

Appendix B

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: Total station

Trade Mark: SOUTH, KOLIDA, SANDING, RUIDE, TIANYU

Test Model: NAVI STATION

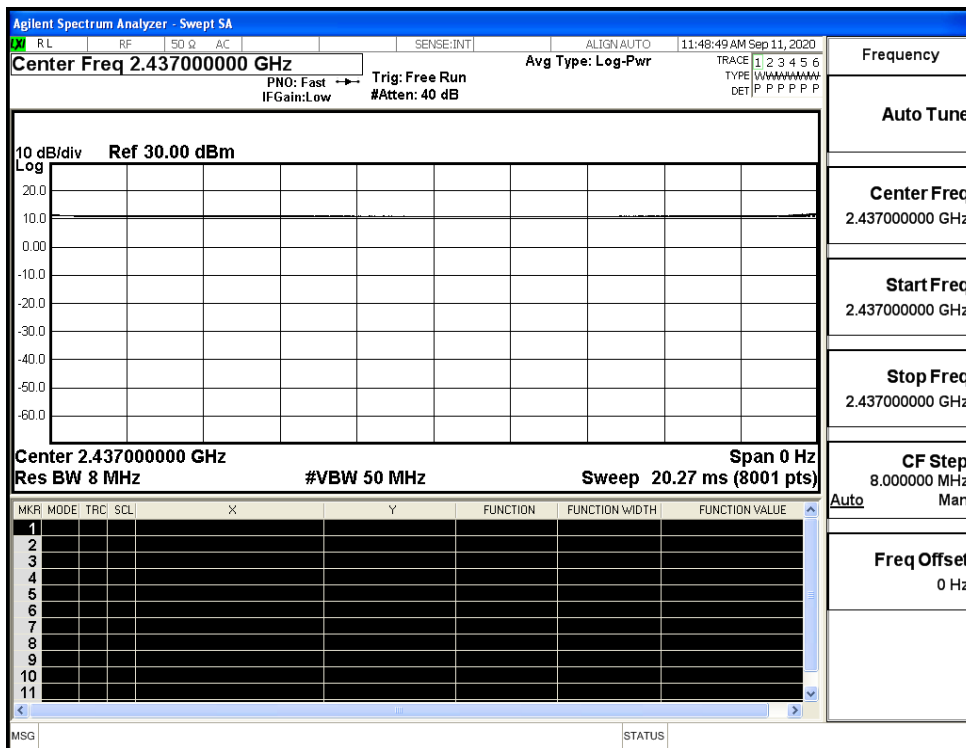
Environmental Conditions

Temperature:	22.3°C
Relative Humidity:	52.8%
ATM Pressure:	100.0 kPa
Test Engineer:	Jay Li
Supervised by:	Li Huan

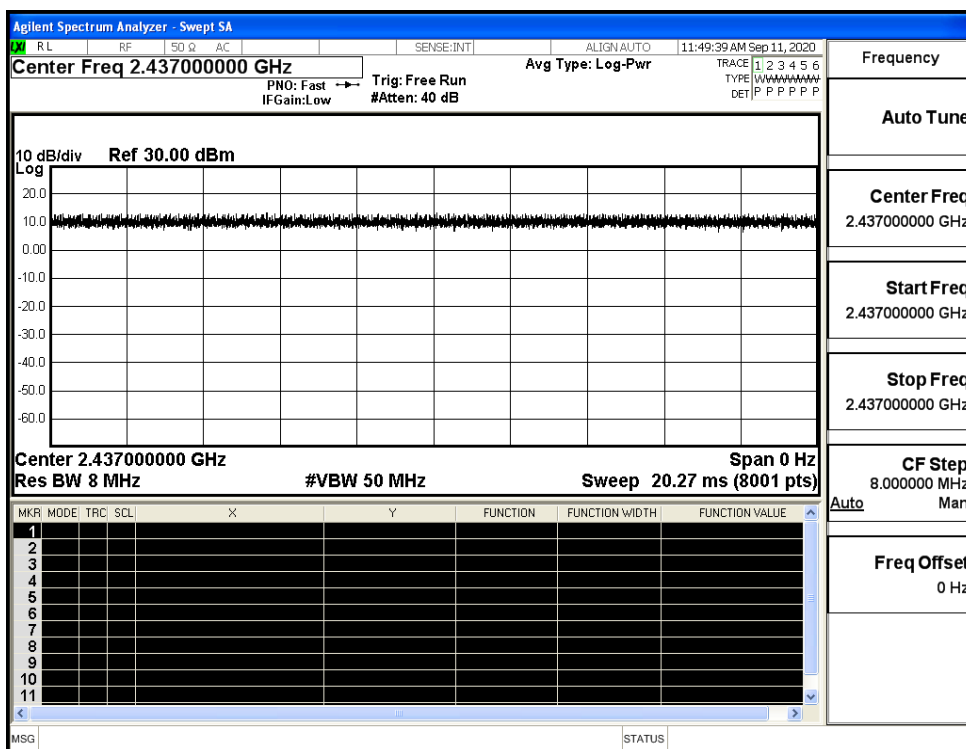
B.1 Duty Cycle

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

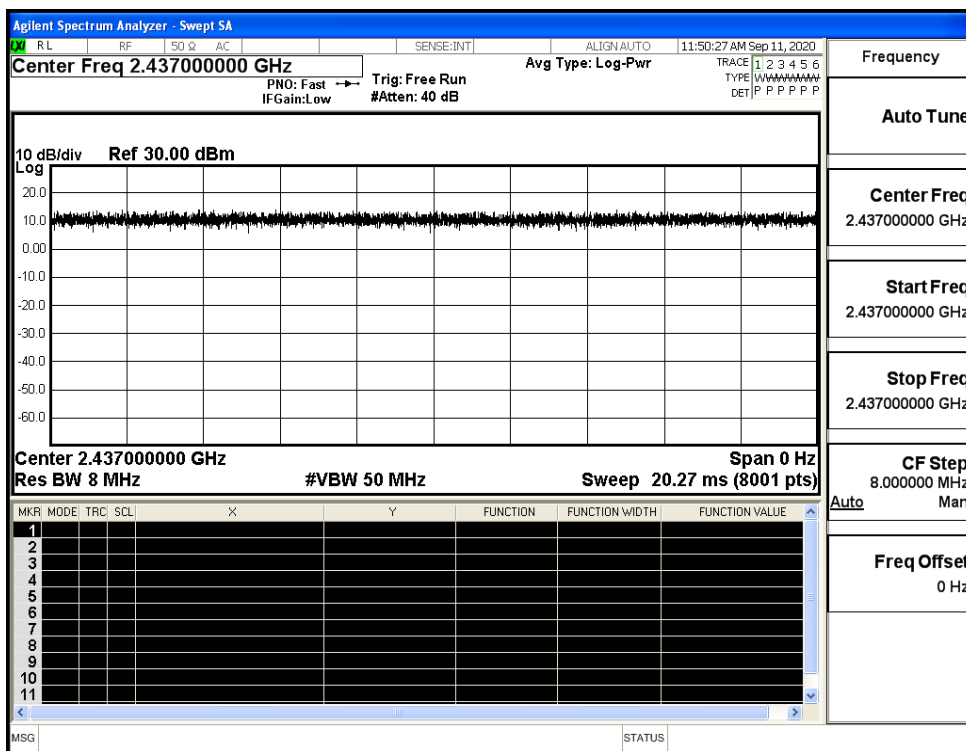
Duty Cycle_11B_2437_Ant1



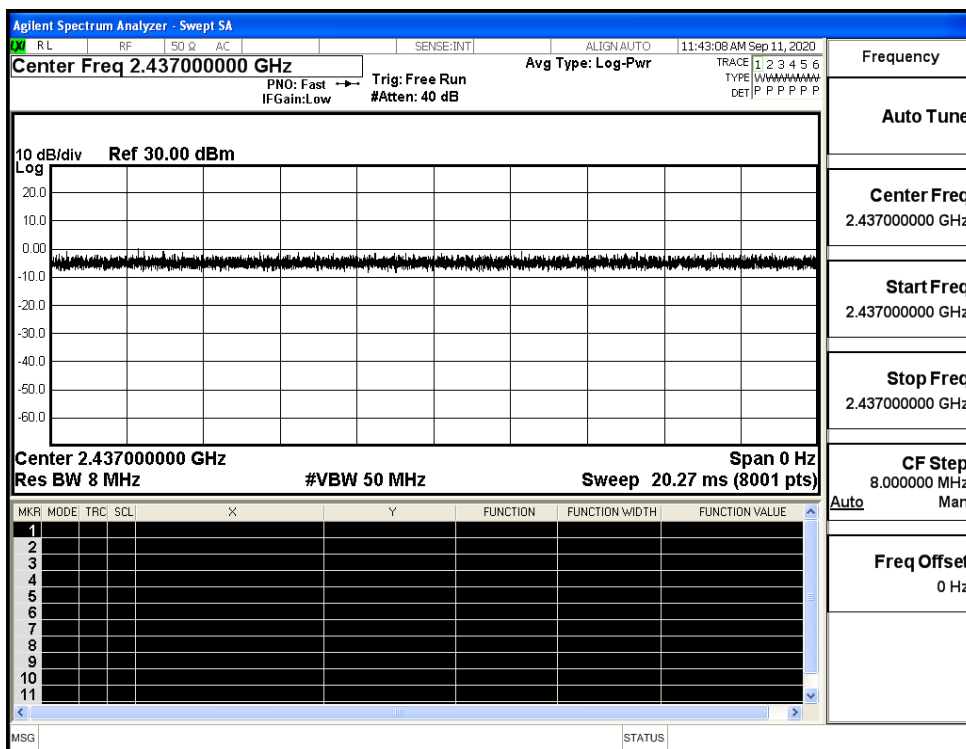
Duty Cycle_11G_2437_Ant1



Duty Cycle_11N20SISO_2437_Ant1



Duty Cycle_11N40SISO_2437_Ant1



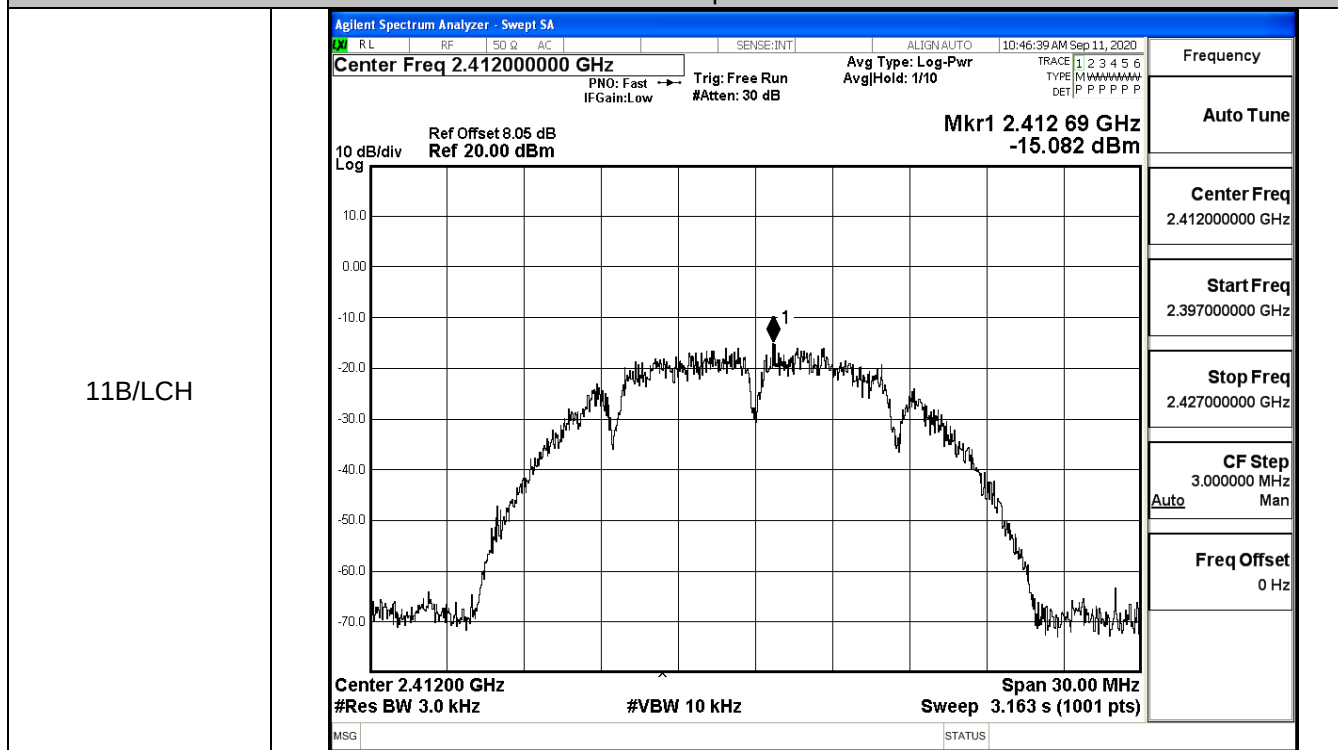
B.2 Maximum Conducted Output Power

Mode	Channel	Meas.Level [dBm]	Limit [dBm]	Verdict
11B	LCH	11.97	30	PASS
	MCH	11.1	30	PASS
	HCH	10.76	30	PASS
11G	LCH	11.59	30	PASS
	MCH	11.7	30	PASS
	HCH	11.1	30	PASS
11N20SISO	LCH	10.64	30	PASS
	MCH	10.73	30	PASS
	HCH	10.35	30	PASS
11N40SISO	LCH	11.42	30	PASS
	MCH	11.39	30	PASS
	HCH	11.29	30	PASS

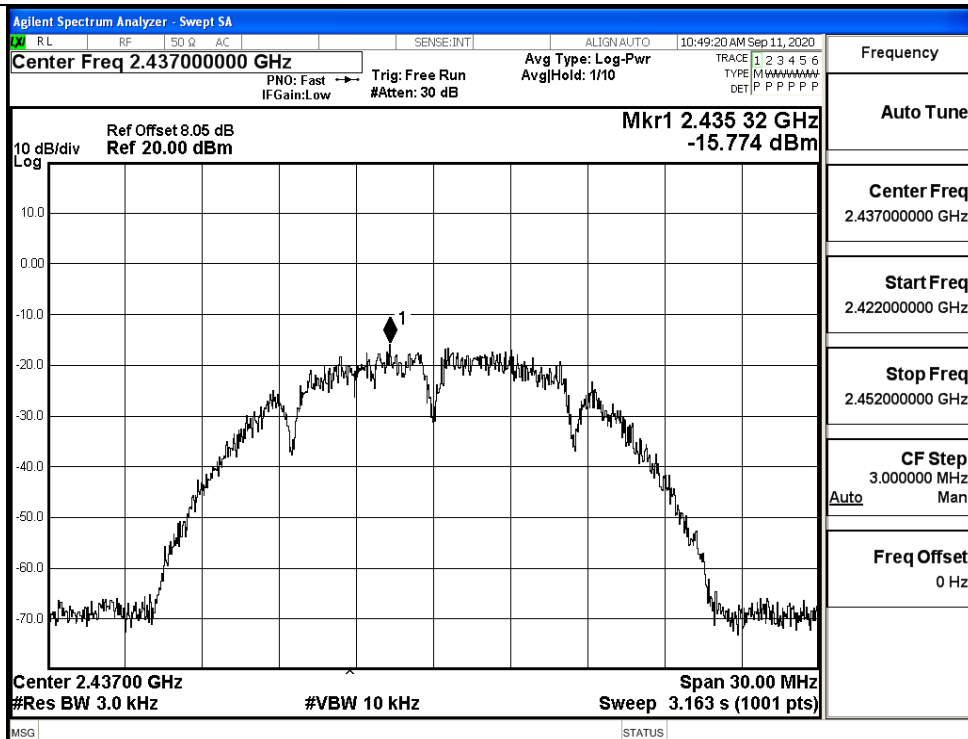
B.3 Maximum Power Spectral Density

Mode	Channel	Meas.Level [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
11B	LCH	-15.082	8	PASS
	MCH	-15.774	8	PASS
	HCH	-16.587	8	PASS
11G	LCH	-21.433	8	PASS
	MCH	-21.195	8	PASS
	HCH	-21.515	8	PASS
11N20SISO	LCH	-24.098	8	PASS
	MCH	-23.141	8	PASS
	HCH	-24.223	8	PASS
11N40SISO	LCH	-25.358	8	PASS
	MCH	-23.481	8	PASS
	HCH	-24.387	8	PASS

