

## Appendix A

### RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: **Biometric Time Recorder**

Trade Mark: **N/A**

Test Model: **CB4000**

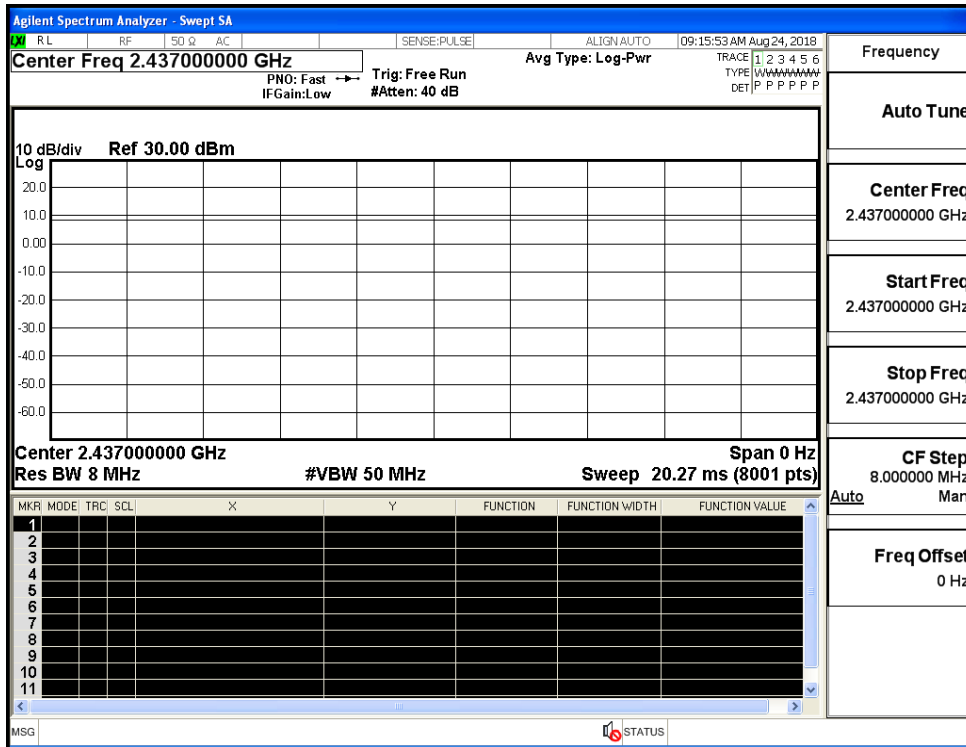
#### Environmental Conditions

Temperature:	24.3° C
Relative Humidity:	54.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Mina.Xu
Supervised by:	Jayden.Zhuo

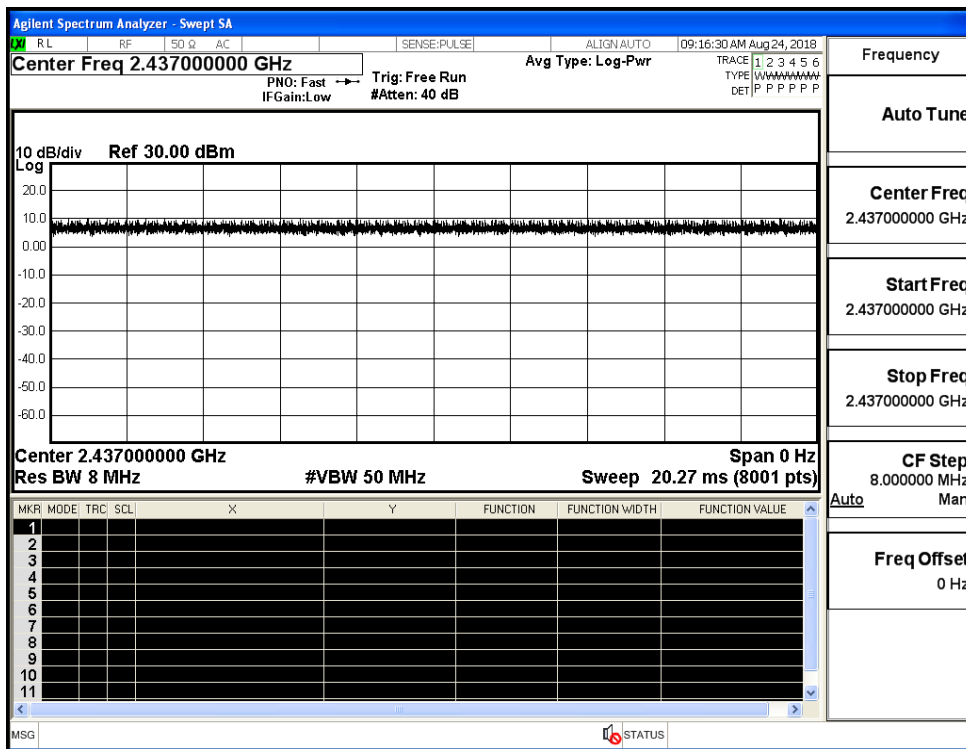
#### A.1 Duty Cycle

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

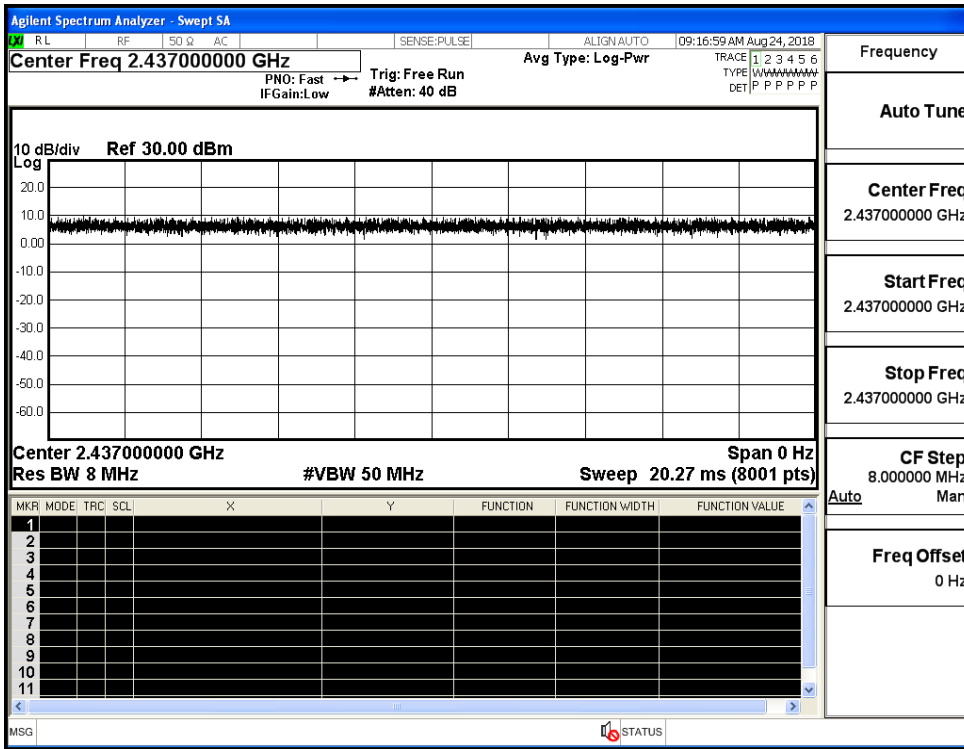
Duty Cycle\_11B\_2437\_Ant1



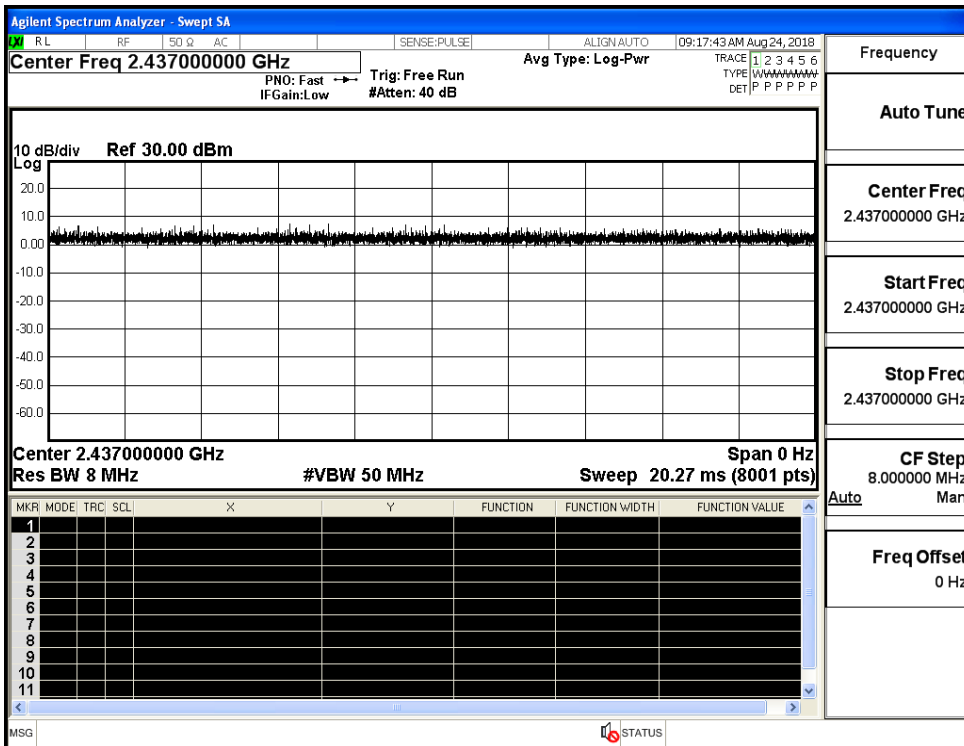
Duty Cycle\_11G\_2437\_Ant1



Duty Cycle\_11N20SISO\_2437\_Ant1



Duty Cycle\_11N40SISO\_2437\_Ant1



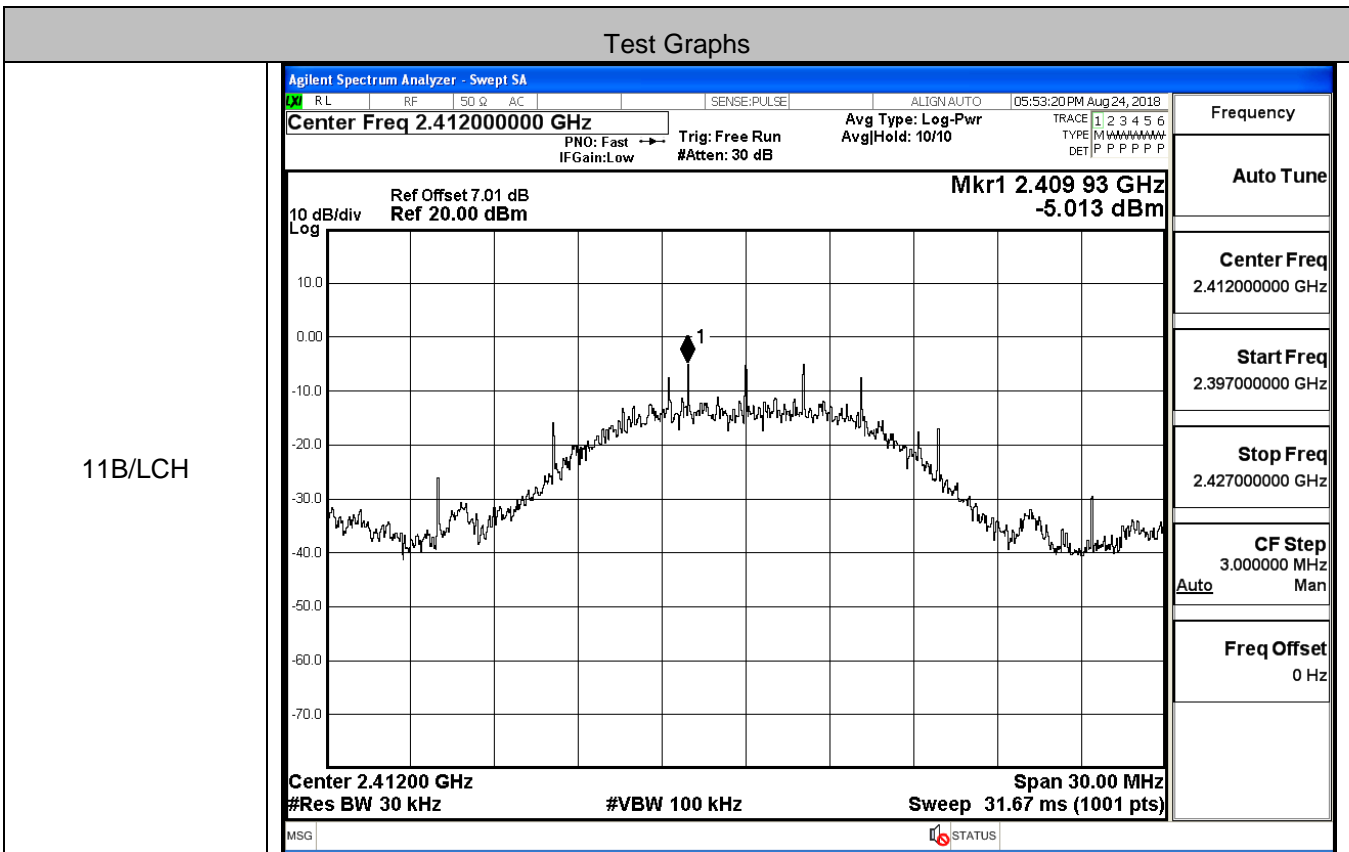
## A.2 Maximum Conducted Output Power

Mode	Channel	Meas.Level [dBm]	Limit [dBm]	Verdict
11B	LCH	13.45	30	PASS
	MCH	13.84	30	PASS
	HCH	13.29	30	PASS
11G	LCH	12.98	30	PASS
	MCH	12.64	30	PASS
	HCH	12.43	30	PASS
11N20SISO	LCH	12.41	30	PASS
	MCH	12.87	30	PASS
	HCH	12.64	30	PASS
11N40SISO	LCH	11.21	30	PASS
	MCH	11.39	30	PASS
	HCH	11.41	30	PASS

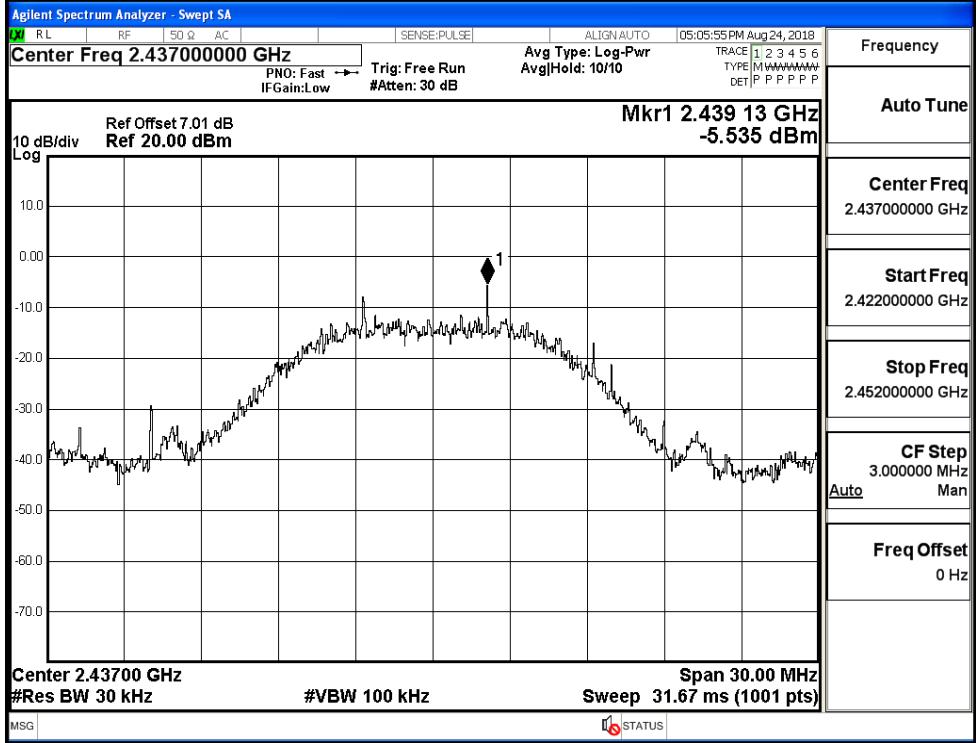
### A.3 Maximum Power Spectral Density

Mode	Channel	Meas.Level [dBm/30KHz]	Limit [dBm/3KHz]	Verdict
11B	LCH	-5.013	8	PASS
	MCH	-5.535	8	PASS
	HCH	-5.284	8	PASS
11G	LCH	-13.035	8	PASS
	MCH	-12.906	8	PASS
	HCH	-13.192	8	PASS
11N20SISO	LCH	-12.836	8	PASS
	MCH	-13.119	8	PASS
	HCH	-12.889	8	PASS
11N40SISO	LCH	-16.506	8	PASS
	MCH	-16.709	8	PASS
	HCH	-16.672	8	PASS

#### Test Graphs

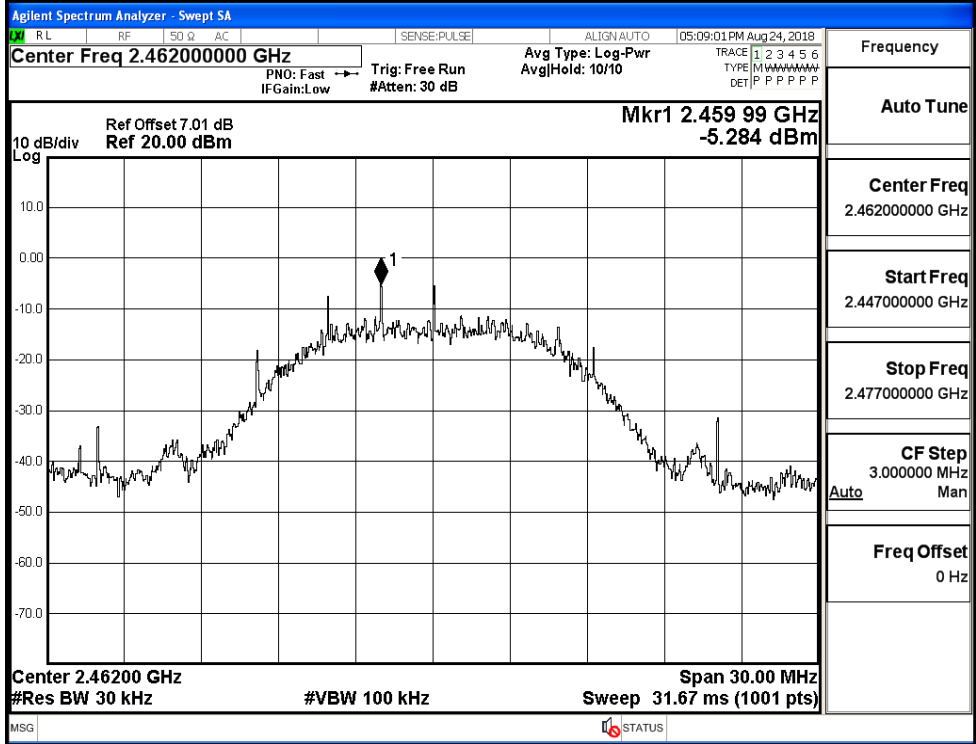


11B/MCH



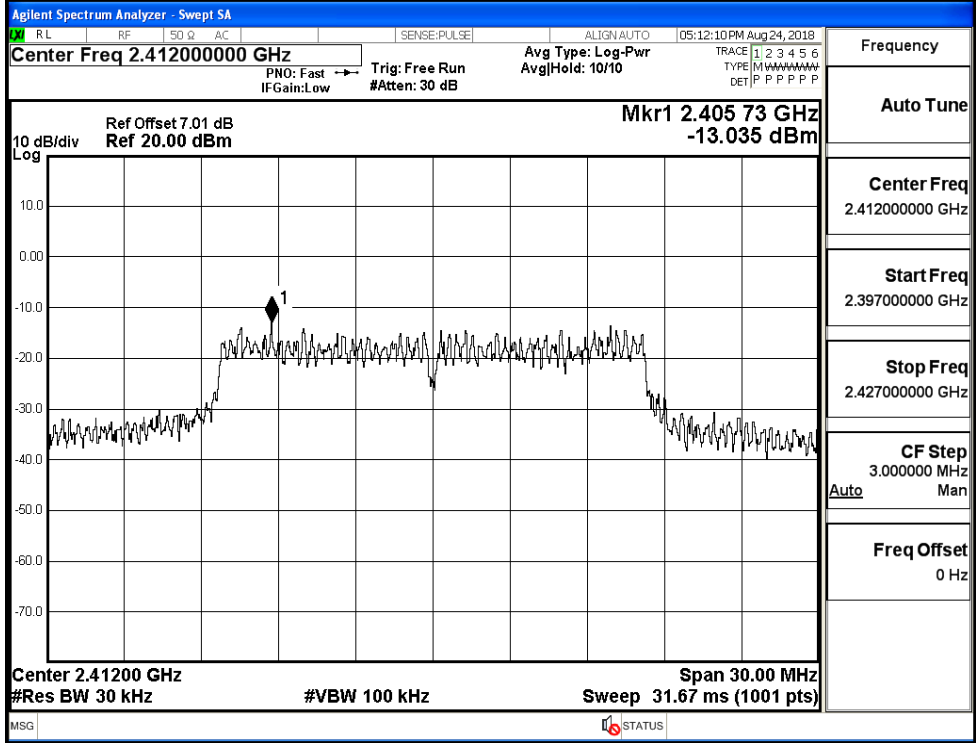
Frequency
Auto Tune
Center Freq 2.43700000 GHz
Start Freq 2.42200000 GHz
Stop Freq 2.45200000 GHz
CF Step 3.000000 MHz Auto Man
Freq Offset 0 Hz

11B/HCH

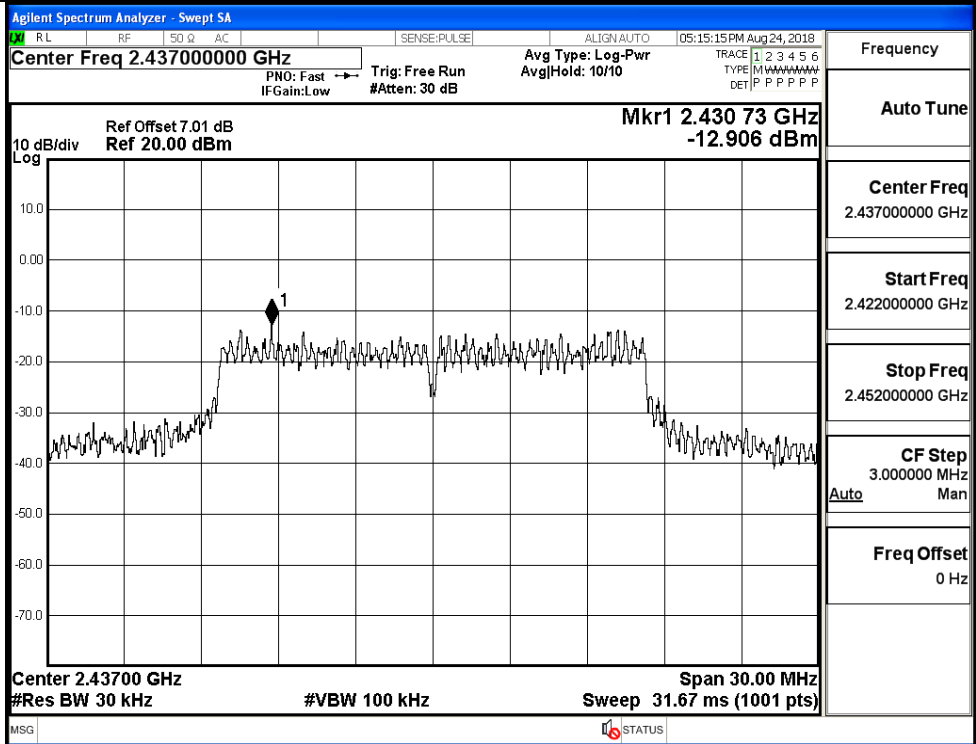


Frequency
Auto Tune
Center Freq 2.46200000 GHz
Start Freq 2.44700000 GHz
Stop Freq 2.47700000 GHz
CF Step 3.000000 MHz Auto Man
Freq Offset 0 Hz

