

## Appendix A

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

Product Name: Smart Gateway

Trade Mark: N/A

Test Model: TYGWZW-01N

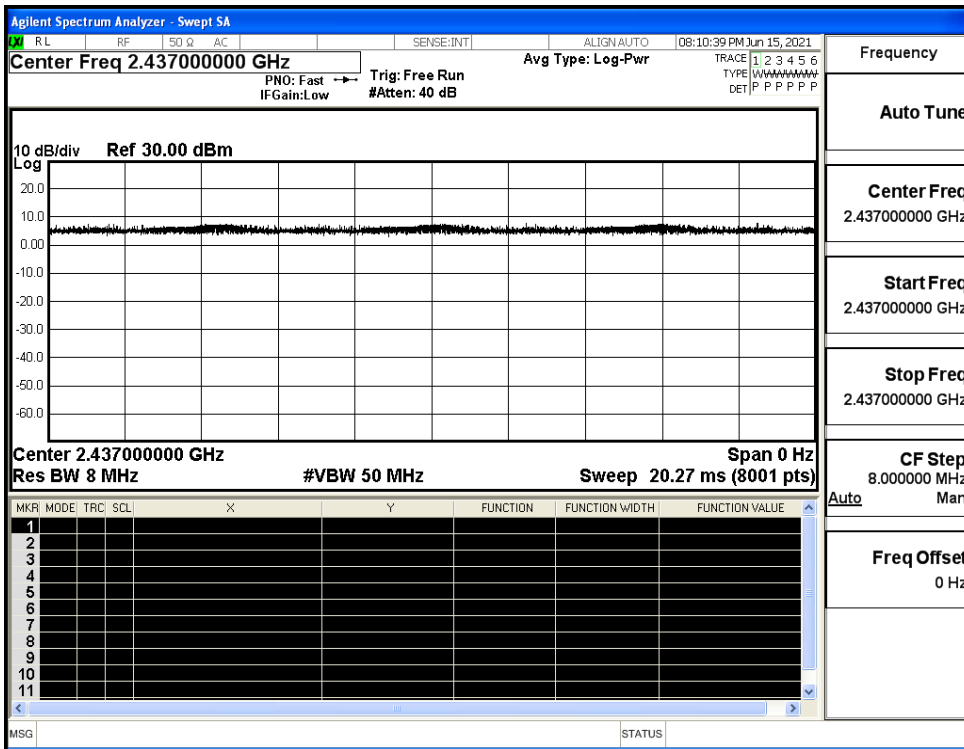
#### Environmental Conditions

Temperature:	21.6° C
Relative Humidity:	52.7%
ATM Pressure:	100.0 kPa
Test Engineer:	Ken He
Supervised by:	Li Huan

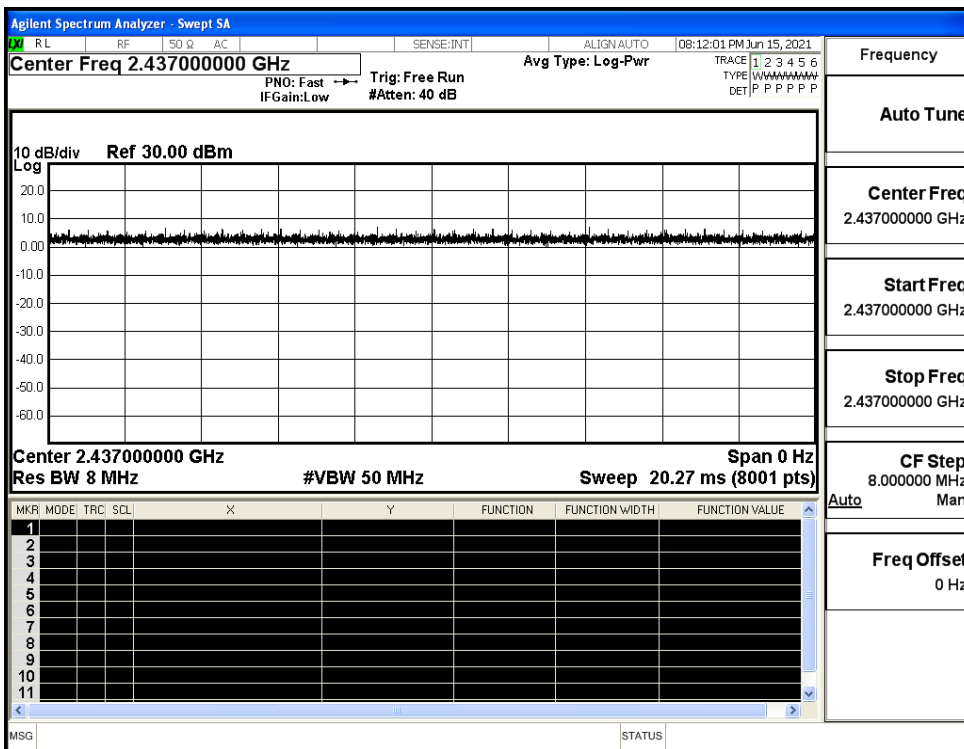
#### A.1 Duty Cycle

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

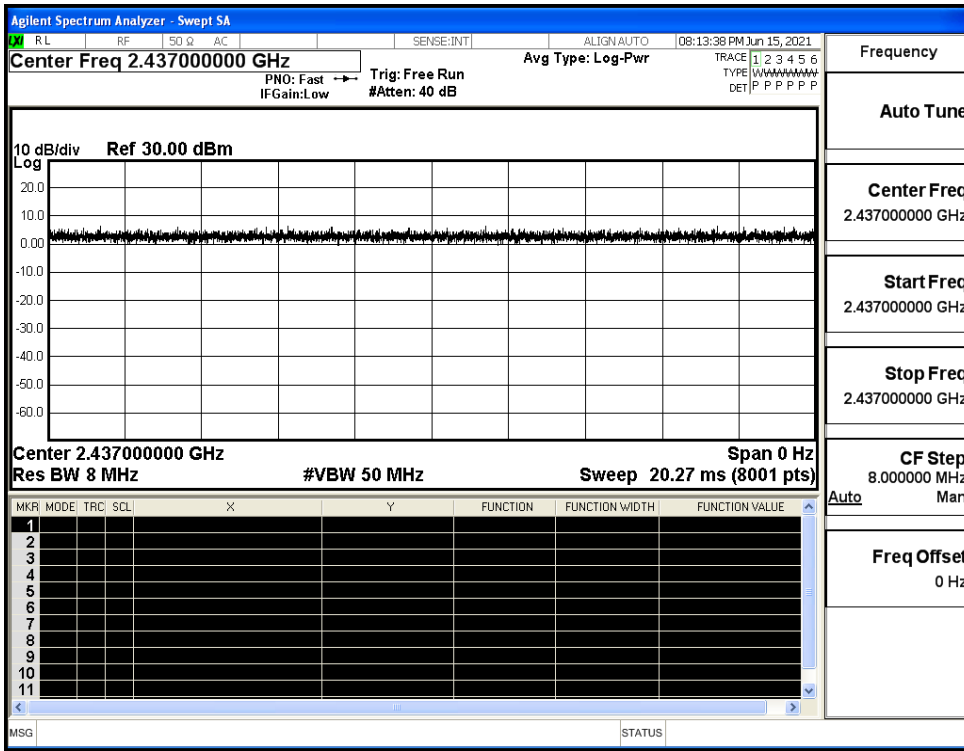
Duty Cycle\_11B\_2437\_Ant1



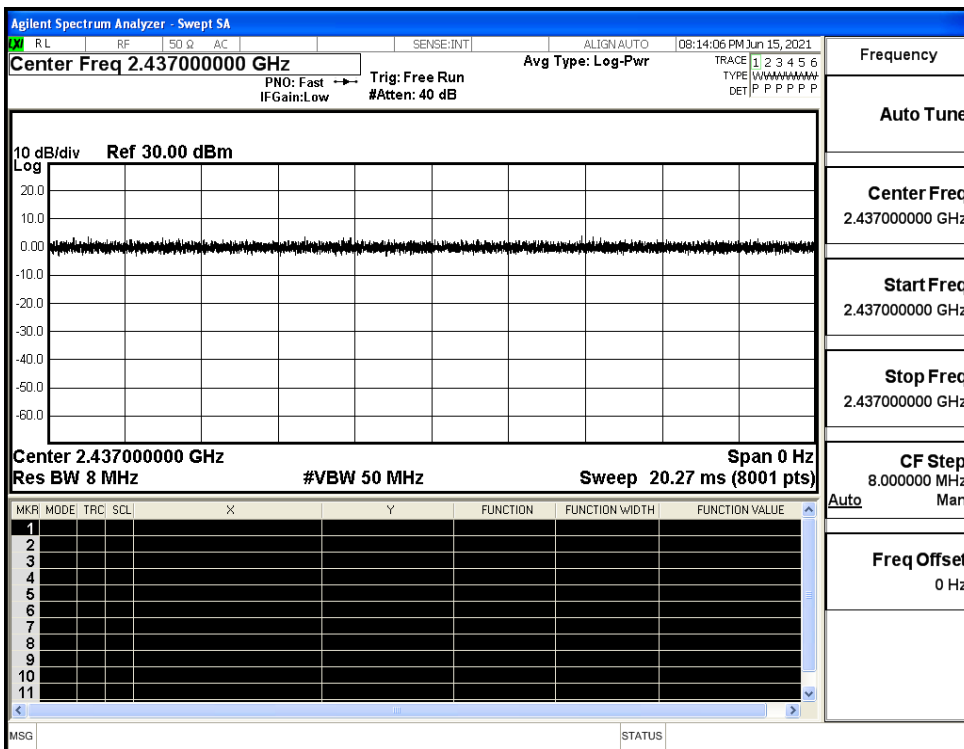
Duty Cycle\_11G\_2437\_Ant1



Duty Cycle\_11N20SISO\_2437\_Ant1



Duty Cycle\_11N40SISO\_2437\_Ant1

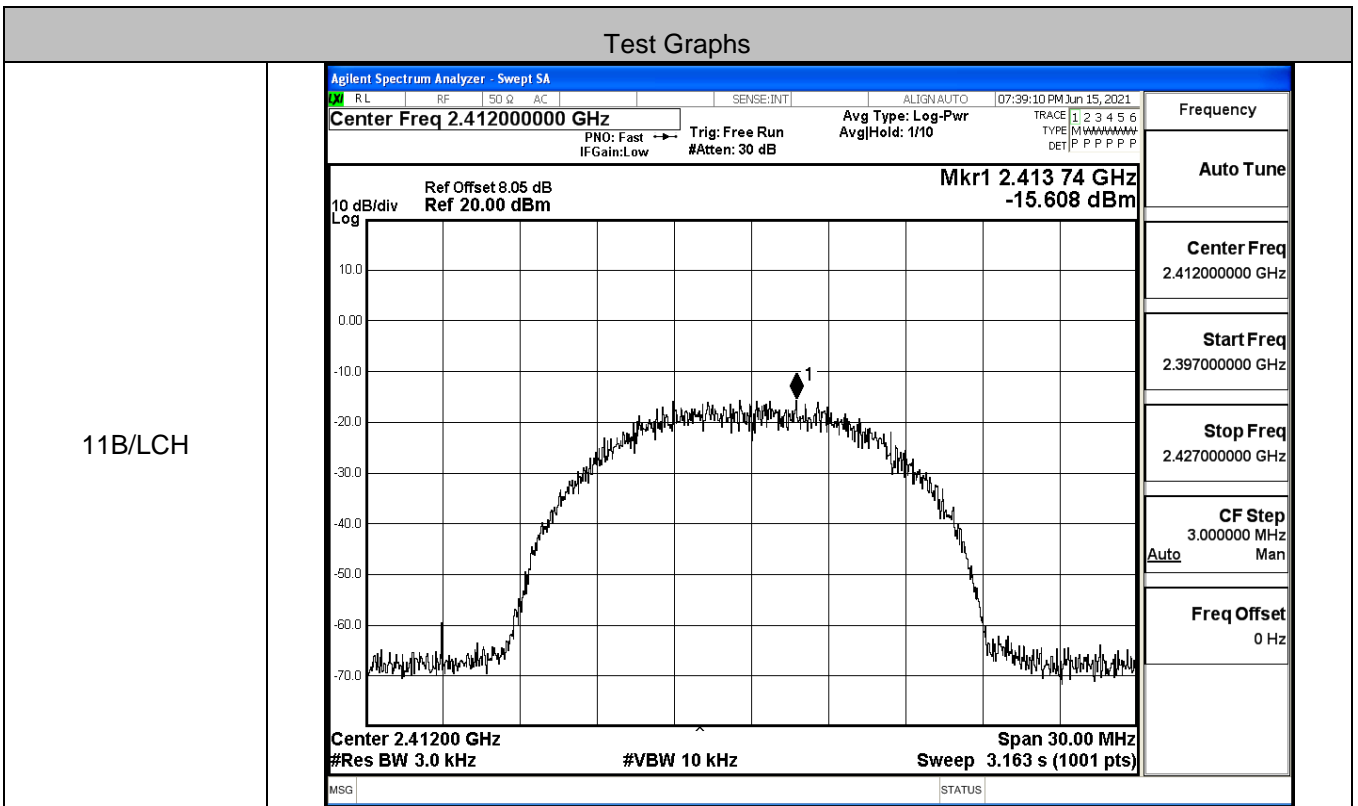


**A.2 Maximum Conducted Output Power**

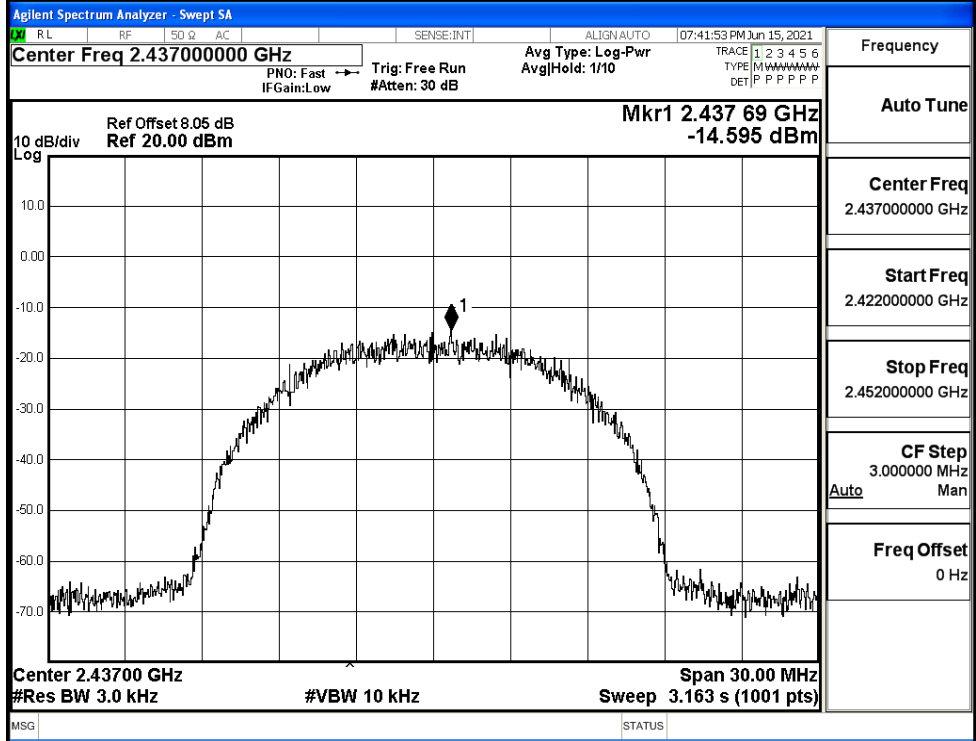
Mode	Channel	Meas.Level [dBm]	Limit [dBm]	Verdict
11B	LCH	16.69	30	PASS
	MCH	17.12	30	PASS
	HCH	16.96	30	PASS
11G	LCH	16.28	30	PASS
	MCH	16.77	30	PASS
	HCH	16.68	30	PASS
11N20SISO	LCH	16.51	30	PASS
	MCH	16.95	30	PASS
	HCH	16.87	30	PASS
11N40SISO	LCH	17.25	30	PASS
	MCH	17.43	30	PASS
	HCH	17.57	30	PASS

### A.3 Maximum Power Spectral Density

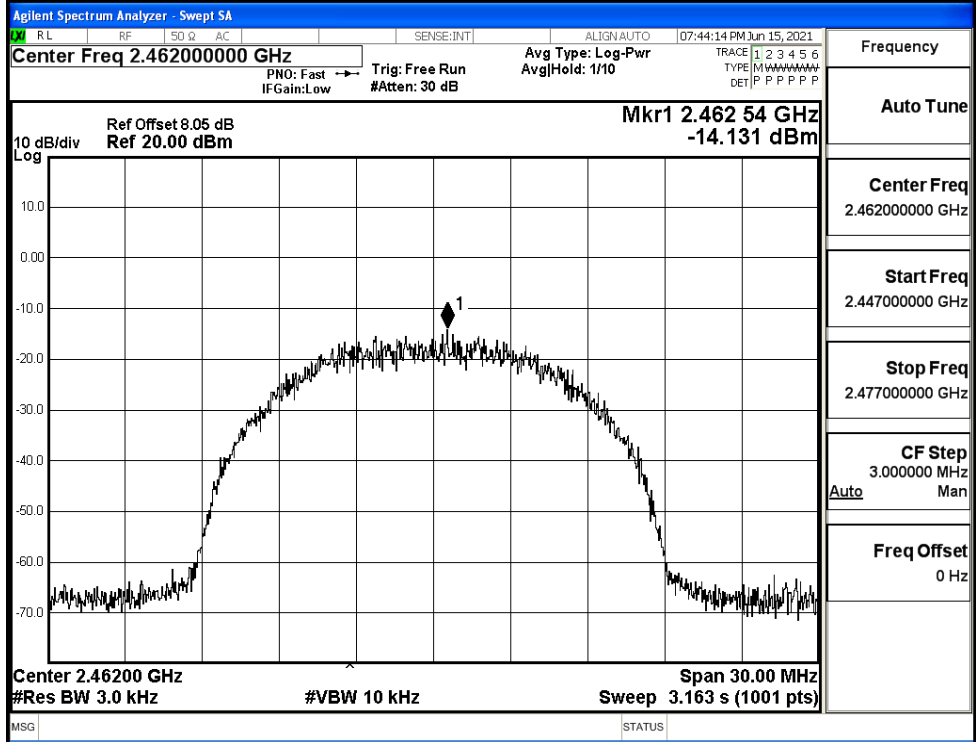
Mode	Channel	Meas.Level [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
11B	LCH	-15.608	8	PASS
	MCH	-14.595	8	PASS
	HCH	-14.131	8	PASS
11G	LCH	-17.450	8	PASS
	MCH	-17.755	8	PASS
	HCH	-15.986	8	PASS
11N20SISO	LCH	-17.368	8	PASS
	MCH	-16.397	8	PASS
	HCH	-16.897	8	PASS
11N40SISO	LCH	-15.918	8	PASS
	MCH	-15.708	8	PASS
	HCH	-15.302	8	PASS



