

Appendix A

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: 3D Printer

Trade Mark:  **FLASHFORGE**
3D PRINTER

Test Model: Adventurer 3

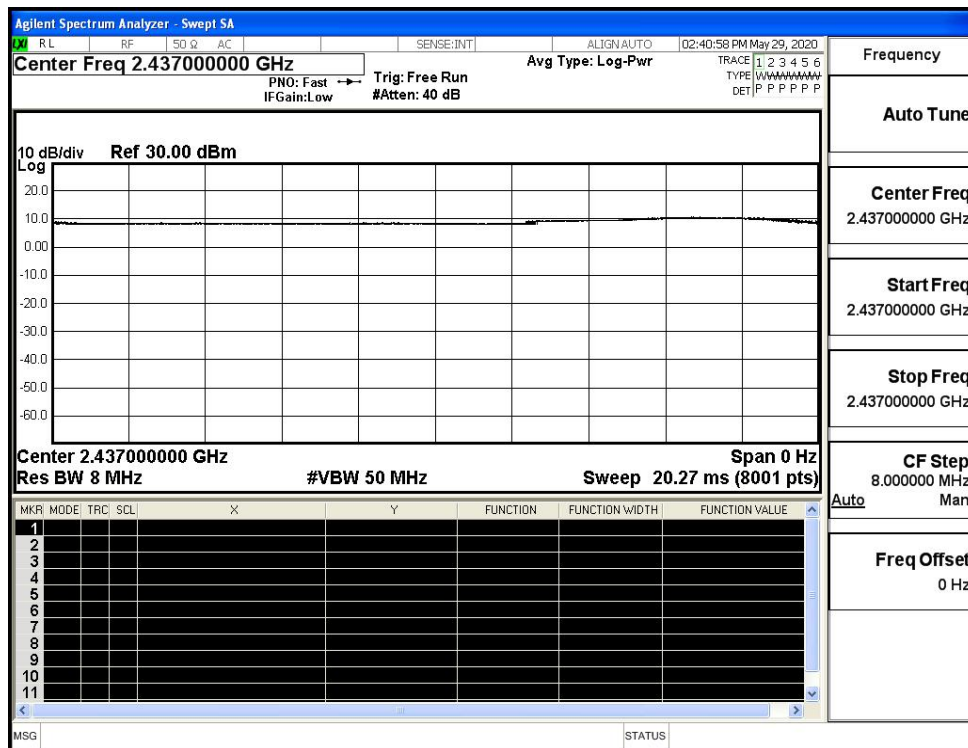
Environmental Conditions

Temperature:	23.5 ° C
Relative Humidity:	52.8%
ATM Pressure:	100.0 kPa
Test Engineer:	Diamond Lu
Supervised by:	Li Huan

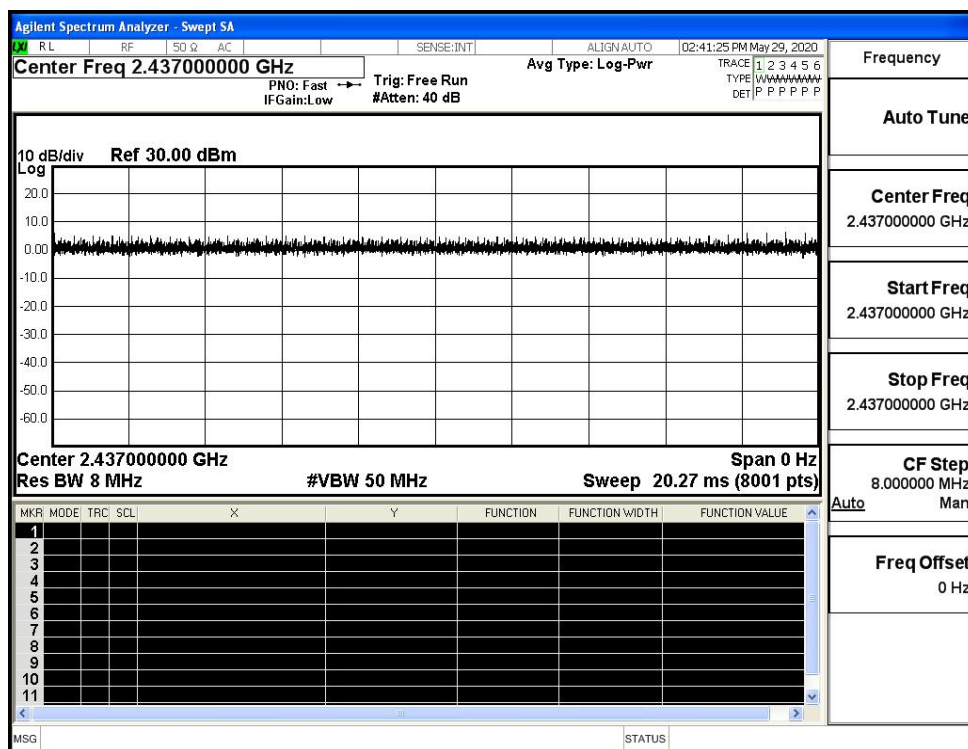
A.1 Duty Cycle

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

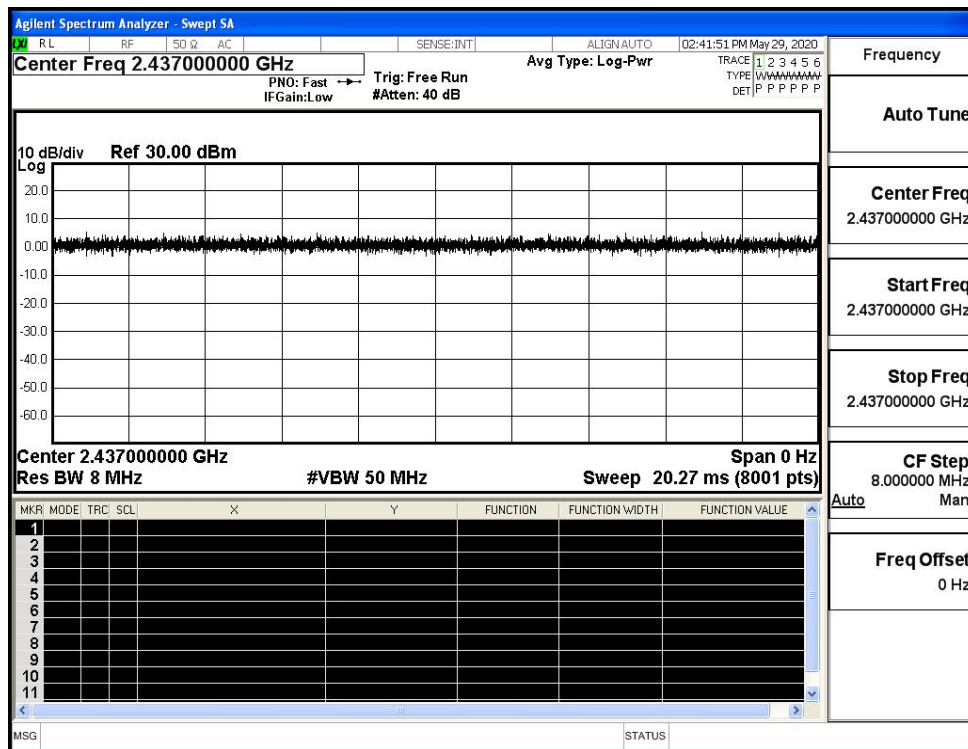
Duty Cycle_11B_2437_Ant1



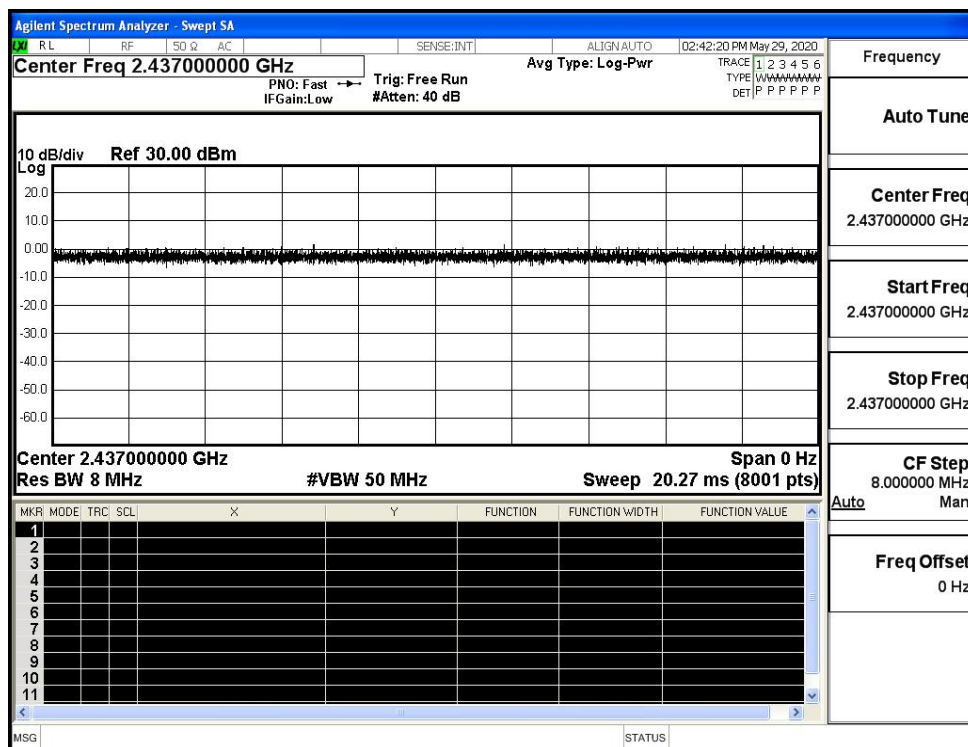
Duty Cycle_11G_2437_Ant1



Duty Cycle_11N20SISO_2437_Ant1



Duty Cycle_11N40SISO_2437_Ant1

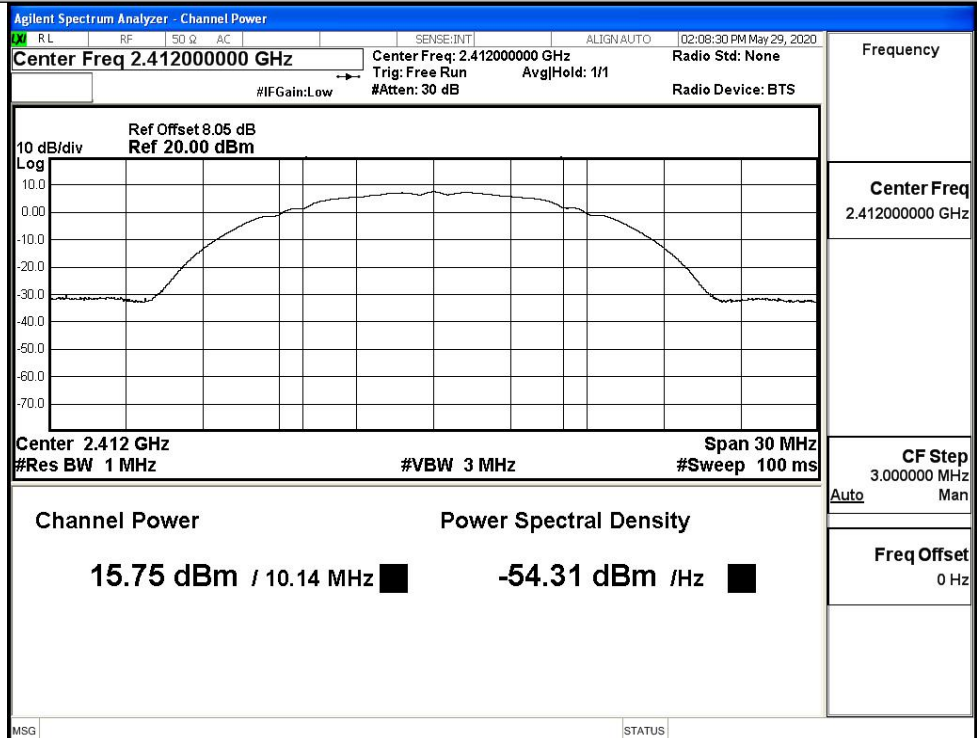


A.2 Maximum Conducted Output Power

Mode	Channel	Meas.Level [dBm]	Limit [dBm]	Verdict
11B	LCH	15.75	30	PASS
	MCH	15.44	30	PASS
	HCH	15.58	30	PASS
11G	LCH	13.48	30	PASS
	MCH	14.26	30	PASS
	HCH	14.38	30	PASS
11N20SISO	LCH	13.81	30	PASS
	MCH	13.92	30	PASS
	HCH	14.03	30	PASS
11N40SISO	LCH	13.33	30	PASS
	MCH	13.60	30	PASS
	HCH	13.73	30	PASS

