

Appendix

Main Test Instruments

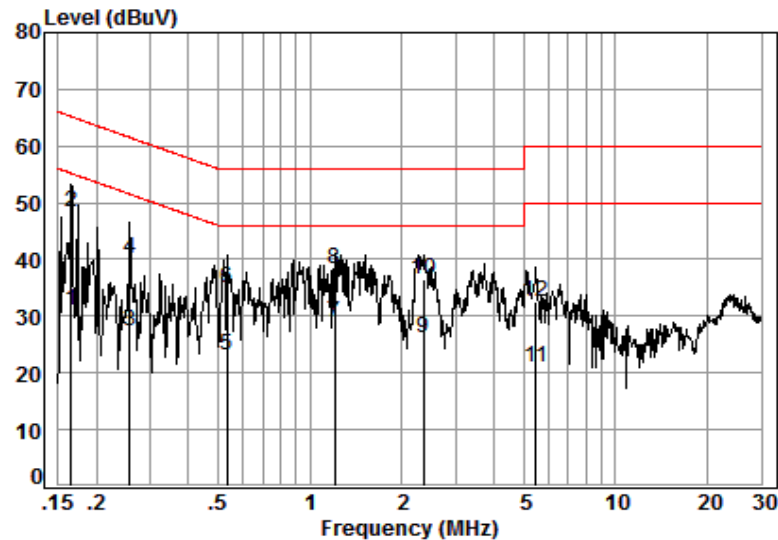
Conducted Emission					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date	Cal.Duedate
				(yyyy-mm-dd)	(yyyy-mm-dd)
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2017/5/10	2020/5/9
LISN	Rohde & Schwarz	ENV216	SEM007-01	2018/9/2	2019/9/2
LISN	ETS-LINDGREN	Feb-16	SEM007-02	2019/3/2	2020/3/1
Measurement Software	AUDIX	e3 V5.4.1221d	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2018/7/12	2019/7/11
2 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T2-02	EMC0122	2019/2/11	2020/2/10
EMI Test Receiver	Rohde & Schwarz	ESCI	SEM004-02	2019/3/2	2020/3/1
RF conducted test					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date	Cal.Duedate
				(yyyy-mm-dd)	(yyyy-mm-dd)
DC Power Supply	Agilent Technologies Inc	66311B	W009-09	2018/9/15	2019/9/15
Signal Analyzer	Rohde & Schwarz	FSV	W025-05	2019/1/13	2020/1/12
Coaxial Cable	SGS	N/A	SEM031-01	2018/7/13	2019/7/12
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2018/9/2	2019/9/2
Temperature Chamber	GIANT FORCE	ICT-150-40-CP-AR	W027-03	2018/11/27	2019/11/27
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2018/9/2	2019/9/2

Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Total RF power, conducted	±0.75dB
2	RF power density, conducted	±2.84dB
3	Spurious emissions, conducted	±0.75dB
5	Conduct emission test	±3.12 dB (9KHz- 30MHz)

AC Power Line Conducted Emissions

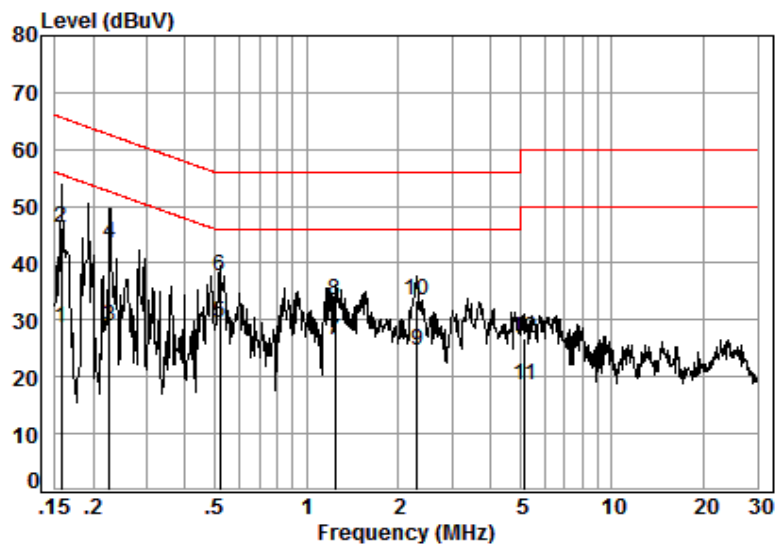
Live Line:



Site : Shielding Room
 Condition: Line
 Job No. : 11305CR
 Test mode: b

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.17	0.01	9.66	21.37	31.04	55.21	-24.17	Average
2	0.17	0.01	9.66	38.60	48.27	65.21	-16.94	QP
3	0.26	0.03	9.67	17.54	27.24	51.51	-24.27	Average
4	0.26	0.03	9.67	30.45	40.15	61.51	-21.36	QP
5	0.53	0.06	9.67	13.24	22.97	46.00	-23.03	Average
6	0.53	0.06	9.67	25.36	35.09	56.00	-20.91	QP
7	1.20	0.11	9.73	19.10	28.94	46.00	-17.06	Average
8	1.20	0.11	9.73	28.39	38.23	56.00	-17.77	QP
9	2.35	0.16	9.71	16.31	26.18	46.00	-19.82	Average
10	2.35	0.16	9.71	26.74	36.61	56.00	-19.39	QP
11	5.51	0.17	9.75	11.09	21.01	50.00	-28.99	Average
12	5.51	0.17	9.75	22.60	32.52	60.00	-27.48	QP

Neutral Line:



Site : Shielding Room
 Condition: Neutral
 Job No. : 11305CR
 Test mode: b

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.16	0.01	9.63	19.06	28.70	55.60	-26.90	Average
2	0.16	0.01	9.63	36.46	46.10	65.60	-19.50	QP
3	0.23	0.03	9.64	19.08	28.75	52.57	-23.82	Average
4	0.23	0.03	9.64	33.76	43.43	62.57	-19.14	QP
5	0.52	0.06	9.64	19.95	29.65	46.00	-16.35	Average
6	0.52	0.06	9.64	28.12	37.82	56.00	-18.18	QP
7	1.24	0.11	9.70	16.71	26.52	46.00	-19.48	Average
8	1.24	0.11	9.70	23.78	33.59	56.00	-22.41	QP
9	2.30	0.16	9.68	14.86	24.70	46.00	-21.30	Average
10	2.30	0.16	9.68	23.67	33.51	56.00	-22.49	QP
11	5.19	0.17	9.72	8.61	18.50	50.00	-31.50	Average
12	5.19	0.17	9.72	17.02	26.91	60.00	-33.09	QP

Remarks:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.

Duty Cycle

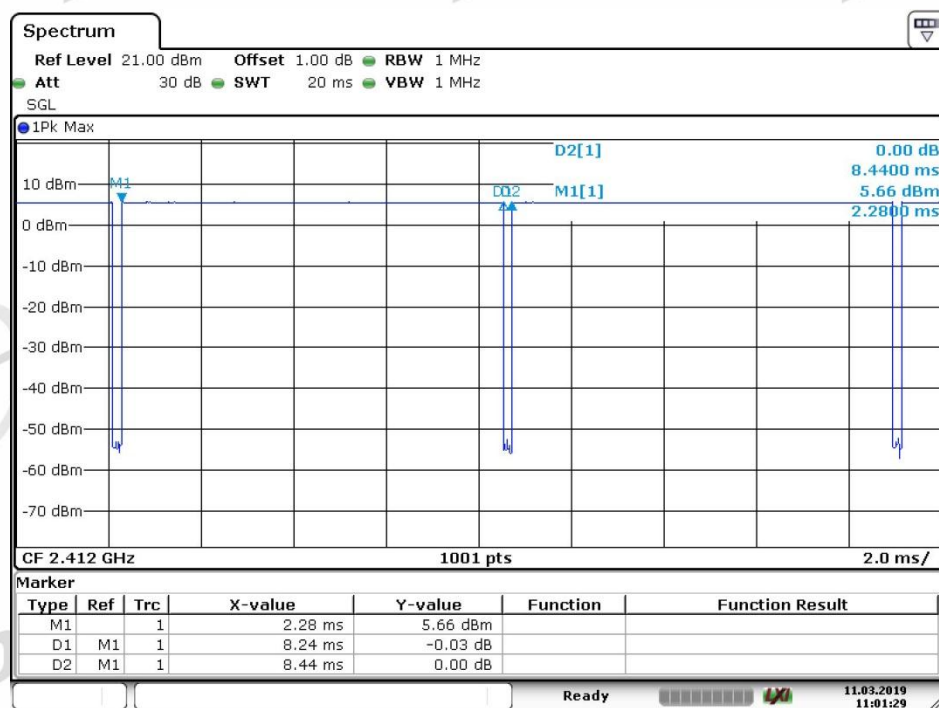
Test Results

Test Mode	TX Freq. [MHz]	Duty cycle [%]
11B	Ant 1: CH1	97.63
11G	Ant 1: CH1	86.54
11N20	Ant 1: CH1	85.84

Test Plots

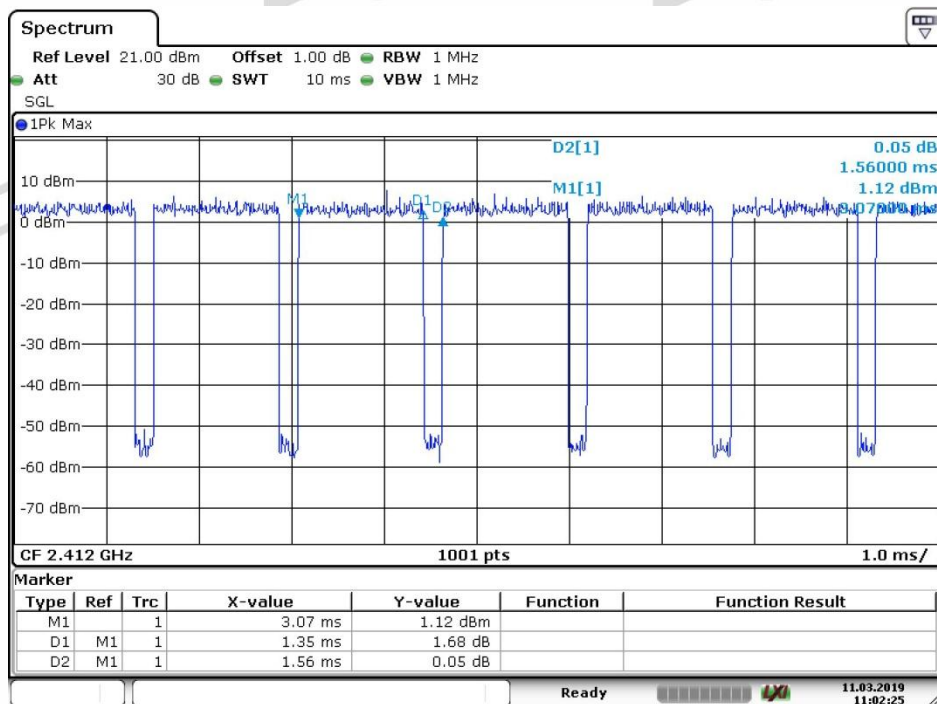
ANT1

11B



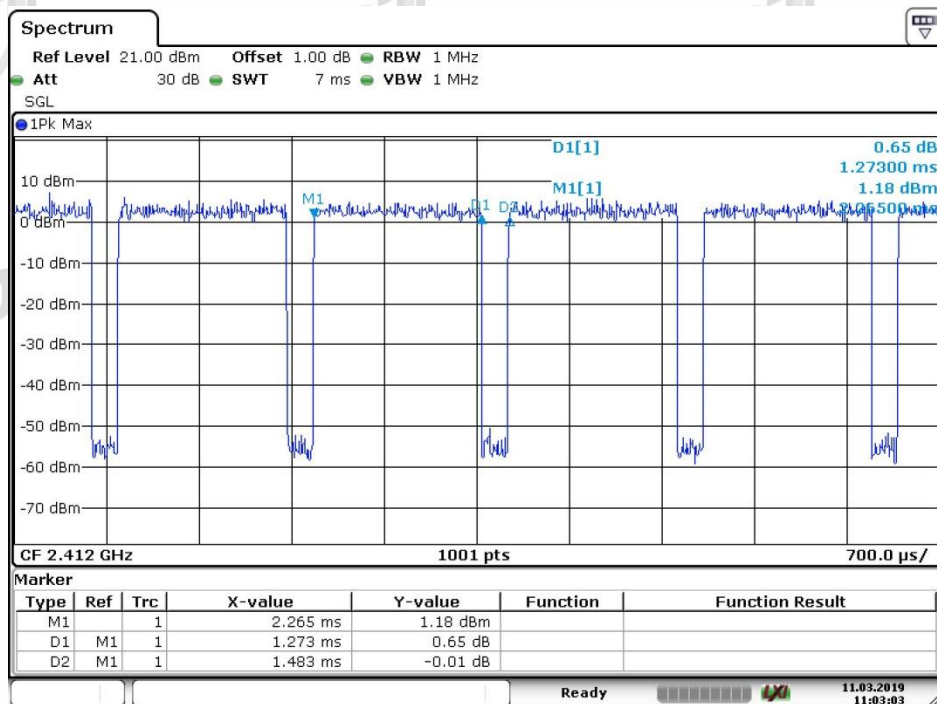
Date: 11.MAR.2019 11:01:30

11G



Date: 11.MAR.2019 11:02:25

11N20



Date: 11.MAR.2019 11:03:03

Conducted Output Power

Test Results

Measurement Data of Peak Power:

