Appendix A

RF Test Data for BT V4.0 (BDR/EDR) (Conducted Measurement)

Product Name: DUO wireless speaker

Trade Mark: HYM originals

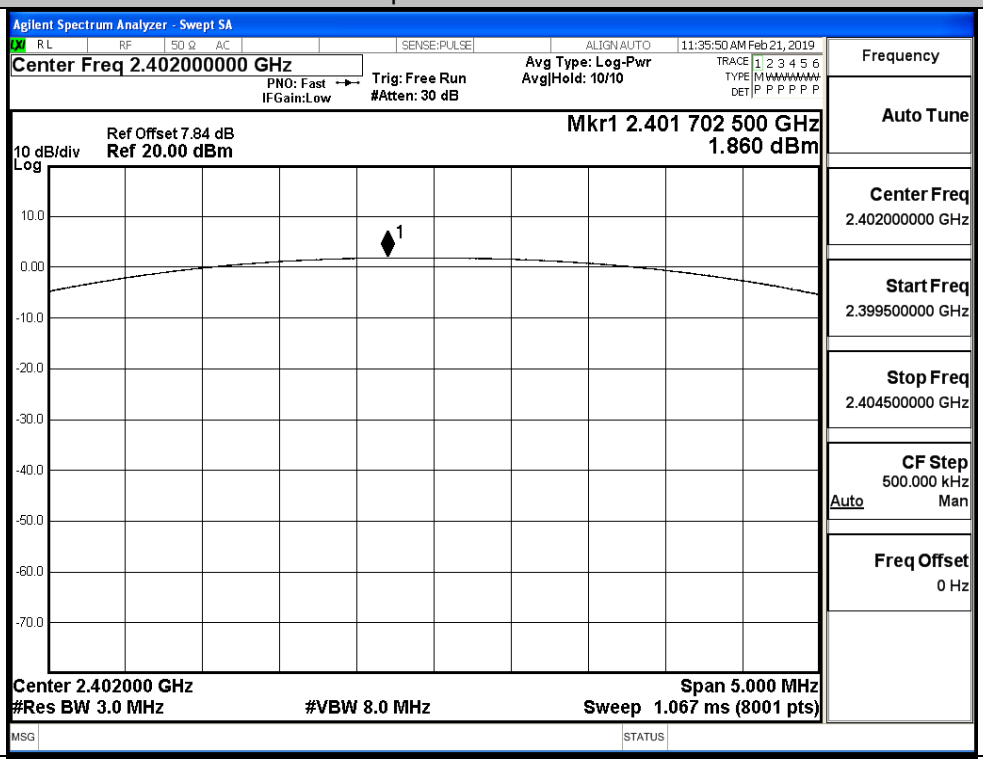
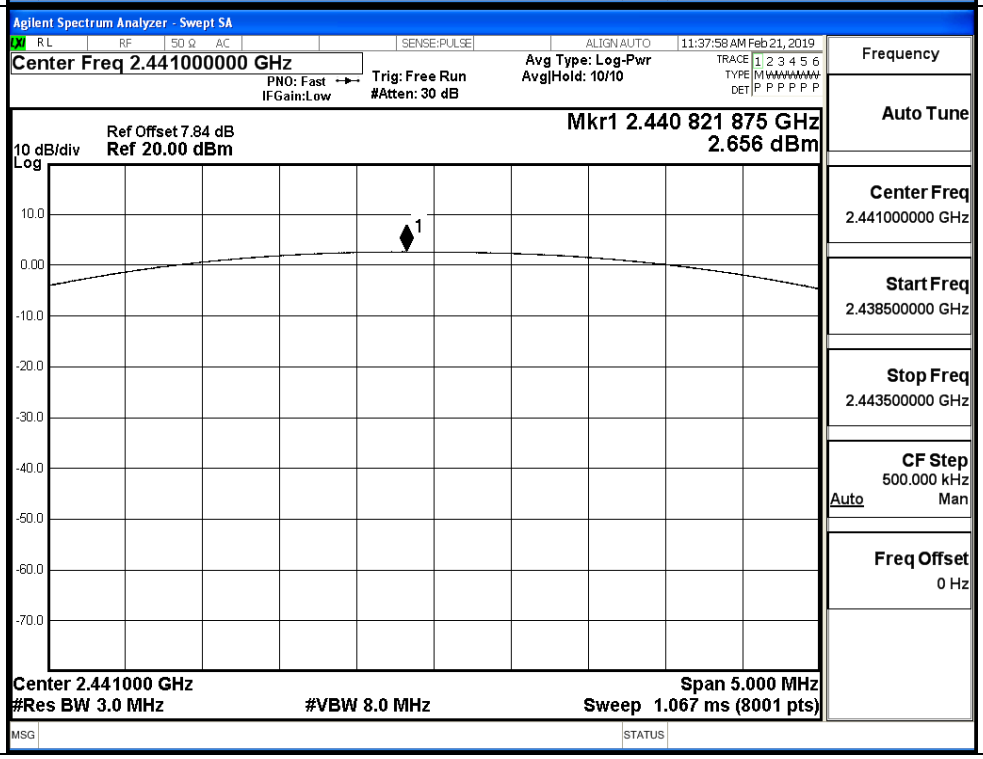
Test Model: H1-duc01

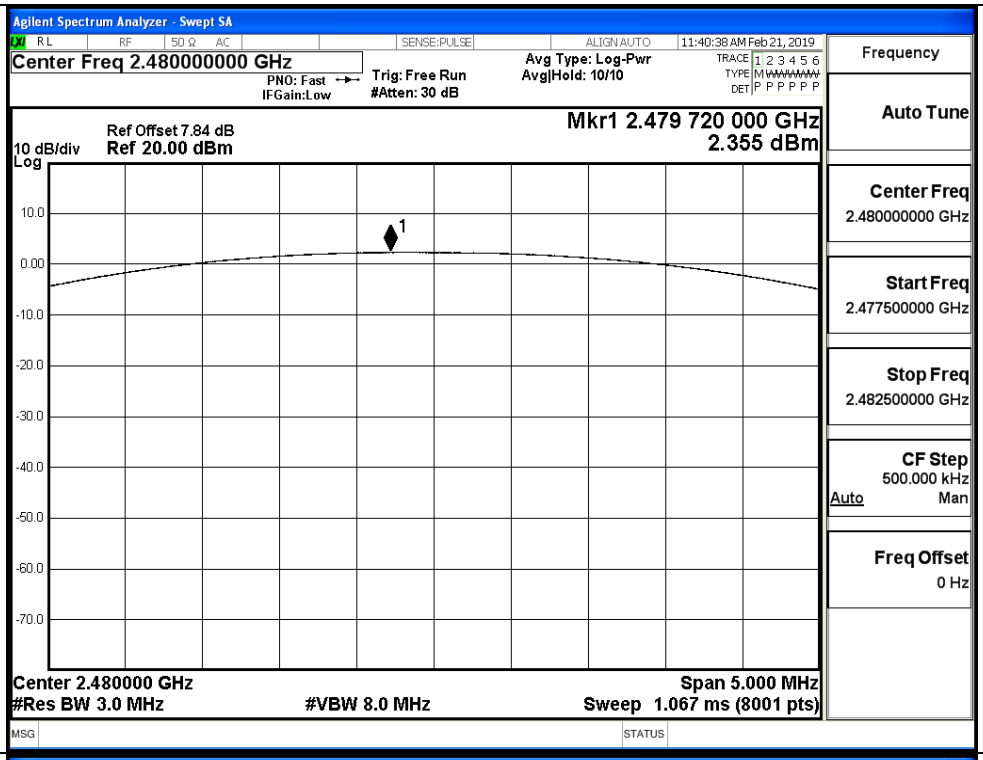
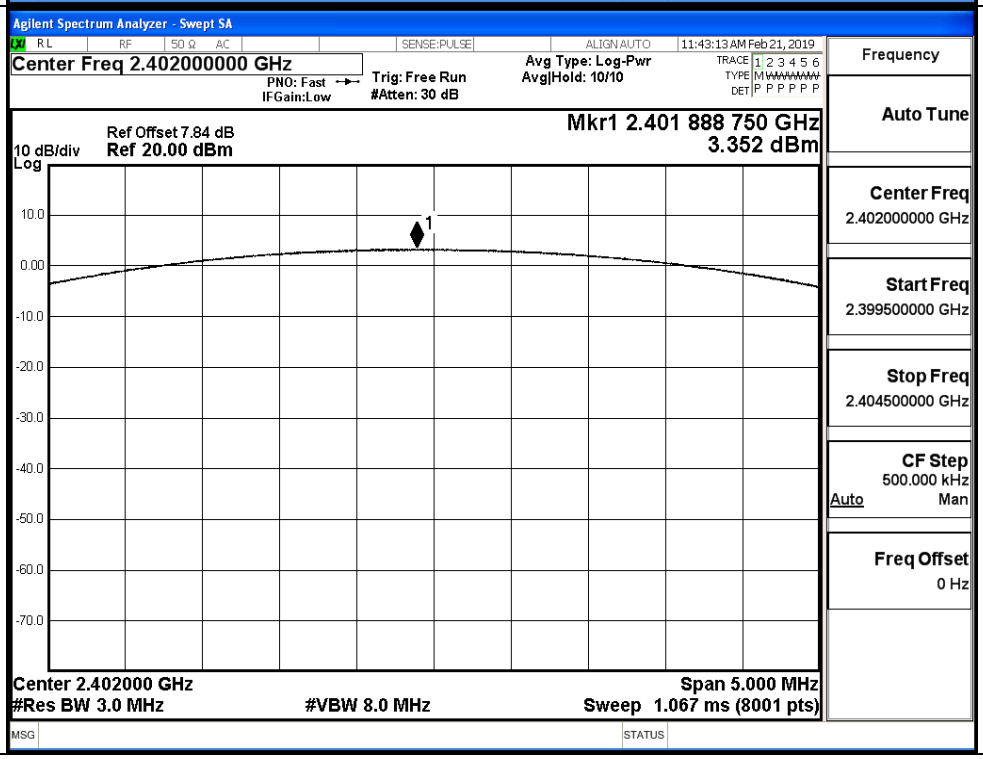
Environmental Conditions

Temperature:	23.7 ° C
Relative Humidity:	54.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Mina.Xu
Supervised by:	Jayden.Zhuo

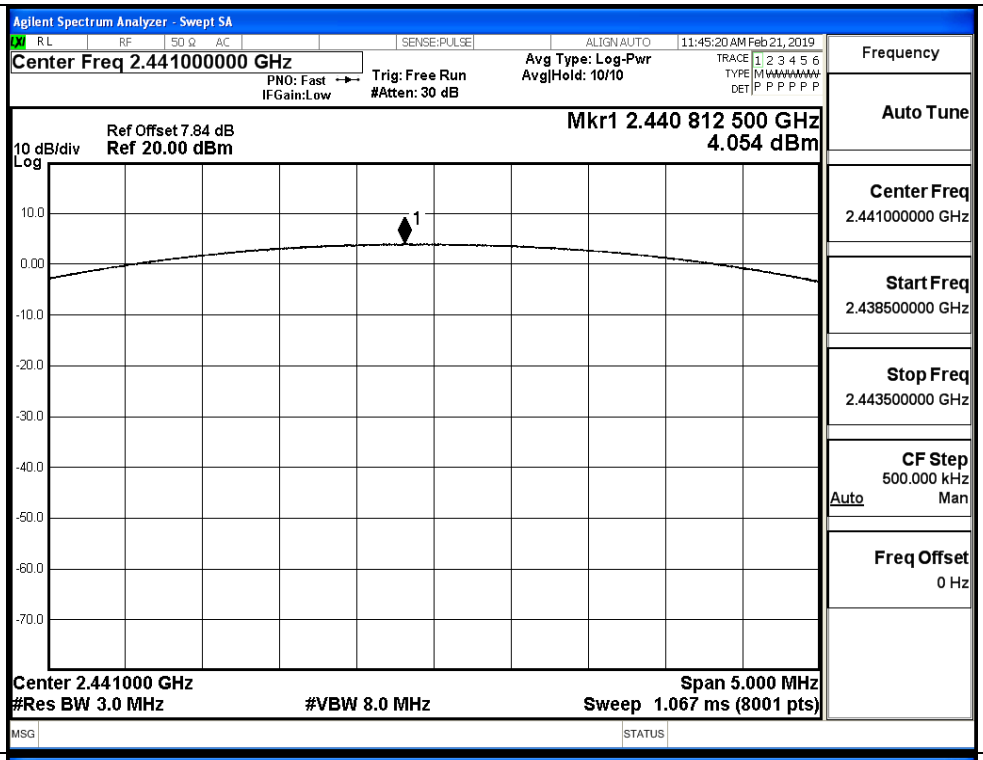
A.1 Maximum Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.860	21	PASS
	MCH	2.656	21	PASS
	HCH	2.355	21	PASS
π/4DQPSK	LCH	3.352	21	PASS
	MCH	4.054	21	PASS
	HCH	3.750	21	PASS
8DPSK	LCH	3.516	21	PASS
	MCH	4.277	21	PASS
	HCH	3.967	21	PASS

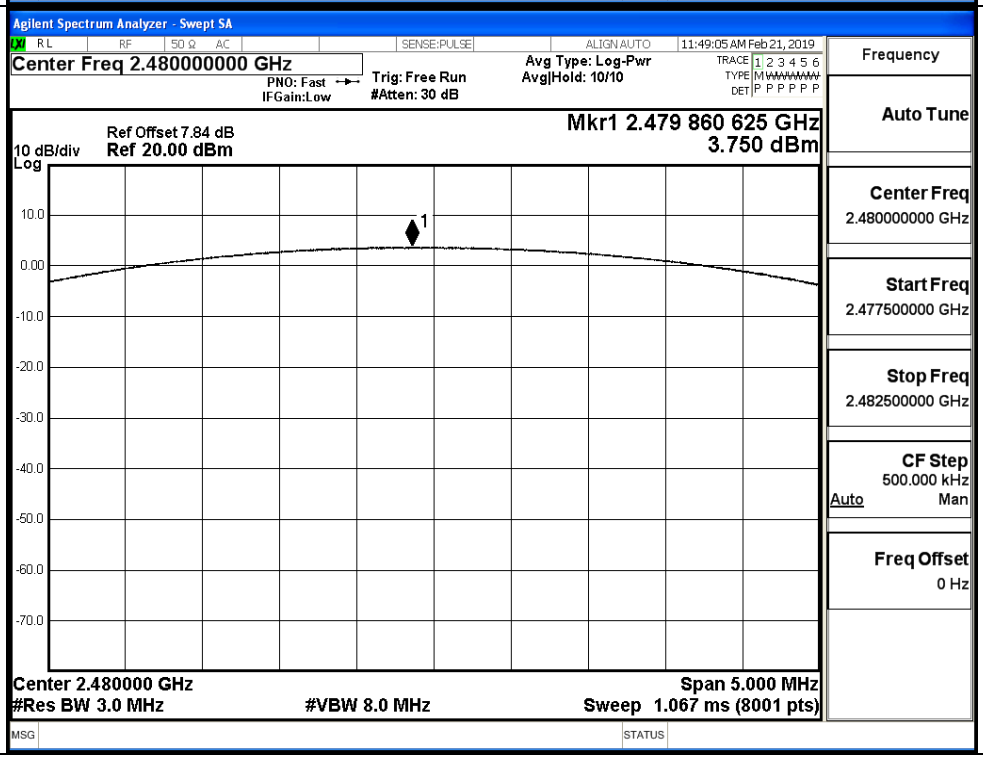
Test Graphs		
GFSK/LCH		
GFSK/MCH		

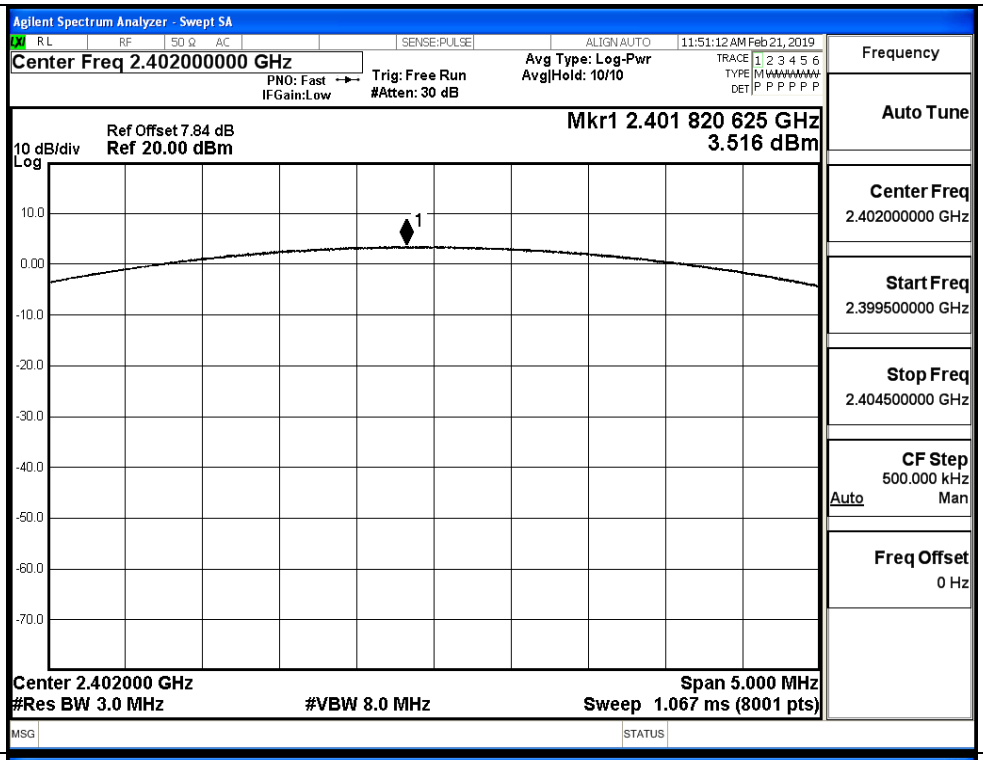
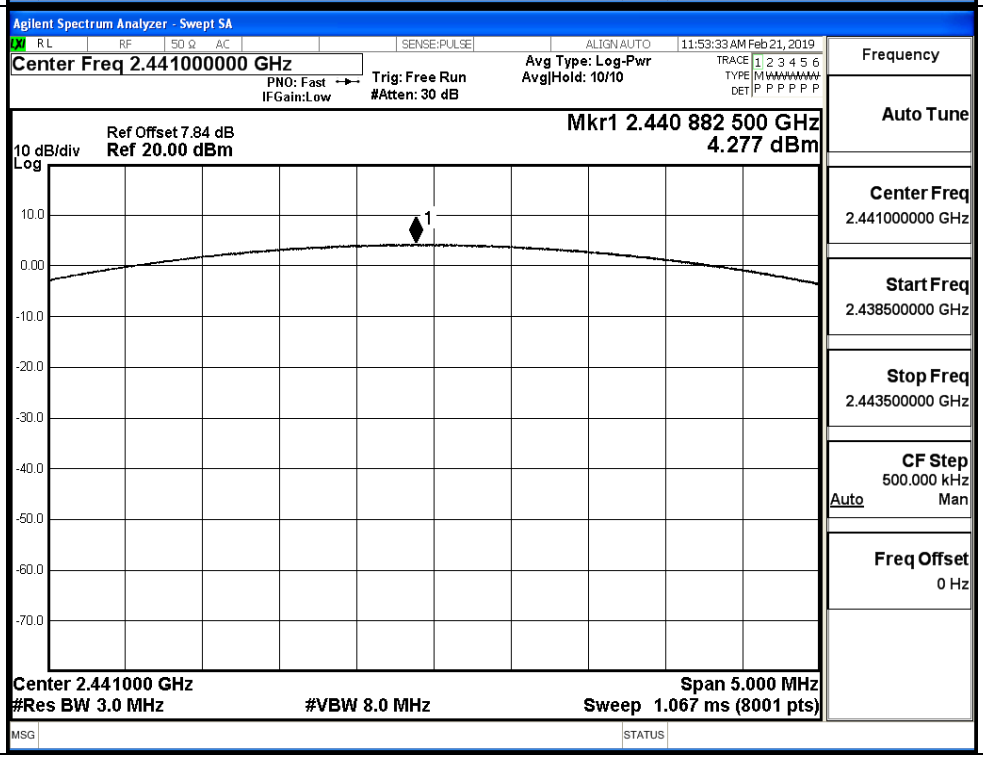
GFSK/HCH		
π/4DQPSK/LCH		

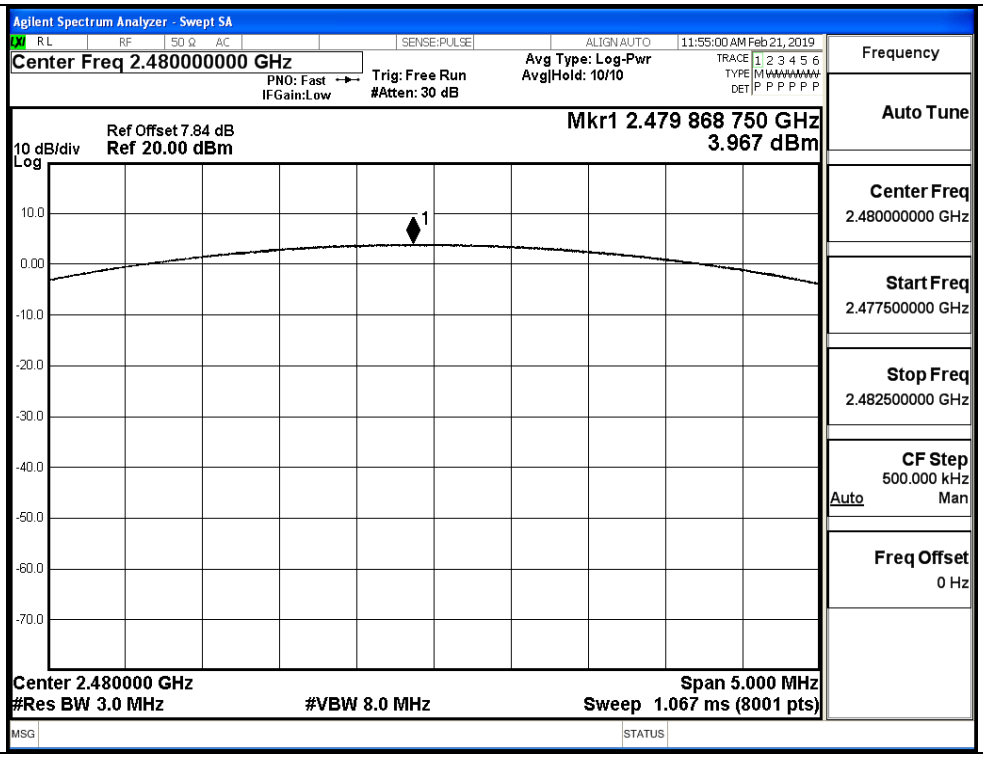
π/4DQPSK/MCH



π/4DQPSK/HCH



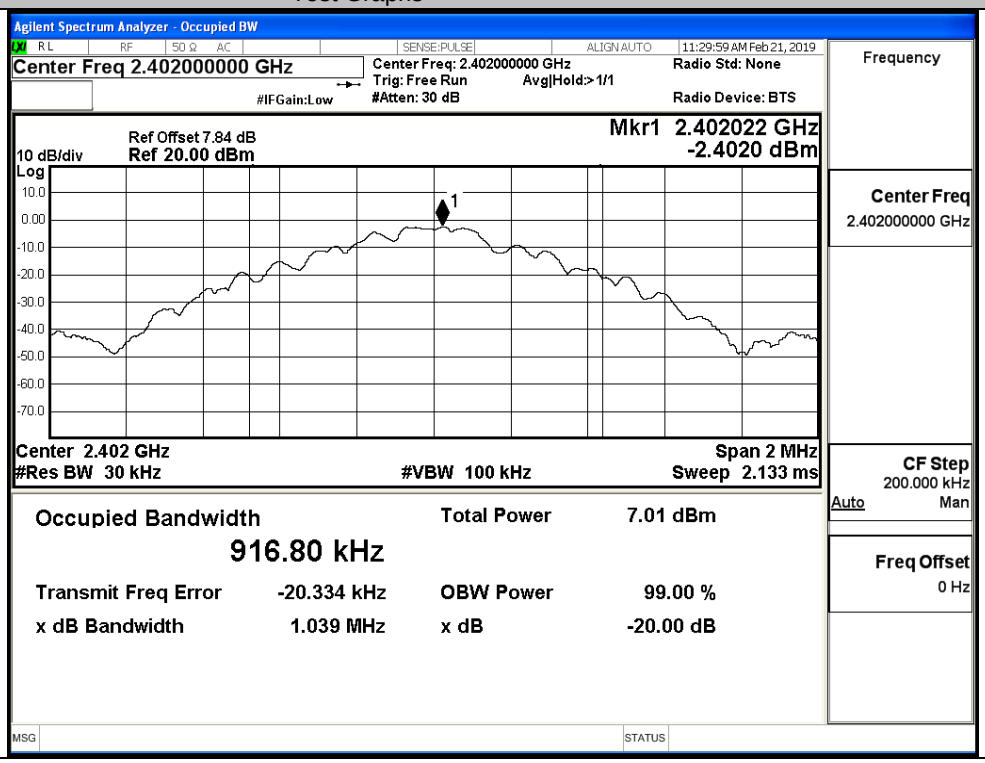
8DPSK/LCH	
8DPSK/MCH	

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
11:55:00 AM Feb 21, 2019
Ref Offset 7.84 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.479 868 750 GHz
3.967 dBm
Center 2.480000 GHz
#Res BW 3.0 MHz
#VBW 8.0 MHz
Span 5.000 MHz
Sweep 1.067 ms (8001 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.477500000 GHz
Stop Freq
2.482500000 GHz
CF Step
500.000 kHz
Auto
Man
Freq Offset
0 Hz

