

Appendix A

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: Home LoRaWAN Gateway

Trade Mark: **Friendcom**[®]

Test Model: GW200

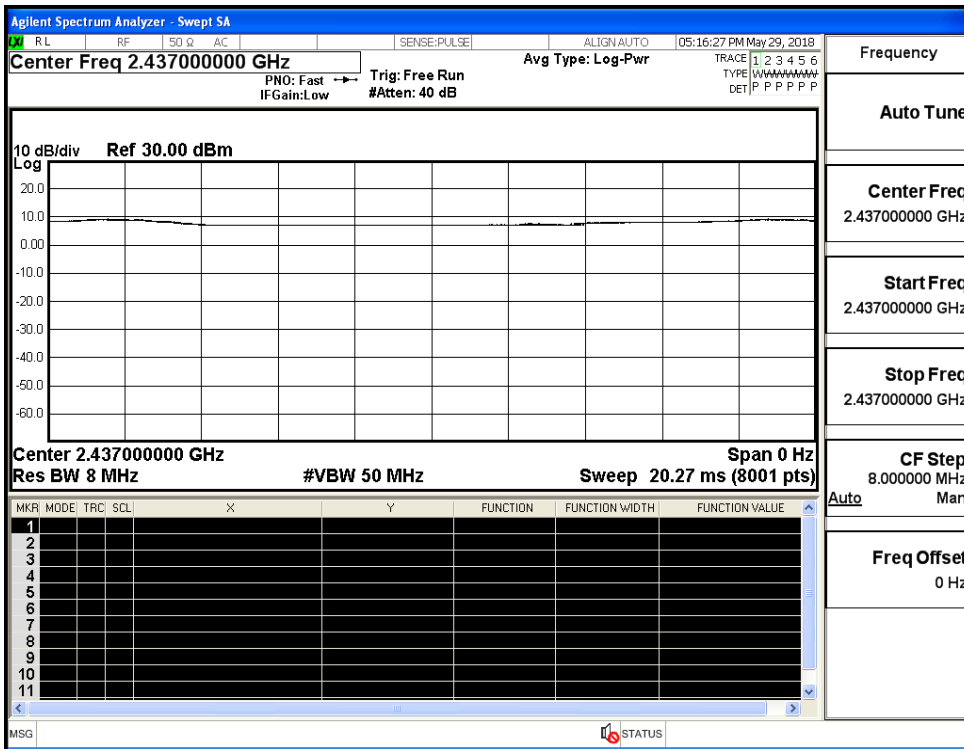
Environmental Conditions

Temperature:	24.5 ° C
Relative Humidity:	52.4%
ATM Pressure:	100.0 kPa
Test Engineer:	WAGCHUANG
Supervised by:	Jayden.Zhuo

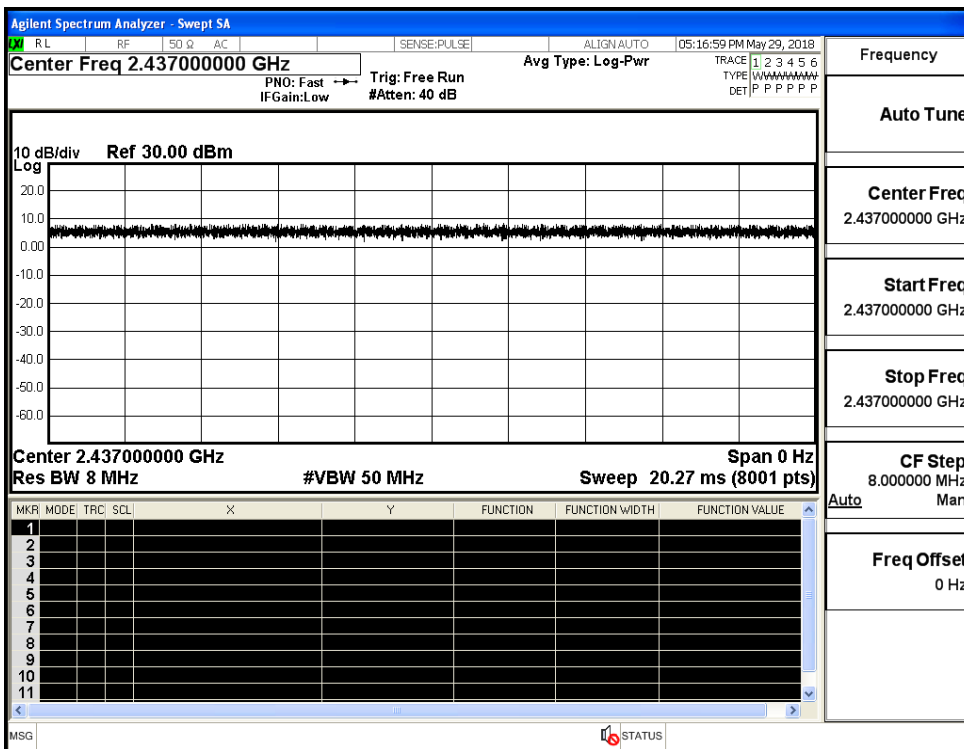
A.1 Duty Cycle

Test Mode	Test Channel	Ant	Duty Cycle[%]	Verdict
11B	2437	Ant1	100	PASS
11G	2437	Ant1	100	PASS
11N20SISO	2437	Ant1	100	PASS
11N40SISO	2437	Ant1	100	PASS

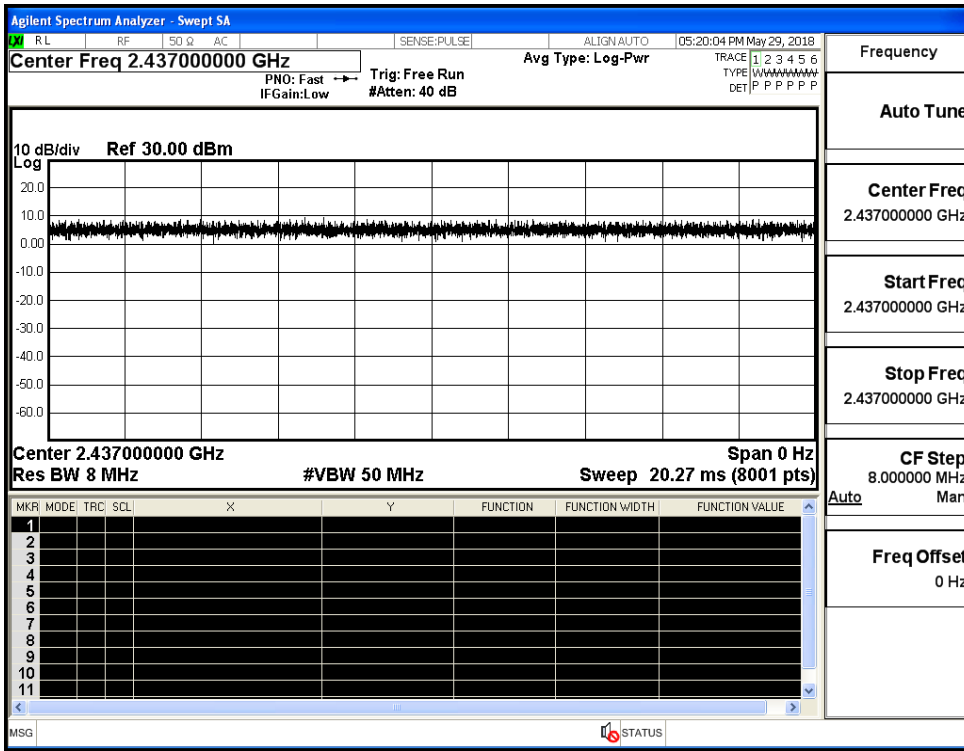
Duty Cycle_11B_2437_Ant1



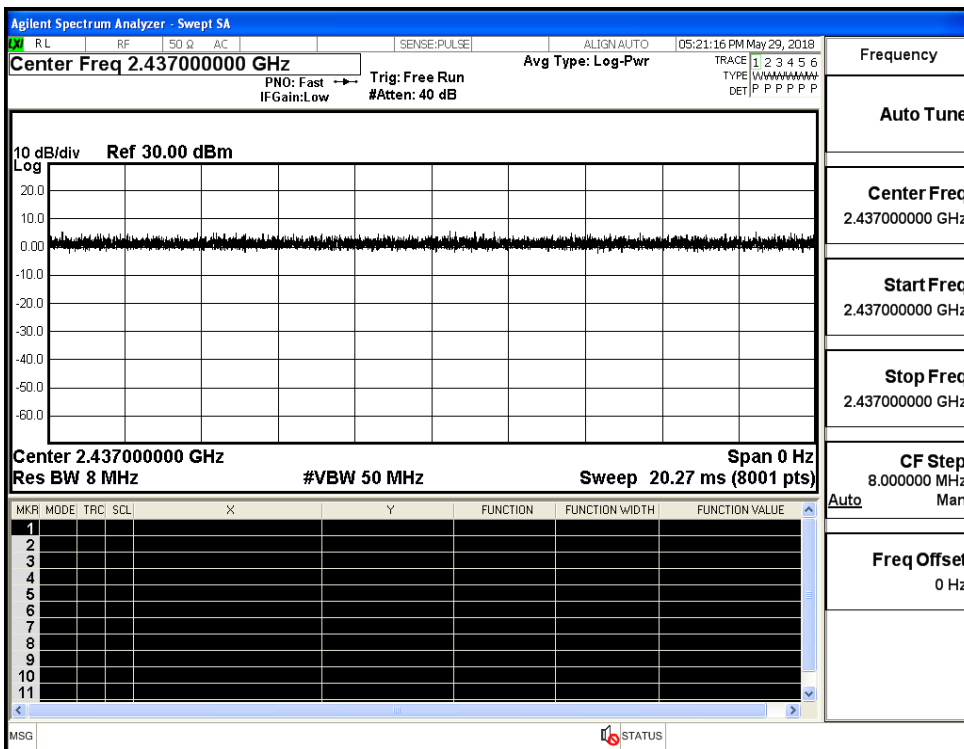
Duty Cycle_11G_2437_Ant1



Duty Cycle_11N20SISO_2437_Ant1

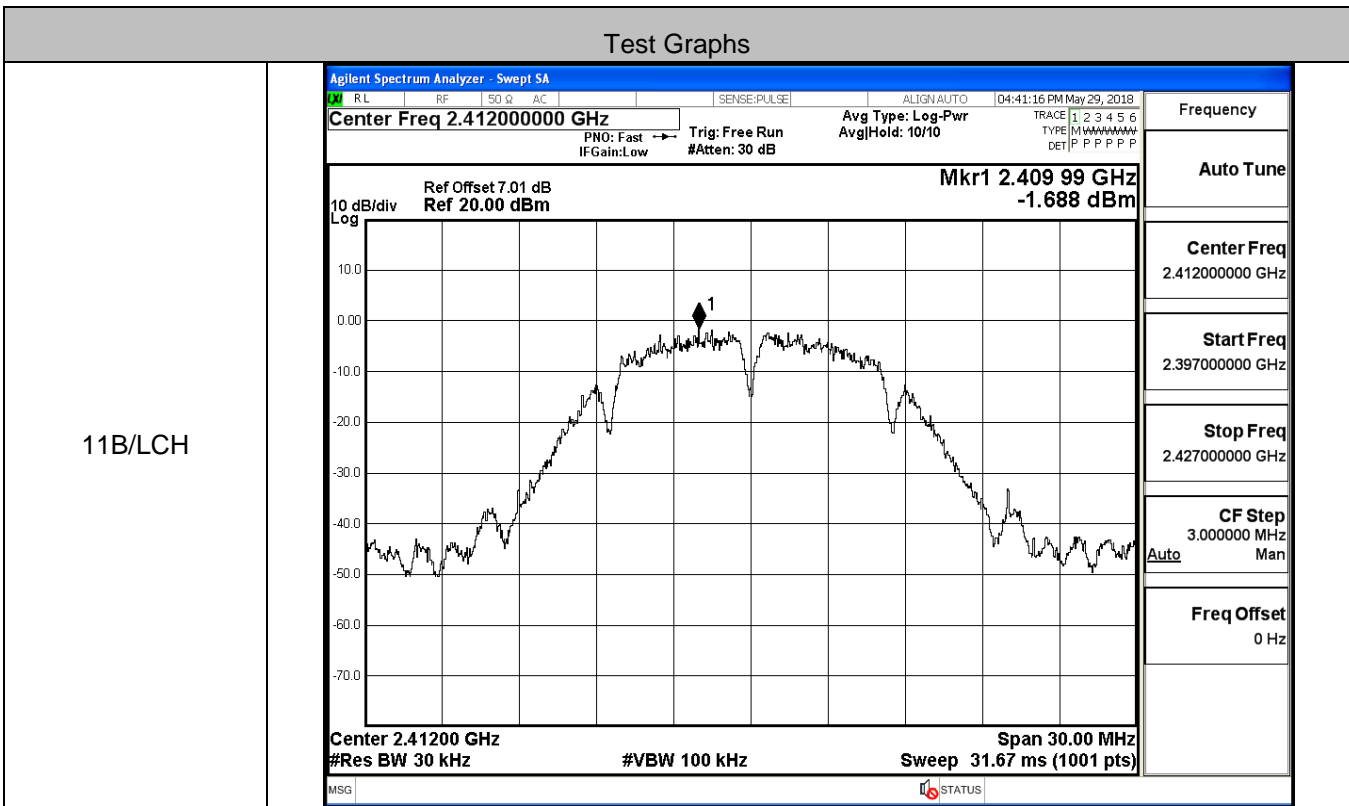


Duty Cycle_11N40SISO_2437_Ant1



A.2 Maximum Power Spectral Density

Mode	Channel	Meas.Level [dBm/30KHz]	Limit [dBm/3KHz]	Verdict
11B	LCH	-1.688	8	PASS
	MCH	-0.967	8	PASS
	HCH	0.501	8	PASS
11G	LCH	-7.535	8	PASS
	MCH	-6.084	8	PASS
	HCH	-7.050	8	PASS
11N20SISO	LCH	-6.932	8	PASS
	MCH	-6.271	8	PASS
	HCH	-5.881	8	PASS
11N40SISO	LCH	-9.522	8	PASS
	MCH	-9.731	8	PASS
	HCH	-10.467	8	PASS



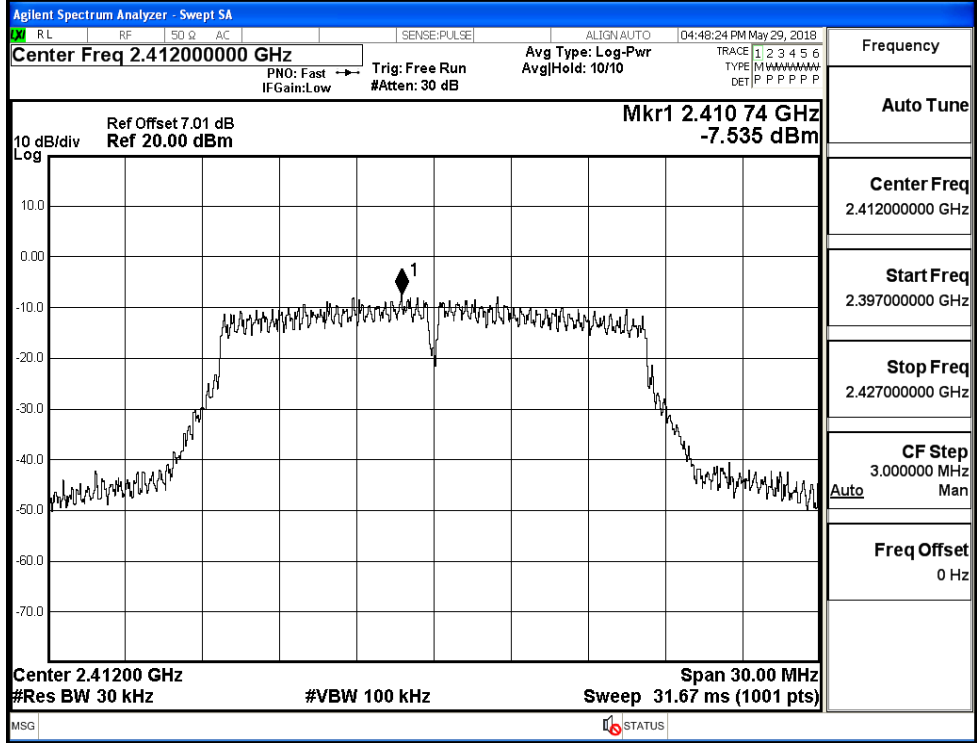
11B/MCH



11B/HCH

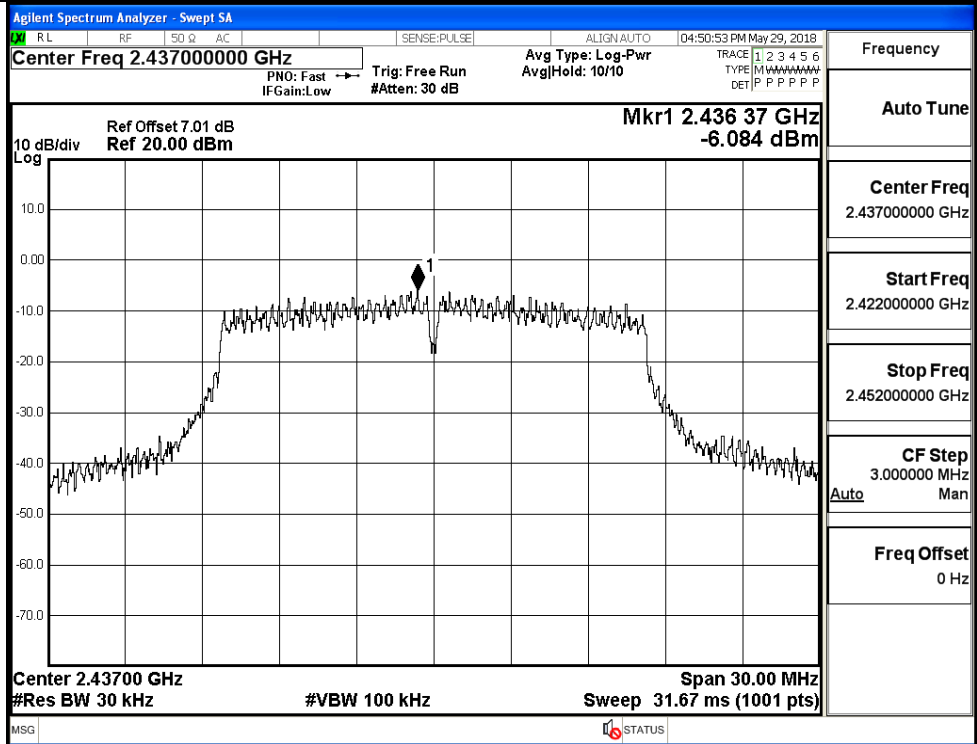


11G/LCH



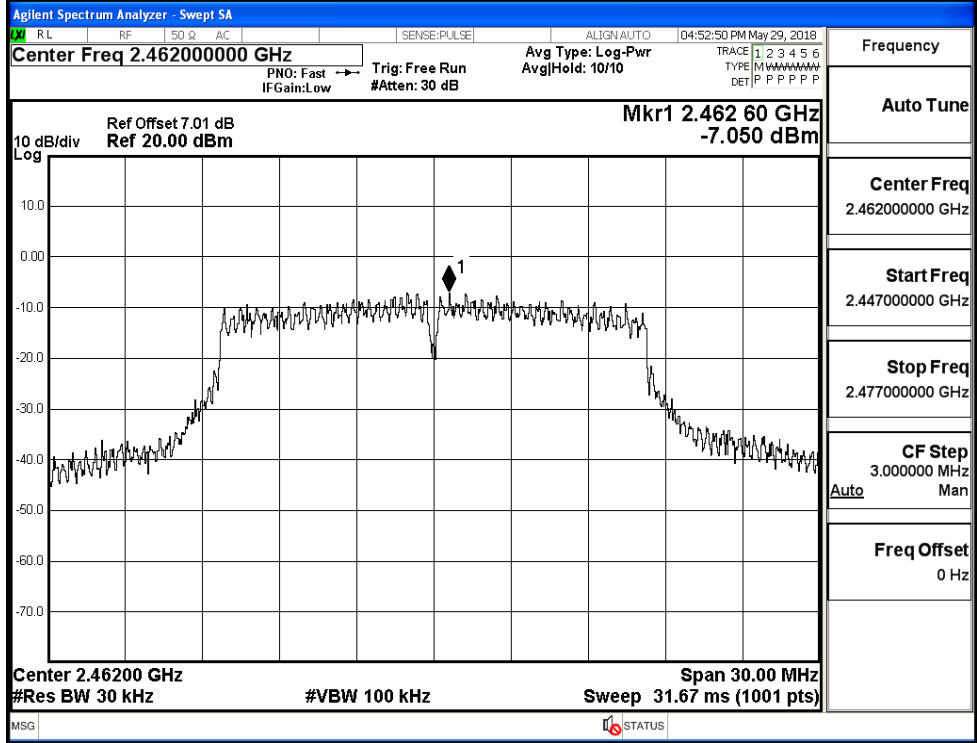
Frequency
Auto Tune
Center Freq 2.41200000 GHz
Start Freq 2.397000000 GHz
Stop Freq 2.427000000 GHz
CF Step 3.000000 MHz Auto
Freq Offset 0 Hz

11G/MCH

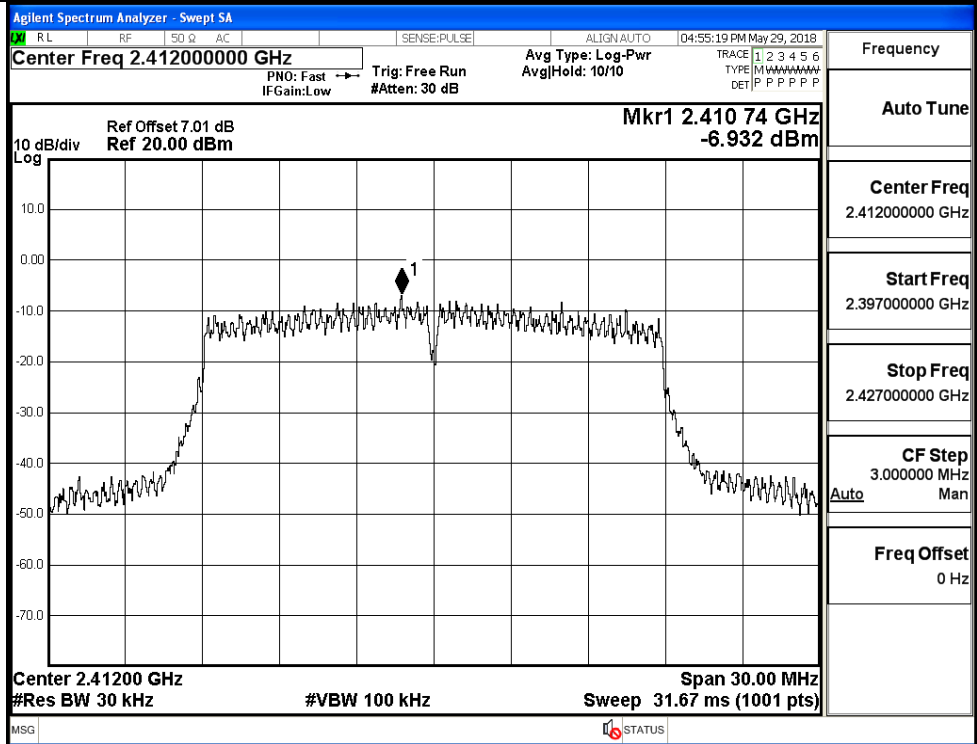


Frequency
Auto Tune
Center Freq 2.437000000 GHz
Start Freq 2.422000000 GHz
Stop Freq 2.452000000 GHz
CF Step 3.000000 MHz Auto
Freq Offset 0 Hz