Mode	Test Channel	Peak Output Power (dBm)	Limit (dBm)	Result
802.11B	Lowest	15.38	30.00	Pass
	Middle	15.87	30.00	Pass
	Highest	16.11	30.00	Pass
802.11G	Lowest	19.78	30.00	Pass
	Middle	19.56	30.00	Pass
	Highest	18.74	30.00	Pass
802.11N20	Lowest	19.13	30.00	Pass
	Middle	19.72	30.00	Pass
	Highest	18.95	30.00	Pass

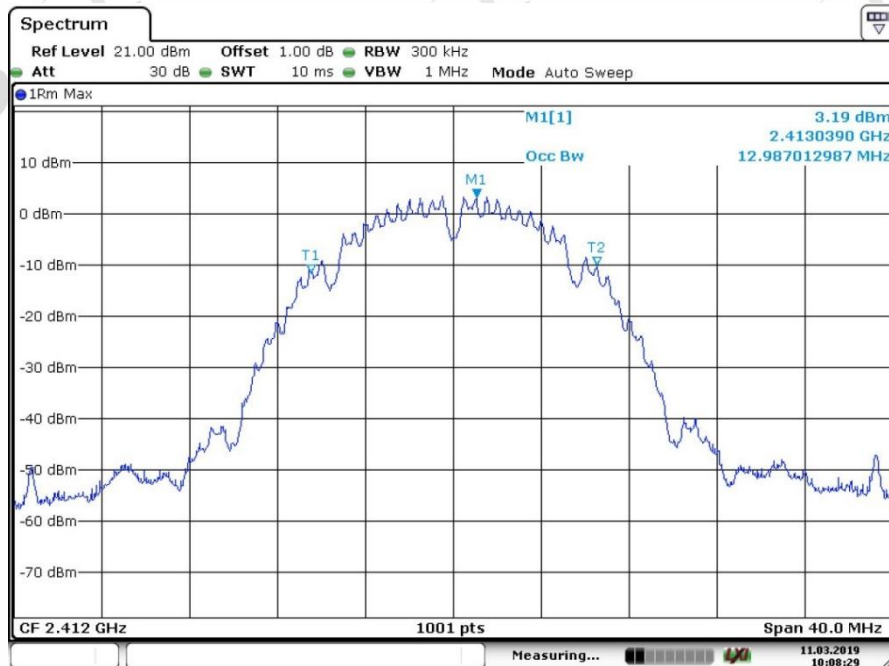
DTS (6 dB) Bandwidth & 99% Occupied Bandwidth**Test Results**

Mode	Test Channel	Occupied Bandwidth (MHz)	6dB Emission Bandwidth (MHz)	Limit (kHz)	Result
802.11B	Lowest	12.99	7.63	≥500	Pass
	Middle	12.95	8.11	≥500	Pass
	Highest	12.95	7.63	≥500	Pass
802.11G	Lowest	16.66	16.34	≥500	Pass
	Middle	16.66	16.38	≥500	Pass
	Highest	16.62	16.34	≥500	Pass
802.11N20	Lowest	17.78	17.58	≥500	Pass
	Middle	17.78	17.42	≥500	Pass
	Highest	17.78	17.34	≥500	Pass

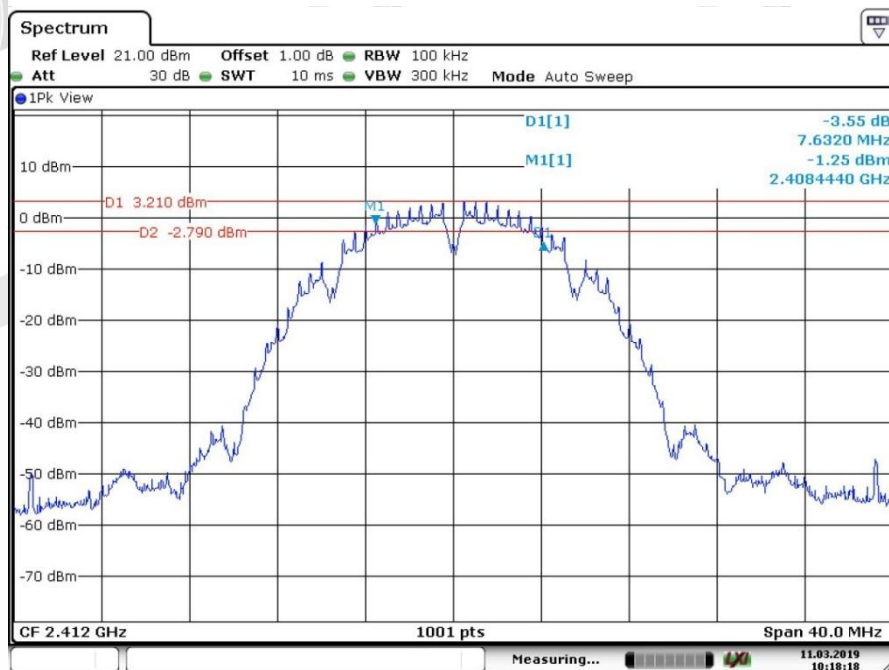
Test plots

ANT1

802.11B_Lowest Channel

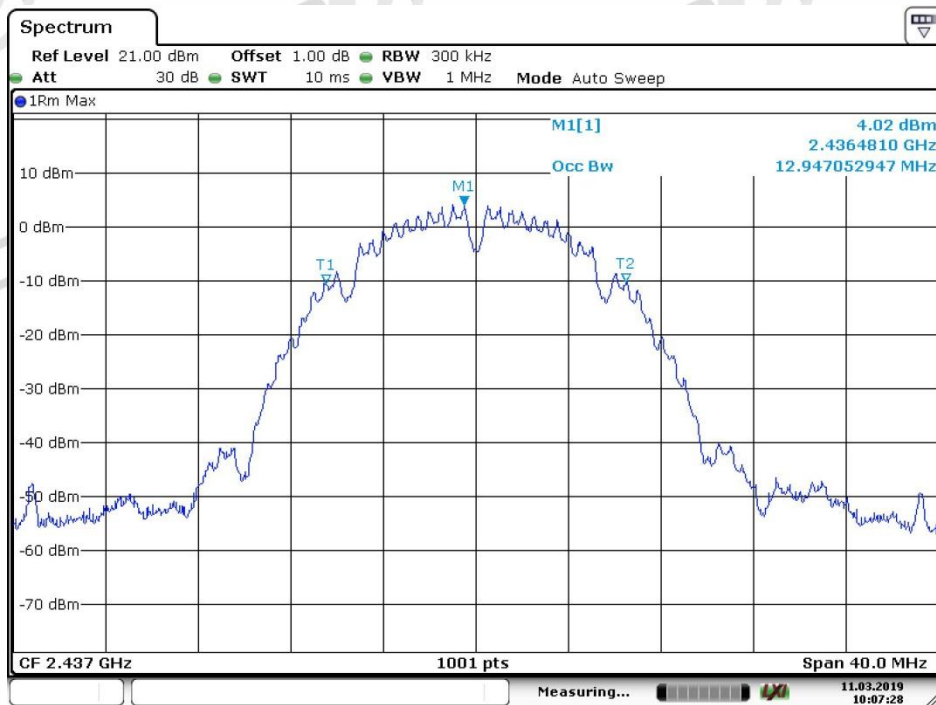


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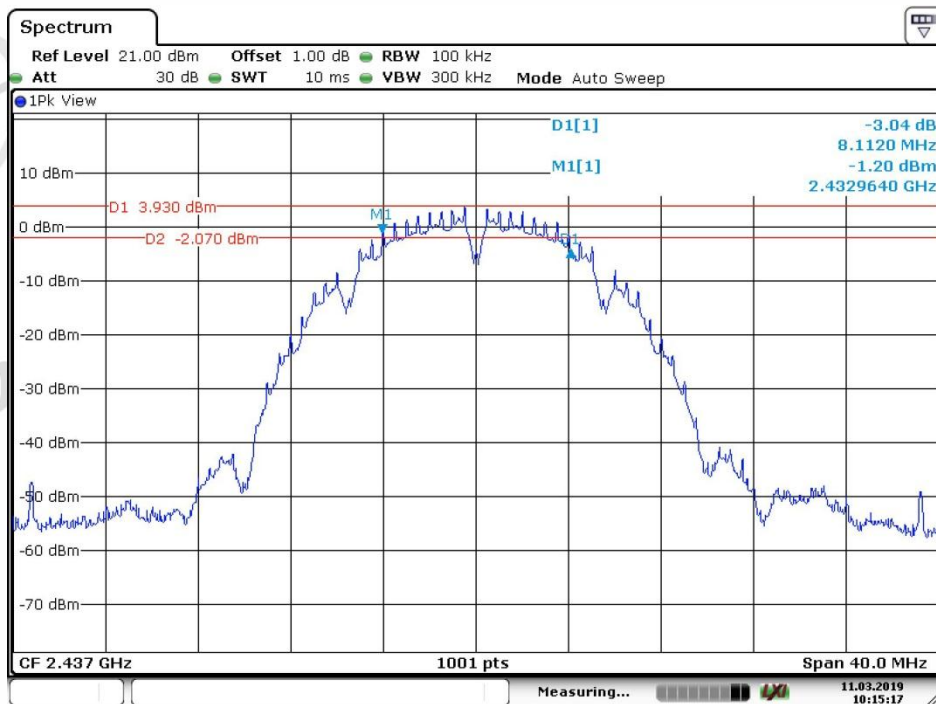


