

Appendix A

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: Smart Plug

Trade Mark: **SIMPNIC**

Test Model: SPG-US-SW

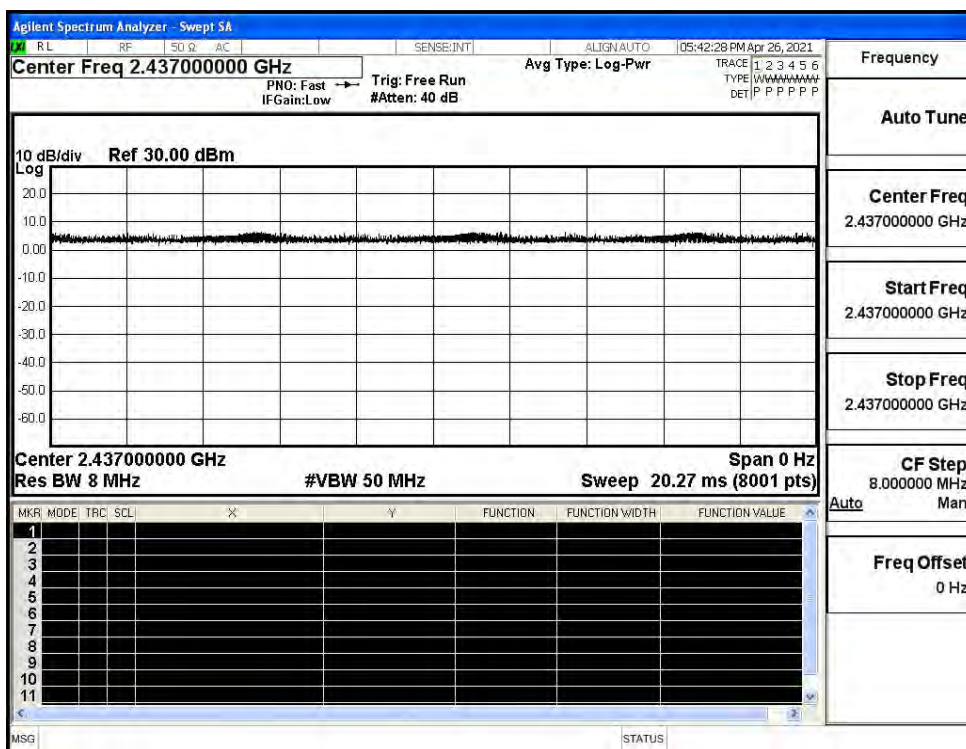
Environmental Conditions

Temperature:	24.6° C
Relative Humidity:	54.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Ken He
Supervised by:	Li Huan

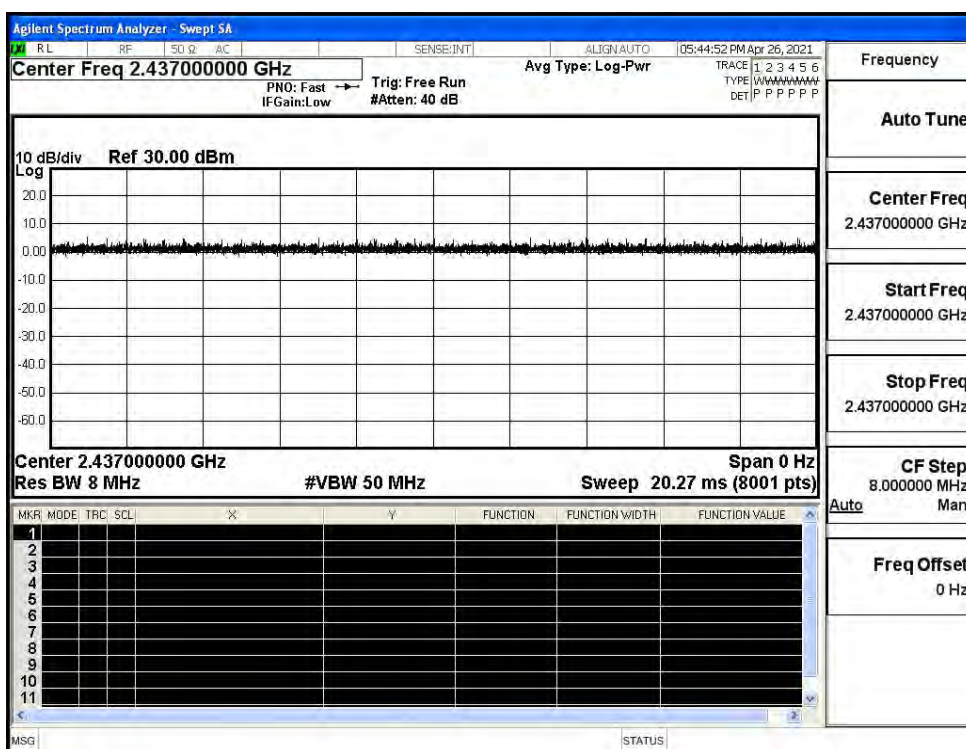
A.1 Duty Cycle

Test Mode	Test Channel	Ant	Duty Cycle[%]	Verdict
11B	2437	Ant1	100	PASS
11G	2437	Ant1	100	PASS
11N20SISO	2437	Ant1	100	PASS

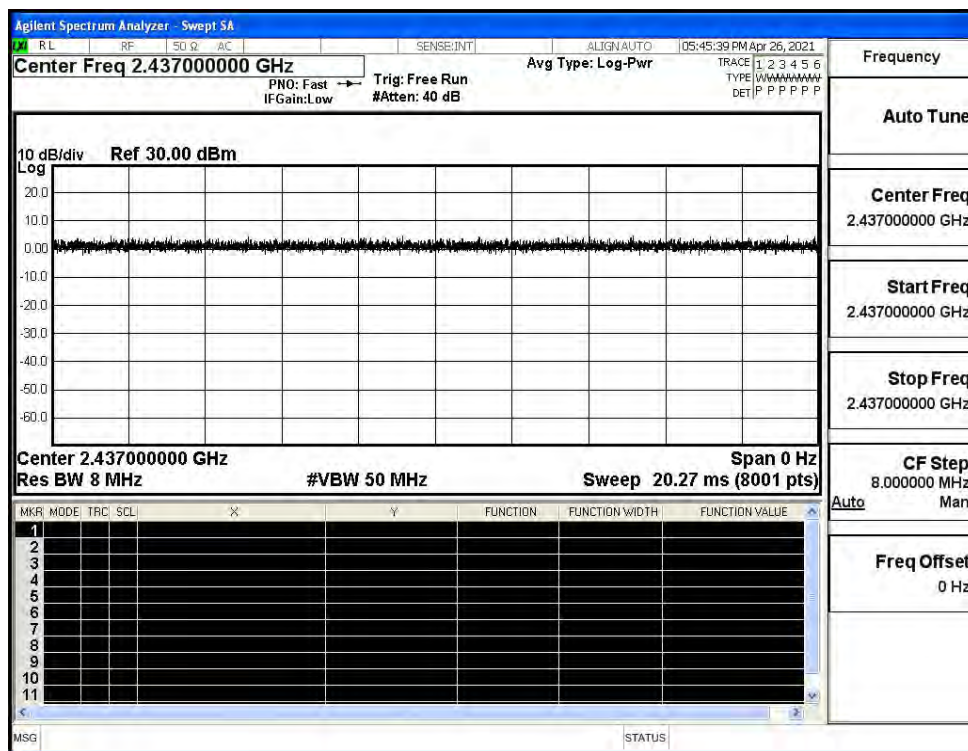
Duty Cycle_11B_2437_Ant1



Duty Cycle_11G_2437_Ant1



Duty Cycle_11N20SISO_2437_Ant1

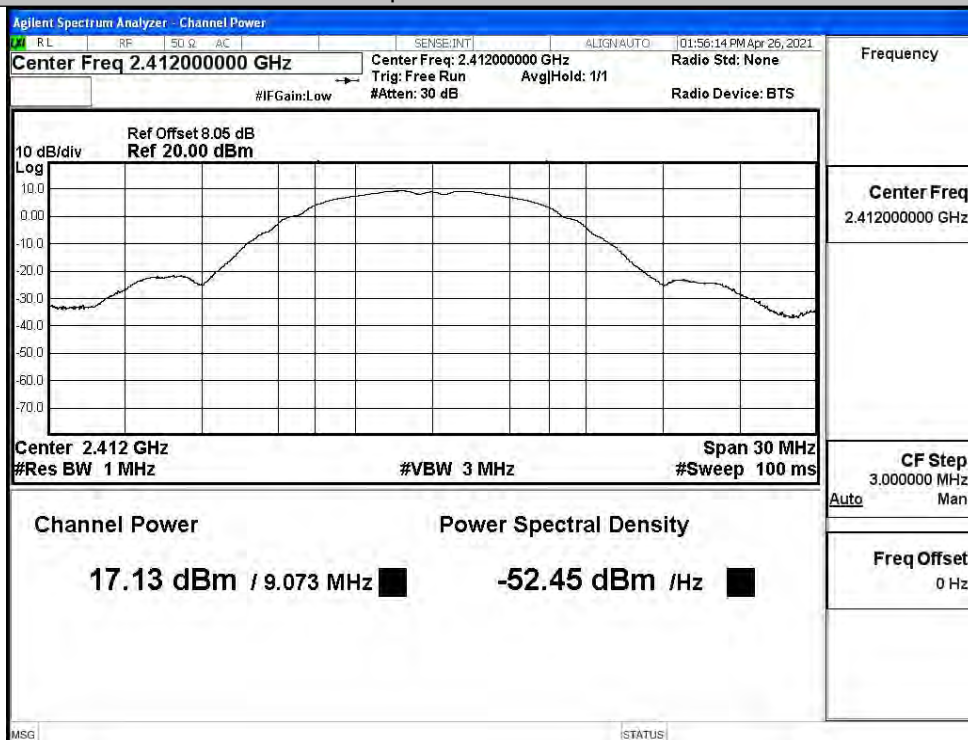


A.2 Maximum Conducted Output Power

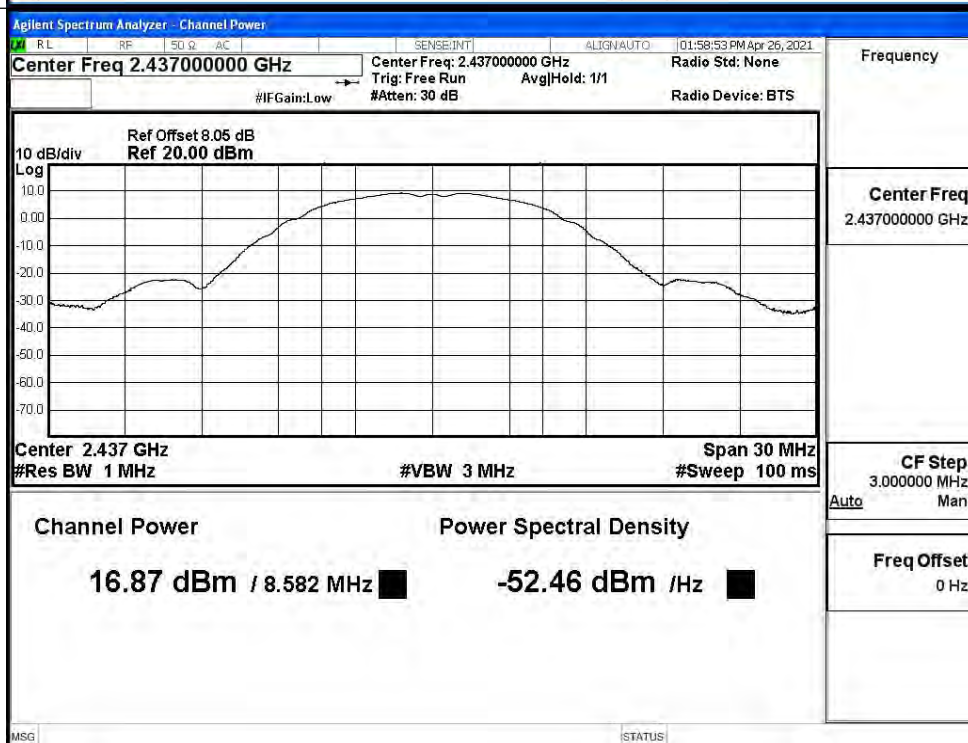
Mode	Channel	Meas.Level [dBm]	Limit [dBm]	Verdict
11B	LCH	17.13	30	PASS
	MCH	16.87	30	PASS
	HCH	15.86	30	PASS
11G	LCH	16.96	30	PASS
	MCH	17.21	30	PASS
	HCH	16.23	30	PASS
11N20SISO	LCH	17.36	30	PASS
	MCH	17.29	30	PASS
	HCH	16.35	30	PASS

