

Appendix C
RF Test Data for 2.4G WIFI (Conducted Measurement)
Product Name: Communicator
Trade Mark: N/A
Test Model: Communicator 3

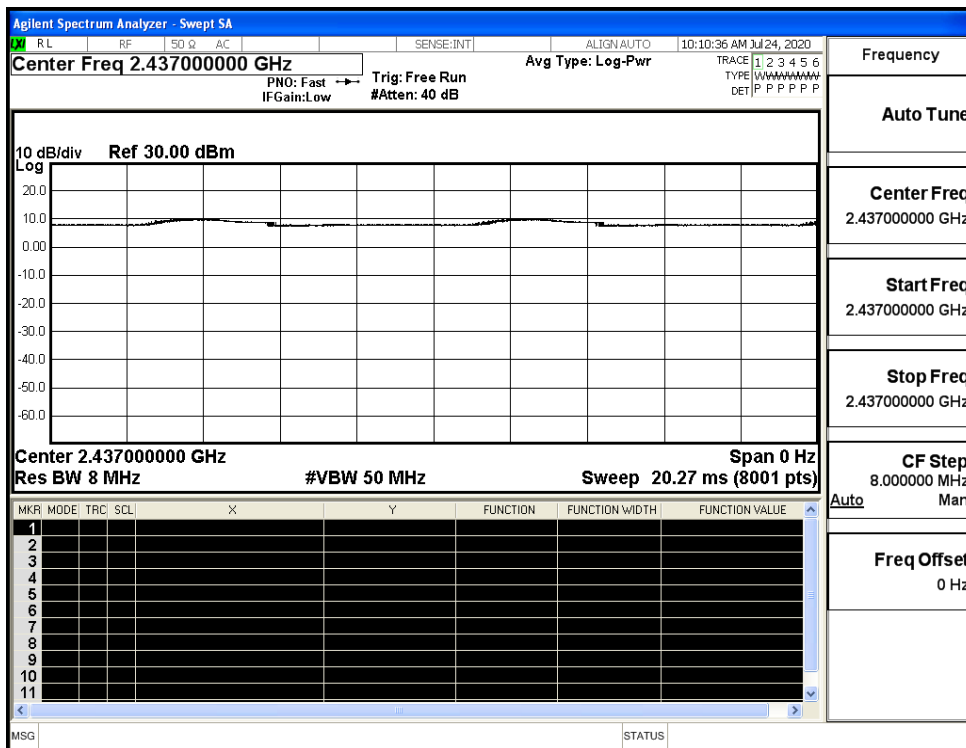
Environmental Conditions

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

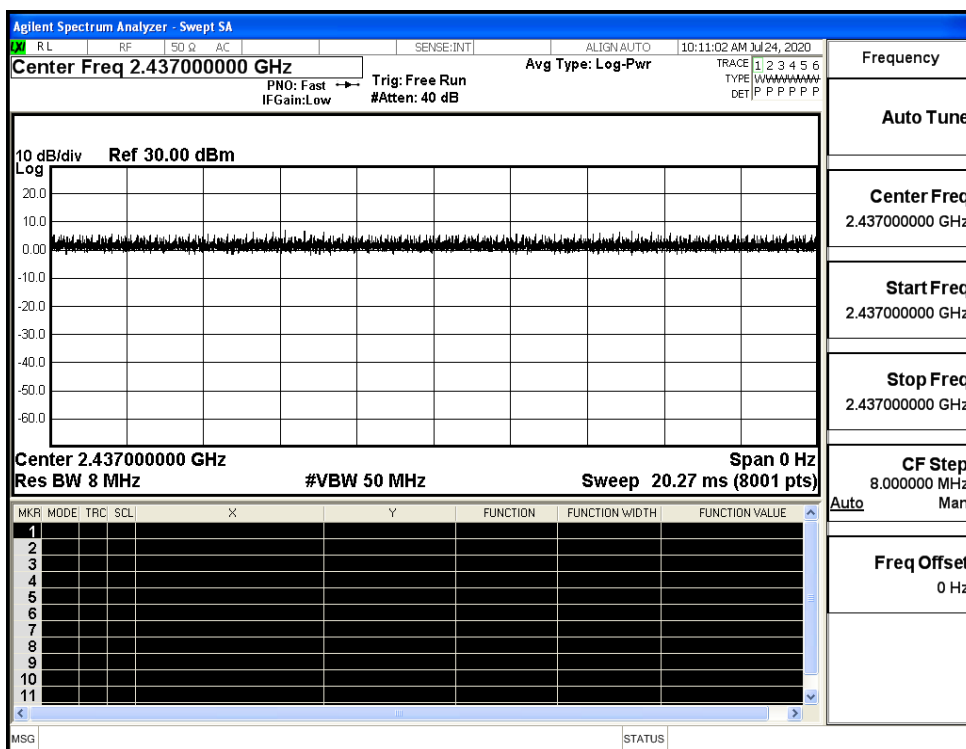
C.1 Duty Cycle

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

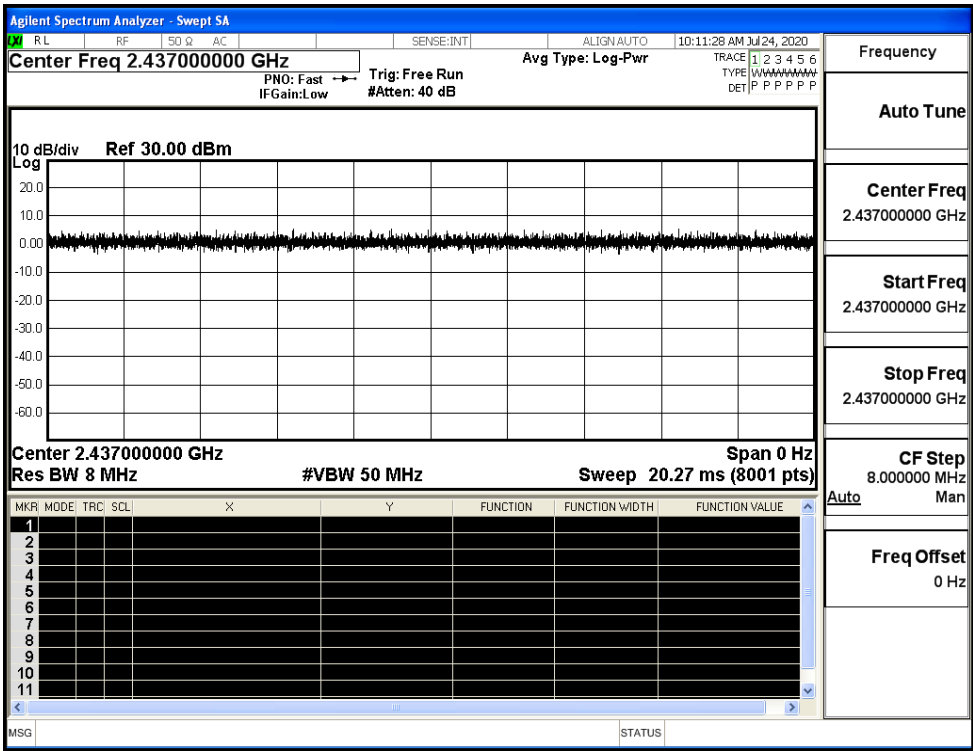
Duty Cycle_11B_2437_Ant1



Duty Cycle_11G_2437_Ant1



Duty Cycle_11N20SISO_2437_Ant1



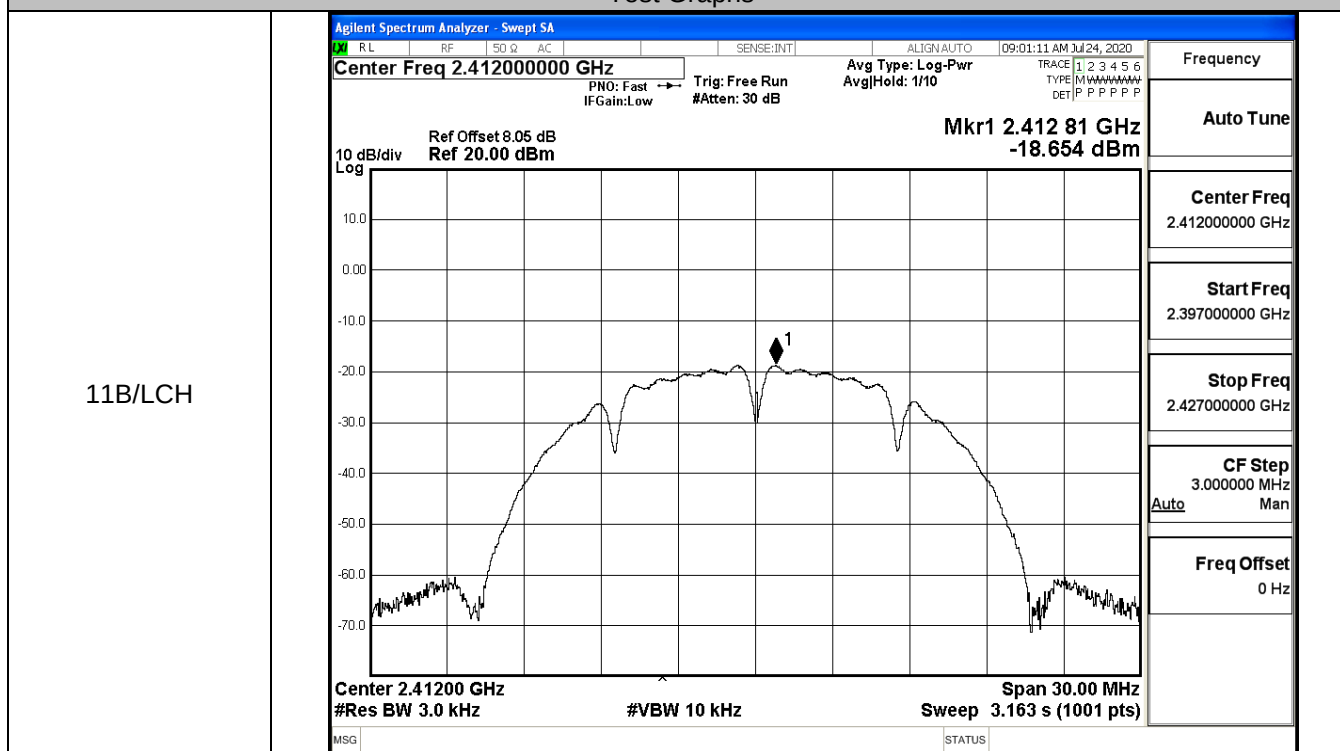
C.2 Maximum Conducted Output Power

Mode	Channel	Meas.Level [dBm]	Limit [dBm]	Verdict
11B	LCH	14.26	30	PASS
	MCH	14.39	30	PASS
	HCH	14.21	30	PASS
11G	LCH	13.28	30	PASS
	MCH	14.75	30	PASS
	HCH	14.83	30	PASS
11N20SISO	LCH	13.53	30	PASS
	MCH	14.27	30	PASS
	HCH	14.55	30	PASS

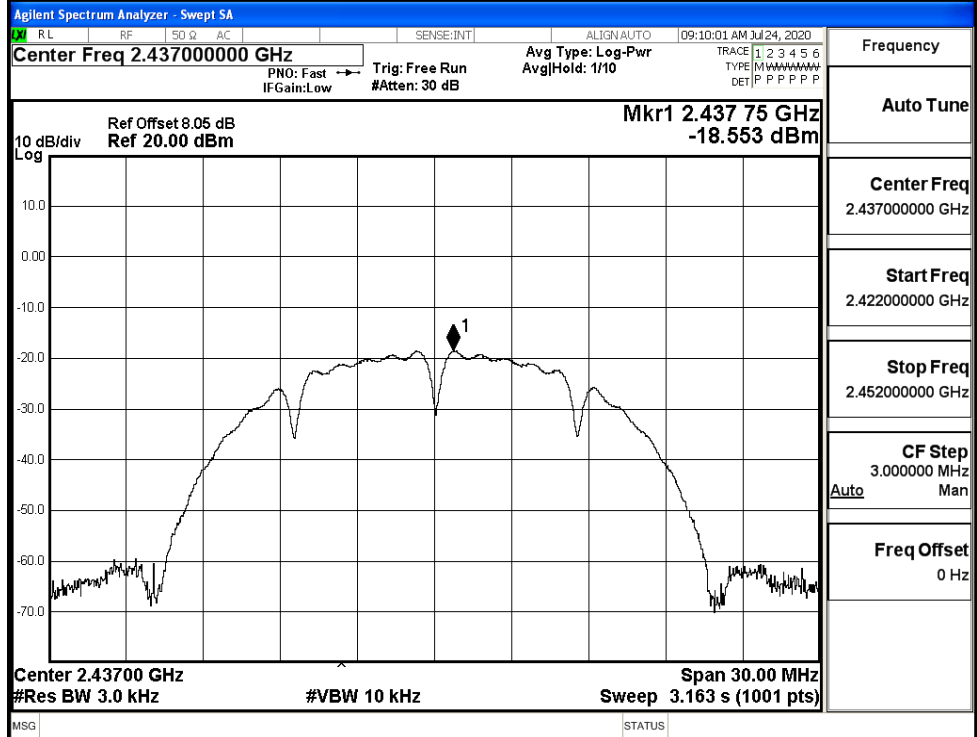
C.3 Maximum Power Spectral Density

Mode	Channel	Meas.Level [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
11B	LCH	-18.654	8	PASS
	MCH	-18.553	8	PASS
	HCH	-18.685	8	PASS
11G	LCH	-22.515	8	PASS
	MCH	-21.649	8	PASS
	HCH	-21.057	8	PASS
11N20SISO	LCH	-21.799	8	PASS
	MCH	-21.751	8	PASS
	HCH	-21.543	8	PASS

