

Appendix A

RF Test Data for BT V4.2(BDR/EDR) (Conducted Measurement)

Product Name: Diagnosis System

Trade Mark: XTOOL

Test Model: H6 Elite

Environmental Conditions

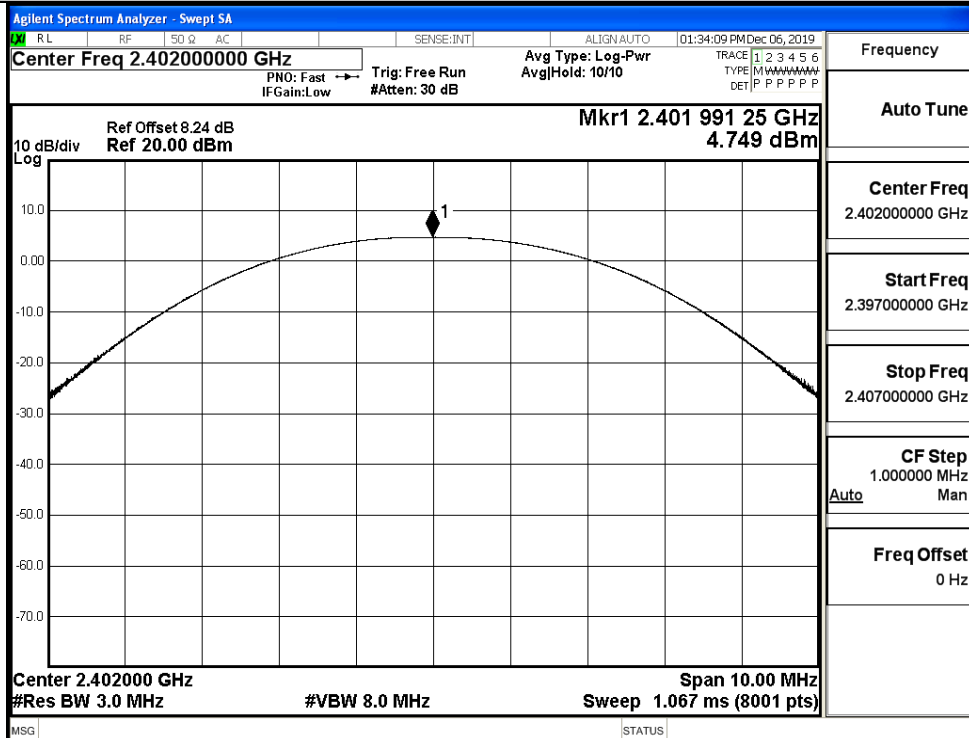
Temperature:	24.6 ° C
Relative Humidity:	52.8%
ATM Pressure:	100.0 kPa
Test Engineer:	Scout Wu
Supervised by:	TOM LIU

A.1 Maximum Conducted Peak Output Power

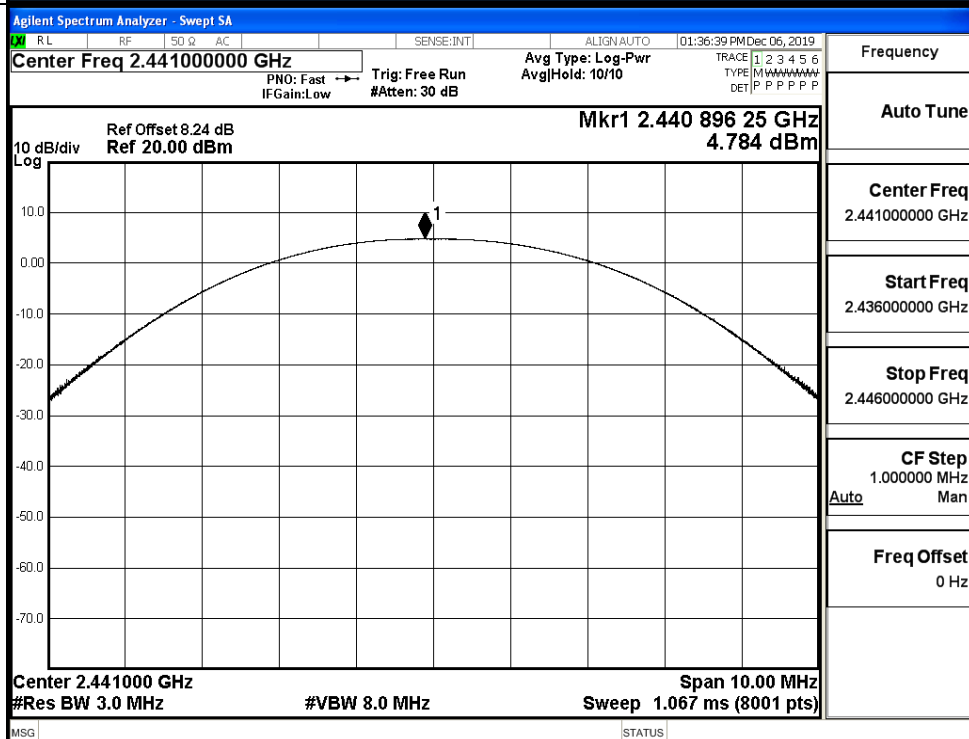
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	4.749	21	PASS
	MCH	4.784	21	PASS
	HCH	1.070	21	PASS
$\pi/4$ DQPSK	LCH	1.227	21	PASS
	MCH	1.153	21	PASS
	HCH	0.683	21	PASS
8DPSK	LCH	1.607	21	PASS
	MCH	1.445	21	PASS
	HCH	1.023	21	PASS

Test Graphs

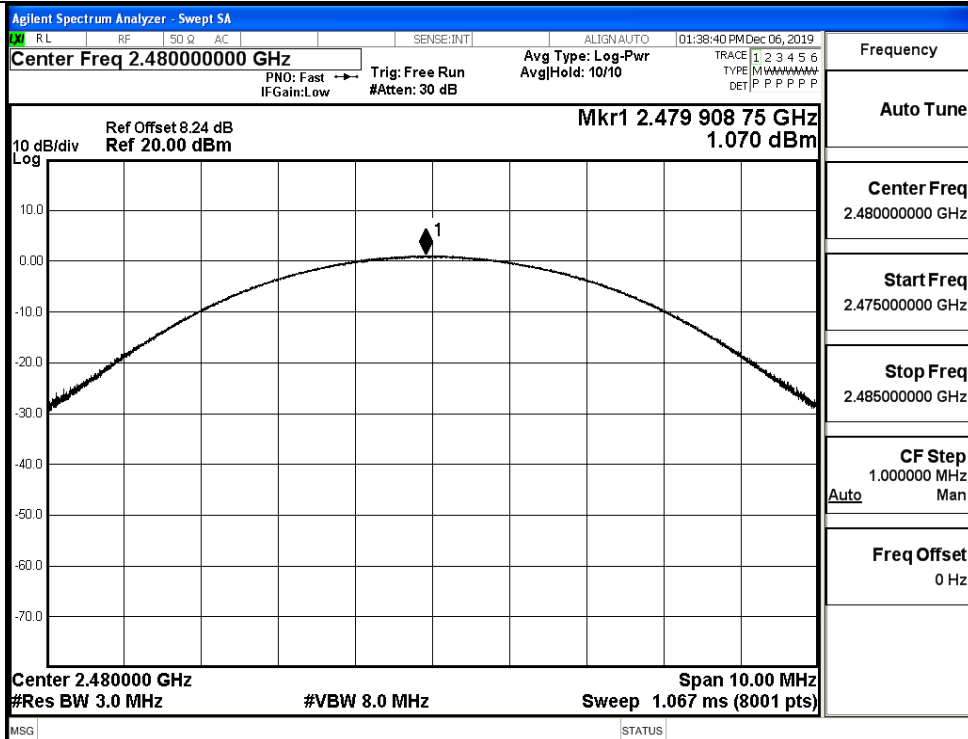
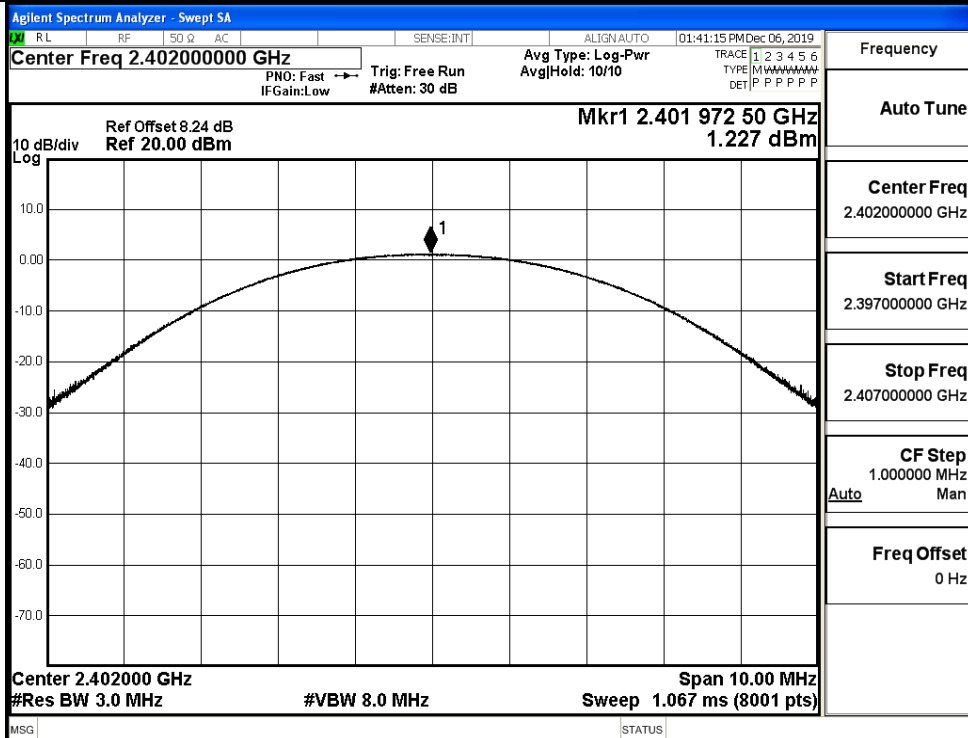
GFSK/LCH

