



Appendix A

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: 3D Printer

Trade Mark:  **FLASHFORGE®**
3D PRINTER

Test Model: Foto 8.9S

Environmental Conditions

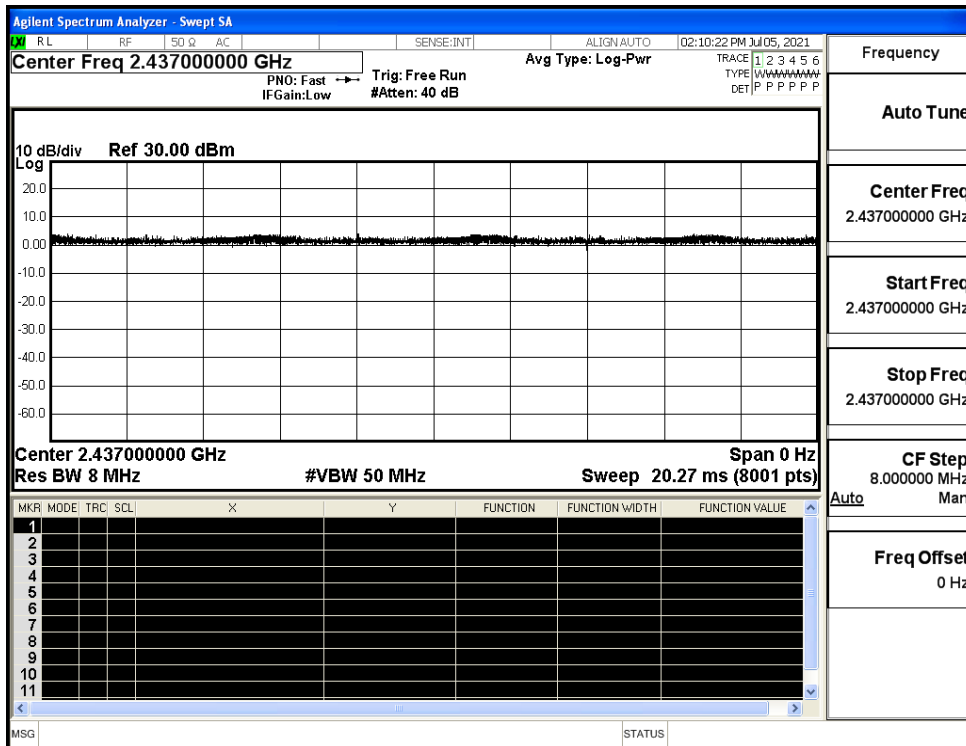
Temperature:	21.6° C
Relative Humidity:	52.7%
ATM Pressure:	100.0 kPa
Test Engineer:	Carl Fu
Supervised by:	Li Huan

A.1 Duty Cycle

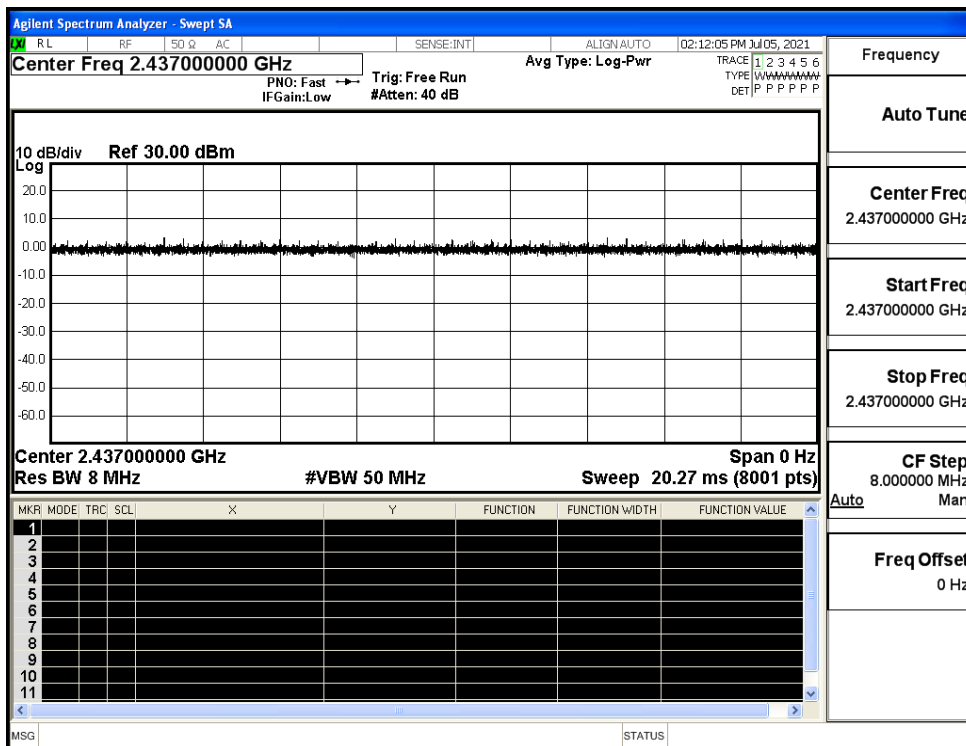
Test Mode	Test Channel	Ant	Duty Cycle[%]	Verdict
11B	2437	Ant1	100	PASS
11G	2437	Ant1	100	PASS
11N20SISO	2437	Ant1	100	PASS
11N40SISO	2437	Ant1	100	PASS



Duty Cycle_11B_2437_Ant1

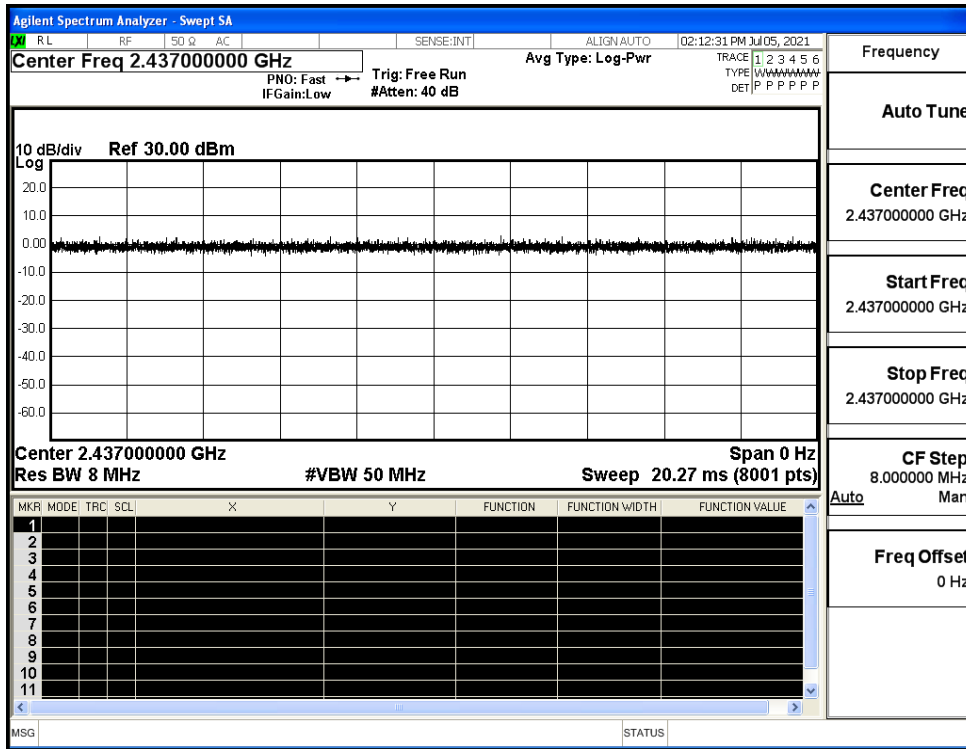


Duty Cycle_11G_2437_Ant1

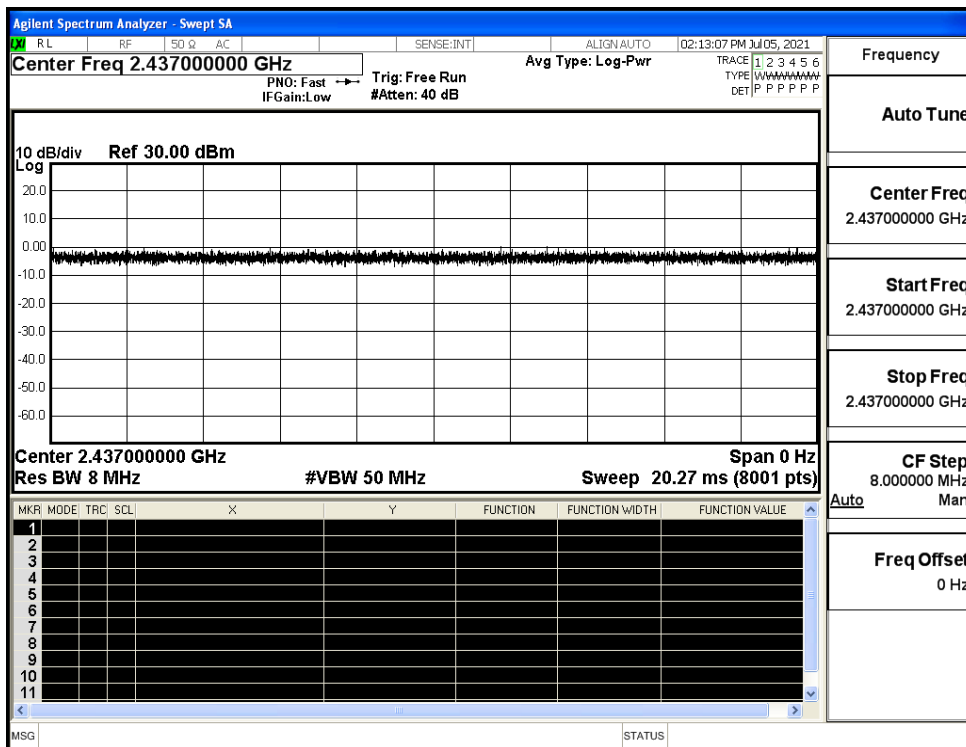




Duty Cycle_11N20SISO_2437_Ant1



Duty Cycle_11N40SISO_2437_Ant1





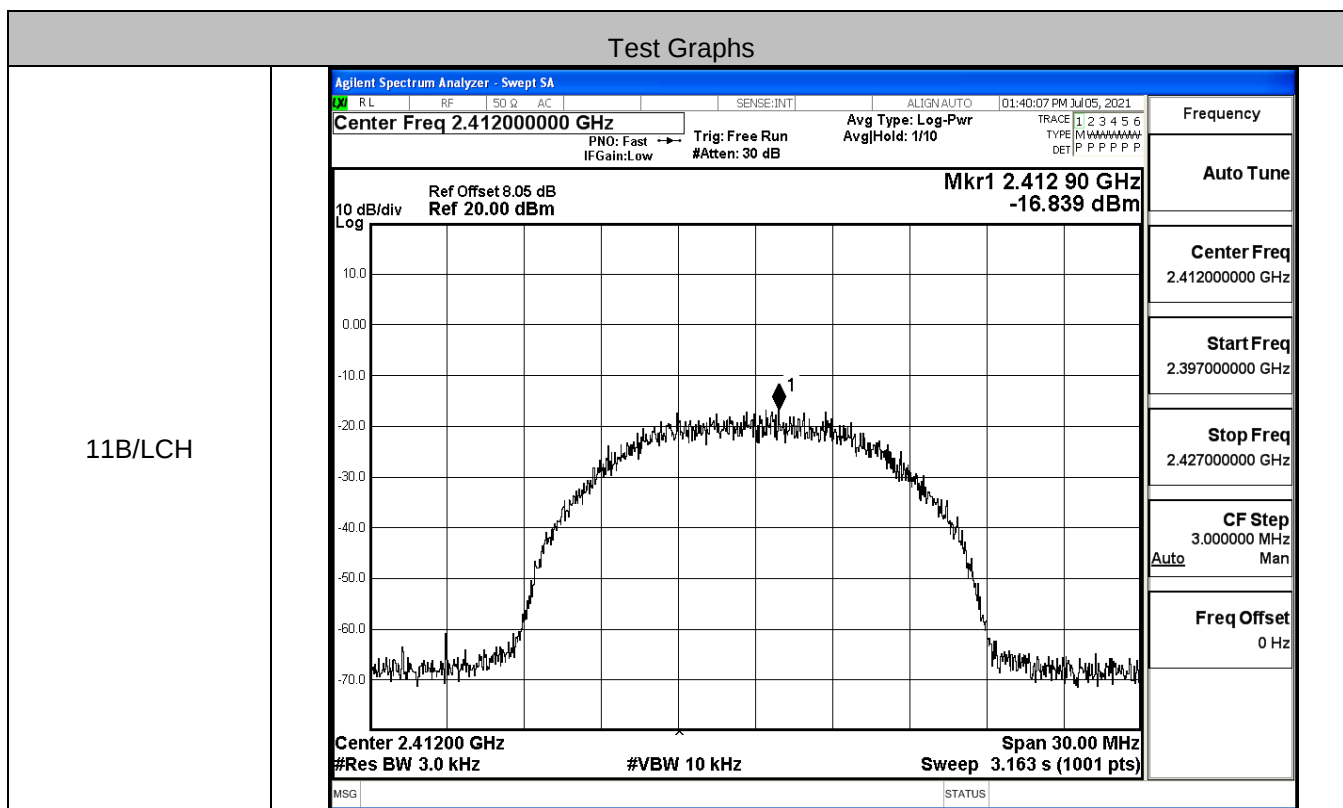
A.2 Maximum Conducted Output Power

Mode	Channel	Meas.Level [dBm]	Limit [dBm]	Verdict
11B	LCH	15.08	30	PASS
	MCH	15.51	30	PASS
	HCH	15.82	30	PASS
11G	LCH	14.32	30	PASS
	MCH	14.83	30	PASS
	HCH	15.35	30	PASS
11N20SISO	LCH	13.82	30	PASS
	MCH	14.62	30	PASS
	HCH	14.82	30	PASS
11N40SISO	LCH	13.79	30	PASS
	MCH	13.80	30	PASS
	HCH	13.71	30	PASS



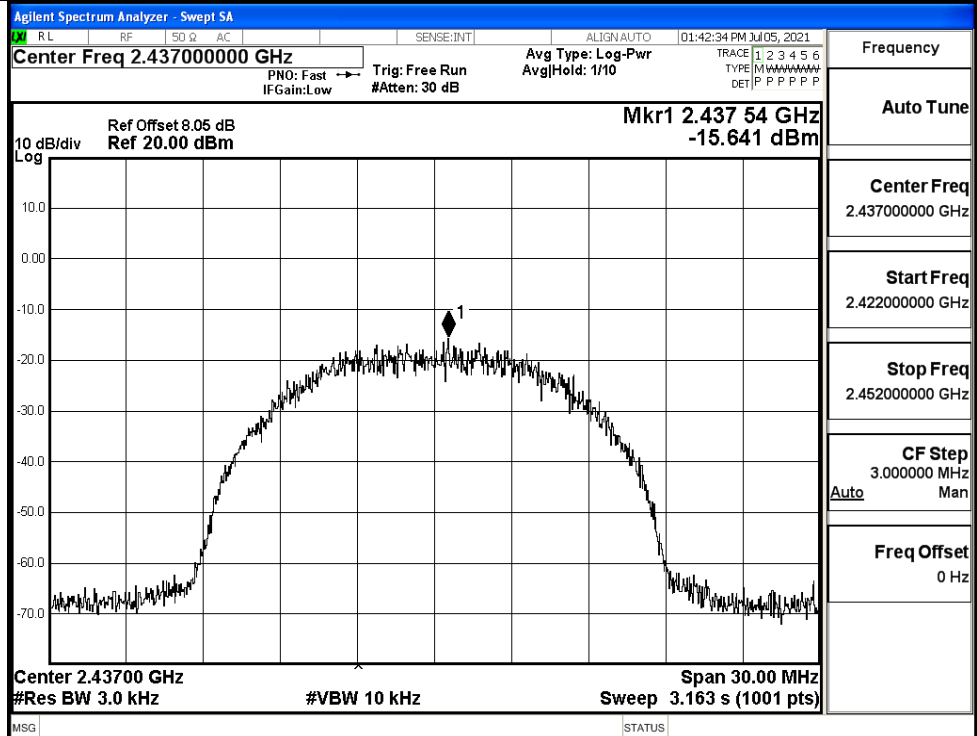
A.3 Maximum Power Spectral Density

Mode	Channel	Meas.Level [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
11B	LCH	-16.839	8	PASS
	MCH	-15.641	8	PASS
	HCH	-15.722	8	PASS
11G	LCH	-19.078	8	PASS
	MCH	-18.338	8	PASS
	HCH	-17.085	8	PASS
11N20SISO	LCH	-19.192	8	PASS
	MCH	-17.932	8	PASS
	HCH	-17.565	8	PASS
11N40SISO	LCH	-18.354	8	PASS
	MCH	-16.827	8	PASS
	HCH	-16.753	8	PASS

