Appendix A

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: LED Projector

Trade Mark: N/A

Test Model: K2

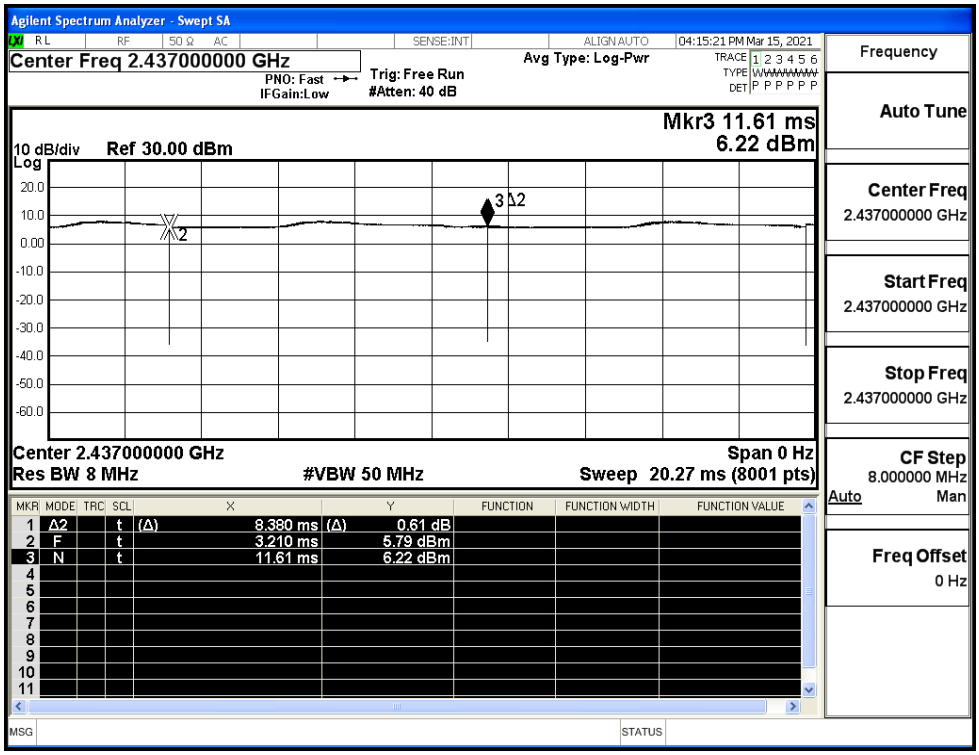
Environmental Conditions

Temperature:	24.2 ° C
Relative Humidity:	57.7%
ATM Pressure:	100.0 kPa
Test Engineer:	Carl Fu
Supervised by:	Li Huan

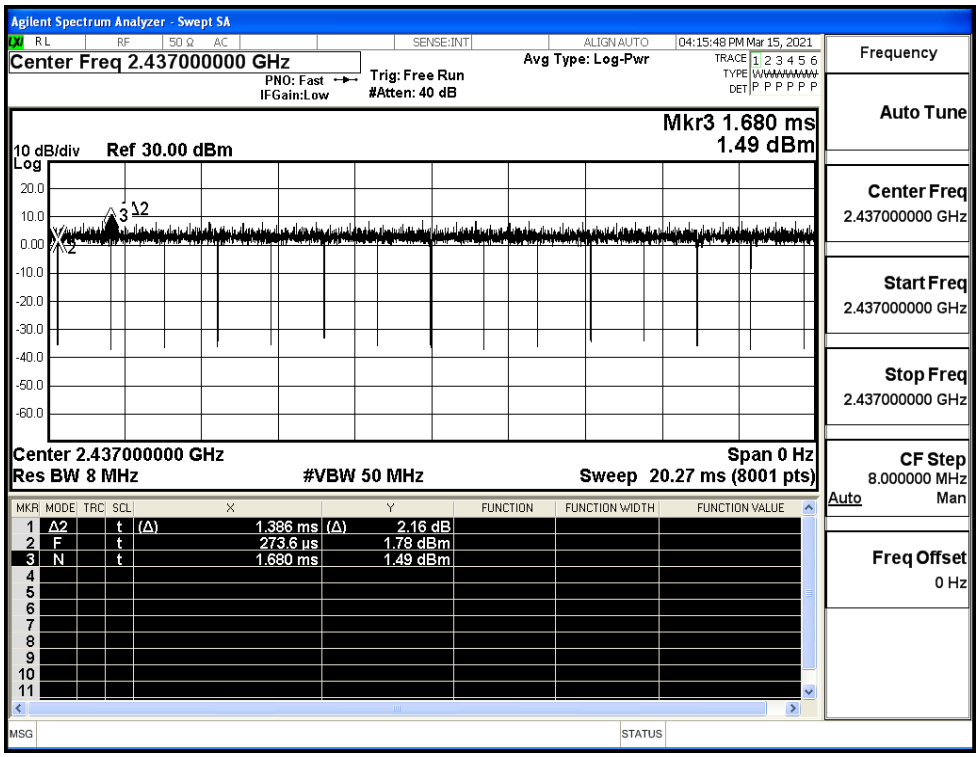
A.1 Duty Cycle

Test Mode	Test Channel	Ant	Duty Cycle[%]	10log(1/x) Factor (dB)	1/B Minimum VBW(KHz)
11B	2437	Ant1	99.79	0.01	PASS
11G	2437	Ant1	98.56	0.06	PASS
11N20SISO	2437	Ant1	98.46	0.07	PASS
11N40SISO	2437	Ant1	97.68	0.10	PASS

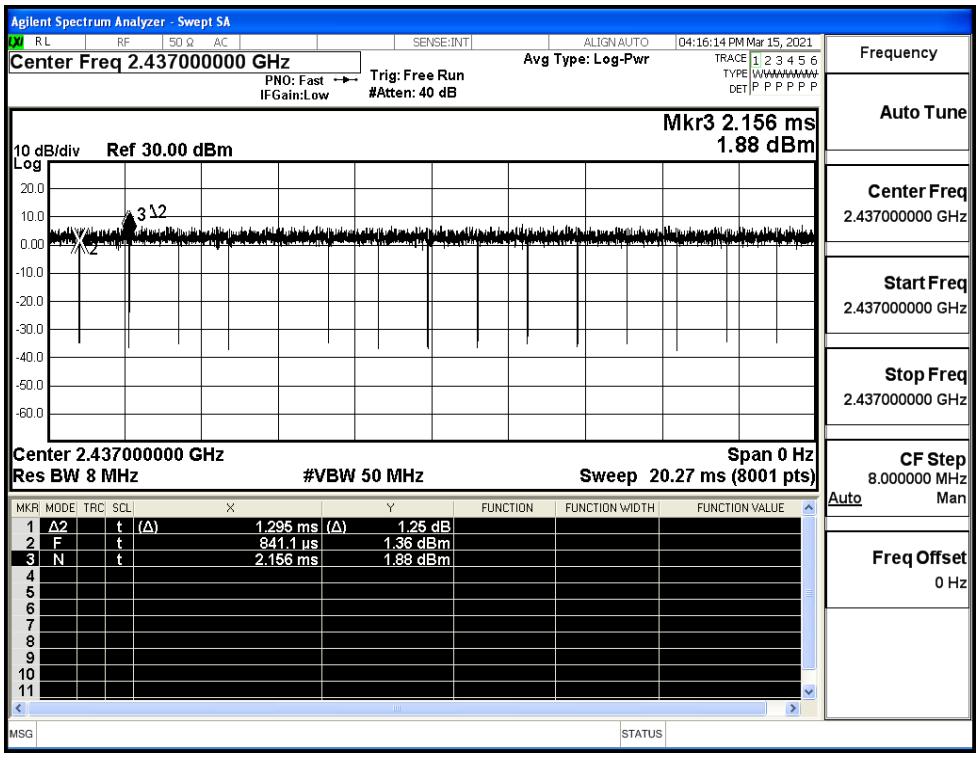
Duty Cycle_11B_2437_Ant1



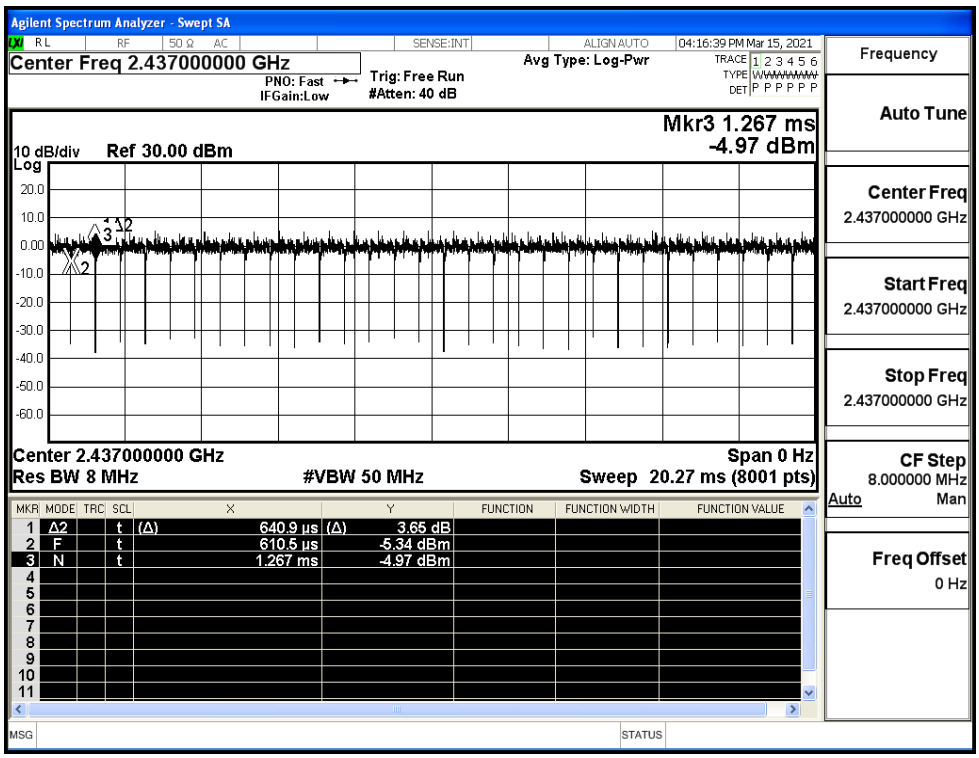
Duty Cycle_11G_2437_Ant1



Duty Cycle_11N20SISO_2437_Ant1



Duty Cycle_11N40SISO_2437_Ant1

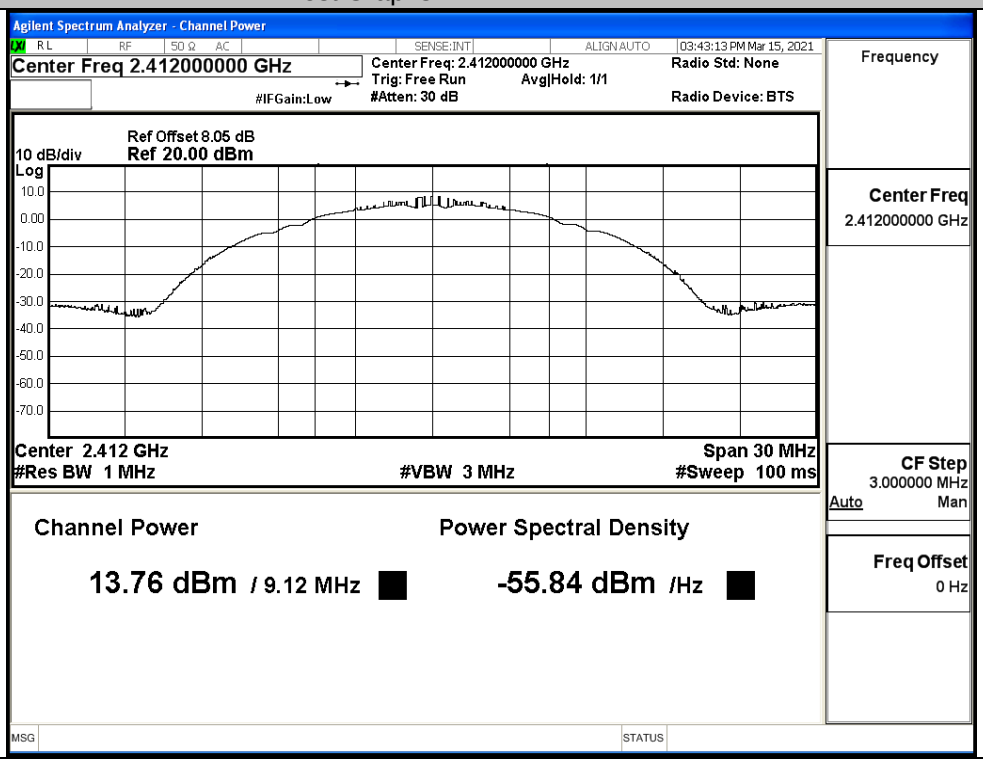


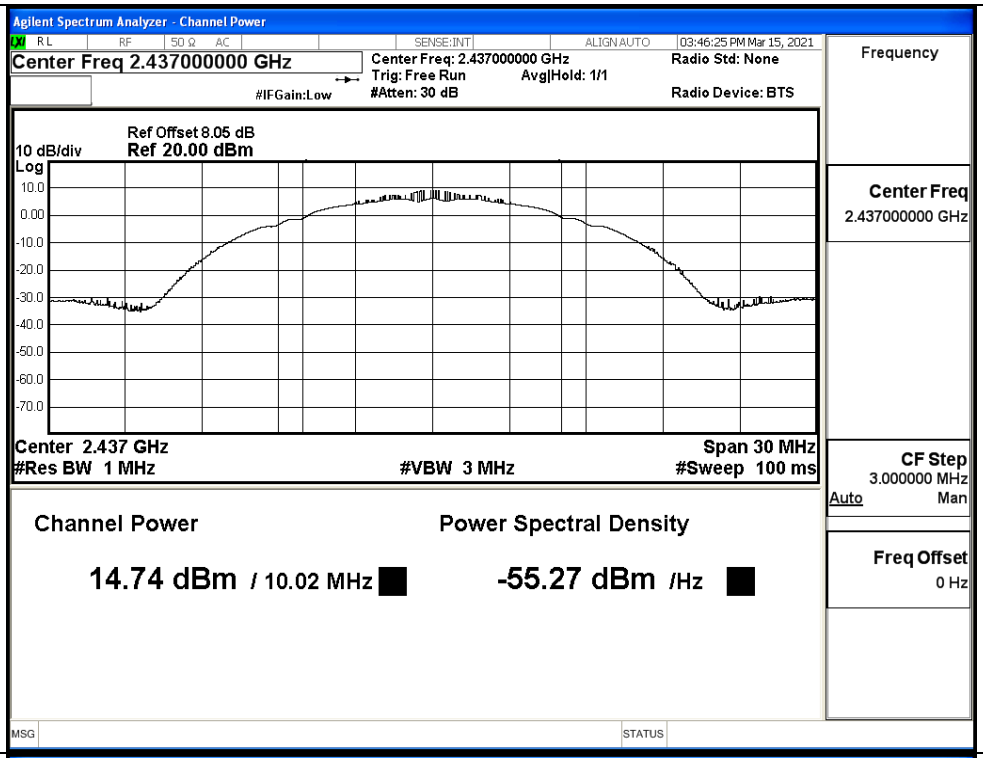
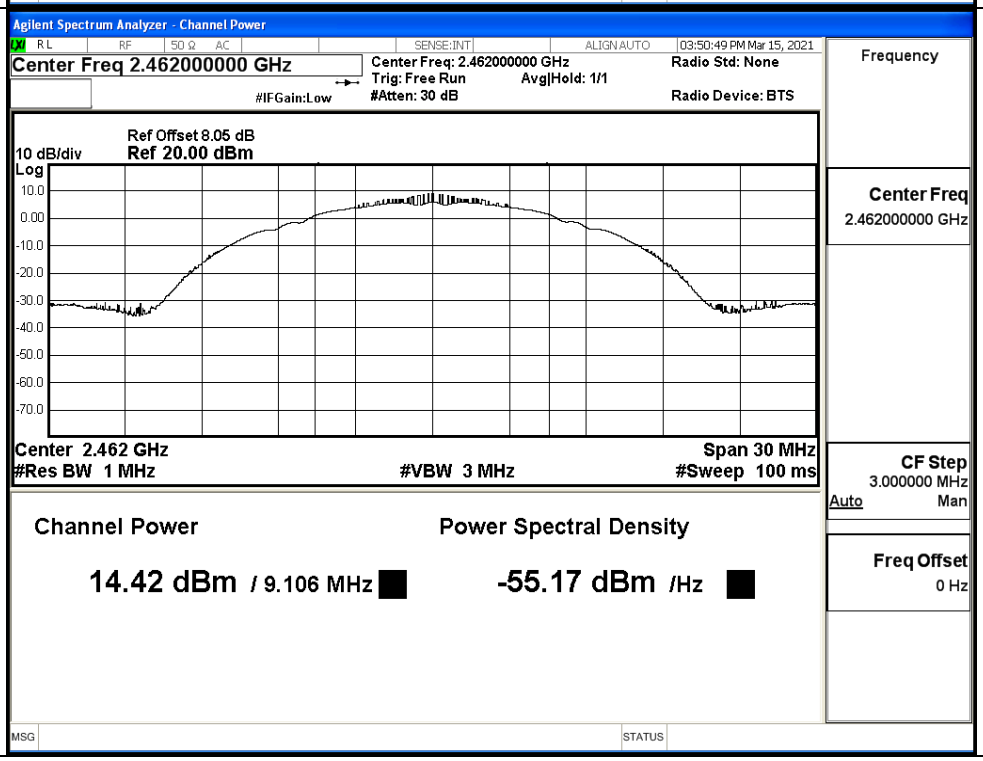
A.2 Maximum Conducted Output Power

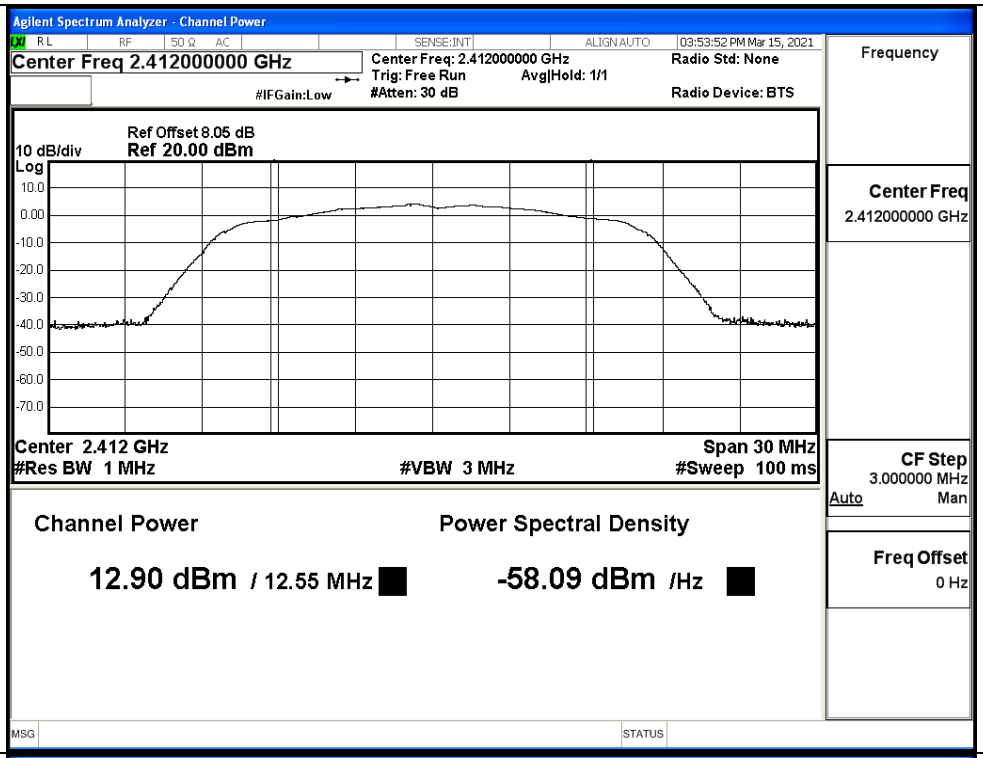
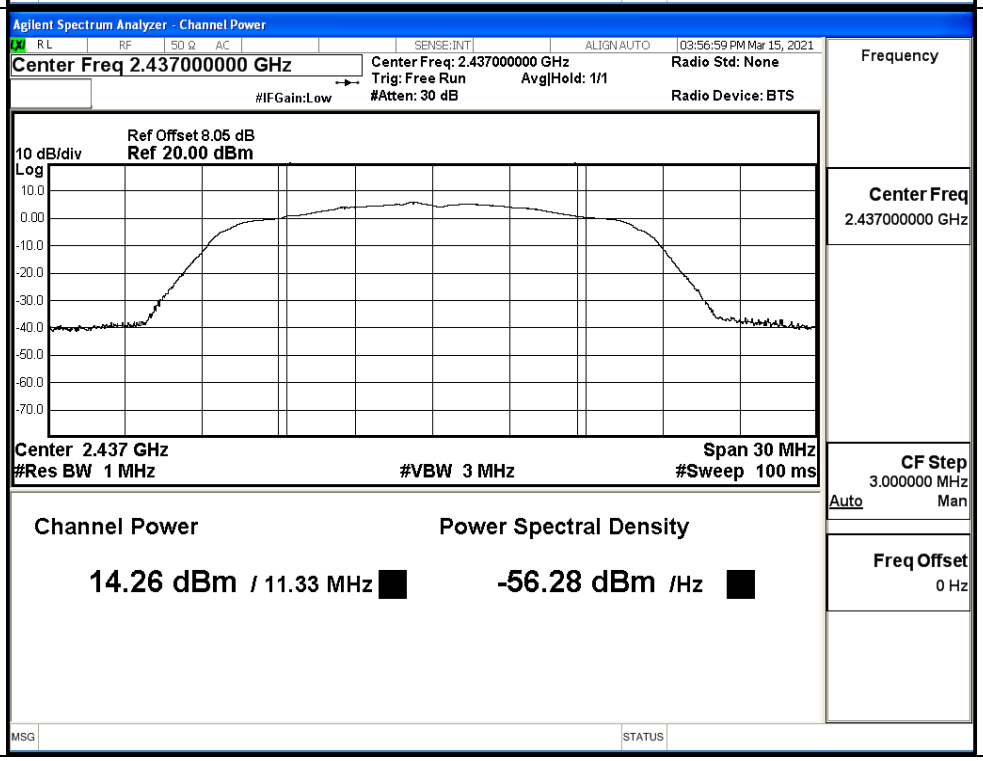
Mode	Channel	AVG Conducted Power (dBm)	Duty Cycle Factor(dB)	Report Conducted Power(dBm)	Limit [dBm]	Verdict
11B	LCH	13.76	0.01	13.77	30	PASS
	MCH	14.74	0.01	14.75	30	PASS
	HCH	14.42	0.01	14.43	30	PASS
11G	LCH	12.9	0.06	12.96	30	PASS
	MCH	14.26	0.06	14.32	30	PASS
	HCH	14.87	0.06	14.93	30	PASS
11N20SISO	LCH	12.55	0.07	12.62	30	PASS
	MCH	13.97	0.07	14.04	30	PASS
	HCH	14.61	0.07	14.68	30	PASS
11N40SISO	LCH	13.78	0.10	13.88	30	PASS
	MCH	14.48	0.10	14.58	30	PASS
	HCH	14.95	0.10	15.05	30	PASS

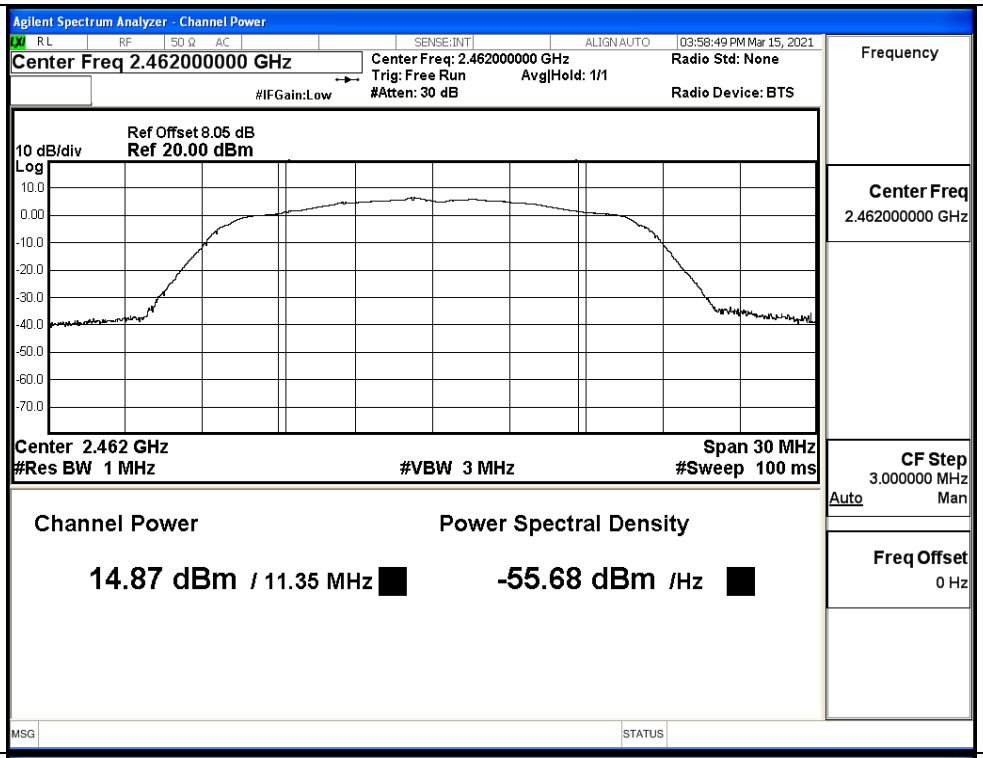
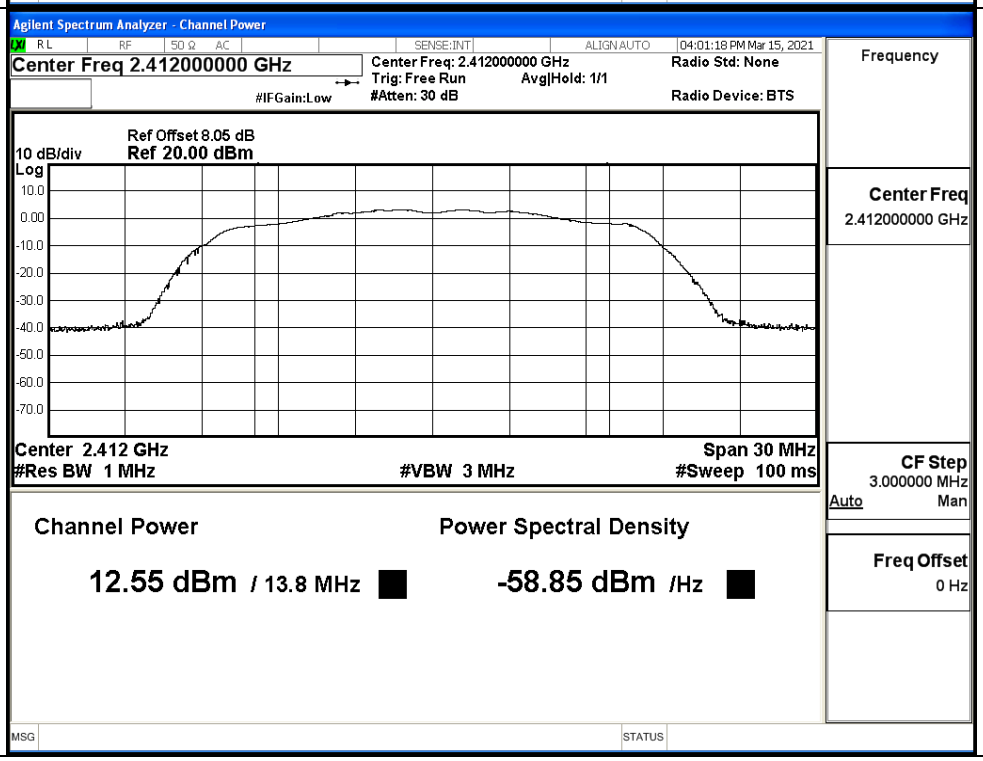
Test Graphs

