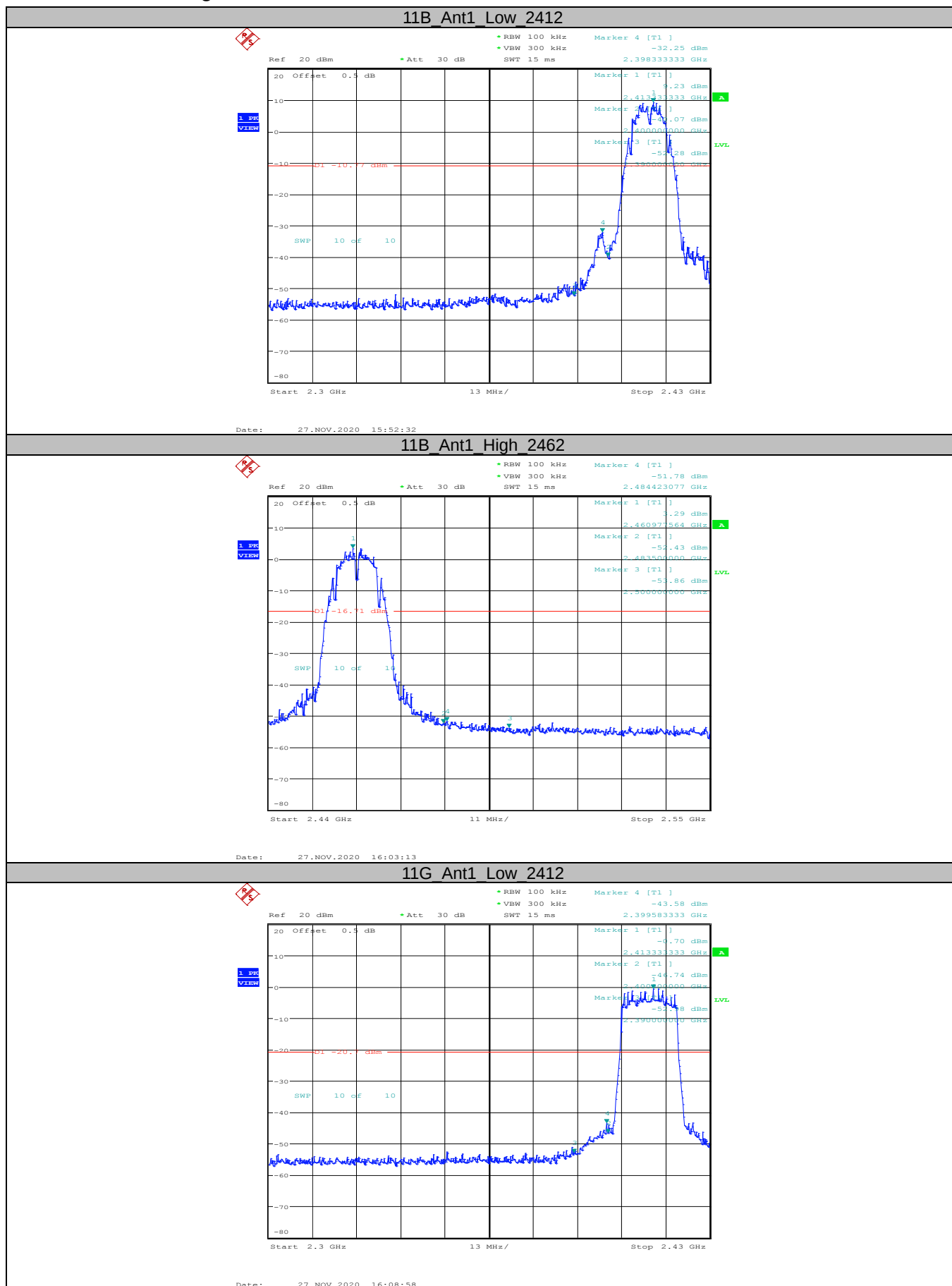
Remarks:

- 1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
- 2.Margin value = Level -Limit value





Conducted band edge data:



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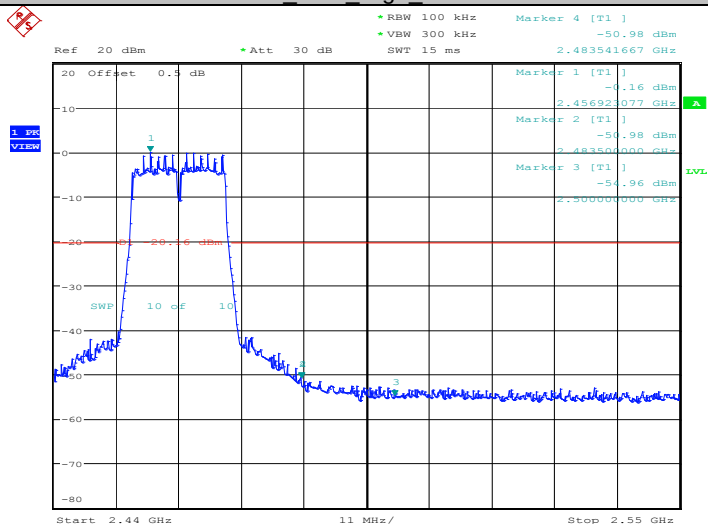
Fax: (86)755-27521011

