Appendix A

RF Test Data for BT 5.0(BDR/EDR) (Conducted Measurement)

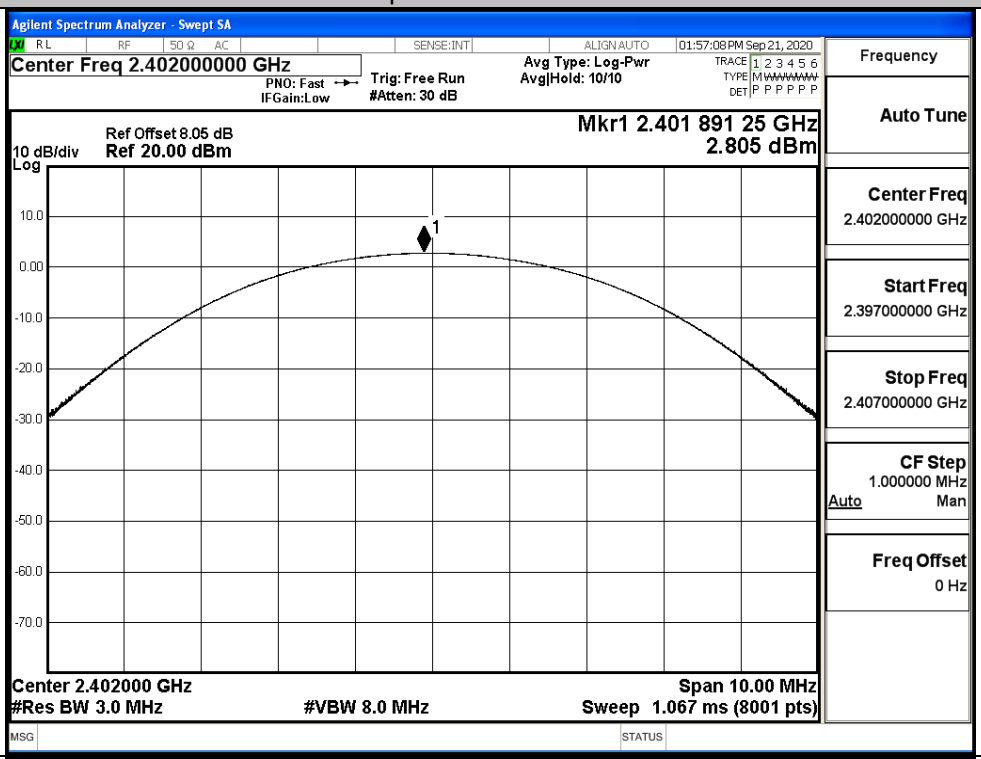
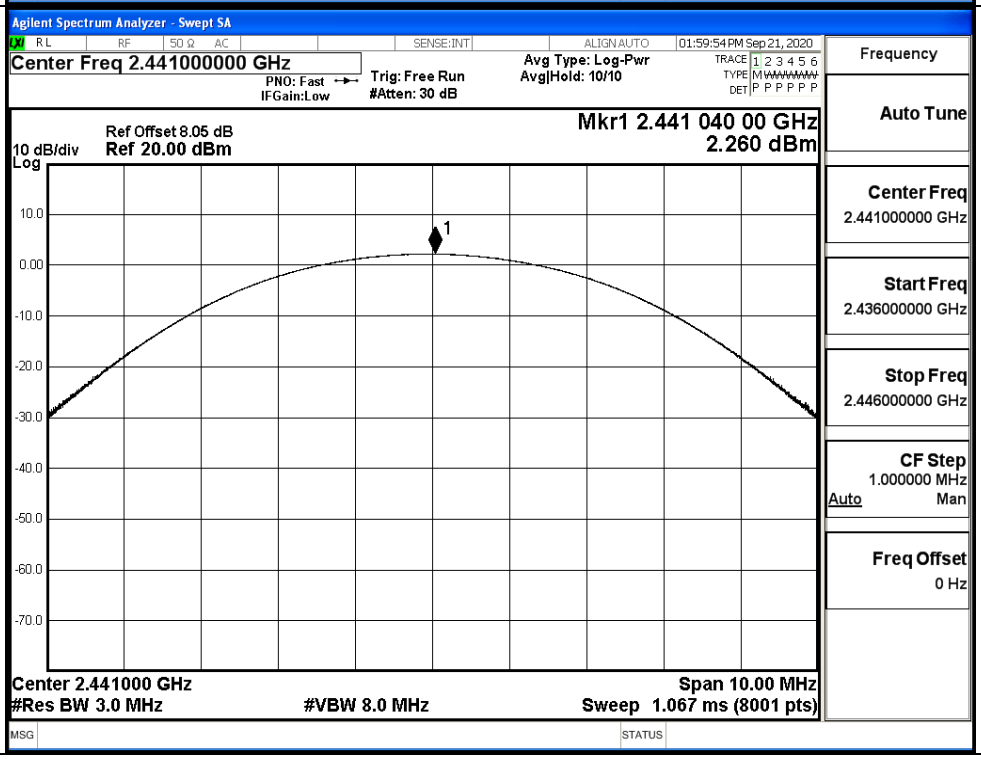
Product Name: Total station
Trade Mark: SOUTH, KOLIDA, SANDING, RUIDE, TIANYU
Test Model: NAVI STATION

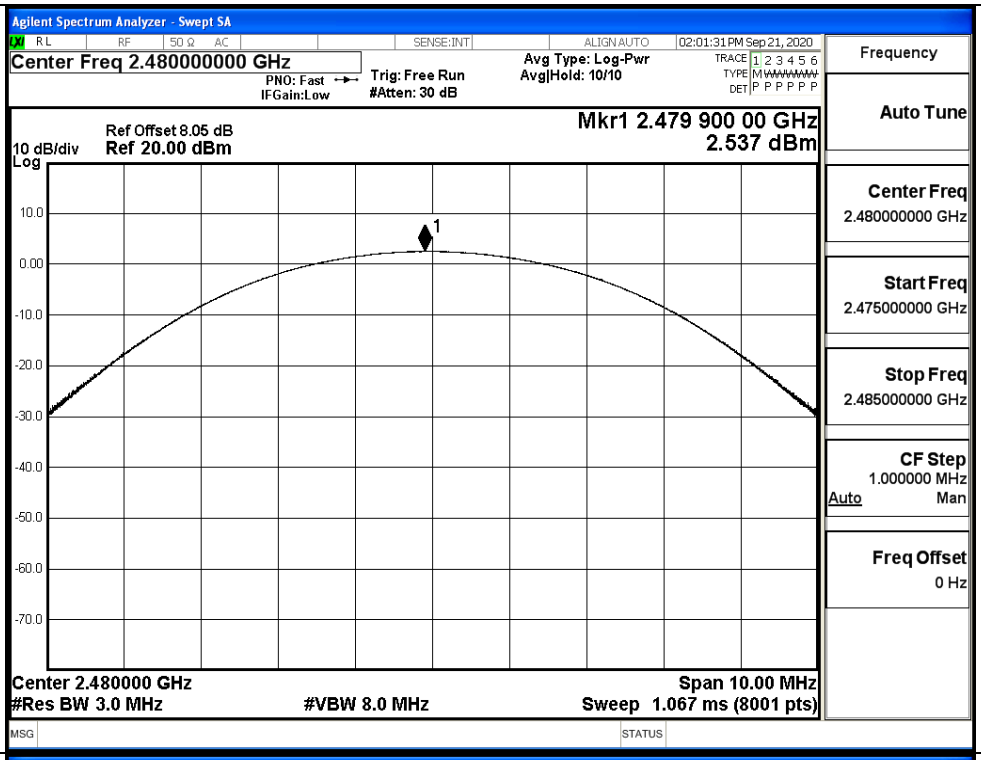
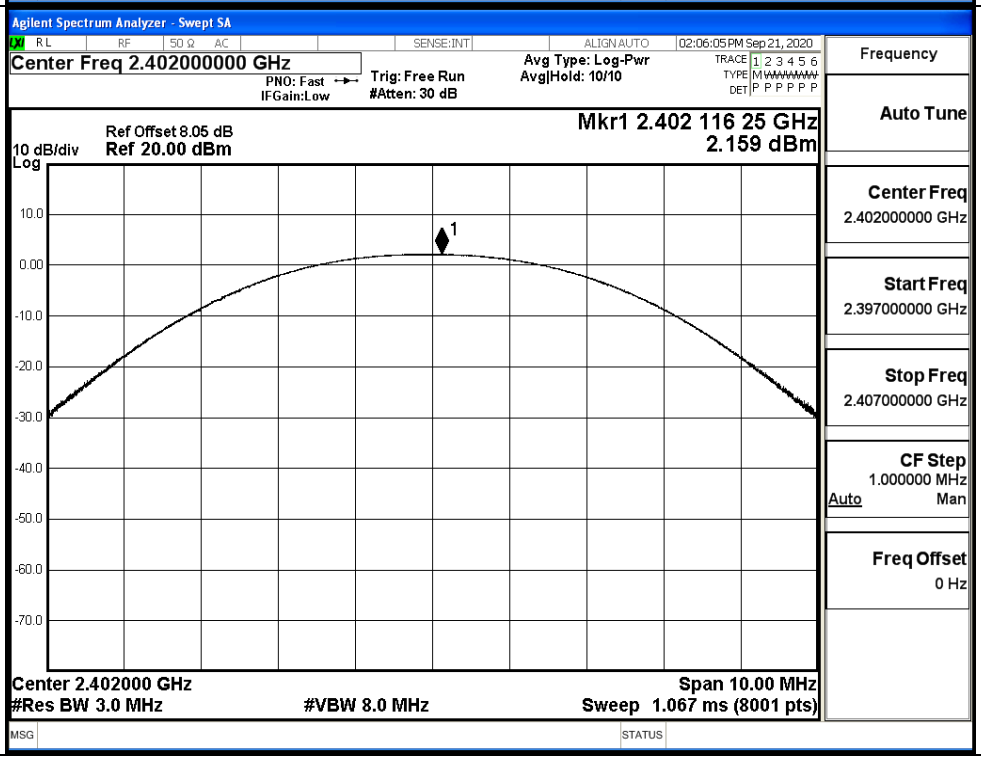
Environmental Conditions

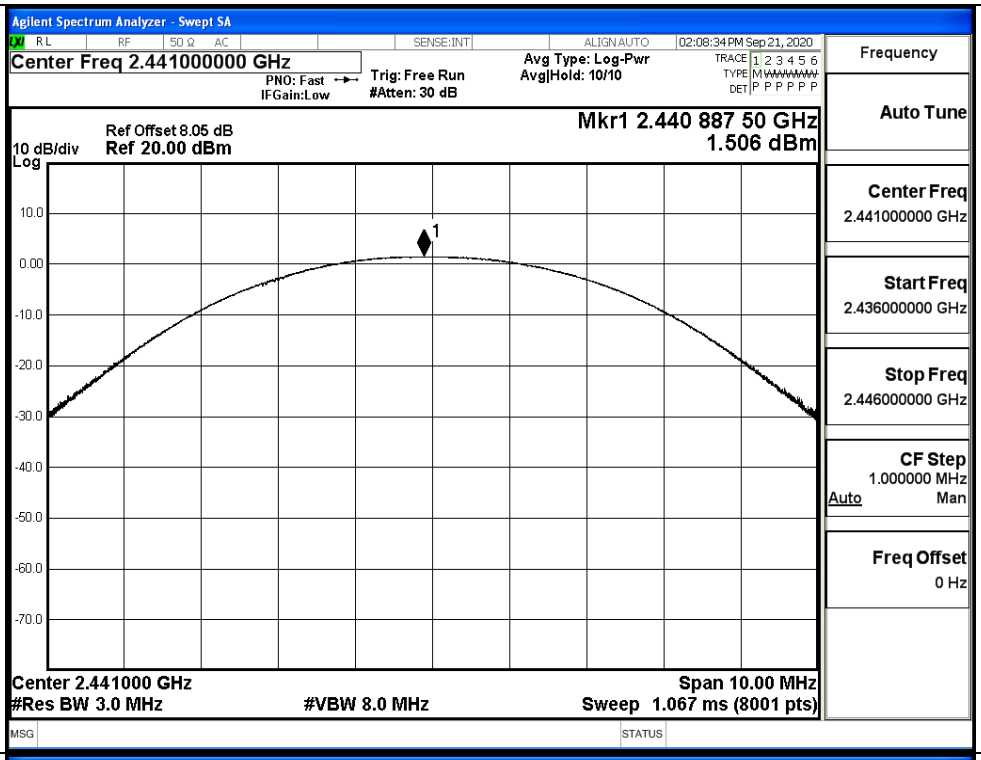
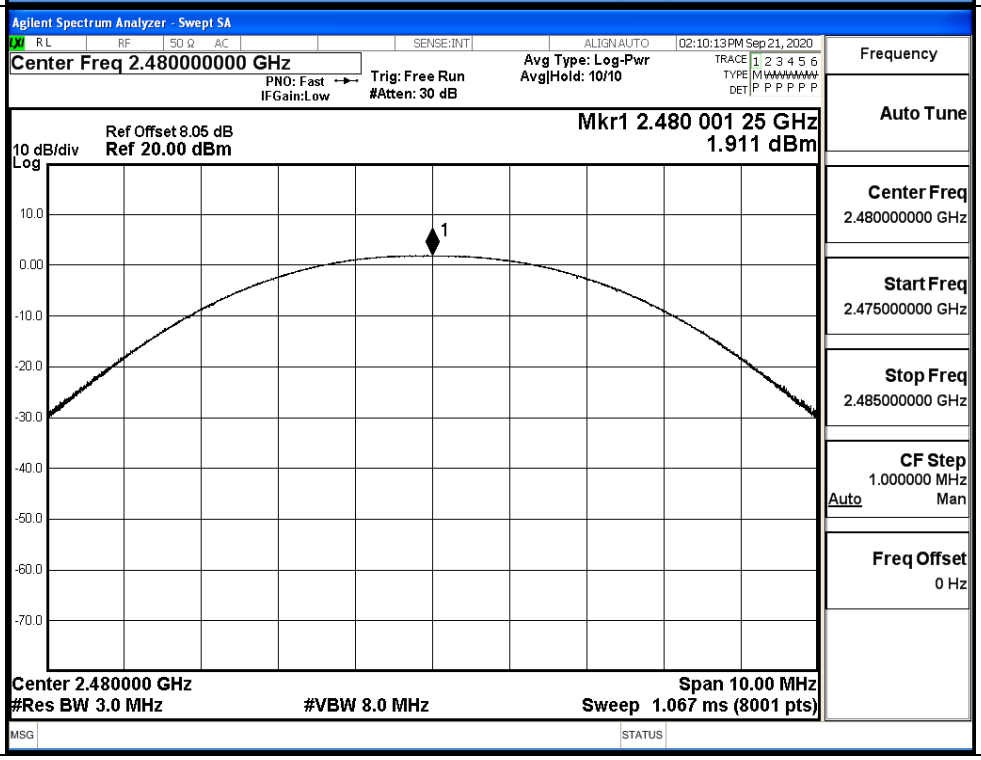
Temperature:	22.3°C
Relative Humidity:	52.8%
ATM Pressure:	100.0 kPa
Test Engineer:	Jay Li
Supervised by:	Li Huan

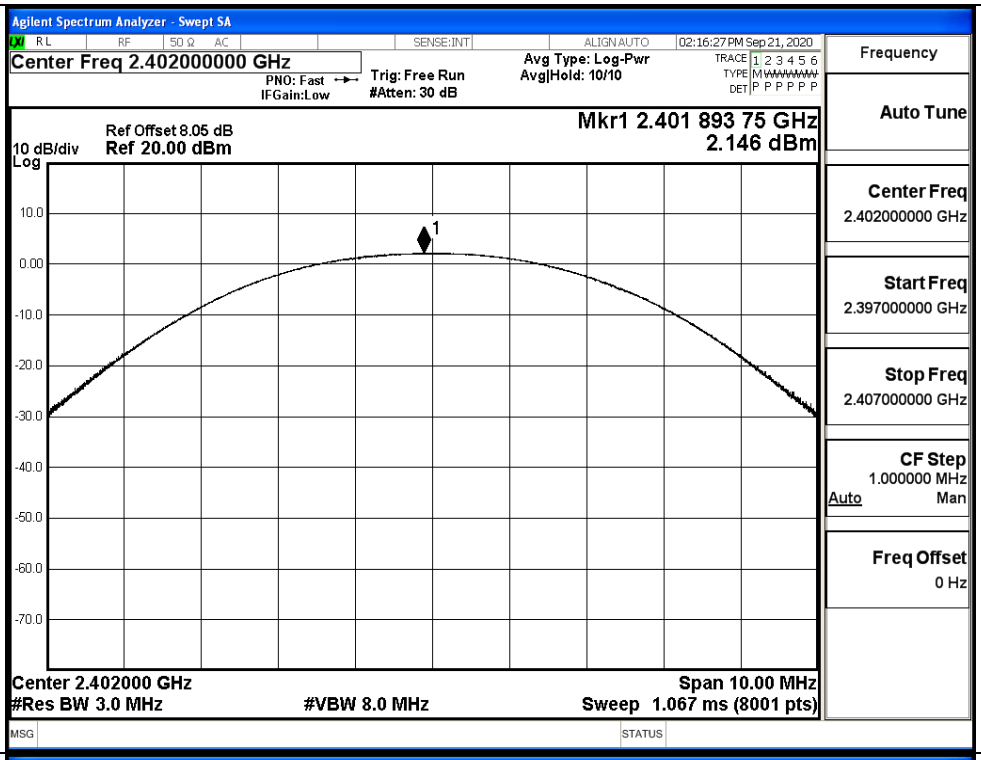
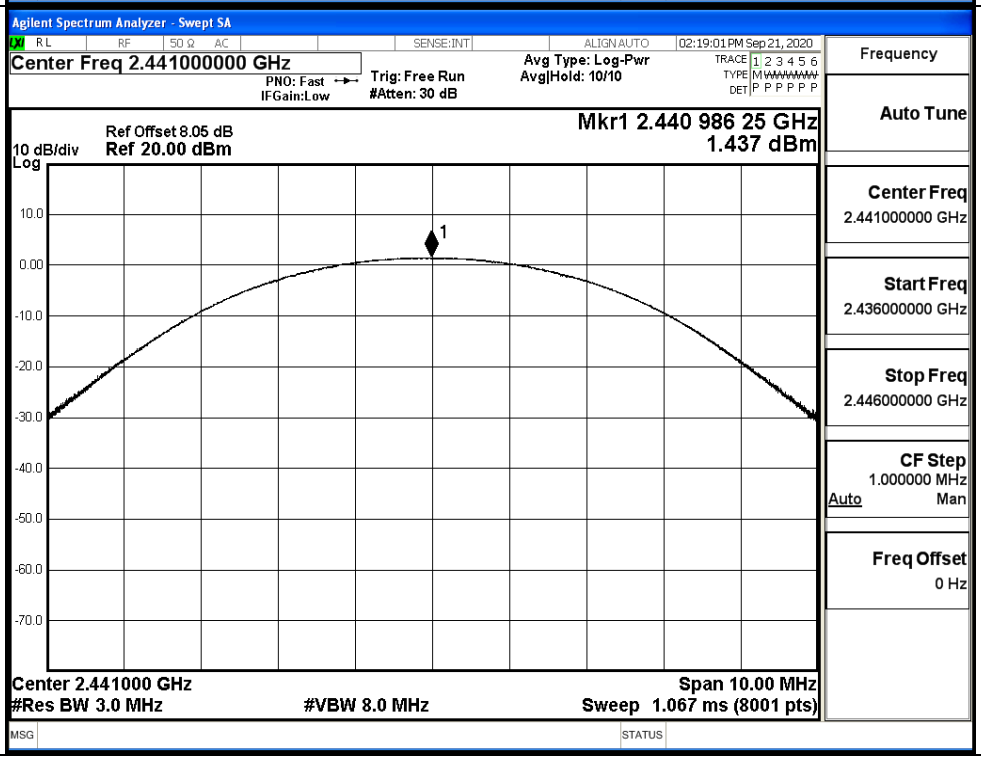
A.1 Maximum Conducted Peak Output Power

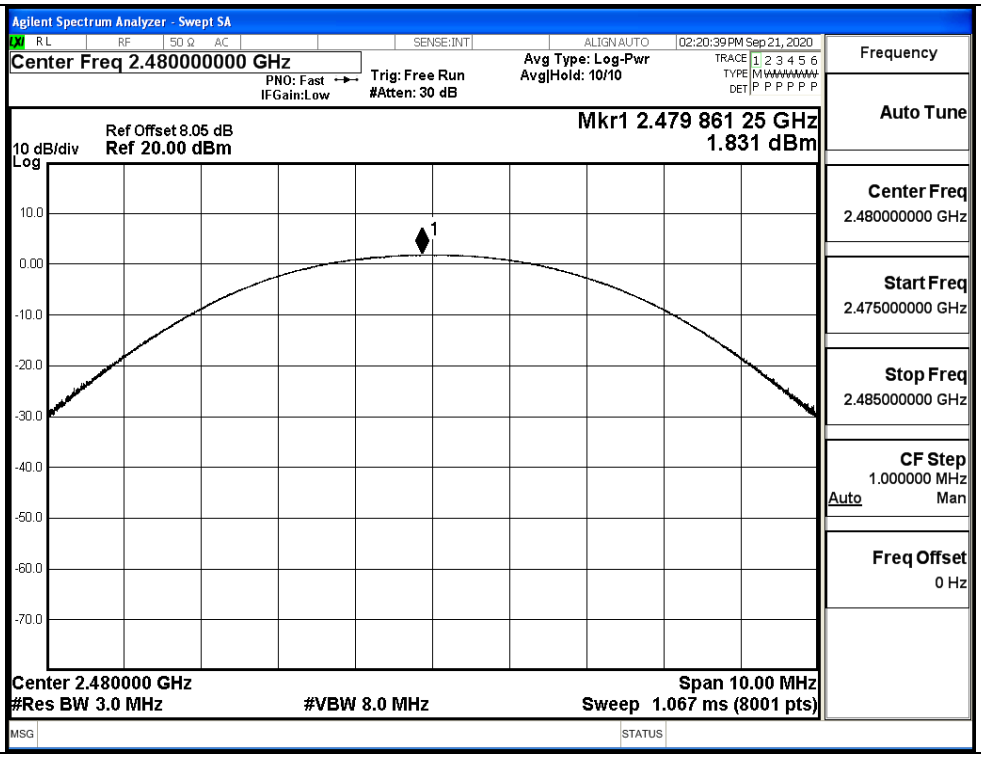
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2.805	21	PASS
	MCH	2.260	21	PASS
	HCH	2.537	21	PASS
π/4DQPSK	LCH	2.159	21	PASS
	MCH	1.506	21	PASS
	HCH	1.911	21	PASS
8DPSK	LCH	2.146	21	PASS
	MCH	1.437	21	PASS
	HCH	1.831	21	PASS

Test Graphs		
GFSK/LCH		
GFSK/MCH		

GFSK/HCH		
π/4DQPSK/LCH		

π/4DQPSK/MCH		
π/4DQPSK/HCH		

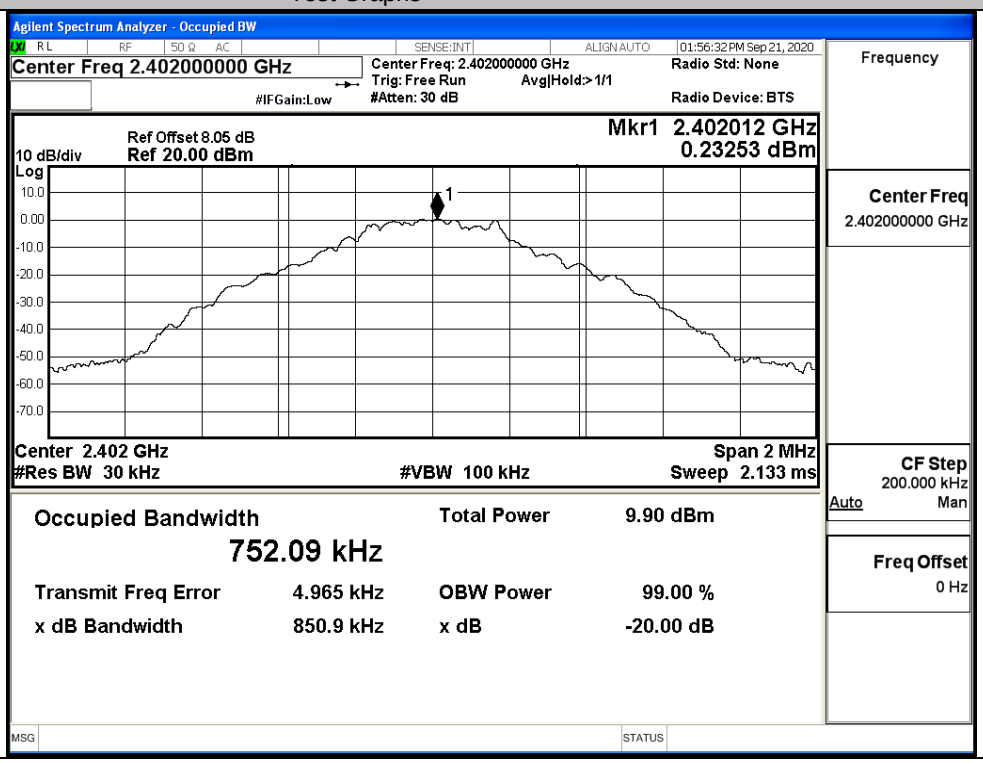
8DPSK/LCH	
8DPSK/MCH	

8DPSK/HCH		

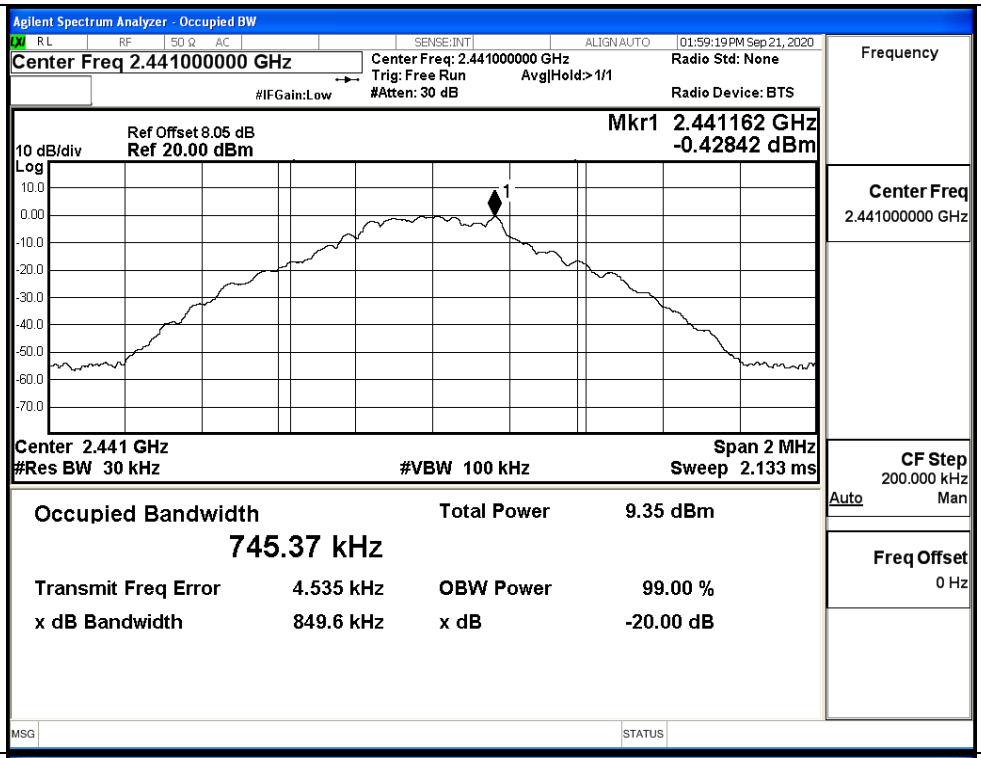
Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
02:20:39 PM Sep 21, 2020
Ref Offset 8.05 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.479 861 25 GHz
1.831 dBm
Center 2.480000 GHz
#Res BW 3.0 MHz
#VBW 8.0 MHz
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 20dB Bandwidth