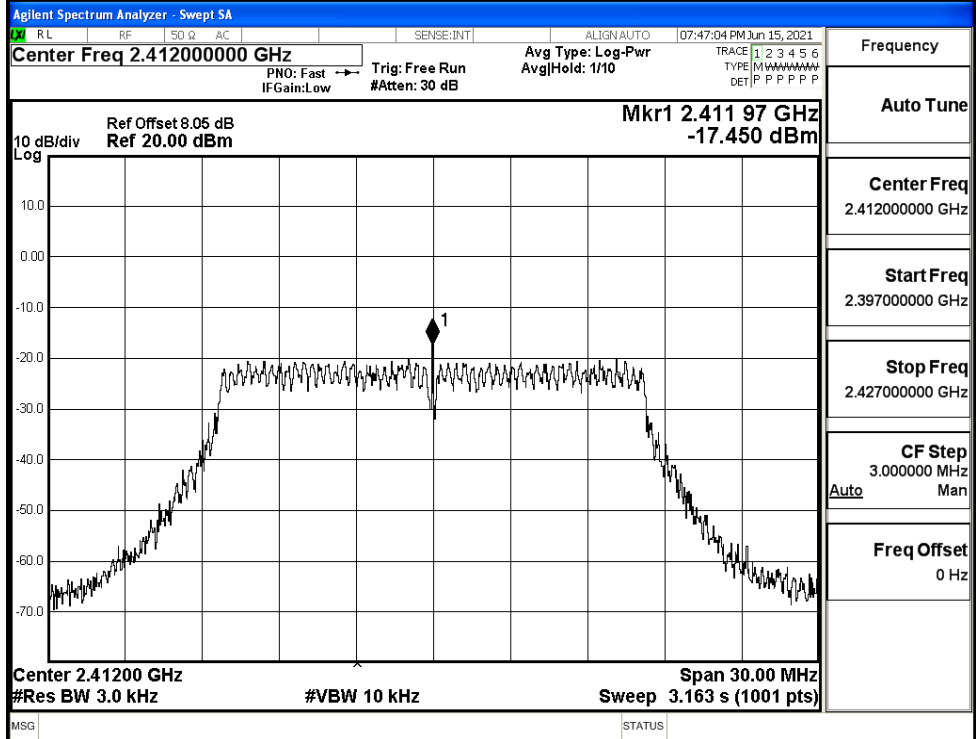
11B/MCH



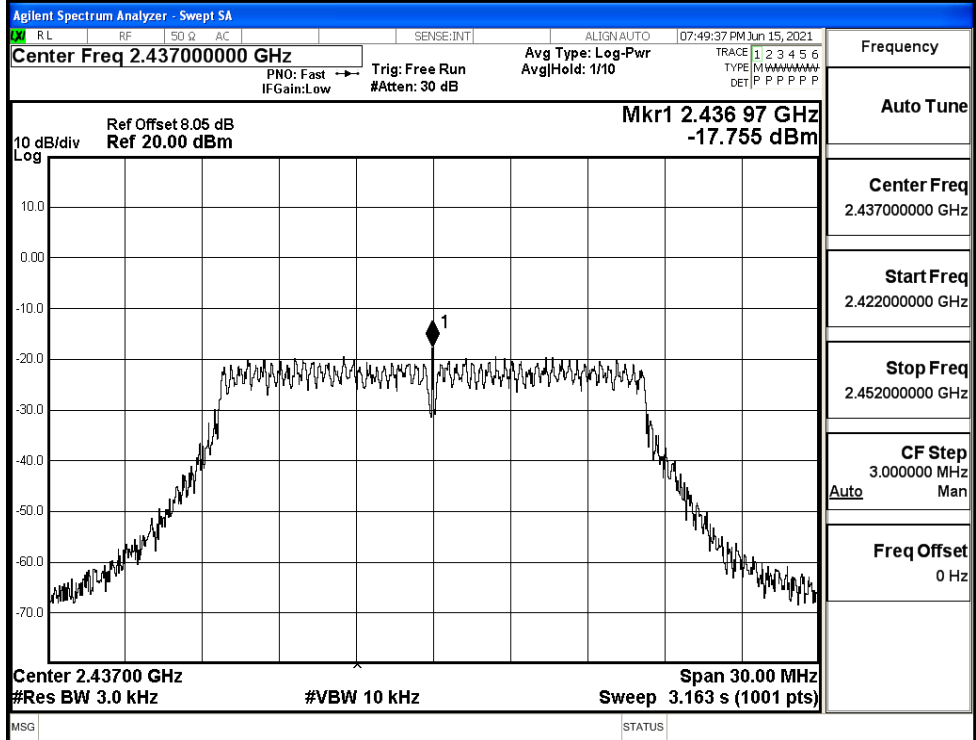
11B/HCH



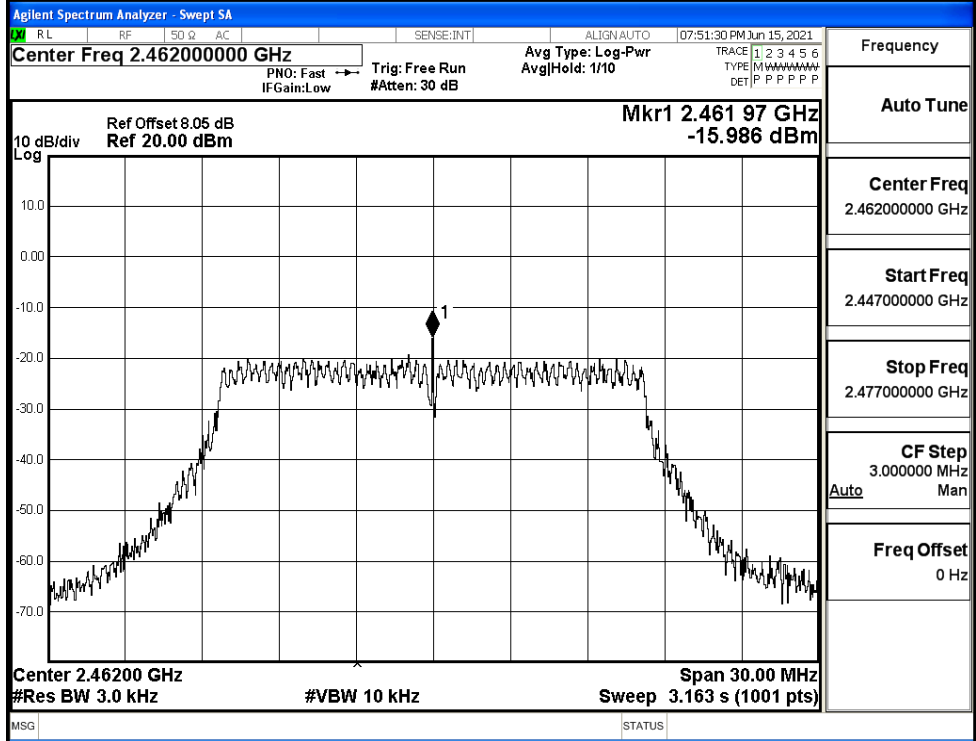
11G/LCH



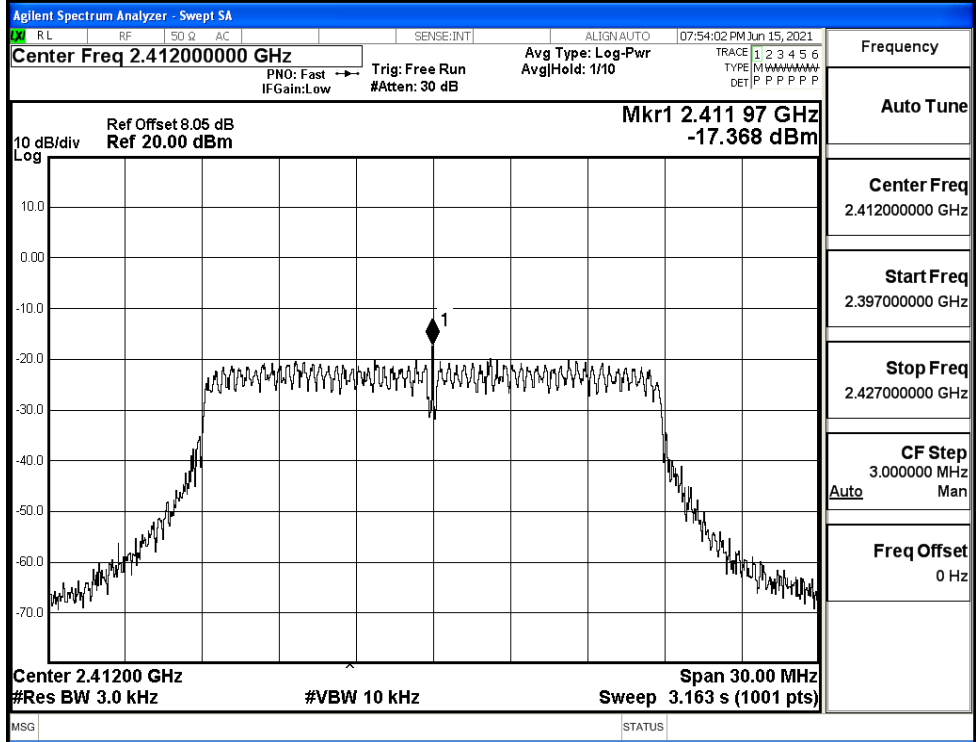
11G/MCH



11G/HCH

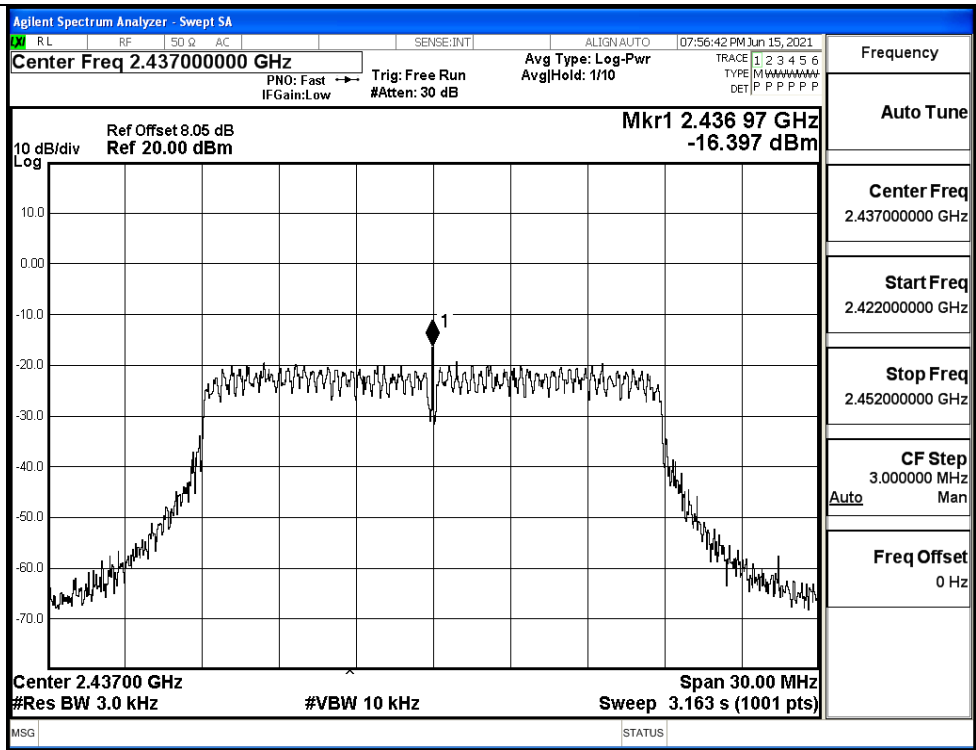


11N20SISO/LCH

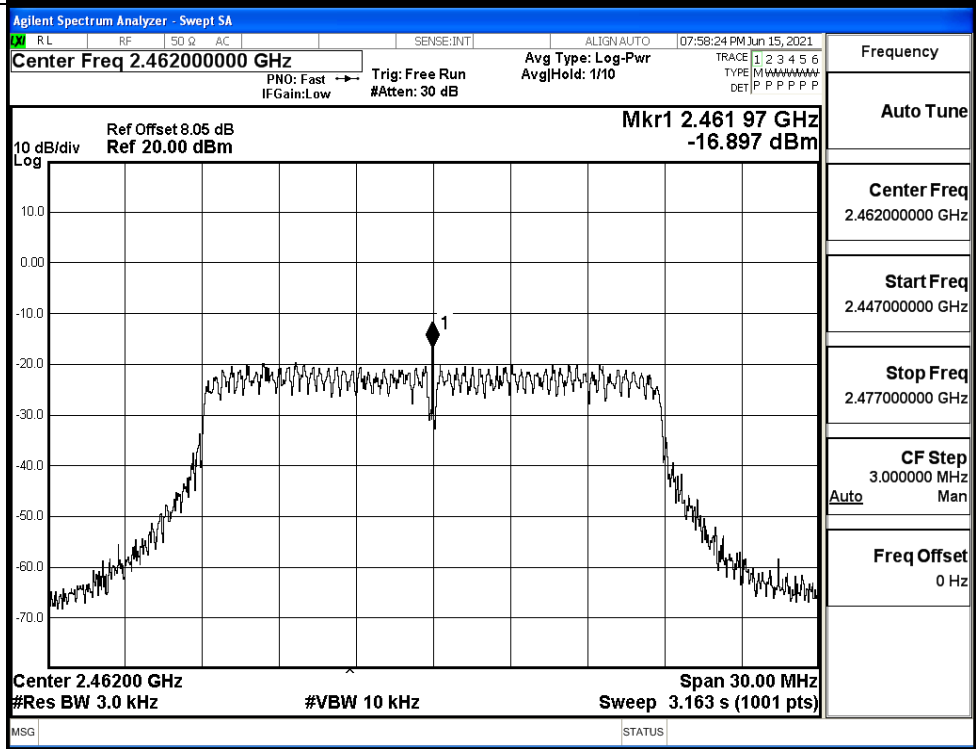




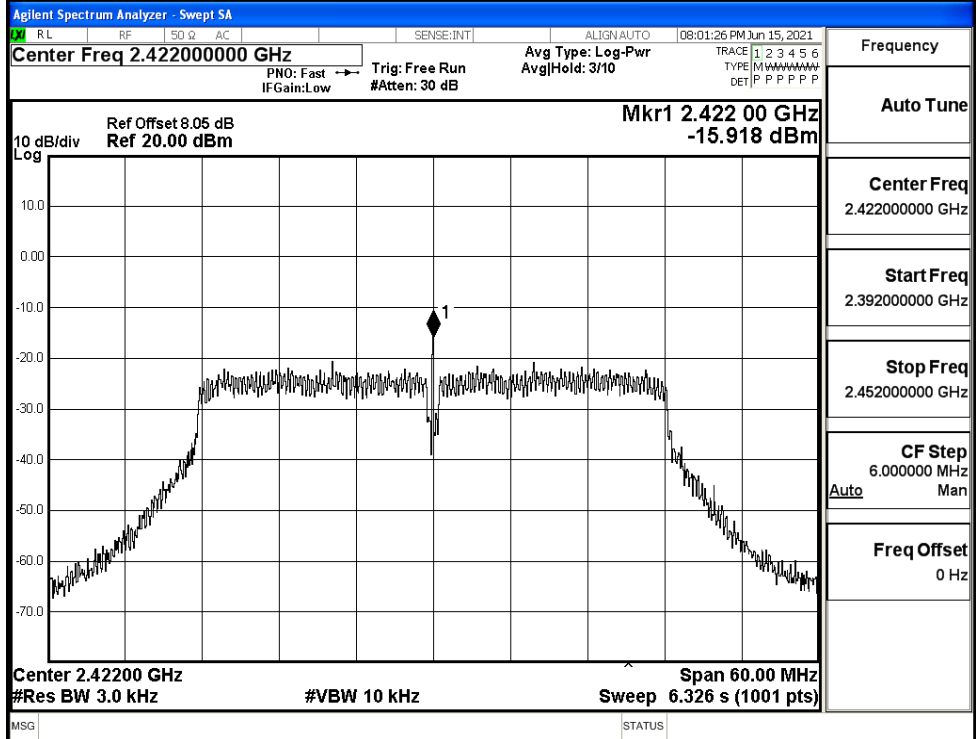
11N20SISO/MCH



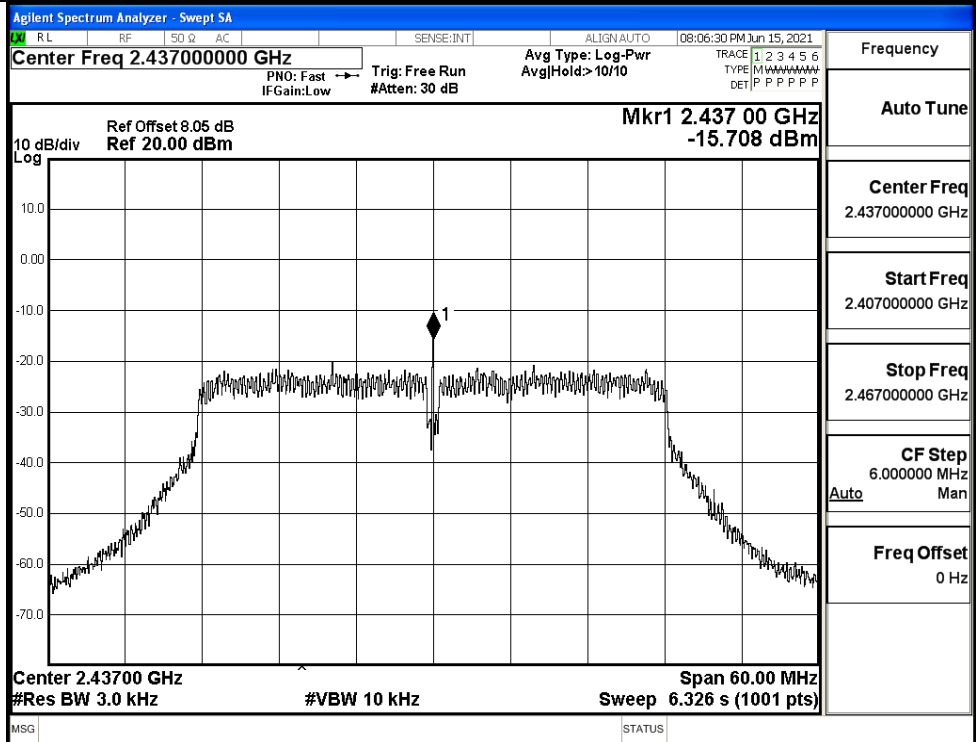
11N20SISO/HCH



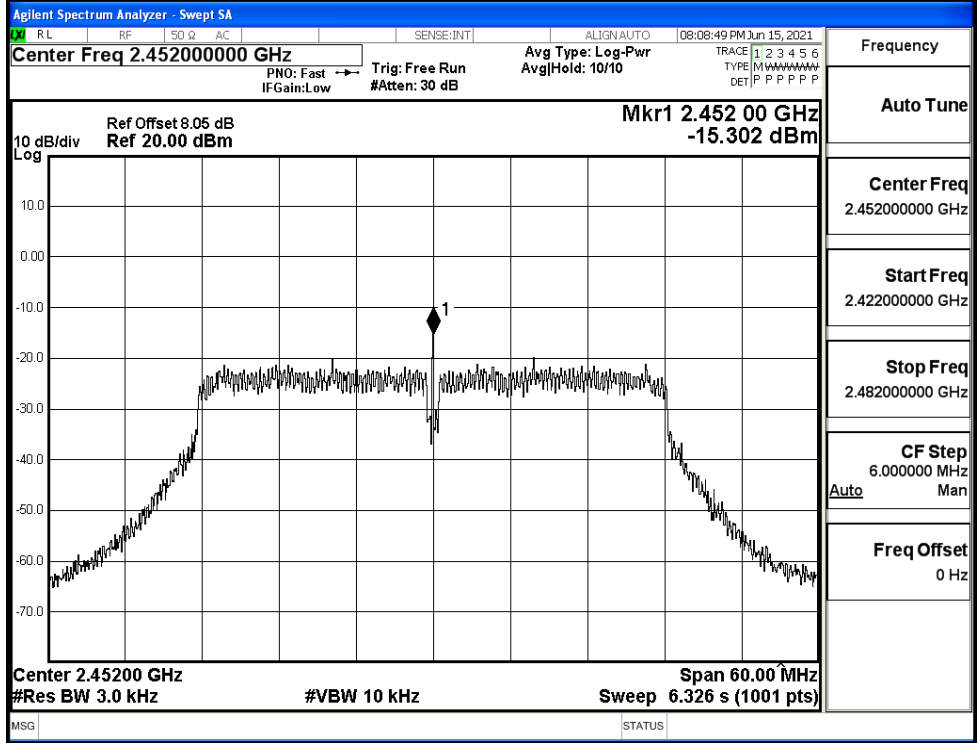
11N40SISO/LCH



11N40SISO/MCH

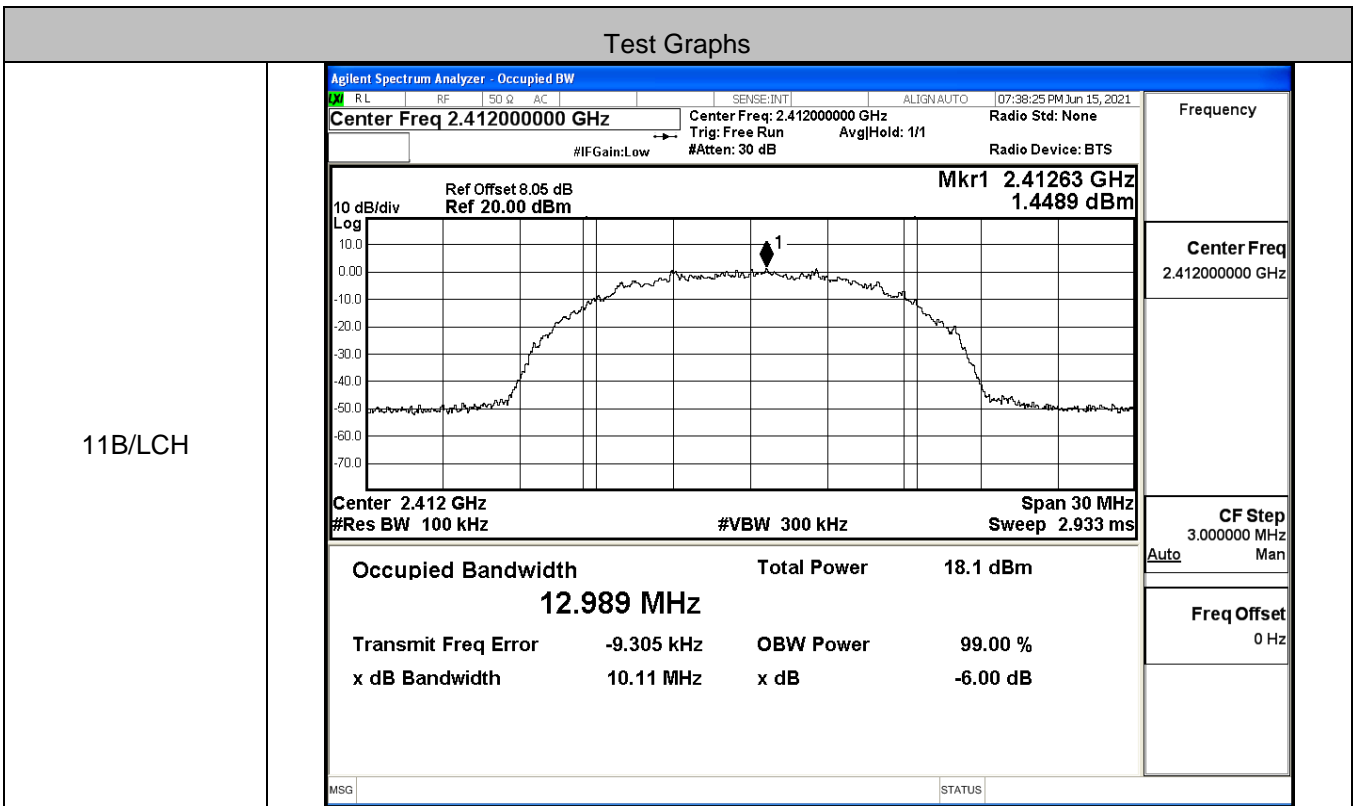


11N40SISO/HCH

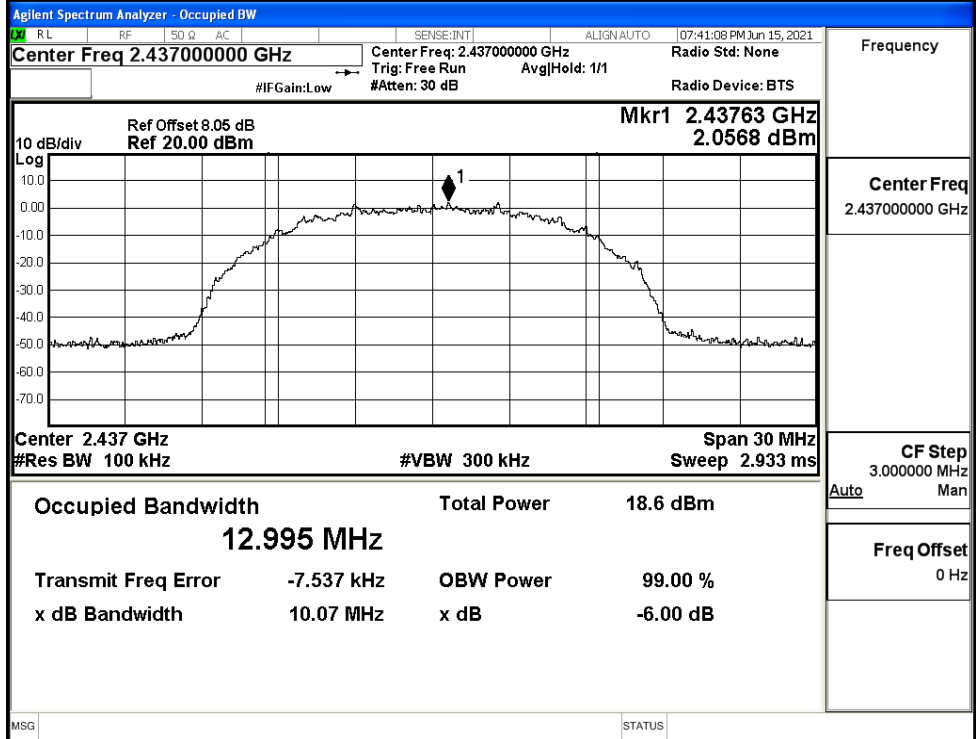


**A.4 6dB Bandwidth**

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
11B	LCH	10.11	≥0.5	PASS
	MCH	10.07	≥0.5	PASS
	HCH	10.09	≥0.5	PASS
11G	LCH	16.47	≥0.5	PASS
	MCH	16.49	≥0.5	PASS
	HCH	16.49	≥0.5	PASS
11N20SISO	LCH	17.60	≥0.5	PASS
	MCH	17.62	≥0.5	PASS
	HCH	17.61	≥0.5	PASS
11N40SISO	LCH	36.51	≥0.5	PASS
	MCH	36.50	≥0.5	PASS
	HCH	36.50	≥0.5	PASS