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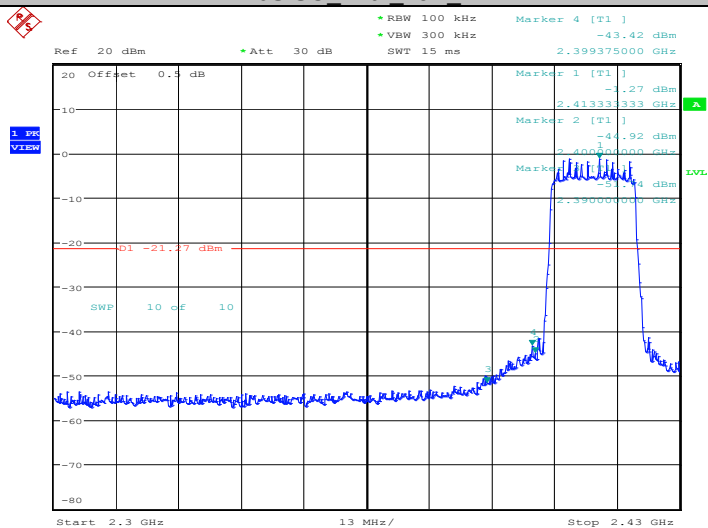
中国国家认证认可监督管理委员会
Certification and Accreditation Administration of the People's Republic of ChinaFor anti-fake verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China : yz.cnca.cn



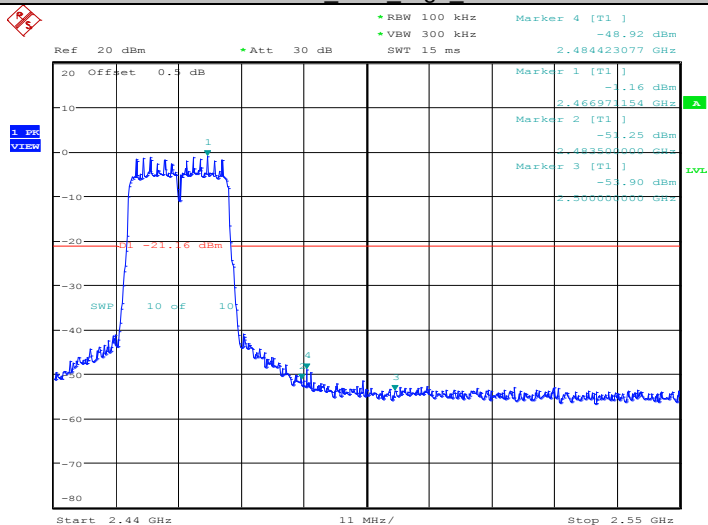
11G Ant1 High 2462



11N20SISO Ant1 Low 2412

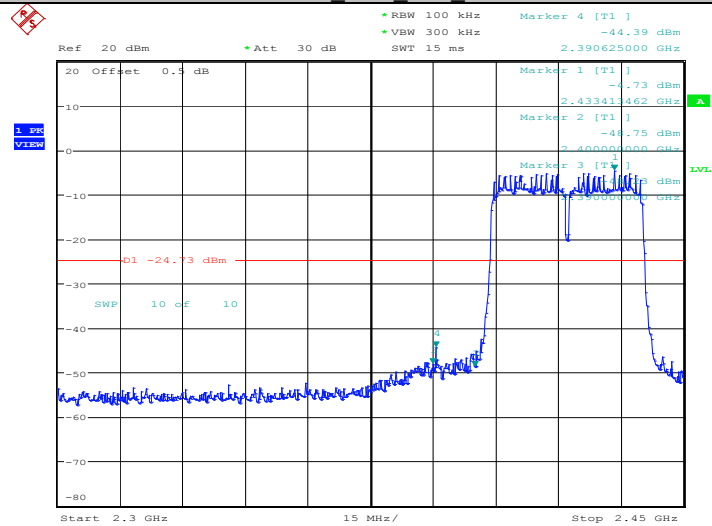


11N20SISO Ant1 High 2462



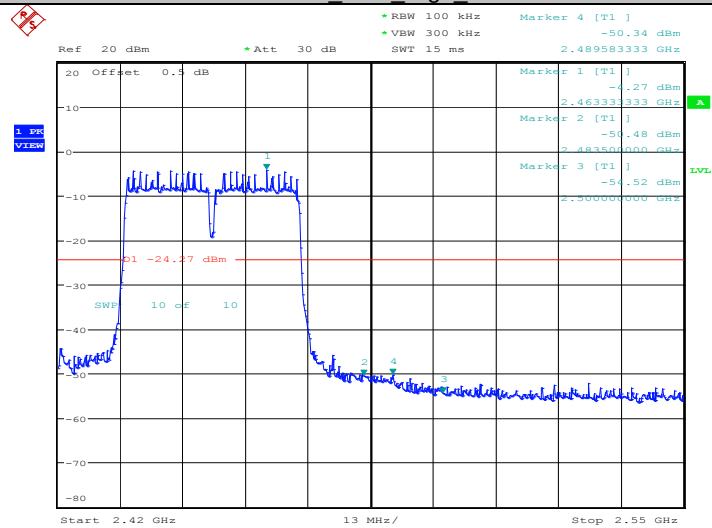


11N40SISO_Ant1_Low_2422



Date: 27.NOV.2020 16:42:52

11N40SISO_Ant1_High_2452



Date: 27.NOV.2020 16:56:03

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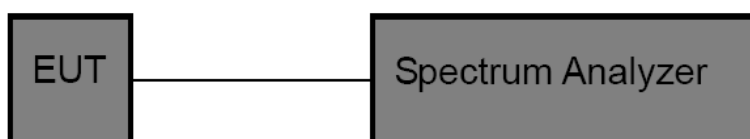
3.4. Bandwidth

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2)

Test Item	Limit	Frequency Range(MHz)
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 2.3.

