Appendix A

RF Test Data for BT V4.1 (BDR/EDR) (Conducted Measurement)

Product Name: Bluetooth Headset

Trade Mark: N/A

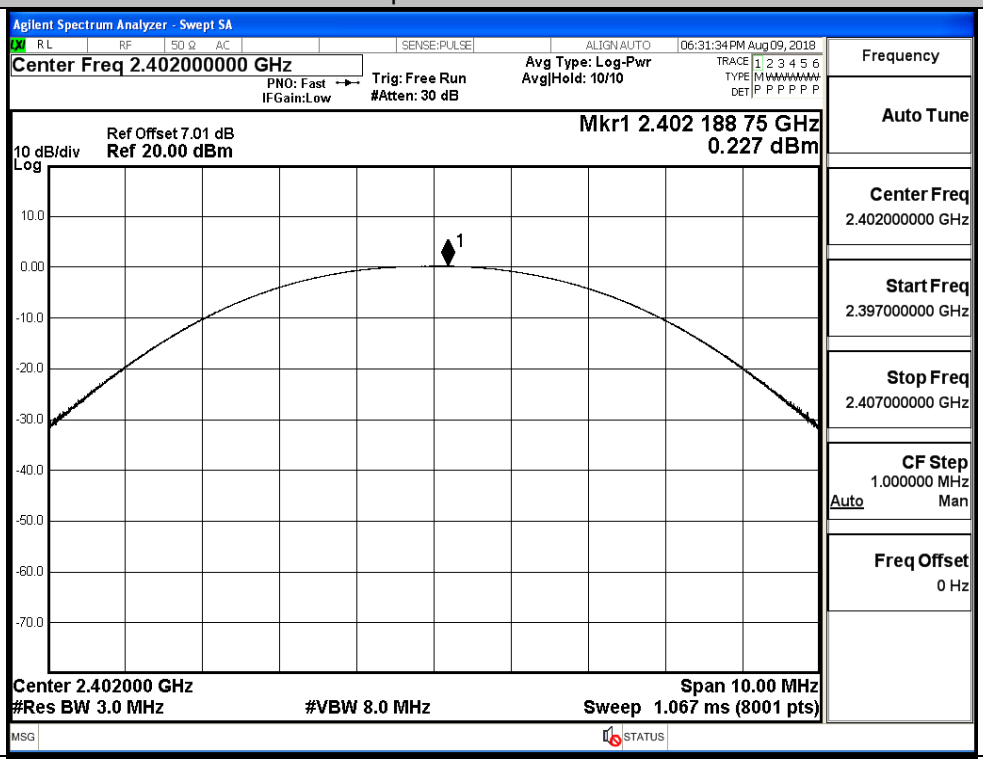
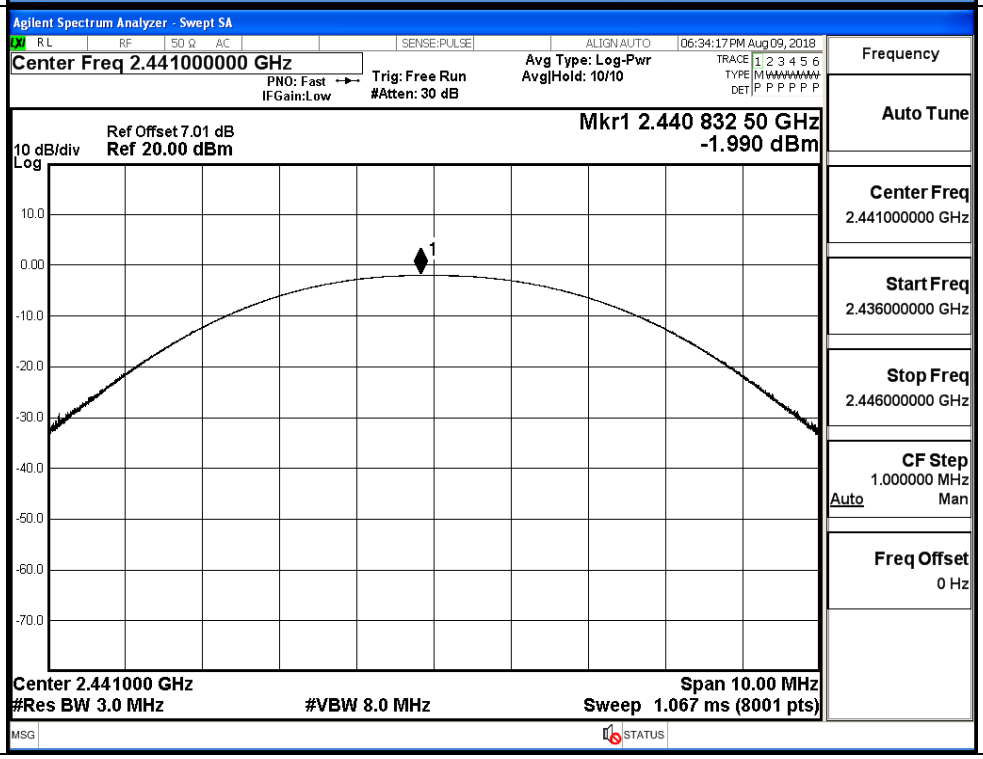
Test Model: TX-90

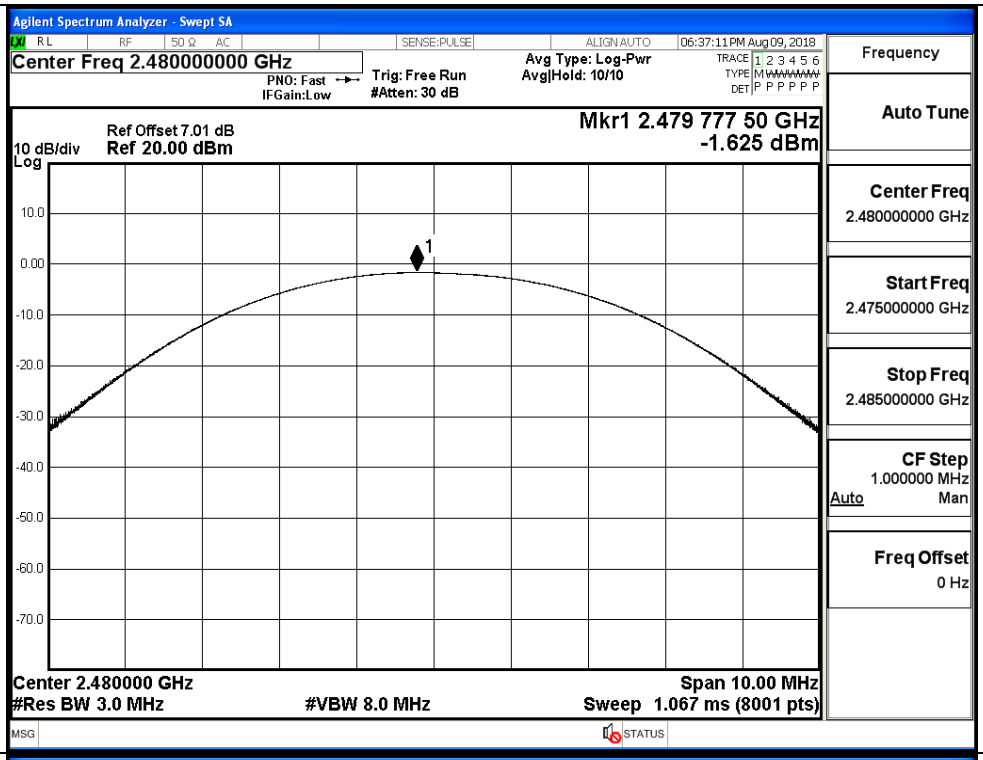
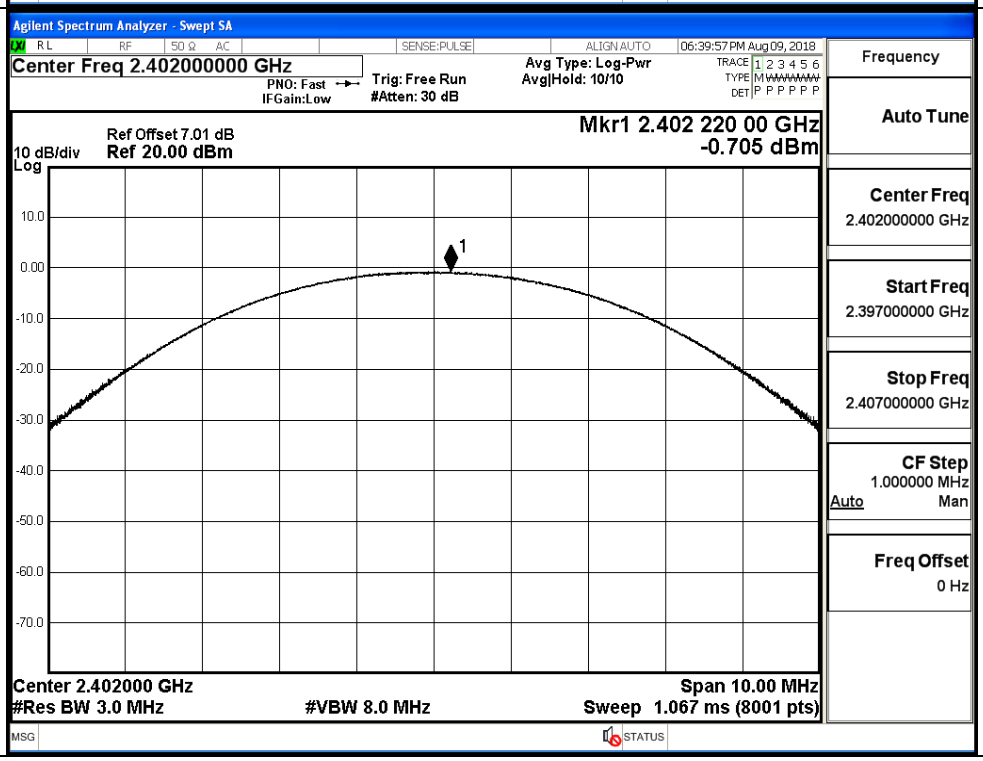
Environmental Conditions

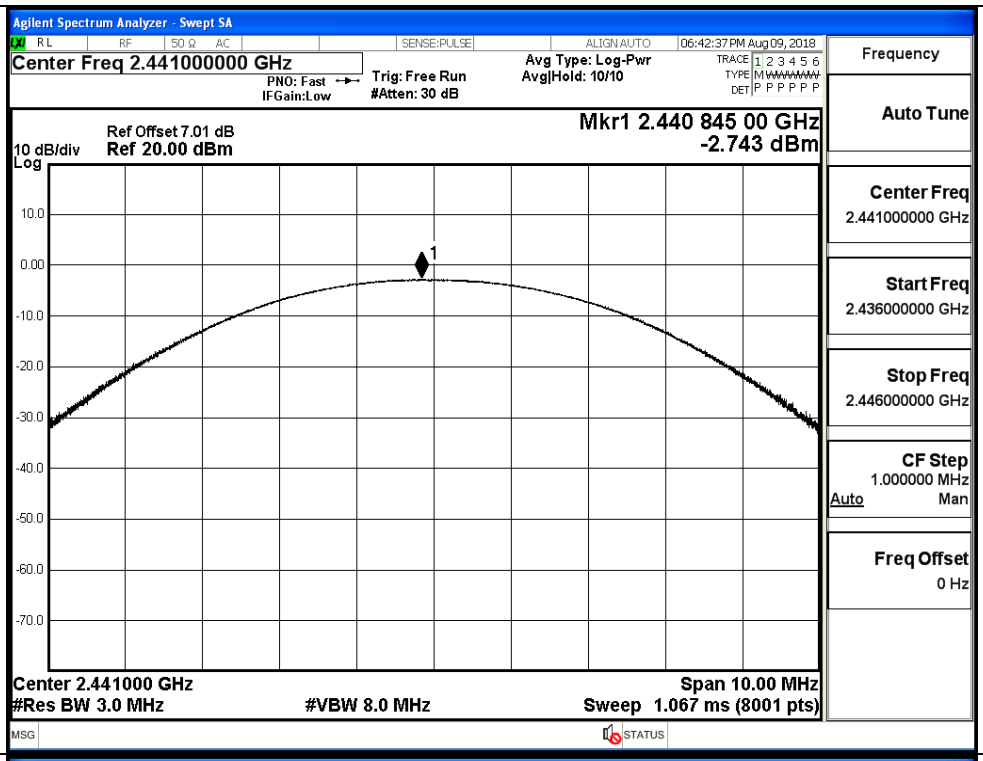
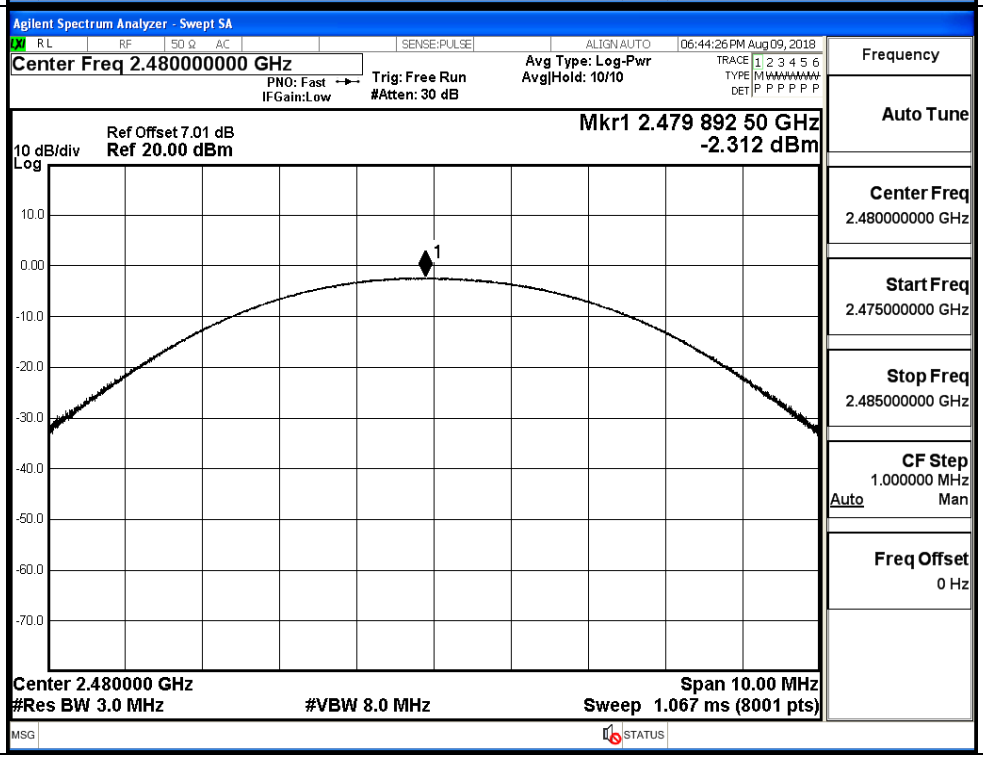
Temperature:	24.2° C
Relative Humidity:	53.8%
ATM Pressure:	100.0 kPa
Test Engineer:	Mina.Xu
Supervised by:	Jayden.Zhuo

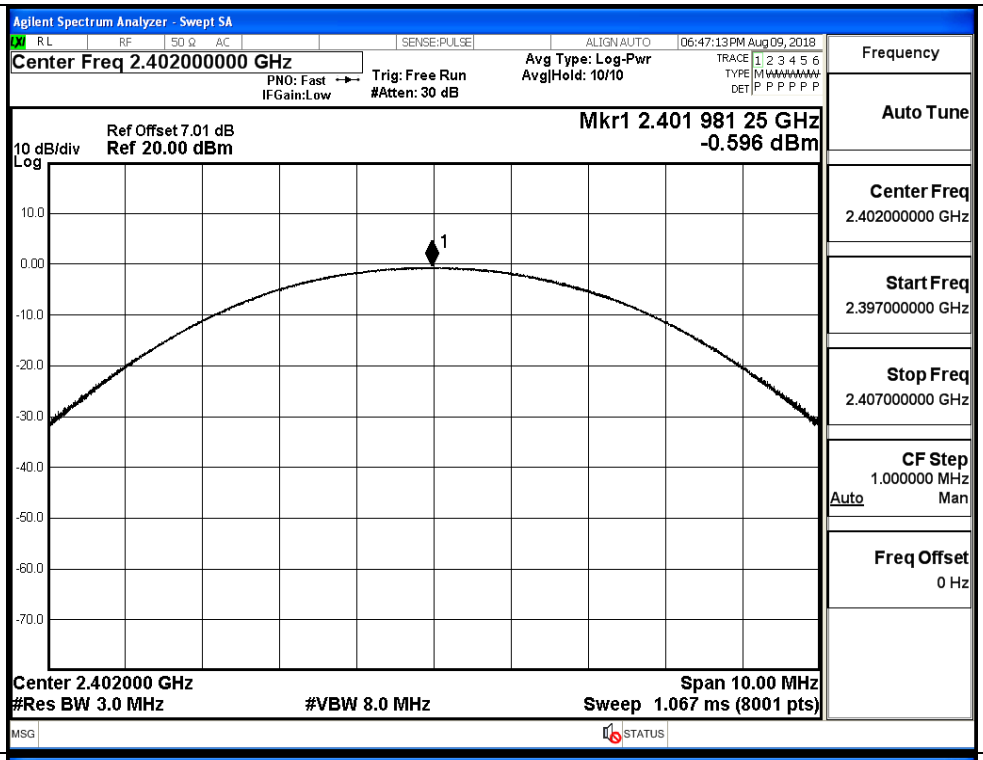
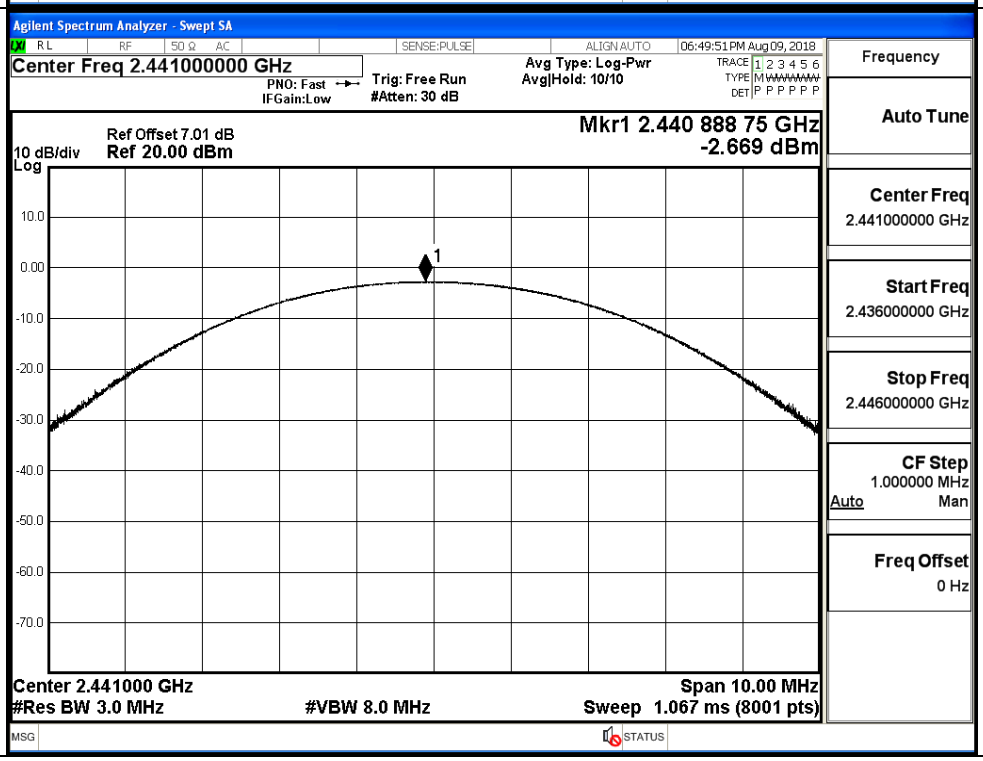
A.1 Maximum Conducted Peak Output Power

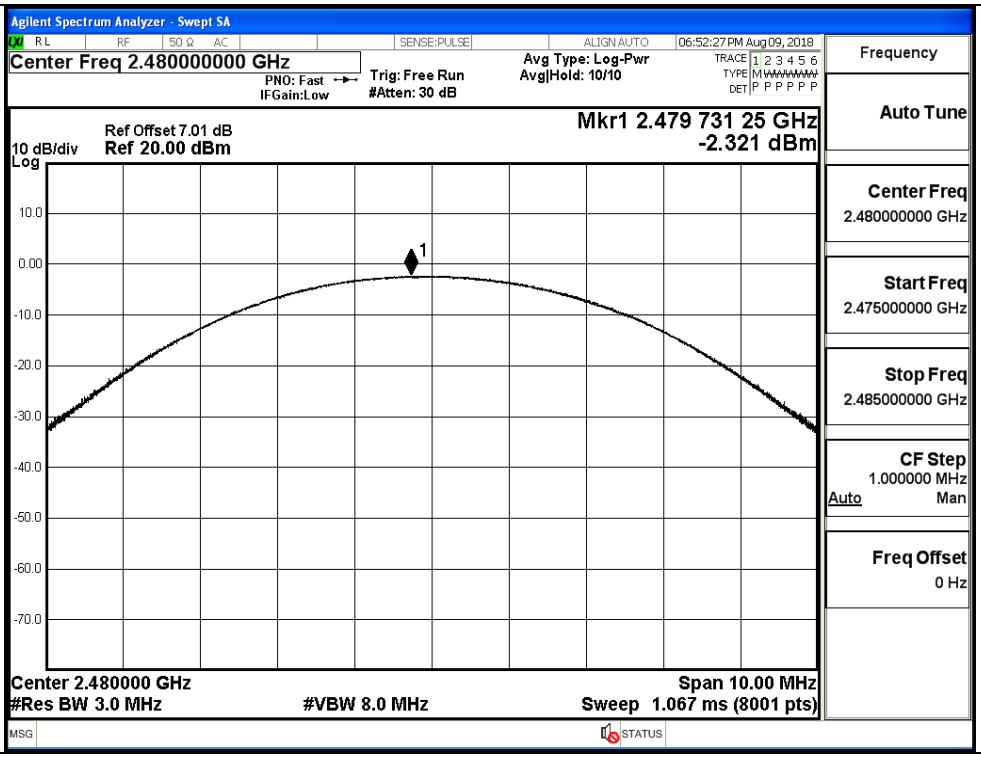
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.227	21	PASS
	MCH	-1.990	21	PASS
	HCH	-1.625	21	PASS
π/4DQPSK	LCH	-0.705	21	PASS
	MCH	-2.743	21	PASS
	HCH	-2.312	21	PASS
8DPSK	LCH	-0.596	21	PASS
	MCH	-2.669	21	PASS
	HCH	-2.321	21	PASS

Test Graphs		
GFSK/LCH		
GFSK/MCH		

GFSK/HCH		
π/4DQPSK/LCH		

π/4DQPSK/MCH		
π/4DQPSK/HCH		

8DPSK/LCH		
8DPSK/MCH		

8DPSK/HCH		

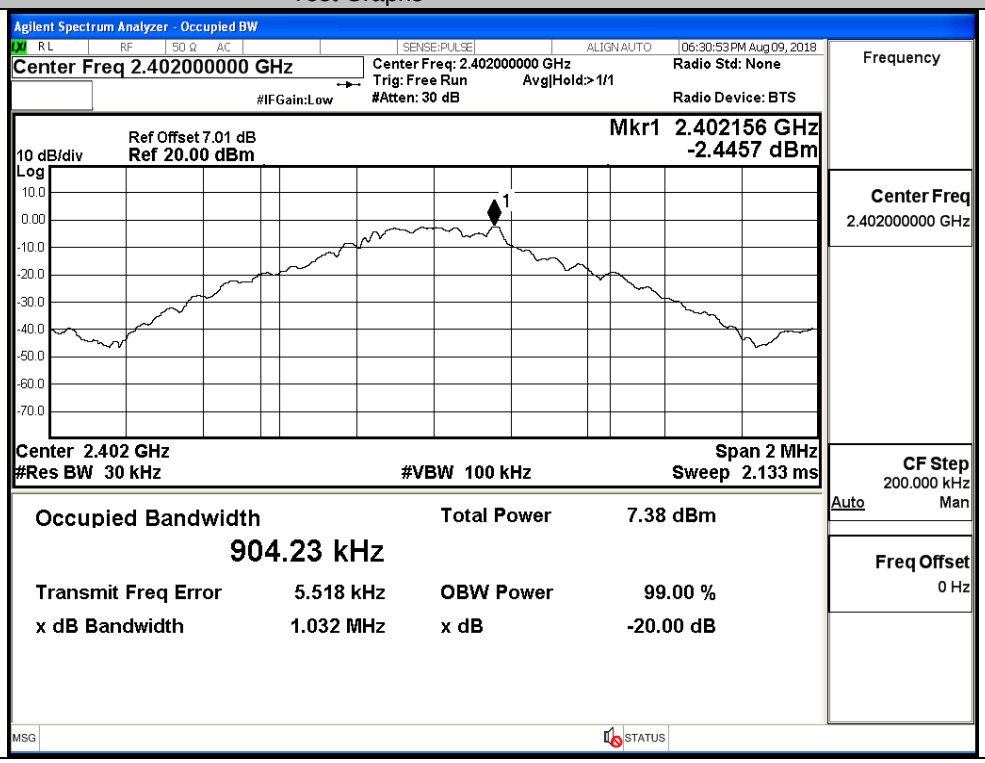
Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
06:52:27 PM Aug 09, 2018
Ref Offset 7.01 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.479 731 25 GHz
-2.321 dBm
Center 2.480000 GHz
#Res BW 3.0 MHz
#VBW 8.0 MHz
Span 10.00 MHz
Sweep 1.067 ms (8001 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.475000000 GHz
Stop Freq
2.485000000 GHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz

