FCC TEST REPORT

For

Smart Microwave Oven

Model Number: DW221

FCC ID: 2BB9RDW221

Report Number : WT238001356

Test Laboratory	:	Shenzhen Academy of Metrology and Quality Inspection
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Revision History

No	Date	Remark
V1.0	2023.08.04	Initial issue

TEST REPORT DECLARATION

Applicant	:	Shenzhen Shuying Technology Co.，Ltd
Address	:	Room 01, 13th Floor, No. 9988 Shennan District, Shenzhen, China
Manufacturer	:	Shenzhen Shuying Technology Co.，Ltd
Address	:	Room 01, 13th Floor, No. 9988 Shennan District, Shenzhen, China
EUT Description	:	Smart Microwave Oven
Model No.	:	DW221
Trade mark	:	WANDECHU 万得厨
Serial Number	:	/
FCC ID	:	2BB9RDW221

Test Standards:

FCC Part 15 Subpart E

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with FCC Rules Part 15.207, 15.209 and 15.407.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Project Engineer:	陈司林 (Chen Silin 陈司林)	Date:	Aug.04, 2023
Checked by:	万晓婧 (Wan Xiaojing 万晓婧)	Date:	Aug.04, 2023
Approved by:	林奕翔 (Lin Yixiang 林奕翔)	Date:	Aug.04, 2023

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1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	FCC Rules	Test Results
6dB Bandwidth	FCC §15.407 (e)	Pass
26dB Bandwidth	FCC §15.407 (a)	Pass
Maximum Peak Conducted Power	FCC §15.407 (a)	Pass
Maximum Power Spectral Density Level	FCC §15.407 (a)	Pass
Radiated Bandedge and Spurious	15.407 (b) 15.209 15.205	Pass
Conducted emission test for AC power port	15.207	Pass
Antenna Requirement	15.203	Pass

Remark: “N/A” means “Not applicable.”

2. GENERAL INFORMATION

2.1. Report Information

This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.

The sample/s mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through SMQ, unless the applicant has authorized SMQ in writing to do so.

The lab will not be liable for any loss or damage resulting for false, inaccurate, inappropriate or incomplete product information provided by the applicant/manufacturer.

2.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at NETC Building, No.4 Tongfa Rd., Xili, Nanshan, Shenzhen, China. At the time of testing, Laboratory is accredited by the following organizations:

China National Accreditation Service for Conformity Assessment (CNAS) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is CNAS L0579.

The Laboratory is Accredited Testing Laboratory of FCC with Designation number CN1165 and Site registration number 582918.

The Laboratory is registered to perform emission tests with Innovation, Science and Economic Development (ISED), and the registration number is 11177A.

The Laboratory is registered to perform emission tests with VCCI, and the registration number are C-20048, G20076, R-20077, R-20078 and T-20047.

The Laboratory is Accredited Testing Laboratory of American Association for Laboratory Accreditation (A2LA) and certificate number is 3292.01.

2.3. Measurement Uncertainty

Conducted Emission
9 kHz~150 kHz *U*=3.7dB k=2
150 kHz~30MHz *U*=3.3dB k=2

Radiated Emission
30MHz~1000MHz *U*=4.3dB k=2
1GHz~6GHz *U*=4.6 dB k=2
6GHz~40GHz *U*=5.1dB k=2

3. PRODUCT DESCRIPTION

NOTE: The extreme test conditions for temperature and antenna gain were declared by the manufacturer.

3.1. EUT Description

Description	:	Smart Microwave Oven
Manufacturer	:	Shenzhen Shuying Technology Co.，Ltd
Model Number	:	DW221
Operate Frequency	:	U-NII 1(5150~5250 MHz) U-NII 2A(5250~5350 MHz) U-NII 2C(5470~5725 MHz) U-NII 3(5725~5850 MHz)
Antenna Designation	:	FPC Antenna U-NII 1(5150~5250 MHz): MAX -2.05 dBi U-NII 2A(5250~5350 MHz): MAX -2.96 dBi U-NII 2C(5470~5725 MHz): MAX 1.2 dBi U-NII 3(5725~5850 MHz): MAX 1.0 dBi
Operating voltage	:	AC 120V/60Hz
Software Version	:	1.3.6
Hardware Version	:	1.0

Remark: /

Frequency List:

Band 1

Ch.	Frequency (MHz)
36	5180
40	5200
44	5220
48	5240

Band 2A

Ch.	Frequency (MHz)
52	5260
56	5280
60	5300
64	5320

Band 2C

Ch.	Frequency (MHz)
100	5500
104	5520
108	5540
112	5560
116	5580
120	5600
124	5620
128	5640
132	5660
136	5680
140	5700

Band 3

Ch.	Frequency (MHz)
149	5745
153	5765
157	5785
161	5805
165	5825

Table 2 802.11a/802.11n/802.11ac (20MHz) Frequency /Channel operations

Band 1		Band 2A		Band 2C		Band 3	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
38	5190	54	5270	102	5510	151	5755
46	5230	62	5310	110	5550	159	5795
				118	5590		
				126	5630		
				134	5670		

Table 3 802.11n/802.11ac (40MHz BW) Frequency /Channel operations

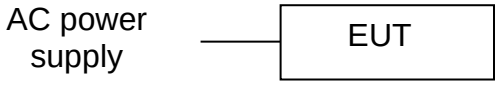
Band 1		Band 2A		Band 2C		Band 3	
Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
42	5210	58	5290	106	5530	155	5775
				122	5610		

Table 4 802.11ac (80MHz BW) Frequency /Channel operations

3.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: 2BB9RDW221 filing to comply with Section 15.207，15.209，15.407 of the FCC Part 15, Subpart E .

3.3. Block Diagram of EUT Configuration



Setup of test

3.4. Operating Condition of EUT

The Radiated spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission (X plane).
Worst-case mode and channel used for 30-1000 MHz radiated and power line conducted emissions was the mode and channel with the highest output power.
Worst-case data rates as provided by the client were:
802.11a mode: 6 Mbps
802.11n HT20 mode: MCS0
802.11n HT40 mode: MCS0
802.11ac VHT20 mode: MCS0
802.11ac VHT40 mode: MCS0
802.11ac VHT80 mode: MCS0

Modulation Mode:	Single(TX)
802.11a	support
802.11n HT20	support
802.11n HT40	support
802.11ac VHT20	support
802.11ac VHT40	support
802.11ac VHT80	support

3.5. Directional Antenna Gain

Directional gain need NOT to be considered.

3.6. Support Equipment List

Table 5 Support Equipment List

Name	Model No	S/N	Manufacturer
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3.7. Test Conditions

Date of test: Jan.10, 2023- Aug.03, 2023
Date of EUT Receive: Oct.25, 2022
Temperature: 20℃-26℃
Relative Humidity: 44%-56%

3.8. Special Accessories

Not available for this EUT intended for grant.

3.9. Equipment Modifications

Not available for this EUT intended for grant.

4. TEST EQUIPMENT USED

Table 6 Test Equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB9058/05	Test Receiver	R&S	ESCI 3	Sep.13,2022	1 Year
SB4357	AMN	R&S	ENN216	Aug.23,2022	1 Year
SB9548	Shielded Room	Albatross	SR	Sep.06,2022	1 Year
SB17366	Test Receiver	R&S	ESR26	May.30,2023	1 Year
SB3345	Loop Antenna	Schwarzbeck	FMZB1516-113	Jan.19,2023	1 Year
SB3955	Broadband Antenna	SCHWARZBECK	VULB9163	May.30,2023	1 Year
SB13958	Horn Antenna	R&S	HF907	May.30,2023	1 Year
SB9555/01	Semi Anechoic Chamber	Albatross	9×6×6(m)	Aug.16,2022	1 Year
SB8501/09	Test Receiver	R&S	ESU40	Jan.19,2023	1 Year
SB3435	Horn Antenna	R&S	HF906	Nov.28,2022	1 Year
SB9058/03	Pre-Amplifier	R&S	SCU 18	Jan.19,2023	1 Year
SB8501/11	Antenna	R&S	3160-09	Feb.22,2023	3 Years
SB8501/12	Antenna	R&S	3160-10	Feb.22,2023	3 Years
SB8501/16	Pre-Amplifier	R&S	SCU-26	Jan.19,2023	1 Year
SB9059	Pre-Amplifier	R&S	SCU-40	Aug.23,2022	1 Year
SB9060	Spectrum Analyzer	R&S	FSQ40	Apr.24, 2023	1 Year
SB9555/02	Fully Anechoic Chamber	Albatross	10.0×5.2×5.4(m)	Aug.16,2022	1 Year
SB20321/01	Spectrum Analyzer	R&S	FSV3044	Dec.15, 2022	1 Year

Table 7 Test software

Name	Manufacturer	Version
Bluetooth and WiFi Test System	Shenzhen JS tonscend co.,ltd	3.2.22

5. DUTY CYCLE

5.1. Limits of Duty Cycle

None; for reporting purposes only

5.2. Test Procedure

1. Set span = Zero
2. RBW = 20MHz
3. VBW = 30MHz,
4. Detector = Peak

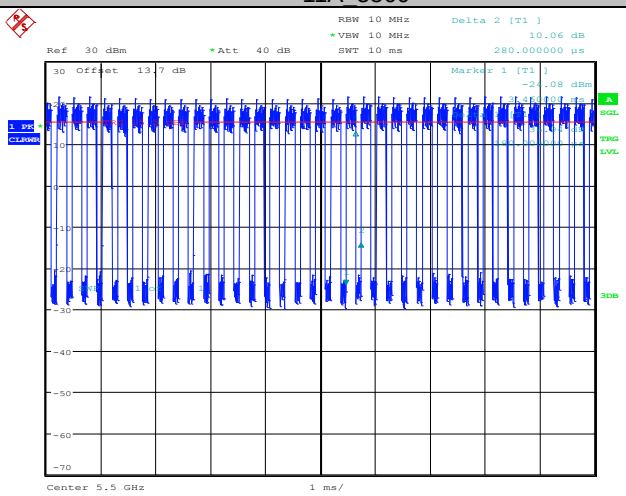
5.3. Test Setup

5.4. Test Data

Table 8 Duty Cycle Test Data

Test Mode	On Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	0.18	64.29	-1.92	0.01
802.11n HT20	0.17	62.96	-2.01	0.01
802.11n HT40	0.10	71.43	-1.46	0.01
802.11ac VHT20	0.17	80.95	-0.92	0.01
802.11ac VHT40	0.09	52.94	-2.76	0.01
802.11ac VHT80	0.32	60.38	-2.19	0.01

11A_5500



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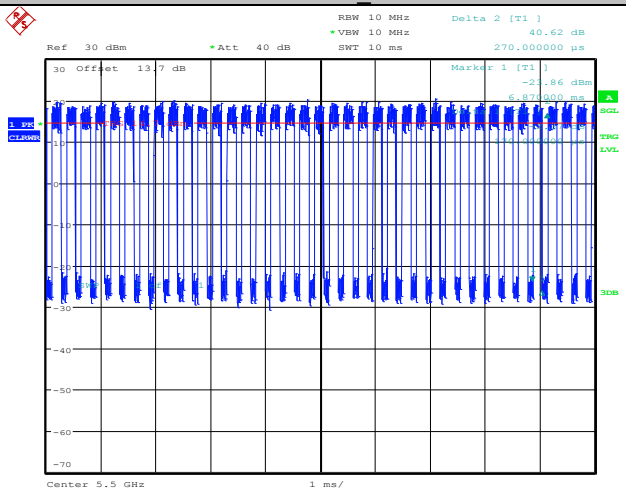

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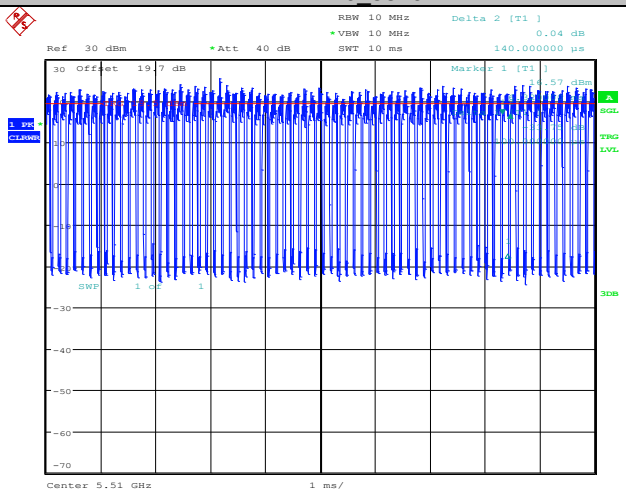

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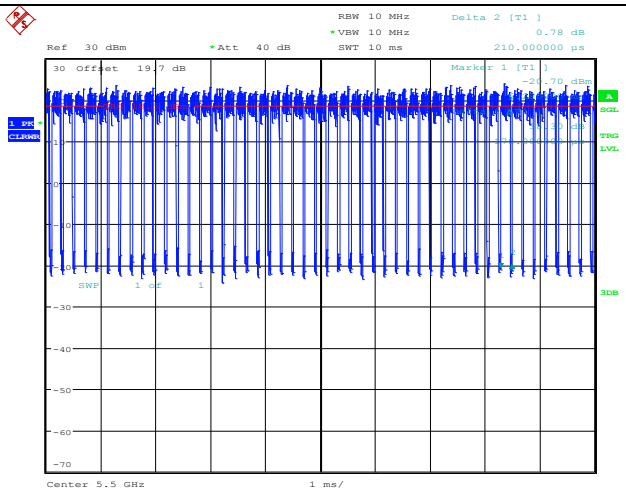

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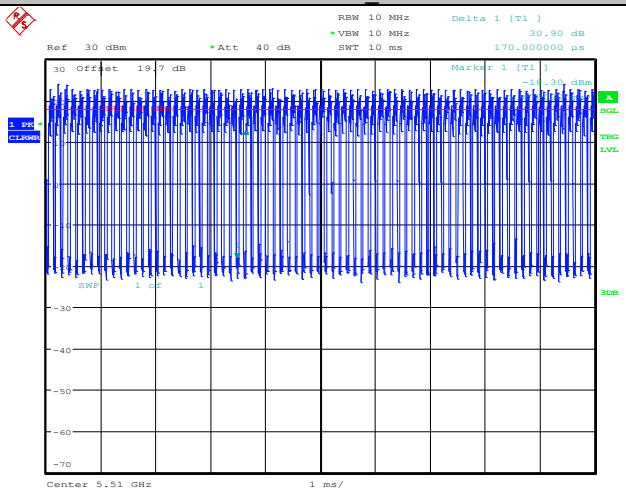

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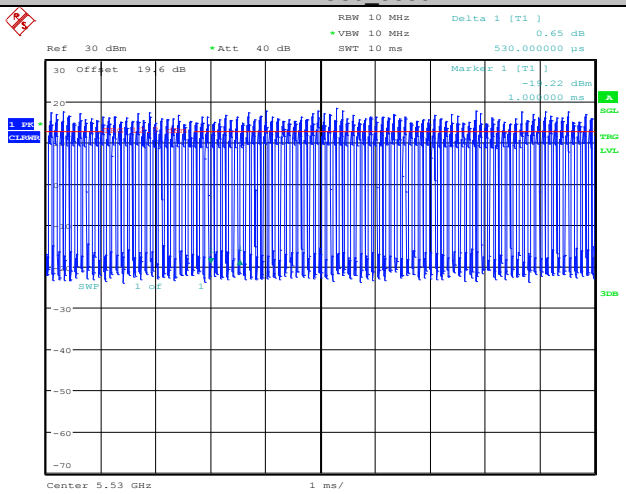

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6. 6DB BANDWIDTH MEASUREMENT

6.1. Limits of 6dB Bandwidth Measurement

The minimum 6 dB emission bandwidth of at least 500 kHz for the band 5.725-5.85 GHz.

6.2. Test Procedure

The transmitter output was connected to the spectrum analyzer.
a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 x RBW.
c)Detector = Peak.
d)Trace mode = max hold.
e)Sweep = auto couple.
f)Allow the trace to stabilize.
g)Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.3. Test Setup

6.4. Test Data

6dB Bandwidth Test Data

TestMode	Antenna	Channel	6db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5745	15.68	5737.12	5752.80	0.5	PASS
		5785	15.64	5777.16	5792.80	0.5	PASS
		5825	15.68	5817.12	5832.80	0.5	PASS
11N20SISO	Ant1	5745	16.88	5736.16	5753.04	0.5	PASS
		5785	17.52	5776.16	5793.68	0.5	PASS
		5825	16.36	5817.32	5833.68	0.5	PASS
11N40SISO	Ant1	5755	35.44	5737.32	5772.76	0.5	PASS
		5795	35.76	5777.32	5813.08	0.5	PASS
11AC20SISO	Ant1	5745	16.92	5736.76	5753.68	0.5	PASS
		5785	17.56	5776.12	5793.68	0.5	PASS
		5825	17.56	5816.16	5833.72	0.5	PASS
11AC40SISO	Ant1	5755	35.36	5737.32	5772.68	0.5	PASS
		5795	35.52	5777.00	5812.52	0.5	PASS
11AC80SISO	Ant1	5775	75.20	5737.40	5812.60	0.5	PASS

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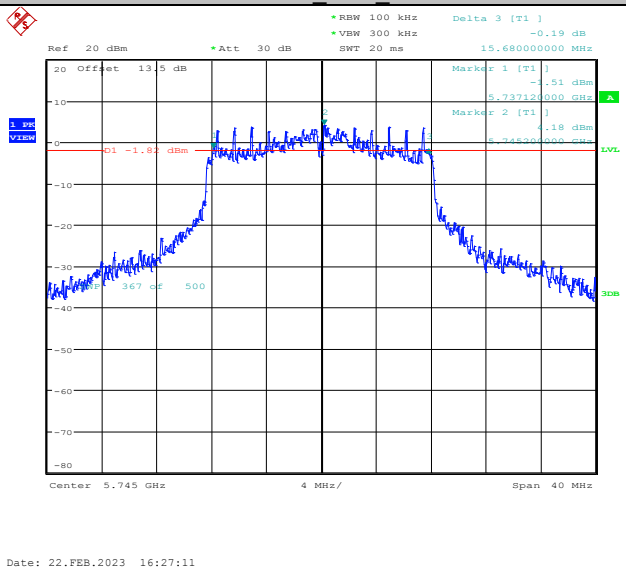

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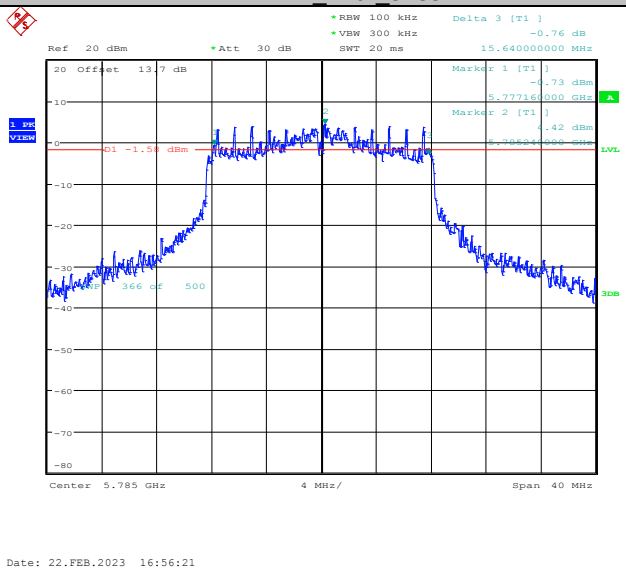

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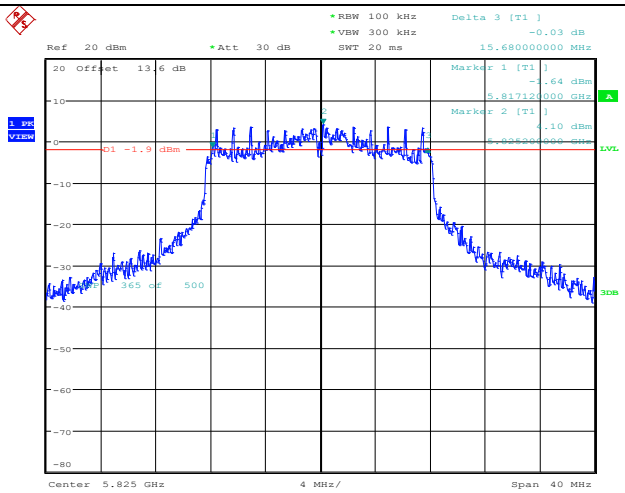

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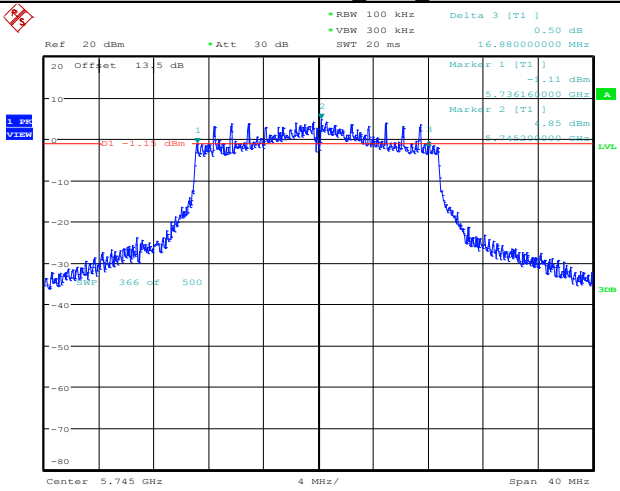

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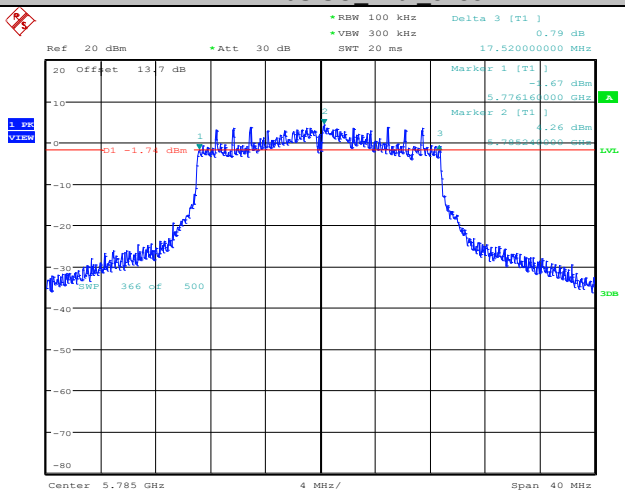

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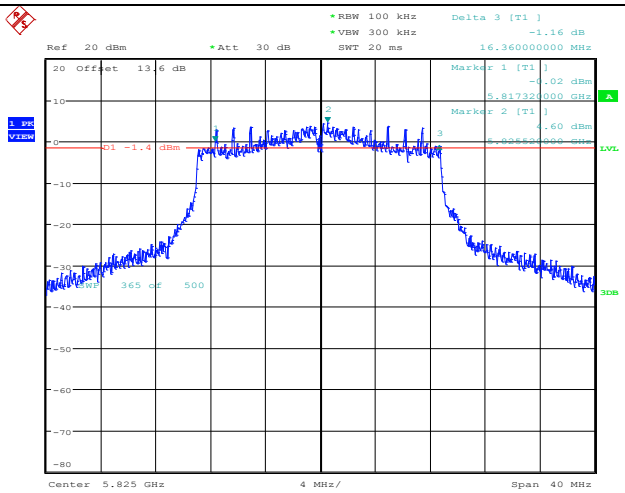

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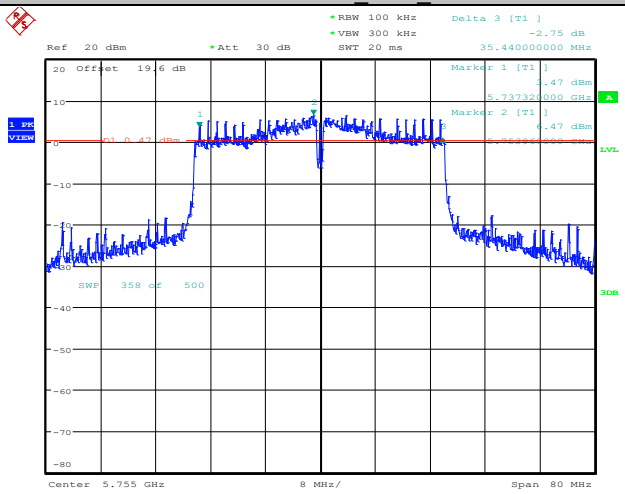

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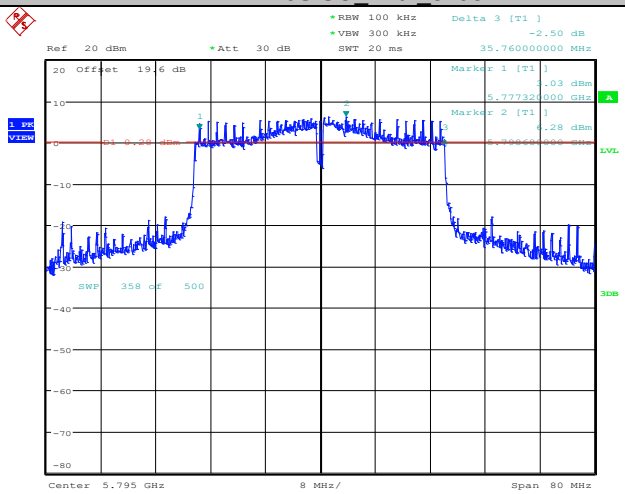

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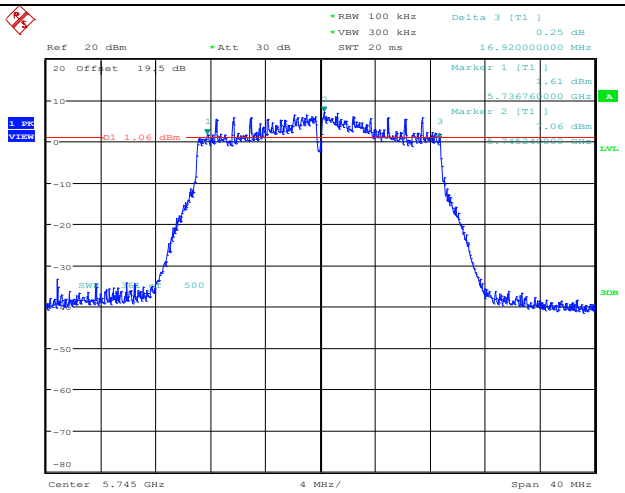

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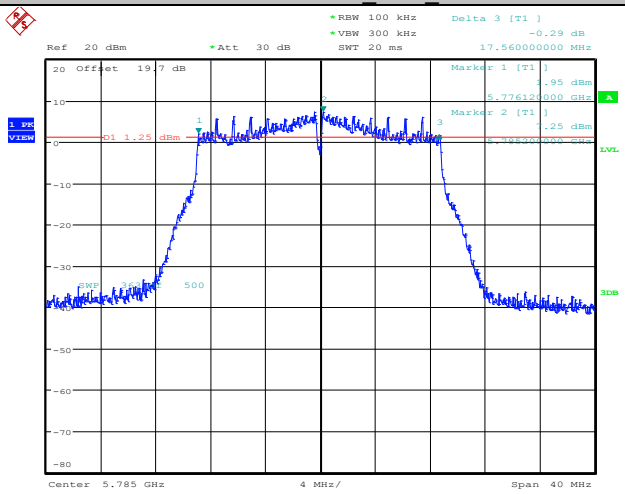

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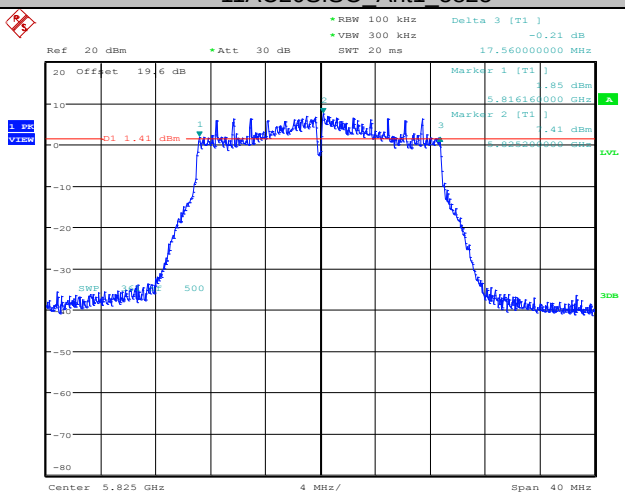

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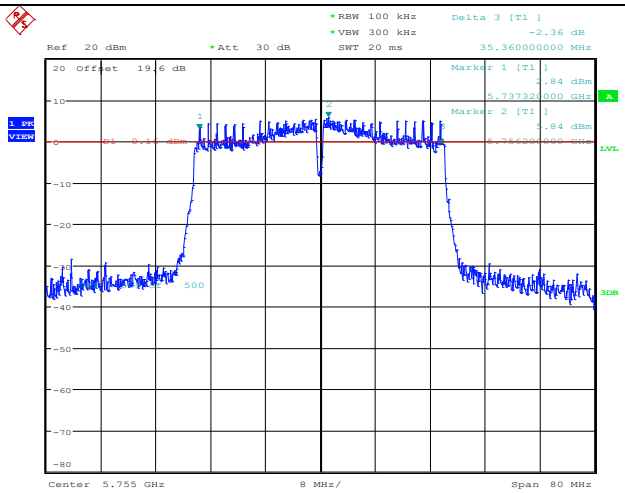

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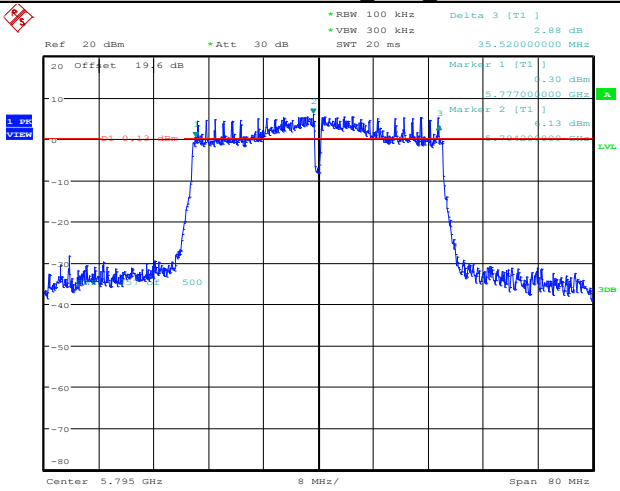

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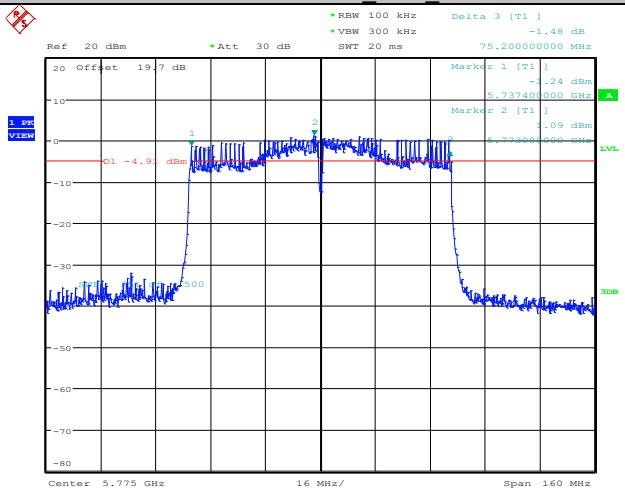

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7. 26DB BANDWIDTH MEASUREMENT

7.1. Limts of 26dB Bandwidth Measurement

None; for reporting purposes only.

