

Appendix B

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: Multi function projector

Trade Mark: PHILIPS

Test Model: NeoPix Prime

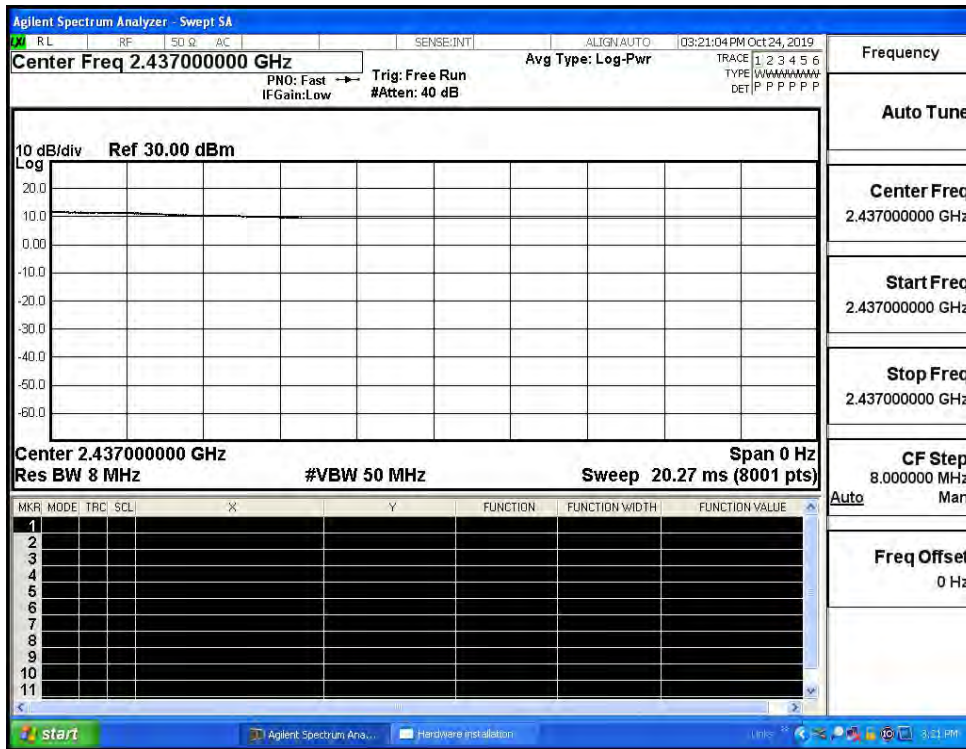
Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	50%
ATM Pressure:	100.0 kPa
Test Engineer:	Wang Chuang
Supervised by:	Wang.Chuang

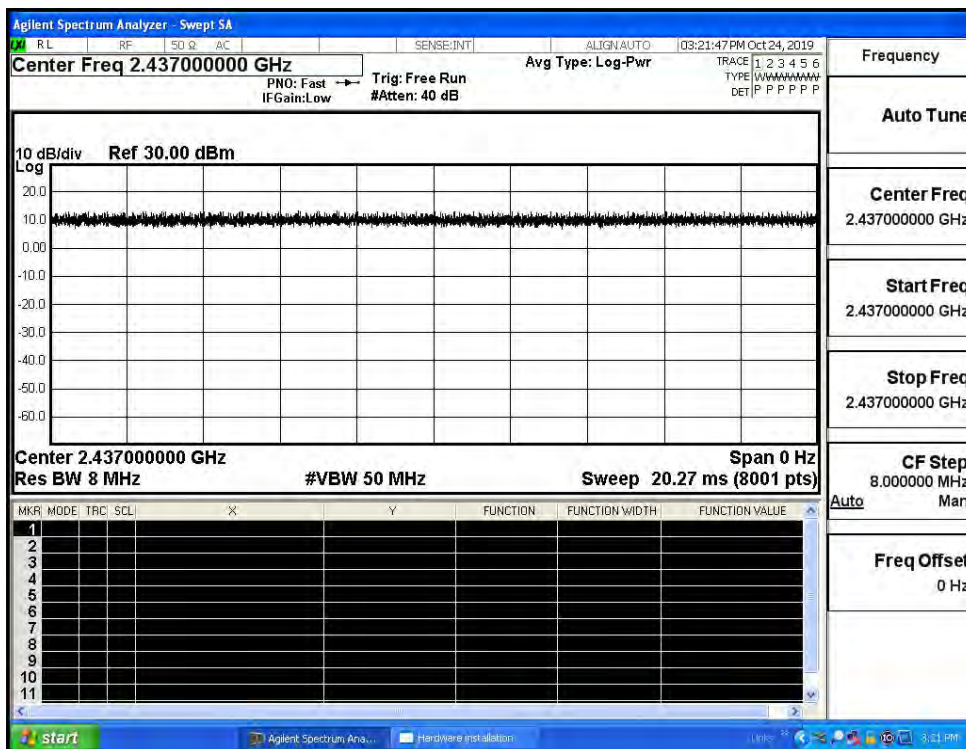
B.1 Duty Cycle

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

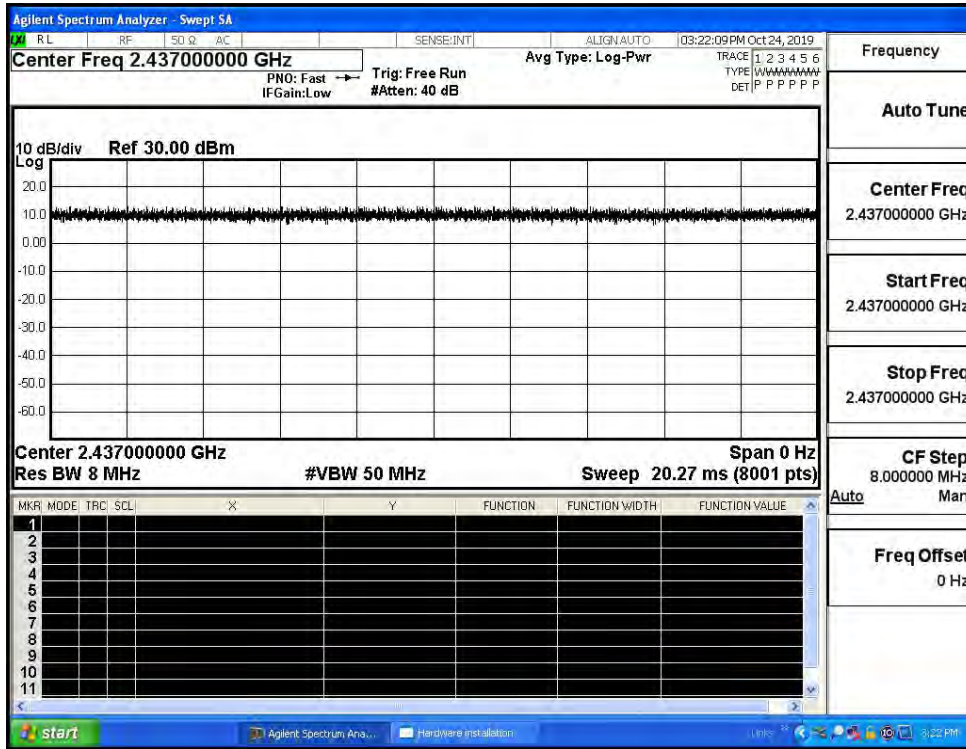
Duty Cycle_11B_2437_Ant1



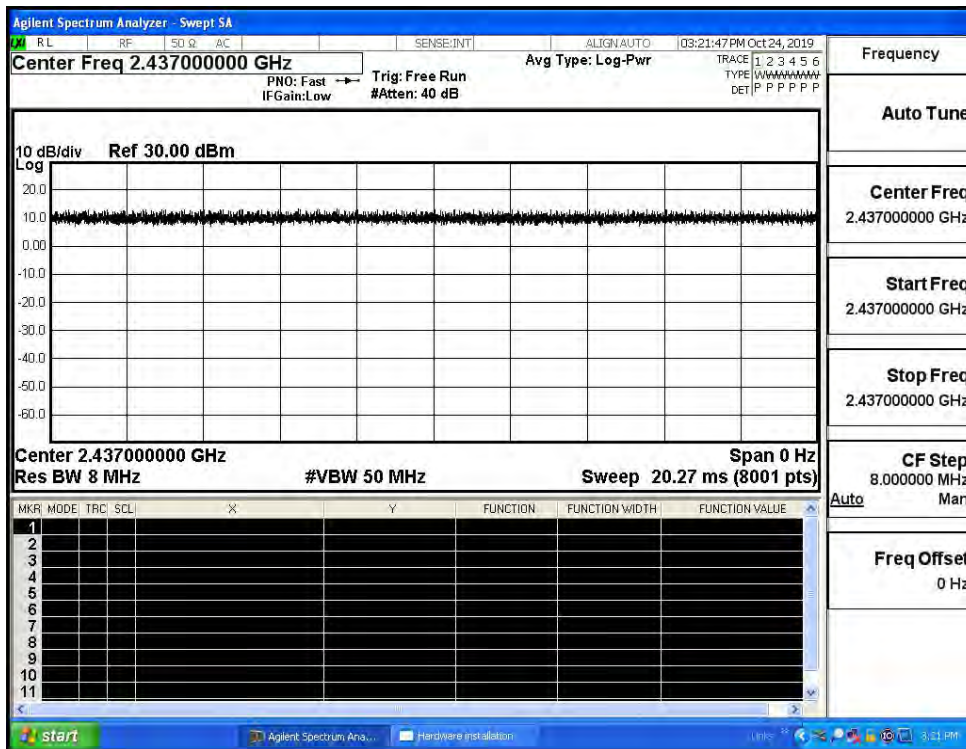
Duty Cycle_11G_2437_Ant1



Duty Cycle_11N20SISO_2437_Ant1



Duty Cycle_11N40SISO_2437_Ant1



B.2 Maximum Conducted Output Power

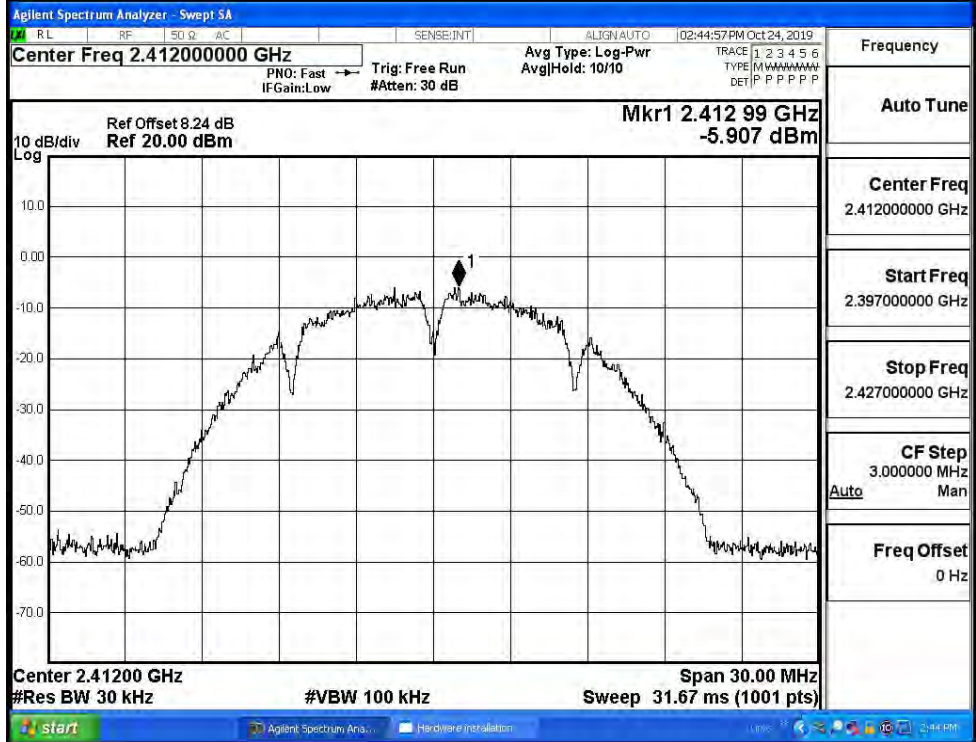
Mode	Channel	Meas.Level [dBm]	Limit [dBm]	Verdict
11B	LCH	10	30	PASS
	MCH	9.83	30	PASS
	HCH	9.41	30	PASS
11G	LCH	14.11	30	PASS
	MCH	14.51	30	PASS
	HCH	13.68	30	PASS
11N20SISO	LCH	14.03	30	PASS
	MCH	14.63	30	PASS
	HCH	13.81	30	PASS
11N40SISO	LCH	14.36	30	PASS
	MCH	14.54	30	PASS
	HCH	11.11	30	PASS

B.3 Maximum Power Spectral Density

Mode	Channel	Meas.Level [dBm/30KHz]	Limit [dBm/3KHz]	Verdict
11B	LCH	-5.907	8	PASS
	MCH	-6.744	8	PASS
	HCH	-5.837	8	PASS
11G	LCH	-9.085	8	PASS
	MCH	-9.203	8	PASS
	HCH	-8.714	8	PASS
11N20SISO	LCH	-9.113	8	PASS
	MCH	-9.420	8	PASS
	HCH	-9.146	8	PASS
11N40SISO	LCH	-11.120	8	PASS
	MCH	-11.634	8	PASS
	HCH	-10.880	8	PASS

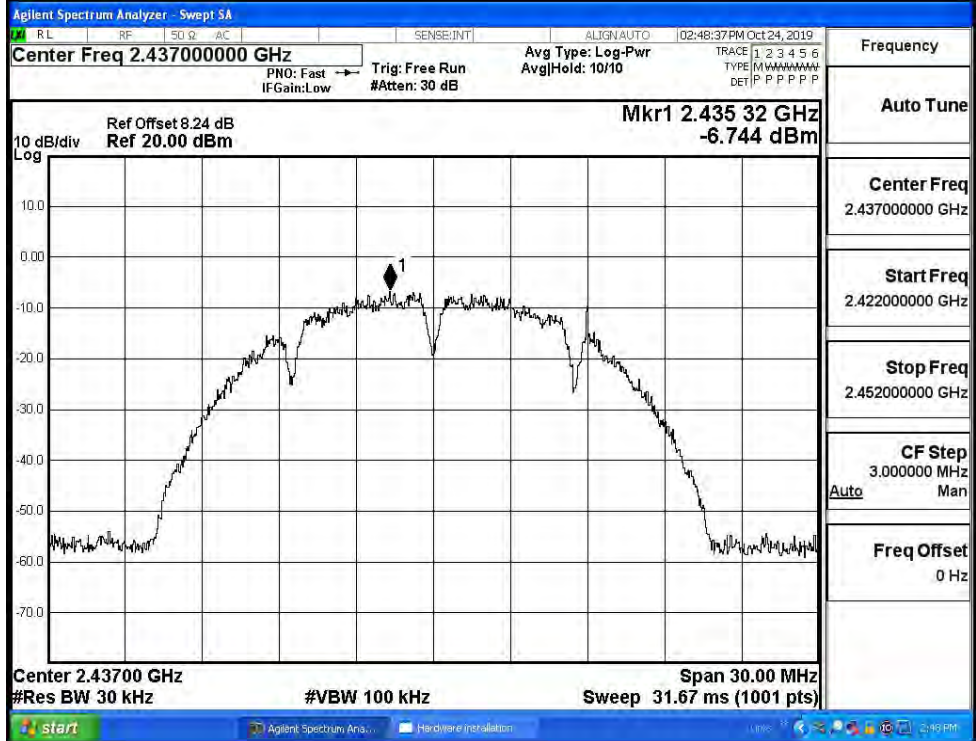
Test Graphs

11B/LCH



Frequency	
Auto Tune	
Center Freq	2.412000000 GHz
Start Freq	2.397000000 GHz
Stop Freq	2.427000000 GHz
CF Step	3.000000 MHz Auto Man
Freq Offset	0 Hz

11B/MCH



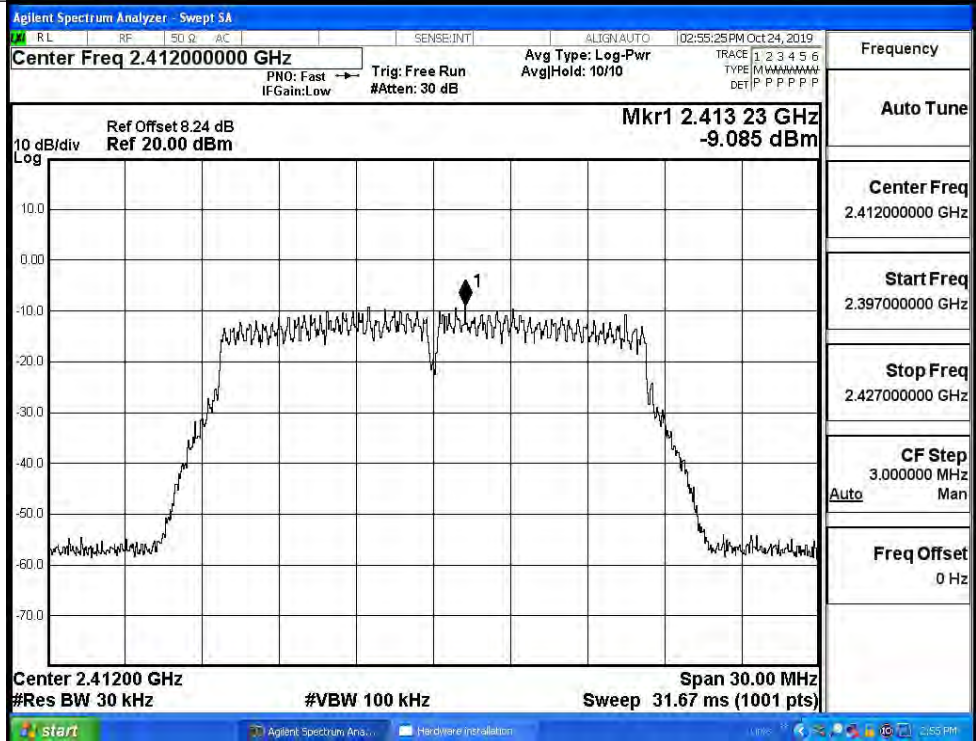
Frequency	
Auto Tune	
Center Freq	2.437000000 GHz
Start Freq	2.422000000 GHz
Stop Freq	2.452000000 GHz
CF Step	3.000000 MHz Auto Man
Freq Offset	0 Hz