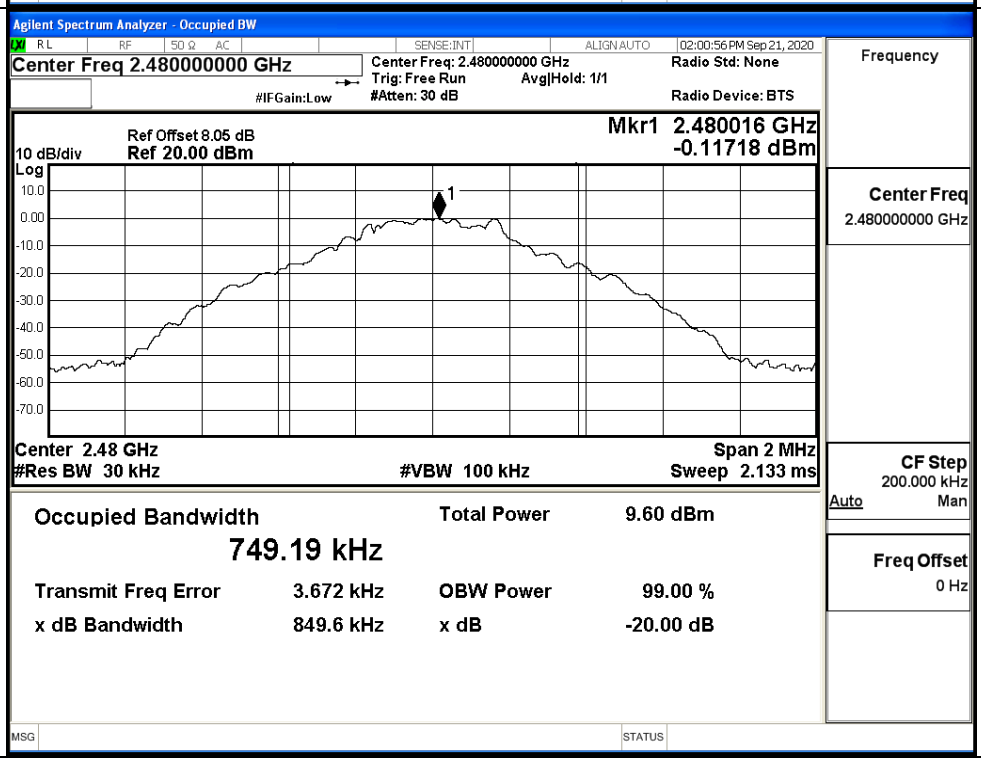
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.8509	Not Specified	PASS
	MCH	0.8496	Not Specified	PASS
	HCH	0.8496	Not Specified	PASS
π/4DQPSK	LCH	1.269	Not Specified	PASS
	MCH	1.268	Not Specified	PASS
	HCH	1.266	Not Specified	PASS
8DPSK	LCH	1.272	Not Specified	PASS
	MCH	1.274	Not Specified	PASS
	HCH	1.267	Not Specified	PASS

Test Graphs		
GFSK/LCH		

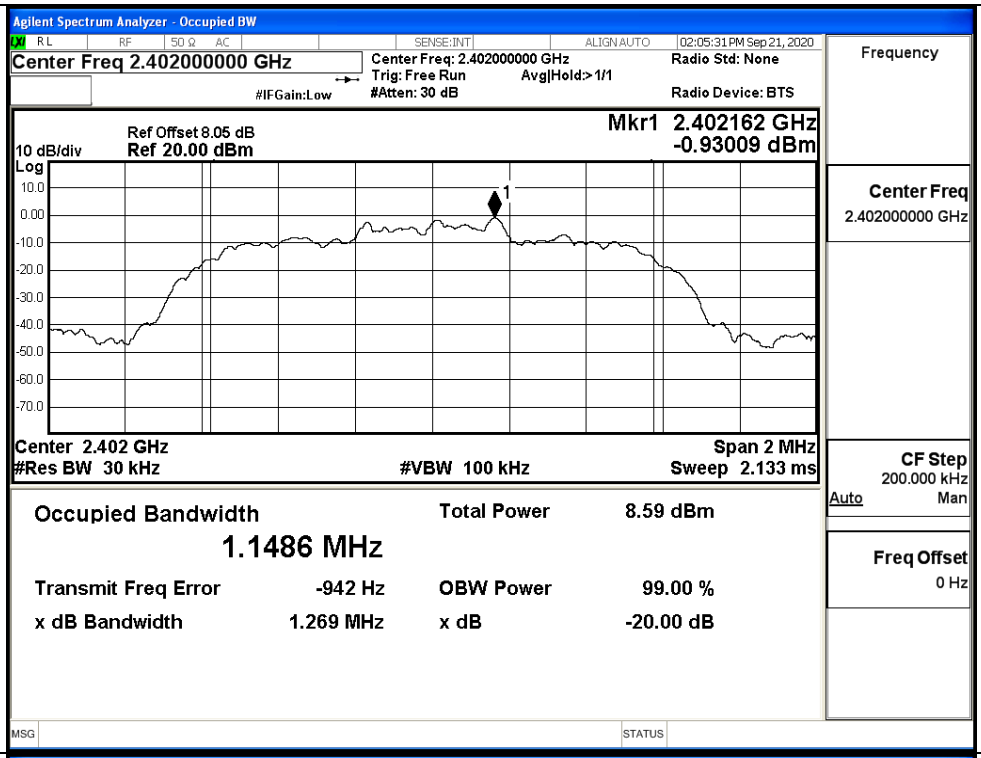
GFSK/MCH



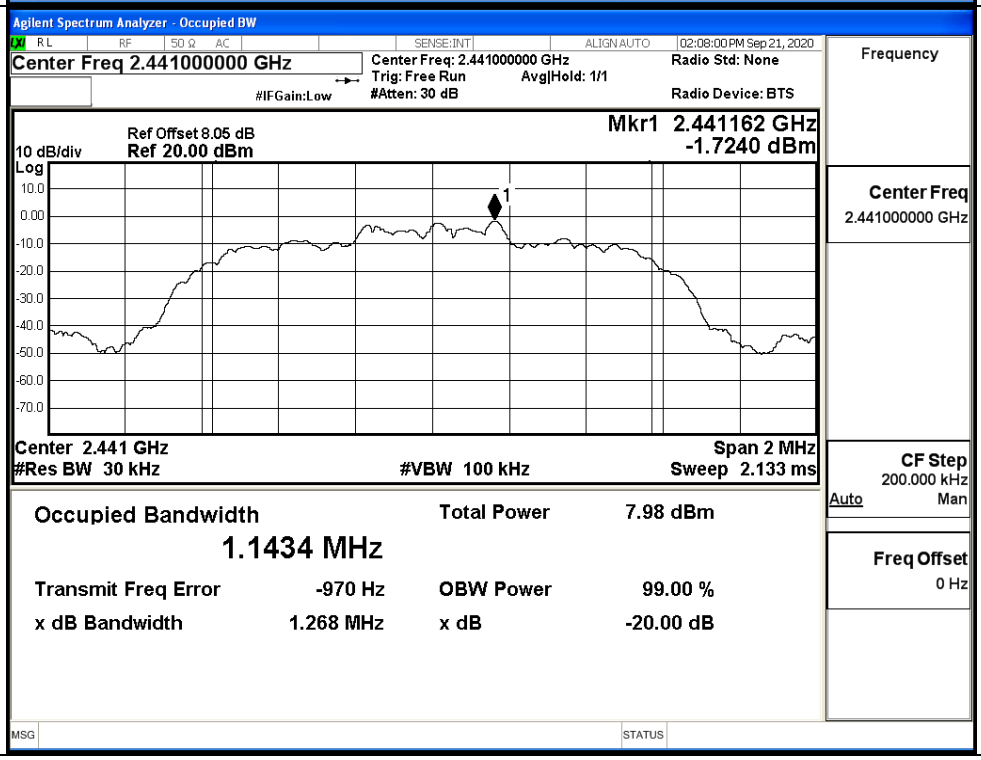
GFSK/HCH



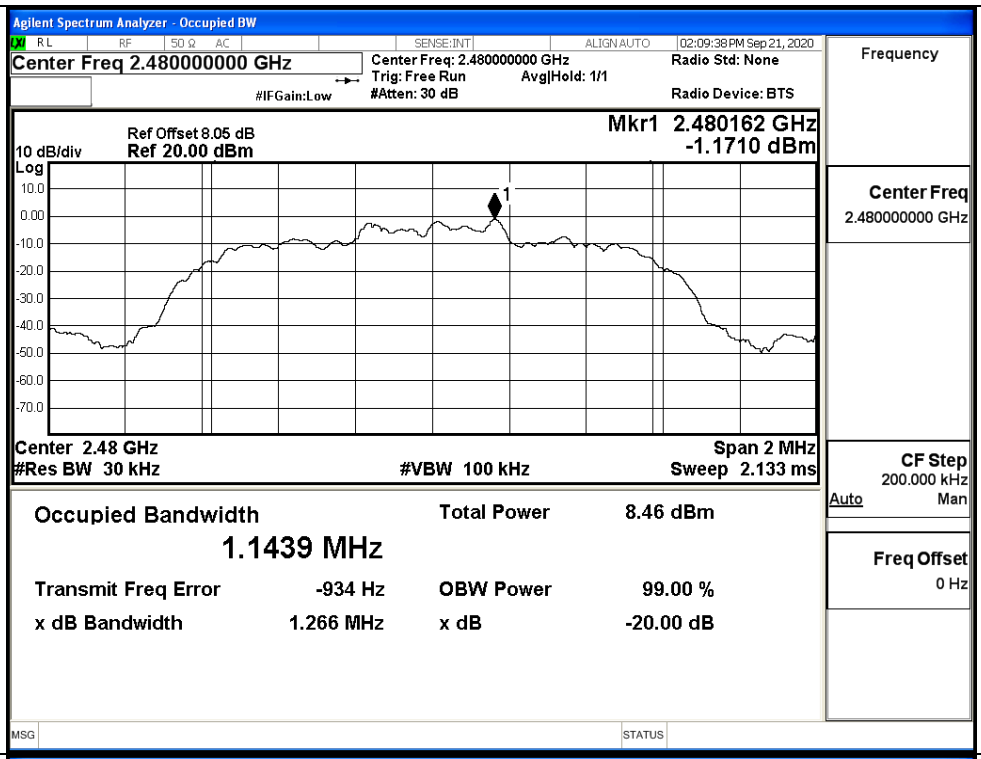
π/4DQPSK/LCH



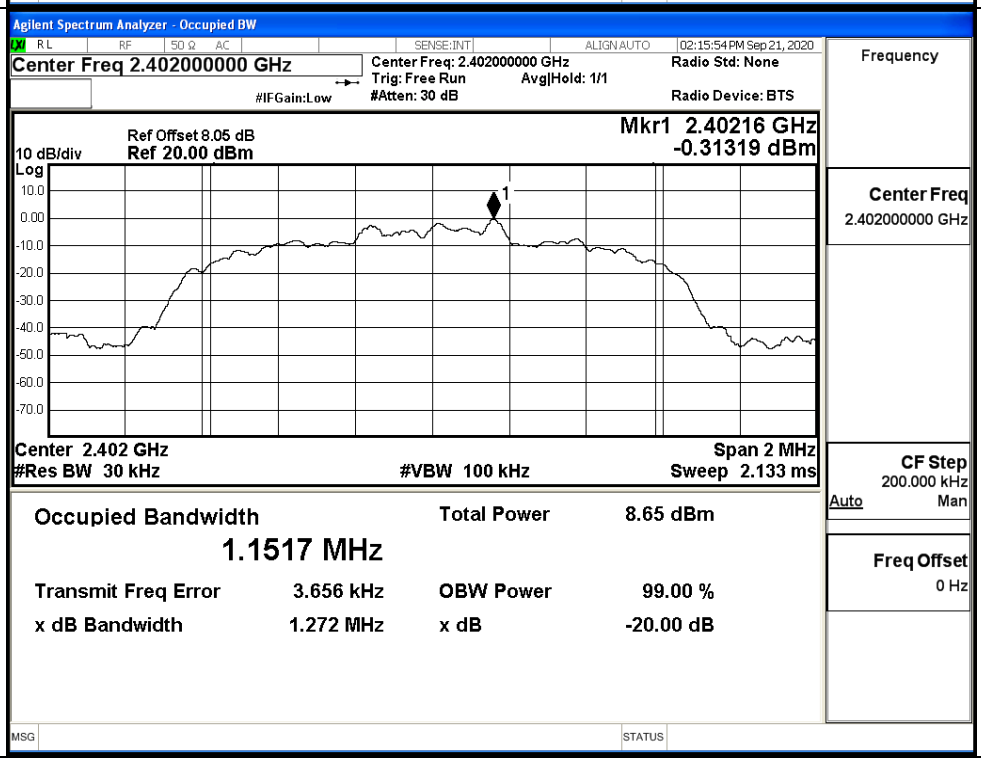
π/4DQPSK/MCH



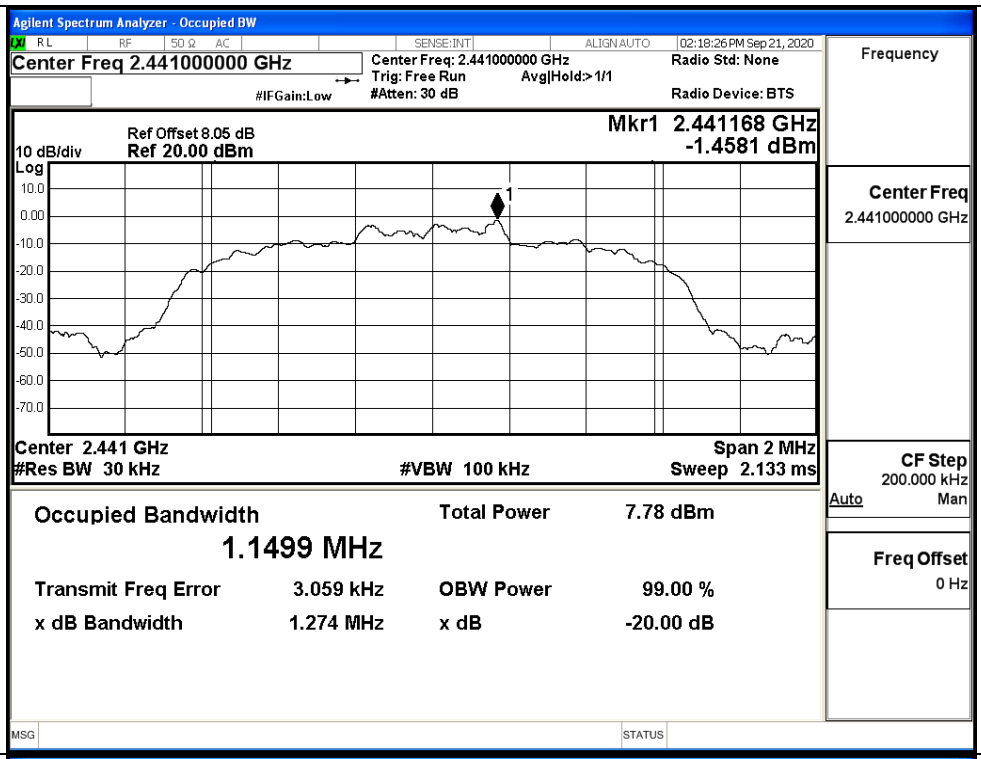
π/4DQPSK/HCH



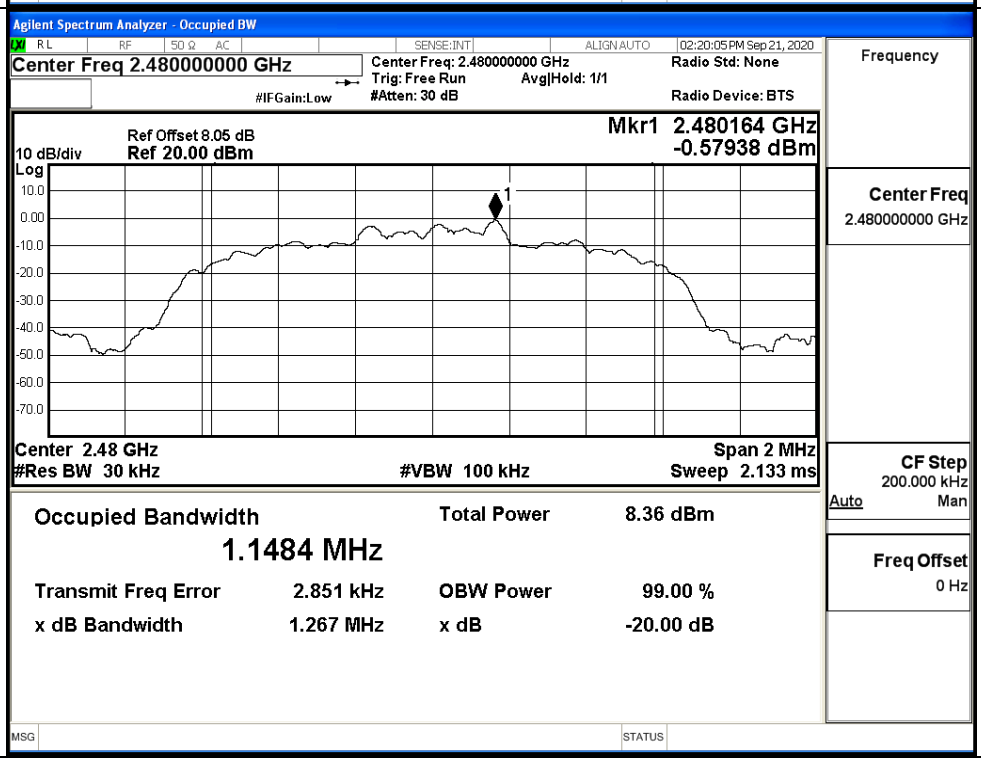
8DPSK/LCH



8DPSK/MCH

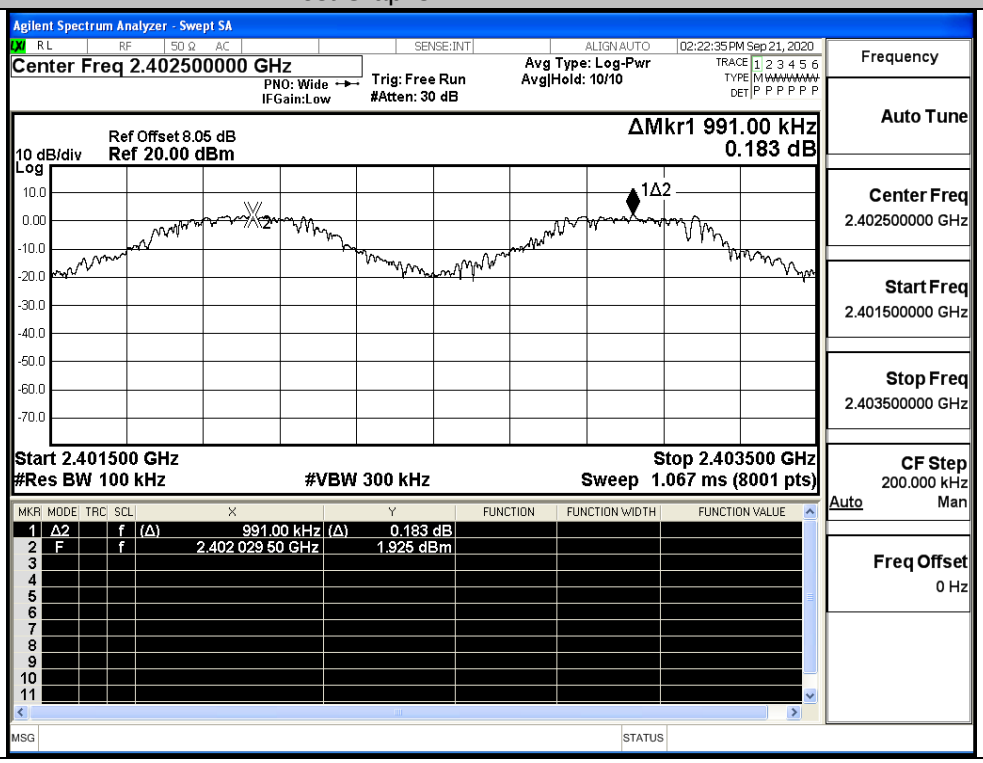


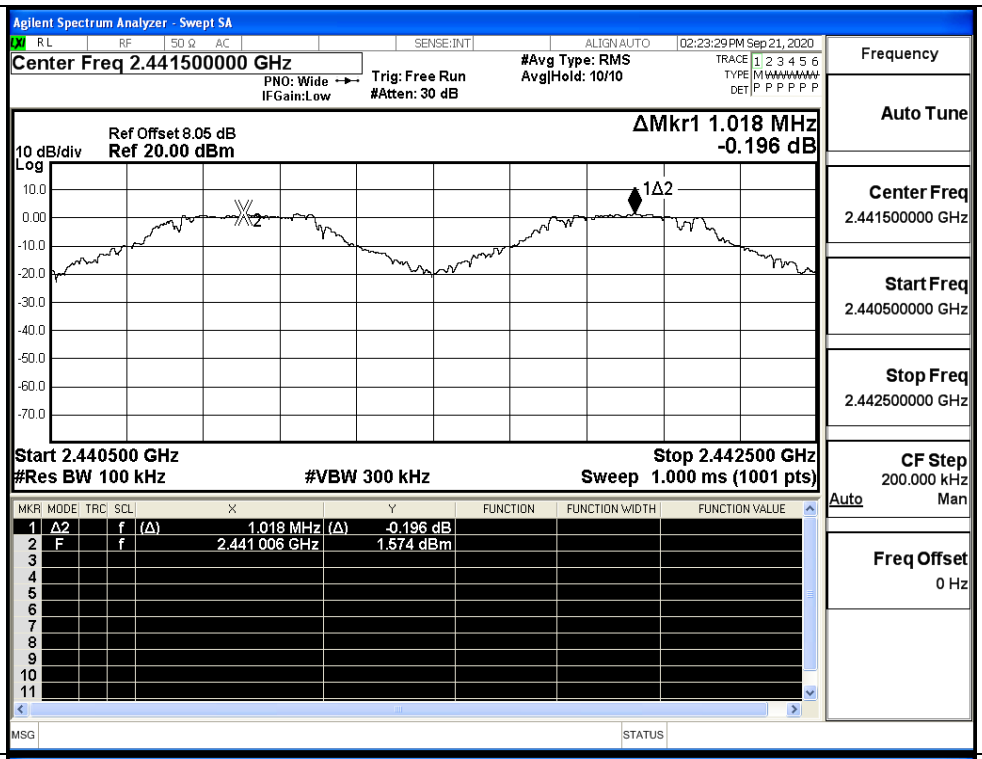
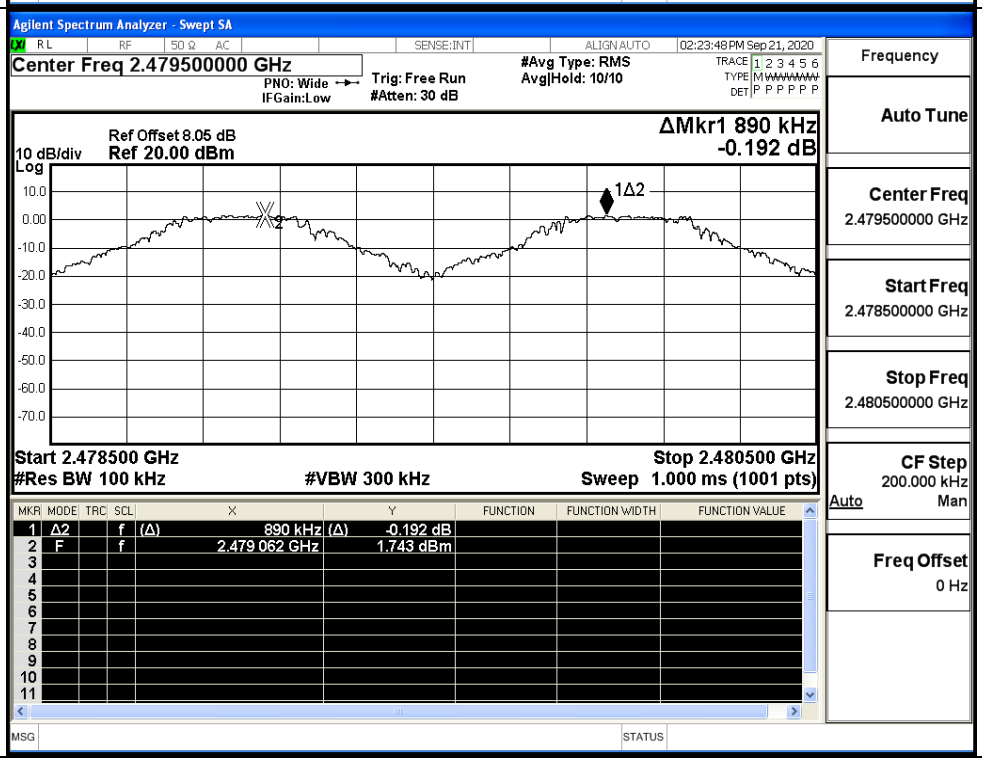
8DPSK/HCH