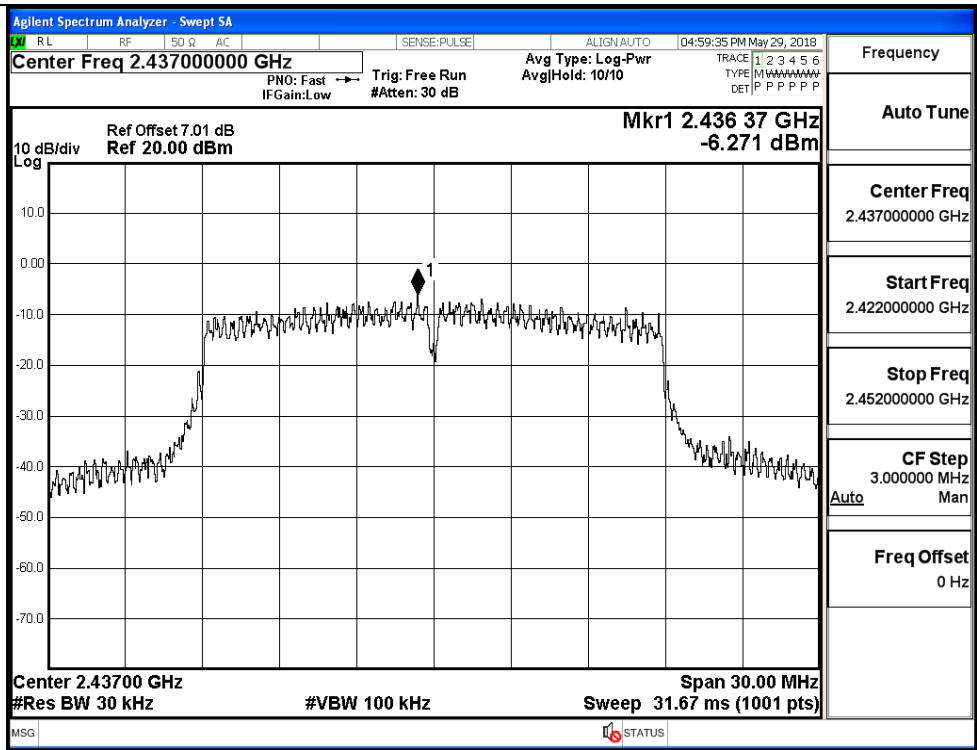
11G/HCH



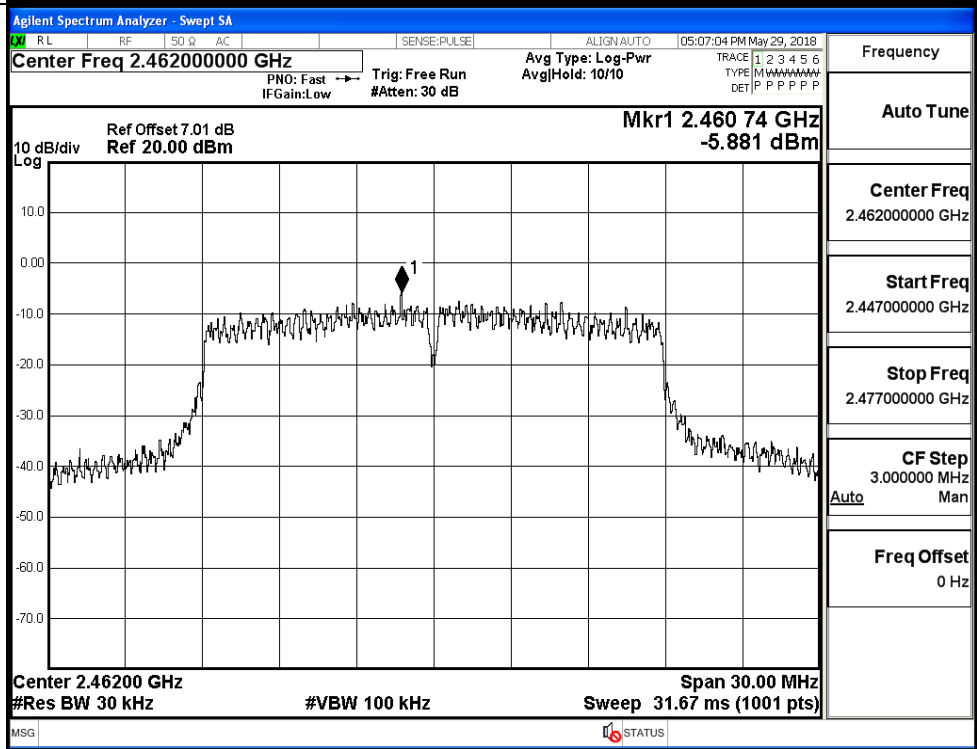
11N20SISO/LCH



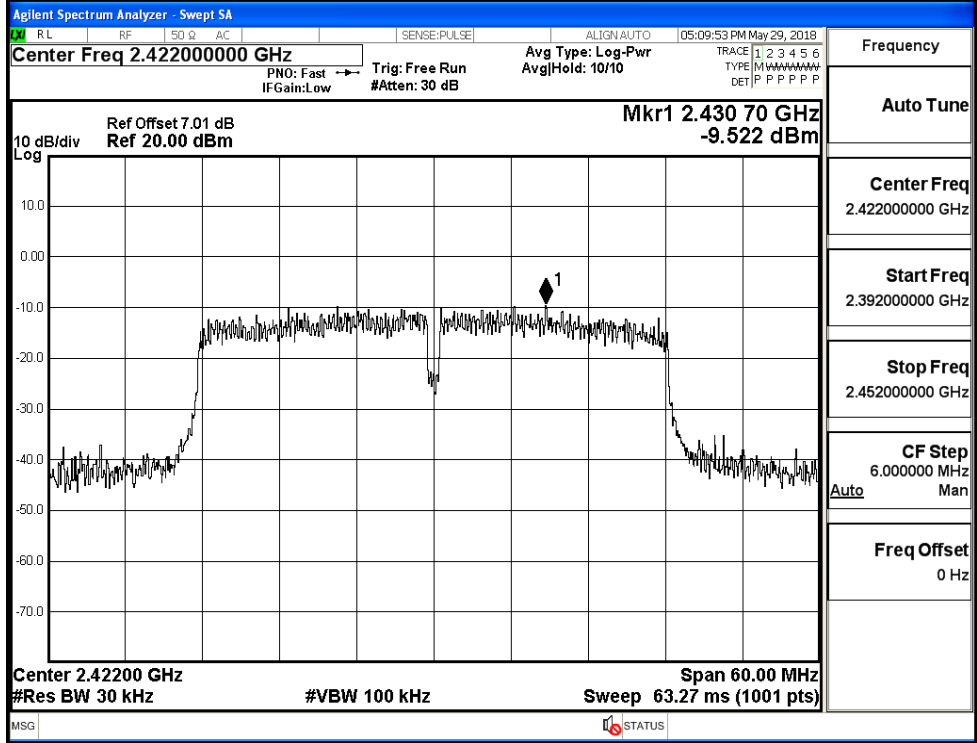
11N20SISO/MCH



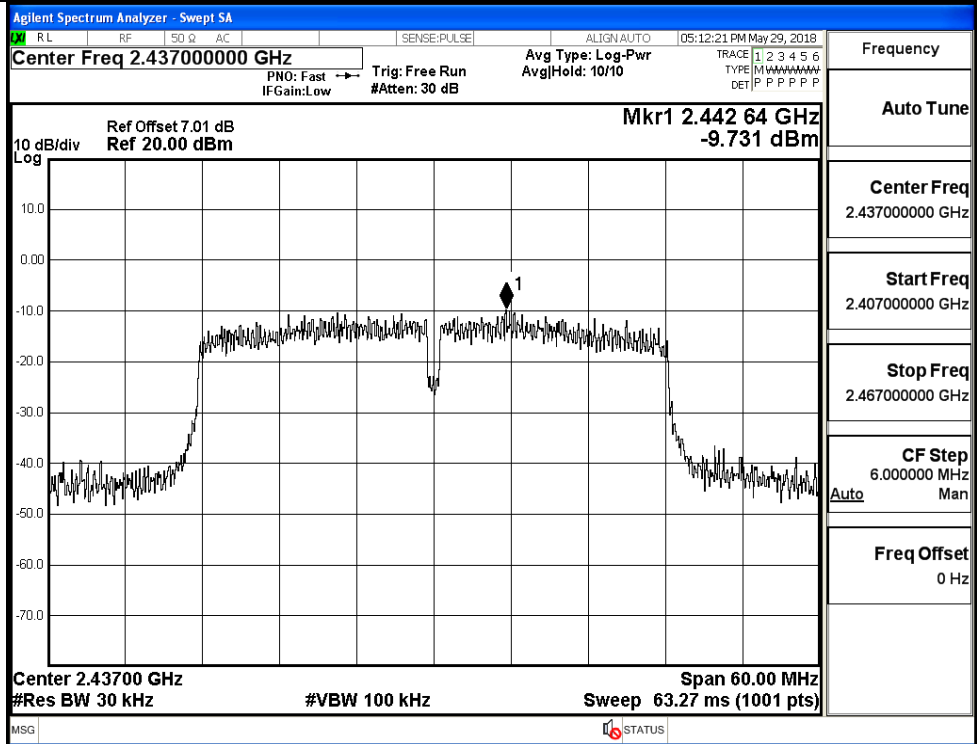
11N20SISO/HCH



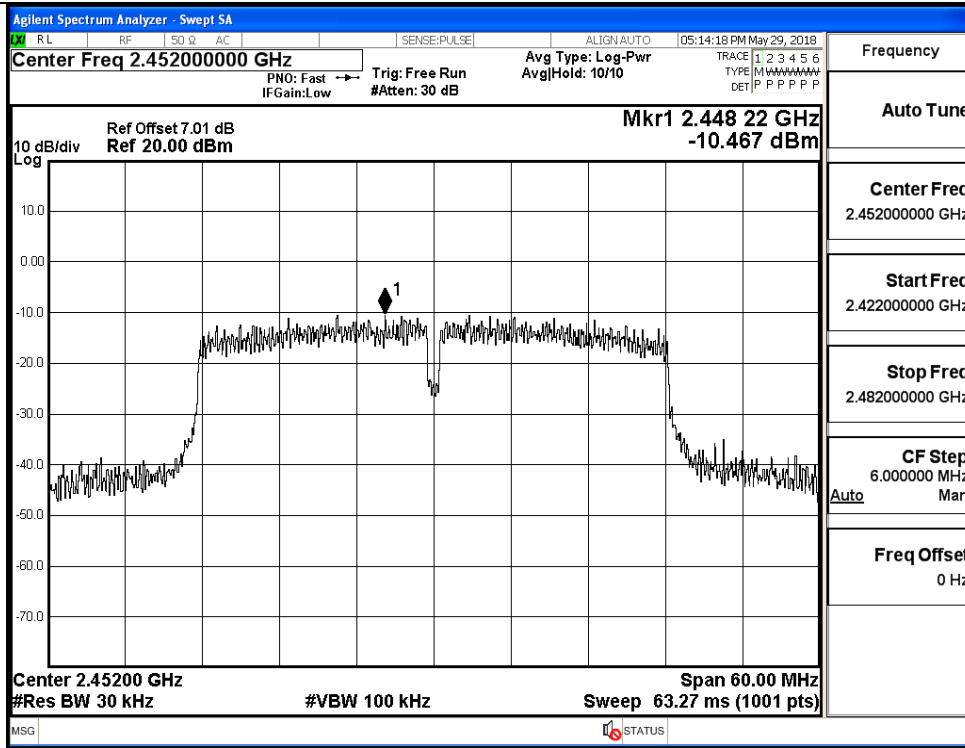
11N40SISO/LCH



11N40SISO/MCH

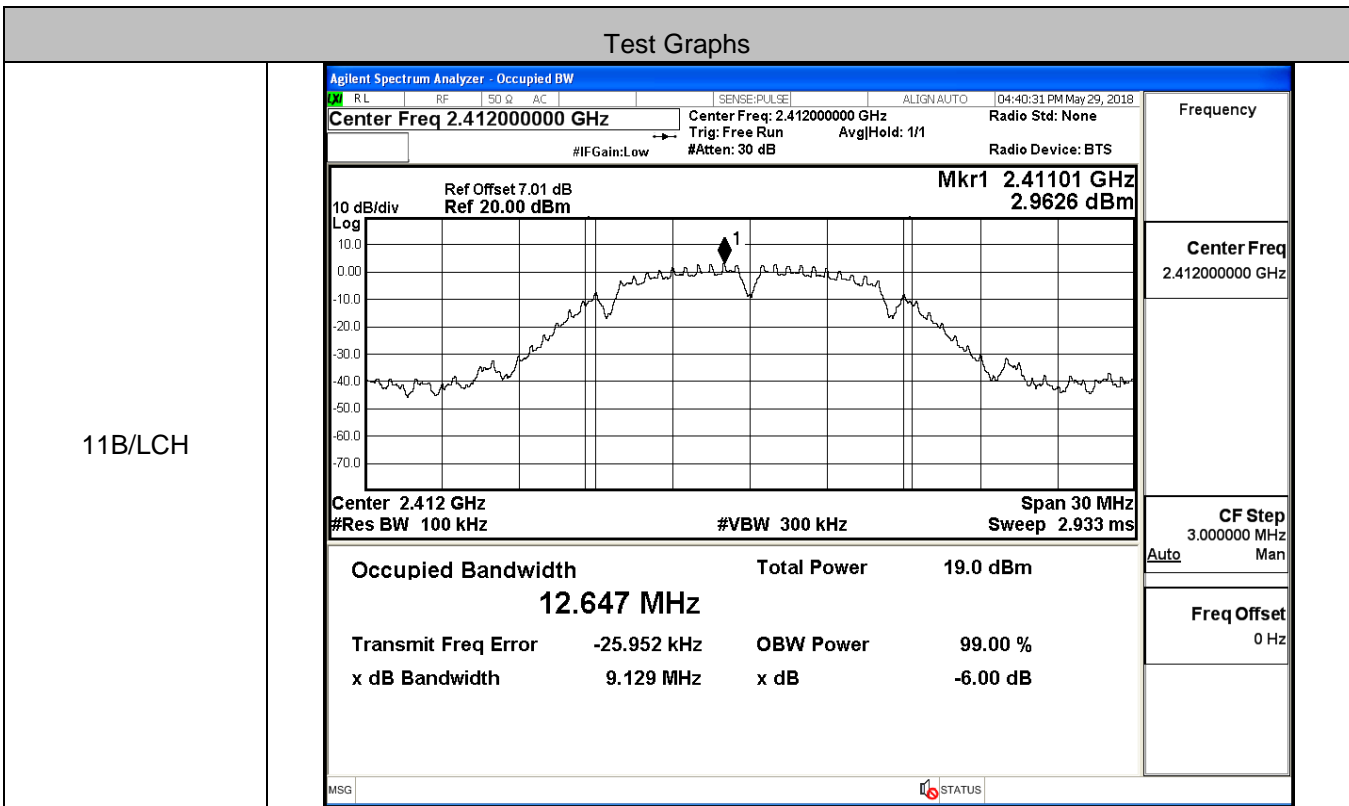


11N40SISO/HCH

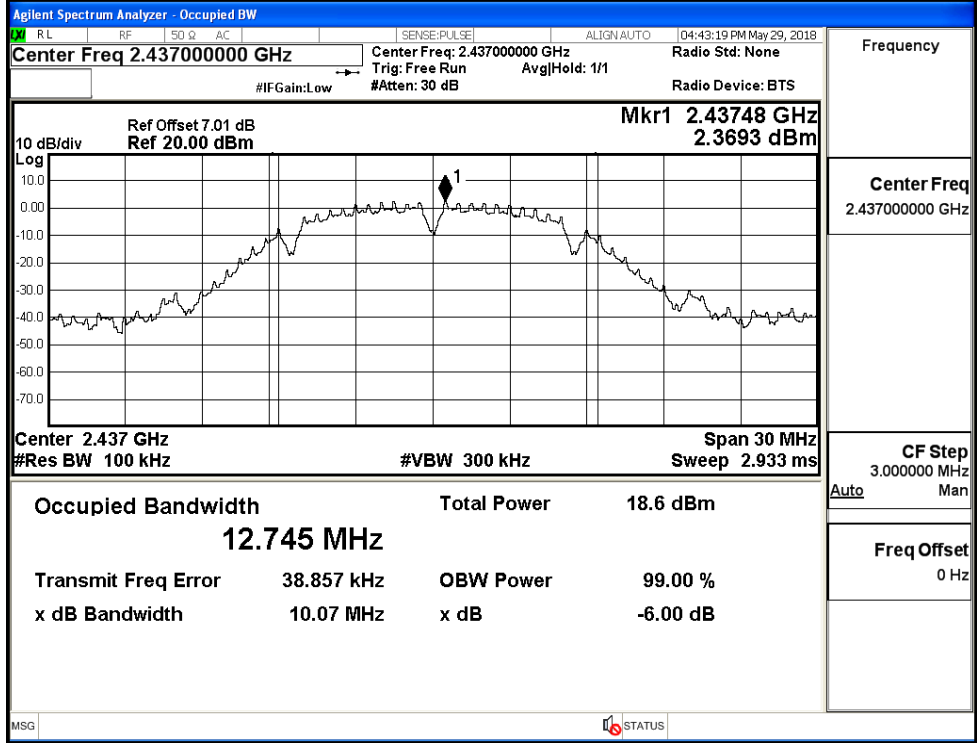


A.3 6dB Bandwidth

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
11B	LCH	9.129	≥0.5	PASS
	MCH	10.07	≥0.5	PASS
	HCH	10.02	≥0.5	PASS
11G	LCH	15.48	≥0.5	PASS
	MCH	15.13	≥0.5	PASS
	HCH	15.31	≥0.5	PASS
11N20SISO	LCH	15.15	≥0.5	PASS
	MCH	15.16	≥0.5	PASS
	HCH	15.17	≥0.5	PASS
11N40SISO	LCH	35.24	≥0.5	PASS
	MCH	35.23	≥0.5	PASS
	HCH	35.23	≥0.5	PASS