7.2. Test Procedure

a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

7.3. Test Setup

7.4. Test Data

26dB Bandwidth Test Data

TestMode	Antenna	Channel	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	20.36	5169.96	5190.32	---	---
		5200	20.36	5190.00	5210.36	---	---
		5240	20.52	5229.84	5250.36	---	---
		5260	21.64	5249.48	5271.12	---	---
		5280	24.00	5269.16	5293.16	---	---
		5320	20.52	5309.84	5330.36	---	---
		5500	20.56	5489.84	5510.40	---	---
		5580	21.04	5569.32	5590.36	---	---
		5700	21.08	5689.28	5710.36	---	---
		5745	21.08	5734.36	5755.44	---	---
		5785	20.52	5774.84	5795.36	---	---
		5825	20.72	5814.68	5835.40	---	---
11N20SISO	Ant1	5180	21.56	5169.08	5190.64	---	---
		5200	21.28	5189.32	5210.60	---	---
		5240	21.52	5229.20	5250.72	---	---
		5260	21.52	5249.16	5270.68	---	---
		5280	21.64	5269.12	5290.76	---	---
		5320	21.48	5309.12	5330.60	---	---
		5500	21.60	5489.04	5510.64	---	---
		5580	21.64	5569.12	5590.76	---	---
		5700	21.76	5689.08	5710.84	---	---
		5745	22.32	5733.36	5755.68	---	---
		5785	22.52	5773.36	5795.88	---	---

		5825	21.68	5814.20	5835.88	---	---
11N40SISO	Ant1	5190	39.76	5170.32	5210.08	---	---
		5230	39.92	5210.00	5249.92	---	---
		5270	42.88	5250.08	5292.96	---	---
		5310	40.96	5290.08	5331.04	---	---
		5510	40.00	5489.92	5529.92	---	---
		5550	40.08	5530.00	5570.08	---	---
		5670	40.16	5649.92	5690.08	---	---
		5755	40.96	5735.16	5776.12	---	---
		5795	39.92	5775.08	5815.00	---	---
11AC20SISO	Ant1	5180	21.08	5169.32	5190.40	---	---
		5200	21.12	5189.32	5210.44	---	---
		5240	20.96	5229.44	5250.40	---	---
		5260	20.96	5249.44	5270.40	---	---
		5280	21.16	5269.32	5290.48	---	---
		5320	21.12	5309.36	5330.48	---	---
		5500	21.08	5489.32	5510.40	---	---
		5580	21.04	5569.32	5590.36	---	---
		5700	21.16	5689.32	5710.48	---	---
		5745	21.24	5734.24	5755.48	---	---
		5785	21.16	5774.32	5795.48	---	---
		5825	21.28	5814.24	5835.52	---	---
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		5230	40.24	5209.84	5250.08	---	---
		5270	40.32	5249.76	5290.08	---	---
		5310	40.16	5289.84	5330.00	---	---
		5510	40.16	5489.76	5529.92	---	---
		5550	40.16	5529.76	5569.92	---	---
		5670	40.24	5649.68	5689.92	---	---
		5755	40.16	5734.76	5774.92	---	---
		5795	40.16	5774.76	5814.92	---	---
11AC80SISO	Ant1	5210	80.96	5169.68	5250.64	---	---
		5290	80.96	5249.68	5330.64	---	---
		5530	81.12	5489.52	5570.64	---	---
		5610	81.12	5569.52	5650.64	---	---
		5775	81.28	5734.36	5815.64	---	---

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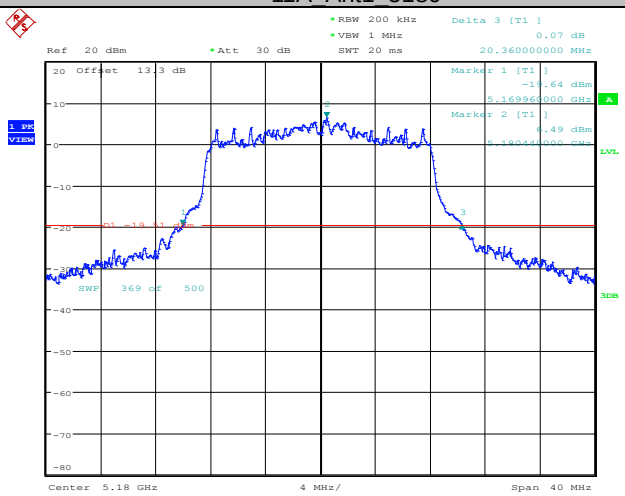

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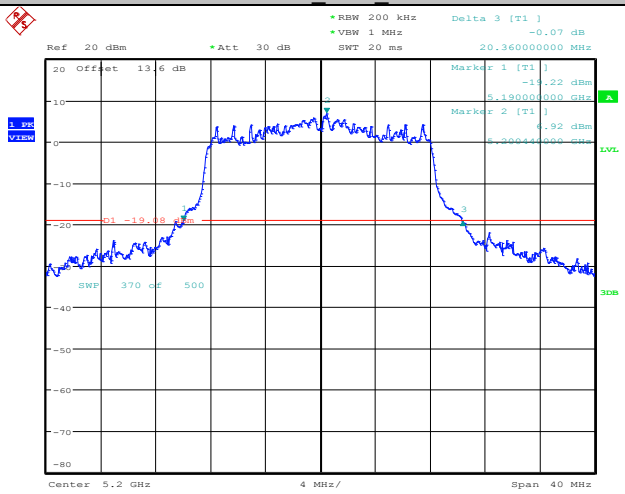

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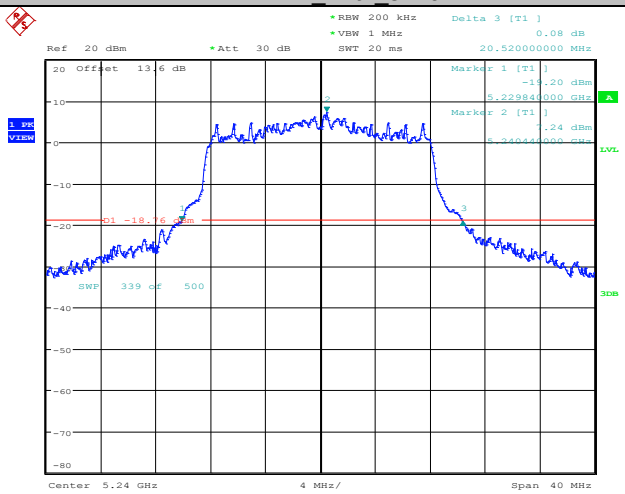

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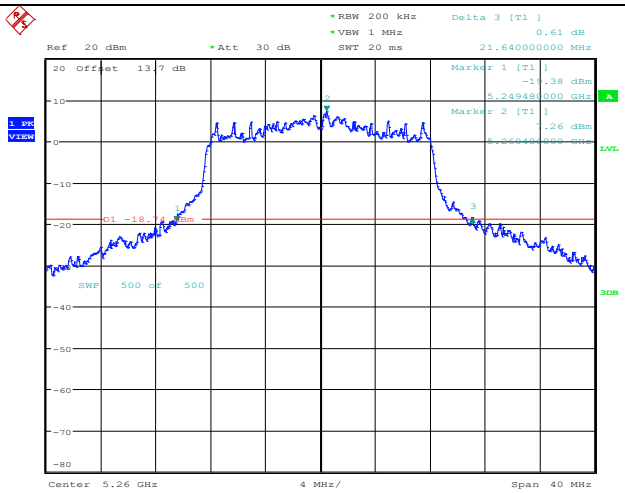

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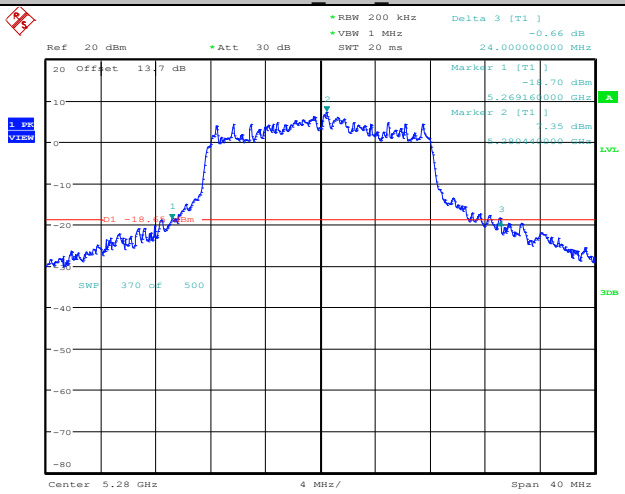

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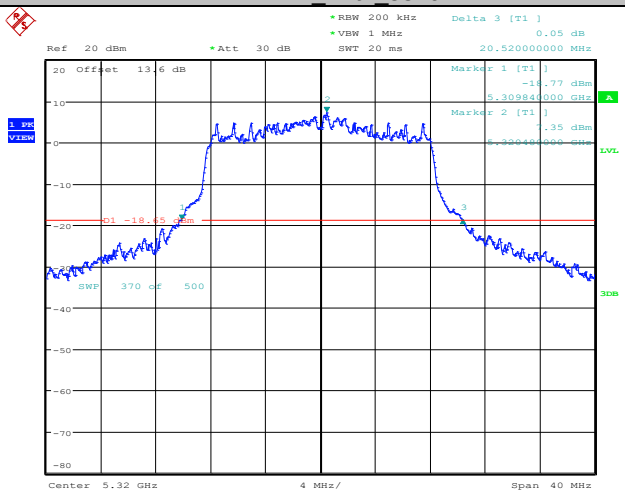

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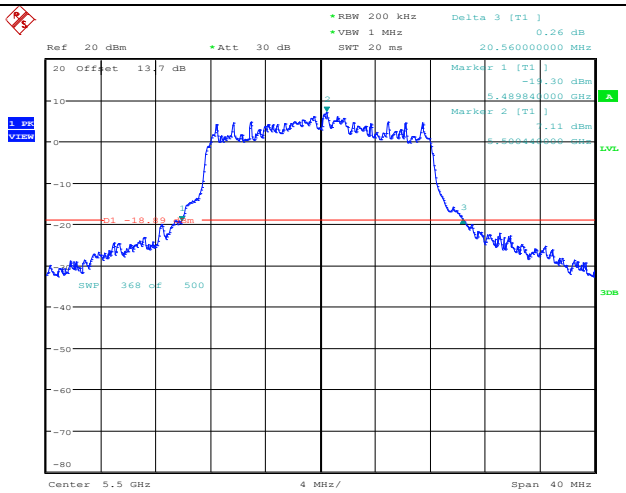

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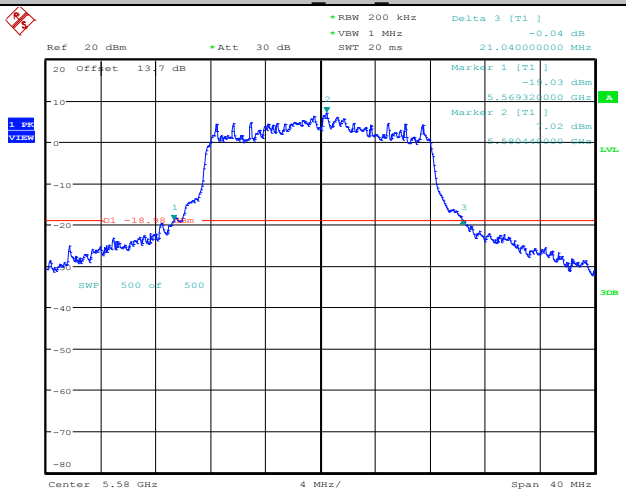

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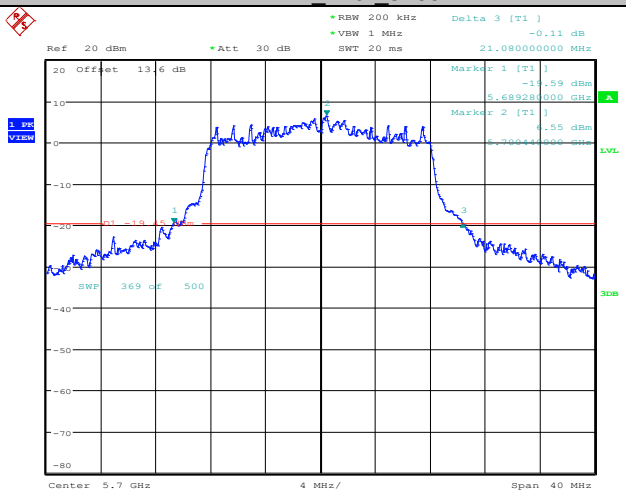

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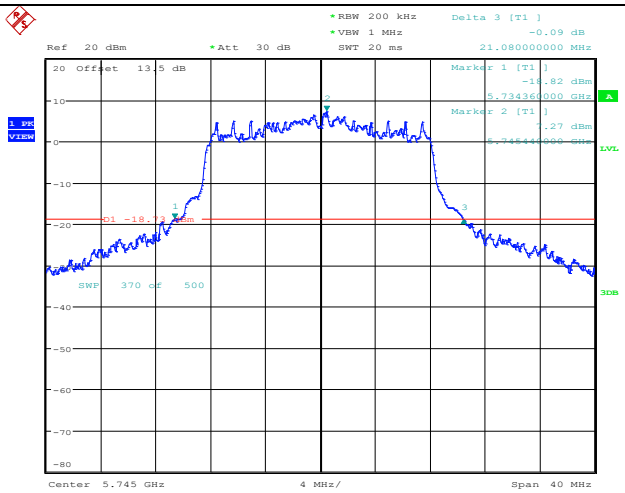

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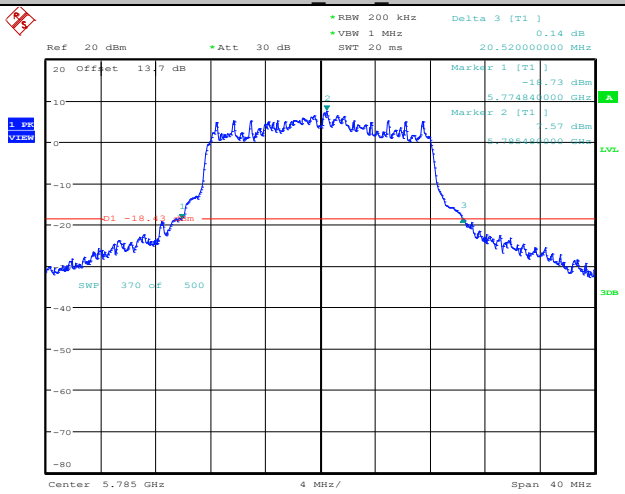

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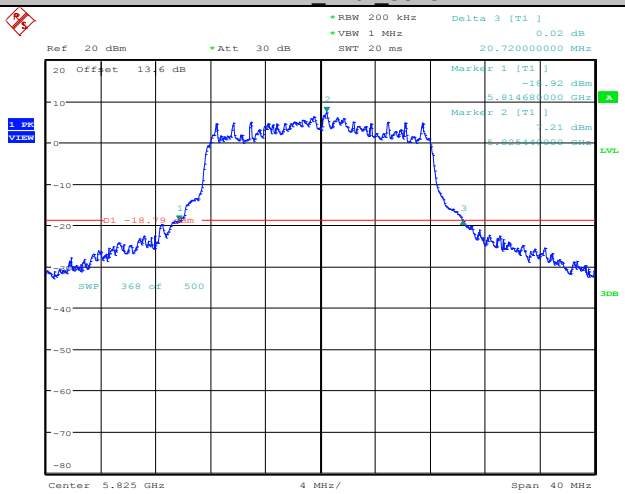

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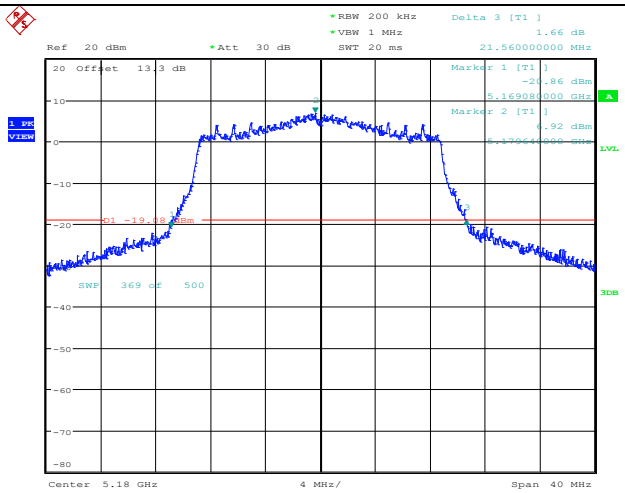

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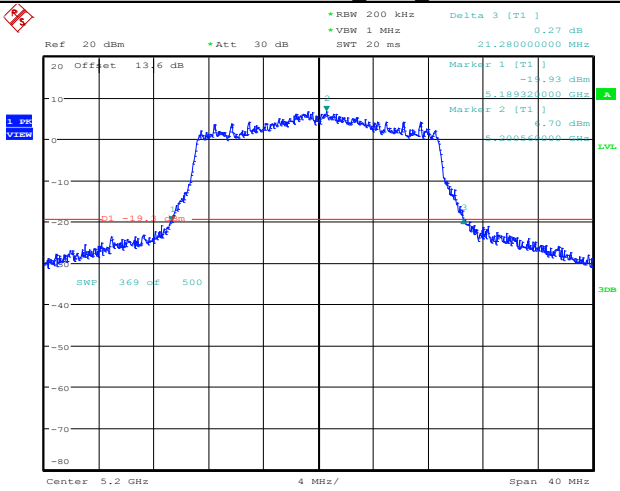

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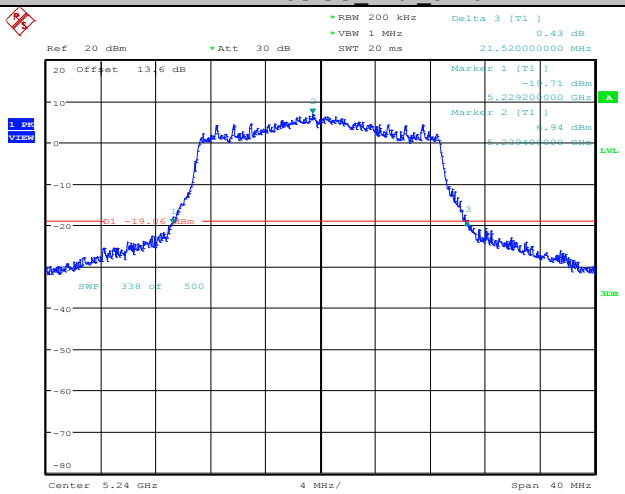

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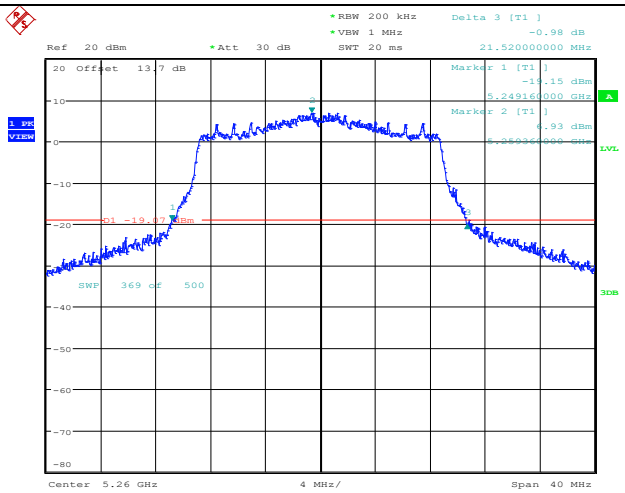

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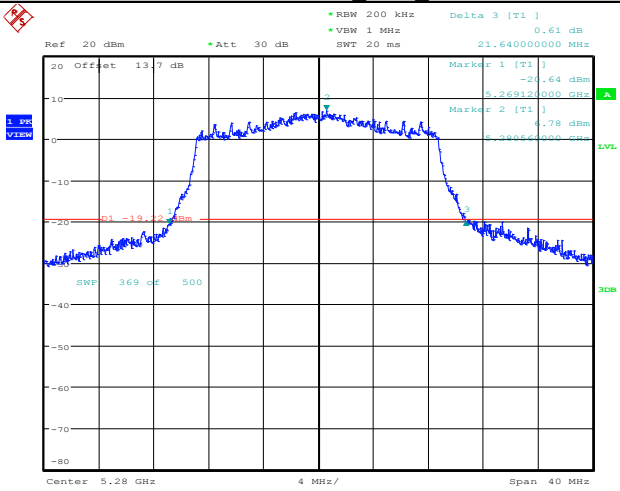

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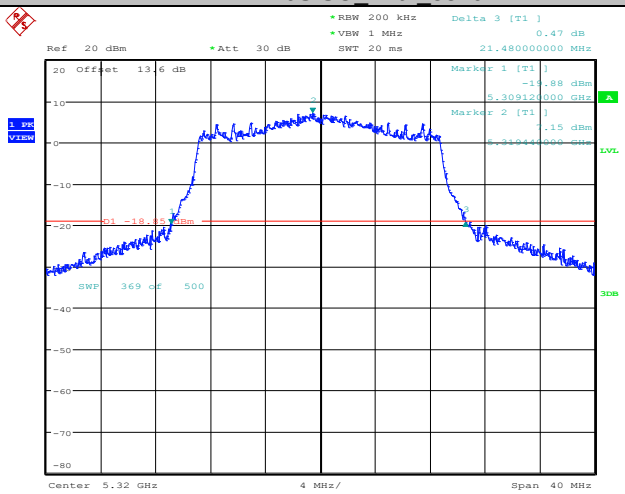

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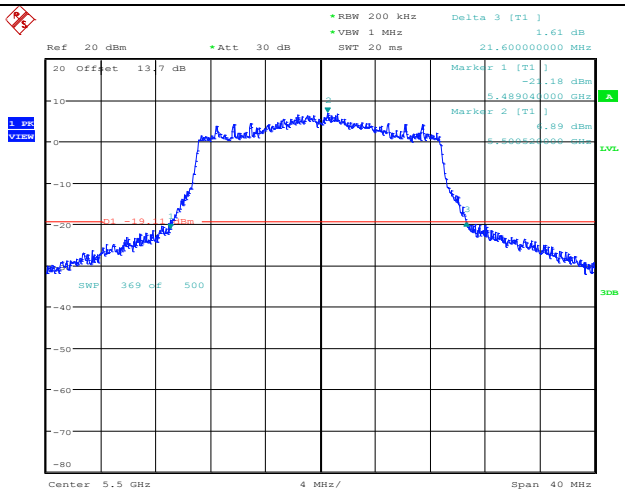

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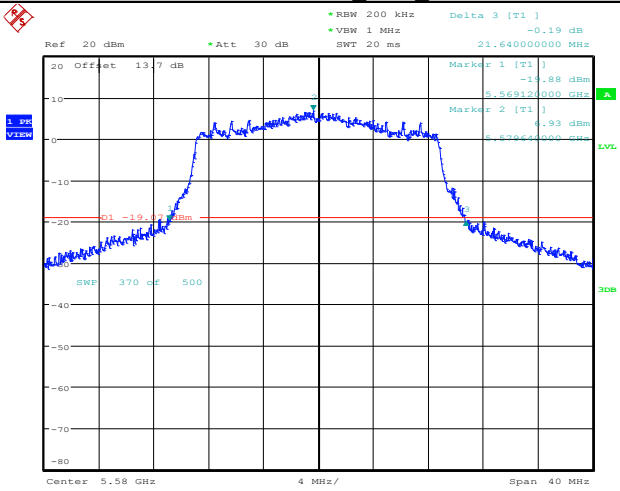

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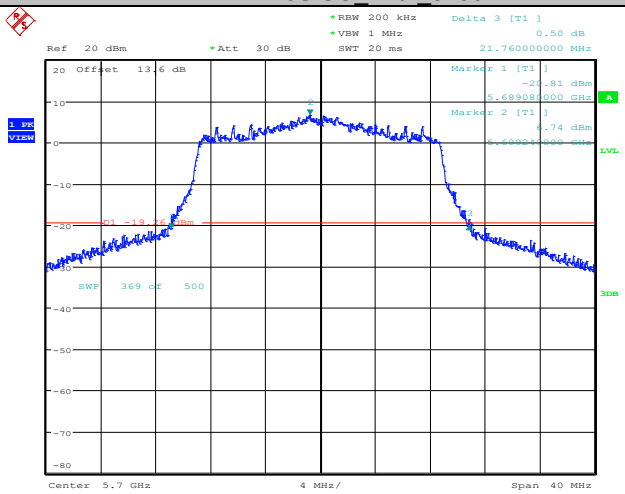

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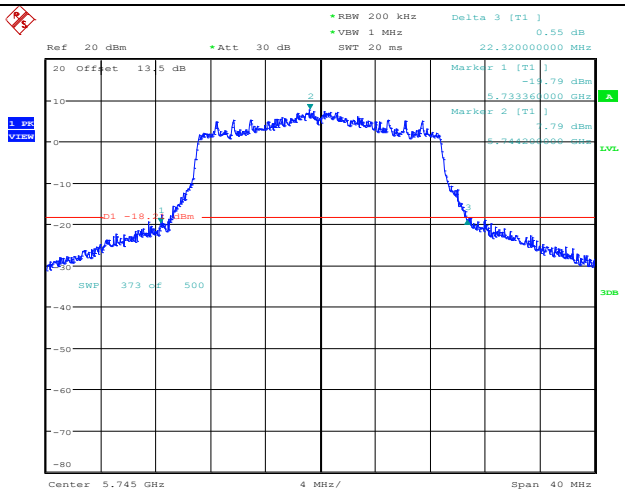

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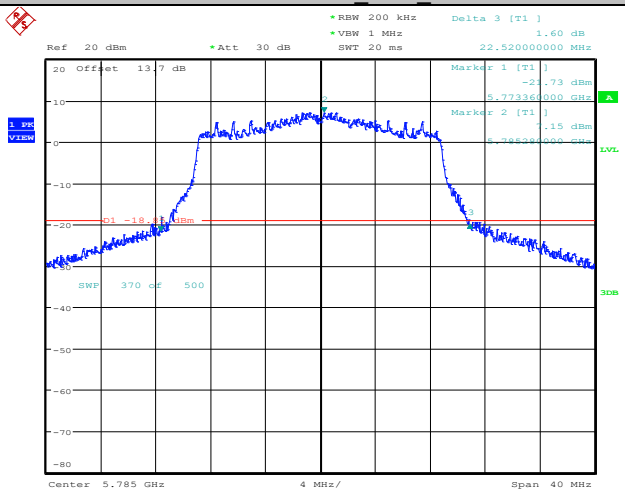

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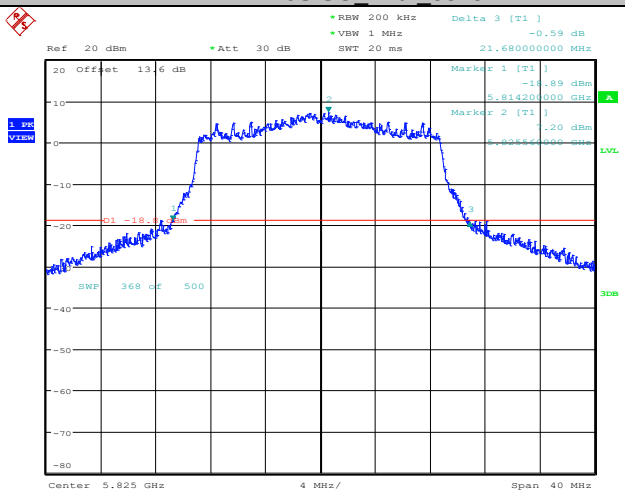

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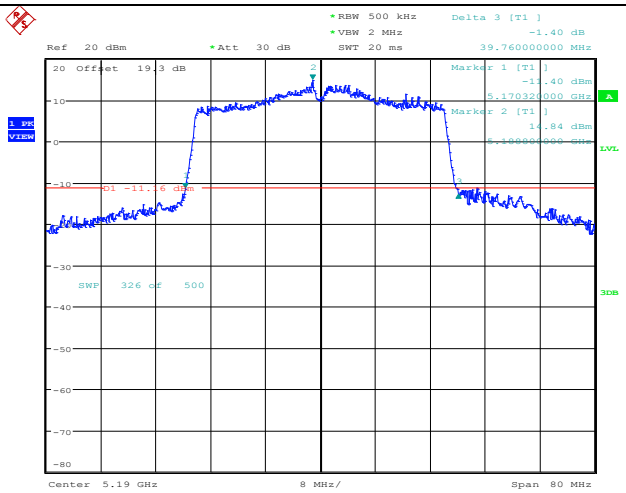

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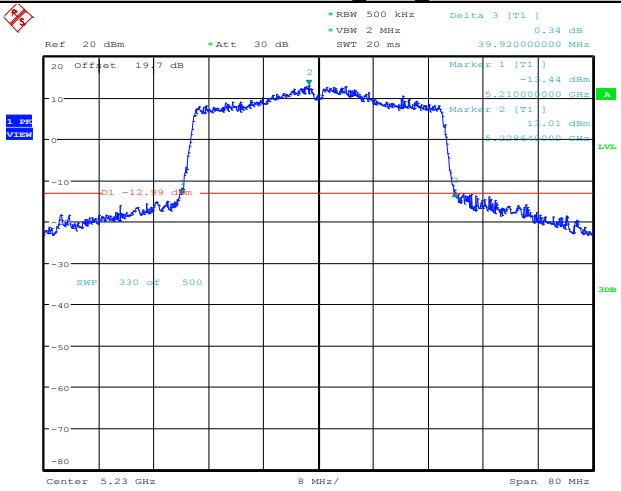

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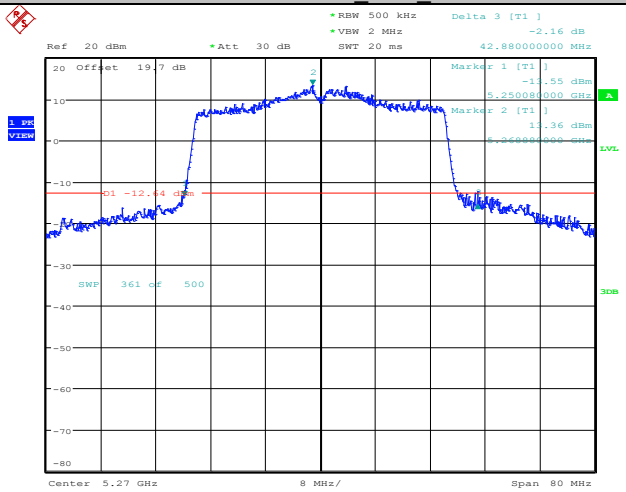

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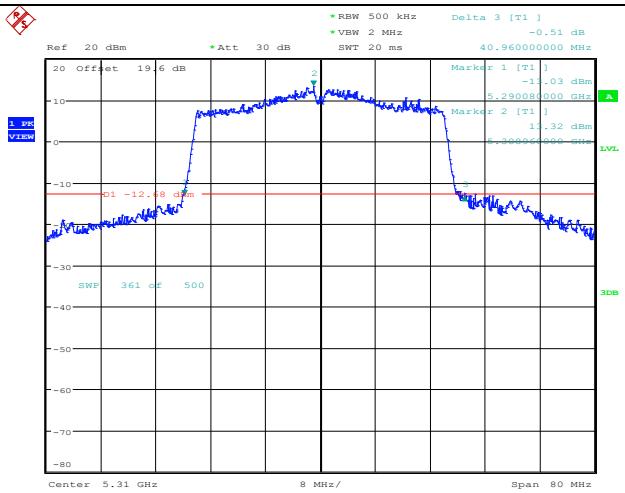

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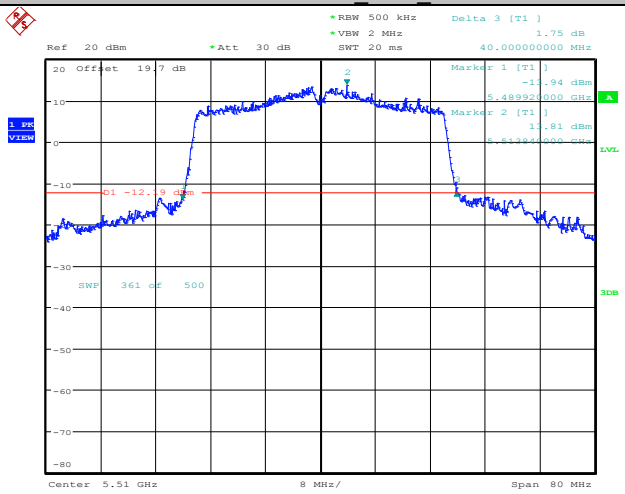

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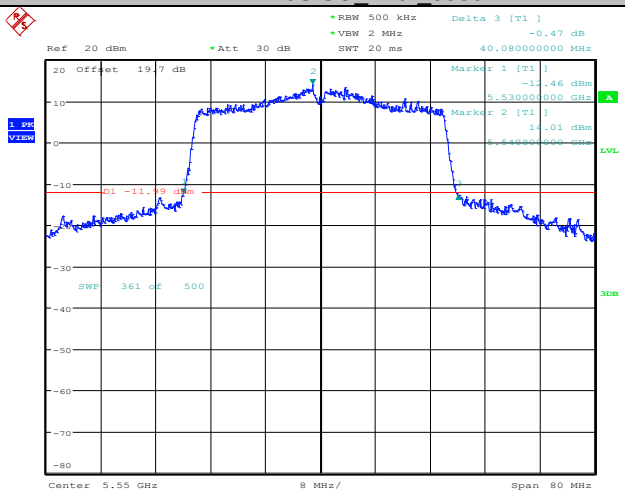

