

Appendix A

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: Smart Plug

Trade Mark: iCreation, Sunway, Shengwei

Test Model: XL-9062

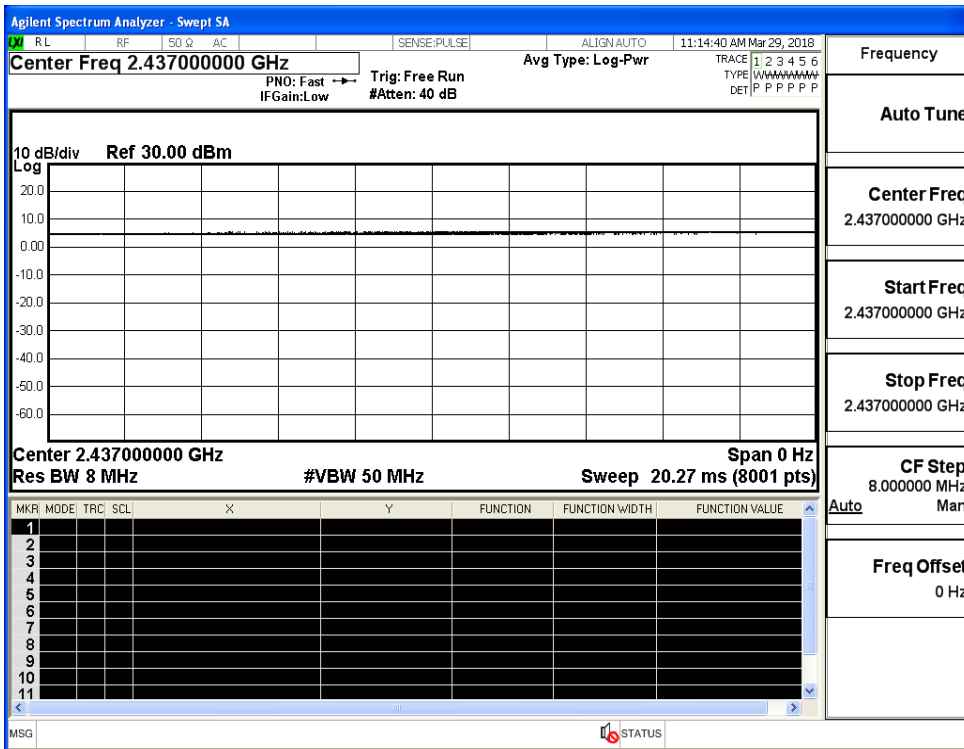
Environmental Conditions

Temperature:	21.3 ° C
Relative Humidity:	52.8%
ATM Pressure:	100.0 kPa
Test Engineer:	Jayden.Zhuo
Supervised by:	Dick.Su

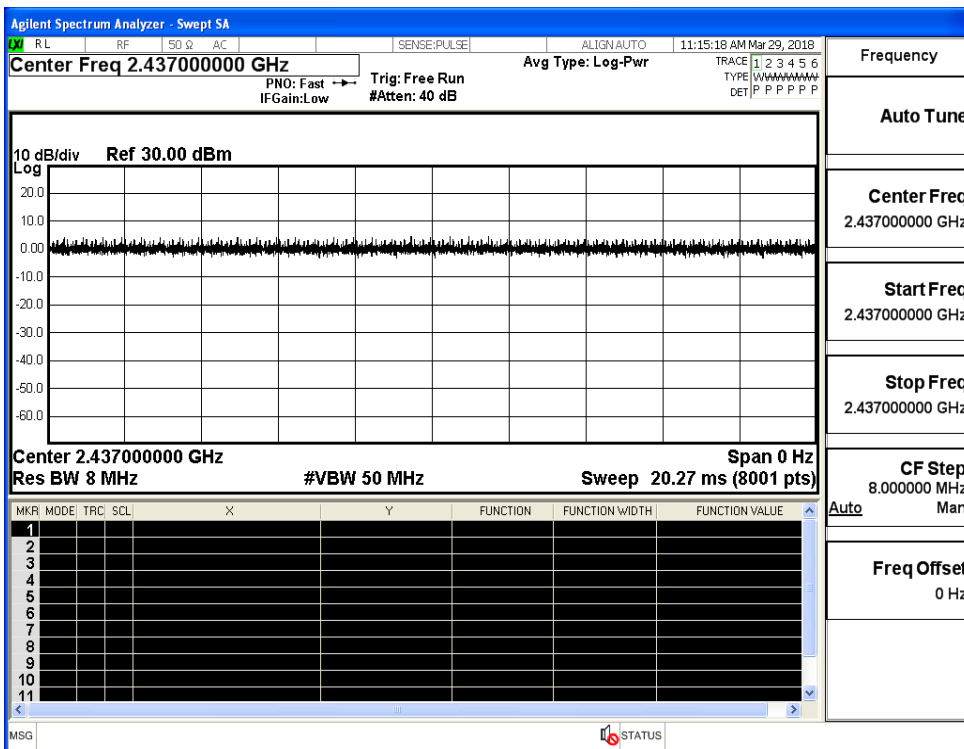
A.1 Duty Cycle

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

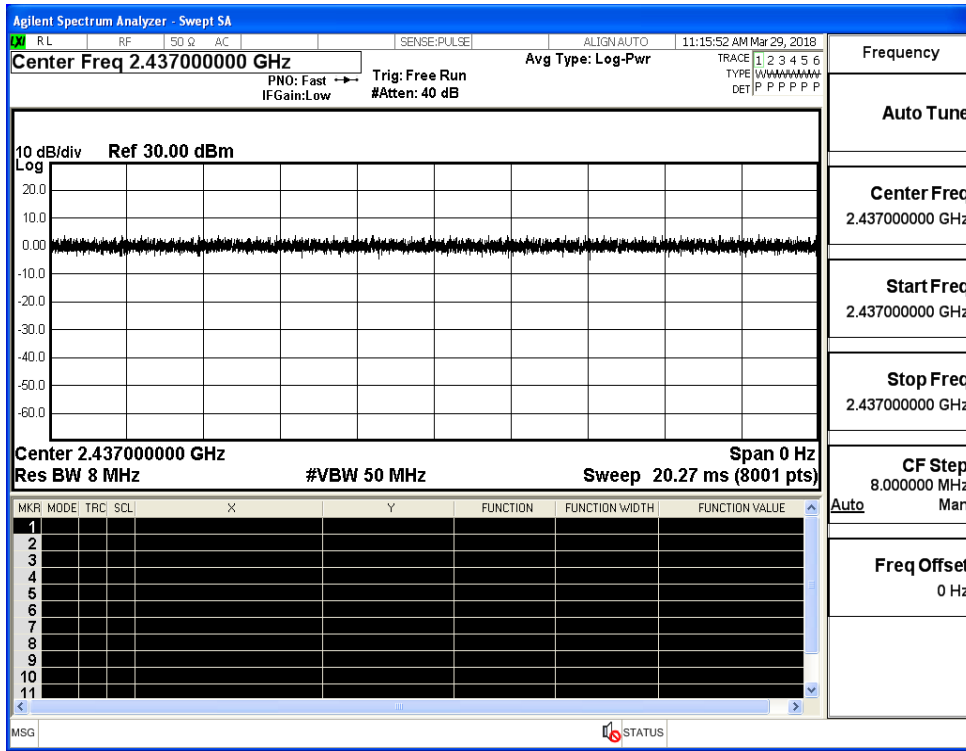
Duty Cycle_11B_2437_Ant1



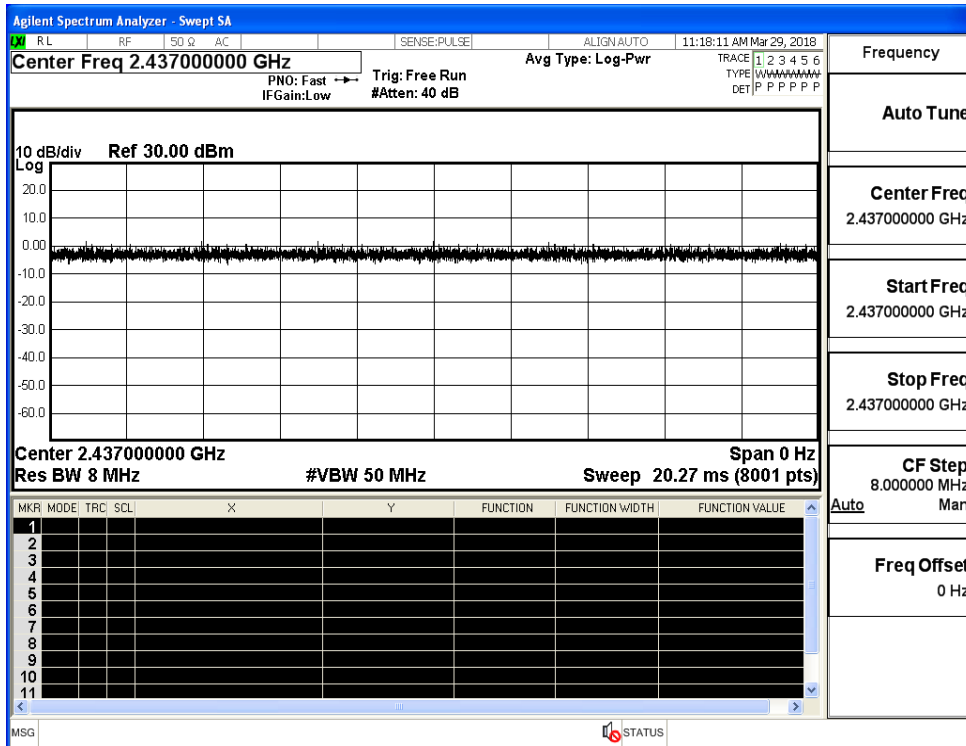
Duty Cycle_11G_2437_Ant1



Duty Cycle_11N20SISO_2437_Ant1



Duty Cycle_11N40SISO_2437_Ant1



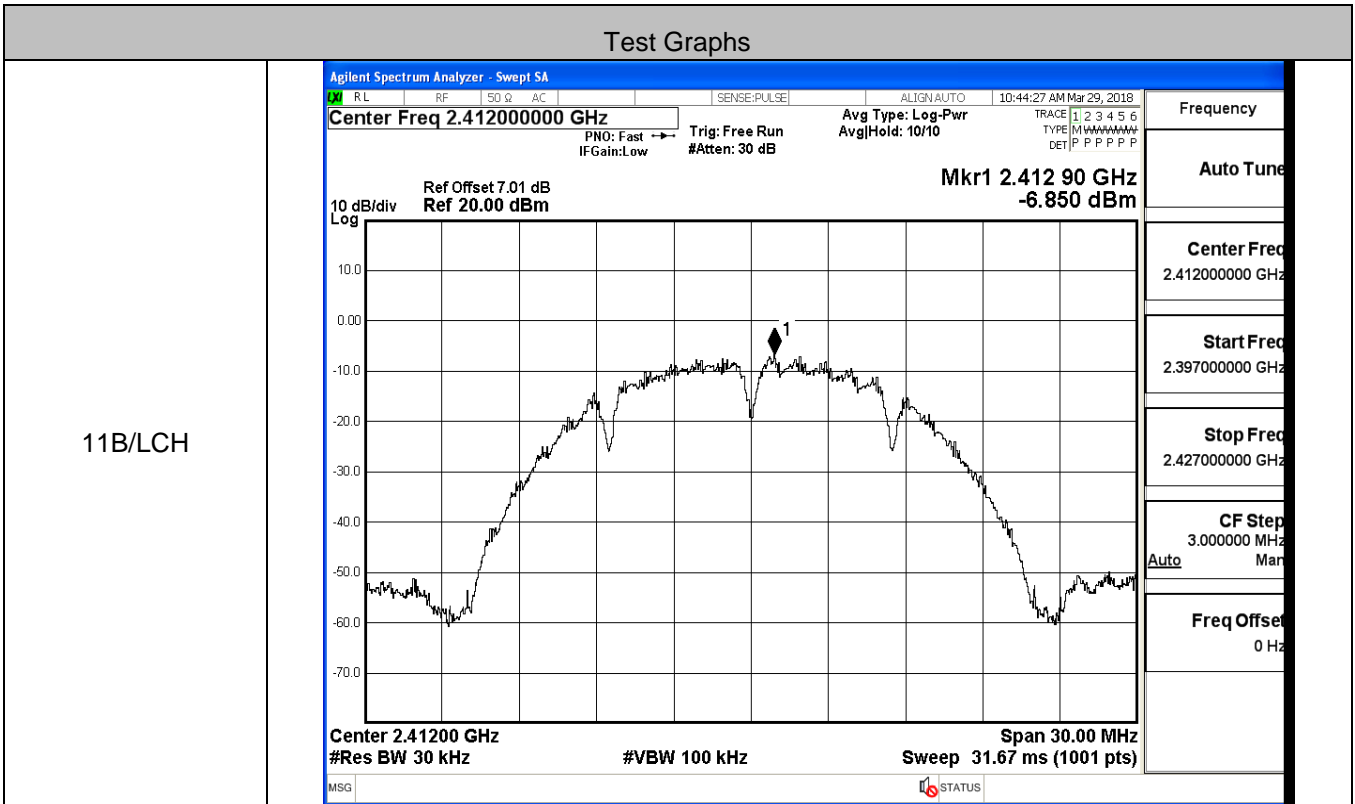
A.2 Maximum Conducted Output Power

Mode	Channel	Meas.Level [dBm, Peak]	Meas.Level [dBm, Average]	Limit [dBm]	Verdict
11B	LCH	11.44	8.69	30	PASS
	MCH	11.22	8.39	30	PASS
	HCH	11.07	8.32	30	PASS
11G	LCH	12.65	6.36	30	PASS
	MCH	11.93	5.74	30	PASS
	HCH	11.44	5.24	30	PASS
11N20SISO	LCH	12.34	6.11	30	PASS
	MCH	12.31	6.08	30	PASS
	HCH	11.65	5.44	30	PASS
11N40SISO	LCH	12.49	5.78	30	PASS
	MCH	12.09	5.34	30	PASS
	HCH	12.20	5.37	30	PASS

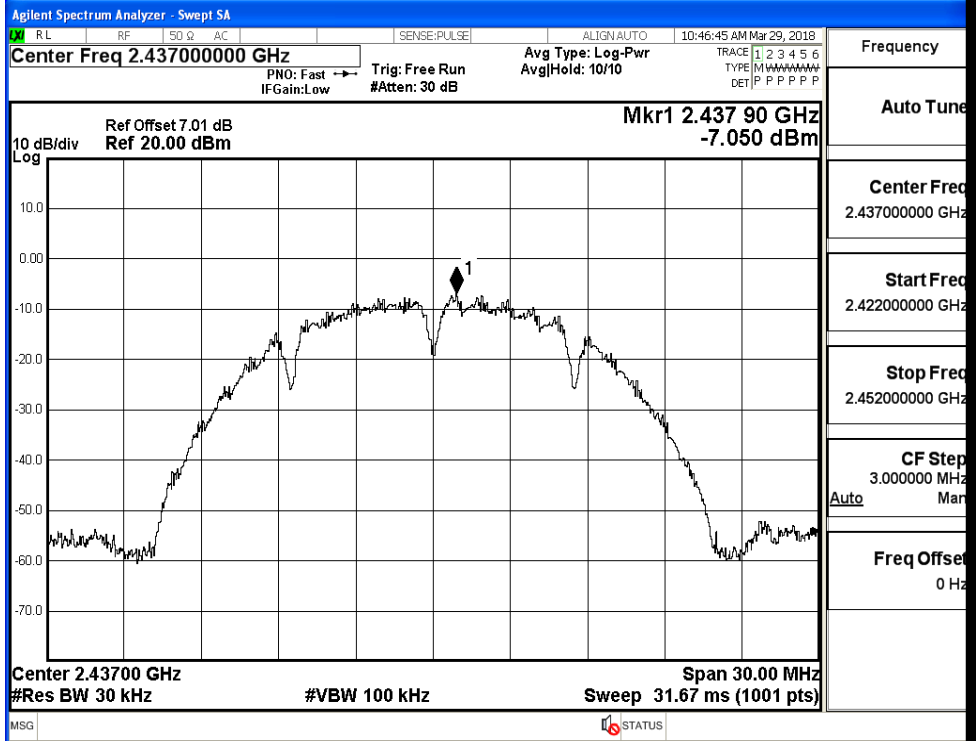
A.3 Maximum Power Spectral Density

Mode	Channel	Meas.Level [dBm/30KHz]	Limit [dBm/3KHz]	Verdict
11B	LCH	-6.850	8	PASS
	MCH	-7.050	8	PASS
	HCH	-7.537	8	PASS
11G	LCH	-11.936	8	PASS
	MCH	-12.418	8	PASS
	HCH	-13.285	8	PASS
11N20SISO	LCH	-12.159	8	PASS
	MCH	-11.960	8	PASS
	HCH	-12.736	8	PASS
11N40SISO	LCH	-15.690	8	PASS
	MCH	-15.906	8	PASS
	HCH	-16.048	8	PASS

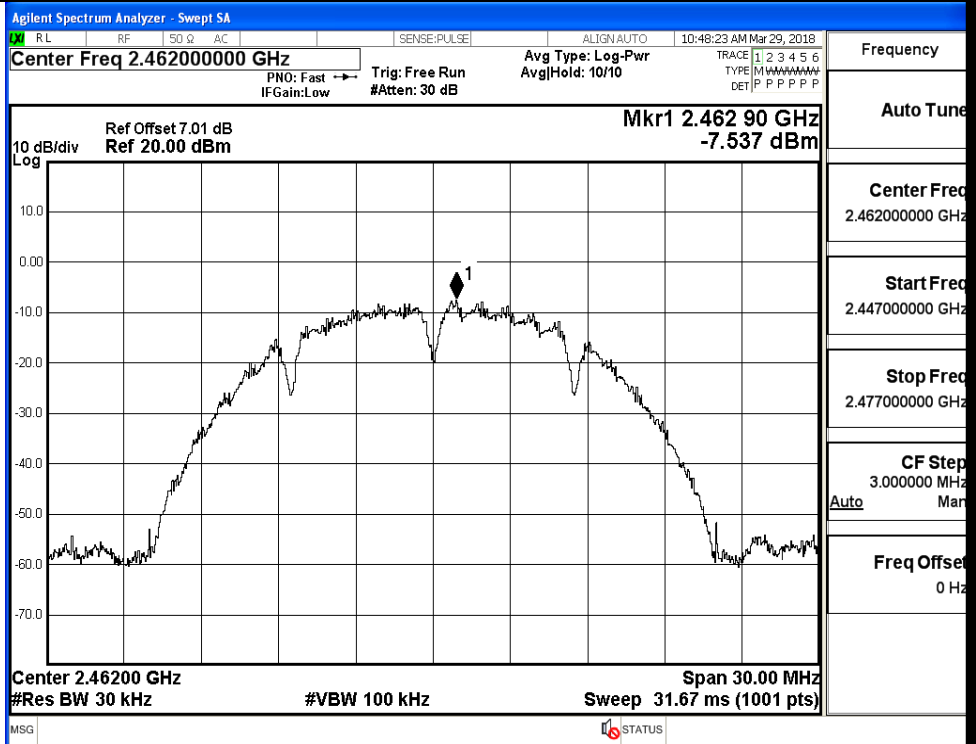
Test Graphs



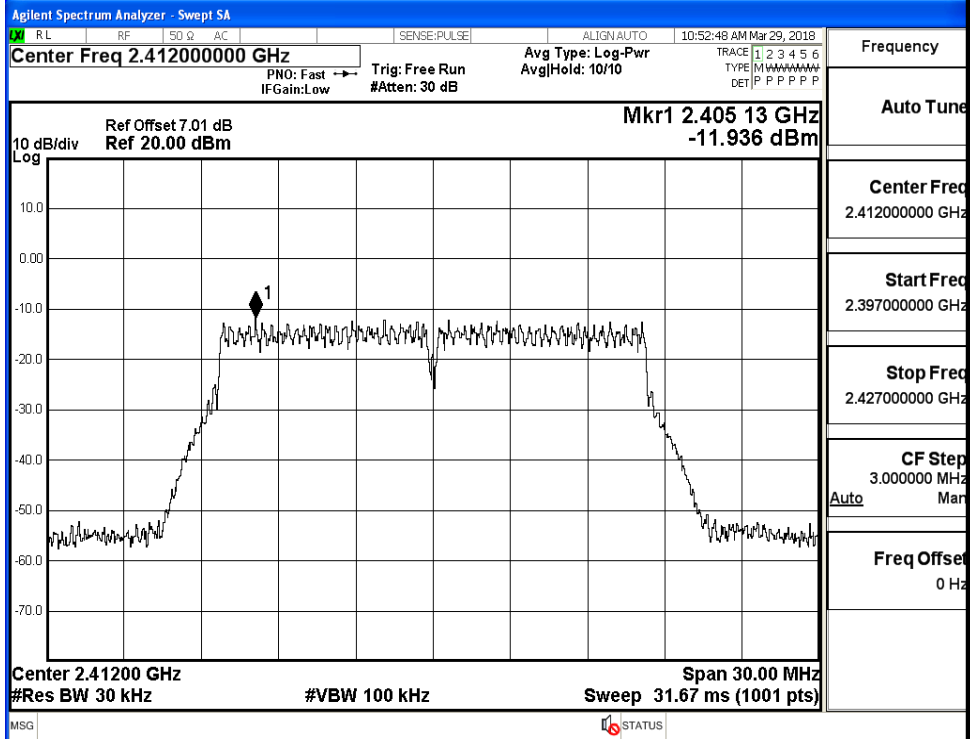
11B/MCH



11B/HCH

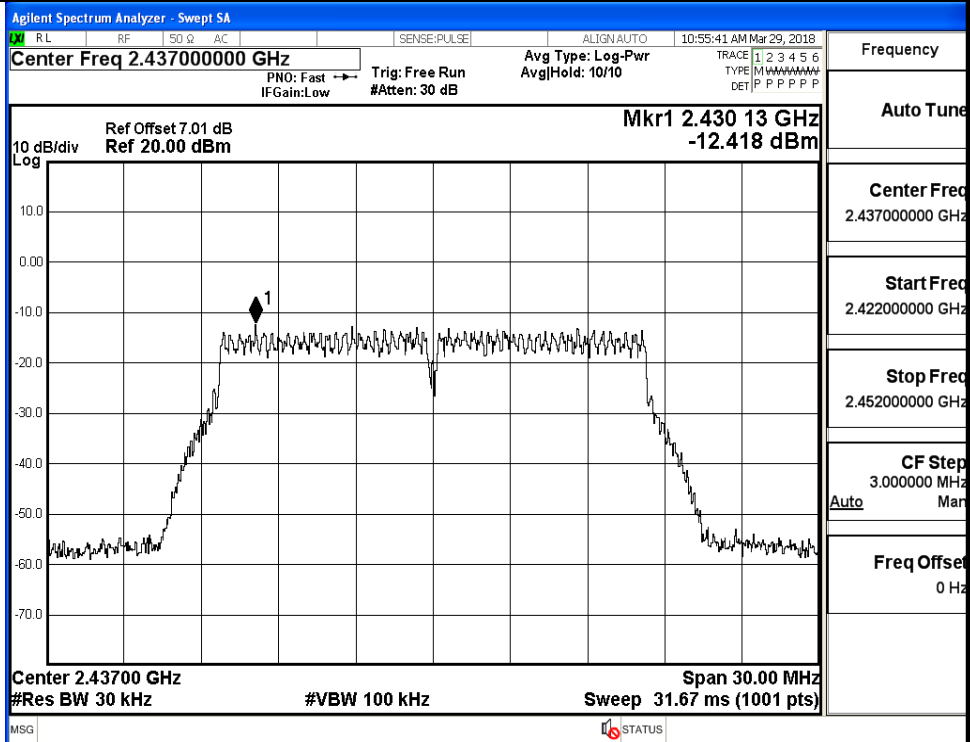


11G/LCH



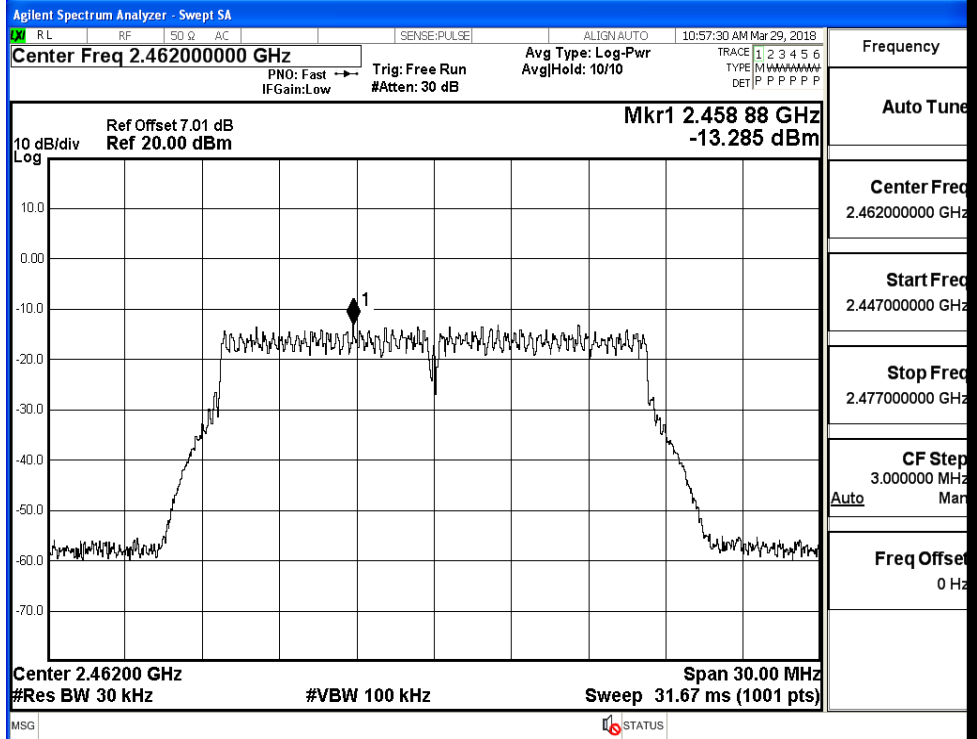
Frequency	
Auto Tune	
Center Freq	2.41200000 GHz
Start Freq	2.397000000 GHz
Stop Freq	2.427000000 GHz
CF Step	3.000000 MHz
Freq Offset	0 Hz