Test Graphs

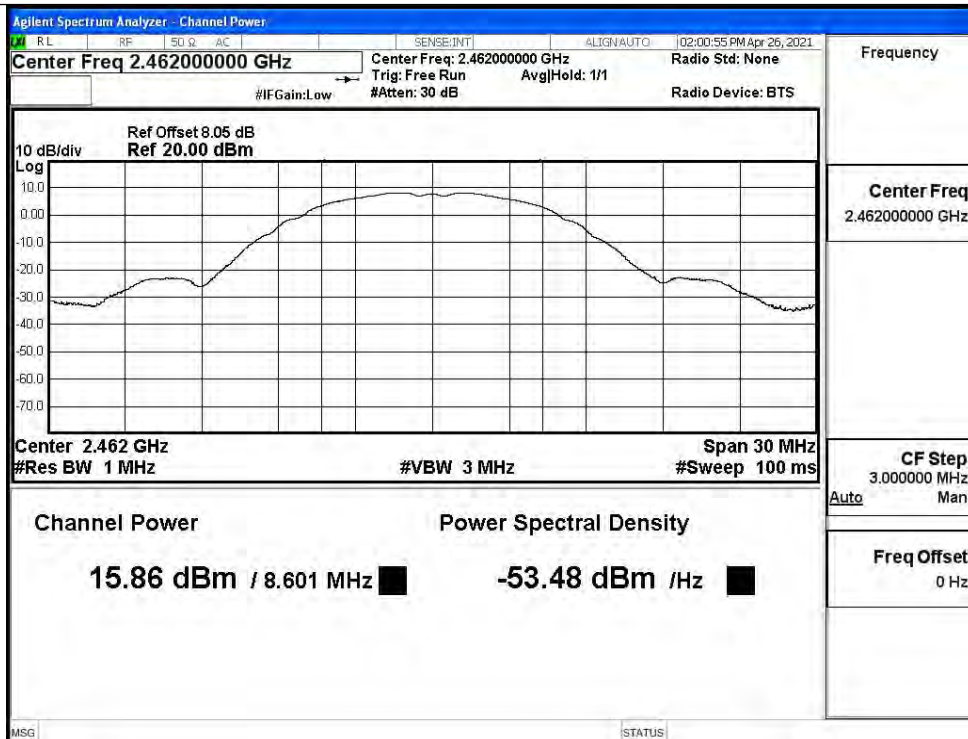
11B/LCH



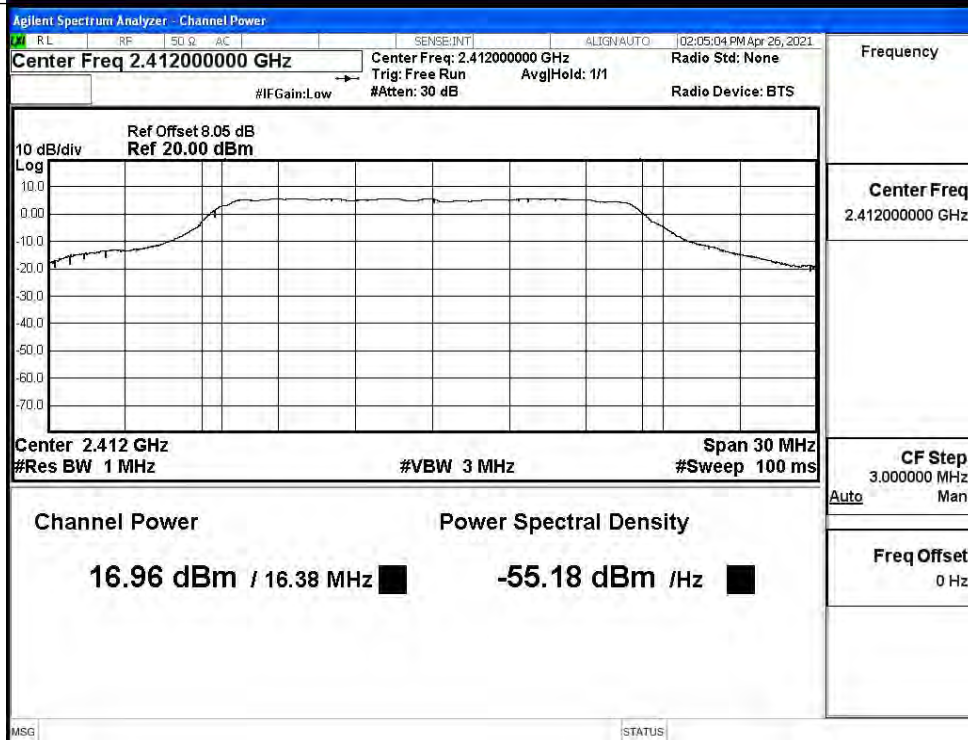
11B/MCH



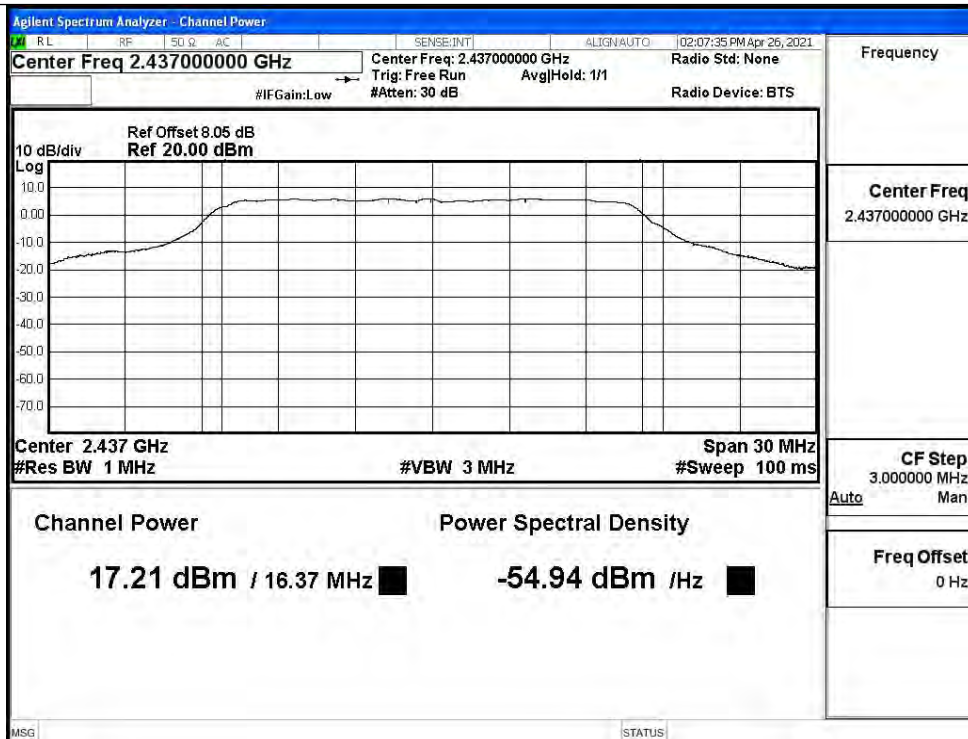
11B/HCH



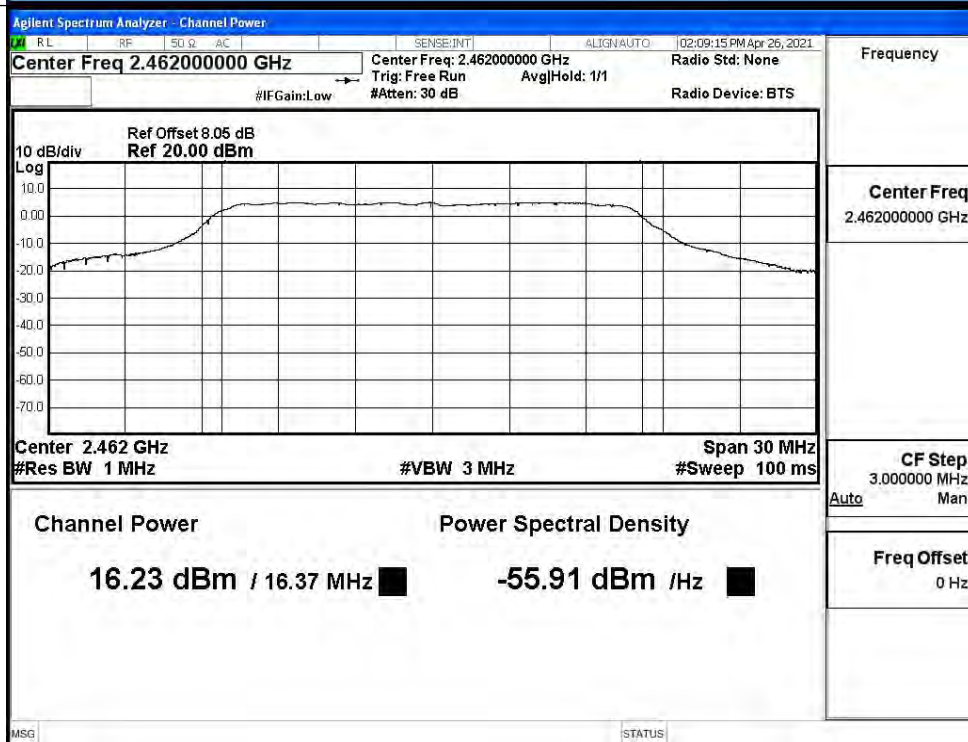
11G/LCH

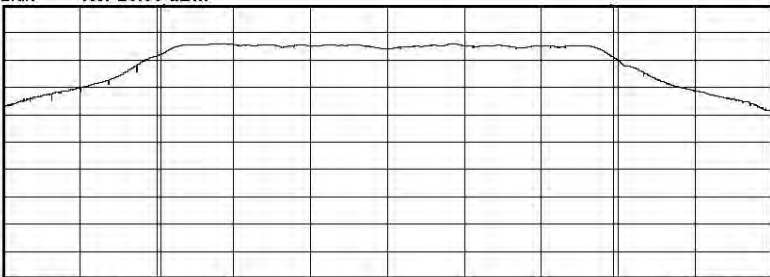
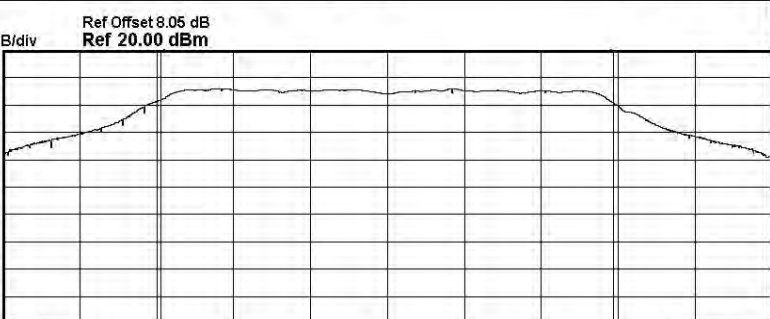


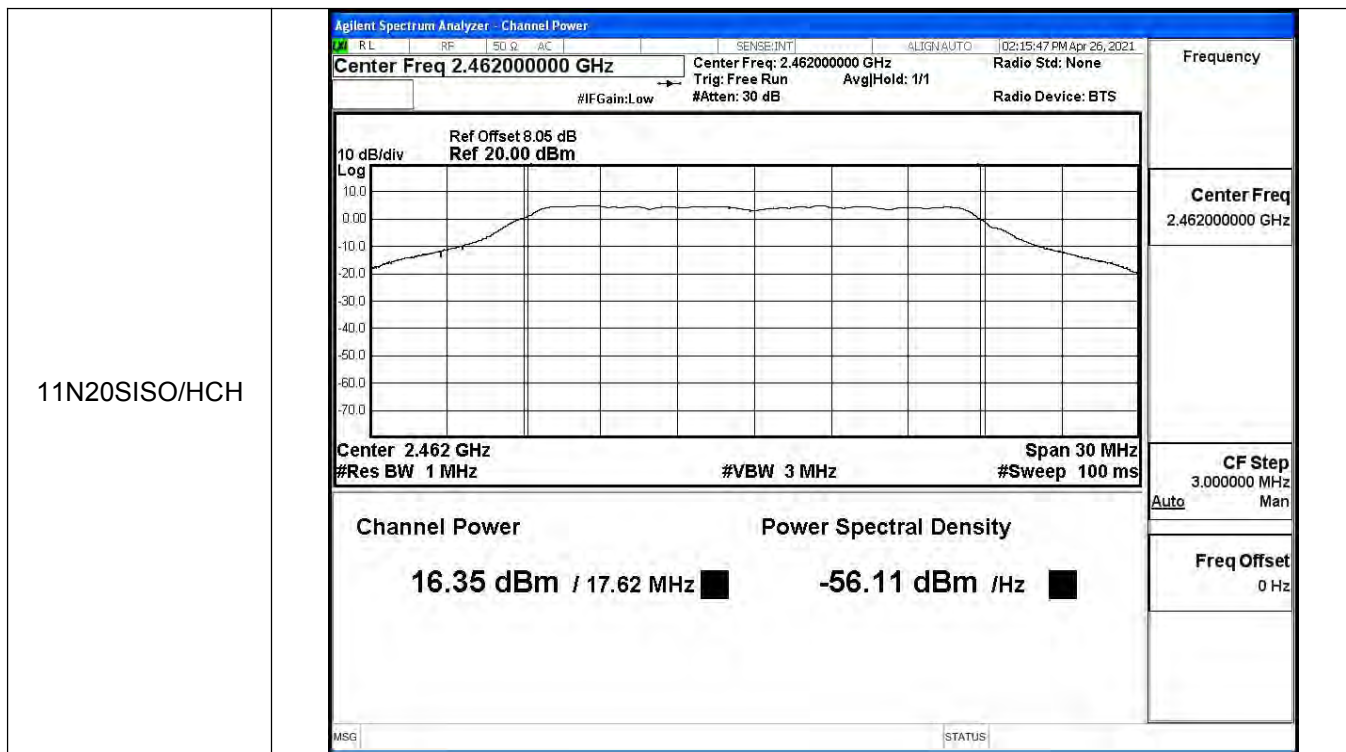
11G/MCH



11G/HCH



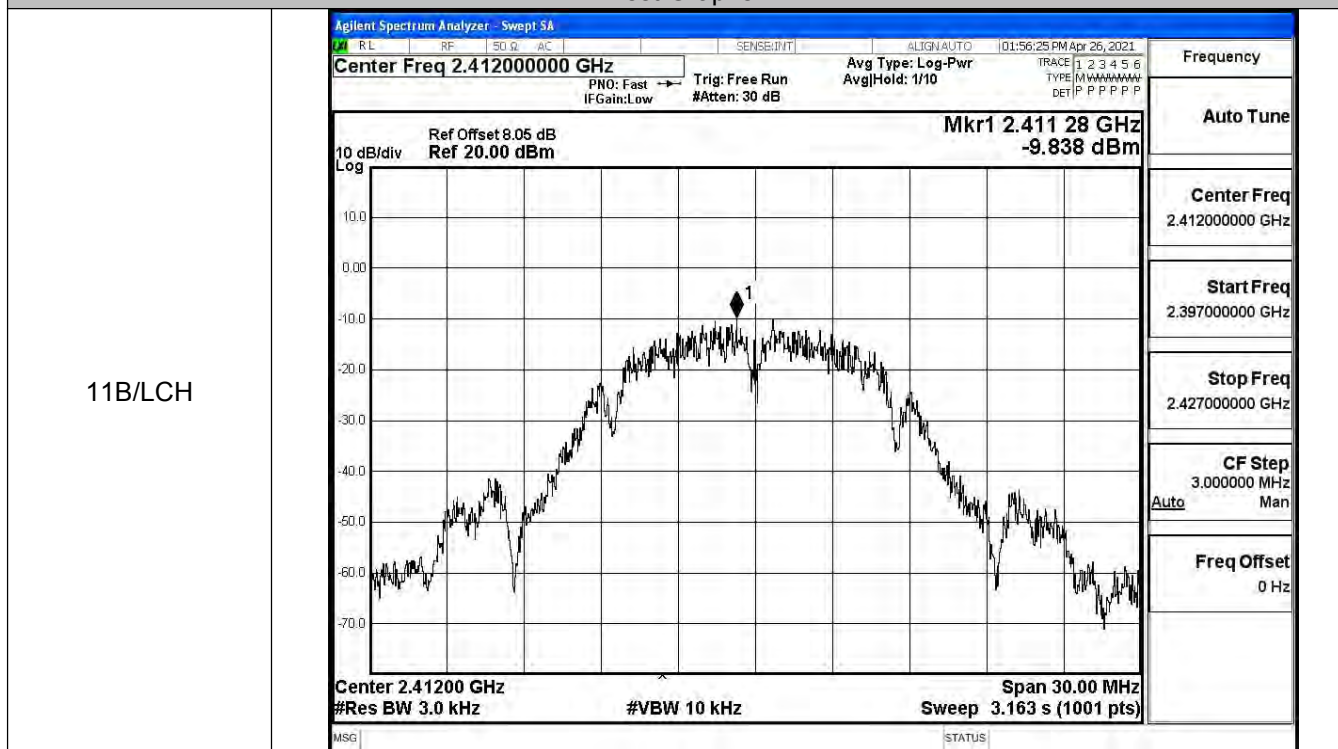
11N20SISO/LCH	Agilent Spectrum Analyzer - Channel Power RL RF 50 Ω AC SENSE:INT ALIGN: AUTO 02:11:43 PM Apr 26, 2021 Center Freq 2.412000000 GHz Center Freq: 2.412000000 GHz Trig: Free Run Avg Hold: 1/1 Radio Std: None #IF Gain: Low #Atten: 30 dB Radio Device: BTS 10 dB/div Ref Offset 8.05 dB Ref 20.00 dBm Log  Center 2.412 GHz #Res BW 1 MHz #VBW 3 MHz Span 30 MHz #Sweep 100 ms Channel Power Power Spectral Density 17.36 dBm / 17.63 MHz -55.11 dBm /Hz MSG STATUS Frequency Center Freq 2.412000000 GHz CF Step 3.000000 MHz Auto Man Freq Offset 0 Hz
11N20SISO/MCH	Agilent Spectrum Analyzer - Channel Power RL RF 50 Ω AC SENSE:INT ALIGN: AUTO 02:14:08 PM Apr 26, 2021 Center Freq 2.437000000 GHz Center Freq: 2.437000000 GHz Trig: Free Run Avg Hold: 1/1 Radio Std: None #IF Gain: Low #Atten: 30 dB Radio Device: BTS 10 dB/div Ref Offset 8.05 dB Ref 20.00 dBm Log  Center 2.437 GHz #Res BW 1 MHz #VBW 3 MHz Span 30 MHz #Sweep 100 ms Channel Power Power Spectral Density 17.29 dBm / 17.61 MHz -55.16 dBm /Hz MSG STATUS Frequency Center Freq 2.437000000 GHz CF Step 3.000000 MHz Auto Man Freq Offset 0 Hz



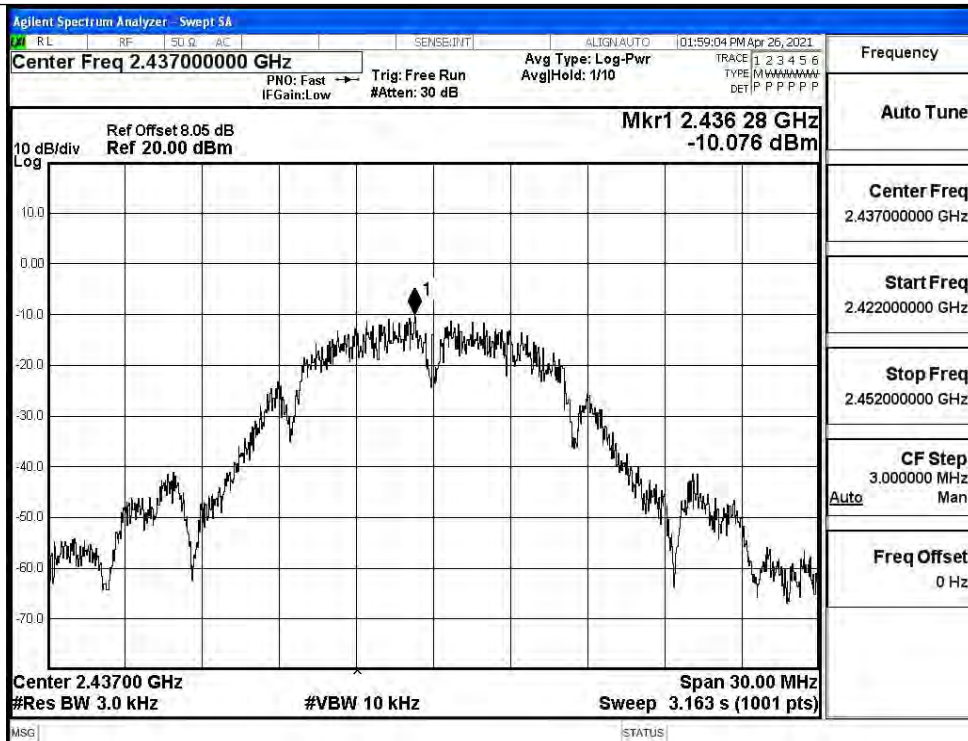
A.3 Maximum Power Spectral Density

Mode	Channel	Meas.Level [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
11B	LCH	-9.838	8	PASS
	MCH	-10.076	8	PASS
	HCH	-11.135	8	PASS
11G	LCH	-17.100	8	PASS
	MCH	-15.946	8	PASS
	HCH	-17.223	8	PASS
11N20SISO	LCH	-17.436	8	PASS
	MCH	-17.575	8	PASS
	HCH	-17.353	8	PASS