Test Graphs

11B/LCH



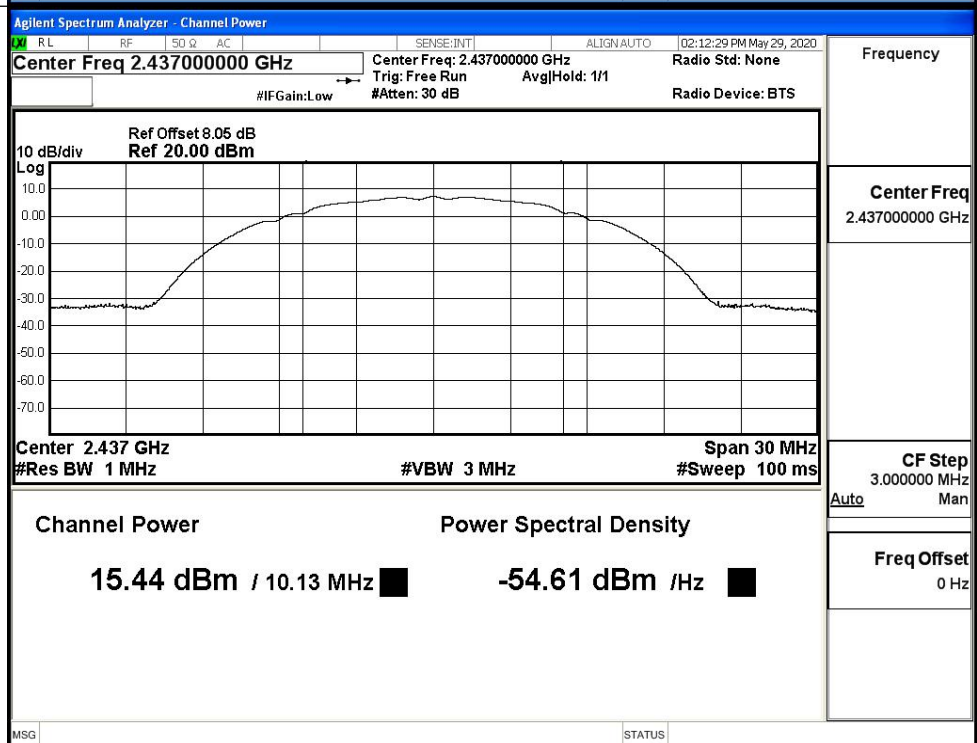
Frequency

Center Freq
2.41200000 GHz

CF Step
3.000000 MHz
Auto Man

Freq Offset
0 Hz

11B/MCH



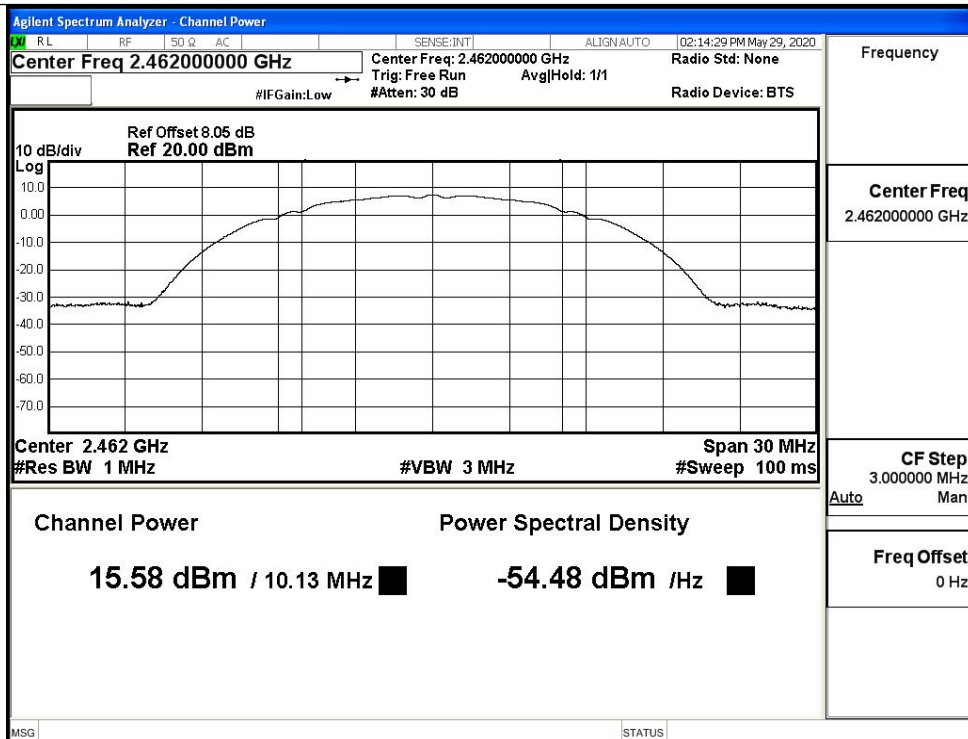
Frequency

Center Freq
2.437000000 GHz

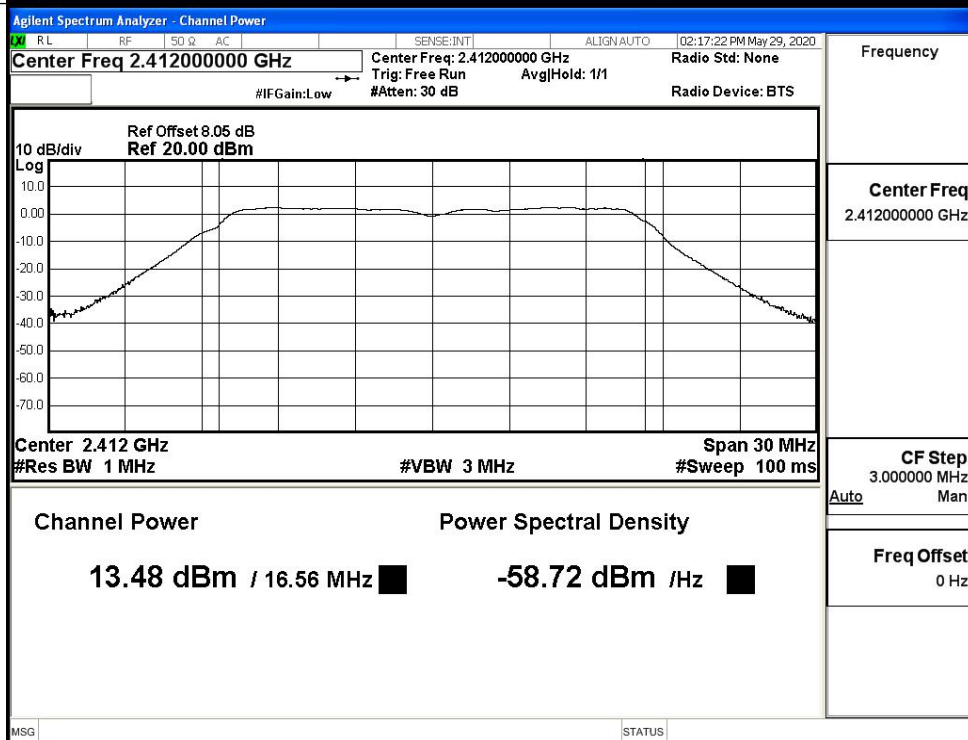
CF Step
3.000000 MHz
Auto Man

Freq Offset
0 Hz

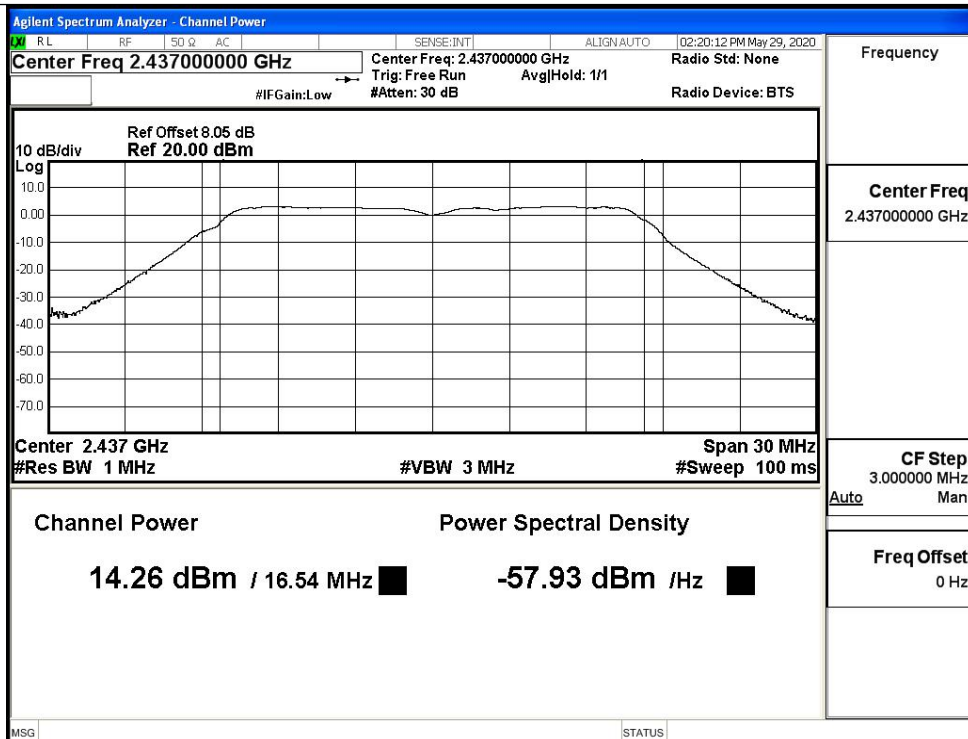
11B/HCH



11G/LCH



11G/MCH



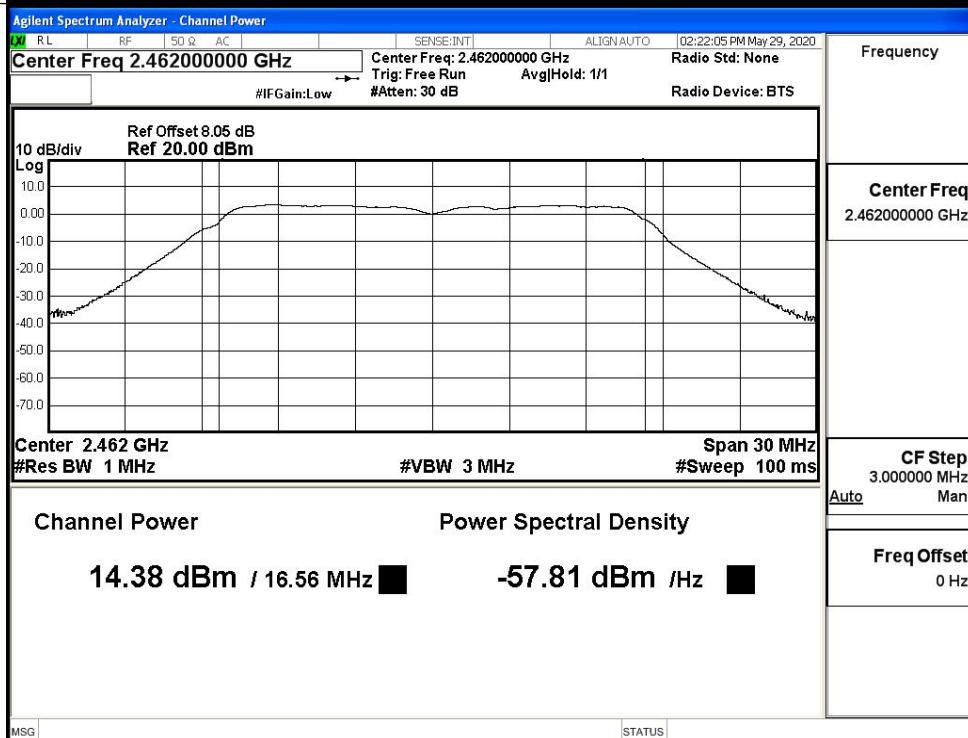
Frequency

Center Freq
2.437000000 GHz

CF Step
3.000000 MHz
Auto Man

Freq Offset
0 Hz

11G/HCH

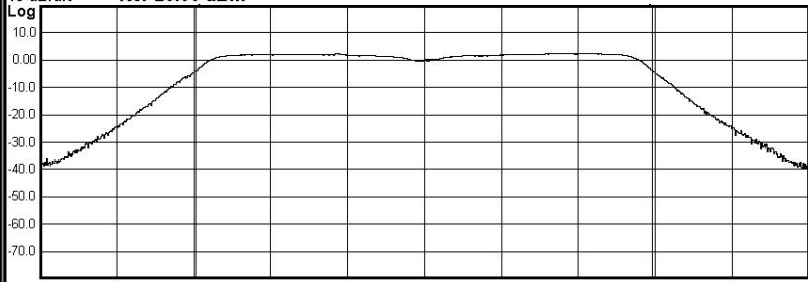
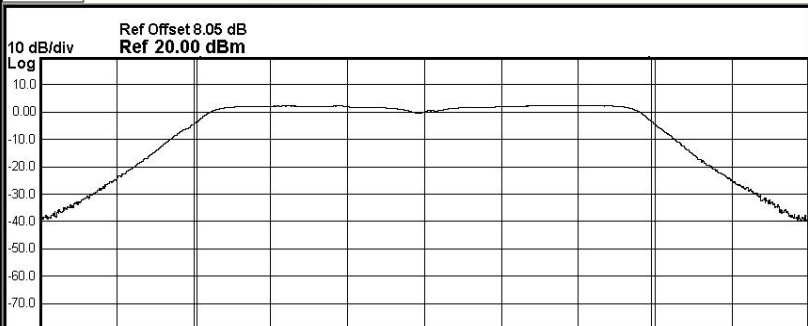


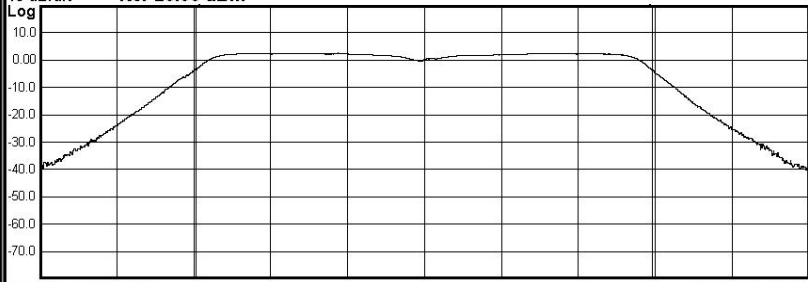
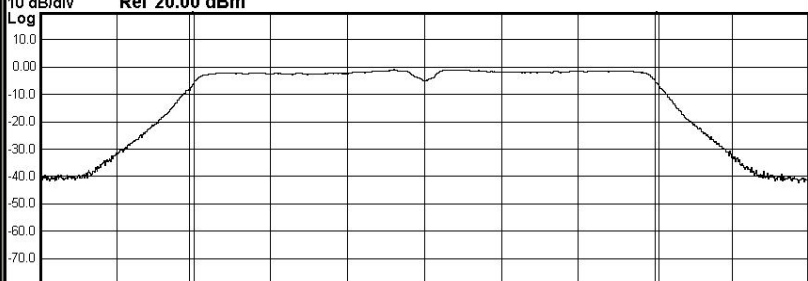
Frequency

Center Freq
2.462000000 GHz

CF Step
3.000000 MHz
Auto Man

Freq Offset
0 Hz

11N20SISO/LCH	Agilent Spectrum Analyzer - Channel Power RL RF 50 Ω AC SENSE:INT ALIGN: AUTO 02:24:51 PM May 29, 2020 Center Freq 2.412000000 GHz Center Freq: 2.412000000 GHz Trig: Free Run Avg Hold: 1/1 Radio Std: None #IFGain: 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 13.81 dBm / 17.76 MHz -58.69 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 02:27:22 PM May 29, 2020 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 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 13.92 dBm / 17.7 MHz -58.56 dBm /Hz MSG STATUS	Frequency Center Freq 2.437000000 GHz CF Step 3.000000 MHz Auto Man Freq Offset 0 Hz

11N20SISO/HCH	Agilent Spectrum Analyzer - Channel Power RL RF 50 Ω AC SENSE:INT ALIGN AUTO 02:30:23 PM May 29, 2020 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 10 dB/div Ref Offset 8.05 dB Ref 20.00 dBm Log  Center 2.462 GHz #Res BW 1 MHz #VBW 3 MHz Span 30 MHz #Sweep 100 ms Channel Power Power Spectral Density 14.03 dBm / 17.72 MHz -58.45 dBm /Hz MSG STATUS	Frequency Center Freq 2.462000000 GHz CF Step 3.000000 MHz Auto Man Freq Offset 0 Hz
11N40SISO/LCH	Agilent Spectrum Analyzer - Channel Power RL RF 50 Ω AC SENSE:INT ALIGN AUTO 02:32:53 PM May 29, 2020 Center Freq 2.422000000 GHz Center Freq: 2.422000000 GHz Trig: Free Run Avg Hold: 1/1 Radio Std: None #IFGain:Low #Atten: 30 dB Radio Device: BTS 10 dB/div Ref Offset 8.05 dB Ref 20.00 dBm Log  Center 2.422 GHz #Res BW 1 MHz #VBW 3 MHz Span 60 MHz #Sweep 100 ms Channel Power Power Spectral Density 13.33 dBm / 36.5 MHz -62.30 dBm /Hz MSG STATUS	Frequency Center Freq 2.422000000 GHz CF Step 6.000000 MHz Auto Man Freq Offset 0 Hz