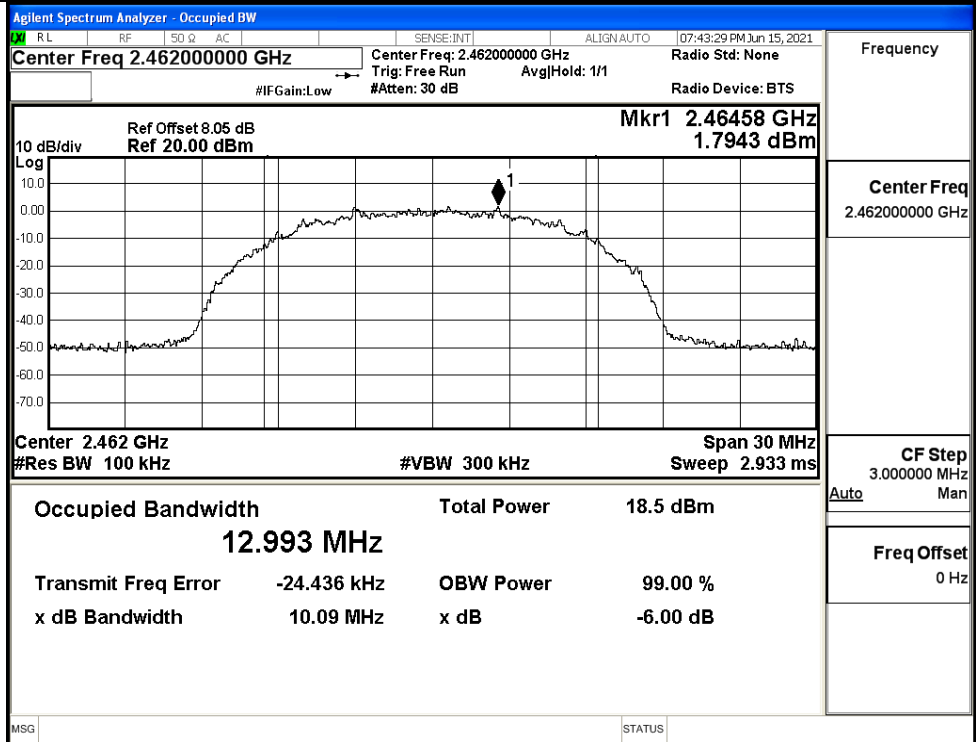


11B/MCH



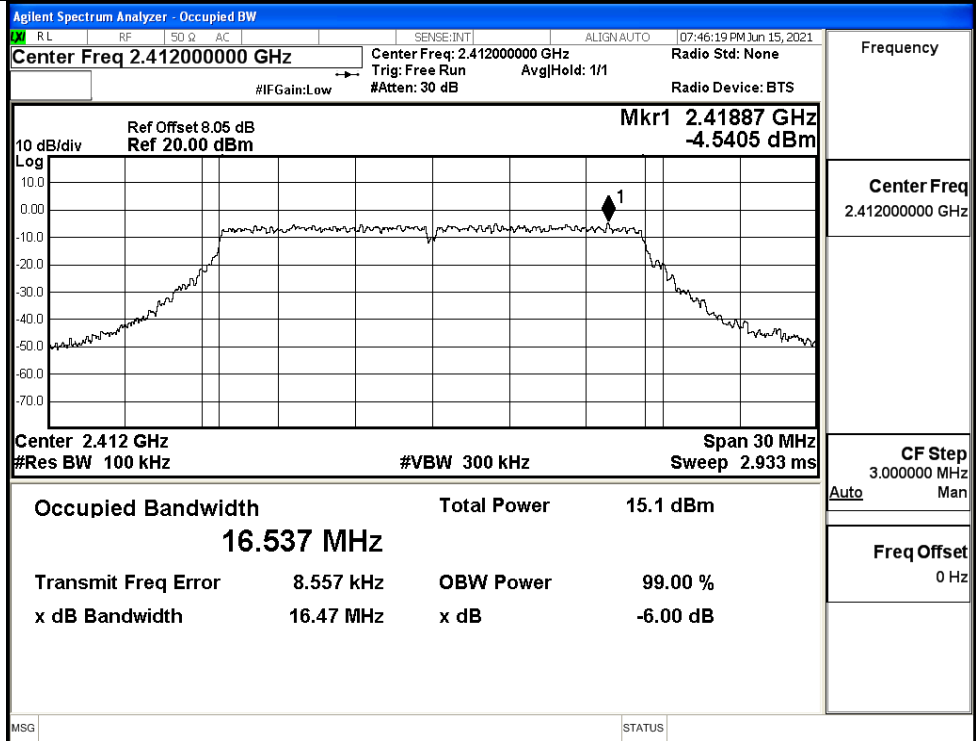
Frequency	2.43700000 GHz
Center Freq	2.43700000 GHz
CF Step	3.000000 MHz
Auto	Man
Freq Offset	0 Hz

11B/HCH

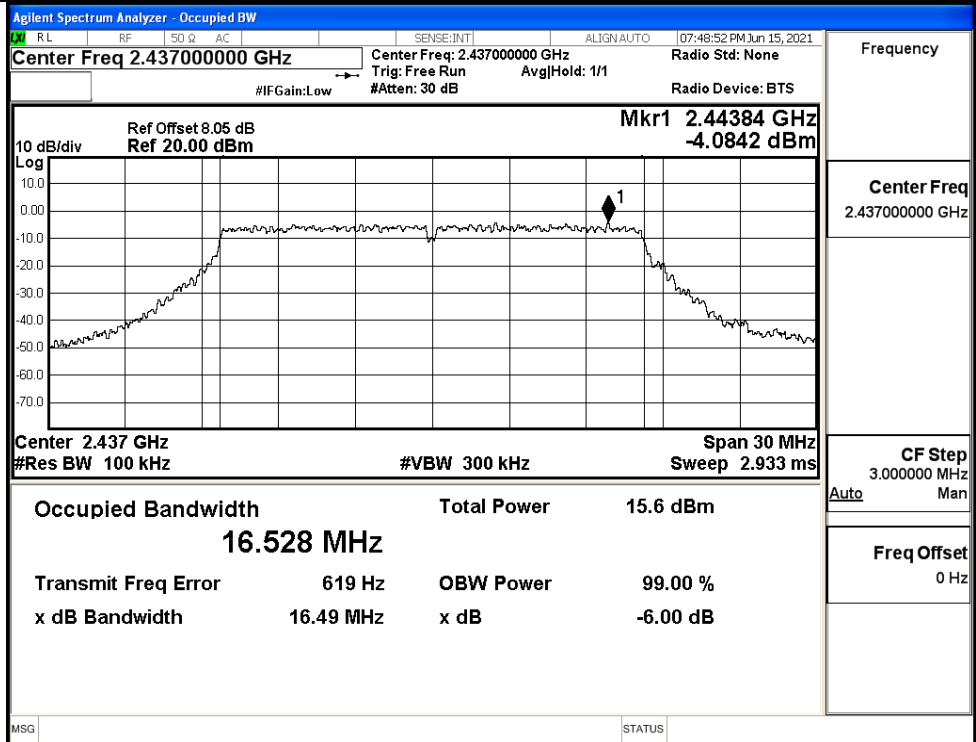


Frequency	2.46200000 GHz
Center Freq	2.46200000 GHz
CF Step	3.000000 MHz
Auto	Man
Freq Offset	0 Hz

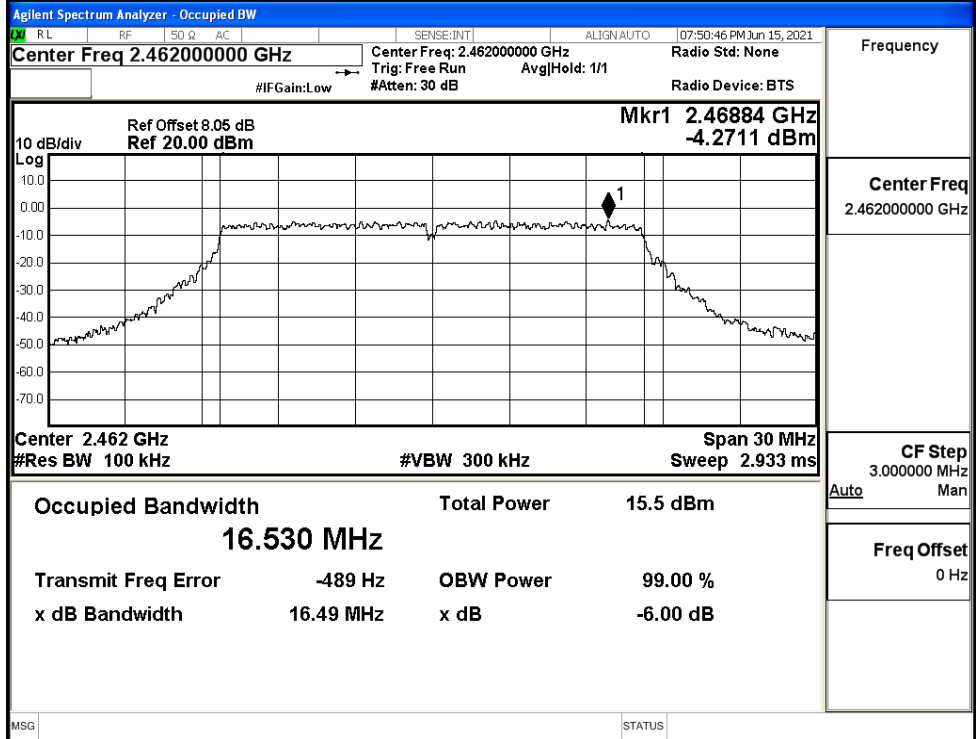
11G/LCH



11G/MCH

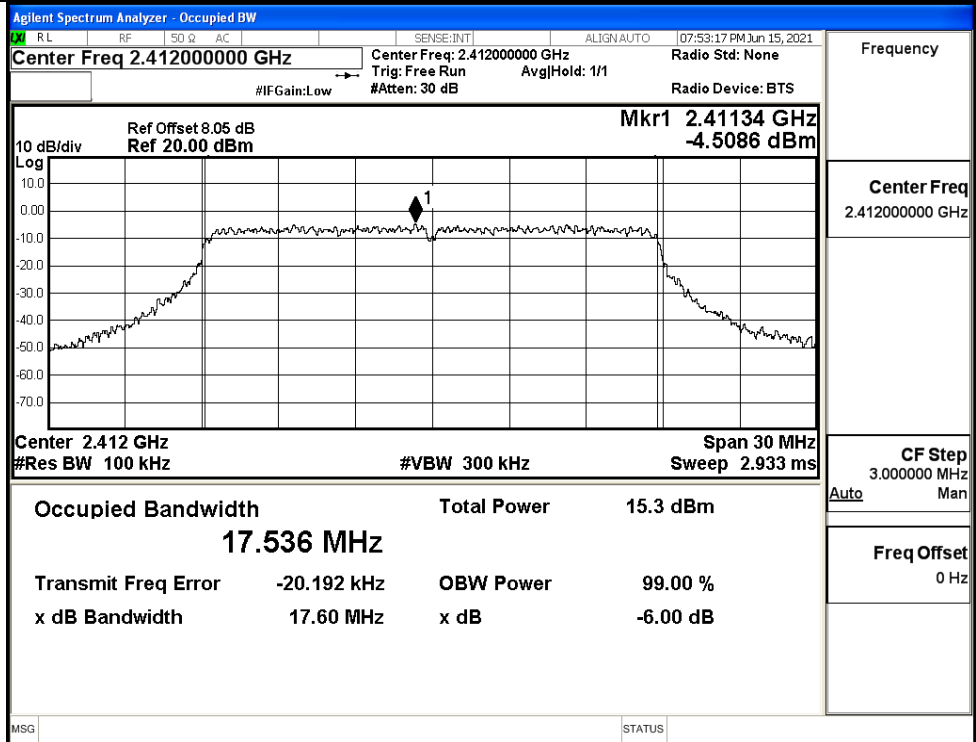


11G/HCH



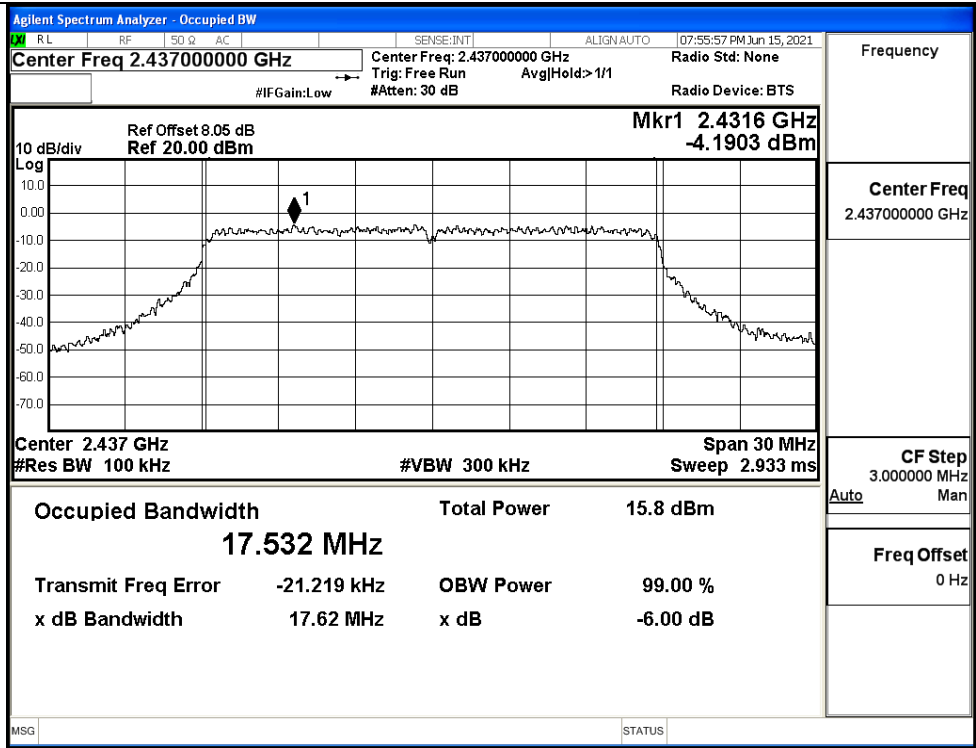
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Center Freq	2.46200000 GHz
CF Step	3.000000 MHz
Auto	Man
Freq Offset	0 Hz

11N20SISO/LCH

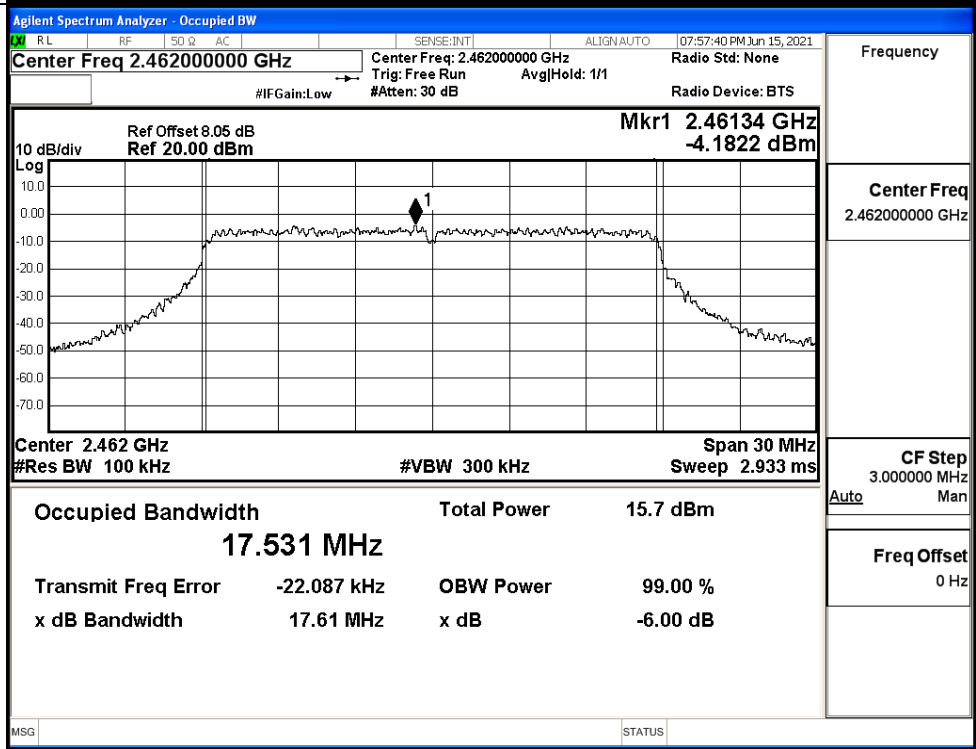


Frequency	2.41200000 GHz
Center Freq	2.41200000 GHz
CF Step	3.000000 MHz
Auto	Man
Freq Offset	0 Hz

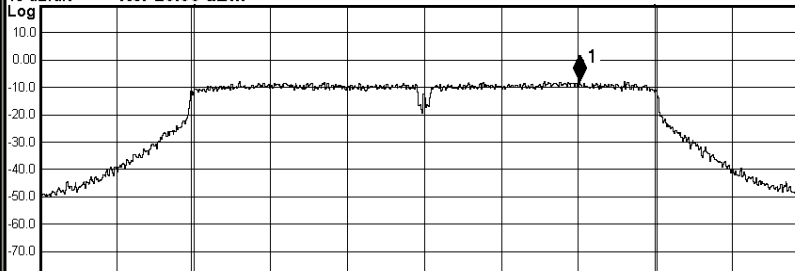
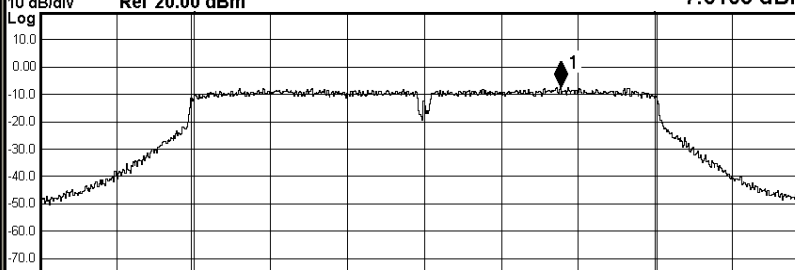
11N20SISO/MCH

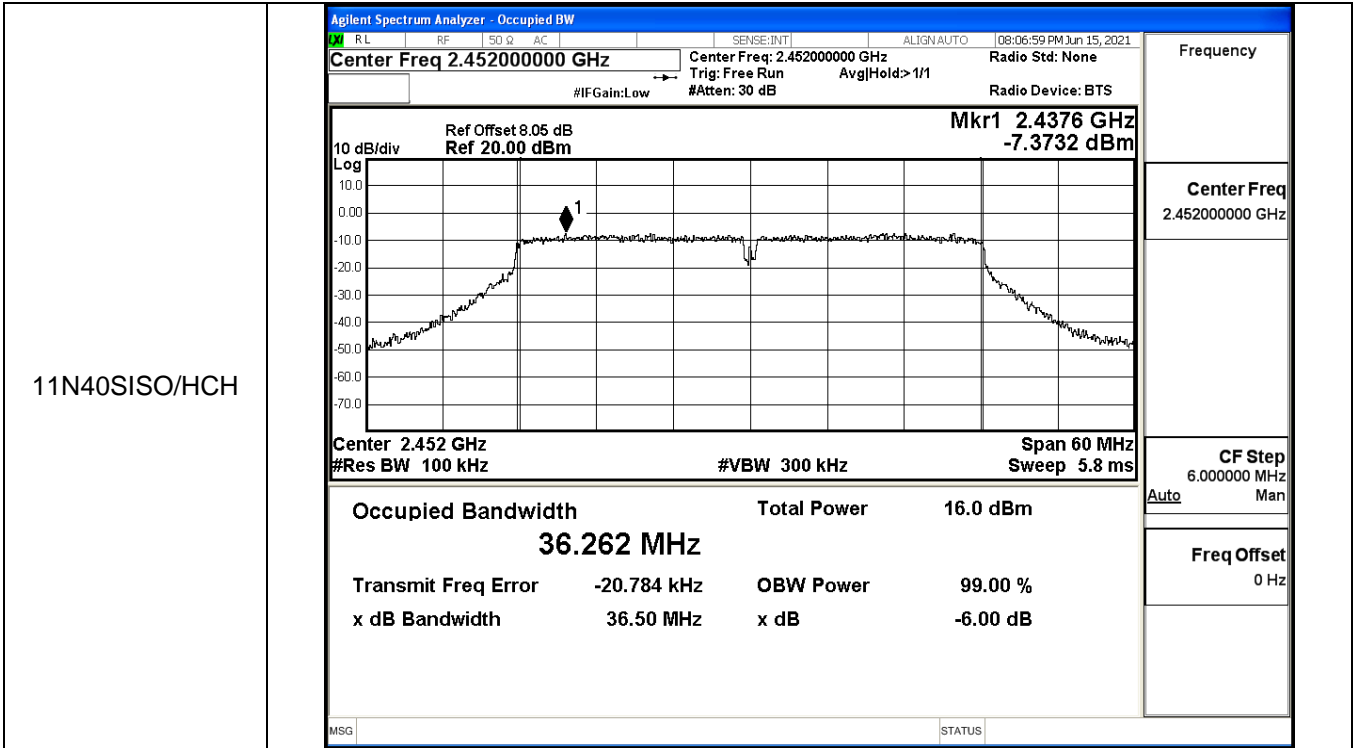


11N20SISO/HCH





<p>11N40SISO/LCH</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>RL RF 50 Ω AC SENSE:INT ALIGN AUTO 08:00:21 PM Jun 15, 2021</p> <p>Center Freq 2.42200000 GHz Center Freq: 2.42200000 GHz Radio Std: None                  Trig: Free Run Avg Hold: 1/1                  #IFGain:Low #Atten: 30 dB Radio Device: BTS</p> <p>10 dB/div Ref Offset 8.05 dB Mkr1 2.43412 GHz                  Ref 20.00 dBm -7.8576 dBm</p>  <p>Center 2.422 GHz Span 60 MHz                  #Res BW 100 kHz #VBW 300 kHz Sweep 5.8 ms</p> <p>Occupied Bandwidth Total Power 15.7 dBm  <b>36.271 MHz</b></p> <p>Transmit Freq Error -9.263 kHz OBW Power 99.00 %                  x dB Bandwidth 36.51 MHz x dB -6.00 dB</p> <p>MSG STATUS</p>	<p>Frequency</p> <p>Center Freq 2.42200000 GHz</p> <p>CF Step 6.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
	<p>11N40SISO/MCH</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>RL RF 50 Ω AC SENSE:INT ALIGN AUTO 08:03:07 PM Jun 15, 2021</p> <p>Center Freq 2.43700000 GHz Center Freq: 2.43700000 GHz Radio Std: None                  Trig: Free Run Avg Hold: 1/1                  #IFGain:Low #Atten: 30 dB Radio Device: BTS</p> <p>10 dB/div Ref Offset 8.05 dB Mkr1 2.44762 GHz                  Ref 20.00 dBm -7.5103 dBm</p>  <p>Center 2.437 GHz Span 60 MHz                  #Res BW 100 kHz #VBW 300 kHz Sweep 5.8 ms</p> <p>Occupied Bandwidth Total Power 15.9 dBm  <b>36.278 MHz</b></p> <p>Transmit Freq Error -2.737 kHz OBW Power 99.00 %                  x dB Bandwidth 36.50 MHz x dB -6.00 dB</p> <p>MSG STATUS</p>