Test Results

Please see the Appendix A1, A2.



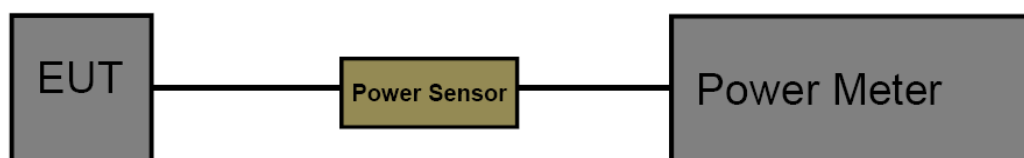
3.5. Peak Output Power

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 2.3

Test Result



TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	21.46	<=30	PASS
		2437	15.64	<=30	PASS
		2462	15.63	<=30	PASS
11G	Ant1	2412	17.28	<=30	PASS
		2437	17.60	<=30	PASS
		2462	18.17	<=30	PASS
11N20SISO	Ant1	2412	16.97	<=30	PASS
		2437	17.20	<=30	PASS
		2462	17.23	<=30	PASS
11N40SISO	Ant1	2422	16.39	<=30	PASS
		2437	16.72	<=30	PASS
		2452	16.64	<=30	PASS

Note: Test results increased RF cable loss by 0.5dB.



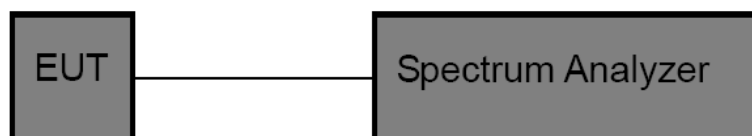
3.6. Power Spectral Density

Limit

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

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: 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 2.3

Test Result

Please see the Appendix B.

Note : Duty Cycle Correction Factor = $10 \cdot \log(1/\text{duty cycle})$
The Duty Cycle Correction Factor is compensated in the graph.



3.7. 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 less than 6dBi, please refer to the EUT internal photographs antenna photo.