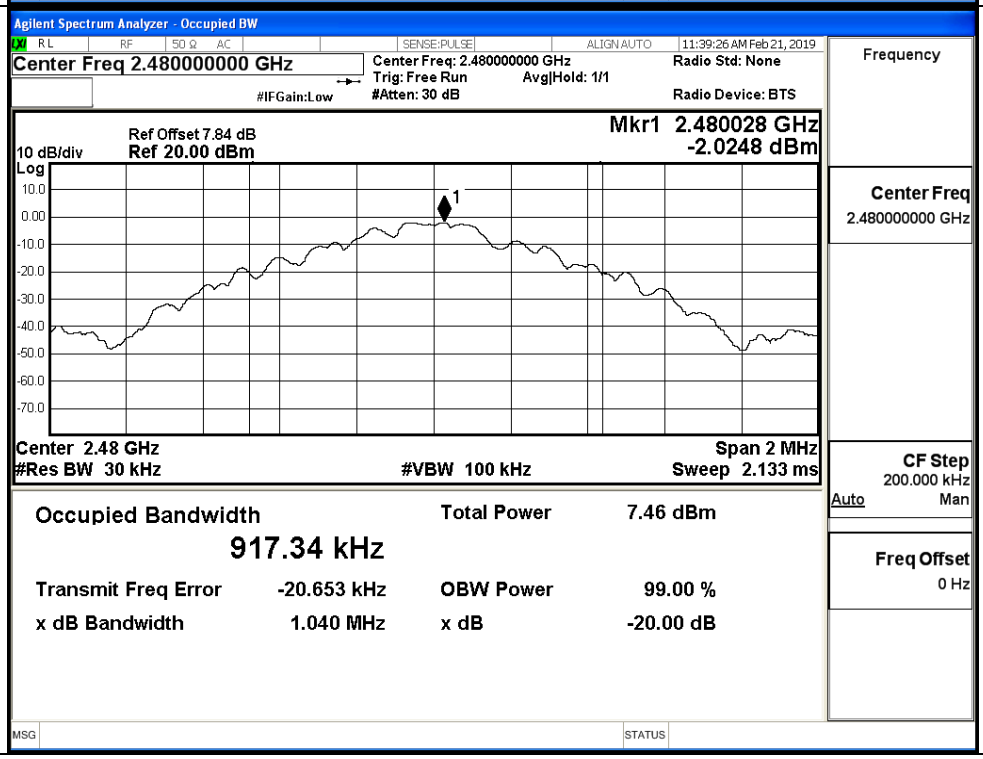
A.2 99% and 20dB Bandwidth

Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.91680	1.039	Not Specified	PASS
	MCH	0.91891	1.039	Not Specified	PASS
	HCH	0.91734	1.040	Not Specified	PASS
π/4DQPSK	LCH	1.2007	1.364	Not Specified	PASS
	MCH	1.2014	1.364	Not Specified	PASS
	HCH	1.2015	1.363	Not Specified	PASS
8DPSK	LCH	1.1770	1.304	Not Specified	PASS
	MCH	1.1787	1.305	Not Specified	PASS
	HCH	1.1779	1.305	Not Specified	PASS

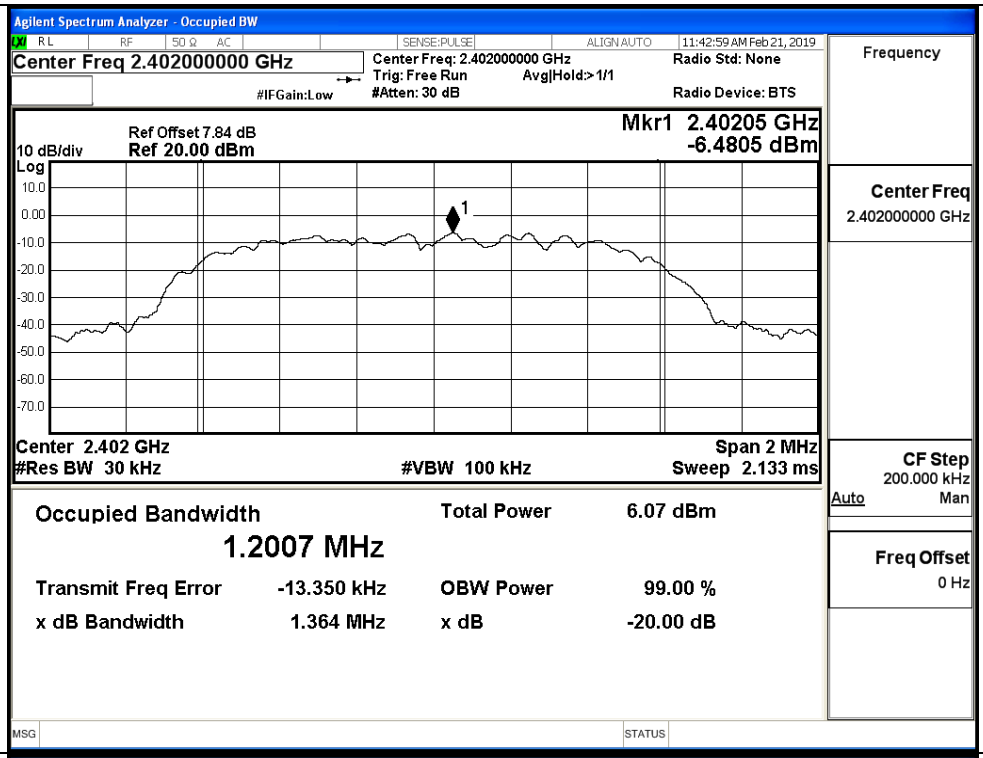
Test Graphs	
GFSK/LCH	

GFSK/MCH

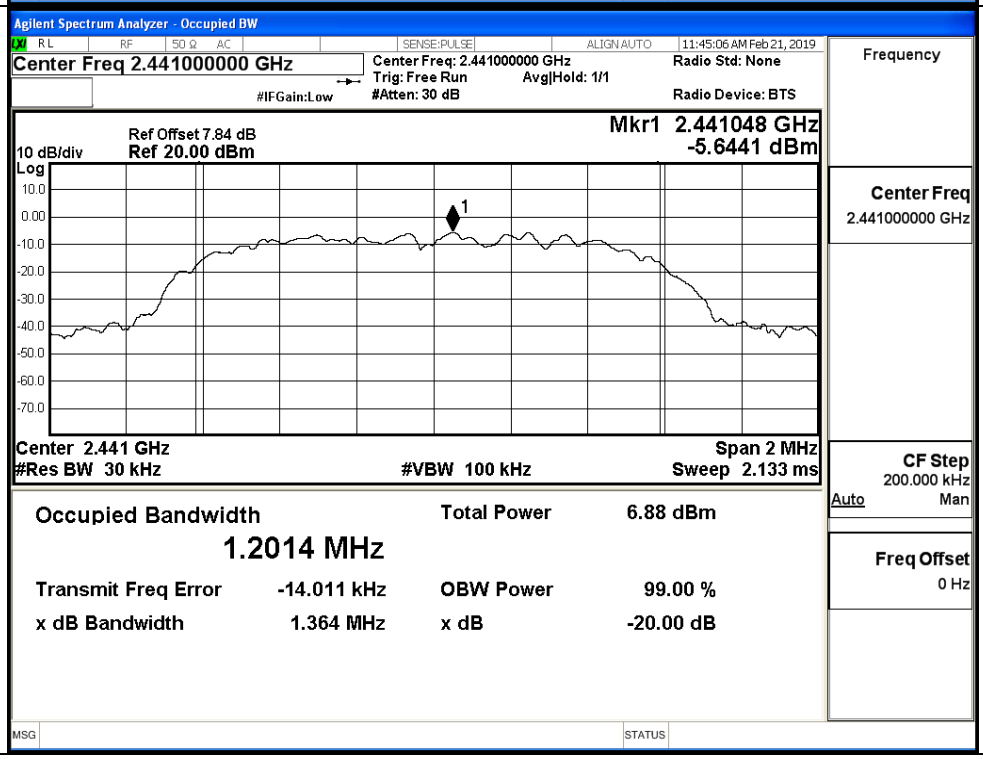
GFSK/HCH



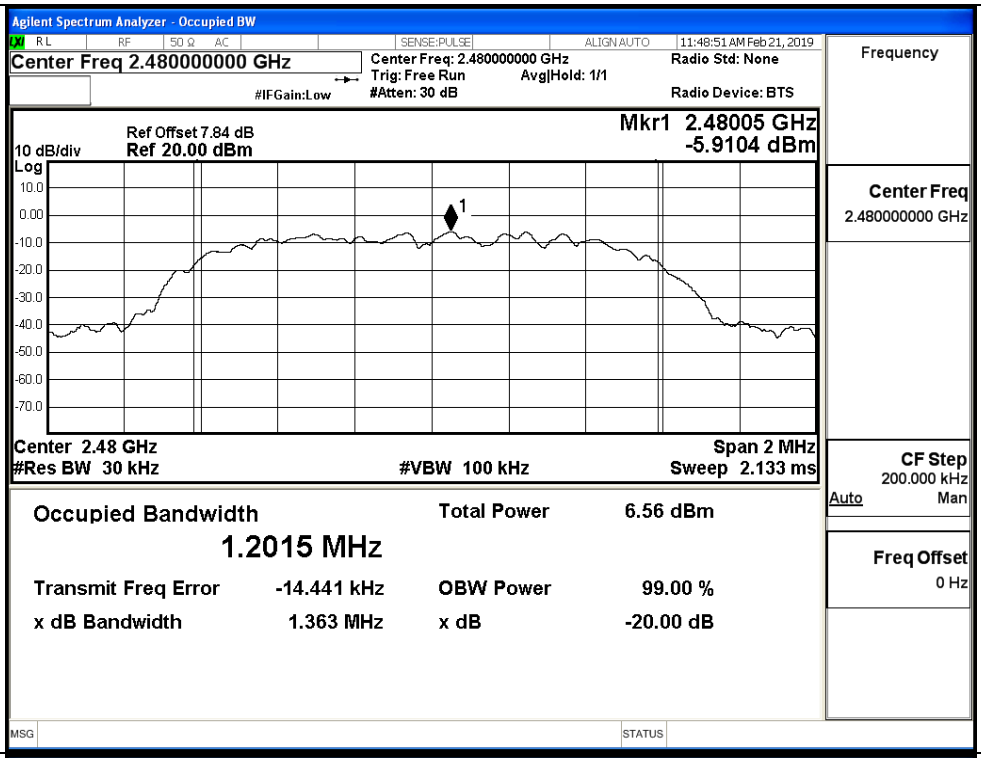
π/4DQPSK/LCH



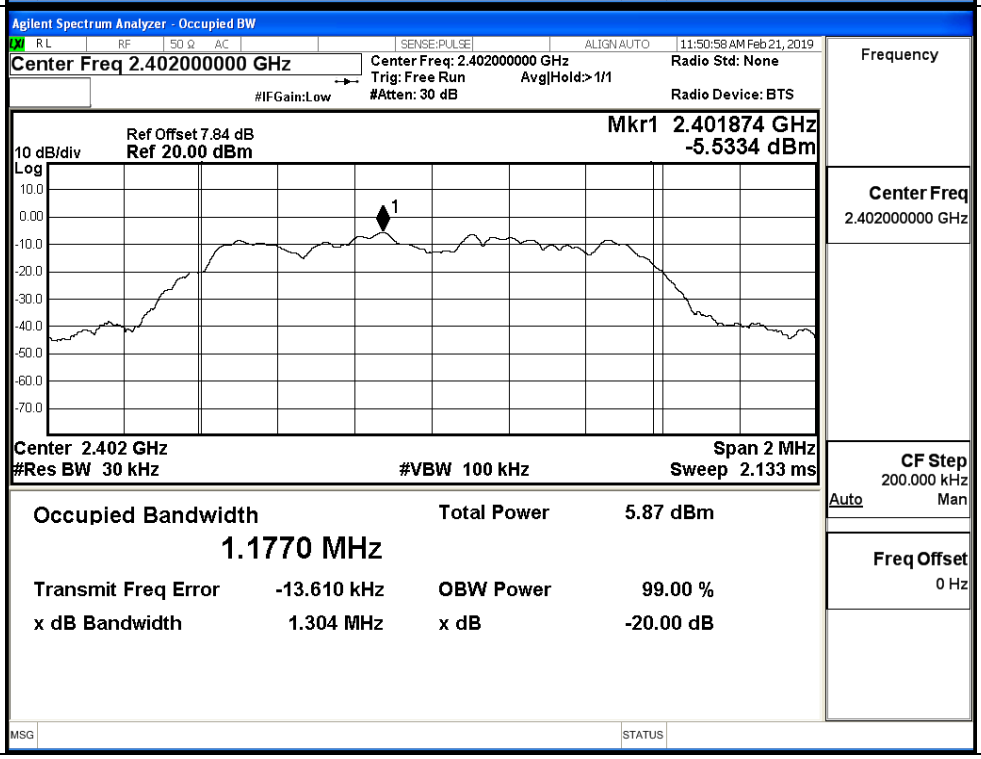
π/4DQPSK/MCH

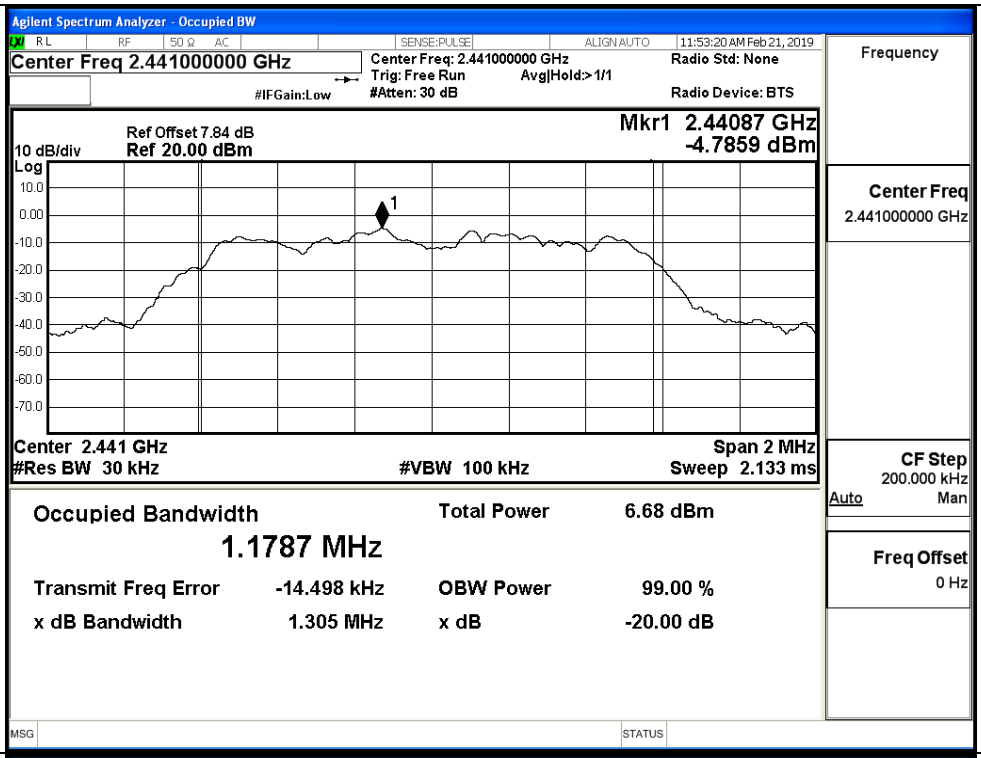
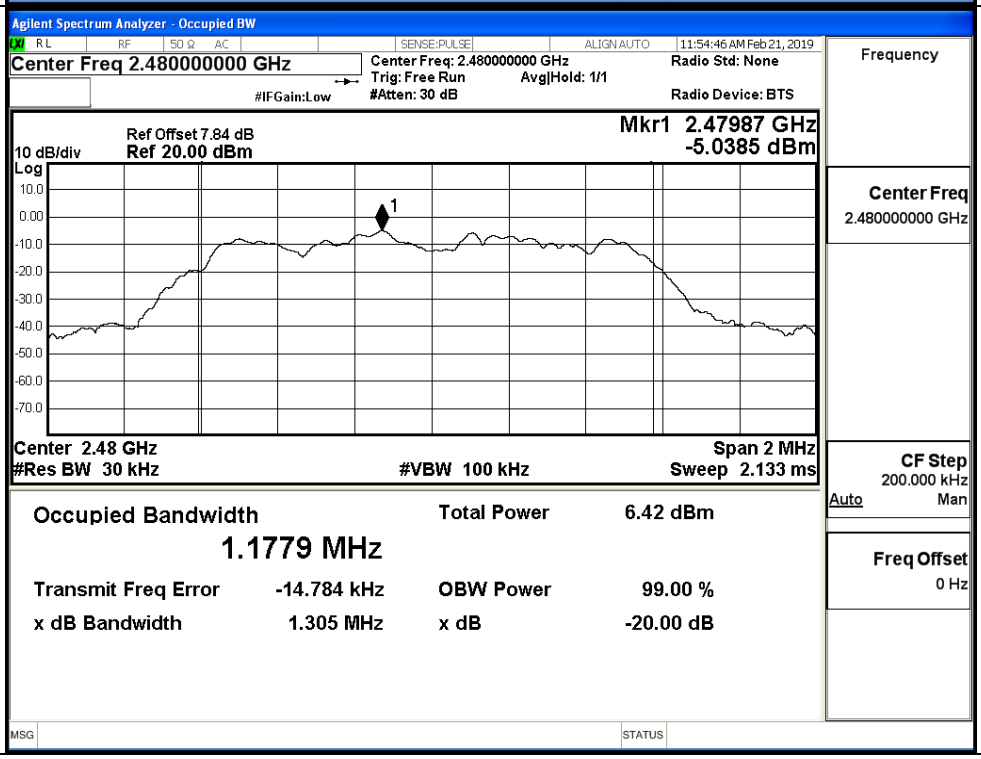


π/4DQPSK/HCH



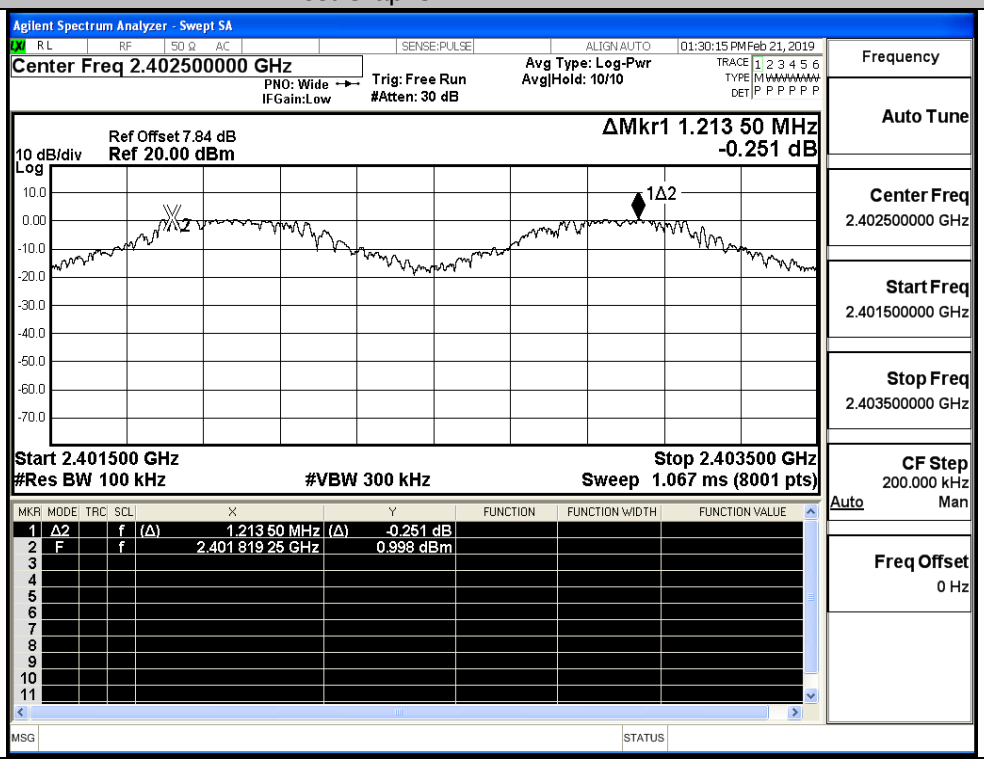
8DPSK/LCH

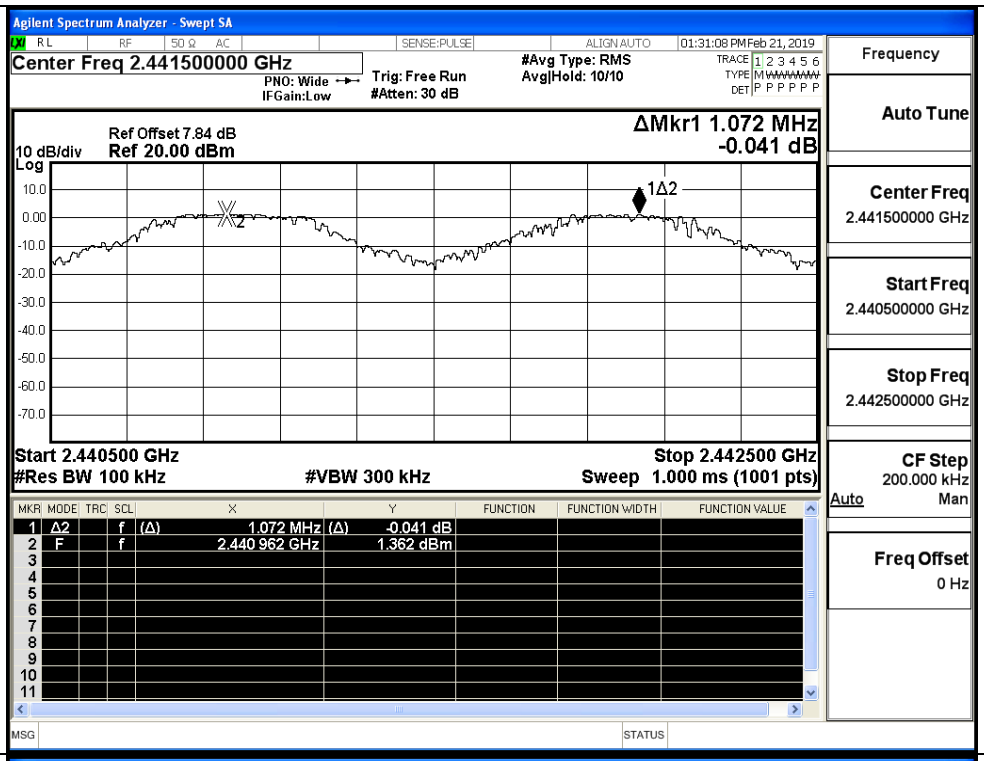
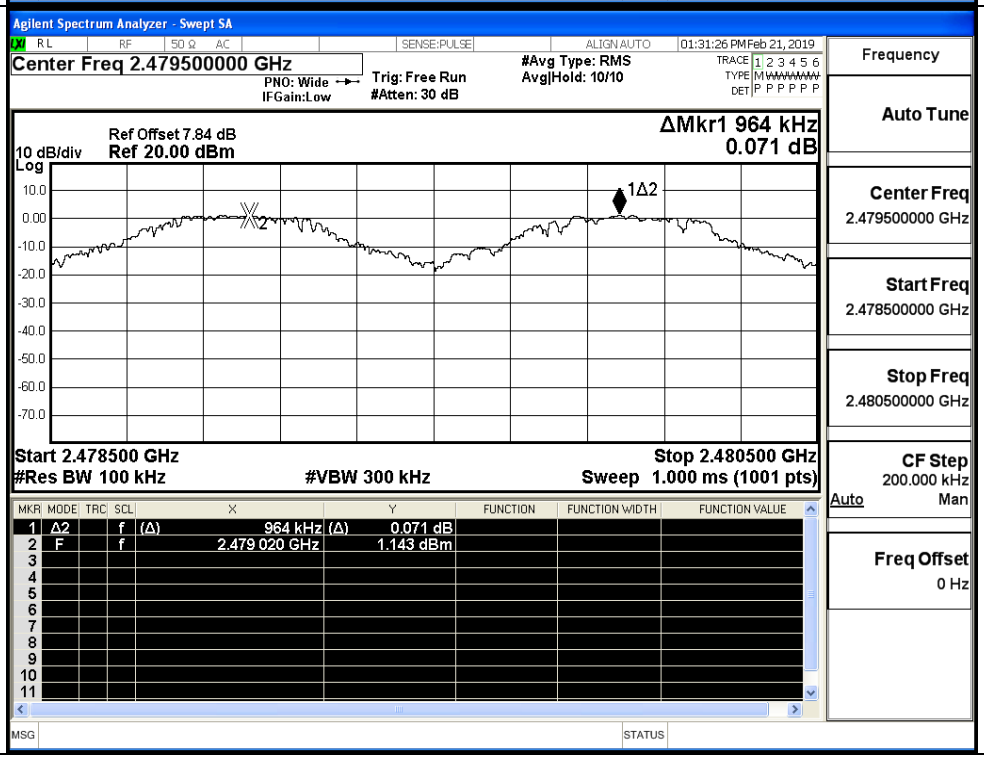