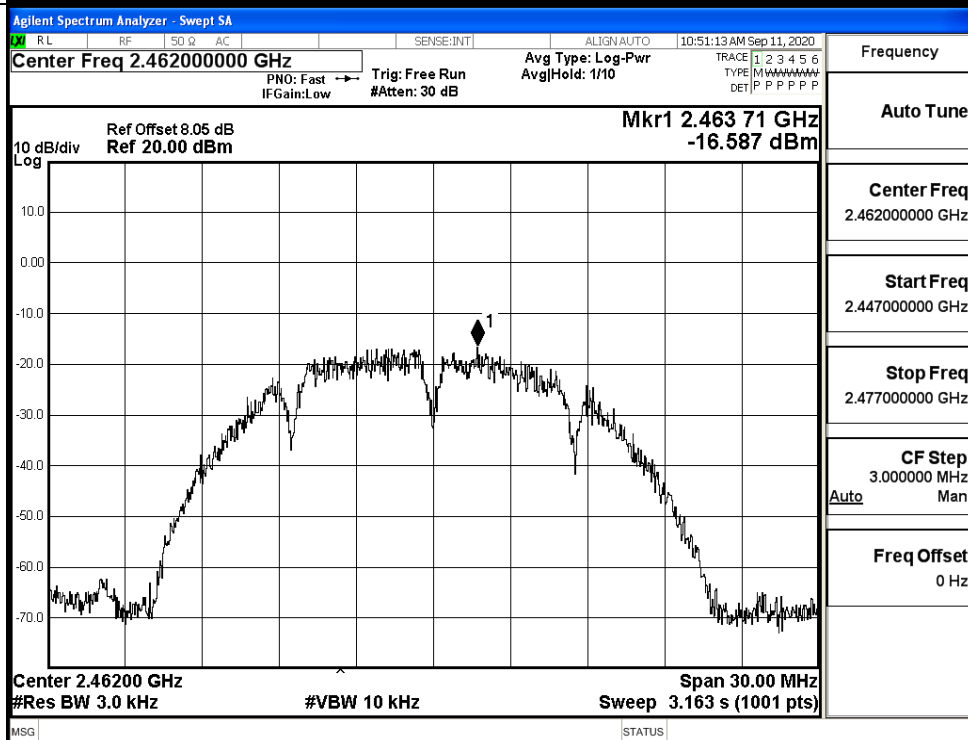
Test Graphs



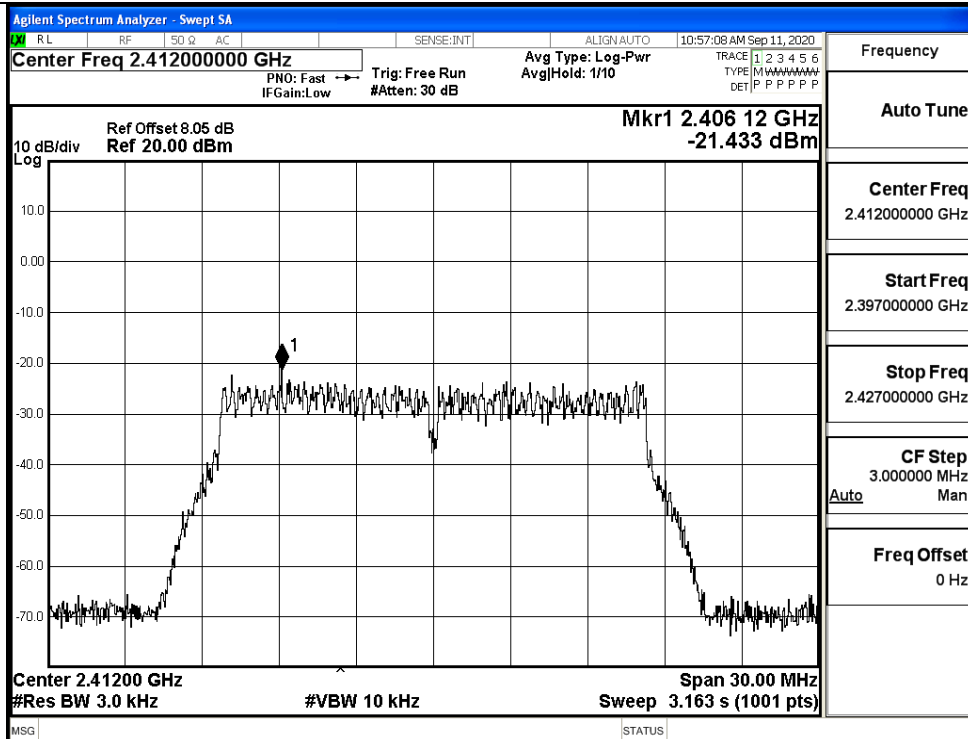
11B/MCH



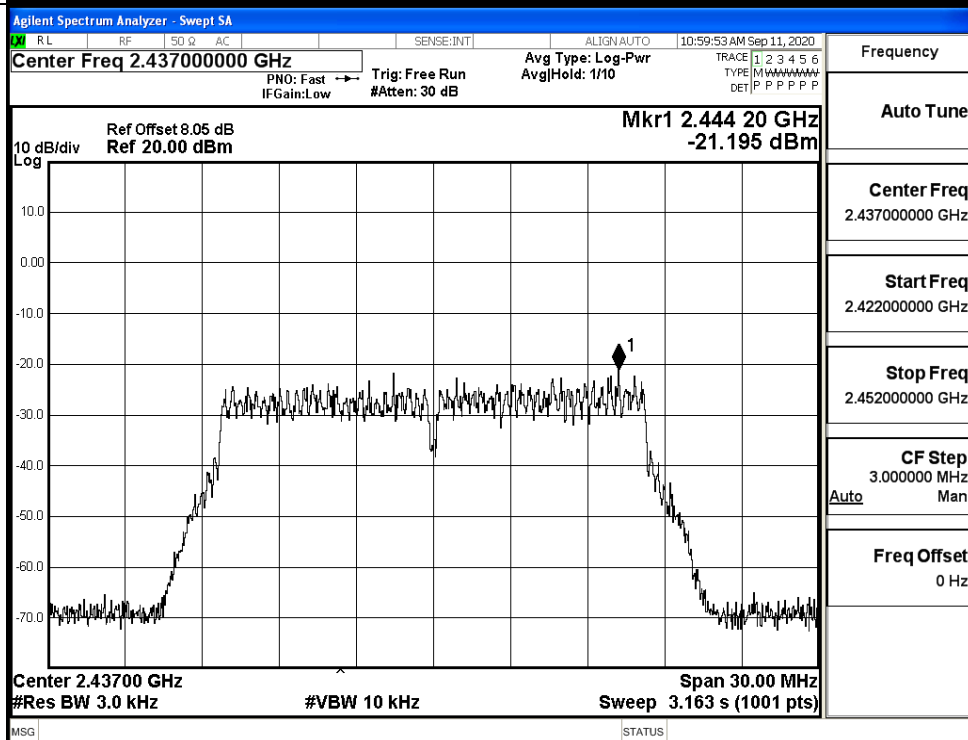
11B/HCH



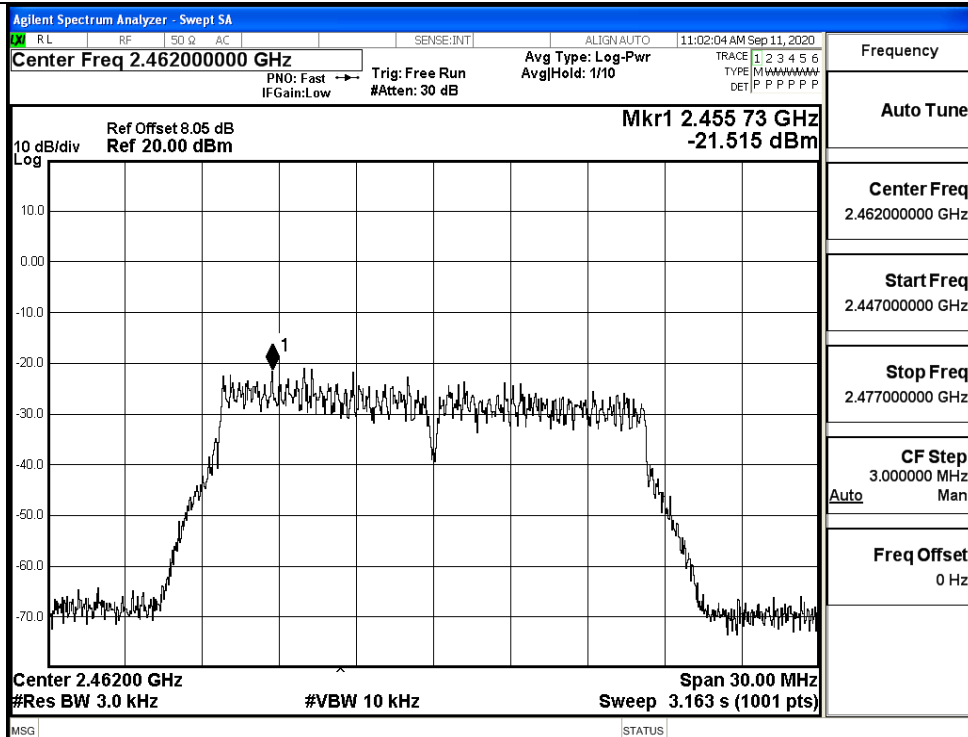
11G/LCH



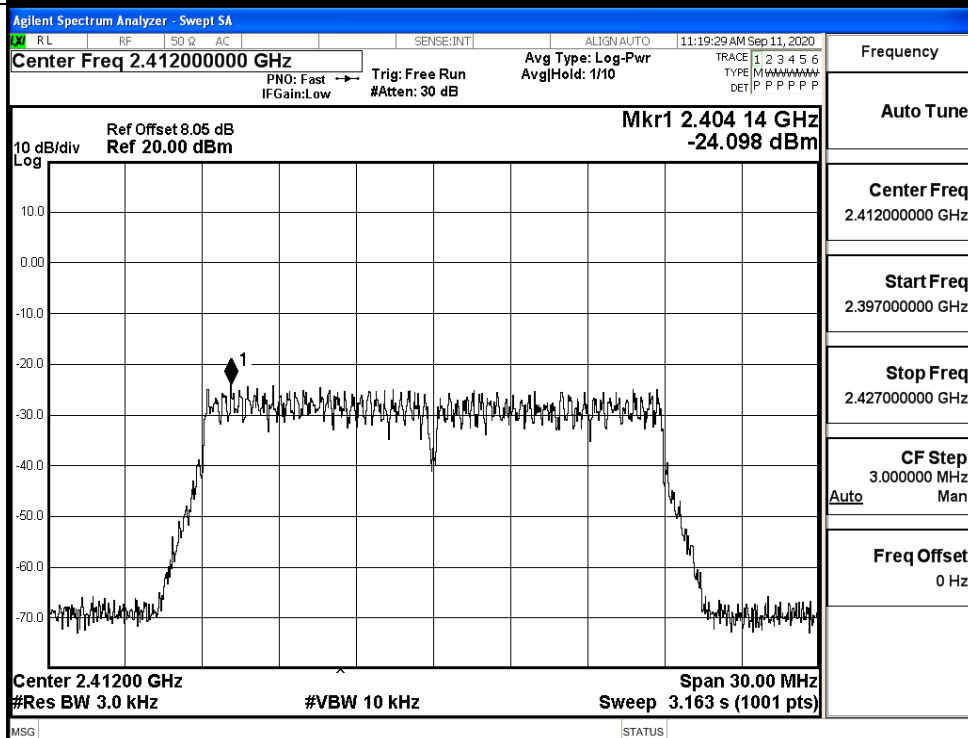
11G/MCH

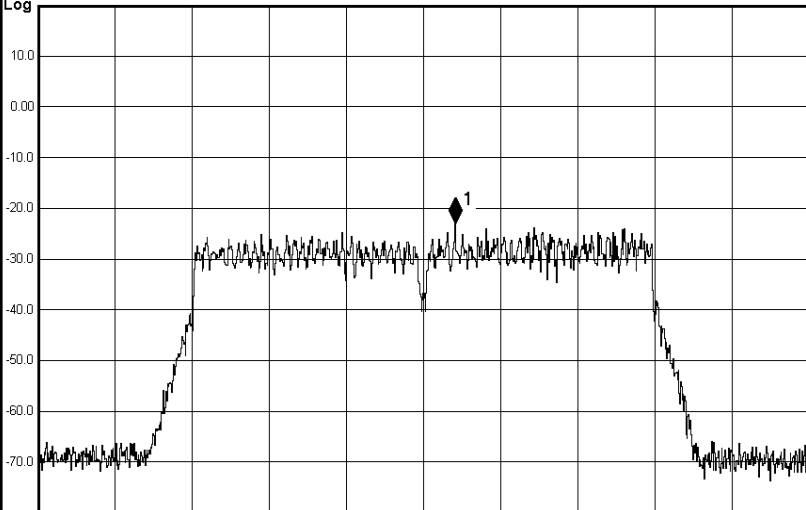
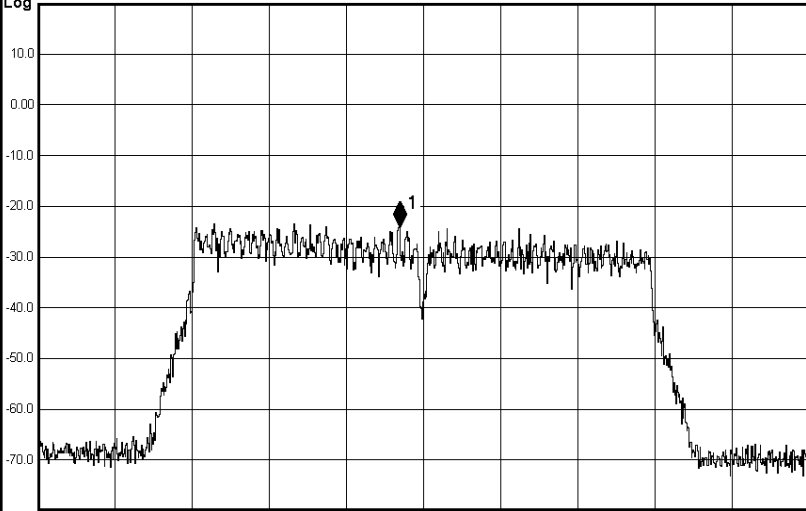


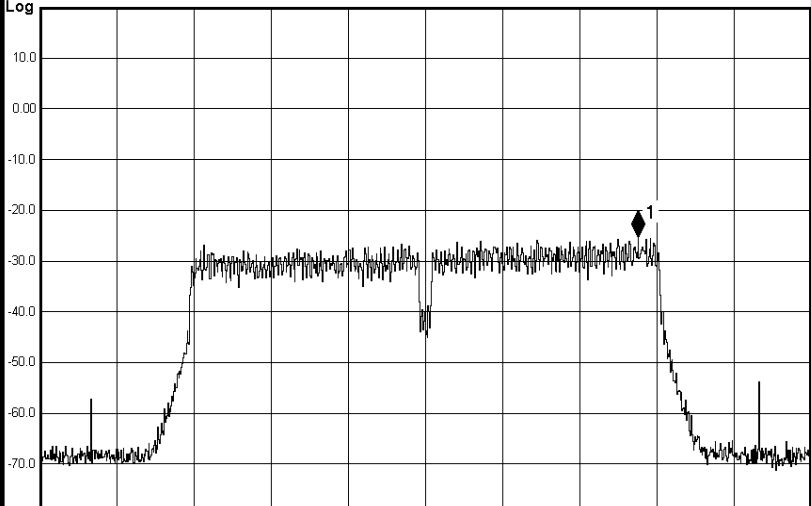
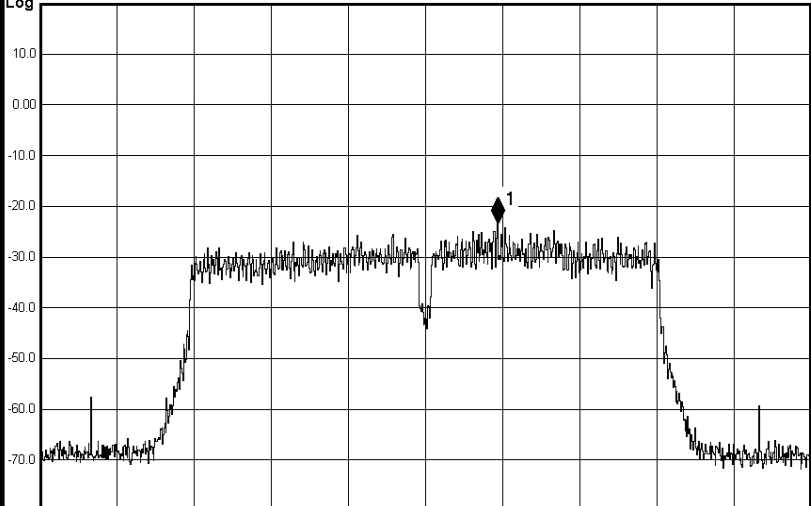
11G/HCH

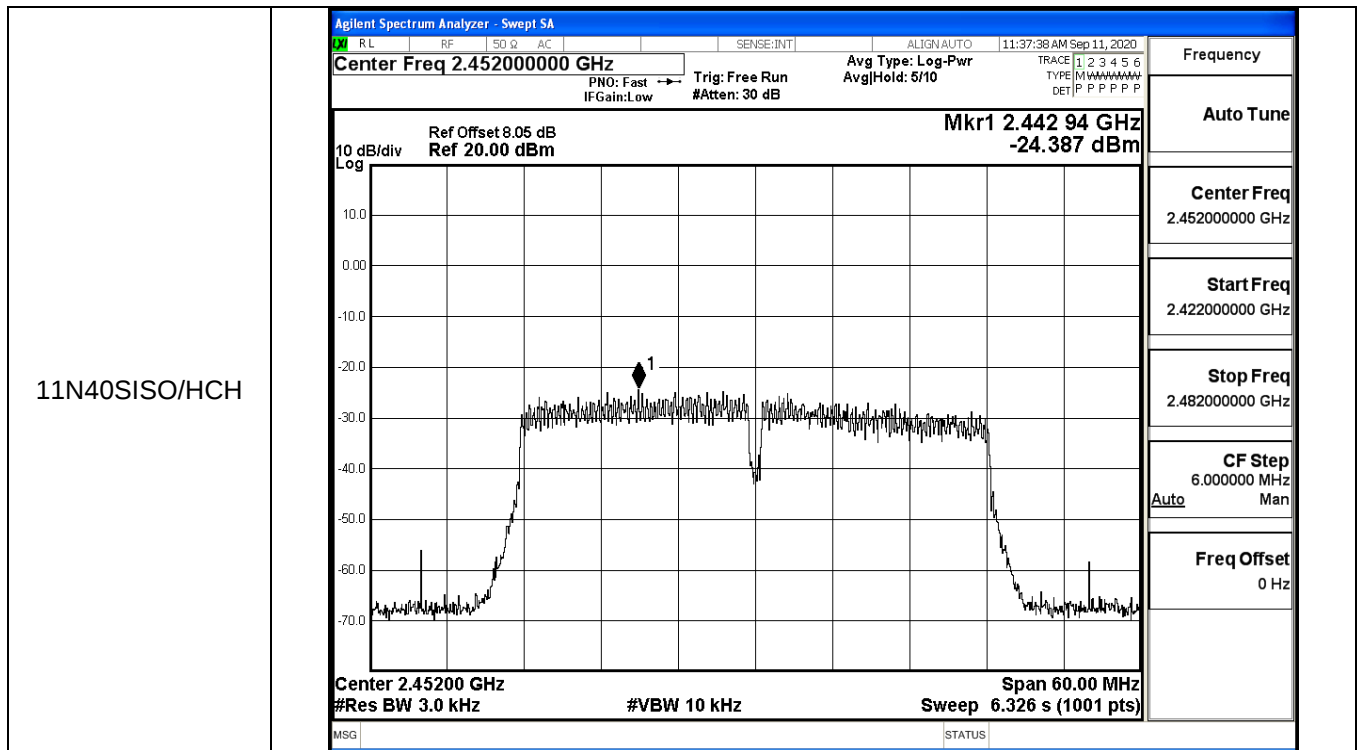


11N20SISO/LCH



11N20SISO/MCH	Agilent Spectrum Analyzer - Swept SA Center Freq 2.437000000 GHz Ref Offset 8.05 dB Ref 20.00 dBm Mkr1 2.438 23 GHz -23.141 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 07 GHz -24.223 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

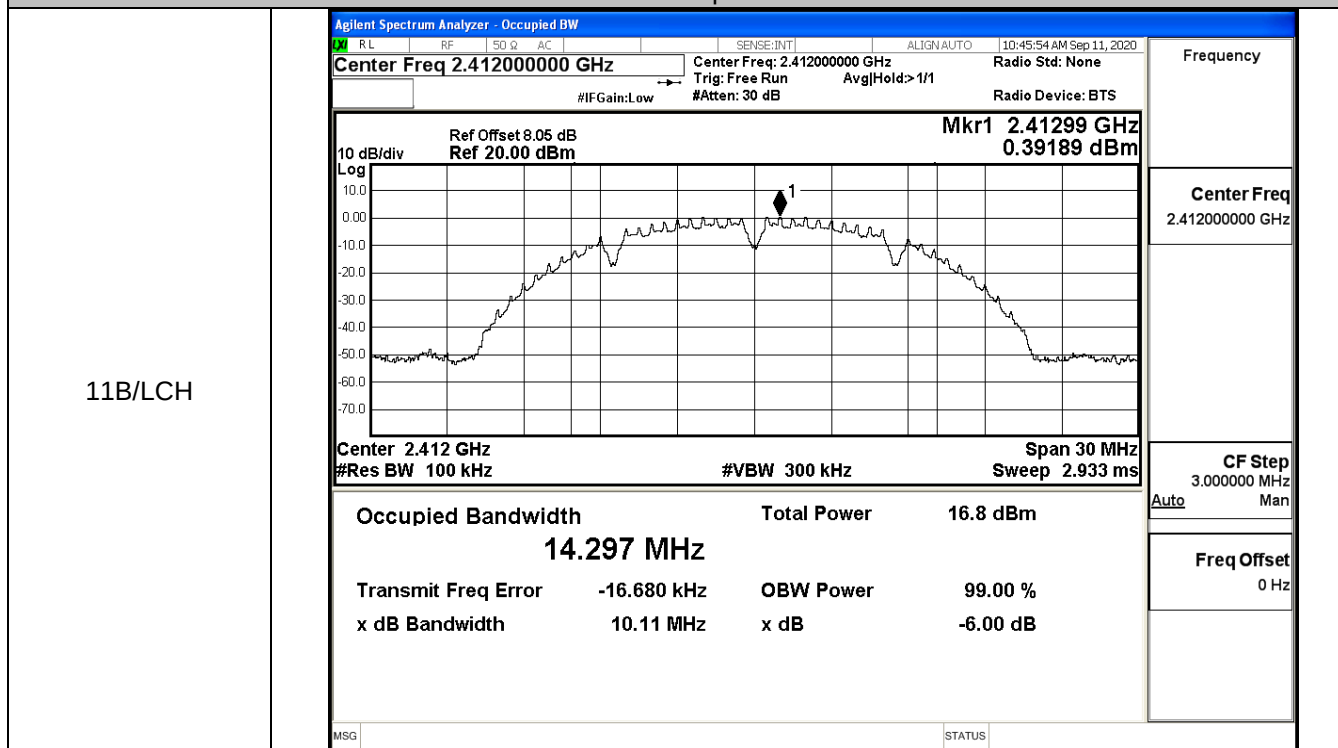
11N40SISO/LCH	Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC SENSE:INT ALIGN: AUTO 11:29:19 AM Sep 11, 2020 Center Freq 2.422000000 GHz PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB Avg Type: Log-Pwr Avg Hold: 1/10 Ref Offset 8.05 dB Ref 20.00 dBm Mkr1 2.438 56 GHz -25.358 dBm 10 dB/div Log  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 11:34:49 AM Sep 11, 2020 Center Freq 2.437000000 GHz PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB Avg Type: Log-Pwr Avg Hold: 1/10 Ref Offset 8.05 dB Ref 20.00 dBm Mkr1 2.442 64 GHz -23.481 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



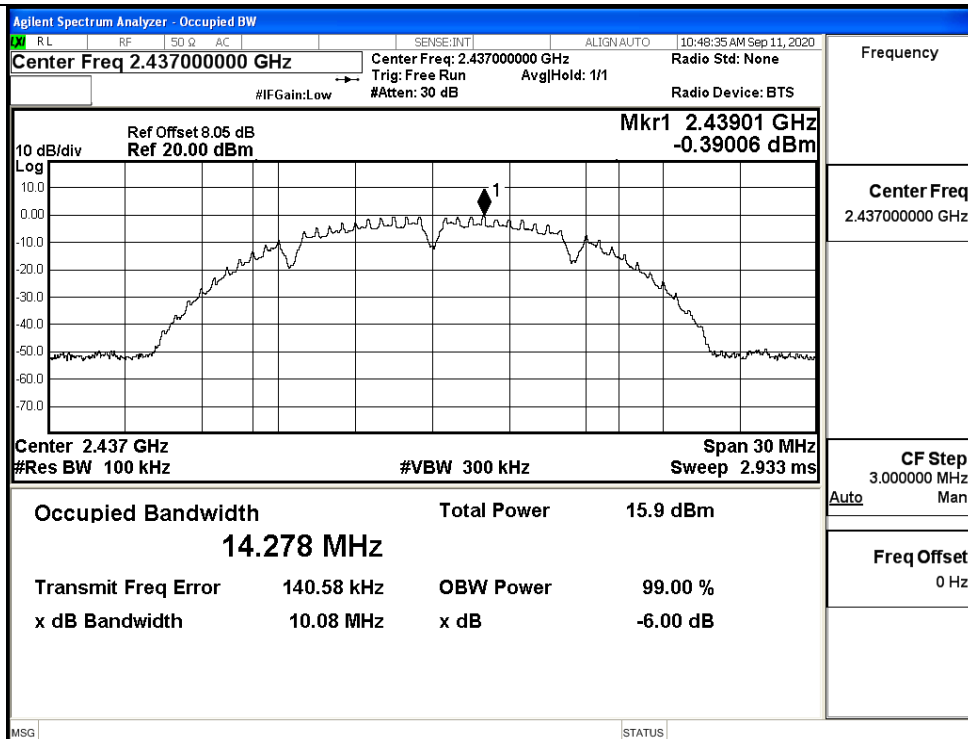
B.4 6dB Bandwidth

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
11B	LCH	10.11	≥ 0.5	PASS
	MCH	10.08	≥ 0.5	PASS
	HCH	9.612	≥ 0.5	PASS
11G	LCH	16.41	≥ 0.5	PASS
	MCH	16.11	≥ 0.5	PASS
	HCH	16.02	≥ 0.5	PASS
11N20SISO	LCH	17.63	≥ 0.5	PASS
	MCH	17.34	≥ 0.5	PASS
	HCH	17.23	≥ 0.5	PASS
11N40SISO	LCH	35.79	≥ 0.5	PASS
	MCH	35.49	≥ 0.5	PASS
	HCH	35.45	≥ 0.5	PASS

