

Appendix C

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: Rugged Phone

Trade Mark: SNOPOW

Test Model: M10

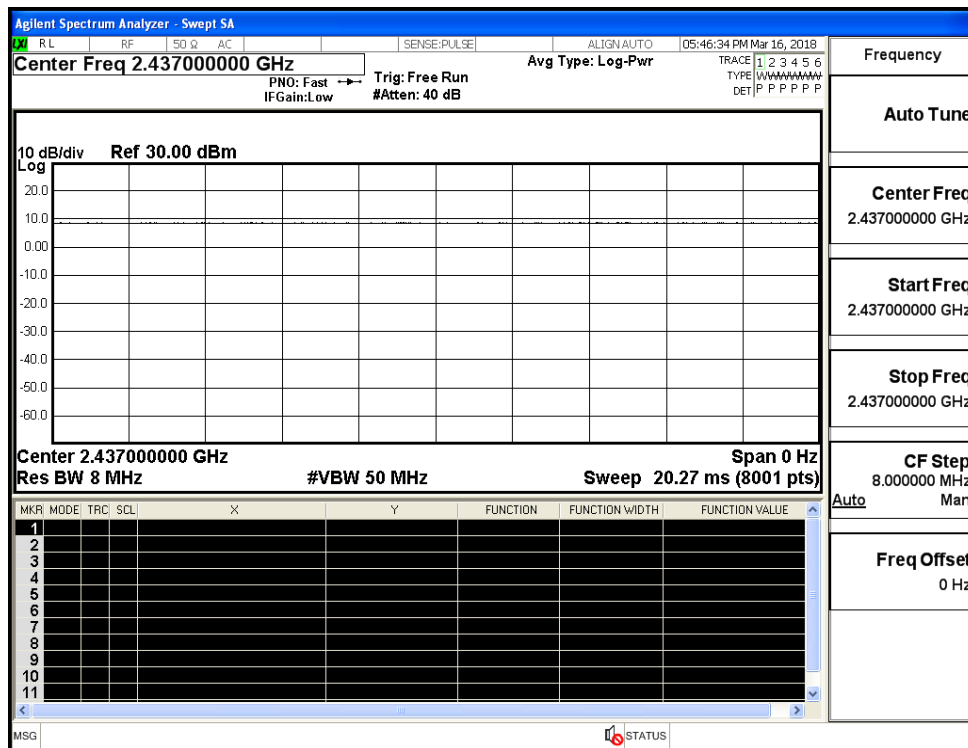
Environmental Conditions

Temperature:	23.5 ° C
Relative Humidity:	52.6%
ATM Pressure:	100.0 kPa
Test Engineer:	Jayden Zhuo
Supervised by:	Dick Su

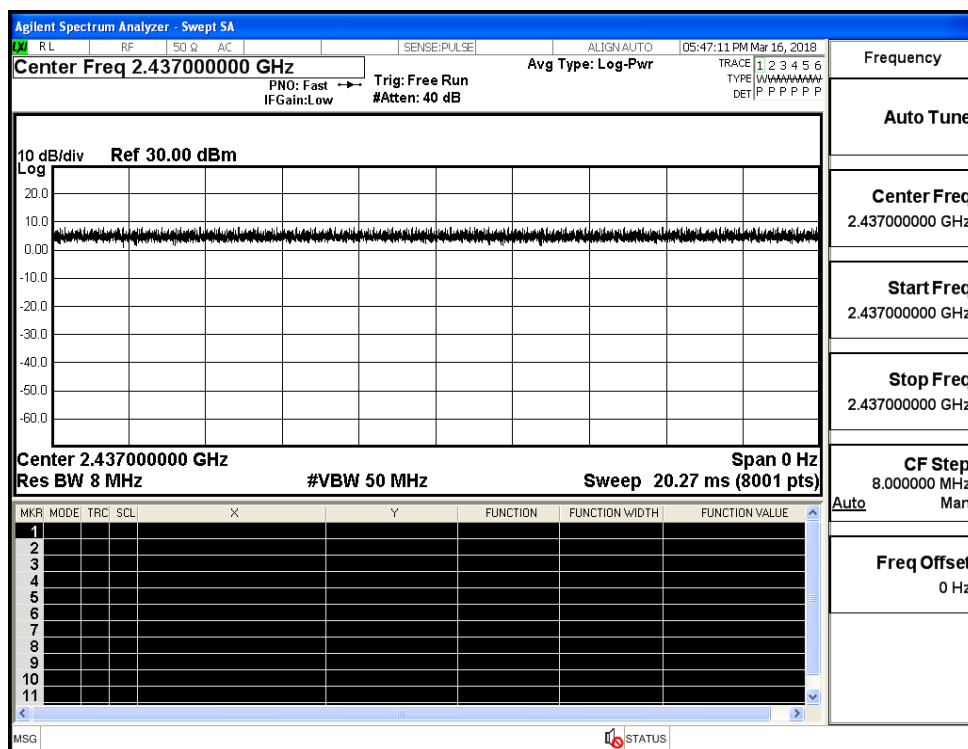
C.1 Duty Cycle

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

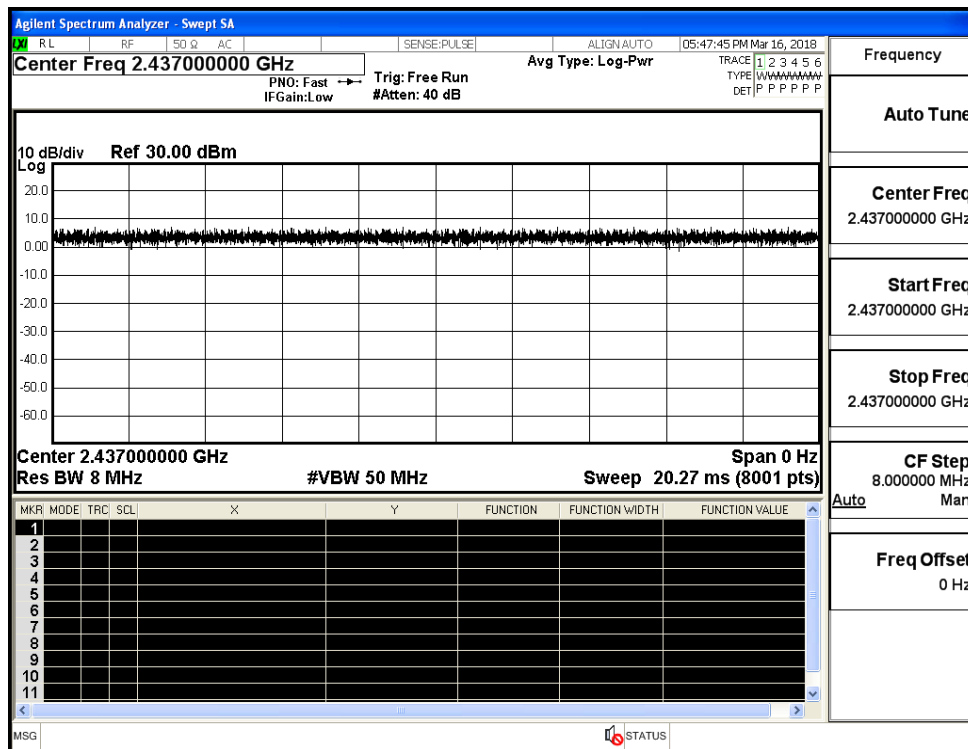
Duty Cycle_11B_2437_Ant1



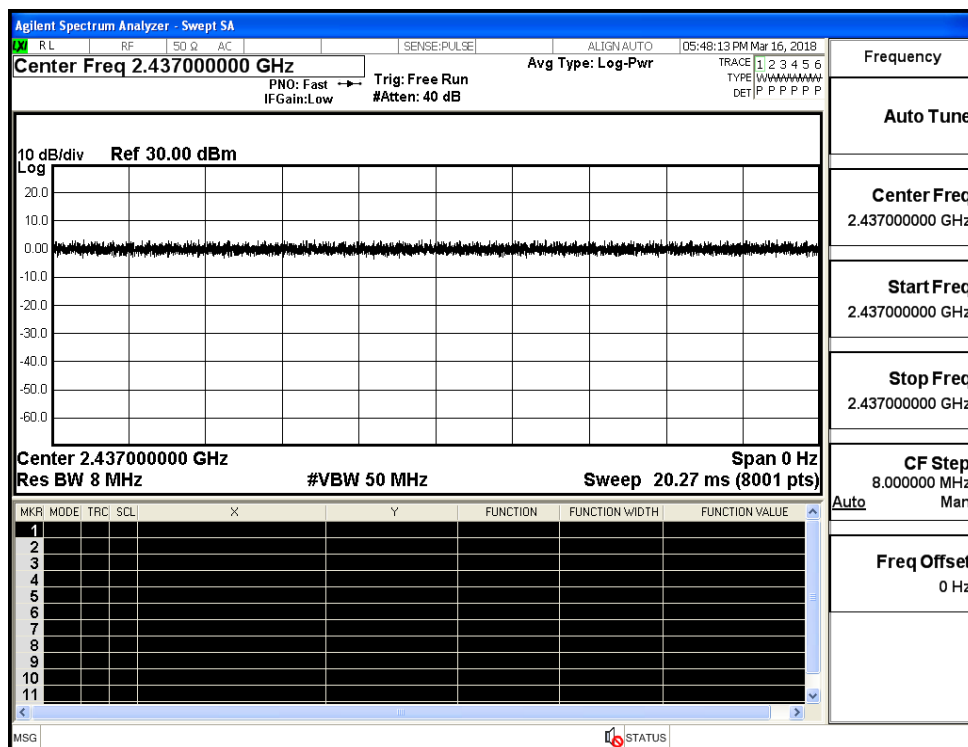
Duty Cycle_11G_2437_Ant1



Duty Cycle_11N20SISO_2437_Ant1



Duty Cycle_11N40SISO_2437_Ant1



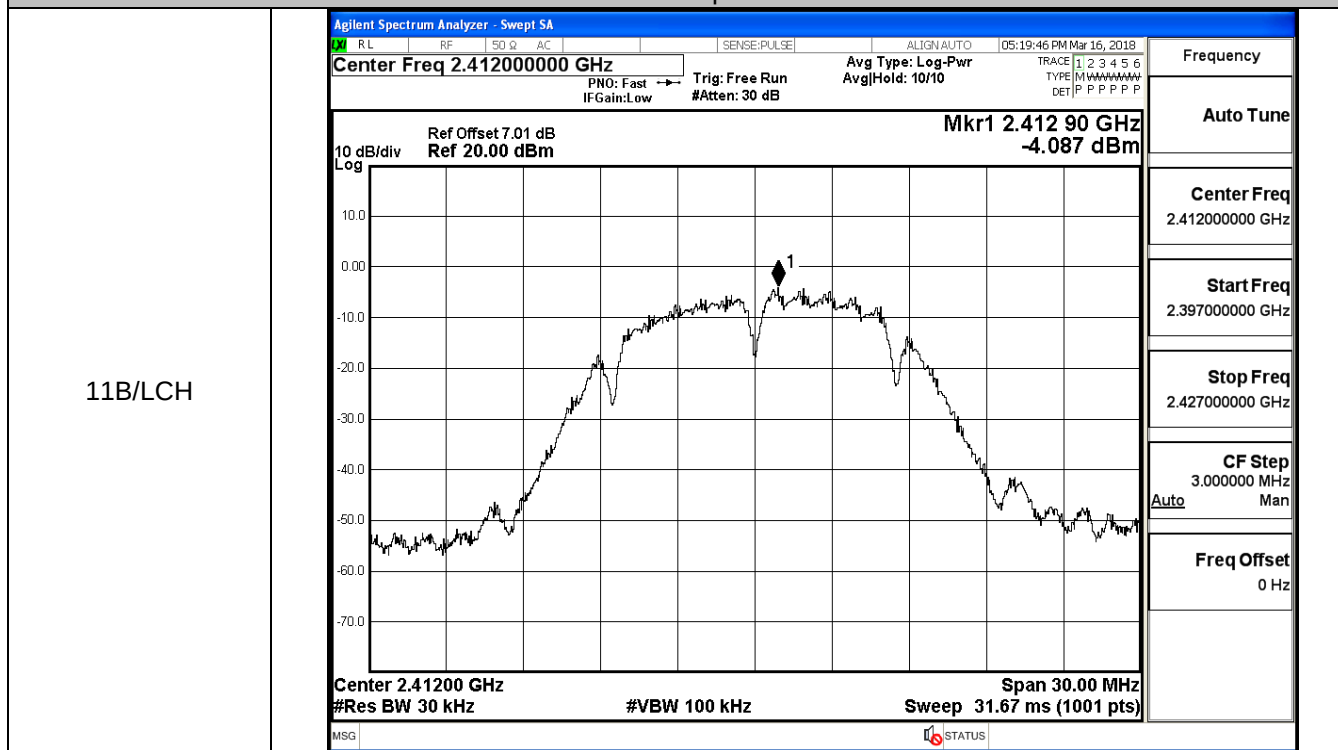
C.2 Maximum Conducted Output Power

Mode	Channel	Meas.Level [dBm, Peak]	Meas.Level [dBm, Average]	Limit [dBm]	Verdict
11B	LCH	16.62	14.82	30	PASS
	MCH	17.44	14.65	30	PASS
	HCH	16.59	14.55	30	PASS
11G	LCH	14.43	13.25	30	PASS
	MCH	15.04	13.12	30	PASS
	HCH	14.84	13.54	30	PASS
11N20SISO	LCH	13.87	11.62	30	PASS
	MCH	14.15	11.76	30	PASS
	HCH	13.93	11.43	30	PASS
11N40SISO	LCH	10.74	8.55	30	PASS
	MCH	11.39	8.67	30	PASS
	HCH	10.77	8.39	30	PASS

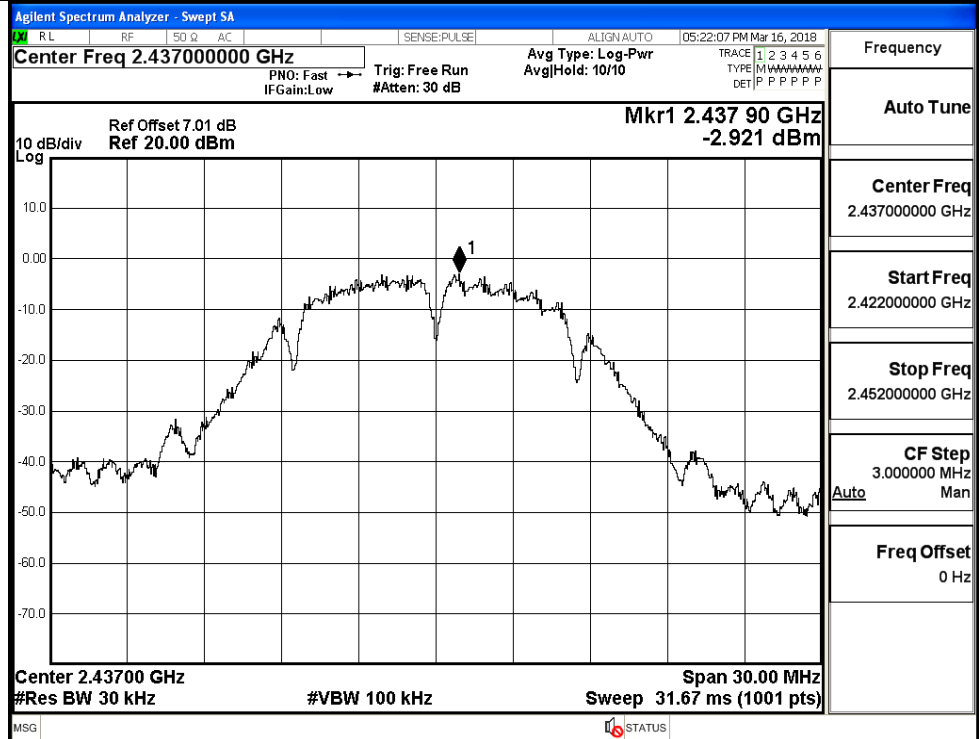
C.3 Maximum Power Spectral Density

Mode	Channel	Meas.Level [dBm/30KHz]	Limit [dBm/3KHz]	Verdict
11B	LCH	-4.087	8	PASS
	MCH	-2.921	8	PASS
	HCH	-3.099	8	PASS
11G	LCH	-6.168	8	PASS
	MCH	-7.692	8	PASS
	HCH	-8.247	8	PASS
11N20SISO	LCH	-8.360	8	PASS
	MCH	-7.435	8	PASS
	HCH	-7.320	8	PASS
11N40SISO	LCH	-10.722	8	PASS
	MCH	-11.085	8	PASS
	HCH	-12.351	8	PASS