8DPSK/MCH		
8DPSK/HCH		

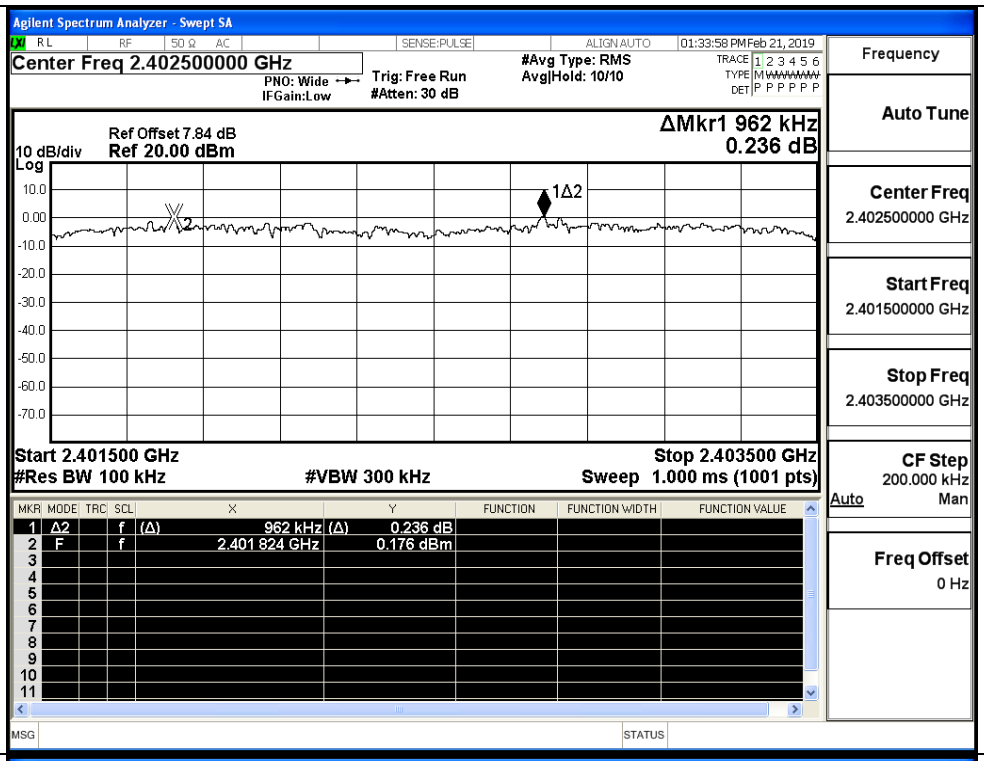
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.213	0.693	PASS
	MCH	1.072	0.693	PASS
	HCH	0.964	0.693	PASS
π/4DQPSK	LCH	0.962	0.909	PASS
	MCH	1.252	0.909	PASS
	HCH	0.962	0.909	PASS
8DPSK	LCH	1.020	0.870	PASS
	MCH	0.984	0.870	PASS
	HCH	1.008	0.870	PASS

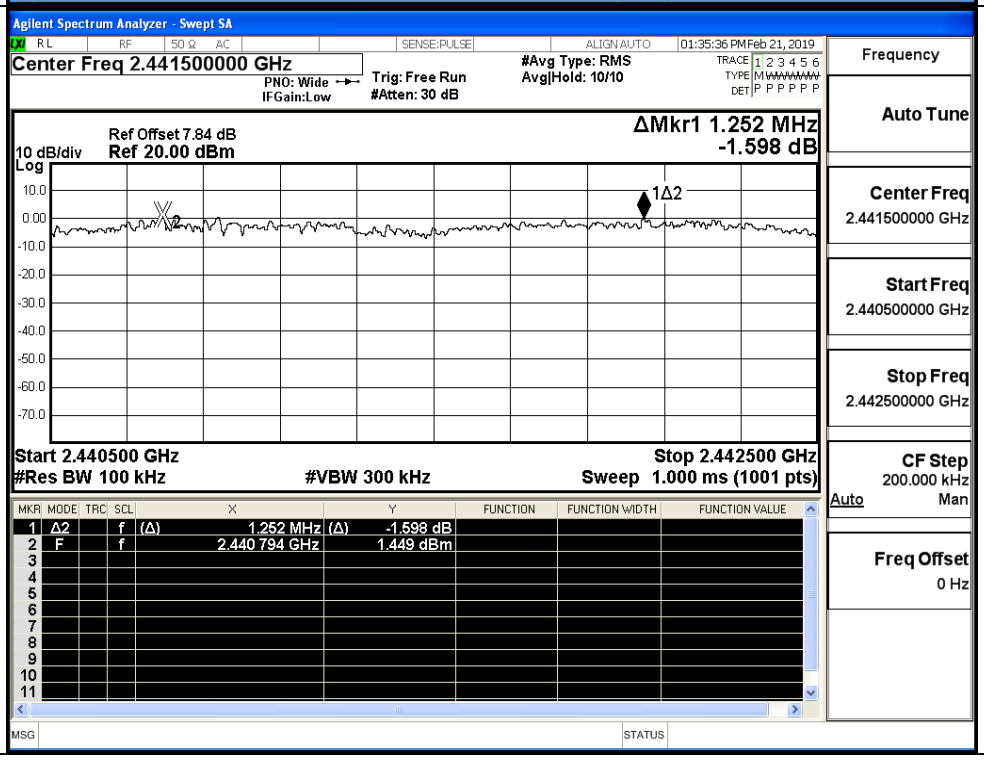
Test Graphs		
GFSK/LCH		

GFSK/MCH		
GFSK/HCH		

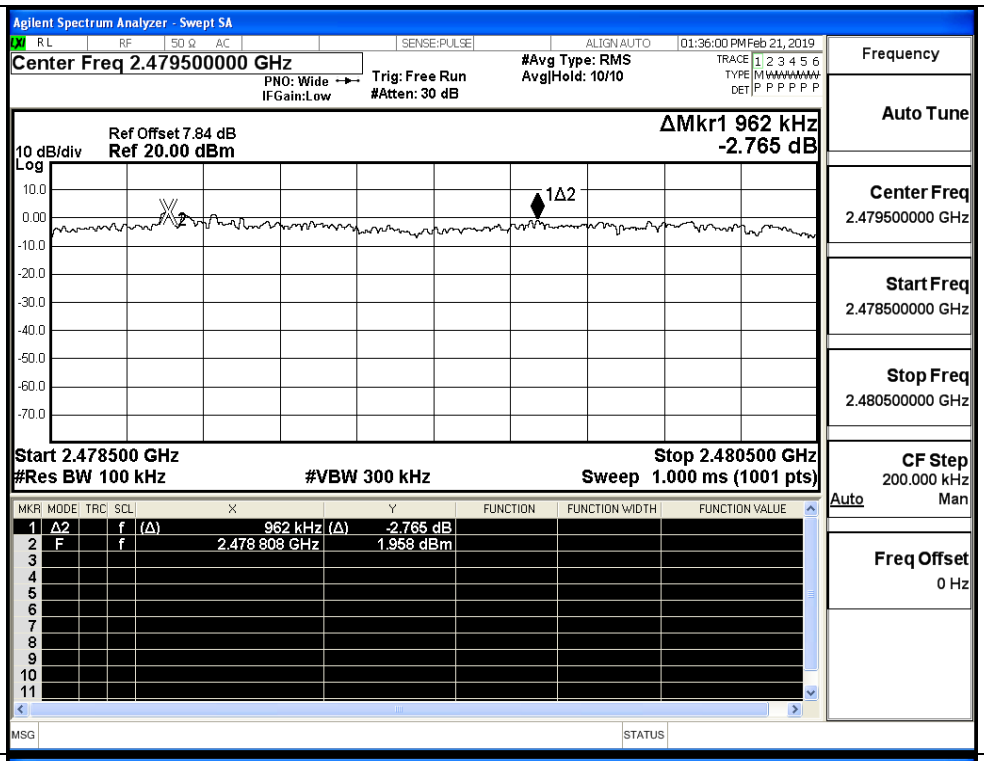
π/4DQPSK/LCH



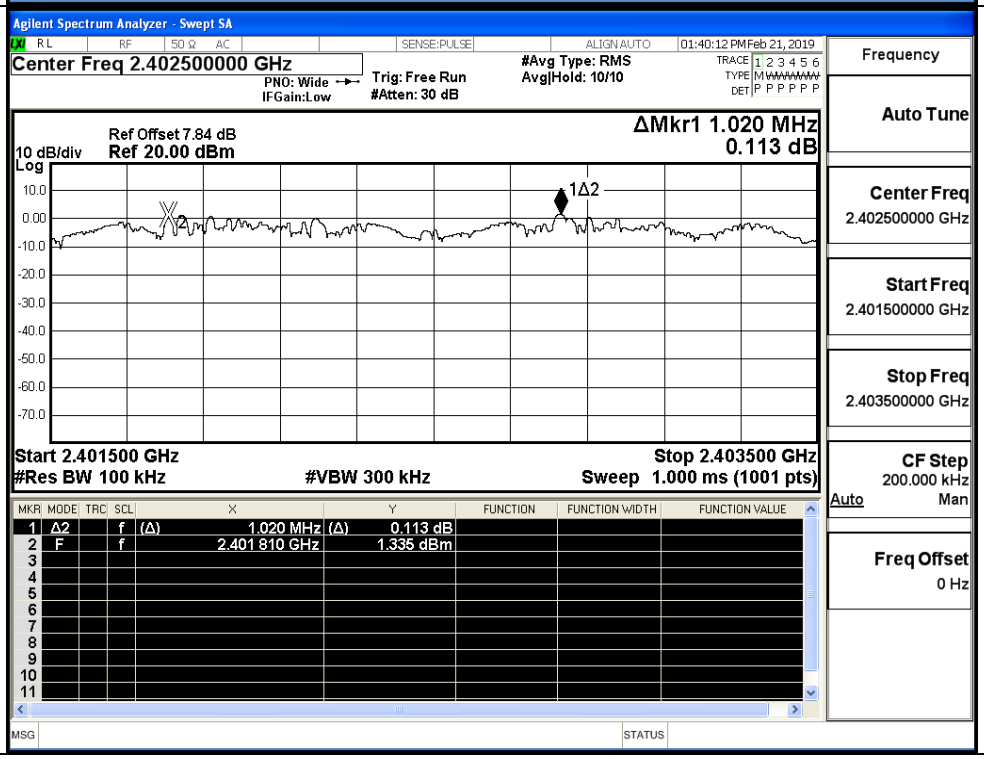
π/4DQPSK/MCH



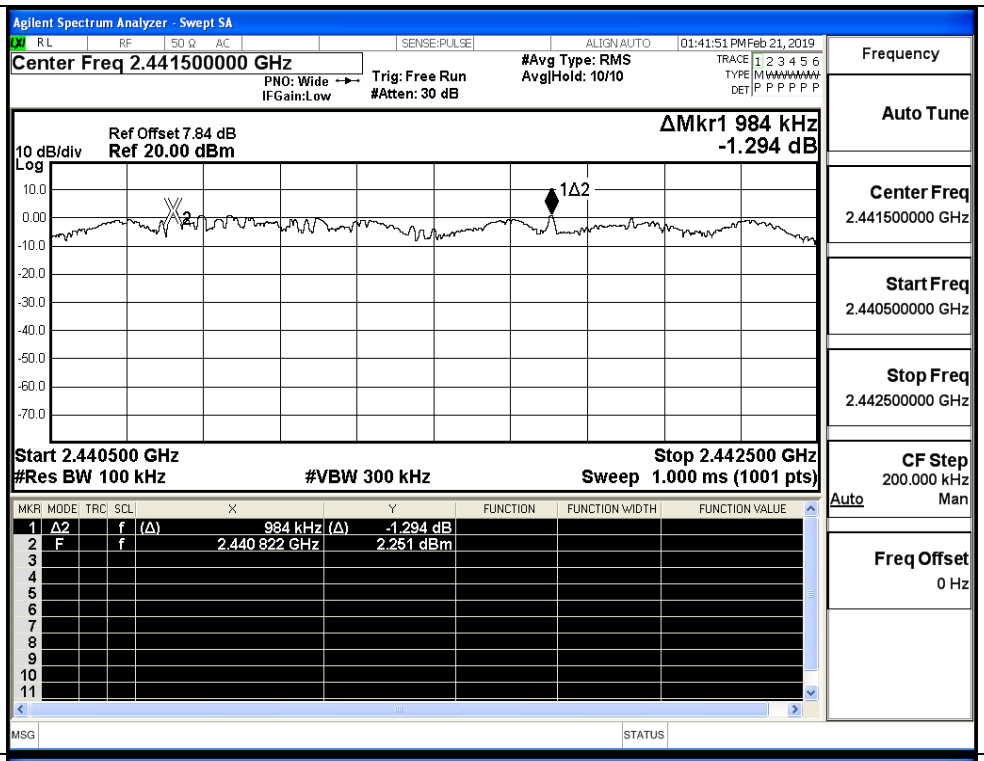
π/4DQPSK/HCH



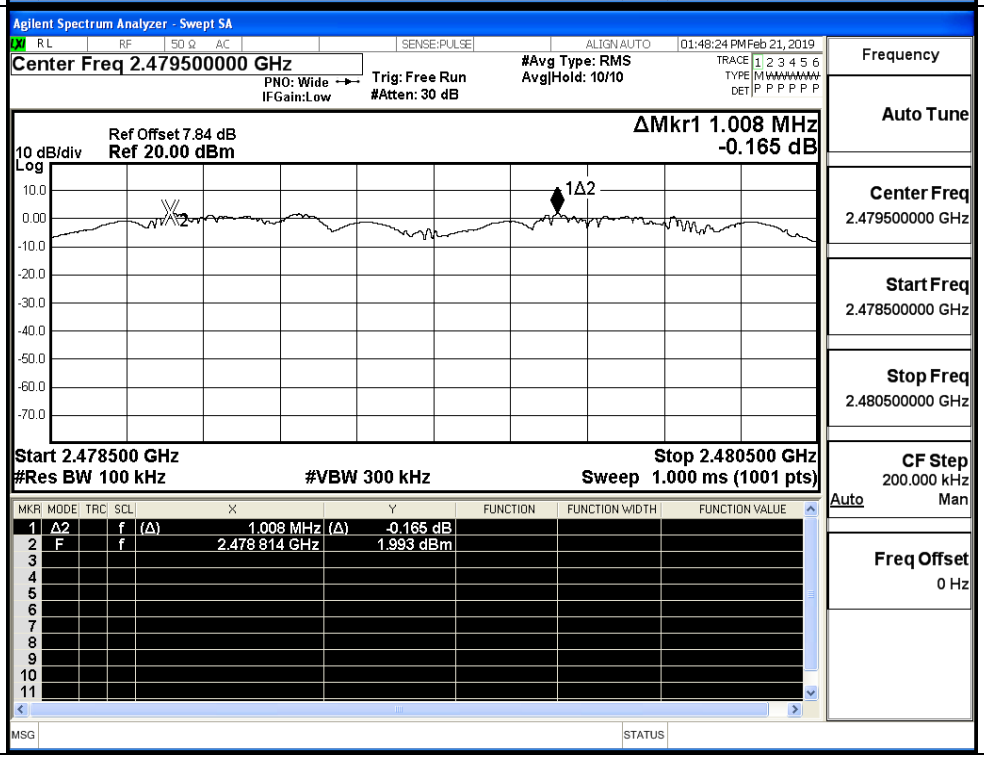
8DPSK/LCH



8DPSK/MCH

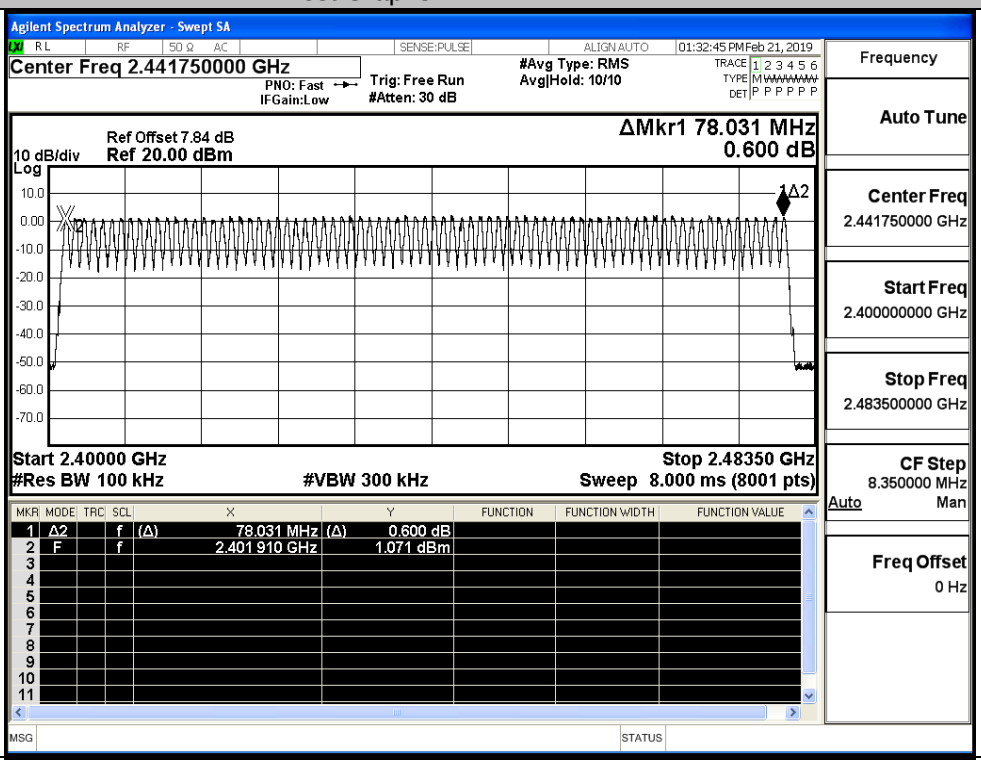
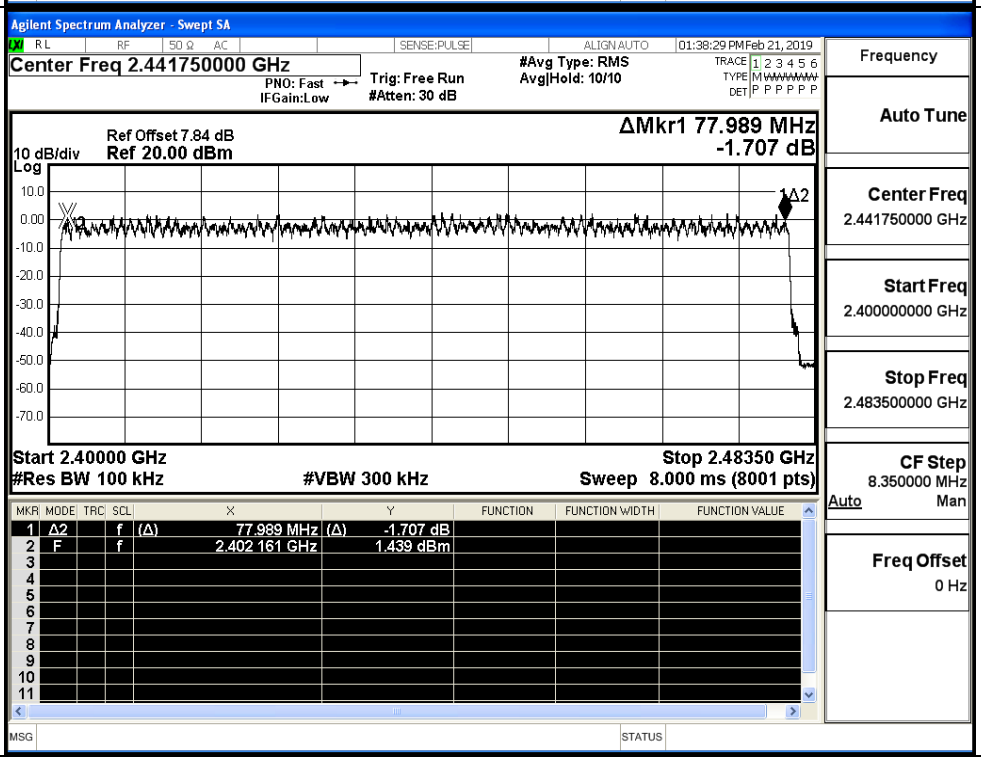