Agilent Spectrum Analyzer - Channel Power

Center Freq 2.437000000 GHz

Ref Offset 8.05 dB
Ref 20.00 dBm

10 dB/div
Log

Center 2.437 GHz
#Res BW 1 MHz

#VBW 3 MHz

Span 60 MHz
#Sweep 100 ms

Channel Power

Power Spectral Density

13.60 dBm / 36.49 MHz

-62.02 dBm /Hz

Frequency

Center Freq
2.437000000 GHz

CF Step
6.000000 MHz
Auto Man

Freq Offset
0 Hz

11N40SISO/MCH

Agilent Spectrum Analyzer - Channel Power

Center Freq 2.452000000 GHz

Ref Offset 8.05 dB
Ref 20.00 dBm

10 dB/div
Log

Center 2.452 GHz
#Res BW 1 MHz

#VBW 3 MHz

Span 60 MHz
#Sweep 100 ms

Channel Power

Power Spectral Density

13.73 dBm / 36.53 MHz

-61.90 dBm /Hz

Frequency

Center Freq
2.452000000 GHz

CF Step
6.000000 MHz
Auto Man

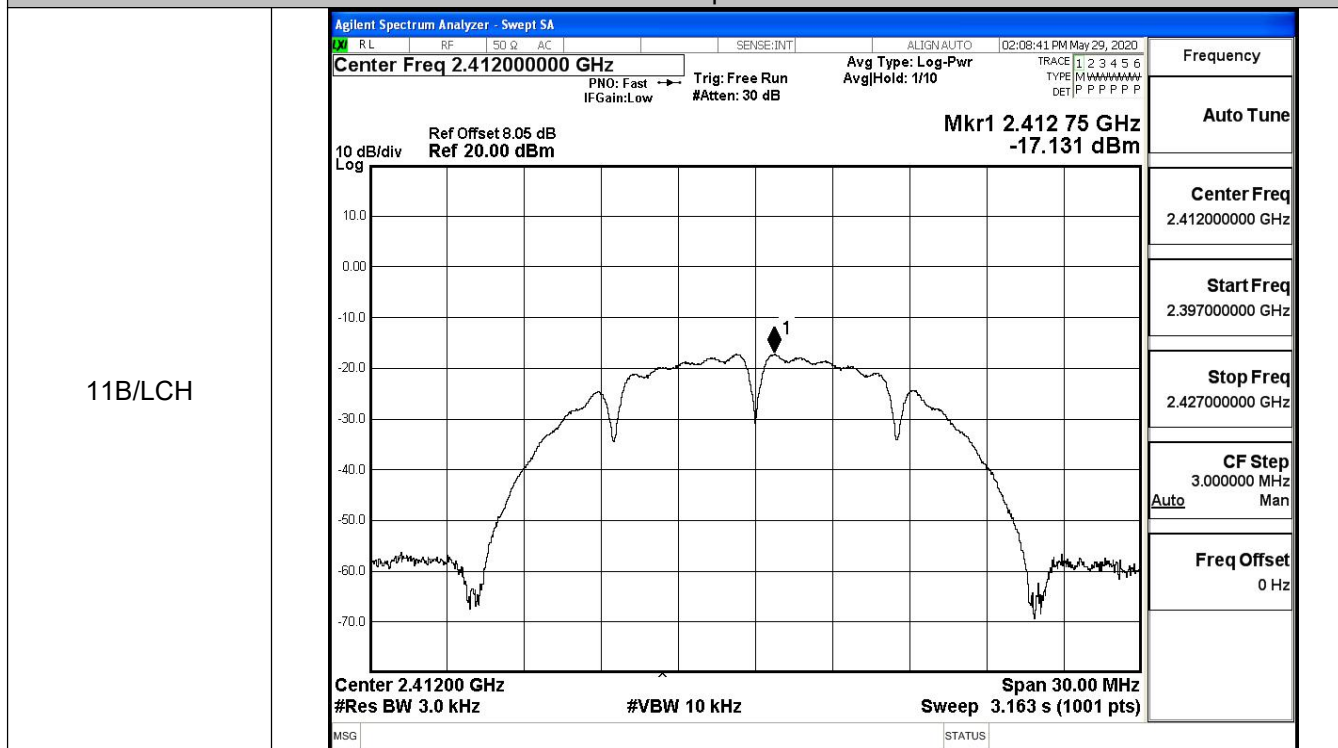
Freq Offset
0 Hz

11N40SISO/HCH

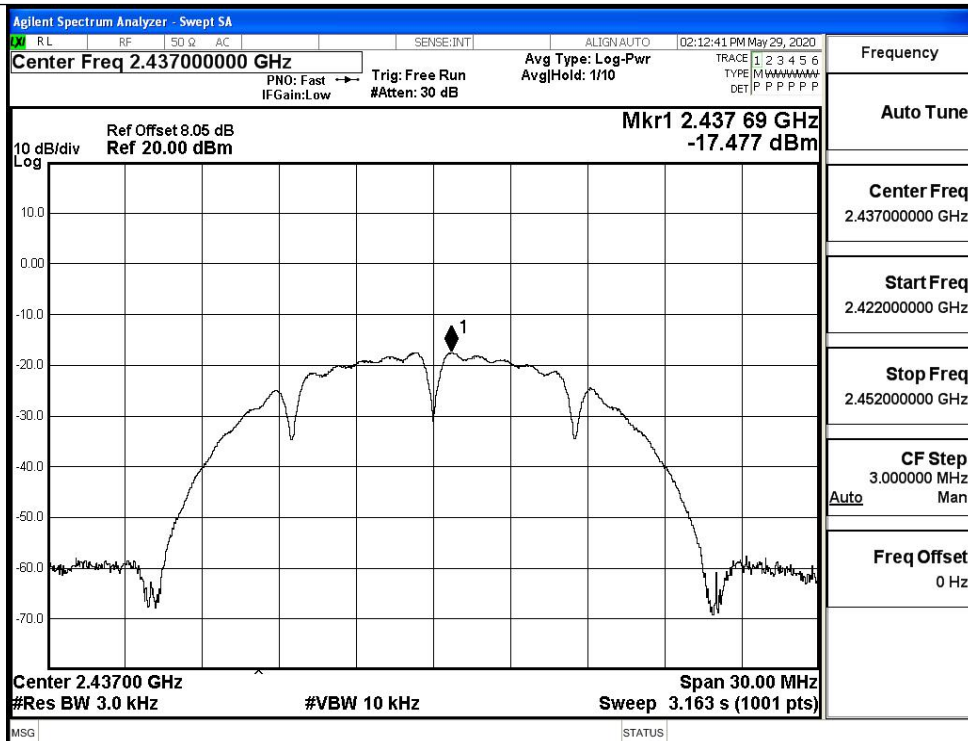
A.3 Maximum Power Spectral Density

Mode	Channel	Meas.Level [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
11B	LCH	-17.131	8	PASS
	MCH	-17.477	8	PASS
	HCH	-17.345	8	PASS
11G	LCH	-22.671	8	PASS
	MCH	-22.109	8	PASS
	HCH	-21.654	8	PASS
11N20SISO	LCH	-22.375	8	PASS
	MCH	-21.956	8	PASS
	HCH	-21.815	8	PASS
11N40SISO	LCH	-25.064	8	PASS
	MCH	-25.364	8	PASS
	HCH	-24.523	8	PASS

