Appendix A

RF Test Data for BT V5.0 (BDR/EDR) (Conducted Measurement)

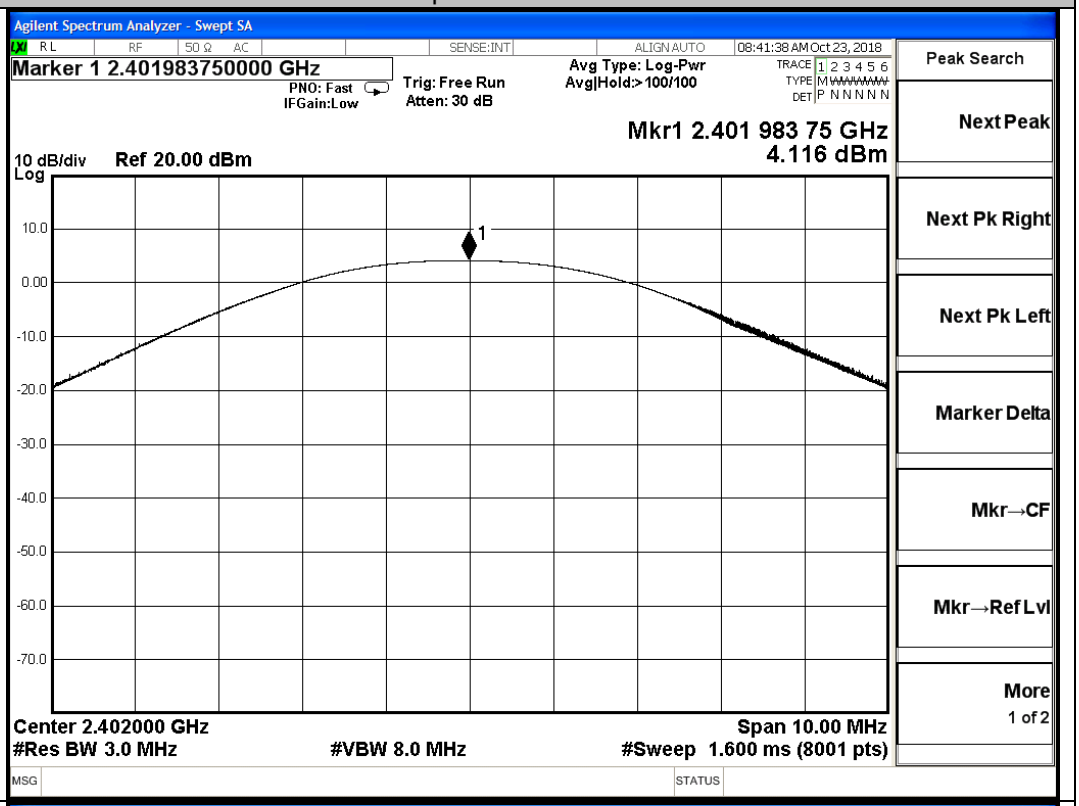
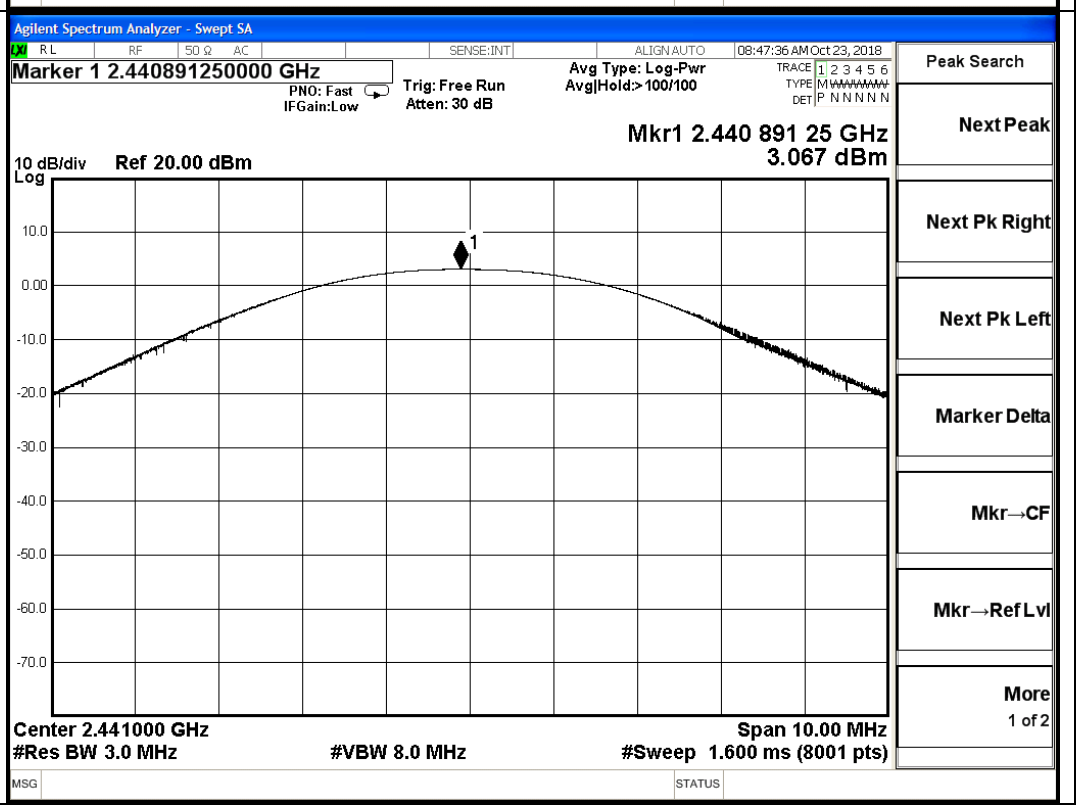
Product Name: Bluetooth Alarm Clock With USB Charging Ports
Trade Mark: S.E.M. / S-LOGO / NIL / SDIGITAL / S-DIGITAL / S.E.M. AUDIO LABORATORIES / CONAIR TIME
Test Model: Q-7-BTV3W

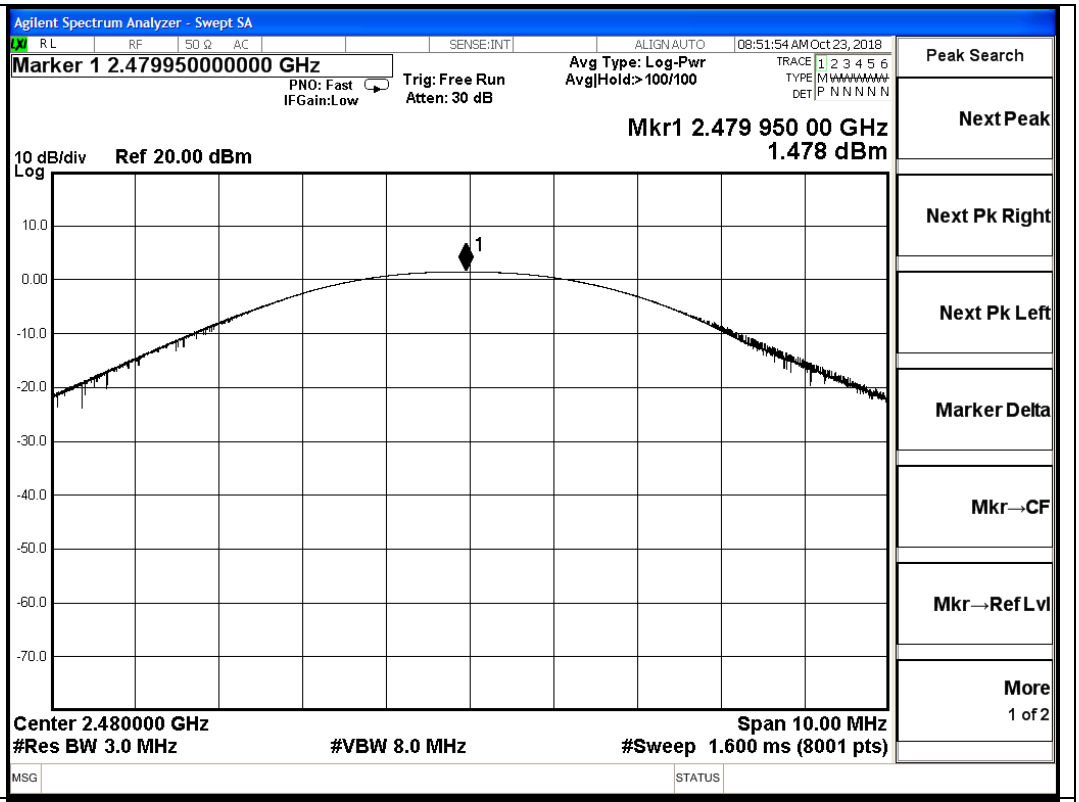
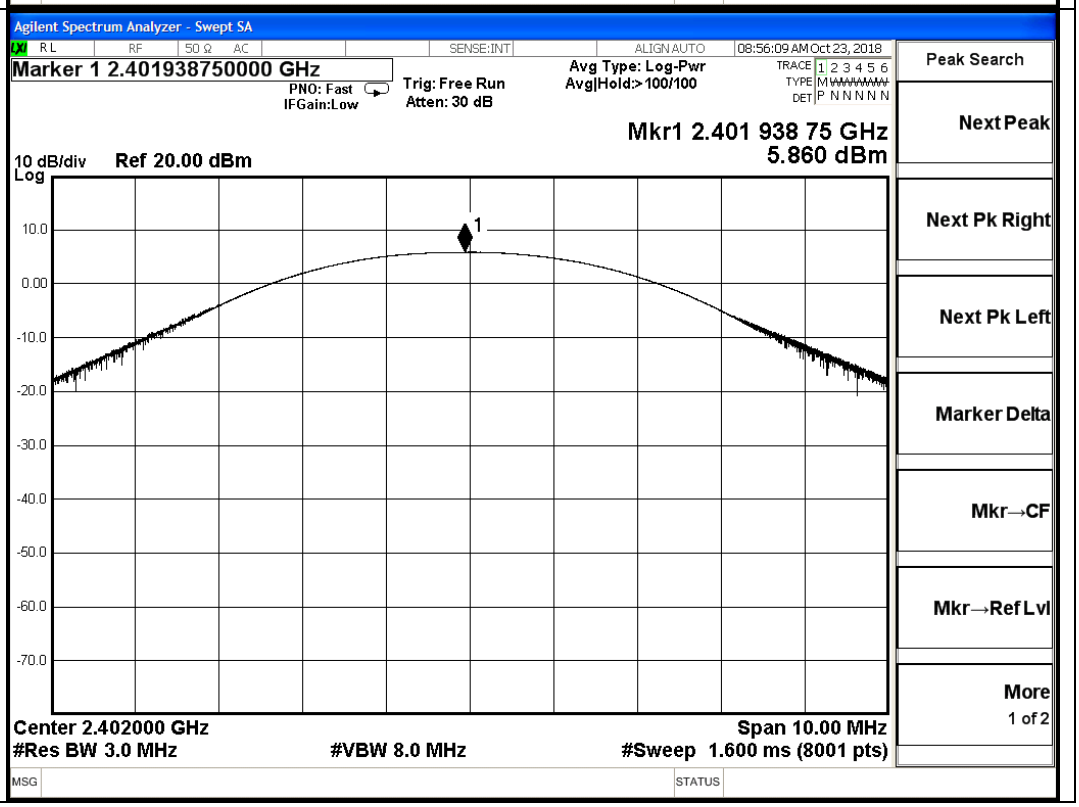
Environmental Conditions

Temperature:	23.5 ° C
Relative Humidity:	66%
ATM Pressure:	100.0 kPa
Test Engineer:	AKING JIN
Supervised by:	JAYDEN ZHUO

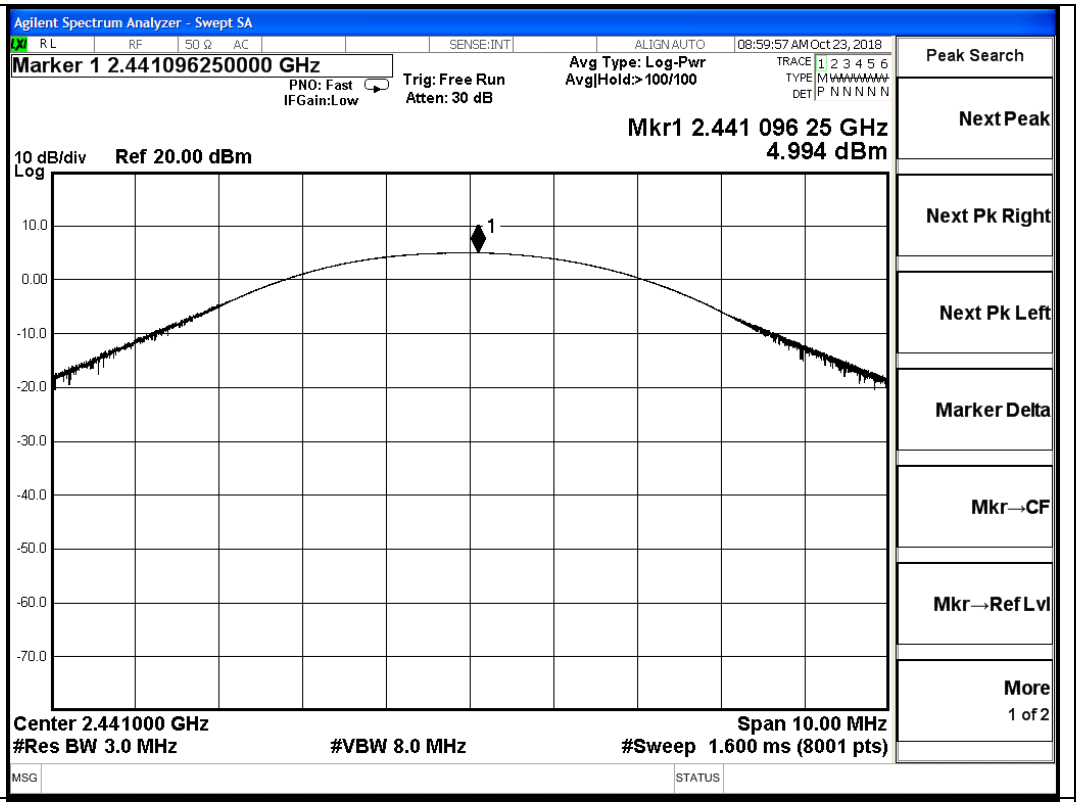
A.1 Maximum Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	4.116	21	PASS
	MCH	3.067	21	PASS
	HCH	1.478	21	PASS
π/4DQPSK	LCH	5.860	21	PASS
	MCH	4.994	21	PASS
	HCH	3.561	21	PASS
8DPSK	LCH	6.118	21	PASS
	MCH	5.210	21	PASS
	HCH	3.885	21	PASS

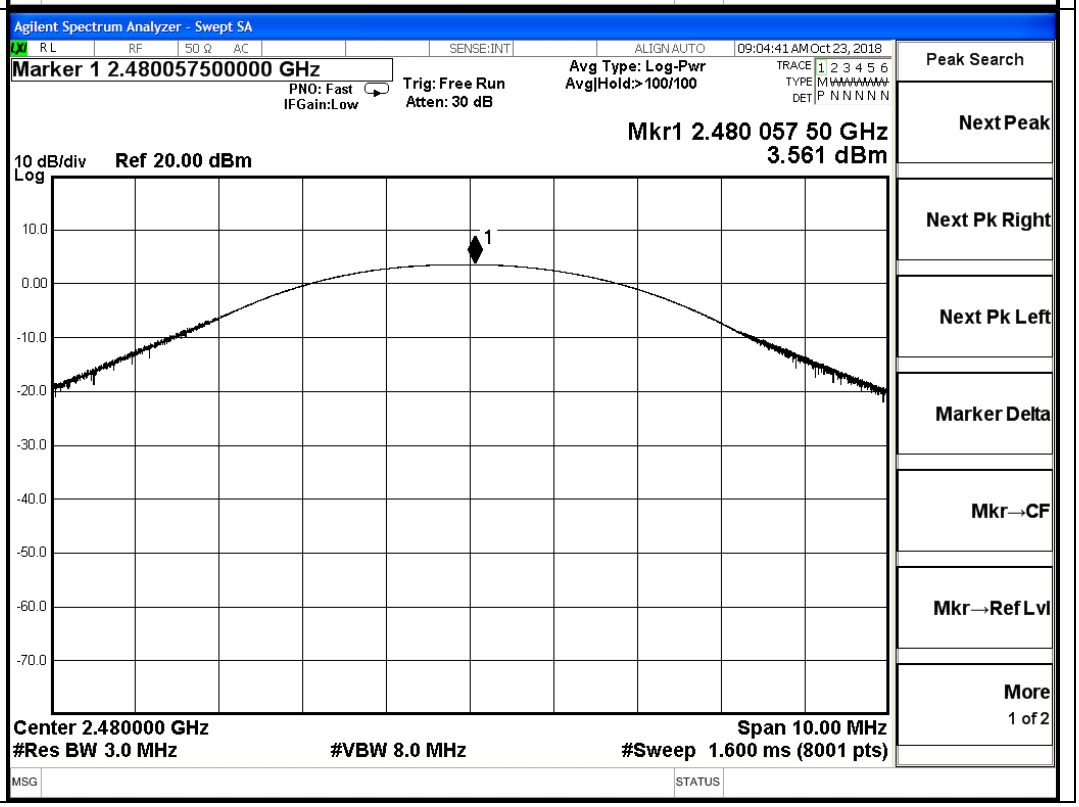
Test Graphs	
GFSK/LCH	
GFSK/MCH	

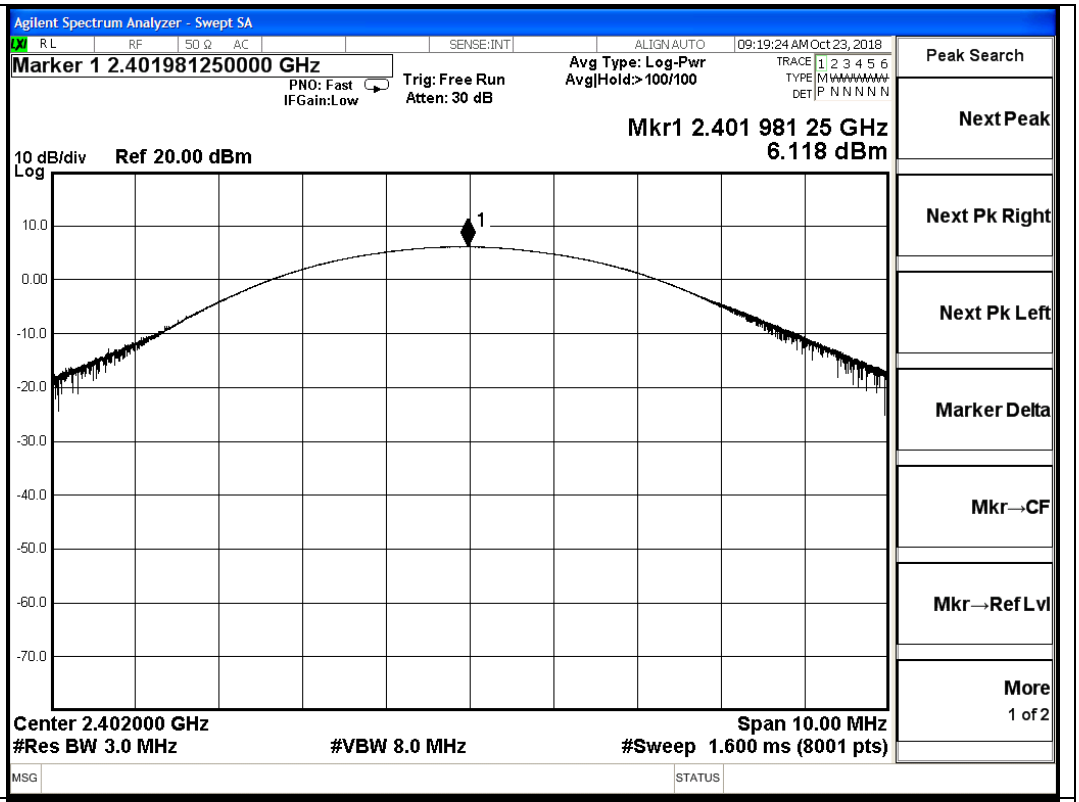
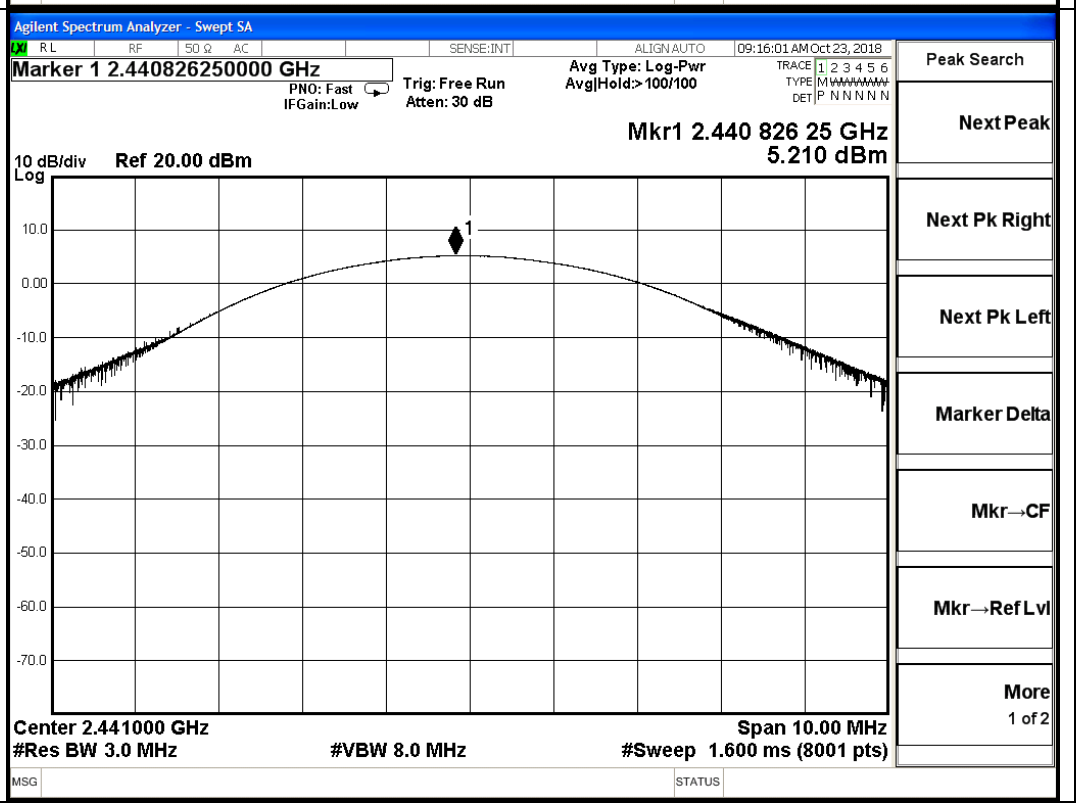
GFSK/HCH	
π/4DQPSK/LCH	

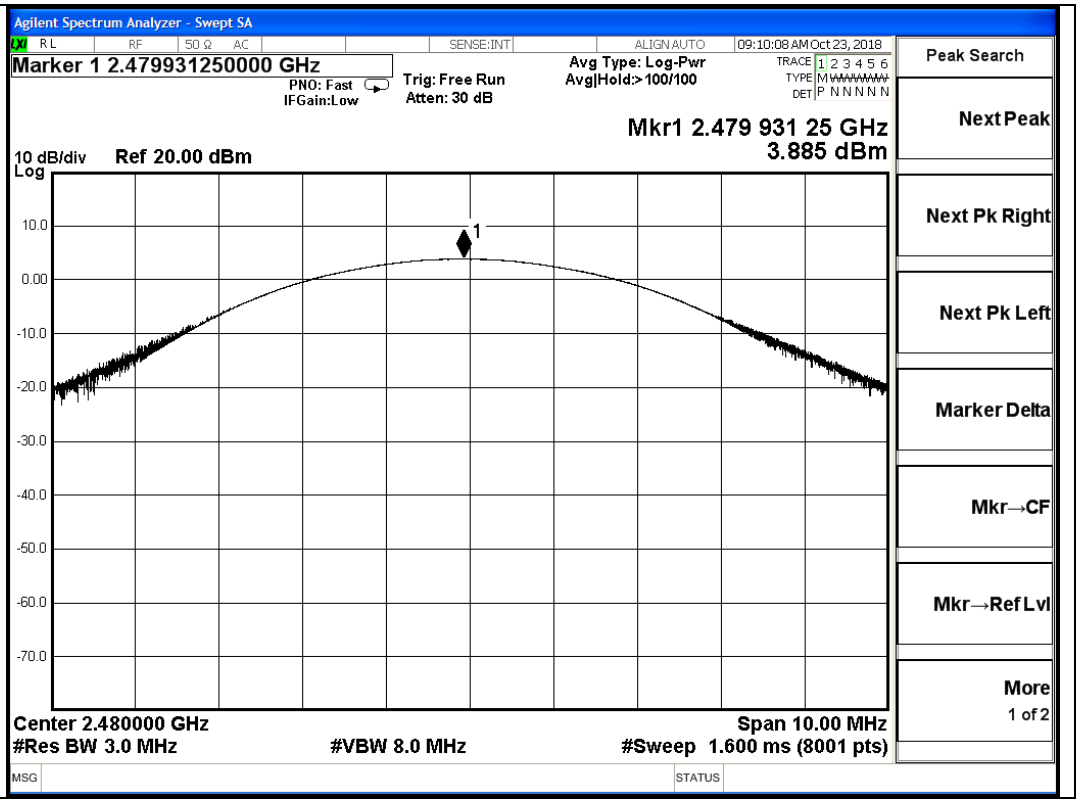
π/4DQPSK/MCH



π/4DQPSK/HCH



8DPSK/LCH	
8DPSK/MCH	

8DPSK/HCH	

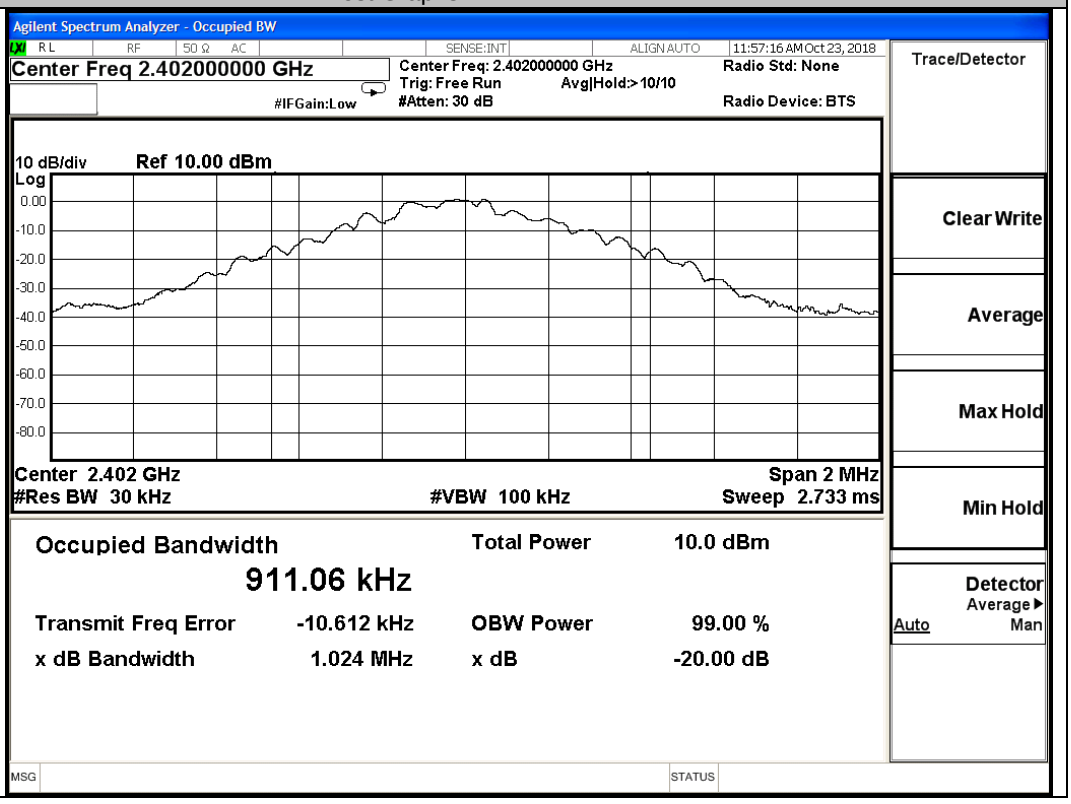
Agilent Spectrum Analyzer - Swept SA
RL
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
09:10:08 AM Oct 23, 2018
Marker 1 2.479931250000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Mkr1 2.479 931 25 GHz
3.885 dBm
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
1
Center 2.480000 GHz
#Res BW 3.0 MHz
#VBW 8.0 MHz
Span 10.00 MHz
#Sweep 1.600 ms (8001 pts)
MSG
STATUS
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