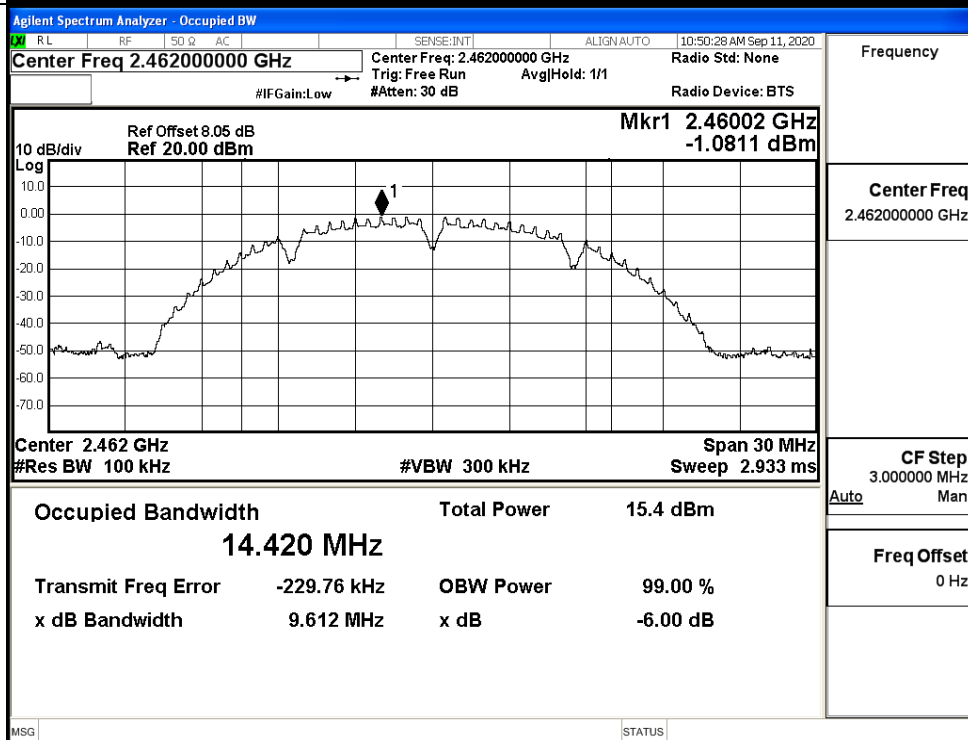
Test Graphs



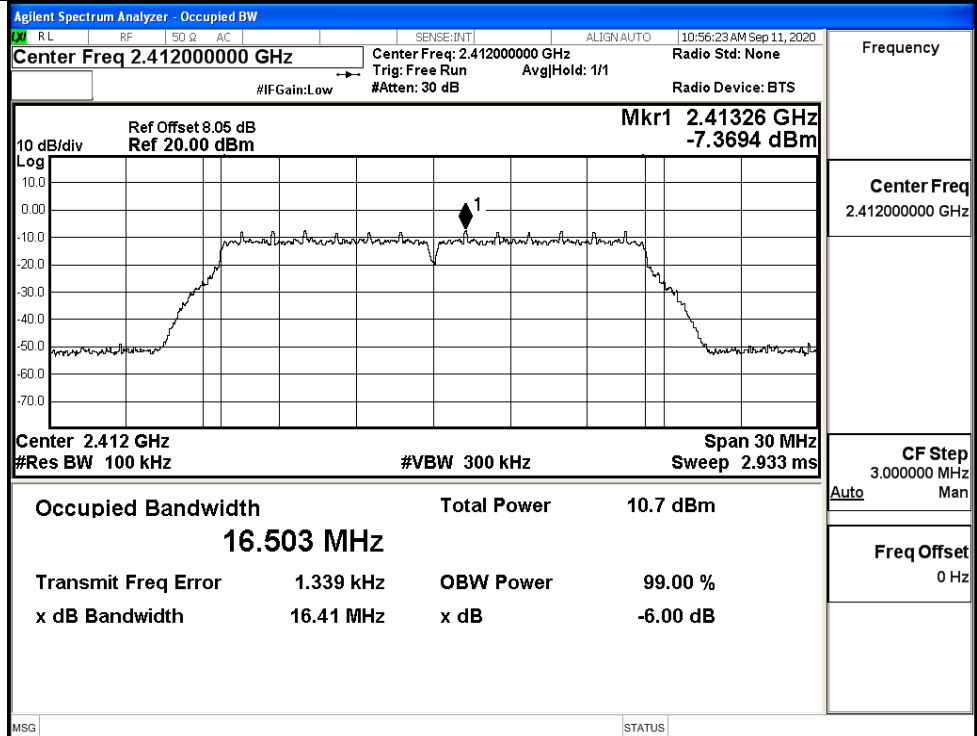
11B/MCH



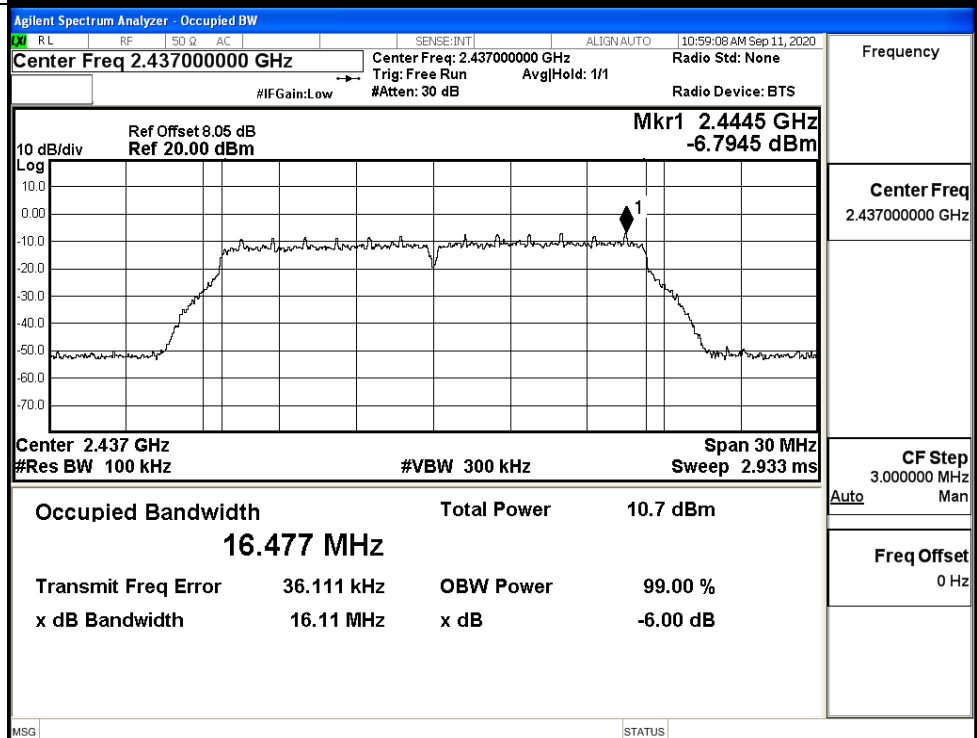
11B/HCH



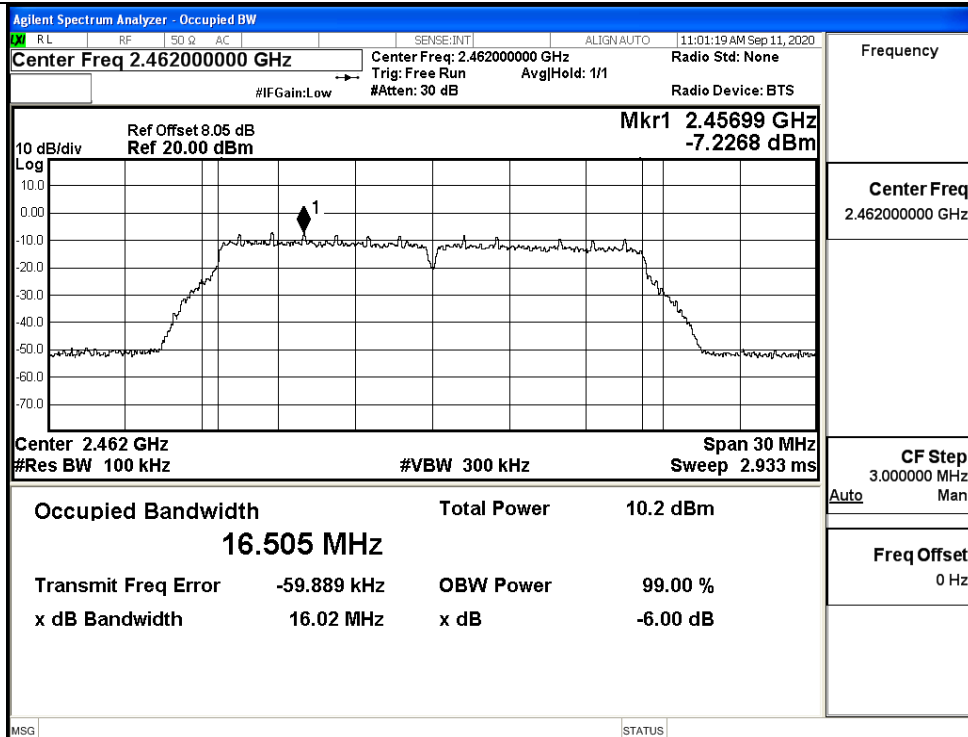
11G/LCH



11G/MCH



11G/HCH



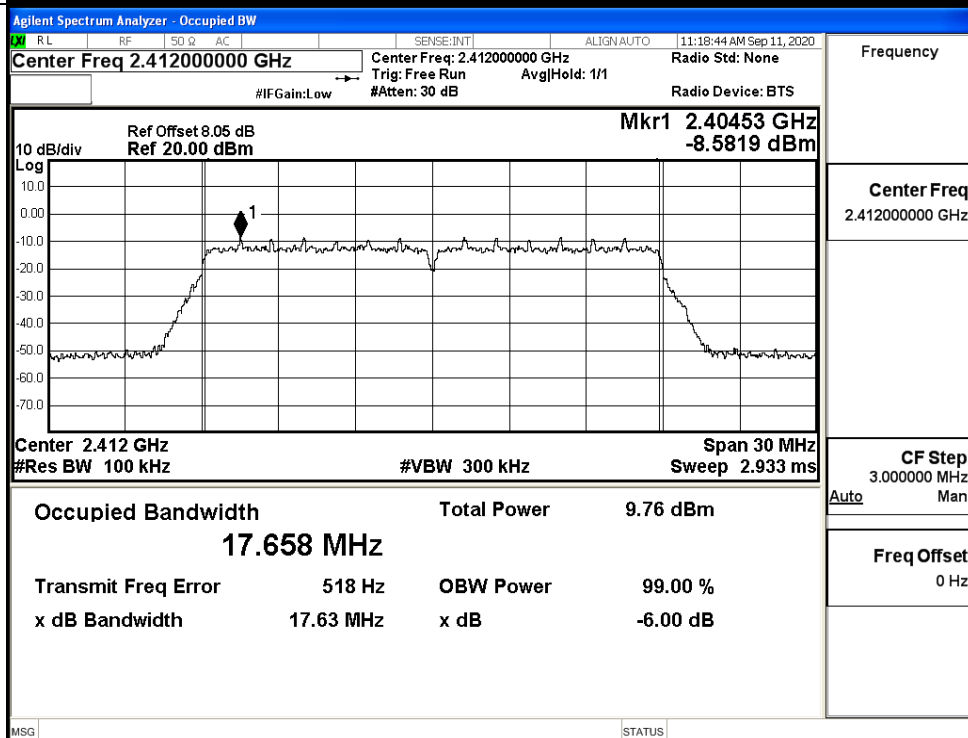
Frequency

Center Freq
2.462000000 GHz

CF Step
3.000000 MHz
Auto Man

Freq Offset
0 Hz

11N20SISO/LCH

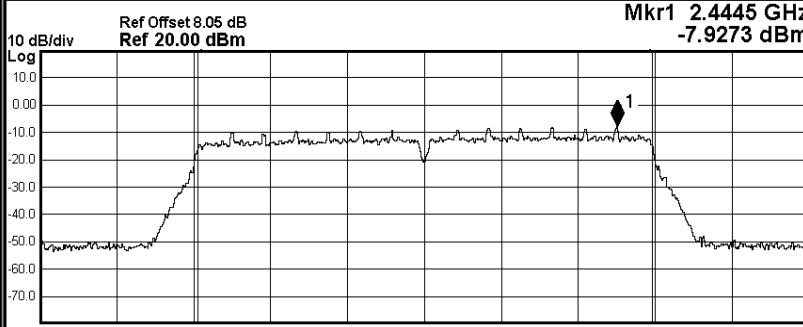


Frequency

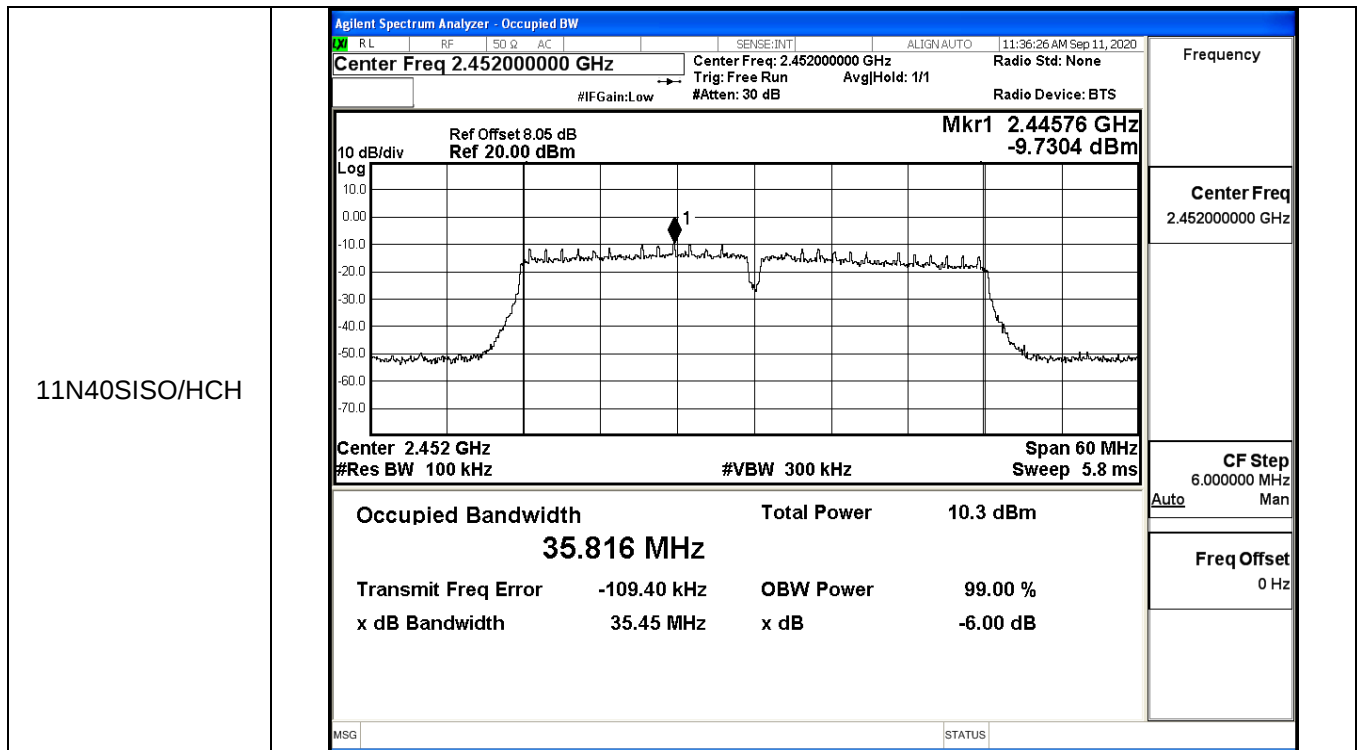
Center Freq
2.412000000 GHz

CF Step
3.000000 MHz
Auto Man

Freq Offset
0 Hz

11N20SISO/MCH	Agilent Spectrum Analyzer - Occupied BW Center Freq 2.43700000 GHz Ref Offset 8.05 dB Ref 20.00 dBm  Center 2.437 GHz #Res BW 100 kHz #VBW 300 kHz Span 30 MHz Sweep 2.933 ms Occupied Bandwidth 17.645 MHz Total Power 9.76 dBm Transmit Freq Error 39.728 kHz OBW Power 99.00 % x dB Bandwidth 17.34 MHz x dB -6.00 dB Frequency Center Freq 2.43700000 GHz CF Step 3.000000 MHz Freq Offset 0 Hz
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11N40SISO/LCH	Agilent Spectrum Analyzer - Occupied BW RL RF SO Q AC SENSE:INT ALIGN:AUTO 11:27:05 AM Sep 11, 2020 Center Freq 2.422000000 GHz Center Freq: 2.422000000 GHz Radio Std: None Trig: Free Run Avg/Hold: 1/1 #IF Gain: Low #Atten: 30 dB Radio Device: BTS 10 dB/div Log Ref Offset 8.05 dB Ref 20.00 dBm Mkr1 2.43946 GHz -10.077 dBm Center 2.422 GHz #Res BW 100 kHz Span 60 MHz Sweep 5.8 ms #VBW 300 kHz Occupied Bandwidth 36.105 MHz Total Power 10.6 dBm Transmit Freq Error 71.501 kHz OBW Power 99.00 % x dB Bandwidth 35.79 MHz x dB -6.00 dB MSG STATUS
11N40SISO/MCH	Agilent Spectrum Analyzer - Occupied BW RL RF SO Q AC SENSE:INT ALIGN:AUTO 11:33:27 AM Sep 11, 2020 Center Freq 2.437000000 GHz Center Freq: 2.437000000 GHz Radio Std: None Trig: Free Run Avg/Hold: 1/1 #IF Gain: Low #Atten: 30 dB Radio Device: BTS 10 dB/div Log Ref Offset 8.05 dB Ref 20.00 dBm Mkr1 2.44324 GHz -10.136 dBm Center 2.437 GHz #Res BW 100 kHz Span 60 MHz Sweep 5.8 ms #VBW 300 kHz Occupied Bandwidth 35.878 MHz Total Power 10.6 dBm Transmit Freq Error 72.154 kHz OBW Power 99.00 % x dB Bandwidth 35.49 MHz x dB -6.00 dB MSG STATUS

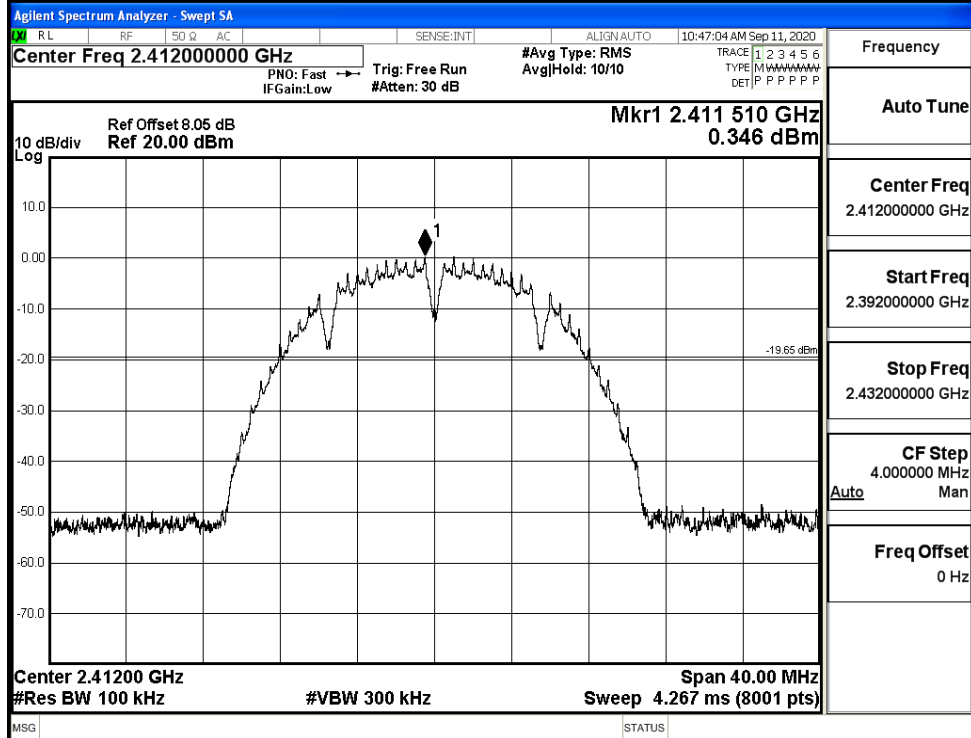


B.5 RF Conducted Spurious Emissions

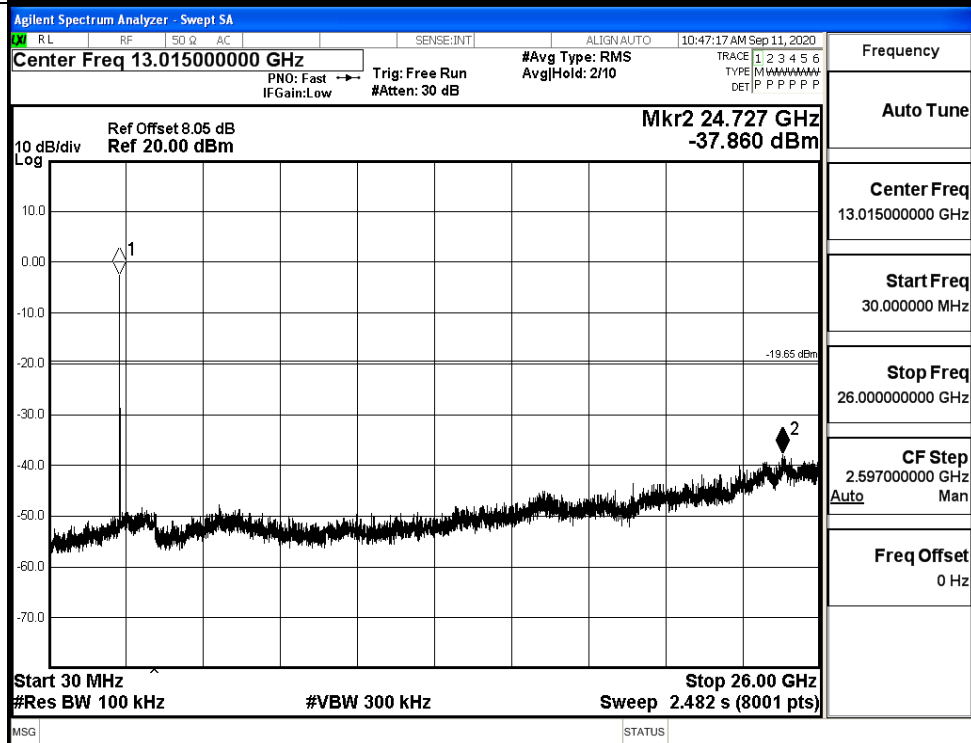
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
11B	LCH	0.346	-37.860	-19.654	PASS
	MCH	-0.371	-37.655	-20.371	PASS
	HCH	-0.679	-37.507	-20.679	PASS
11G	LCH	-7.603	-38.287	-27.603	PASS
	MCH	-7.098	-38.276	-27.098	PASS
	HCH	-6.986	-38.374	-26.986	PASS
11N20 SISO	LCH	-8.226	-38.220	-28.226	PASS
	MCH	-8.086	-37.228	-28.086	PASS
	HCH	-8.127	-38.564	-28.127	PASS
11N40 SISO	LCH	-9.967	-38.459	-29.967	PASS
	MCH	-10.011	-36.826	-30.011	PASS
	HCH	-10.249	-38.348	-30.249	PASS