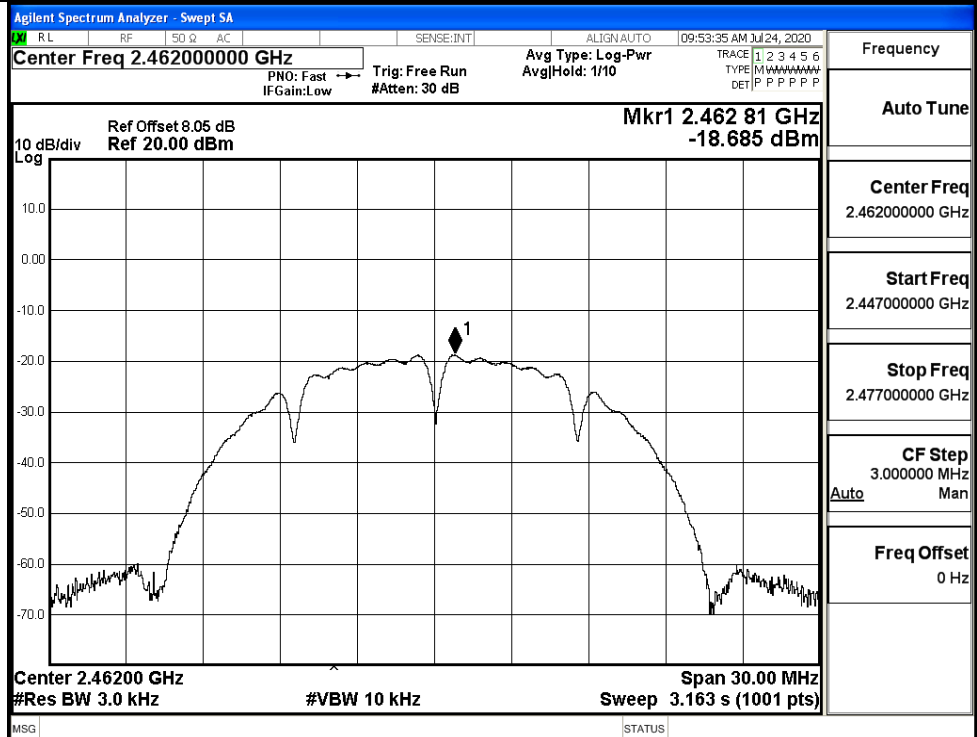
Test Graphs



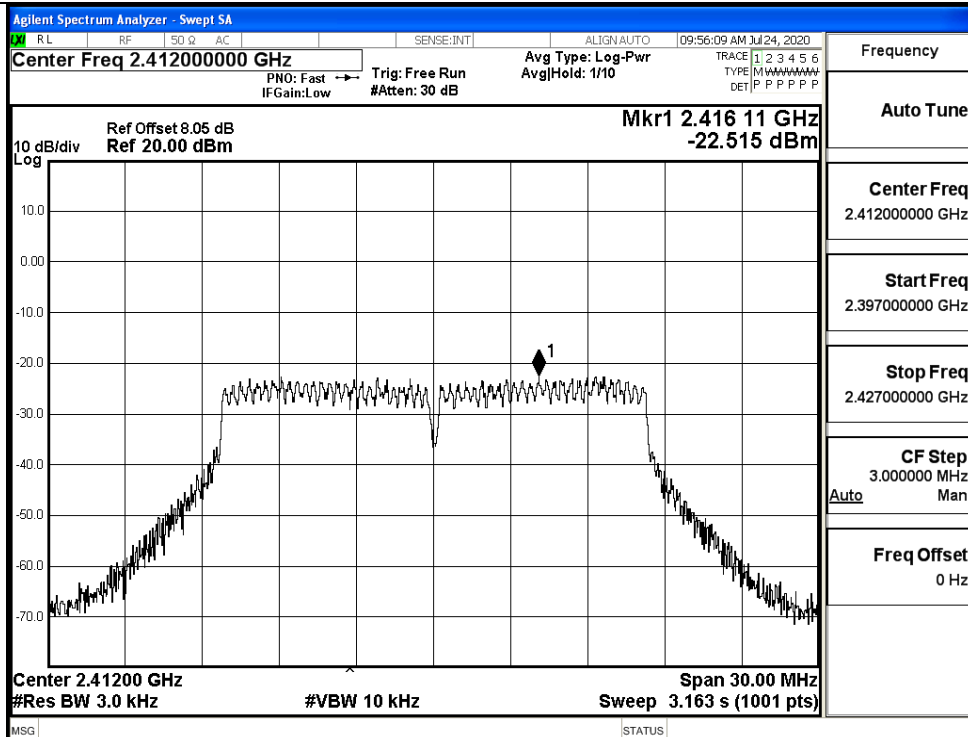
11B/MCH



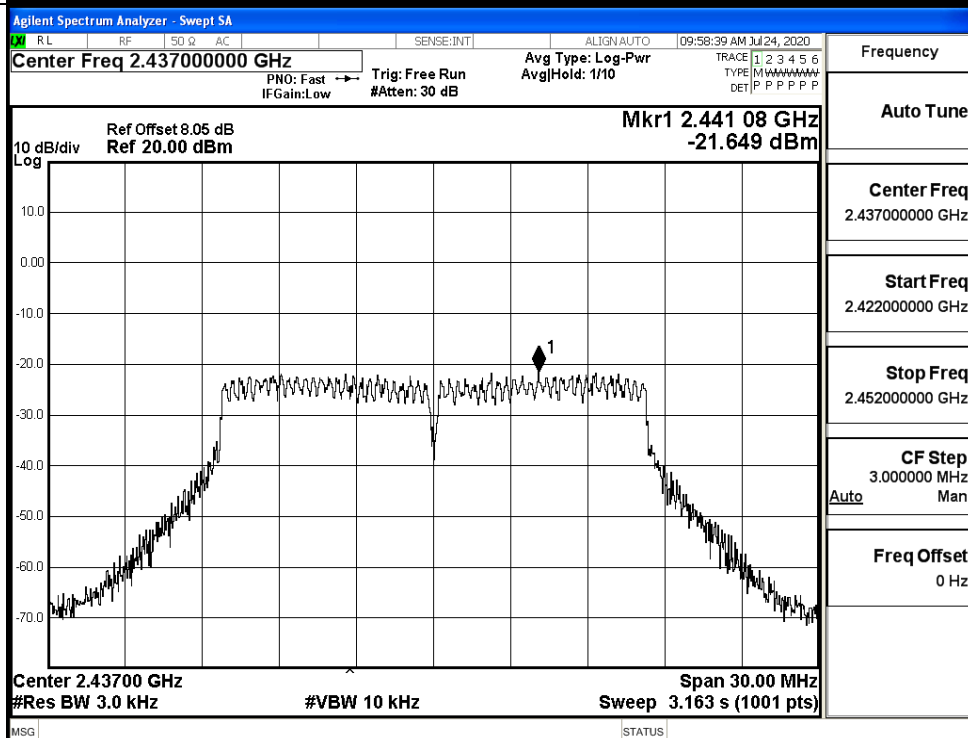
11B/HCH



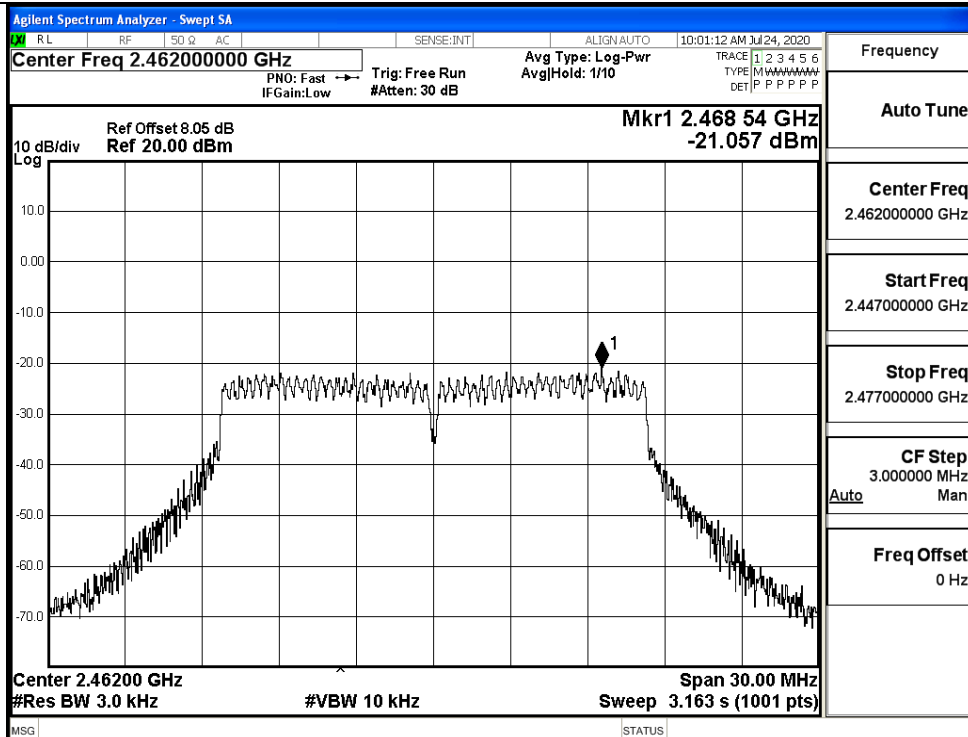
11G/LCH



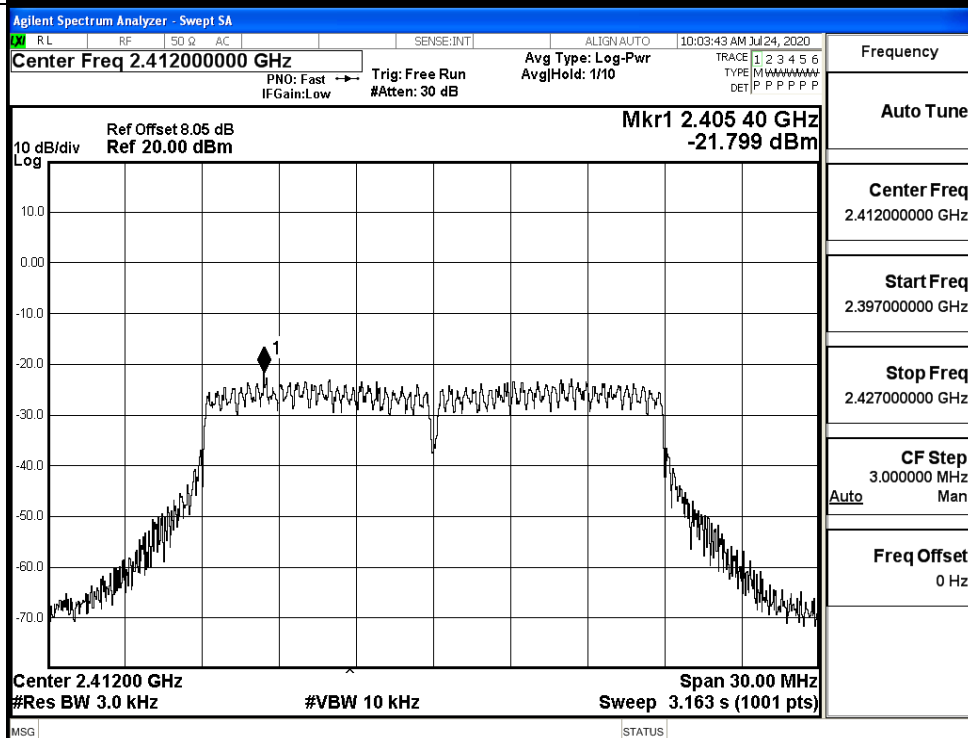
11G/MCH

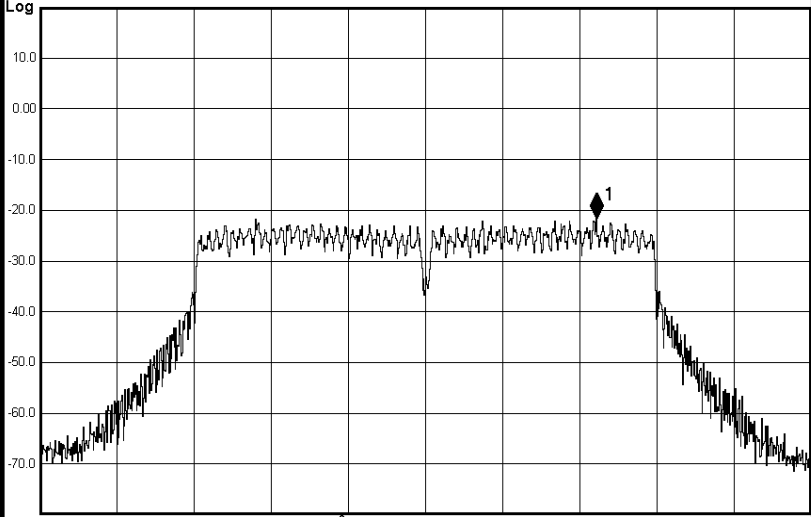
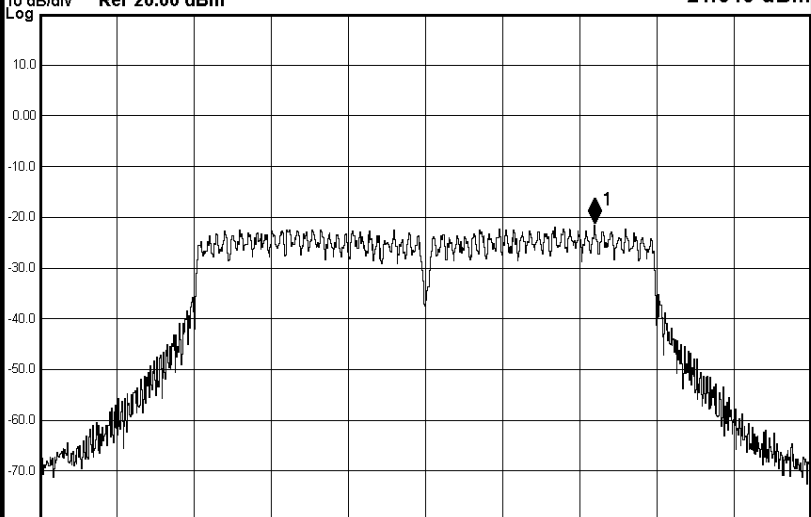


11G/HCH



11N20SISO/LCH

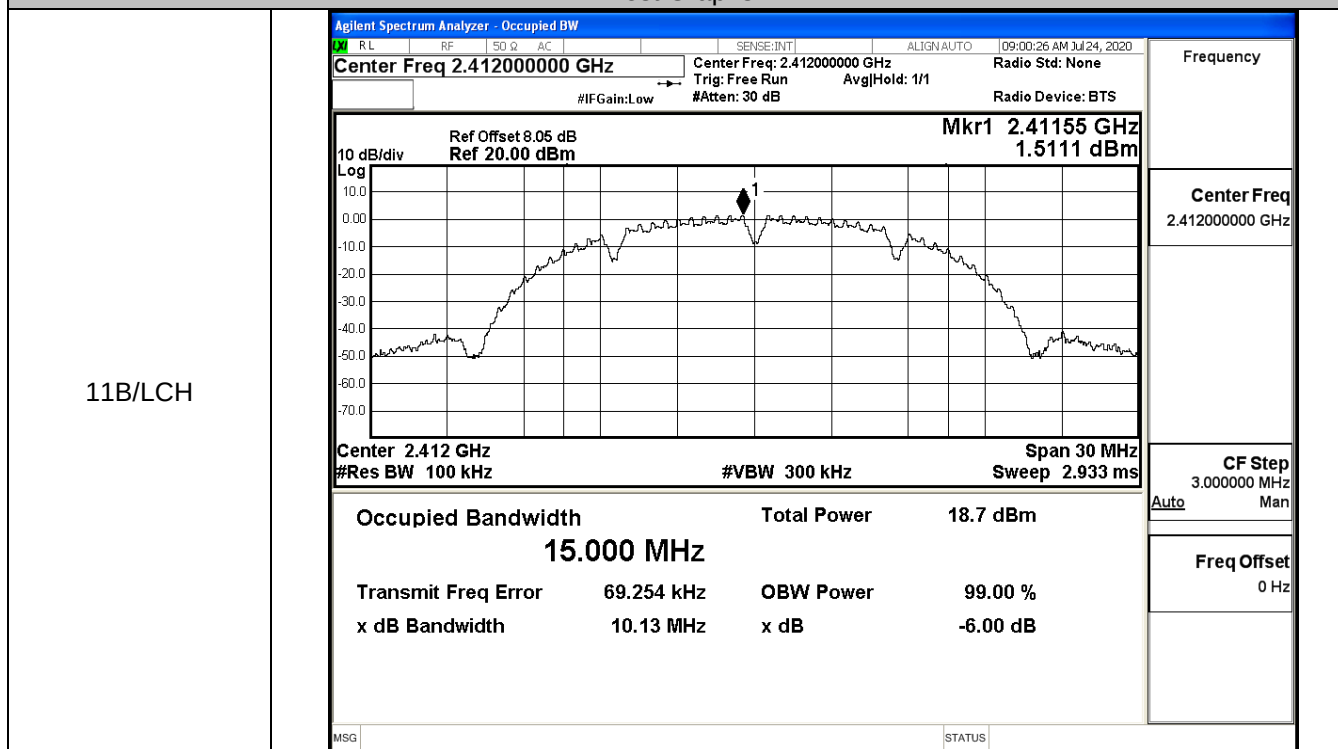


11N20SISO/MCH	Agilent Spectrum Analyzer - Swept SA RL RF SO Q AC SENSE:INT ALIGN: AUTO 10:06:24 AM Jul 24, 2020 Center Freq 2.437000000 GHz PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB Avg Type: Log-Pwr AvgHold: 1/10 Ref Offset 8.05 dB Ref 20.00 dBm Mkr1 2.443 66 GHz -21.751 dBm 10 dB/div Log  Center 2.43700 GHz Span 30.00 MHz #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 SO Q AC SENSE:INT ALIGN: AUTO 10:08:55 AM Jul 24, 2020 Center Freq 2.462000000 GHz PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB Avg Type: Log-Pwr AvgHold: 1/10 Ref Offset 8.05 dB Ref 20.00 dBm Mkr1 2.468 57 GHz -21.543 dBm 10 dB/div Log  Center 2.46200 GHz Span 30.00 MHz #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

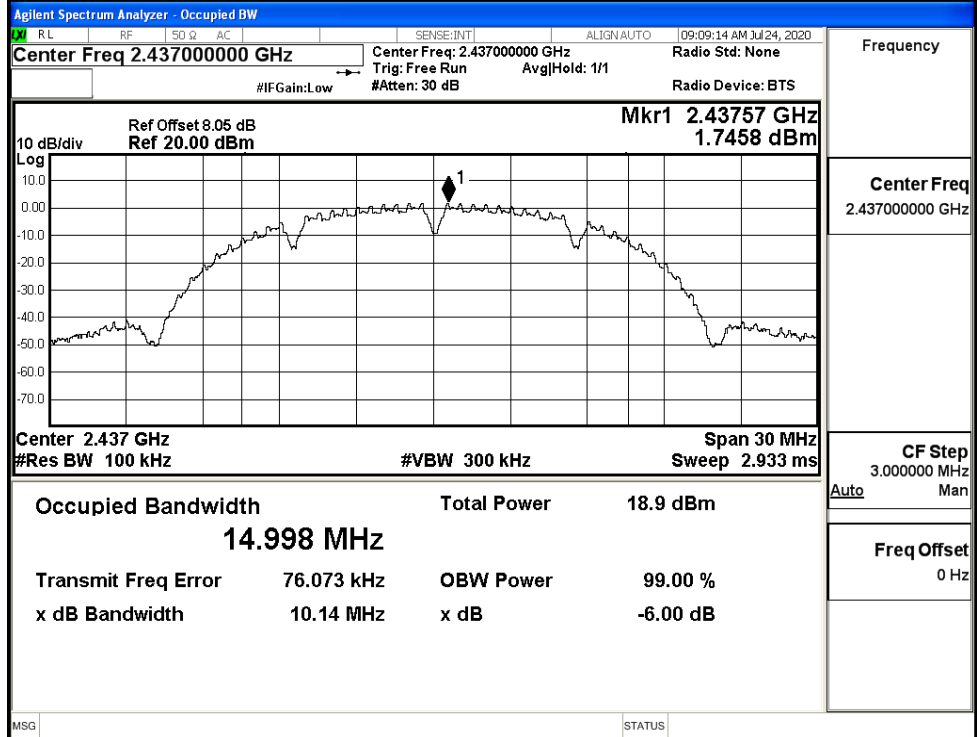
C.4 6dB Bandwidth

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
11B	LCH	10.13	≥ 0.5	PASS
	MCH	10.14	≥ 0.5	PASS
	HCH	10.13	≥ 0.5	PASS
11G	LCH	16.58	≥ 0.5	PASS
	MCH	16.57	≥ 0.5	PASS
	HCH	16.57	≥ 0.5	PASS
11N20SISO	LCH	17.73	≥ 0.5	PASS
	MCH	17.73	≥ 0.5	PASS
	HCH	17.73	≥ 0.5	PASS