11G/MCH

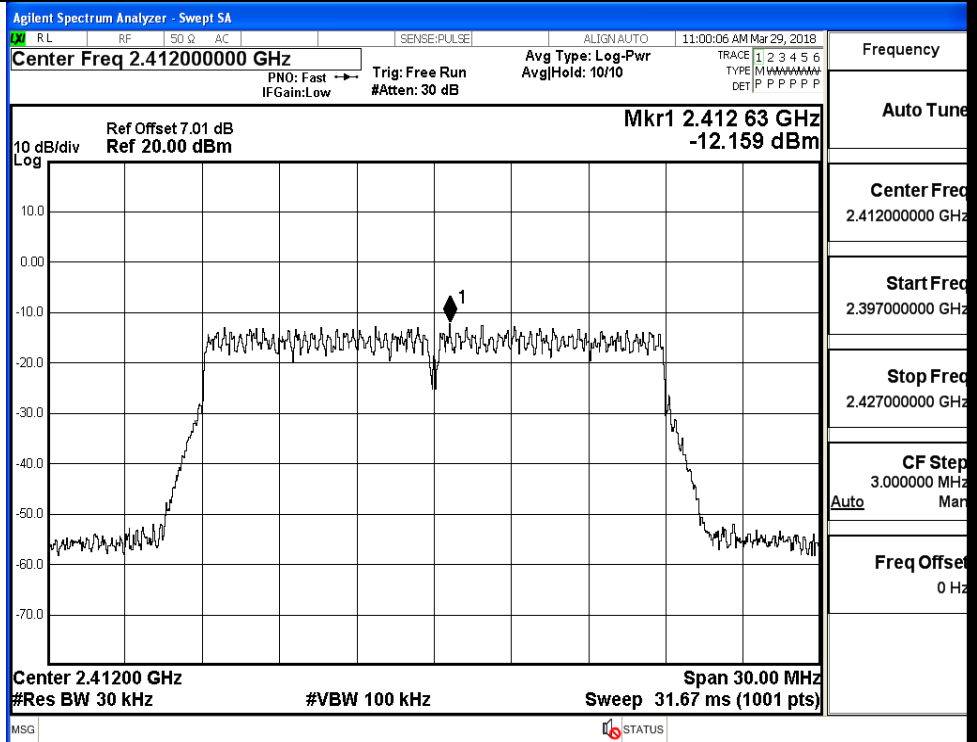


Frequency	
Auto Tune	
Center Freq	2.437000000 GHz
Start Freq	2.422000000 GHz
Stop Freq	2.452000000 GHz
CF Step	3.000000 MHz
Freq Offset	0 Hz

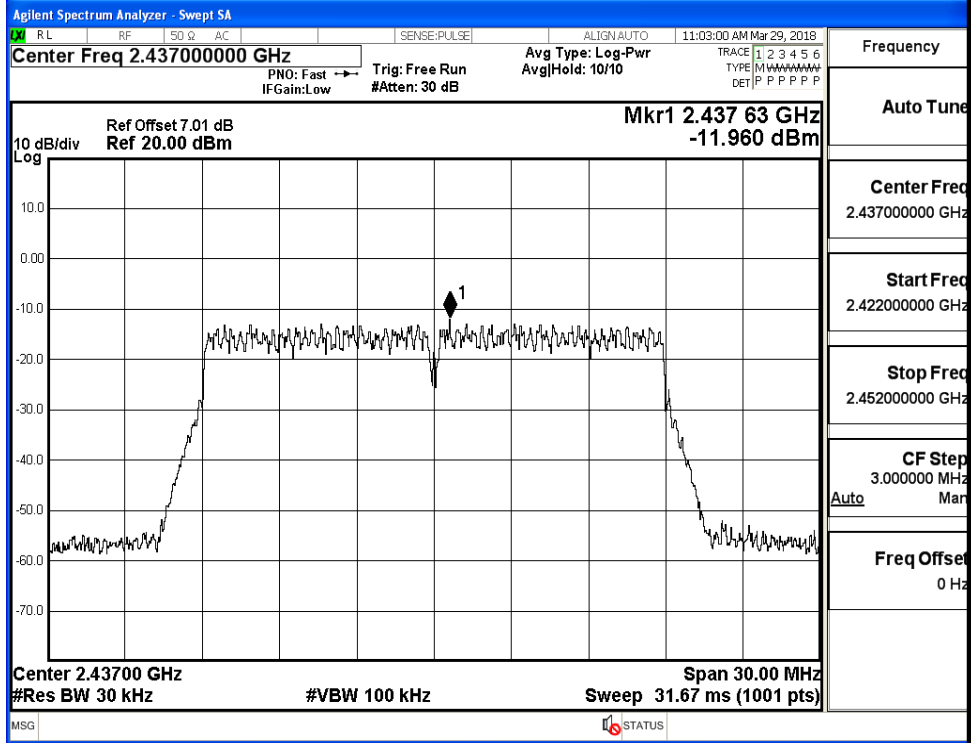
11G/HCH



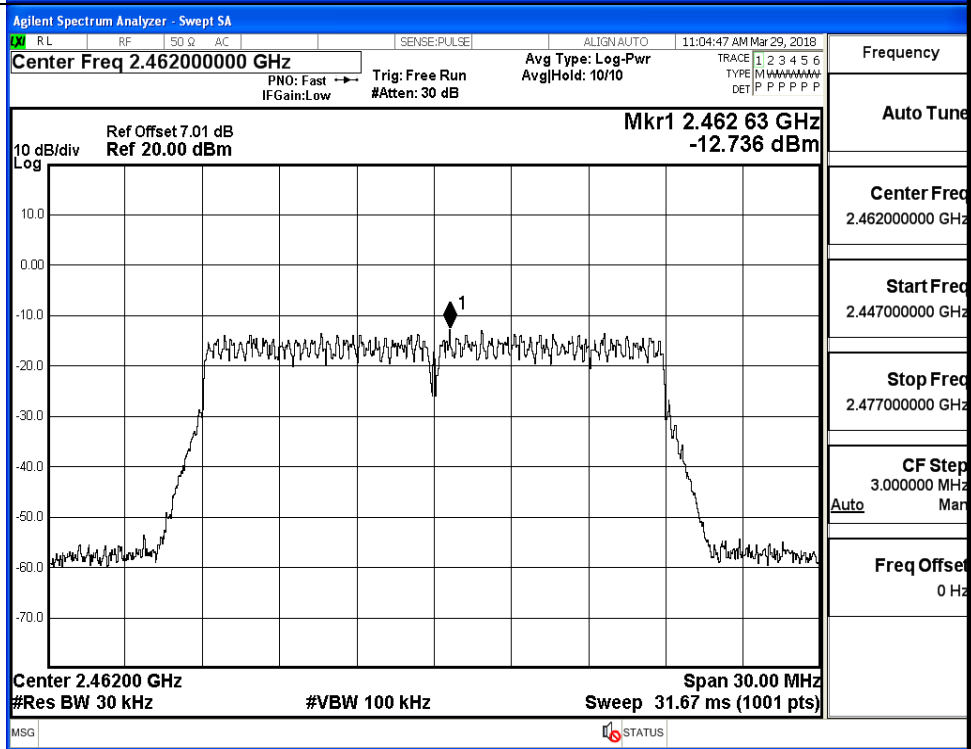
11N20SISO/LCH



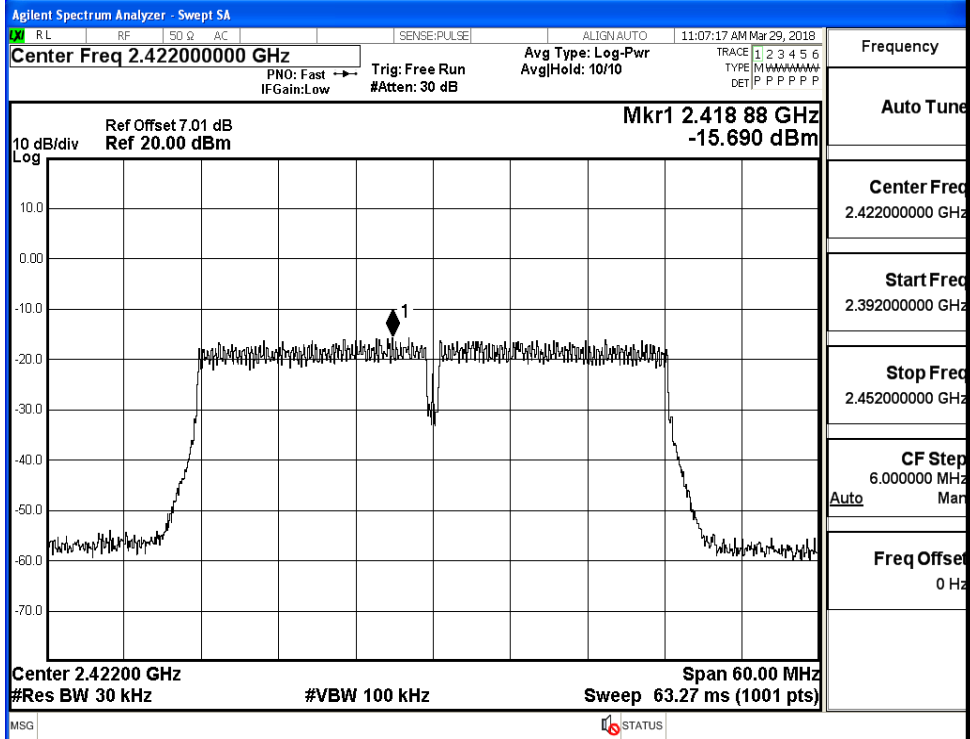
11N20SISO/MCH



11N20SISO/HCH

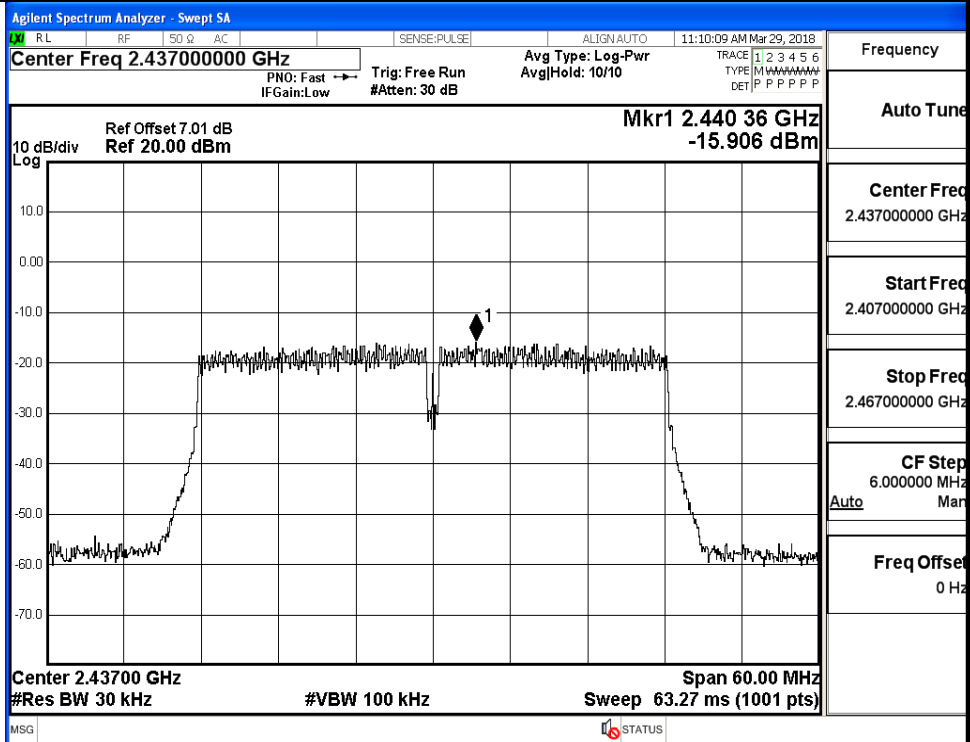


11N40SISO/LCH



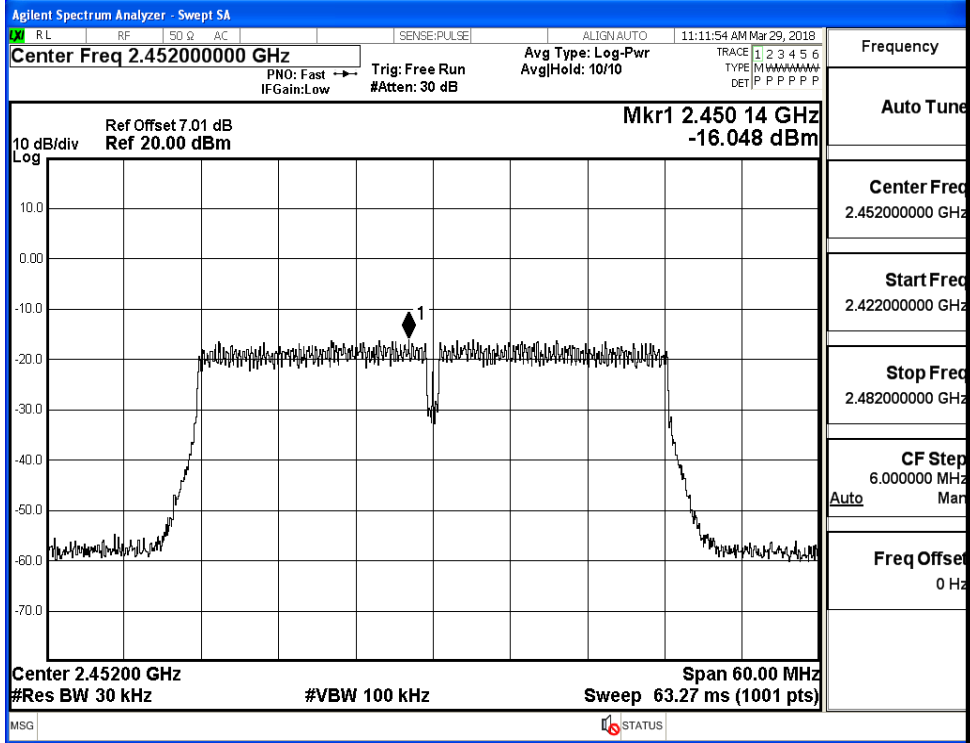
Frequency	
Auto Tune	
Center Freq	2.42200000 GHz
Start Freq	2.392000000 GHz
Stop Freq	2.452000000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz

11N40SISO/MCH



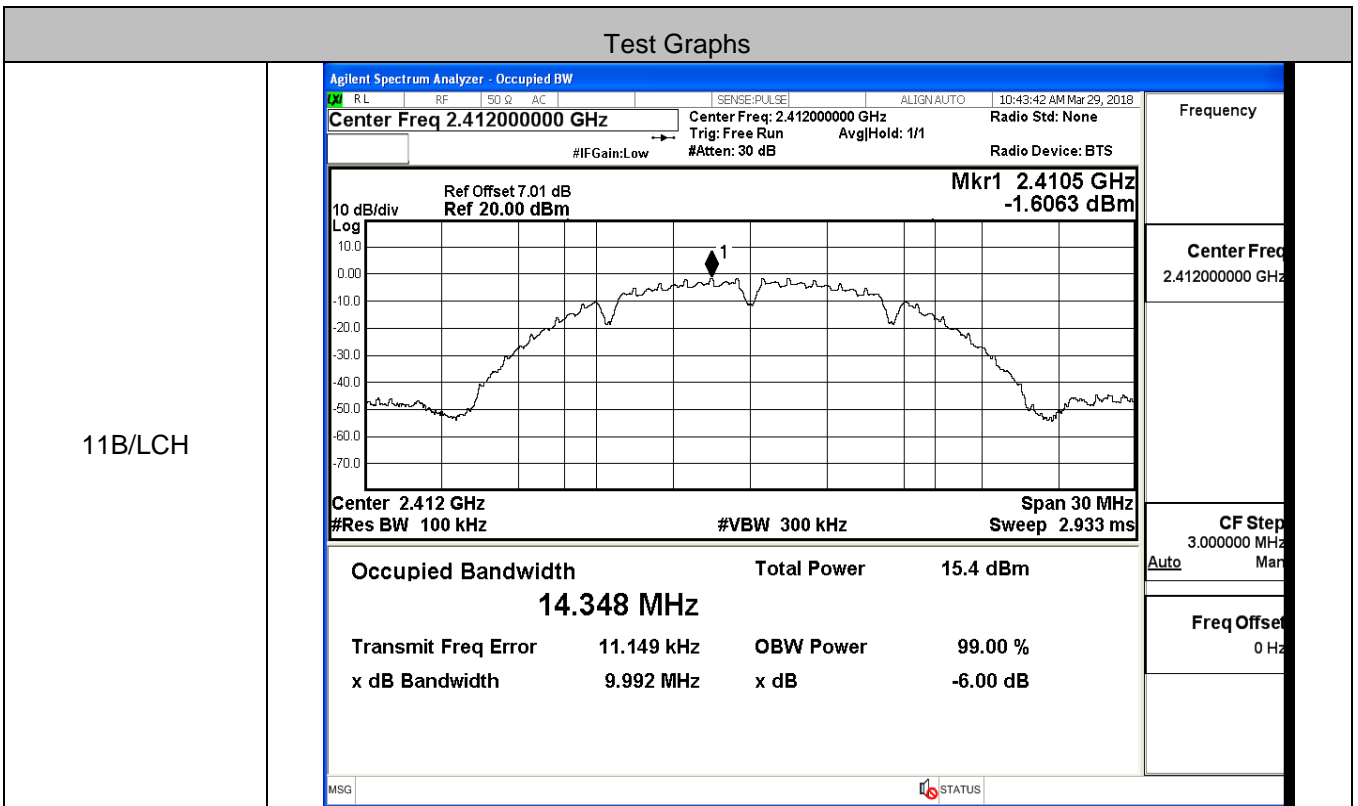
Frequency	
Auto Tune	
Center Freq	2.437000000 GHz
Start Freq	2.407000000 GHz
Stop Freq	2.467000000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz

11N40SISO/HCH

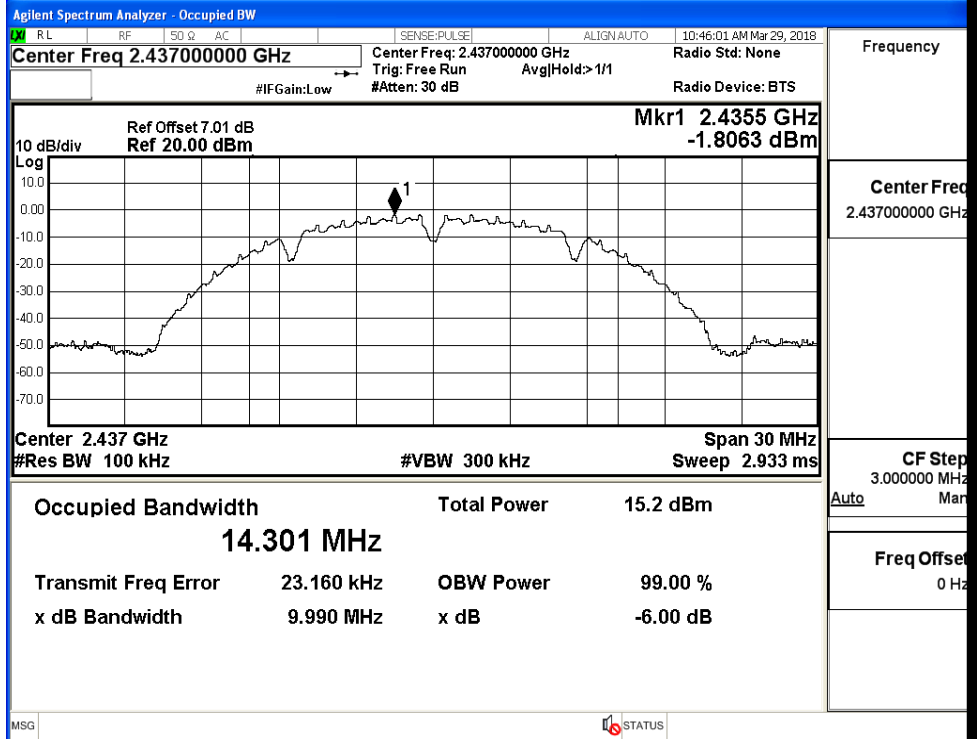


A.4 6dB Bandwidth

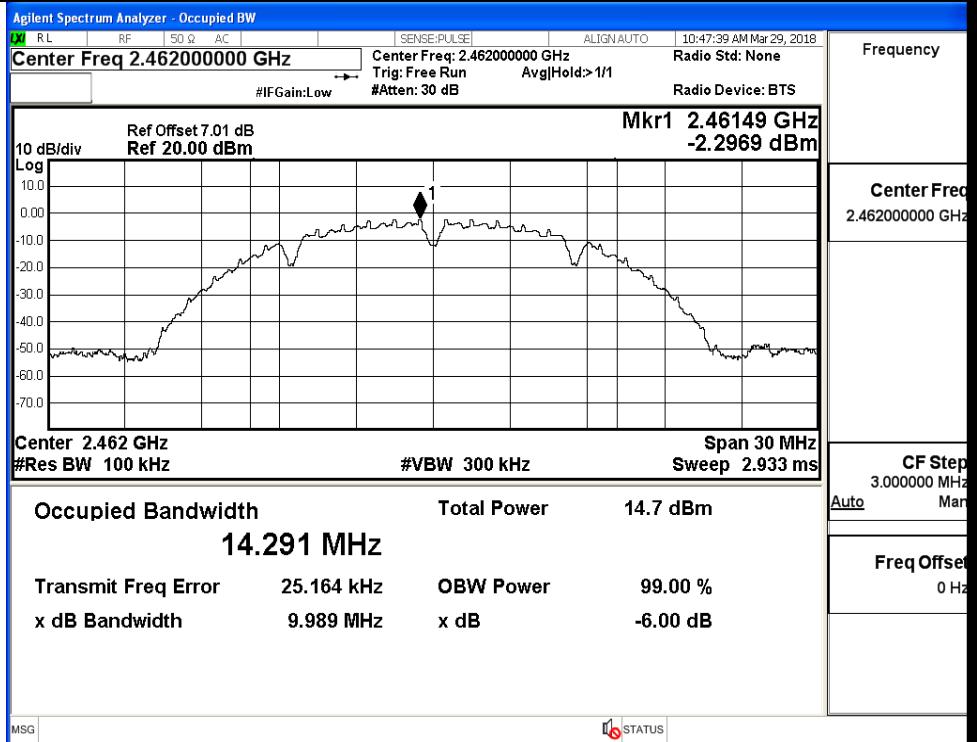
Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
11B	LCH	9.992	≥0.5	PASS
	MCH	9.990	≥0.5	PASS
	HCH	9.989	≥0.5	PASS
11G	LCH	16.61	≥0.5	PASS
	MCH	16.61	≥0.5	PASS
	HCH	16.60	≥0.5	PASS
11N20SISO	LCH	17.83	≥0.5	PASS
	MCH	17.83	≥0.5	PASS
	HCH	17.82	≥0.5	PASS
11N40SISO	LCH	36.49	≥0.5	PASS
	MCH	36.47	≥0.5	PASS
	HCH	36.47	≥0.5	PASS



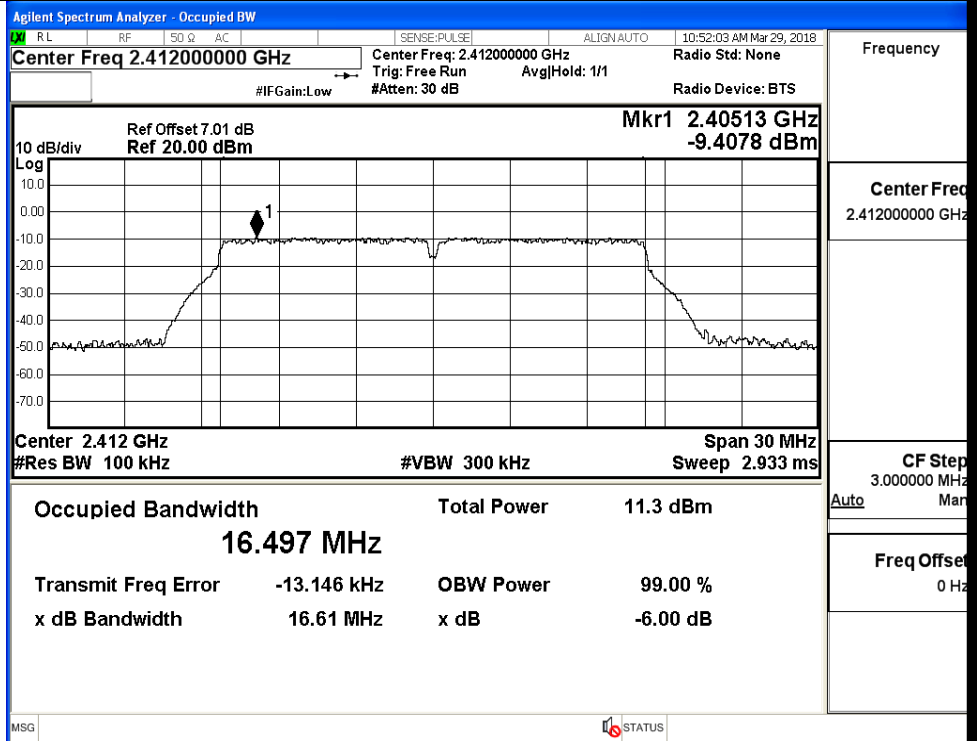
11B/MCH



11B/HCH

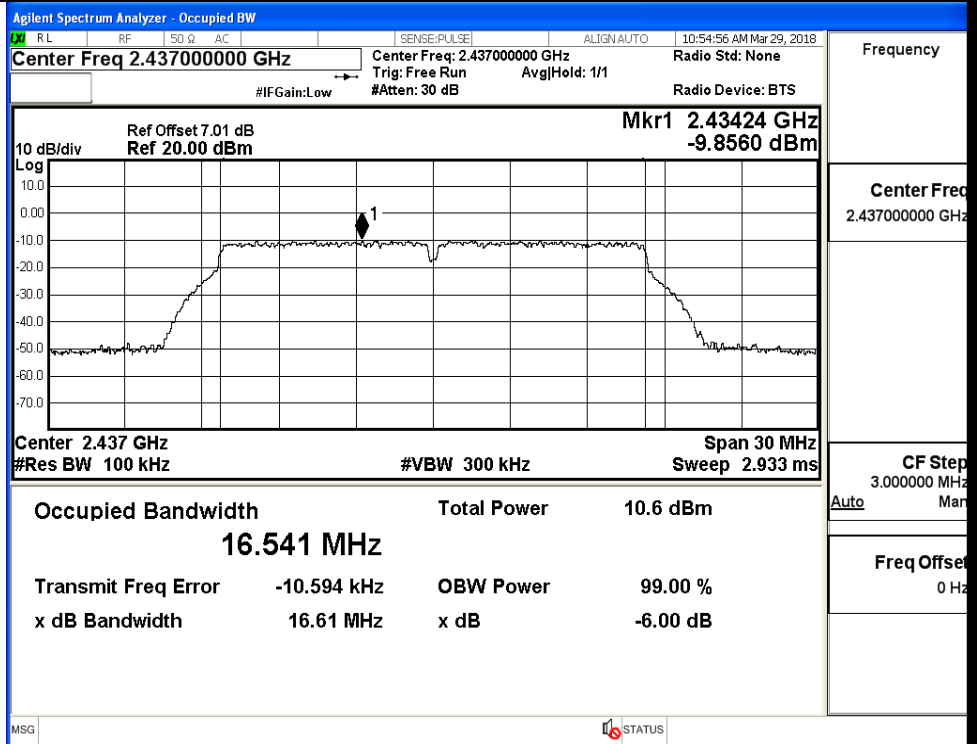


11G/LCH



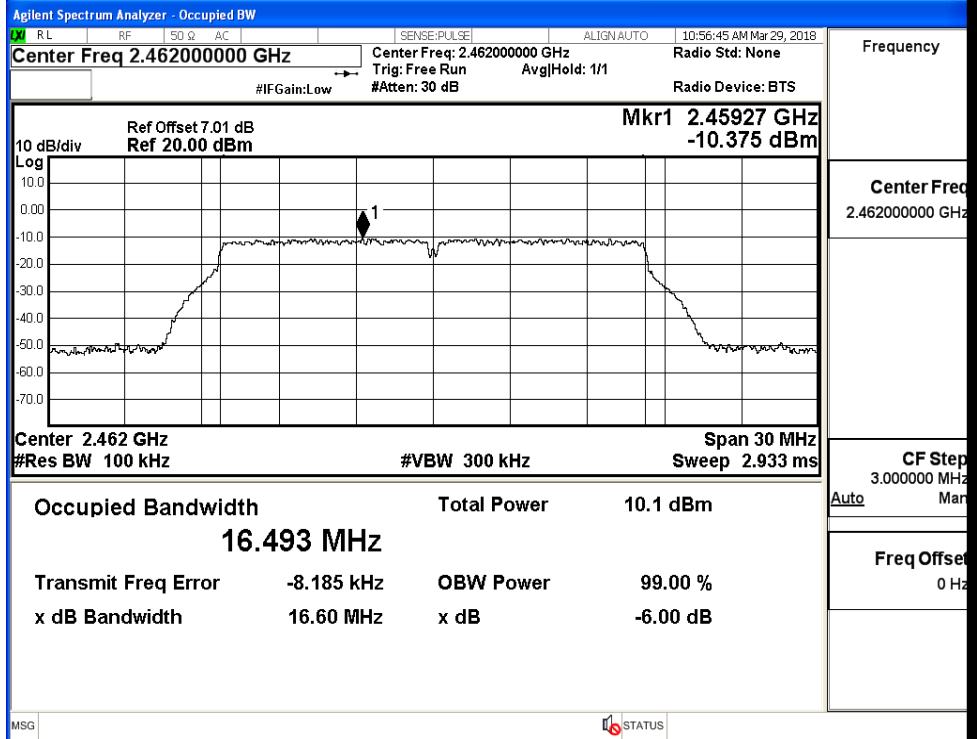
Frequency	2.41200000 GHz
Center Freq	2.41200000 GHz
CF Step	3.000000 MHz
Auto	Man
Freq Offset	0 Hz