11B/MCH



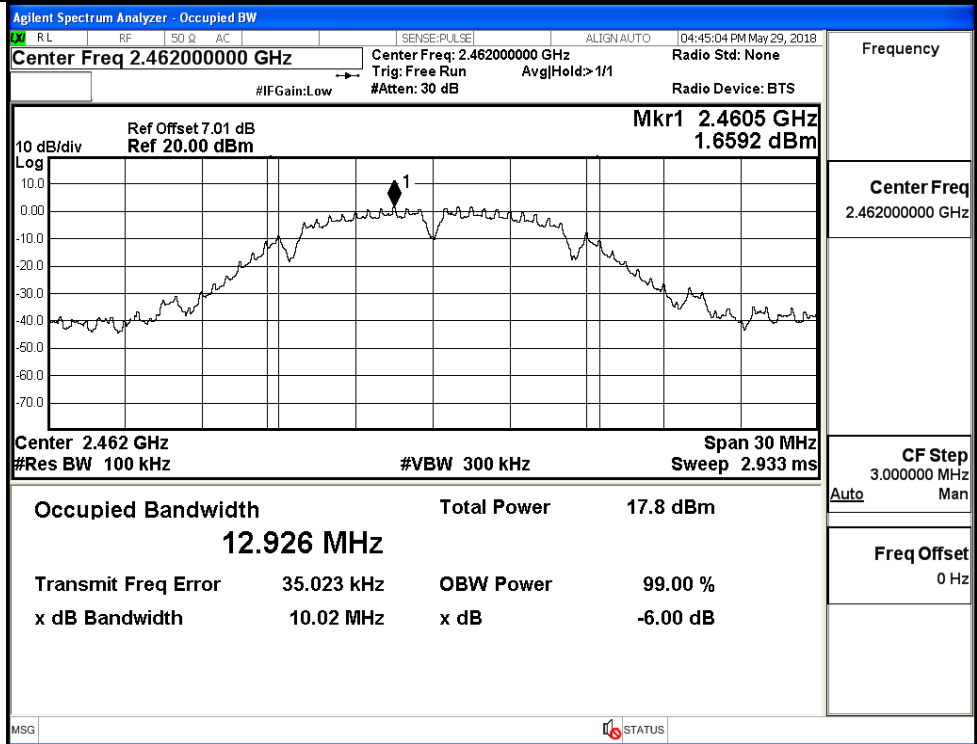
Frequency

Center Freq
2.43700000 GHz

CF Step
3.000000 MHz
Auto Man

Freq Offset
0 Hz

11B/HCH



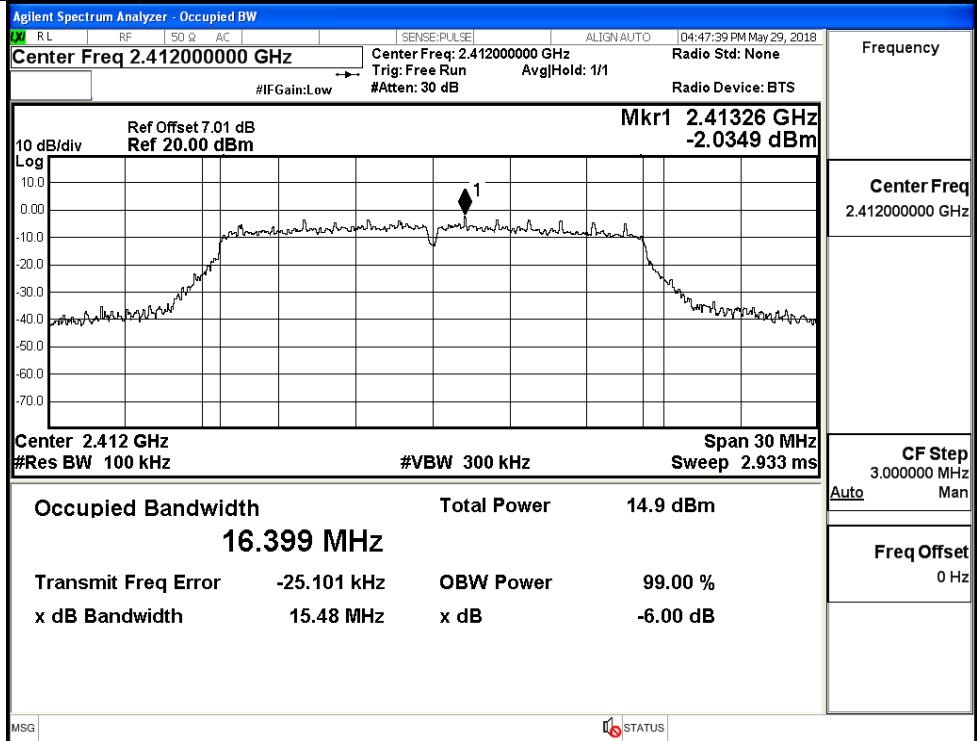
Frequency

Center Freq
2.46200000 GHz

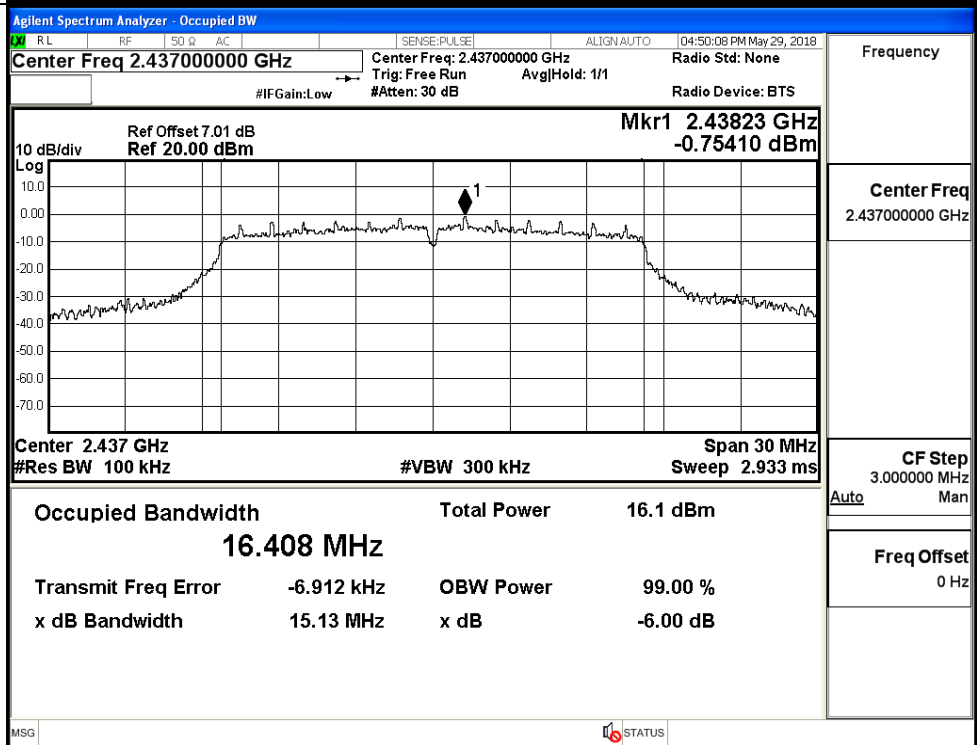
CF Step
3.000000 MHz
Auto Man

Freq Offset
0 Hz

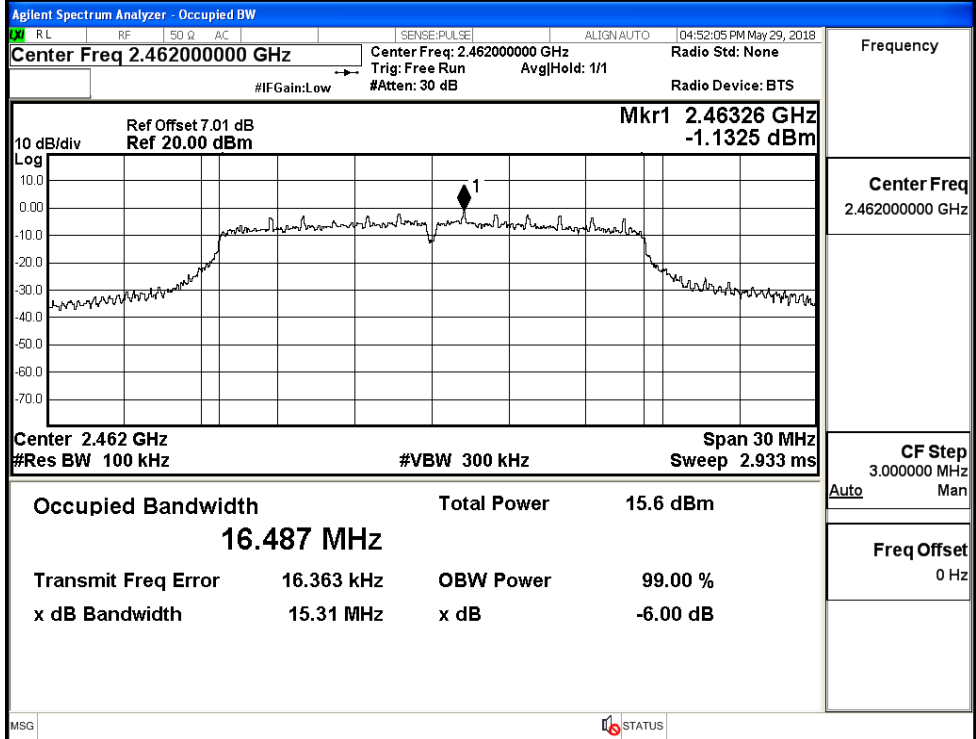
11G/LCH



11G/MCH

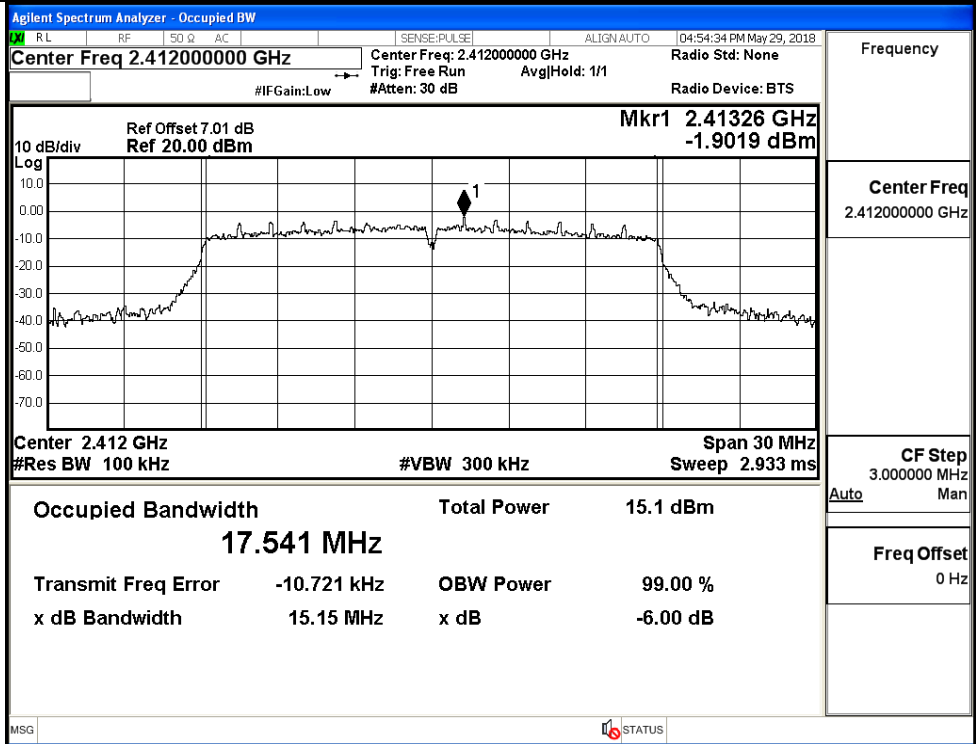


11G/HCH



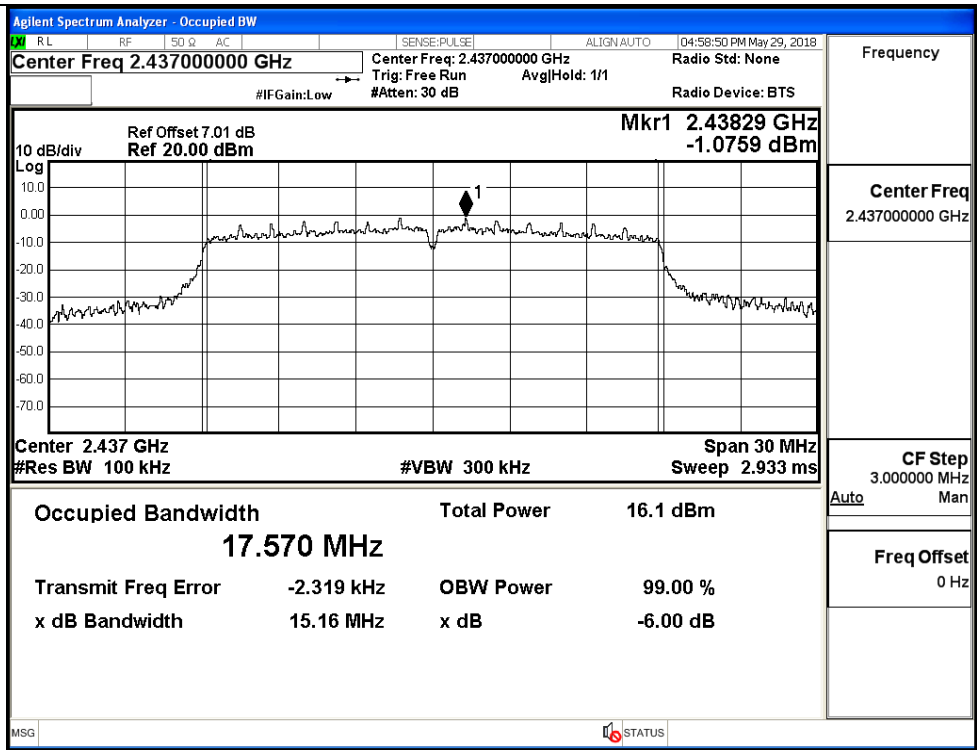
Frequency	2.46200000 GHz
Center Freq	2.46200000 GHz
CF Step	3.000000 MHz
Auto	Man
Freq Offset	0 Hz

11N20SISO/LCH

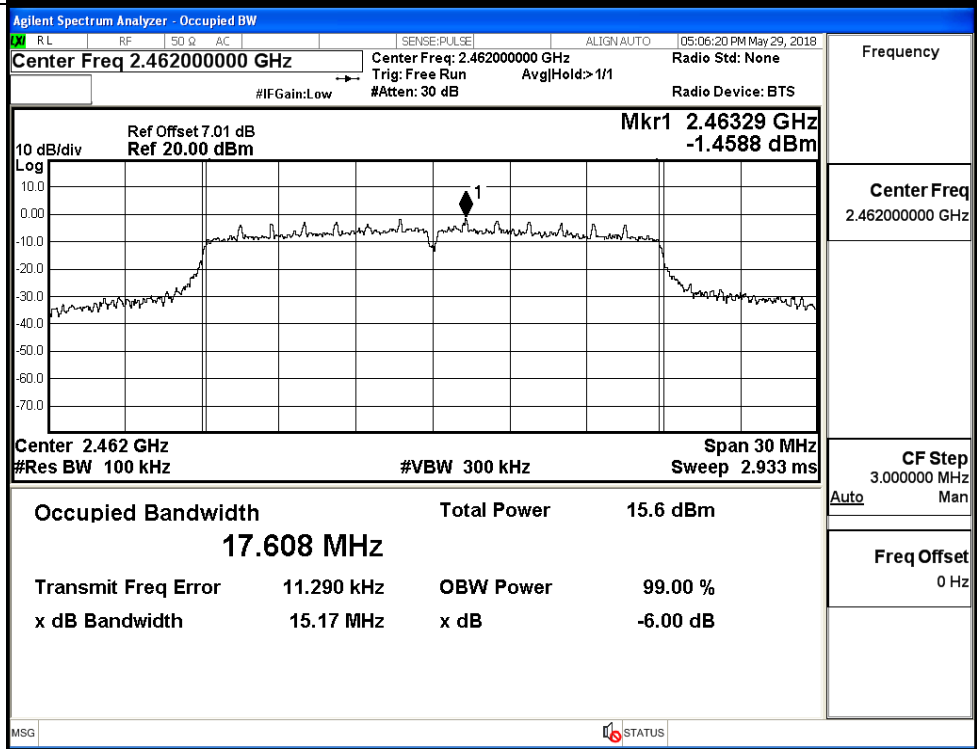


Frequency	2.41200000 GHz
Center Freq	2.41200000 GHz
CF Step	3.000000 MHz
Auto	Man
Freq Offset	0 Hz

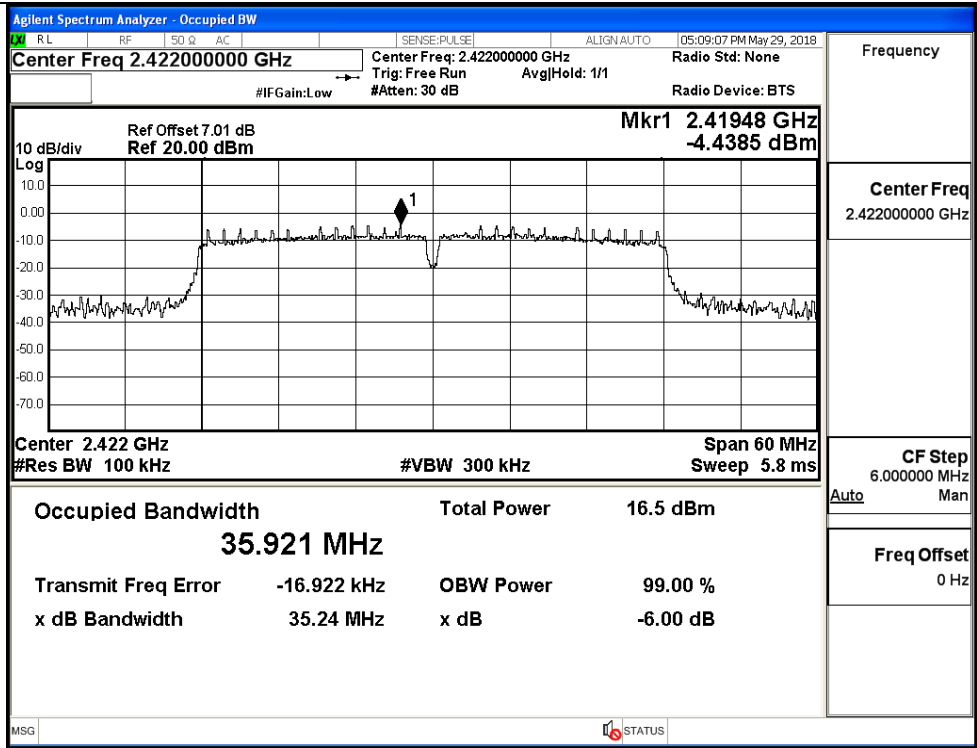
11N20SISO/MCH



11N20SISO/HCH

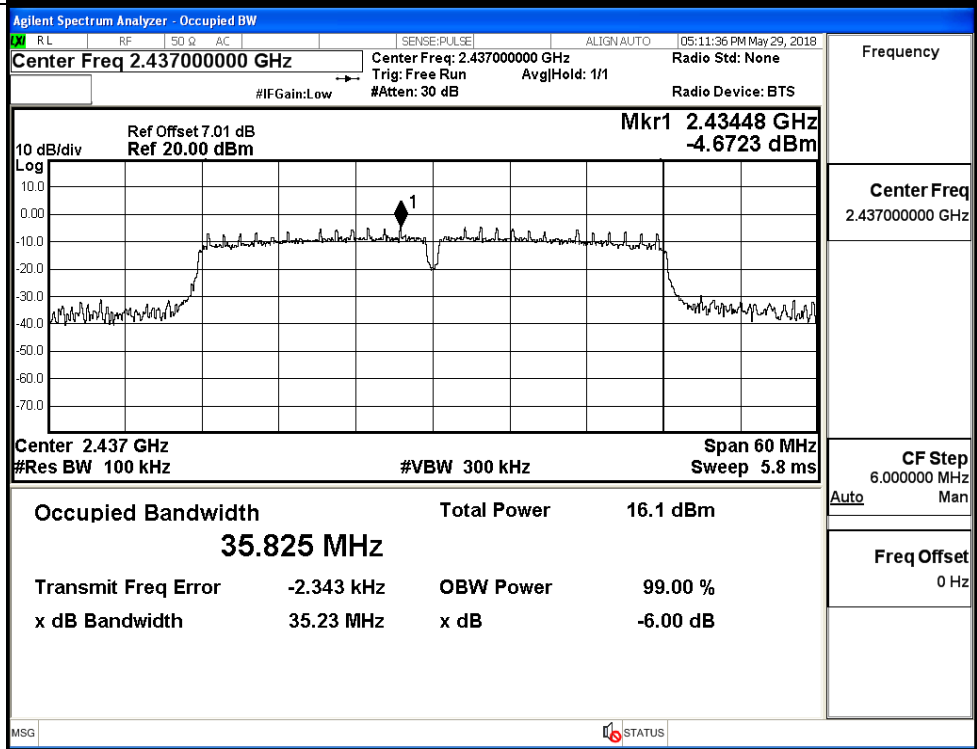


11N40SISO/LCH



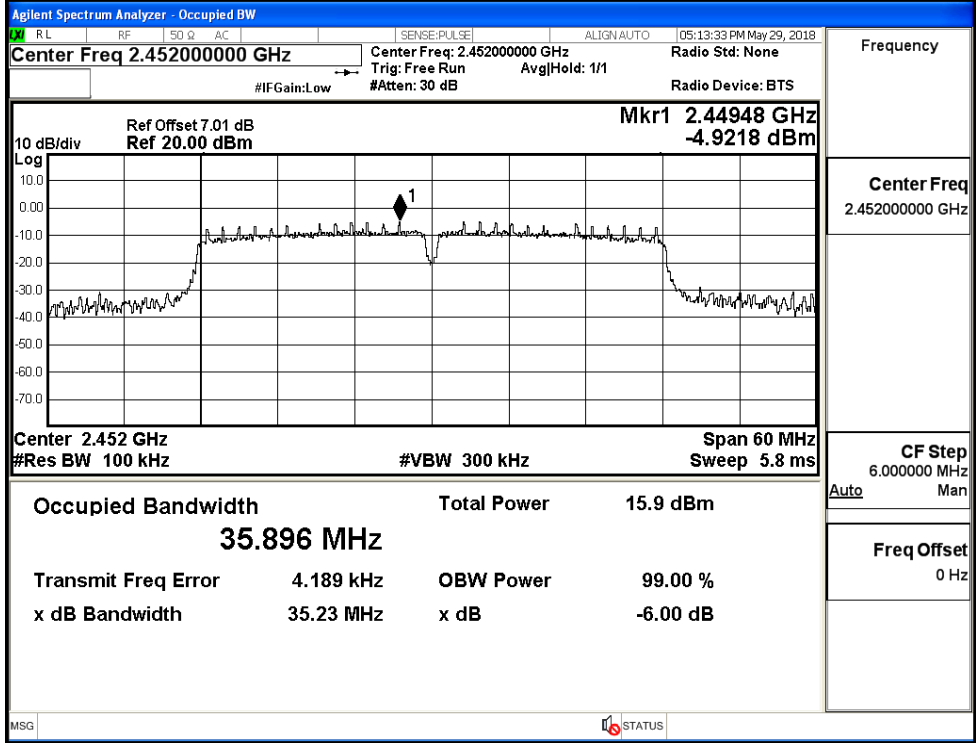
Frequency	2.42200000 GHz
Center Freq	2.42200000 GHz
CF Step	6.000000 MHz
Auto	Man
Freq Offset	0 Hz

11N40SISO/MCH



Frequency	2.43700000 GHz
Center Freq	2.43700000 GHz
CF Step	6.000000 MHz
Auto	Man
Freq Offset	0 Hz