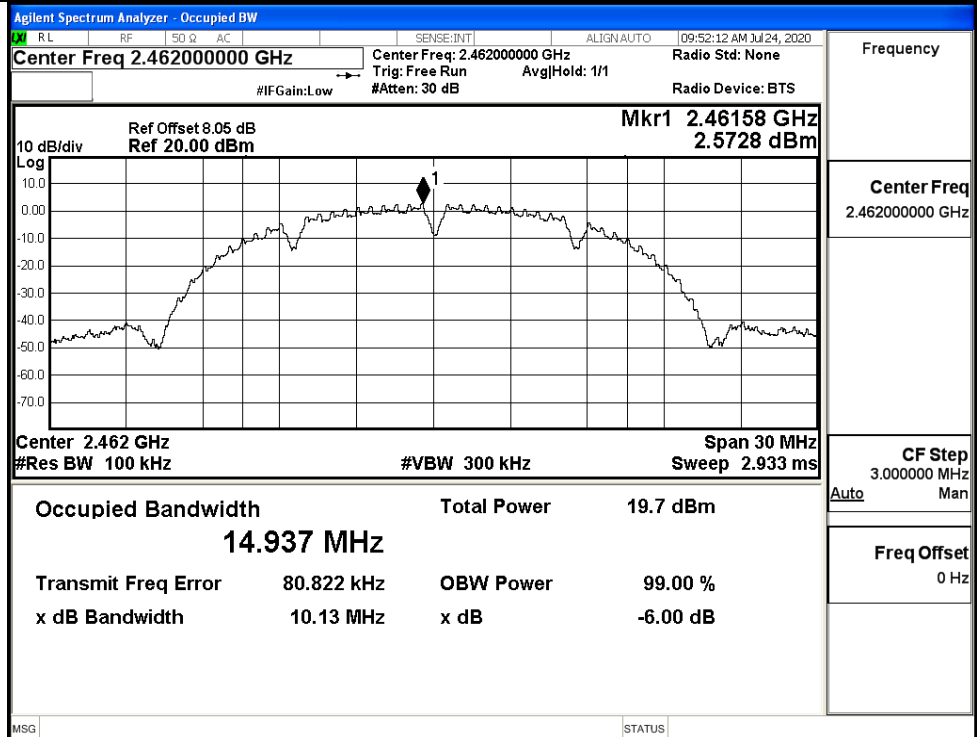
Test Graphs



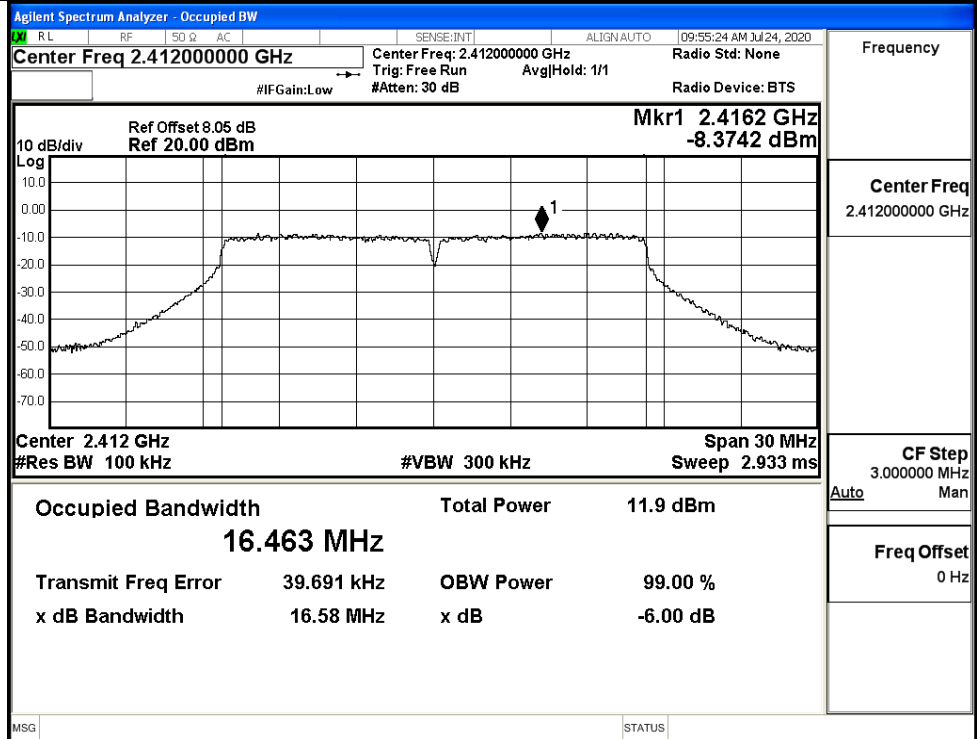
11B/MCH



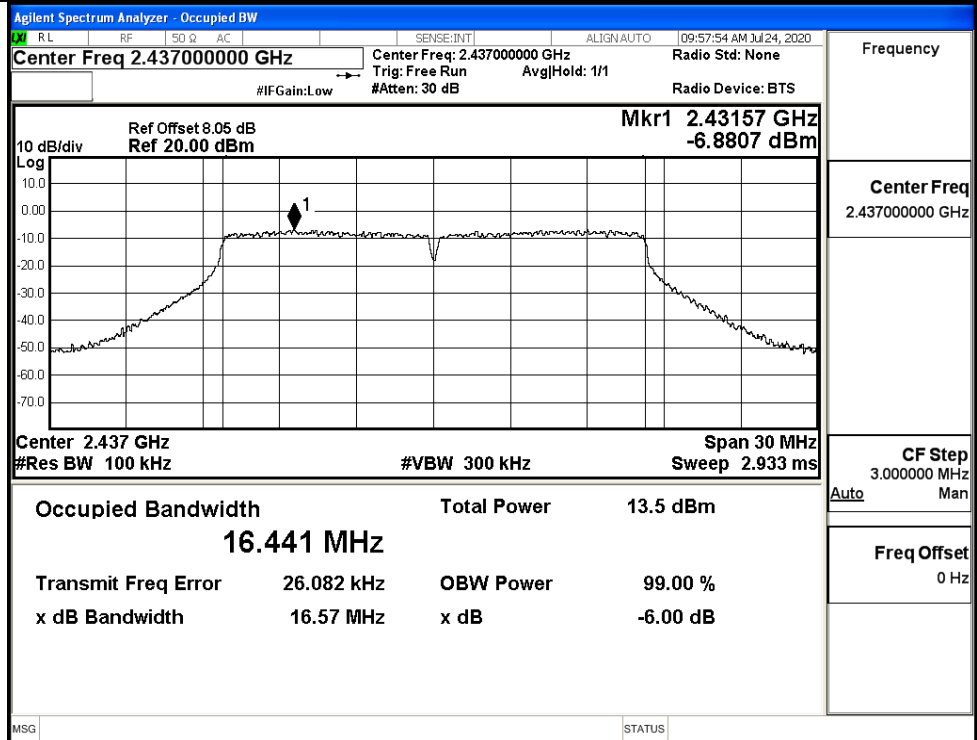
11B/HCH



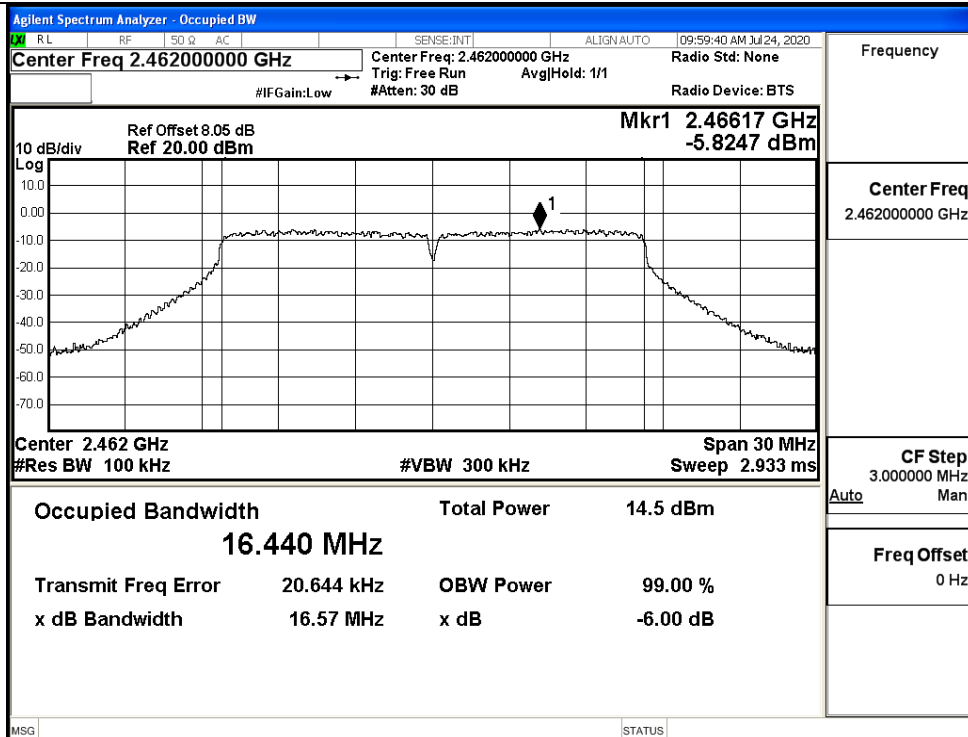
11G/LCH



11G/MCH



11G/HCH



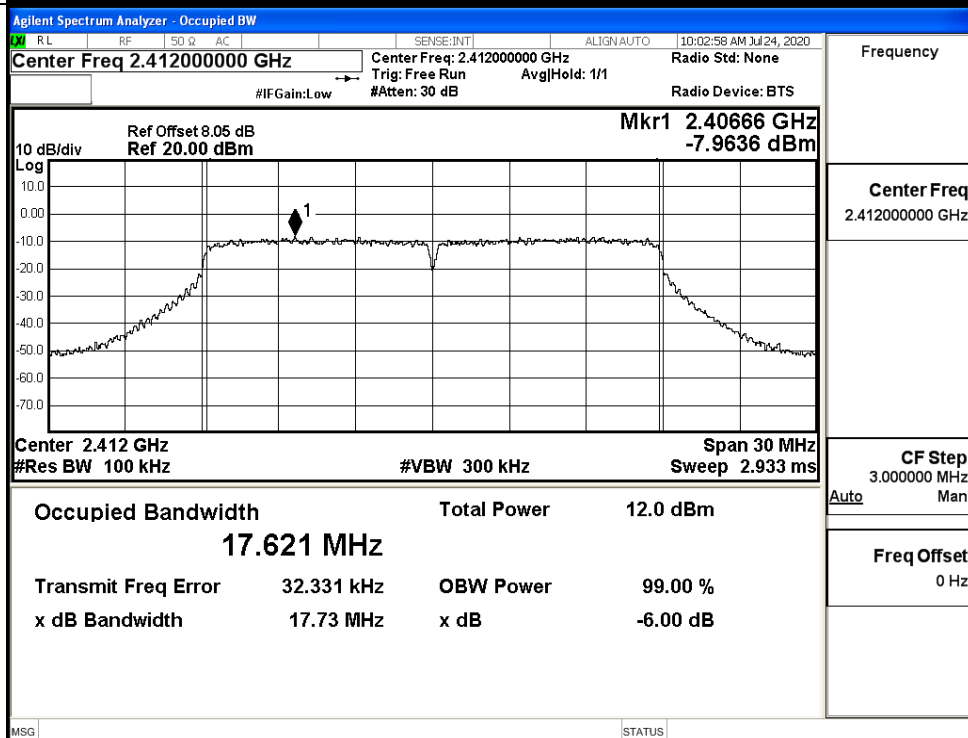
Frequency

Center Freq
2.46200000 GHz

CF Step
3.000000 MHz
Auto Man

Freq Offset
0 Hz

11N20SISO/LCH



Frequency

Center Freq
2.41200000 GHz

CF Step
3.000000 MHz
Auto Man

Freq Offset
0 Hz

11N20SISO/MCH

Agilent Spectrum Analyzer - Occupied BW

Center Freq 2.437000000 GHz

Ref Offset 8.05 dB
Ref 20.00 dBm

10 dB/div
Log

Mkr1 2.43163 GHz
-7.1123 dBm

Center 2.437 GHz
#Res BW 100 kHz

Span 30 MHz
Sweep 2.933 ms

Occupied Bandwidth
17.626 MHz

Total Power
12.8 dBm

Transmit Freq Error
30.366 kHz

OBW Power
99.00 %

x dB Bandwidth
17.73 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

Center Freq 2.462000000 GHz

Ref Offset 8.05 dB
Ref 20.00 dBm

10 dB/div
Log

Mkr1 2.45666 GHz
-6.4345 dBm

Center 2.462 GHz
#Res BW 100 kHz

Span 30 MHz
Sweep 2.933 ms

Occupied Bandwidth
17.616 MHz

Total Power
13.6 dBm

Transmit Freq Error
26.547 kHz

OBW Power
99.00 %

x dB Bandwidth
17.73 MHz

x dB
-6.00 dB

MSG

STATUS

Frequency
Center Freq
2.462000000 GHz

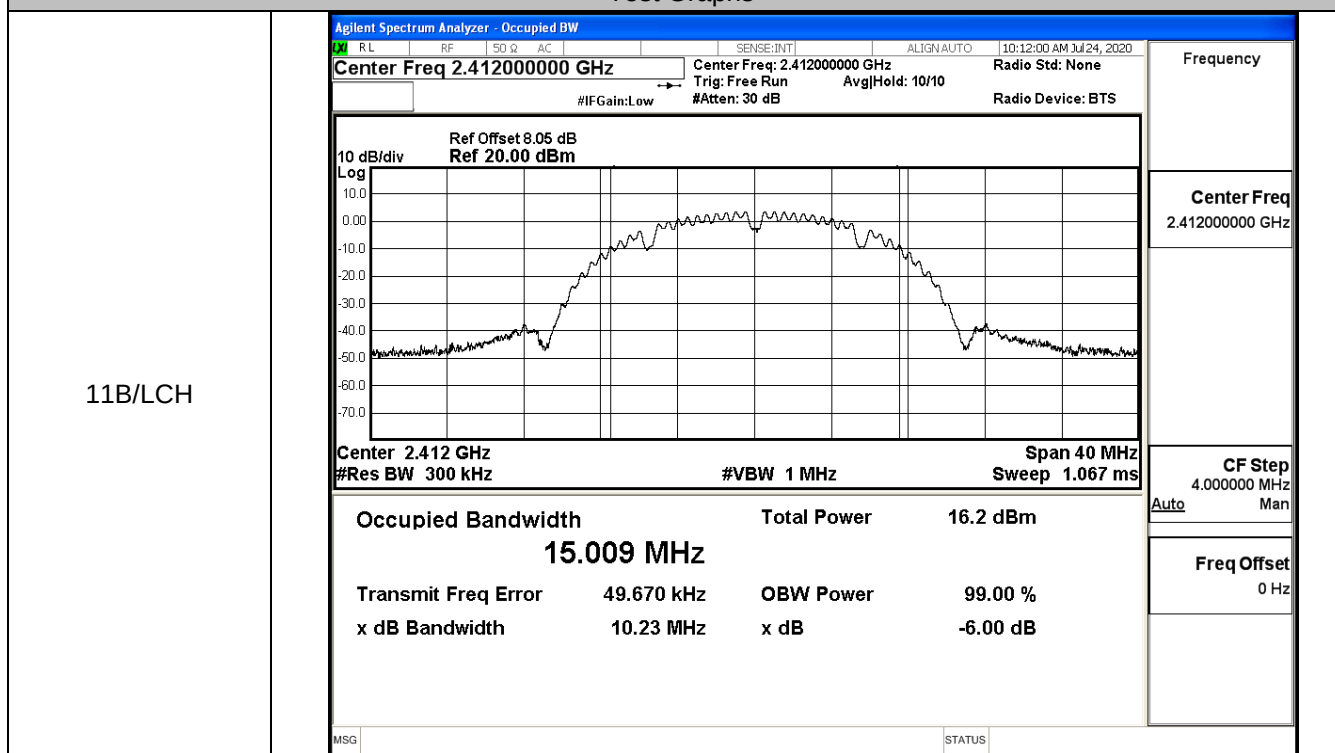
CF Step
3.000000 MHz
Auto Man

Freq Offset
0 Hz

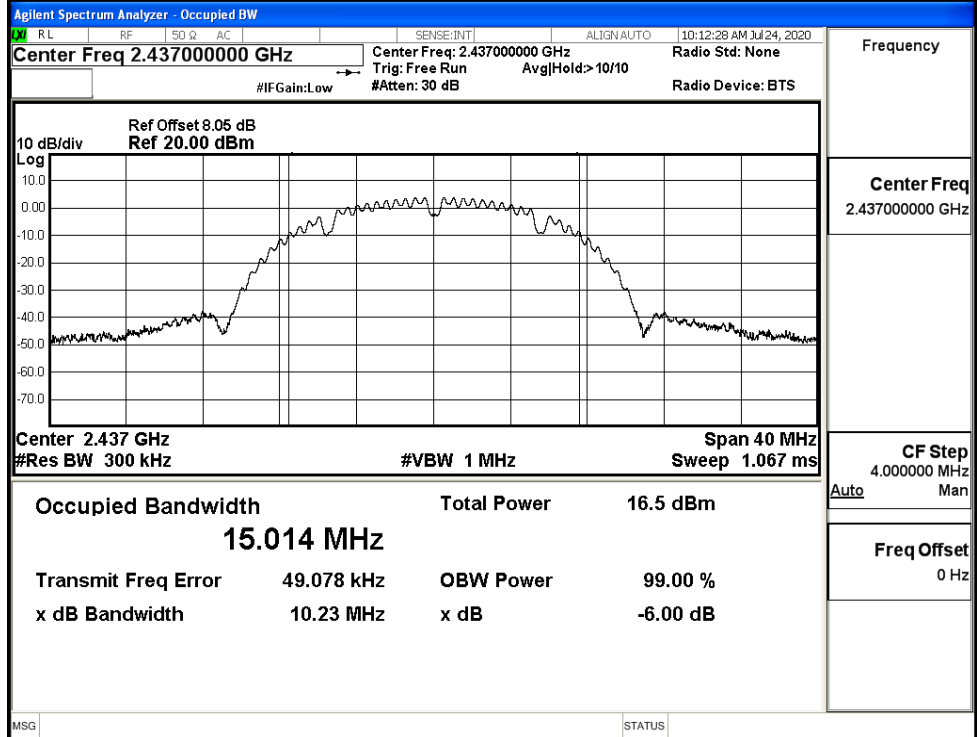
C.5 Occupied Bandwidth

Mode	Channel	Occupied Bandwidth [MHz]	Limit [MHz]	Verdict
11B	LCH	15.009	≥ 0.5	PASS
	MCH	15.014	≥ 0.5	PASS
	HCH	14.962	≥ 0.5	PASS
11G	LCH	16.706	≥ 0.5	PASS
	MCH	16.720	≥ 0.5	PASS
	HCH	16.696	≥ 0.5	PASS
11N20SISO	LCH	17.768	≥ 0.5	PASS
	MCH	17.803	≥ 0.5	PASS
	HCH	17.616	≥ 0.5	PASS