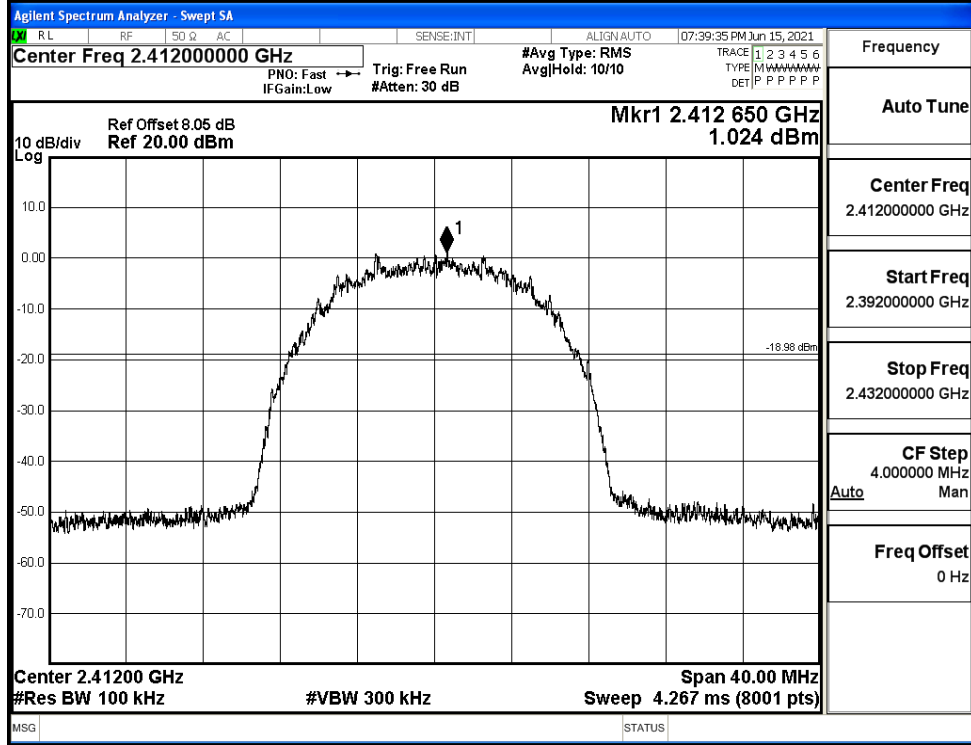
**A.5 RF Conducted Spurious Emissions**

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdic
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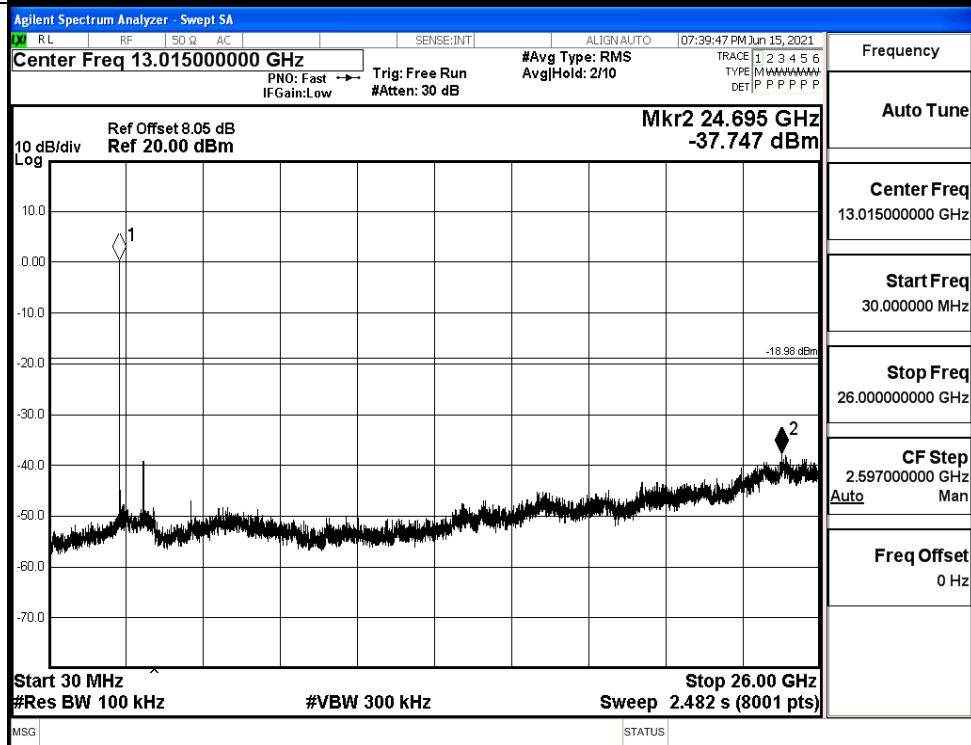
					t
11B	LCH	1.024	-37.747	-18.976	PASS
	MCH	1.836	-38.680	-18.164	PASS
	HCH	1.653	-37.869	-18.347	PASS
11G	LCH	-4.653	-38.097	-24.653	PASS
	MCH	-4.133	-37.136	-24.133	PASS
	HCH	-4.311	-38.312	-24.311	PASS
11N20 SISO	LCH	-5.084	-38.199	-25.084	PASS
	MCH	-4.592	-38.411	-24.592	PASS
	HCH	-4.452	-37.978	-24.452	PASS
11N40 SISO	LCH	-7.84	-37.522	-27.840	PASS
	MCH	-7.461	-38.386	-27.461	PASS
	HCH	-7.515	-38.395	-27.515	PASS