11B/HCH



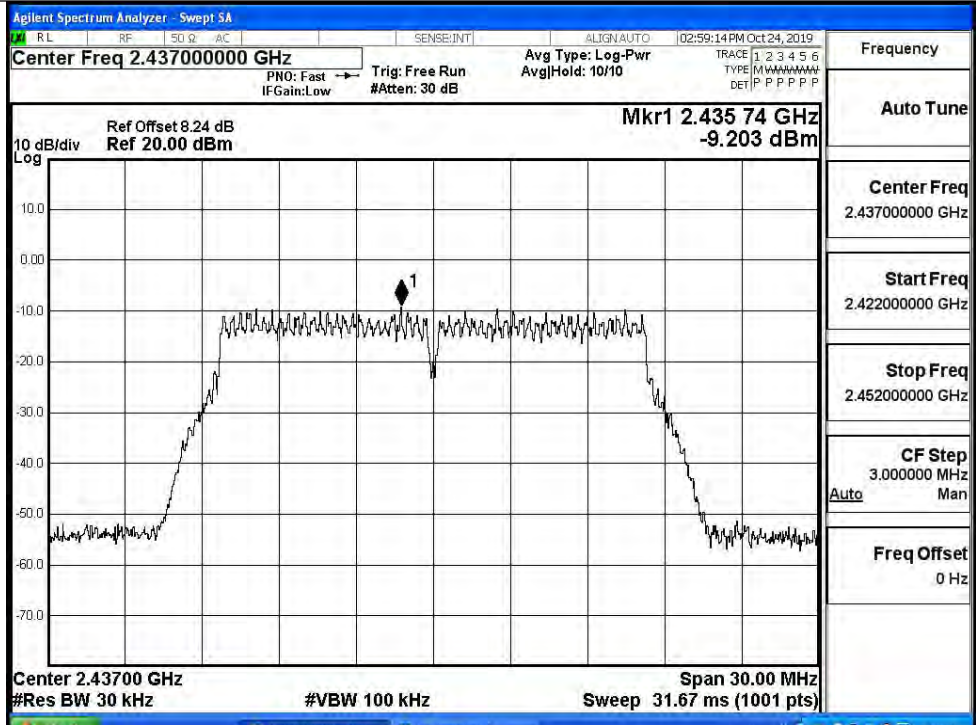
Frequency	
Auto Tune	
Center Freq	2.462000000 GHz
Start Freq	2.447000000 GHz
Stop Freq	2.477000000 GHz
CF Step	3.000000 MHz
Auto	Man
Freq Offset	0 Hz

11G/LCH

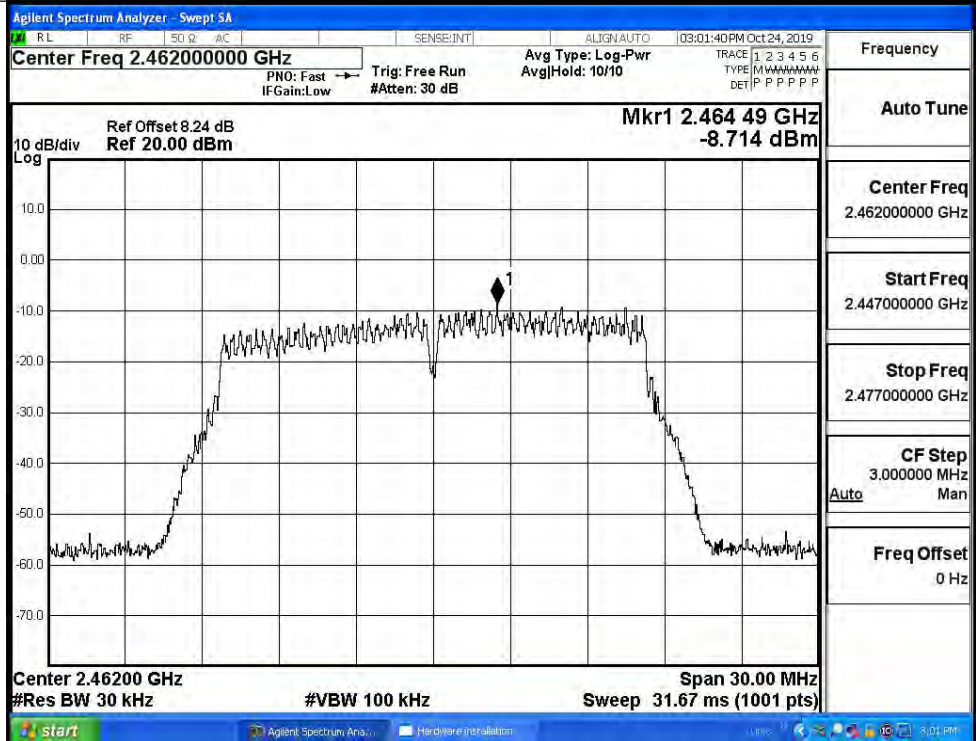


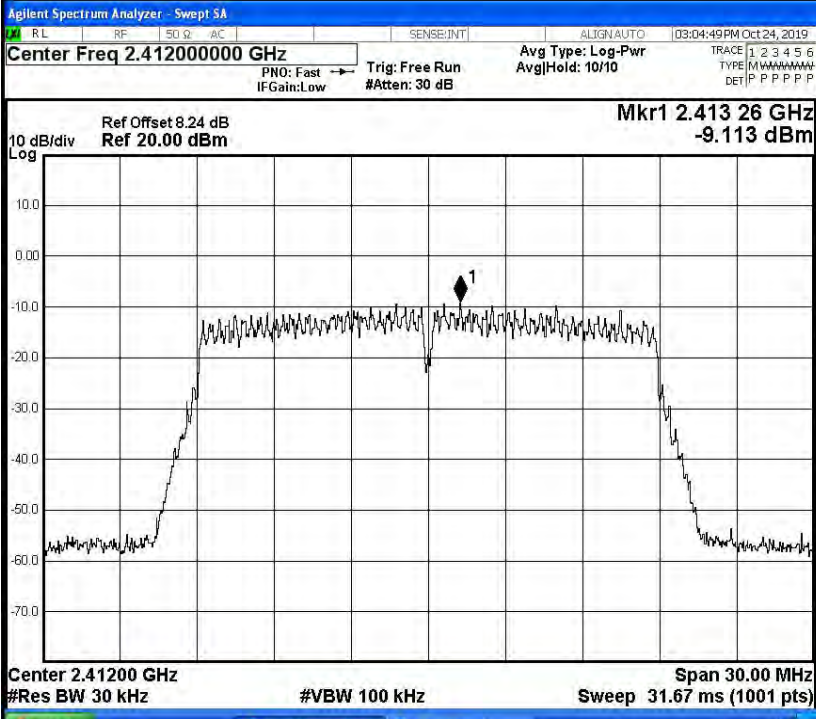
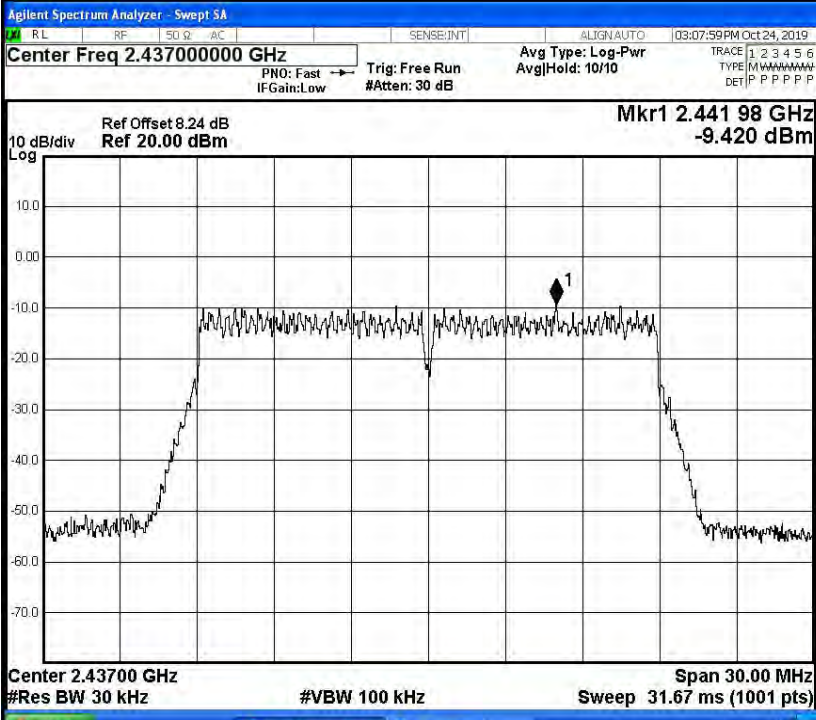
Frequency	
Auto Tune	
Center Freq	2.412000000 GHz
Start Freq	2.397000000 GHz
Stop Freq	2.427000000 GHz
CF Step	3.000000 MHz
Auto	Man
Freq Offset	0 Hz

11G/MCH

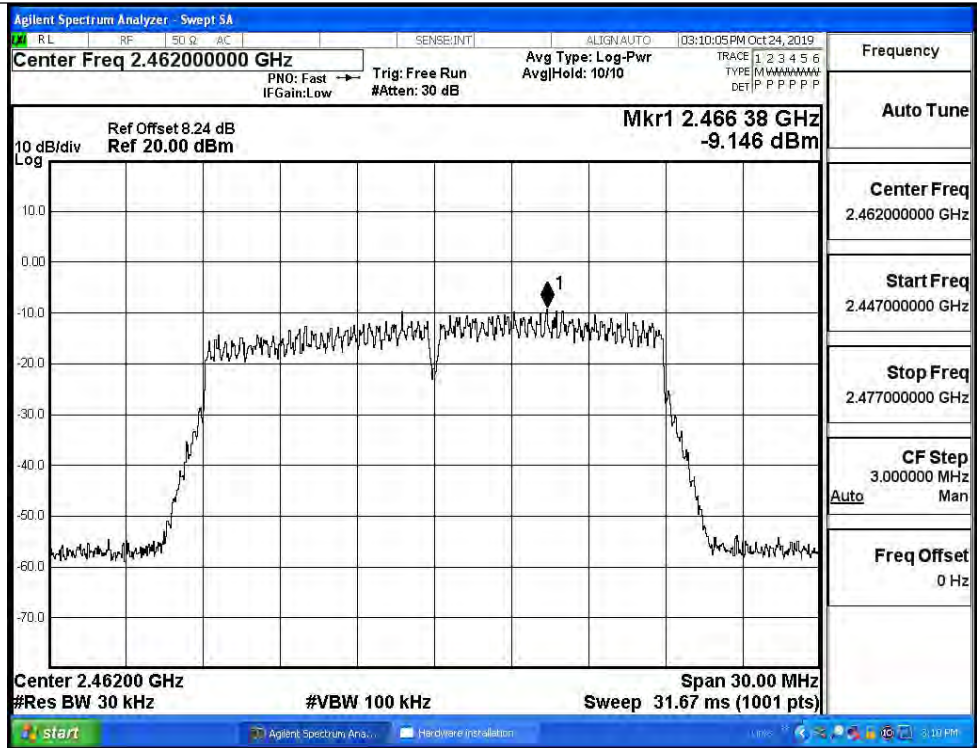


11G/HCH

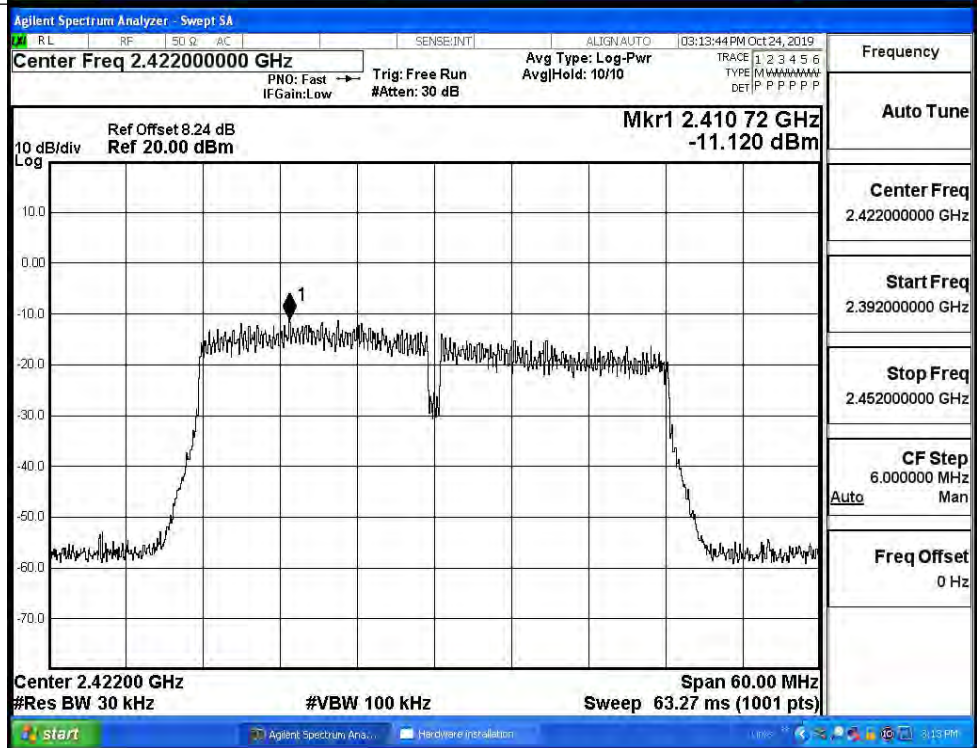


<p>11N20SISO/LCH</p>	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.41200000 GHz</p> <p>Ref Offset 8.24 dB Ref 20.00 dBm</p> <p>Mkr1 2.41326 GHz -9.113 dBm</p> <p>10 dB/div Log</p> <p>Center 2.41200 GHz #Res BW 30 kHz</p> <p>#VBW 100 kHz</p> <p>Span 30.00 MHz Sweep 31.67 ms (1001 pts)</p>
<p>11N20SISO/MCH</p>	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.43700000 GHz</p> <p>Ref Offset 8.24 dB Ref 20.00 dBm</p> <p>Mkr1 2.44198 GHz -9.420 dBm</p> <p>10 dB/div Log</p> <p>Center 2.43700 GHz #Res BW 30 kHz</p> <p>#VBW 100 kHz</p> <p>Span 30.00 MHz Sweep 31.67 ms (1001 pts)</p>