Test Graphs



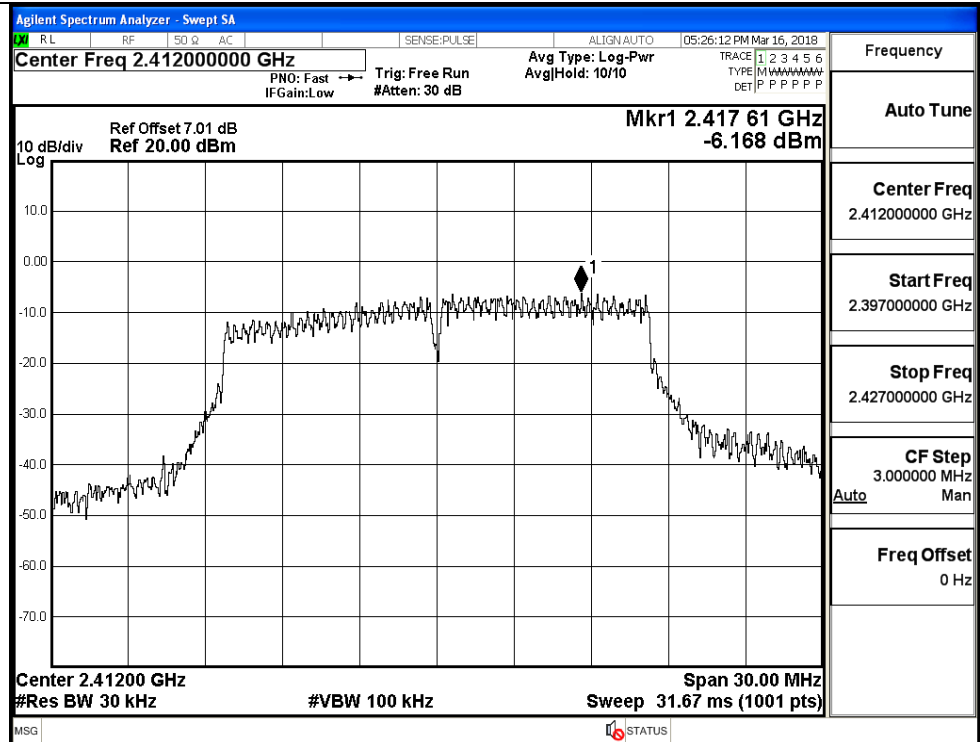
11B/MCH



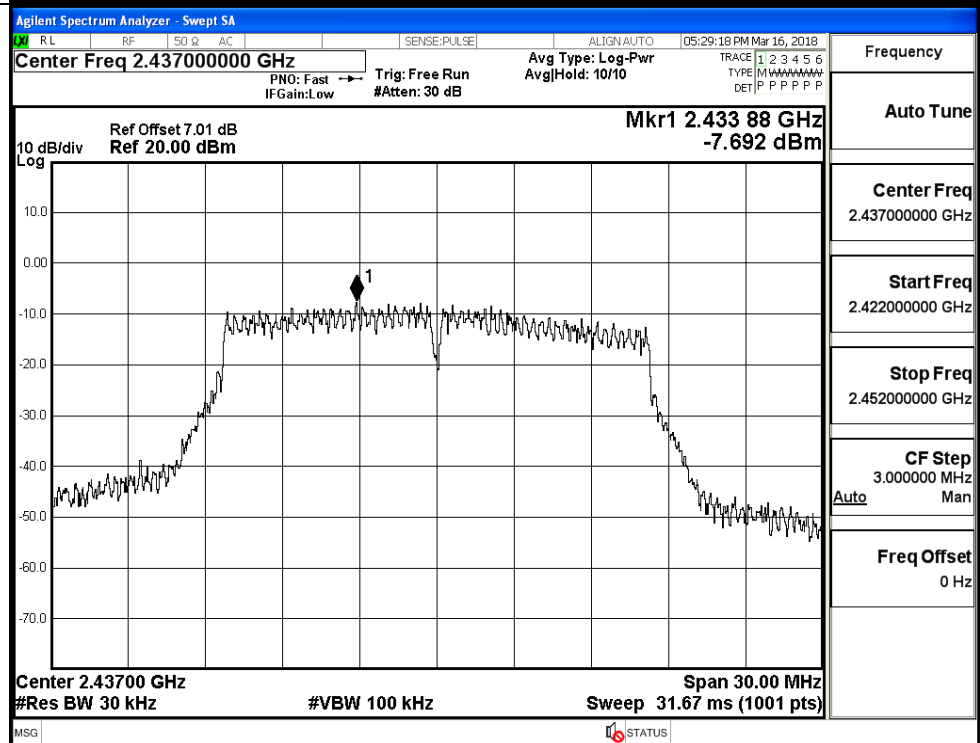
11B/HCH



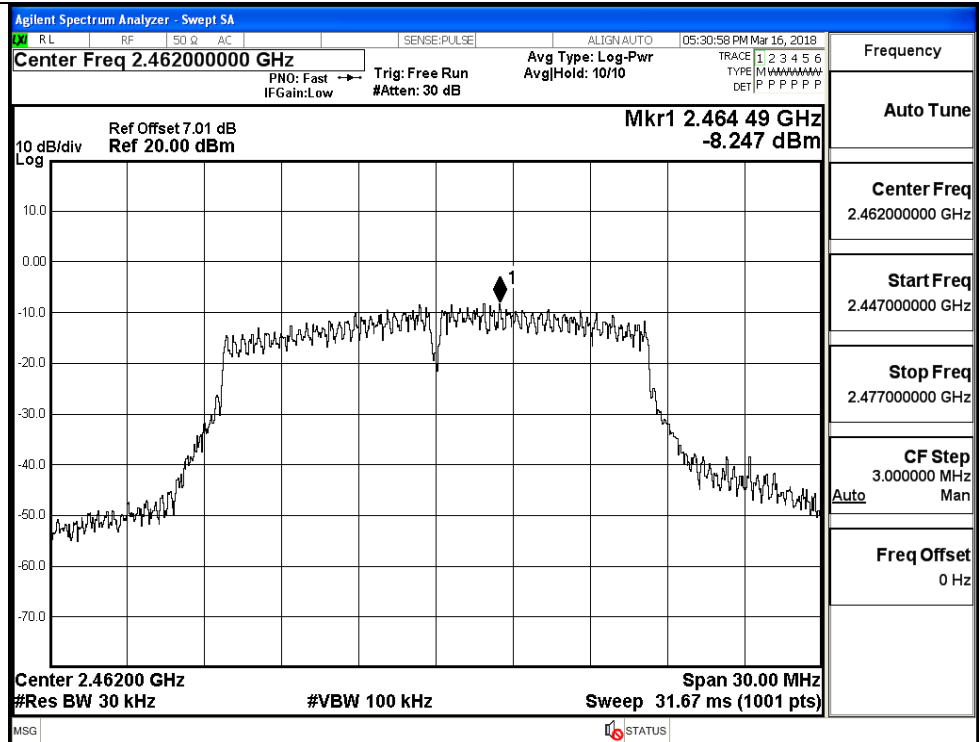
11G/LCH



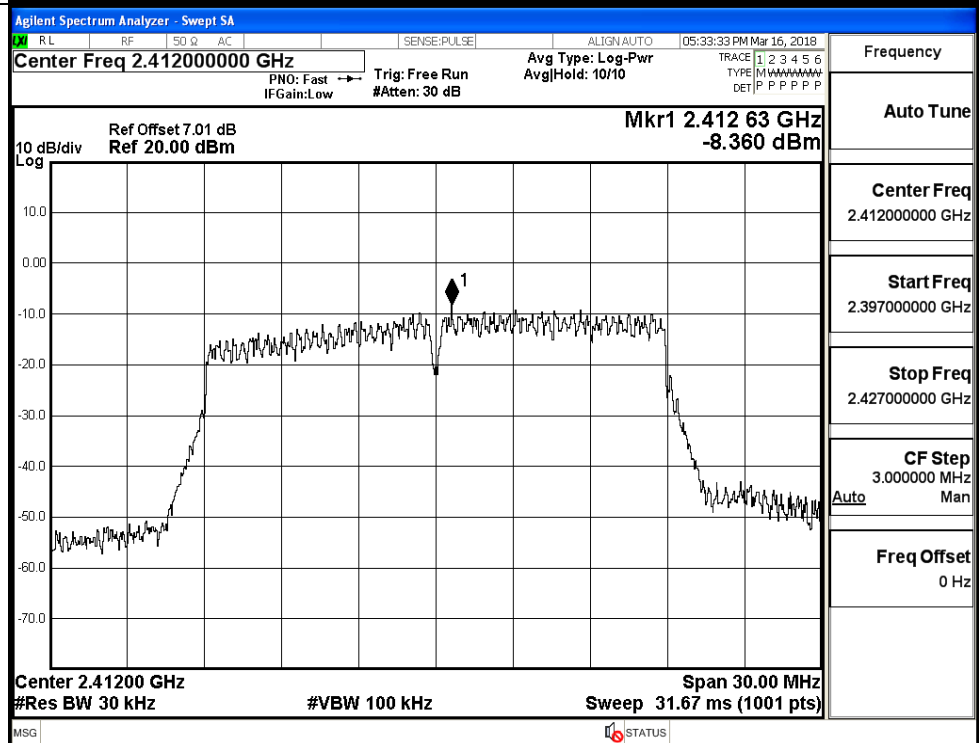
11G/MCH

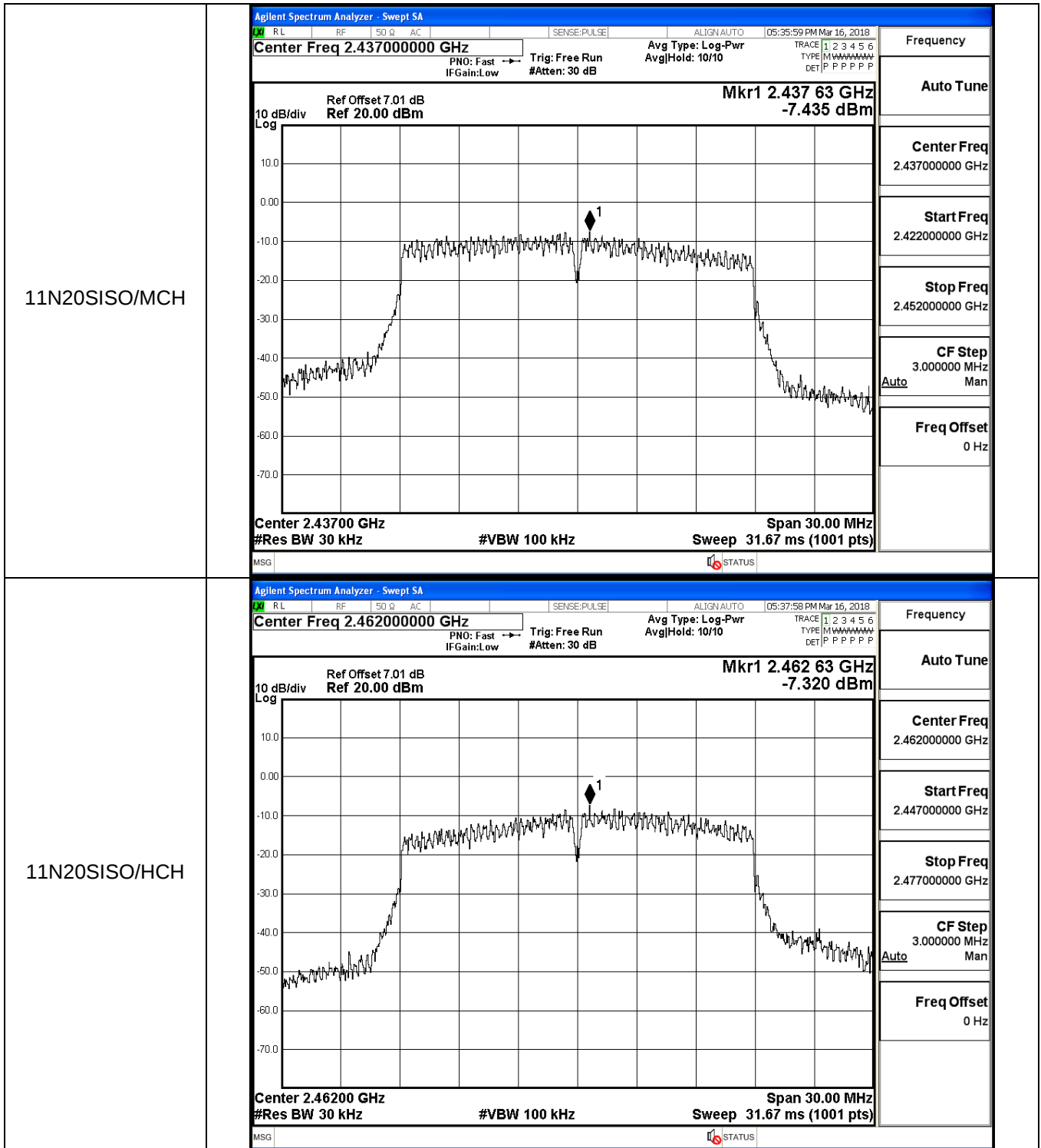


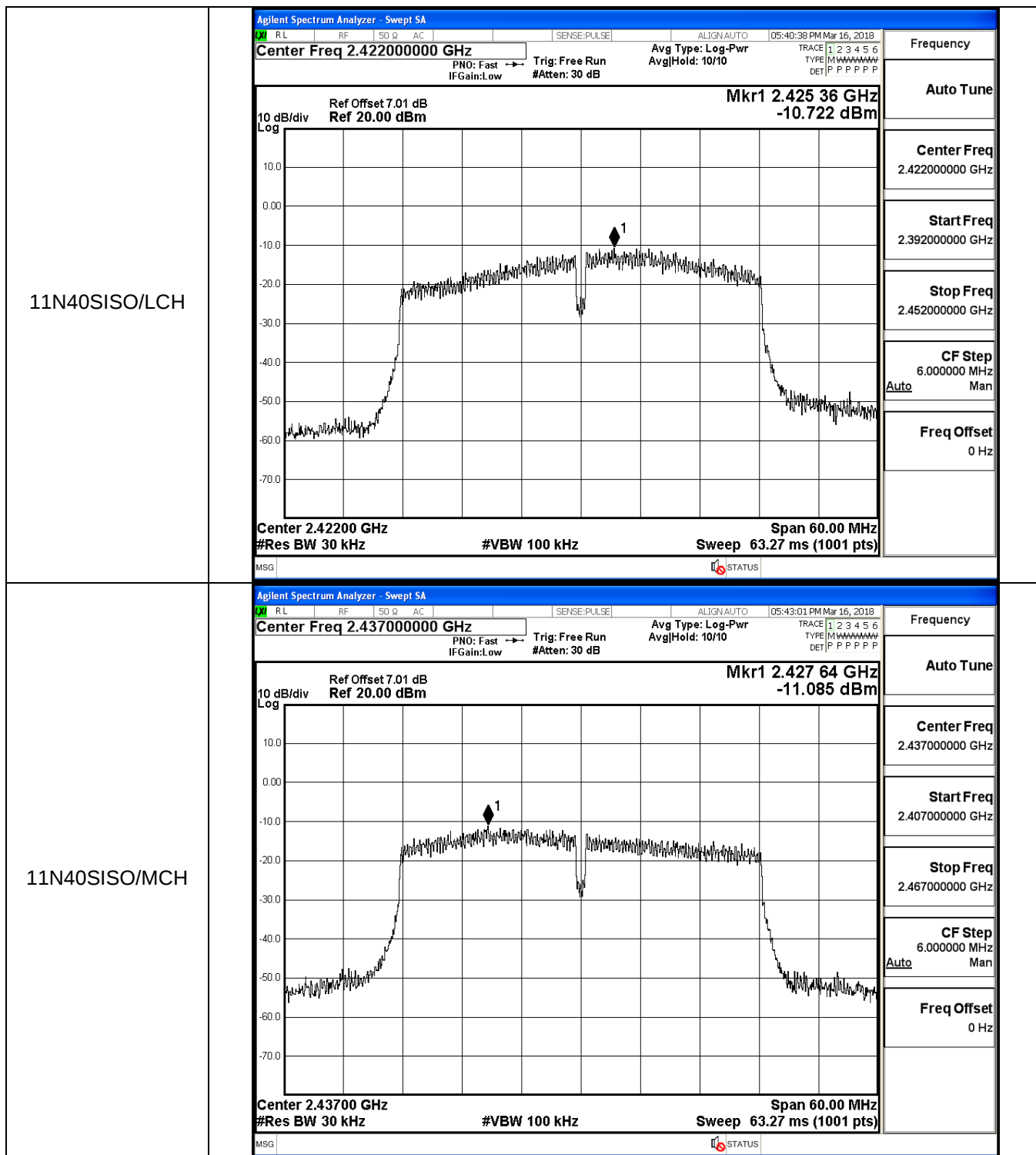
11G/HCH



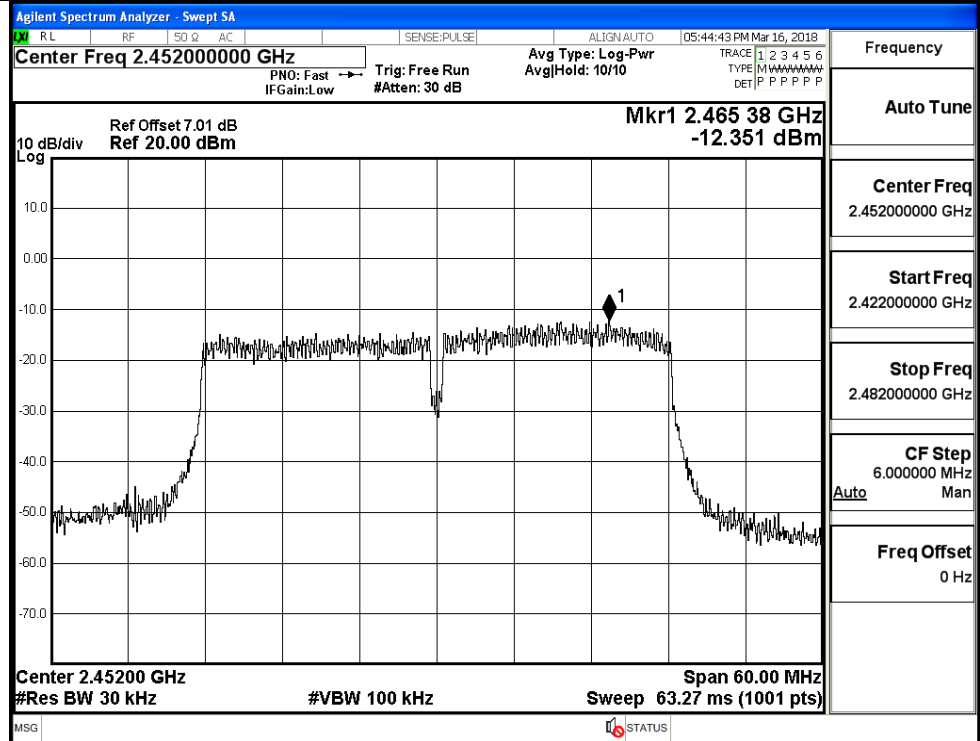
11N20SISO/LCH





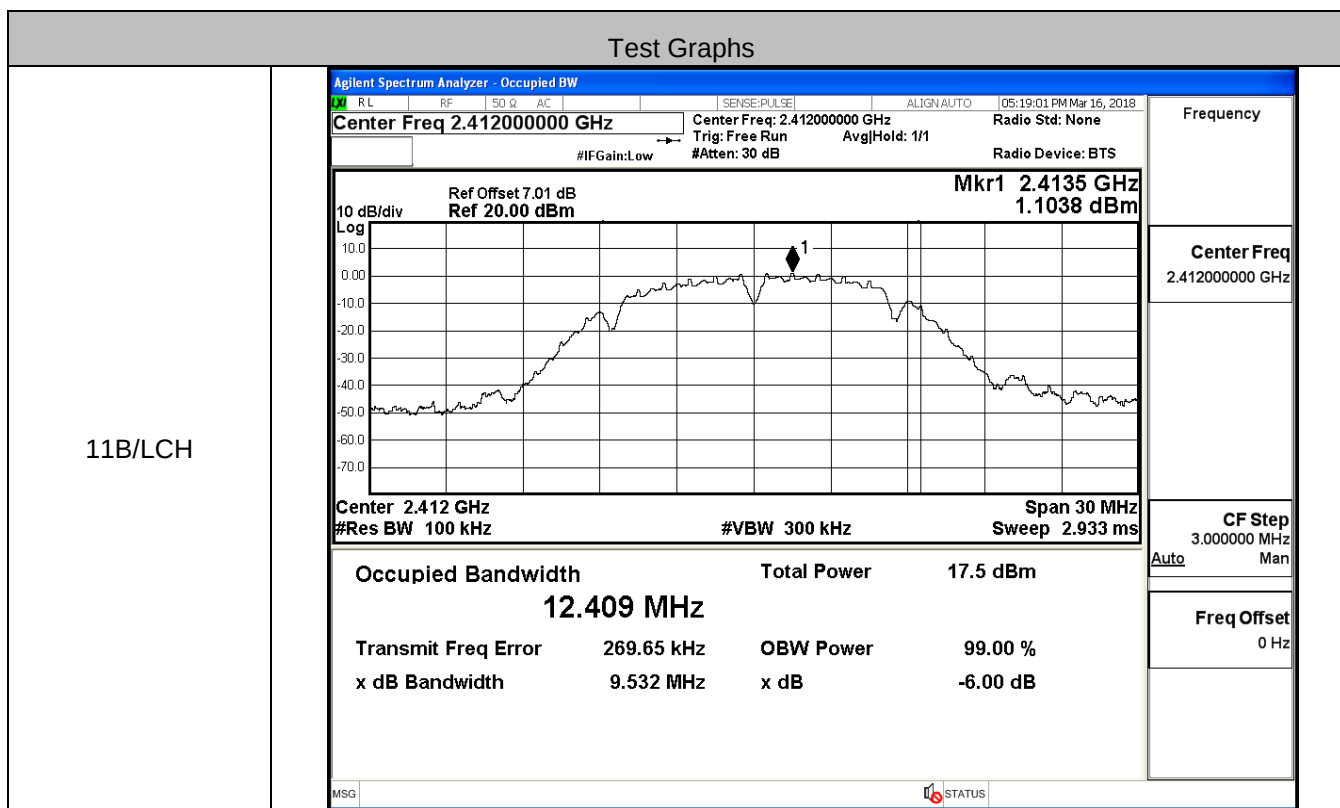


11N40SISO/HCH

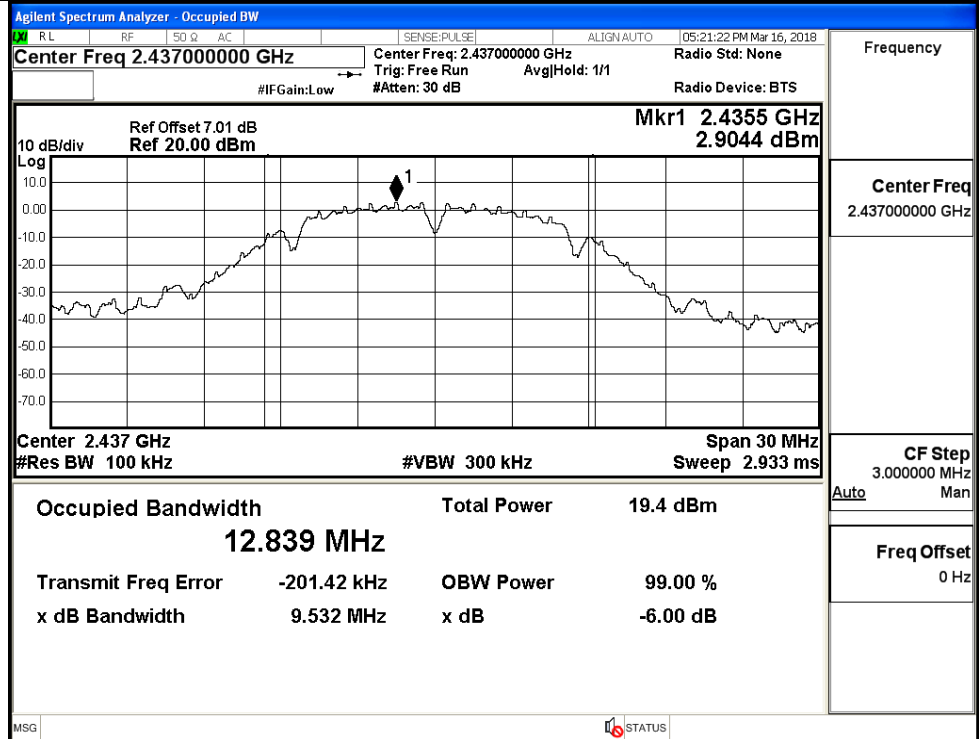


C.4 6dB Bandwidth

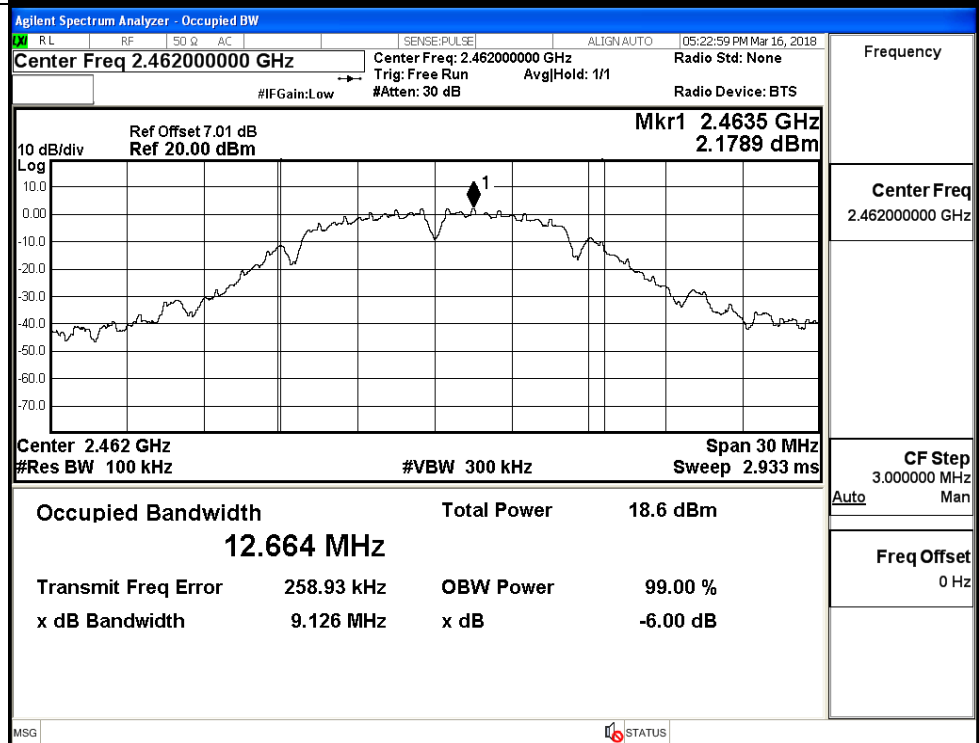
Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
11B	LCH	9.532	≥ 0.5	PASS
	MCH	9.532	≥ 0.5	PASS
	HCH	9.126	≥ 0.5	PASS
11G	LCH	16.19	≥ 0.5	PASS
	MCH	16.23	≥ 0.5	PASS
	HCH	15.50	≥ 0.5	PASS
11N20SISO	LCH	16.84	≥ 0.5	PASS
	MCH	17.27	≥ 0.5	PASS
	HCH	17.20	≥ 0.5	PASS
11N40SISO	LCH	26.91	≥ 0.5	PASS
	MCH	35.89	≥ 0.5	PASS
	HCH	36.41	≥ 0.5	PASS