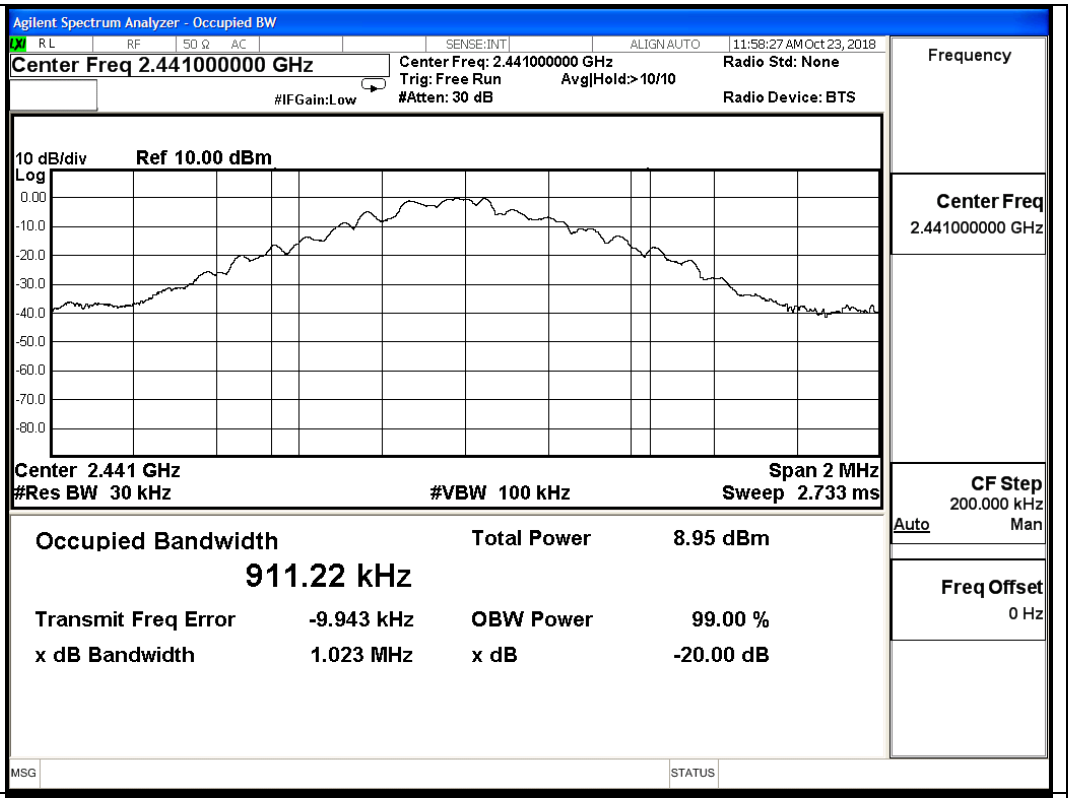
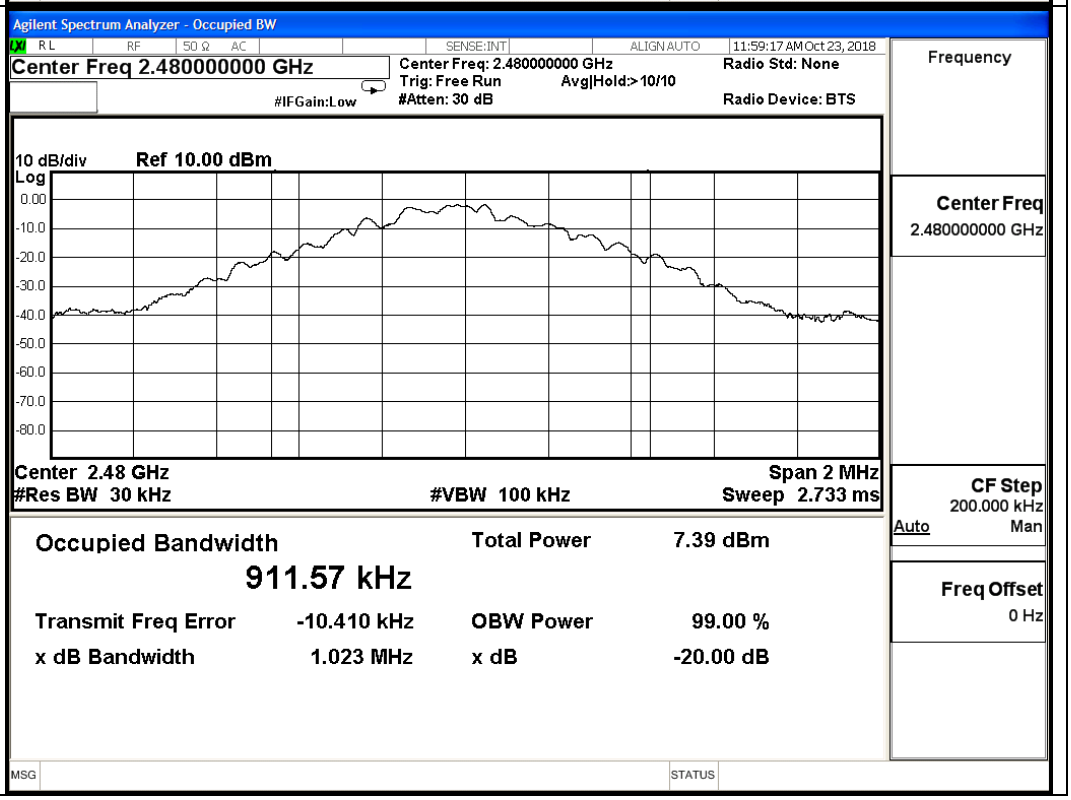
A.2 99% and 20dB Bandwidth

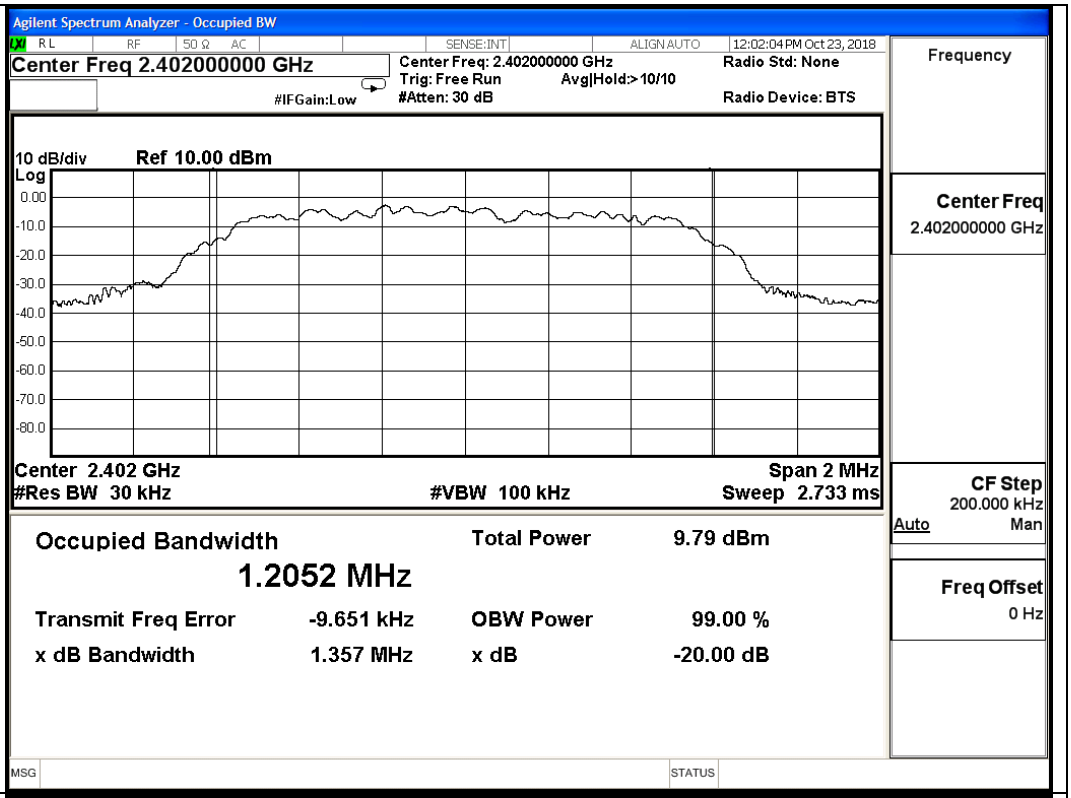
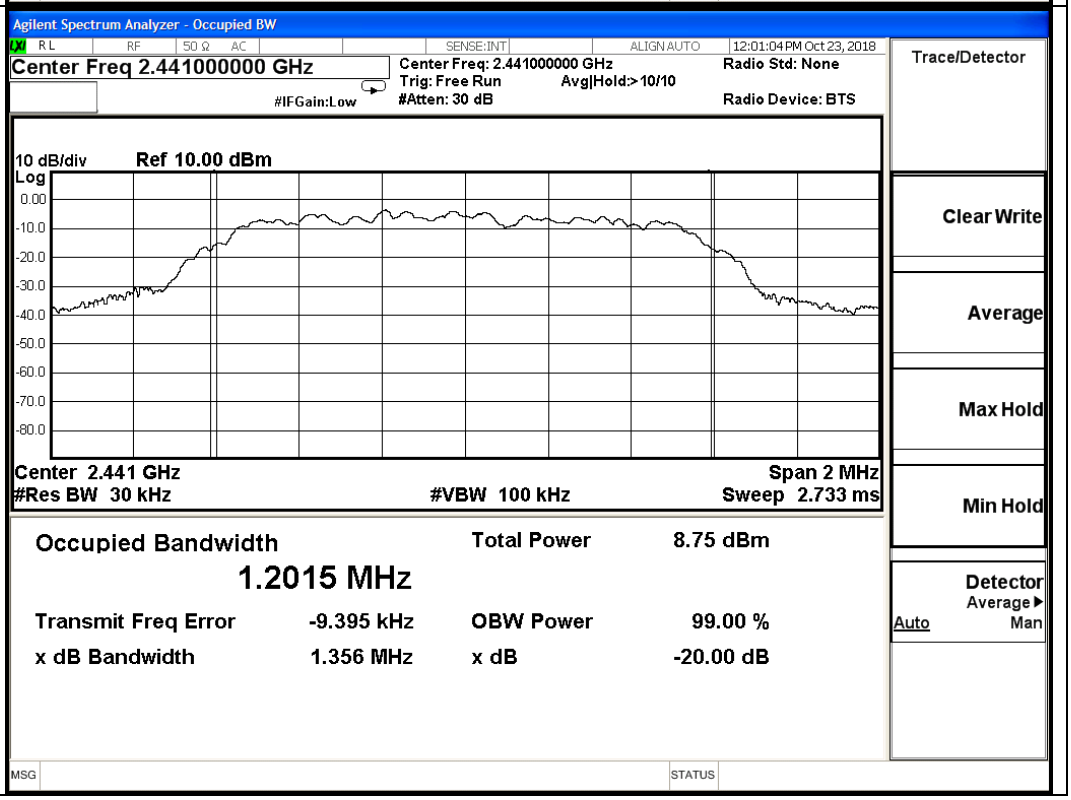
Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.91106	1.024	Not Specified	PASS
	MCH	0.91122	1.023	Not Specified	PASS
	HCH	0.91157	1.023	Not Specified	PASS
π/4DQPSK	LCH	1.2052	1.357	Not Specified	PASS
	MCH	1.2015	1.356	Not Specified	PASS
	HCH	1.1989	1.356	Not Specified	PASS
8DPSK	LCH	1.1966	1.352	Not Specified	PASS
	MCH	1.1935	1.349	Not Specified	PASS
	HCH	1.1923	1.347	Not Specified	PASS

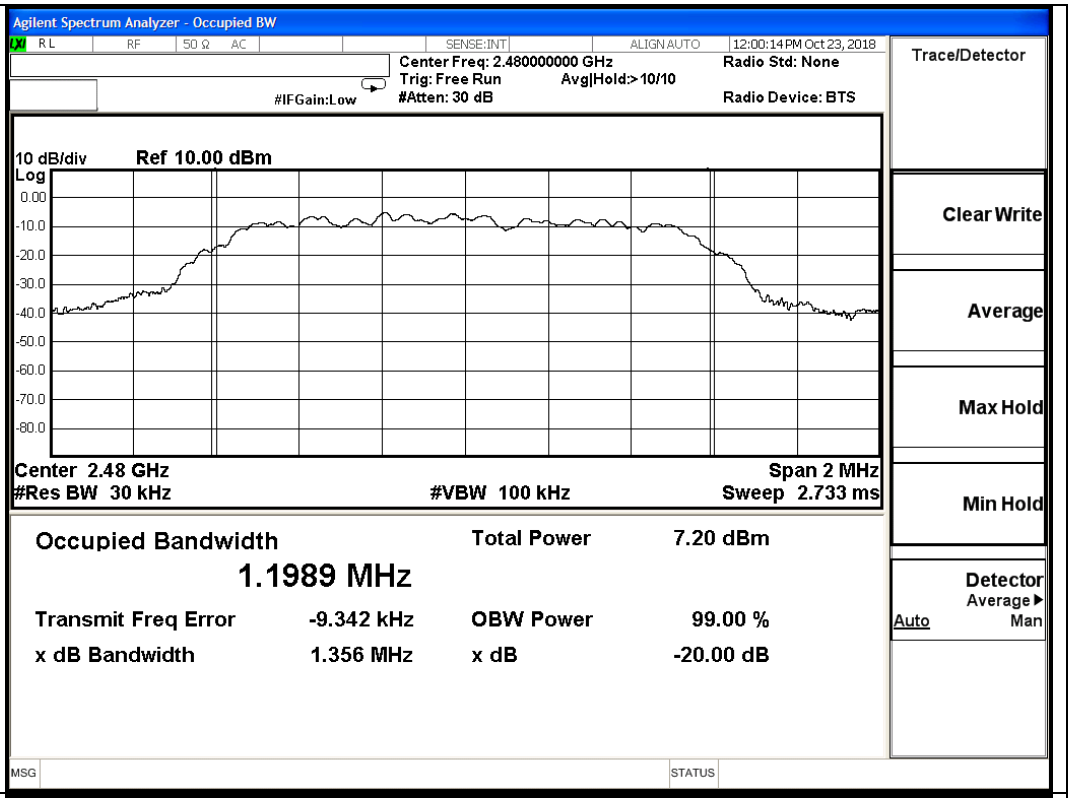
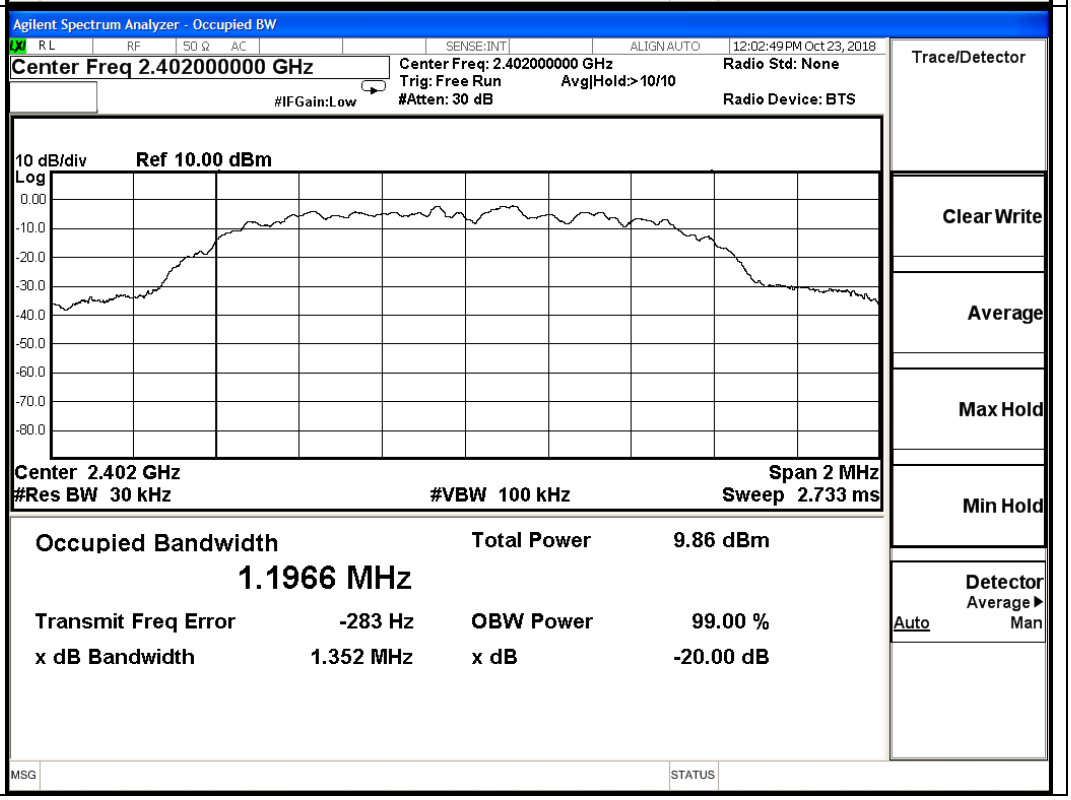
Test Graphs

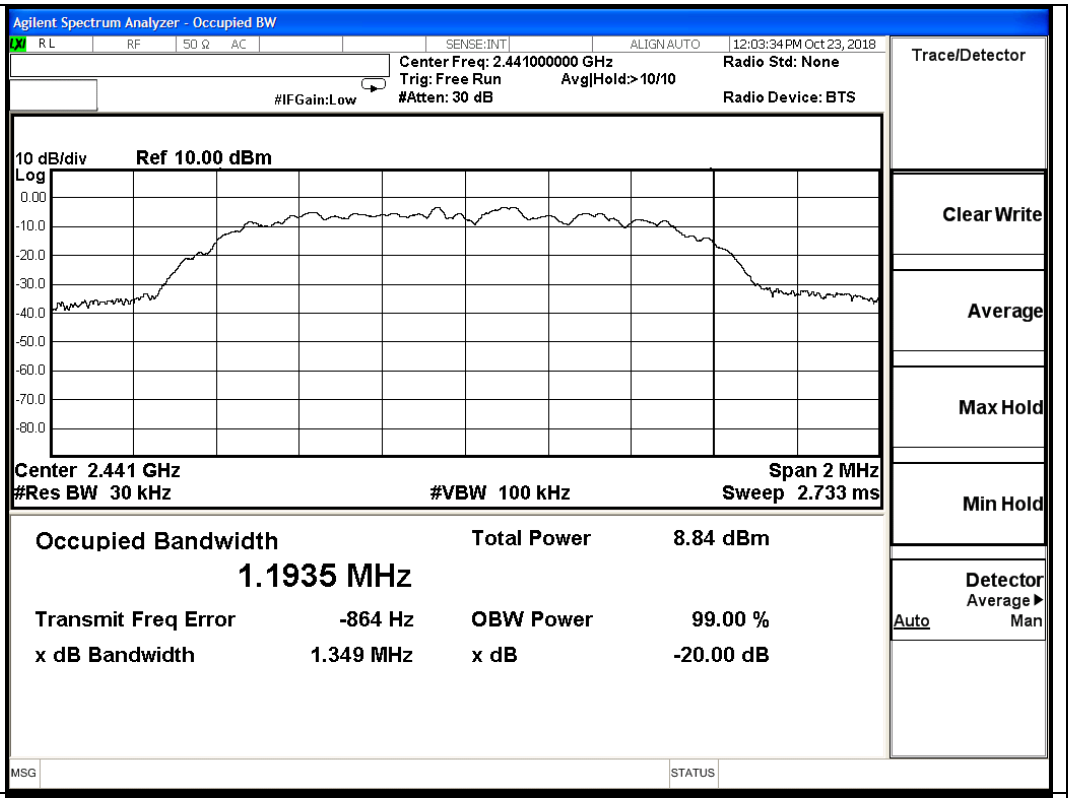
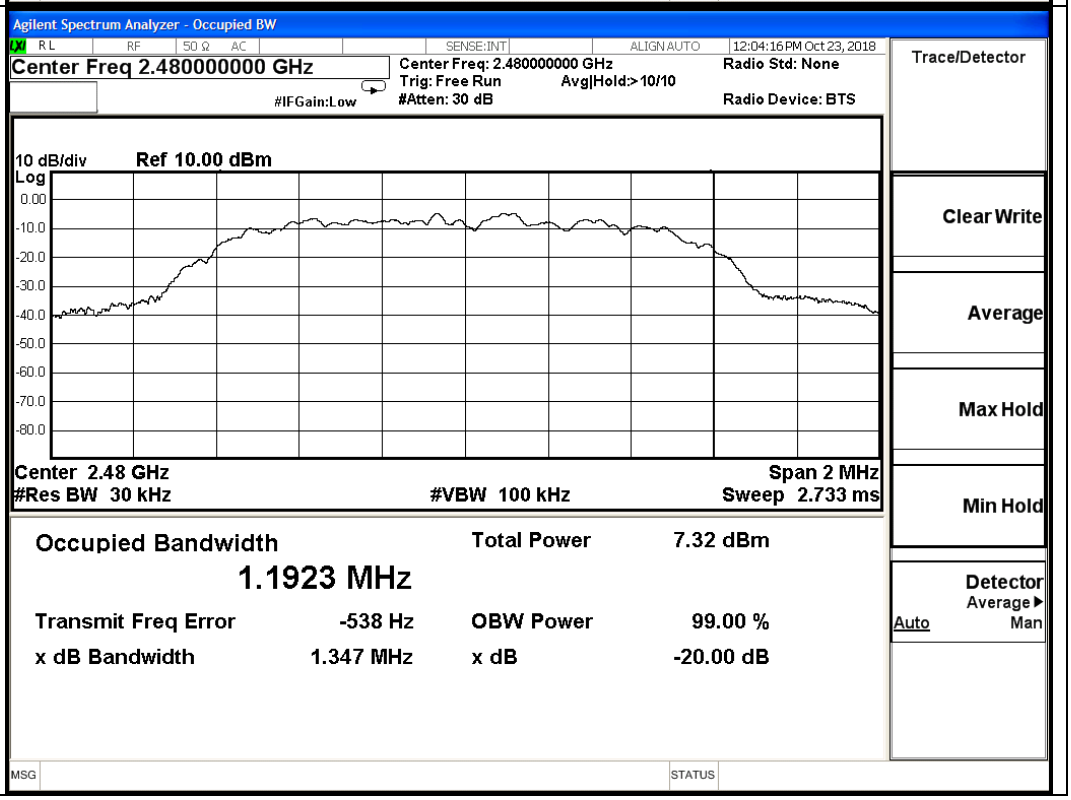
GFSK/LCH



GFSK/MCH	
GFSK/HCH	

π/4DQPSK/LCH	
π/4DQPSK/MCH	

π/4DQPSK/HCH	
8DPSK/LCH	

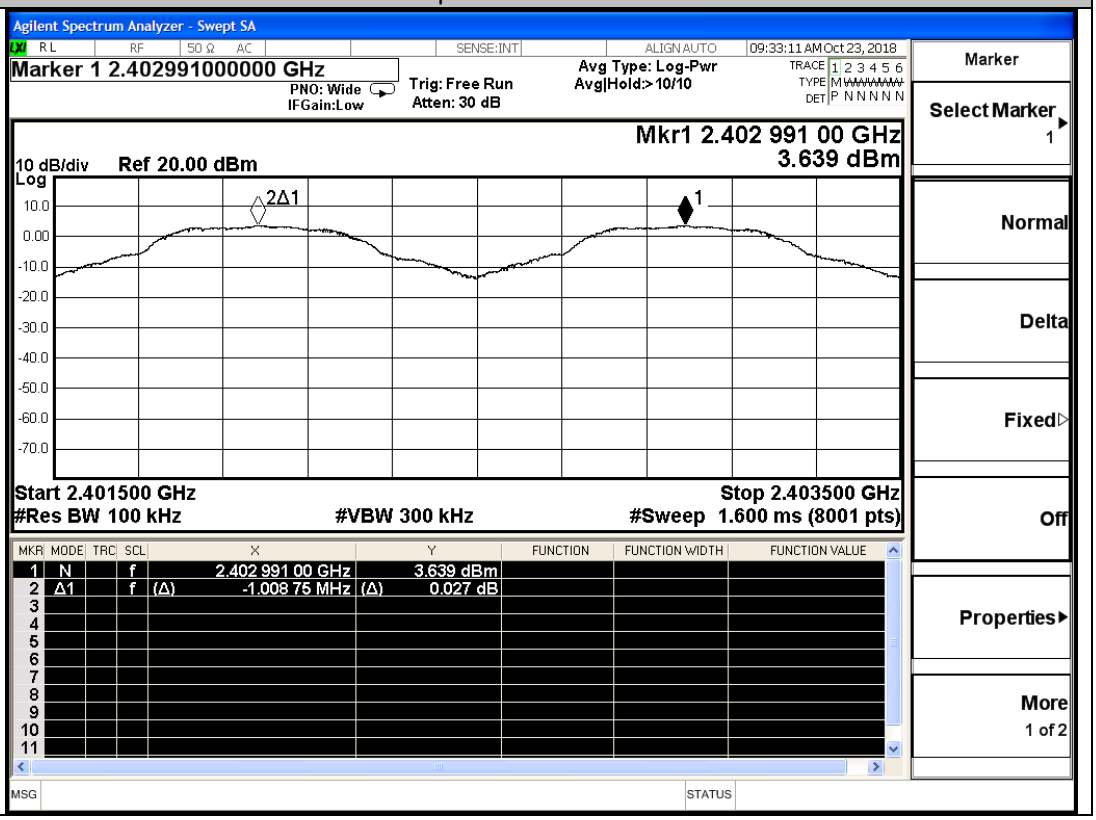
8DPSK/MCH	
8DPSK/HCH	

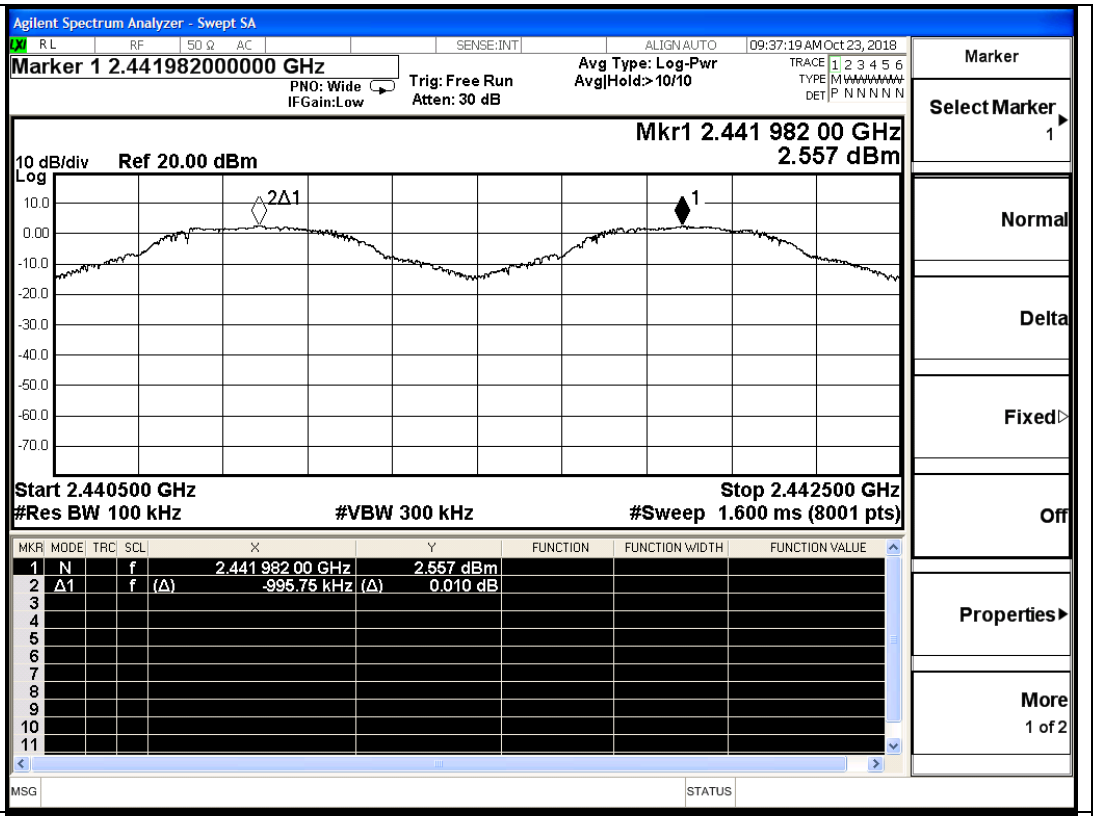
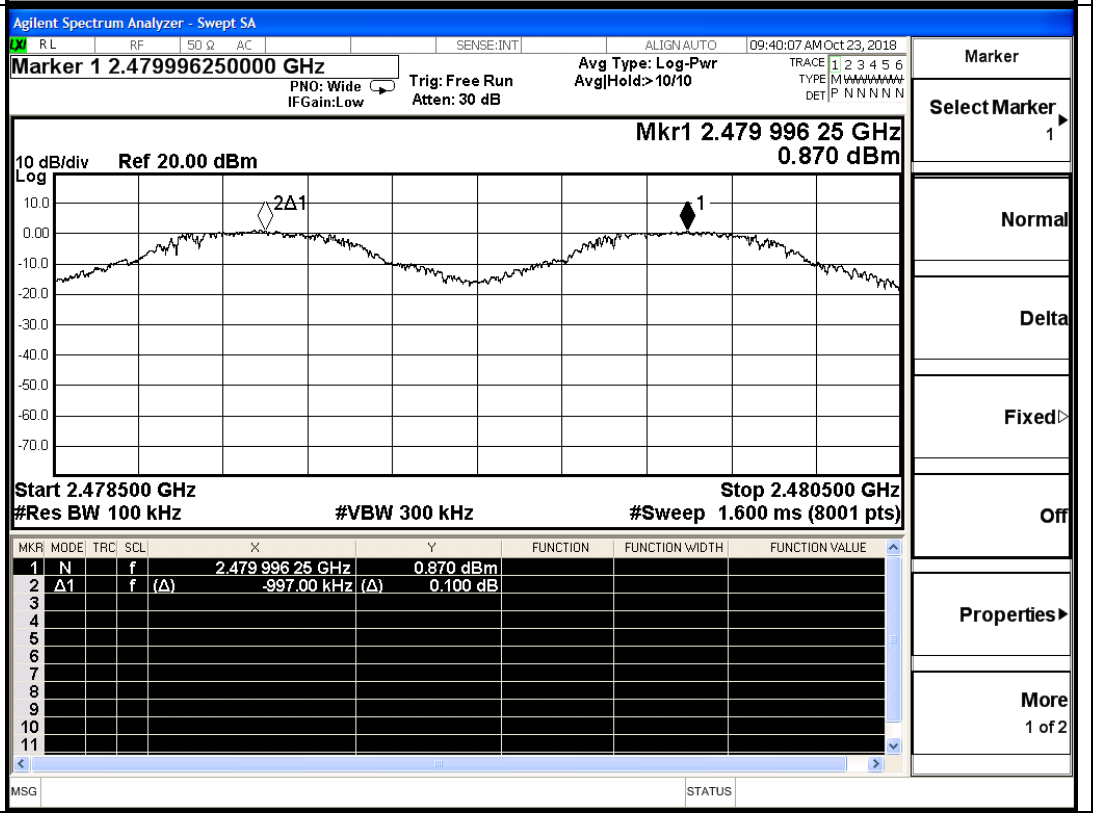
A.3 Carrier Frequency Separation