Test Graphs



11B/MCH



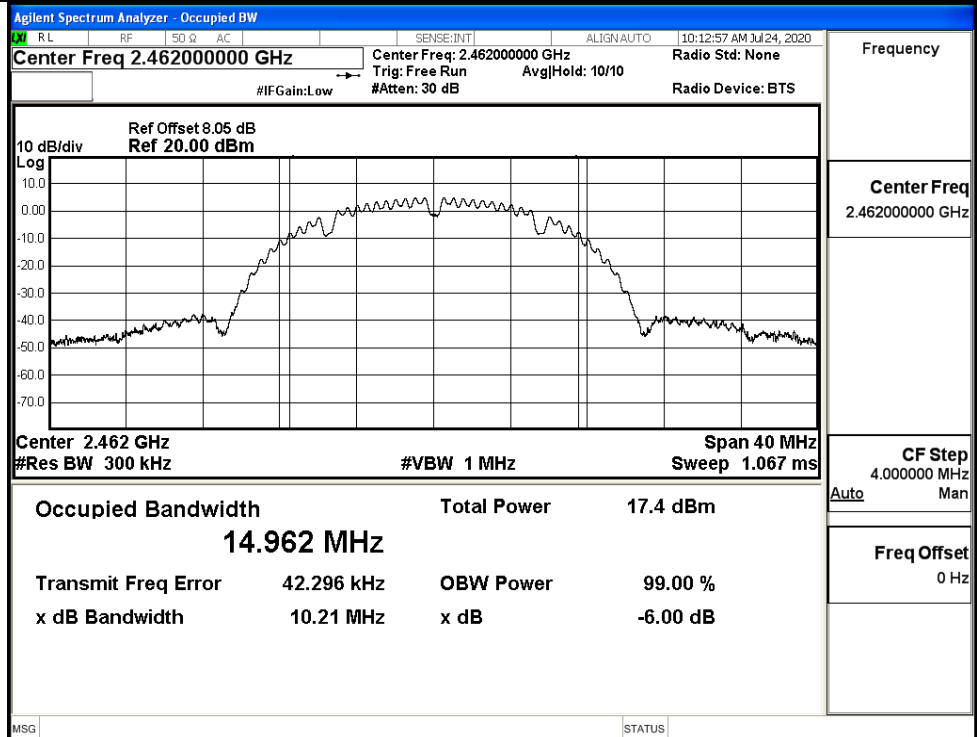
Frequency

Center Freq
2.437000000 GHz

CF Step
4.000000 MHz
Auto Man

Freq Offset
0 Hz

11B/HCH



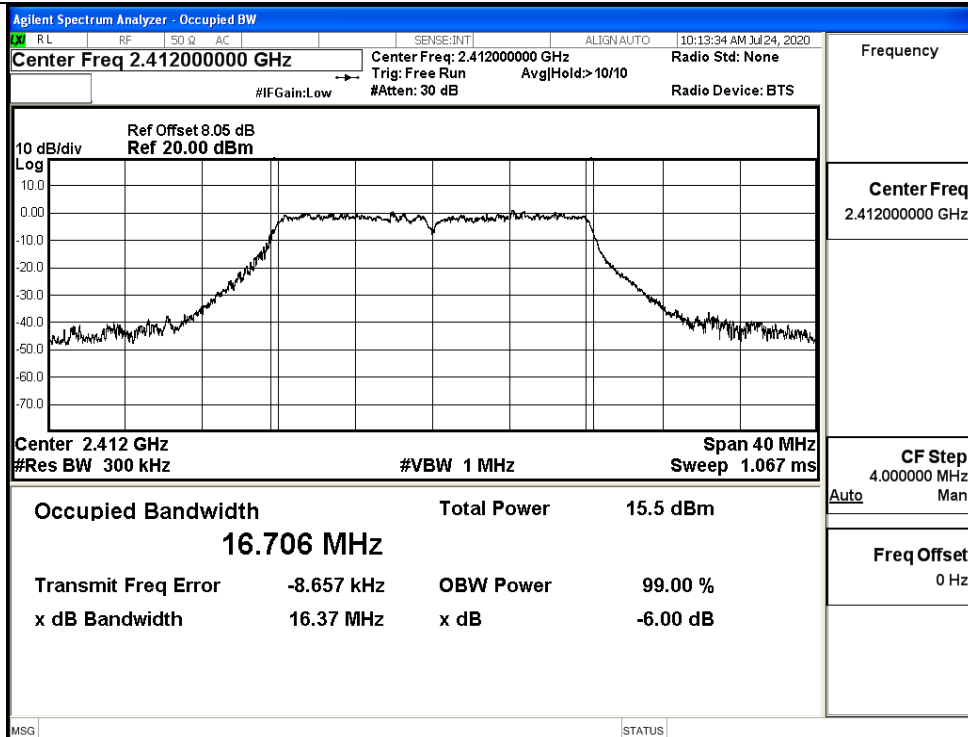
Frequency

Center Freq
2.462000000 GHz

CF Step
4.000000 MHz
Auto Man

Freq Offset
0 Hz

11G/LCH



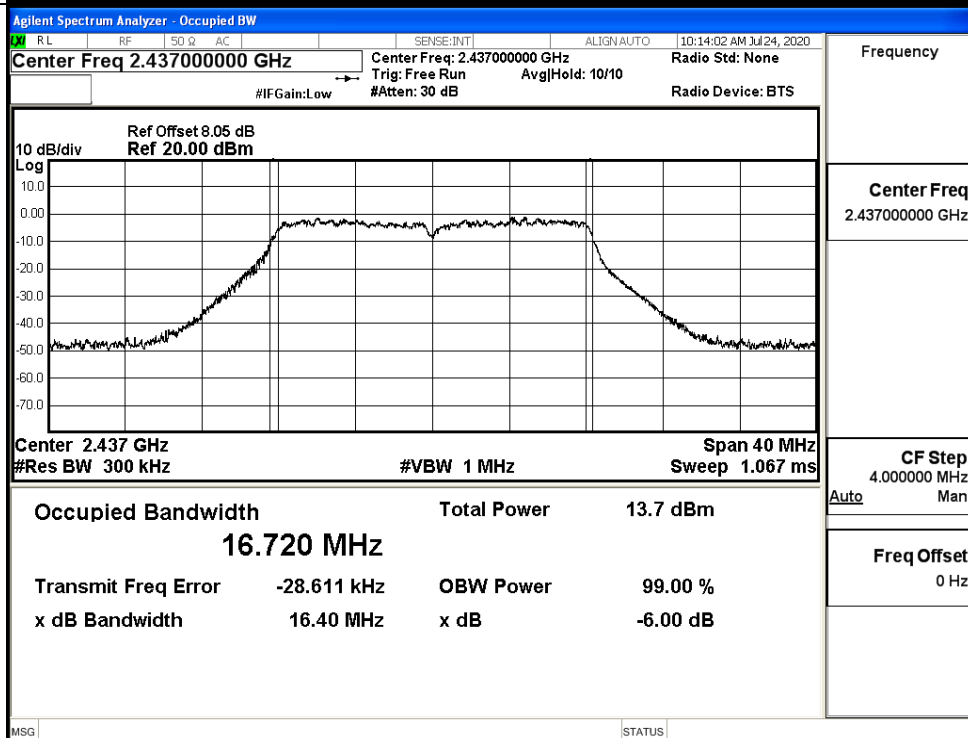
Frequency

Center Freq
2.41200000 GHz

CF Step
4.000000 MHz
Auto Man

Freq Offset
0 Hz

11G/MCH



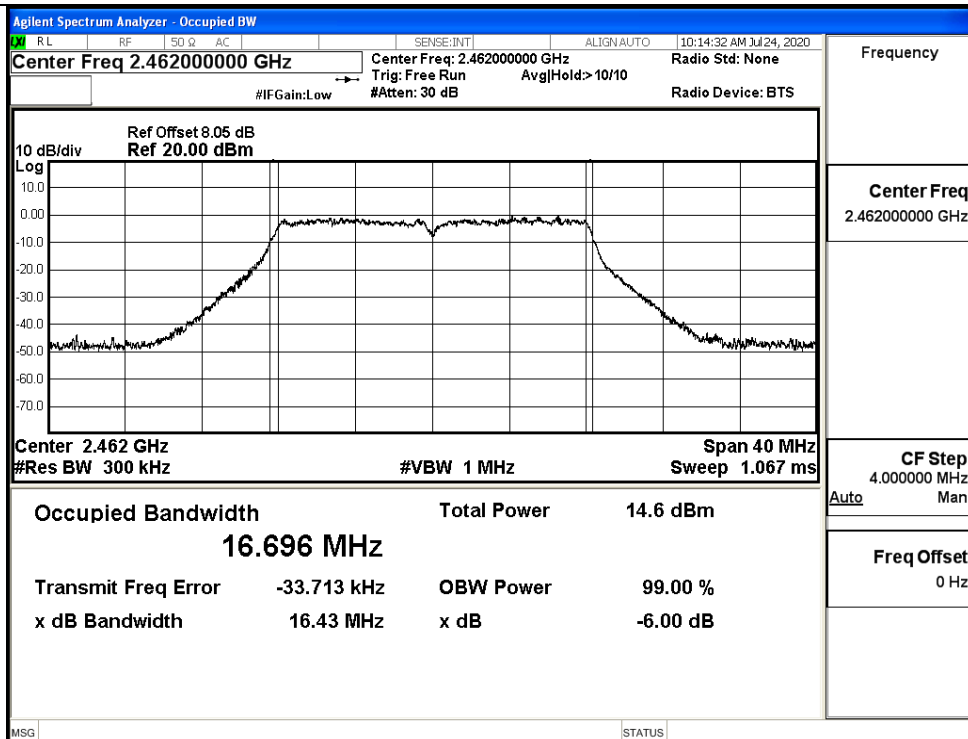
Frequency

Center Freq
2.43700000 GHz

CF Step
4.000000 MHz
Auto Man

Freq Offset
0 Hz

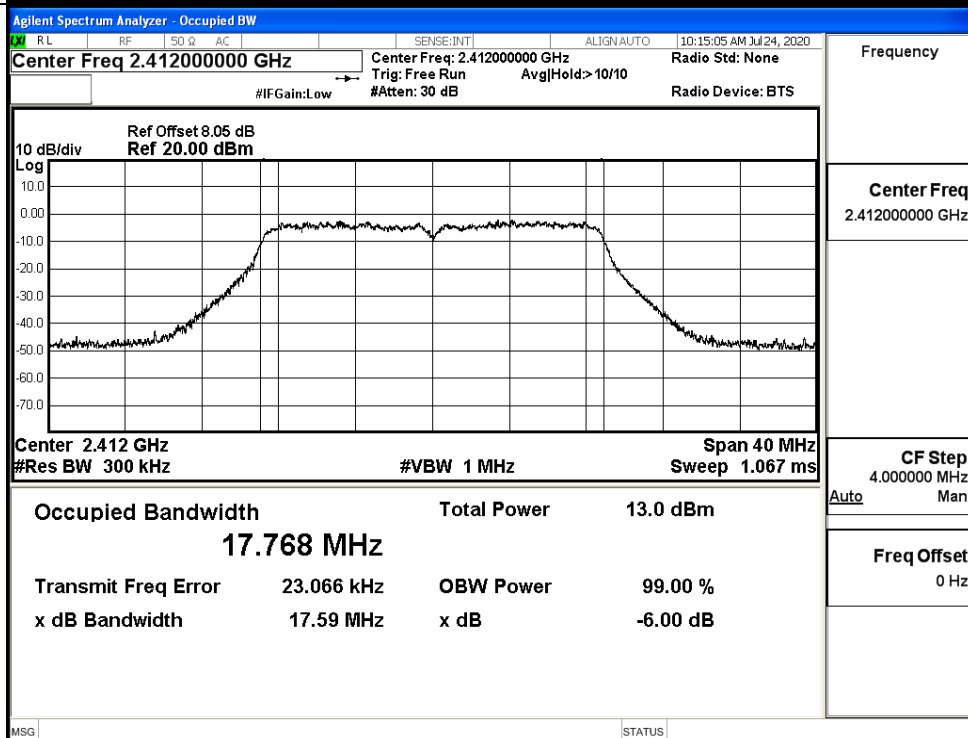
11G/HCH



Frequency

Center Freq
2.462000000 GHzCF Step
4.000000 MHz
Auto ManFreq Offset
0 Hz

11N20SISO/LCH



Frequency

Center Freq
2.412000000 GHzCF Step
4.000000 MHz
Auto ManFreq Offset
0 Hz

Agilent Spectrum Analyzer - Occupied BW

Center Freq 2.437000000 GHz

Ref Offset 8.05 dB
Ref 20.00 dBm

10 dB/div
Log

Center Freq: 2.437000000 GHz
Trig: Free Run
AvalHold: > 10/10
Radio Std: None
Radio Device: BTS

Frequency

Center Freq
2.437000000 GHz

CF Step
4.000000 MHz
Man

Freq Offset
0 Hz

Occupied Bandwidth

17.803 MHz

Total Power

13.6 dBm

Transmit Freq Error

7.709 kHz

OBW Power

99.00 %

x dB Bandwidth

17.58 MHz

x dB

-6.00 dB

Center 2.437 GHz
#Res BW 300 kHz
#VBW 1 MHz
Span 40 MHz
Sweep 1.067 ms

MSG

STATUS

Agilent Spectrum Analyzer - Occupied BW

Center Freq 2.462000000 GHz

Ref Offset 8.05 dB
Ref 20.00 dBm

10 dB/div
Log

Center Freq: 2.462000000 GHz
Trig: Free Run
AvalHold: 1/1
Radio Std: None
Radio Device: BTS

Frequency

Center Freq
2.462000000 GHz

CF Step
3.000000 MHz
Man

Freq Offset
0 Hz

Occupied Bandwidth

17.616 MHz

Total Power

13.6 dBm

Transmit Freq Error

26.547 kHz

OBW Power

99.00 %

x dB Bandwidth

17.73 MHz

x dB

-6.00 dB

Center 2.462 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 30 MHz
Sweep 2.933 ms

MSG

STATUS

Mkr1 2.45666 GHz
-6.4345 dBm

C.6 RF Conducted Spurious Emissions

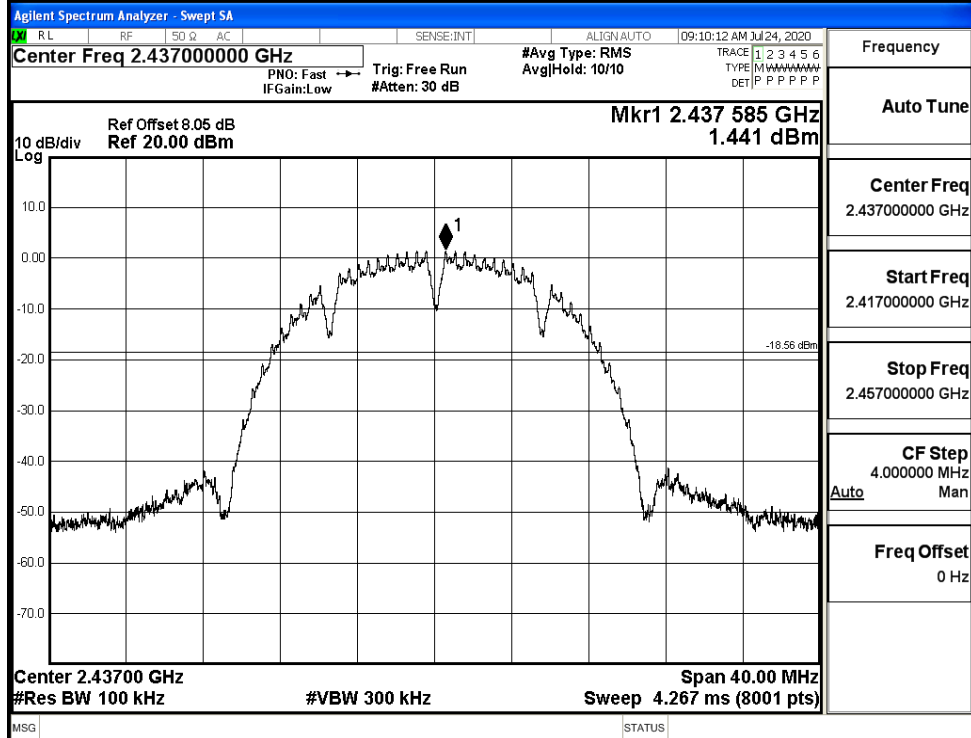
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
11B	LCH	1.236	-37.967	-18.764	PASS
	MCH	1.441	-38.116	-18.559	PASS
	HCH	1.328	-38.144	-18.672	PASS
11G	LCH	-7.581	-37.910	-27.581	PASS
	MCH	-7.035	-37.788	-27.035	PASS
	HCH	-6.942	-36.737	-26.942	PASS
11N20 SISO	LCH	-8.271	-38.595	-28.271	PASS
	MCH	-7.322	-37.510	-27.322	PASS
	HCH	-7.133	-37.752	-27.133	PASS

11B LCH Graphs

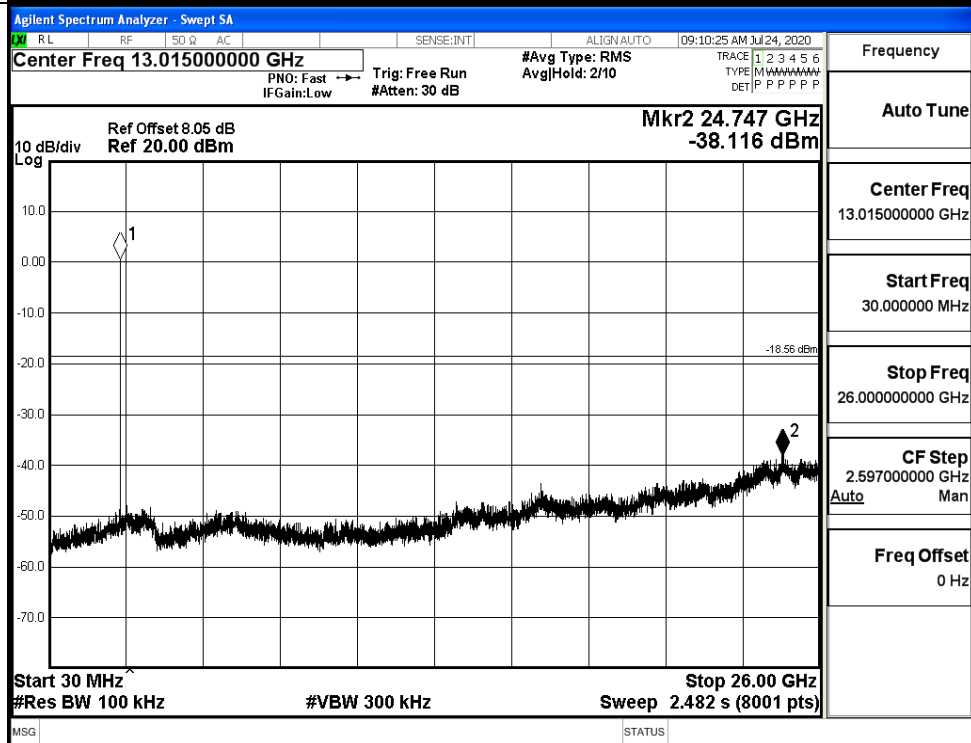
Pref/11B/LCH	Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC SENSE:INT ALIGN: AUTO 09:01:36 AM Jul 24, 2020 Center Freq 2.412000000 GHz PN0: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB #Avg Type: RMS Avg/Hold: 10/10 TRACE 1 2 3 4 5 6 TYPE M M M M M M M M DET P P P P P P Ref Offset 8.05 dB Ref 20.00 dBm Mkr1 2.412 550 GHz 1.236 dBm 10 dB/div Log Center 2.41200 GHz #Res BW 100 kHz #VBW 300 kHz Span 40.00 MHz Sweep 4.267 ms (8001 pts) MSG STATUS Frequency Auto Tune Center Freq 2.412000000 GHz Start Freq 2.392000000 GHz Stop Freq 2.432000000 GHz CF Step 4.000000 MHz Auto Freq Offset 0 Hz
Puw/11B/LCH	Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC SENSE:INT ALIGN: AUTO 09:01:48 AM Jul 24, 2020 Center Freq 13.015000000 GHz PN0: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB #Avg Type: RMS Avg/Hold: 2/10 TRACE 1 2 3 4 5 6 TYPE M M M M M M M M DET P P P P P P Ref Offset 8.05 dB Ref 20.00 dBm Mkr2 25.500 GHz -37.967 dBm 10 dB/div Log Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Stop 26.00 GHz Sweep 2.482 s (8001 pts) MSG STATUS Frequency Auto Tune Center Freq 13.015000000 GHz Start Freq 30.000000 MHz Stop Freq 26.000000000 GHz CF Step 2.597000000 GHz Auto Freq Offset 0 Hz