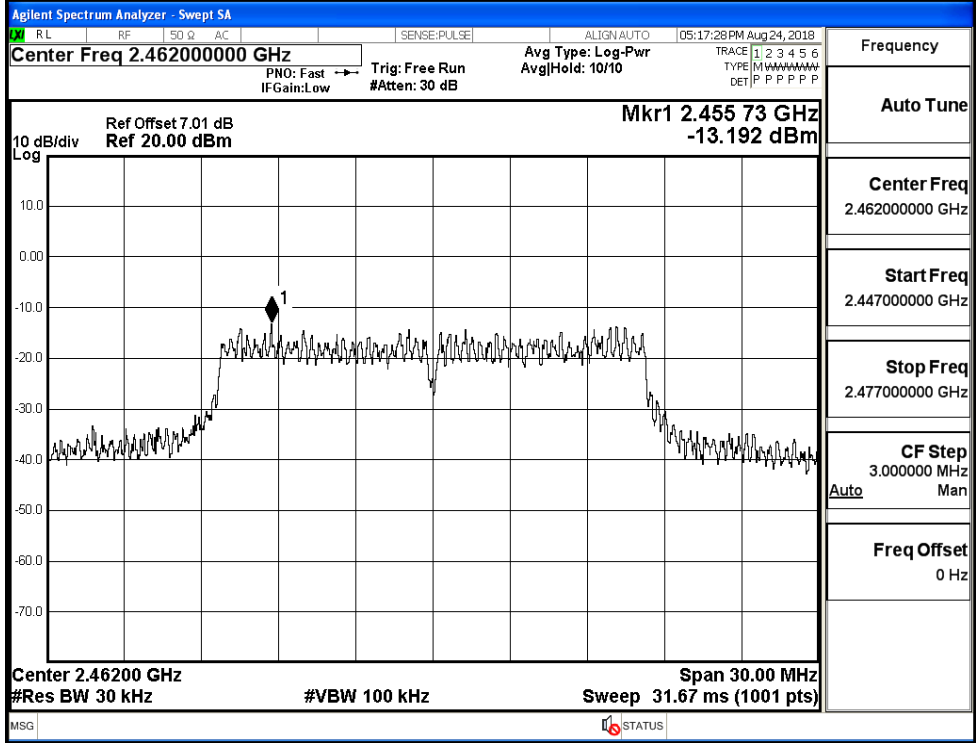
11G/LCH



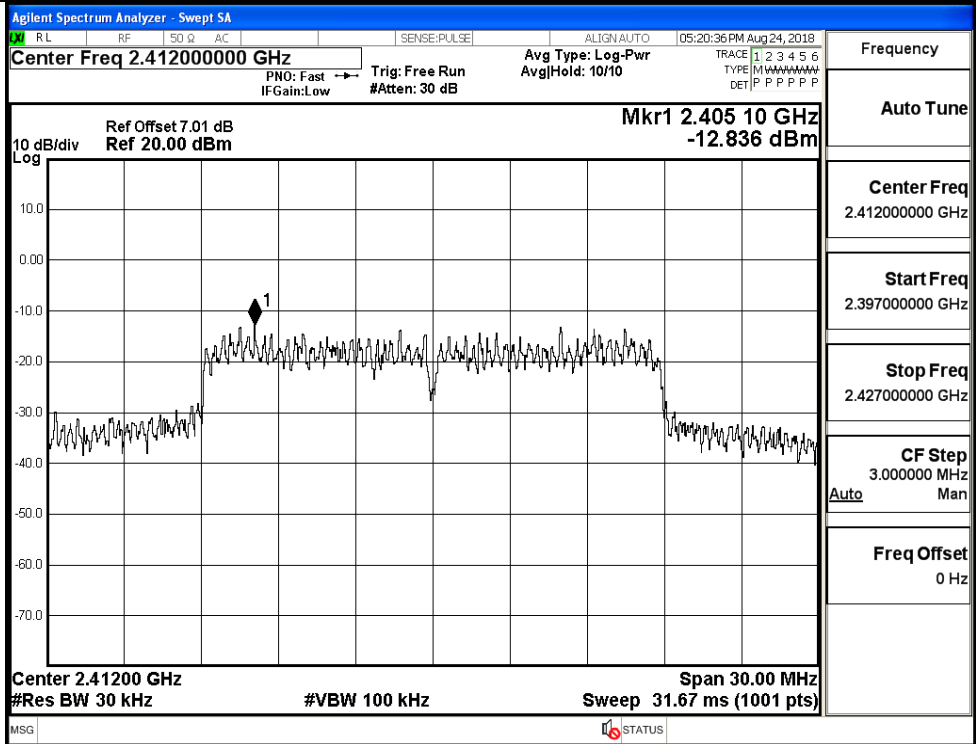
11G/MCH



11G/HCH

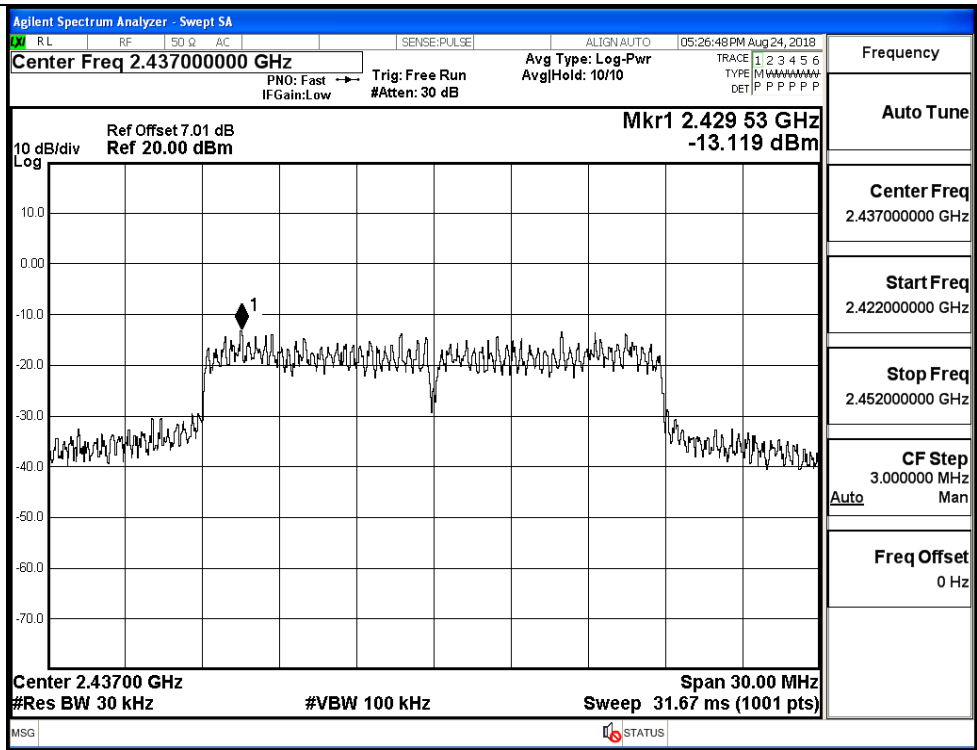


11N20SISO/LCH

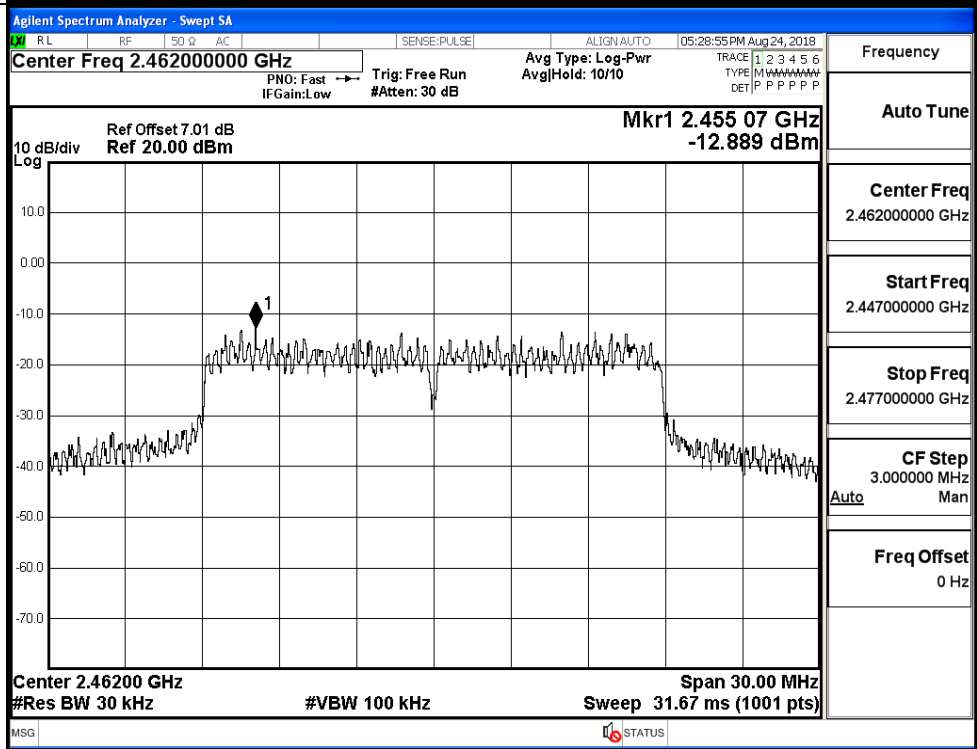




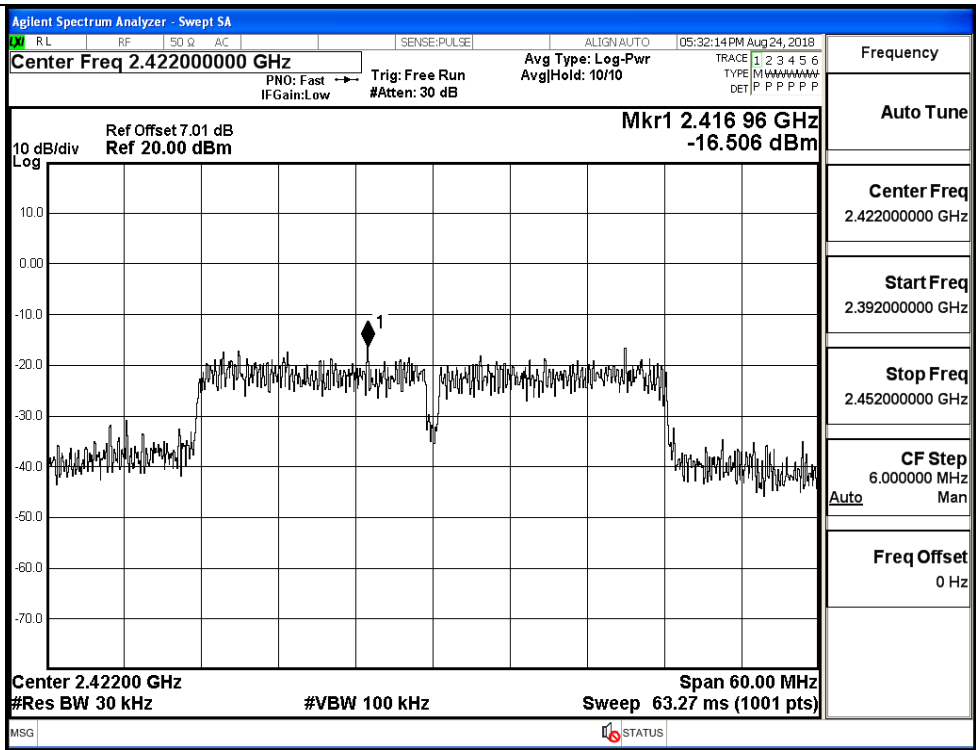
11N20SISO/MCH



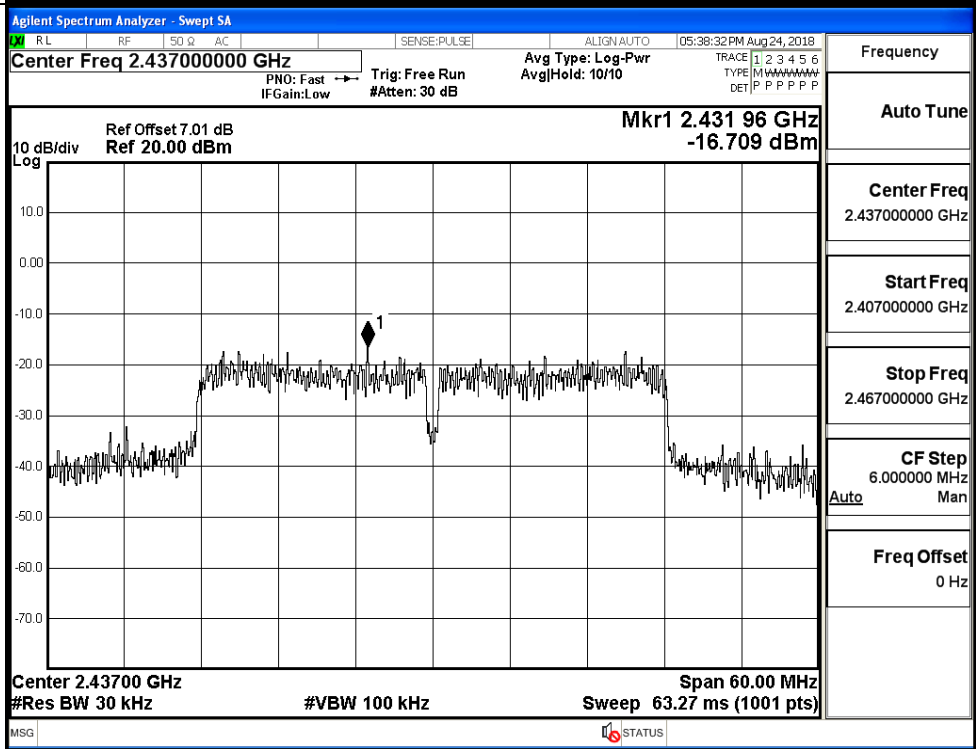
11N20SISO/HCH

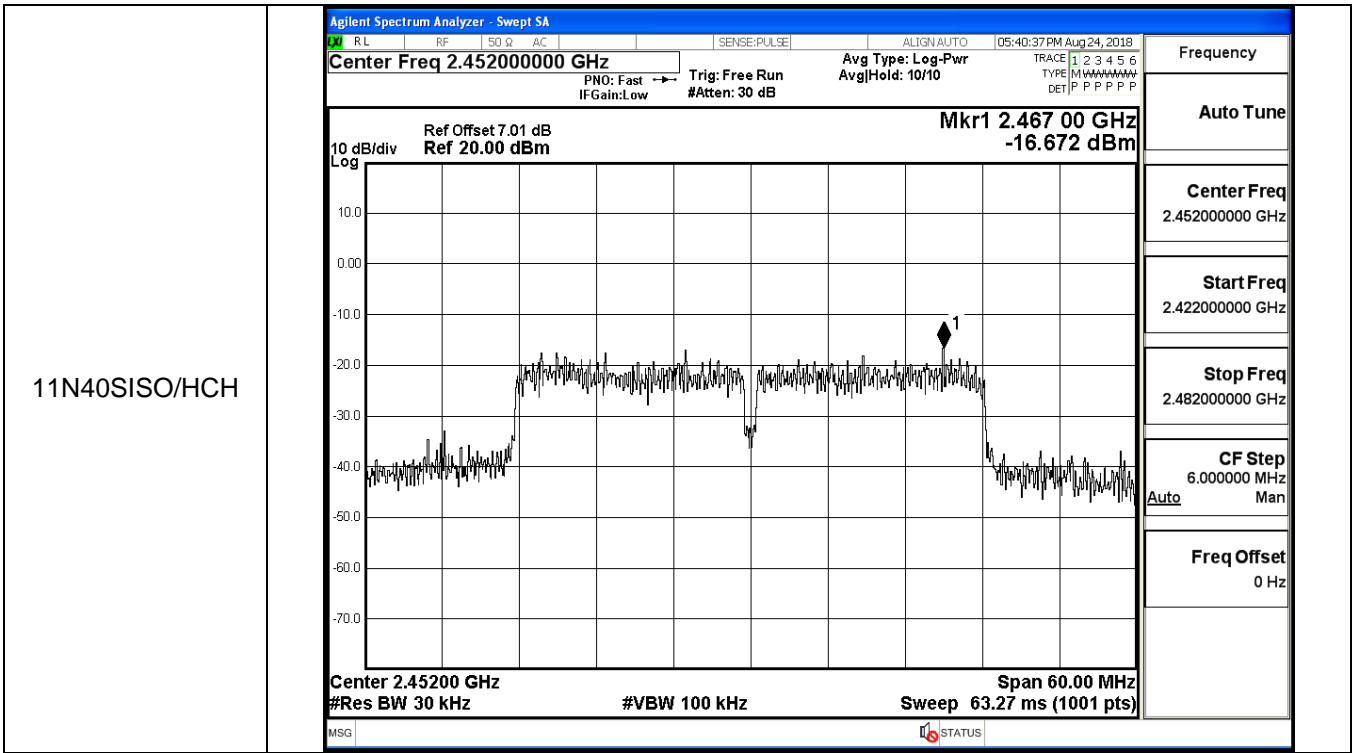


11N40SISO/LCH



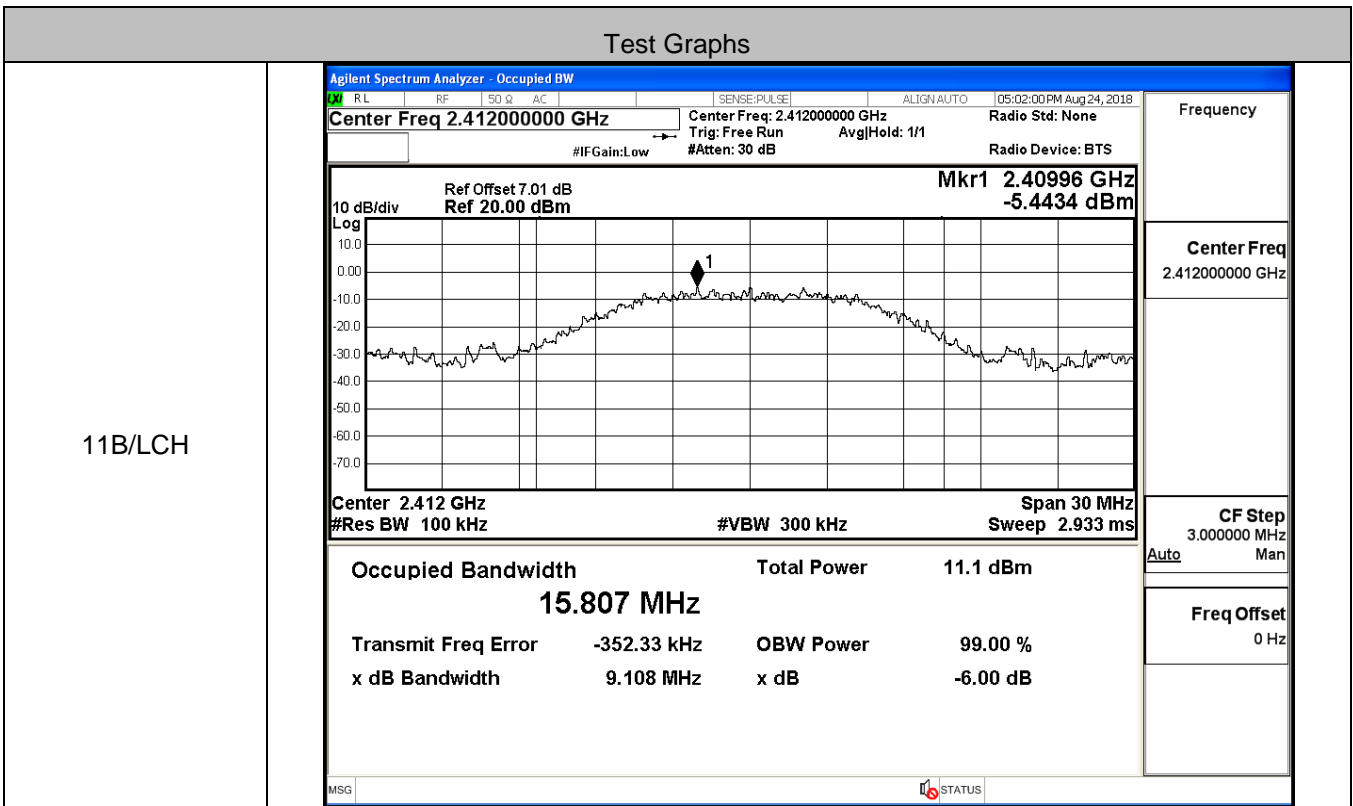
11N40SISO/MCH



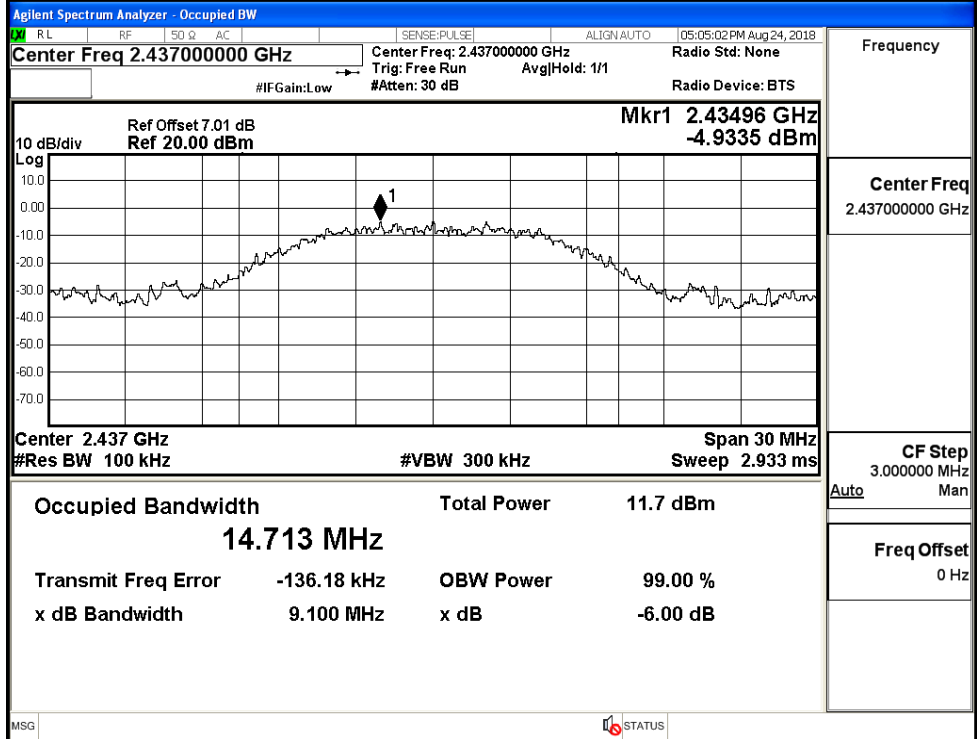


**A.4 6dB Bandwidth**

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
11B	LCH	9.108	≥0.5	PASS
	MCH	9.100	≥0.5	PASS
	HCH	9.089	≥0.5	PASS
11G	LCH	16.48	≥0.5	PASS
	MCH	16.50	≥0.5	PASS
	HCH	16.48	≥0.5	PASS
11N20SISO	LCH	17.48	≥0.5	PASS
	MCH	17.44	≥0.5	PASS
	HCH	17.54	≥0.5	PASS
11N40SISO	LCH	35.71	≥0.5	PASS
	MCH	36.00	≥0.5	PASS
	HCH	35.70	≥0.5	PASS