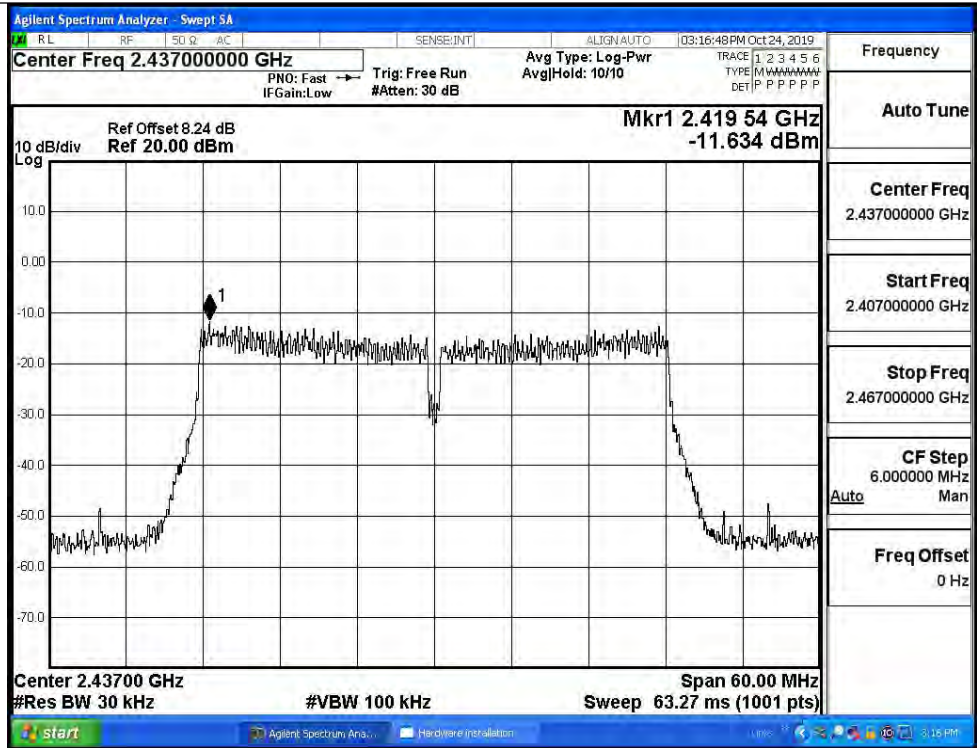
11N20SISO/HCH



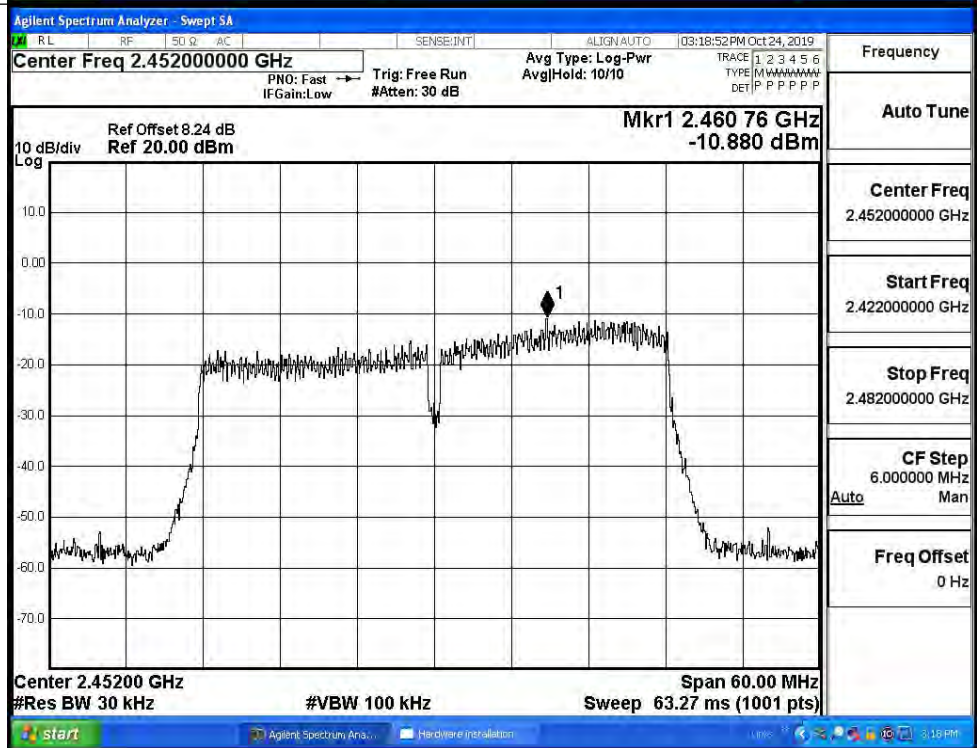
11N40SISO/LCH



11N40SISO/MCH



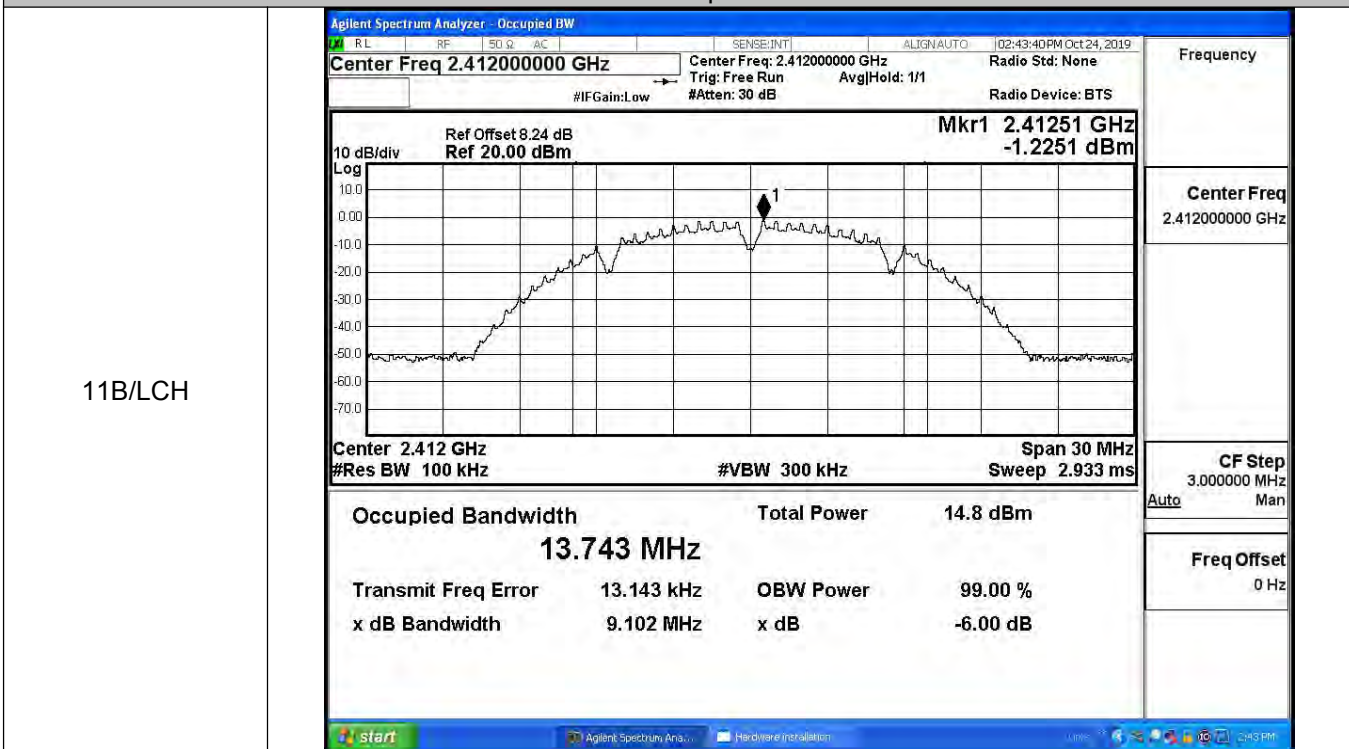
11N40SISO/HCH



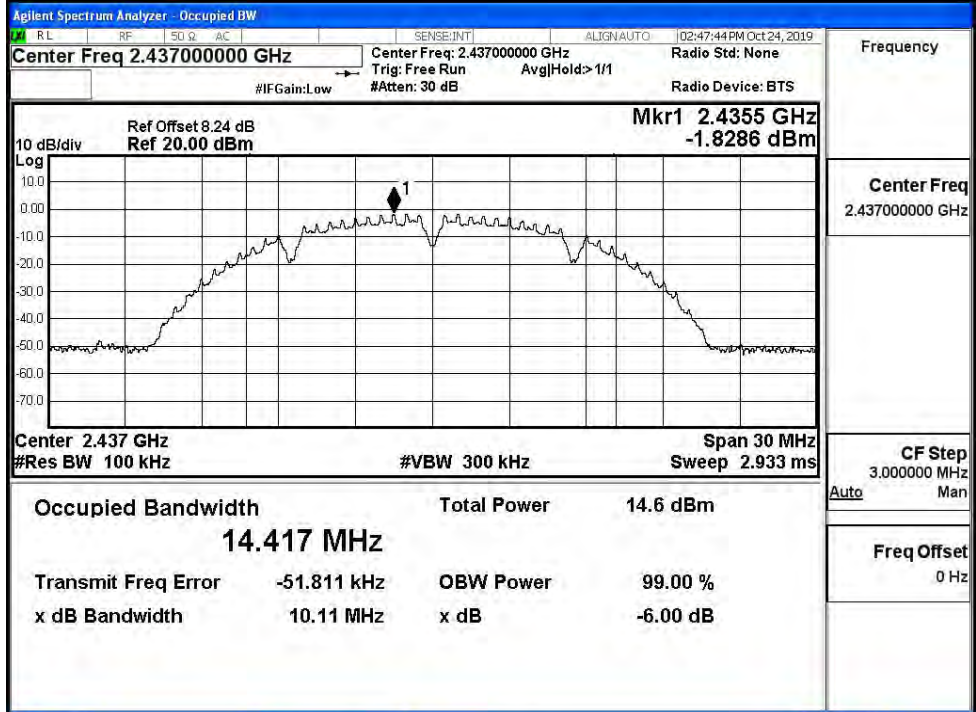
B.4 6dB Bandwidth

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
11B	LCH	9.102	≥0.5	PASS
	MCH	10.11	≥0.5	PASS
	HCH	9.087	≥0.5	PASS
11G	LCH	15.45	≥0.5	PASS
	MCH	16.44	≥0.5	PASS
	HCH	14.47	≥0.5	PASS
11N20SISO	LCH	15.16	≥0.5	PASS
	MCH	17.67	≥0.5	PASS
	HCH	16.32	≥0.5	PASS
11N40SISO	LCH	31.37	≥0.5	PASS
	MCH	36.36	≥0.5	PASS
	HCH	20.34	≥0.5	PASS

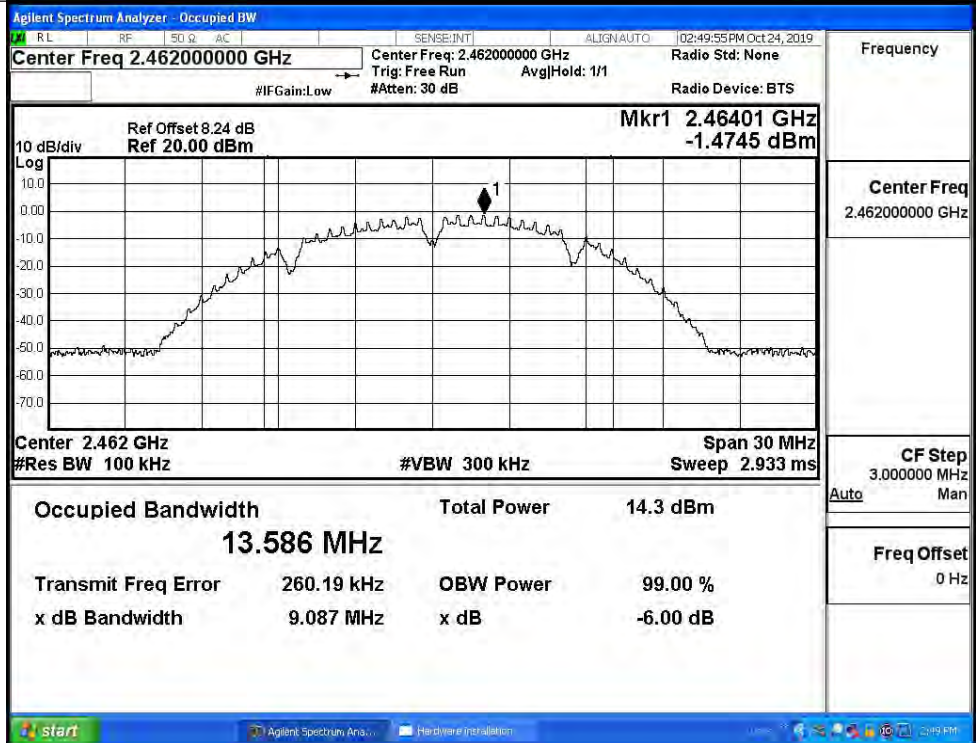
Test Graphs



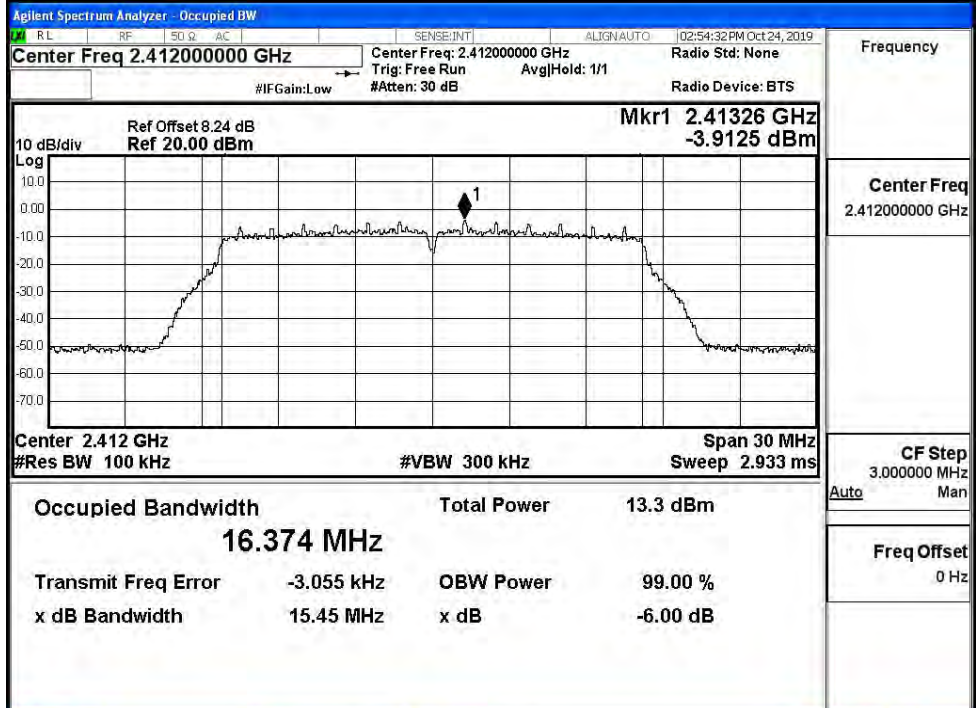
11B/MCH



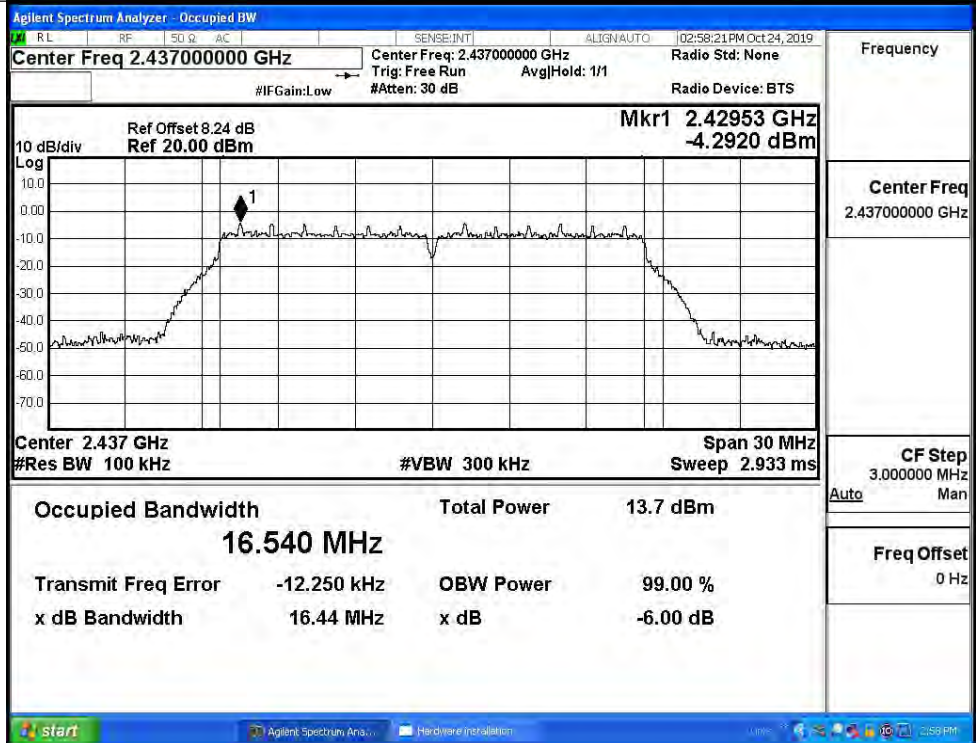
11B/HCH



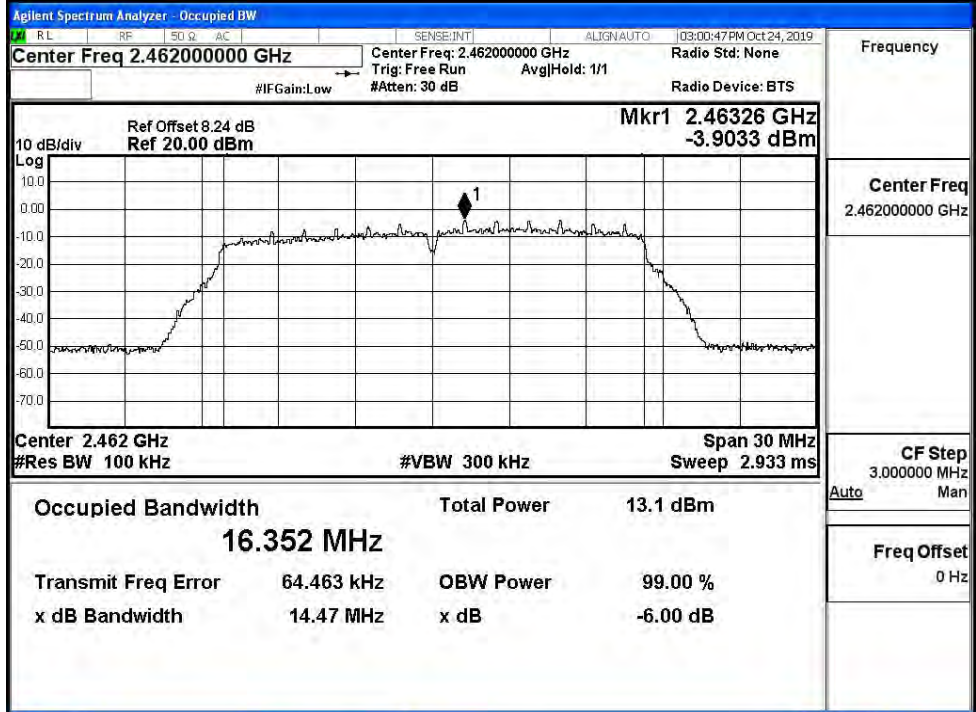
11G/LCH



11G/MCH

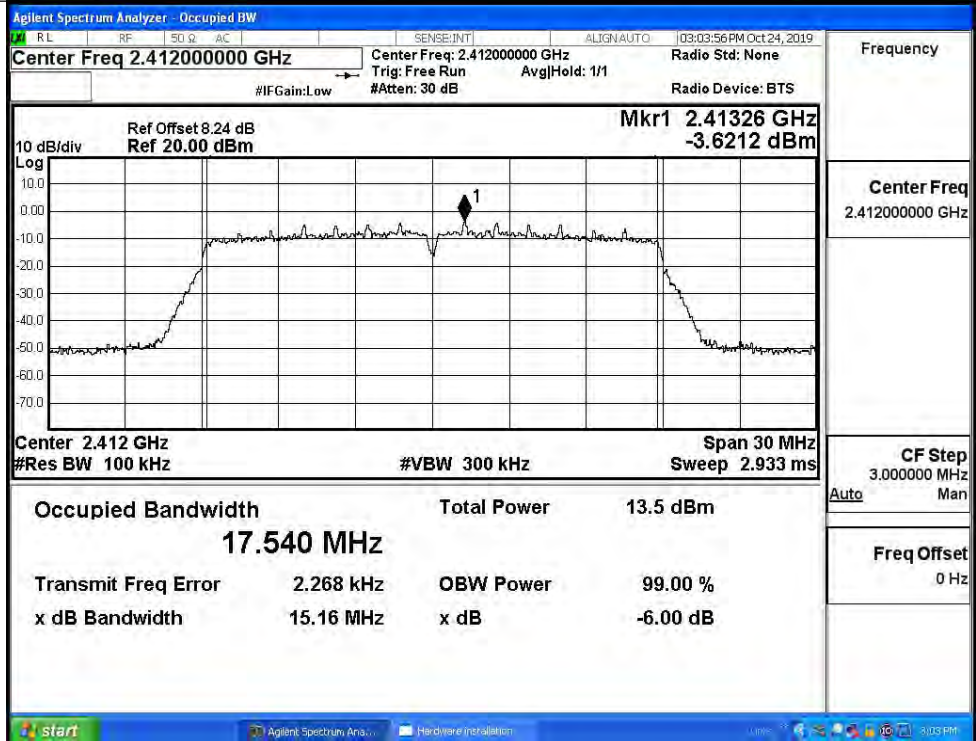


11G/HCH



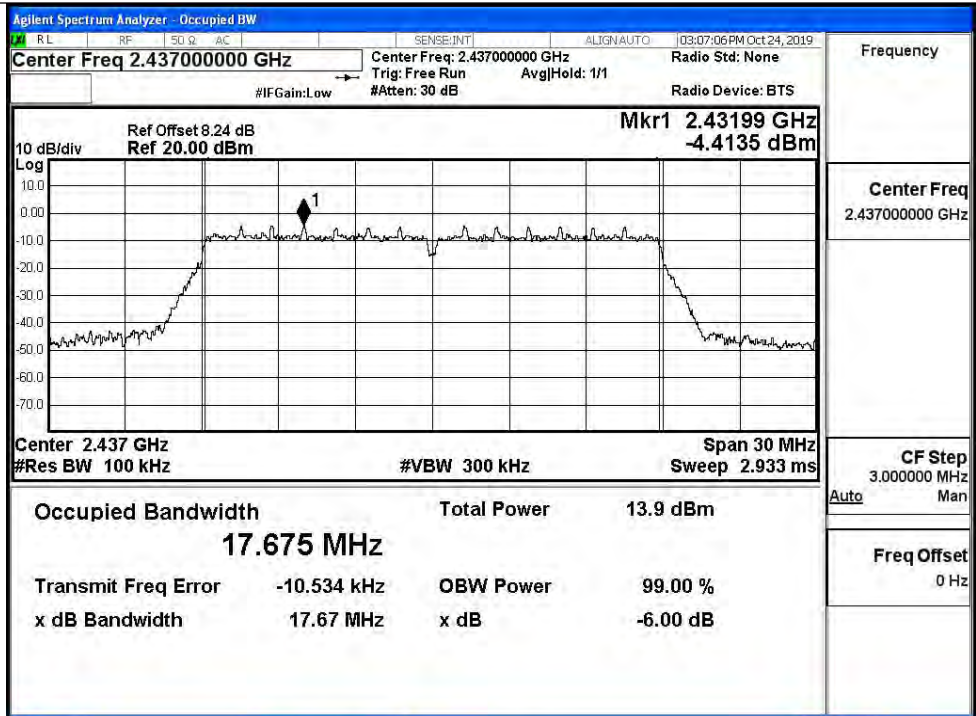
Frequency
 2.46200000 GHz
 CF Step
 3.000000 MHz
 Freq Offset
 0 Hz