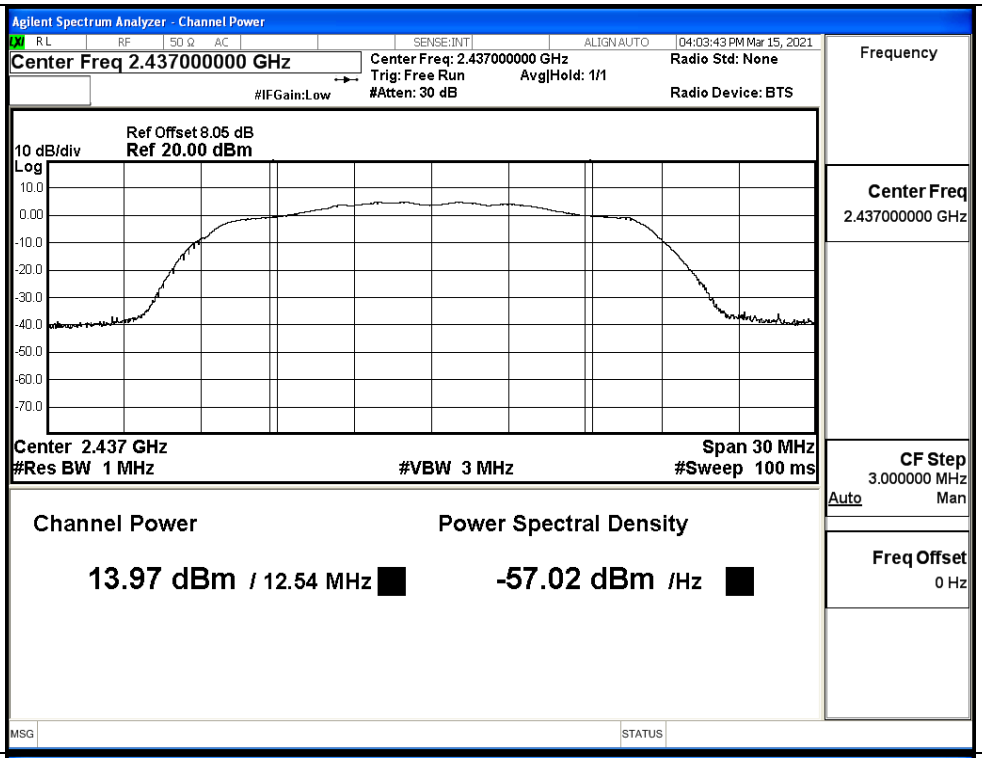
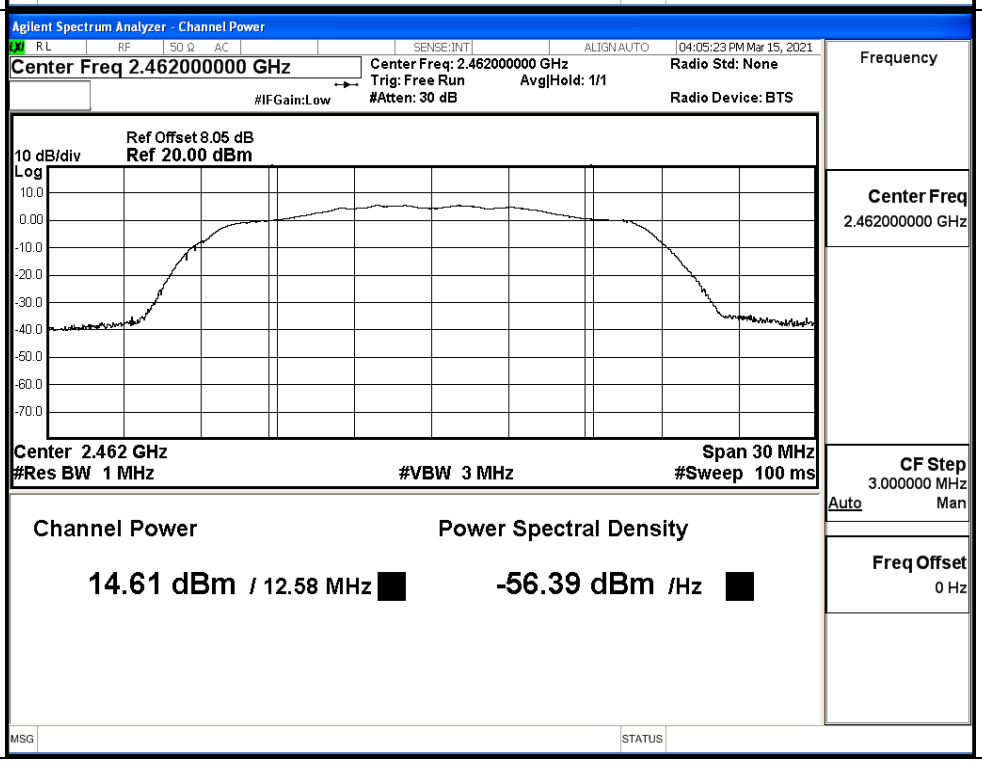
11B/LCH

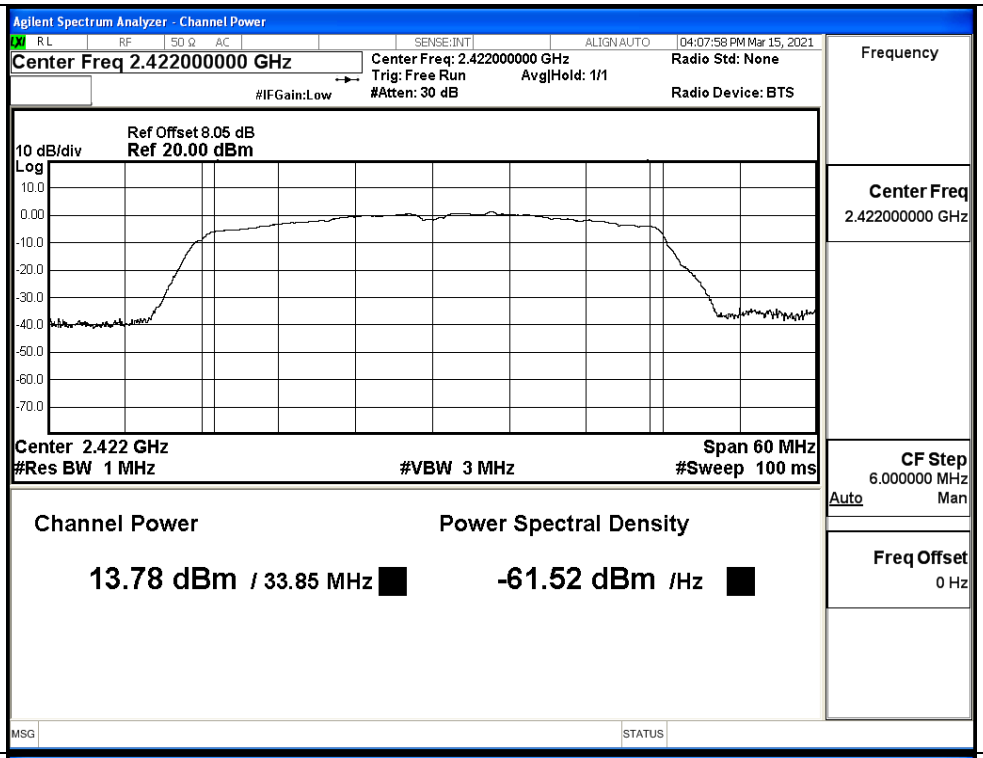
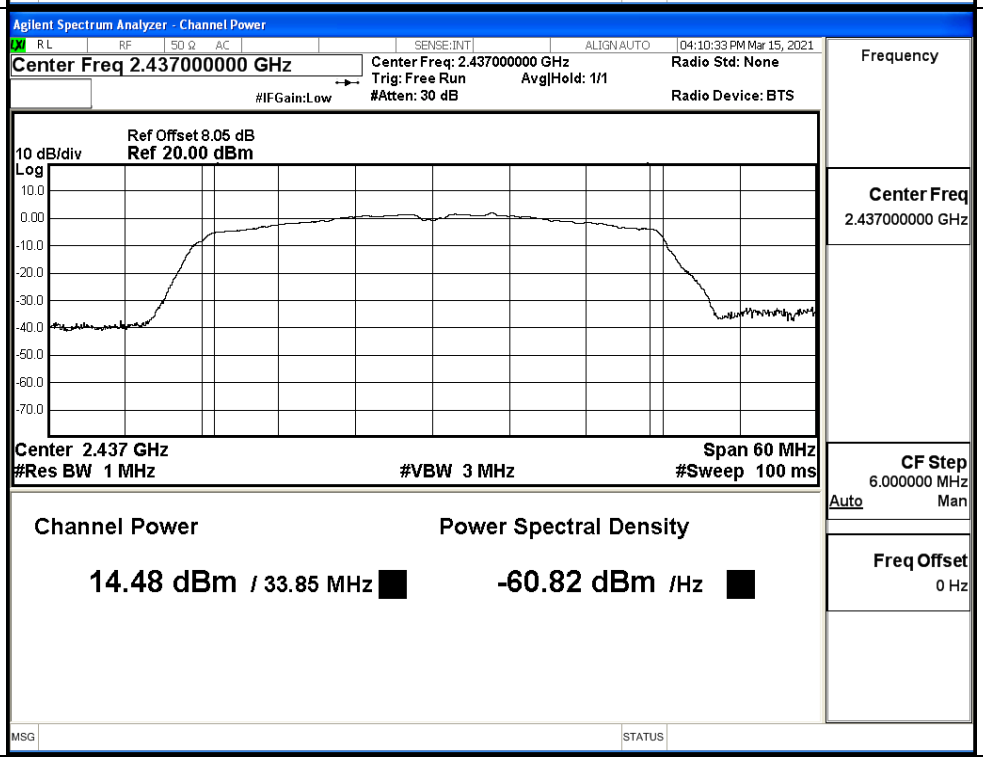


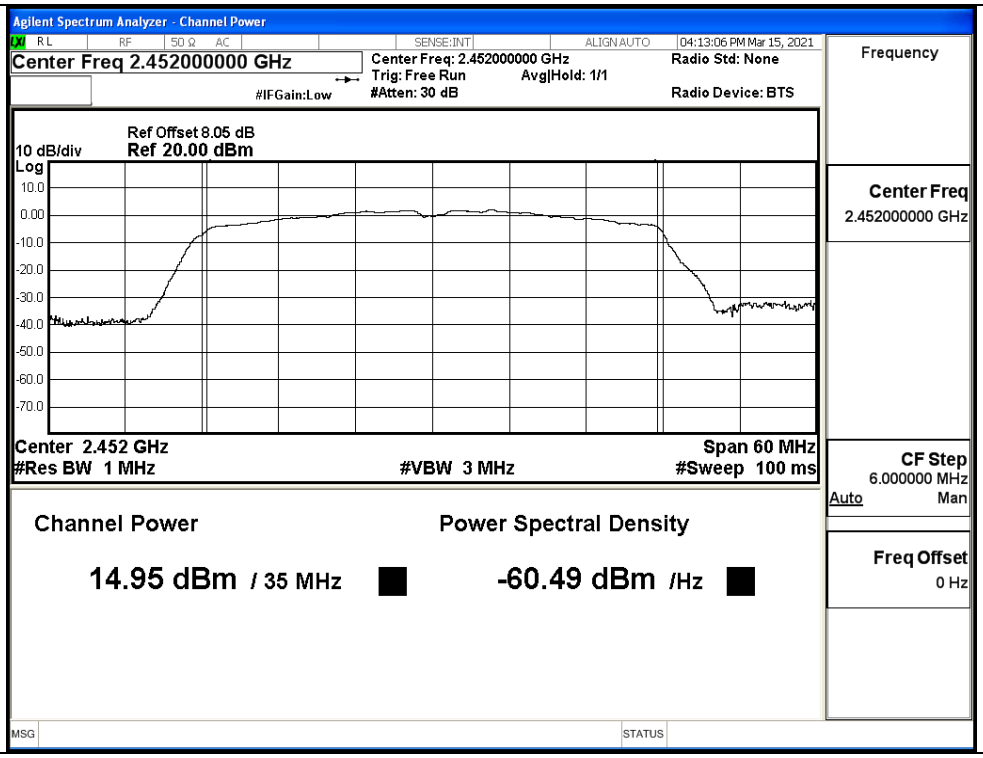
11B/MCH	
11B/HCH	

11G/LCH	
11G/MCH	

11G/HCH	
11N20SISO/LCH	

11N20SISO/MCH		
11N20SISO/HCH		

11N40SISO/LCH	
11N40SISO/MCH	

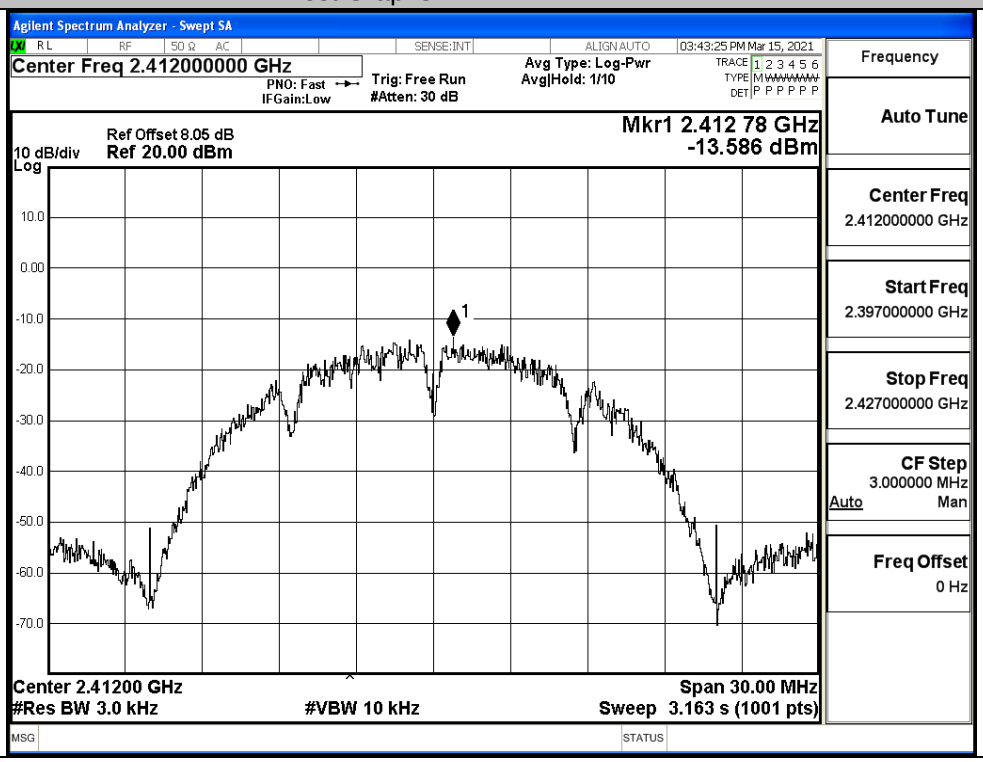
11N40SISO/HCH	

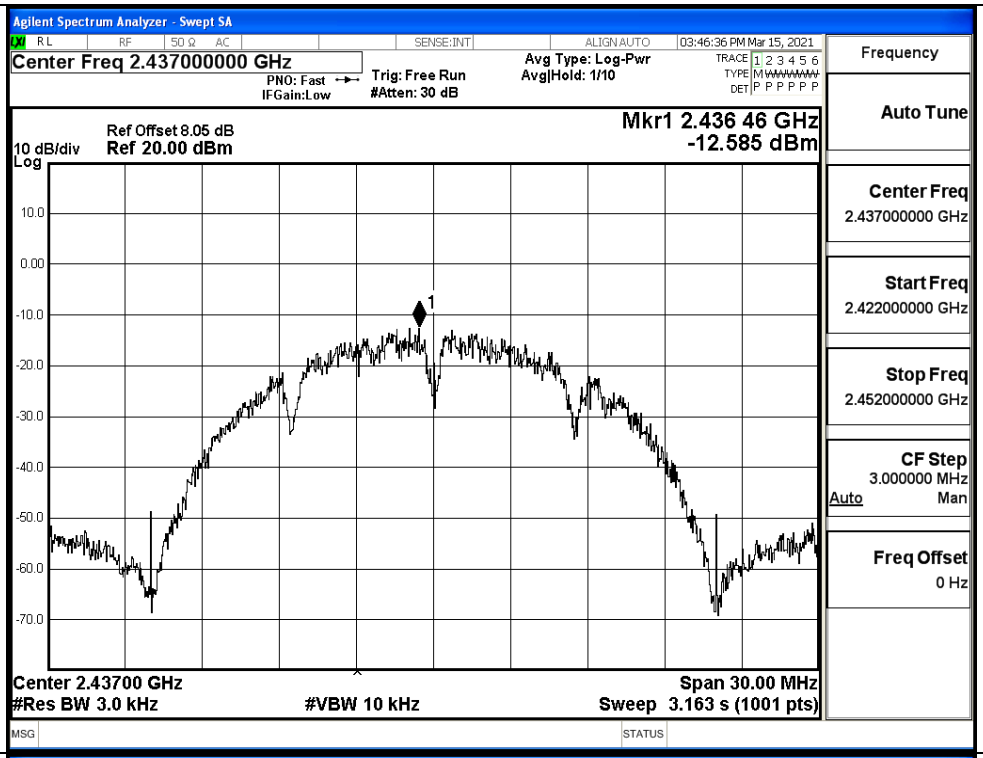
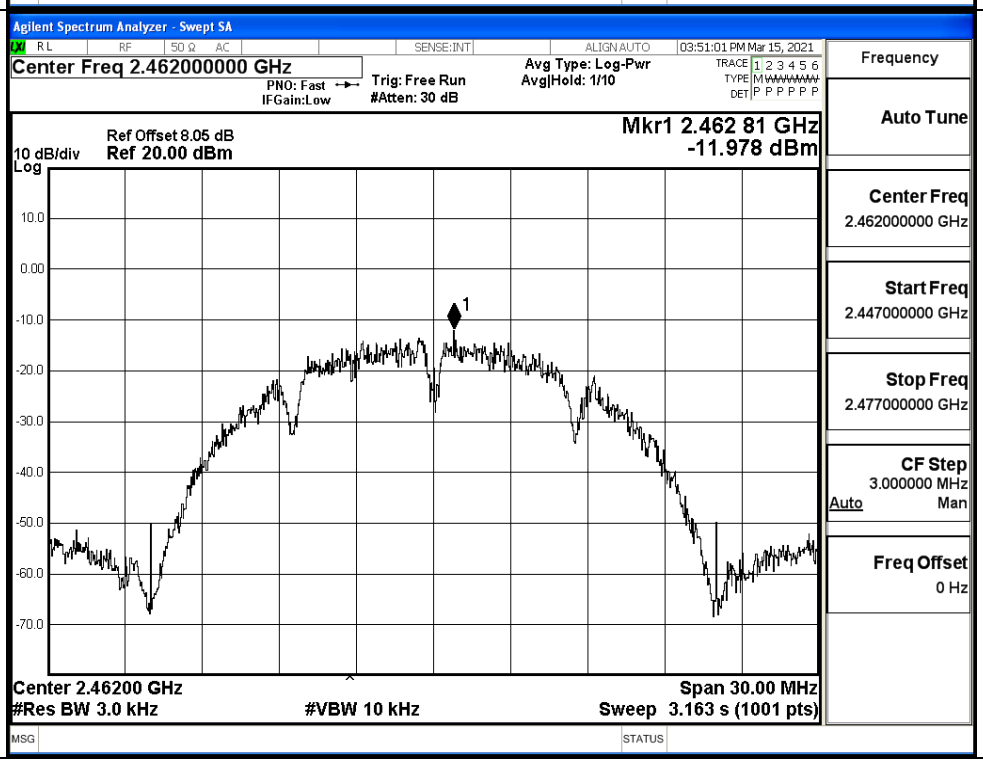
A.3 Maximum Power Spectral Density

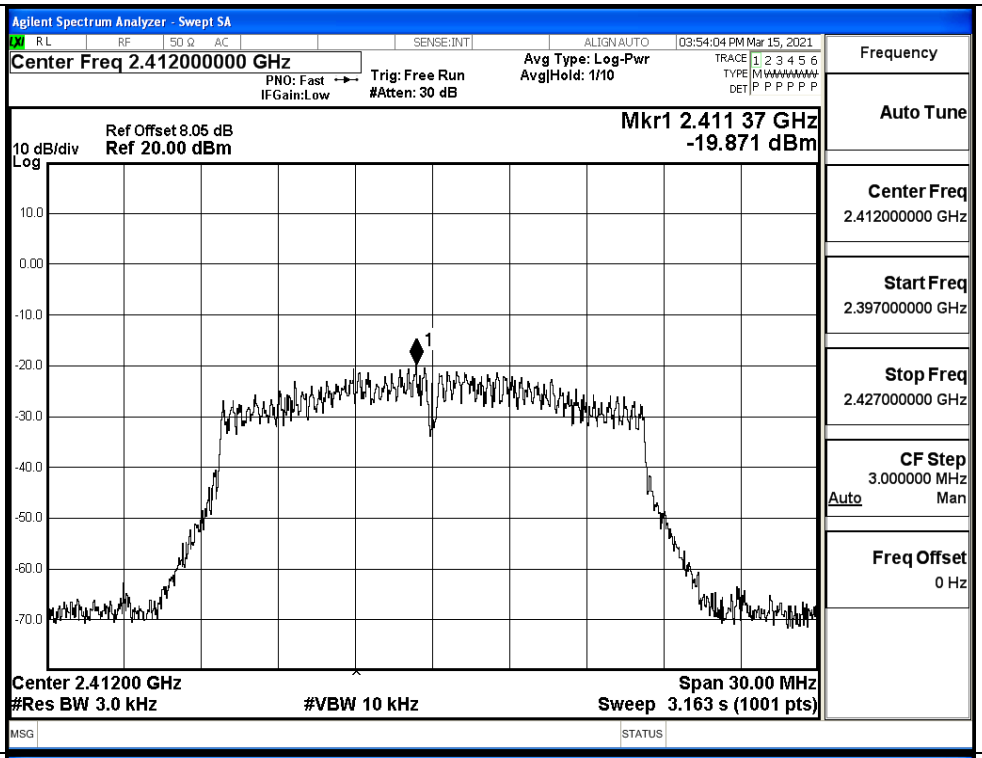
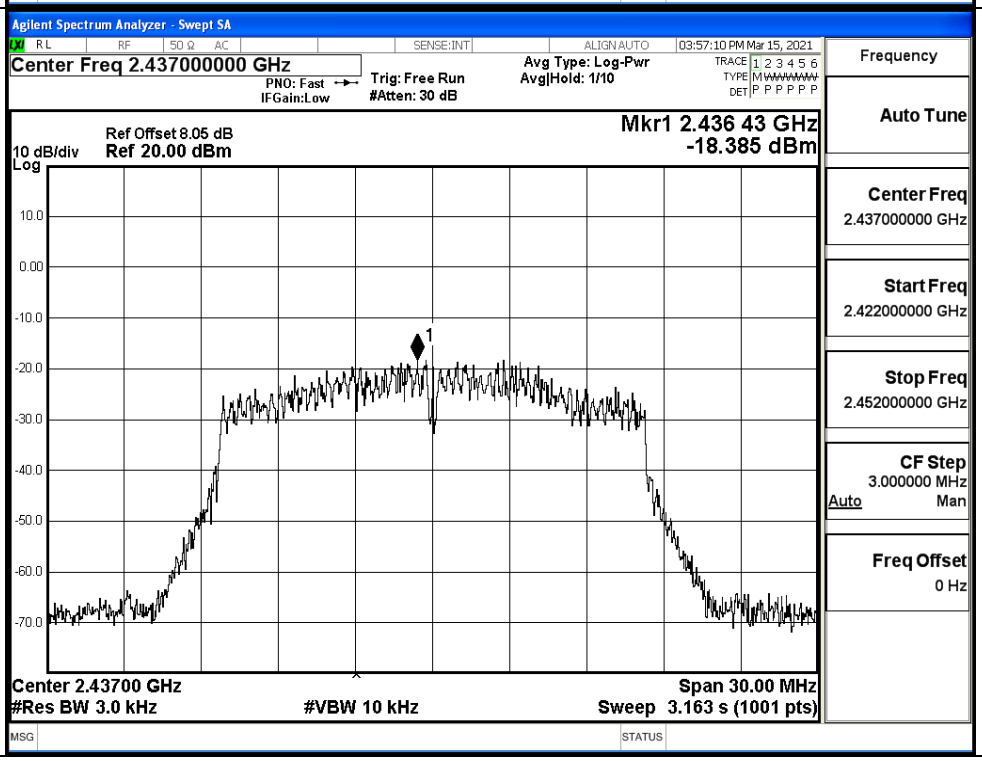
Mode	Channel	Power Density [dBm/3KHz]	Duty Cycle Factor (dB)	RBW Factor (dB)	Report Power Density [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
11B	LCH	-13.586	0.01	0	-13.576	8	PASS
	MCH	-12.585	0.01	0	-12.575	8	PASS
	HCH	-11.978	0.01	0	-11.968	8	PASS
11G	LCH	-19.871	0.06	0	-19.811	8	PASS
	MCH	-18.385	0.06	0	-18.325	8	PASS
	HCH	-17.757	0.06	0	-17.697	8	PASS
11N20 SISO	LCH	-20.013	0.07	0	-19.943	8	PASS
	MCH	-18.251	0.07	0	-18.181	8	PASS
	HCH	-16.834	0.07	0	-16.764	8	PASS
11N40 SISO	LCH	-21.855	0.1	0	-21.755	8	PASS
	MCH	-20.136	0.1	0	-20.036	8	PASS
	HCH	-19.219	0.1	0	-19.119	8	PASS