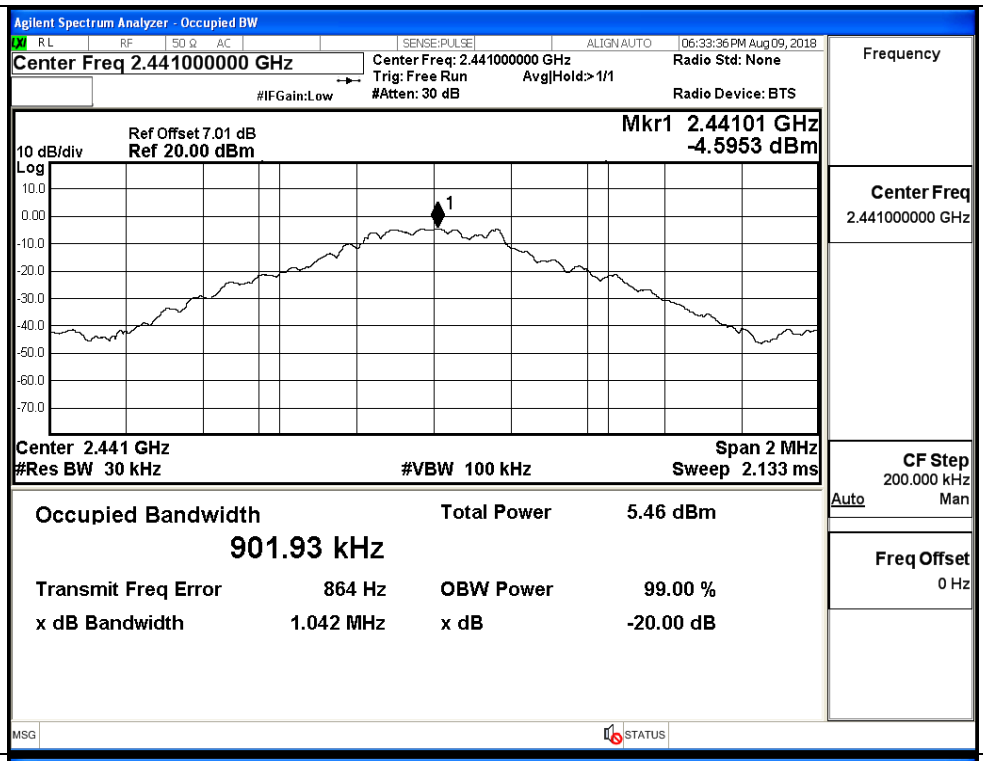
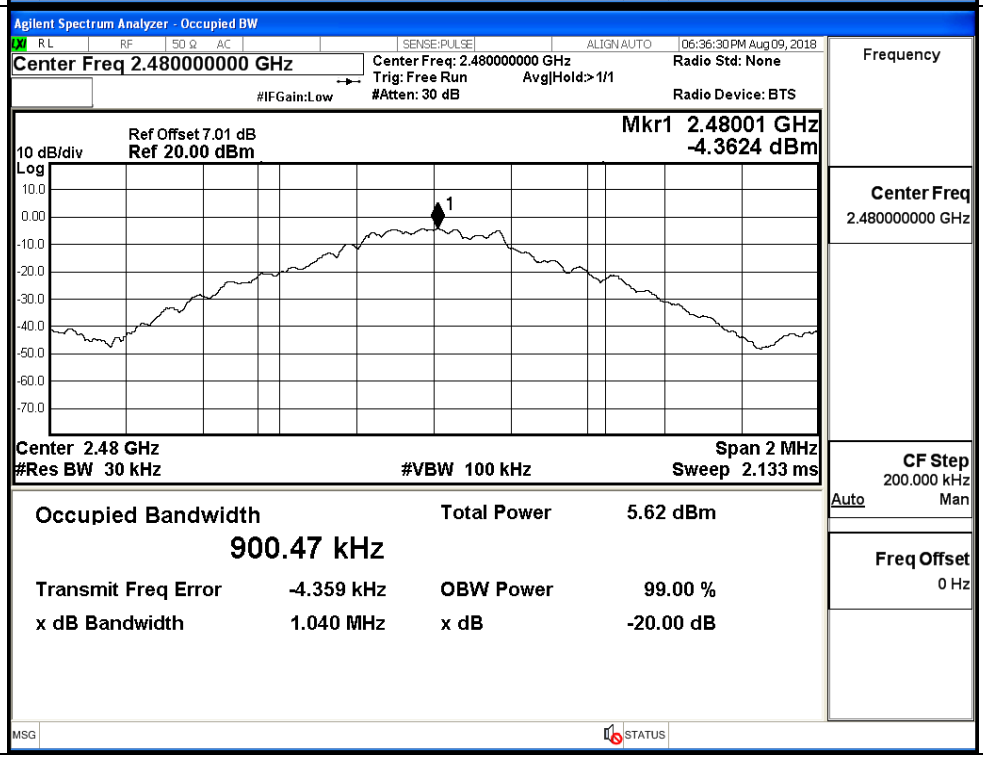
A.2 99% and 20dB Bandwidth

Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.90423	1.032	Not Specified	PASS
	MCH	0.90193	1.042	Not Specified	PASS
	HCH	0.90047	1.040	Not Specified	PASS
π/4DQPSK	LCH	1.1736	1.291	Not Specified	PASS
	MCH	1.1851	1.318	Not Specified	PASS
	HCH	1.1734	1.312	Not Specified	PASS
8DPSK	LCH	1.1782	1.296	Not Specified	PASS
	MCH	1.1975	1.301	Not Specified	PASS
	HCH	1.1816	1.297	Not Specified	PASS

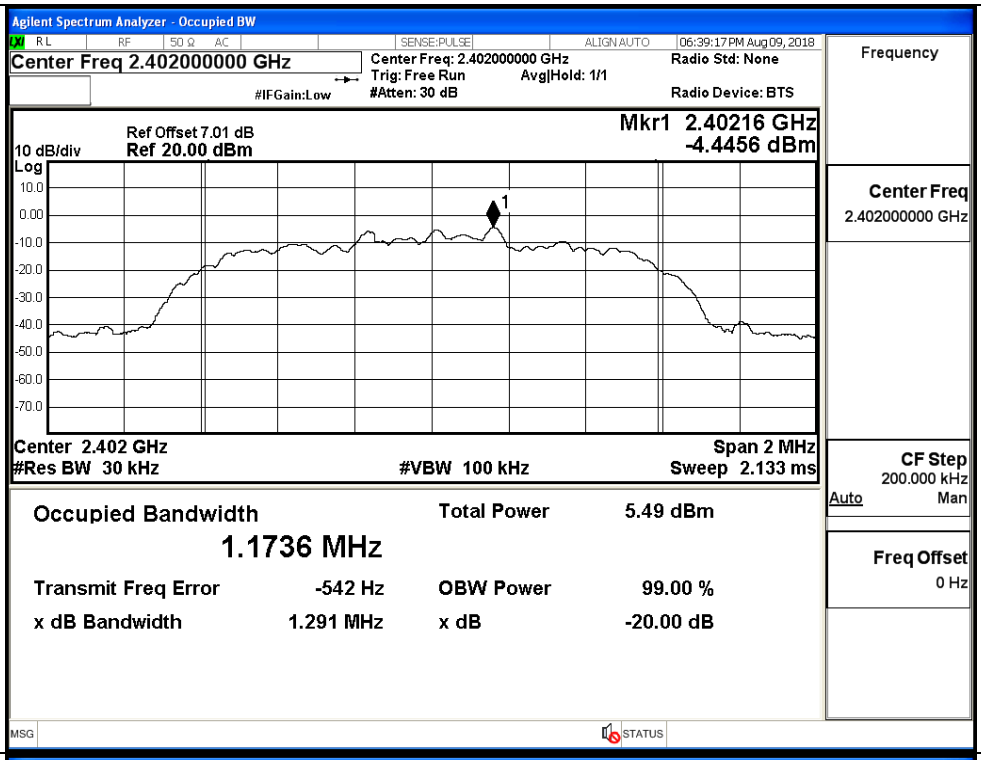
Test Graphs

GFSK/LCH

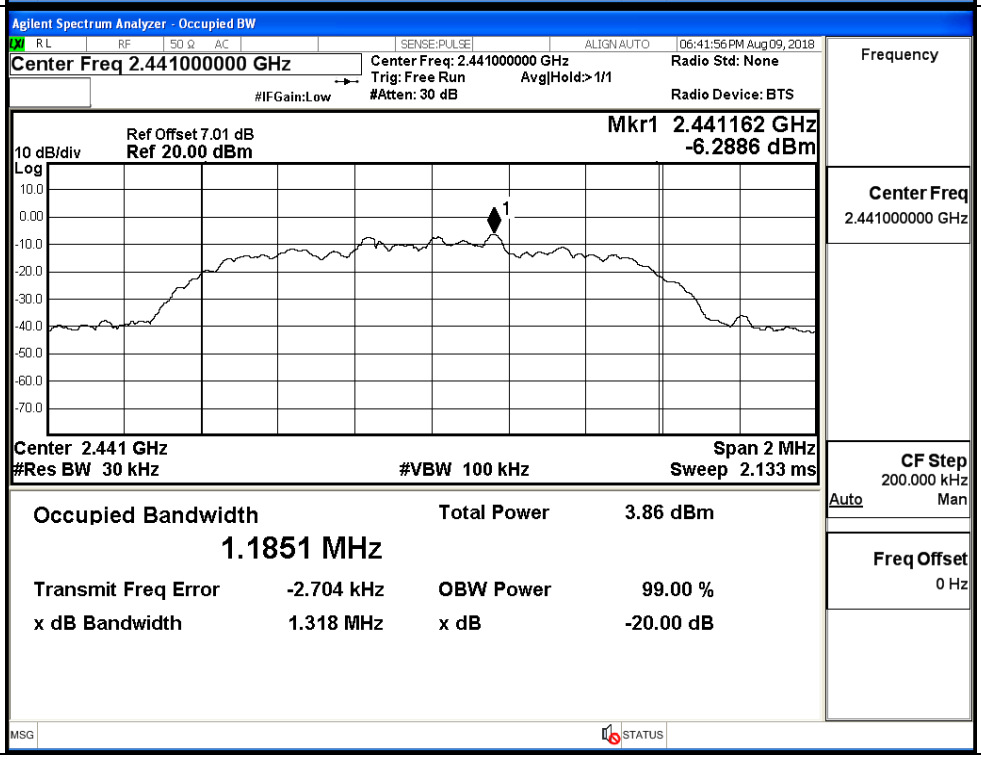


GFSK/MCH	
GFSK/HCH	

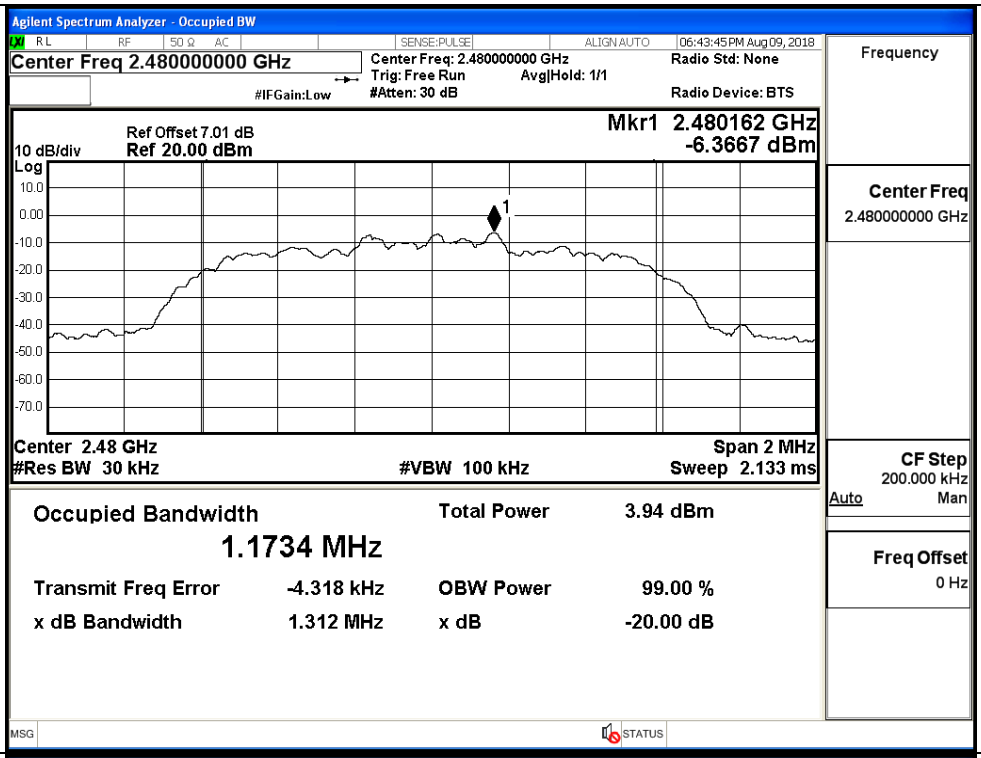
π/4DQPSK/LCH



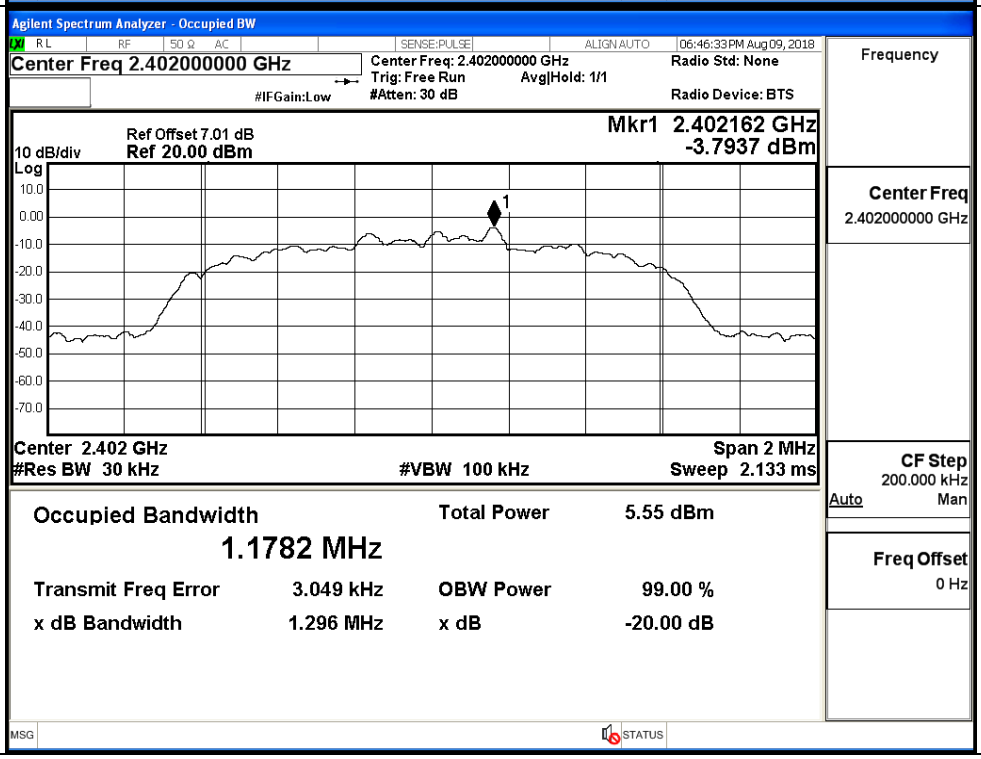
π/4DQPSK/MCH

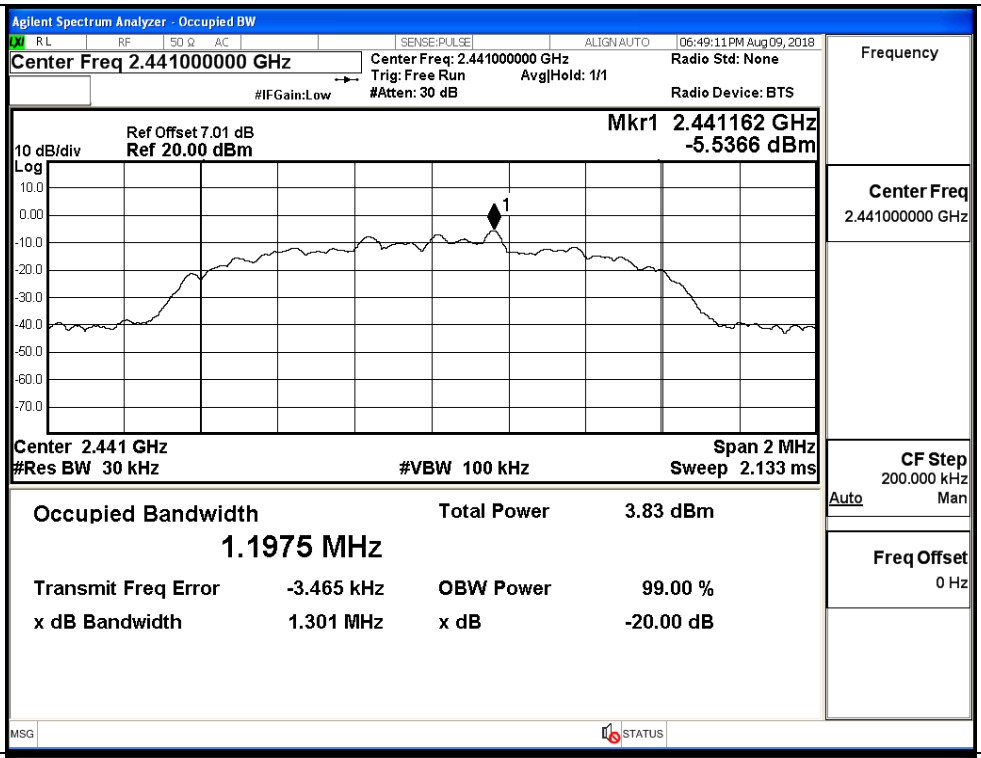
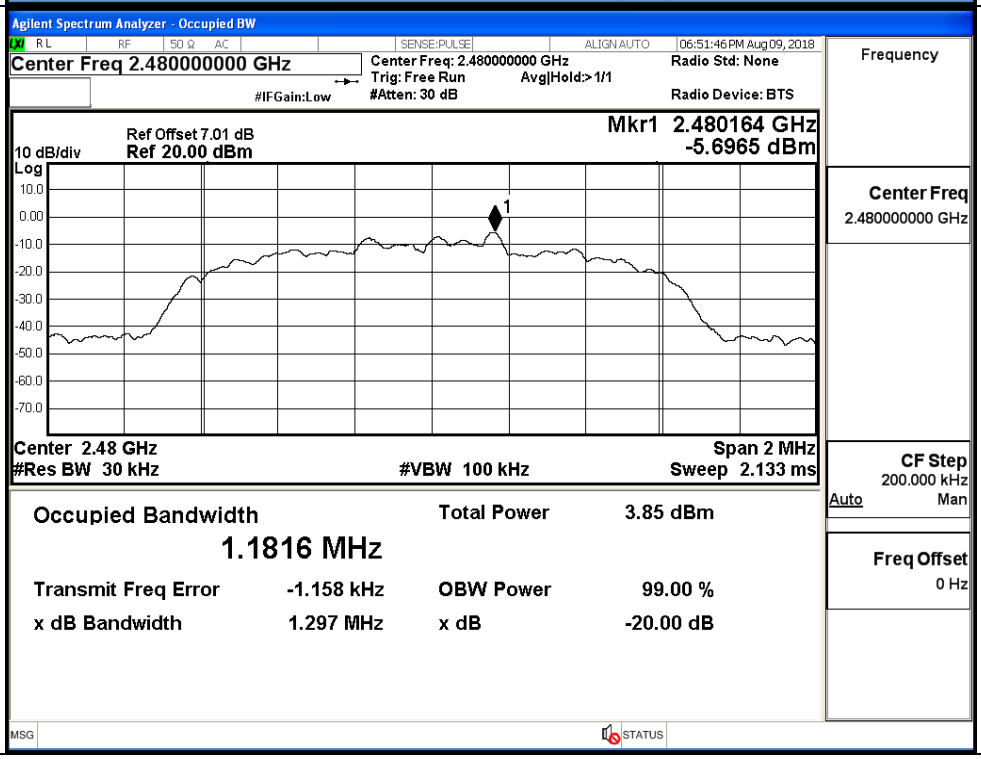


π/4DQPSK/HCH



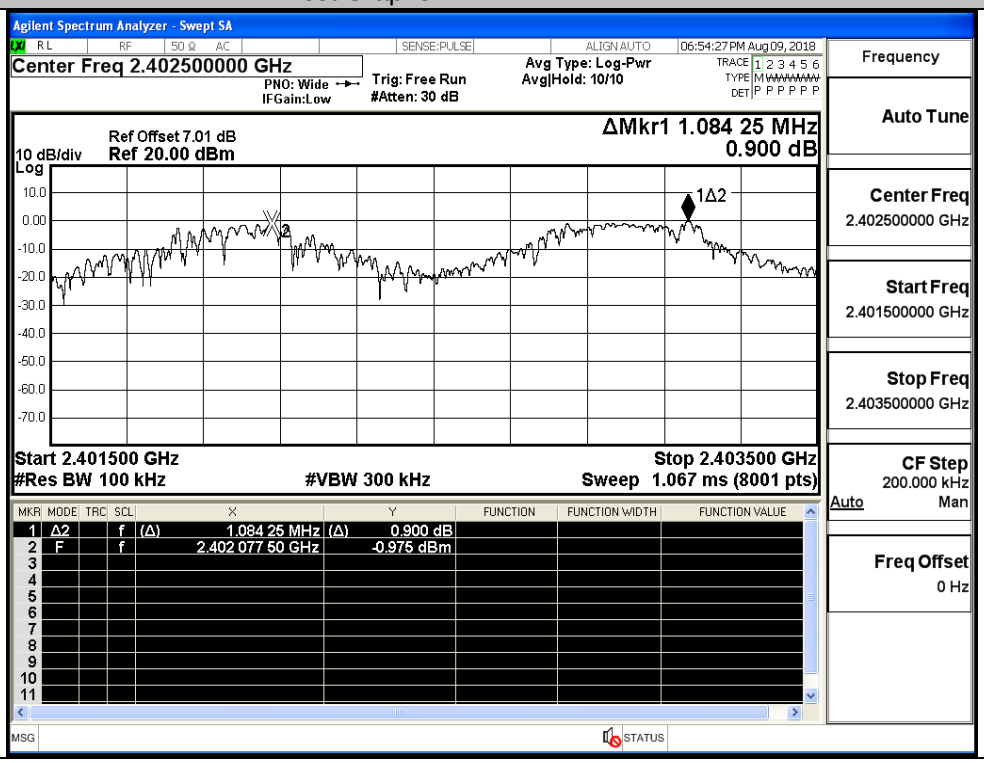
8DPSK/LCH

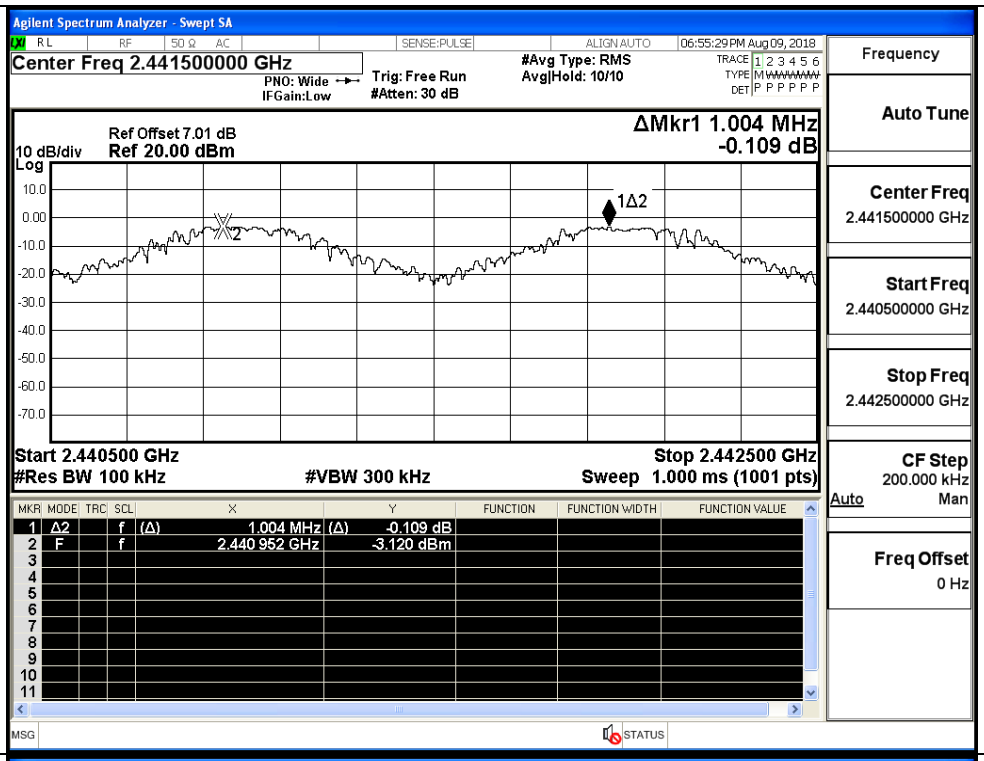
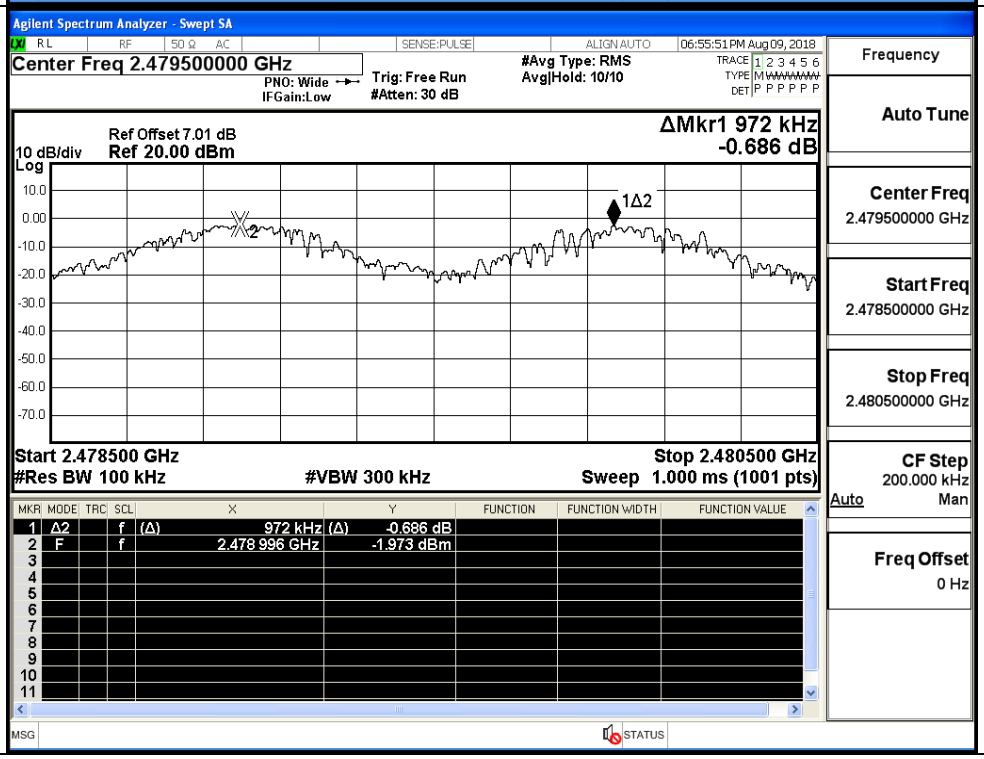


