

Appendix A

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: Wi-Fi Smart Switch with Energy Monitoring

Trade Mark: SONOFF

Test Model: POWR3

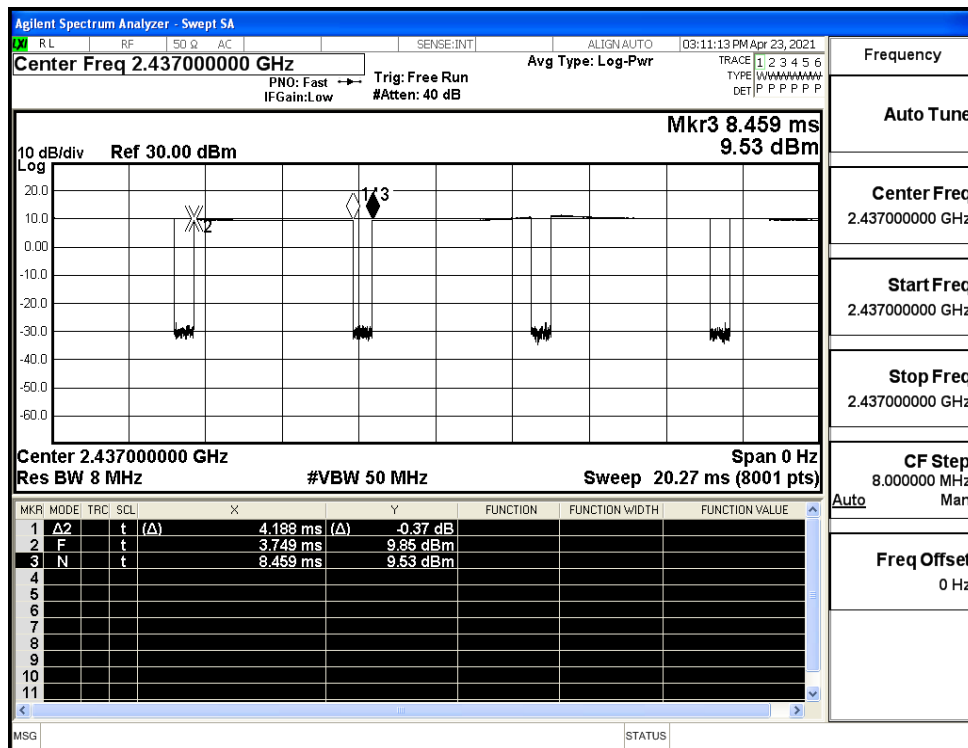
Environmental Conditions

Temperature:	24.6° C
Relative Humidity:	54.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Carl Fu
Supervised by:	Jay Li

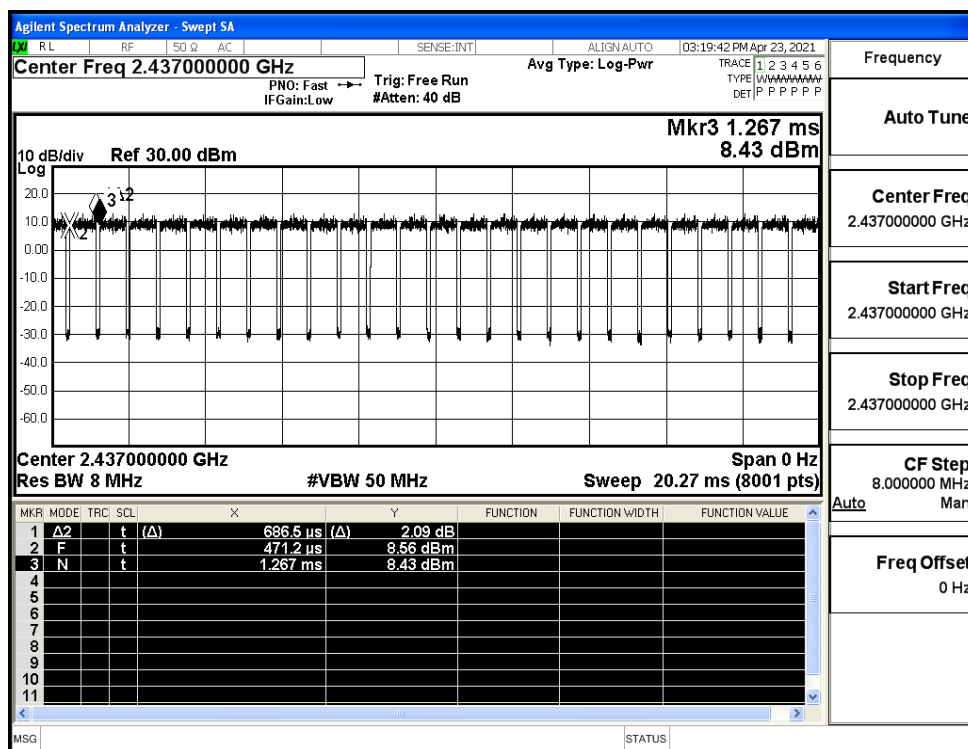
A.1 Duty Cycle

Test Mode	Test Channel	Ant	Duty Cycle[%]	1/T Minimum VBW(KHz)	Verdict
11B	2437	Ant1	88.92	0.24	PASS
11G	2437	Ant1	86.31	1.46	PASS
11N20SISO	2437	Ant1	85.95	1.54	PASS

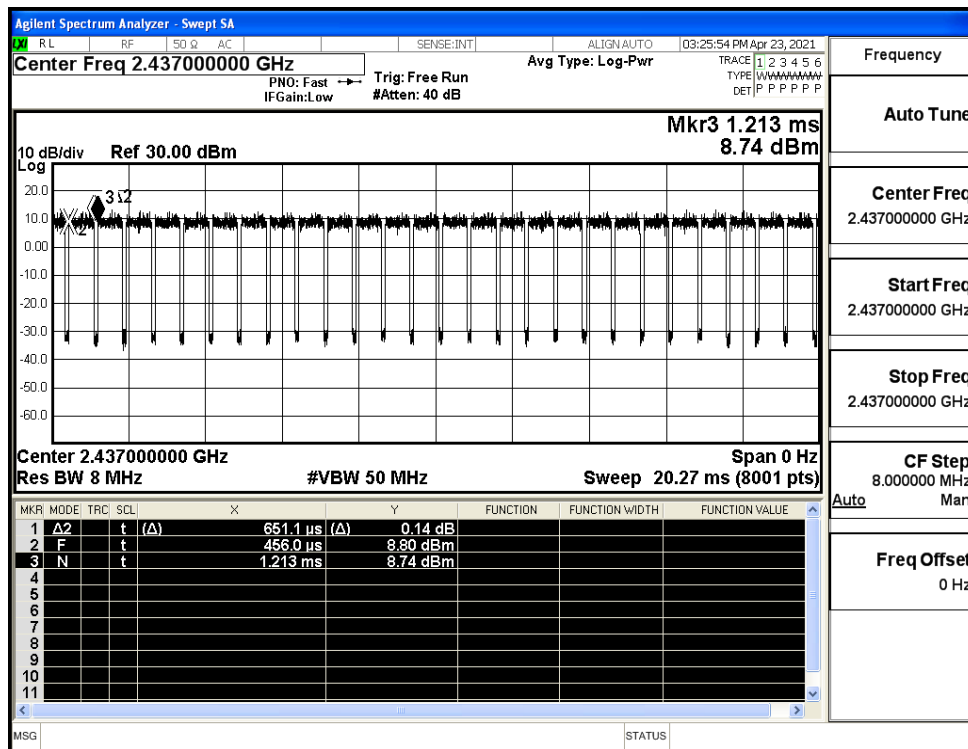
Duty Cycle_11B_2437_Ant1



Duty Cycle_11G_2437_Ant1



Duty Cycle_11N20SISO_2437_Ant1



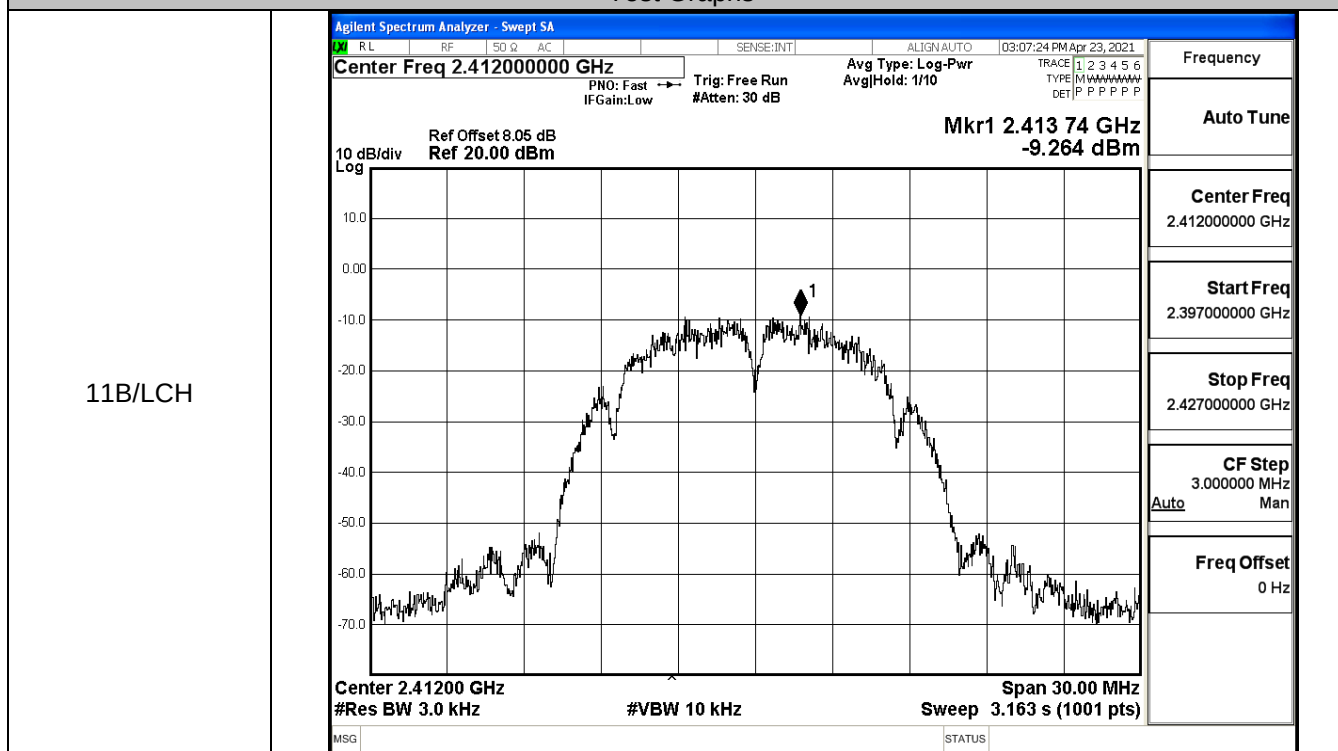
A.2 Maximum Conducted Output Power

Mode	Channel	Meas.Level [dBm]	Limit [dBm]	Verdict
11B	LCH	17.87	30	PASS
	MCH	16.67	30	PASS
	HCH	14.28	30	PASS
11G	LCH	21.53	30	PASS
	MCH	22.19	30	PASS
	HCH	16.29	30	PASS
11N20SISO	LCH	21.39	30	PASS
	MCH	22.02	30	PASS
	HCH	16.16	30	PASS

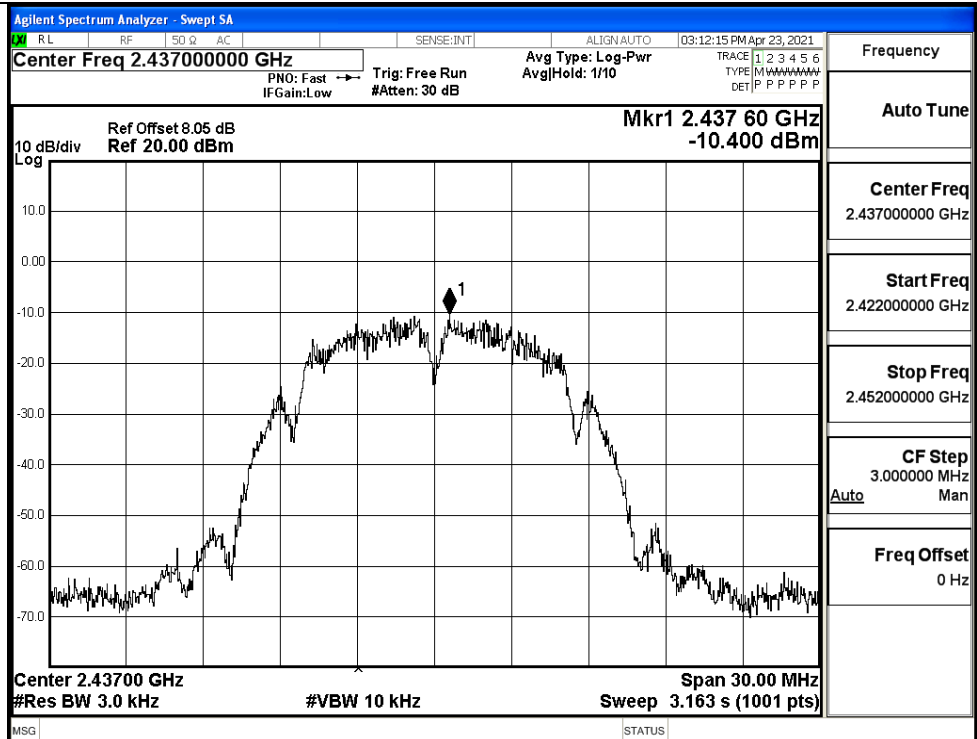
A.3 Maximum Power Spectral Density

Mode	Channel	Meas.Level [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
11B	LCH	-9.264	8	PASS
	MCH	-10.400	8	PASS
	HCH	-12.338	8	PASS
11G	LCH	-12.501	8	PASS
	MCH	-11.911	8	PASS
	HCH	-17.134	8	PASS
11N20SISO	LCH	-13.376	8	PASS
	MCH	-11.923	8	PASS
	HCH	-18.801	8	PASS