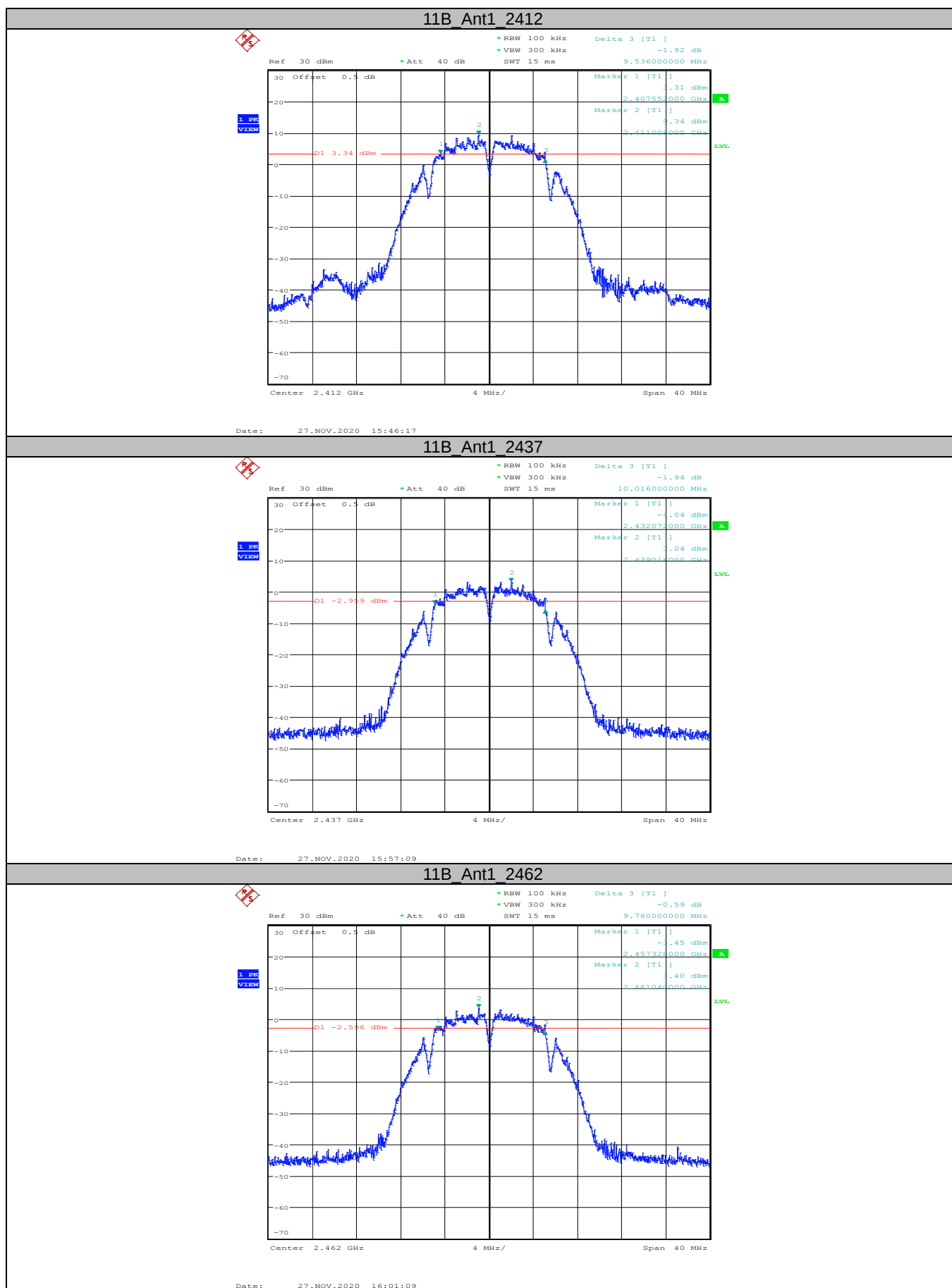
Appendix A1: DTS Bandwidth

Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	9.536	2407.552	2417.088	≥ 0.5	PASS
		2437	10.016	2432.072	2442.088	≥ 0.5	PASS
		2462	9.760	2457.328	2467.088	≥ 0.5	PASS
11G	Ant1	2412	16.352	2403.840	2420.192	≥ 0.5	PASS
		2437	16.416	2428.808	2445.224	≥ 0.5	PASS
		2462	16.416	2453.808	2470.224	≥ 0.5	PASS
11N20SISO	Ant1	2412	16.992	2403.584	2420.576	≥ 0.5	PASS
		2437	17.056	2428.488	2445.544	≥ 0.5	PASS
		2462	17.120	2453.456	2470.576	≥ 0.5	PASS
11N40SISO	Ant1	2422	35.456	2404.208	2439.664	≥ 0.5	PASS
		2437	35.264	2419.400	2454.664	≥ 0.5	PASS
		2452	35.520	2434.144	2469.664	≥ 0.5	PASS



Test Graphs



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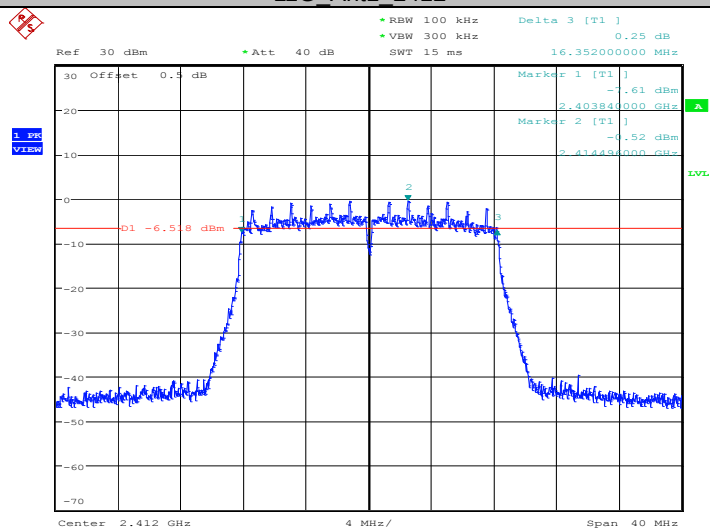
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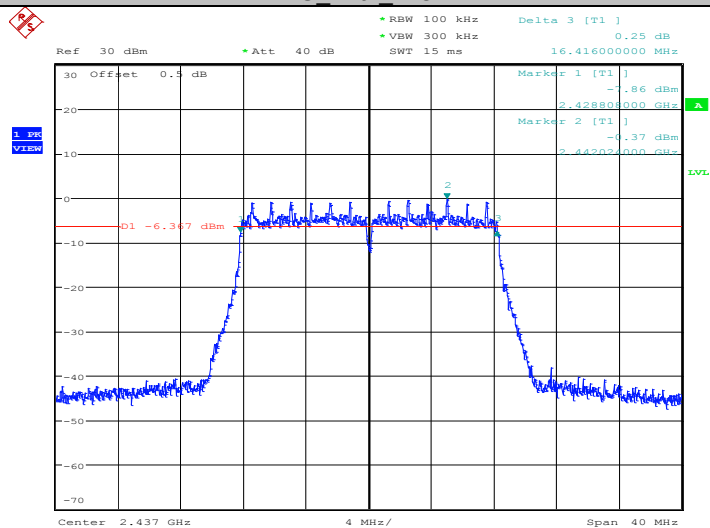
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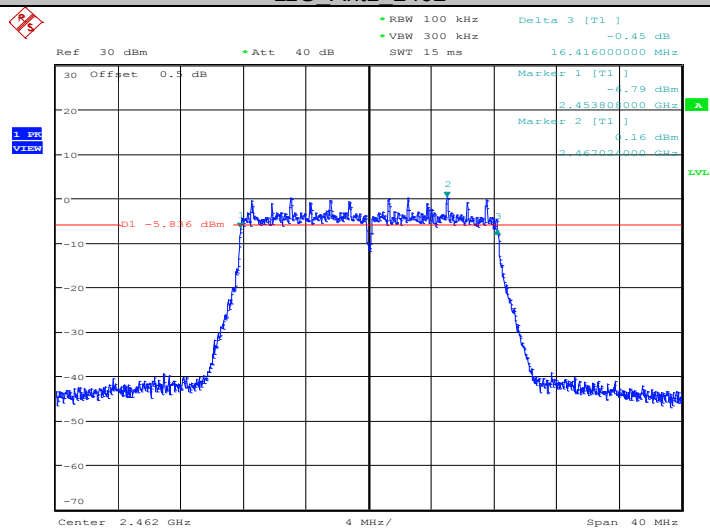
11G_Ant1_2412