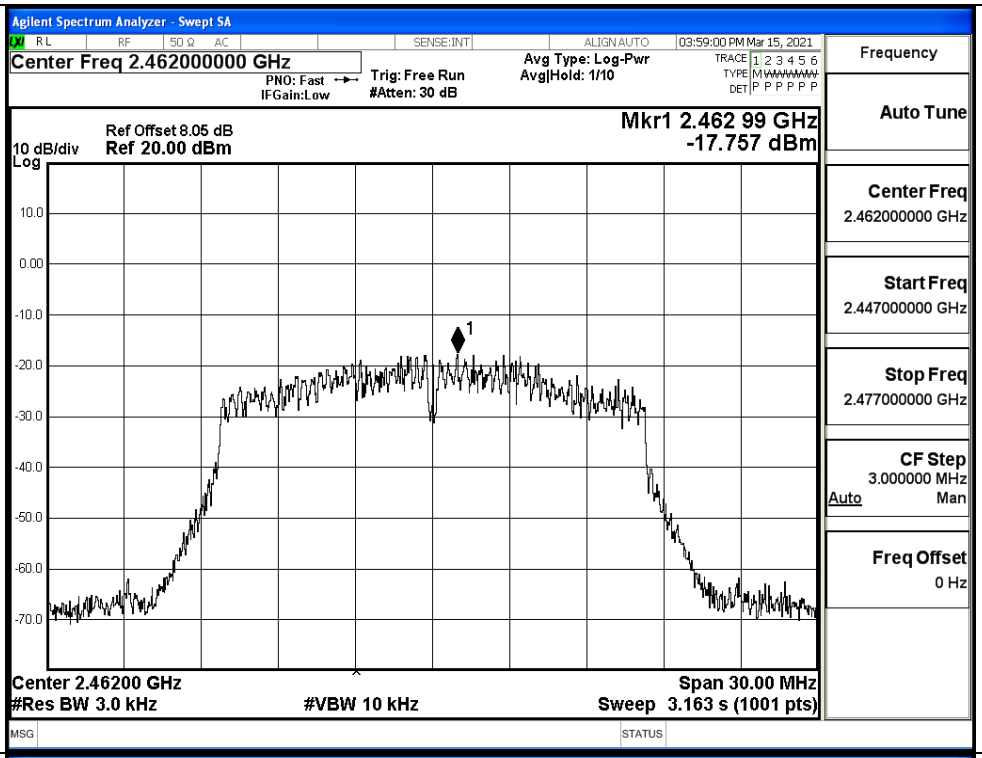
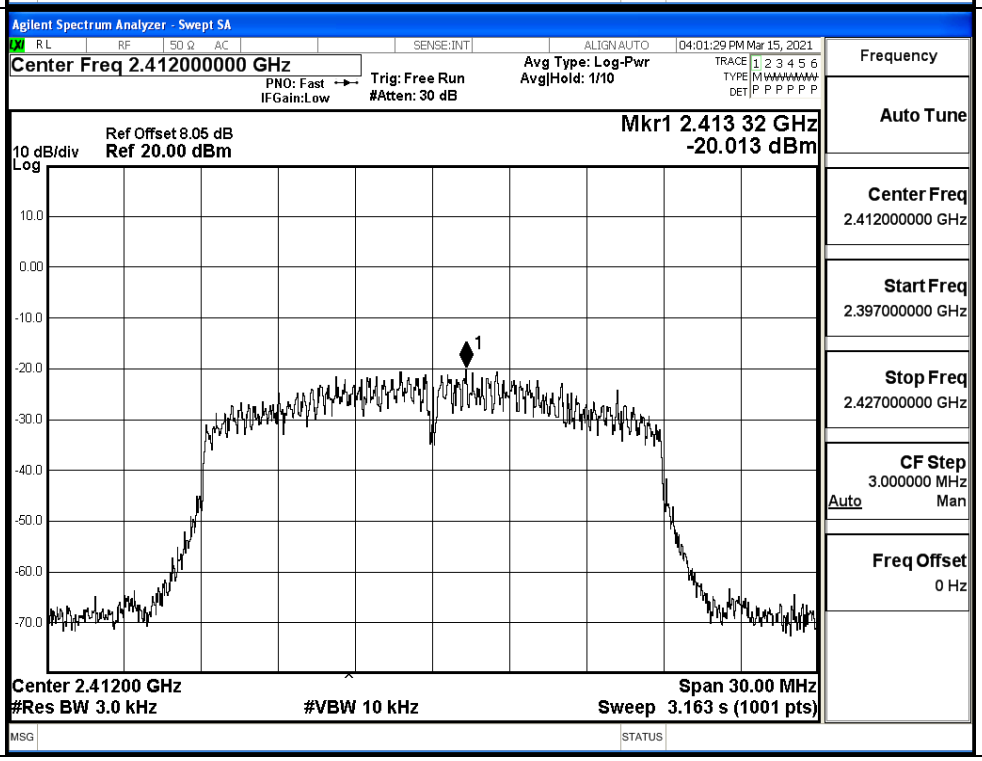
Note: 1. RBW Factor(dB)=10log(3/3)

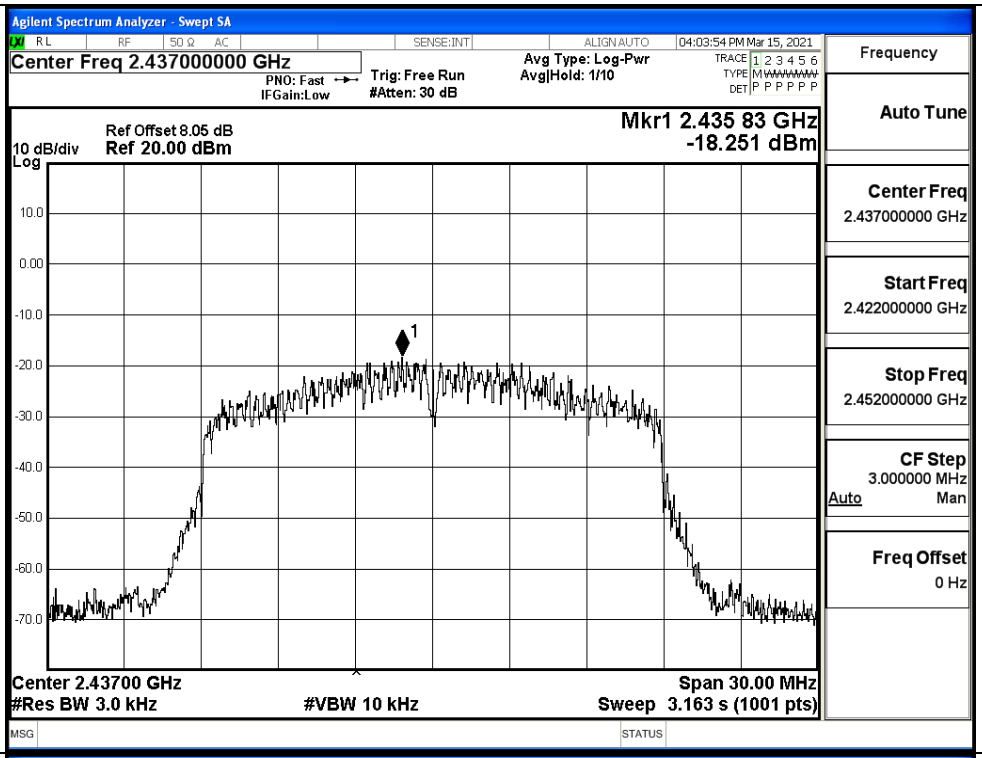
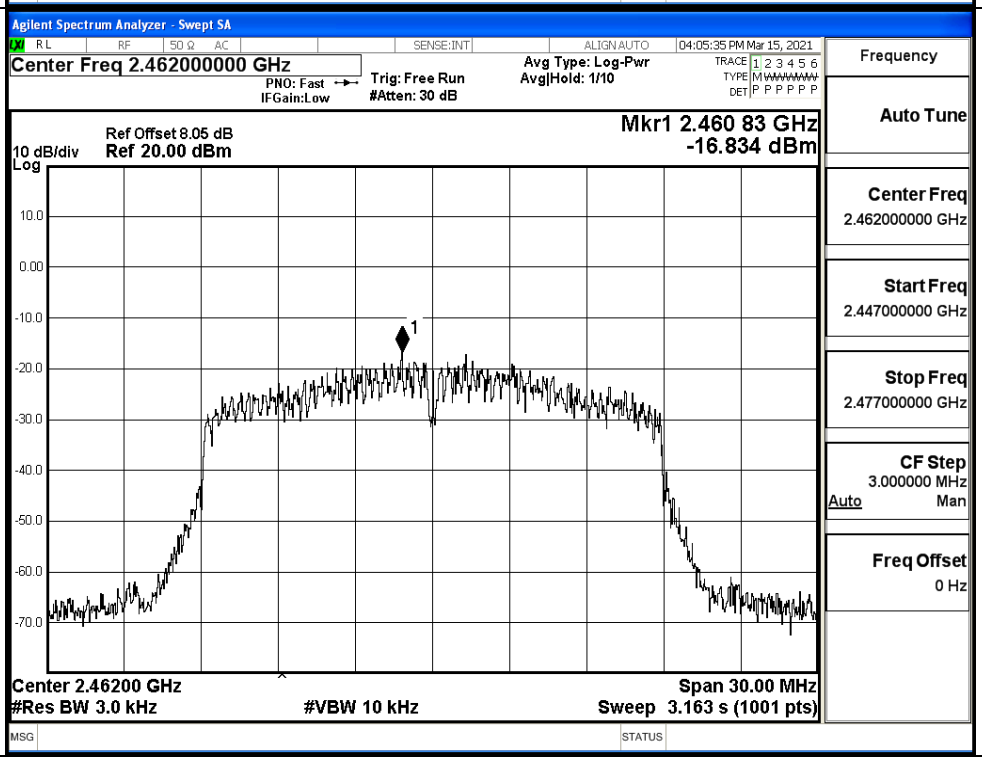
2. Report Power Density [dBm/3KHz]= Power Density[dBm/3KHz]+ Duty Cycle Factor(dB)+ RBW Factor(dB)

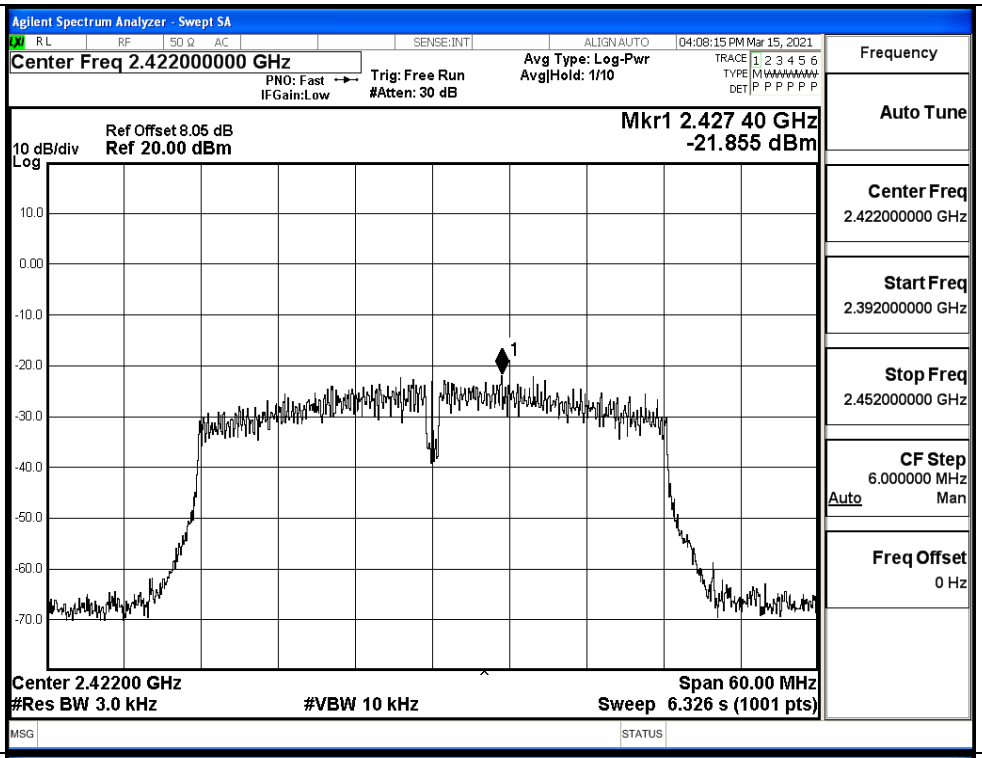
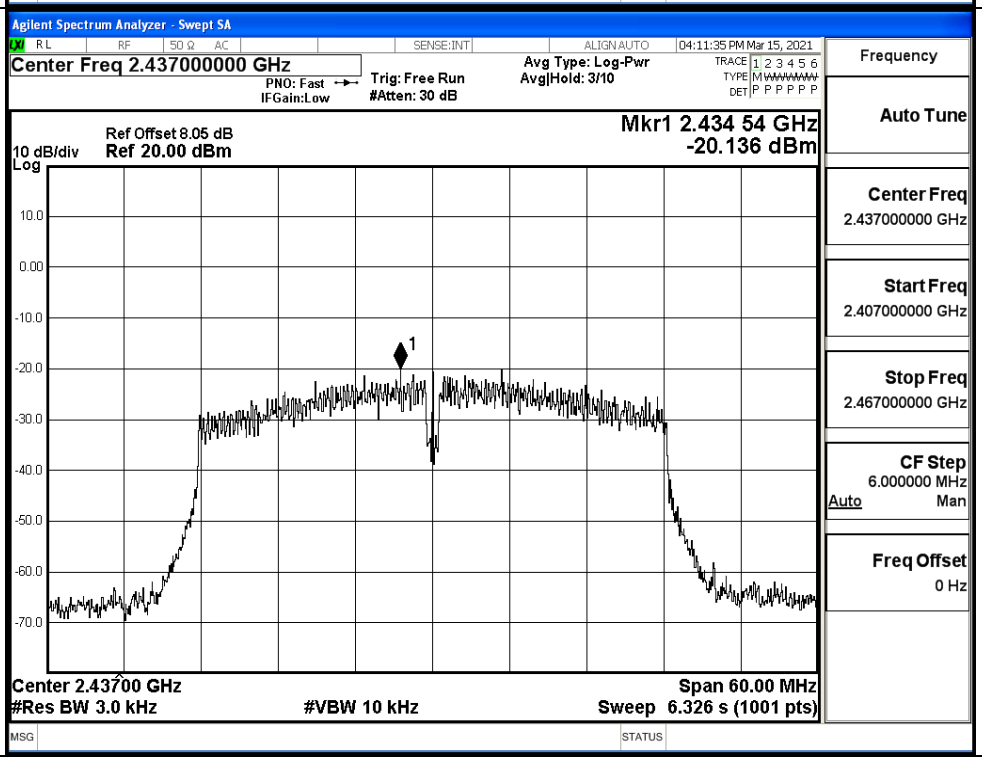
Test Graphs	
11B/LCH	

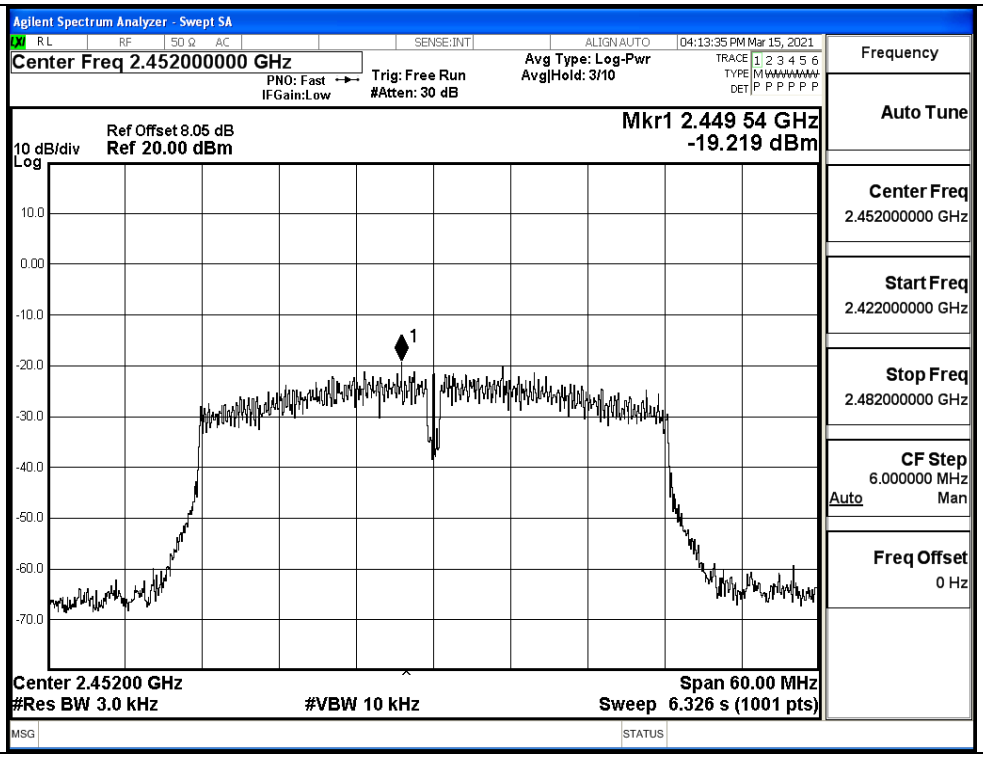
11B/MCH	
11B/HCH	

11G/LCH		
11G/MCH		

11G/HCH		
11N20SISO/LCH		

11N20SISO/MCH		
11N20SISO/HCH		

11N40SISO/LCH		
11N40SISO/MCH		

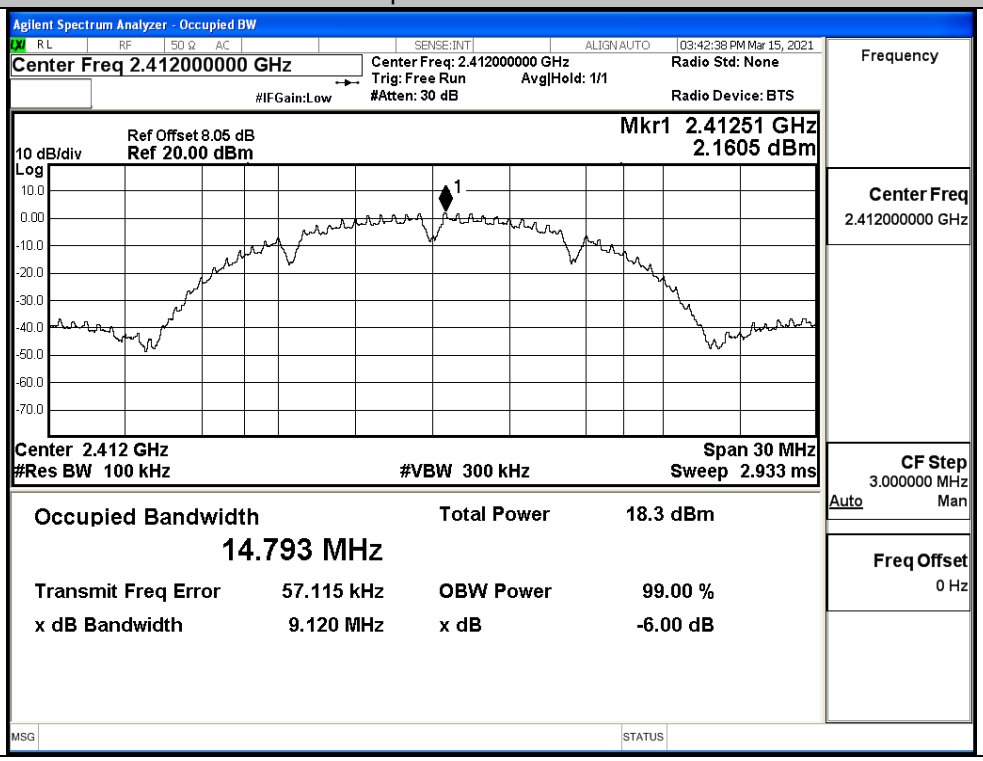
11N40SISO/HCH	

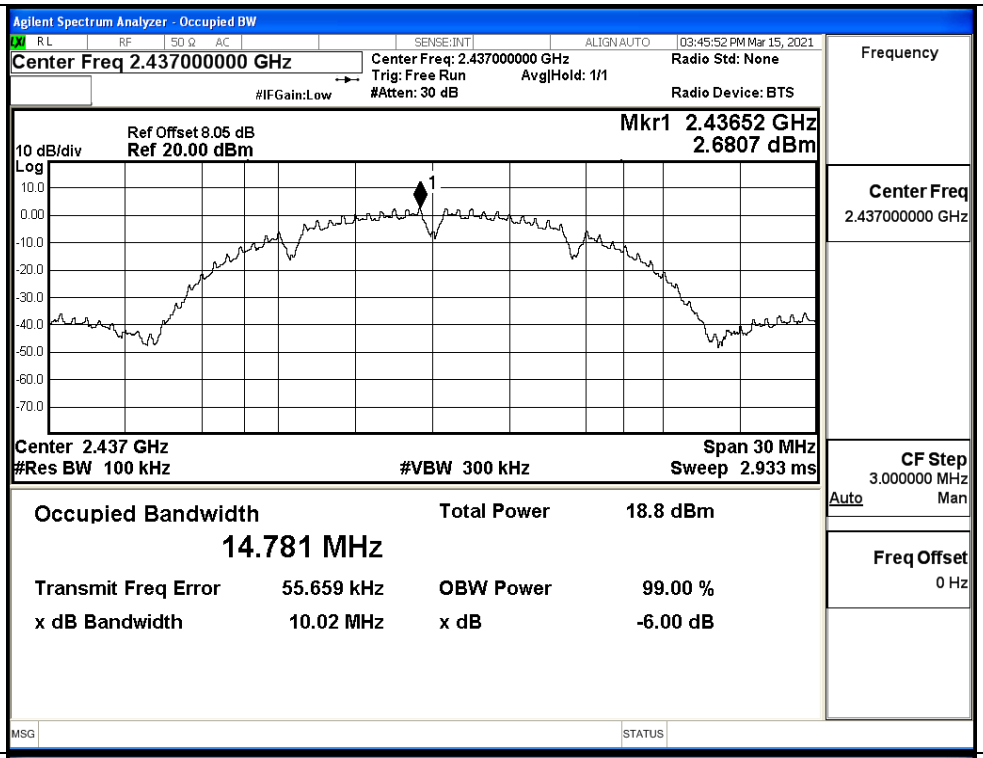
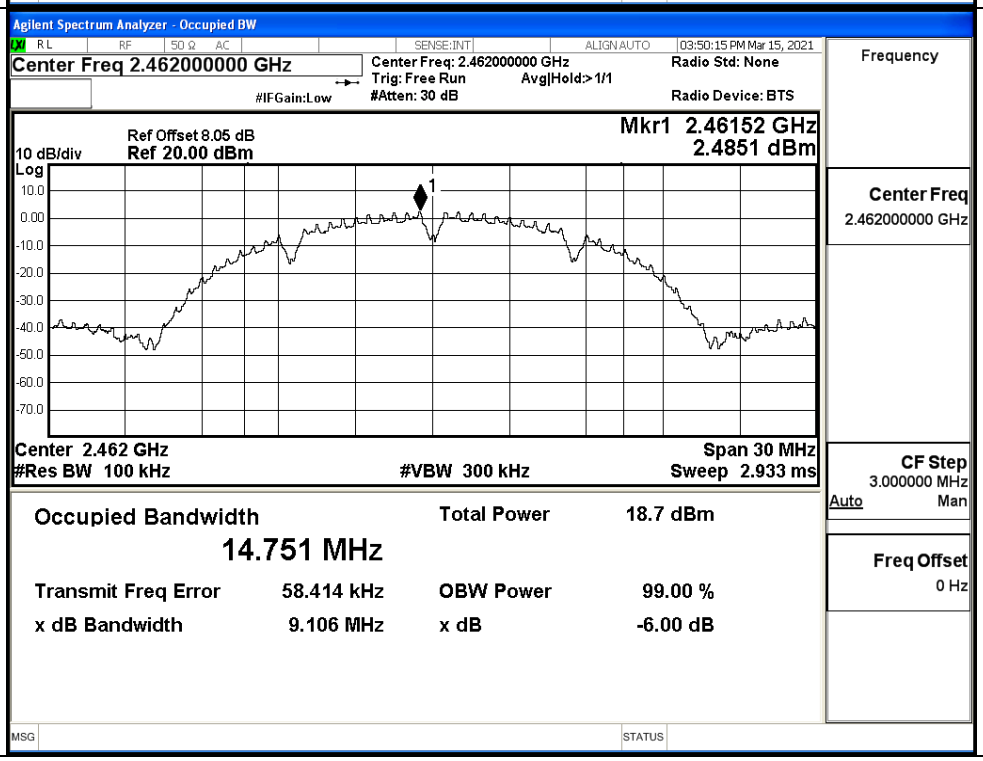
A.4 6dB Bandwidth

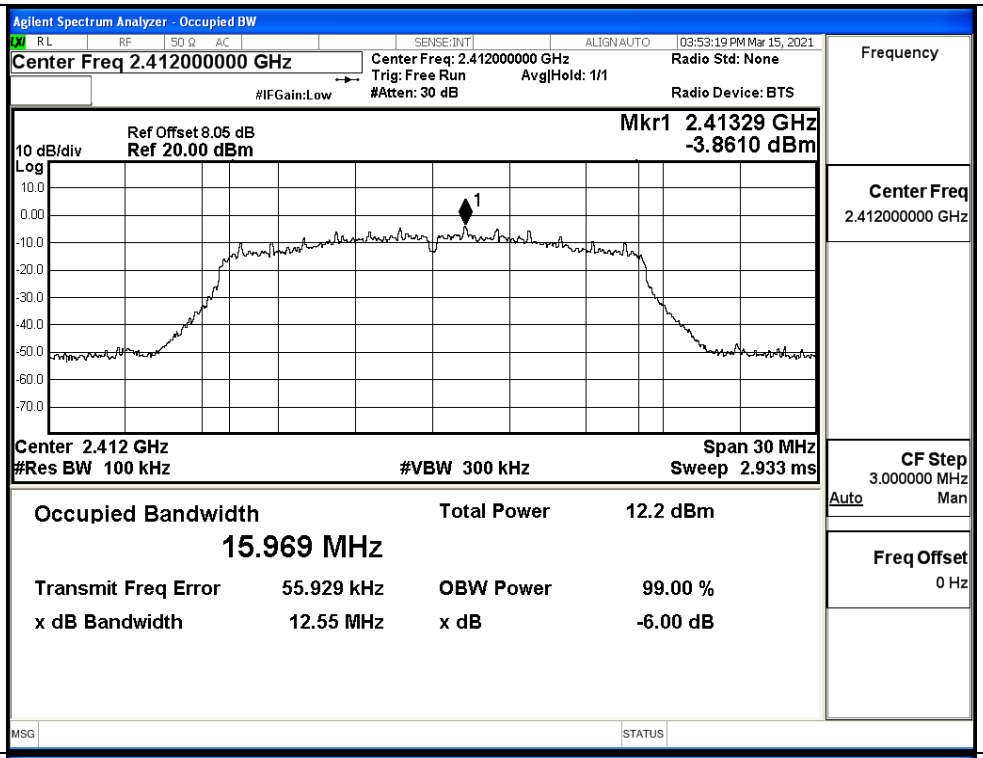
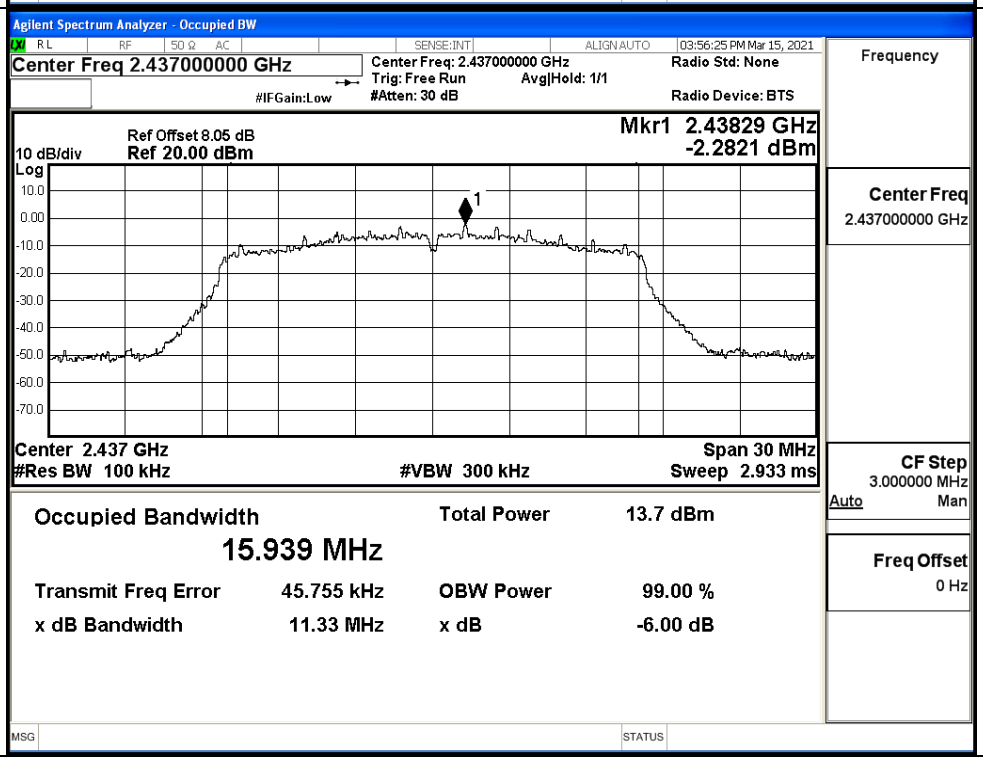
Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
11B	LCH	9.120	≥0.5	PASS
	MCH	10.02	≥0.5	PASS
	HCH	9.106	≥0.5	PASS
11G	LCH	12.55	≥0.5	PASS
	MCH	11.33	≥0.5	PASS
	HCH	11.35	≥0.5	PASS
11N20SISO	LCH	13.80	≥0.5	PASS
	MCH	12.54	≥0.5	PASS
	HCH	12.58	≥0.5	PASS
11N40SISO	LCH	33.85	≥0.5	PASS
	MCH	33.85	≥0.5	PASS
	HCH	35.00	≥0.5	PASS