11N20SISO/LCH



Frequency
 2.41200000 GHz
 CF Step
 3.000000 MHz
 Freq Offset
 0 Hz

11N20SISO/MCH



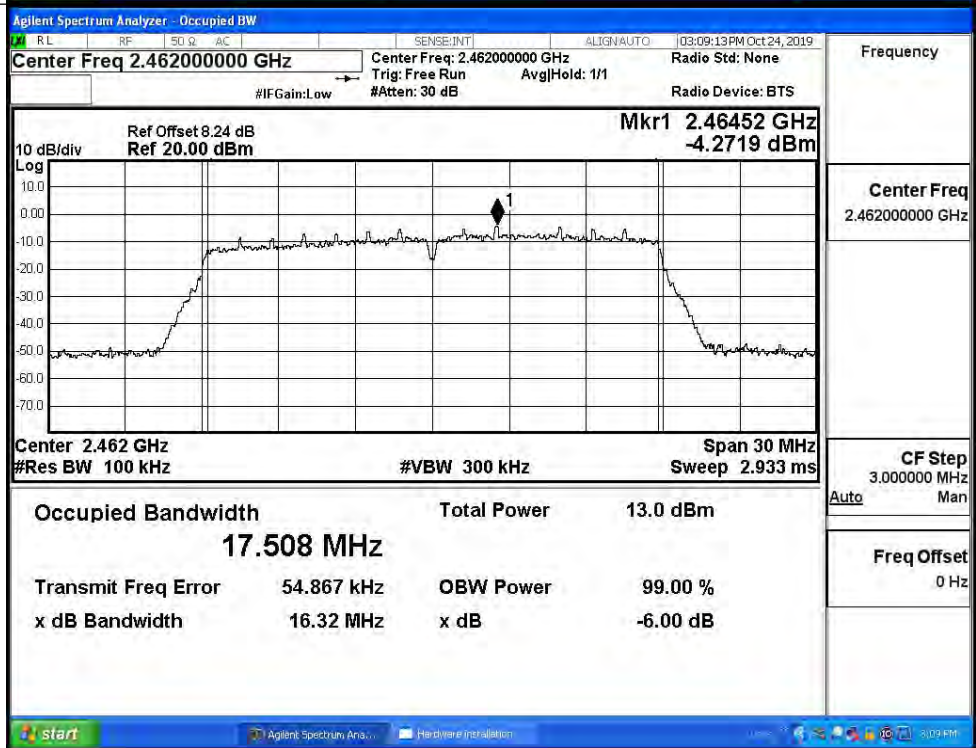
Frequency

Center Freq
2.43700000 GHz

CF Step
3.000000 MHz

Freq Offset
0 Hz

11N20SISO/HCH



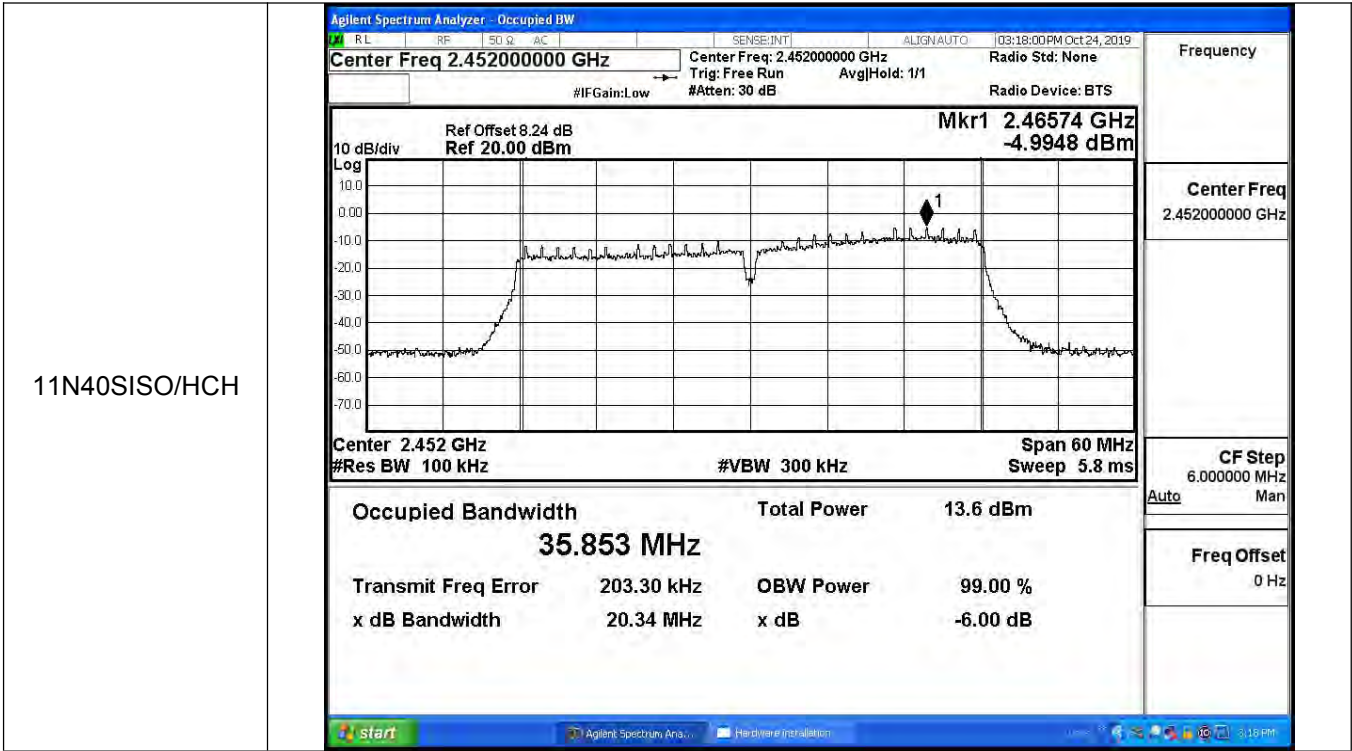
Frequency

Center Freq
2.46200000 GHz

CF Step
3.000000 MHz

Freq Offset
0 Hz

<p>11N40SISO/LCH</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.42200000 GHz</p> <p>Center Freq: 2.42200000 GHz</p> <p>Trig: Free Run</p> <p>Avg Hold: 1/1</p> <p>Radio Std: None</p> <p>Radio Device: BTS</p> <p>Ref Offset 8.24 dB</p> <p>Ref 20.00 dBm</p> <p>Mkr1 2.41324 GHz</p> <p>-5.2669 dBm</p> <p>10 dB/div</p> <p>Log</p> <p>Center 2.422 GHz</p> <p>#Res BW 100 kHz</p> <p>#VBW 300 kHz</p> <p>Span 60 MHz</p> <p>Sweep 5.8 ms</p> <p>Occupied Bandwidth</p> <p>35.770 MHz</p> <p>Total Power</p> <p>13.9 dBm</p> <p>Transmit Freq Error</p> <p>-141.12 kHz</p> <p>OBW Power</p> <p>99.00 %</p> <p>x dB Bandwidth</p> <p>31.37 MHz</p> <p>x dB</p> <p>-6.00 dB</p> <p>start</p> <p>Agilent Spectrum Ana...</p> <p>Hardware Installation</p> <p>03:12:51 PM Oct 24, 2019</p>	<p>Frequency</p> <p>Center Freq</p> <p>2.42200000 GHz</p> <p>CF Step</p> <p>6.000000 MHz</p> <p>Auto</p> <p>Man</p> <p>Freq Offset</p> <p>0 Hz</p>
<p>11N40SISO/MCH</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.43700000 GHz</p> <p>Center Freq: 2.43700000 GHz</p> <p>Trig: Free Run</p> <p>Avg Hold: 1/1</p> <p>Radio Std: None</p> <p>Radio Device: BTS</p> <p>Ref Offset 8.24 dB</p> <p>Ref 20.00 dBm</p> <p>Mkr1 2.41954 GHz</p> <p>-5.8671 dBm</p> <p>10 dB/div</p> <p>Log</p> <p>Center 2.437 GHz</p> <p>#Res BW 100 kHz</p> <p>#VBW 300 kHz</p> <p>Span 60 MHz</p> <p>Sweep 5.8 ms</p> <p>Occupied Bandwidth</p> <p>36.275 MHz</p> <p>Total Power</p> <p>13.9 dBm</p> <p>Transmit Freq Error</p> <p>-13.806 kHz</p> <p>OBW Power</p> <p>99.00 %</p> <p>x dB Bandwidth</p> <p>36.36 MHz</p> <p>x dB</p> <p>-6.00 dB</p> <p>start</p> <p>Agilent Spectrum Ana...</p> <p>Hardware Installation</p> <p>03:15:56 PM Oct 24, 2019</p>	<p>Frequency</p> <p>Center Freq</p> <p>2.43700000 GHz</p> <p>CF Step</p> <p>6.000000 MHz</p> <p>Auto</p> <p>Man</p> <p>Freq Offset</p> <p>0 Hz</p>



B.5 RF Conducted Spurious Emissions

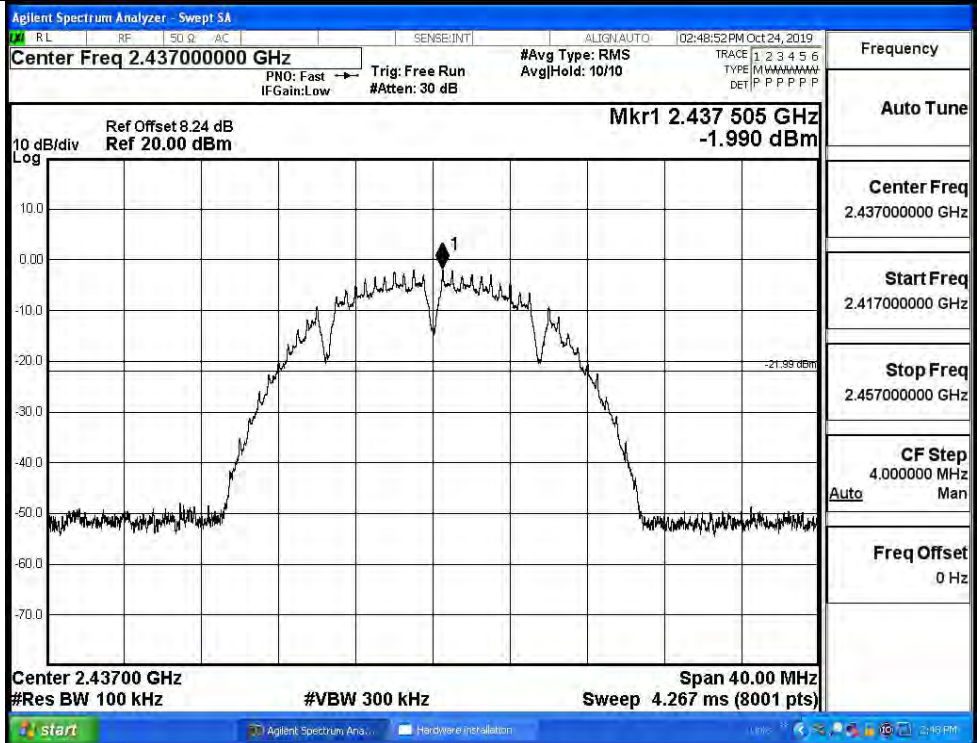
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
11B	LCH	-1.29	-36.965	-21.290	PASS
	MCH	-1.99	-36.576	-21.990	PASS
	HCH	-1.881	-36.737	-21.881	PASS
11G	LCH	-4.419	-37.080	-24.419	PASS
	MCH	-4.461	-37.269	-24.461	PASS
	HCH	-4.047	-37.481	-24.047	PASS
11N20 SISO	LCH	-4.043	-37.723	-24.043	PASS
	MCH	-4.43	-37.230	-24.430	PASS
	HCH	-4.023	-38.156	-24.023	PASS
11N40 SISO	LCH	-5.323	-37.143	-25.323	PASS
	MCH	-6.15	-37.531	-26.150	PASS
	HCH	-5.152	-36.730	-25.152	PASS

11B LCH Graphs

<p>Pref/11B/LCH</p>	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.41200000 GHz Ref Offset 8.24 dB Ref 20.00 dBm Mkr1 2.412 505 GHz -1.290 dBm 10 dB/div Log Center 2.41200 GHz #Res BW 100 kHz #VBW 300 kHz Span 40.00 MHz Sweep 4.267 ms (8001 pts)</p>
<p>Puw/11B/LCH</p>	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 13.01500000 GHz Ref Offset 8.24 dB Ref 20.00 dBm Mkr2 24.760 GHz -36.965 dBm 10 dB/div Log Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Stop 26.00 GHz Sweep 2.482 s (8001 pts)</p>

11B_MCH_Graphs

Pref/11B/MCH



Frequency
Auto Tune
Center Freq 2.437000000 GHz
Start Freq 2.417000000 GHz
Stop Freq 2.457000000 GHz
CF Step 4.000000 MHz Auto Man
Freq Offset 0 Hz

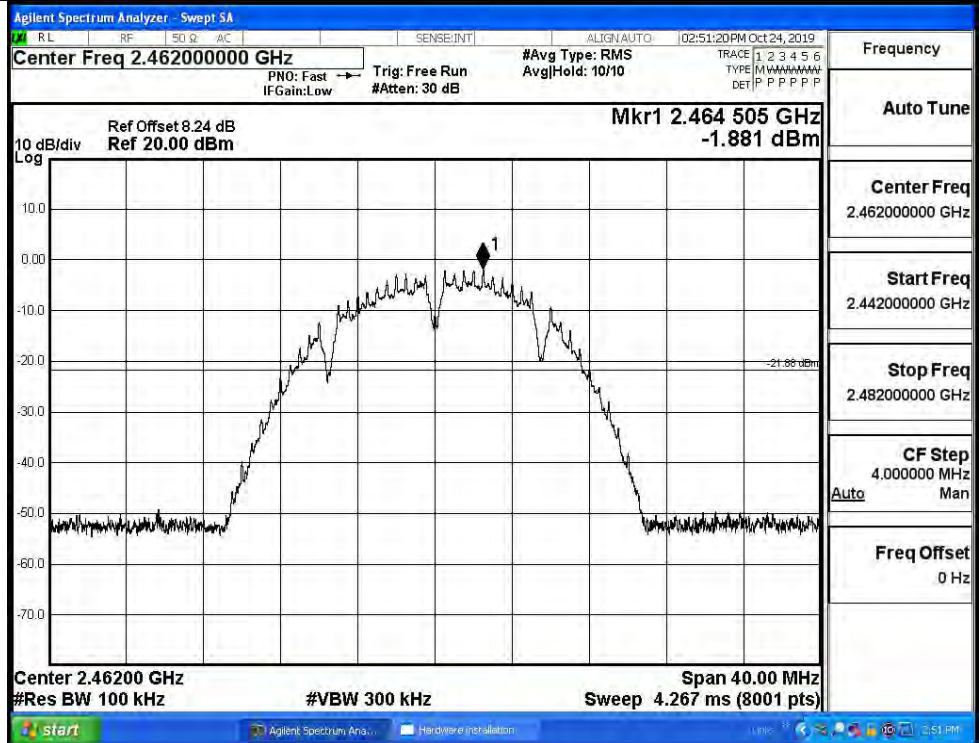
Puw/11B/MCH



Frequency
Auto Tune
Center Freq 13.015000000 GHz
Start Freq 30.000000 MHz
Stop Freq 26.000000000 GHz
CF Step 2.597000000 GHz Auto Man
Freq Offset 0 Hz

11B HCH Graphs

Pref/11B/HCH



Frequency
Auto Tune
Center Freq 2.462000000 GHz
Start Freq 2.442000000 GHz
Stop Freq 2.482000000 GHz
CF Step 4.000000 MHz Auto Man
Freq Offset 0 Hz

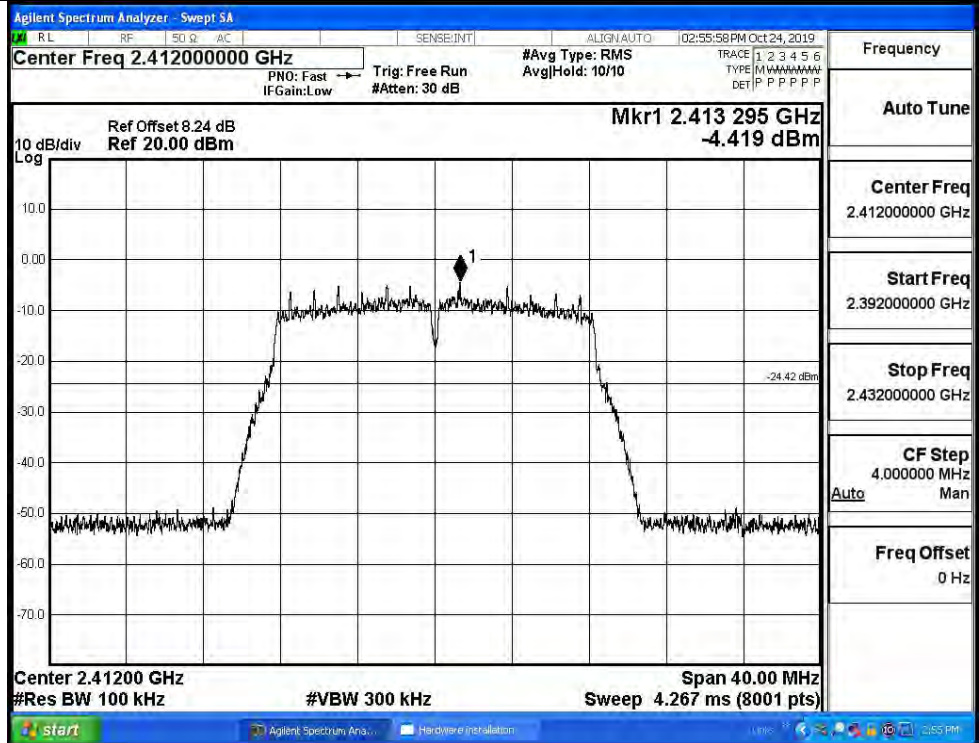
Puw/11B/HCH



Frequency
Auto Tune
Center Freq 13.015000000 GHz
Start Freq 30.000000 MHz
Stop Freq 26.000000000 GHz
CF Step 2.597000000 GHz Auto Man
Freq Offset 0 Hz