11B MCH Graphs

Pref/11B/MCH

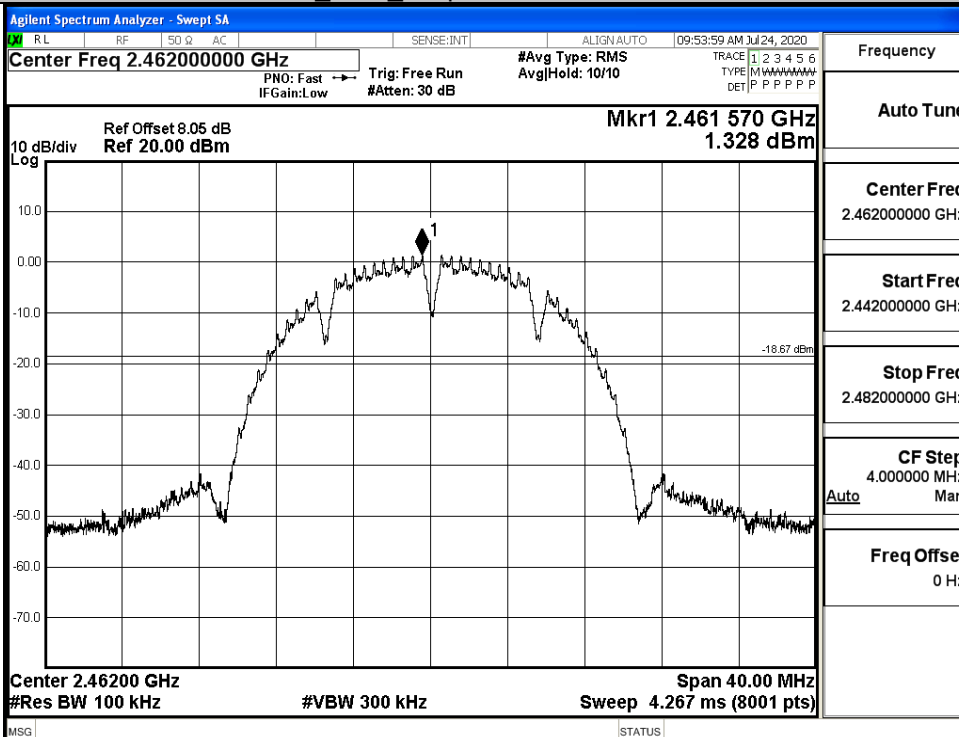


Puw/11B/MCH

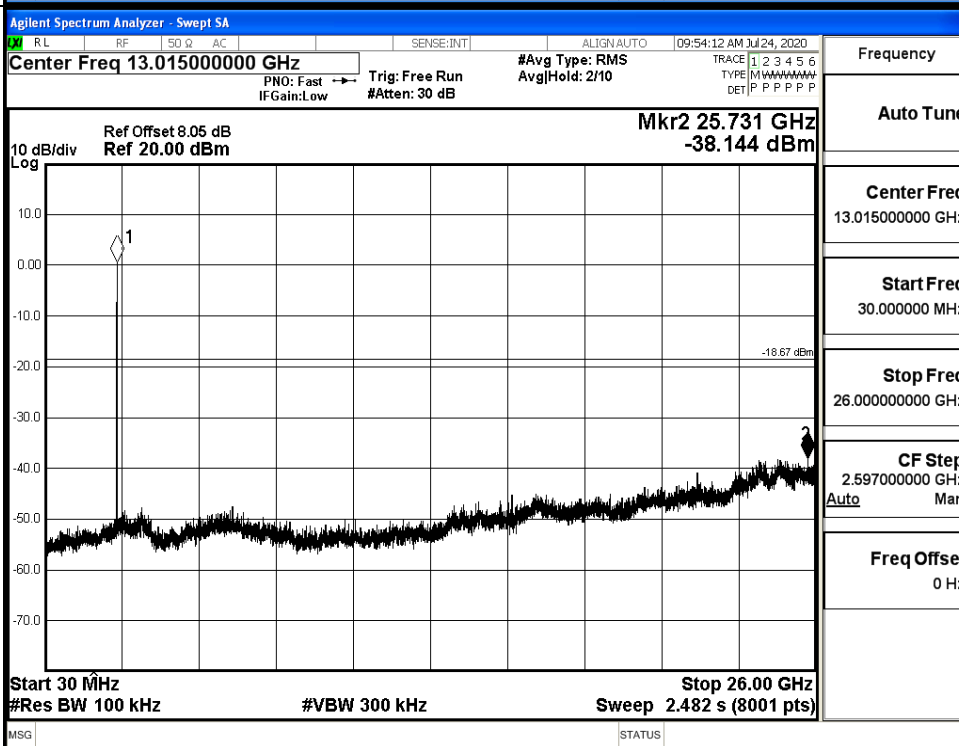


11B HCH Graphs

Pref/11B/HCH

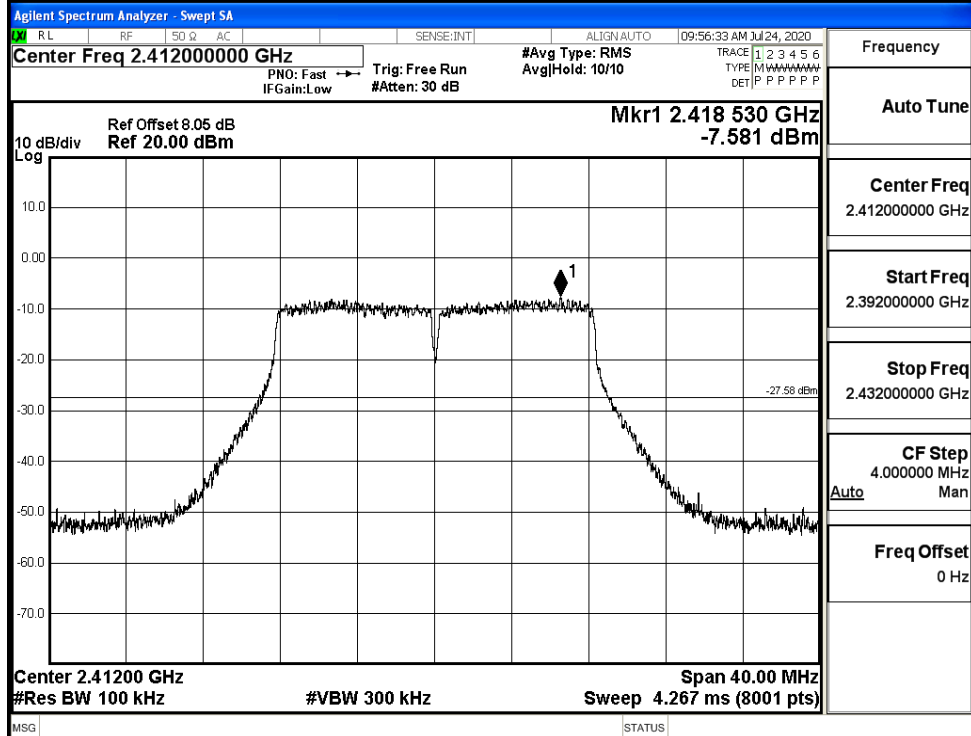


Puw/11B/HCH

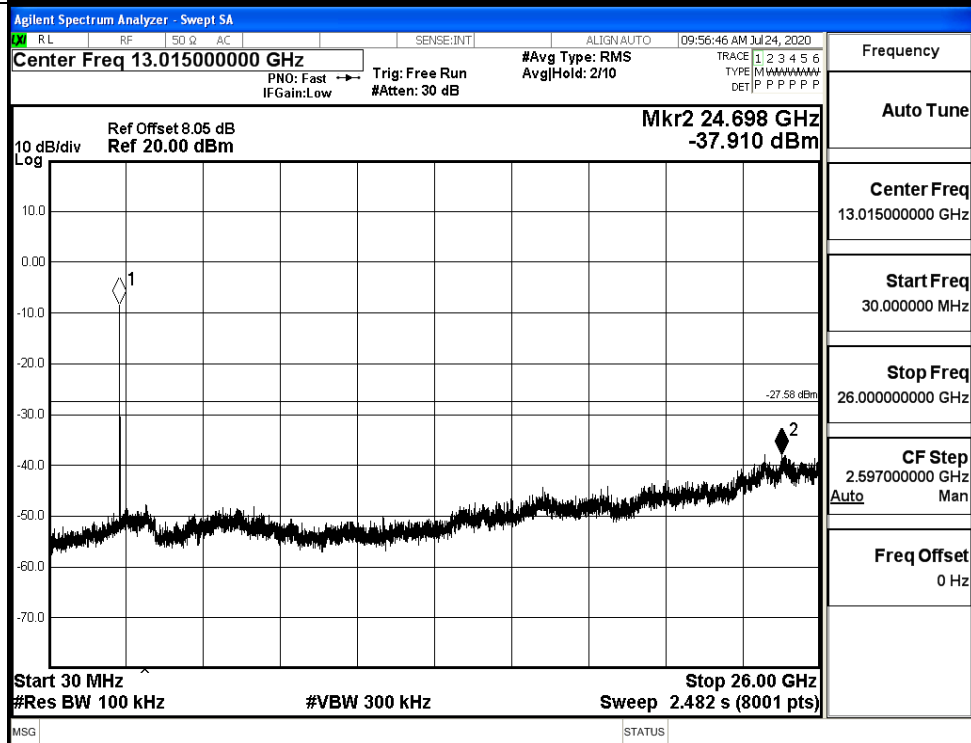


11G LCH Graphs

Pref/11G/LCH

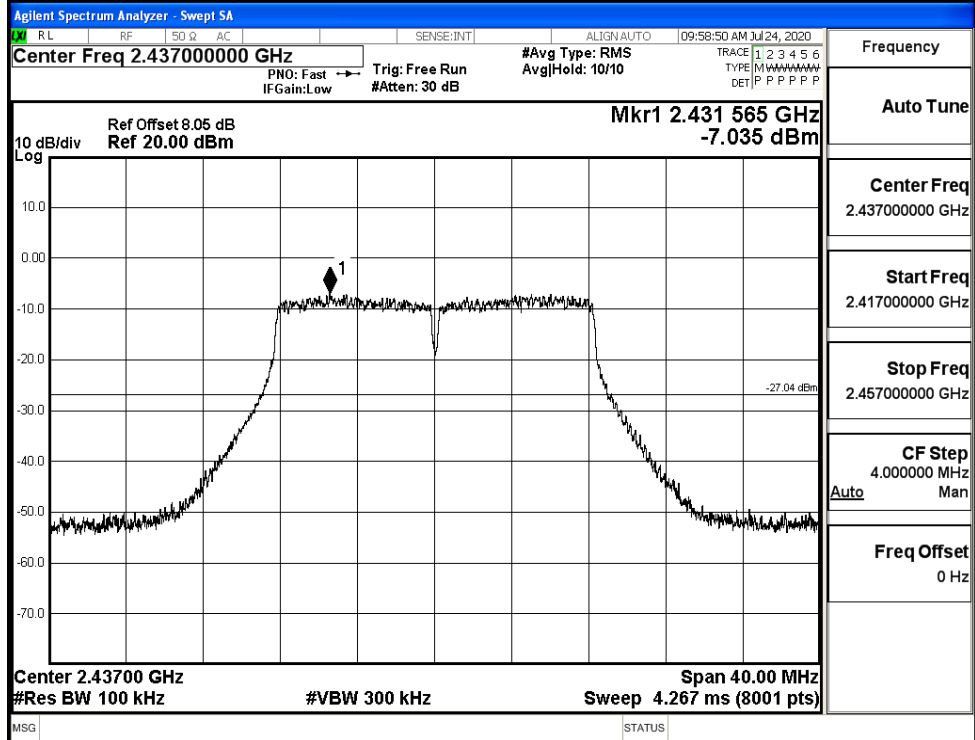


Puw/11G/LCH

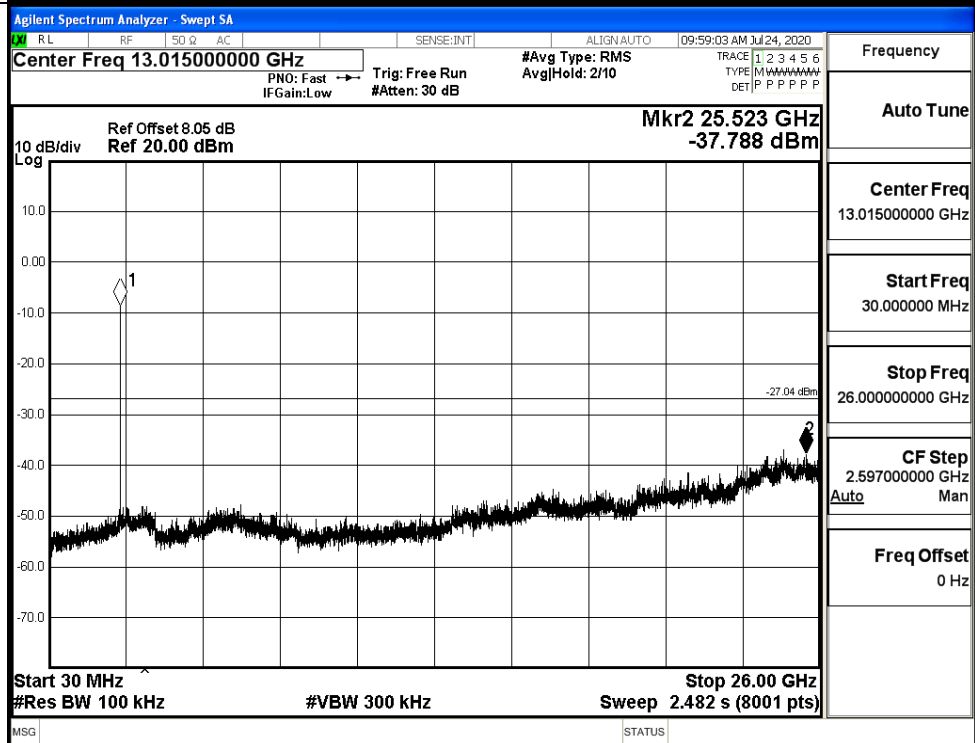


11G MCH Graphs

Pref/11G/MCH

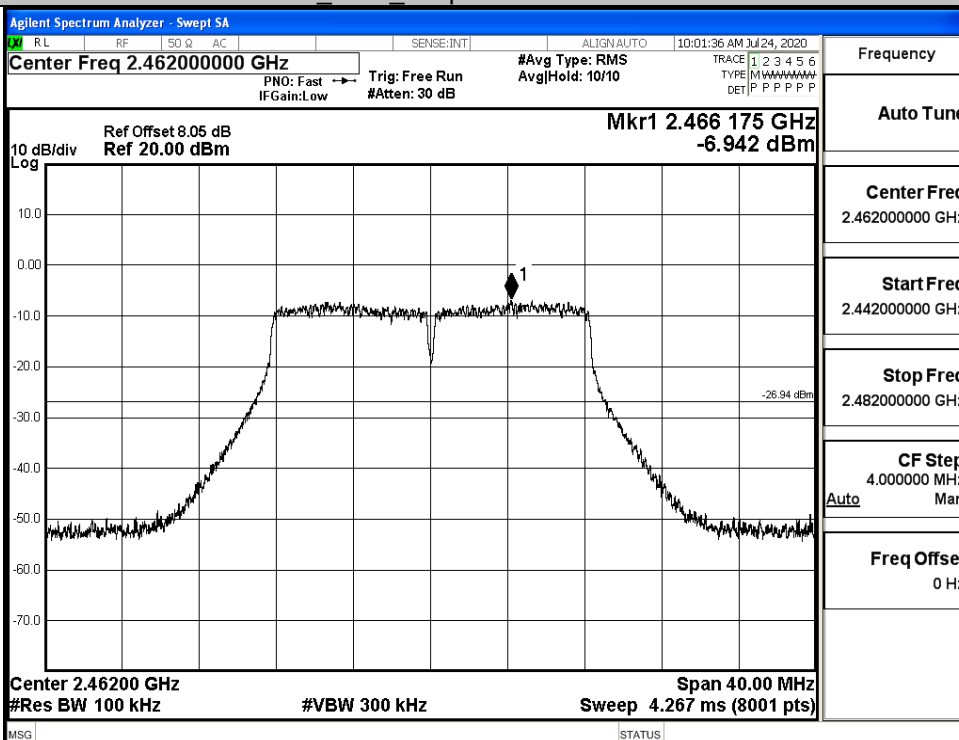


Puw/11G/MCH

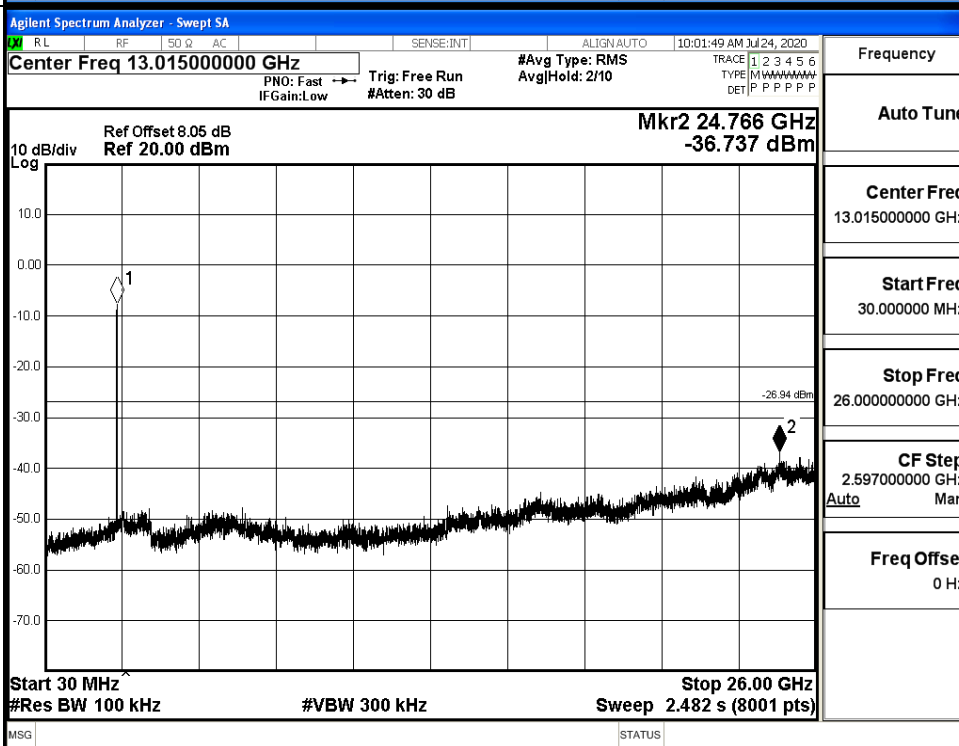


11G HCH Graphs

Pref/11G/HCH

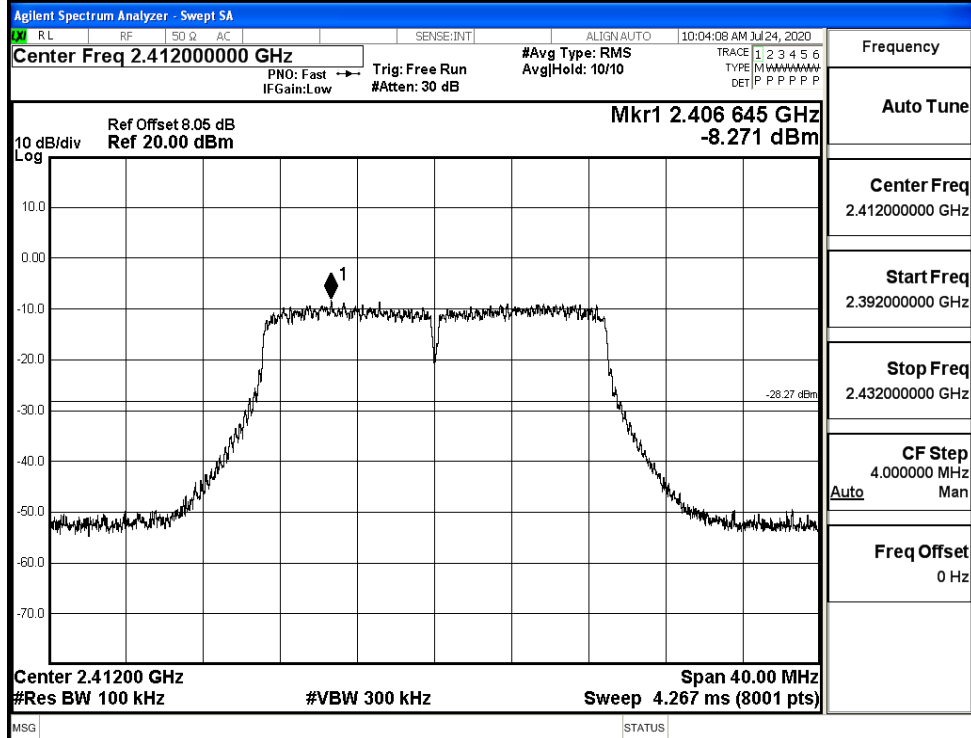


Puw/11G/HCH

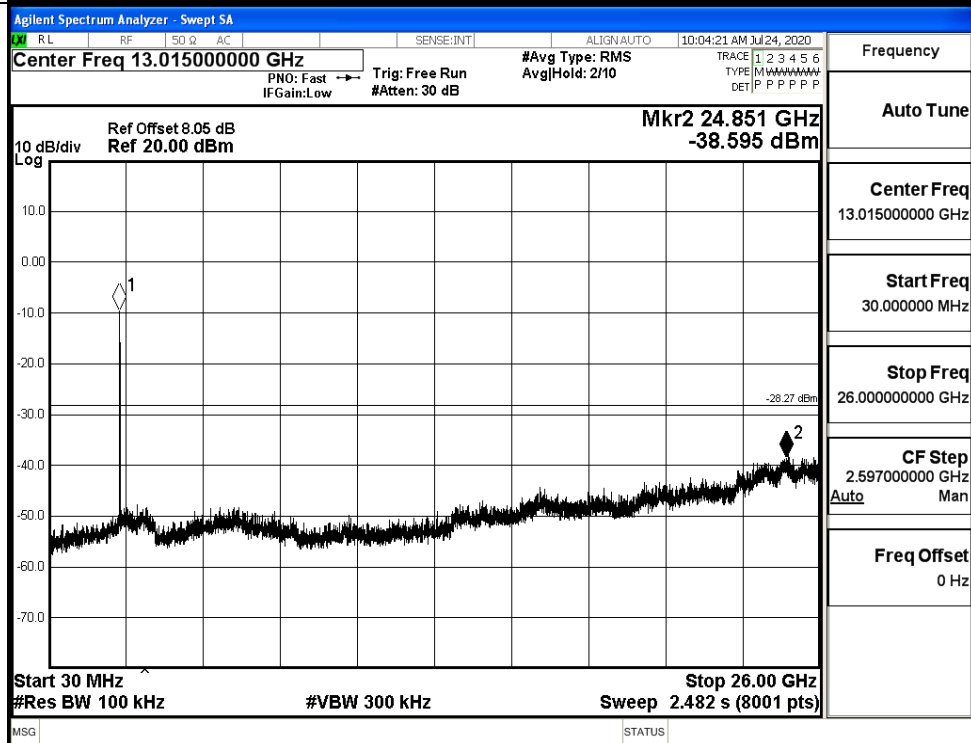


11N20SISO LCH Graphs

Pref/11N20SIS
O/LCH