8DPSK/HCH

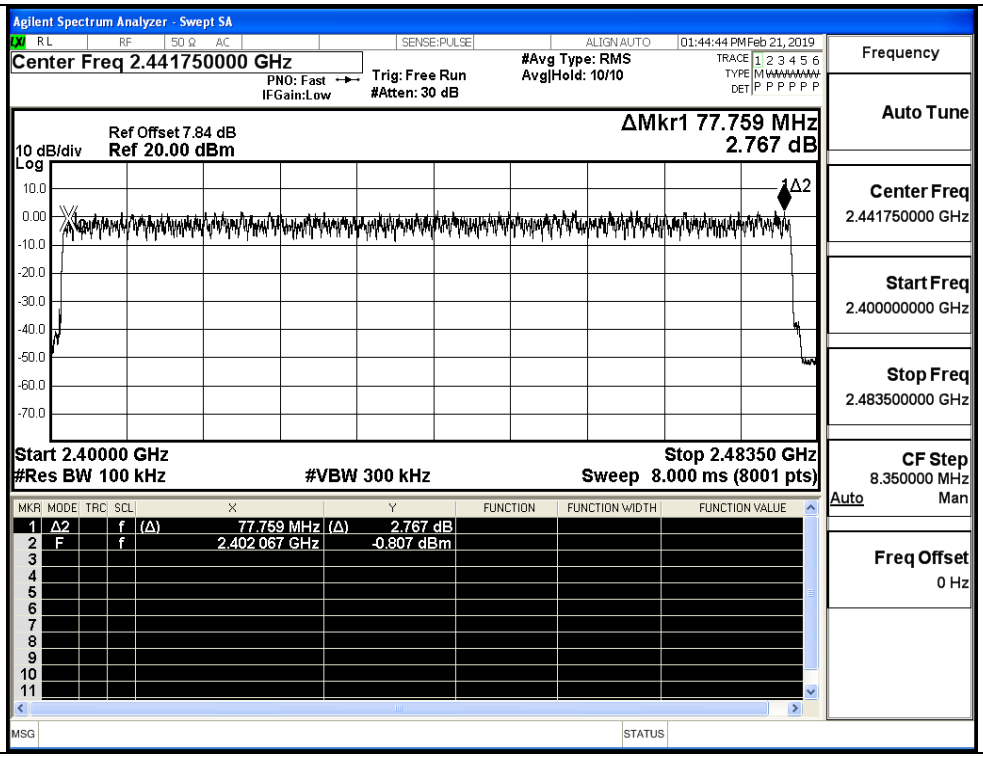


A.4 Hopping Channel Number

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

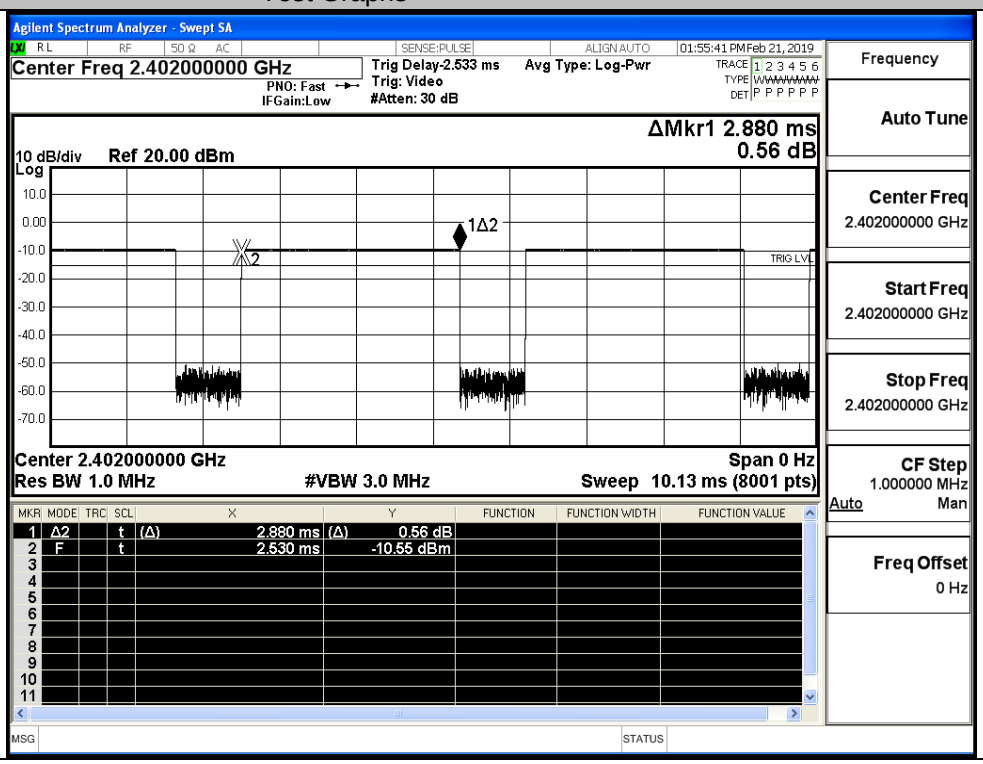
Test Graphs		
GFSK/Hop		
π/4DQPSK/Hop		

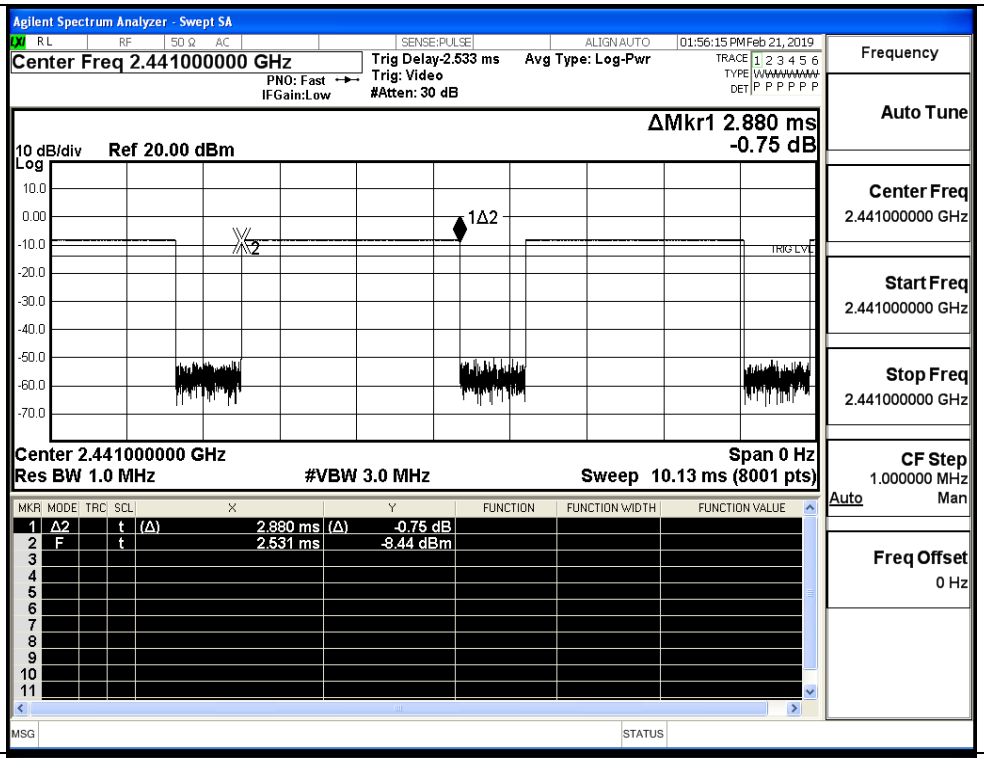
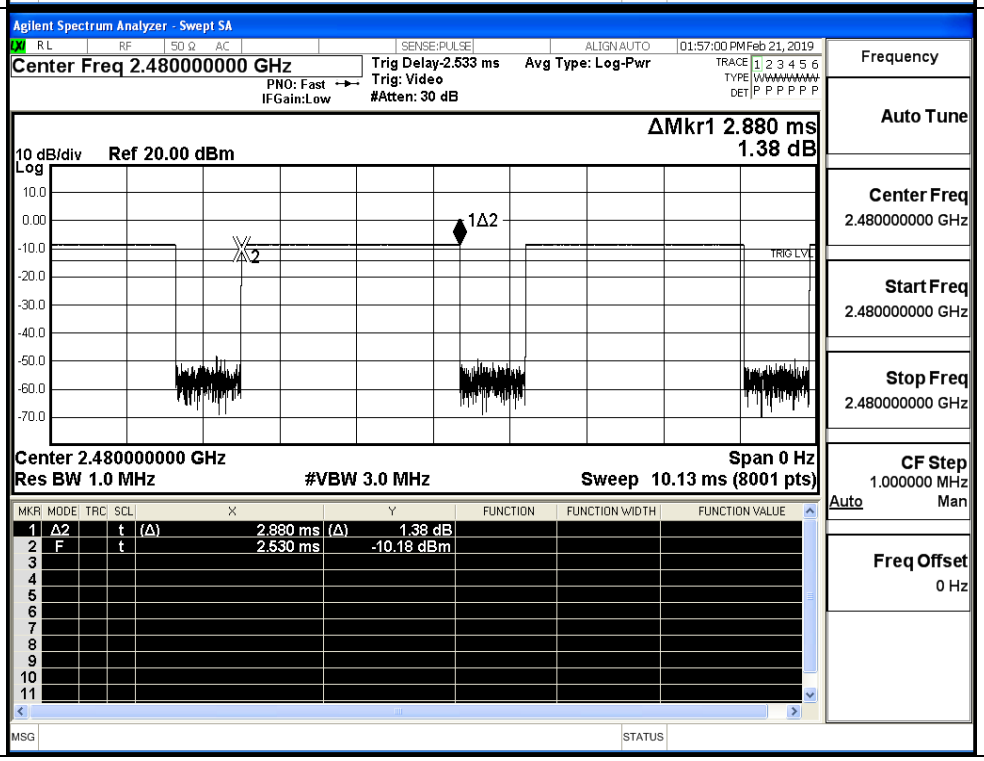
8DPSK/Hop

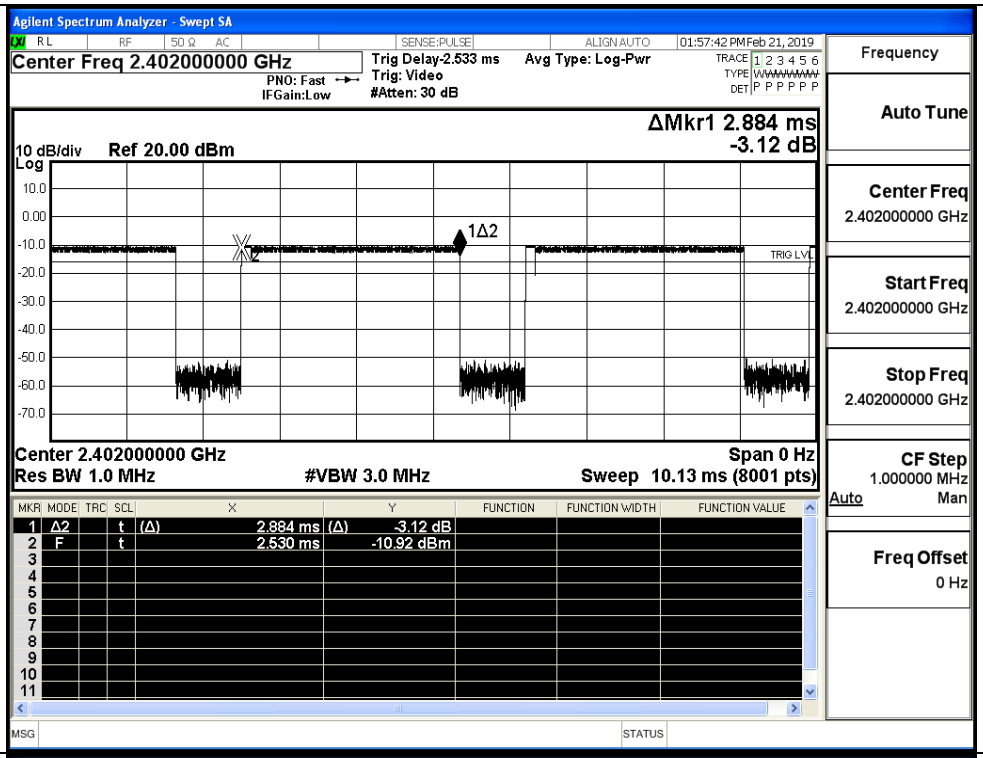
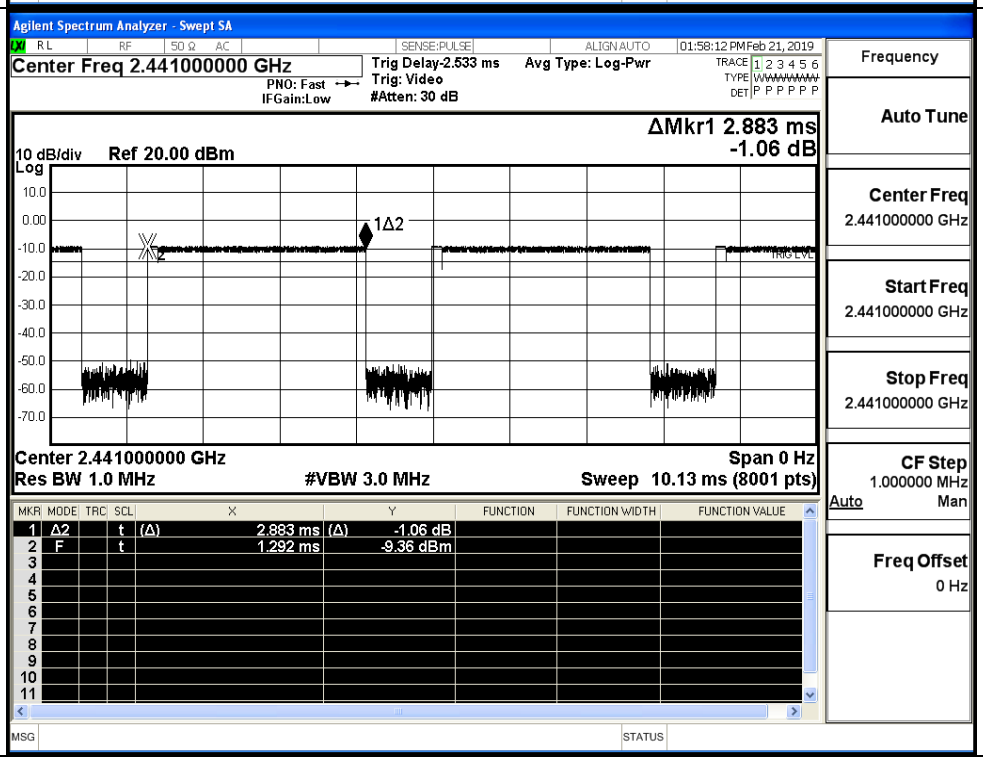

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441750000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 10/10
01:44:44 PM Feb 21, 2019
Ref Offset 7.84 dB
10 dB/div
Ref 20.00 dBm
ΔMkr1 77.759 MHz
2.767 dB
Start 2.40000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.48350 GHz
Sweep 8.000 ms (8001 pts)
1 Δ2 f (Δ) 77.759 MHz (Δ) 2.767 dB
2 F f 2.402 067 GHz -0.807 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

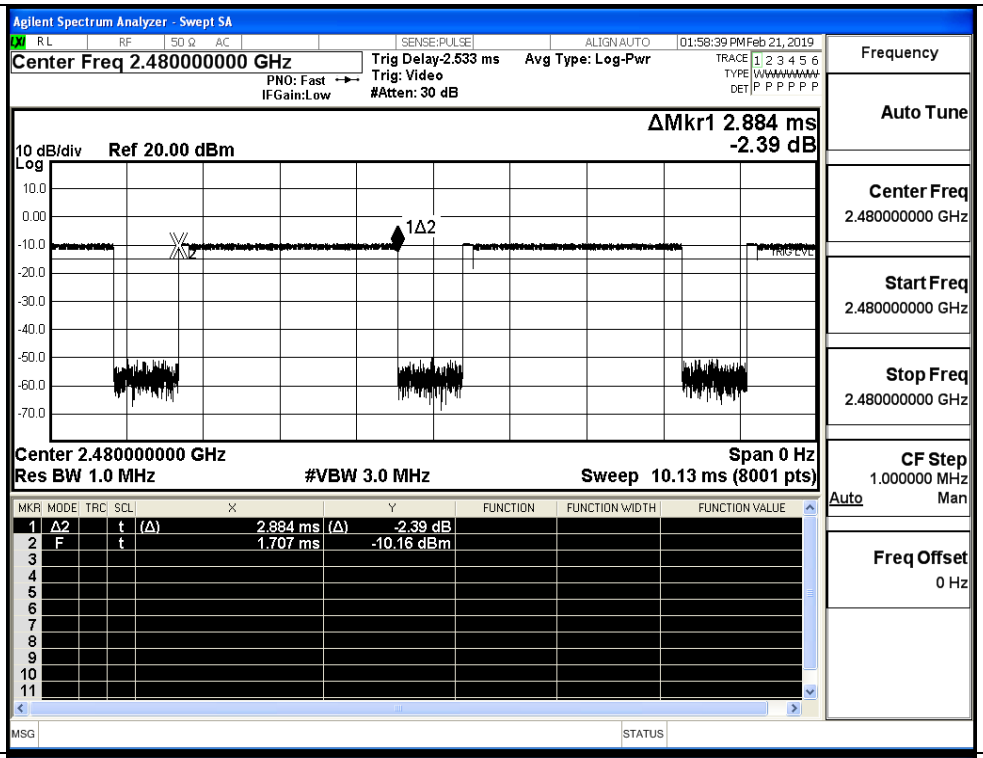
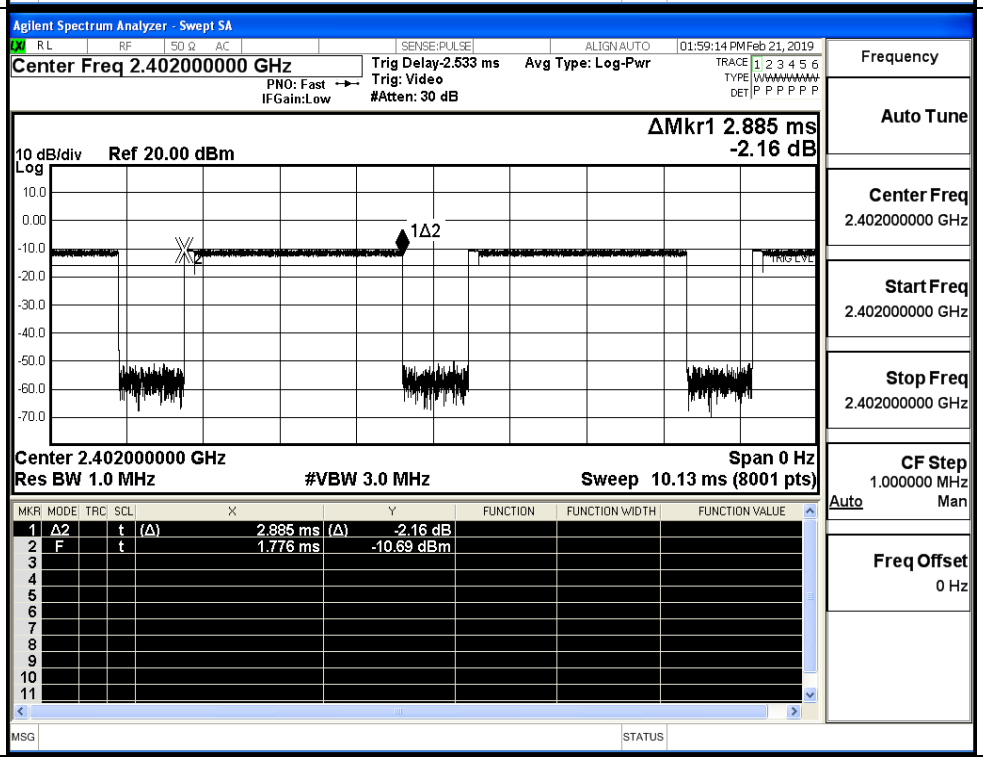
A.5 Dwell Time

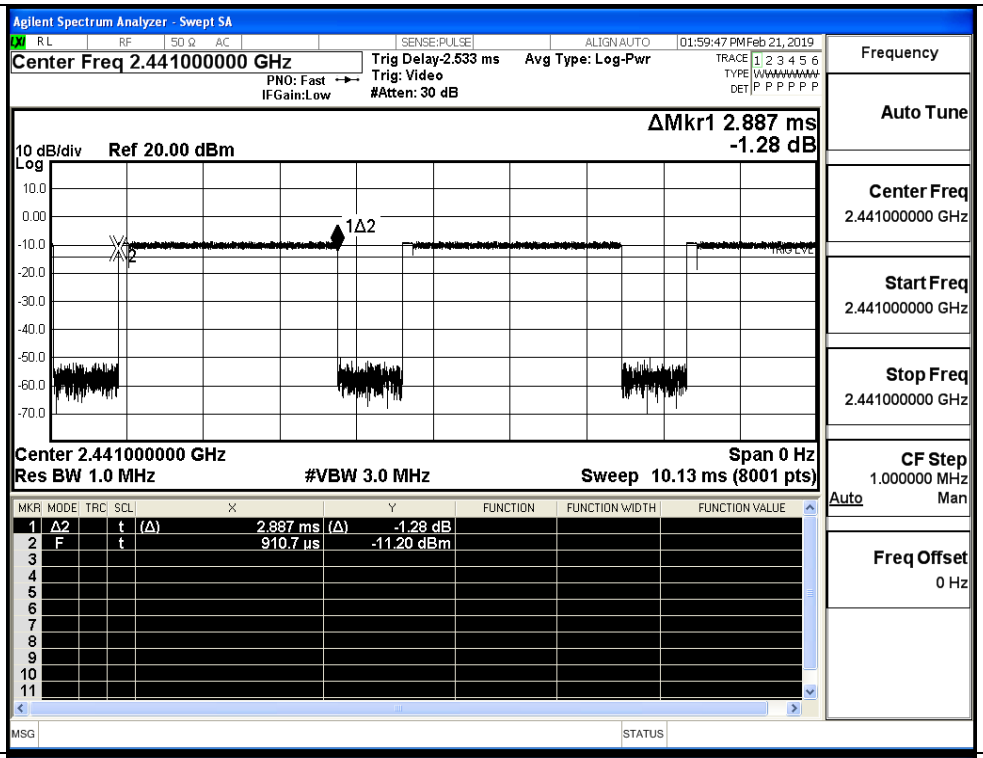
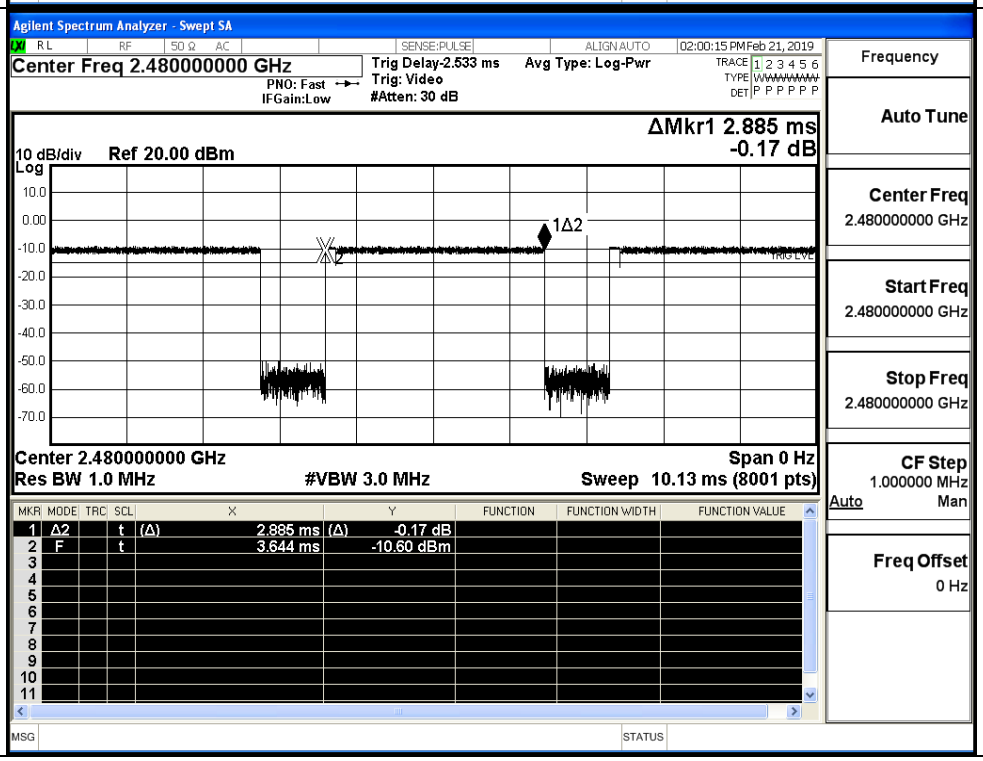
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
π/4DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88	106.7	0.307	0.4	PASS
8DPSK	3DH5	LCH	2.89	106.7	0.308	0.4	PASS
	3DH5	MCH	2.89	106.7	0.308	0.4	PASS
	3DH5	HCH	2.89	106.7	0.308	0.4	PASS

Test Graphs	
GFSK_DH5/LCH	

GFSK_DH5/MCH	
GFSK_DH5/HCH	

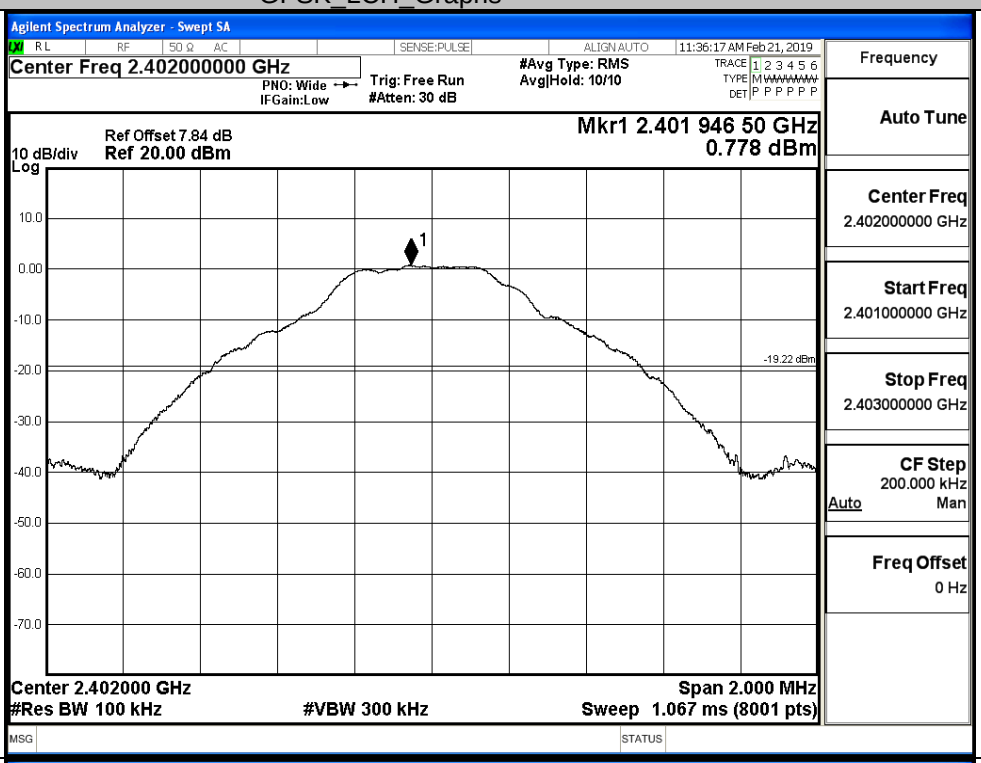
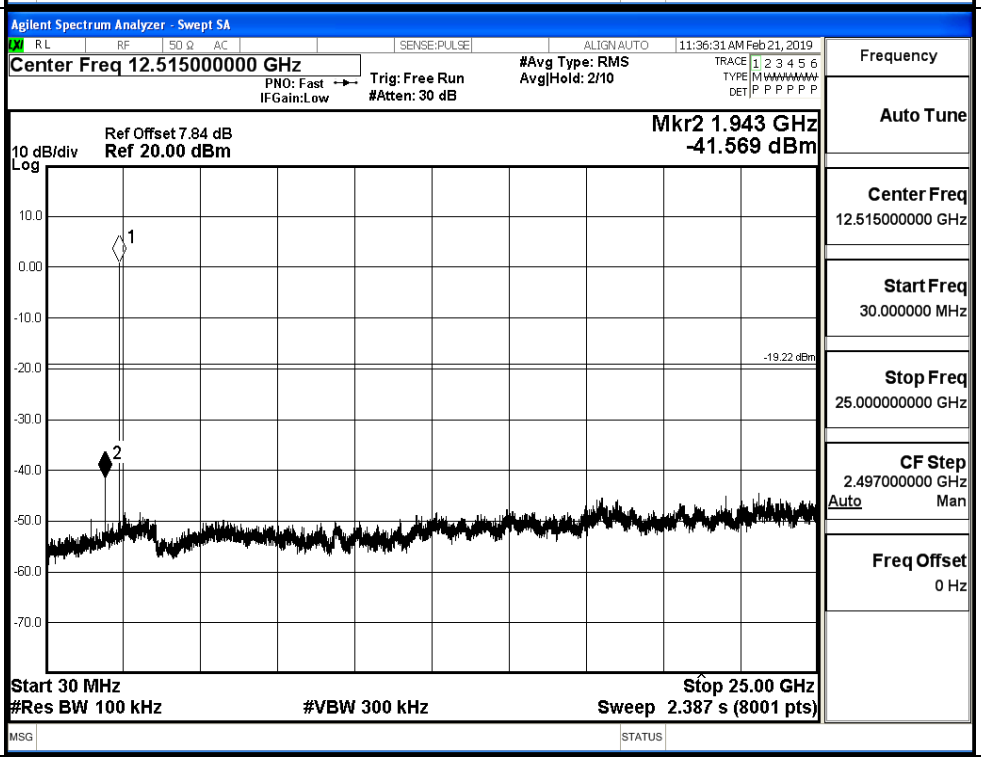
π/4DQPSK _2DH5/LCH	
π/4DQPSK _2DH5/MCH	