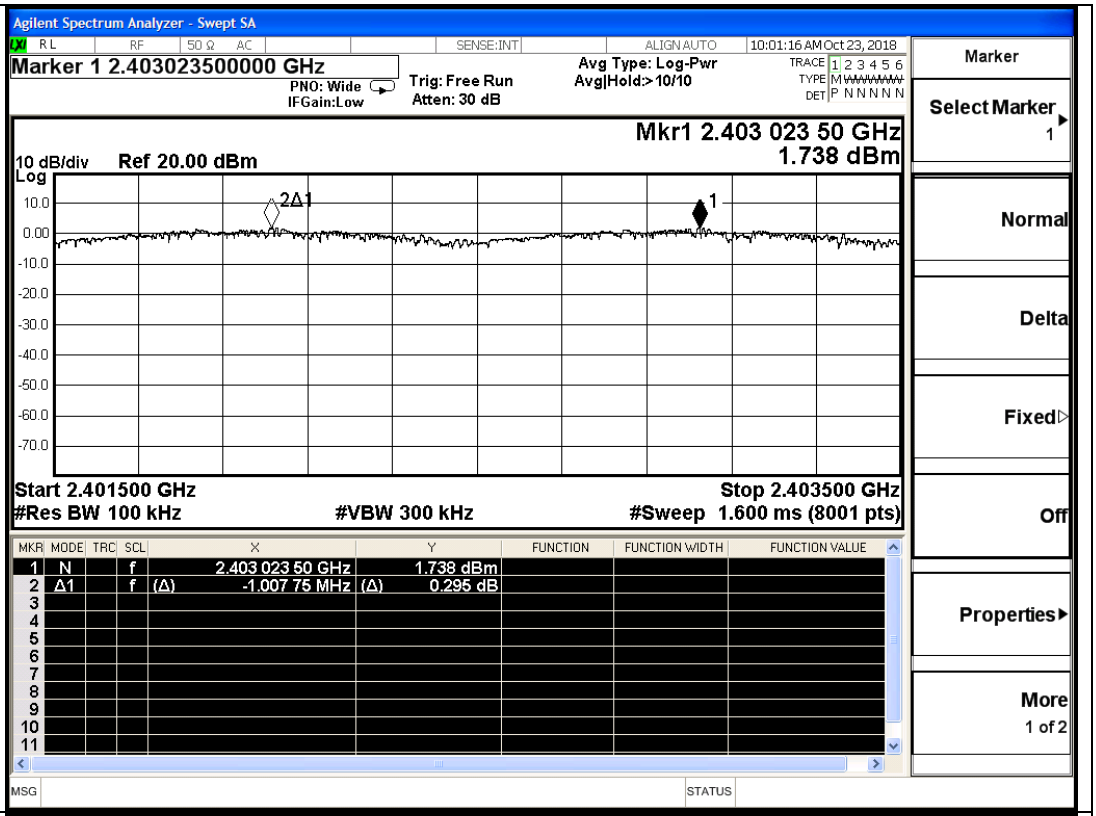
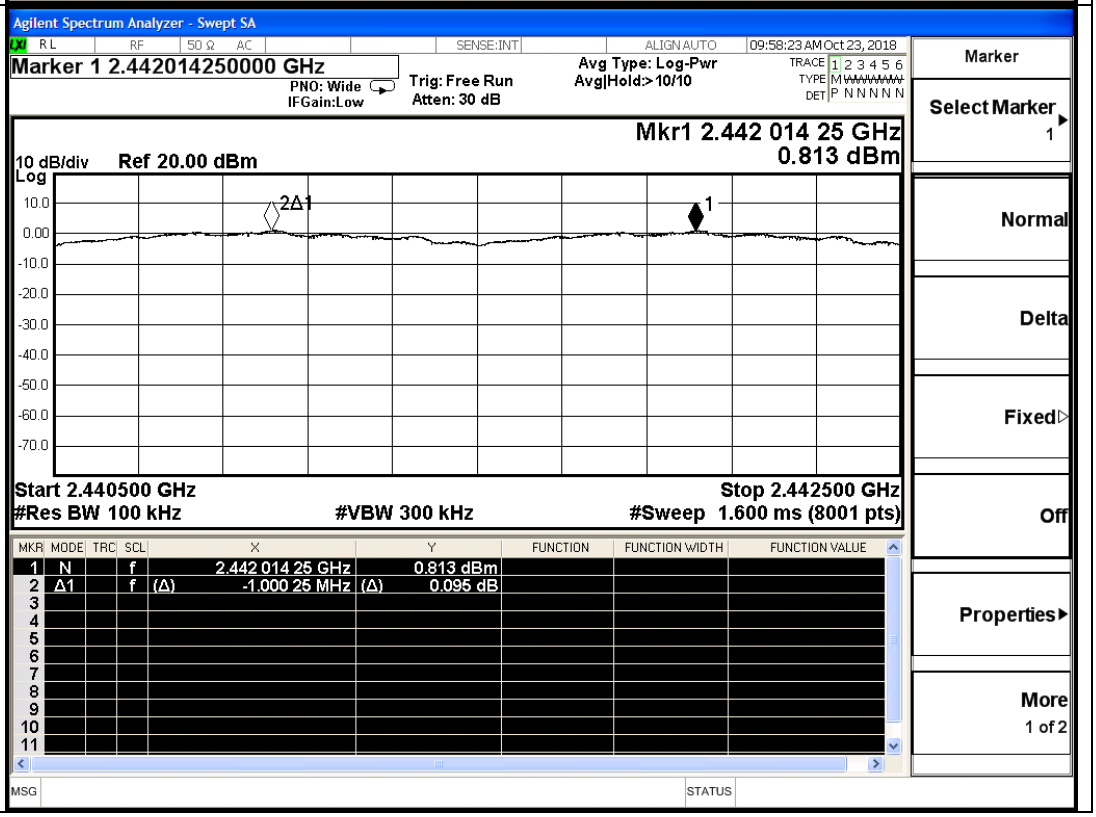
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz] 2/3*20dB Bandwidth	Verdict
GFSK	LCH	1.009	0.683	PASS
	MCH	0.996	0.682	PASS
	HCH	0.997	0.682	PASS
π/4DQPSK	LCH	1.008	0.905	PASS
	MCH	1.000	0.904	PASS
	HCH	1.001	0.904	PASS
8DPSK	LCH	1.008	0.901	PASS
	MCH	1.000	0.899	PASS
	HCH	1.000	0.898	PASS

Test Graphs

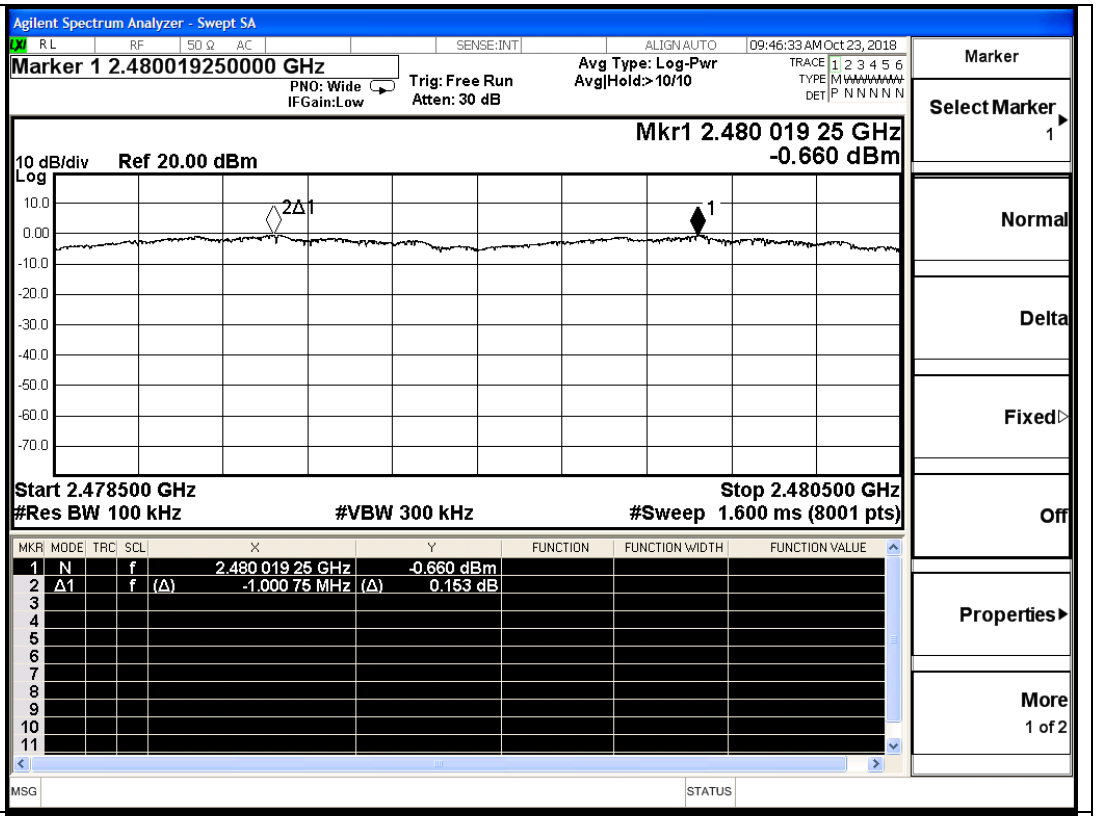
GFSK/LCH



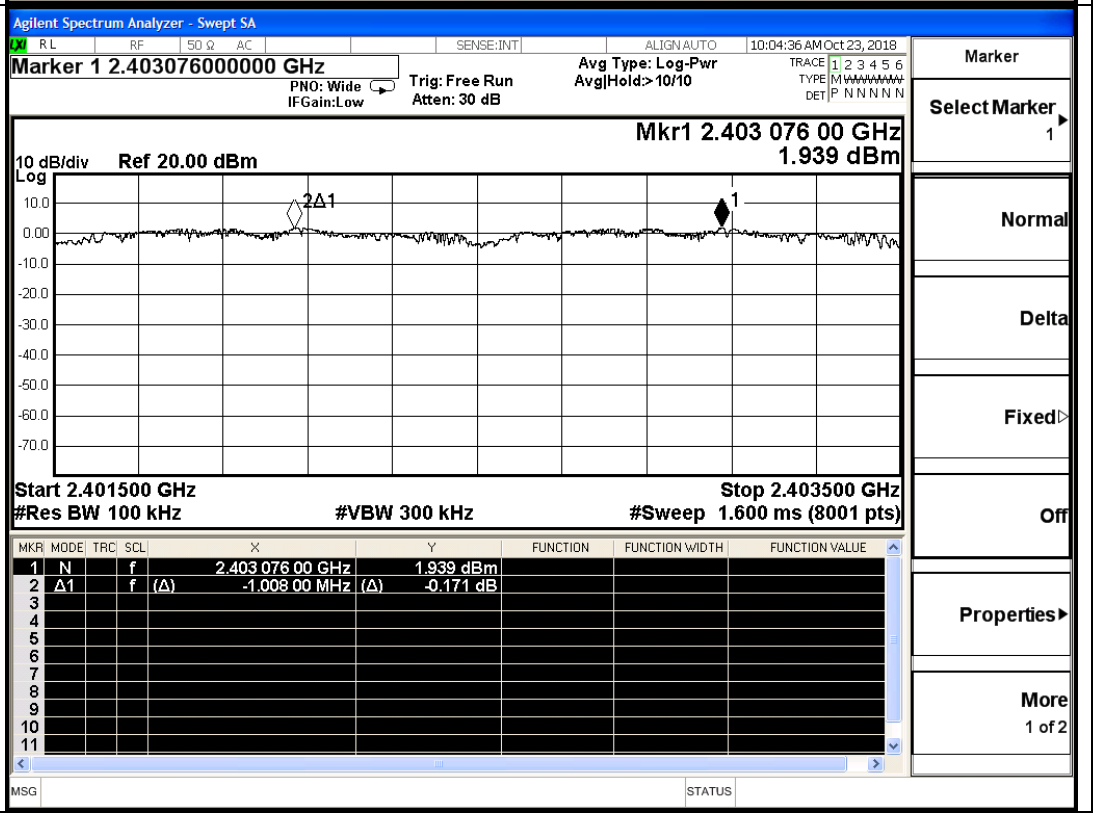
GFSK/MCH	
GFSK/HCH	

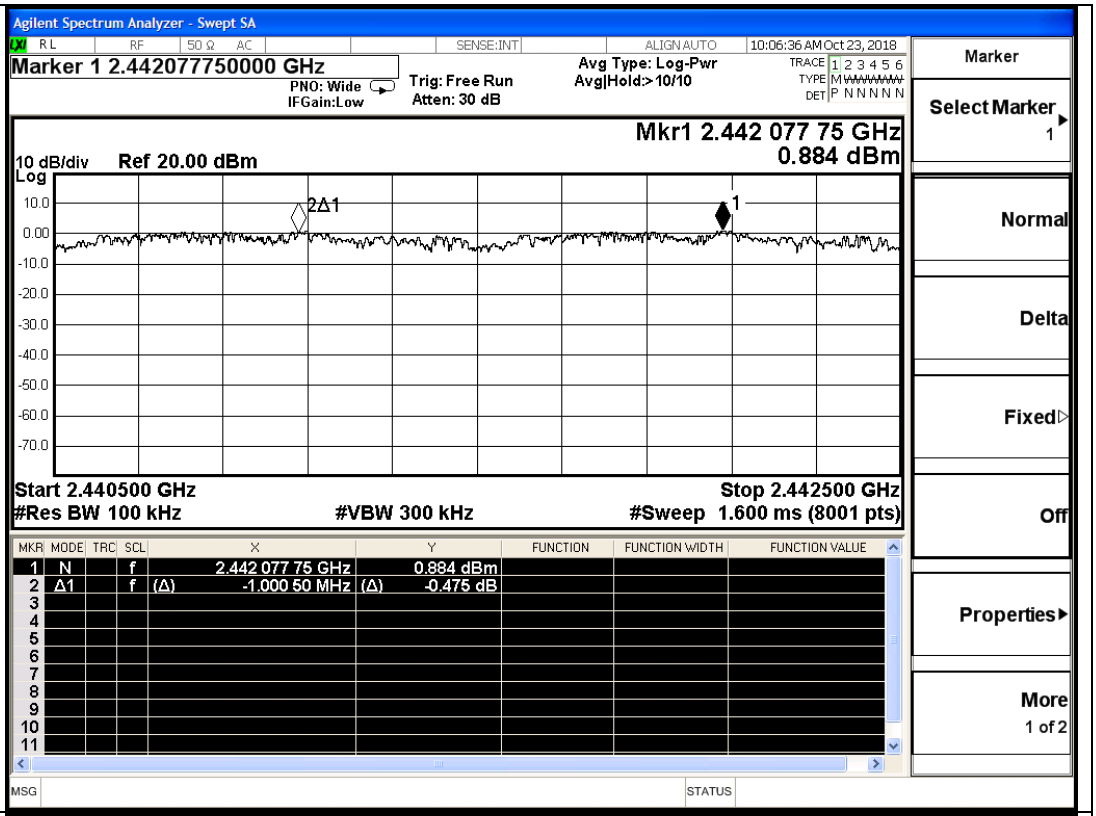
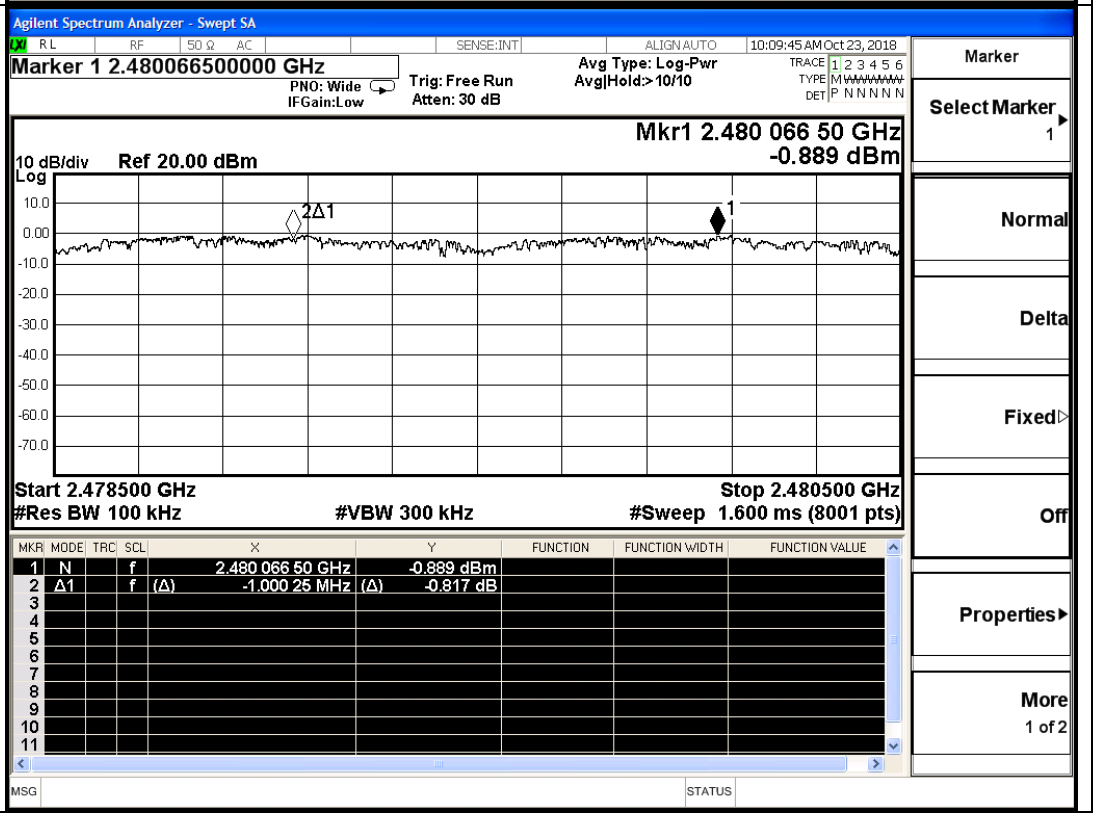
π/4DQPSK/LCH	
π/4DQPSK/MCH	

π/4DQPSK/HCH



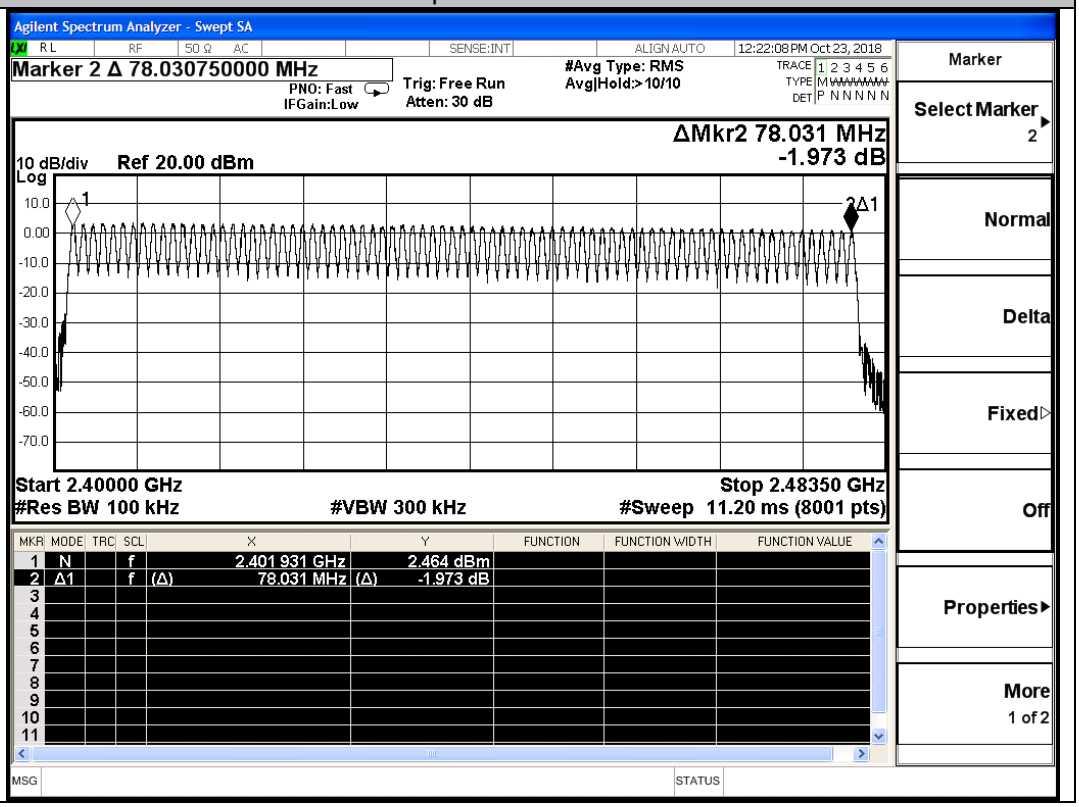
8DPSK/LCH

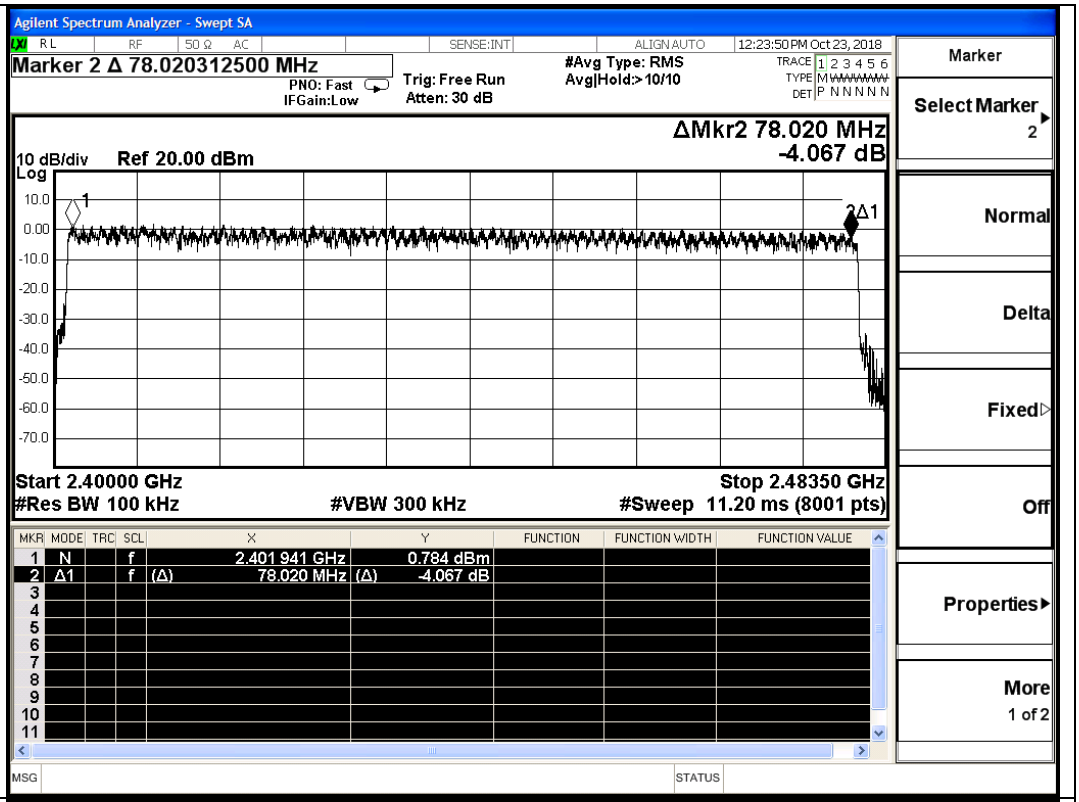
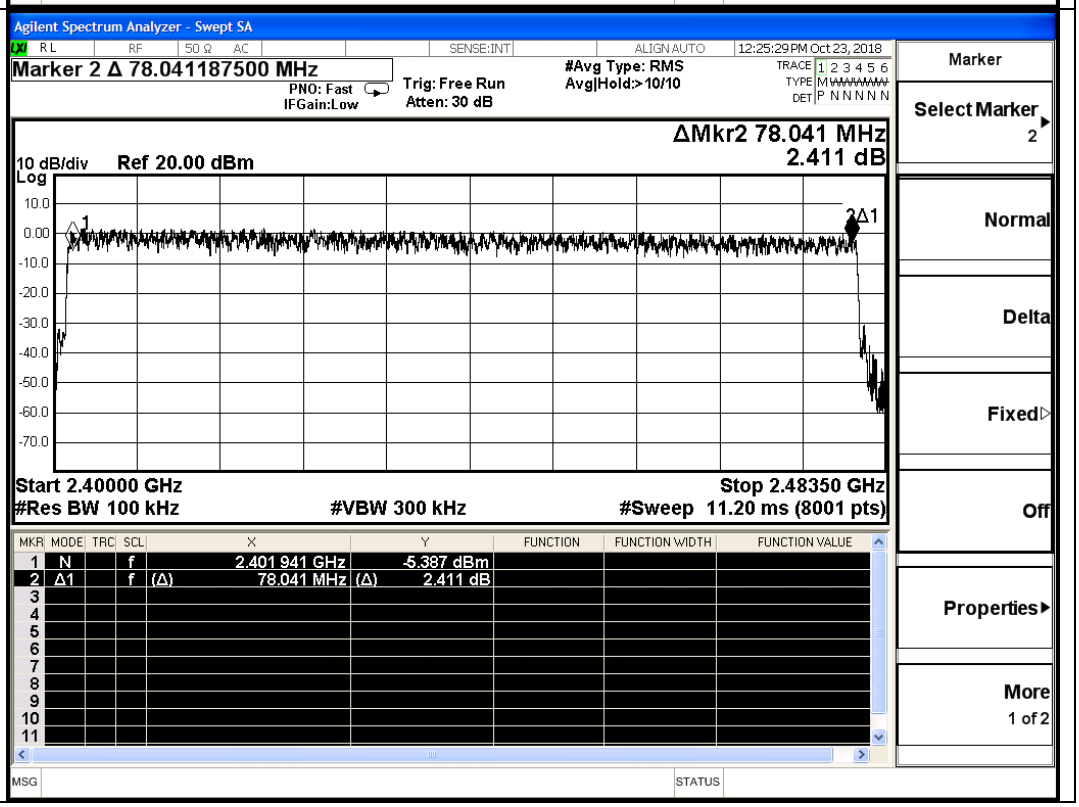