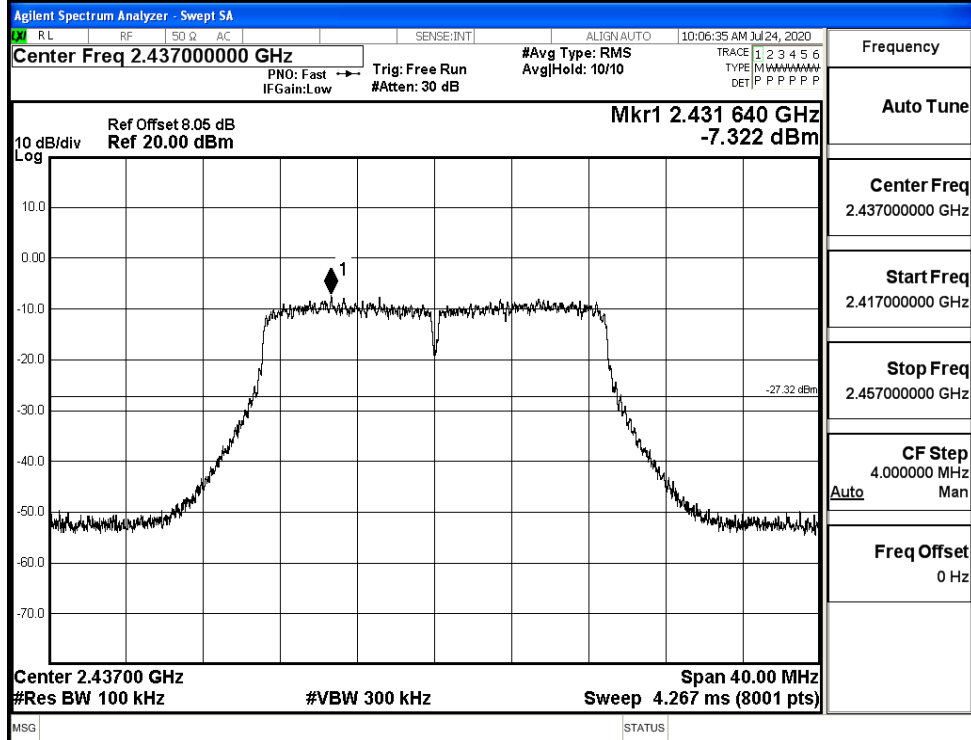


Puw/11N20
SISO/LCH

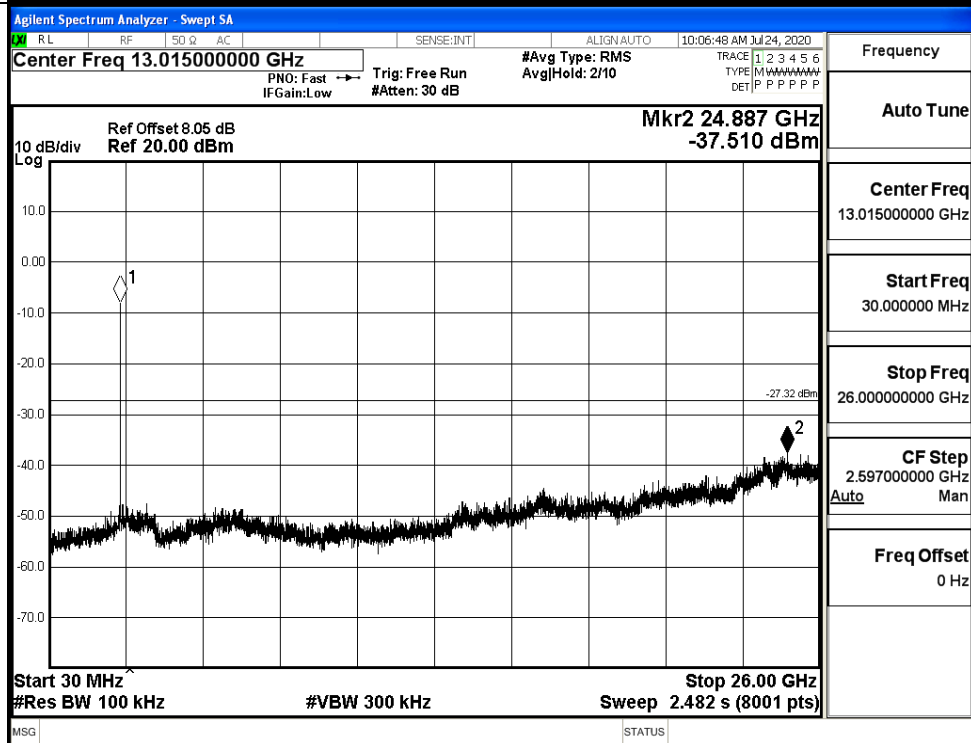


11N20SISO_MCH_Graphs

Pref/11N20
SISO/MCH

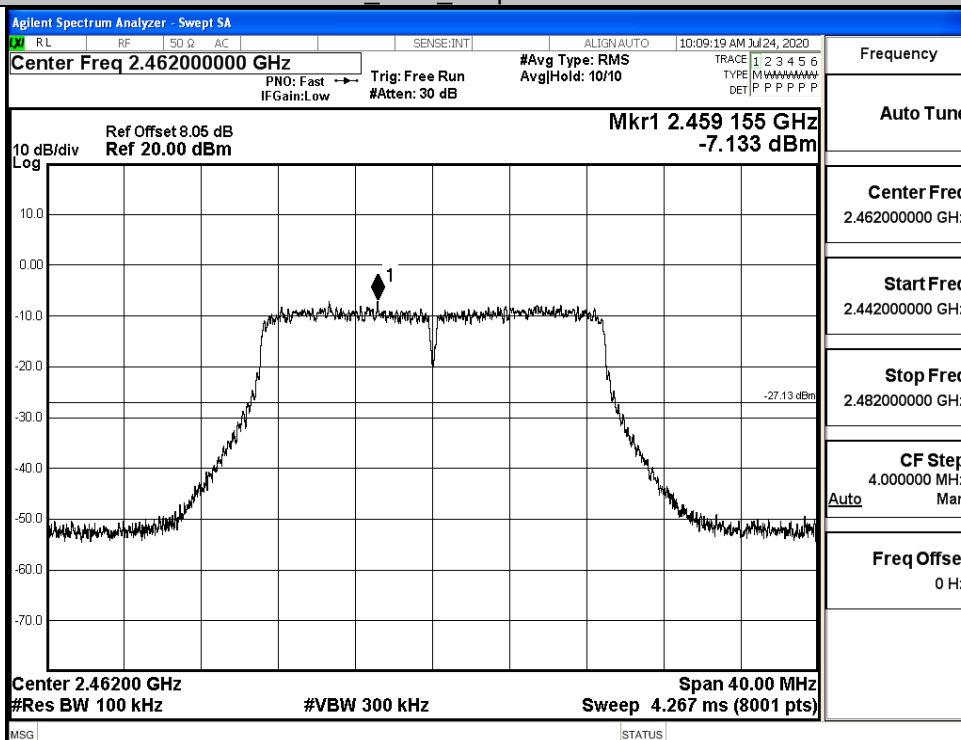


Puw/11N20
SISO/MCH

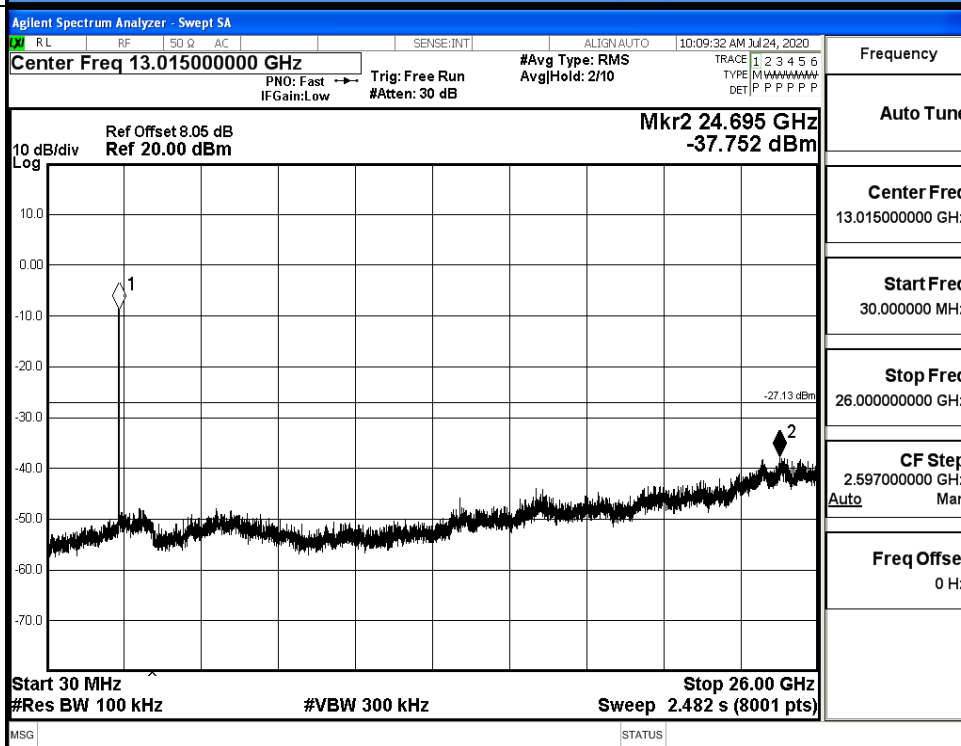


11N20SISO HCH Graphs

Pref/11N20
SISO/HCH



Puw/11N20
SISO/HCH

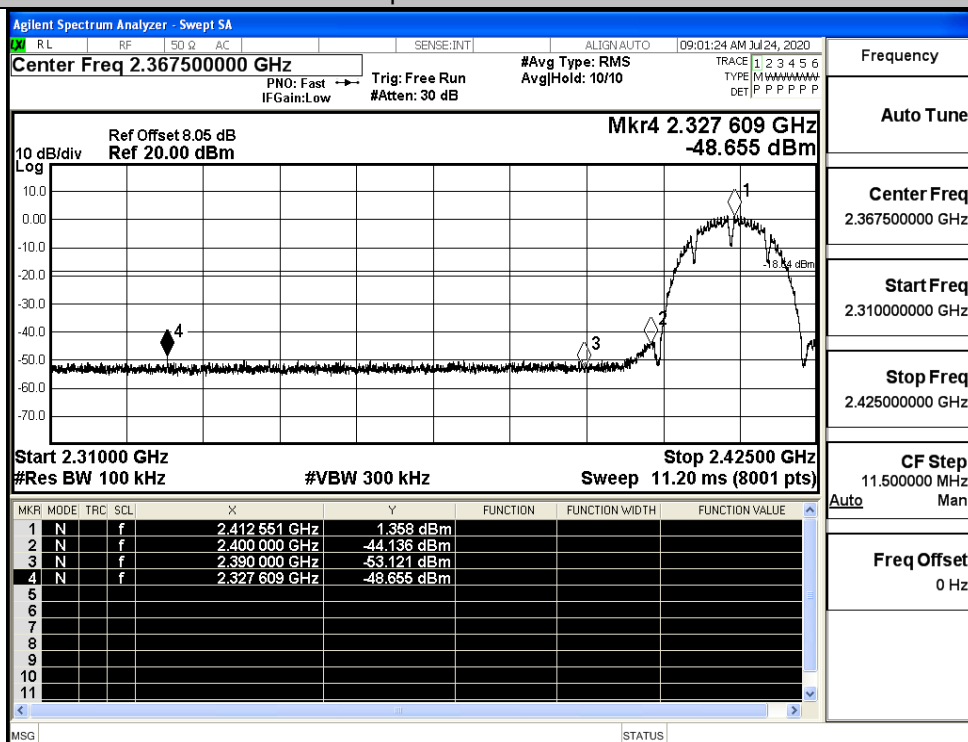


C.7 Band-edge for RF Conducted Emissions

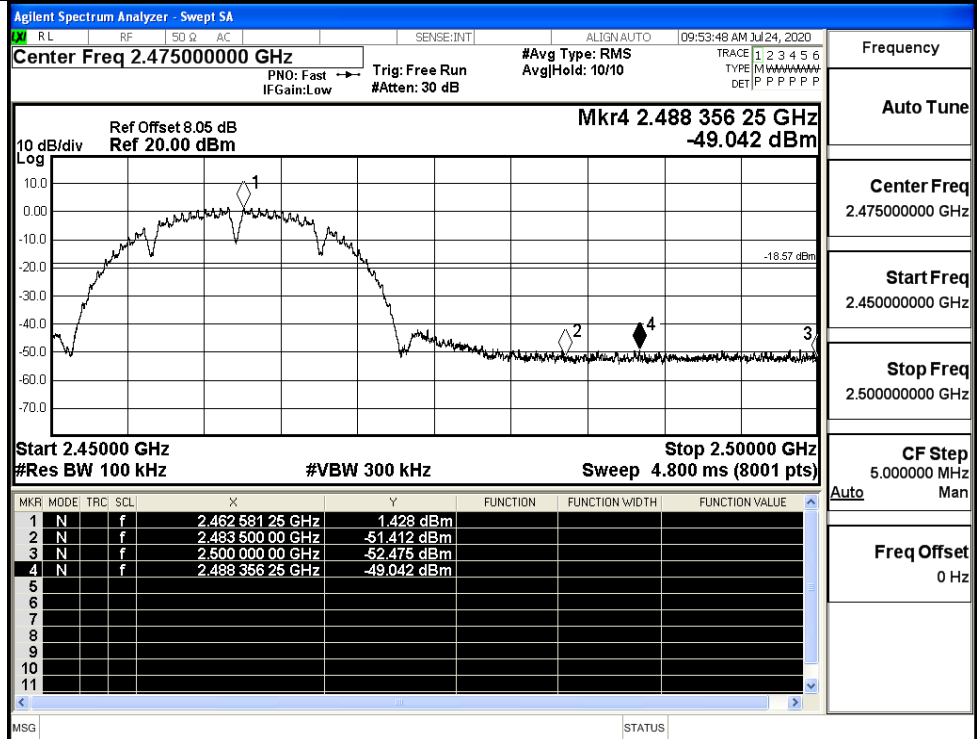
Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
11B	LCH	1.358	-48.655	-18.64	PASS
	HCH	1.428	-49.042	-18.57	PASS
11G	LCH	-7.576	-49.558	-27.58	PASS
	HCH	-6.874	-48.704	-26.87	PASS
11N20SISO	LCH	-8.171	-48.798	-28.17	PASS
	HCH	-7.199	-47.956	-27.2	PASS