11G_Ant1_2437

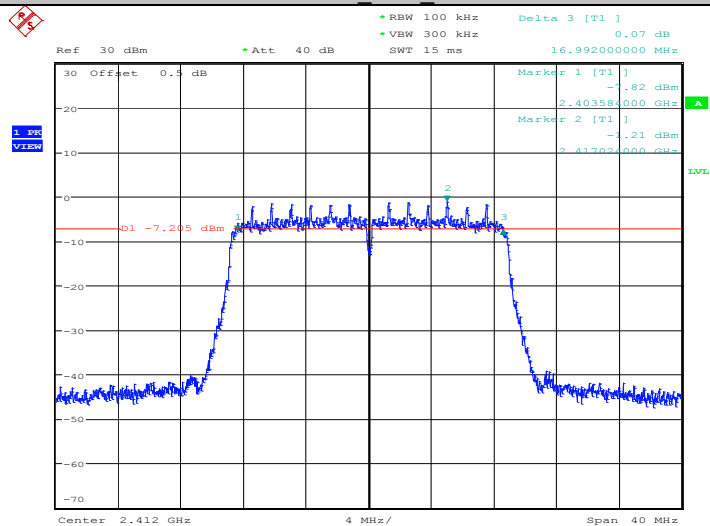


11G_Ant1_2462



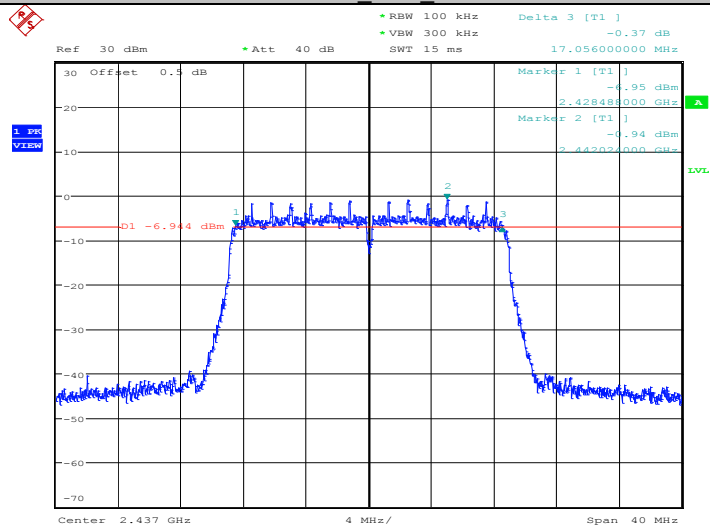


11N20SISO_Ant1_2412



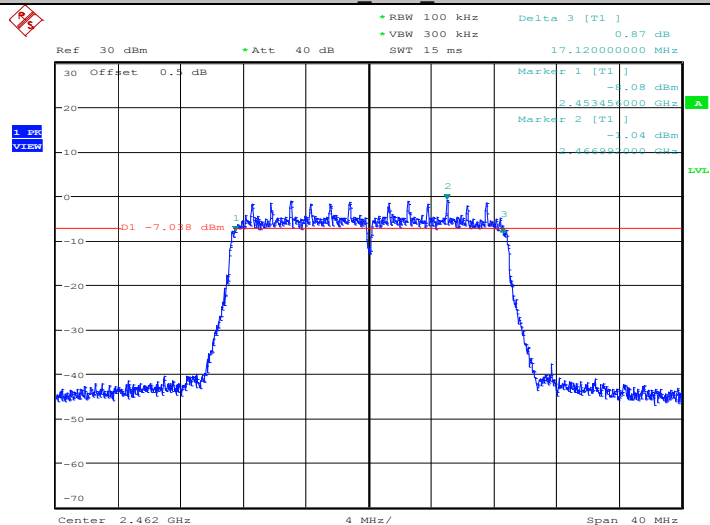
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Date: 27.NOV.2020 16:28:56