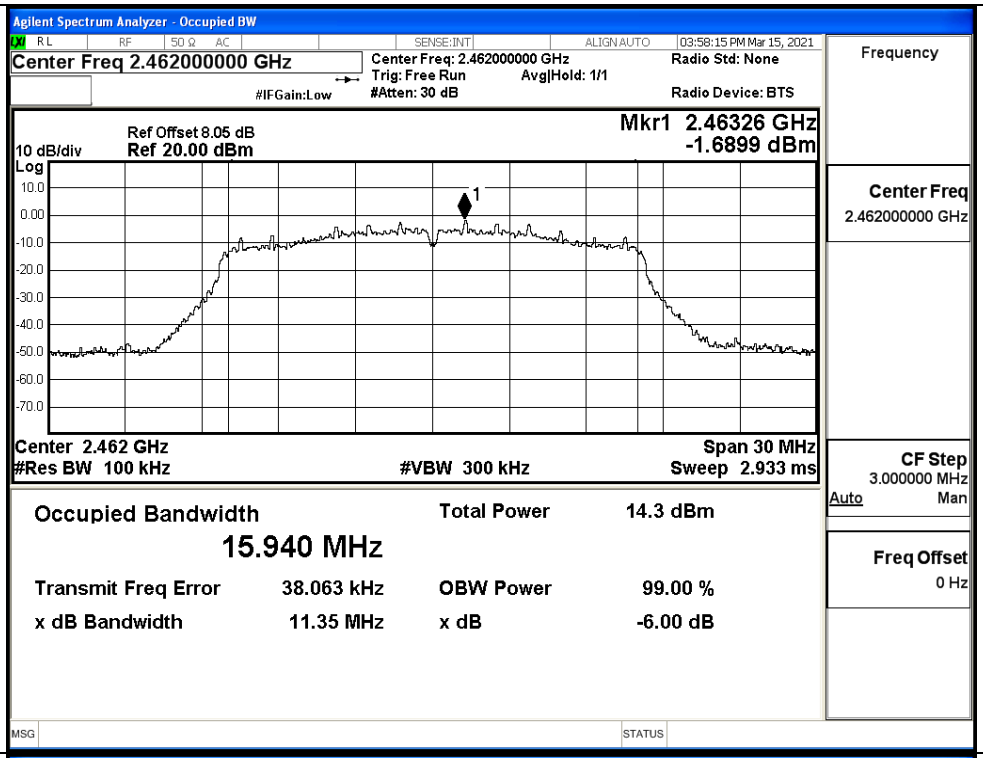
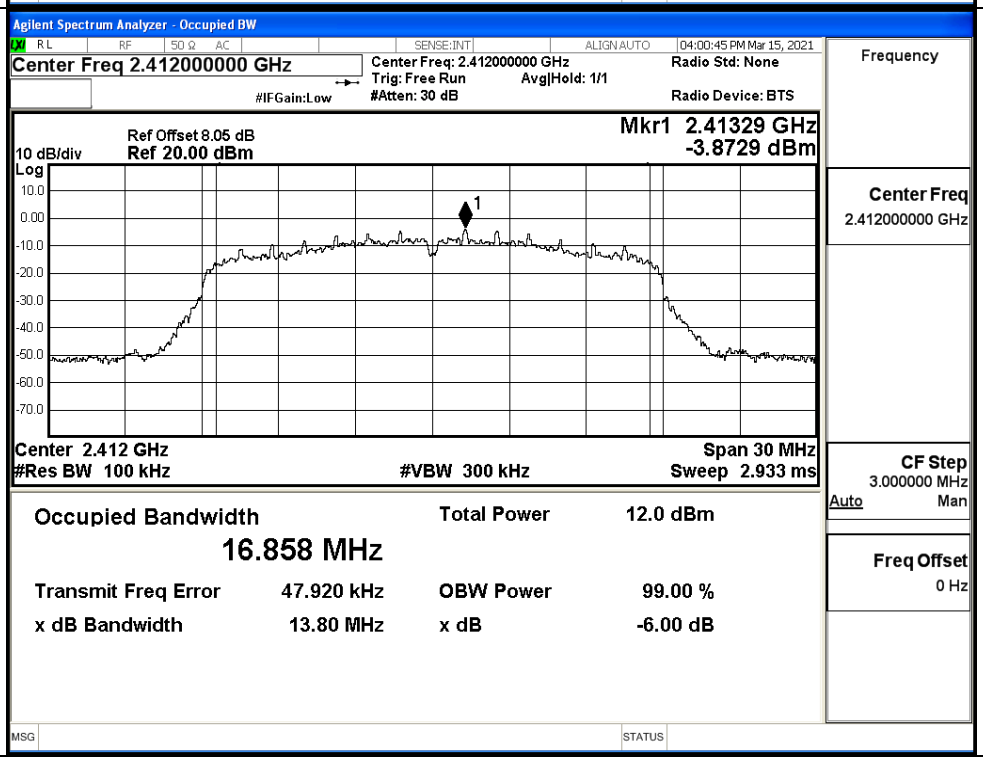
Test Graphs

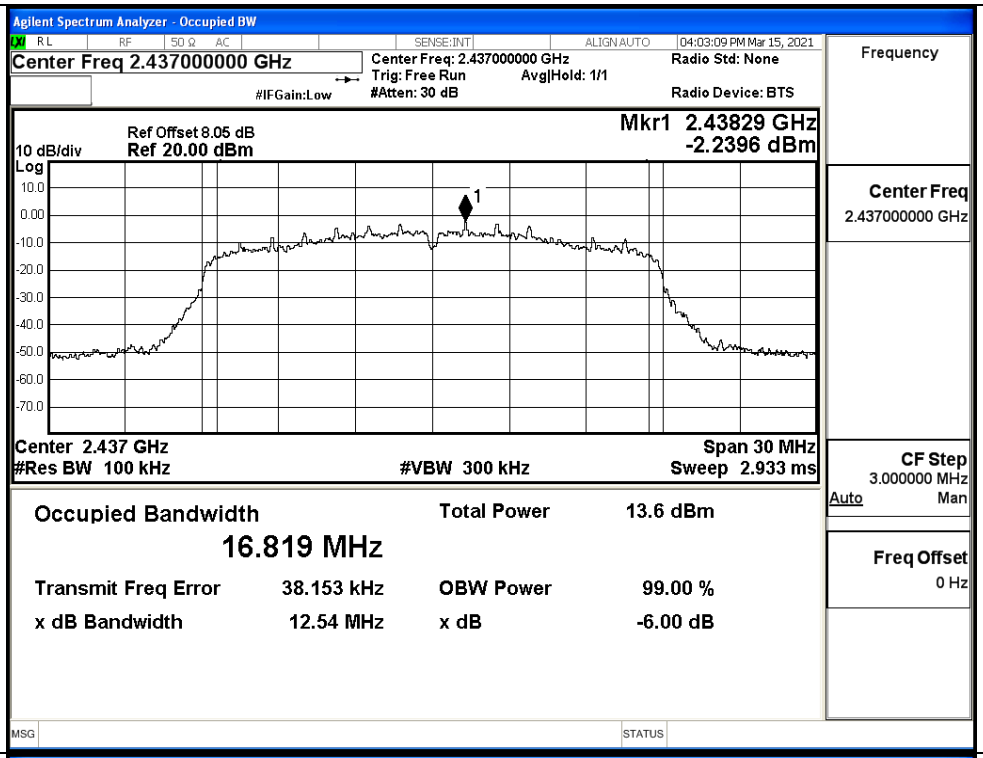
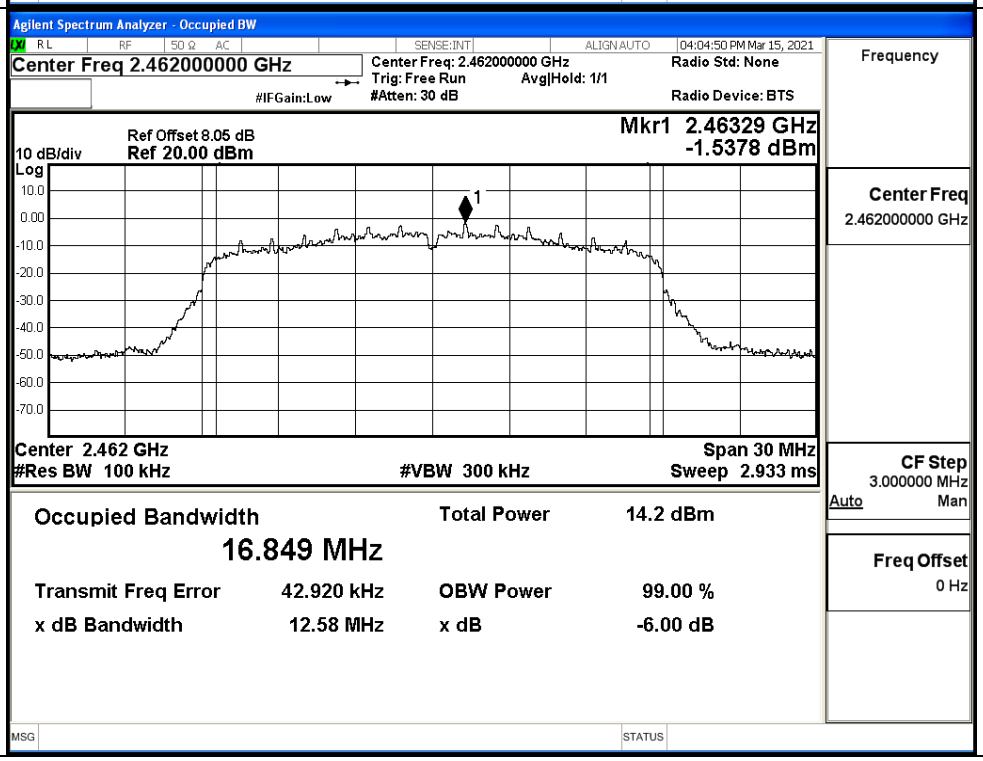
11B/LCH

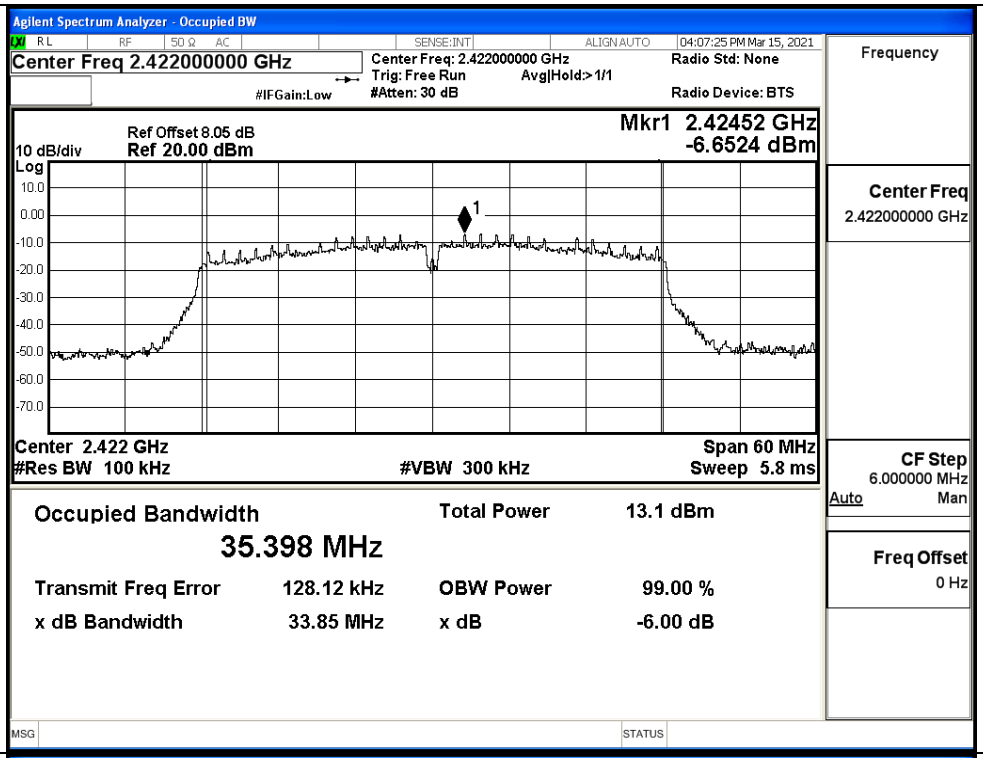
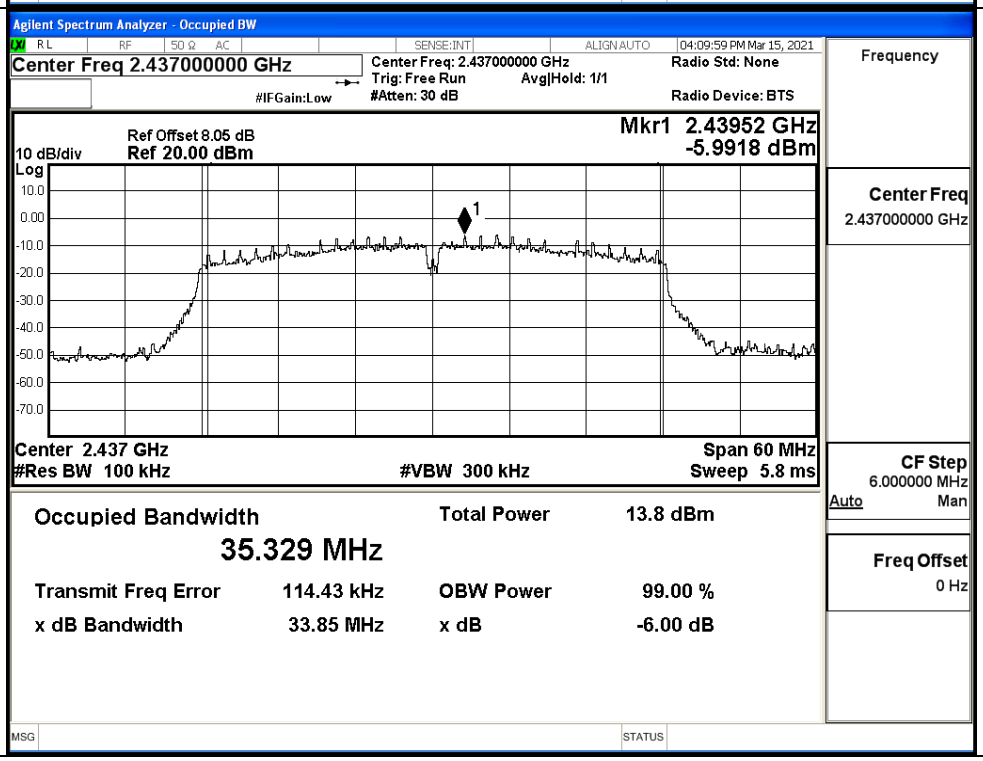


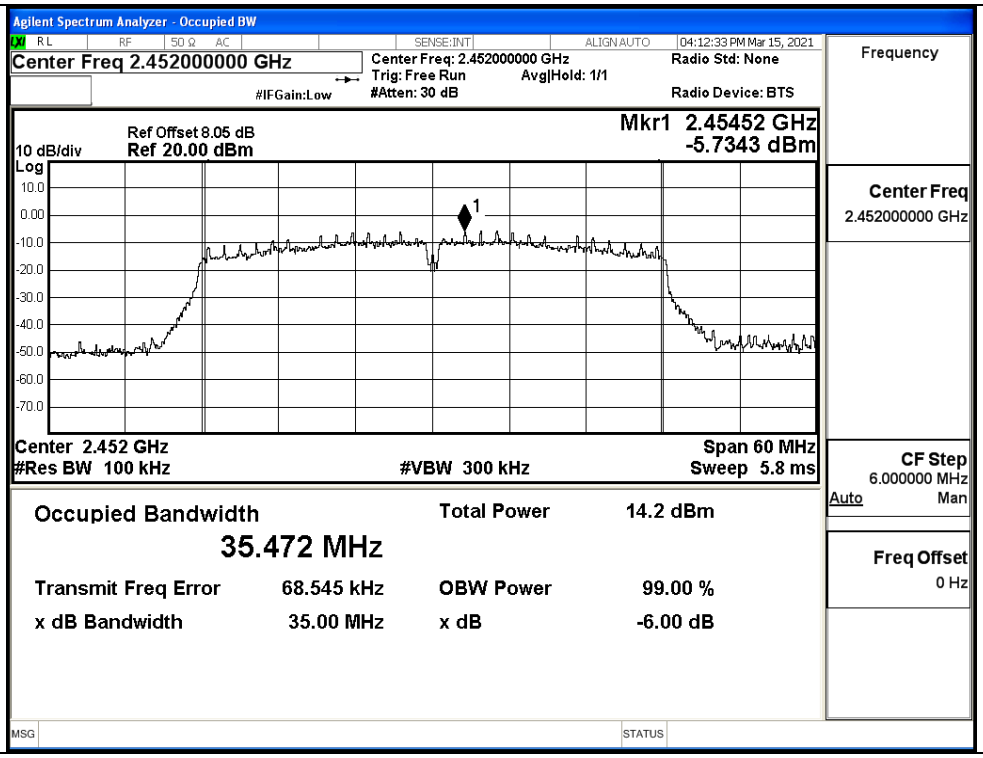
11B/MCH	
11B/HCH	

11G/LCH	
11G/MCH	

11G/HCH	
11N20SISO/LCH	

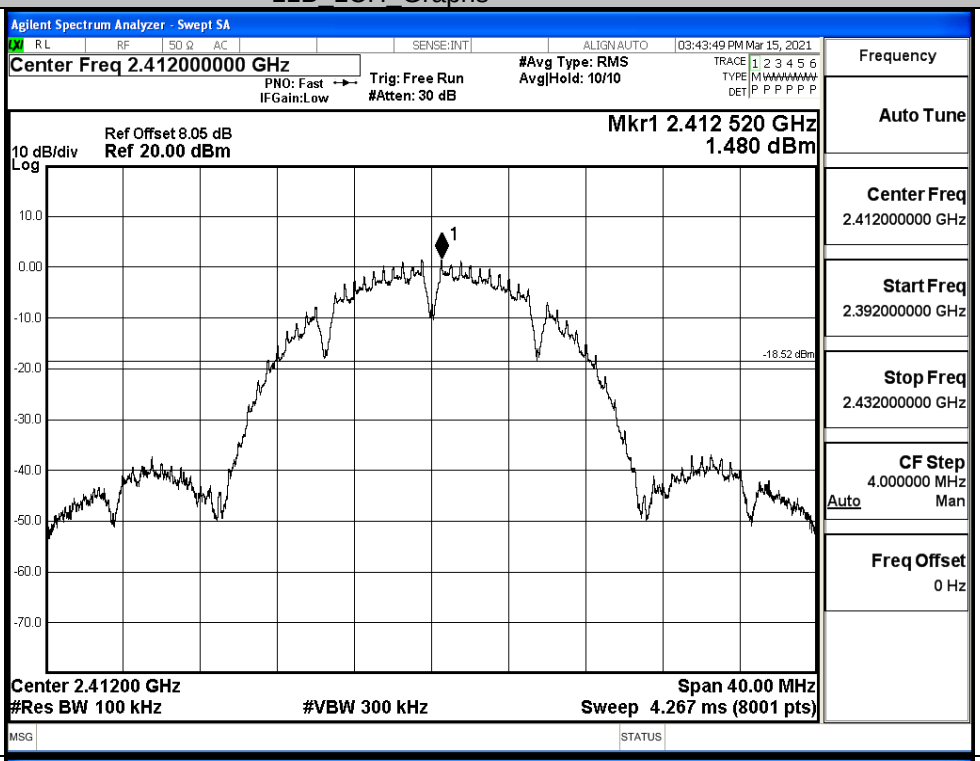
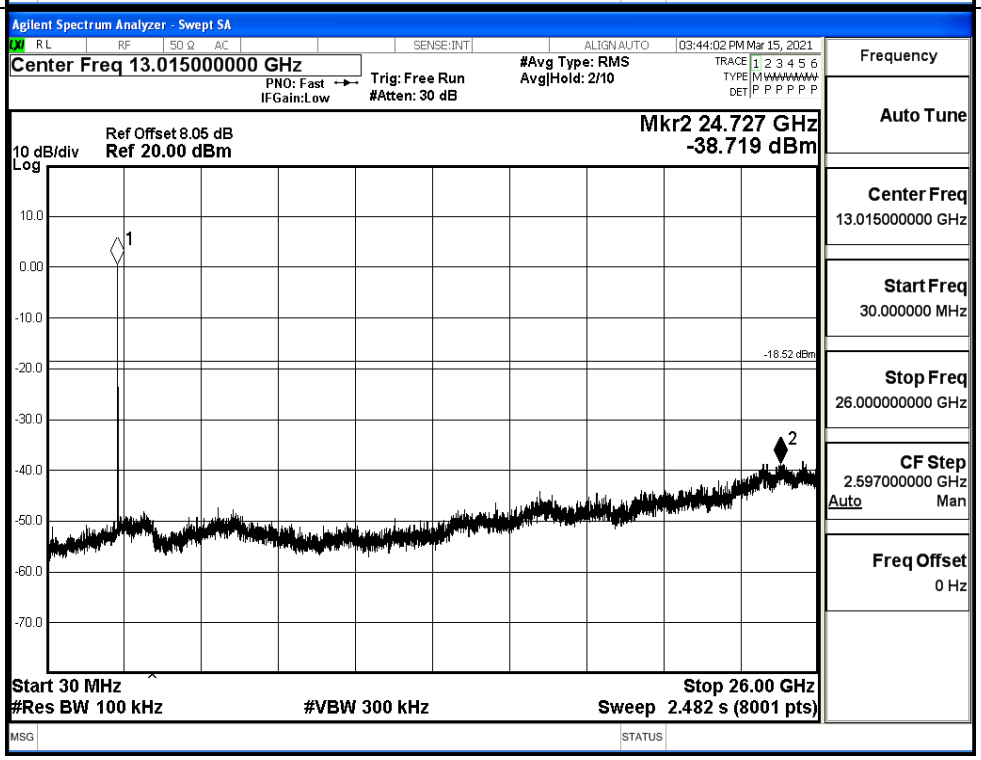
11N20SISO/MCH	
11N20SISO/HCH	

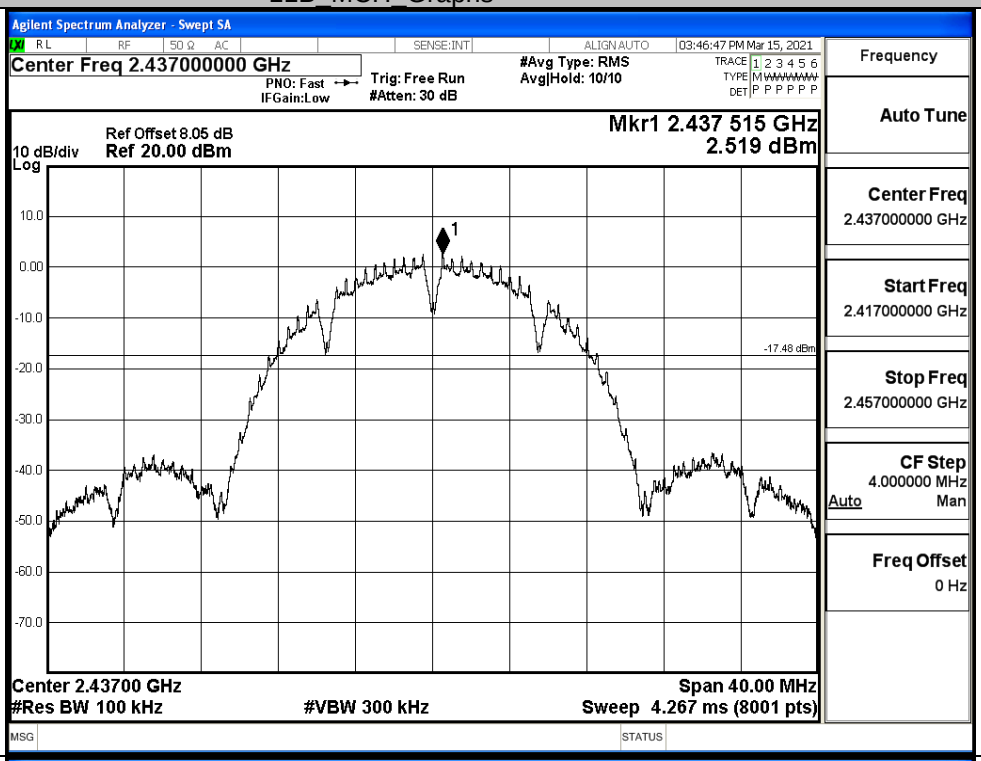
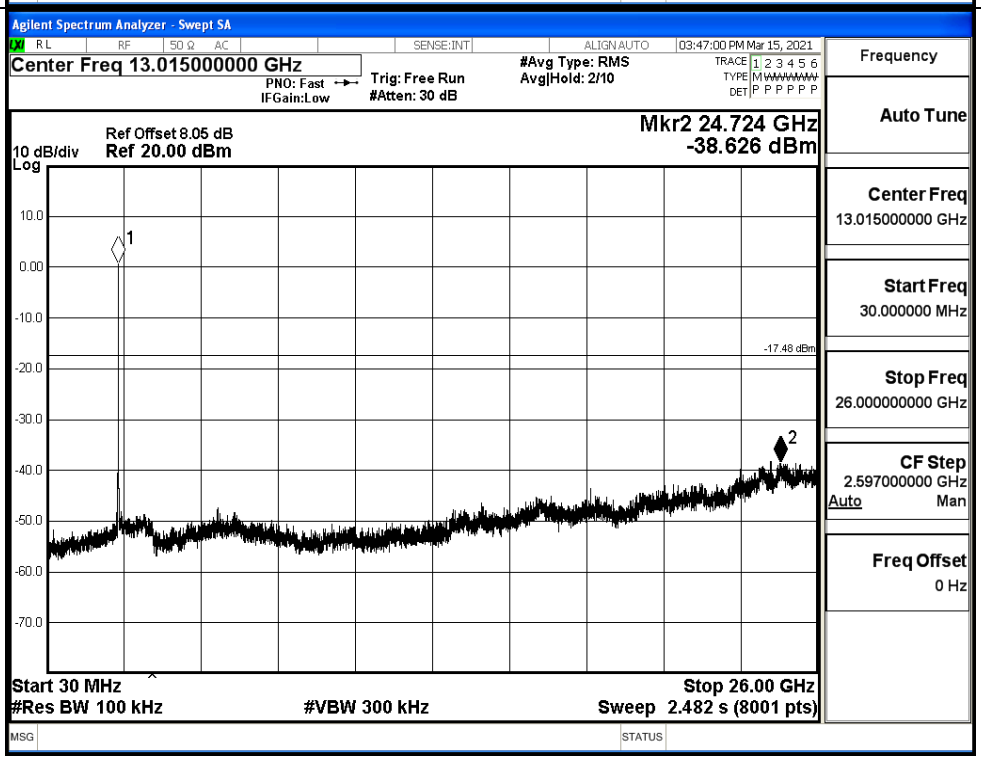
11N40SISO/LCH	
11N40SISO/MCH	