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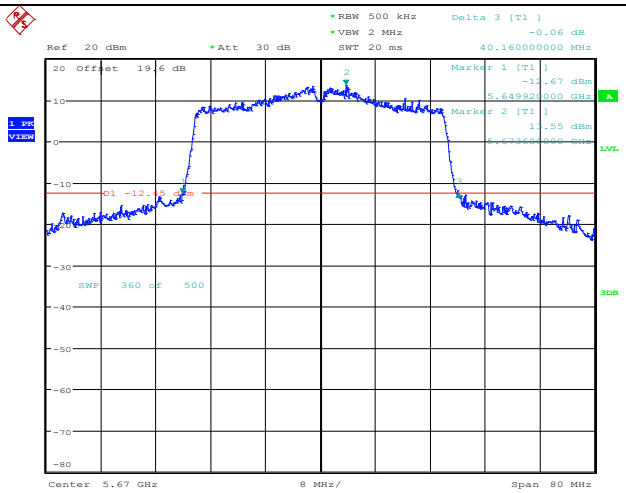

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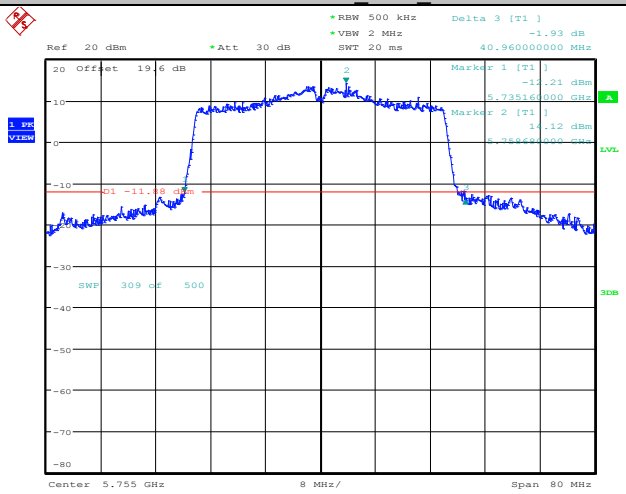

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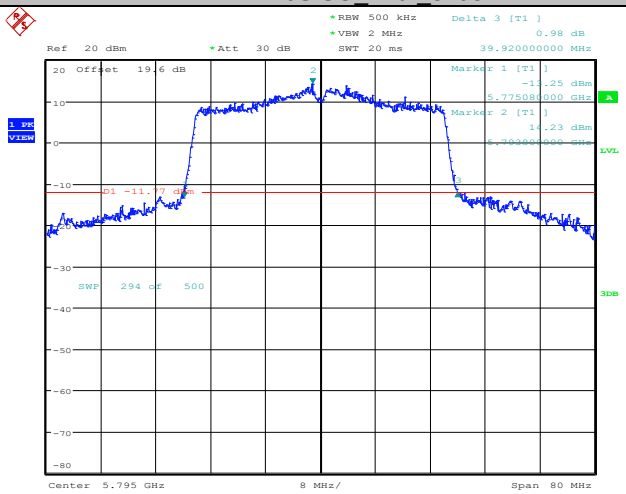

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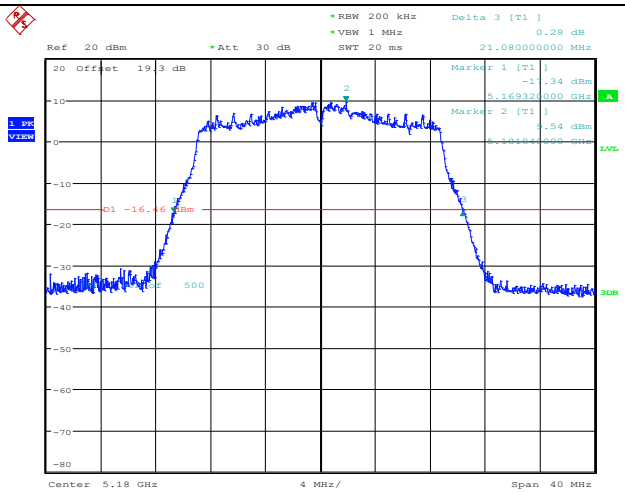

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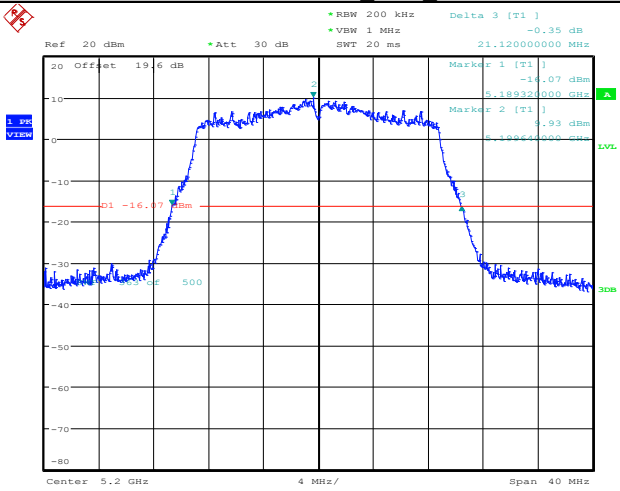

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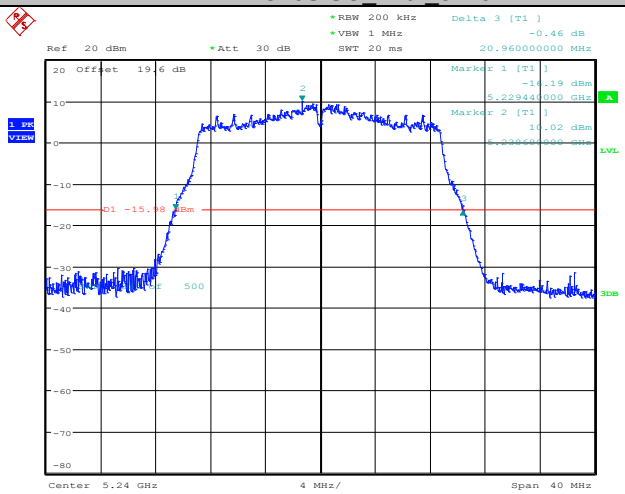

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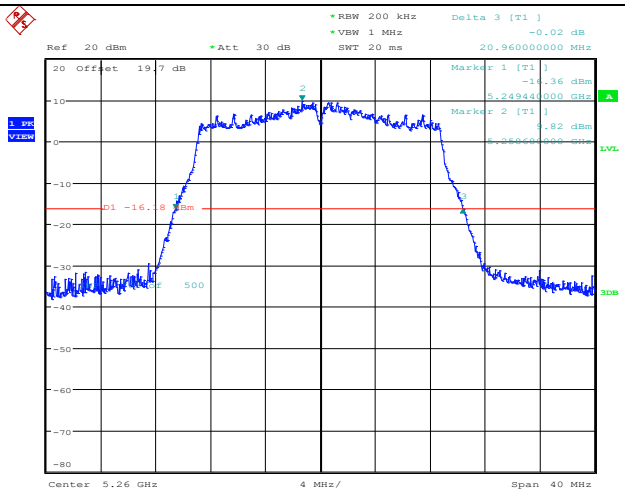

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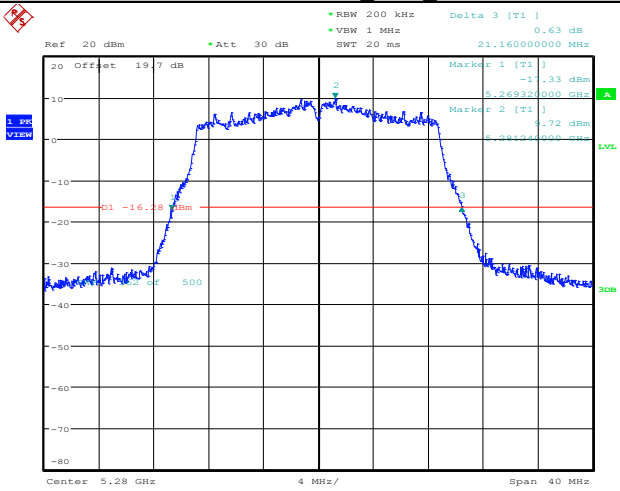

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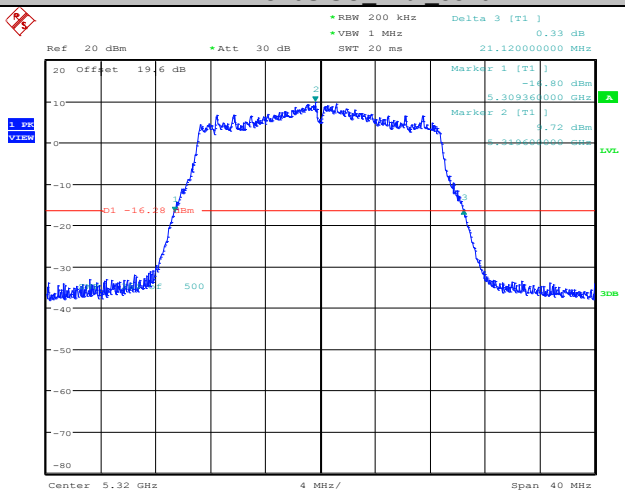

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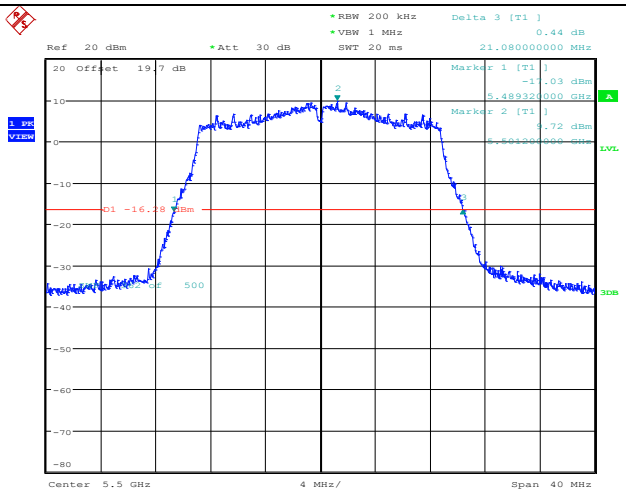

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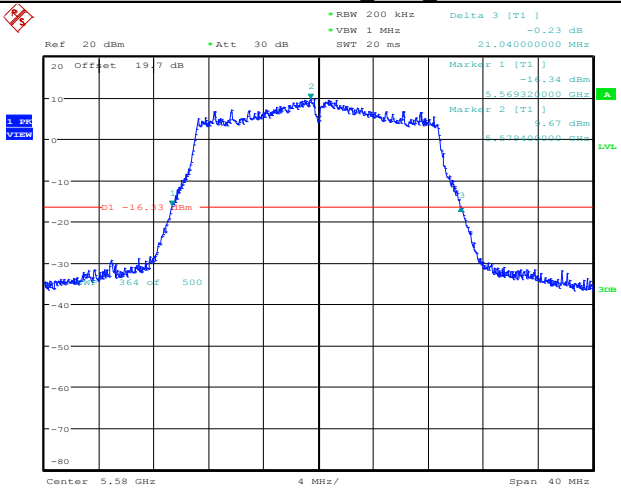

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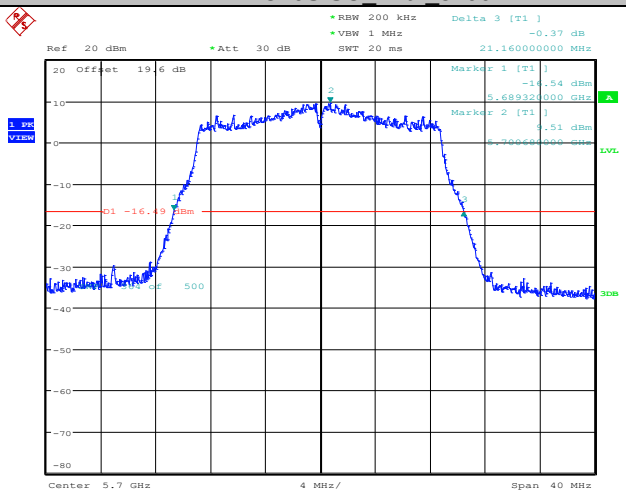

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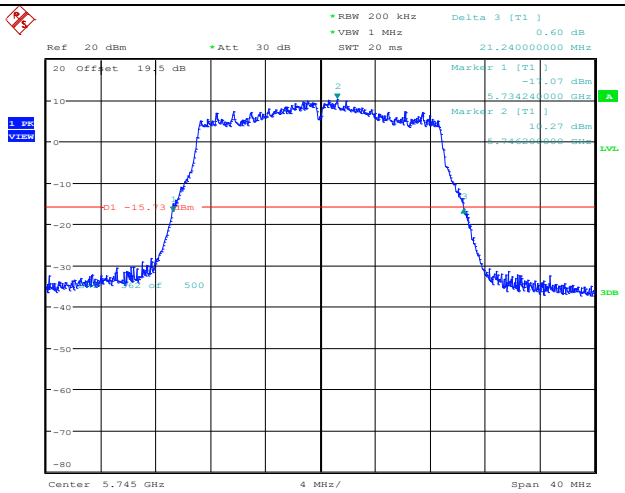

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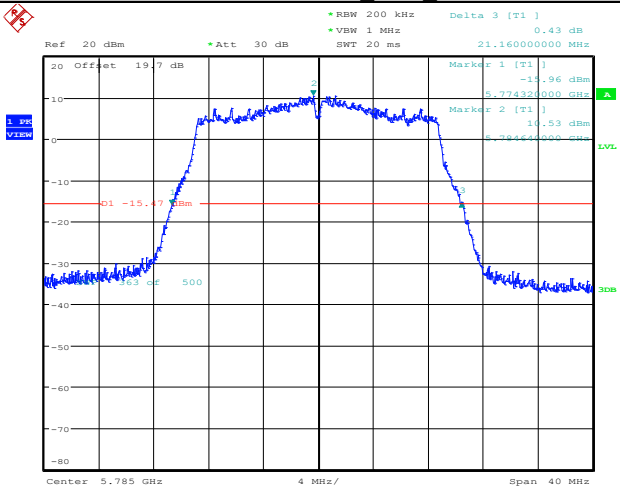

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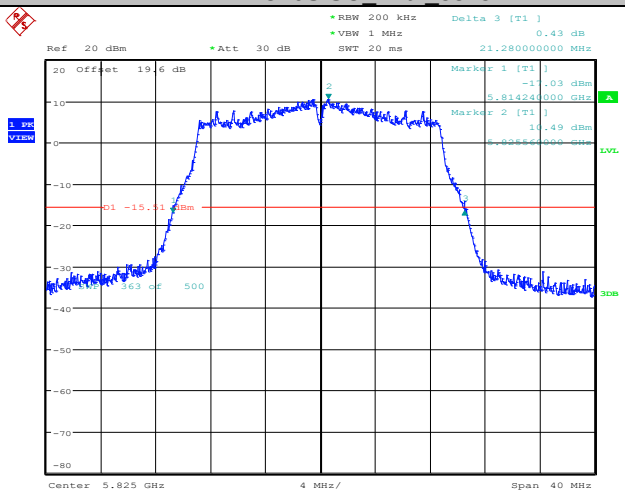

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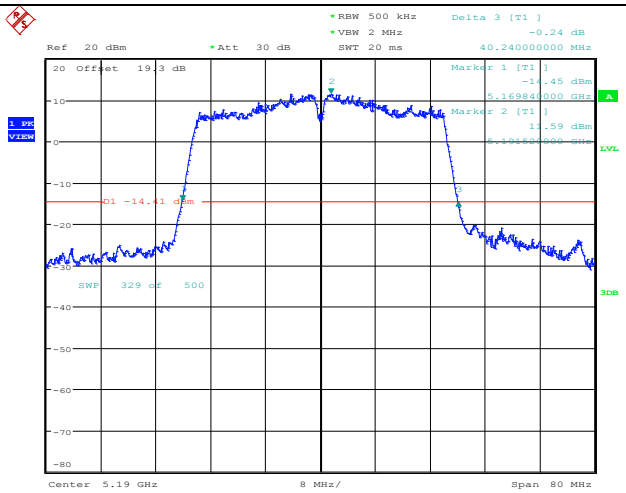

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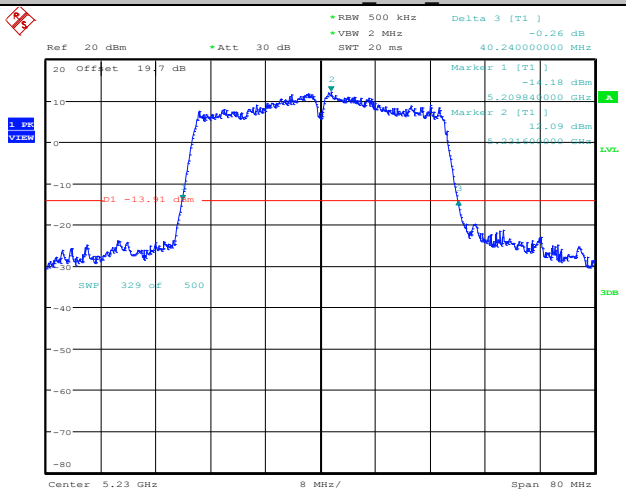

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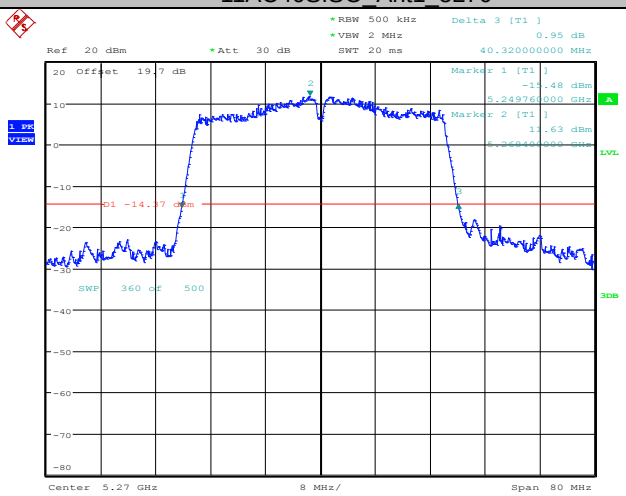

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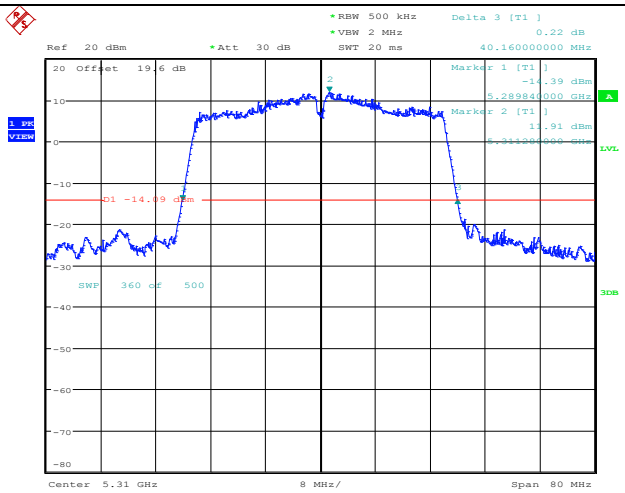

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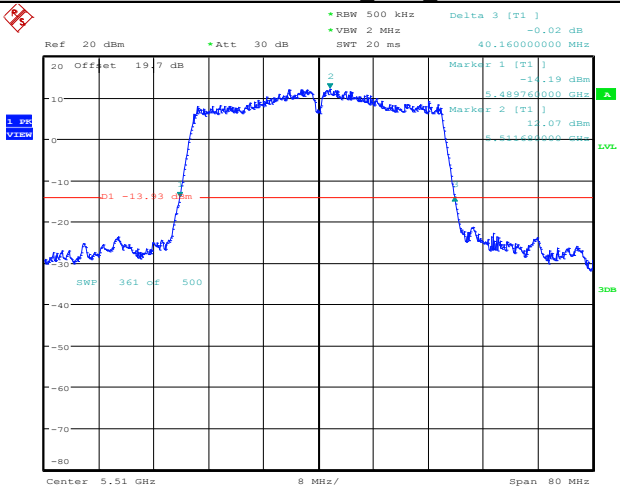

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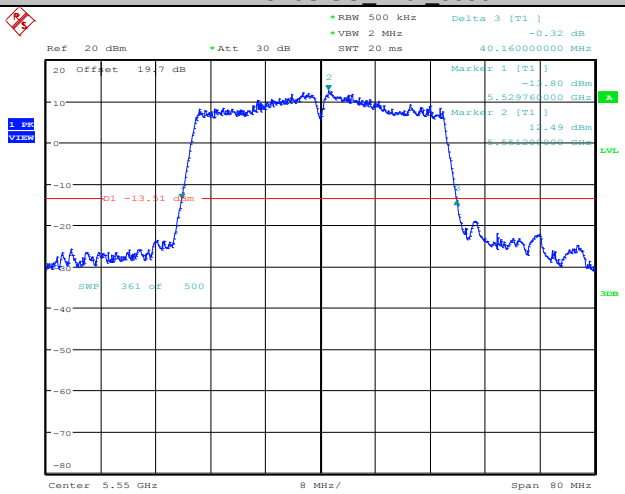

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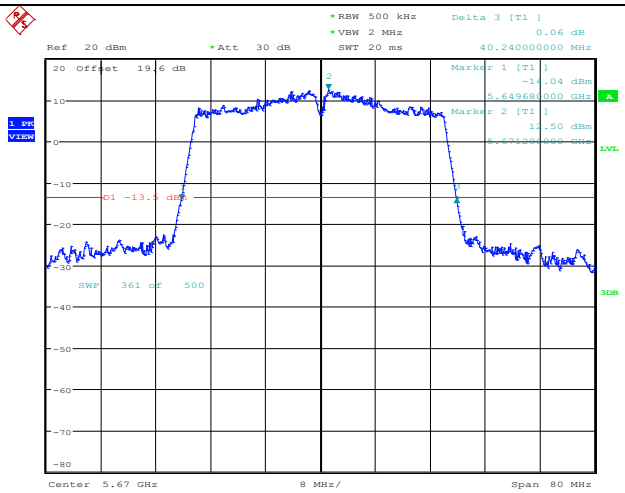

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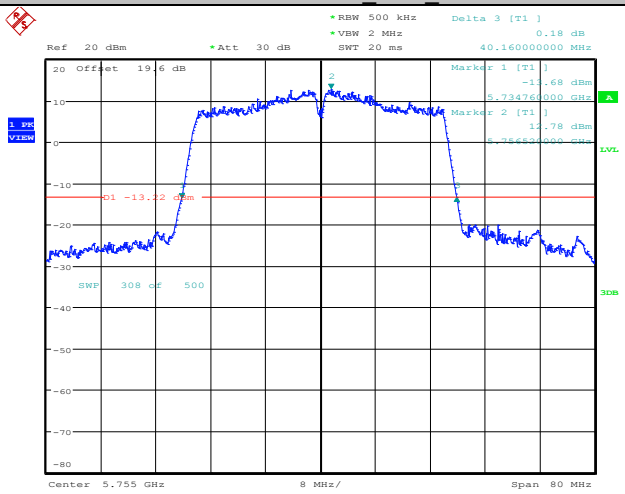

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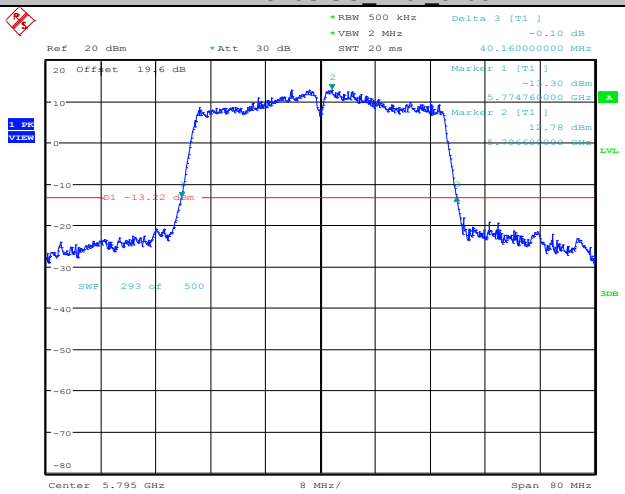

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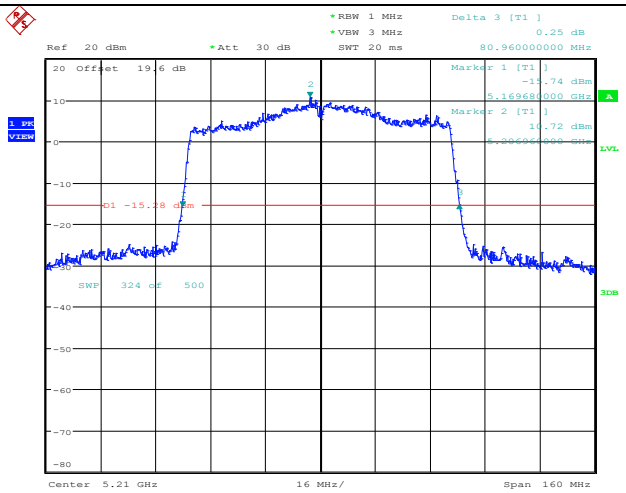

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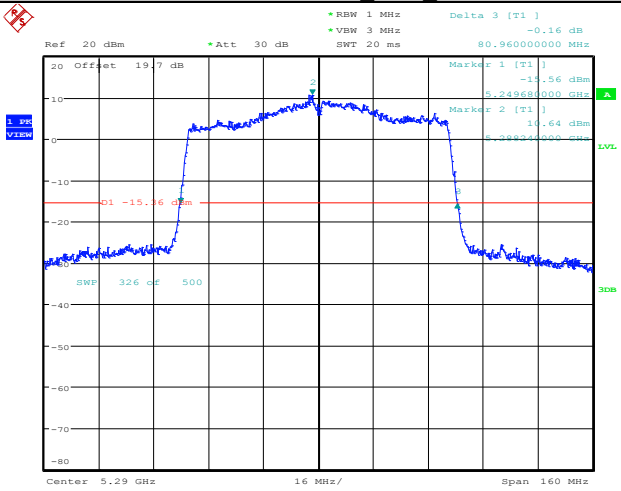

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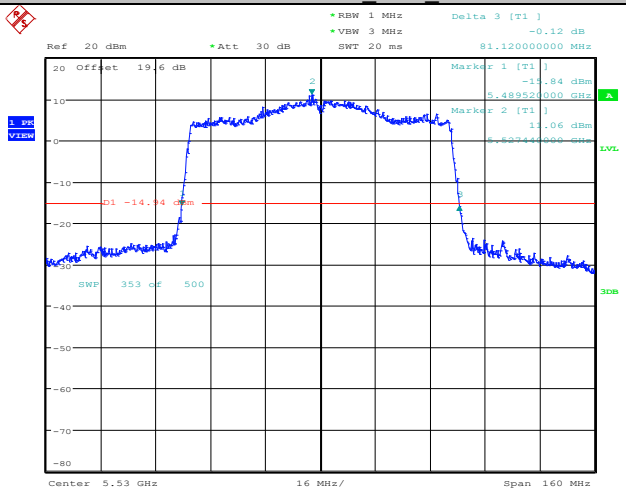

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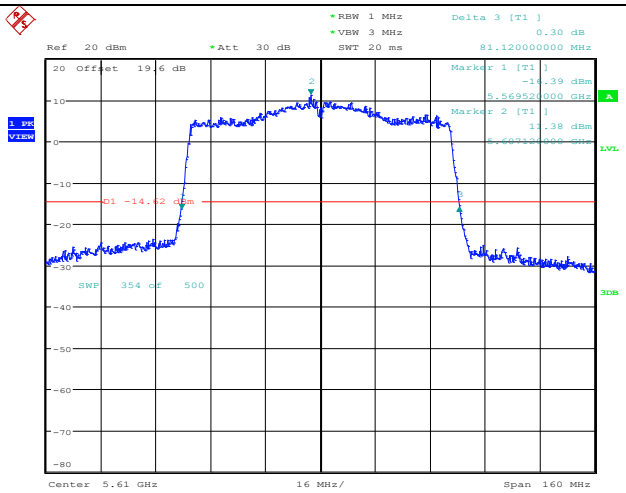

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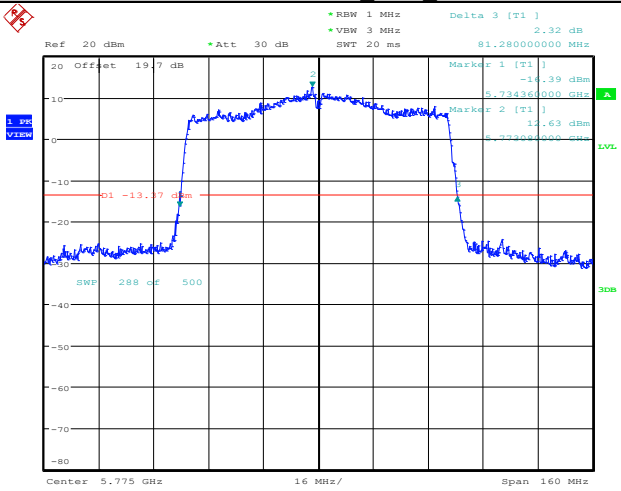

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8. MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

8.1. Limits of Maximum Conducted Output Power Measurement

CFR 47 (FCC) part 15.407 (a)
For the band 5.15–5.25 GHz.
For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the max-imum antenna gain does not exceed 6 dBi.
For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz,the maximum antenna gain does not exceed 6 dBi.
For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

8.2. Test Procedure

(i) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.
The EUT is configured to transmit continuously or to transmit with a constant duty cycle.
At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
(ii) If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section II.B.
(iii) Measure the average power of the transmitter. This measurement is an average overboth the on and off periods of the transmitter.
(iv) Adjust the measurement in dBm by adding 10 log (1/x) where x is the duty cycle (e.g.,10 log (1/0.25) if the duty cycle is 25%).the measurement result.