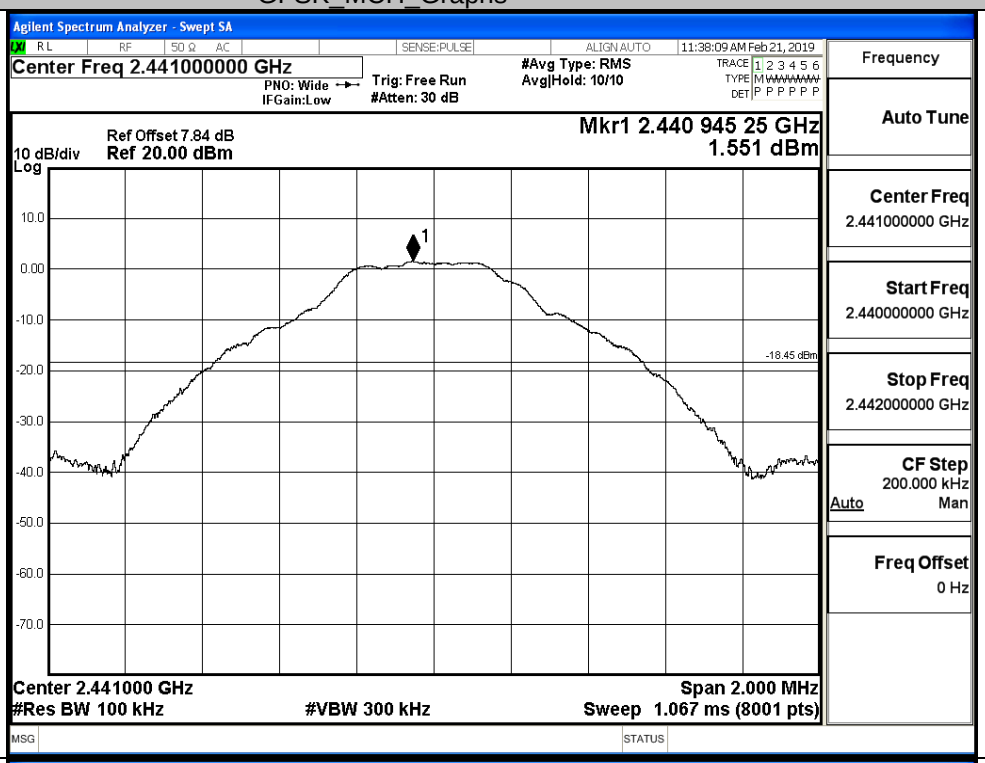
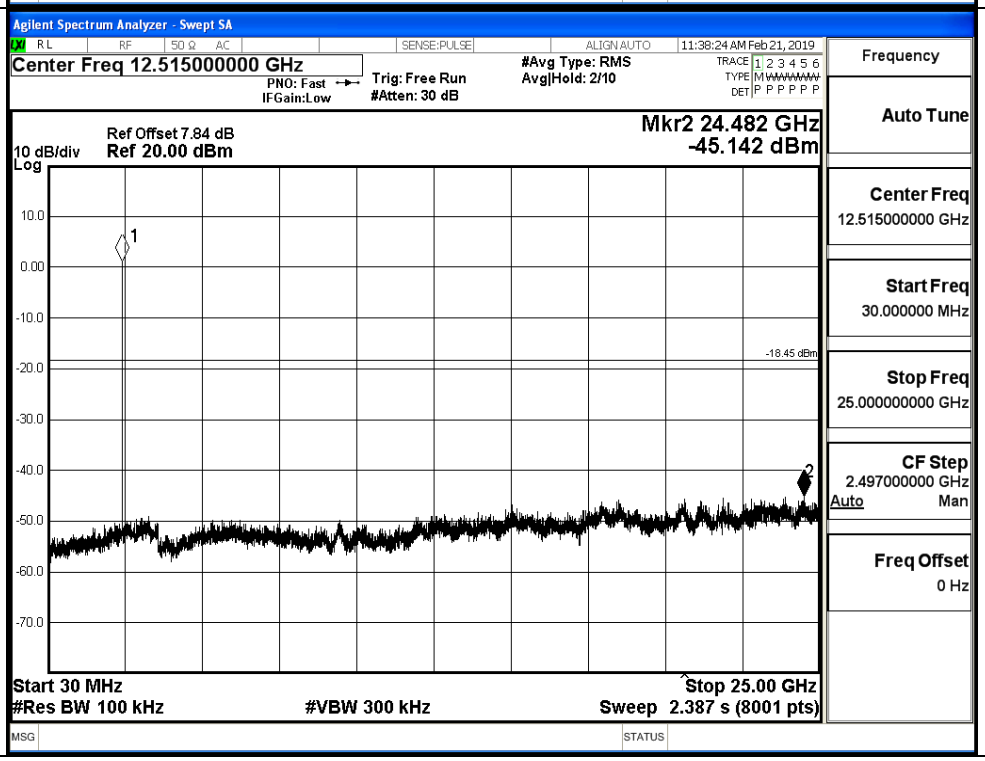
π/4DQPSK _2DH5/HCH	
8DPSK _3DH5/LCH	

8DPSK _3DH5/MCH	
8DPSK _3DH5/HCH	

A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.778	-41.569	-19.222	PASS
	MCH	1.551	-45.142	-18.449	PASS
	HCH	1.234	-44.061	-18.766	PASS
π/4DQPSK	LCH	-1.579	-44.311	-21.579	PASS
	MCH	-0.735	-45.273	-20.735	PASS
	HCH	-1.087	-44.703	-21.087	PASS
8DPSK	LCH	-1.809	-44.627	-21.809	PASS
	MCH	-0.993	-44.916	-20.993	PASS
	HCH	-1.281	-44.526	-21.281	PASS

GFSK_LCH_Graphs		
Pref		
Puw		

GFSK_MCH_Graphs		
Pref		
Puw		

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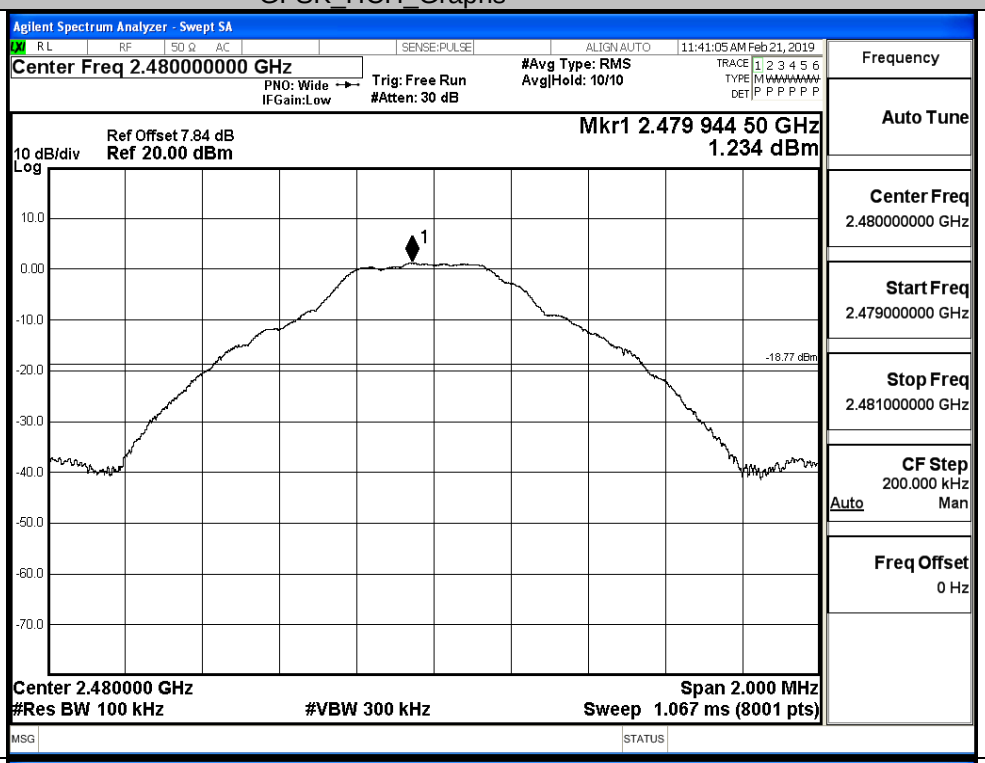
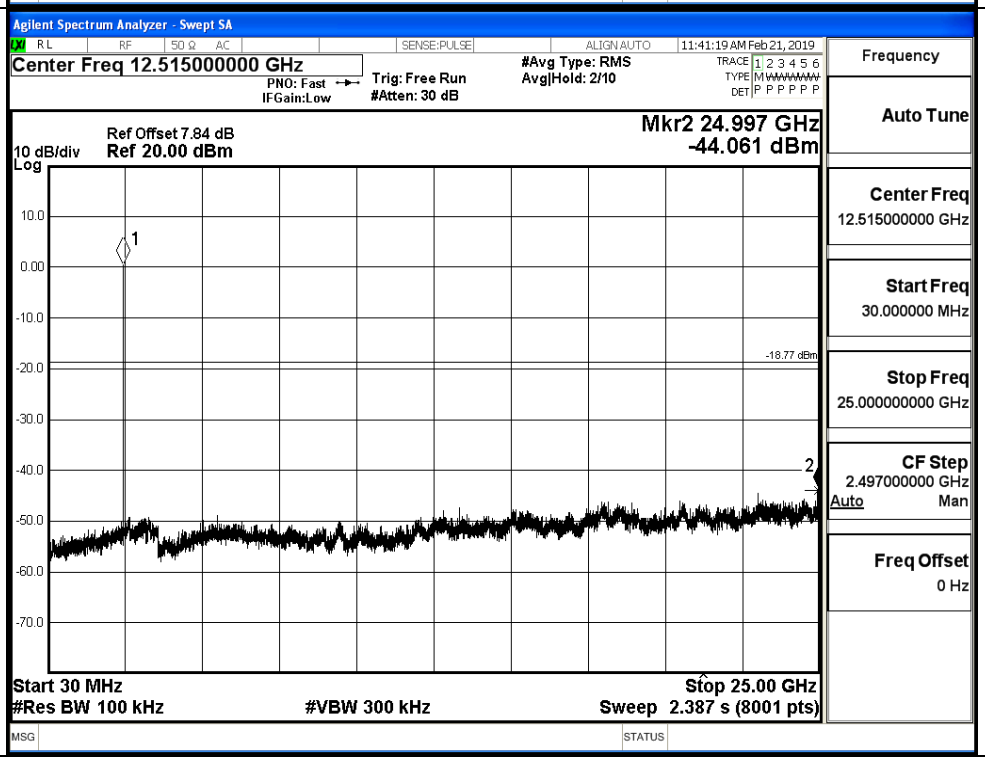
Pref		
Puw		

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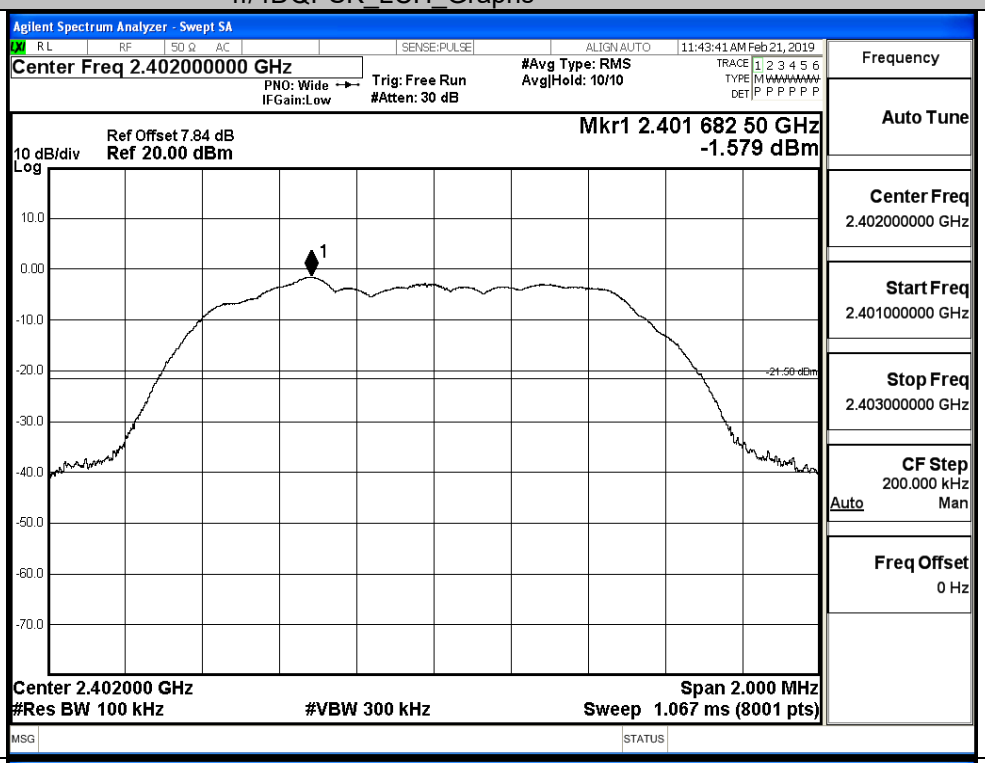
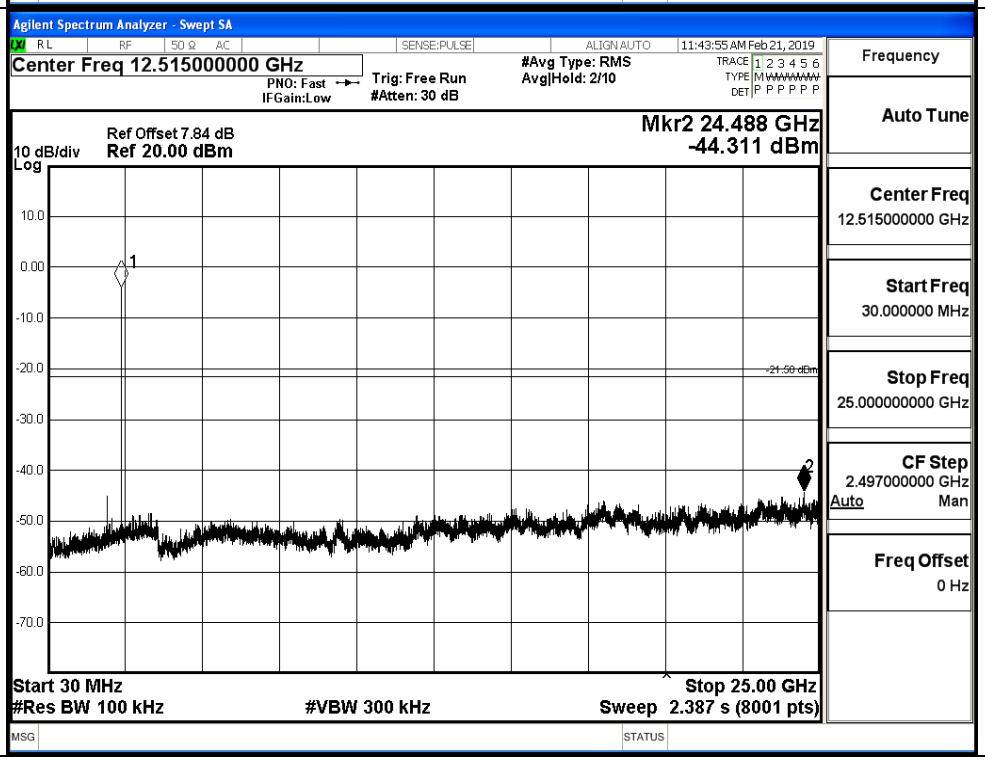
Pref			
Puw			

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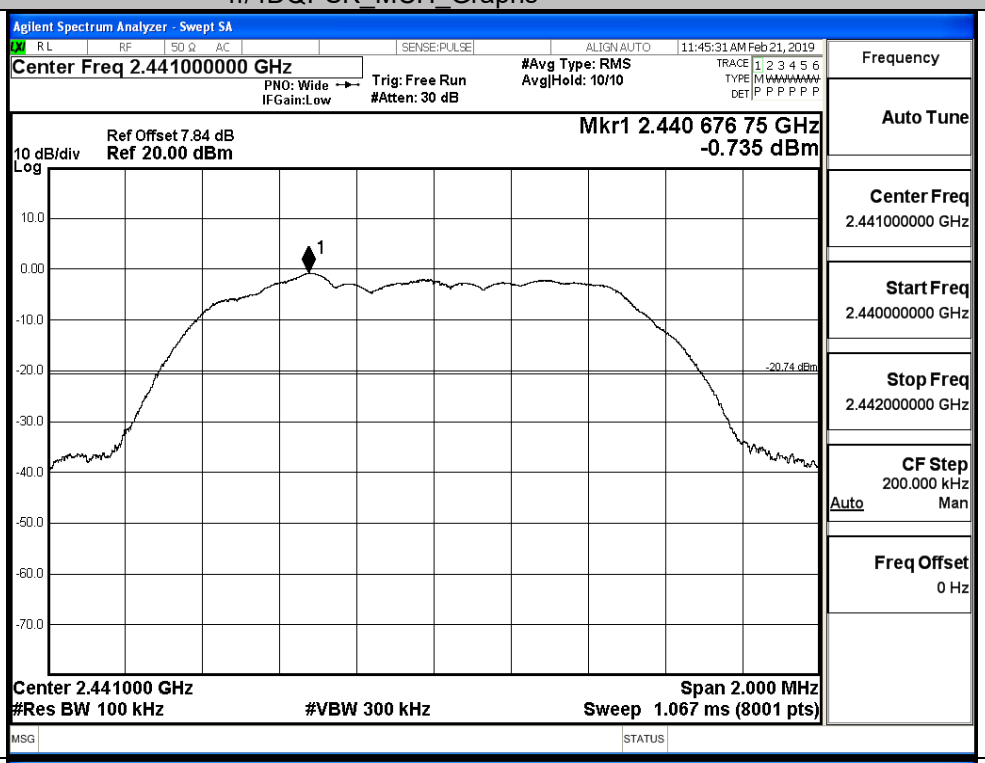
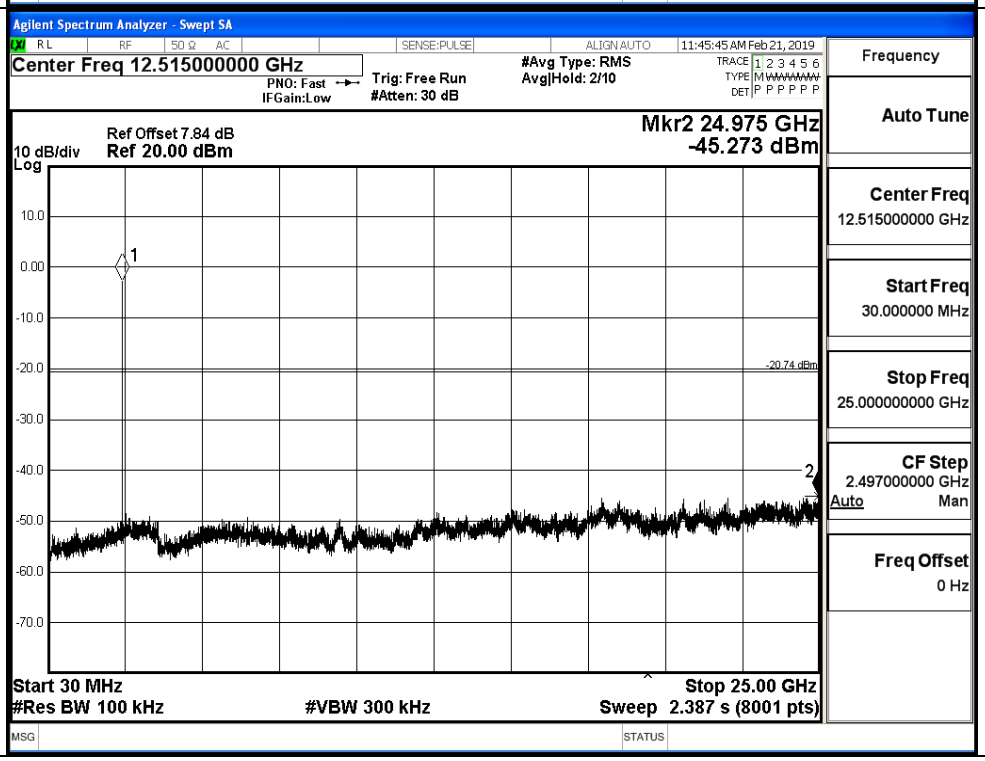
Pref		
Puw		

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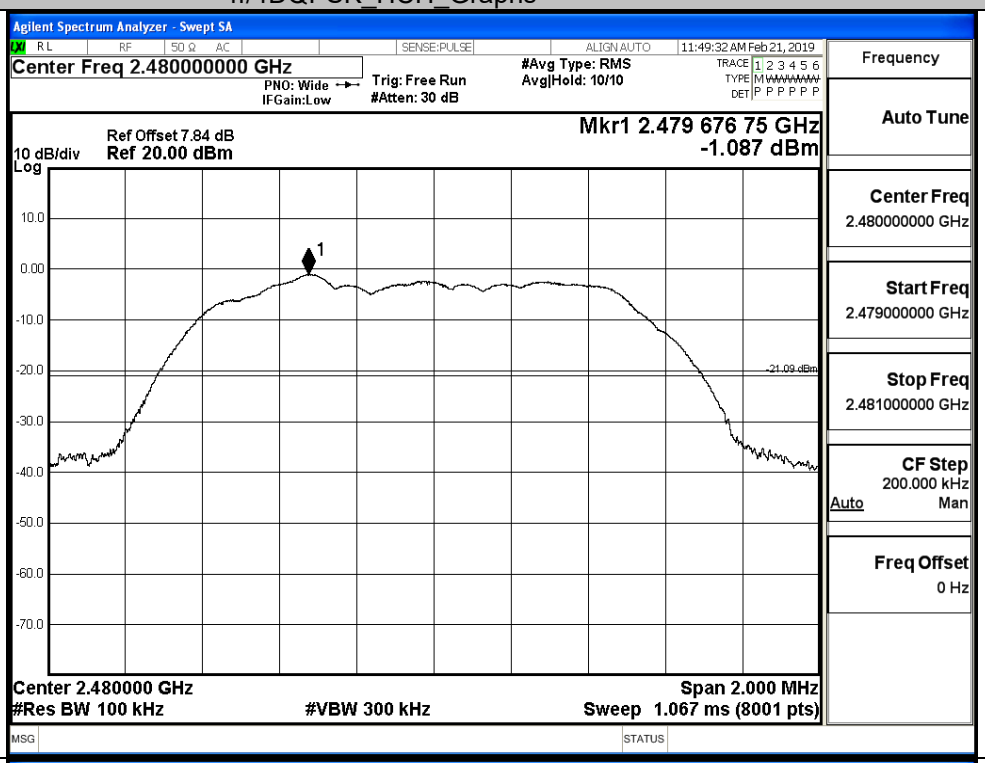
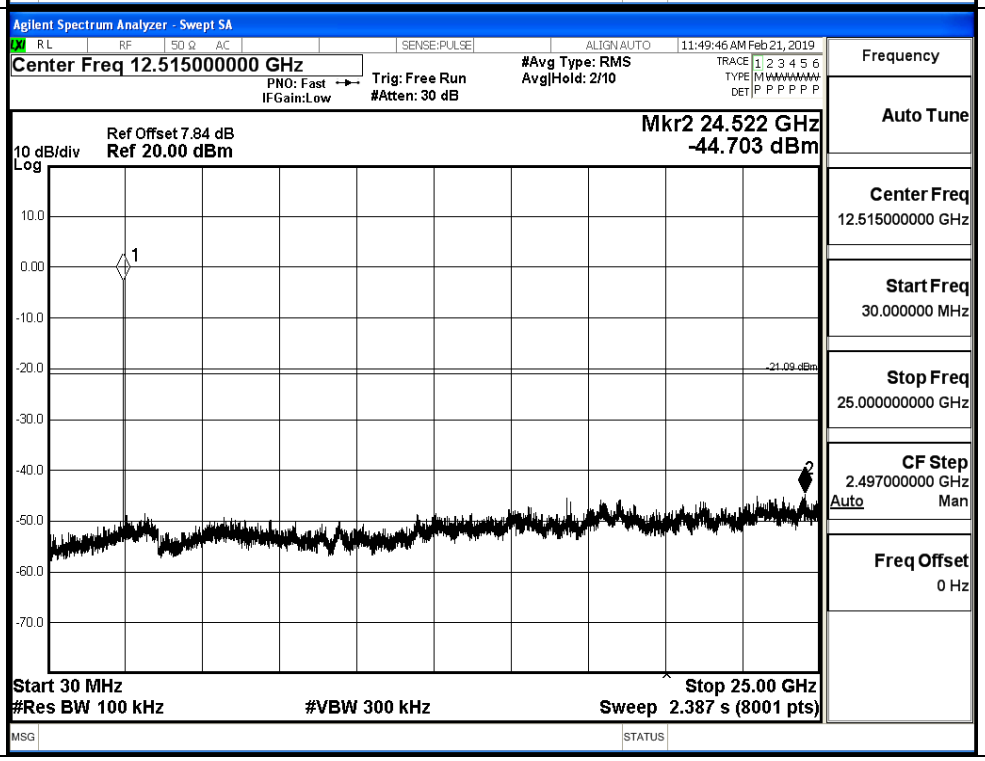
Pref		
Puw		