11G/MCH

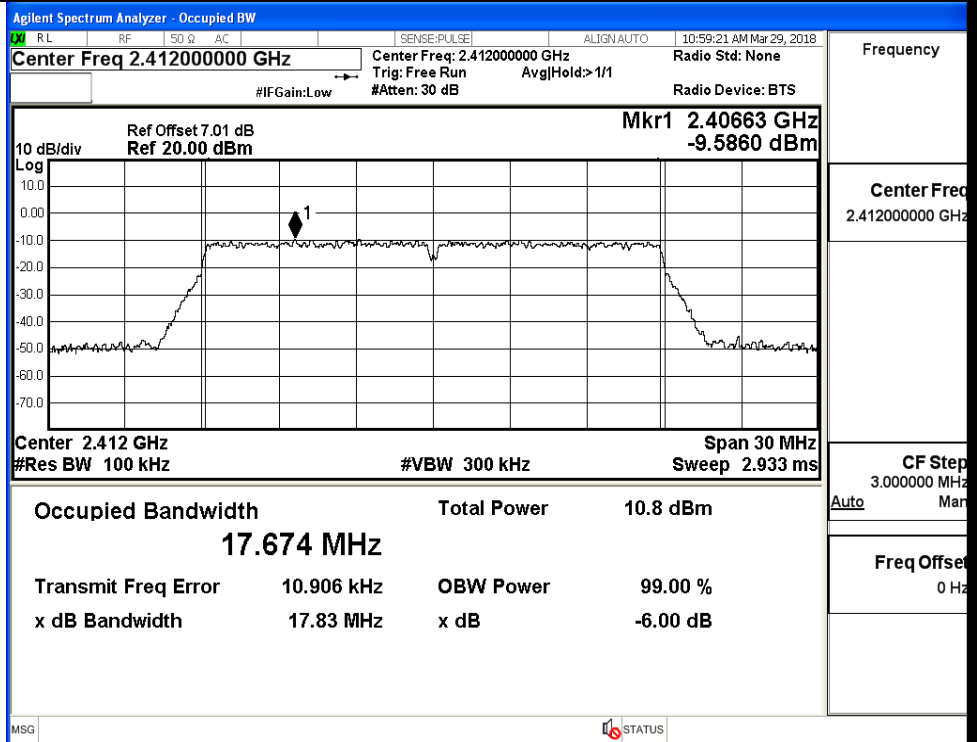


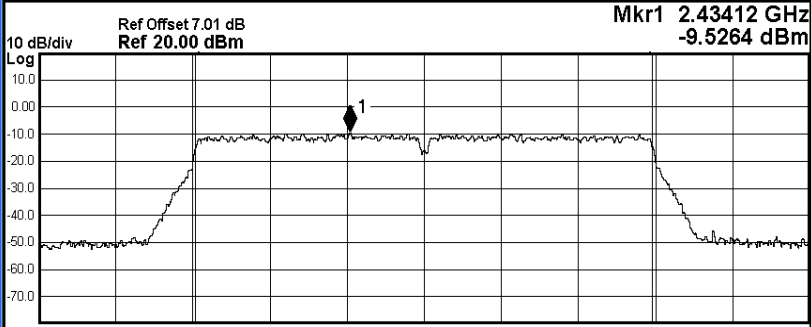
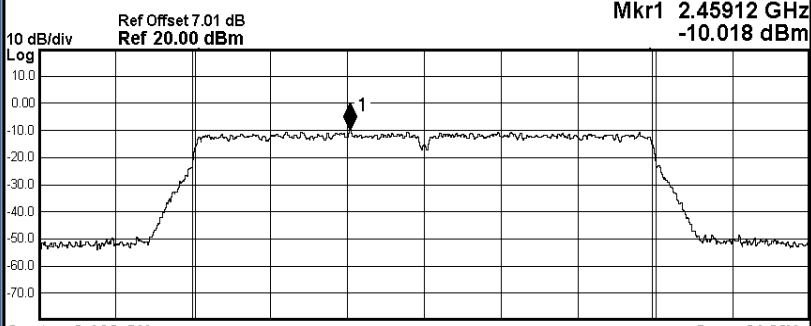
Frequency	2.43700000 GHz
Center Freq	2.437000000 GHz
CF Step	3.000000 MHz
Auto	Man
Freq Offset	0 Hz

11G/HCH

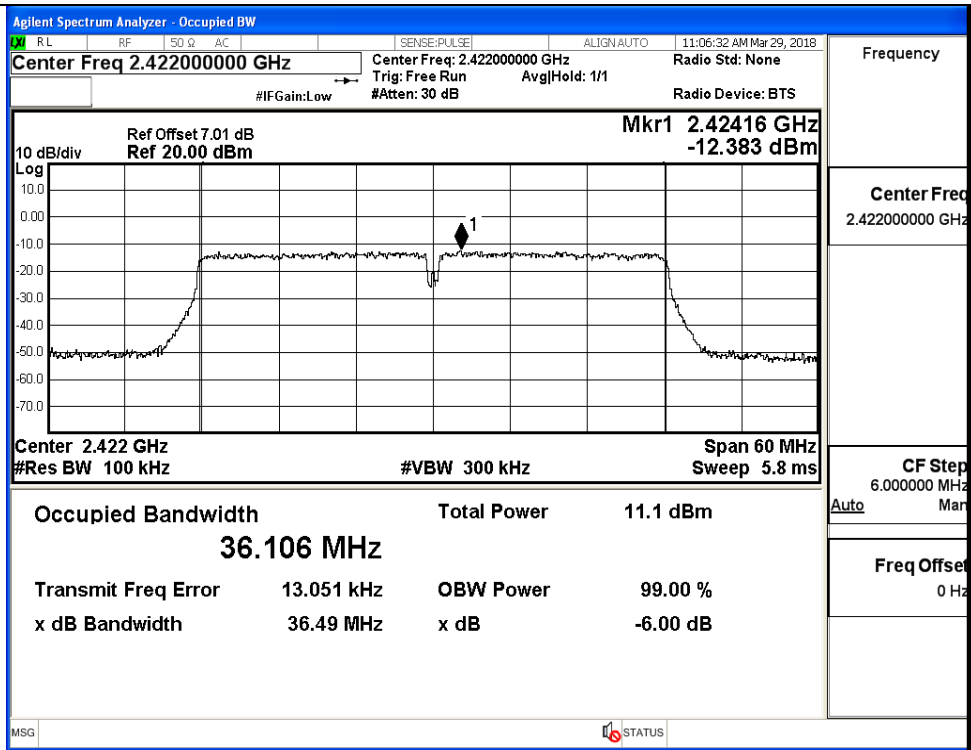


11N20SISO/LCH

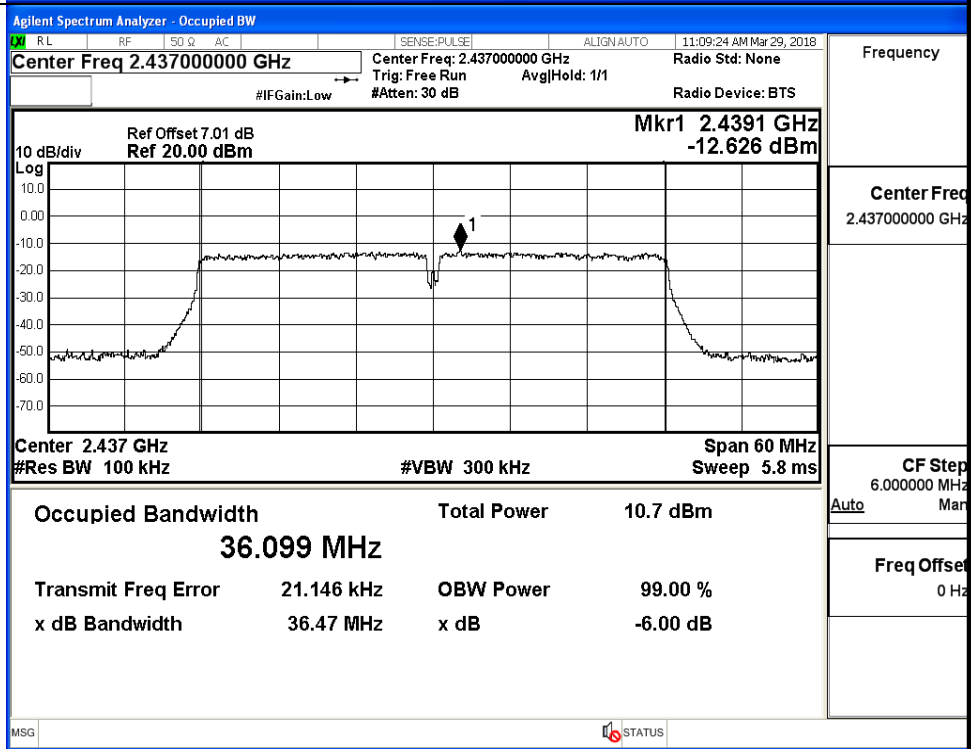


<p>11N20SISO/MCH</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.43700000 GHz</p> <p>Center Freq: 2.43700000 GHz Trig: Free Run #Atten: 30 dB</p> <p>Radio Std: None Radio Device: BTS</p> <p>10 dB/div Ref Offset 7.01 dB Ref 20.00 dBm</p>  <p>Center 2.437 GHz #Res BW 100 kHz</p> <p>Span 30 MHz Sweep 2.933 ms</p> <p>Occupied Bandwidth 17.671 MHz</p> <p>Total Power 10.8 dBm</p> <p>Transmit Freq Error 15.277 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 17.83 MHz</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.43700000 GHz</p> <p>CF Step 3.000000 MHz</p> <p>Freq Offset 0 Hz</p>
	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.46200000 GHz</p> <p>Center Freq: 2.46200000 GHz Trig: Free Run #Atten: 30 dB</p> <p>Radio Std: None Radio Device: BTS</p> <p>10 dB/div Ref Offset 7.01 dB Ref 20.00 dBm</p>  <p>Center 2.462 GHz #Res BW 100 kHz</p> <p>Span 30 MHz Sweep 2.933 ms</p> <p>Occupied Bandwidth 17.672 MHz</p> <p>Total Power 10.1 dBm</p> <p>Transmit Freq Error 15.342 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 17.82 MHz</p> <p>x dB -6.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.46200000 GHz</p> <p>CF Step 3.000000 MHz</p> <p>Freq Offset 0 Hz</p>

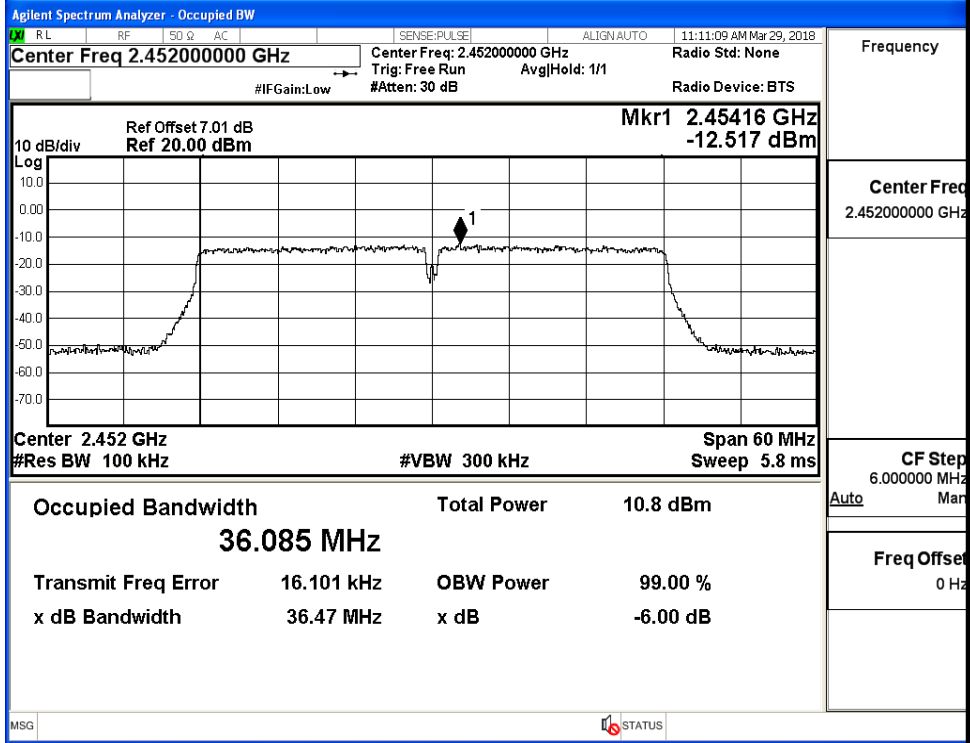
11N40SISO/LCH



11N40SISO/MCH



11N40SISO/HCH

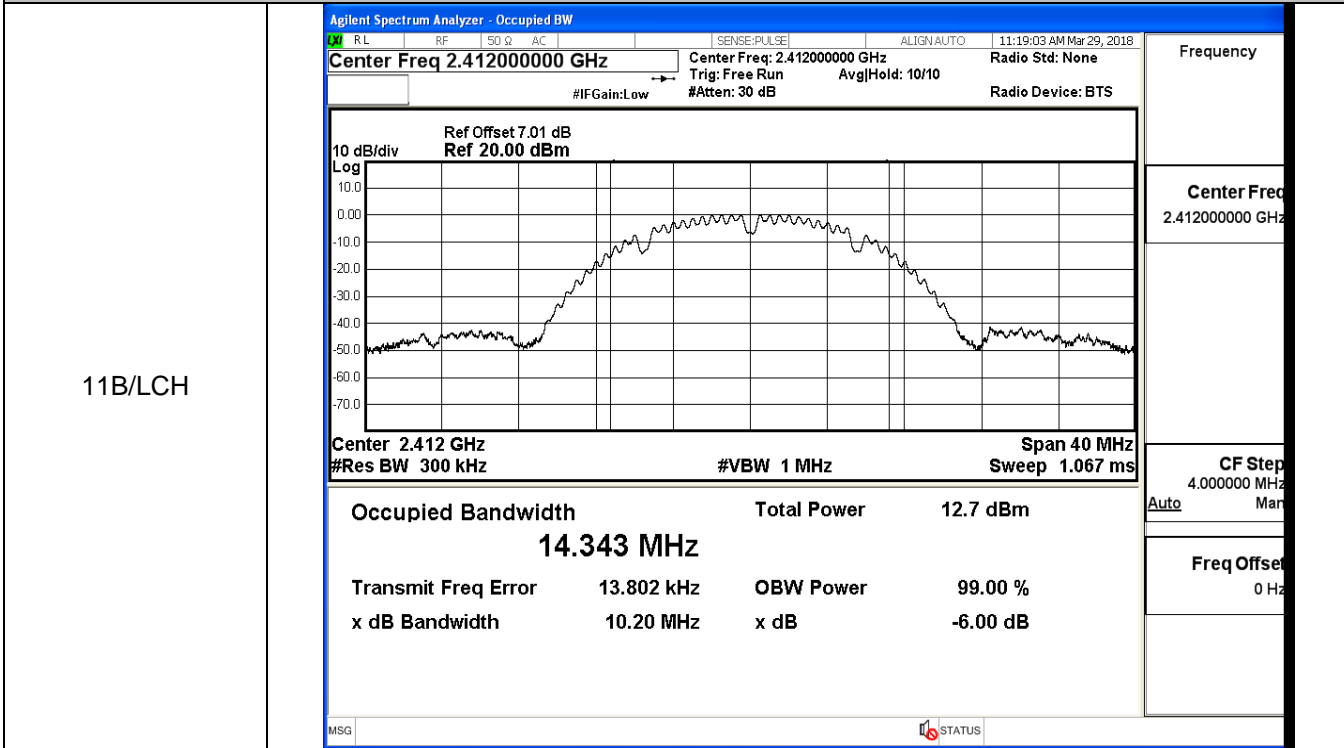


Frequency	2.45200000 GHz
Center Freq	2.45200000 GHz
CF Step	6.000000 MHz
Auto	Man
Freq Offset	0 Hz

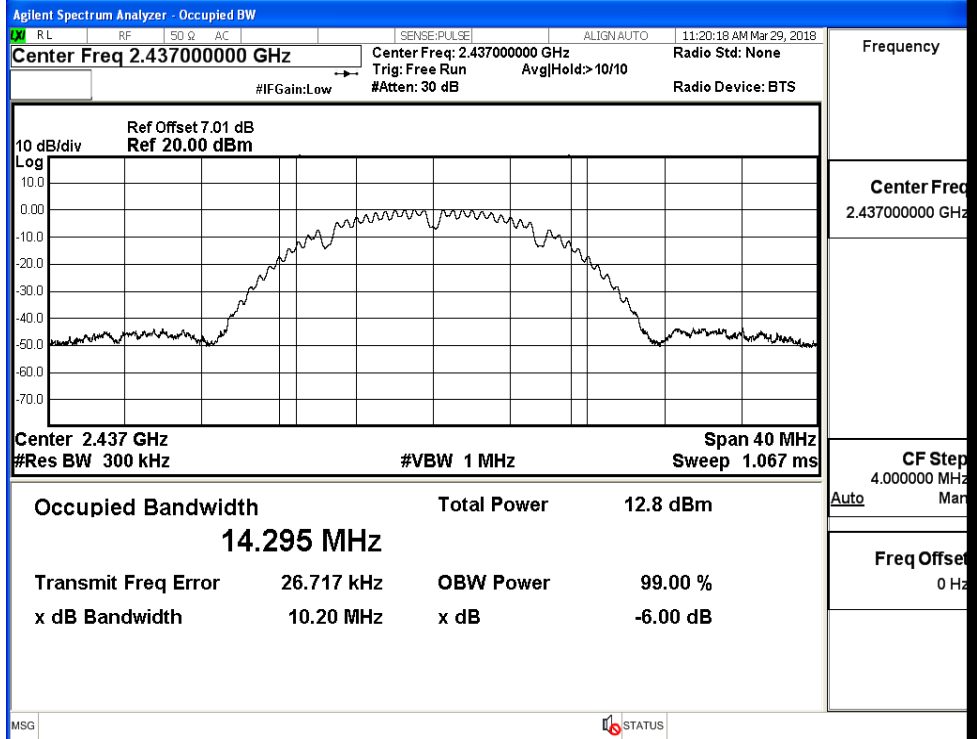
A.5 Occupied Bandwidth

Mode	Channel	Occupied Bandwidth [MHz]	Limit [MHz]	Verdict
11B	LCH	14.343	Not Specified	PASS
	MCH	14.295	Not Specified	PASS
	HCH	14.286	Not Specified	PASS
11G	LCH	17.043	Not Specified	PASS
	MCH	16.924	Not Specified	PASS
	HCH	16.911	Not Specified	PASS
11N20SISO	LCH	17.785	Not Specified	PASS
	MCH	17.653	Not Specified	PASS
	HCH	17.783	Not Specified	PASS
11N40SISO	LCH	36.237	Not Specified	PASS
	MCH	36.189	Not Specified	PASS
	HCH	36.225	Not Specified	PASS

Test Graphs

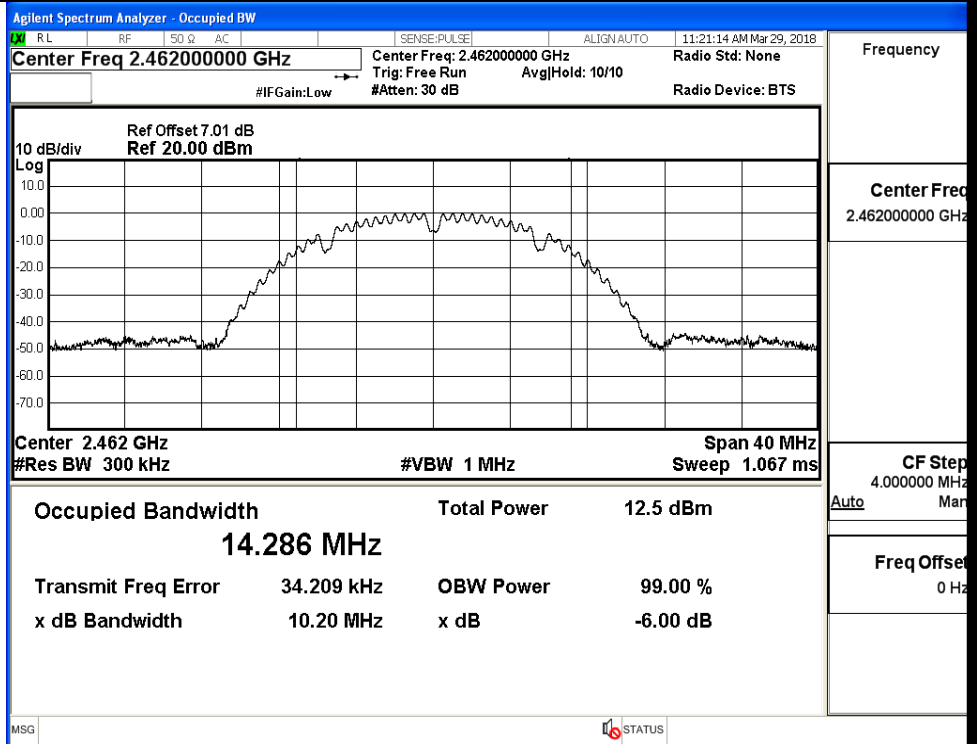


11B/MCH



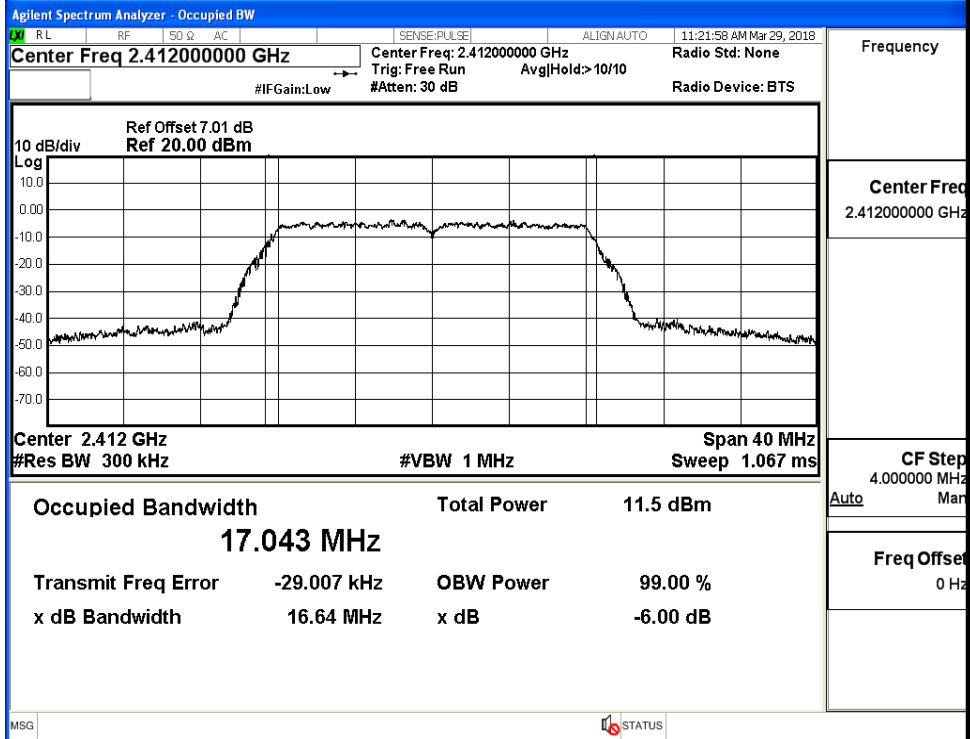
Frequency	2.43700000 GHz
Center Freq	2.43700000 GHz
CF Step	4.000000 MHz
Freq Offset	0 Hz