8DPSK/MCH	
8DPSK/HCH	

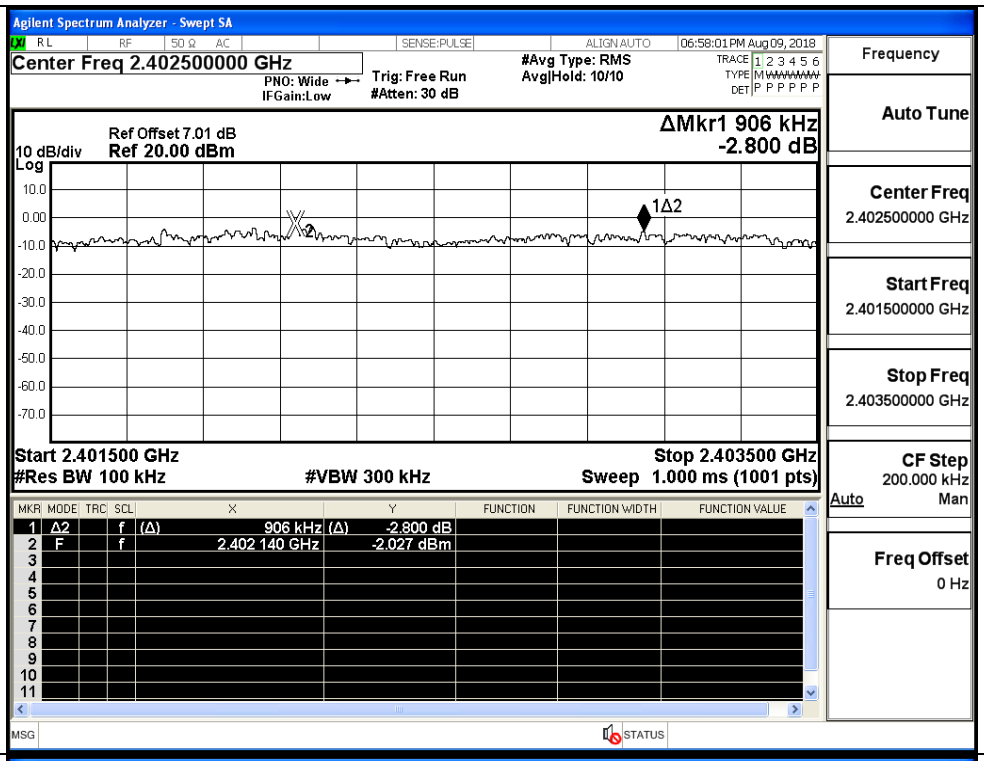
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.084	0.695	PASS
	MCH	1.004	0.695	PASS
	HCH	0.972	0.695	PASS
π/4DQPSK	LCH	0.906	0.879	PASS
	MCH	1.356	0.879	PASS
	HCH	1.020	0.879	PASS
8DPSK	LCH	1.192	0.867	PASS
	MCH	0.876	0.867	PASS
	HCH	1.076	0.867	PASS

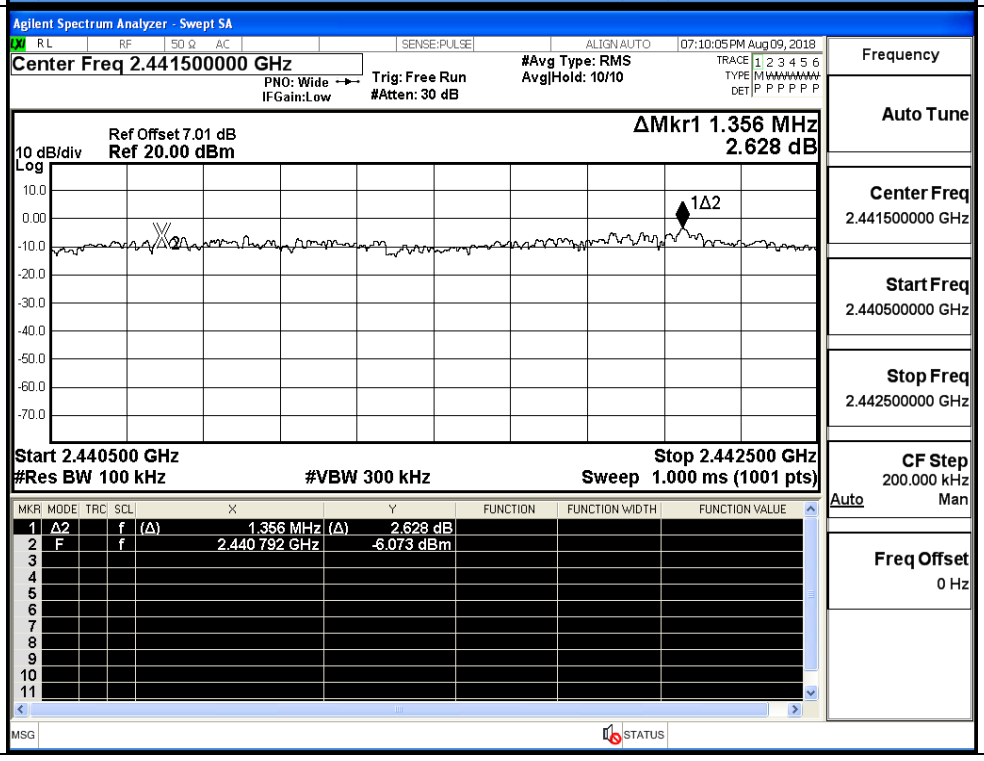
Test Graphs	
GFSK/LCH	

GFSK/MCH		
GFSK/HCH		

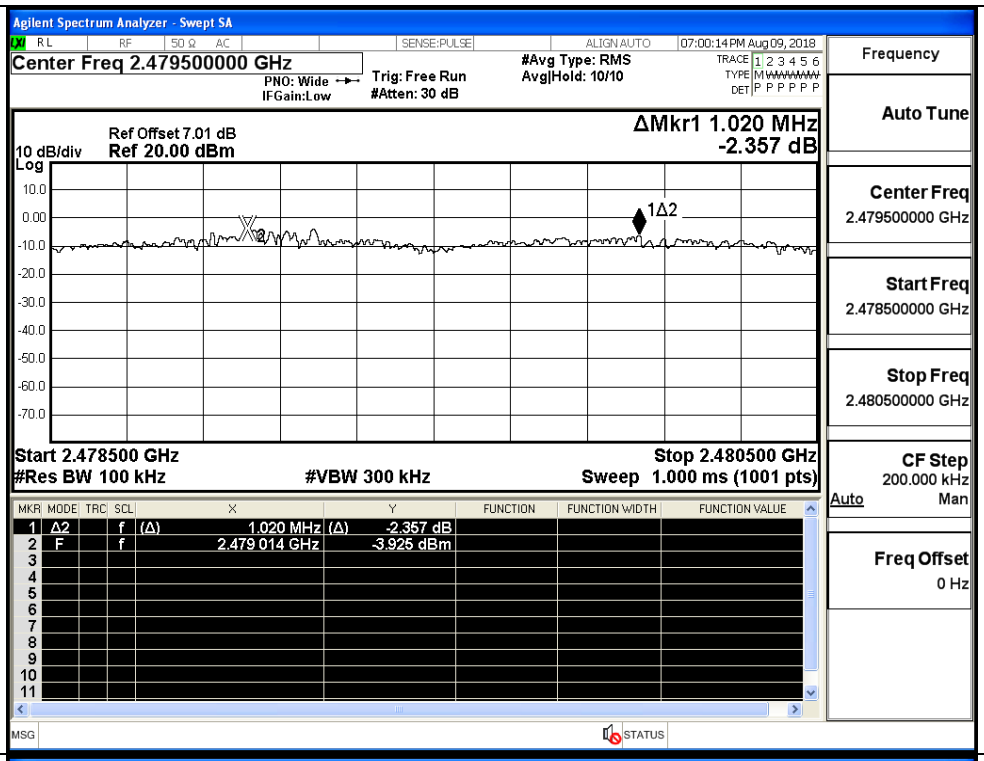
π/4DQPSK/LCH



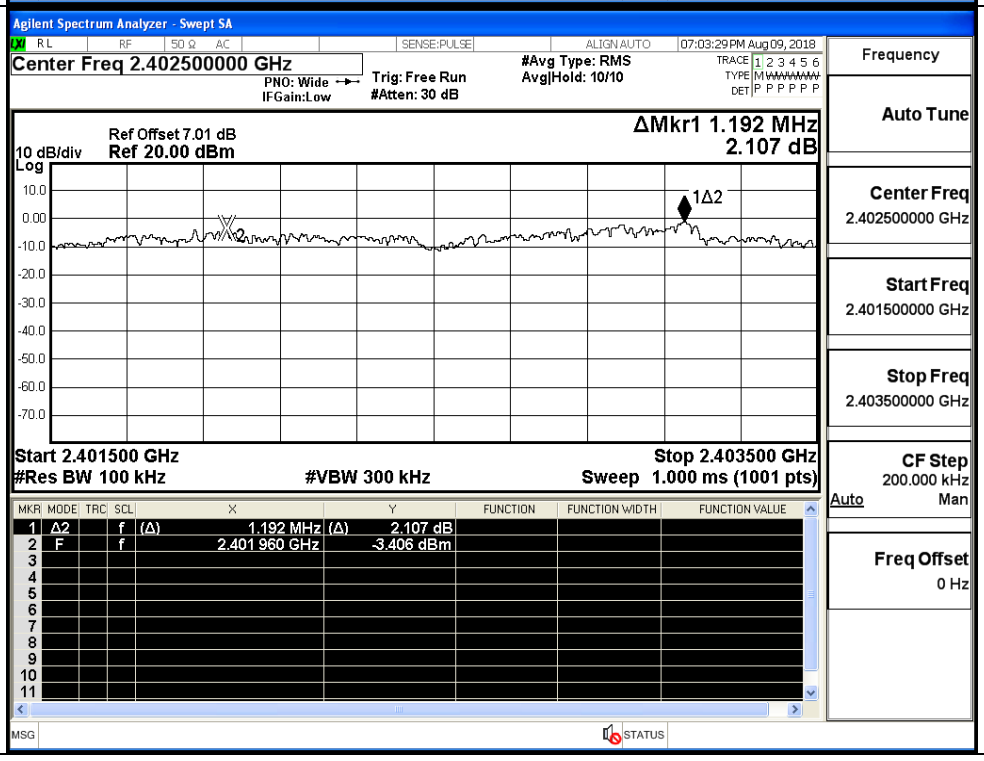
π/4DQPSK/MCH

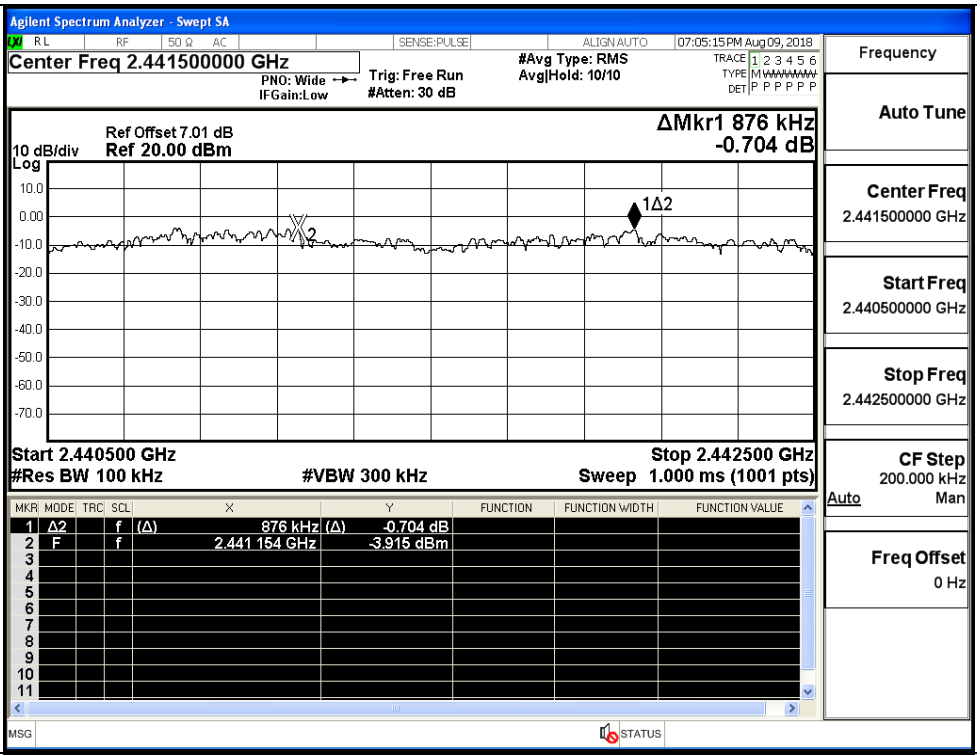
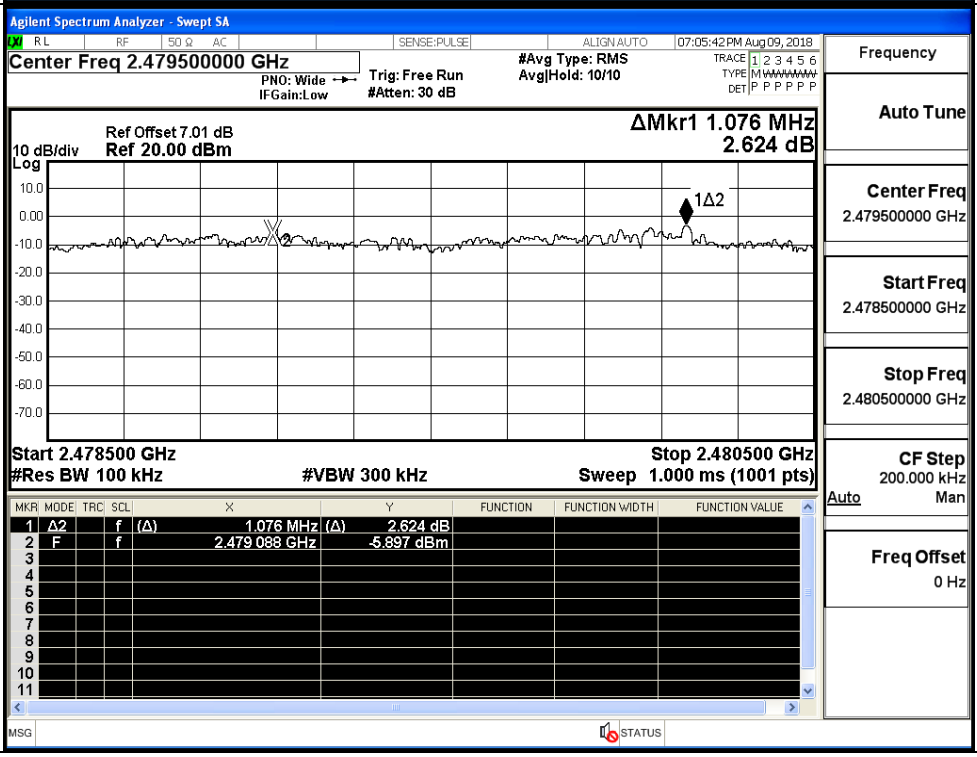


π/4DQPSK/HCH



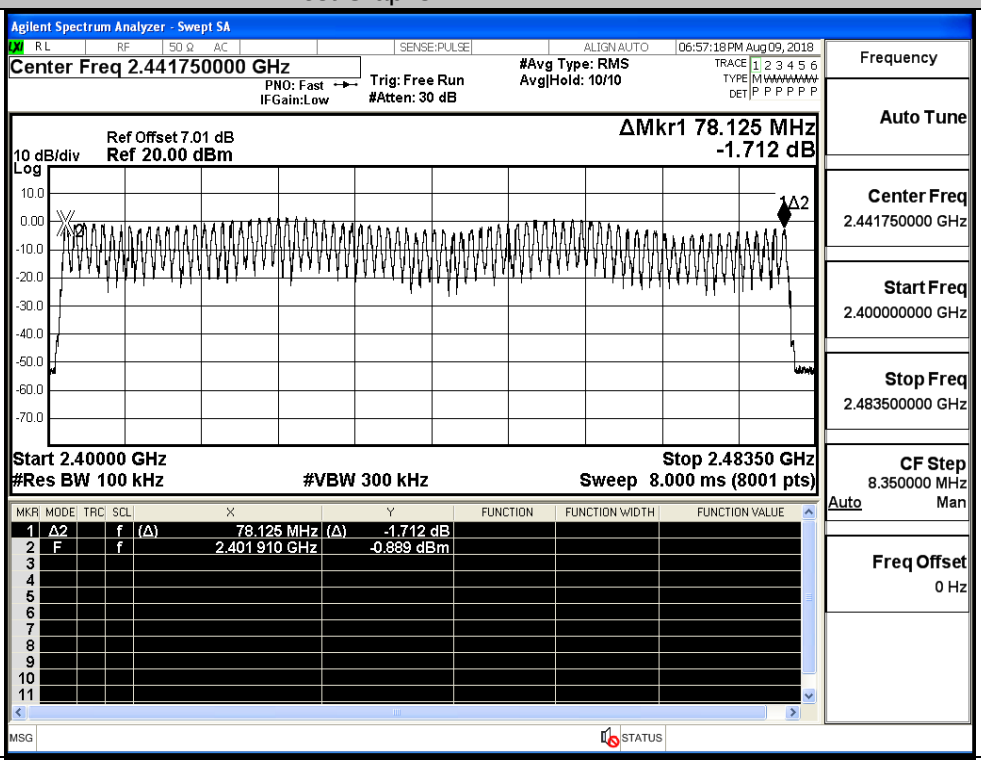
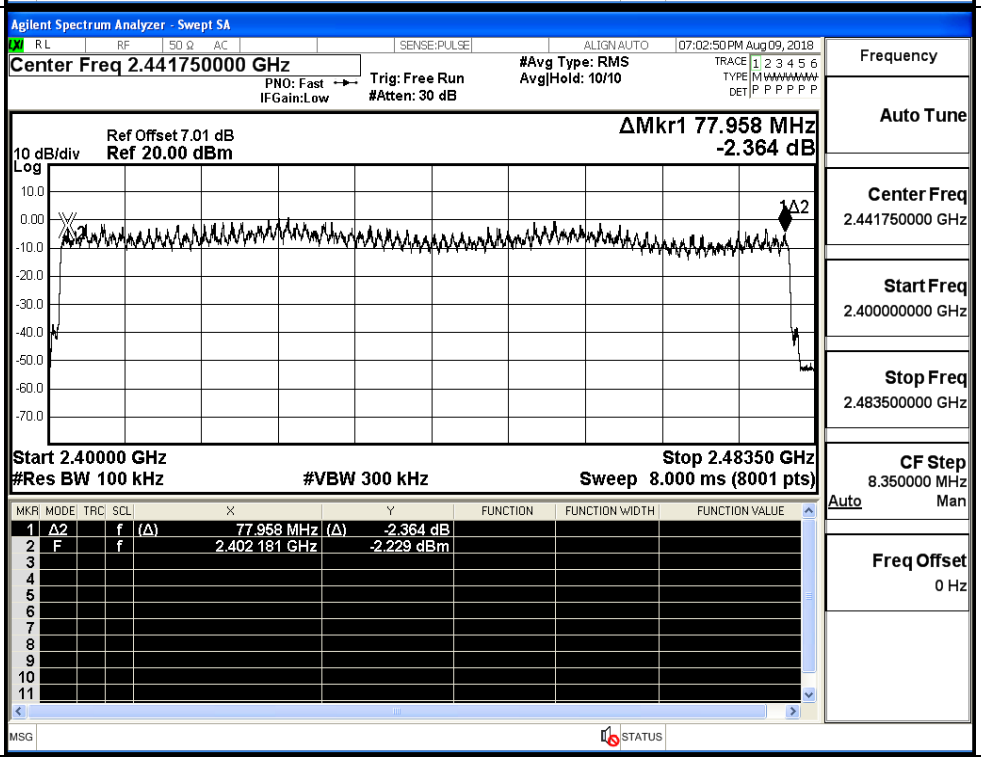
8DPSK/LCH

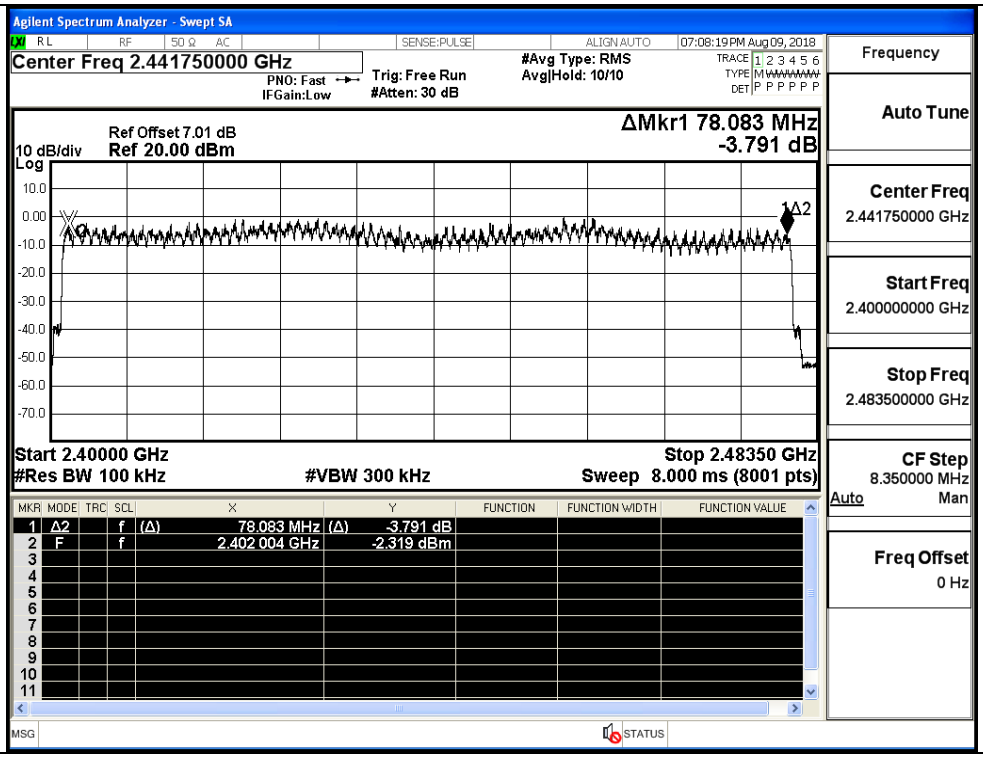


8DPSK/MCH		
8DPSK/HCH		

A.4 Hopping Channel Number

Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
π/4DQPSK	Hop	79	>=15	PASS
8DPSK	Hop	79	>=15	PASS