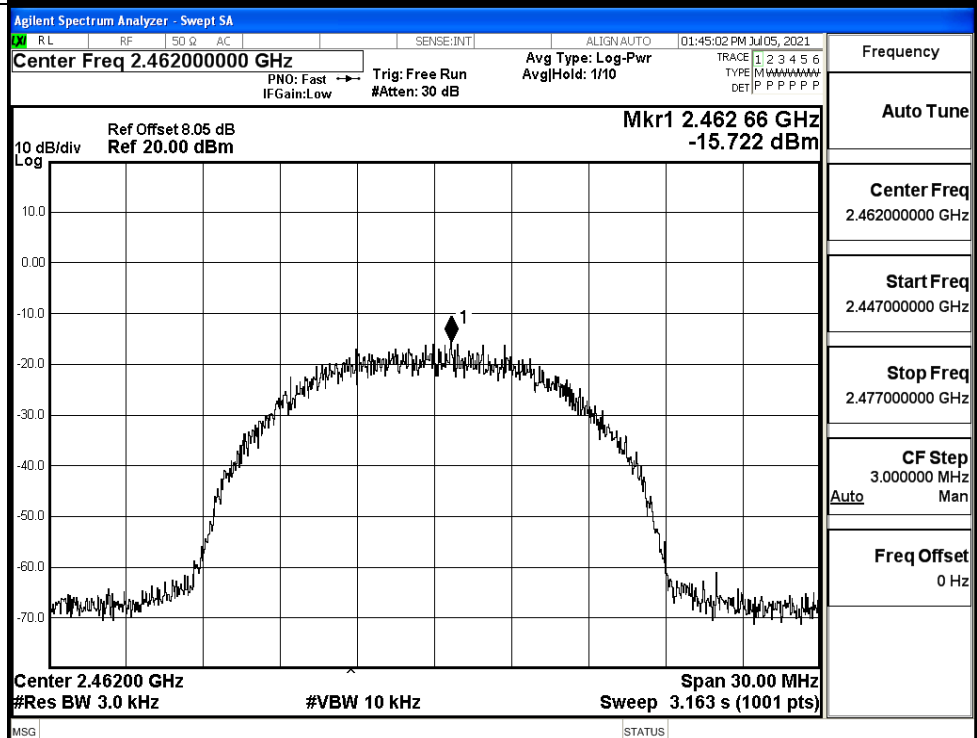




11B/MCH

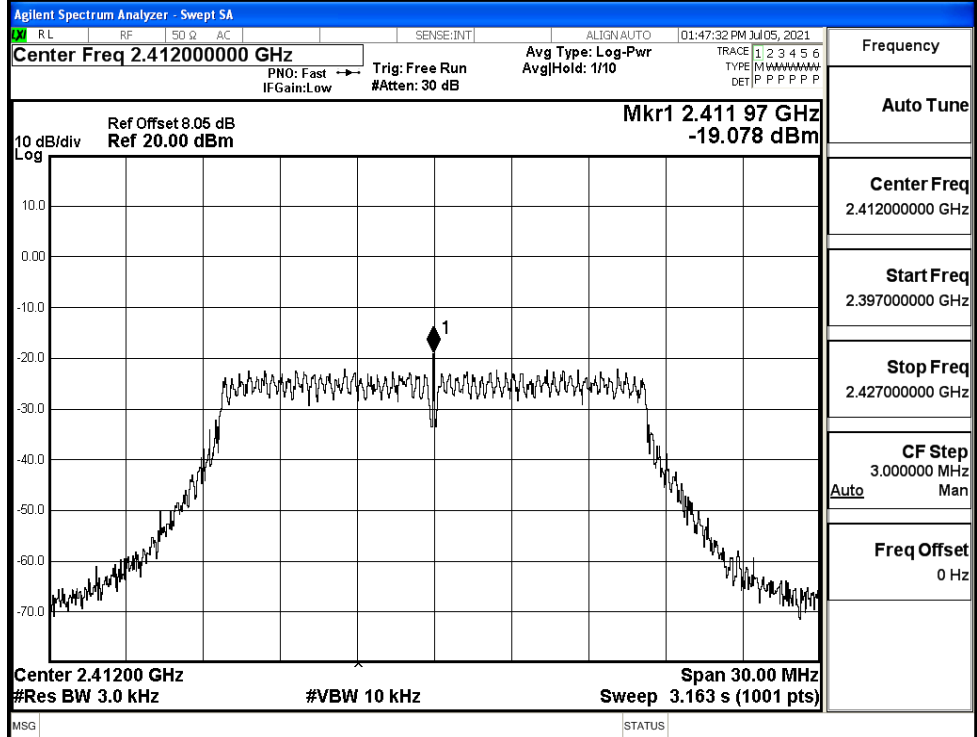


11B/HCH

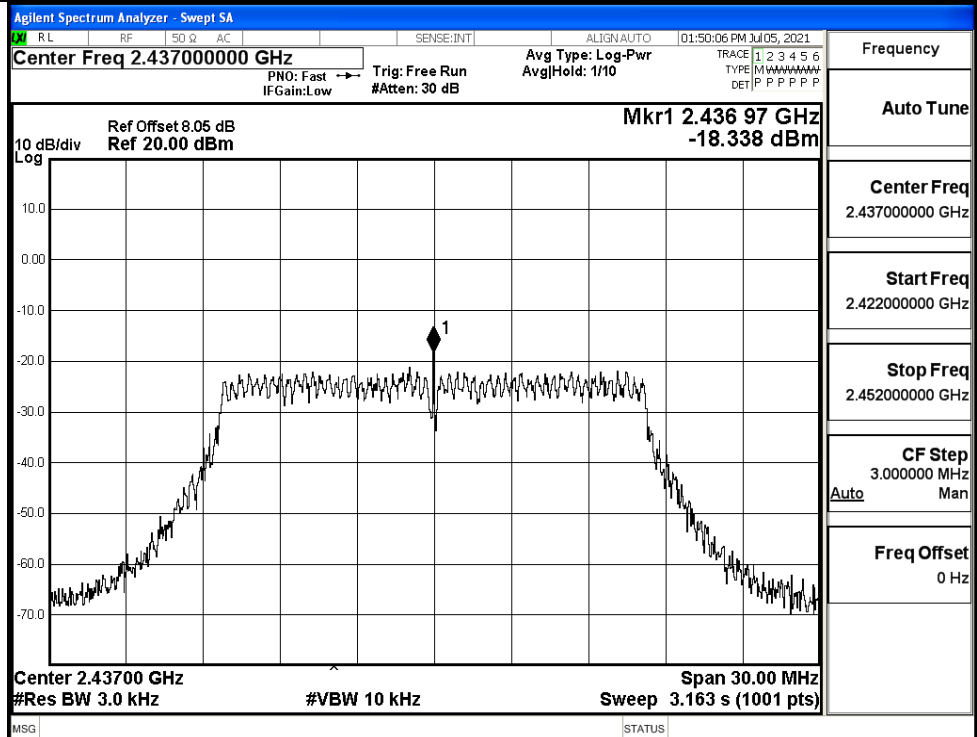




11G/LCH



11G/MCH

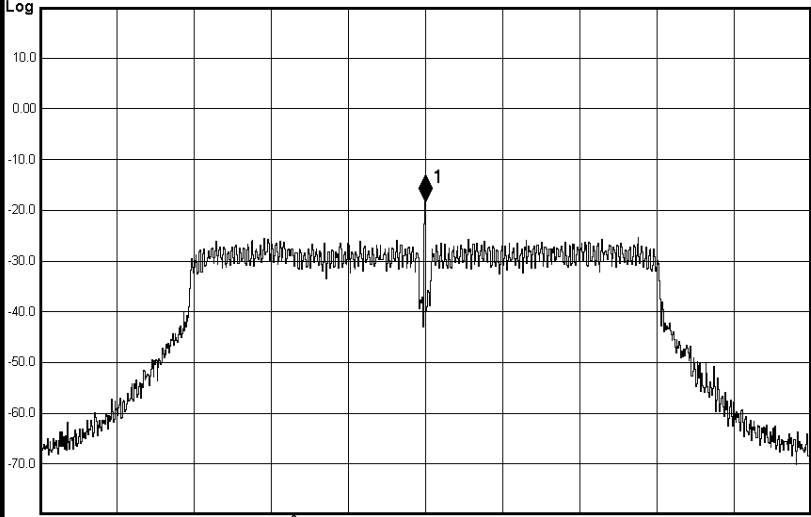
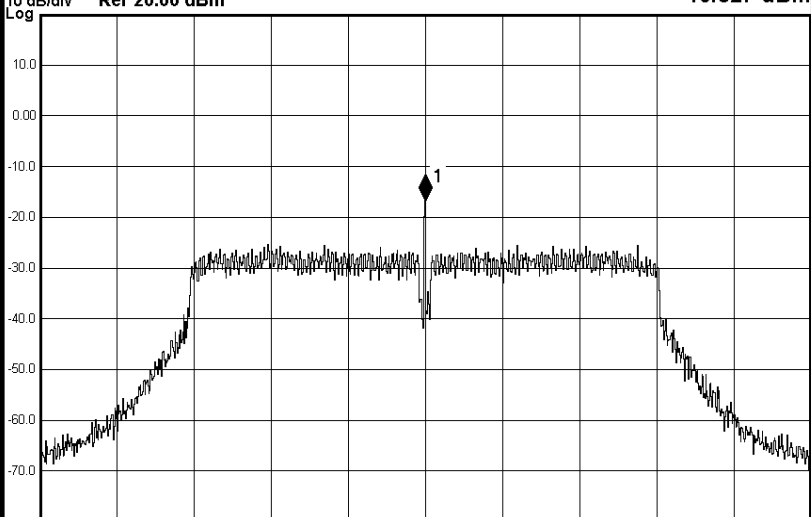


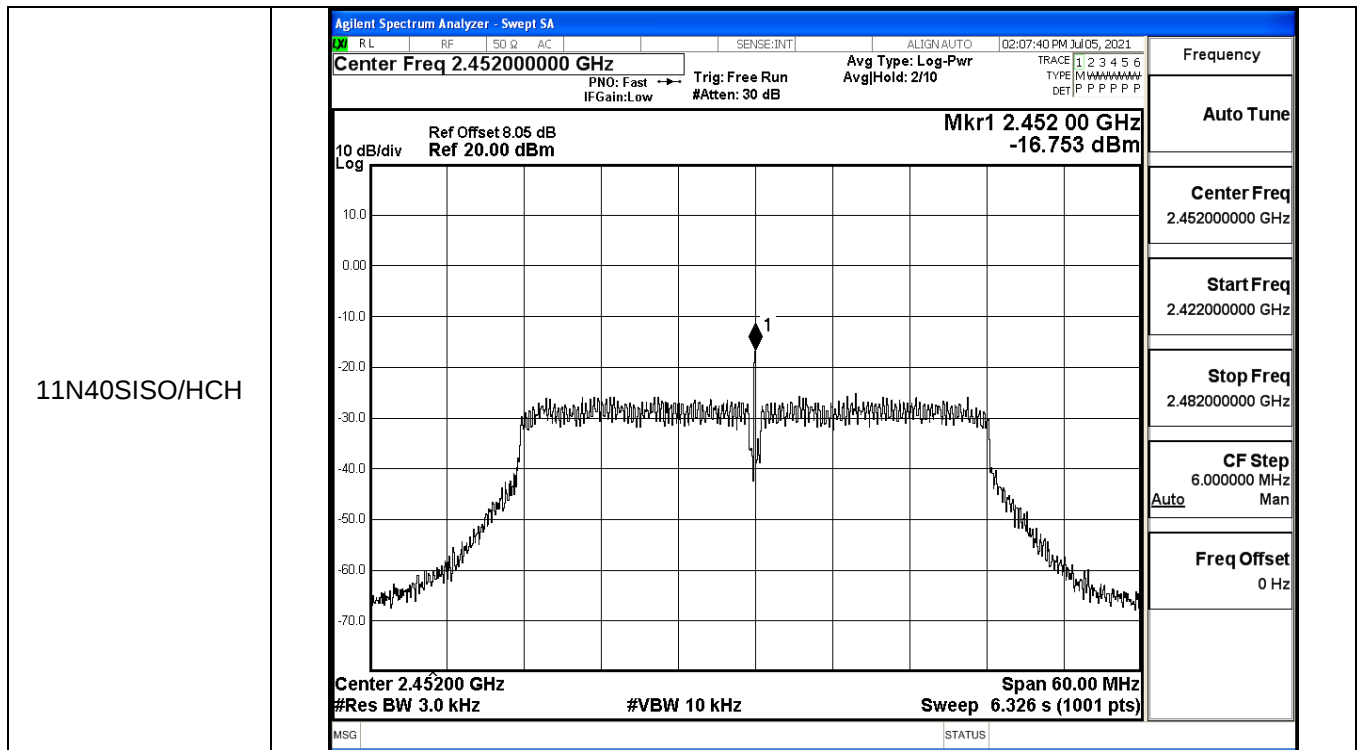
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11N20SISO/MCH	Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC SENSE:INT ALIGN:AUTO 01:57:04 PM Jul 05, 2021 Center Freq 2.437000000 GHz PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB Avg Type: Log-Pwr Avg Hold: 1/10 TRACE 1 2 3 4 5 6 TYPE [M W A W A W A W A W] DET [P P P P P P P P] Ref Offset 8.05 dB Ref 20.00 dBm Mkr1 2.436 97 GHz -17.932 dBm Center 2.43700 GHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 3.163 s (1001 pts) MSG STATUS 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 RL RF 50 Ω AC SENSE:INT ALIGN:AUTO 01:59:49 PM Jul 05, 2021 Center Freq 2.462000000 GHz PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB Avg Type: Log-Pwr Avg Hold: 1/10 TRACE 1 2 3 4 5 6 TYPE [M W A W A W A W A W] DET [P P P P P P P P] Ref Offset 8.05 dB Ref 20.00 dBm Mkr1 2.461 97 GHz -17.565 dBm Center 2.46200 GHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 3.163 s (1001 pts) MSG STATUS 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



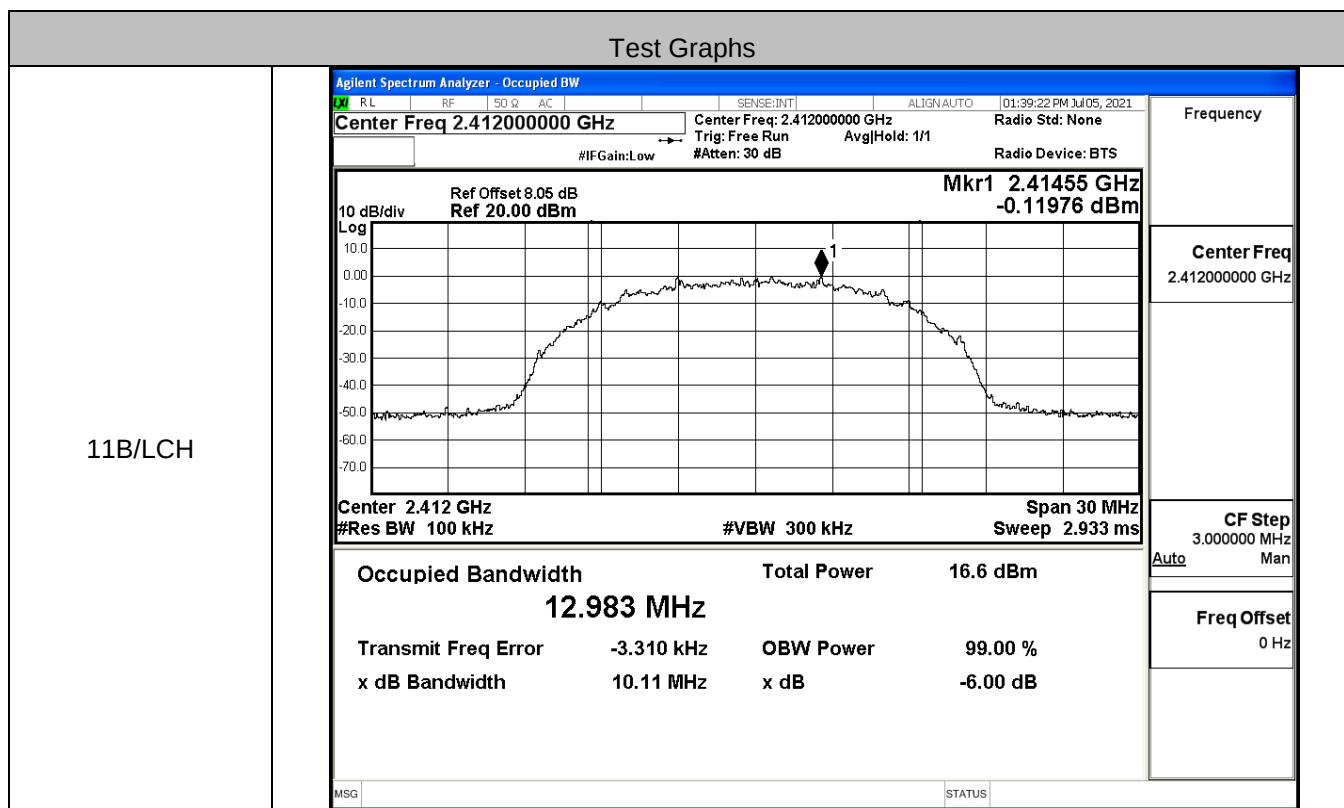
11N40SISO/LCH	Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC SENSE:INT ALIGN:AUTO 02:03:13 PM Jul 05, 2021 Center Freq 2.422000000 GHz PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 1/10 TRACE 1 2 3 4 5 6 TYPE [M] W [A] W [A] W [A] W [A] W [A] W [A] DET [P] P P P P P P Ref Offset 8.05 dB Ref 20.00 dBm Mkr1 2.422 00 GHz -18.354 dBm 10 dB/div Log  Center 2.42200 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 60.00 MHz Sweep 6.326 s (1001 pts) MSG STATUS Frequency Auto Tune Center Freq 2.422000000 GHz Start Freq 2.392000000 GHz Stop Freq 2.452000000 GHz CF Step 6.000000 MHz Auto Man Freq Offset 0 Hz
11N40SISO/MCH	Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC SENSE:INT ALIGN:AUTO 02:05:47 PM Jul 05, 2021 Center Freq 2.437000000 GHz PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 1/10 TRACE 1 2 3 4 5 6 TYPE [M] W [A] W [A] W [A] W [A] W [A] DET [P] P P P P P P Ref Offset 8.05 dB Ref 20.00 dBm Mkr1 2.437 00 GHz -16.827 dBm 10 dB/div Log  Center 2.43700 GHz #Res BW 3.0 kHz #VBW 10 kHz Span 60.00 MHz Sweep 6.326 s (1001 pts) MSG STATUS Frequency Auto Tune Center Freq 2.437000000 GHz Start Freq 2.407000000 GHz Stop Freq 2.467000000 GHz CF Step 6.000000 MHz Auto Man Freq Offset 0 Hz





A.4 6dB Bandwidth

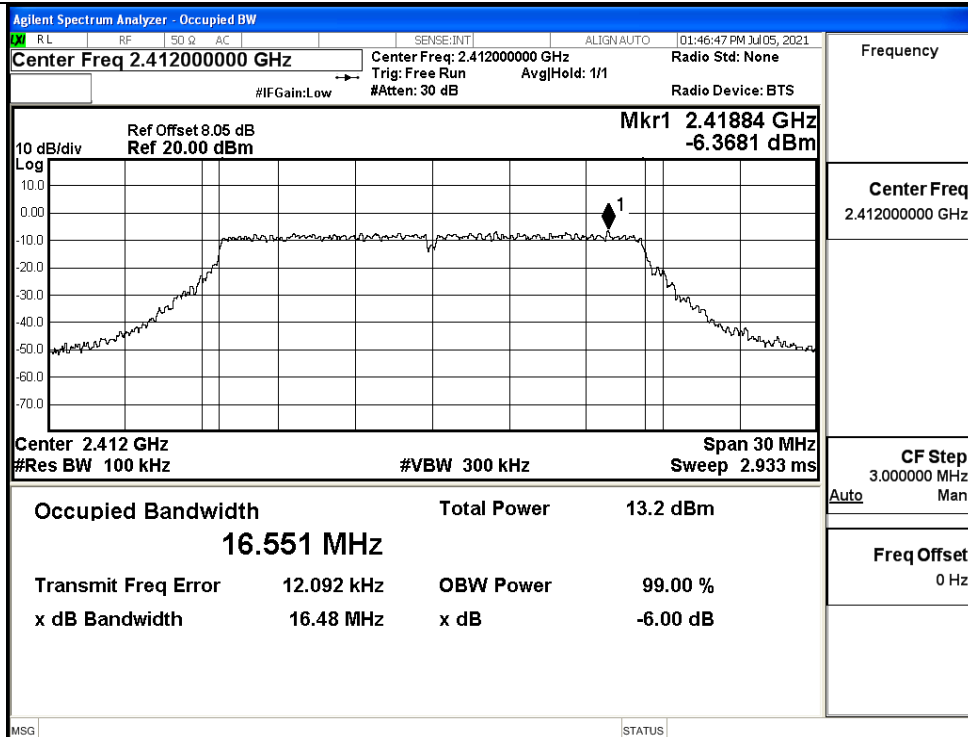
Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
11B	LCH	10.11	≥ 0.5	PASS
	MCH	10.10	≥ 0.5	PASS
	HCH	10.09	≥ 0.5	PASS
11G	LCH	16.48	≥ 0.5	PASS
	MCH	16.48	≥ 0.5	PASS
	HCH	16.50	≥ 0.5	PASS
11N20SISO	LCH	17.61	≥ 0.5	PASS
	MCH	17.61	≥ 0.5	PASS
	HCH	17.62	≥ 0.5	PASS
11N40SISO	LCH	36.47	≥ 0.5	PASS
	MCH	36.51	≥ 0.5	PASS
	HCH	36.50	≥ 0.5	PASS



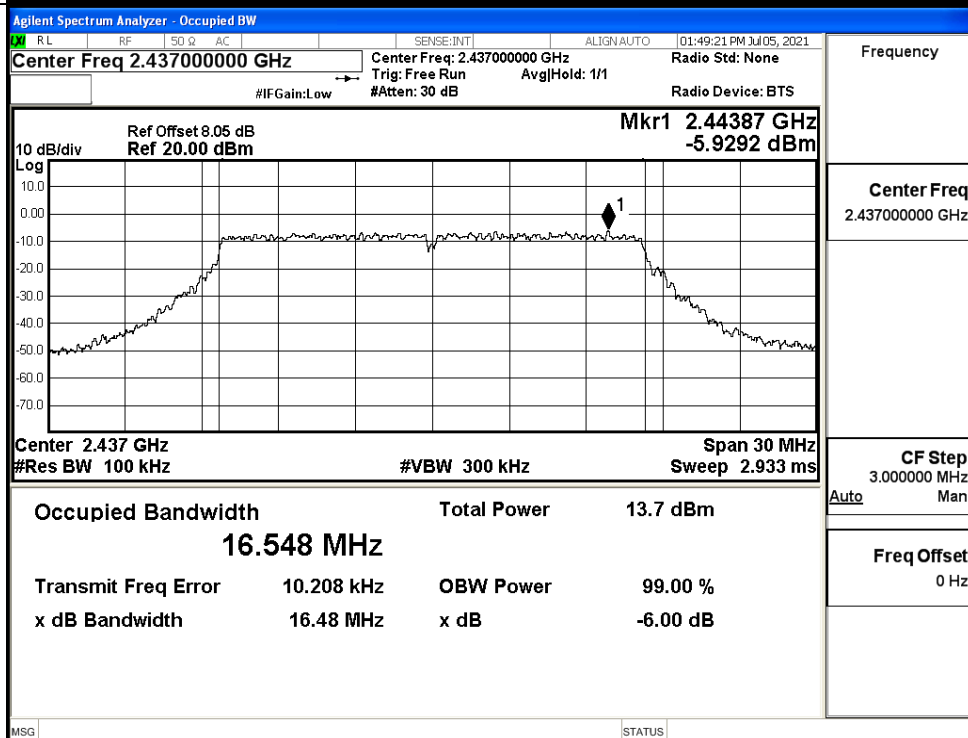
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11G/LCH