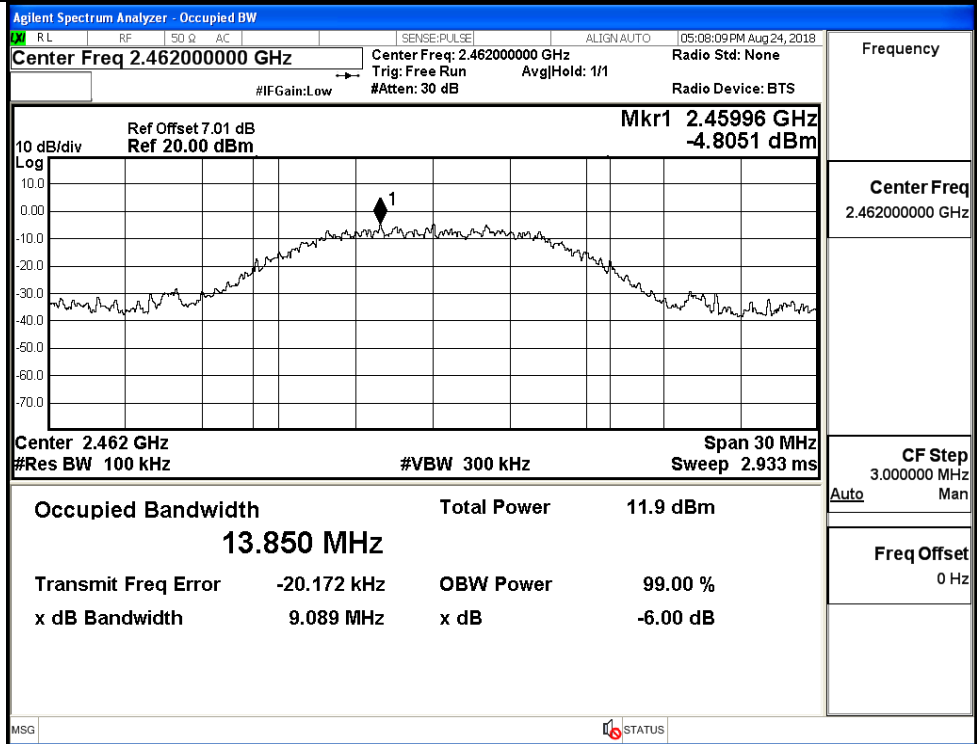


11B/MCH



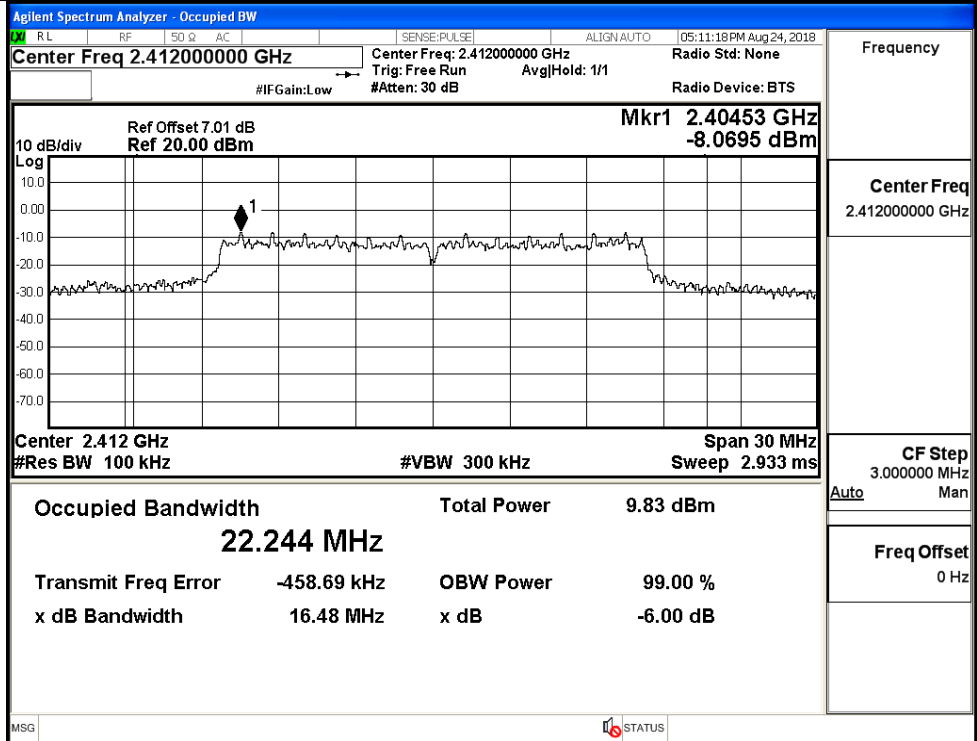
Frequency	2.43700000 GHz
Center Freq	2.43700000 GHz
CF Step	3.000000 MHz
Auto	Man
Freq Offset	0 Hz

11B/HCH

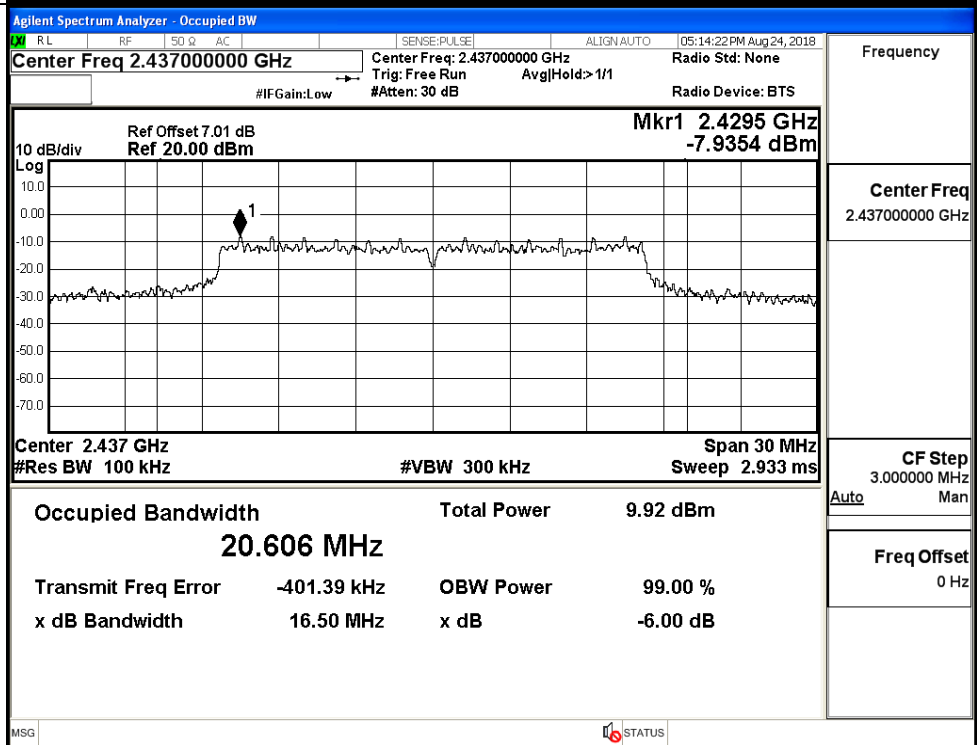


Frequency	2.46200000 GHz
Center Freq	2.46200000 GHz
CF Step	3.000000 MHz
Auto	Man
Freq Offset	0 Hz

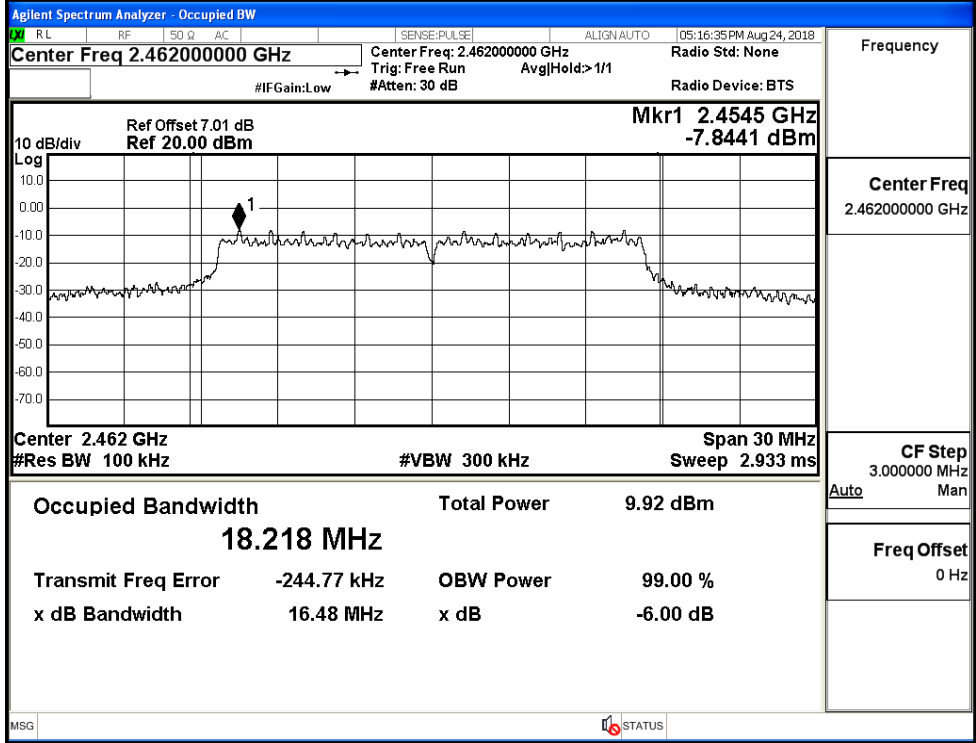
11G/LCH



11G/MCH

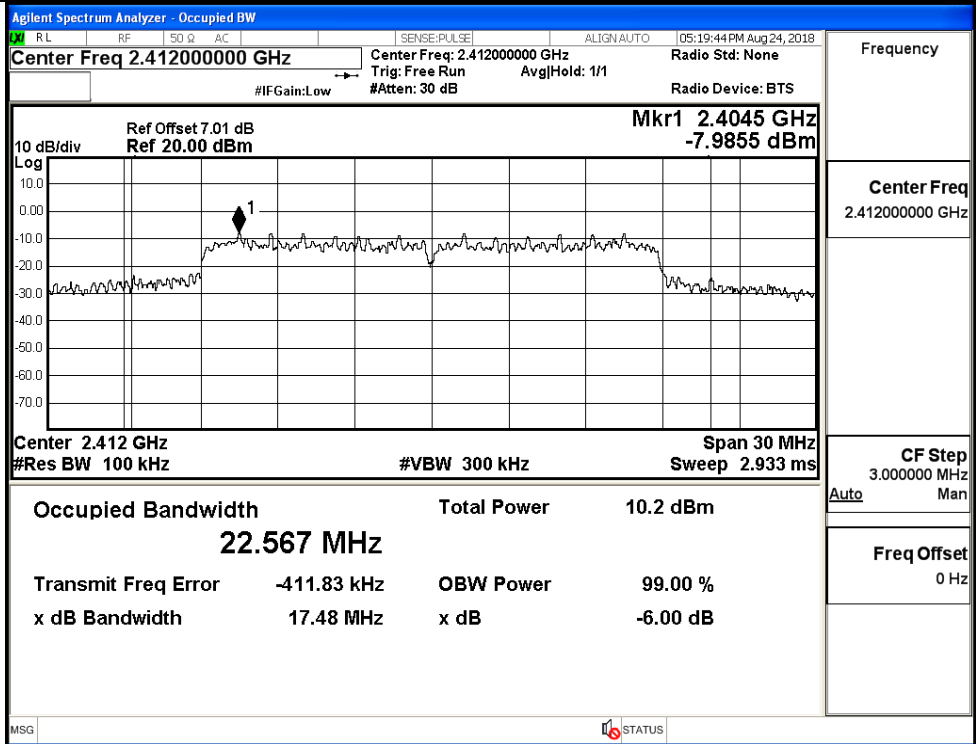


11G/HCH



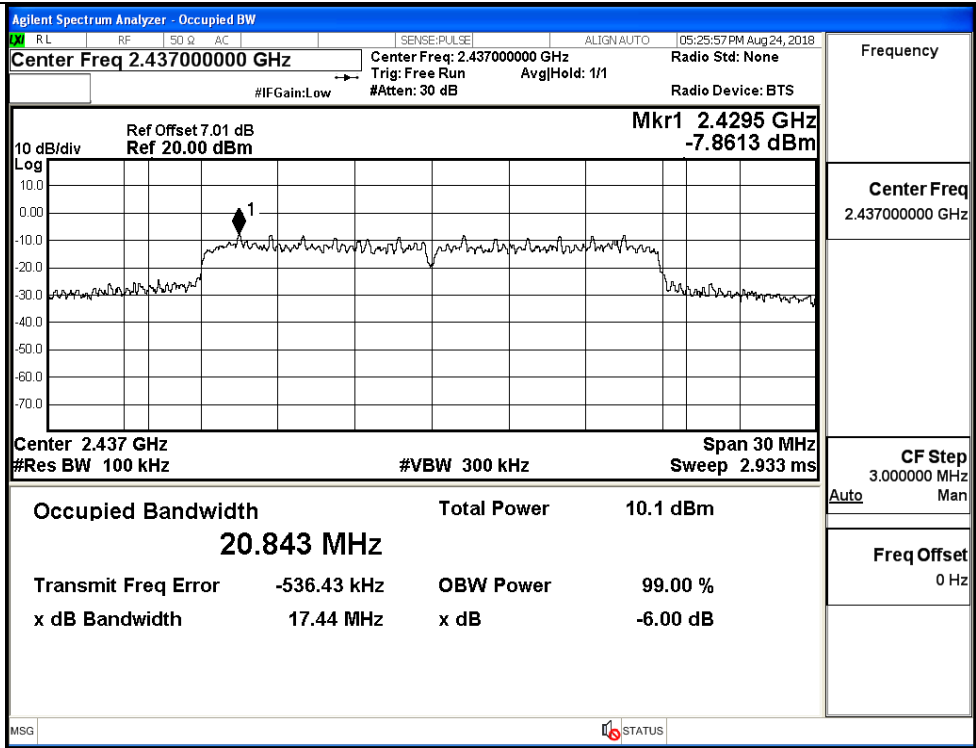
Frequency	2.46200000 GHz
Center Freq	2.46200000 GHz
CF Step	3.000000 MHz
Auto	Man
Freq Offset	0 Hz

11N20SISO/LCH

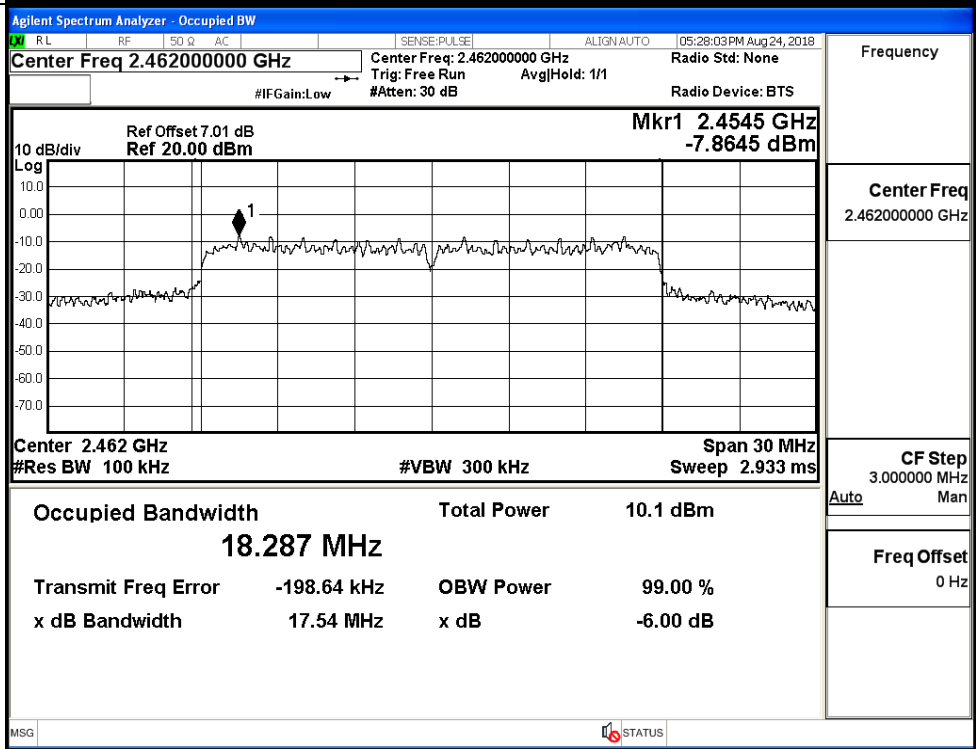


Frequency	2.41200000 GHz
Center Freq	2.41200000 GHz
CF Step	3.000000 MHz
Auto	Man
Freq Offset	0 Hz