11G LCH Graphs

Pref/11G/LCH

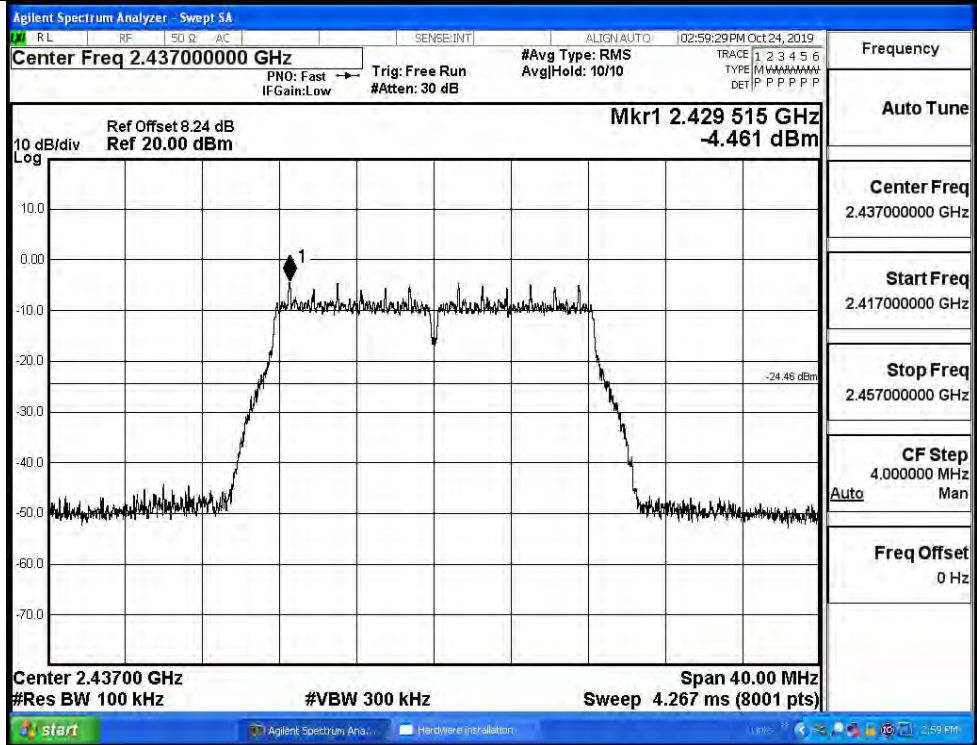


Puw/11G/LCH



11G MCH Graphs

Pref/11G/MCH

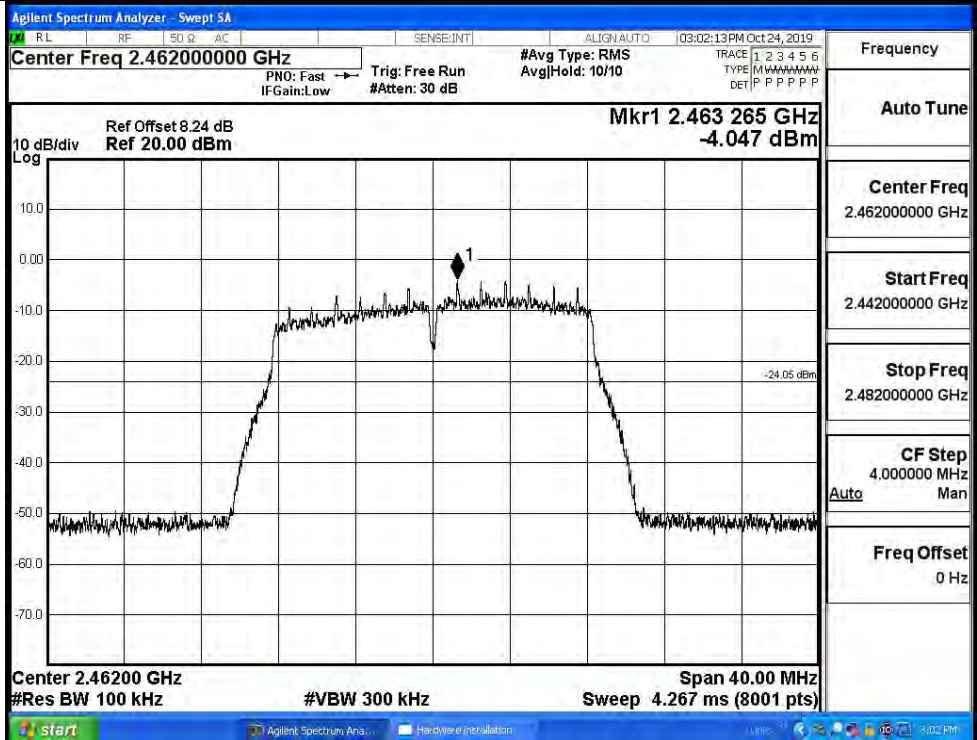


Puw/11G/MCH



11G_HCH_Graphs

Pref/11G/HCH

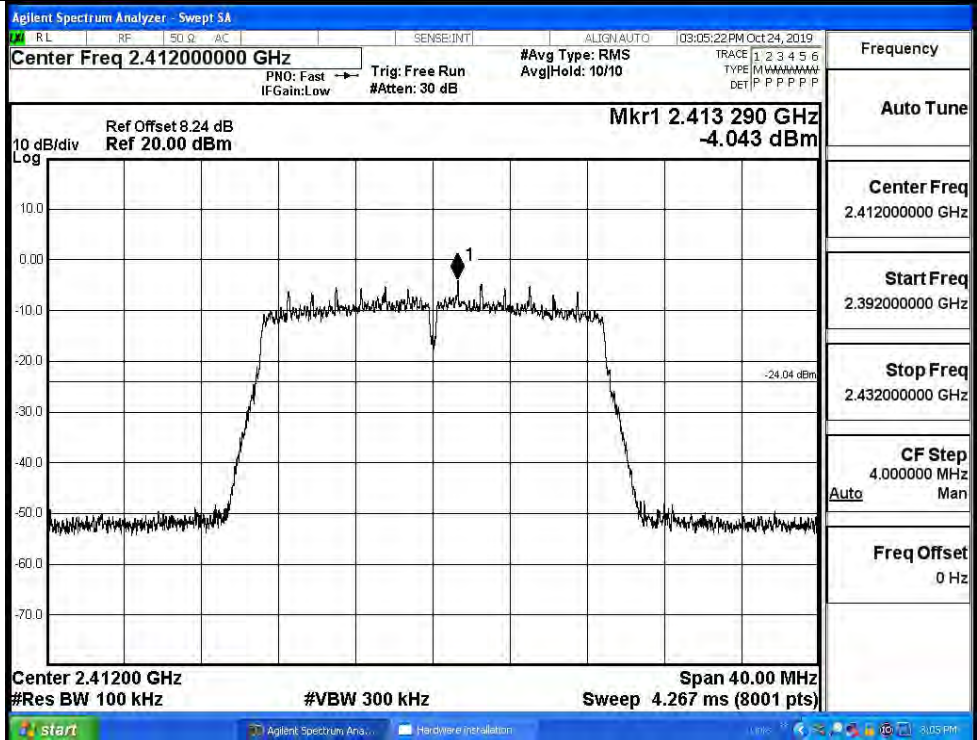


Puw/11G/HCH



11N20SISO_LCH_Graphs

Pref/11N20SIS
O/LCH



Frequency
Auto Tune
Center Freq 2.412000000 GHz
Start Freq 2.392000000 GHz
Stop Freq 2.432000000 GHz
CF Step 4.000000 MHz Auto Man
Freq Offset 0 Hz

Puw/11N20
SISO/LCH



Frequency
Auto Tune
Center Freq 13.015000000 GHz
Start Freq 30.000000 MHz
Stop Freq 26.000000000 GHz
CF Step 2.597000000 GHz Auto Man
Freq Offset 0 Hz

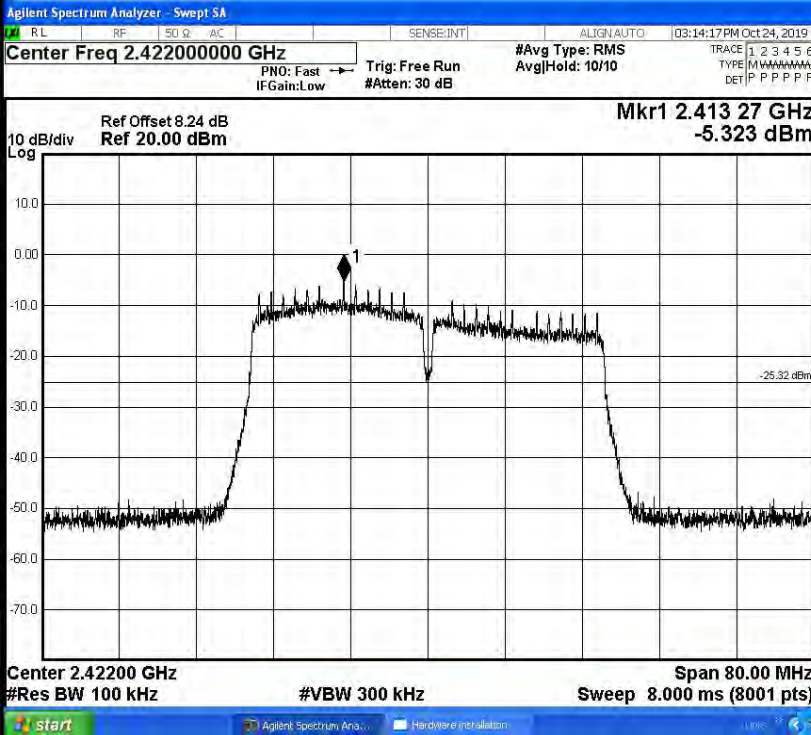
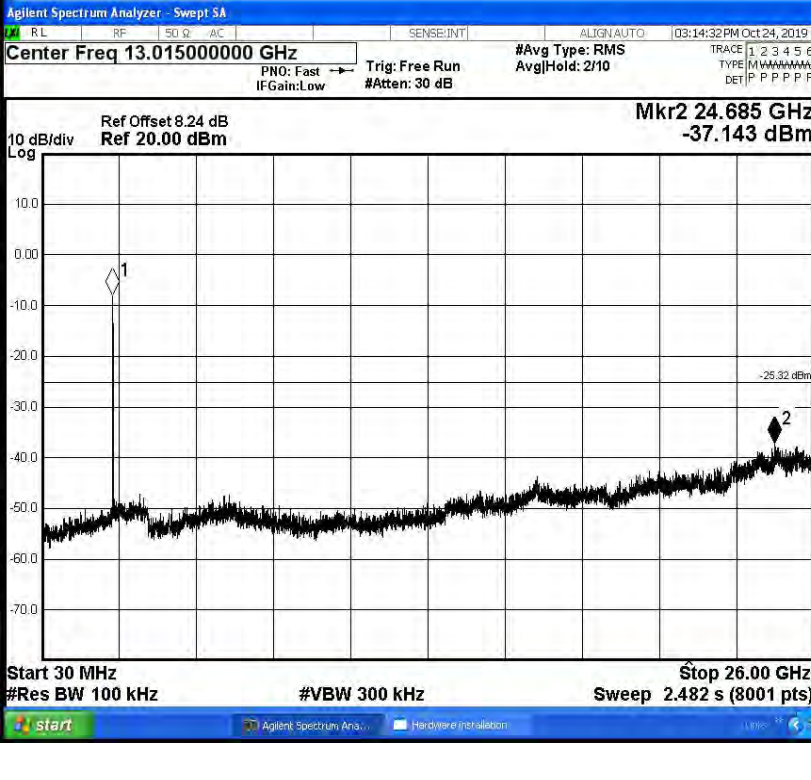
11N20SISO_MCH_Graphs

<p>Pref/11N20 SISO/MCH</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.437000000 GHz</p> <p>Start Freq 2.417000000 GHz</p> <p>Stop Freq 2.457000000 GHz</p> <p>CF Step 4.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>Puw/11N20 SISO/MCH</p>		<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 13.015000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 26.000000000 GHz</p> <p>CF Step 2.597000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>

11N20SISO_HCH_Graphs

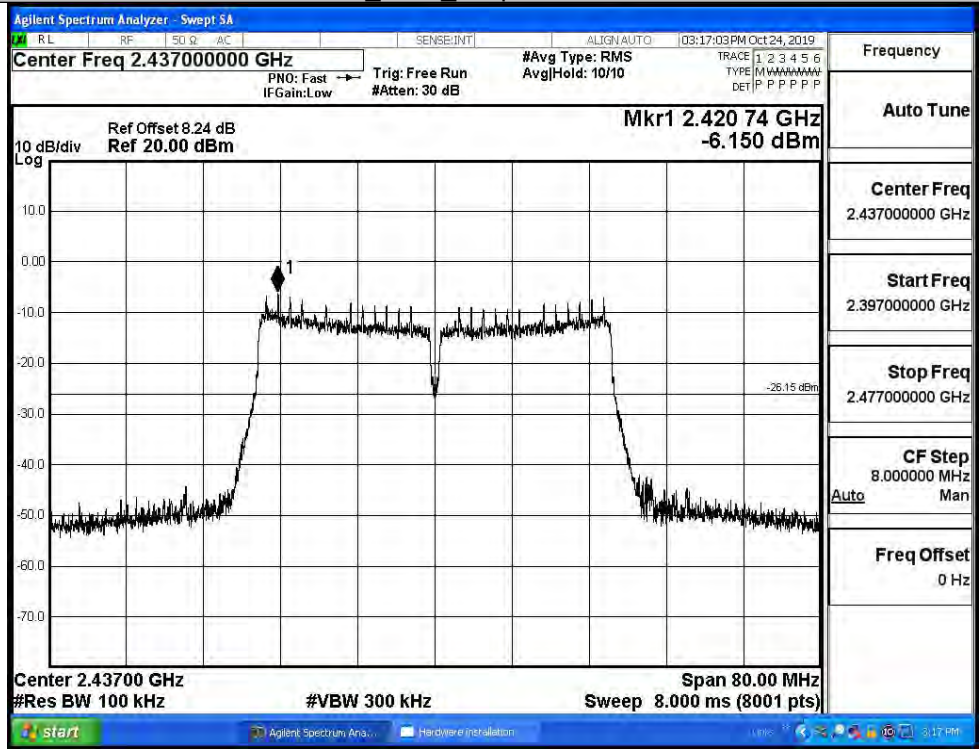
<p>Pref/11N20 SISO/HCH</p>		<p>Frequency Auto Tune Center Freq 2.462000000 GHz Start Freq 2.442000000 GHz Stop Freq 2.482000000 GHz CF Step 4.000000 MHz Auto Man Freq Offset 0 Hz</p>
<p>Puw/11N20 SISO/HCH</p>		<p>Frequency Auto Tune Center Freq 13.015000000 GHz Start Freq 30.000000 MHz Stop Freq 26.000000000 GHz CF Step 2.597000000 GHz Auto Man Freq Offset 0 Hz</p>

11N40SISO_LCH_Graphs

<p>Pref/11N40 SISO/LCH</p>		<p>Frequency Auto Tune Center Freq 2.422000000 GHz Start Freq 2.382000000 GHz Stop Freq 2.462000000 GHz CF Step 8.000000 MHz Auto Man Freq Offset 0 Hz</p>
<p>Puw/11N40 SISO/LCH</p>		<p>Frequency Auto Tune Center Freq 13.015000000 GHz Start Freq 30.000000 MHz Stop Freq 26.000000000 GHz CF Step 2.597000000 GHz Auto Man Freq Offset 0 Hz</p>

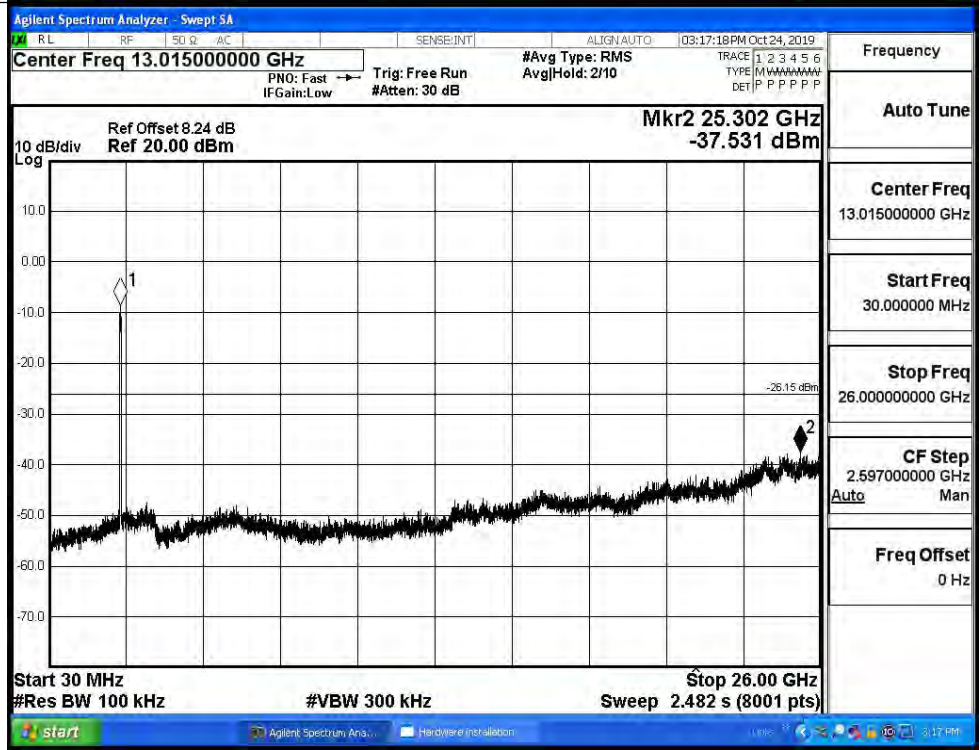
11N40SISO_MCH_Graphs

Pref/11N40
SISO/MCH



Frequency
Auto Tune
Center Freq 2.437000000 GHz
Start Freq 2.397000000 GHz
Stop Freq 2.477000000 GHz
CF Step 8.000000 MHz Auto Man
Freq Offset 0 Hz

Puw/11N40
SISO/MCH



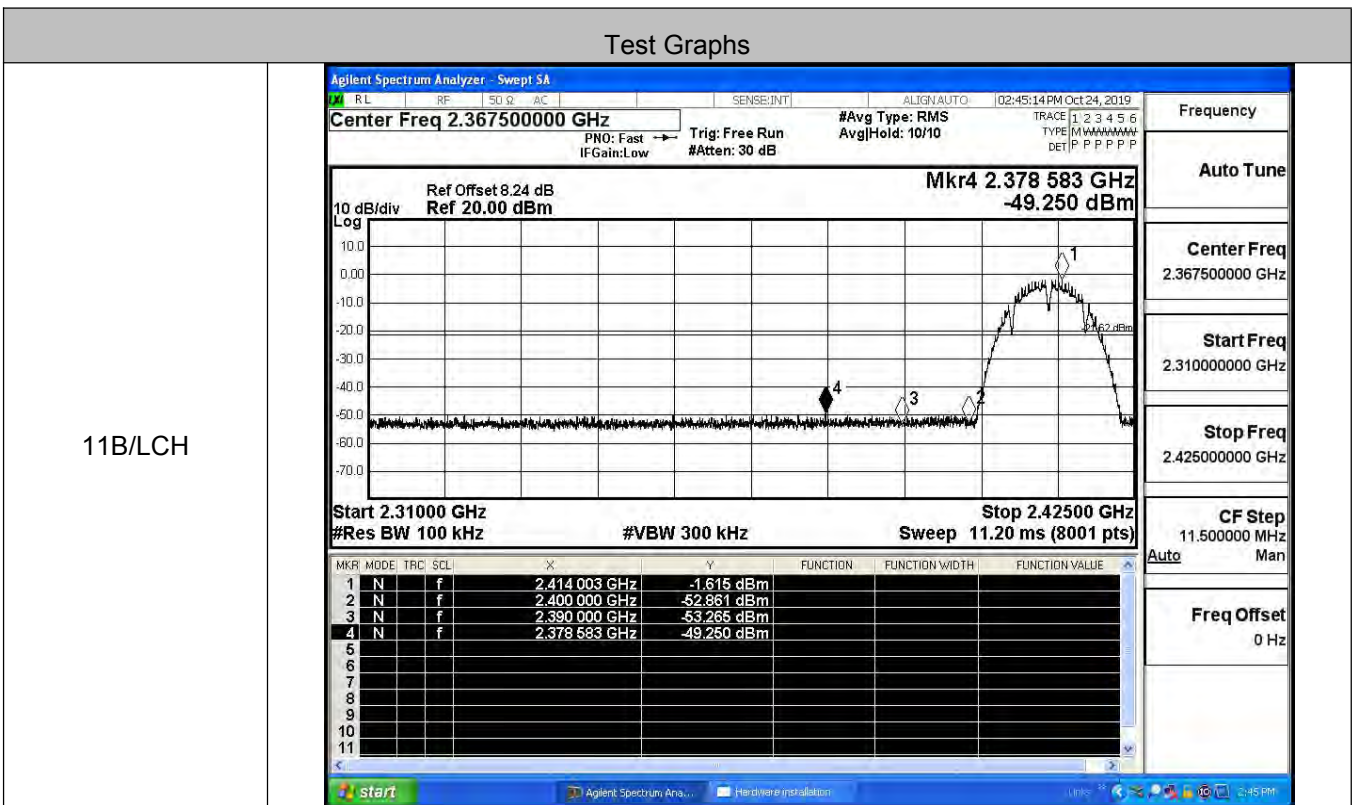
Frequency
Auto Tune
Center Freq 13.015000000 GHz
Start Freq 30.000000 MHz
Stop Freq 26.000000000 GHz
CF Step 2.597000000 GHz Auto Man
Freq Offset 0 Hz