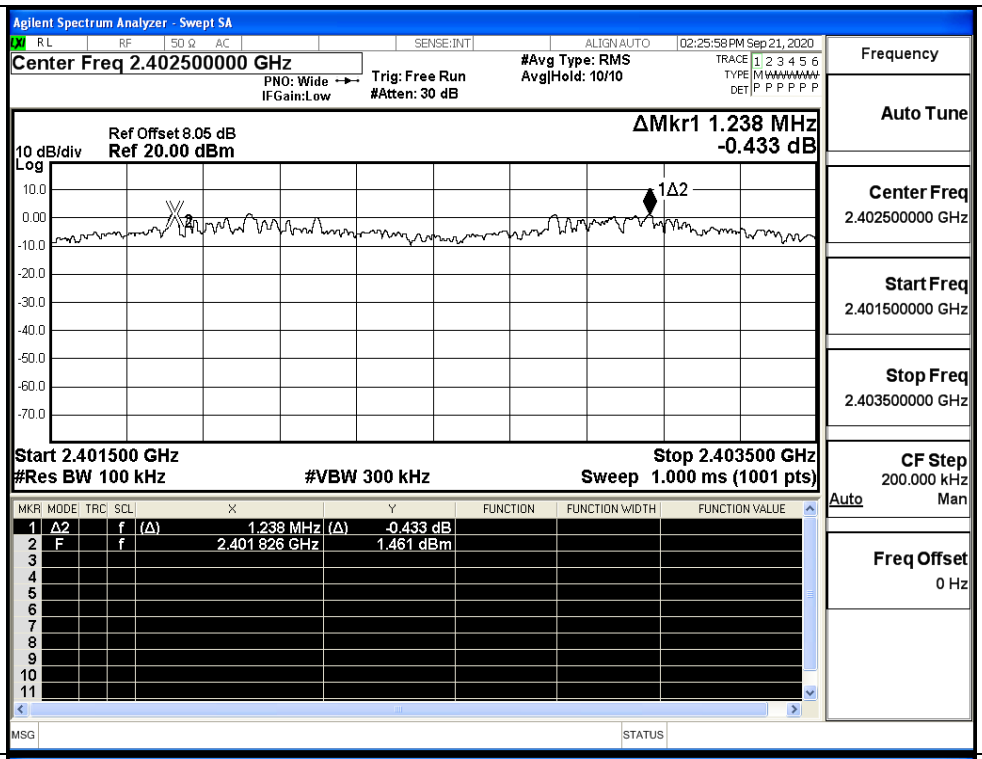
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.991	0.567	PASS
	MCH	1.018	0.567	PASS
	HCH	0.890	0.567	PASS
π/4DQPSK	LCH	1.238	0.846	PASS
	MCH	1.236	0.846	PASS
	HCH	1.068	0.846	PASS
8DPSK	LCH	1.110	0.849	PASS
	MCH	1.000	0.849	PASS
	HCH	0.894	0.849	PASS

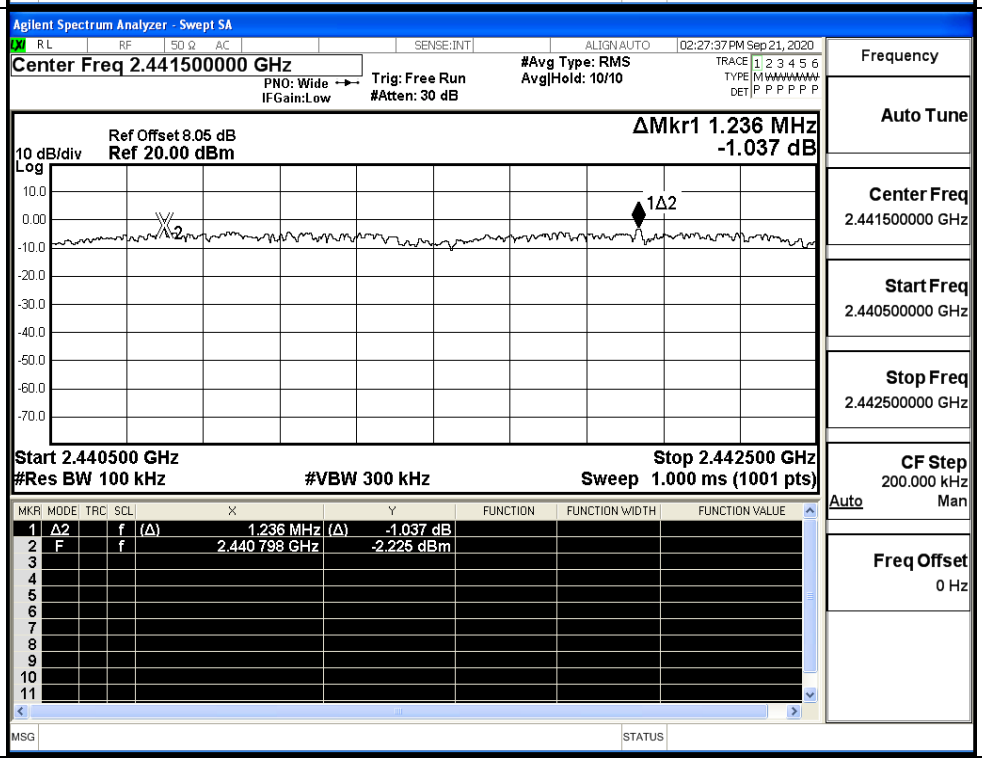
Test Graphs		
GFSK/LCH		

GFSK/MCH		
GFSK/HCH		

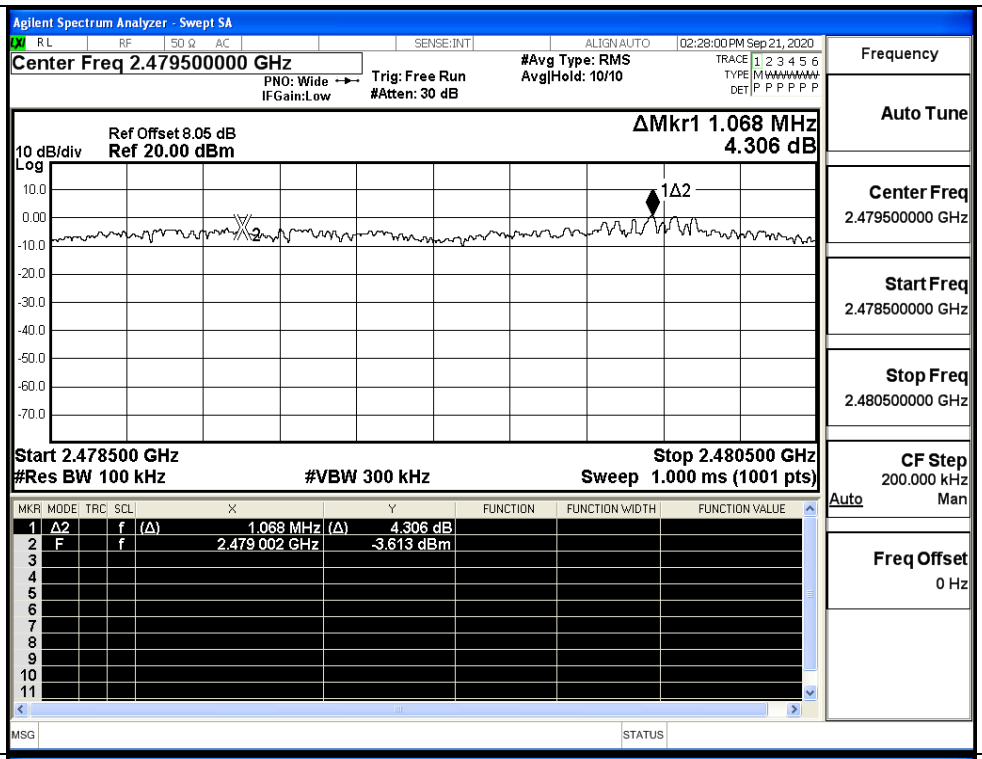
π/4DQPSK/LCH



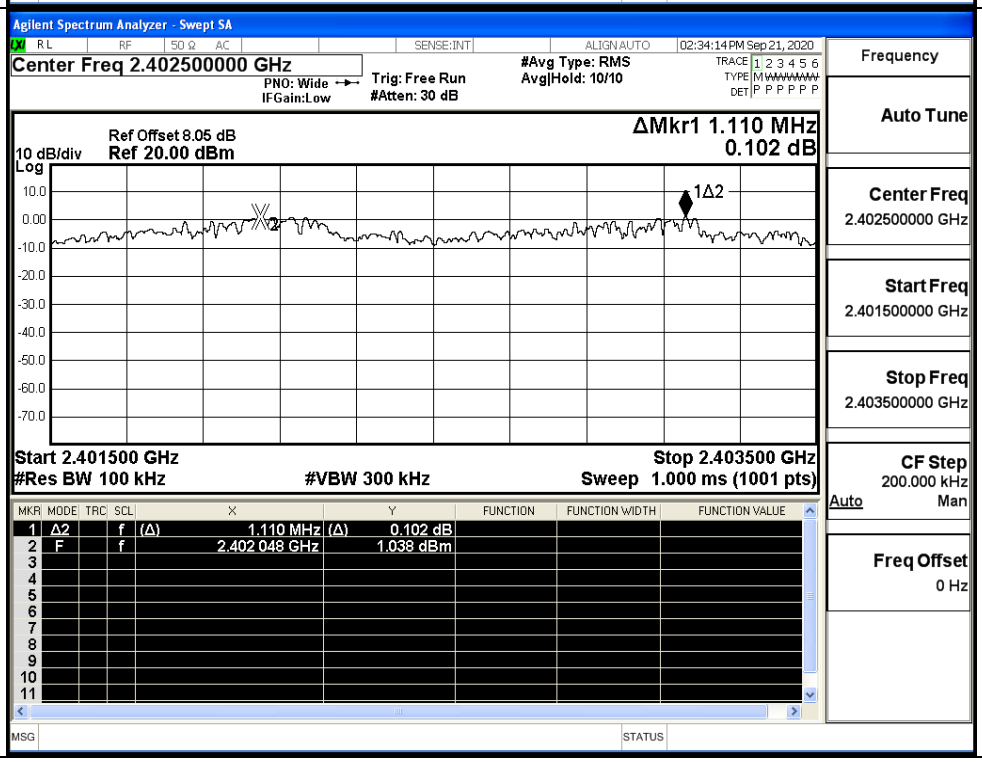
π/4DQPSK/MCH

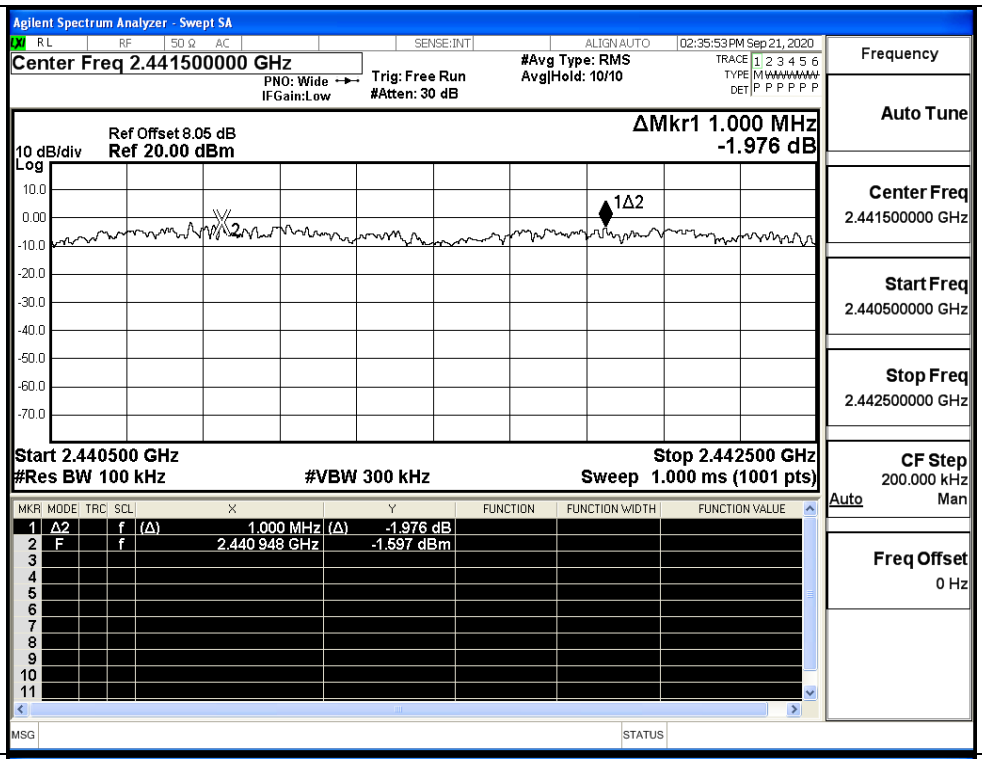
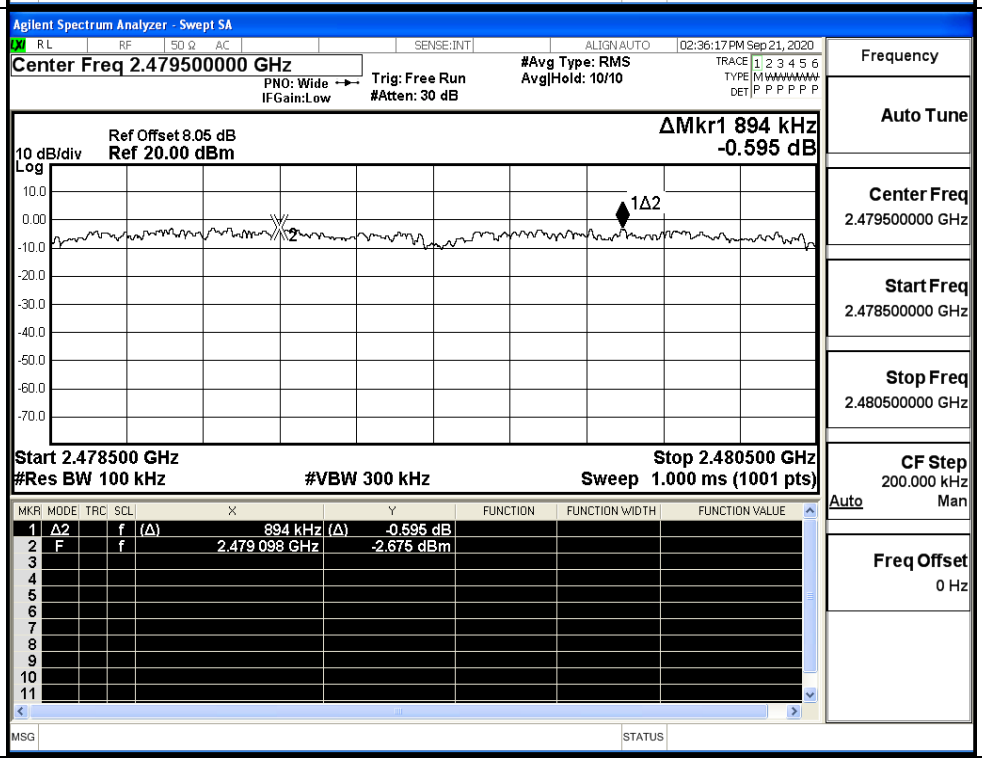


π/4DQPSK/HCH



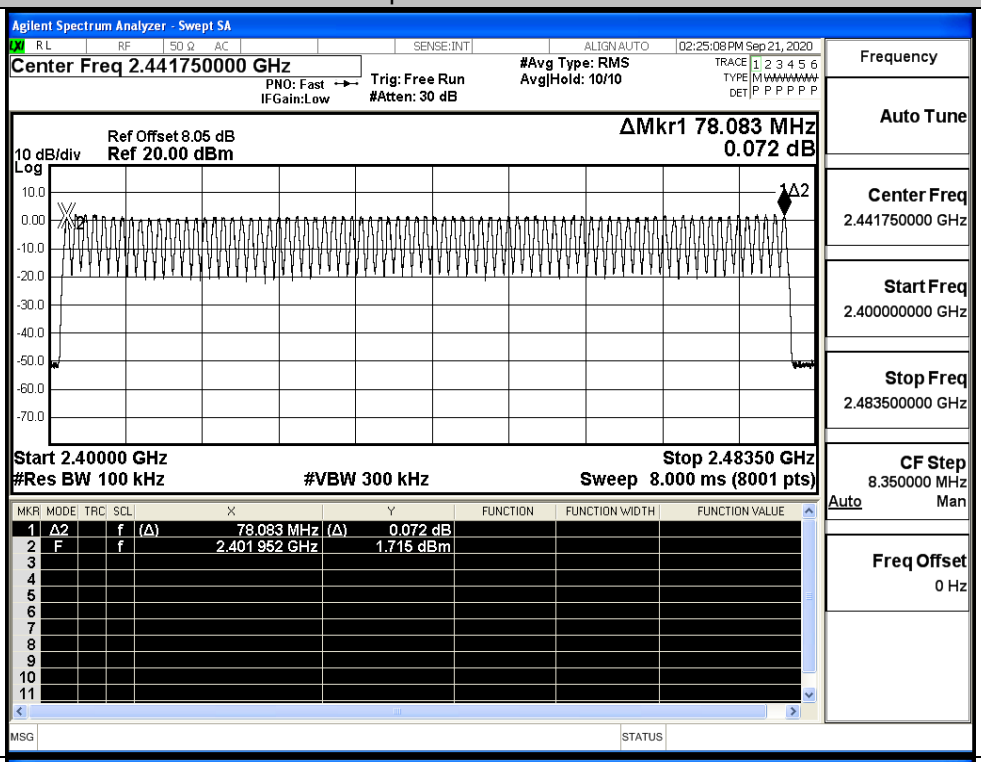
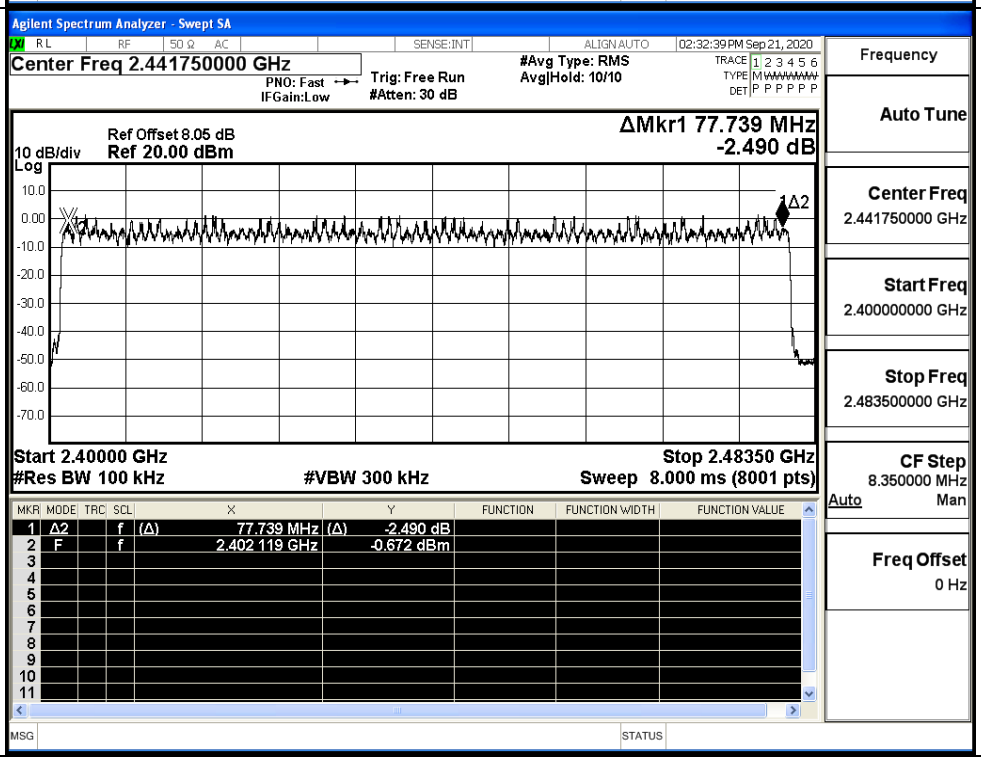
8DPSK/LCH