Test Graphs		
GFSK/Hop		
π/4DQPSK/Hop		

8DPSK/Hop	

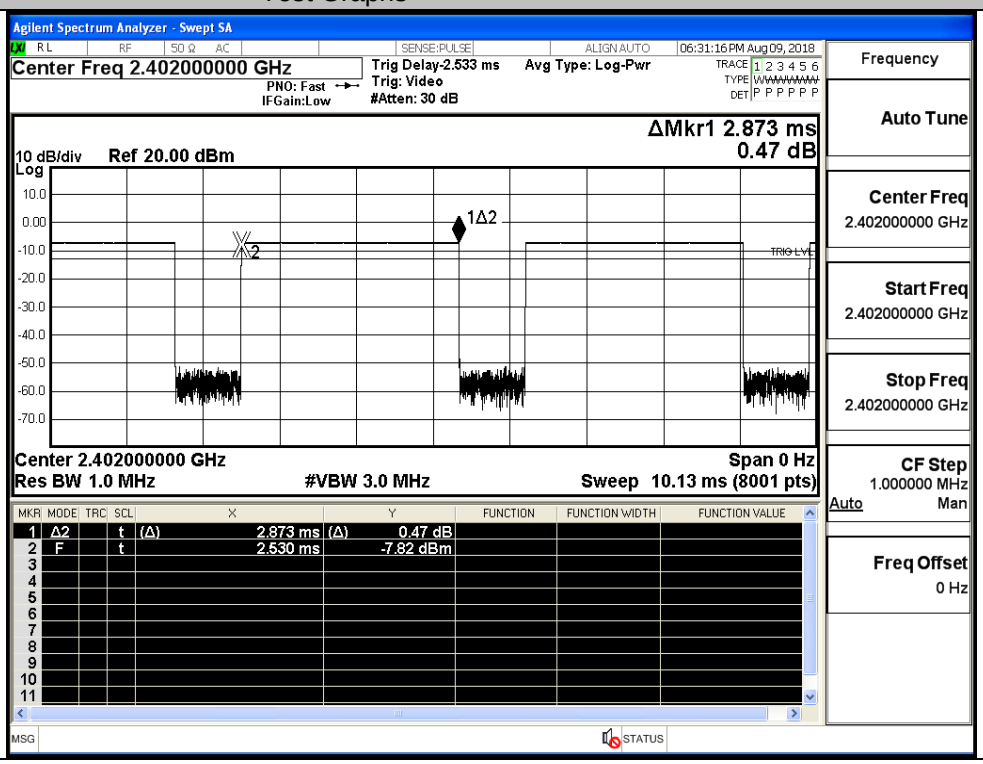
Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441750000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 10/10
07:08:19 PM Aug 09, 2018
Ref Offset 7.01 dB
10 dB/div
Ref 20.00 dBm
ΔMkr1 78.083 MHz
-3.791 dB
Start 2.40000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.48350 GHz
Sweep 8.000 ms (8001 pts)
1 Δ2 f (Δ) 78.083 MHz (Δ) -3.791 dB
2 F f 2.402 004 GHz -2.319 dBm
Frequency
Auto Tune
Center Freq 2.441750000 GHz
Start Freq 2.400000000 GHz
Stop Freq 2.483500000 GHz
CF Step 8.350000 MHz
Auto Man
Freq Offset 0 Hz

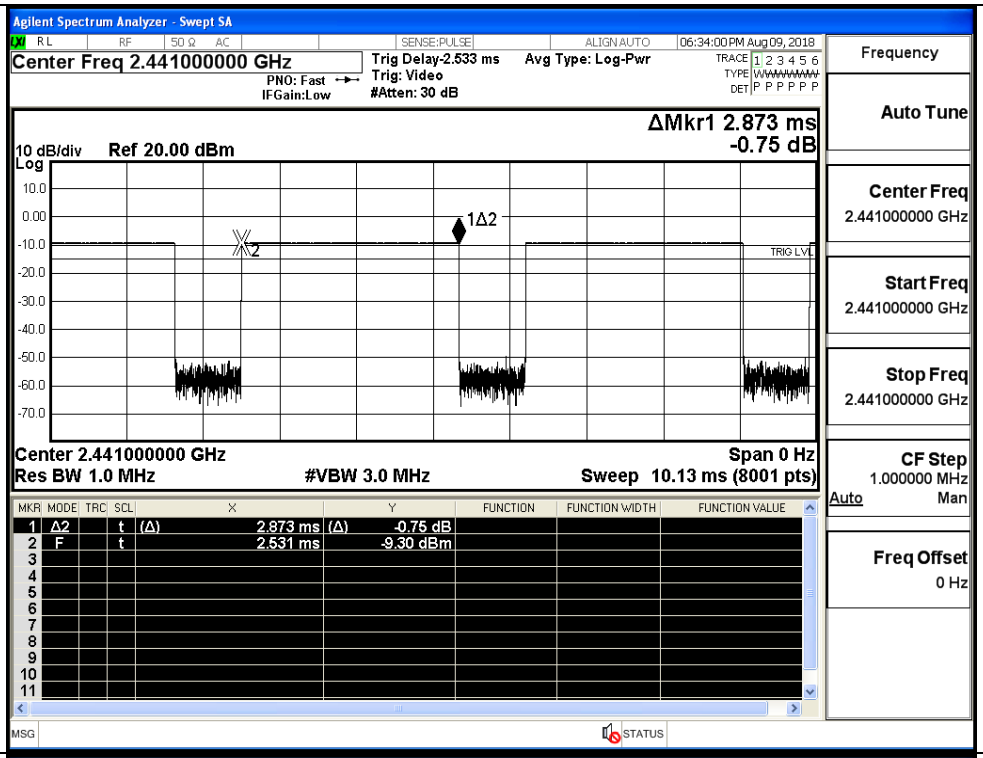
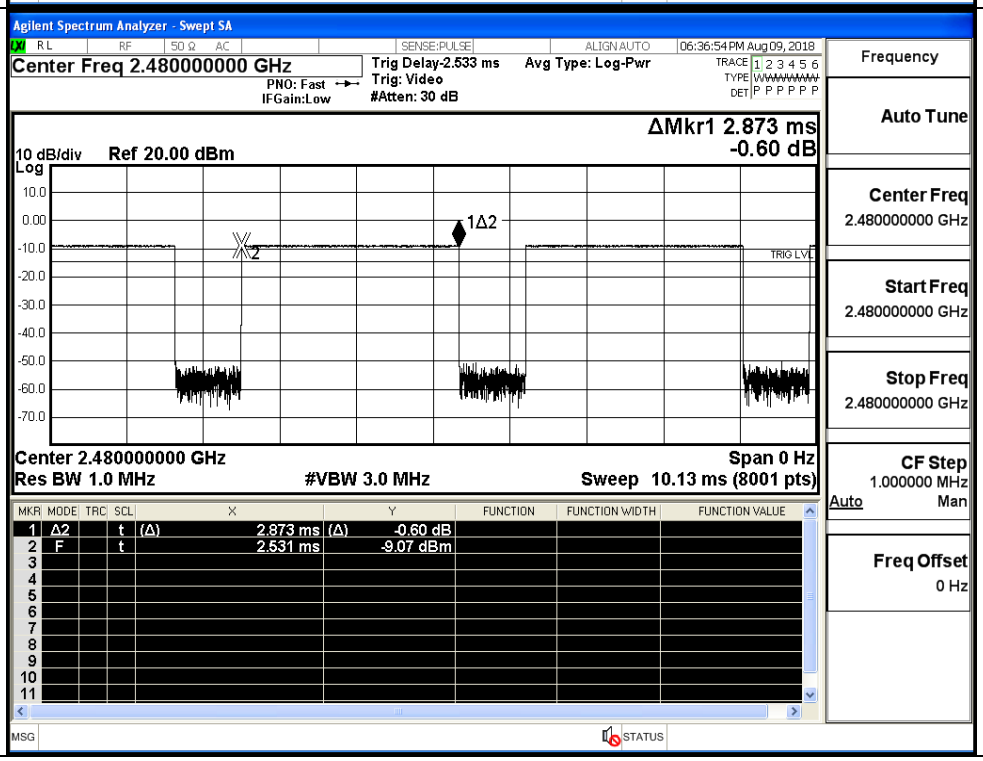
A.5 Dwell Time

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.873	106.7	0.306	0.4	PASS
	DH5	MCH	2.873	106.7	0.306	0.4	PASS
	DH5	HCH	2.873	106.7	0.306	0.4	PASS
π/4DQPSK	2DH5	LCH	2.877	106.7	0.307	0.4	PASS
	2DH5	MCH	2.877	106.7	0.307	0.4	PASS
	2DH5	HCH	2.877	106.7	0.307	0.4	PASS
8DPSK	3DH5	LCH	2.879	106.7	0.307	0.4	PASS
	3DH5	MCH	2.879	106.7	0.307	0.4	PASS
	3DH5	HCH	2.879	106.7	0.307	0.4	PASS

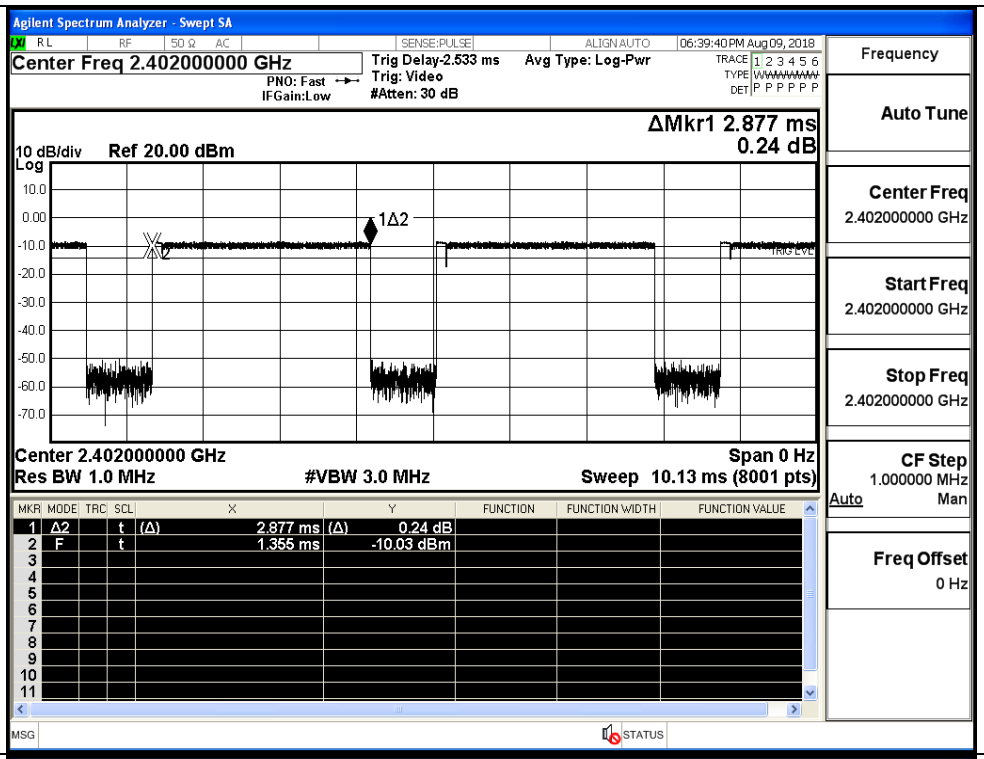
Test Graphs

GFSK_DH5/LCH

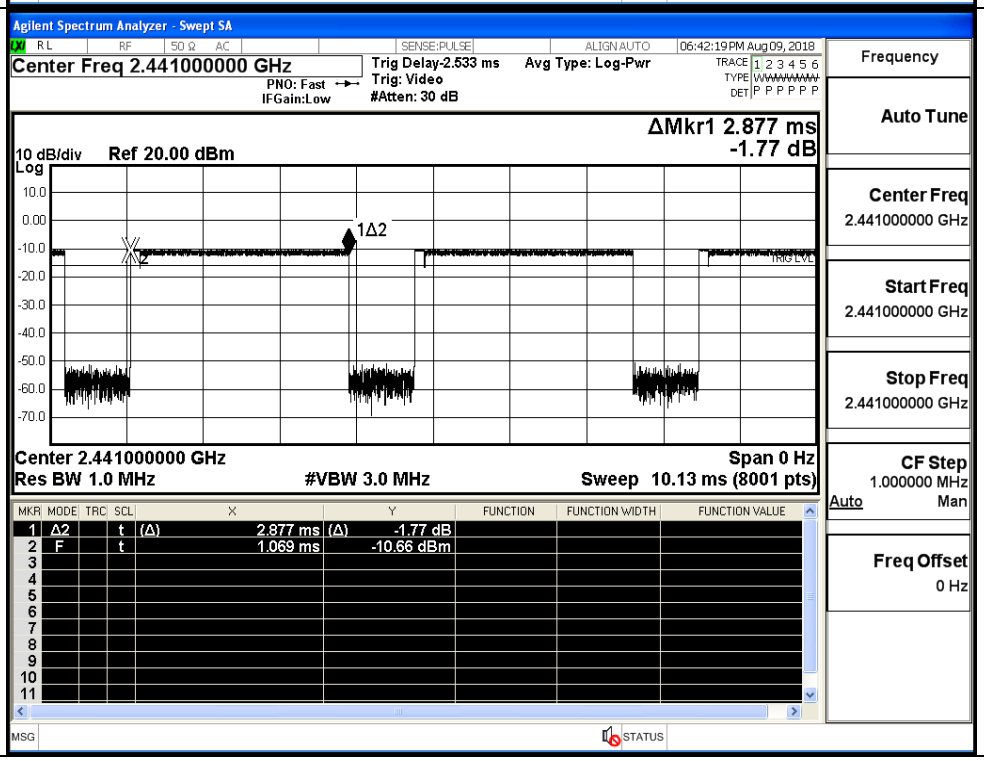


GFSK_DH5/MCH	
GFSK_DH5/HCH	

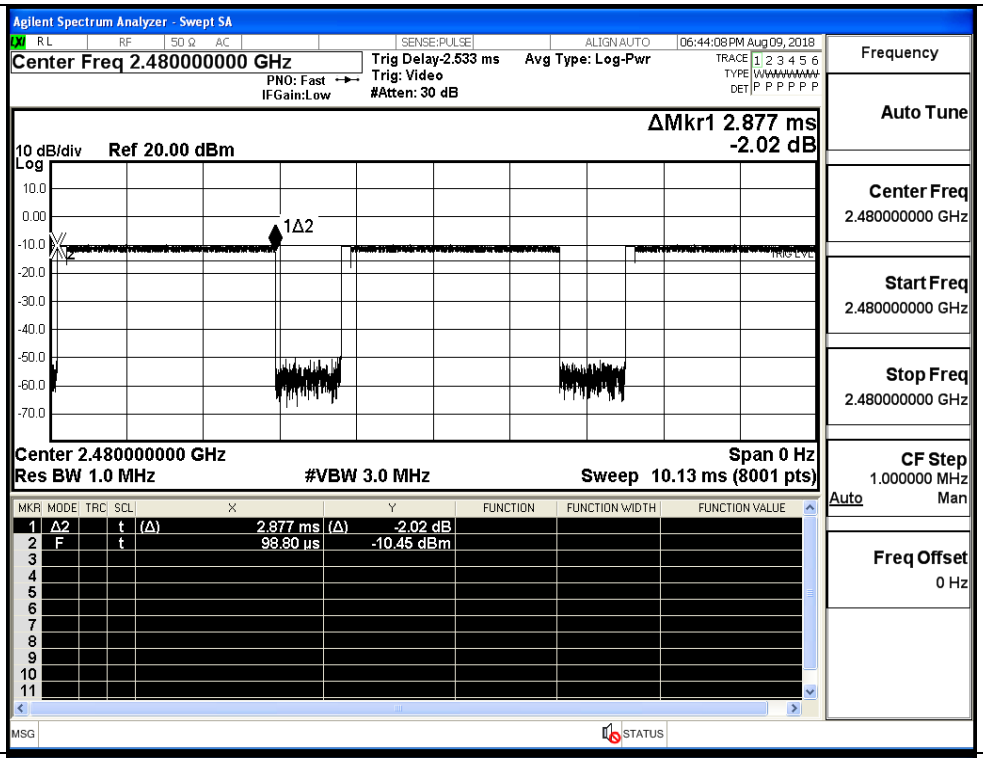
π/4DQPSK
_2DH5/LCH



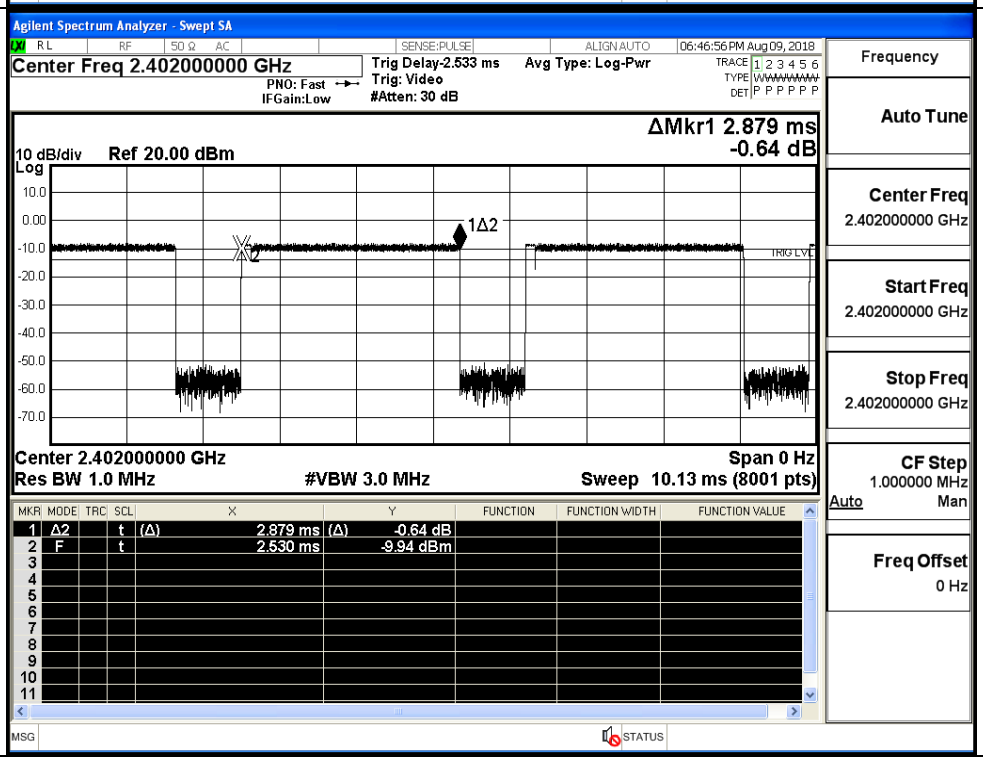
π/4DQPSK
_2DH5/MCH

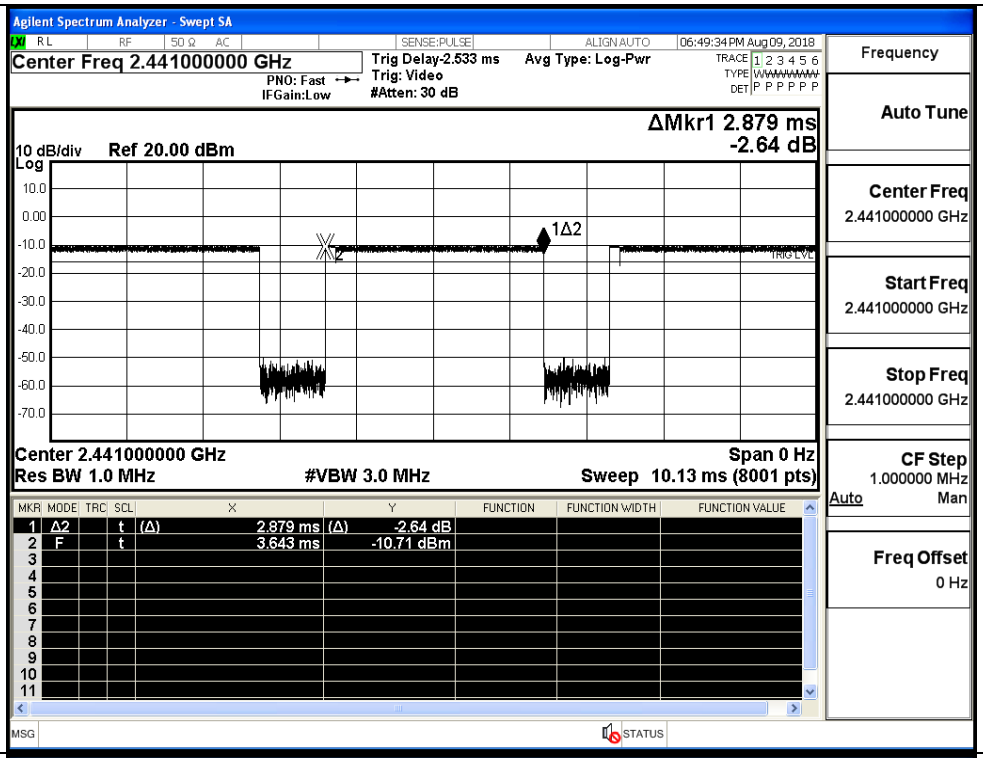
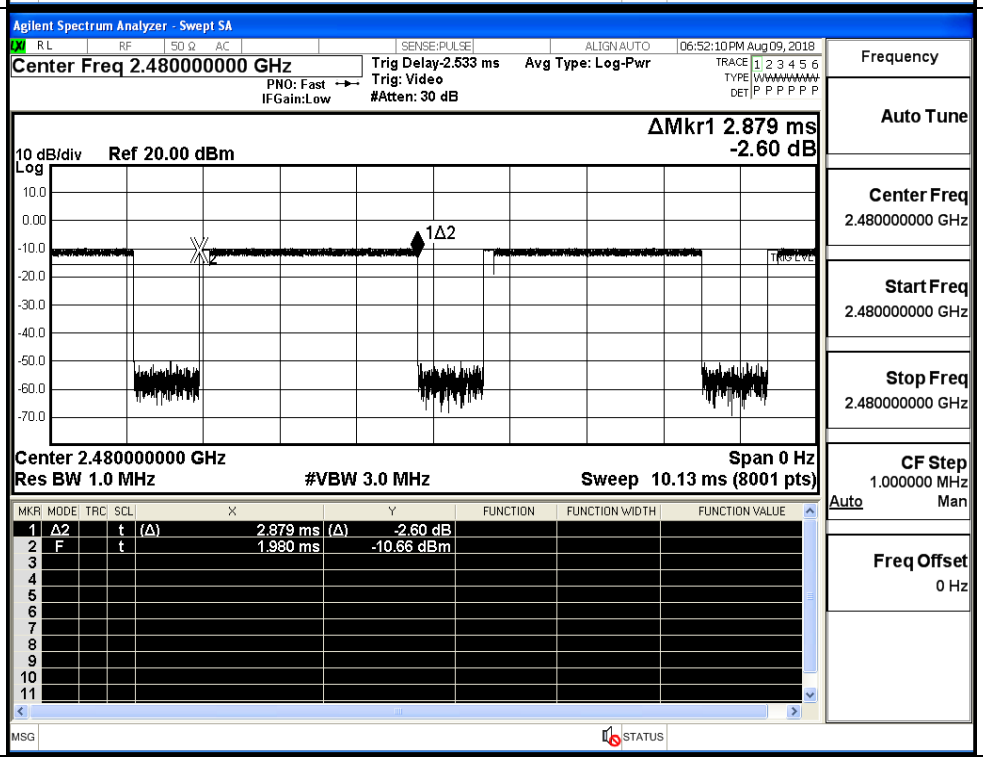


π/4DQPSK _2DH5/HCH



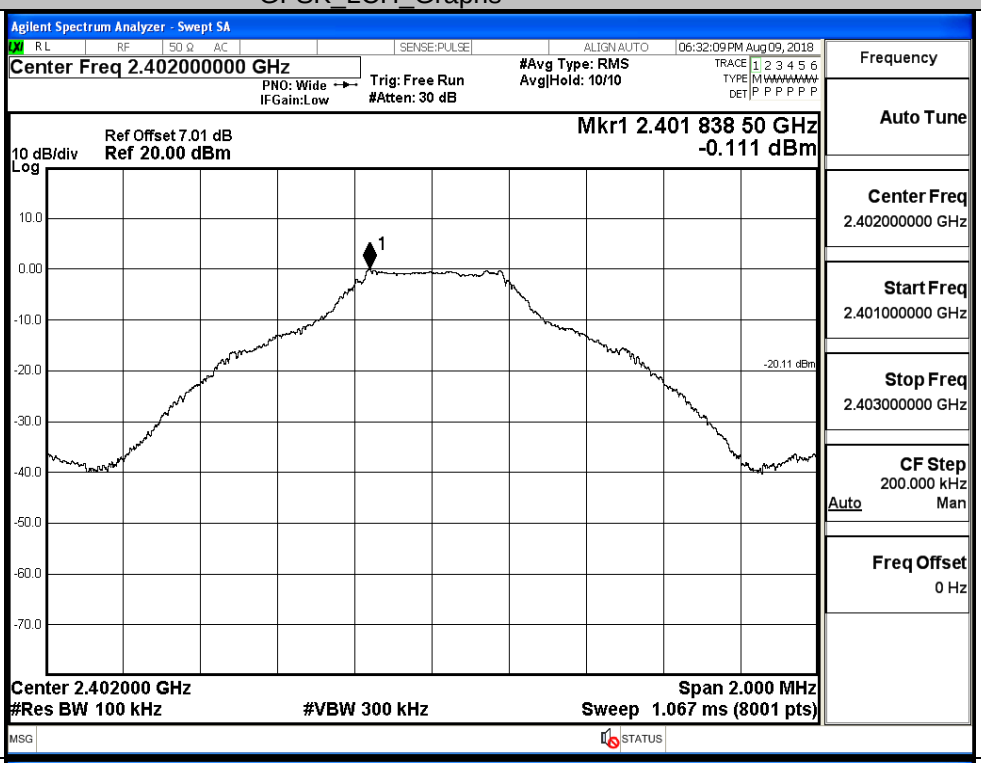
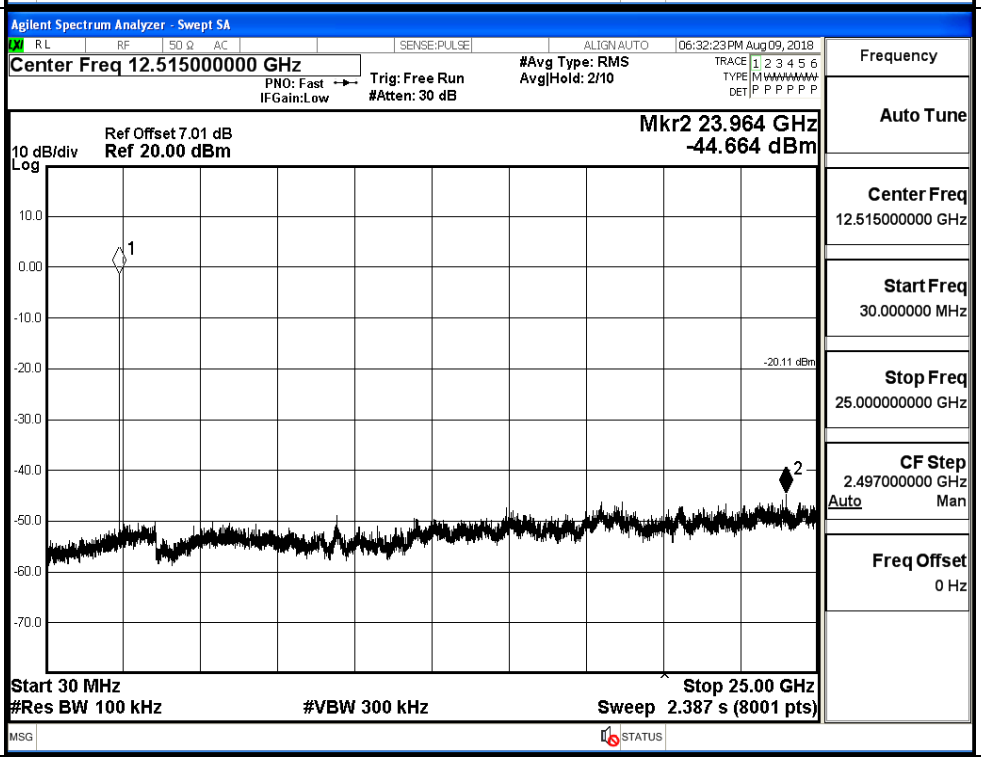
8DPSK _3DH5/LCH