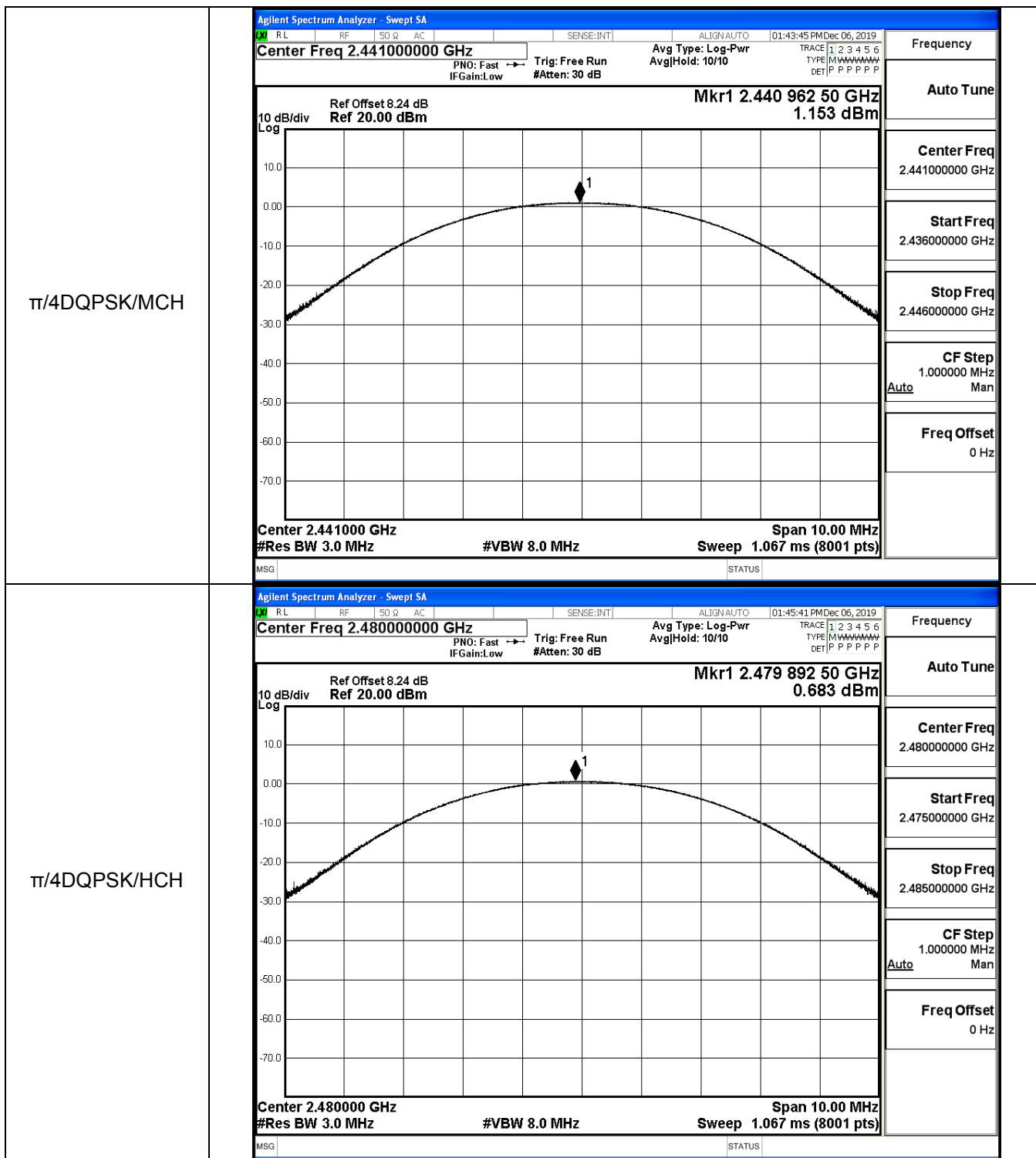


GFSK/MCH

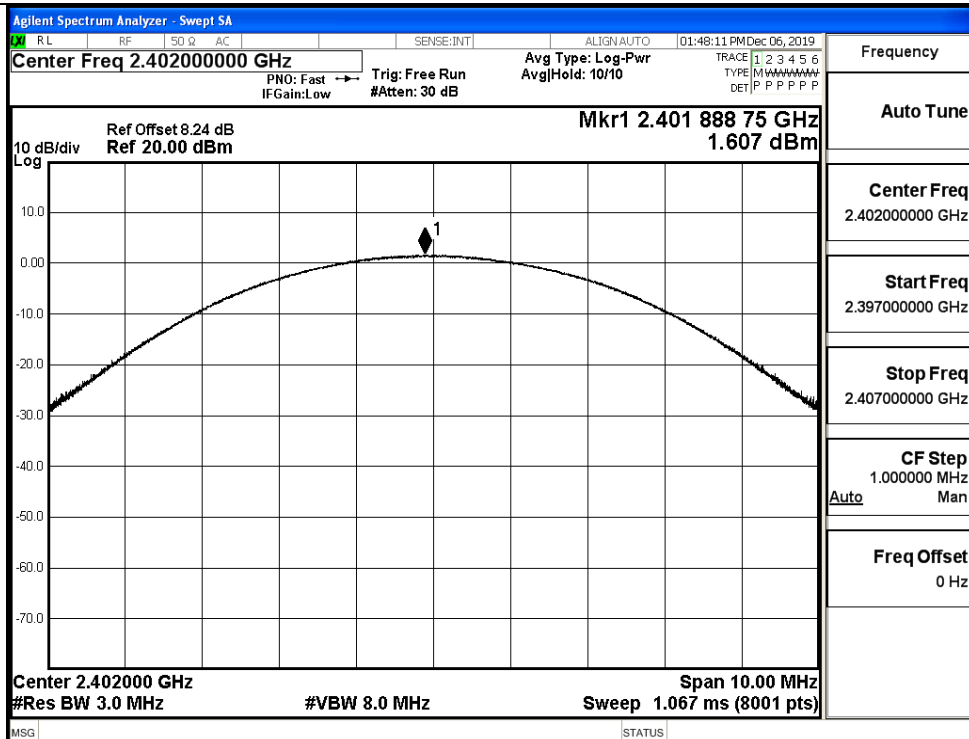


GFSK/HCH

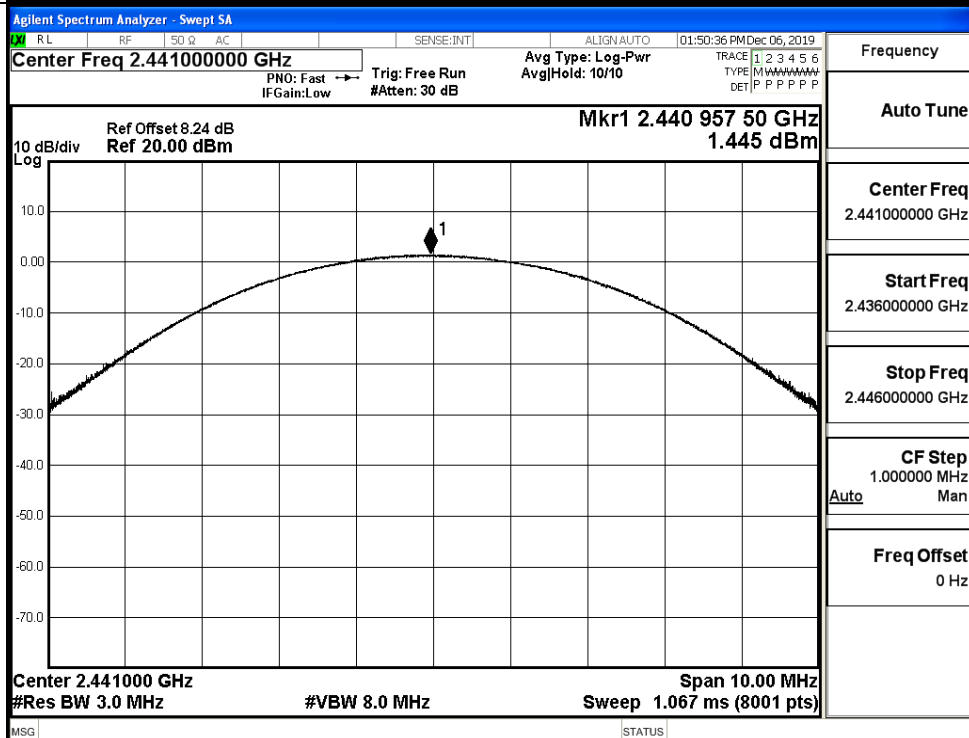
 π /4DQPSK/LCH



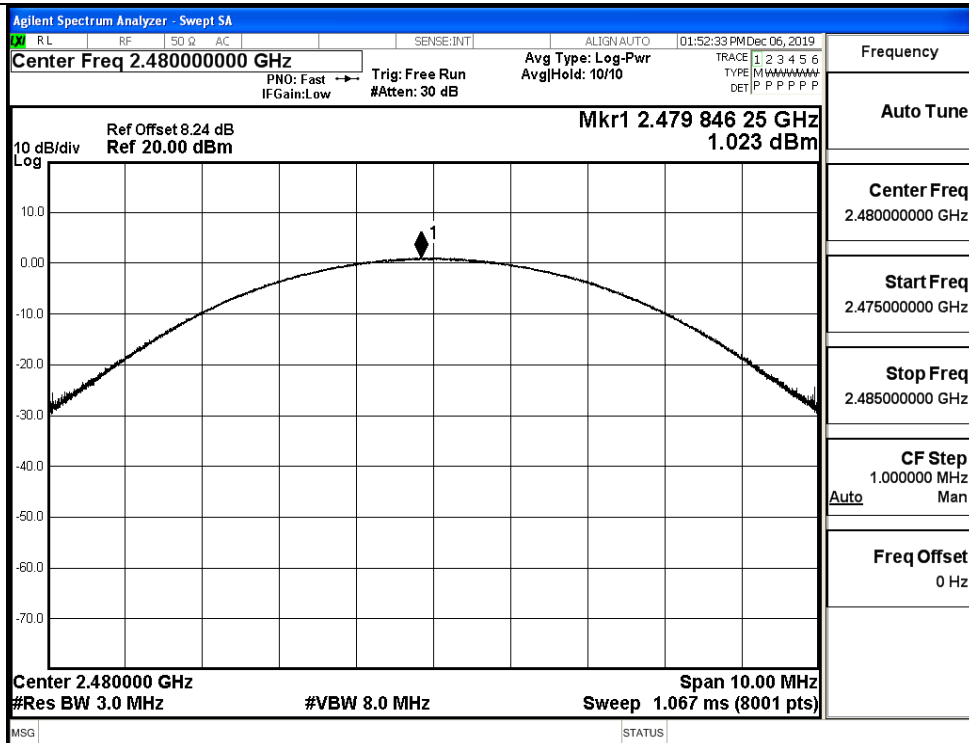
8DPSK/LCH



8DPSK/MCH



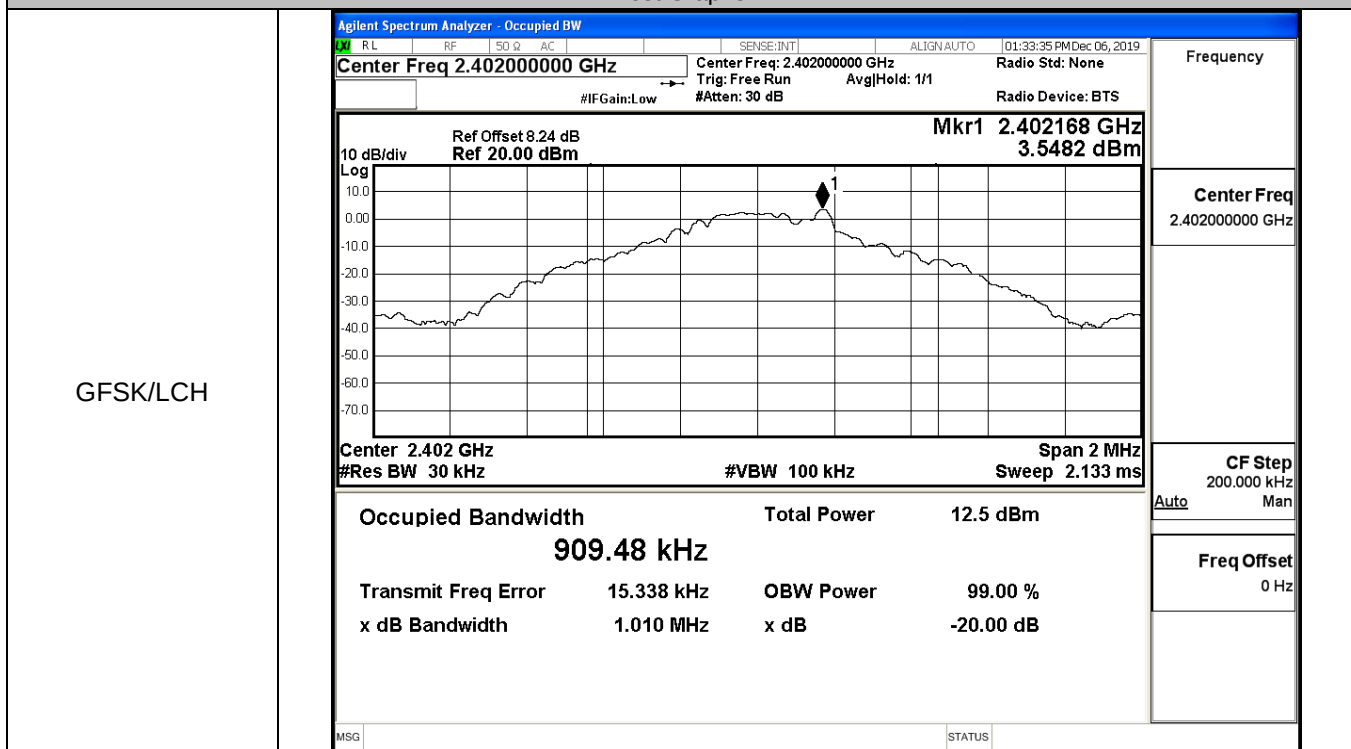
8DPSK/HCH



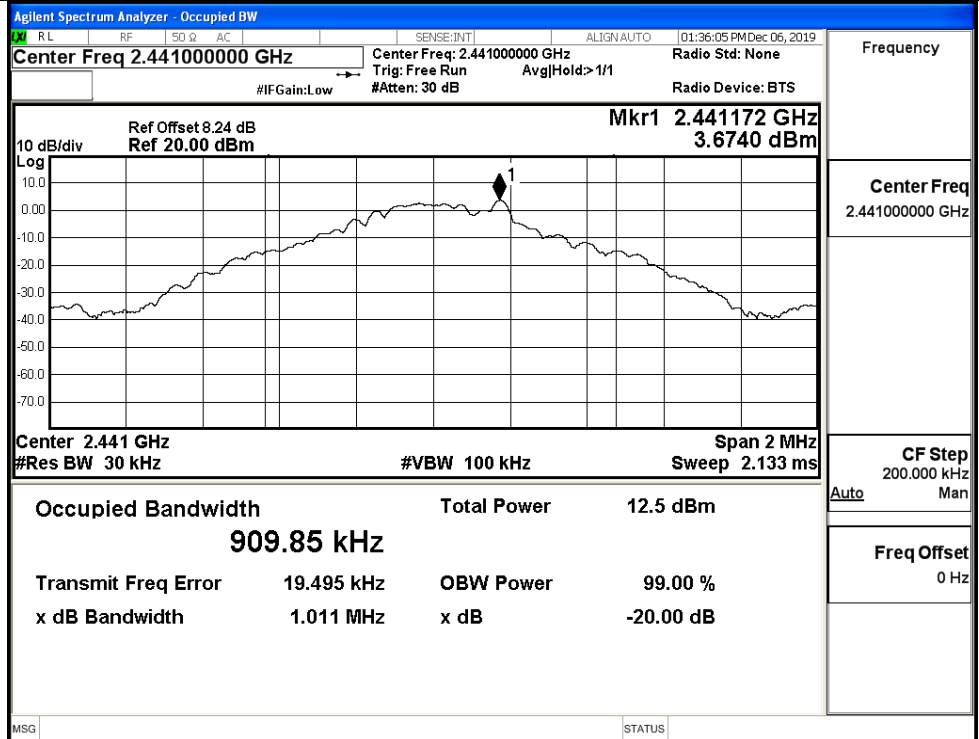
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.010	Not Specified	PASS