11B/HCH



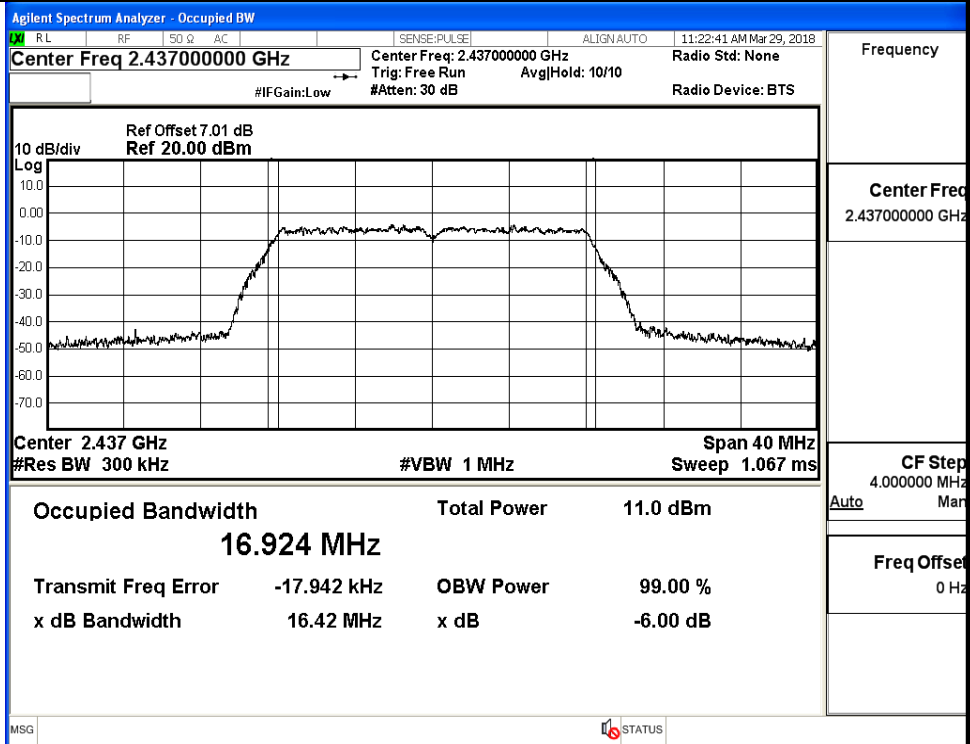
Frequency	2.46200000 GHz
Center Freq	2.46200000 GHz
CF Step	4.000000 MHz
Freq Offset	0 Hz

11G/LCH



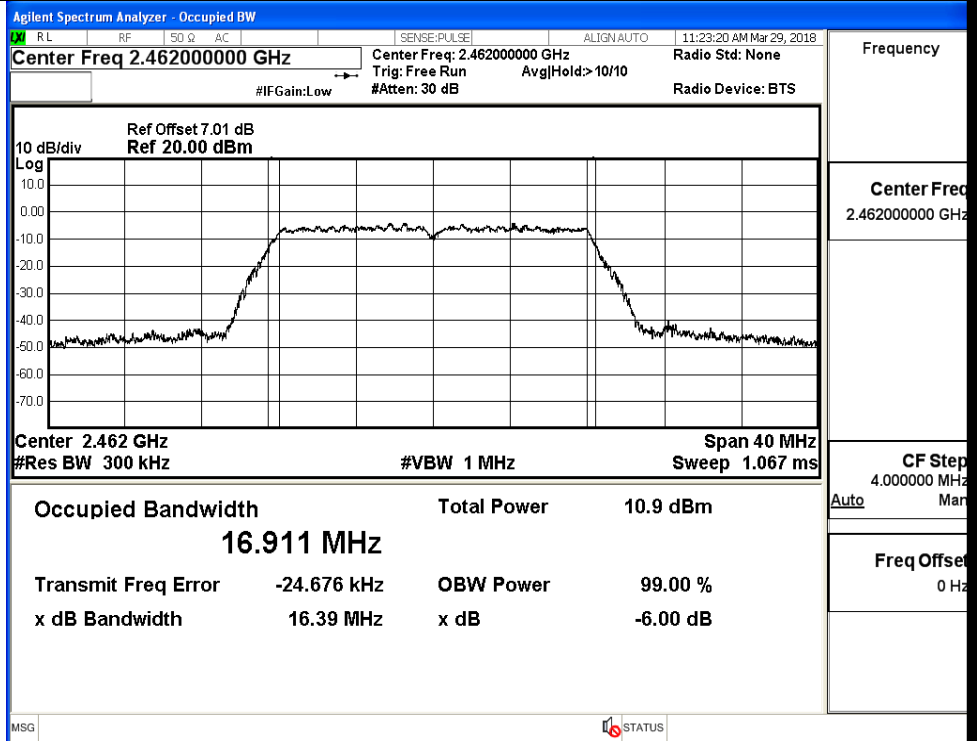
Frequency	2.41200000 GHz
Center Freq	2.41200000 GHz
CF Step	4.000000 MHz
Freq Offset	0 Hz

11G/MCH

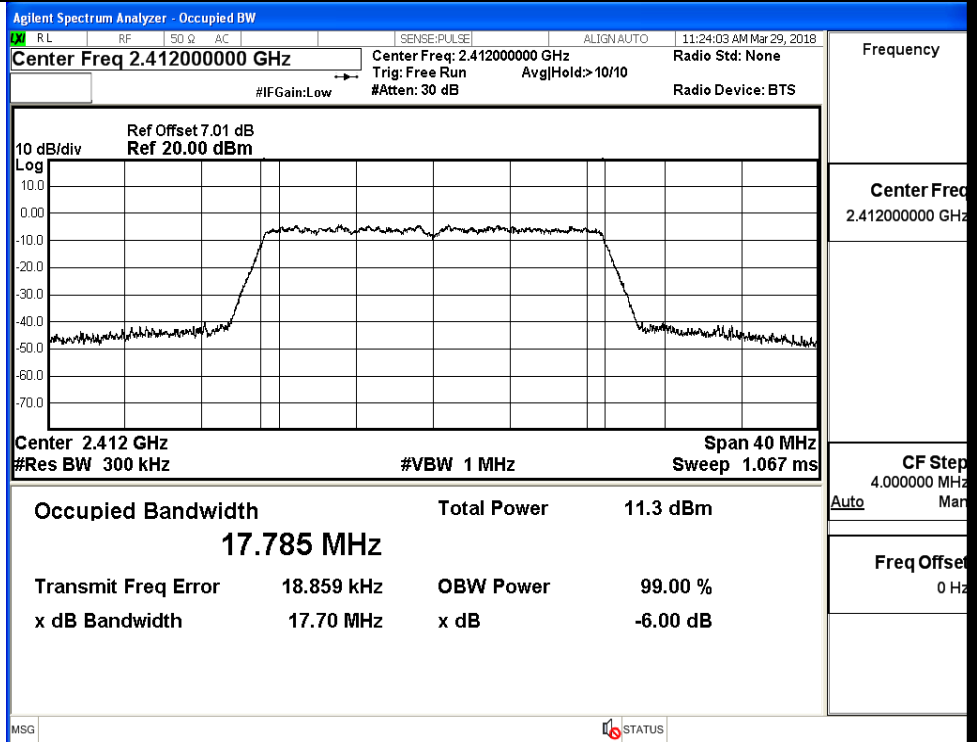


Frequency	2.43700000 GHz
Center Freq	2.43700000 GHz
CF Step	4.000000 MHz
Freq Offset	0 Hz

11G/HCH

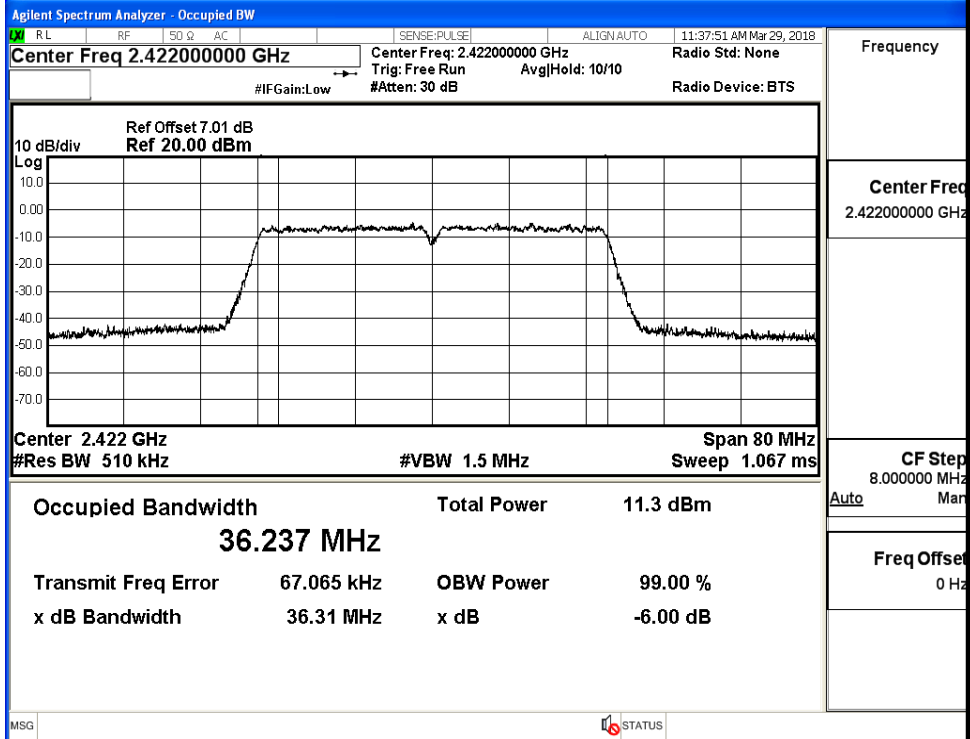


11N20SISO/LCH



<p>11N20SISO/MCH</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.437000000 GHz</p> <p>Center Freq: 2.437000000 GHz</p> <p>Trig: Free Run</p> <p>Avg/Hold: 10/10</p> <p>Radio Std: None</p> <p>Radio Device: BTS</p> <p>#IFGain:Low</p> <p>#Atten: 30 dB</p> <p>Ref Offset 7.01 dB</p> <p>Ref 20.00 dBm</p> <p>10 dB/div</p> <p>Log</p> <p>Center 2.437 GHz</p> <p>#Res BW 300 kHz</p> <p>#VBW 1 MHz</p> <p>Span 40 MHz</p> <p>Sweep 1.067 ms</p> <p>Occupied Bandwidth 17.653 MHz</p> <p>Total Power 20.0 dBm</p> <p>Transmit Freq Error 26.865 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 17.42 MHz</p> <p>x dB -6.00 dB</p> <p>MSG STATUS</p>	<p>Frequency</p> <p>Center Freq 2.437000000 GHz</p> <p>CF Step 4.000000 MHz</p> <p>Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>11N20SISO/HCH</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.462000000 GHz</p> <p>Center Freq: 2.462000000 GHz</p> <p>Trig: Free Run</p> <p>Avg/Hold: >10/10</p> <p>Radio Std: None</p> <p>Radio Device: BTS</p> <p>#IFGain:Low</p> <p>#Atten: 30 dB</p> <p>Ref Offset 7.01 dB</p> <p>Ref 20.00 dBm</p> <p>10 dB/div</p> <p>Log</p> <p>Center 2.462 GHz</p> <p>#Res BW 300 kHz</p> <p>#VBW 1 MHz</p> <p>Span 40 MHz</p> <p>Sweep 1.067 ms</p> <p>Occupied Bandwidth 17.783 MHz</p> <p>Total Power 10.6 dBm</p> <p>Transmit Freq Error 26.566 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 17.69 MHz</p> <p>x dB -6.00 dB</p> <p>MSG STATUS</p>	<p>Frequency</p> <p>Center Freq 2.462000000 GHz</p> <p>CF Step 4.000000 MHz</p> <p>Auto Man</p> <p>Freq Offset 0 Hz</p>

11N40SISO/LCH



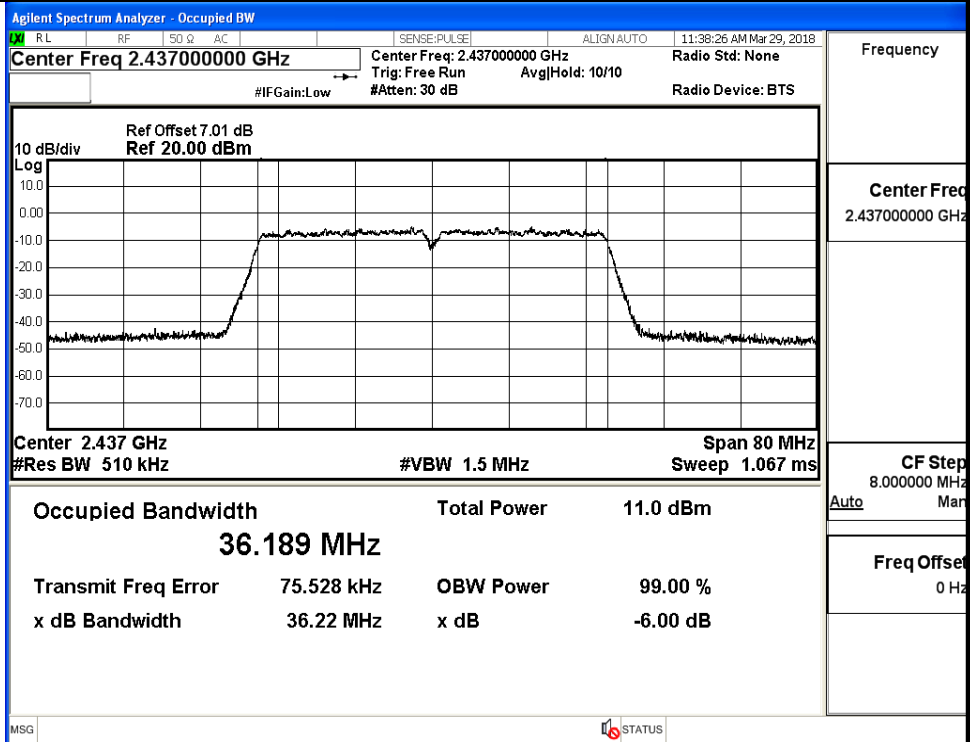
Frequency

Center Freq
2.42200000 GHz

CF Step
8.000000 MHz

Freq Offset
0 Hz

11N40SISO/MCH



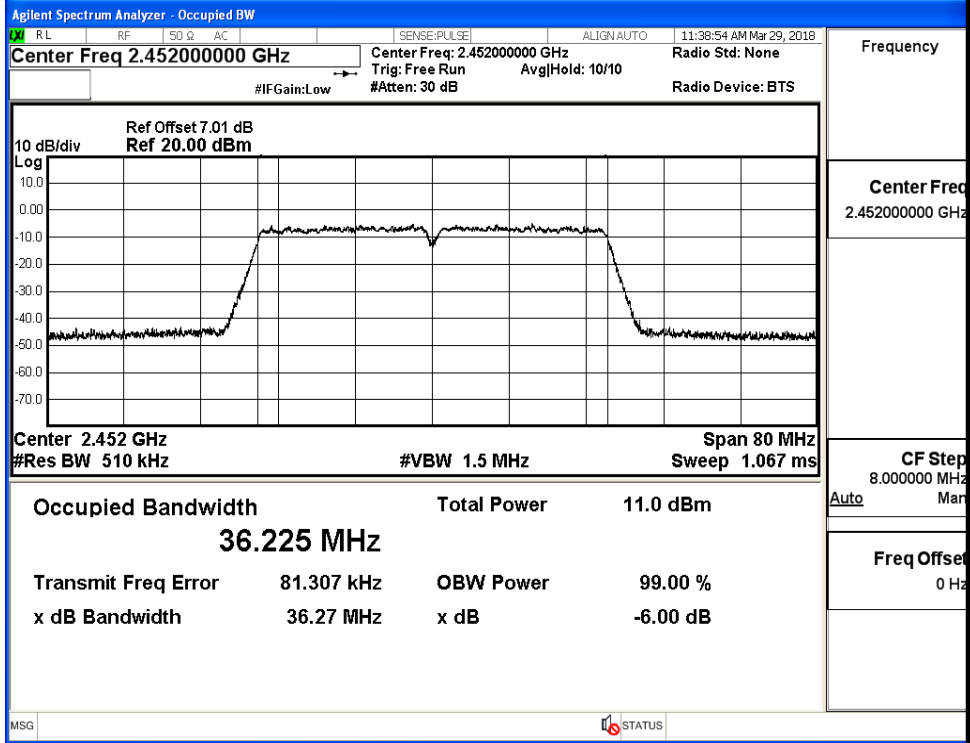
Frequency

Center Freq
2.43700000 GHz

CF Step
8.000000 MHz

Freq Offset
0 Hz

11N40SISO/HCH

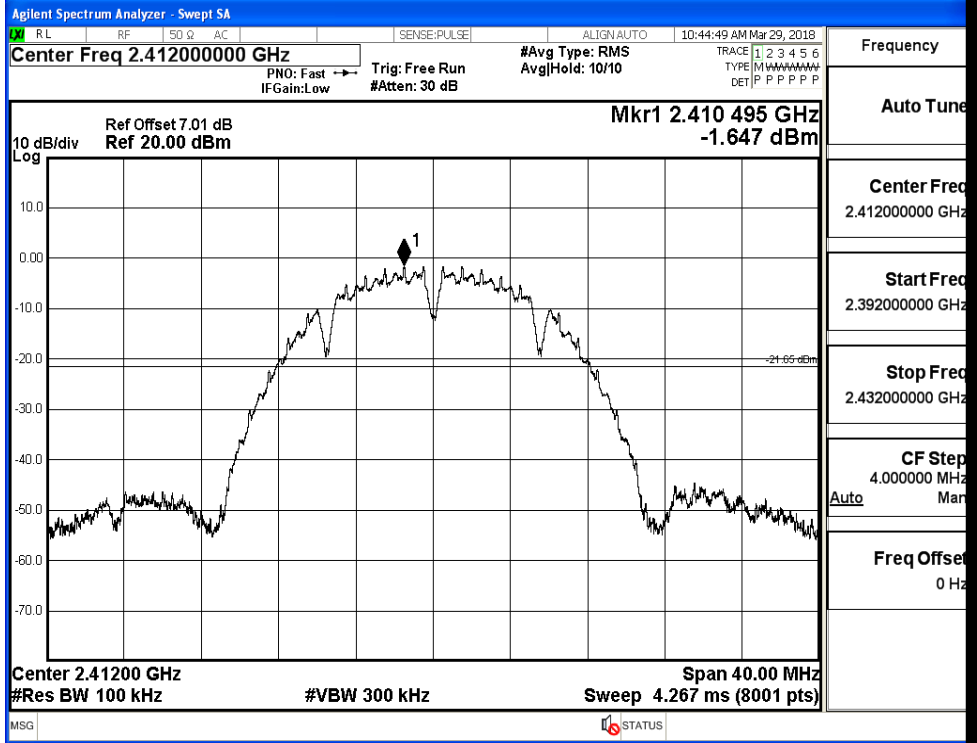


A.6 RF Conducted Spurious Emissions

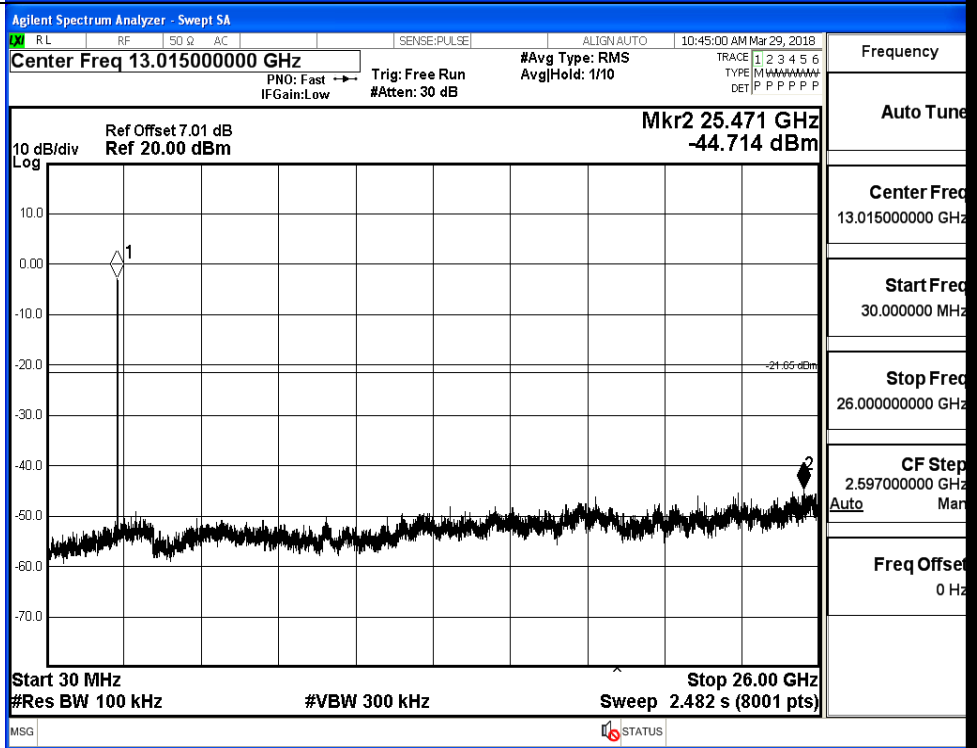
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
11B	LCH	-1.647	-44.714	-21.647	PASS
	MCH	-1.831	-44.632	-21.831	PASS
	HCH	-2.349	-44.494	-22.349	PASS
11G	LCH	-9.272	-44.101	-29.272	PASS
	MCH	-9.911	-44.840	-29.911	PASS
	HCH	-10.599	-44.908	-30.599	PASS
11N20 SISO	LCH	-9.456	-44.176	-29.456	PASS
	MCH	-9.555	-45.167	-29.555	PASS
	HCH	-10.282	-45.403	-30.282	PASS
11N40 SISO	LCH	-12.634	-45.047	-32.634	PASS
	MCH	-12.895	-44.789	-32.895	PASS
	HCH	-13.17	-44.353	-33.170	PASS