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802.11B Middle Channel

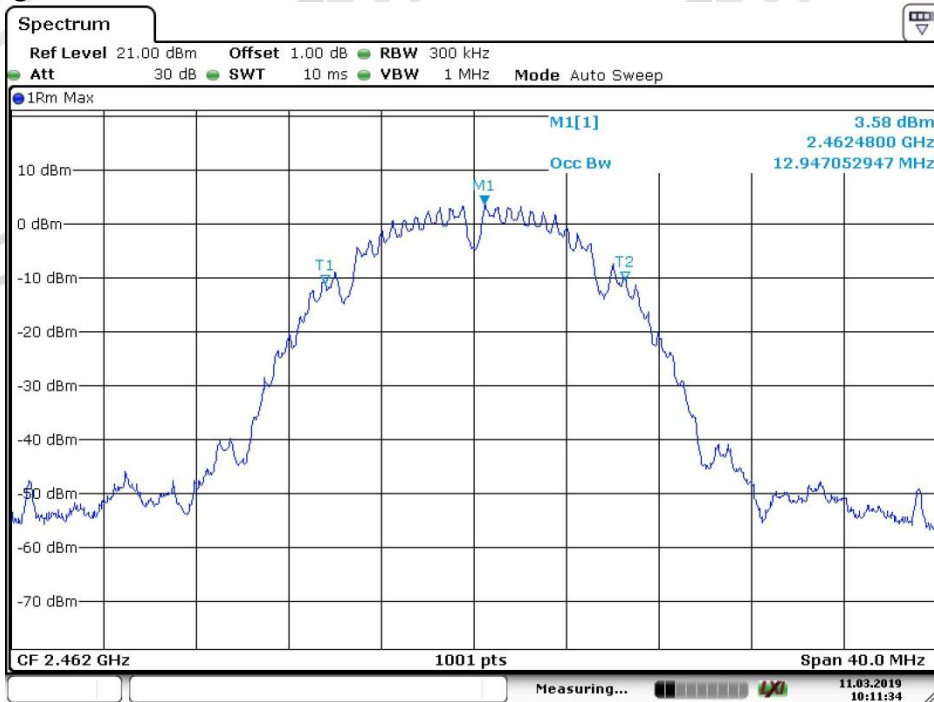


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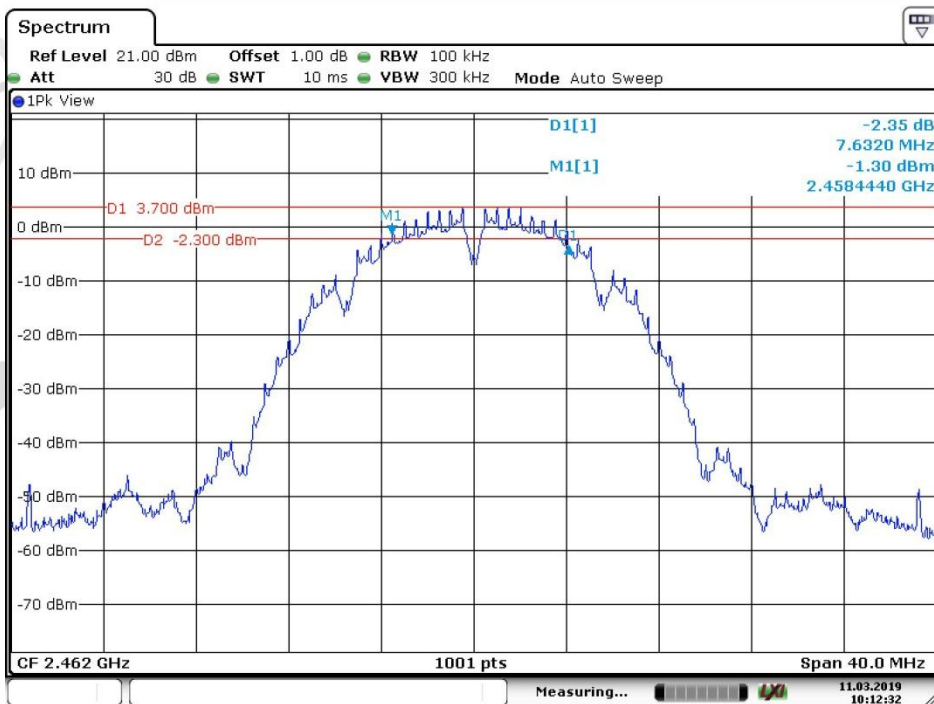


Date: 11.MAR.2019 10:15:18

802.11B_Highest Channel

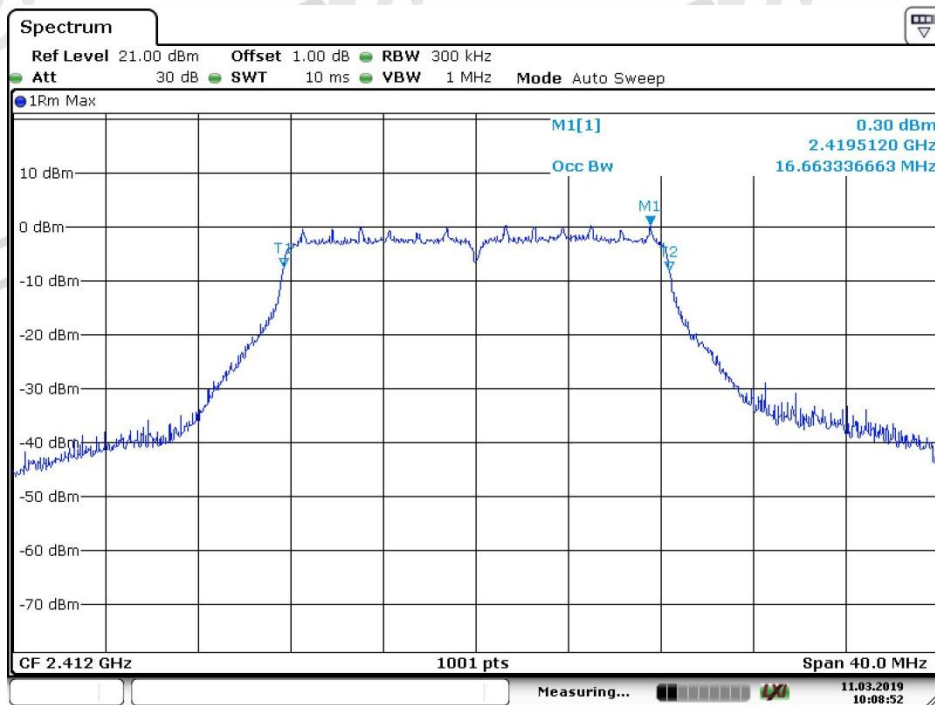


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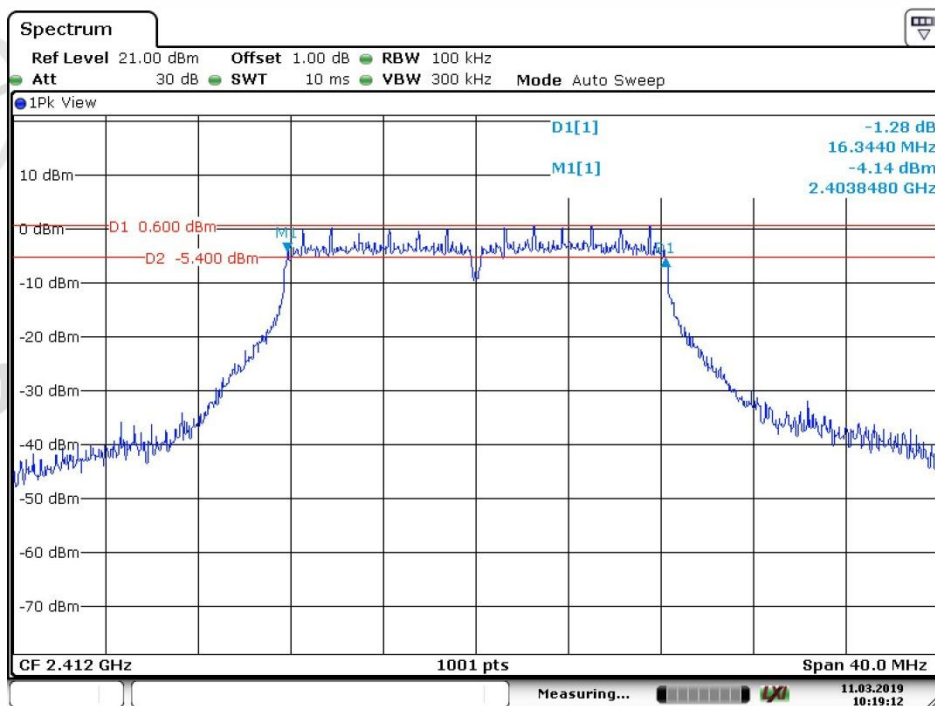


Date: 11.MAR.2019 10:12:32

802.11G_Lowest Channel

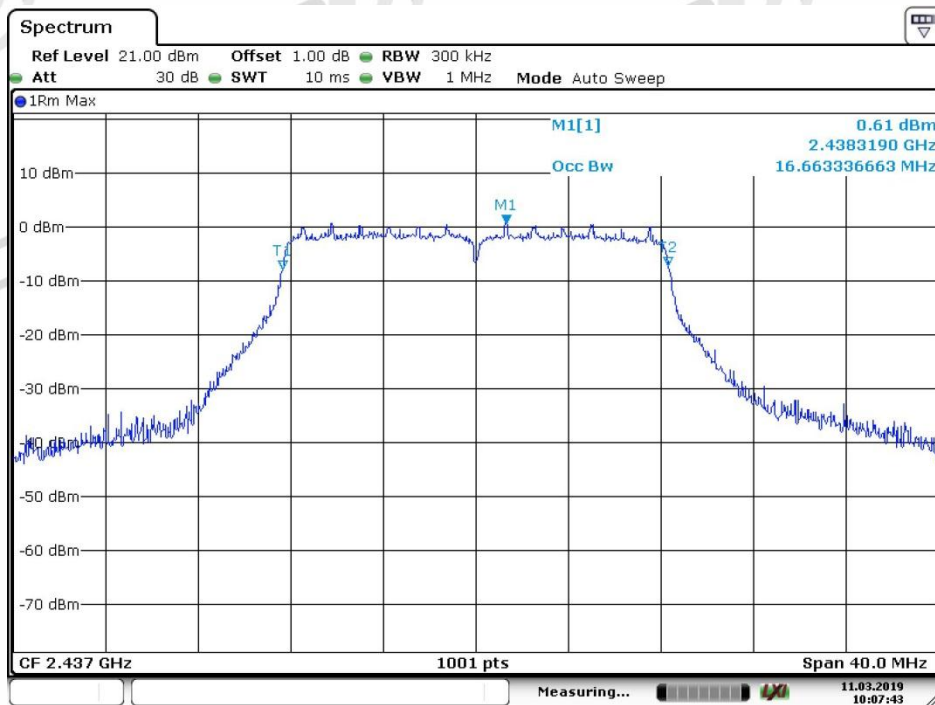


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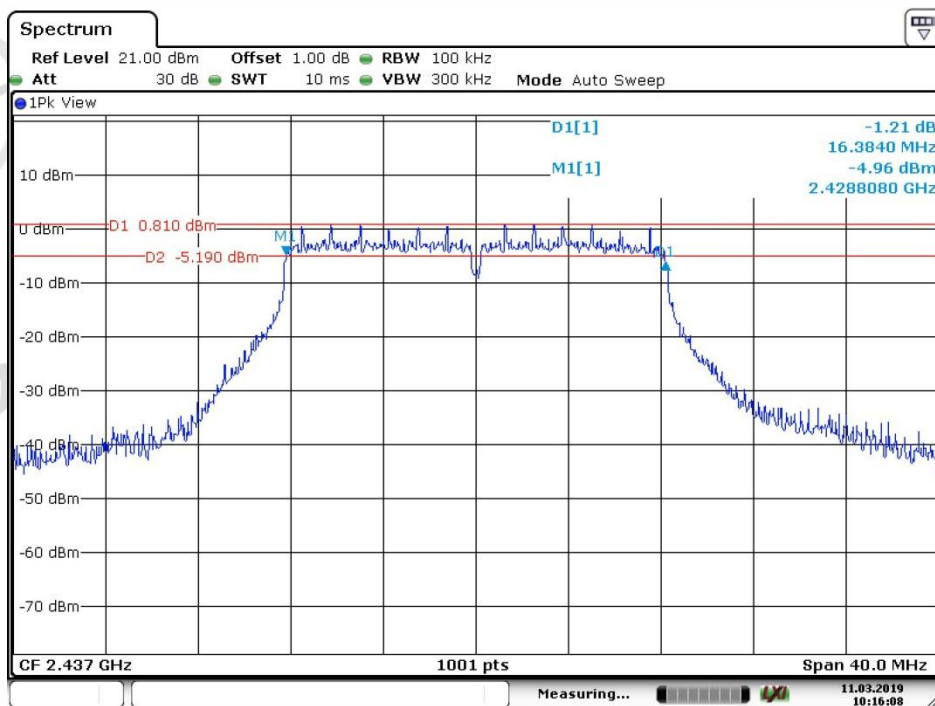