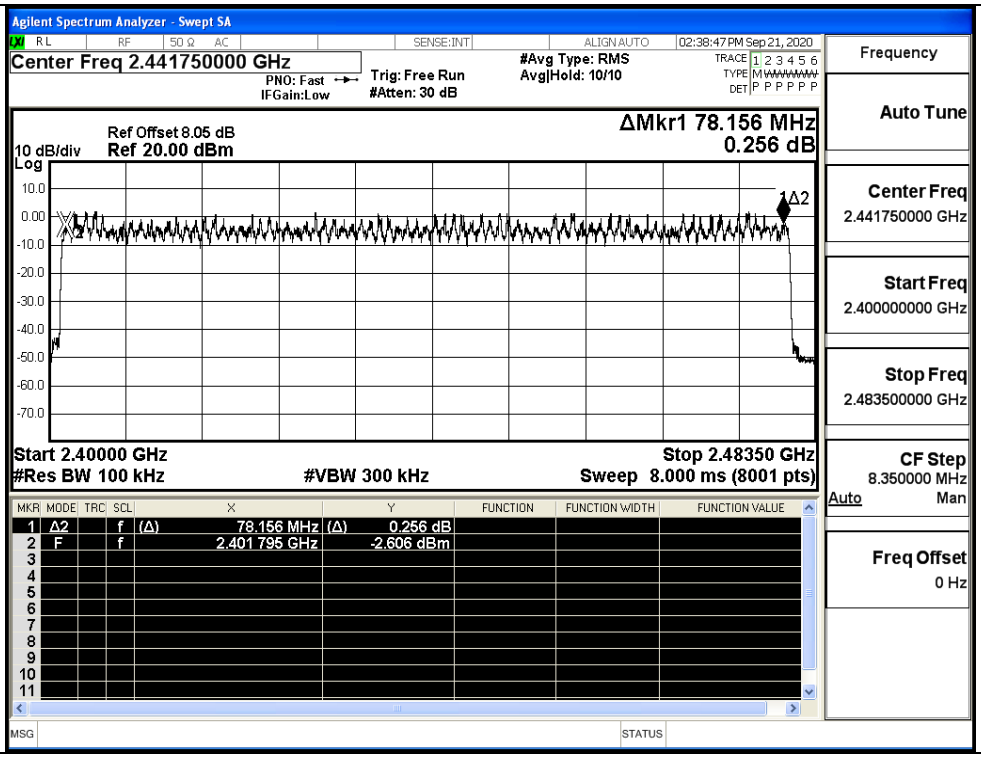


8DPSK/MCH		
8DPSK/HCH		

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

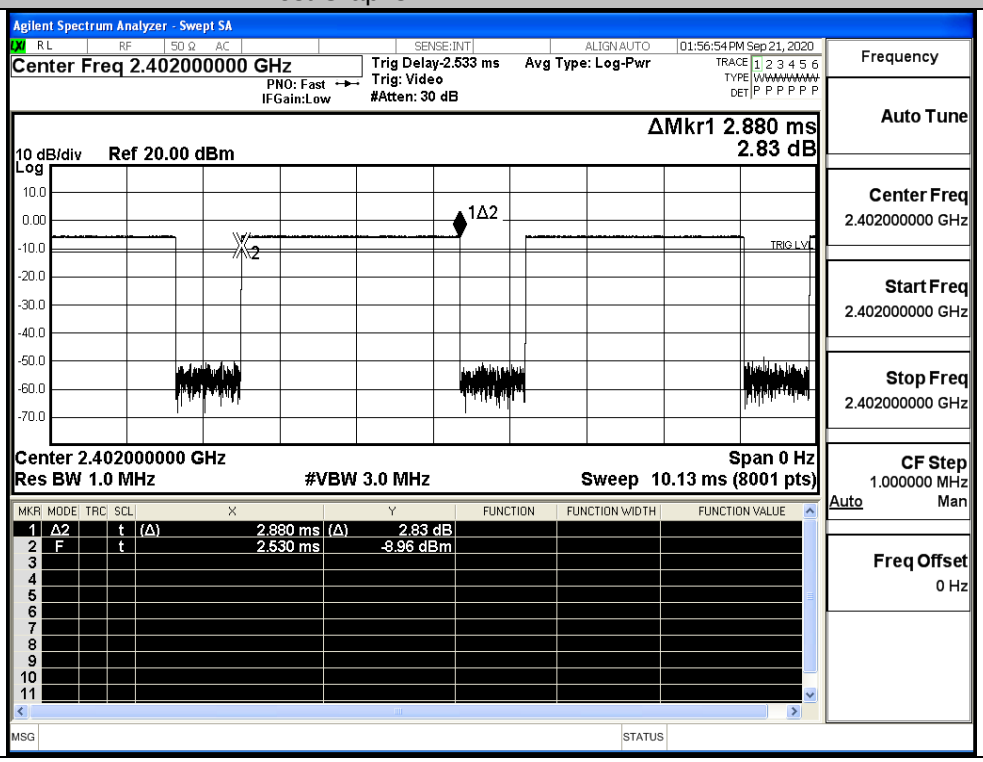
Test Graphs	
GFSK/Hop	
π/4DQPSK/Hop	

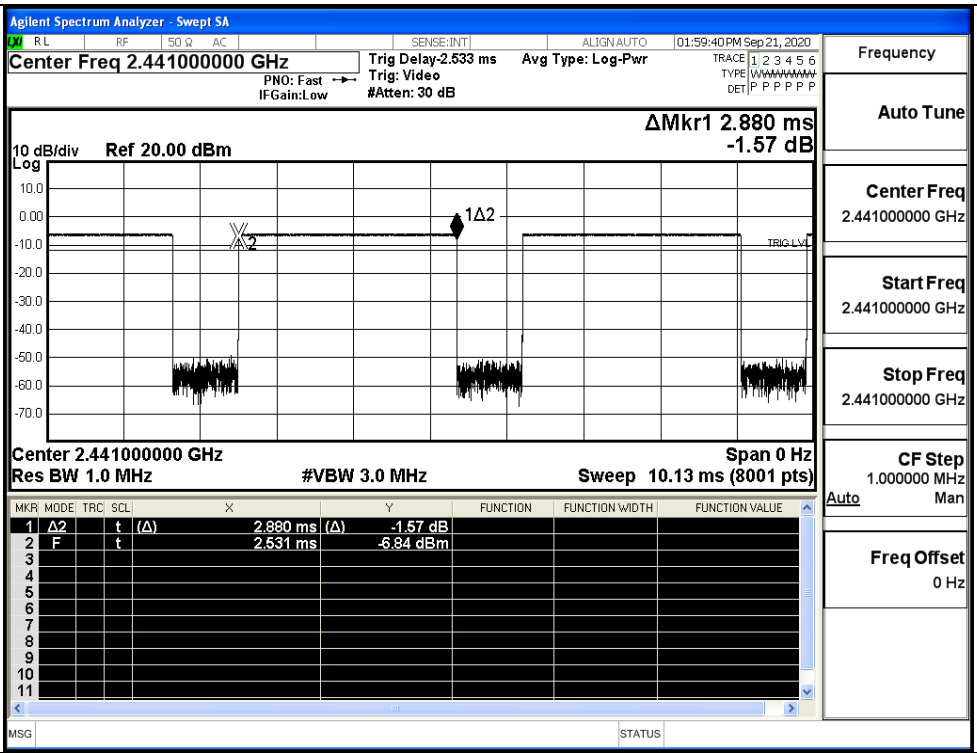
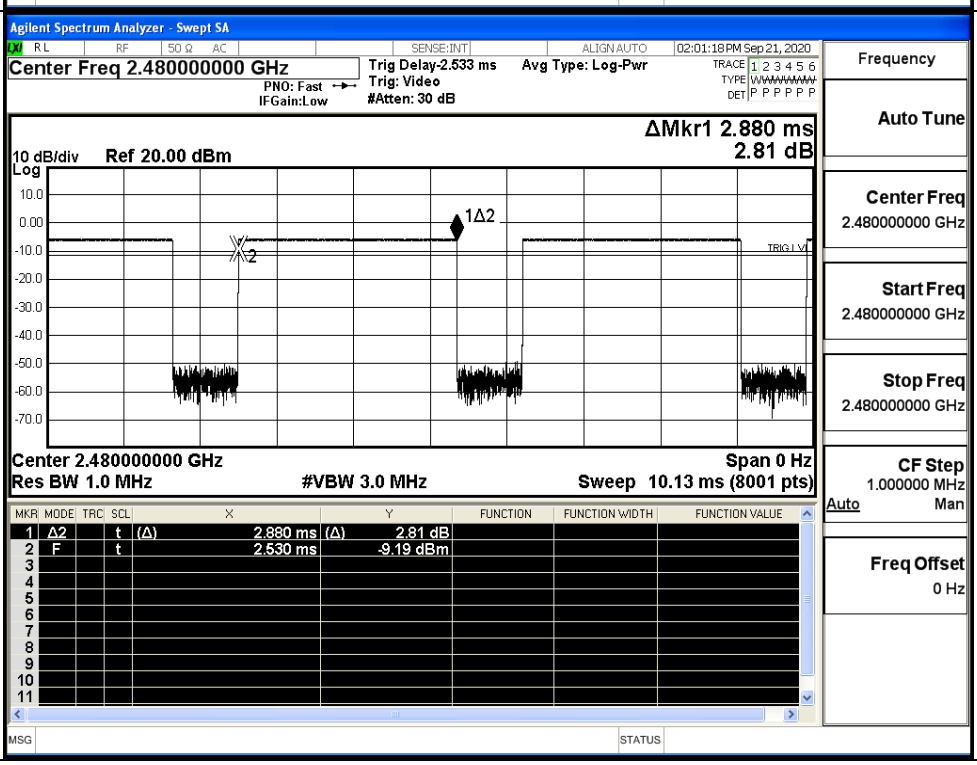
8DPSK/Hop		

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
02:38:47 PM Sep 21, 2020
Ref Offset 8.05 dB
10 dB/div
Ref 20.00 dBm
ΔMkr1 78.156 MHz
0.256 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) 78.156 MHz (Δ) 0.256 dB
2 F f 2.401 795 GHz -2.606 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

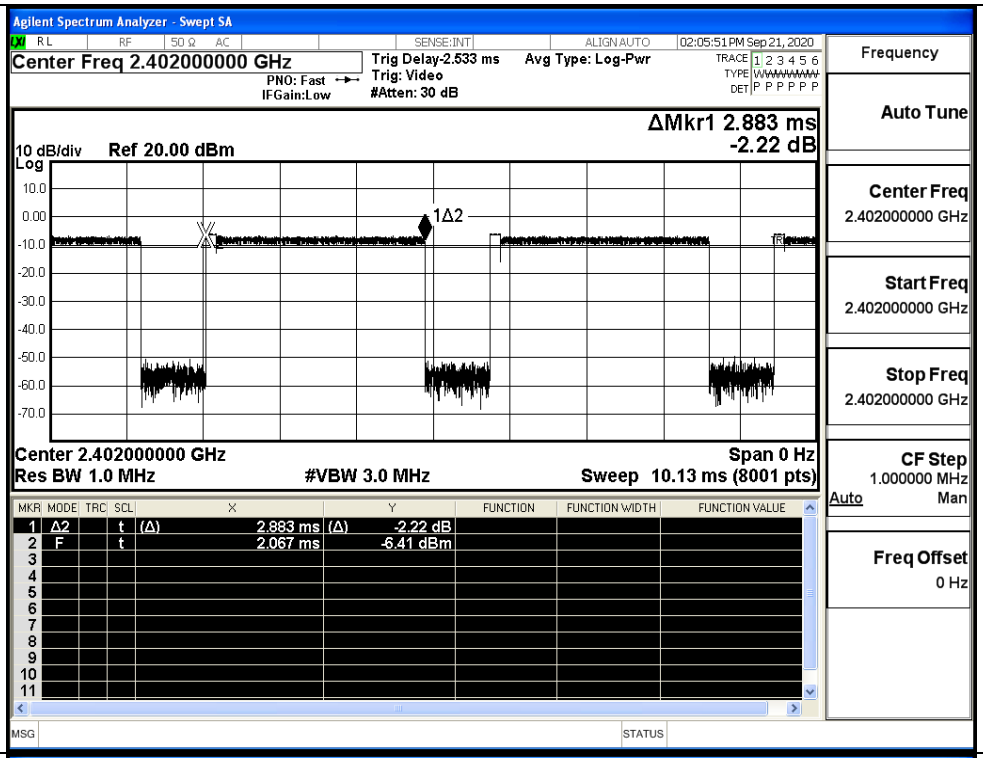
A.5 Dwell Time

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	2.88	106.7	0.308	0.4	PASS
	3DH5	MCH	2.88	106.7	0.308	0.4	PASS
	3DH5	HCH	2.88	106.7	0.308	0.4	PASS

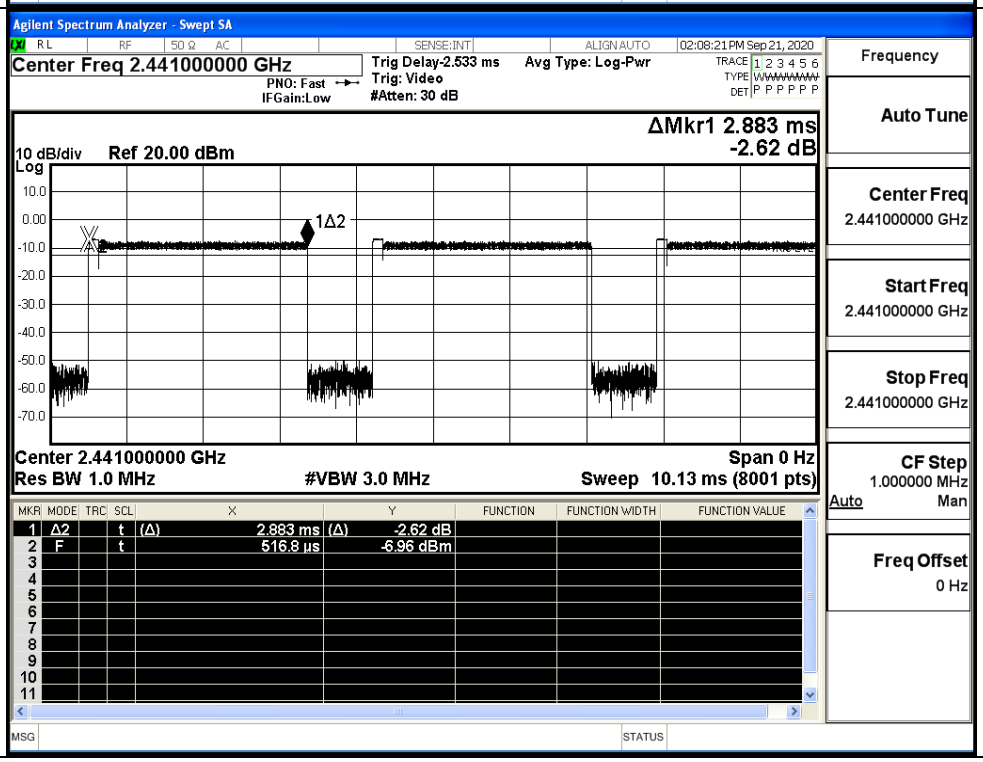
Test Graphs	
GFSK_DH5/LCH	

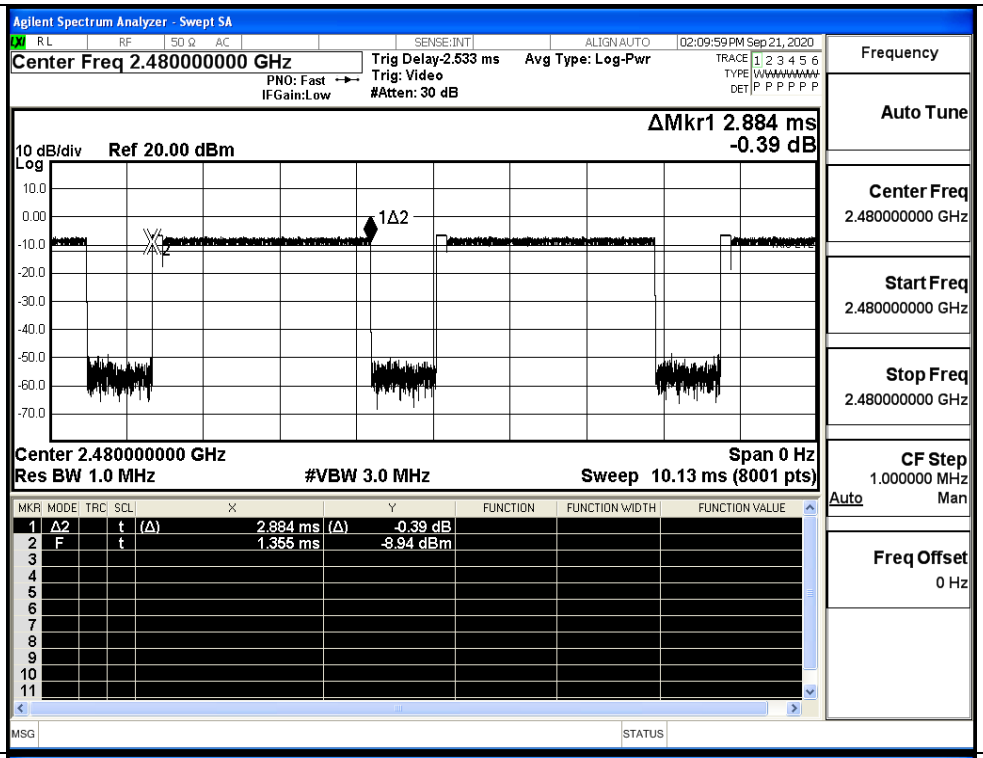
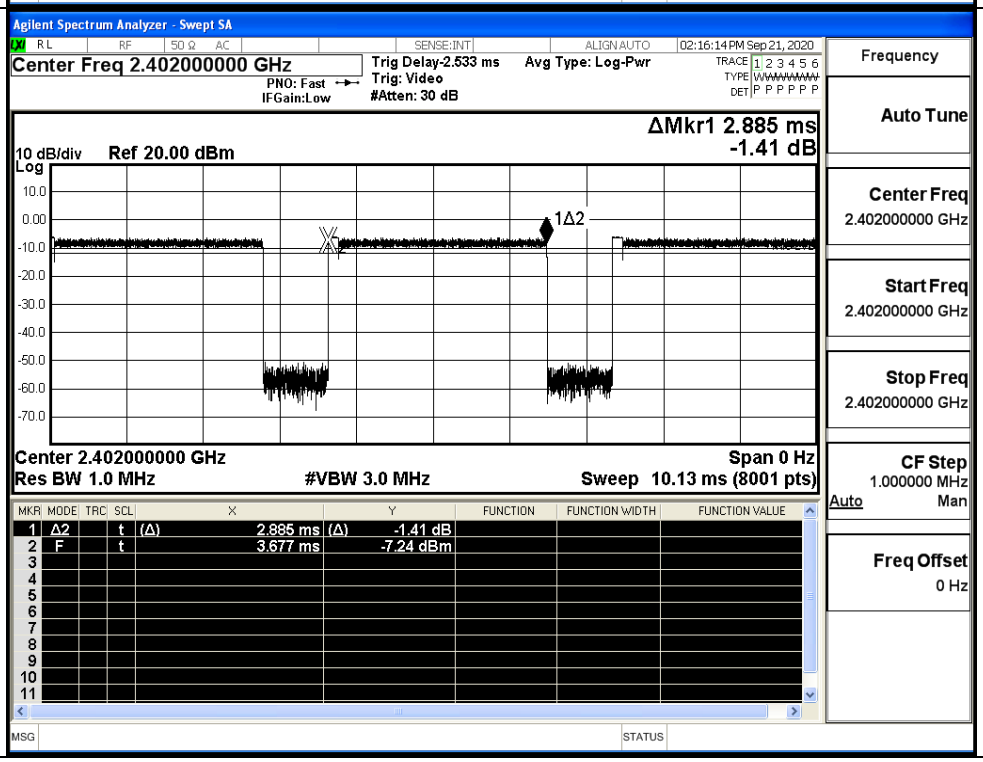
GFSK_DH5/MCH	
GFSK_DH5/HCH	

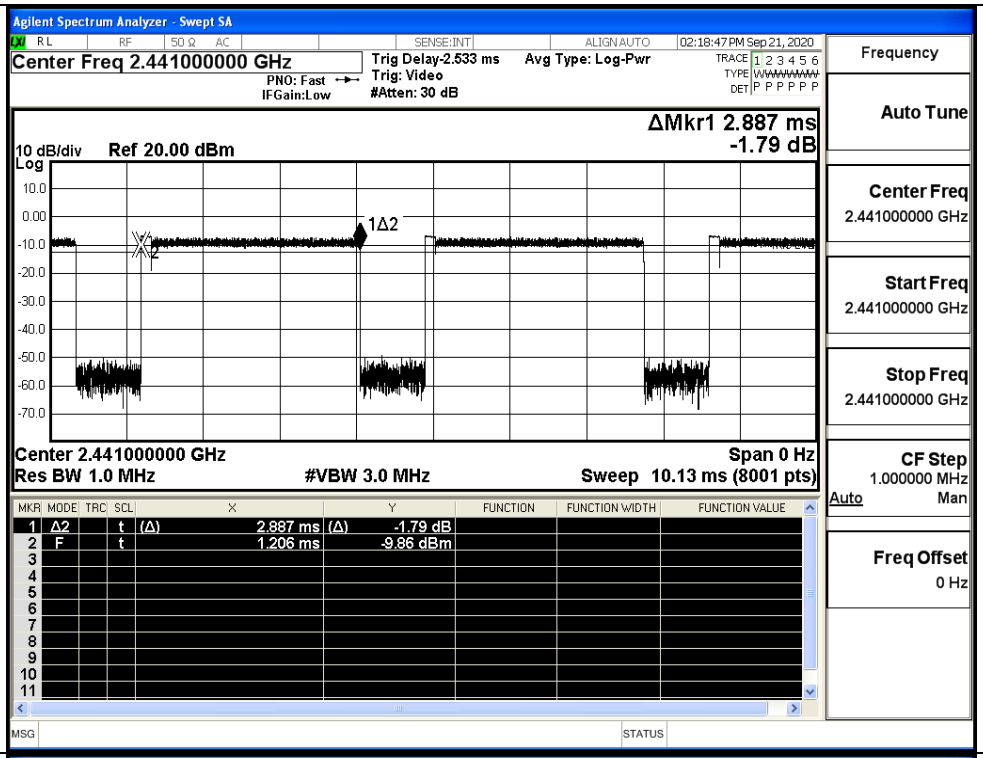
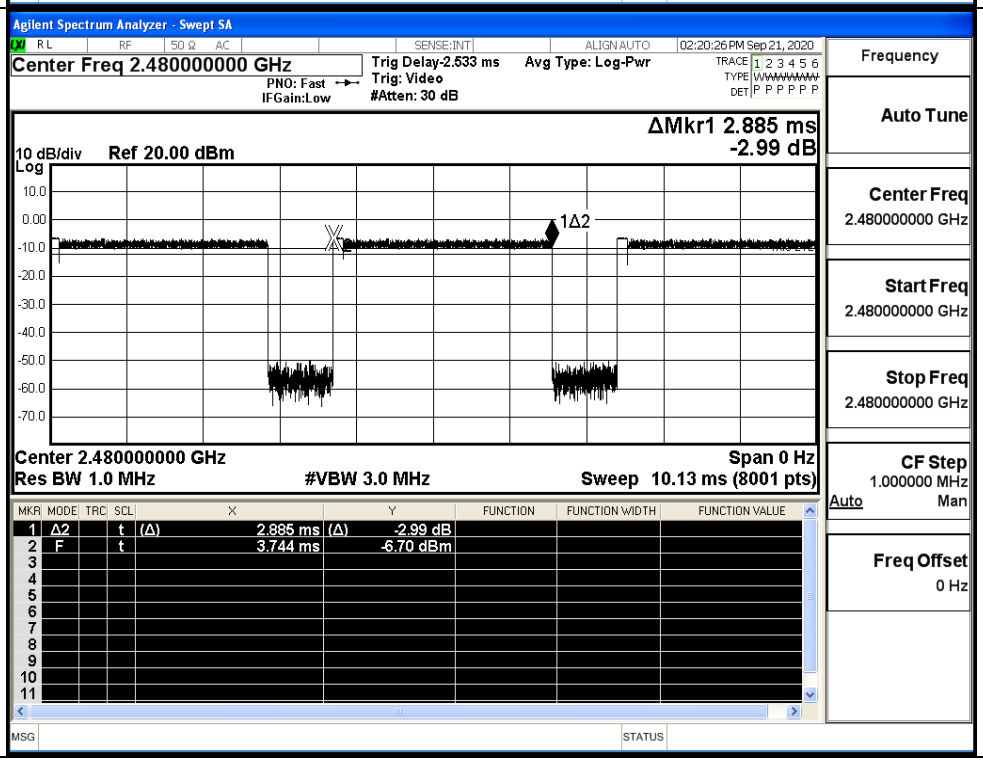
π/4DQPSK
_2DH5/LCH