11B LCH Graphs

Pref/11B/LCH

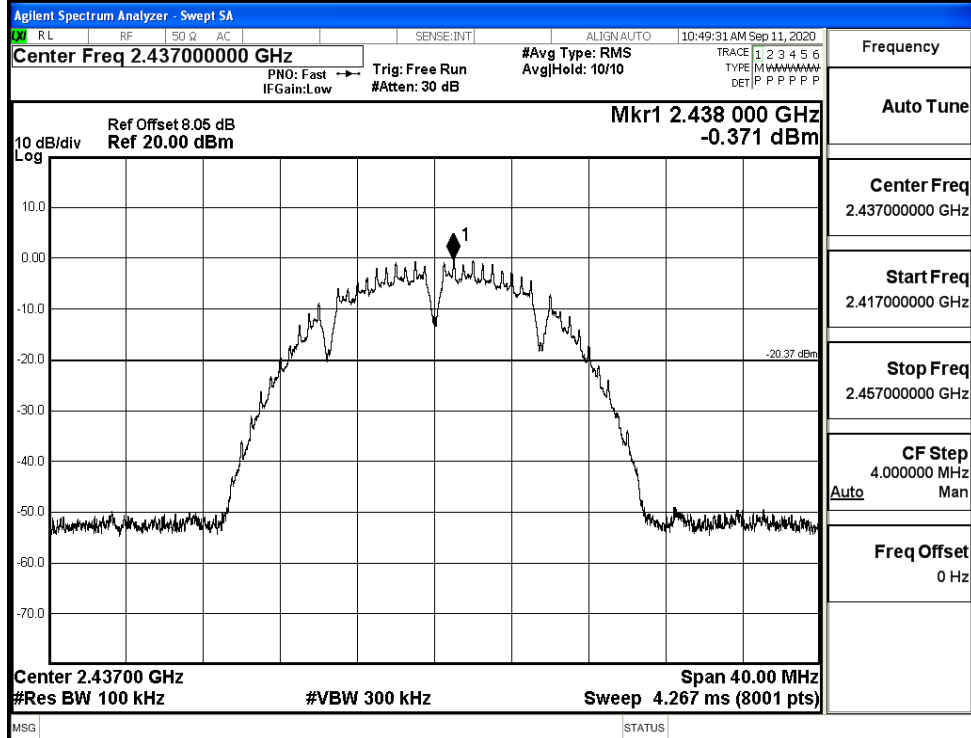


Puw/11B/LCH

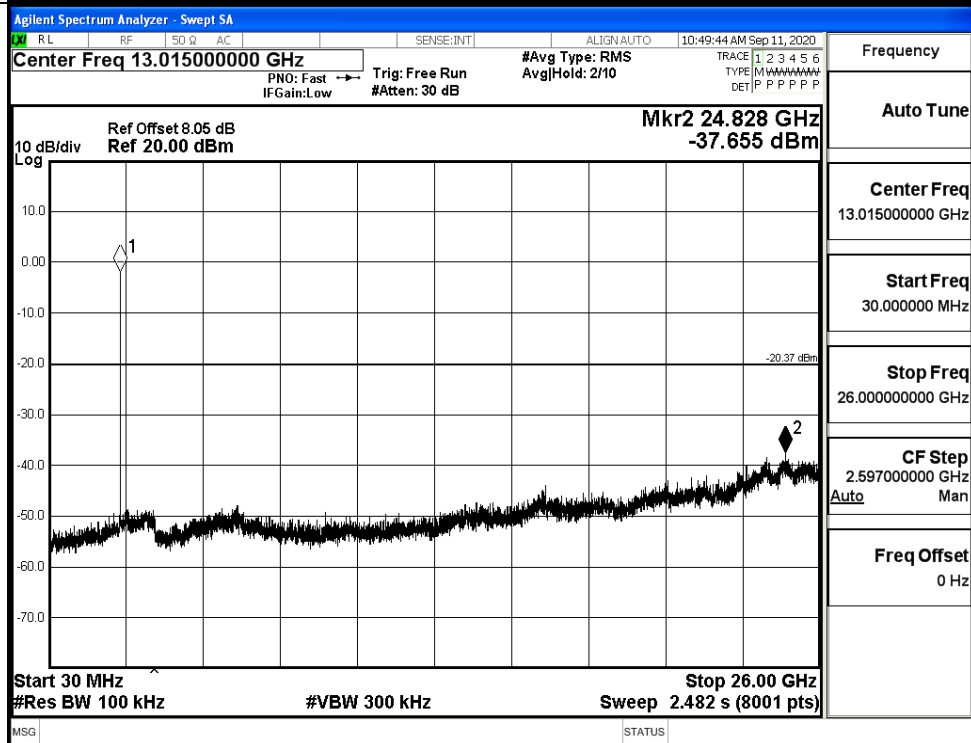


11B MCH Graphs

Pref/11B/MCH

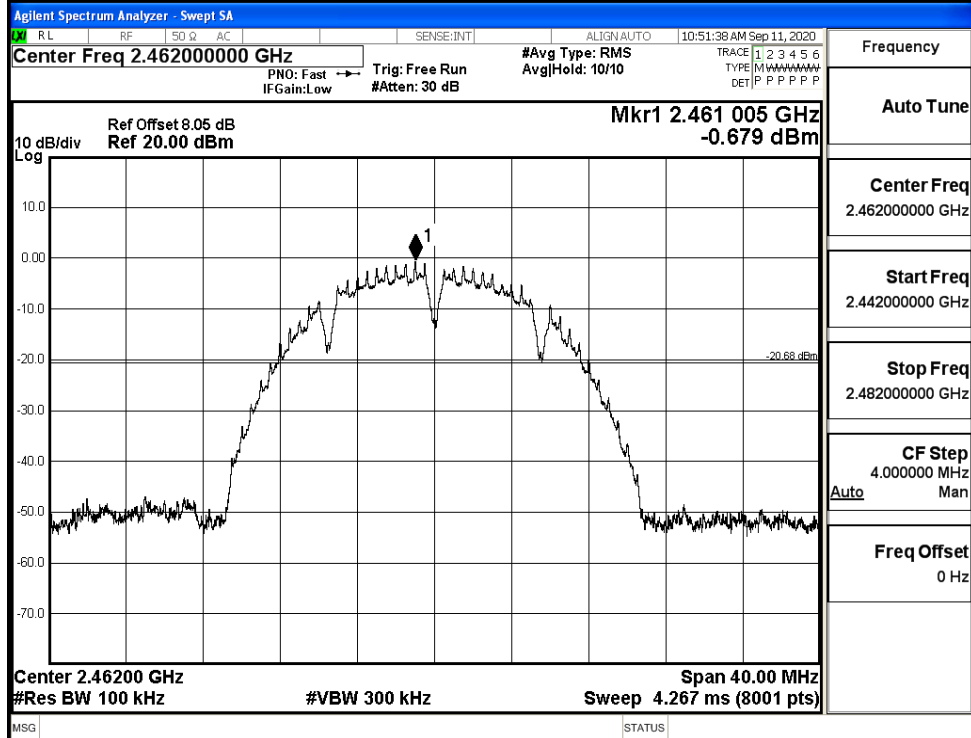


Puw/11B/MCH

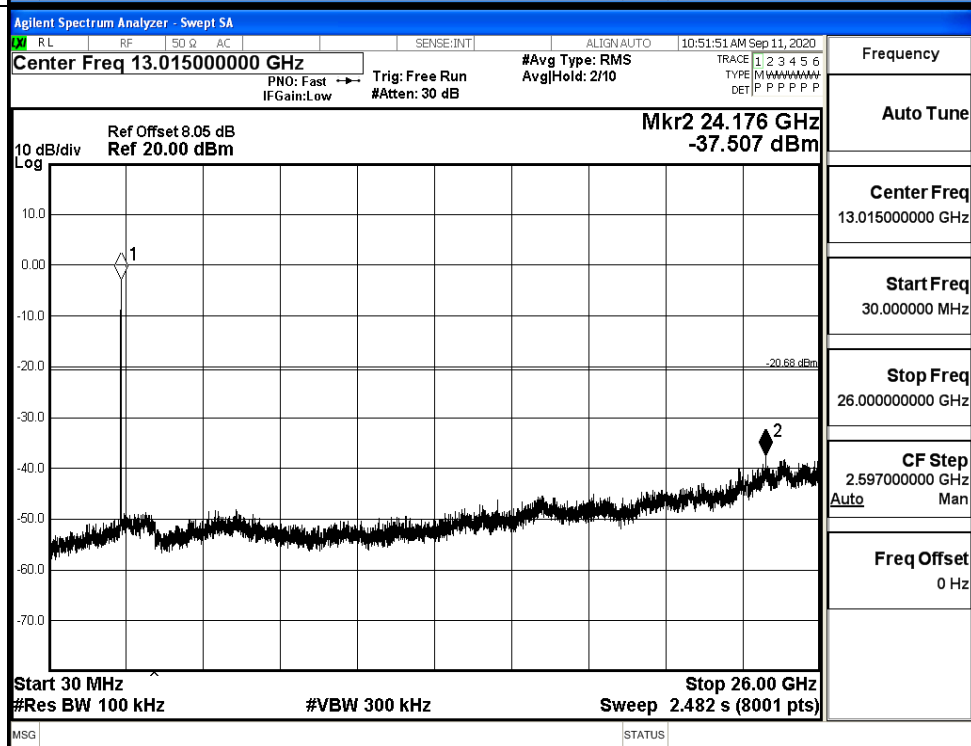


11B HCH Graphs

Pref/11B/HCH

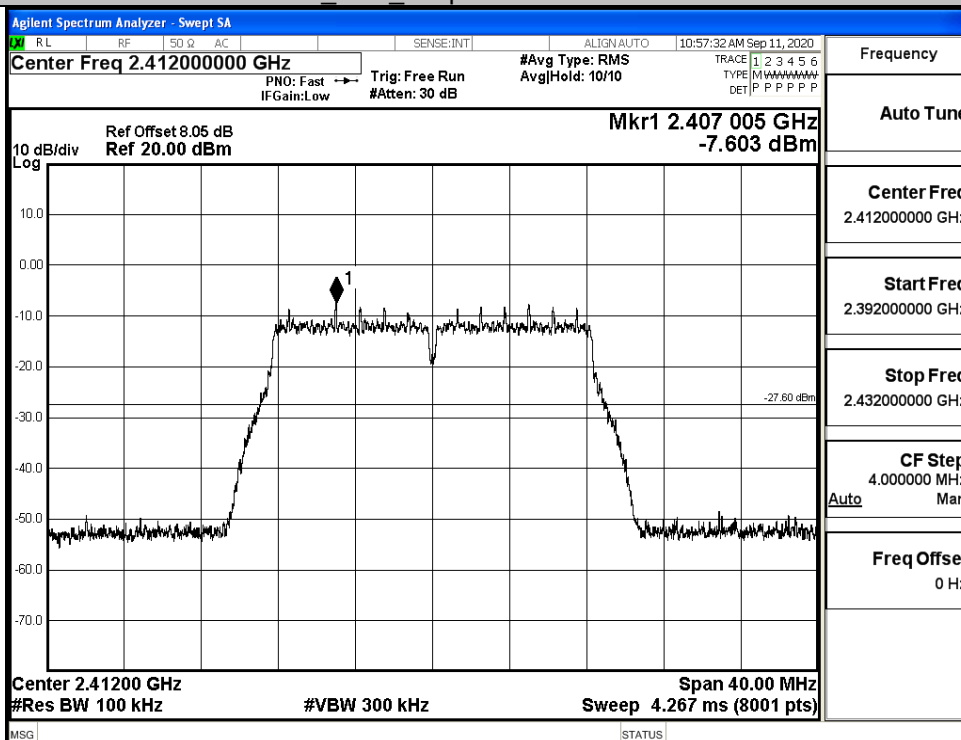


Puw/11B/HCH

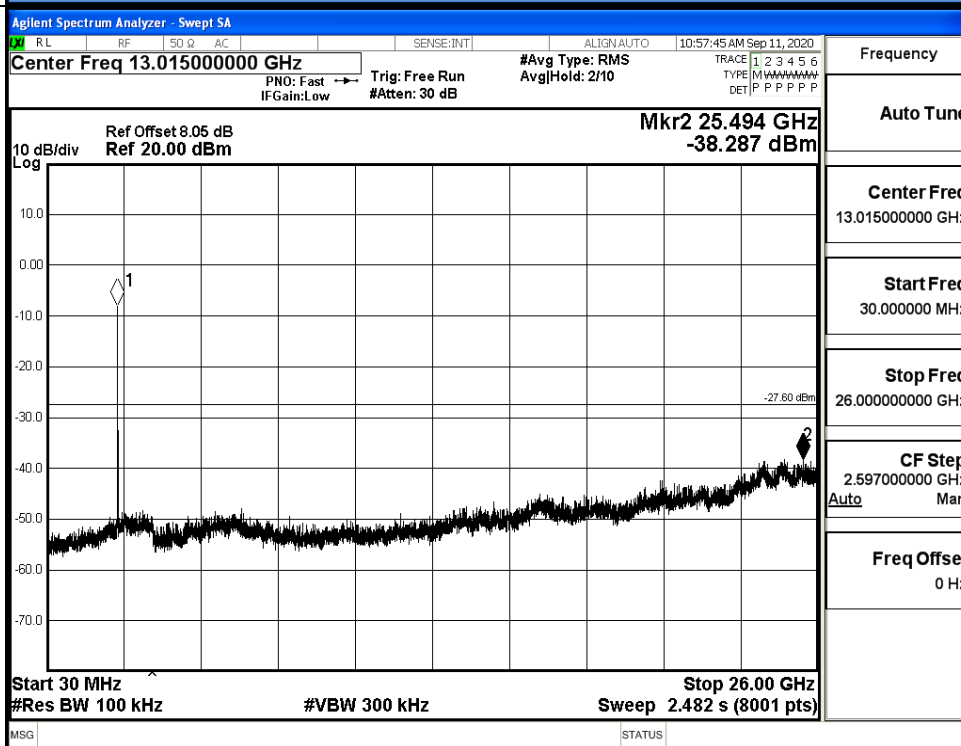


11G LCH Graphs

Pref/11G/LCH

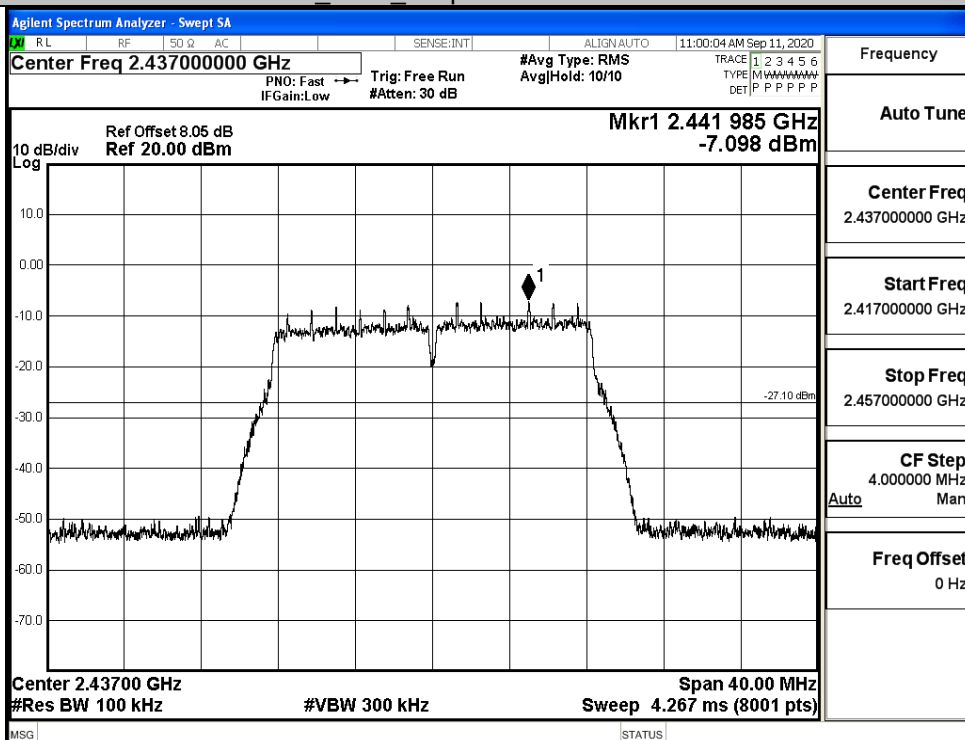


Puw/11G/LCH

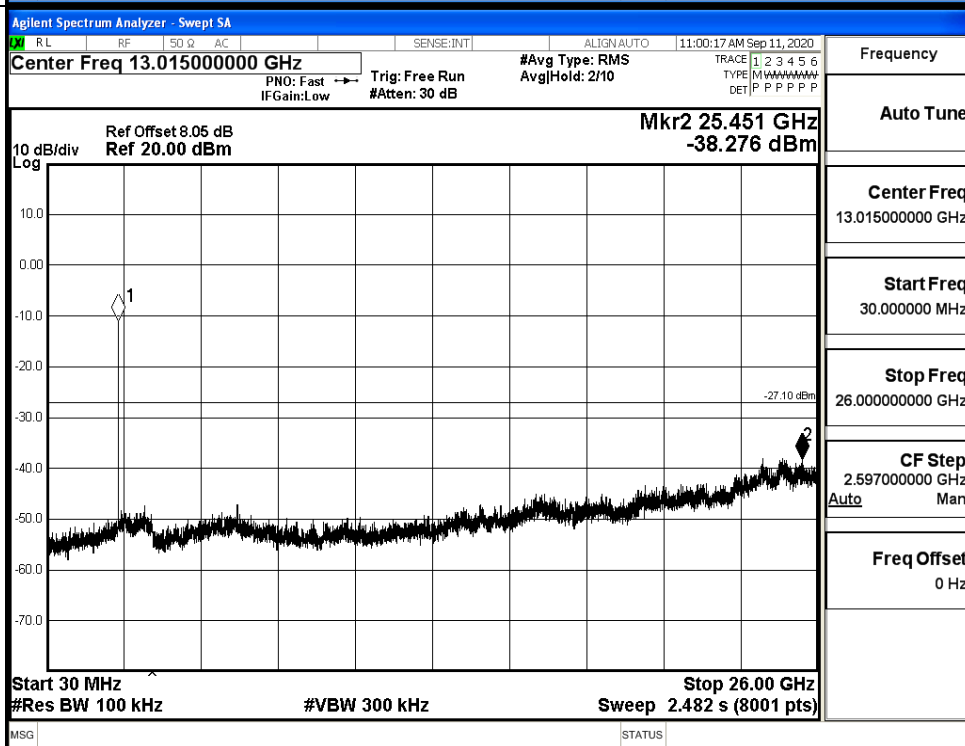


11G MCH Graphs

Pref/11G/MCH

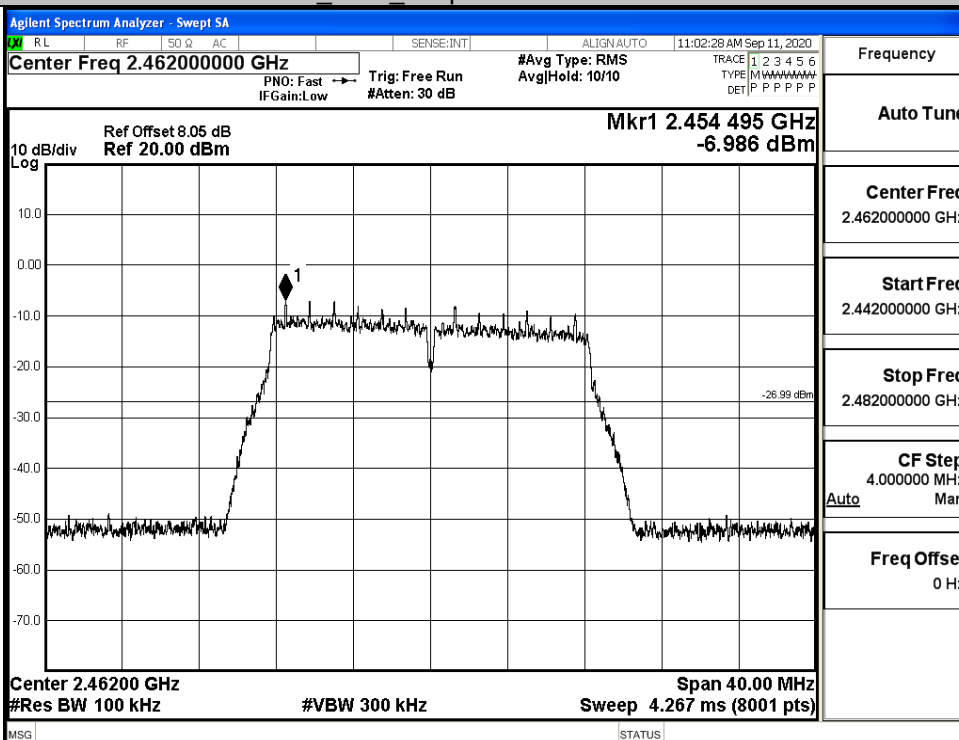


Puw/11G/MCH

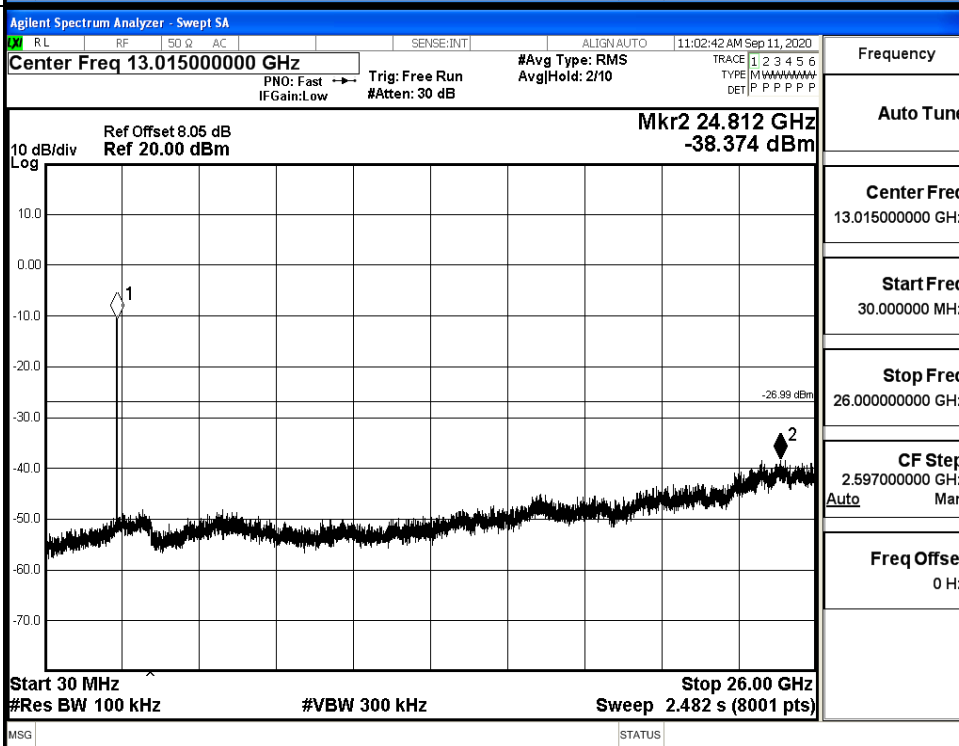


11G HCH Graphs

Pref/11G/HCH

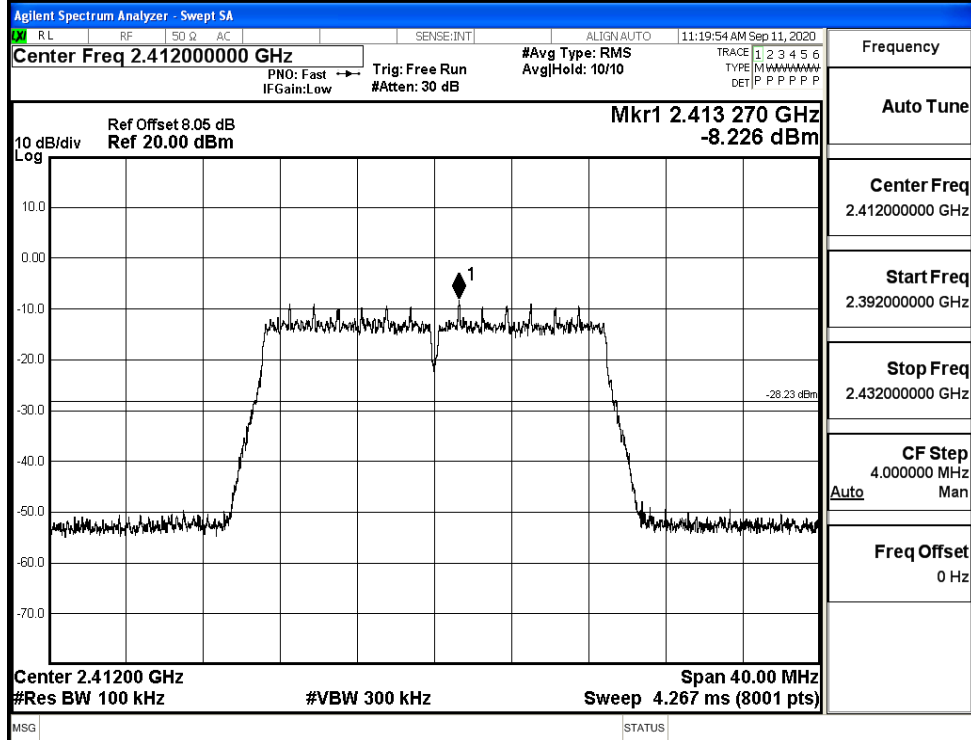


Puw/11G/HCH

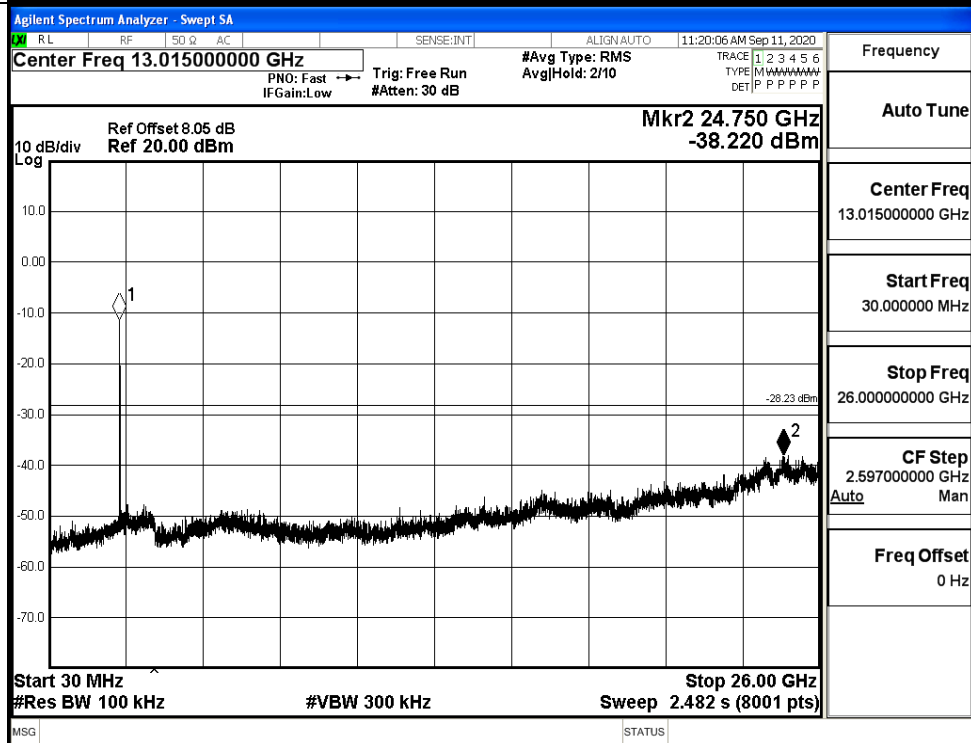


11N20SISO LCH Graphs

Pref/11N20SIS
O/LCH

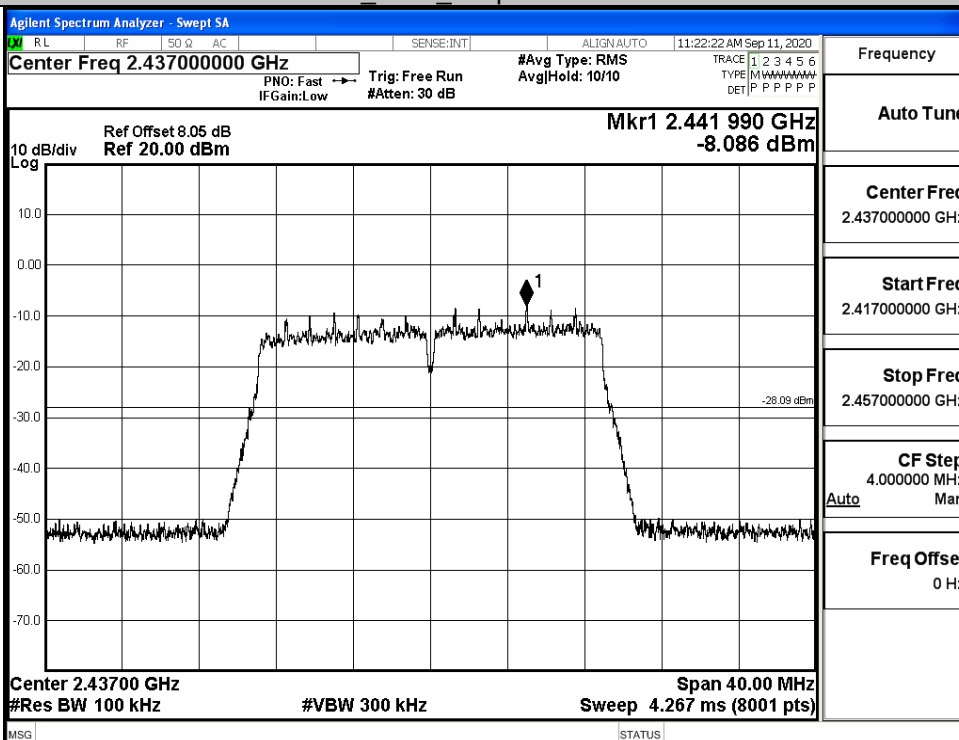


Puw/11N20
SISO/LCH

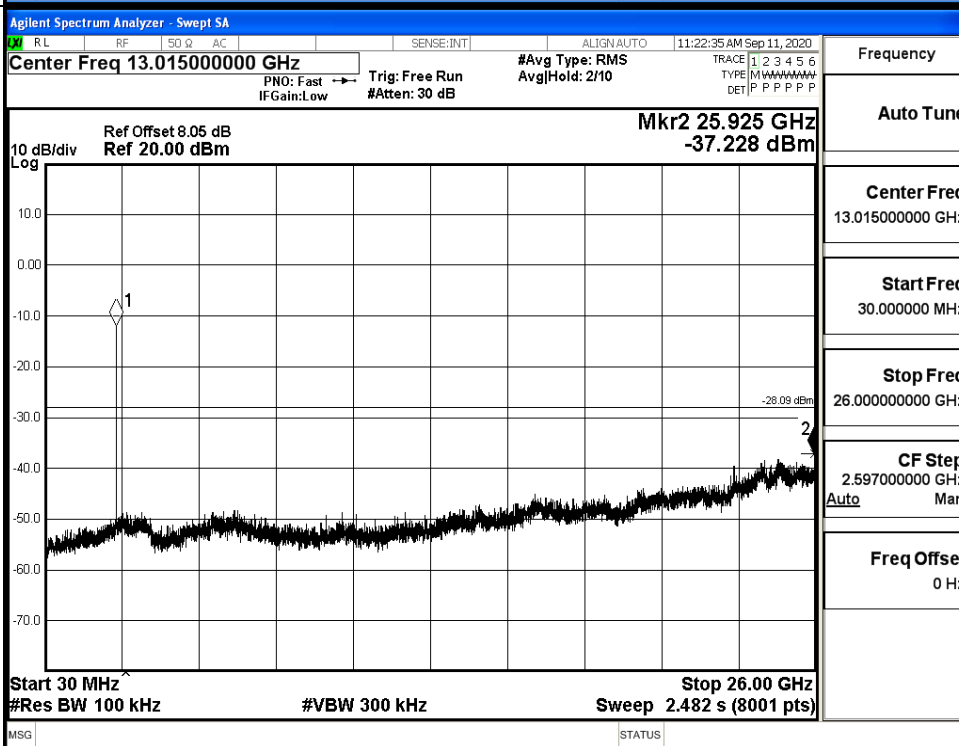