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802.11G_Middle Channel

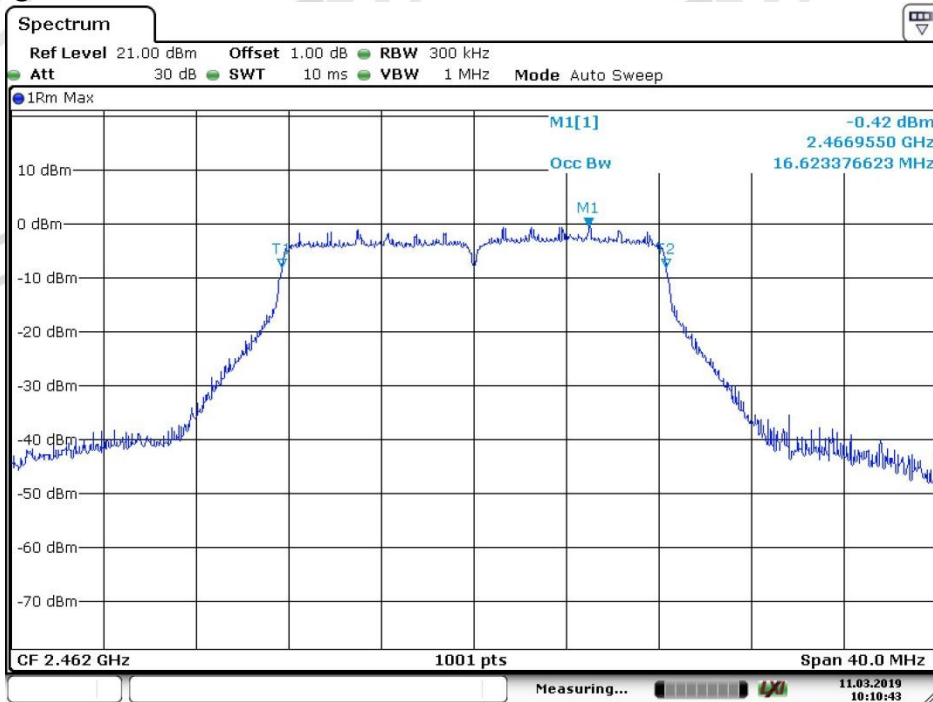


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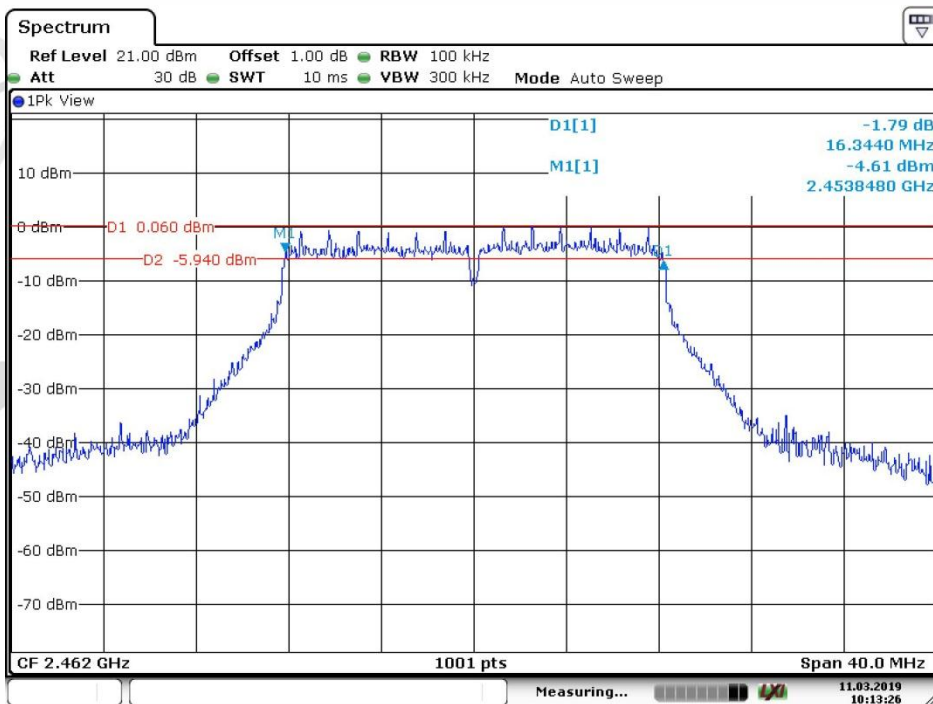


Date: 11.MAR.2019 10:16:08

802.11G_Highest Channel



Date: 11.MAR.2019 10:10:44



Date: 11.MAR.2019 10:13:26

Spectrum

Ref Level 21.00 dBm Offset 1.00 dB RBW 300 kHz

Att 30 dB SWT 10 ms VBW 1 MHz Mode Auto Sweep

1Rm Max

M1[1] 0.35 dBm
2.4169950 GHz
17.782217782 MHz

Occ Bw

M1

T1 T2

CF 2.412 GHz 1001 pts Span 40.0 MHz

Measuring... 11.03.2019 10:09:14

Spectrum

Ref Level 21.00 dBm Offset 1.00 dB RBW 100 kHz
Att 30 dB SWT 10 ms VBW 300 kHz Mode Auto Sweep

1Pk View

D1 0.590 dBm
D2 -5.410 dBm
M1
D1[1] -2.26 dB
M1[1] -4.52 dB
2.4032490 GHz

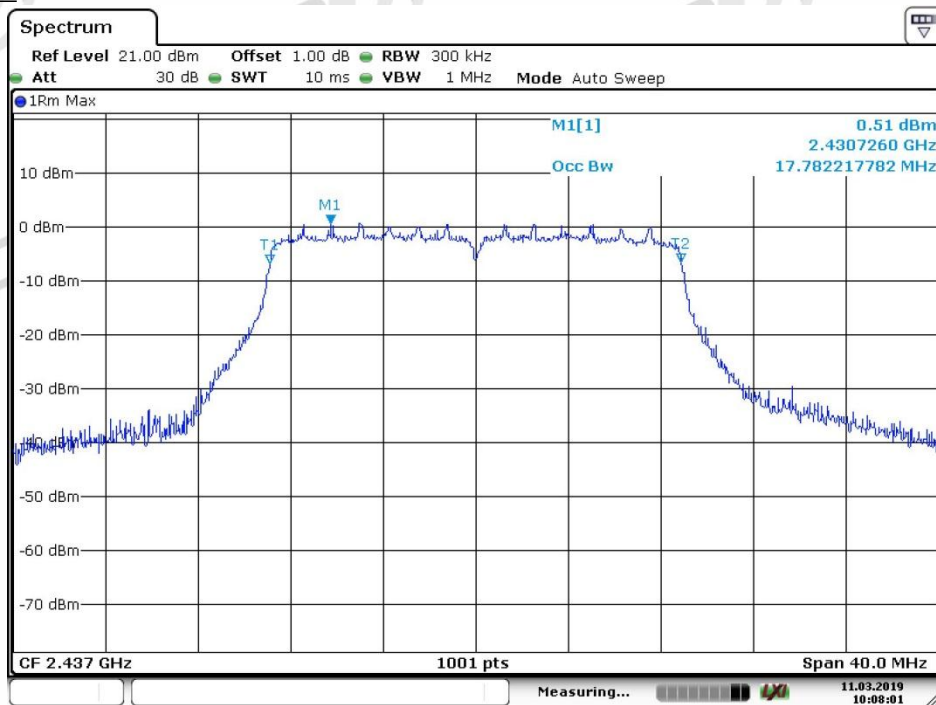
CF 2.412 GHz 1001 pts Span 40.0 MHz

Measuring...

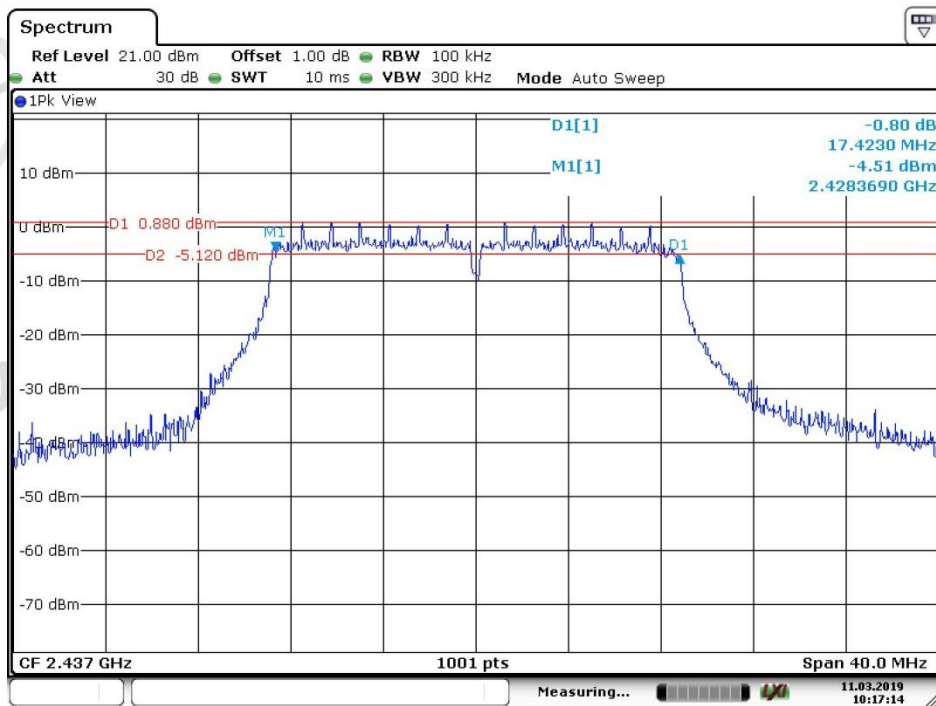
11.03.2019 10:20:14

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802.11 N20 Middle Channel

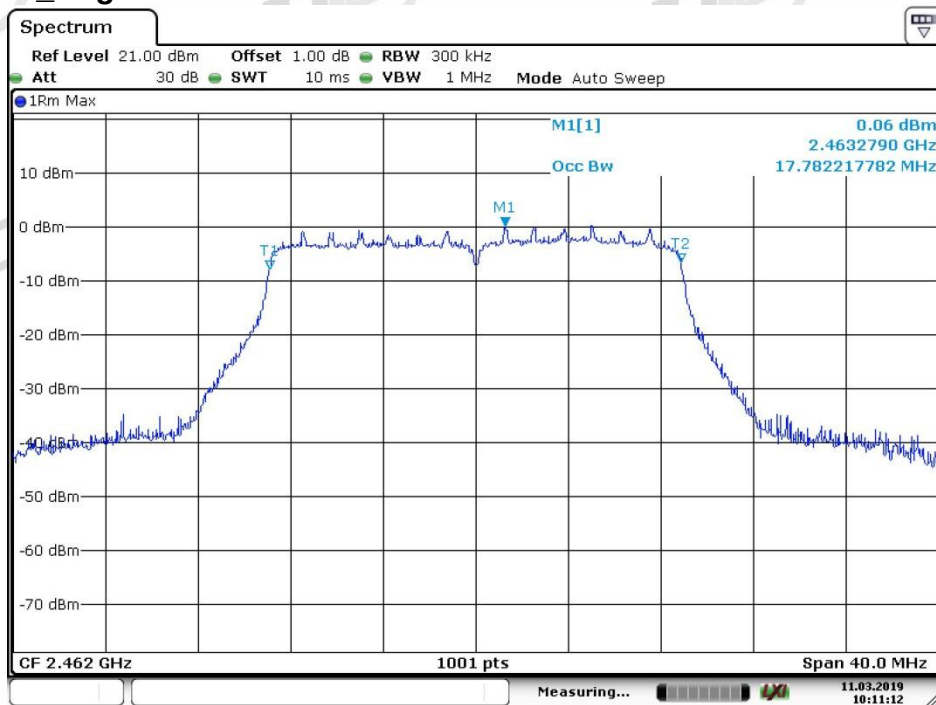


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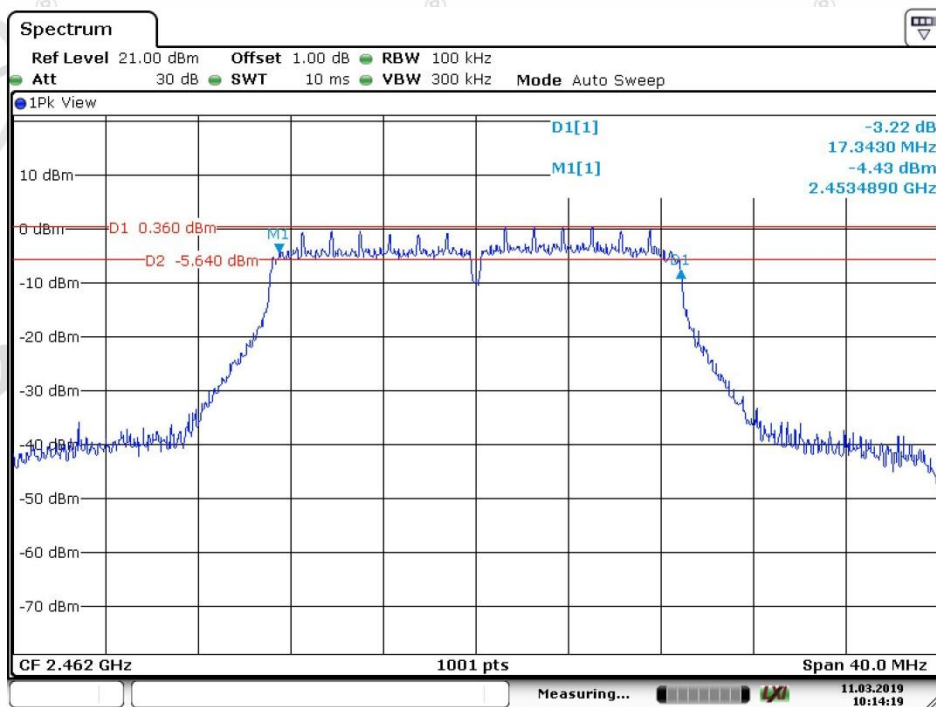