11N20SISO_Ant1_2462



Date: 27.NOV.2020 16:33:18

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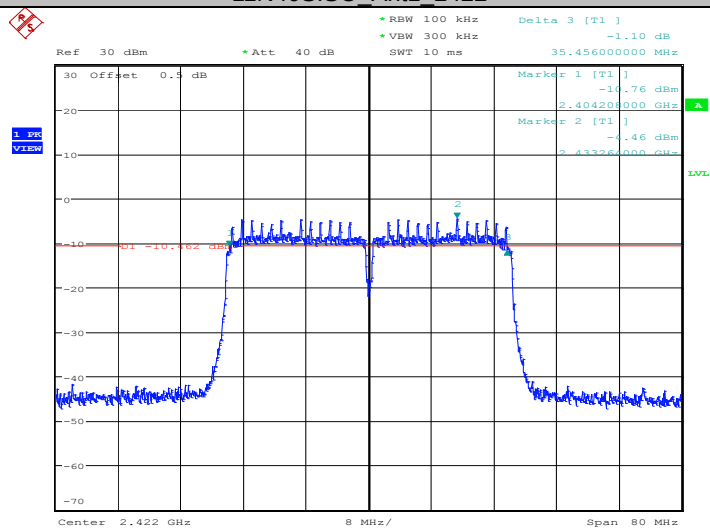
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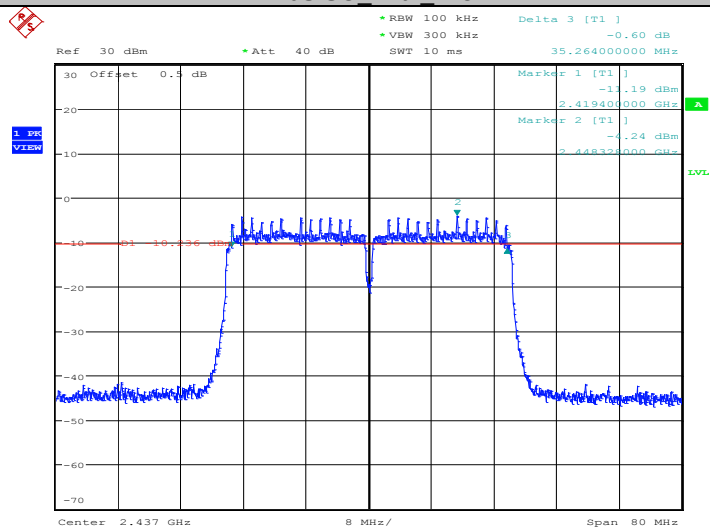
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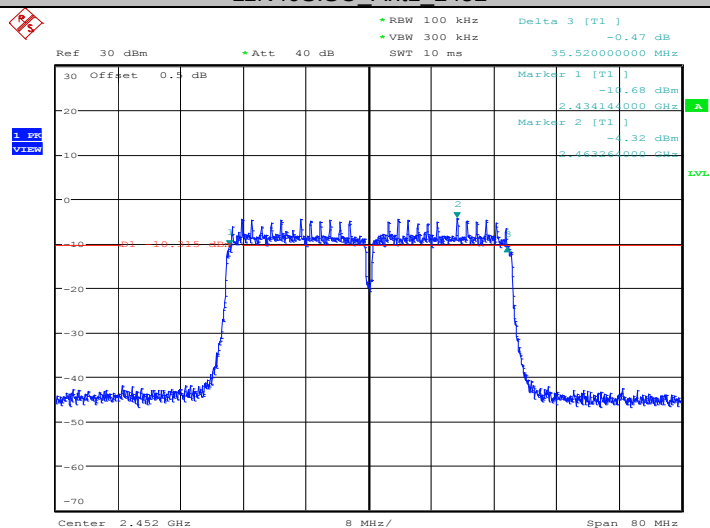
11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