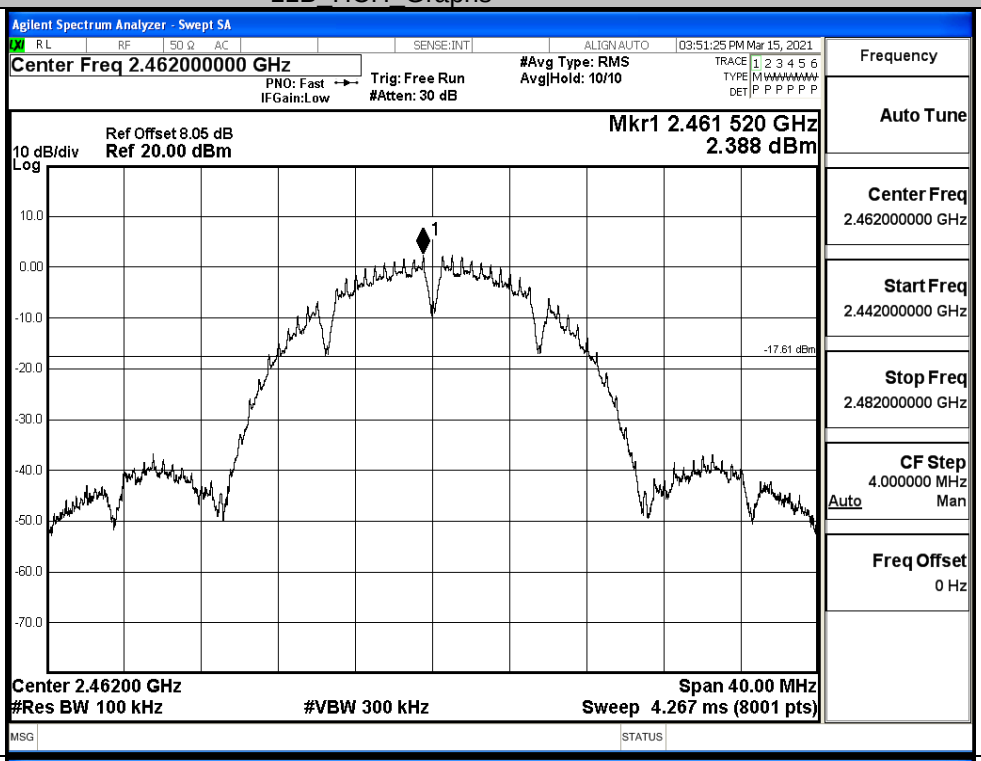
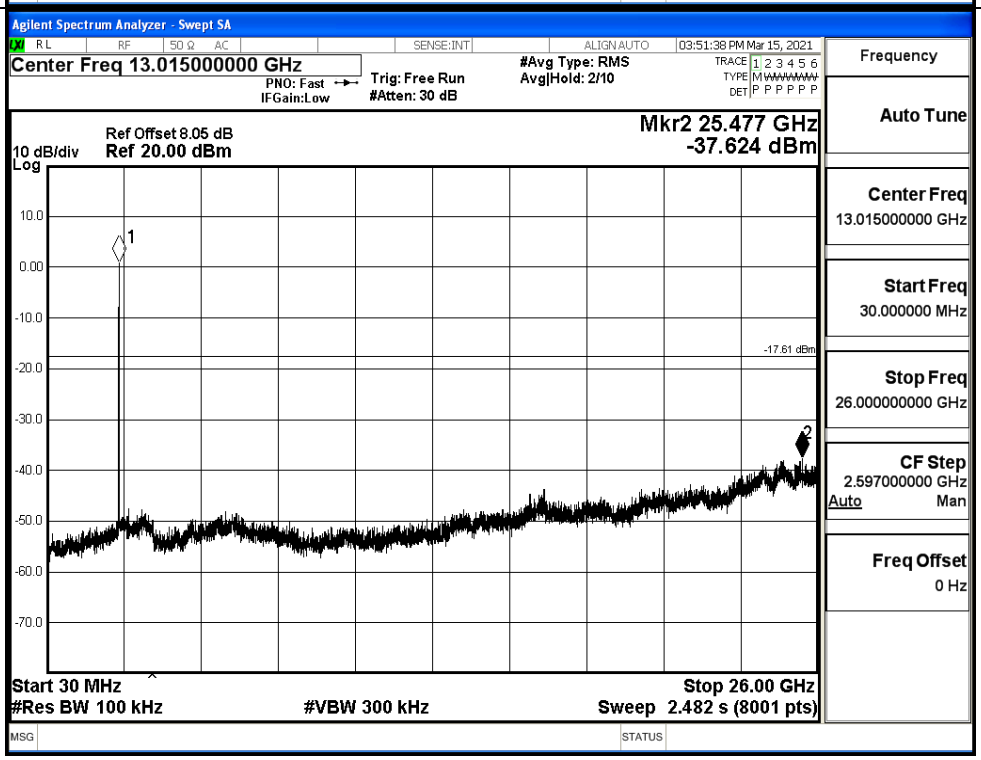
11N40SISO/HCH	

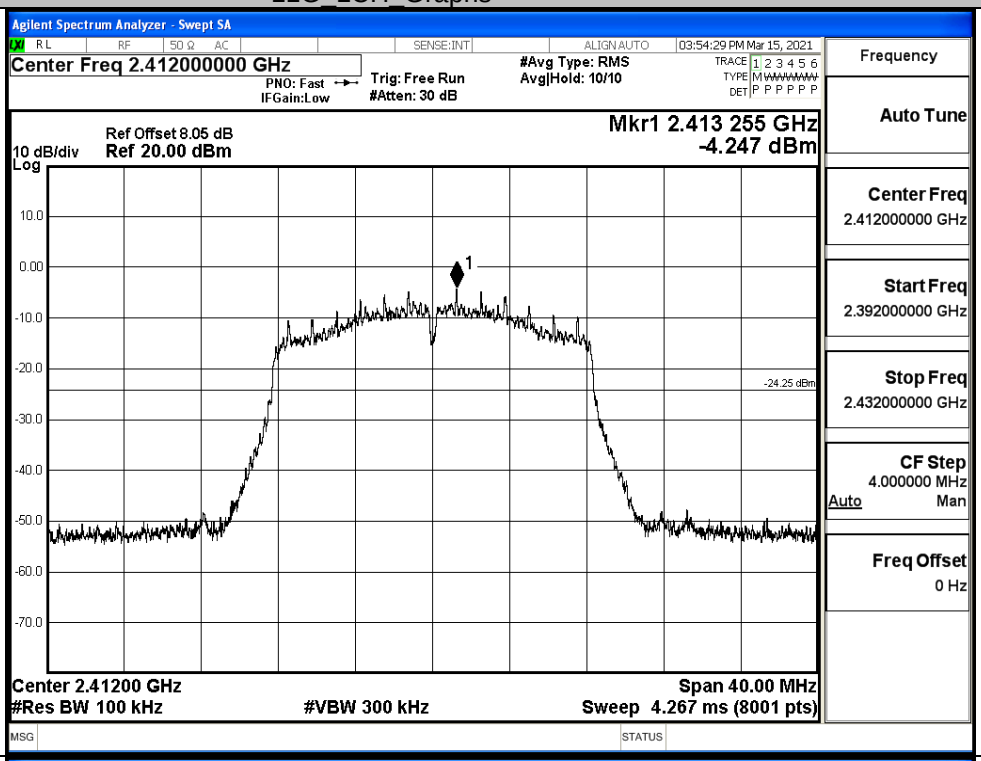
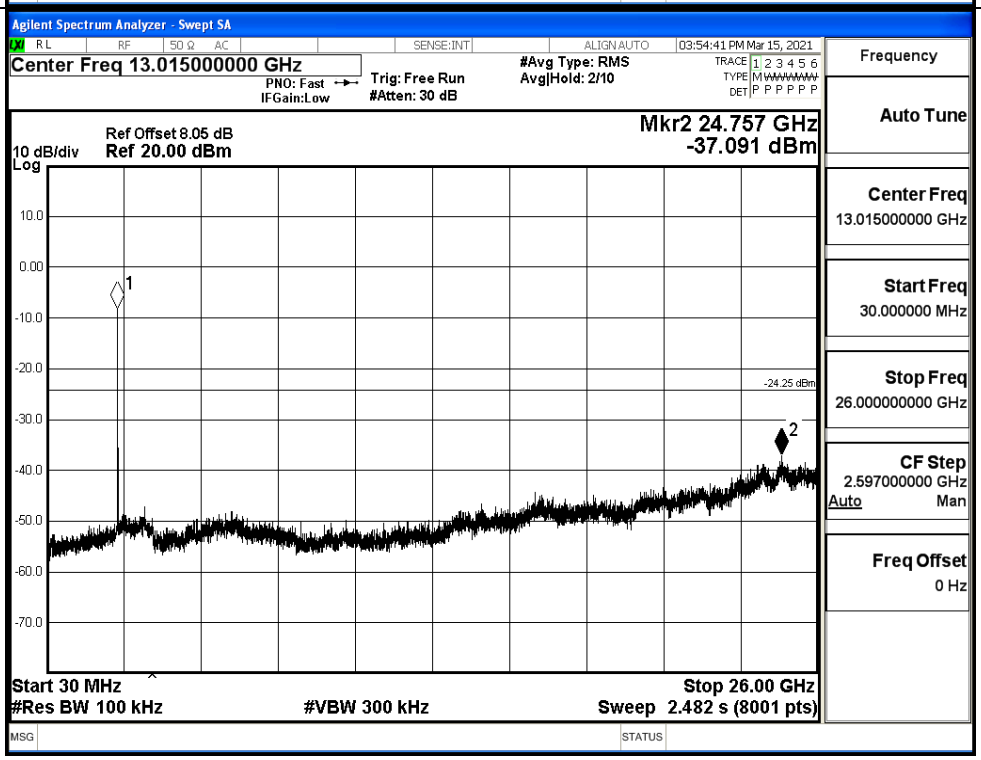
A.5 RF Conducted Spurious Emissions

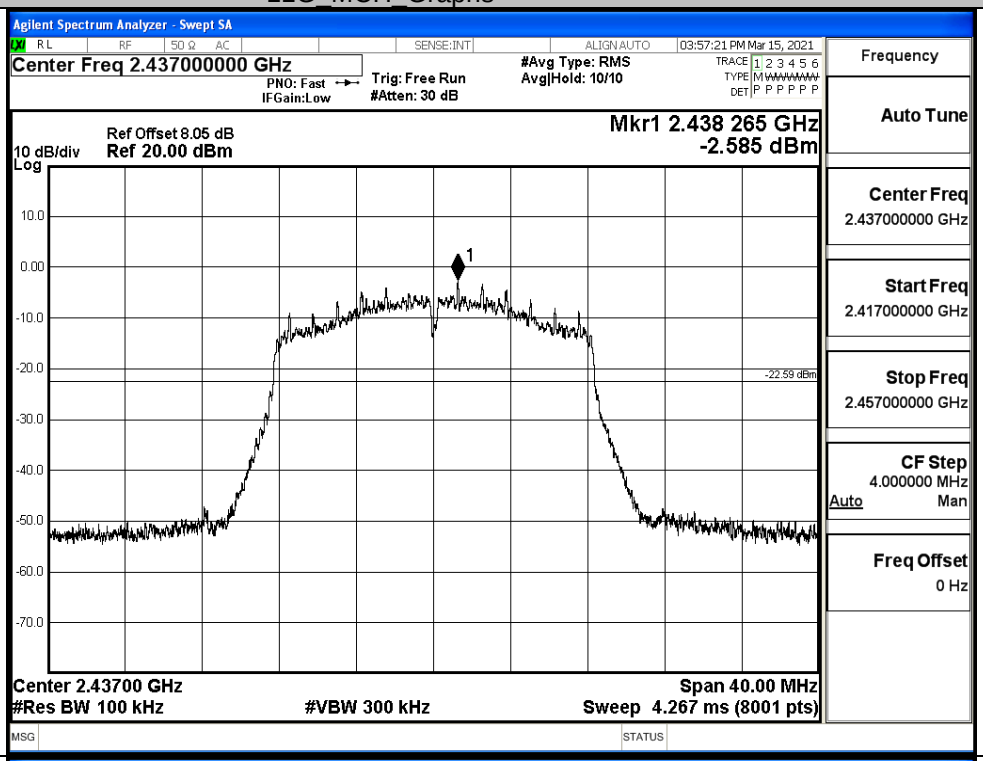
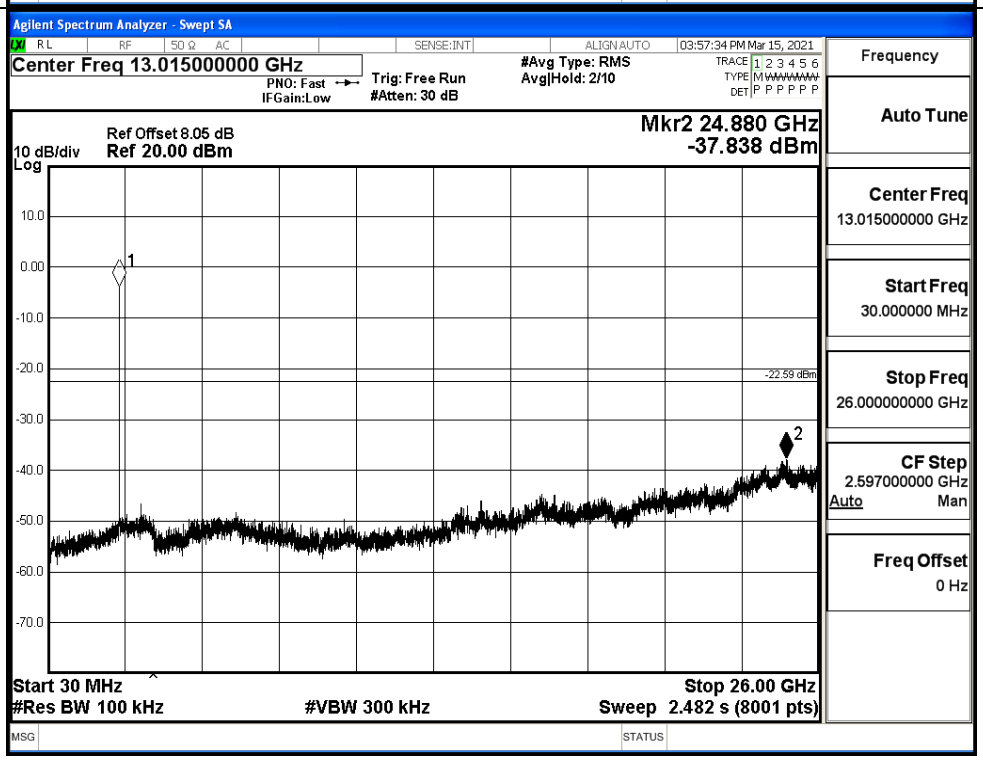
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
11B	LCH	1.48	-38.719	-18.520	PASS
	MCH	2.519	-38.626	-17.481	PASS
	HCH	2.388	-37.624	-17.612	PASS
11G	LCH	-4.247	-37.091	-24.247	PASS
	MCH	-2.585	-37.838	-22.585	PASS
	HCH	-1.876	-38.395	-21.876	PASS
11N20 SISO	LCH	-4.16	-37.359	-24.160	PASS
	MCH	-2.429	-37.523	-22.429	PASS
	HCH	-1.807	-38.178	-21.807	PASS
11N40 SISO	LCH	-6.833	-37.771	-26.833	PASS
	MCH	-6.217	-38.637	-26.217	PASS
	HCH	-5.939	-38.011	-25.939	PASS

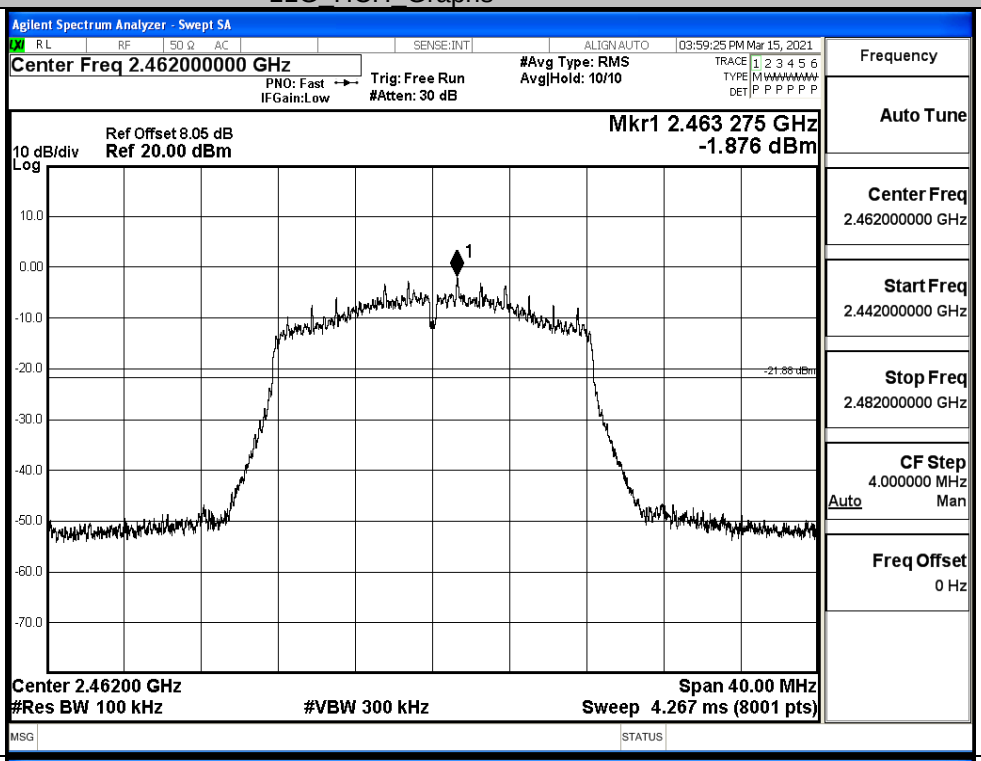
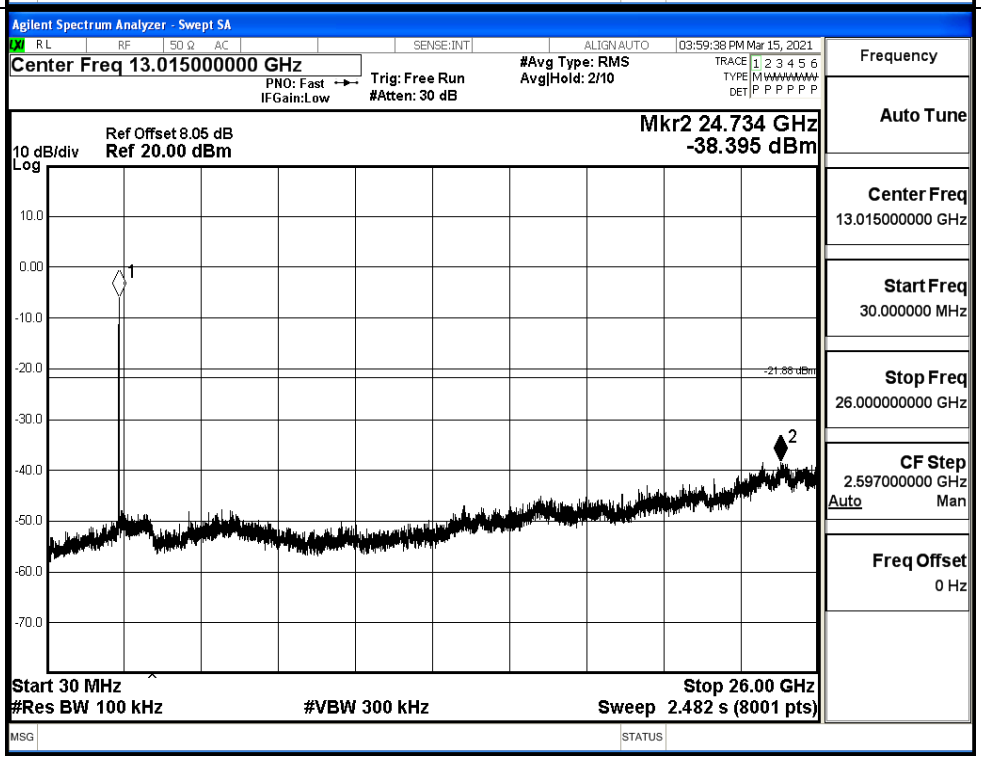
11B_LCH_Graphs	
Pref/11B/LCH	
Puw/11B/LCH	

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	

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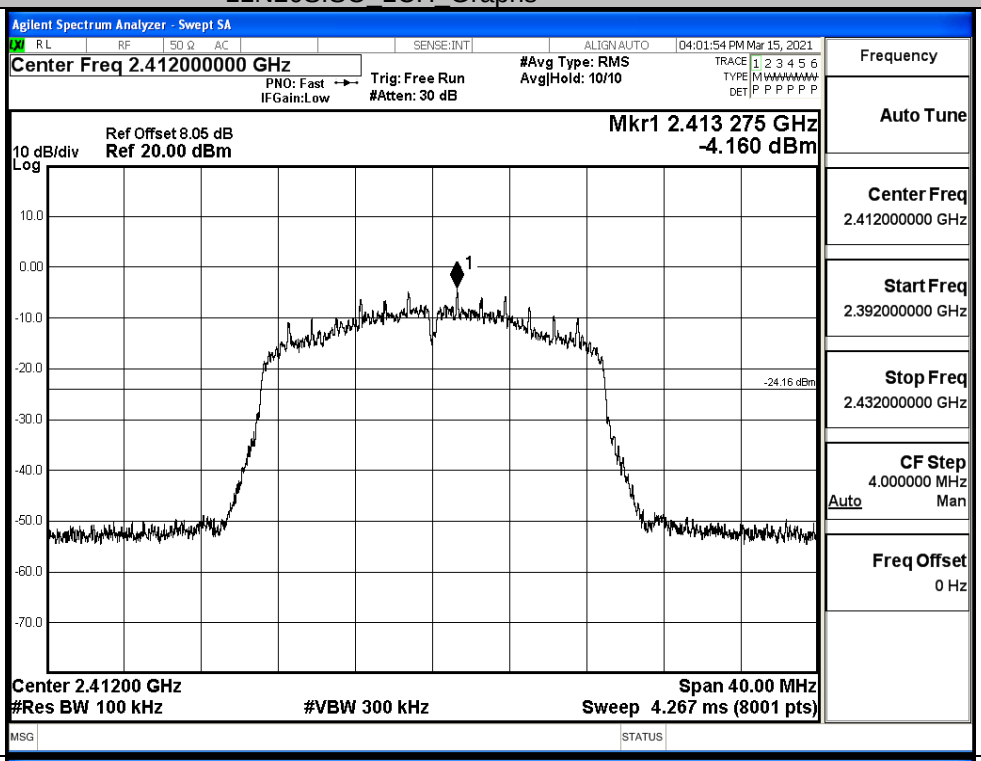
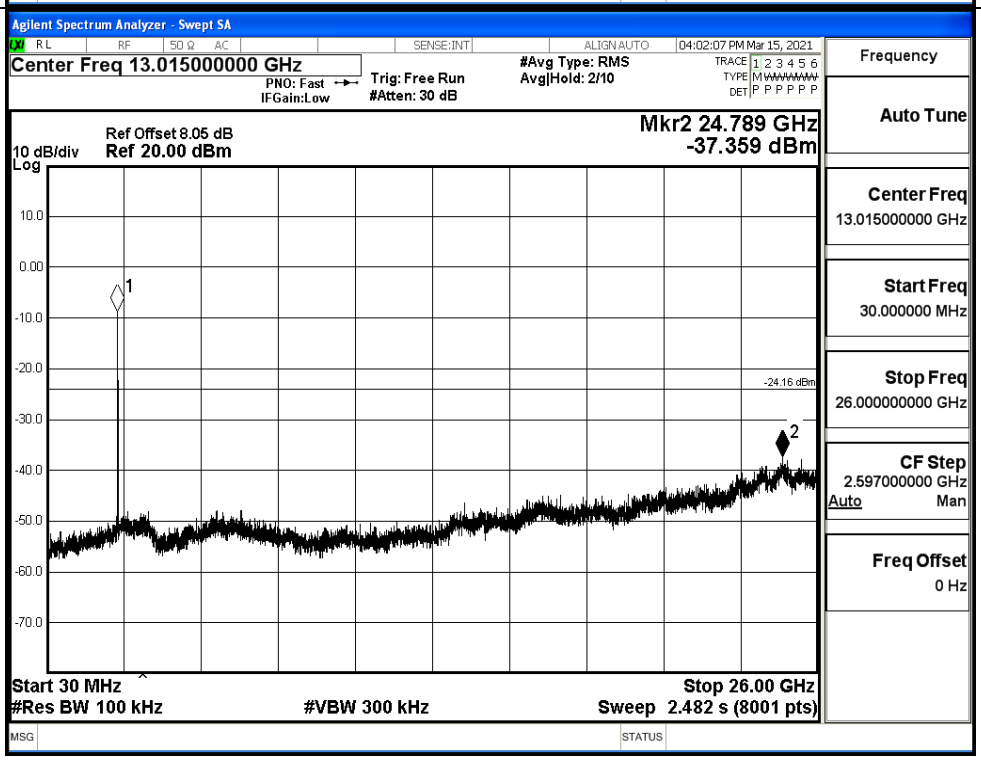
Pref/11N20SISO/LCH	
Puw/11N20SISO/LCH	

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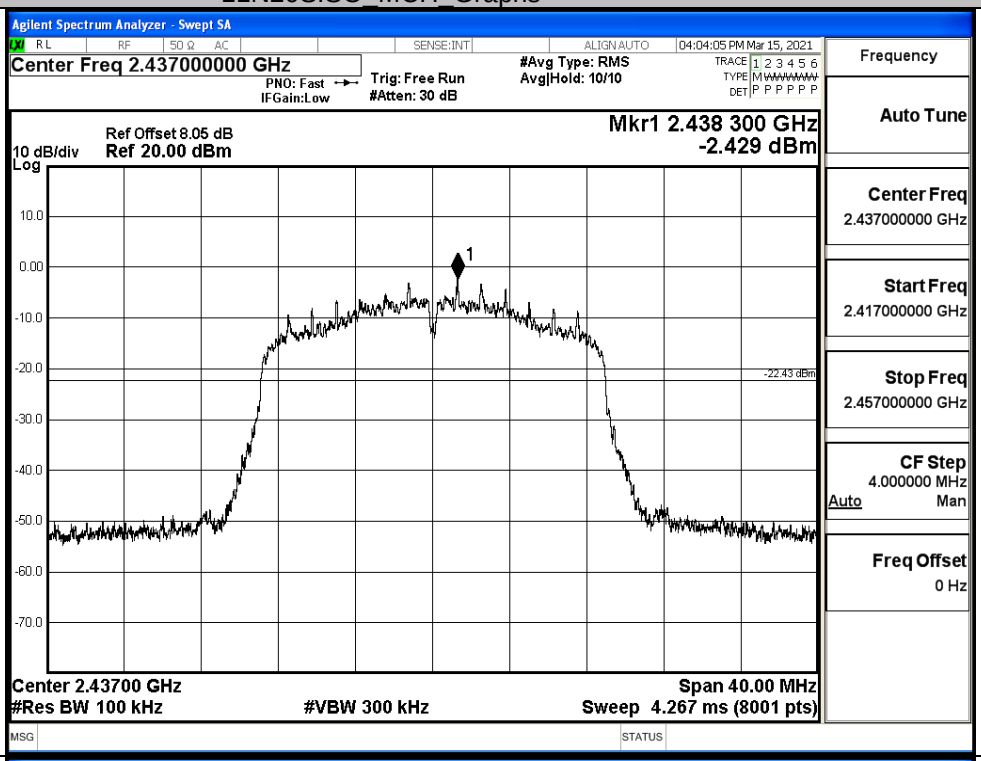
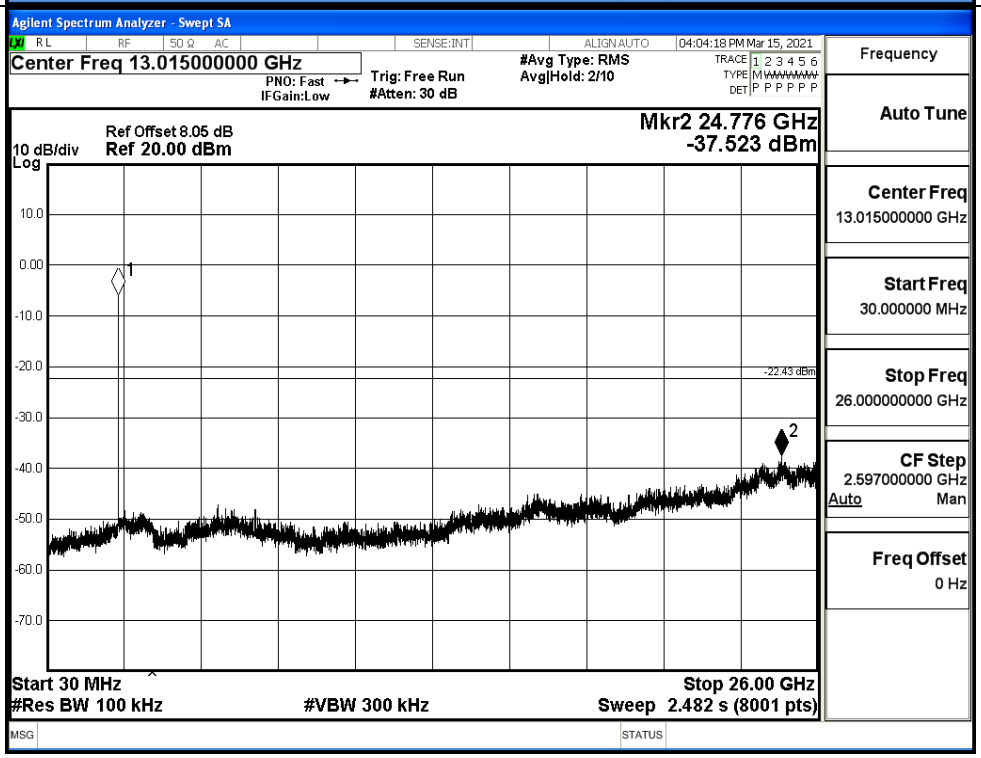
Pref/11N20 SISO/MCH	
Puw/11N20 SISO/MCH	