	MCH	1.011	Not Specified	PASS
	HCH	1.317	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.357	Not Specified	PASS
	MCH	1.361	Not Specified	PASS
	HCH	1.359	Not Specified	PASS
8DPSK	LCH	1.316	Not Specified	PASS
	MCH	1.317	Not Specified	PASS
	HCH	1.316	Not Specified	PASS

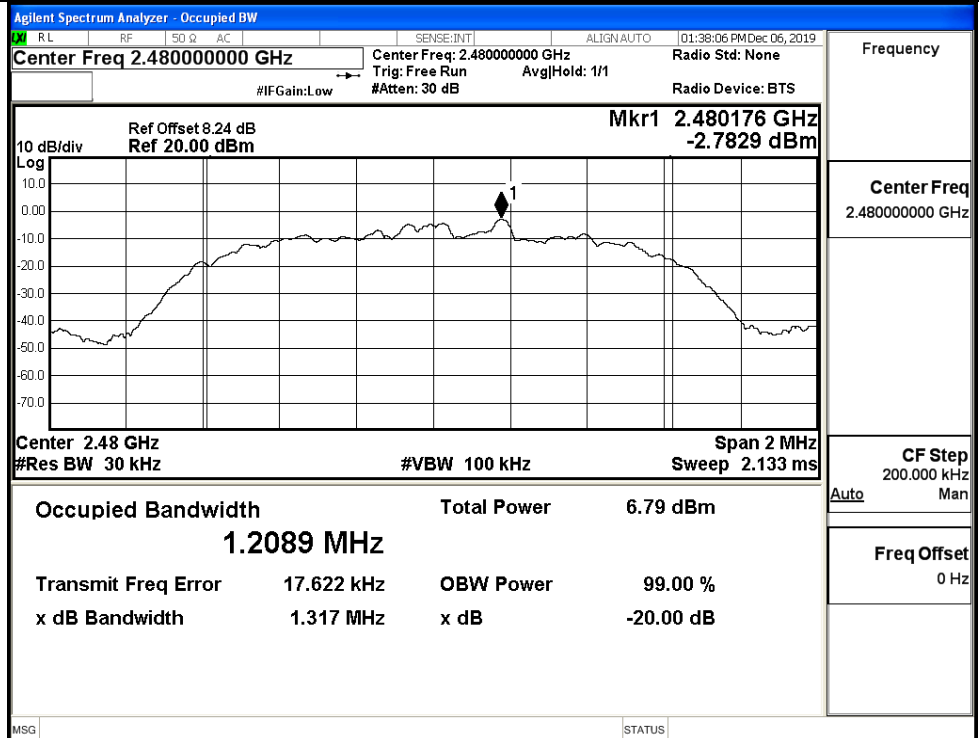
Test Graphs

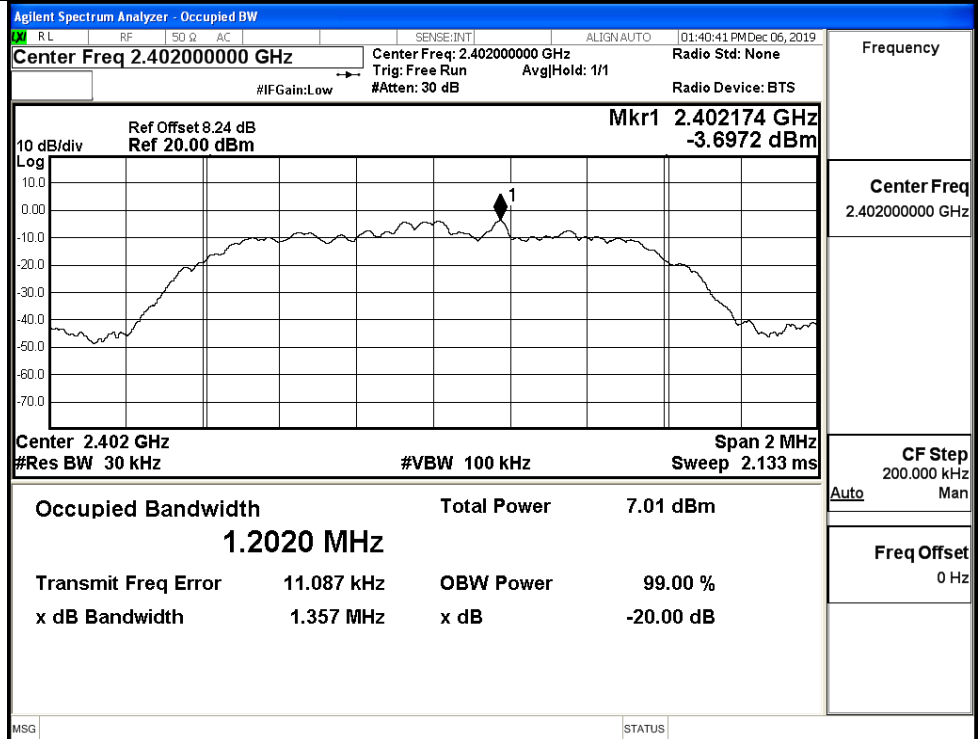
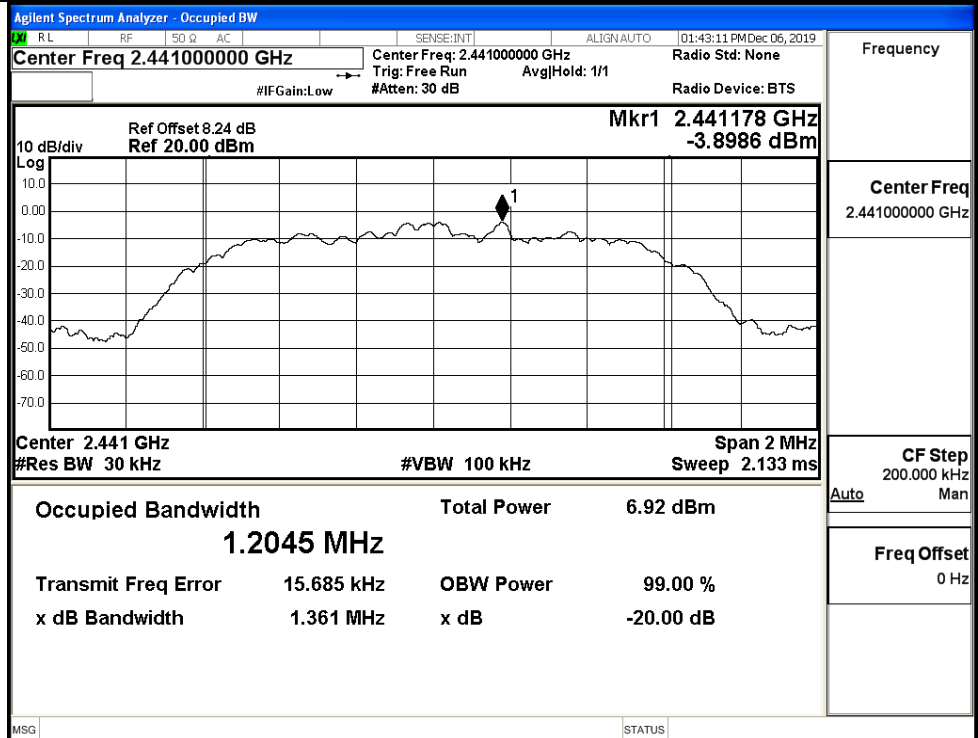