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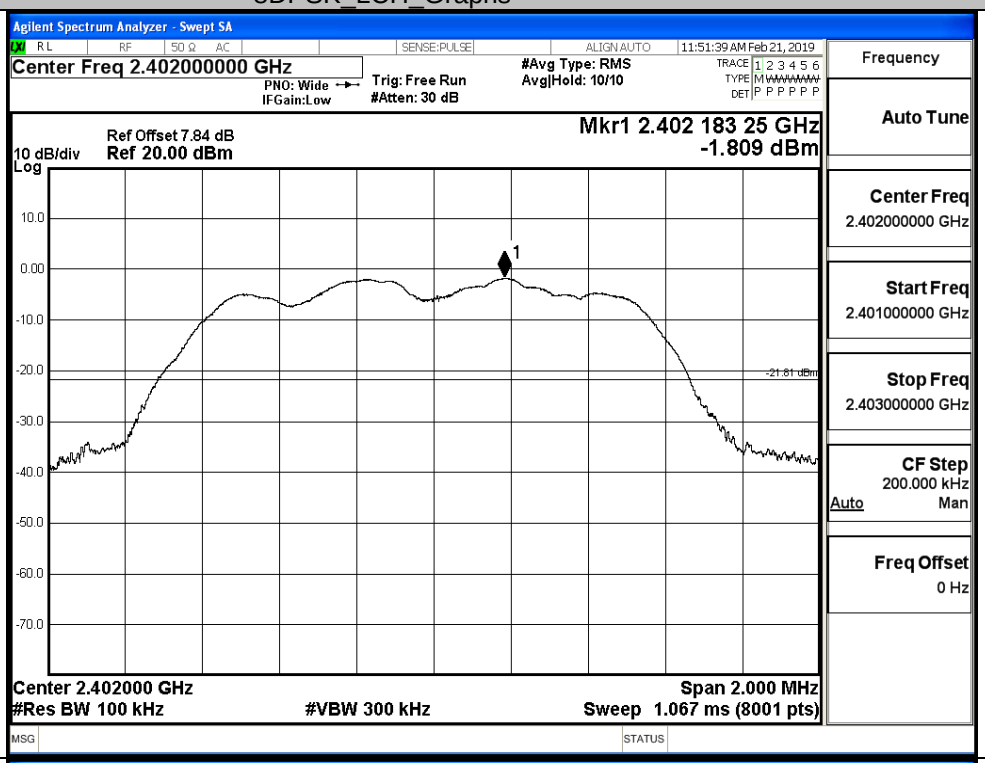
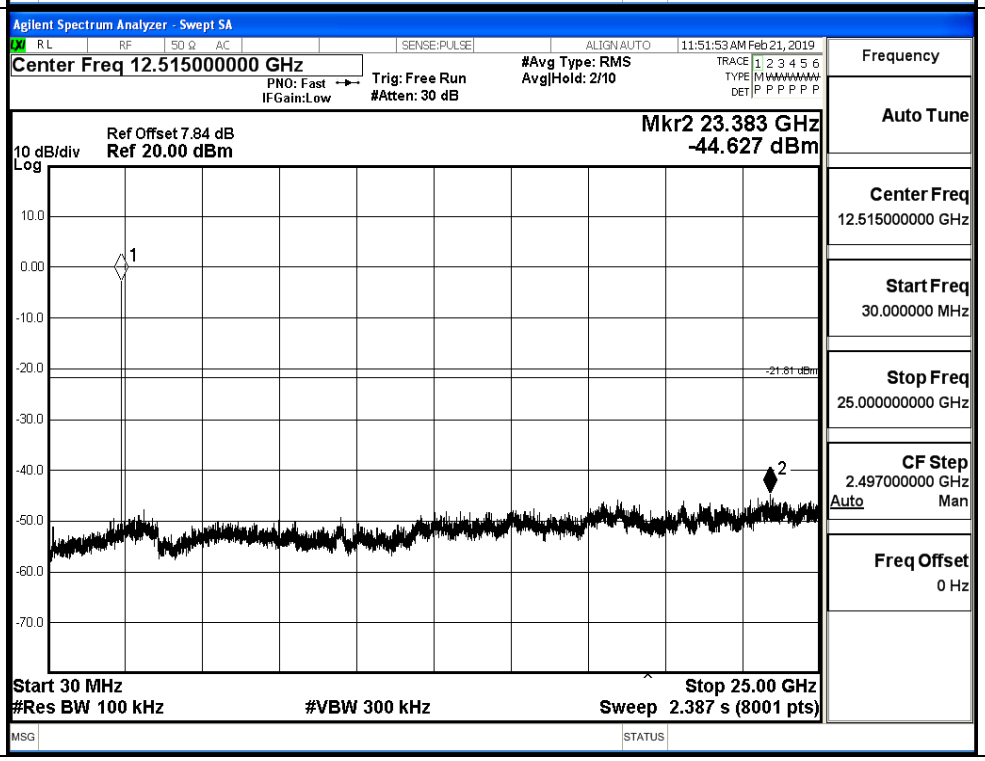
Pref		
Puw		

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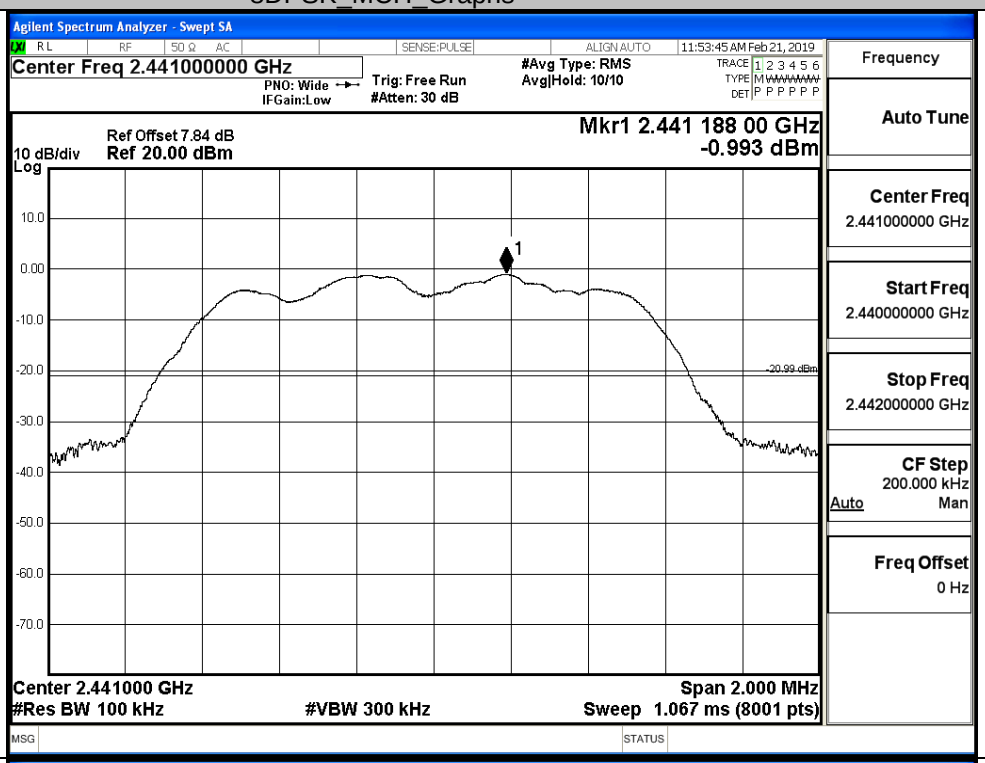
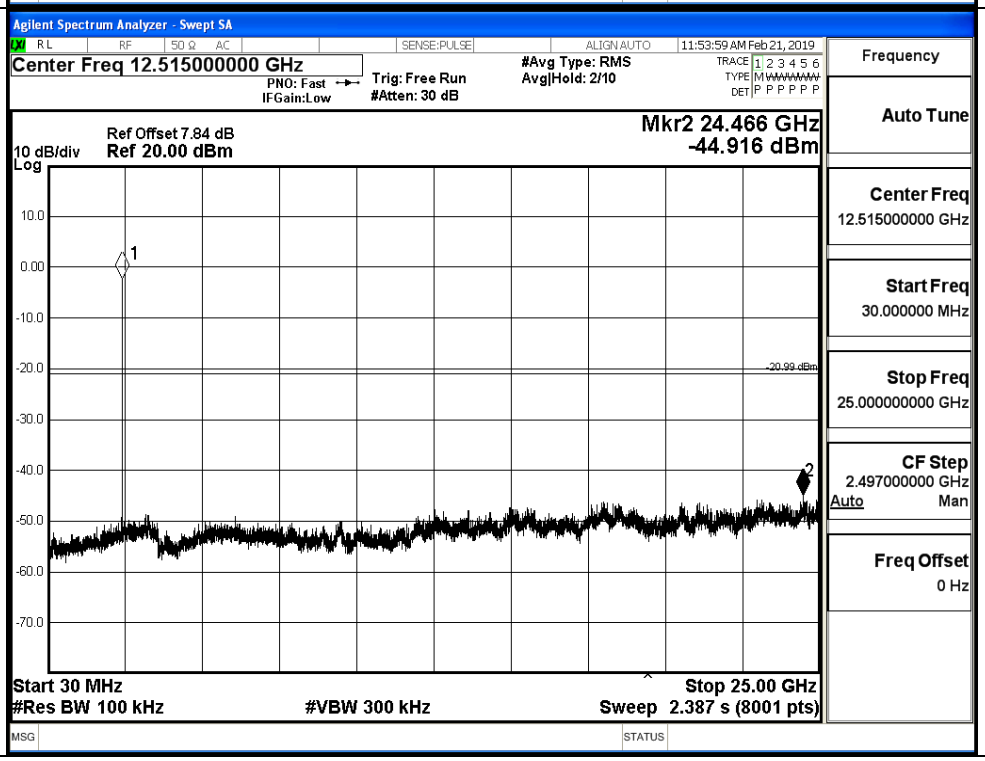
Pref		
Puw		

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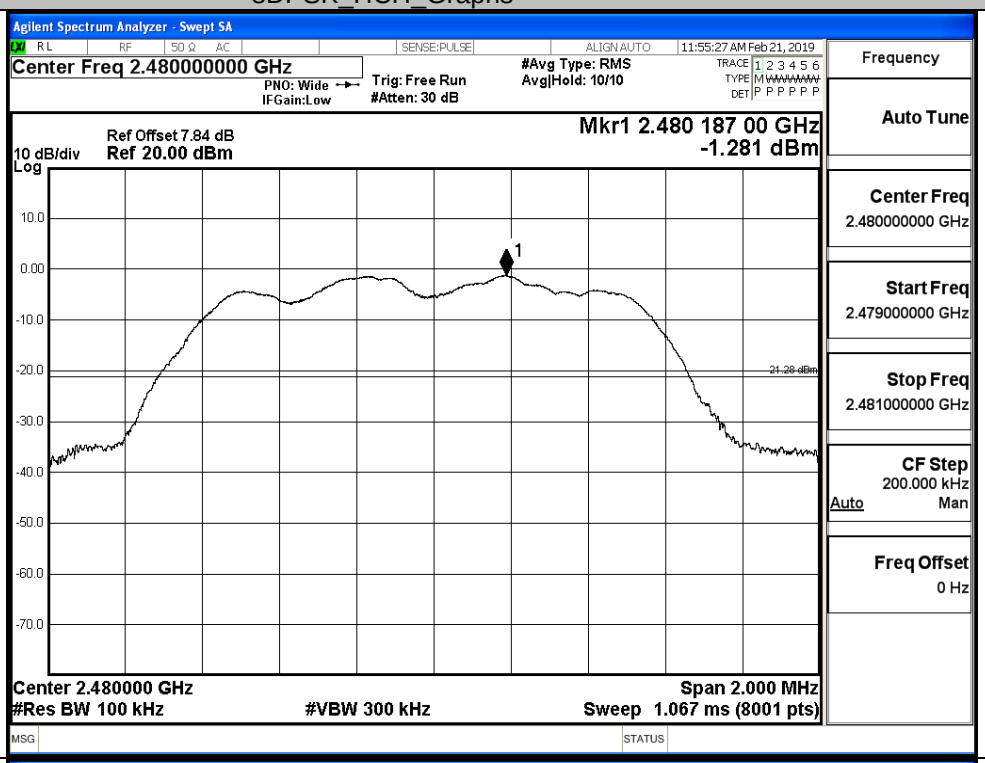
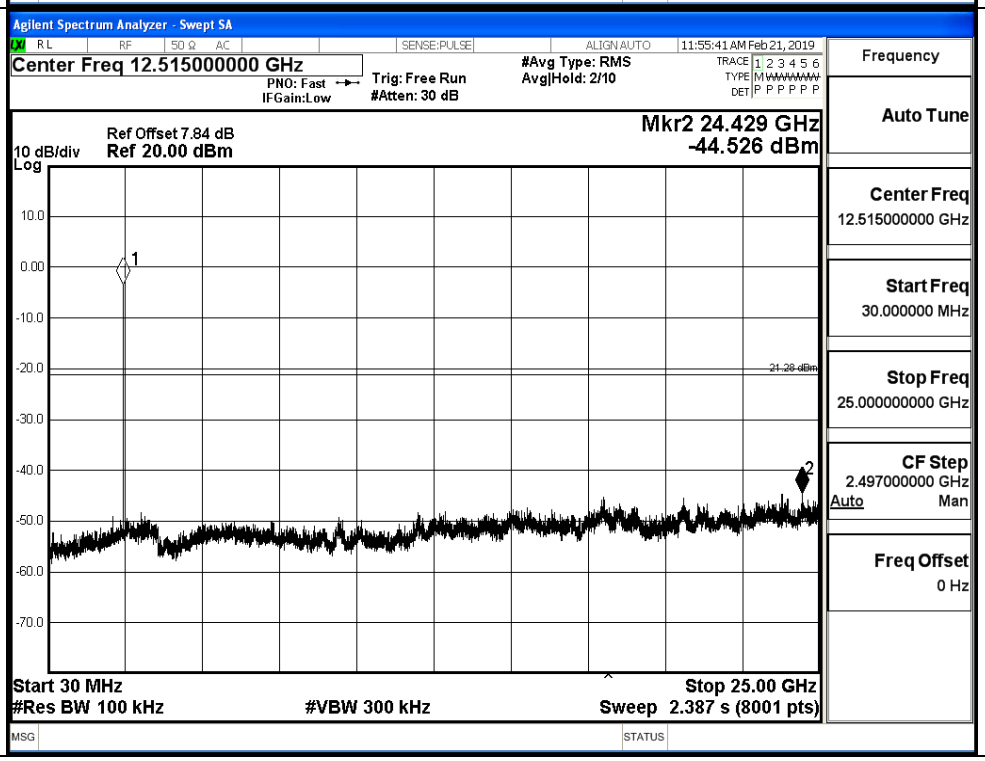
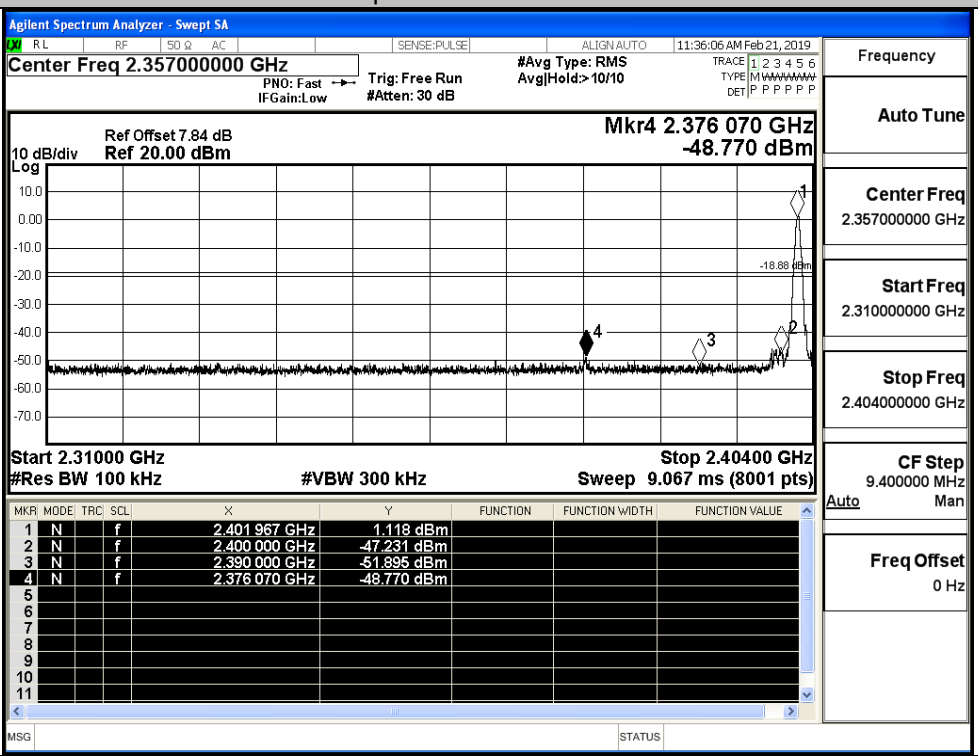
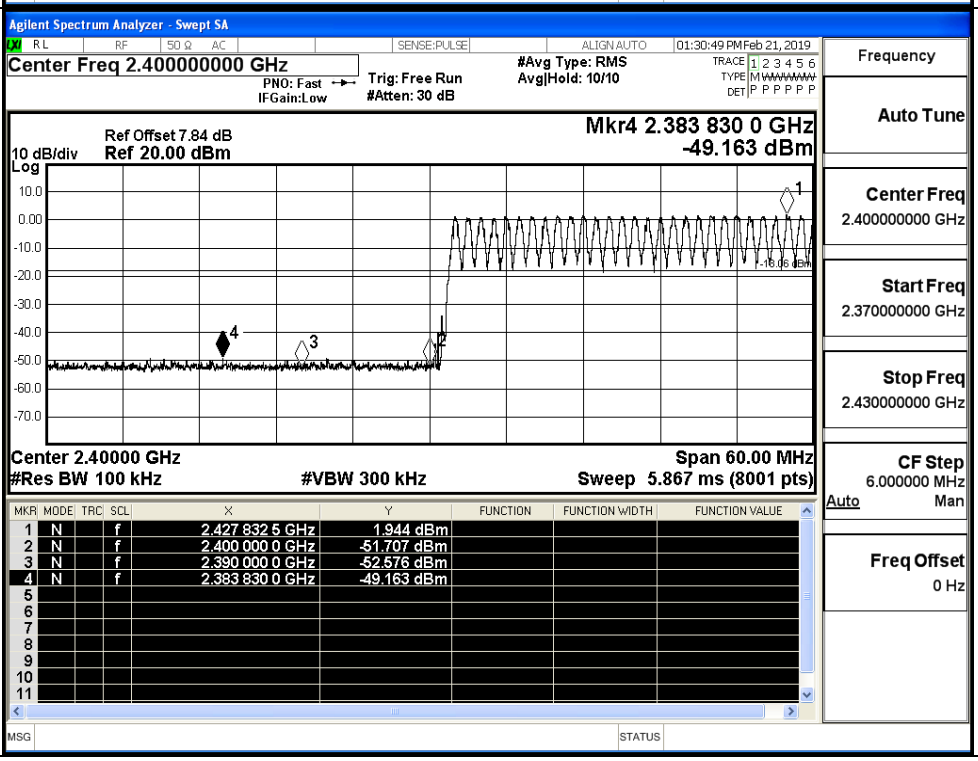
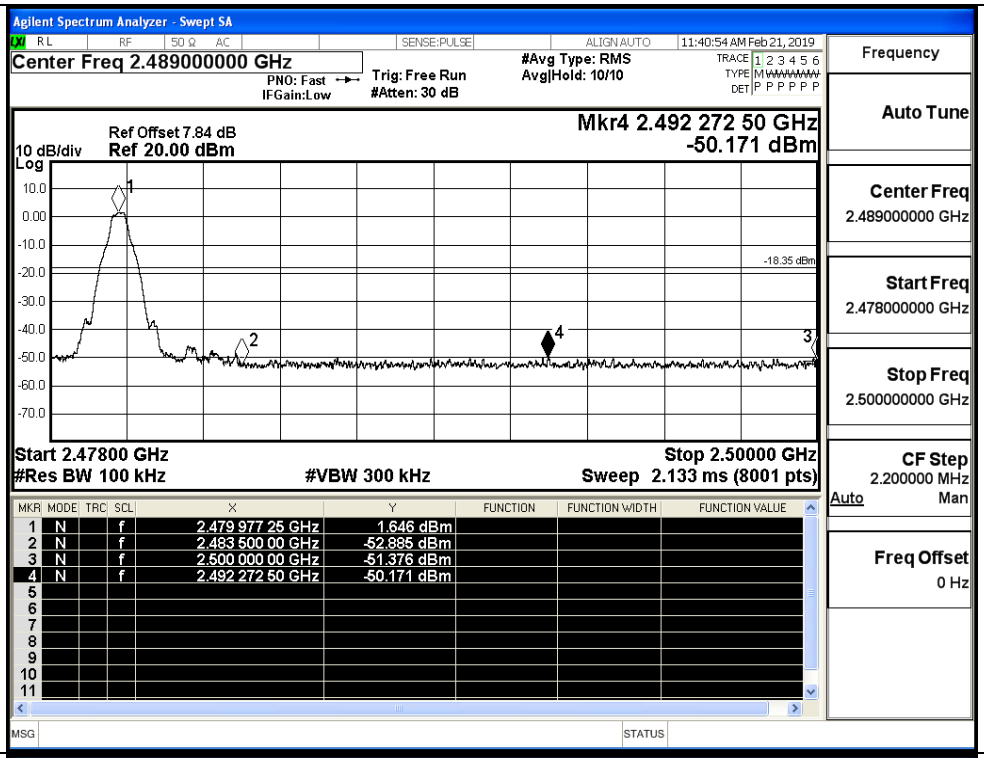
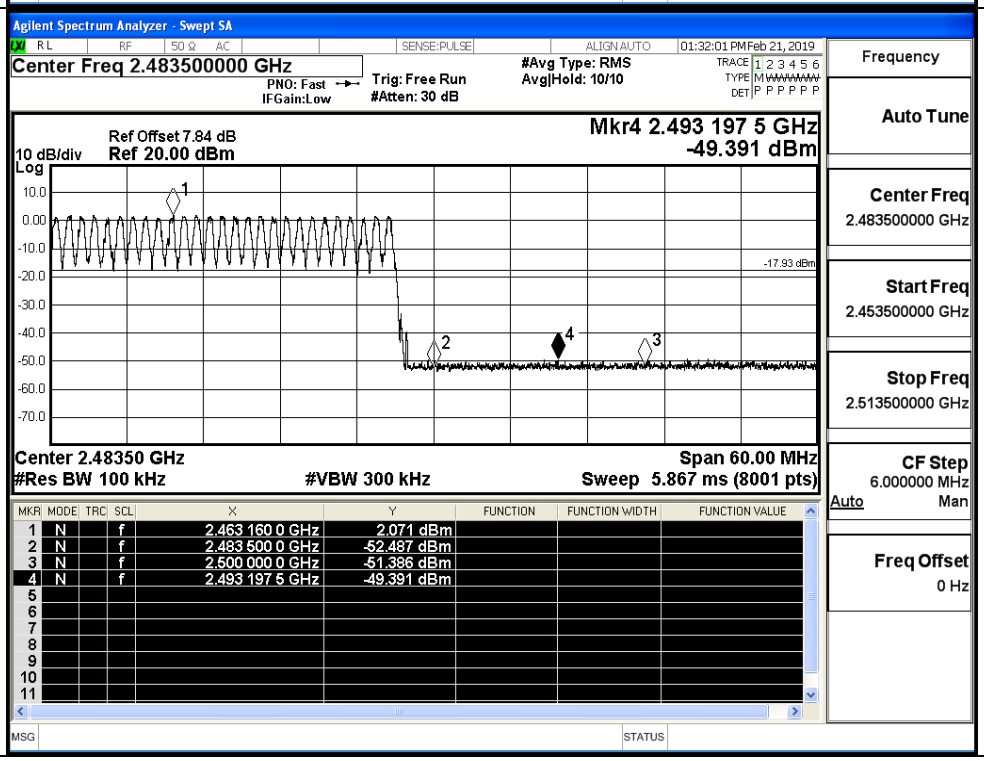
Pref		
Puw		