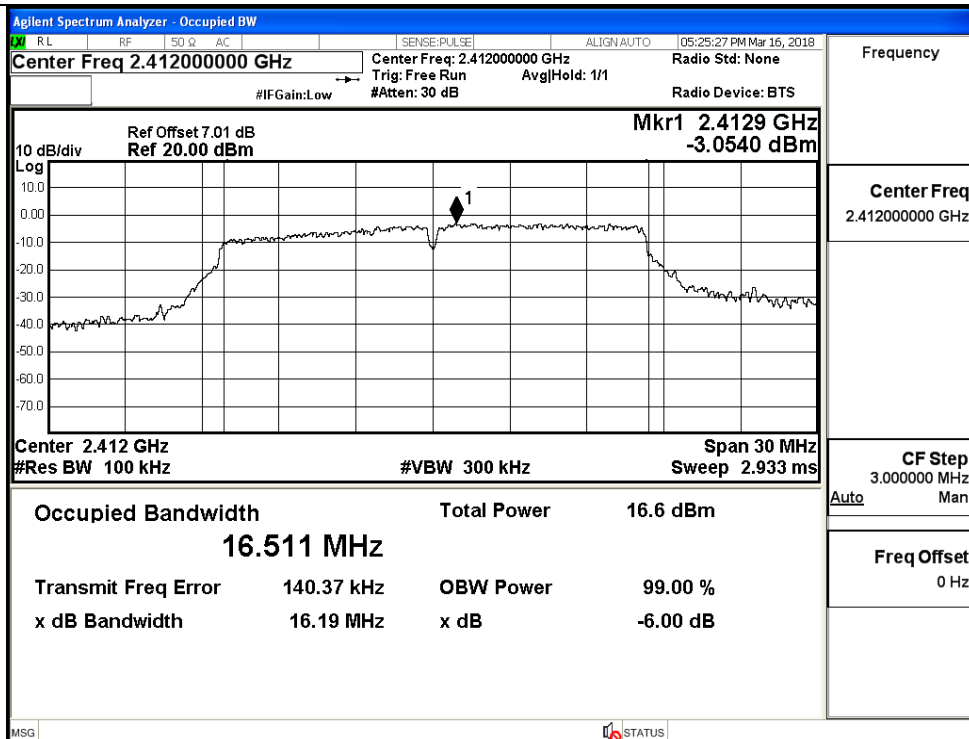
11B/MCH



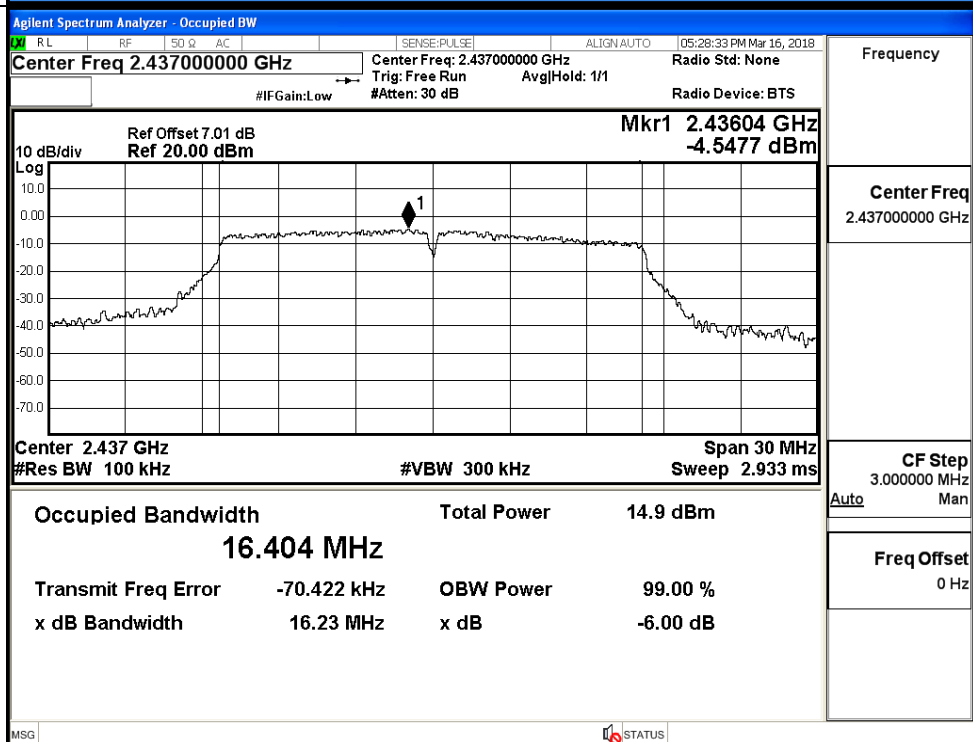
11B/HCH



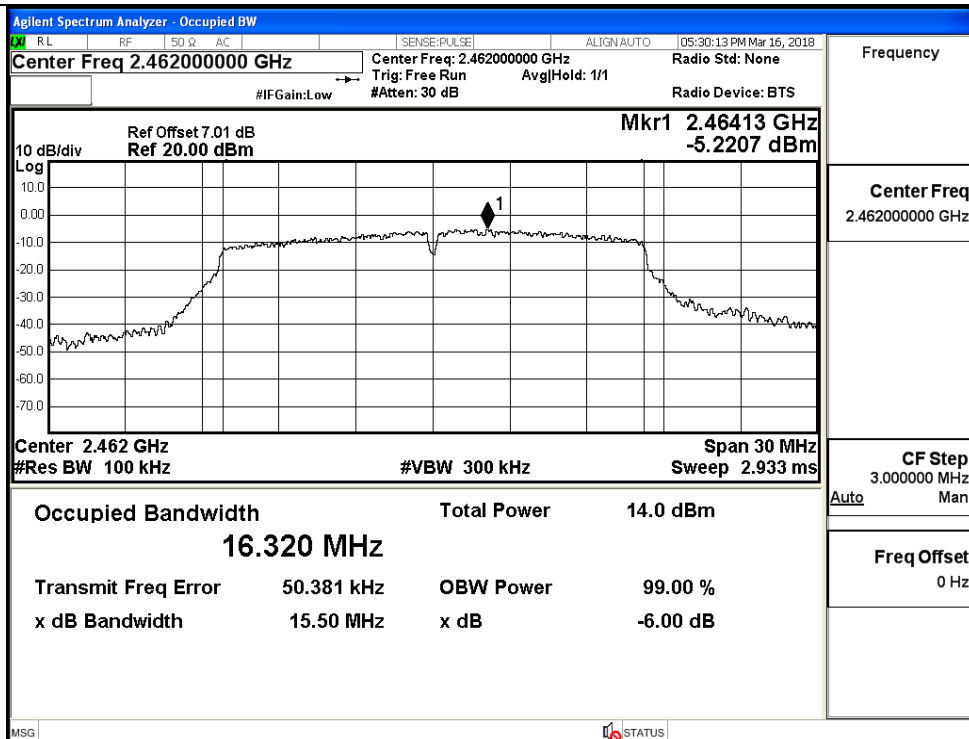
11G/LCH



11G/MCH



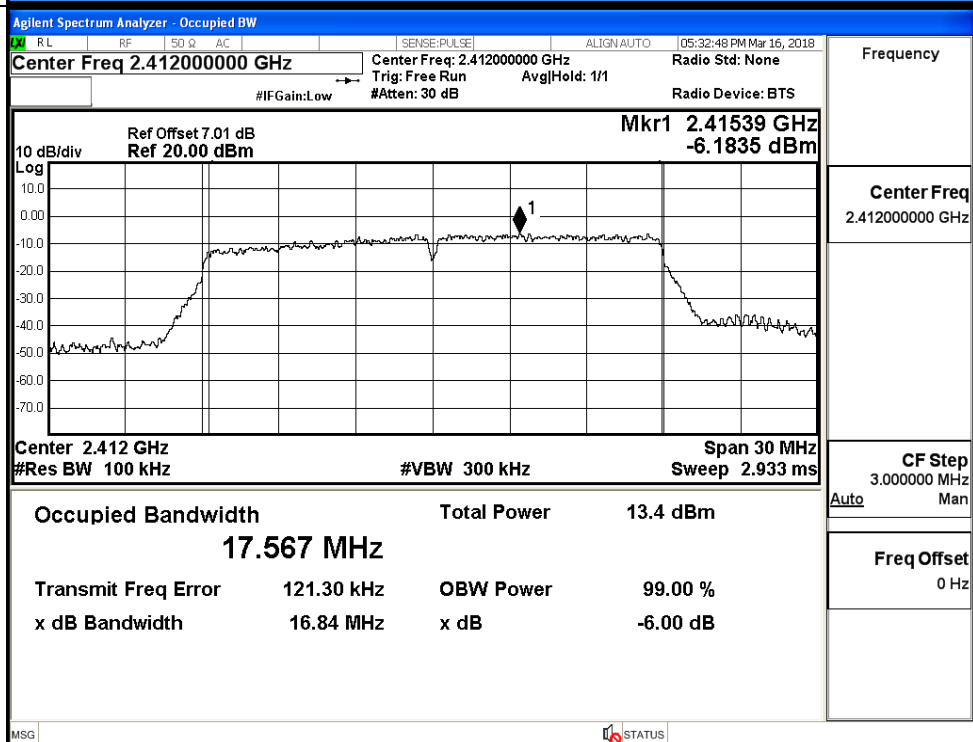
11G/HCH



Frequency

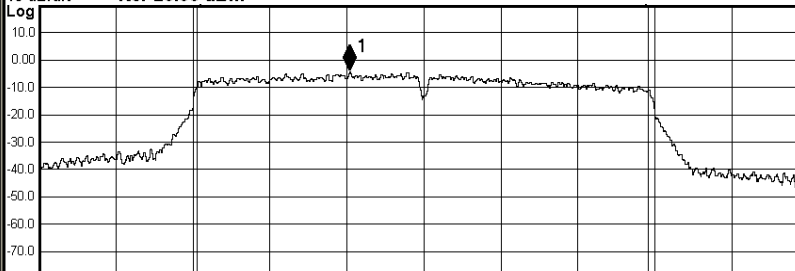
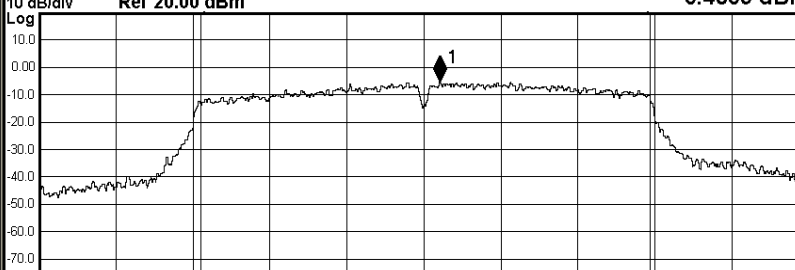
Center Freq
2.462000000 GHzCF Step
3.000000 MHz
Auto ManFreq Offset
0 Hz

11N20SISO/LCH

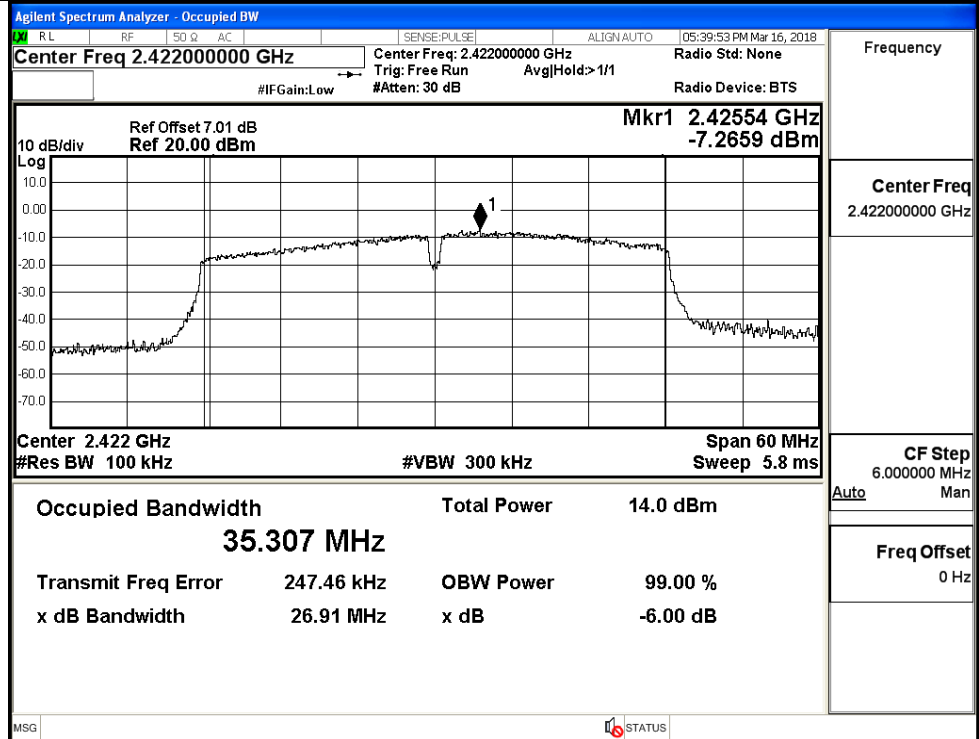


Frequency

Center Freq
2.412000000 GHzCF Step
3.000000 MHz
Auto ManFreq Offset
0 Hz

11N20SISO/MCH	Agilent Spectrum Analyzer - Occupied BW RL RF 50 Ω AC SENSE:PULSE ALIGN:AUTO 05:35:14 PM Mar 16, 2018 Center Freq 2.437000000 GHz Center Freq: 2.437000000 GHz Trig: Free Run Avg/Hold: 1/1 Radio Std: None #IFGain:Low #Atten: 30 dB Radio Device: BTS Ref Offset 7.01 dB Ref 20.00 dBm Mkr1 2.43412 GHz -4.1694 dBm  Center 2.437 GHz #Res BW 100 kHz #VBW 300 kHz Span 30 MHz Sweep 2.933 ms Occupied Bandwidth 17.574 MHz Total Power 14.8 dBm Transmit Freq Error -51.432 kHz OBW Power 99.00 % x dB Bandwidth 17.27 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:PULSE ALIGN:AUTO 05:37:13 PM Mar 16, 2018 Center Freq 2.462000000 GHz Center Freq: 2.462000000 GHz Trig: Free Run Avg/Hold: 1/1 Radio Std: None #IFGain:Low #Atten: 30 dB Radio Device: BTS Ref Offset 7.01 dB Ref 20.00 dBm Mkr1 2.46263 GHz -5.4859 dBm  Center 2.462 GHz #Res BW 100 kHz #VBW 300 kHz Span 30 MHz Sweep 2.933 ms Occupied Bandwidth 17.496 MHz Total Power 13.9 dBm Transmit Freq Error 64.022 kHz OBW Power 99.00 % x dB Bandwidth 17.20 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