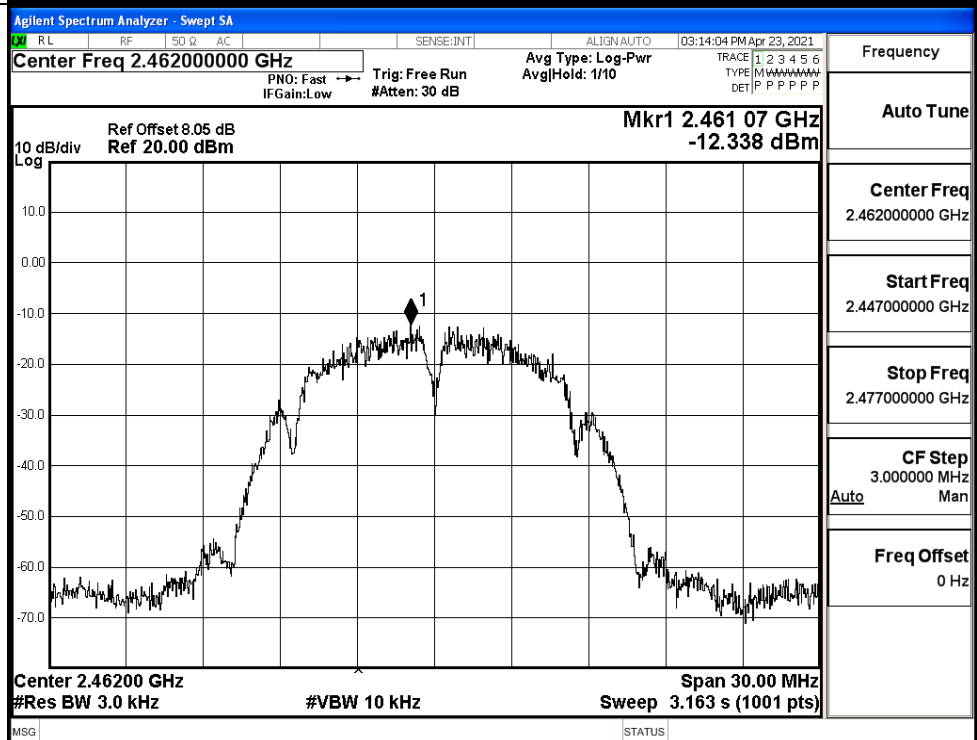
Test Graphs



11B/MCH

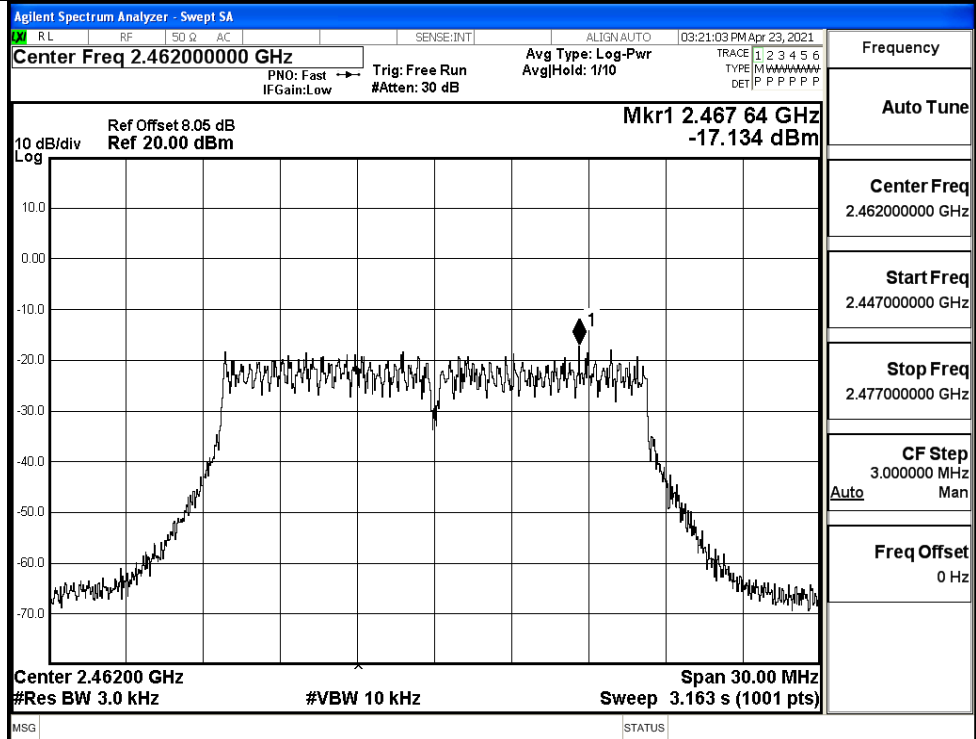


11B/HCH

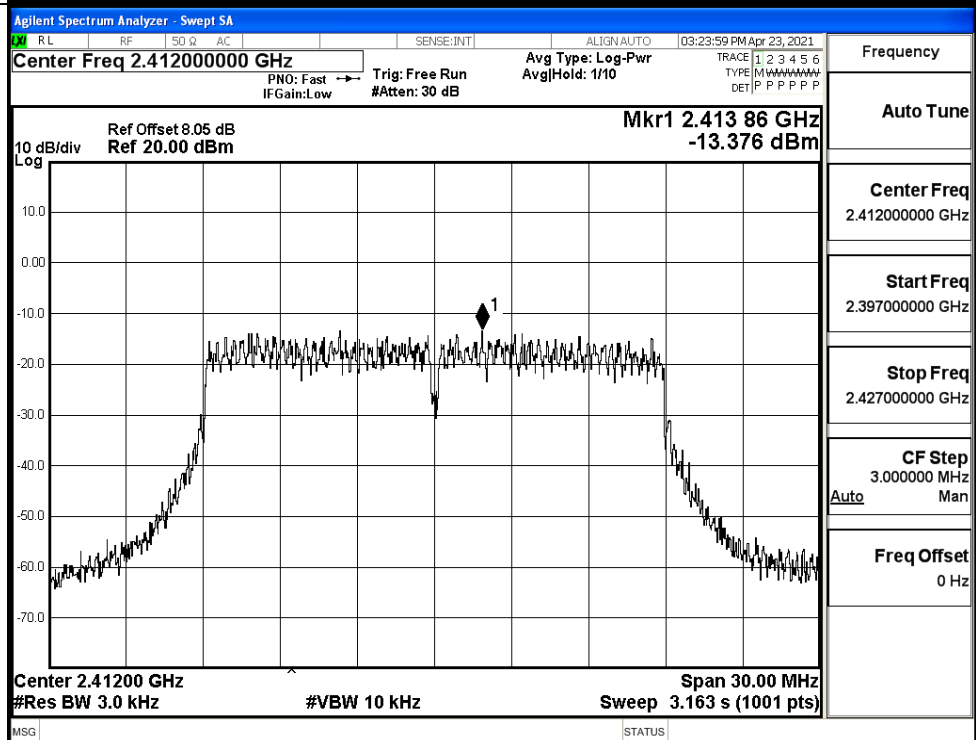


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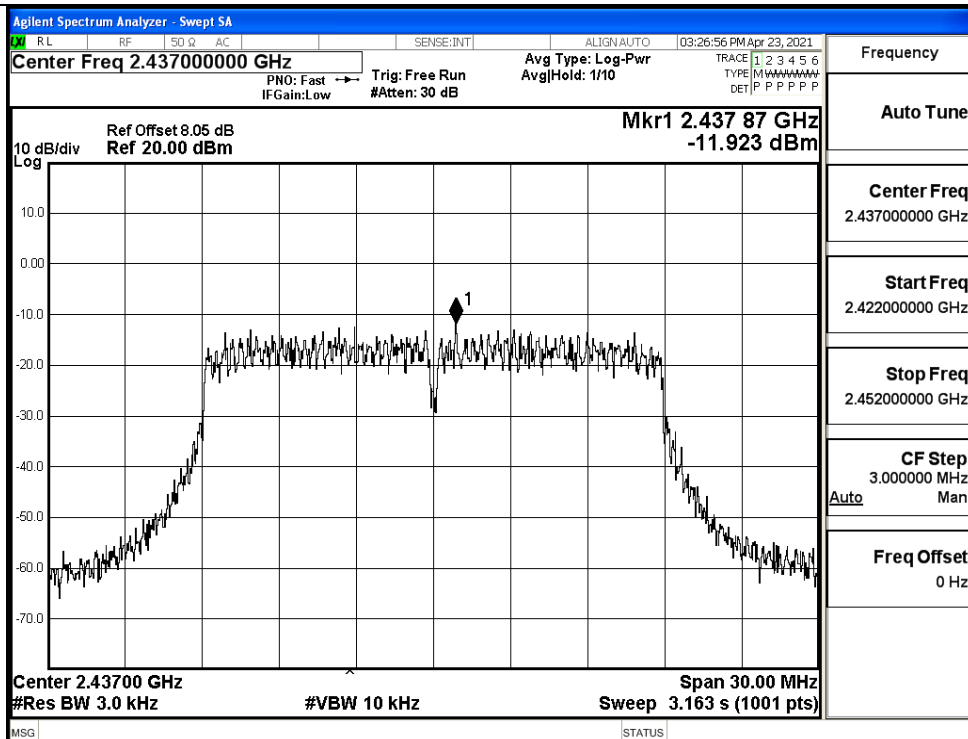
11G/HCH



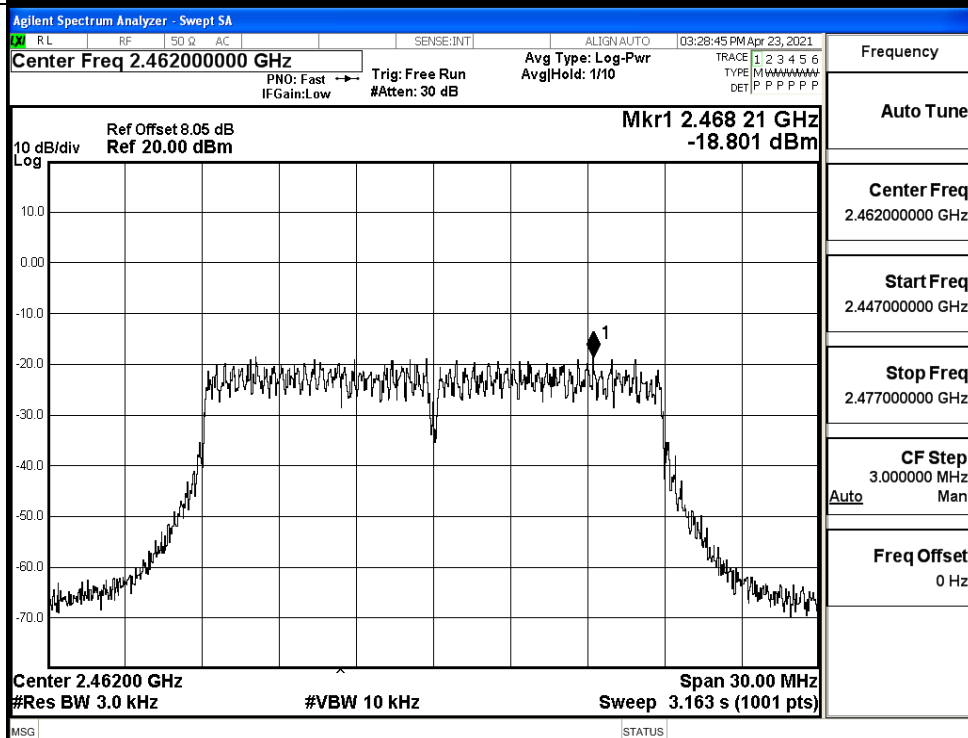
11N20SISO/LCH



11N20SISO/MCH



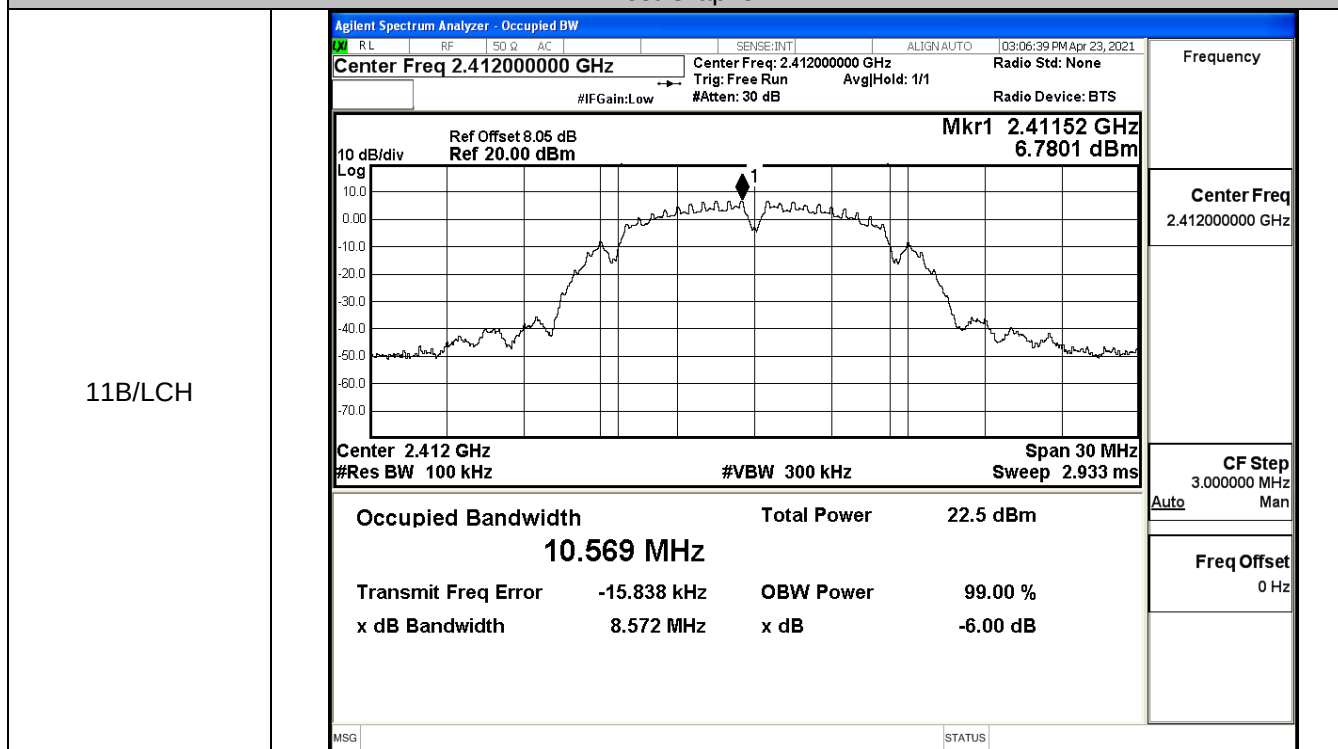
11N20SISO/HCH



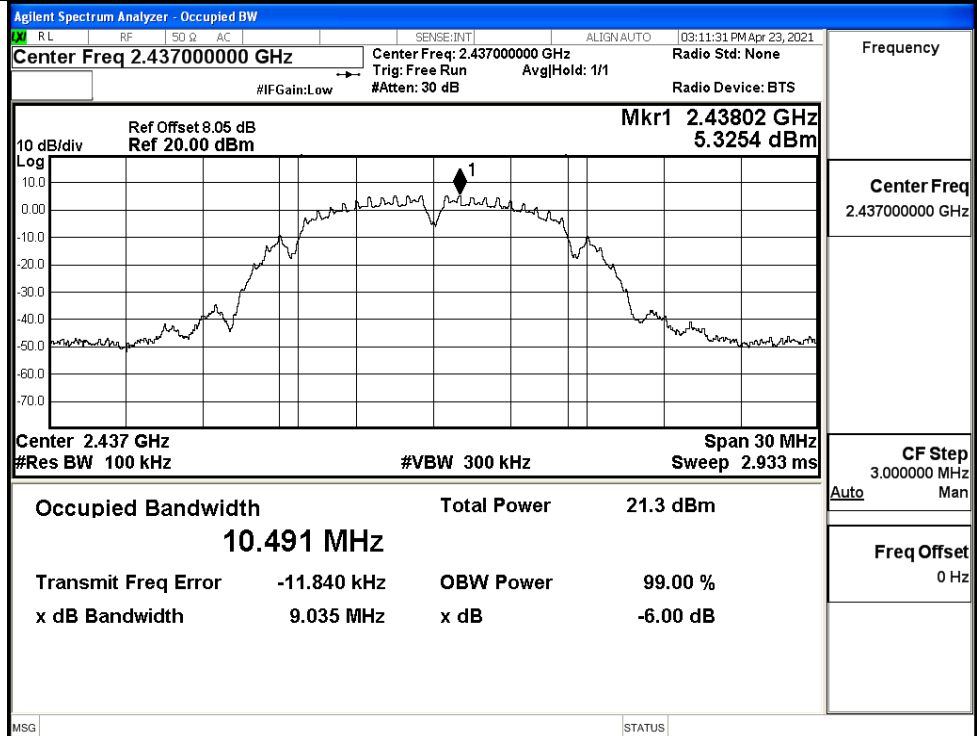
A.4 6dB Bandwidth

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
11B	LCH	8.572	≥ 0.5	PASS
	MCH	9.035	≥ 0.5	PASS
	HCH	8.561	≥ 0.5	PASS
11G	LCH	16.37	≥ 0.5	PASS
	MCH	16.36	≥ 0.5	PASS
	HCH	16.36	≥ 0.5	PASS
11N20SISO	LCH	16.68	≥ 0.5	PASS
	MCH	16.60	≥ 0.5	PASS
	HCH	17.05	≥ 0.5	PASS