11B_LCH_Graphs

Pref/11B/LCH

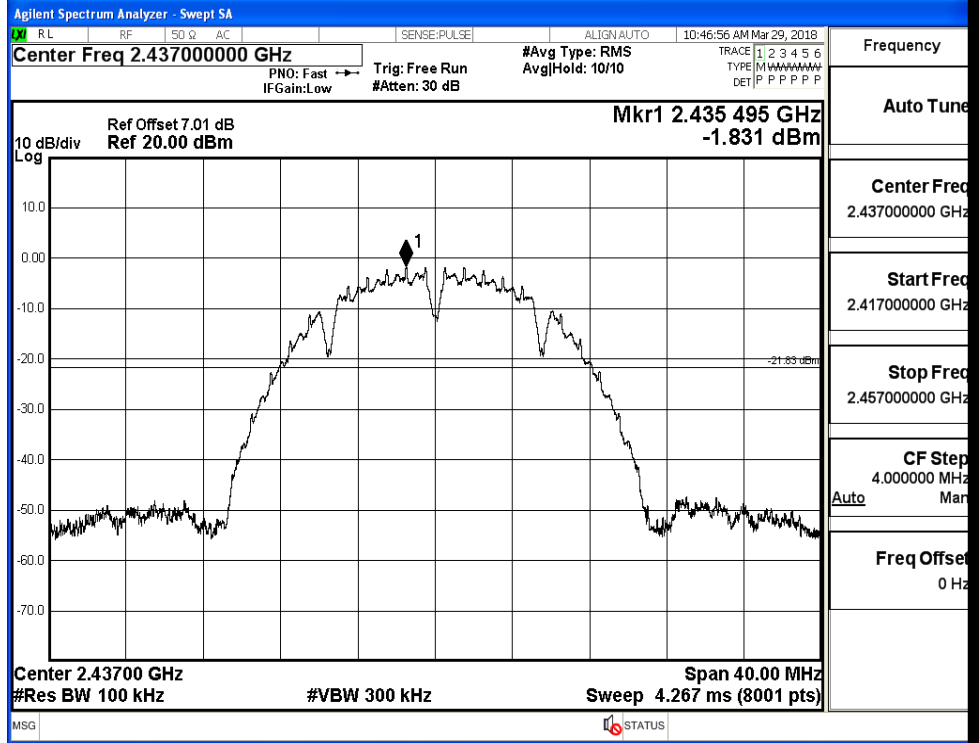


Puw/11B/LCH

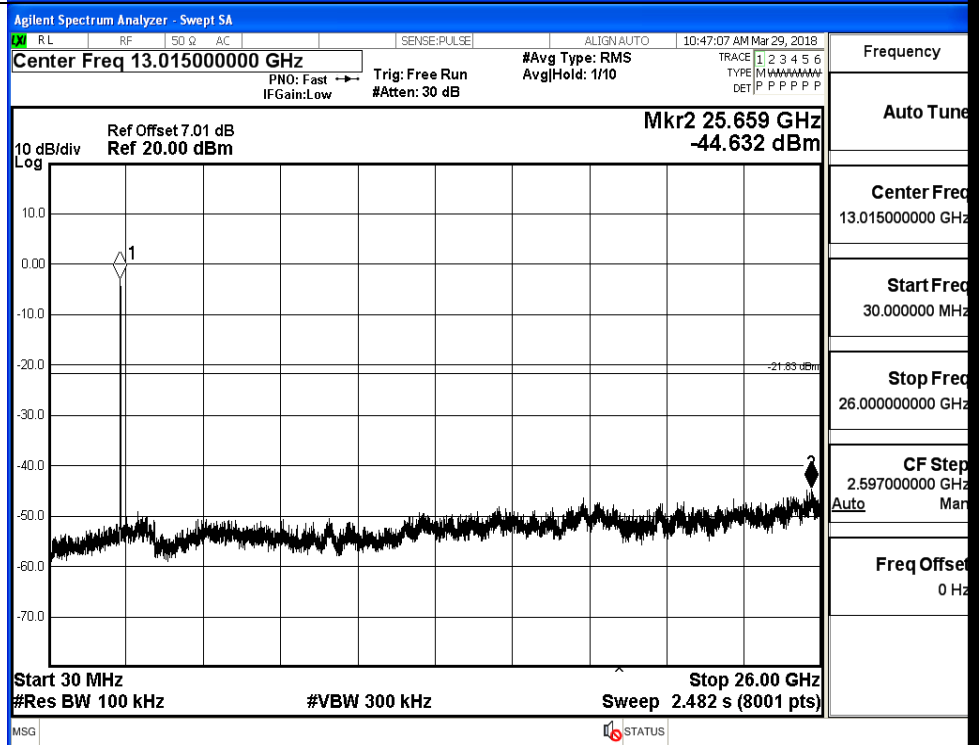


11B_MCH_Graphs

Pref/11B/MCH

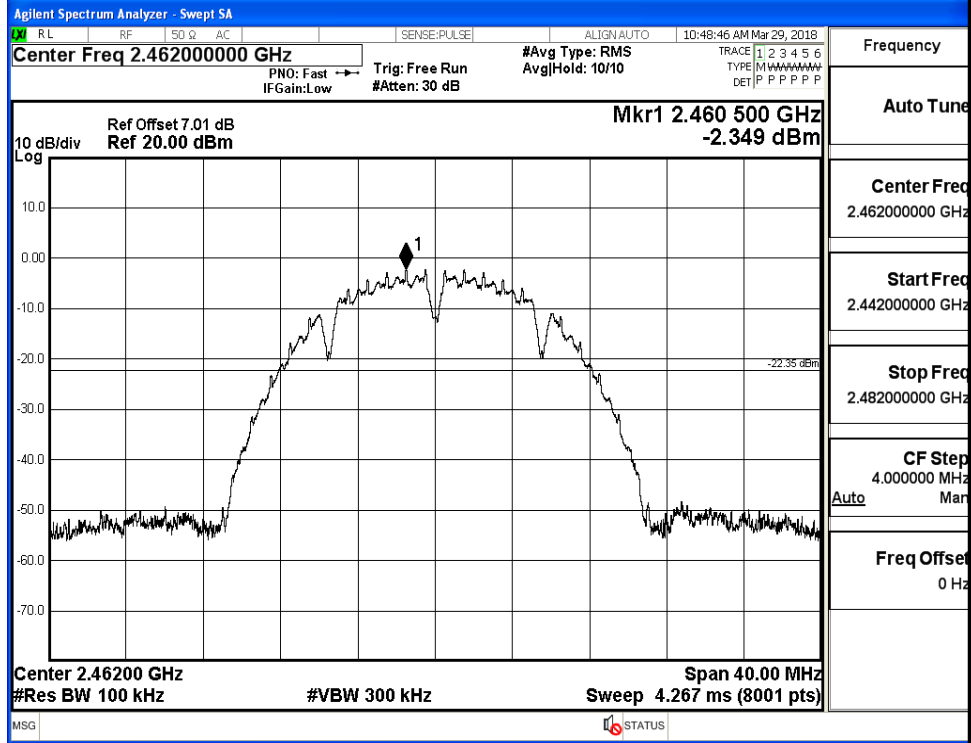


Puw/11B/MCH

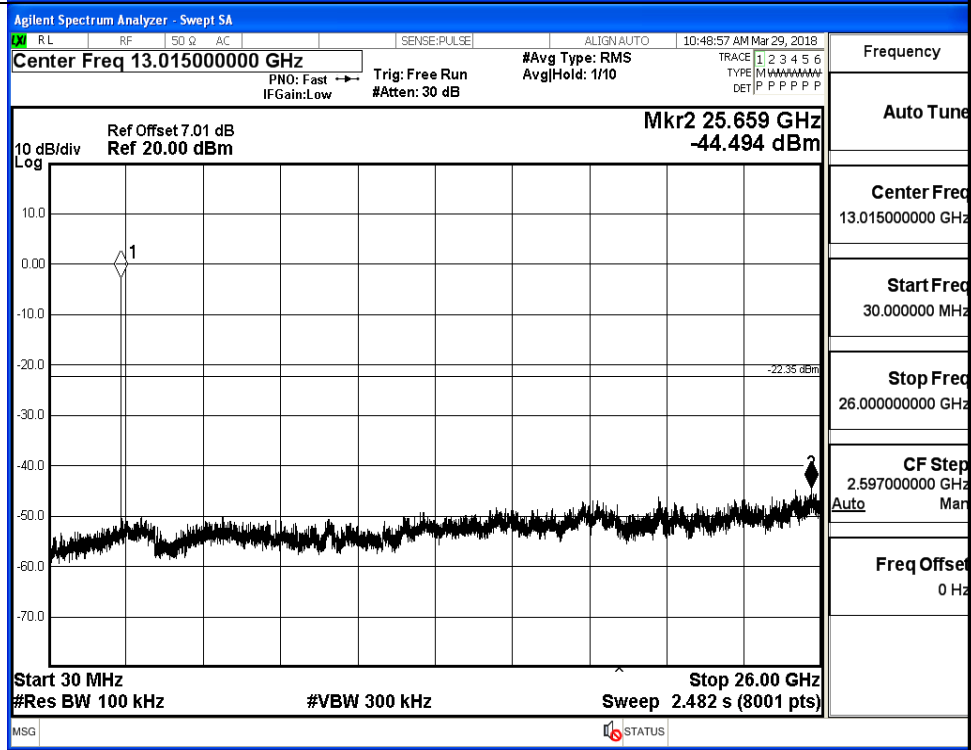


11B_HCH_Graphs

Pref/11B/HCH

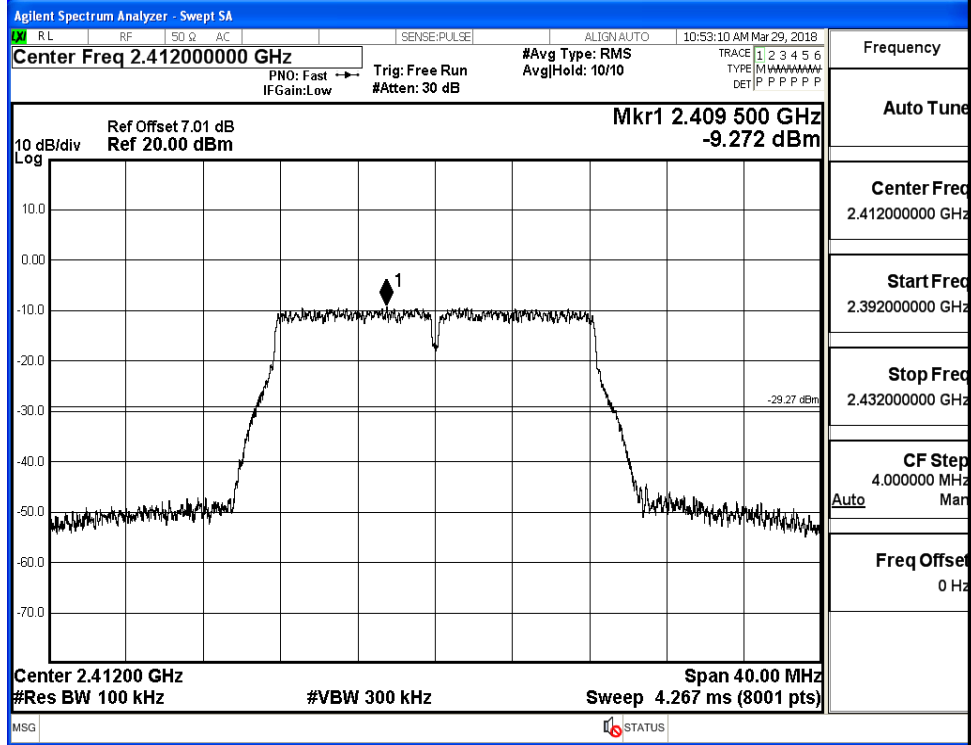


Puw/11B/HCH

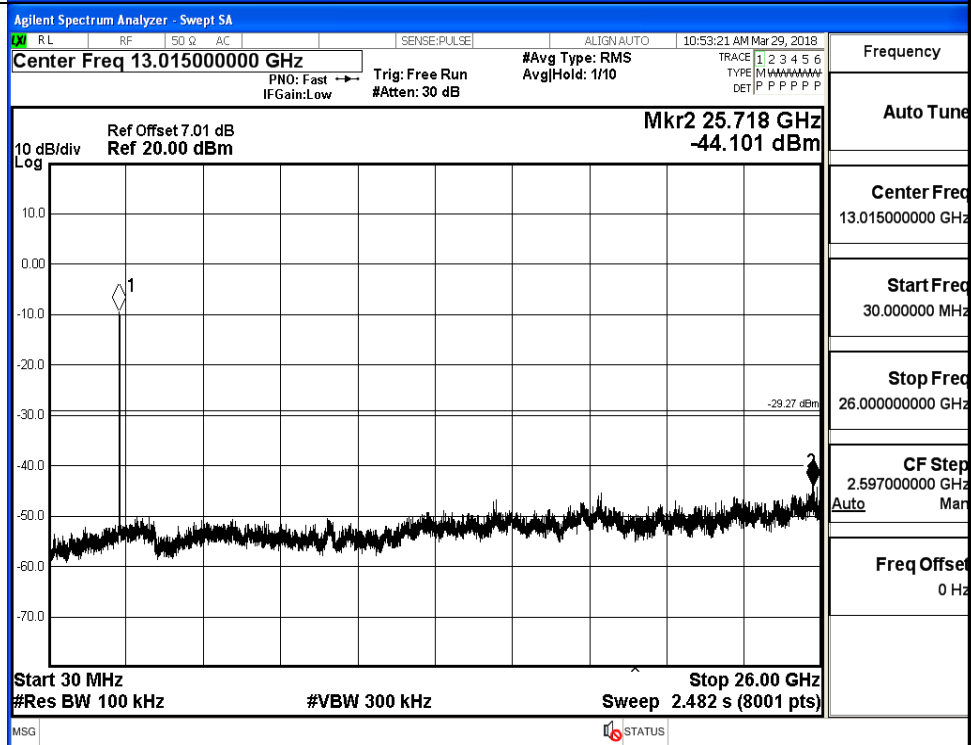


11G_LCH_Graphs

Pref/11G/LCH

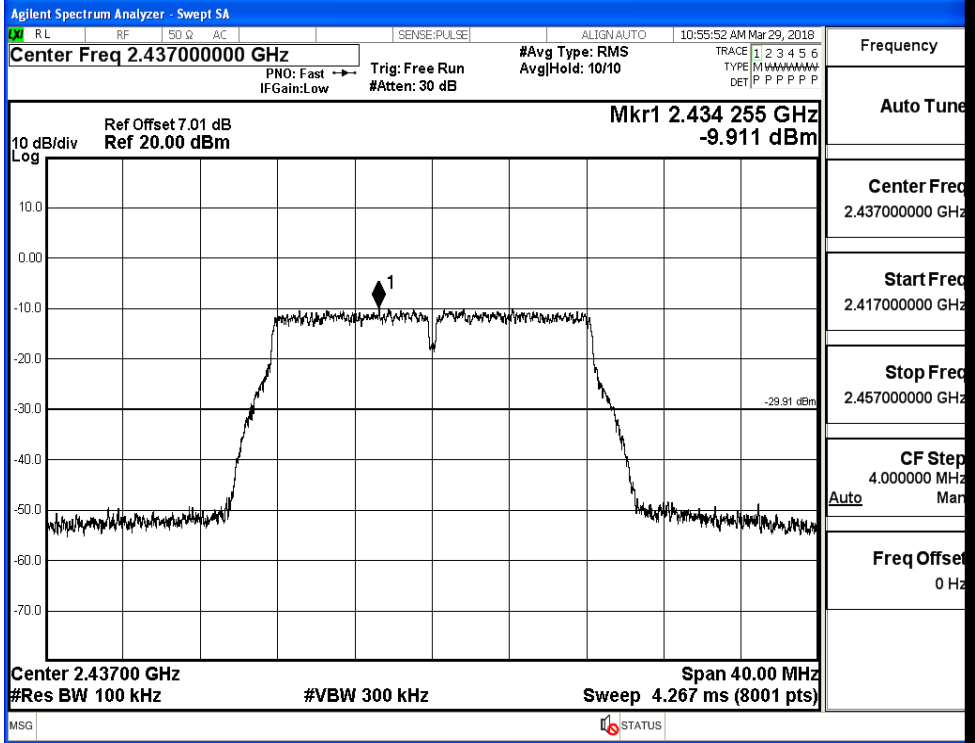


Puw/11G/LCH

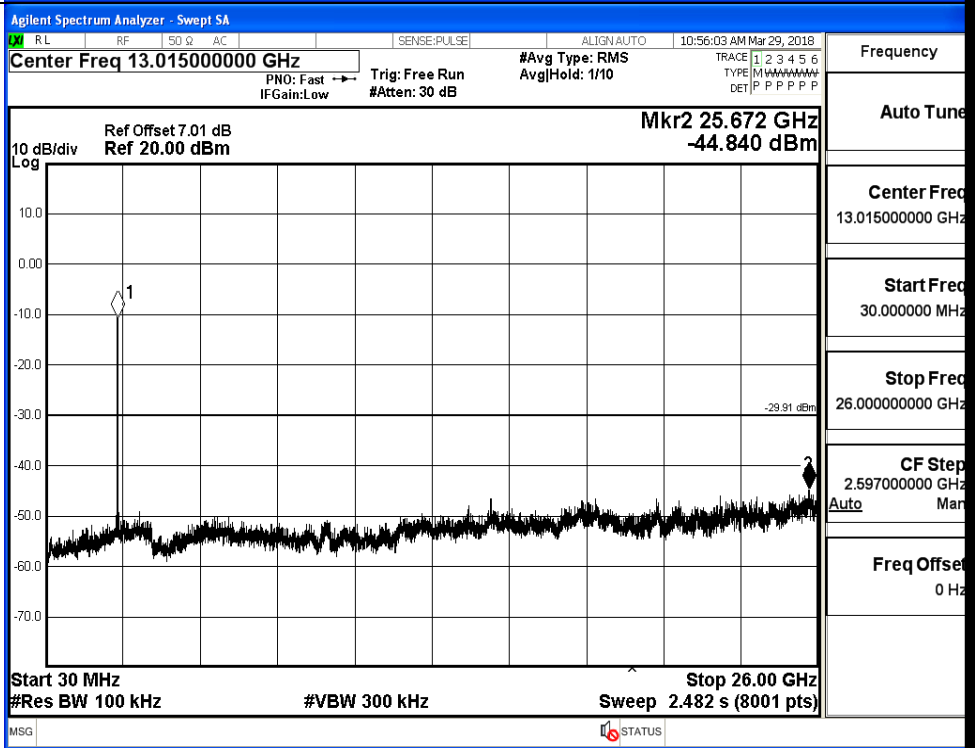


11G_MCH_Graphs

Pref/11G/MCH

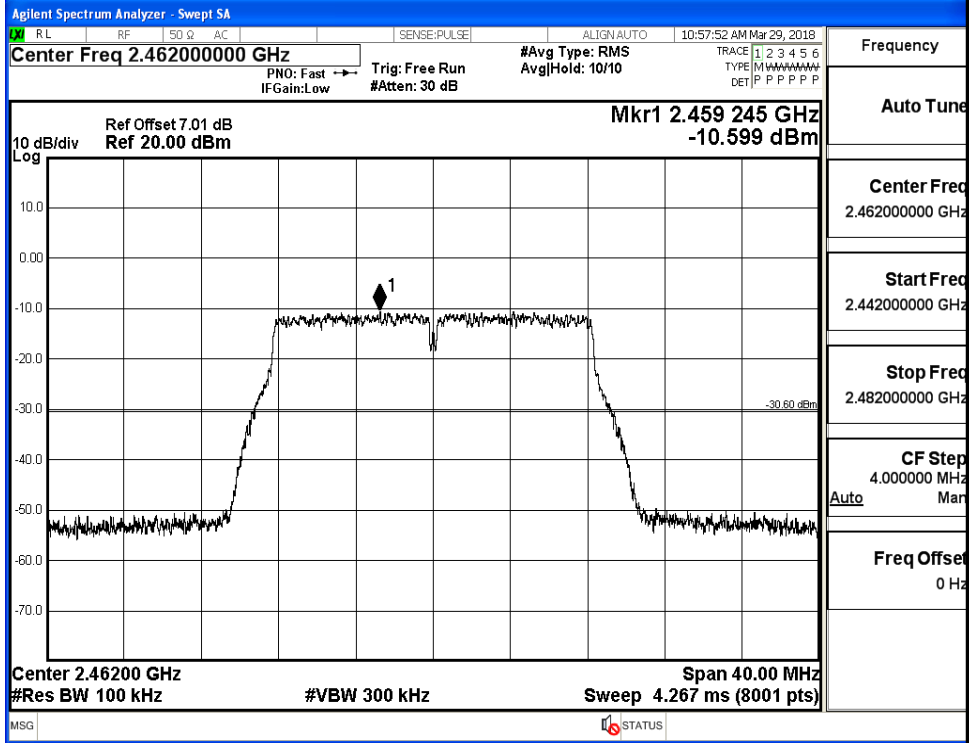


Puw/11G/MCH

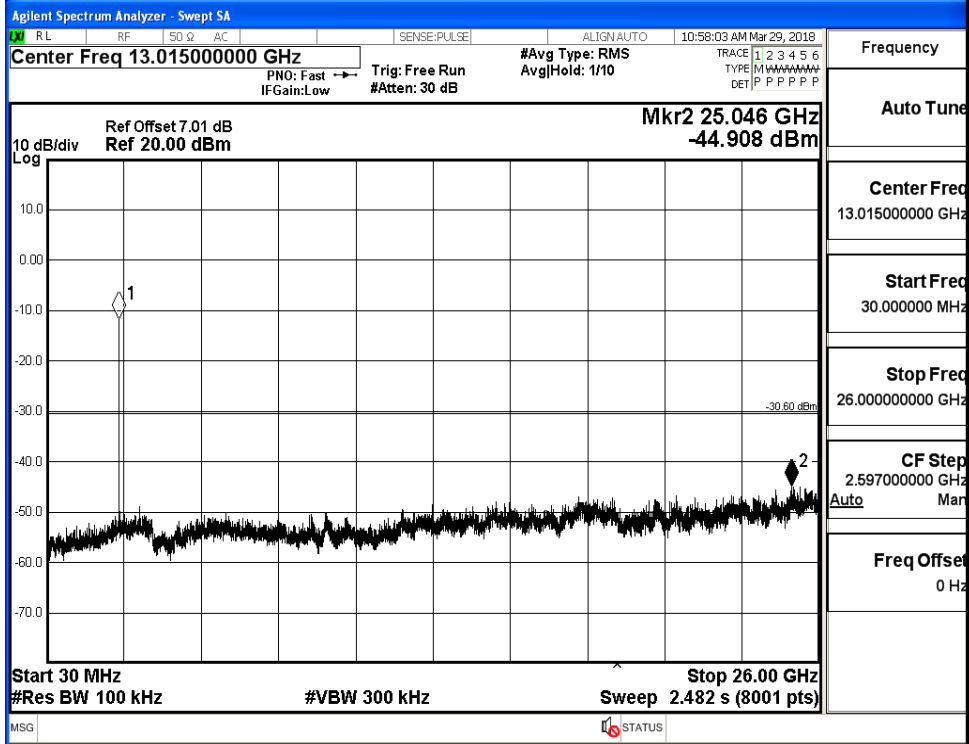


11G_HCH_Graphs

Pref/11G/HCH

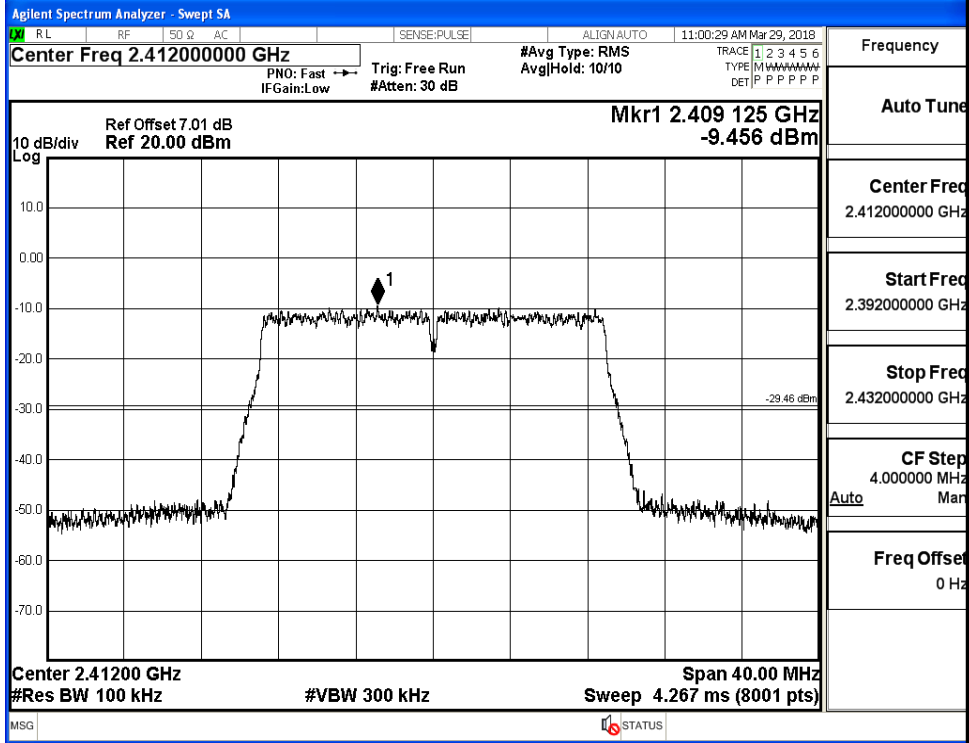


Puw/11G/HCH

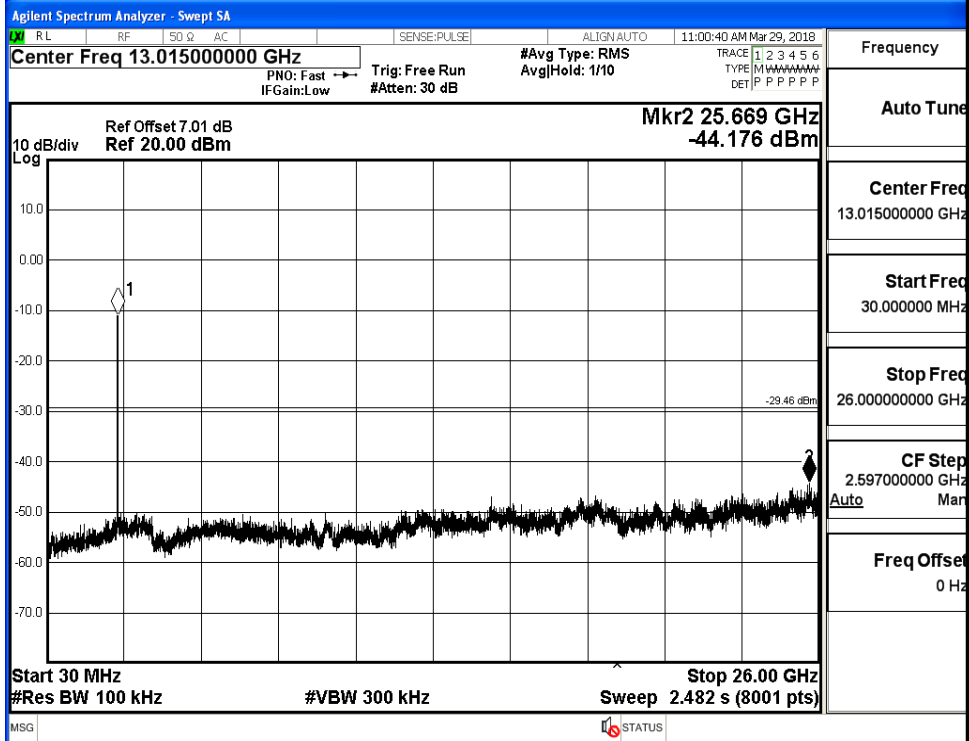


11N20SISO_LCH_Graphs

Pref/11N20SIS
O/LCH

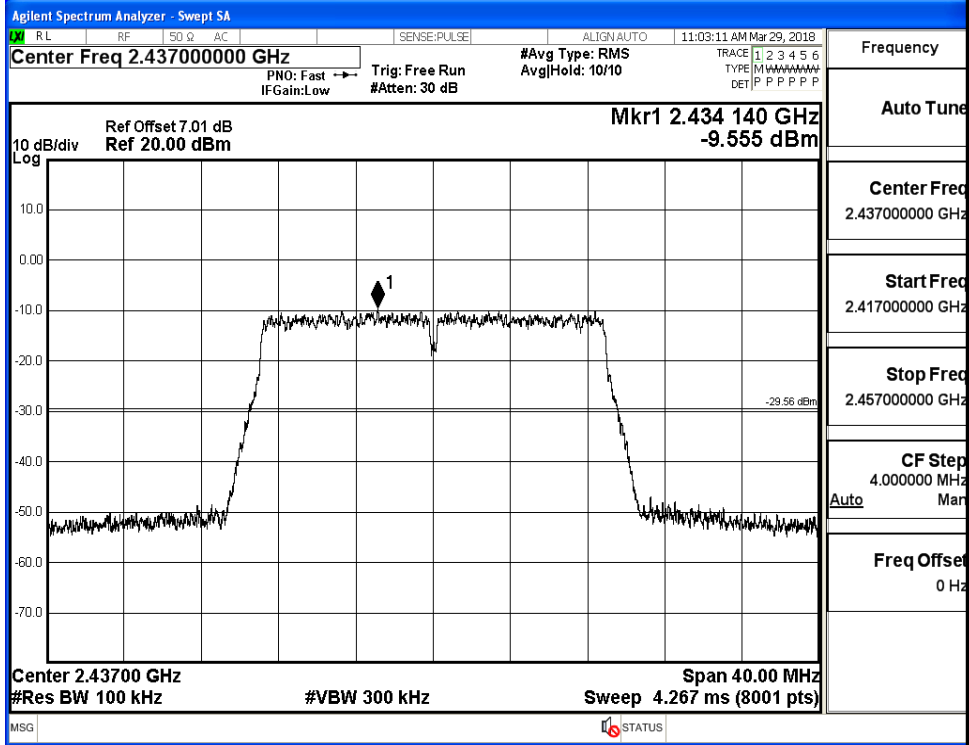


Puw/11N20
SISO/LCH

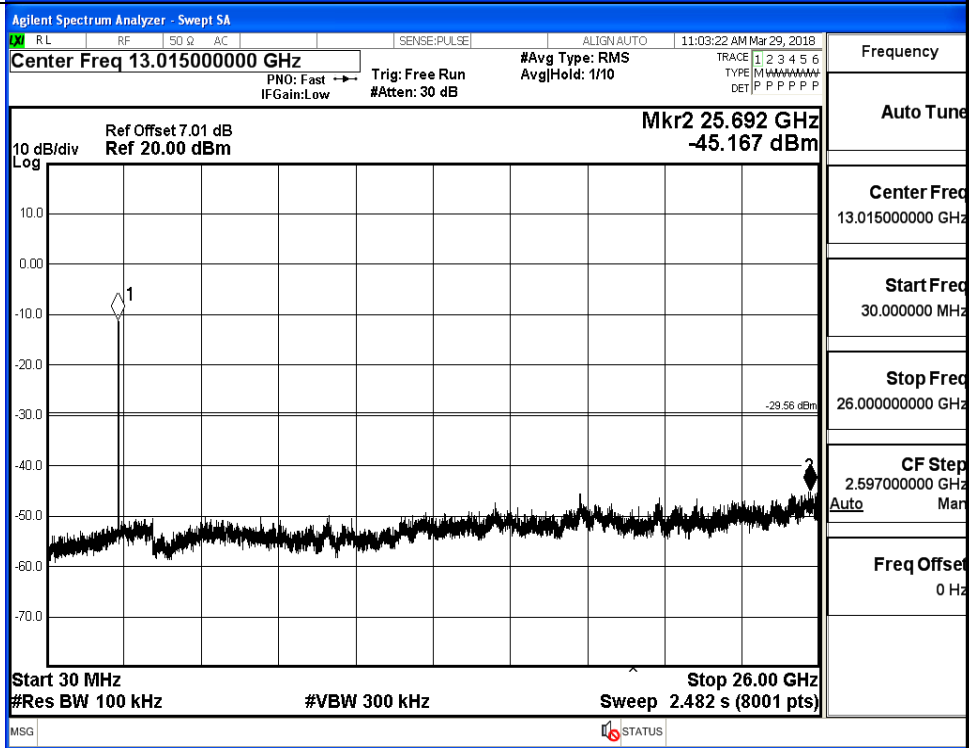


11N20SISO_MCH_Graphs

Pref/11N20
SISO/MCH