11N40SISO/HCH

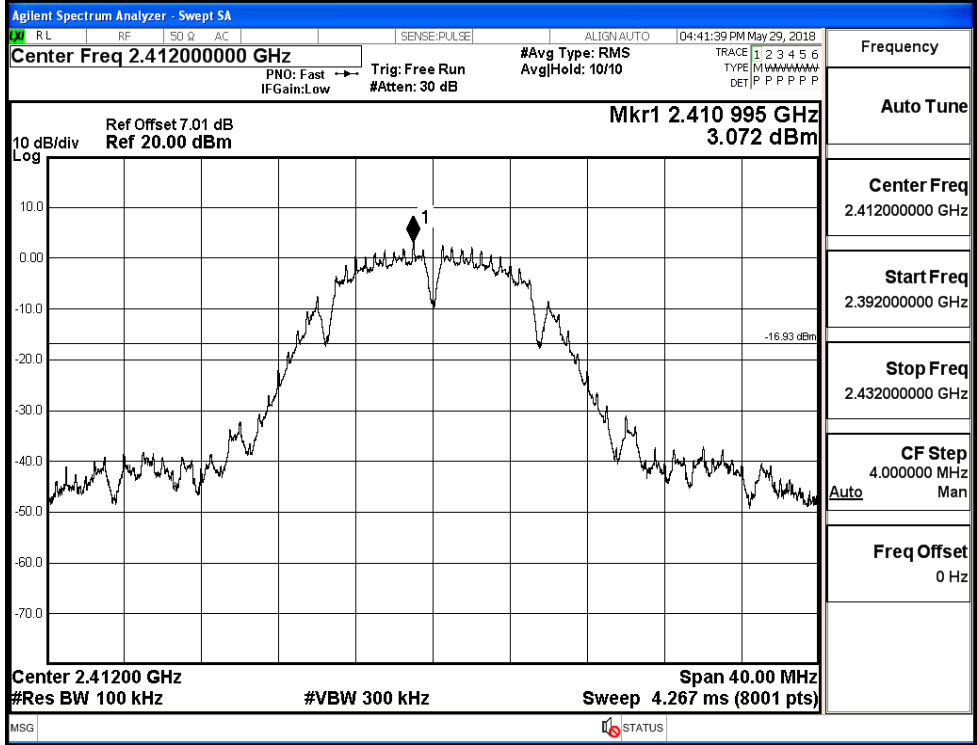


A.4 RF Conducted Spurious Emissions

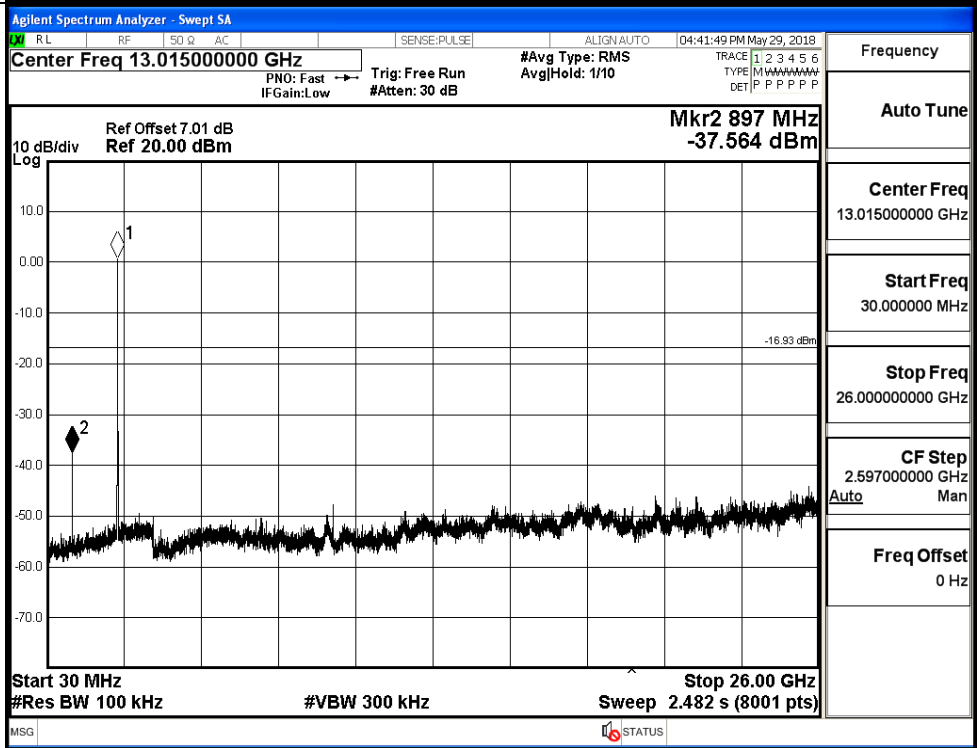
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
11B	LCH	3.072	-37.564	-16.928	PASS
	MCH	2.121	-44.520	-17.879	PASS
	HCH	1.819	-44.254	-18.181	PASS
11G	LCH	-2.371	-44.372	-22.371	PASS
	MCH	-0.525	-44.491	-20.525	PASS
	HCH	-1.807	-44.459	-21.807	PASS
11N20 SISO	LCH	-2.082	-45.222	-22.082	PASS
	MCH	-0.853	-30.150	-20.853	PASS
	HCH	-1.726	-44.284	-21.726	PASS
11N40 SISO	LCH	-4.34	-44.765	-24.340	PASS
	MCH	-4.653	-44.527	-24.653	PASS
	HCH	-4.975	-43.989	-24.975	PASS