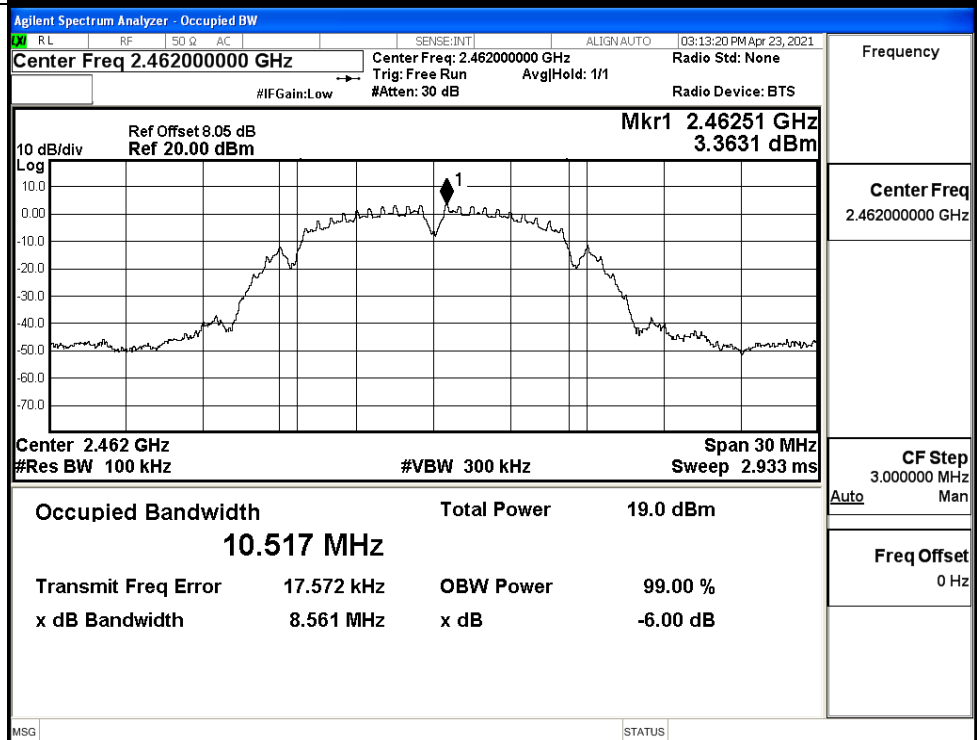
Test Graphs



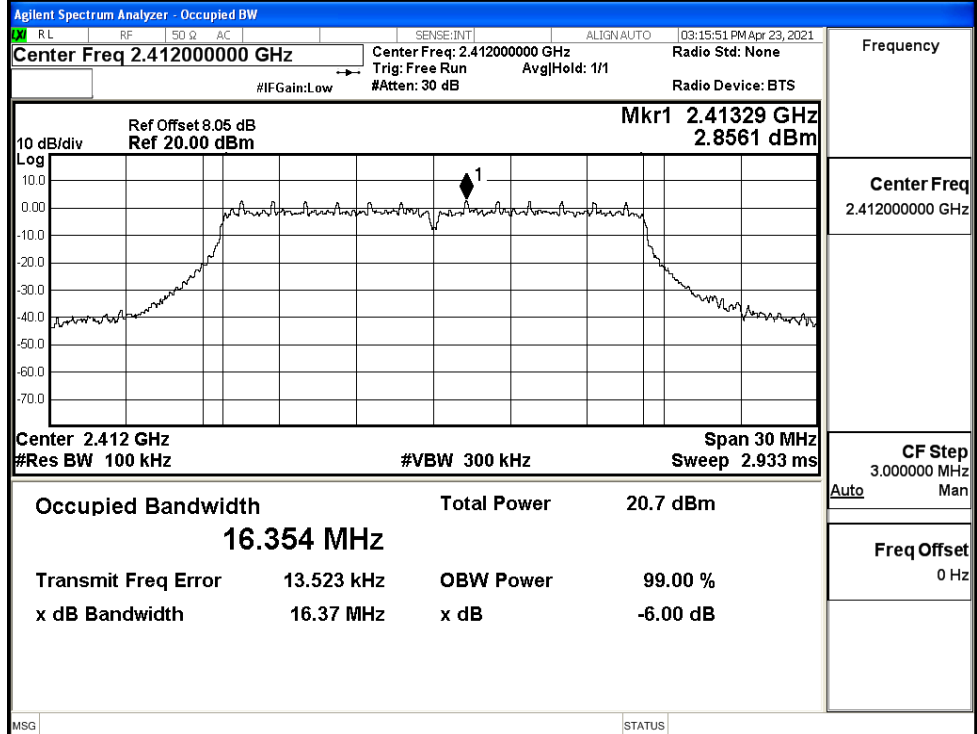
11B/MCH



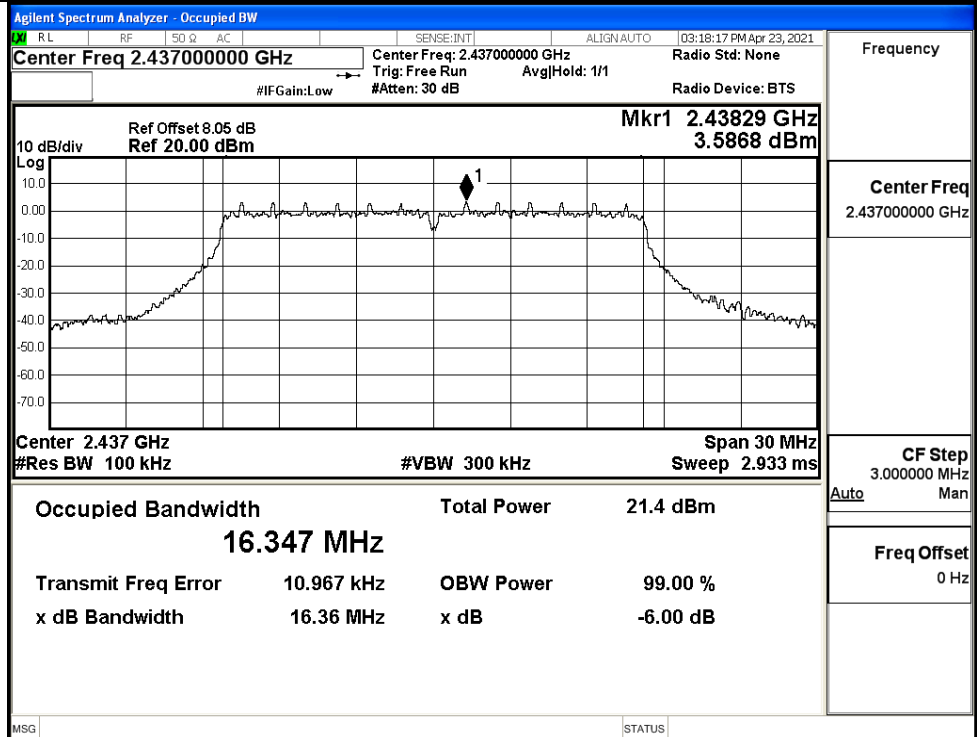
11B/HCH



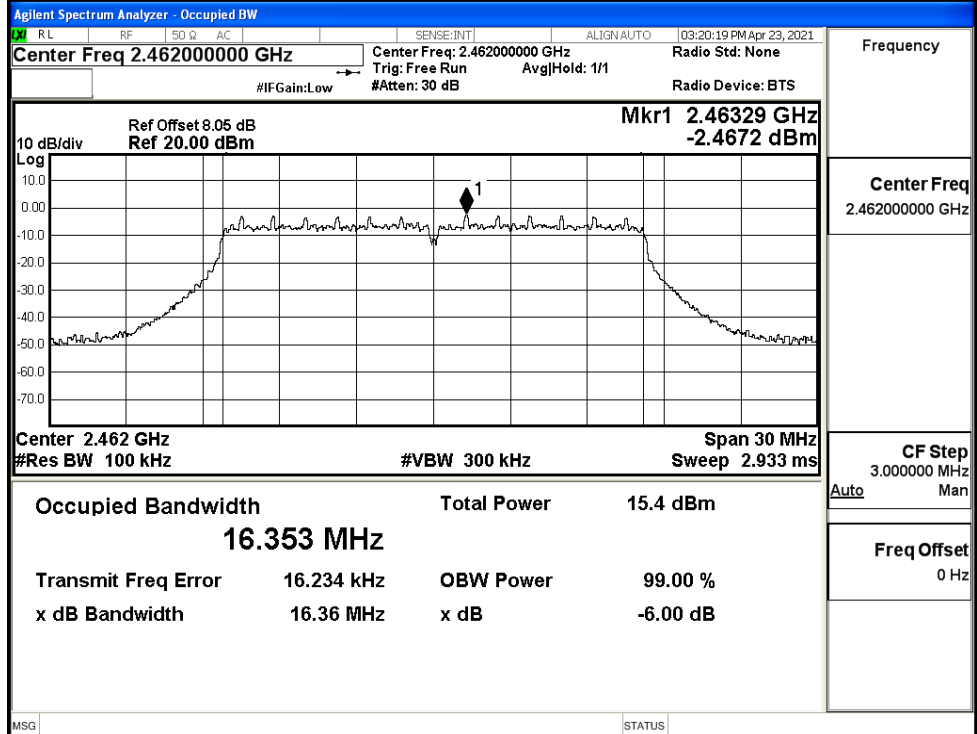
11G/LCH



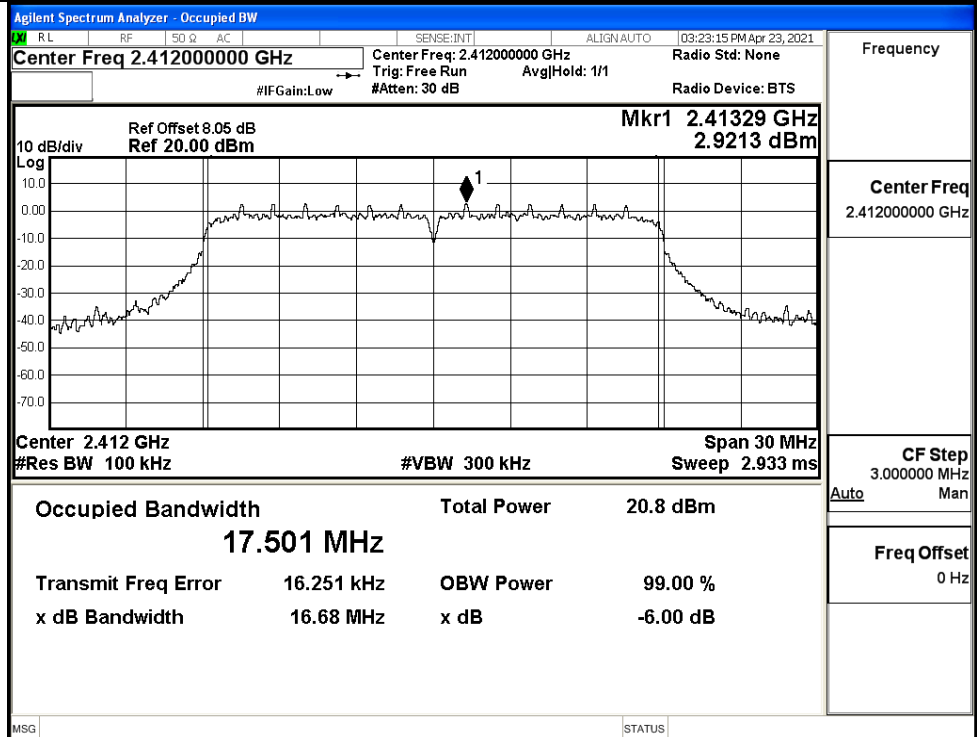
11G/MCH



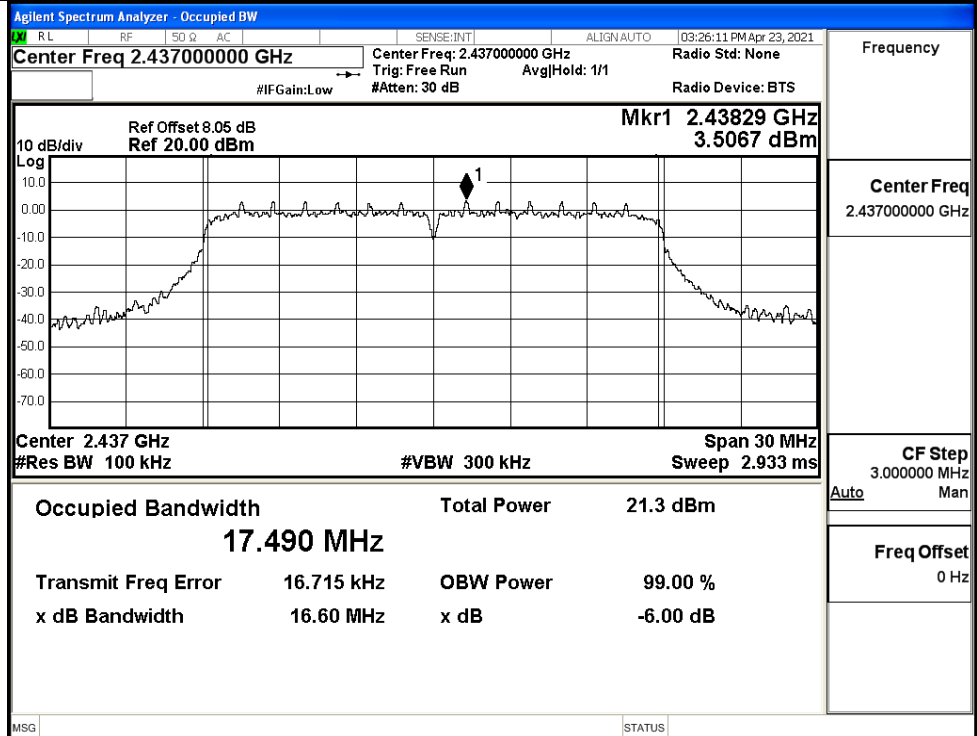
11G/HCH



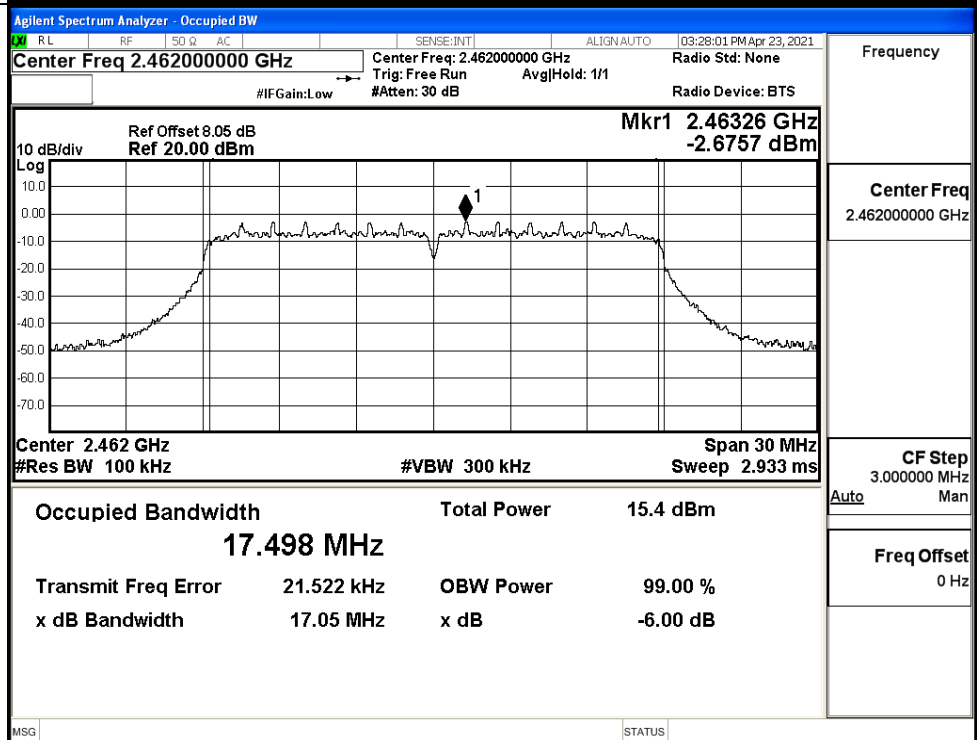
11N20SISO/LCH



11N20SISO/MCH



11N20SISO/HCH

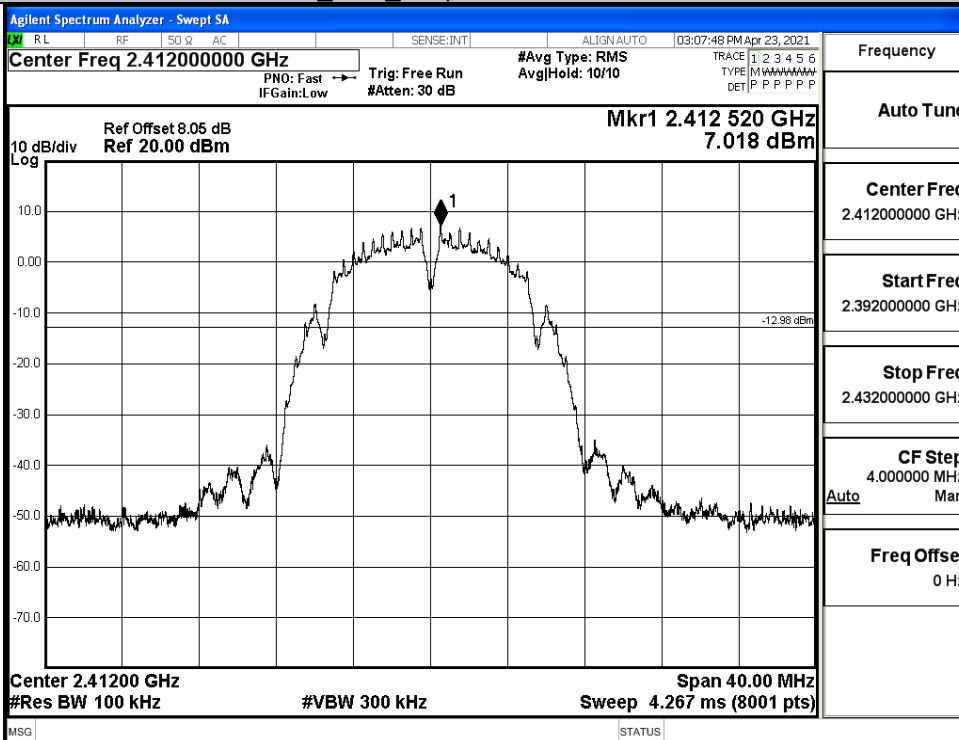


A.5 RF Conducted Spurious Emissions

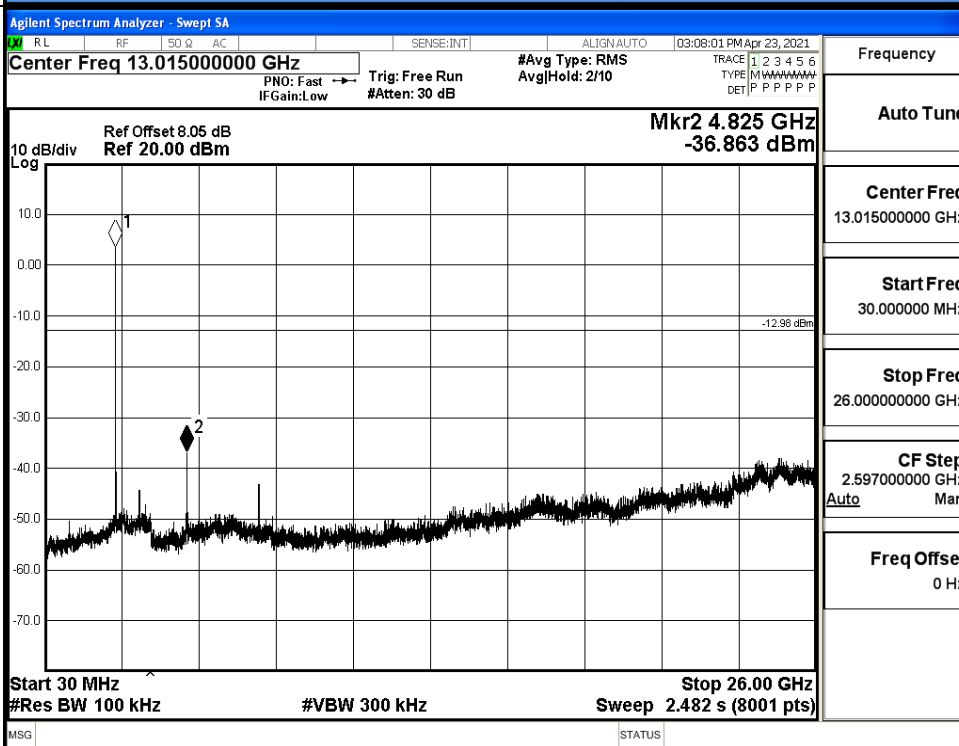
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
11B	LCH	7.018	-36.863	-12.982	PASS
	MCH	5.426	-38.720	-14.574	PASS
	HCH	3.298	-38.001	-16.702	PASS
11G	LCH	2.664	-38.217	-17.336	PASS
	MCH	3.387	-37.777	-16.613	PASS
	HCH	-2.693	-37.988	-22.693	PASS
11N20 SISO	LCH	2.567	-38.260	-17.433	PASS
	MCH	3.425	-38.341	-16.575	PASS
	HCH	-2.625	-37.713	-22.625	PASS