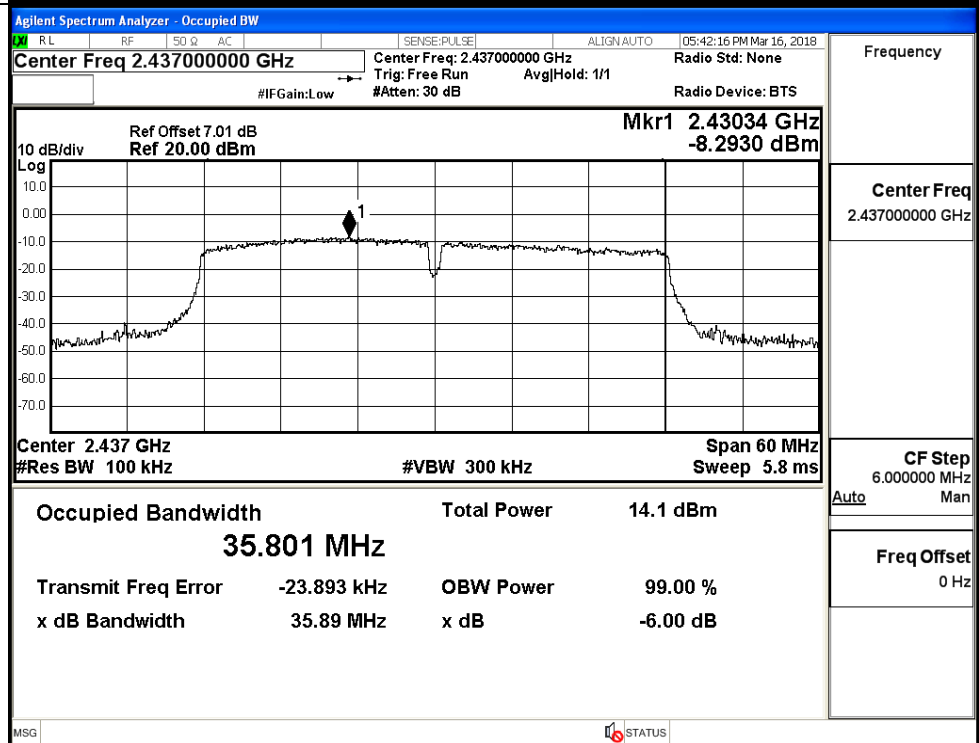
Frequency

Center Freq
2.422000000 GHz

CF Step
6.000000 MHz
Auto Man

Freq Offset
0 Hz

11N40SISO/MCH

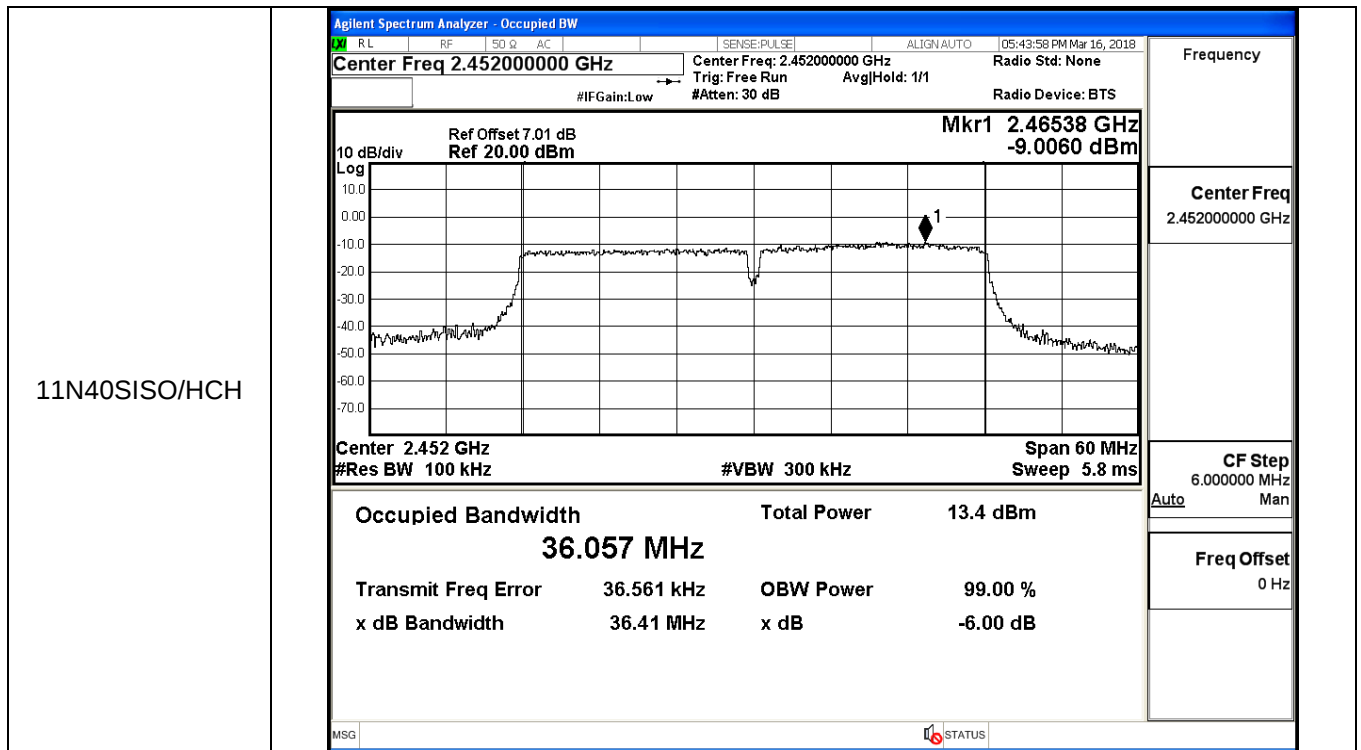


Frequency

Center Freq
2.437000000 GHz

CF Step
6.000000 MHz
Auto Man

Freq Offset
0 Hz

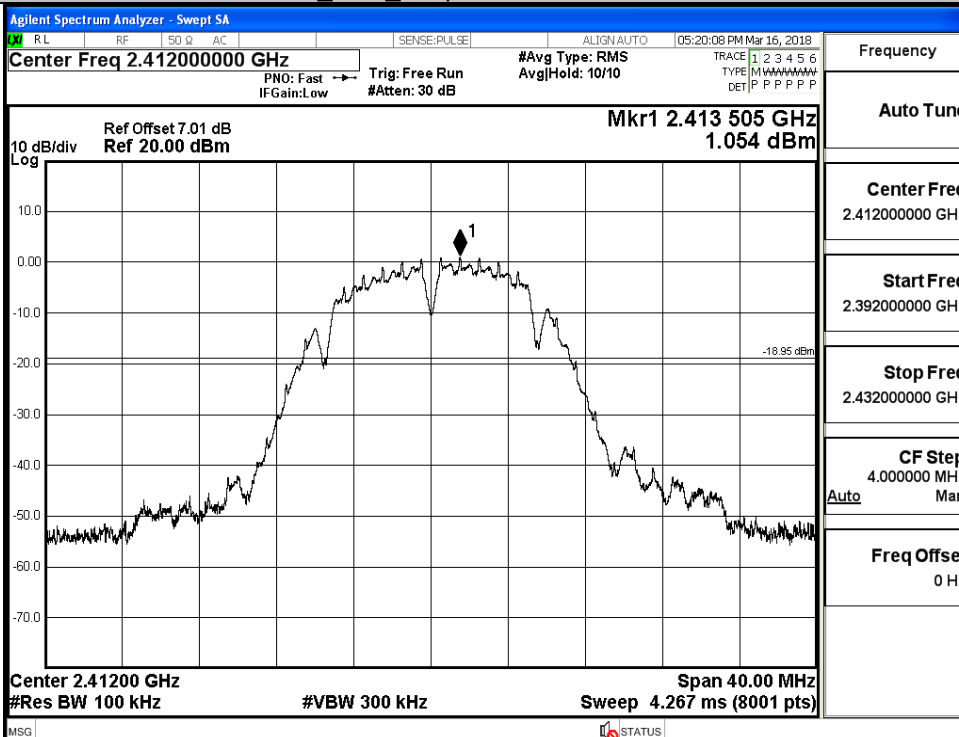


C.5 RF Conducted Spurious Emissions

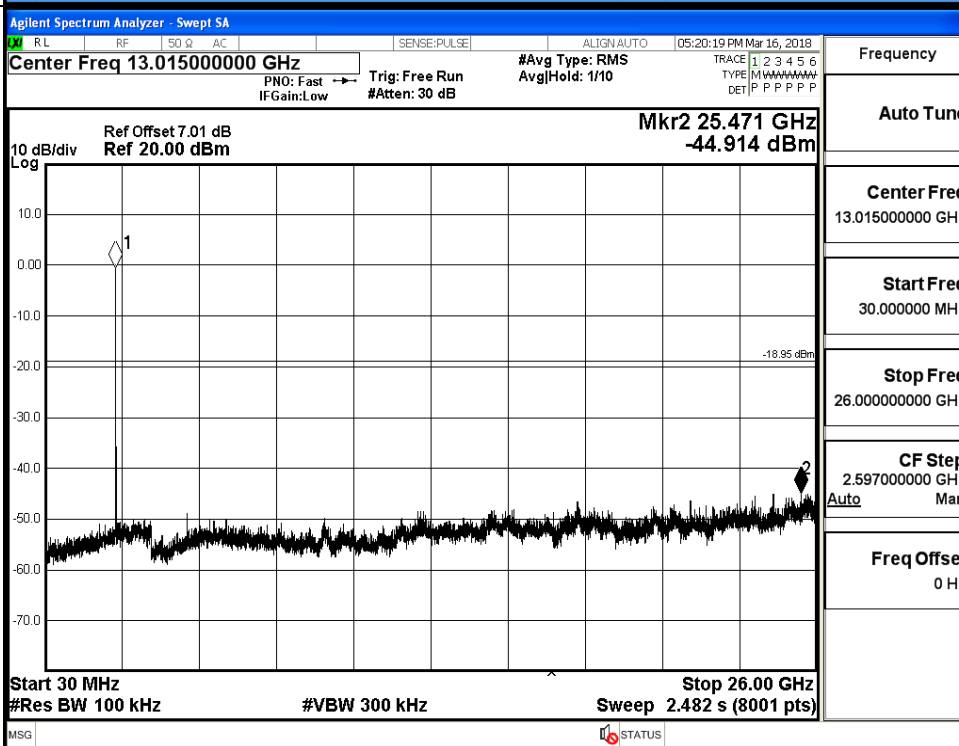
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
11B	LCH	1.054	-44.914	-18.946	PASS
	MCH	2.772	-43.663	-17.228	PASS
	HCH	2.068	-44.749	-17.932	PASS
11G	LCH	-3.279	-43.700	-23.279	PASS
	MCH	-4.849	-44.416	-24.849	PASS
	HCH	-5.346	-39.808	-25.346	PASS
11N20 SISO	LCH	-6.333	-44.896	-26.333	PASS
	MCH	-4.726	-45.539	-24.726	PASS
	HCH	-5.541	-45.347	-25.541	PASS
11N40 SISO	LCH	-7.768	-44.569	-27.768	PASS
	MCH	-8.679	-45.554	-28.679	PASS
	HCH	-9.214	-43.027	-29.214	PASS