8DPSK/MCH	
8DPSK/HCH	

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	

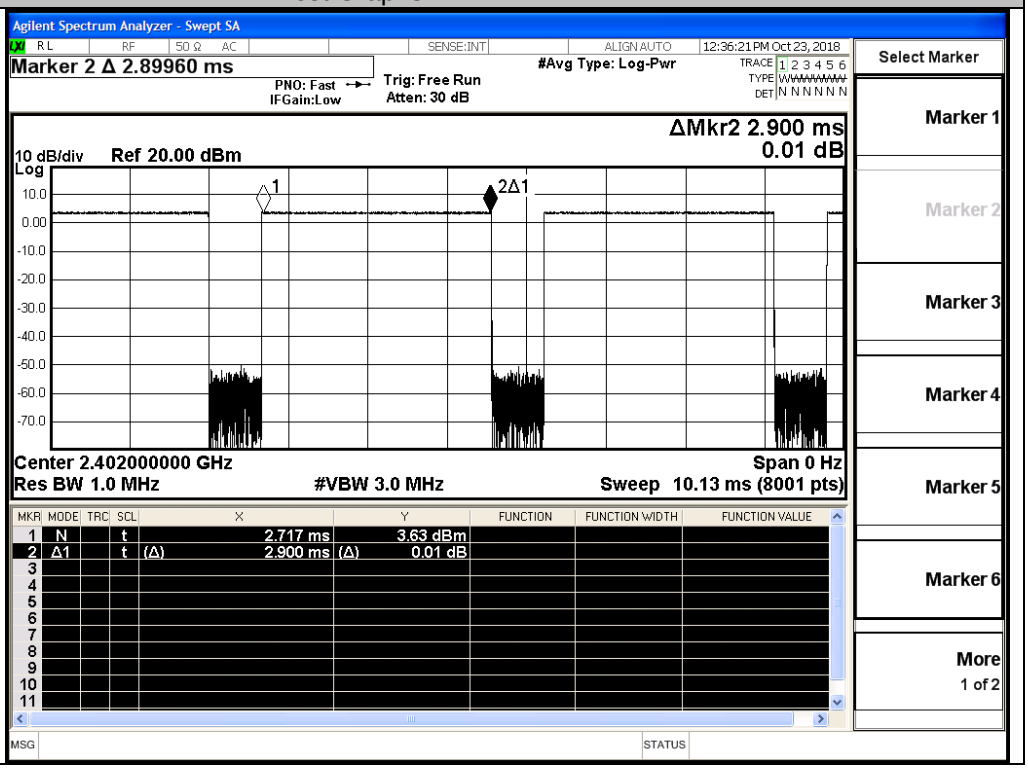
π/4DQPSK/Hop	
8DPSK/Hop	

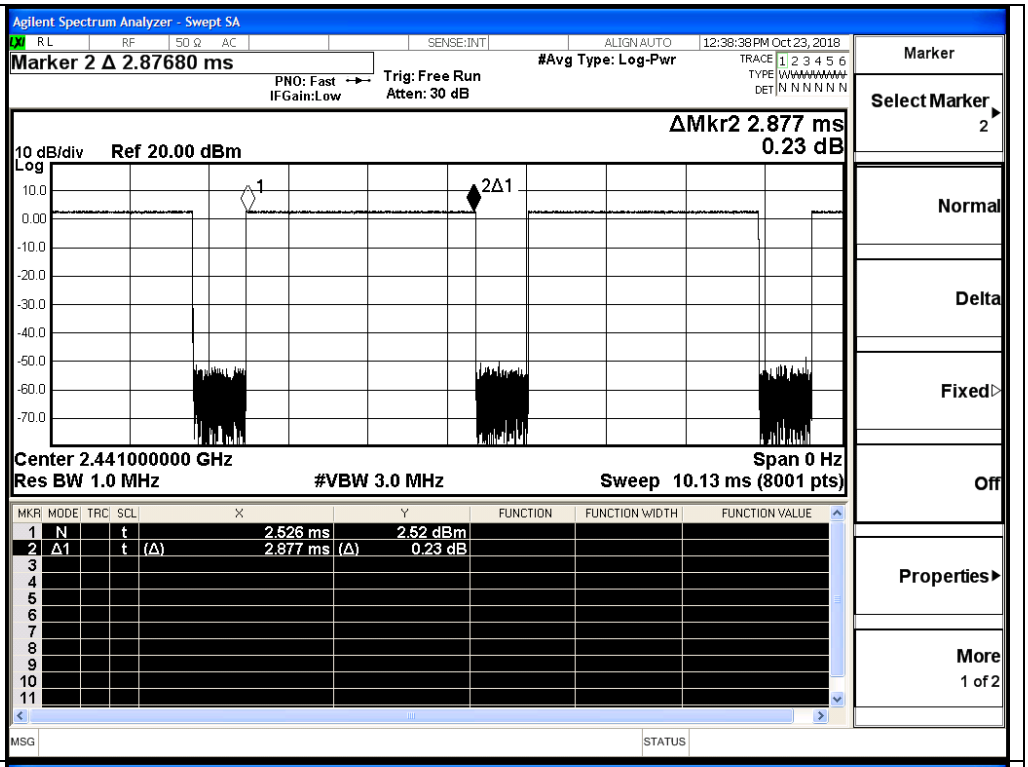
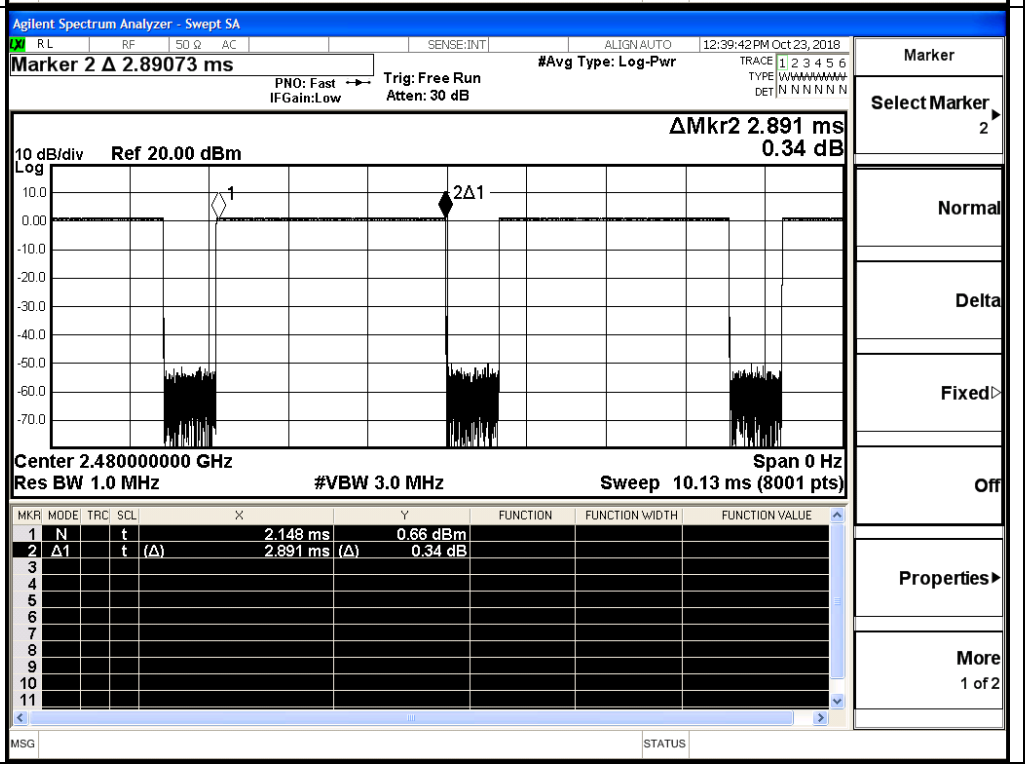
A.5 Dwell Time

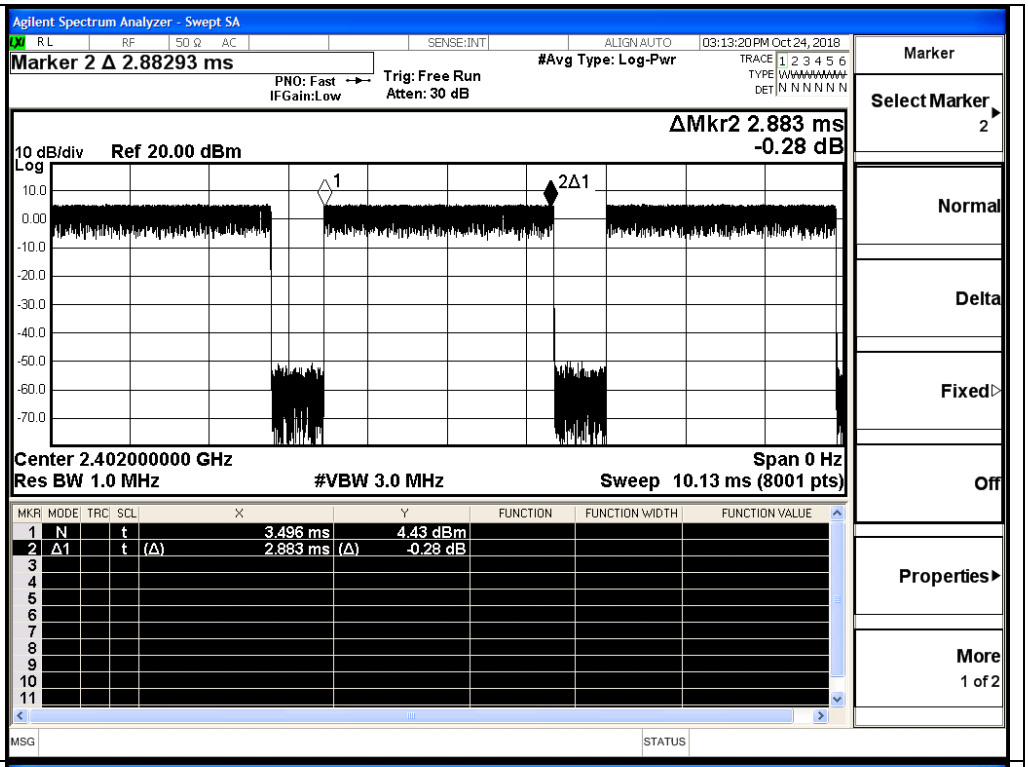
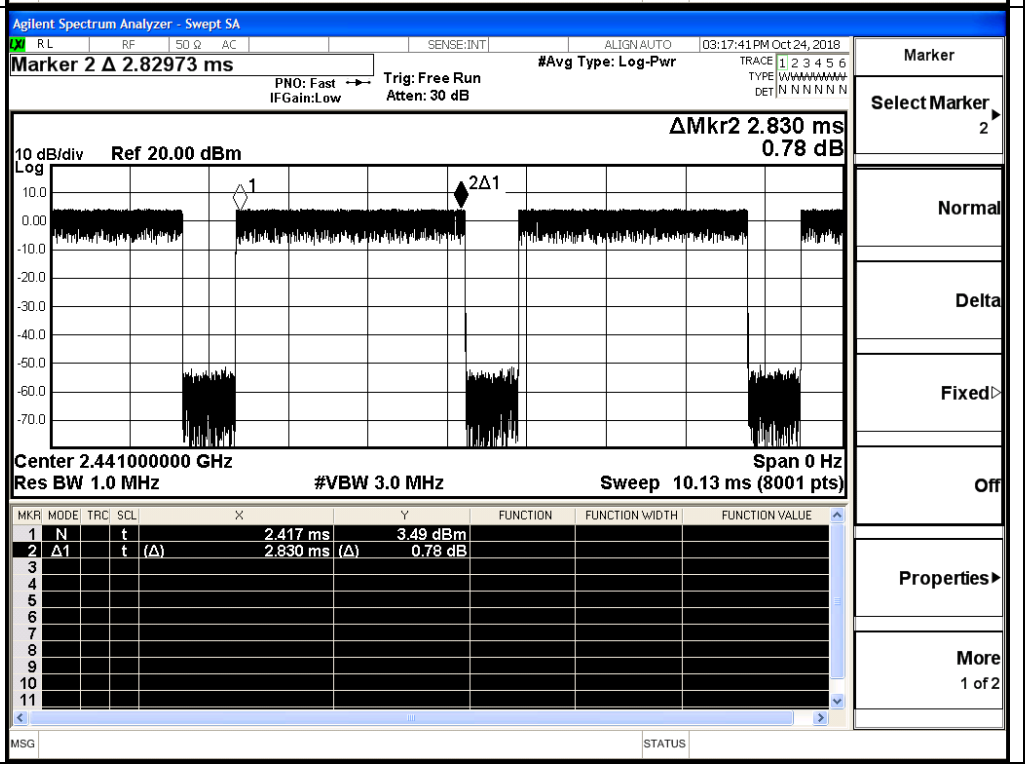
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.90	106.7	0.309	0.4	PASS
	DH5	MCH	2.87	106.7	0.306	0.4	PASS
	DH5	HCH	2.89	106.7	0.308	0.4	PASS
π/4DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.83	106.7	0.302	0.4	PASS
	2DH5	HCH	2.88	106.7	0.307	0.4	PASS
8DPSK	3DH5	LCH	2.82	106.7	0.301	0.4	PASS
	3DH5	MCH	2.87	106.7	0.306	0.4	PASS
	3DH5	HCH	2.86	106.7	0.305	0.4	PASS

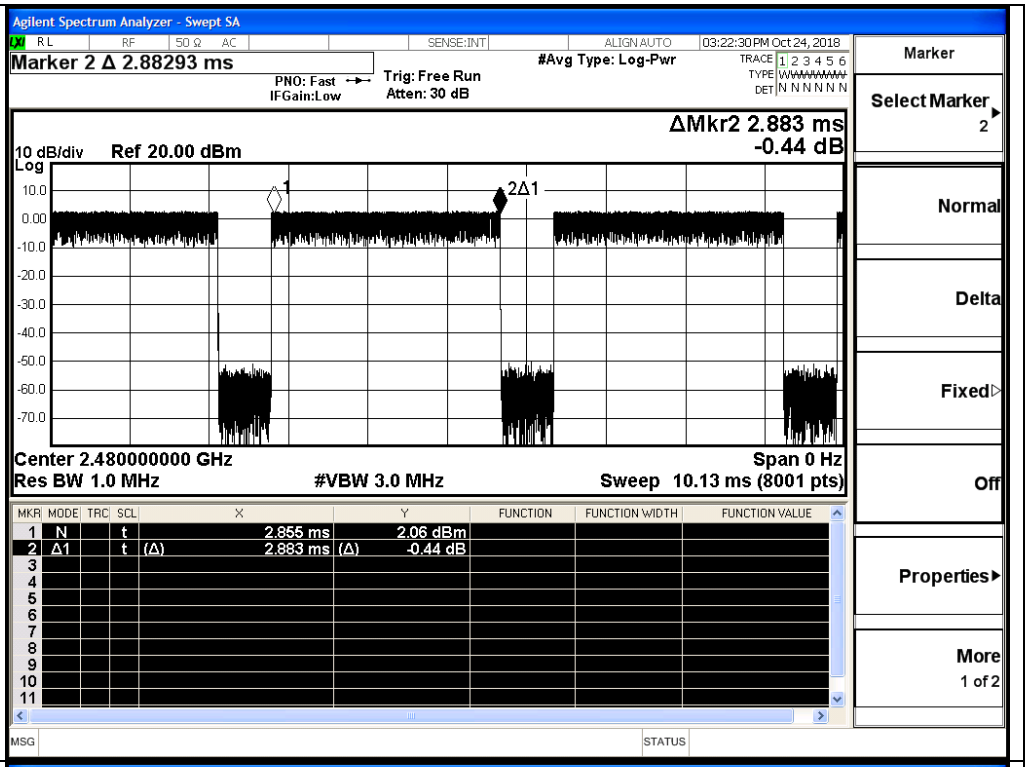
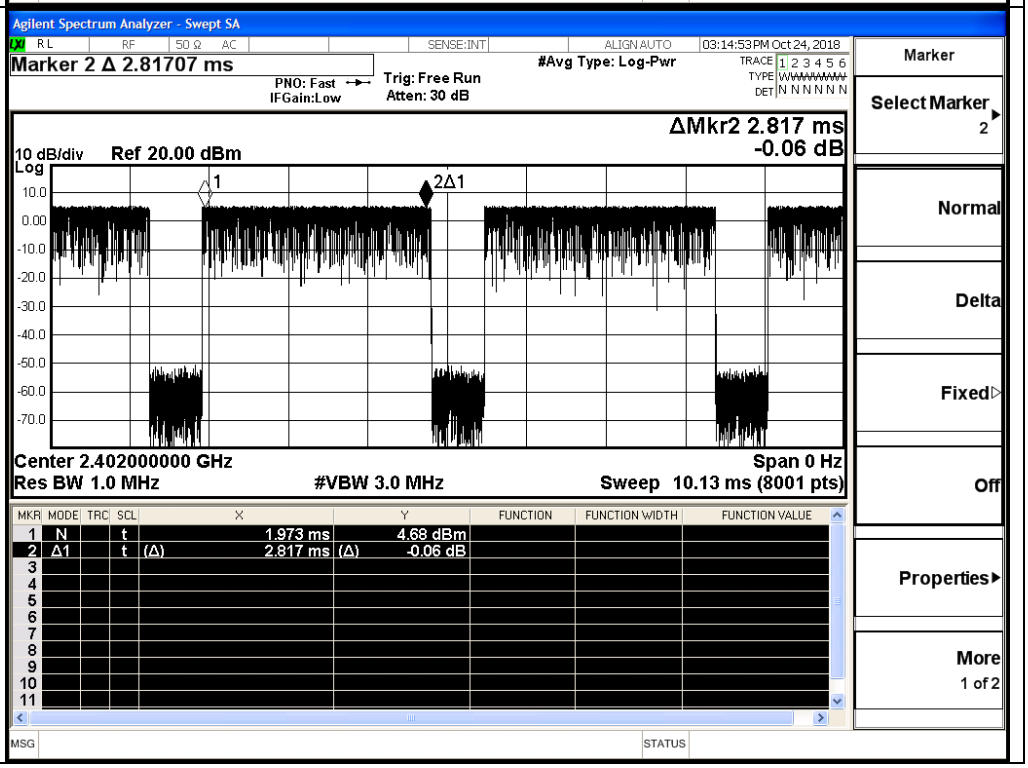
Test Graphs

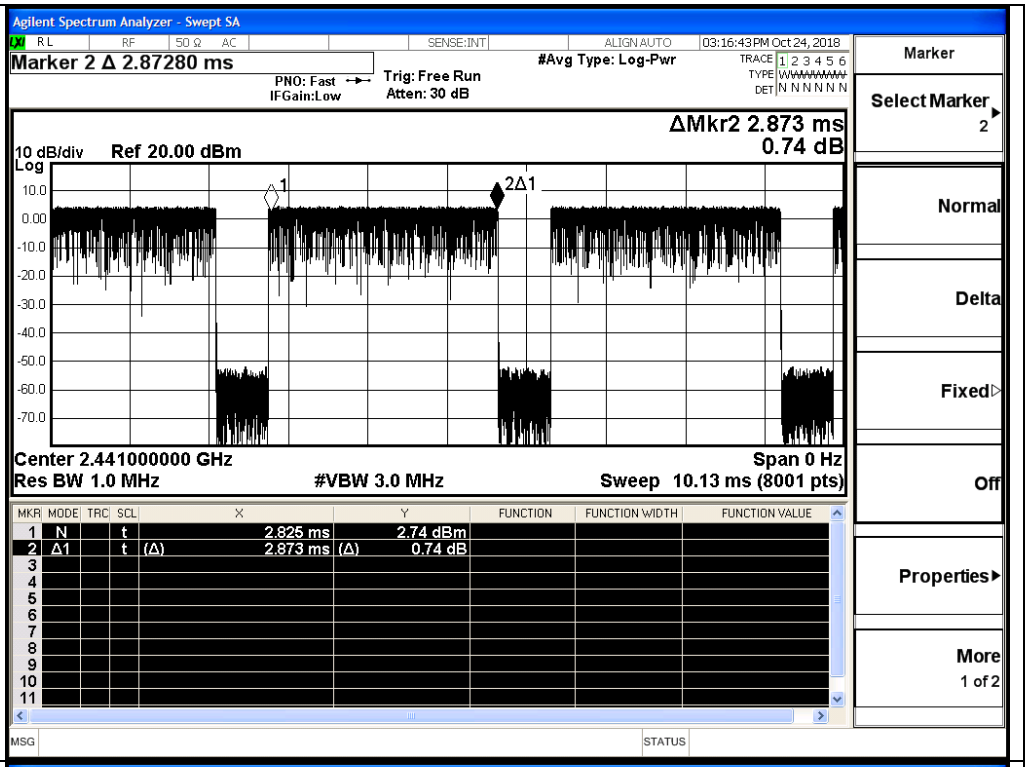
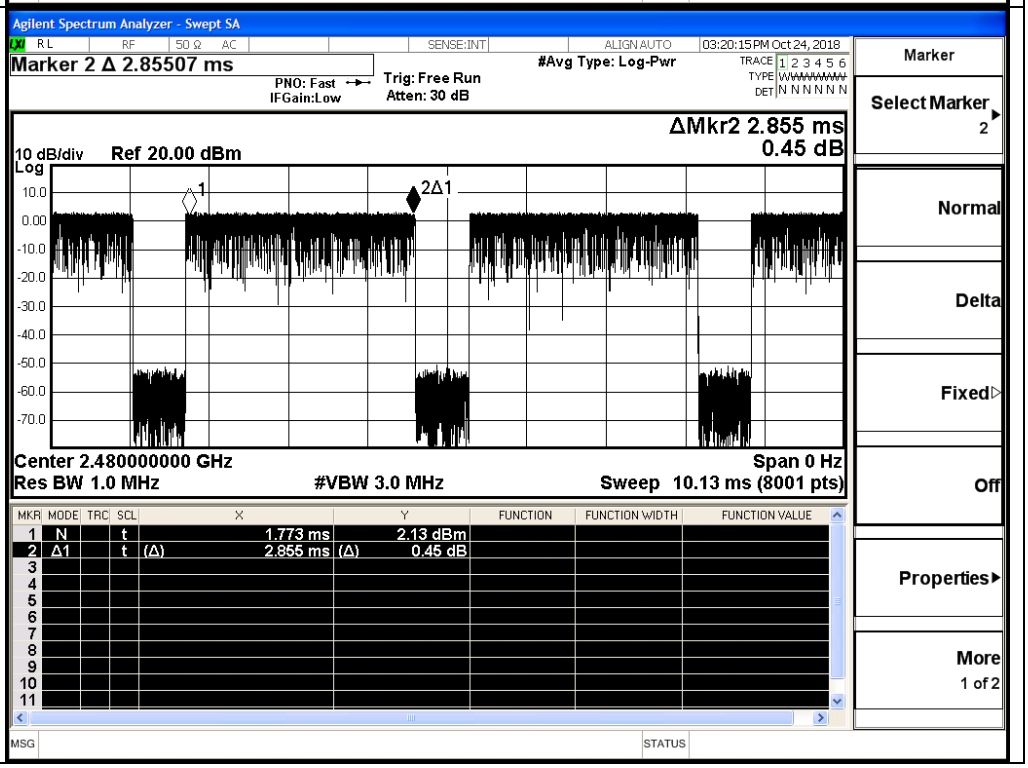
GFSK_DH5/LCH



GFSK_DH5/MCH	
GFSK_DH5/HCH	

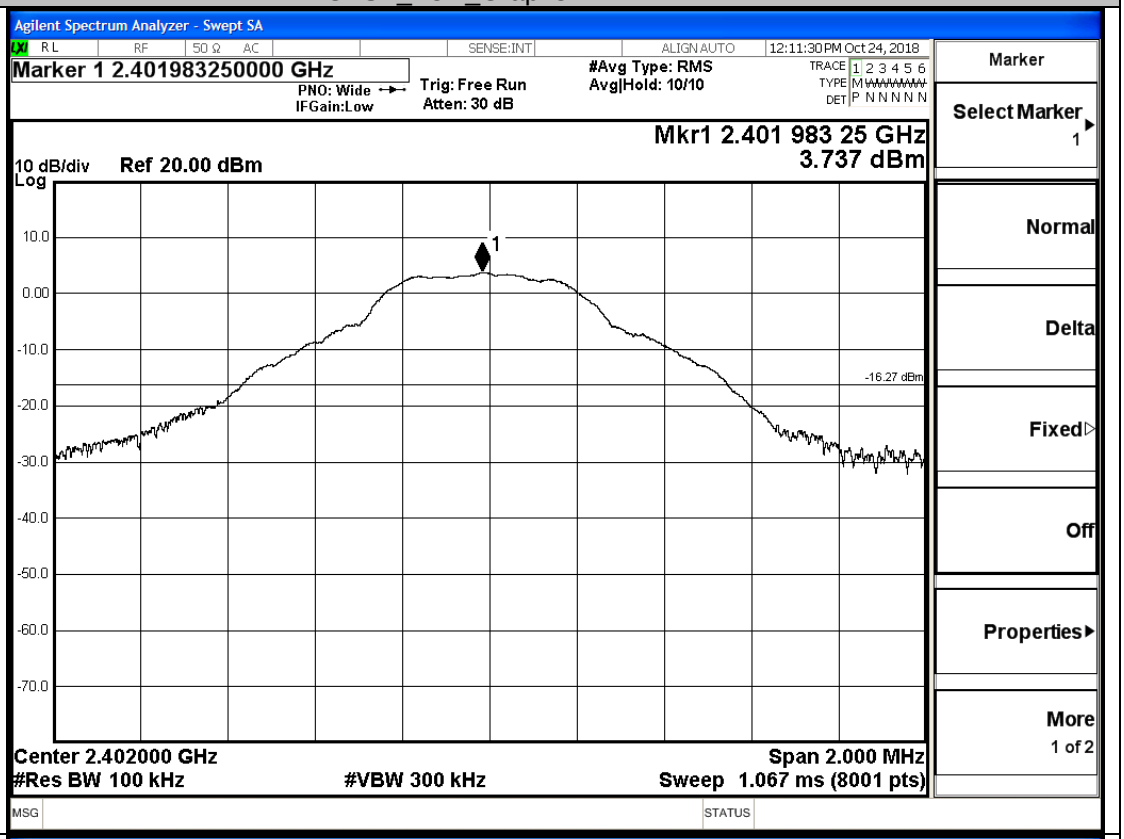
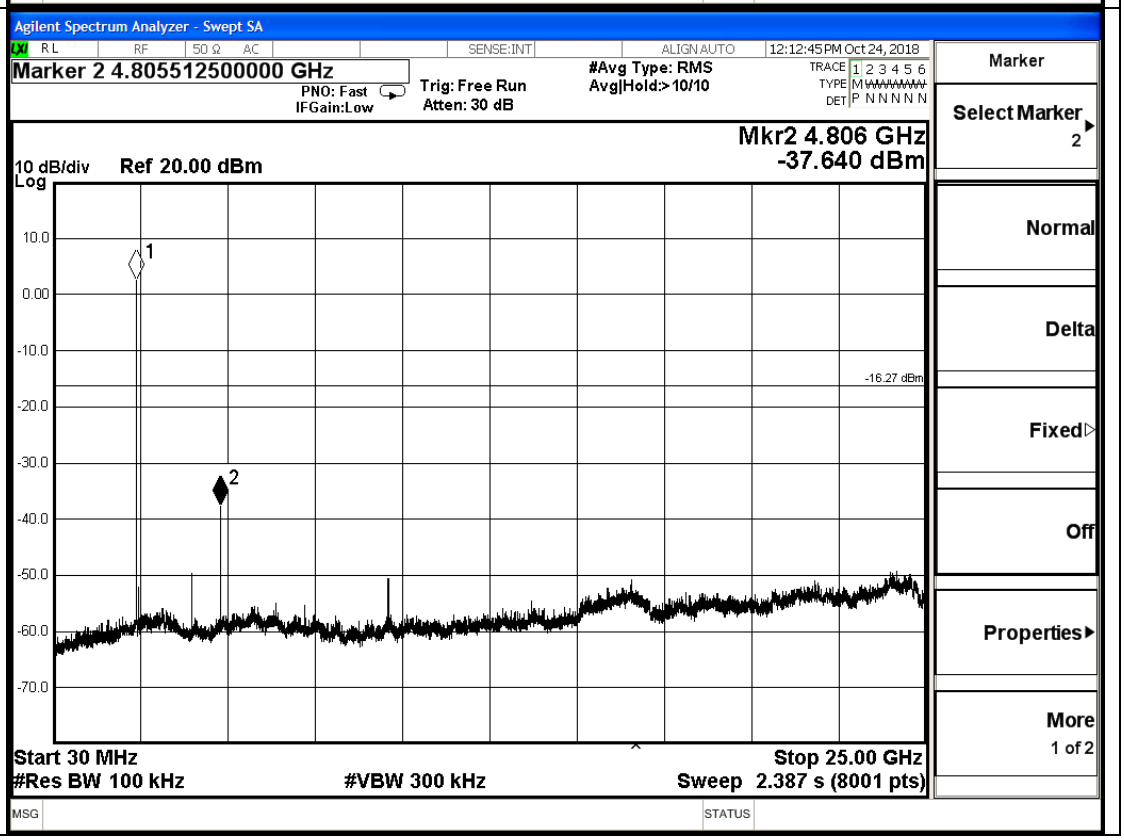
π/4DQPSK _2DH5/LCH	
π/4DQPSK _2DH5/MCH	