11B LCH Graphs

Pref/11B/LCH

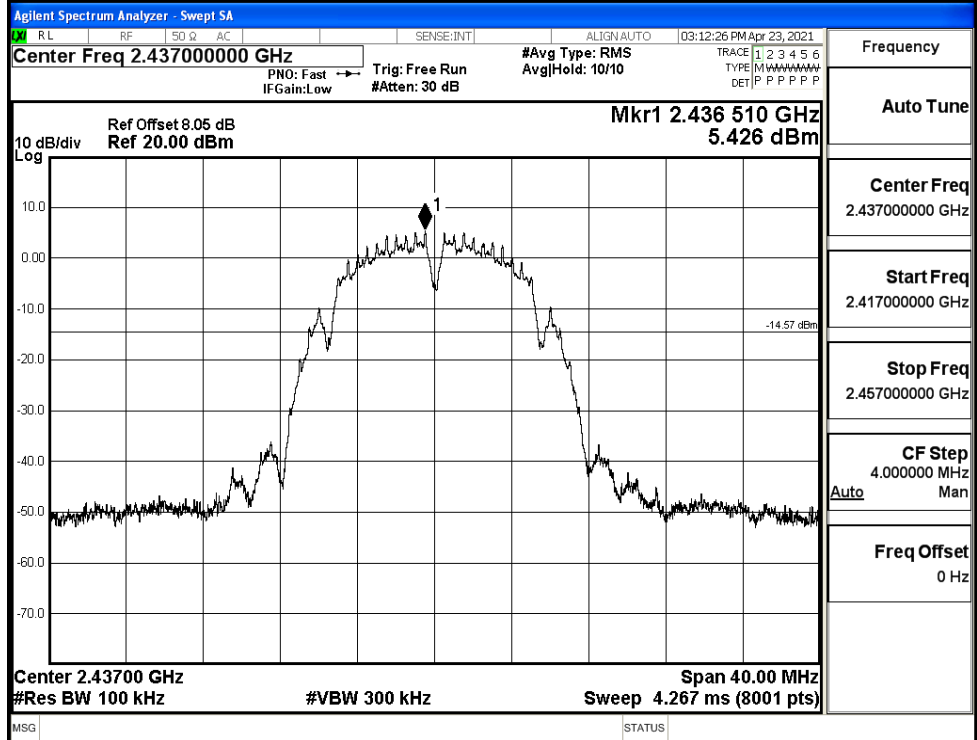


Puw/11B/LCH

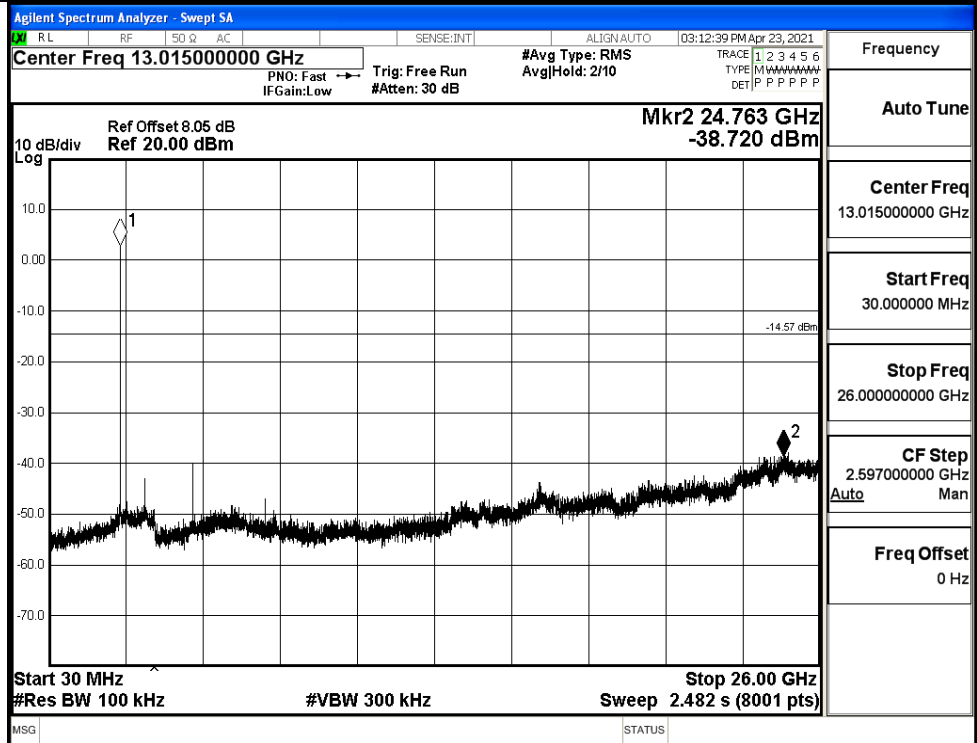


11B MCH Graphs

Pref/11B/MCH

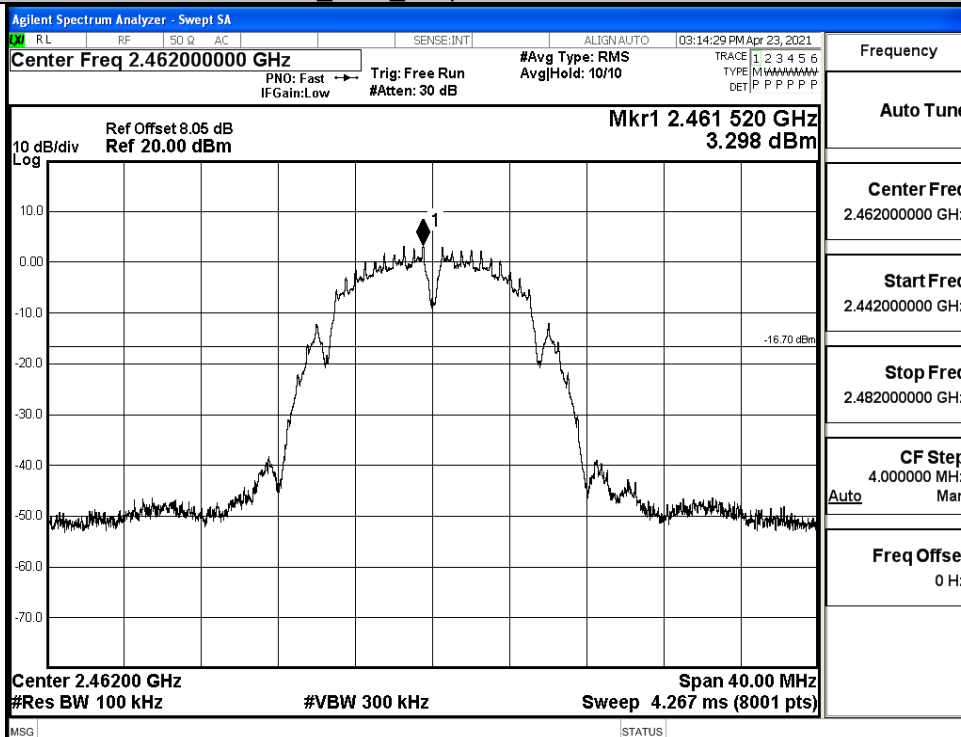


Puw/11B/MCH

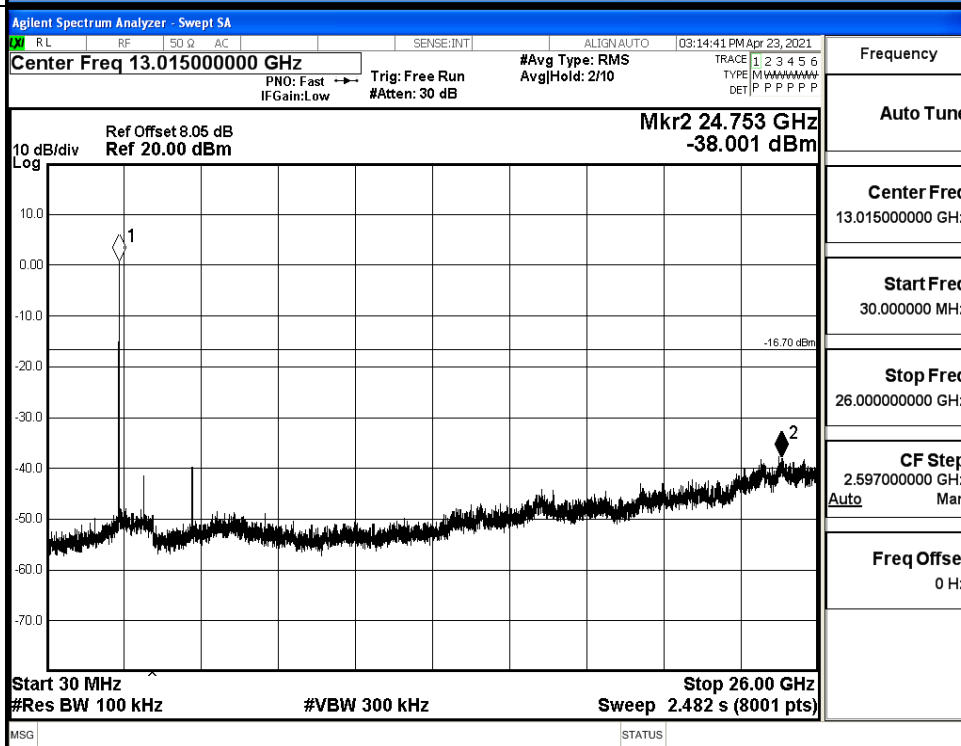


11B HCH Graphs

Pref/11B/HCH

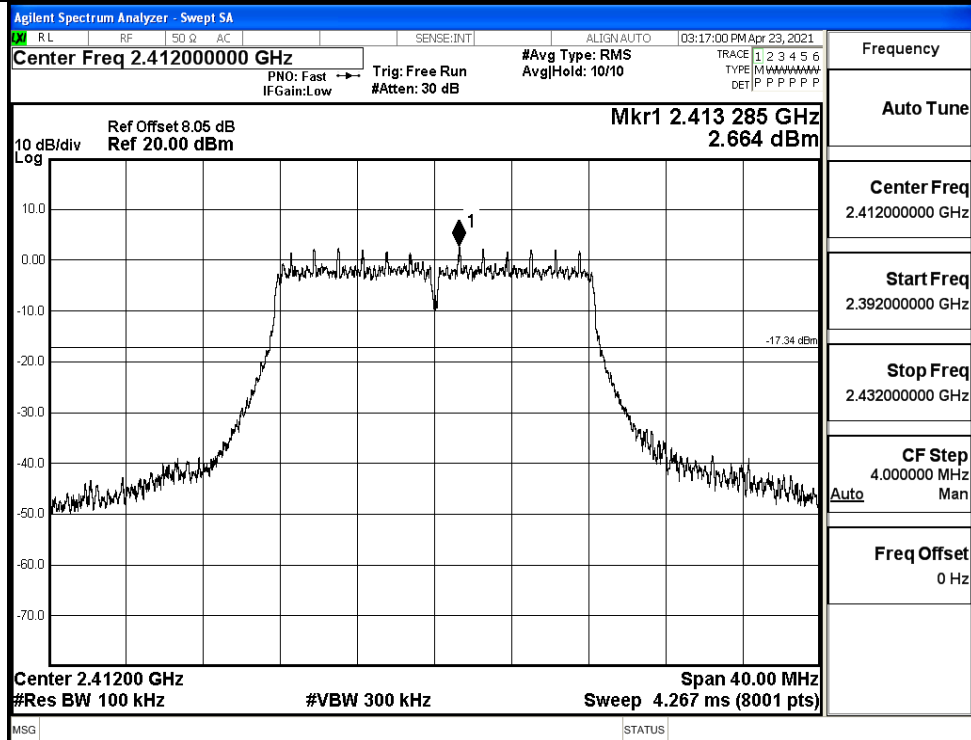


Puw/11B/HCH

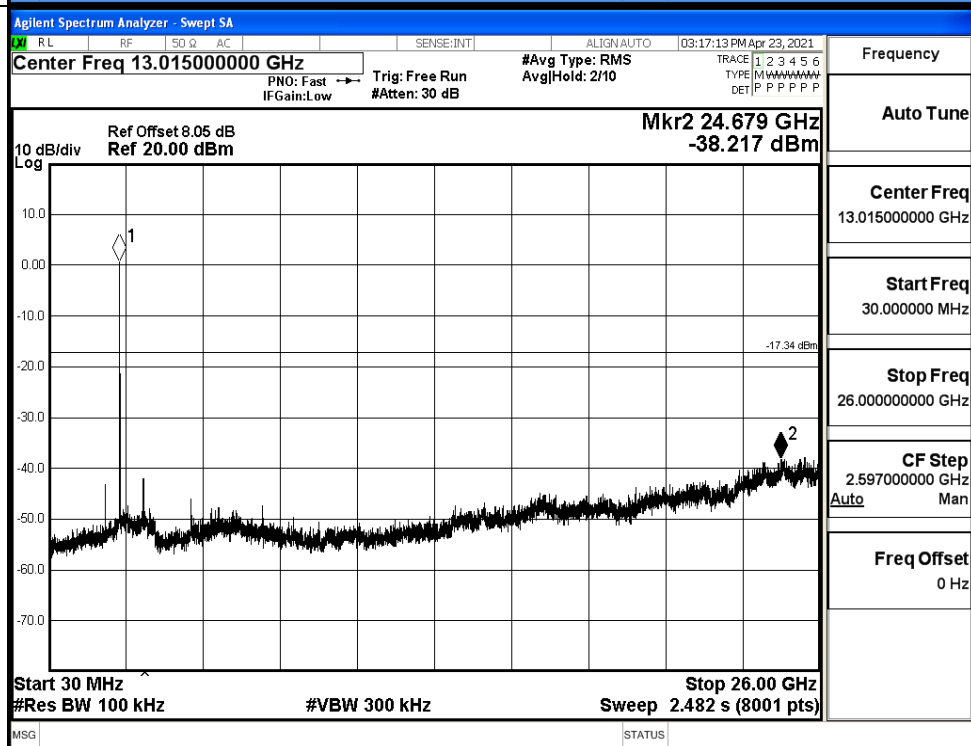


11G LCH Graphs

Pref/11G/LCH

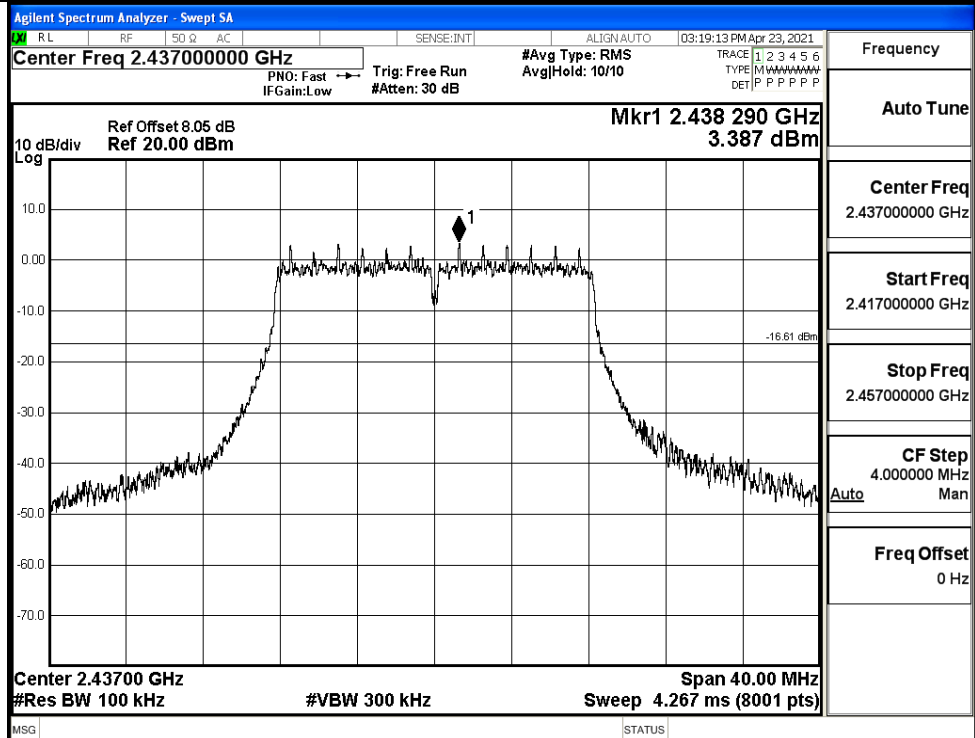


Puw/11G/LCH

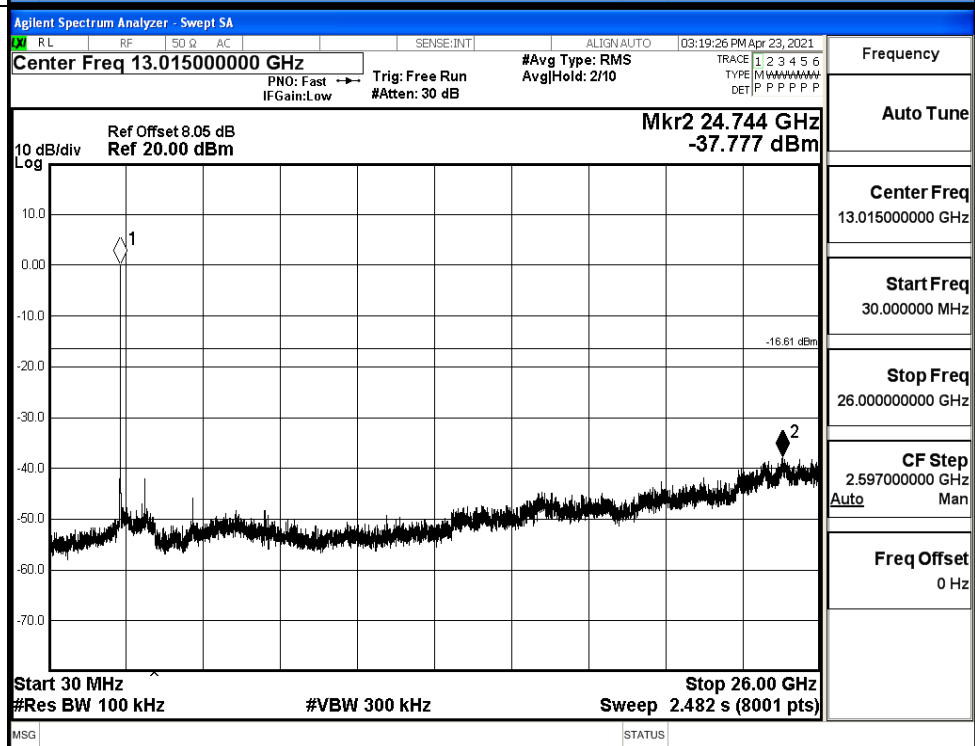


11G MCH Graphs

Pref/11G/MCH

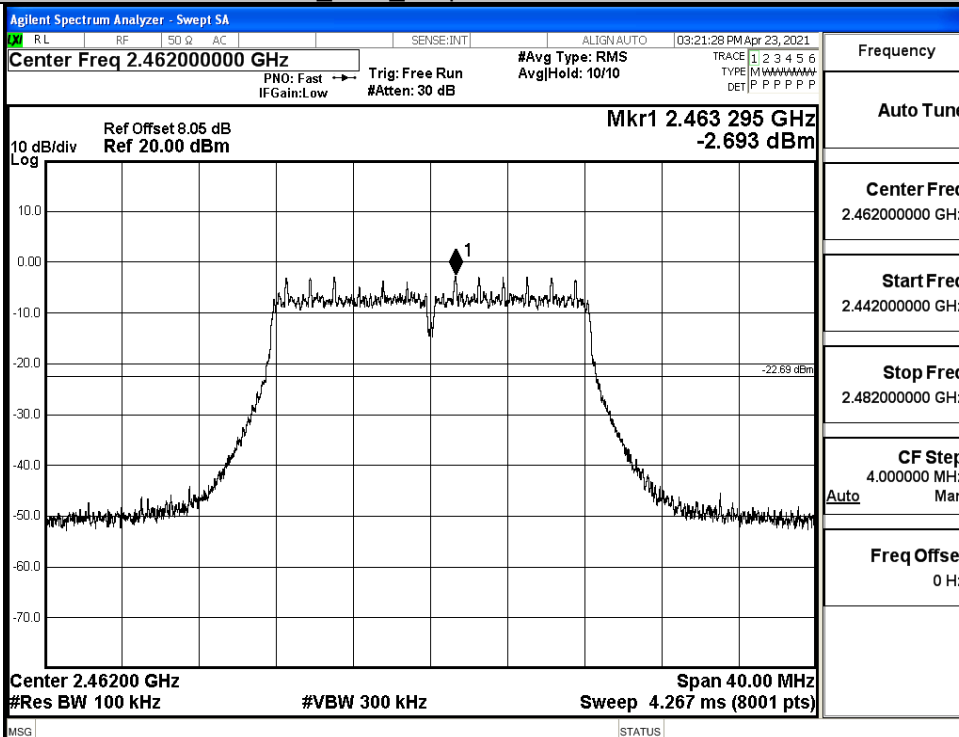


Puw/11G/MCH

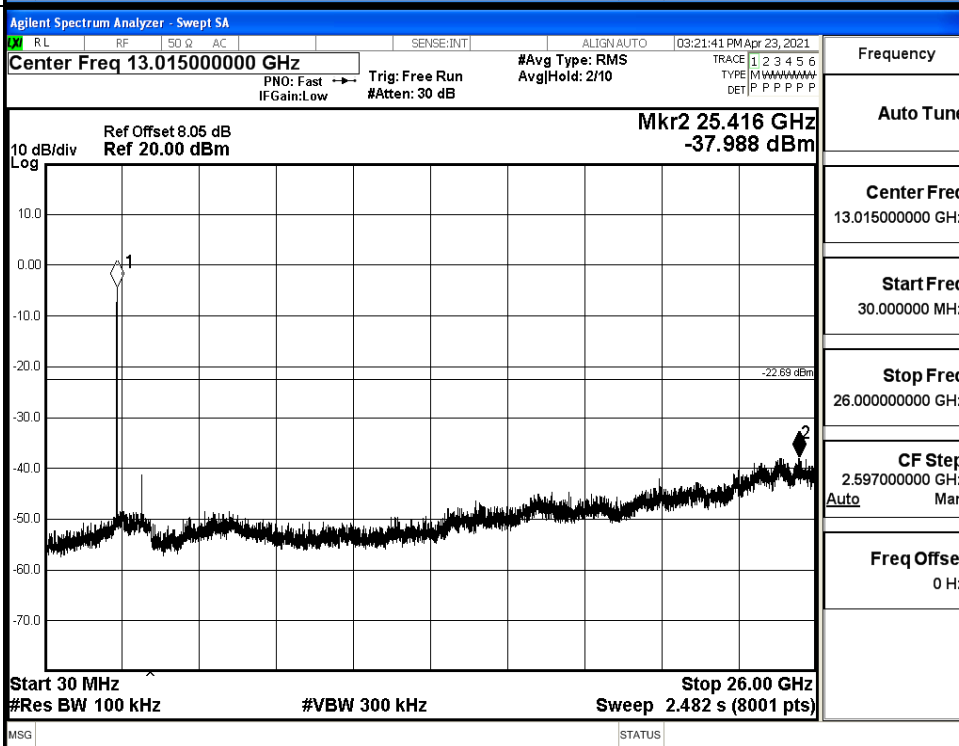


11G HCH Graphs

Pref/11G/HCH

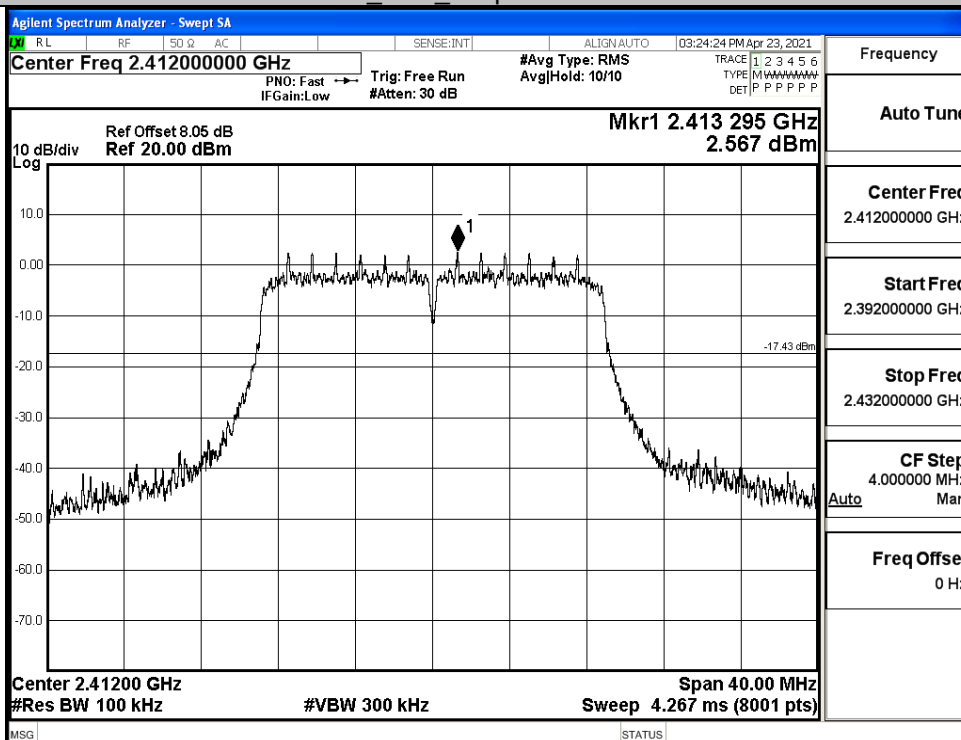


Puw/11G/HCH

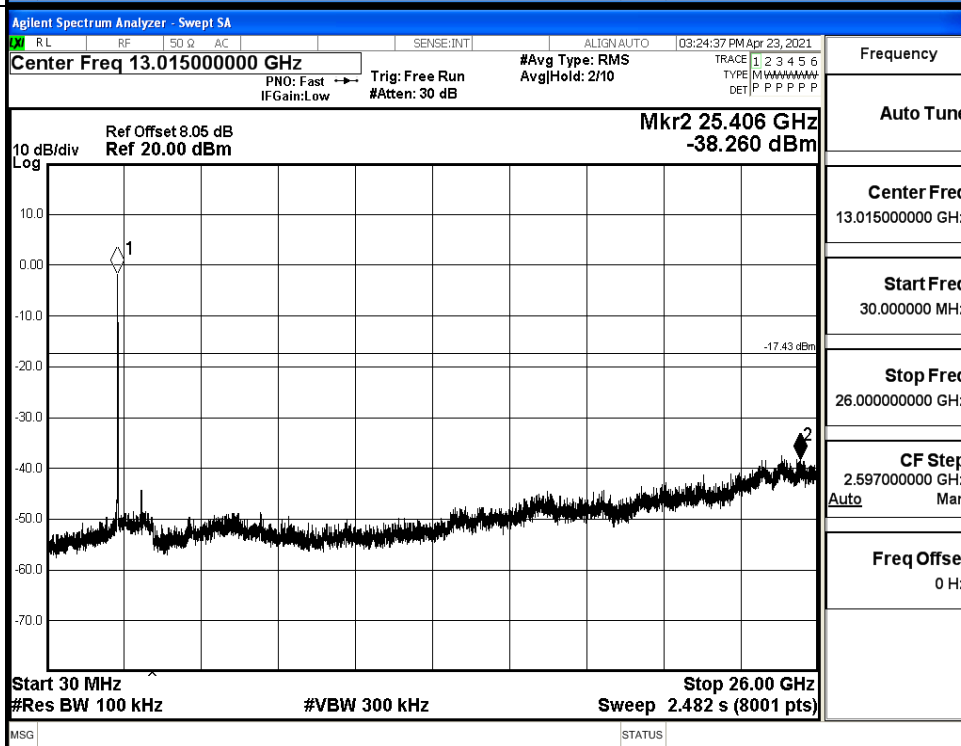


11N20SISO LCH Graphs

Pref/11N20SIS
O/LCH

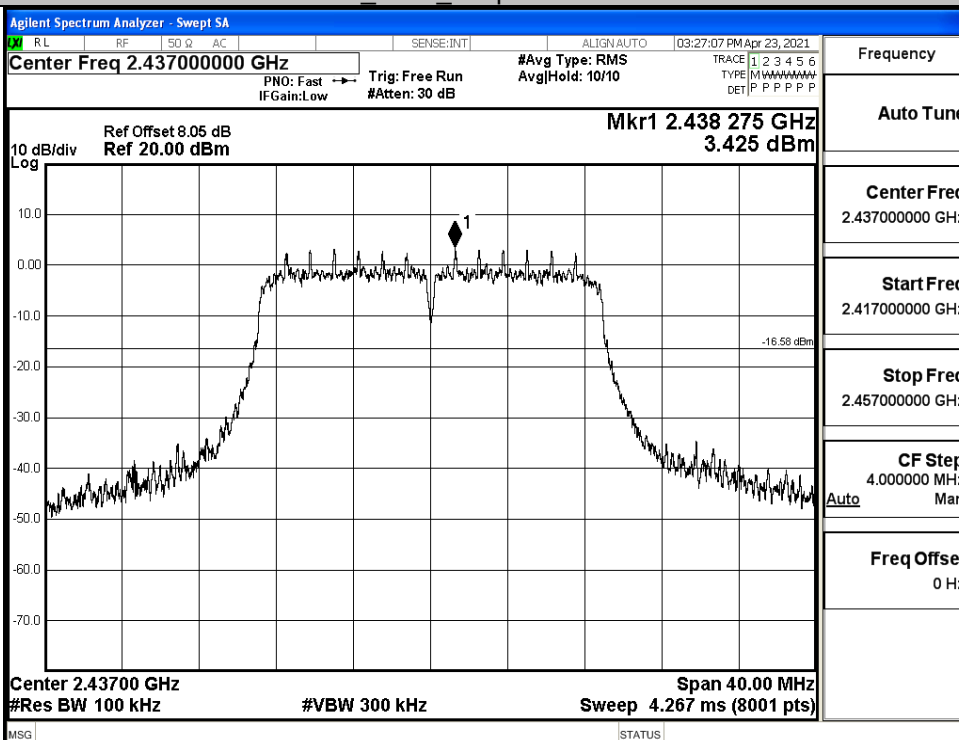


Puw/11N20
SISO/LCH

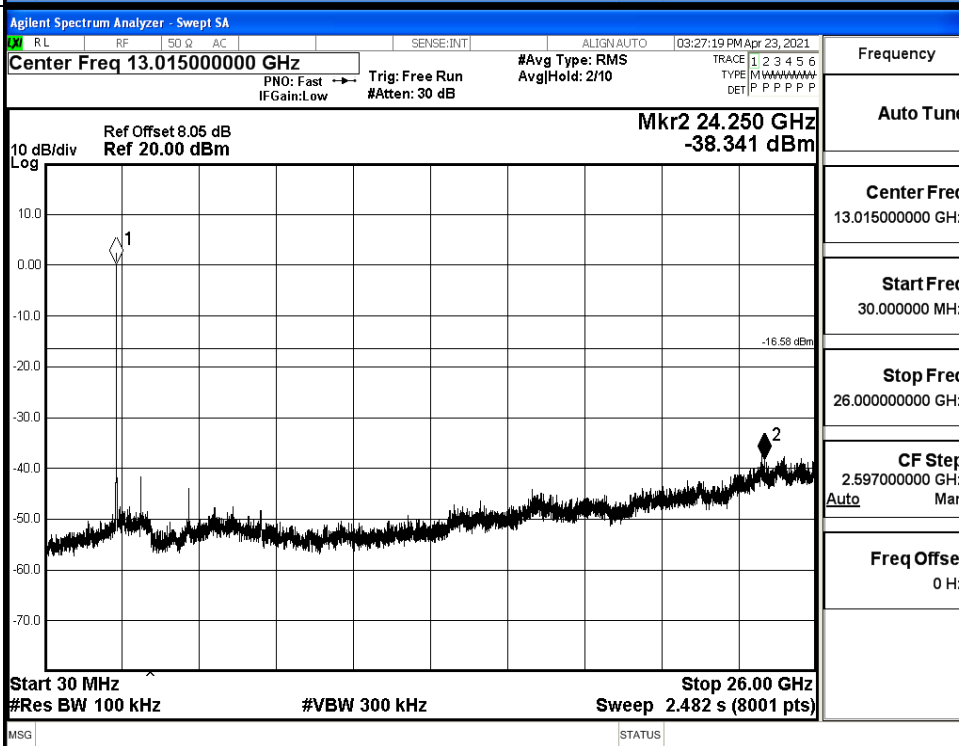