11N20SISO/MCH

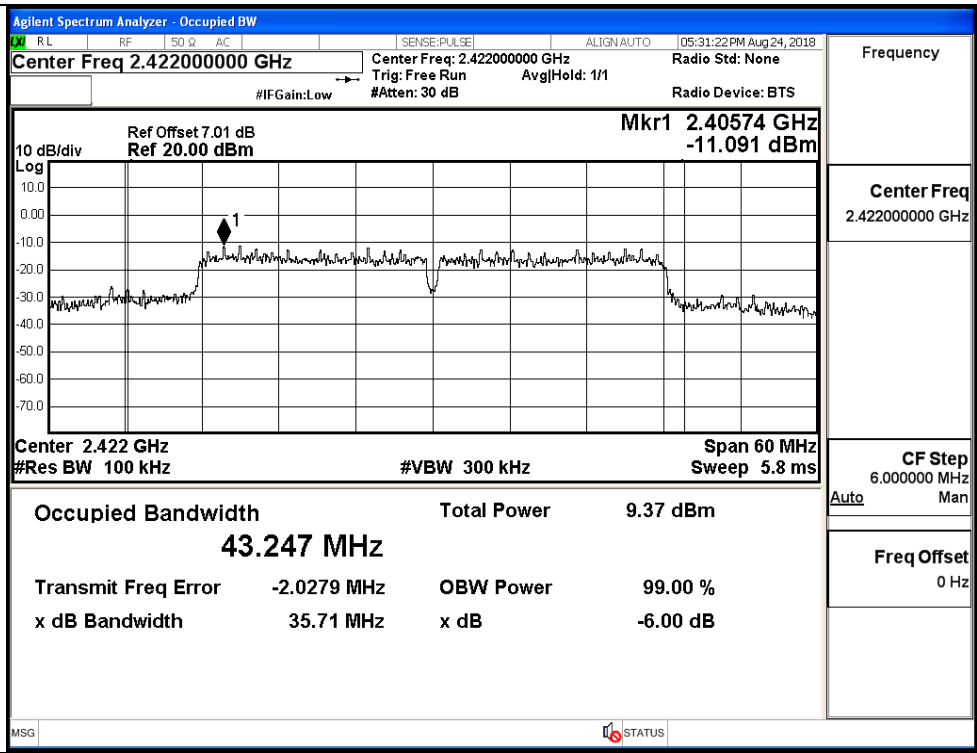


11N20SISO/HCH

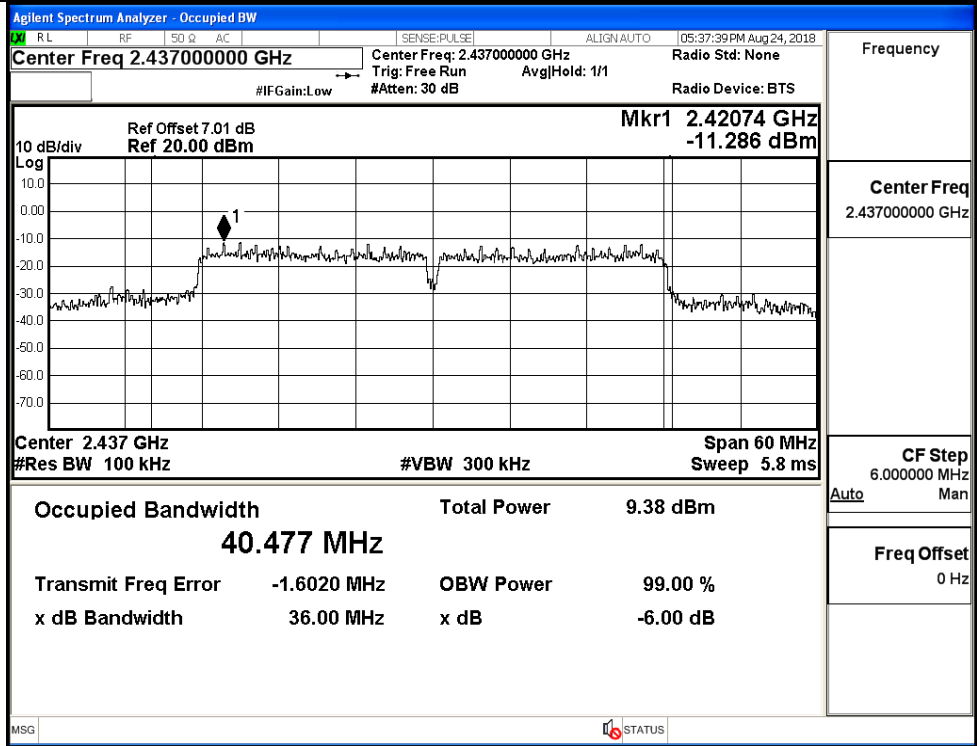


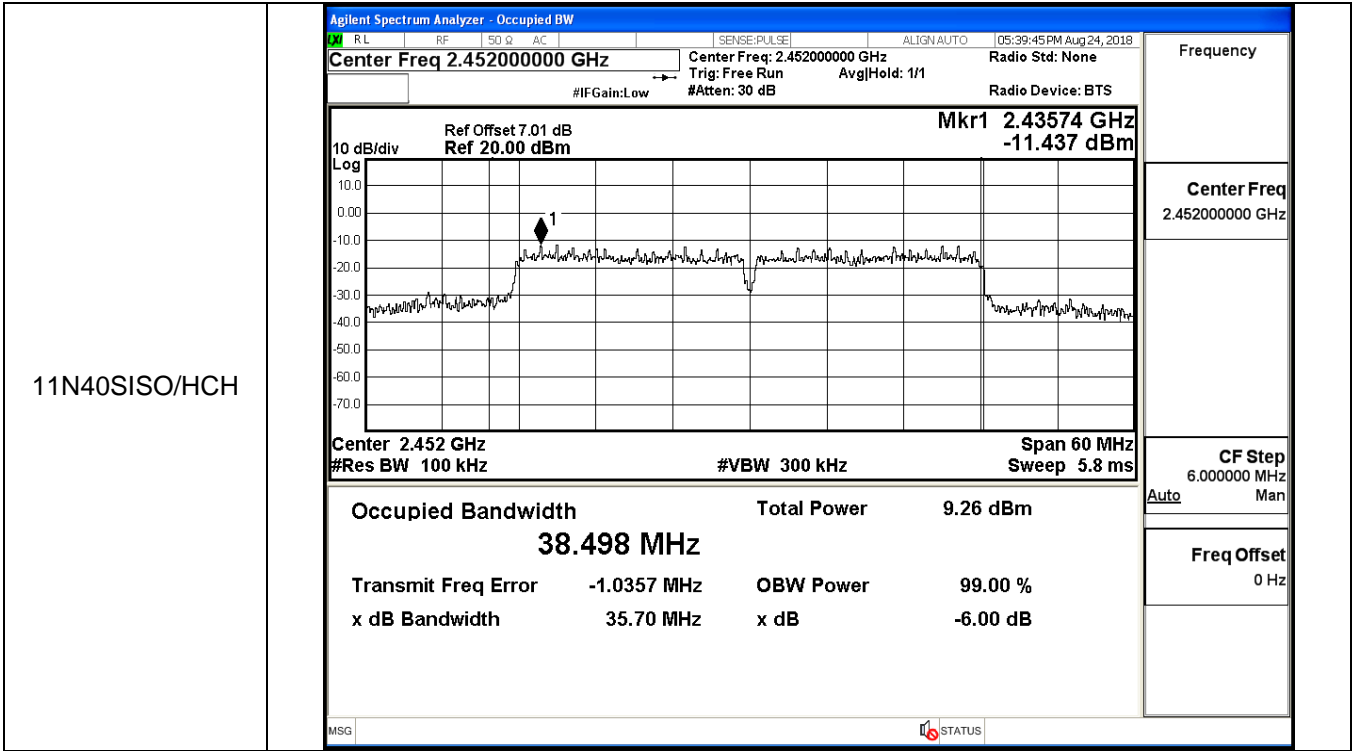


11N40SISO/LCH



11N40SISO/MCH



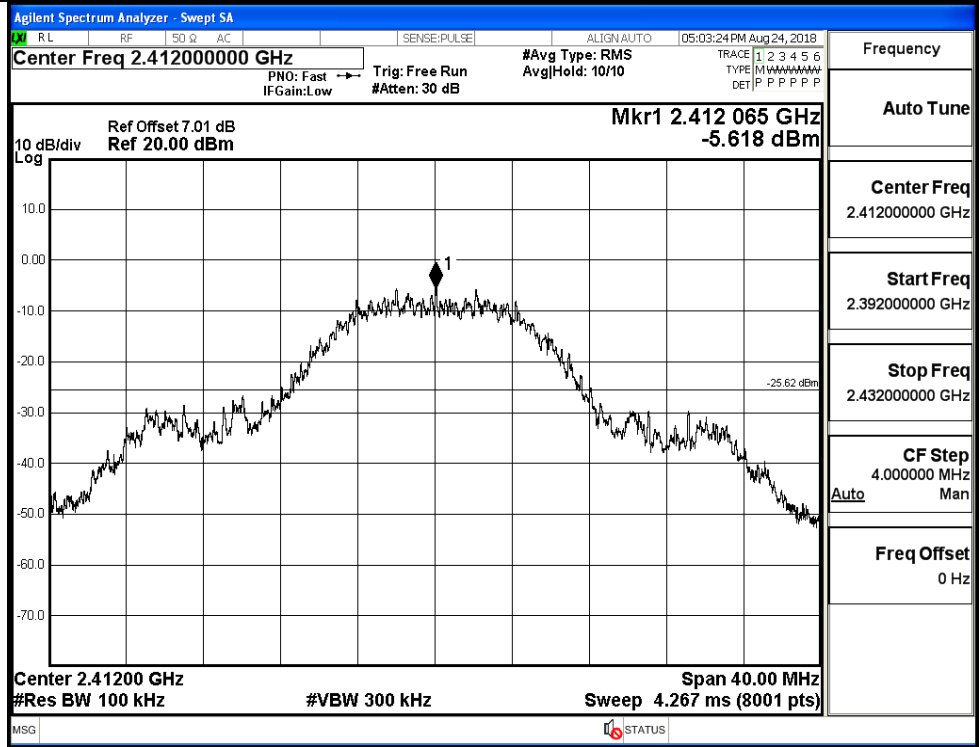


### A.5 RF Conducted Spurious Emissions

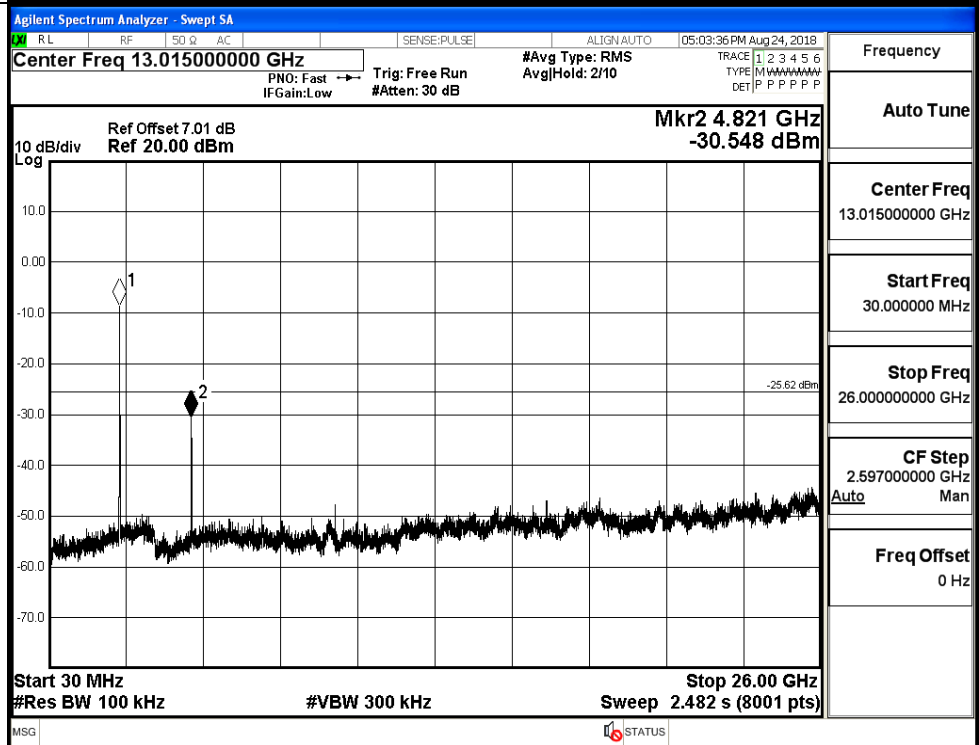
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
11B	LCH	-5.618	-30.548	-25.618	PASS
	MCH	-5.414	-32.284	-25.414	PASS
	HCH	-5.31	-35.881	-25.310	PASS
11G	LCH	-8.121	-32.269	-28.121	PASS
	MCH	-8.011	-34.790	-28.011	PASS
	HCH	-8.187	-36.865	-28.187	PASS
11N20SISO	LCH	-8.142	-30.846	-28.142	PASS
	MCH	-8.032	-35.157	-28.032	PASS
	HCH	-8.031	-33.394	-28.031	PASS
11N40SISO	LCH	-11.468	-34.920	-31.468	PASS
	MCH	-11.473	-37.890	-31.473	PASS
	HCH	-11.530	-35.635	-31.510	PASS