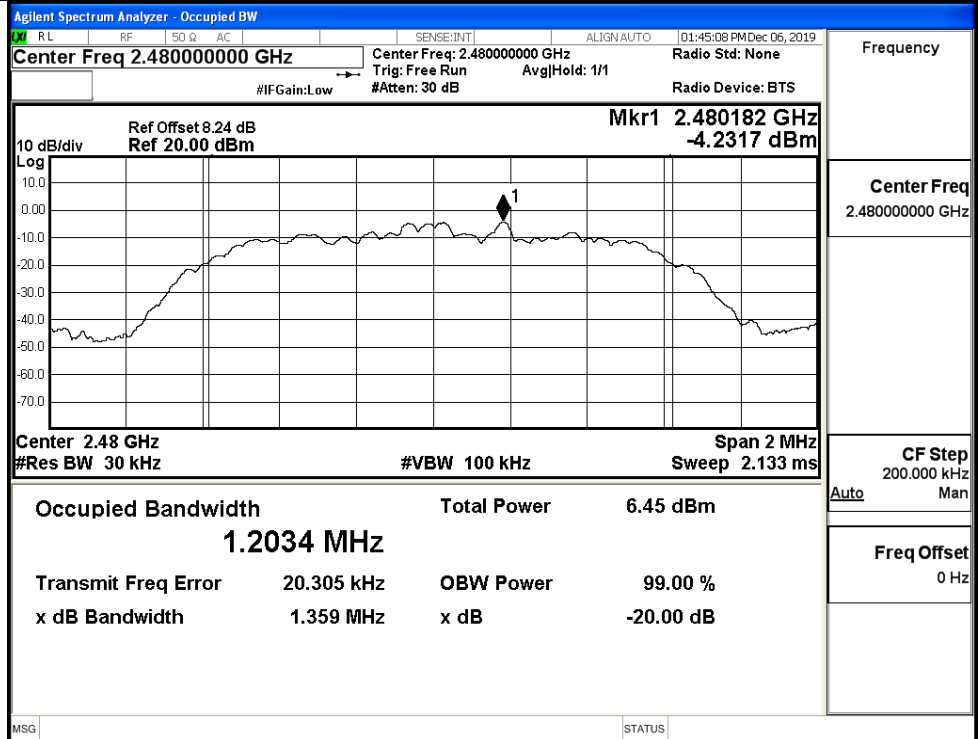
GFSK/MCH



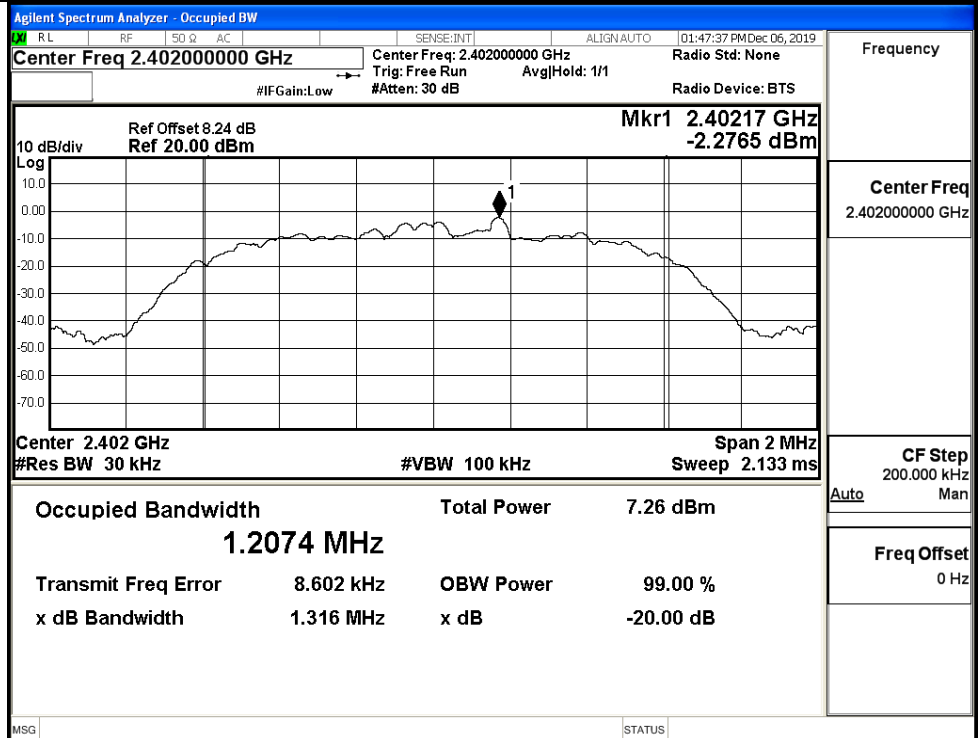
GFSK/HCH



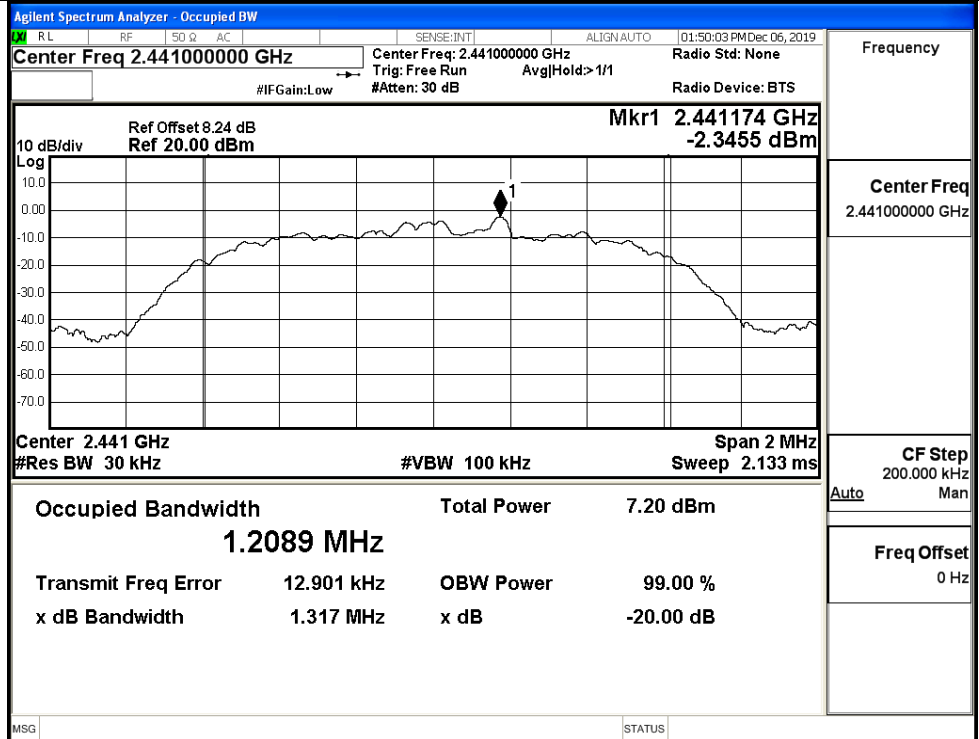
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