11N20SISO_MCH_Graphs

Pref/11N20
SISO/MCH

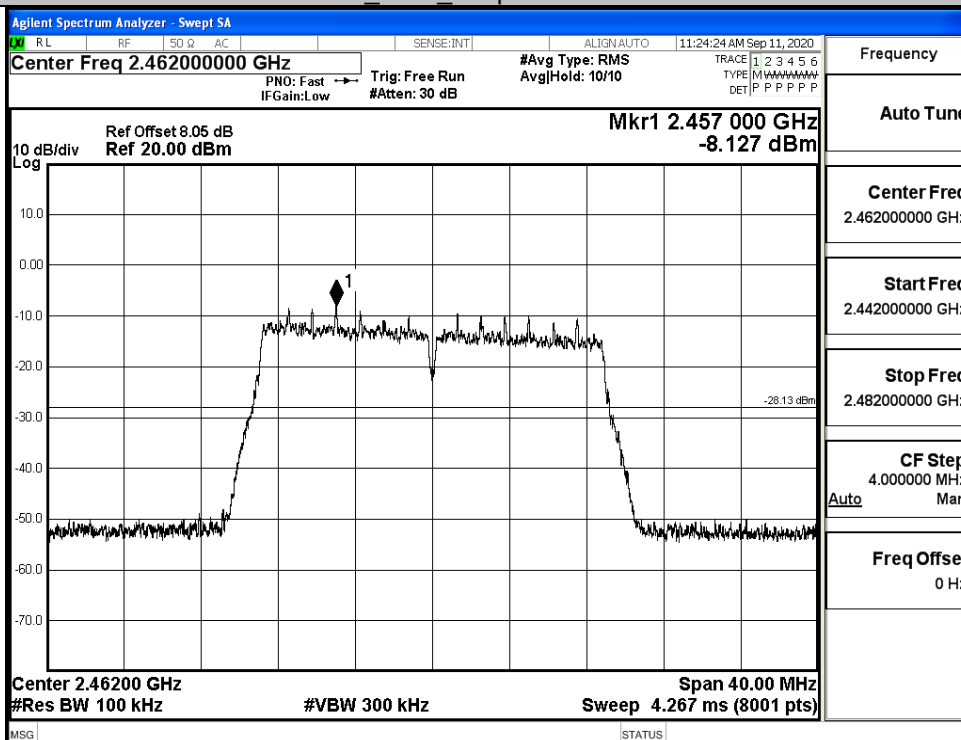


Puw/11N20
SISO/MCH

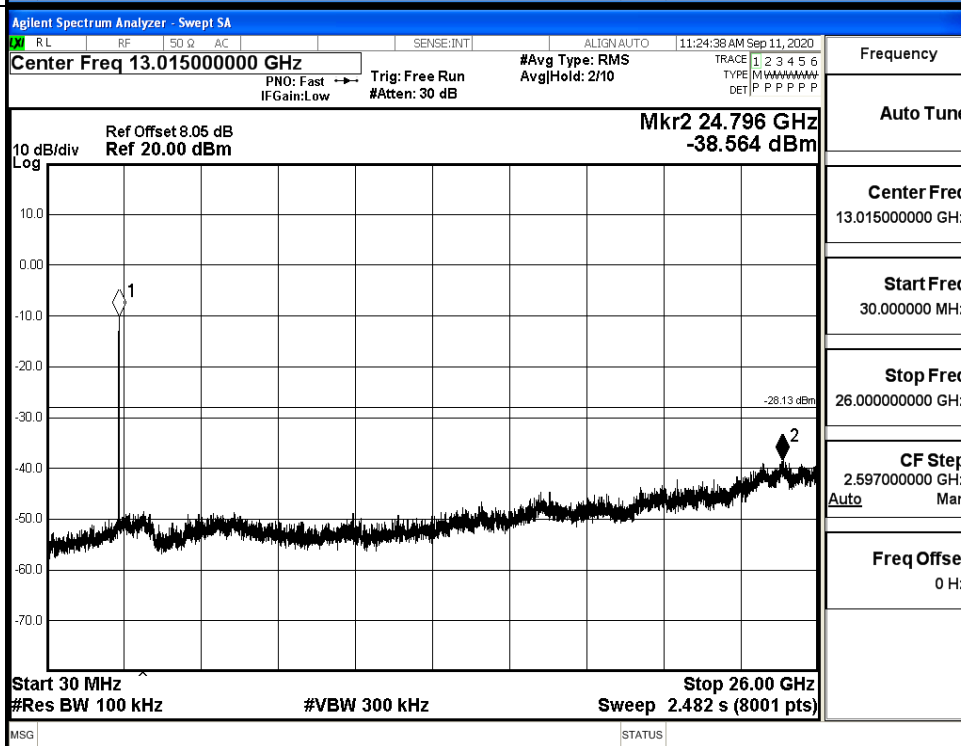


11N20SISO HCH Graphs

Pref/11N20
SISO/HCH

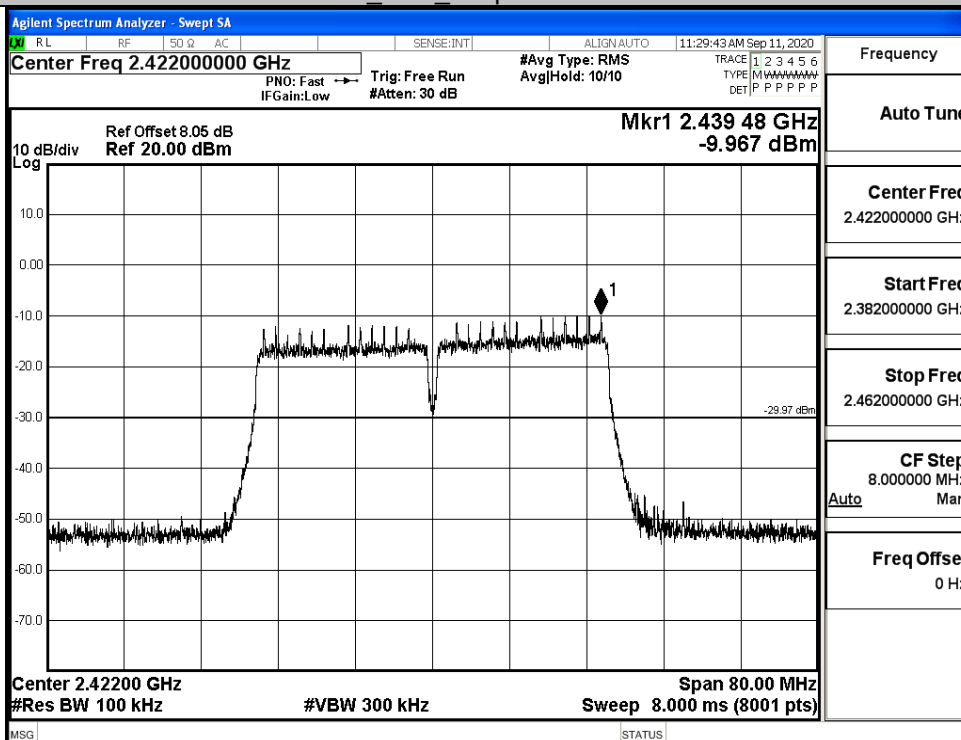


Puw/11N20
SISO/HCH

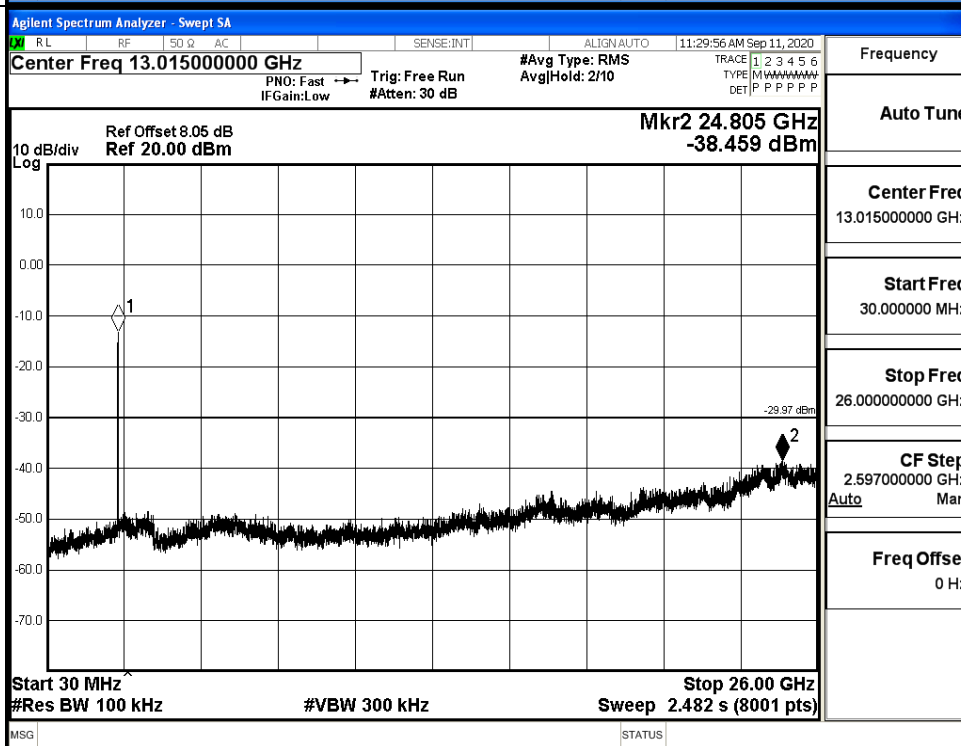


11N40SISO LCH Graphs

Pref/11N40
SISO/LCH

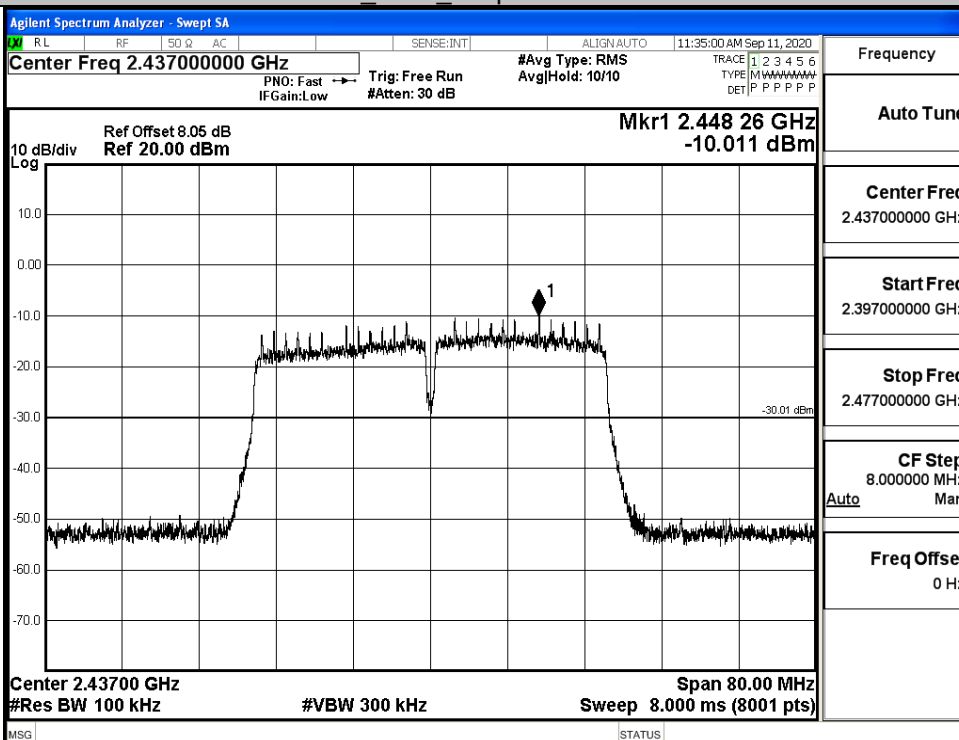


Puw/11N40
SISO/LCH

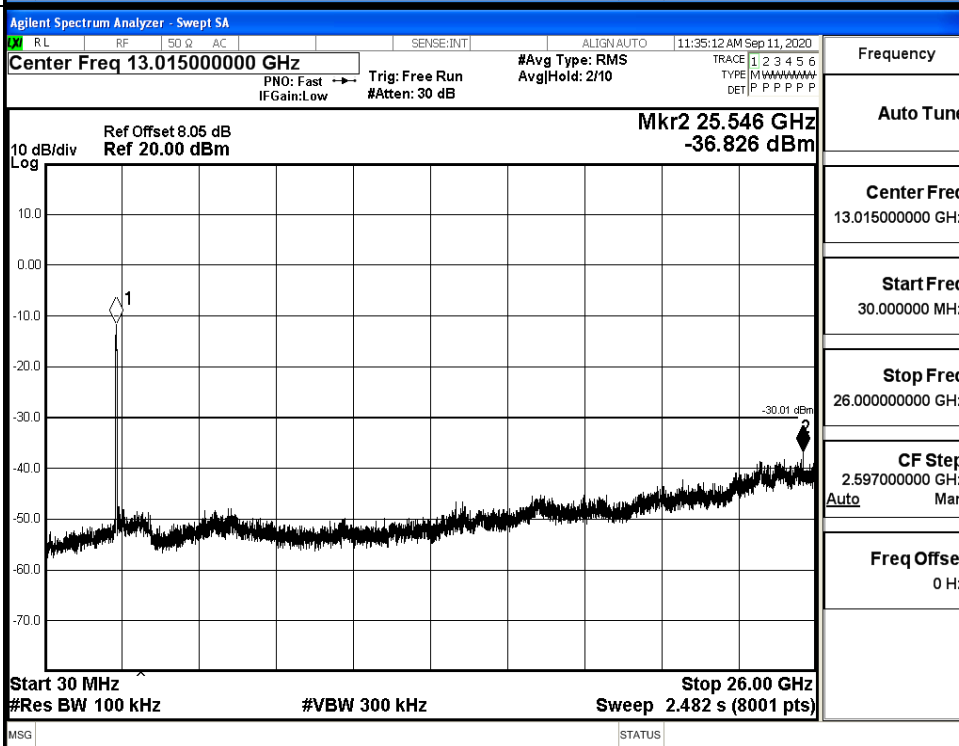


11N40SISO_MCH_Graphs

Pref/11N40
SISO/MCH

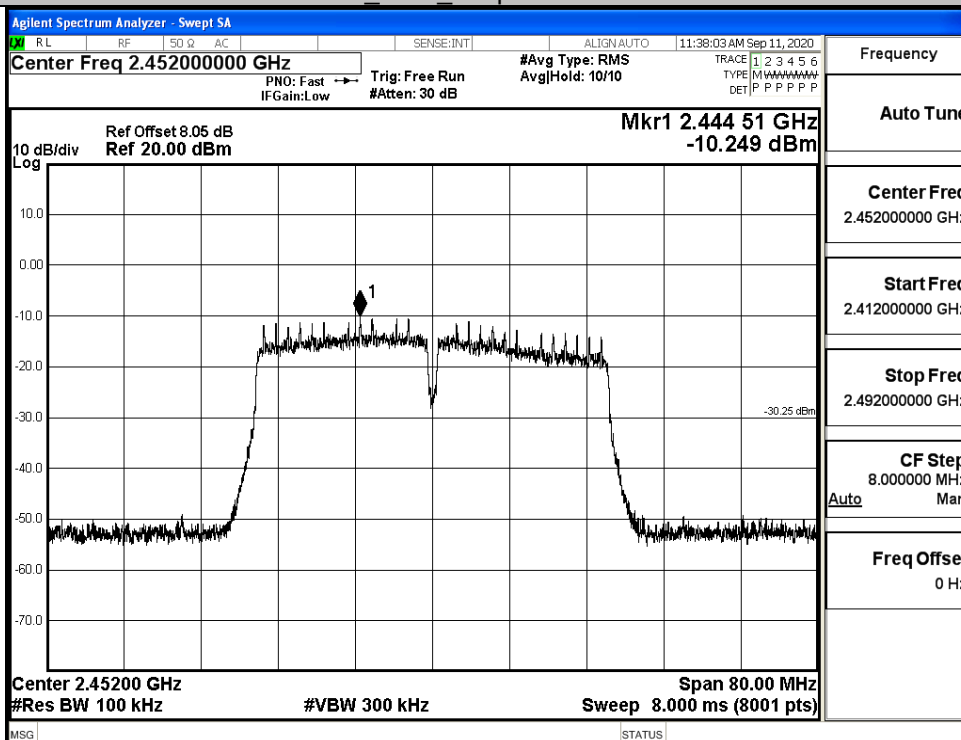


Puw/11N40
SISO/MCH

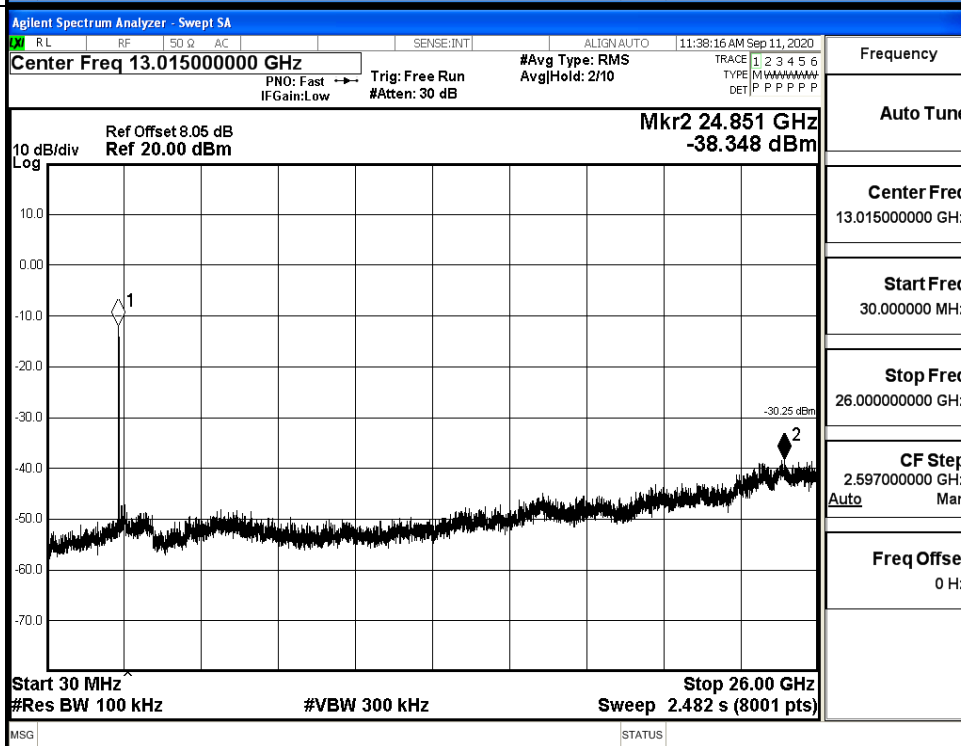


11N40SISO HCH Graphs

Pref/11N40
SISO/HCH



Puw/11N40
SISO/HCH

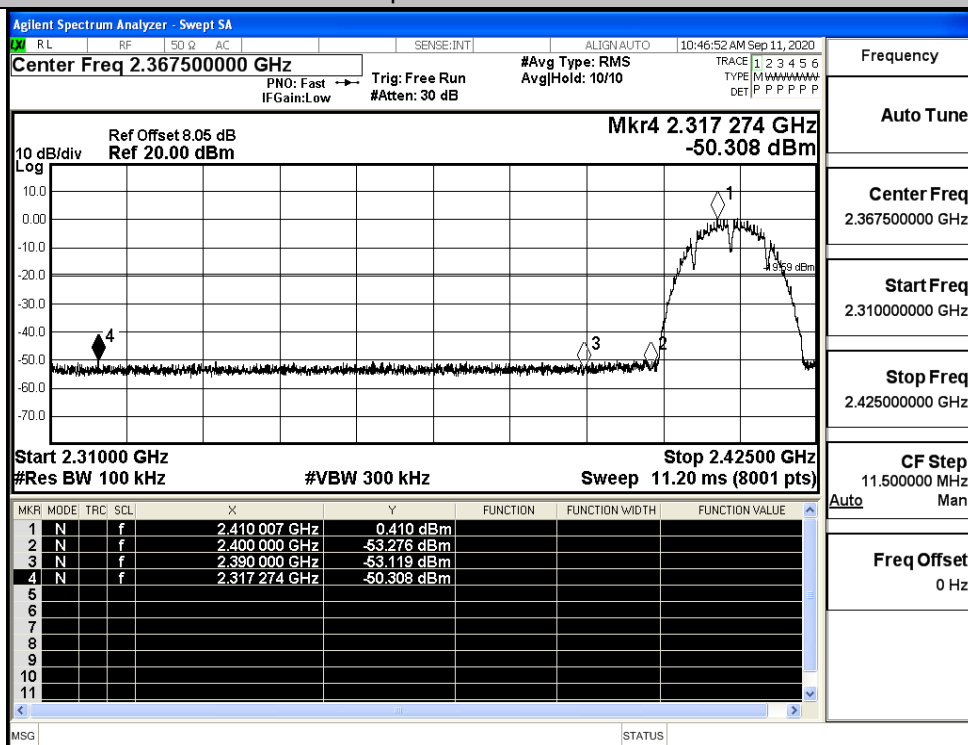


B.6 Band-edge for RF Conducted Emissions

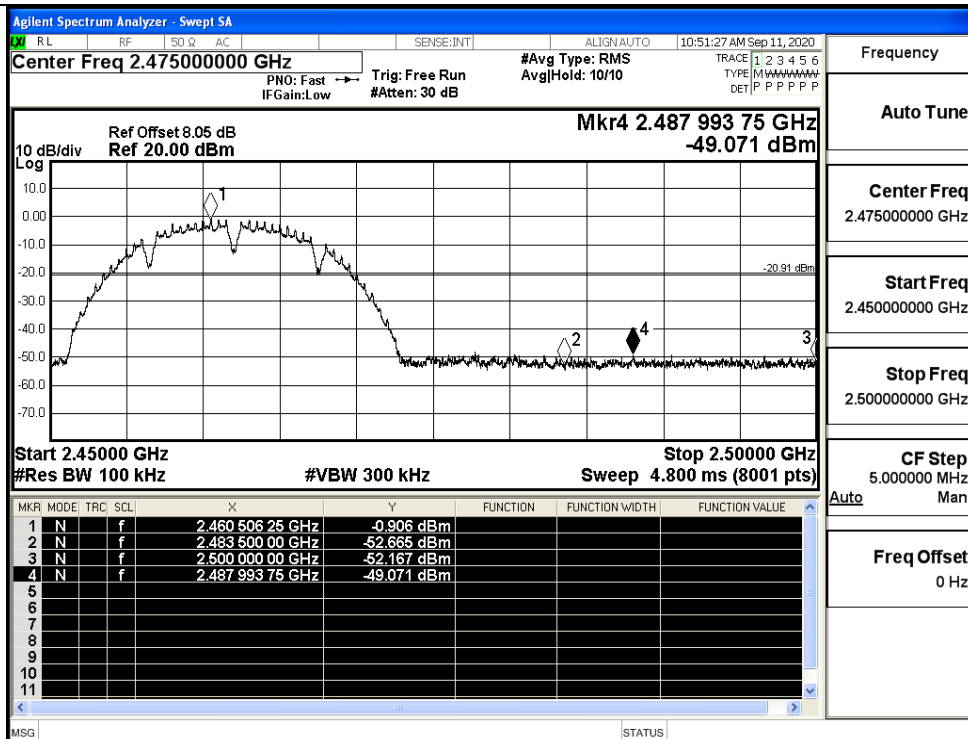
Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
11B	LCH	0.410	-50.308	-19.59	PASS
	HCH	-0.906	-49.071	-20.91	PASS
11G	LCH	-7.386	-49.902	-27.39	PASS