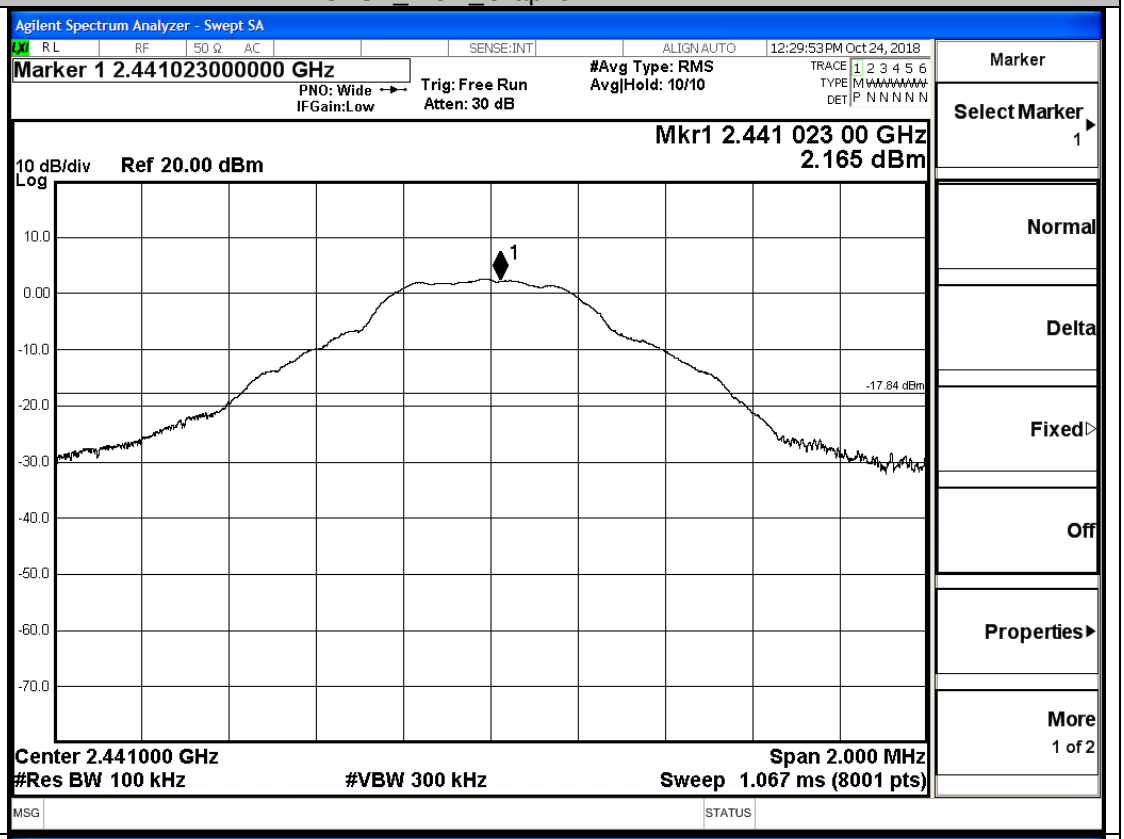
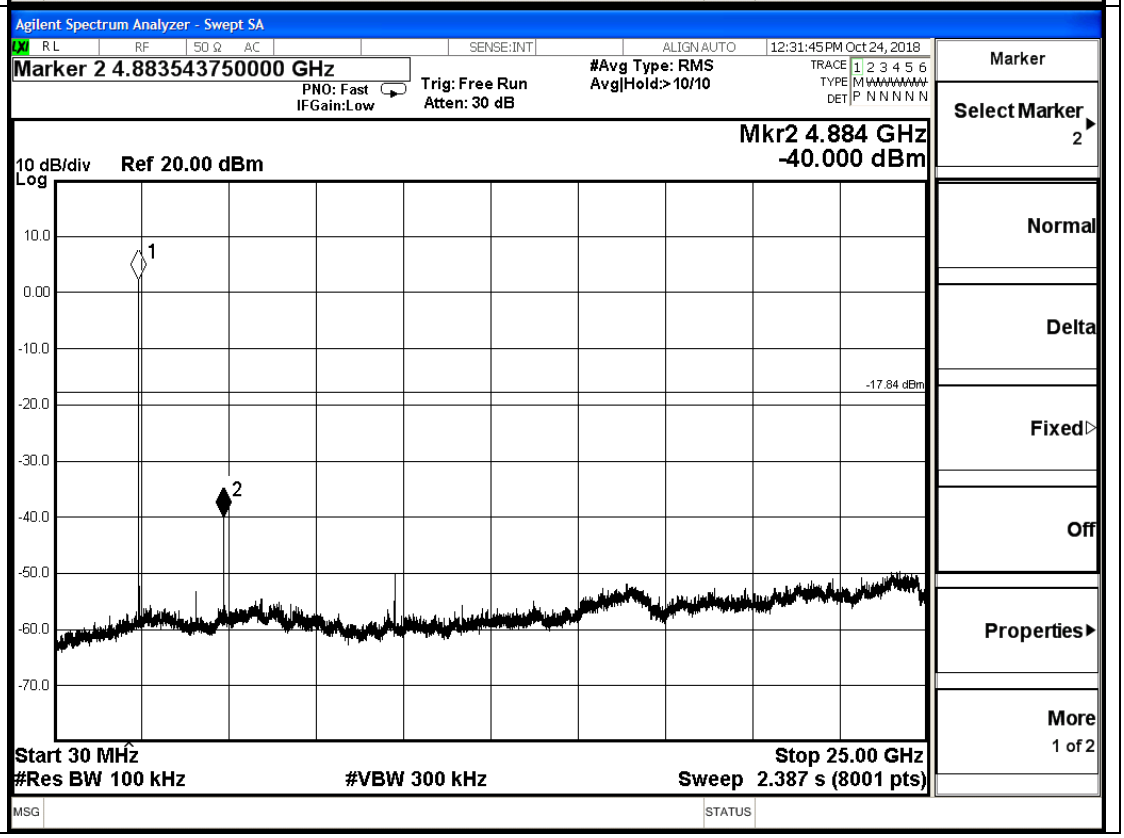
π/4DQPSK _2DH5/HCH	
8DPSK _3DH5/LCH	

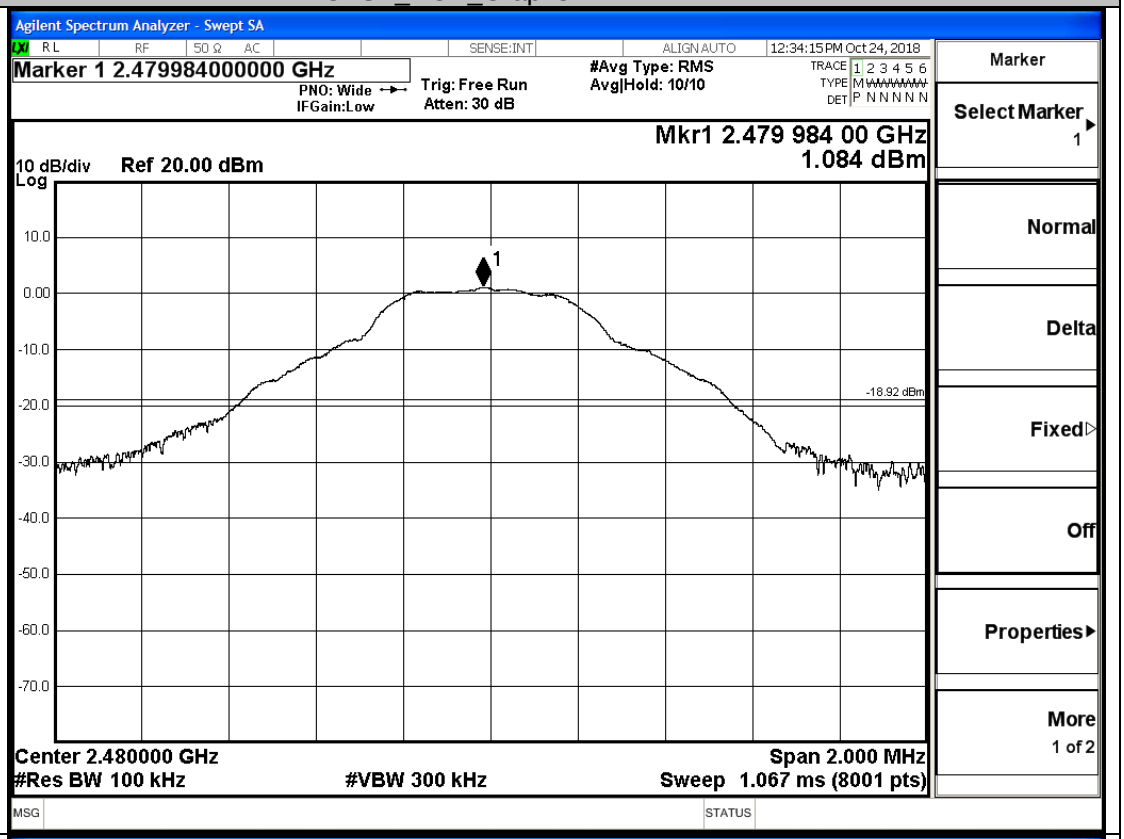
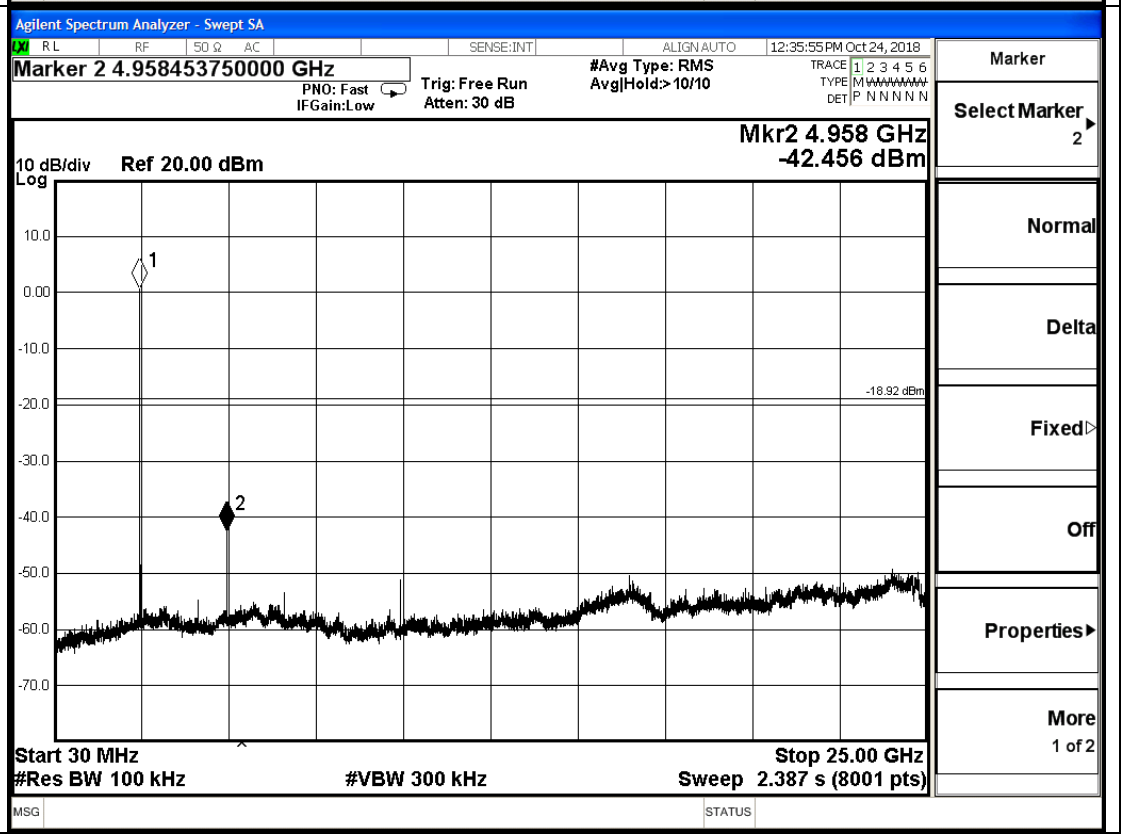
8DPSK _3DH5/MCH	
8DPSK _3DH5/HCH	

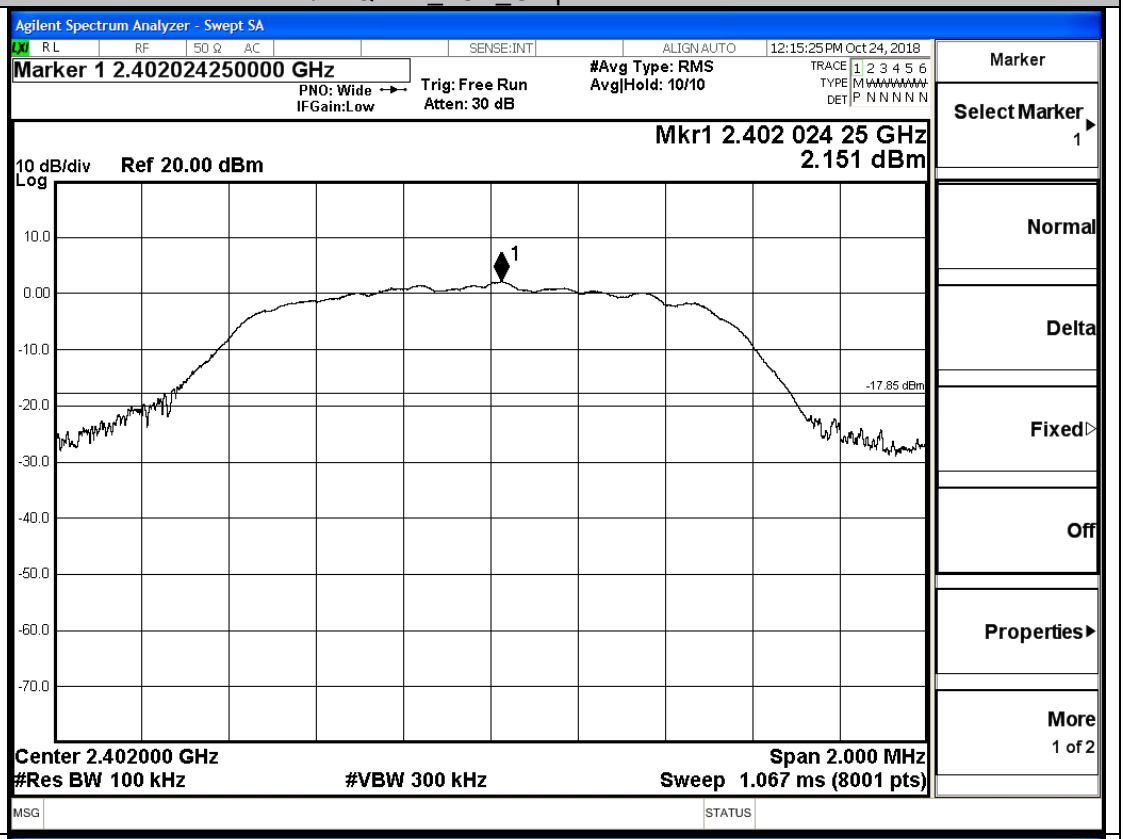
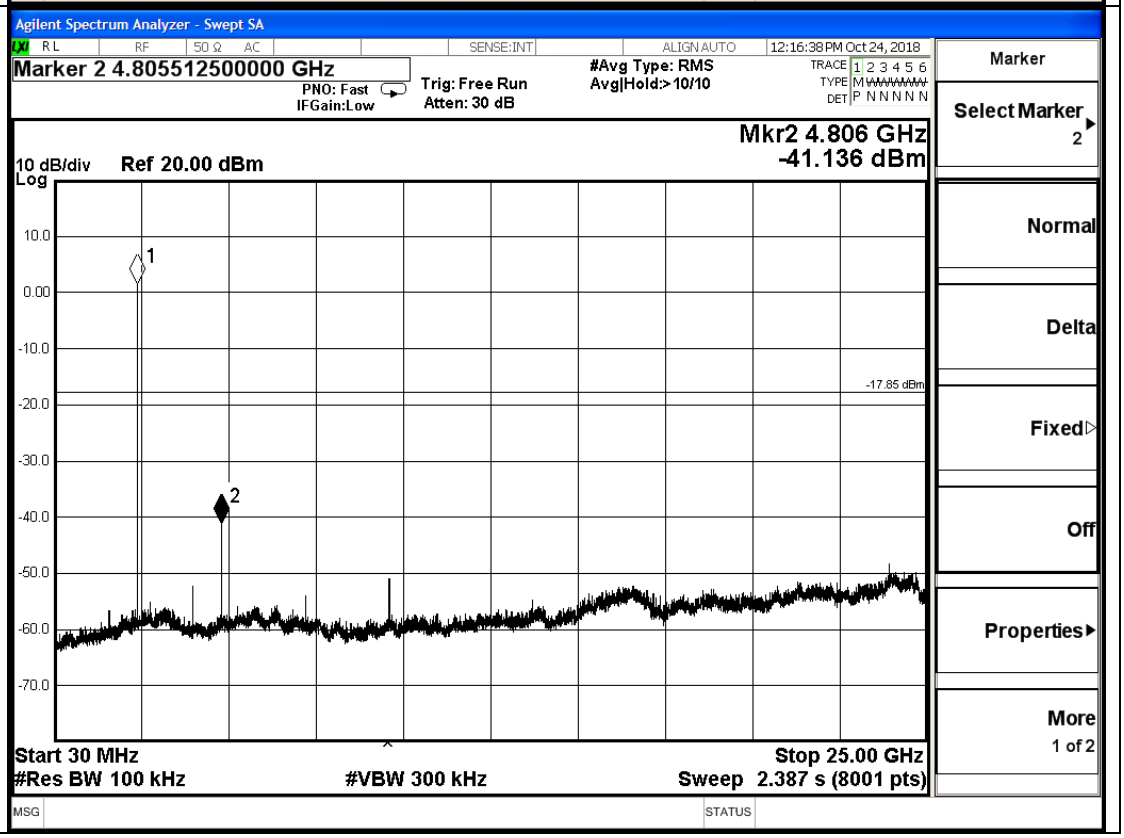
A.6 RF Conducted Spurious Emissions

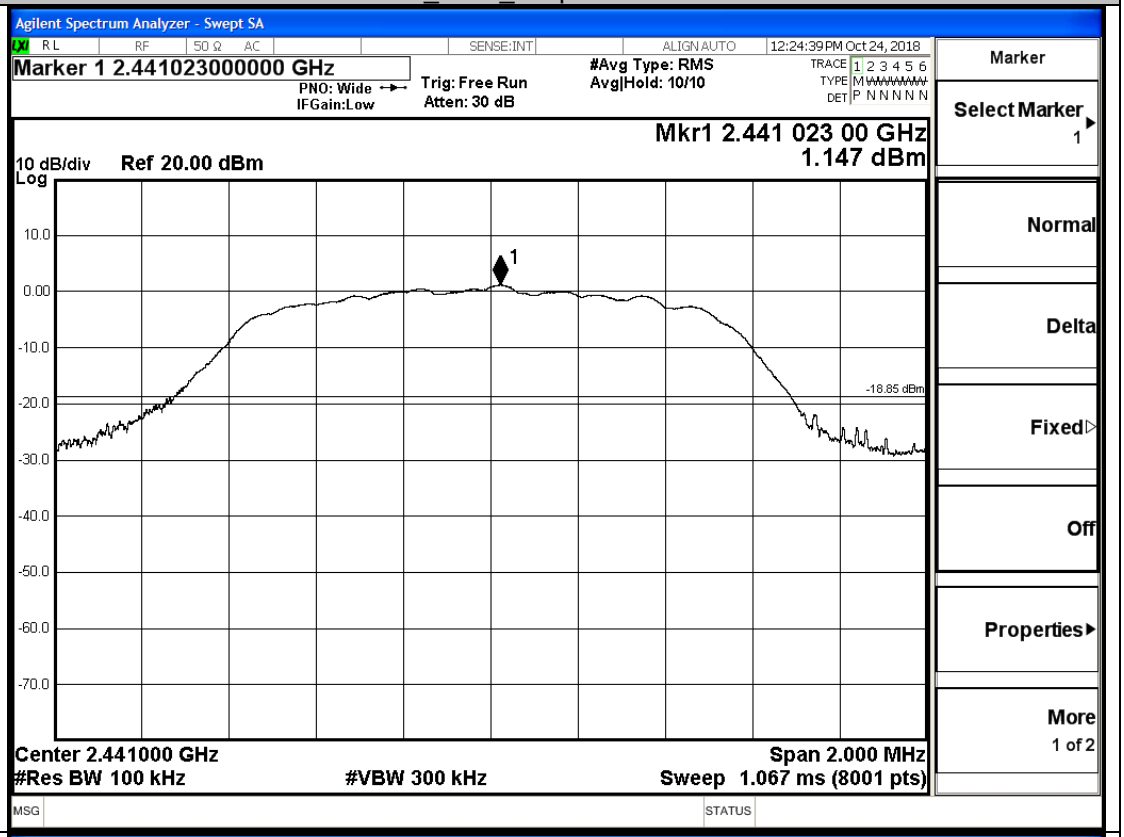
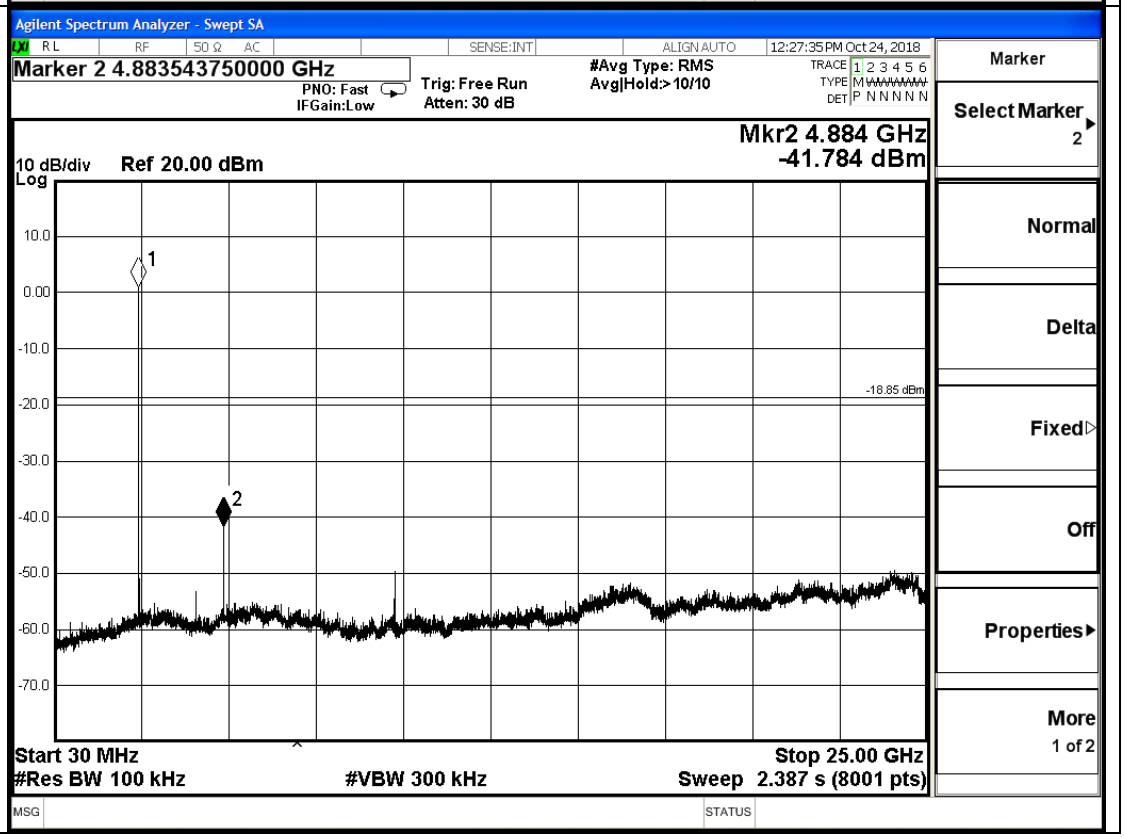
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.737	-37.640	-16.26	PASS
	MCH	2.165	-40.000	-17.84	PASS
	HCH	1.084	-42.456	-18.92	PASS
π/4DQPSK	LCH	2.151	-41.136	-17.85	PASS
	MCH	1.147	-41.784	-18.85	PASS
	HCH	-0.427	-43.612	-20.43	PASS
8DPSK	LCH	2.095	-39.929	-17.91	PASS
	MCH	1.138	-42.989	-18.86	PASS
	HCH	-0.483	-41.820	-20.48	PASS

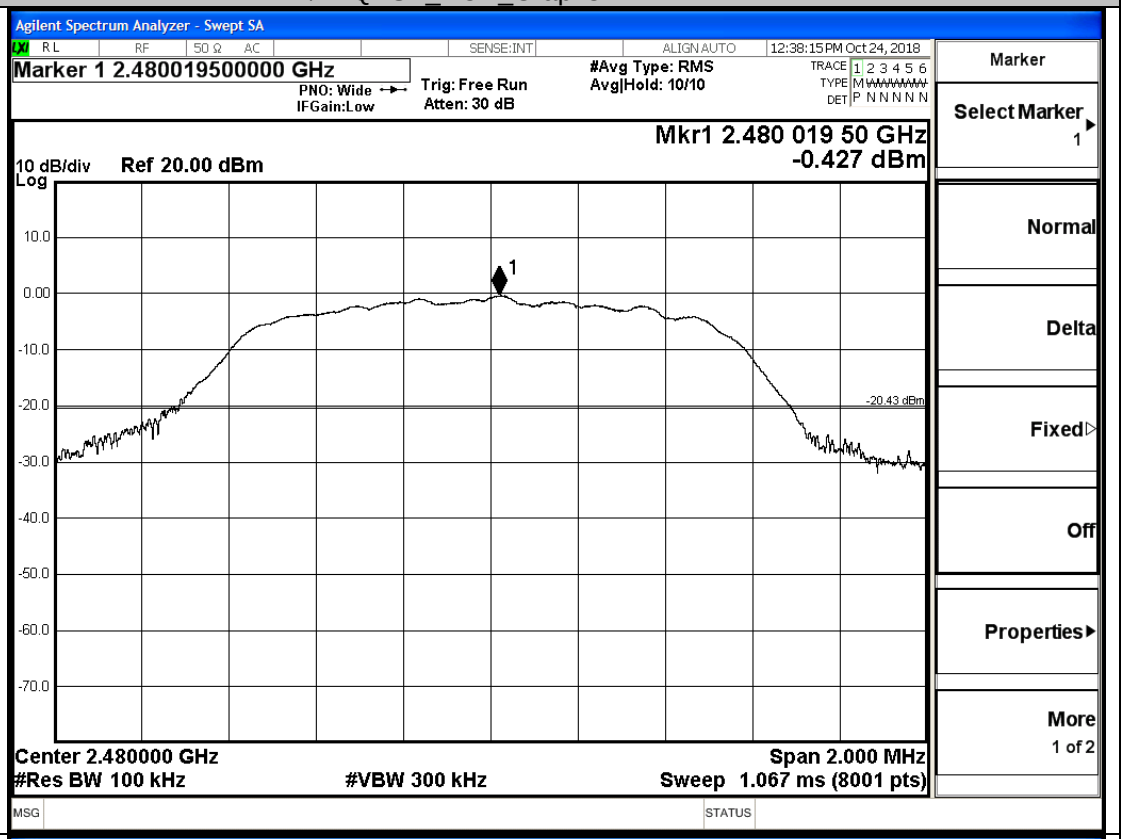
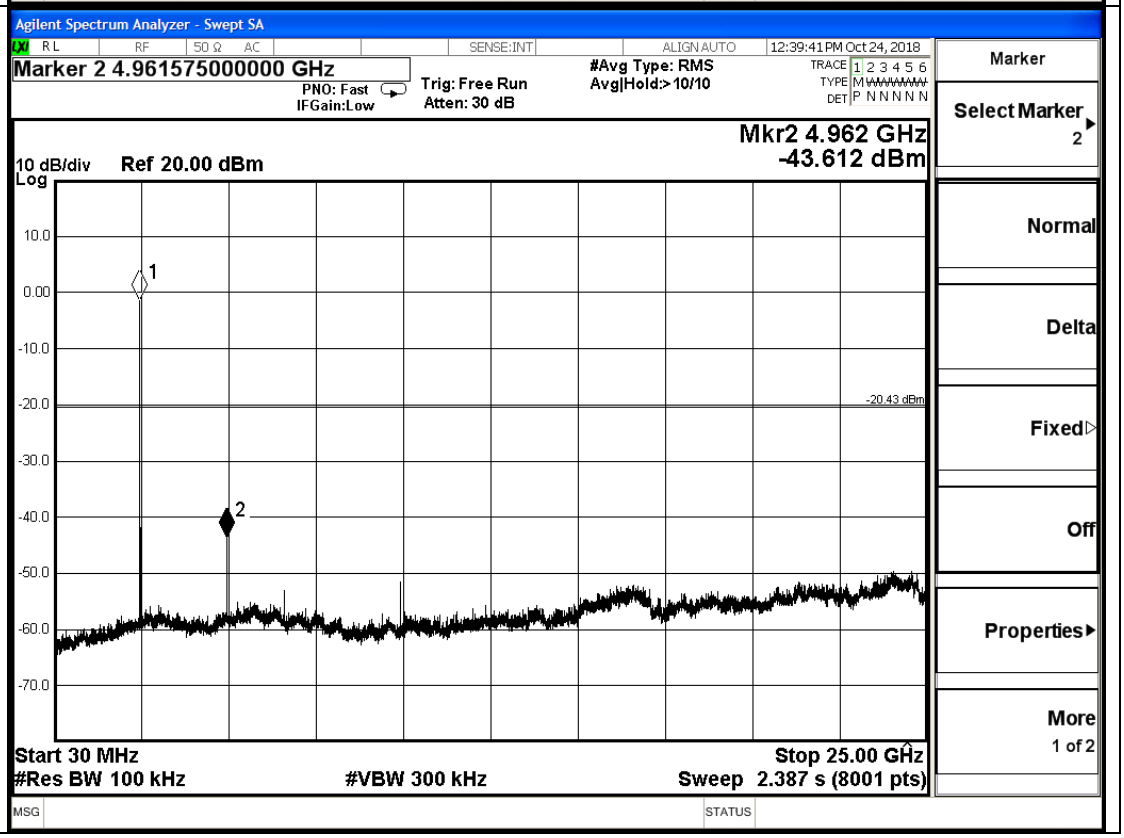
GFSK_LCH_Graphs	
Pref	
Puw	