11B\_LCH\_Graphs

Pref/11B/LCH

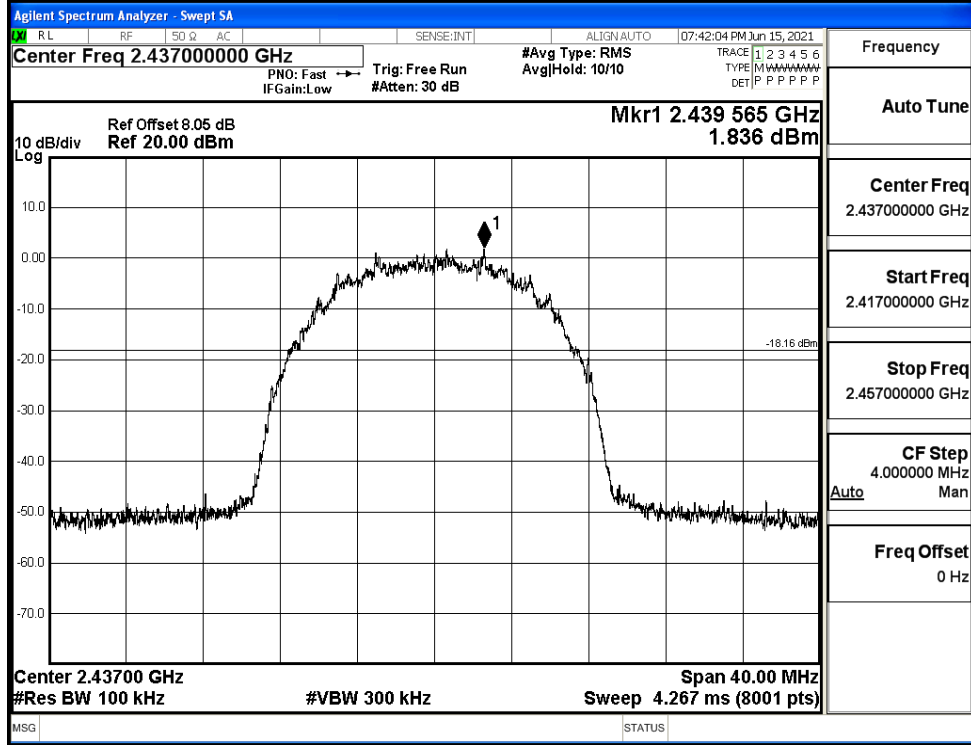


Puw/11B/LCH

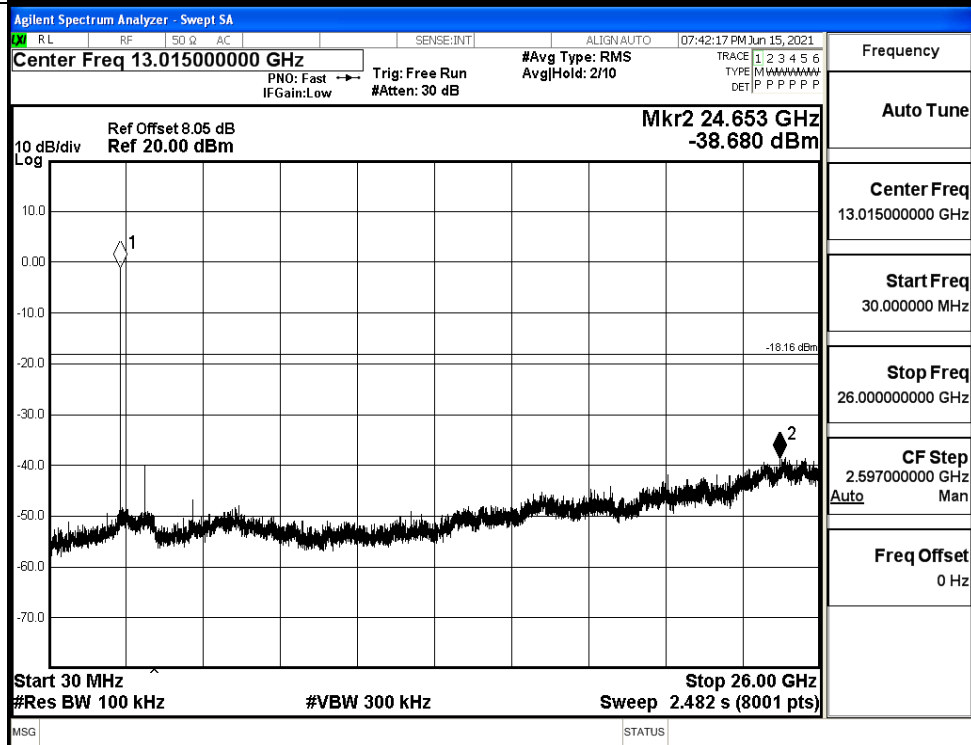


11B\_MCH\_Graphs

Pref/11B/MCH

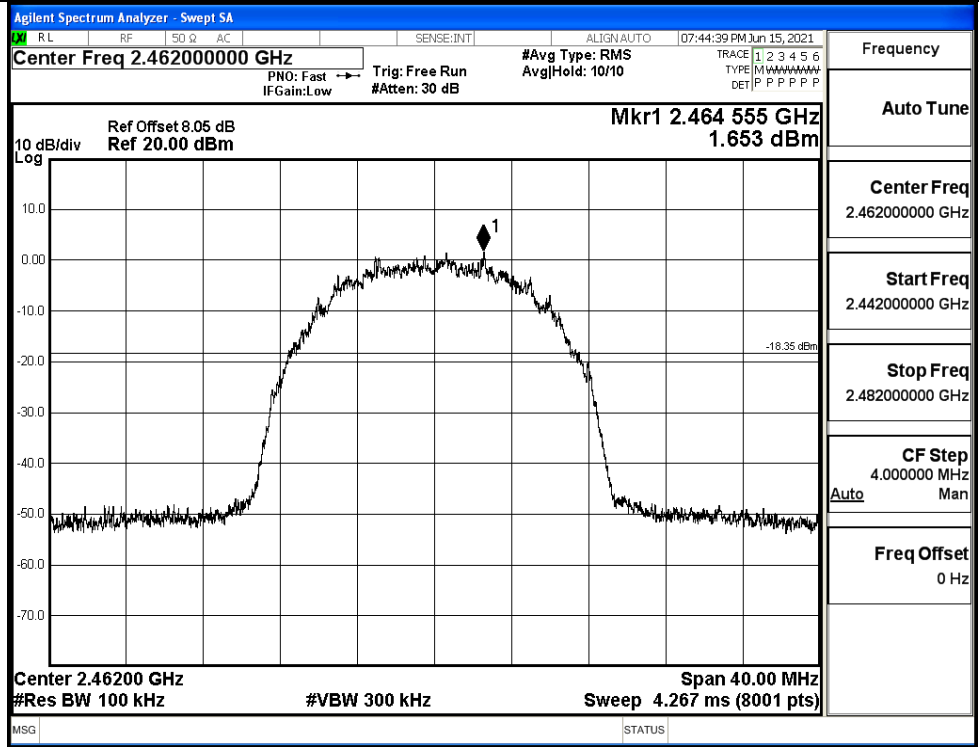


Puw/11B/MCH

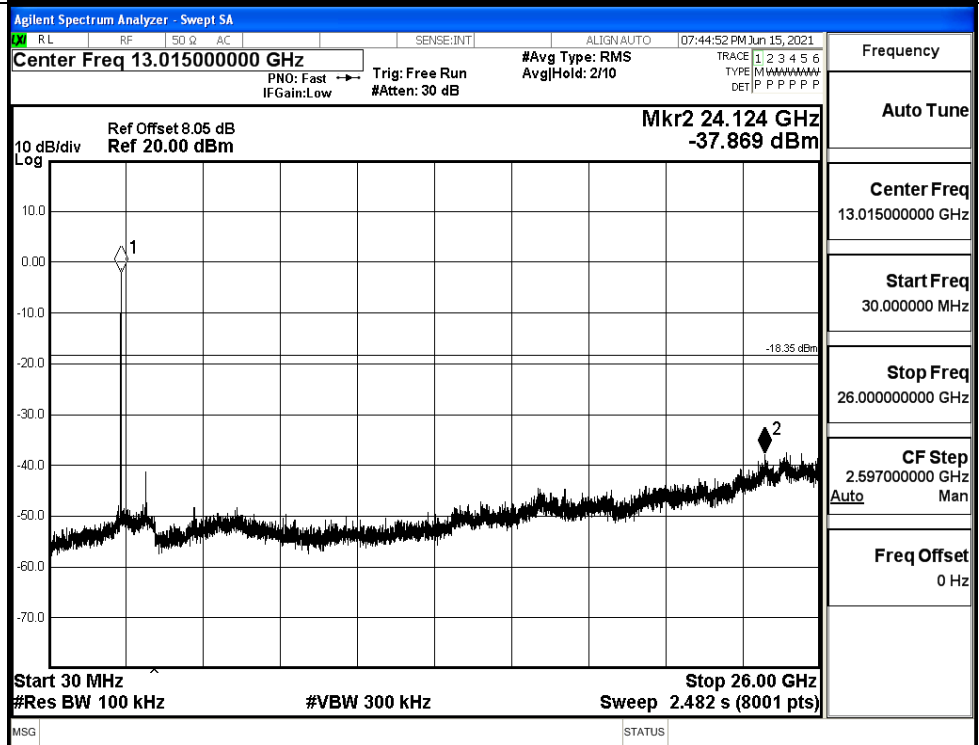


11B\_HCH\_Graphs

Pref/11B/HCH

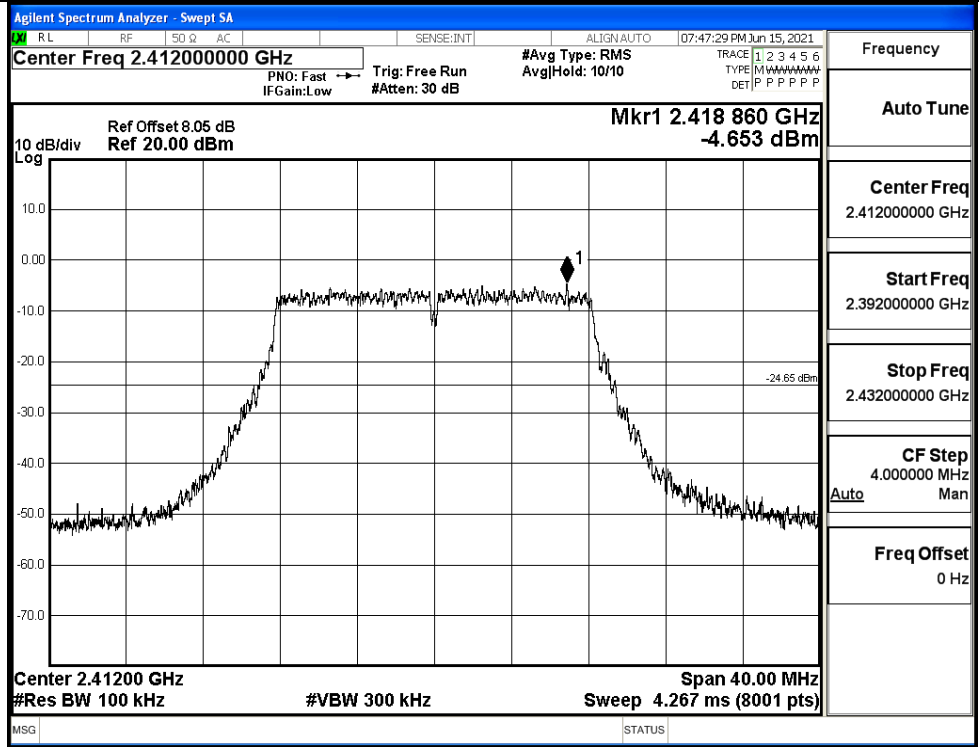


Puw/11B/HCH

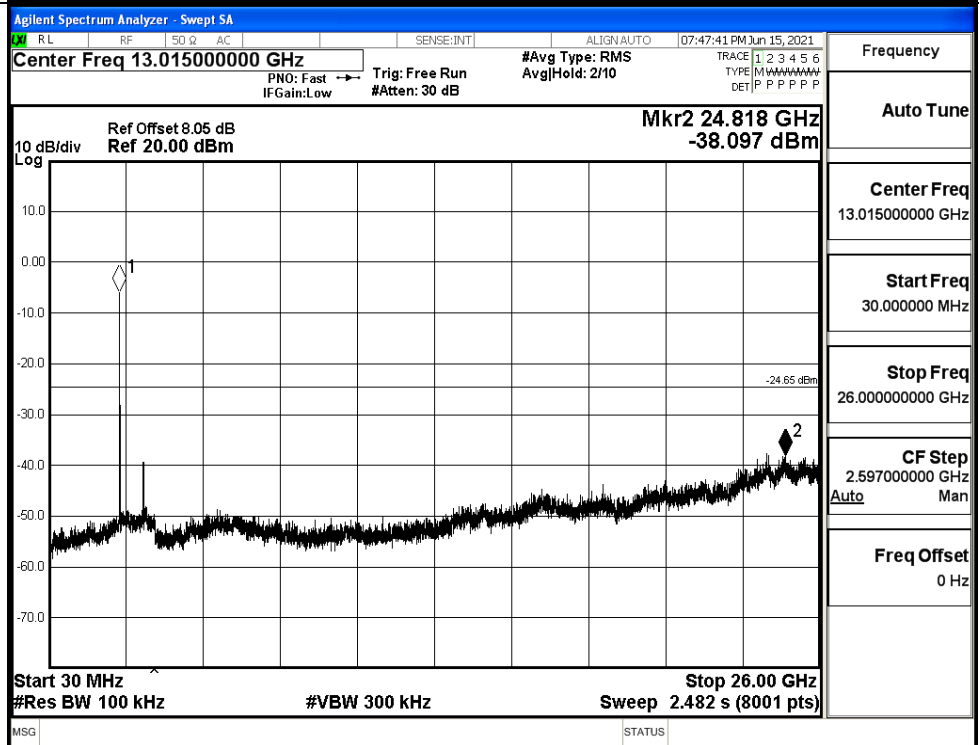


11G\_LCH\_Graphs

Pref/11G/LCH

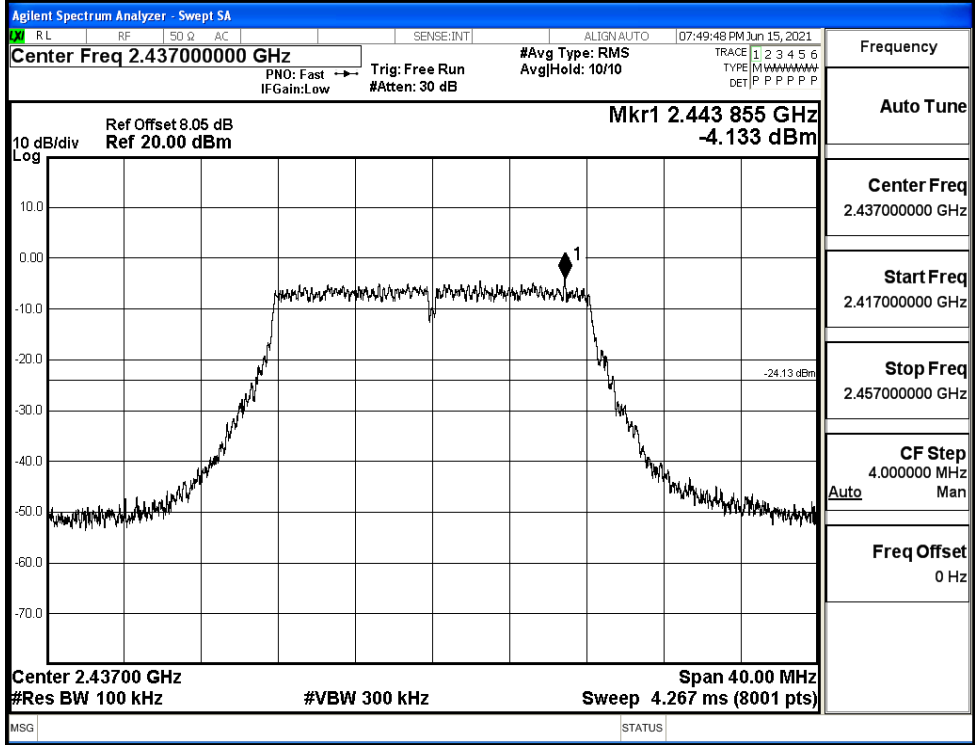


Puw/11G/LCH

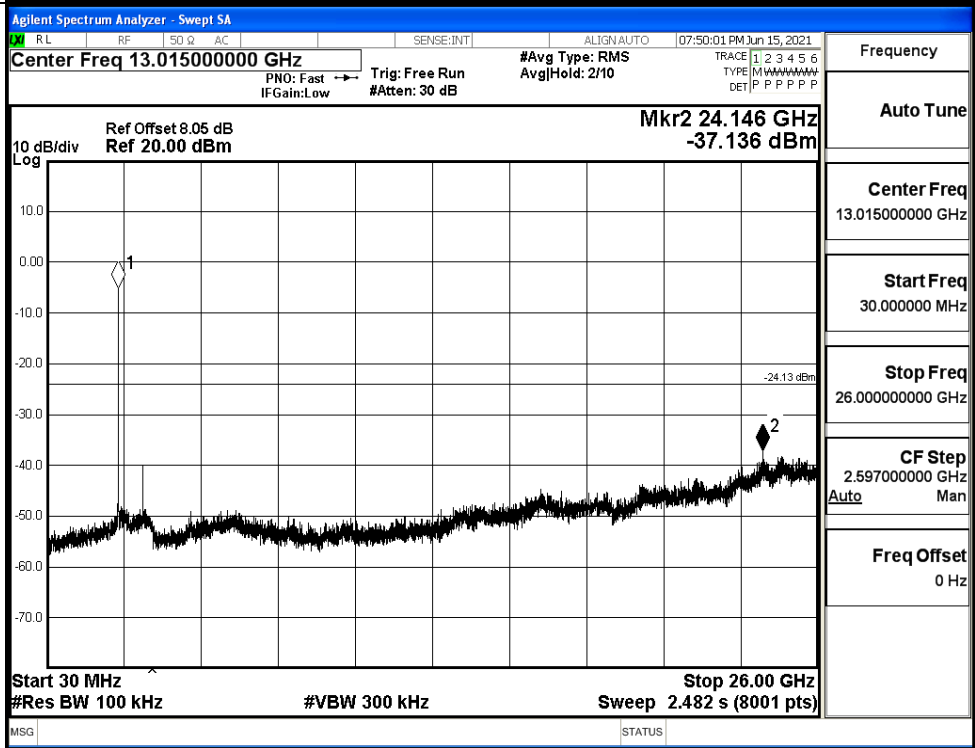


11G\_MCH\_Graphs

Pref/11G/MCH



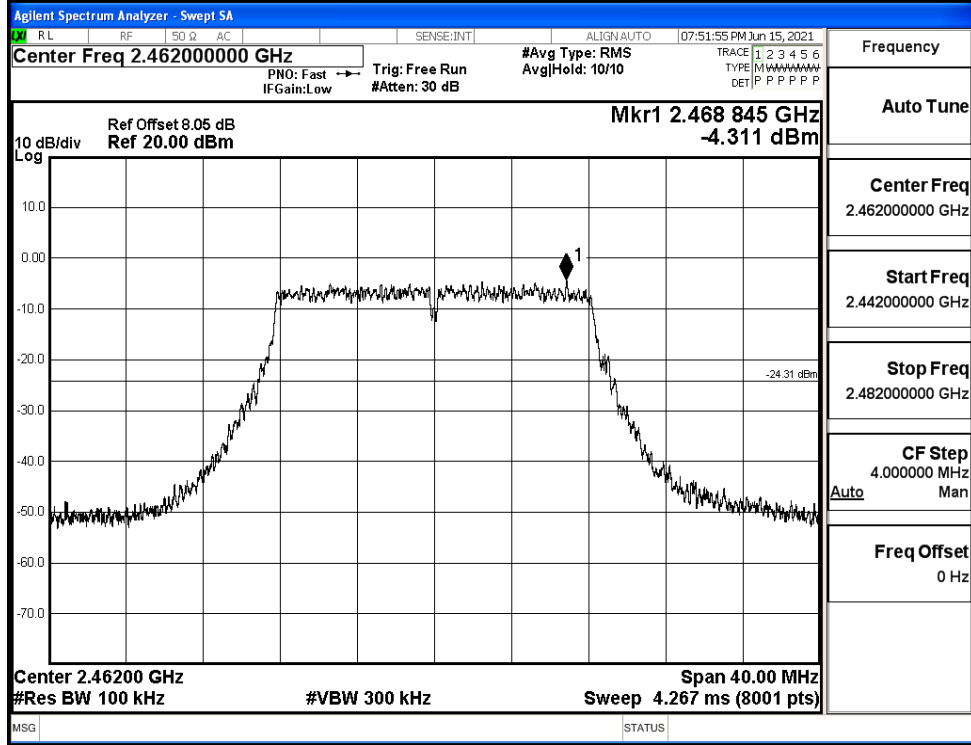
Puw/11G/MCH



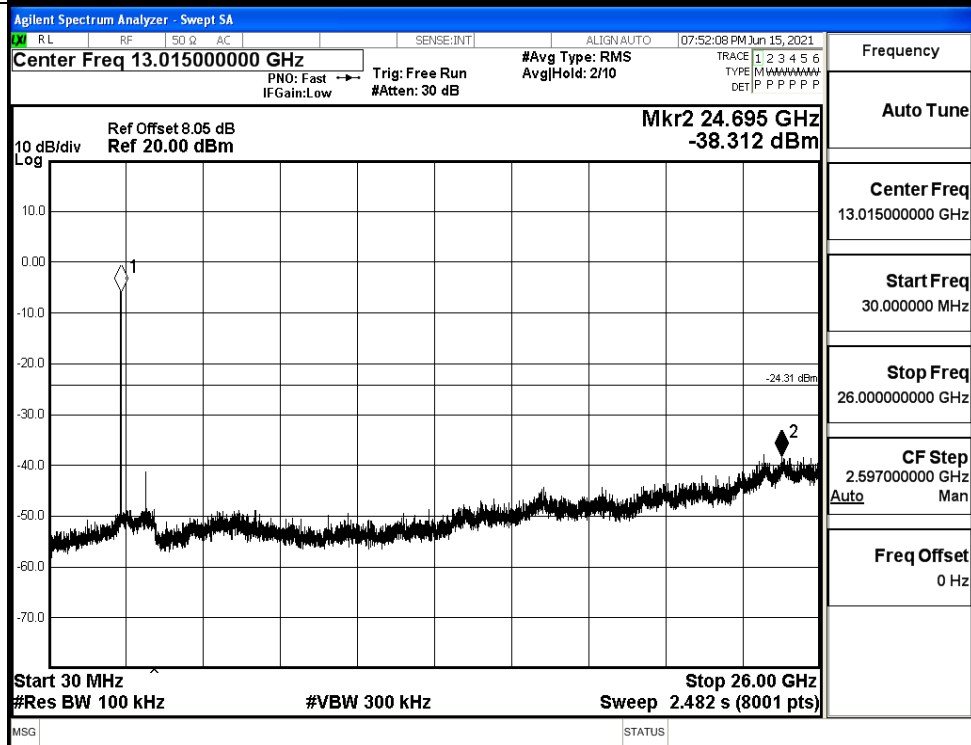


11G\_HCH\_Graphs

Pref/11G/HCH

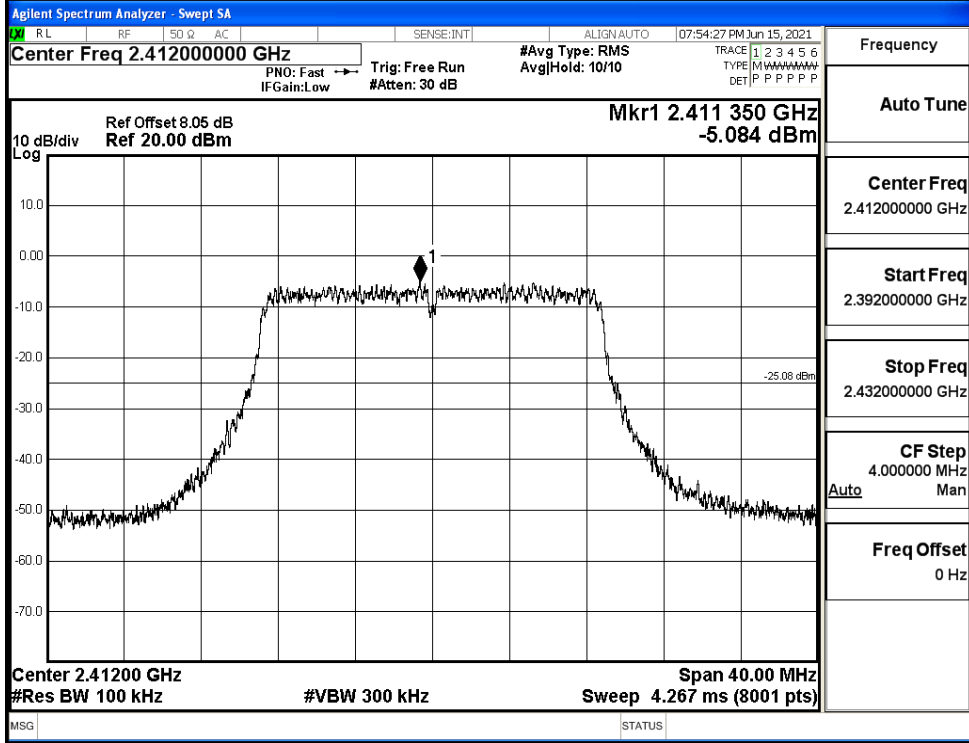


Puw/11G/HCH

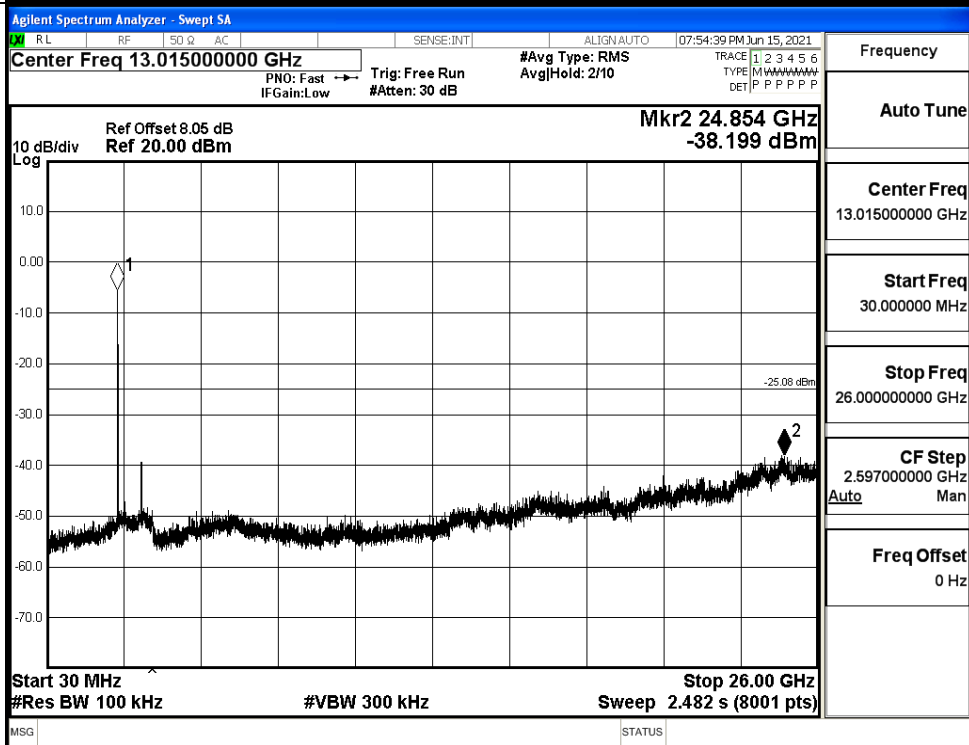


11N20SISO\_LCH\_Graphs

Pref/11N20SIS  
O/LCH

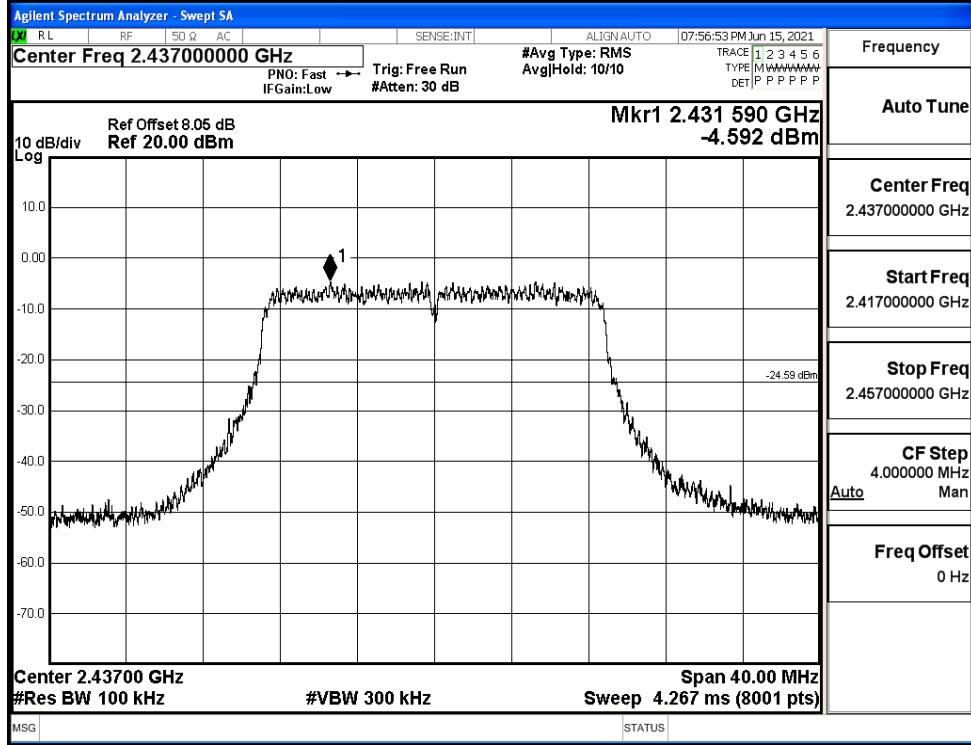


Puw/11N20  
SISO/LCH

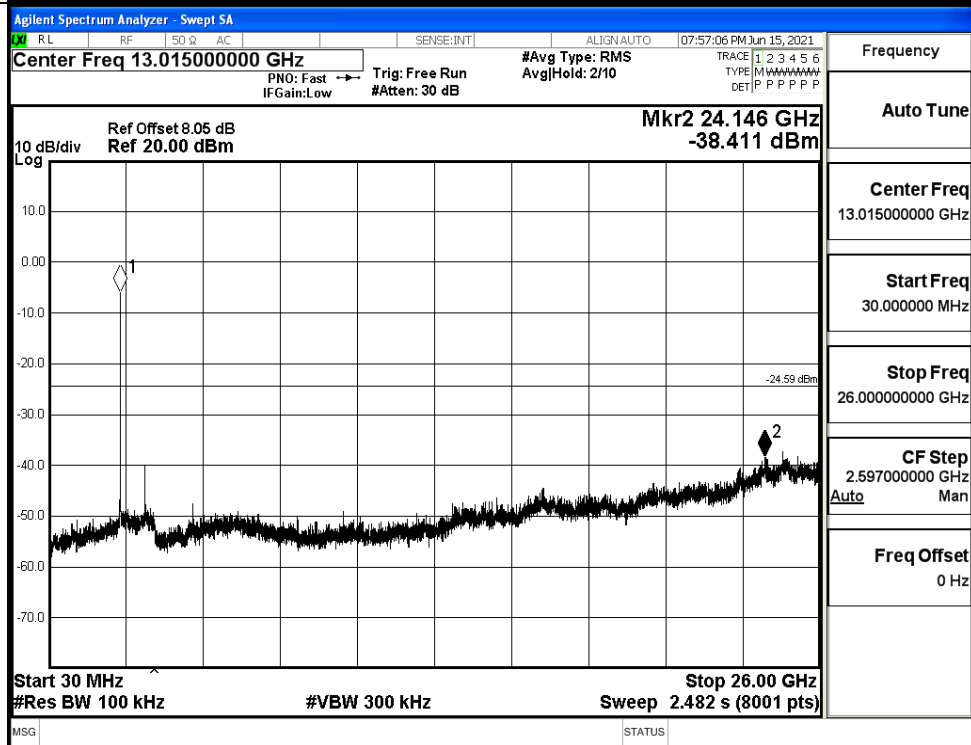


11N20SISO\_MCH\_Graphs

Pref/11N20  
SISO/MCH

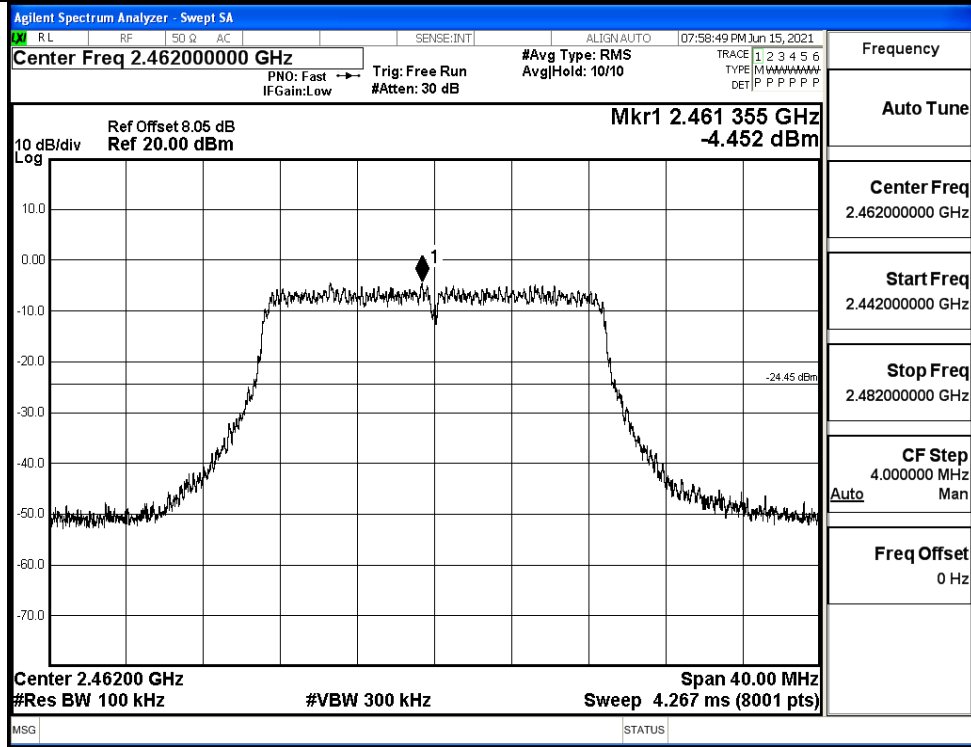