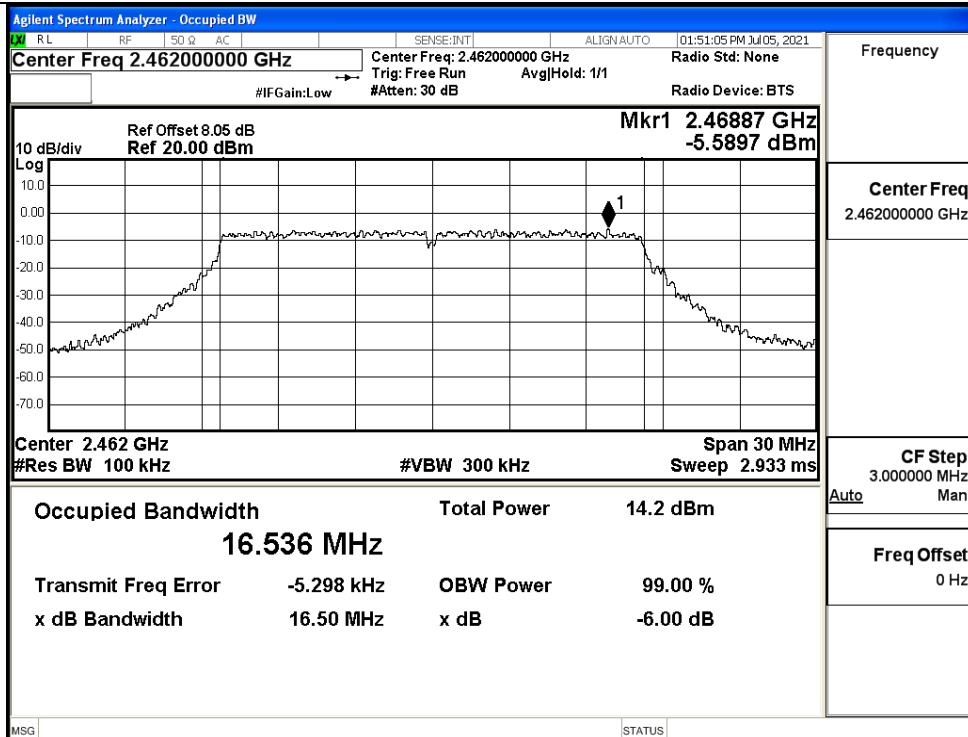


11G/MCH





11G/HCH



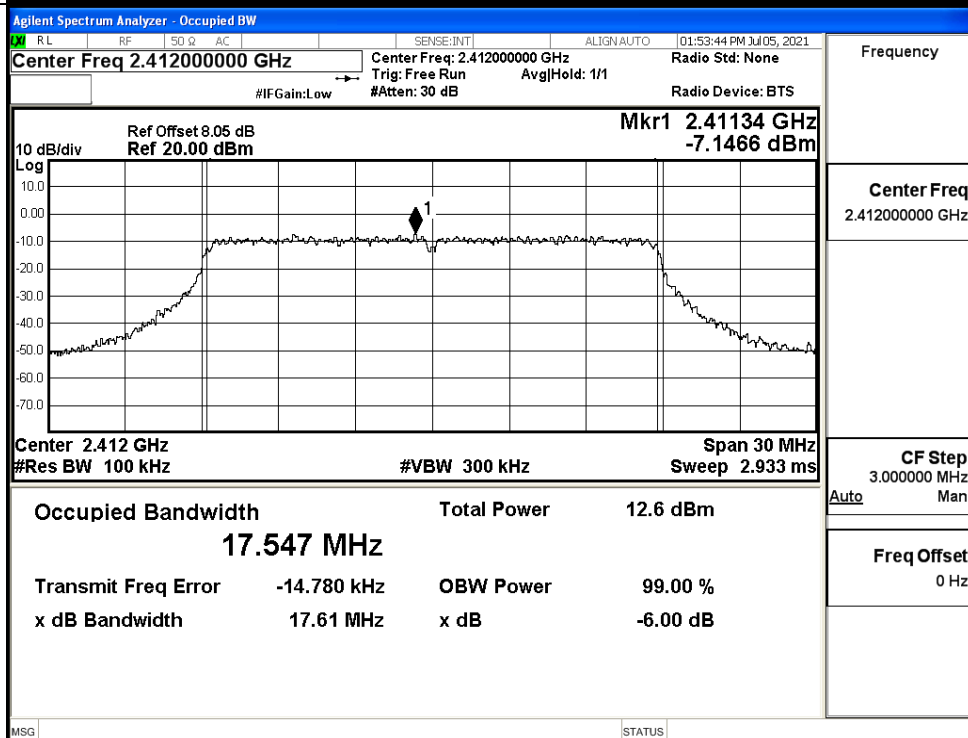
Frequency

Center Freq
2.462000000 GHz

CF Step
3.000000 MHz
Auto Man

Freq Offset
0 Hz

11N20SISO/LCH



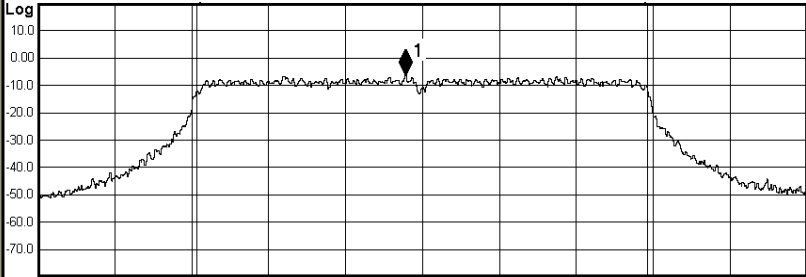
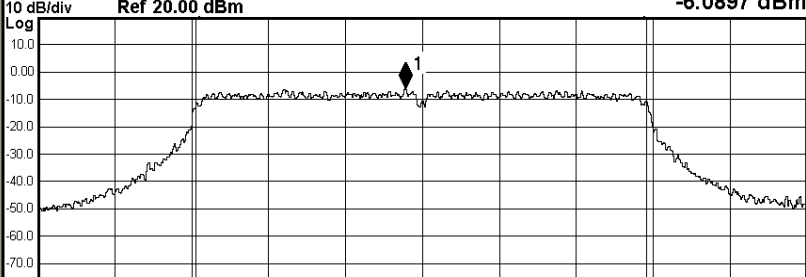
Frequency

Center Freq
2.412000000 GHz

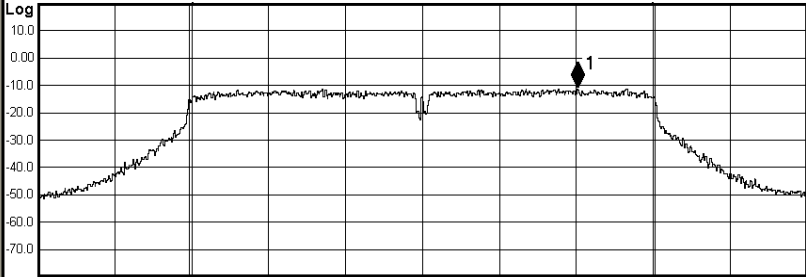
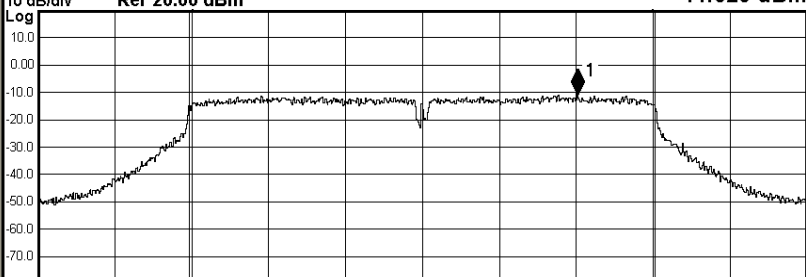
CF Step
3.000000 MHz
Auto Man

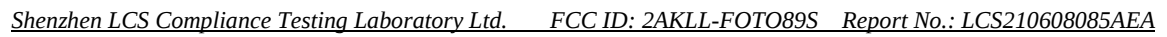
Freq Offset
0 Hz



11N20SISO/MCH	Agilent Spectrum Analyzer - Occupied BW RL RF 50 Ω AC SENSE:INT ALIGN: AUTO 01:56:19 PM Jul 05, 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 Mkr1 2.43634 GHz -6.4299 dBm Log  Center 2.437 GHz #Res BW 100 kHz #VBW 300 kHz Span 30 MHz Sweep 2.933 ms Occupied Bandwidth Total Power 13.5 dBm 17.542 MHz Transmit Freq Error -14.559 kHz OBW Power 99.00 % x dB Bandwidth 17.61 MHz x dB -6.00 dB MSG STATUS Frequency Center Freq 2.437000000 GHz CF Step 3.000000 MHz Auto Man Freq Offset 0 Hz
11N20SISO/HCH	Agilent Spectrum Analyzer - Occupied BW RL RF 50 Ω AC SENSE:INT ALIGN: AUTO 01:59:04 PM Jul 05, 2021 Center Freq 2.462000000 GHz Center Freq: 2.462000000 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 Mkr1 2.46134 GHz -6.0897 dBm Log  Center 2.462 GHz #Res BW 100 kHz #VBW 300 kHz Span 30 MHz Sweep 2.933 ms Occupied Bandwidth Total Power 13.6 dBm 17.540 MHz Transmit Freq Error -26.374 kHz OBW Power 99.00 % x dB Bandwidth 17.62 MHz x dB -6.00 dB MSG STATUS Frequency Center Freq 2.462000000 GHz CF Step 3.000000 MHz Auto Man Freq Offset 0 Hz



11N40SISO/LCH	Agilent Spectrum Analyzer - Occupied BW RL RF 50 Ω AC SENSE:INT ALIGN: AUTO 02:02:24 PM Jul 05, 2021 Center Freq 2.422000000 GHz Center Freq: 2.422000000 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 Mkr1 2.43412 GHz -11.226 dBm Log  Center 2.422 GHz #Res BW 100 kHz #VBW 300 kHz Span 60 MHz Sweep 5.8 ms Occupied Bandwidth Total Power 12.3 dBm 36.268 MHz Transmit Freq Error 2.569 kHz OBW Power 99.00 % x dB Bandwidth 36.47 MHz x dB -6.00 dB MSG STATUS Frequency Center Freq 2.422000000 GHz CF Step 6.000000 MHz Auto Man Freq Offset 0 Hz
11N40SISO/MCH	Agilent Spectrum Analyzer - Occupied BW RL RF 50 Ω AC SENSE:INT ALIGN: AUTO 02:04:58 PM Jul 05, 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 Mkr1 2.44912 GHz -11.026 dBm Log  Center 2.437 GHz #Res BW 100 kHz #VBW 300 kHz Span 60 MHz Sweep 5.8 ms Occupied Bandwidth Total Power 12.3 dBm 36.291 MHz Transmit Freq Error -2.625 kHz OBW Power 99.00 % x dB Bandwidth 36.51 MHz x dB -6.00 dB MSG STATUS Frequency Center Freq 2.437000000 GHz CF Step 6.000000 MHz Auto Man Freq Offset 0 Hz

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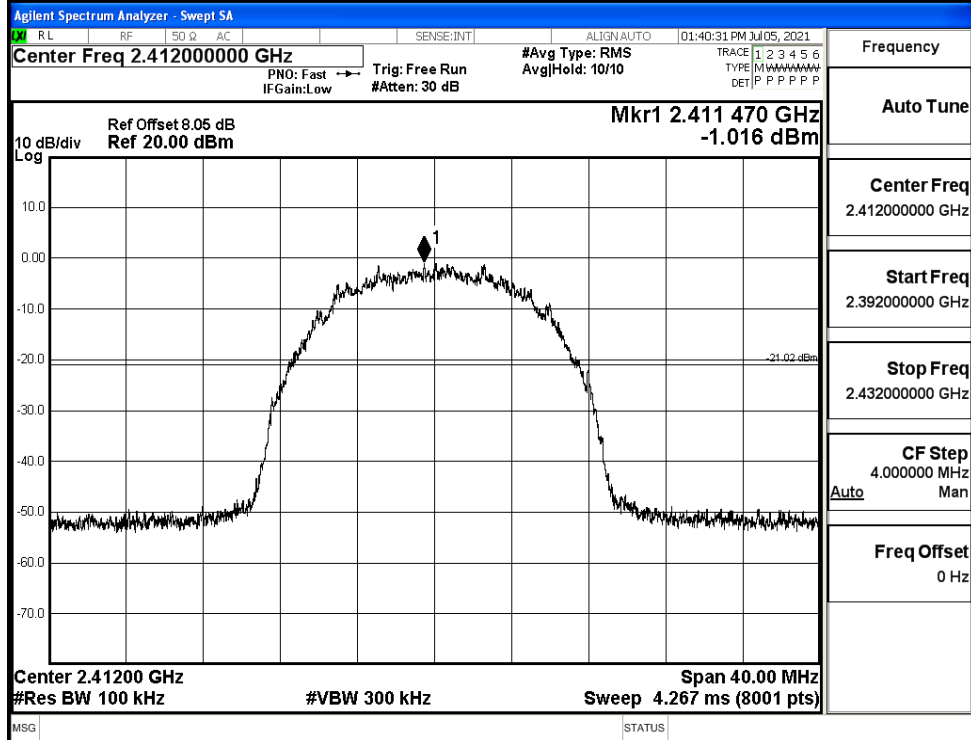
A.5 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
11B	LCH	-1.016	-37.677	-21.016	PASS
	MCH	0.202	-37.747	-19.798	PASS
	HCH	0.56	-37.969	-19.440	PASS
11G	LCH	-6.49	-37.740	-26.490	PASS
	MCH	-6.393	-37.412	-26.393	PASS
	HCH	-5.963	-37.899	-25.963	PASS
11N20 SISO	LCH	-7.505	-37.282	-27.505	PASS
	MCH	-7.027	-37.756	-27.027	PASS
	HCH	-6.482	-38.442	-26.482	PASS
11N40 SISO	LCH	-11.208	-37.890	-31.208	PASS
	MCH	-11.192	-38.080	-31.192	PASS
	HCH	-11.373	-37.563	-31.373	PASS