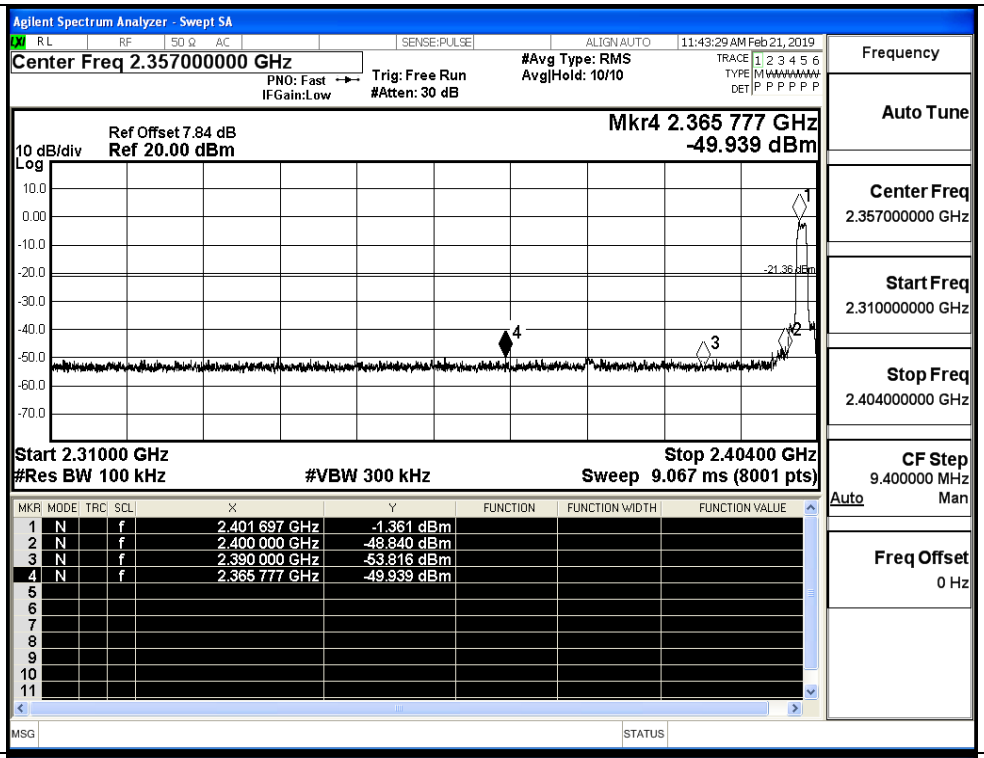
A.7 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	1.118	Off	-48.770	-18.88	PASS
			1.944	On	-49.163	-18.06	PASS
	HCH	2480	1.646	Off	-50.171	-18.35	PASS
			2.071	On	-49.391	-17.93	PASS
π/4DQPSK	LCH	2402	-1.361	Off	-49.939	-21.36	PASS
			1.977	On	-49.567	-18.02	PASS
	HCH	2480	-0.852	Off	-49.452	-20.85	PASS
			2.183	On	-49.521	-17.82	PASS
8DPSK	LCH	2402	-1.440	Off	-50.051	-21.44	PASS
			2.091	On	-49.261	-17.91	PASS
	HCH	2480	-0.832	Off	-50.134	-20.83	PASS
			2.053	On	-49.697	-17.95	PASS

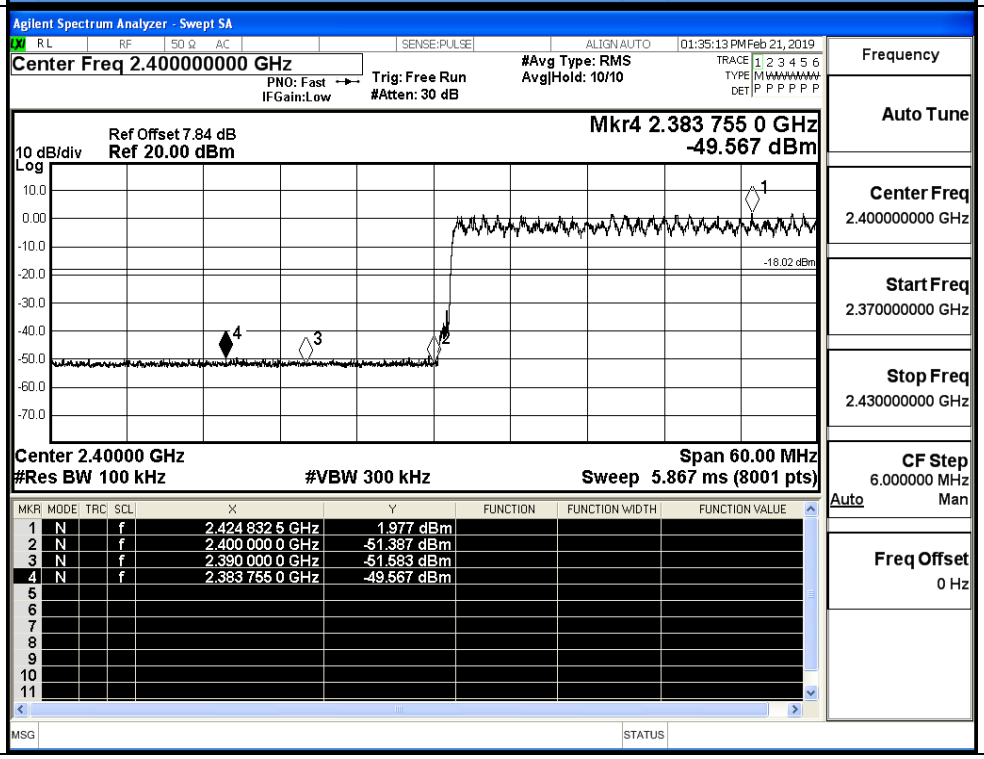
Test Graphs	
GFSK/LCH/No Hop	
GFSK/LCH/Hop	

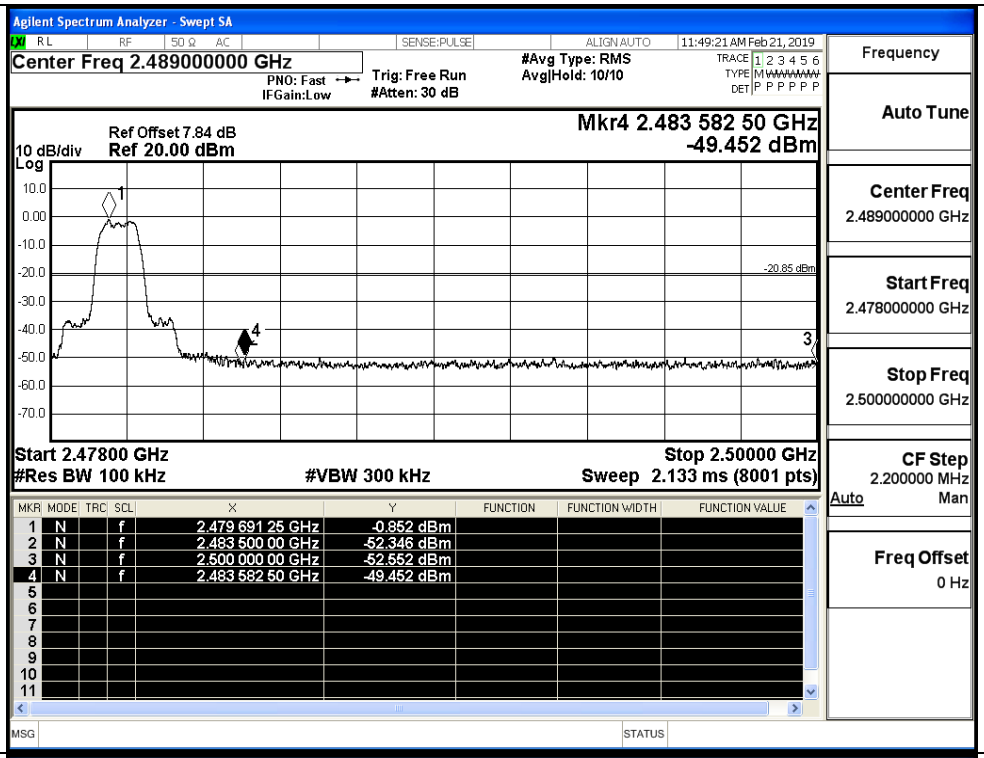
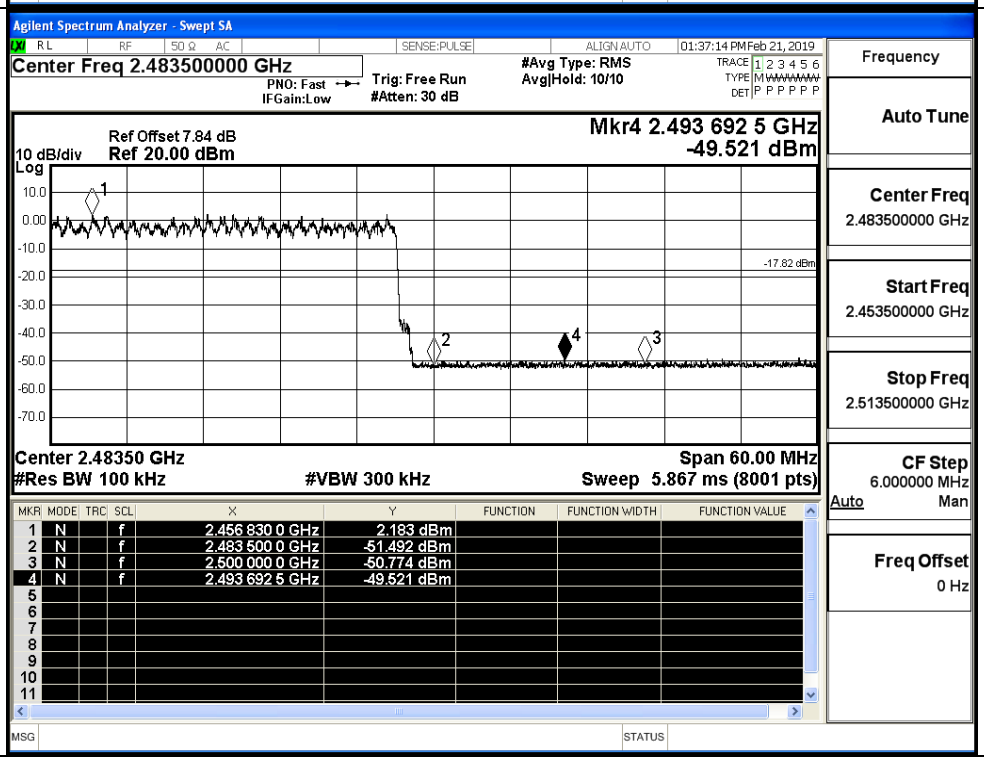
GFSK/HCH/No Hop	
GFSK/HCH/Hop	

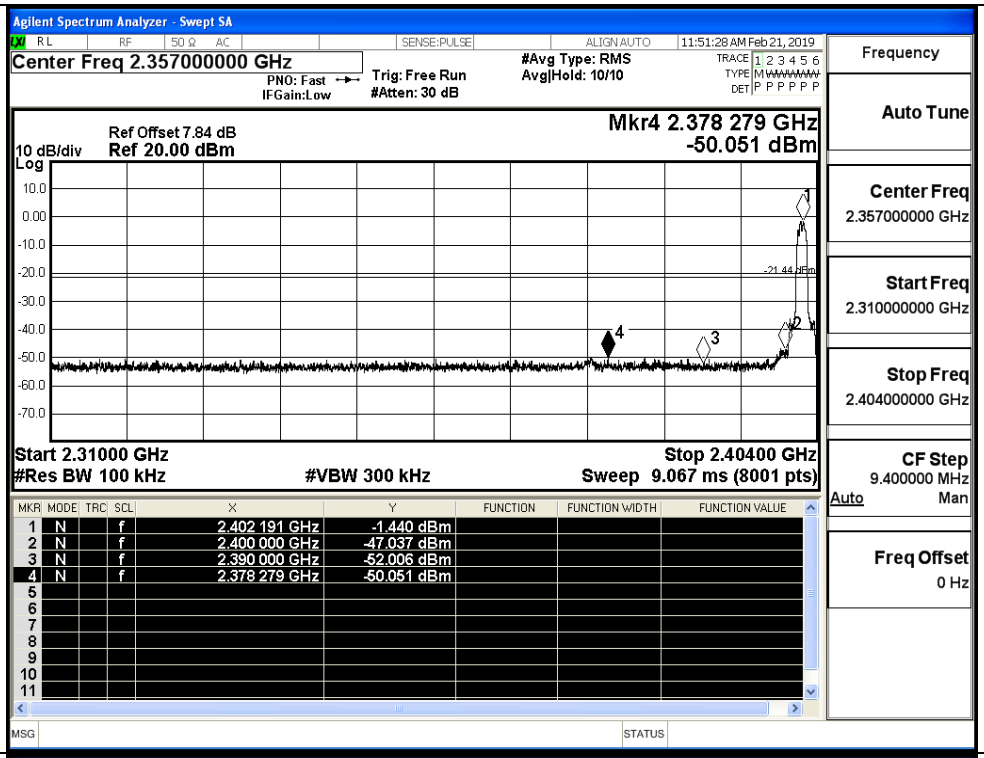
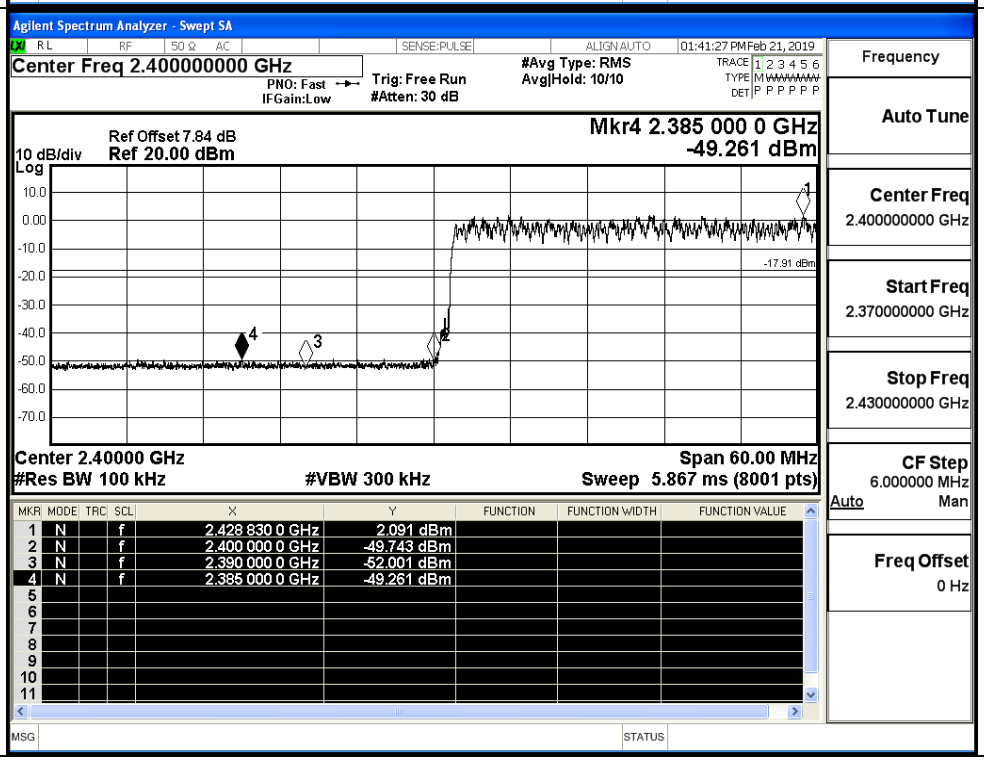
π/4DQPSK/LCH/No Hop

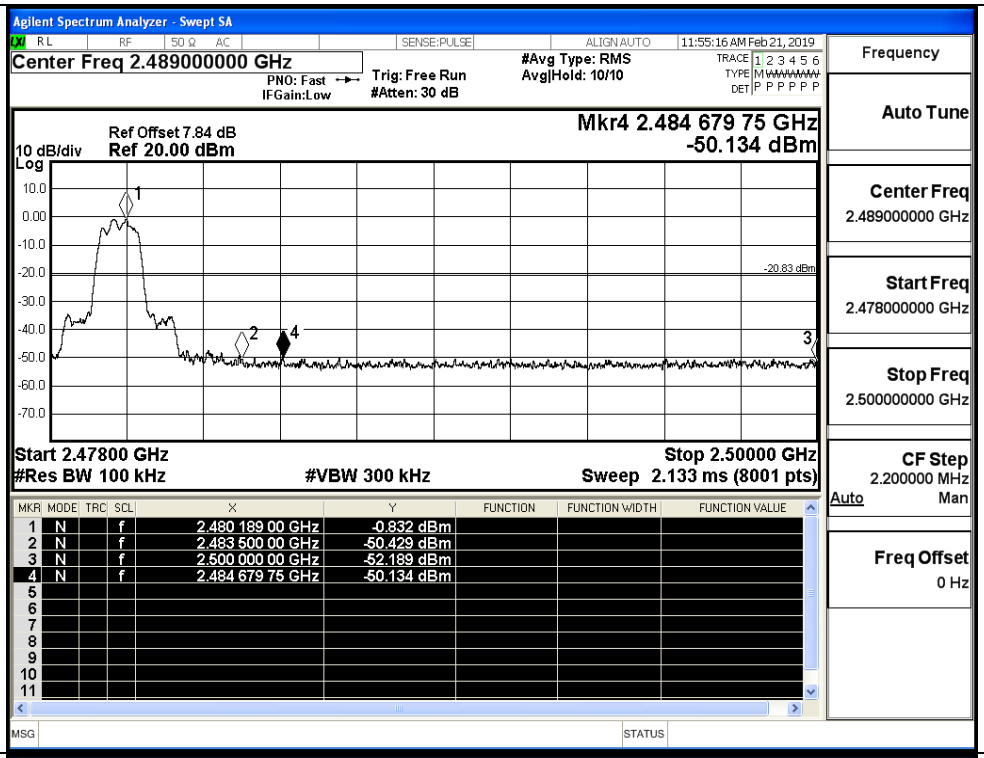
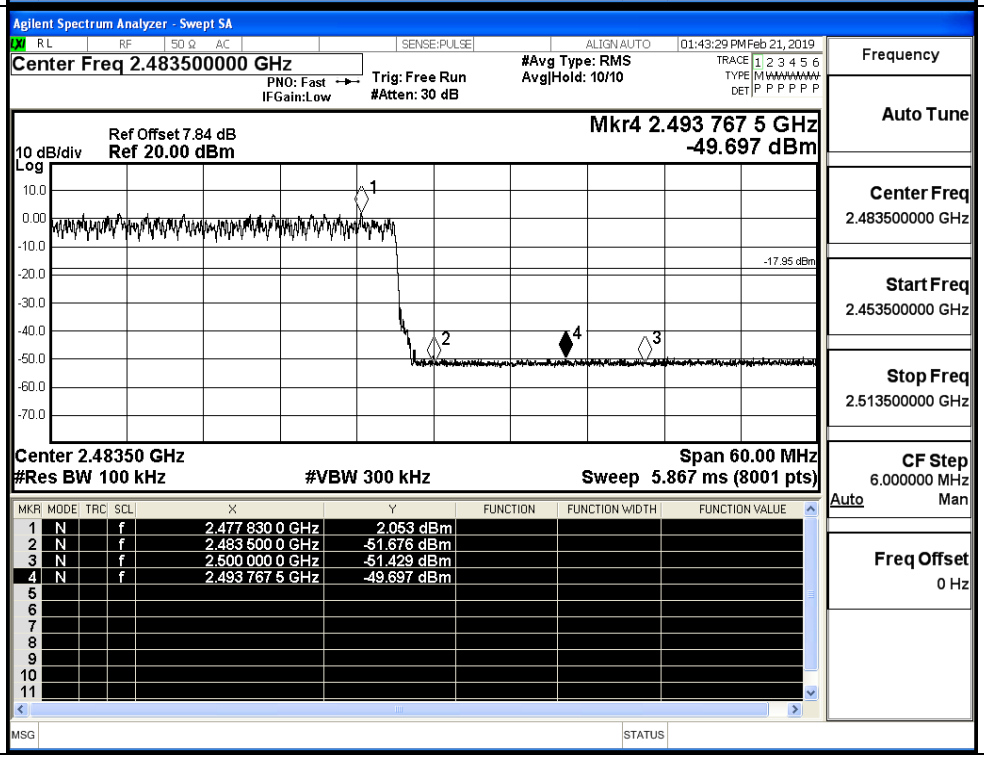


π/4DQPSK/LCH/Hop



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

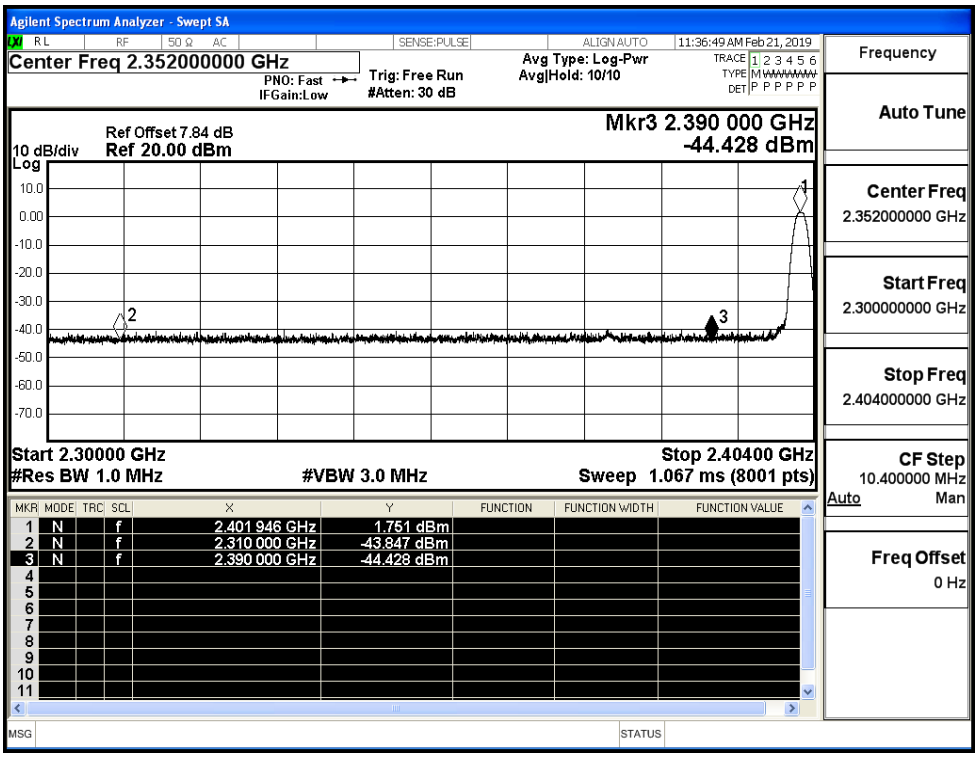
8DPSK/LCH/No Hop	
8DPSK/LCH/Hop	

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

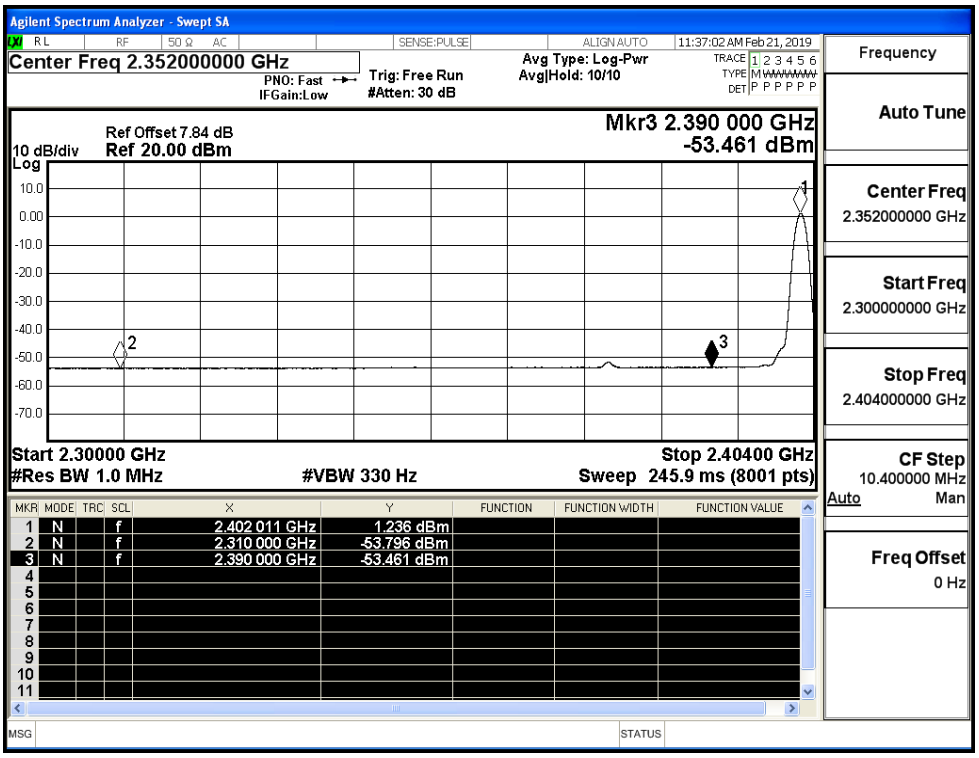
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.85	2.0	0	53.41	PEAK	74	PASS
	Off	2310.0	-53.80	2.0	0	43.46	AV	54	PASS
	Off	2390.0	-44.43	2.0	0	52.83	PEAK	74	PASS
	Off	2390.0	-53.46	2.0	0	43.80	AV	54	PASS
	Off	2483.5	-42.61	2.0	0	54.65	PEAK	74	PASS
	Off	2483.5	-51.68	2.0	0	45.57	AV	54	PASS
	Off	2500.0	-42.33	2.0	0	54.93	PEAK	74	PASS
	Off	2500.0	-53.01	2.0	0	44.24	AV	54	PASS
π/4DQPSK	Off	2310.0	-41.75	2.0	0	55.51	PEAK	74	PASS
	Off	2310.0	-53.85	2.0	0	43.41	AV	54	PASS
	Off	2390.0	-43.84	2.0	0	53.42	PEAK	74	PASS
	Off	2390.0	-53.41	2.0	0	43.85	AV	54	PASS
	Off	2483.5	-42.24	2.0	0	55.02	PEAK	74	PASS
	Off	2483.5	-51.74	2.0	0	45.52	AV	54	PASS
	Off	2500.0	-44.17	2.0	0	53.09	PEAK	74	PASS
	Off	2500.0	-53.04	2.0	0	44.22	AV	54	PASS
8DPSK	Off	2310.0	-43.56	2.0	0	53.70	PEAK	74	PASS
	Off	2310.0	-53.75	2.0	0	43.51	AV	54	PASS
	Off	2390.0	-43.69	2.0	0	53.57	PEAK	74	PASS
	Off	2390.0	-53.46	2.0	0	43.80	AV	54	PASS
	Off	2483.5	-43.77	2.0	0	53.49	PEAK	74	PASS
	Off	2483.5	-51.76	2.0	0	45.49	AV	54	PASS
	Off	2500.0	-42.41	2.0	0	54.85	PEAK	74	PASS
	Off	2500.0	-53.06	2.0	0	44.19	AV	54	PASS