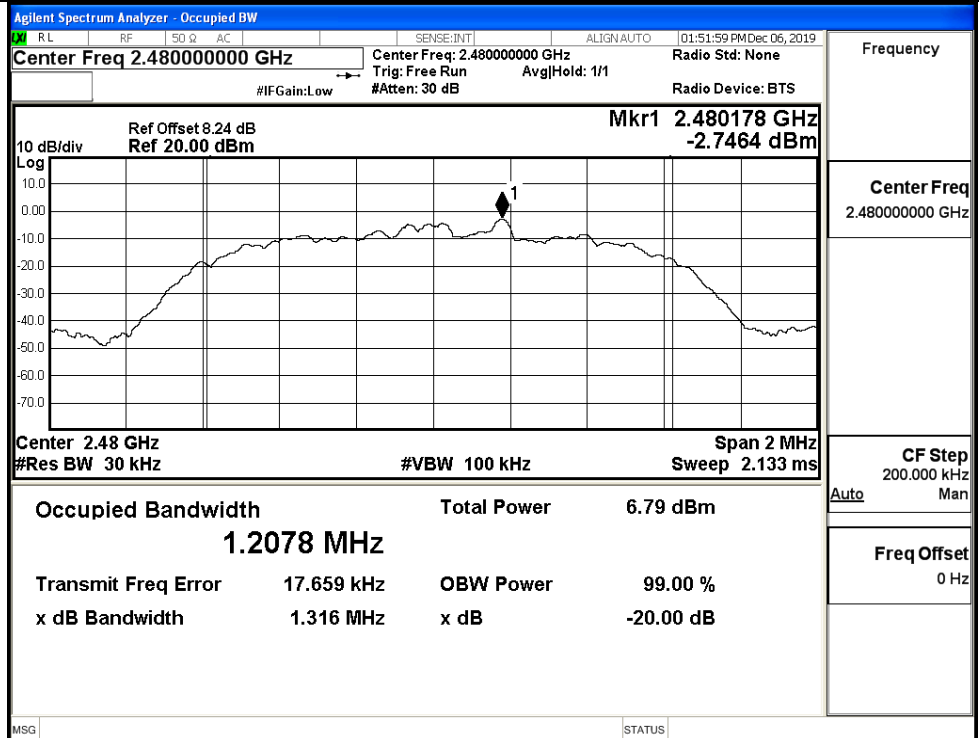
8DPSK/LCH



8DPSK/MCH



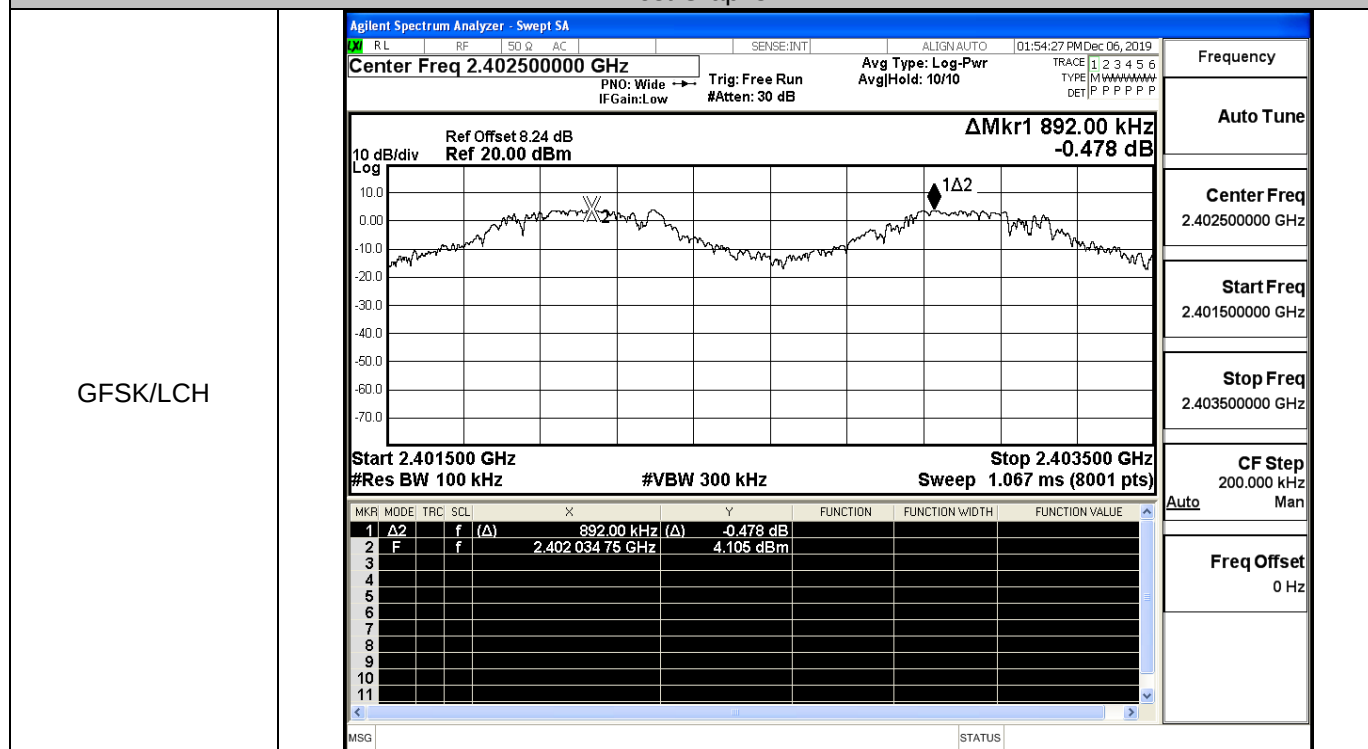
8DPSK/HCH



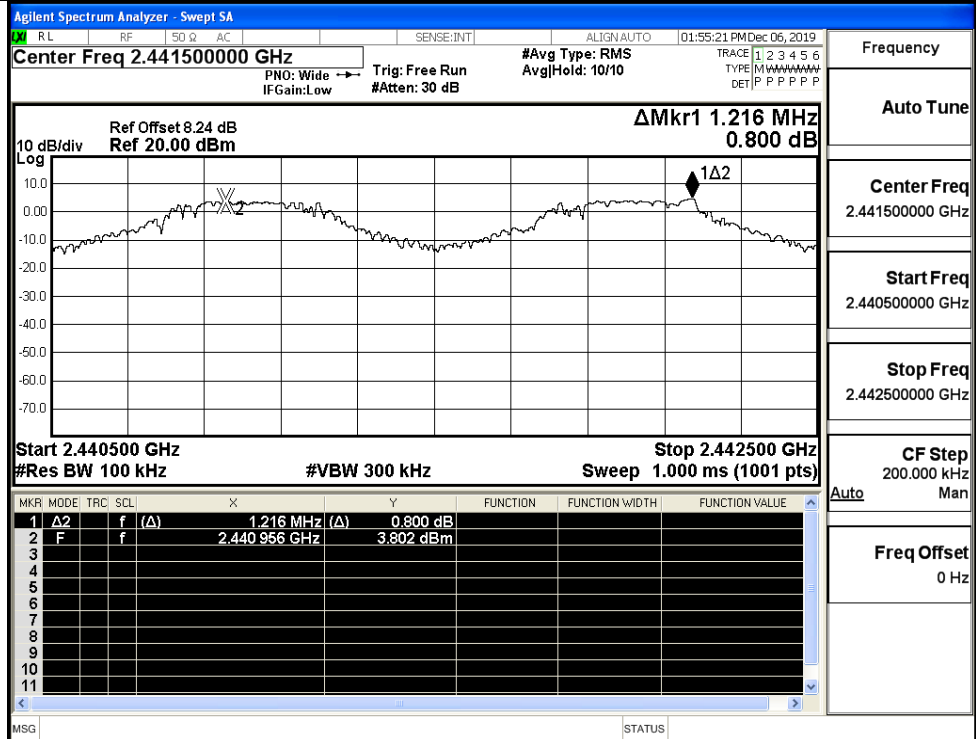
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.892	0.878	PASS
	MCH	1.216	0.878	PASS
	HCH	0.926	0.878	PASS
$\pi/4$ DQPSK	LCH	1.090	0.907	PASS
	MCH	1.010	0.907	PASS
	HCH	0.996	0.907	PASS
8DPSK	LCH	1.064	0.878	PASS
	MCH	0.974	0.878	PASS
	HCH	1.254	0.878	PASS