11B_LCH_Graphs

Pref/11B/LCH

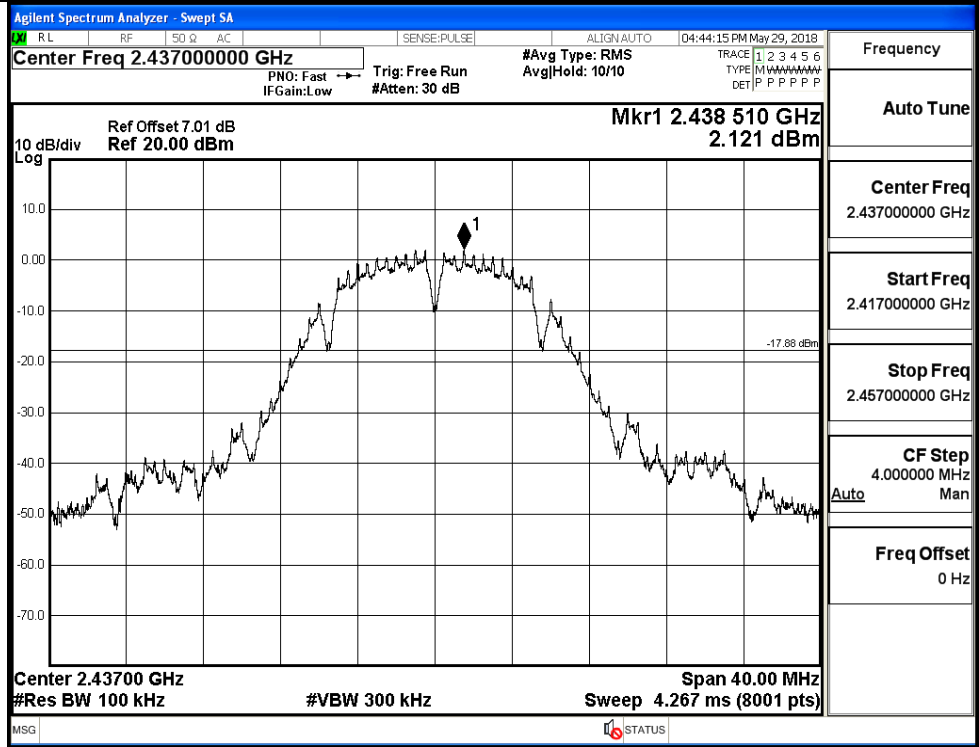


Puw/11B/LCH

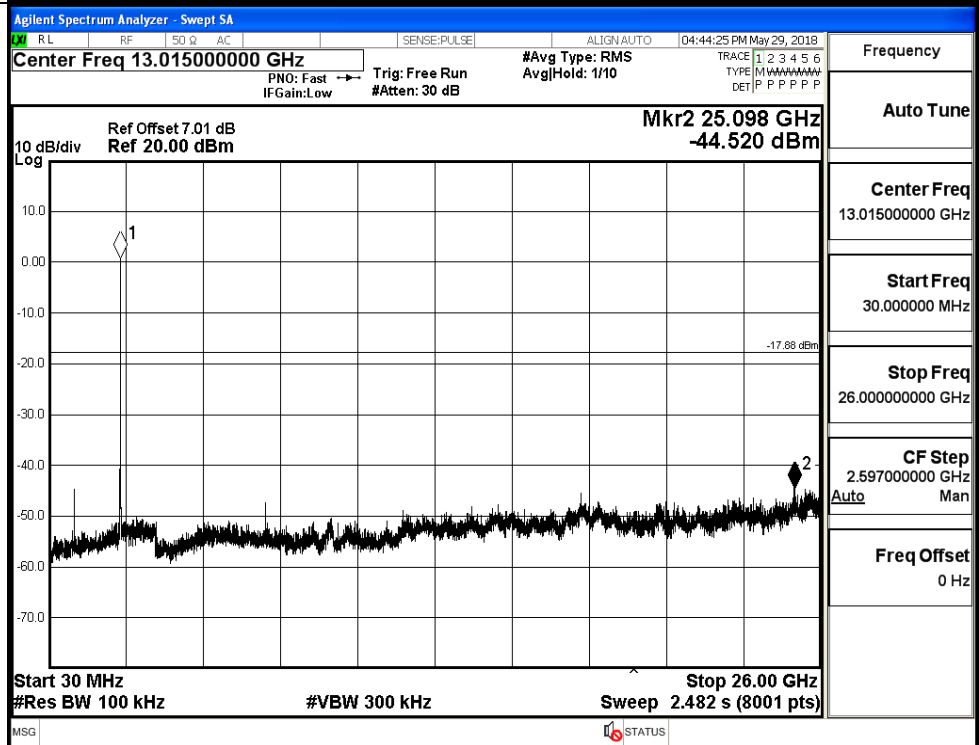


11B_MCH_Graphs

Pref/11B/MCH

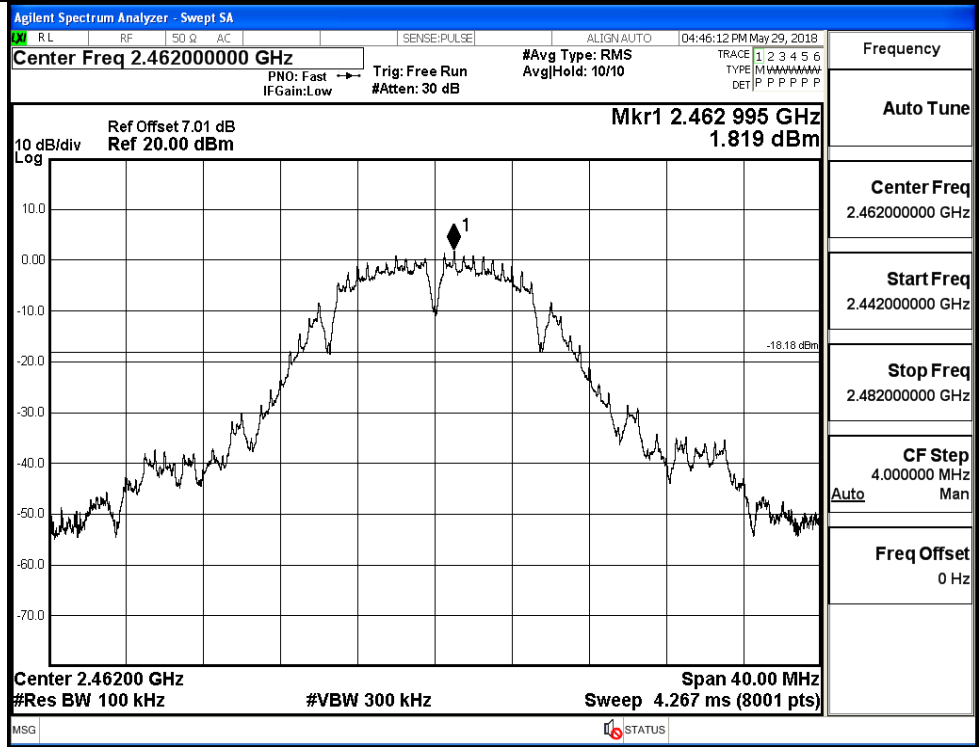


Puw/11B/MCH

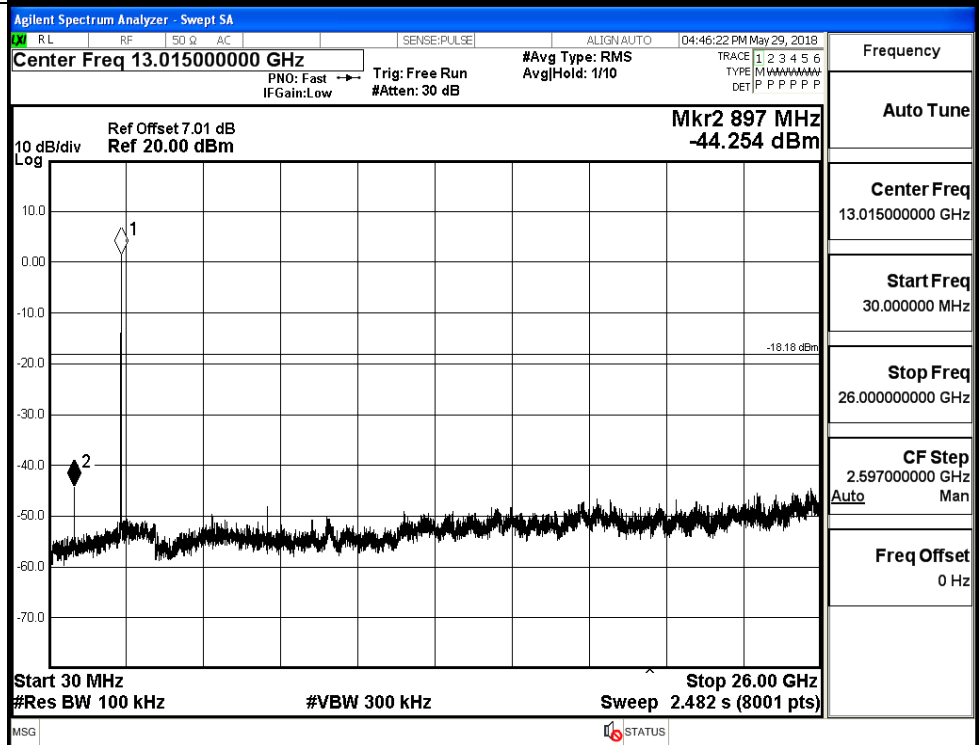


11B_HCH_Graphs

Pref/11B/HCH

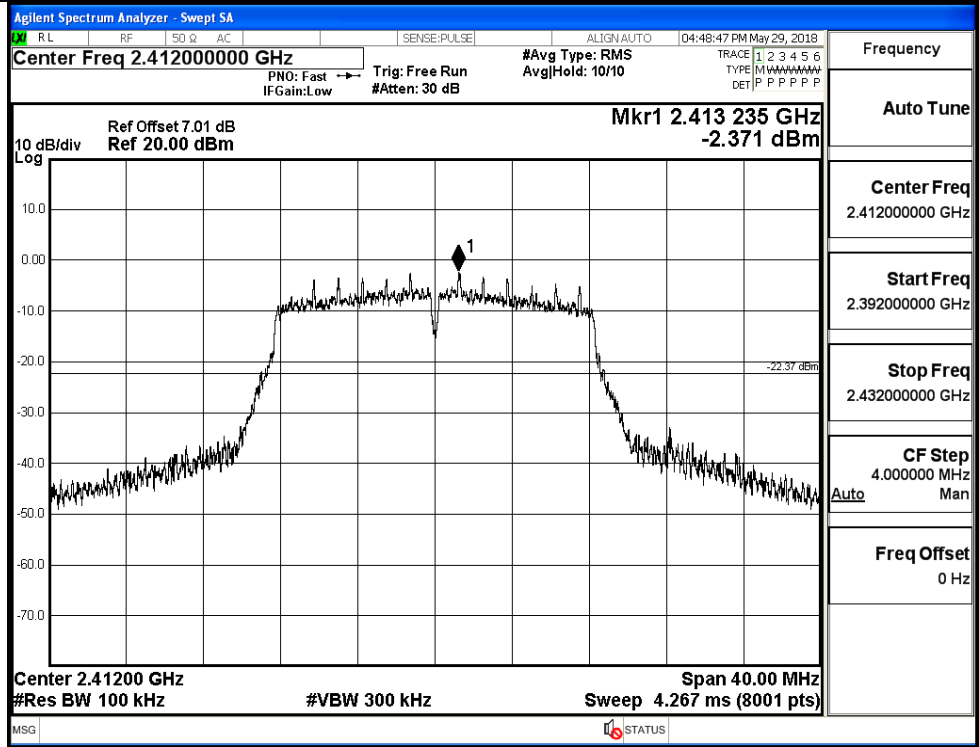


Puw/11B/HCH

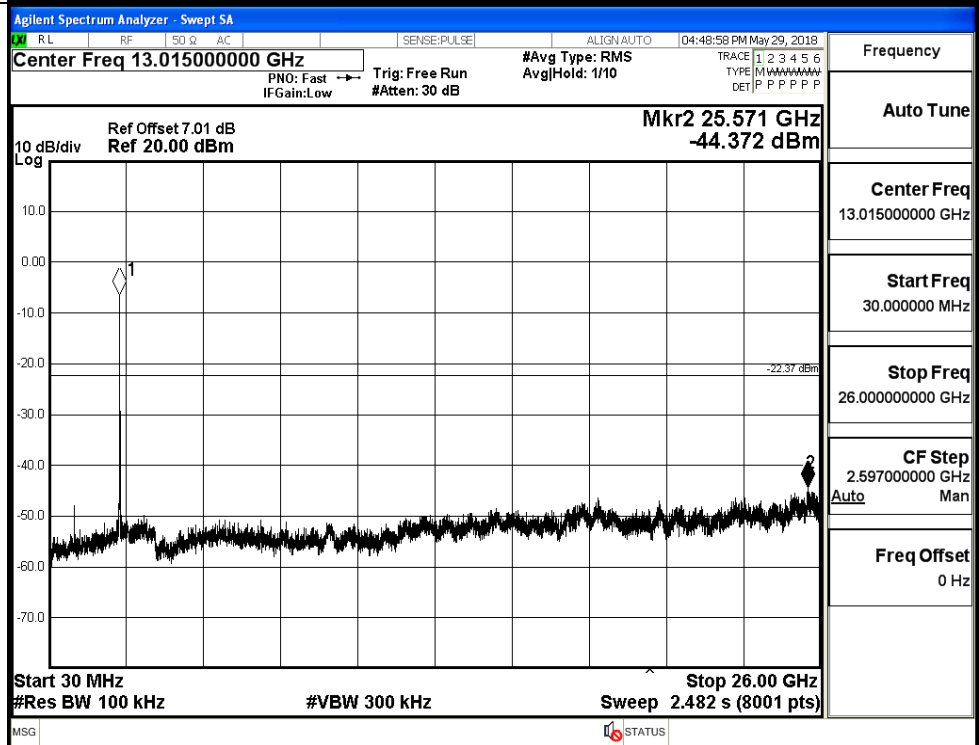


11G_LCH_Graphs

Pref/11G/LCH

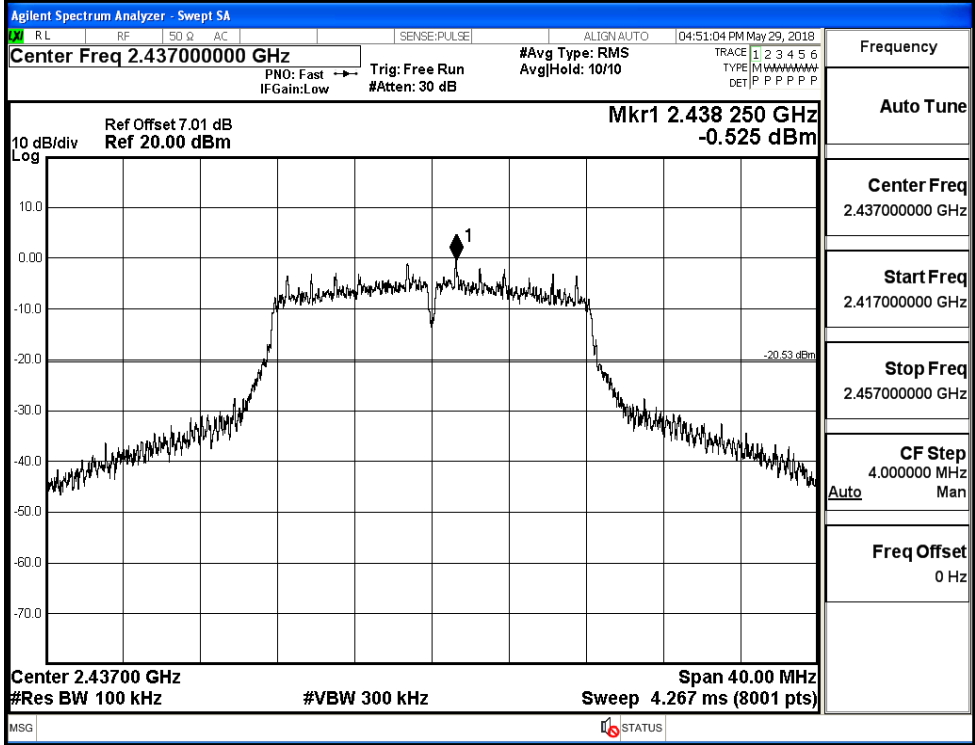


Puw/11G/LCH

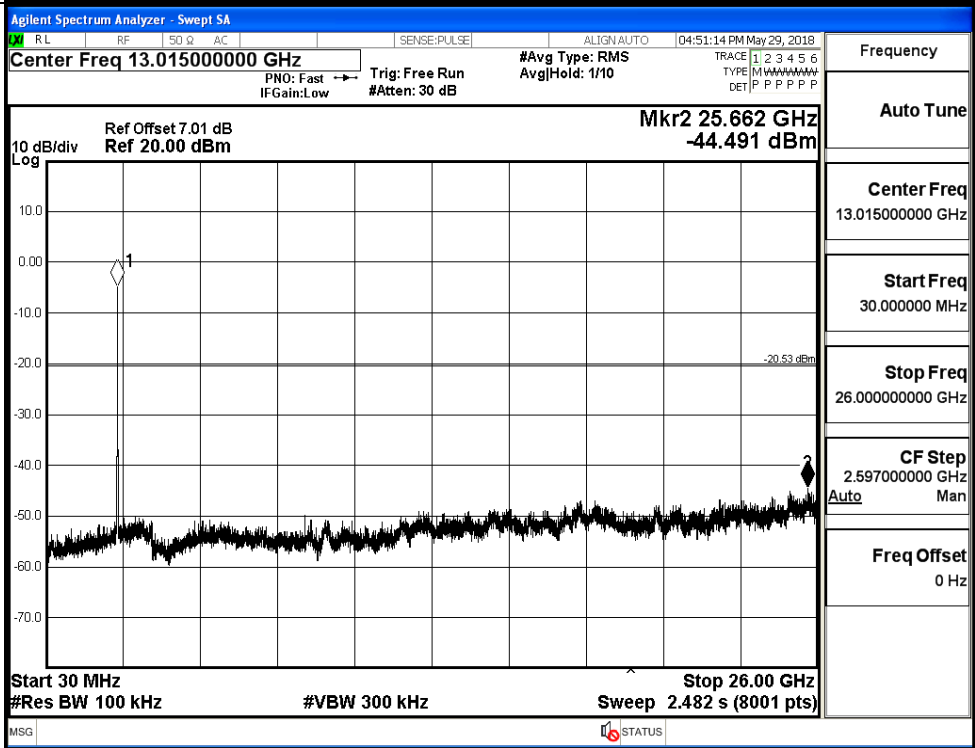


11G_MCH_Graphs

Pref/11G/MCH

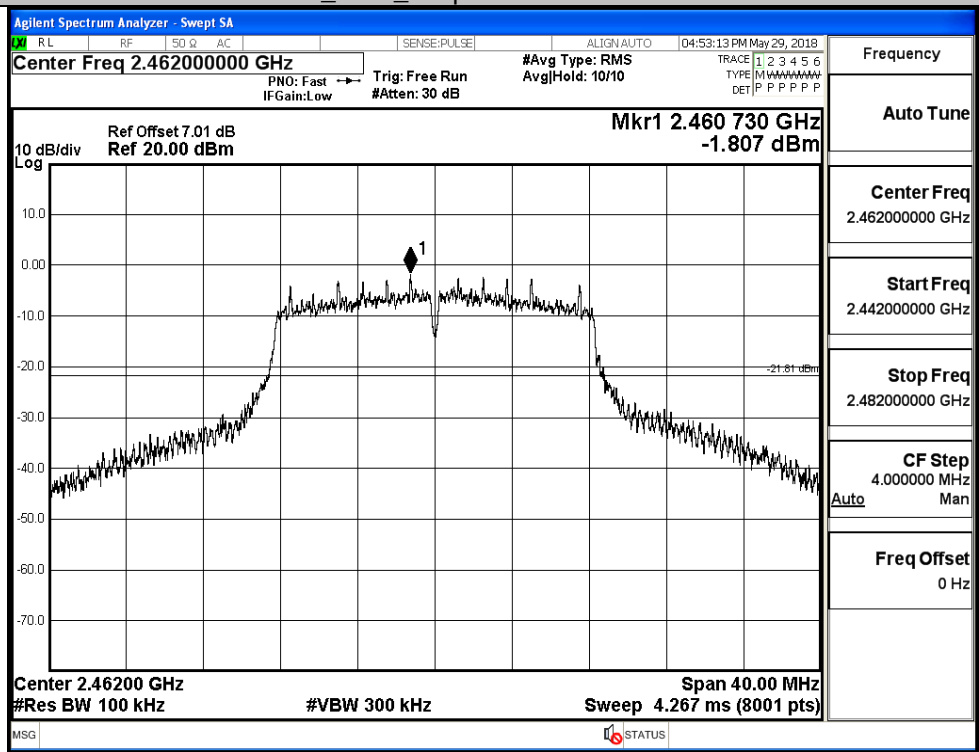


Puw/11G/MCH

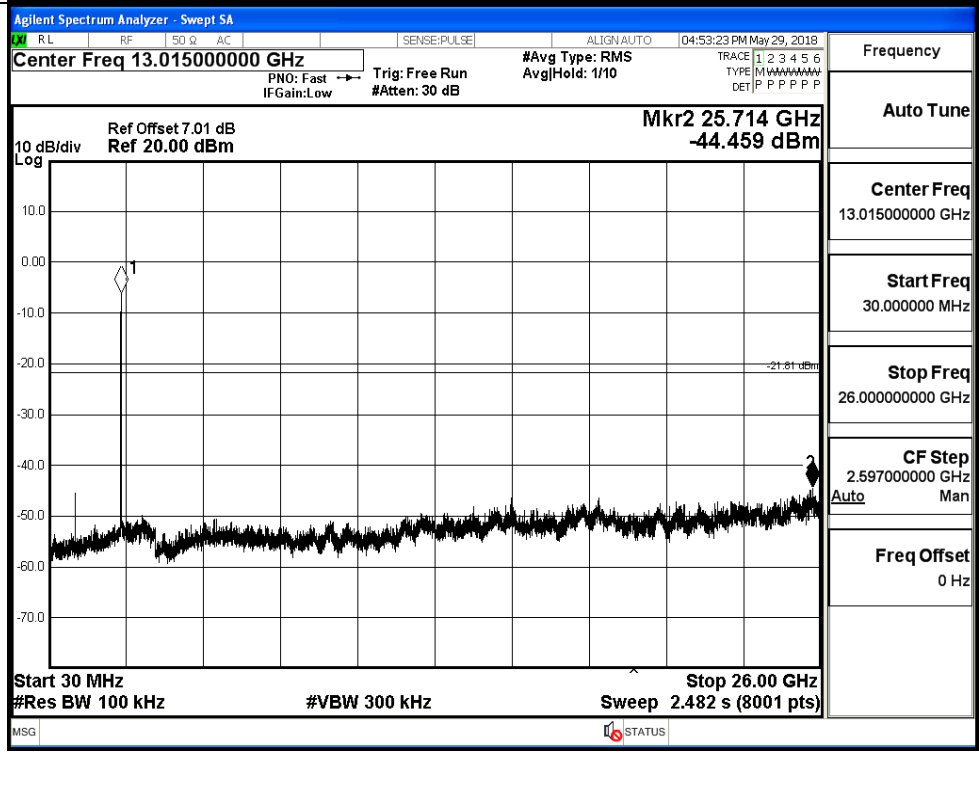


11G_HCH_Graphs

Pref/11G/HCH

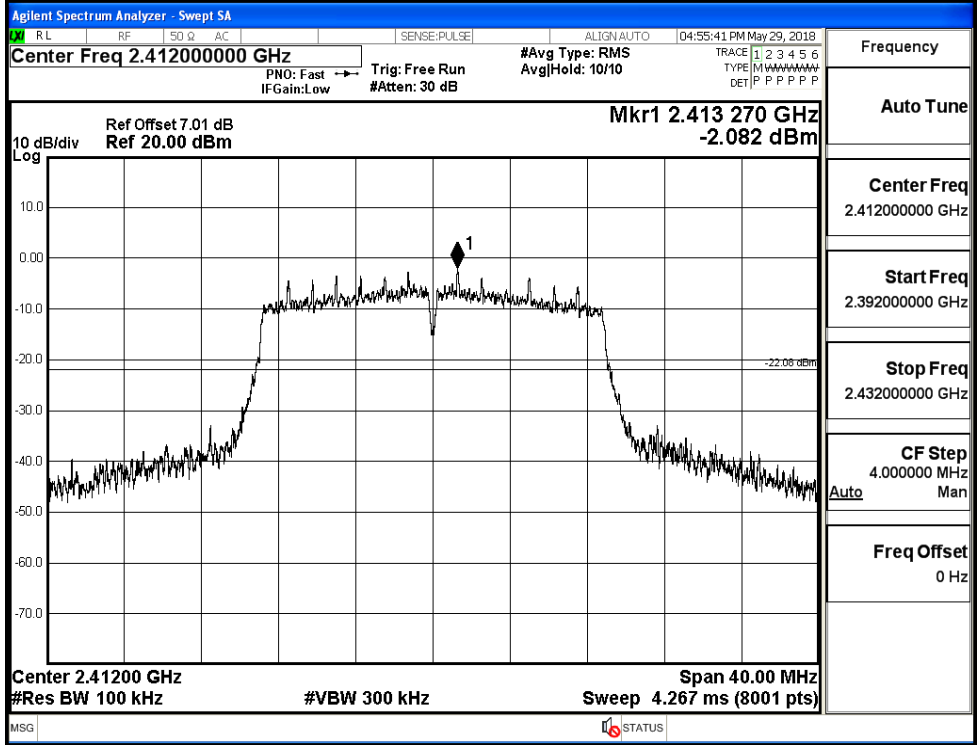


Puw/11G/HCH

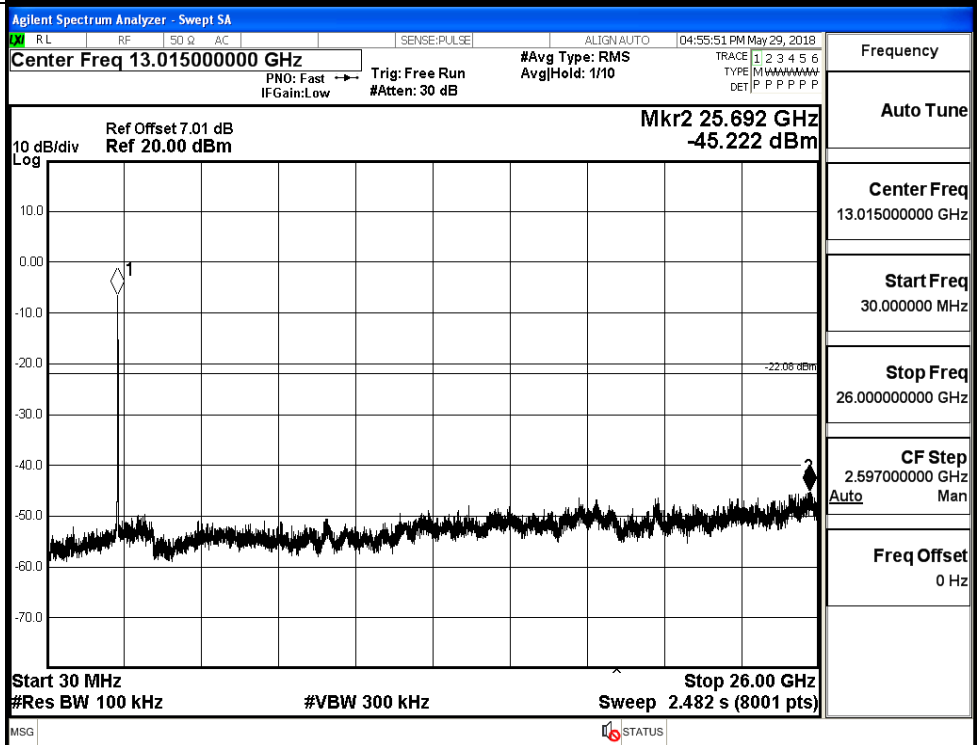


11N20SISO_LCH_Graphs

Pref/11N20SIS
O/LCH

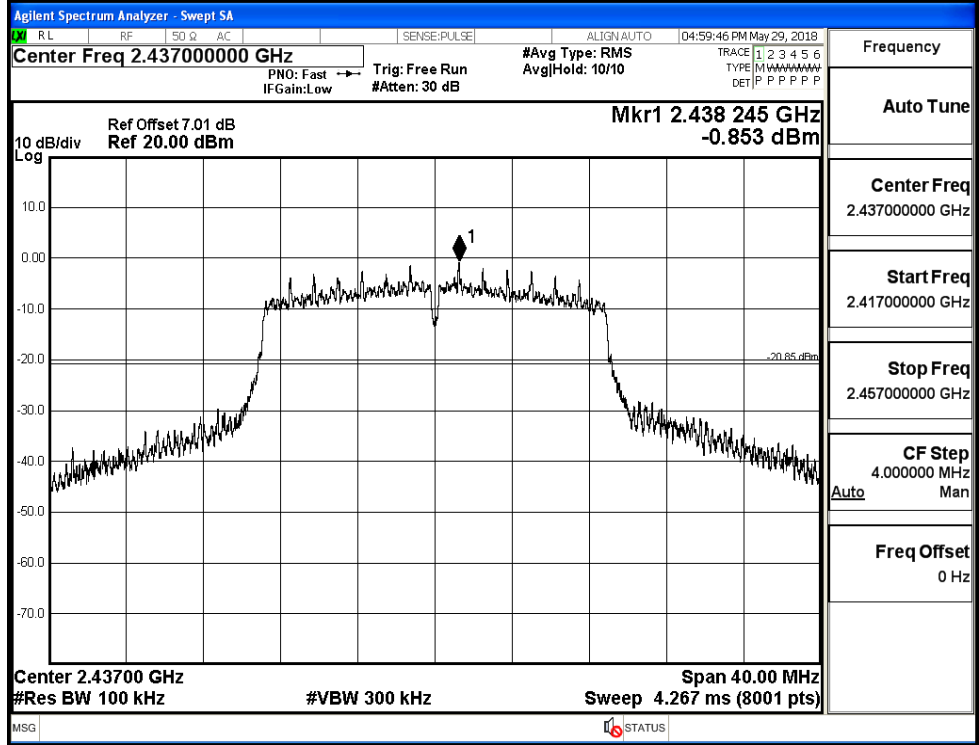


Puw/11N20
SISO/LCH

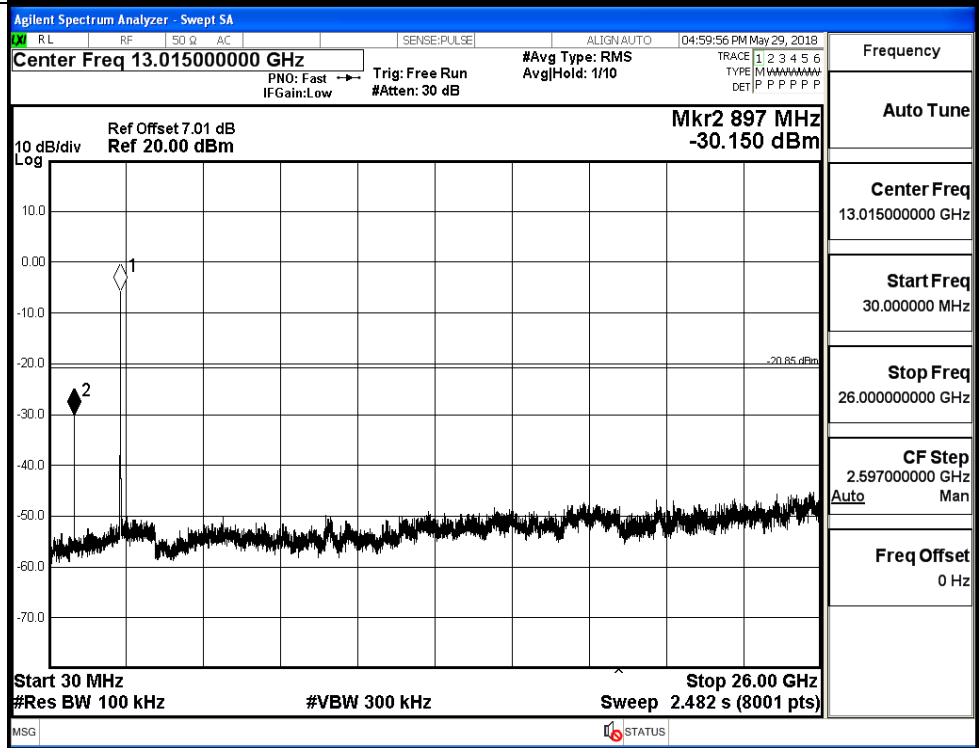


11N20SISO_MCH_Graphs

Pref/11N20
SISO/MCH

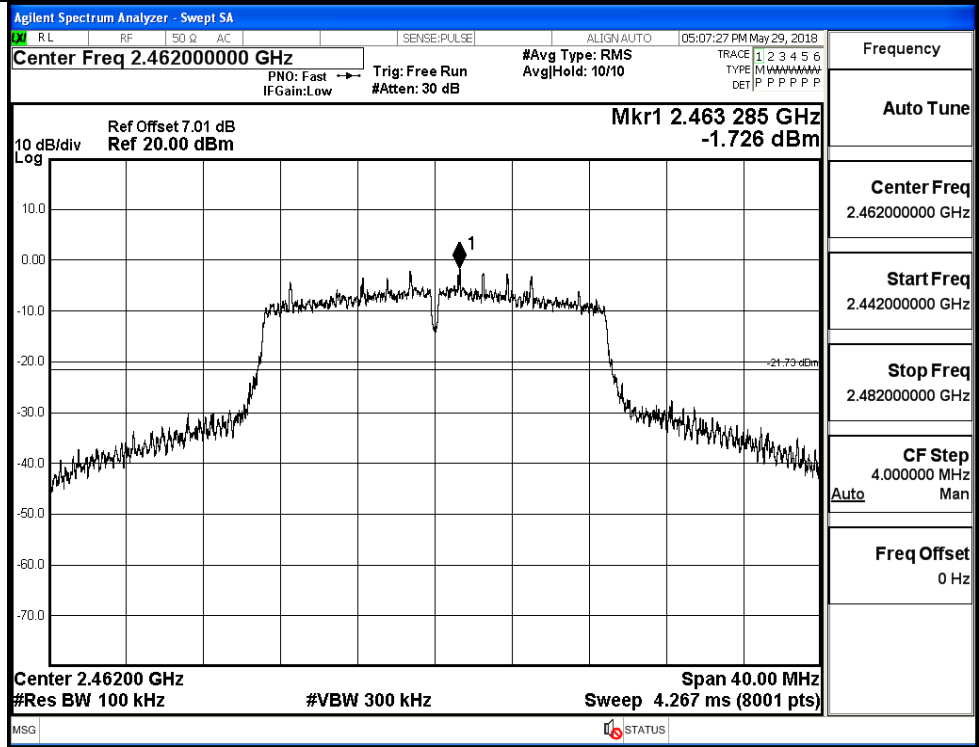


Puw/11N20
SISO/MCH

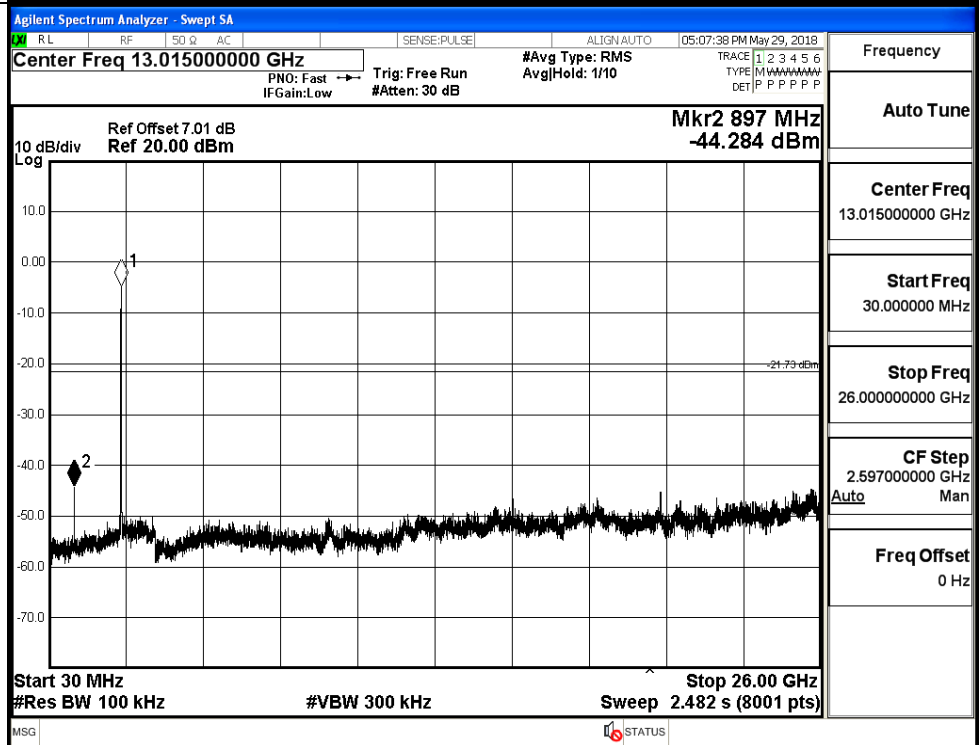


11N20SISO_HCH_Graphs

Pref/11N20
SISO/HCH

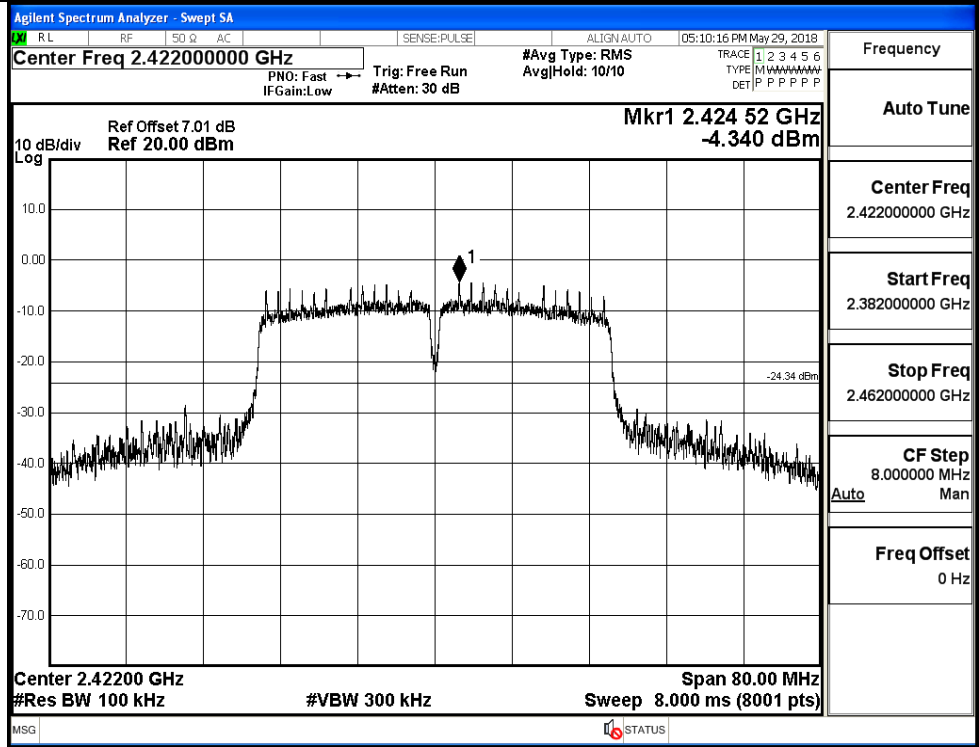


Puw/11N20
SISO/HCH

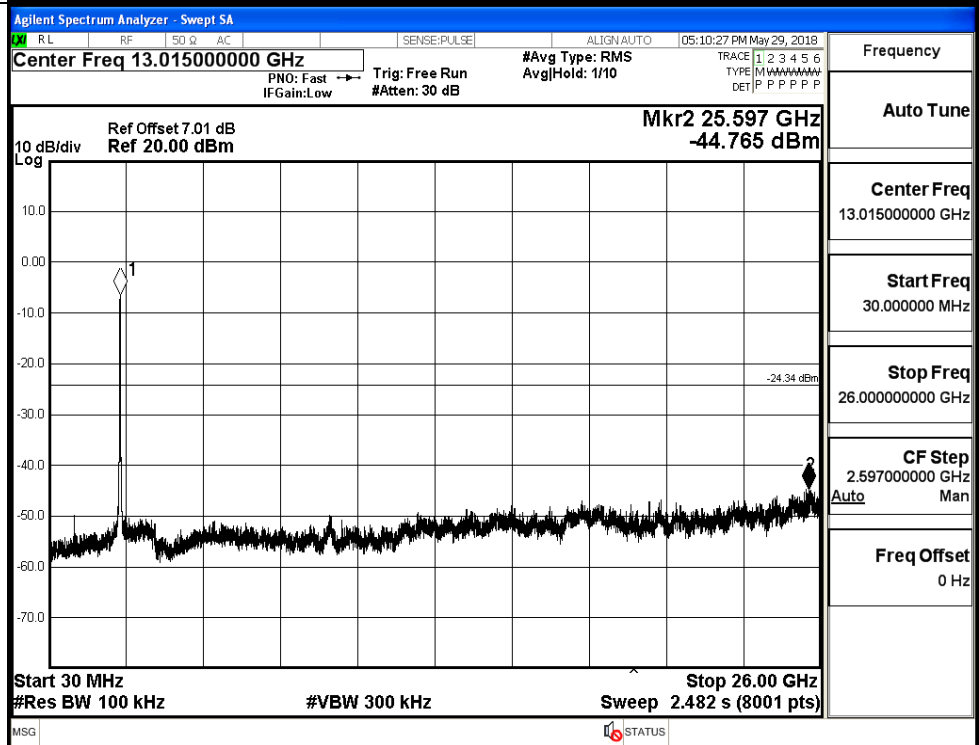