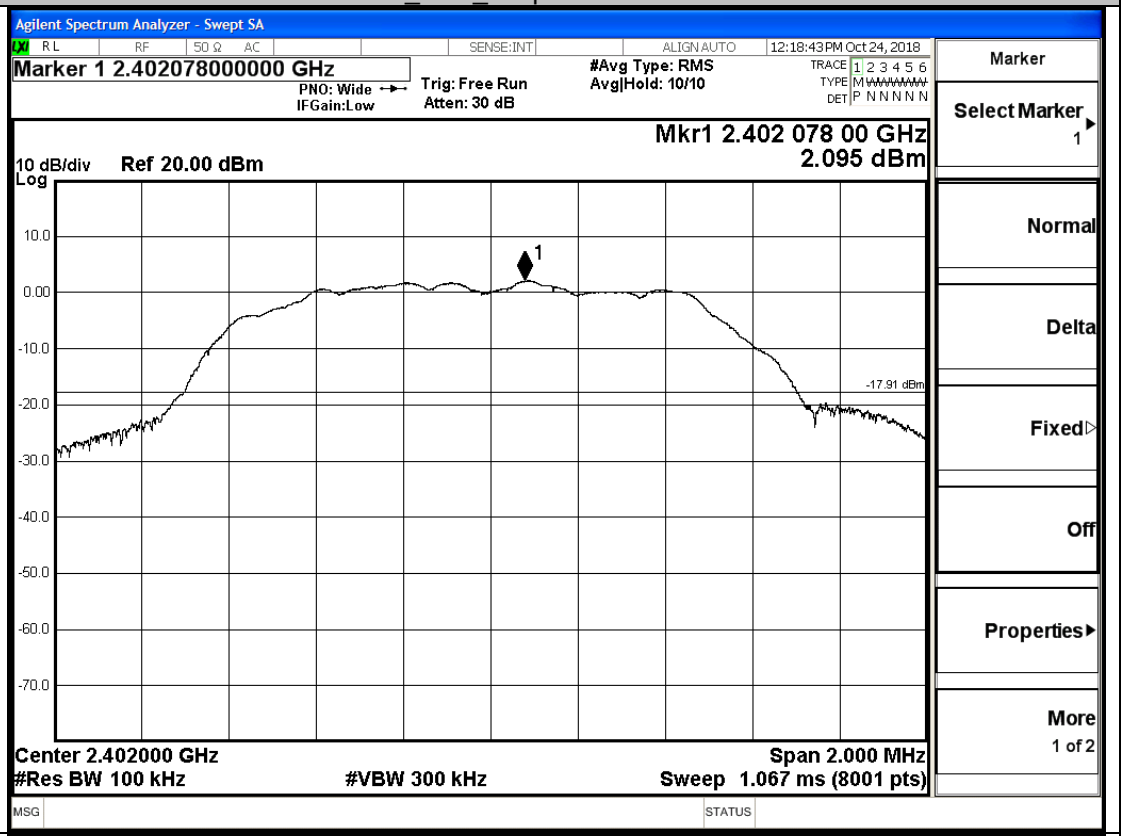
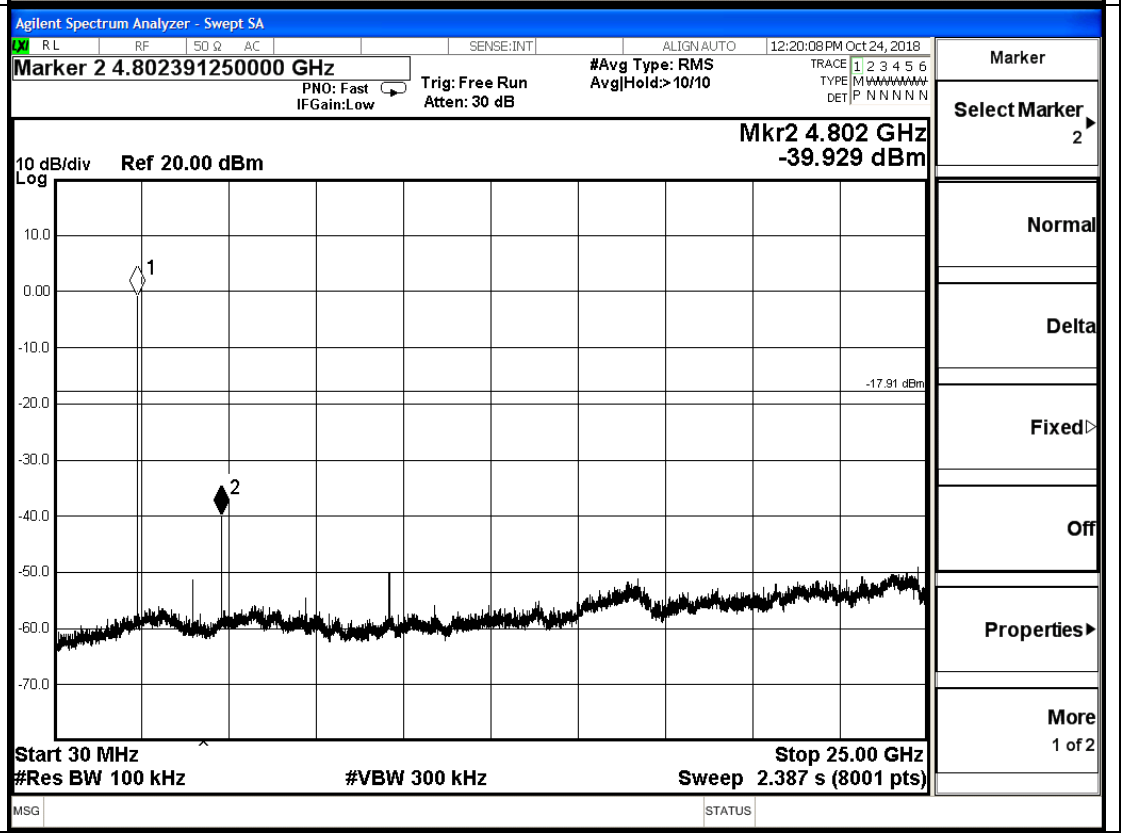
GFSK_MCH_Graphs	
Pref	
Puw	

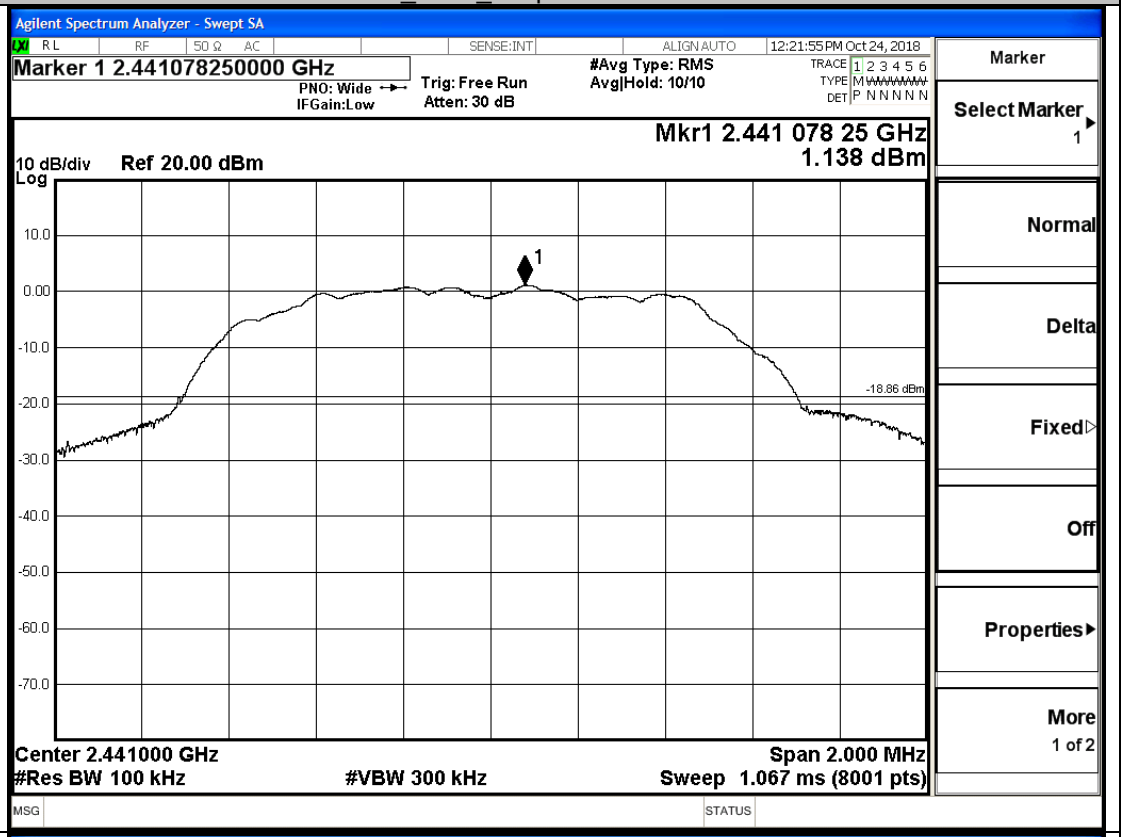
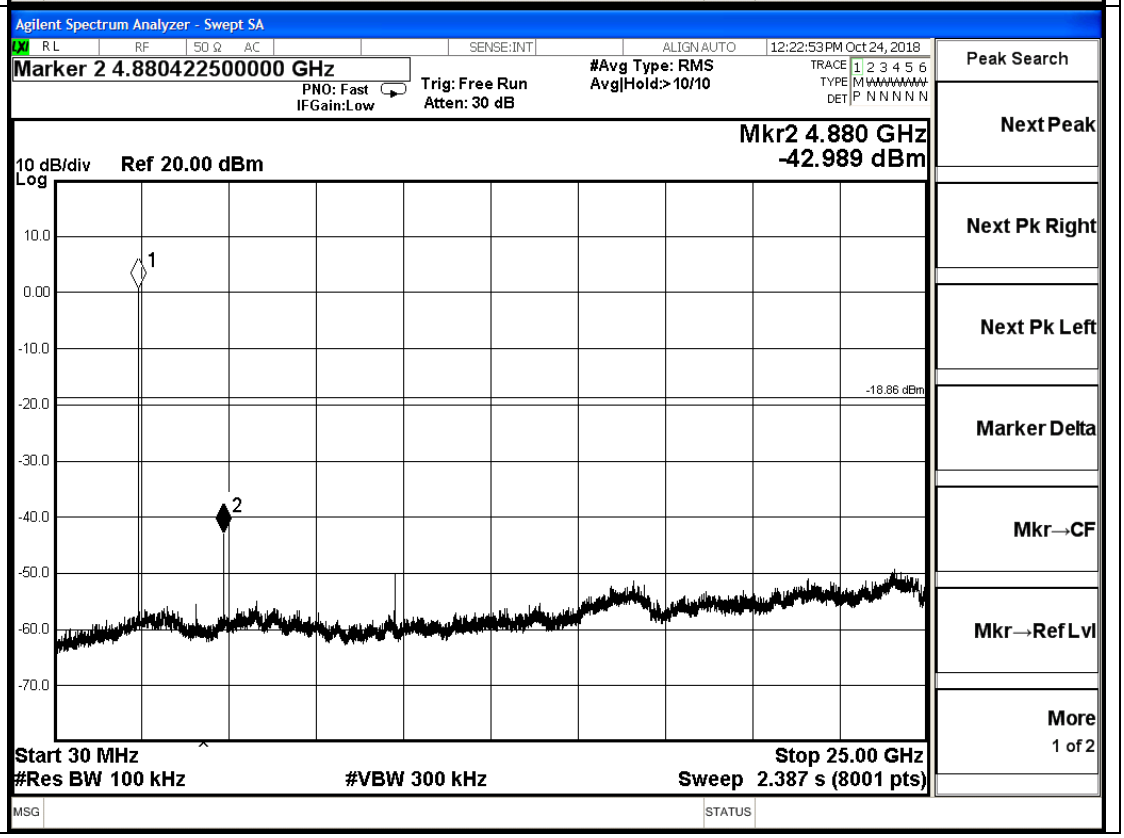
GFSK_HCH_Graphs	
Pref	
Puw	

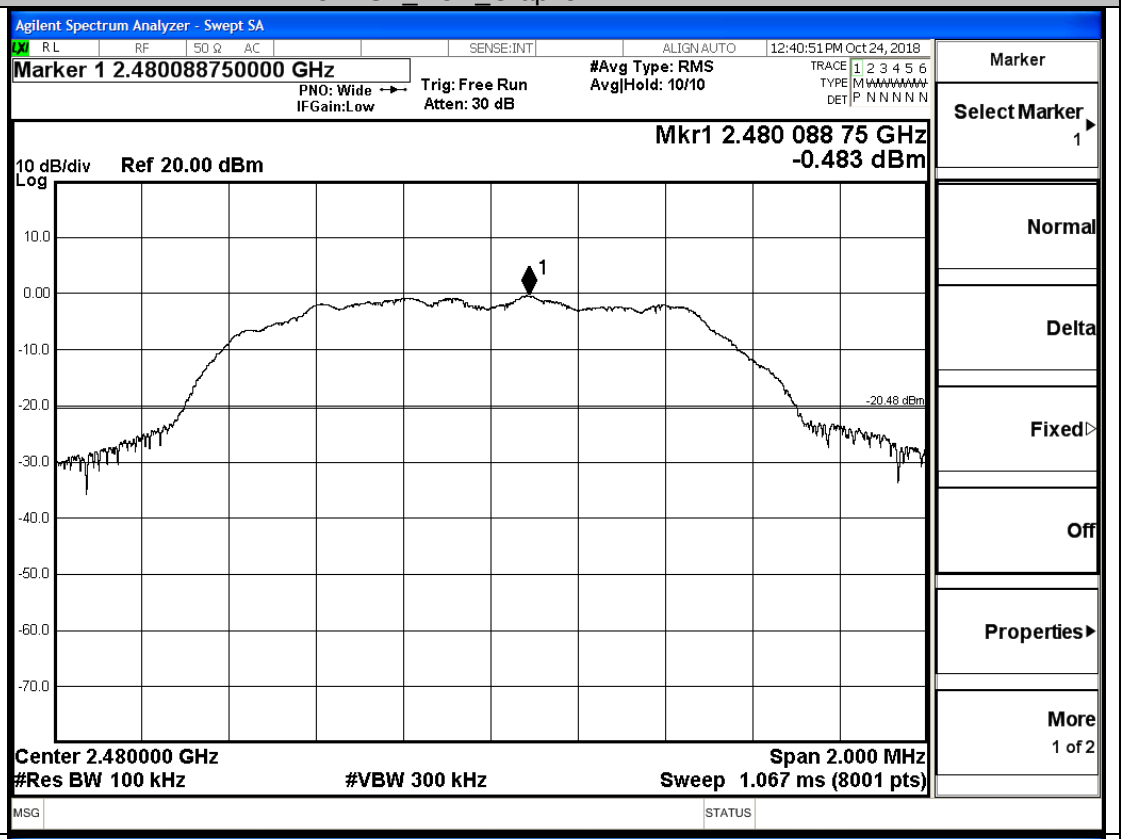
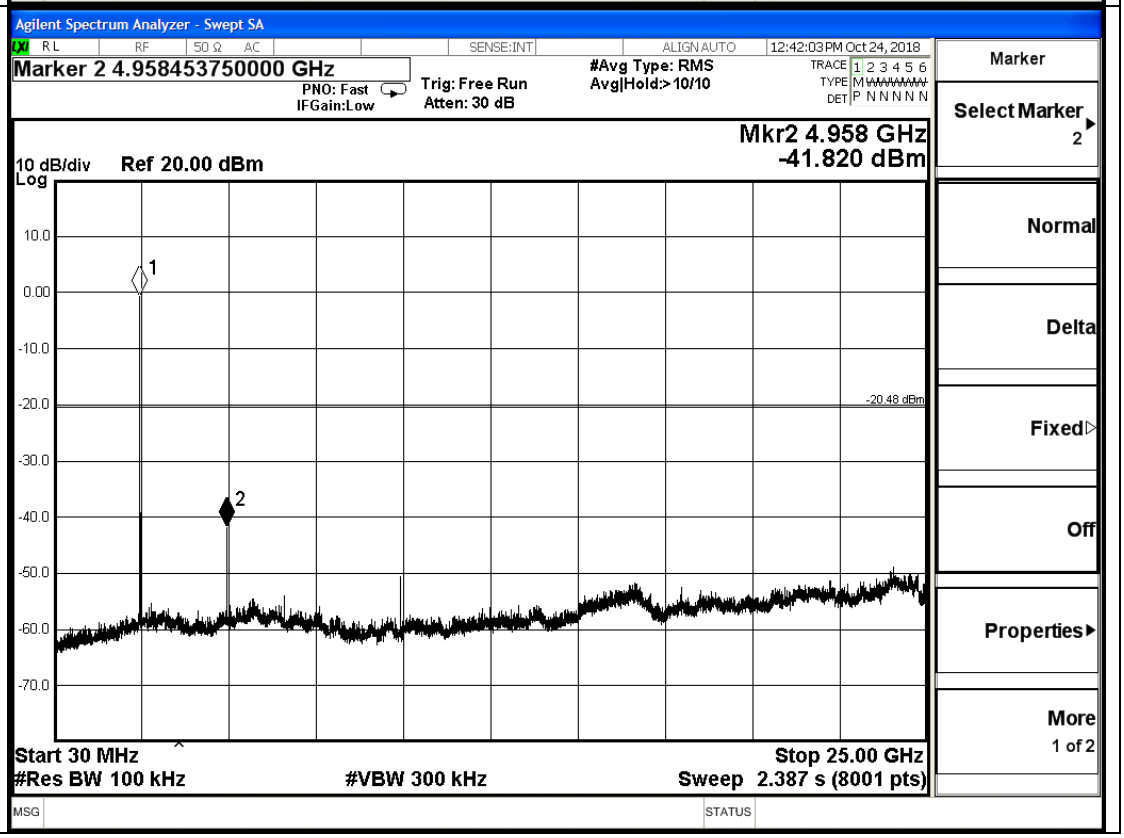
π/4DQPSK_LCH_Graphs	
Pref	
Puw	

π/4DQPSK_MCH_Graphs	
Pref	
Puw	

π/4DQPSK_HCH_Graphs	
Pref	
Puw	

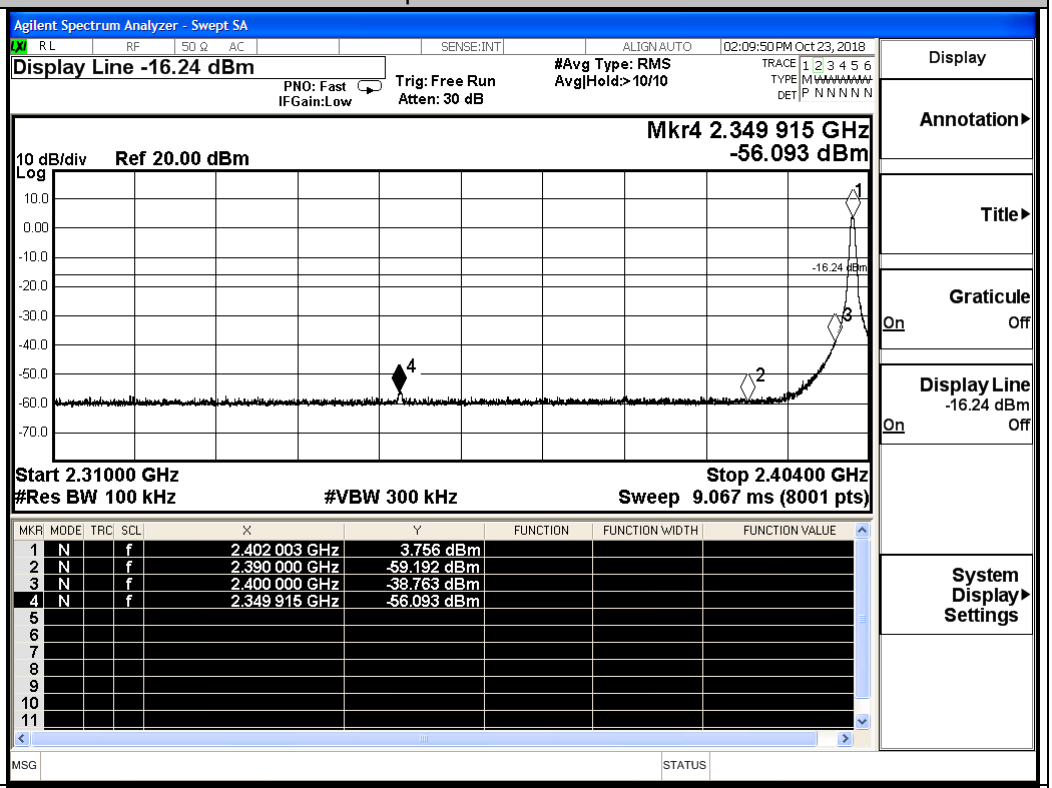
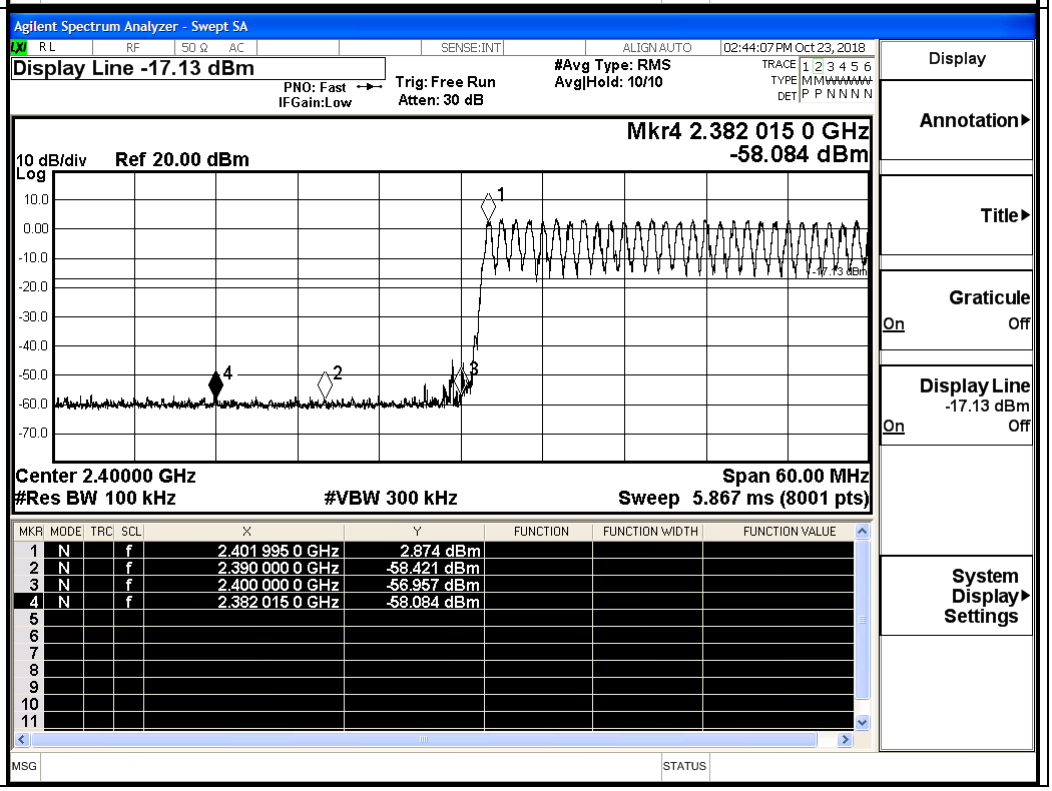
8DPSK_LCH_Graphs	
Pref	
Puw	

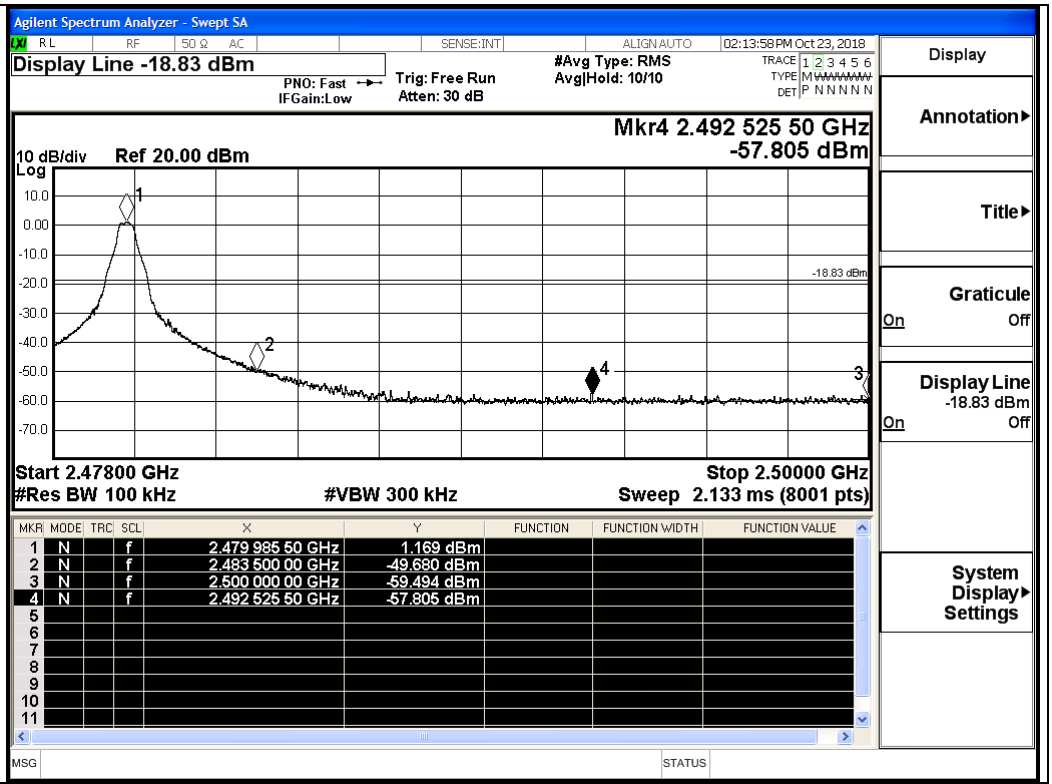
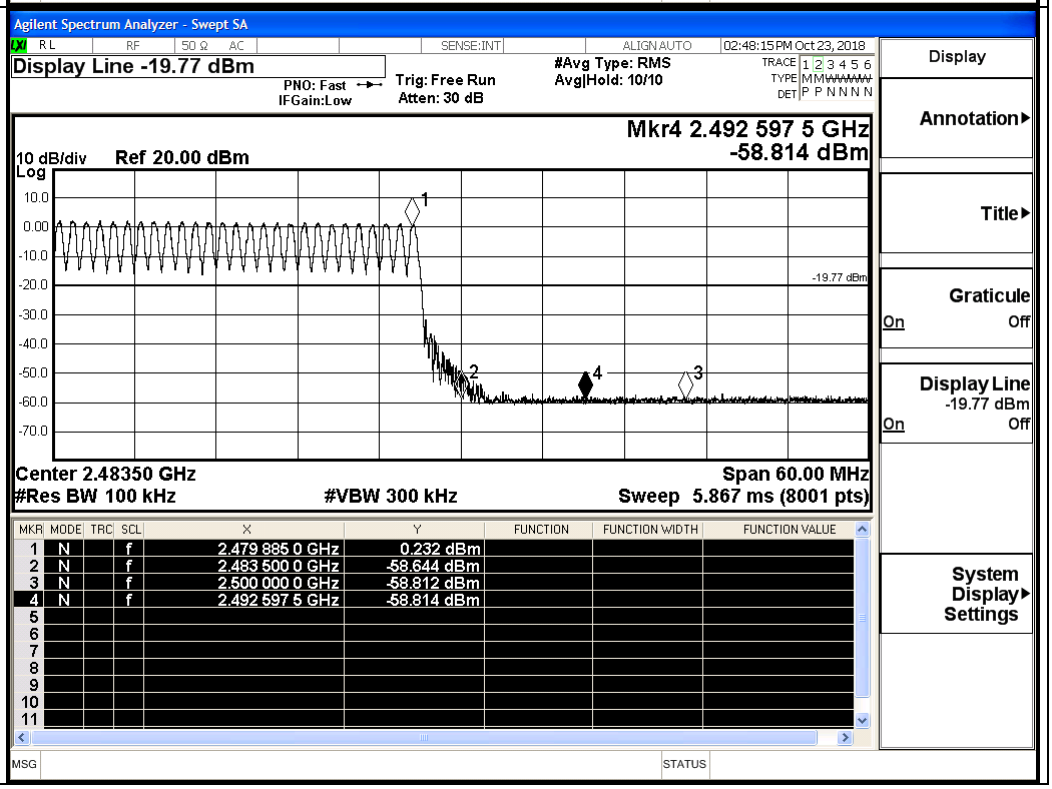
8DPSK_MCH_Graphs	
Pref	
Puw	