Test Graphs

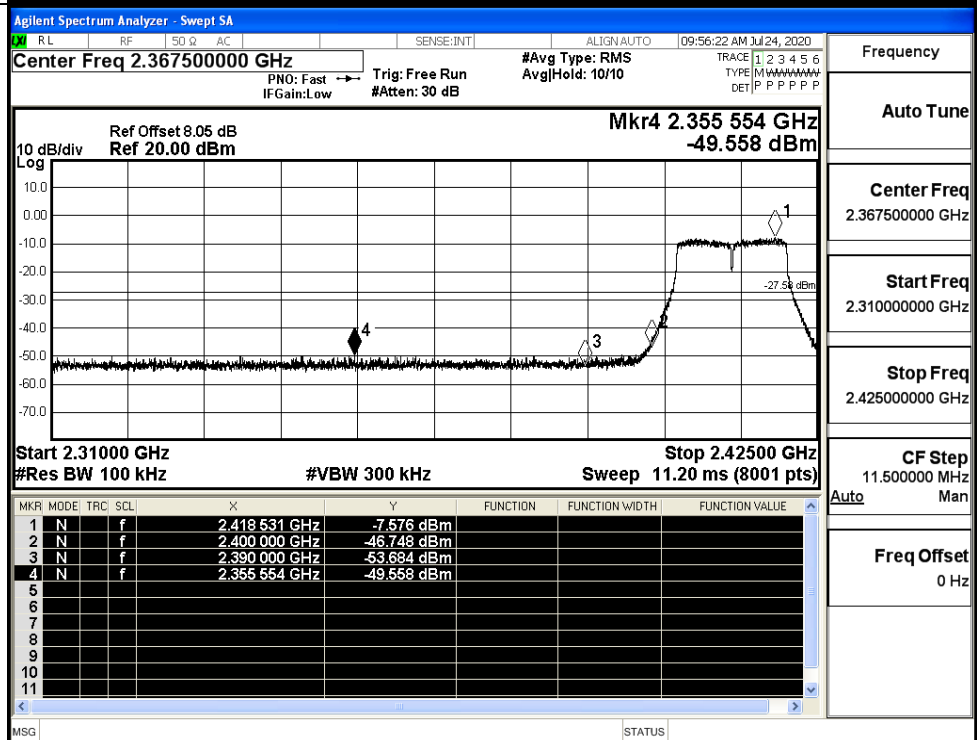
11B/LCH



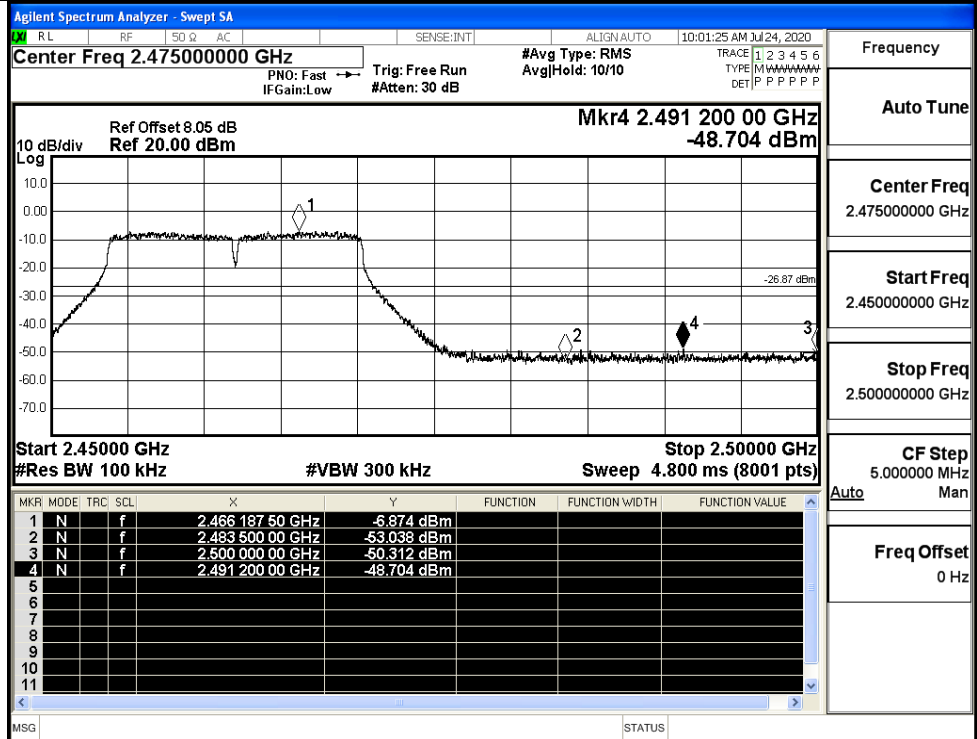
11B/HCH



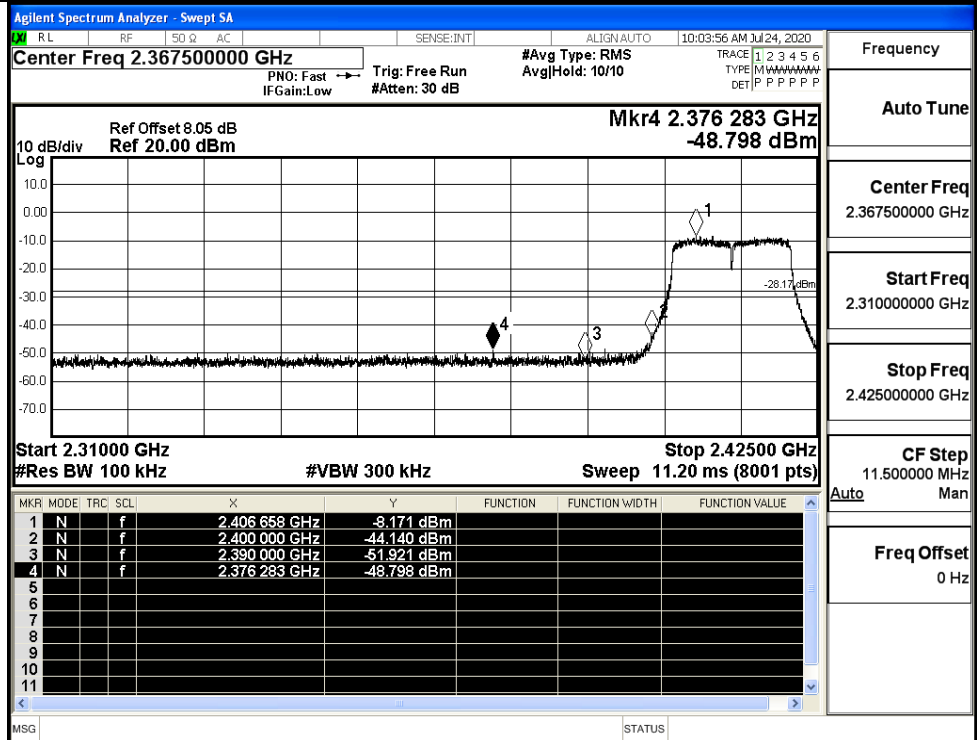
11G/LCH



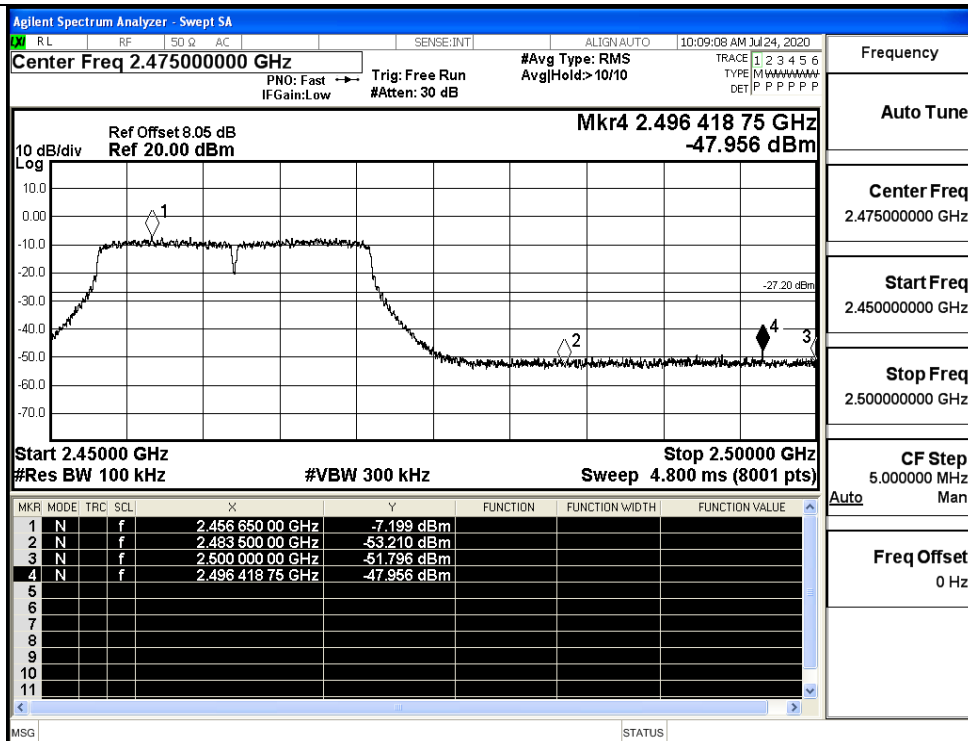
11G/HCH



11N20SISO/LCH



11N20SISO/HCH



Frequency

Auto Tune

Center Freq
2.475000000 GHz

Start Freq
2.450000000 GHz

Stop Freq
2.500000000 GHz

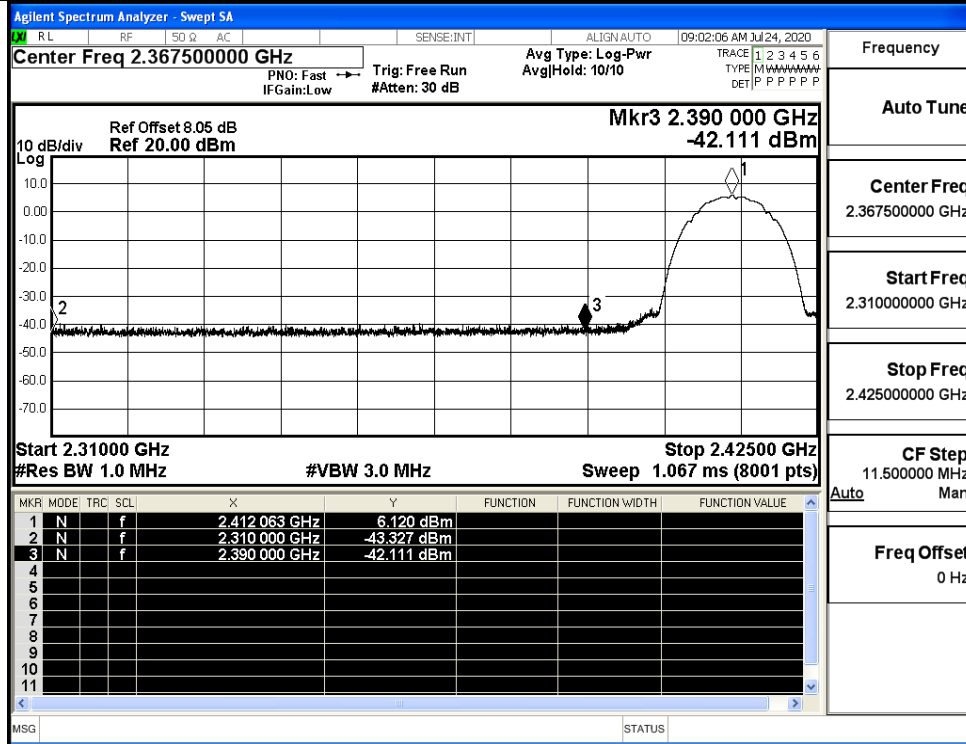
CF Step
5.000000 MHz
Auto Man

Freq Offset
0 Hz

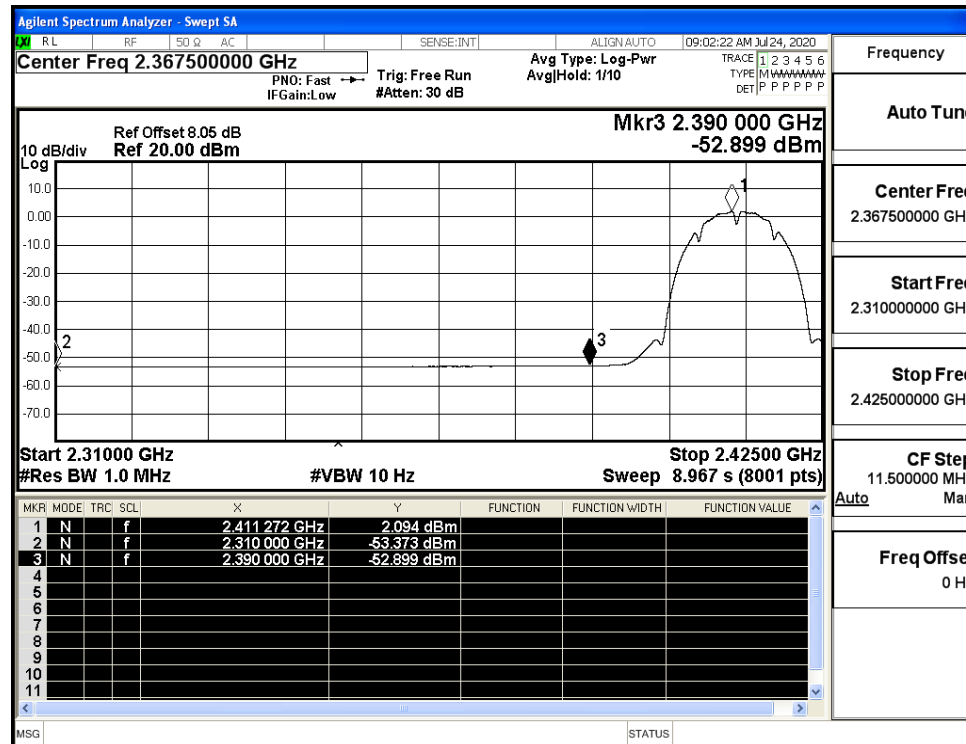
C.8 Restrict-band band-edge measurements

Test Mode	Test Channel	Ant	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
11B	2412	Ant1	2310.0	-43.33	3.2	0	55.10	PEAK	74	PASS
	2412	Ant1	2310.0	-53.37	3.2	0	45.06	AV	54	PASS
	2412	Ant1	2390.0	-42.11	3.2	0	56.32	PEAK	74	PASS
	2412	Ant1	2390.0	-52.90	3.2	0	45.53	AV	54	PASS
	2462	Ant1	2483.5	-40.95	3.2	0	57.48	PEAK	74	PASS
	2462	Ant1	2483.5	-52.41	3.2	0	46.02	AV	54	PASS
	2462	Ant1	2500.0	-42.58	3.2	0	55.85	PEAK	74	PASS
	2462	Ant1	2500.0	-52.25	3.2	0	46.18	AV	54	PASS
11G	2412	Ant1	2310.0	-43.81	3.2	0	54.62	PEAK	74	PASS
	2412	Ant1	2310.0	-53.45	3.2	0	44.98	AV	54	PASS
	2412	Ant1	2390.0	-43.00	3.2	0	55.43	PEAK	74	PASS
	2412	Ant1	2390.0	-52.88	3.2	0	45.55	AV	54	PASS
	2462	Ant1	2483.5	-42.46	3.2	0	55.97	PEAK	74	PASS
	2462	Ant1	2483.5	-52.44	3.2	0	45.99	AV	54	PASS
	2462	Ant1	2500.0	-41.72	3.2	0	56.71	PEAK	74	PASS
	2462	Ant1	2500.0	-52.30	3.2	0	46.13	AV	54	PASS
11N20 SISO	2412	Ant1	2310.0	-42.59	3.2	0	55.84	PEAK	74	PASS
	2412	Ant1	2310.0	-53.43	3.2	0	45.00	AV	54	PASS
	2412	Ant1	2390.0	-41.89	3.2	0	56.54	PEAK	74	PASS
	2412	Ant1	2390.0	-52.85	3.2	0	45.58	AV	54	PASS
	2462	Ant1	2483.5	-41.17	3.2	0	57.26	PEAK	74	PASS
	2462	Ant1	2483.5	-52.48	3.2	0	45.95	AV	54	PASS
	2462	Ant1	2500.0	-42.96	3.2	0	55.47	PEAK	74	PASS
	2462	Ant1	2500.0	-52.37	3.2	0	46.06	AV	54	PASS

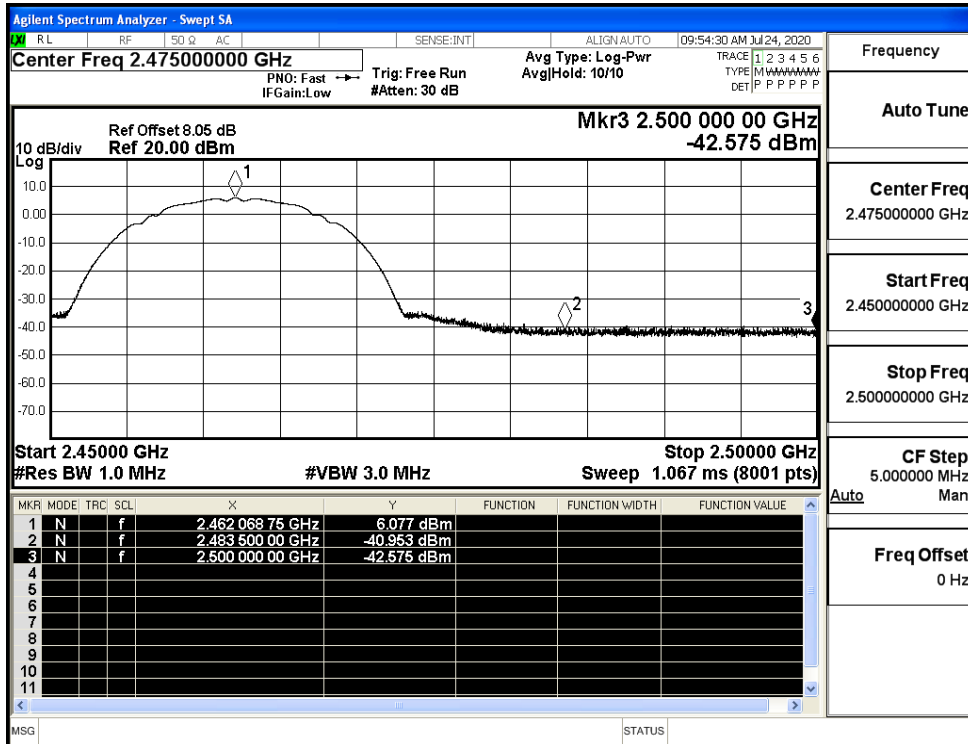
Restrict-band band-edge measurements_11B_2412_Ant1_PEAK