π/4DQPSK
_2DH5/MCH

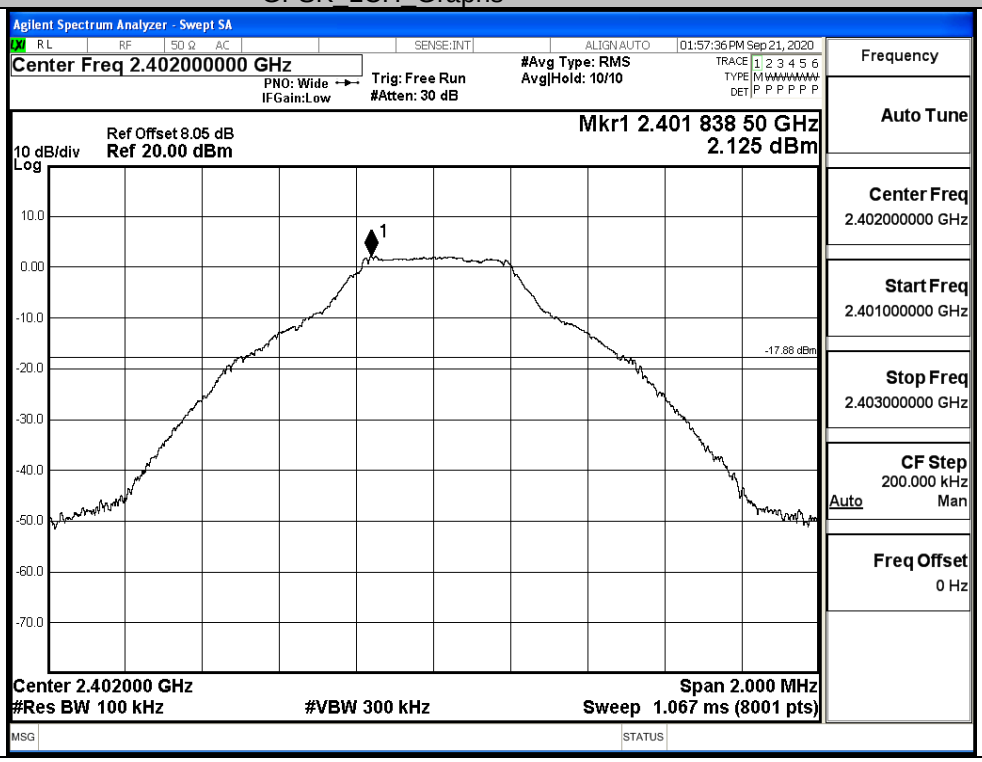


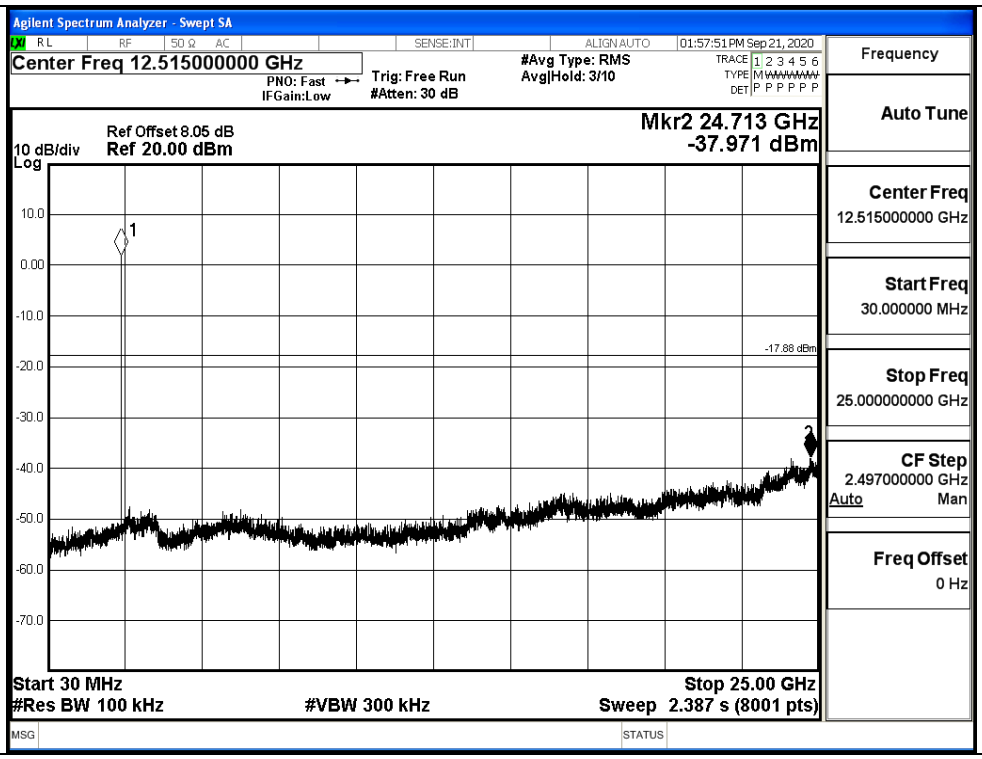
π/4DQPSK _2DH5/HCH	
8DPSK _3DH5/LCH	

8DPSK _3DH5/MCH	
8DPSK _3DH5/HCH	

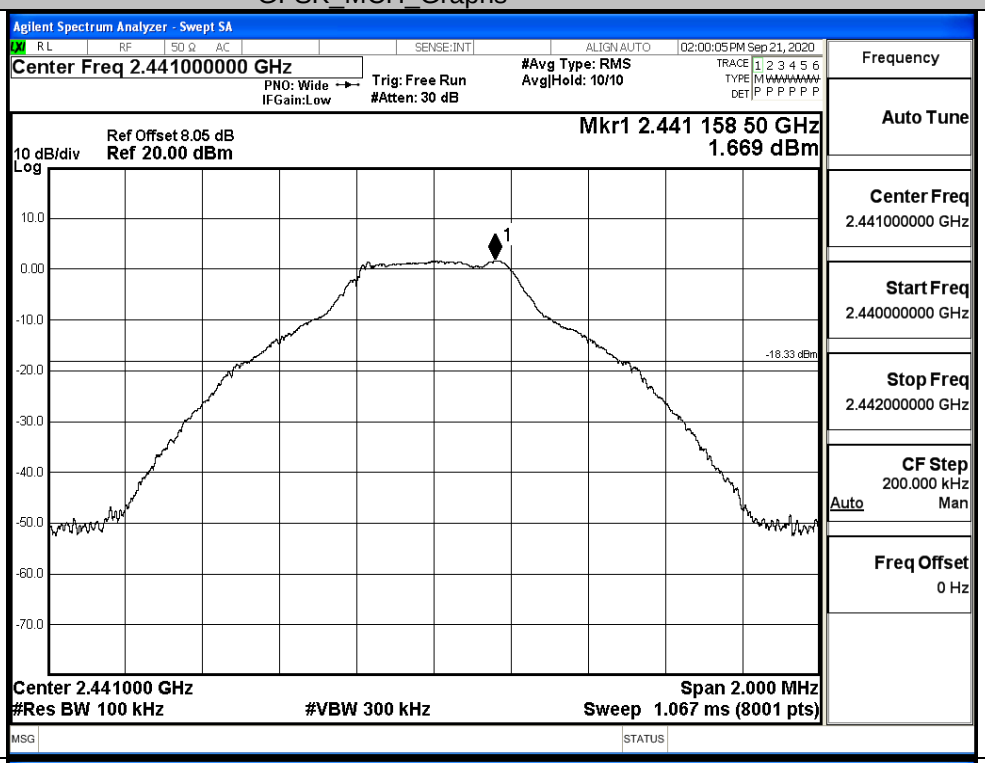
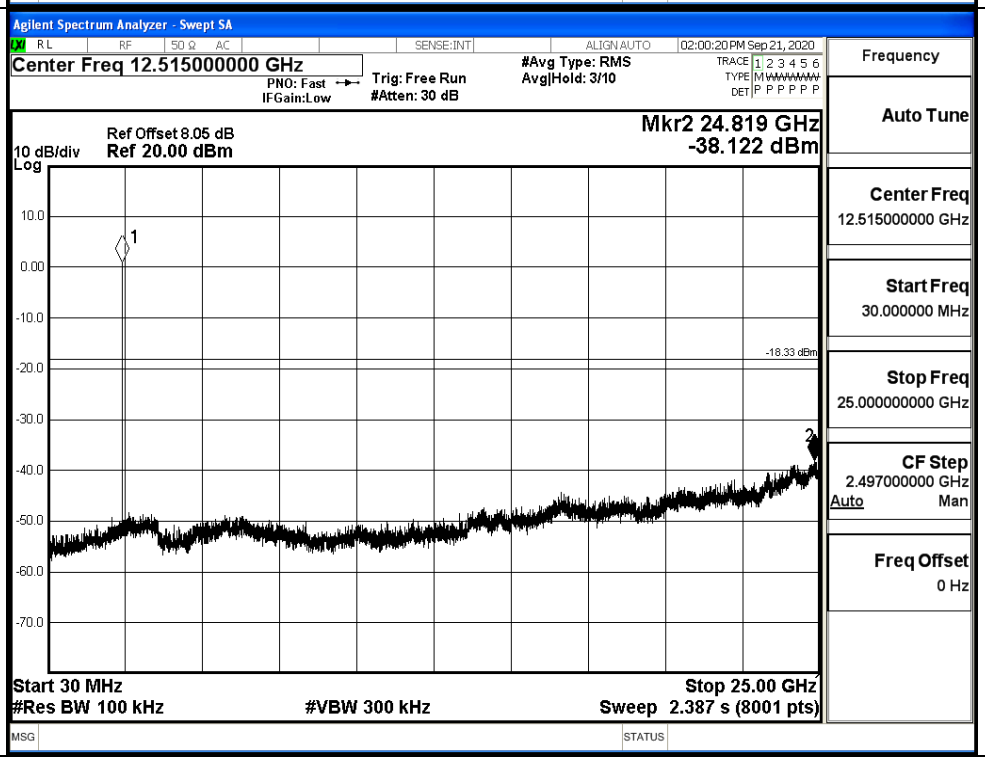
A.6 RF Conducted Spurious Emissions

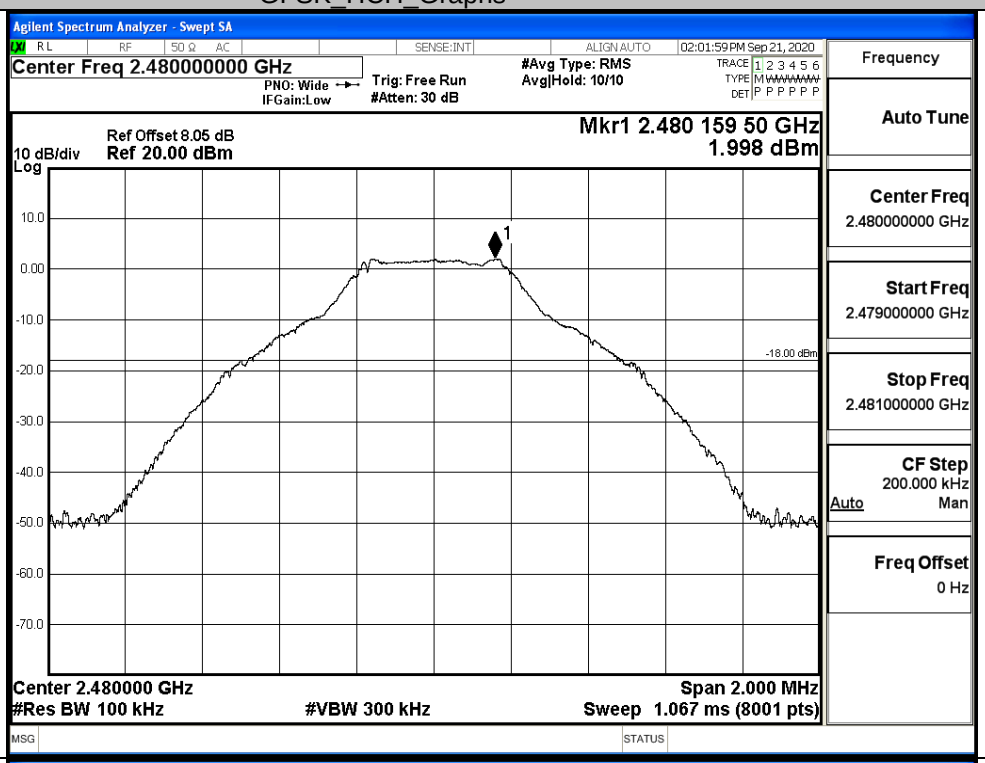
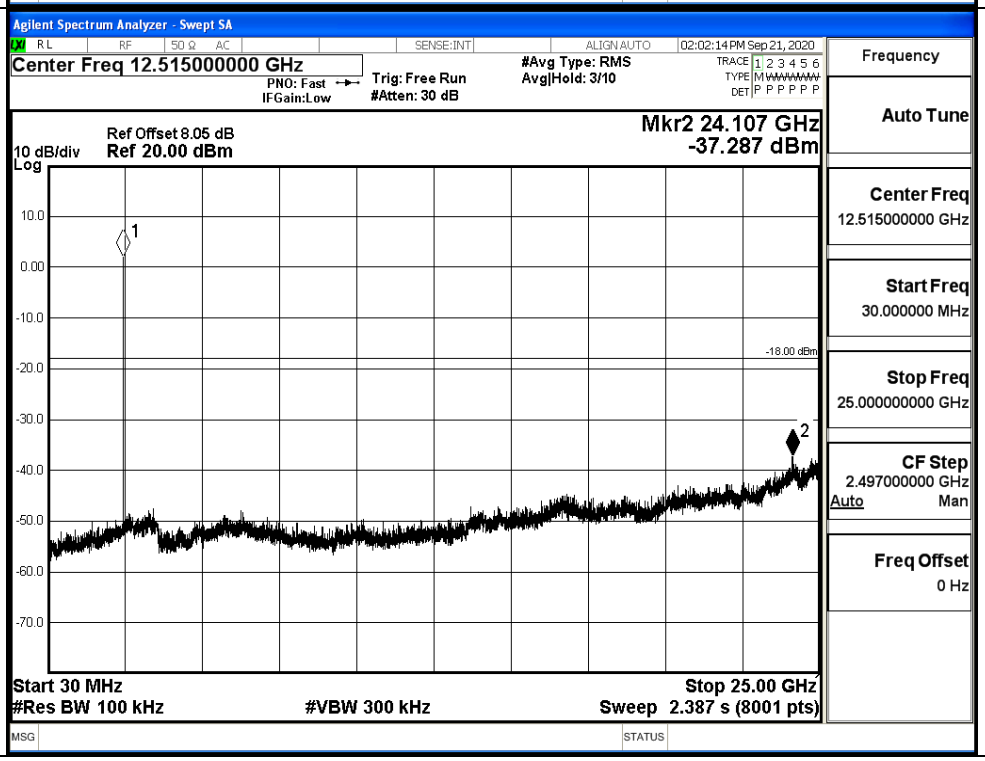
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2.125	-37.971	-17.875	PASS
	MCH	1.669	-38.122	-18.331	PASS
	HCH	1.998	-37.287	-18.002	PASS
π/4DQPSK	LCH	1.699	-37.525	-18.301	PASS
	MCH	1	-37.819	-19.000	PASS
	HCH	1.453	-37.316	-18.547	PASS
8DPSK	LCH	1.071	-36.559	-18.929	PASS
	MCH	1.108	-36.813	-18.892	PASS
	HCH	1.062	-38.105	-18.938	PASS

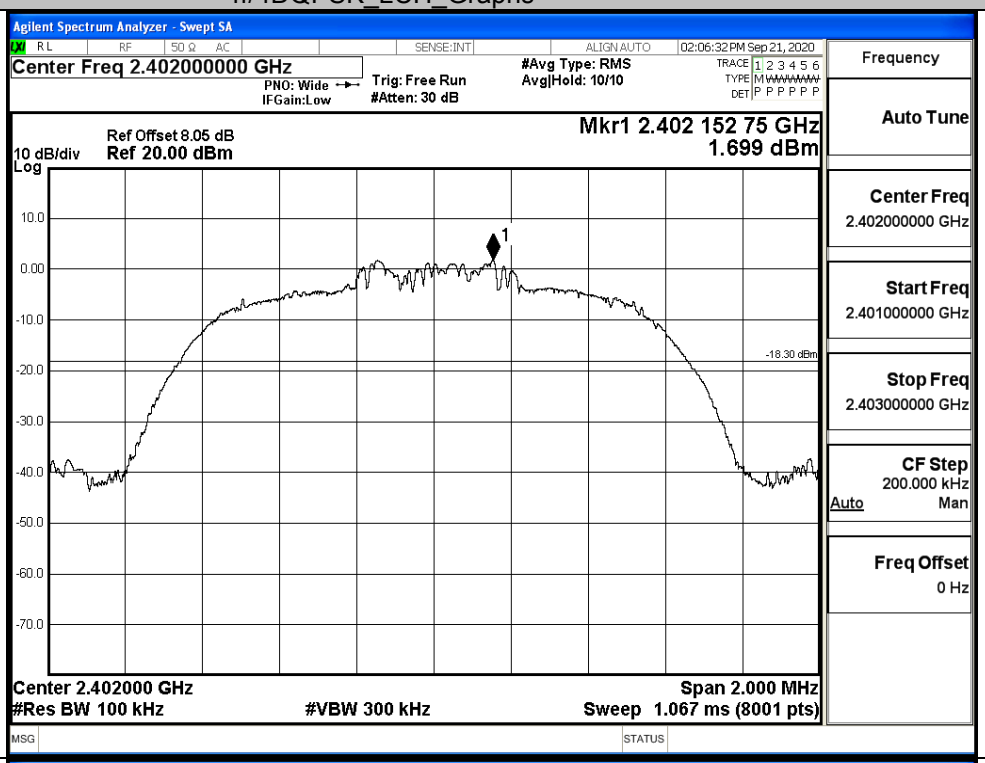
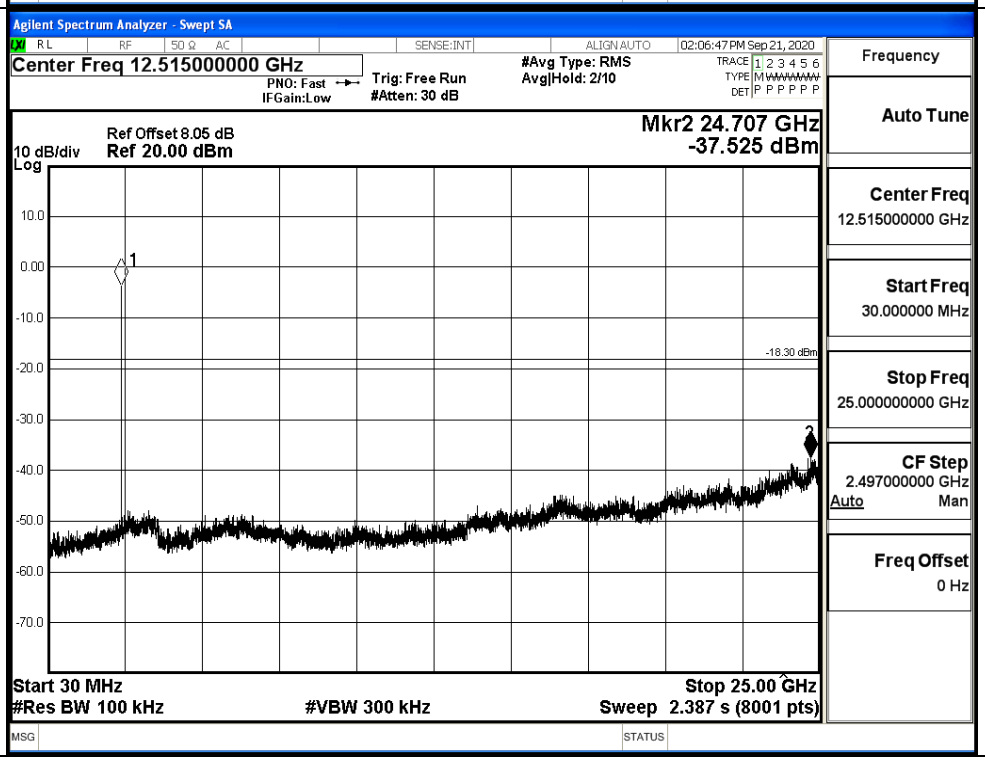
GFSK_LCH_Graphs		
Pref		

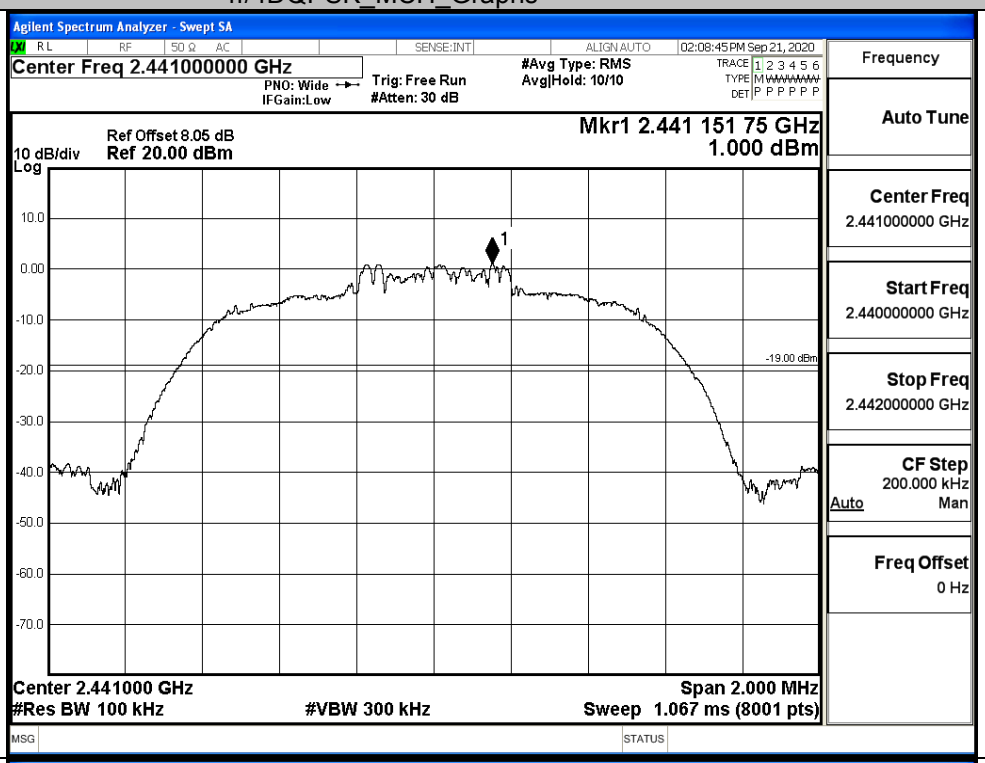
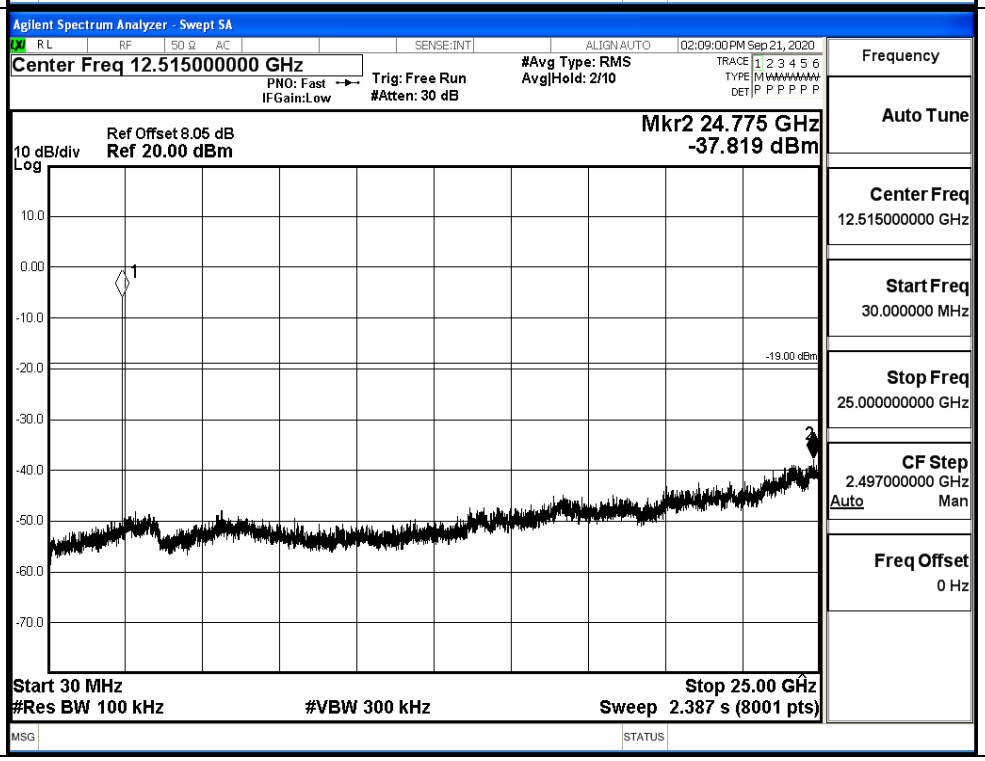
Puw		

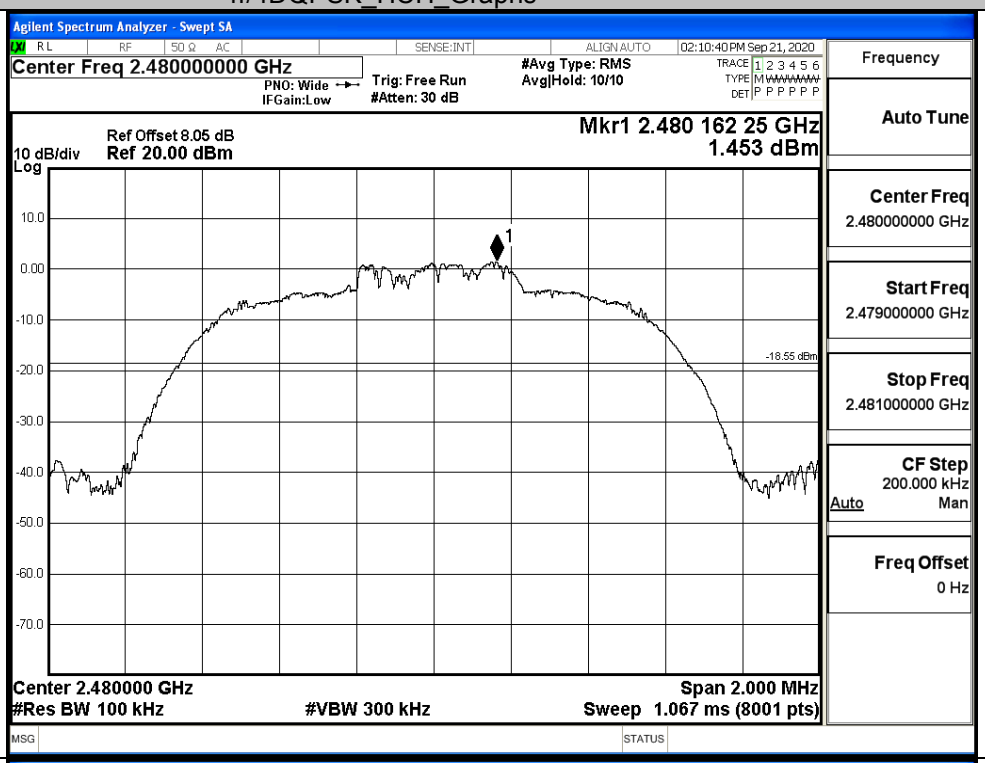
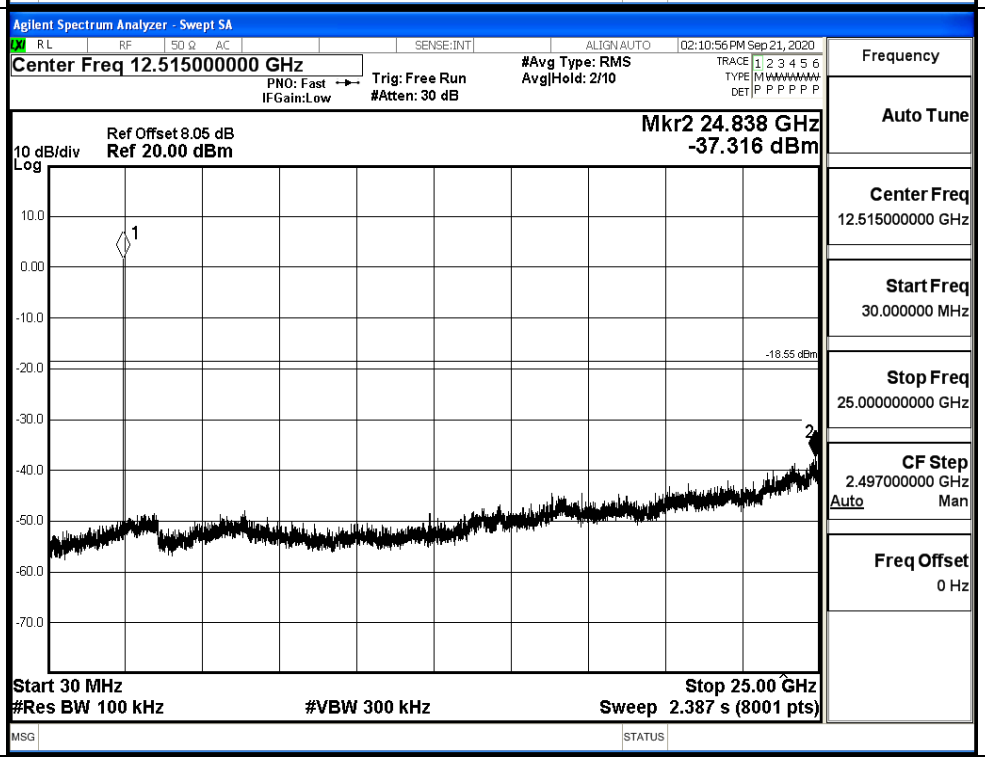
Agilent Spectrum Analyzer - Swept SA
Center Freq 12.515000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 3/10
01:57:51 PM Sep 21, 2020
Ref Offset 8.05 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr2 24.713 GHz
-37.971 dBm
-17.88 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.387 s (8001 pts)
Frequency
Auto Tune
Center Freq
12.515000000 GHz
Start Freq
30.000000 MHz
Stop Freq
25.000000000 GHz
CF Step
2.497000000 GHz
Auto
Man
Freq Offset
0 Hz