	HCH	-6.917	-47.413	-26.92	PASS
11N20SISO	LCH	-8.849	-49.445	-28.85	PASS
	HCH	-8.125	-49.537	-28.13	PASS
11N40SISO	LCH	-9.733	-50.029	-29.73	PASS
	HCH	-9.776	-50.184	-29.78	PASS

Test Graphs

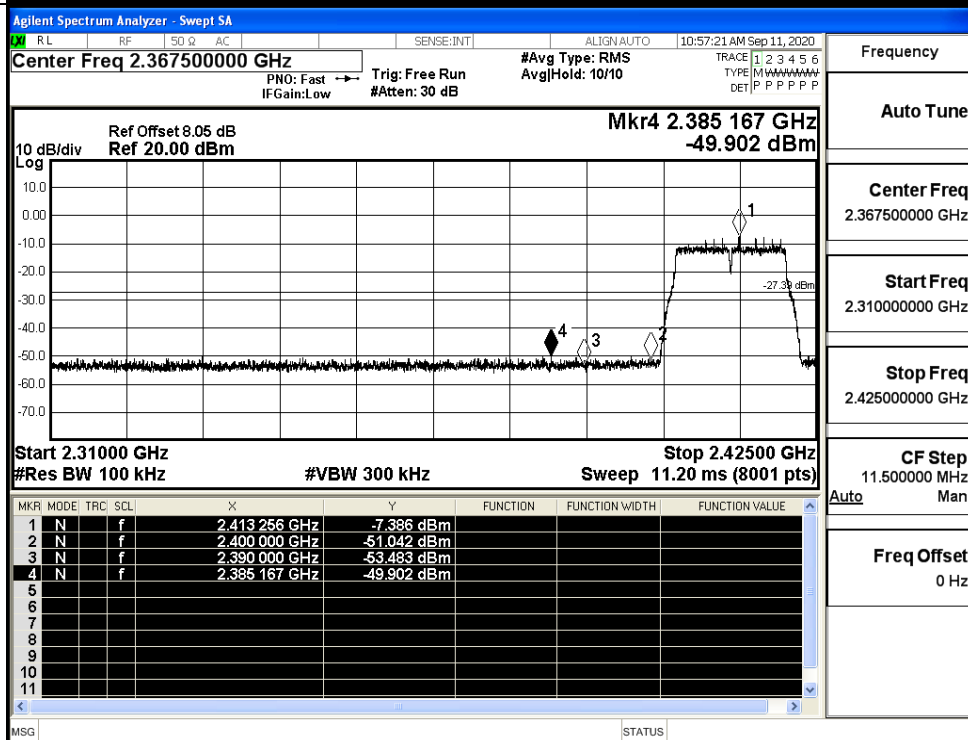
11B/LCH



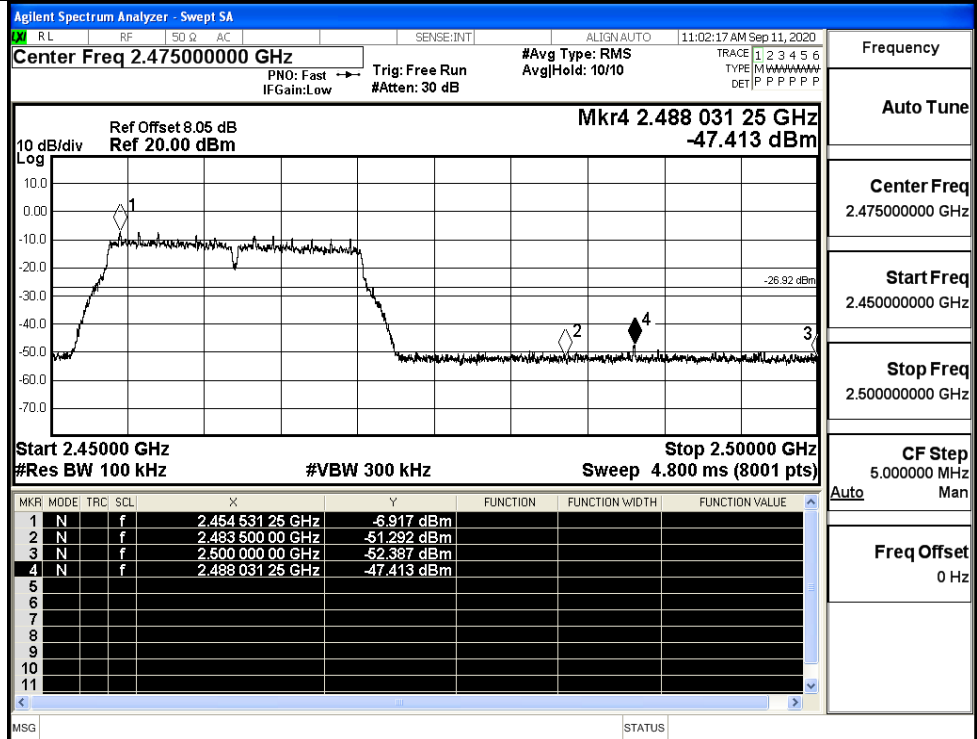
11B/HCH



11G/LCH



11G/HCH



Frequency

Auto Tune

Center Freq
2.475000000 GHz

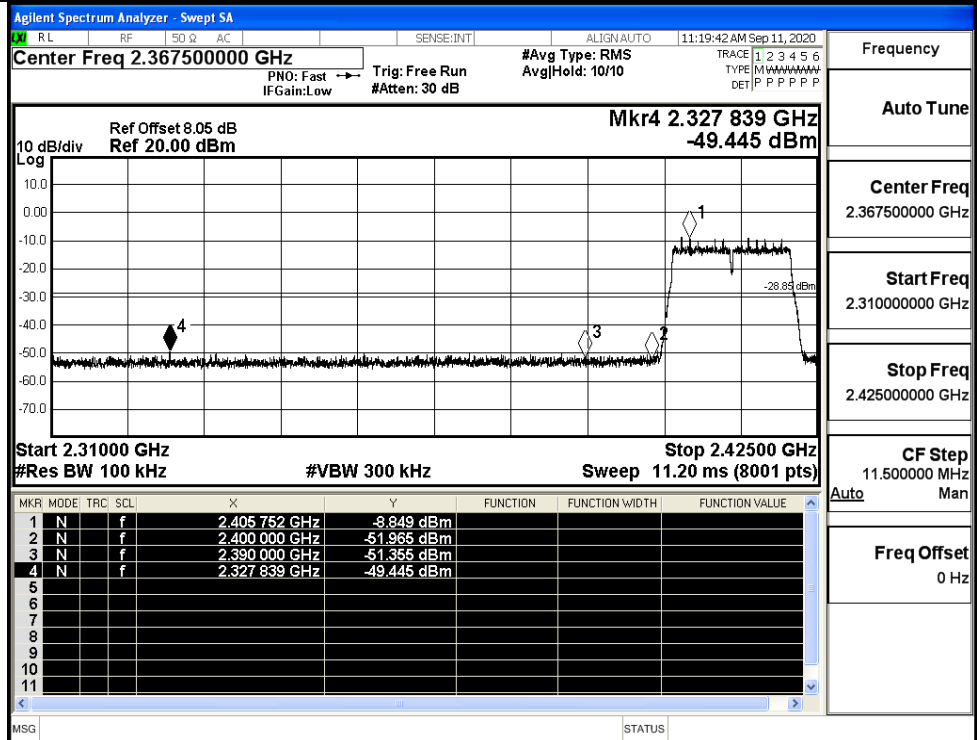
Start Freq
2.450000000 GHz

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

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.475000000 GHz

PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB

#Avg Type: RMS AvgHold: 10/10

Ref Offset 8.05 dB Ref 20.00 dBm

Mkr4 2.487 968 75 GHz -49.537 dBm

10 dB/div Log

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	2.456 993 75 GHz	-8.125 dBm			
2	N		f	2.483 500 00 GHz	-51.814 dBm			
3	N		f	2.500 000 00 GHz	-50.809 dBm			
4	N		f	2.487 968 75 GHz	-49.537 dBm			