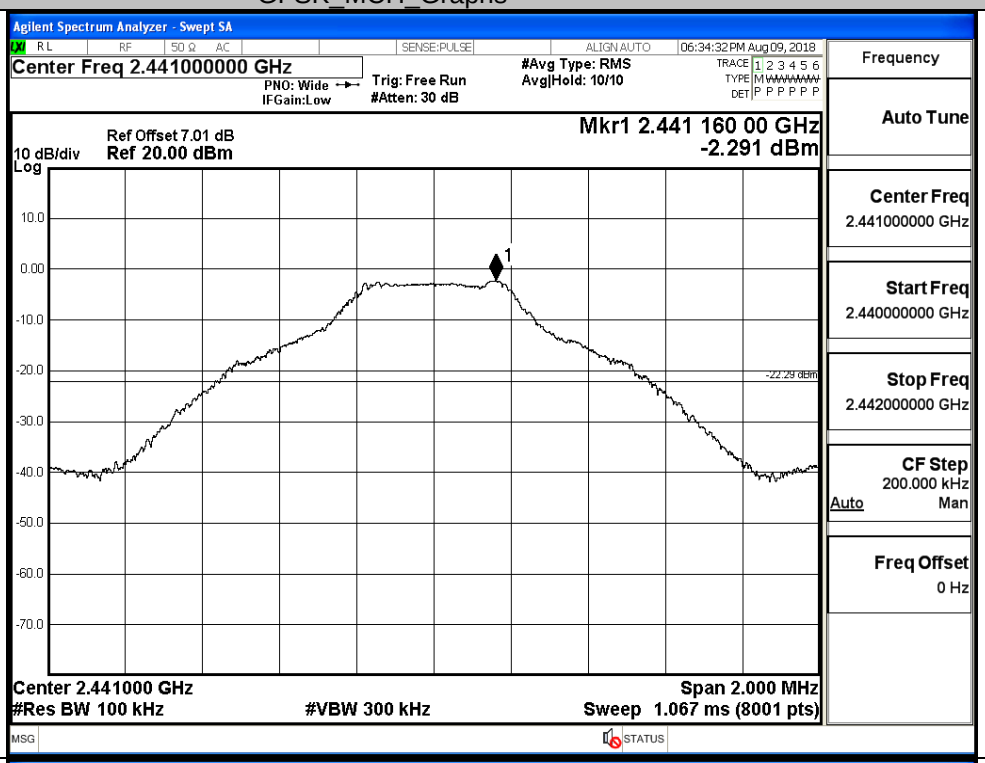
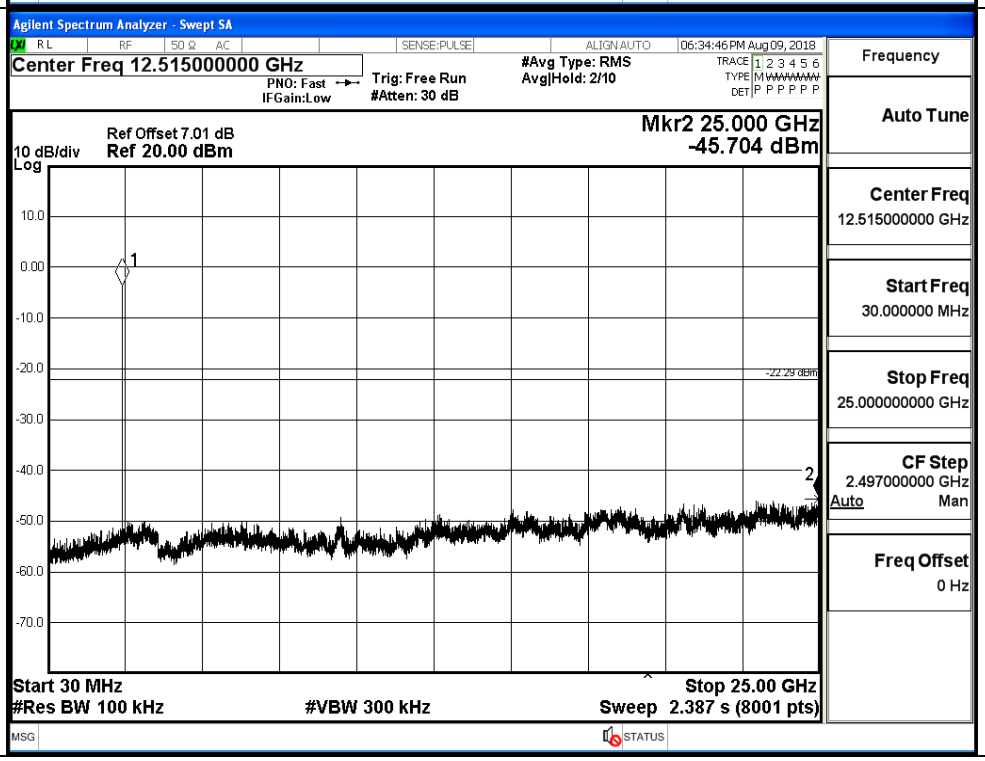


8DPSK _3DH5/MCH	
8DPSK _3DH5/HCH	

A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.111	-44.664	-20.111	PASS
	MCH	-2.291	-45.704	-22.291	PASS
	HCH	-2.383	-44.563	-22.383	PASS
π/4DQPSK	LCH	-1.727	-45.513	-21.727	PASS
	MCH	-3.713	-46.091	-23.713	PASS
	HCH	-3.501	-46.205	-23.501	PASS
8DPSK	LCH	-1.568	-46.086	-21.568	PASS
	MCH	-3.534	-45.953	-23.534	PASS
	HCH	-3.387	-46.332	-23.387	PASS

GFSK_LCH_Graphs		
Pref		
Puw		

GFSK_MCH_Graphs		
Pref		
Puw		

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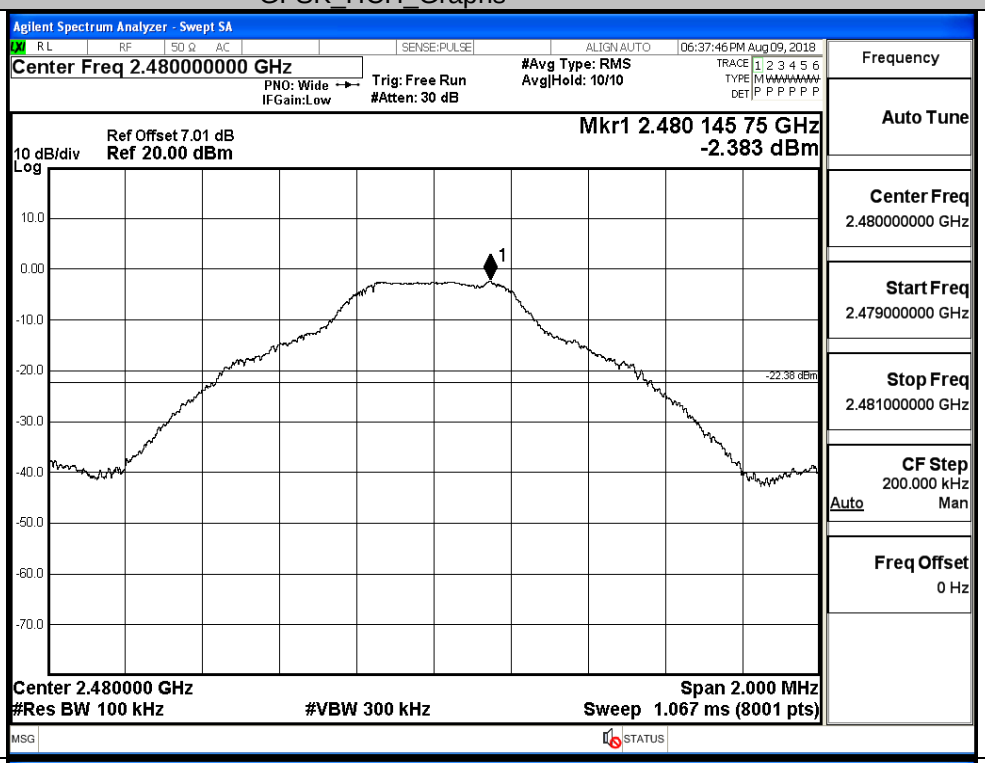
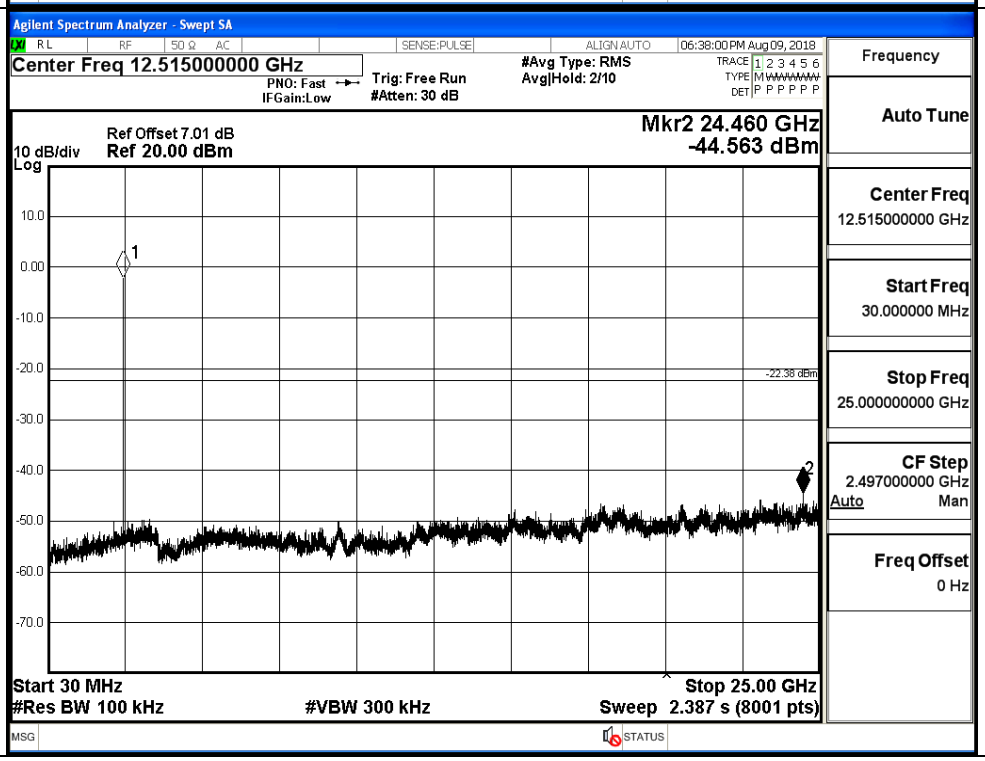
Pref		
Puw		

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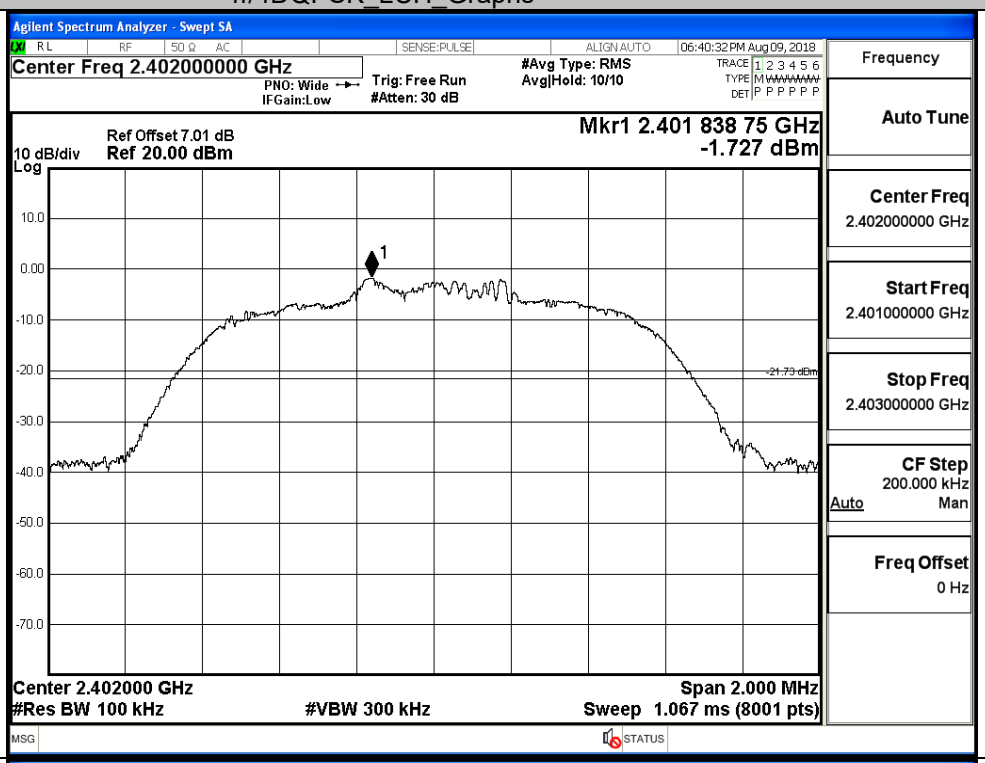
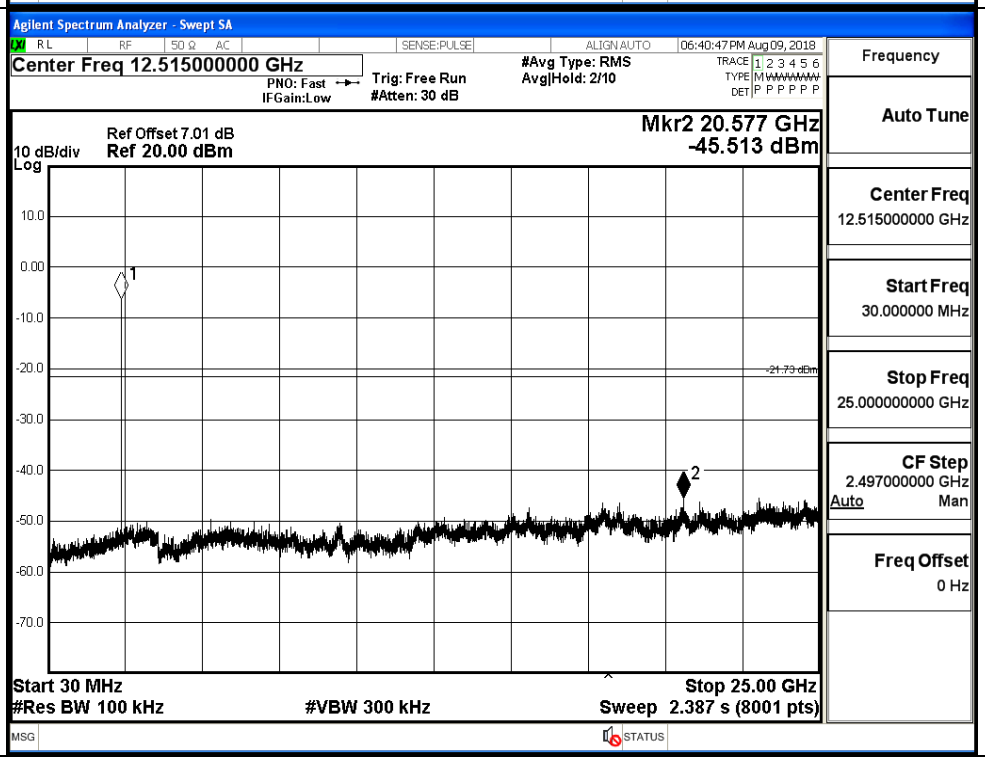
Pref		
Puw		

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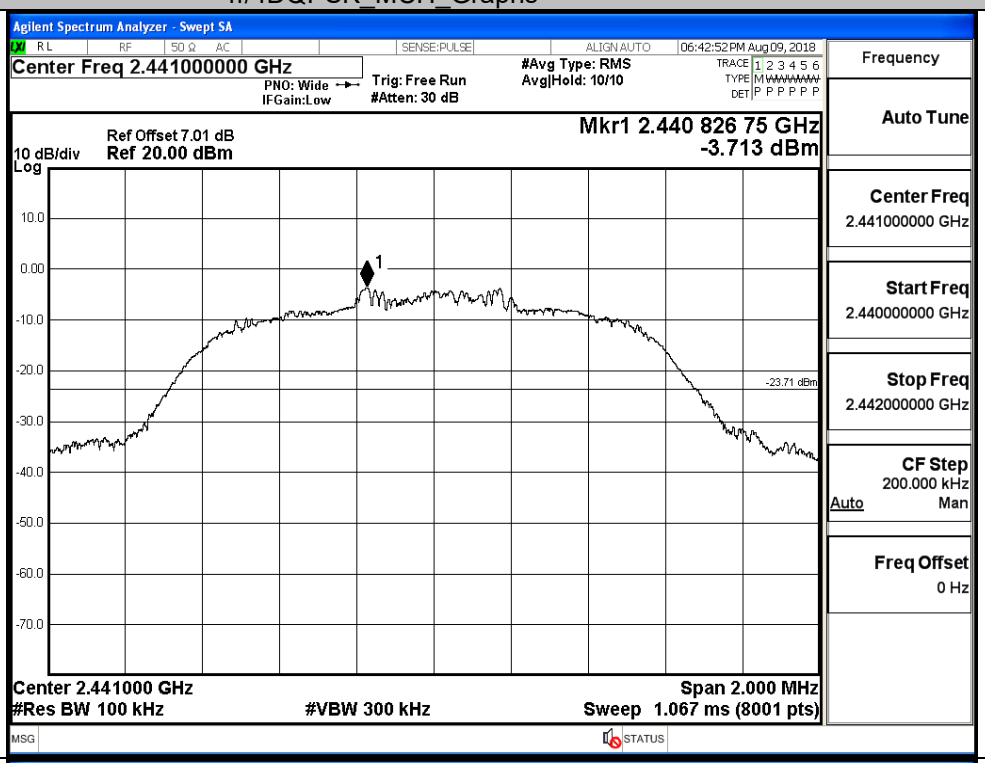
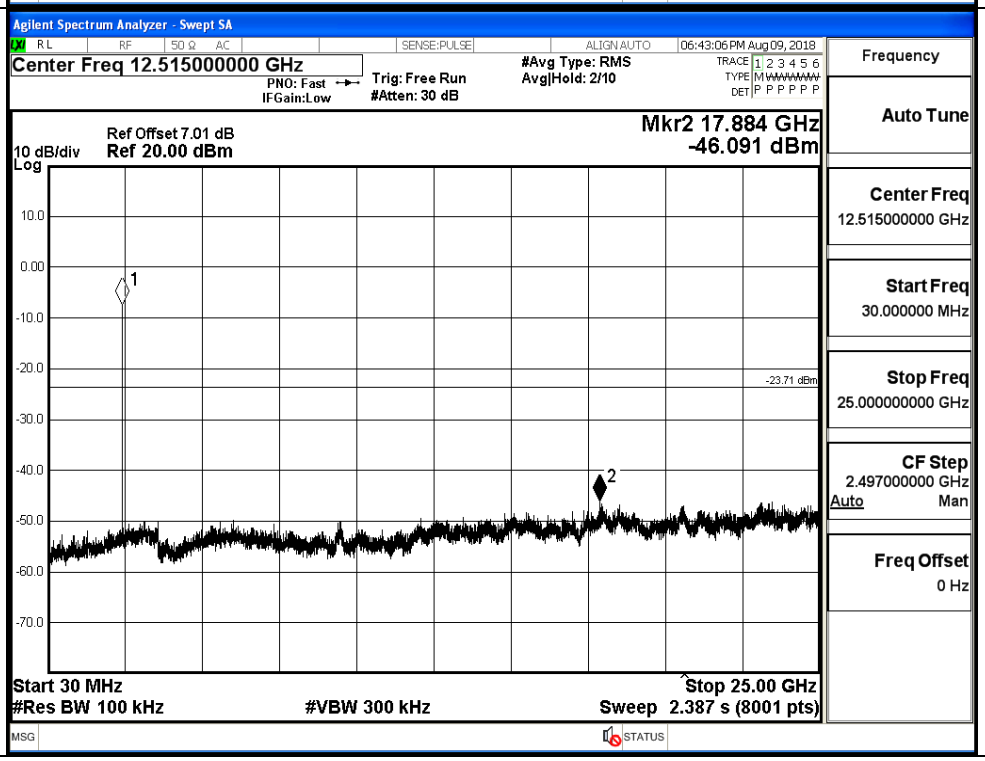
Pref		
Puw		