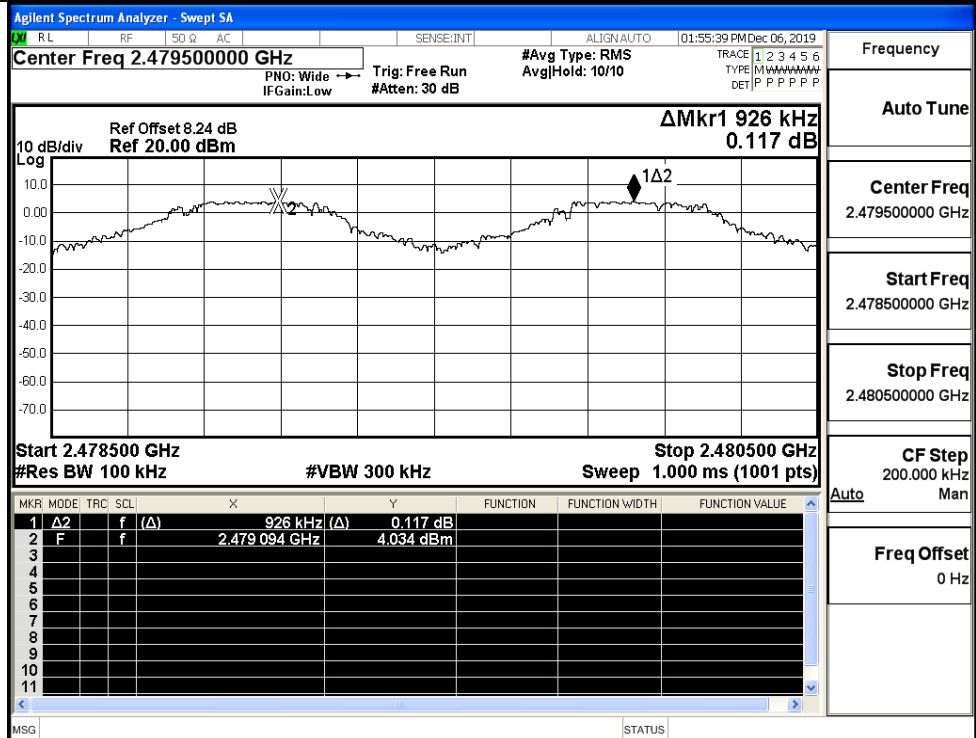
Test Graphs

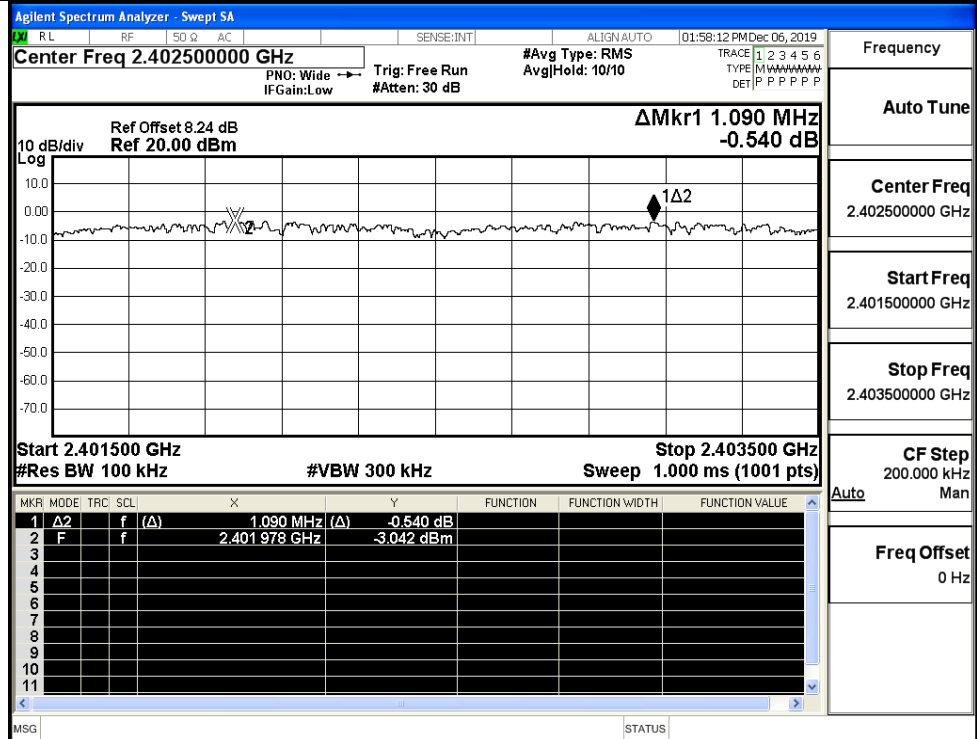
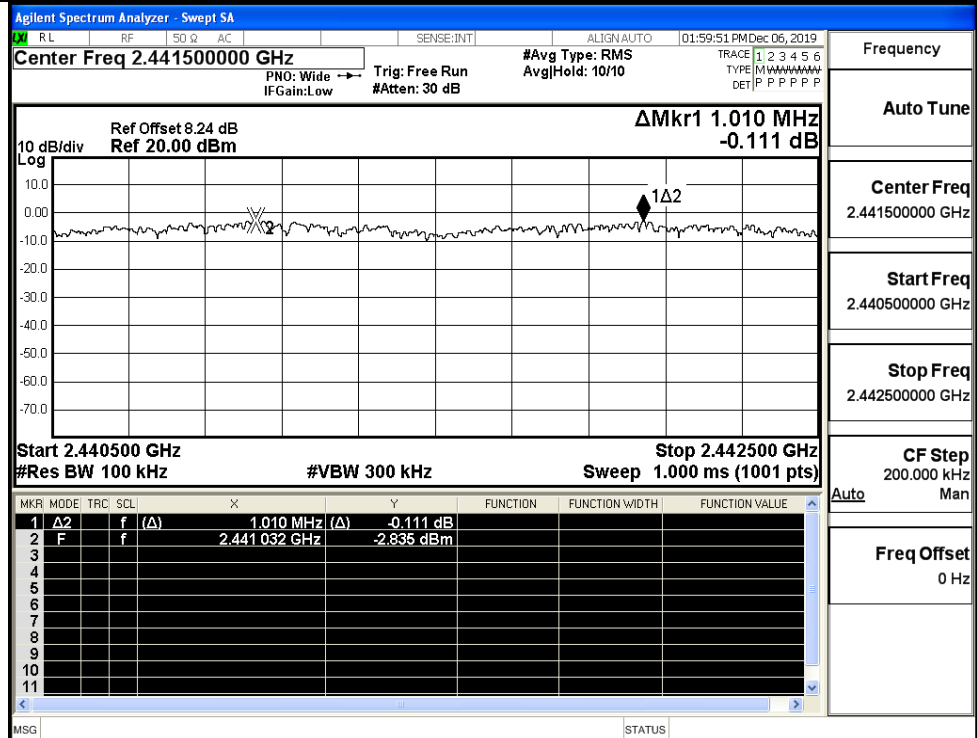


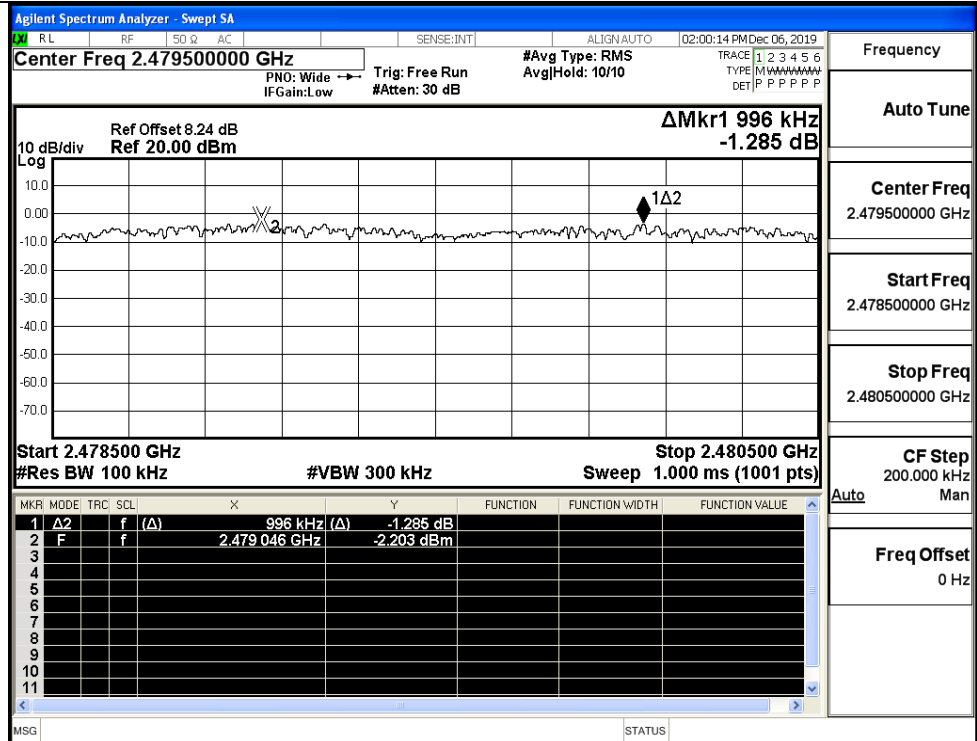
GFSK/MCH



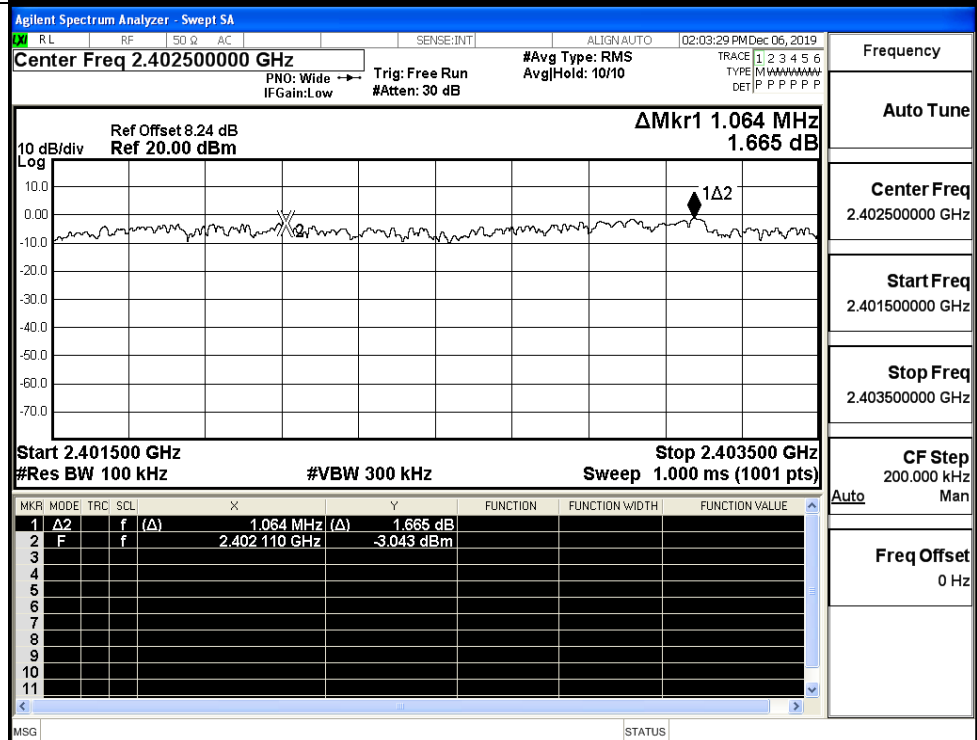
GFSK/HCH



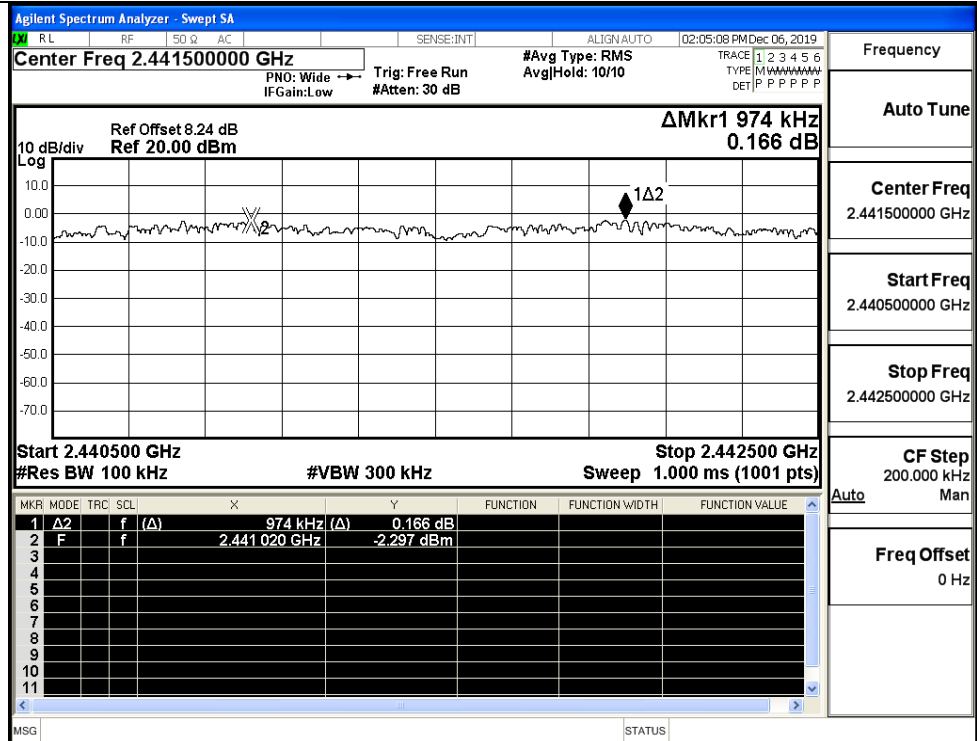
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