Date: 11.MAR.2019 10:17:14

802.11 N20_Highest Channel



Date: 11.MAR.2019 10:11:12



Date: 11.MAR.2019 10:14:20

Power Spectral Density

Test Results

Mode	Test Channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
802.11B	Lowest	-9.63	≤8.00	Pass
	Middle	-9.95	≤8.00	Pass
	Highest	-10.39	≤8.00	Pass
802.11G	Lowest	-12.18	≤8.00	Pass
	Middle	-11.15	≤8.00	Pass
	Highest	-12.47	≤8.00	Pass
802.11N20	Lowest	-12.09	≤8.00	Pass
	Middle	-12.17	≤8.00	Pass
	Highest	-12.49	≤8.00	Pass

Test plots

ANT1

802.11B_Lowest Channel



Date: 11.MAR.2019 10:22:45

802.11B_Middle Channel



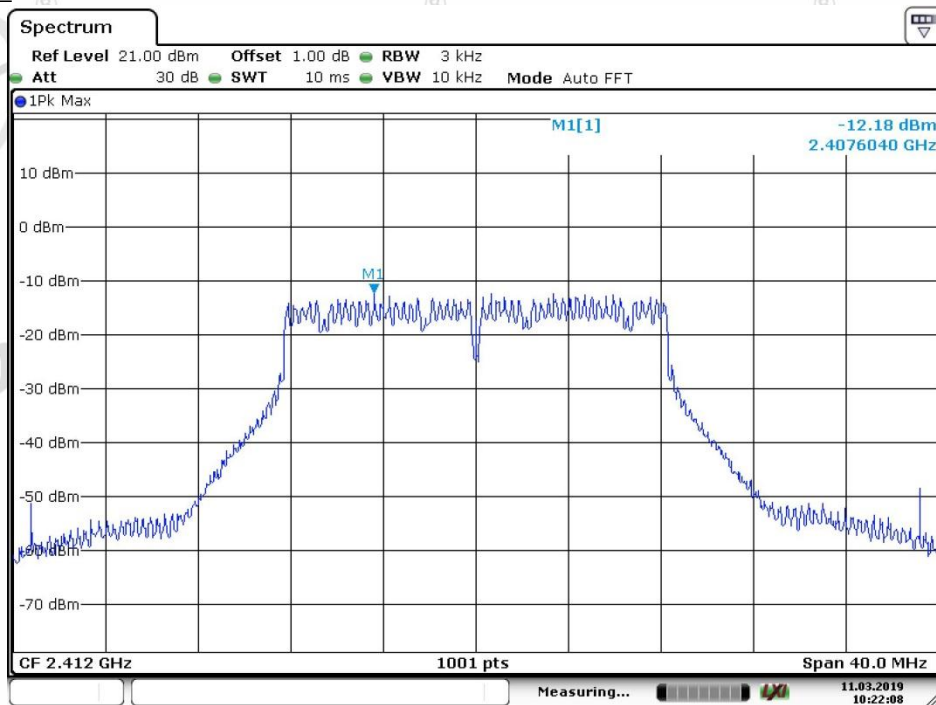
Date: 11.MAR.2019 10:26:14

802.11B_Highest Channel



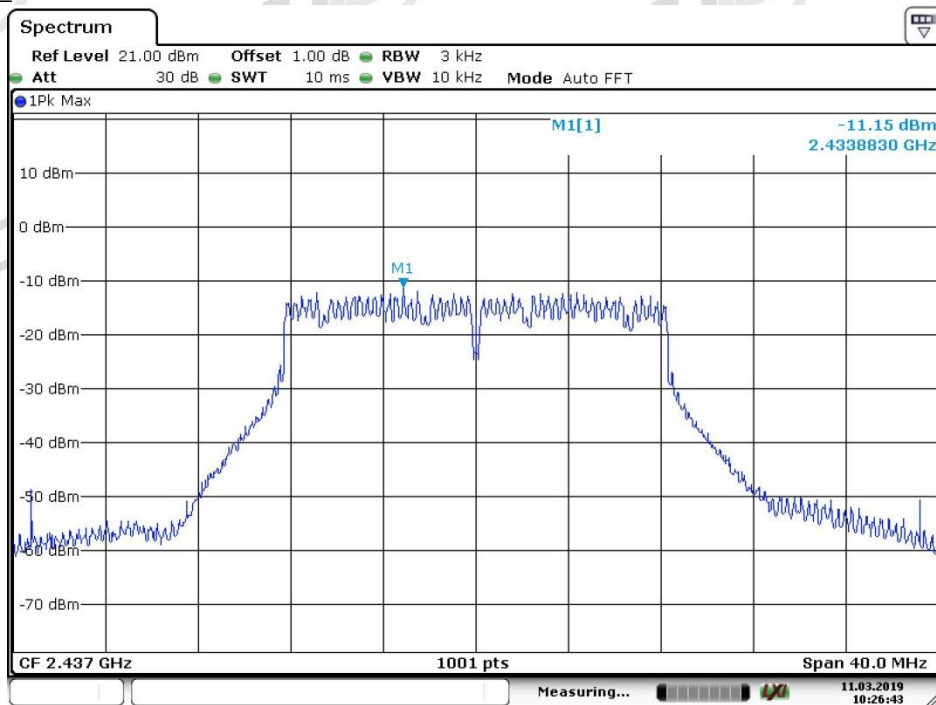
Date: 11.MAR.2019 10:28:02

802.11G_Lowest Channel



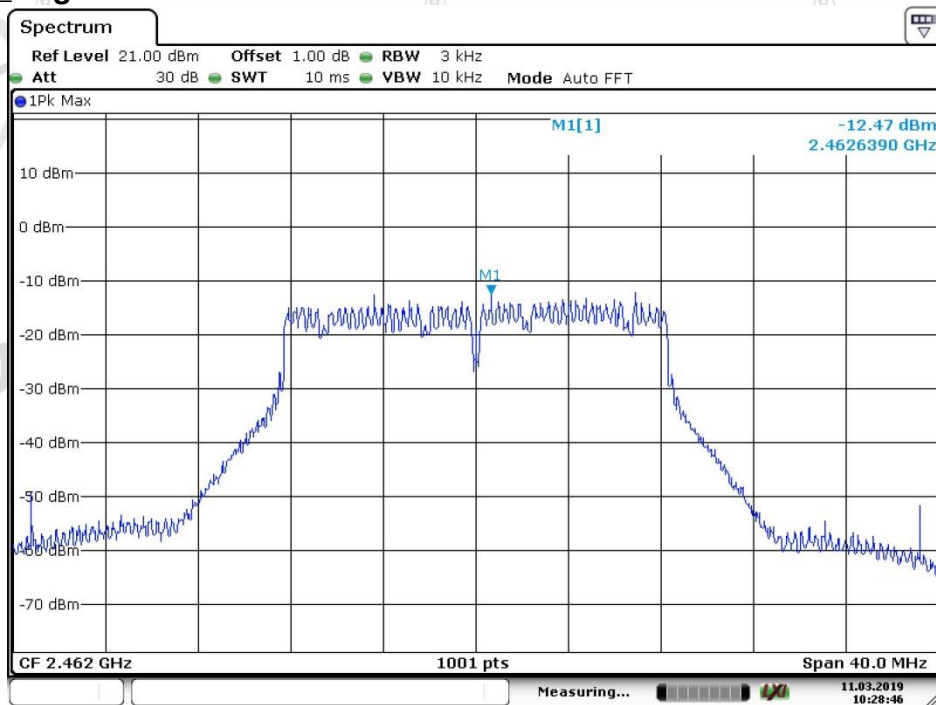
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802.11G_Middle Channel