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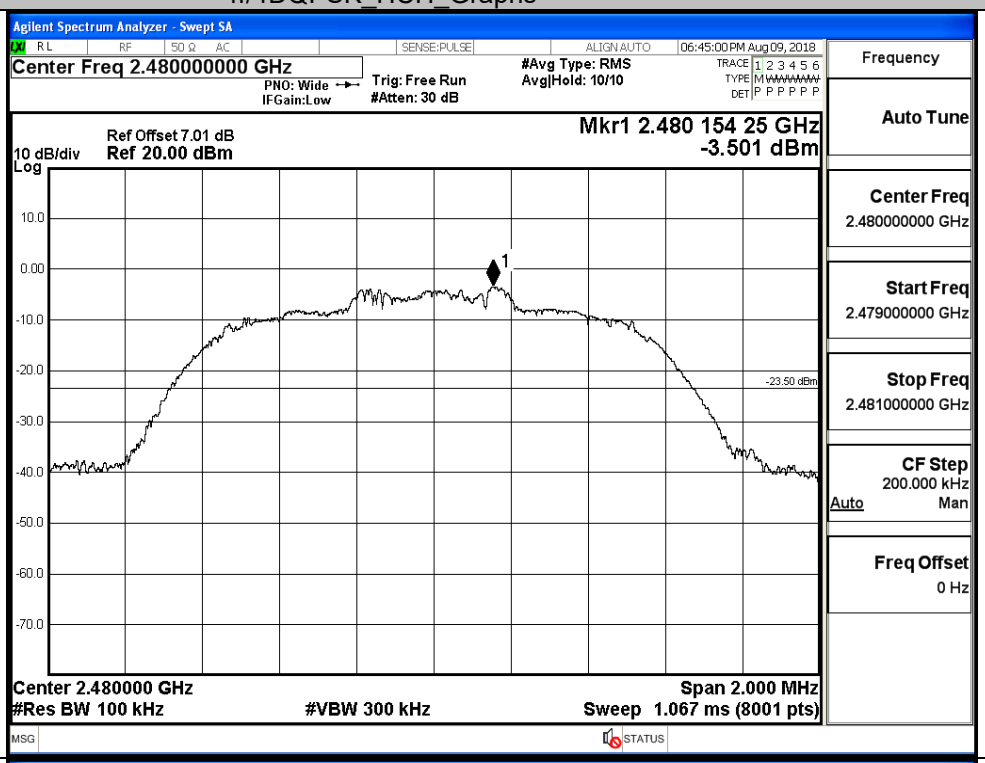
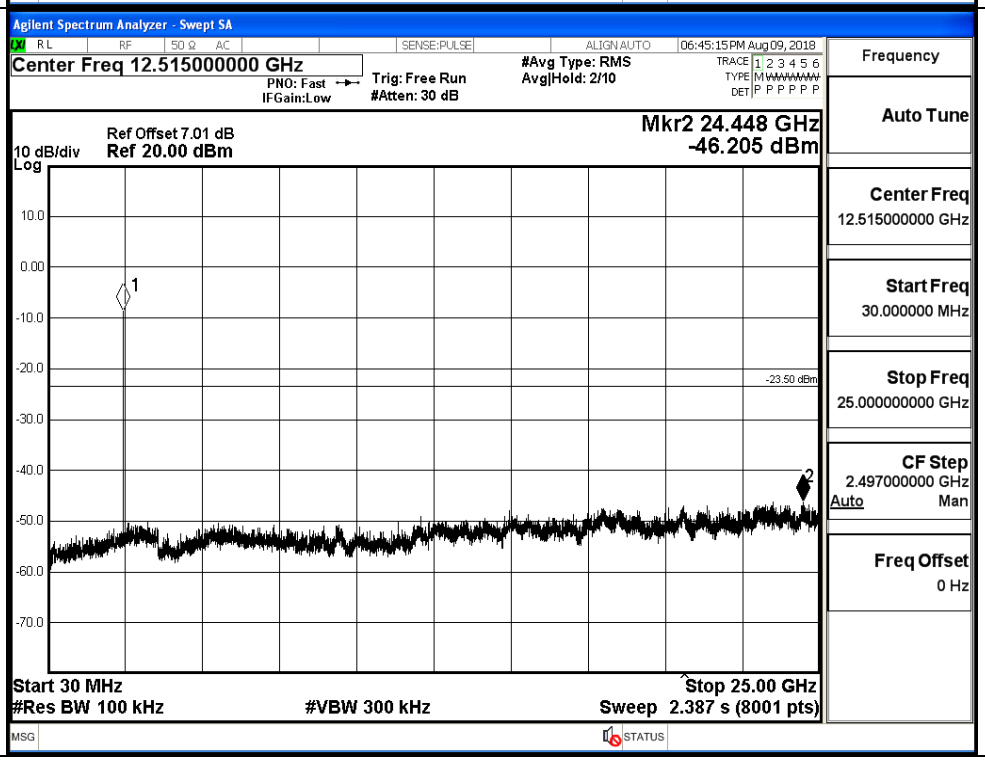
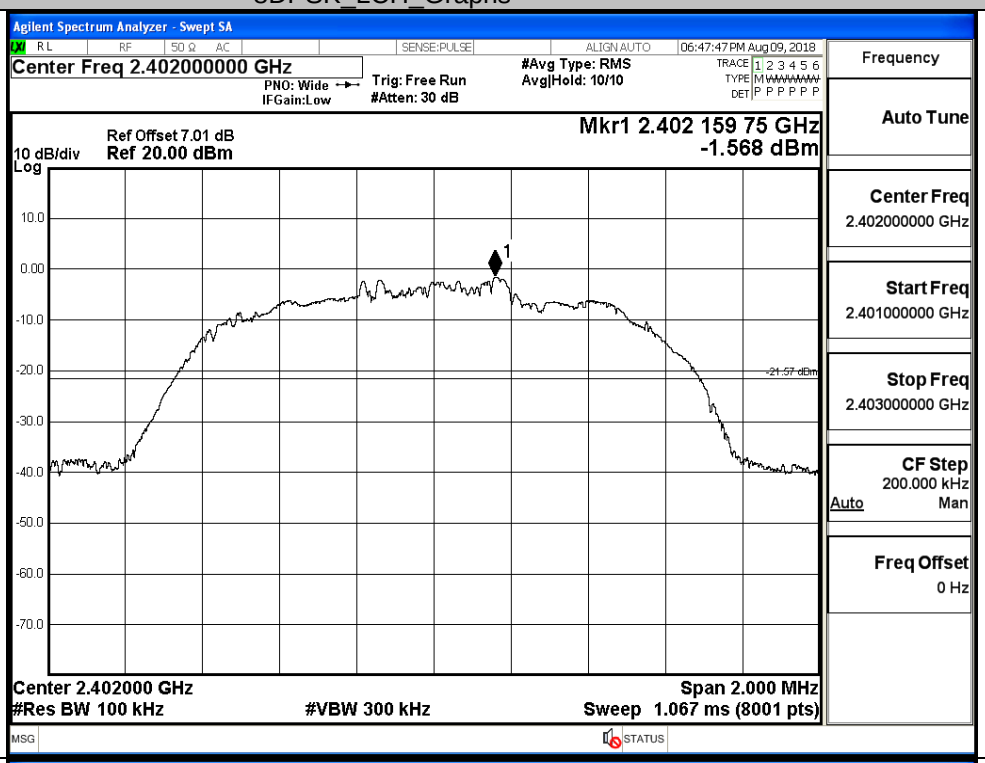
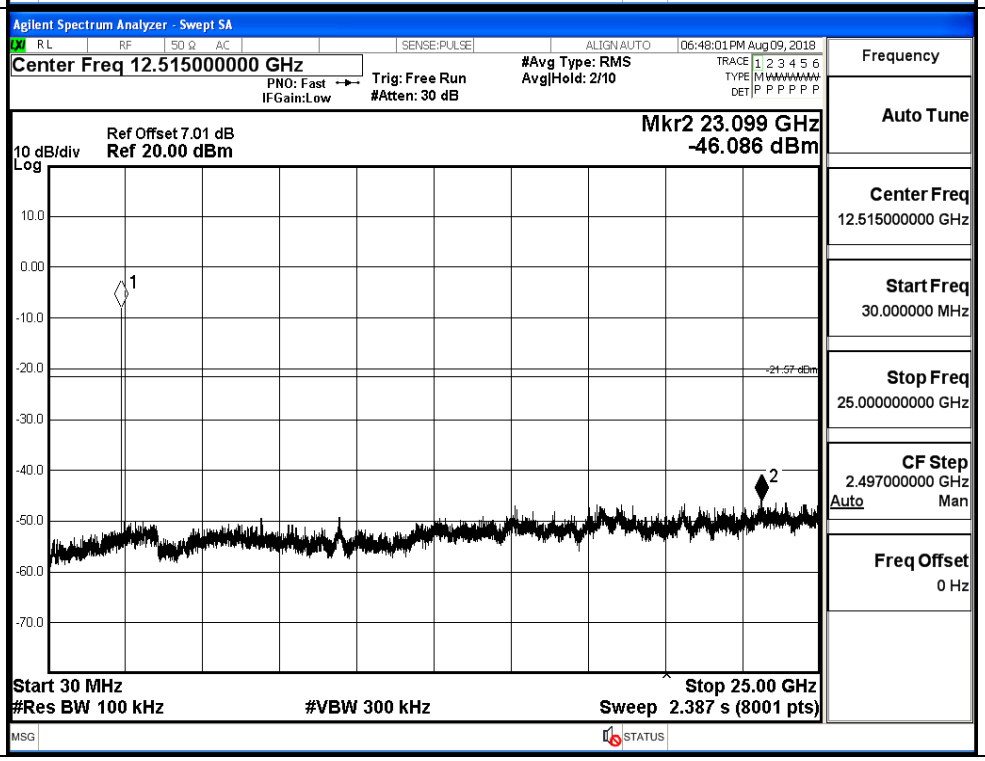
Pref		
Puw		

8DPSK_LCH_Graphs		
Pref		
Puw		

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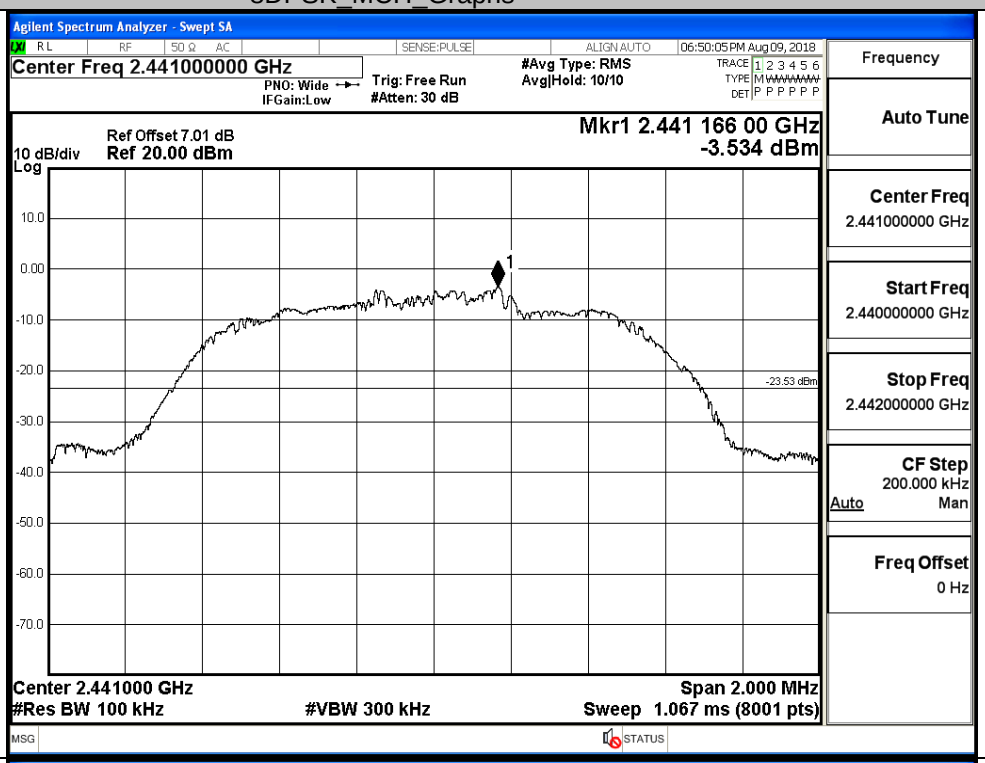
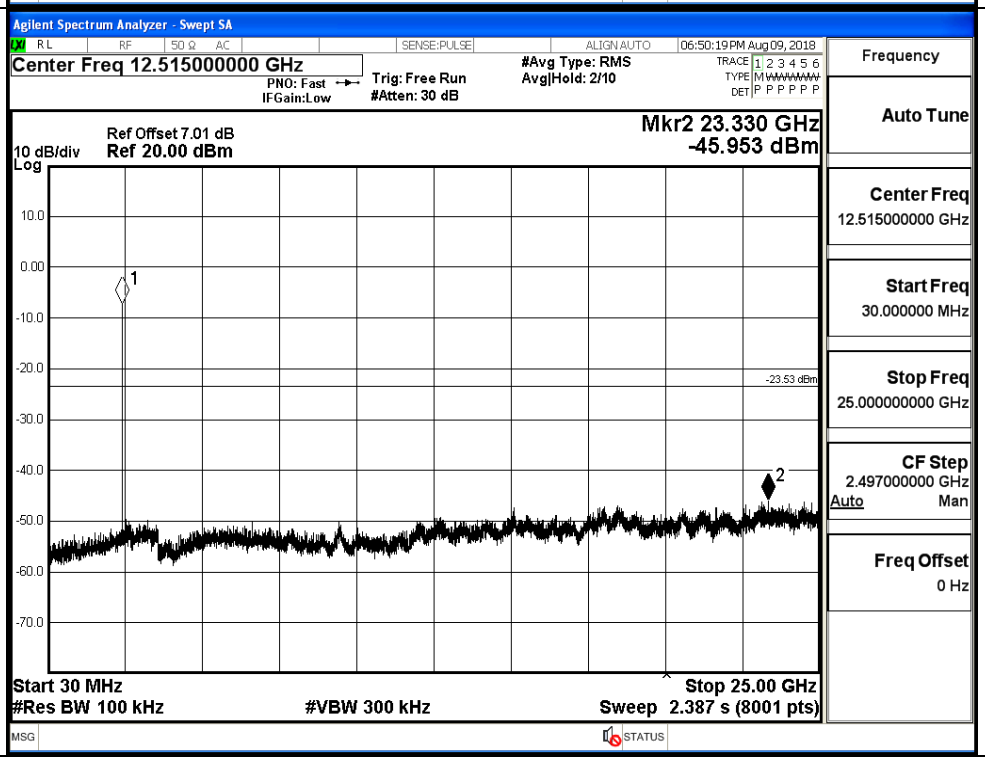
Pref		
Puw		

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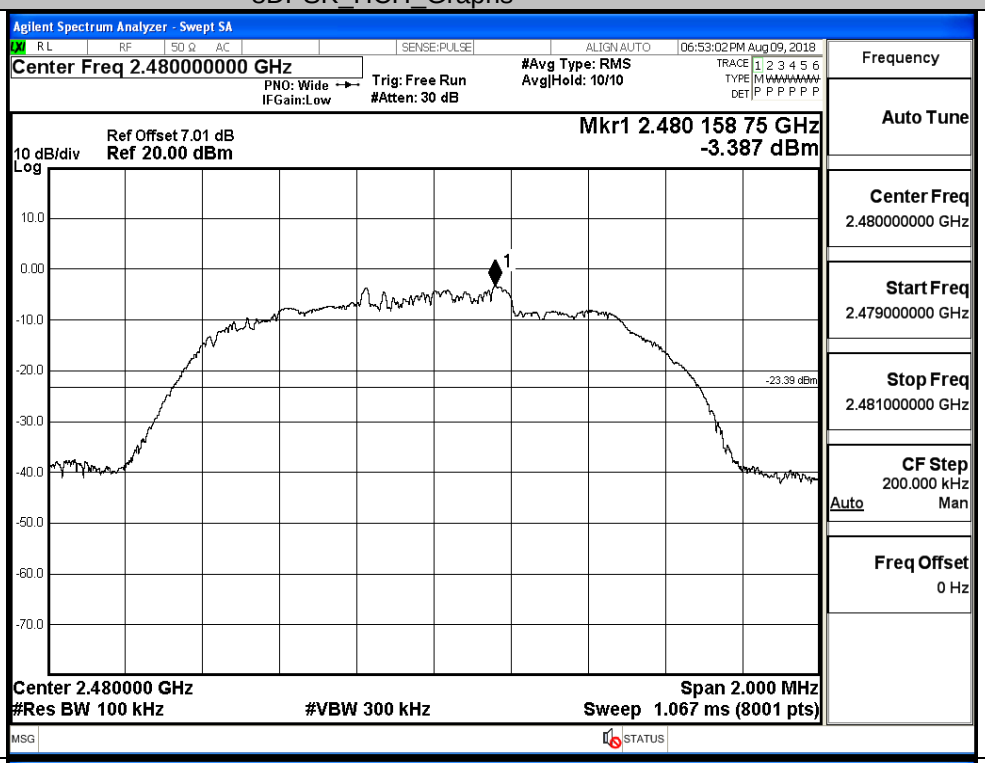
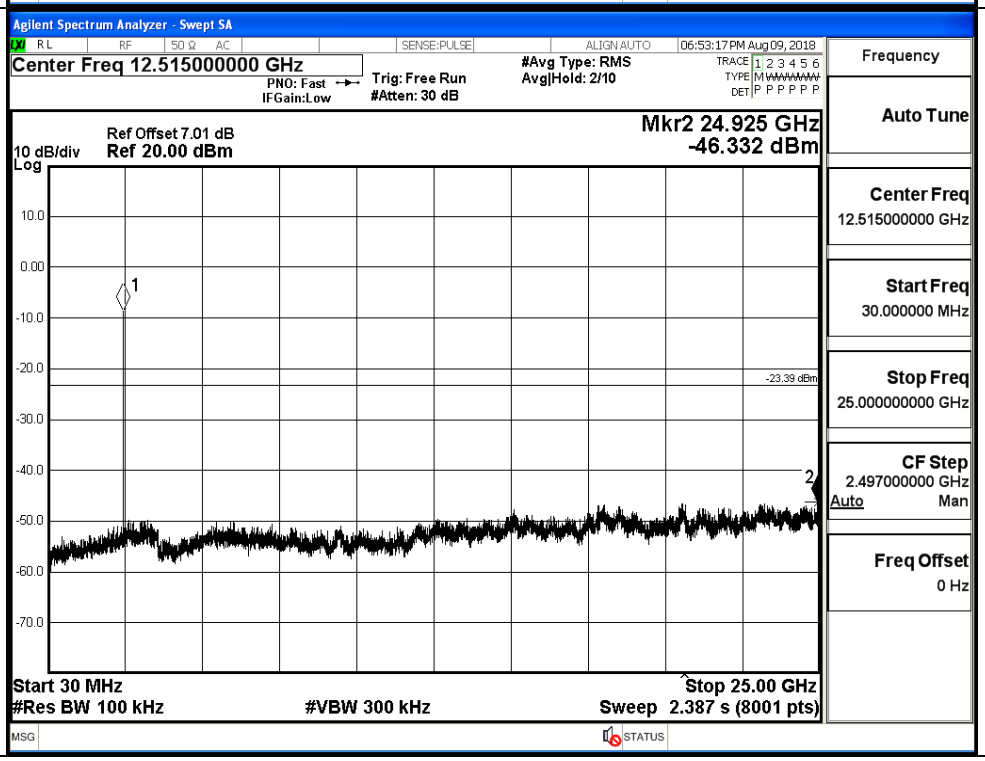
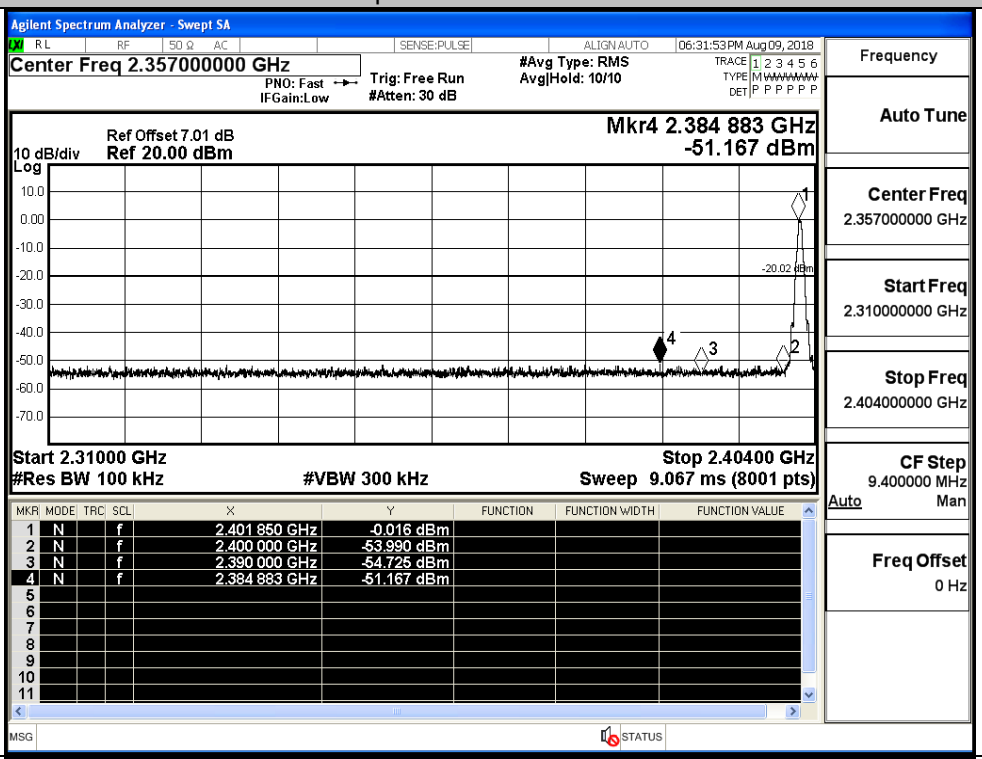
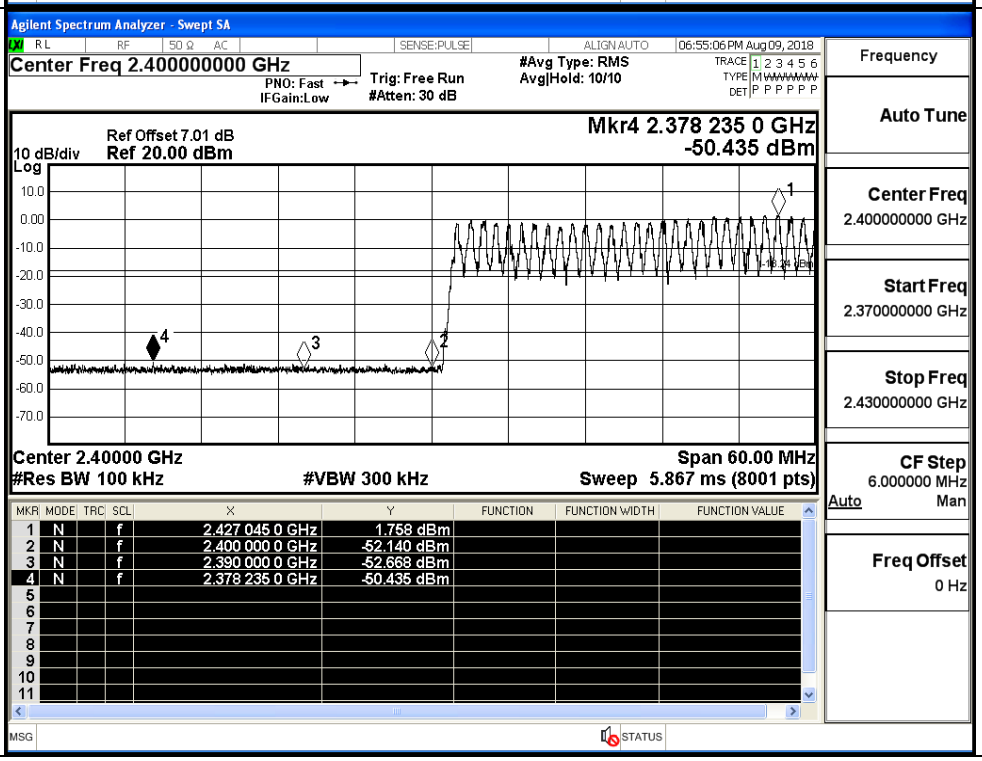
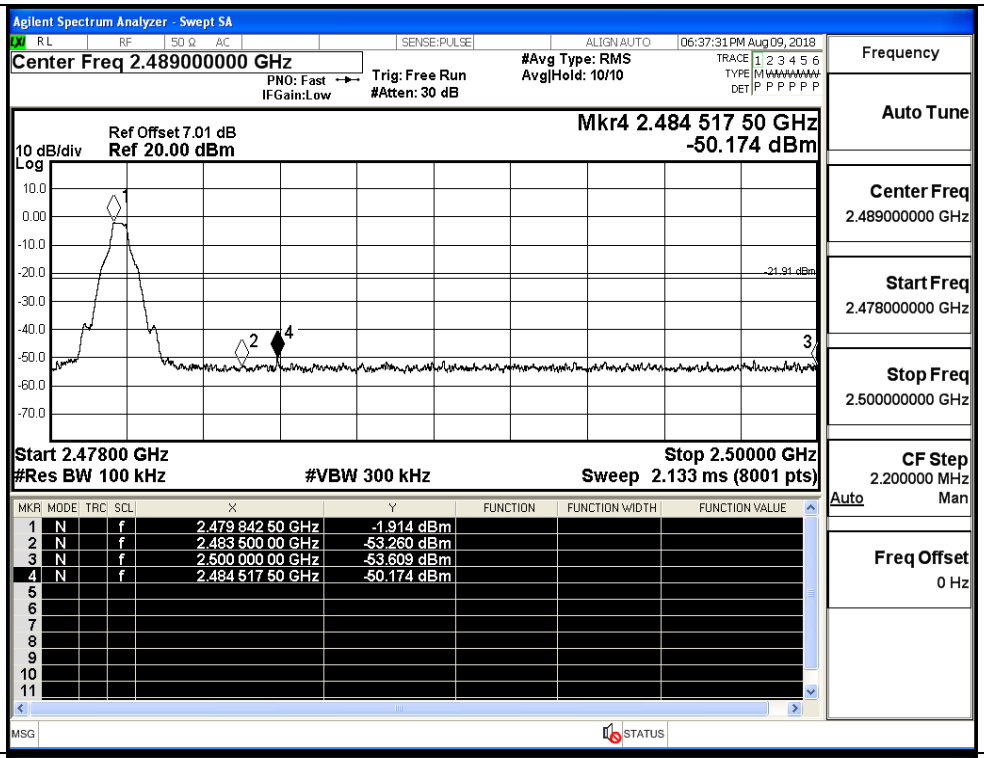
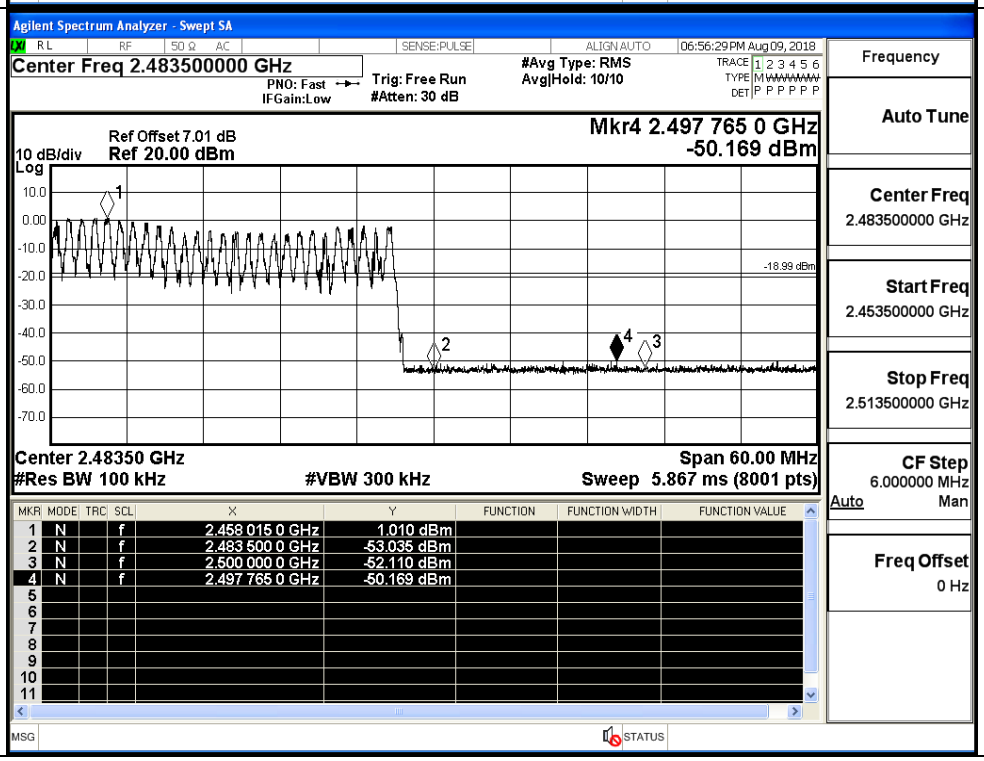
Pref		
Puw		