11N40SISO_Ant1_2452



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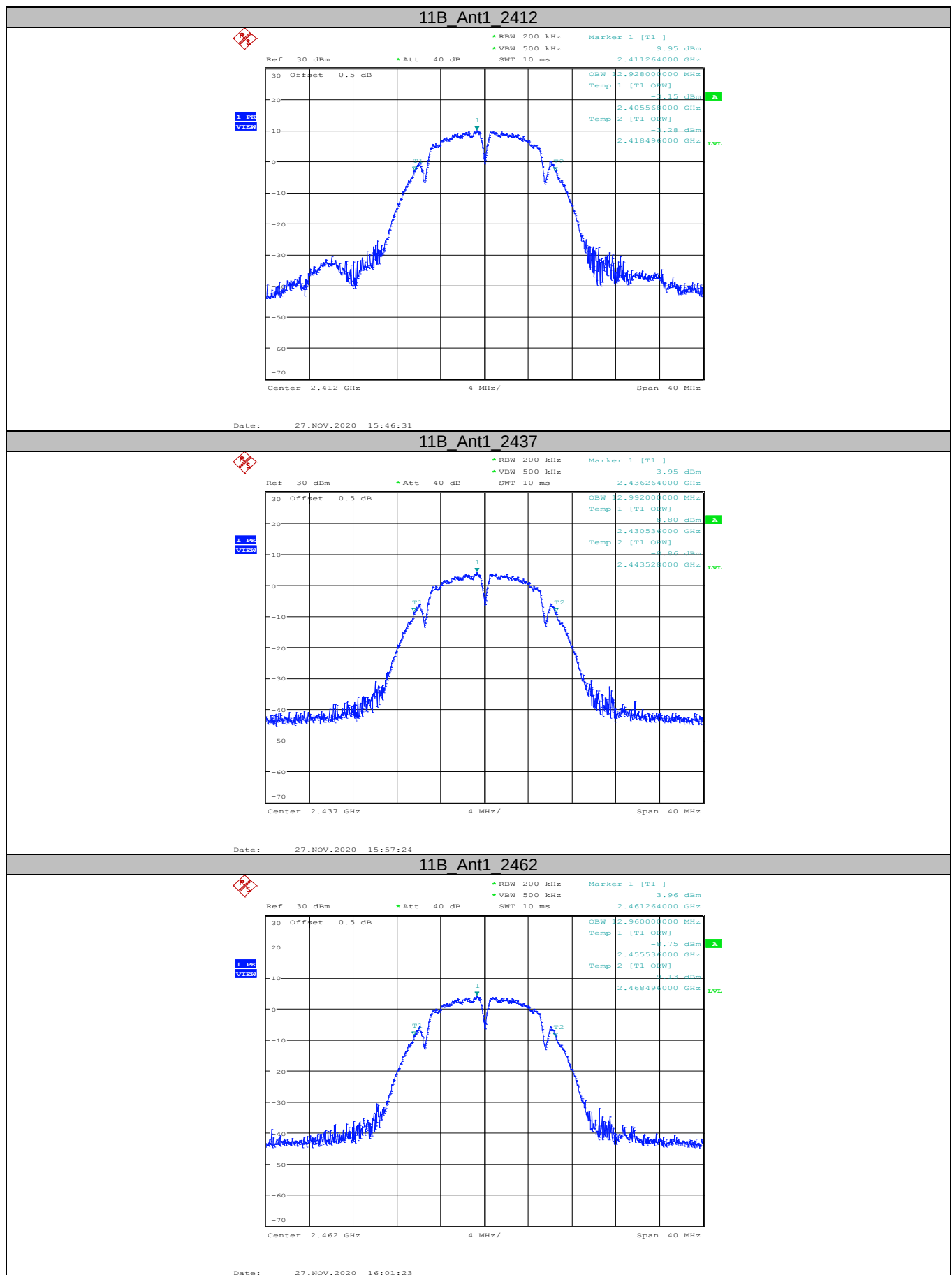
Appendix A2: Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Verdict
11B	Ant1	2412	12.928	2405.568	2418.496	PASS
		2437	12.992	2430.536	2443.528	PASS
		2462	12.96	2455.536	2468.496	PASS
11G	Ant1	2412	16.768	2403.712	2420.480	PASS
		2437	16.96	2428.616	2445.576	PASS
		2462	16.96	2453.616	2470.576	PASS
11N20SISO	Ant1	2412	17.792	2403.136	2420.928	PASS
		2437	17.792	2428.136	2445.928	PASS
		2462	17.792	2453.136	2470.928	PASS
11N40SISO	Ant1	2422	36.096	2404.160	2440.112	PASS
		2437	36.096	2419.016	2455.112	PASS
		2452	36.16	2433.952	2470.112	PASS



Test Graphs



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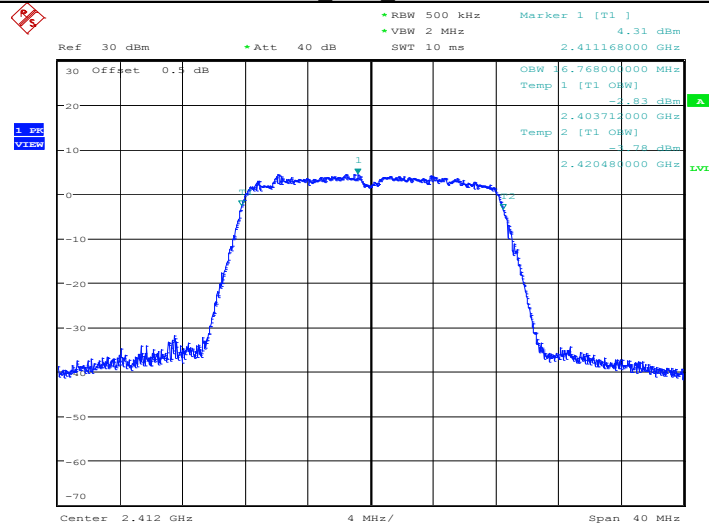
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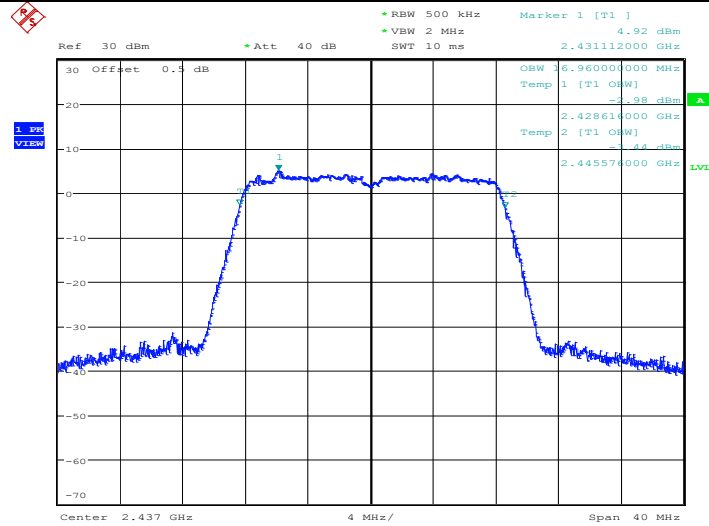