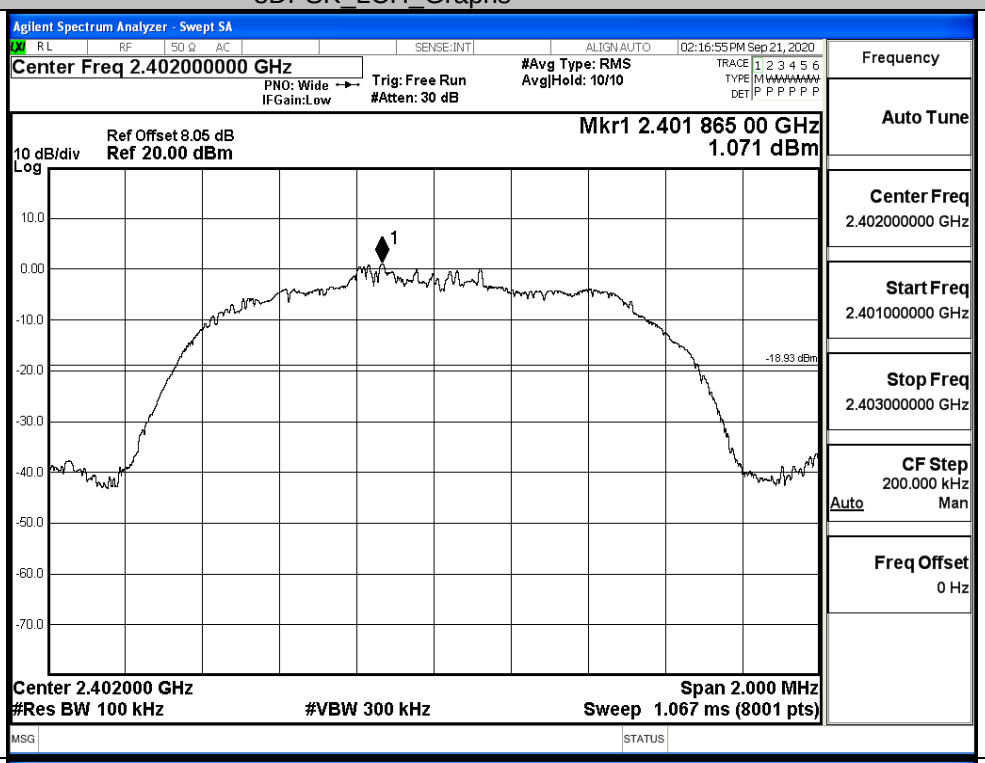
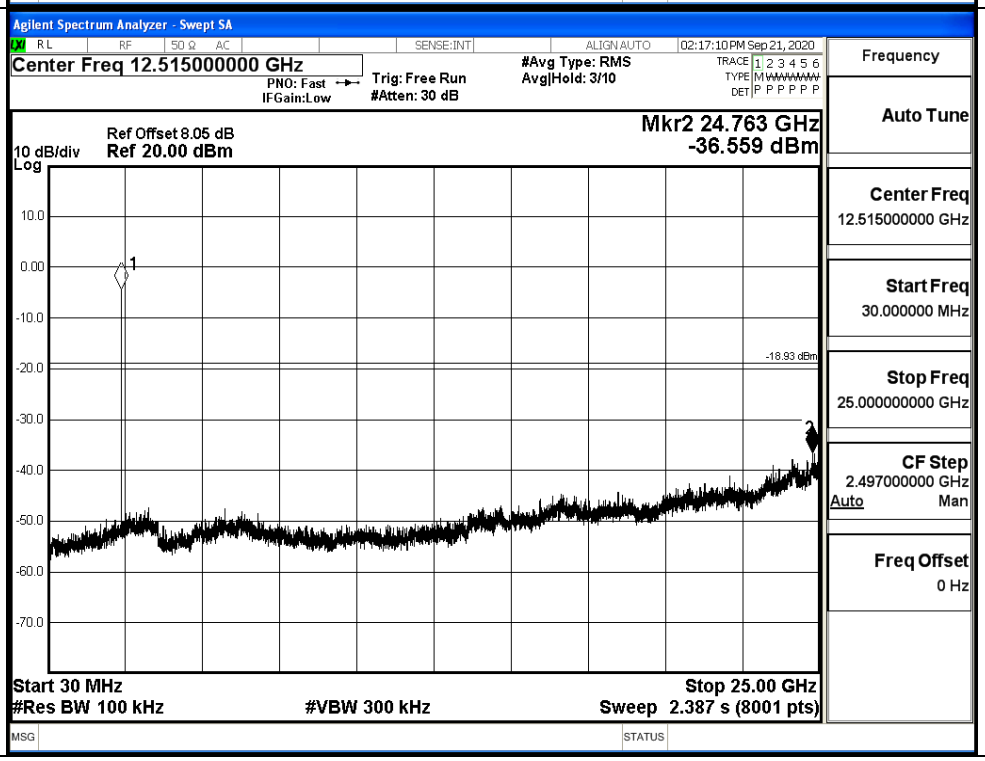
GFSK_MCH_Graphs		
Pref		
Puw		

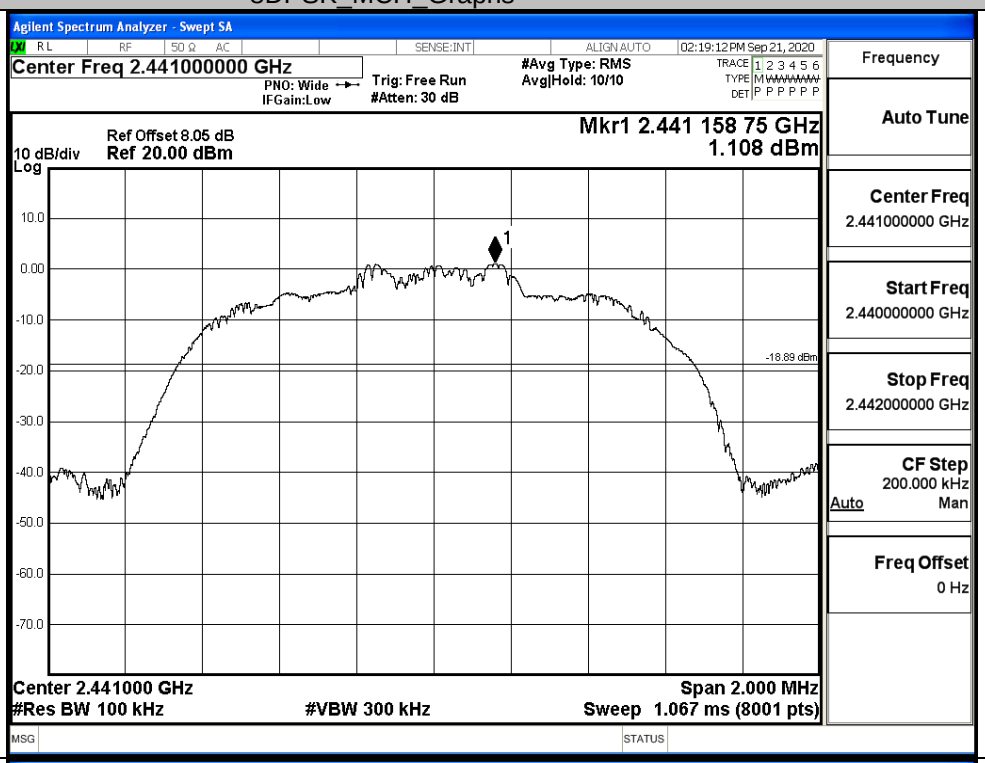
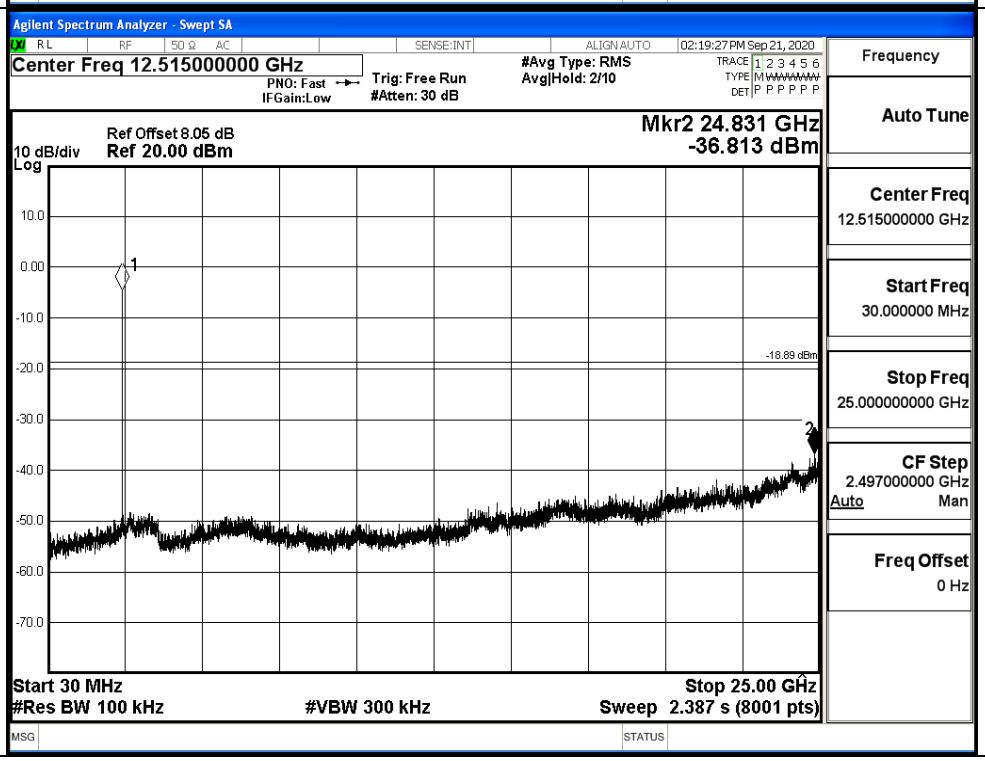
GFSK_HCH_Graphs		
Pref		
Puw		

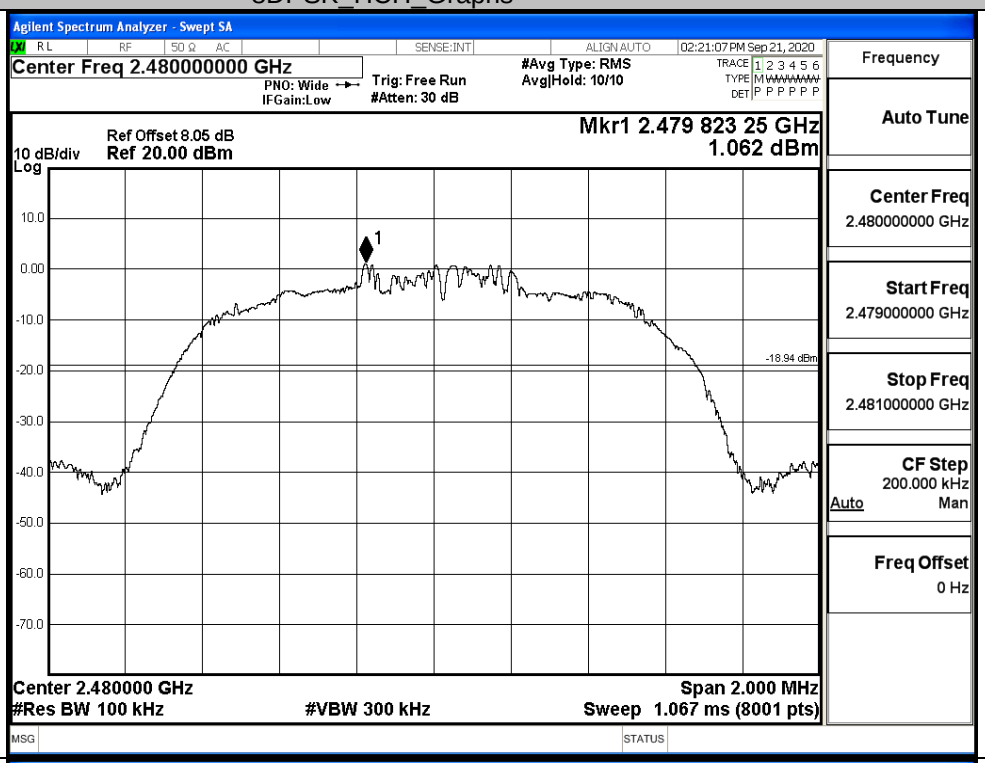
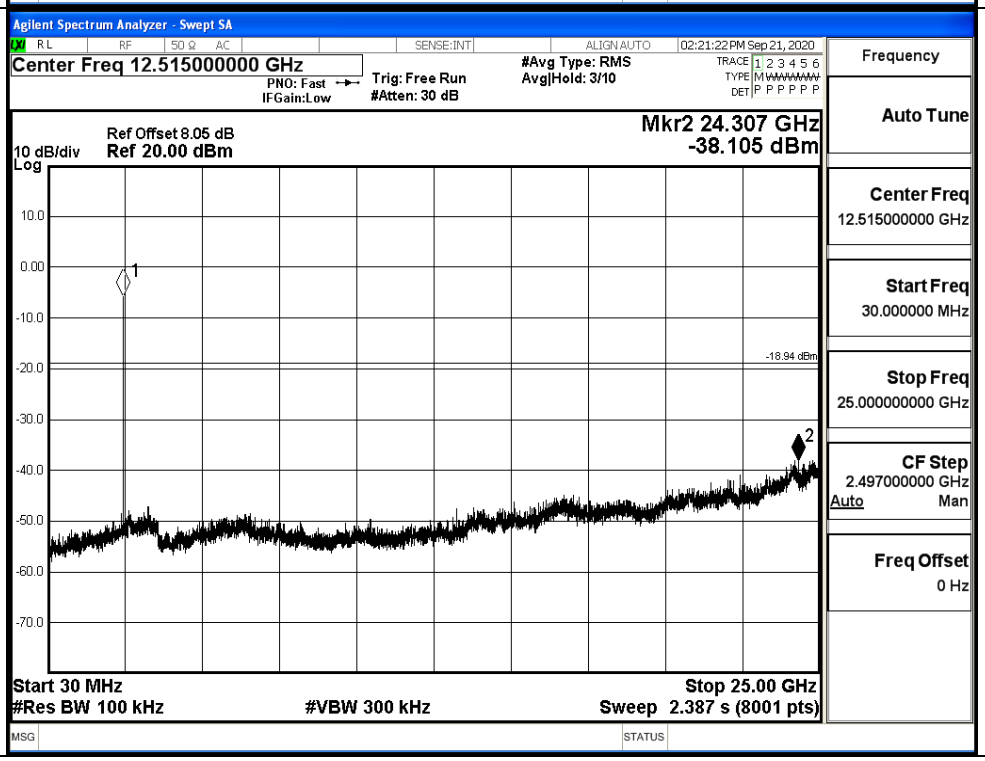
π/4DQPSK_LCH_Graphs		
Pref		
Puw		

π/4DQPSK_MCH_Graphs		
Pref		
Puw		

π/4DQPSK_HCH_Graphs		
Pref		
Puw		

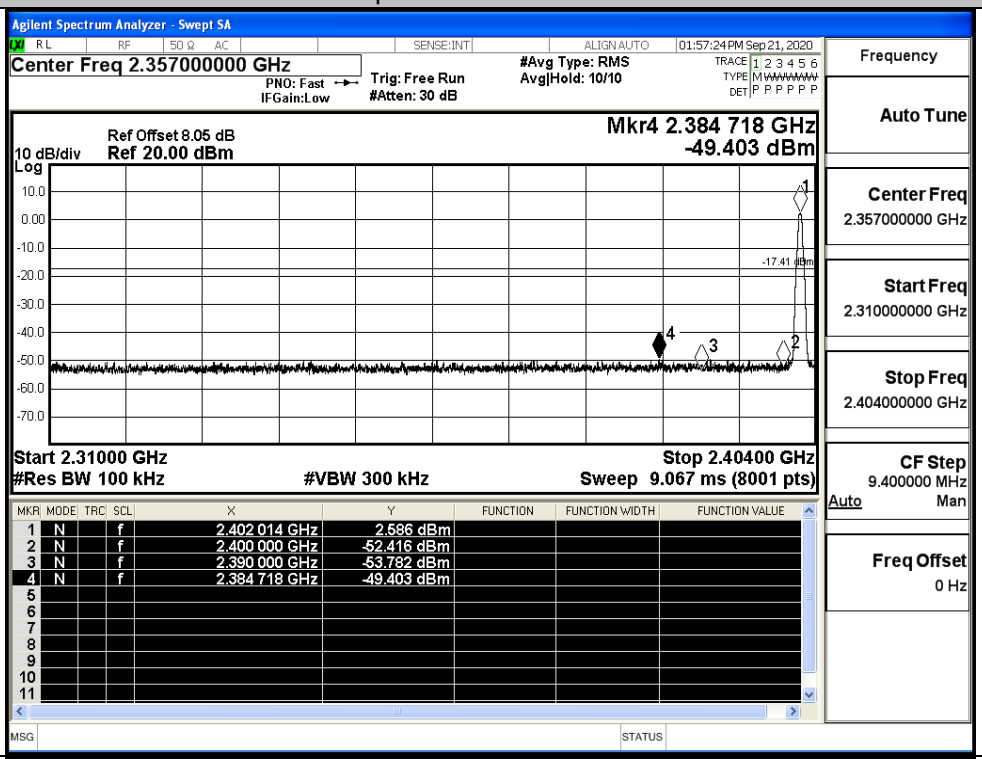
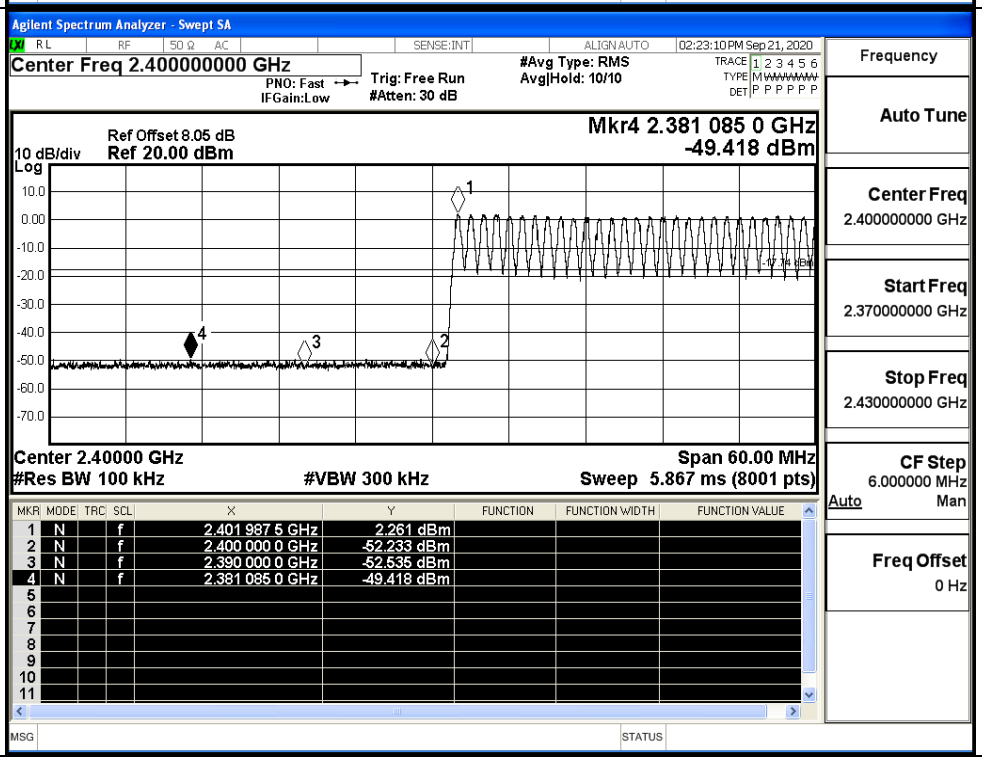
8DPSK_LCH_Graphs		
Pref		
Puw		

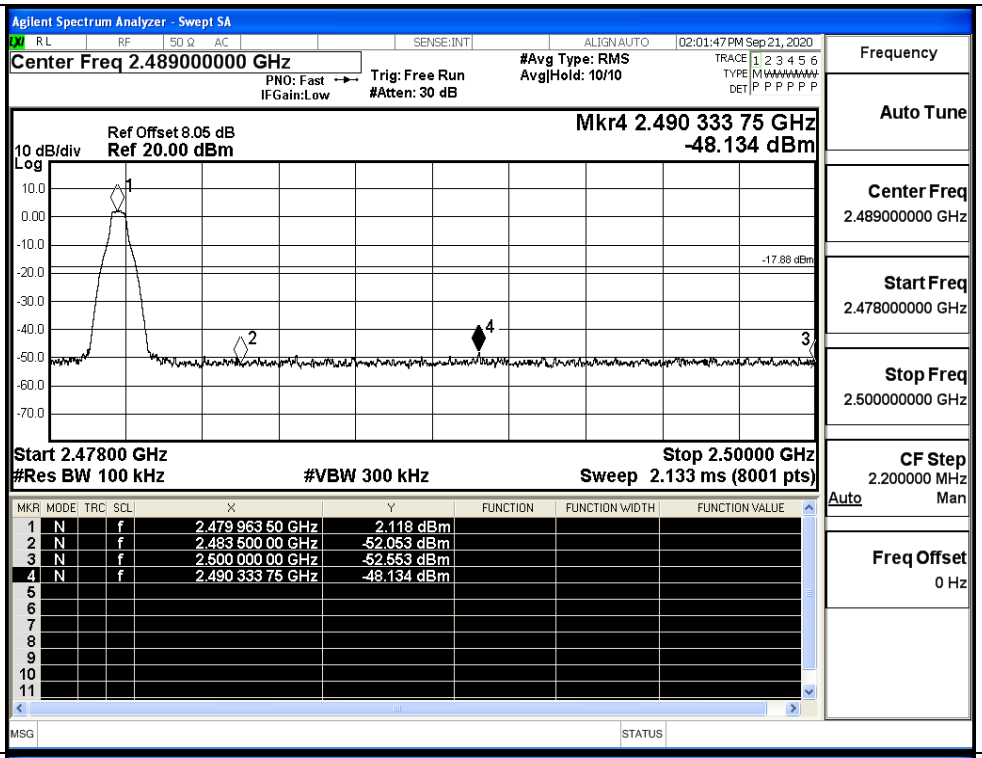
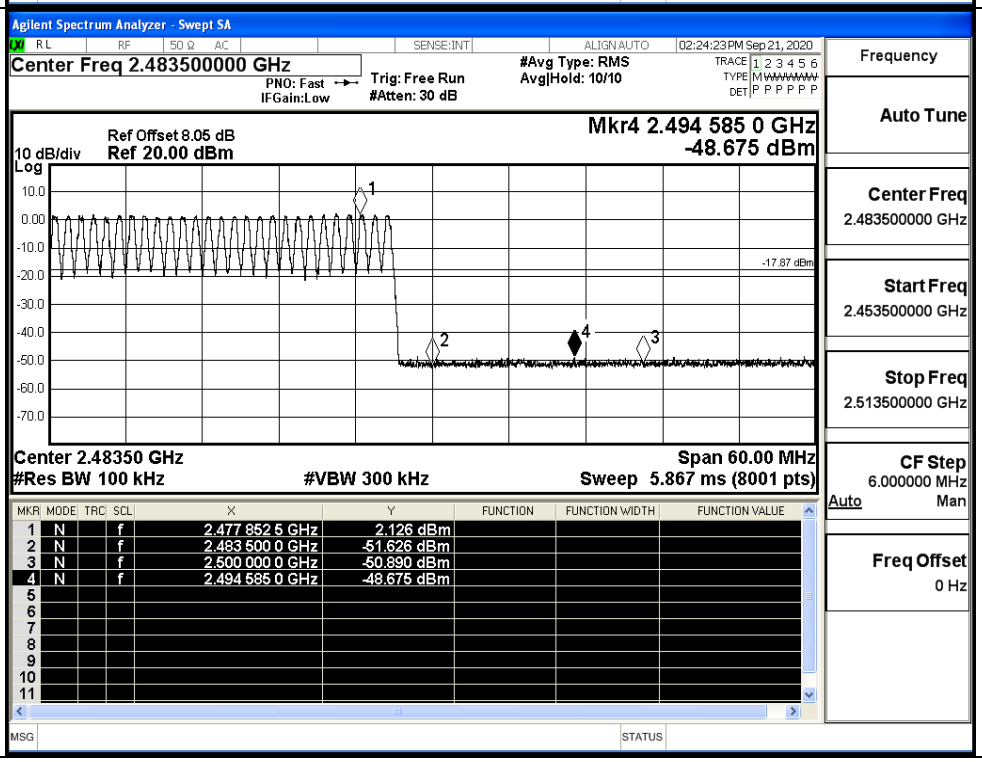
8DPSK_MCH_Graphs		
Pref		
Puw		