11B LCH Graphs

Pref/11B/LCH

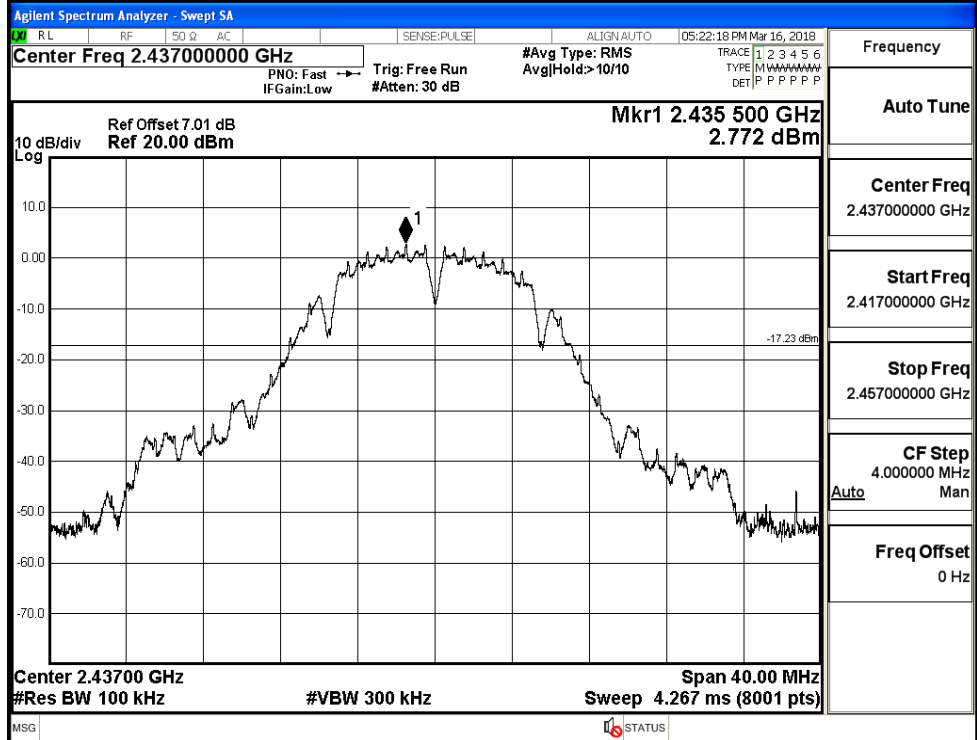


Puw/11B/LCH

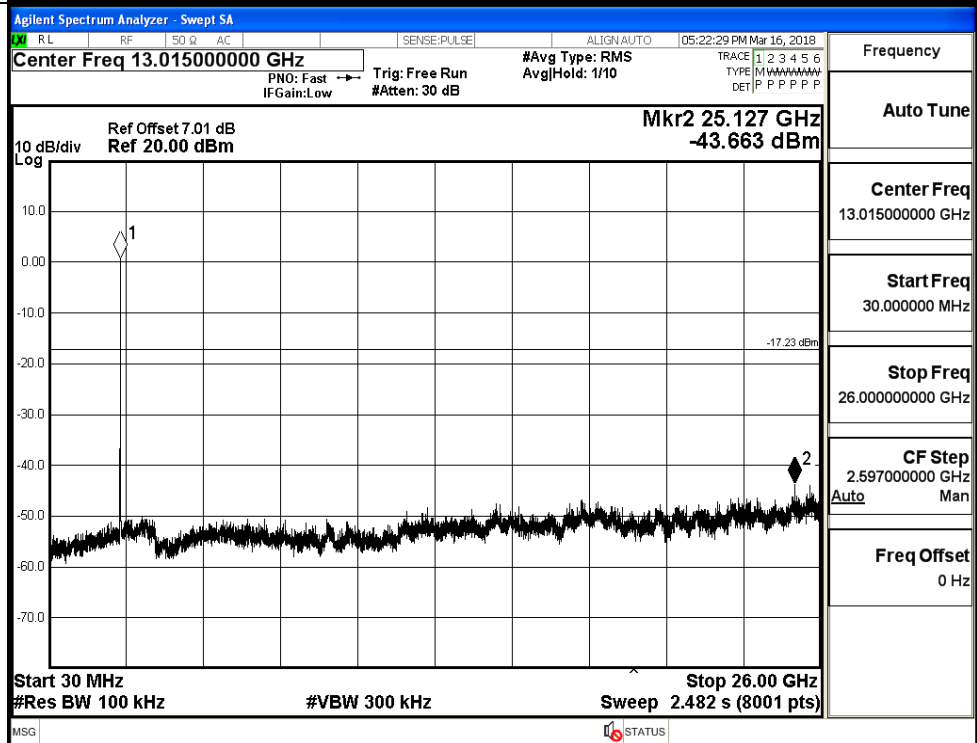


11B MCH Graphs

Pref/11B/MCH

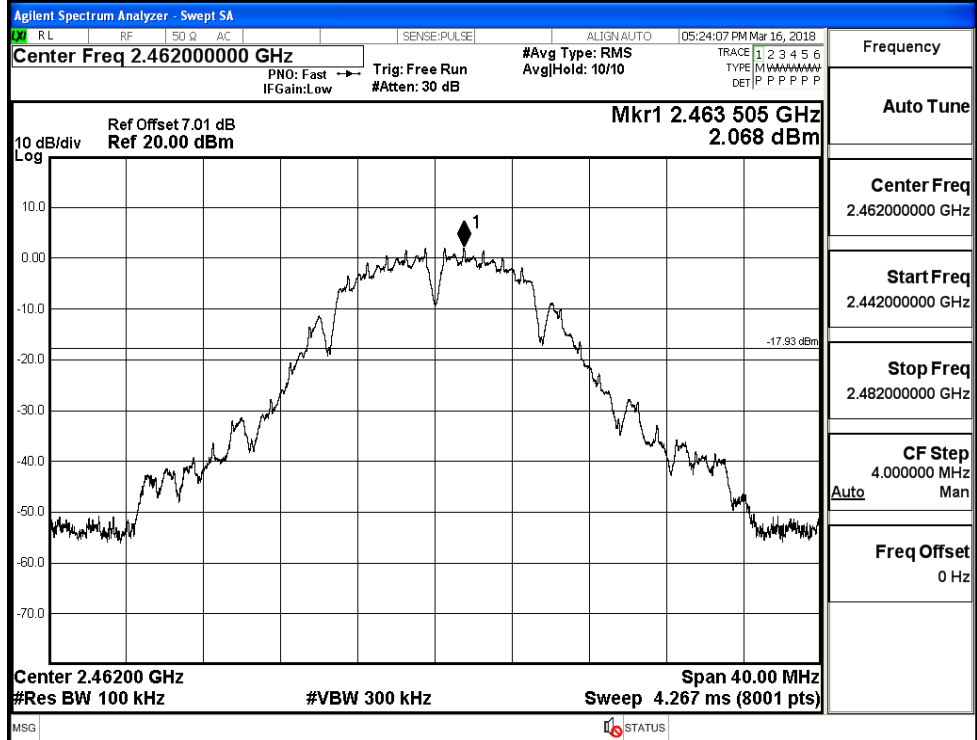


Puw/11B/MCH

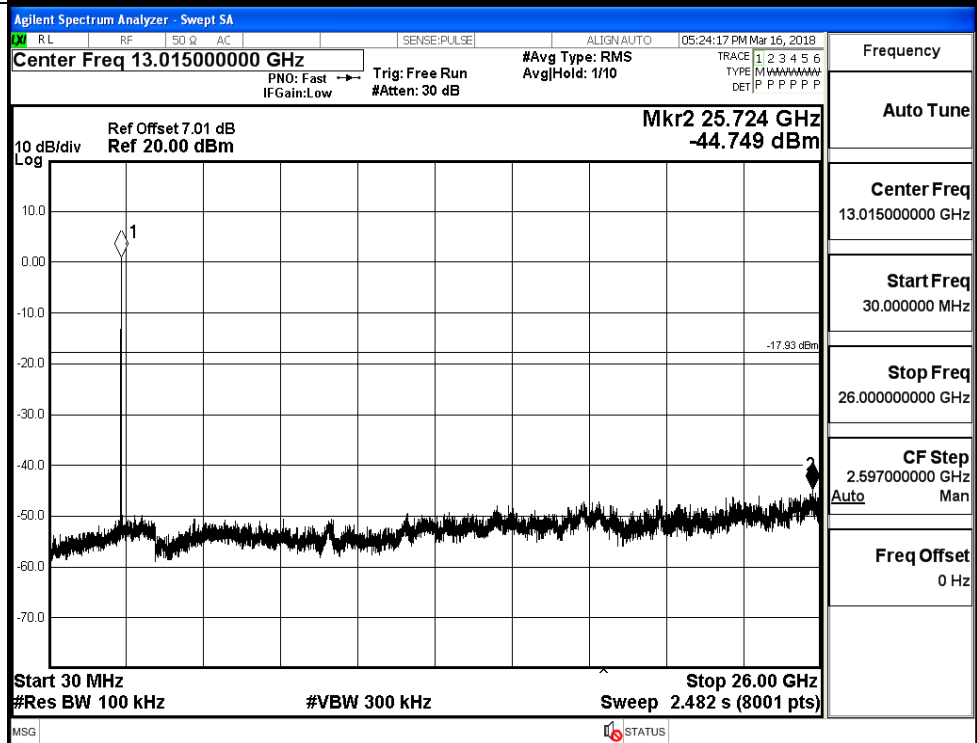


11B HCH Graphs

Pref/11B/HCH

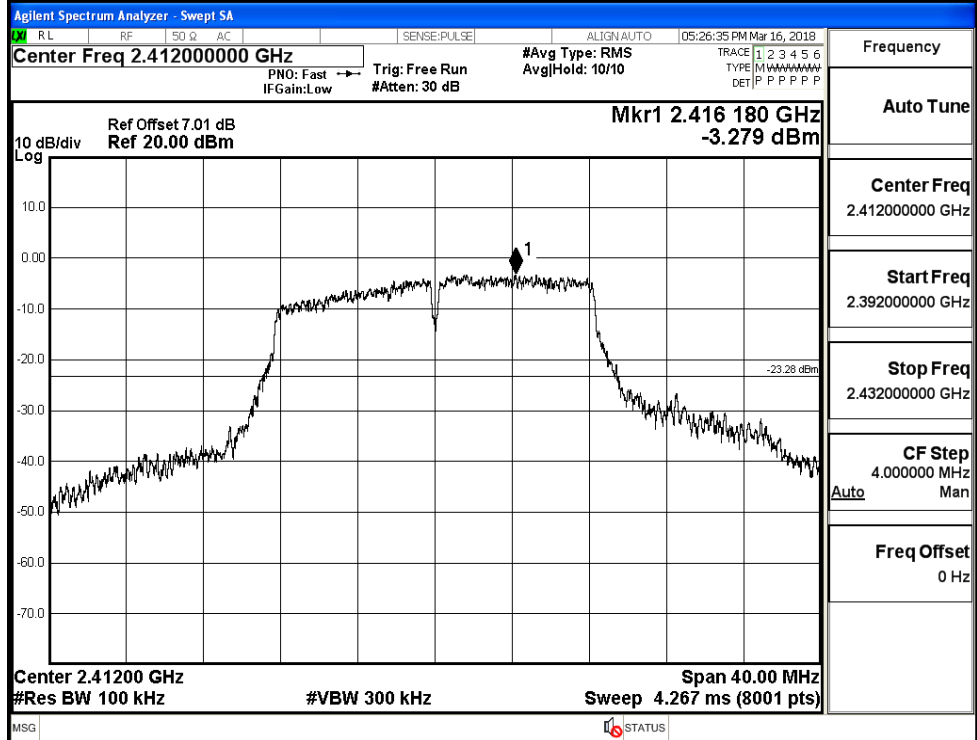


Puw/11B/HCH

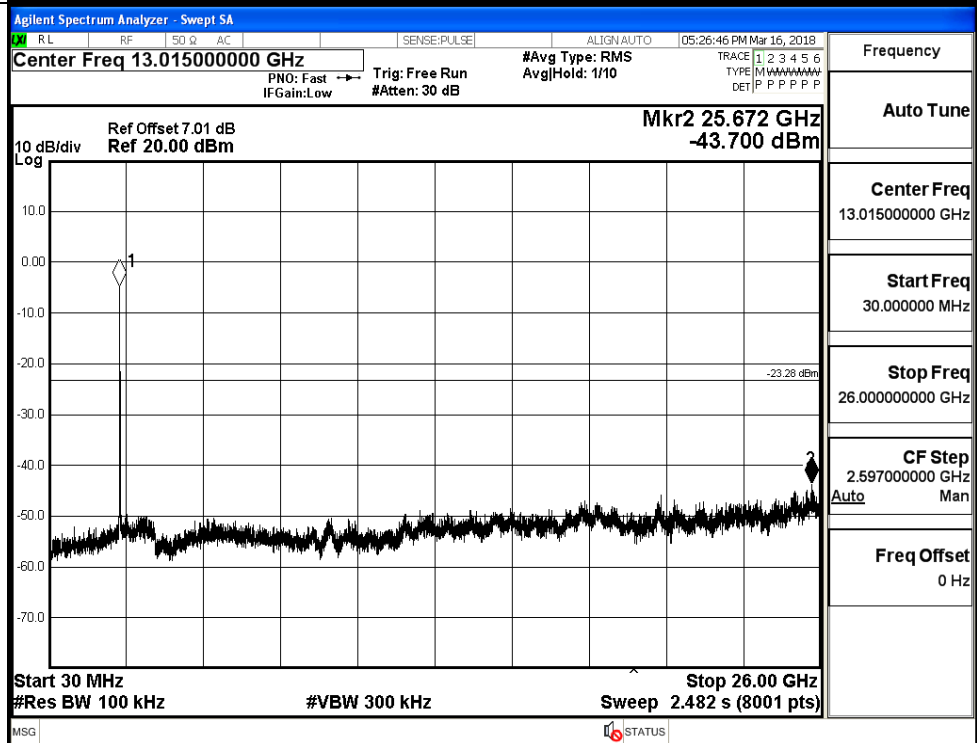


11G LCH Graphs

Pref/11G/LCH

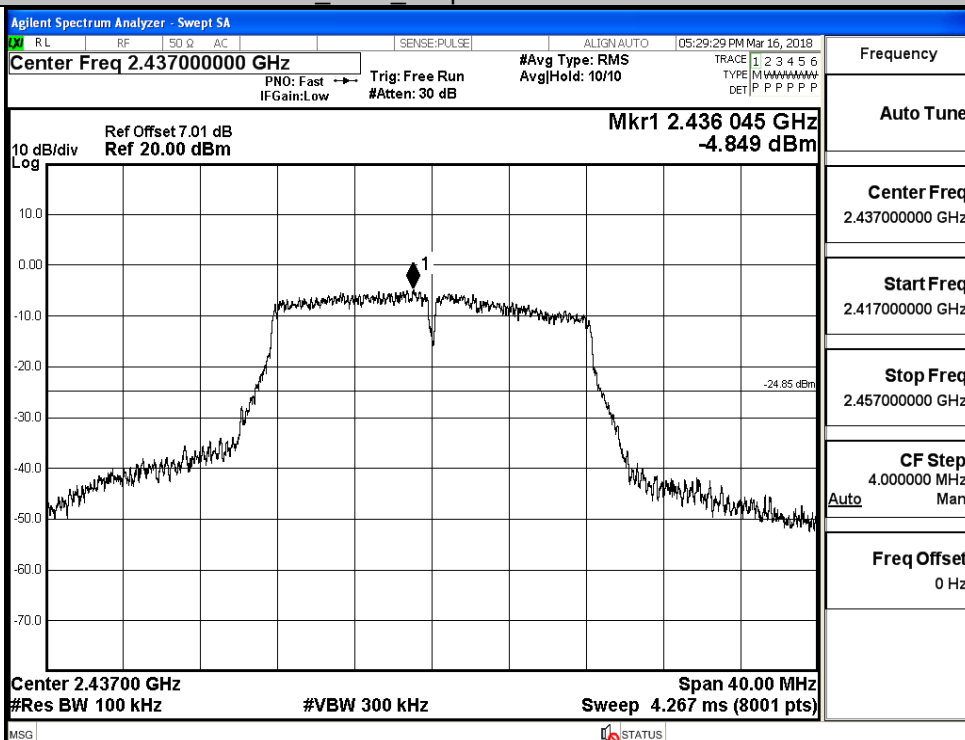


Puw/11G/LCH

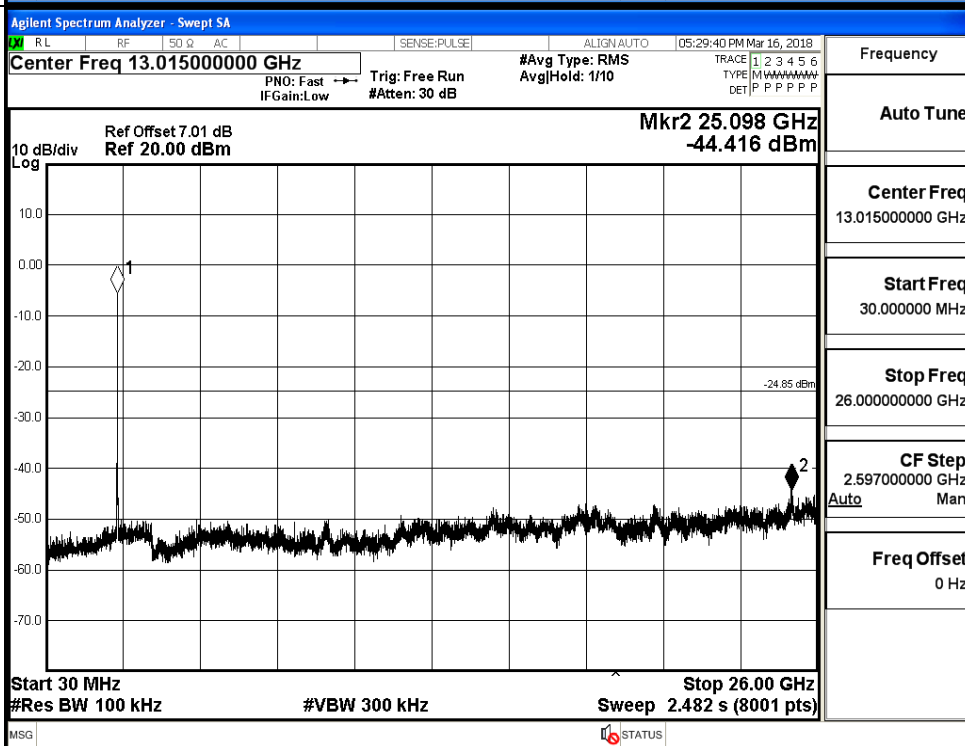


11G MCH Graphs

Pref/11G/MCH

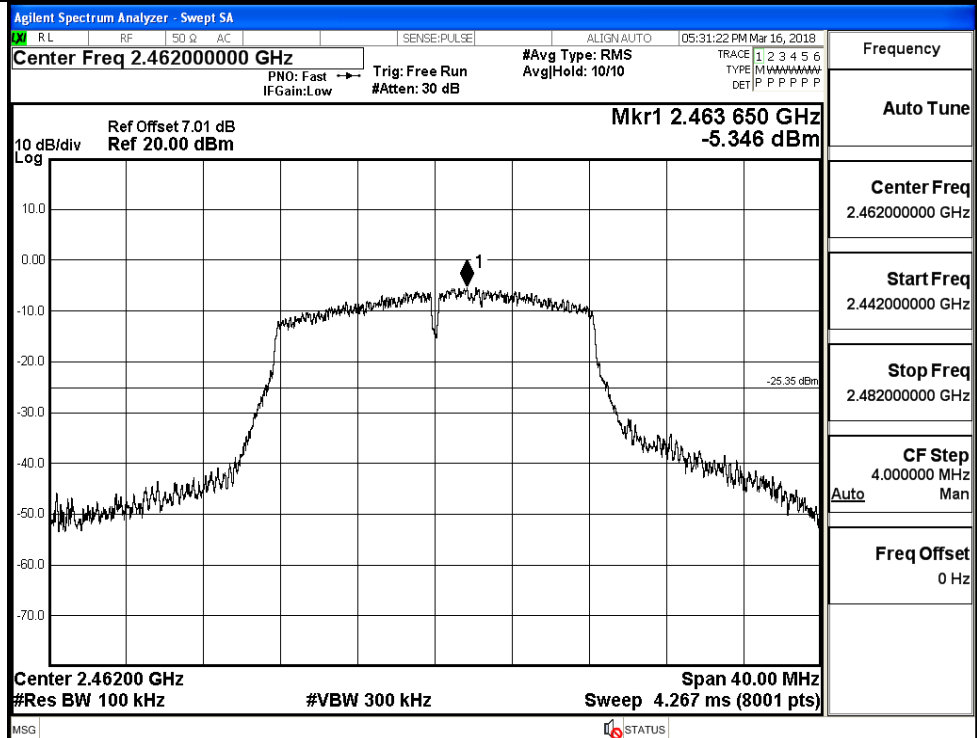


Puw/11G/MCH

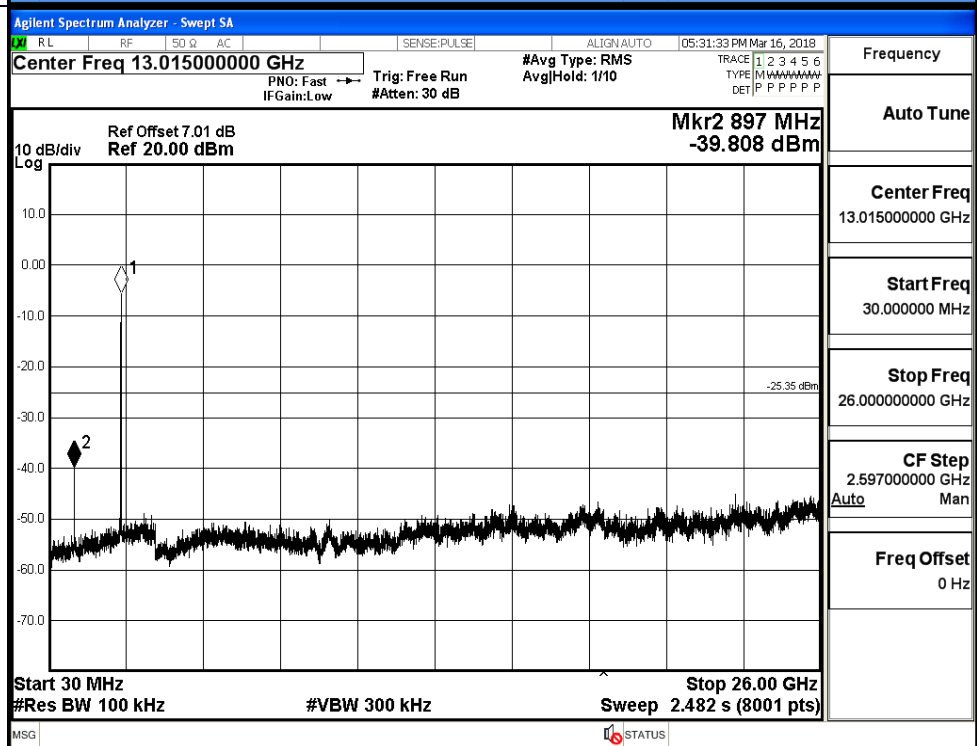


11G HCH Graphs

Pref/11G/HCH

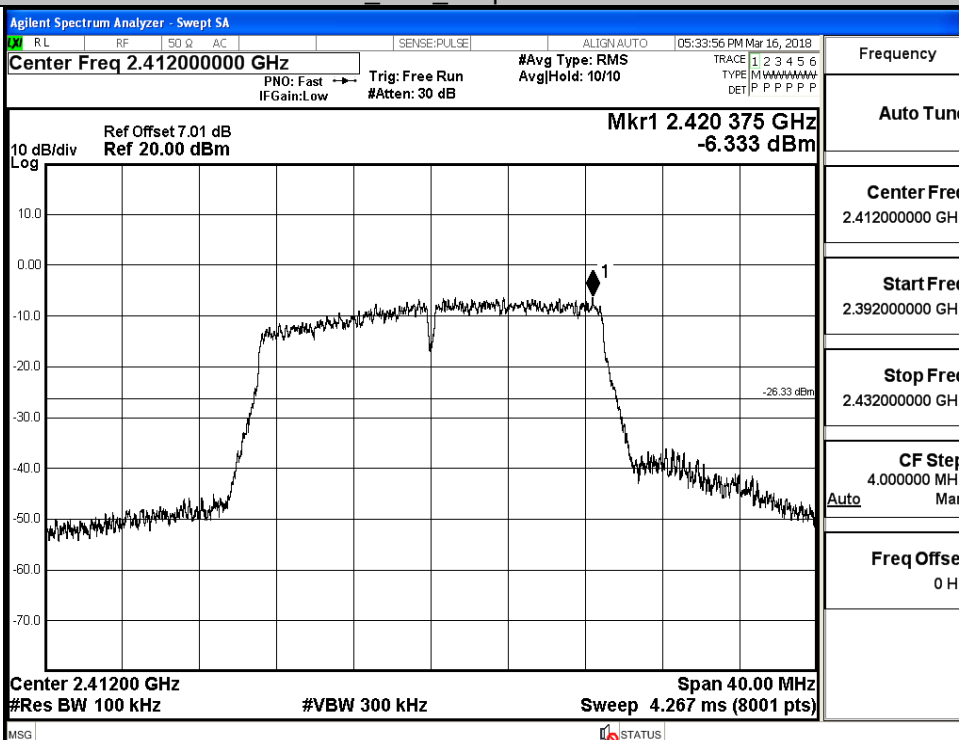


Puw/11G/HCH

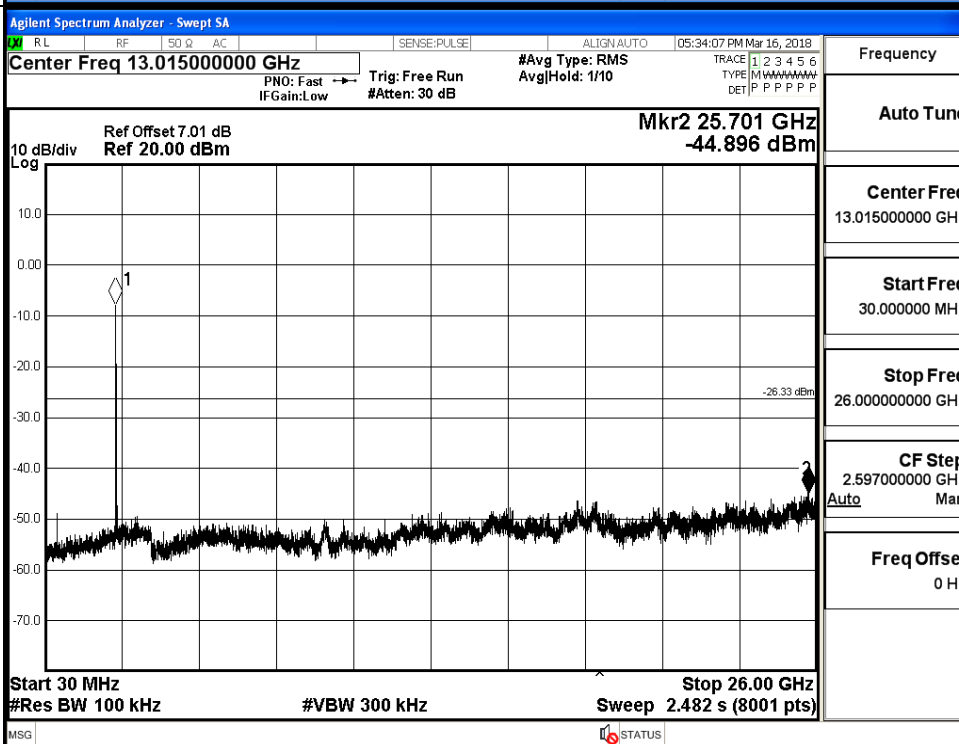


11N20SISO LCH Graphs

Pref/11N20SIS
O/LCH

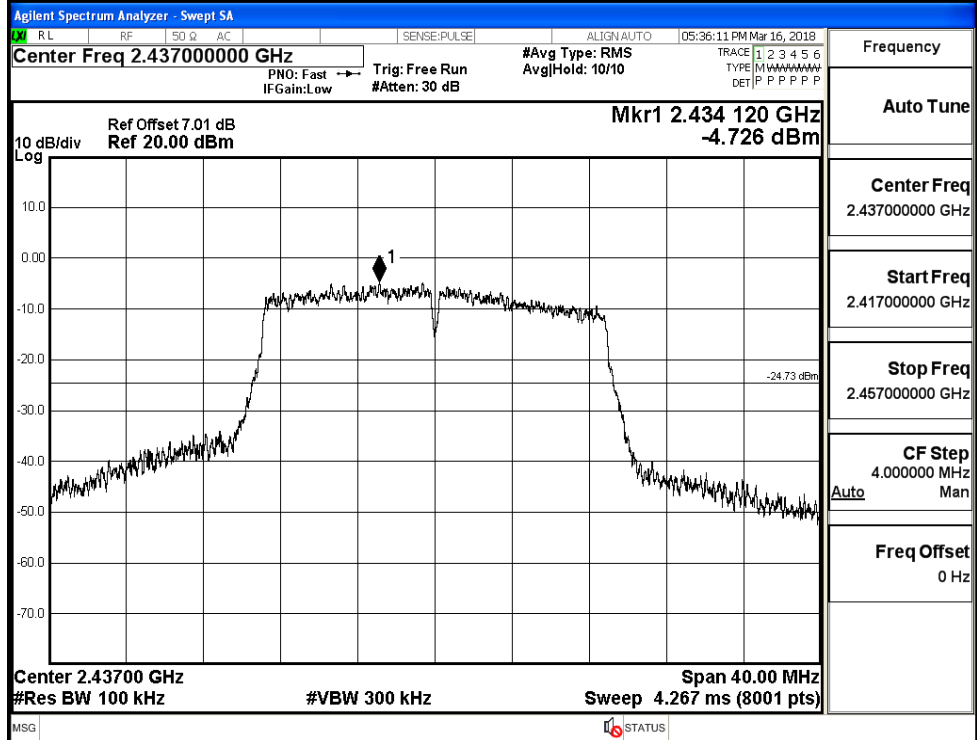


Puw/11N20
SISO/LCH

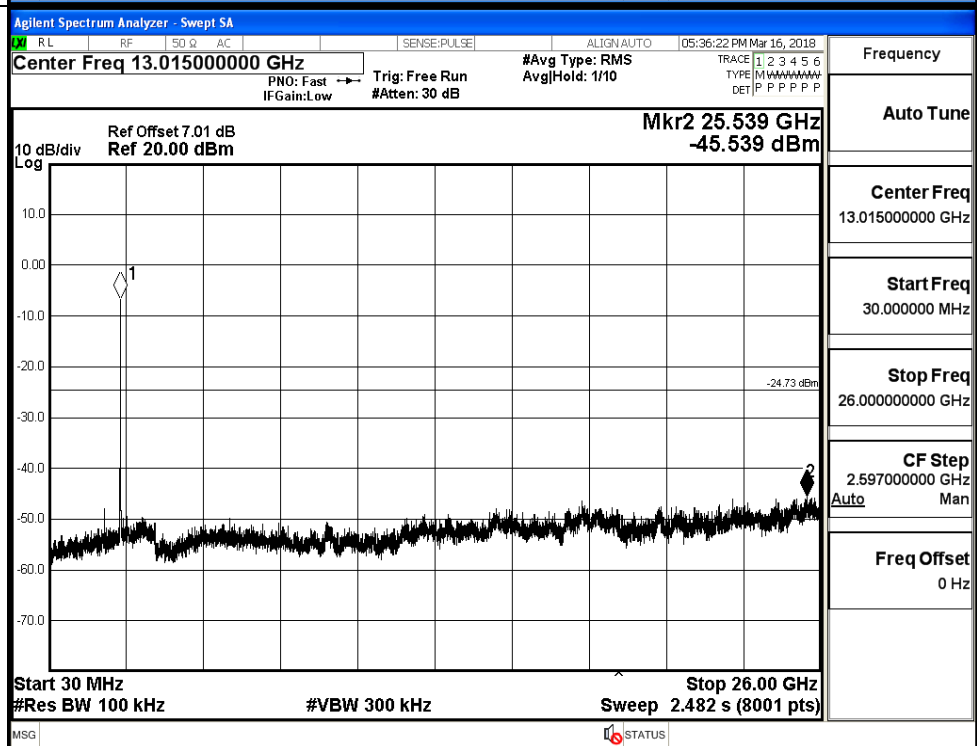


11N20SISO_MCH_Graphs

Pref/11N20
SISO/MCH

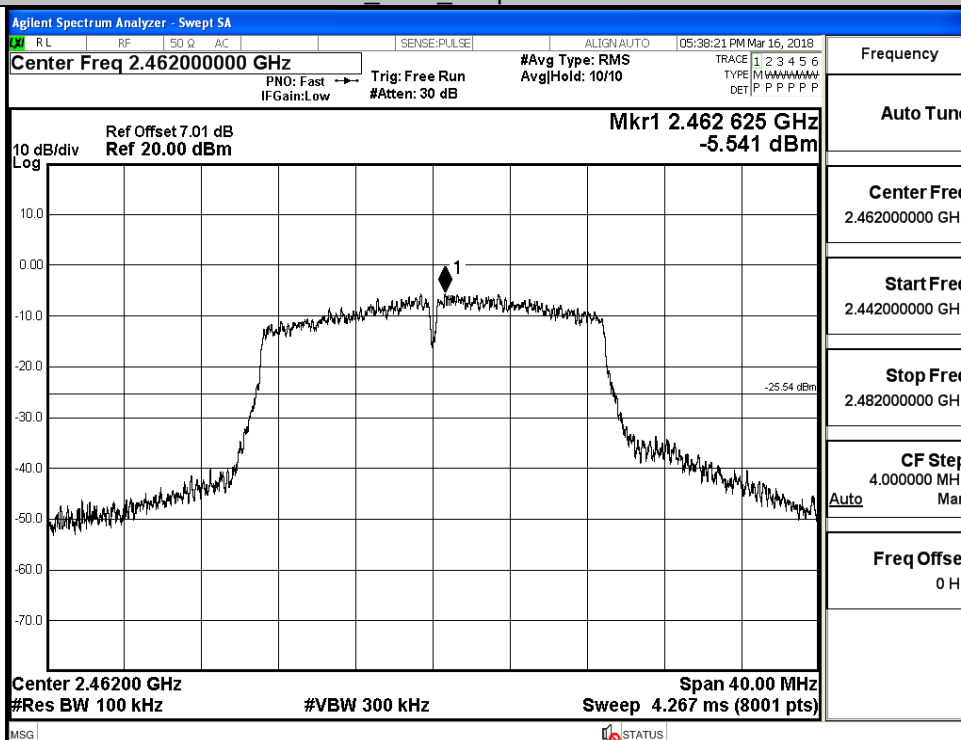


Puw/11N20
SISO/MCH

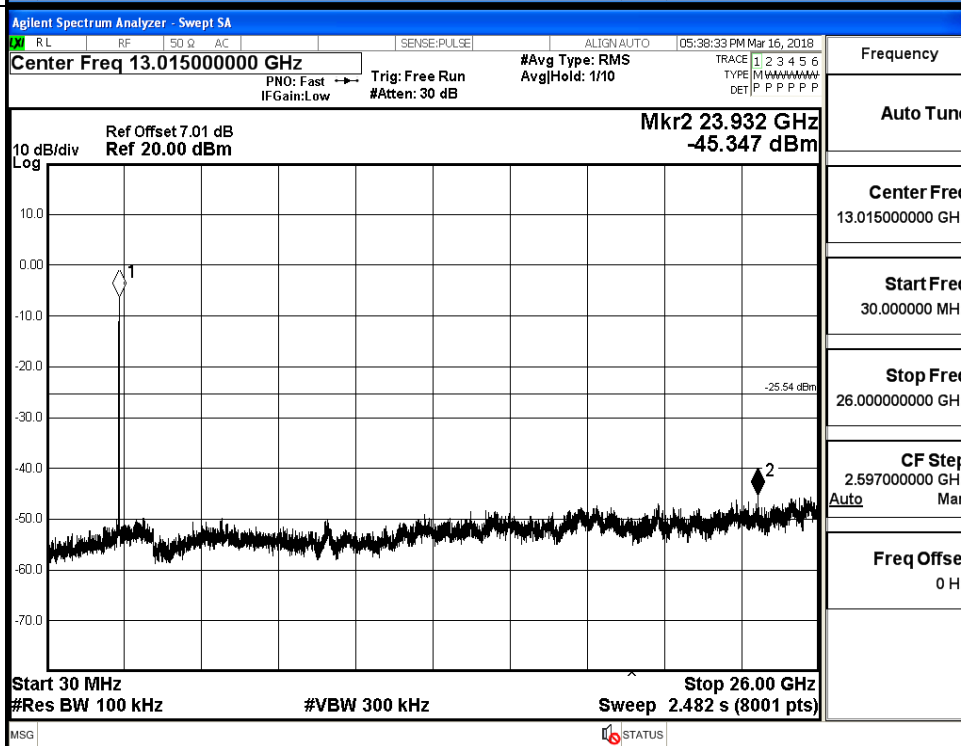


11N20SISO HCH Graphs

Pref/11N20
SISO/HCH

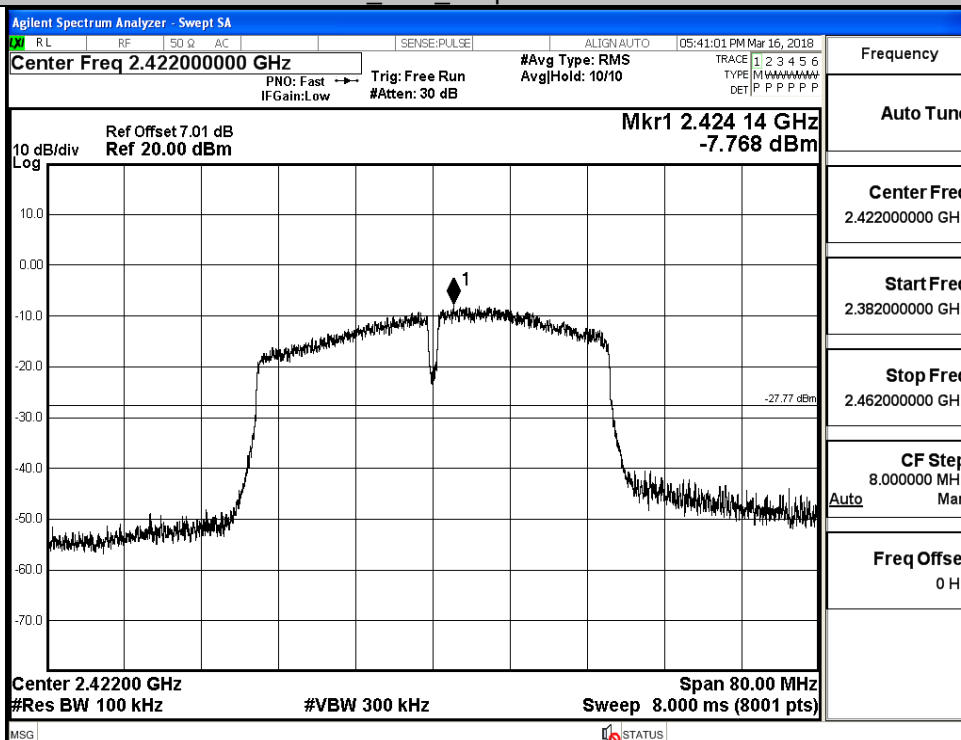


Puw/11N20
SISO/HCH

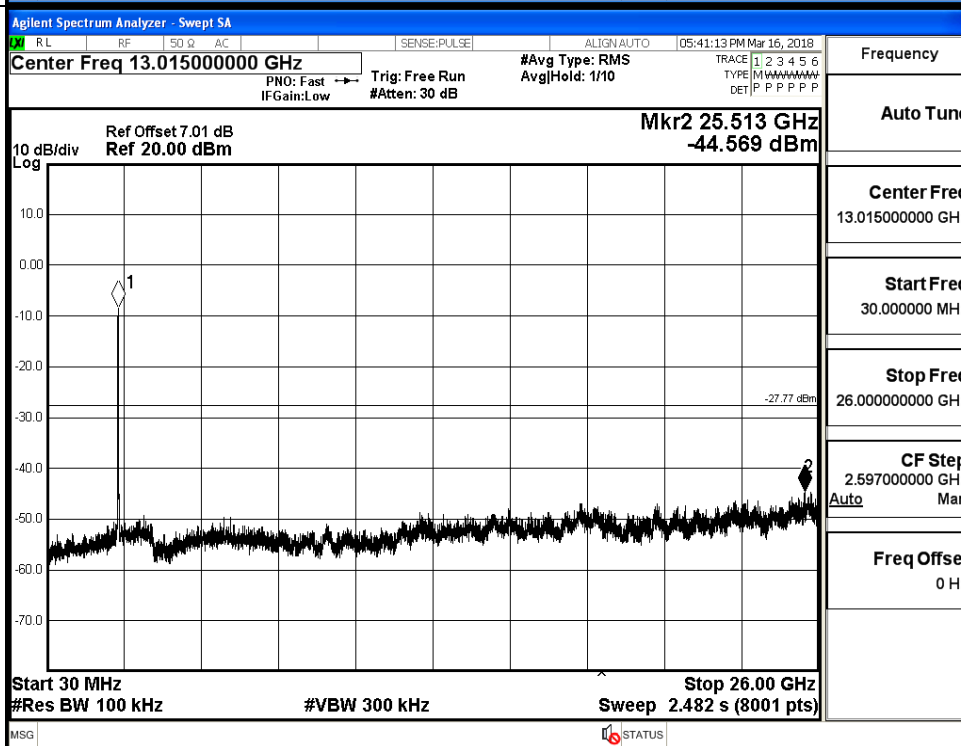


11N40SISO LCH Graphs

Pref/11N40
SISO/LCH

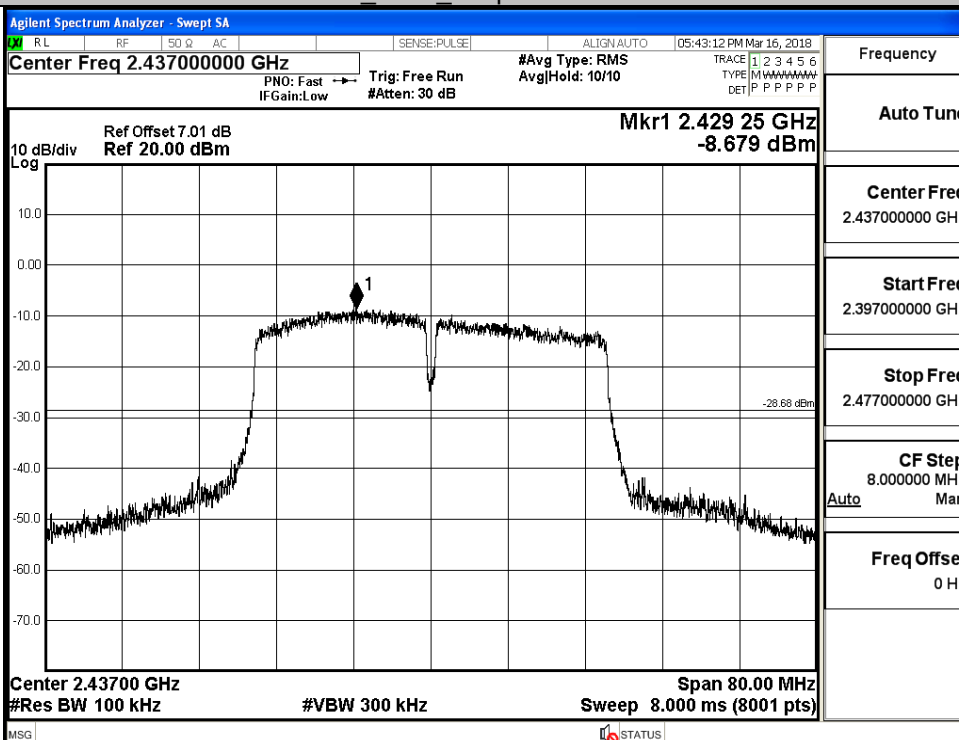


Puw/11N40
SISO/LCH

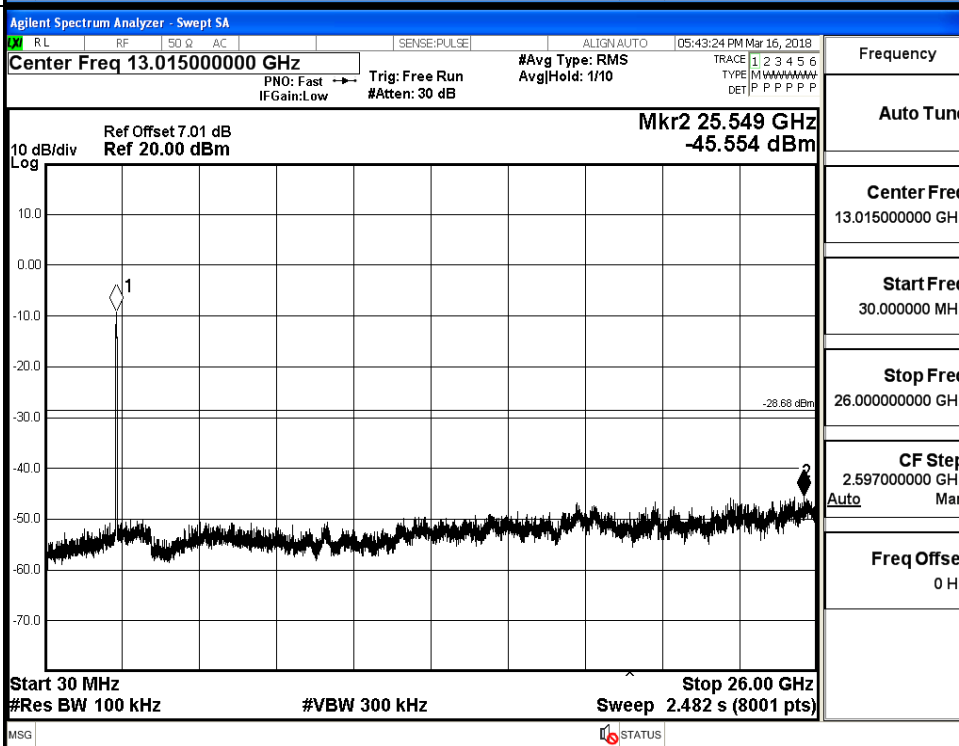


11N40SISO_MCH_Graphs