11N20SISO_MCH_Graphs

Pref/11N20
SISO/MCH

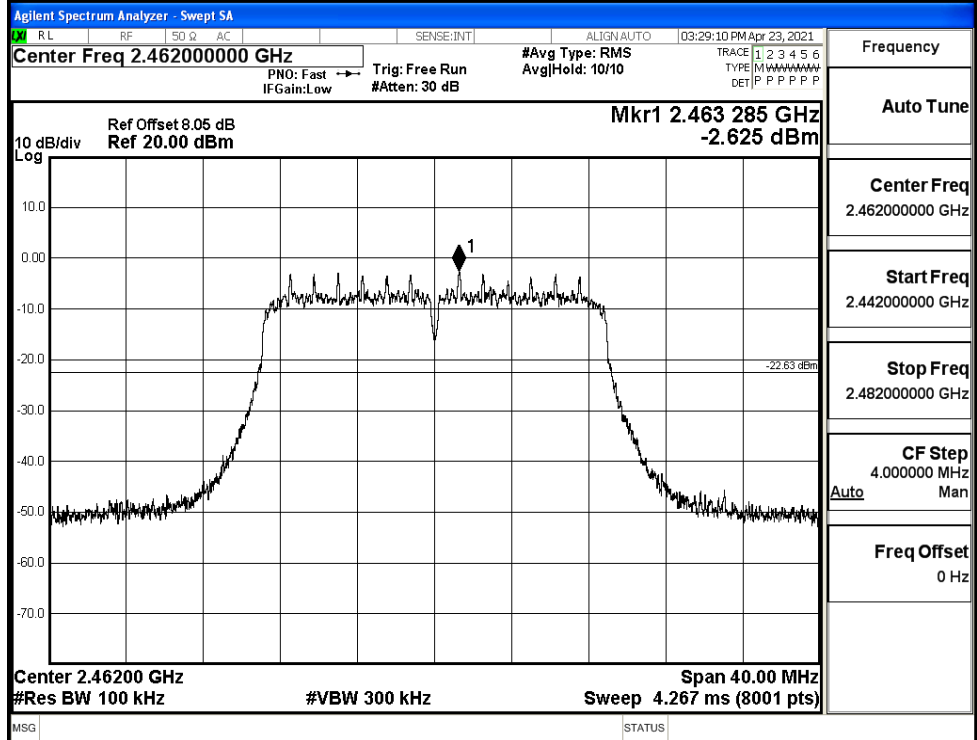


Puw/11N20
SISO/MCH

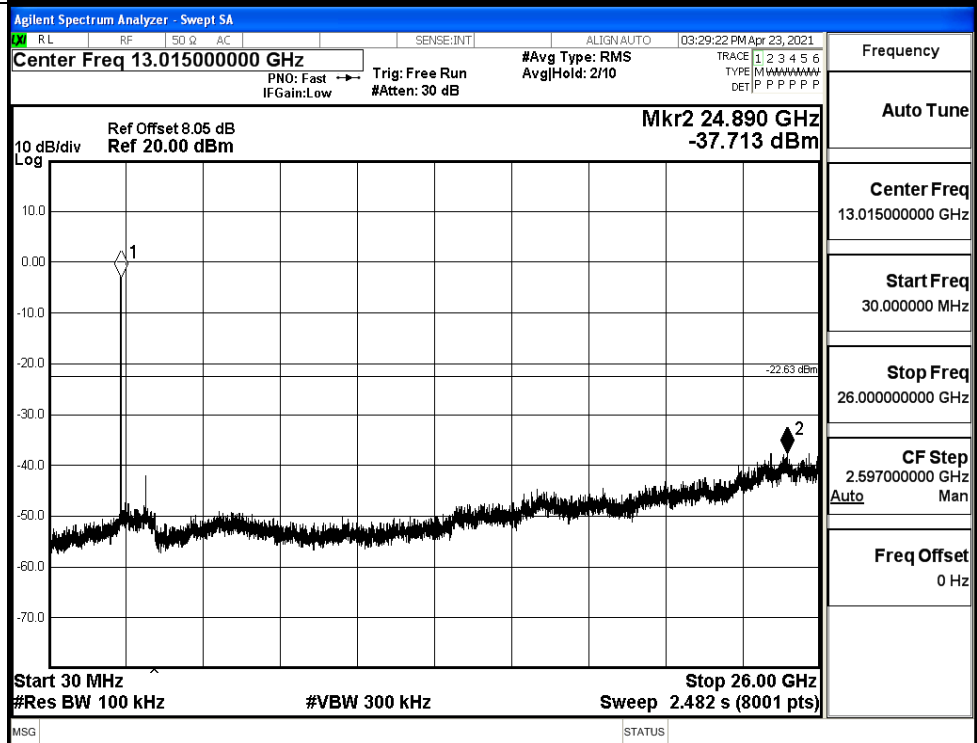


11N20SISO HCH Graphs

Pref/11N20
SISO/HCH



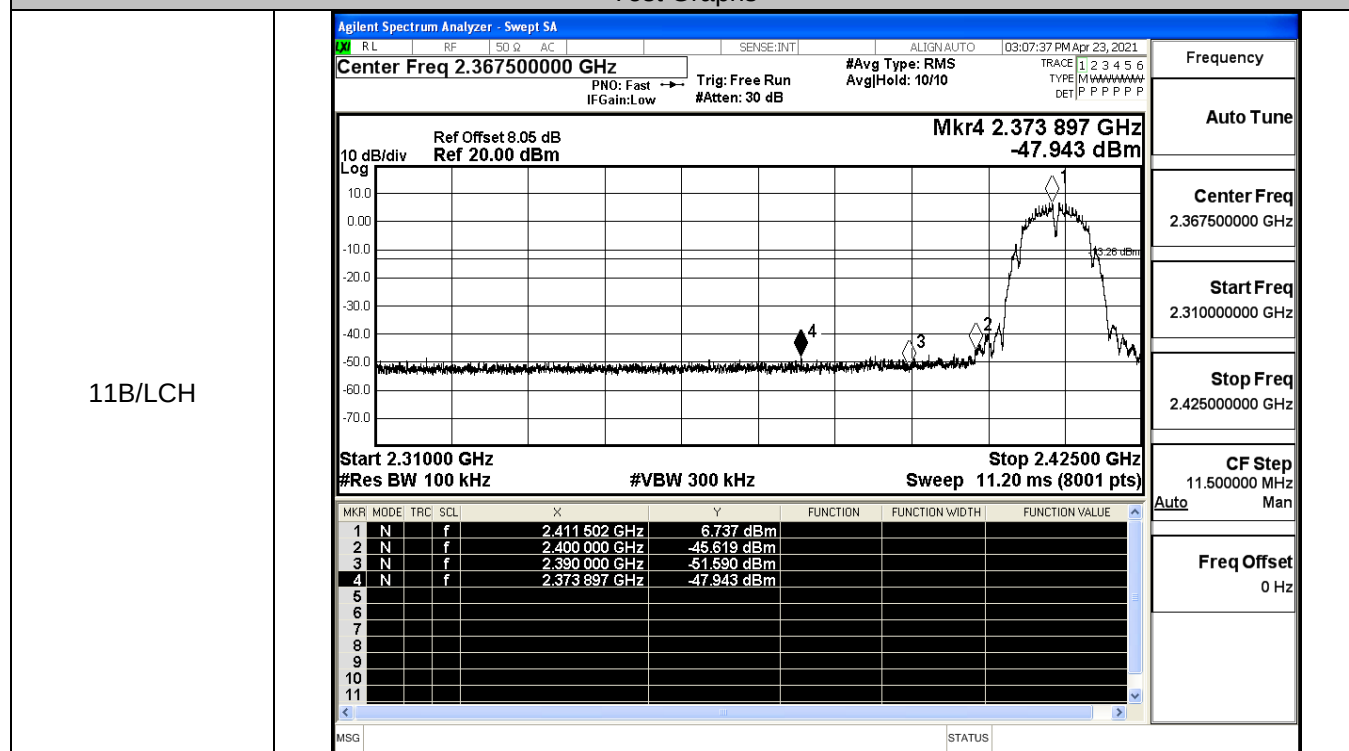
Puw/11N20
SISO/HCH



A.6 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
11B	LCH	6.737	-47.943	-13.26	PASS
	HCH	3.143	-48.393	-16.86	PASS
11G	LCH	2.698	-47.709	-17.3	PASS
	HCH	-2.917	-48.005	-22.92	PASS
11N20SISO	LCH	2.497	-46.806	-17.5	PASS
	HCH	-2.593	-47.887	-22.59	PASS

Test Graphs



Agilent Spectrum Analyzer - Swept SA

RL RF 50 Ω AC SENSE:INT 03:14:17 PM Apr 23, 2021

Center Freq 2.475000000 GHz PNO: Fast Trg: Free Run #Avg Type: RMS AvgHold: 10/10

Ref Offset 8.05 dB Ref 20.00 dBm Mkr4 2.490 812 50 GHz -48.393 dBm

10 dB/div Log

Start 2.45000 GHz Stop 2.50000 GHz
#Res BW 100 kHz #VBW 300 kHz Sweep 4.800 ms (8001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N		f	2.460 512 50 GHz	-3.143 dBm			