11B\_LCH\_Graphs

Pref/11B/LCH

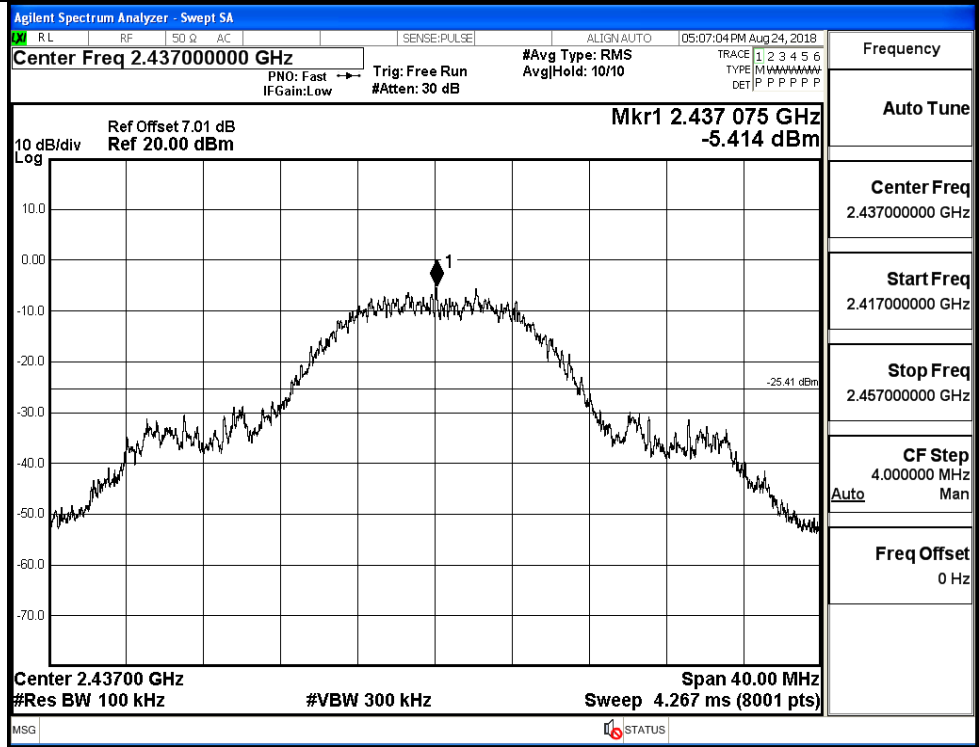


Puw/11B/LCH

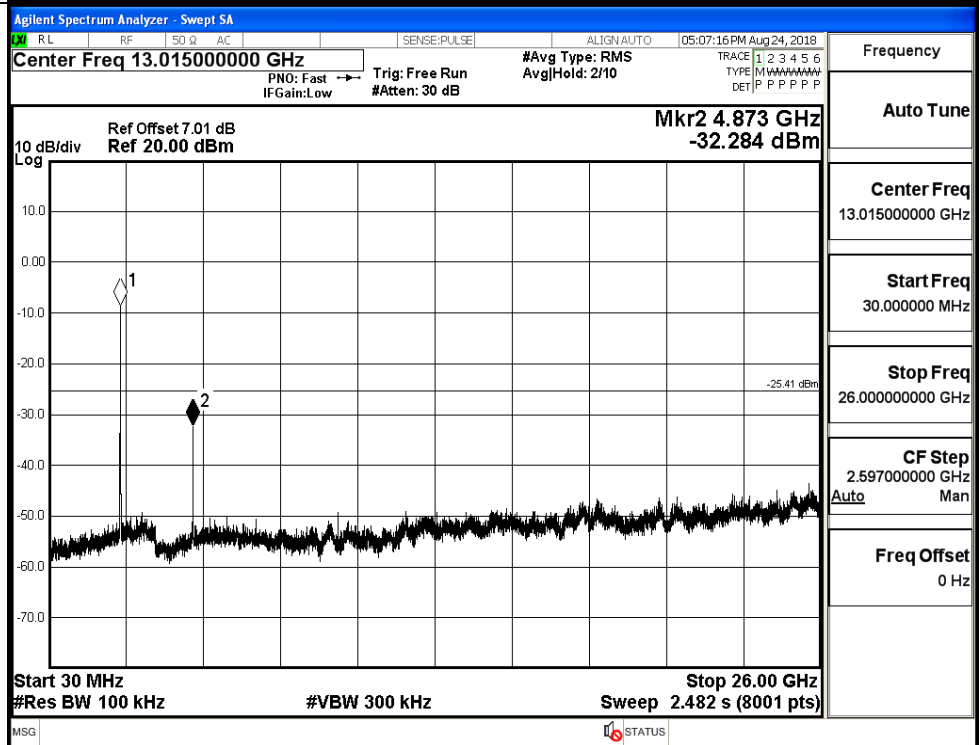


11B\_MCH\_Graphs

Pref/11B/MCH

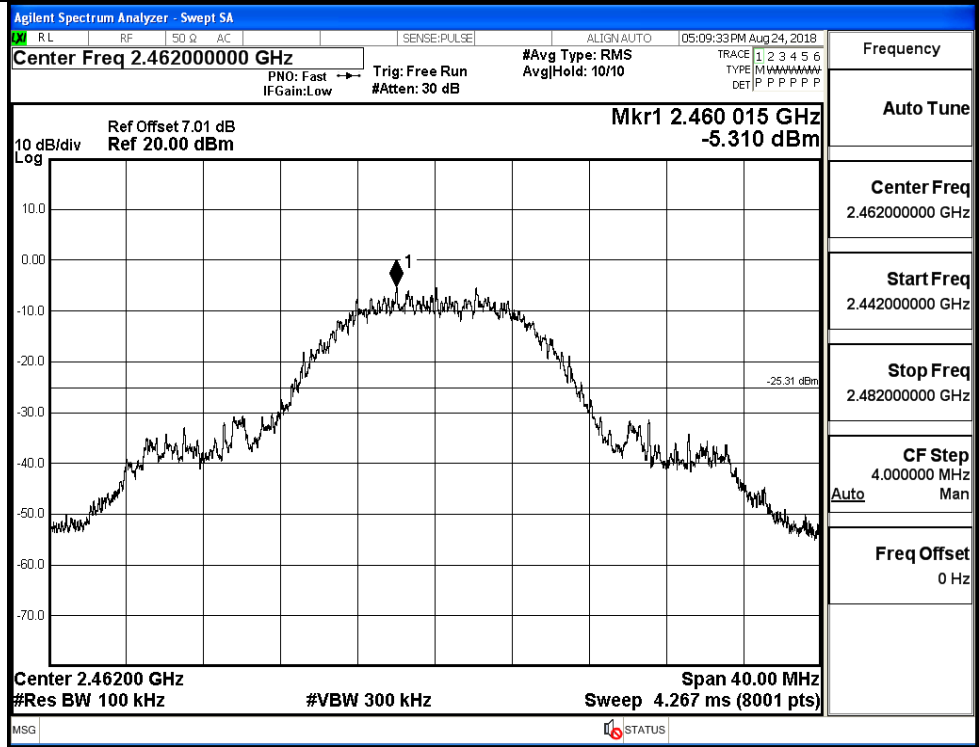


Puw/11B/MCH

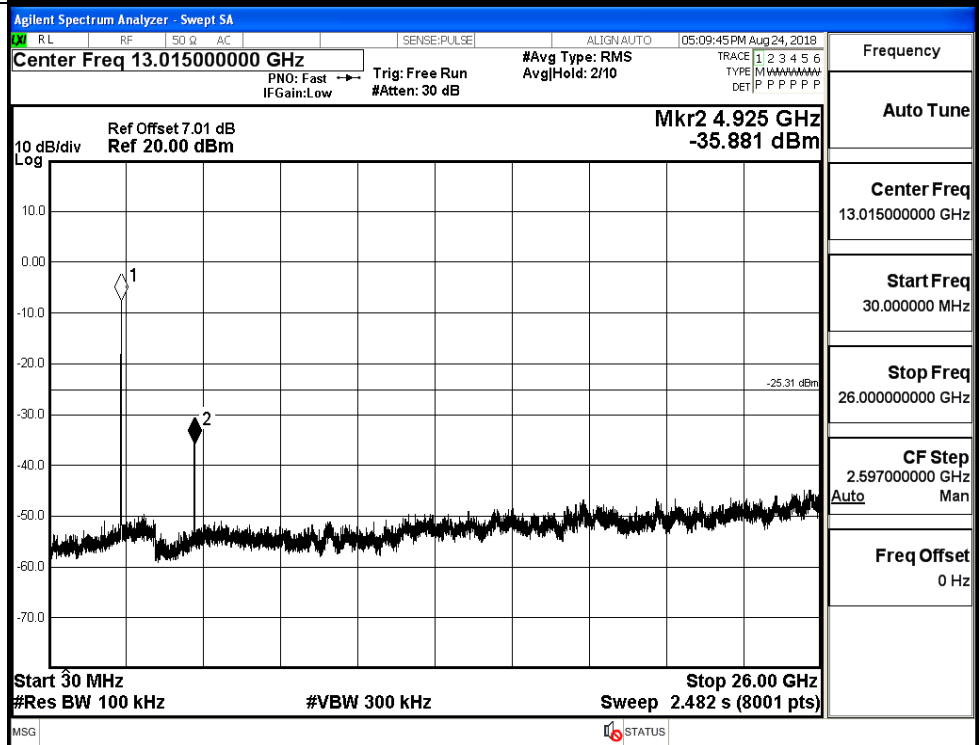


11B\_HCH\_Graphs

Pref/11B/HCH

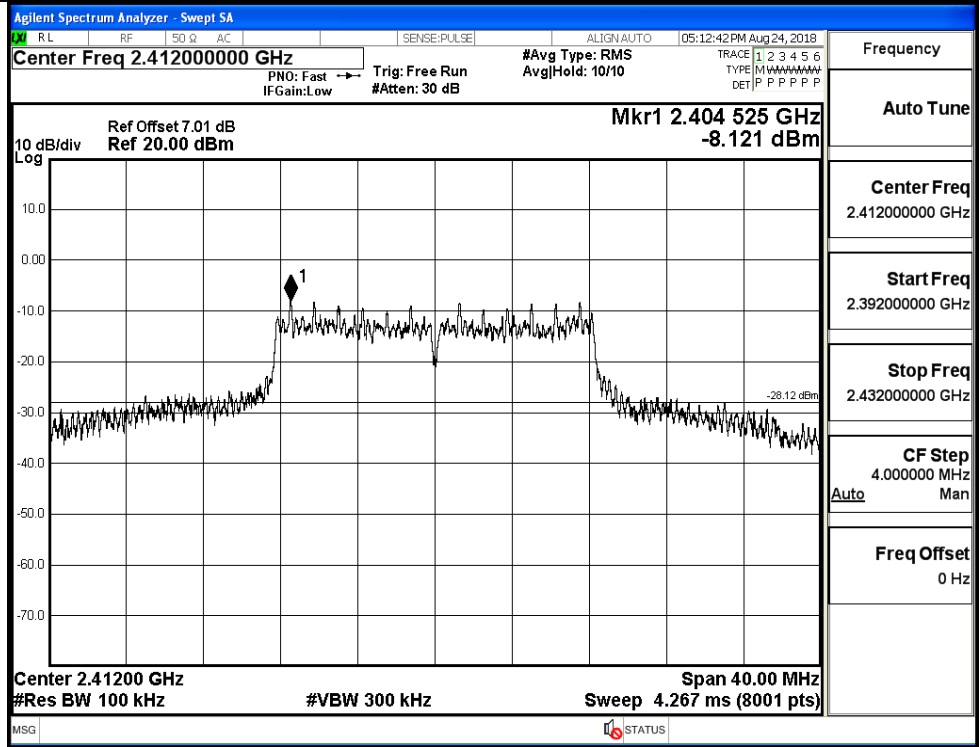


Puw/11B/HCH

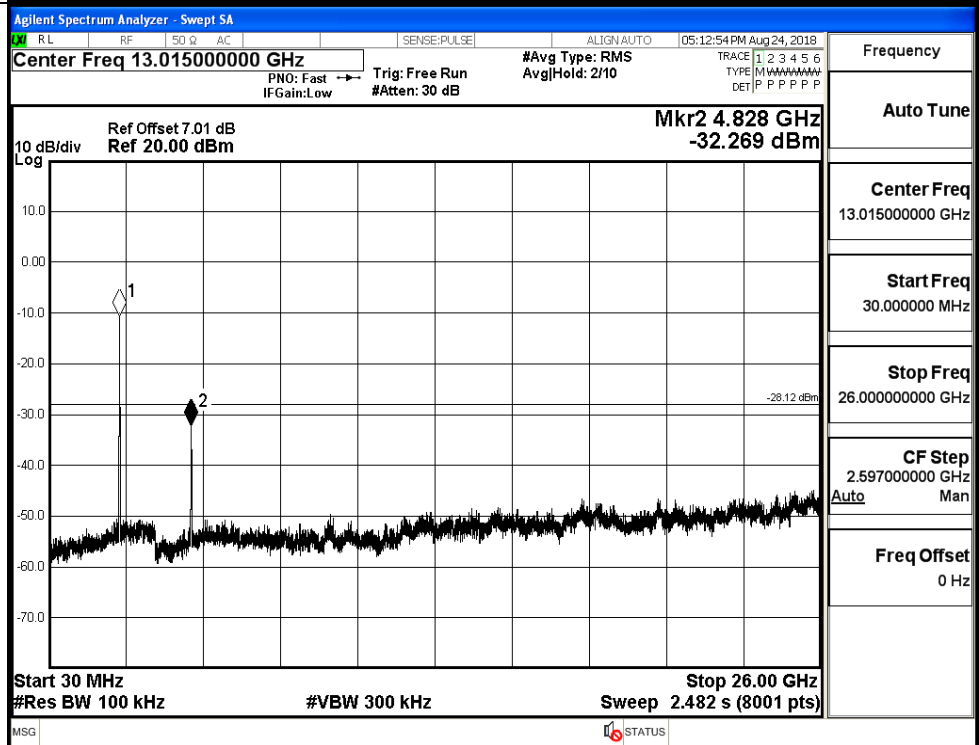


11G\_LCH\_Graphs

Pref/11G/LCH

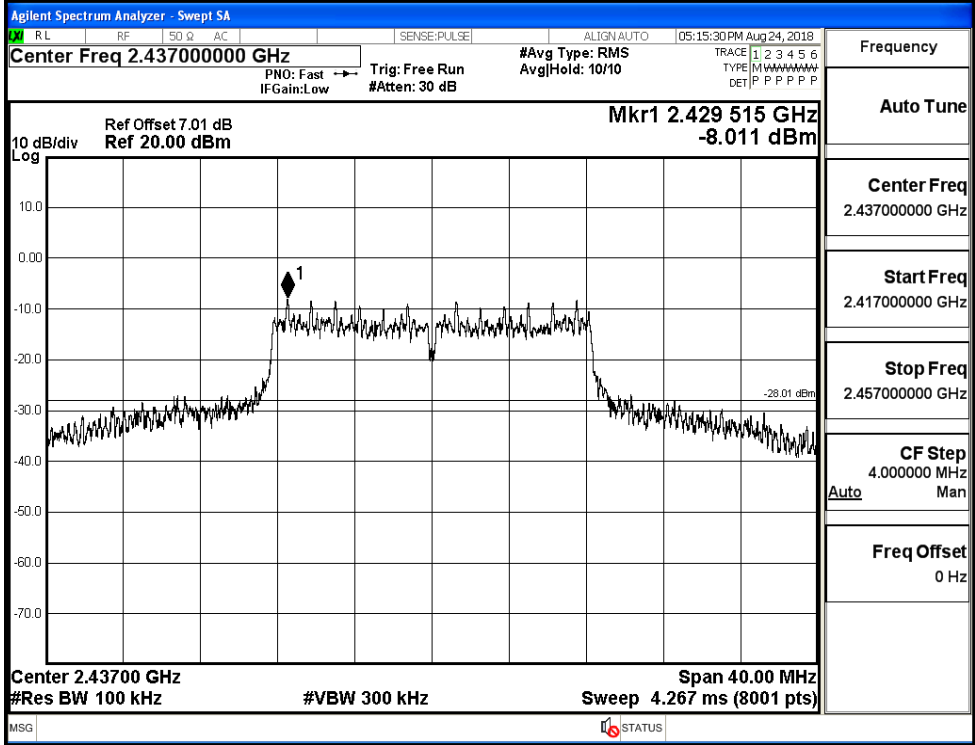


Puw/11G/LCH

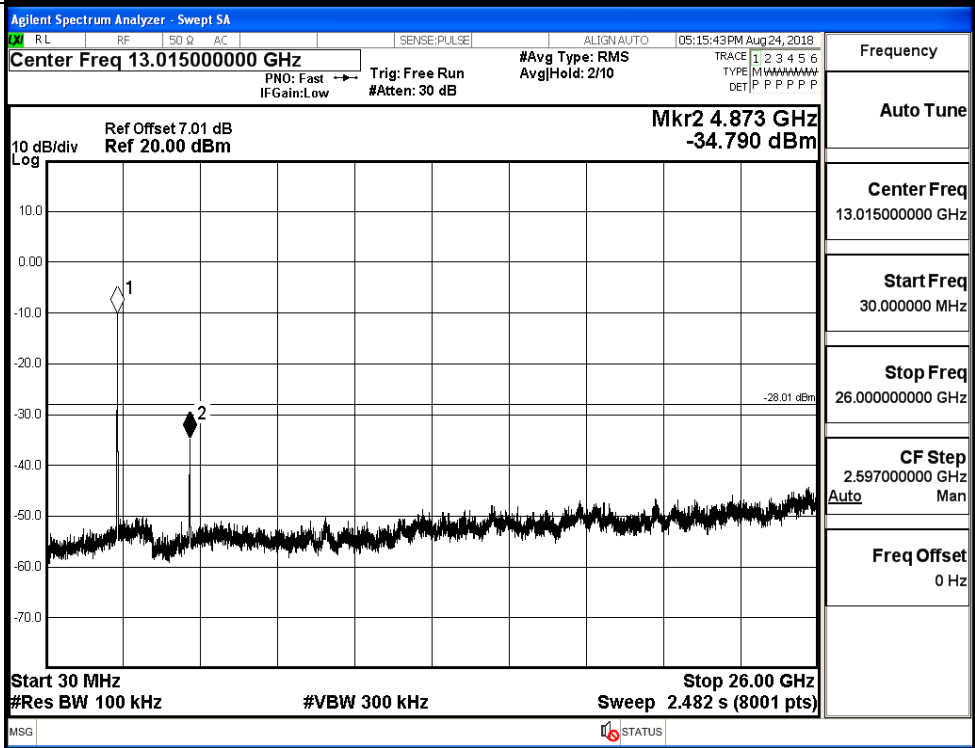


11G\_MCH\_Graphs

Pref/11G/MCH



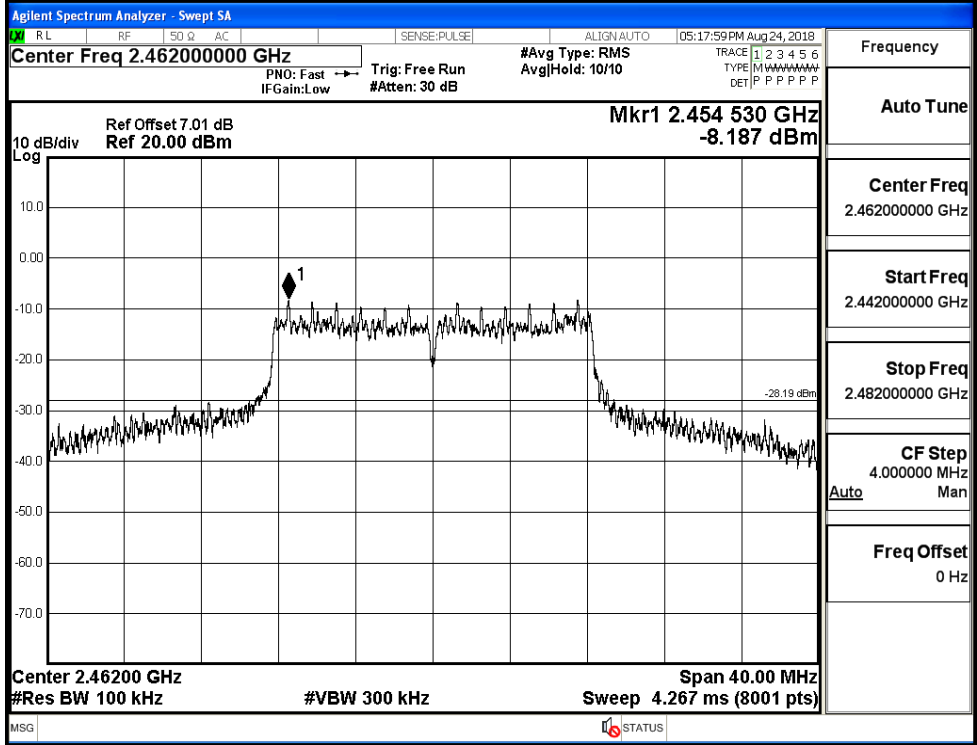
Puw/11G/MCH



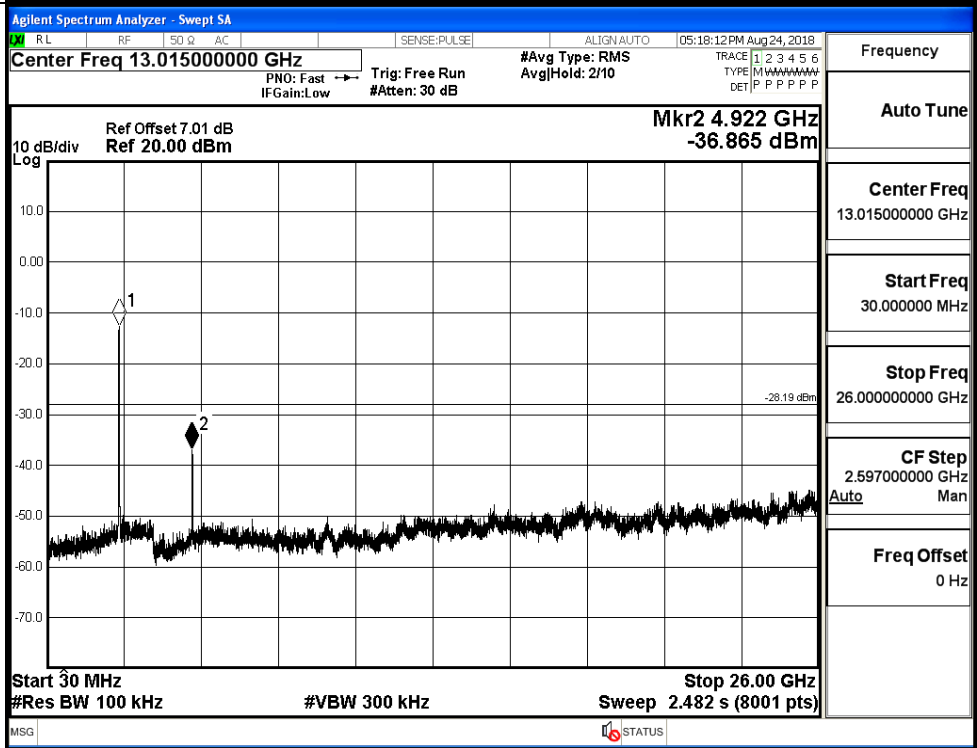


11G\_HCH\_Graphs

Pref/11G/HCH

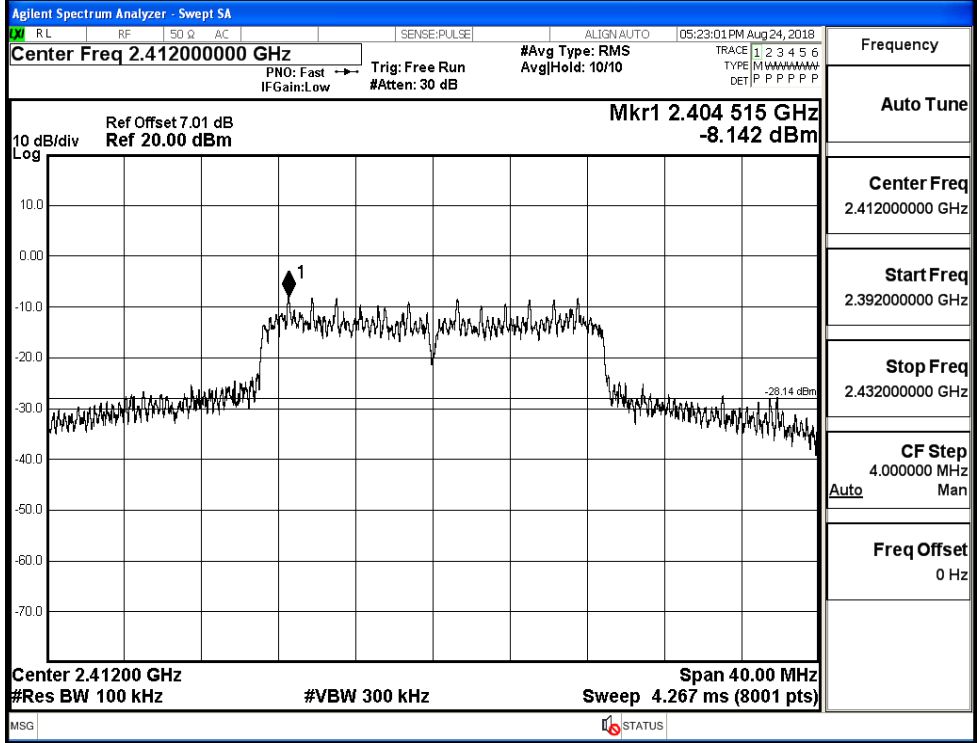


Puw/11G/HCH

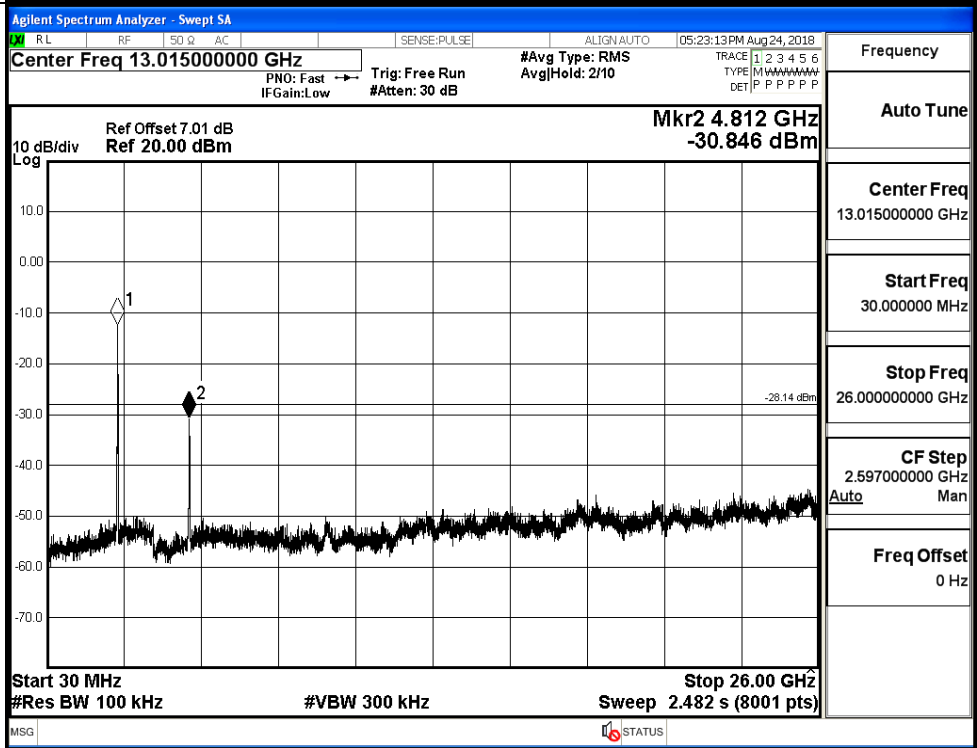


11N20SISO\_LCH\_Graphs

Pref/11N20SIS  
O/LCH

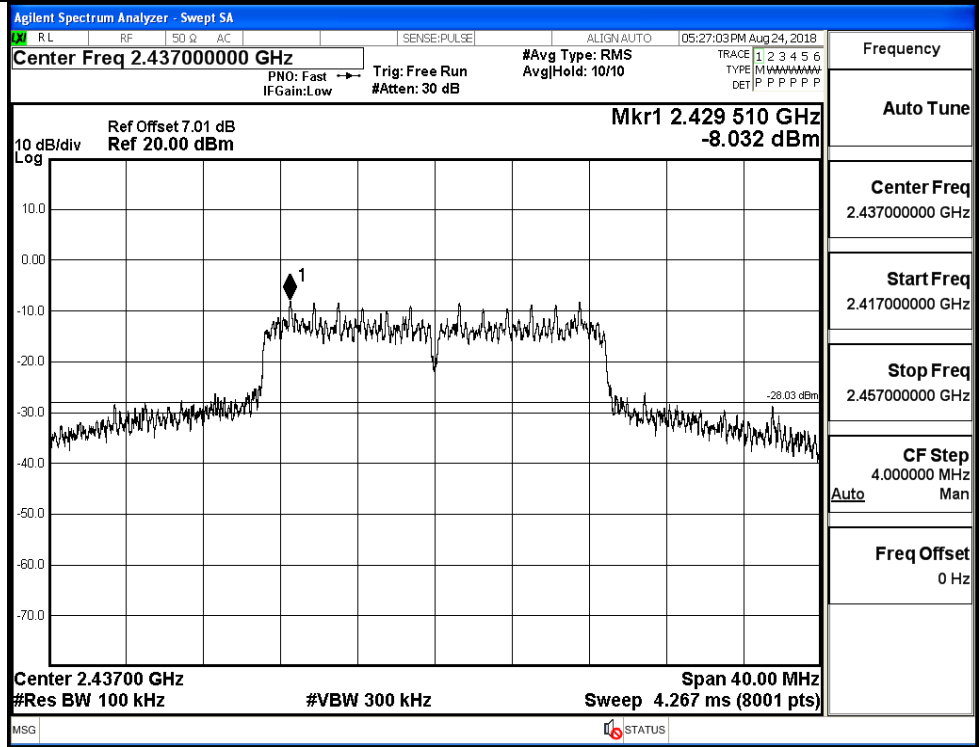


Puw/11N20  
SISO/LCH

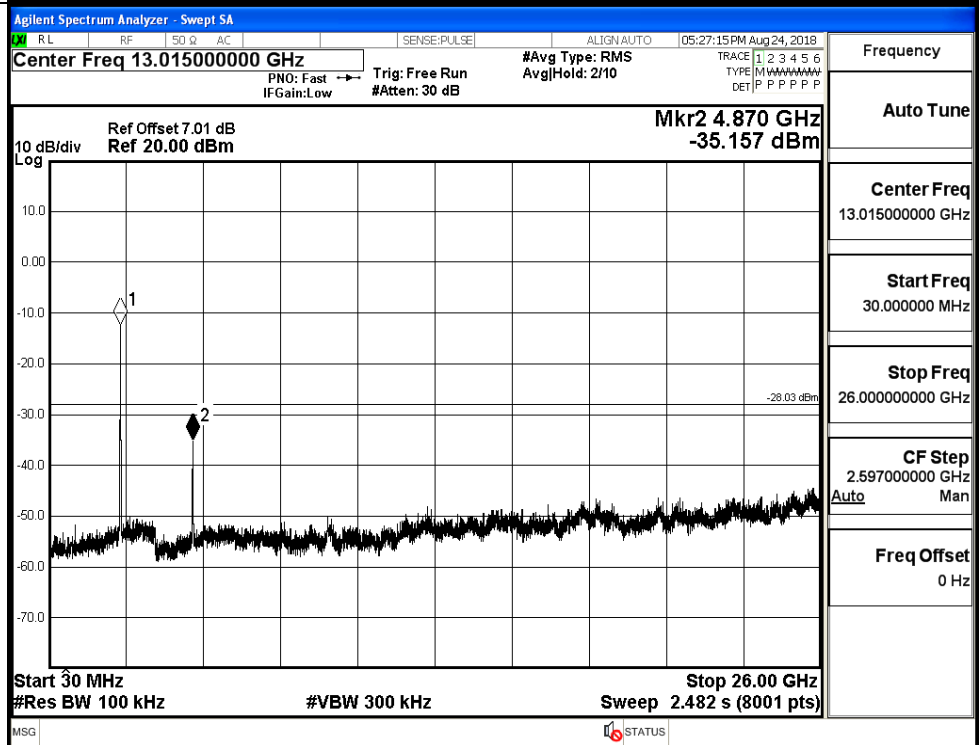


11N20SISO\_MCH\_Graphs

Pref/11N20  
SISO/MCH

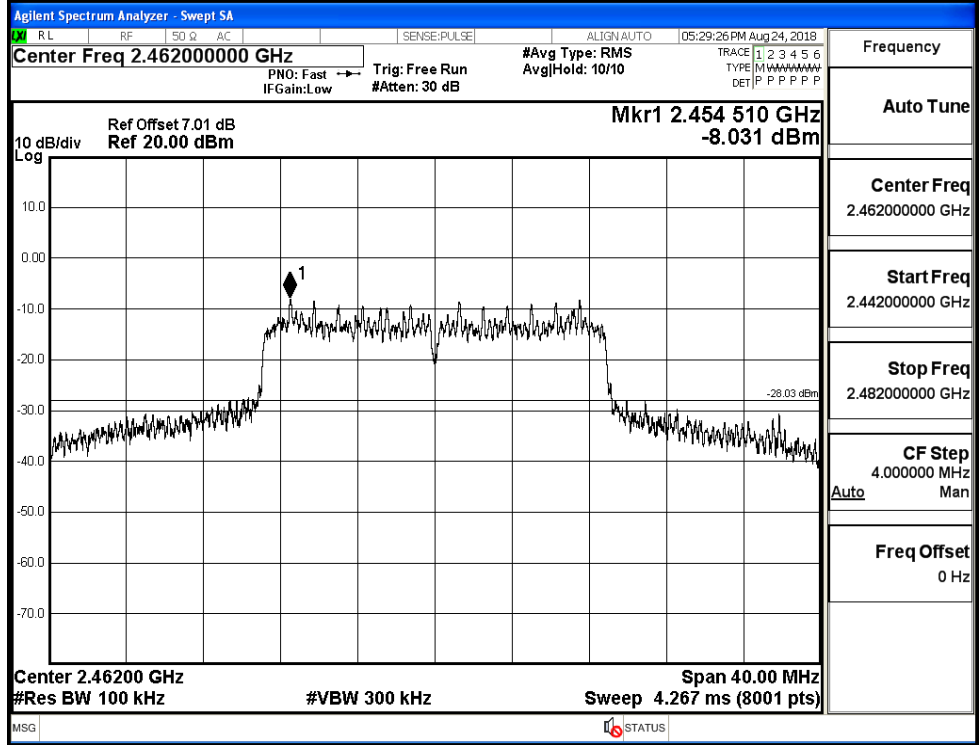


Puw/11N20  
SISO/MCH

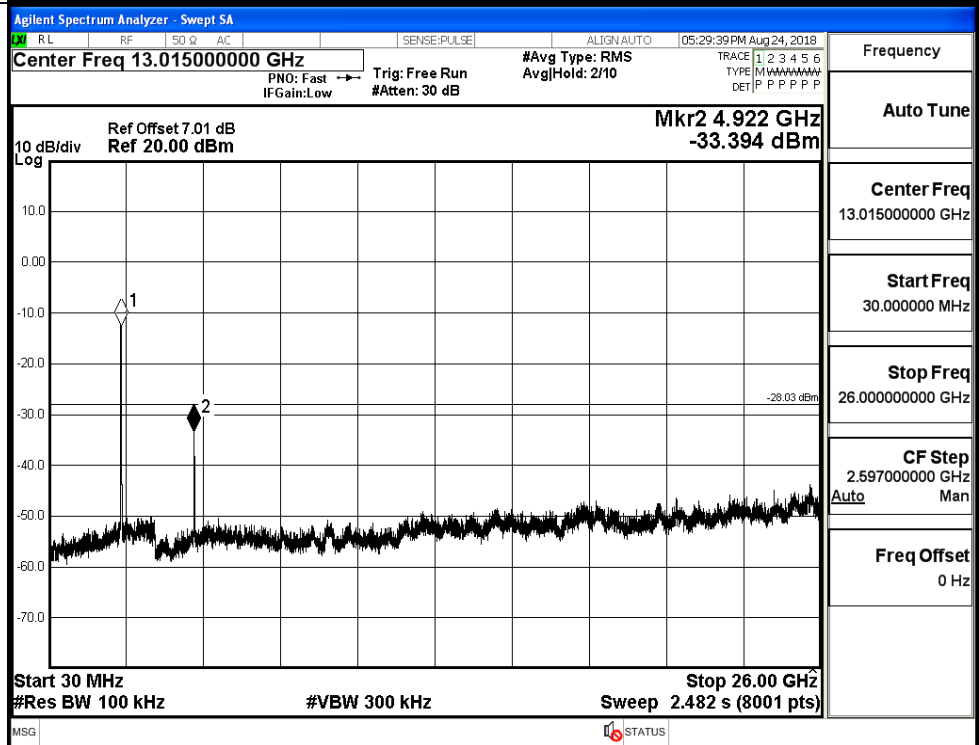


11N20SISO\_HCH\_Graphs

Pref/11N20  
SISO/HCH