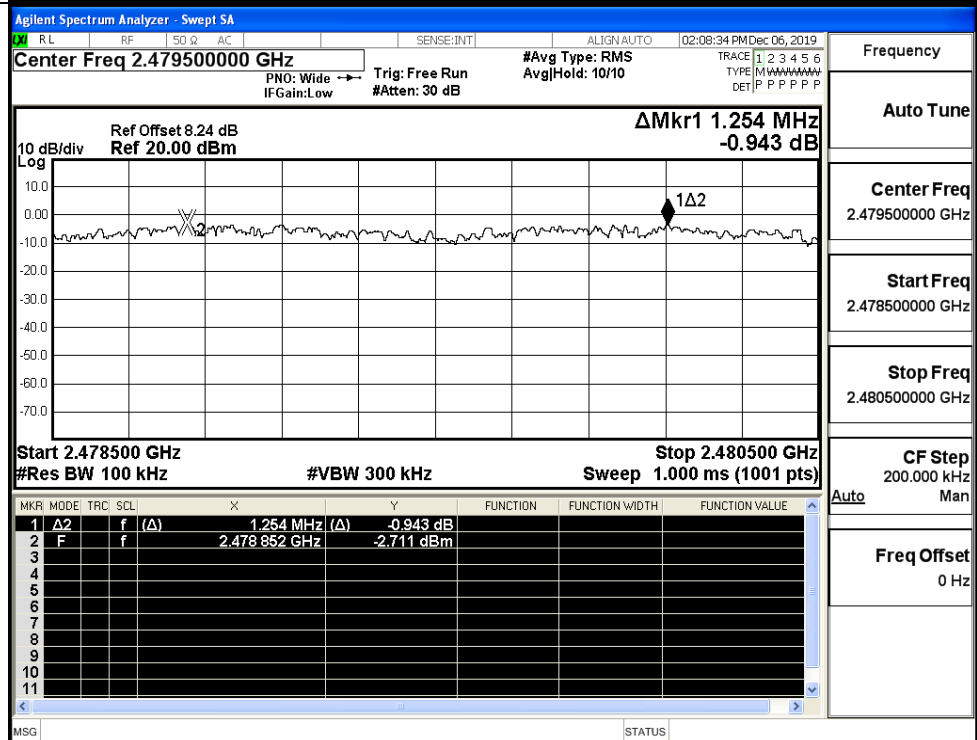
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

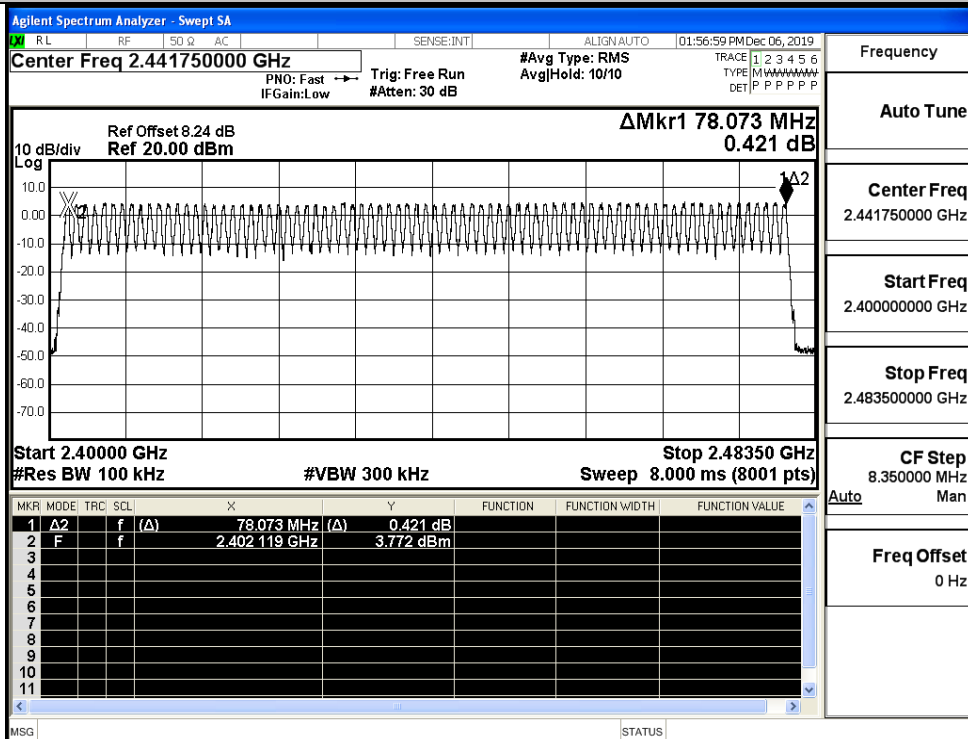
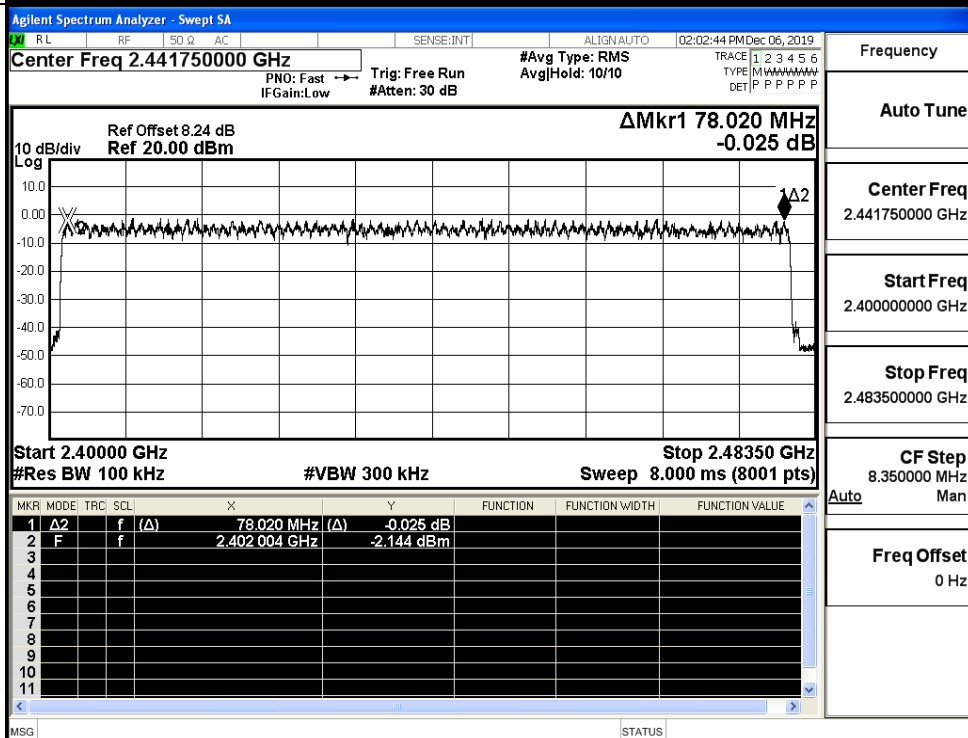


A.4 Hopping Channel Number

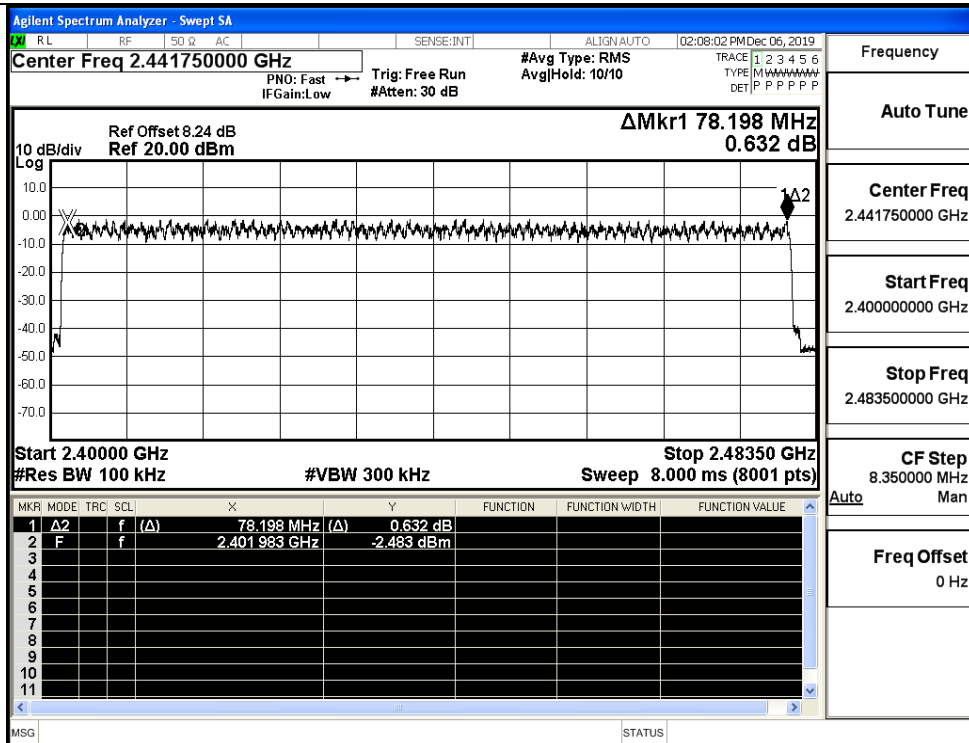
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS
8DPSK	Hop	79	>=15	PASS