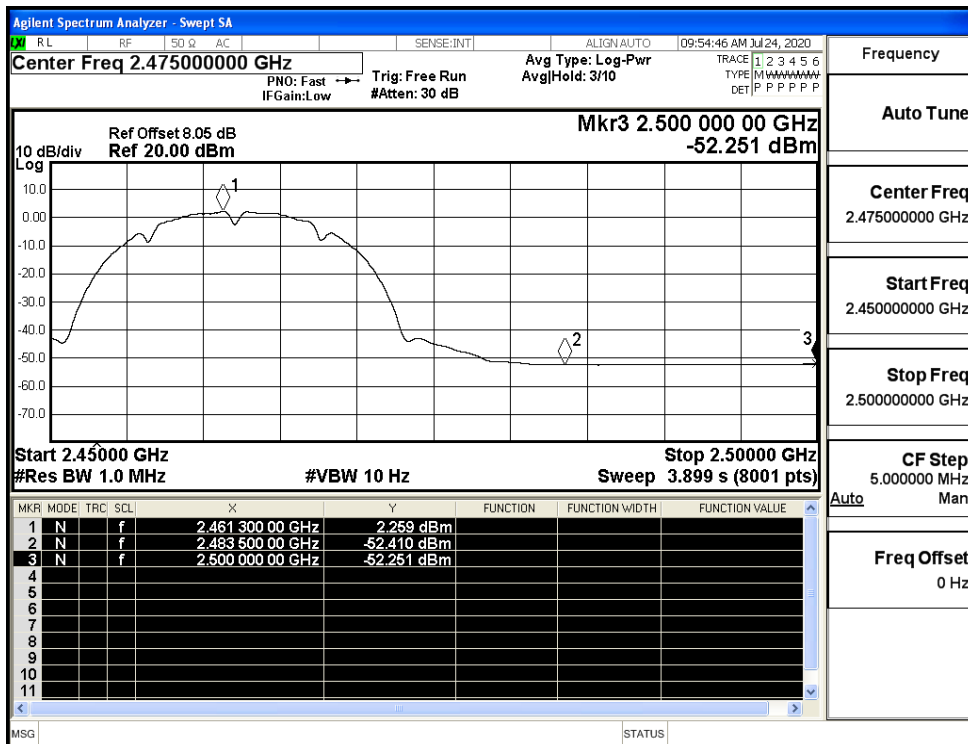
Restrict-band band-edge measurements_11B_2412_Ant1_AV



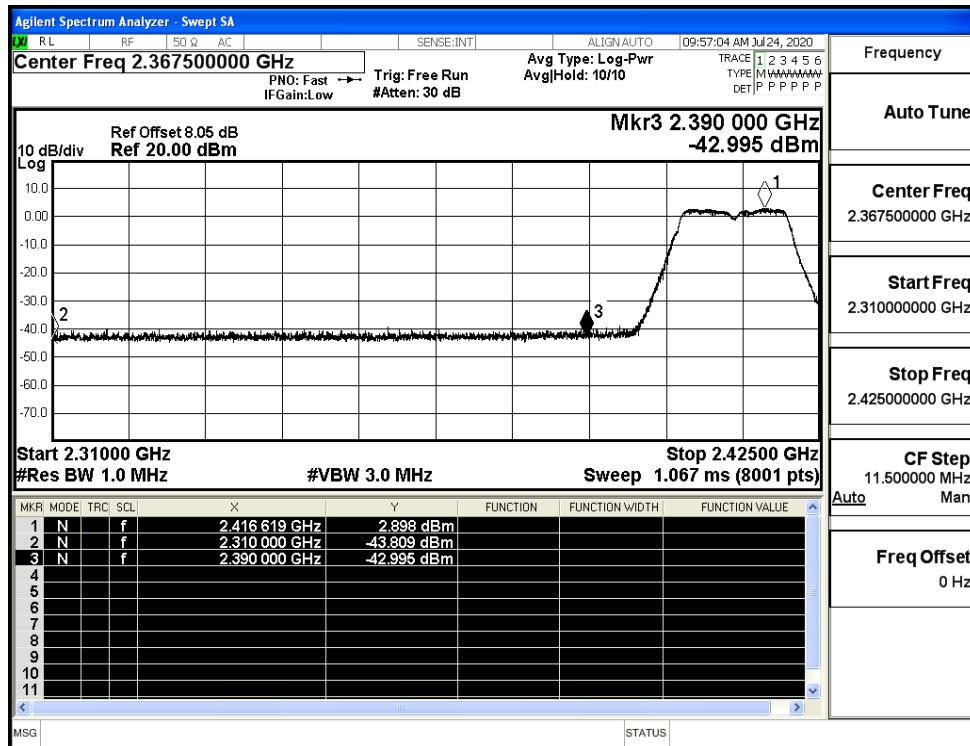
Restrict-band band-edge measurements_11B_2462_Ant1_PEAK



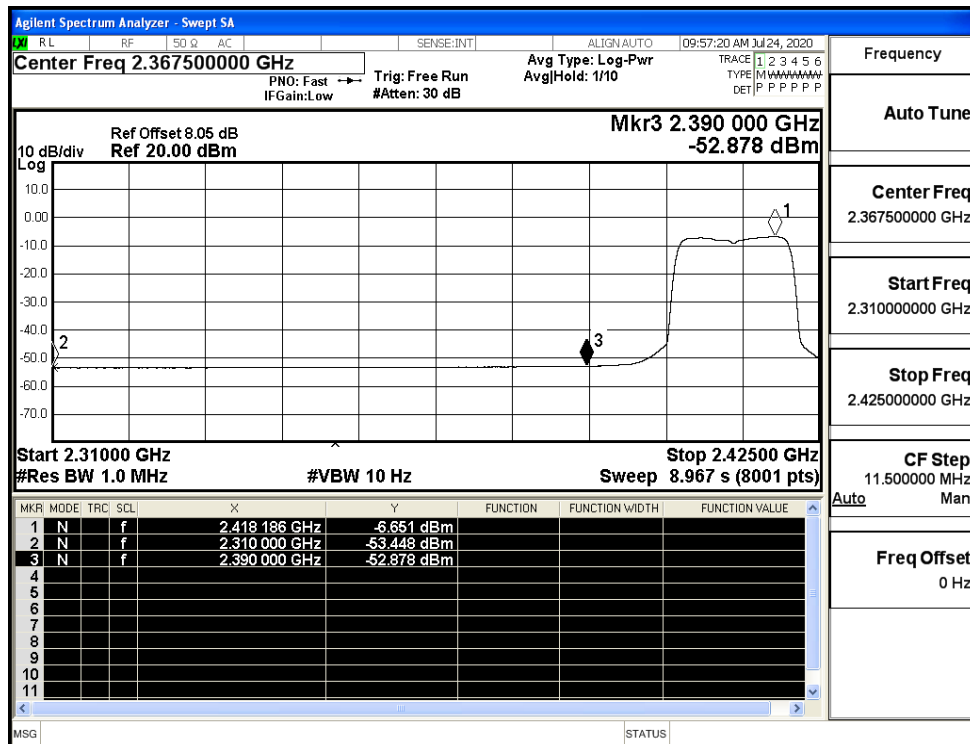
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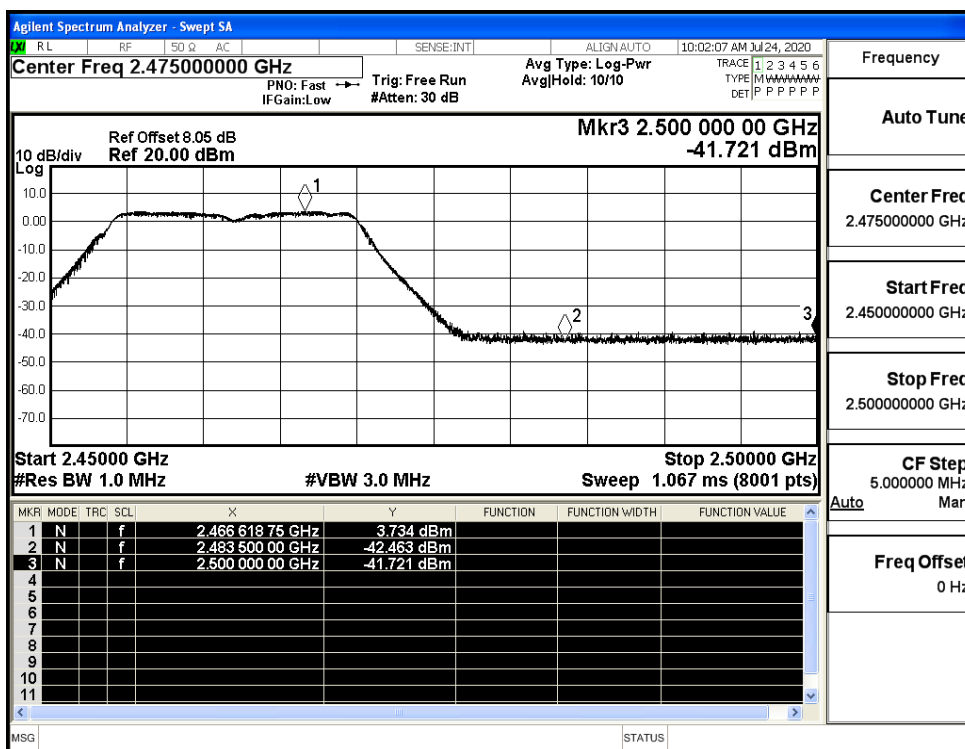
Restrict-band band-edge measurements_11G_2412_Ant1_PEAK



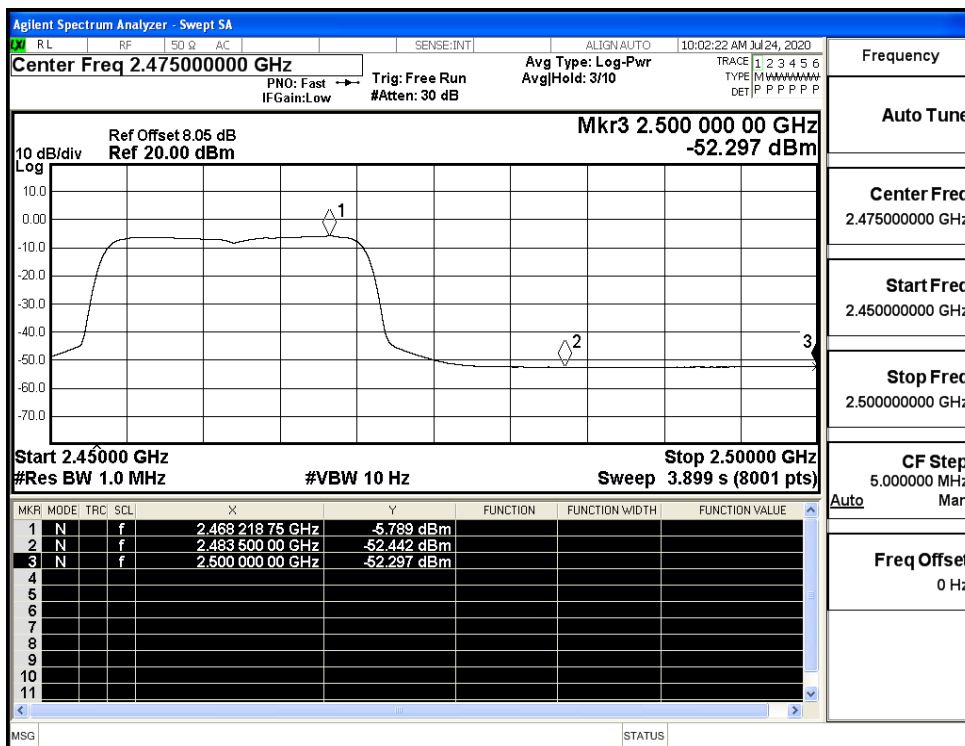
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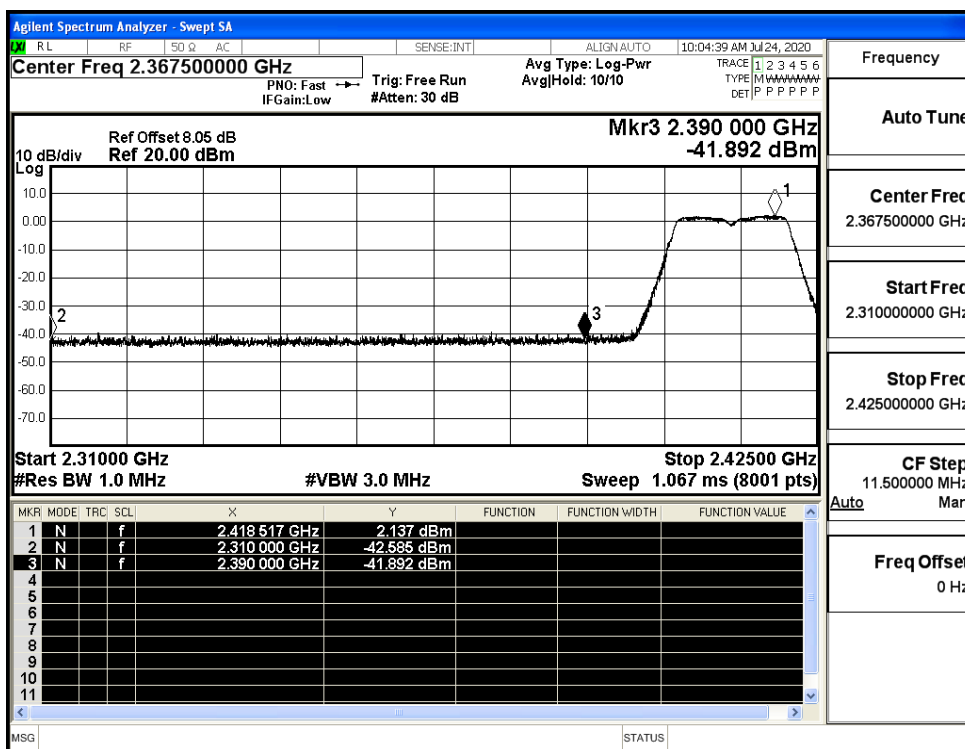
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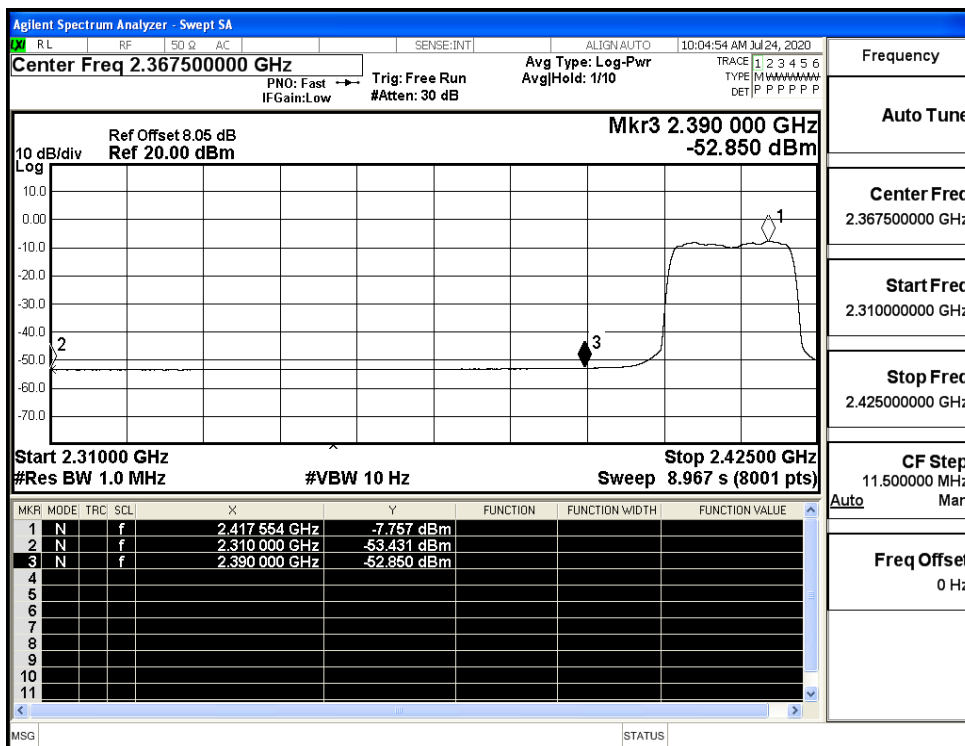
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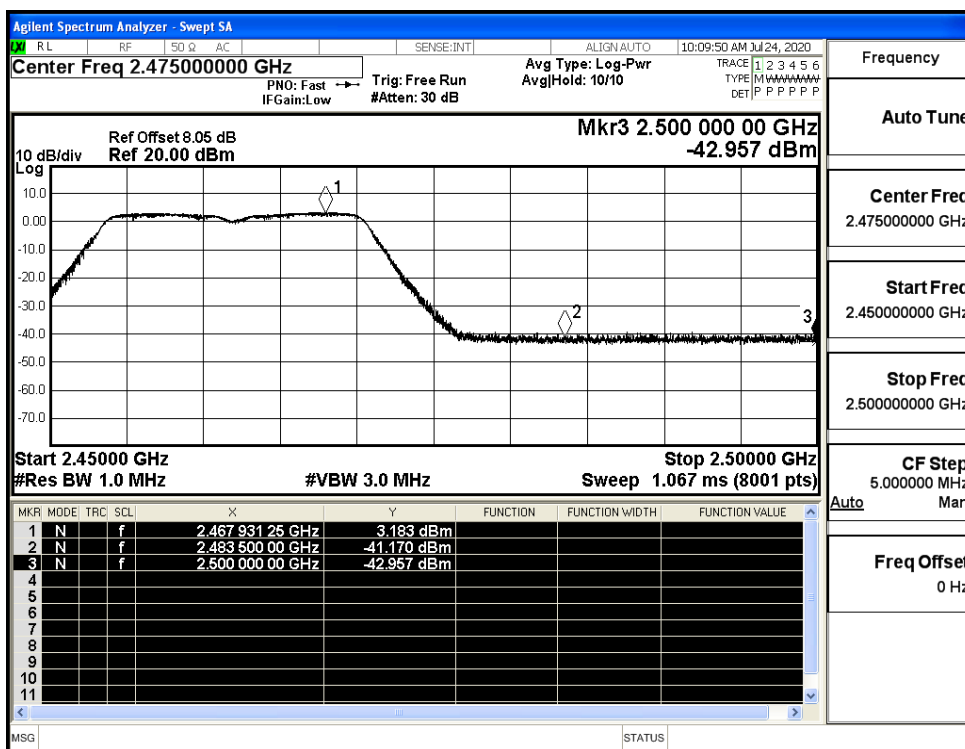
Restrict-band band-edge measurements_11N20SISO_2412_Ant1_PEAK



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