11N40SISO_LCH_Graphs

Pref/11N40
SISO/LCH

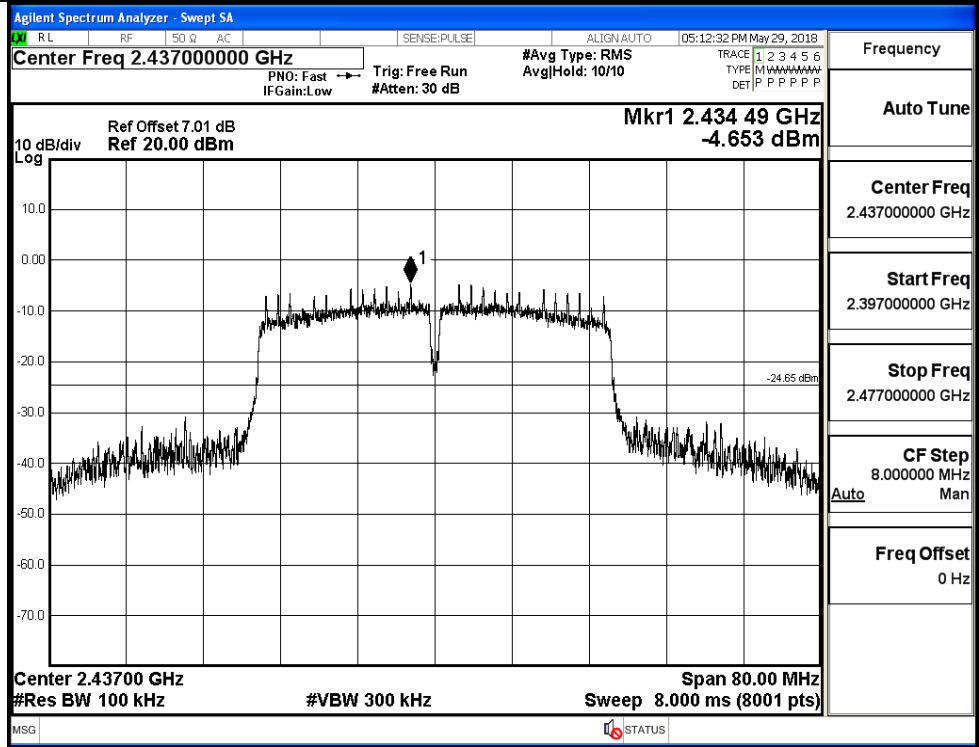


Puw/11N40
SISO/LCH

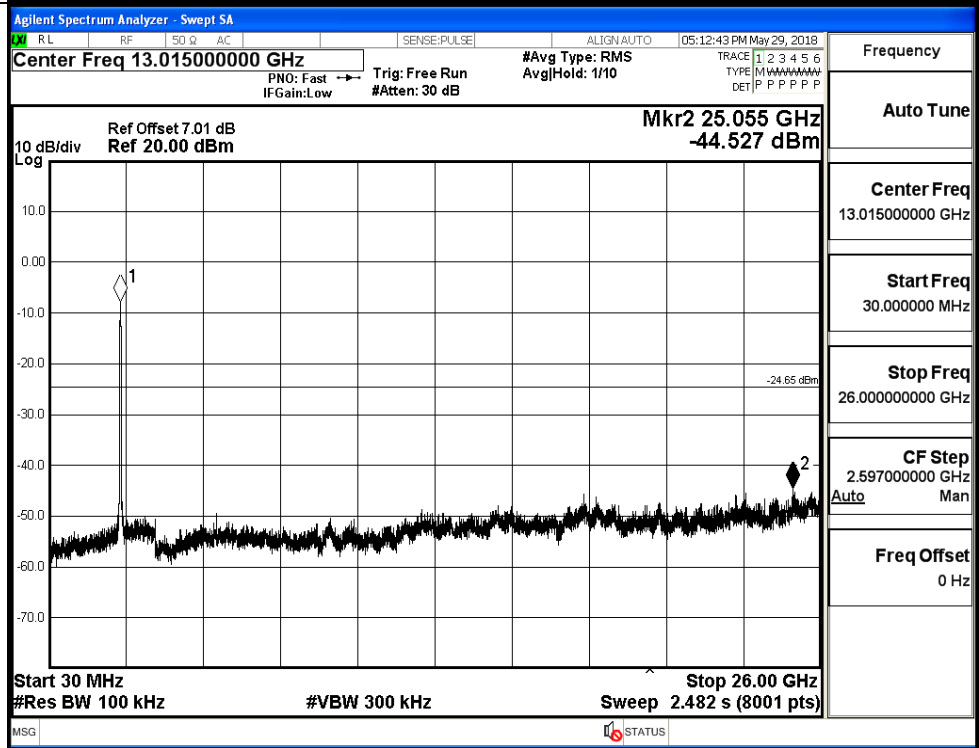


11N40SISO_MCH_Graphs

Pref/11N40
SISO/MCH

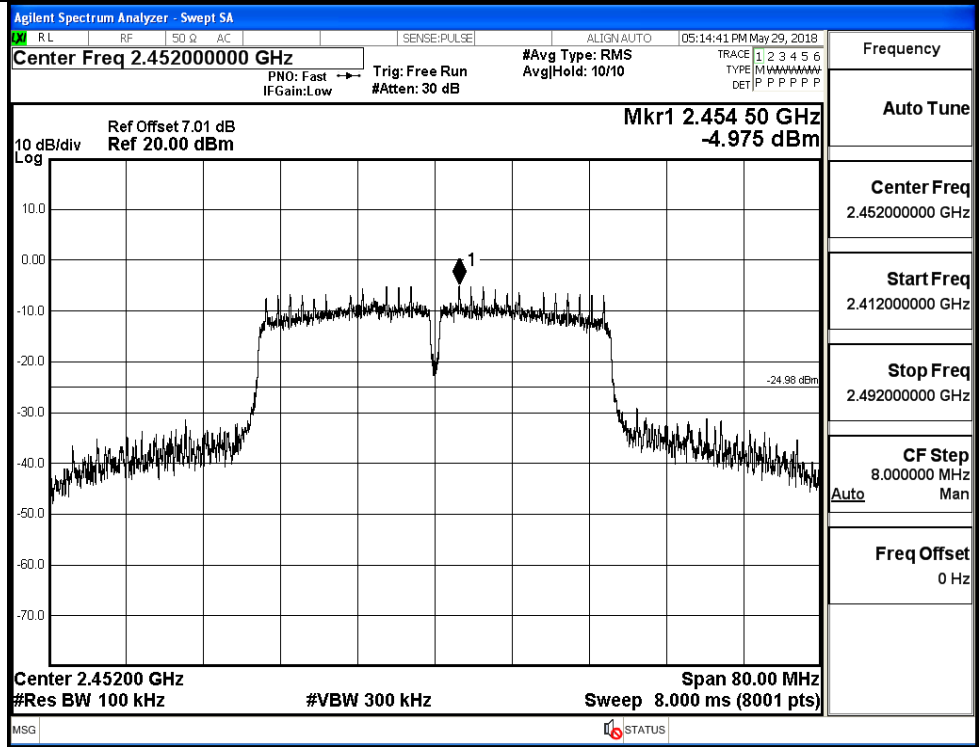


Puw/11N40
SISO/MCH

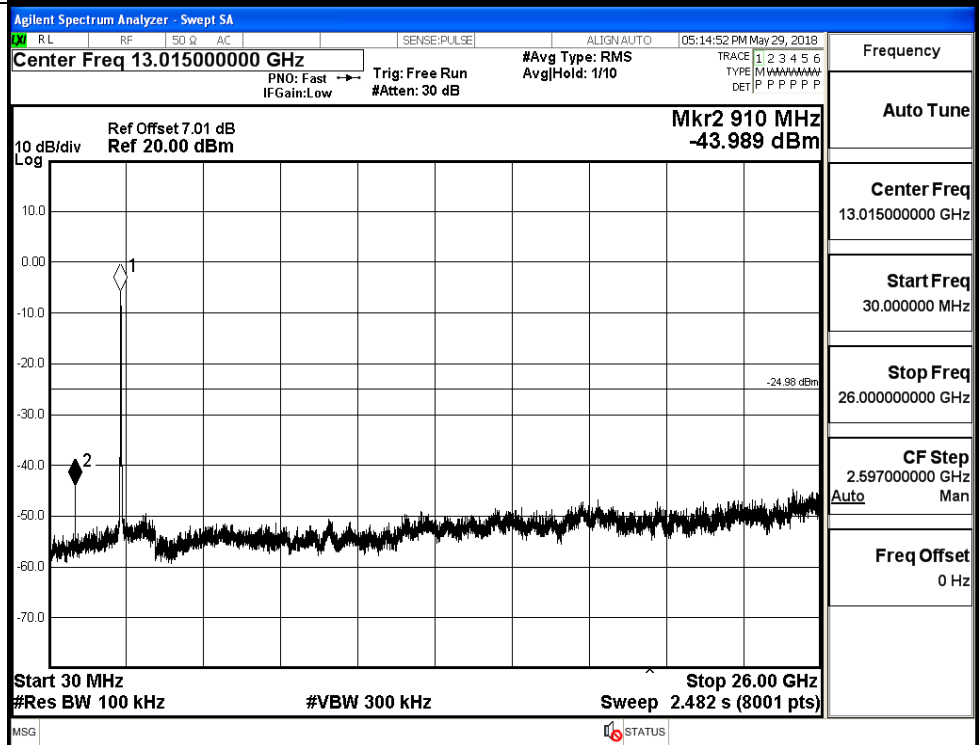


11N40SISO_HCH_Graphs

Pref/11N40
SISO/HCH

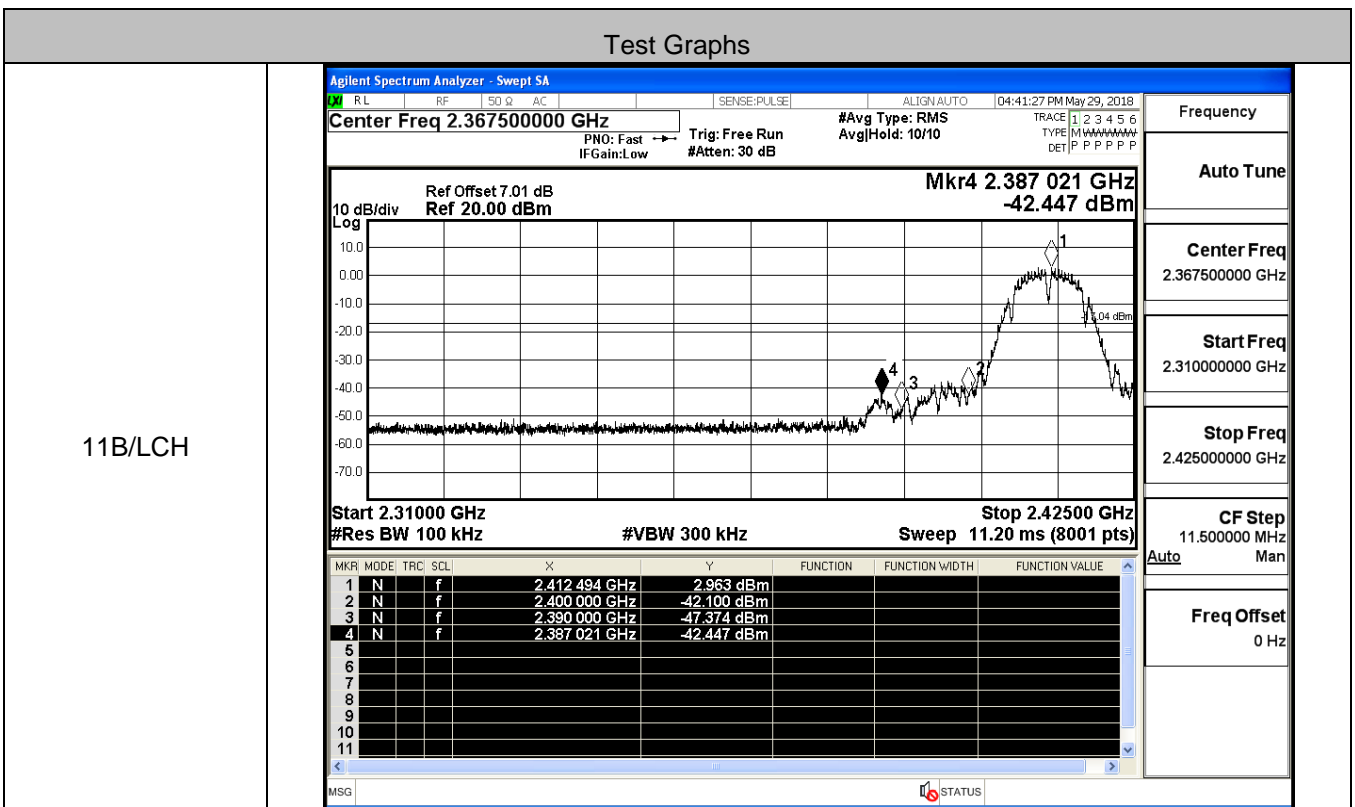


Puw/11N40
SISO/HCH

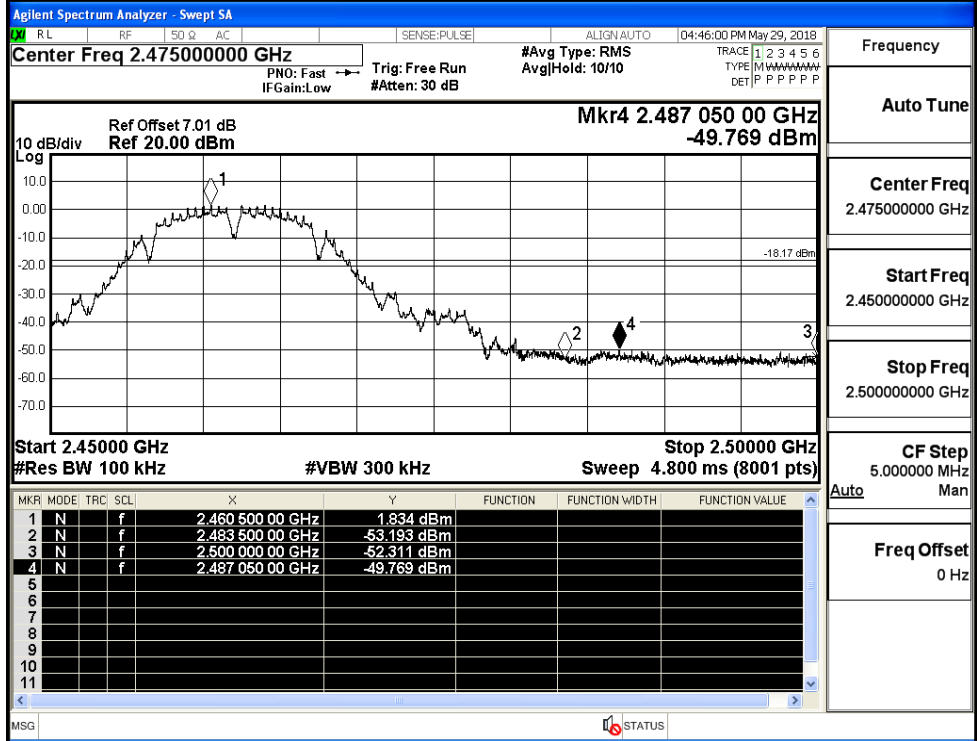


A.5 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
11B	LCH	2.963	-42.447	-17.04	PASS
	HCH	1.834	-49.769	-18.17	PASS
11G	LCH	-2.072	-45.092	-22.07	PASS
	HCH	-1.114	-43.648	-21.11	PASS
11N20SISO	LCH	-2.082	-45.712	-22.08	PASS
	HCH	-1.119	-42.334	-21.12	PASS
11N40SISO	LCH	-4.287	-34.344	-24.29	PASS
	HCH	-4.970	-33.588	-24.97	PASS

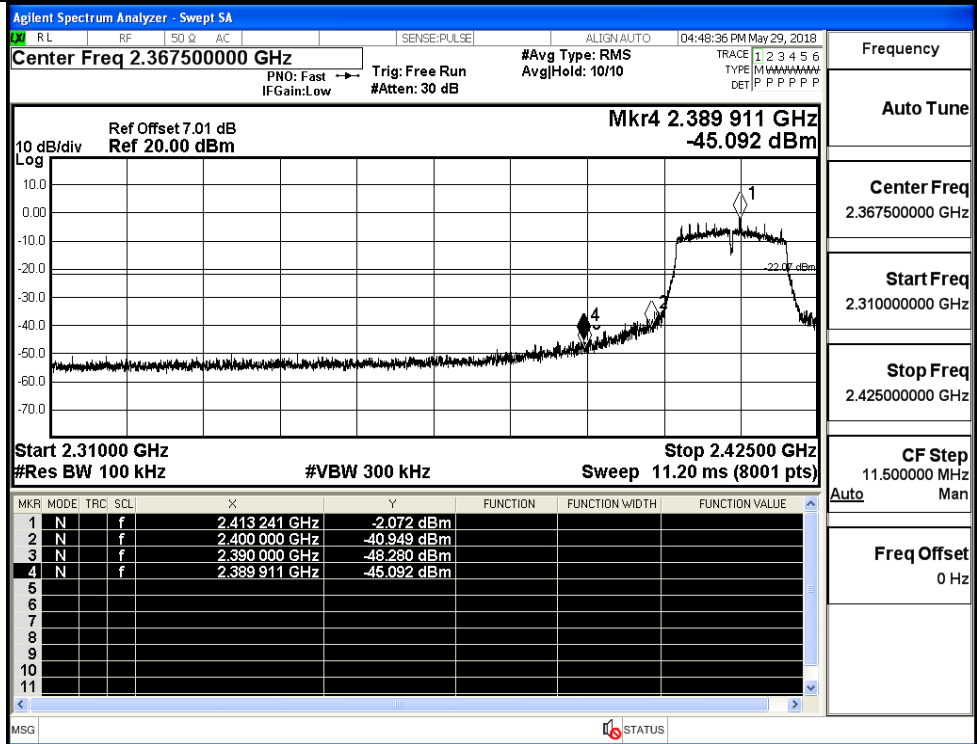


11B/HCH



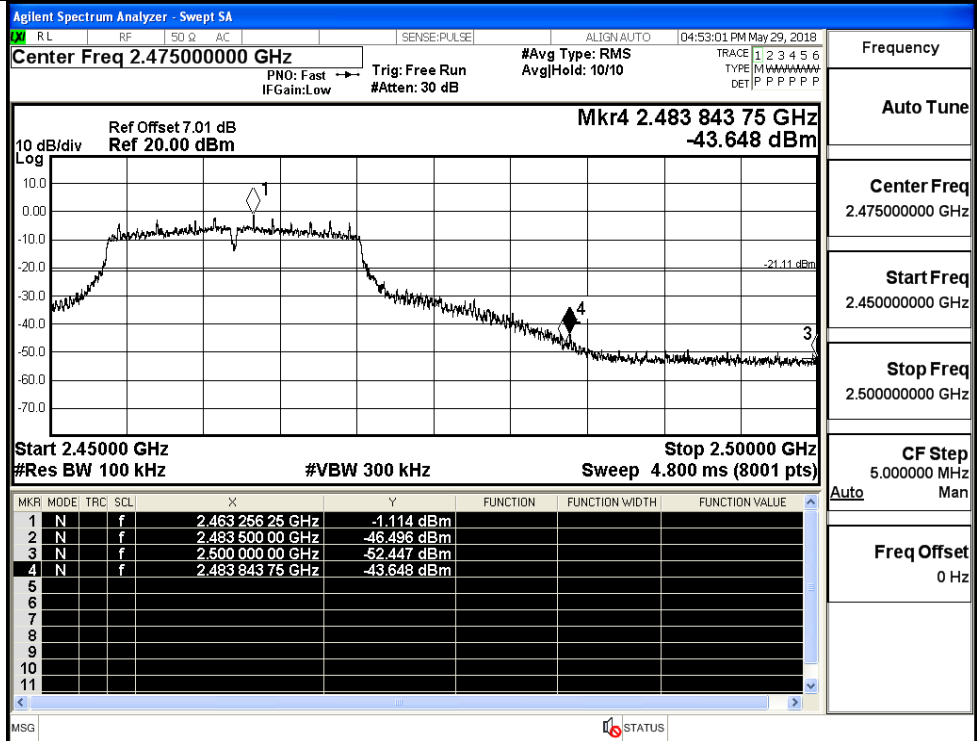
Frequency	2.47500000 GHz
Auto Tune	
Center Freq	2.47500000 GHz
Start Freq	2.45000000 GHz
Stop Freq	2.50000000 GHz
CF Step	5.000000 MHz
Freq Offset	0 Hz

11G/LCH



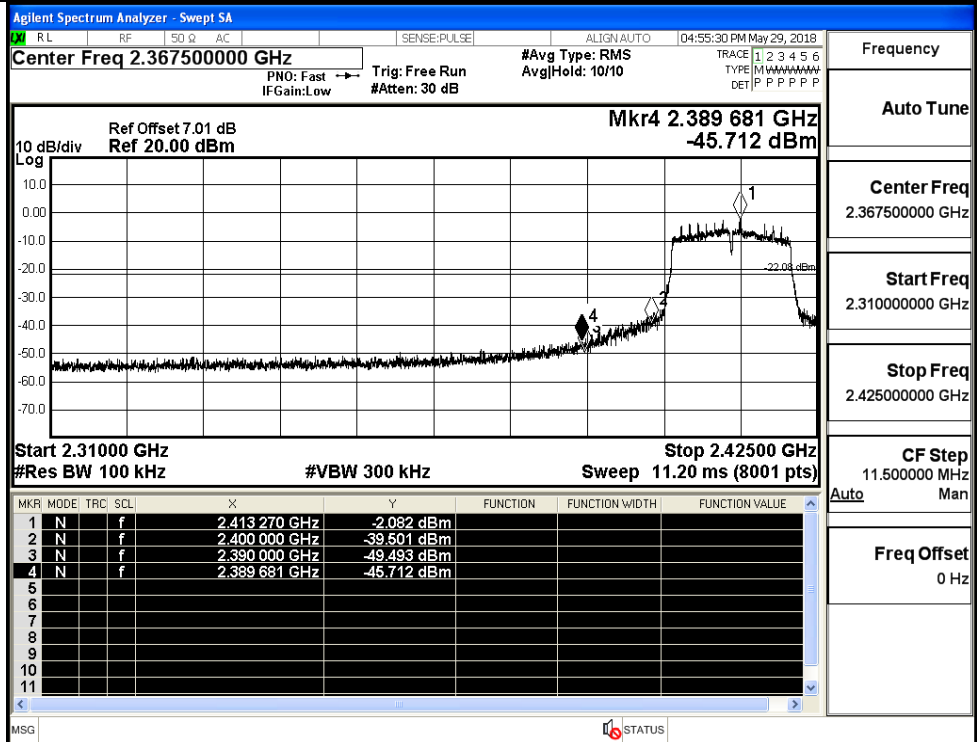
Frequency	2.36750000 GHz
Auto Tune	
Center Freq	2.36750000 GHz
Start Freq	2.31000000 GHz
Stop Freq	2.42500000 GHz
CF Step	11.500000 MHz
Freq Offset	0 Hz