11N40SISO_HCH_Graphs

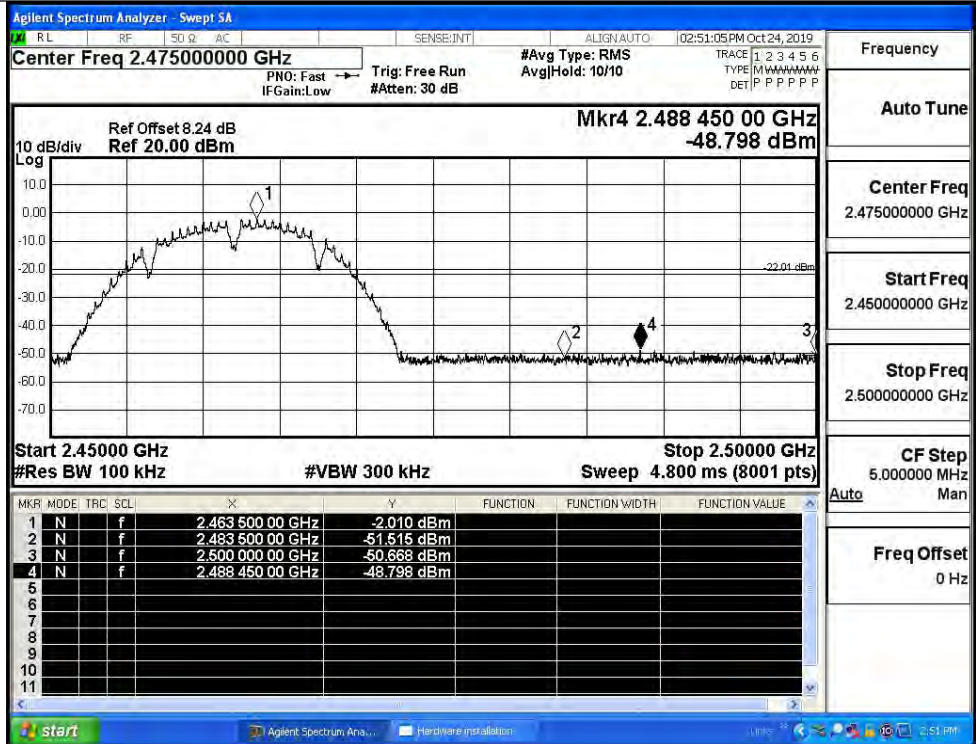
<p>Pref/11N40 SISO/HCH</p>	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.45200000 GHz Ref Offset 8.24 dB Ref 20.00 dBm Mkr1 2.46327 GHz -5.152 dBm 10 dB/div Log Start 2.45200 GHz #Res BW 300 kHz #VBW 300 kHz Span 80.00 MHz Sweep 8.000 ms (8001 pts)</p>	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.452000000 GHz</p> <p>Start Freq 2.412000000 GHz</p> <p>Stop Freq 2.492000000 GHz</p> <p>CF Step 8.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>Puw/11N40 SISO/HCH</p>	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 13.01500000 GHz Ref Offset 8.24 dB Ref 20.00 dBm Mkr2 24.760 GHz -36.730 dBm 10 dB/div Log Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Stop 26.00 GHz Sweep 2.482 s (8001 pts)</p>	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 13.015000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 26.000000000 GHz</p> <p>CF Step 2.597000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>

B.6 Band-edge for RF Conducted Emissions

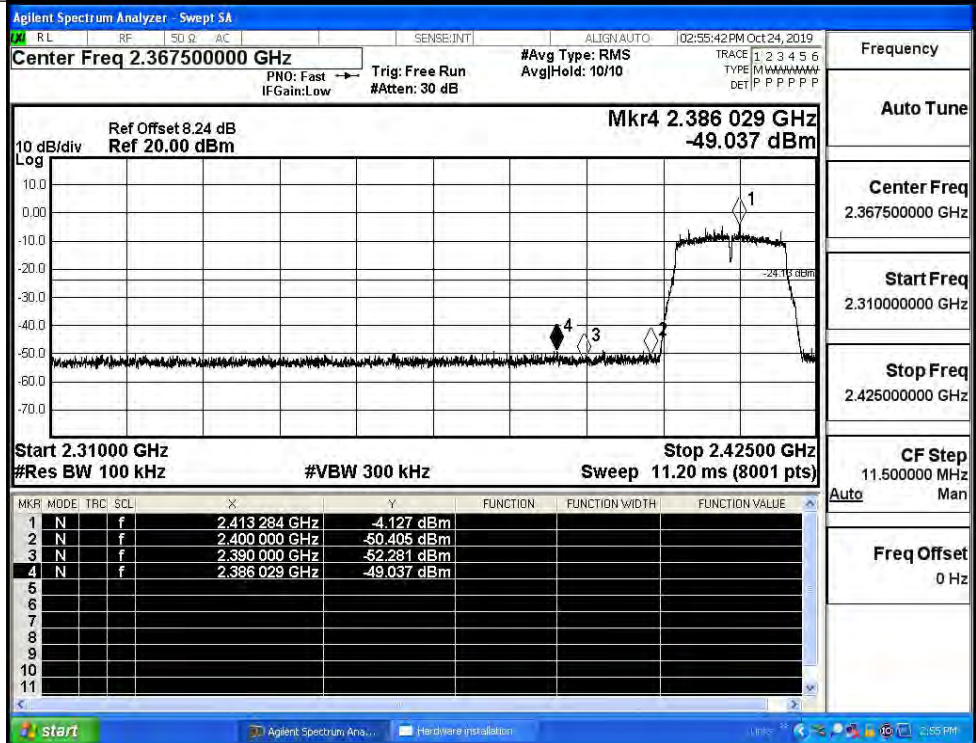
Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
11B	LCH	-1.615	-49.250	-21.62	PASS
	HCH	-2.010	-48.798	-22.01	PASS
11G	LCH	-4.127	-49.037	-24.13	PASS
	HCH	-4.044	-49.032	-24.04	PASS
11N20SISO	LCH	-4.466	-49.013	-24.47	PASS
	HCH	-3.982	-48.713	-23.98	PASS
11N40SISO	LCH	-5.388	-49.811	-25.39	PASS
	HCH	-5.068	-48.969	-25.07	PASS



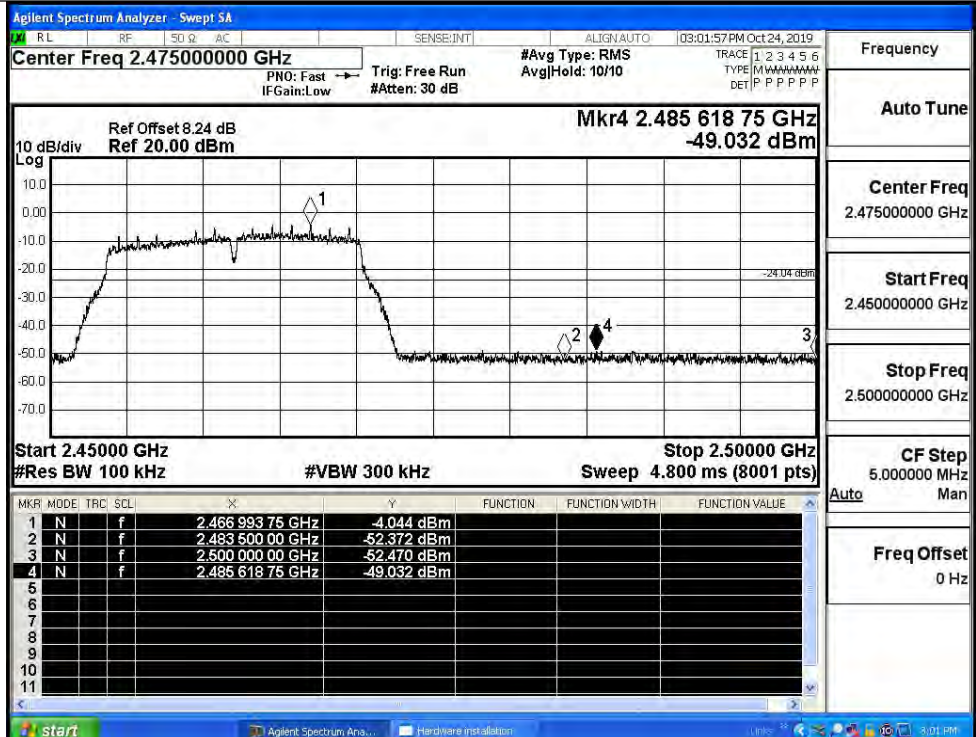
11B/HCH



11G/LCH

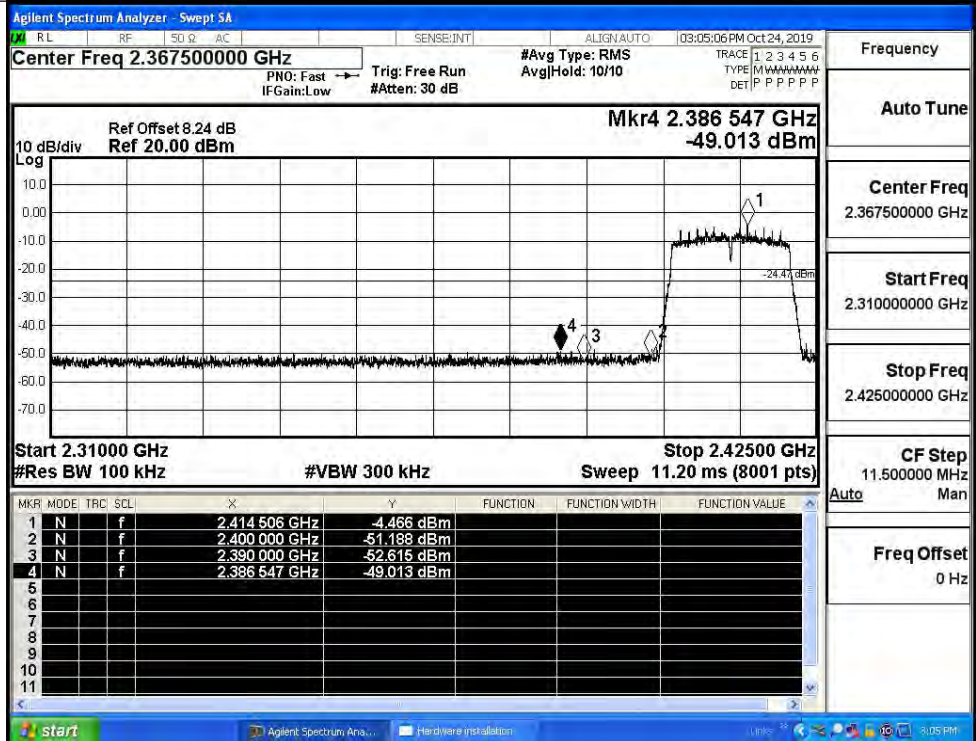


11G/HCH



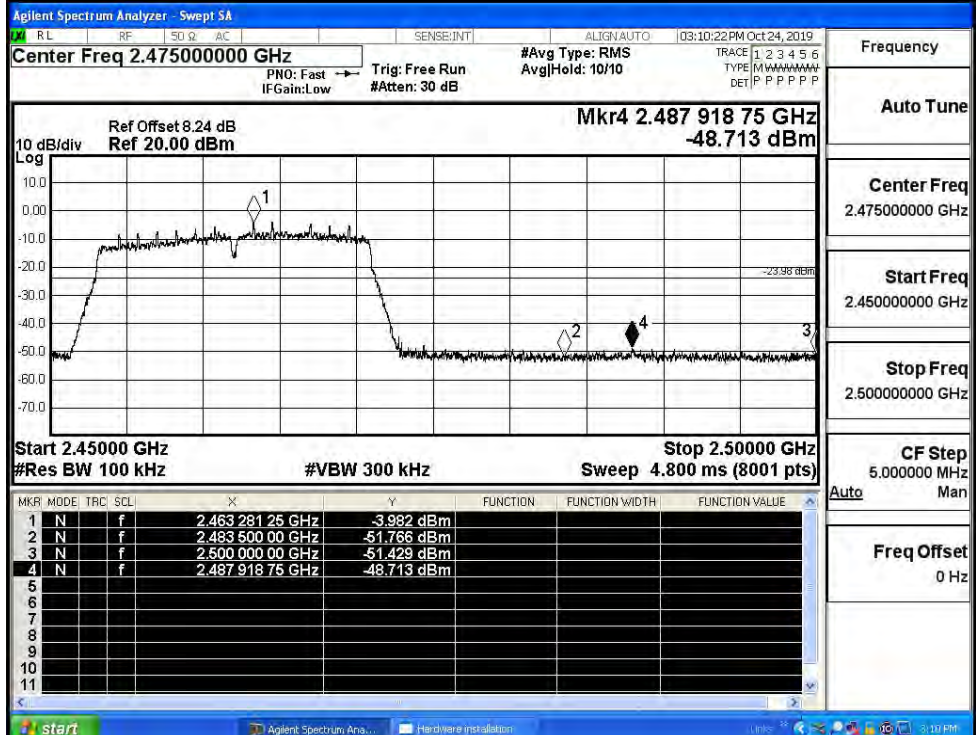
Frequency
Auto Tune
Center Freq
2.475000000 GHz
Start Freq
2.450000000 GHz
Stop Freq
2.500000000 GHz
CF Step
5.000000 MHz
Man
Freq Offset
0 Hz

11N20SISO/LCH

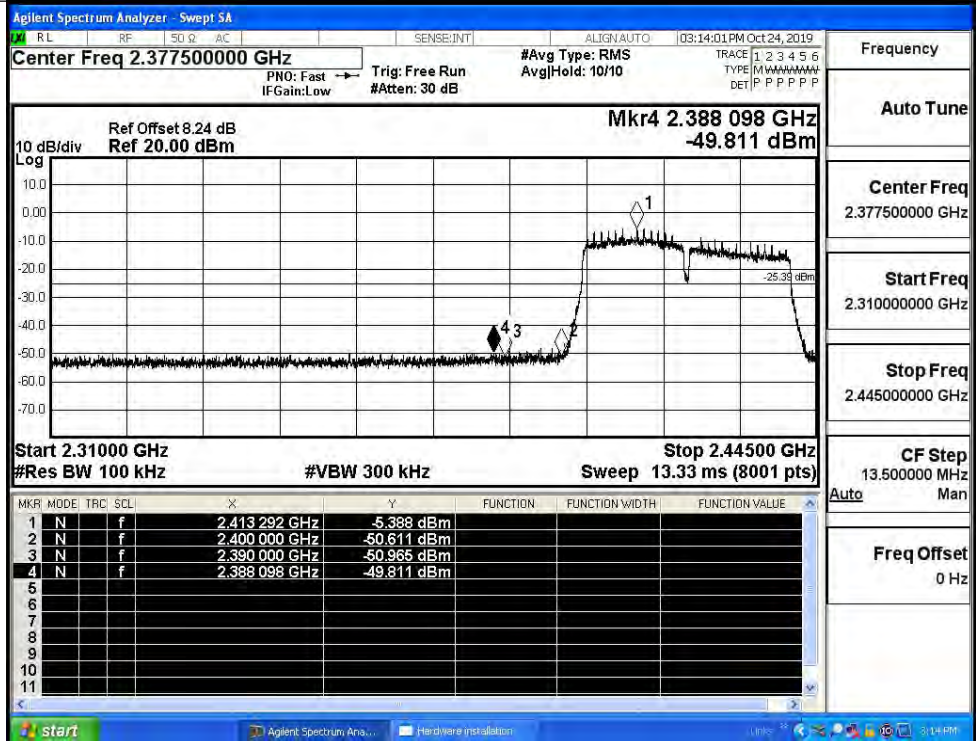


Frequency
Auto Tune
Center Freq
2.367500000 GHz
Start Freq
2.310000000 GHz
Stop Freq
2.425000000 GHz
CF Step
11.500000 MHz
Man
Freq Offset
0 Hz