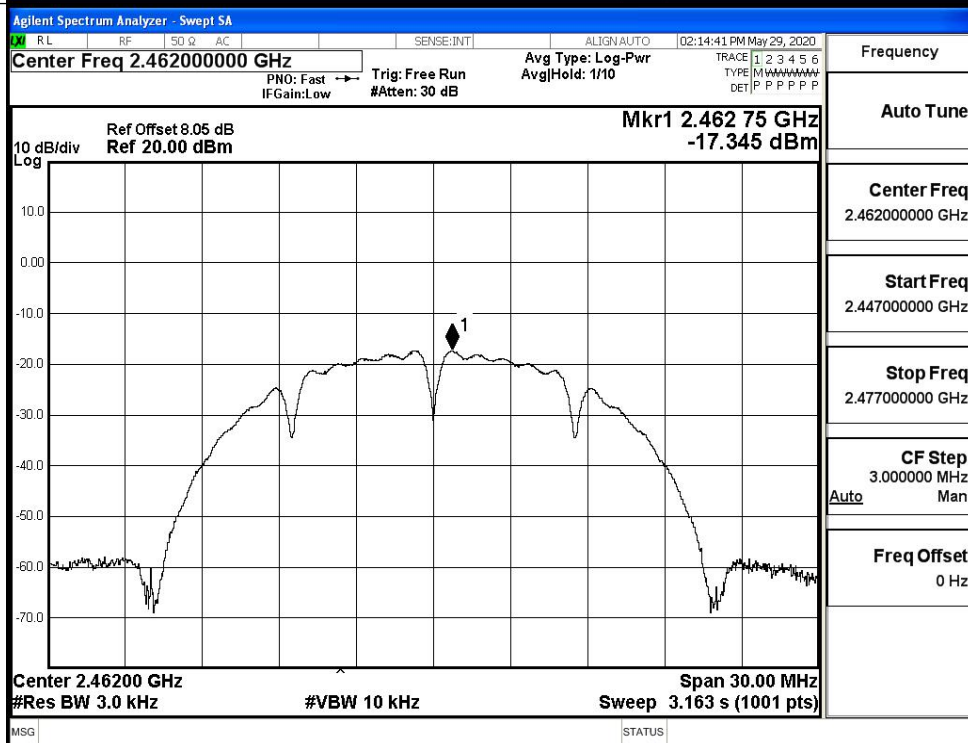
Test Graphs



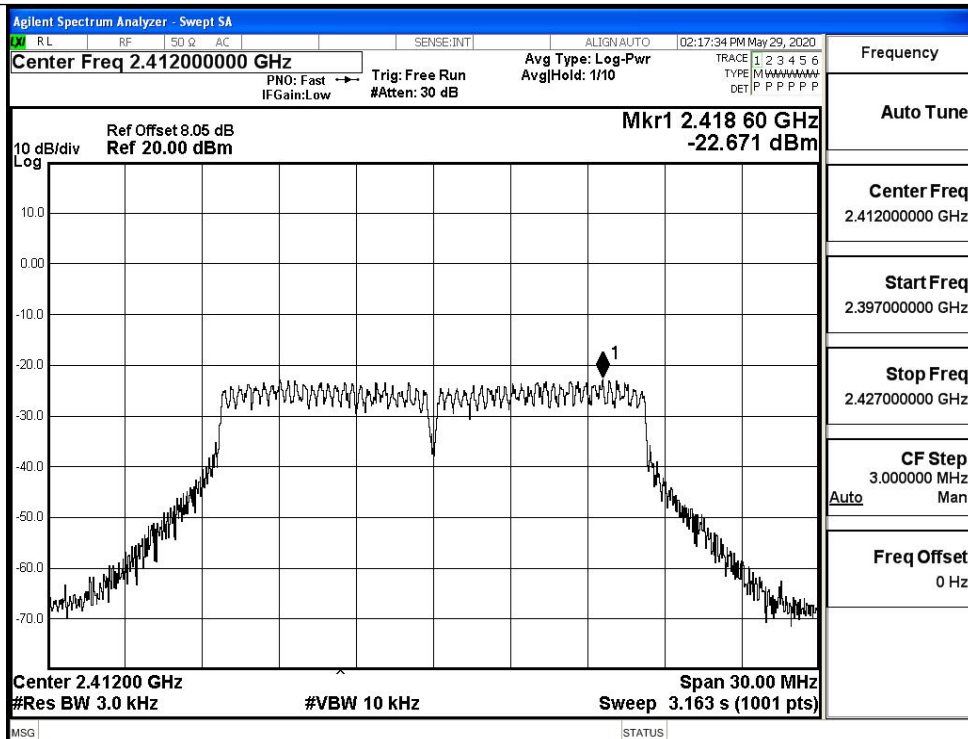
11B/MCH



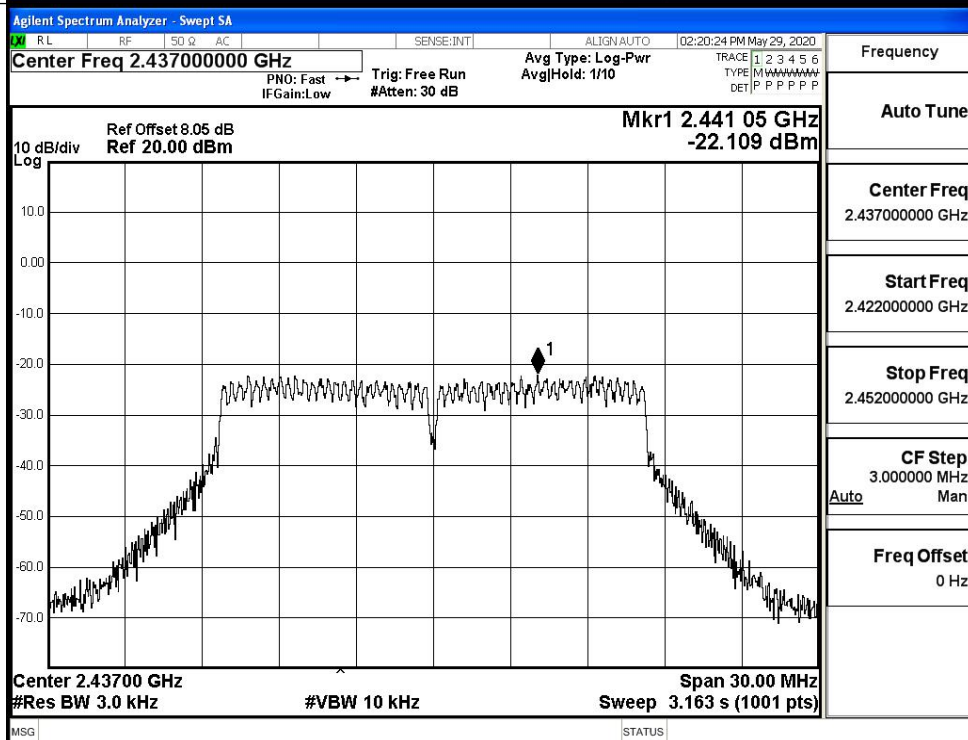
11B/HCH



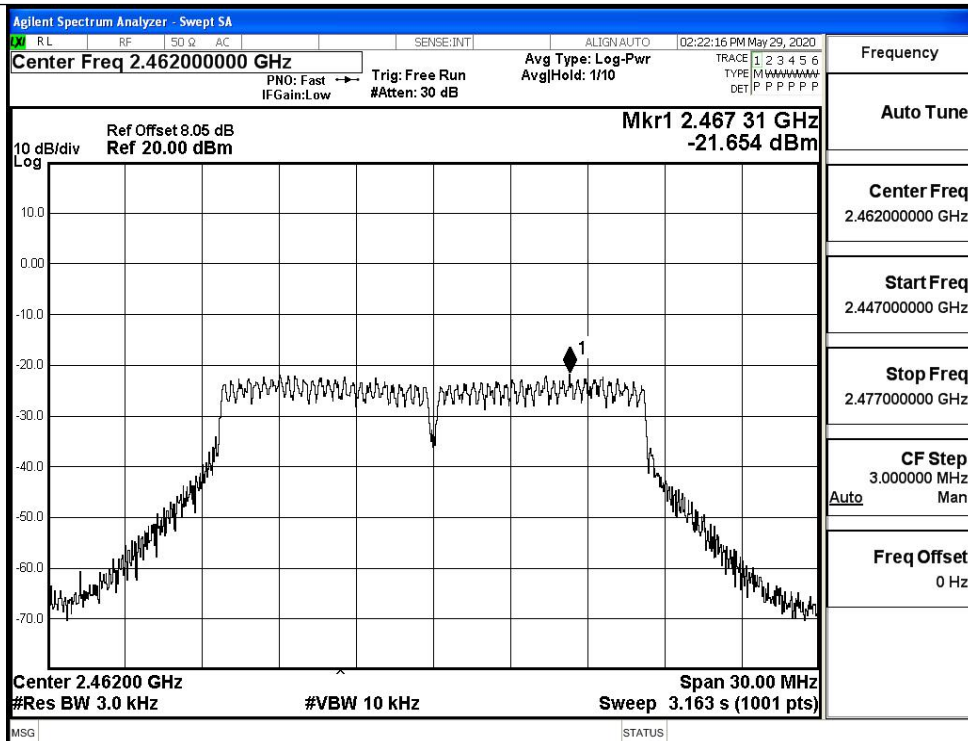
11G/LCH



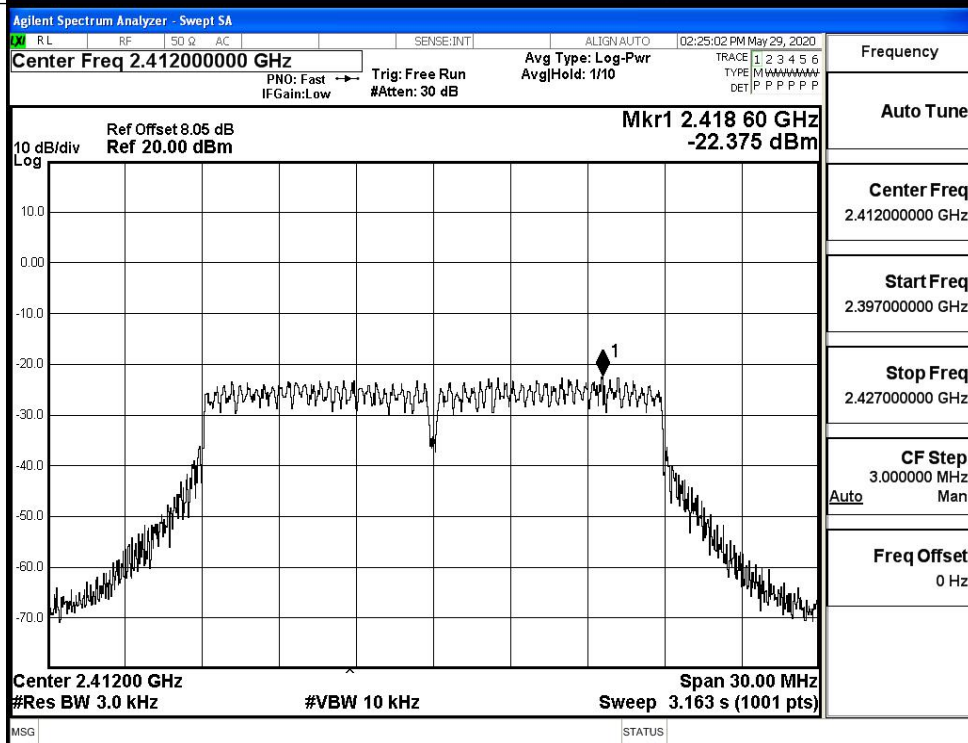
11G/MCH

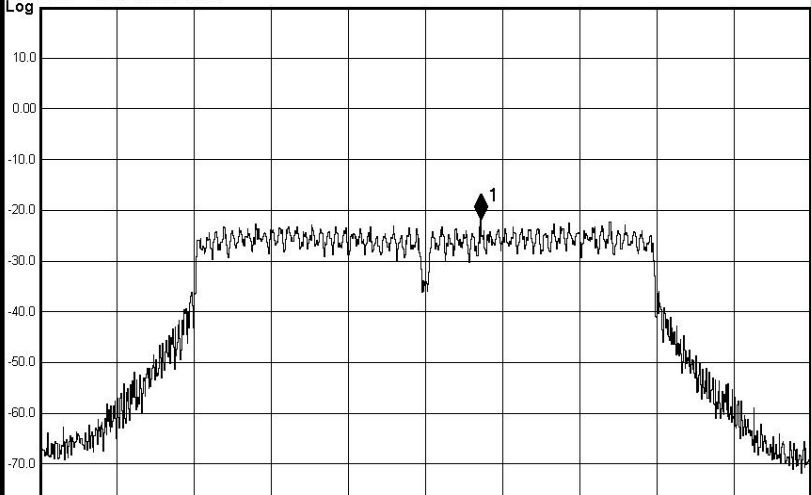
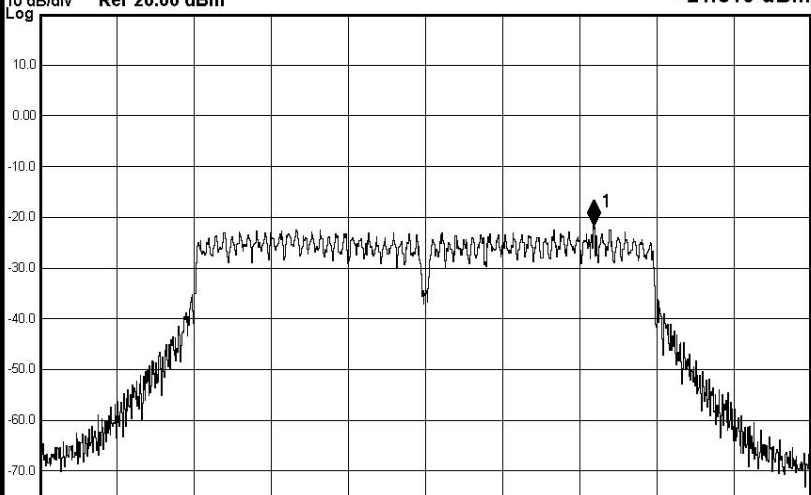


11G/HCH

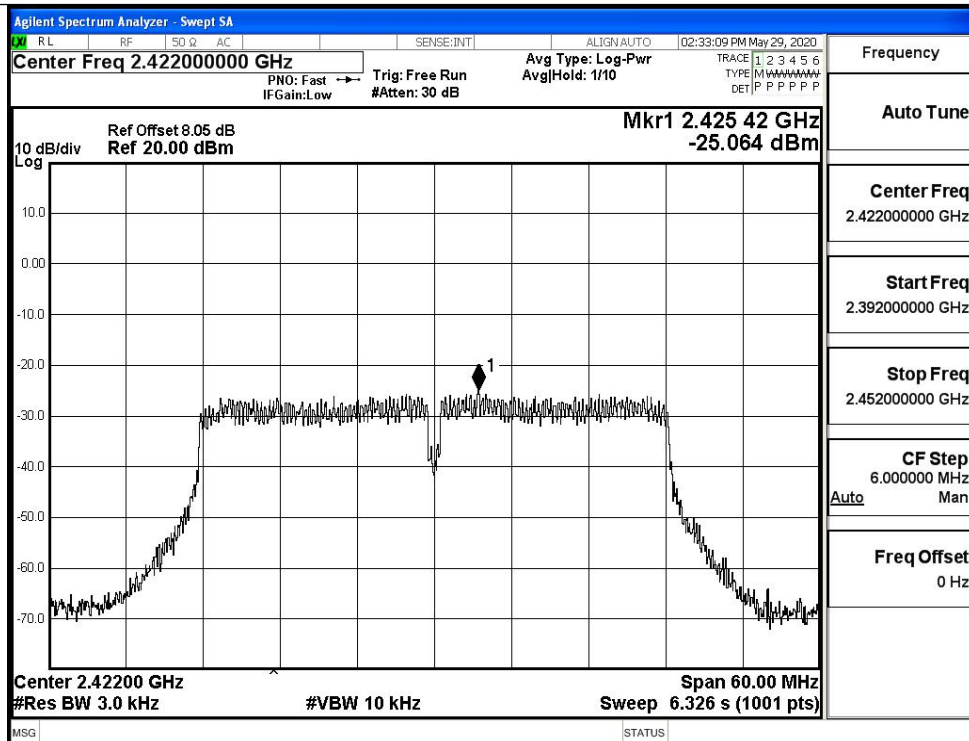


11N20SISO/LCH

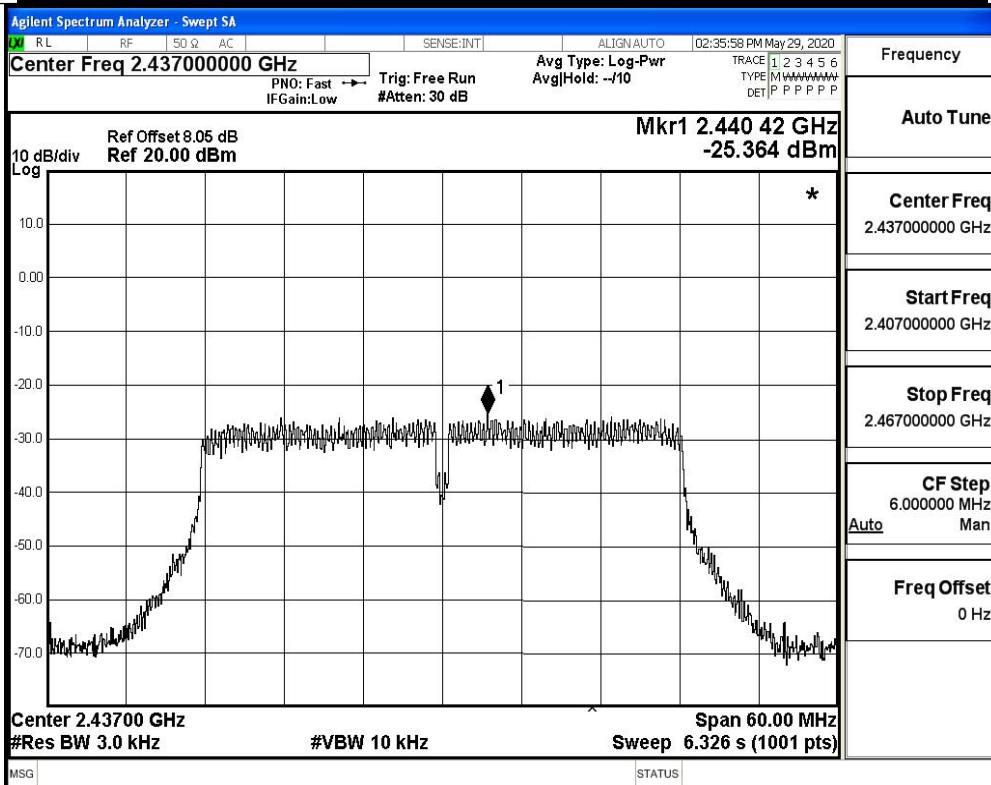


11N20SISO/MCH	Agilent Spectrum Analyzer - Swept SA RL RF SO Q AC SENSE:INT ALIGN AUTO 02:27:33 PM May 29, 2020 Center Freq 2.437000000 GHz PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB Avg Type: Log-Pwr Avg Hold: 1/10 TRACE 1 2 3 4 5 6 TYPE M W W W W W W W DET P P P P P P P Frequency Auto Tune 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 10 dB/div Ref Offset 8.05 dB Mkr1 2.439 16 GHz Log Ref 20.00 dBm -21.956 dBm  Center 2.43700 GHz Span 30.00 MHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 3.163 s (1001 pts) MSG STATUS
11N20SISO/HCH	Agilent Spectrum Analyzer - Swept SA RL RF SO Q AC SENSE:INT ALIGN AUTO 02:30:35 PM May 29, 2020 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 W W W W W W DET P P P P P P P 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 10 dB/div Ref Offset 8.05 dB Mkr1 2.468 54 GHz Log Ref 20.00 dBm -21.815 dBm  Center 2.46200 GHz Span 30.00 MHz #Res BW 3.0 kHz #VBW 10 kHz Sweep 3.163 s (1001 pts) MSG STATUS