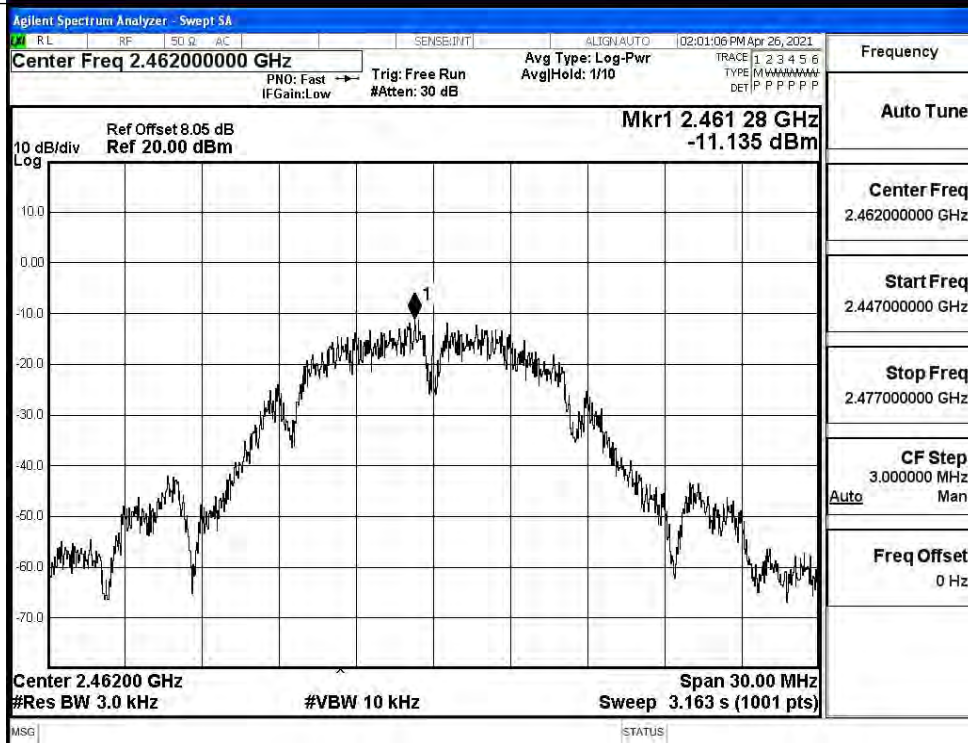
Test Graphs



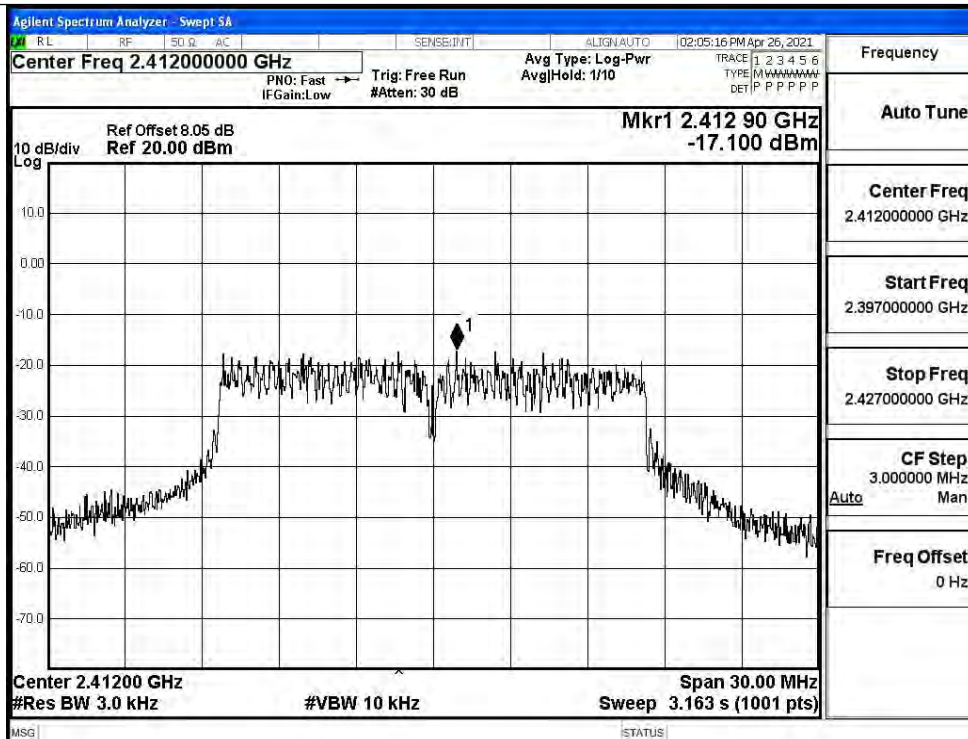
11B/MCH



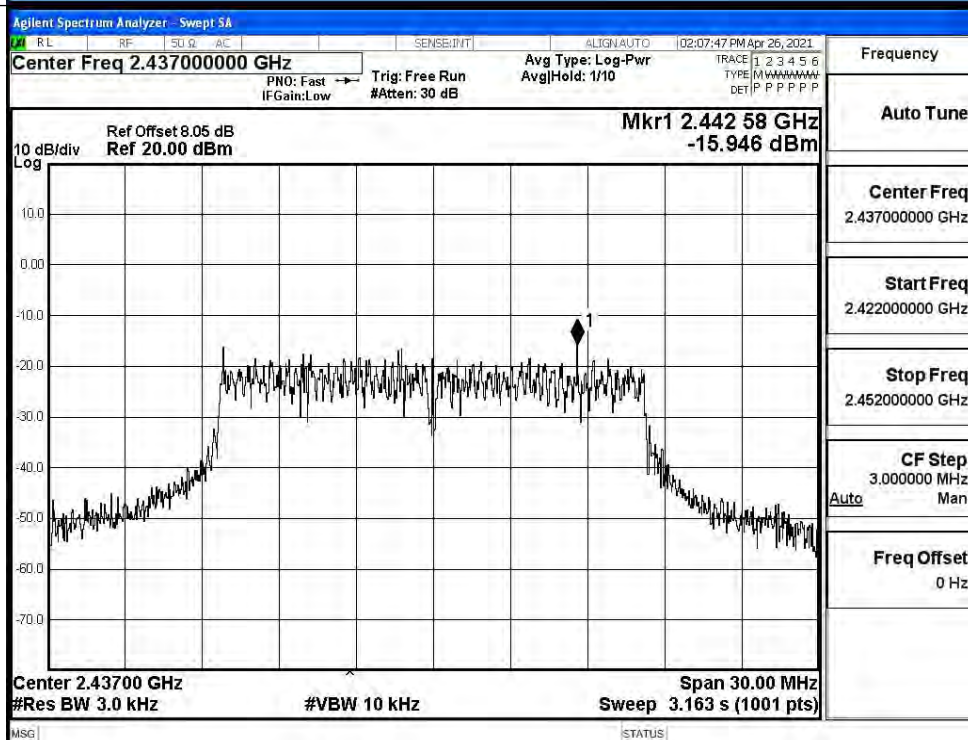
11B/HCH



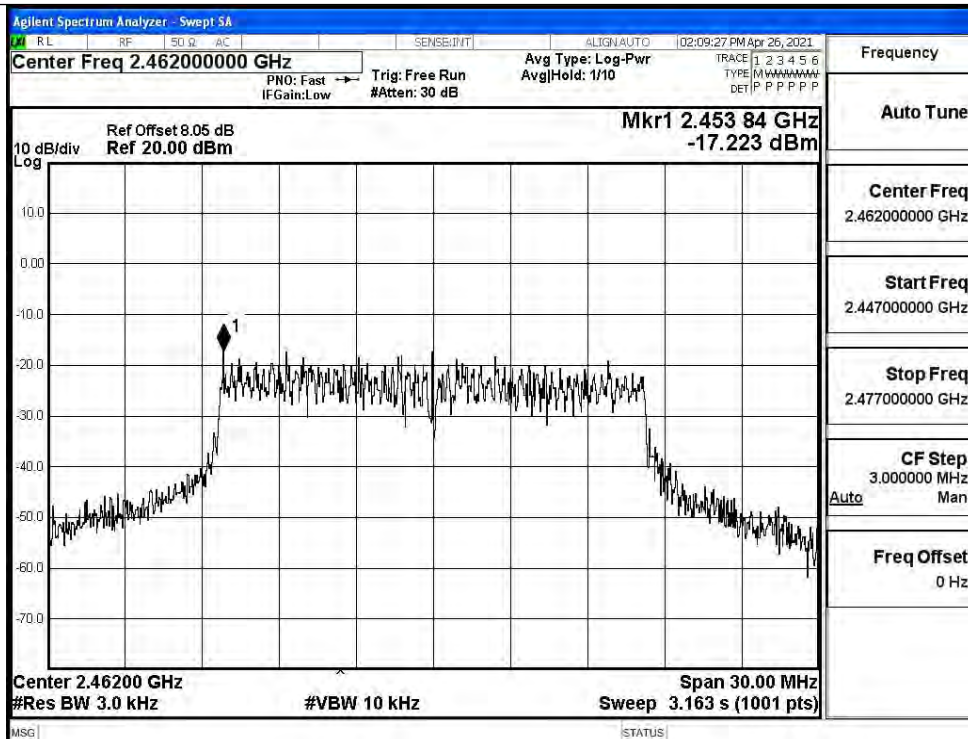
11G/LCH



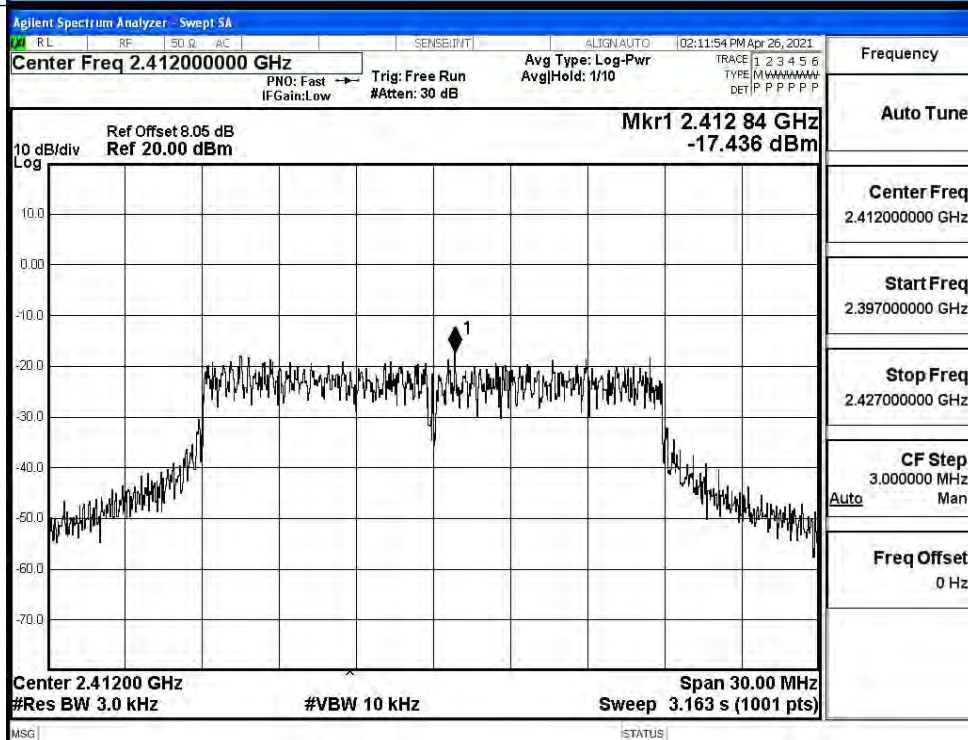
11G/MCH

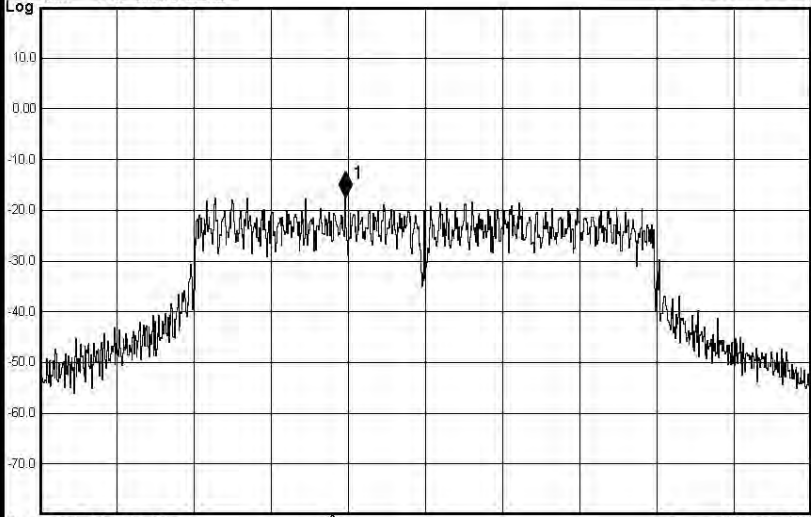
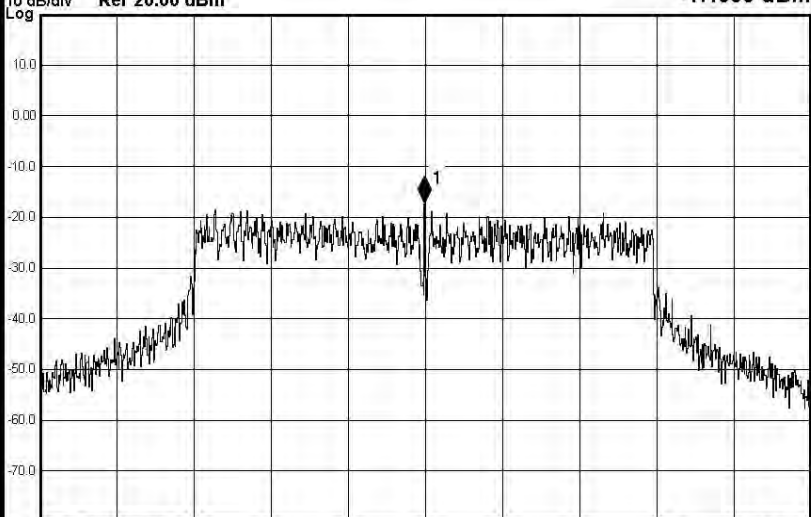


11G/HCH



11N20SISO/LCH



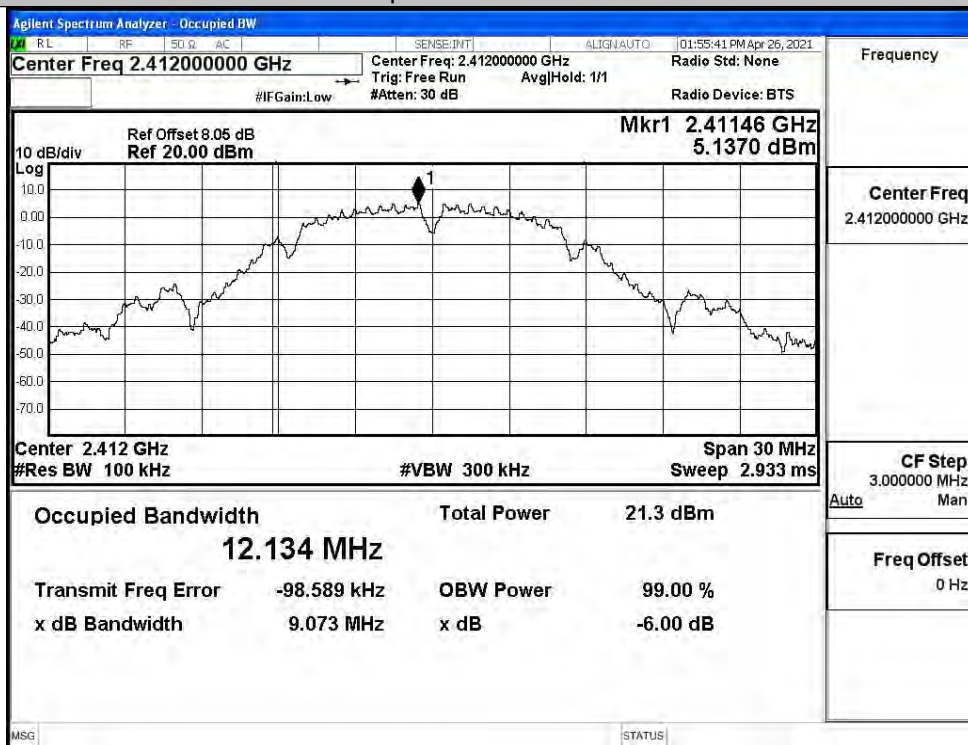
11N20SISO/MCH	Agilent Spectrum Analyzer - Swept SA Center Freq 2.437000000 GHz Ref Offset 8.05 dB Ref 20.00 dBm Mkr1 2.433 88 GHz -17.575 dBm  Center 2.43700 GHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 3.163 s (1001 pts)	Frequency Auto Tune Center Freq 2.437000000 GHz Start Freq 2.422000000 GHz Stop Freq 2.452000000 GHz CF Step 3.000000 MHz Auto Man Freq Offset 0 Hz
11N20SISO/HCH	Agilent Spectrum Analyzer - Swept SA Center Freq 2.462000000 GHz Ref Offset 8.05 dB Ref 20.00 dBm Mkr1 2.461 97 GHz -17.353 dBm  Center 2.46200 GHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 3.163 s (1001 pts)	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

A.4 6dB Bandwidth

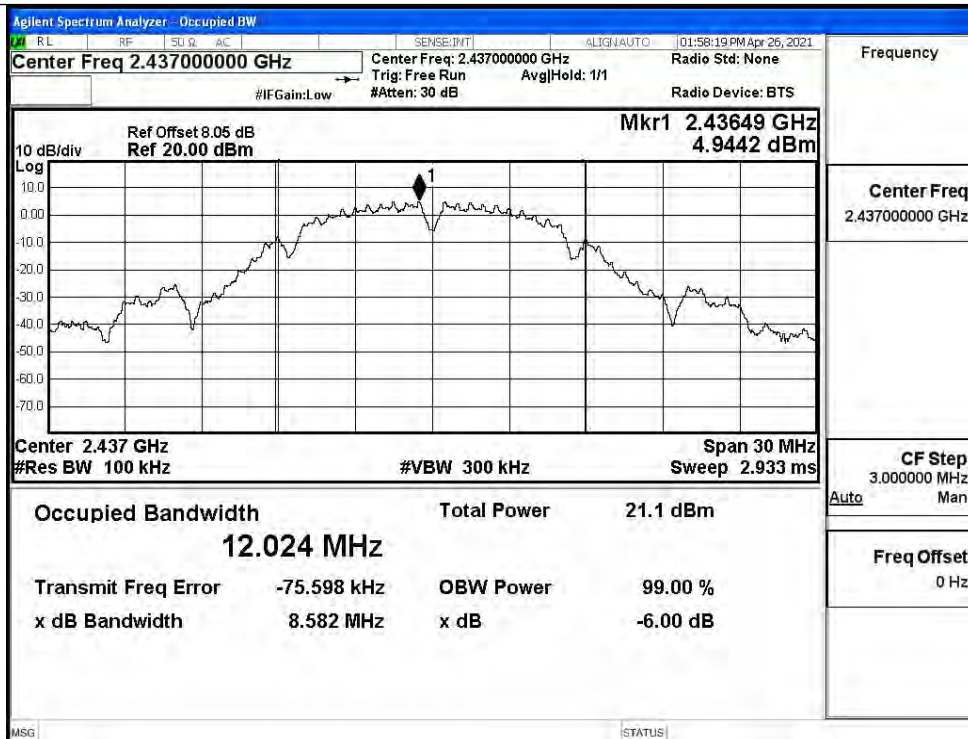
Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
11B	LCH	9.073	≥ 0.5	PASS
	MCH	8.582	≥ 0.5	PASS
	HCH	8.601	≥ 0.5	PASS
11G	LCH	16.38	≥ 0.5	PASS
	MCH	16.37	≥ 0.5	PASS
	HCH	16.37	≥ 0.5	PASS
11N20SISO	LCH	17.63	≥ 0.5	PASS
	MCH	17.61	≥ 0.5	PASS
	HCH	17.62	≥ 0.5	PASS