Pref/11N40
SISO/MCH

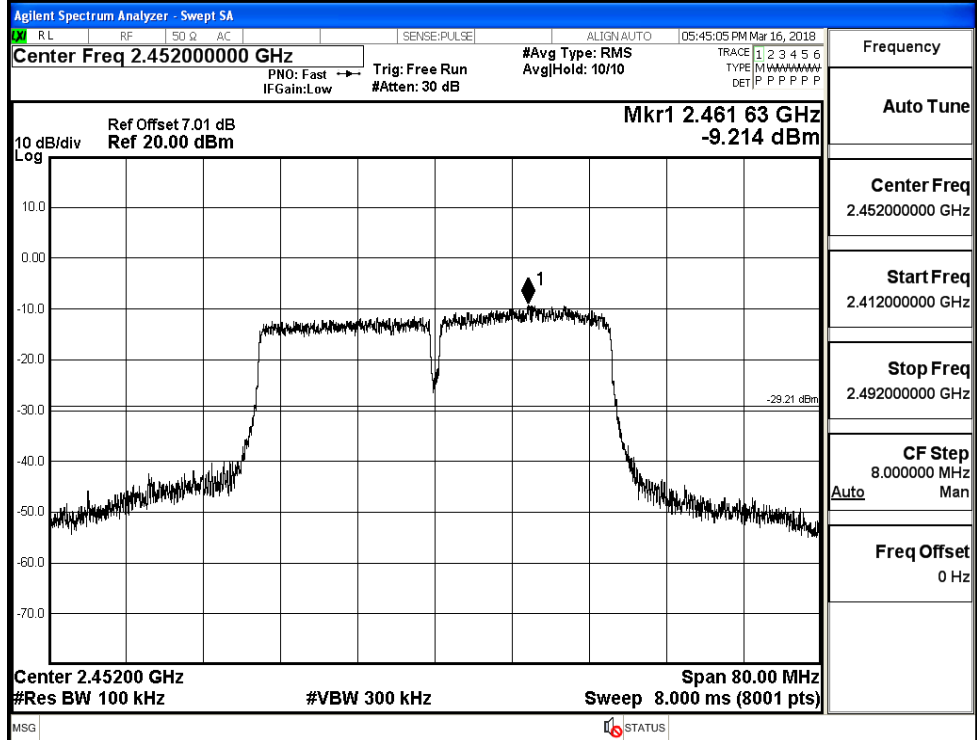


Puw/11N40
SISO/MCH

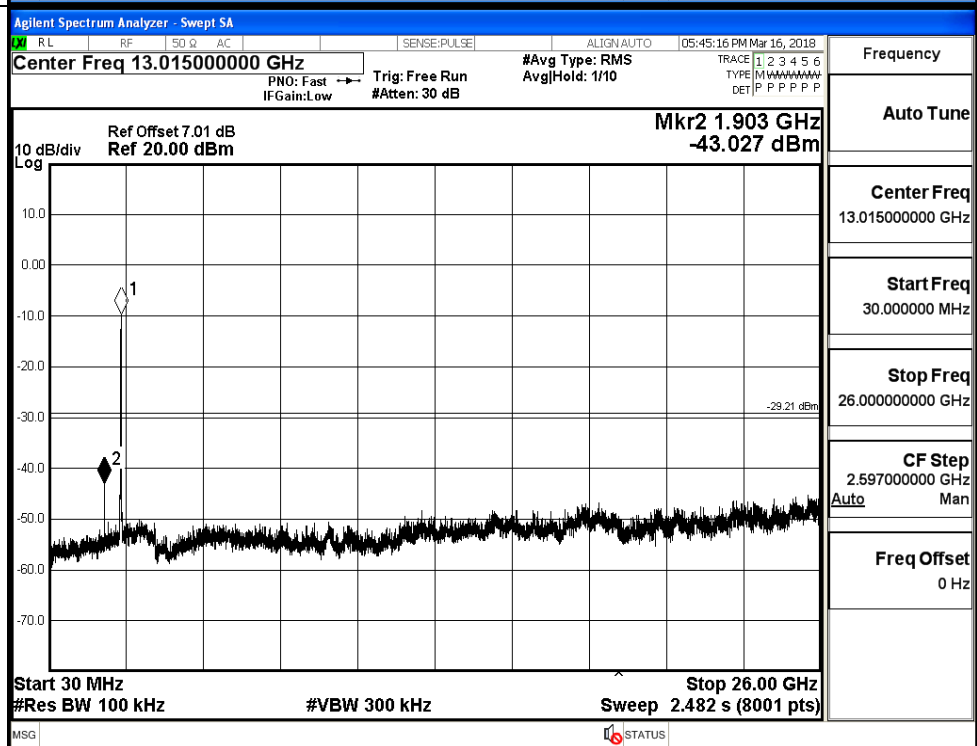


11N40SISO HCH Graphs

Pref/11N40
SISO/HCH



Puw/11N40
SISO/HCH

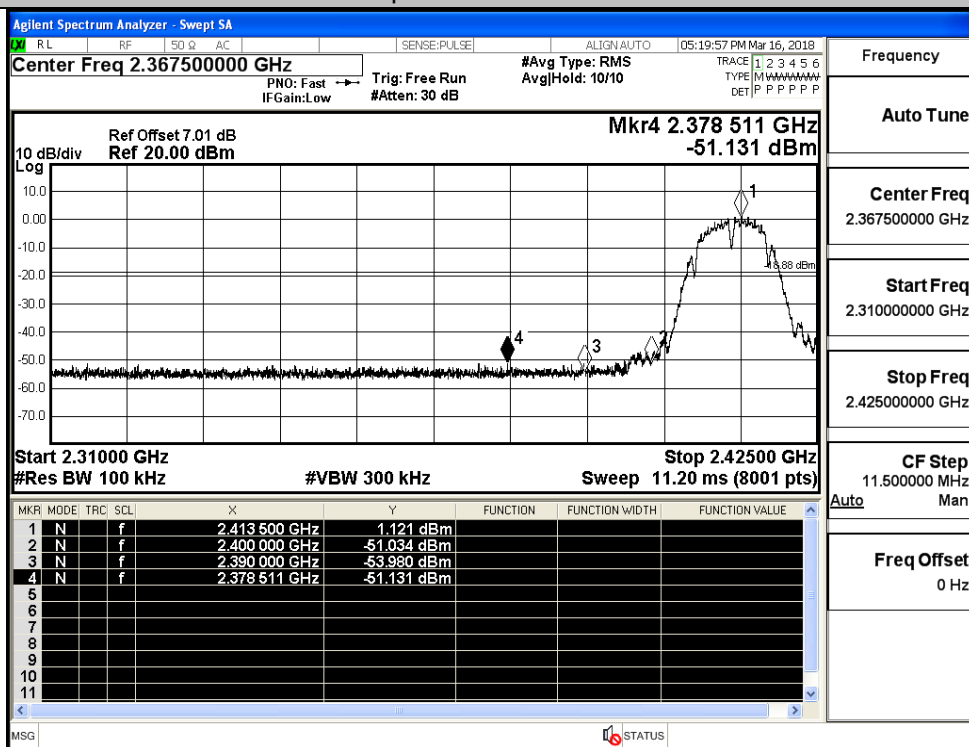


C.6 Band-edge for RF Conducted Emissions

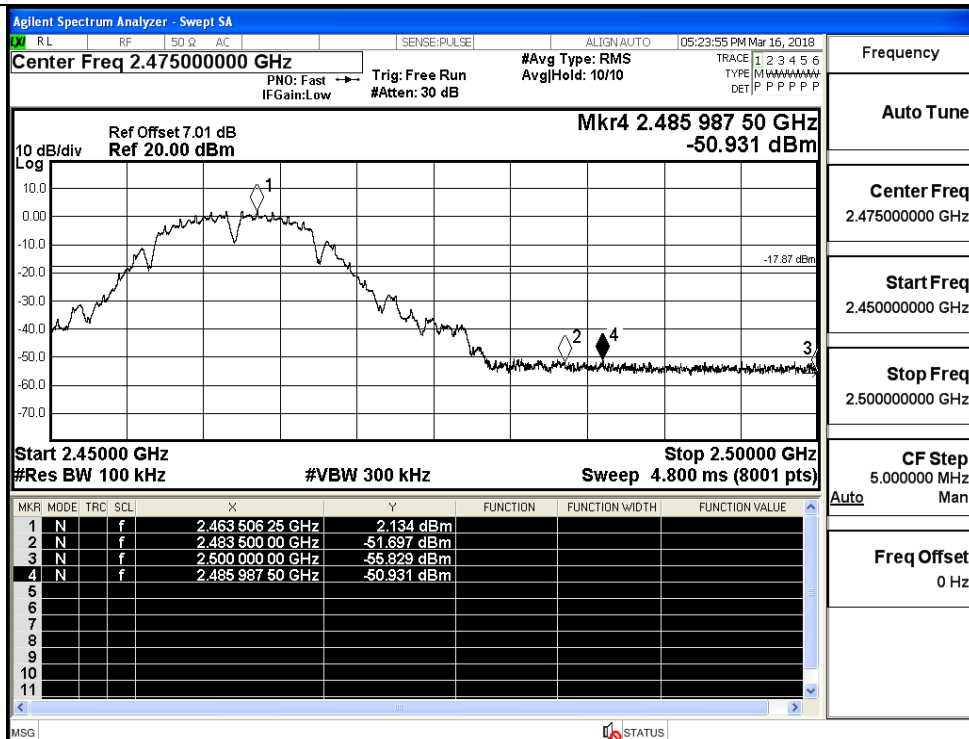
Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
11B	LCH	1.121	-51.131	-18.879	PASS
	HCH	2.134	-50.931	-17.866	PASS
11G	LCH	-3.169	-49.175	-23.169	PASS
	HCH	-5.297	-49.498	-25.297	PASS
11N20SISO	LCH	-6.357	-51.014	-26.357	PASS
	HCH	-5.485	-48.715	-25.485	PASS
11N40SISO	LCH	-7.776	-51.182	-27.776	PASS
	HCH	-9.287	-47.213	-29.287	PASS

Test Graphs

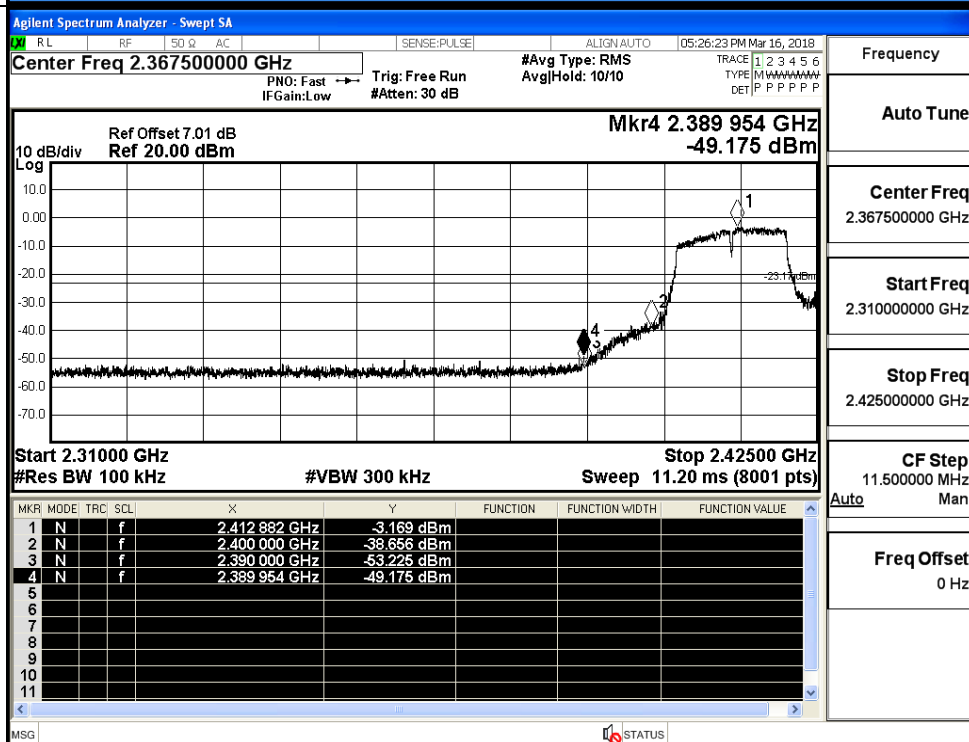
11B/LCH



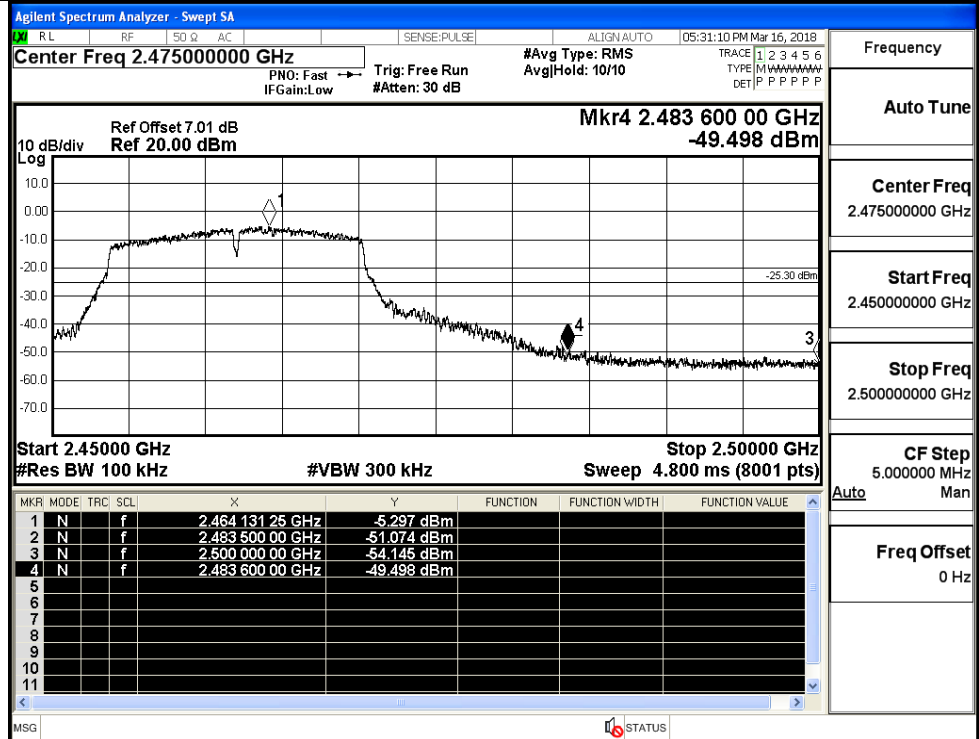
11B/HCH



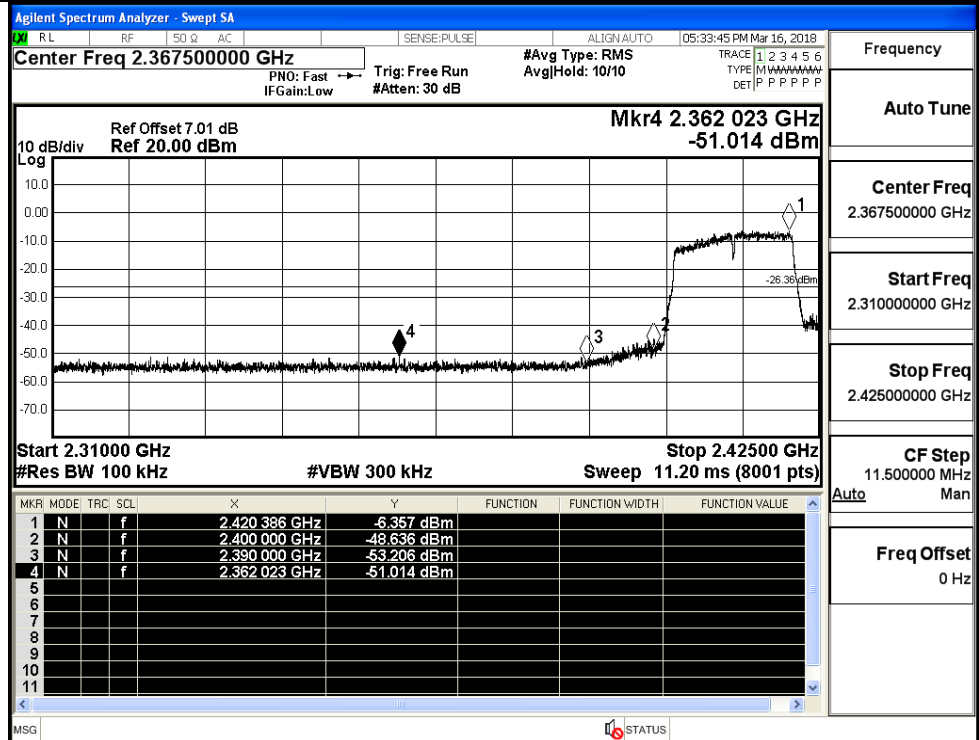
11G/LCH



11G/HCH



11N20SISO/LCH



11N20SISO/HCH

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.475000000 GHz

PNO: Fast IFGain:Low Trig: Free Run #Atten: 30 dB

#Avg Type: RMS AvgHold: 10/10

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

Auto Man

Freq Offset 0 Hz

Ref Offset 7.01 dB Ref 20.00 dBm

Mkr4 2.484 437 50 GHz -48.715 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	2.462 625 00 GHz	-5.485 dBm			
2	N		f	2.483 500 00 GHz	-49.109 dBm			
3	N		f	2.500 000 00 GHz	-55.684 dBm			
4	N		f	2.484 437 50 GHz	-48.715 dBm			