Puw/11N20  
SISO/MCH

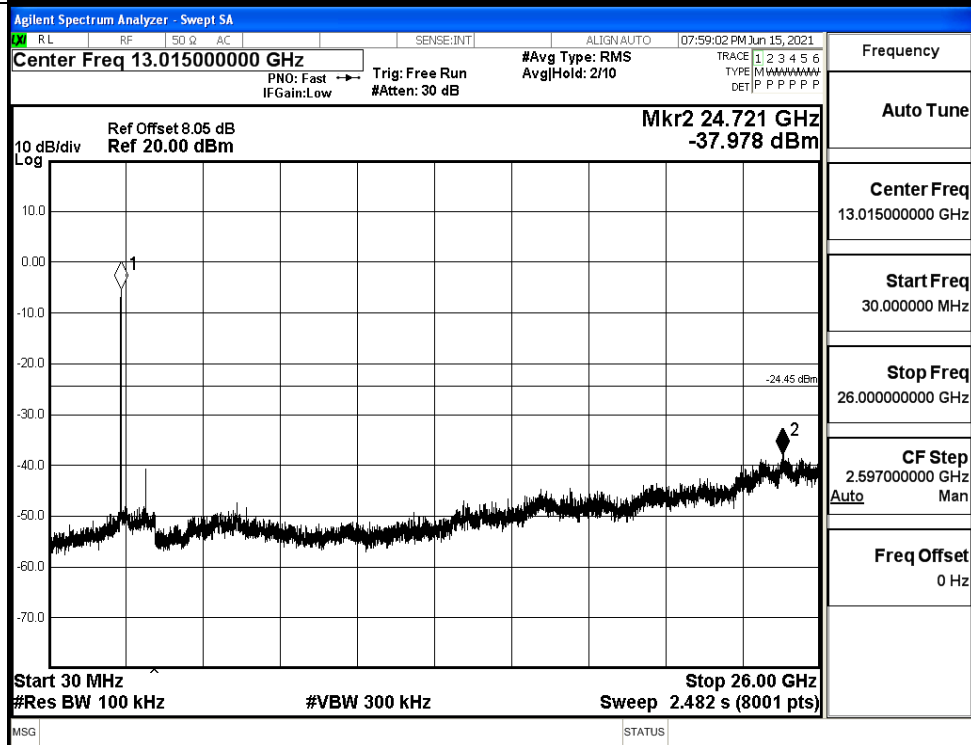


11N20SISO\_HCH\_Graphs

Pref/11N20  
SISO/HCH

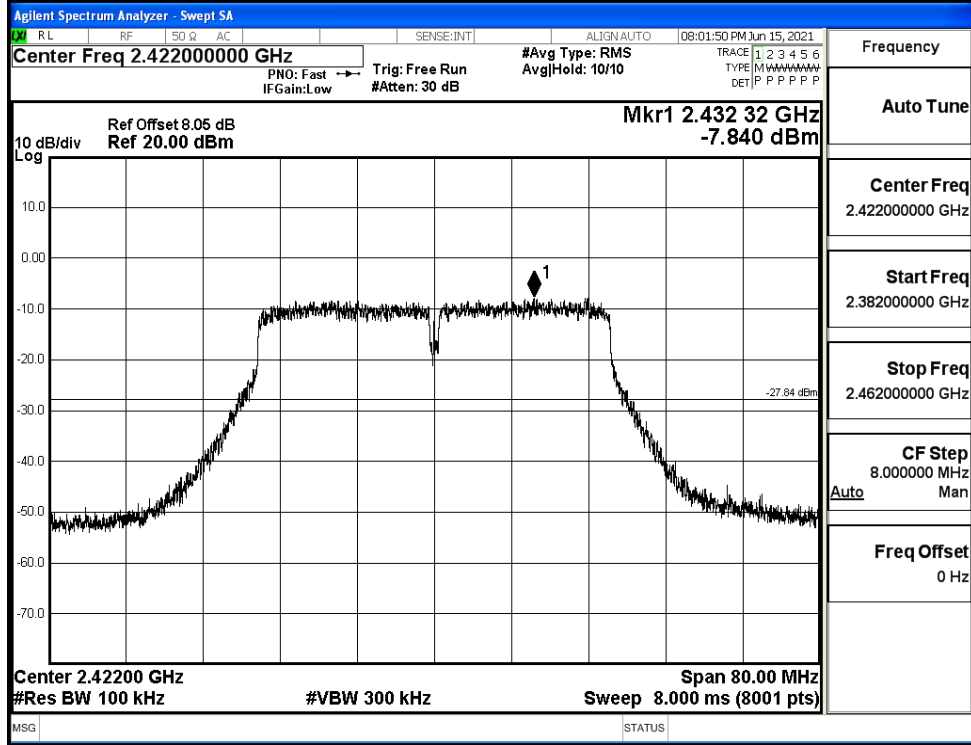


Puw/11N20  
SISO/HCH

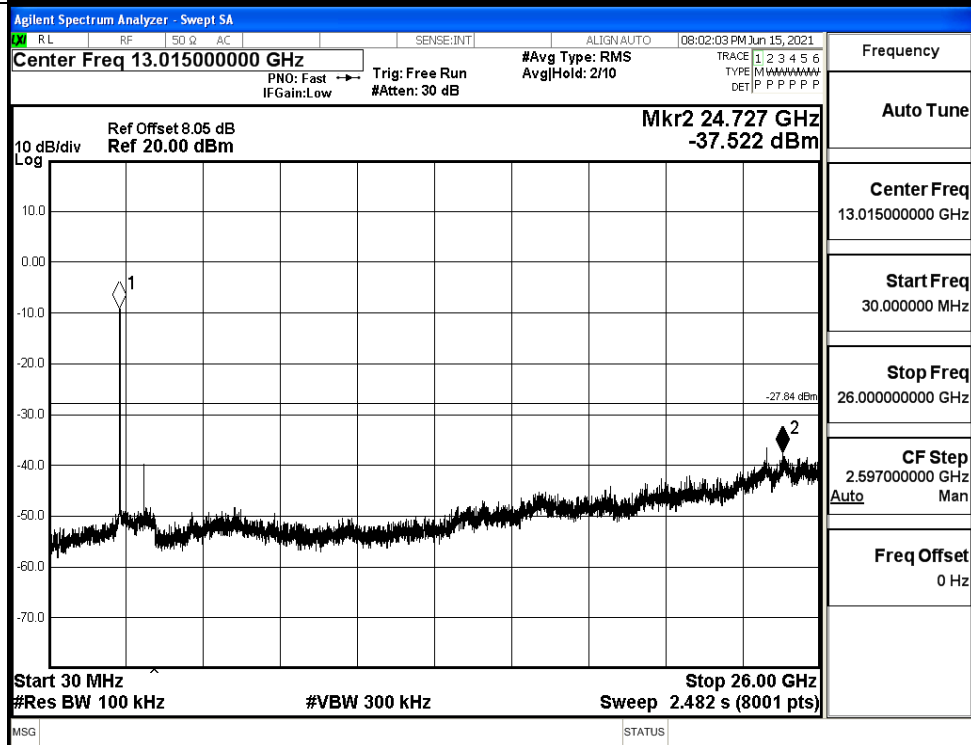


11N40SISO\_LCH\_Graphs

Pref/11N40  
SISO/LCH

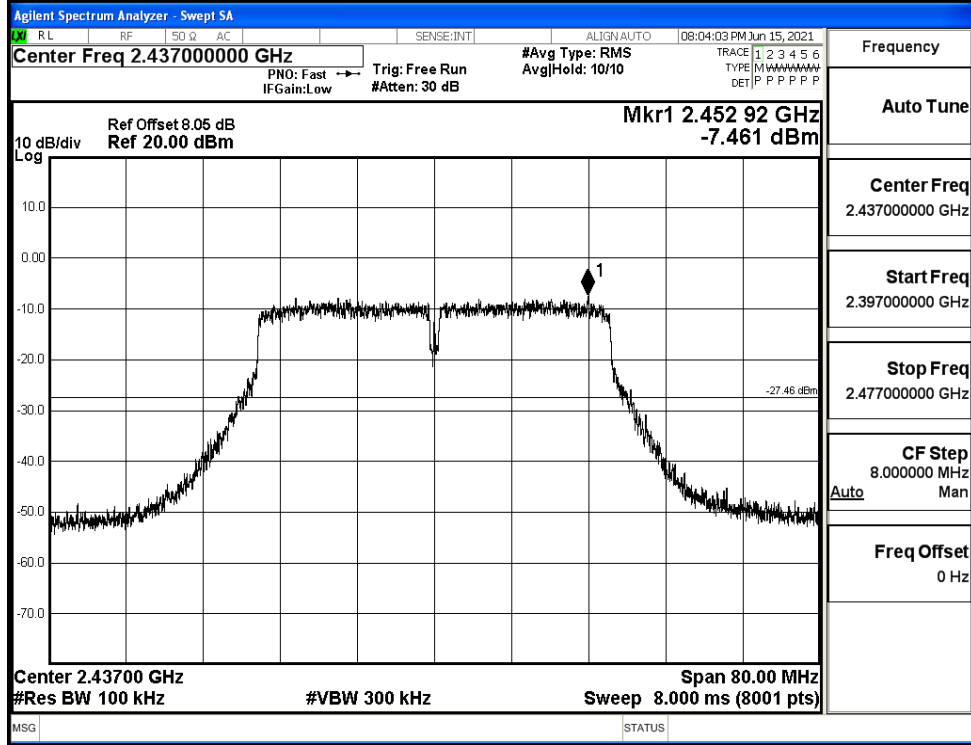


Puw/11N40  
SISO/LCH

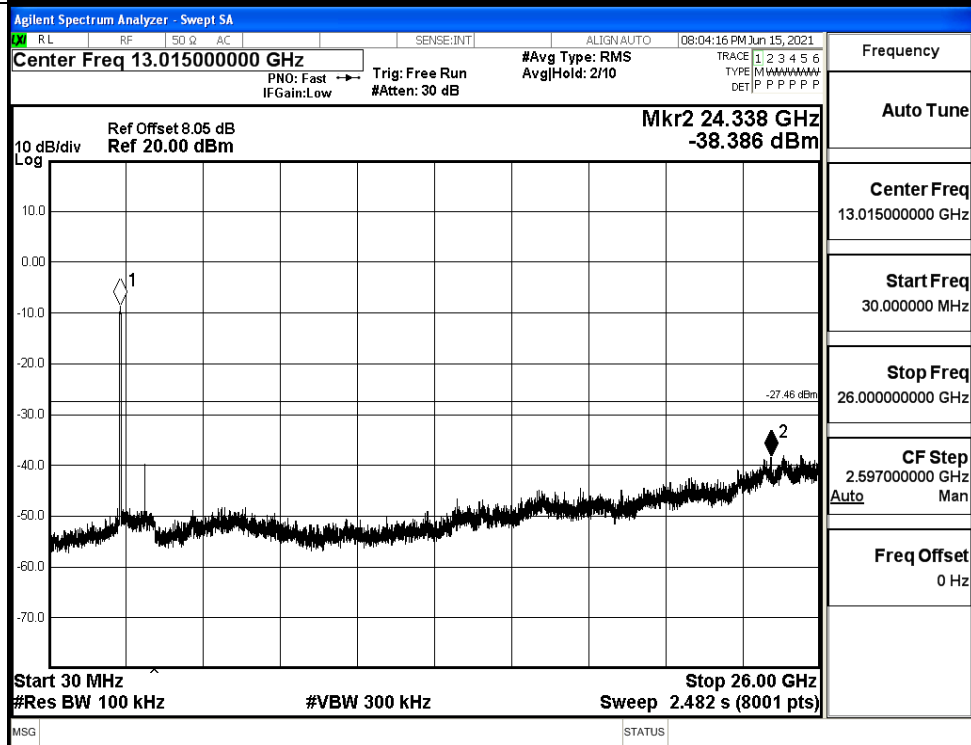


11N40SISO\_MCH\_Graphs

Pref/11N40  
SISO/MCH

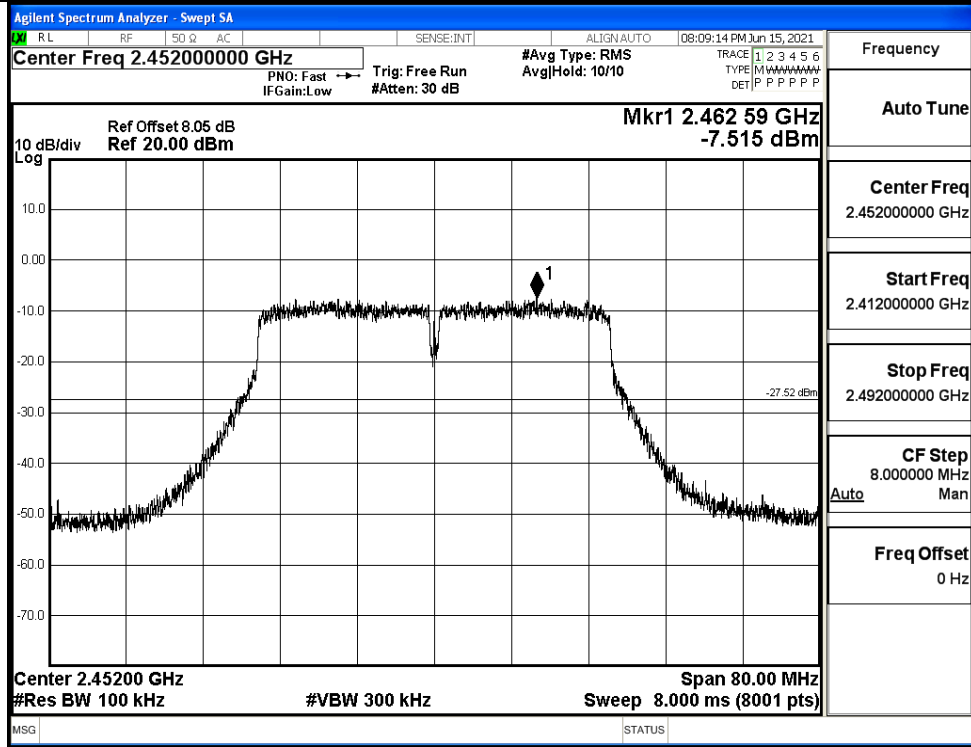


Puw/11N40  
SISO/MCH

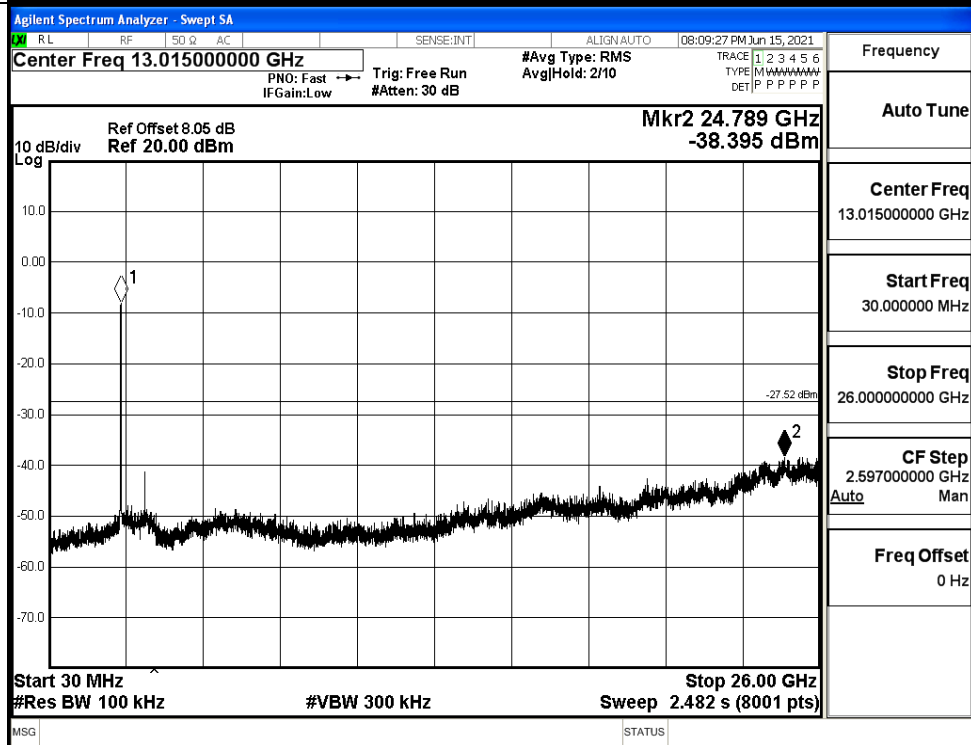


11N40SISO\_HCH\_Graphs

Pref/11N40  
SISO/HCH

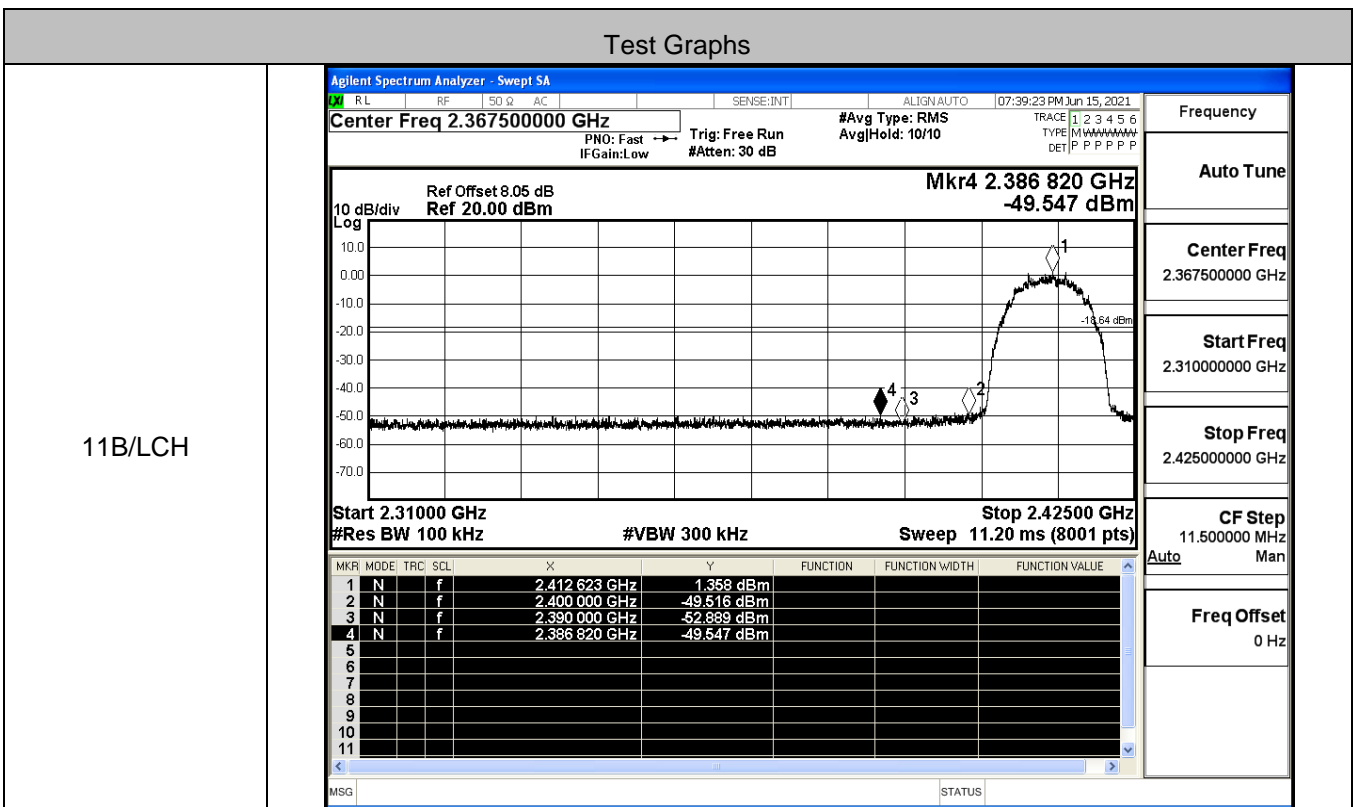


Puw/11N40  
SISO/HCH



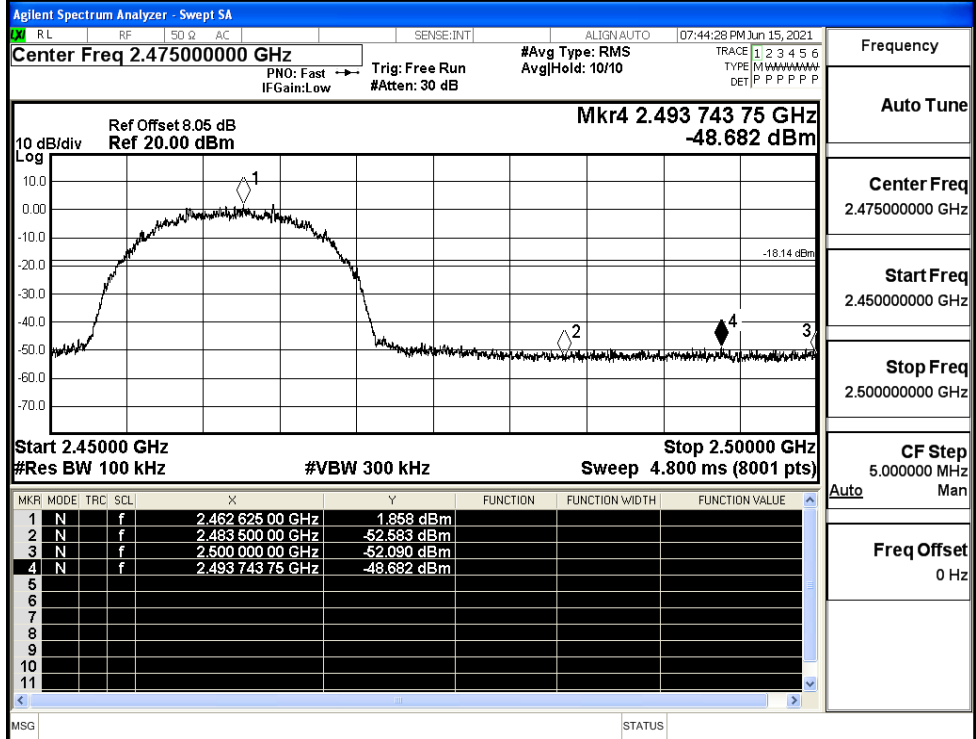
### A.6 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
11B	LCH	1.358	-49.547	-18.64	PASS
	HCH	1.858	-48.682	-18.14	PASS
11G	LCH	-4.717	-49.513	-24.72	PASS
	HCH	-4.267	-48.200	-24.27	PASS
11N20SISO	LCH	-4.639	-49.237	-24.64	PASS
	HCH	-4.422	-47.856	-24.42	PASS
11N40SISO	LCH	-7.854	-48.442	-27.85	PASS
	HCH	-7.478	-47.220	-27.48	PASS