8.3. Test Setup

8.4. Test Data

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11A	Ant1	5180	14.19	≤23.98	PASS
		5200	14.34	≤23.98	PASS
		5240	14.95	≤23.98	PASS
		5260	14.73	≤23.98	PASS
		5280	14.80	≤23.98	PASS
		5320	14.65	≤23.98	PASS
		5500	14.31	≤23.98	PASS
		5580	14.43	≤23.98	PASS
		5700	14.16	≤23.98	PASS
		5745	14.67	≤30.00	PASS
		5785	14.88	≤30.00	PASS
		5825	14.68	≤30.00	PASS
11N20SISO	Ant1	5180	13.98	≤23.98	PASS
		5200	13.92	≤23.98	PASS
		5240	14.04	≤23.98	PASS
		5260	14.42	≤23.98	PASS
		5280	14.12	≤23.98	PASS
		5320	14.40	≤23.98	PASS
		5500	13.93	≤23.98	PASS
		5580	14.07	≤23.98	PASS
		5700	13.87	≤23.98	PASS
		5745	14.79	≤30.00	PASS
		5785	14.56	≤30.00	PASS
		5825	14.51	≤30.00	PASS
11N40SISO	Ant1	5190	19.85	≤23.98	PASS
		5230	19.12	≤23.98	PASS
		5270	18.96	≤23.98	PASS
		5310	18.93	≤23.98	PASS
		5510	19.15	≤23.98	PASS
		5550	19.36	≤23.98	PASS
		5670	19.25	≤23.98	PASS
		5755	19.57	≤30.00	PASS
		5795	19.48	≤30.00	PASS
11AC20SISO	Ant1	5180	16.13	≤23.98	PASS
		5200	16.54	≤23.98	PASS
		5240	16.59	≤23.98	PASS
		5260	16.61	≤23.98	PASS
		5280	16.46	≤23.98	PASS
		5320	16.27	≤23.98	PASS
		5500	16.44	≤23.98	PASS
		5580	16.60	≤23.98	PASS
		5700	16.34	≤23.98	PASS
		5745	16.90	≤30.00	PASS
		5785	17.17	≤30.00	PASS
		5825	17.01	≤30.00	PASS
11AC40SISO	Ant1	5190	19.32	≤23.98	PASS
		5230	19.41	≤23.98	PASS
		5270	19.35	≤23.98	PASS
		5310	19.31	≤23.98	PASS
		5510	19.69	≤23.98	PASS
		5550	19.92	≤23.98	PASS
		5670	19.75	≤23.98	PASS
		5755	20.11	≤30.00	PASS
		5795	20.33	≤30.00	PASS
11AC80SISO	Ant1	5210	15.35	≤23.98	PASS
		5290	15.50	≤23.98	PASS
		5530	16.09	≤23.98	PASS
		5610	15.92	≤23.98	PASS
		5775	17.19	≤30.00	PASS

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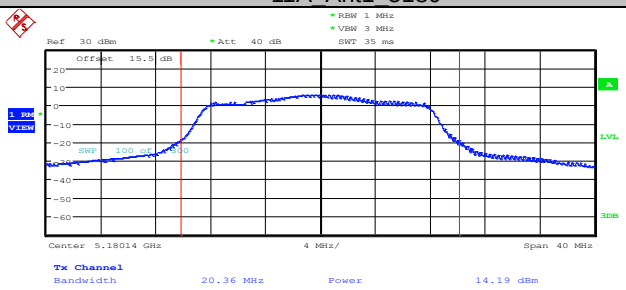

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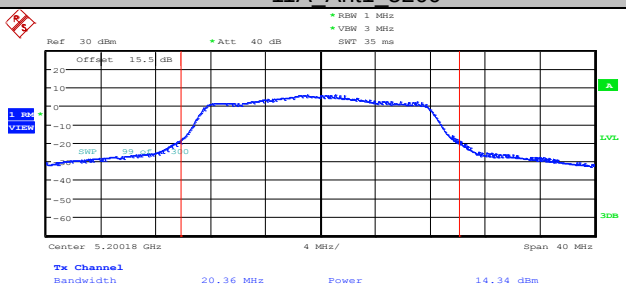

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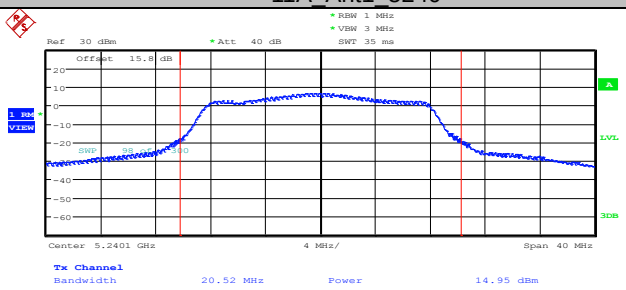

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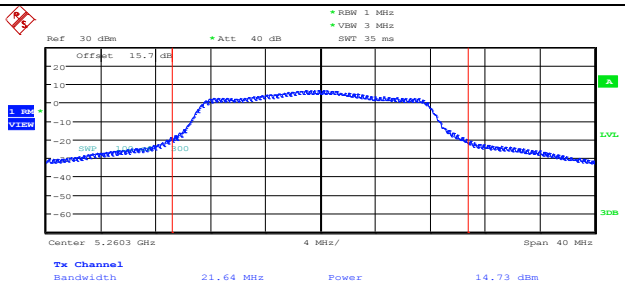

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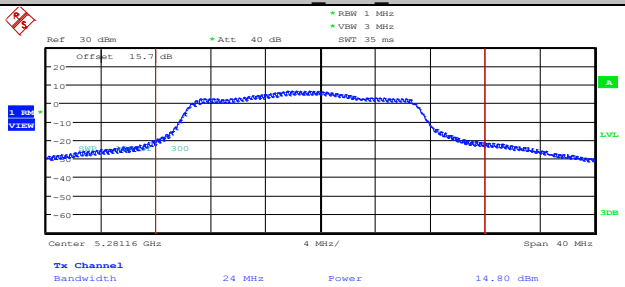

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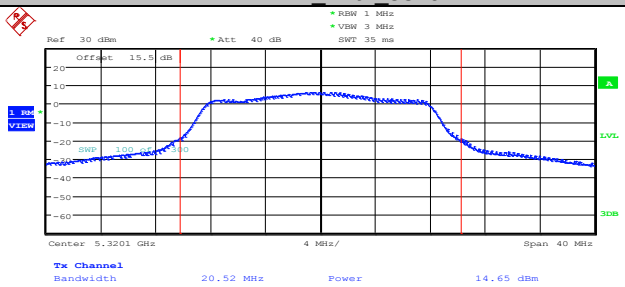

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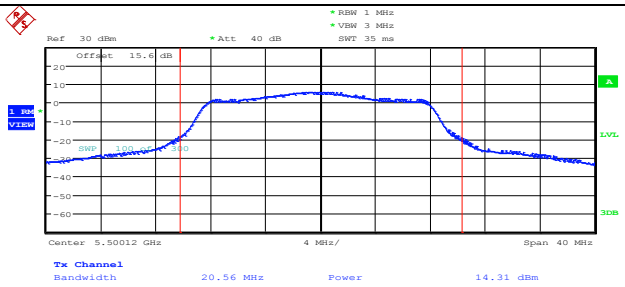

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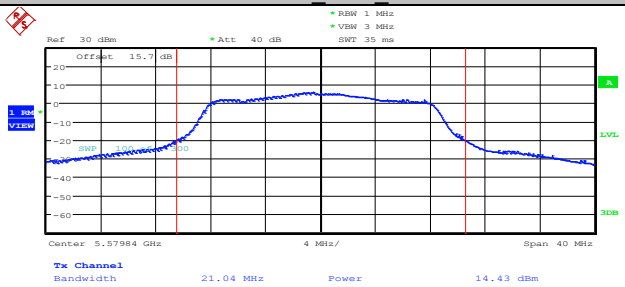

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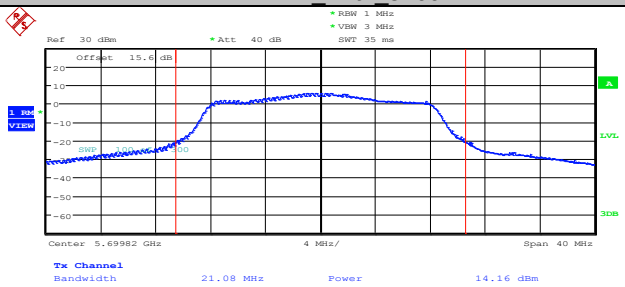

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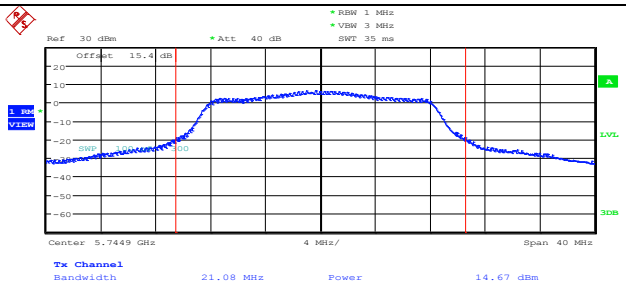

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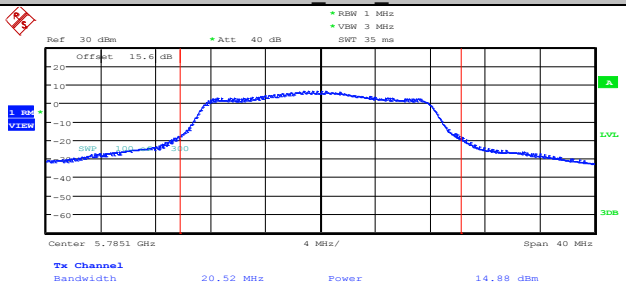

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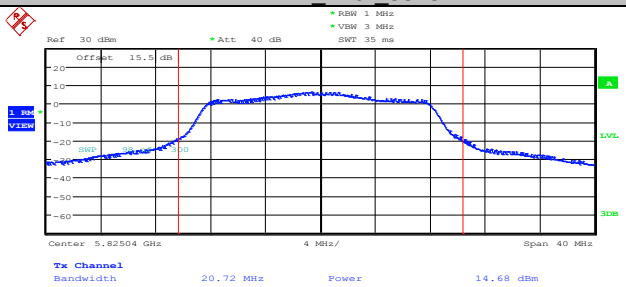

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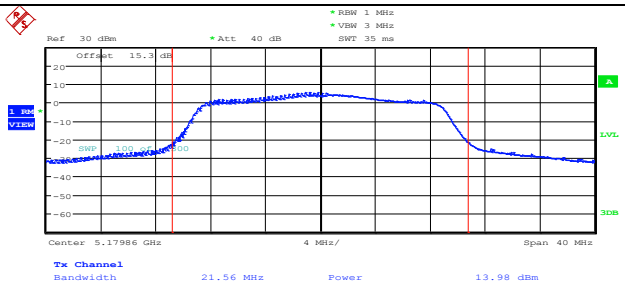

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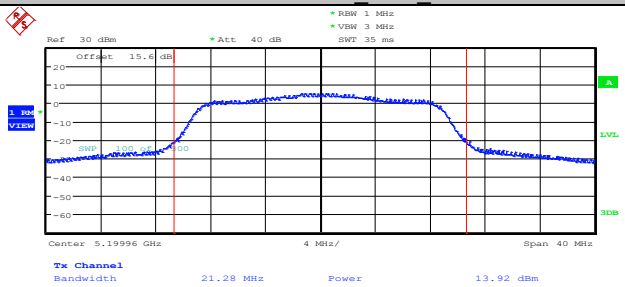

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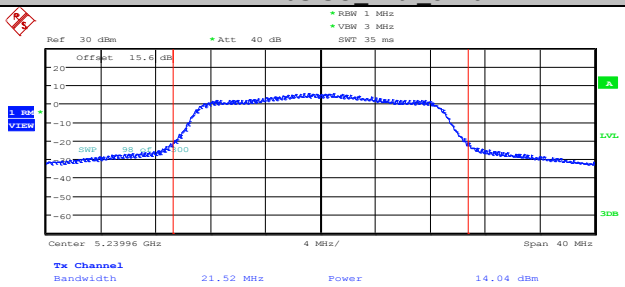

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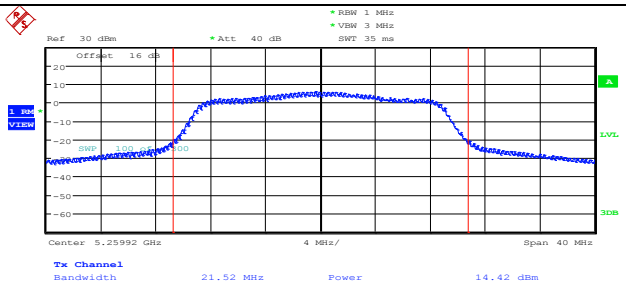

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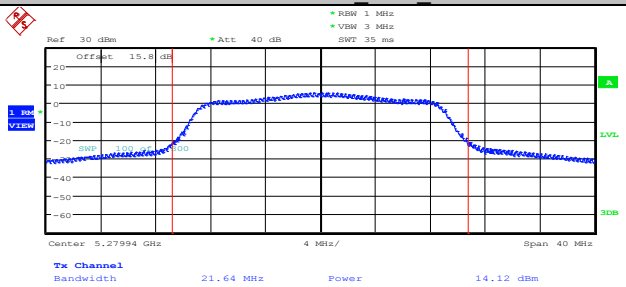

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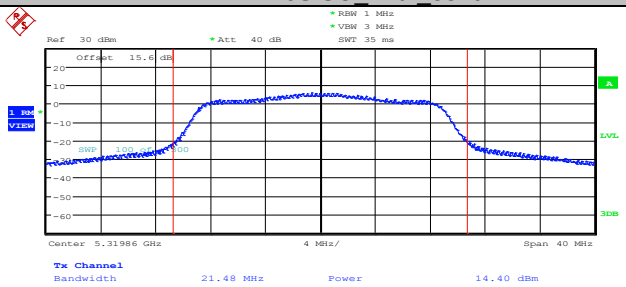

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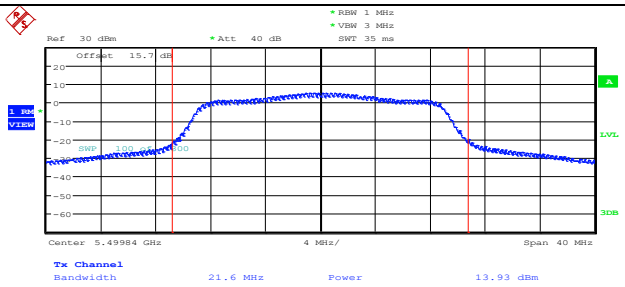

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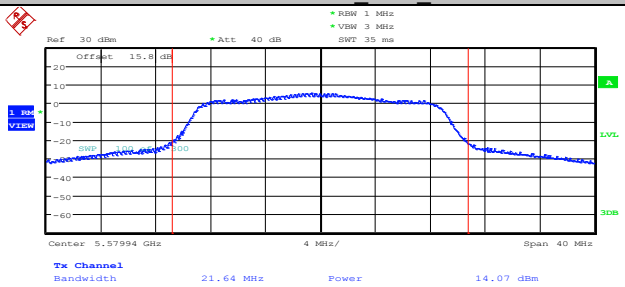

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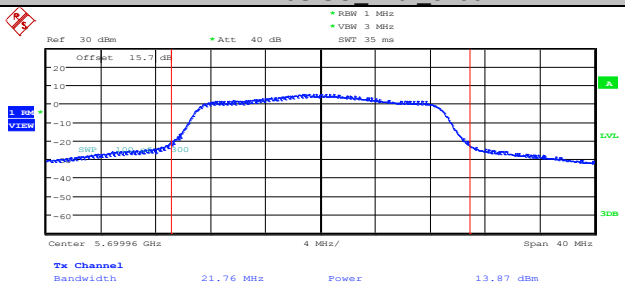

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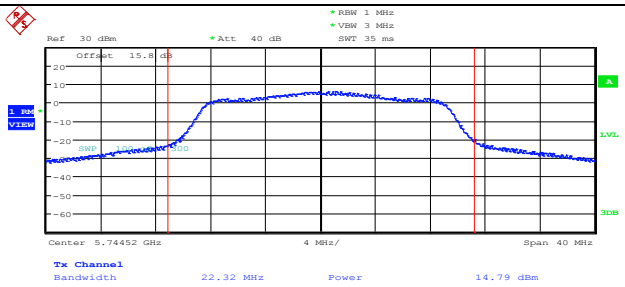

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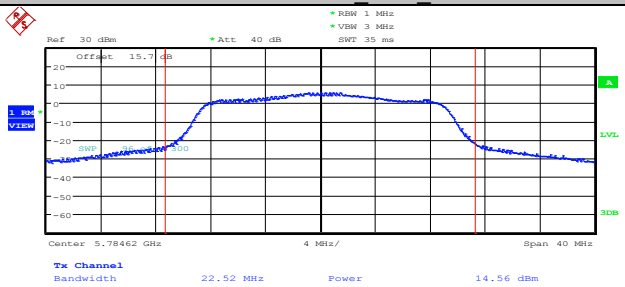

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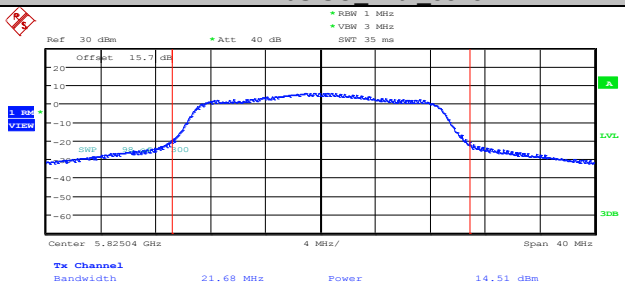

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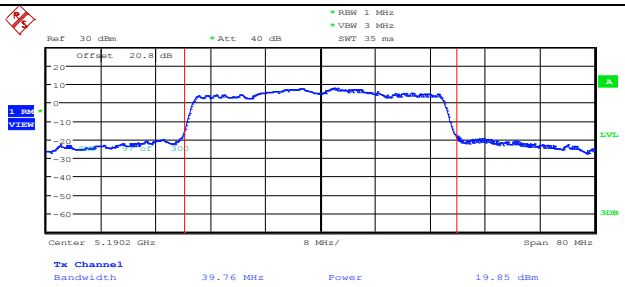

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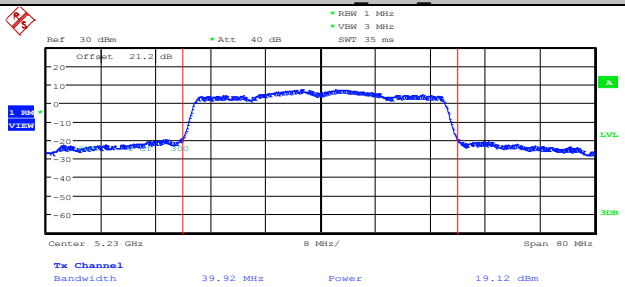

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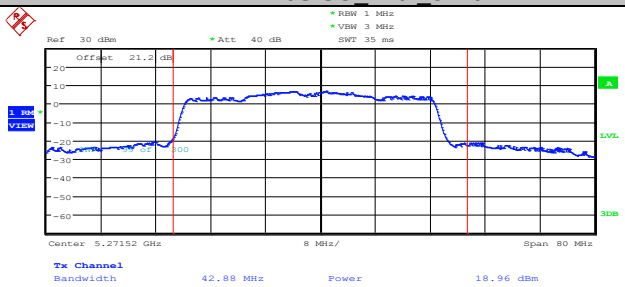

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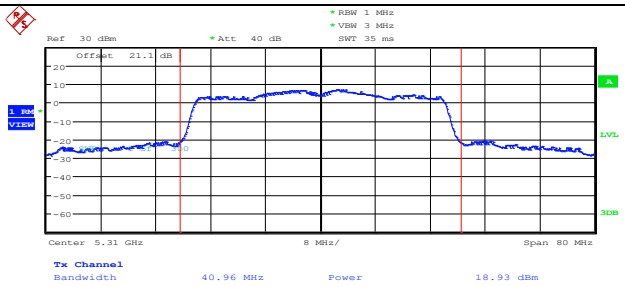

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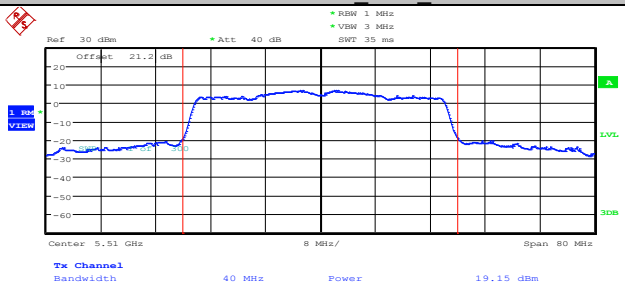

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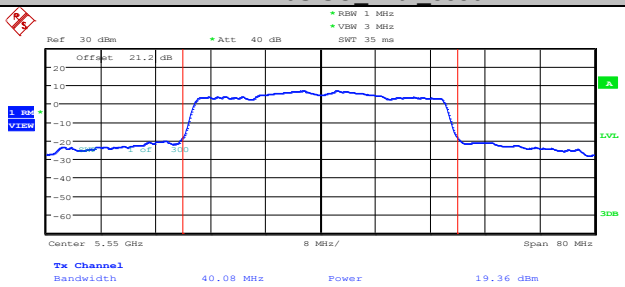

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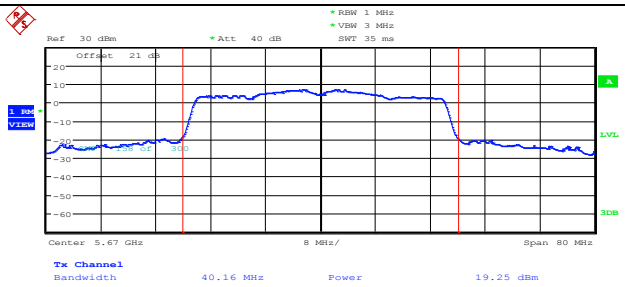

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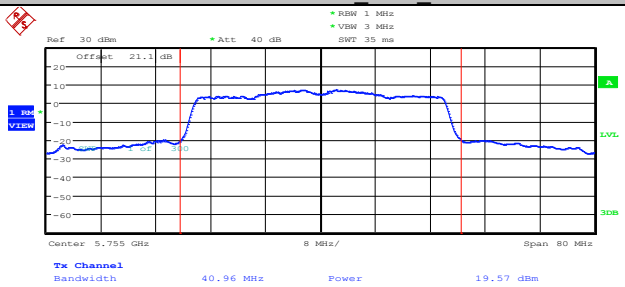

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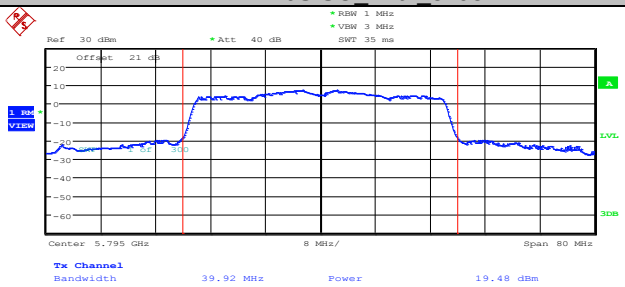

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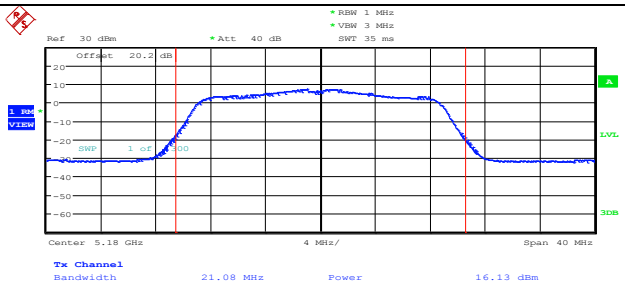

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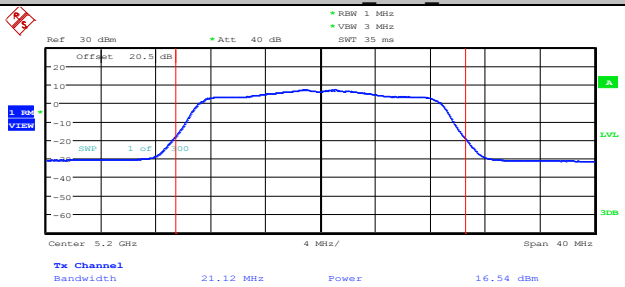

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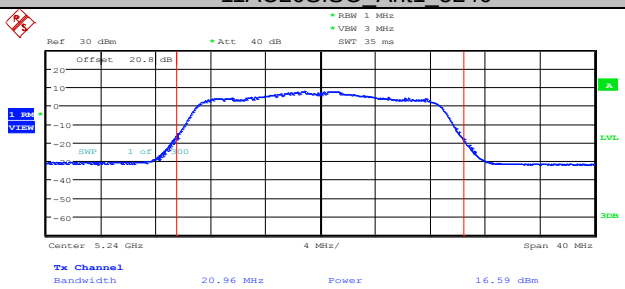

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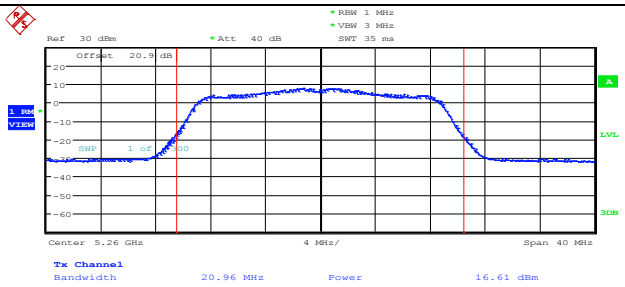

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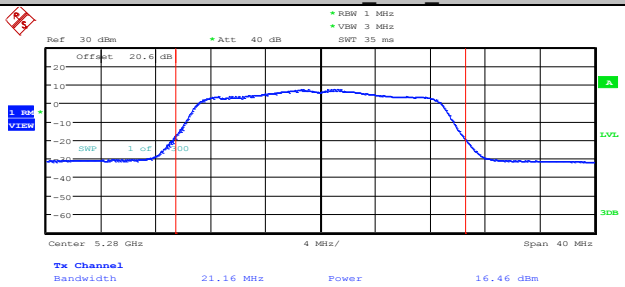

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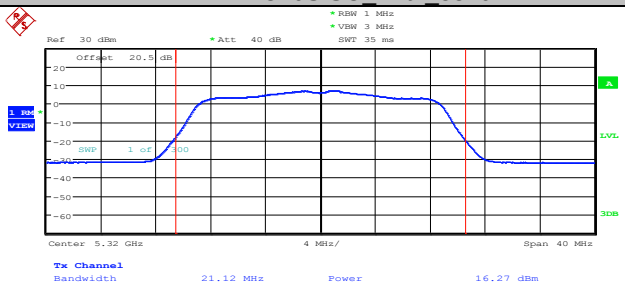

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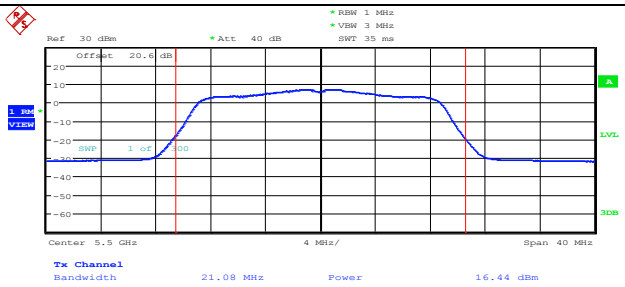

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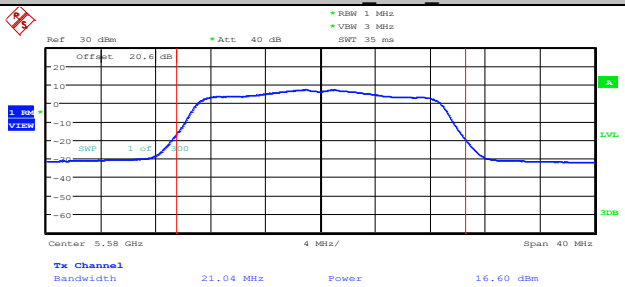

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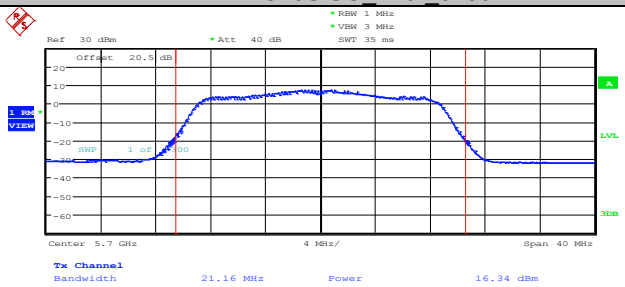

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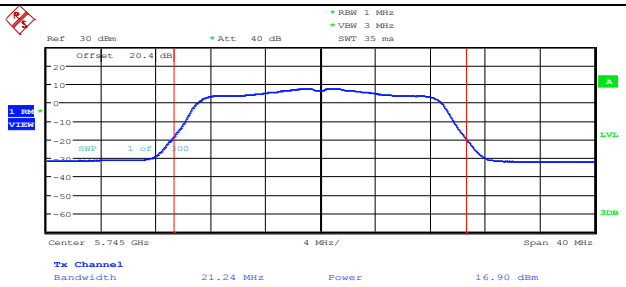

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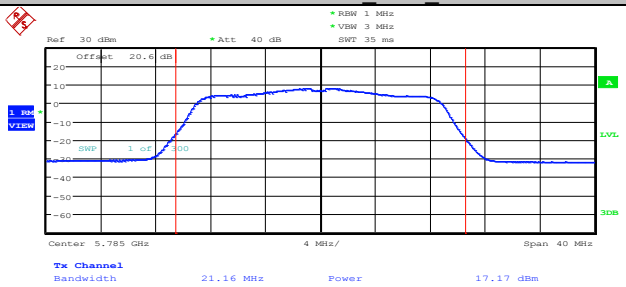

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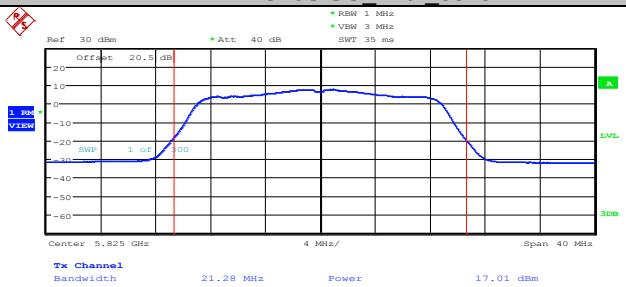

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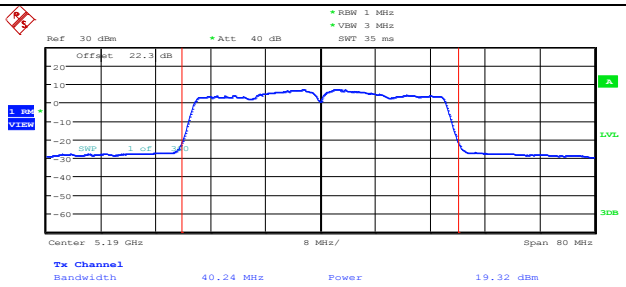

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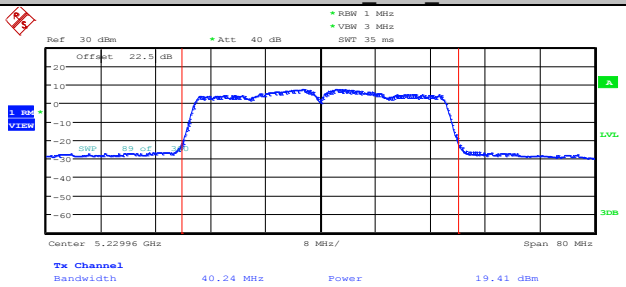

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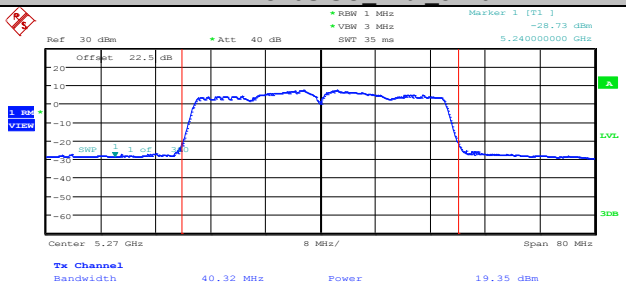

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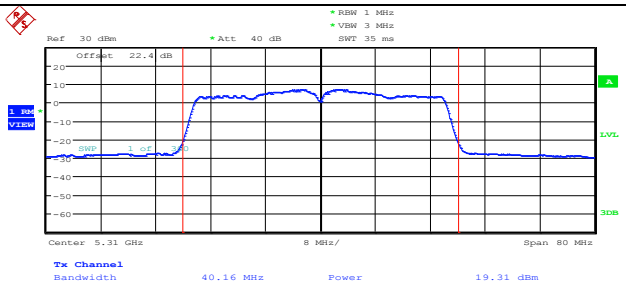

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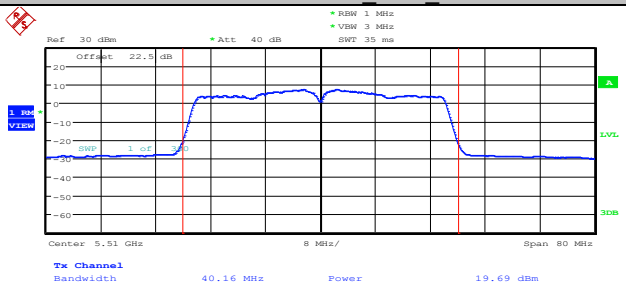

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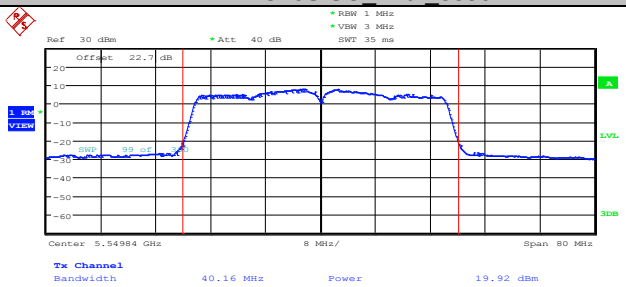

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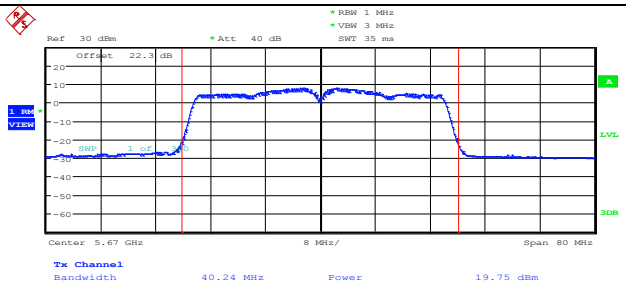

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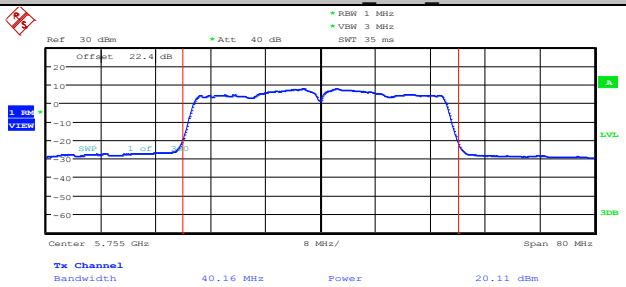

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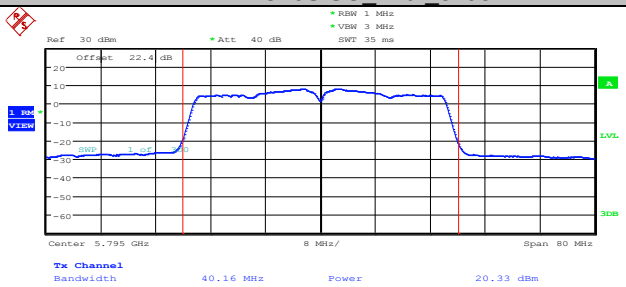

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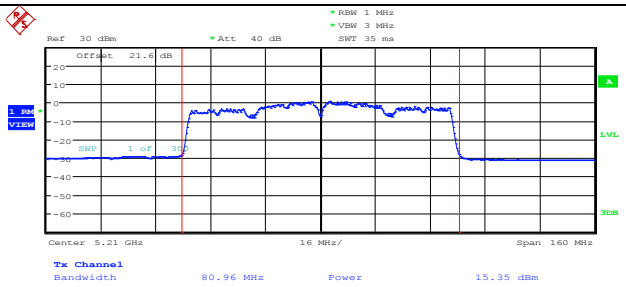

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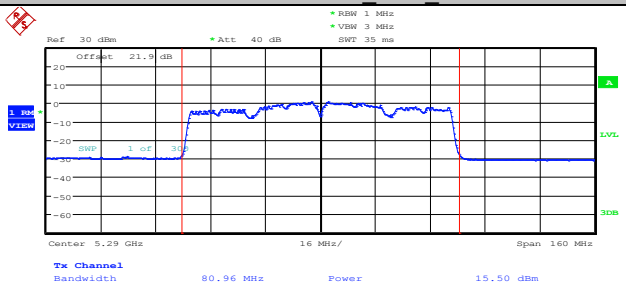

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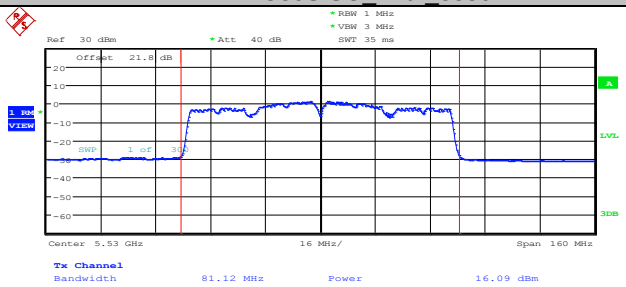

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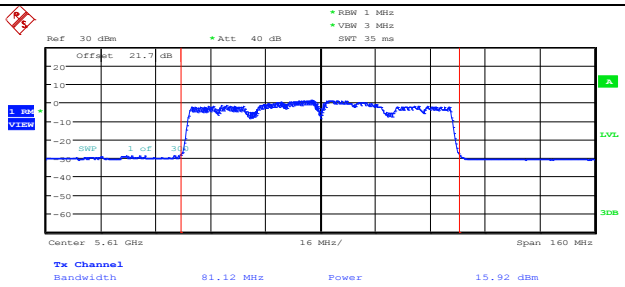

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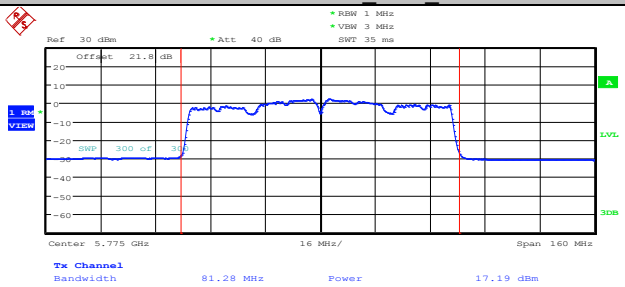

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9. MAXIMUM POWER SPECTRAL DENSITY LEVEL MEASUREMENT

9.1. Limits of Maximum Power Spectral Density Level Measurement

CFR 47 (FCC) part 15.407 (a)

For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

9.2. Test Procedure

1.Create an average power spectrum for the EUT operating mode being tested by following the instructions in section II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, “Compute power….” (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)

2. Use the peak search function on the instrument to find the peak of the spectrum and record its value.

3. Make the following adjustments to the peak value of the spectrum, if applicable:

a) If Method SA-2 or SA-2 Alternative was used, add 10 log (1/x), where x is the duty cycle, to the peak of the spectrum.

b) If Method SA-3 Alternative was used and the linear mode was used in step II.E.2.g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.