Test Graphs

11B/LCH



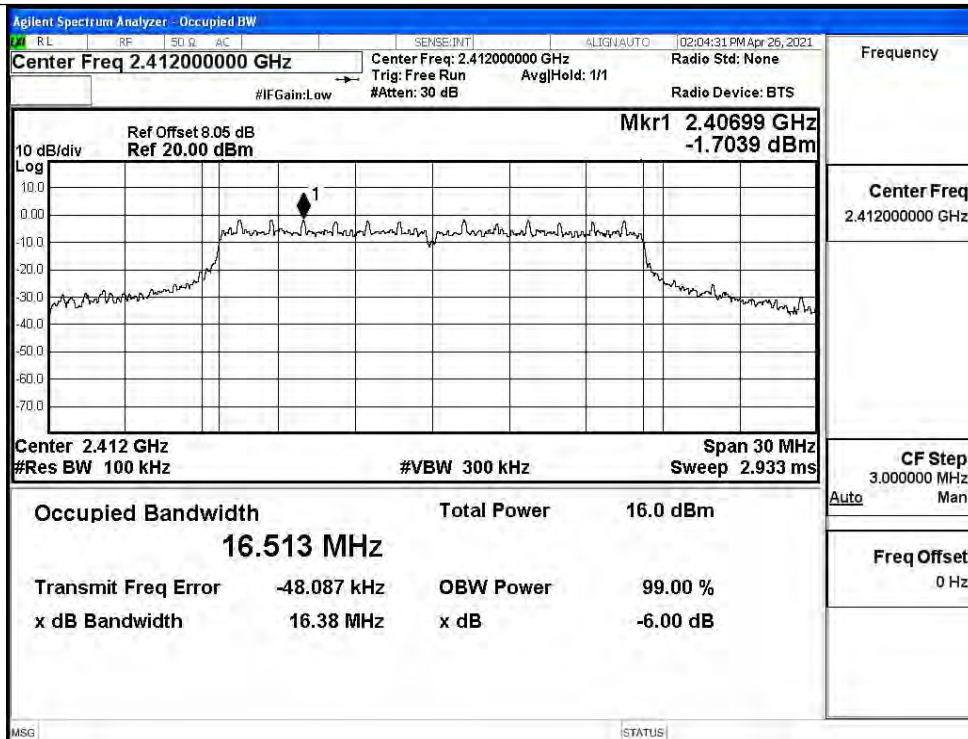
11B/MCH



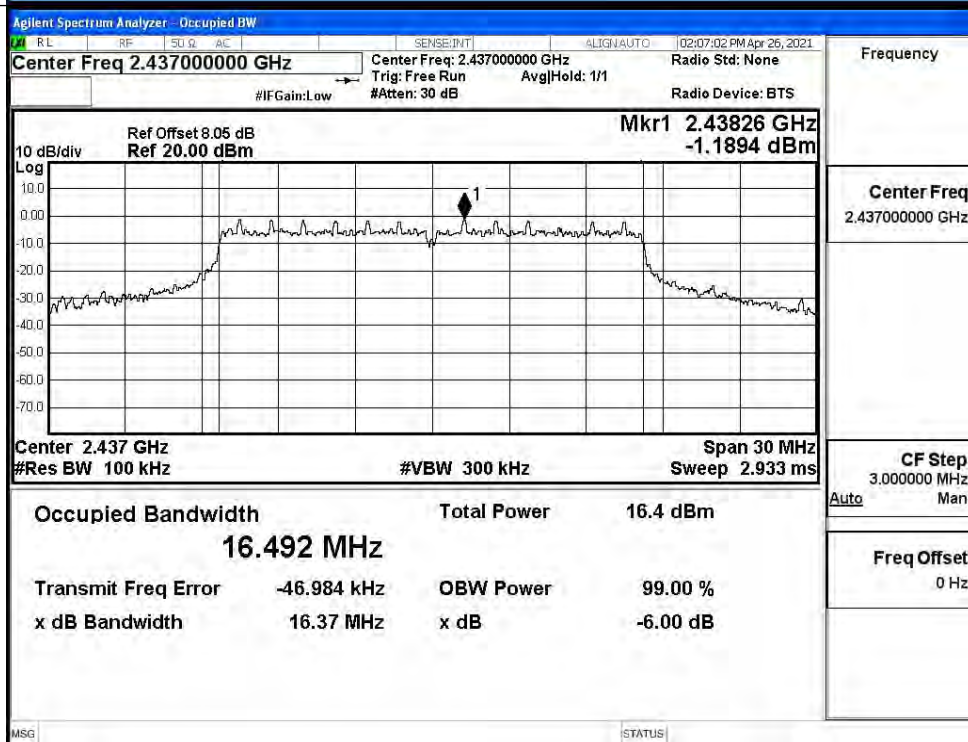
11B/HCH



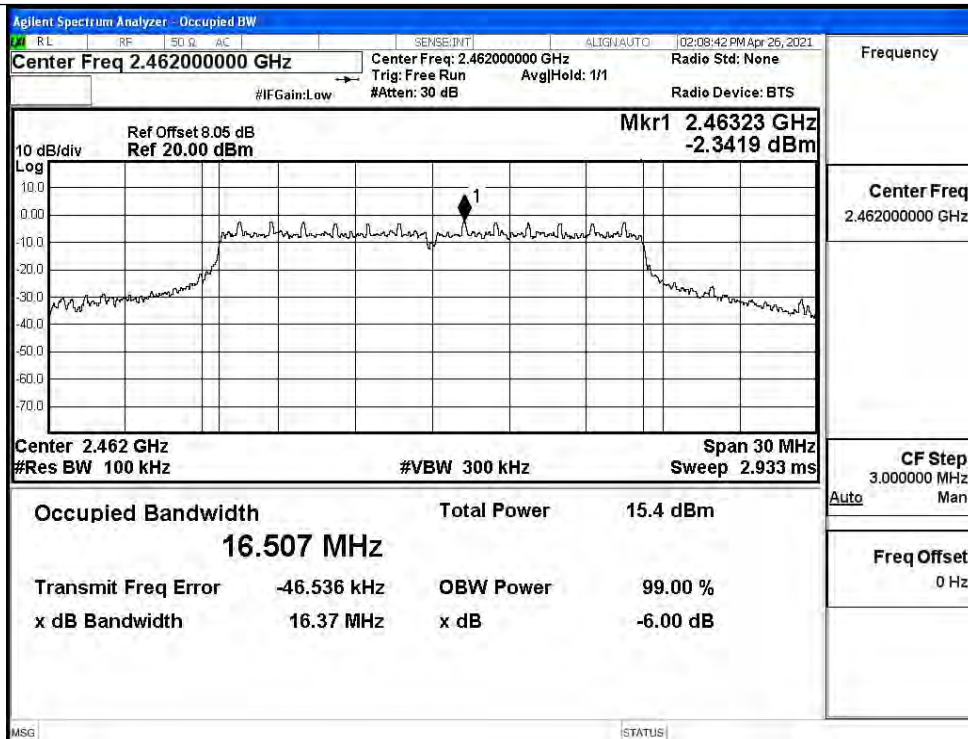
11G/LCH



11G/MCH



11G/HCH



Frequency

Center Freq
2.462000000 GHz

CF Step
3.000000 MHz
Auto Man

Freq Offset
0 Hz

11N20SISO/LCH



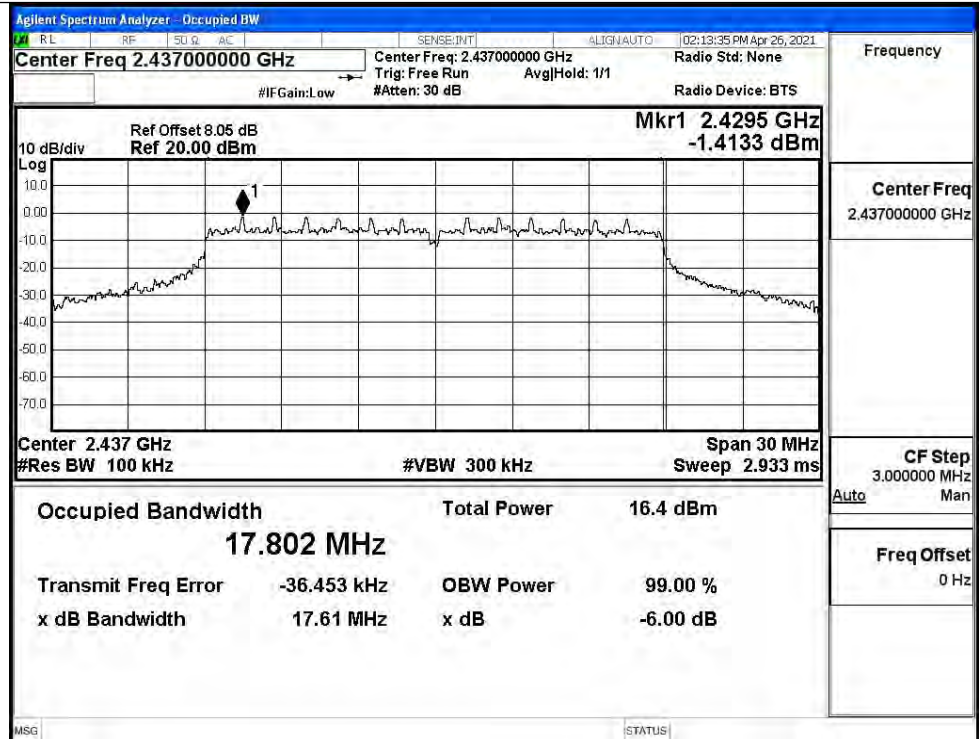
Frequency

Center Freq
2.412000000 GHz

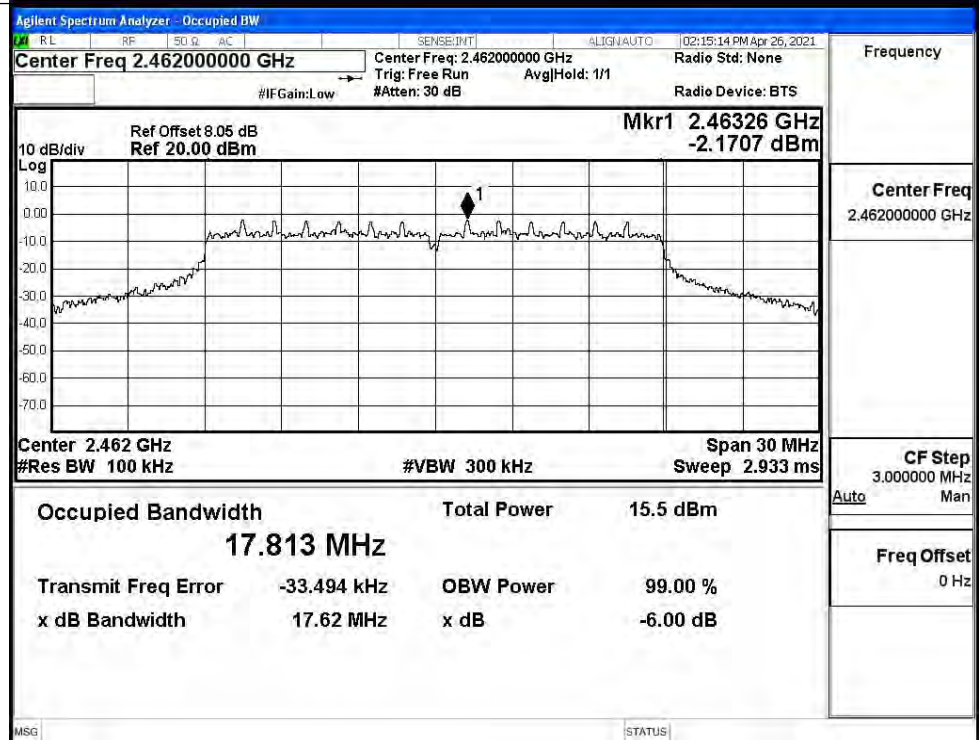
CF Step
3.000000 MHz
Auto Man

Freq Offset
0 Hz

11N20SISO/MCH



11N20SISO/HCH

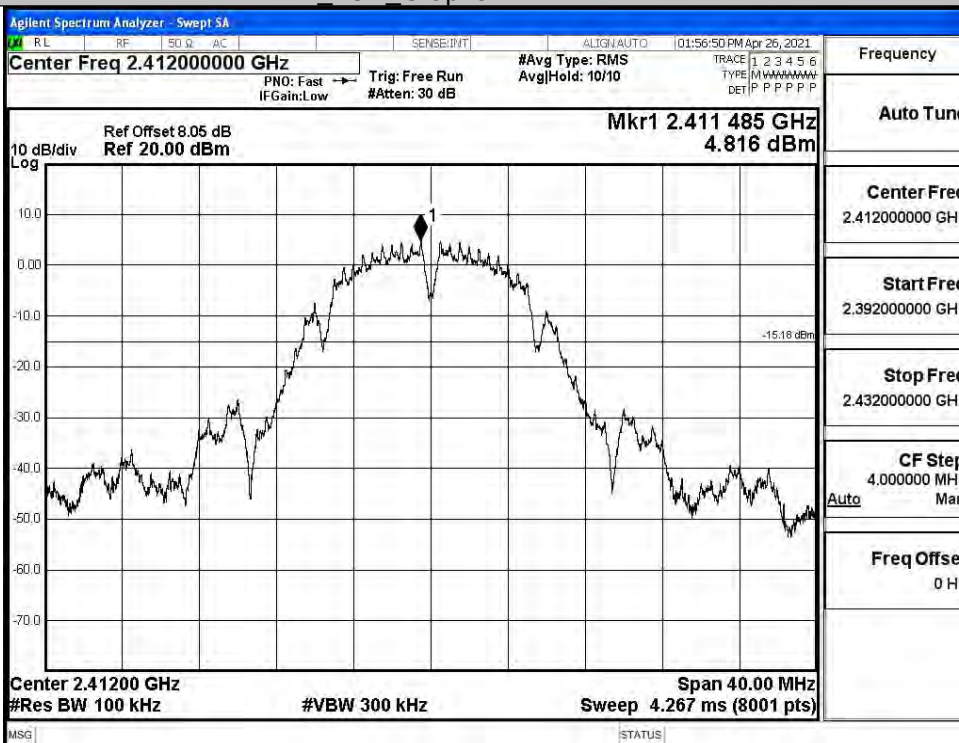


A.5 RF Conducted Spurious Emissions

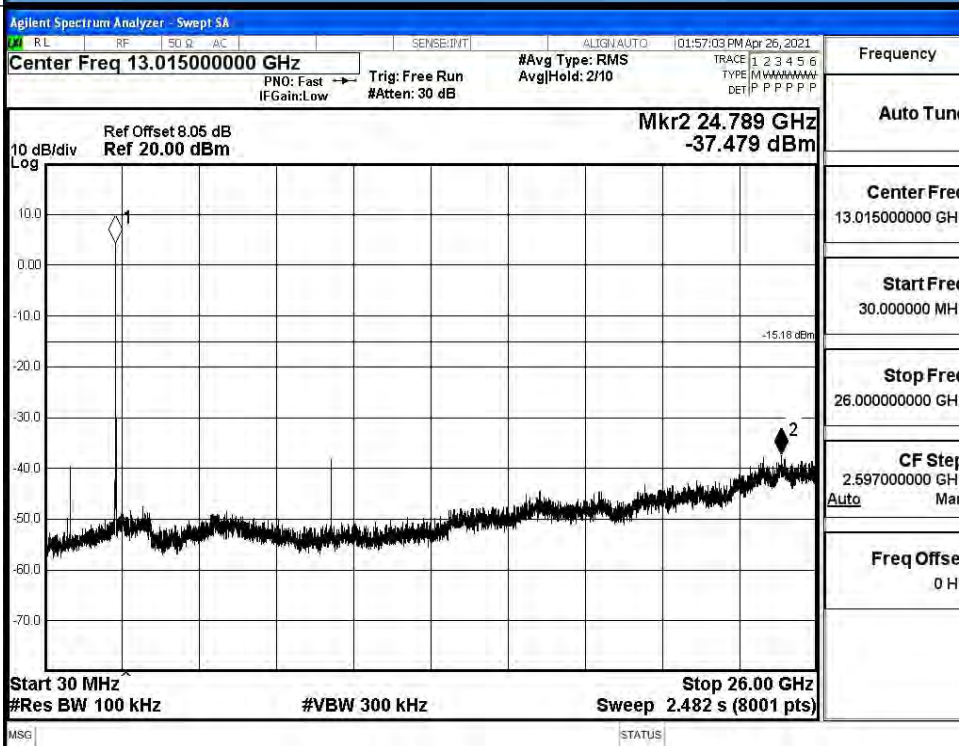
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
11B	LCH	4.816	-37.479	-15.184	PASS
	MCH	4.673	-38.260	-15.327	PASS
	HCH	3.653	-36.856	-16.347	PASS
11G	LCH	-1.607	-38.256	-21.607	PASS
	MCH	-1.446	-37.799	-21.446	PASS
	HCH	-2.489	-38.248	-22.489	PASS
11N20 SISO	LCH	-1.444	-38.683	-21.444	PASS
	MCH	-1.383	-37.882	-21.383	PASS
	HCH	-2.512	-37.412	-22.512	PASS