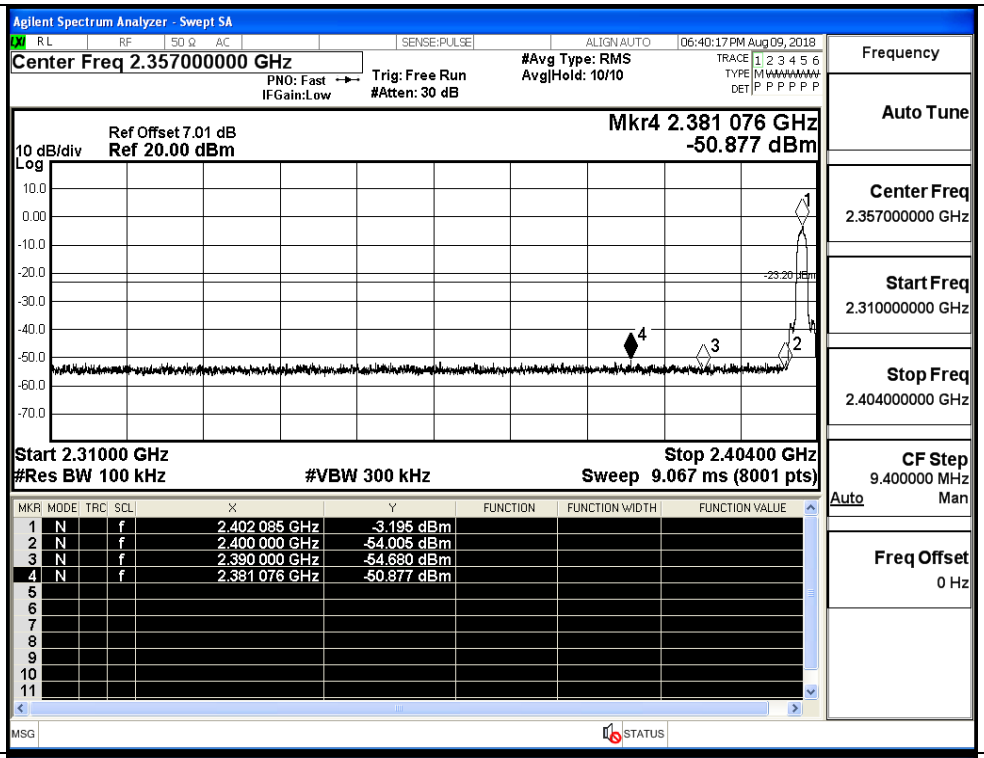
A.7 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-0.016	Off	-51.167	-20.02	PASS
			1.758	On	-50.435	-18.24	PASS
	HCH	2480	-1.914	Off	-50.174	-21.91	PASS
			1.010	On	-50.169	-18.99	PASS
π/4DQPSK	LCH	2402	-3.195	Off	-50.877	-23.2	PASS
			0.544	On	-50.567	-19.46	PASS
	HCH	2480	-3.348	Off	-51.169	-23.35	PASS
			-1.369	On	-50.011	-21.37	PASS
8DPSK	LCH	2402	-1.673	Off	-51.126	-21.67	PASS
			0.749	On	-50.557	-19.25	PASS
	HCH	2480	-3.386	Off	-50.741	-23.39	PASS
			-0.534	On	-49.872	-20.53	PASS

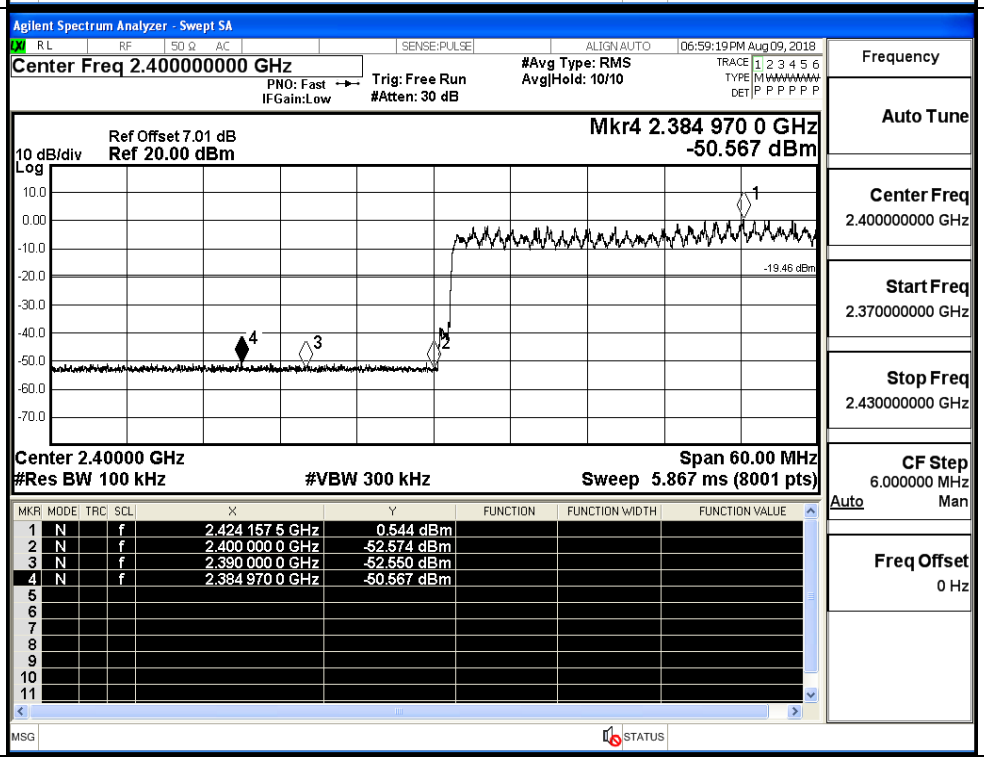
Test Graphs	
GFSK/LCH/No Hop	
GFSK/LCH/Hop	

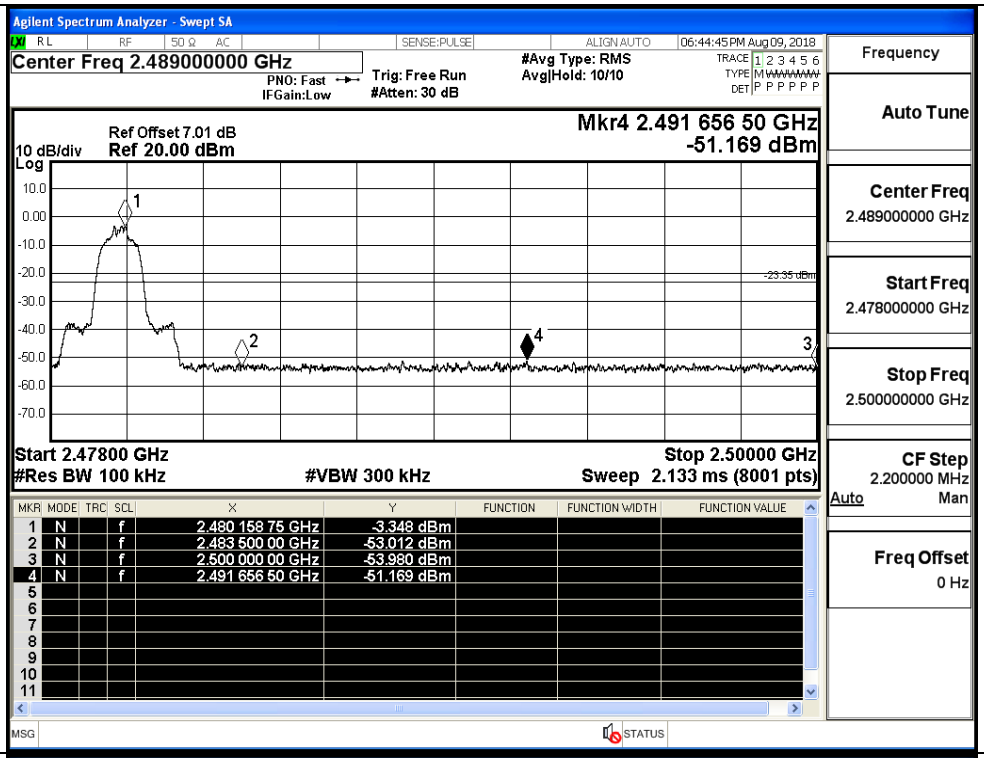
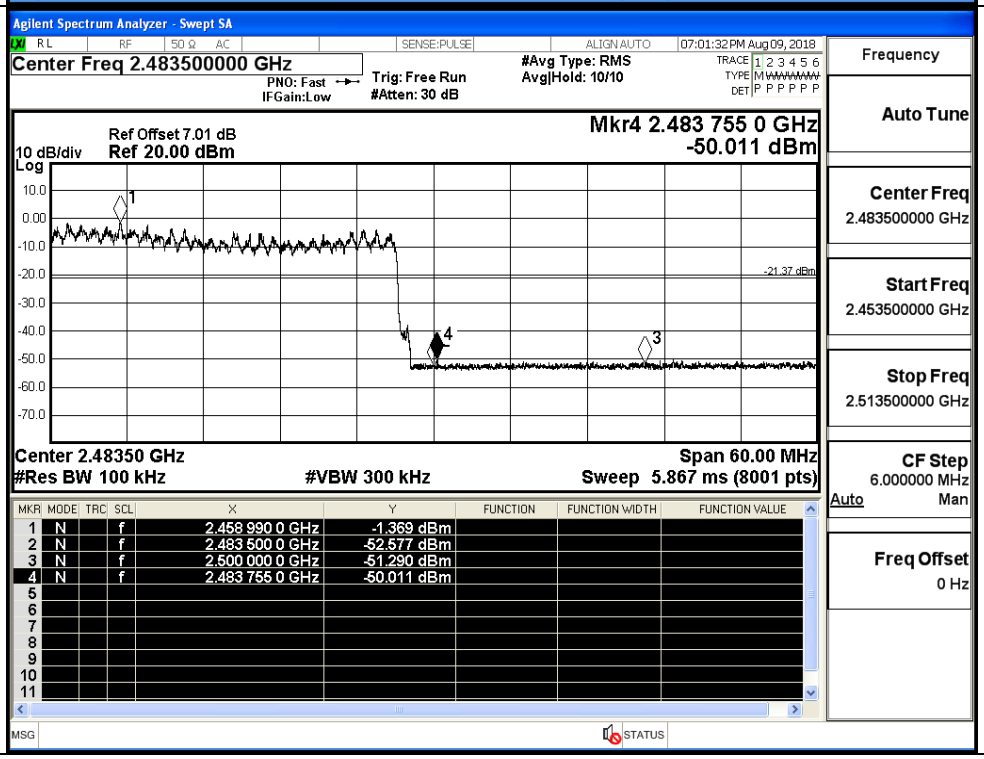
GFSK/HCH/No Hop	
GFSK/HCH/Hop	

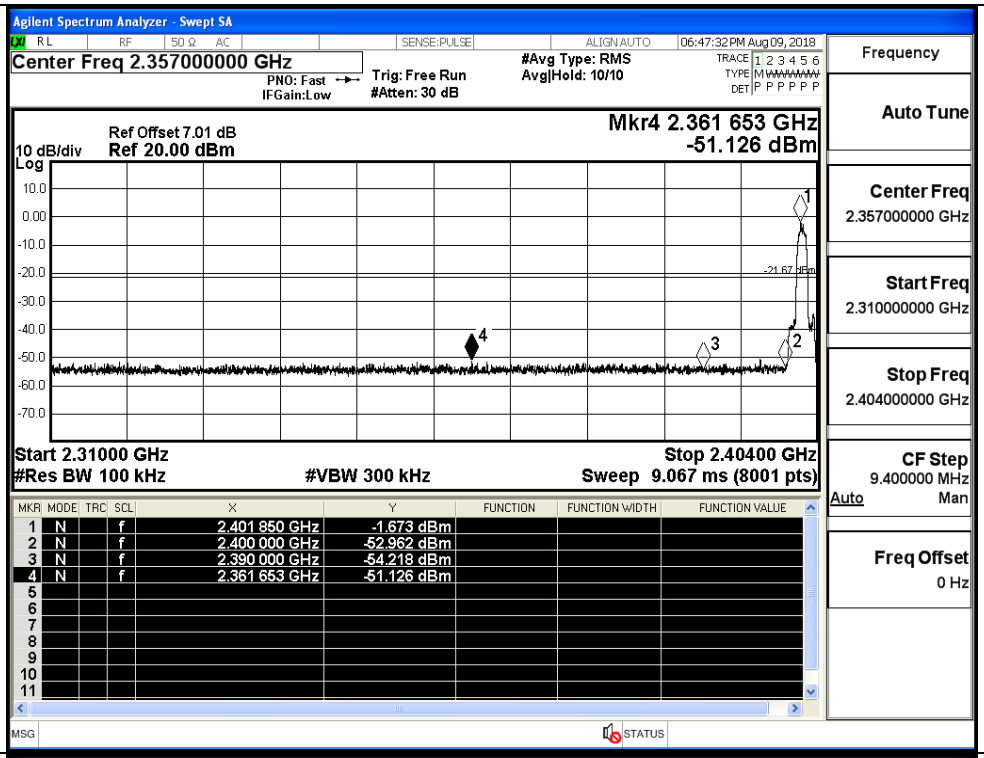
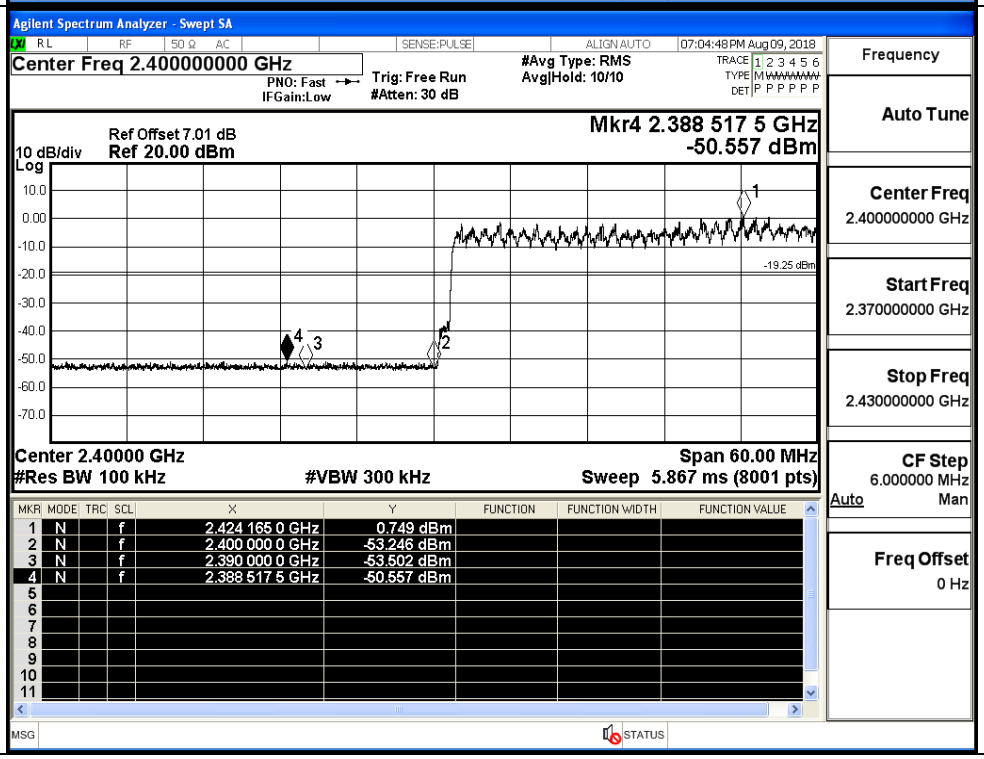
π/4DQPSK/LCH/No Hop

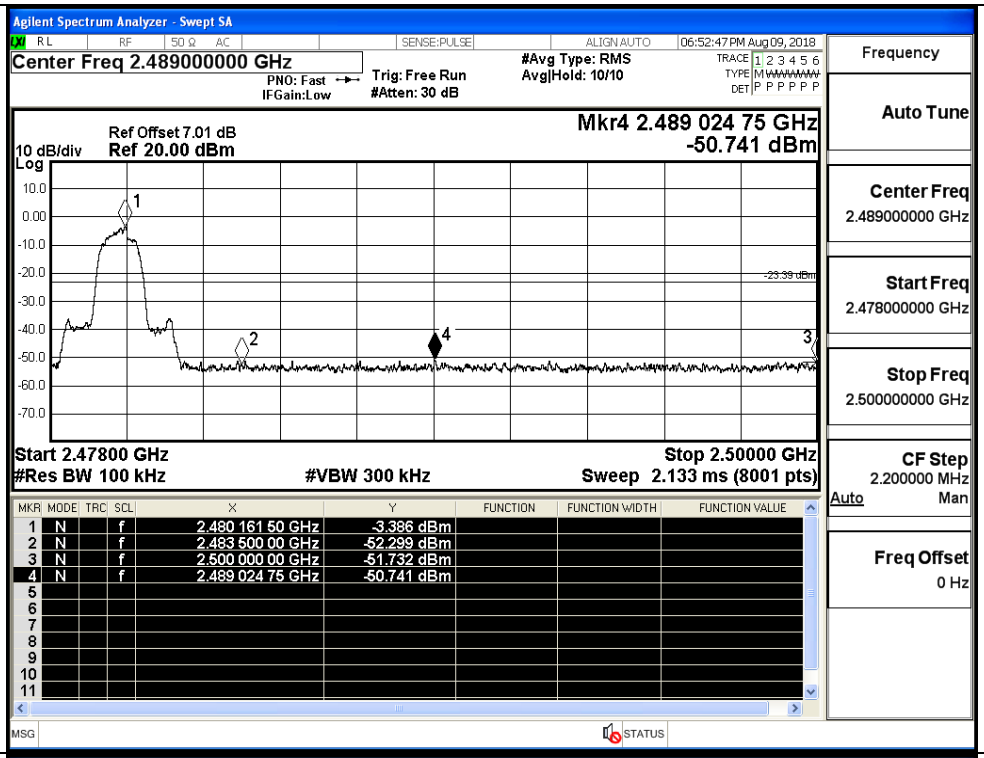
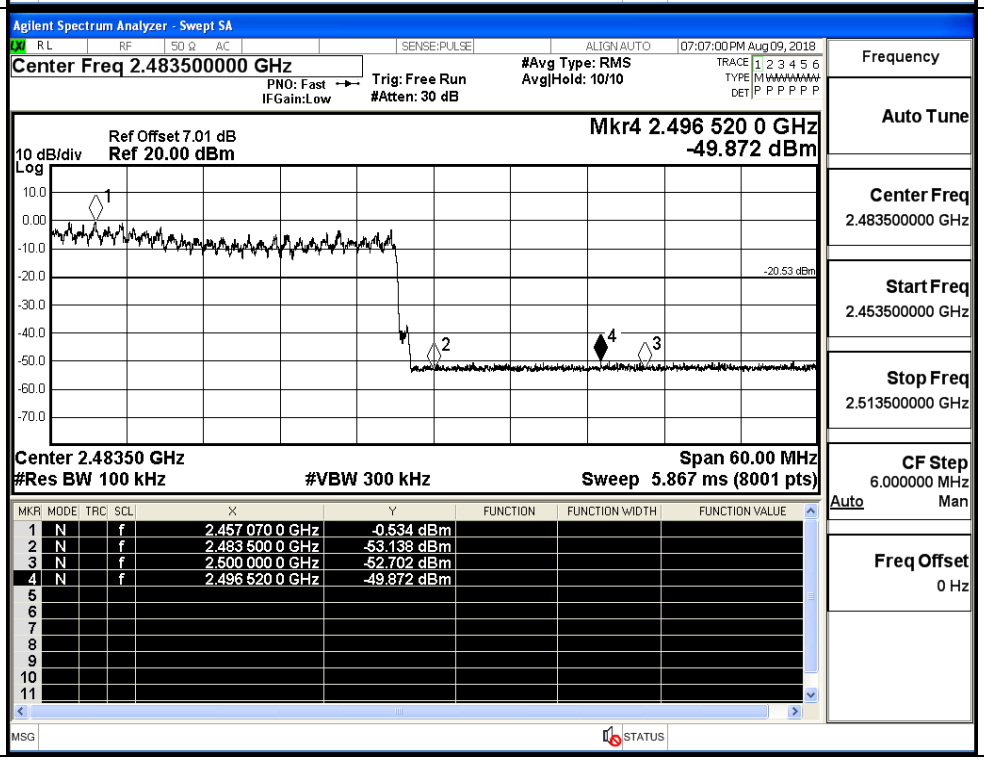


π/4DQPSK/LCH/Hop



π/4DQPSK/HCH/No Hop	
π/4DQPSK/HCH/Hop	

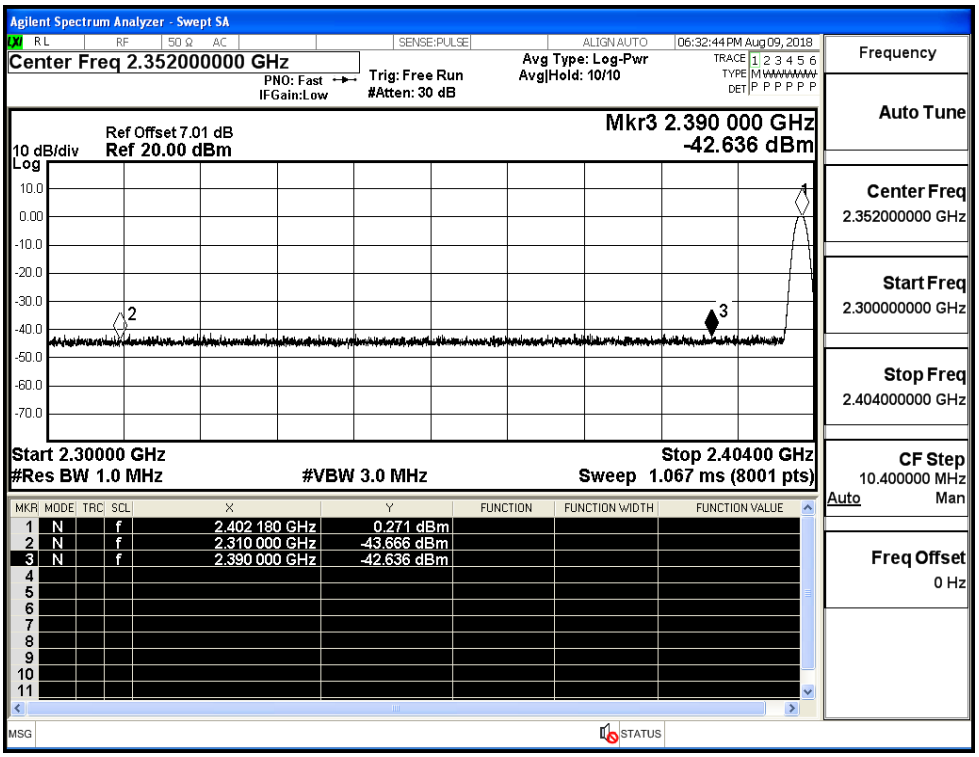
8DPSK/LCH/No Hop	
8DPSK/LCH/Hop	

8DPSK/HCH/No Hop	
8DPSK/HCH/Hop	

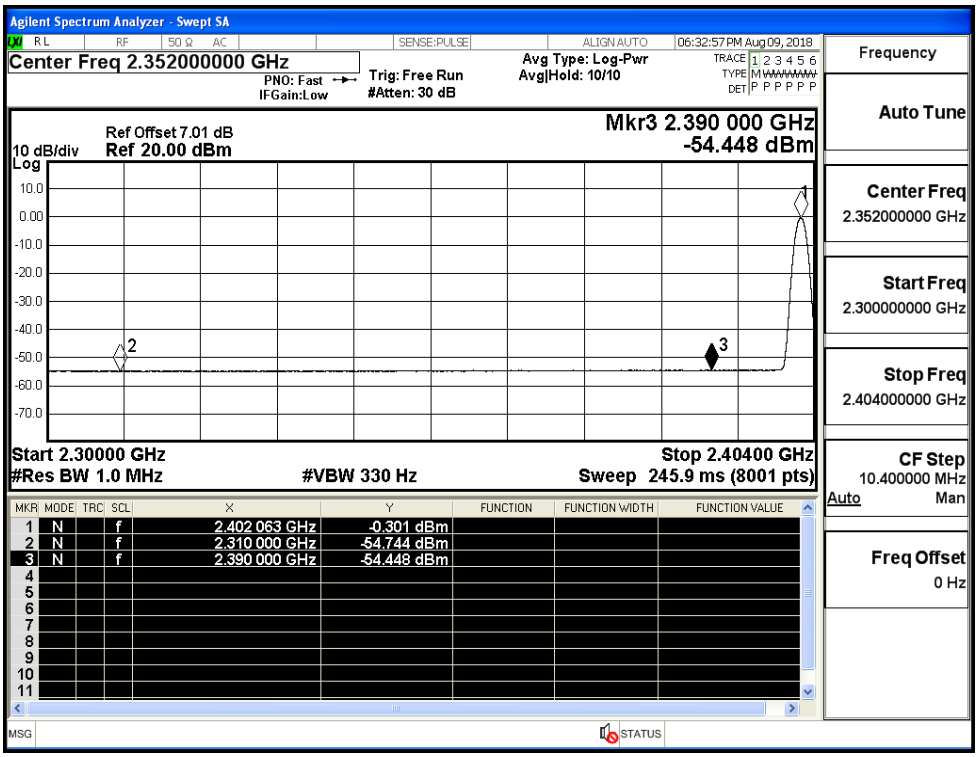
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.67	2.0	0	53.59	PEAK	74	PASS
	Off	2310.0	-54.74	2.0	0	42.51	AV	54	PASS
	Off	2390.0	-42.64	2.0	0	54.62	PEAK	74	PASS
	Off	2390.0	-54.45	2.0	0	42.81	AV	54	PASS
	Off	2483.5	-43.66	2.0	0	53.60	PEAK	74	PASS
	Off	2483.5	-54.32	2.0	0	42.94	AV	54	PASS
	Off	2500.0	-43.22	2.0	0	54.04	PEAK	74	PASS
	Off	2500.0	-54.16	2.0	0	43.10	AV	54	PASS
π/4DQPSK	Off	2310.0	-45.16	2.0	0	52.10	PEAK	74	PASS
	Off	2310.0	-54.71	2.0	0	42.54	AV	54	PASS
	Off	2390.0	-45.12	2.0	0	52.14	PEAK	74	PASS
	Off	2390.0	-54.57	2.0	0	42.68	AV	54	PASS
	Off	2483.5	-44.14	2.0	0	53.11	PEAK	74	PASS
	Off	2483.5	-54.22	2.0	0	43.03	AV	54	PASS
	Off	2500.0	-43.17	2.0	0	54.09	PEAK	74	PASS
	Off	2500.0	-54.22	2.0	0	43.03	AV	54	PASS
8DPSK	Off	2310.0	-44.80	2.0	0	52.46	PEAK	74	PASS
	Off	2310.0	-54.75	2.0	0	42.51	AV	54	PASS
	Off	2390.0	-43.67	2.0	0	53.59	PEAK	74	PASS
	Off	2390.0	-54.46	2.0	0	42.80	AV	54	PASS
	Off	2483.5	-44.78	2.0	0	52.47	PEAK	74	PASS
	Off	2483.5	-54.16	2.0	0	43.10	AV	54	PASS
	Off	2500.0	-43.86	2.0	0	53.40	PEAK	74	PASS
	Off	2500.0	-54.17	2.0	0	43.09	AV	54	PASS