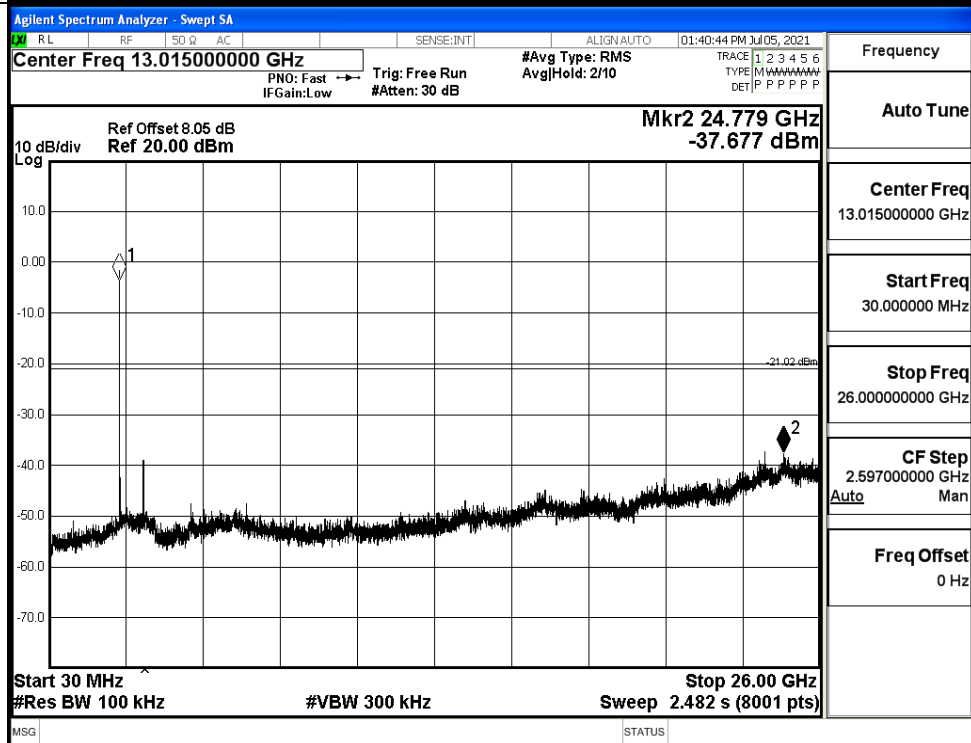


11B LCH Graphs

Pref/11B/LCH



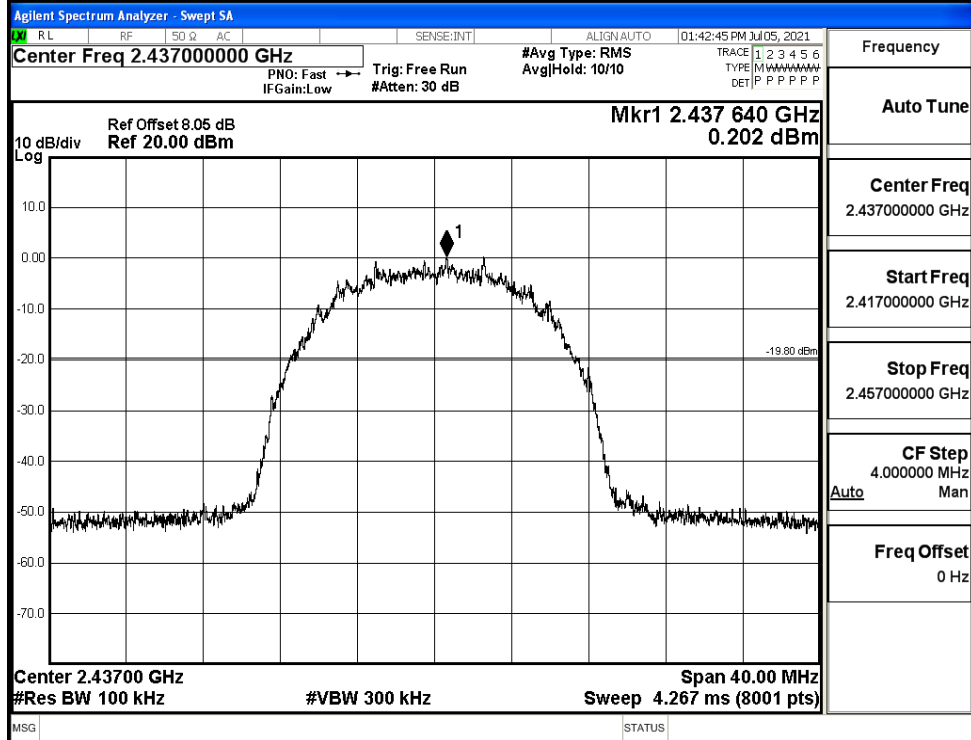
Puw/11B/LCH



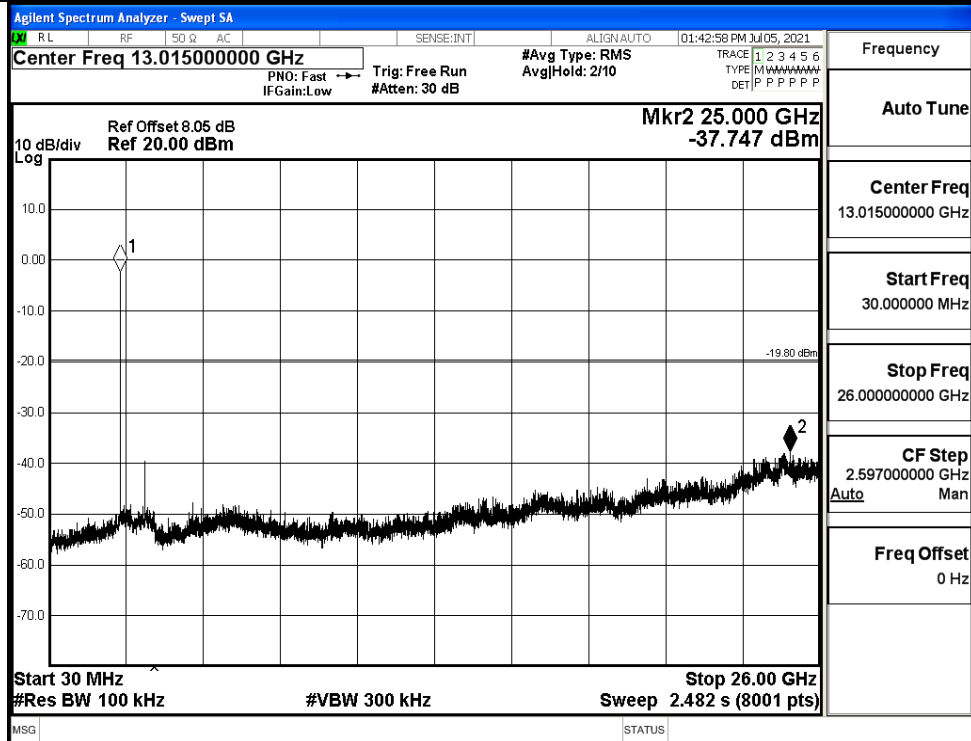


11B MCH Graphs

Pref/11B/MCH



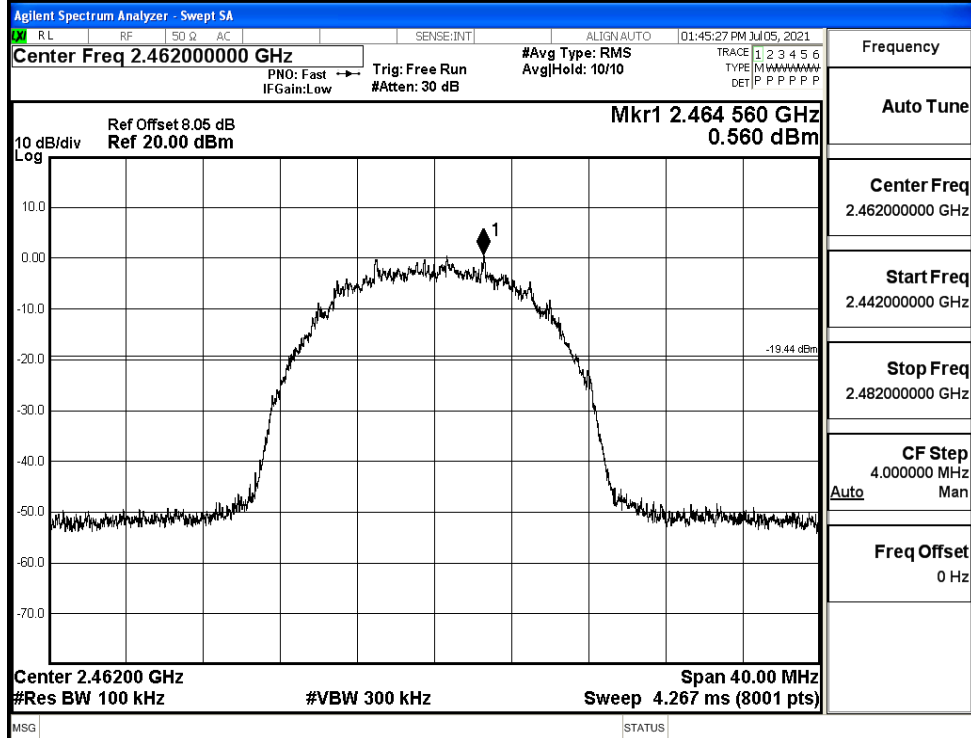
Puw/11B/MCH



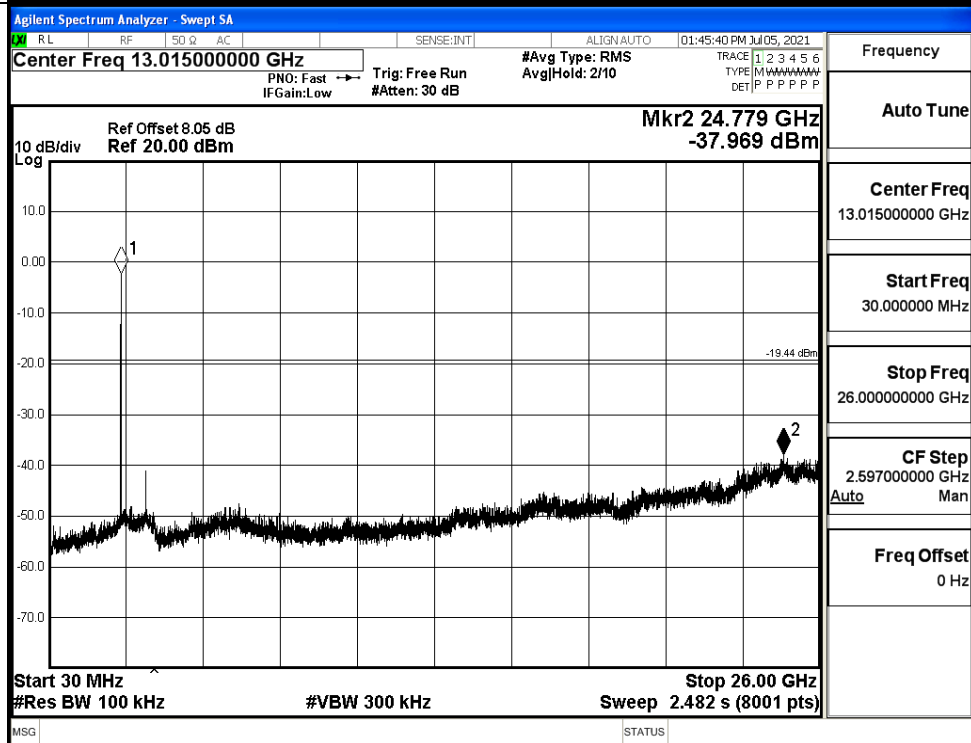


11B HCH Graphs

Pref/11B/HCH



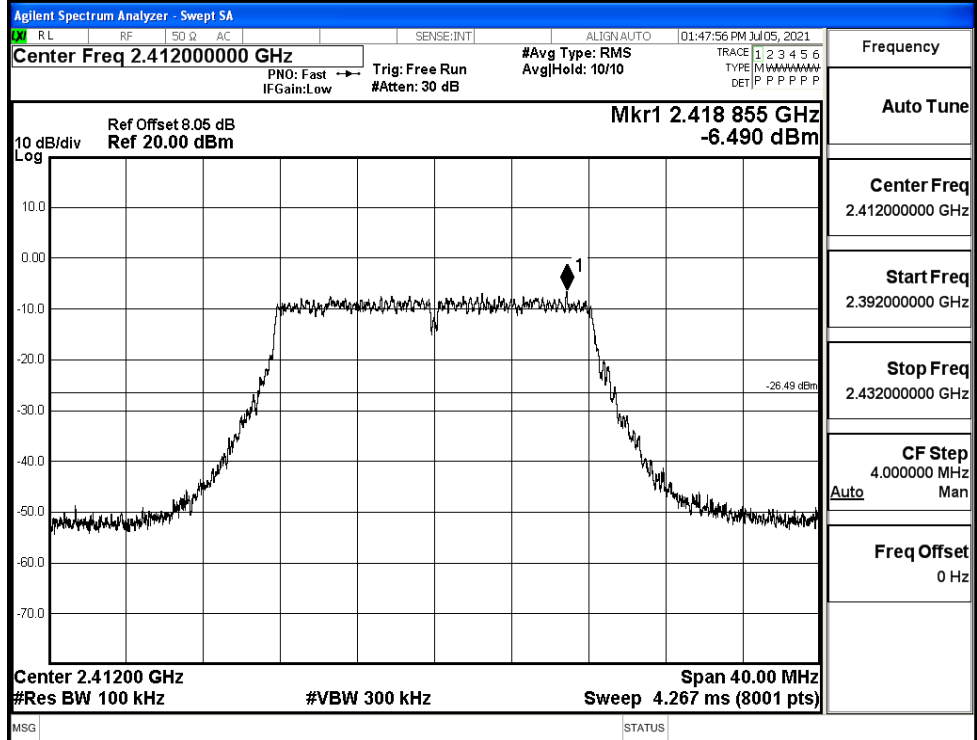
Puw/11B/HCH



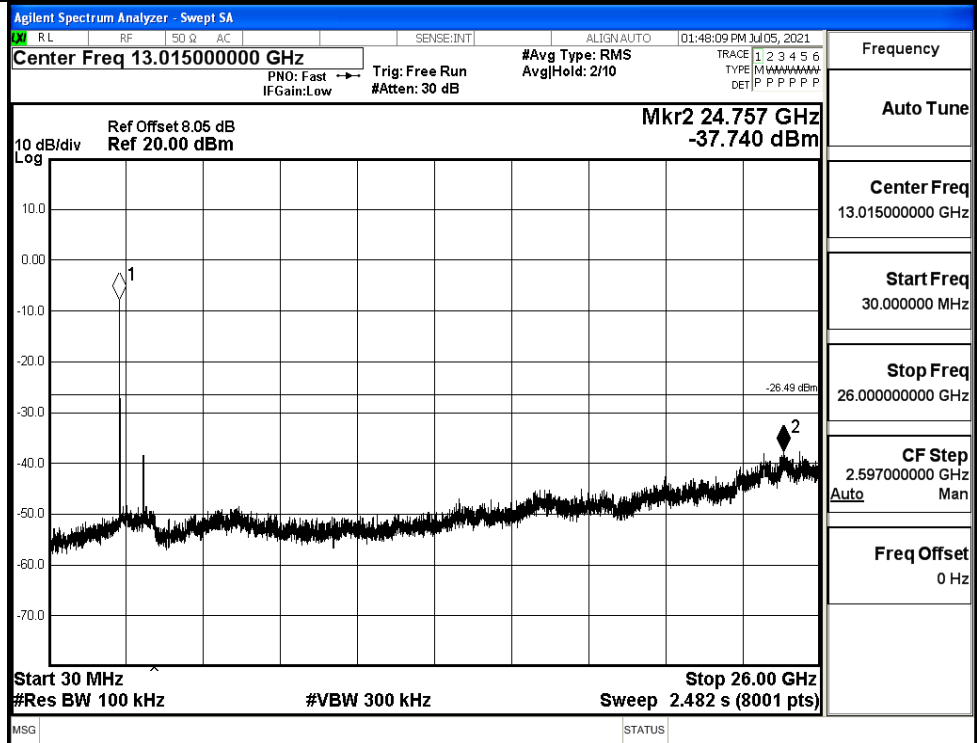


11G LCH Graphs

Pref/11G/LCH



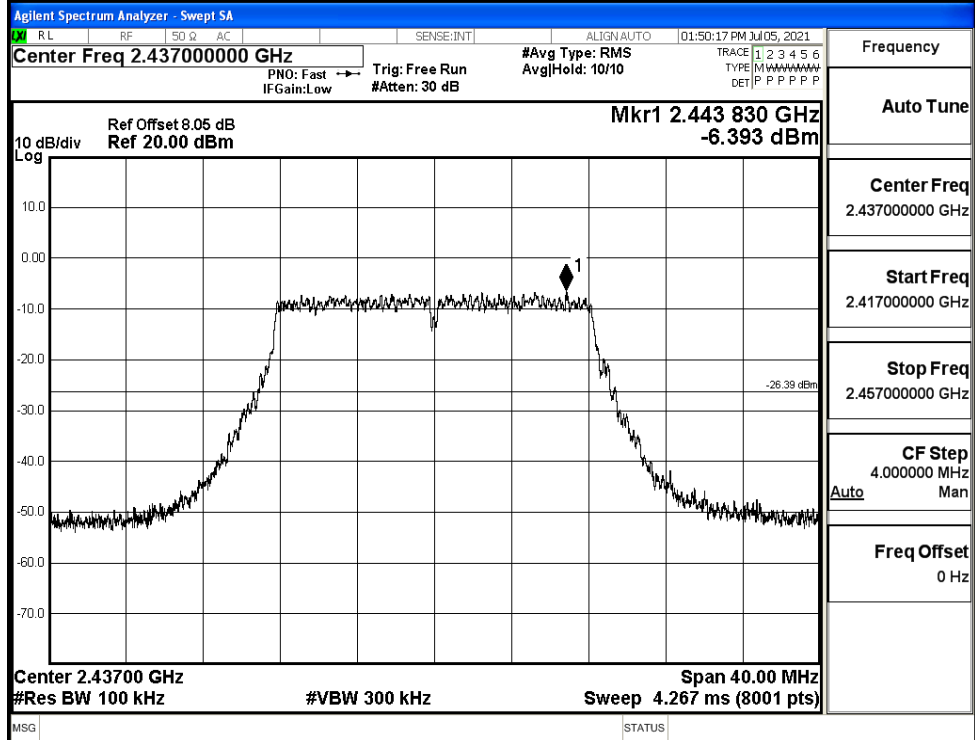
Puw/11G/LCH



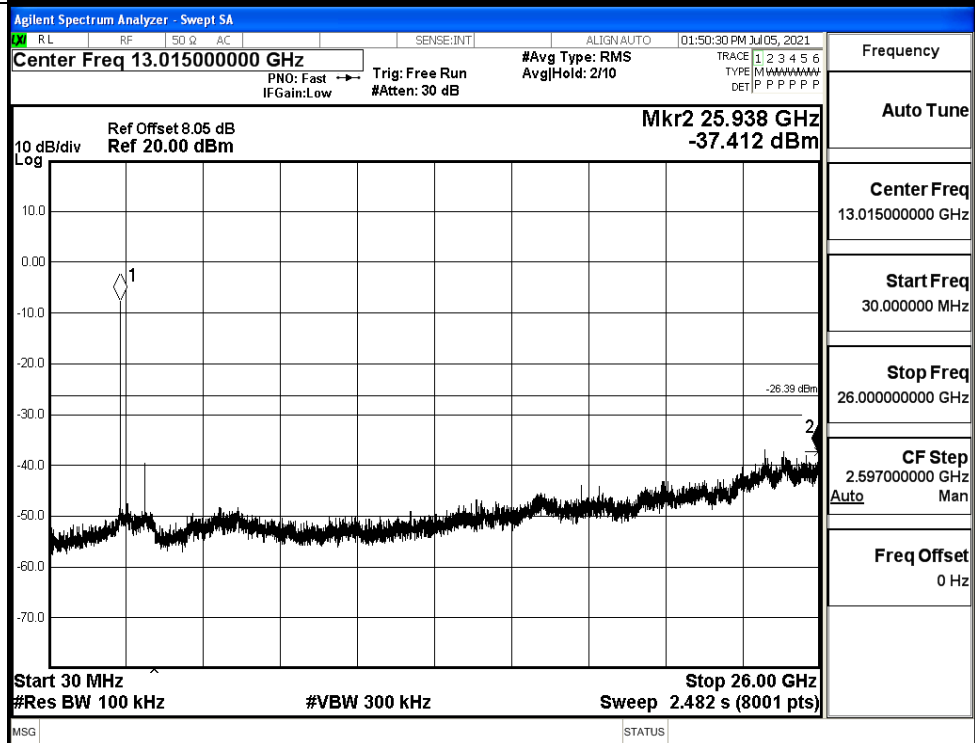


11G MCH Graphs

Pref/11G/MCH



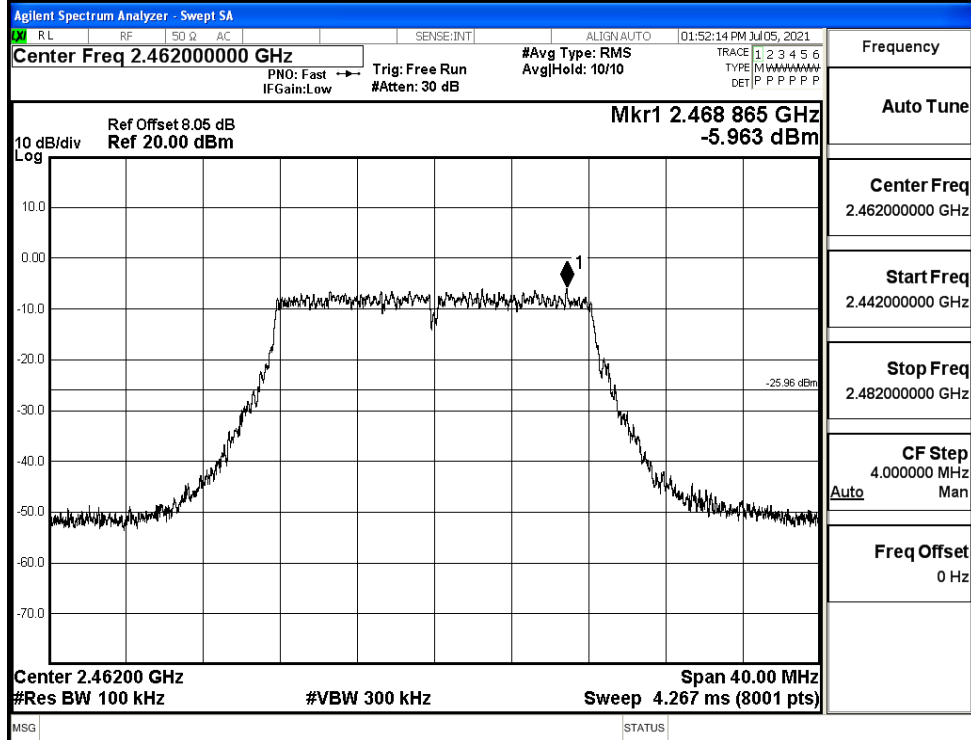
Puw/11G/MCH



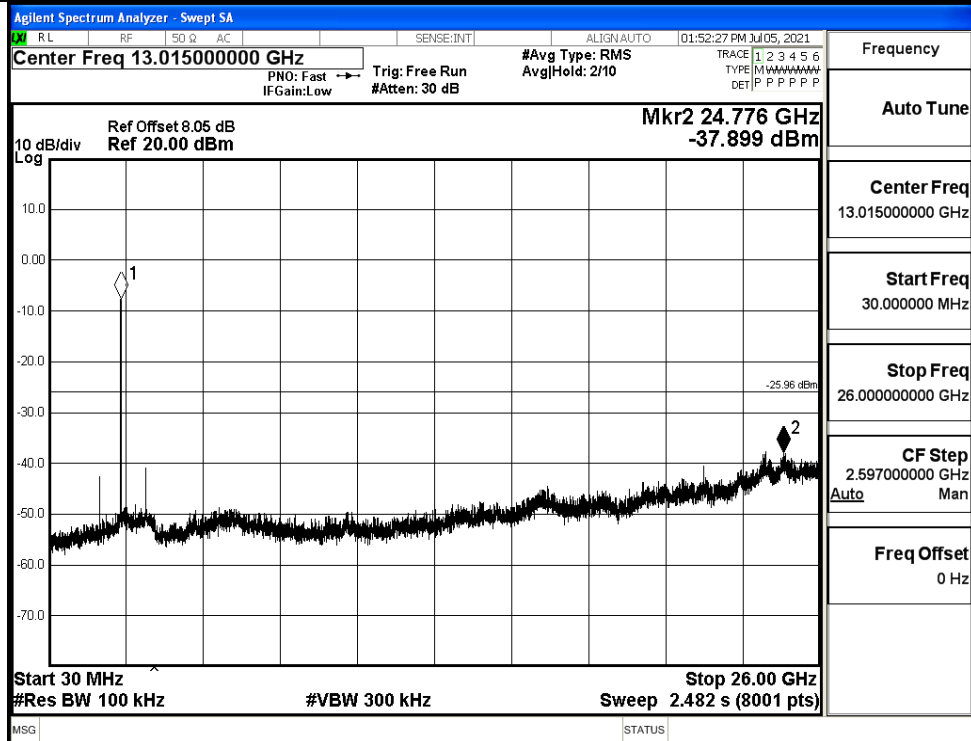


11G HCH Graphs

Pref/11G/HCH



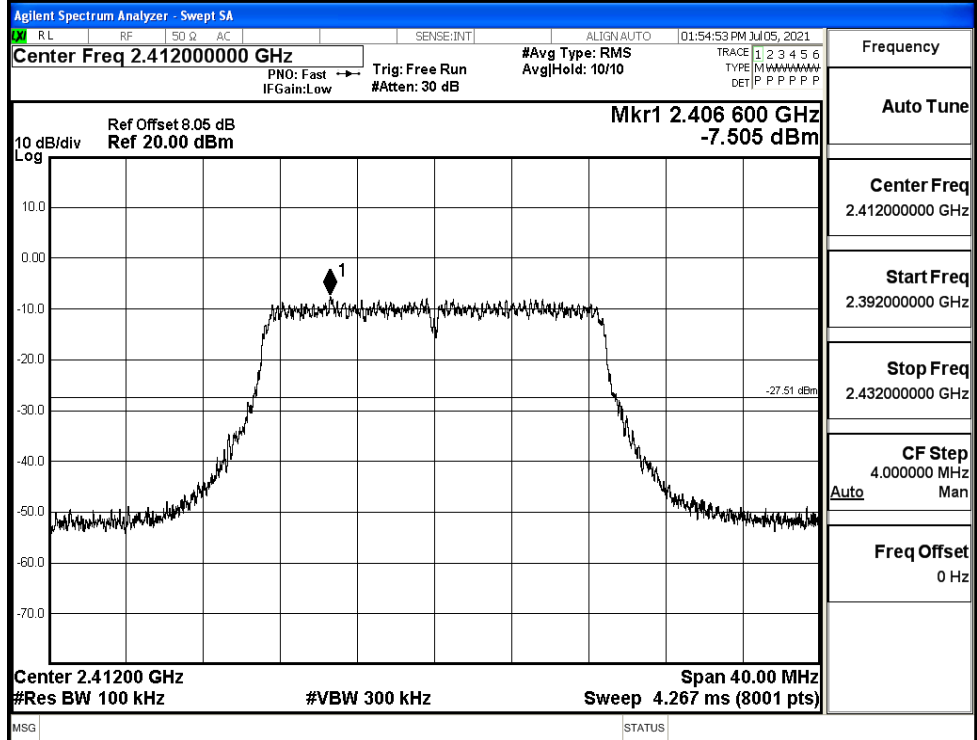
Puw/11G/HCH



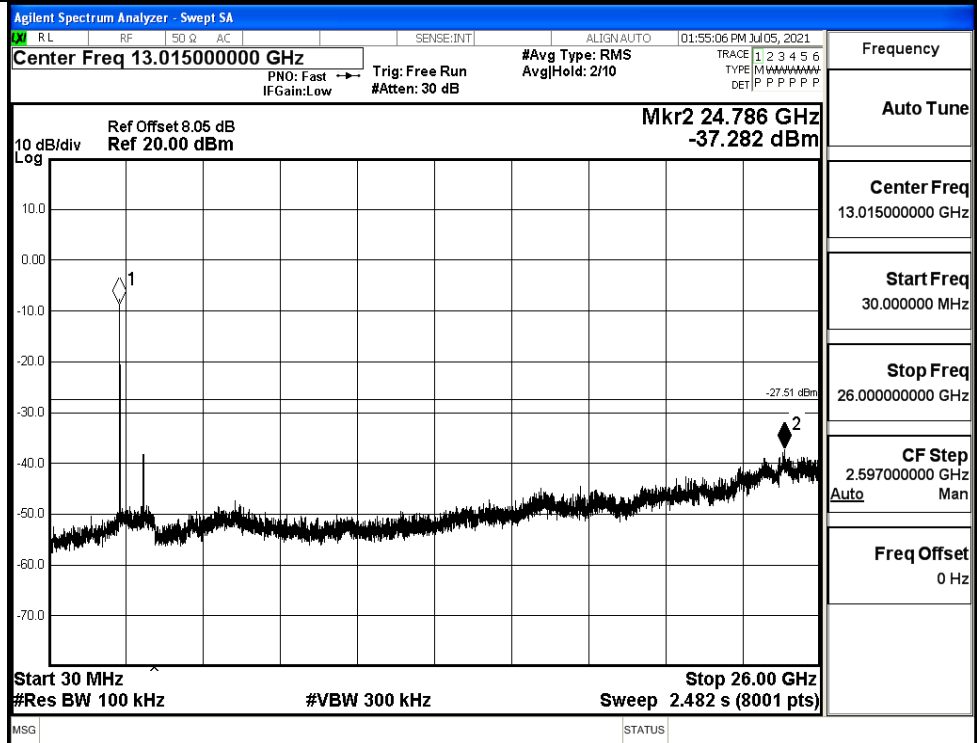


11N20SISO LCH Graphs

Pref/11N20SIS
O/LCH



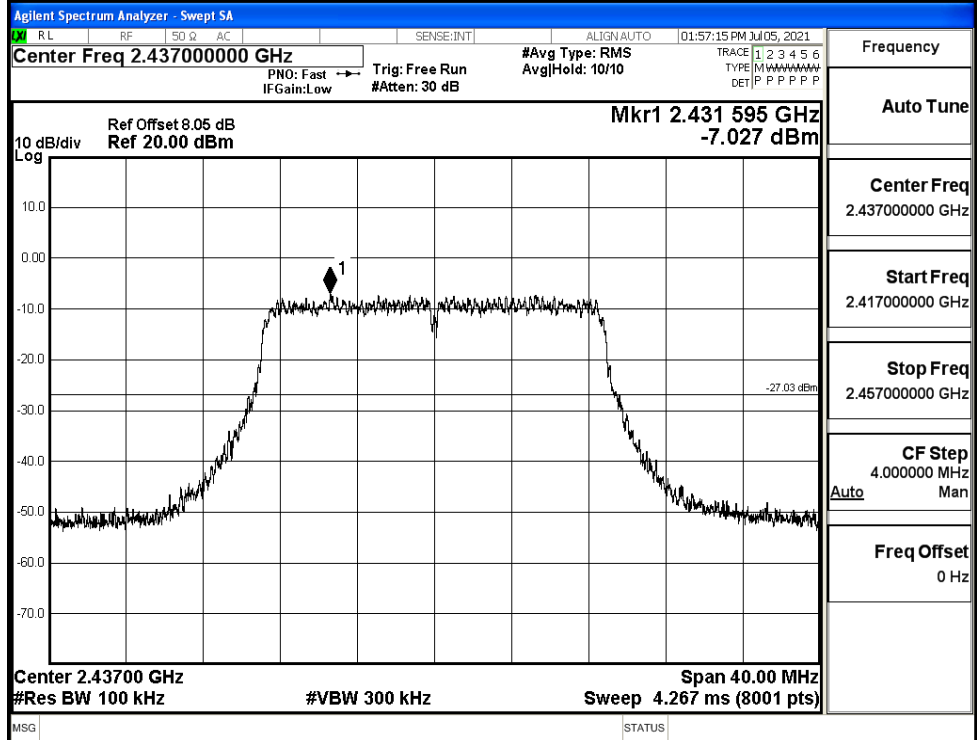
Puw/11N20
SISO/LCH





11N20SISO_MCH_Graphs

Pref/11N20
SISO/MCH



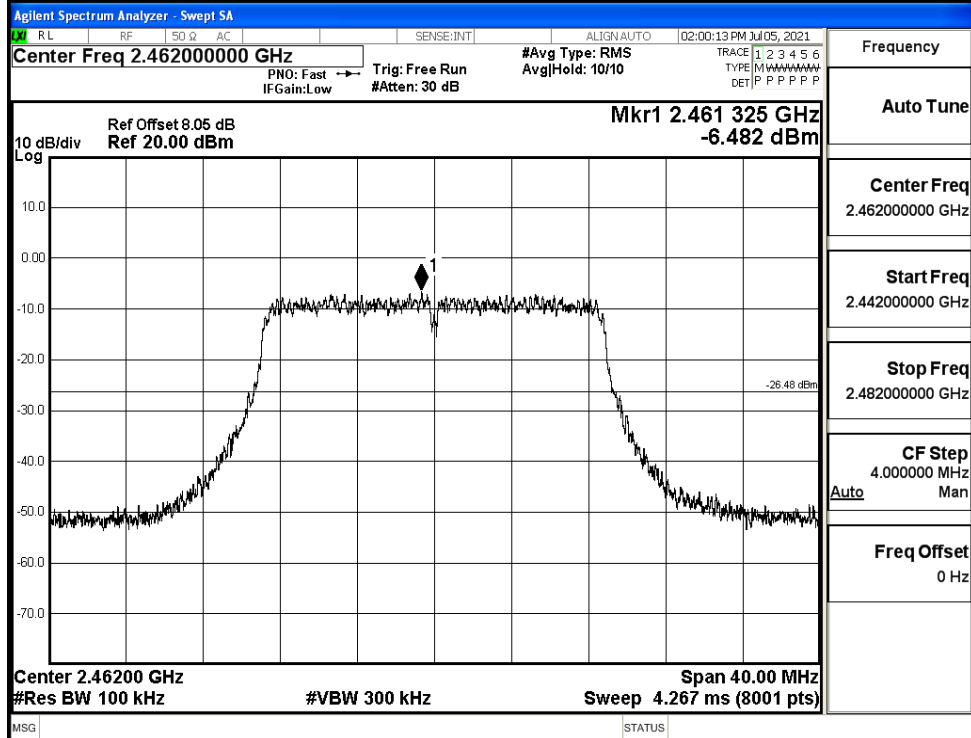
Puw/11N20
SISO/MCH



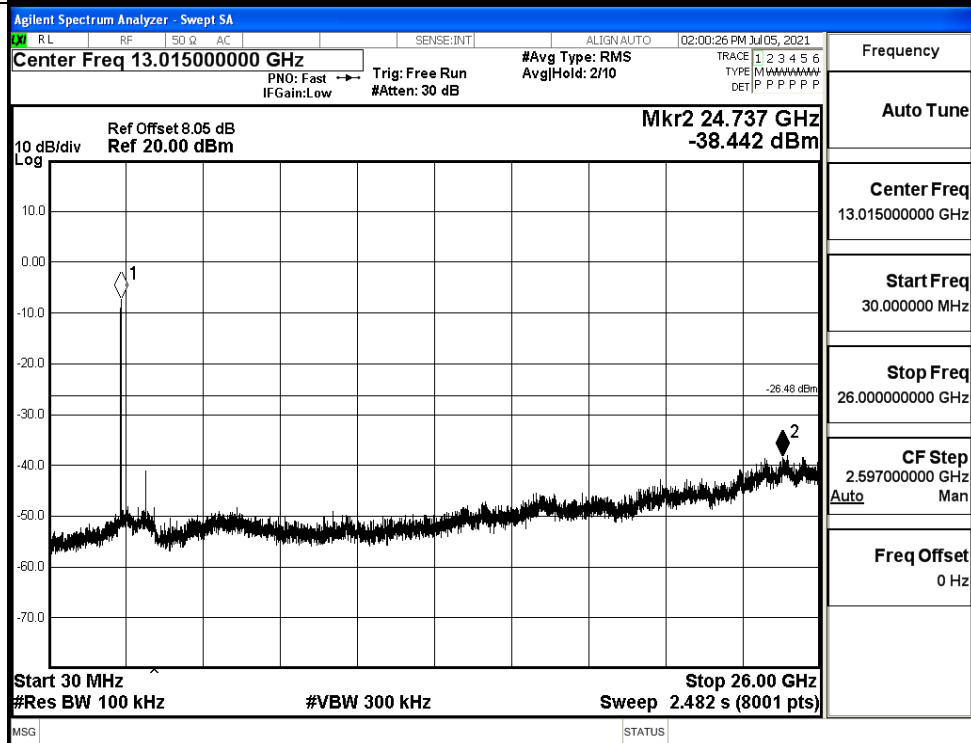