MSG STATUS

11N40SISO/LCH

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.377500000 GHz

PNO: Fast IFGain:Low Trig: Free Run #Atten: 30 dB

#Avg Type: RMS AvgHold: 10/10

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

Auto Man

Freq Offset 0 Hz

Ref Offset 7.01 dB Ref 20.00 dBm

Mkr4 2.387 642 GHz -51.182 dBm

10 dB/div Log

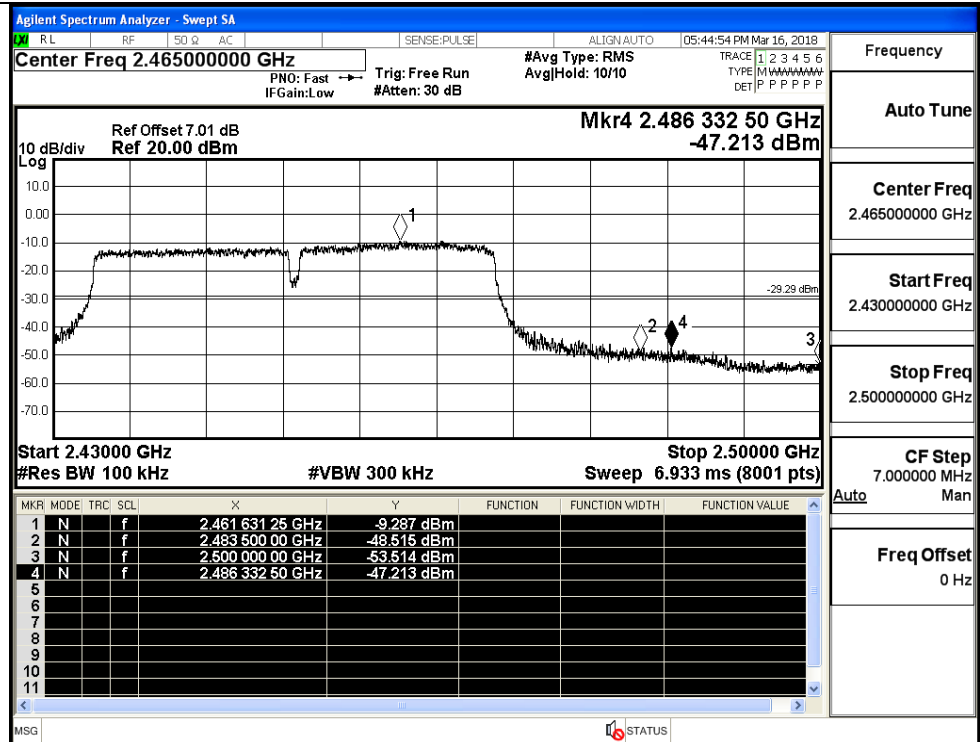
Start 2.31000 GHz Stop 2.44500 GHz

#Res BW 100 kHz #VBW 300 kHz Sweep 13.33 ms (8001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N		f	2.425 374 GHz	-7.776 dBm			
2	N		f	2.400 000 GHz	-53.183 dBm			
3	N		f	2.390 000 GHz	-52.561 dBm			
4	N		f	2.387 642 GHz	-51.182 dBm			

MSG STATUS

11N40SISO/HCH

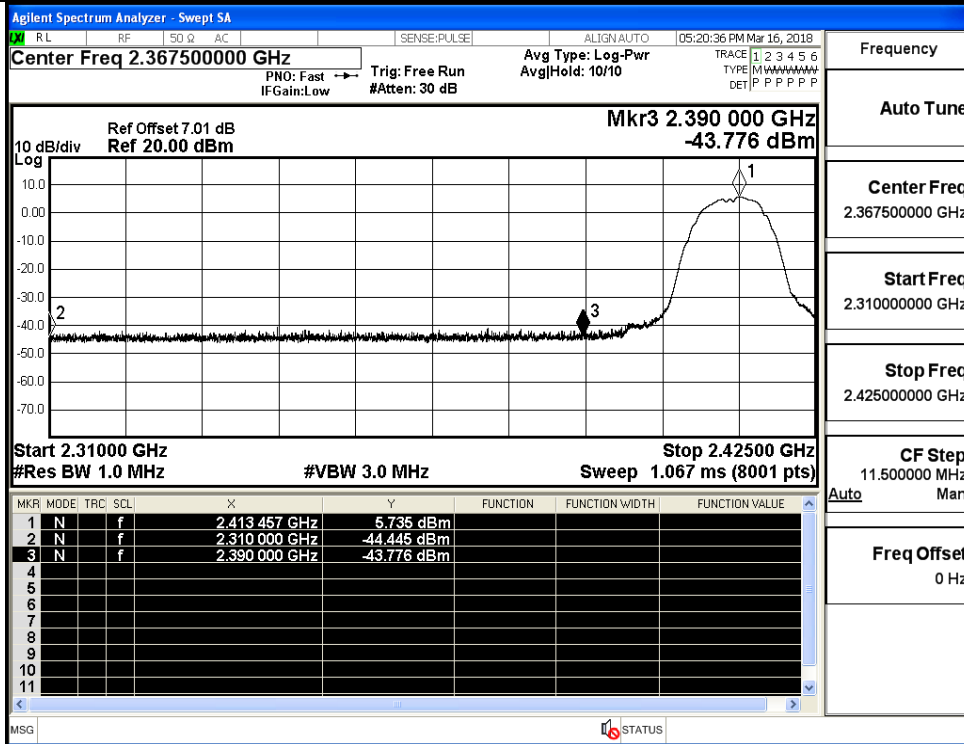


C.7 Restrict-band band-edge measurements

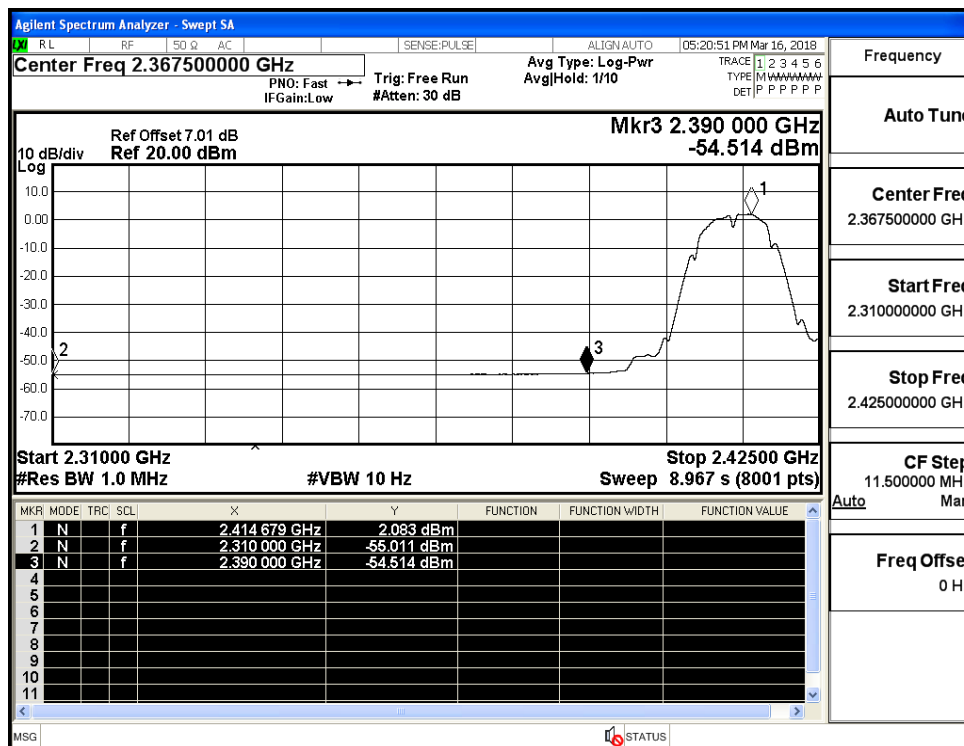
Test Mode	Test Channel	Ant	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
11B	2412	Ant1	2310.0	-44.45	2.0	0	52.81	PEAK	74	PASS
	2412	Ant1	2310.0	-55.01	2.0	0	42.25	AV	54	PASS
	2412	Ant1	2390.0	-43.78	2.0	0	53.48	PEAK	74	PASS
	2412	Ant1	2390.0	-54.51	2.0	0	42.75	AV	54	PASS
	2462	Ant1	2483.5	-43.22	2.0	0	54.04	PEAK	74	PASS
	2462	Ant1	2483.5	-52.83	2.0	0	44.43	AV	54	PASS
	2462	Ant1	2500.0	-43.93	2.0	0	53.33	PEAK	74	PASS
	2462	Ant1	2500.0	-54.38	2.0	0	42.88	AV	54	PASS
11G	2412	Ant1	2310.0	-43.43	2.0	0	53.83	PEAK	74	PASS
	2412	Ant1	2310.0	-55.01	2.0	0	42.25	AV	54	PASS
	2412	Ant1	2390.0	-38.85	2.0	0	58.41	PEAK	74	PASS
	2412	Ant1	2390.0	-52.33	2.0	0	44.93	AV	54	PASS
	2462	Ant1	2483.5	-38.20	2.0	0	59.06	PEAK	74	PASS
	2462	Ant1	2483.5	-52.27	2.0	0	44.99	AV	54	PASS
	2462	Ant1	2500.0	-44.14	2.0	0	53.12	PEAK	74	PASS
	2462	Ant1	2500.0	-54.44	2.0	0	42.82	AV	54	PASS
11N20 SISO	2412	Ant1	2310.0	-43.64	2.0	0	53.62	PEAK	74	PASS
	2412	Ant1	2310.0	-55.04	2.0	0	42.22	AV	54	PASS
	2412	Ant1	2390.0	-44.27	2.0	0	52.99	PEAK	74	PASS
	2412	Ant1	2390.0	-53.95	2.0	0	43.31	AV	54	PASS
	2462	Ant1	2483.5	-35.02	2.0	0	62.24	PEAK	74	PASS
	2462	Ant1	2483.5	-51.57	2.0	0	45.69	AV	54	PASS
	2462	Ant1	2500.0	-44.52	2.0	0	52.74	PEAK	74	PASS
	2462	Ant1	2500.0	-54.40	2.0	0	42.86	AV	54	PASS
11N40 SISO	2422	Ant1	2310.0	-43.31	2.0	0	53.95	PEAK	74	PASS
	2422	Ant1	2310.0	-55.11	2.0	0	42.15	AV	54	PASS

	2422	Ant1	2390.0	-42.06	2.0	0	55.20	PEAK	74	PASS
	2422	Ant1	2390.0	-53.97	2.0	0	43.29	AV	54	PASS
	2452	Ant1	2483.5	-38.79	2.0	0	58.47	PEAK	74	PASS
	2452	Ant1	2483.5	-50.51	2.0	0	46.75	AV	54	PASS
	2452	Ant1	2500.0	-44.84	2.0	0	52.42	PEAK	74	PASS
	2452	Ant1	2500.0	-54.55	2.0	0	42.71	AV	54	PASS

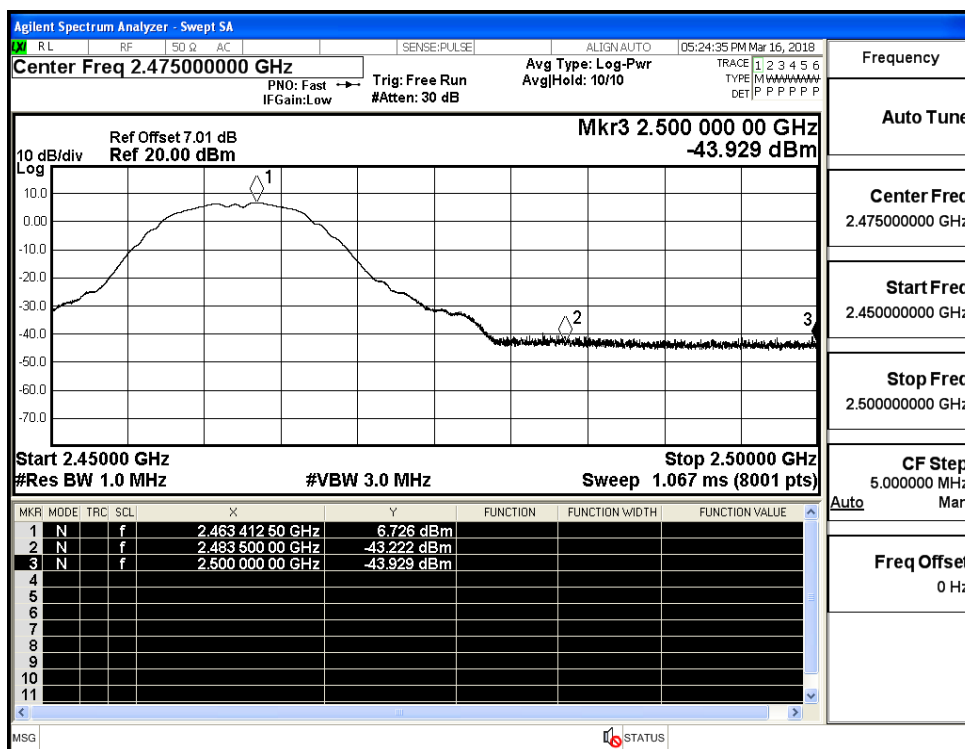
Restrict-band band-edge measurements_11B_2412_Ant1_PEAK



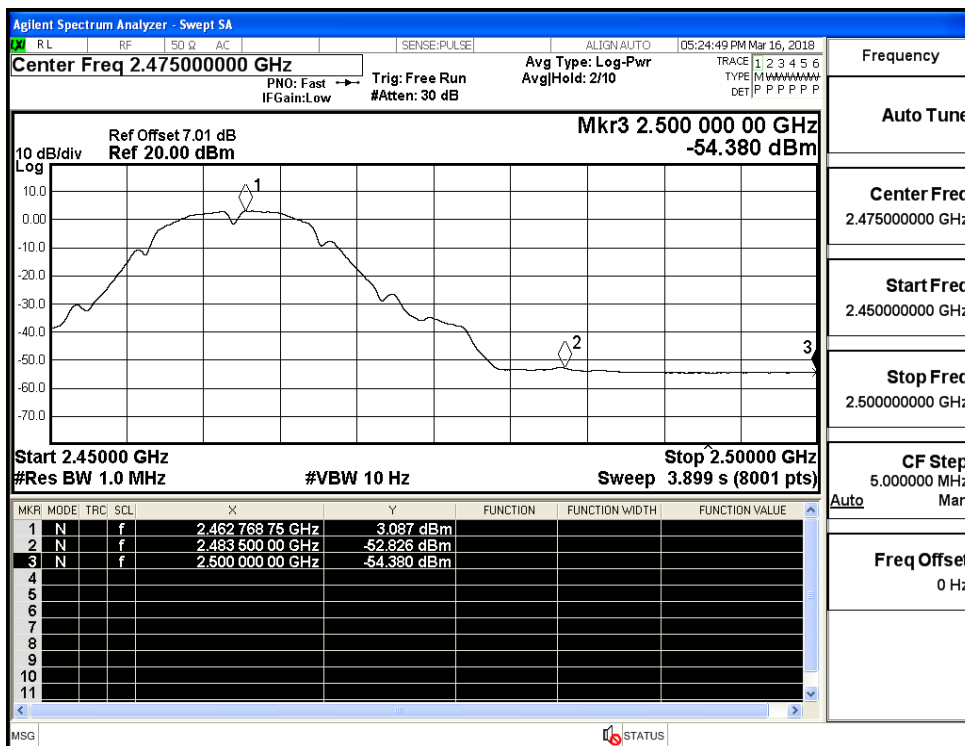
Restrict-band band-edge measurements_11B_2412_Ant1_AV



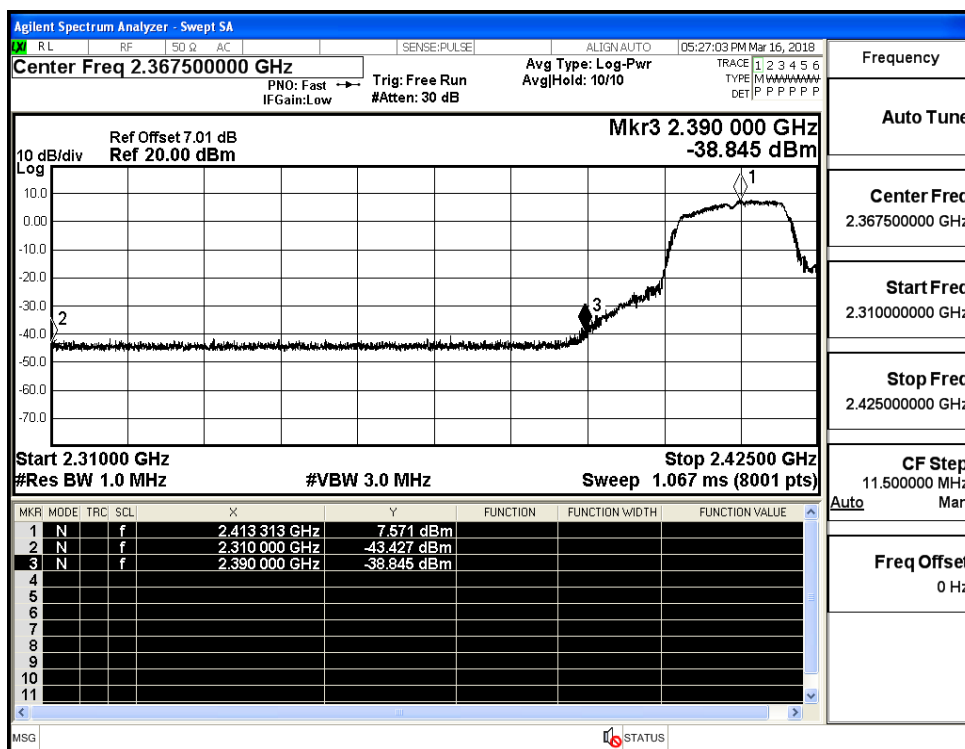
Restrict-band band-edge measurements_11B_2462_Ant1_PEAK