11G/HCH



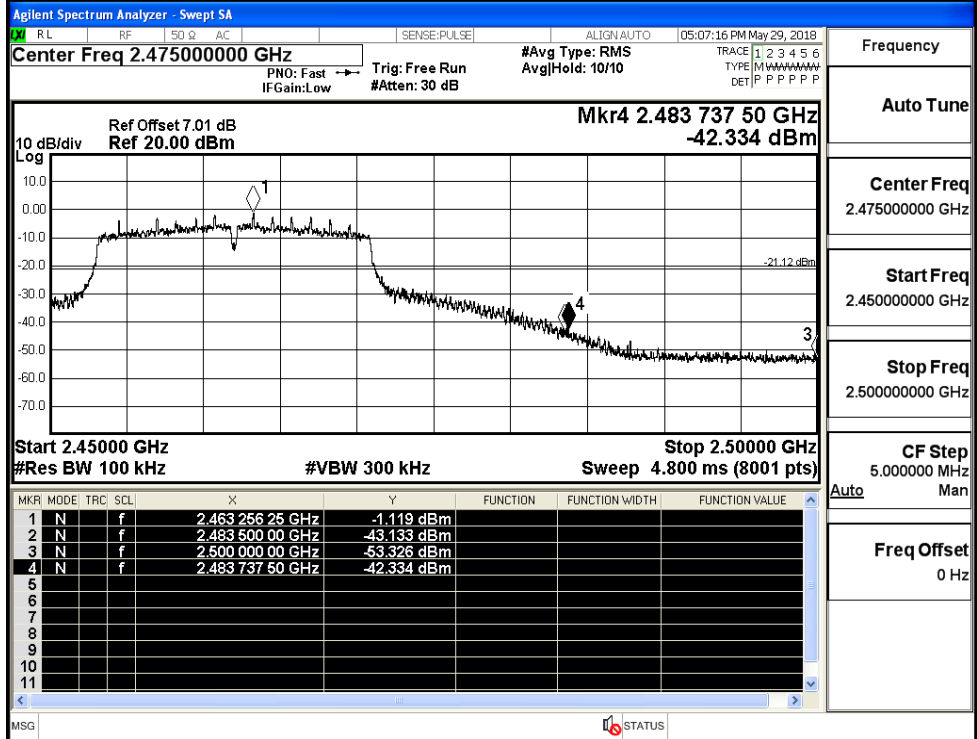
Frequency	
Auto Tune	
Center Freq	2.47500000 GHz
Start Freq	2.45000000 GHz
Stop Freq	2.50000000 GHz
CF Step	5.000000 MHz
Freq Offset	0 Hz

11N20SISO/LCH



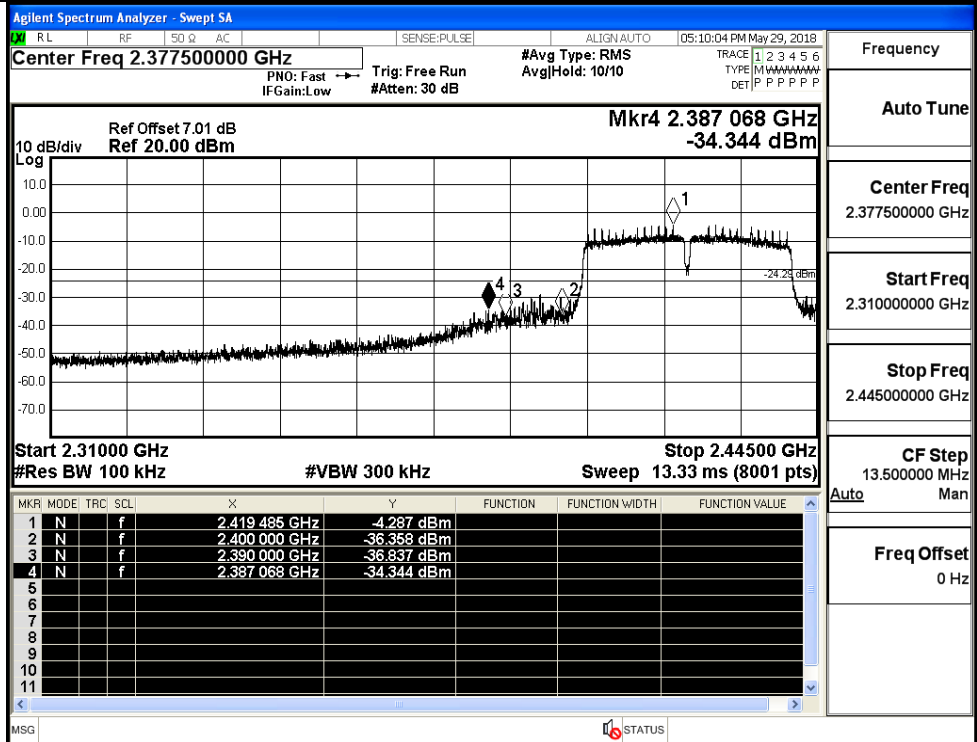
Frequency	
Auto Tune	
Center Freq	2.36750000 GHz
Start Freq	2.31000000 GHz
Stop Freq	2.42500000 GHz
CF Step	11.500000 MHz
Freq Offset	0 Hz

11N20SISO/HCH



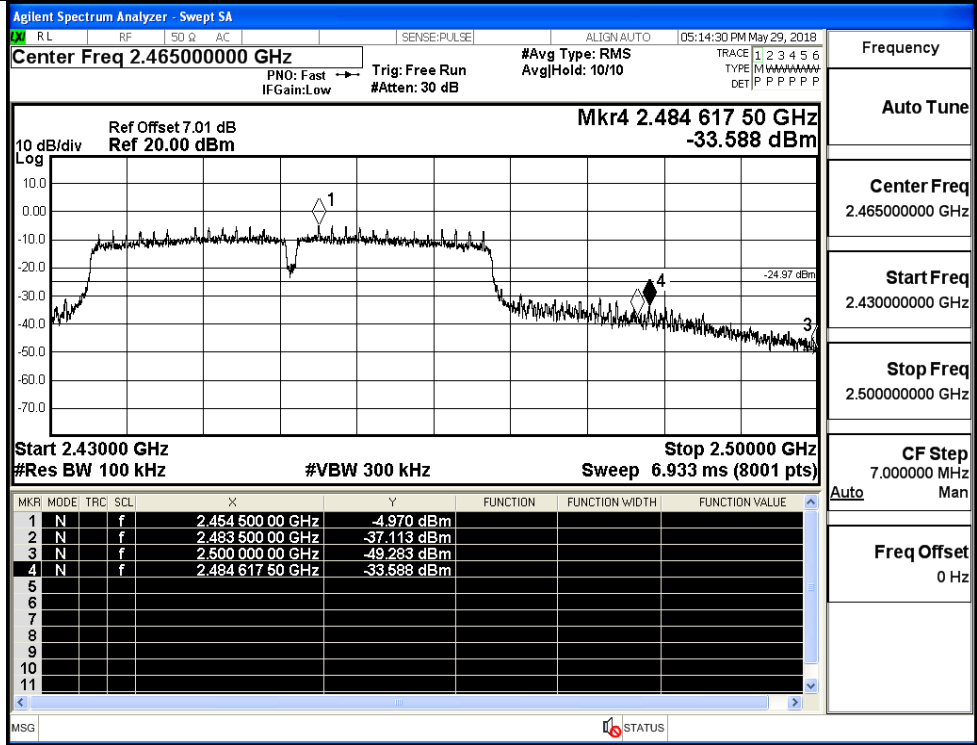
Frequency	2.47500000 GHz
Auto Tune	
Center Freq	2.47500000 GHz
Start Freq	2.45000000 GHz
Stop Freq	2.50000000 GHz
CF Step	5.000000 MHz
Freq Offset	0 Hz

11N40SISO/LCH



Frequency	2.37750000 GHz
Auto Tune	
Center Freq	2.37750000 GHz
Start Freq	2.31000000 GHz
Stop Freq	2.44500000 GHz
CF Step	13.500000 MHz
Freq Offset	0 Hz

11N40SISO/HCH

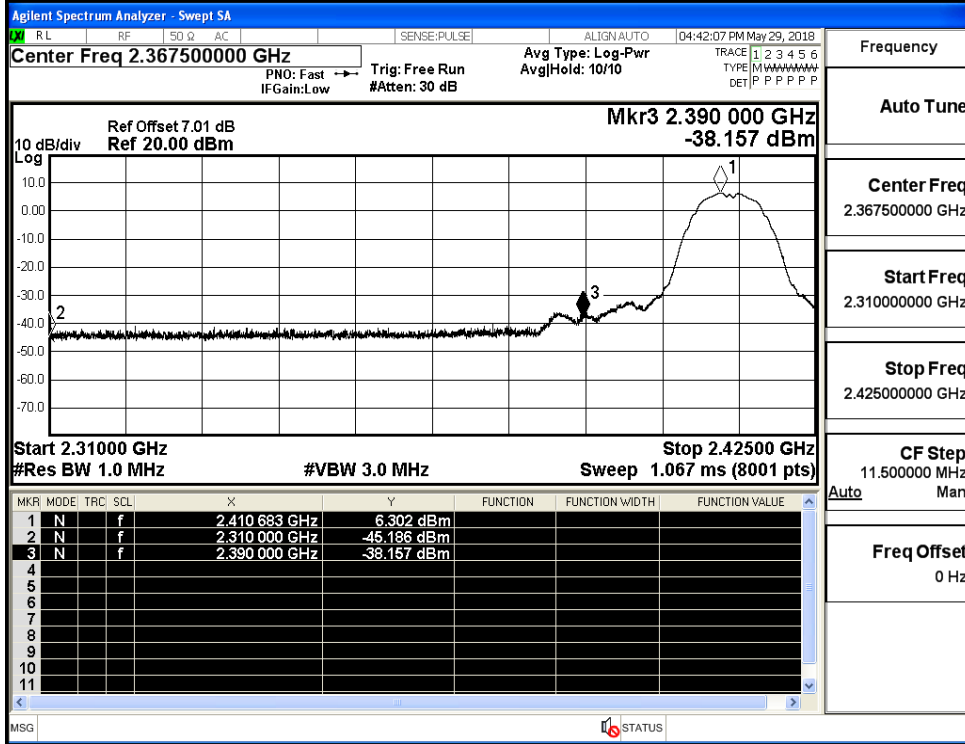


A.6 Restrict-band band-edge measurements

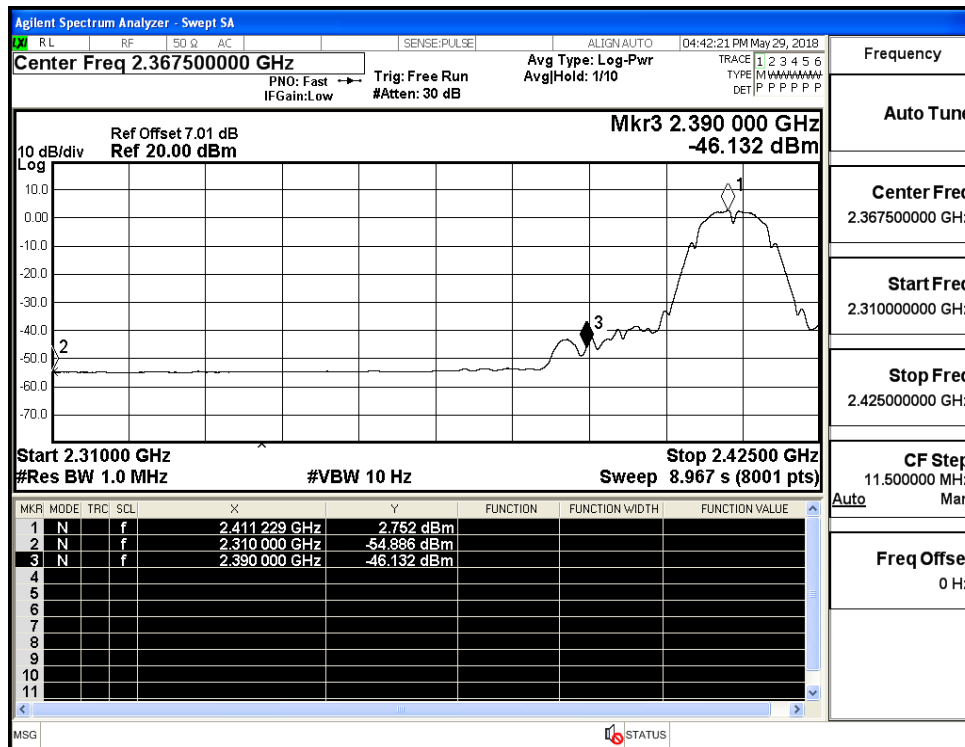
Test Mode	Test Channel	Ant	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBu V/m]	Verdict
11B	2412	Ant1	2310.0	-45.19	5.0	0	55.07	PEAK	74	PASS
	2412	Ant1	2310.0	-54.89	5.0	0	45.37	AV	54	PASS
	2412	Ant1	2390.0	-38.16	5.0	0	62.10	PEAK	74	PASS
	2412	Ant1	2390.0	-46.13	5.0	0	54.13	AV	54	PASS
	2462	Ant1	2483.5	-42.92	5.0	0	57.34	PEAK	74	PASS
	2462	Ant1	2483.5	-52.89	5.0	0	47.37	AV	54	PASS
	2462	Ant1	2500.0	-43.41	5.0	0	56.85	PEAK	74	PASS
	2462	Ant1	2500.0	-54.07	5.0	0	46.19	AV	54	PASS
11G	2412	Ant1	2310.0	-43.26	5.0	0	57.00	PEAK	74	PASS
	2412	Ant1	2310.0	-54.76	5.0	0	45.50	AV	54	PASS
	2412	Ant1	2390.0	-36.28	5.0	0	63.98	PEAK	74	PASS
	2412	Ant1	2390.0	-48.92	5.0	0	51.34	AV	54	PASS
	2462	Ant1	2483.5	-32.38	5.0	0	67.88	PEAK	74	PASS
	2462	Ant1	2483.5	-48.44	5.0	0	51.82	AV	54	PASS
	2462	Ant1	2500.0	-42.46	5.0	0	57.80	PEAK	74	PASS
	2462	Ant1	2500.0	-53.44	5.0	0	46.82	AV	54	PASS
11N20 SISO	2412	Ant1	2310.0	-43.93	5.0	0	56.33	PEAK	74	PASS
	2412	Ant1	2310.0	-54.70	5.0	0	45.56	AV	54	PASS
	2412	Ant1	2390.0	-36.16	5.0	0	64.10	PEAK	74	PASS
	2412	Ant1	2390.0	-48.27	5.0	0	51.99	AV	54	PASS
	2462	Ant1	2483.5	-29.46	5.0	0	70.80	PEAK	74	PASS
	2462	Ant1	2483.5	-46.41	5.0	0	53.85	AV	54	PASS
	2462	Ant1	2500.0	-41.47	5.0	0	58.79	PEAK	74	PASS
	2462	Ant1	2500.0	-53.34	5.0	0	46.92	AV	54	PASS
11N40 SISO	2422	Ant1	2310.0	-43.74	5.0	0	56.52	PEAK	74	PASS
	2422	Ant1	2310.0	-54.85	5.0	0	45.41	AV	54	PASS

	2422	Ant1	2390.0	-38.81	5.0	0	61.45	PEAK	74	PASS
	2422	Ant1	2390.0	-50.29	5.0	0	49.97	AV	54	PASS
	2452	Ant1	2483.5	-42.91	5.0	0	57.35	PEAK	74	PASS
	2452	Ant1	2483.5	-53.17	5.0	0	47.09	AV	54	PASS
	2452	Ant1	2500.0	-43.20	5.0	0	57.06	PEAK	74	PASS
	2452	Ant1	2500.0	-53.94	5.0	0	46.32	AV	54	PASS