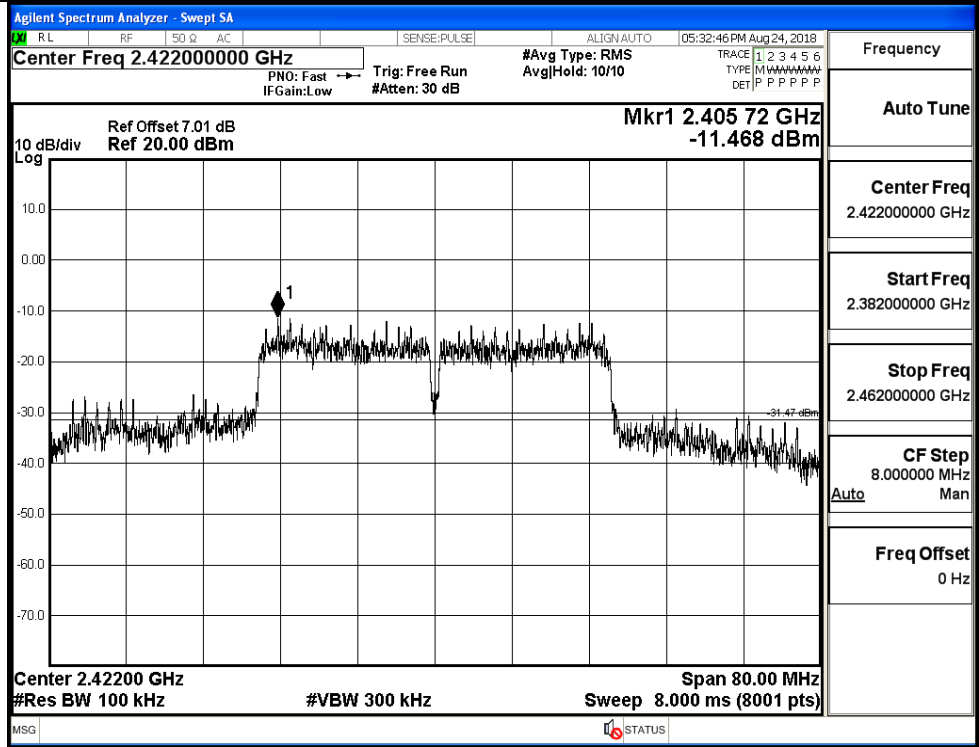


Puw/11N20  
SISO/HCH

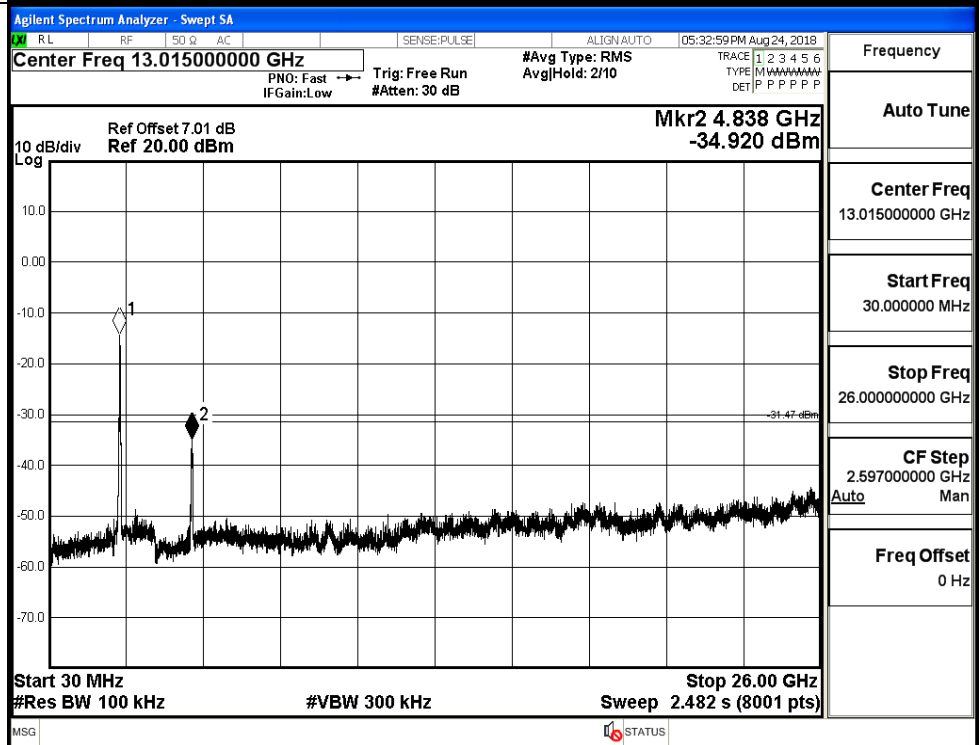


11N40SISO\_LCH\_Graphs

Pref/11N40  
SISO/LCH

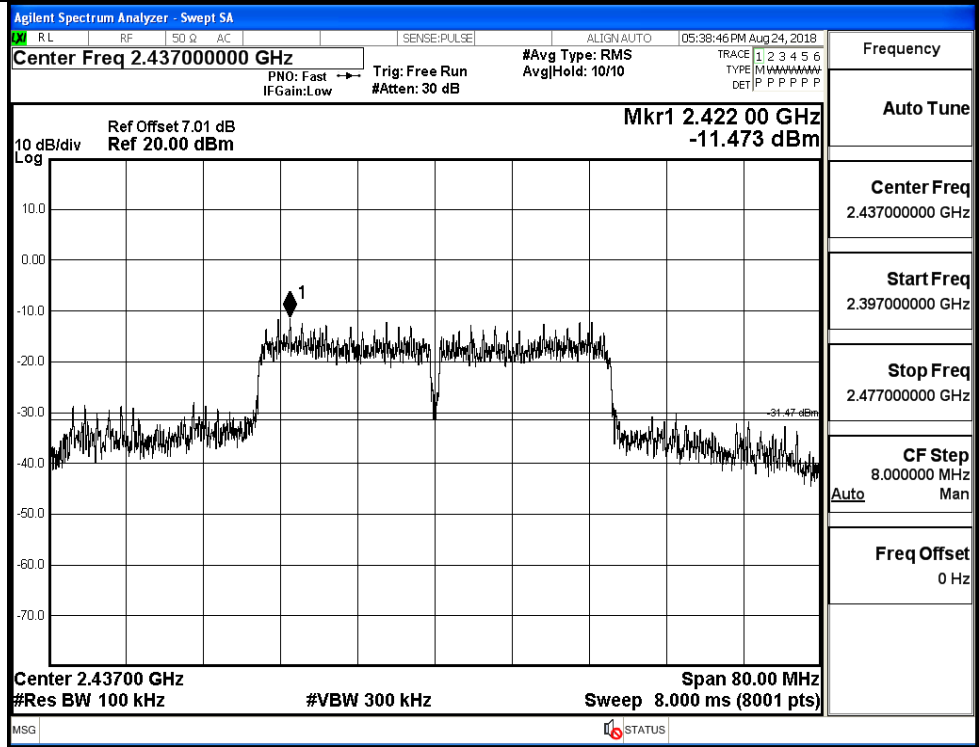


Puw/11N40  
SISO/LCH

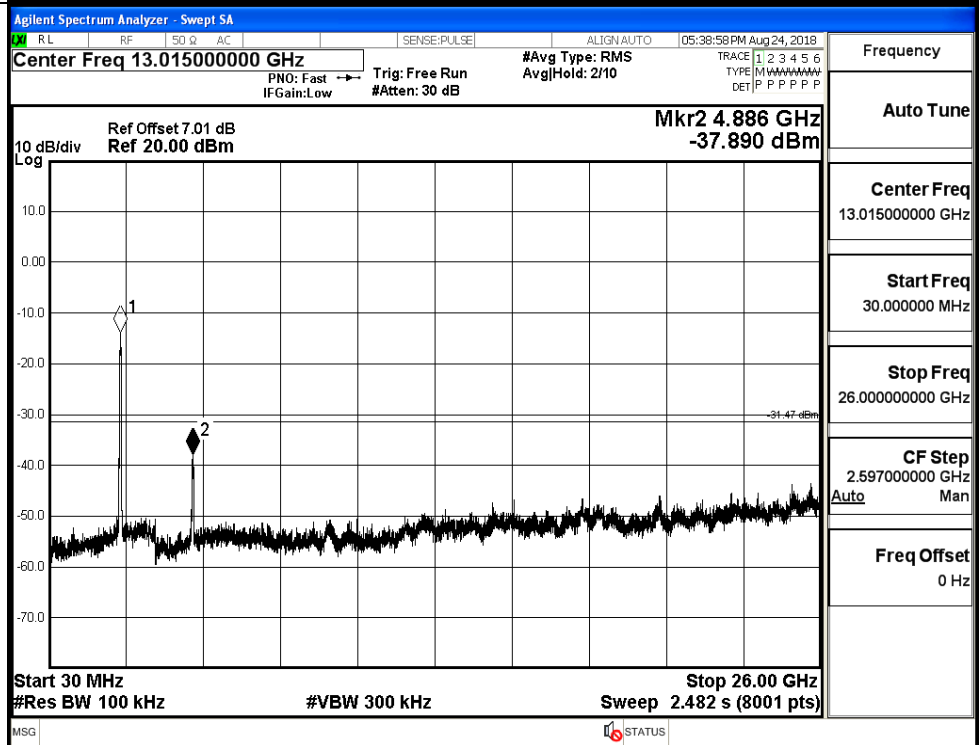


11N40SISO\_MCH\_Graphs

Pref/11N40  
SISO/MCH

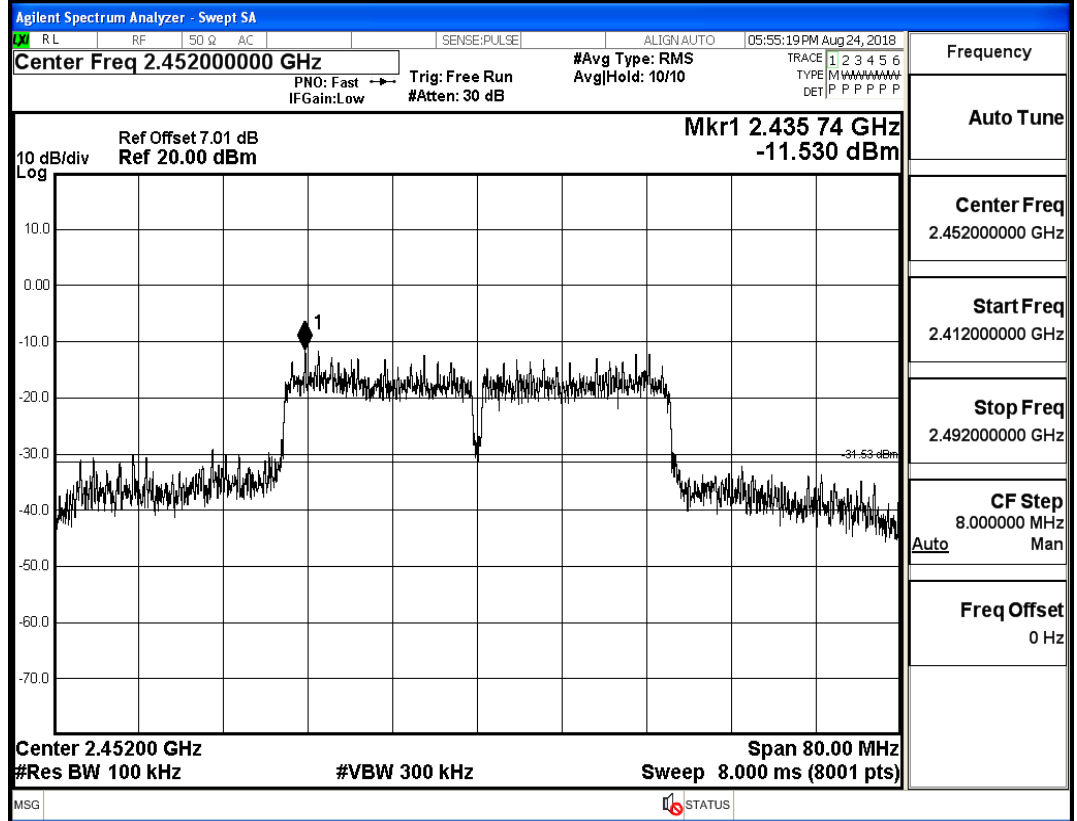


Puw/11N40  
SISO/MCH

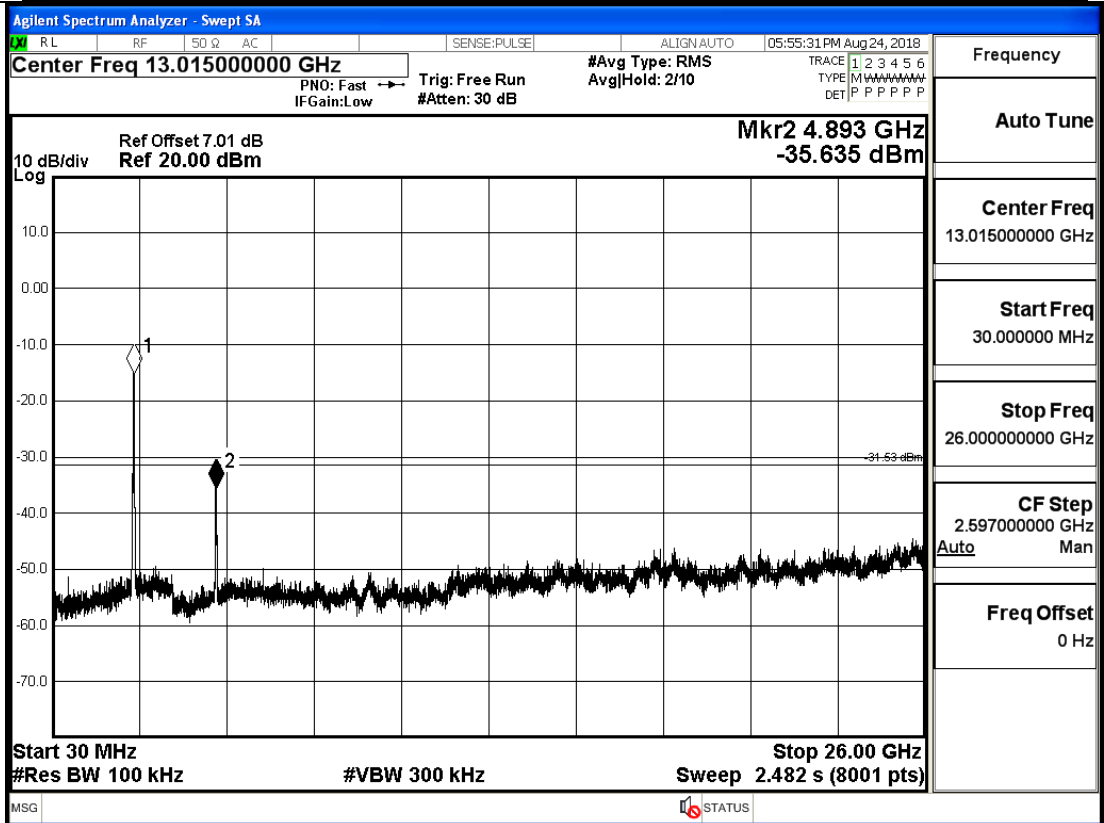


11N40SISO\_HCH\_Graphs

Pref/11N40  
SISO/HCH

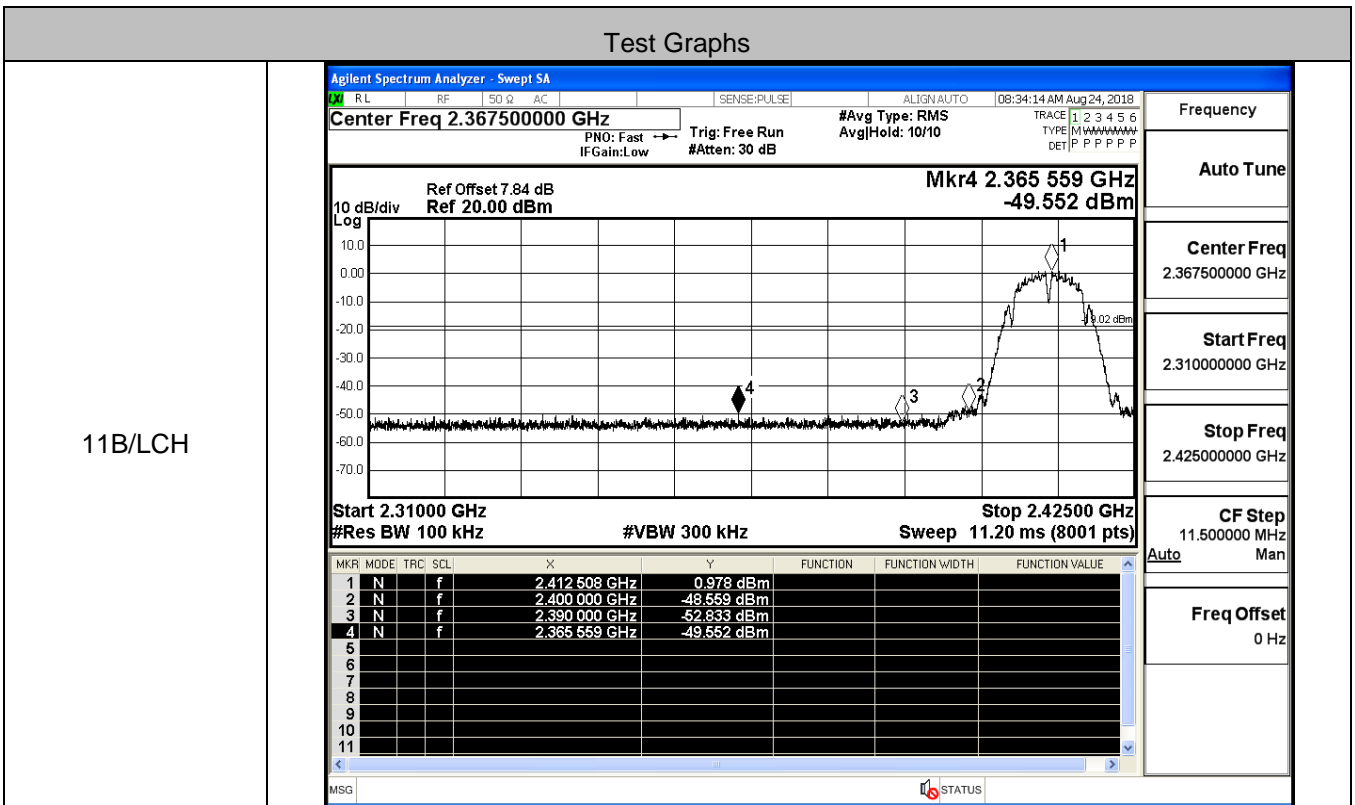


Puw/11N40  
SISO/HCH



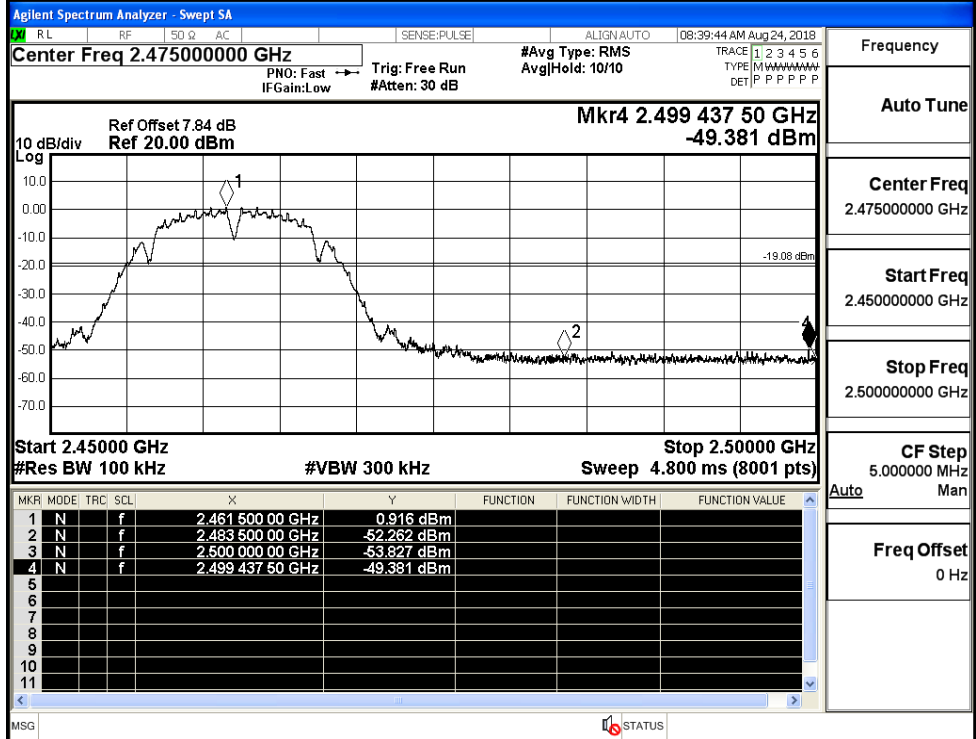
### A.6 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
11B	LCH	0.978	-49.552	-19.02	PASS
	HCH	0.916	-49.381	-19.08	PASS
11G	LCH	-7.492	-49.932	-27.49	PASS
	HCH	-8.805	-49.203	-28.81	PASS
11N20SISO	LCH	-8.054	-49.139	-28.05	PASS
	HCH	-8.771	-49.389	-28.77	PASS
11N40SISO	LCH	-11.121	-49.789	-31.12	PASS
	HCH	-11.338	-50.192	-31.34	PASS



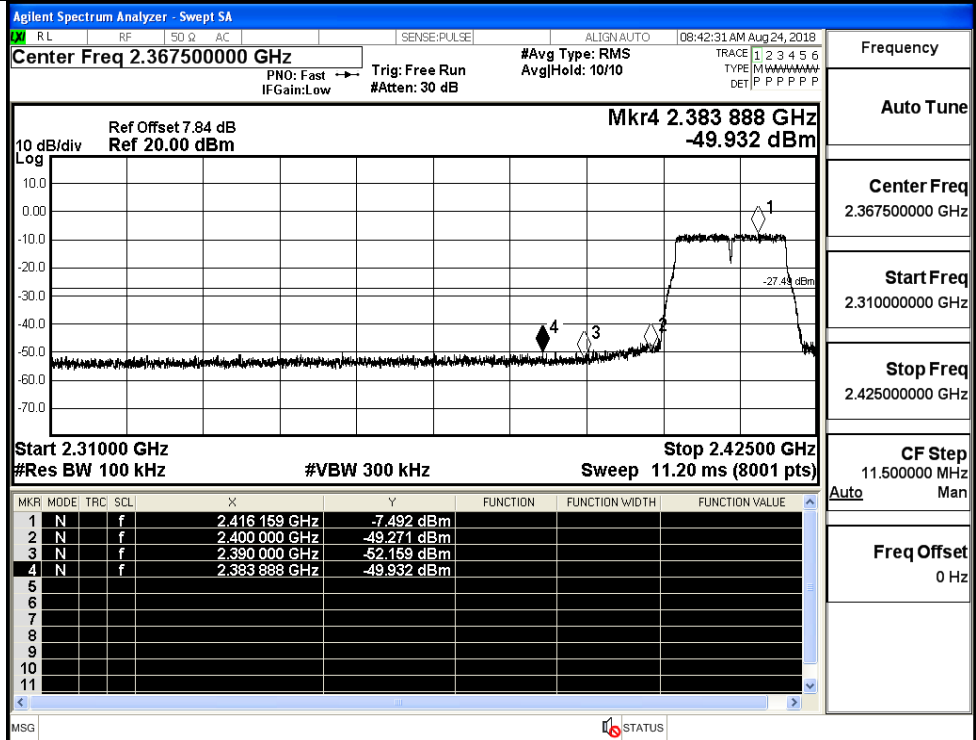


11B/HCH



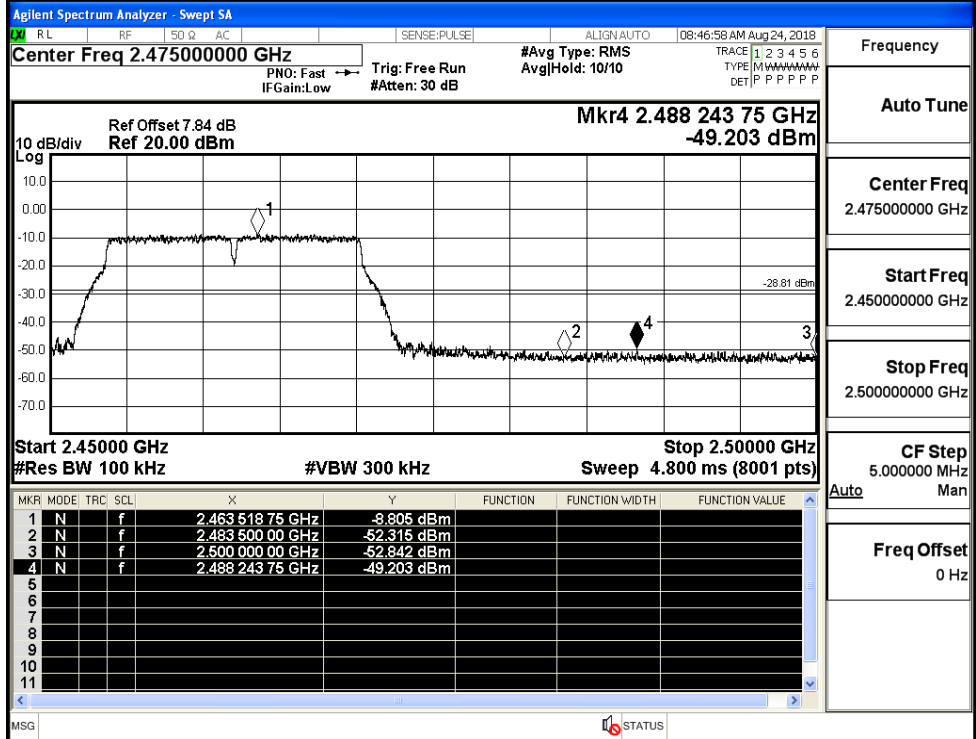
Frequency	
Auto Tune	
Center Freq	2.47500000 GHz
Start Freq	2.45000000 GHz
Stop Freq	2.50000000 GHz
CF Step	5.000000 MHz
Freq Offset	0 Hz