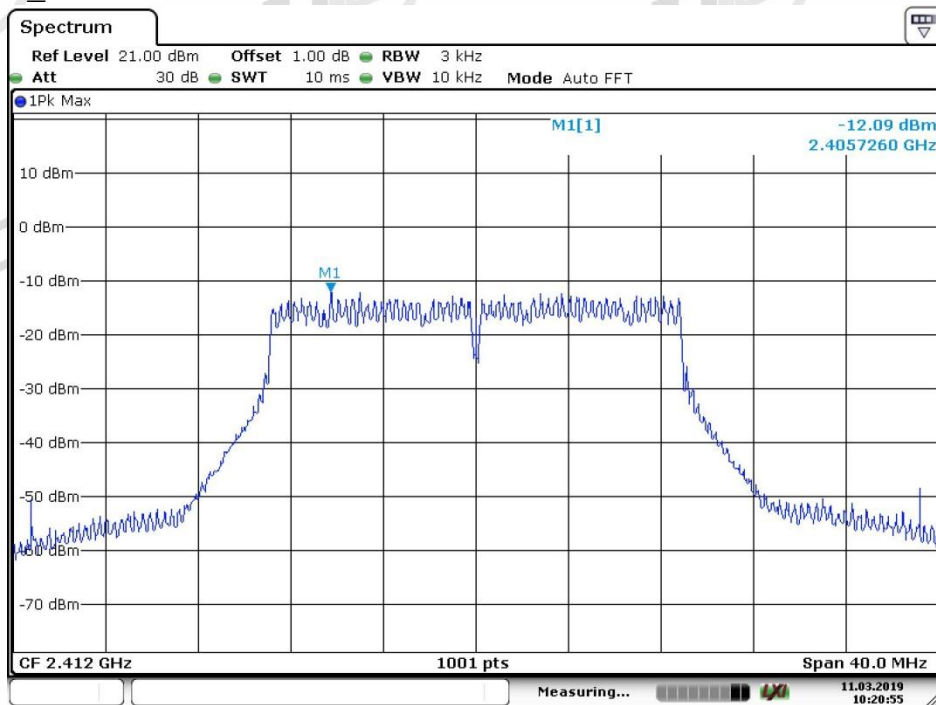
Date: 11.MAR.2019 10:26:43

802.11G_Highest Channel



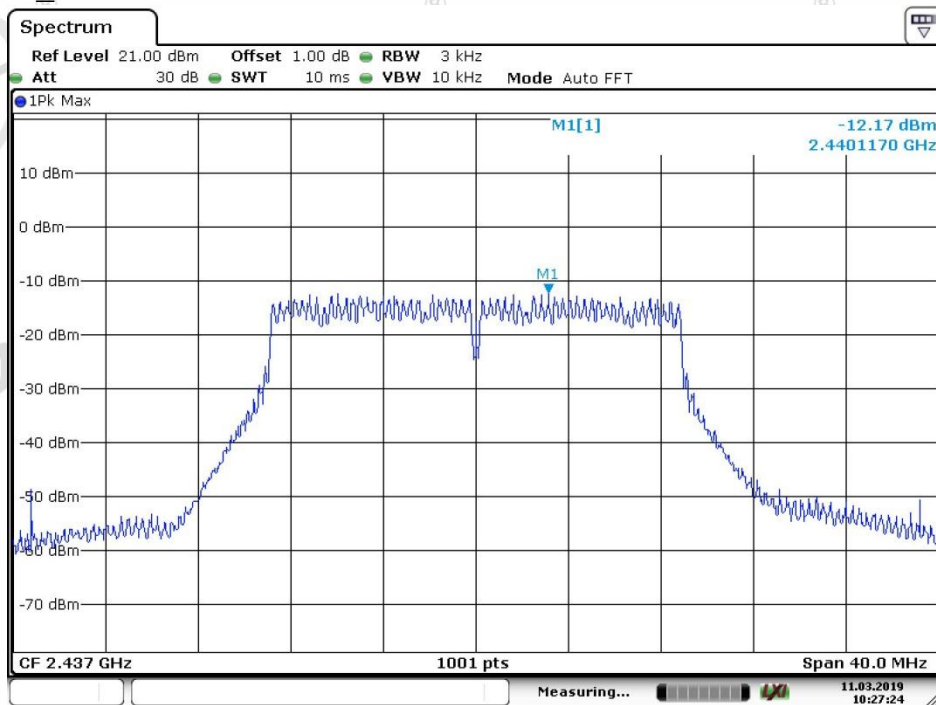
Date: 11.MAR.2019 10:28:47

802.11N20_Lowest Channel



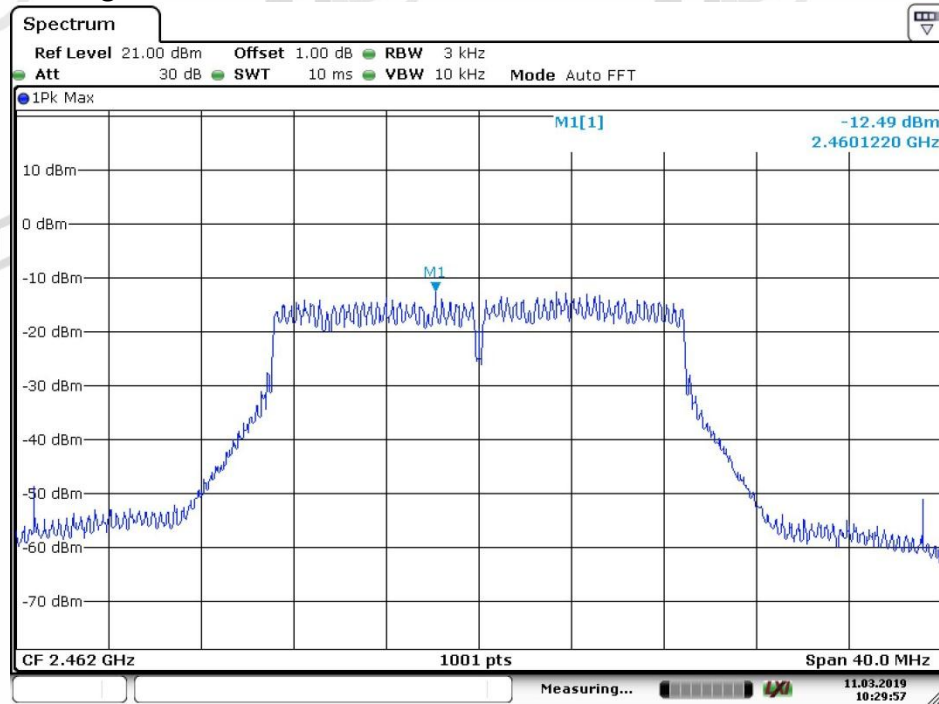
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802.11 N20_Middle Channel