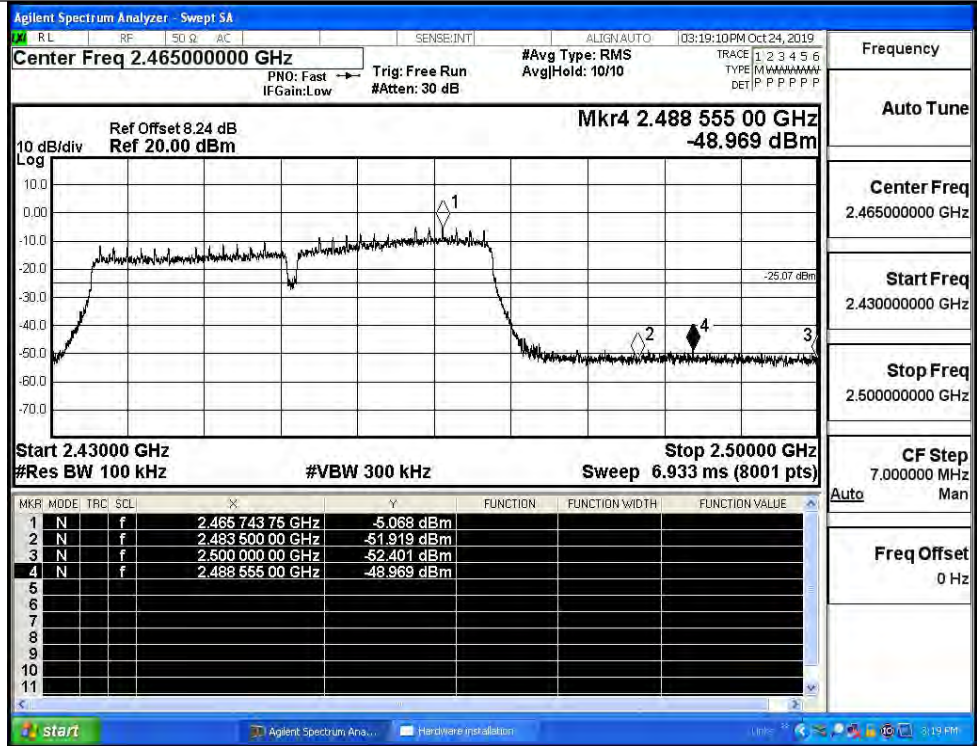
11N20SISO/HCH



11N40SISO/LCH



11N40SISO/HCH

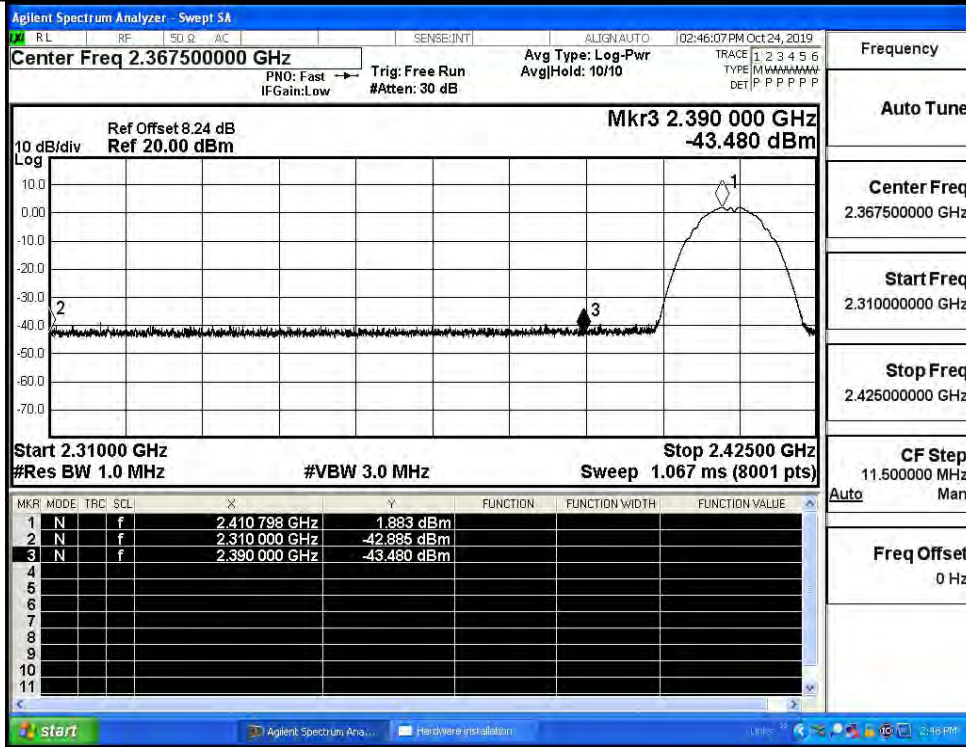


B.7 Restrict-band band-edge measurements

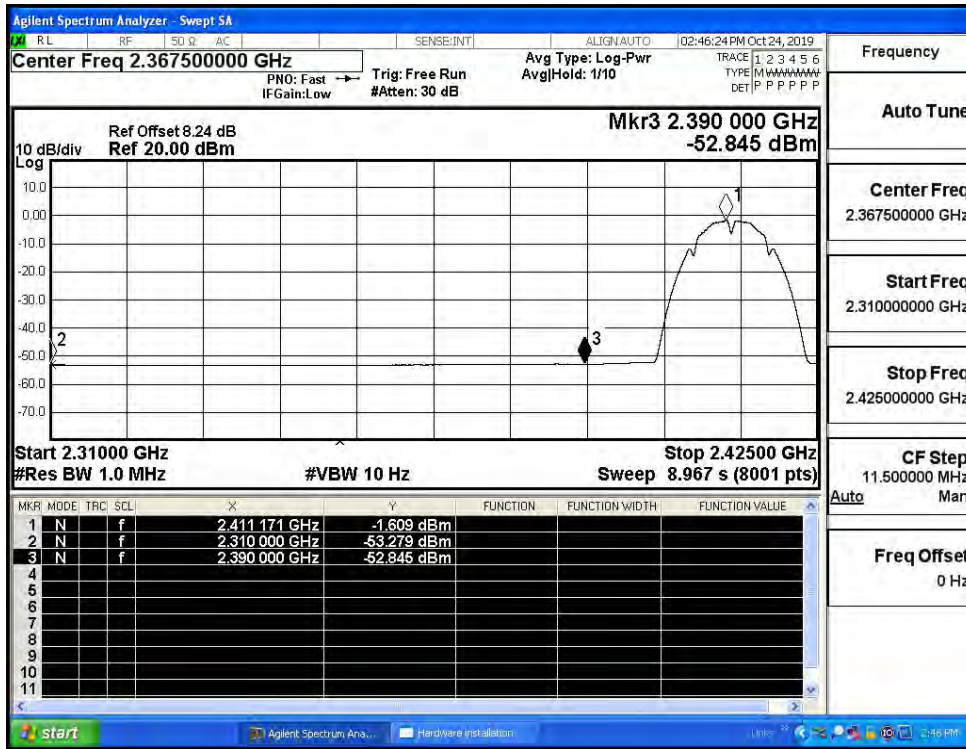
Test Mode	Test Channel	Ant	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBu V/m]	Verdict
11B	2412	Ant1	2310.0	-42.89	2.38	0	54.72	PEAK	74	PASS
	2412	Ant1	2310.0	-53.28	2.38	0	44.33	AV	54	PASS
	2412	Ant1	2390.0	-43.48	2.38	0	54.13	PEAK	74	PASS
	2412	Ant1	2390.0	-52.85	2.38	0	44.76	AV	54	PASS
	2462	Ant1	2483.5	-41.57	2.38	0	56.04	PEAK	74	PASS
	2462	Ant1	2483.5	-52.38	2.38	0	45.23	AV	54	PASS
	2462	Ant1	2500.0	-42.26	2.38	0	55.35	PEAK	74	PASS
	2462	Ant1	2500.0	-52.27	2.38	0	45.34	AV	54	PASS
11G	2412	Ant1	2310.0	-41.20	2.38	0	56.41	PEAK	74	PASS
	2412	Ant1	2310.0	-53.26	2.38	0	44.35	AV	54	PASS
	2412	Ant1	2390.0	-41.04	2.38	0	56.57	PEAK	74	PASS
	2412	Ant1	2390.0	-52.58	2.38	0	45.03	AV	54	PASS
	2462	Ant1	2483.5	-41.58	2.38	0	56.03	PEAK	74	PASS
	2462	Ant1	2483.5	-52.15	2.38	0	45.46	AV	54	PASS
	2462	Ant1	2500.0	-41.32	2.38	0	56.29	PEAK	74	PASS
	2462	Ant1	2500.0	-52.30	2.38	0	45.31	AV	54	PASS
11N20 SISO	2412	Ant1	2310.0	-43.06	2.38	0	54.55	PEAK	74	PASS
	2412	Ant1	2310.0	-53.23	2.38	0	44.38	AV	54	PASS
	2412	Ant1	2390.0	-42.45	2.38	0	55.16	PEAK	74	PASS
	2412	Ant1	2390.0	-52.57	2.38	0	45.04	AV	54	PASS
	2462	Ant1	2483.5	-43.07	2.38	0	54.54	PEAK	74	PASS
	2462	Ant1	2483.5	-52.17	2.38	0	45.44	AV	54	PASS
	2462	Ant1	2500.0	-42.17	2.38	0	55.44	PEAK	74	PASS
	2462	Ant1	2500.0	-52.30	2.38	0	45.31	AV	54	PASS
11N40 SISO	2422	Ant1	2310.0	-43.54	2.38	0	54.07	PEAK	74	PASS
	2422	Ant1	2310.0	-53.24	2.38	0	44.37	AV	54	PASS

	2422	Ant1	2390.0	-41.43	2.38	0	56.18	PEAK	74	PASS
	2422	Ant1	2390.0	-52.25	2.38	0	45.36	AV	54	PASS
	2452	Ant1	2483.5	-42.27	2.38	0	55.34	PEAK	74	PASS
	2452	Ant1	2483.5	-51.94	2.38	0	45.67	AV	54	PASS
	2452	Ant1	2500.0	-42.78	2.38	0	54.83	PEAK	74	PASS
	2452	Ant1	2500.0	-52.29	2.38	0	45.32	AV	54	PASS

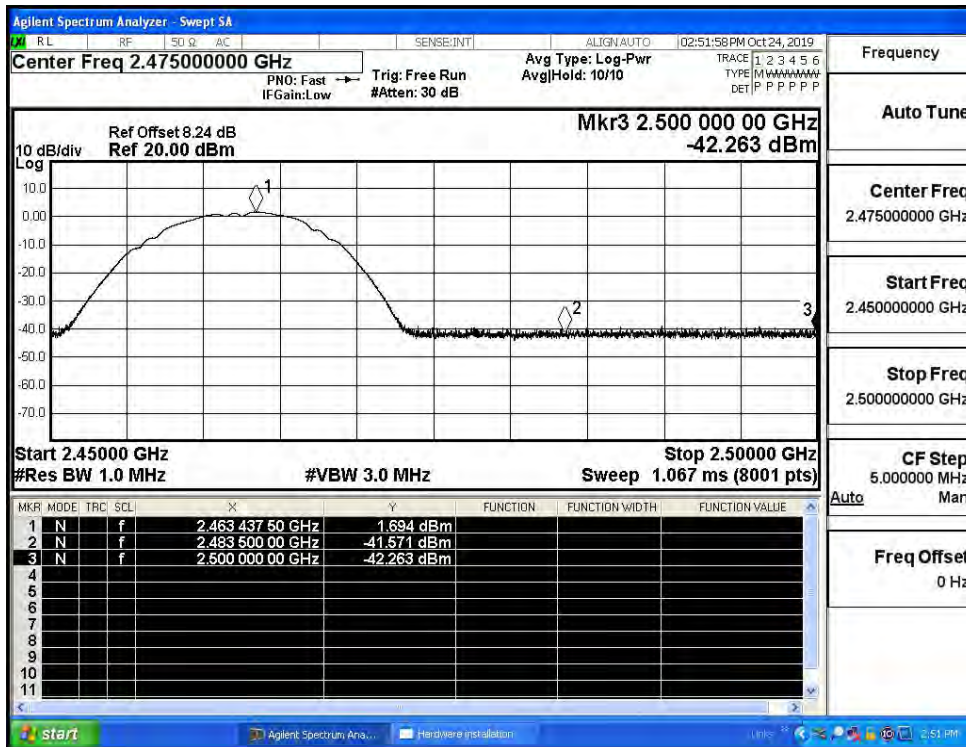
Restrict-band band-edge measurements_11B_2412_Ant1_PEAK



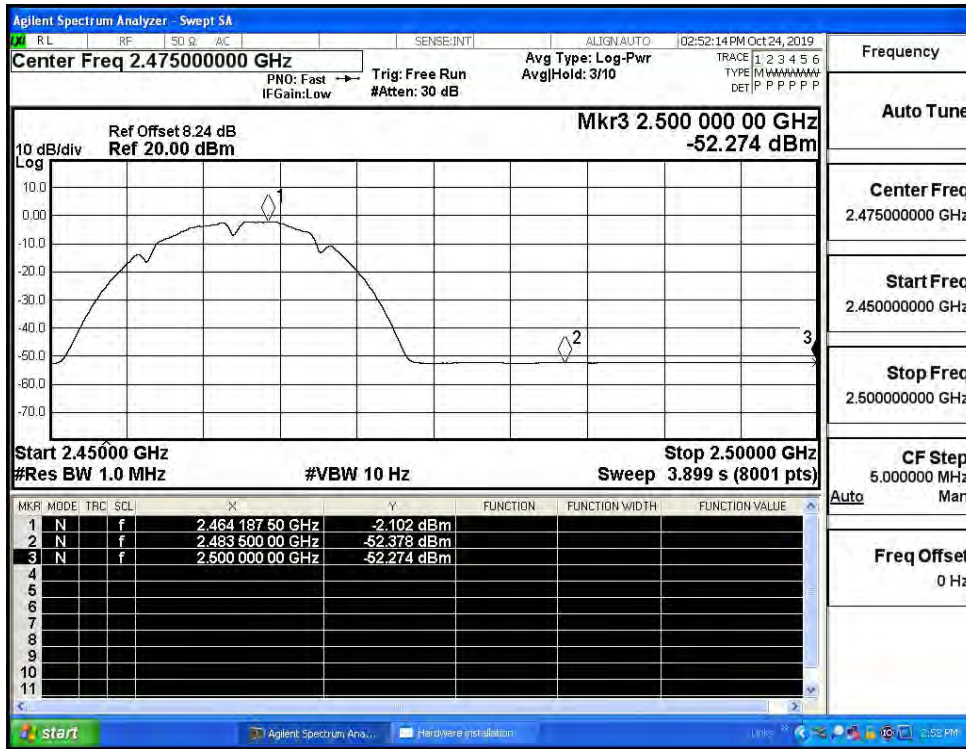
Restrict-band band-edge measurements_11B_2412_Ant1_AV



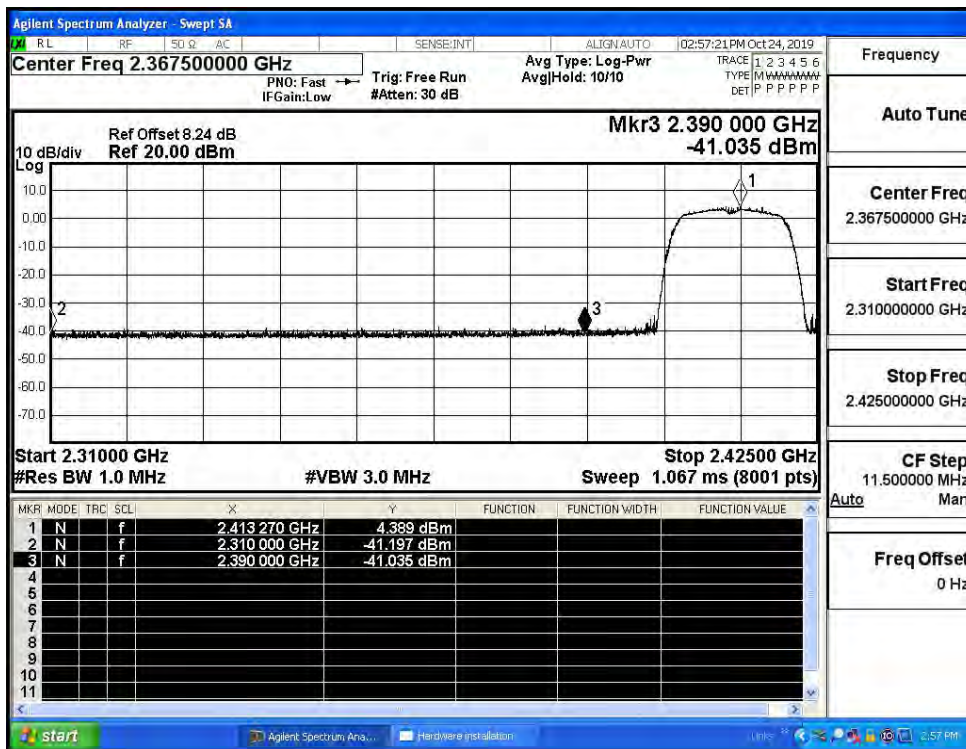
Restrict-band band-edge measurements_11B_2462_Ant1_PEAK



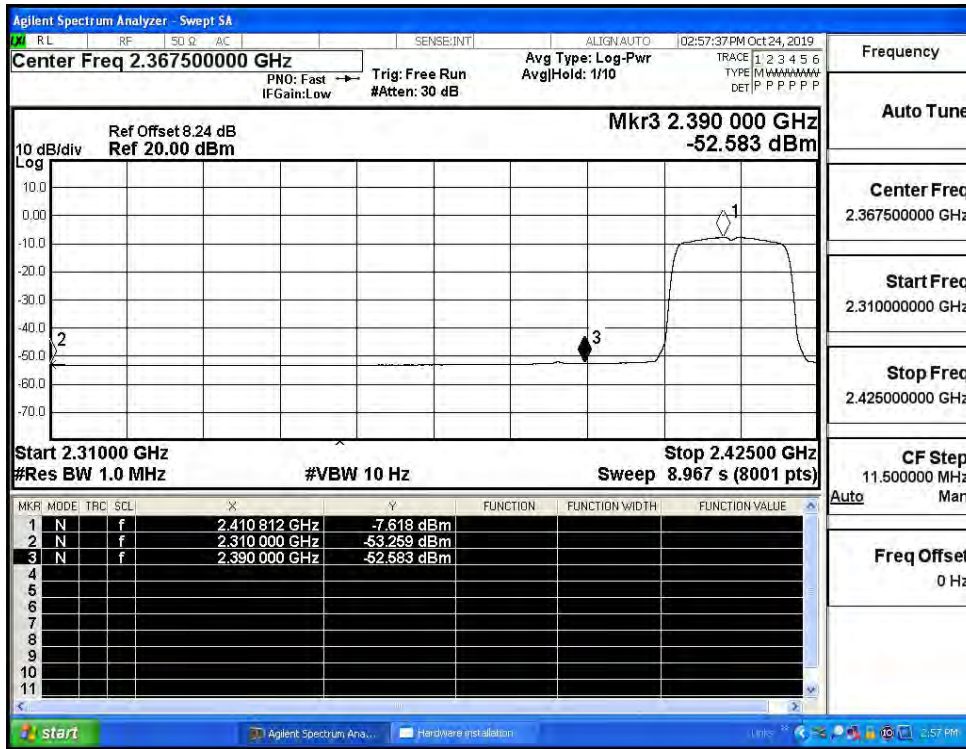
Restrict-band band-edge measurements_11B_2462_Ant1_AV



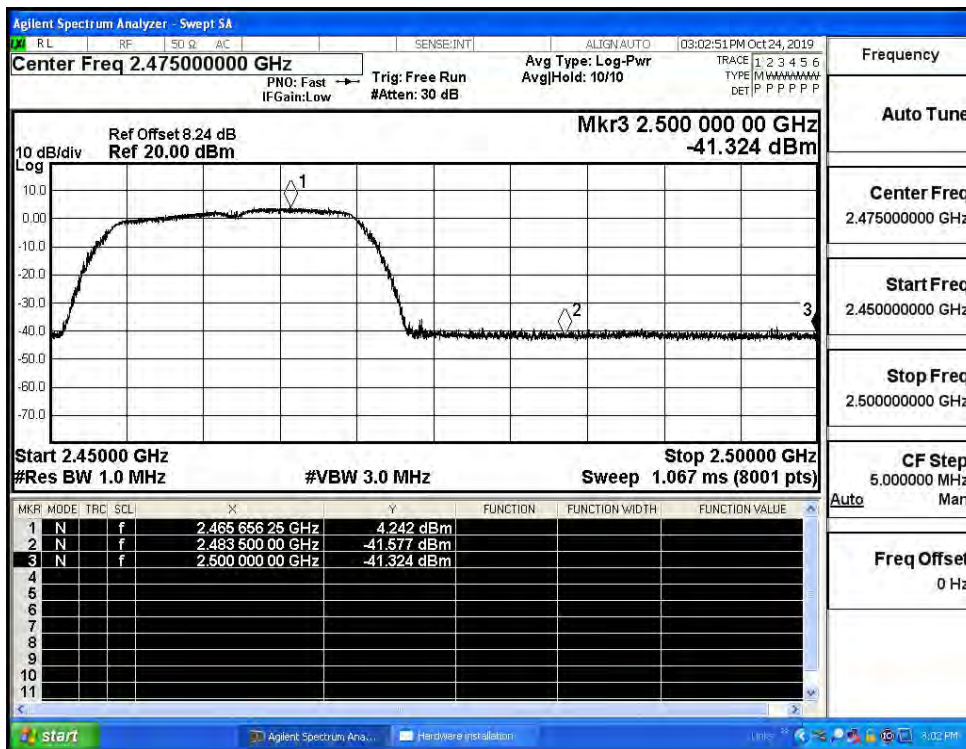
Restrict-band band-edge measurements_11G_2412_Ant1_PEAK