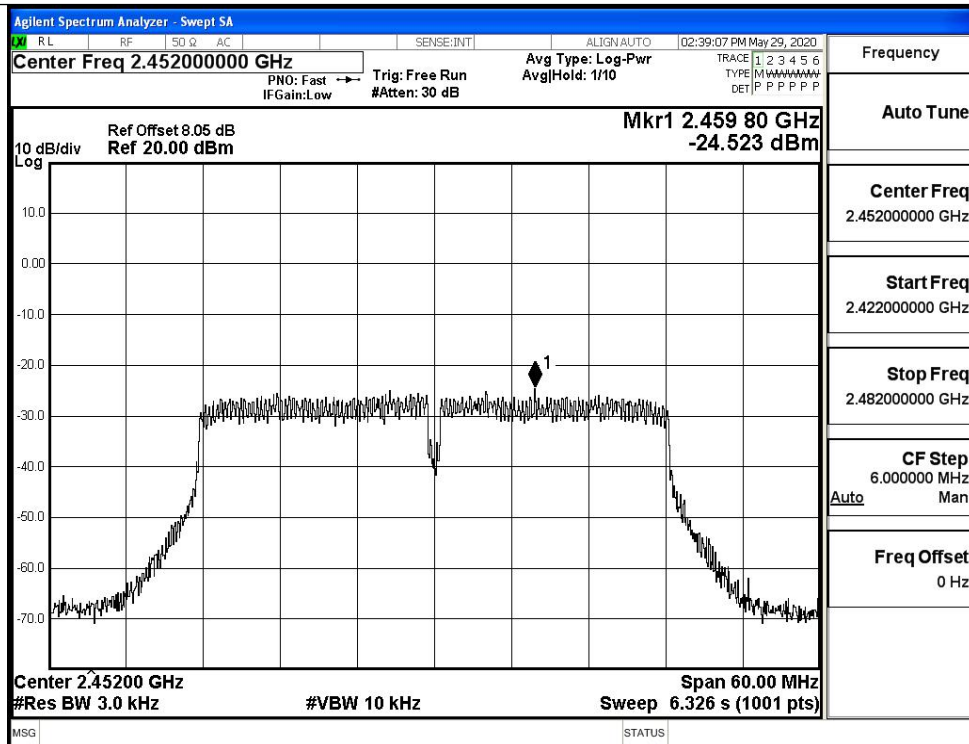
11N40SISO/LCH



11N40SISO/MCH



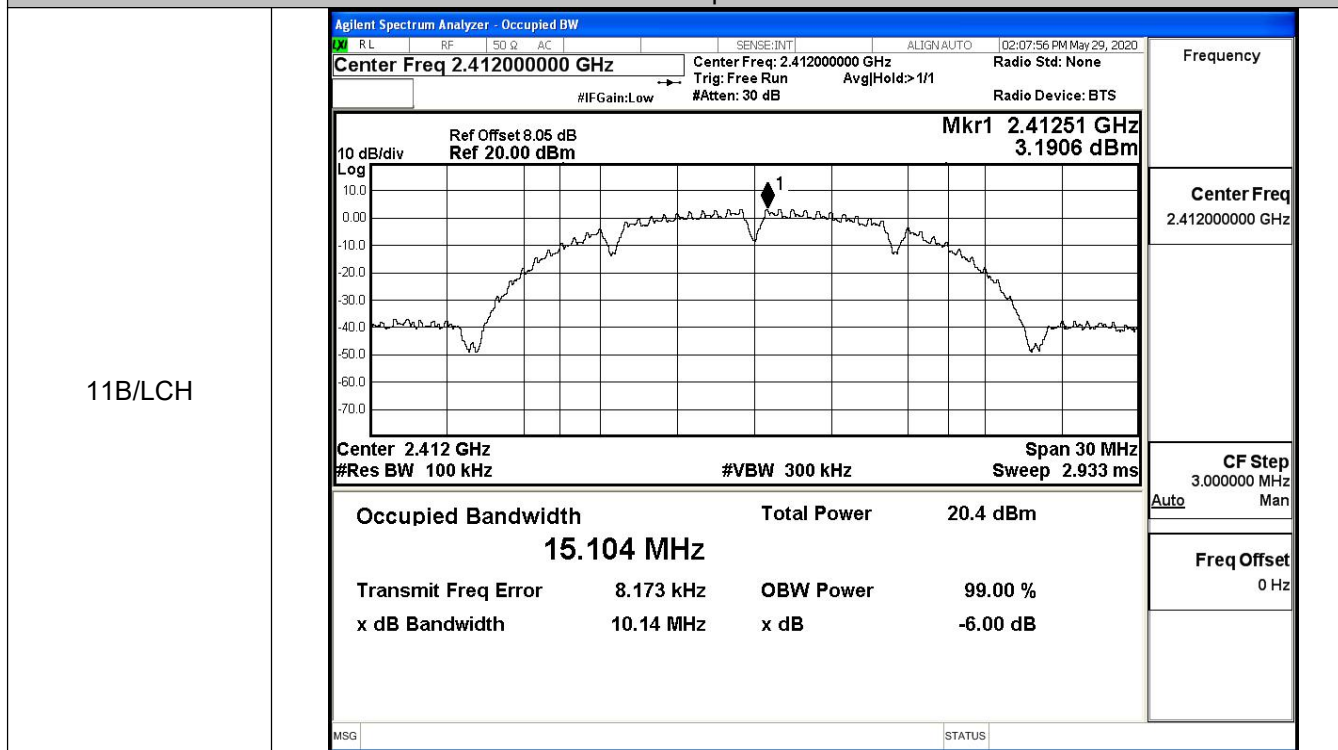
11N40SISO/HCH



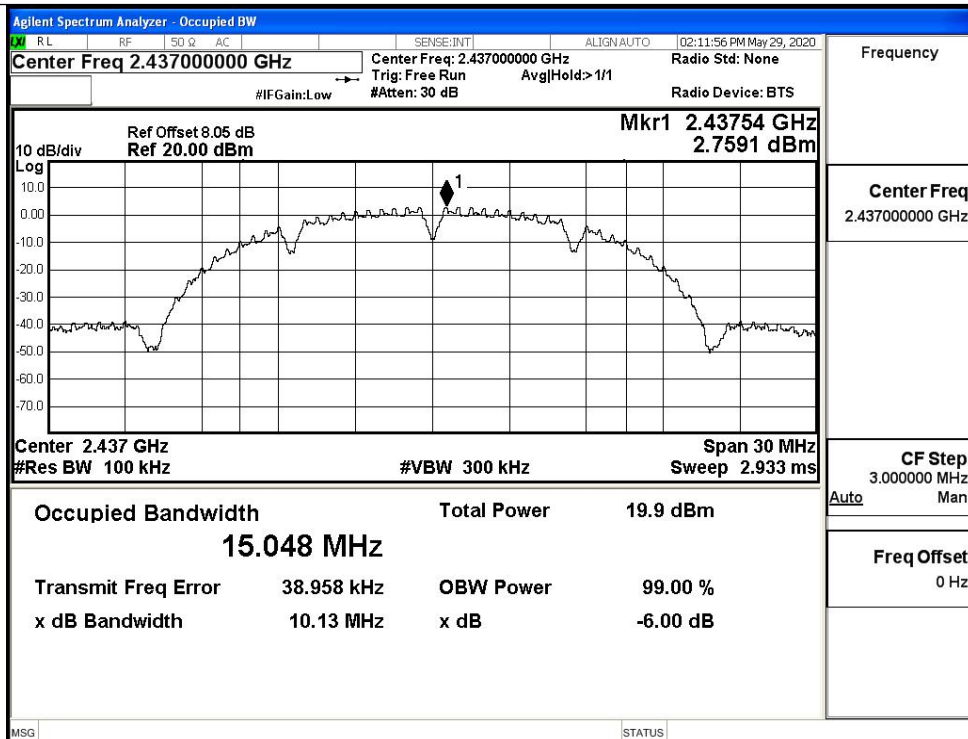
A.4 6dB Bandwidth

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
11B	LCH	10.14	≥ 0.5	PASS
	MCH	10.13	≥ 0.5	PASS
	HCH	10.13	≥ 0.5	PASS
11G	LCH	16.56	≥ 0.5	PASS
	MCH	16.54	≥ 0.5	PASS
	HCH	16.56	≥ 0.5	PASS
11N20SISO	LCH	17.76	≥ 0.5	PASS
	MCH	17.70	≥ 0.5	PASS
	HCH	17.72	≥ 0.5	PASS
11N40SISO	LCH	36.50	≥ 0.5	PASS
	MCH	36.49	≥ 0.5	PASS
	HCH	36.53	≥ 0.5	PASS