4. The result is the Maximum PSD over 1 MHz reference bandwidth.

5. For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or

500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and 789033 D02 General UNII Test Procedures New Rules v01r02 Page 10 integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:
a) Set RBW ≥ 1/T, where T is defined in section II.B.l.a).
b) Set VBW ≥ 3 RBW.
c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10 log (500 kHz/RBW) to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add
10 log (1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.
Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the sections
5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

9.3. Test Data

Maximum Power Spectral Density Level

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11A	Ant1	5180	7.7	≤11.00	PASS
		5200	7.99	≤11.00	PASS
		5240	8.48	≤11.00	PASS
		5260	8.23	≤11.00	PASS
		5280	8.27	≤11.00	PASS
		5320	8.09	≤11.00	PASS
		5500	7.98	≤11.00	PASS
		5580	8.01	≤11.00	PASS
		5700	7.76	≤11.00	PASS
		5745	6.22	≤30.00	PASS
		5785	6.5	≤30.00	PASS
		5825	5.95	≤30.00	PASS
11N20SISO	Ant1	5180	7.91	≤11.00	PASS
		5200	7.84	≤11.00	PASS
		5240	7.84	≤11.00	PASS
		5260	8.08	≤11.00	PASS
		5280	7.95	≤11.00	PASS
		5320	8.25	≤11.00	PASS
		5500	7.88	≤11.00	PASS
		5580	8	≤11.00	PASS
		5700	7.95	≤11.00	PASS
		5745	6.43	≤30.00	PASS
		5785	6.23	≤30.00	PASS
		5825	5.97	≤30.00	PASS
11N40SISO	Ant1	5190	10	≤11.00	PASS
		5230	9.34	≤11.00	PASS
		5270	9.4	≤11.00	PASS
		5310	9.48	≤11.00	PASS
		5510	9.63	≤11.00	PASS
		5550	9.82	≤11.00	PASS
		5670	10.07	≤11.00	PASS
		5755	7.55	≤30.00	PASS
		5795	8.05	≤30.00	PASS
11AC20SISO	Ant1	5180	8.96	≤11.00	PASS
		5200	9.48	≤11.00	PASS

		5240	9.31	≤11.00	PASS
		5260	9.36	≤11.00	PASS
		5280	9.24	≤11.00	PASS
		5320	9.25	≤11.00	PASS
		5500	9.22	≤11.00	PASS
		5580	9.24	≤11.00	PASS
		5700	9.2	≤11.00	PASS
		5745	7.31	≤30.00	PASS
		5785	8.04	≤30.00	PASS
		5825	7.67	≤30.00	PASS
11AC40SISO	Ant1	5190	9.84	≤11.00	PASS
		5230	9.67	≤11.00	PASS
		5270	9.88	≤11.00	PASS
		5310	9.7	≤11.00	PASS
		5510	10.08	≤11.00	PASS
		5550	10.27	≤11.00	PASS
		5670	10.5	≤11.00	PASS
		5755	8.1	≤30.00	PASS
		5795	8.85	≤30.00	PASS
11AC80SISO	Ant1	5210	3.66	≤11.00	PASS
		5290	3.43	≤11.00	PASS
		5530	4.07	≤11.00	PASS
		5610	4.03	≤11.00	PASS
		5775	2.9	≤30.00	PASS

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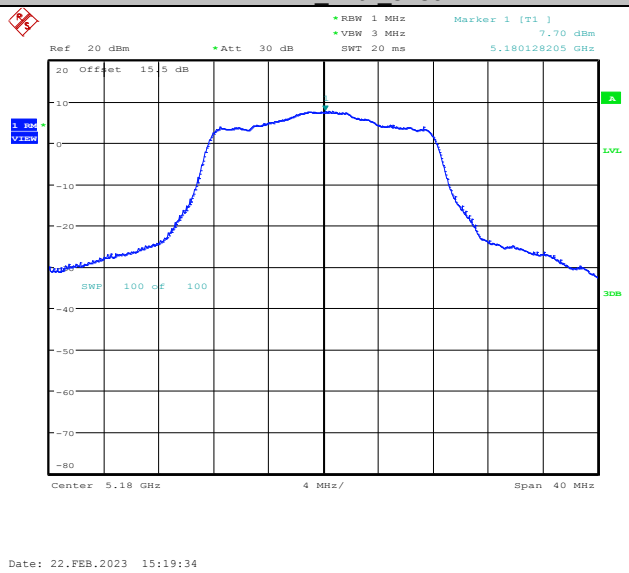

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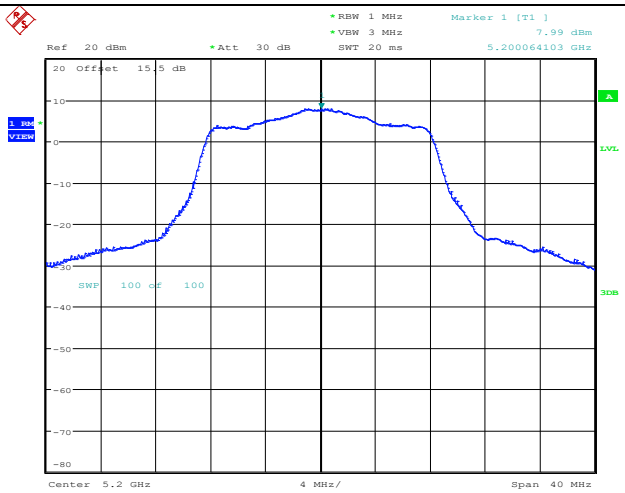

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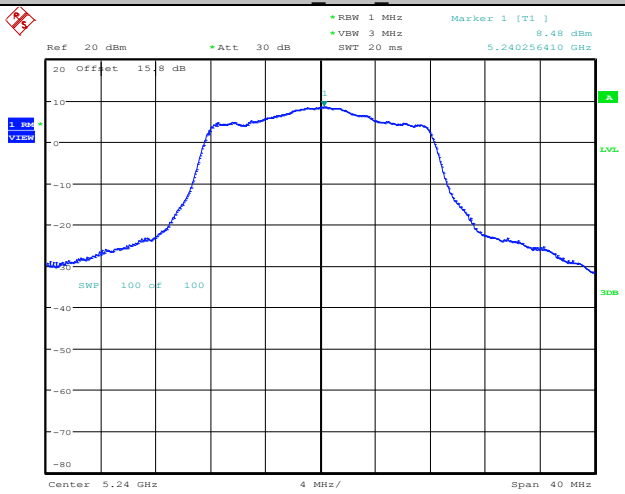

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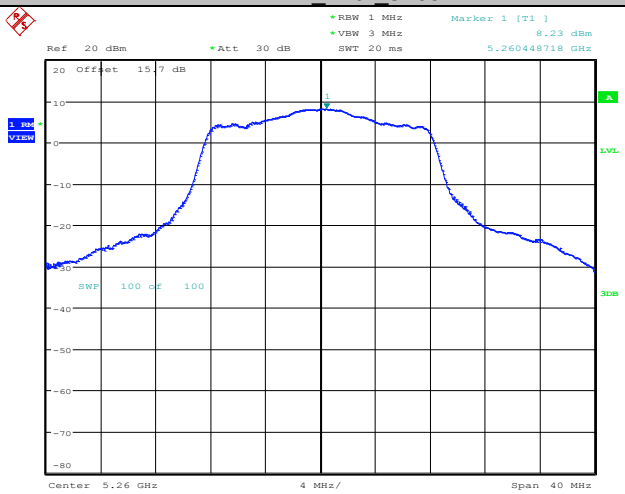

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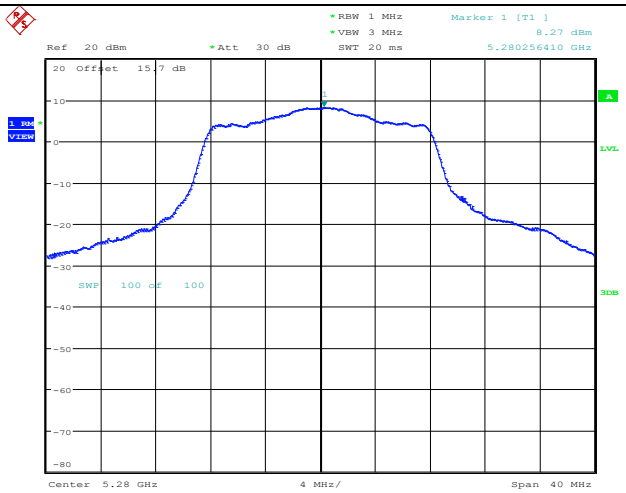

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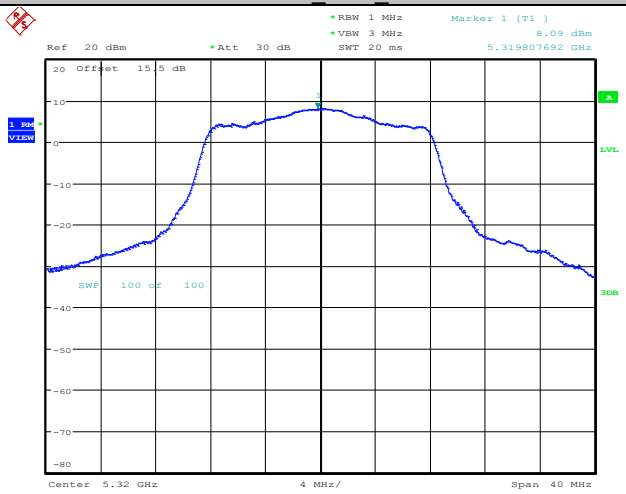

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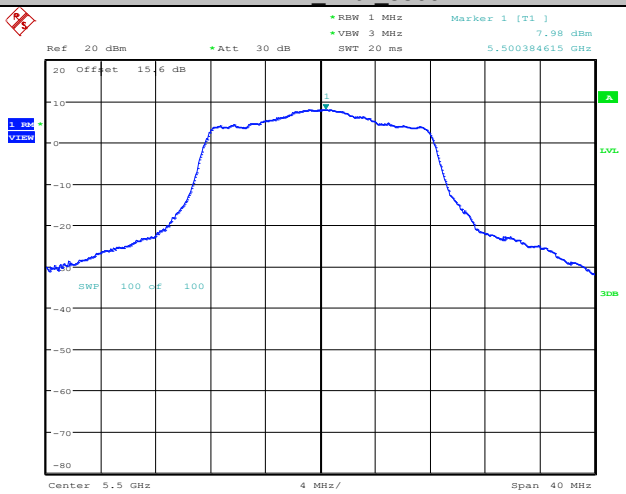

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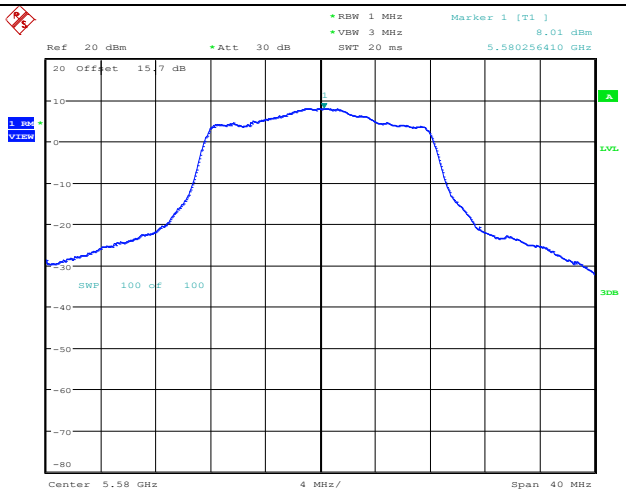

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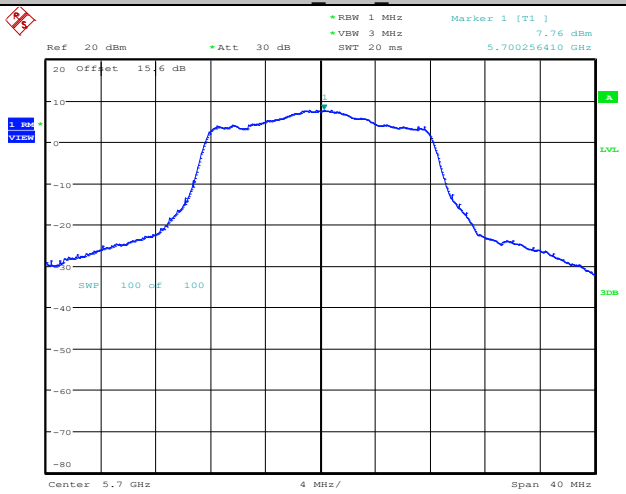

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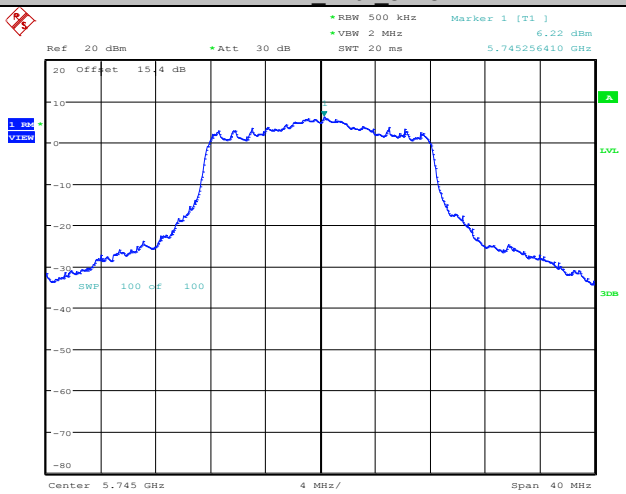

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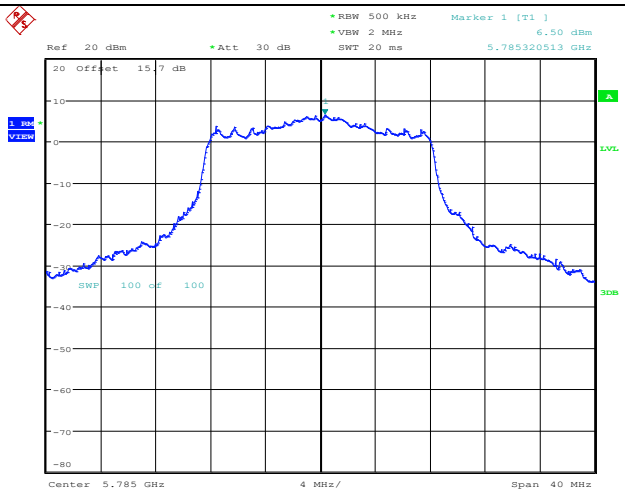

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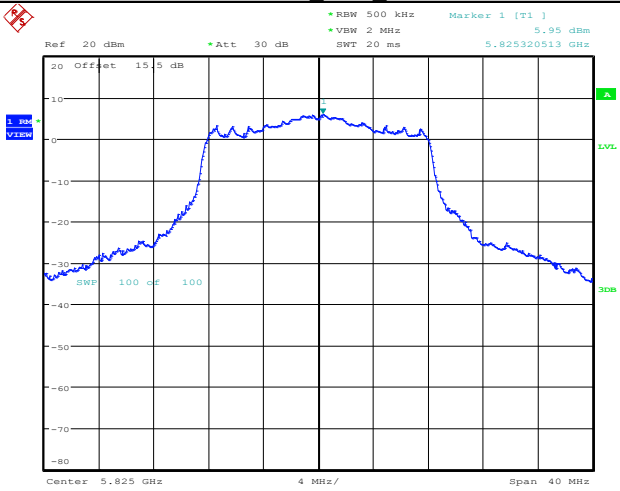

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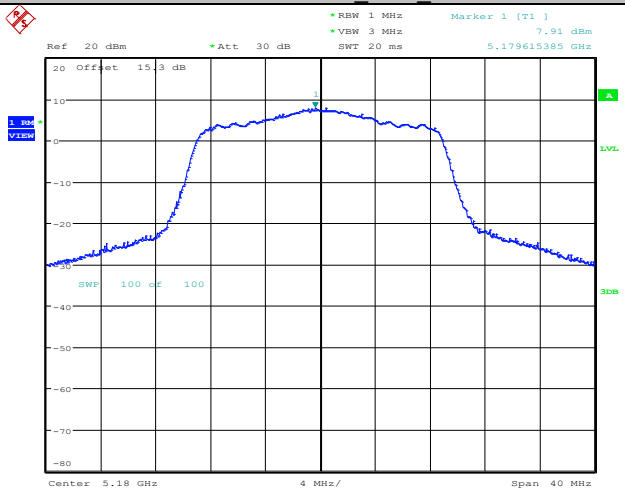

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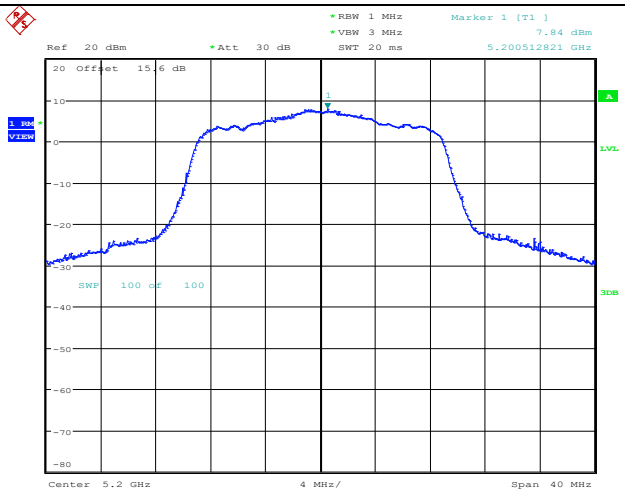

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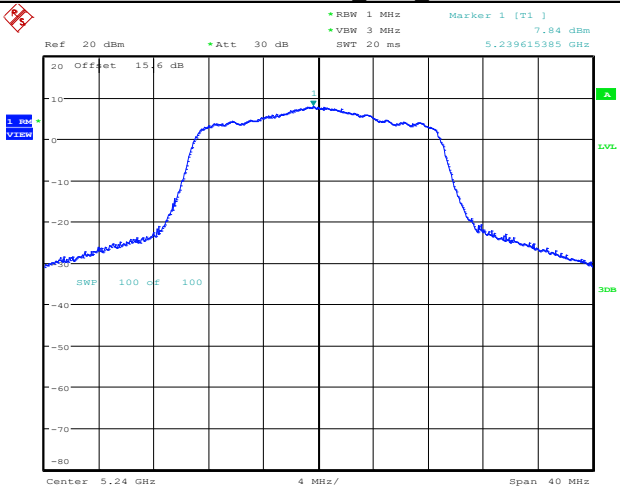

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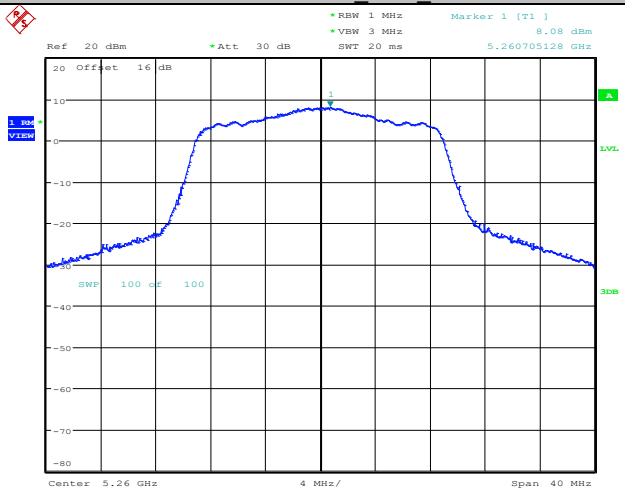

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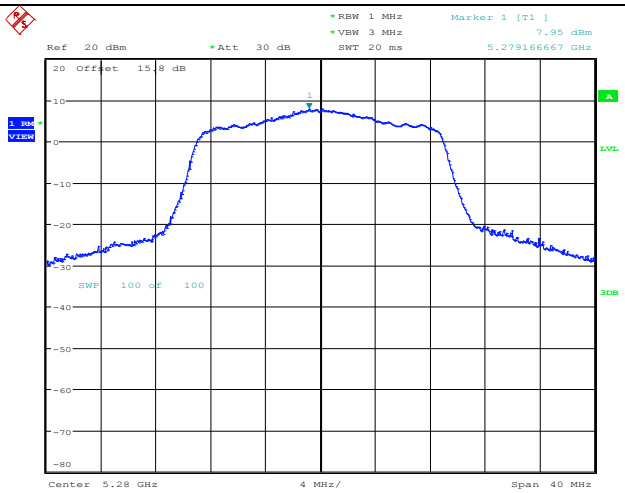

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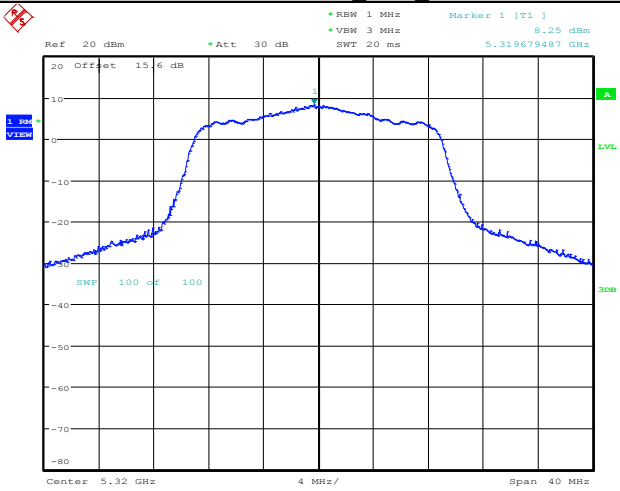

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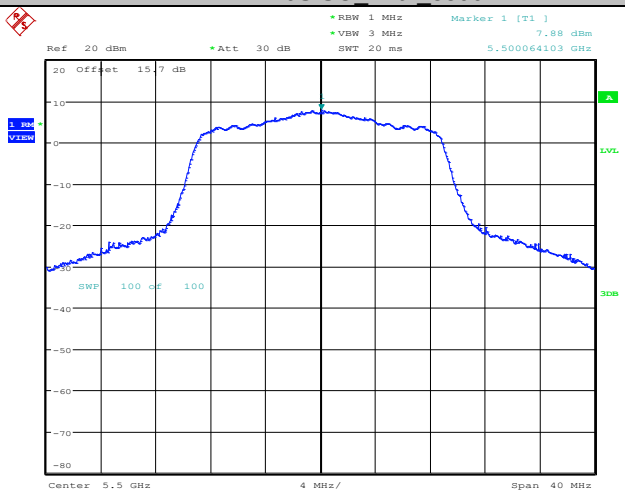

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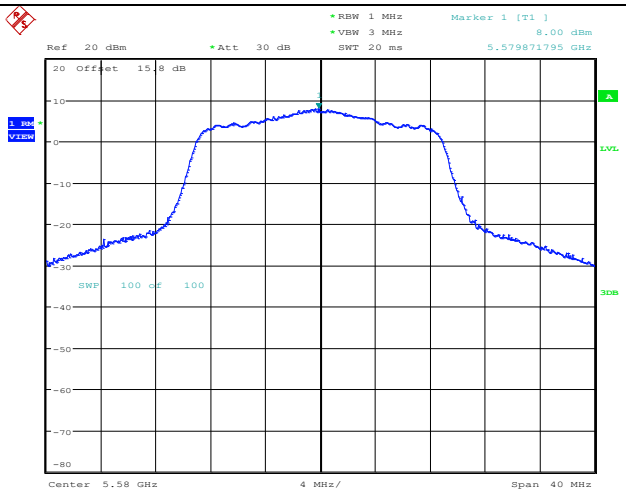

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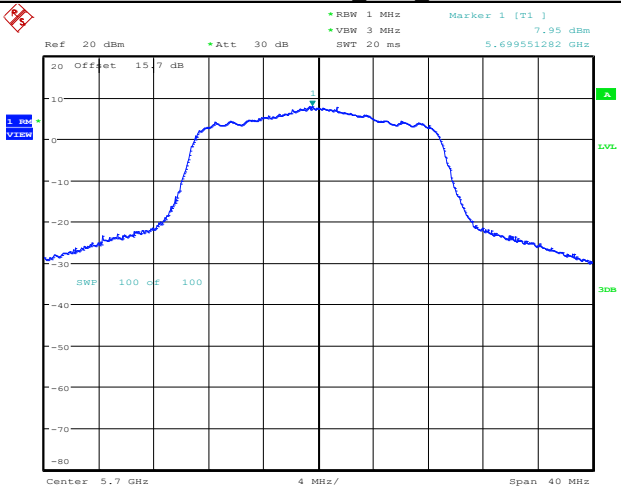

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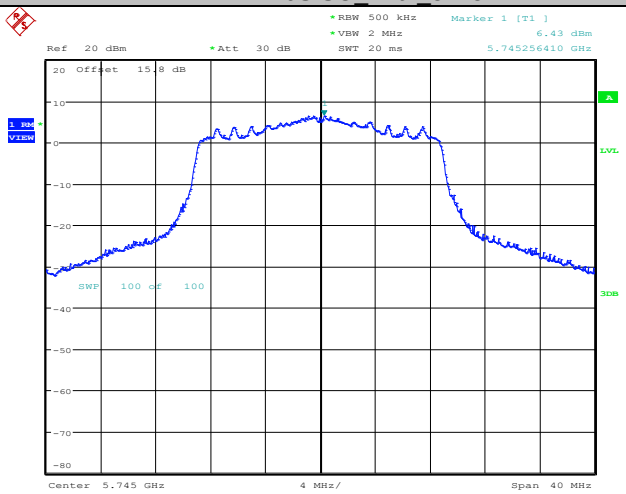

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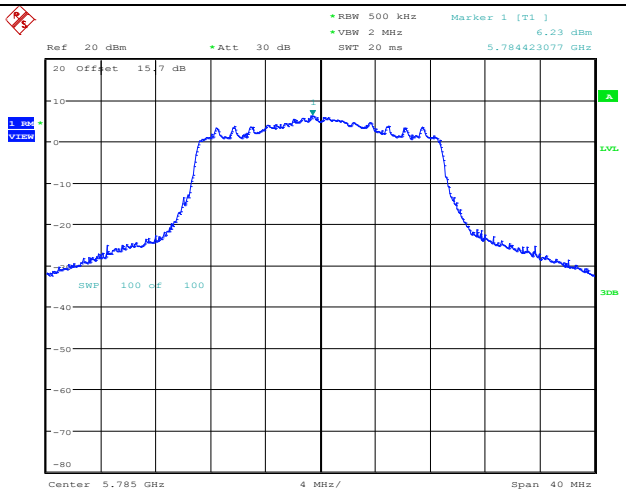

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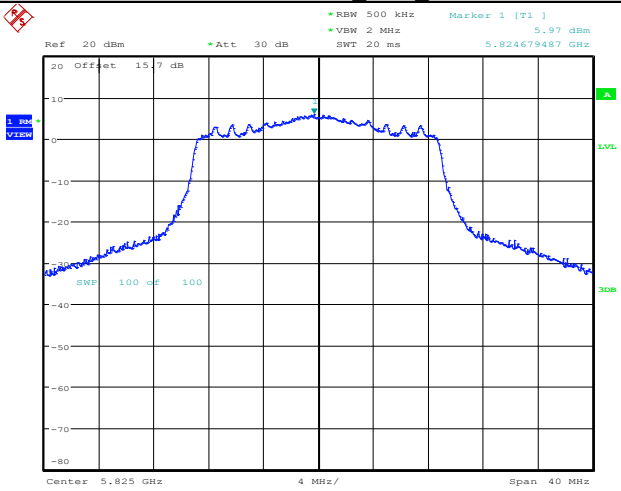

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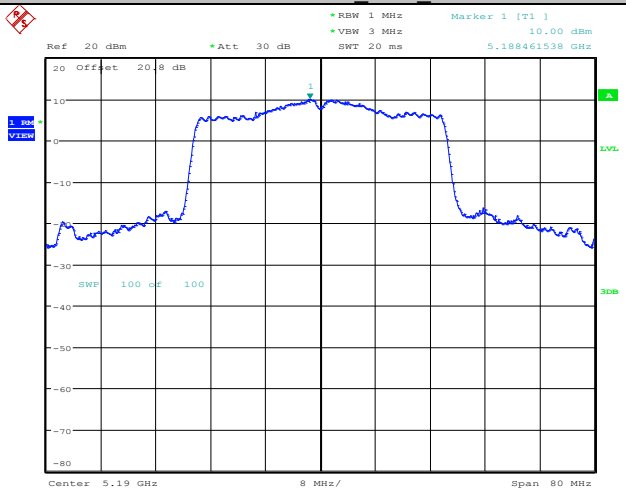