11B/HCH



Frequency

Auto Tune

Center Freq  
2.47500000 GHz

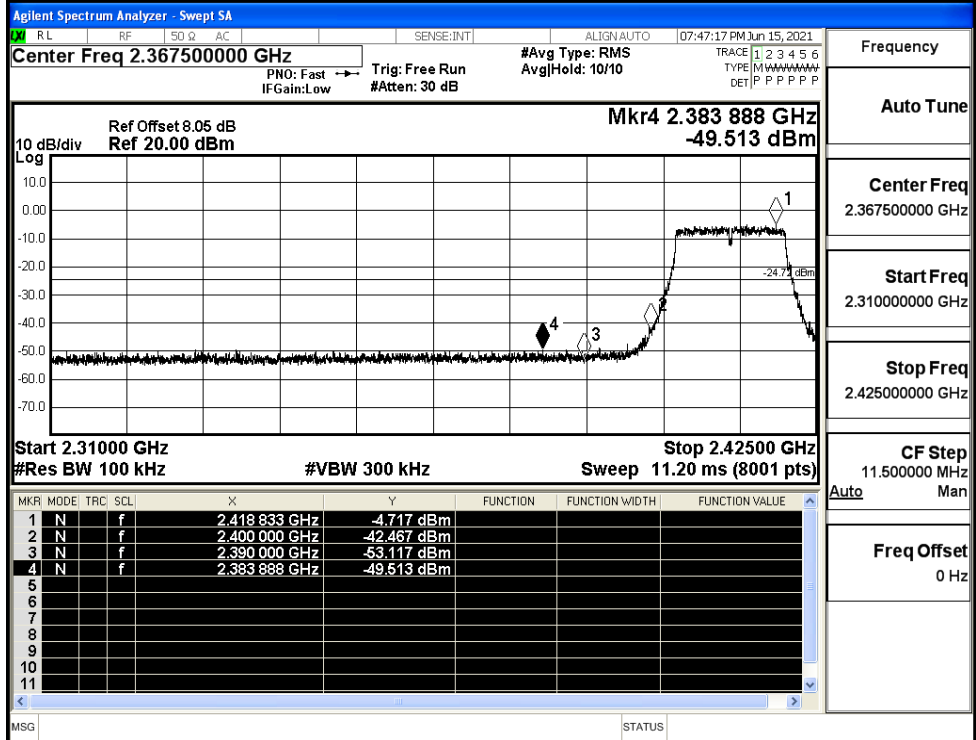
Start Freq  
2.45000000 GHz

Stop Freq  
2.50000000 GHz

CF Step  
5.000000 MHz

Freq Offset  
0 Hz

11G/LCH



Frequency

Auto Tune

Center Freq  
2.36750000 GHz

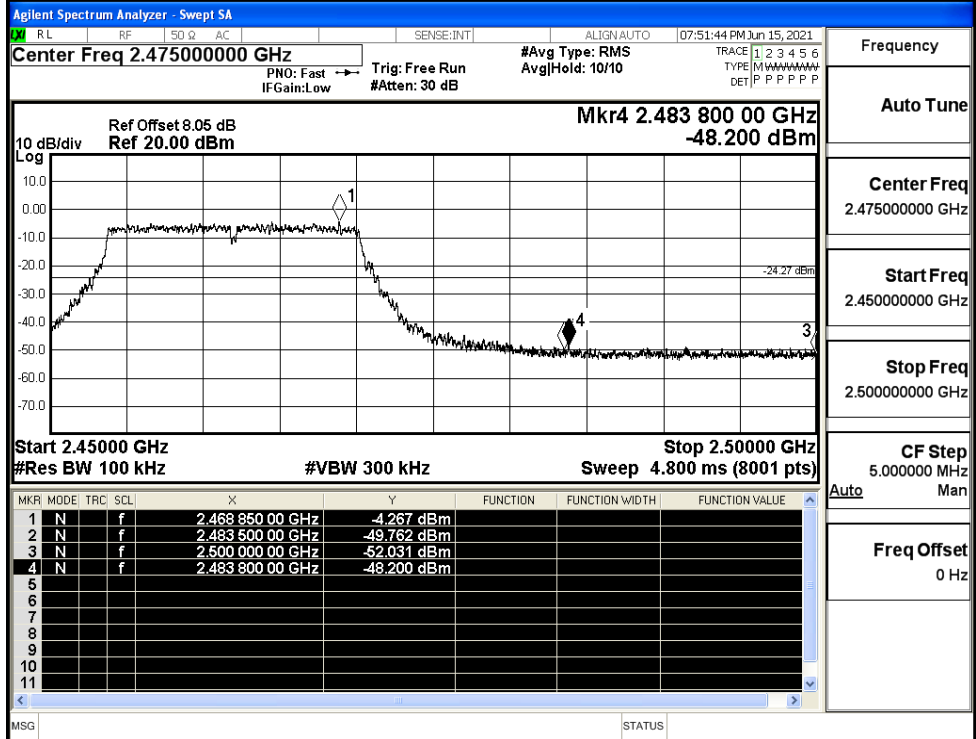
Start Freq  
2.31000000 GHz

Stop Freq  
2.42500000 GHz

CF Step  
11.500000 MHz

Freq Offset  
0 Hz

11G/HCH



Frequency

Auto Tune

Center Freq  
2.475000000 GHz

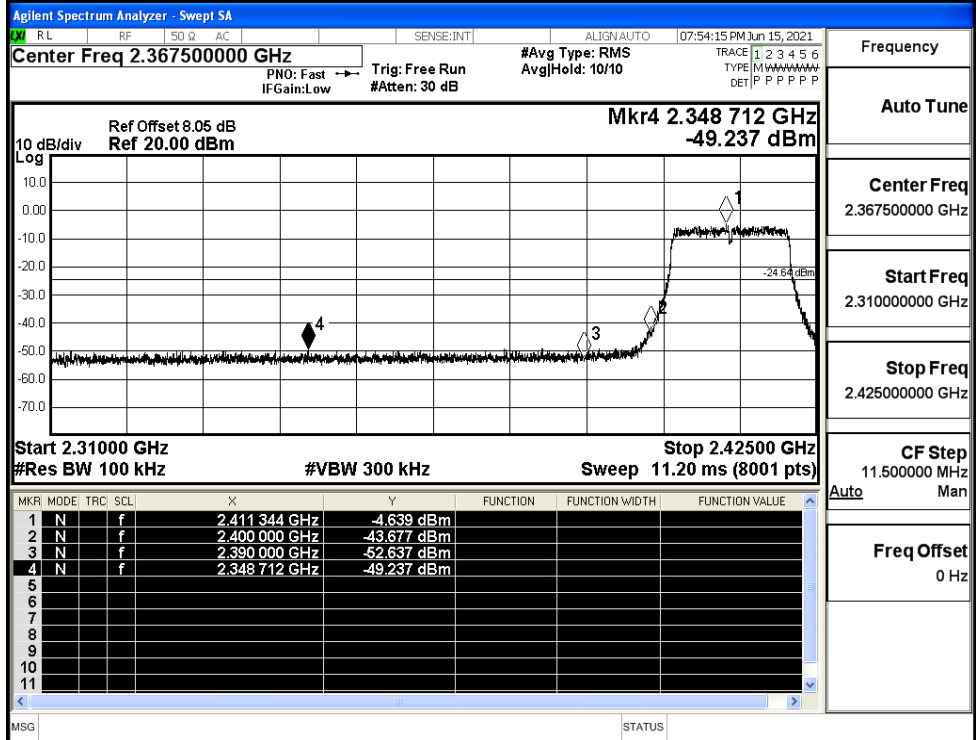
Start Freq  
2.450000000 GHz

Stop Freq  
2.500000000 GHz

CF Step  
5.000000 MHz

Freq Offset  
0 Hz

11N20SISO/LCH



Frequency

Auto Tune

Center Freq  
2.367500000 GHz

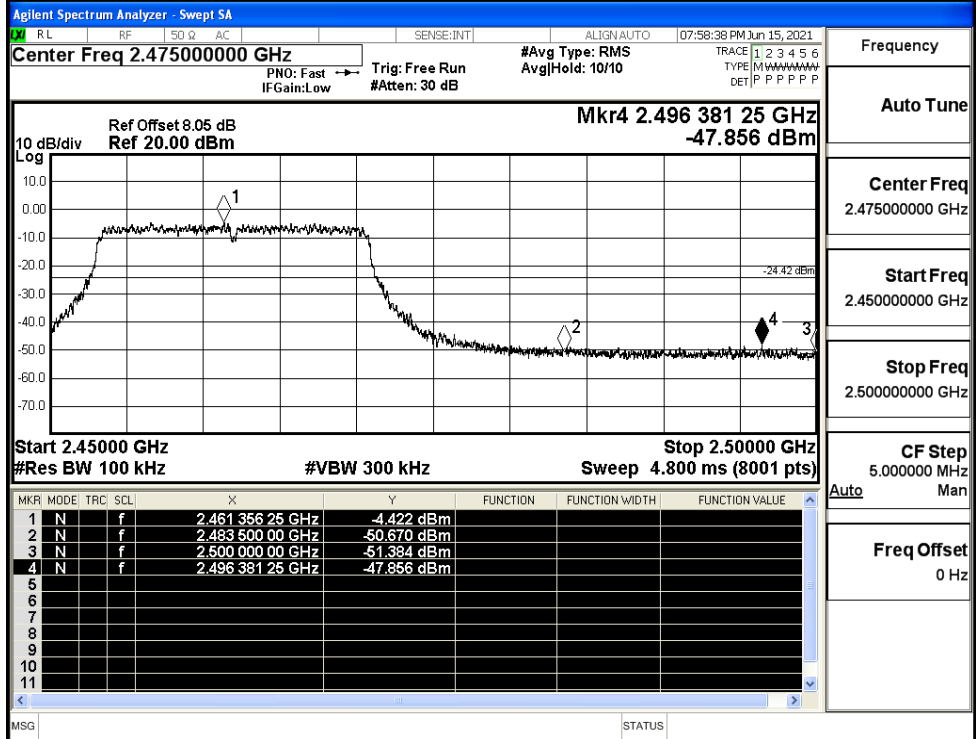
Start Freq  
2.310000000 GHz

Stop Freq  
2.425000000 GHz

CF Step  
11.500000 MHz

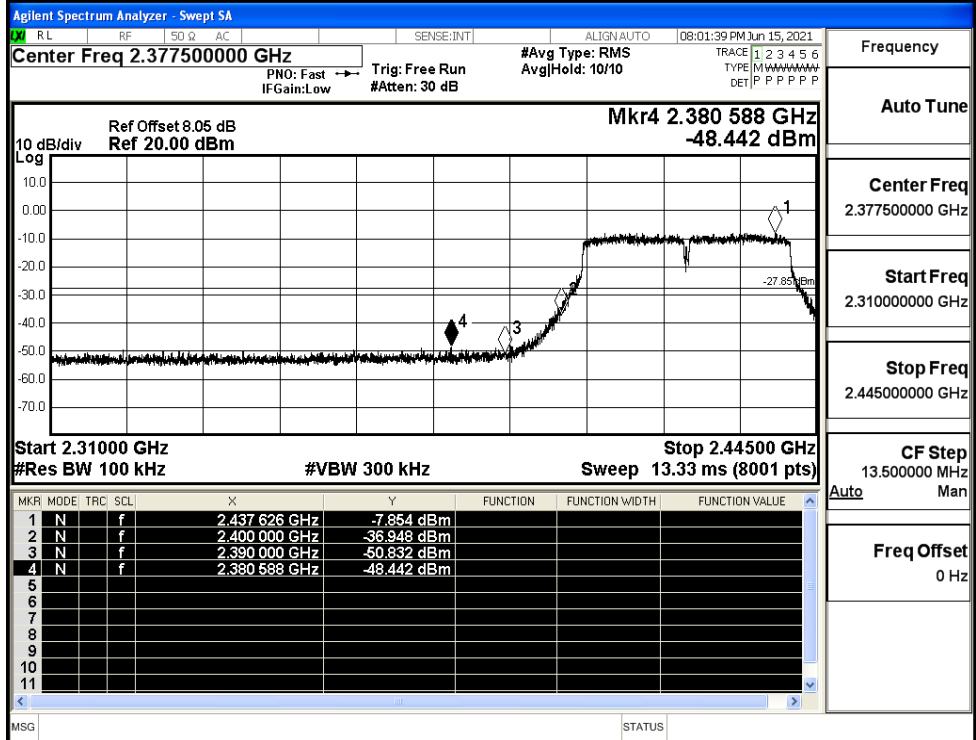
Freq Offset  
0 Hz

11N20SISO/HCH



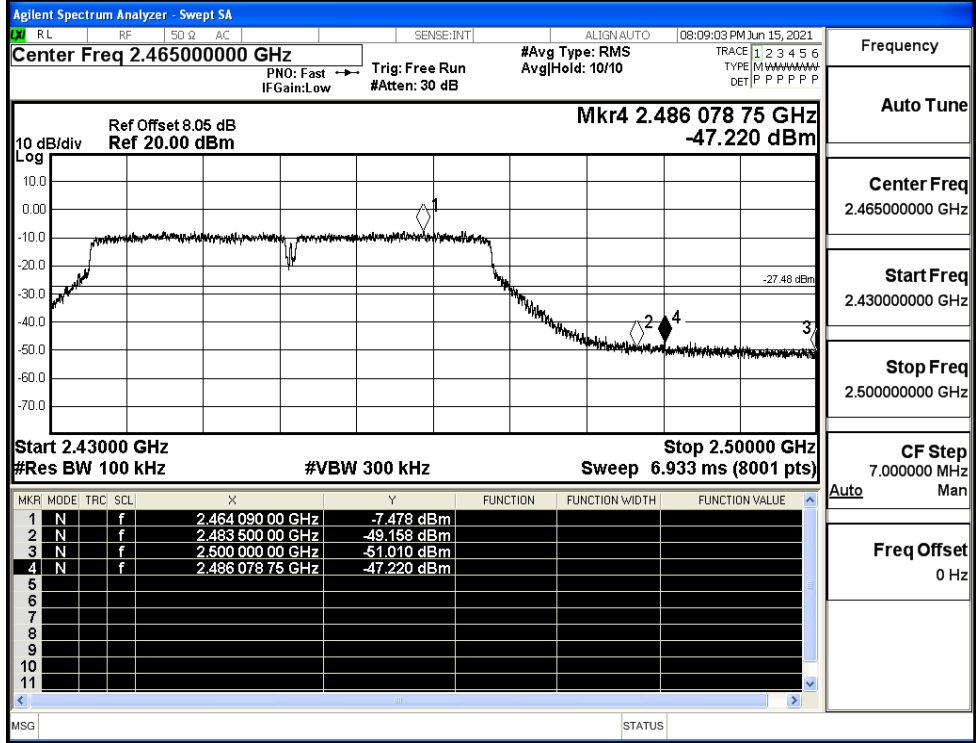
Frequency	2.475000000 GHz
Auto Tune	
Center Freq	2.475000000 GHz
Start Freq	2.450000000 GHz
Stop Freq	2.500000000 GHz
CF Step	5.000000 MHz
Freq Offset	0 Hz

11N40SISO/LCH



Frequency	2.377500000 GHz
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

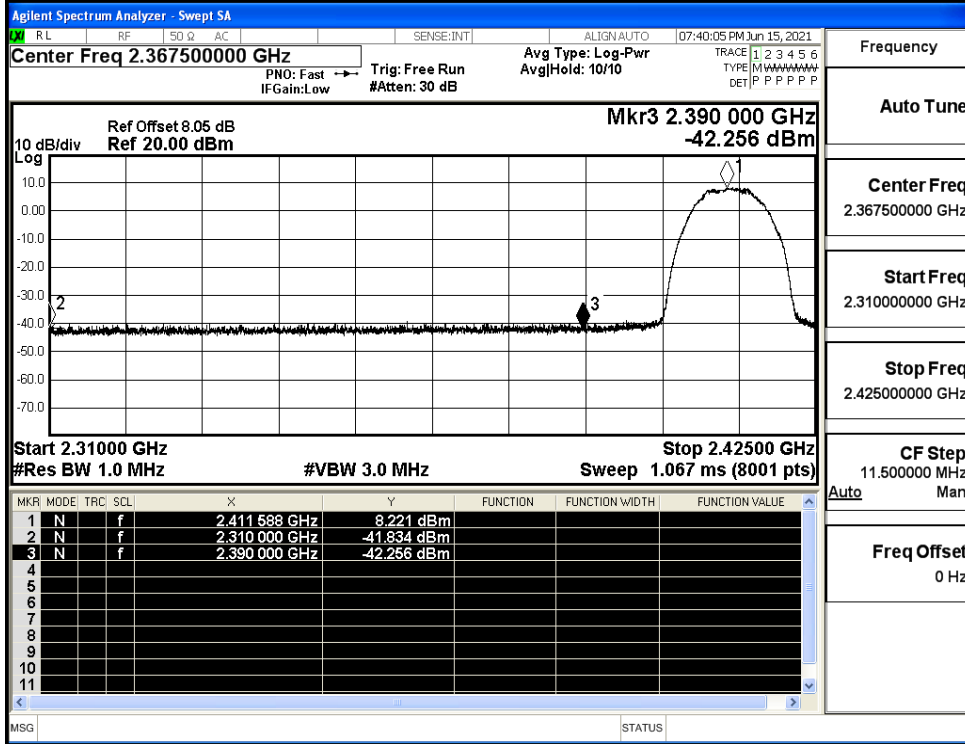


## A.7 Restrict-band band-edge measurements

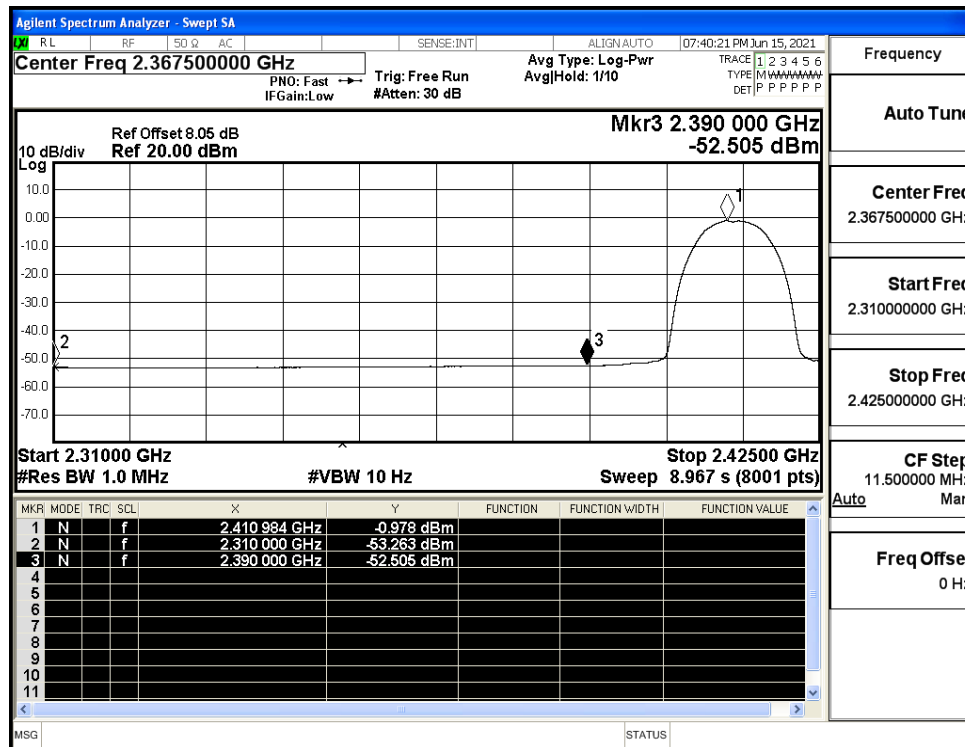
Test Mode	Test Channel	Ant	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBu V/m]	Verdict
11B	2412	Ant1	2310.0	-41.83	3.0	0	56.43	PEAK	74	PASS
	2412	Ant1	2310.0	-53.26	3.0	0	45.00	AV	54	PASS
	2412	Ant1	2390.0	-42.26	3.0	0	56.00	PEAK	74	PASS
	2412	Ant1	2390.0	-52.51	3.0	0	45.75	AV	54	PASS
	2462	Ant1	2483.5	-42.36	3.0	0	55.90	PEAK	74	PASS
	2462	Ant1	2483.5	-51.94	3.0	0	46.32	AV	54	PASS
	2462	Ant1	2500.0	-41.26	3.0	0	57.00	PEAK	74	PASS
	2462	Ant1	2500.0	-51.74	3.0	0	46.52	AV	54	PASS
11G	2412	Ant1	2310.0	-42.95	3.0	0	55.31	PEAK	74	PASS
	2412	Ant1	2310.0	-53.24	3.0	0	45.02	AV	54	PASS
	2412	Ant1	2390.0	-42.38	3.0	0	55.88	PEAK	74	PASS
	2412	Ant1	2390.0	-52.32	3.0	0	45.94	AV	54	PASS
	2462	Ant1	2483.5	-40.57	3.0	0	57.69	PEAK	74	PASS
	2462	Ant1	2483.5	-51.46	3.0	0	46.80	AV	54	PASS
	2462	Ant1	2500.0	-40.32	3.0	0	57.94	PEAK	74	PASS
	2462	Ant1	2500.0	-51.76	3.0	0	46.50	AV	54	PASS
11N20 SISO	2412	Ant1	2310.0	-42.17	3.0	0	56.09	PEAK	74	PASS
	2412	Ant1	2310.0	-53.26	3.0	0	45.00	AV	54	PASS
	2412	Ant1	2390.0	-40.89	3.0	0	57.37	PEAK	74	PASS
	2412	Ant1	2390.0	-52.21	3.0	0	46.05	AV	54	PASS
	2462	Ant1	2483.5	-41.01	3.0	0	57.25	PEAK	74	PASS
	2462	Ant1	2483.5	-51.22	3.0	0	47.04	AV	54	PASS
	2462	Ant1	2500.0	-41.42	3.0	0	56.84	PEAK	74	PASS
	2462	Ant1	2500.0	-51.76	3.0	0	46.50	AV	54	PASS
11N40 SISO	2422	Ant1	2310.0	-43.54	3.0	0	54.72	PEAK	74	PASS
	2422	Ant1	2310.0	-53.22	3.0	0	45.04	AV	54	PASS

	2422	Ant1	2390.0	-39.83	3.0	0	58.43	PEAK	74	PASS
	2422	Ant1	2390.0	-51.46	3.0	0	46.80	AV	54	PASS
	2452	Ant1	2483.5	-38.96	3.0	0	59.30	PEAK	74	PASS
	2452	Ant1	2483.5	-49.25	3.0	0	49.01	AV	54	PASS
	2452	Ant1	2500.0	-40.49	3.0	0	57.77	PEAK	74	PASS
	2452	Ant1	2500.0	-51.46	3.0	0	46.80	AV	54	PASS

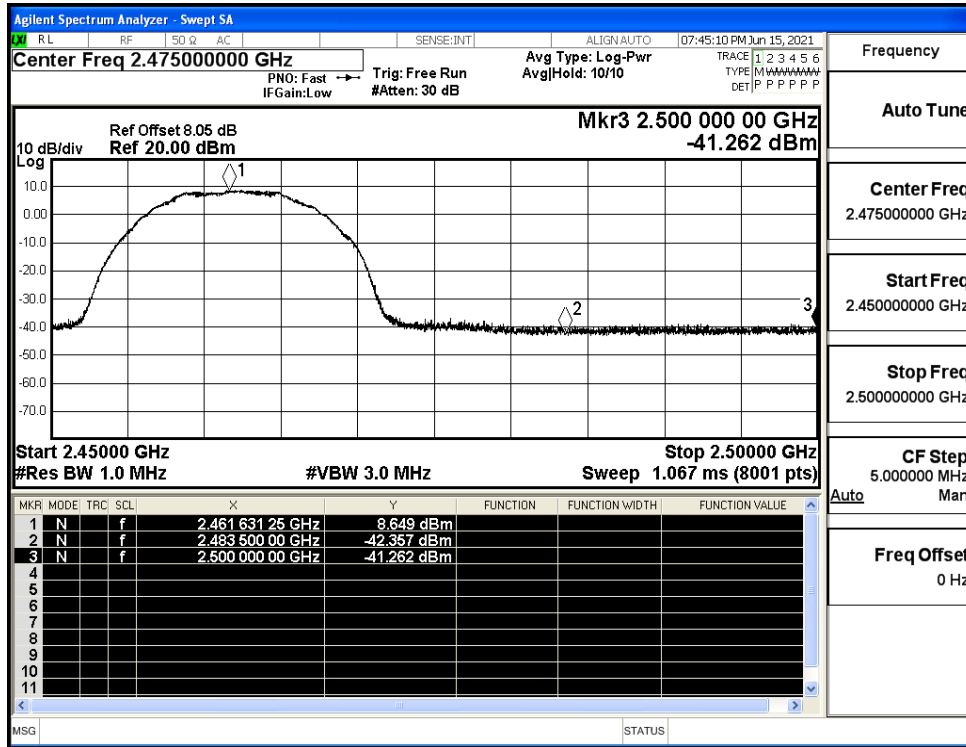
Restrict-band band-edge measurements\_11B\_2412\_Ant1\_PEAK



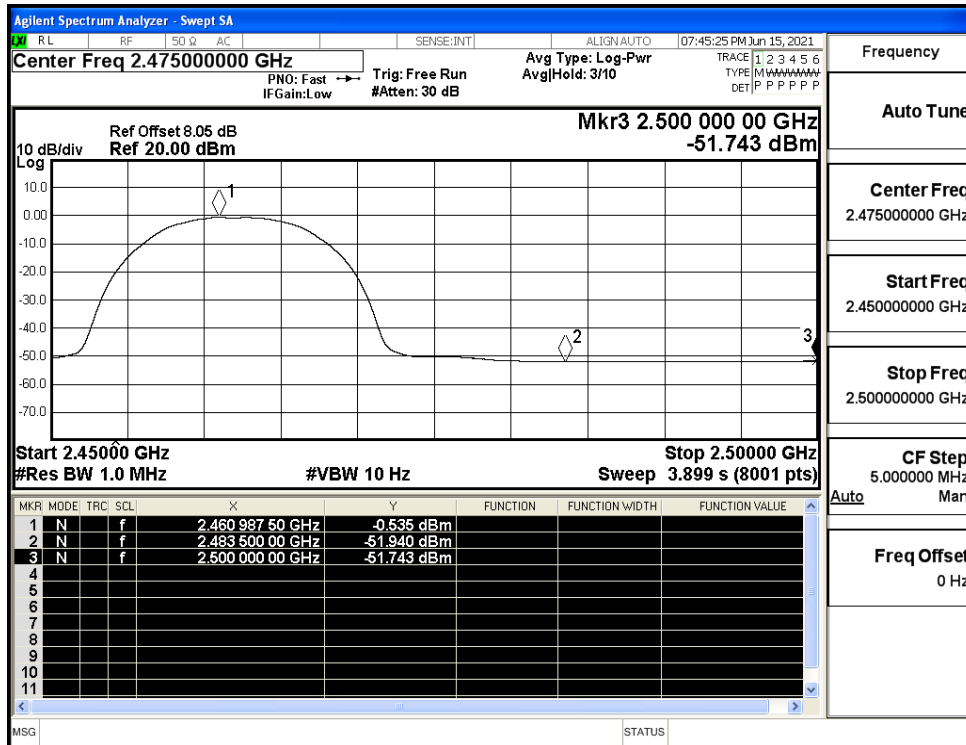
Restrict-band band-edge measurements\_11B\_2412\_Ant1\_AV