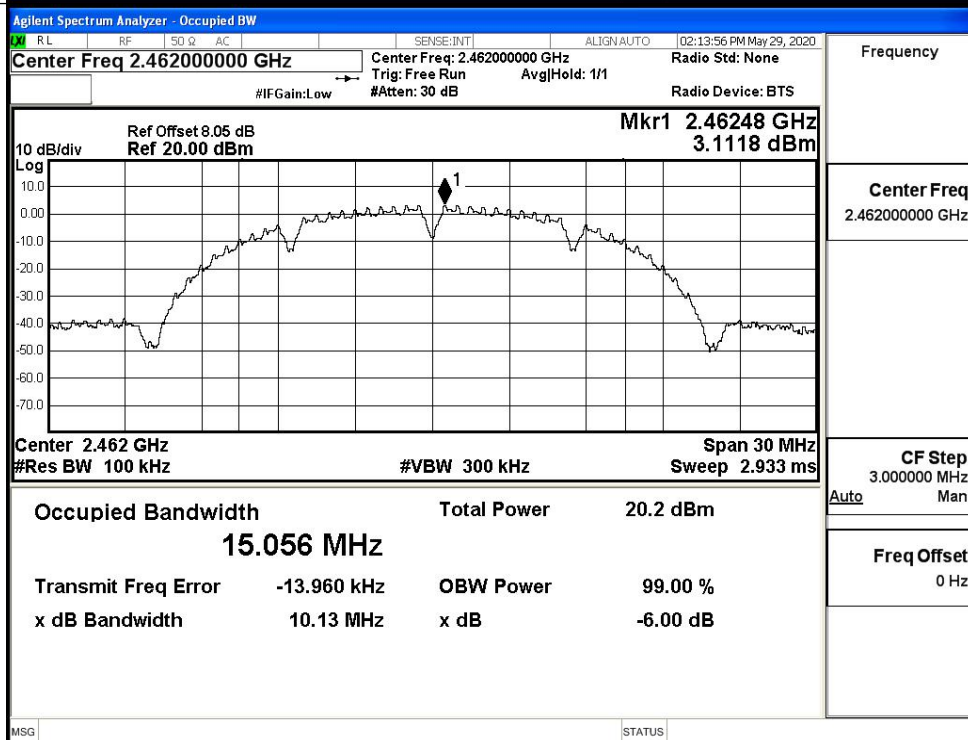
Test Graphs



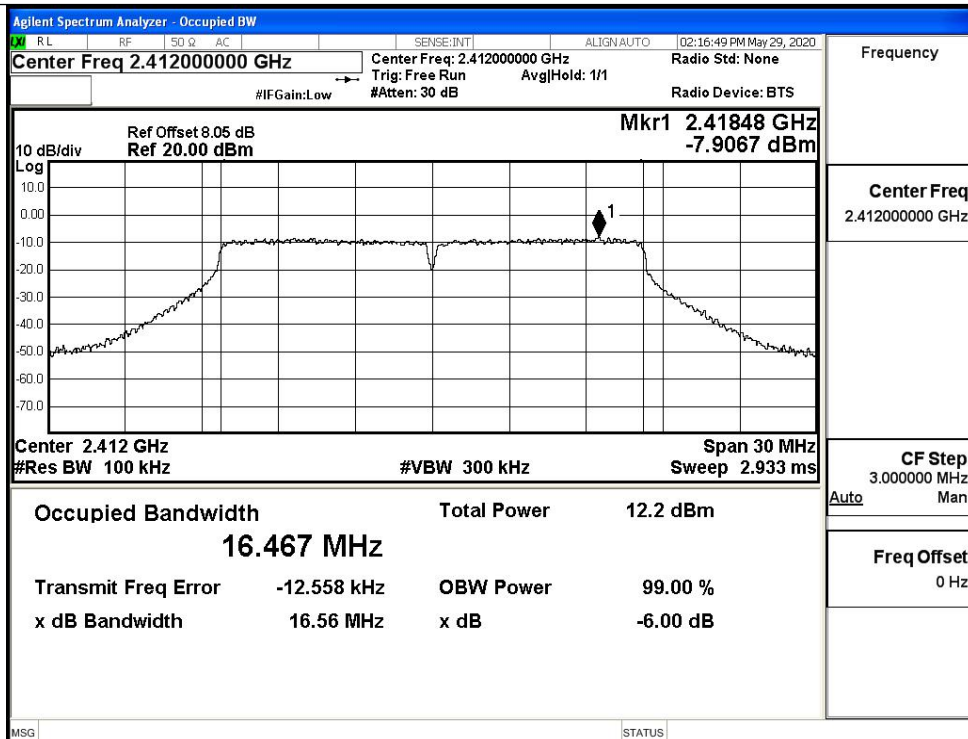
11B/MCH



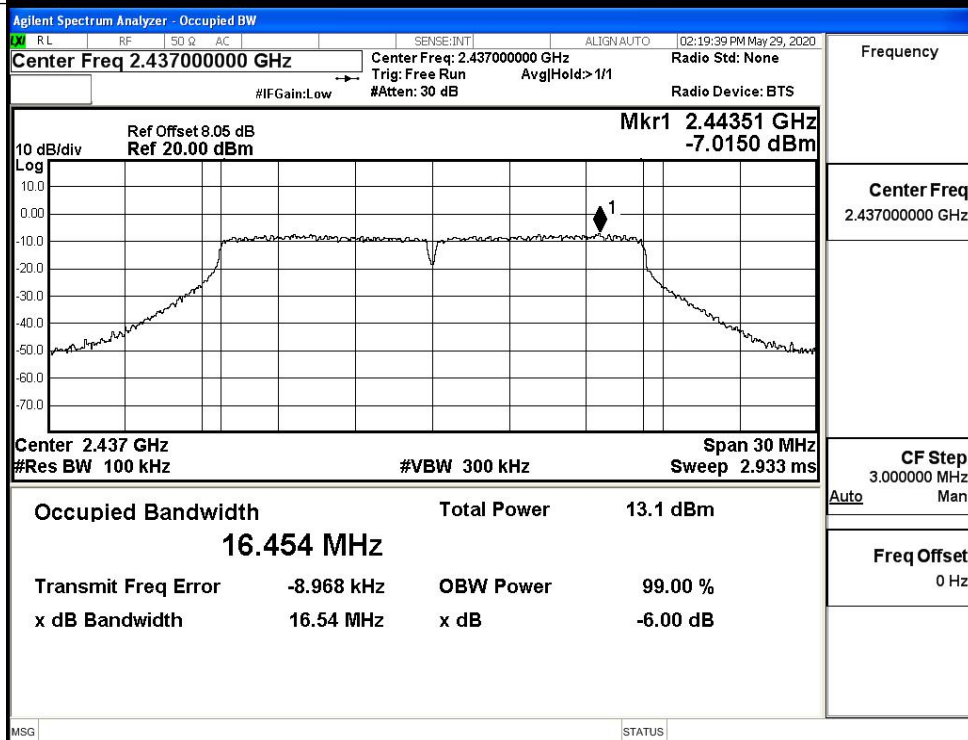
11B/HCH



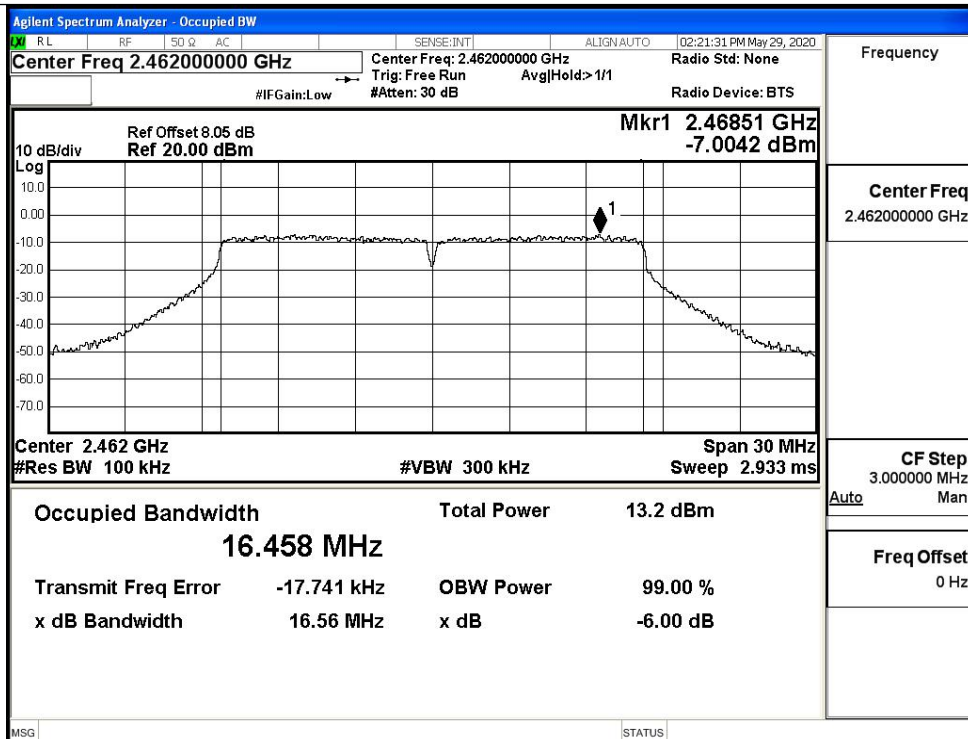
11G/LCH



11G/MCH



11G/HCH



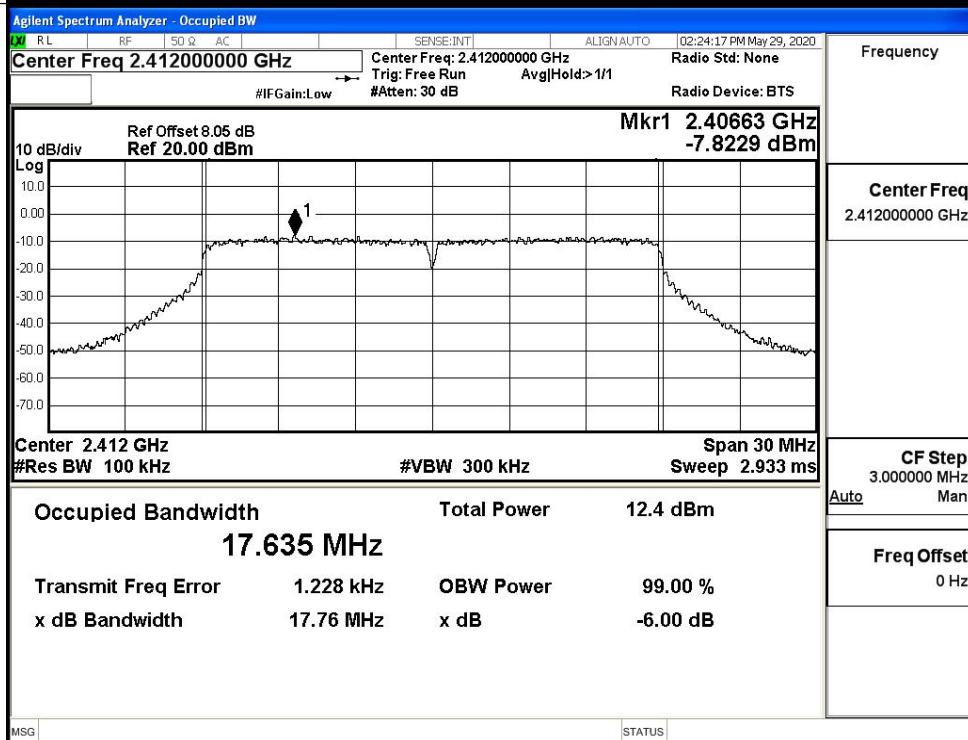
Frequency

Center Freq
2.462000000 GHz

CF Step
3.000000 MHz
Auto Man

Freq Offset
0 Hz

11N20SISO/LCH

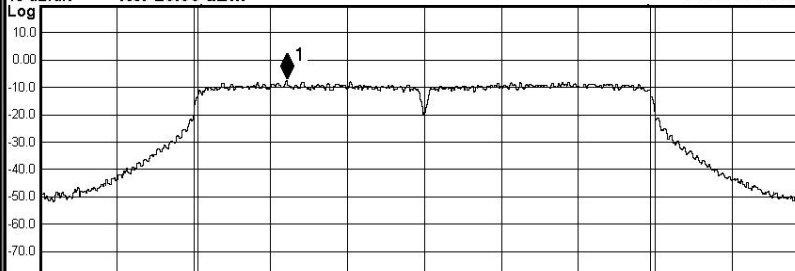
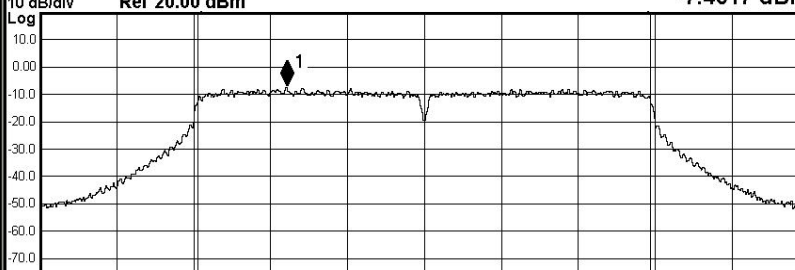


Frequency

Center Freq
2.412000000 GHz

CF Step
3.000000 MHz
Auto Man

Freq Offset
0 Hz

11N20SISO/MCH	Agilent Spectrum Analyzer - Occupied BW RL RF 50 Ω AC SENSE:INT ALIGN AUTO 02:26:49 PM May 29, 2020 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 10 dB/div Ref Offset 8.05 dB Ref 20.00 dBm Mkr1 2.43163 GHz -7.4623 dBm  Center 2.437 GHz #Res BW 100 kHz #VBW 300 kHz Span 30 MHz Sweep 2.933 ms Occupied Bandwidth 17.629 MHz Total Power 12.5 dBm Transmit Freq Error 2.871 kHz OBW Power 99.00 % x dB Bandwidth 17.70 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 02:29:50 PM May 29, 2020 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 10 dB/div Ref Offset 8.05 dB Ref 20.00 dBm Mkr1 2.45663 GHz -7.4517 dBm  Center 2.462 GHz #Res BW 100 kHz #VBW 300 kHz Span 30 MHz Sweep 2.933 ms Occupied Bandwidth 17.632 MHz Total Power 12.6 dBm Transmit Freq Error -4.714 kHz OBW Power 99.00 % x dB Bandwidth 17.72 MHz x dB -6.00 dB MSG STATUS