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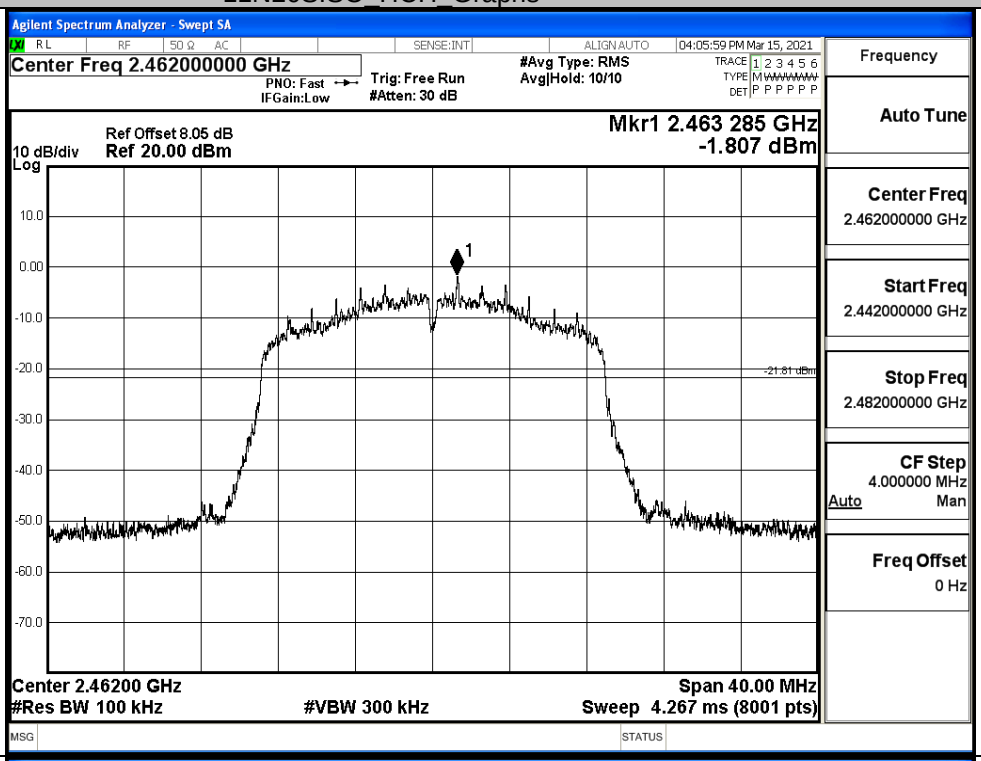
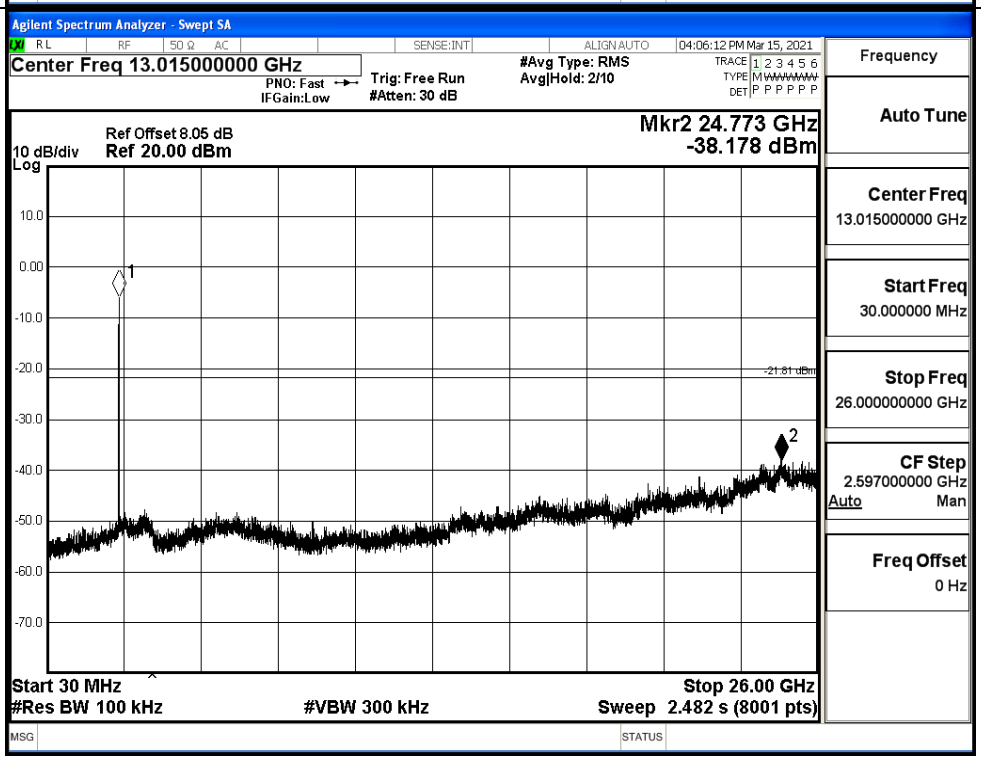
Pref/11N20 SISO/HCH	
Puw/11N20 SISO/HCH	

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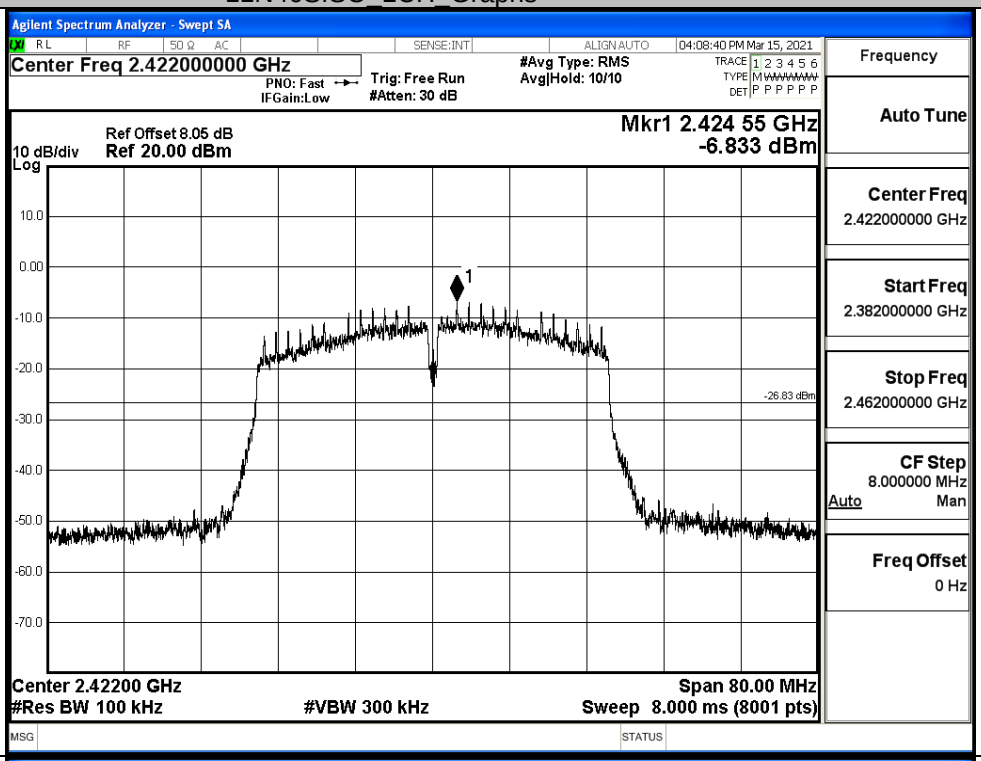
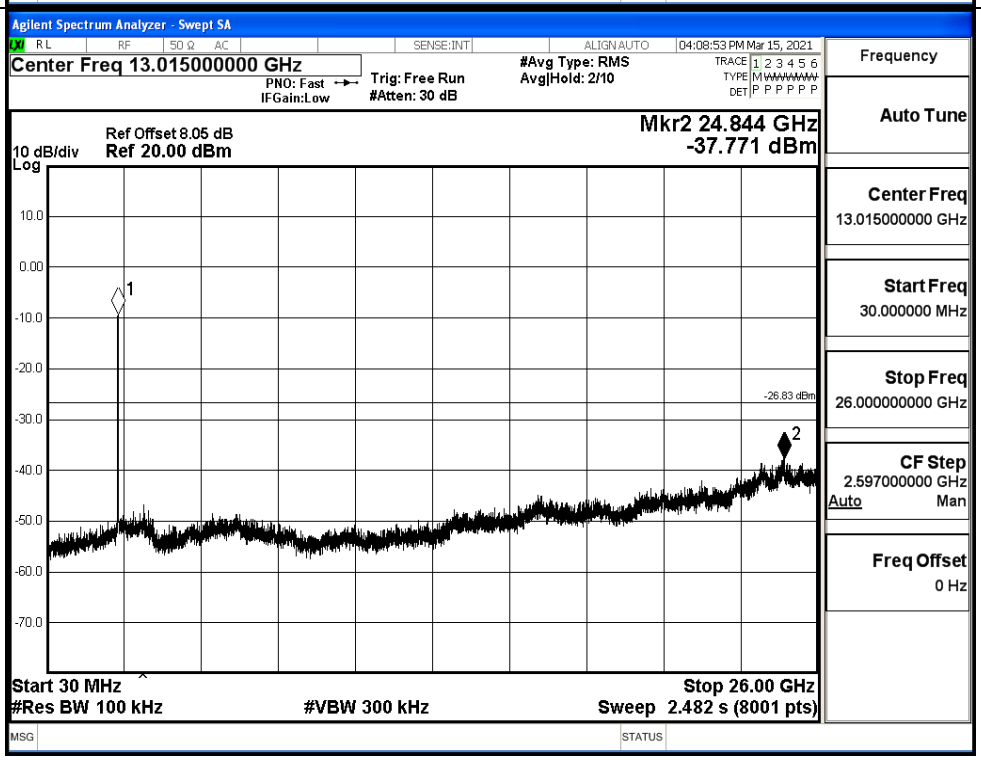
Pref/11N40 SISO/LCH	
Puw/11N40 SISO/LCH	

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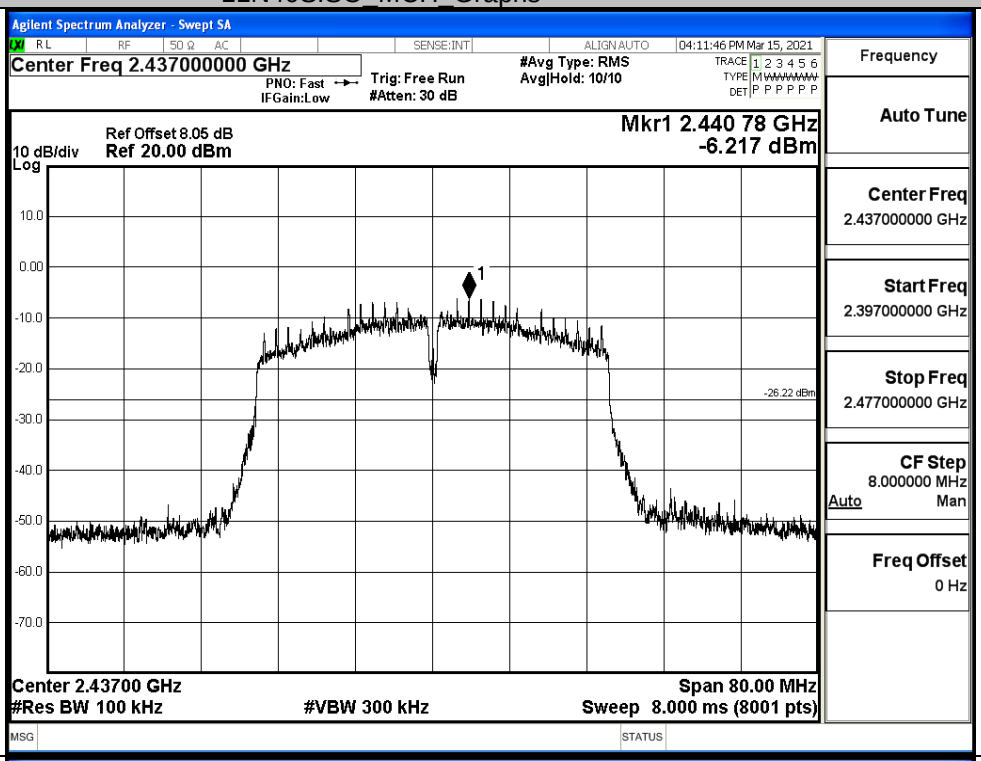
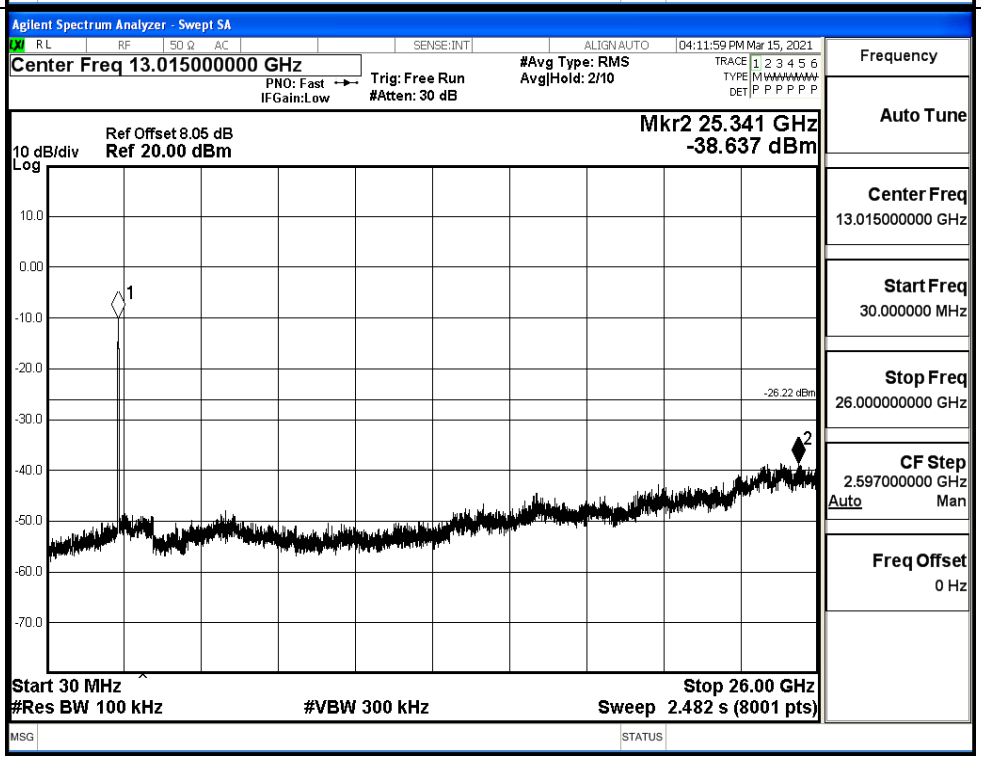
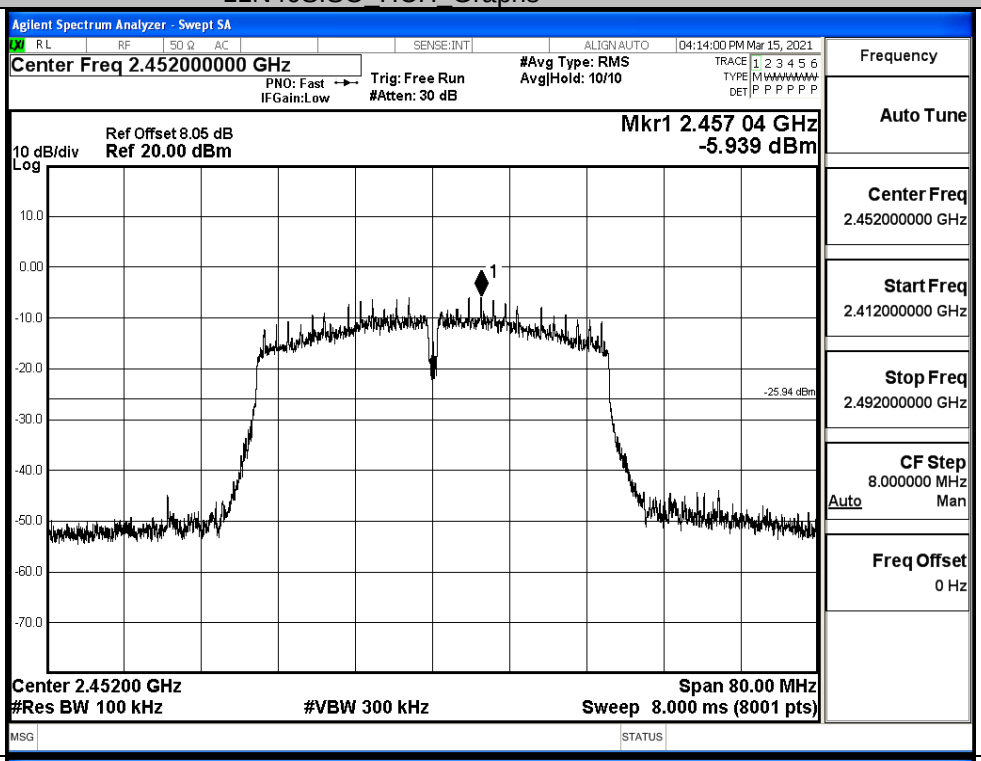
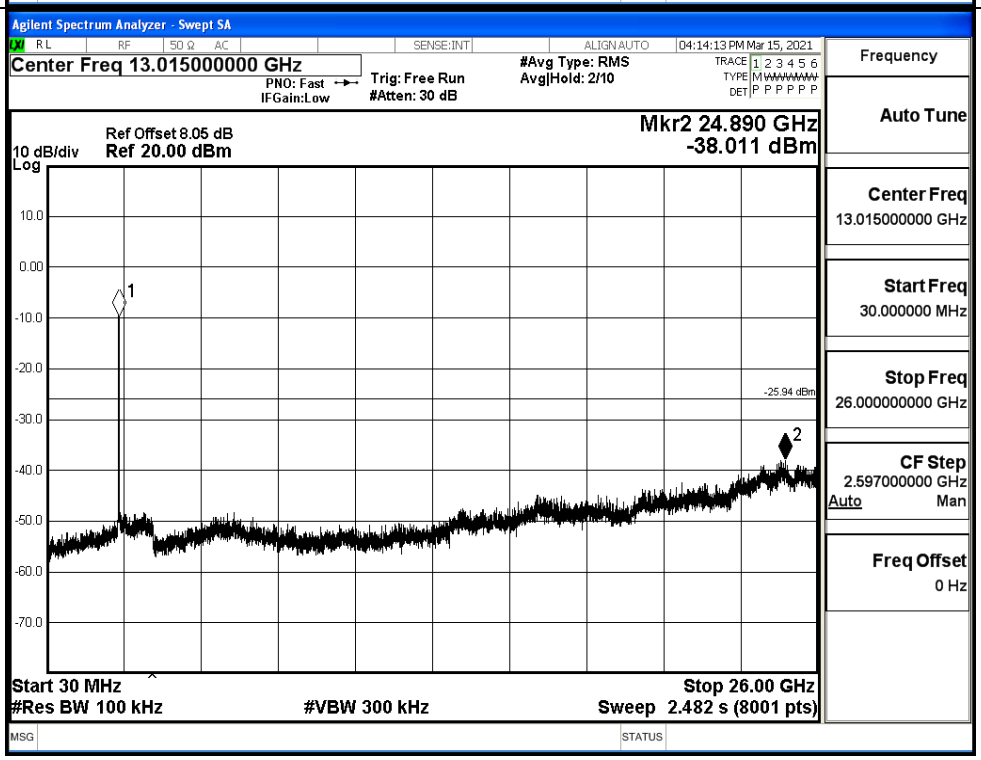
Pref/11N40 SISO/MCH	
Puw/11N40 SISO/MCH	

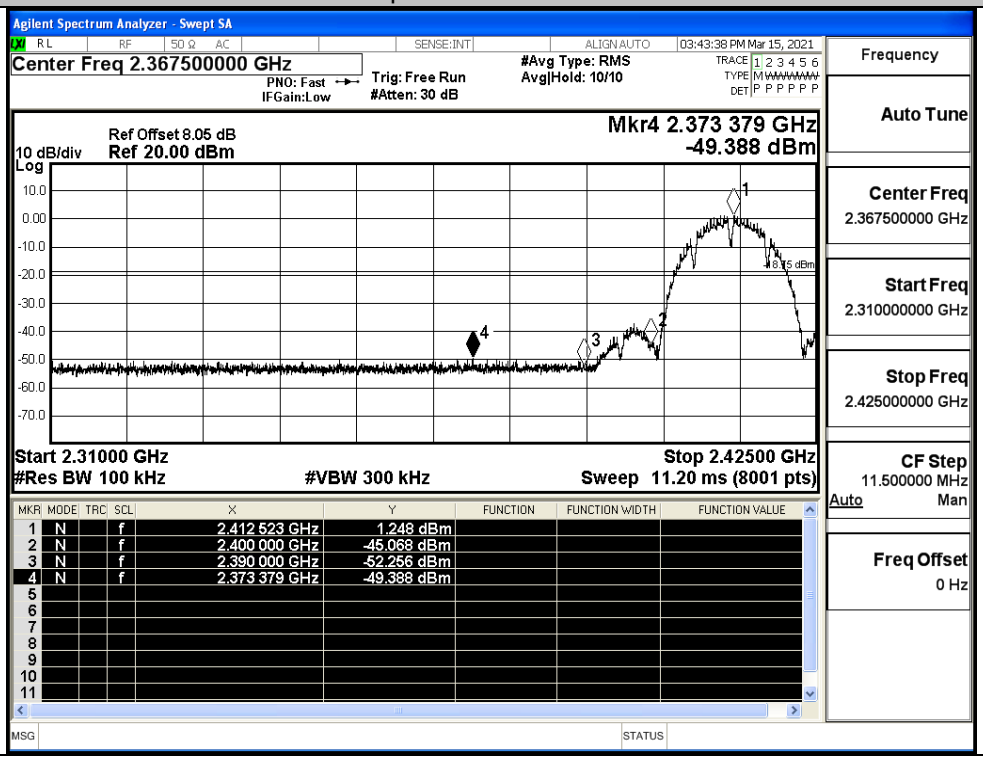
11N40SISO_HCH_Graphs	
Pref/11N40 SISO/HCH	
Puw/11N40 SISO/HCH	

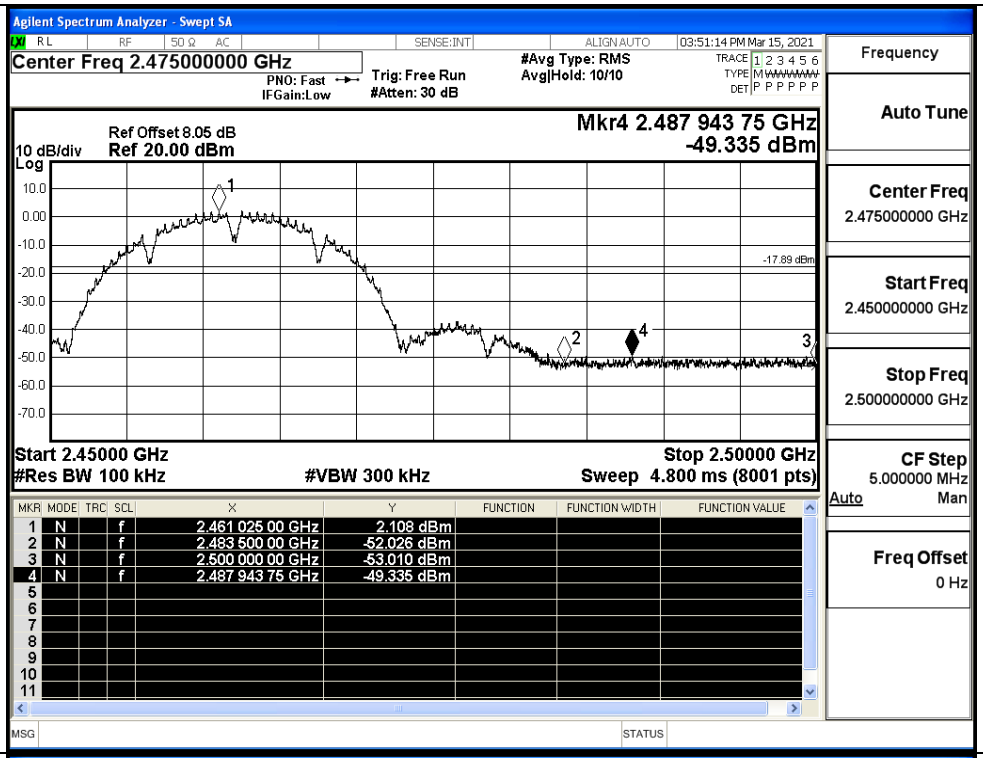
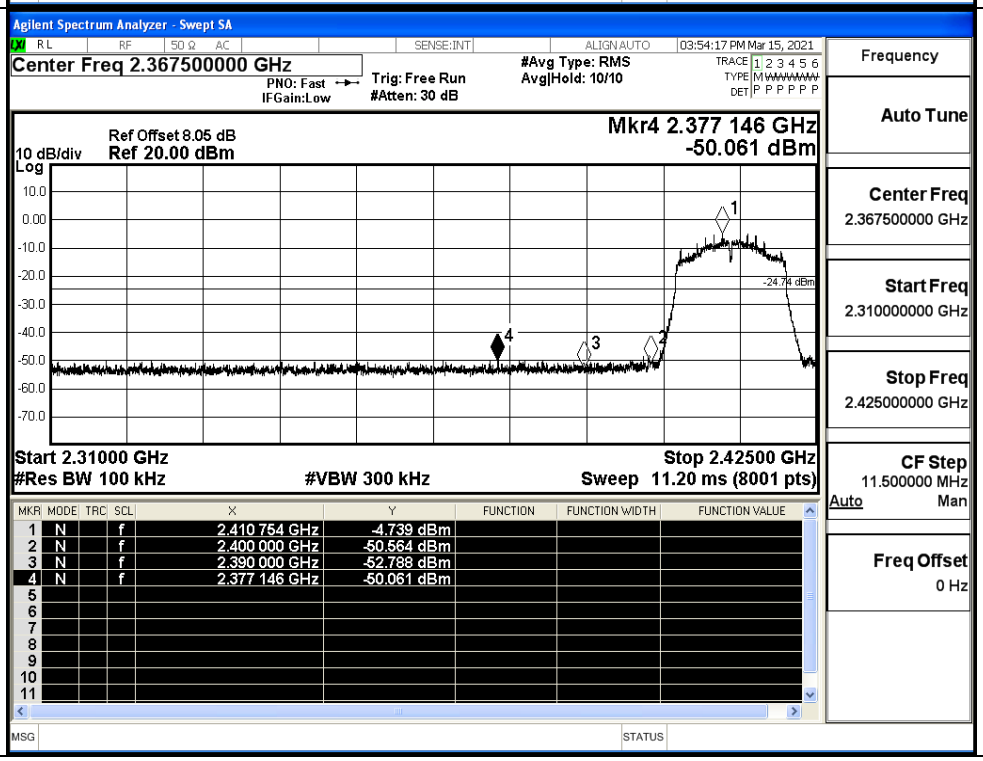
A.6 Band-edge for RF Conducted Emissions