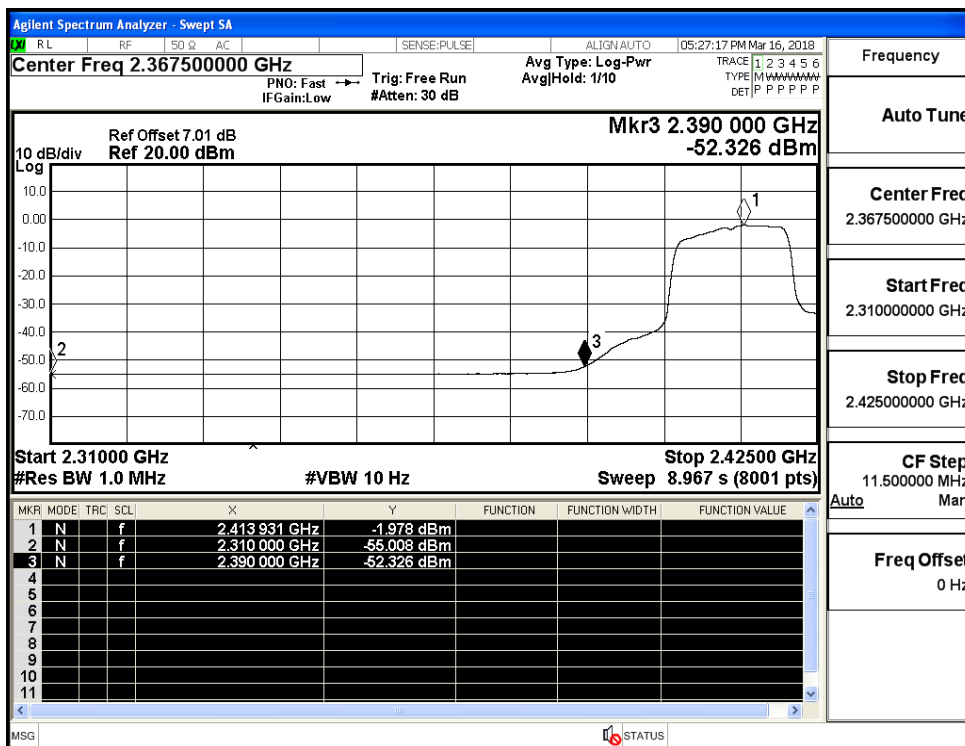
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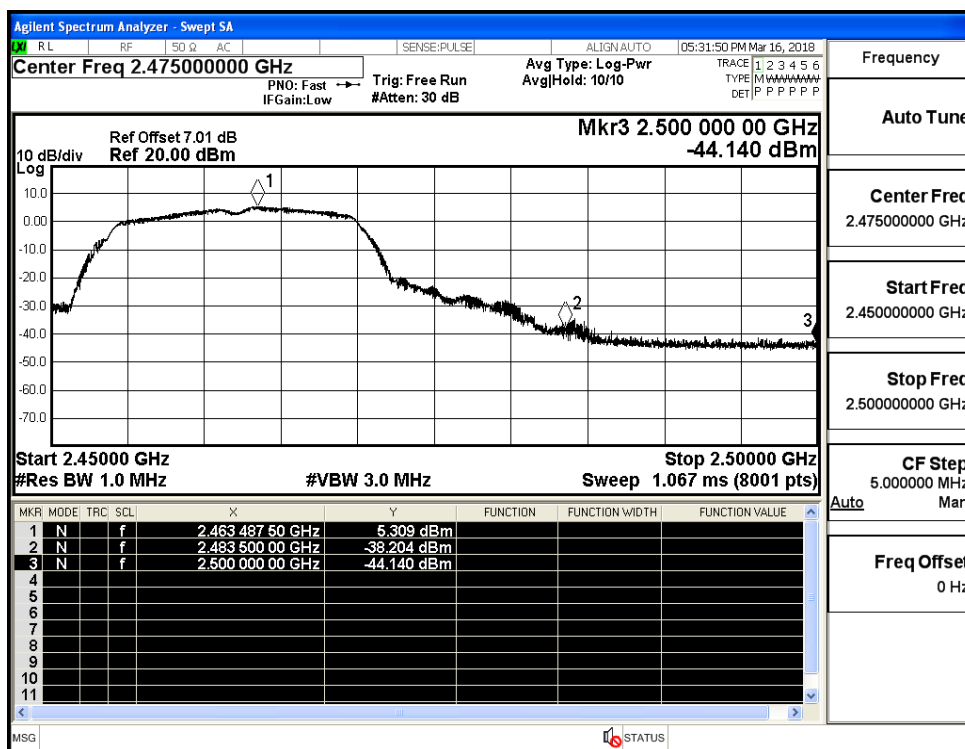
Restrict-band band-edge measurements_11G_2412_Ant1_PEAK



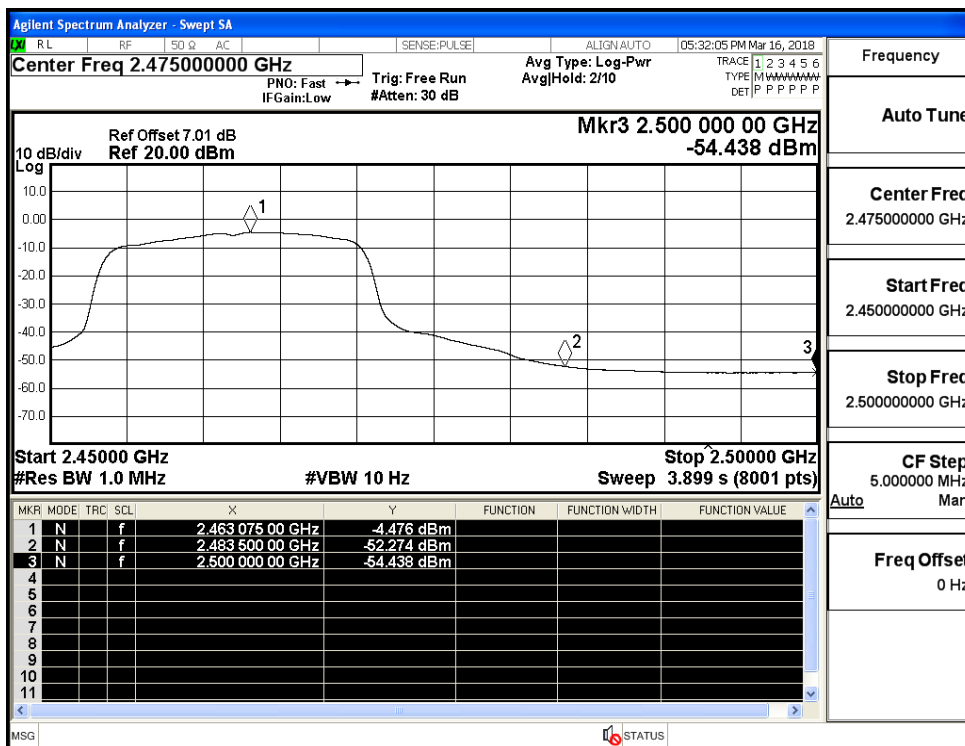
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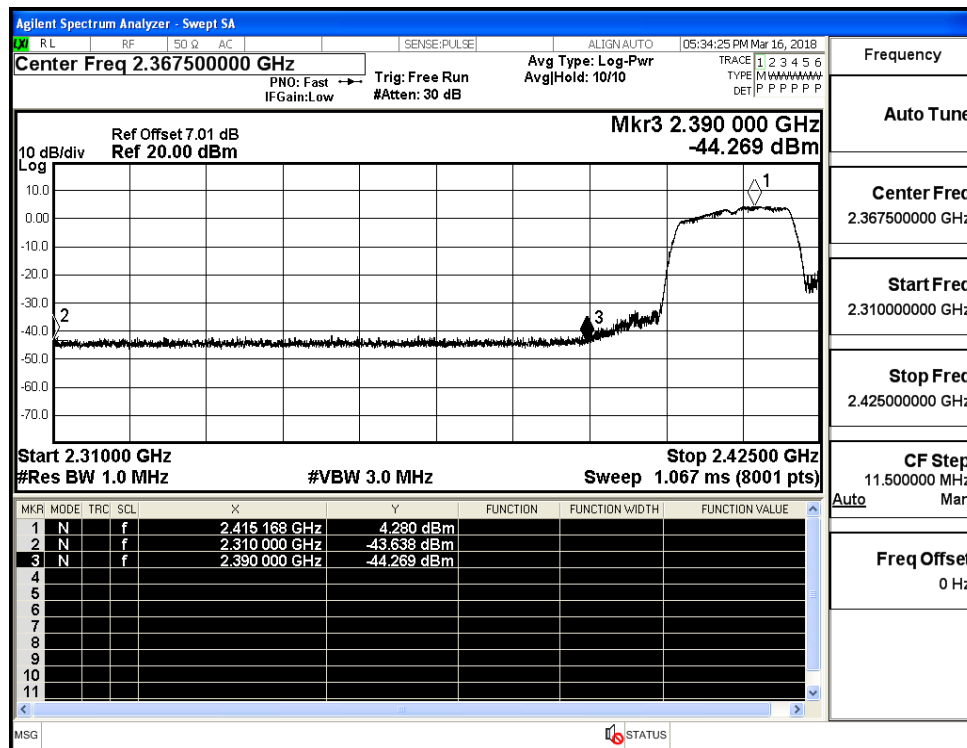
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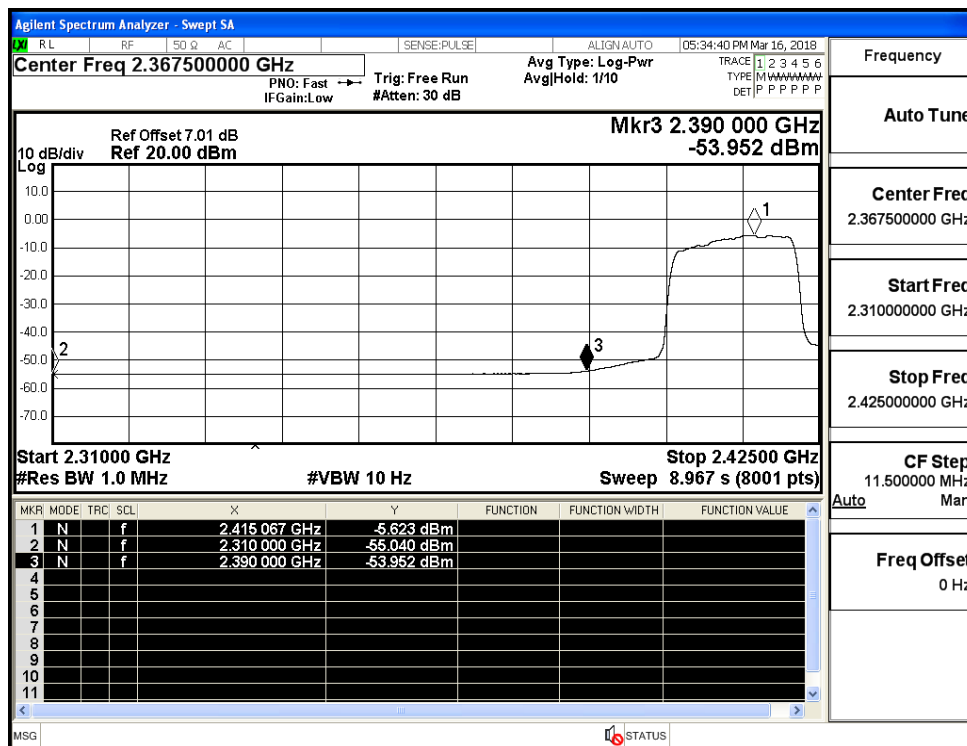
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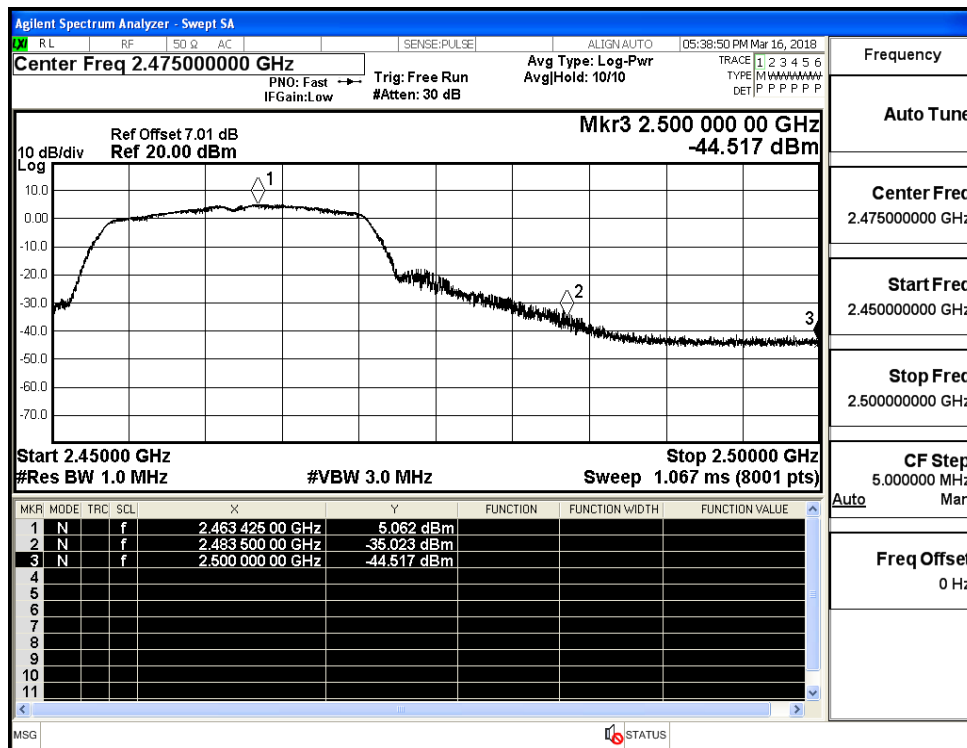
Restrict-band band-edge measurements_11N20SISO_2412_Ant1_PEAK



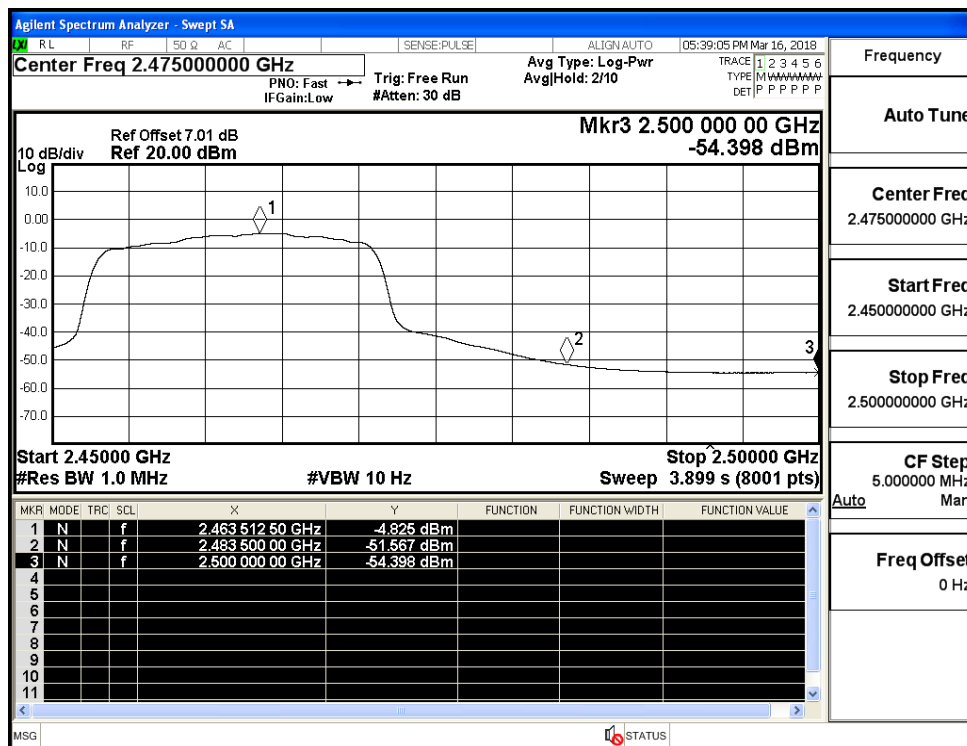
Restrict-band band-edge measurements_11N20SISO_2412_Ant1_AV



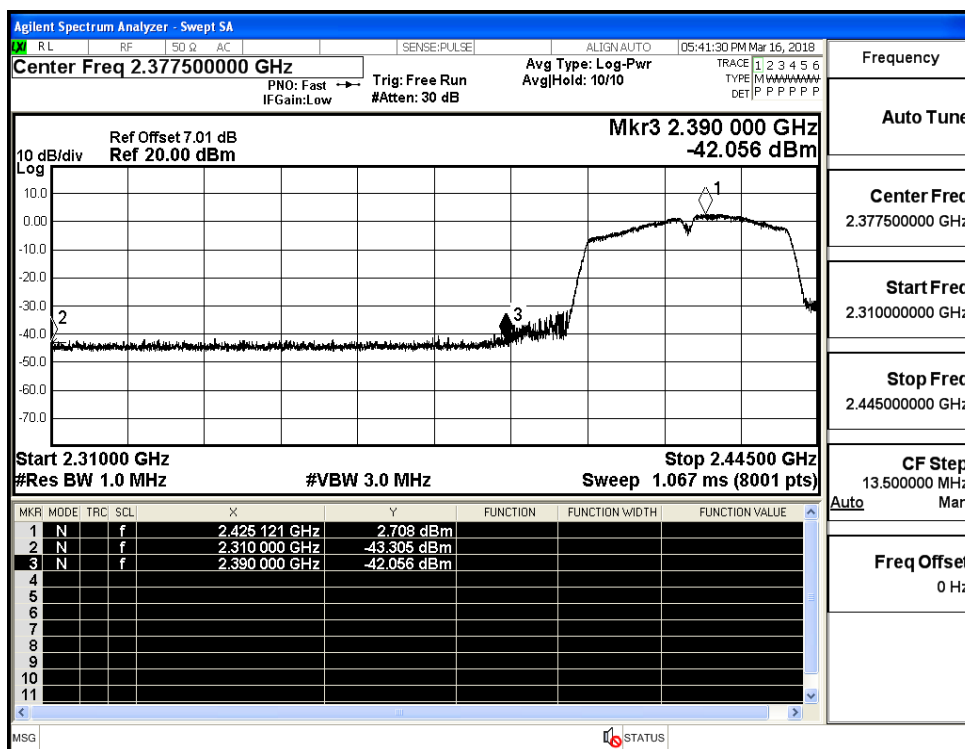
Restrict-band band-edge measurements_11N20SISO_2462_Ant1_PEAK



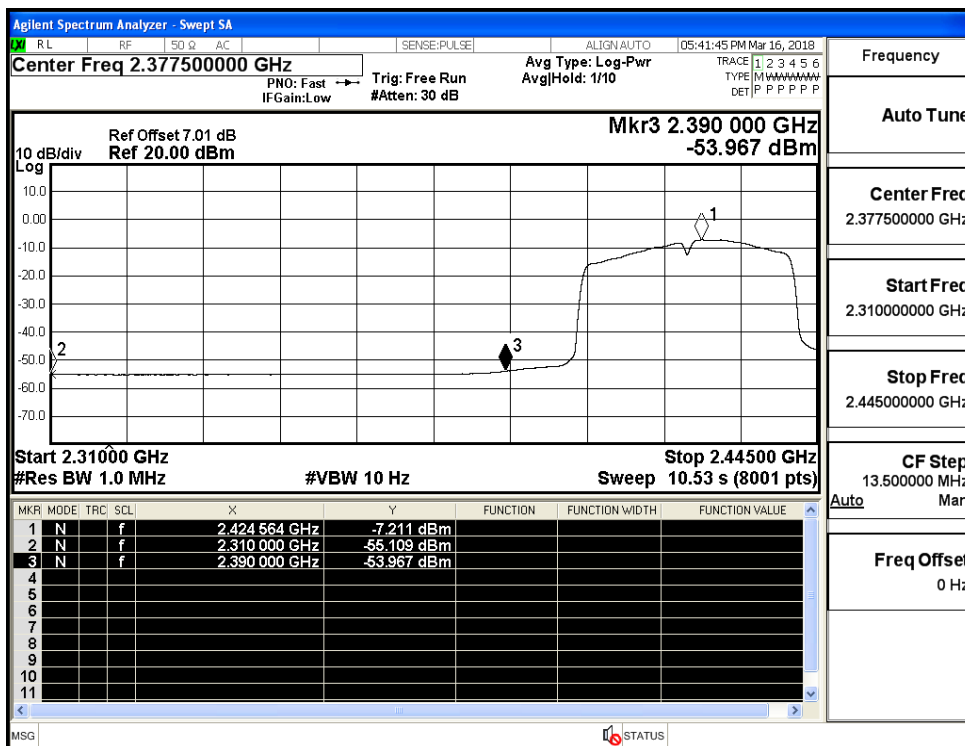
Restrict-band band-edge measurements_11N20SISO_2462_Ant1_AV



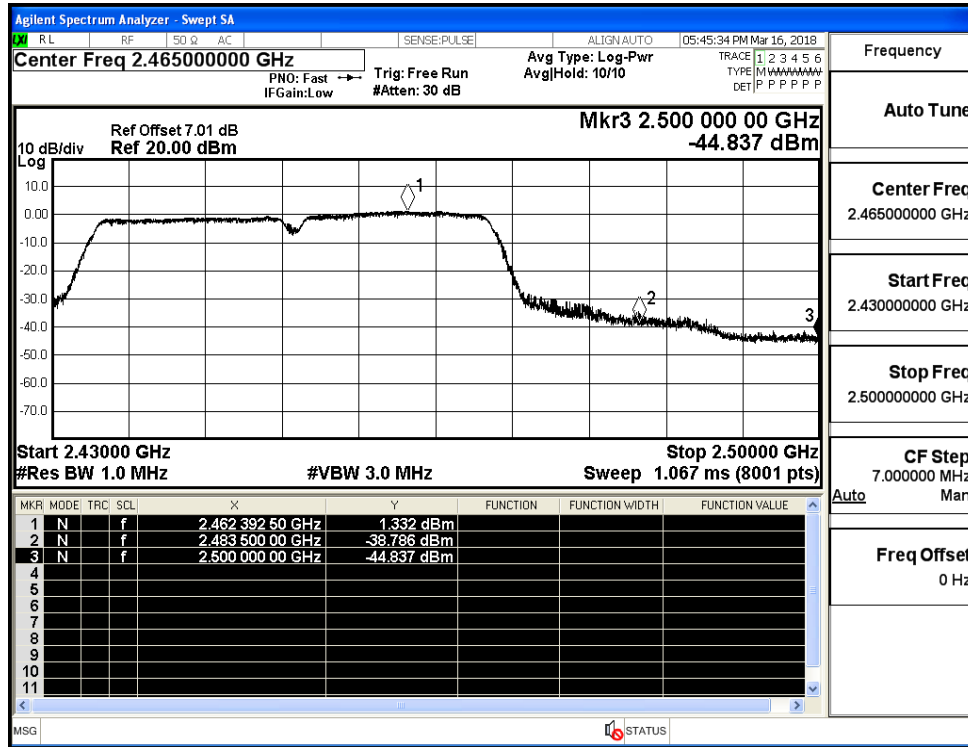
Restrict-band band-edge measurements_11N40SISO_2422_Ant1_PEAK



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