11G/LCH



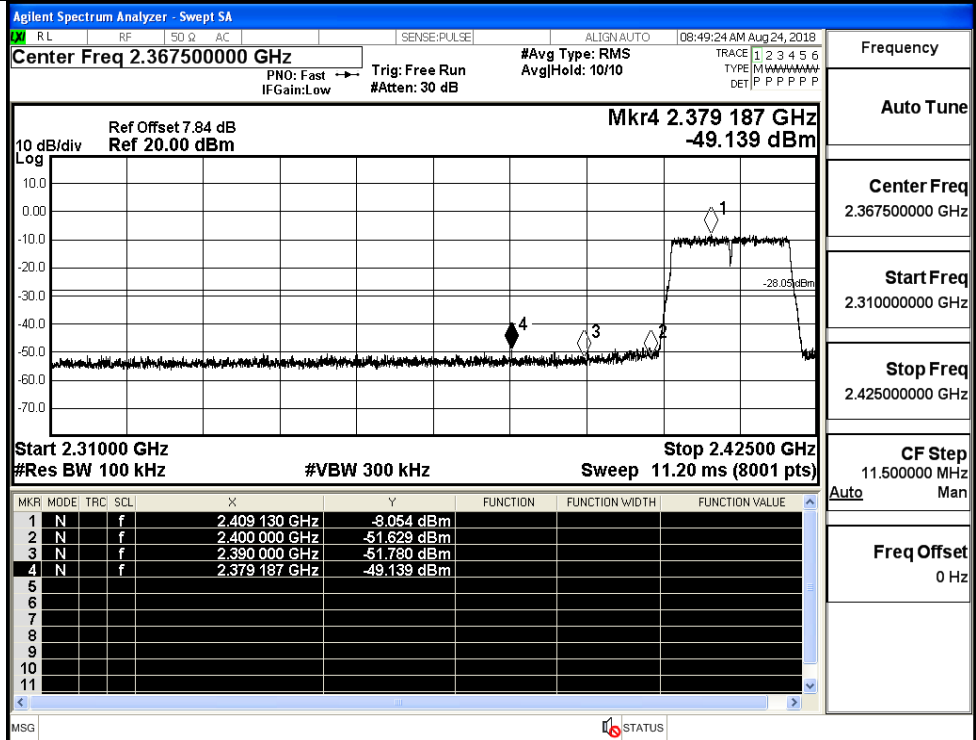
Frequency	
Auto Tune	
Center Freq	2.36750000 GHz
Start Freq	2.31000000 GHz
Stop Freq	2.42500000 GHz
CF Step	11.500000 MHz
Freq Offset	0 Hz

11G/HCH



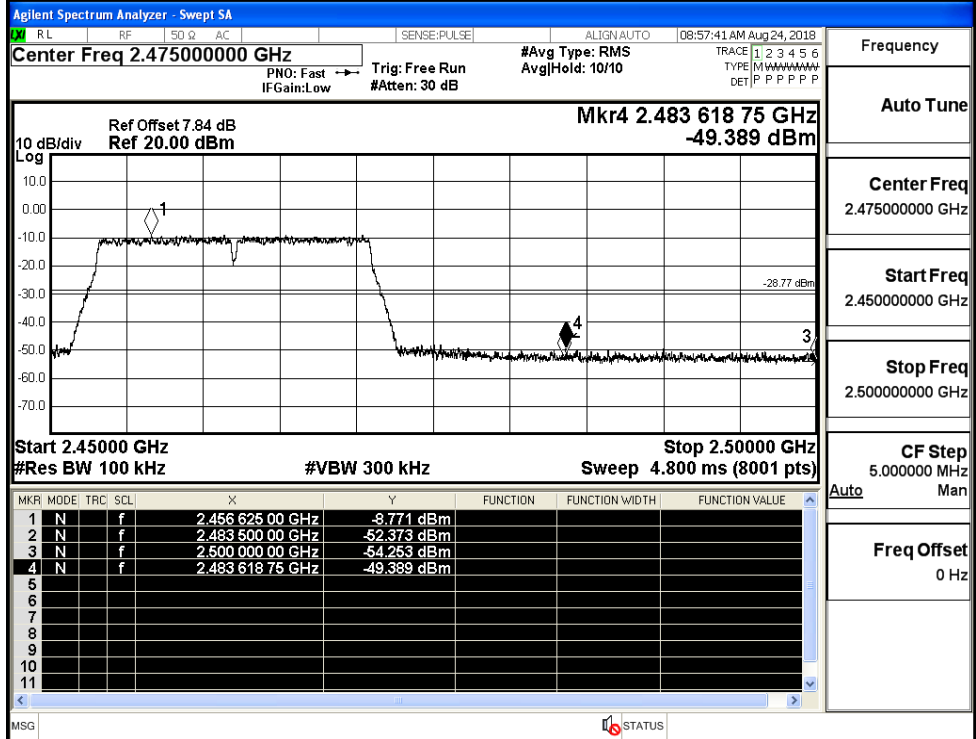
Frequency	
Auto Tune	
Center Freq	2.475000000 GHz
Start Freq	2.450000000 GHz
Stop Freq	2.500000000 GHz
CF Step	5.000000 MHz
Freq Offset	0 Hz

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



Frequency

Auto Tune

Center Freq  
2.475000000 GHz

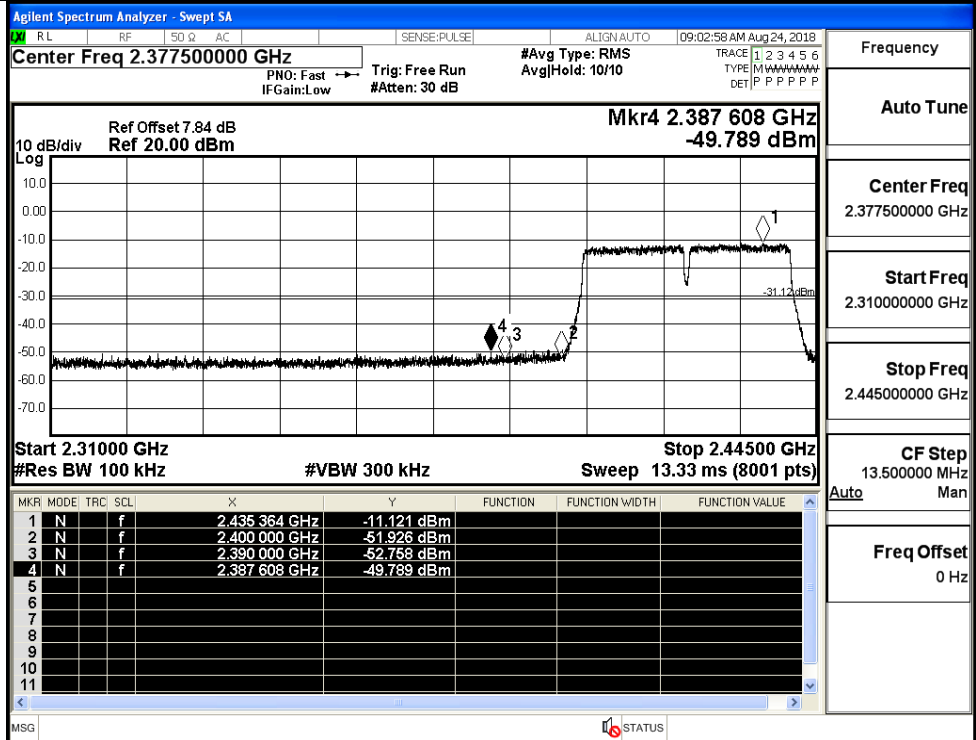
Start Freq  
2.450000000 GHz

Stop Freq  
2.500000000 GHz

CF Step  
5.000000 MHz

Freq Offset  
0 Hz

11N40SISO/LCH



Frequency

Auto Tune

Center Freq  
2.377500000 GHz

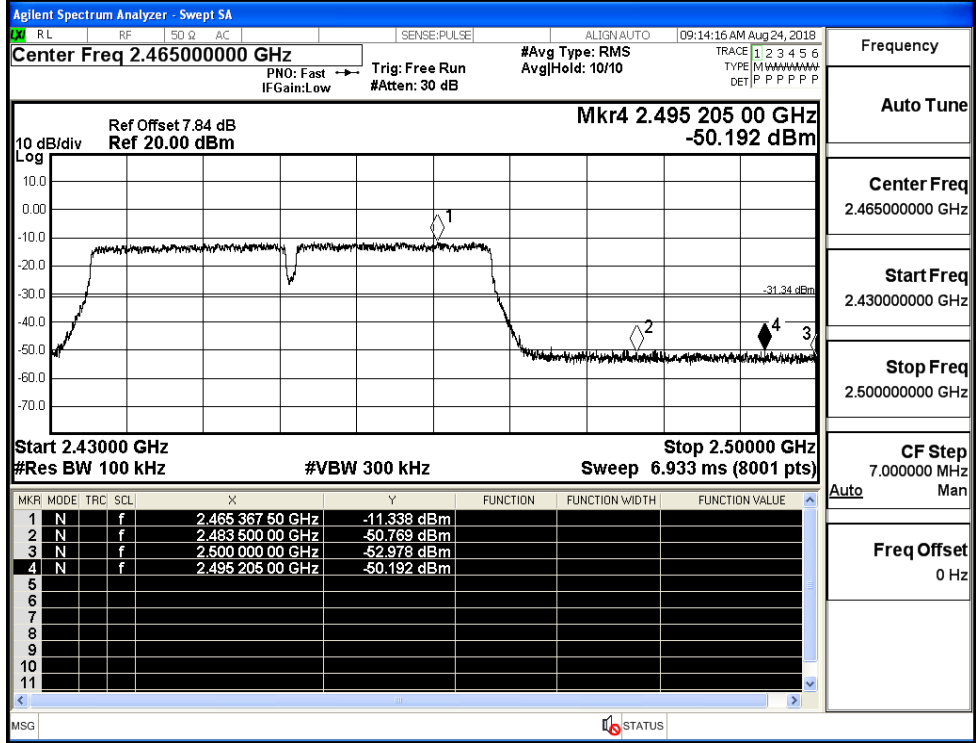
Start Freq  
2.310000000 GHz

Stop Freq  
2.445000000 GHz

CF Step  
13.500000 MHz

Freq Offset  
0 Hz

11N40SISO/HCH

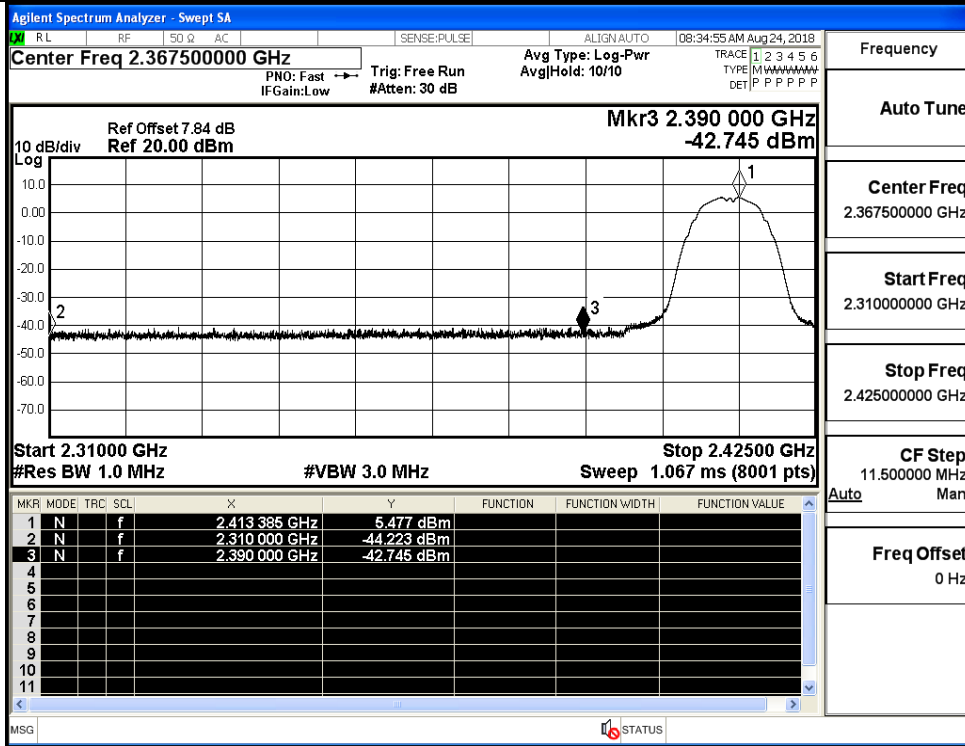


### A.7 Restrict-band band-edge measurements

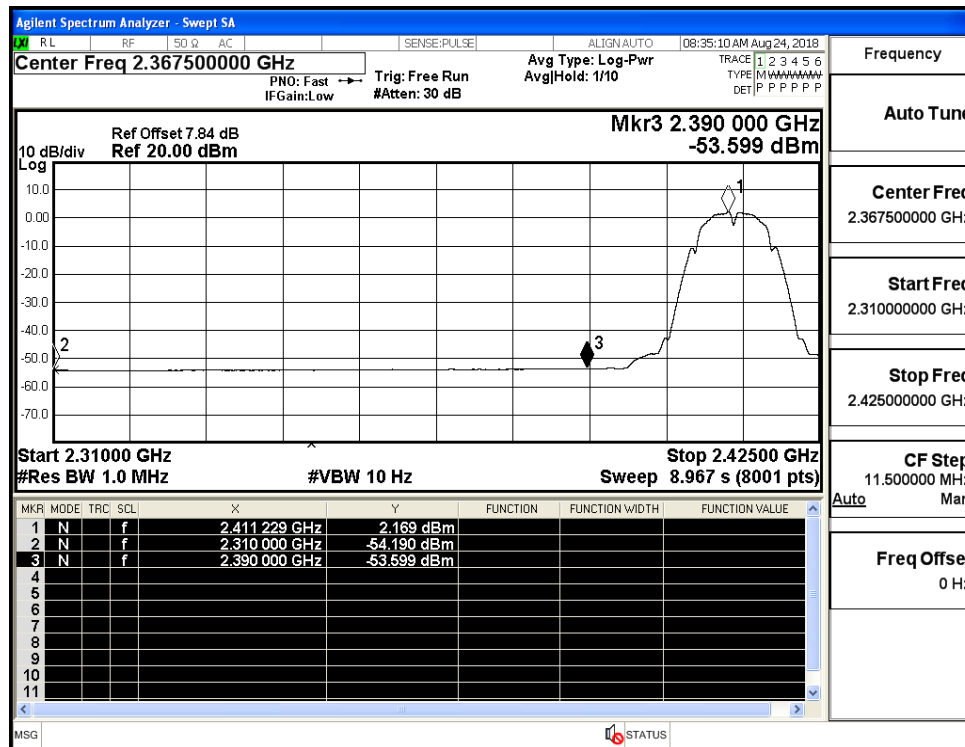
Test Mode	Test Channel	Ant	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBu V/m]	Verdict
11B	2412	Ant1	2310.0	-44.22	3.0	0	54.04	PEAK	74	PASS
	2412	Ant1	2310.0	-54.19	3.0	0	44.07	AV	54	PASS
	2412	Ant1	2390.0	-42.75	3.0	0	55.51	PEAK	74	PASS
	2412	Ant1	2390.0	-53.60	3.0	0	44.66	AV	54	PASS
	2462	Ant1	2483.5	-43.58	3.0	0	54.68	PEAK	74	PASS
	2462	Ant1	2483.5	-53.28	3.0	0	44.98	AV	54	PASS
	2462	Ant1	2500.0	-43.12	3.0	0	55.14	PEAK	74	PASS
	2462	Ant1	2500.0	-53.38	3.0	0	44.88	AV	54	PASS
11G	2412	Ant1	2310.0	-43.21	3.0	0	55.05	PEAK	74	PASS
	2412	Ant1	2310.0	-54.17	3.0	0	44.09	AV	54	PASS
	2412	Ant1	2390.0	-42.54	3.0	0	55.72	PEAK	74	PASS
	2412	Ant1	2390.0	-52.69	3.0	0	45.57	AV	54	PASS
	2462	Ant1	2483.5	-41.57	3.0	0	56.69	PEAK	74	PASS
	2462	Ant1	2483.5	-52.94	3.0	0	45.32	AV	54	PASS
	2462	Ant1	2500.0	-43.15	3.0	0	55.11	PEAK	74	PASS
	2462	Ant1	2500.0	-53.11	3.0	0	45.15	AV	54	PASS
11N20 SISO	2412	Ant1	2310.0	-43.75	3.0	0	54.51	PEAK	74	PASS
	2412	Ant1	2310.0	-54.17	3.0	0	44.09	AV	54	PASS
	2412	Ant1	2390.0	-42.96	3.0	0	55.3	PEAK	74	PASS
	2412	Ant1	2390.0	-53.02	3.0	0	45.24	AV	54	PASS
	2462	Ant1	2483.5	-41.62	3.0	0	56.64	PEAK	74	PASS
	2462	Ant1	2483.5	-52.89	3.0	0	45.37	AV	54	PASS
	2462	Ant1	2500.0	-42.43	3.0	0	55.83	PEAK	74	PASS
	2462	Ant1	2500.0	-53.03	3.0	0	45.23	AV	54	PASS
11N40 SISO	2422	Ant1	2310.0	-44.41	3.0	0	53.85	PEAK	74	PASS
	2422	Ant1	2310.0	-54.20	3.0	0	44.06	AV	54	PASS

	2422	Ant1	2390.0	-42.27	3.0	0	55.99	PEAK	74	PASS
	2422	Ant1	2390.0	-52.82	3.0	0	45.44	AV	54	PASS
	2452	Ant1	2483.5	-41.35	3.0	0	56.91	PEAK	74	PASS
	2452	Ant1	2483.5	-52.74	3.0	0	45.52	AV	54	PASS
	2452	Ant1	2500.0	-41.71	3.0	0	56.55	PEAK	74	PASS
	2452	Ant1	2500.0	-53.01	3.0	0	45.25	AV	54	PASS

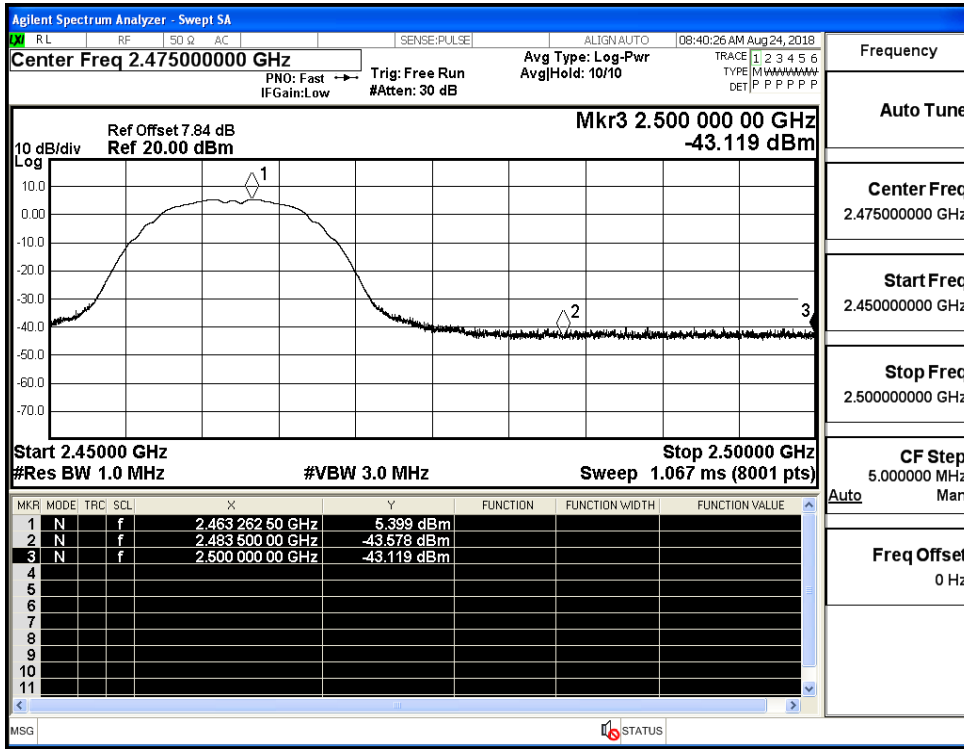
Restrict-band band-edge measurements\_11B\_2412\_Ant1\_PEAK



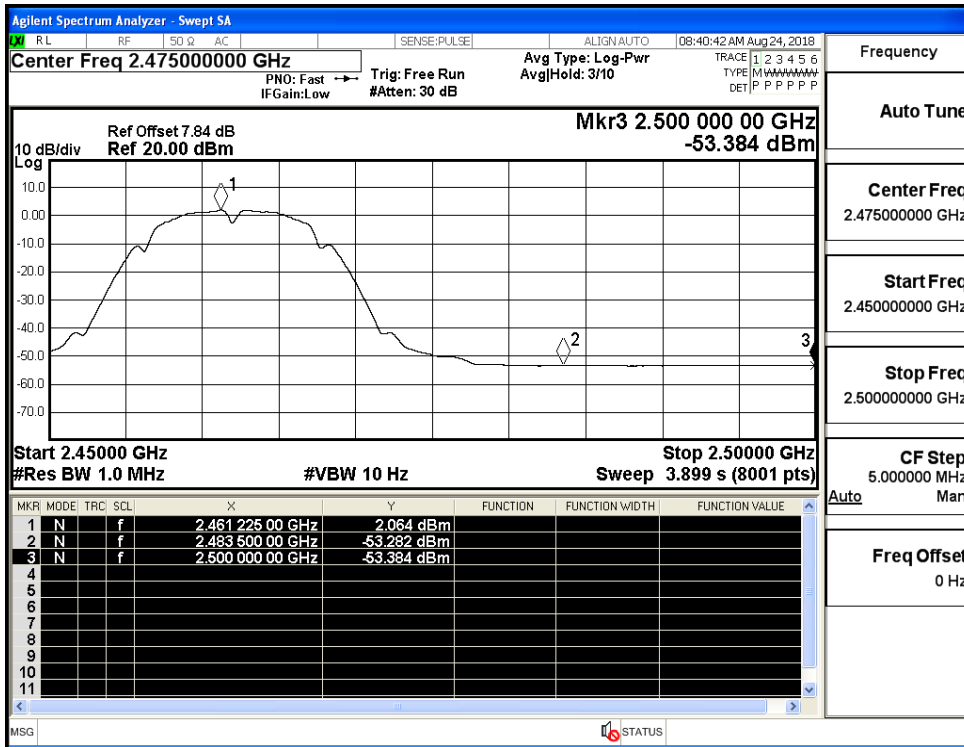
Restrict-band band-edge measurements\_11B\_2412\_Ant1\_AV