2	N		f	2.483 500 00 GHz	-51.633 dBm			
3	N		f	2.500 000 00 GHz	-52.340 dBm			
4	N		f	2.490 812 50 GHz	-48.393 dBm			
5								
6								
7								
8								
9								
10								
11								

Auto

Freq Offset 0 Hz

MSG STATUS

Agilent Spectrum Analyzer - Swept Freq

RL RF 50 Ω AC SENSE:INT ALIGN AUTO 03:16:49 PM Apr 23, 2021

Center Freq 2.367500000 GHz PNO: Fast Trg: Free Run #Avg Type: RMS AvgHld: 10/10 TYPE M W X Y Z DET P P P P P P

IF Gain: Low #Atten: 30 dB

Ref Offset 8.05 dB Ref 20.00 dBm

Mkr4 2.389 192 GHz -47.709 dBm

10 dB/div Log

Start 2.31000 GHz Stop 2.42500 GHz

#Res BW 100 kHz #VBW 300 kHz Sweep 11.20 ms (8001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f		2.413 284 GHz	2.698 dBm			
2	N	f		2.400 000 GHz	-40.745 dBm			
3	N	f		2.390 000 GHz	-49.299 dBm			
4	N	f		2.389 192 GHz	-47.709 dBm			
5								
6								
7								
8								
9								
10								
11								