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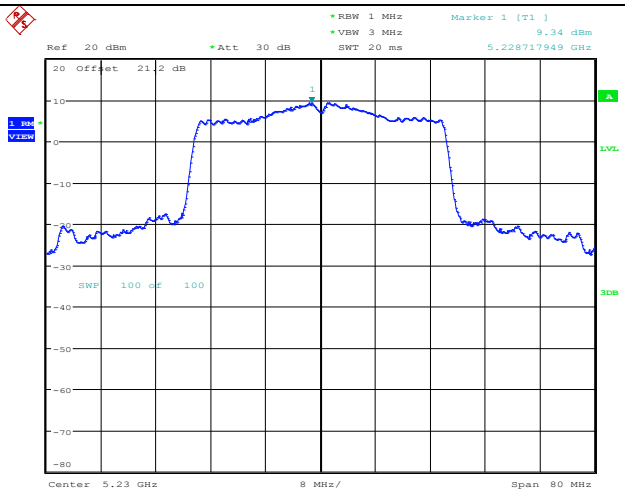

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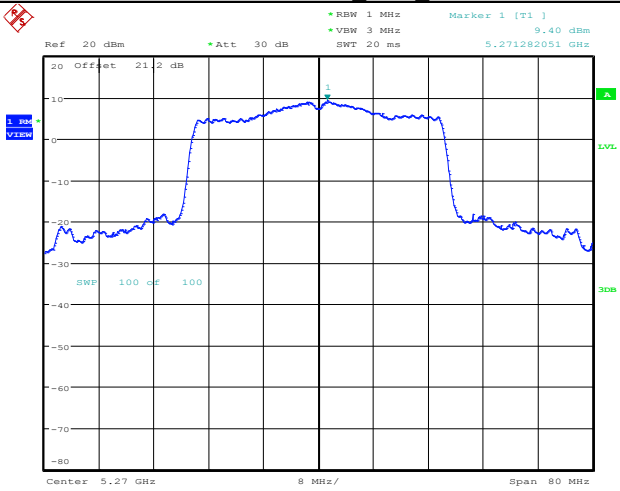

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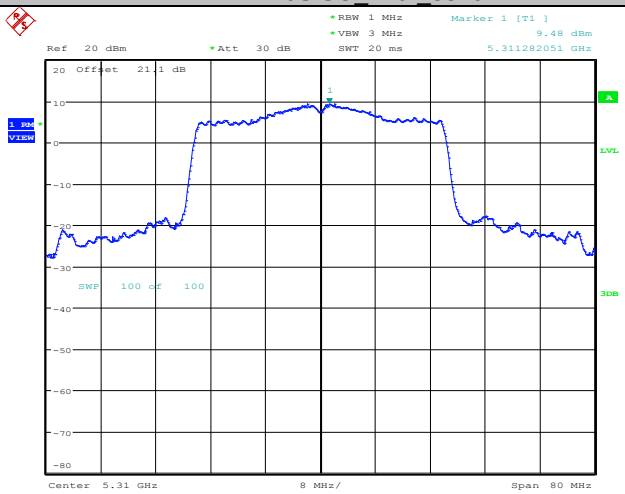

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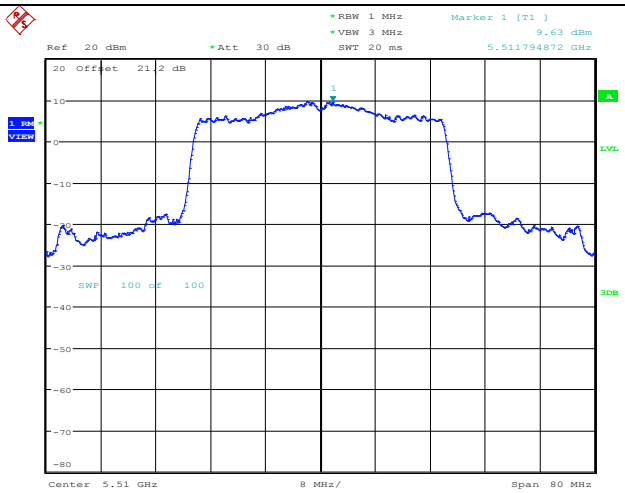

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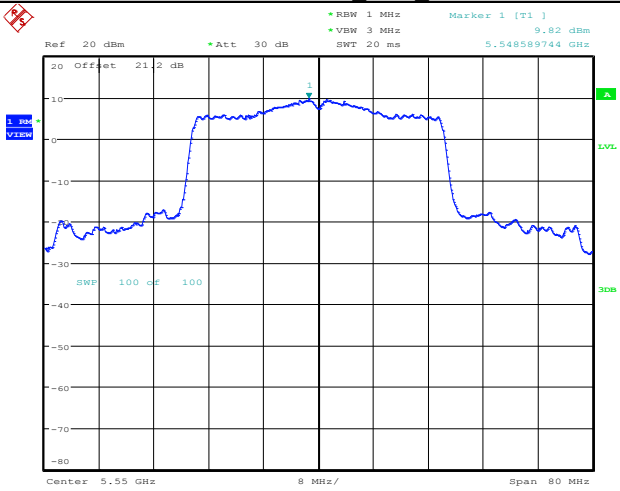

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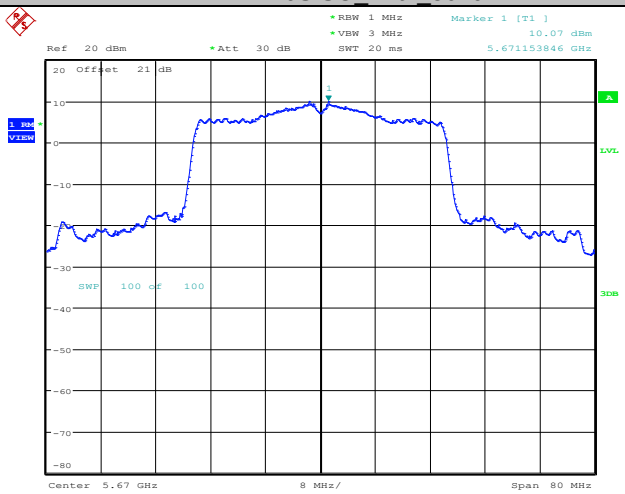

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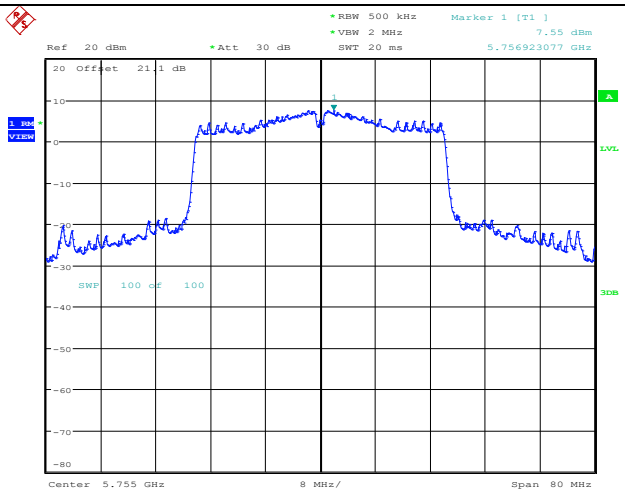

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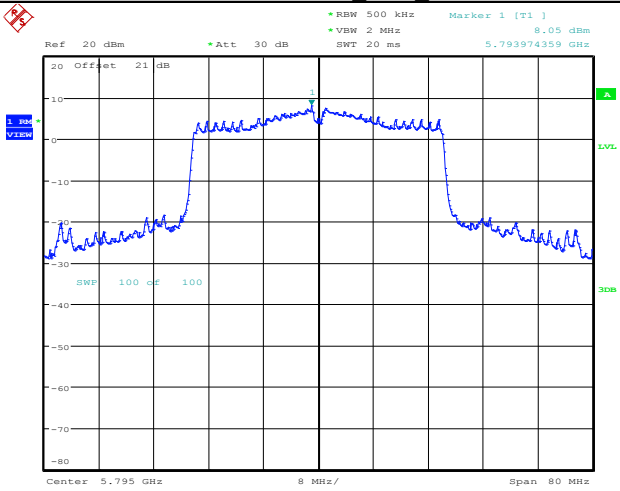

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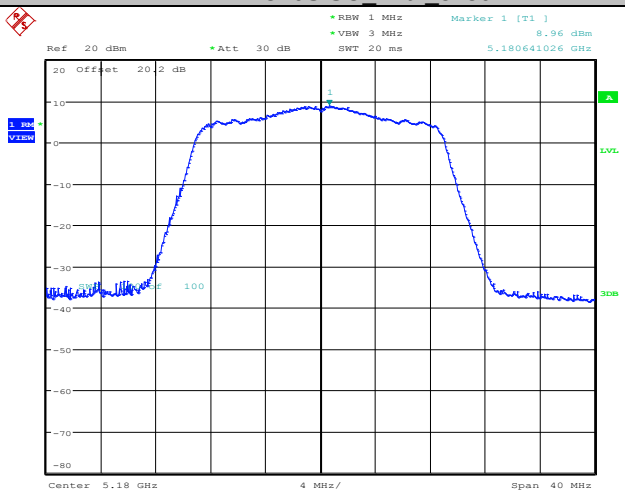

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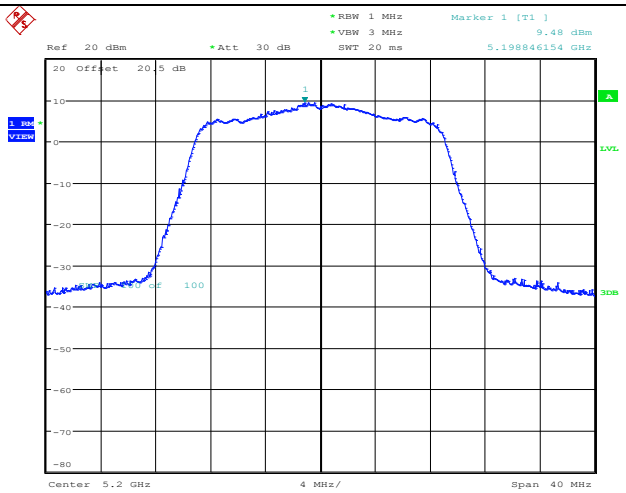

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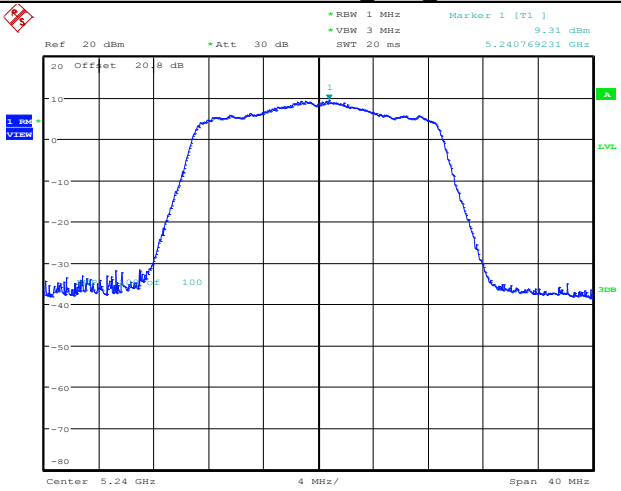

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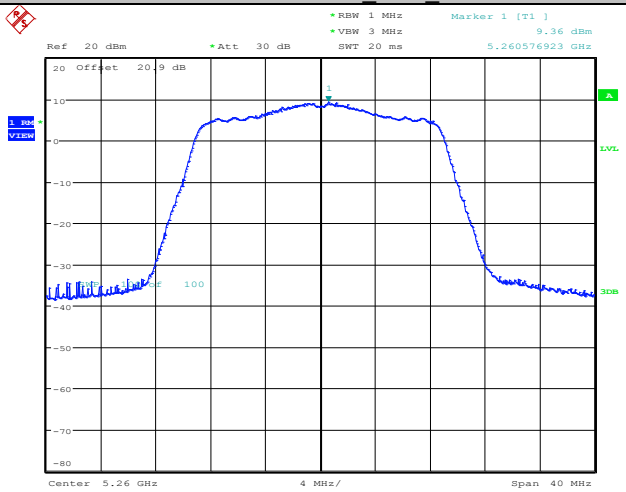

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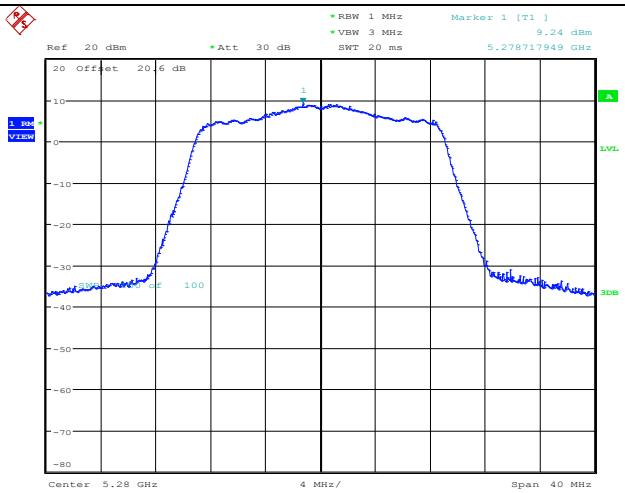

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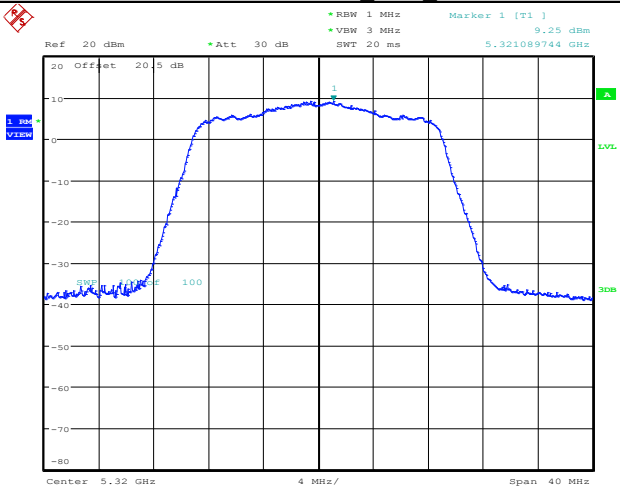

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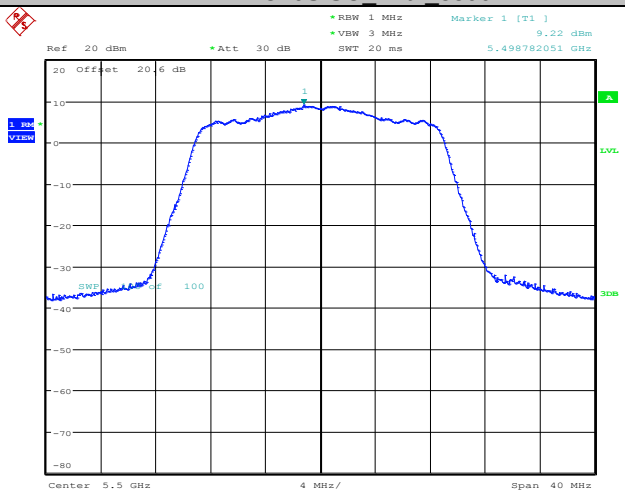

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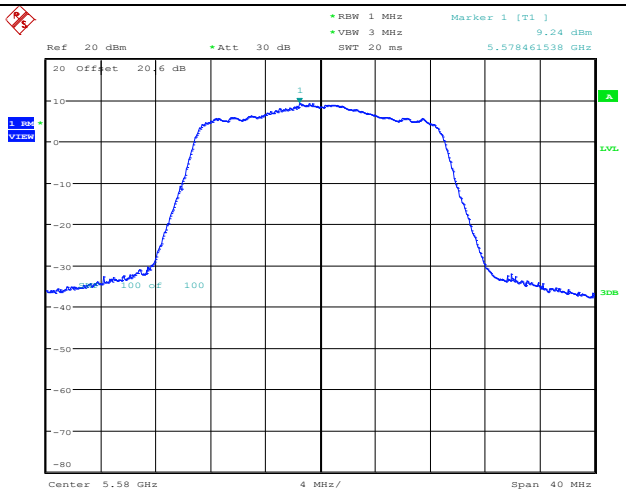

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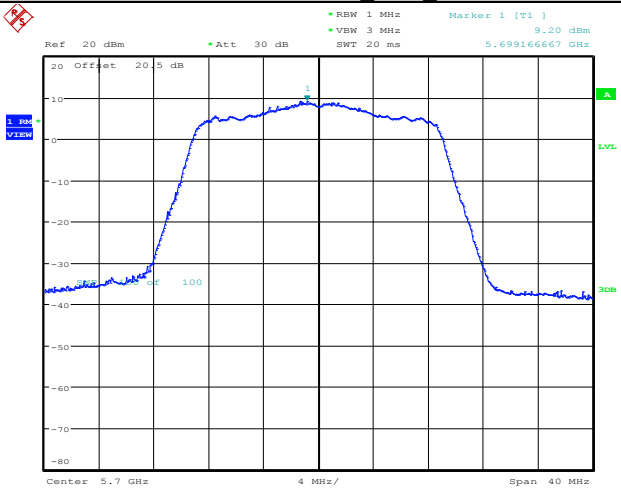

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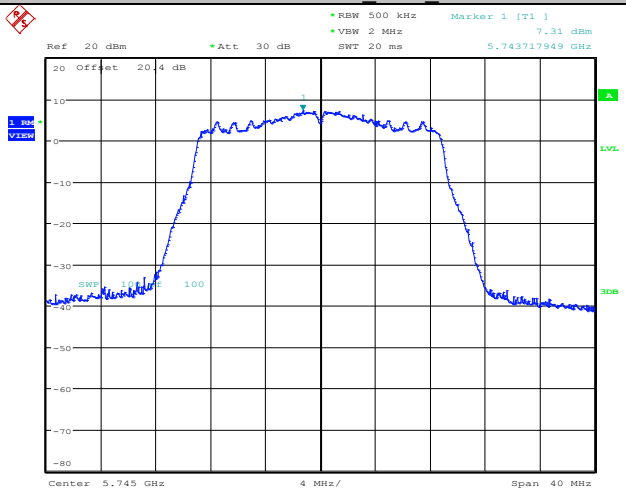

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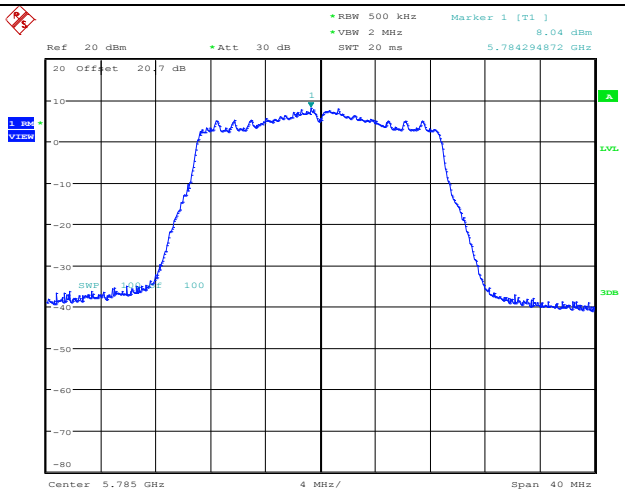

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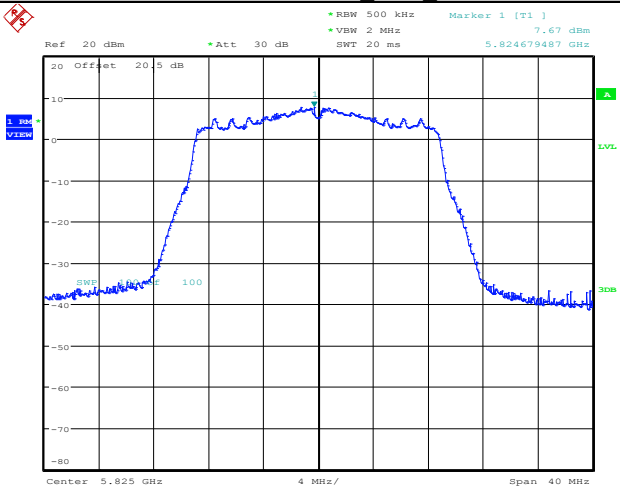

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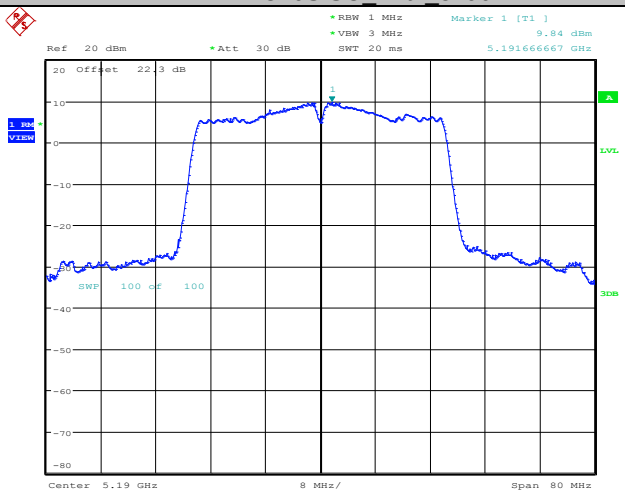

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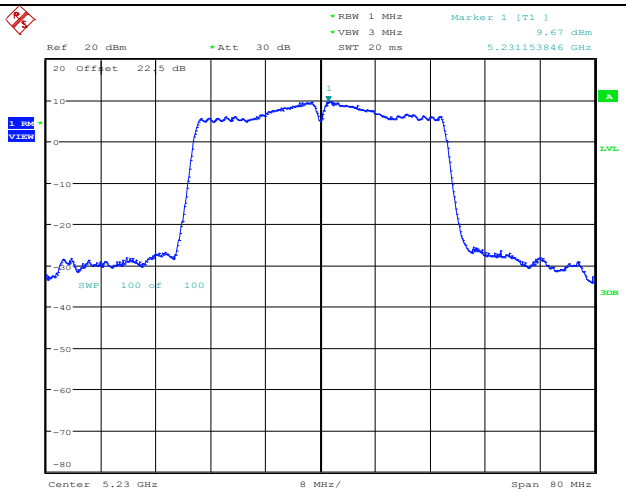

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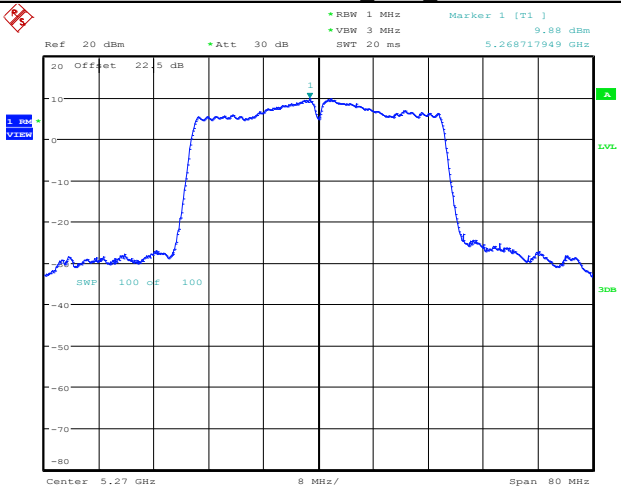

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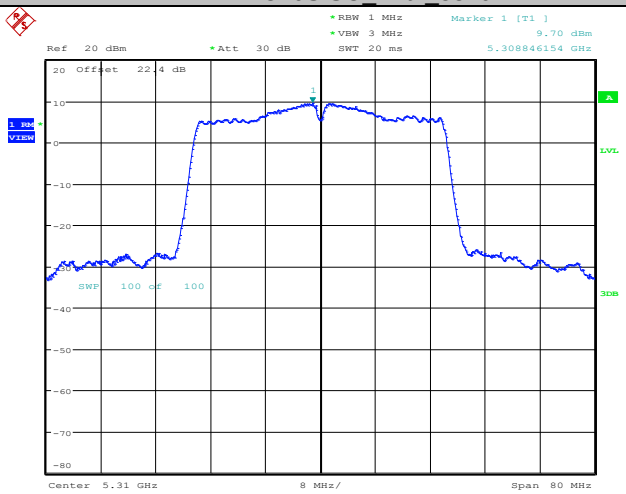

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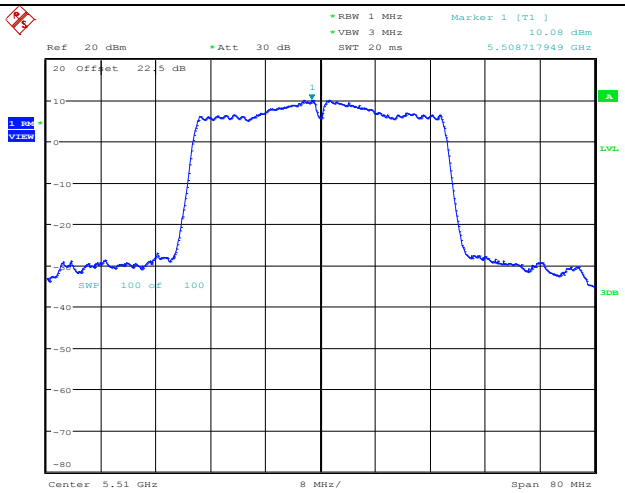

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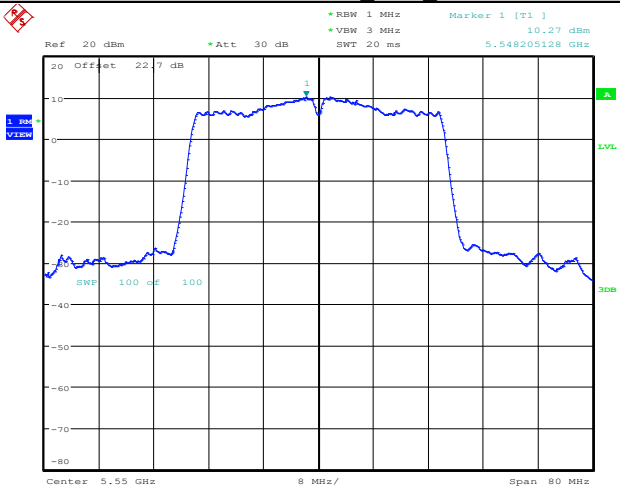

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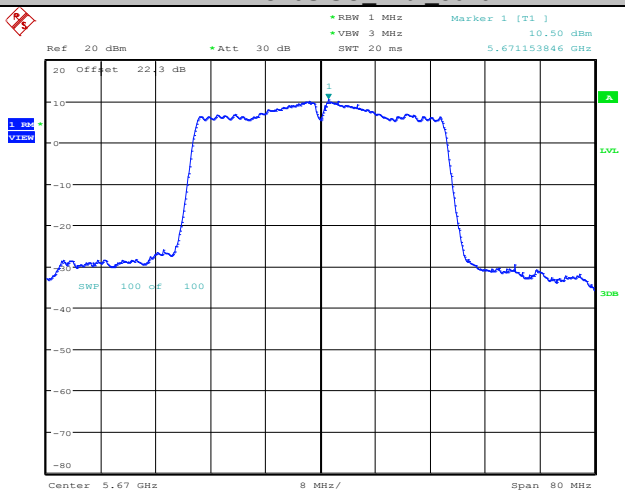

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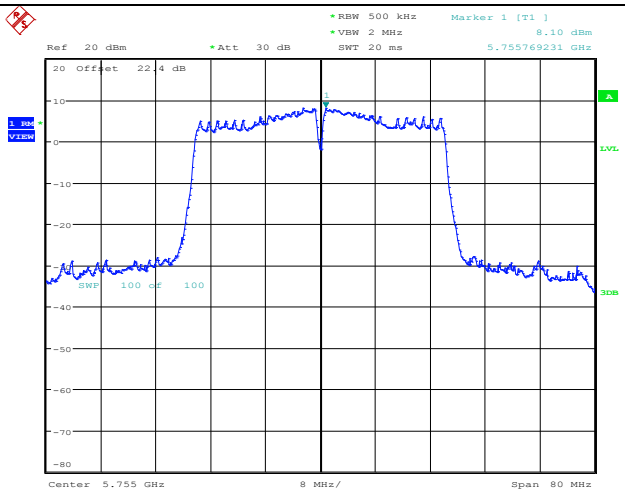

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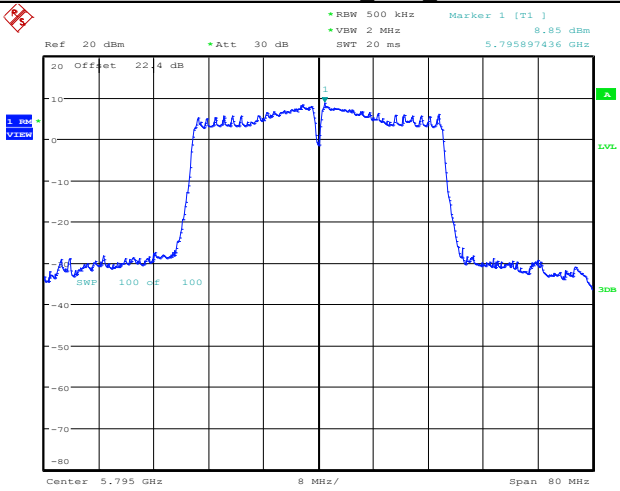

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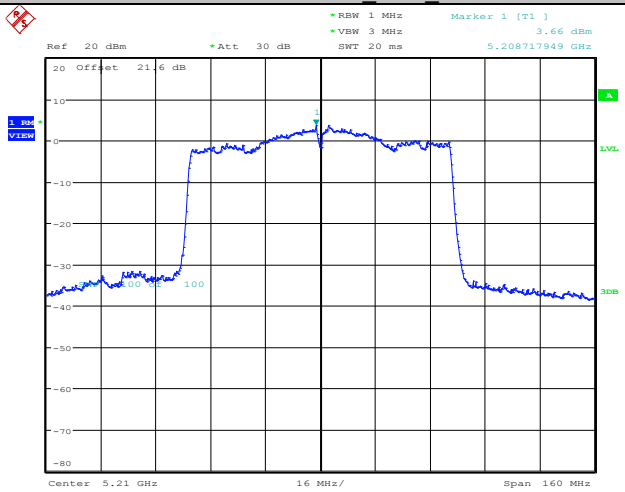

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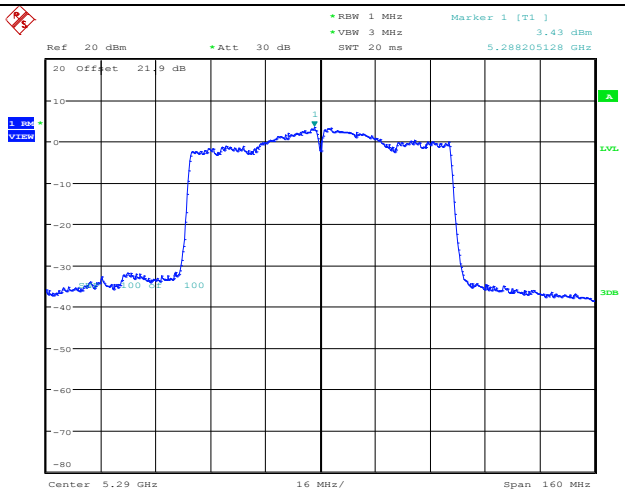

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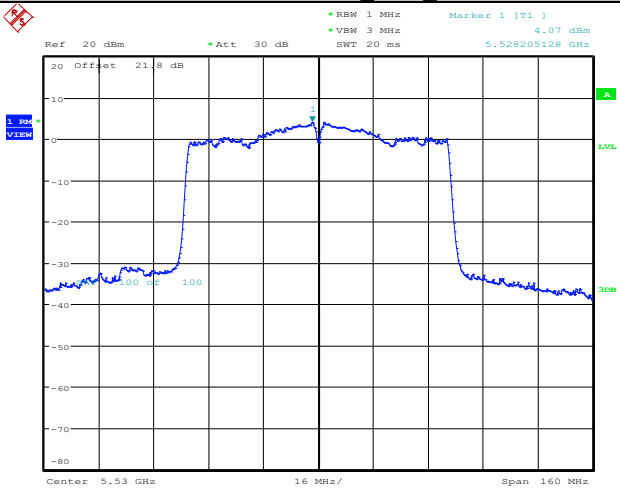

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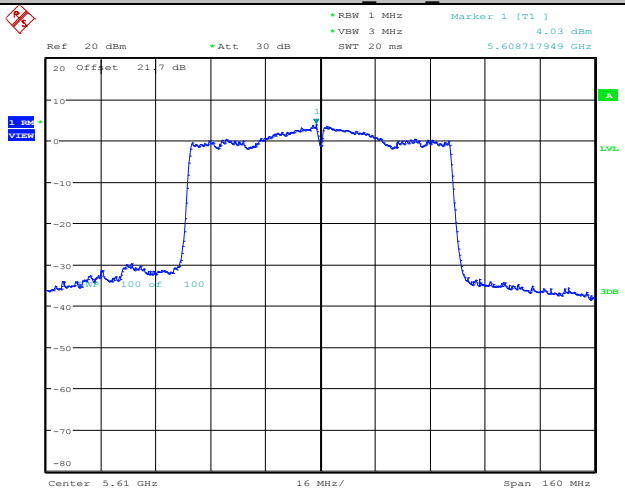

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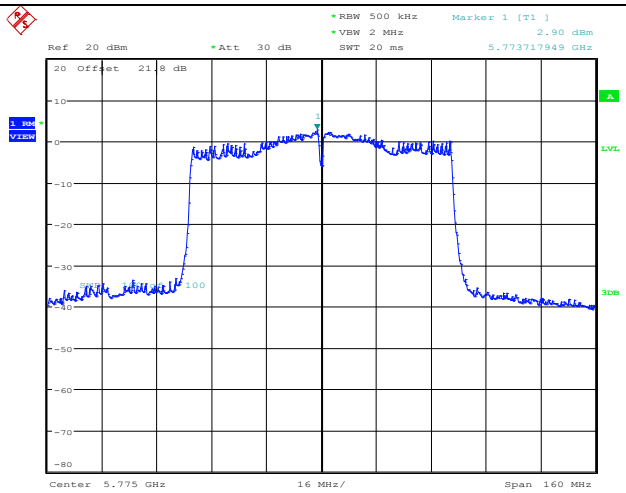

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10. RADIATED BANDEDGE AND SPURIOUS MEASUREMENT

10.1. LIMITS OF Radiated Bandedge and Spurious Measurement

FCC Part 15.205 and 15.209

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

FCC Part 15.407(b)

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

10.2. TEST PROCEDURE

1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. For measurement below 1GHz, the EUT was placed on a turntable with 0.8 meter,above ground. For measurement above 1 GHz, test at FAR, the EUT is placed on a non-conductive table, which is 1.5 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:

(1) Span shall wide enough to fully capture the emission being measured;

(2) Set RBW=100 kHz for f < 1 GHz; VBW >= RBW; Sweep = auto; Detector function = peak; Trace = max hold;

(3) Set RBW = 1 MHz, VBW= 3MHz for f > 1 GHz for peak measurement.