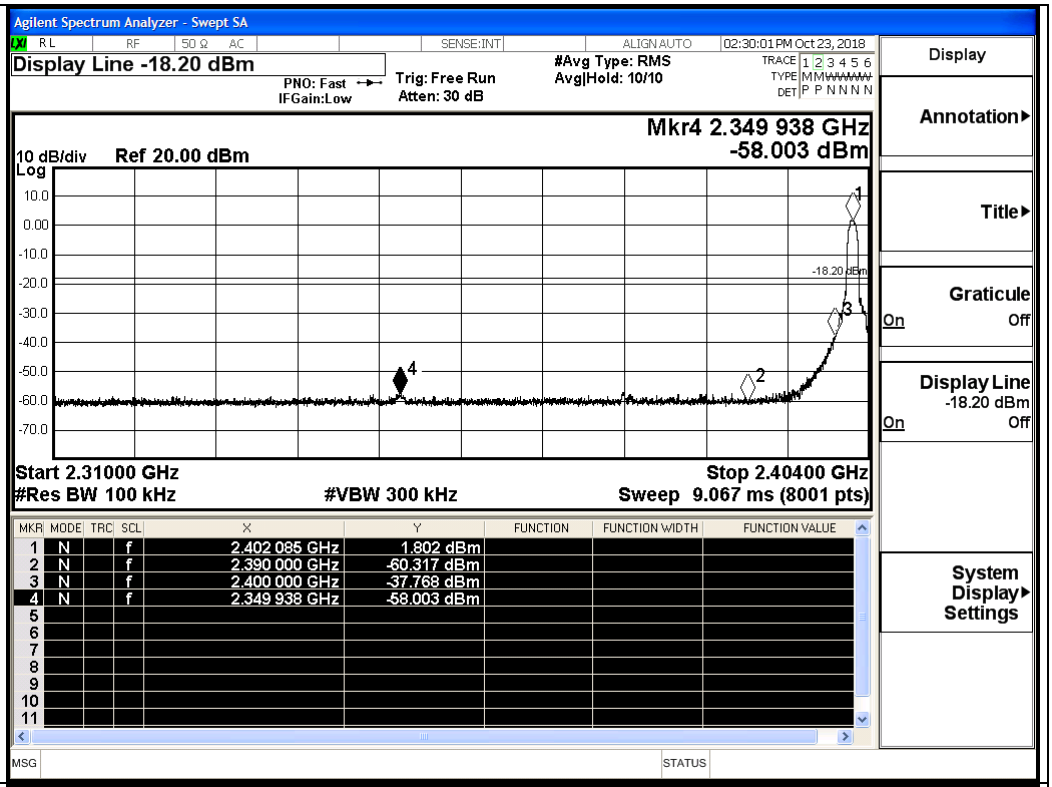
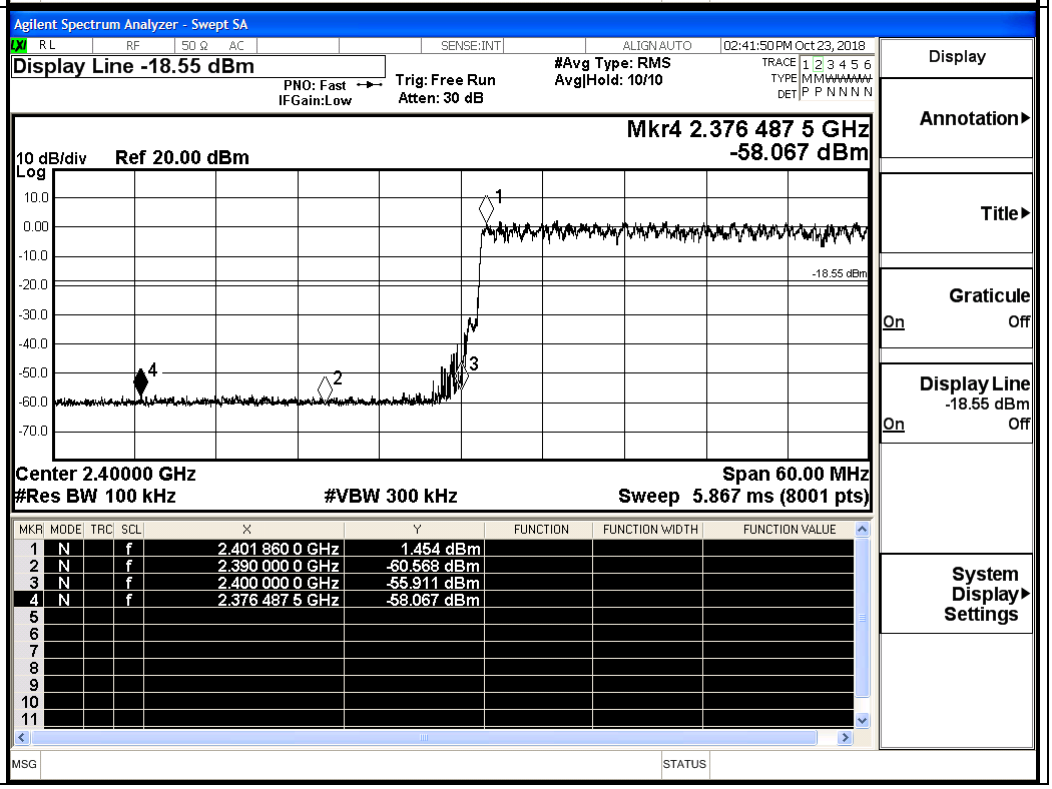
8DPSK_HCH_Graphs	
Pref	
Puw	

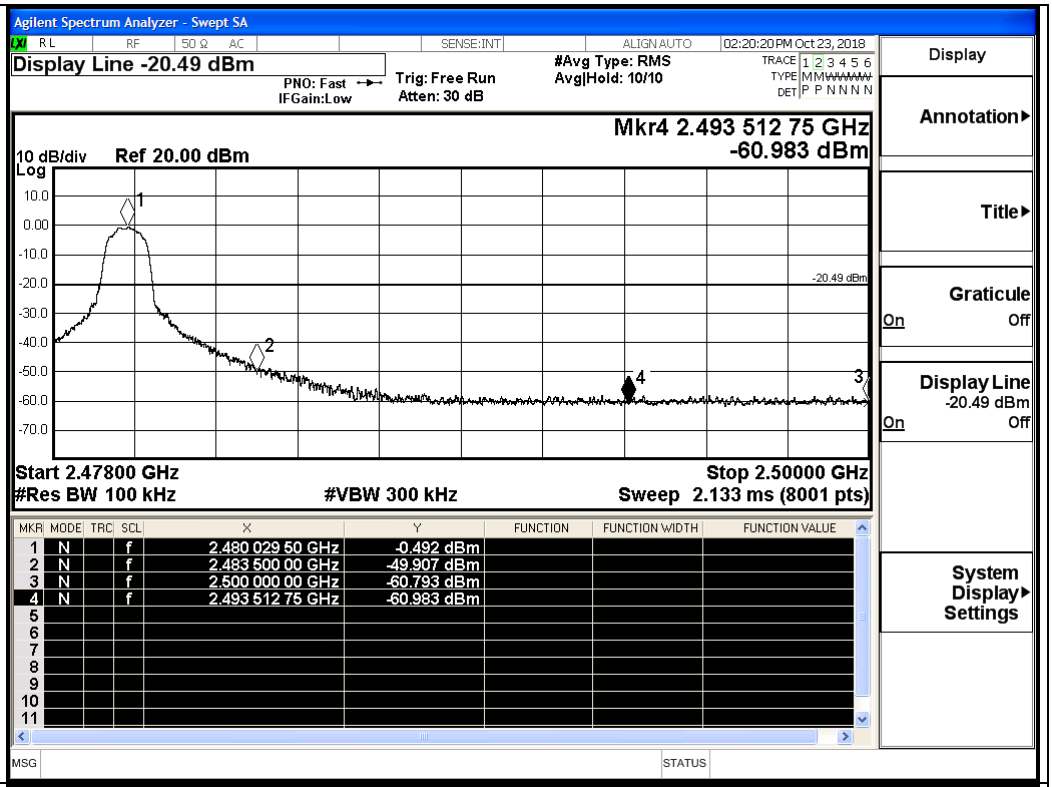
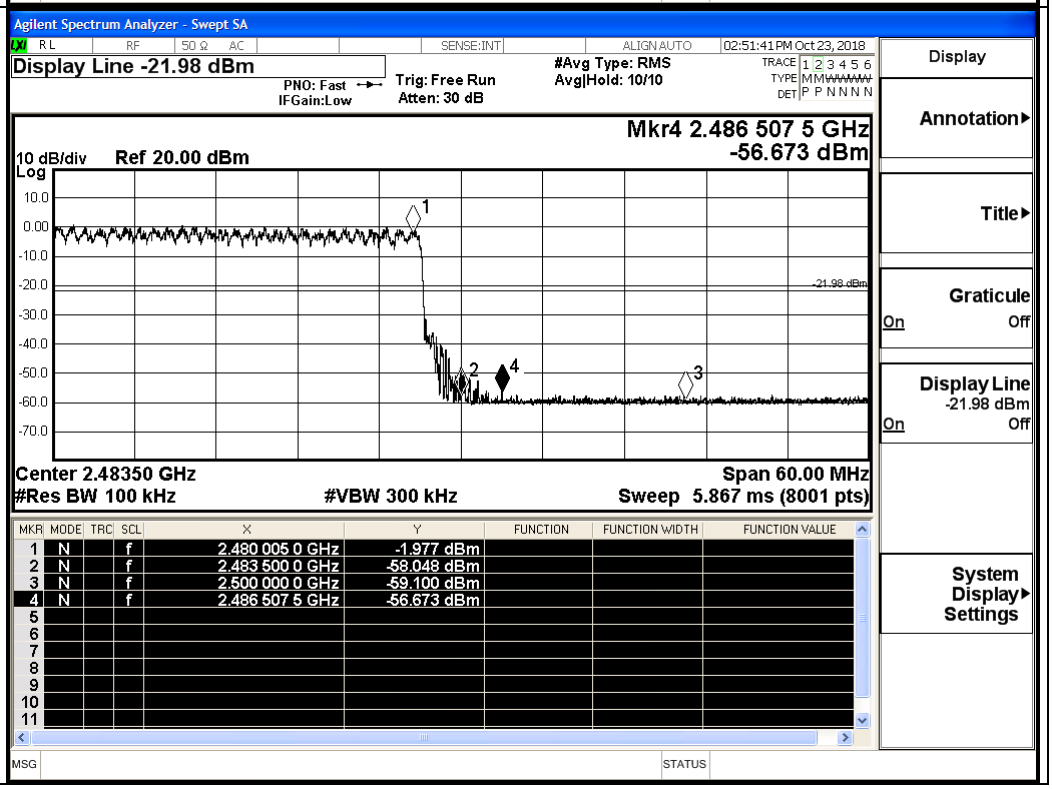
A.7 Band-edge for RF Conducted Emissions

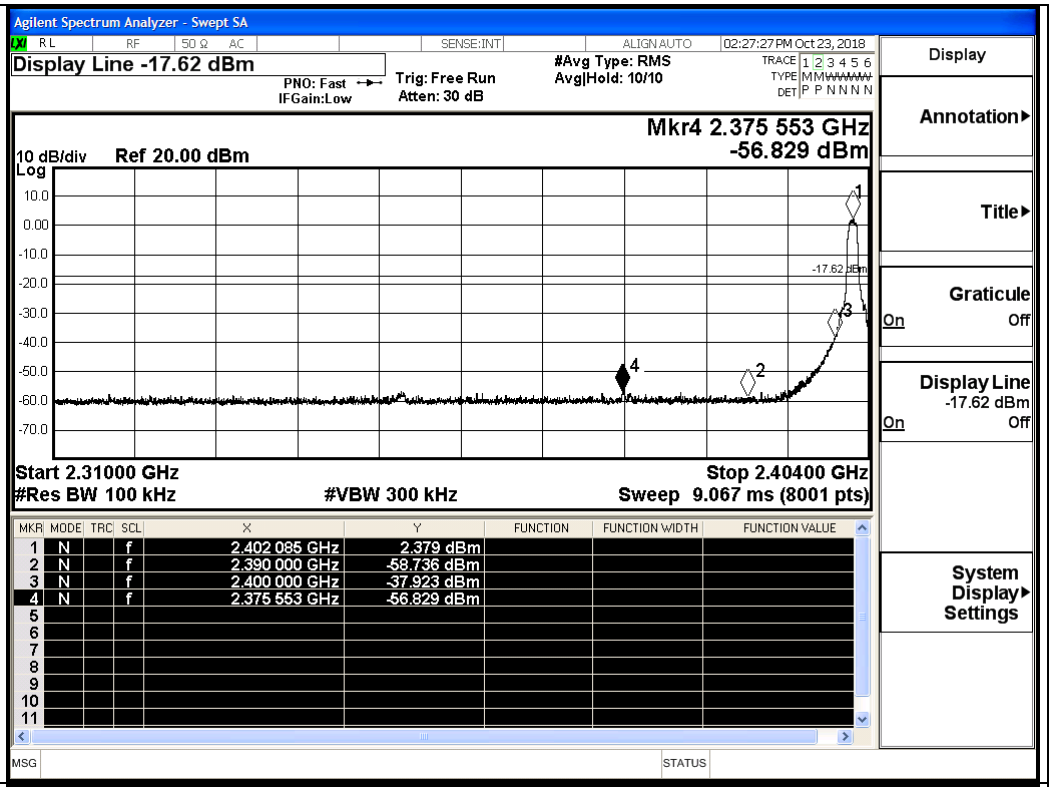
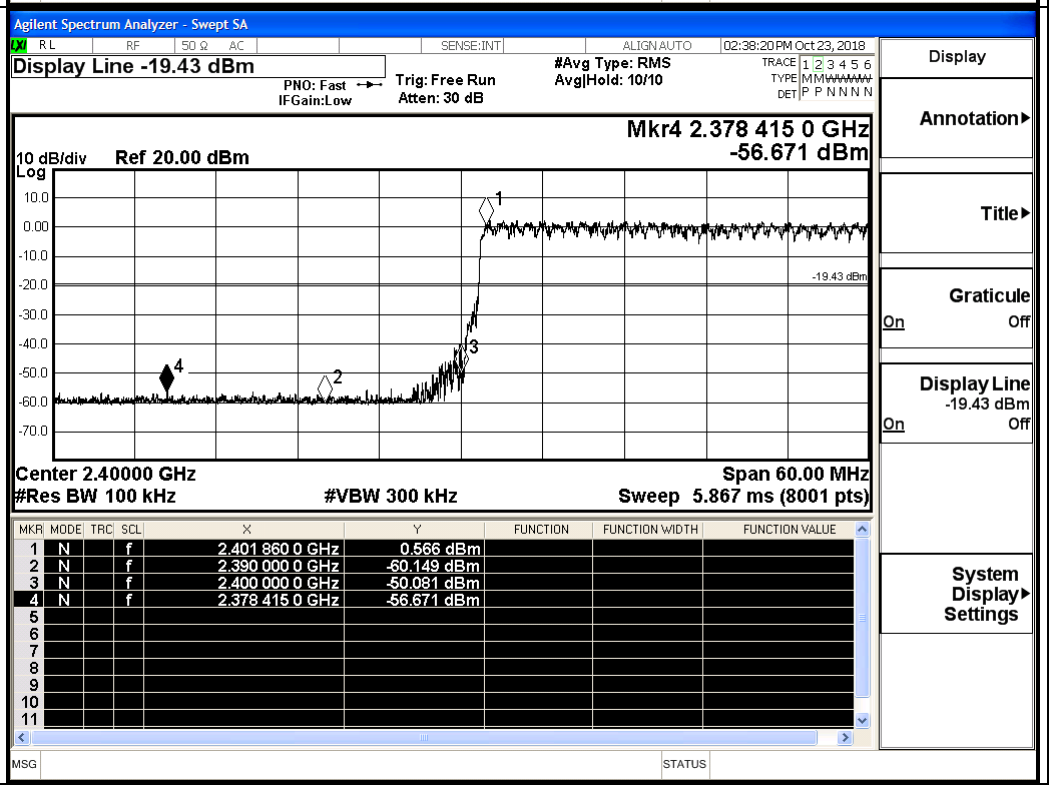
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	3.756	Off	-38.763	-16.24	PASS
			2.874	On	-56.957	-17.13	PASS
	HCH	2480	1.169	Off	-58.644	-18.83	PASS
			0.232	On	-58.644	-19.77	PASS
π/4DQPSK	LCH	2402	1.802	Off	-37.768	-18.20	PASS
			1.454	On	-55.911	-18.55	PASS
	HCH	2480	-0.492	Off	-49.907	-20.49	PASS
			-1.977	On	-56.673	-21.98	PASS
8DPSK	LCH	2402	2.379	Off	-37.923	-17.62	PASS
			0.566	On	-50.081	-19.43	PASS
	HCH	2480	-0.369	Off	-47.108	-20.37	PASS
			-0.724	On	-51.310	-20.72	PASS

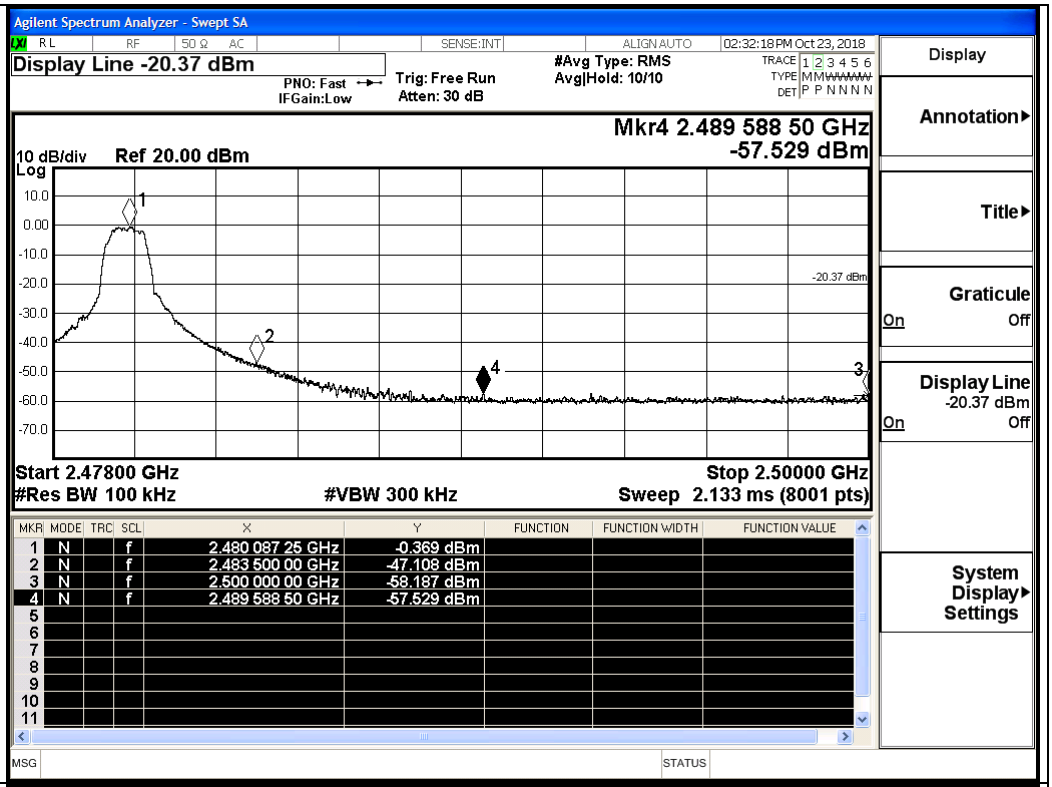
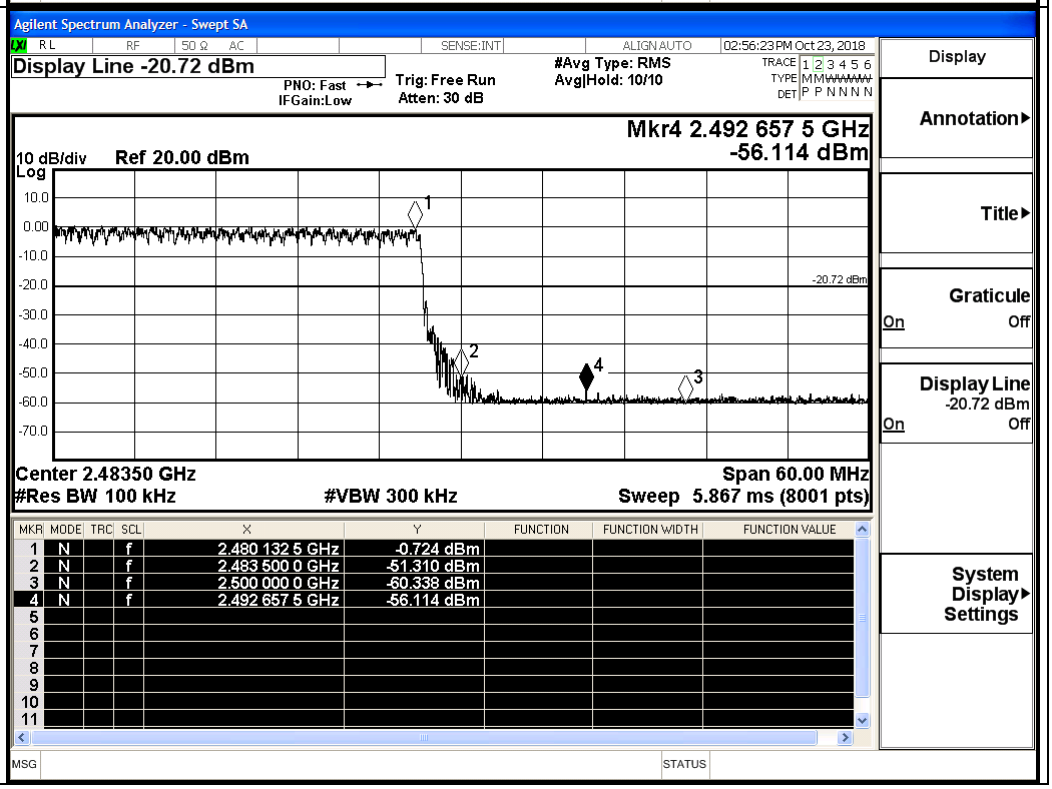
Test Graphs	
GFSK/LCH/No Hop	
GFSK/LCH/Hop	

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	

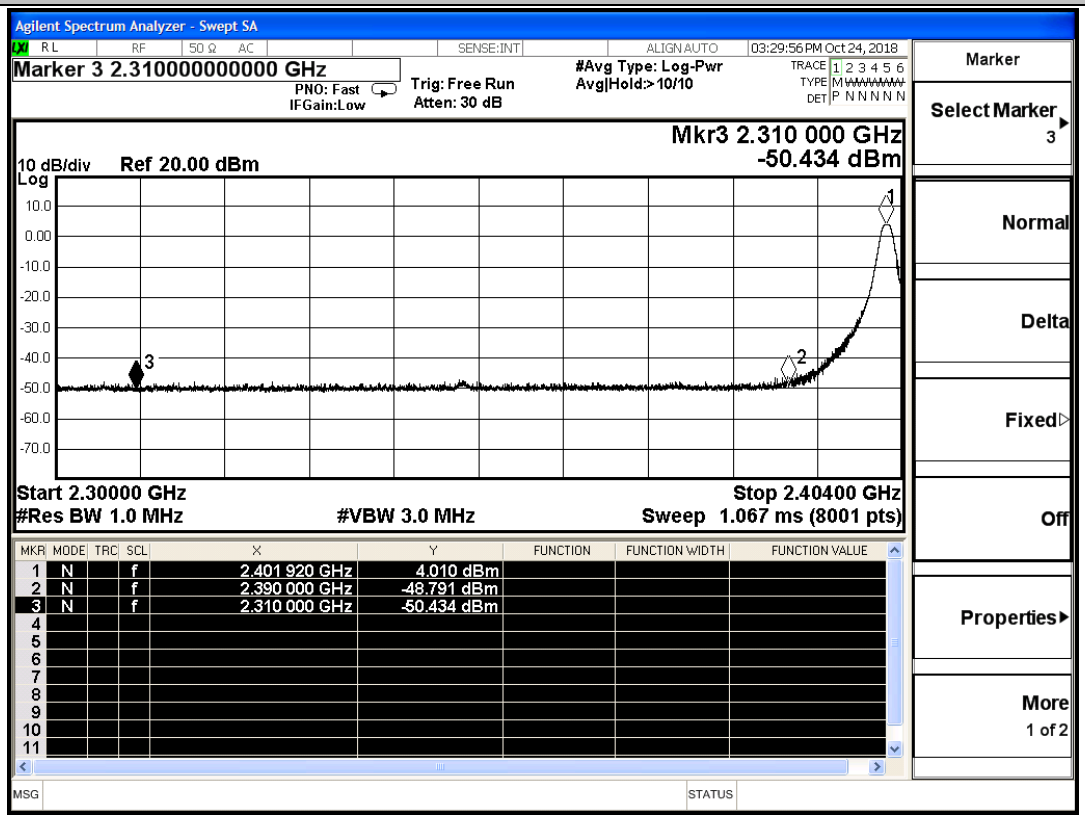
8DPSK/LCH/No Hop	
8DPSK/LCH/Hop	

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

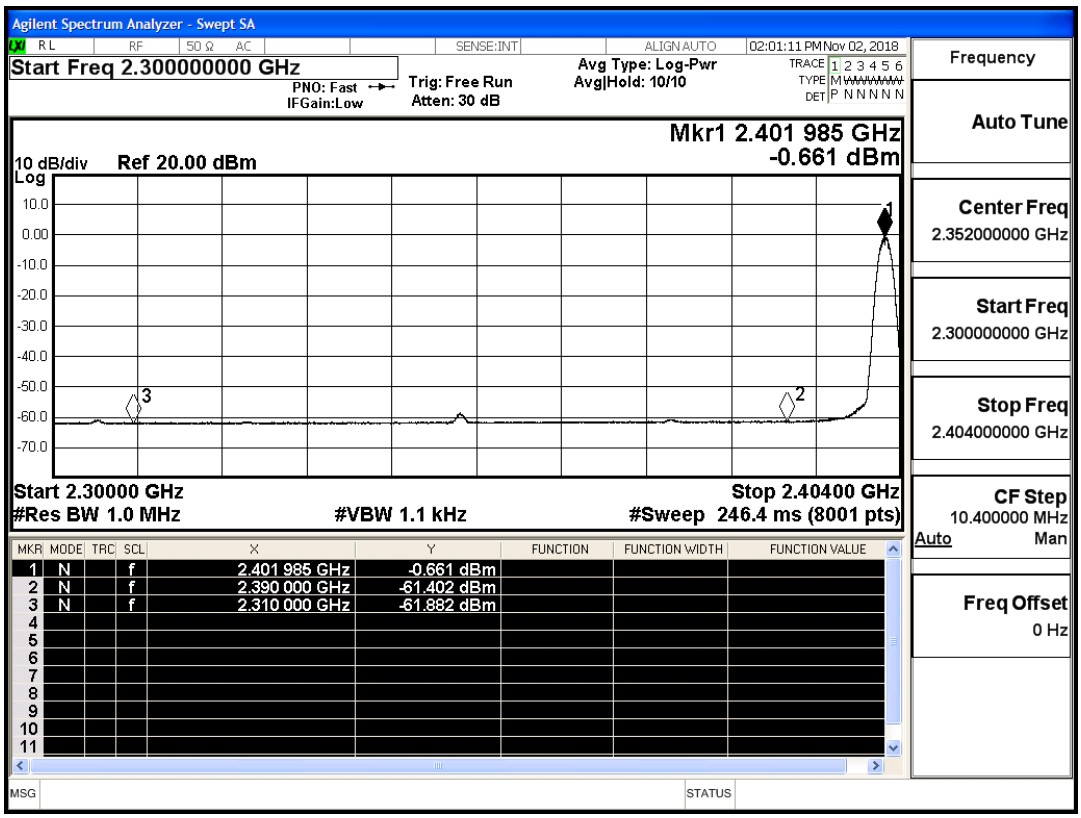
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-48.791	2.0	0	48.437	PEAK	74	PASS
	Off	2310.0	-61.402	2.0	0	35.826	AV	54	PASS
	Off	2390.0	-50.434	2.0	0	46.794	PEAK	74	PASS
	Off	2390.0	-61.882	2.0	0	35.346	AV	54	PASS
	Off	2483.5	-30.143	2.0	0	67.085	PEAK	74	PASS
	Off	2483.5	-58.297	2.0	0	38.931	AV	54	PASS
	Off	2500.0	-50.321	2.0	0	46.907	PEAK	74	PASS
	Off	2500.0	-61.405	2.0	0	35.823	AV	54	PASS
π/4DQPSK	Off	2310.0	-49.445	2.0	0	47.783	PEAK	74	PASS
	Off	2310.0	-61.308	2.0	0	35.920	AV	54	PASS
	Off	2390.0	-49.764	2.0	0	47.464	PEAK	74	PASS
	Off	2390.0	-61.848	2.0	0	35.380	AV	54	PASS
	Off	2483.5	-29.102	2.0	0	68.126	PEAK	74	PASS
	Off	2483.5	-58.222	2.0	0	39.006	AV	54	PASS
	Off	2500.0	-49.427	2.0	0	47.801	PEAK	74	PASS
	Off	2500.0	-61.560	2.0	0	35.668	AV	54	PASS
8DPSK	Off	2310.0	-49.062	2.0	0	48.166	PEAK	74	PASS
	Off	2310.0	-61.495	2.0	0	35.733	AV	54	PASS
	Off	2390.0	-50.789	2.0	0	46.439	PEAK	74	PASS
	Off	2390.0	-62.074	2.0	0	35.154	AV	54	PASS
	Off	2483.5	-28.372	2.0	0	68.856	PEAK	74	PASS
	Off	2483.5	-58.345	2.0	0	38.883	AV	54	PASS
	Off	2500.0	-49.359	2.0	0	47.869	PEAK	74	PASS
	Off	2500.0	-61.557	2.0	0	35.671	AV	54	PASS