11N20SISO HCH Graphs

Pref/11N20
SISO/HCH



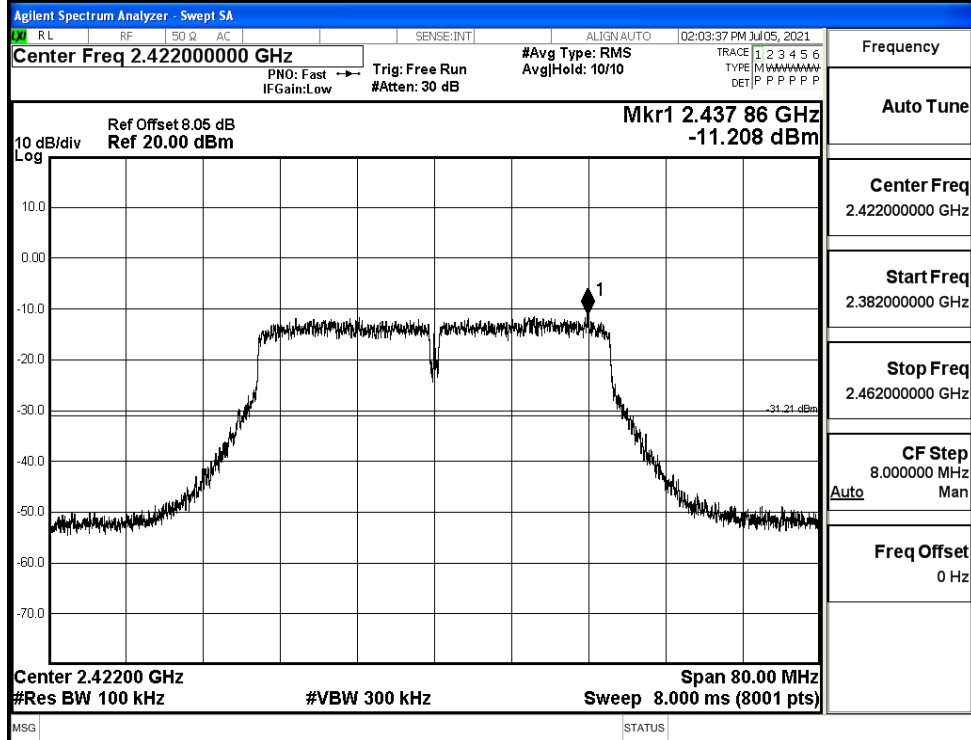
Puw/11N20
SISO/HCH



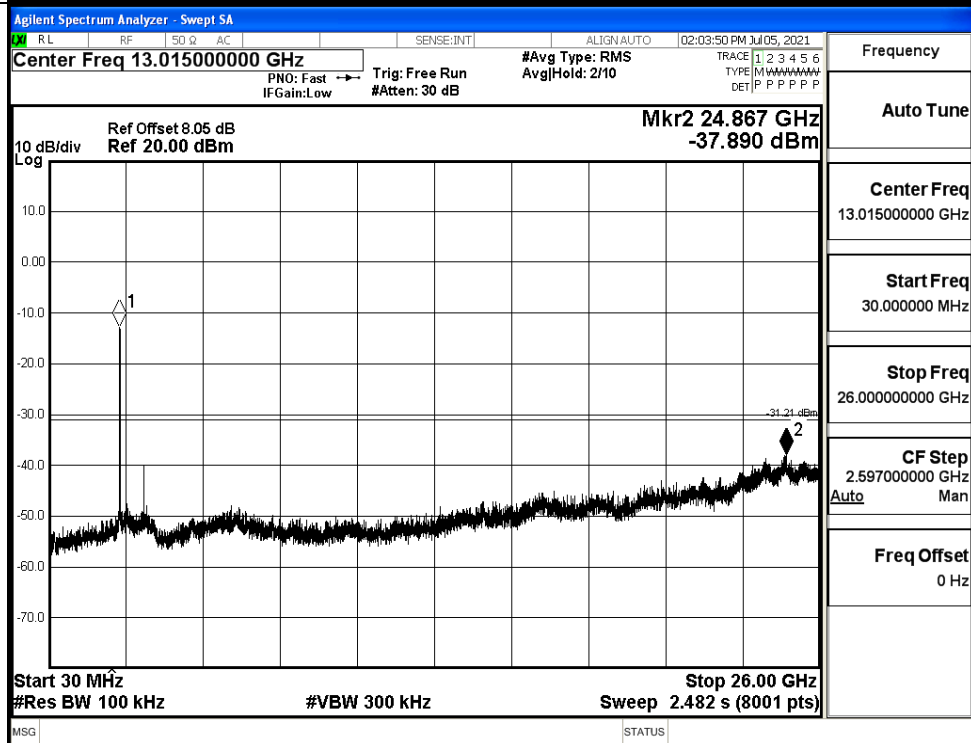


11N40SISO LCH Graphs

Pref/11N40
SISO/LCH



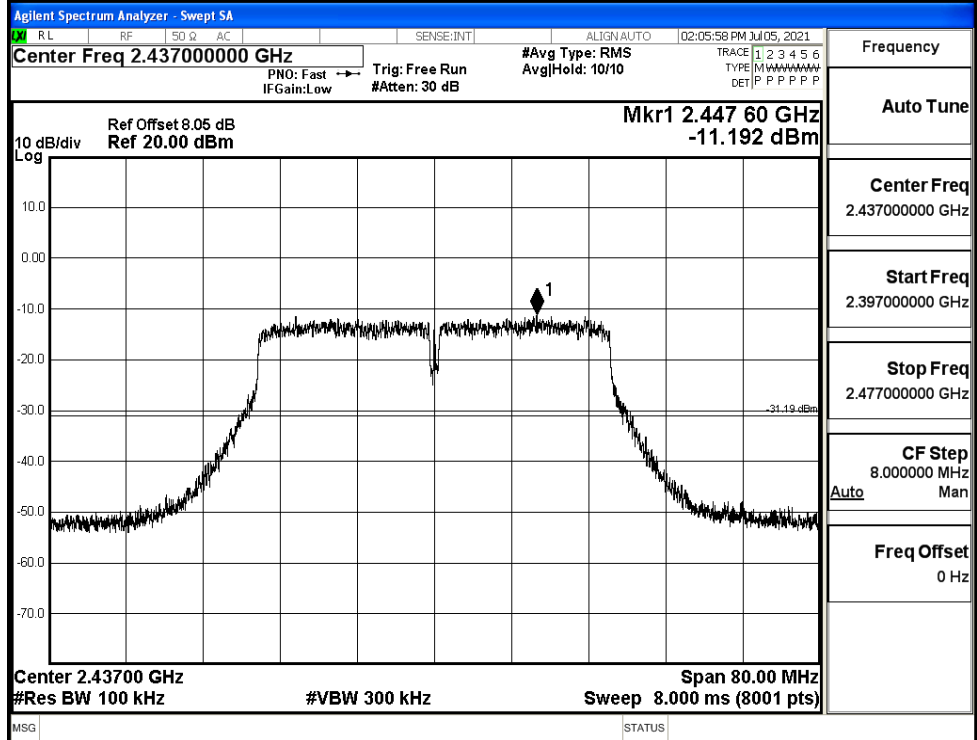
Puw/11N40
SISO/LCH



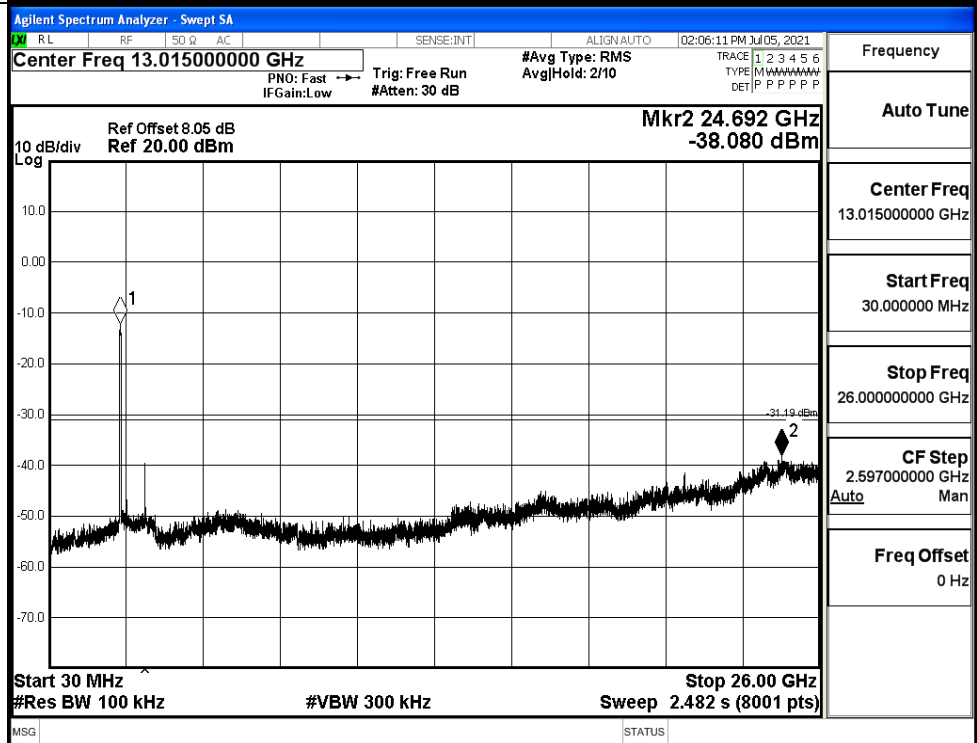


11N40SISO_MCH_Graphs

Pref/11N40
SISO/MCH



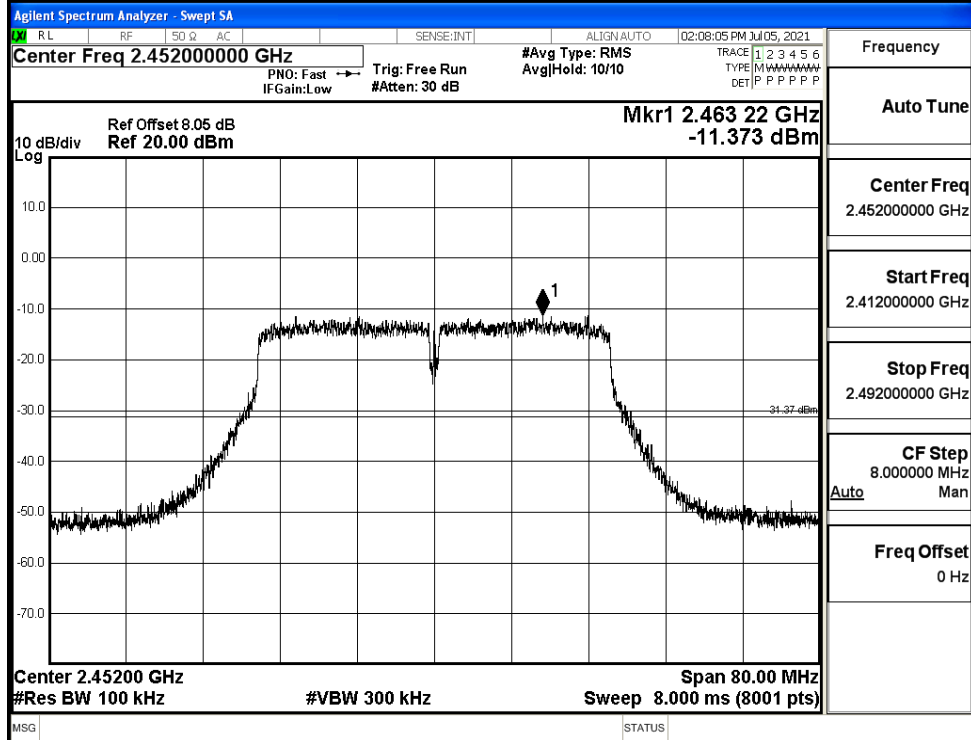
Puw/11N40
SISO/MCH



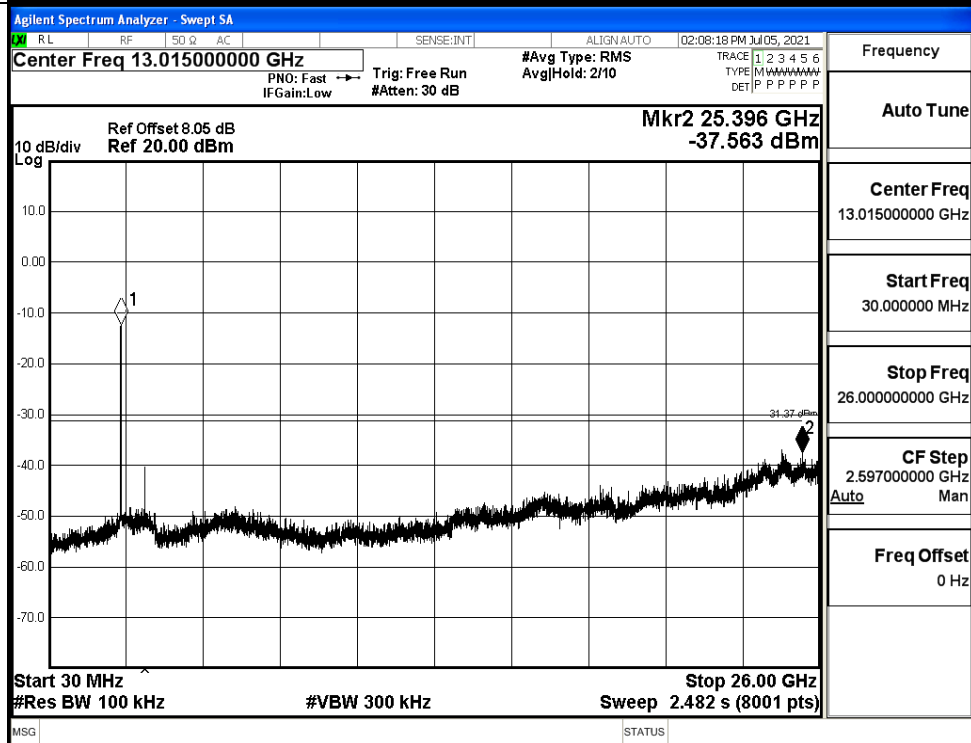


11N40SISO HCH Graphs

Pref/11N40
SISO/HCH



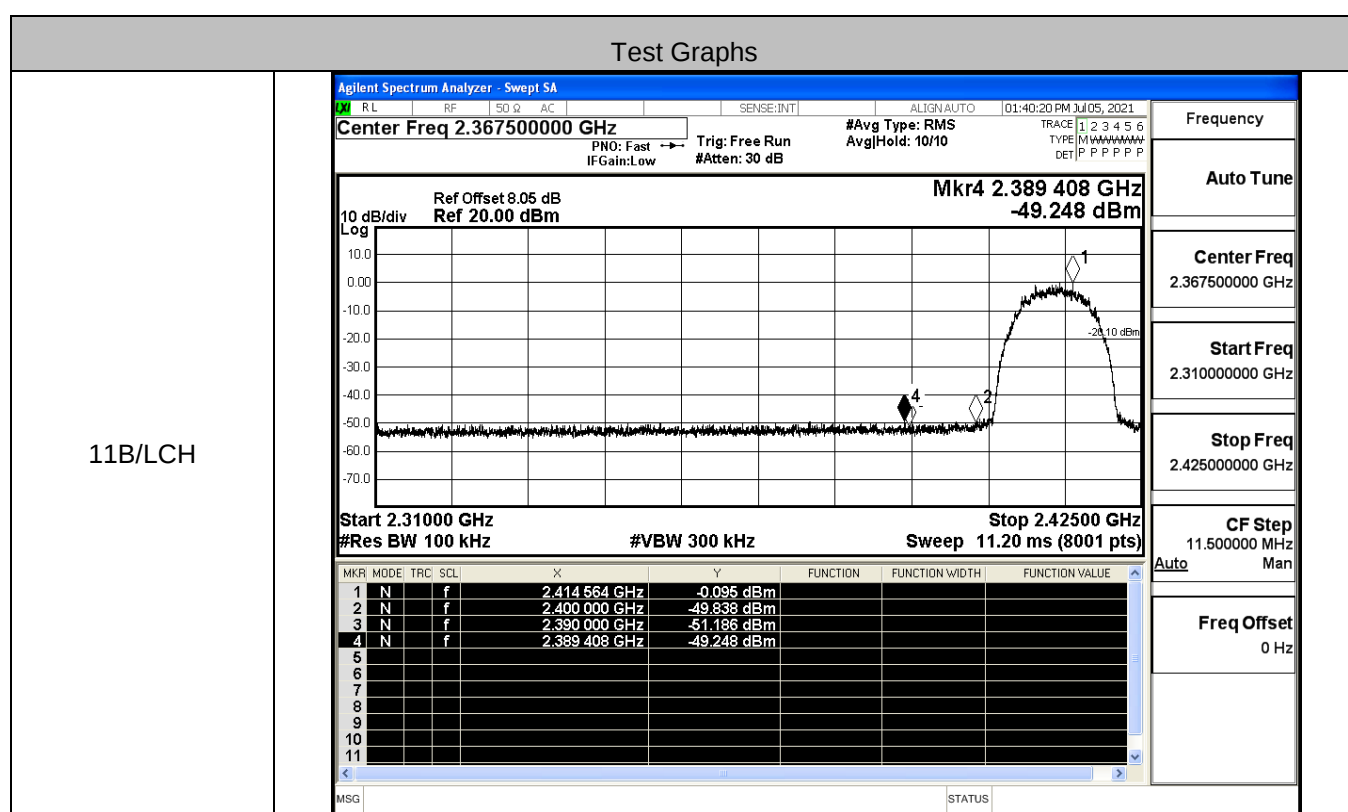
Puw/11N40
SISO/HCH





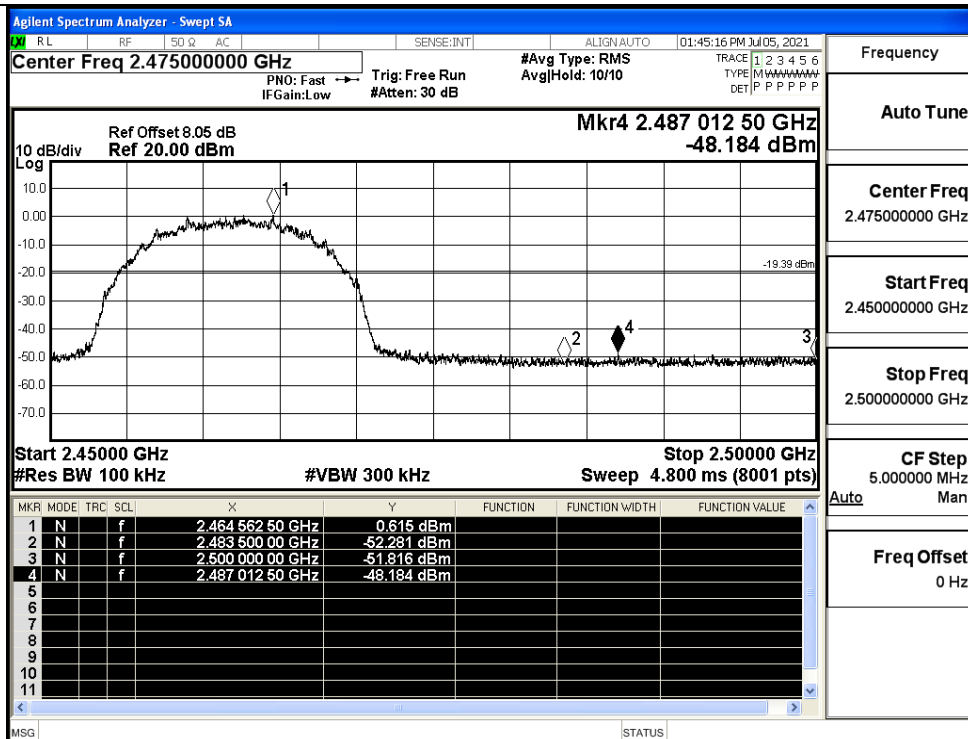
A.6 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
11B	LCH	-0.095	-49.248	-20.1	PASS
	HCH	0.615	-48.184	-19.39	PASS
11G	LCH	-6.596	-48.274	-26.6	PASS
	HCH	-5.724	-48.083	-25.72	PASS
11N20SISO	LCH	-7.507	-48.582	-27.51	PASS
	HCH	-6.535	-48.549	-26.54	PASS
11N40SISO	LCH	-11.350	-49.242	-31.35	PASS
	HCH	-11.534	-48.466	-31.53	PASS

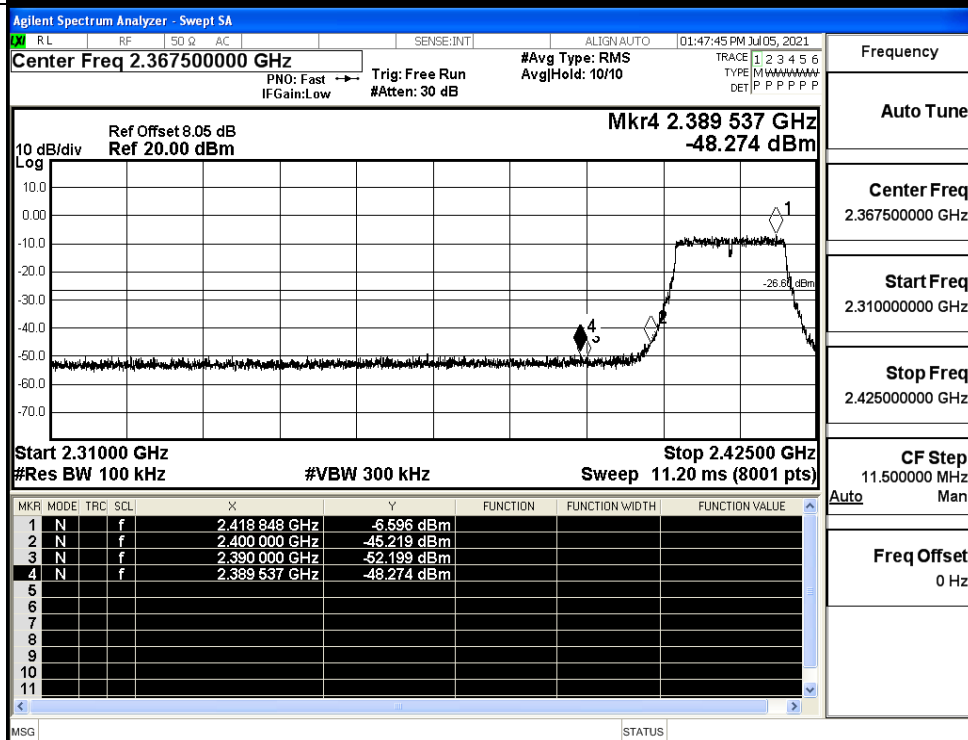




11B/HCH

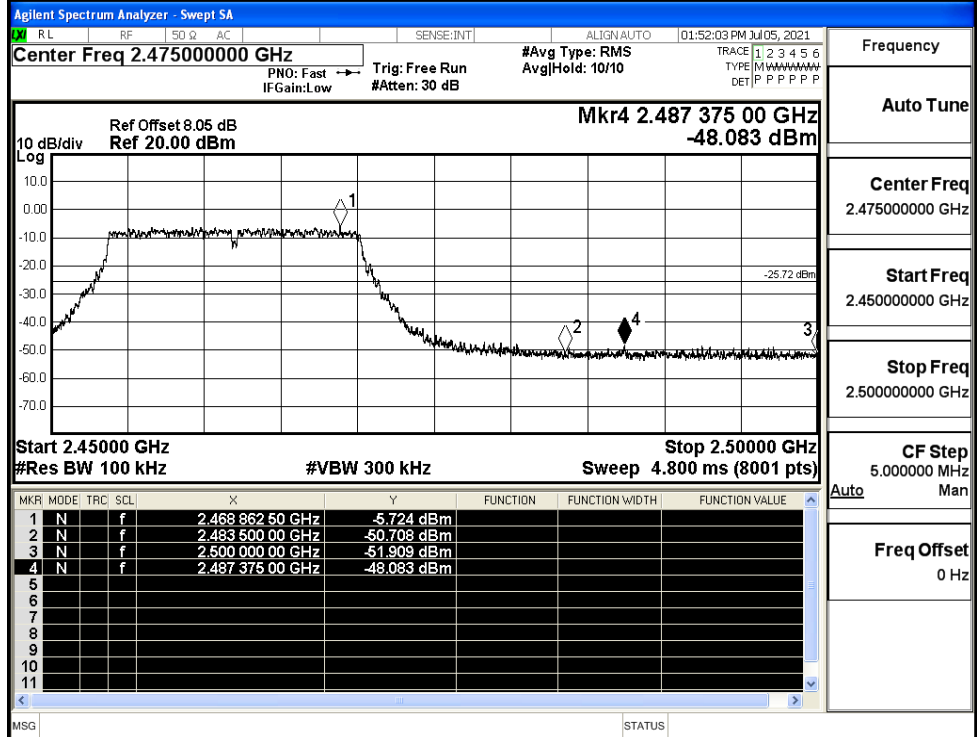


11G/LCH

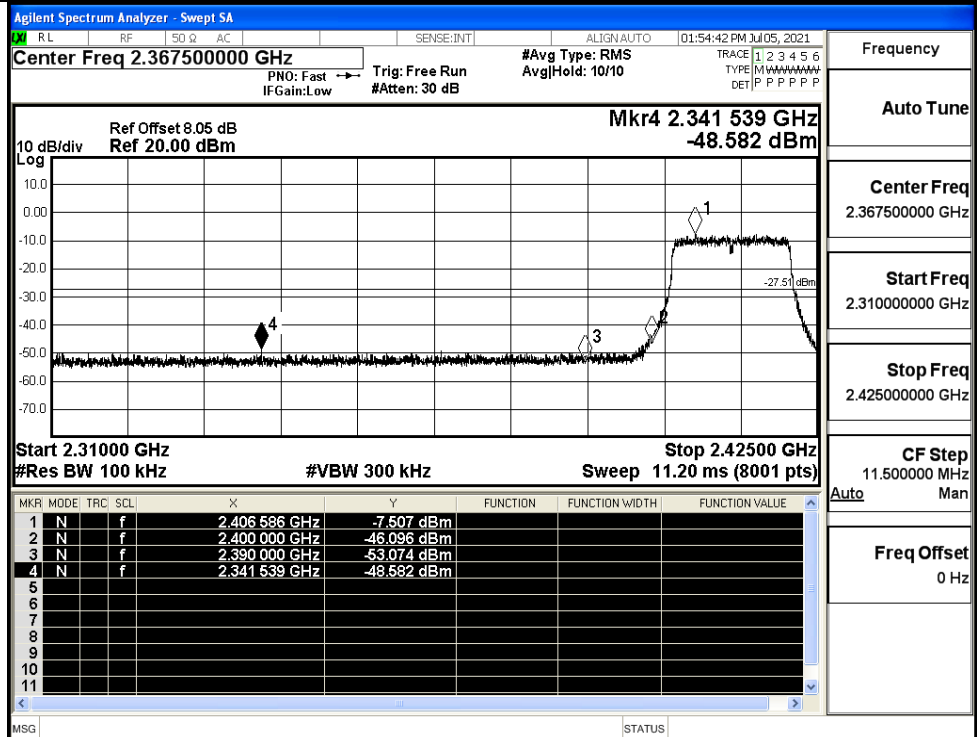




11G/HCH



11N20SISO/LCH





11N20SISO/HCH

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.475000000 GHz

PNO: Fast → Trg: Free Run #Atten: 30 dB

#Avg Type: RMS AvgHld: 10/10

Ref Offset 8.05 dB Ref 20.00 dBm

Mkr4 2.484 843 75 GHz -48.549 dBm

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

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N		f	2.461 318 75 GHz	-6.535 dBm			
2	N		f	2.483 500 00 GHz	-51.375 dBm			
3	N		f	2.500 000 00 GHz	-51.315 dBm			
4	N		f	2.484 843 75 GHz	-48.549 dBm			

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

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.377500000 GHz

PNO: Fast → Trg: Free Run #Atten: 30 dB

#Avg Type: RMS AvgHld: 10/10

Ref Offset 8.05 dB Ref 20.00 dBm

Mkr4 2.375 678 GHz -49.242 dBm

Start 2.31000 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.44500 GHz Sweep 13.33 ms (8001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N		f	2.434 116 GHz	-11.350 dBm			
2	N		f	2.400 000 GHz	-39.268 dBm			
3	N		f	2.390 000 GHz	-52.188 dBm			
4	N		f	2.375 678 GHz	-49.242 dBm			