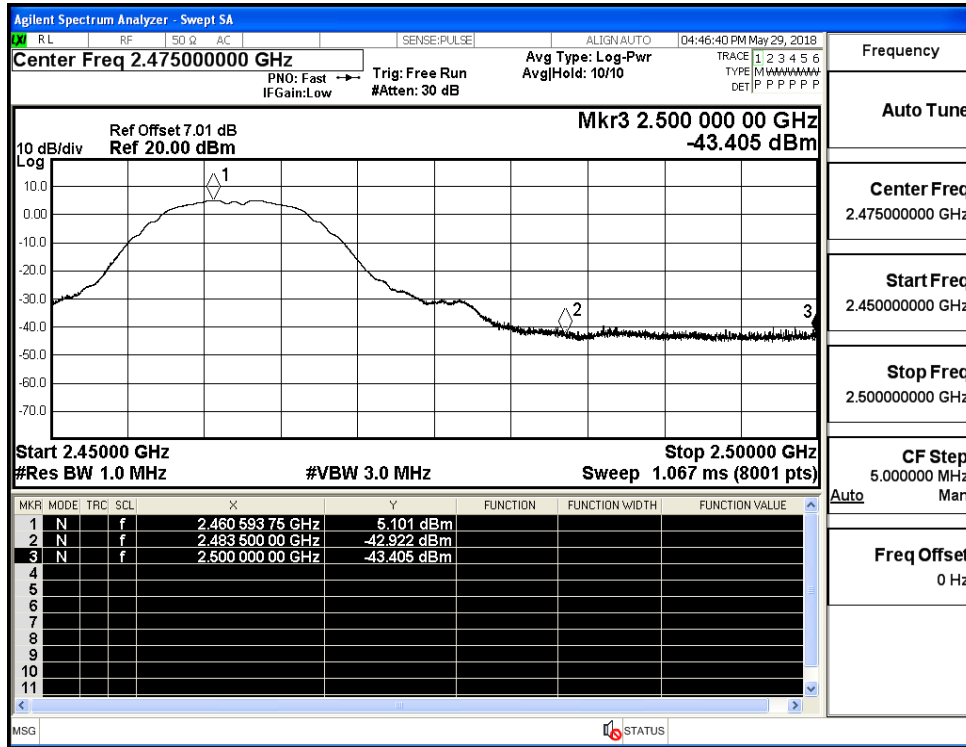
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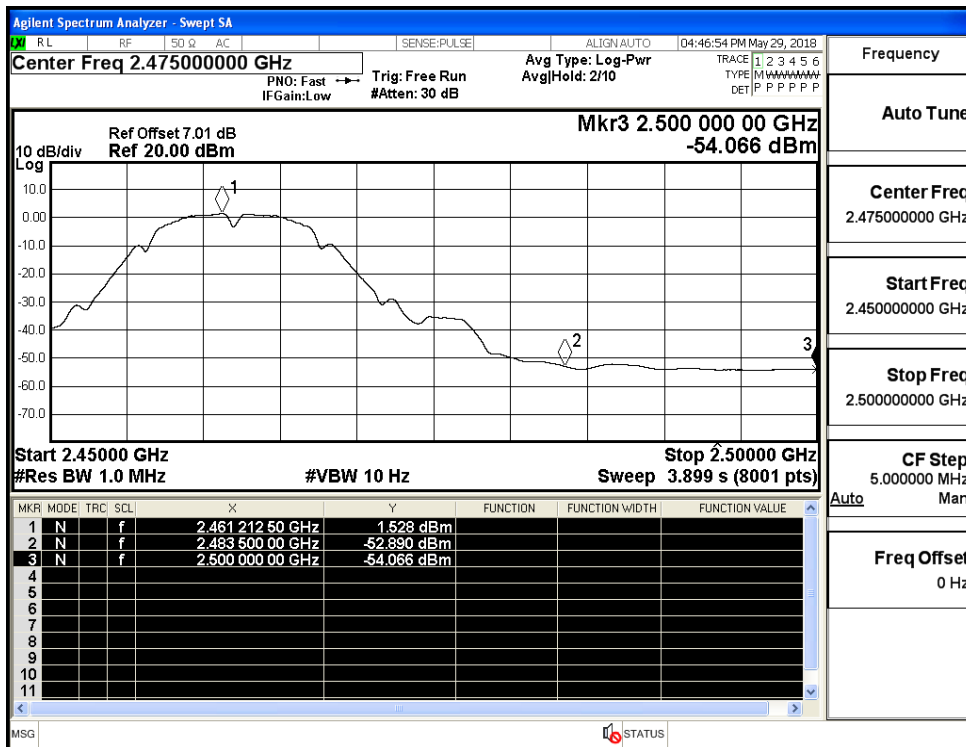
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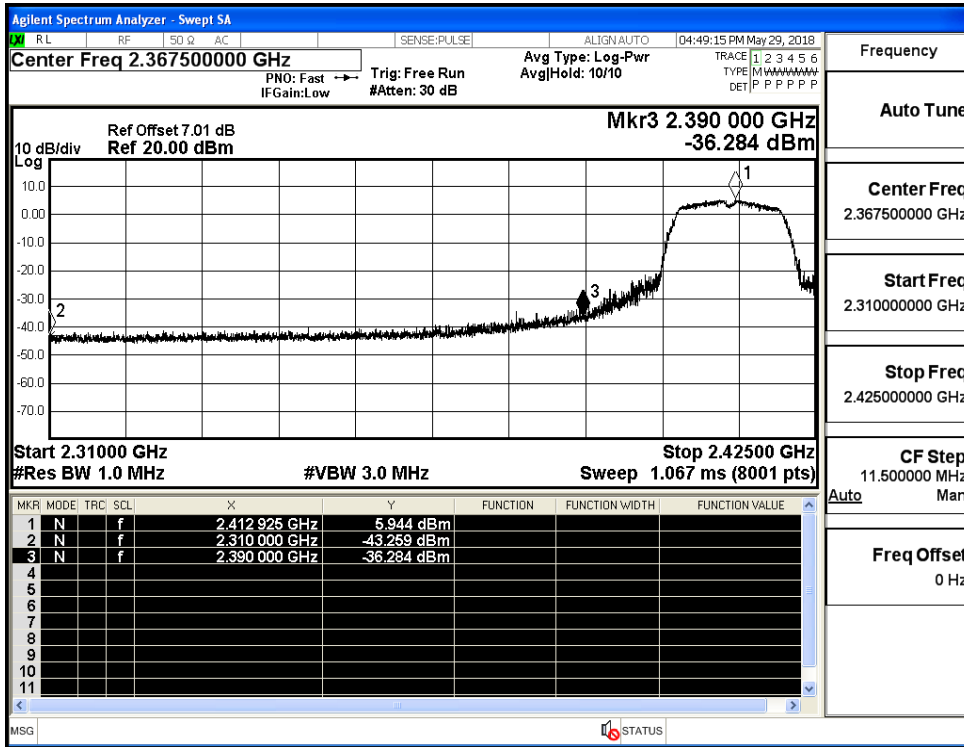
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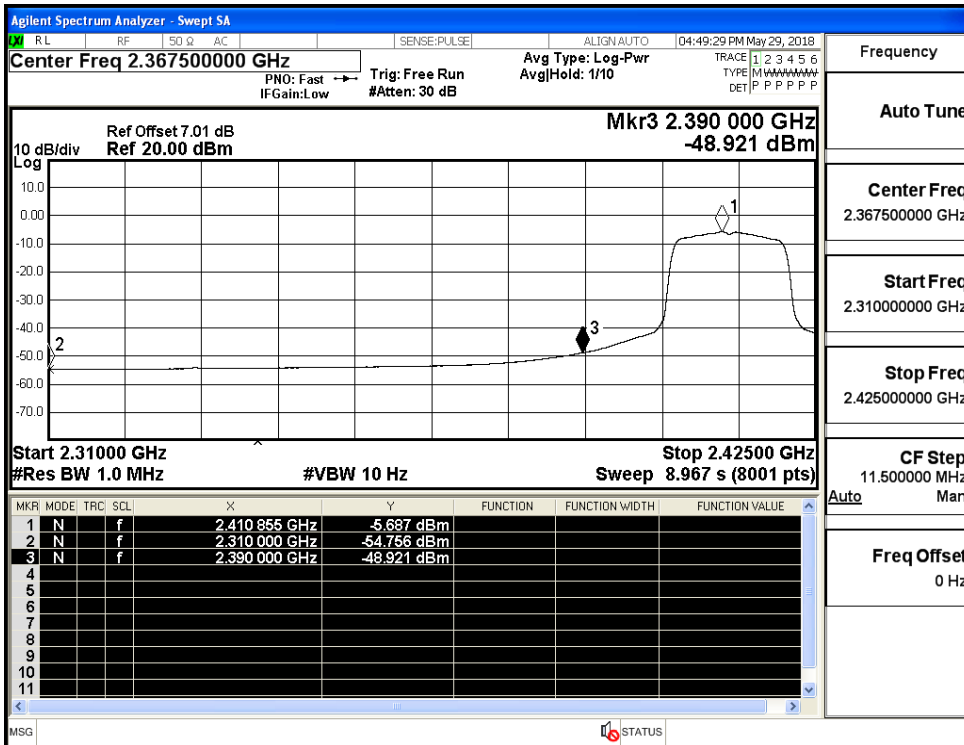
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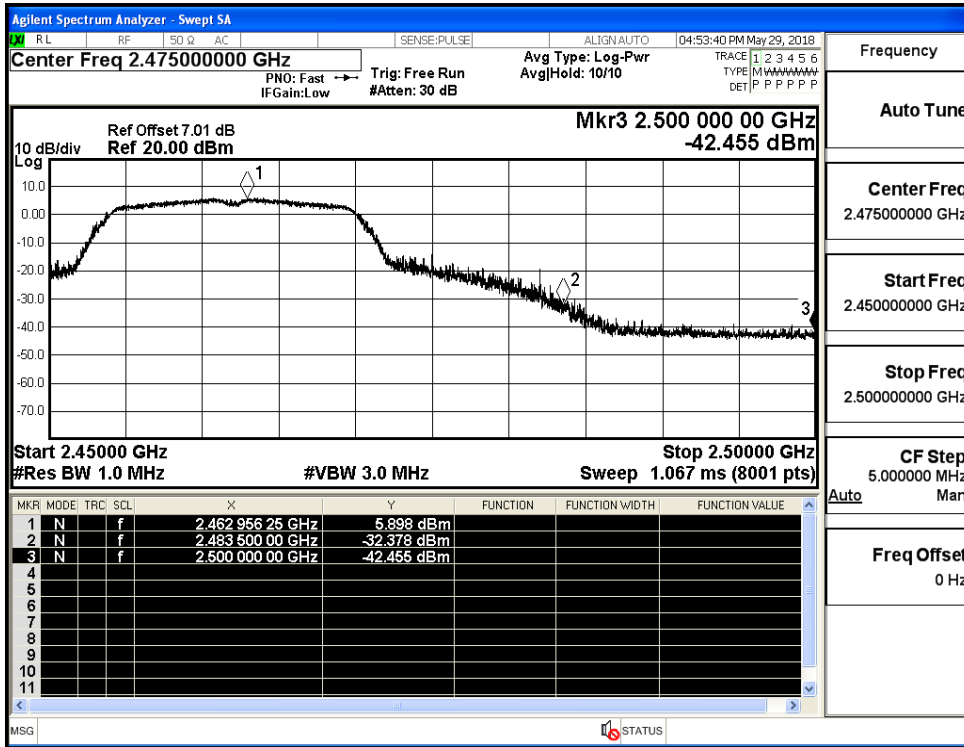
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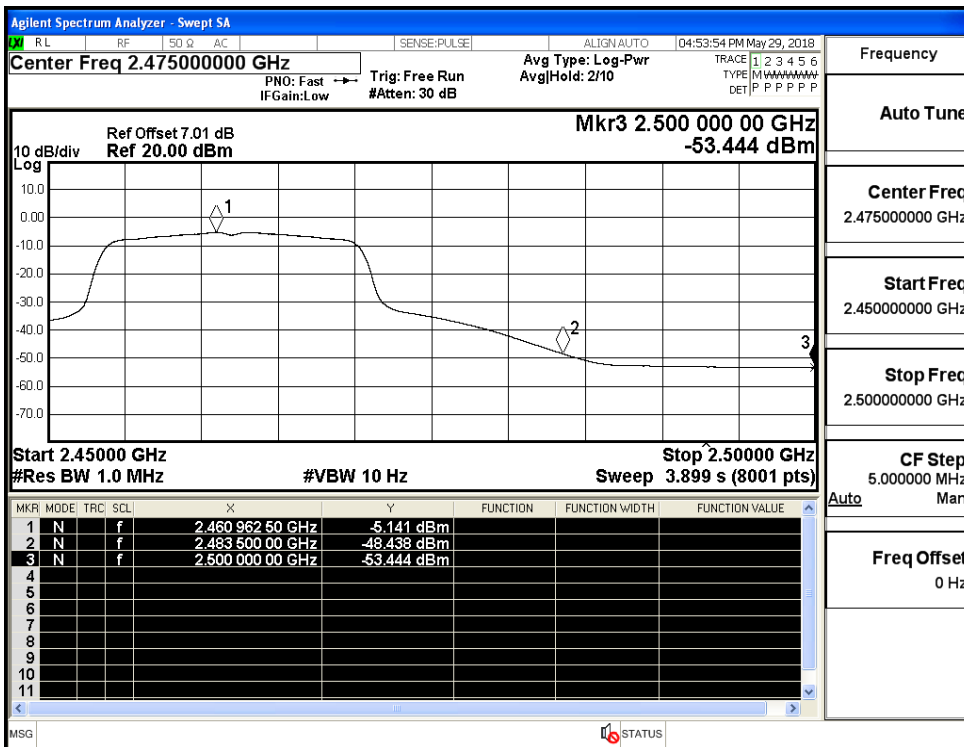
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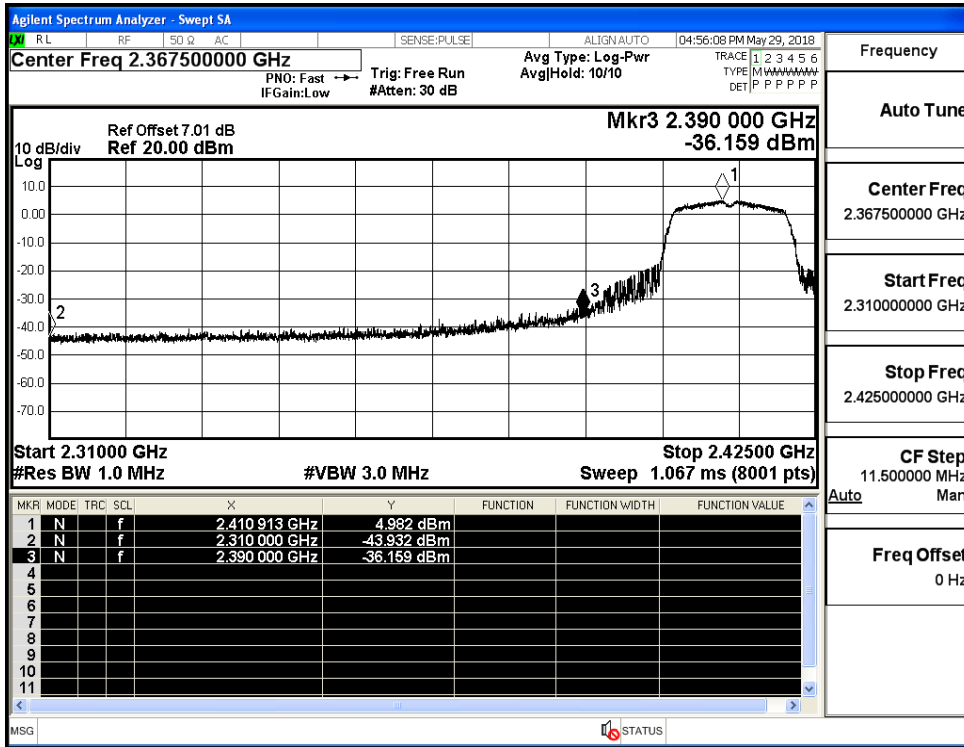
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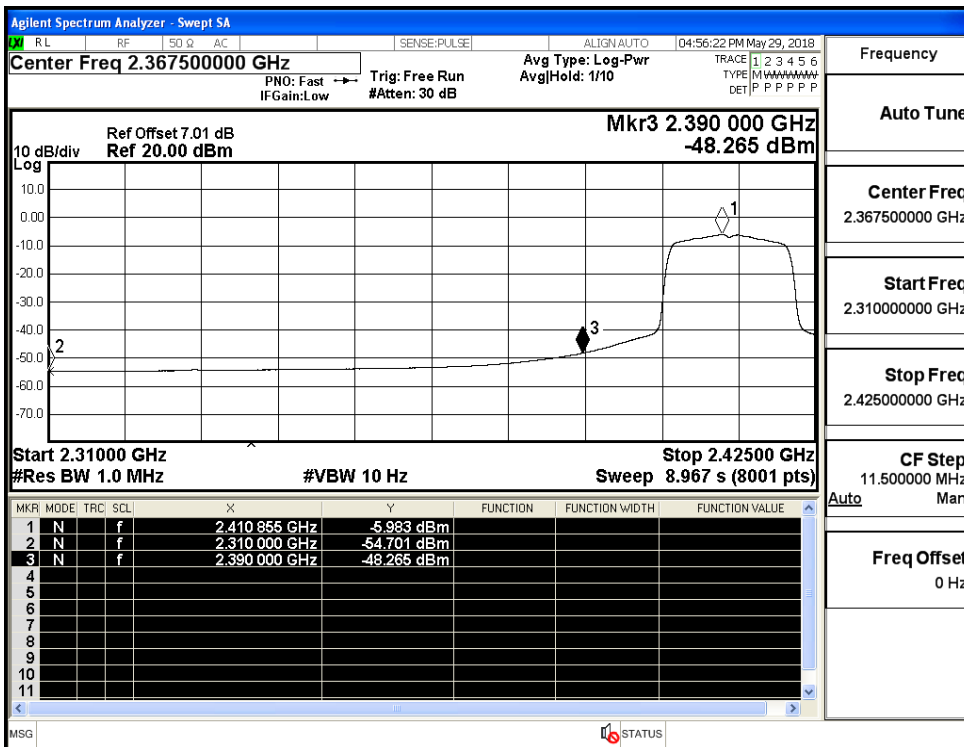
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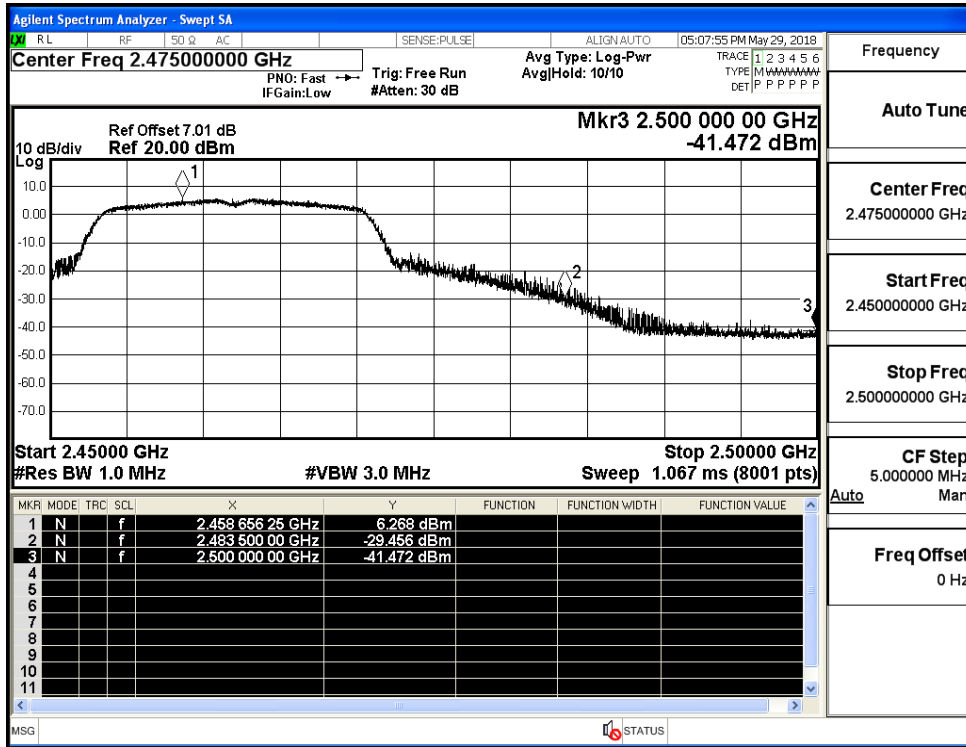
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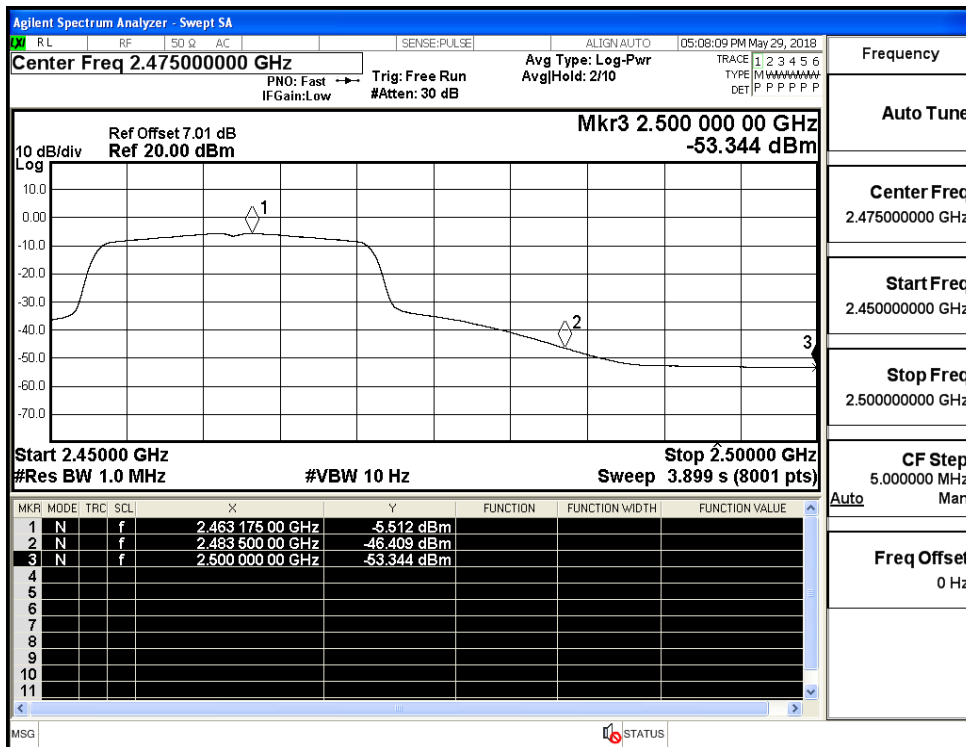
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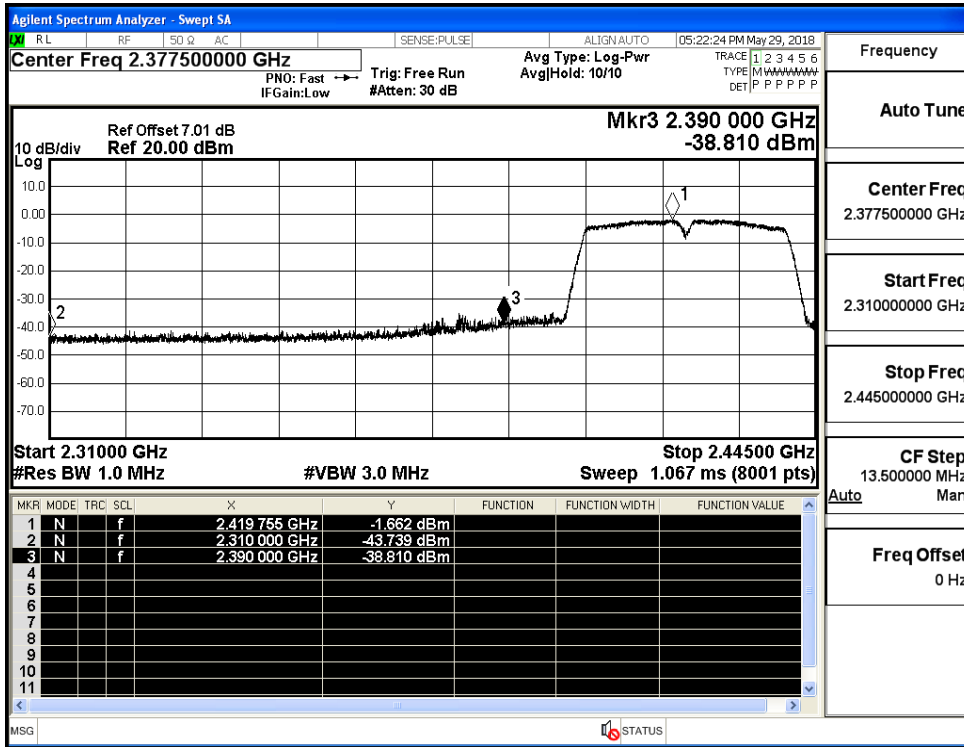
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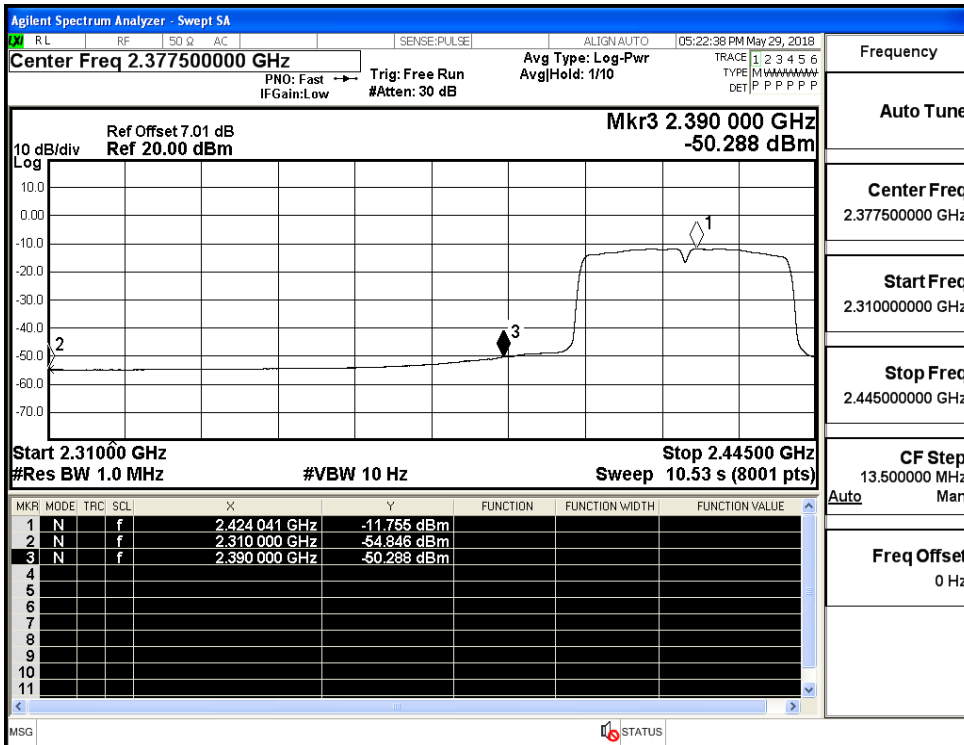
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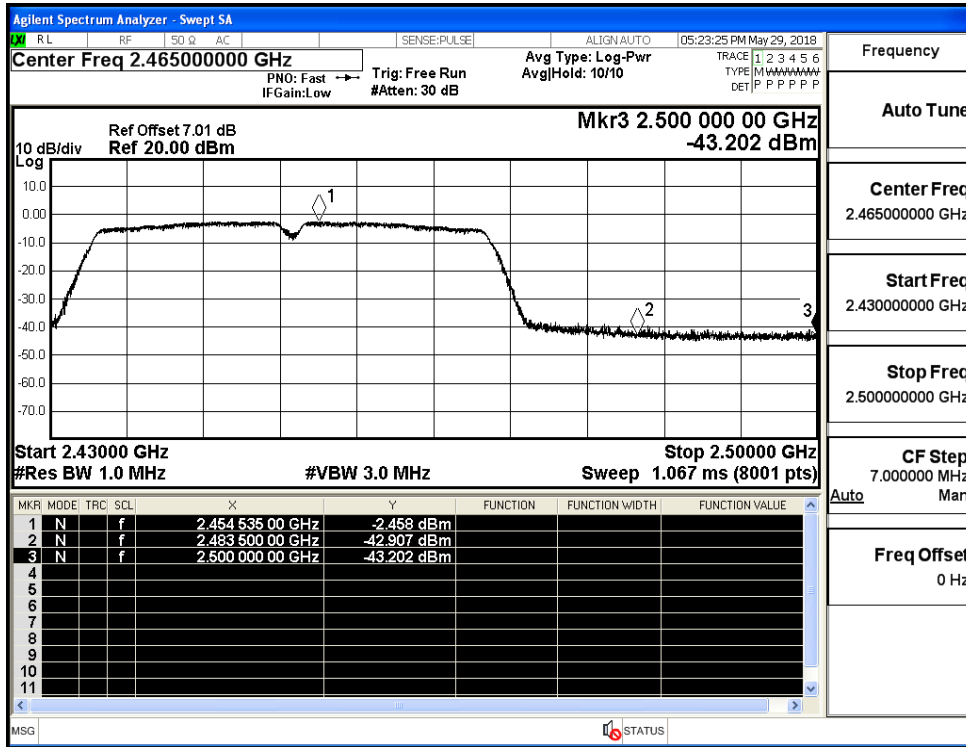
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Restrict-band band-edge measurements_11N40SISO_2422_Ant1_AV



Restrict-band band-edge measurements_11N40SISO_2452_Ant1_PEAK



Restrict-band band-edge measurements_11N40SISO_2452_Ant1_AV