8DPSK_HCH_Graphs		
Pref		
Puw		

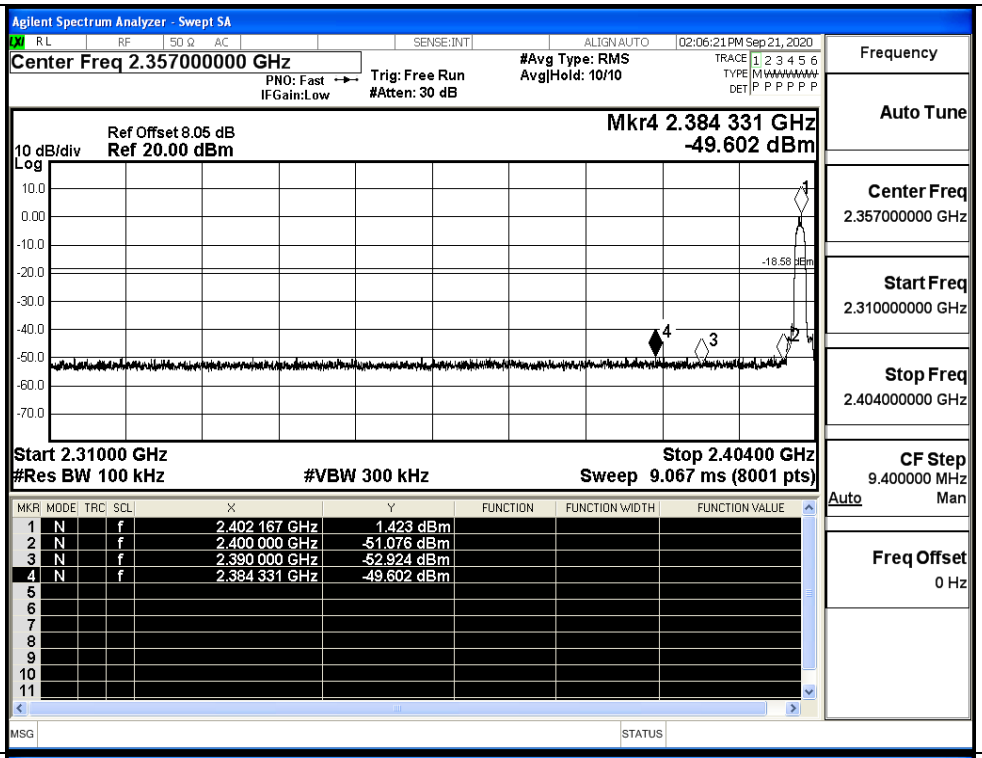
A.7 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	2.586	Off	-49.403	-17.41	PASS
			2.261	On	-49.418	-17.74	PASS
	HCH	2480	2.118	Off	-48.134	-17.88	PASS
			2.126	On	-48.675	-17.87	PASS
π/4DQPSK	LCH	2402	1.423	Off	-49.602	-18.58	PASS
			1.656	On	-48.560	-18.34	PASS
	HCH	2480	1.465	Off	-49.103	-18.54	PASS
			1.757	On	-47.543	-18.24	PASS
8DPSK	LCH	2402	1.606	Off	-48.621	-18.39	PASS
			1.358	On	-48.602	-18.64	PASS
	HCH	2480	1.418	Off	-49.216	-18.58	PASS
			1.696	On	-48.345	-18.3	PASS

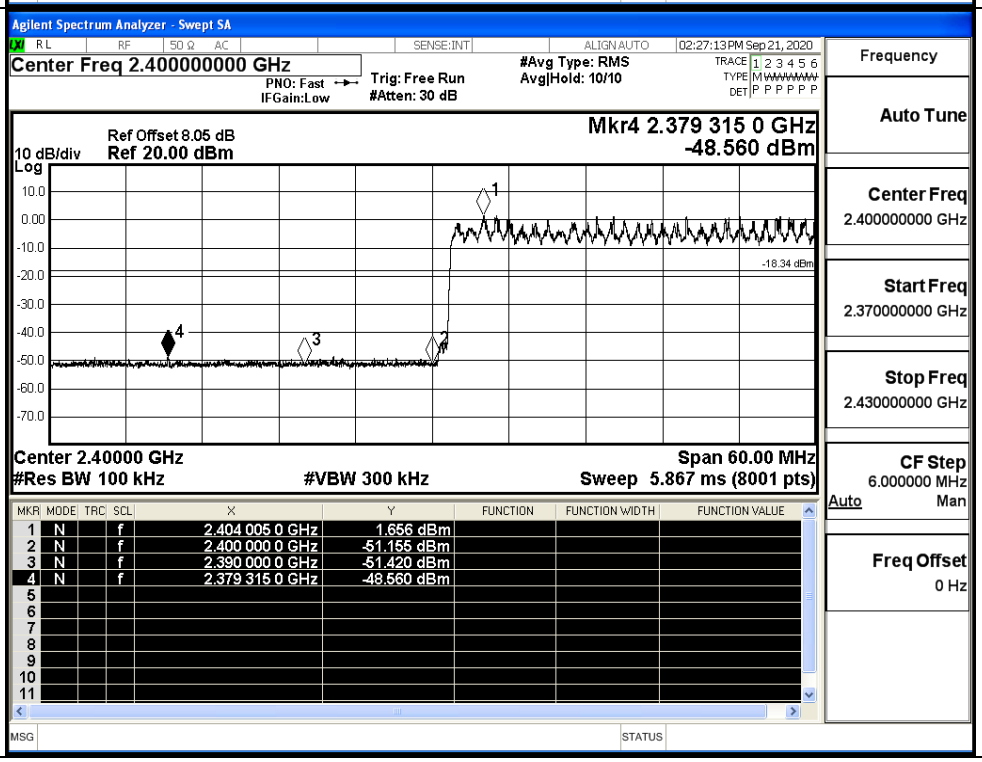
Test Graphs	
GFSK/LCH/No Hop	
GFSK/LCH/Hop	

GFSK/HCH/No Hop	
GFSK/HCH/Hop	

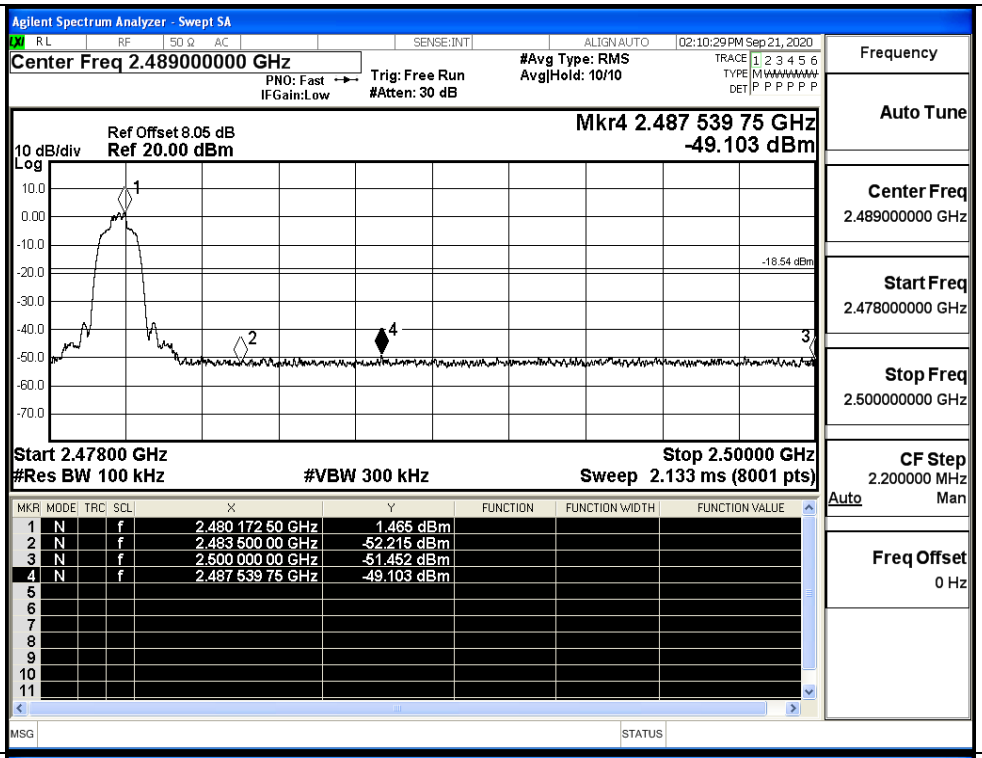
π/4DQPSK/LCH/No Hop



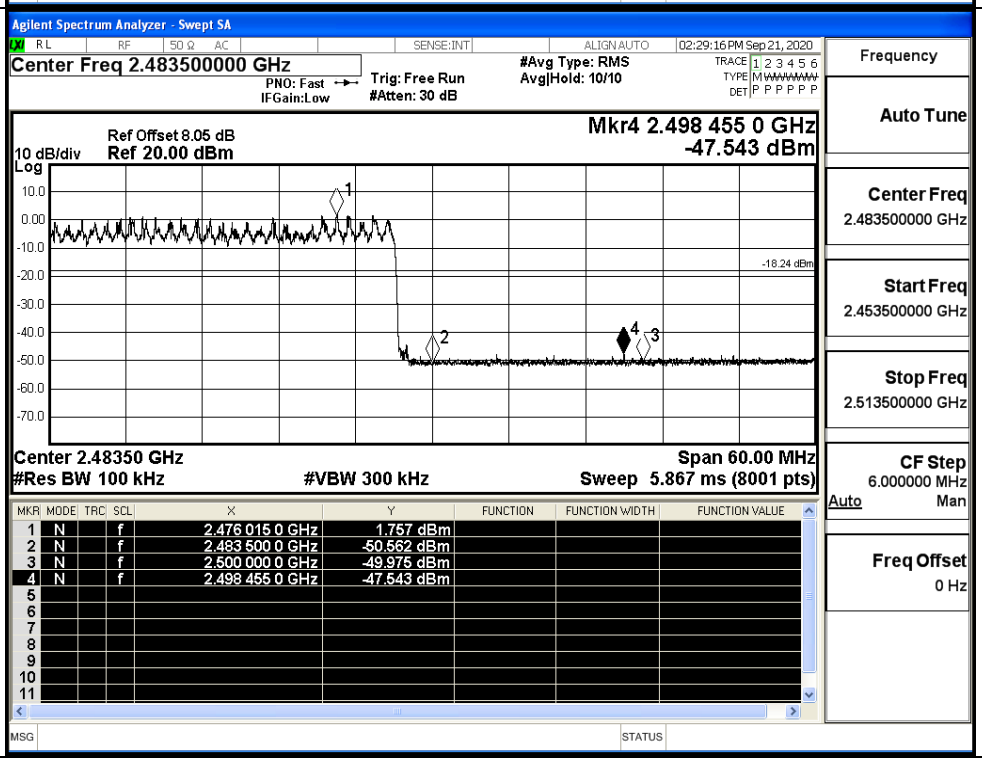
π/4DQPSK/LCH/Hop



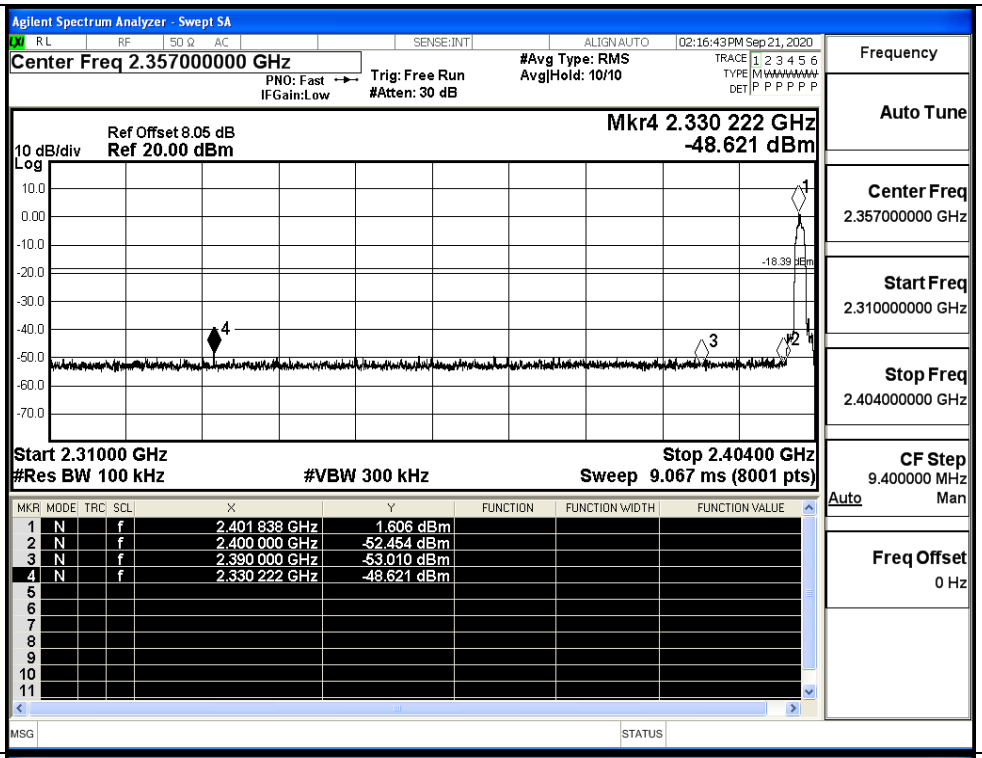
π/4DQPSK/HCH/No Hop



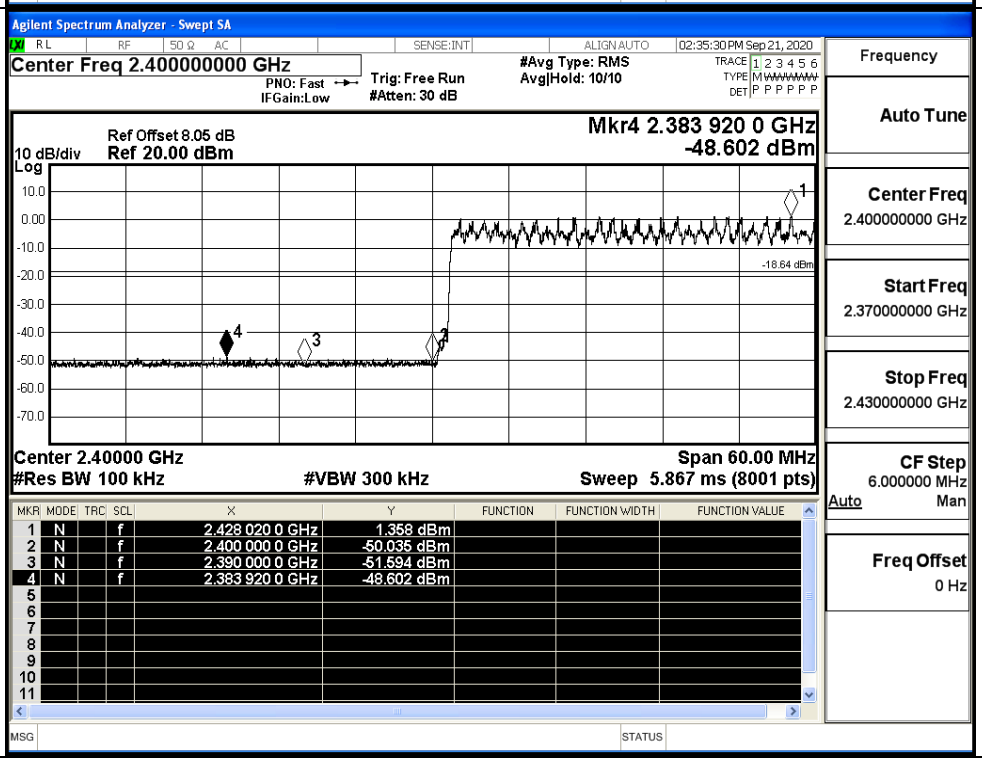
π/4DQPSK/HCH/Hop



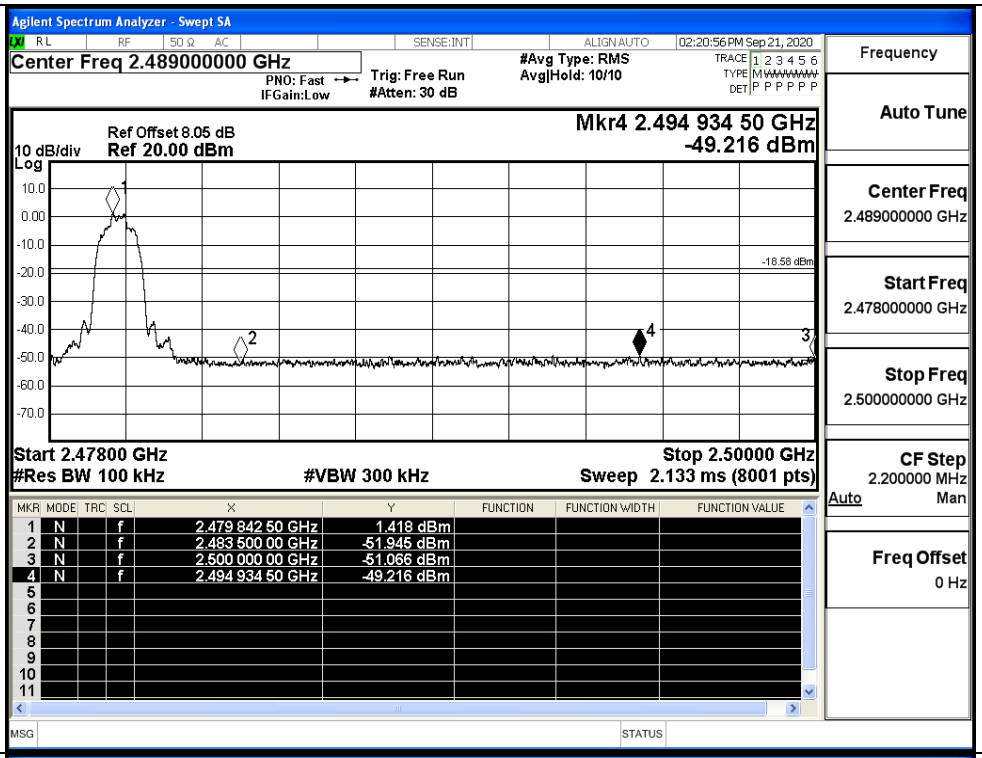
8DPSK/LCH/No Hop



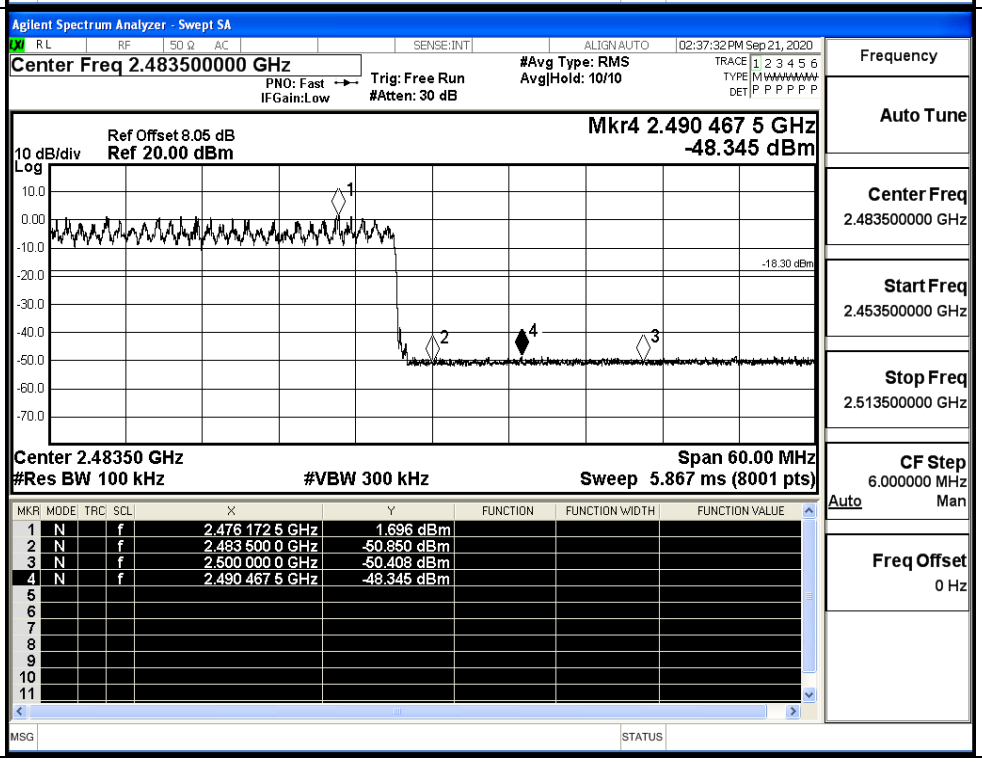
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



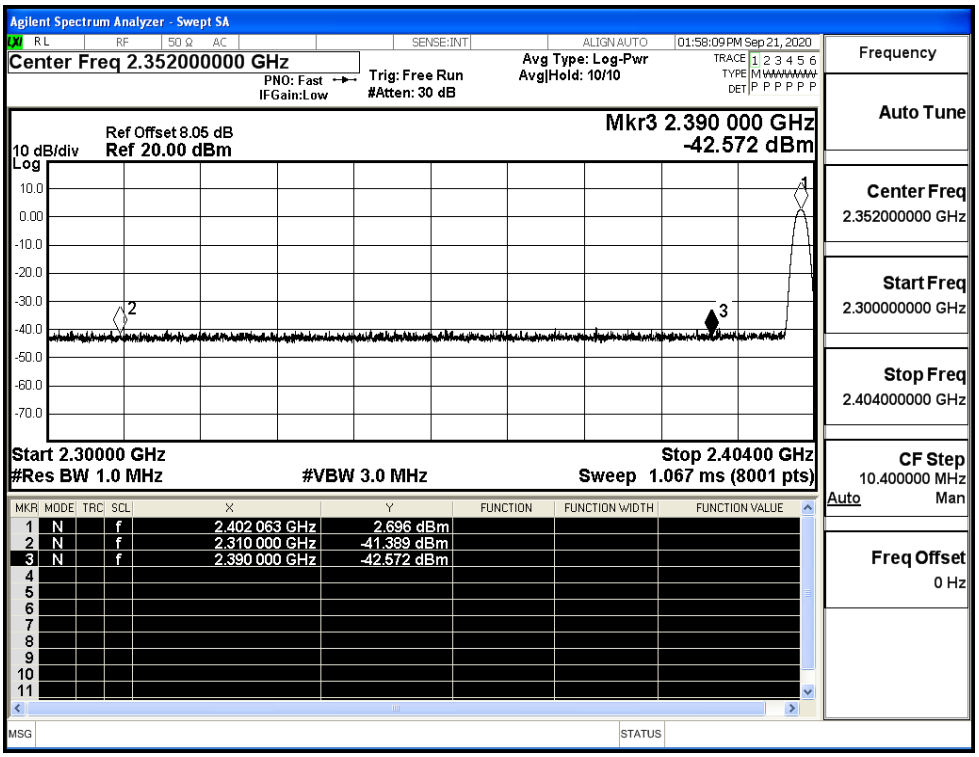
8DPSK/HCH/Hop



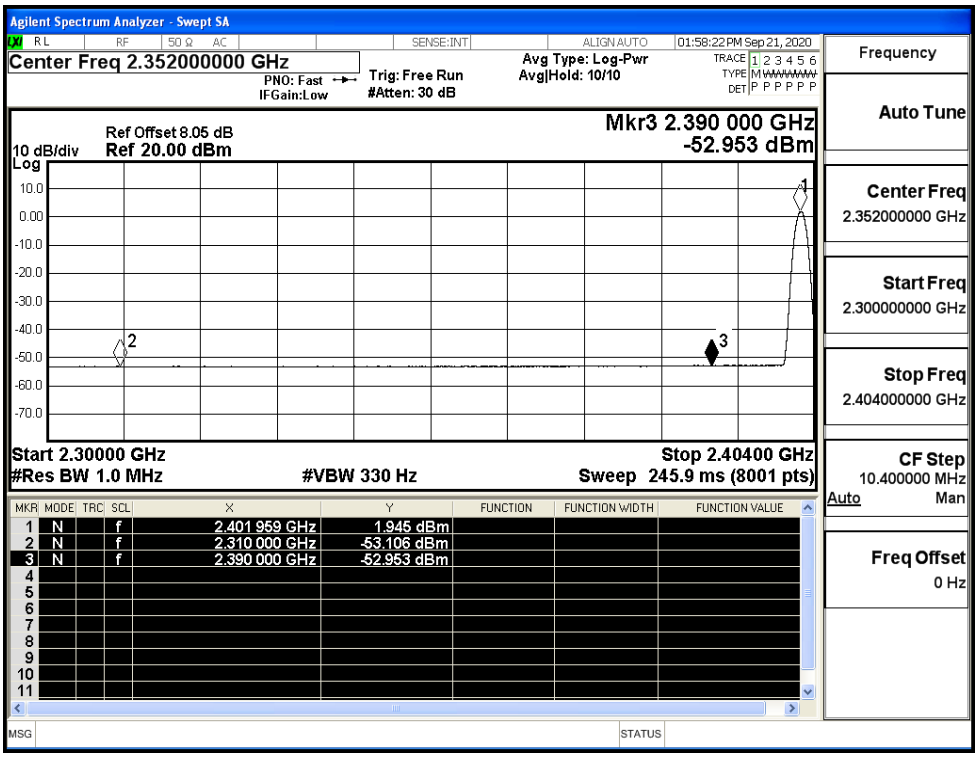
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-41.39	3.0	0	56.84	PEAK	74	PASS
	Off	2310.0	-53.11	3.0	0	45.12	AV	54	PASS
	Off	2390.0	-42.57	3.0	0	55.66	PEAK	74	PASS
	Off	2390.0	-52.95	3.0	0	45.28	AV	54	PASS
	Off	2483.5	-43.28	3.0	0	54.95	PEAK	74	PASS
	Off	2483.5	-52.30	3.0	0	45.93	AV	54	PASS
	Off	2500.0	-41.24	3.0	0	56.99	PEAK	74	PASS
	Off	2500.0	-52.26	3.0	0	45.97	AV	54	PASS
π/4DQPSK	Off	2310.0	-42.30	3.0	0	55.93	PEAK	74	PASS
	Off	2310.0	-53.29	3.0	0	44.94	AV	54	PASS
	Off	2390.0	-43.31	3.0	0	54.92	PEAK	74	PASS
	Off	2390.0	-52.80	3.0	0	45.43	AV	54	PASS
	Off	2483.5	-41.35	3.0	0	56.88	PEAK	74	PASS
	Off	2483.5	-52.35	3.0	0	45.88	AV	54	PASS
	Off	2500.0	-42.35	3.0	0	55.88	PEAK	74	PASS
	Off	2500.0	-52.29	3.0	0	45.94	AV	54	PASS
8DPSK	Off	2310.0	-42.58	3.0	0	55.65	PEAK	74	PASS
	Off	2310.0	-53.24	3.0	0	44.99	AV	54	PASS
	Off	2390.0	-42.19	3.0	0	56.04	PEAK	74	PASS
	Off	2390.0	-52.94	3.0	0	45.29	AV	54	PASS
	Off	2483.5	-42.65	3.0	0	55.58	PEAK	74	PASS
	Off	2483.5	-52.35	3.0	0	45.88	AV	54	PASS
	Off	2500.0	-40.93	3.0	0	57.30	PEAK	74	PASS
	Off	2500.0	-52.25	3.0	0	45.98	AV	54	PASS