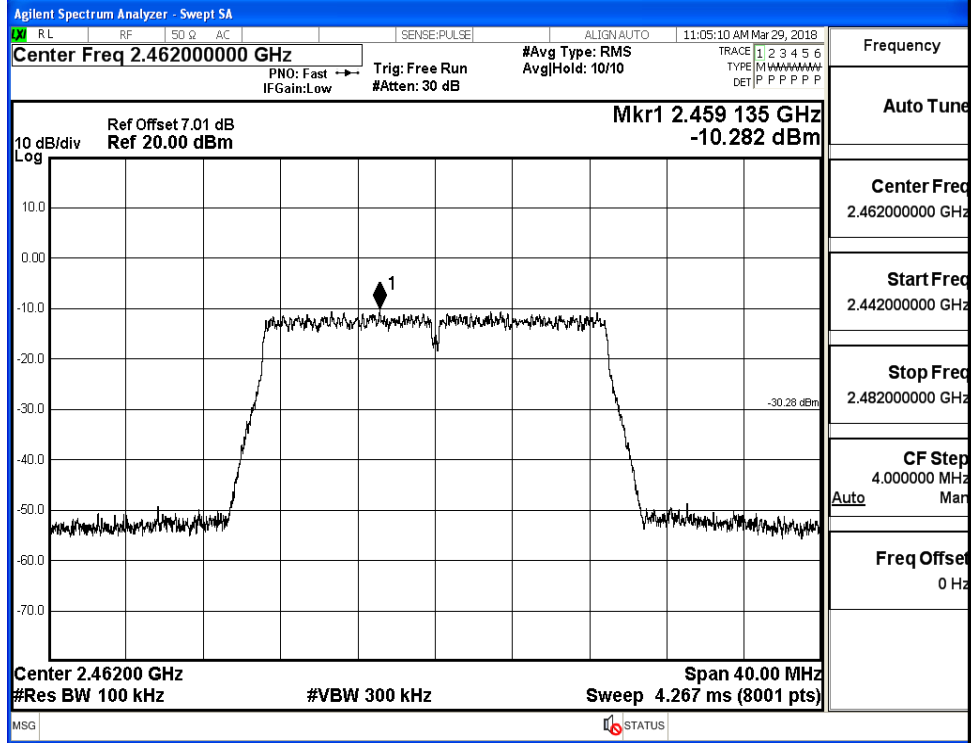


Puw/11N20
SISO/MCH

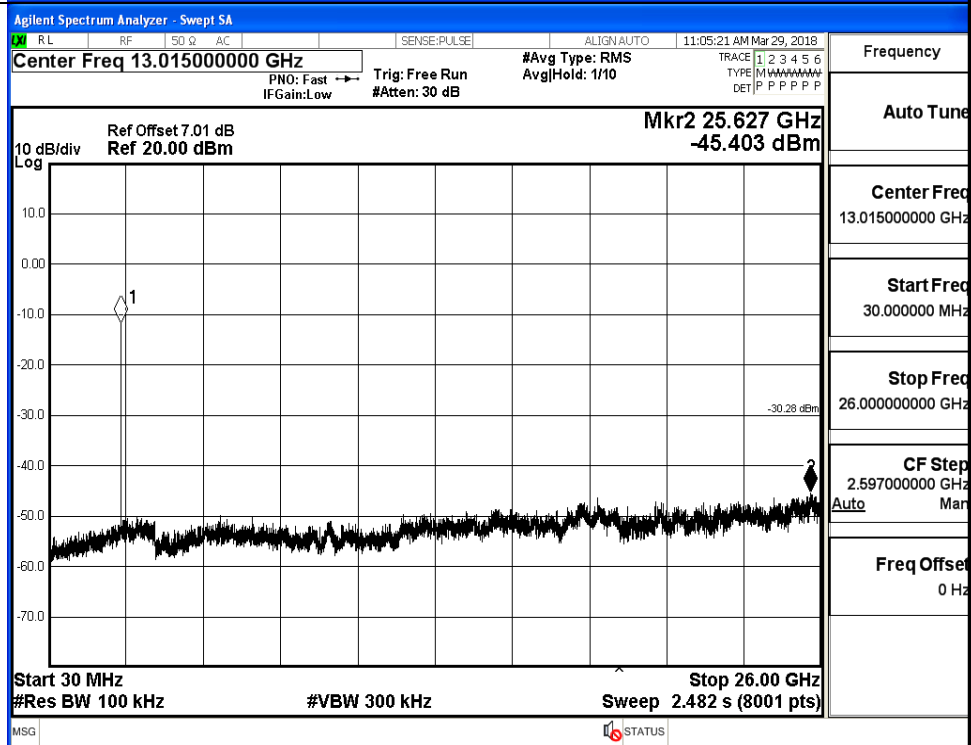


11N20SISO_HCH_Graphs

Pref/11N20
SISO/HCH

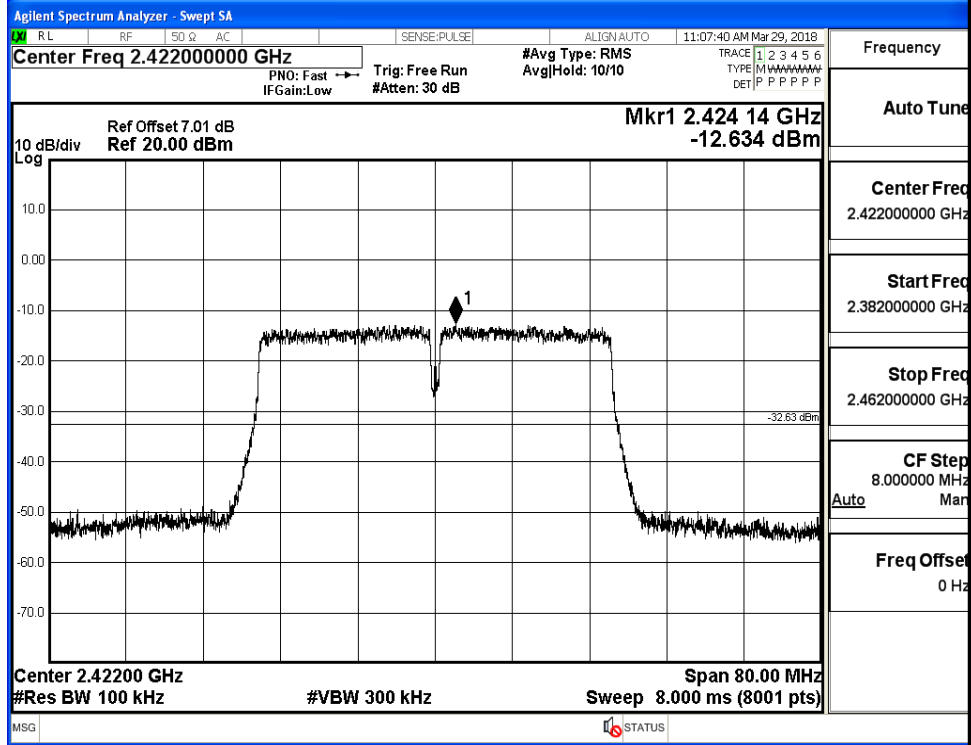


Puw/11N20
SISO/HCH

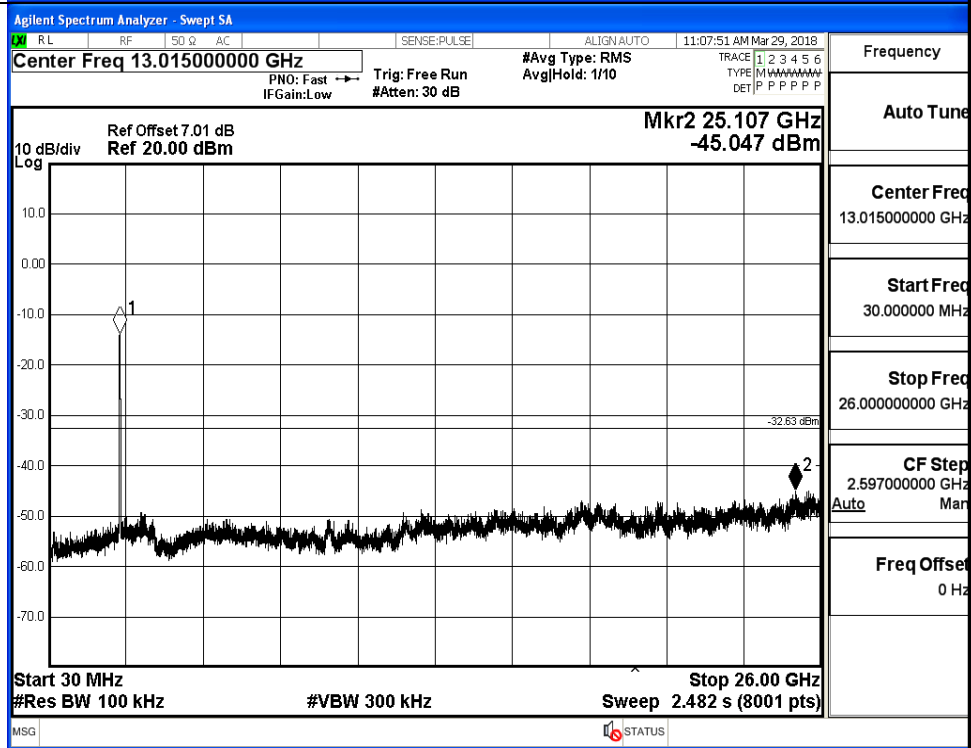


11N40SISO_LCH_Graphs

Pref/11N40
SISO/LCH

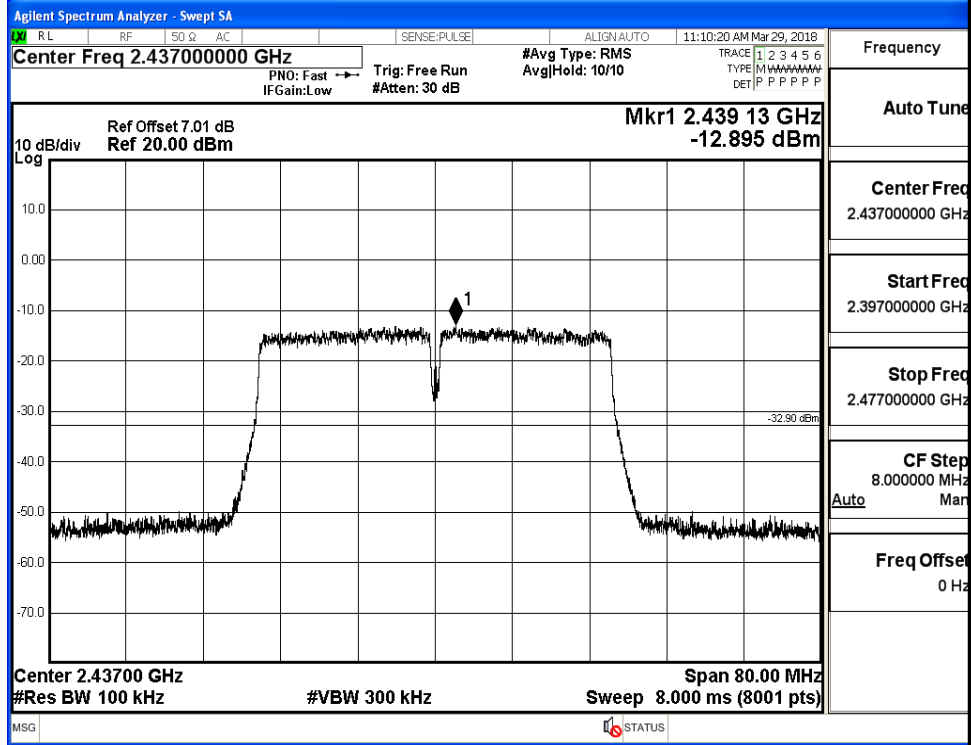


Puw/11N40
SISO/LCH

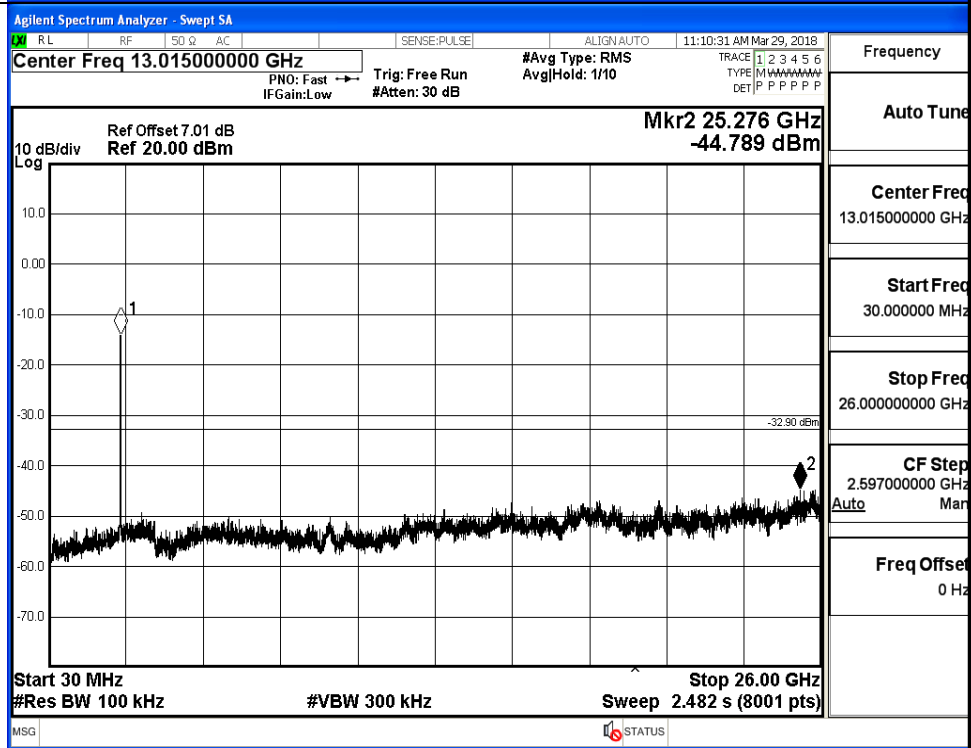


11N40SISO_MCH_Graphs

Pref/11N40
SISO/MCH

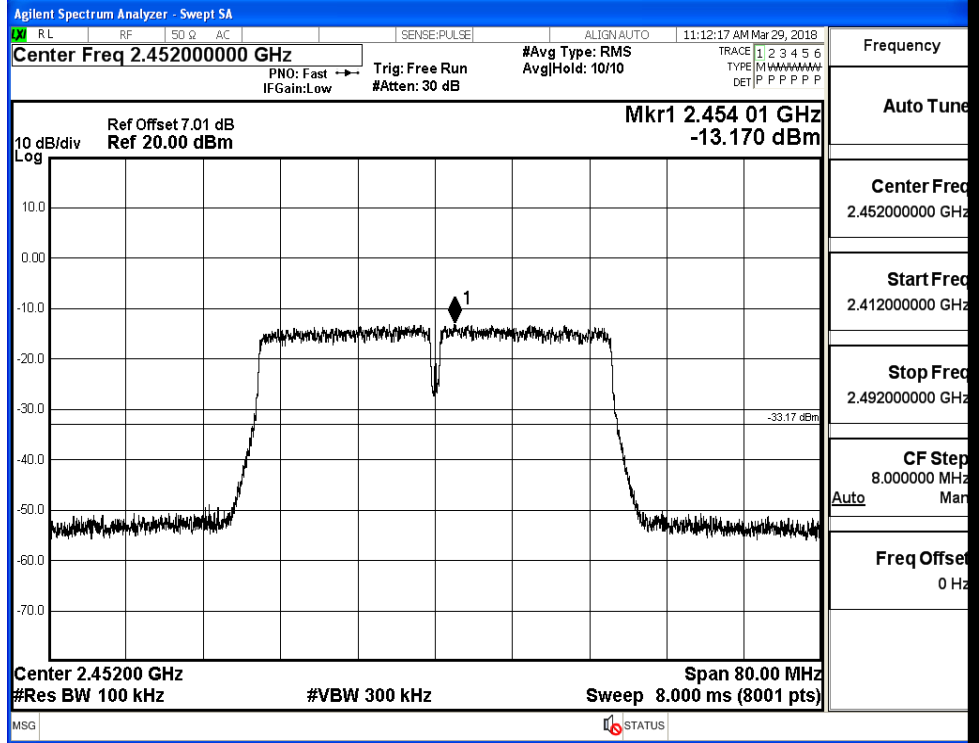


Puw/11N40
SISO/MCH



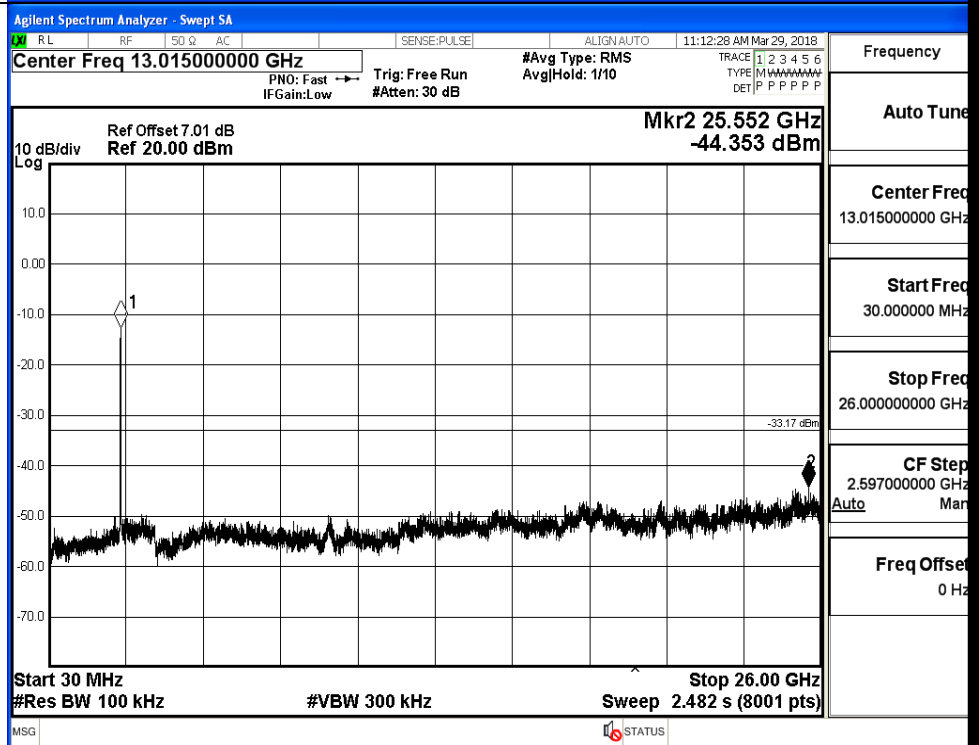
11N40SISO_HCH_Graphs

Pref/11N40
SISO/HCH



Frequency
Auto Tune
Center Freq 2.45200000 GHz
Start Freq 2.412000000 GHz
Stop Freq 2.492000000 GHz
CF Step 8.000000 MHz Auto Man
Freq Offset 0 Hz

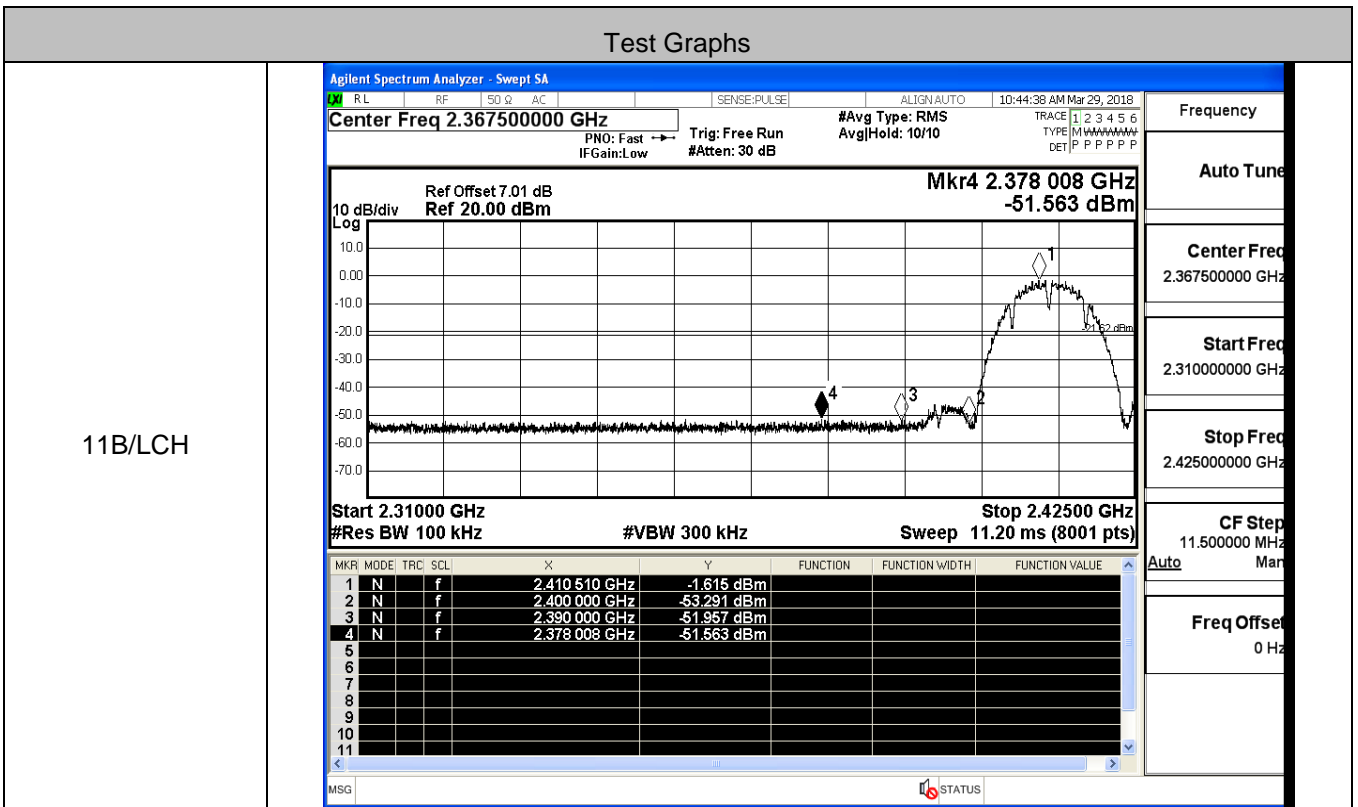
Puw/11N40
SISO/HCH



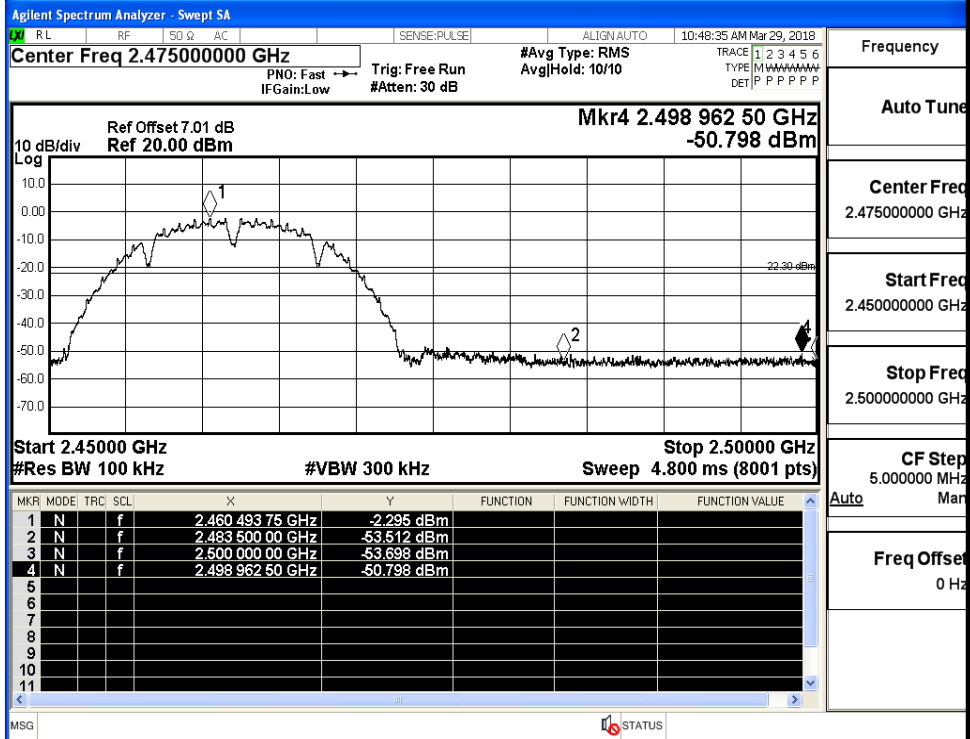
Frequency
Auto Tune
Center Freq 13.01500000 GHz
Start Freq 30.000000 MHz
Stop Freq 26.000000000 GHz
CF Step 2.597000000 GHz Auto Man
Freq Offset 0 Hz