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

11N40SISO/LCH

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.377500000 GHz

PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB

#Avg Type: RMS AvgHold: 10/10

Ref Offset 8.05 dB Ref 20.00 dBm

Mkr4 2.369 214 GHz -50.029 dBm

10 dB/div Log

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	2.439 499 GHz	-9.733 dBm			
2	N		f	2.400 000 GHz	-52.040 dBm			
3	N		f	2.390 000 GHz	-52.880 dBm			
4	N		f	2.369 214 GHz	-50.029 dBm			

Frequency

Auto Tune

Center Freq 2.377500000 GHz

Start Freq 2.310000000 GHz

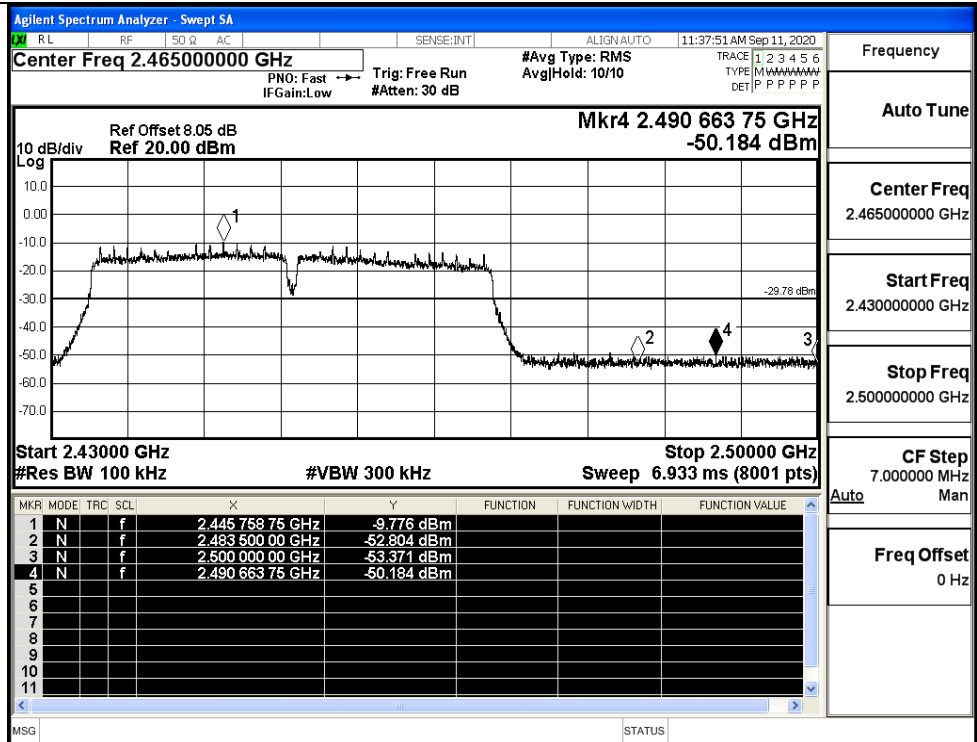
Stop Freq 2.445000000 GHz

CF Step 13.500000 MHz

Auto Man

Freq Offset 0 Hz

11N40SISO/HCH



Frequency

Auto Tune

Center Freq

2.465000000 GHz

Start Freq

2.430000000 GHz

Stop Freq

2.500000000 GHz

CF Step

7.000000 MHz

Freq Offset

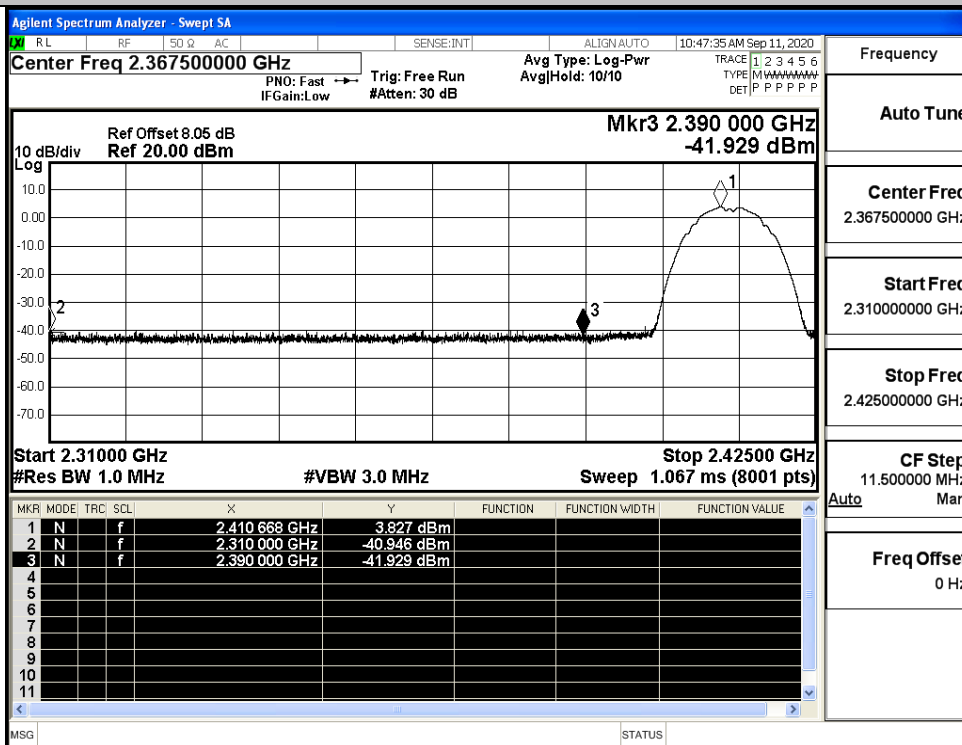
0 Hz

B.7 Restrict-band band-edge measurements

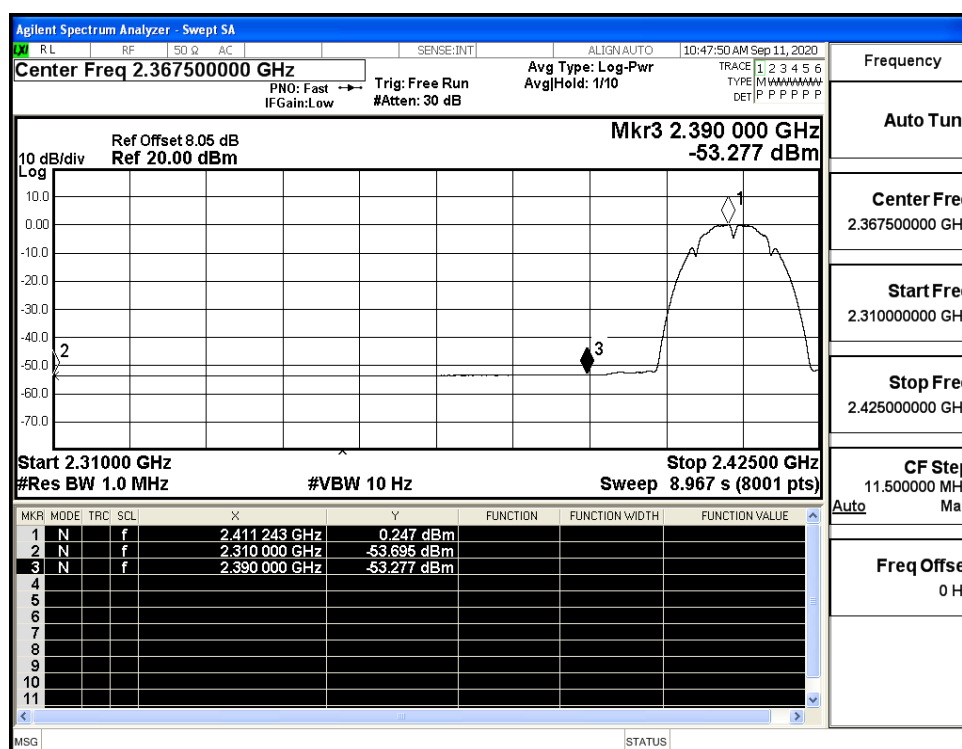
Test Mode	Test Channel	Ant	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
11B	2412	Ant1	2310.0	-40.95	3.0	0	57.28	PEAK	74	PASS
	2412	Ant1	2310.0	-53.70	3.0	0	44.53	AV	54	PASS
	2412	Ant1	2390.0	-41.93	3.0	0	56.30	PEAK	74	PASS
	2412	Ant1	2390.0	-53.28	3.0	0	44.95	AV	54	PASS
	2462	Ant1	2483.5	-42.61	3.0	0	55.62	PEAK	74	PASS
	2462	Ant1	2483.5	-52.79	3.0	0	45.44	AV	54	PASS
	2462	Ant1	2500.0	-42.32	3.0	0	55.91	PEAK	74	PASS
	2462	Ant1	2500.0	-52.68	3.0	0	45.55	AV	54	PASS
11G	2412	Ant1	2310.0	-41.40	3.0	0	56.83	PEAK	74	PASS
	2412	Ant1	2310.0	-53.68	3.0	0	44.55	AV	54	PASS
	2412	Ant1	2390.0	-42.72	3.0	0	55.51	PEAK	74	PASS
	2412	Ant1	2390.0	-53.29	3.0	0	44.94	AV	54	PASS
	2462	Ant1	2483.5	-42.27	3.0	0	55.96	PEAK	74	PASS
	2462	Ant1	2483.5	-52.55	3.0	0	45.68	AV	54	PASS
	2462	Ant1	2500.0	-42.30	3.0	0	55.93	PEAK	74	PASS
	2462	Ant1	2500.0	-52.70	3.0	0	45.53	AV	54	PASS
11N20 SISO	2412	Ant1	2310.0	-42.17	3.0	0	56.06	PEAK	74	PASS
	2412	Ant1	2310.0	-53.64	3.0	0	44.59	AV	54	PASS
	2412	Ant1	2390.0	-42.90	3.0	0	55.33	PEAK	74	PASS
	2412	Ant1	2390.0	-53.24	3.0	0	44.99	AV	54	PASS
	2462	Ant1	2483.5	-42.34	3.0	0	55.89	PEAK	74	PASS
	2462	Ant1	2483.5	-52.67	3.0	0	45.56	AV	54	PASS
	2462	Ant1	2500.0	-41.90	3.0	0	56.33	PEAK	74	PASS
	2462	Ant1	2500.0	-52.63	3.0	0	45.60	AV	54	PASS
11N40 SISO	2422	Ant1	2310.0	-43.21	3.0	0	55.02	PEAK	74	PASS
	2422	Ant1	2310.0	-53.66	3.0	0	44.57	AV	54	PASS

	2422	Ant1	2390.0	-42.55	3.0	0	55.68	PEAK	74	PASS
	2422	Ant1	2390.0	-53.24	3.0	0	44.99	AV	54	PASS
	2452	Ant1	2483.5	-42.54	3.0	0	55.69	PEAK	74	PASS
	2452	Ant1	2483.5	-52.72	3.0	0	45.51	AV	54	PASS
	2452	Ant1	2500.0	-42.81	3.0	0	55.42	PEAK	74	PASS
	2452	Ant1	2500.0	-52.70	3.0	0	45.53	AV	54	PASS

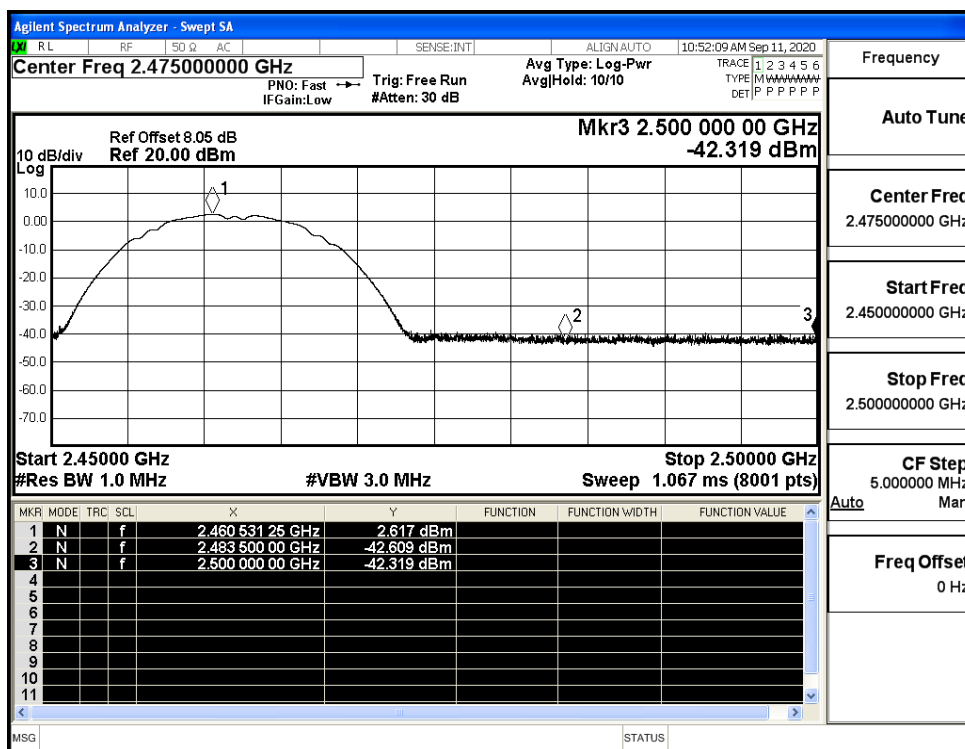
Restrict-band band-edge measurements_11B_2412_Ant1_PEAK



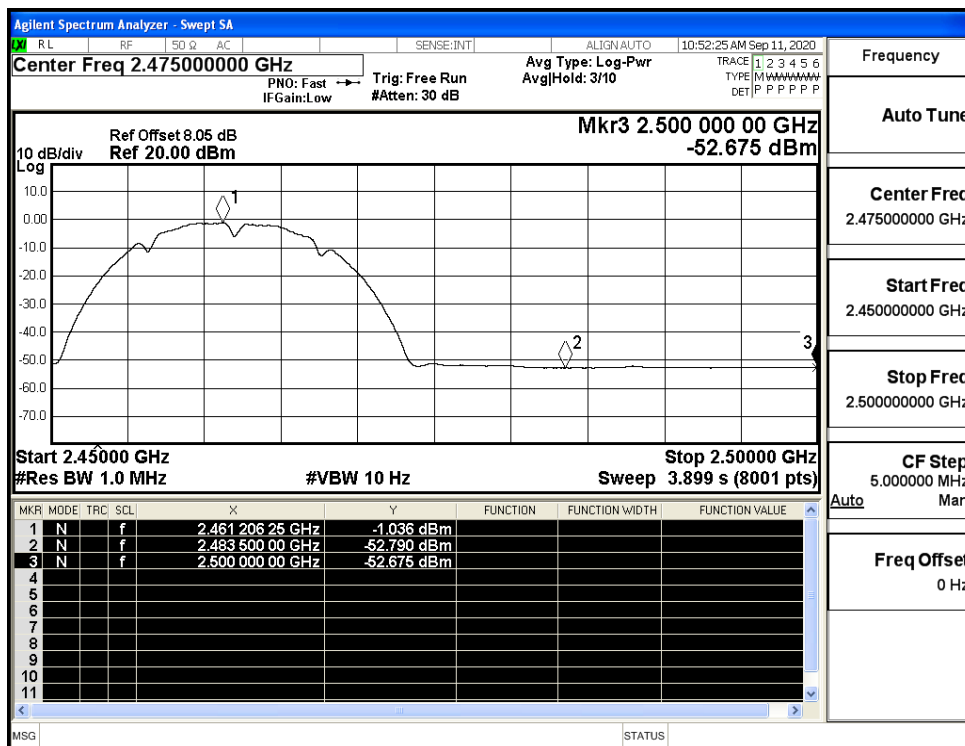
Restrict-band band-edge measurements_11B_2412_Ant1_AV



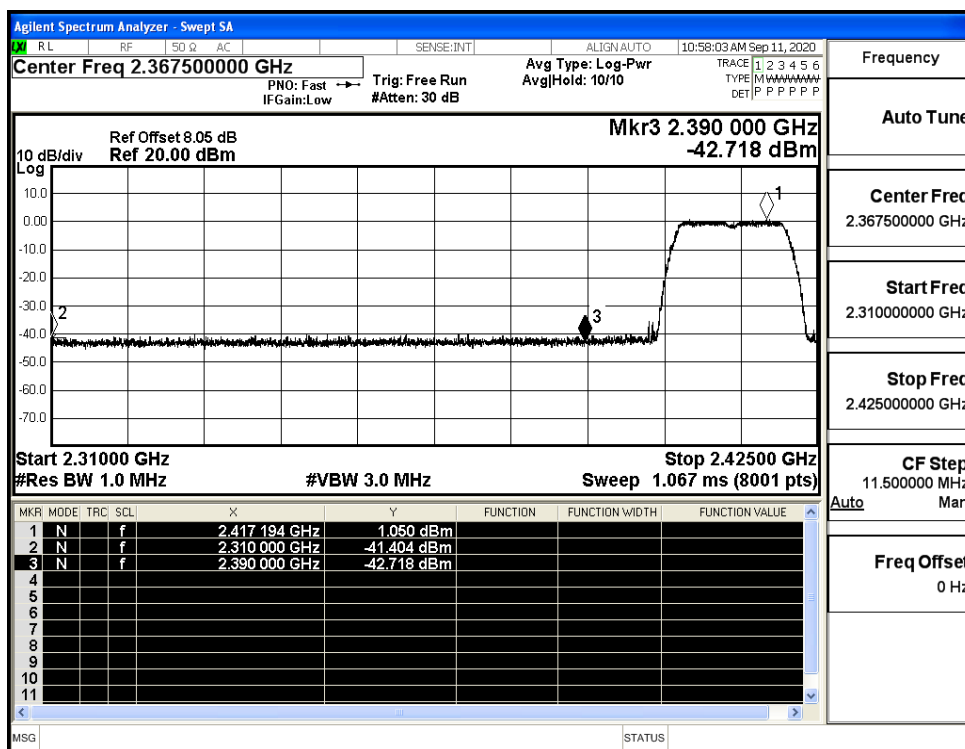
Restrict-band band-edge measurements_11B_2462_Ant1_PEAK