Restrict-band band-edge measurements\_11B\_2462\_Ant1\_PEAK

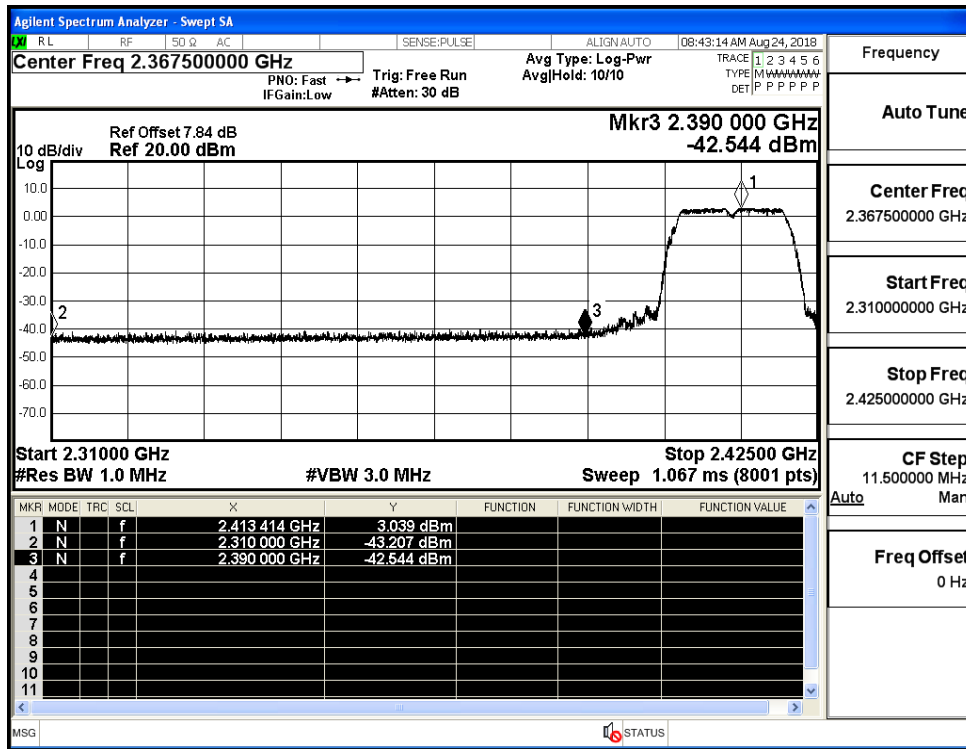


Restrict-band band-edge measurements\_11B\_2462\_Ant1\_AV

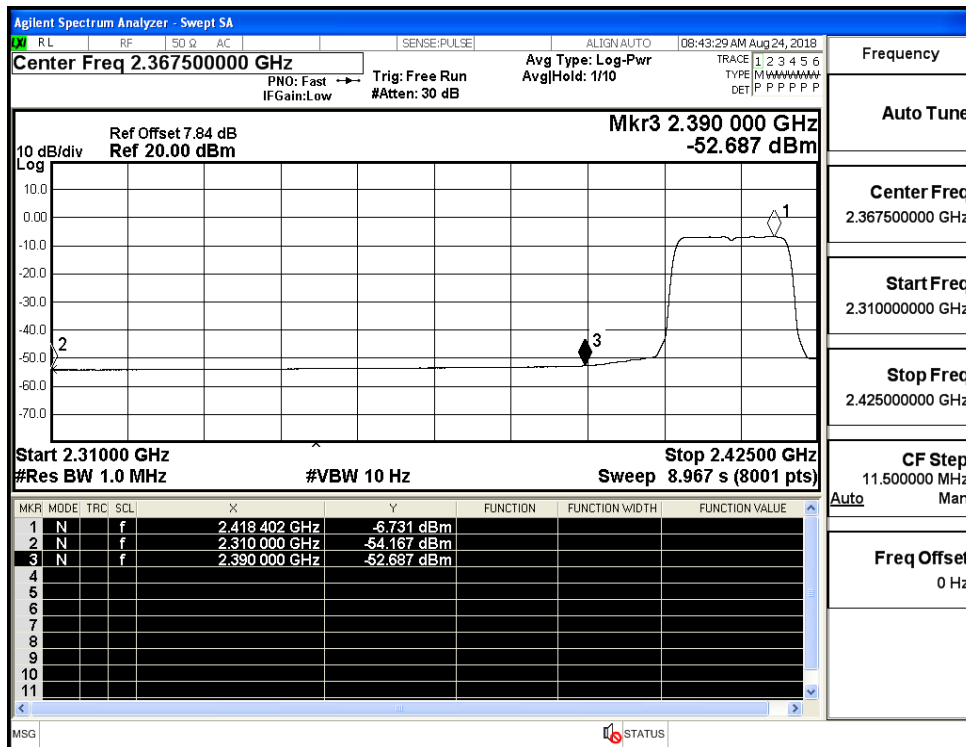




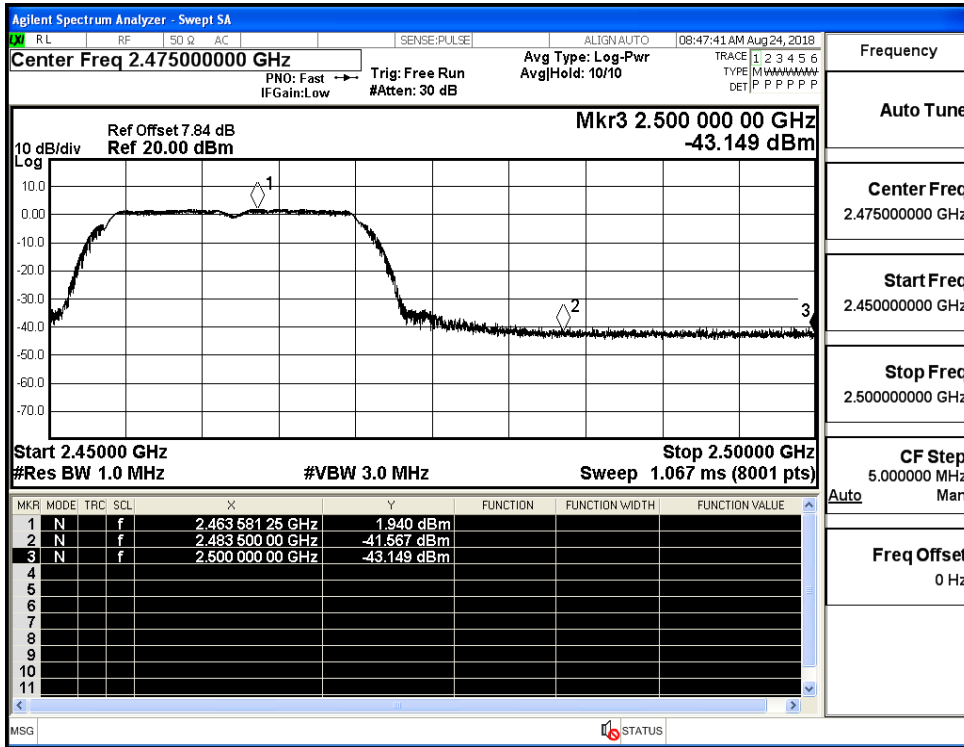
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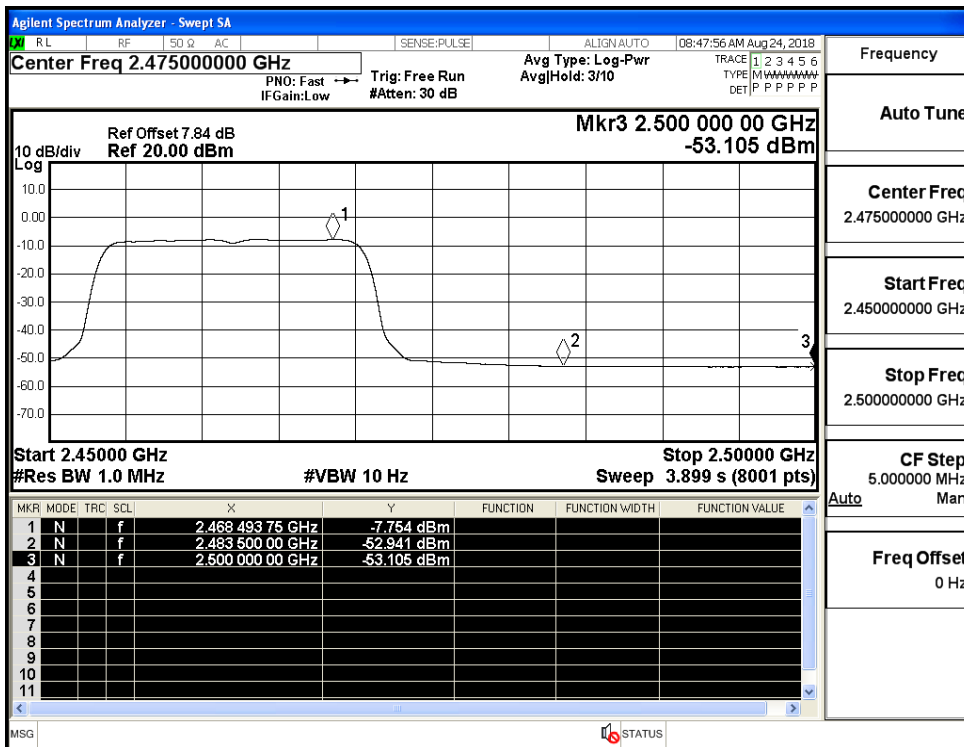
Restrict-band band-edge measurements\_11G\_2412\_Ant1\_AV



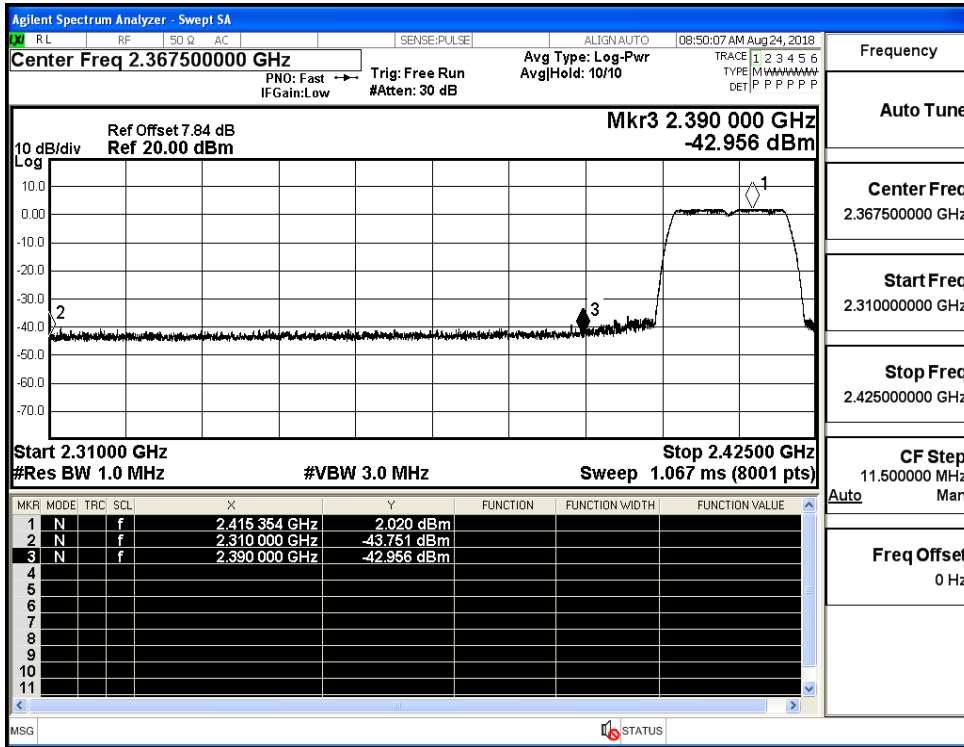
Restrict-band band-edge measurements\_11G\_2462\_Ant1\_PEAK



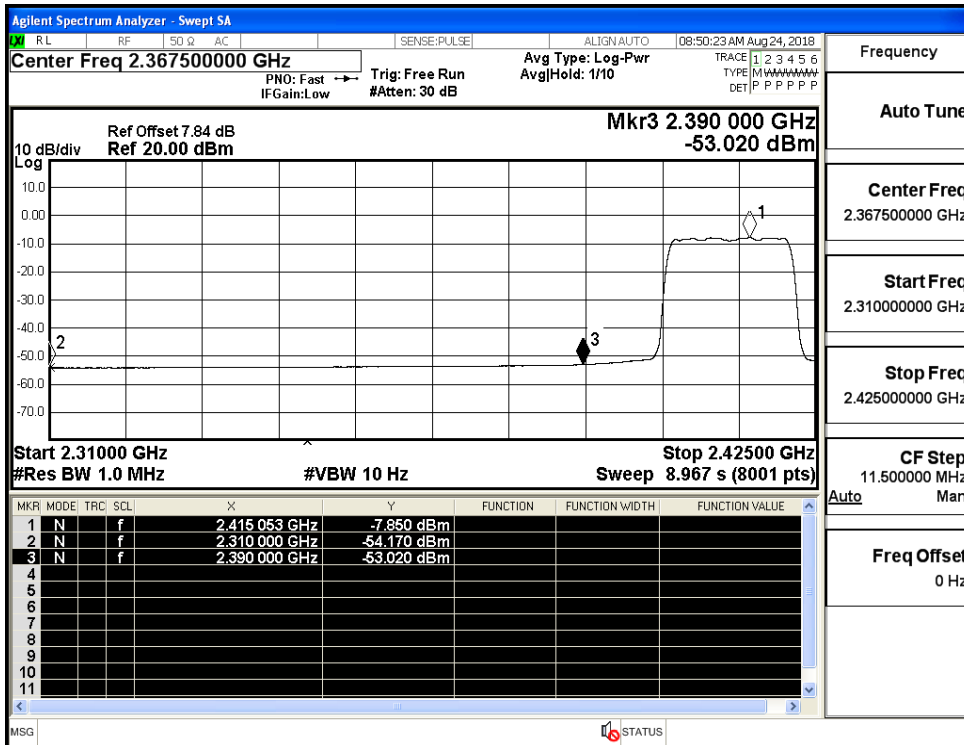
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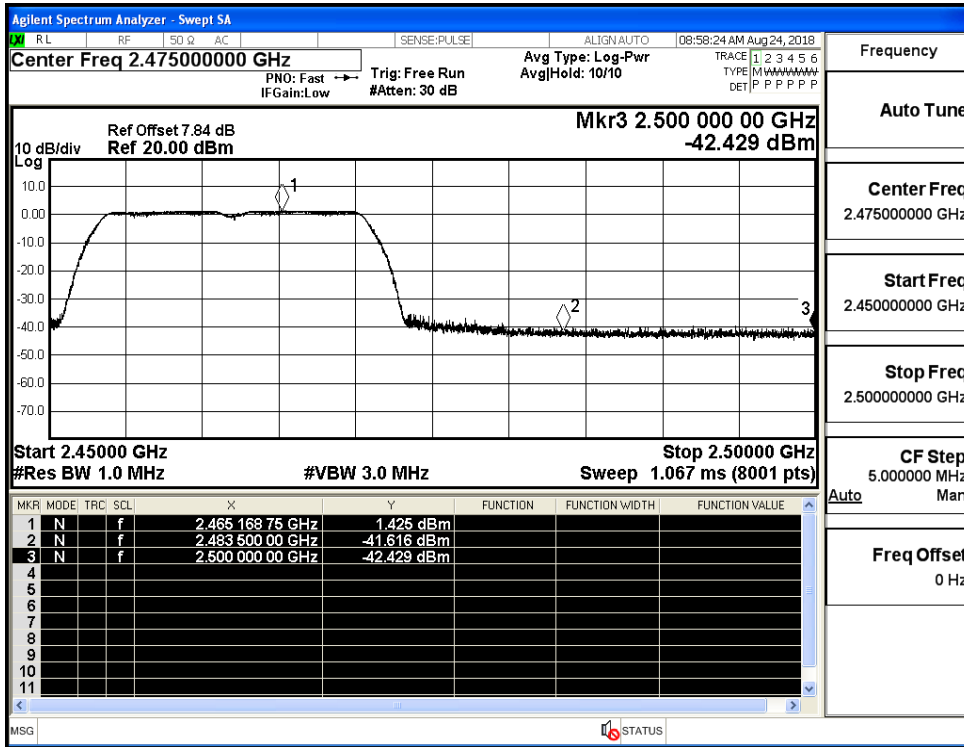
Restrict-band band-edge measurements\_11N20SISO\_2412\_Ant1\_PEAK



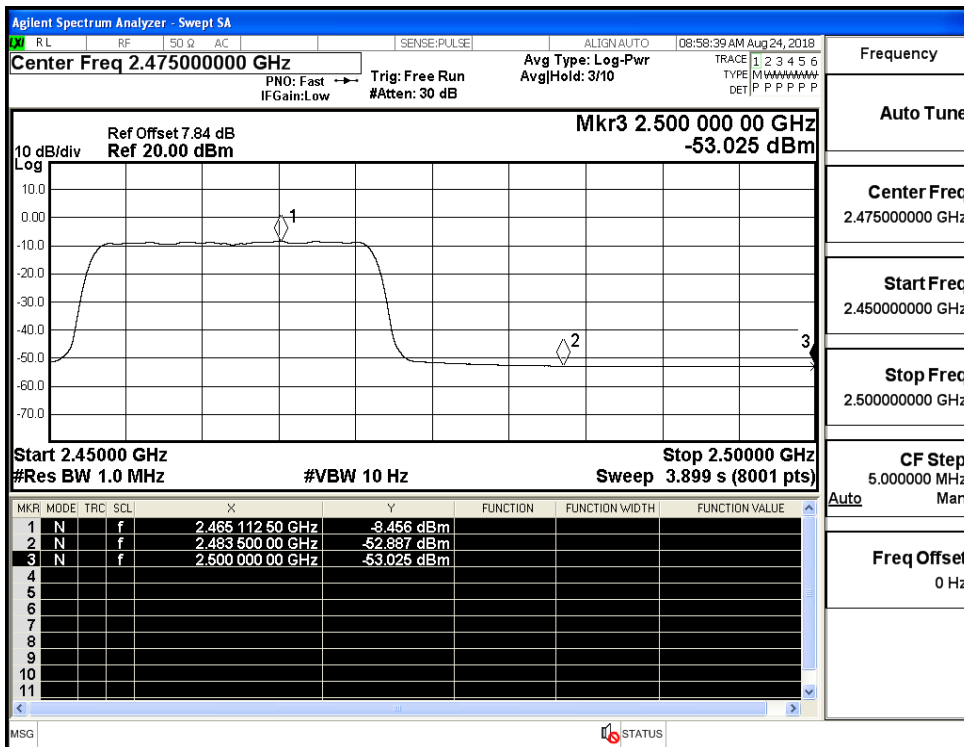
Restrict-band band-edge measurements\_11N20SISO\_2412\_Ant1\_AV



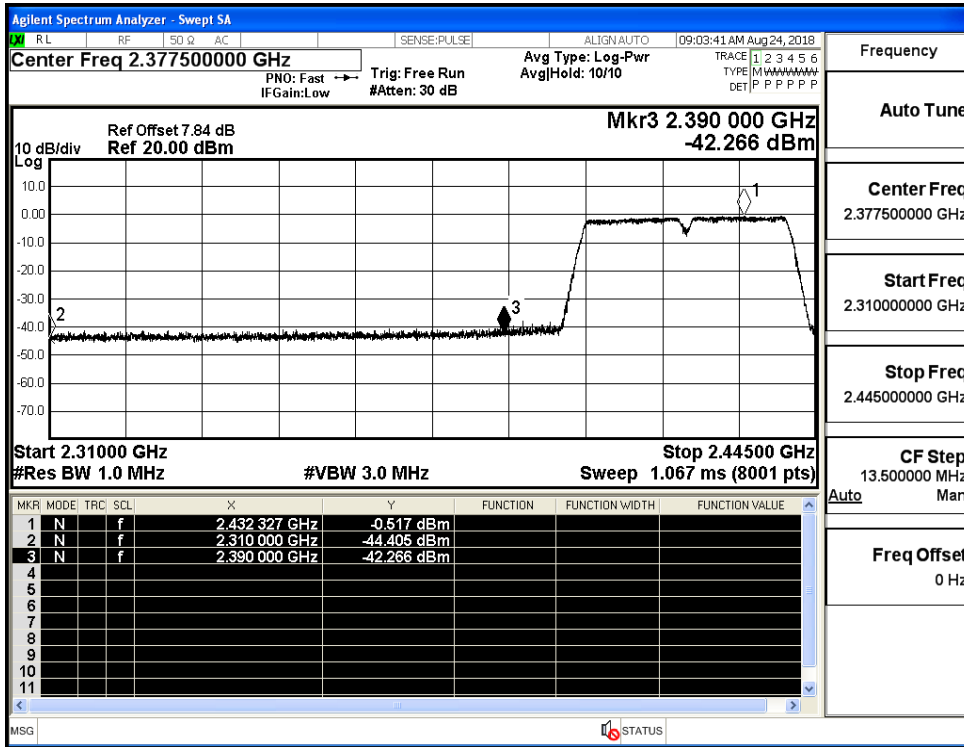
Restrict-band band-edge measurements\_11N20SISO\_2462\_Ant1\_PEAK



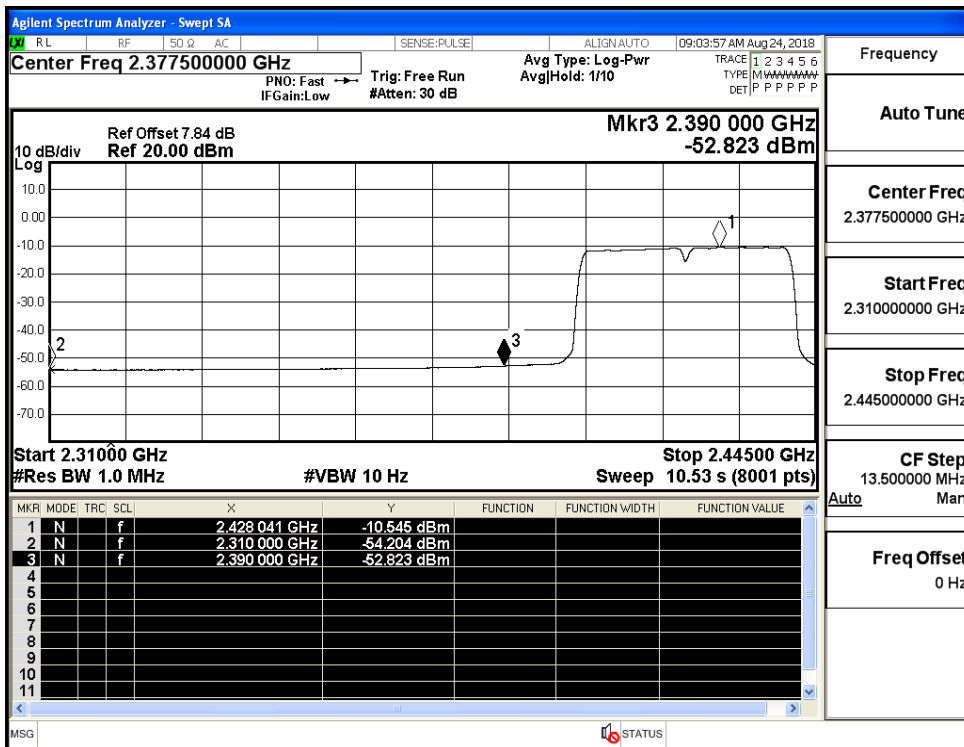
Restrict-band band-edge measurements\_11N20SISO\_2462\_Ant1\_AV



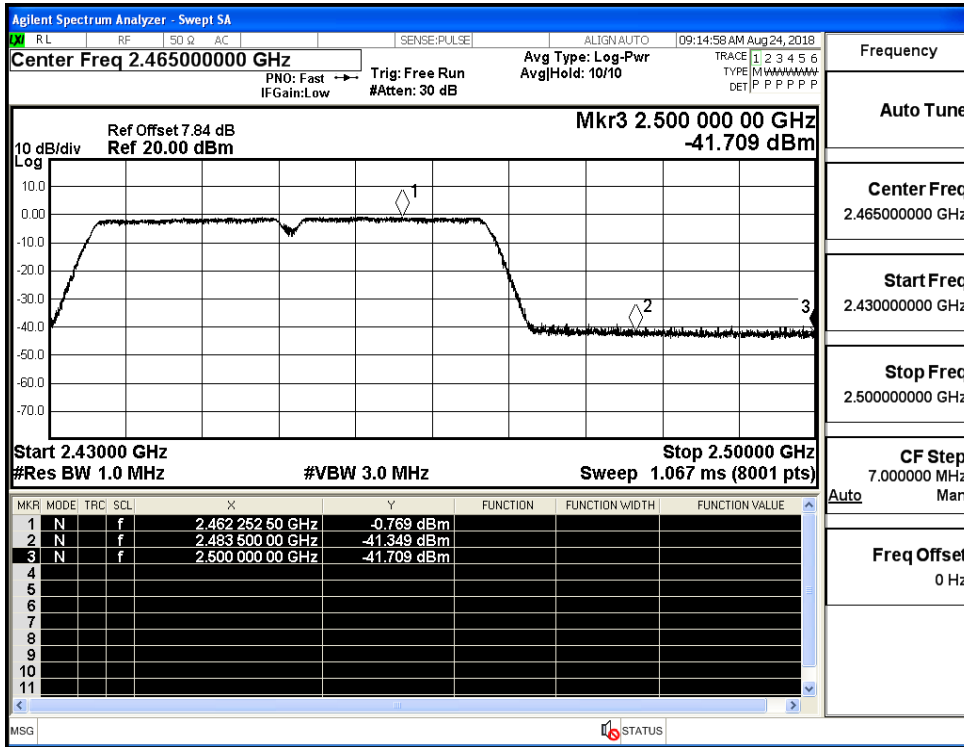
Restrict-band band-edge measurements\_11N40SISO\_2422\_Ant1\_PEAK



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