Date: 11.MAR.2019 10:27:25

802.11 N20_Highest Channel



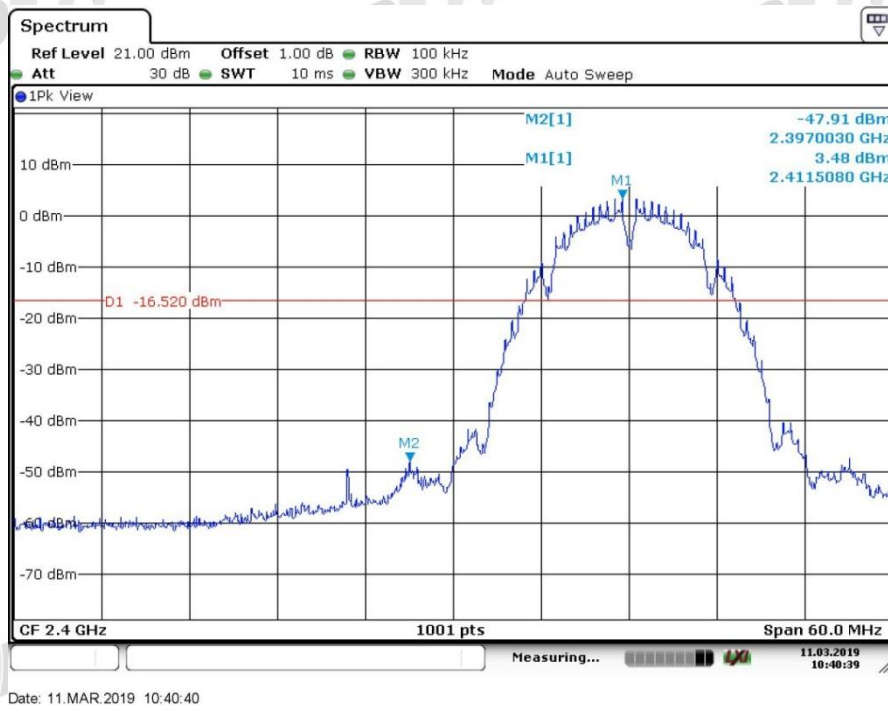
Date: 11.MAR.2019 10:29:58

Band-edge for RF Conducted Emissions

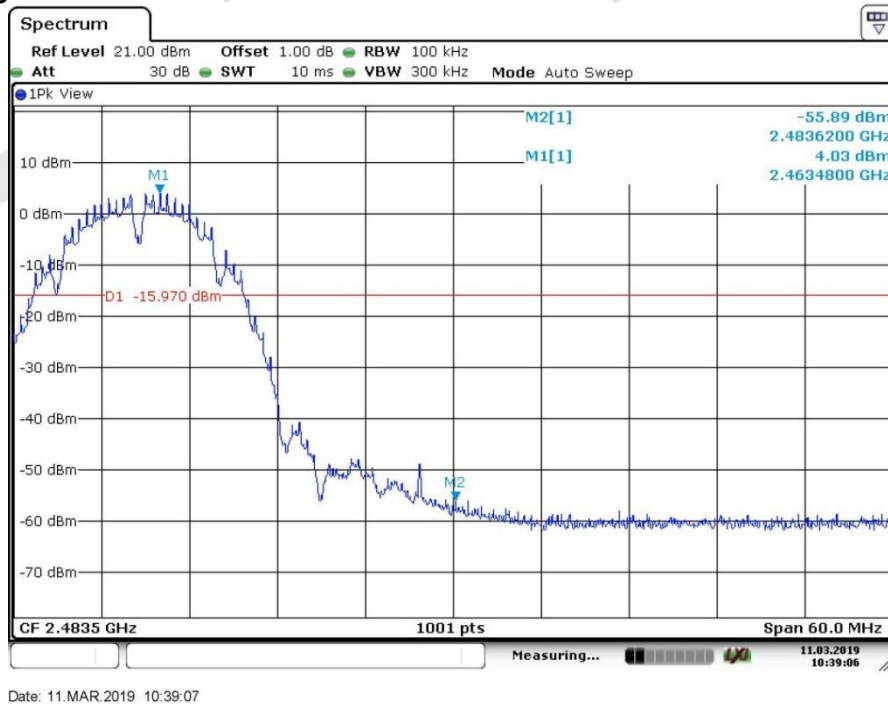
Test plots

ANT1

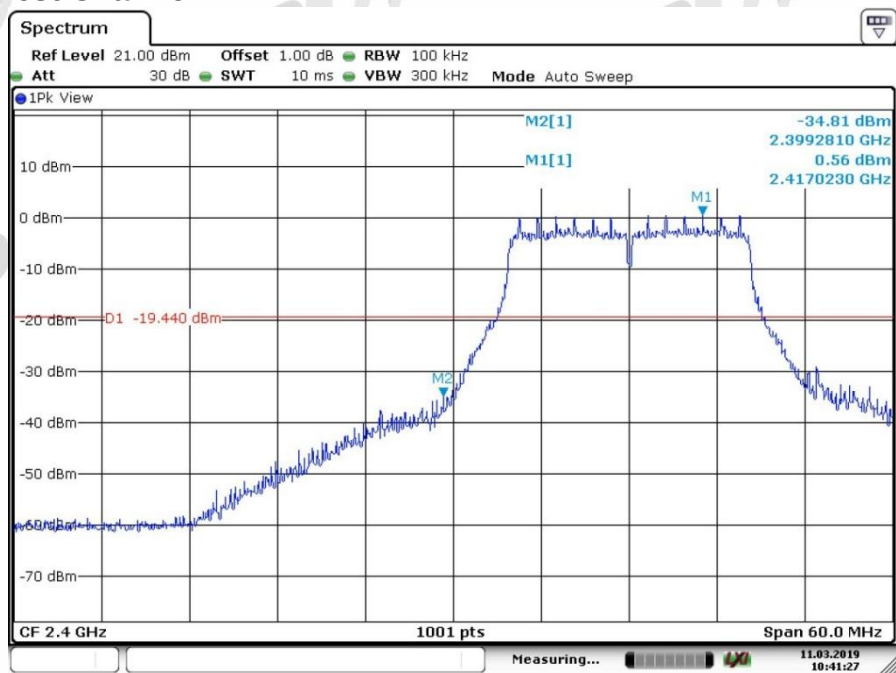
802.11B_Lowest Channel



802.11B_Highest Channel

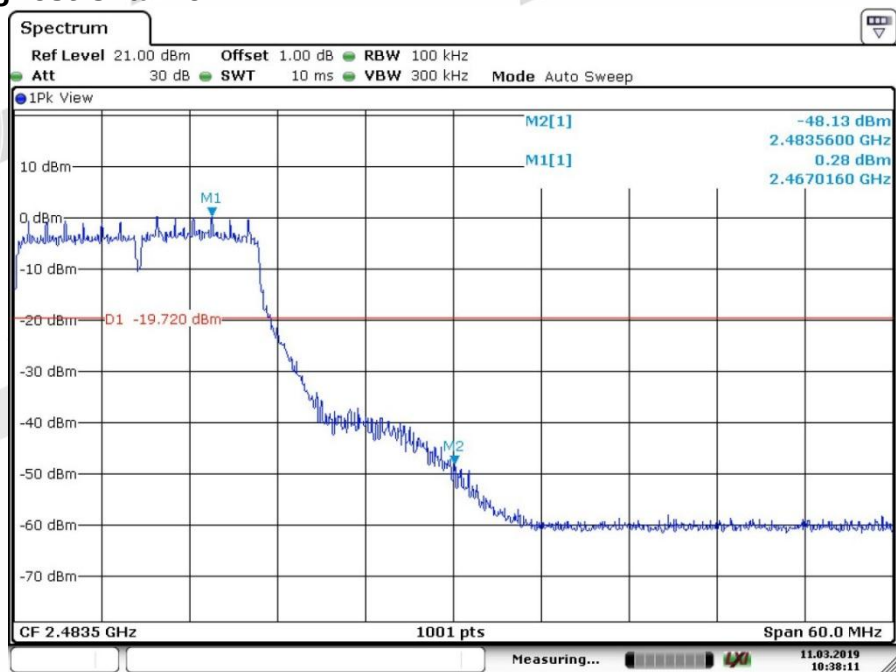


802.11G_Lowest Channel



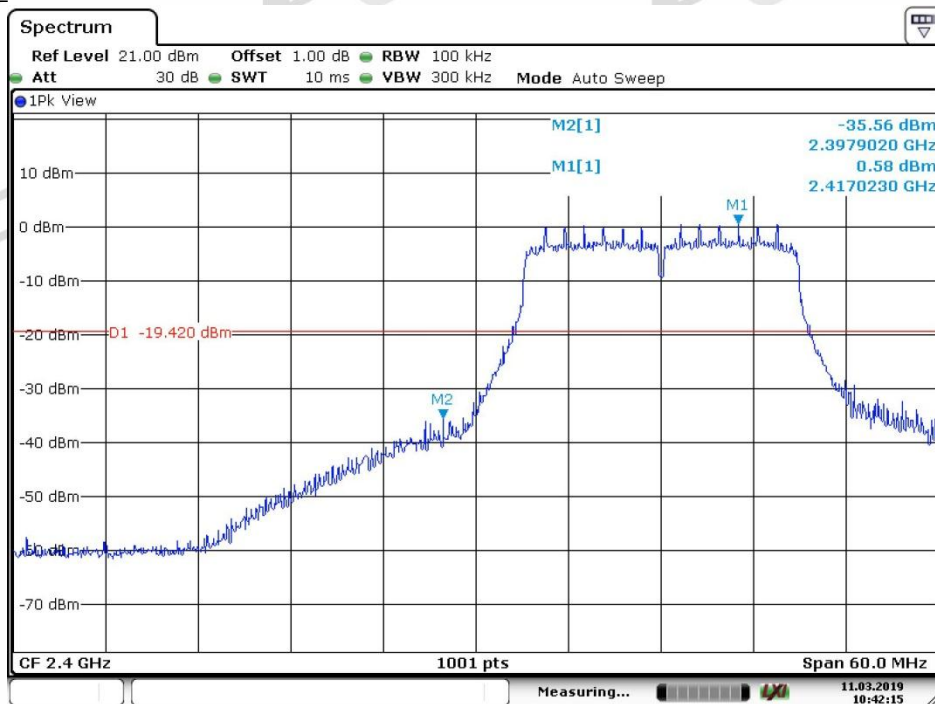
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802.11G_Highest Channel



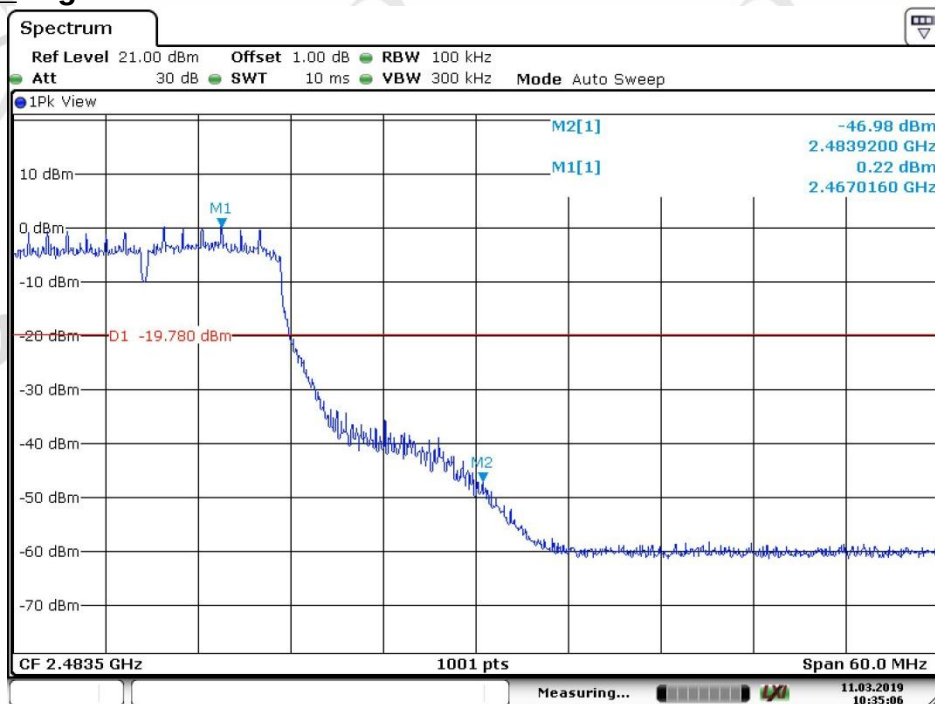
Date: 11.MAR.2019 10:38:11

802.11N20_Lowest Channel



Date: 11.MAR.2019 10:42:15

802.11 N20_Highest Channel



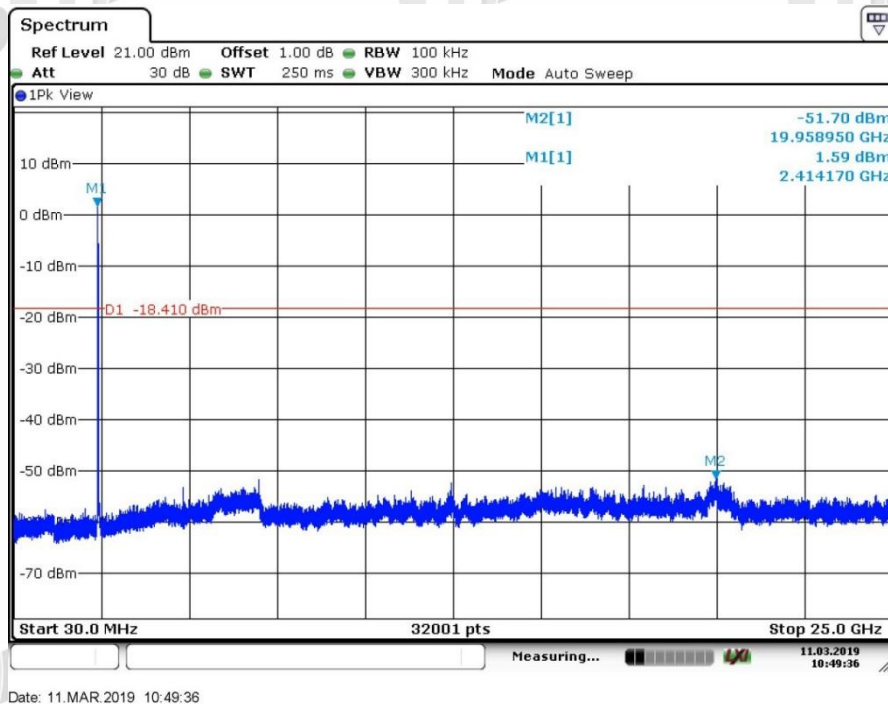
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RF Conducted Spurious Emissions