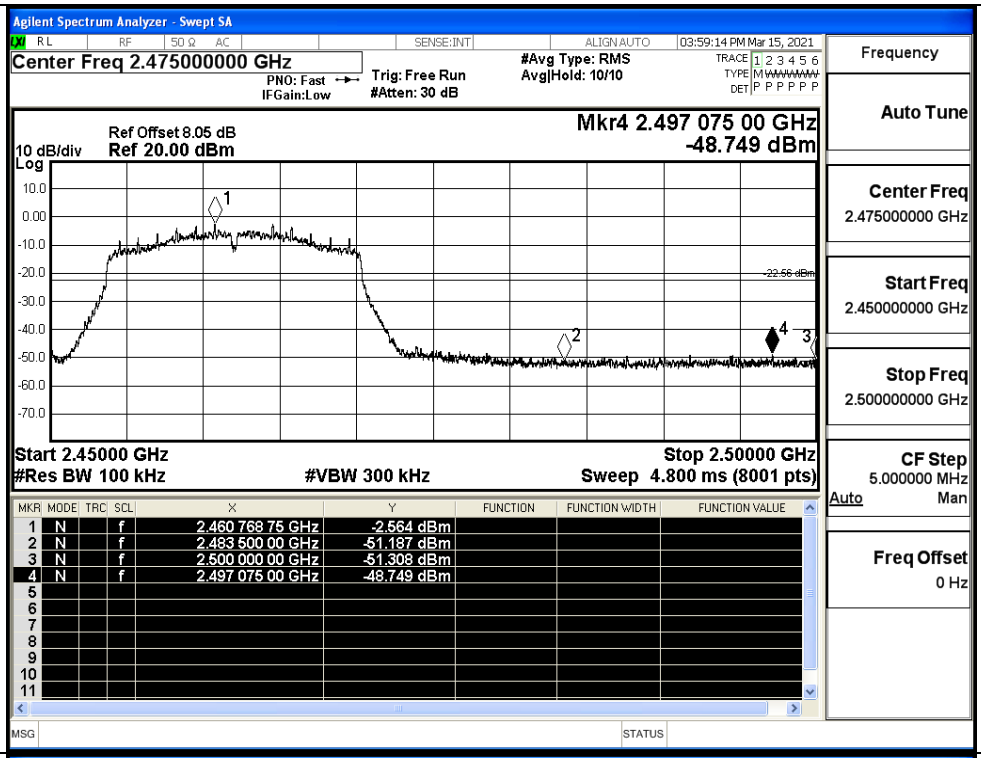
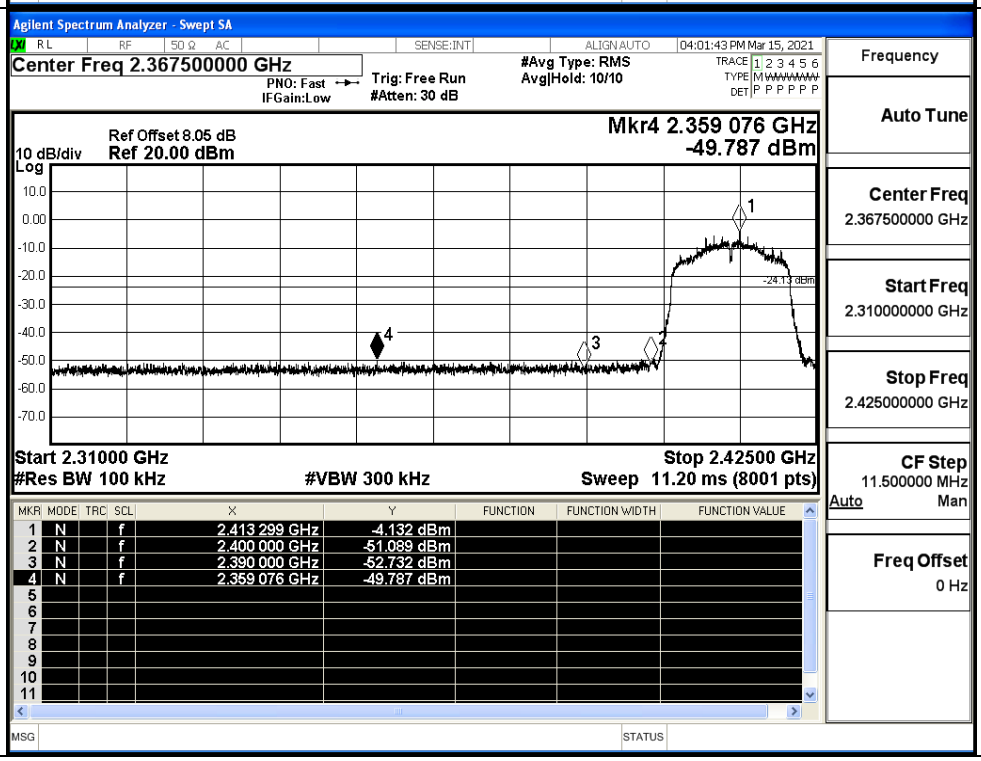
Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
11B	LCH	1.248	-49.388	-18.75	PASS
	HCH	2.108	-49.335	-17.89	PASS
11G	LCH	-4.739	-50.061	-24.74	PASS
	HCH	-2.564	-48.749	-22.56	PASS
11N20SISO	LCH	-4.132	-49.787	-24.13	PASS
	HCH	-1.687	-49.136	-21.69	PASS
11N40SISO	LCH	-6.836	-49.473	-26.84	PASS
	HCH	-5.901	-46.919	-25.9	PASS

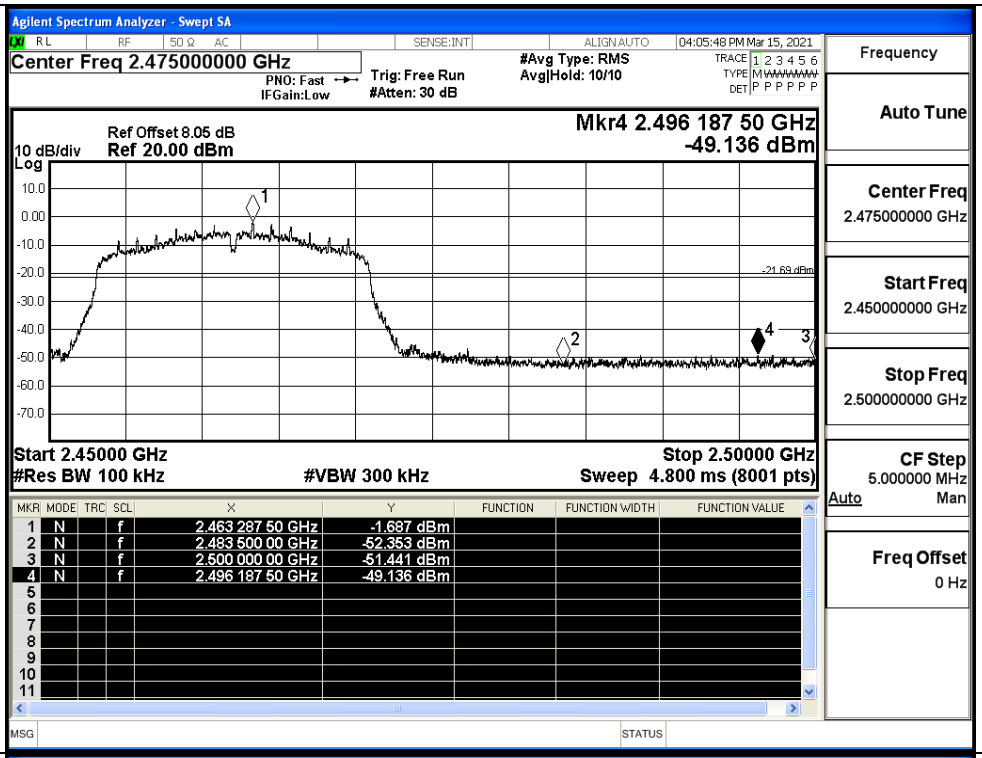
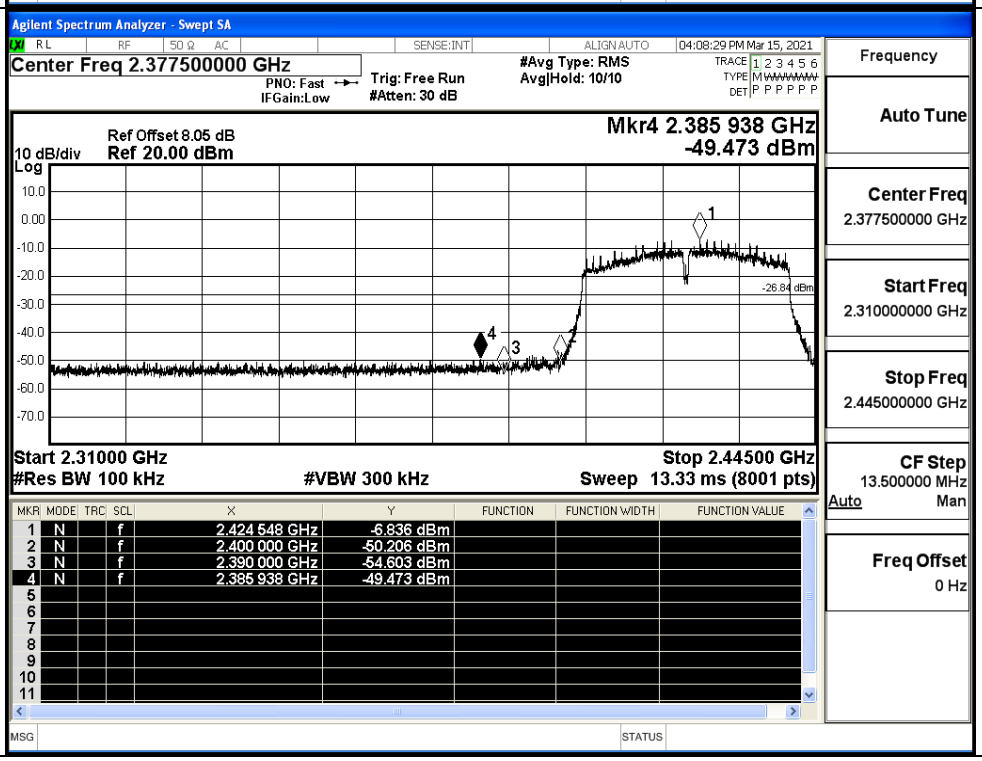
Test Graphs

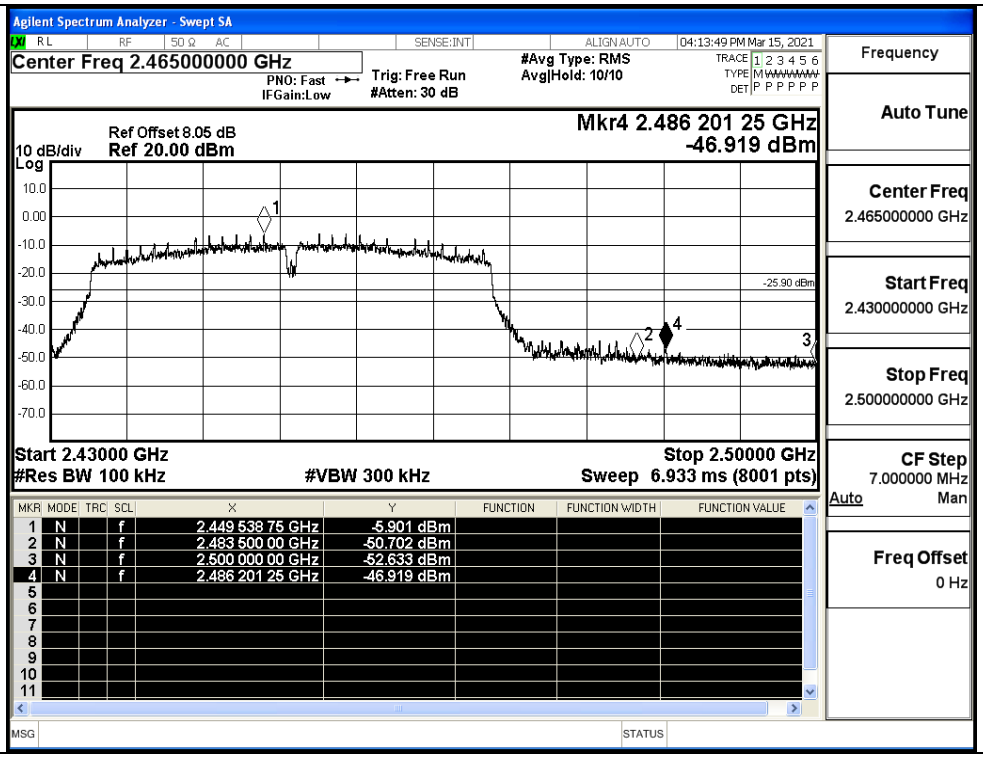
11B/LCH



11B/HCH	
11G/LCH	

11G/HCH	
11N20SISO/LCH	

11N20SISO/HCH		
11N40SISO/LCH		

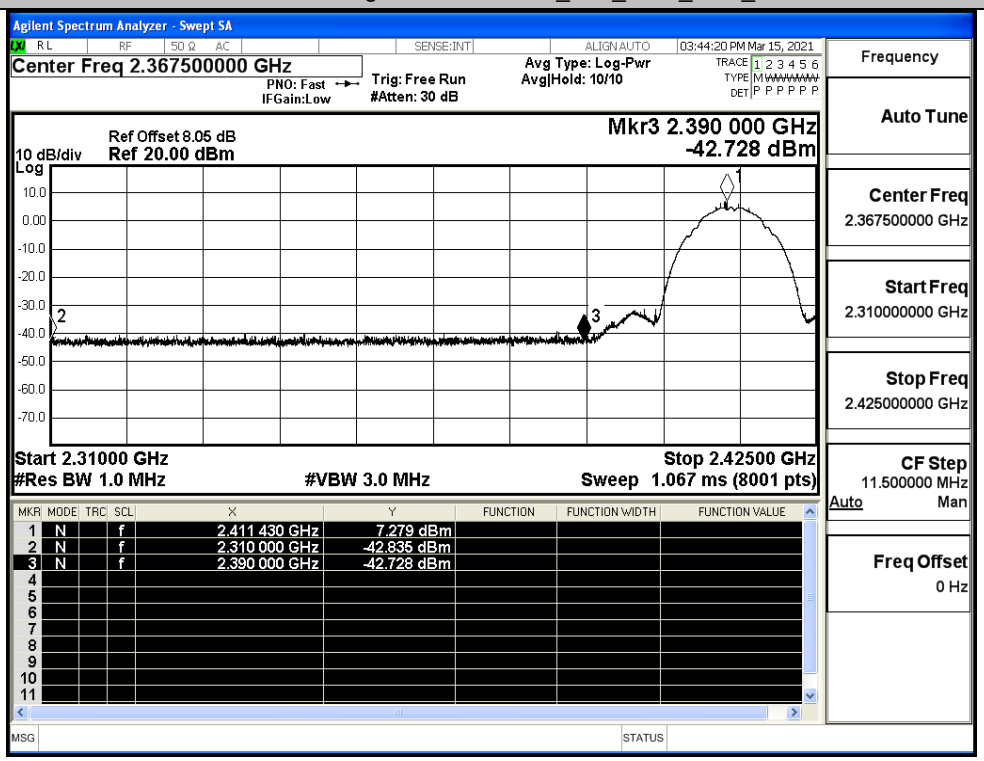
11N40SISO/HCH	

A.7 Restrict-band band-edge measurements

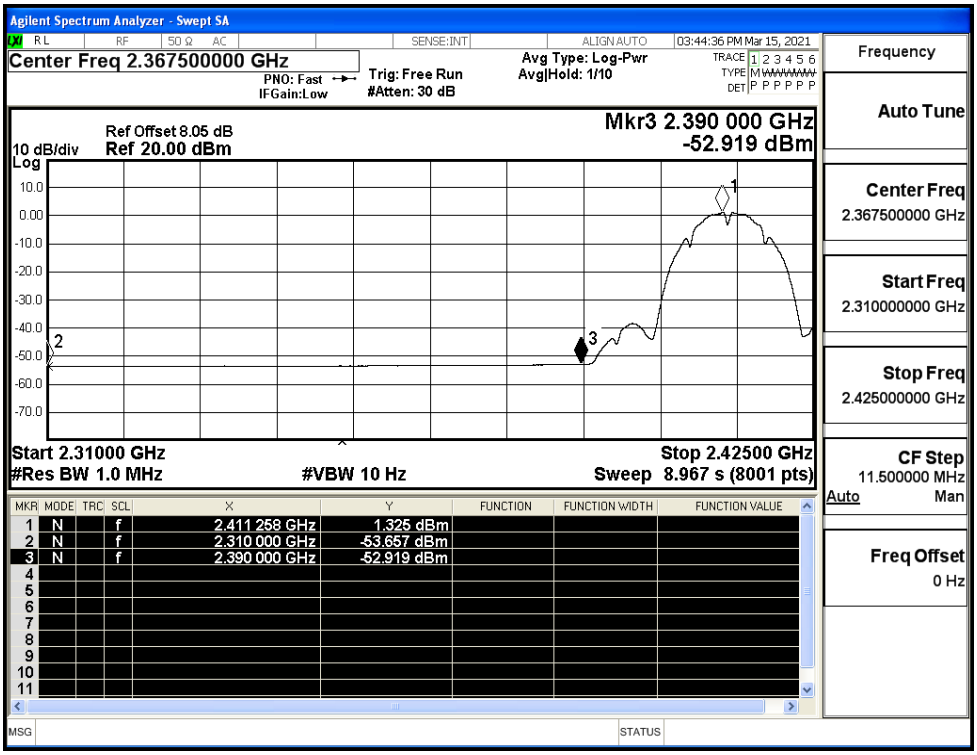
Test Mode	Test Channel	Ant	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
11B	2412	Ant1	2310.0	-42.84	2.0	0	52.42	PEAK	74	PASS
	2412	Ant1	2310.0	-53.66	2.0	0	41.60	AV	54	PASS
	2412	Ant1	2390.0	-42.73	2.0	0	52.53	PEAK	74	PASS
	2412	Ant1	2390.0	-52.92	2.0	0	42.34	AV	54	PASS
	2462	Ant1	2483.5	-41.67	2.0	0	53.59	PEAK	74	PASS
	2462	Ant1	2483.5	-52.38	2.0	0	42.88	AV	54	PASS
	2462	Ant1	2500.0	-41.97	2.0	0	53.29	PEAK	74	PASS
	2462	Ant1	2500.0	-52.26	2.0	0	43.00	AV	54	PASS
11G	2412	Ant1	2310.0	-43.55	2.0	0	51.70	PEAK	74	PASS
	2412	Ant1	2310.0	-53.63	2.0	0	41.63	AV	54	PASS
	2412	Ant1	2390.0	-41.62	2.0	0	53.64	PEAK	74	PASS
	2412	Ant1	2390.0	-53.09	2.0	0	42.17	AV	54	PASS
	2462	Ant1	2483.5	-41.63	2.0	0	53.63	PEAK	74	PASS
	2462	Ant1	2483.5	-52.39	2.0	0	42.87	AV	54	PASS
	2462	Ant1	2500.0	-42.31	2.0	0	52.95	PEAK	74	PASS
	2462	Ant1	2500.0	-52.07	2.0	0	43.19	AV	54	PASS
11N20 SISO	2412	Ant1	2310.0	-42.74	2.0	0	52.52	PEAK	74	PASS
	2412	Ant1	2310.0	-53.66	2.0	0	41.60	AV	54	PASS
	2412	Ant1	2390.0	-42.38	2.0	0	52.88	PEAK	74	PASS
	2412	Ant1	2390.0	-53.13	2.0	0	42.12	AV	54	PASS
	2462	Ant1	2483.5	-42.51	2.0	0	52.75	PEAK	74	PASS
	2462	Ant1	2483.5	-52.37	2.0	0	42.89	AV	54	PASS
	2462	Ant1	2500.0	-40.80	2.0	0	54.46	PEAK	74	PASS
	2462	Ant1	2500.0	-52.10	2.0	0	43.16	AV	54	PASS
11N40 SISO	2422	Ant1	2310.0	-43.38	2.0	0	51.88	PEAK	74	PASS
	2422	Ant1	2310.0	-53.62	2.0	0	41.64	AV	54	PASS

	2422	Ant1	2390.0	-41.74	2.0	0	53.52	PEAK	74	PASS
	2422	Ant1	2390.0	-52.40	2.0	0	42.86	AV	54	PASS
	2452	Ant1	2483.5	-36.36	2.0	0	58.90	PEAK	74	PASS
	2452	Ant1	2483.5	-50.31	2.0	0	44.95	AV	54	PASS
	2452	Ant1	2500.0	-39.86	2.0	0	55.40	PEAK	74	PASS
	2452	Ant1	2500.0	-52.10	2.0	0	43.15	AV	54	PASS

Restrict-band band-edge measurements_11B_2412_Ant1_PEAK



Restrict-band band-edge measurements_11B_2412_Ant1_AV



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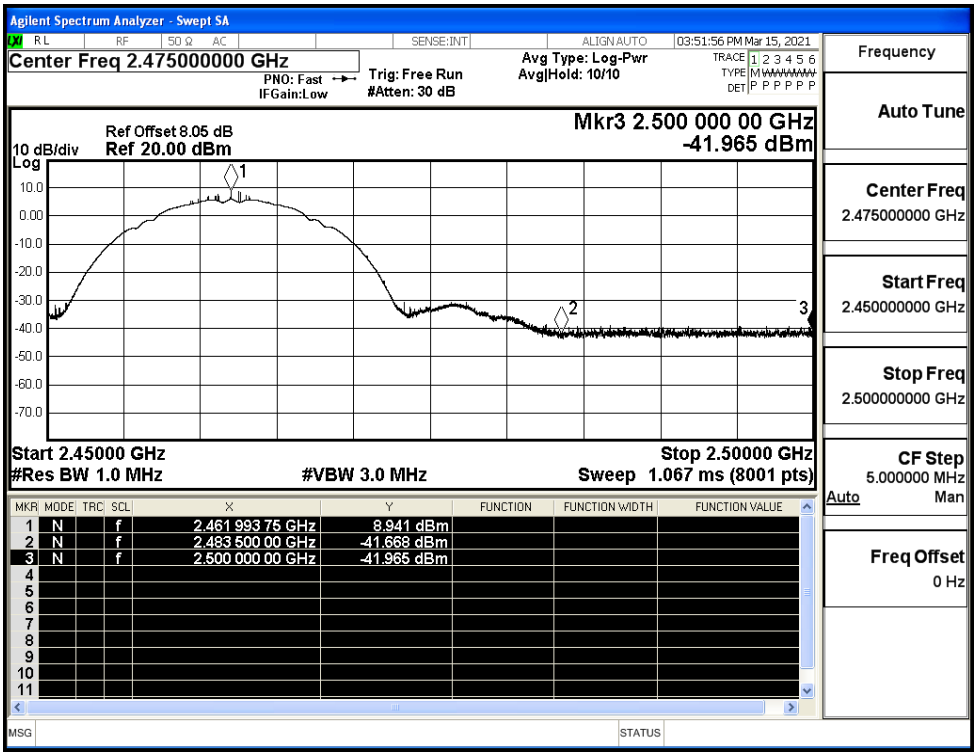

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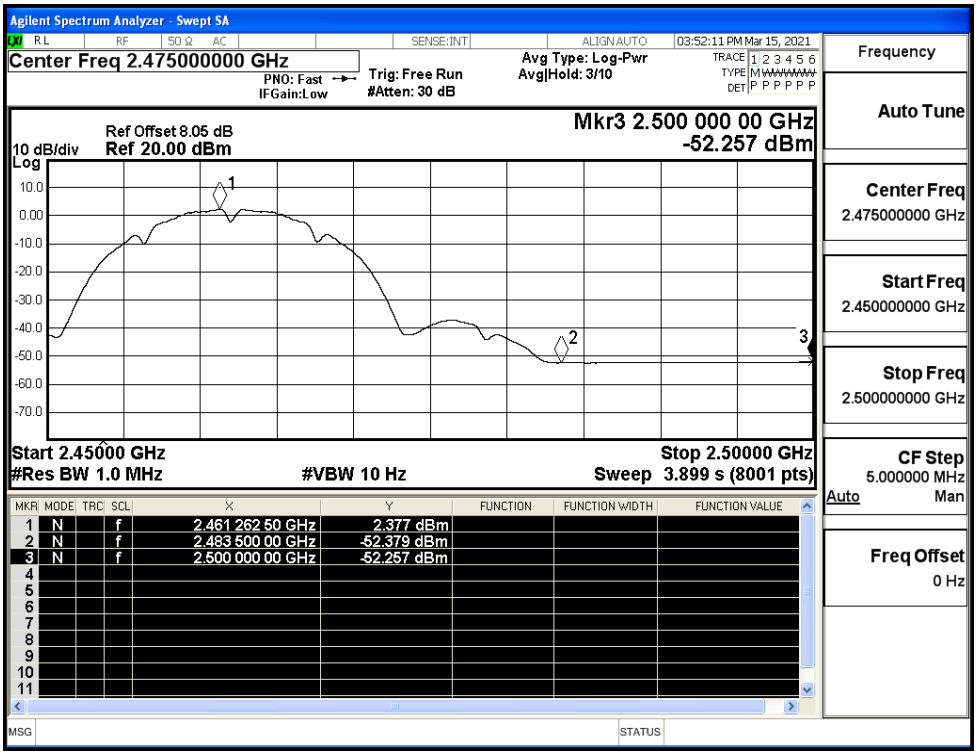