Frequency

Auto Tune

Center Freq
2.377500000 GHz

Start Freq
2.310000000 GHz

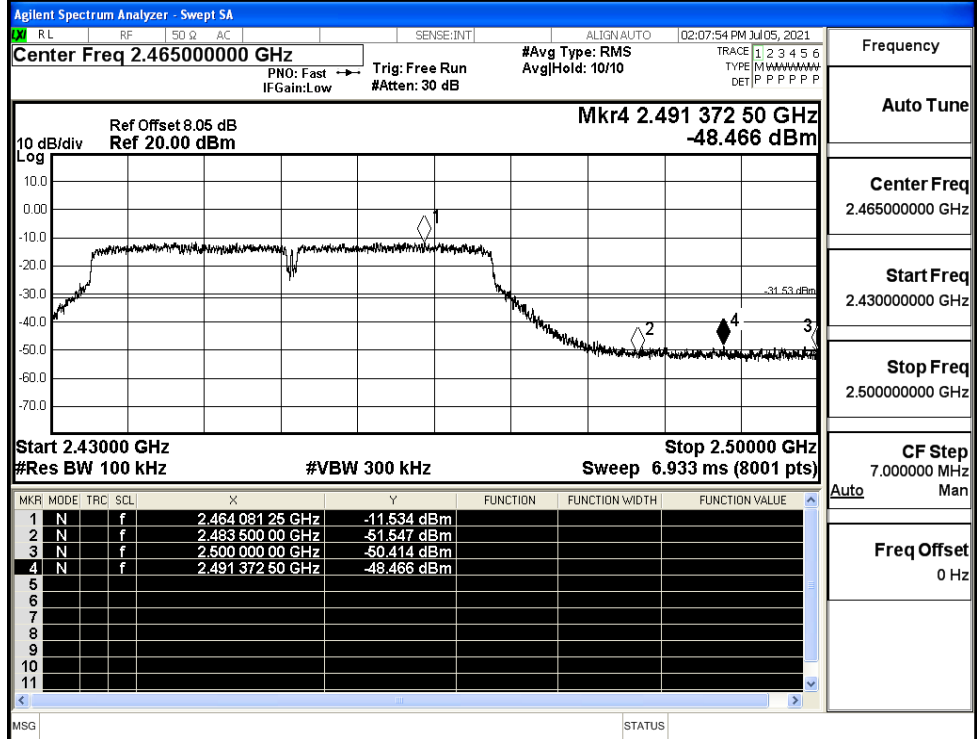
Stop Freq
2.445000000 GHz

CF Step
13.500000 MHz

Freq Offset
0 Hz



11N40SISO/HCH





A.7 Restrict-band band-edge measurements

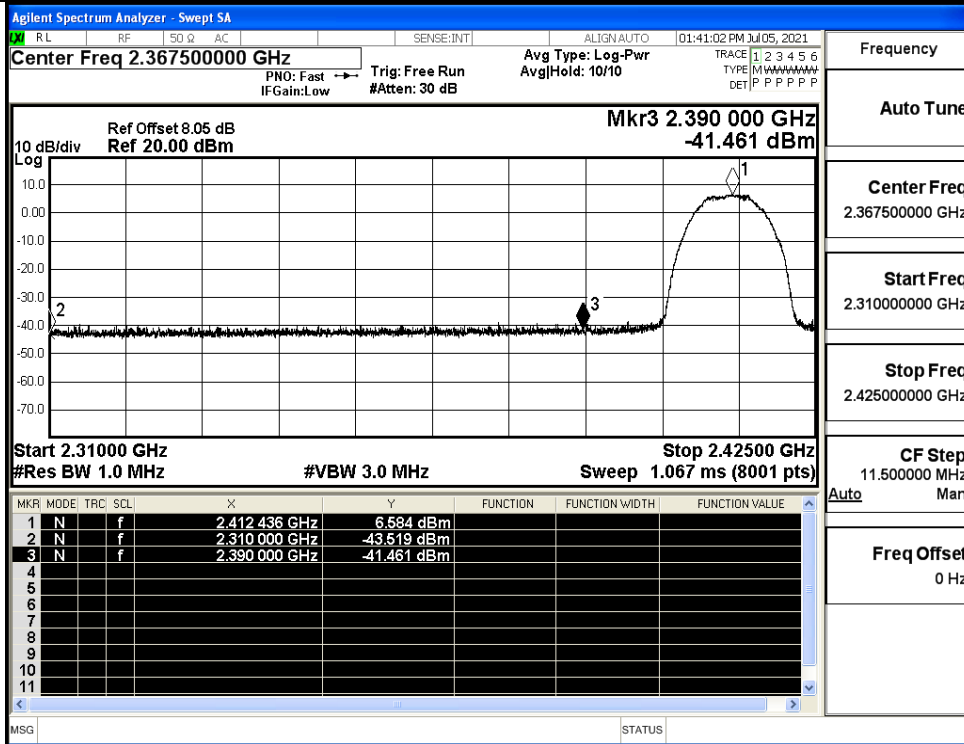
Test Mode	Test Channel	Ant	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
11B	2412	Ant1	2310.0	-43.52	2.0	0	53.71	PEAK	74	PASS
	2412	Ant1	2310.0	-53.37	2.0	0	43.86	AV	54	PASS
	2412	Ant1	2390.0	-41.46	2.0	0	55.77	PEAK	74	PASS
	2412	Ant1	2390.0	-52.58	2.0	0	44.65	AV	54	PASS
	2462	Ant1	2483.5	-41.58	2.0	0	55.65	PEAK	74	PASS
	2462	Ant1	2483.5	-52.01	2.0	0	45.22	AV	54	PASS
	2462	Ant1	2500.0	-39.80	2.0	0	57.43	PEAK	74	PASS
	2462	Ant1	2500.0	-51.83	2.0	0	45.40	AV	54	PASS
11G	2412	Ant1	2310.0	-42.76	2.0	0	54.47	PEAK	74	PASS
	2412	Ant1	2310.0	-53.33	2.0	0	43.90	AV	54	PASS
	2412	Ant1	2390.0	-42.27	2.0	0	54.96	PEAK	74	PASS
	2412	Ant1	2390.0	-52.46	2.0	0	44.77	AV	54	PASS
	2462	Ant1	2483.5	-39.65	2.0	0	57.58	PEAK	74	PASS
	2462	Ant1	2483.5	-51.75	2.0	0	45.48	AV	54	PASS
	2462	Ant1	2500.0	-41.08	2.0	0	56.15	PEAK	74	PASS
	2462	Ant1	2500.0	-51.82	2.0	0	45.41	AV	54	PASS
11N20 SISO	2412	Ant1	2310.0	-42.30	2.0	0	54.93	PEAK	74	PASS
	2412	Ant1	2310.0	-53.31	2.0	0	43.92	AV	54	PASS
	2412	Ant1	2390.0	-42.13	2.0	0	55.10	PEAK	74	PASS
	2412	Ant1	2390.0	-52.47	2.0	0	44.76	AV	54	PASS
	2462	Ant1	2483.5	-42.08	2.0	0	55.15	PEAK	74	PASS
	2462	Ant1	2483.5	-51.68	2.0	0	45.55	AV	54	PASS
	2462	Ant1	2500.0	-41.08	2.0	0	56.15	PEAK	74	PASS
	2462	Ant1	2500.0	-51.80	2.0	0	45.43	AV	54	PASS
11N40 SISO	2422	Ant1	2310.0	-42.19	2.0	0	55.04	PEAK	74	PASS
	2422	Ant1	2310.0	-53.30	2.0	0	43.93	AV	54	PASS
	2422	Ant1	2390.0	-41.30	2.0	0	55.93	PEAK	74	PASS



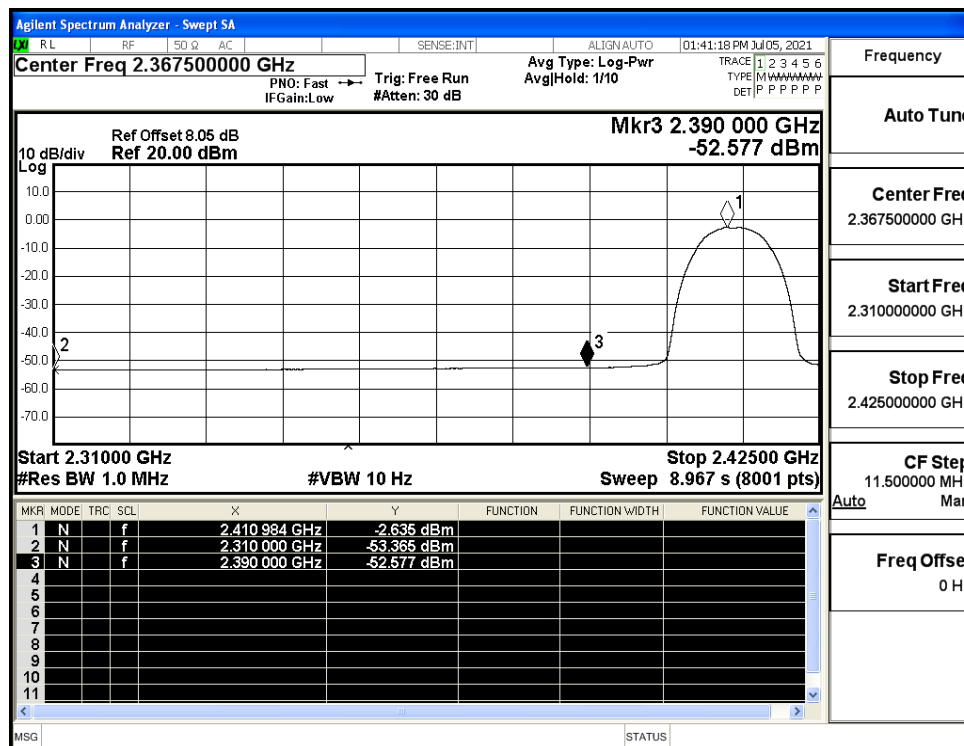
	2422	Ant1	2390.0	-52.06	2.0	0	45.17	AV	54	PASS
	2452	Ant1	2483.5	-40.81	2.0	0	56.42	PEAK	74	PASS
	2452	Ant1	2483.5	-50.96	2.0	0	46.27	AV	54	PASS
	2452	Ant1	2500.0	-40.62	2.0	0	56.61	PEAK	74	PASS
	2452	Ant1	2500.0	-51.73	2.0	0	45.50	AV	54	PASS