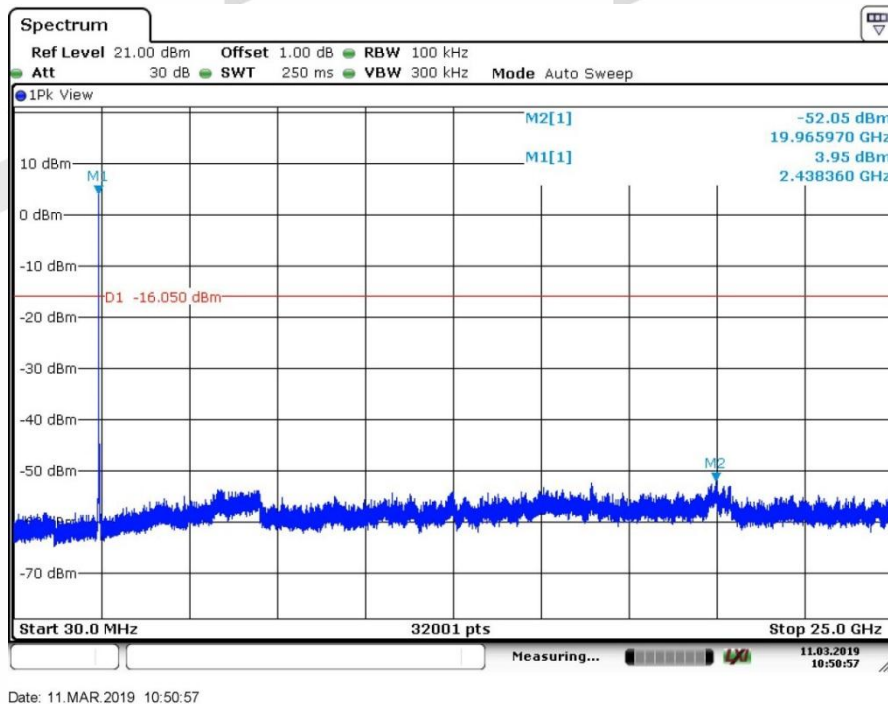
Test plots

ANT1

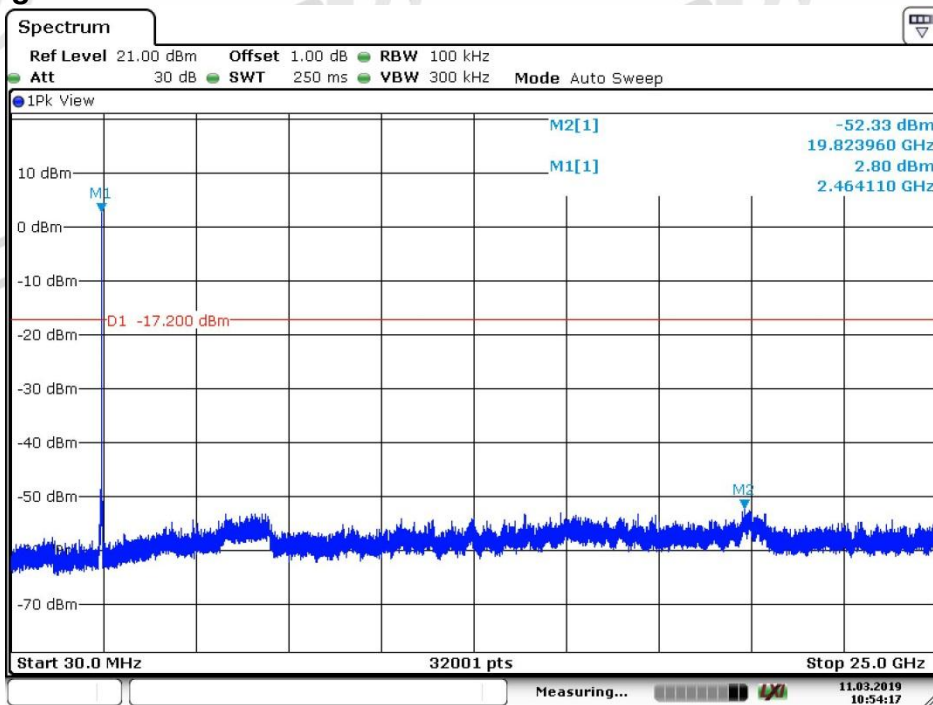
802.11B_Lowest Channel



802.11B_Middle Channel

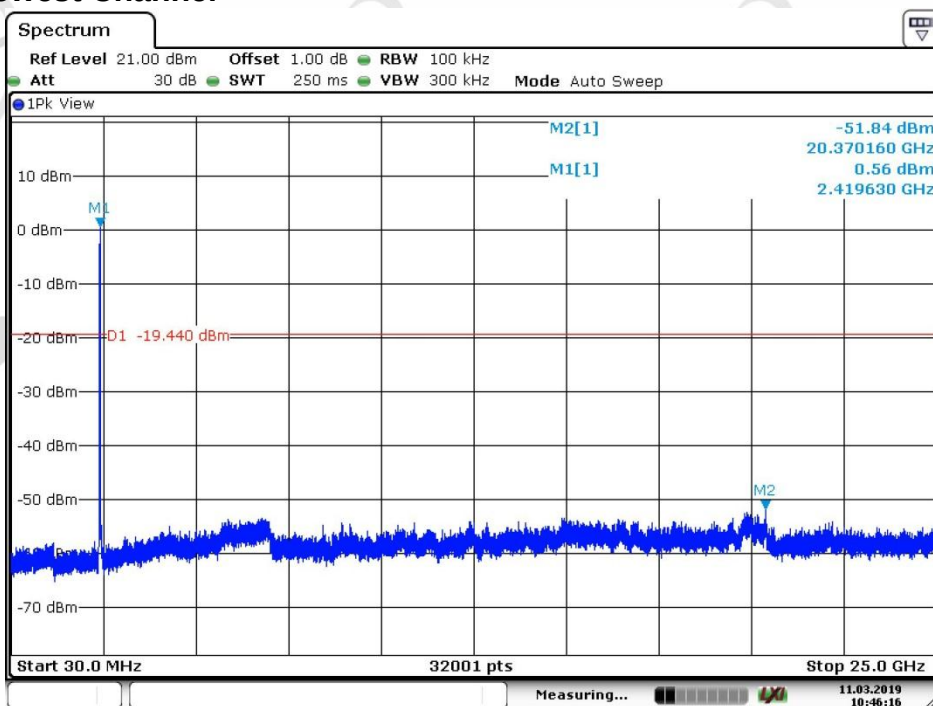


802.11B_Highest Channel



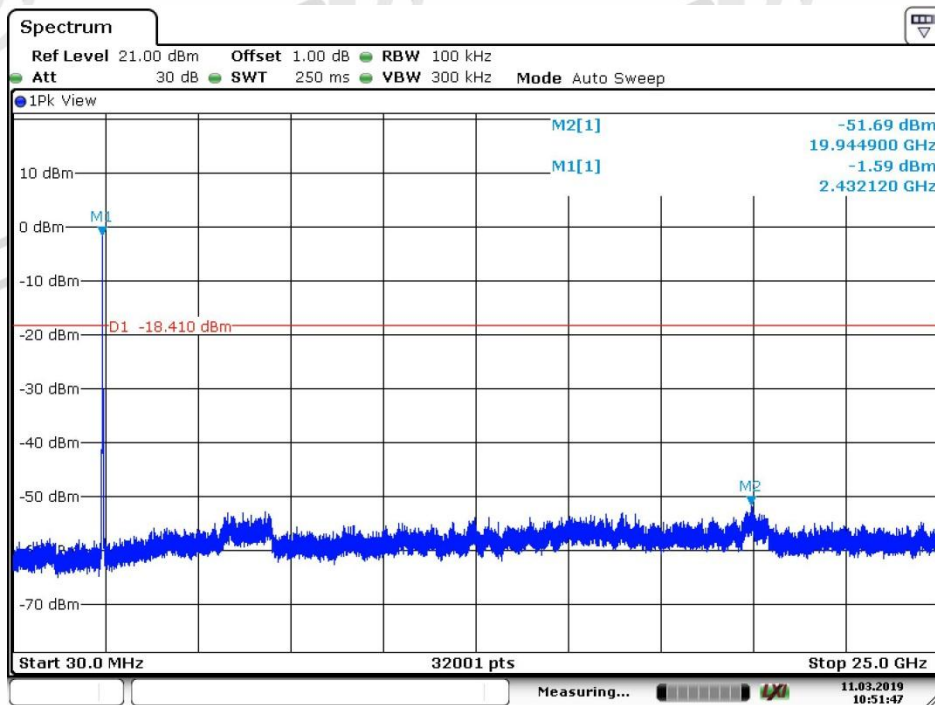
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802.11G_Lowest Channel



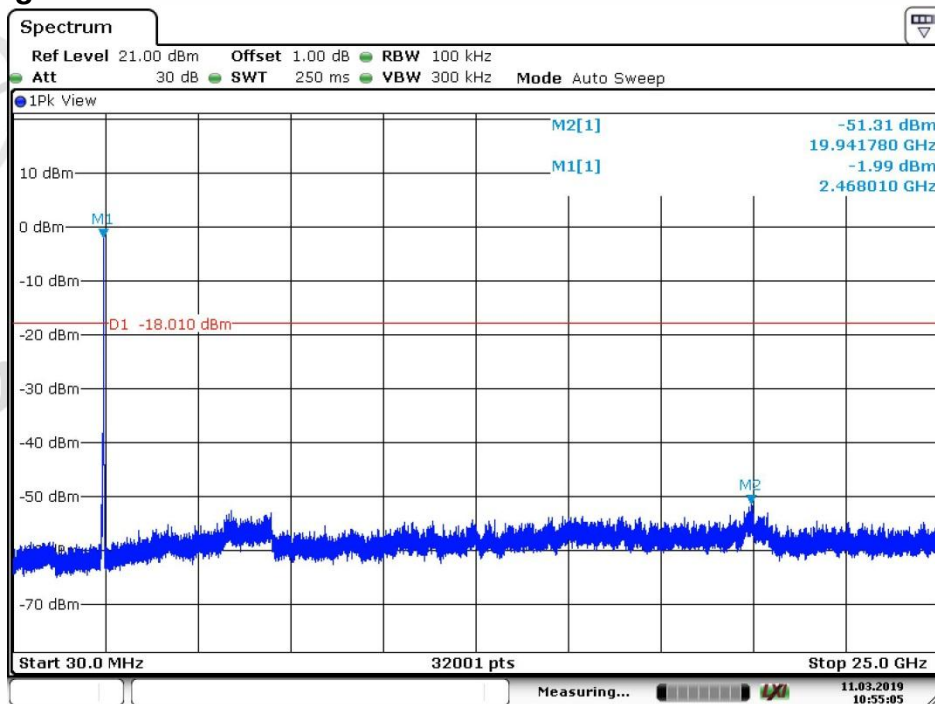
Date: 11.MAR.2019 10:46:16

802.11G_Middle Channel



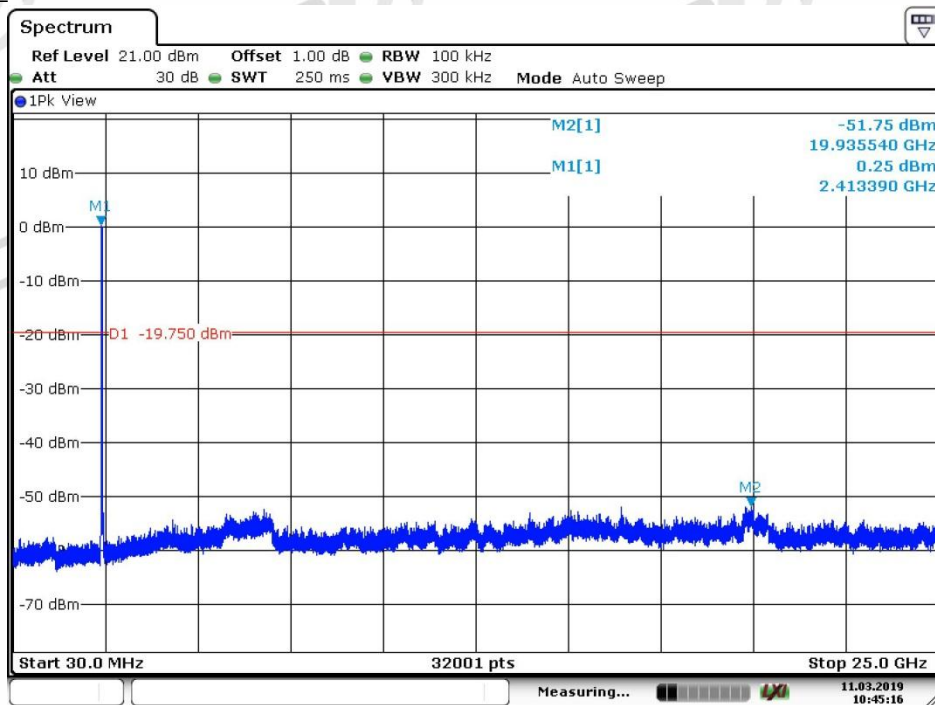
Date: 11.MAR.2019 10:51:48

802.11G_Highest Channel



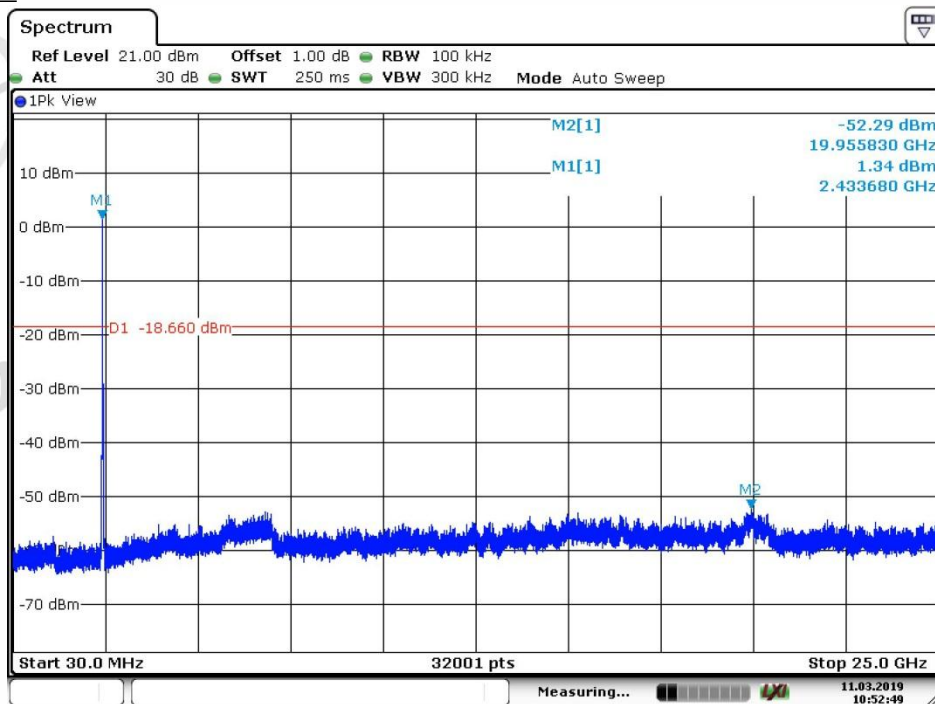
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802.11N20_Lowest Channel



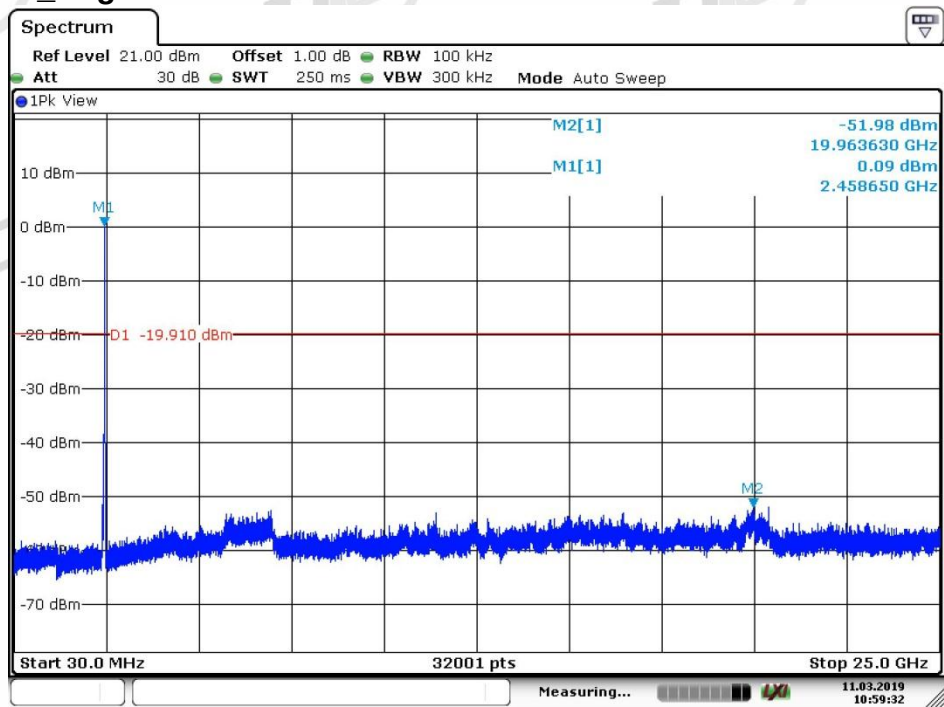
Date: 11.MAR.2019 10:45:17

802.11 N20_Middle Channel



Date: 11.MAR.2019 10:52:50

802.11 N20_Highest Channel



Date: 11.MAR.2019 10:59:32

Remark:

Scan from 9kHz to 25GHz, the disturbance between 9KHz to 30MHz was very low, and the above harmonics were the highest point could be found when testing, The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.