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

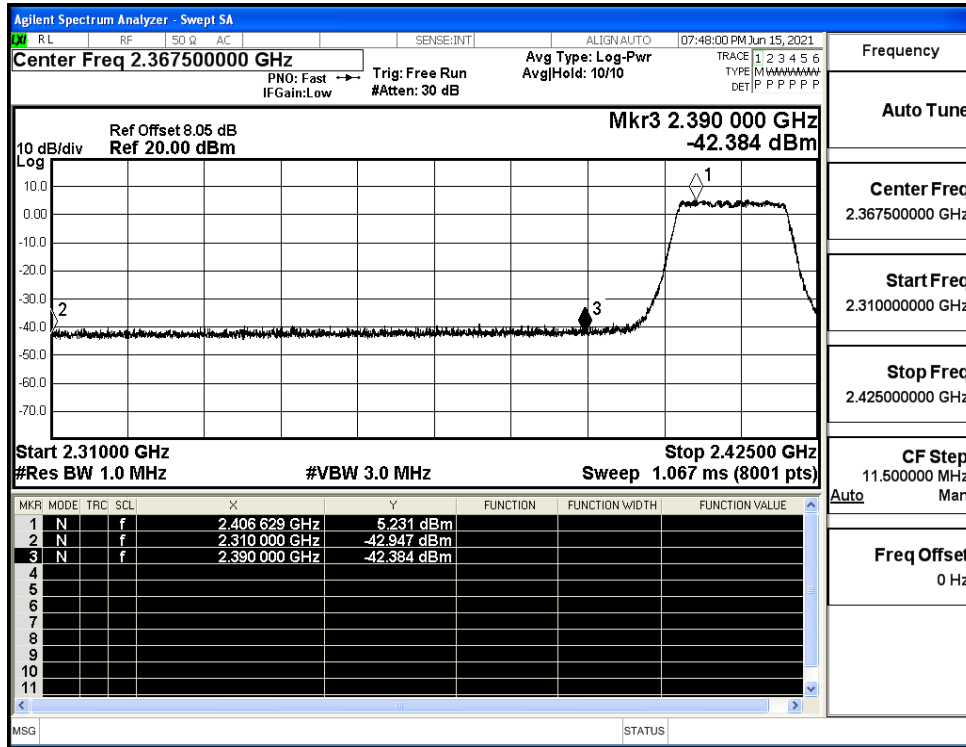


Restrict-band band-edge measurements\_11B\_2462\_Ant1\_AV

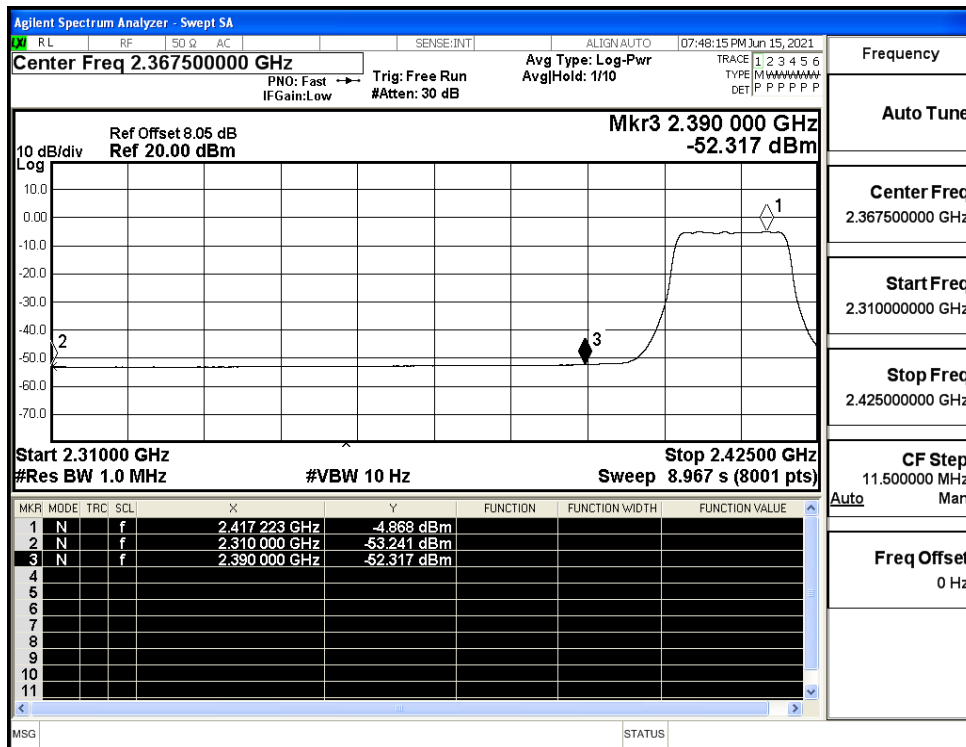




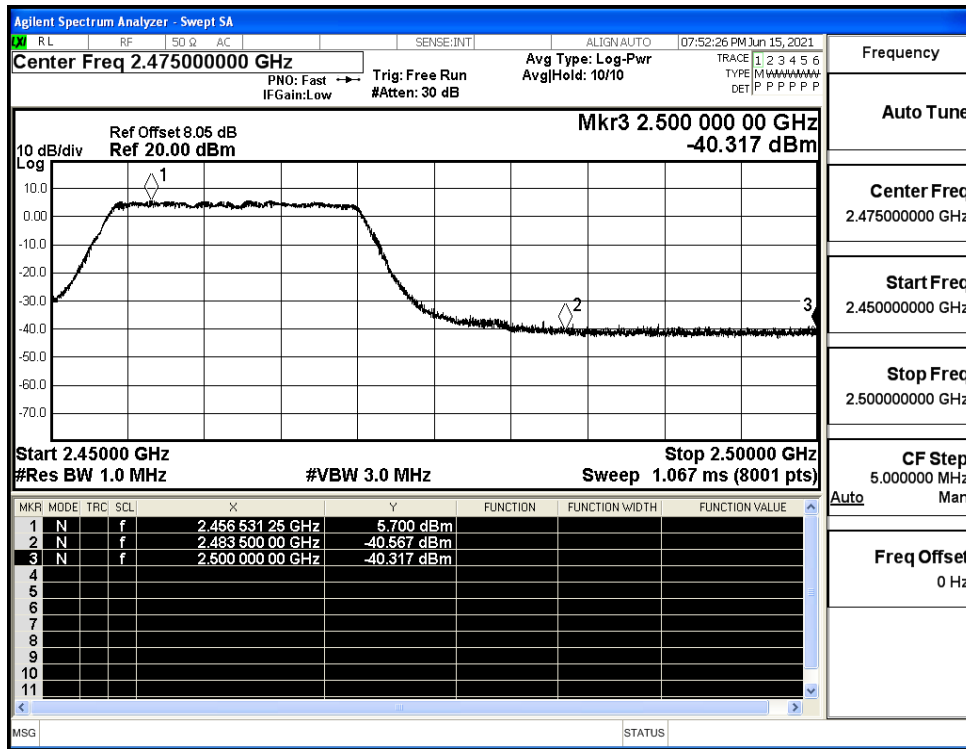
Restrict-band band-edge measurements\_11G\_2412\_Ant1\_PEAK



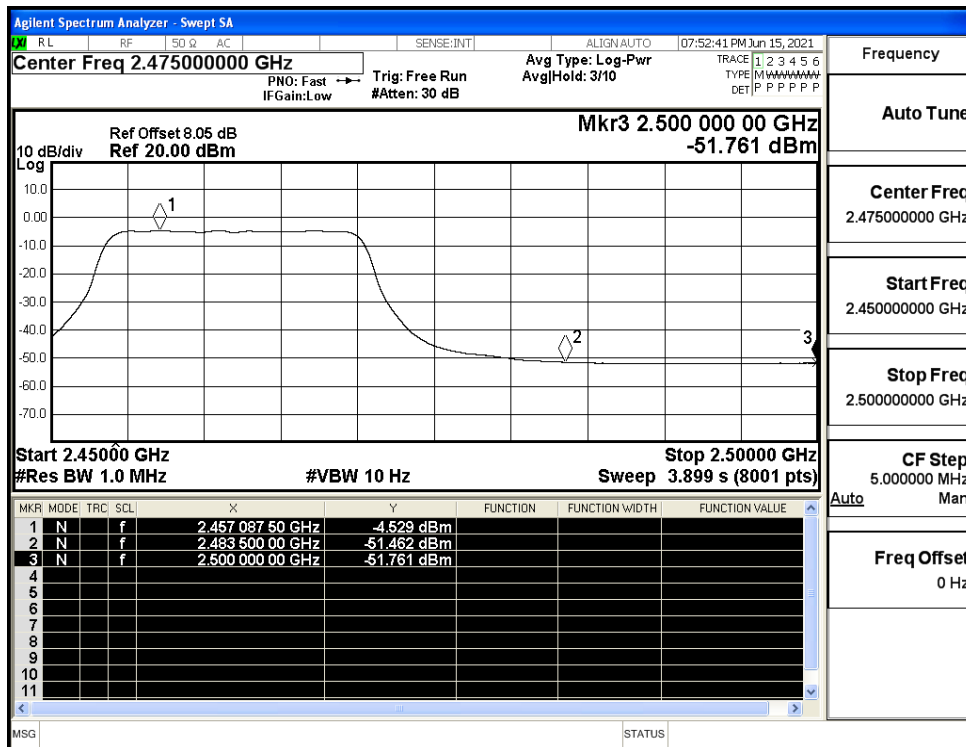
Restrict-band band-edge measurements\_11G\_2412\_Ant1\_AV



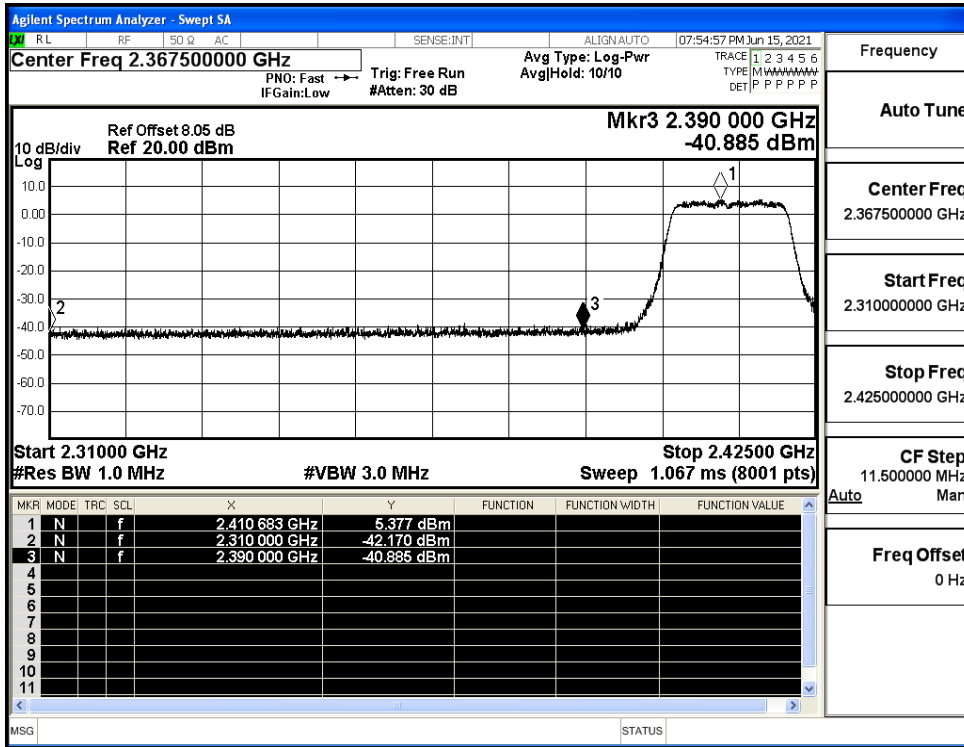
Restrict-band band-edge measurements\_11G\_2462\_Ant1\_PEAK



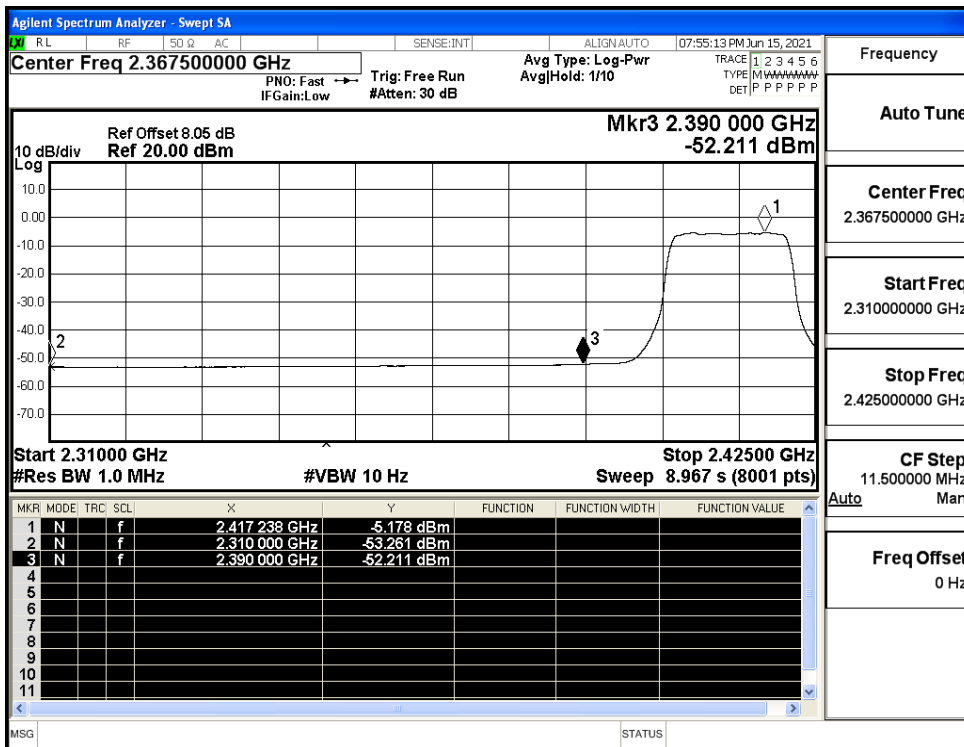
Restrict-band band-edge measurements\_11G\_2462\_Ant1\_AV



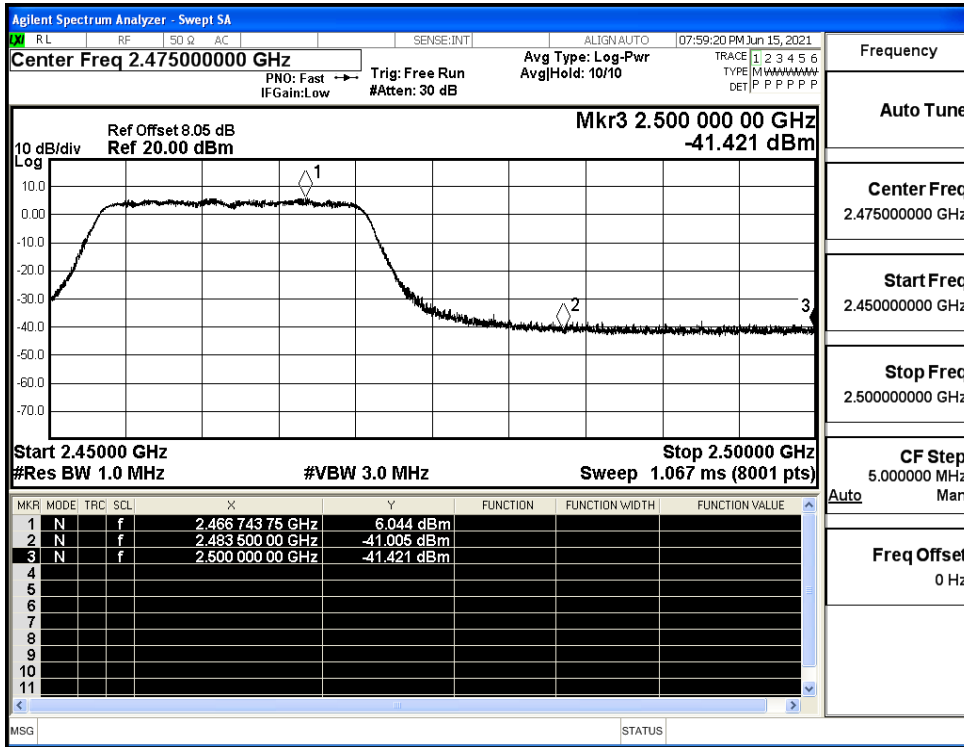
Restrict-band band-edge measurements\_11N20SISO\_2412\_Ant1\_PEAK



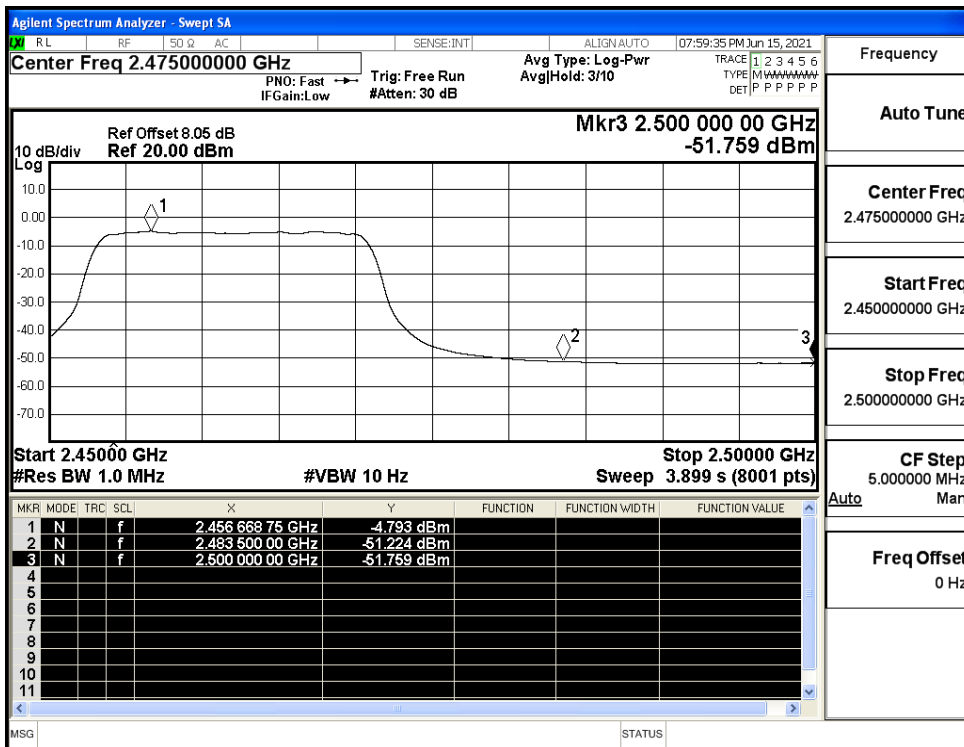
Restrict-band band-edge measurements\_11N20SISO\_2412\_Ant1\_AV



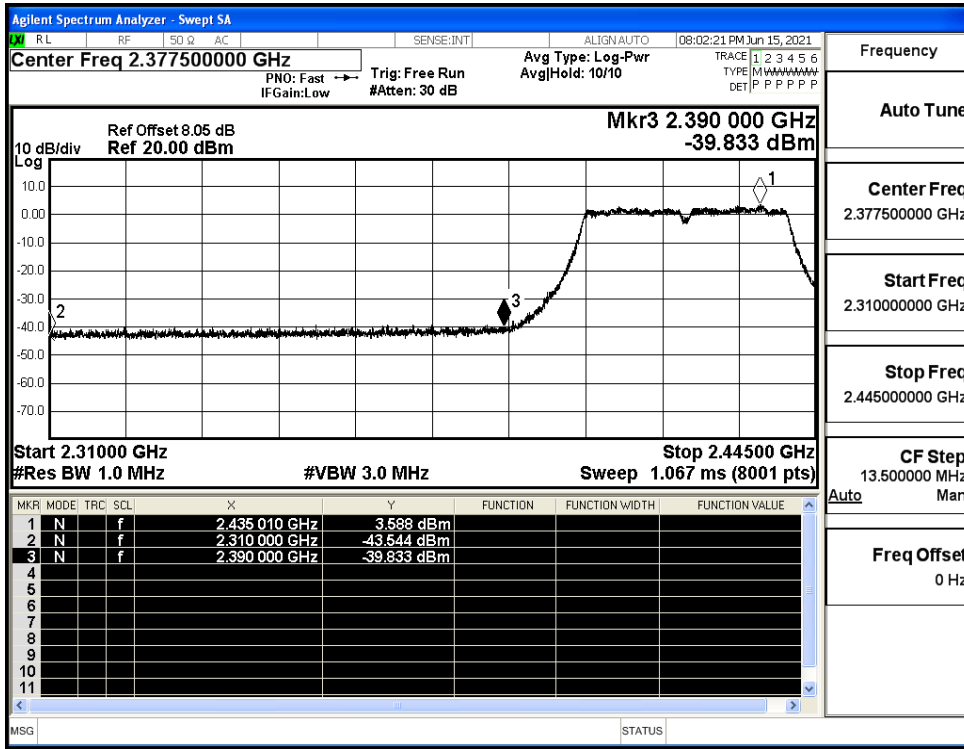
Restrict-band band-edge measurements\_11N20SISO\_2462\_Ant1\_PEAK



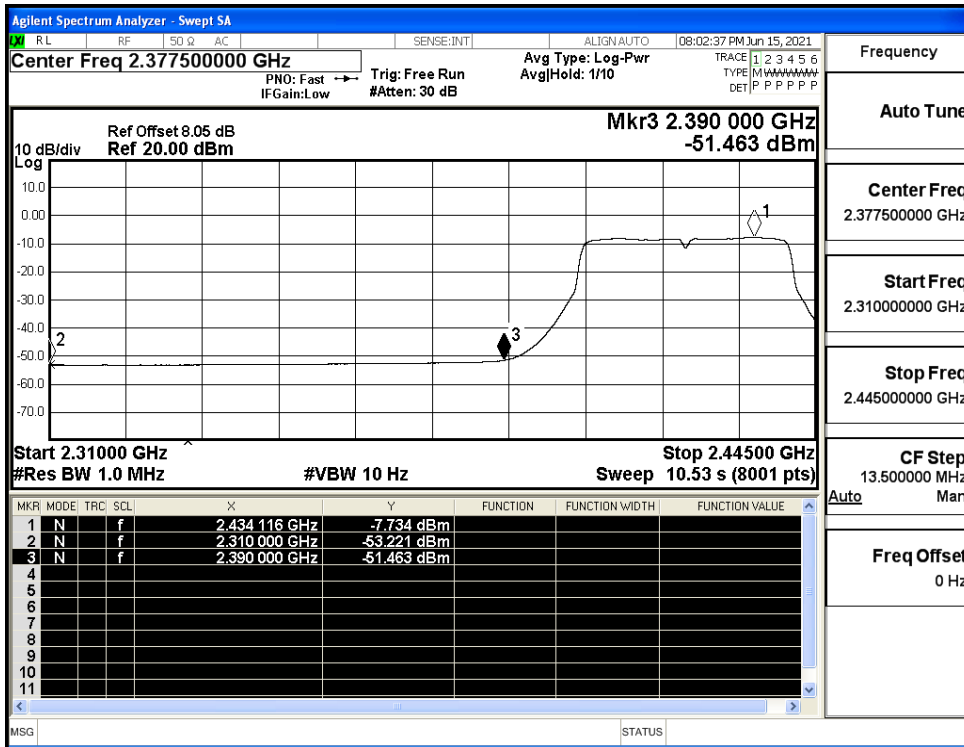
Restrict-band band-edge measurements\_11N20SISO\_2462\_Ant1\_AV



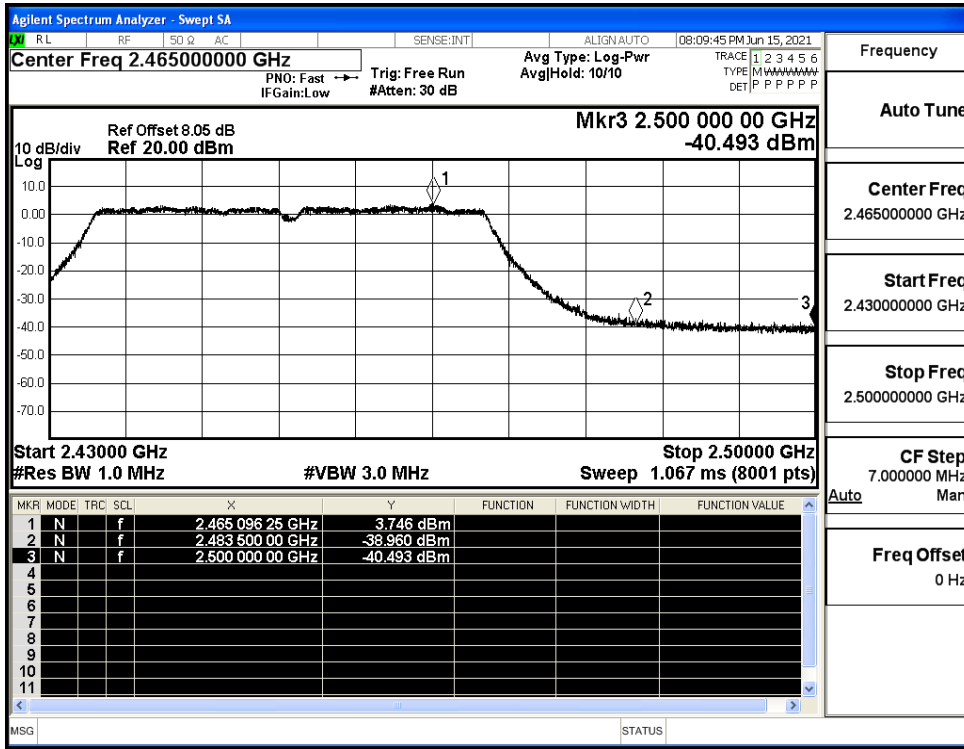
Restrict-band band-edge measurements\_11N40SISO\_2422\_Ant1\_PEAK



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