11B LCH Graphs

Pref/11B/LCH

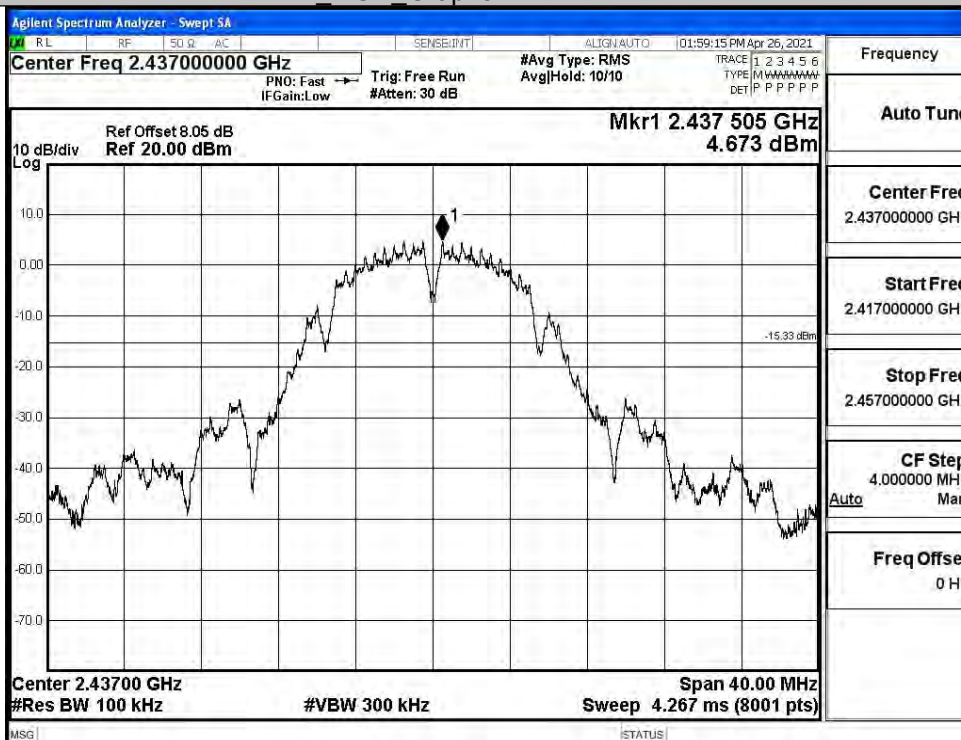


Puw/11B/LCH

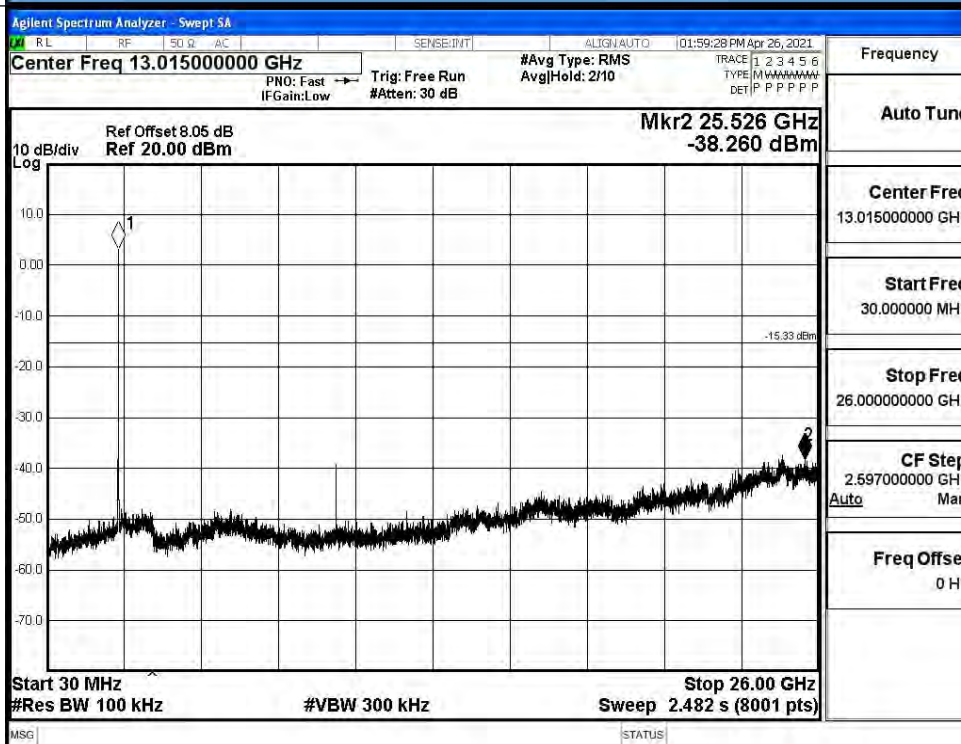


11B MCH Graphs

Pref/11B/MCH

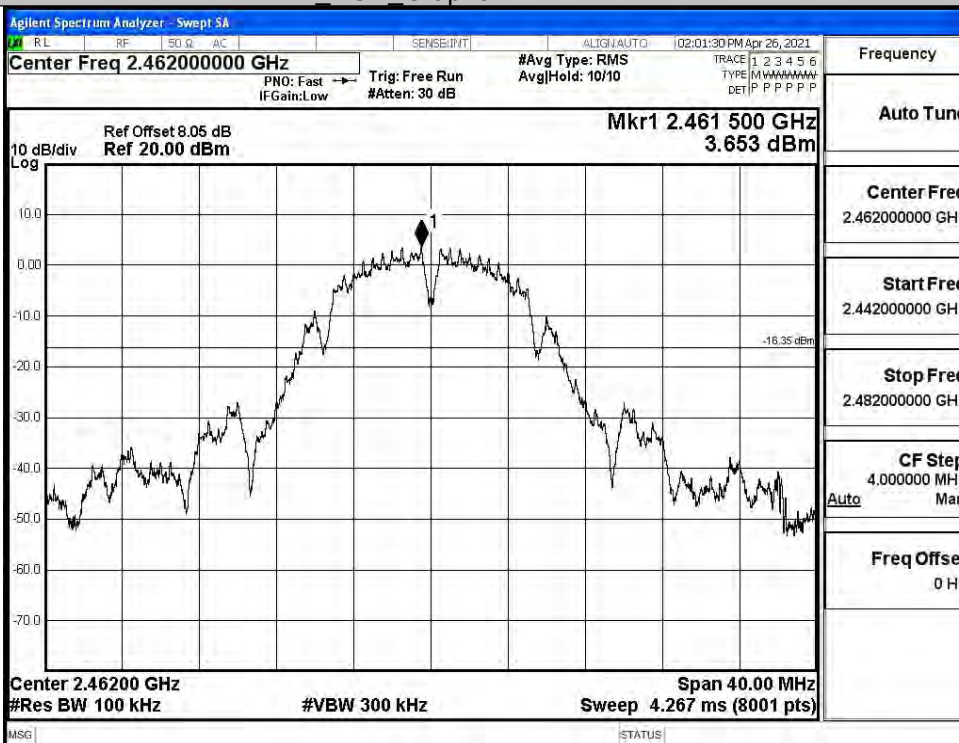


Puw/11B/MCH

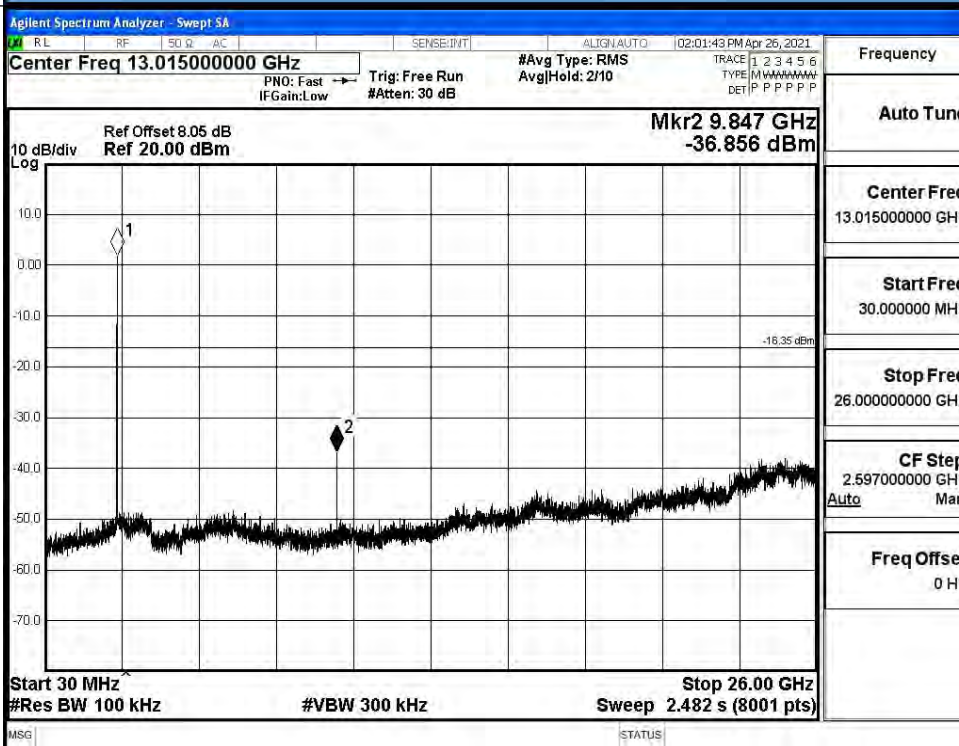


11B HCH Graphs

Pref/11B/HCH

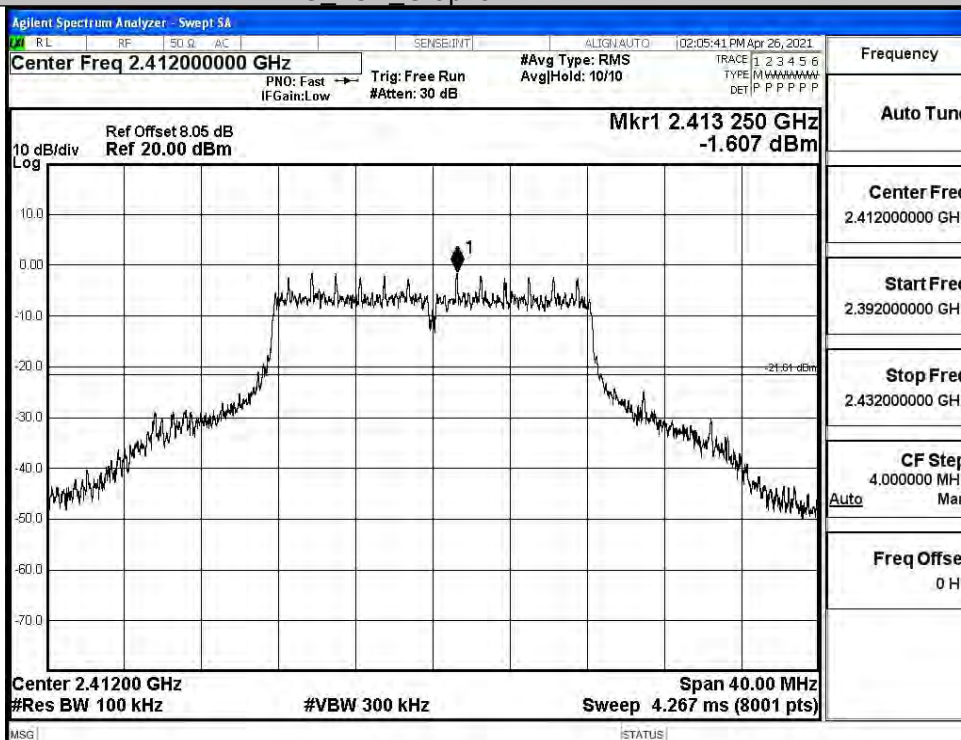


Puw/11B/HCH

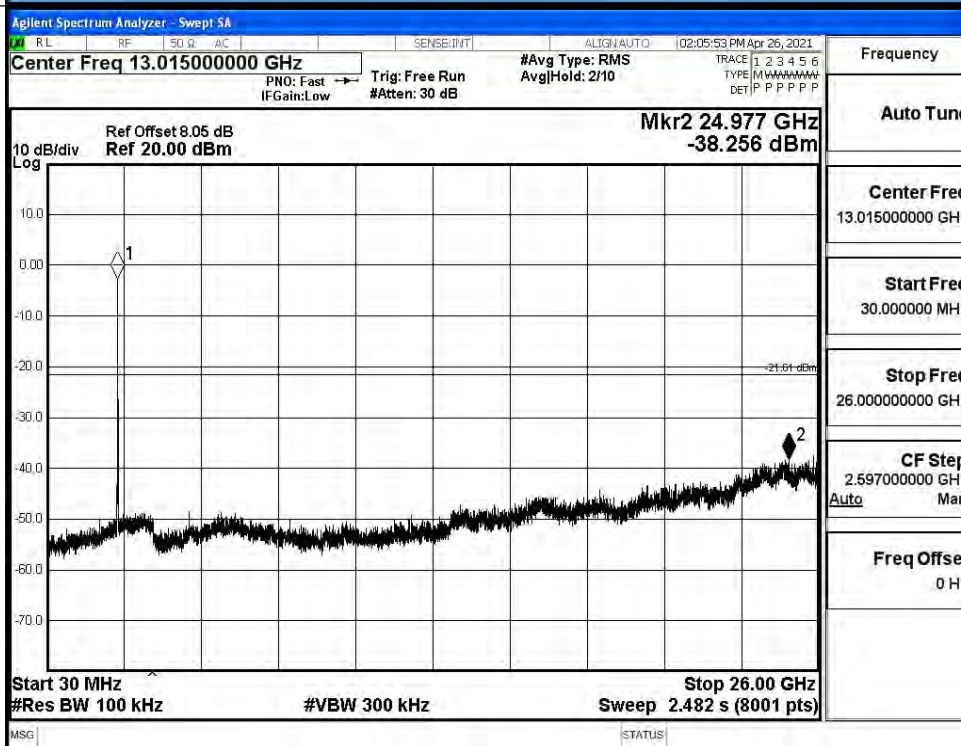


11G LCH Graphs

Pref/11G/LCH

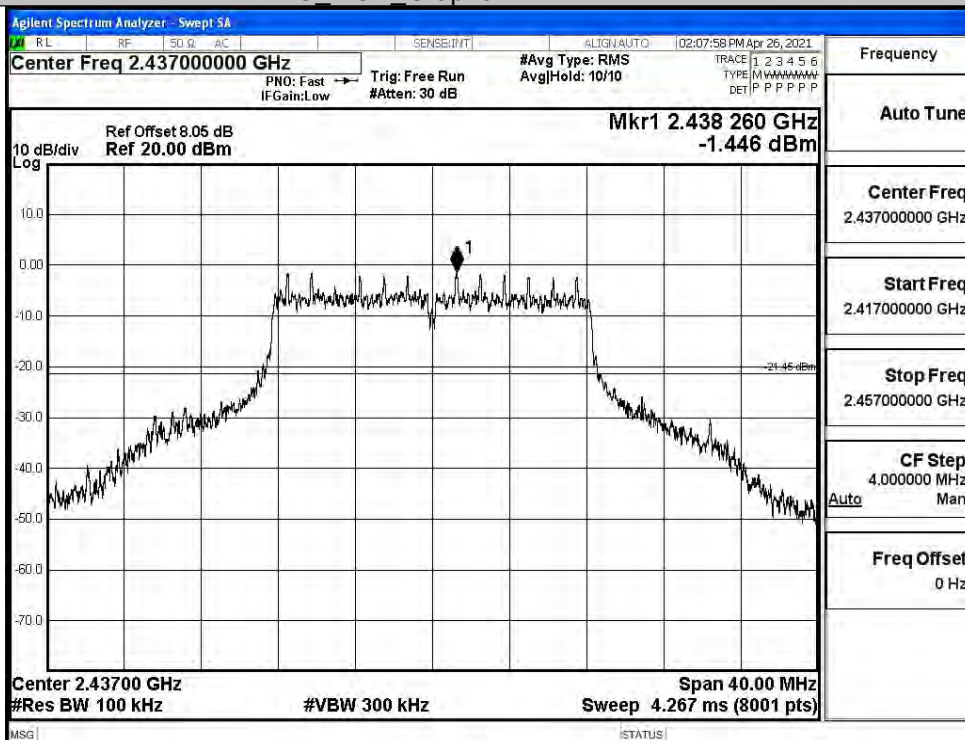


Puw/11G/LCH

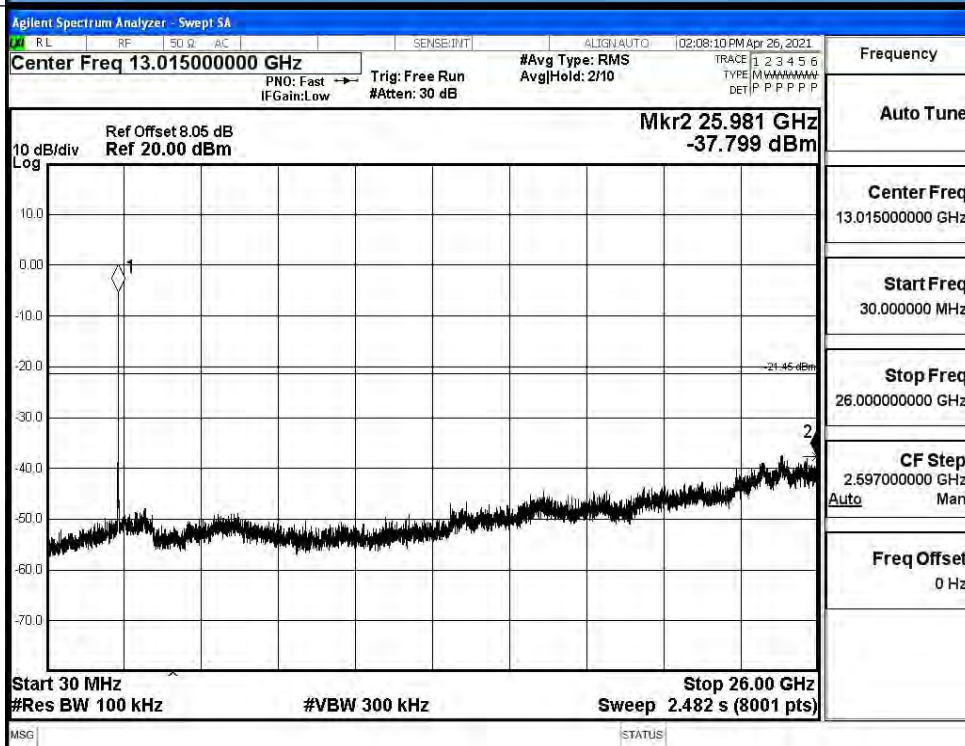


11G MCH Graphs

Pref/11G/MCH

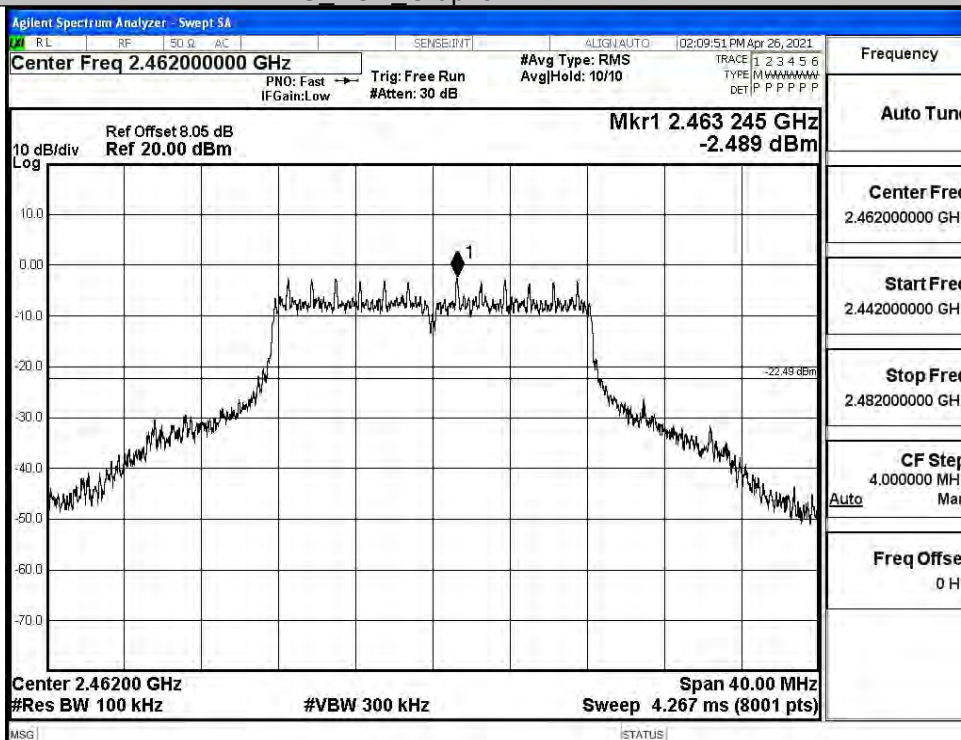


Puw/11G/MCH

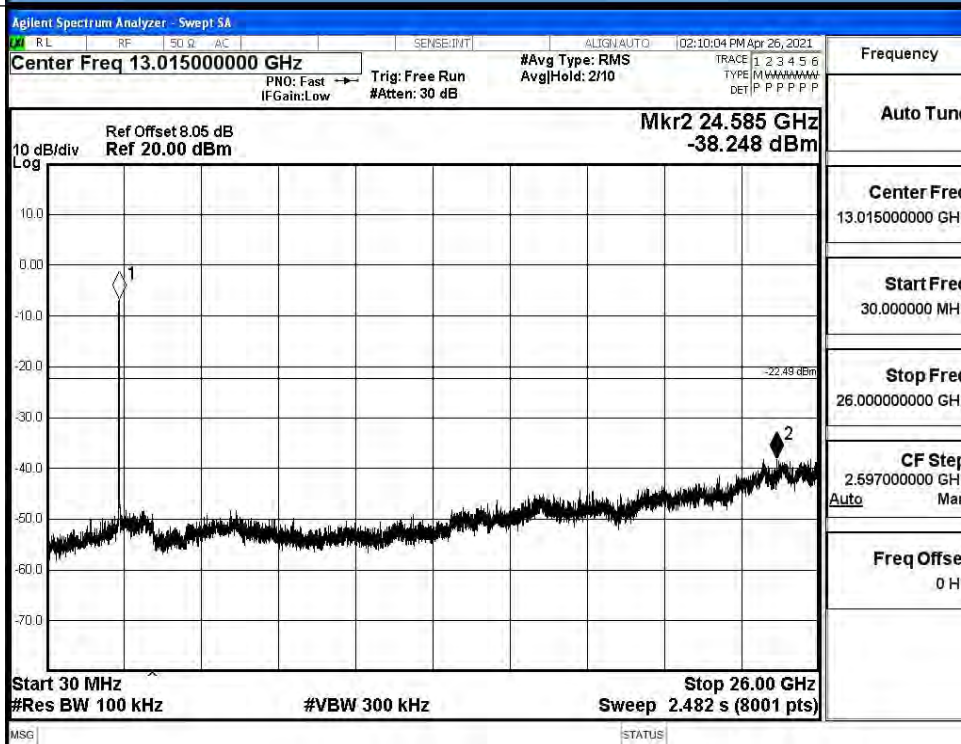


11G HCH Graphs

Pref/11G/HCH

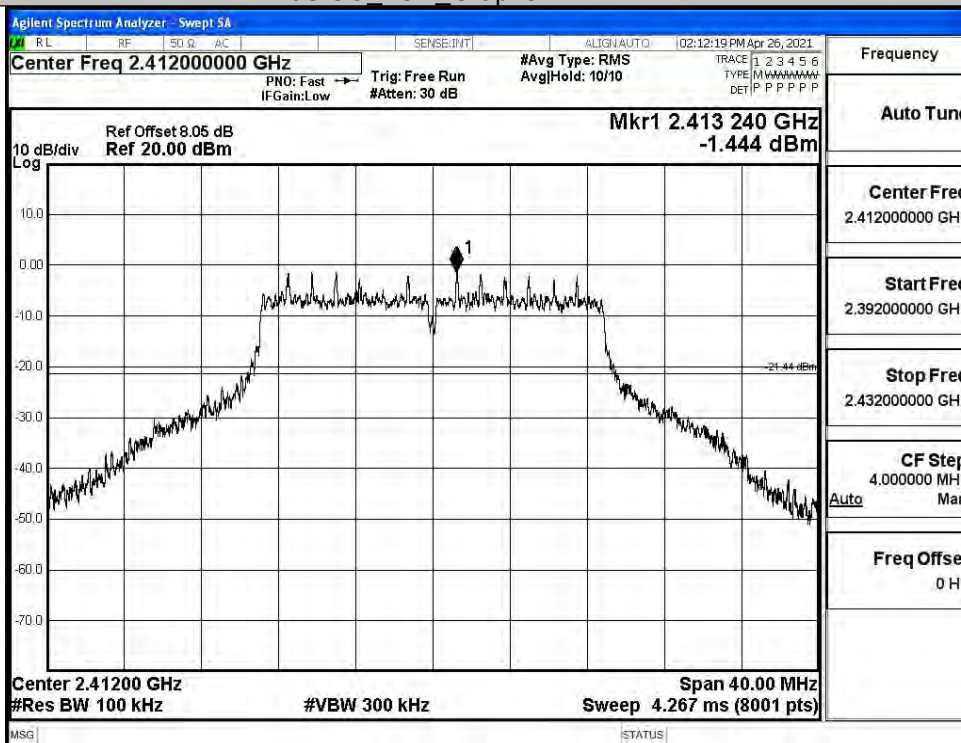


Puw/11G/HCH

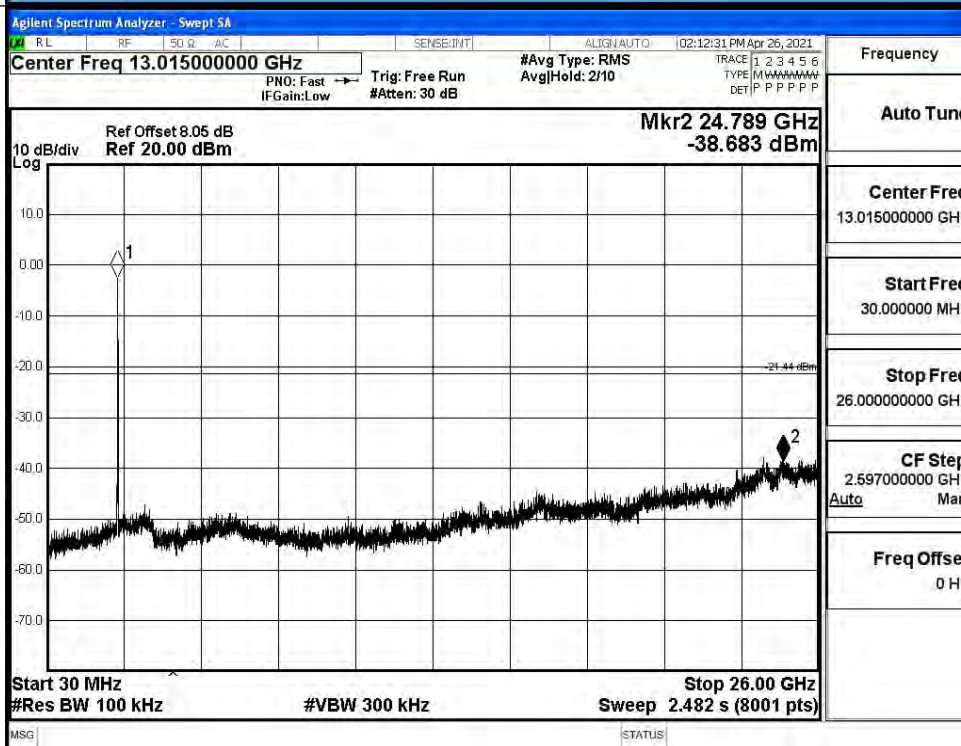


11N20SISO LCH Graphs

Pref/11N20SIS
O/LCH

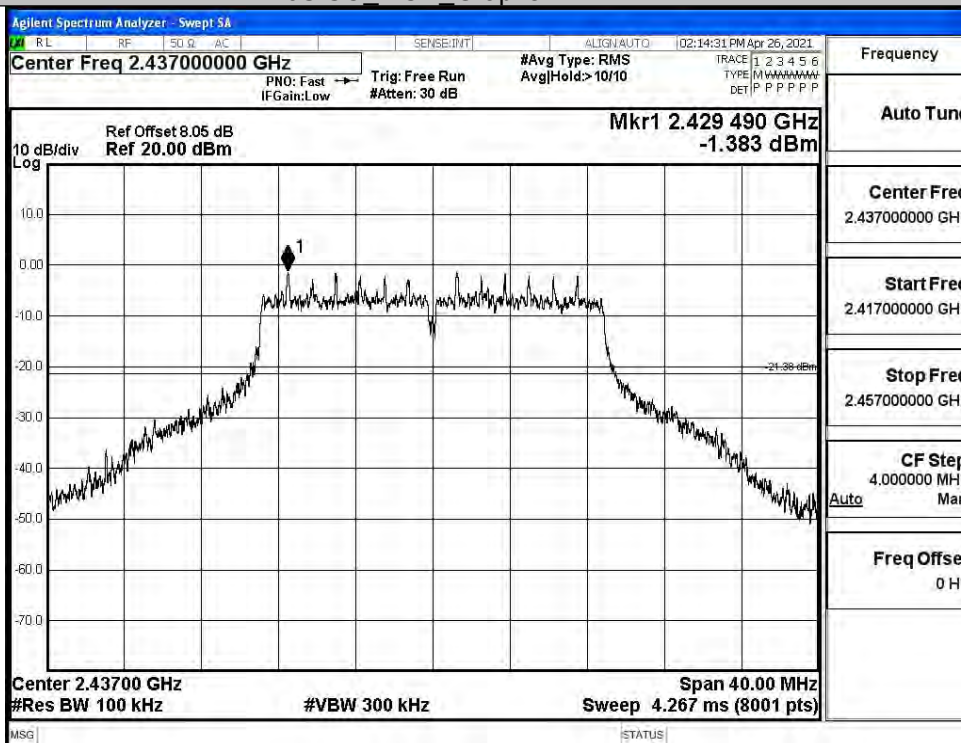


Puw/11N20
SISO/LCH

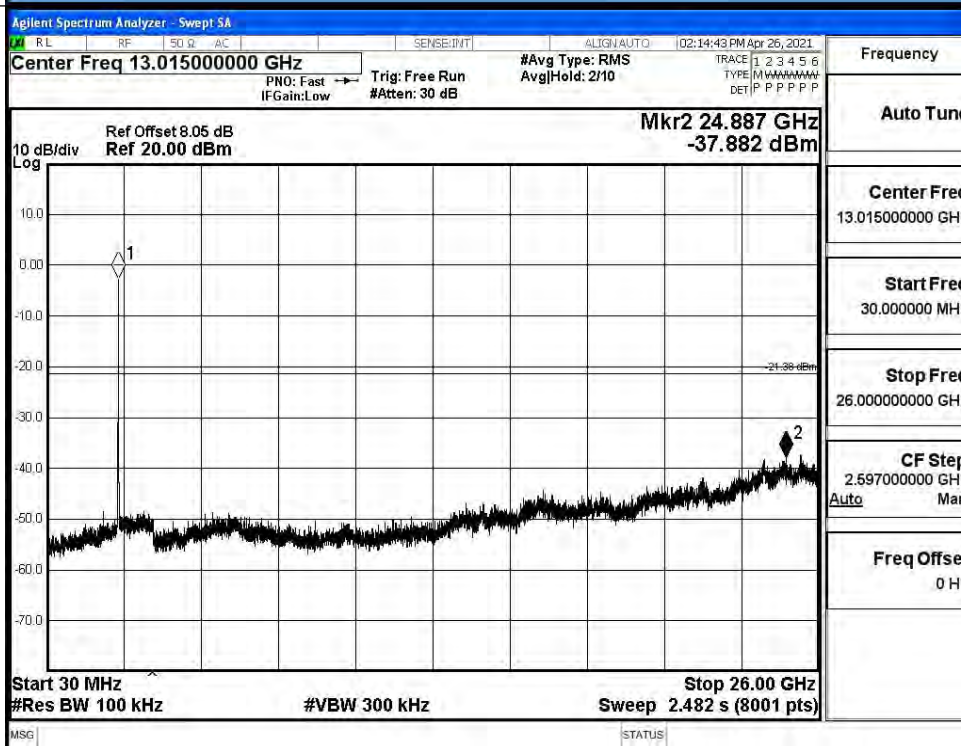


11N20SISO MCH Graphs

Pref/11N20
SISO/MCH

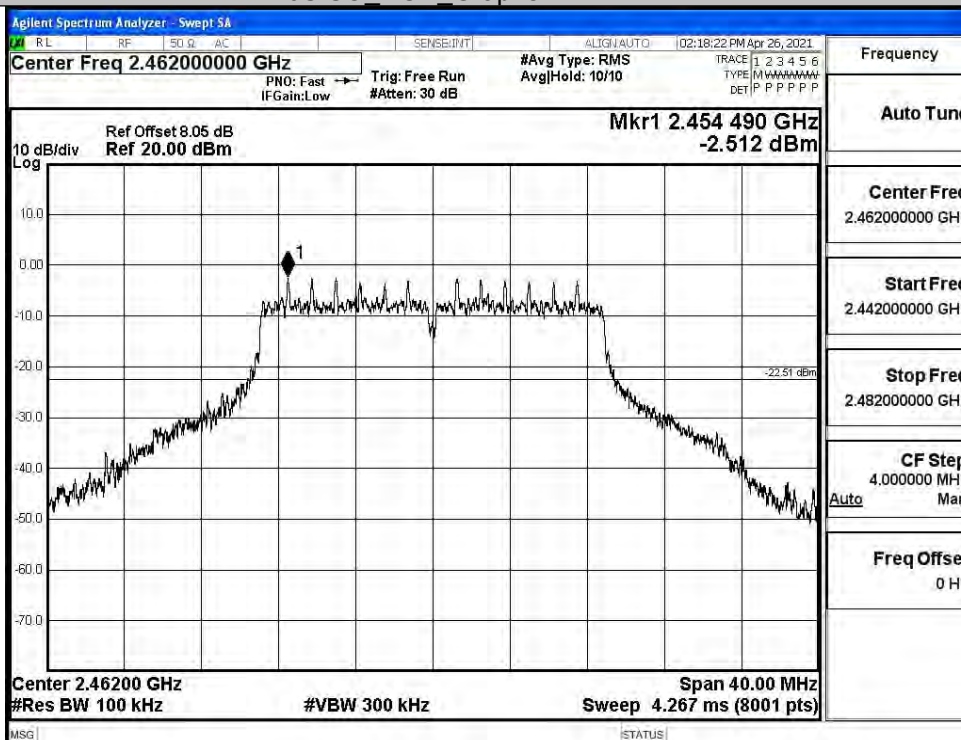


Puw/11N20
SISO/MCH

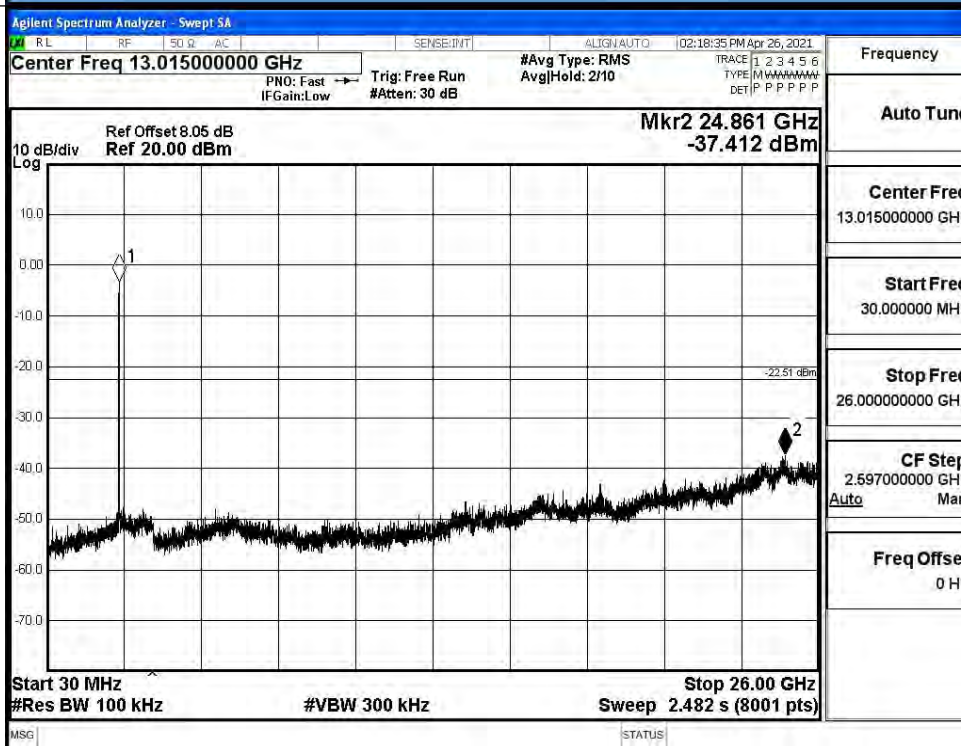


11N20SISO HCH Graphs