Set RBW = 1 MHz, and VBW= 1/T (on time) for average measurement.

10.3.TEST DATA

9 kHz-30MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the r esult which was 20dB lower than the limit line per 15.31(o) was not reported.

Table 9 Radiated Emission Test Data 9k Hz-30MHz

Frequency (MHz)	Cable Loss +preamp (dB)	Antenna Factor (dB)	Reading (dBμV/m)	Level (dBμV/m)	Polarity (Horizontal/ Vertical)	Limit (dBμV/m)	Margin (dB)	Note
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

30MHz-1GHz

Worst case is shown below for 30MHz-1GHz only.

The emissions don’t show in following result tables are more than 20dB below the limits.

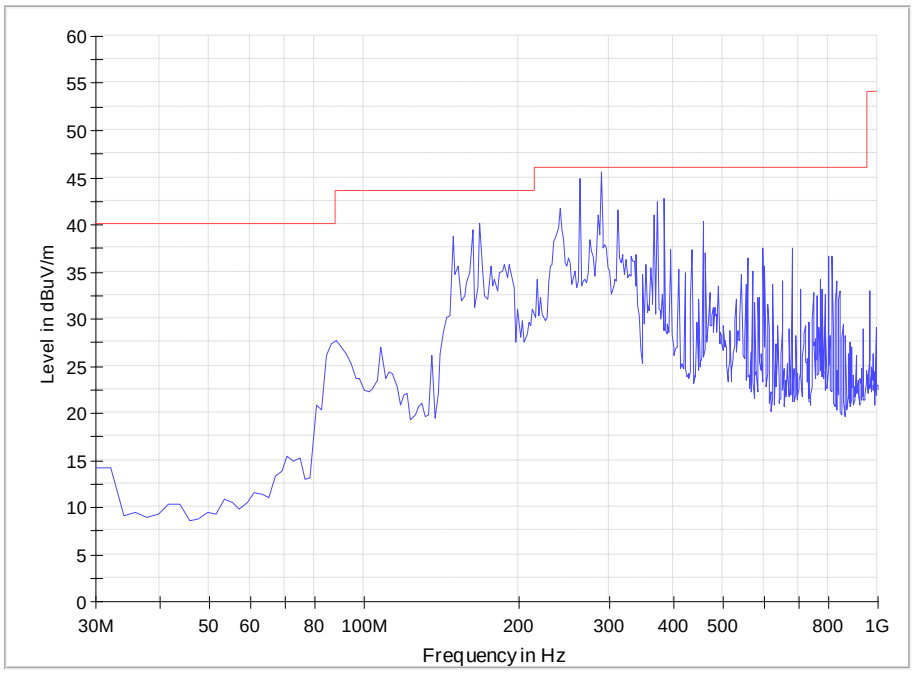
Table 10 Radiated Emission Test Data 30MHz-1GHz

Frequency (MHz)	Cable Loss +preamp (dB)	Antenna Factor (dB)	Reading (dBμV/m)	Level (dBμV/m)	Polarity (Horizontal/ Vertical)	Limit (dBμV/m)	Margin (dB)	Note
162.184	1.5	8.7	25.9	36.1	Horizontal	43.5	7.4	QP
168.016	1.5	8.7	25.8	36	Horizontal	43.5	7.5	QP
239.94	1.9	11.2	25.1	38.2	Horizontal	46.0	7.8	QP
263.266	1.9	12.1	27.4	41.4	Horizontal	46.0	4.6	QP
288.537	2.0	12.7	27.2	41.9	Horizontal	46.0	4.1	QP
383.787	2.4	14.6	22.9	39.9	Horizontal	46.0	6.1	QP
162.184	1.5	8.7	25.0	35.2	Vertical	43.5	8.3	QP
168.016	1.5	8.7	26.0	36.2	Vertical	43.5	7.3	QP
348.797	2.3	14.1	22.3	38.7	Vertical	46	7.3	QP
393.507	2.4	14.6	20.5	37.5	Vertical	46	8.5	QP
339.078	2.1	13.3	20.9	36.3	Vertical	46	9.7	QP
780.341	3.5	18.8	9.8	32.1	Vertical	46	13.9	QP

Remark: Emission level (dBμV)=Read Value(dBμV/m) + Antenna Factor(dB)+ Cable Loss +preamp(dB)

30MHz-1GHz

Horizontal



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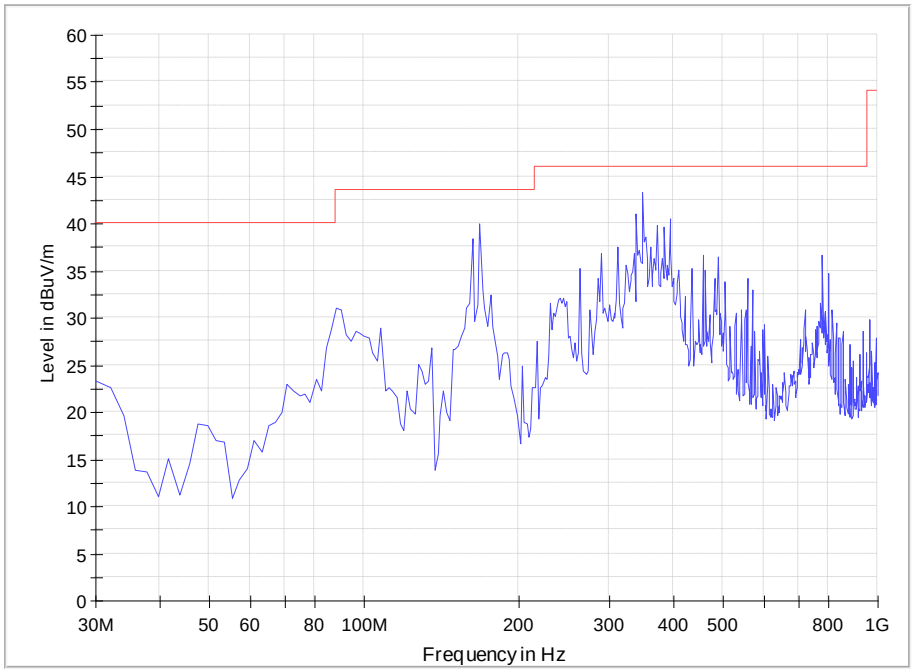
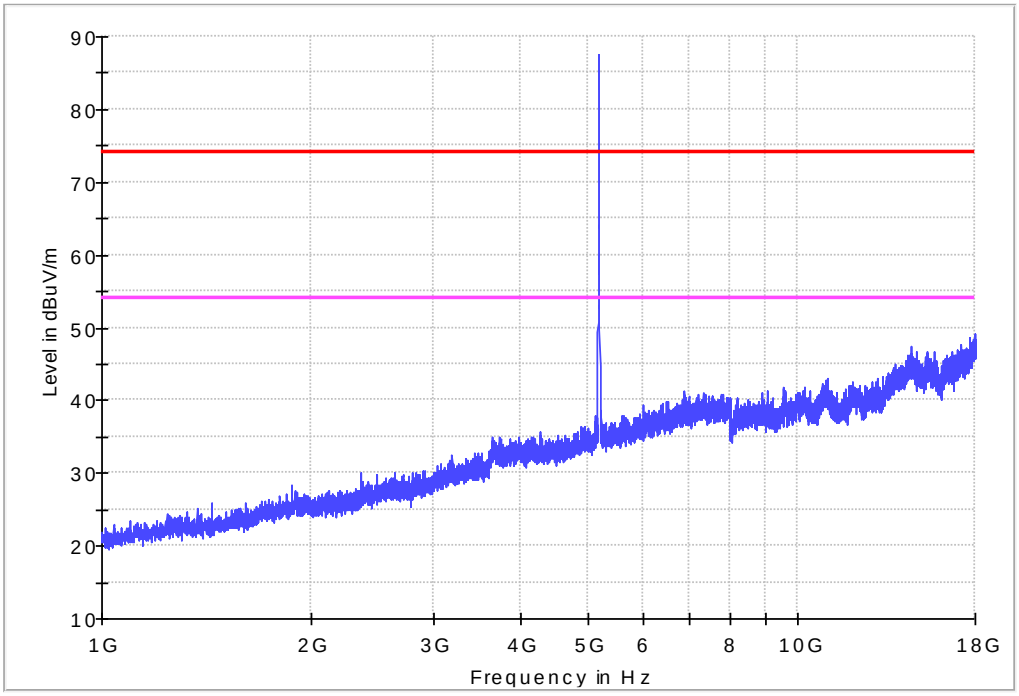


1-18G

11a IN THE 5.2GHz BAND
CH36

Horizontal



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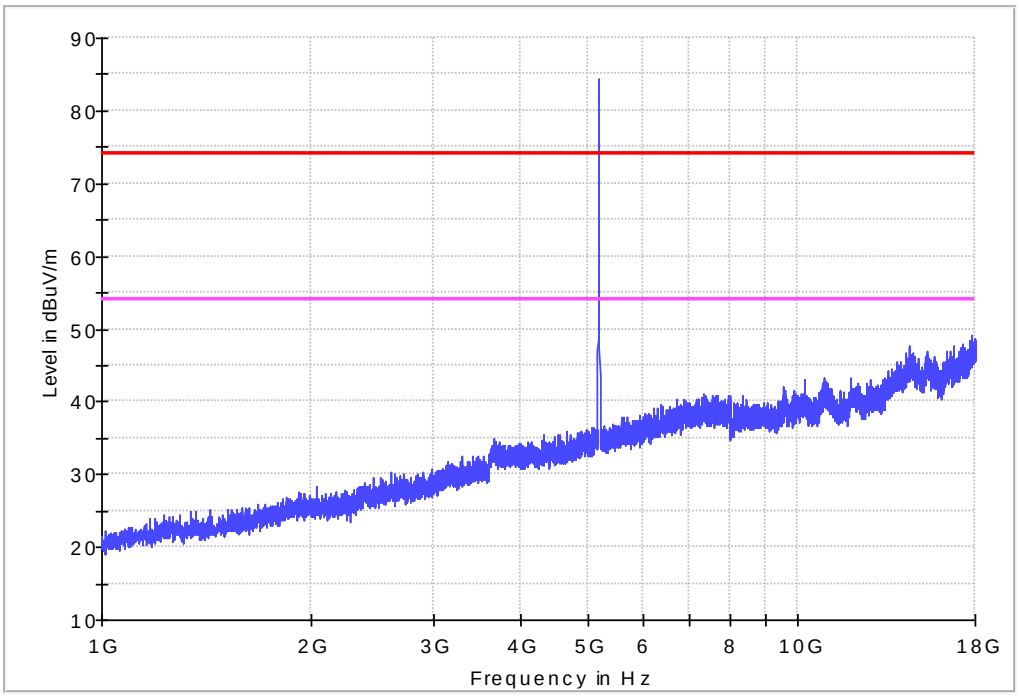
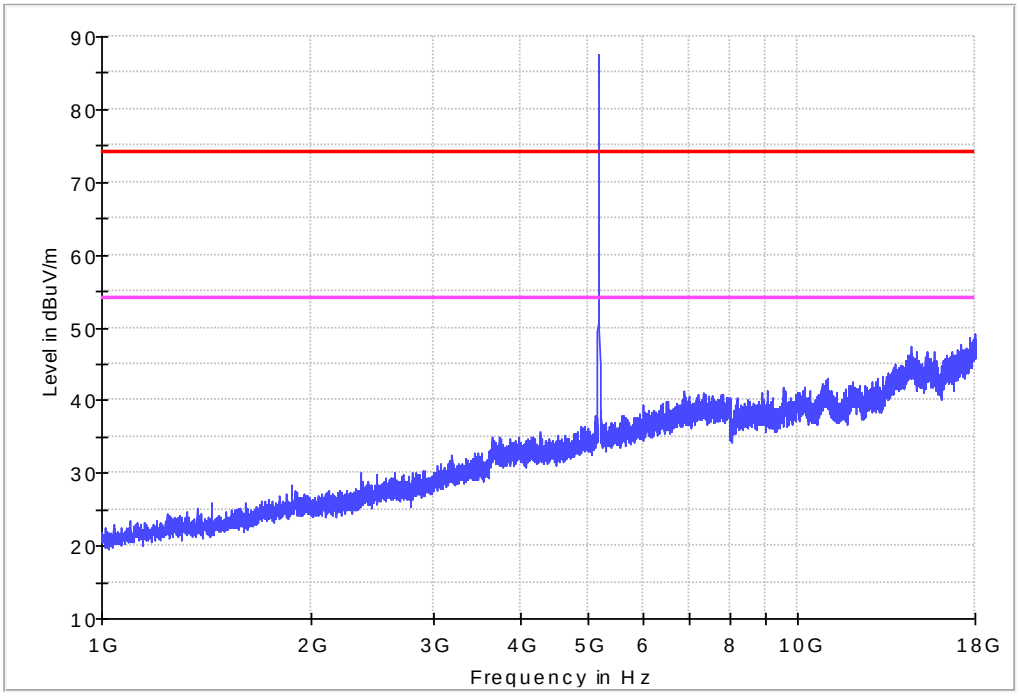


1-18G

11a IN THE 5.2GHz BAND
CH40

Horizontal



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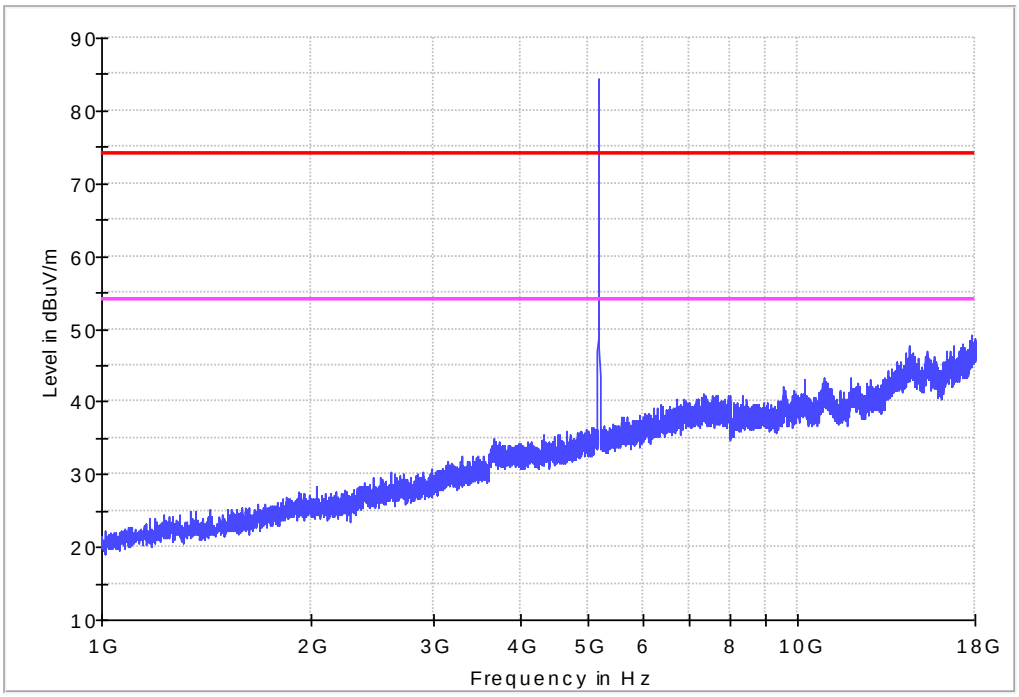
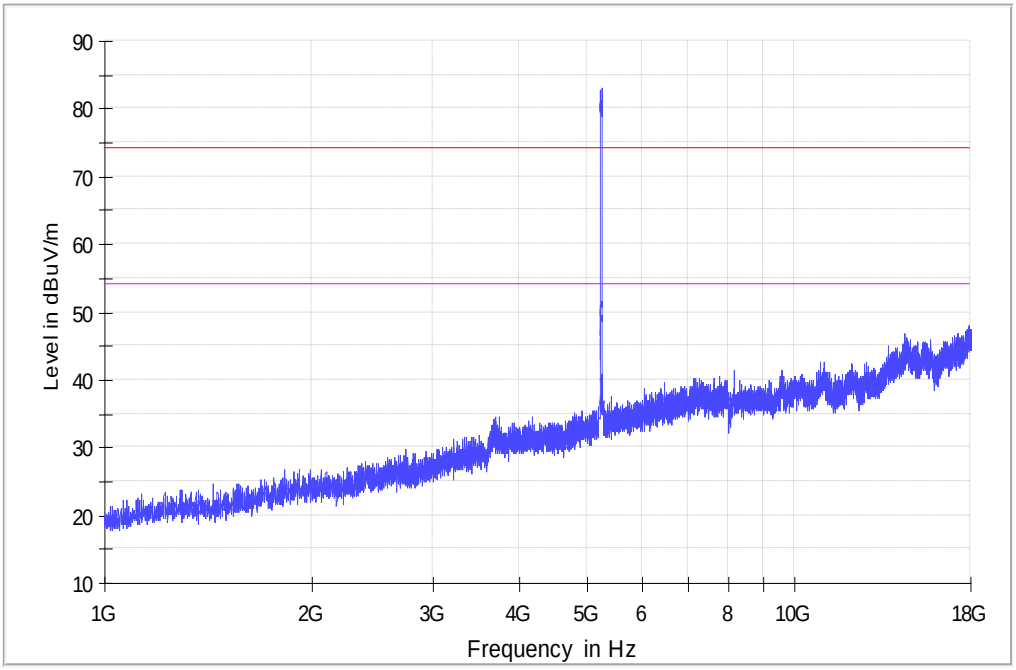


1-18G

11a IN THE 5.2GHz BAND
CH48

Horizontal



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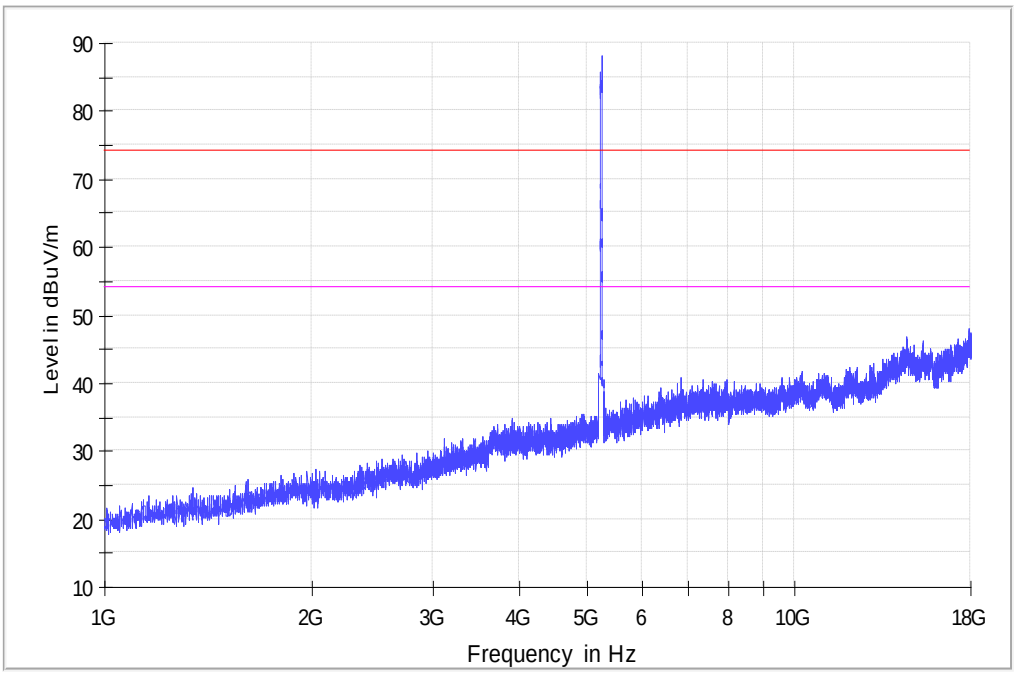
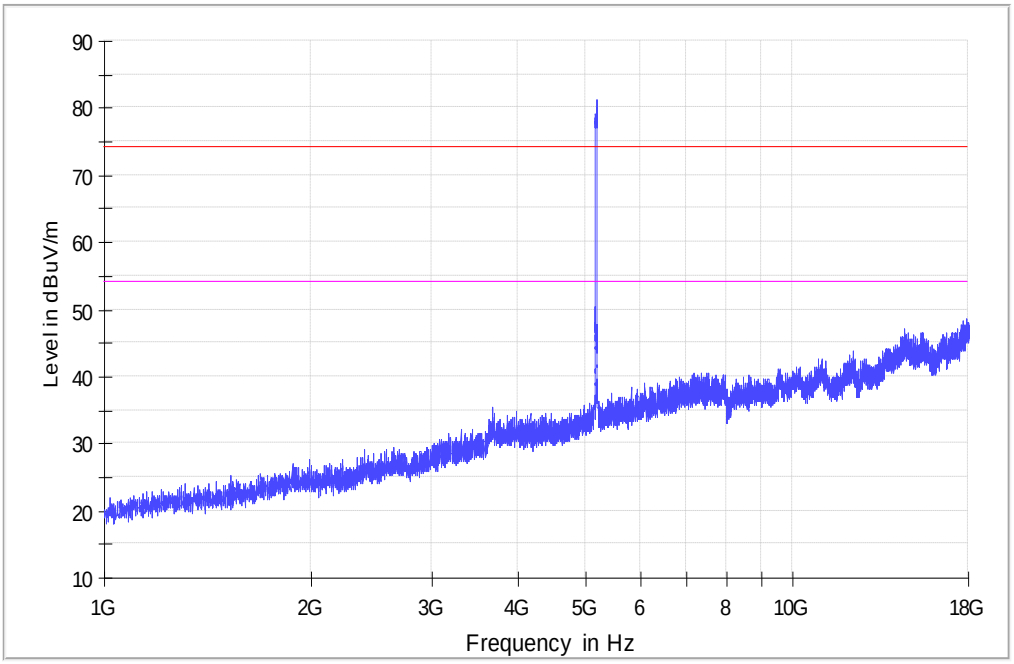


1-18G

11n HT20 IN THE 5.2GHz BAND
CH36

Horizontal



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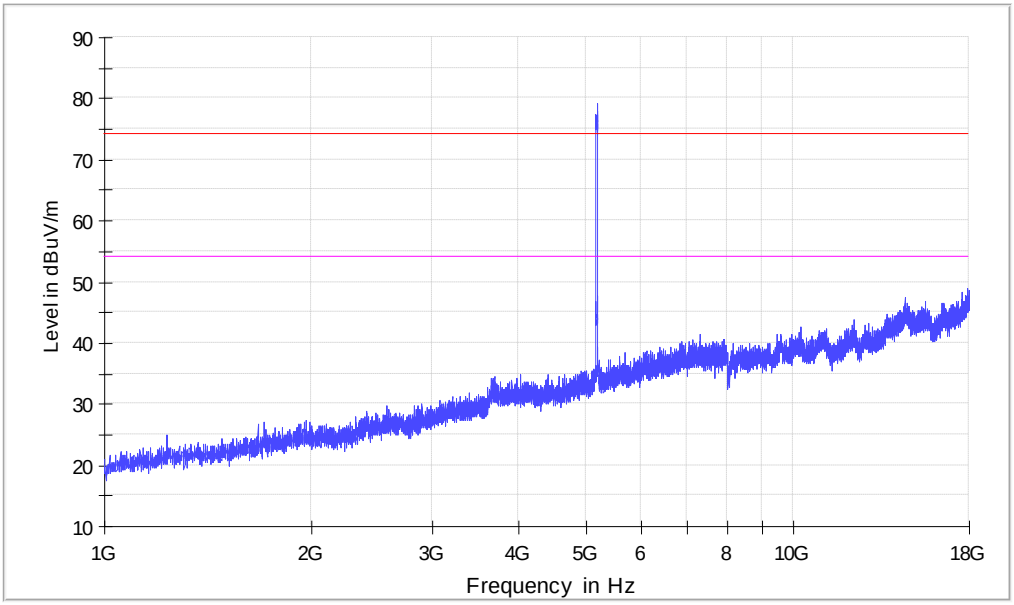
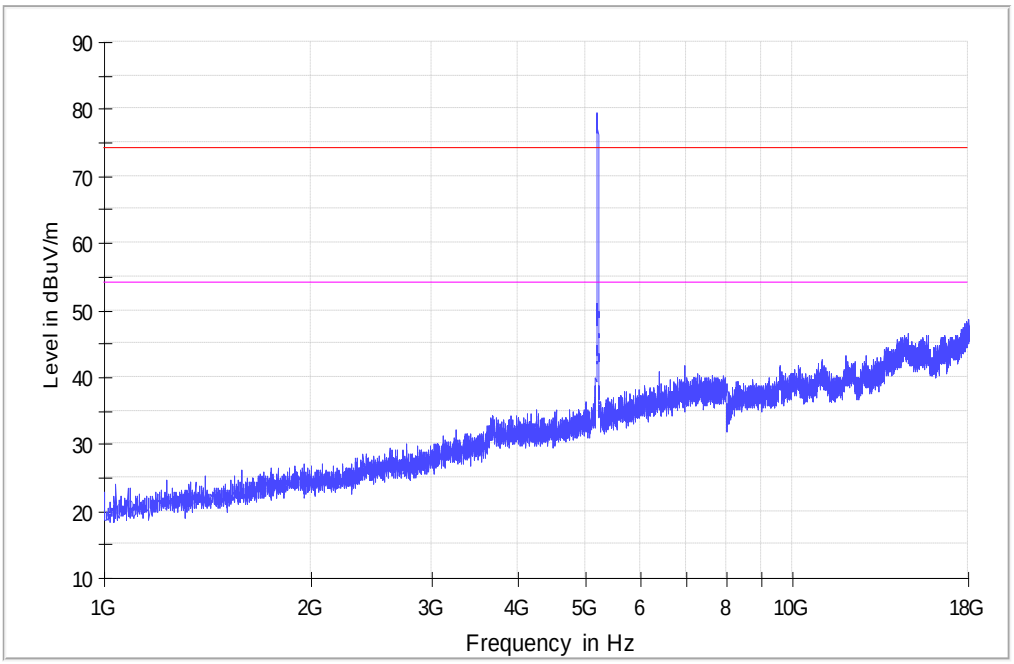


1-18G

11n HT20 IN THE 5.2GHz BAND
CH40

Horizontal



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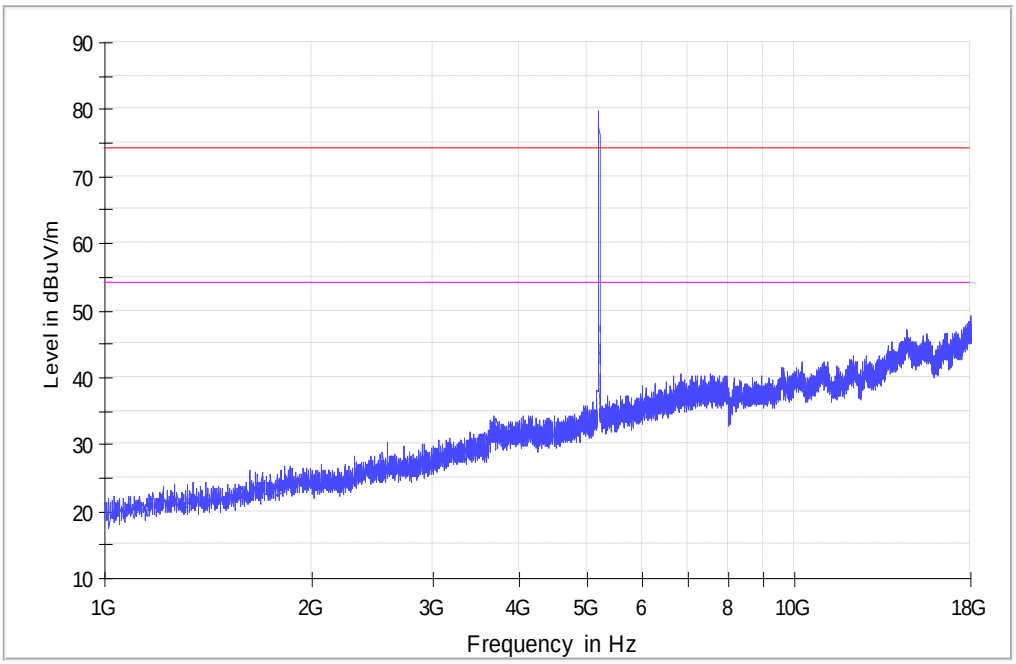
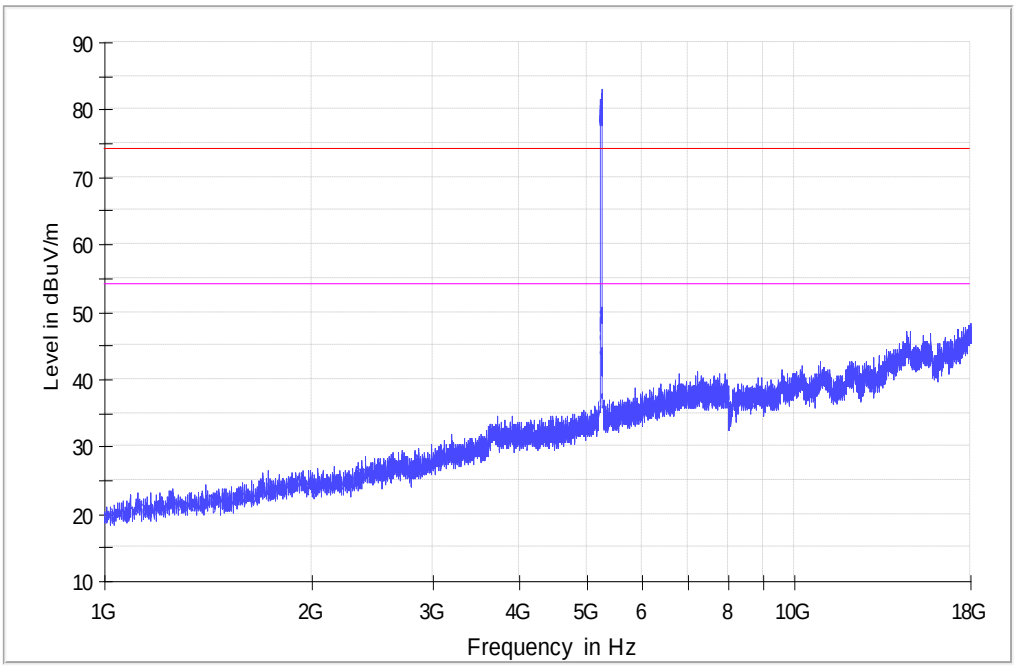