11G_Ant1_2412



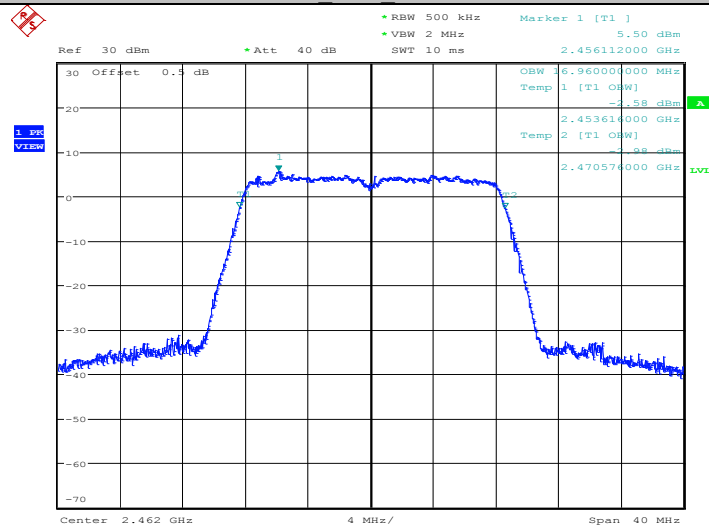
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11G_Ant1_2437



Date: 27.NOV.2020 16:12:33

11G_Ant1_2462



Date: 27.NOV.2020 16:17:16

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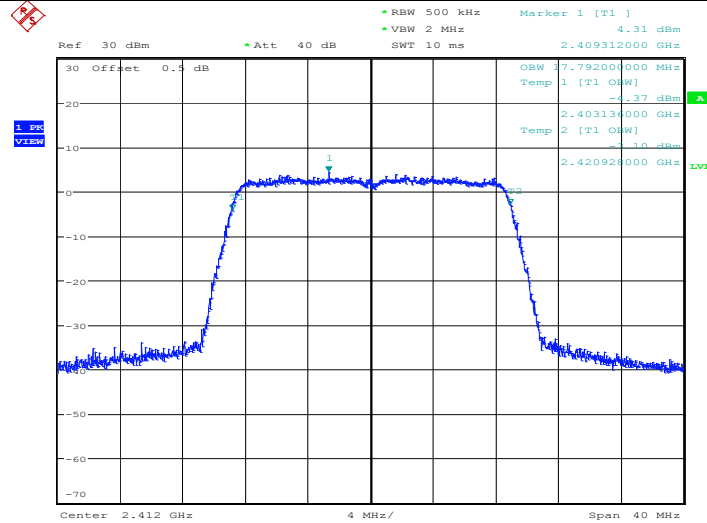
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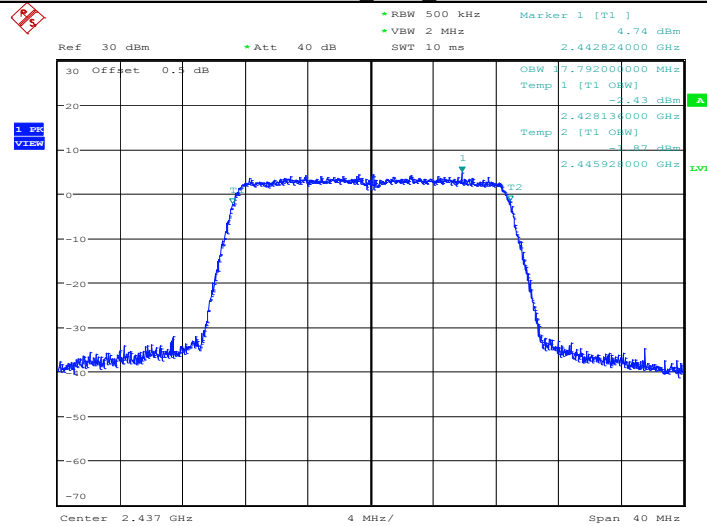


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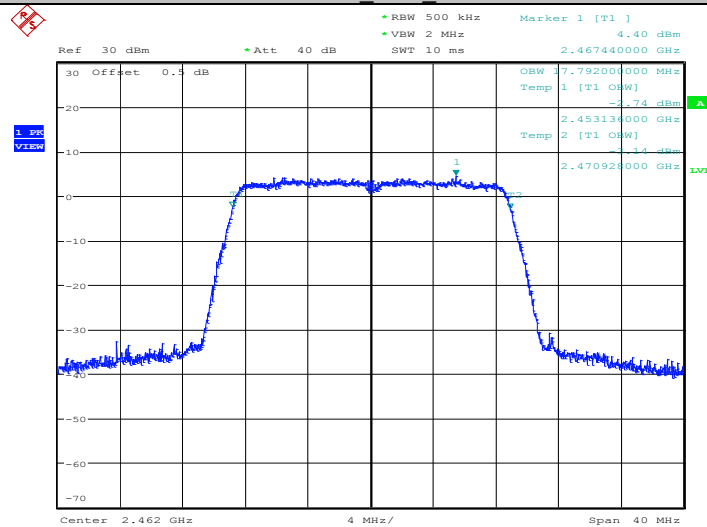
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11N20SISO_Ant1_2437



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11N20SISO_Ant1_2462



Date: 27.NOV.2020 16:33:32

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