Restrict-band band-edge measurements_11B_2412_Ant1_PEAK

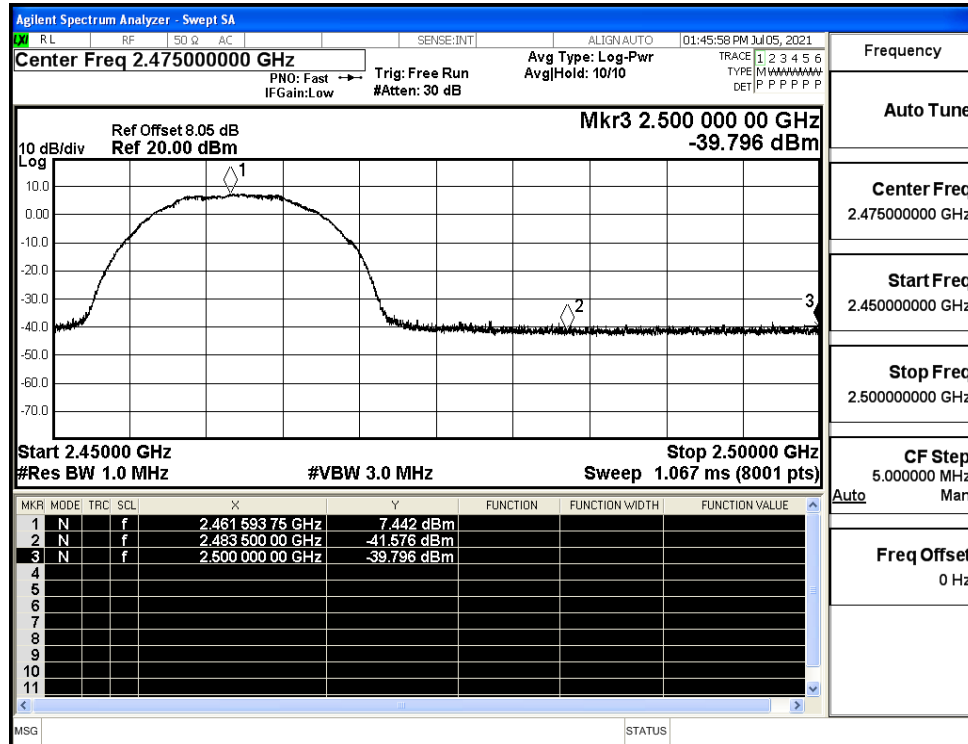


Restrict-band band-edge measurements_11B_2412_Ant1_AV

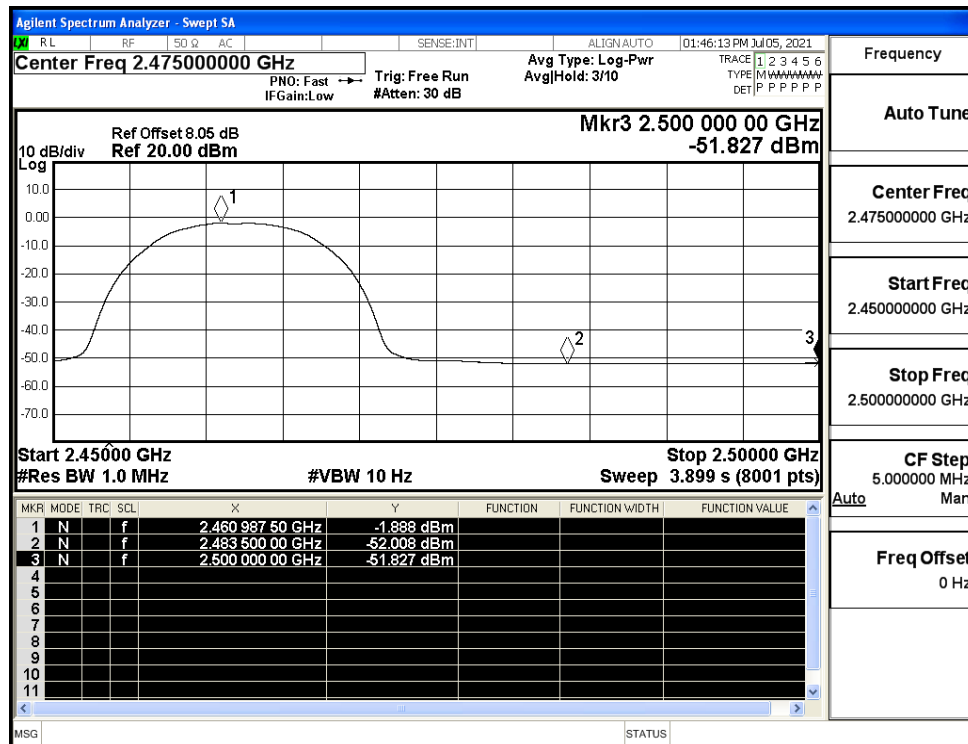




Restrict-band band-edge measurements_11B_2462_Ant1_PEAK

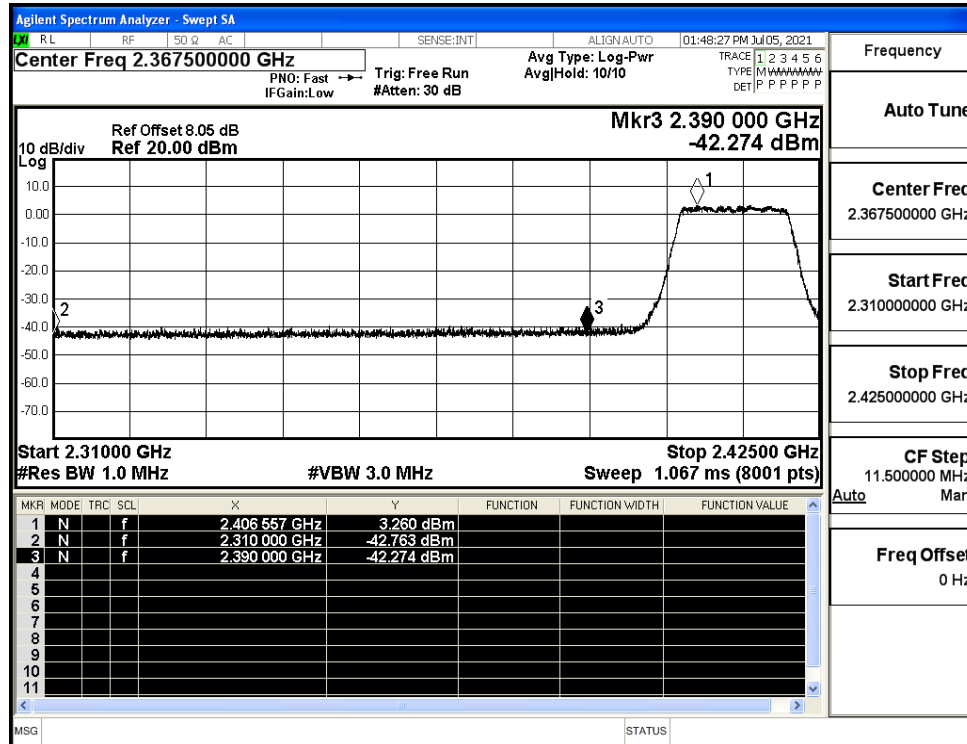


Restrict-band band-edge measurements_11B_2462_Ant1_AV

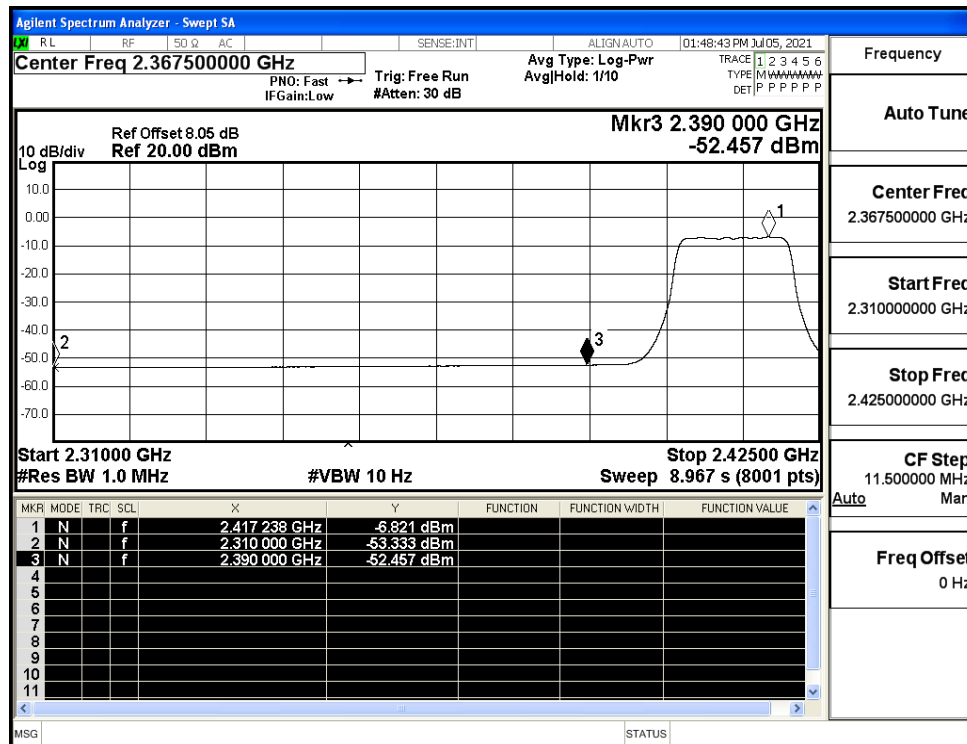




Restrict-band band-edge measurements_11G_2412_Ant1_PEAK

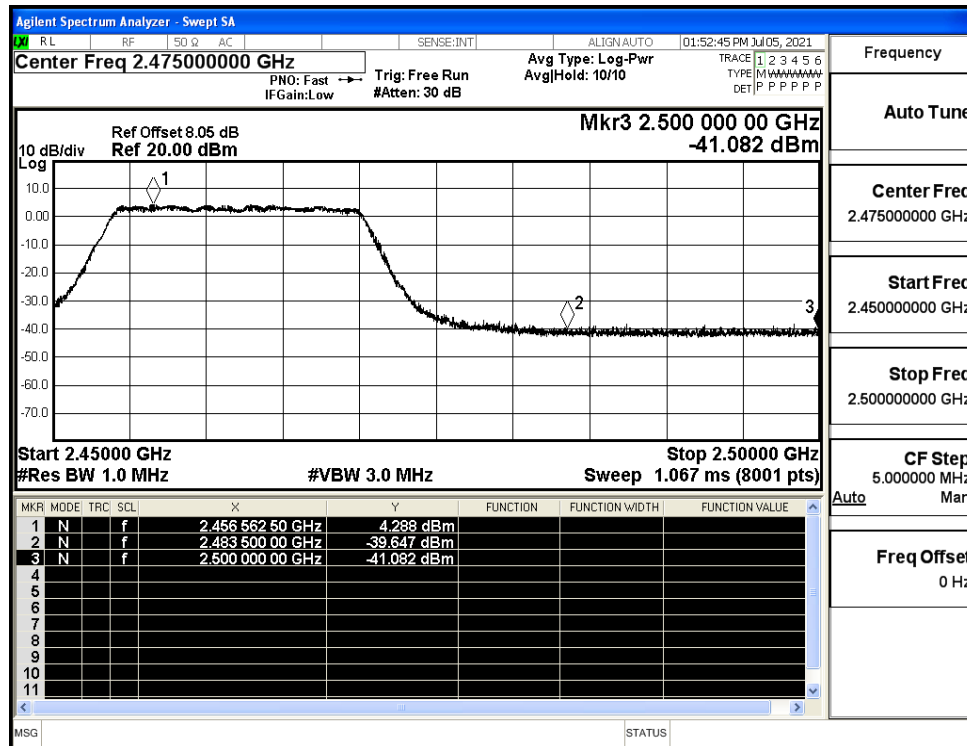


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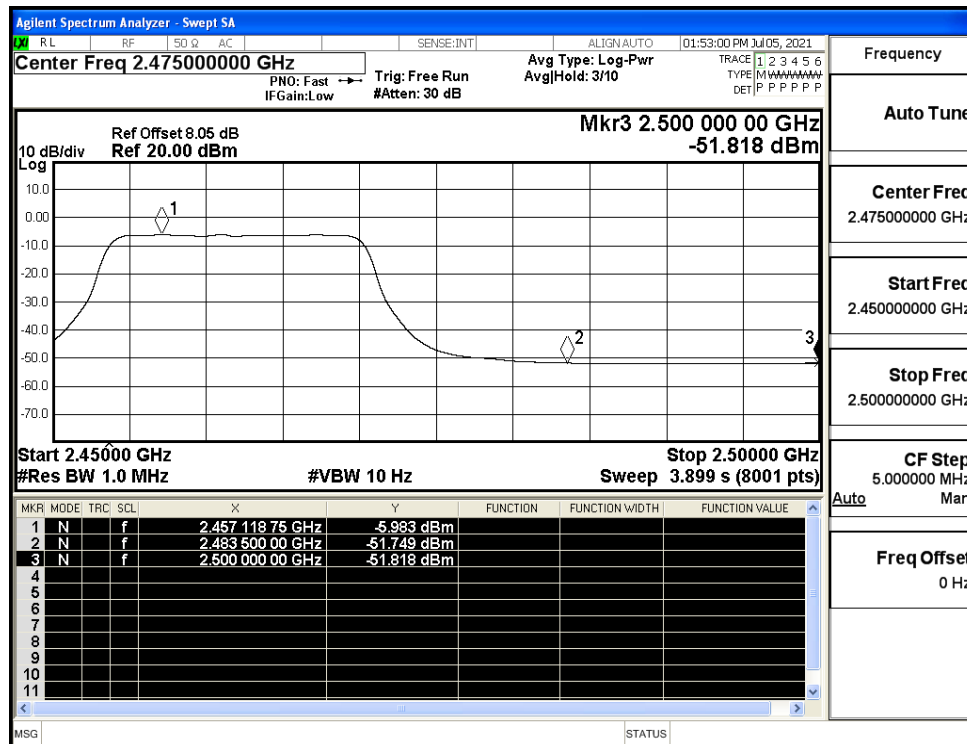




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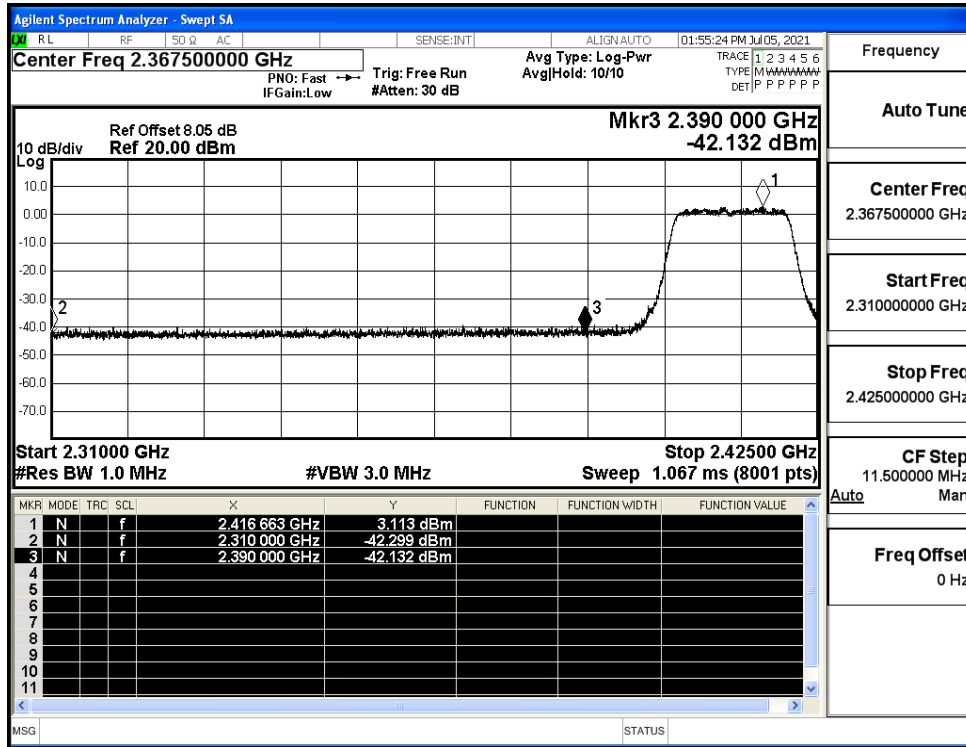


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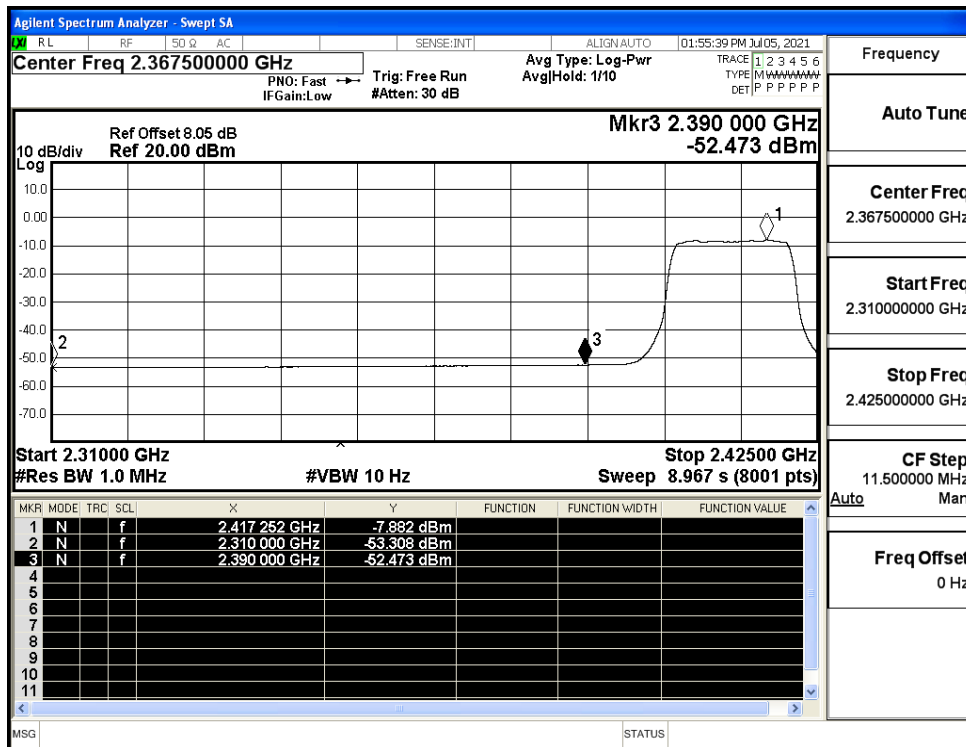




Restrict-band band-edge measurements_11N20SISO_2412_Ant1_PEAK

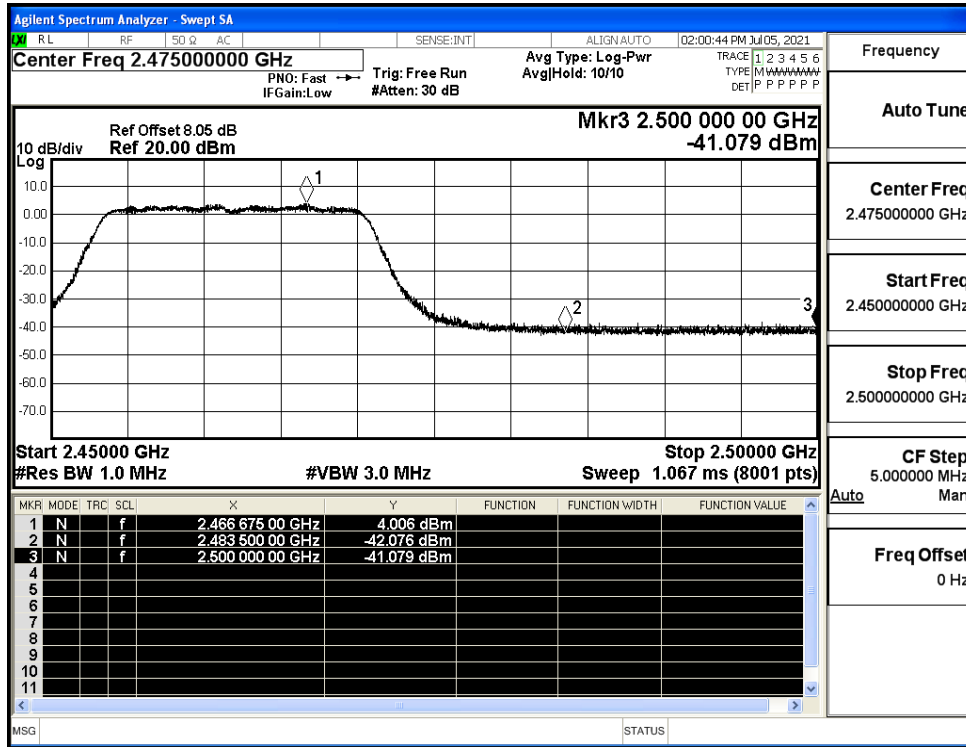


Restrict-band band-edge measurements_11N20SISO_2412_Ant1_AV

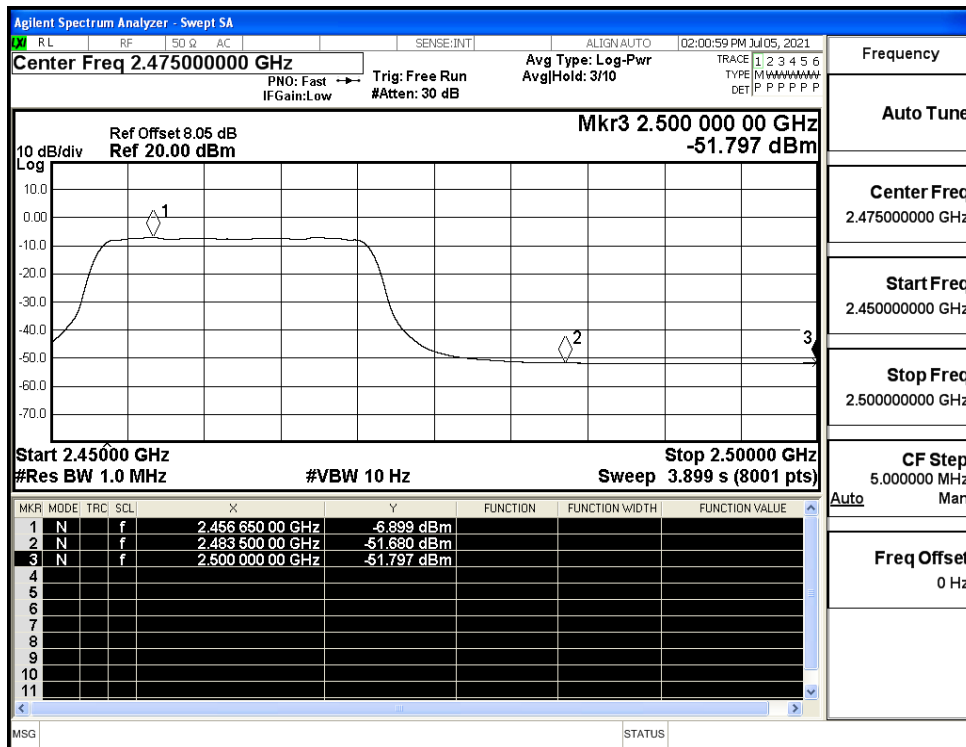




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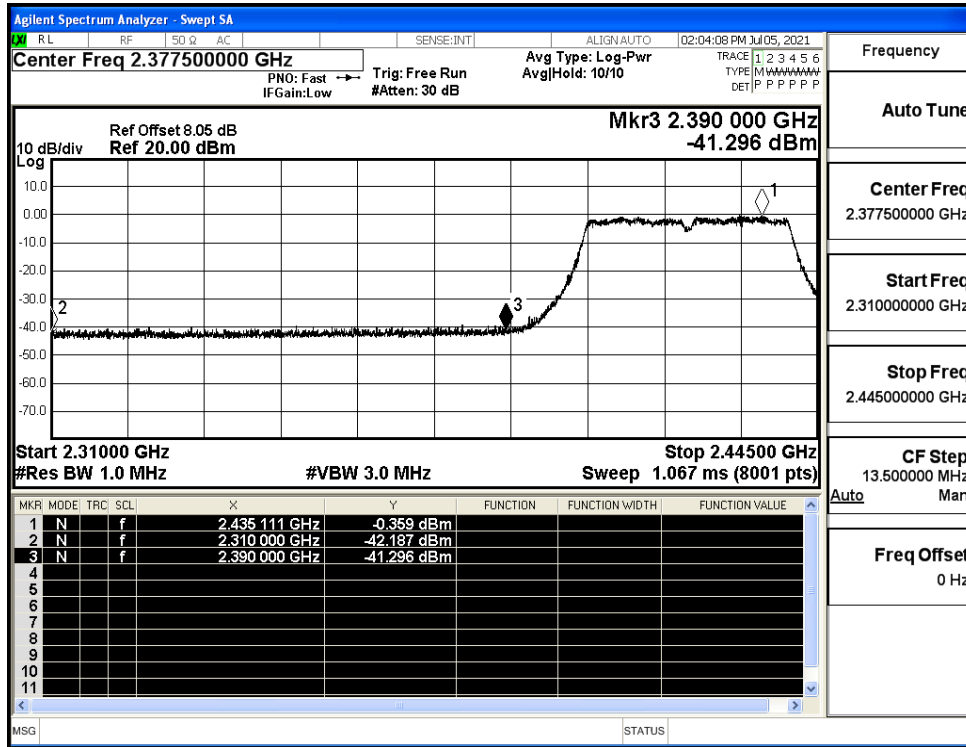


Restrict-band band-edge measurements_11N20SISO_2462_Ant1_AV

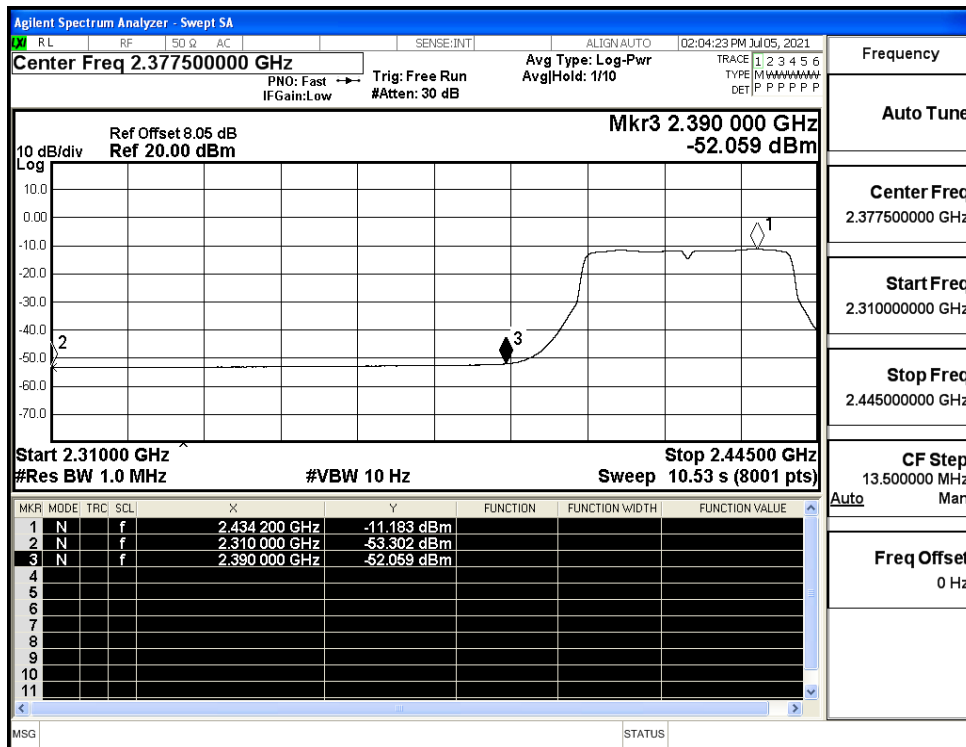




Restrict-band band-edge measurements_11N40SISO_2422_Ant1_PEAK

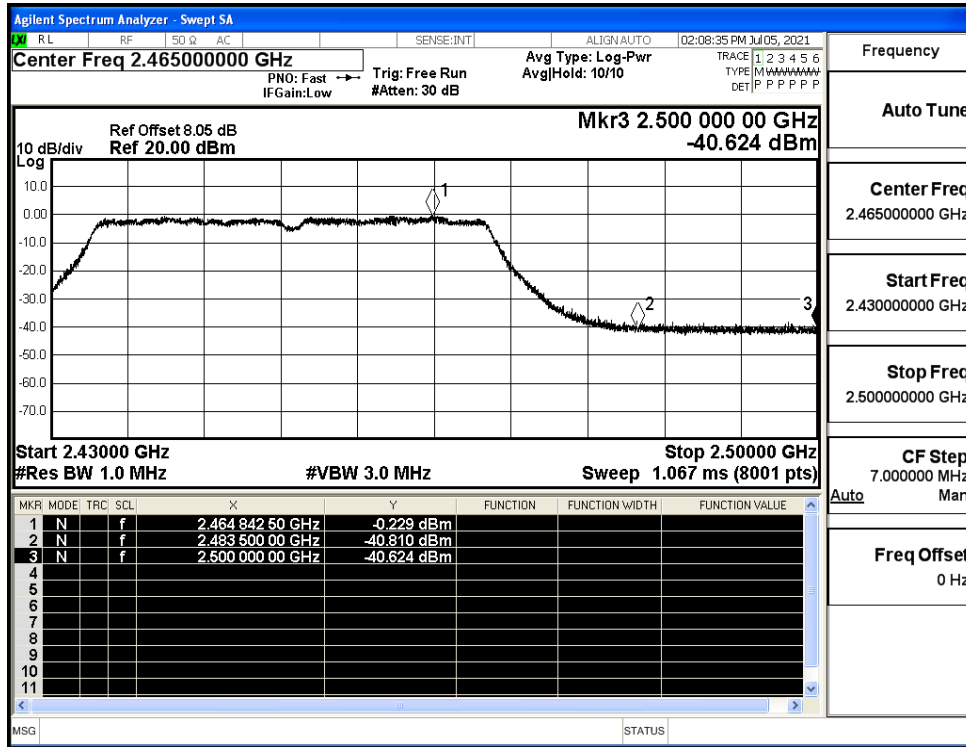


Restrict-band band-edge measurements_11N40SISO_2422_Ant1_AV





Restrict-band band-edge measurements_11N40SISO_2452_Ant1_PEAK



Restrict-band band-edge measurements_11N40SISO_2452_Ant1_AV