Frequency

Center Freq

2.462000000 GHz

CF Step

3.000000 MHz

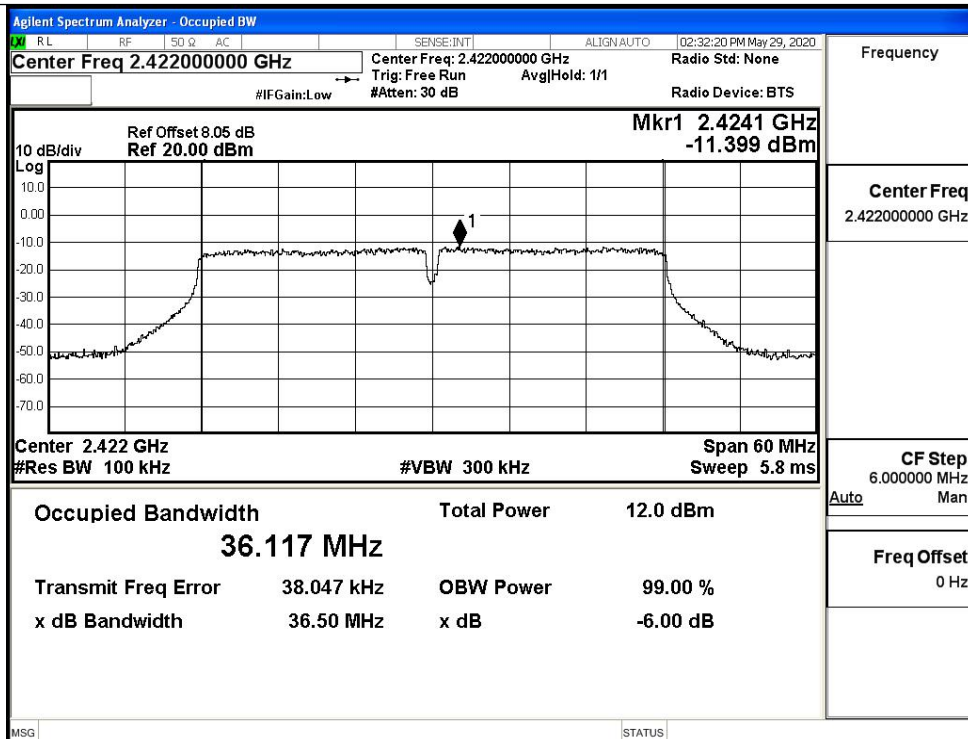
Auto

Man

Freq Offset

0 Hz

11N40SISO/LCH



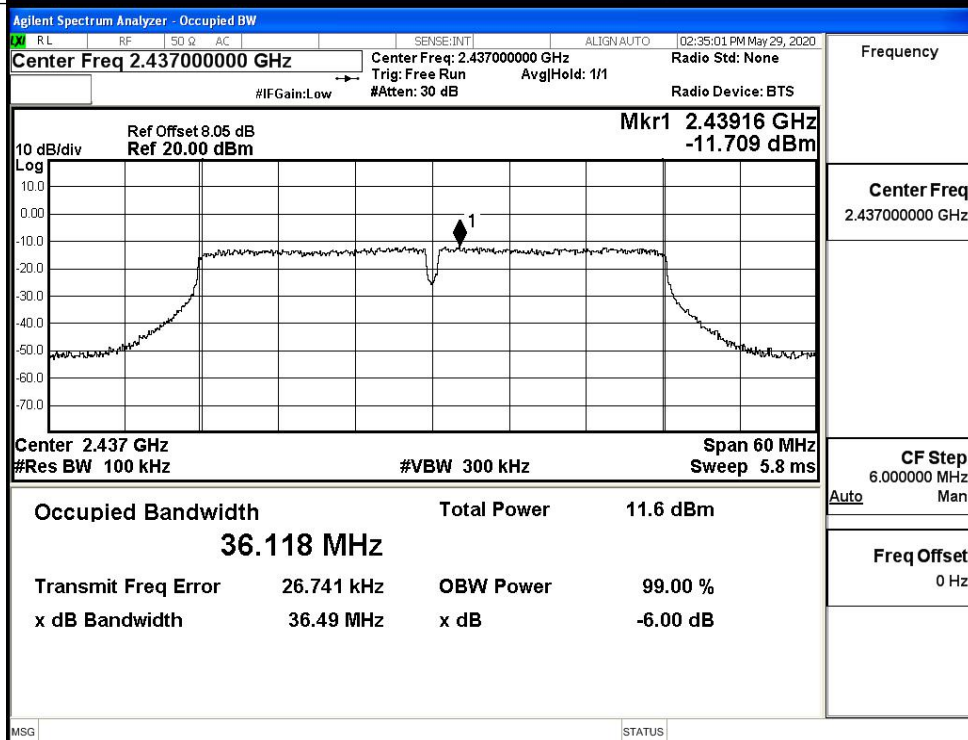
Frequency

Center Freq
2.422000000 GHz

CF Step
6.000000 MHz
Auto Man

Freq Offset
0 Hz

11N40SISO/MCH

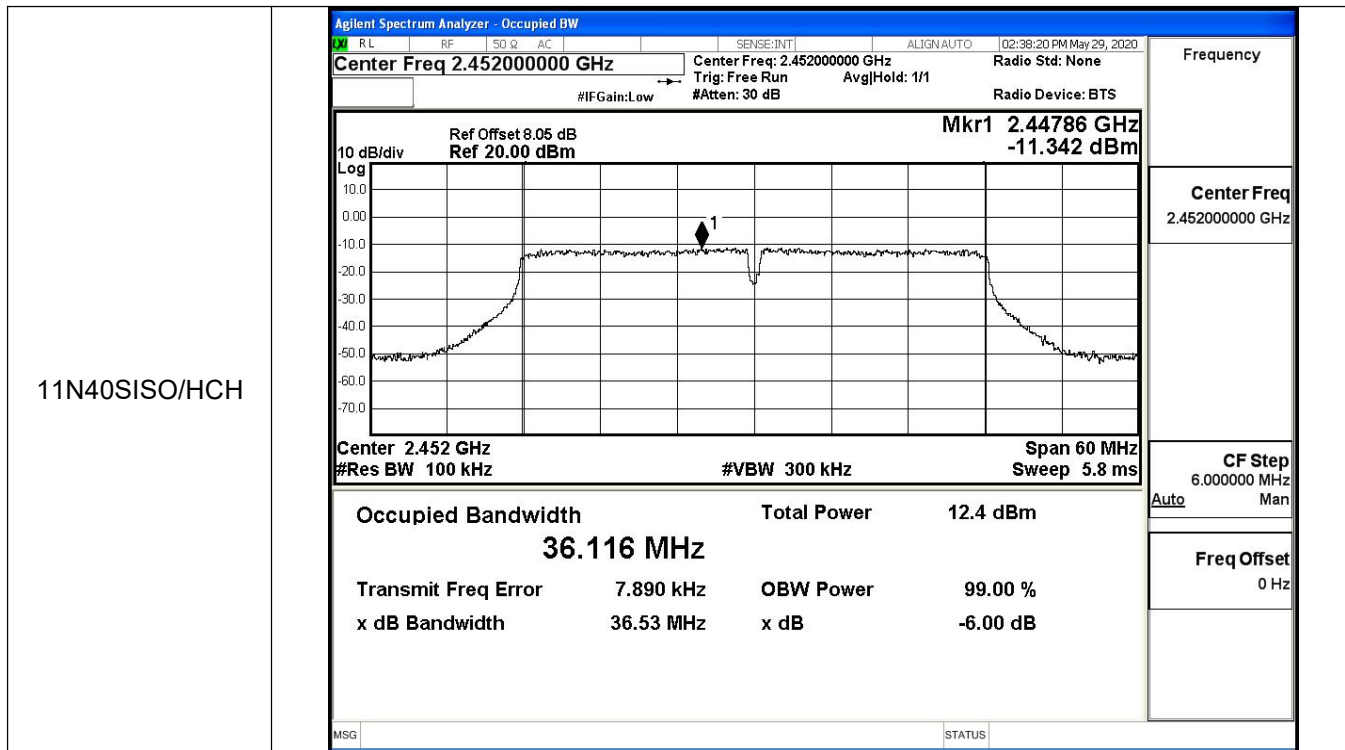


Frequency

Center Freq
2.437000000 GHz

CF Step
6.000000 MHz
Auto Man

Freq Offset
0 Hz

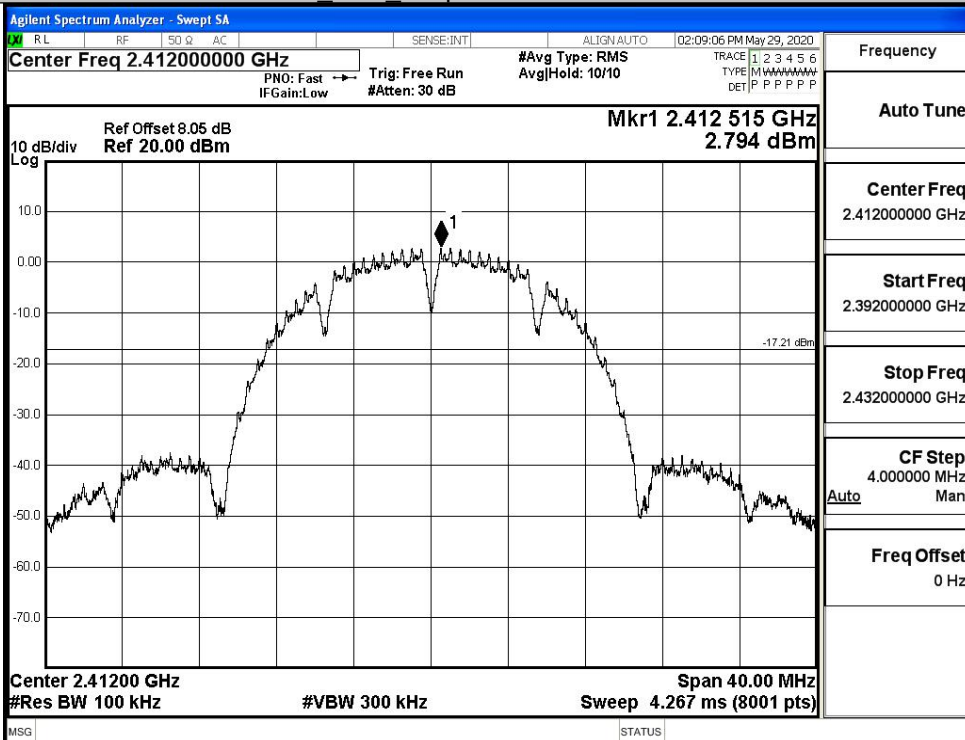


A.5 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
11B	LCH	2.794	-37.087	-17.206	PASS
	MCH	2.602	-38.277	-17.398	PASS
	HCH	2.721	-38.200	-17.279	PASS
11G	LCH	-8.234	-37.945	-28.234	PASS
	MCH	-7.339	-37.739	-27.339	PASS
	HCH	-7.226	-37.541	-27.226	PASS
11N20 SISO	LCH	-7.949	-38.055	-27.949	PASS
	MCH	-7.745	-38.534	-27.745	PASS
	HCH	-7.879	-37.536	-27.879	PASS
11N40 SISO	LCH	-11.606	-38.317	-31.606	PASS
	MCH	-11.484	-37.913	-31.484	PASS
	HCH	-11.491	-38.298	-31.491	PASS

11B LCH Graphs

Pref/11B/LCH



Puw/11B/LCH