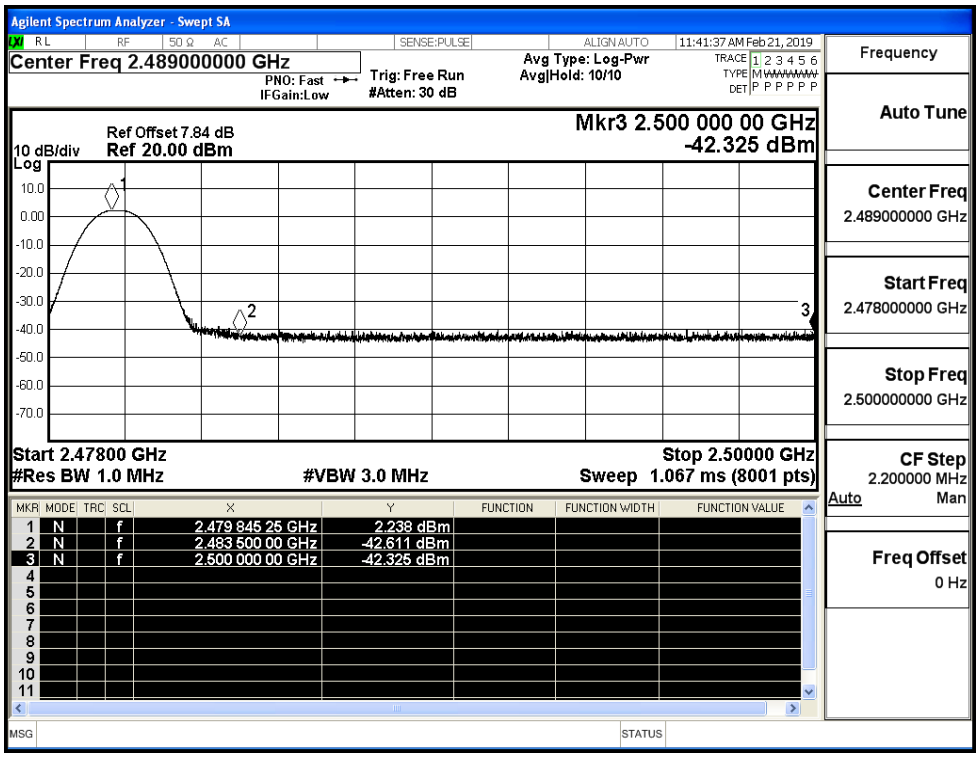
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



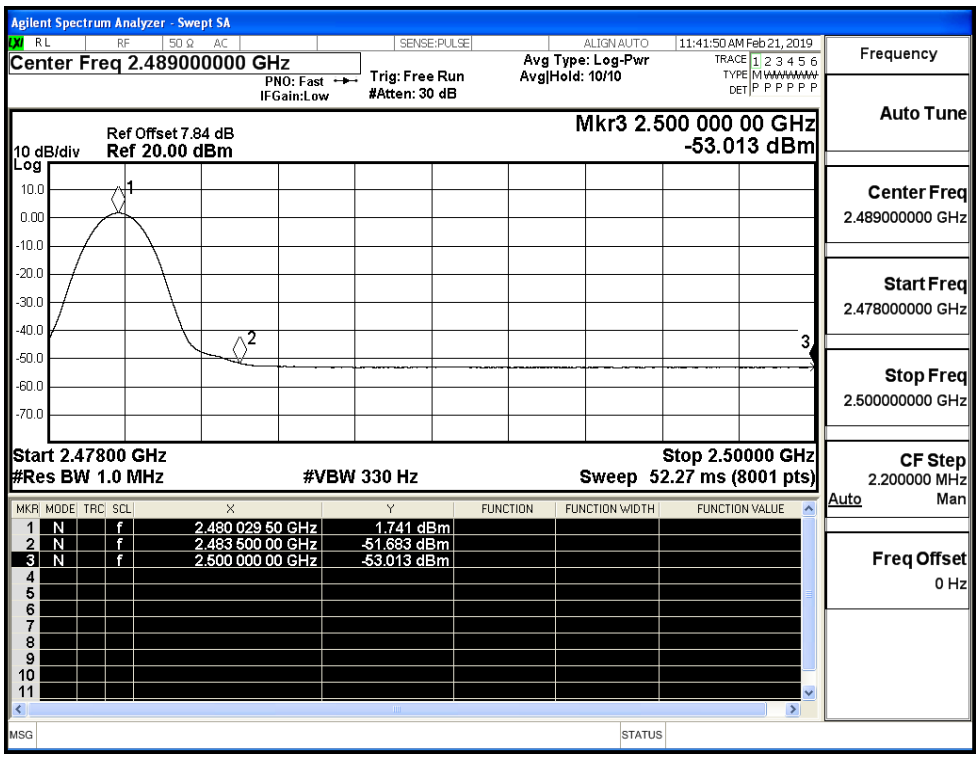
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



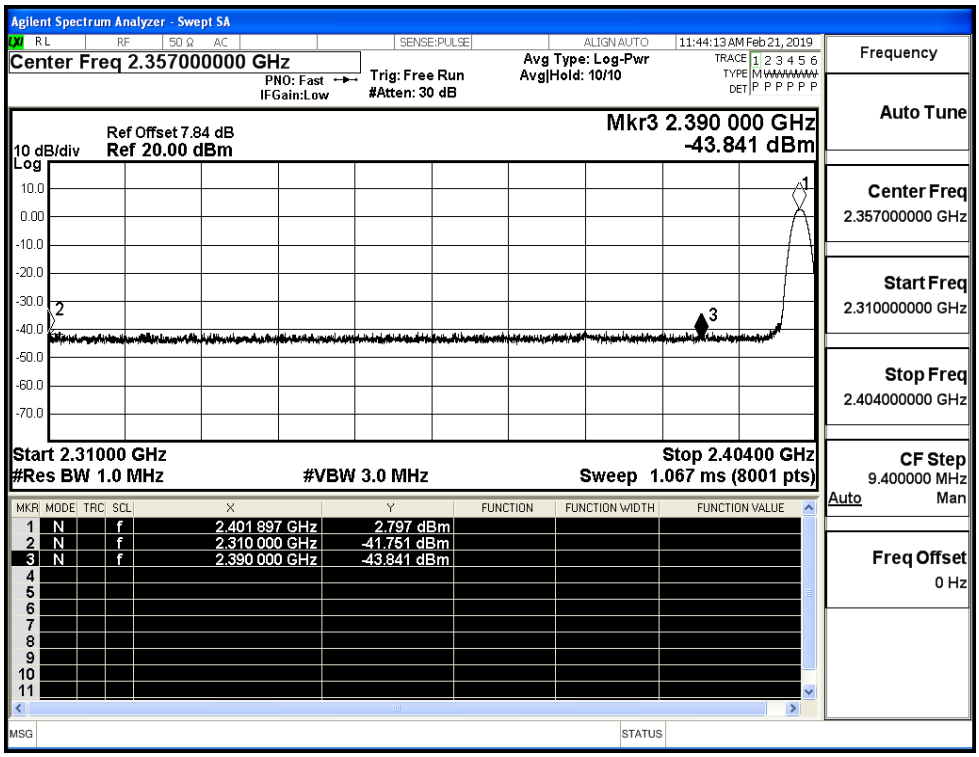
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



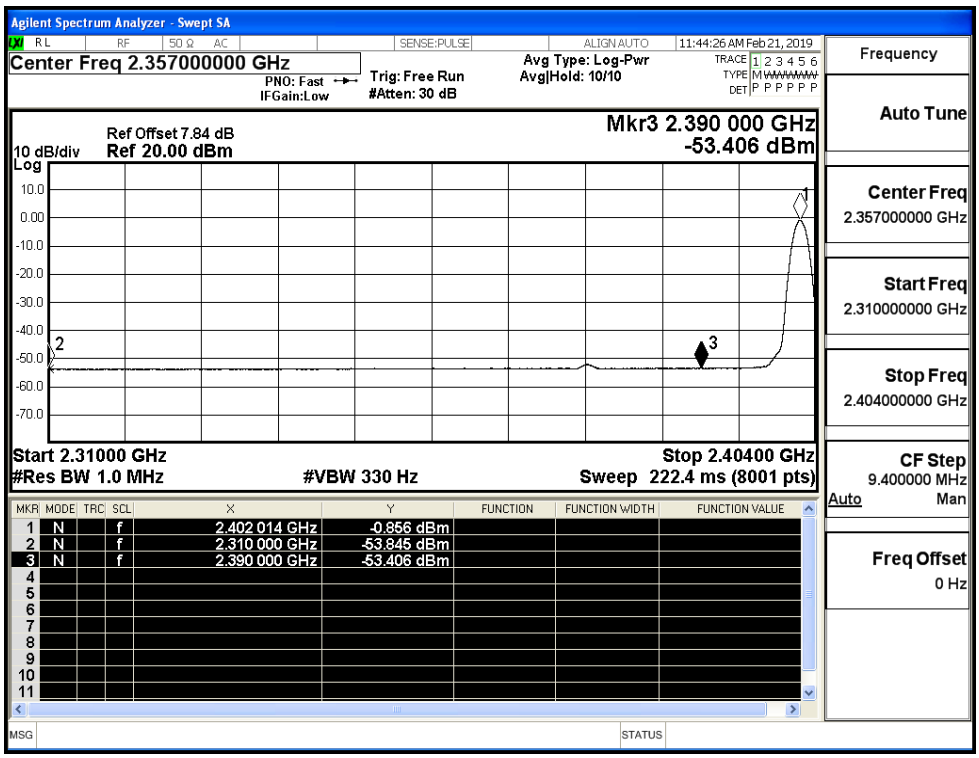
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



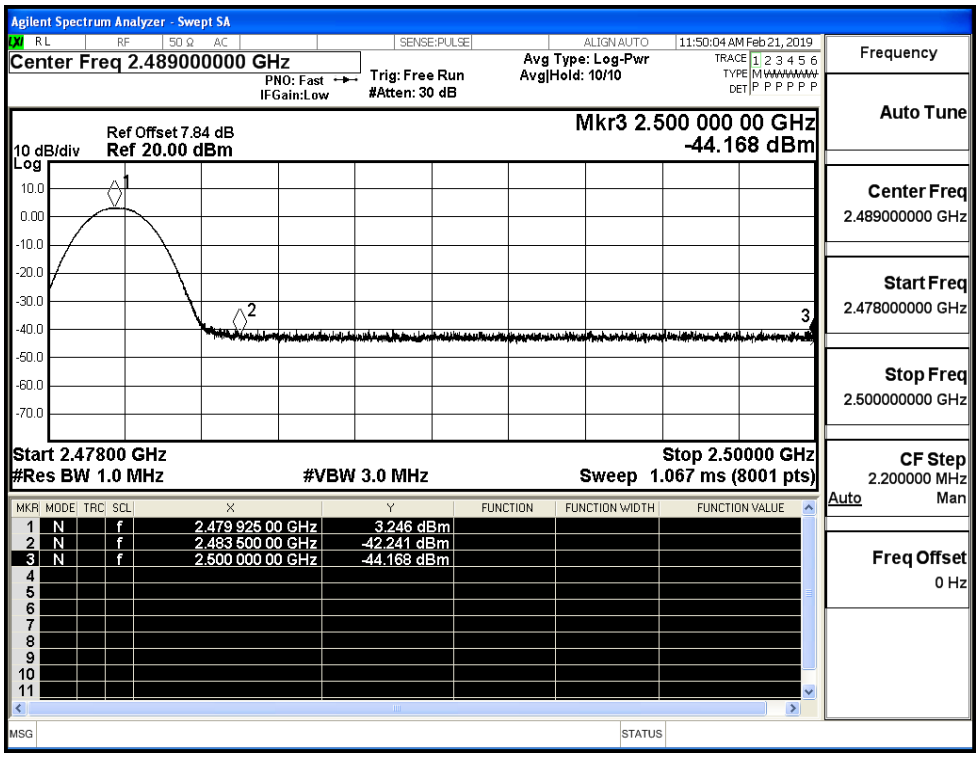
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



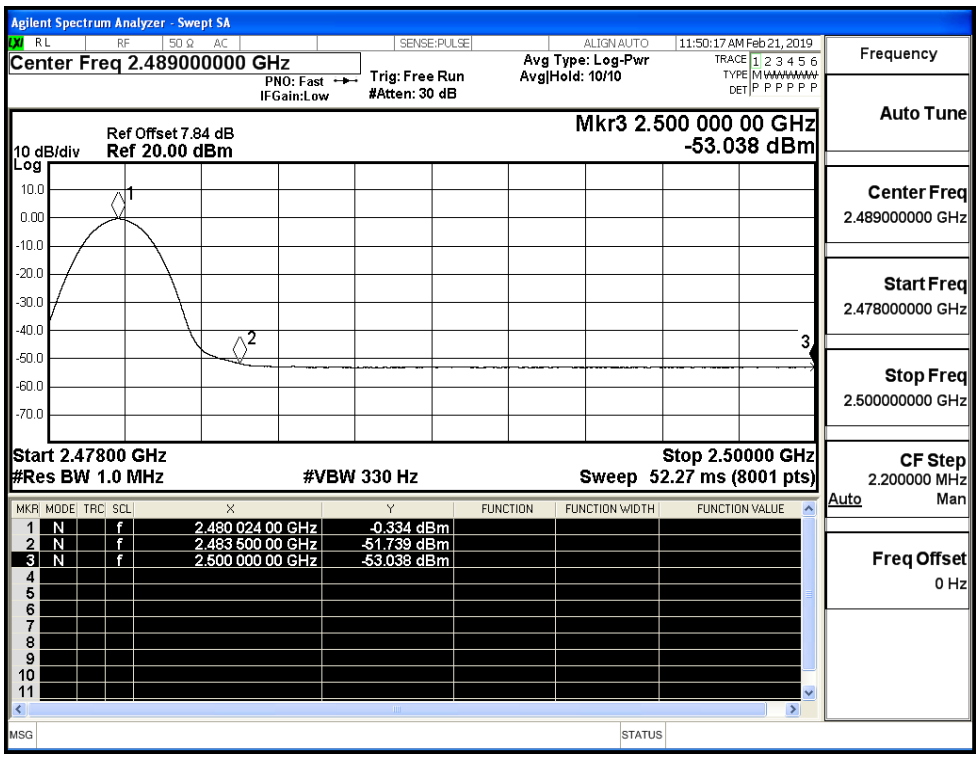
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



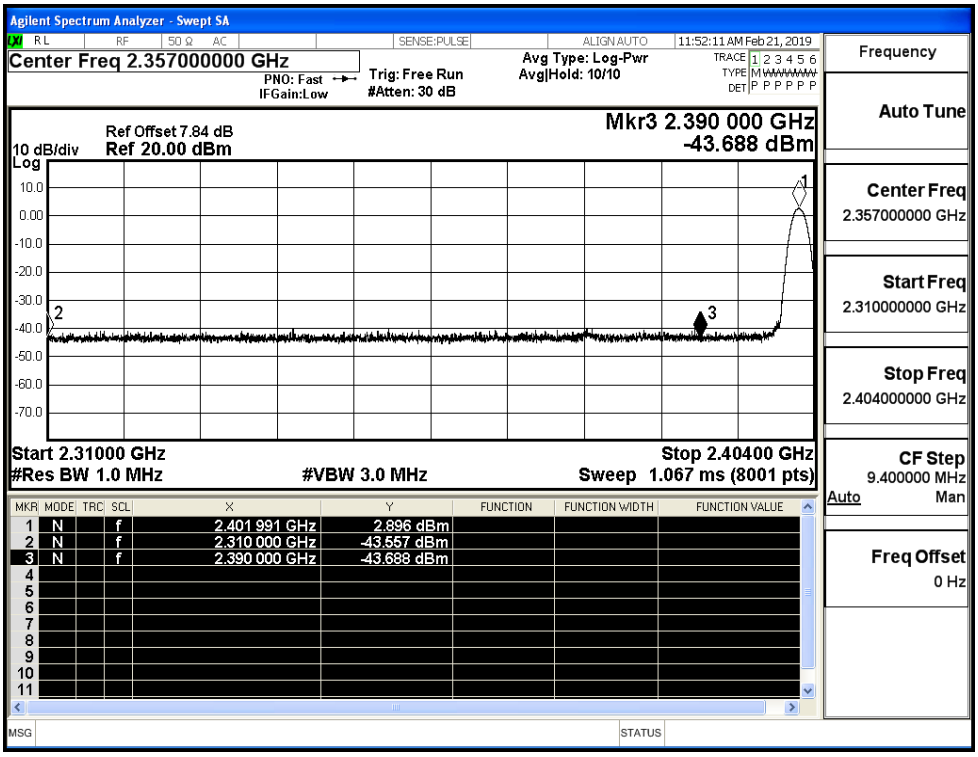
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



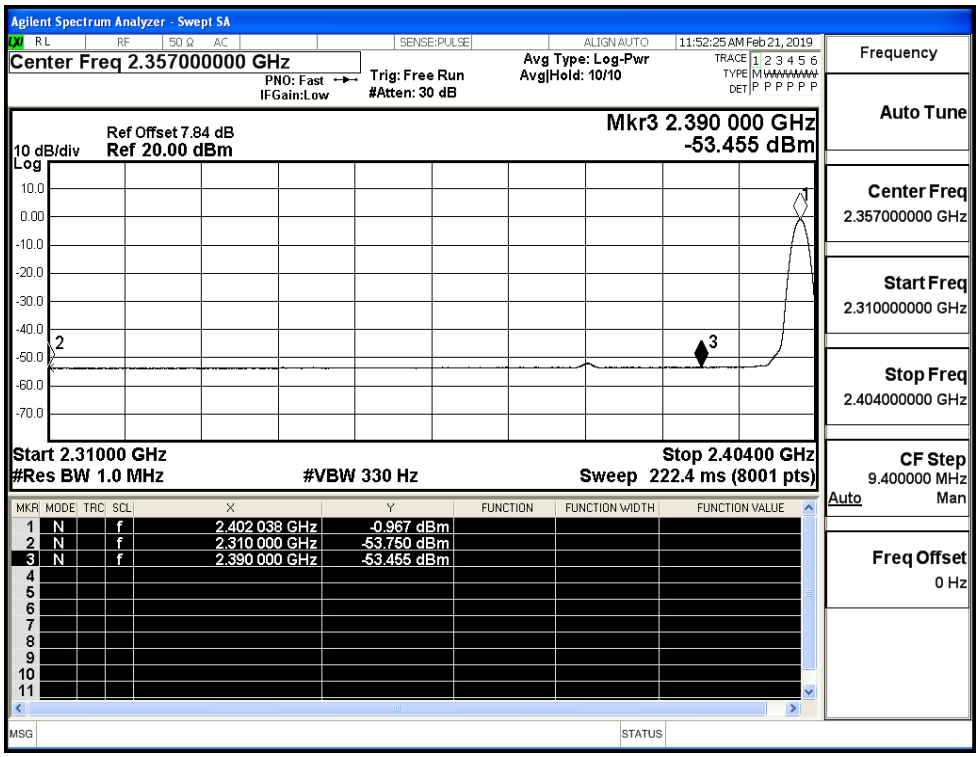
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



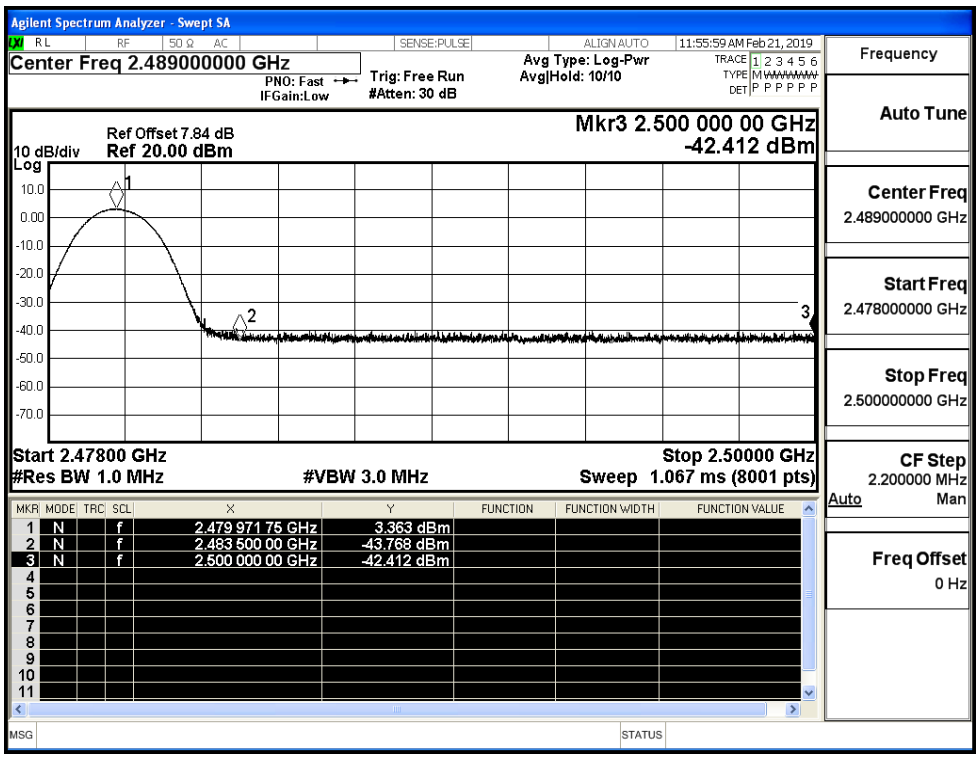
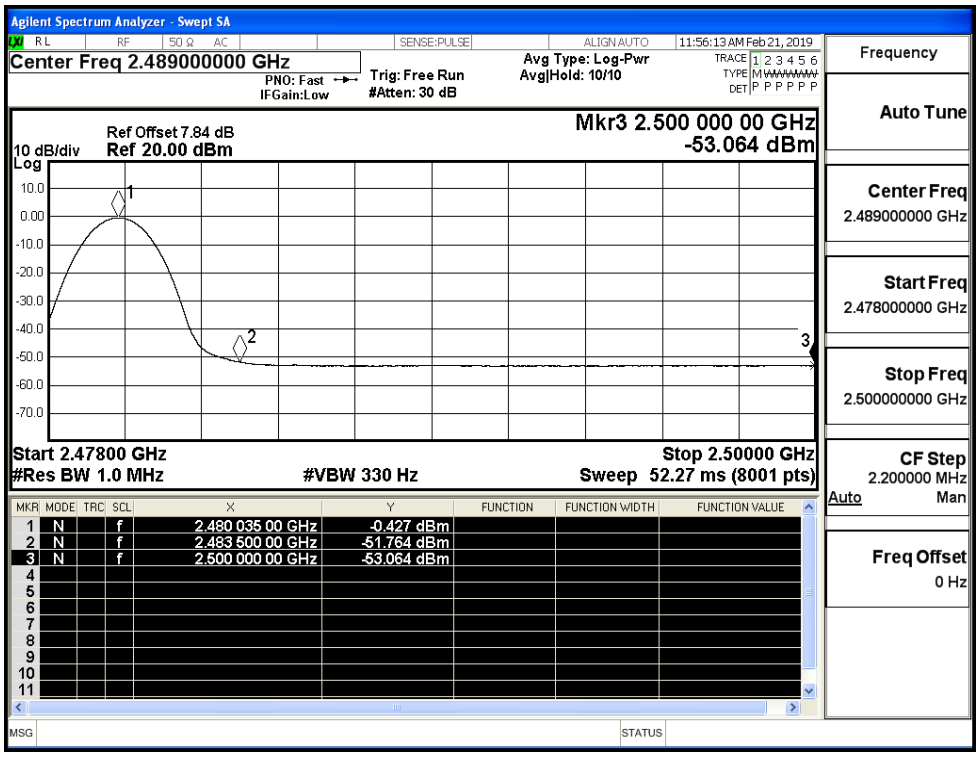
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)