MSG STATUS

Frequency

Auto Tune

Center Freq 2.367500000 GHz

Start Freq 2.310000000 GHz

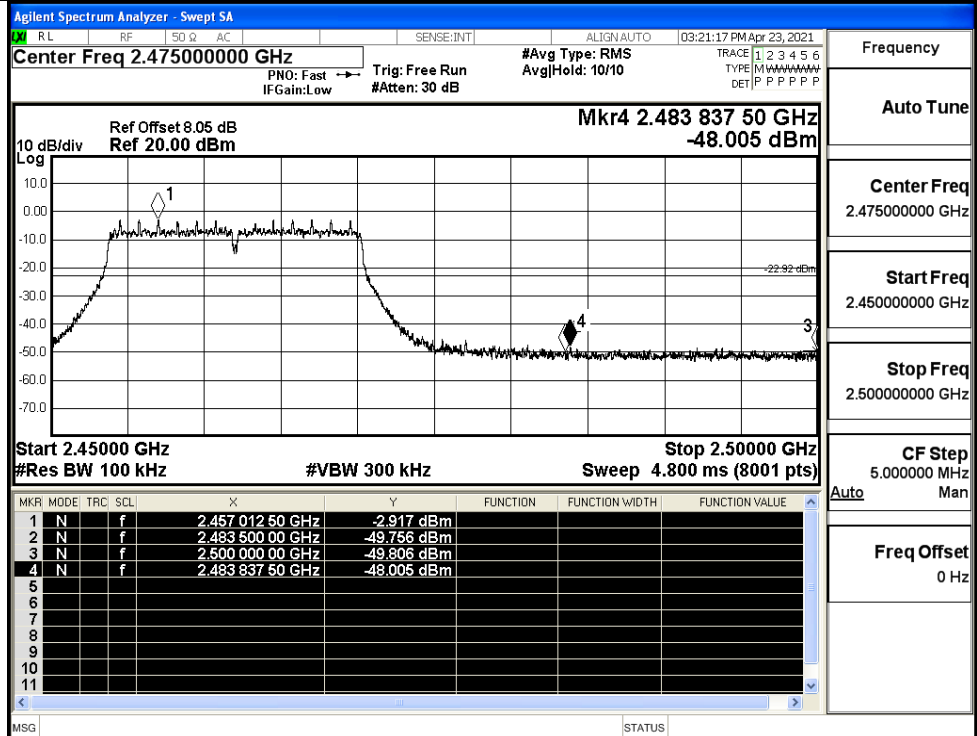
Stop Freq 2.425000000 GHz

CF Step 11.500000 MHz

Auto Man

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

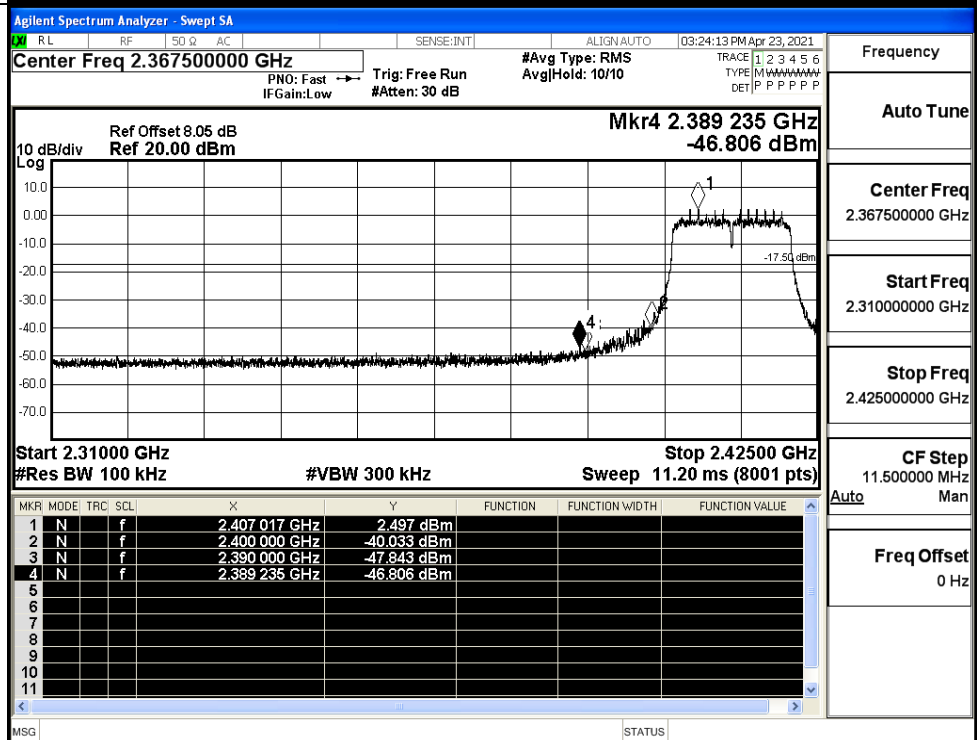
5.000000 MHz

Auto 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

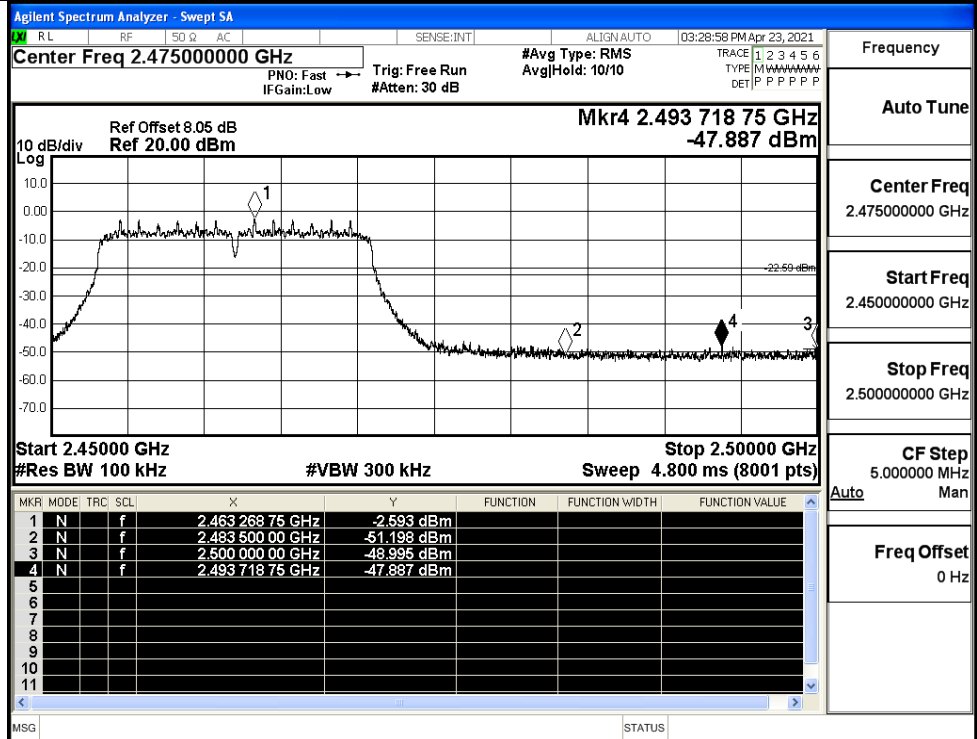
11.500000 MHz

Auto Man

Freq Offset

0 Hz

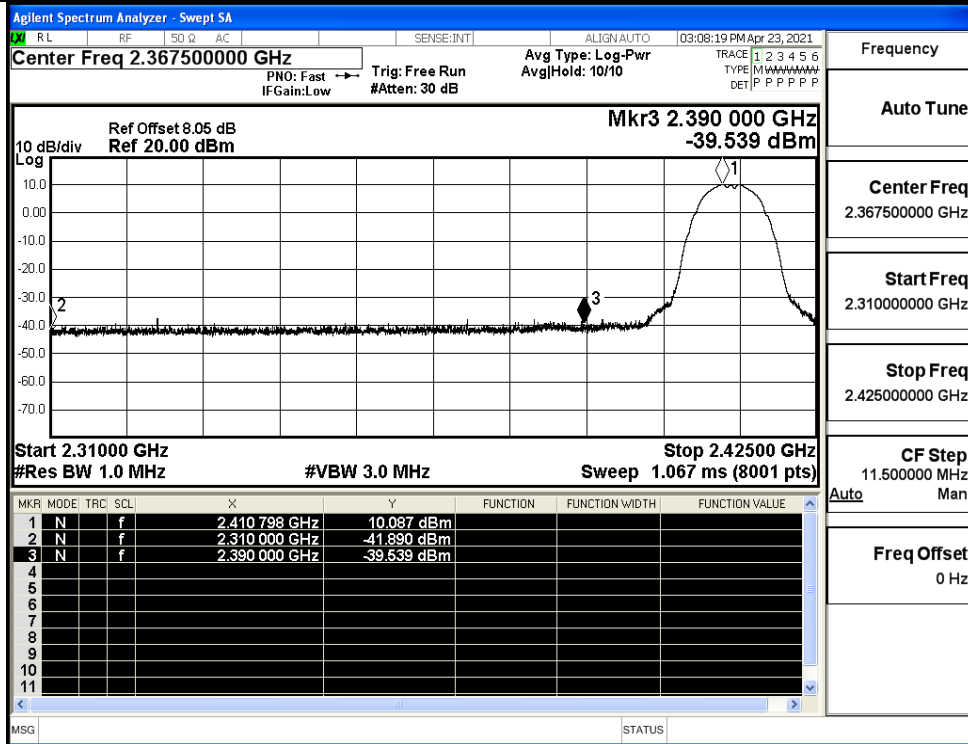
11N20SISO/HCH



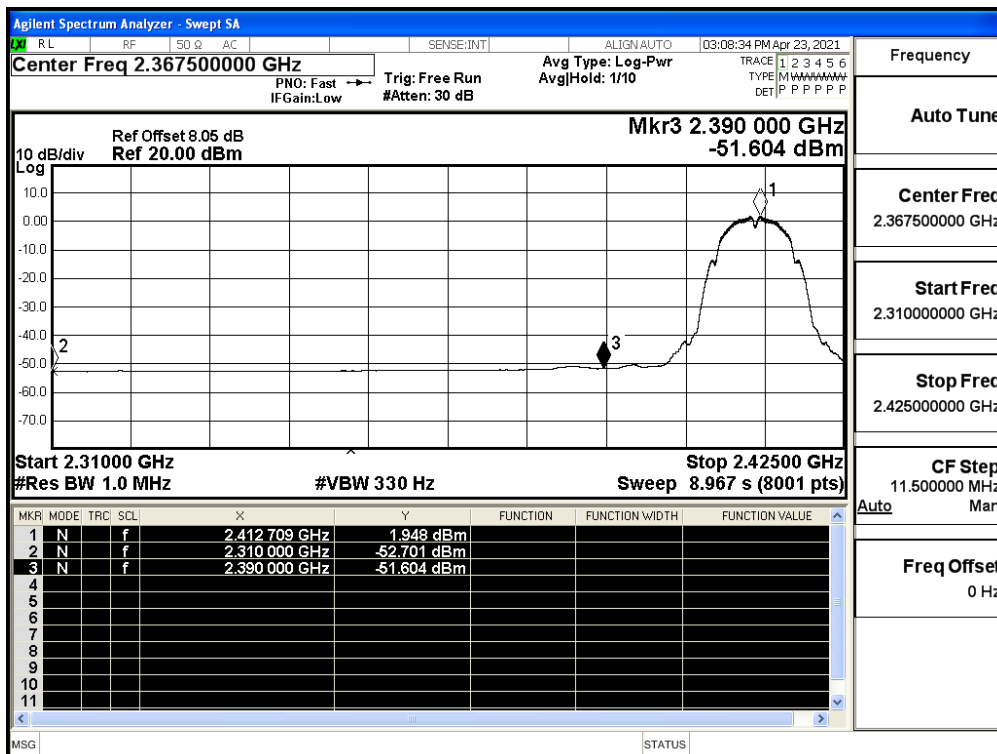
A.7 Restrict-band band-edge measurements

Test Mode	Test Channel	Ant	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
11B	2412	Ant1	2310.0	-41.89	2.0	0	53.37	PEAK	74	PASS
	2412	Ant1	2310.0	-52.70	2.0	0	42.56	AV	54	PASS
	2412	Ant1	2390.0	-39.54	2.0	0	55.72	PEAK	74	PASS
	2412	Ant1	2390.0	-51.60	2.0	0	43.65	AV	54	PASS
	2462	Ant1	2483.5	-41.89	2.0	0	53.37	PEAK	74	PASS
	2462	Ant1	2483.5	-51.42	2.0	0	43.84	AV	54	PASS
	2462	Ant1	2500.0	-41.39	2.0	0	53.87	PEAK	74	PASS
	2462	Ant1	2500.0	-51.54	2.0	0	43.71	AV	54	PASS
11G	2412	Ant1	2310.0	-42.19	2.0	0	53.07	PEAK	74	PASS
	2412	Ant1	2310.0	-52.70	2.0	0	42.56	AV	54	PASS
	2412	Ant1	2390.0	-37.59	2.0	0	57.67	PEAK	74	PASS
	2412	Ant1	2390.0	-50.32	2.0	0	44.94	AV	54	PASS
	2462	Ant1	2483.5	-38.96	2.0	0	56.30	PEAK	74	PASS
	2462	Ant1	2483.5	-51.32	2.0	0	43.93	AV	54	PASS
	2462	Ant1	2500.0	-39.71	2.0	0	55.55	PEAK	74	PASS
	2462	Ant1	2500.0	-51.49	2.0	0	43.77	AV	54	PASS
11N20 SISO	2412	Ant1	2310.0	-42.33	2.0	0	52.93	PEAK	74	PASS
	2412	Ant1	2310.0	-52.73	2.0	0	42.53	AV	54	PASS
	2412	Ant1	2390.0	-37.37	2.0	0	57.89	PEAK	74	PASS
	2412	Ant1	2390.0	-50.11	2.0	0	45.15	AV	54	PASS
	2462	Ant1	2483.5	-40.82	2.0	0	54.43	PEAK	74	PASS
	2462	Ant1	2483.5	-51.11	2.0	0	44.14	AV	54	PASS
	2462	Ant1	2500.0	-40.78	2.0	0	54.48	PEAK	74	PASS
	2462	Ant1	2500.0	-51.53	2.0	0	43.73	AV	54	PASS

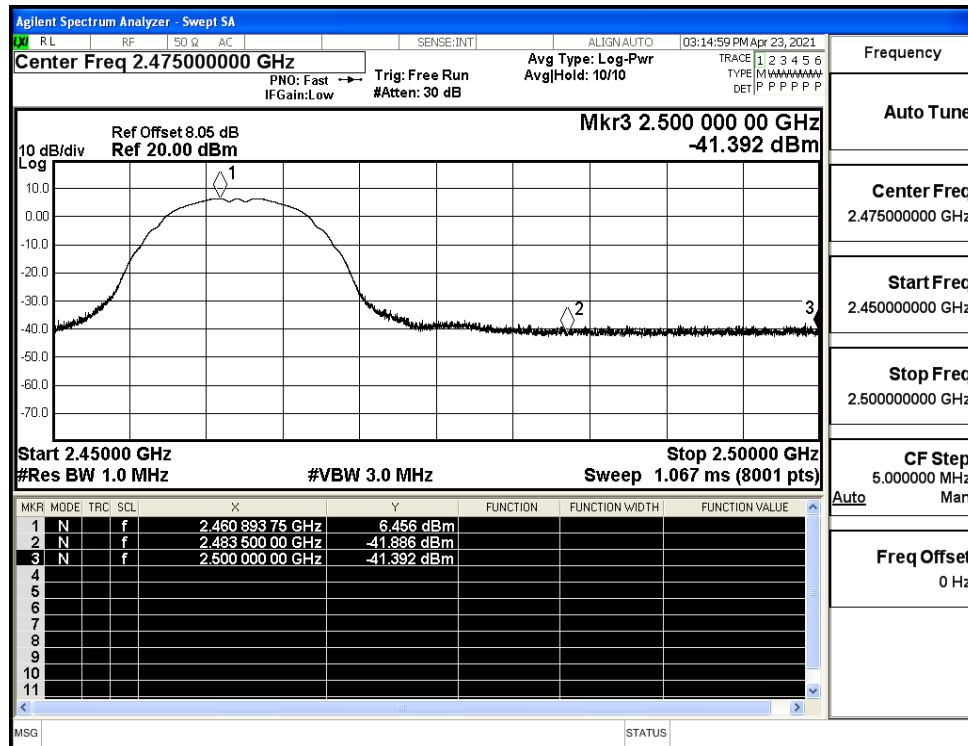
Restrict-band band-edge measurements_11B_2412_Ant1_PEAK



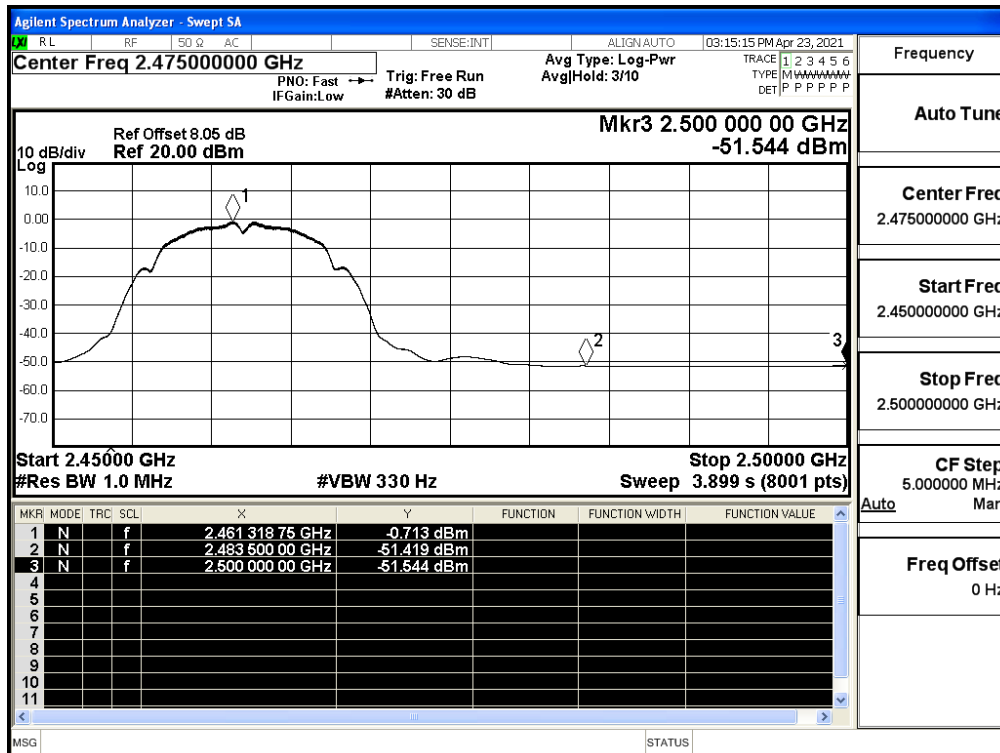
Restrict-band band-edge measurements_11B_2412_Ant1_AV