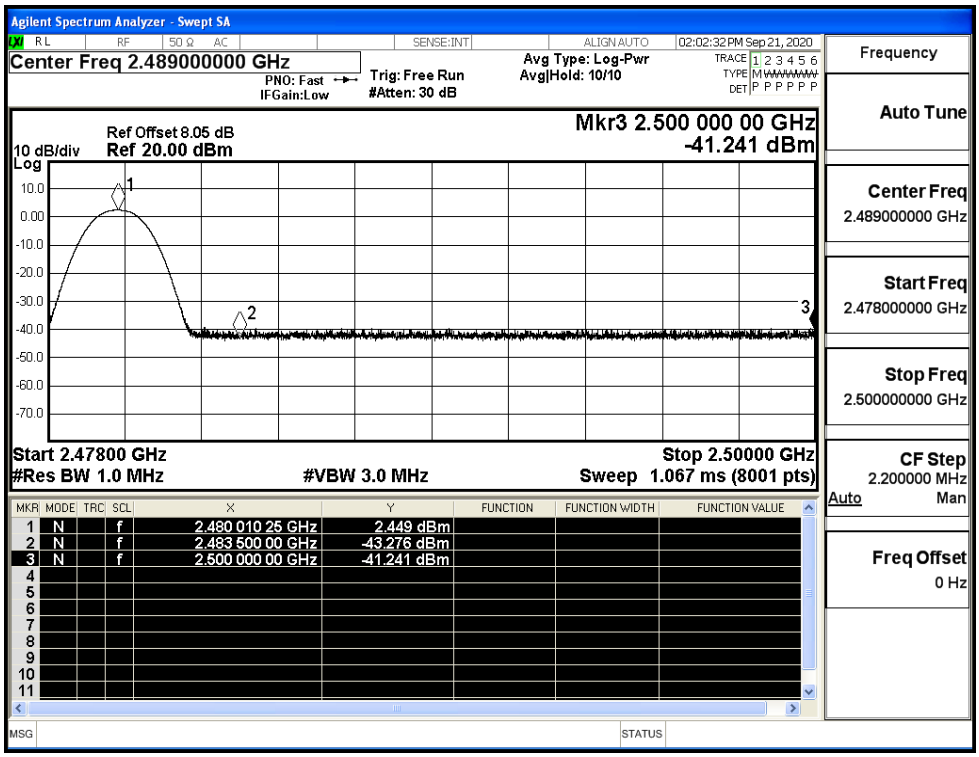
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



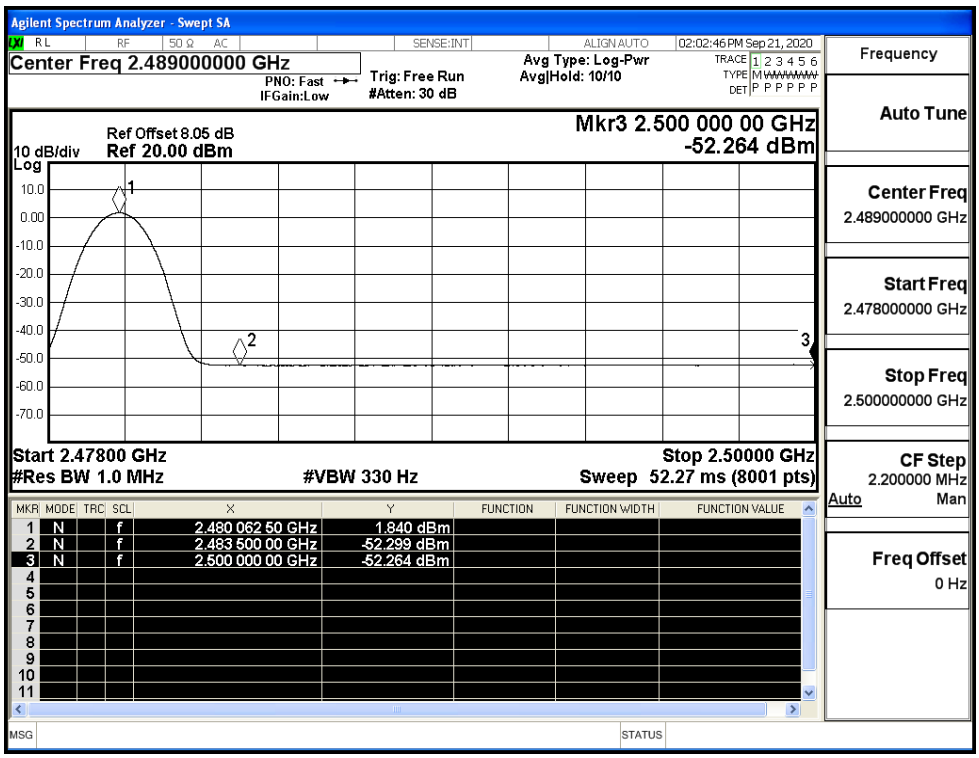
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



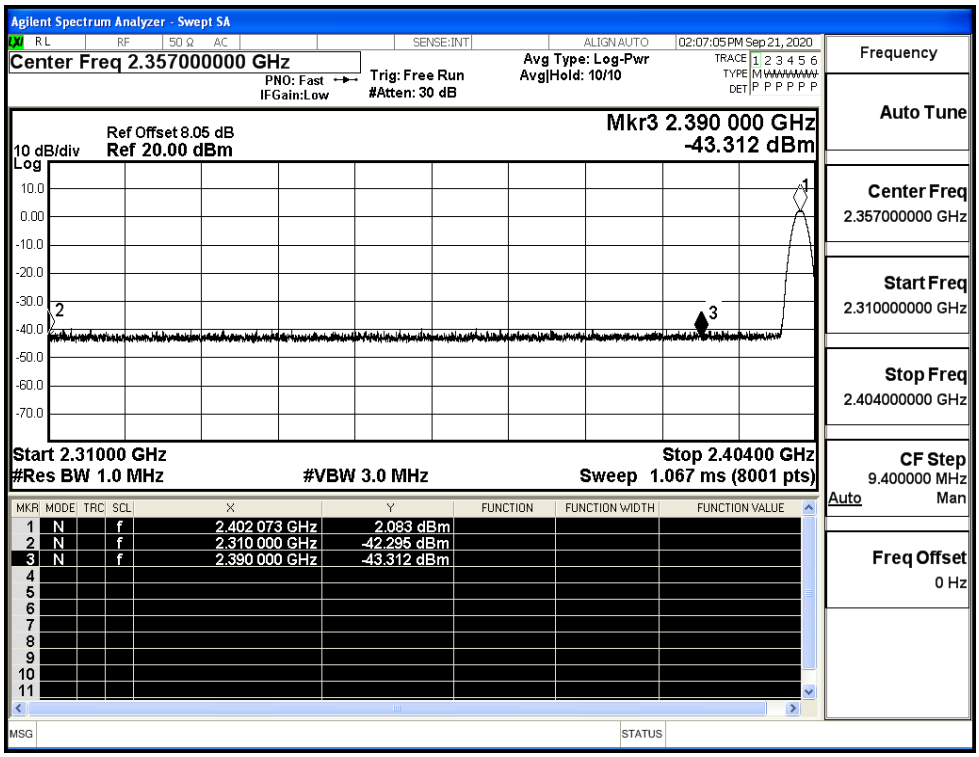
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



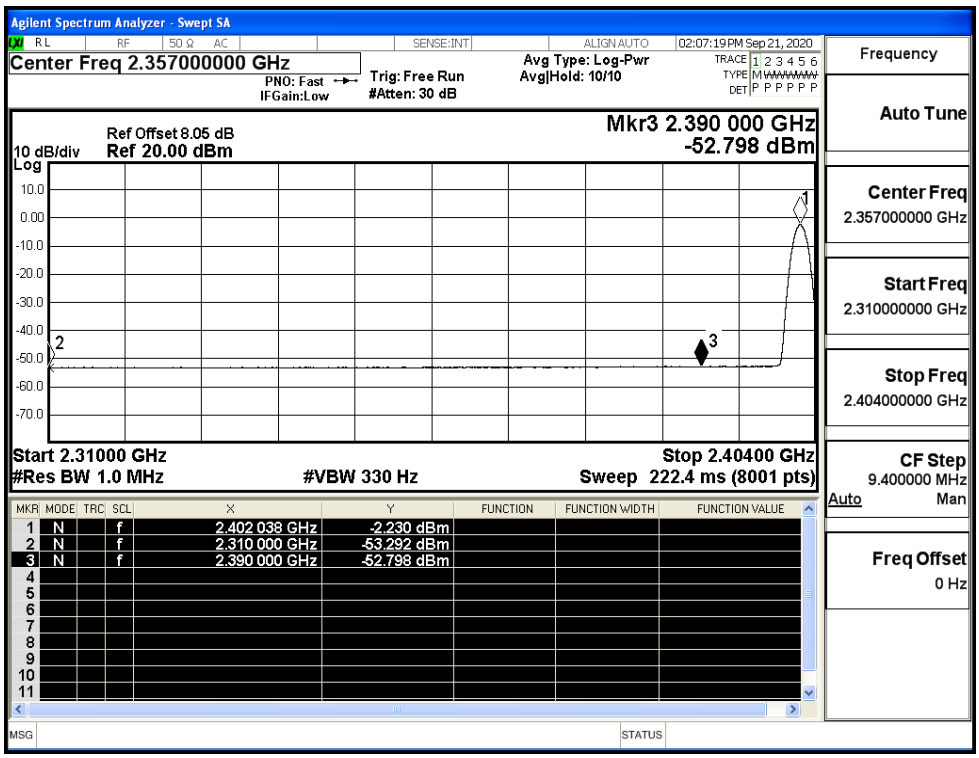
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



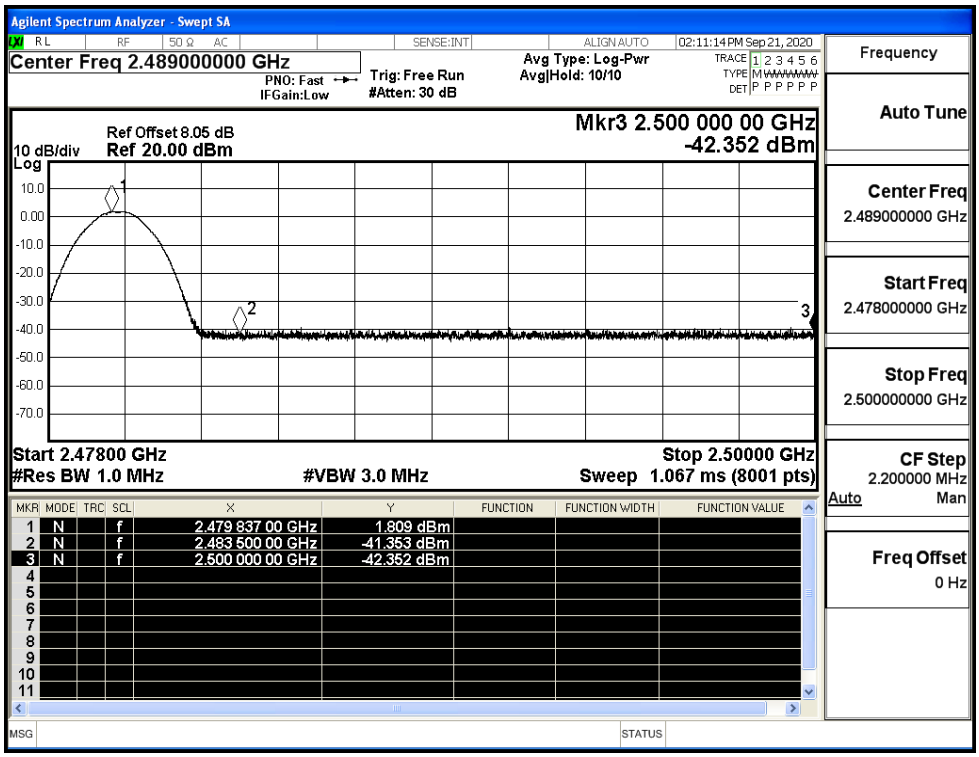
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



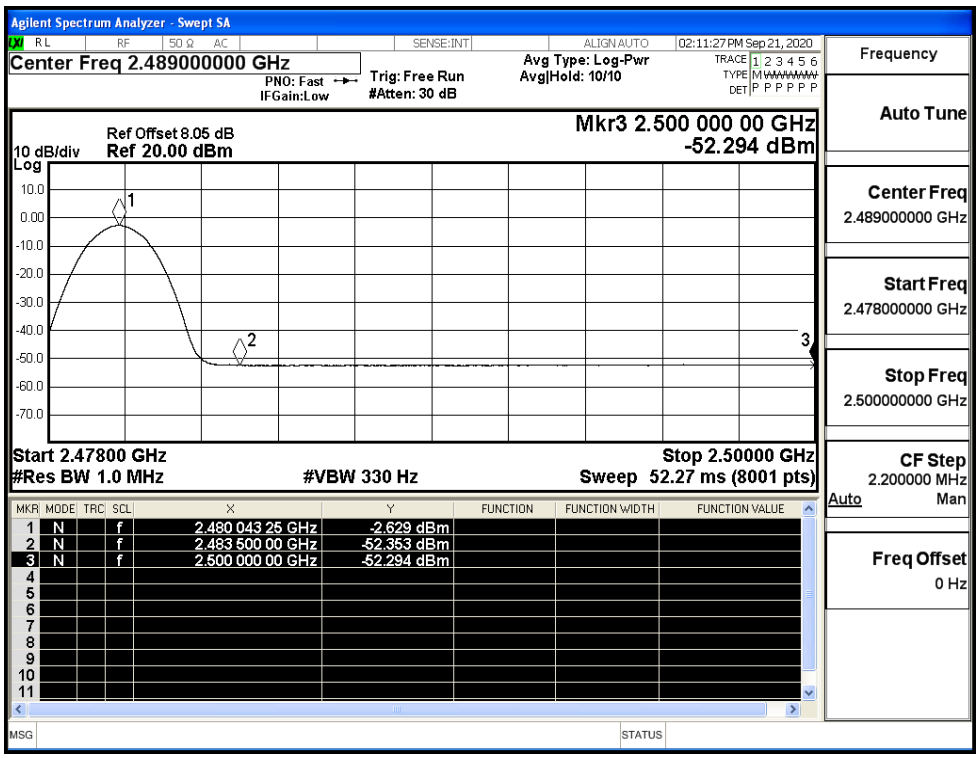
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



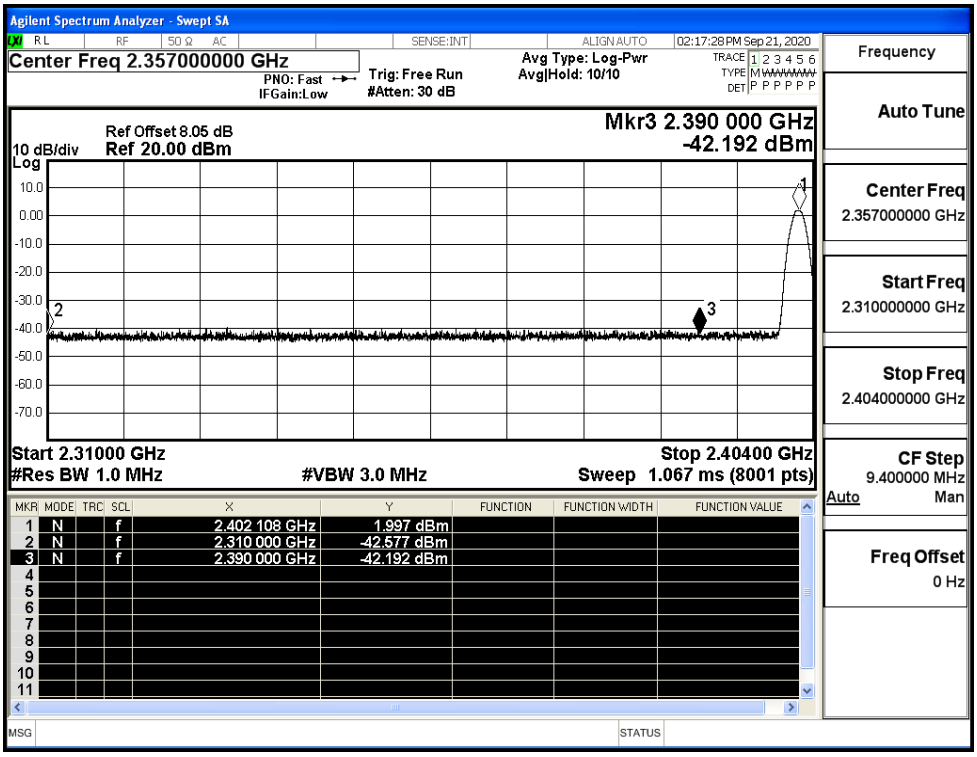
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



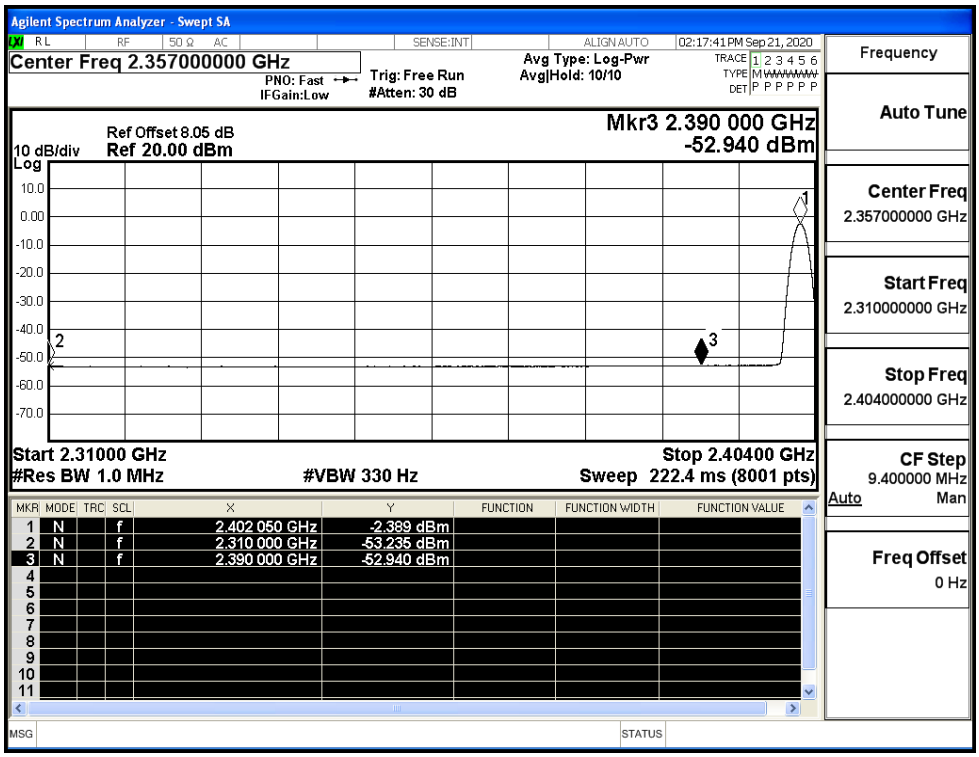
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



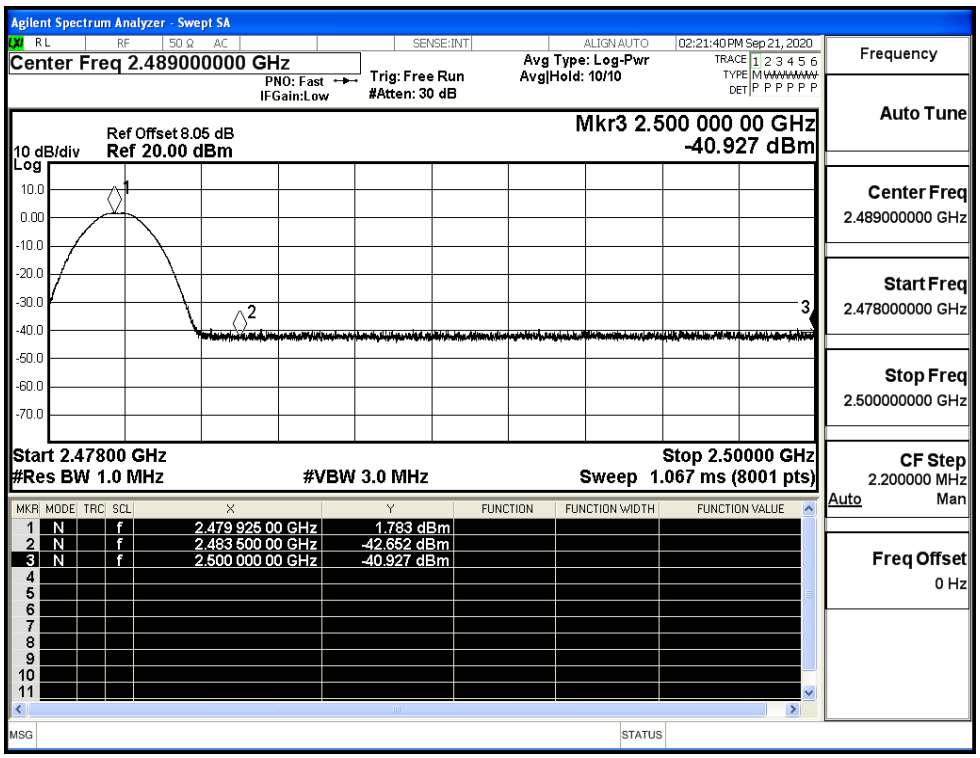
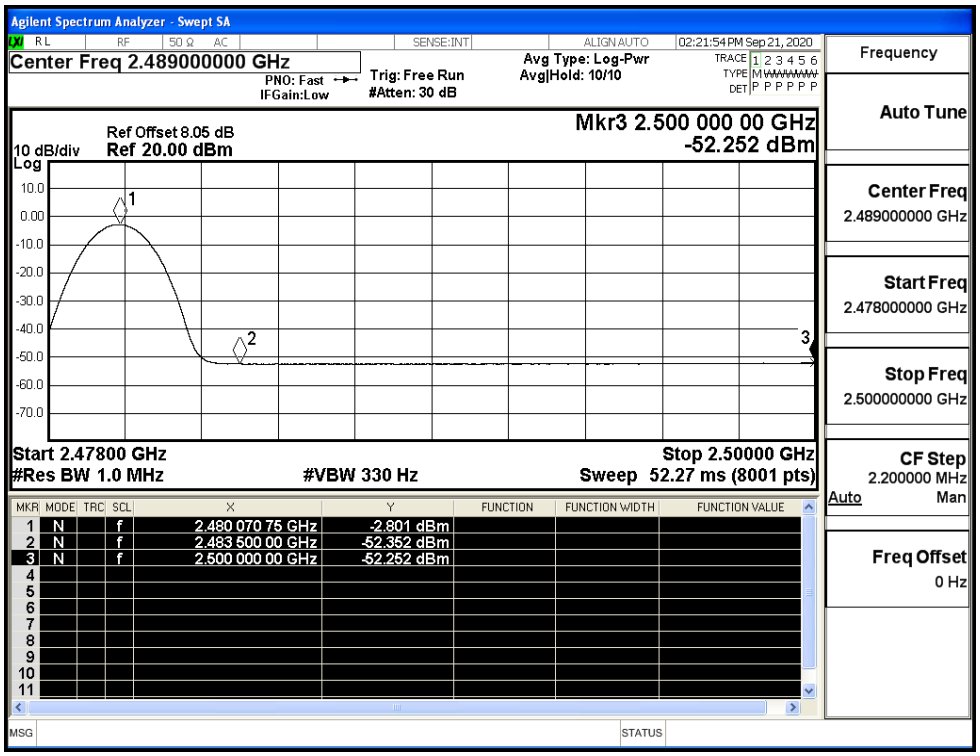
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)