Pref/11N20
SISO/HCH

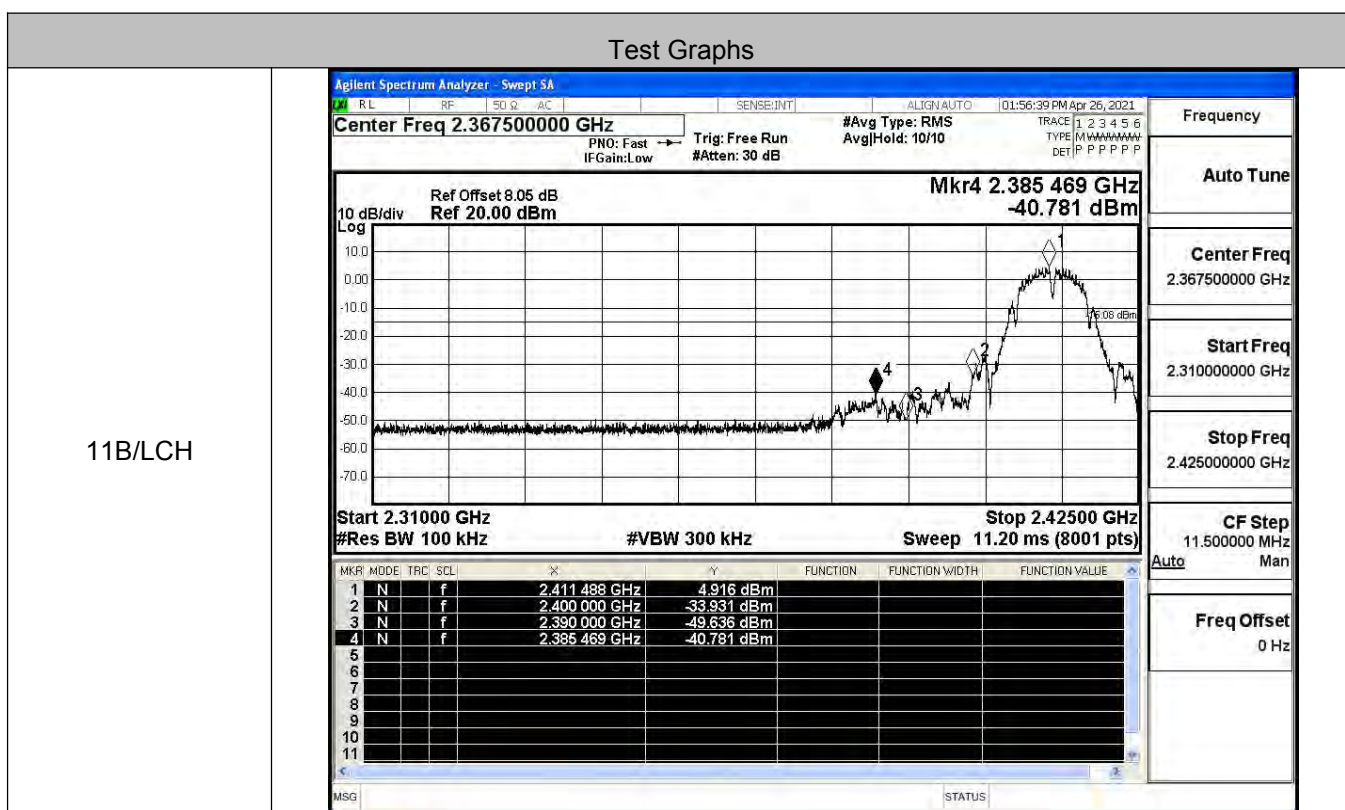


Puw/11N20
SISO/HCH

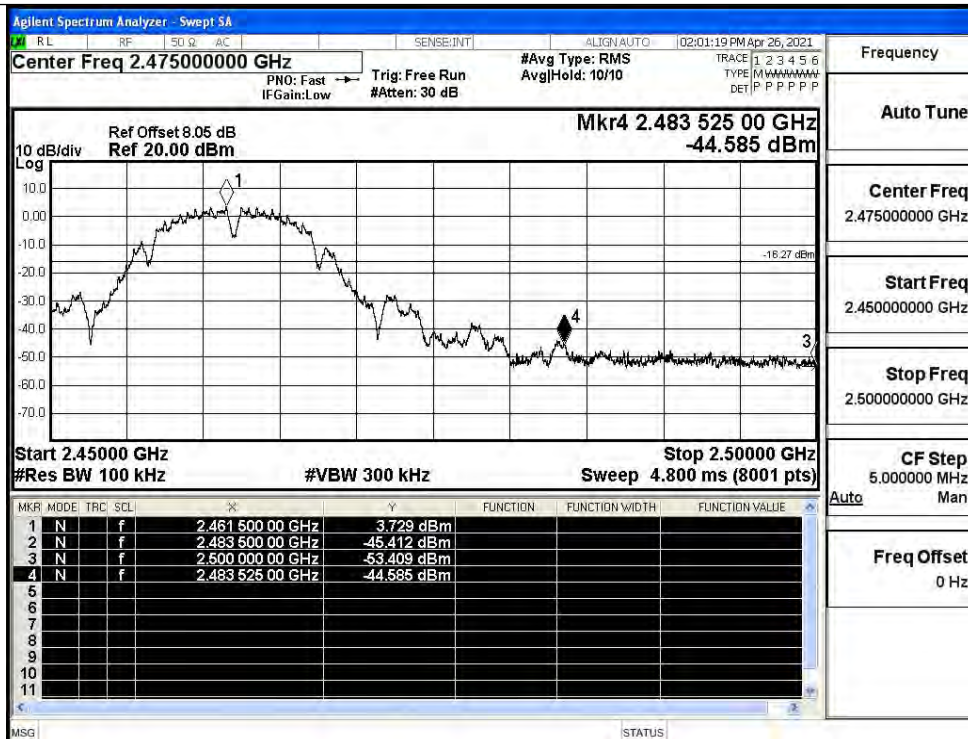


A.6 Band-edge for RF Conducted Emissions

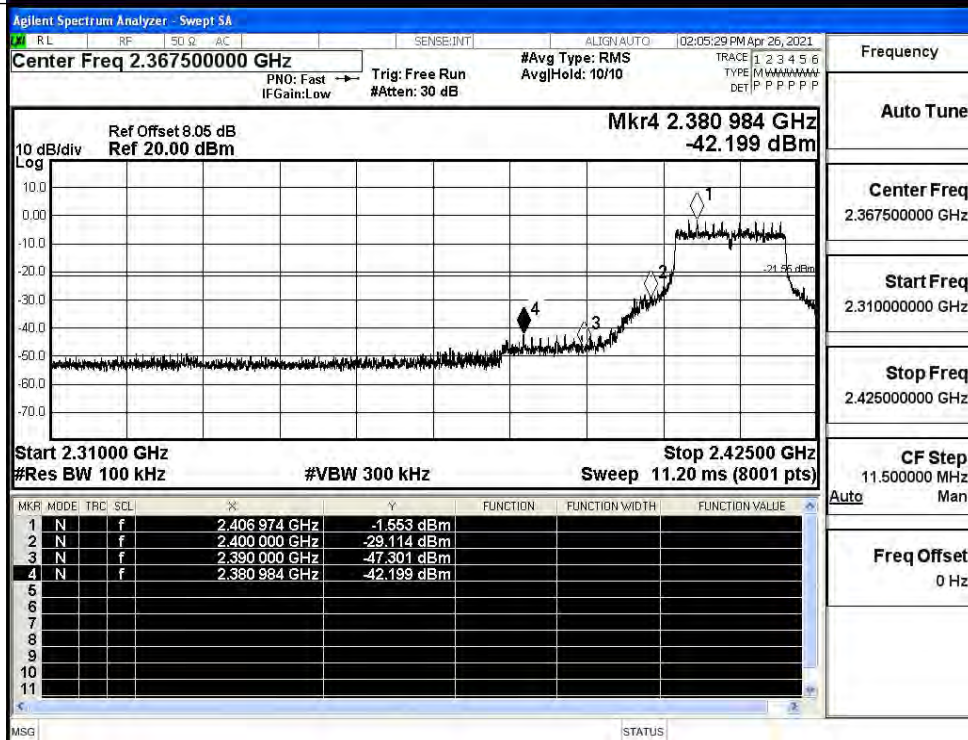
Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
11B	LCH	4.916	-40.781	-15.08	PASS
	HCH	3.729	-44.585	-16.27	PASS
11G	LCH	-1.553	-42.199	-21.55	PASS
	HCH	-2.531	-46.520	-22.53	PASS
11N20SISO	LCH	-1.449	-41.402	-21.45	PASS
	HCH	-2.385	-46.008	-22.39	PASS



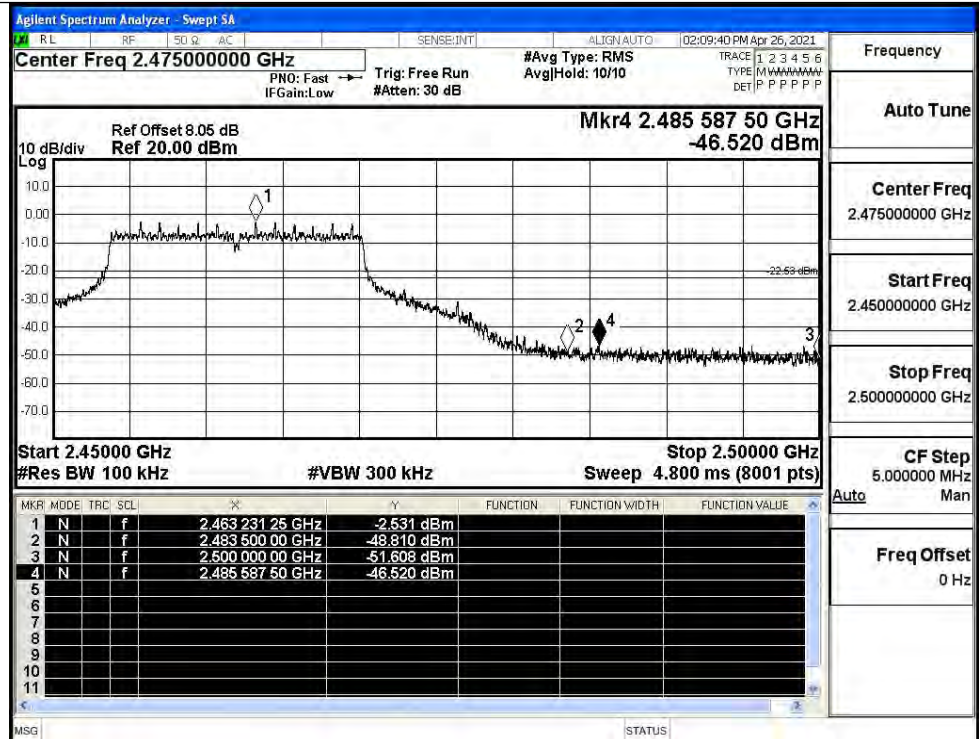
11B/HCH



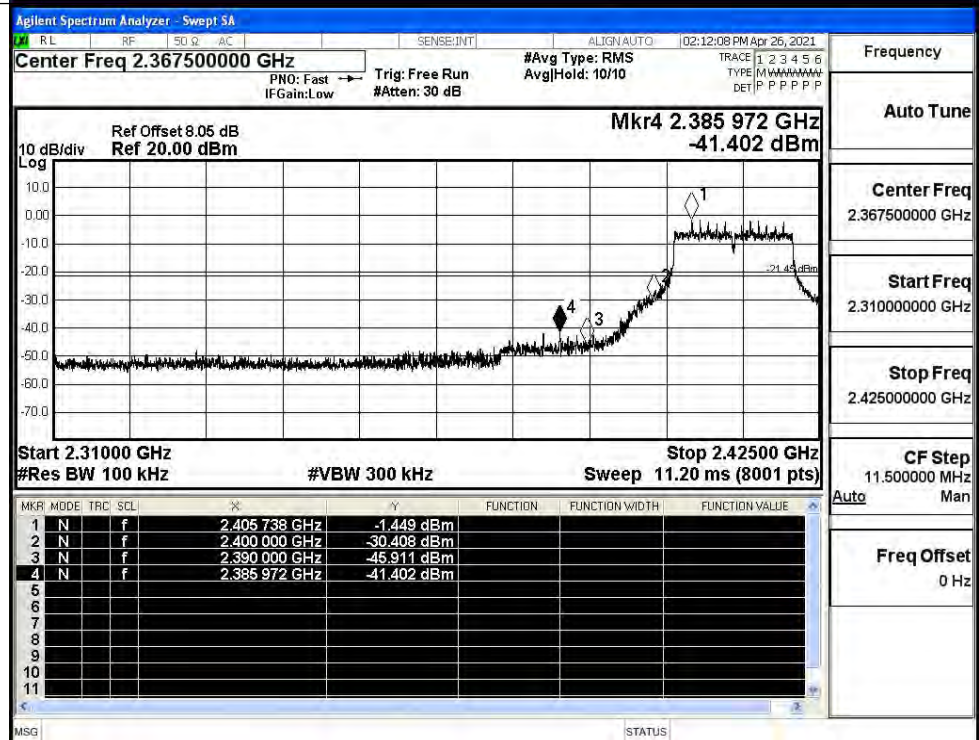
11G/LCH



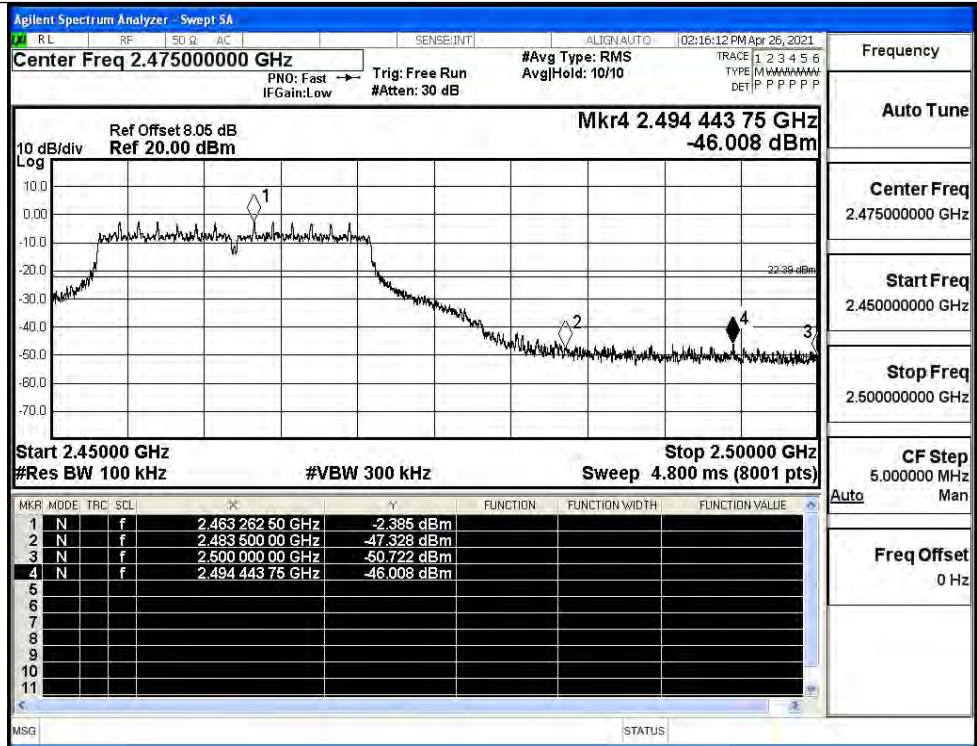
11G/HCH



11N20SISO/LCH



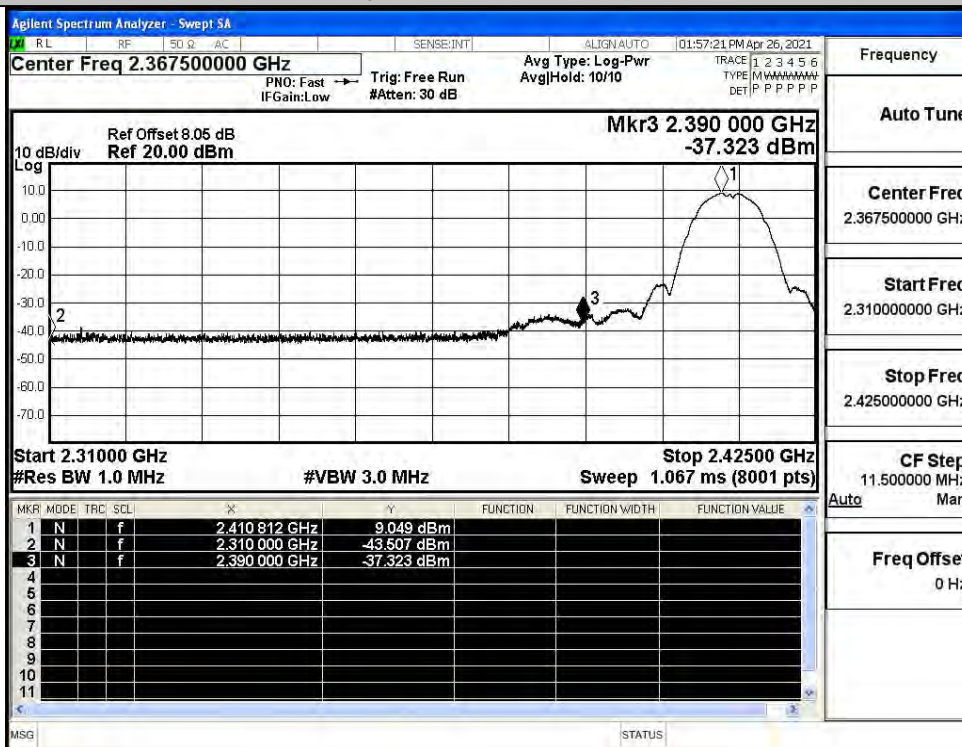
11N20SISO/HCH



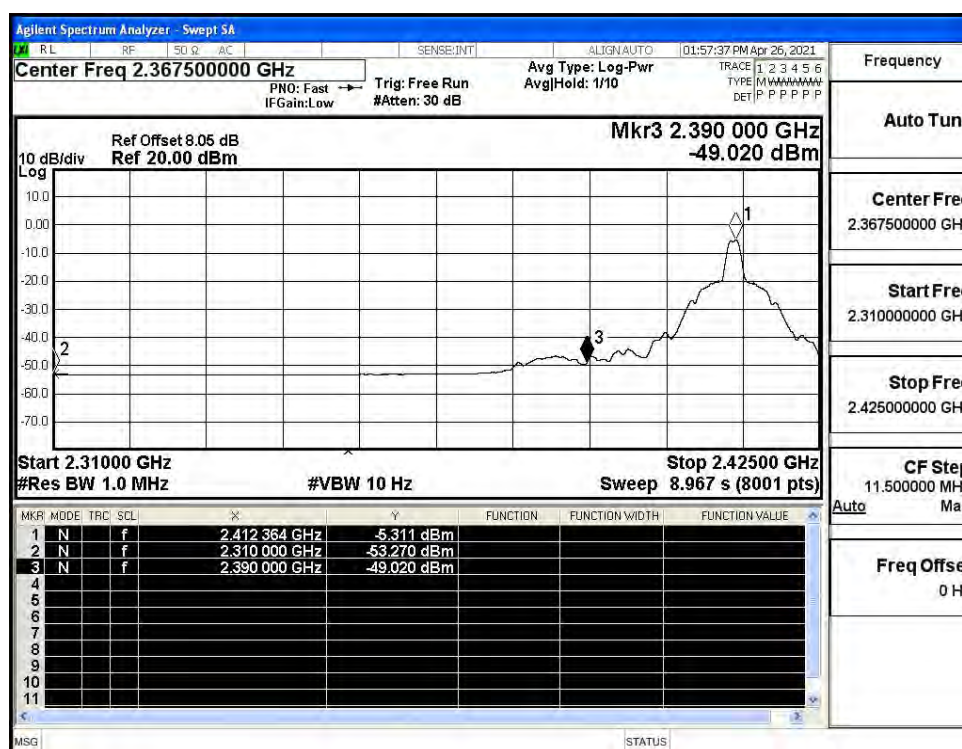
A.7 Restrict-band band-edge measurements

Test Mode	Test Channel	Ant	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
11B	2412	Ant1	2310.0	-43.51	2.0	0	53.72	PEAK	74	PASS
	2412	Ant1	2310.0	-53.27	2.0	0	43.96	AV	54	PASS
	2412	Ant1	2390.0	-37.32	2.0	0	59.91	PEAK	74	PASS
	2412	Ant1	2390.0	-49.02	2.0	0	48.21	AV	54	PASS