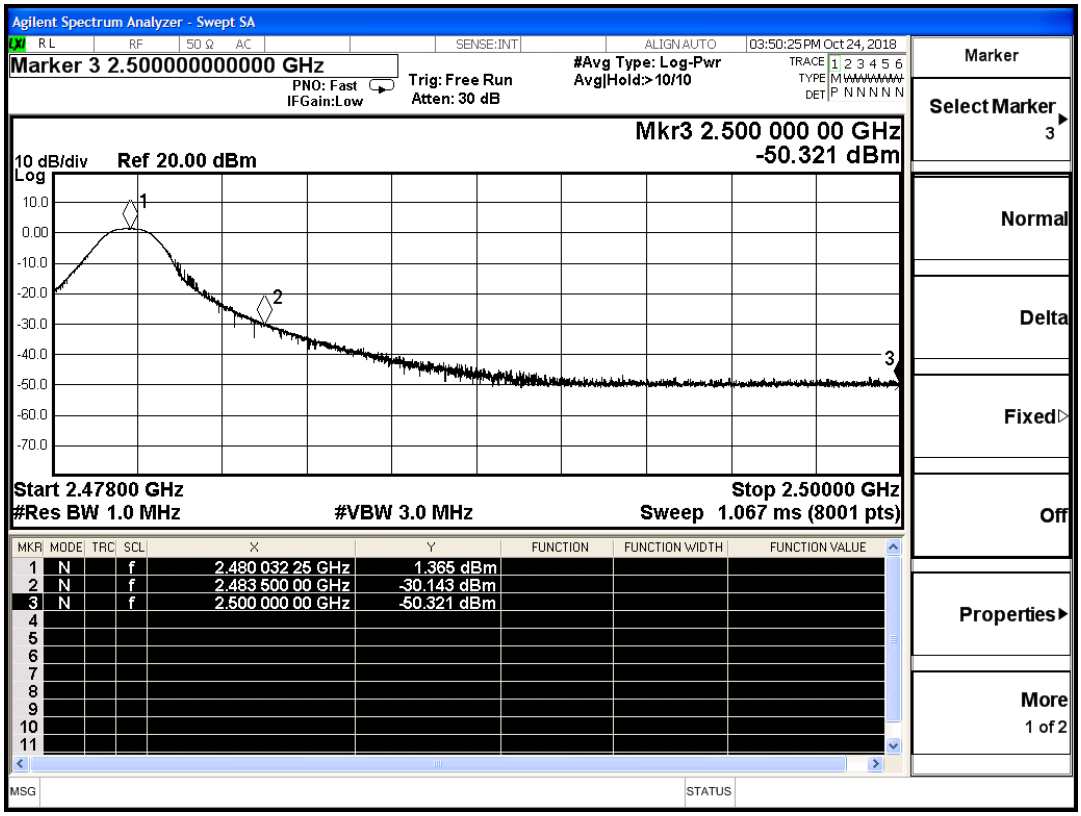
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



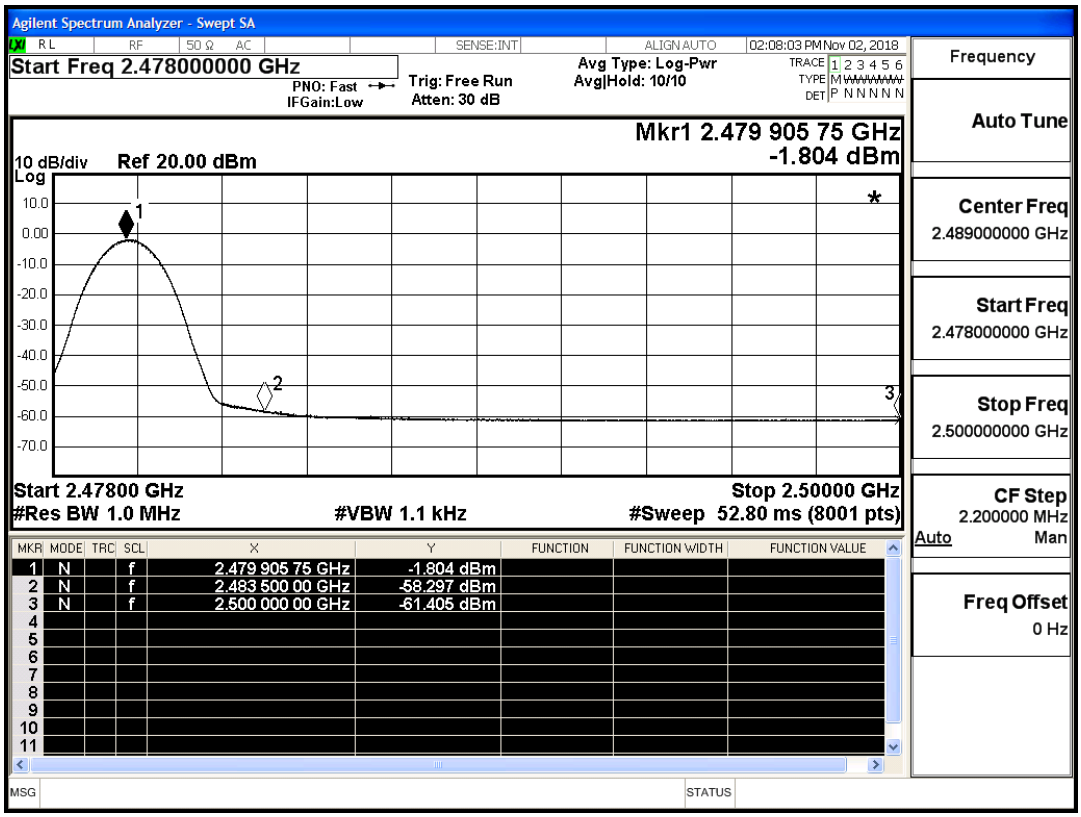
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



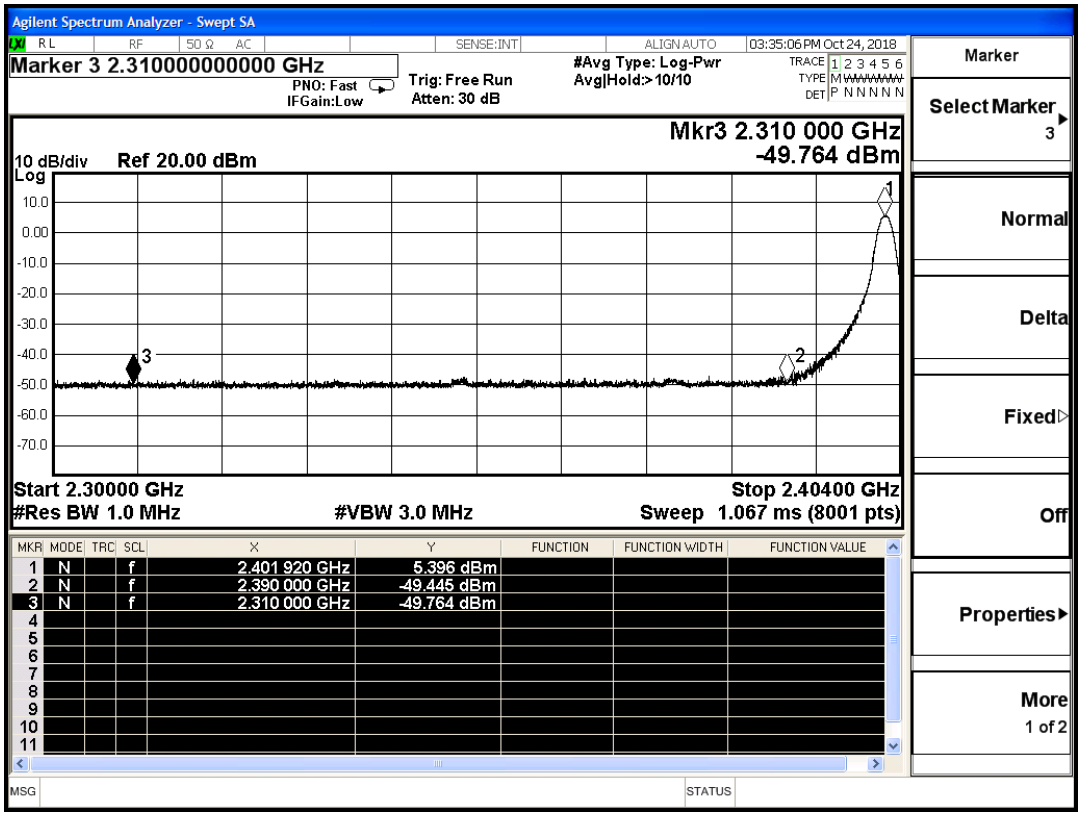
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



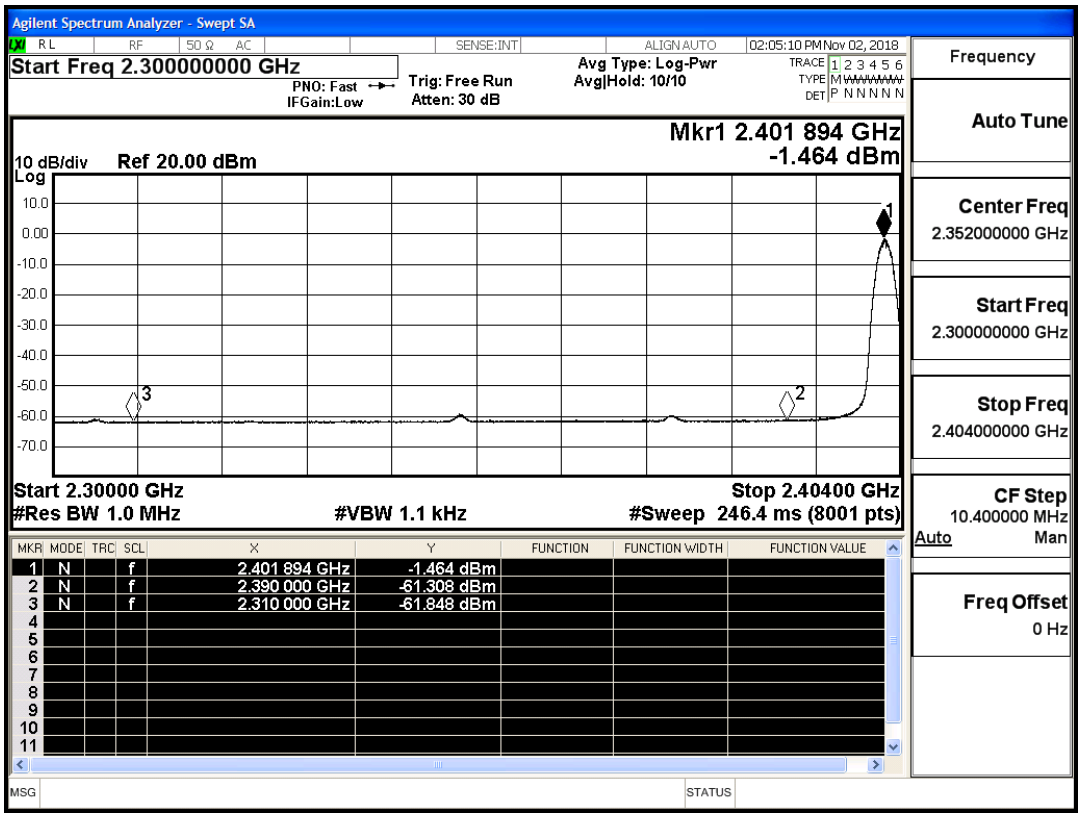
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



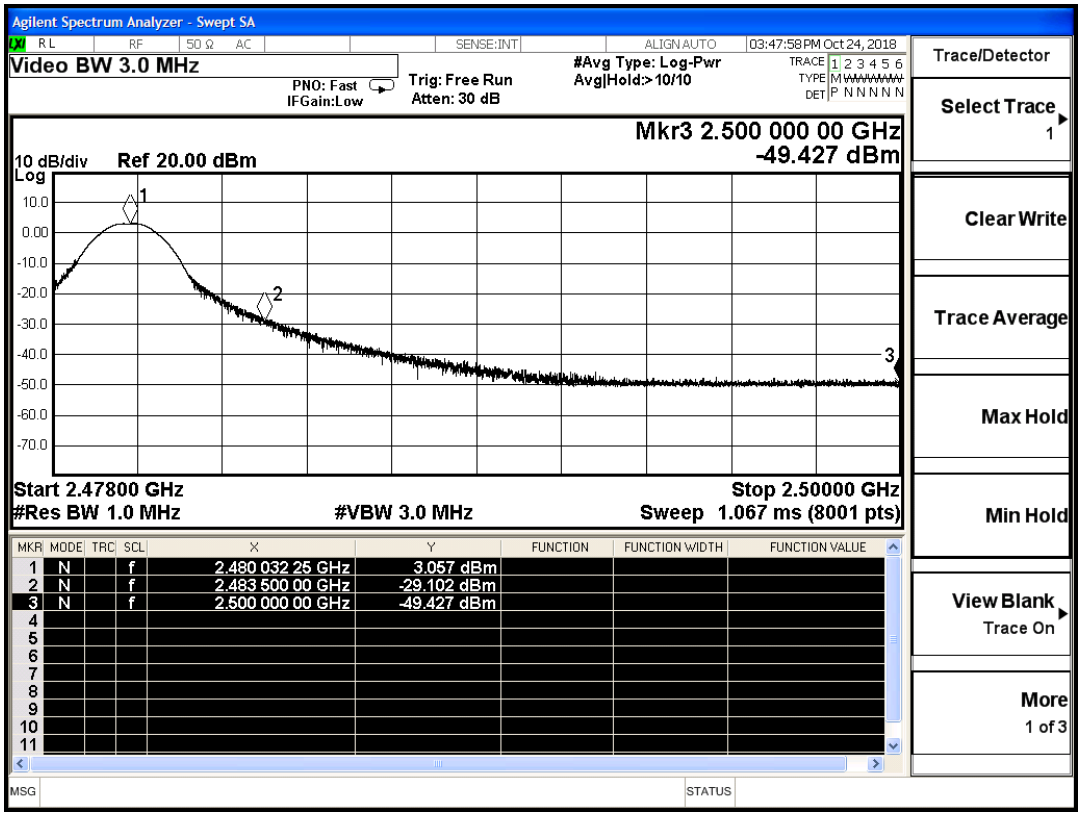
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



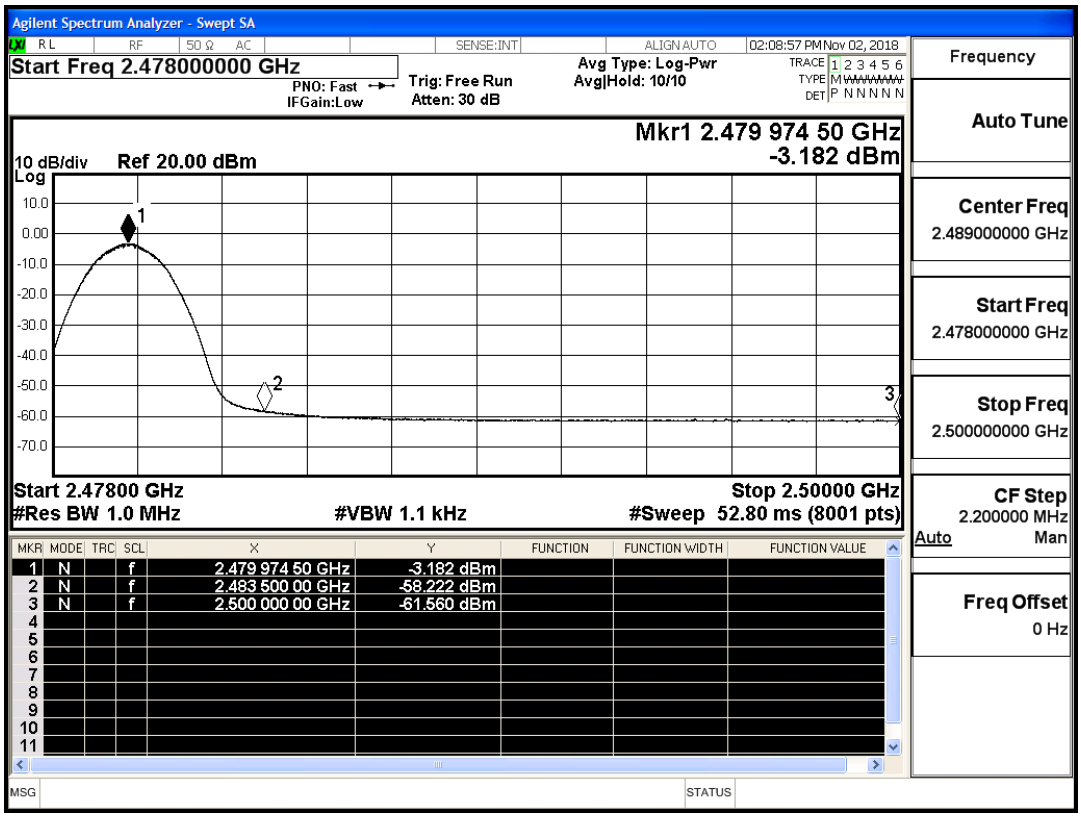
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



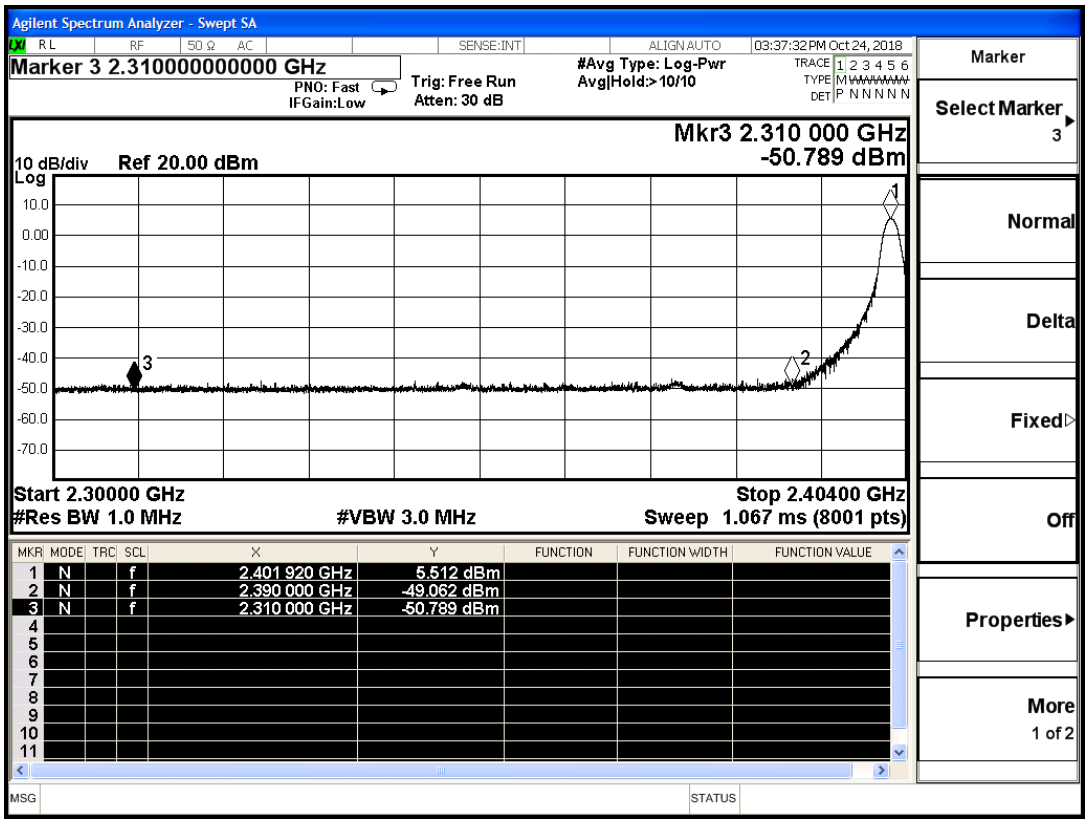
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



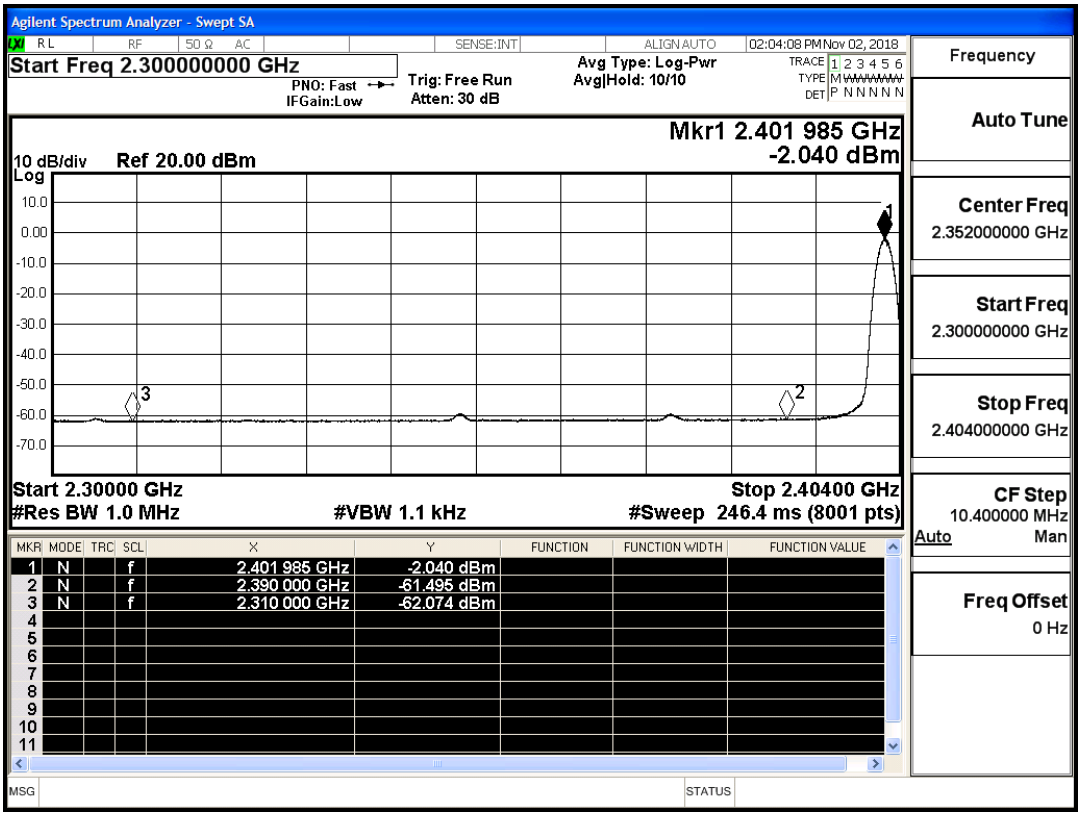
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



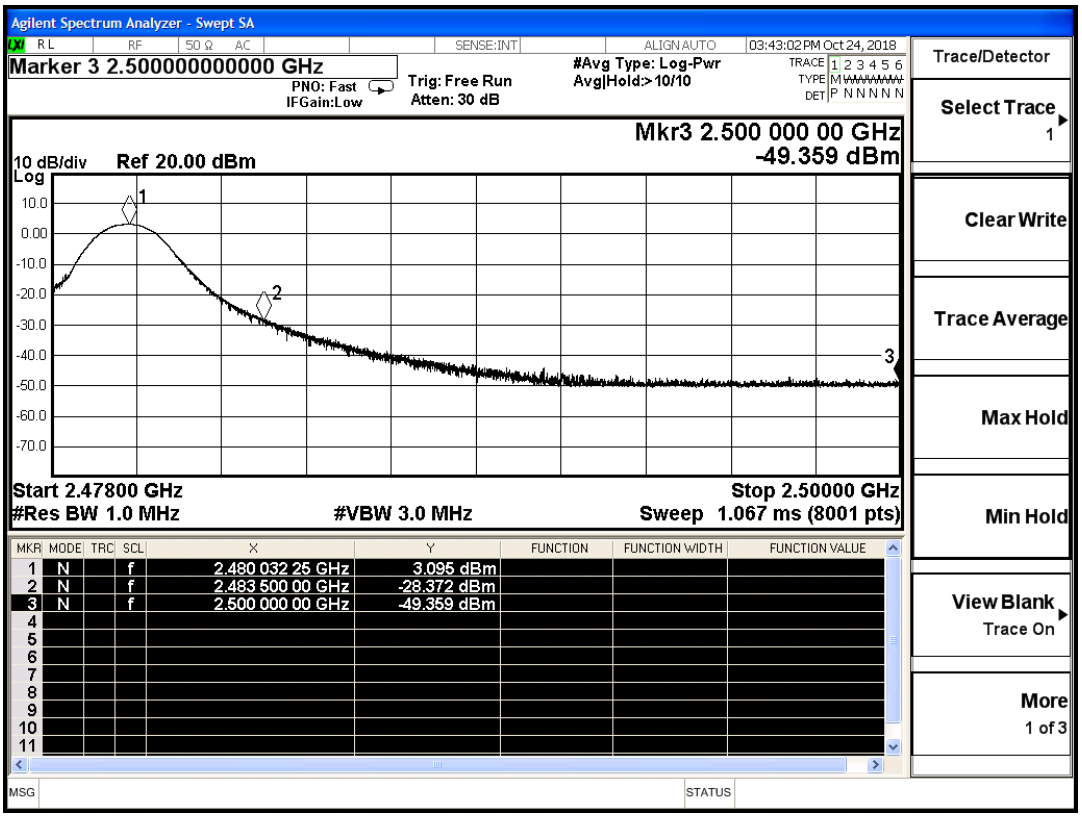
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)