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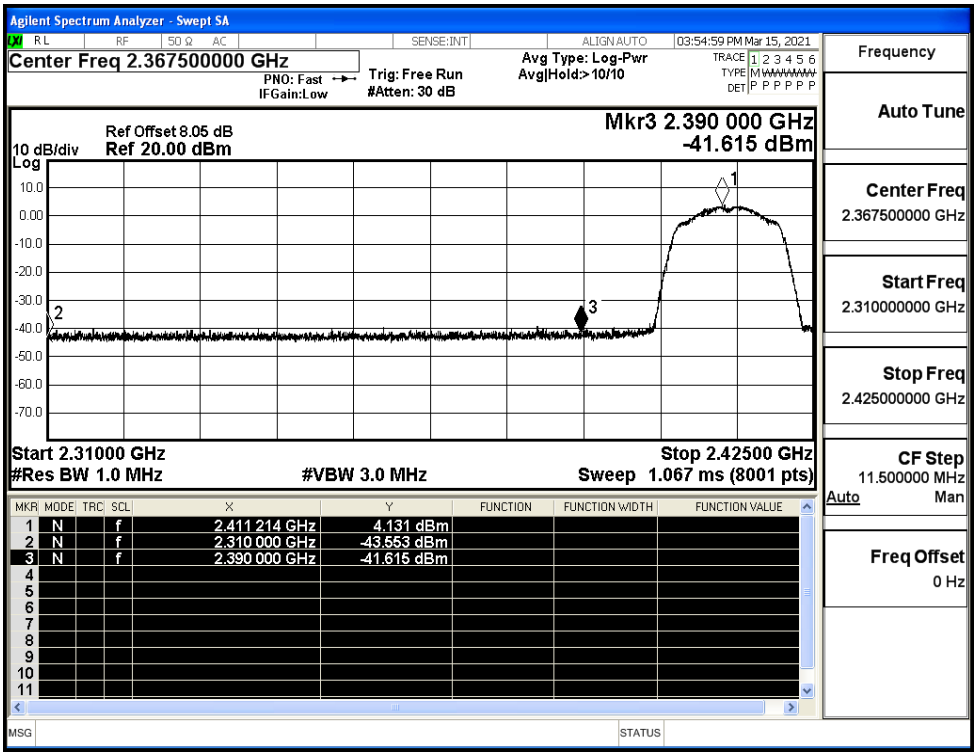
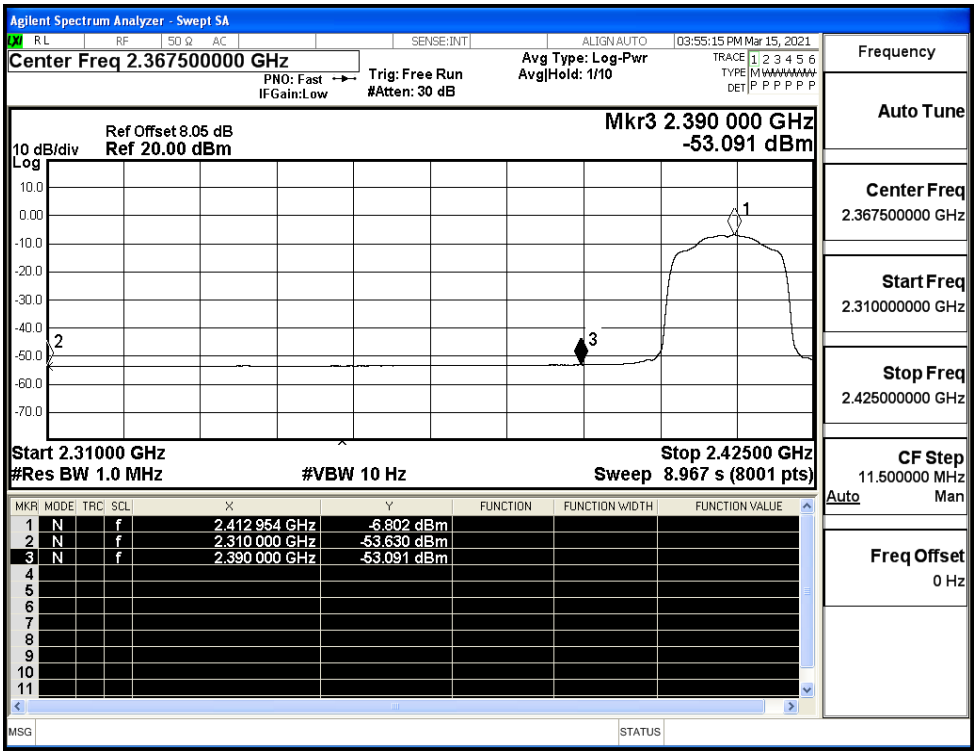
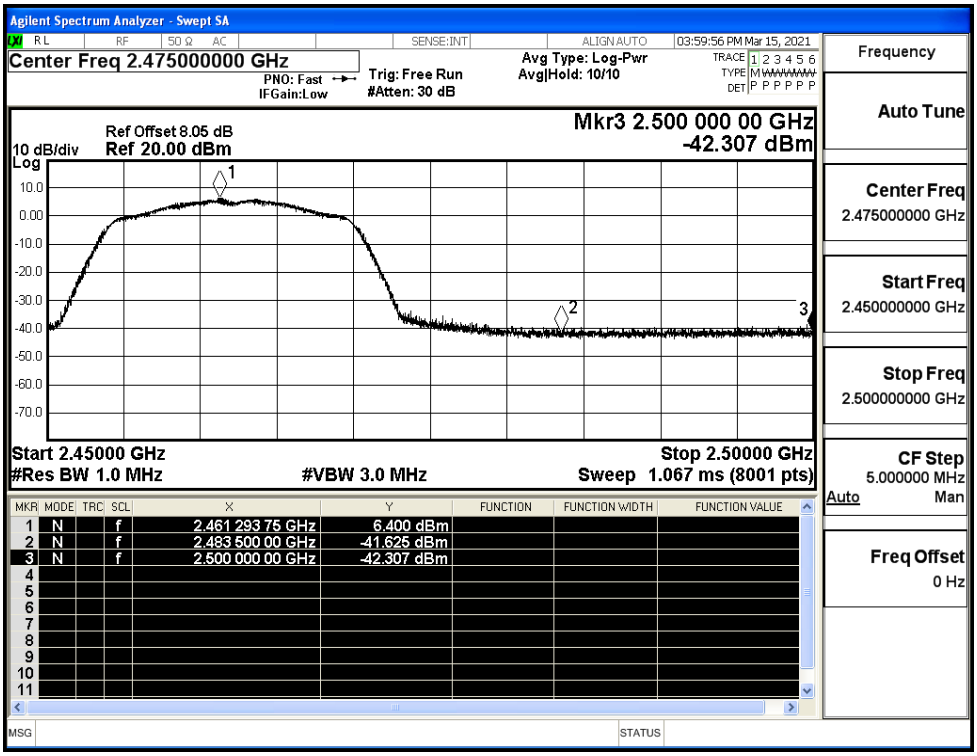


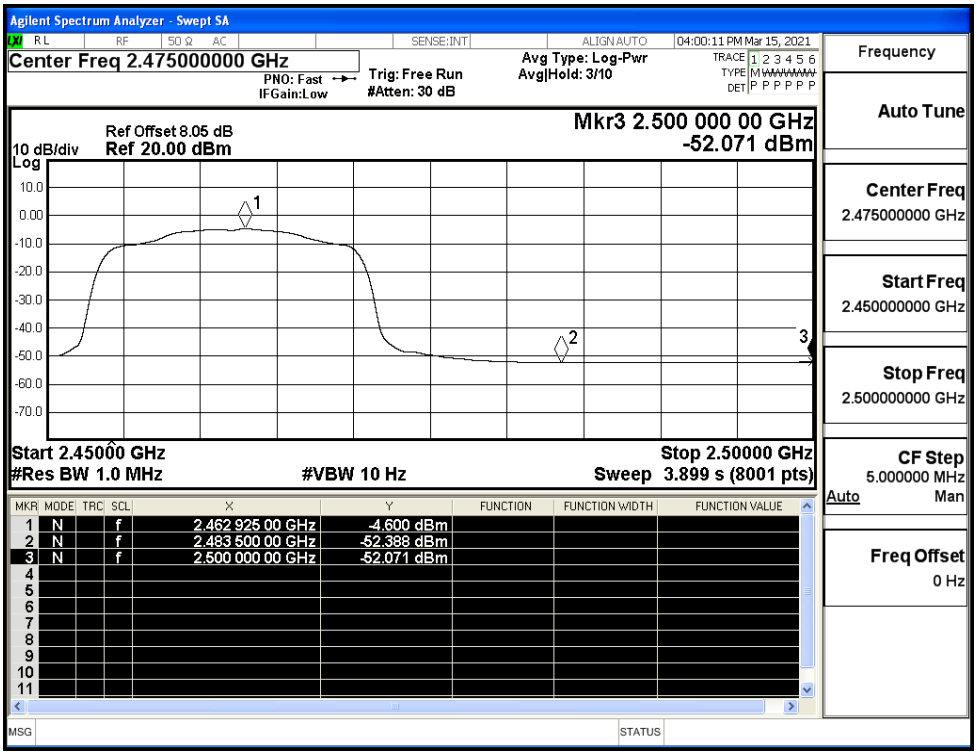
Restrict-band band-edge measurements_11G_2412_Ant1_AV



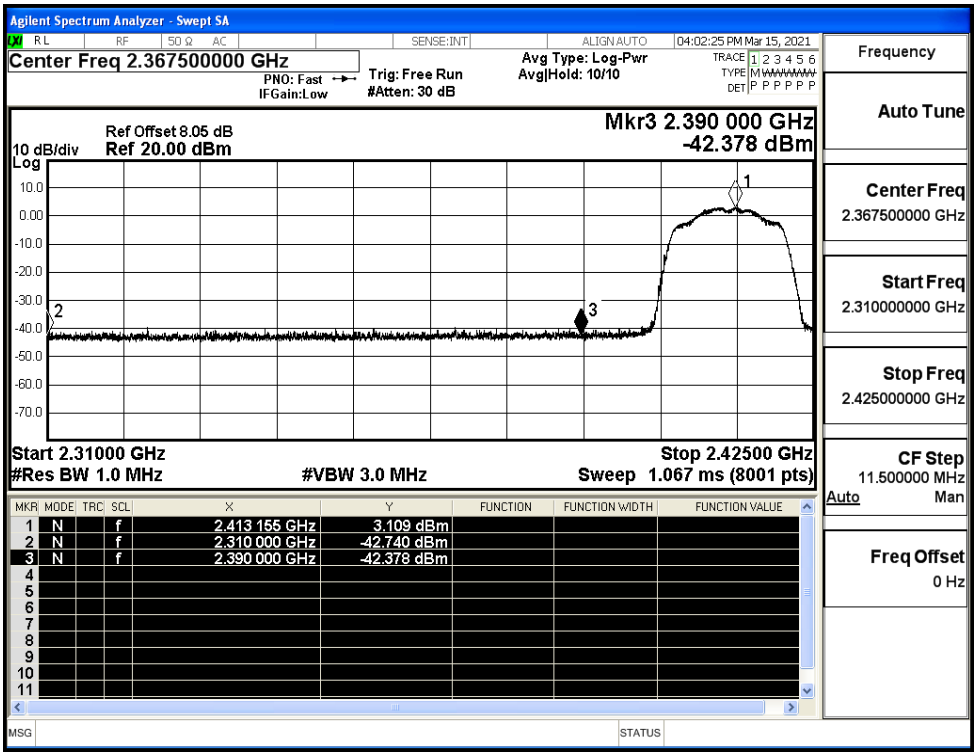
Restrict-band band-edge measurements_11G_2462_Ant1_PEAK



Restrict-band band-edge measurements_11G_2462_Ant1_AV



Restrict-band band-edge measurements_11N20SISO_2412_Ant1_PEAK



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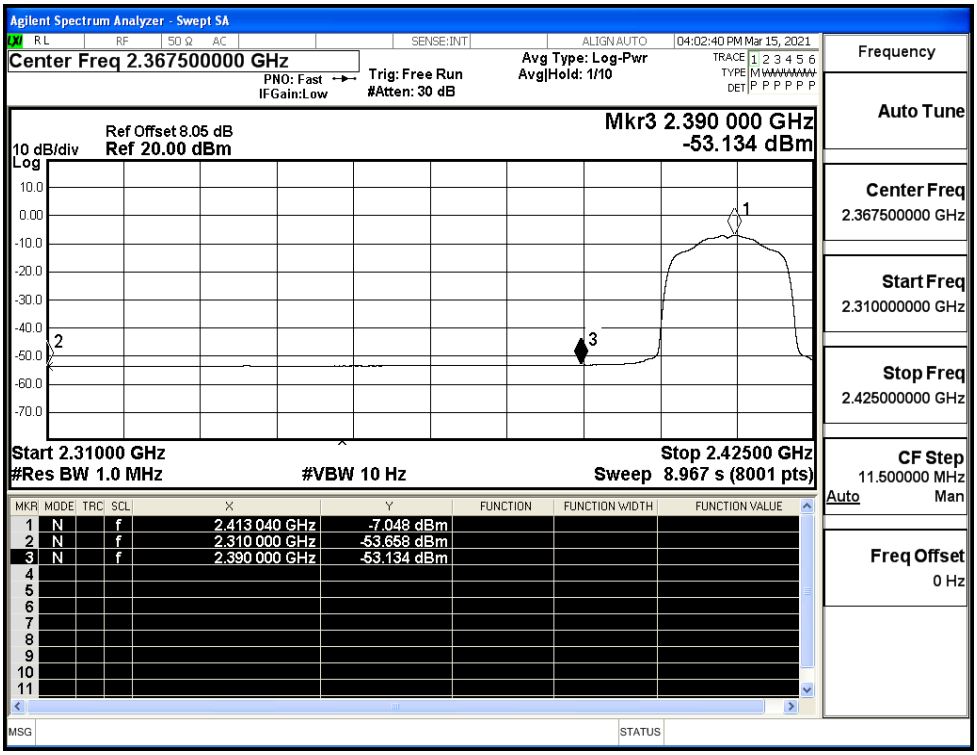

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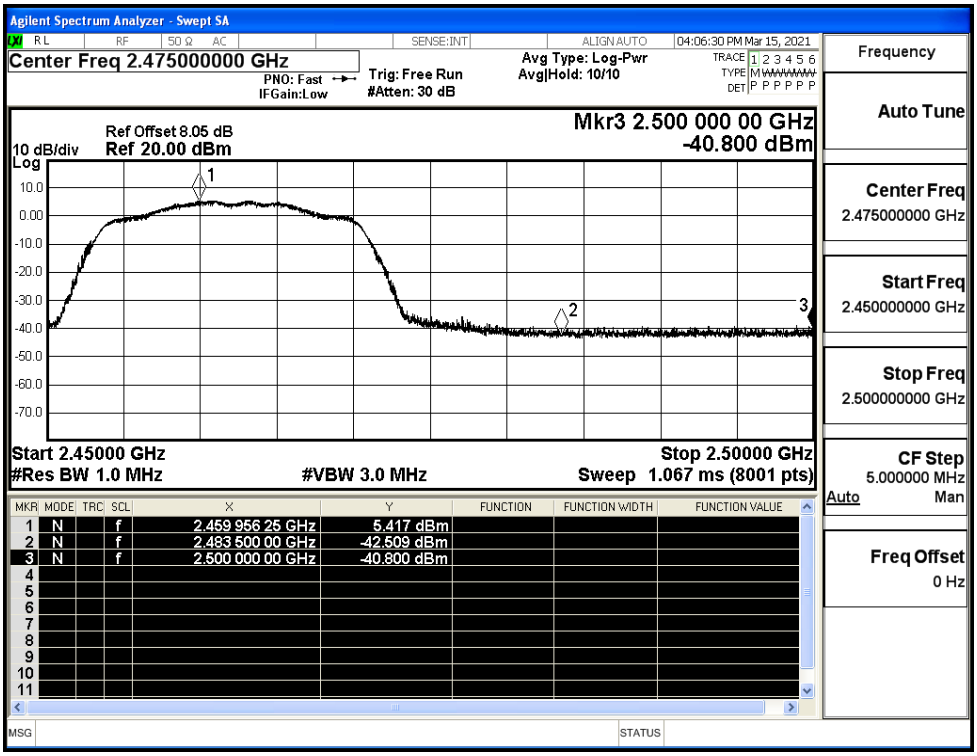

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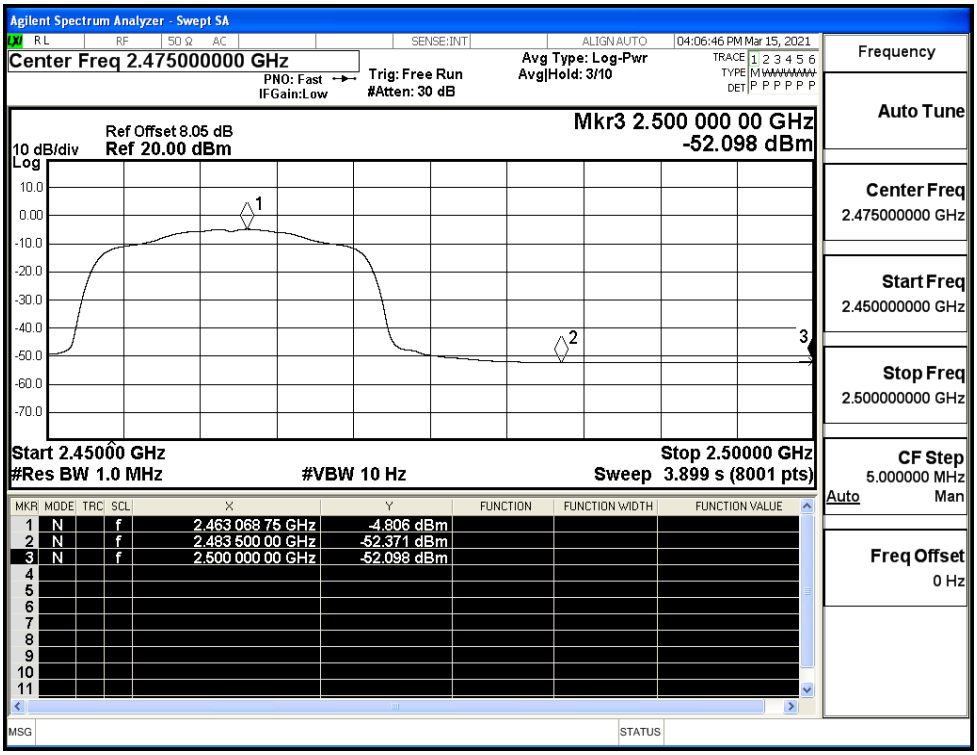
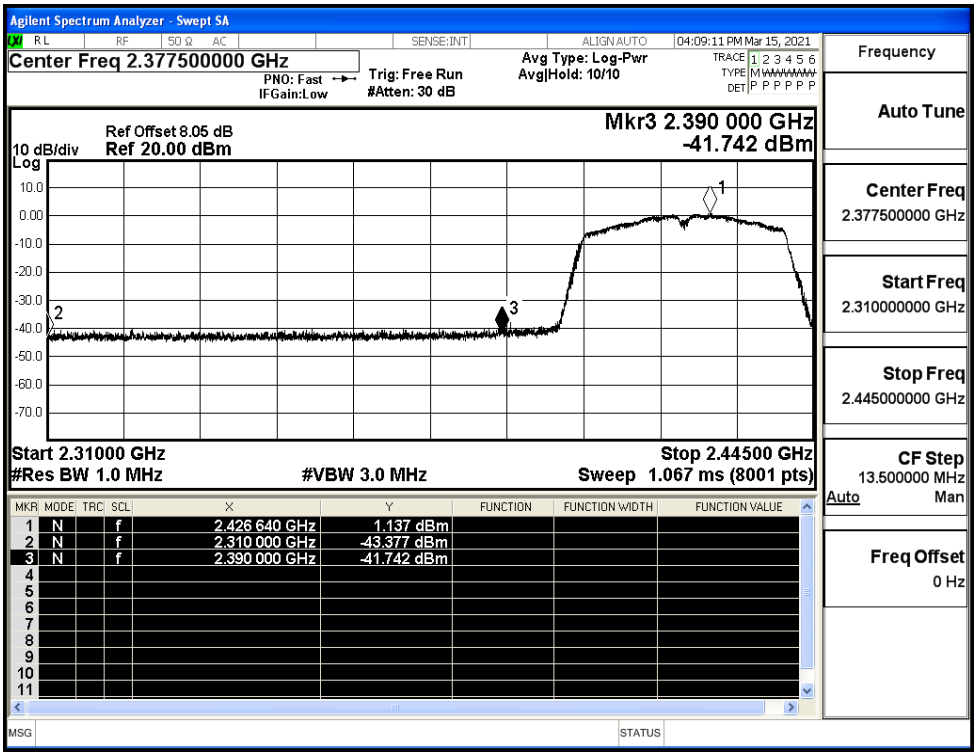
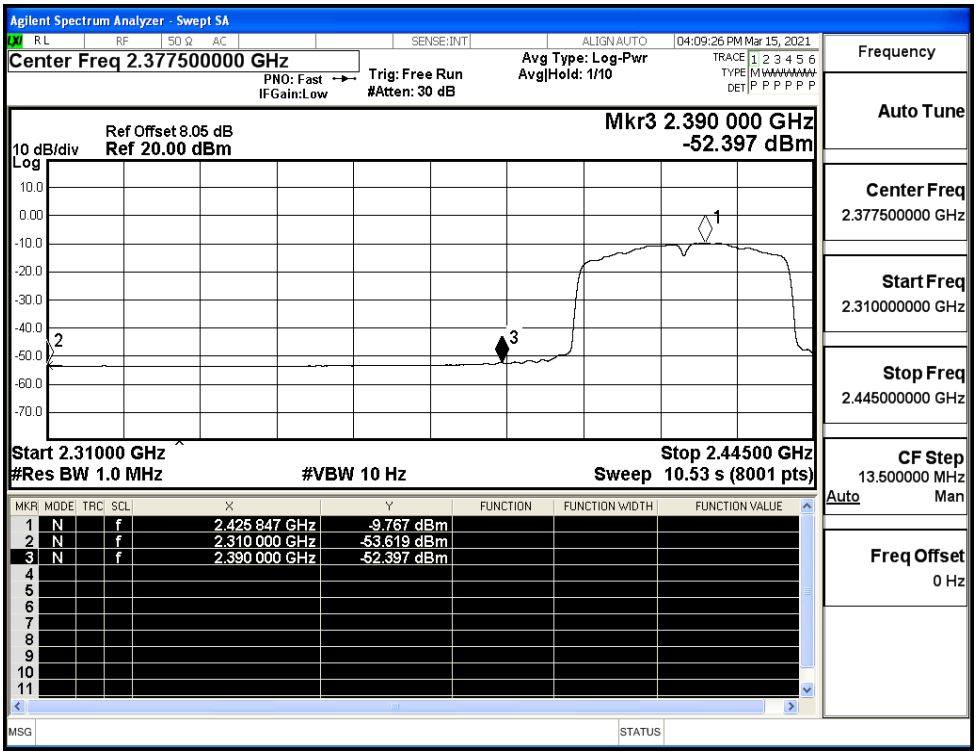


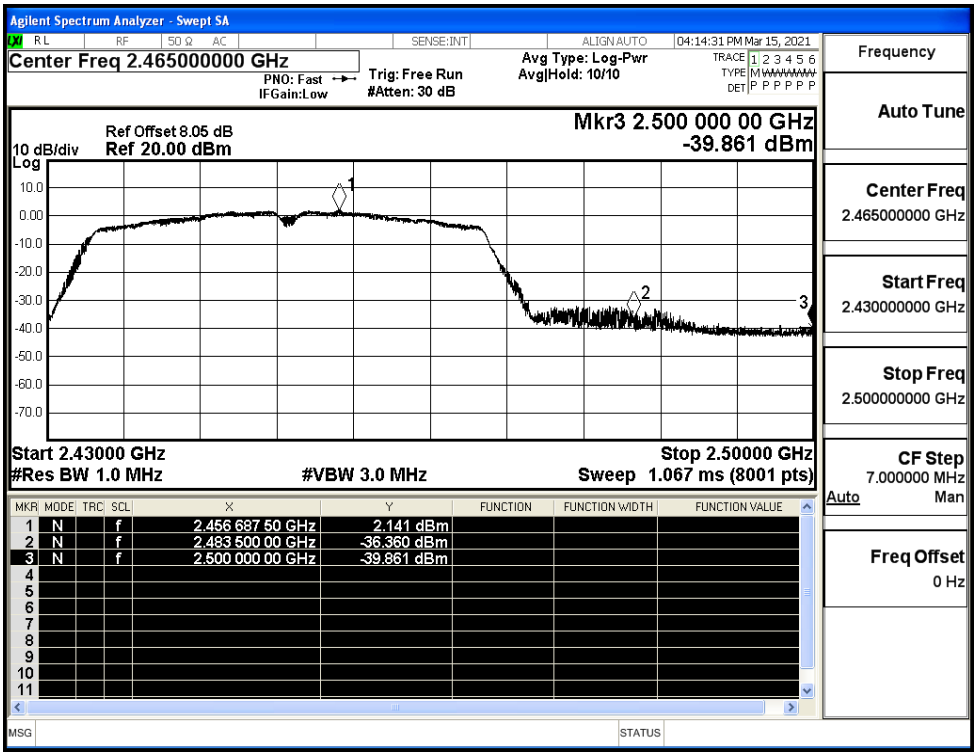
Restrict-band band-edge measurements_11N40SISO_2422_Ant1_PEAK



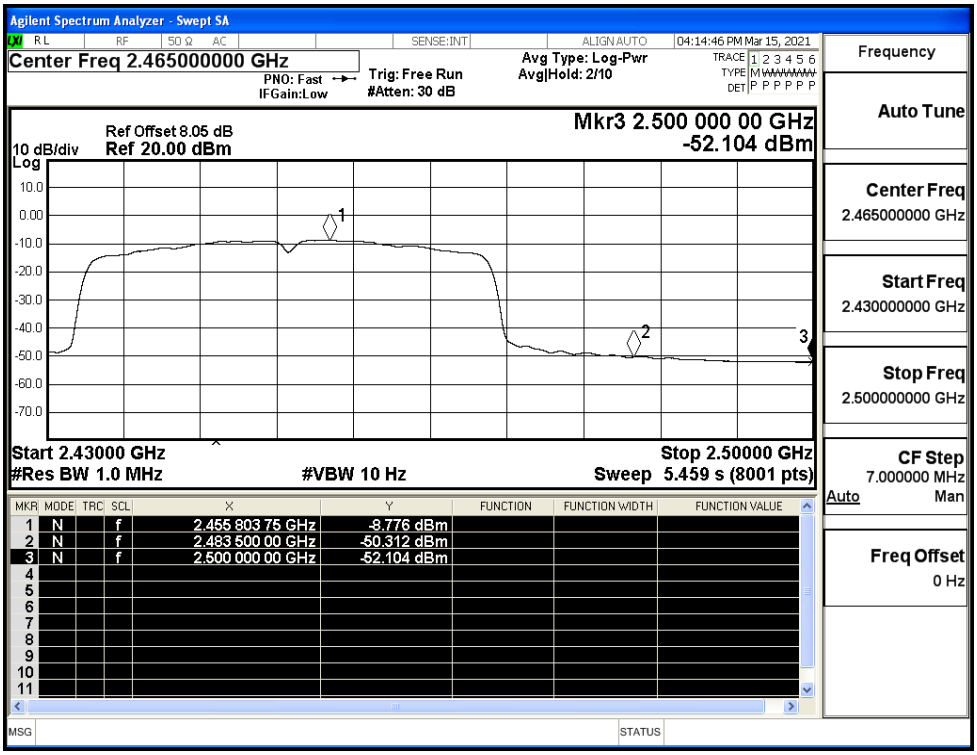
Restrict-band band-edge measurements_11N40SISO_2422_Ant1_AV



Restrict-band band-edge measurements_11N40SISO_2452_Ant1_PEAK



Restrict-band band-edge measurements_11N40SISO_2452_Ant1_AV


Agilent Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
04:14:46 PM Mar 15, 2021
Center Freq 2.465000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 2/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P P P P P P
Ref Offset 8.05 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr3 2.500 000 00 GHz
-52.104 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.43000 GHz
#Res BW 1.0 MHz
#VBW 10 Hz
Stop 2.50000 GHz
Sweep 5.459 s (8001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N f 2.455 803 75 GHz -8.776 dBm
2 N f 2.483 500 00 GHz -50.312 dBm
3 N f 2.500 000 00 GHz -52.104 dBm
4
5
6
7
8
9
10
11
MSG
STATUS
Frequency
Auto Tune
Center Freq
2.465000000 GHz
Start Freq
2.430000000 GHz
Stop Freq
2.500000000 GHz
CF Step
7.000000 MHz
Auto
Man
Freq Offset
0 Hz