	2462	Ant1	2483.5	-38.29	2.0	0	58.94	PEAK	74	PASS
	2462	Ant1	2483.5	-48.66	2.0	0	48.57	AV	54	PASS
	2462	Ant1	2500.0	-41.59	2.0	0	55.64	PEAK	74	PASS
	2462	Ant1	2500.0	-52.43	2.0	0	44.80	AV	54	PASS
11G	2412	Ant1	2310.0	-41.58	2.0	0	55.65	PEAK	74	PASS
	2412	Ant1	2310.0	-53.36	2.0	0	43.87	AV	54	PASS
	2412	Ant1	2390.0	-36.72	2.0	0	60.51	PEAK	74	PASS
	2412	Ant1	2390.0	-49.97	2.0	0	47.26	AV	54	PASS
	2462	Ant1	2483.5	-37.11	2.0	0	60.12	PEAK	74	PASS
	2462	Ant1	2483.5	-51.42	2.0	0	45.81	AV	54	PASS
	2462	Ant1	2500.0	-42.40	2.0	0	54.83	PEAK	74	PASS
	2462	Ant1	2500.0	-52.50	2.0	0	44.73	AV	54	PASS
11N20 SISO	2412	Ant1	2310.0	-41.34	2.0	0	55.89	PEAK	74	PASS
	2412	Ant1	2310.0	-53.36	2.0	0	43.87	AV	54	PASS
	2412	Ant1	2390.0	-28.88	2.0	0	68.35	PEAK	74	PASS
	2412	Ant1	2390.0	-49.91	2.0	0	47.32	AV	54	PASS
	2462	Ant1	2483.5	-38.23	2.0	0	59.00	PEAK	74	PASS
	2462	Ant1	2483.5	-51.36	2.0	0	45.87	AV	54	PASS
	2462	Ant1	2500.0	-41.87	2.0	0	55.36	PEAK	74	PASS
	2462	Ant1	2500.0	-52.47	2.0	0	44.76	AV	54	PASS

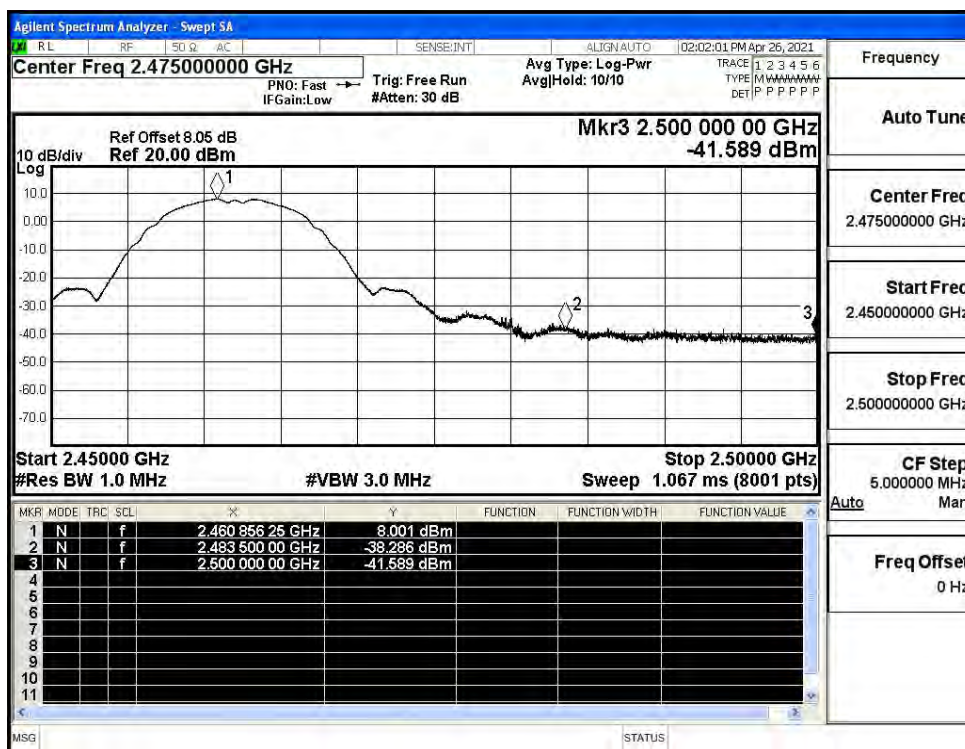
Restrict-band band-edge measurements_11B_2412_Ant1_PEAK