A.7 Band-edge for RF Conducted Emissions

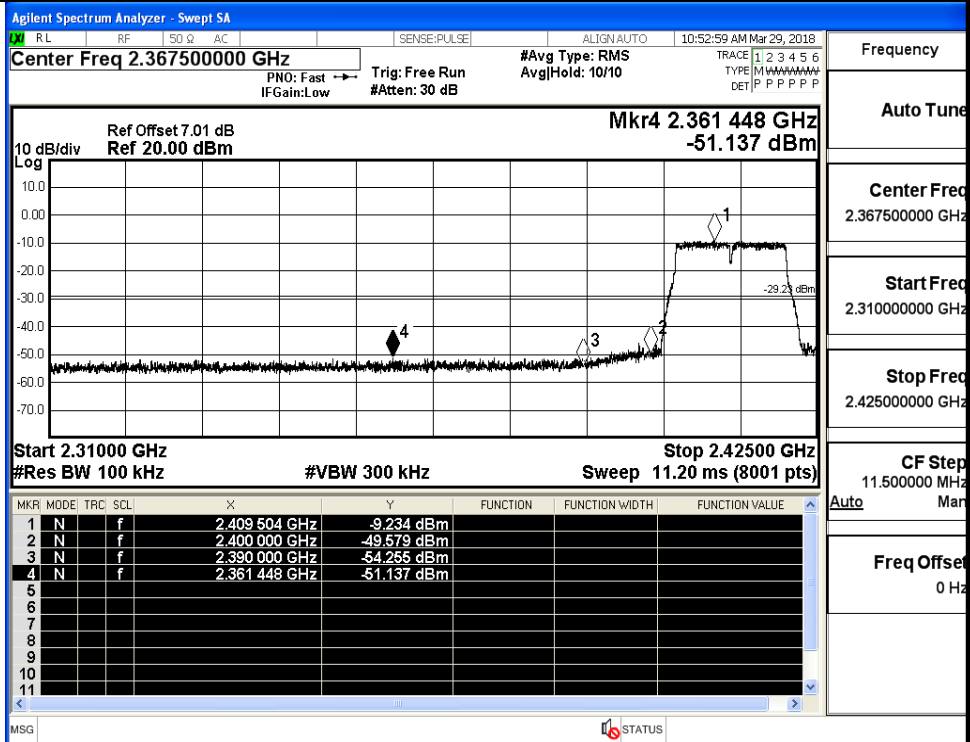
Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
11B	LCH	-1.615	-51.563	-21.62	PASS
	HCH	-2.295	-50.798	-22.3	PASS
11G	LCH	-9.234	-51.137	-29.23	PASS
	HCH	-10.552	-51.047	-30.55	PASS
11N20SISO	LCH	-9.573	-50.604	-29.57	PASS
	HCH	-10.056	-51.224	-30.06	PASS
11N40SISO	LCH	-12.455	-49.840	-32.46	PASS
	HCH	-12.535	-50.959	-32.54	PASS



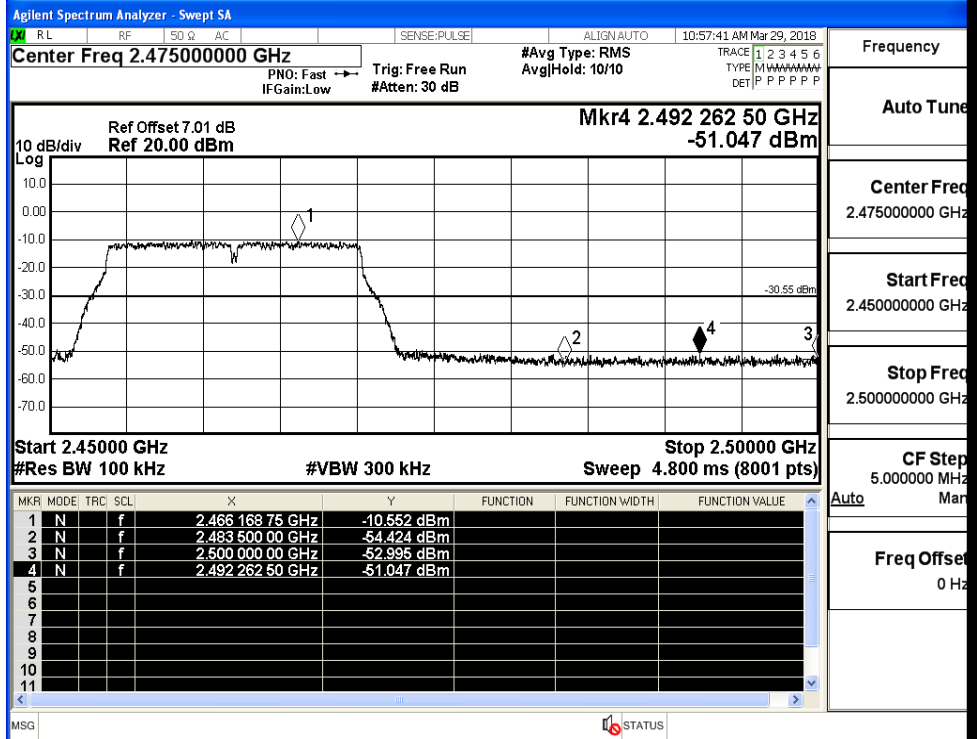
11B/HCH



11G/LCH



11G/HCH



Frequency

Auto Tune

Center Freq
2.475000000 GHz

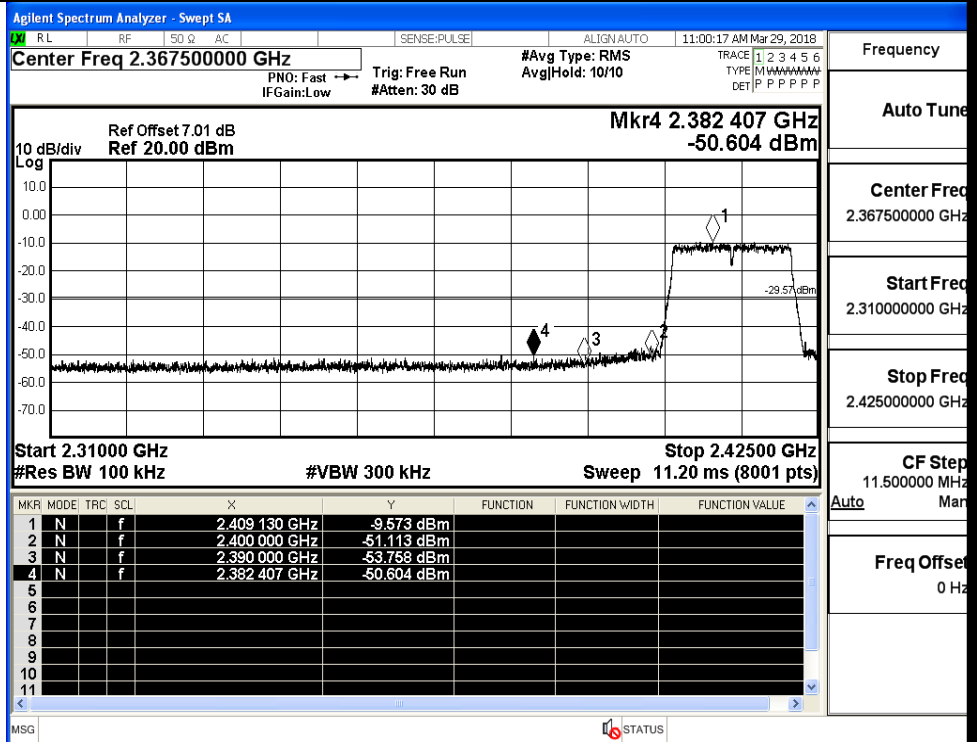
Start Freq
2.450000000 GHz

Stop Freq
2.500000000 GHz

CF Step
5.000000 MHz

Freq Offset
0 Hz

11N20SISO/LCH



Frequency

Auto Tune

Center Freq
2.367500000 GHz

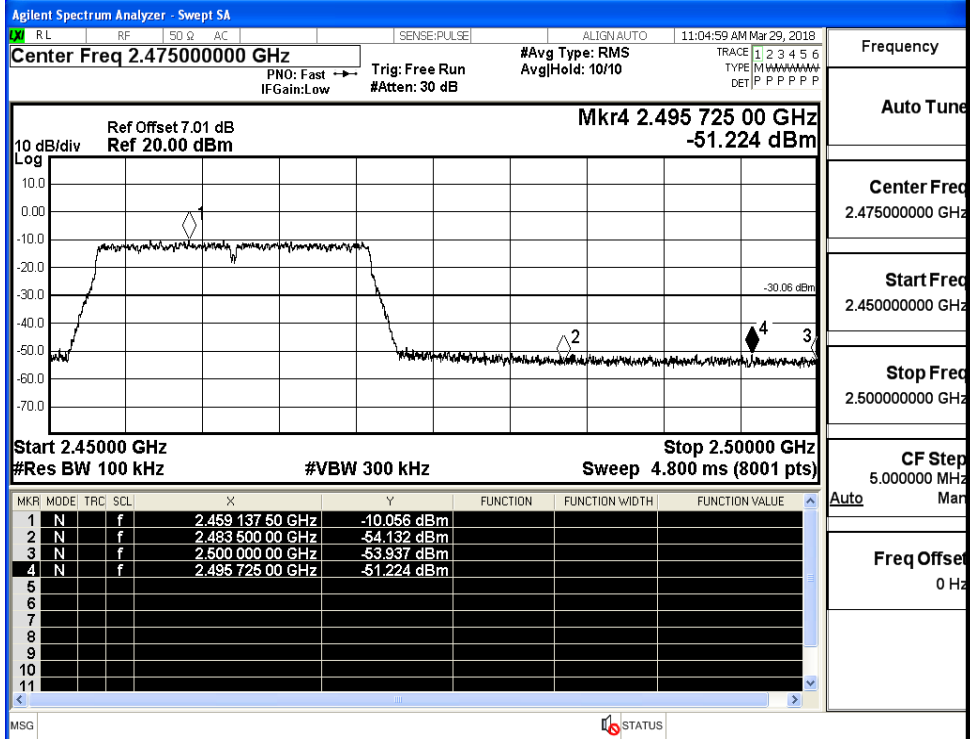
Start Freq
2.310000000 GHz

Stop Freq
2.425000000 GHz

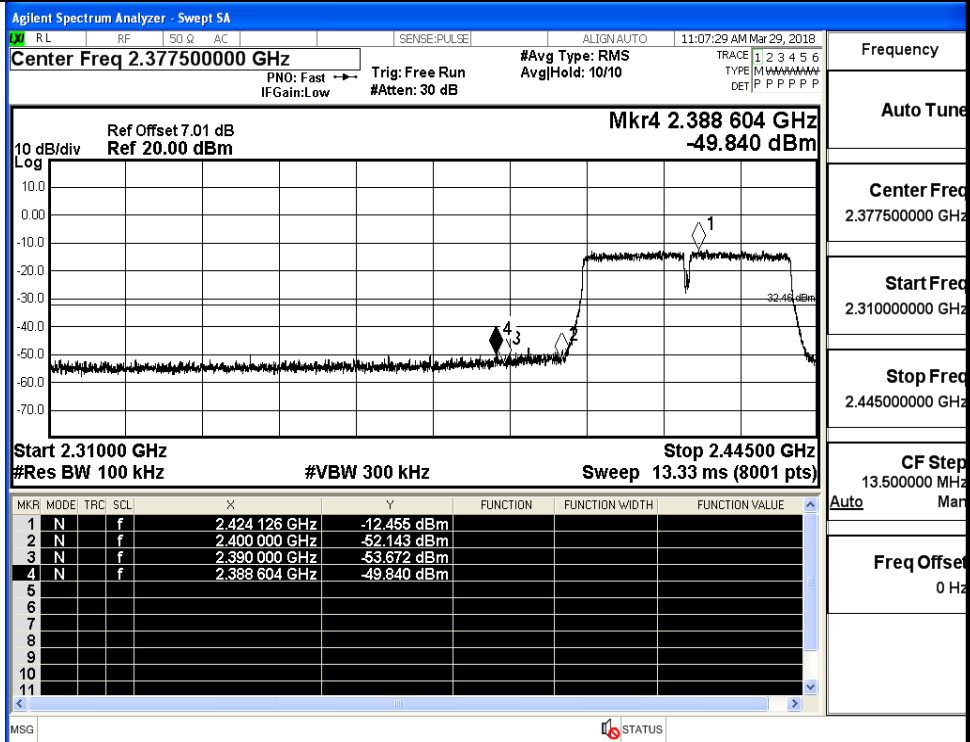
CF Step
11.500000 MHz

Freq Offset
0 Hz

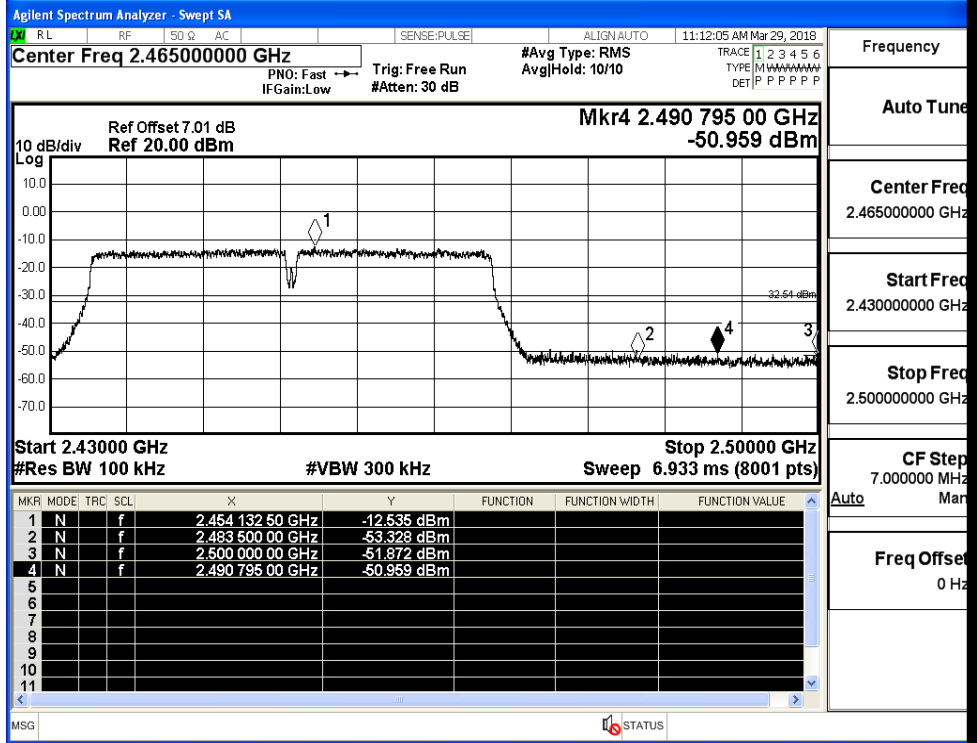
11N20SISO/HCH



11N40SISO/LCH



11N40SISO/HCH



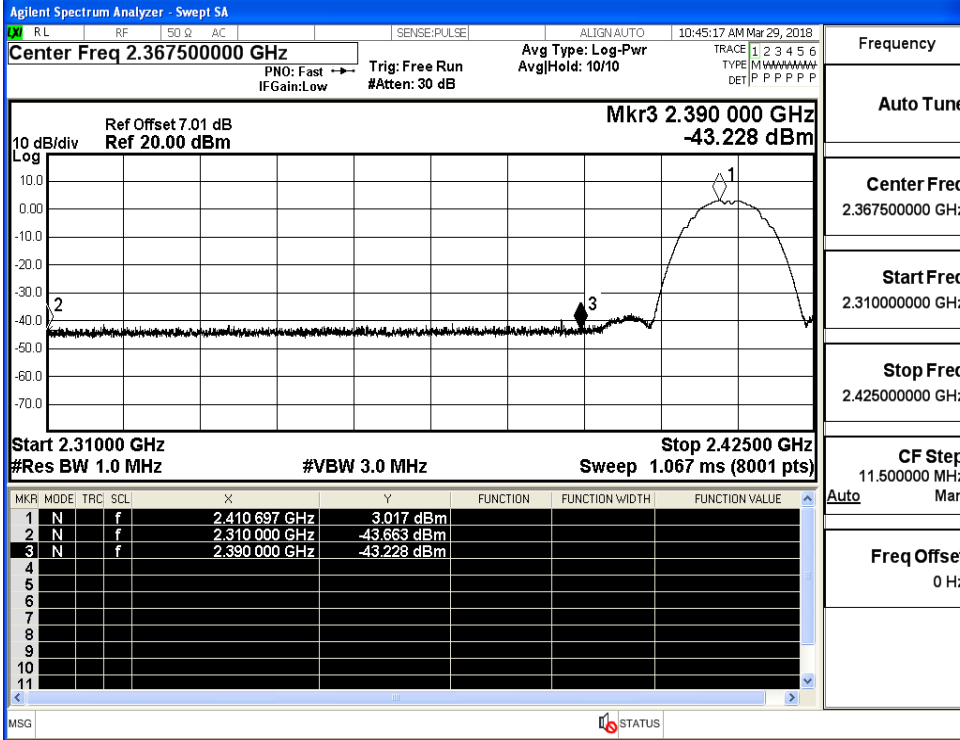
Frequency	
Auto Tune	
Center Freq	2.465000000 GHz
Start Freq	2.430000000 GHz
Stop Freq	2.500000000 GHz
CF Step	7.000000 MHz
Freq Offset	0 Hz

A.8 Restrict-band band-edge measurements

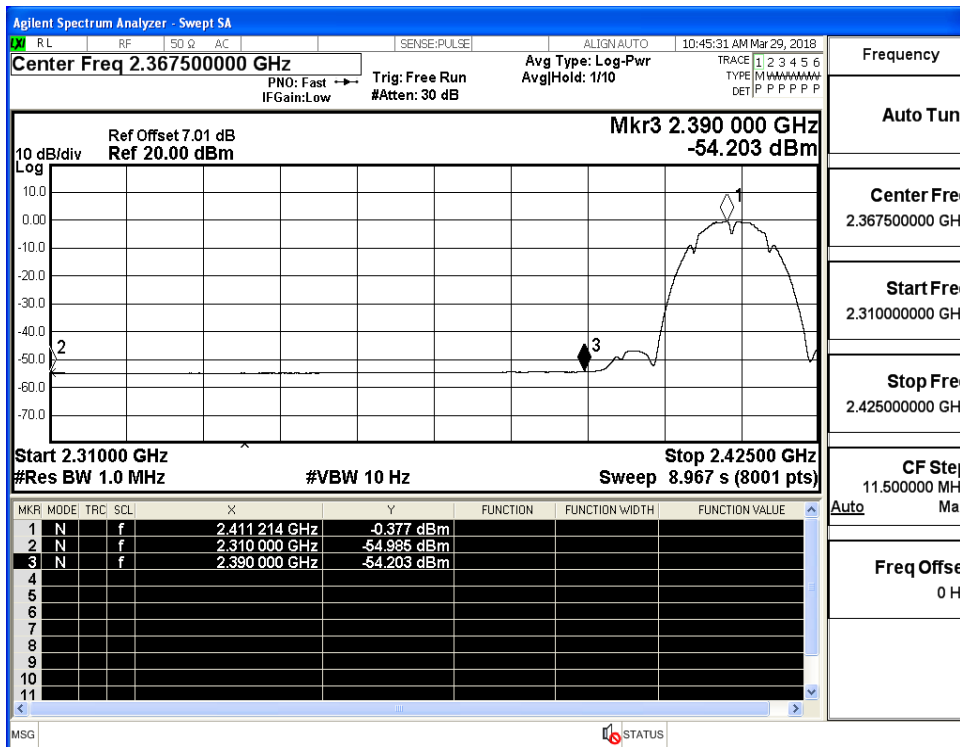
Test Mode	Test Channel	Ant	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
11B	2412	Ant1	2310.0	-43.66	2.0	0	53.60	PEAK	74	PASS
	2412	Ant1	2310.0	-54.99	2.0	0	42.27	AV	54	PASS
	2412	Ant1	2390.0	-43.23	2.0	0	54.03	PEAK	74	PASS
	2412	Ant1	2390.0	-54.20	2.0	0	43.06	AV	54	PASS
	2462	Ant1	2483.5	-44.17	2.0	0	53.09	PEAK	74	PASS
	2462	Ant1	2483.5	-54.31	2.0	0	42.95	AV	54	PASS
	2462	Ant1	2500.0	-43.75	2.0	0	53.51	PEAK	74	PASS
	2462	Ant1	2500.0	-54.33	2.0	0	42.93	AV	54	PASS
11G	2412	Ant1	2310.0	-45.08	2.0	0	52.18	PEAK	74	PASS
	2412	Ant1	2310.0	-54.95	2.0	0	42.31	AV	54	PASS
	2412	Ant1	2390.0	-43.09	2.0	0	54.17	PEAK	74	PASS
	2412	Ant1	2390.0	-53.63	2.0	0	43.63	AV	54	PASS
	2462	Ant1	2483.5	-41.89	2.0	0	55.37	PEAK	74	PASS
	2462	Ant1	2483.5	-54.01	2.0	0	43.25	AV	54	PASS
	2462	Ant1	2500.0	-44.32	2.0	0	52.94	PEAK	74	PASS
	2462	Ant1	2500.0	-54.12	2.0	0	43.14	AV	54	PASS
11N20 SISO	2412	Ant1	2310.0	-43.12	2.0	0	54.14	PEAK	74	PASS
	2412	Ant1	2310.0	-54.92	2.0	0	42.34	AV	54	PASS
	2412	Ant1	2390.0	-41.43	2.0	0	55.83	PEAK	74	PASS
	2412	Ant1	2390.0	-53.33	2.0	0	43.93	AV	54	PASS
	2462	Ant1	2483.5	-43.64	2.0	0	53.62	PEAK	74	PASS
	2462	Ant1	2483.5	-53.92	2.0	0	43.34	AV	54	PASS
	2462	Ant1	2500.0	-44.28	2.0	0	52.98	PEAK	74	PASS
	2462	Ant1	2500.0	-54.12	2.0	0	43.14	AV	54	PASS
11N40 SISO	2422	Ant1	2310.0	-44.57	2.0	0	52.69	PEAK	74	PASS
	2422	Ant1	2310.0	-54.97	2.0	0	42.29	AV	54	PASS
	2422	Ant1	2390.0	-42.11	2.0	0	55.15	PEAK	74	PASS

	2422	Ant1	2390.0	-52.66	2.0	0	44.60	AV	54	PASS
	2452	Ant1	2483.5	-42.65	2.0	0	54.61	PEAK	74	PASS
	2452	Ant1	2483.5	-53.59	2.0	0	43.67	AV	54	PASS
	2452	Ant1	2500.0	-43.70	2.0	0	53.56	PEAK	74	PASS
	2452	Ant1	2500.0	-53.95	2.0	0	43.31	AV	54	PASS

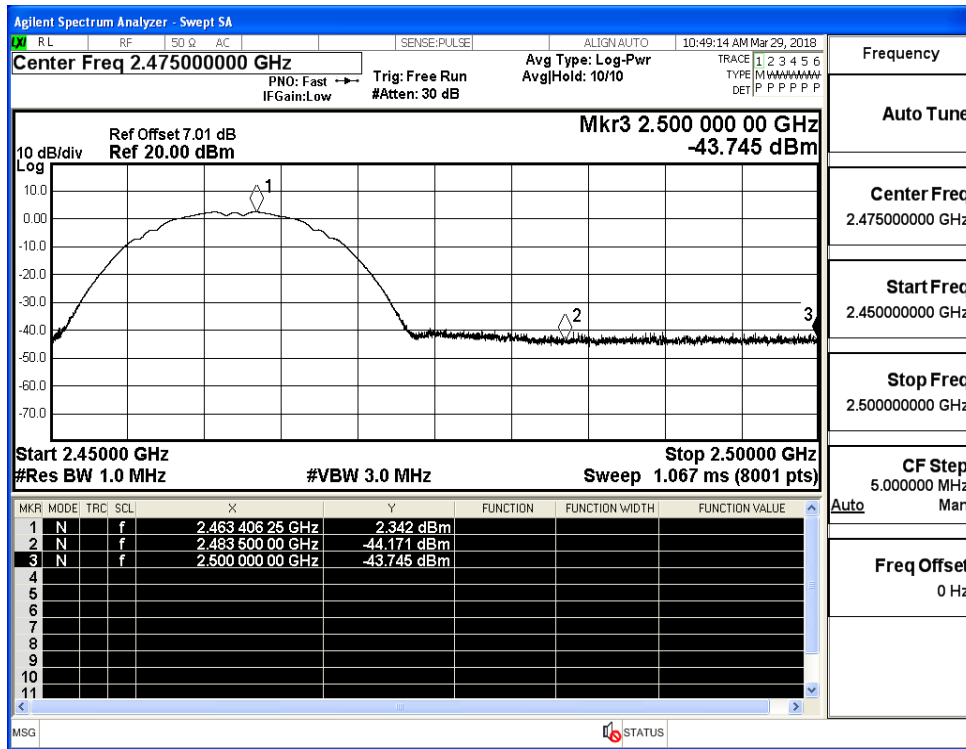
Restrict-band band-edge measurements_11B_2412_Ant1_PEAK



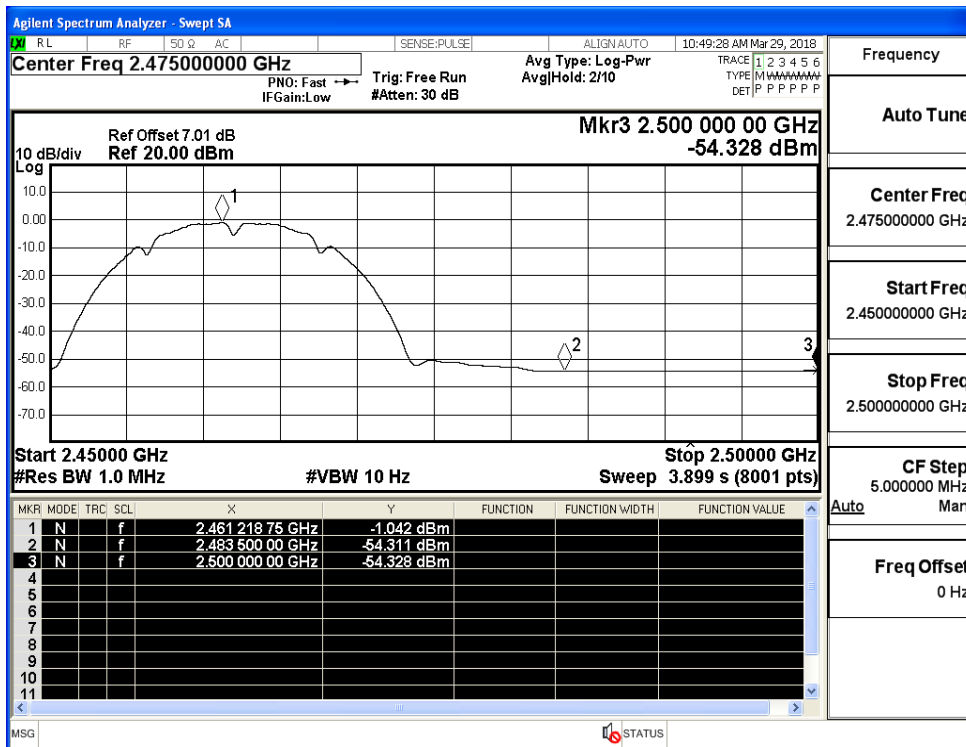
Restrict-band band-edge measurements_11B_2412_Ant1_AV