1-18G

11n HT20 IN THE 5.2GHz BAND
CH48

Horizontal



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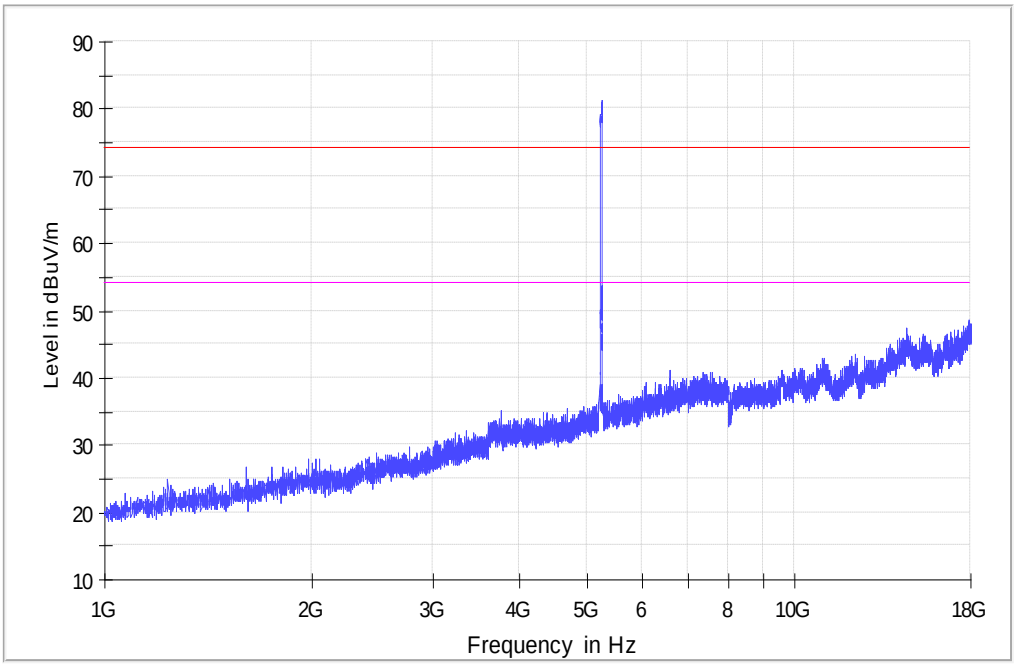
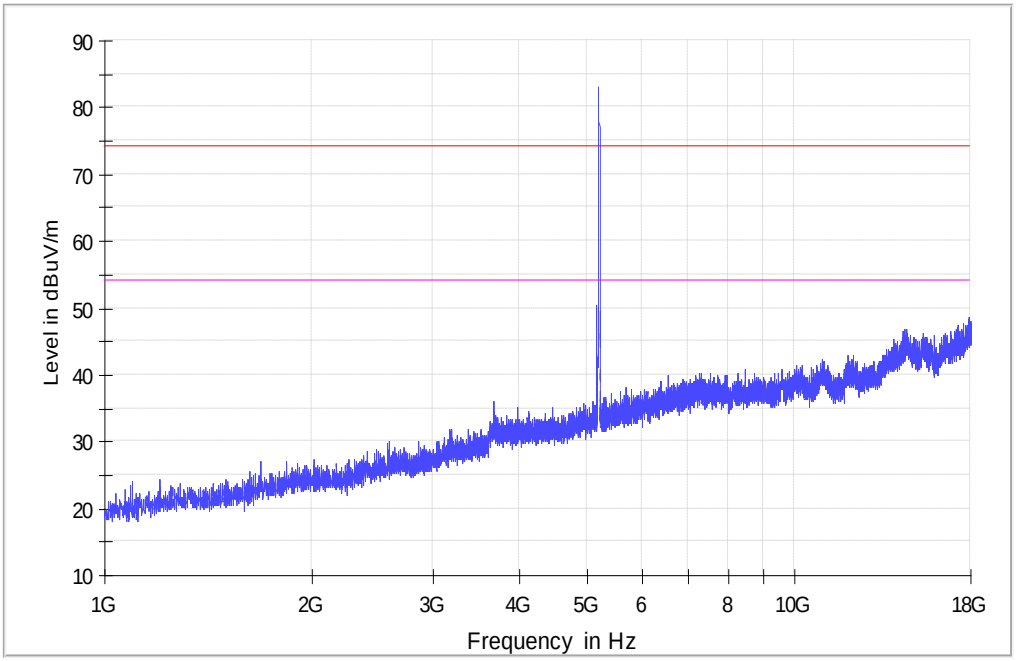


1-18G

11n HT40 IN THE 5.2GHz BAND
CH38

Horizontal



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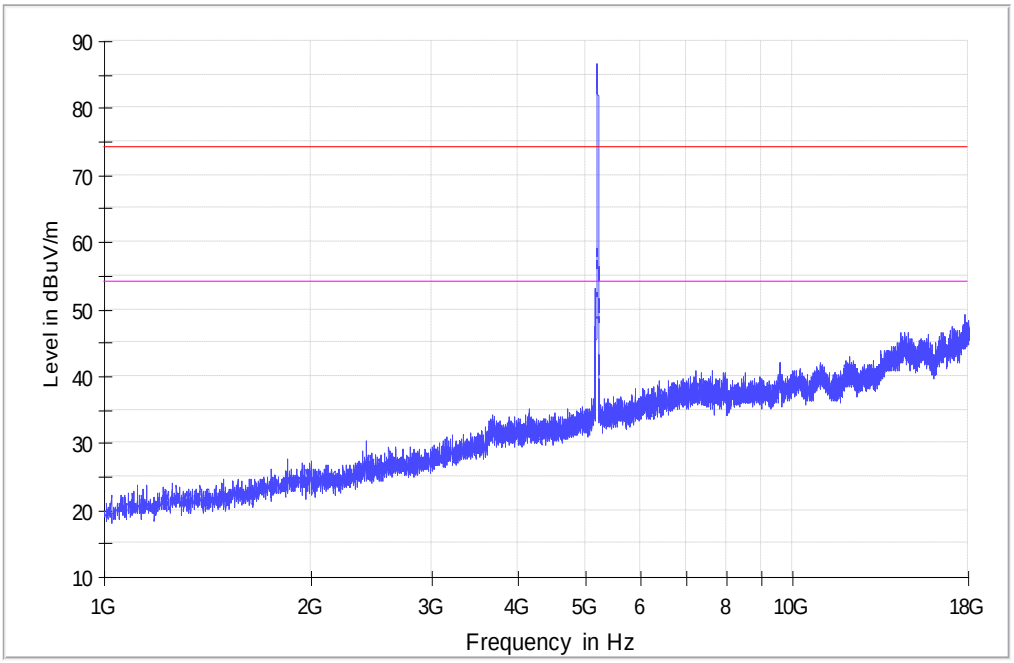
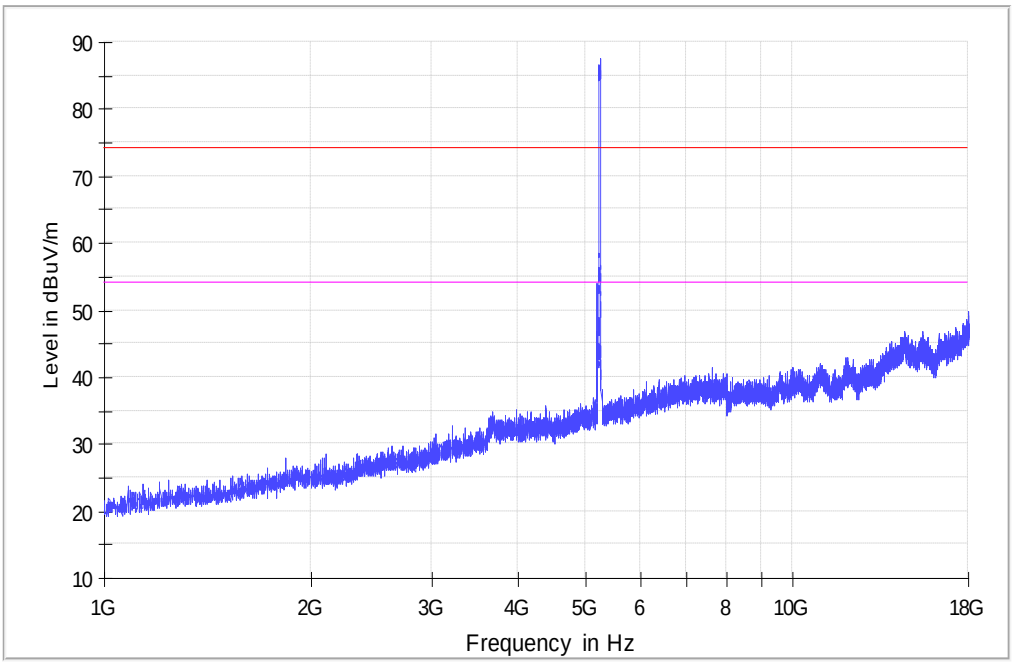


1-18G

11n HT40 IN THE 5.2GHz BAND
CH46

Horizontal



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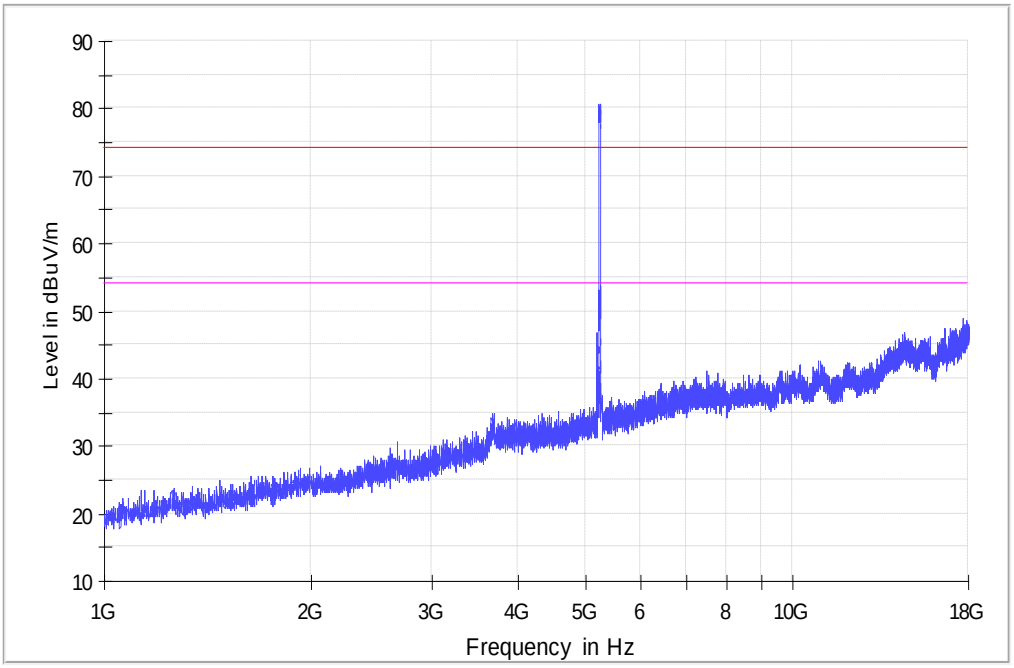
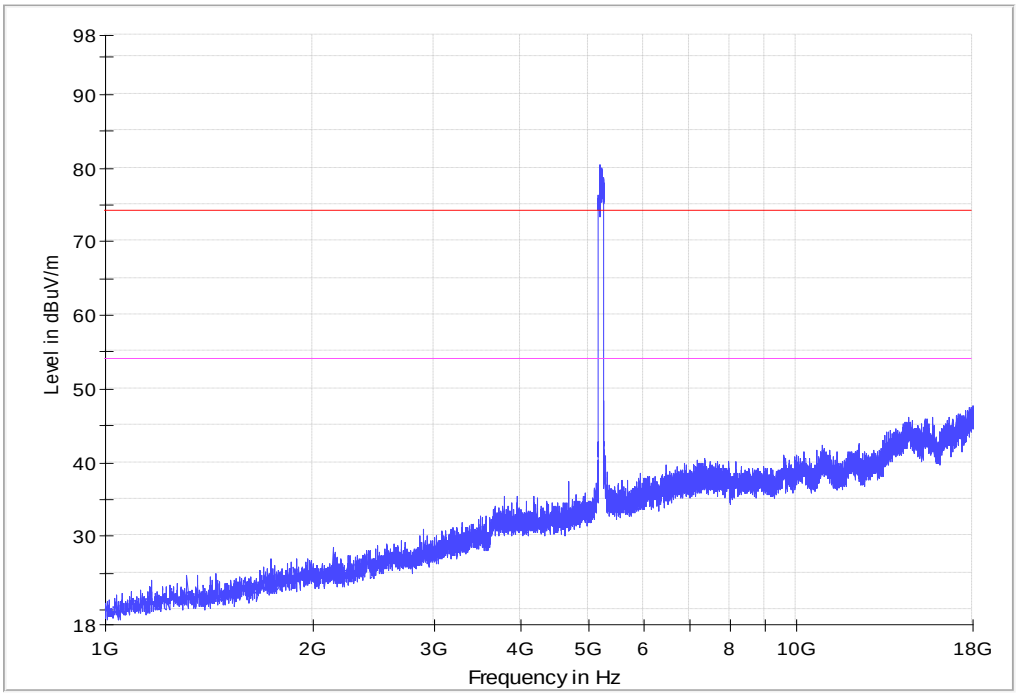


1-18G

11ac VHT80 IN THE 5.2GHz BAND
CH42

Horizontal



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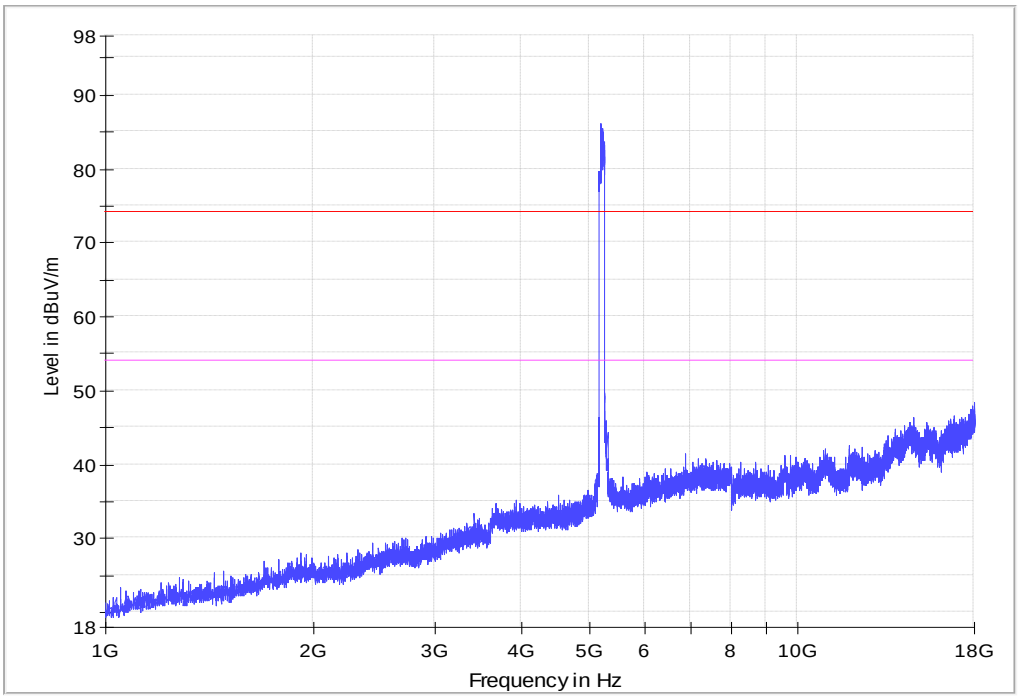
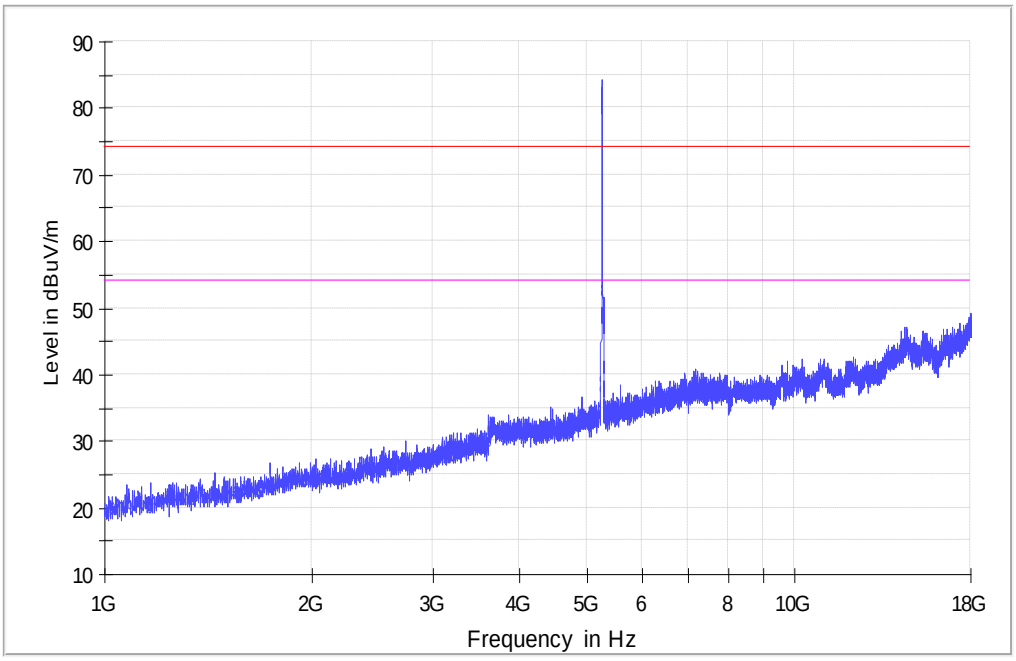


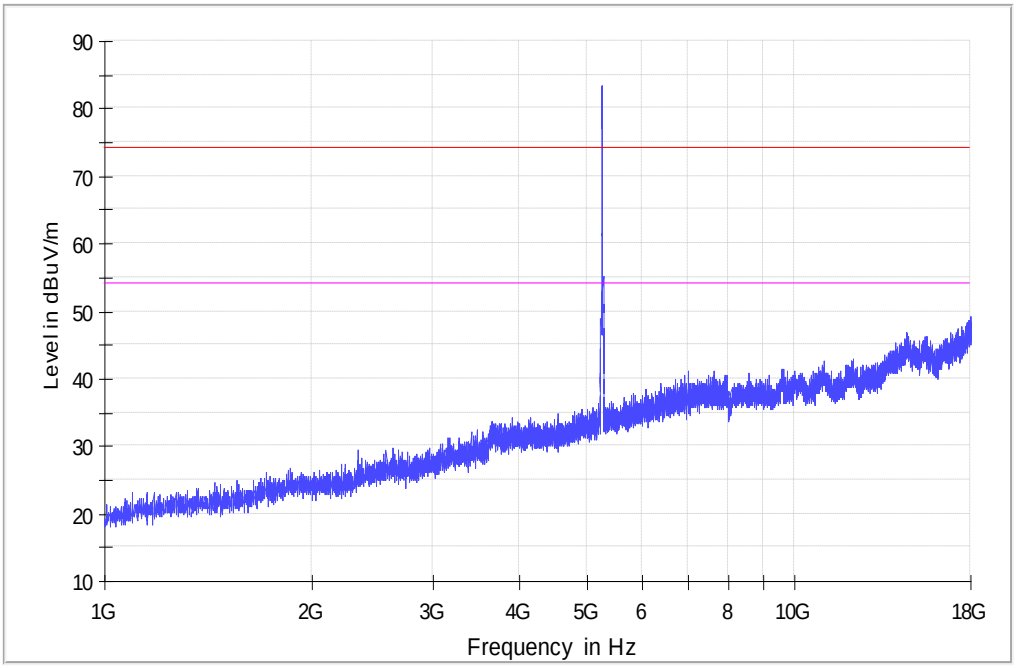
1-18G

11a IN THE 5.3GHz BAND
CH52

Horizontal



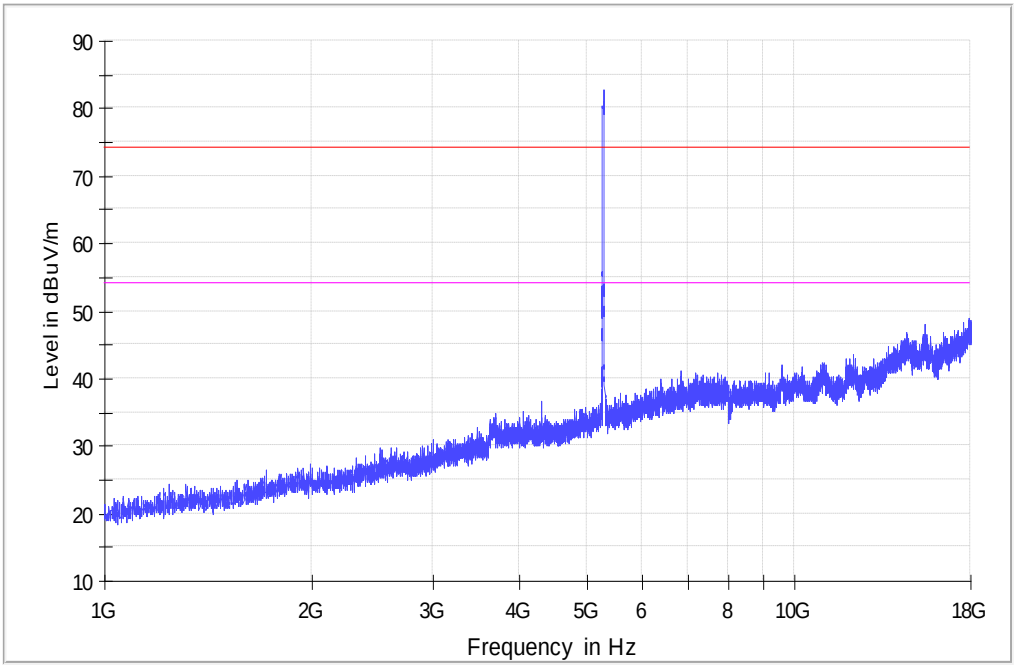
Vertical



1-18G

11a IN THE 5.3GHz BAND
CH56

Horizontal



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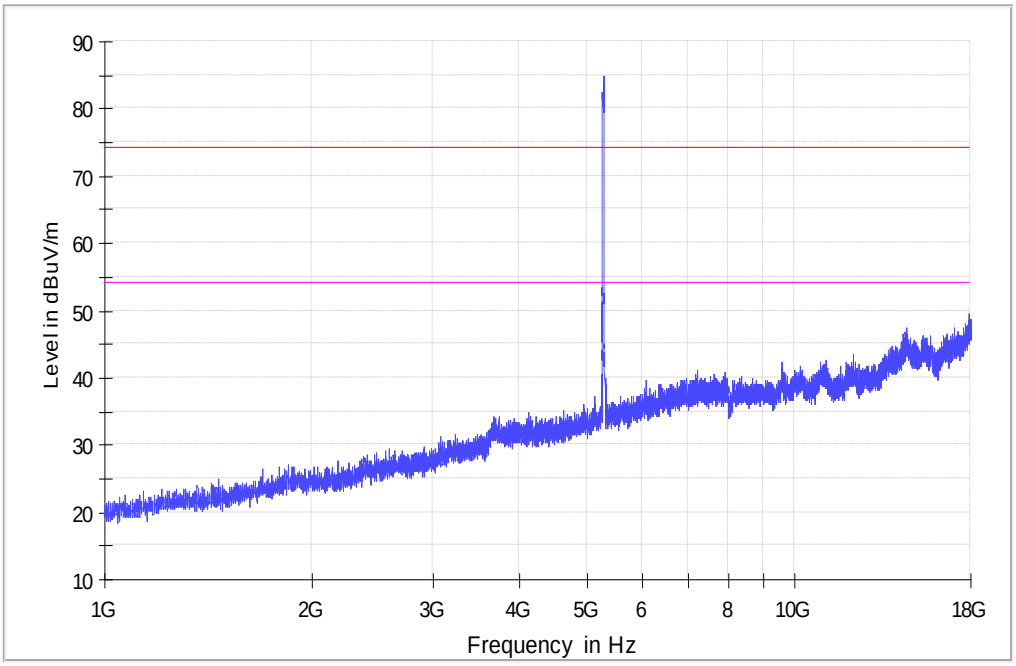
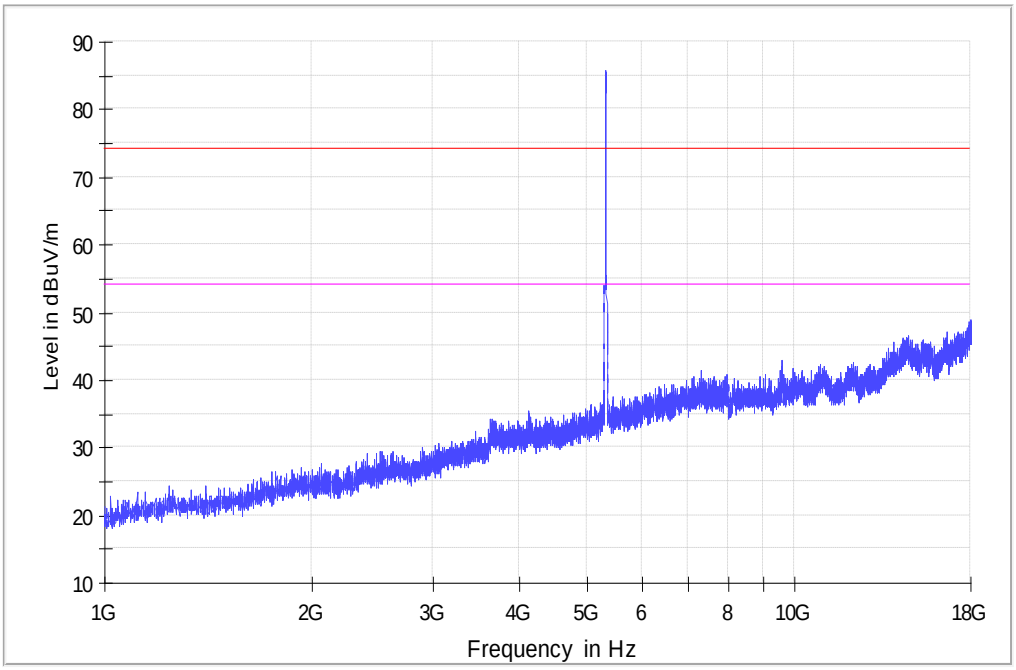


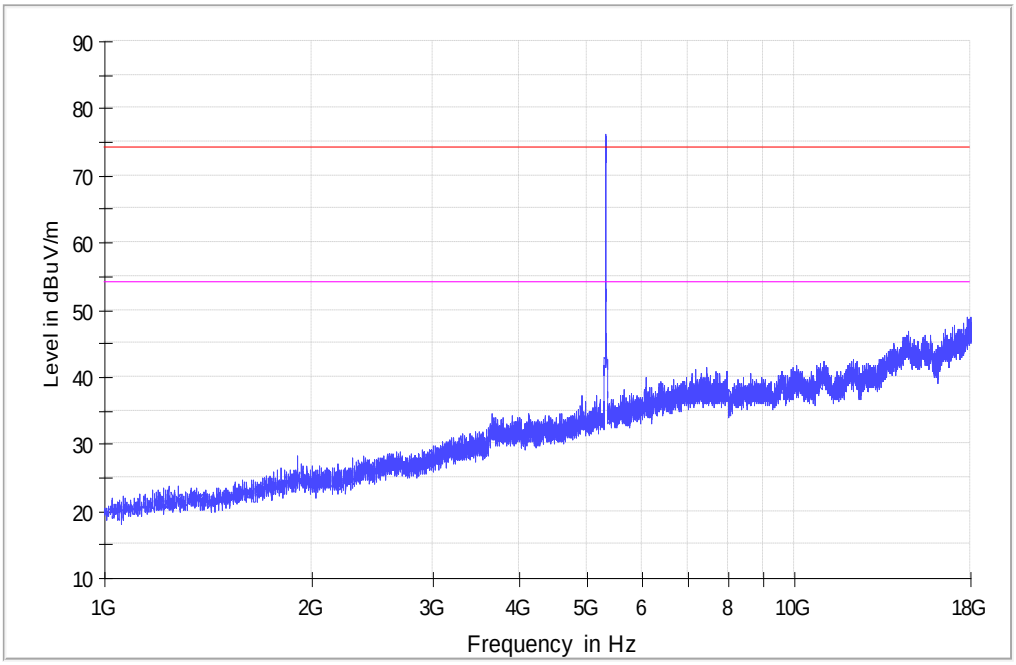
1-18G

11a IN THE 5.3GHz BAND
CH64

Horizontal



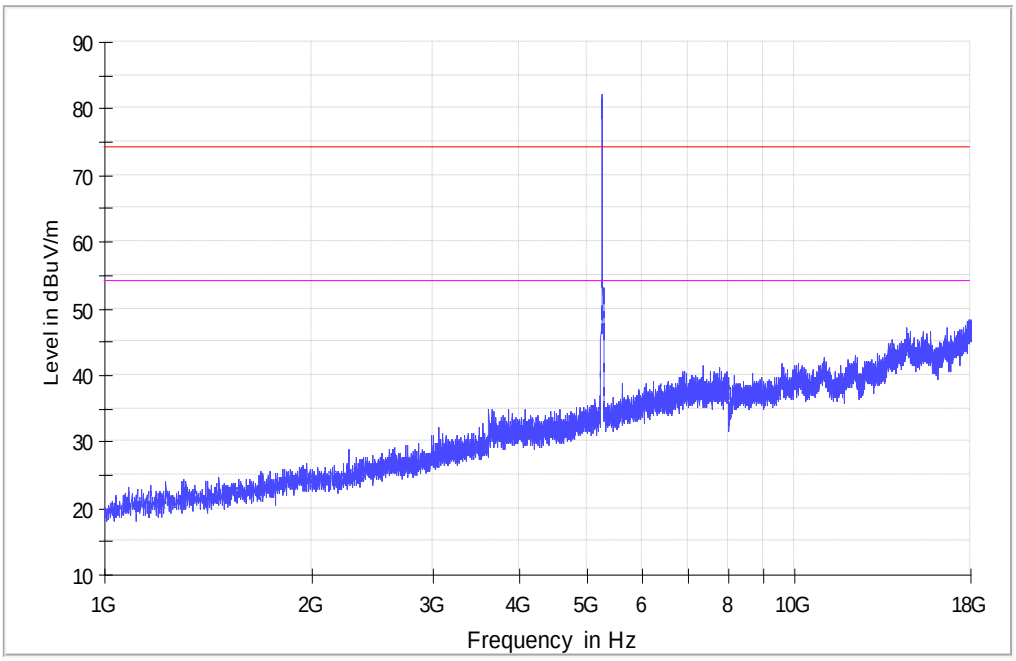
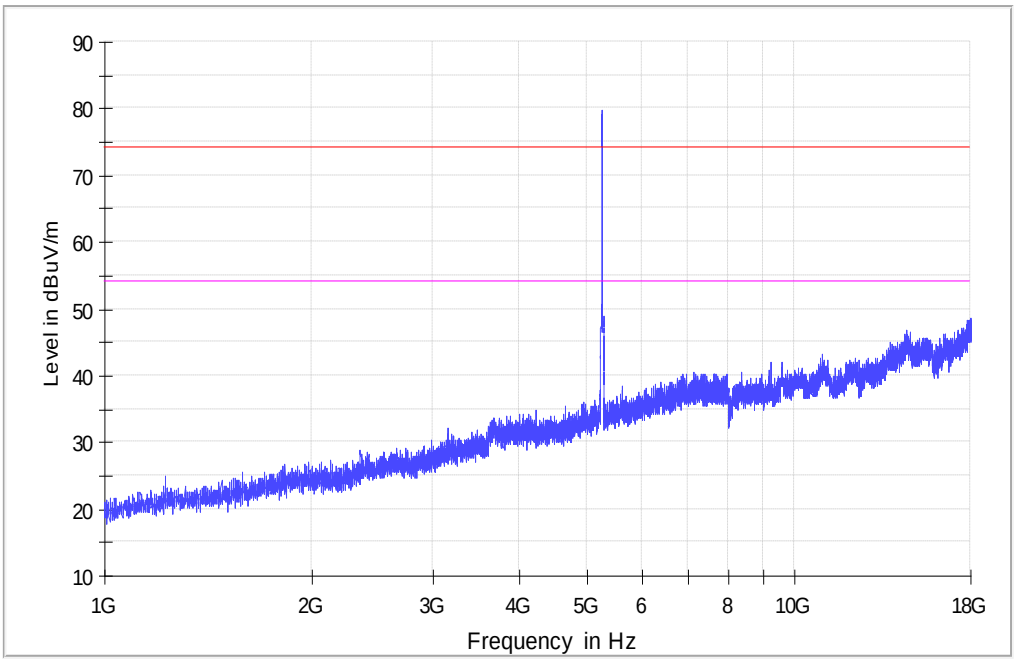
Vertical



1-18G

11n HT20 IN THE 5.3GHz BAND
CH52

Horizontal



Vertical