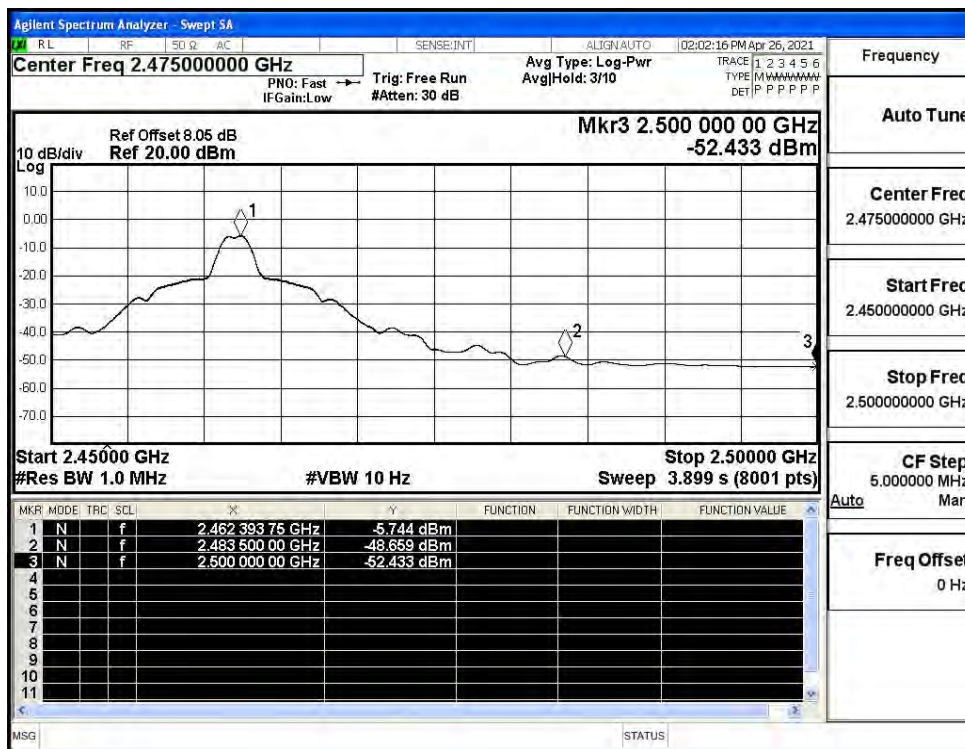
Restrict-band band-edge measurements_11B_2412_Ant1_AV



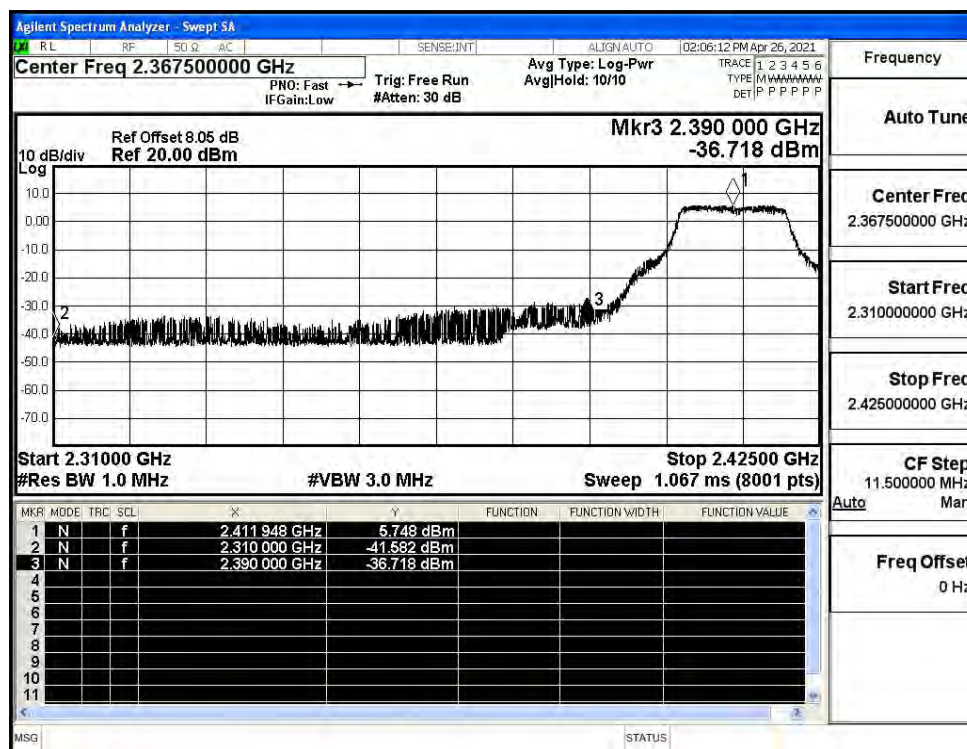
Restrict-band band-edge measurements_11B_2462_Ant1_PEAK



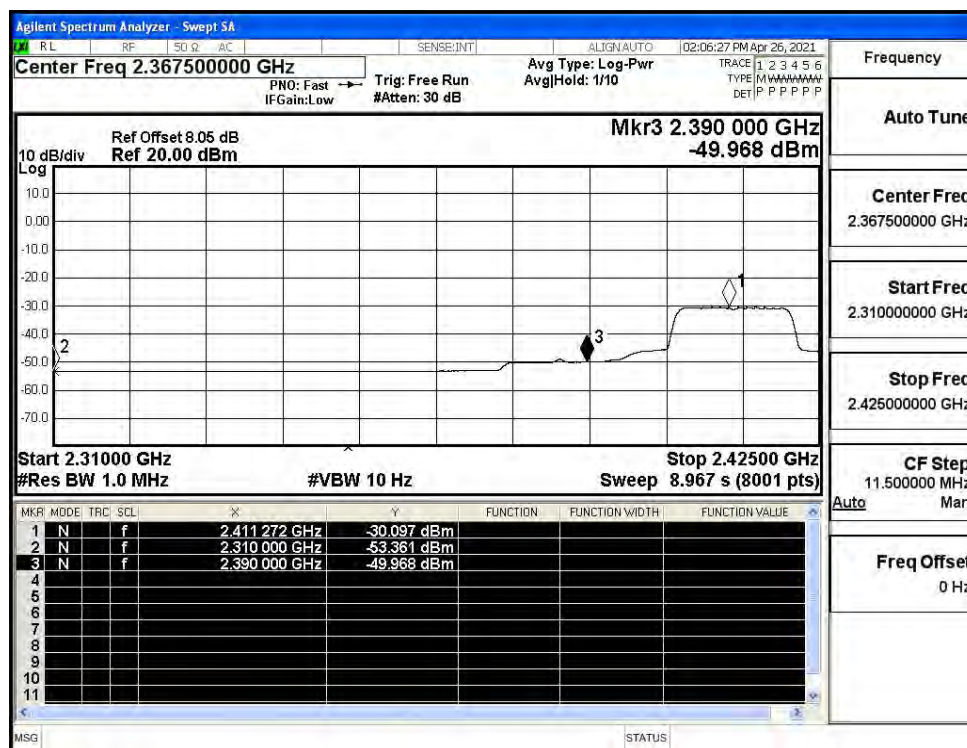
Restrict-band band-edge measurements_11B_2462_Ant1_AV



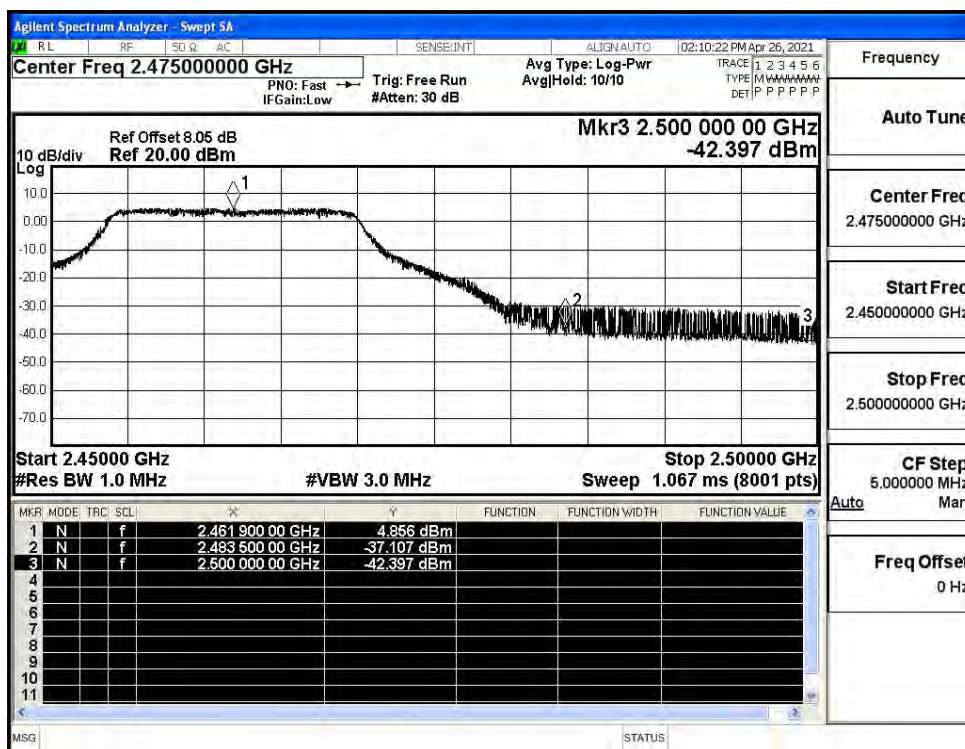
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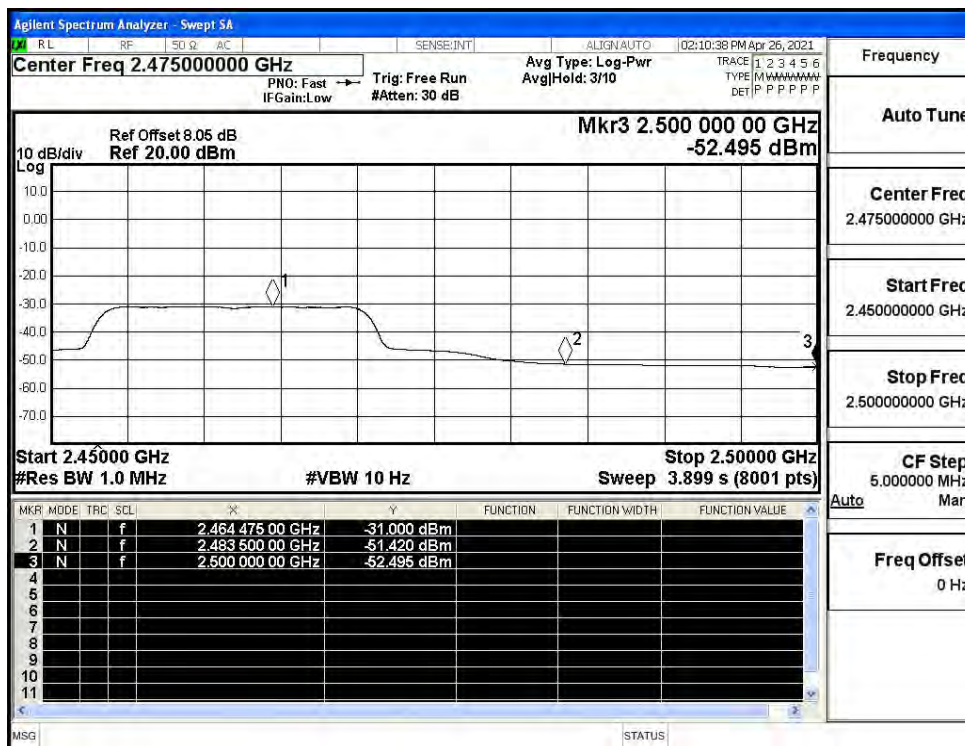
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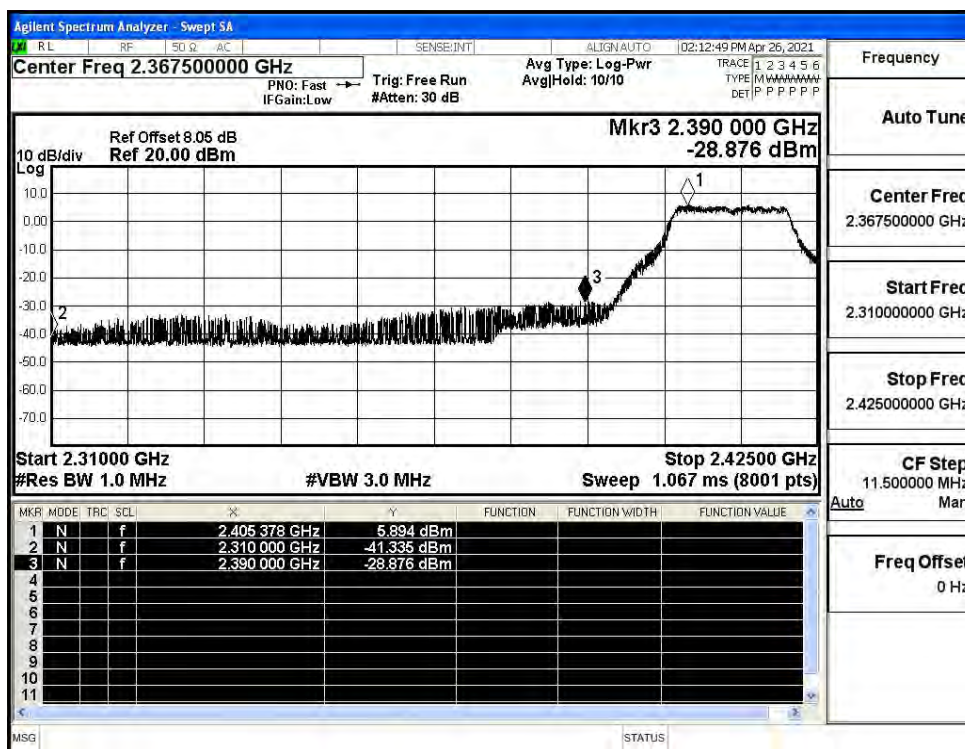
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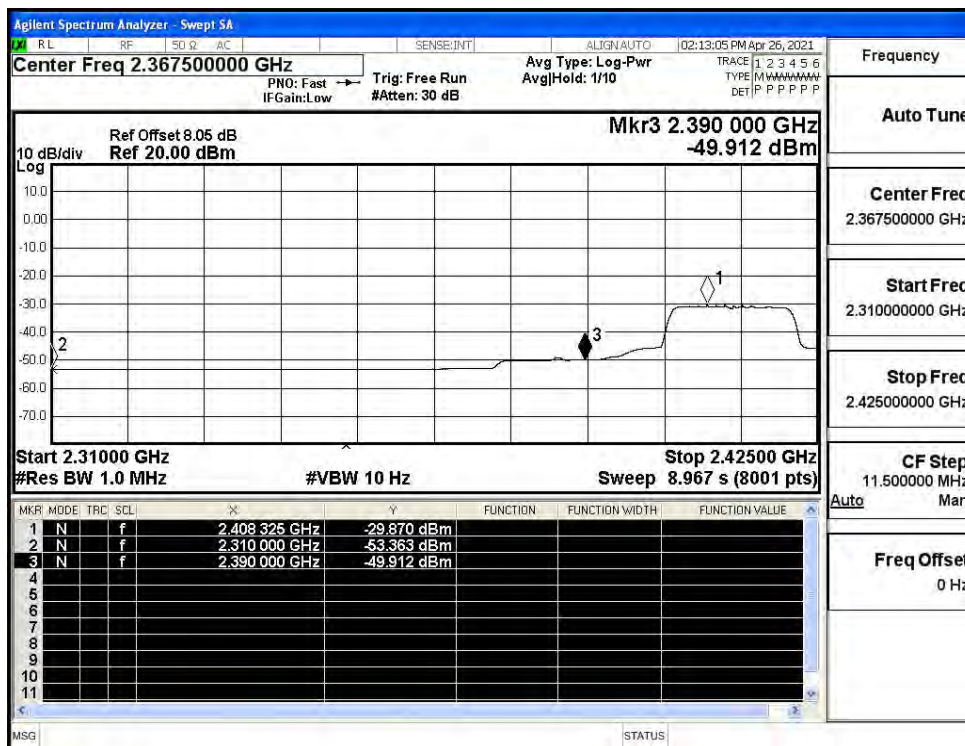
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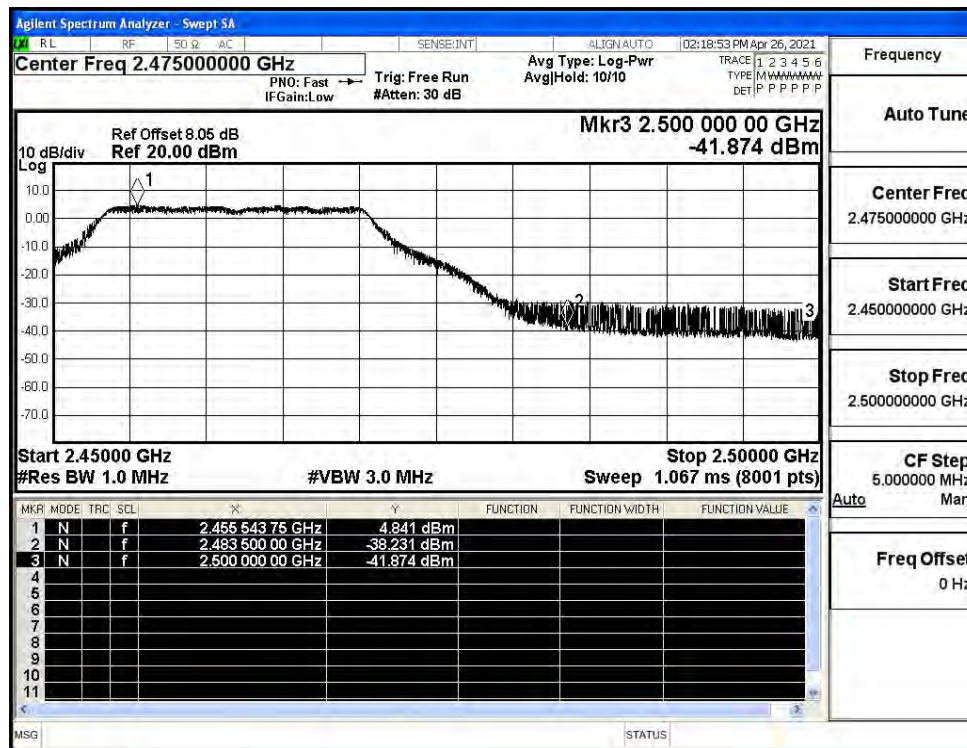
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Restrict-band band-edge measurements_11N20SISO_2412_Ant1_AV



Restrict-band band-edge measurements_11N20SISO_2462_Ant1_PEAK



Restrict-band band-edge measurements_11N20SISO_2462_Ant1_AV