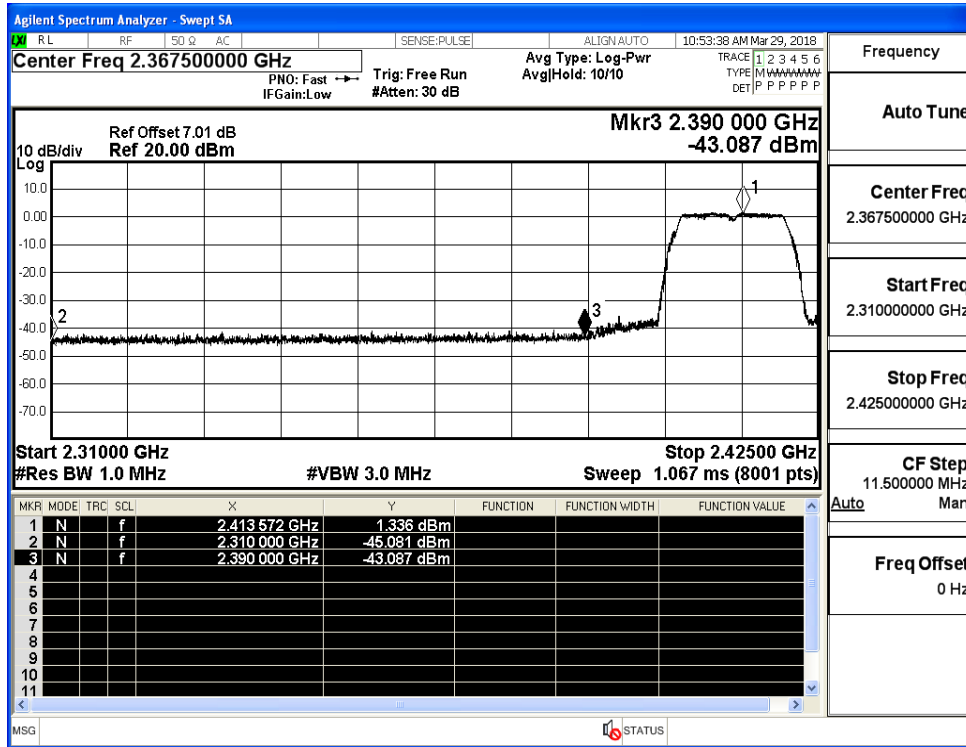
Restrict-band band-edge measurements_11B_2462_Ant1_PEAK



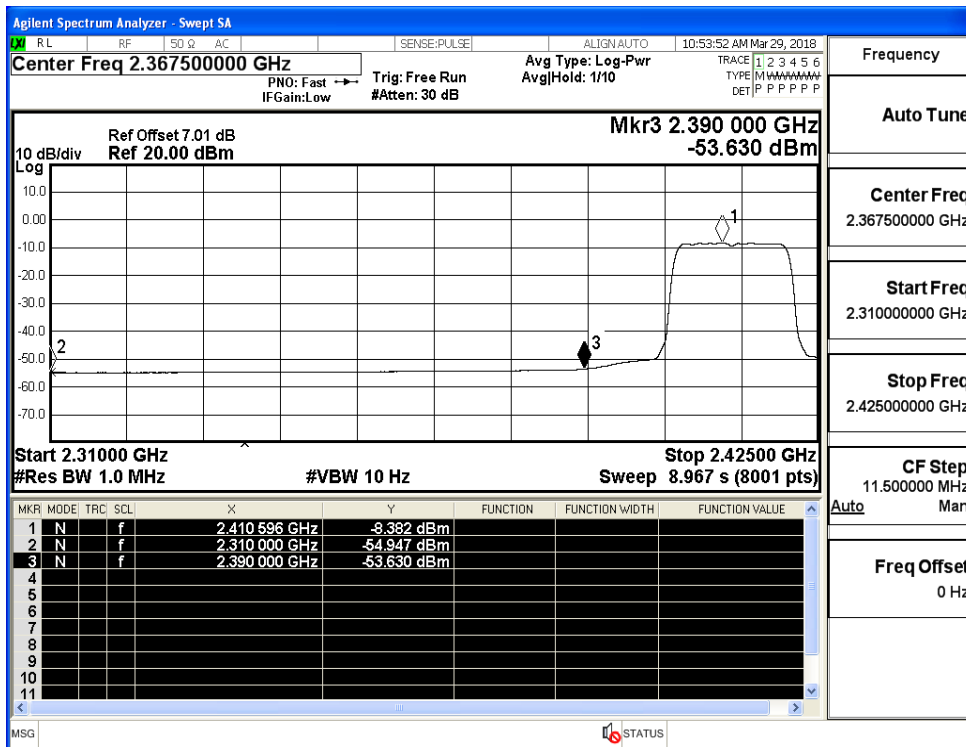
Restrict-band band-edge measurements_11B_2462_Ant1_AV



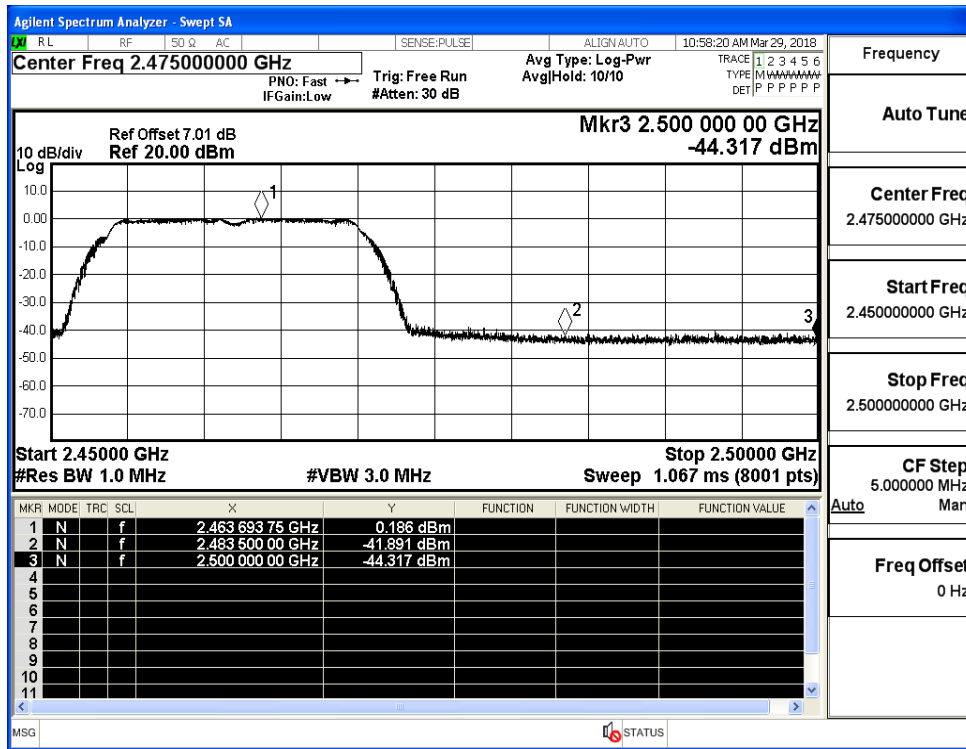
Restrict-band band-edge measurements_11G_2412_Ant1_PEAK



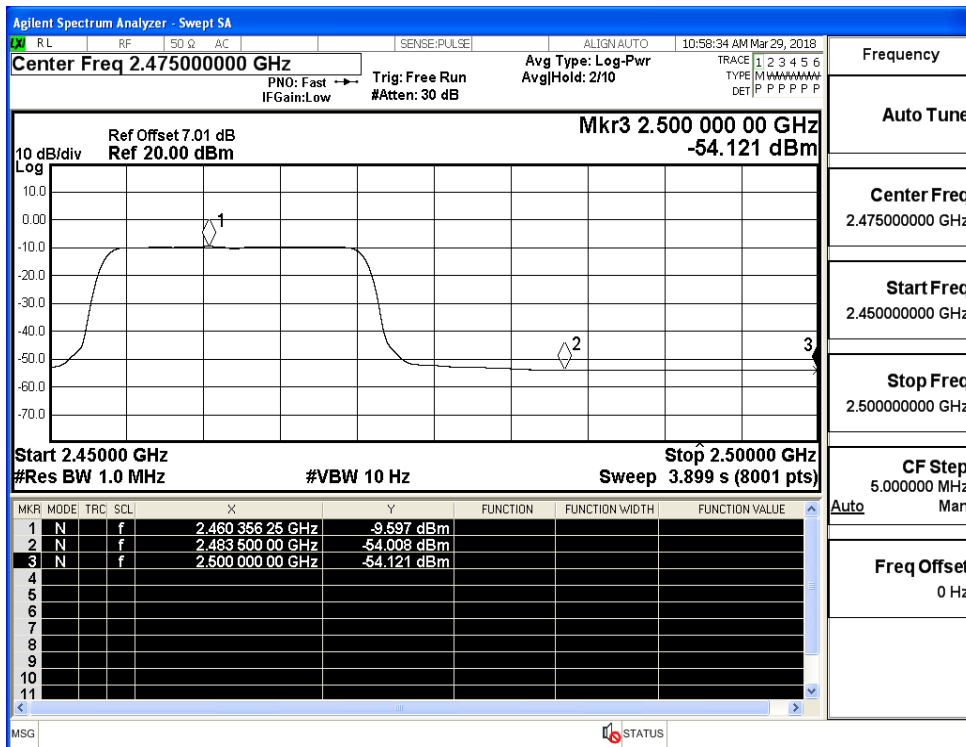
Restrict-band band-edge measurements_11G_2412_Ant1_AV



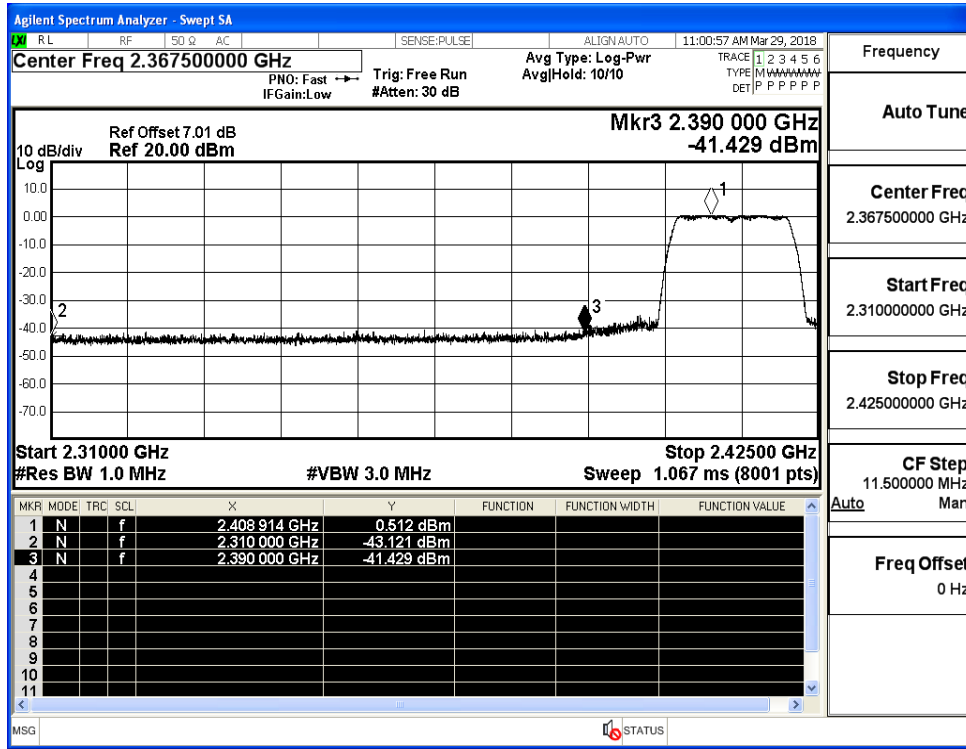
Restrict-band band-edge measurements_11G_2462_Ant1_PEAK



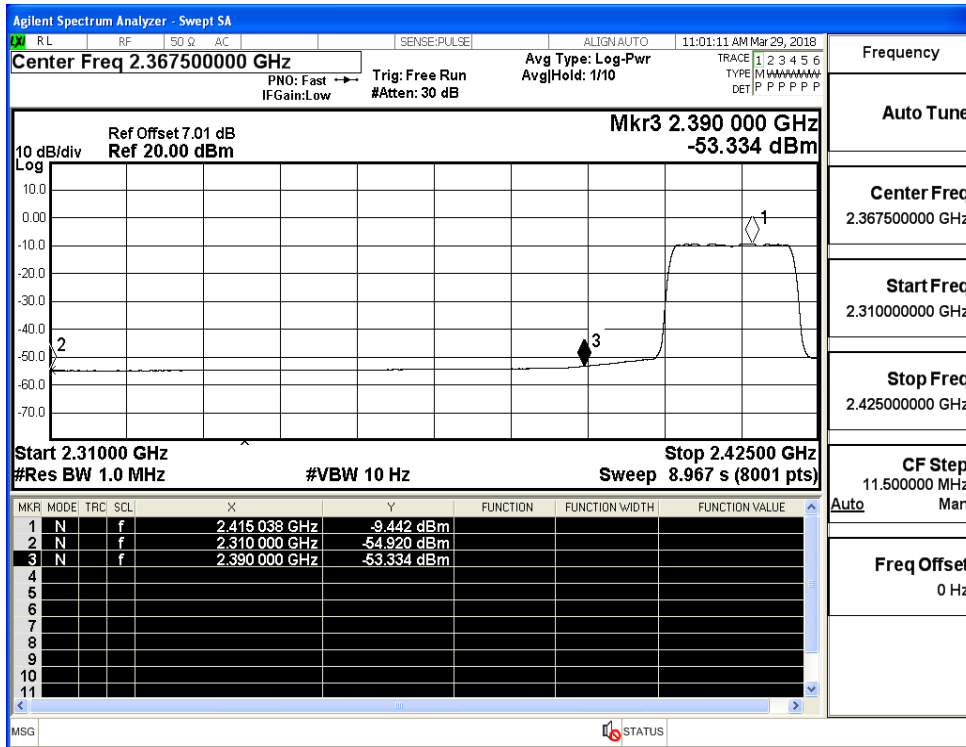
Restrict-band band-edge measurements_11G_2462_Ant1_AV



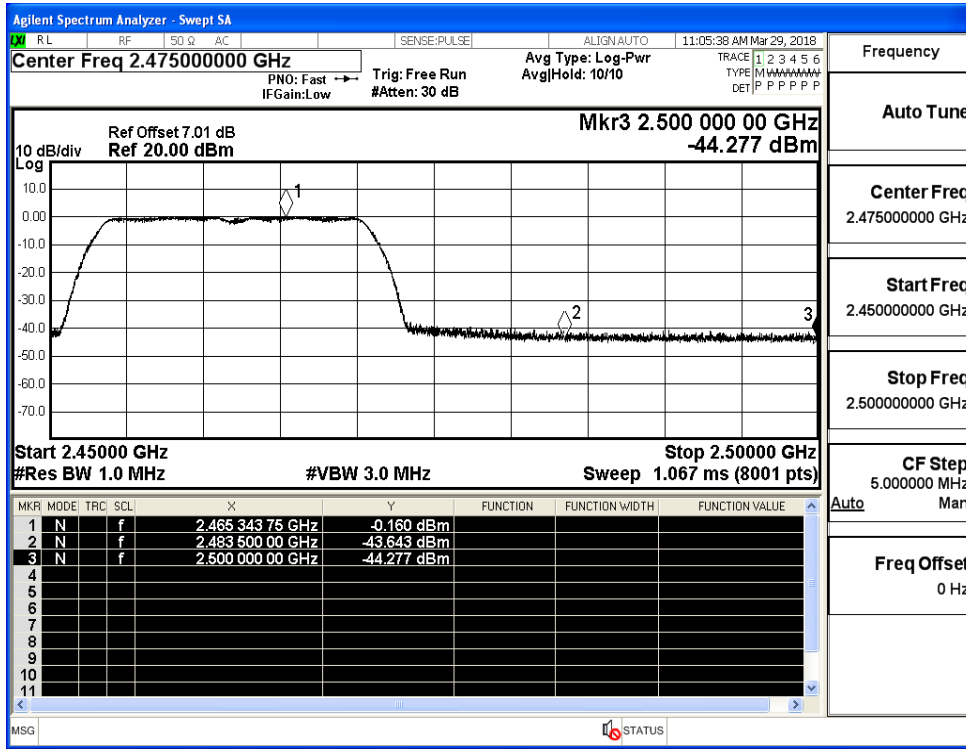
Restrict-band band-edge measurements_11N20SISO_2412_Ant1_PEAK



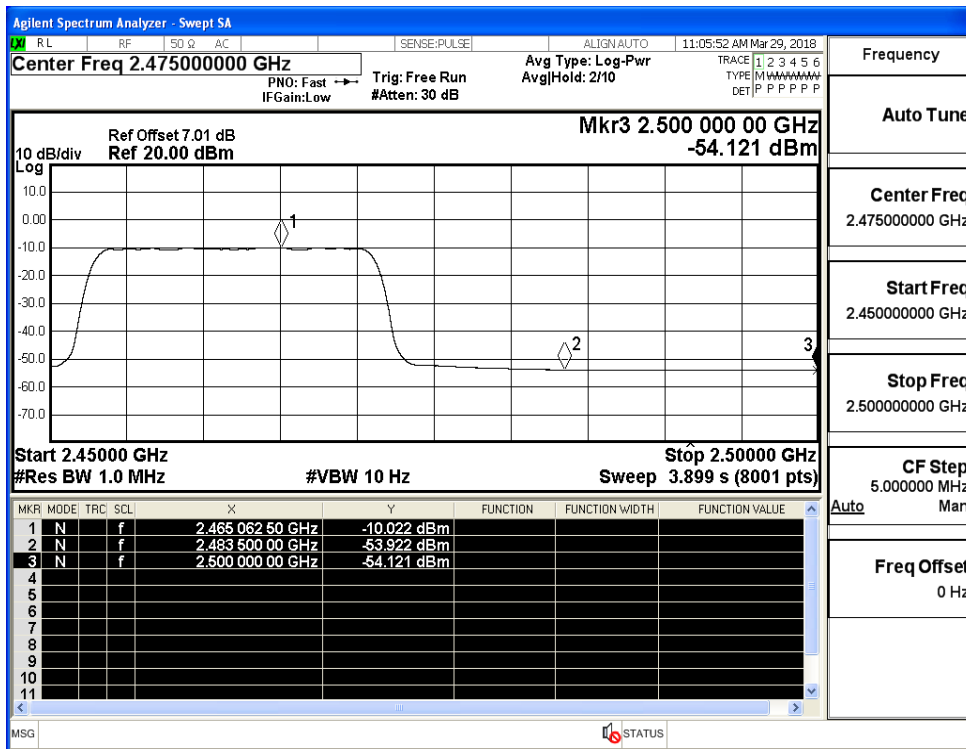
Restrict-band band-edge measurements_11N20SISO_2412_Ant1_AV



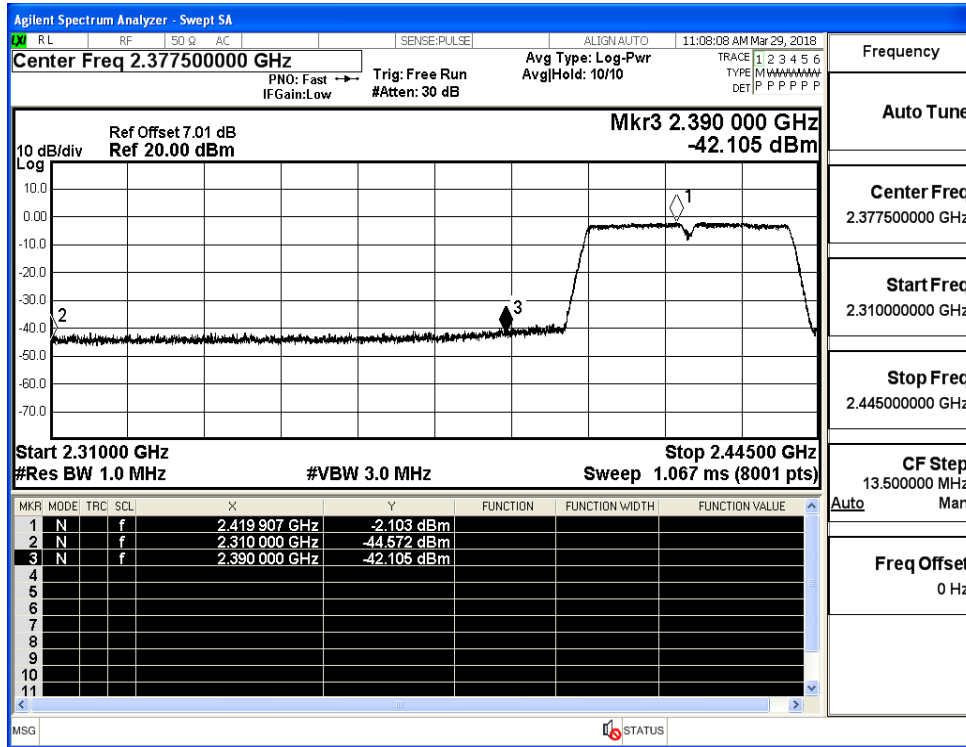
Restrict-band band-edge measurements_11N20SISO_2462_Ant1_PEAK



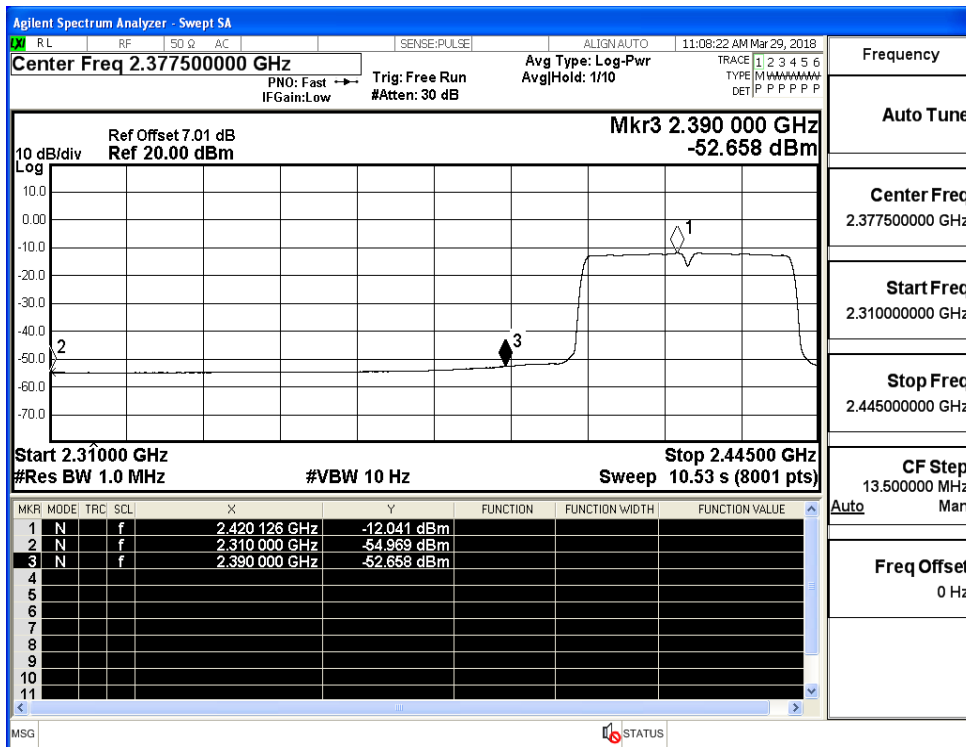
Restrict-band band-edge measurements_11N20SISO_2462_Ant1_AV



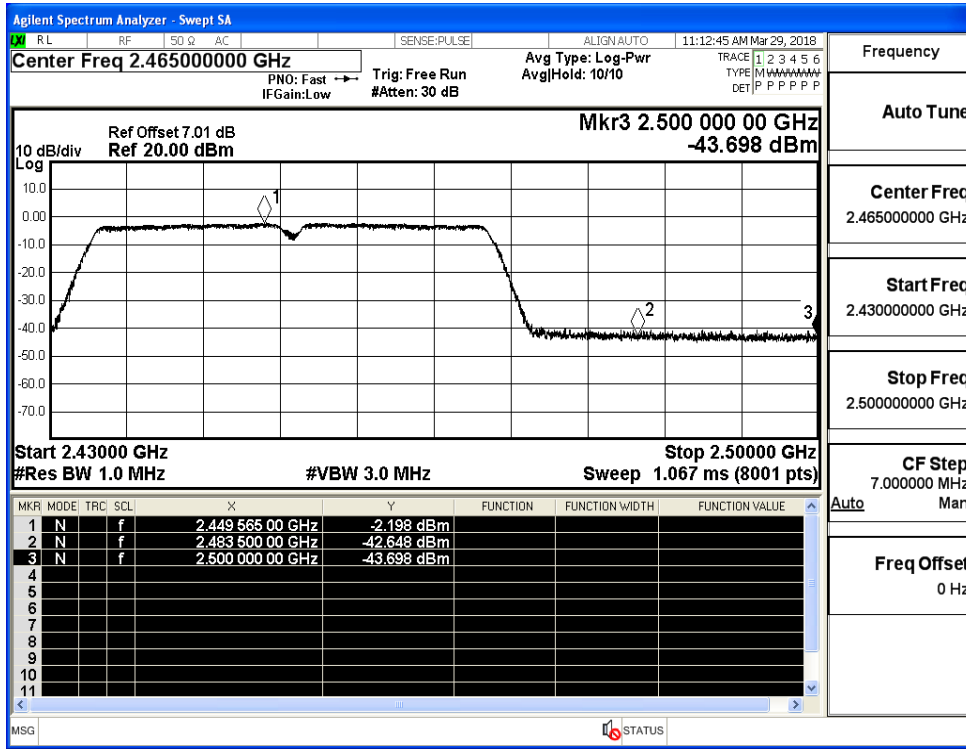
Restrict-band band-edge measurements_11N40SISO_2422_Ant1_PEAK



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