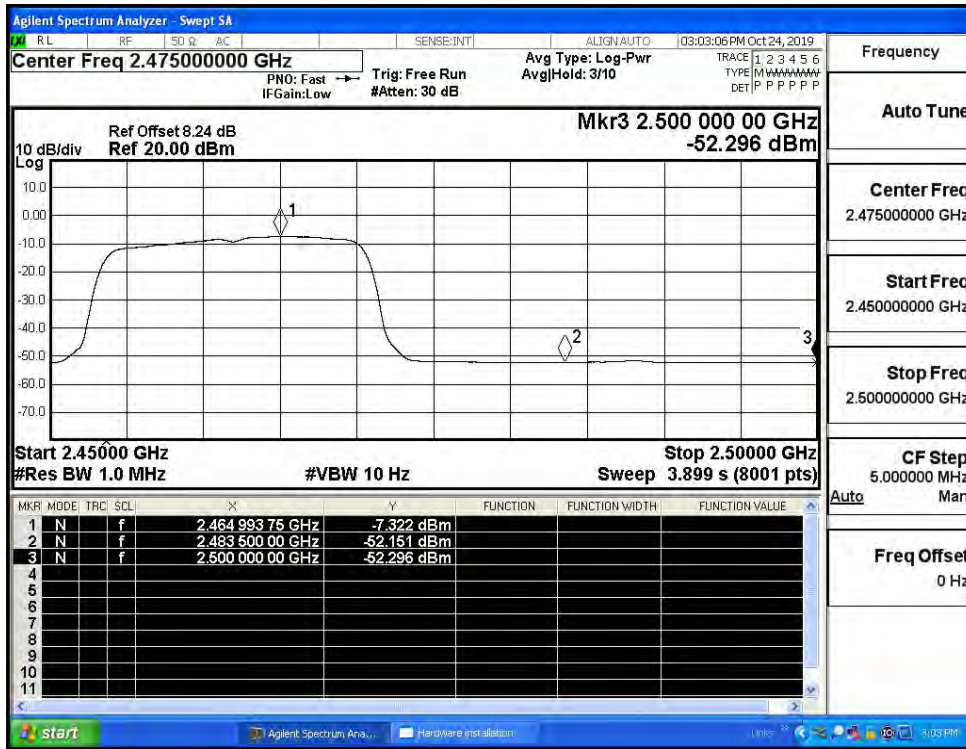
Restrict-band band-edge measurements_11G_2412_Ant1_AV



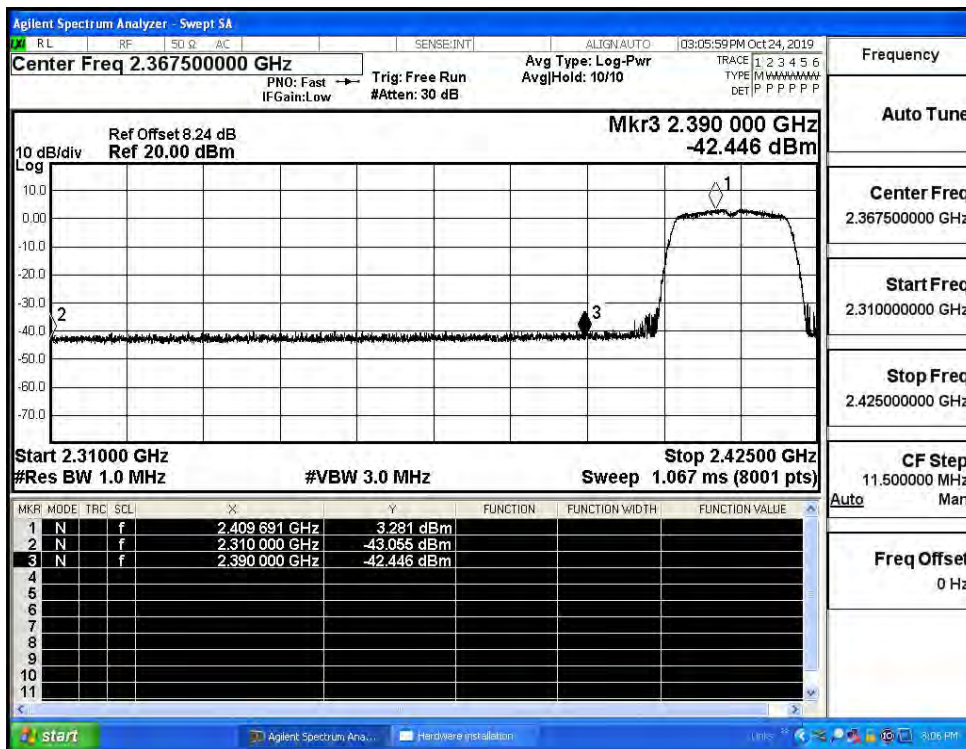
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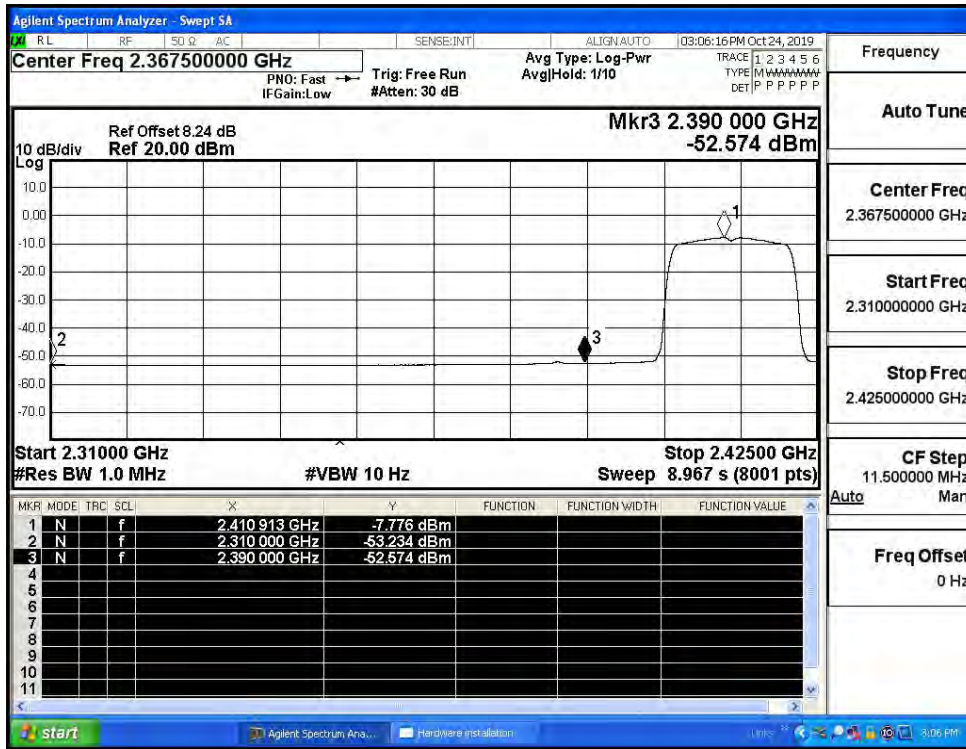
Restrict-band band-edge measurements_11G_2462_Ant1_AV



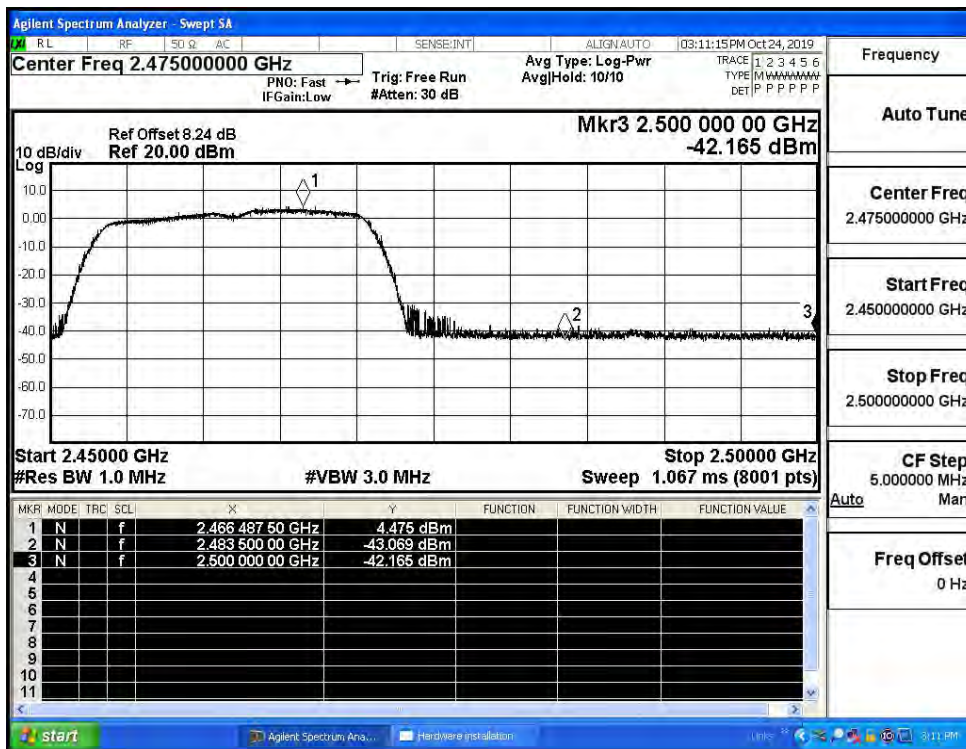
Restrict-band band-edge measurements_11N20SISO_2412_Ant1_PEAK



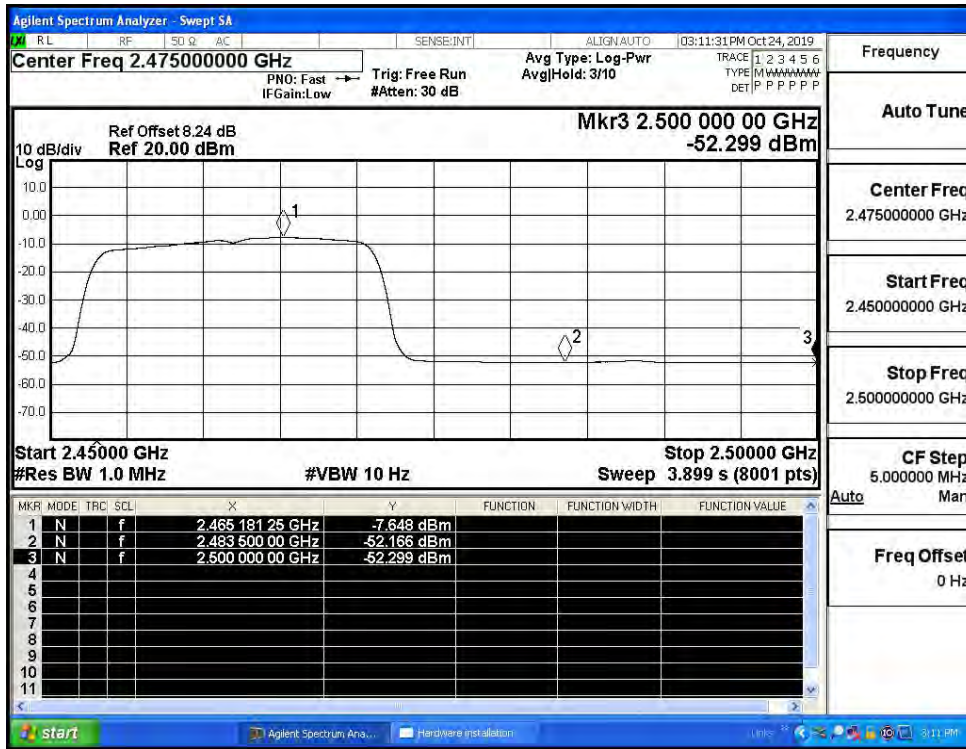
Restrict-band band-edge measurements_11N20SISO_2412_Ant1_AV



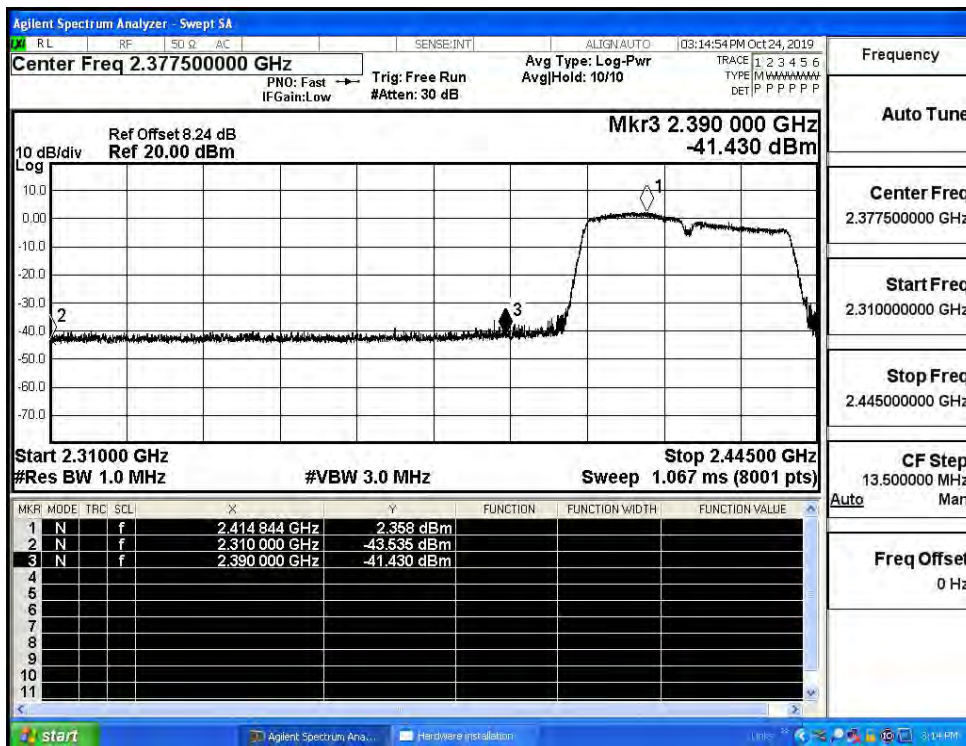
Restrict-band band-edge measurements_11N20SISO_2462_Ant1_PEAK



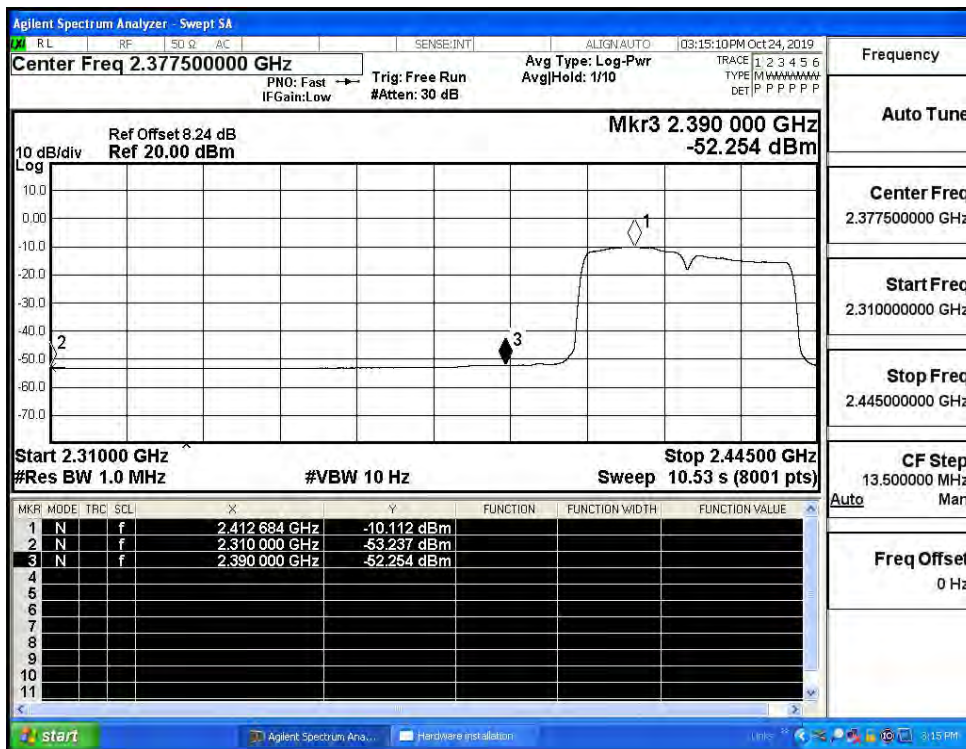
Restrict-band band-edge measurements_11N20SISO_2462_Ant1_AV



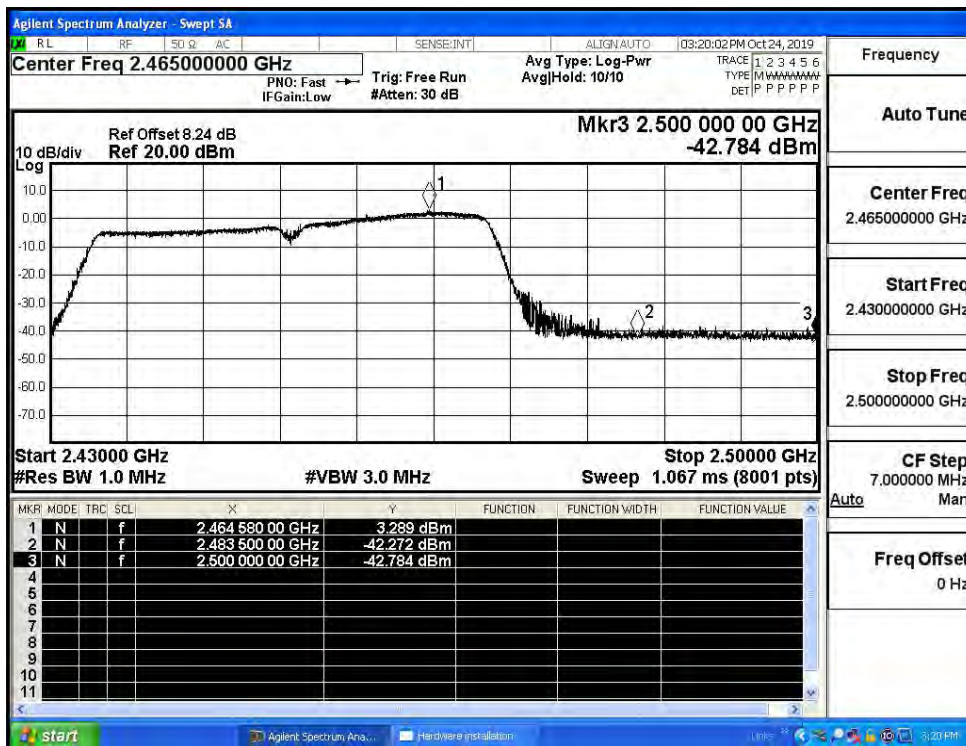
Restrict-band band-edge measurements_11N40SISO_2422_Ant1_PEAK



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