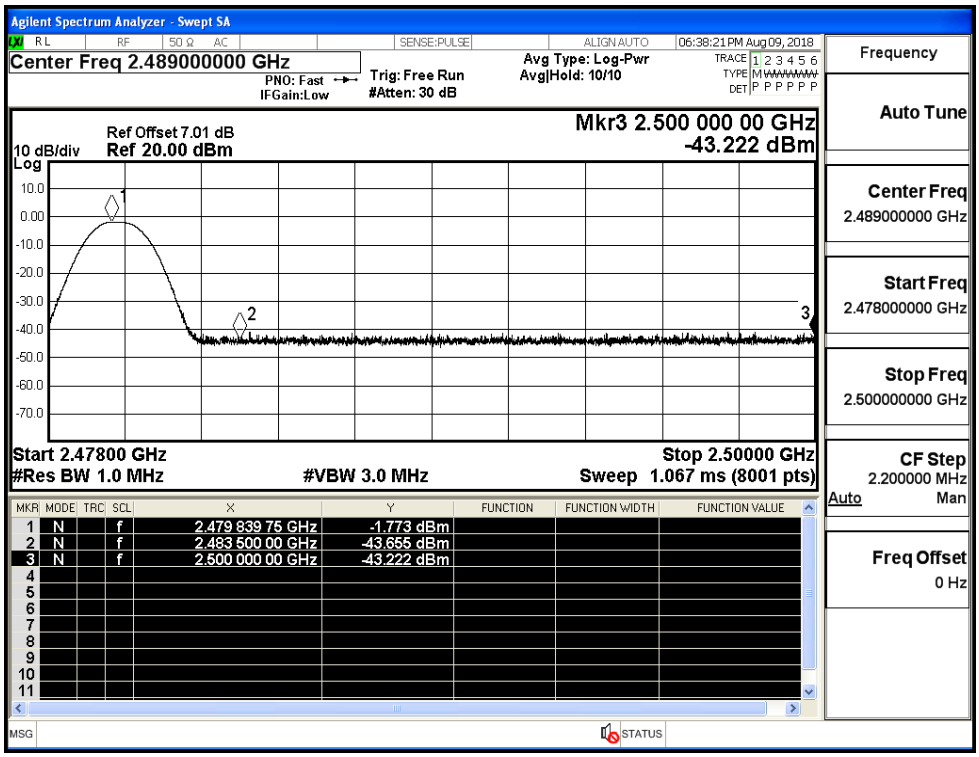
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



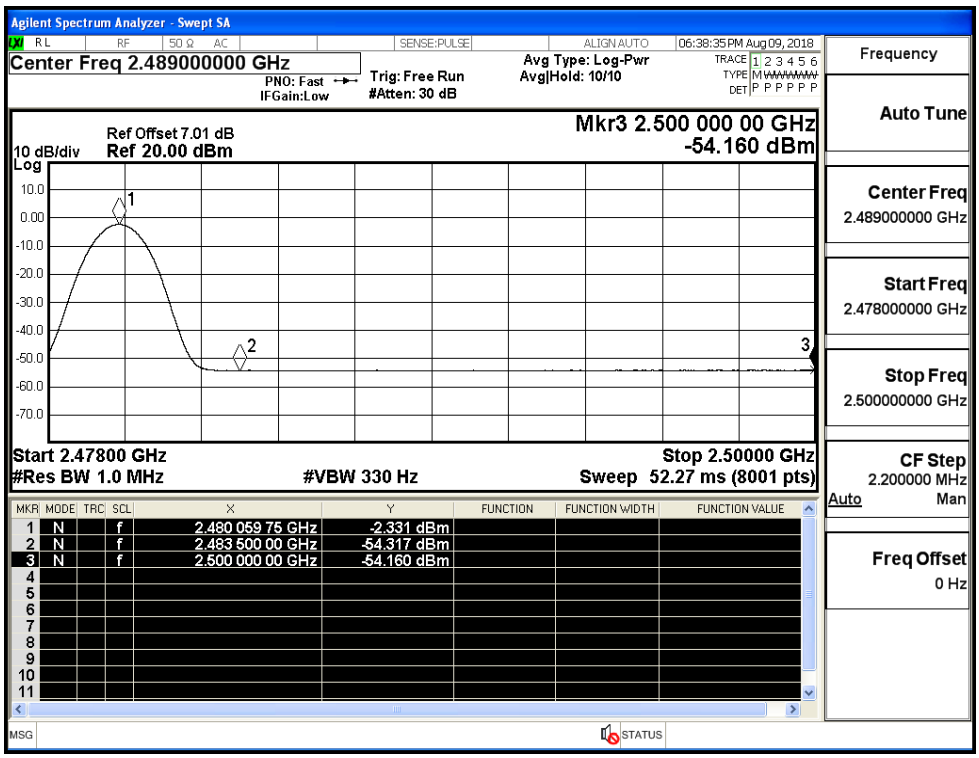
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



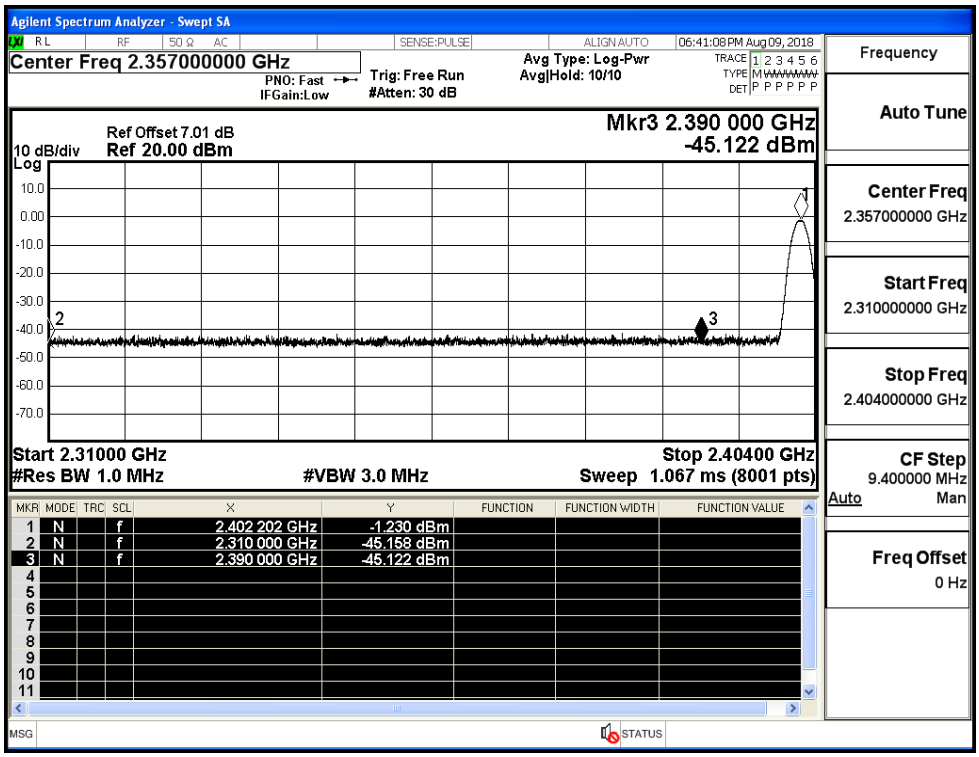
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



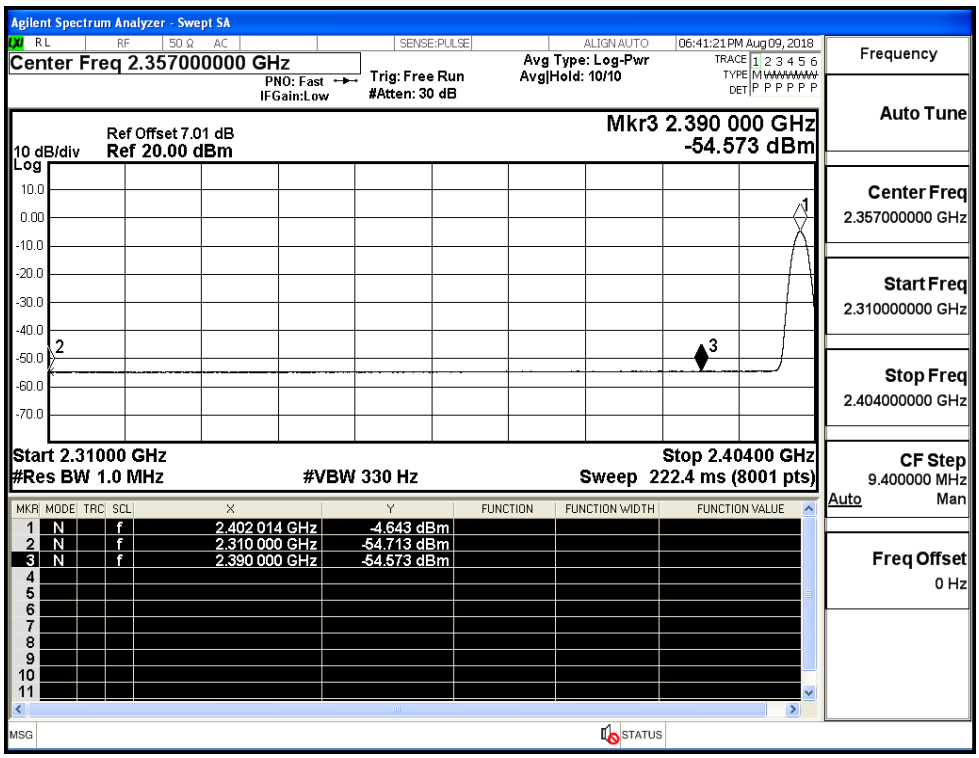
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



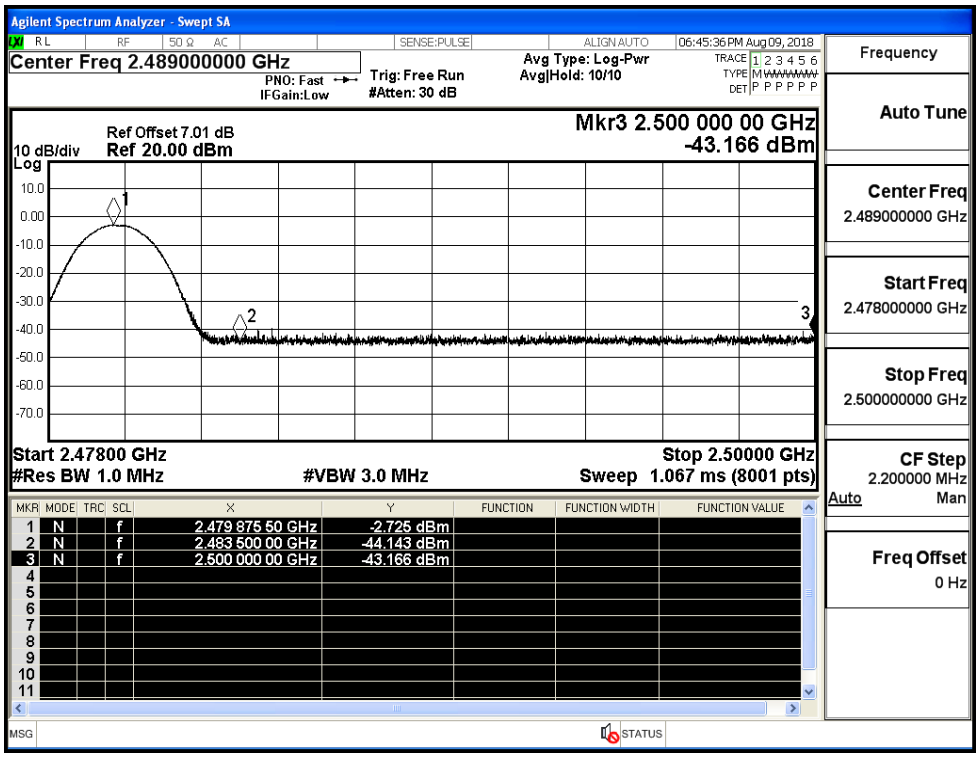
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



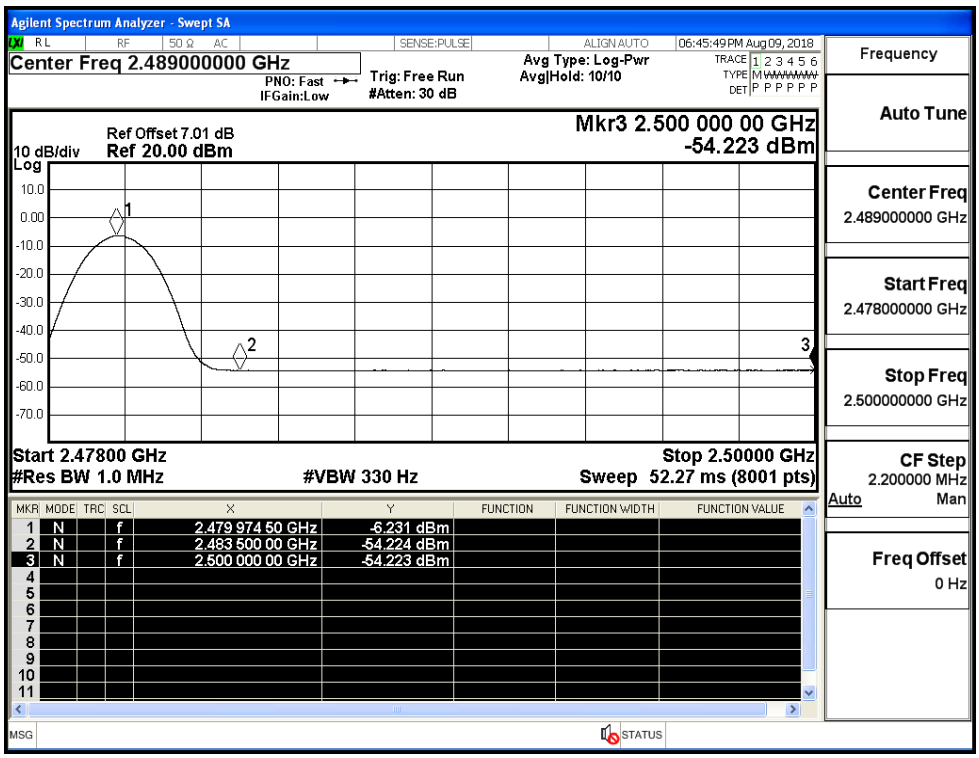
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



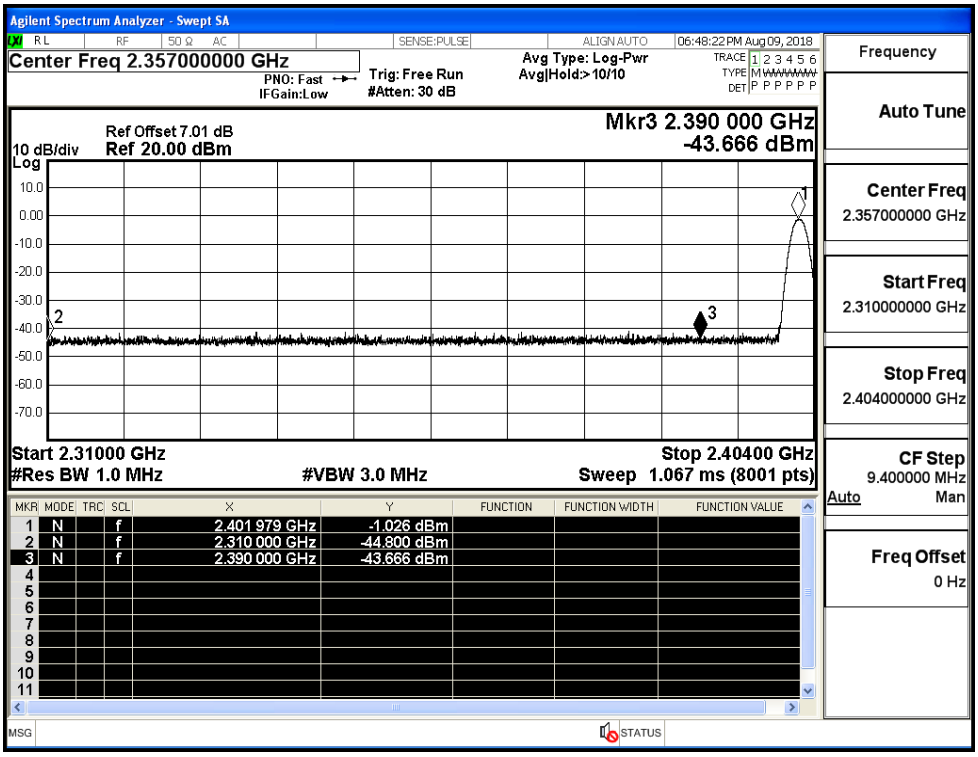
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



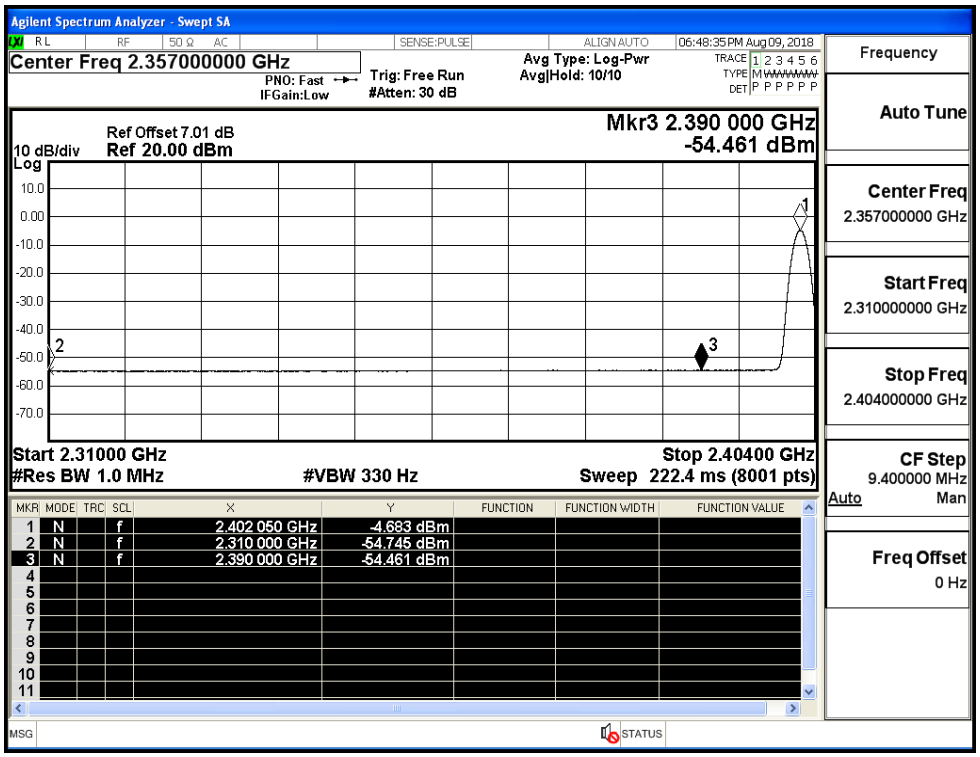
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



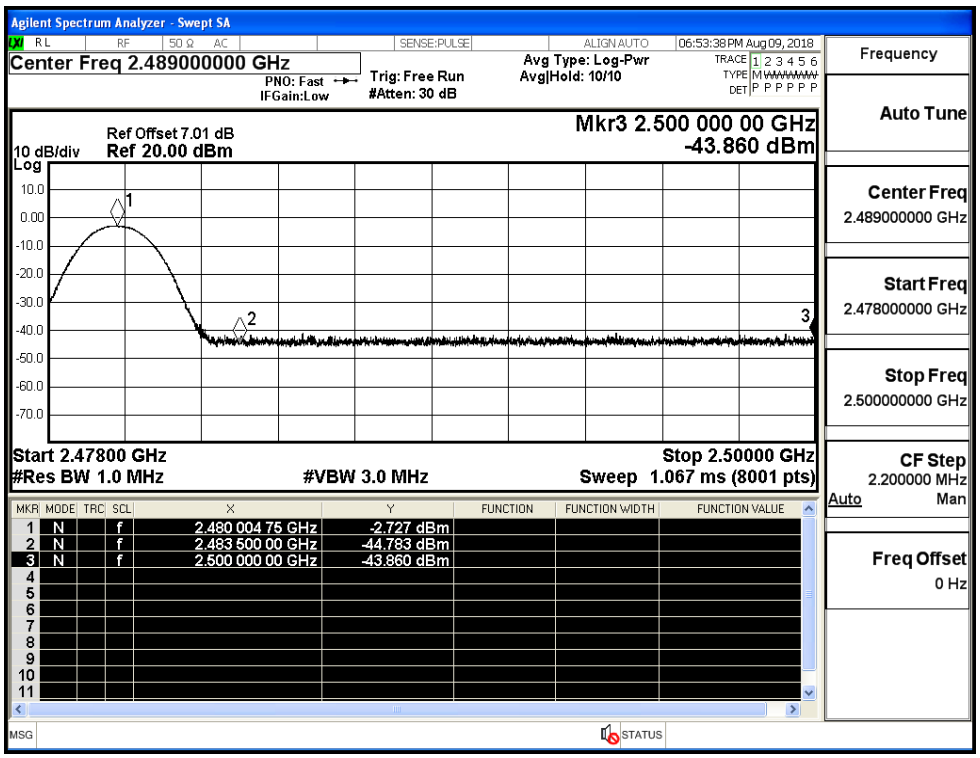
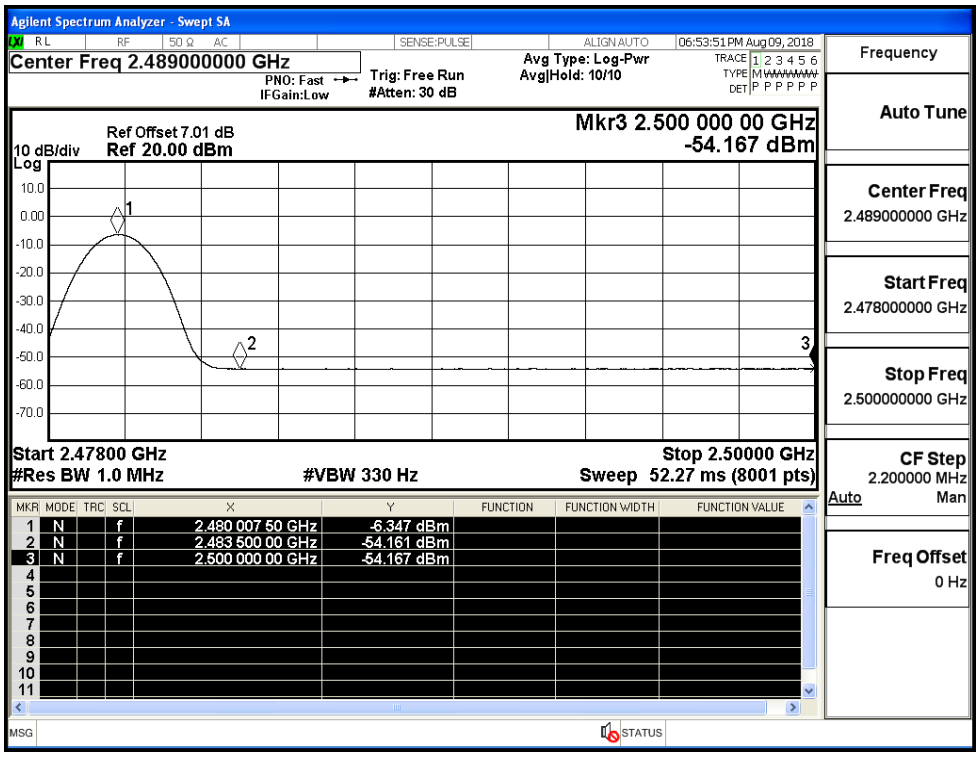
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (Low Channel)



Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (High Channel)



Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (High Channel)