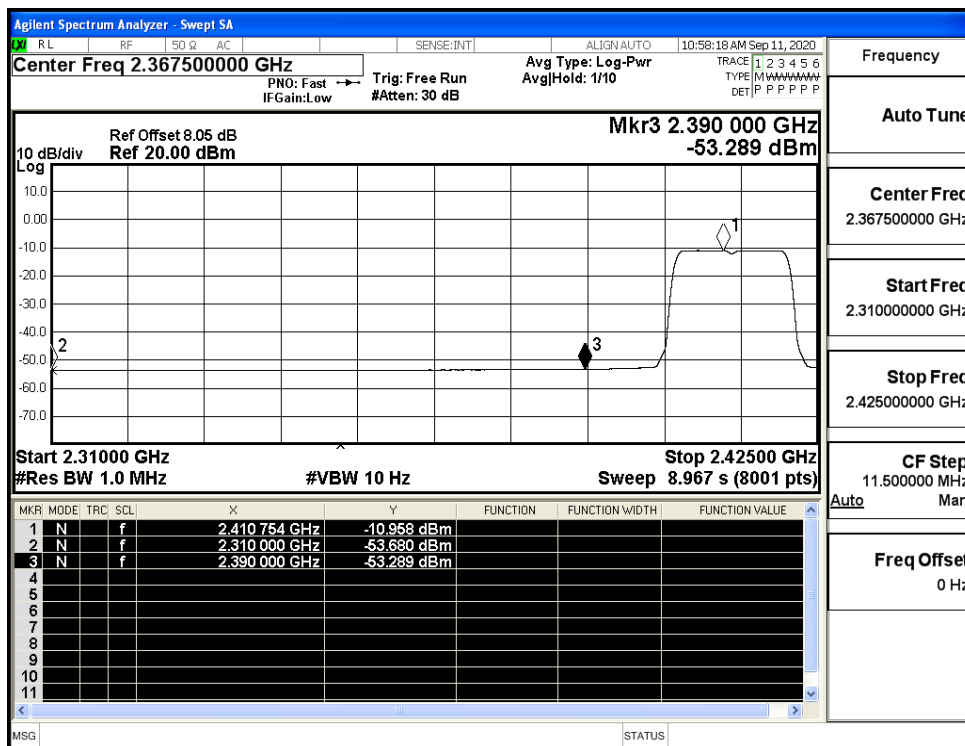
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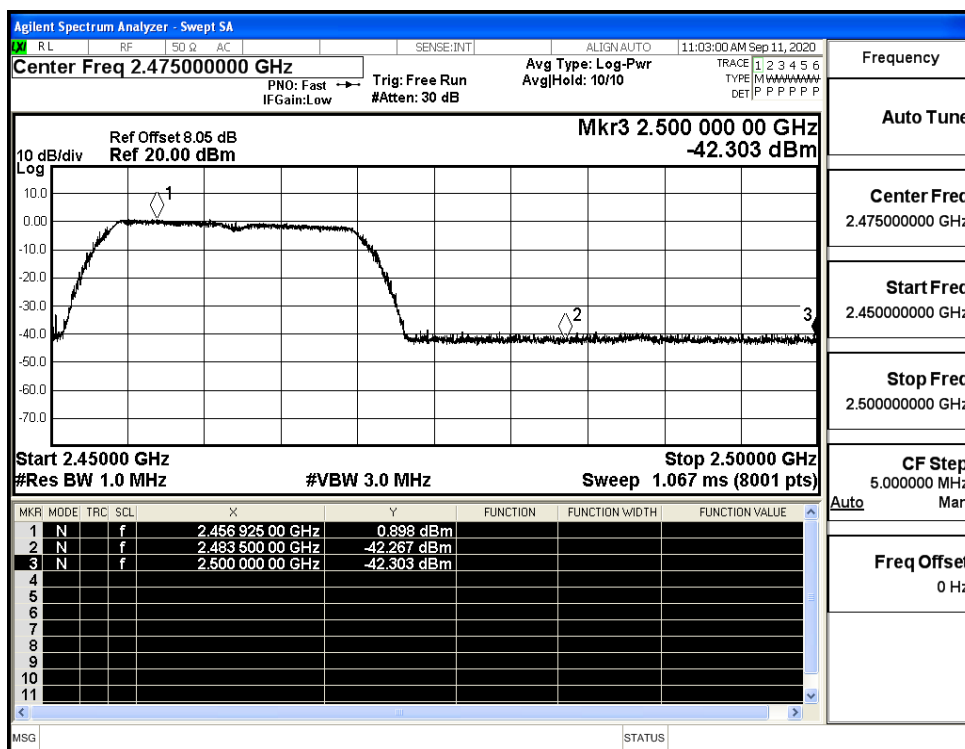
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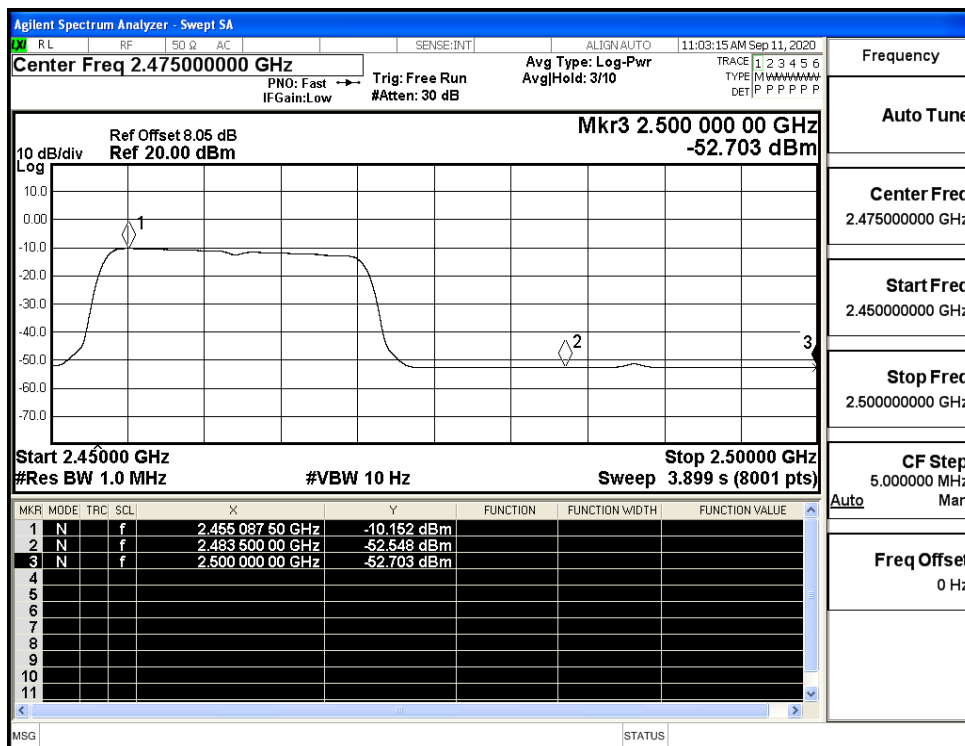
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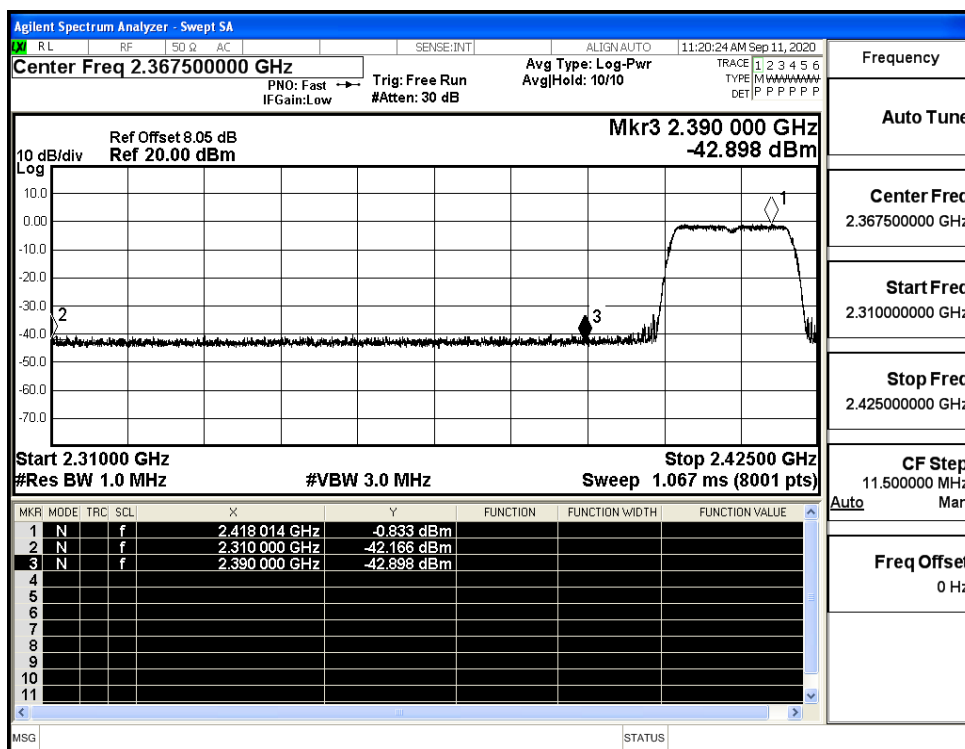
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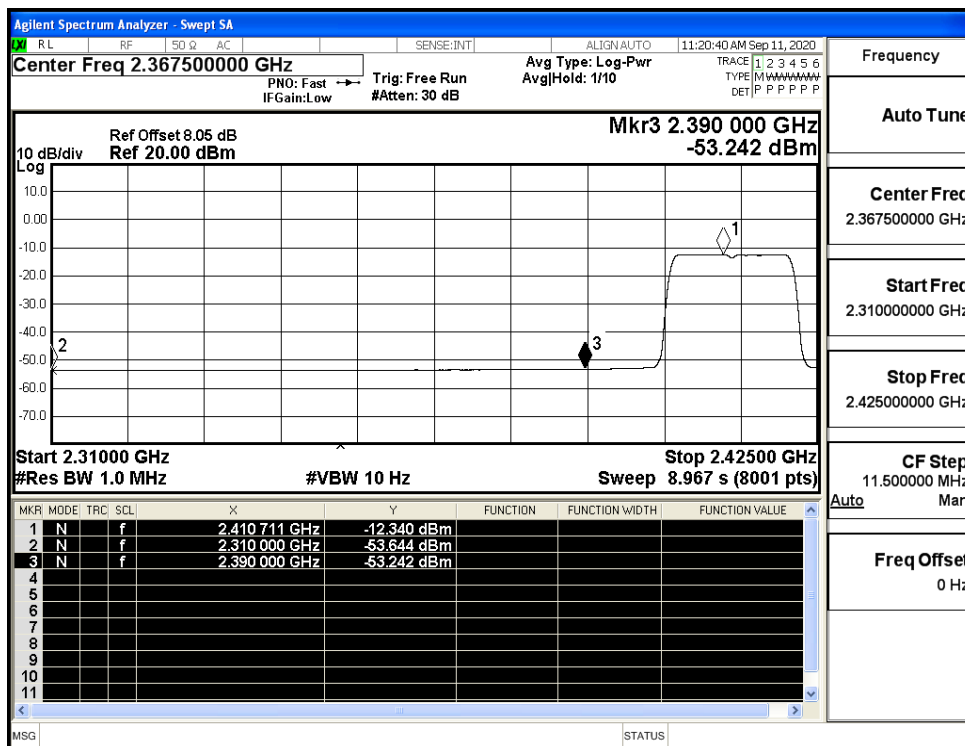
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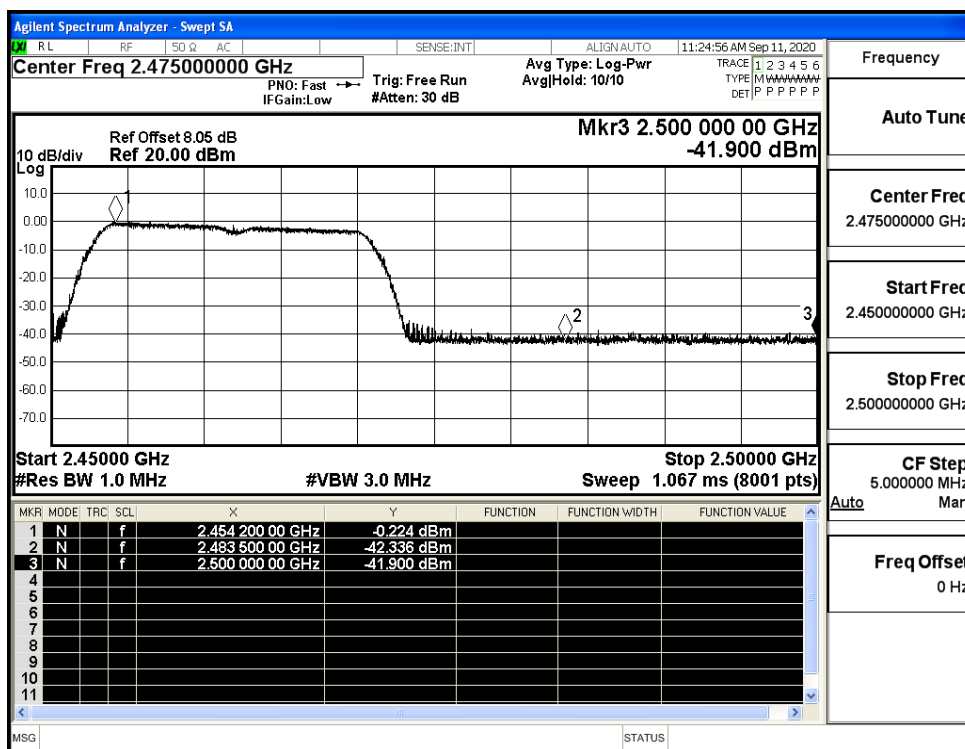
Restrict-band band-edge measurements_11N20SISO_2412_Ant1_PEAK



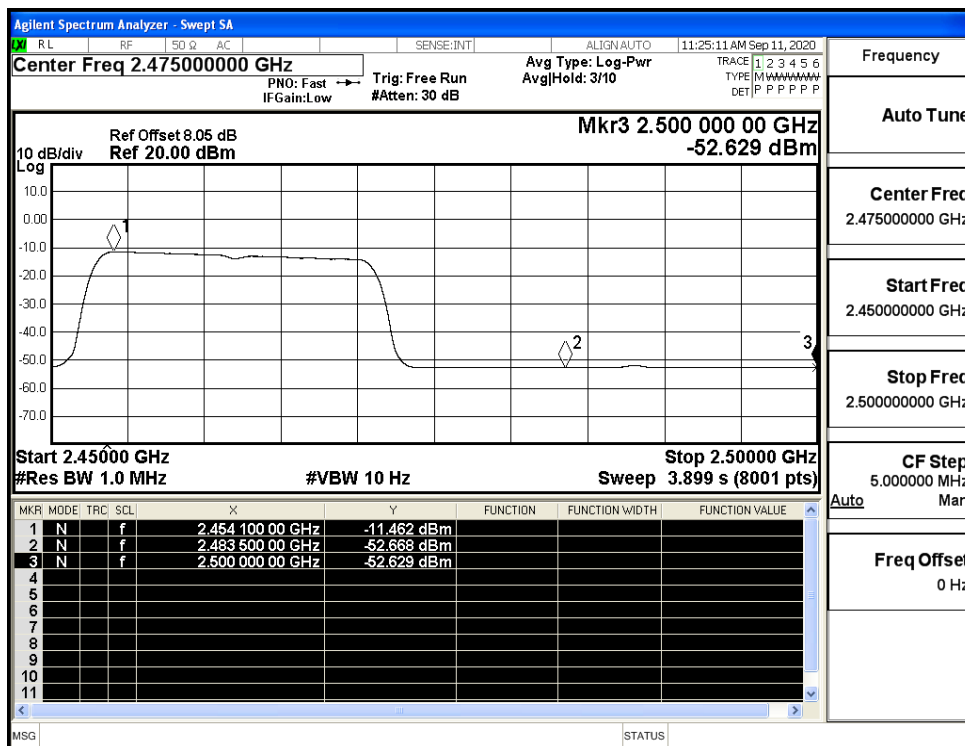
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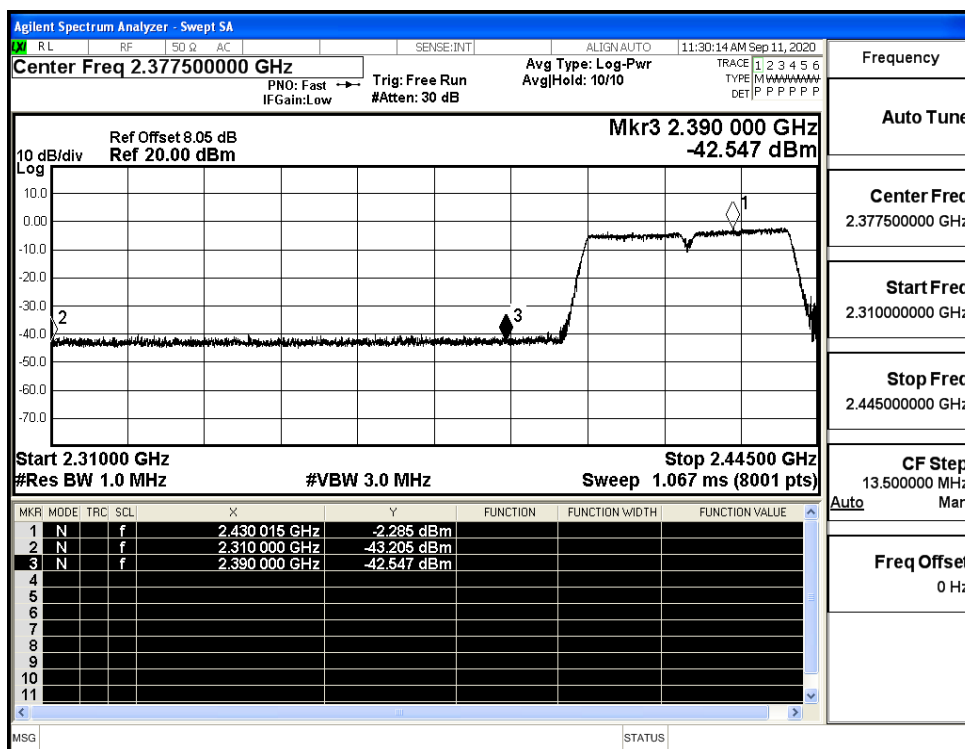
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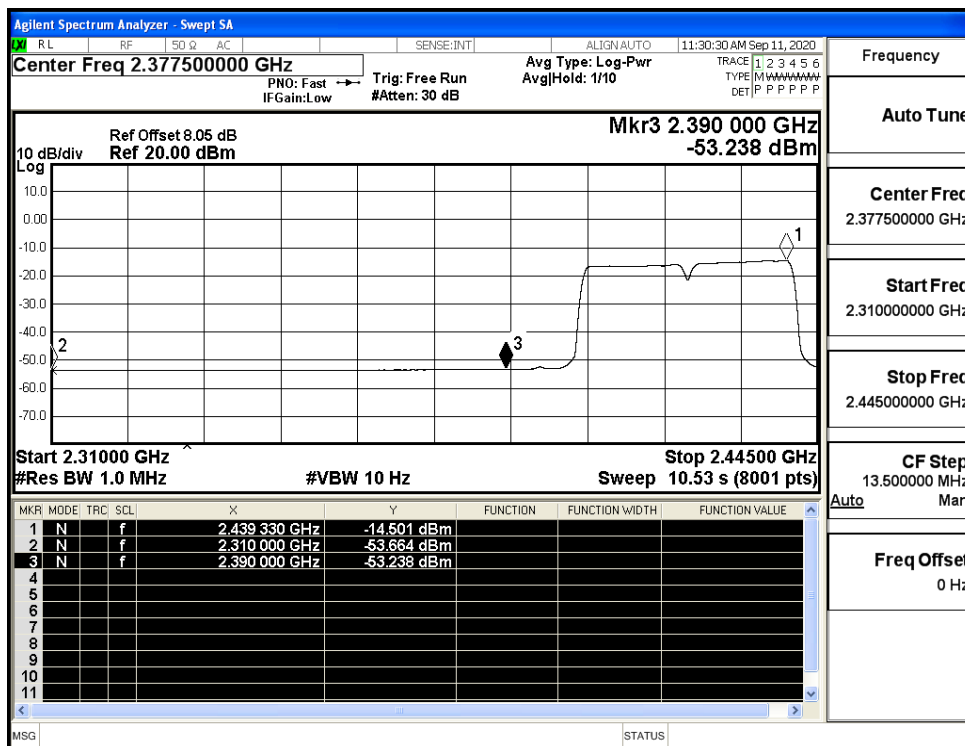
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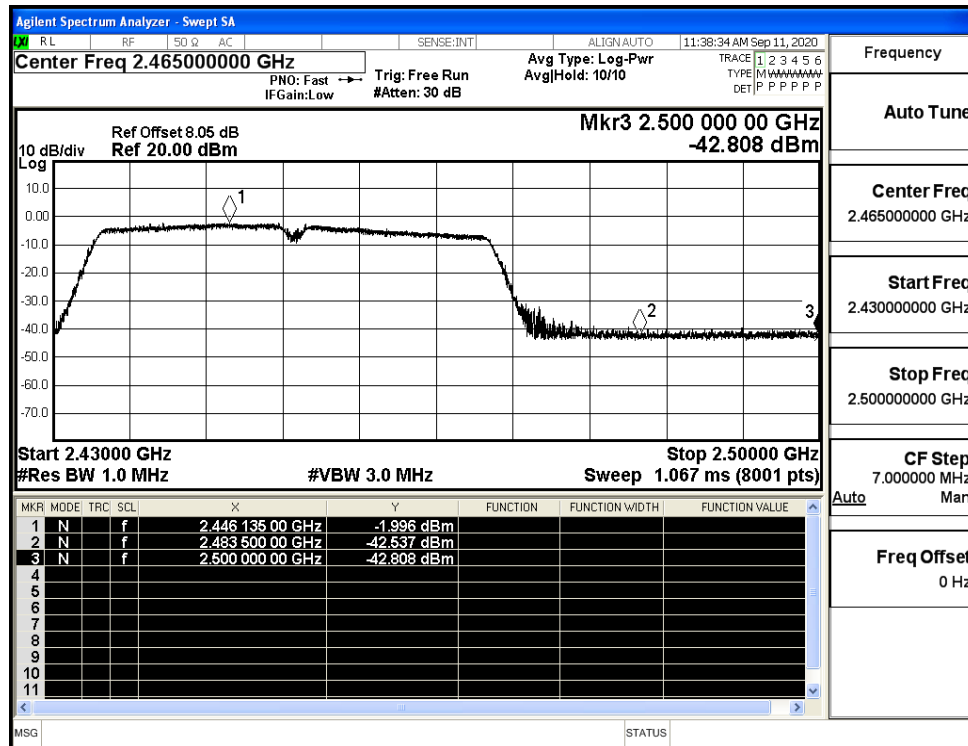
Restrict-band band-edge measurements_11N40SISO_2422_Ant1_PEAK



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