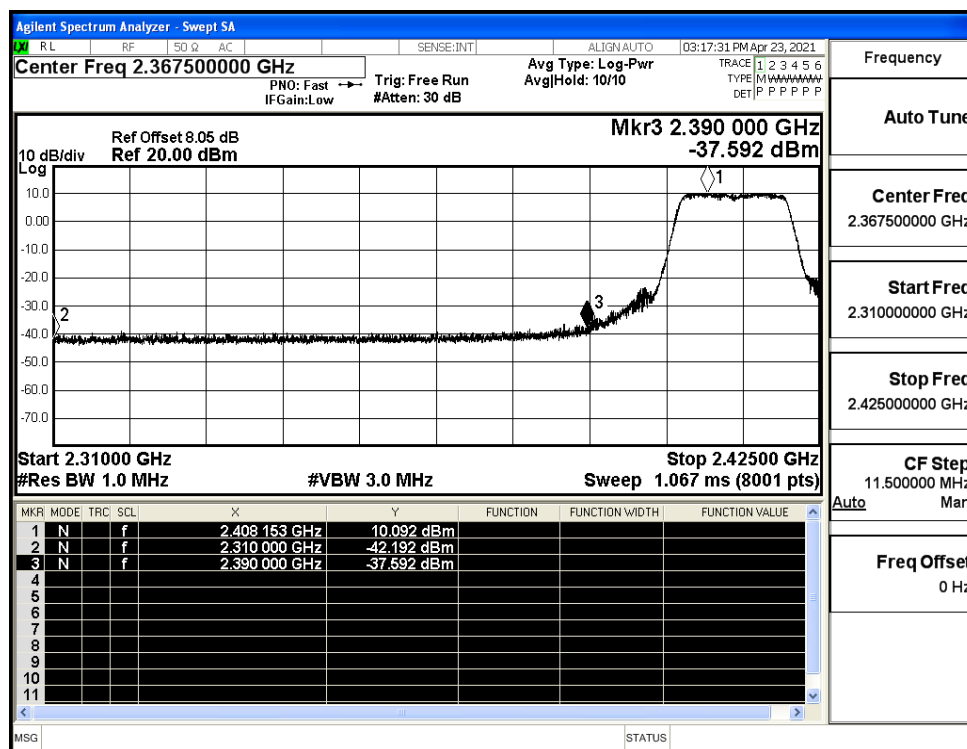
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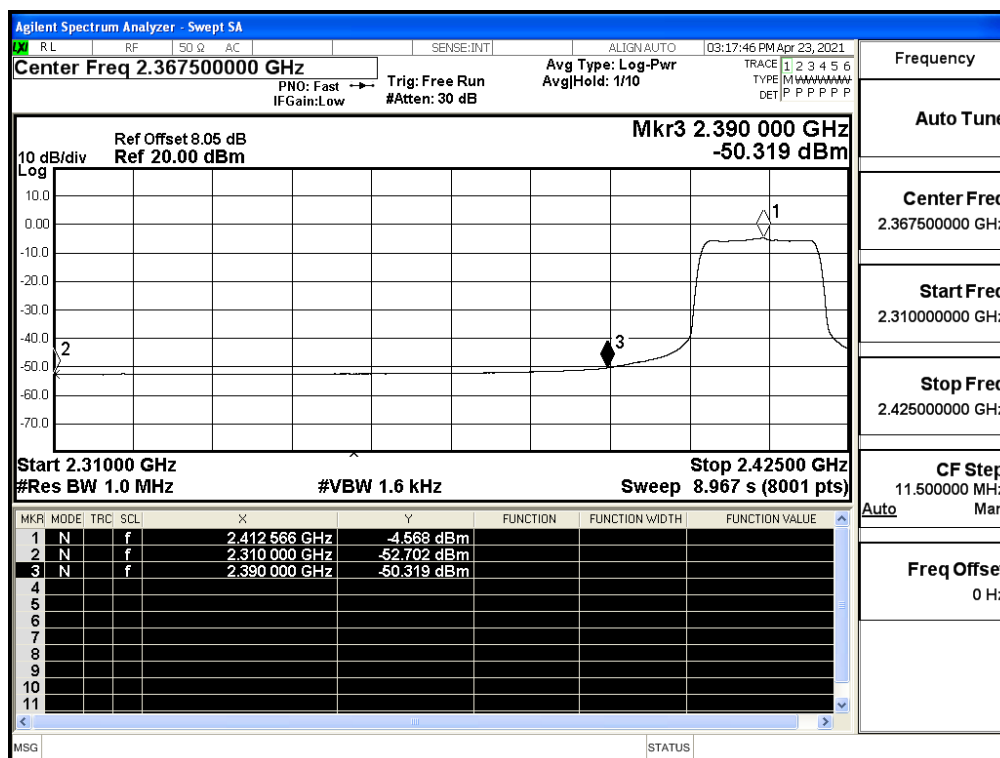
Restrict-band band-edge measurements_11B_2462_Ant1_AV



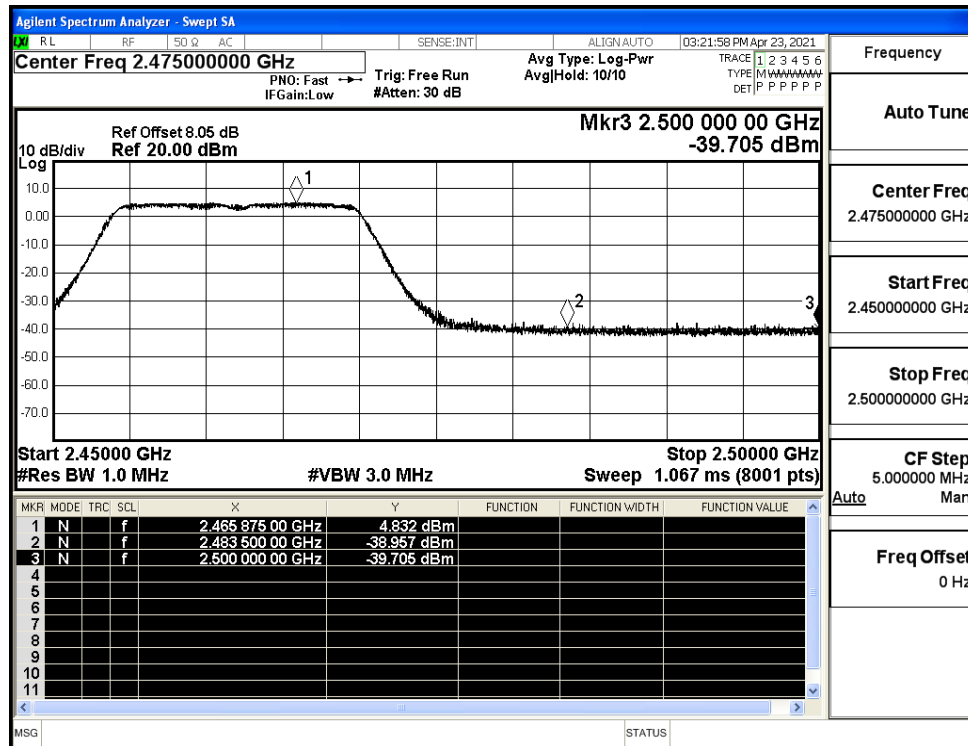
Restrict-band band-edge measurements_11G_2412_Ant1_PEAK



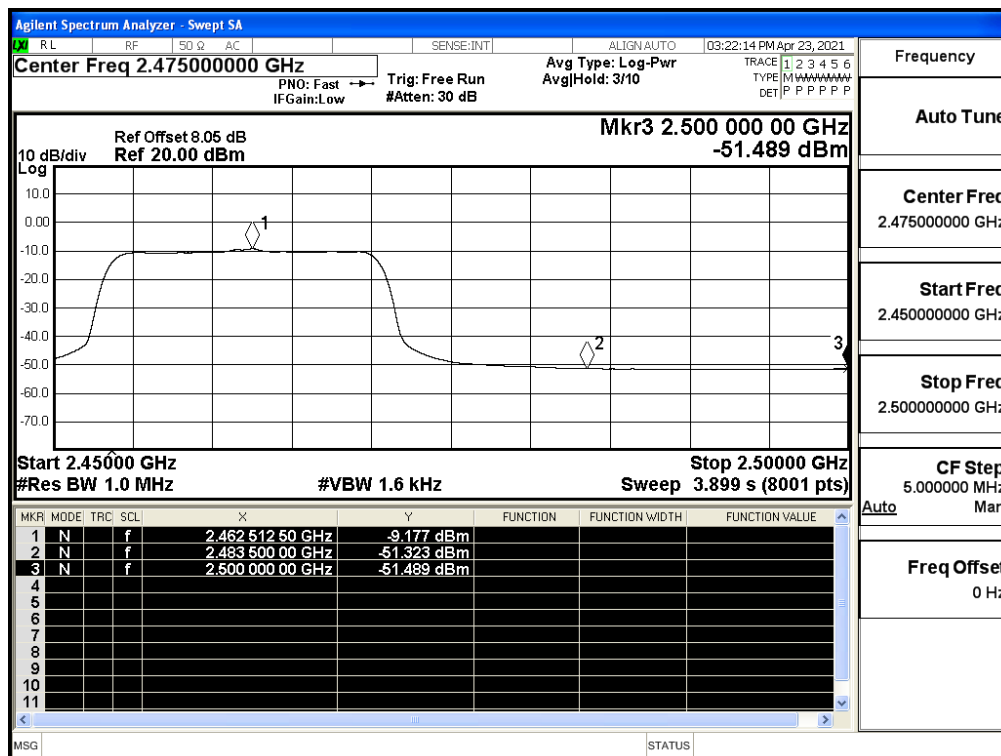
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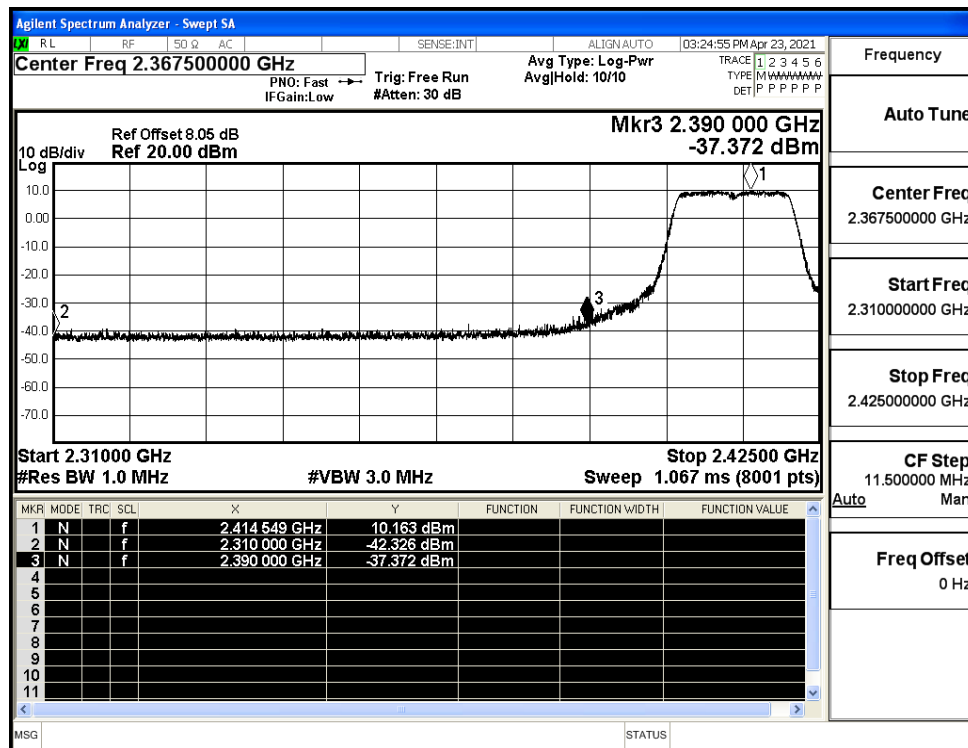
Restrict-band band-edge measurements_11G_2462_Ant1_PEAK



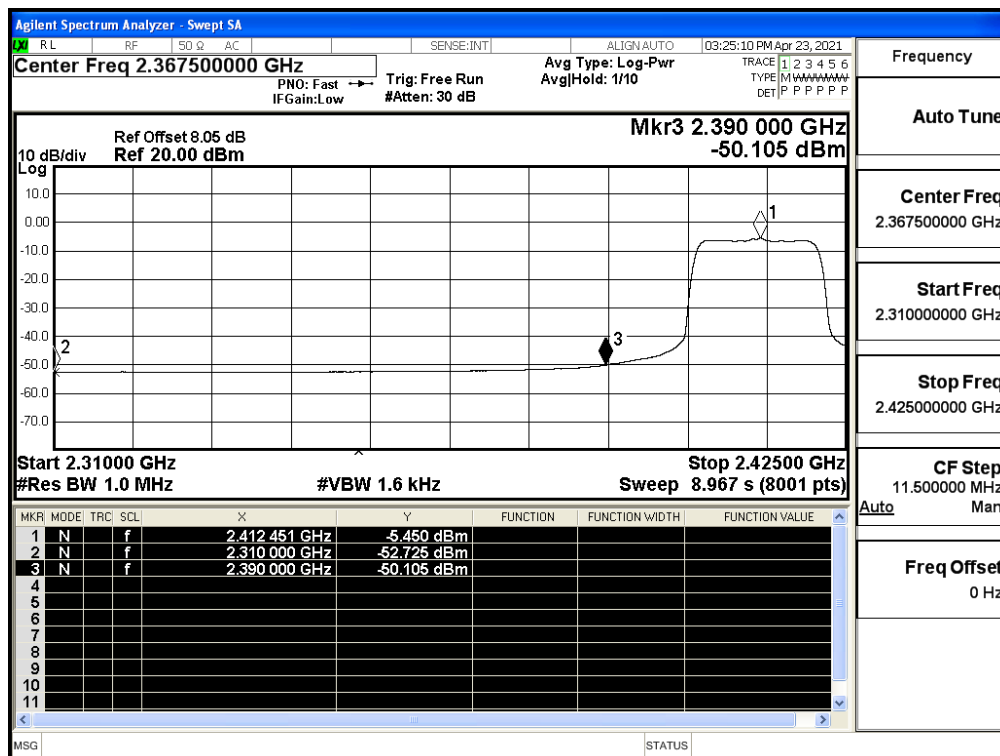
Restrict-band band-edge measurements_11G_2462_Ant1_AV



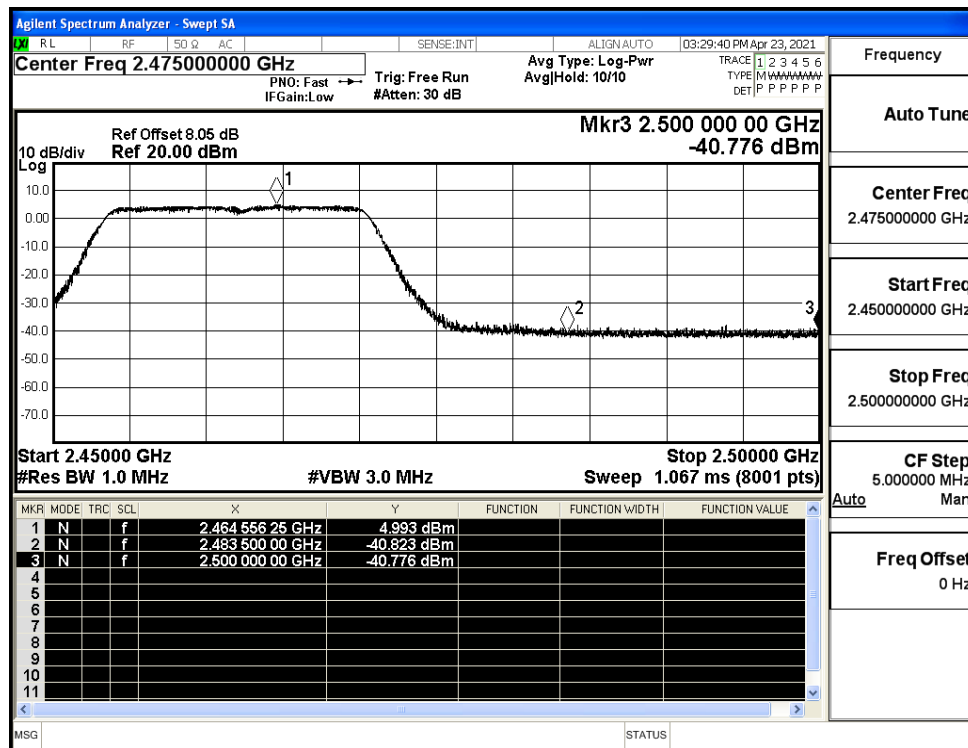
Restrict-band band-edge measurements_11N20SISO_2412_Ant1_PEAK



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