Test Graphs

GFSK/Hop

 $\pi/4$ DQPSK/Hop

8DPSK/Hop

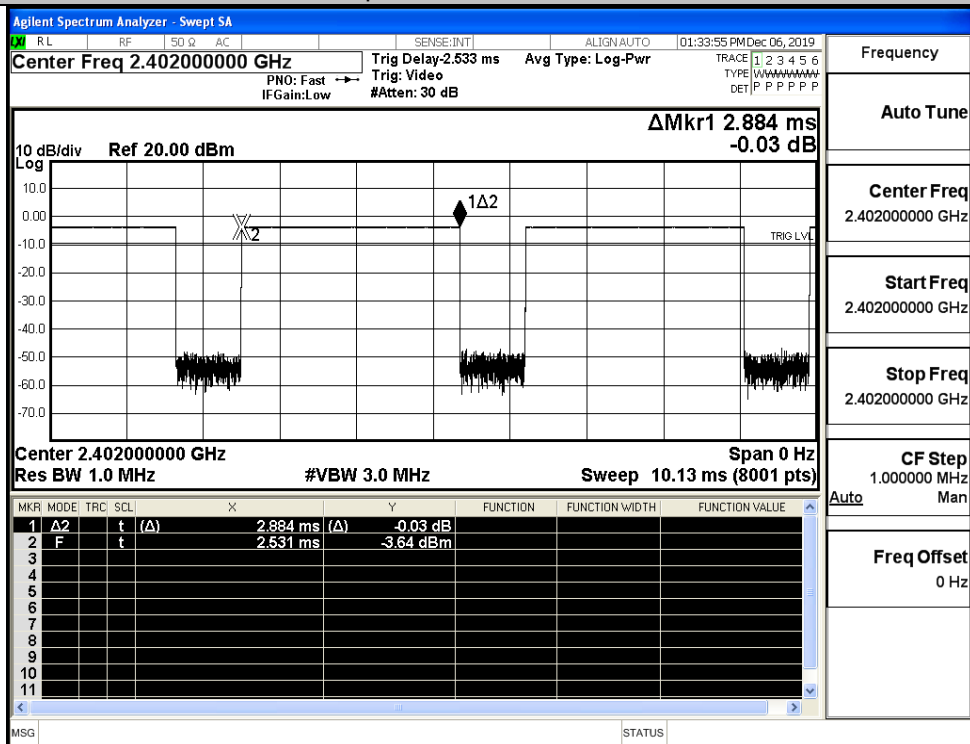


A.5 Dwell Time

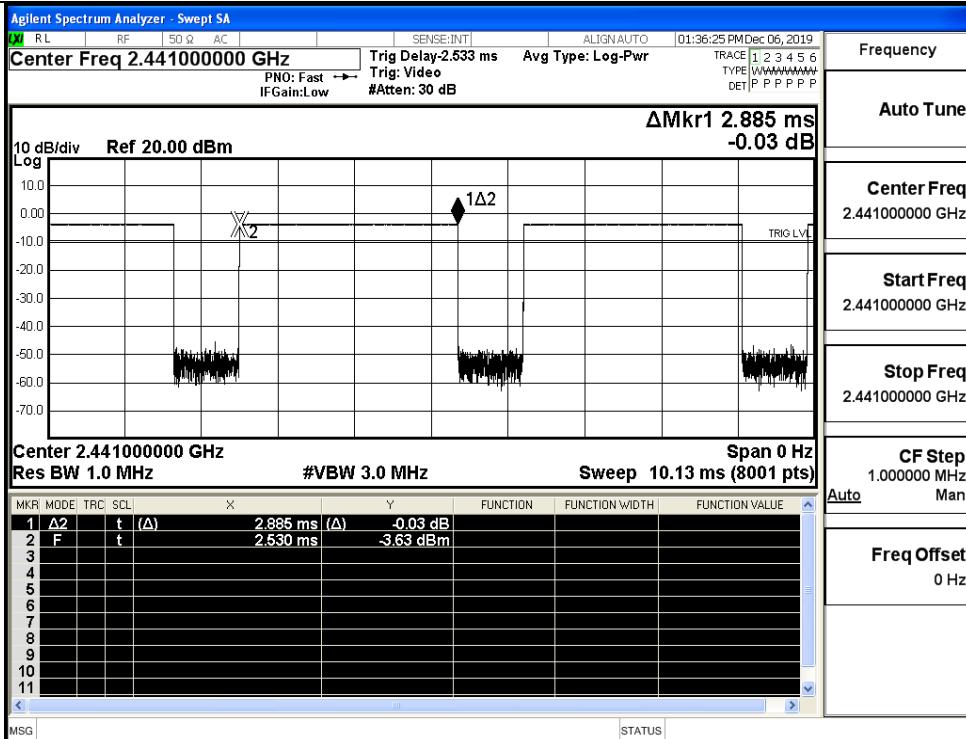
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.89	106.7	0.308	0.4	PASS
	DH5	HCH	2.89	106.7	0.308	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.88	106.7	0.308	0.4	PASS
	2DH5	MCH	2.89	106.7	0.308	0.4	PASS
	2DH5	HCH	2.89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

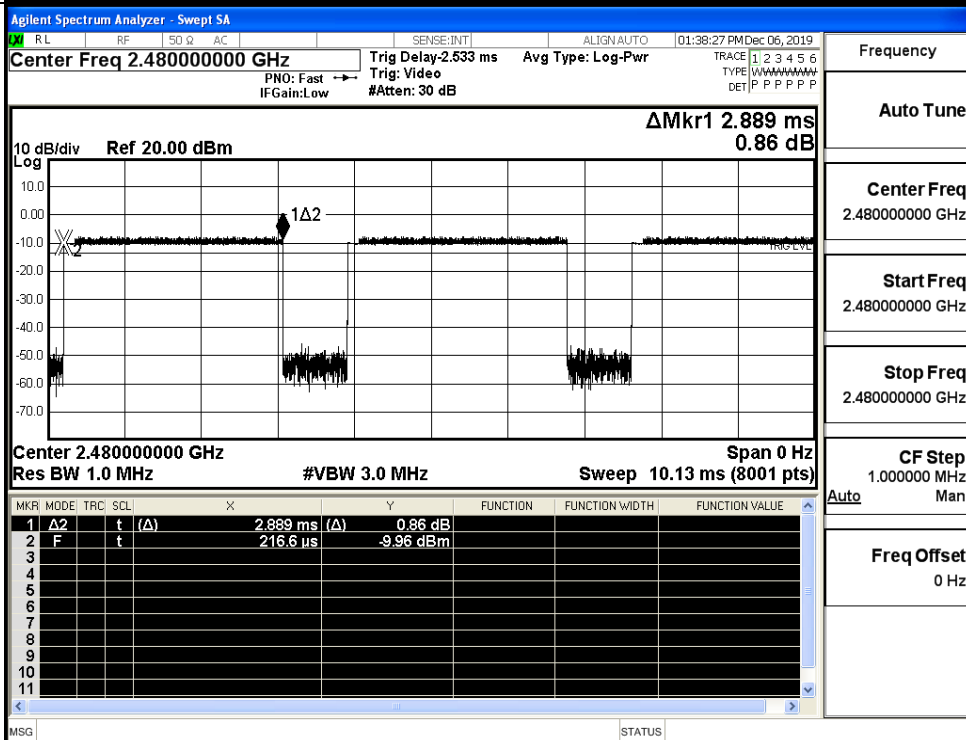
GFSK_DH5/LCH



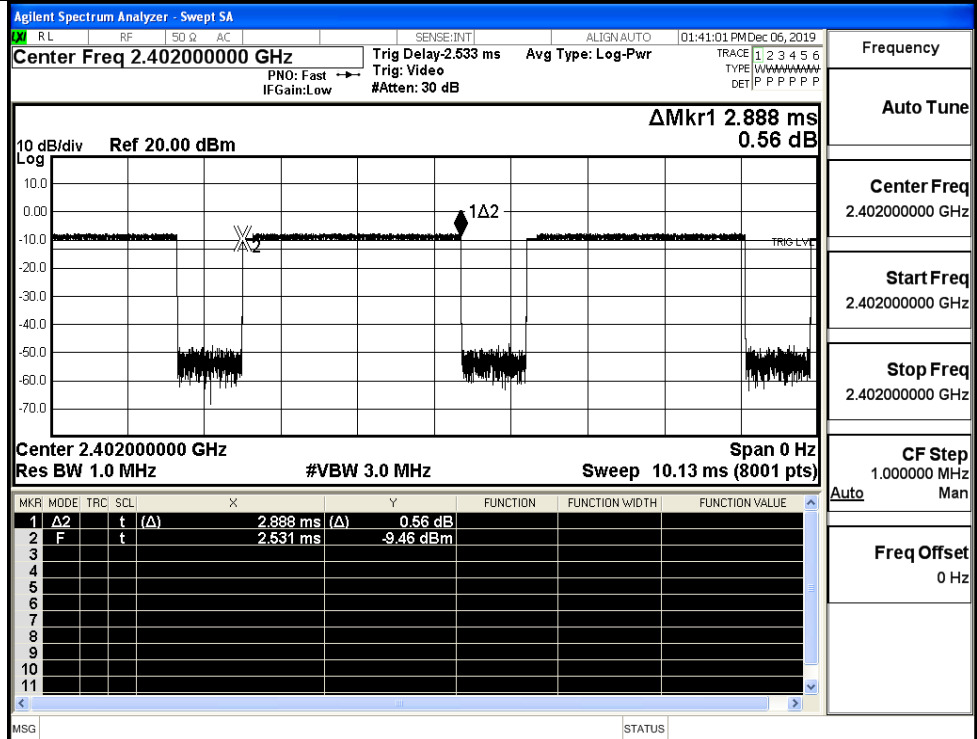
GFSK_DH5/MCH



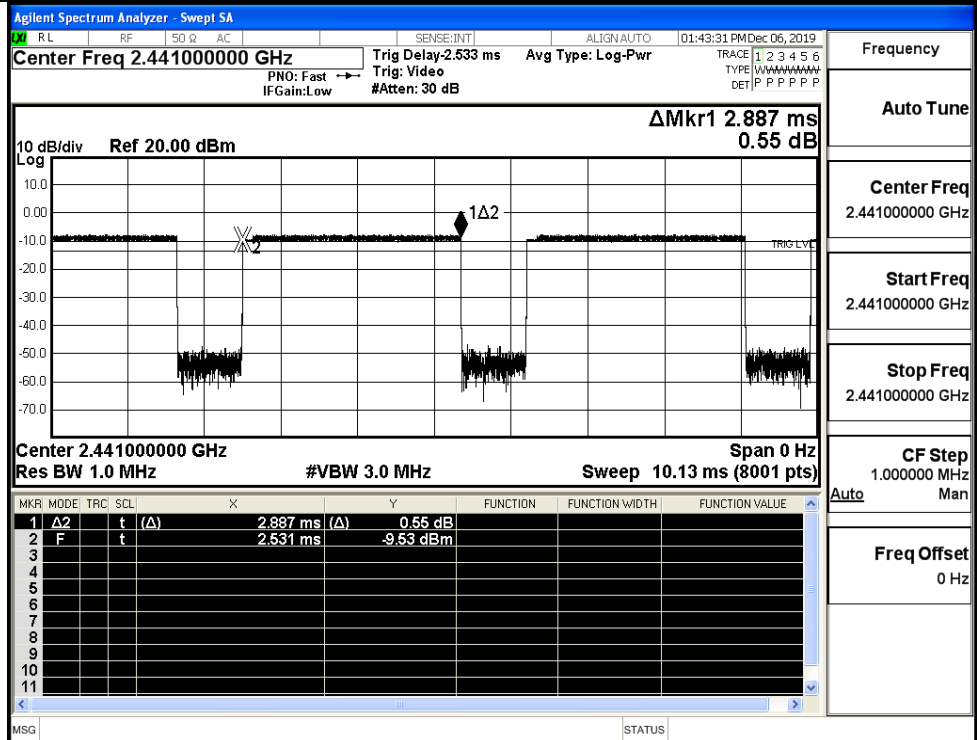
GFSK_DH5/HCH



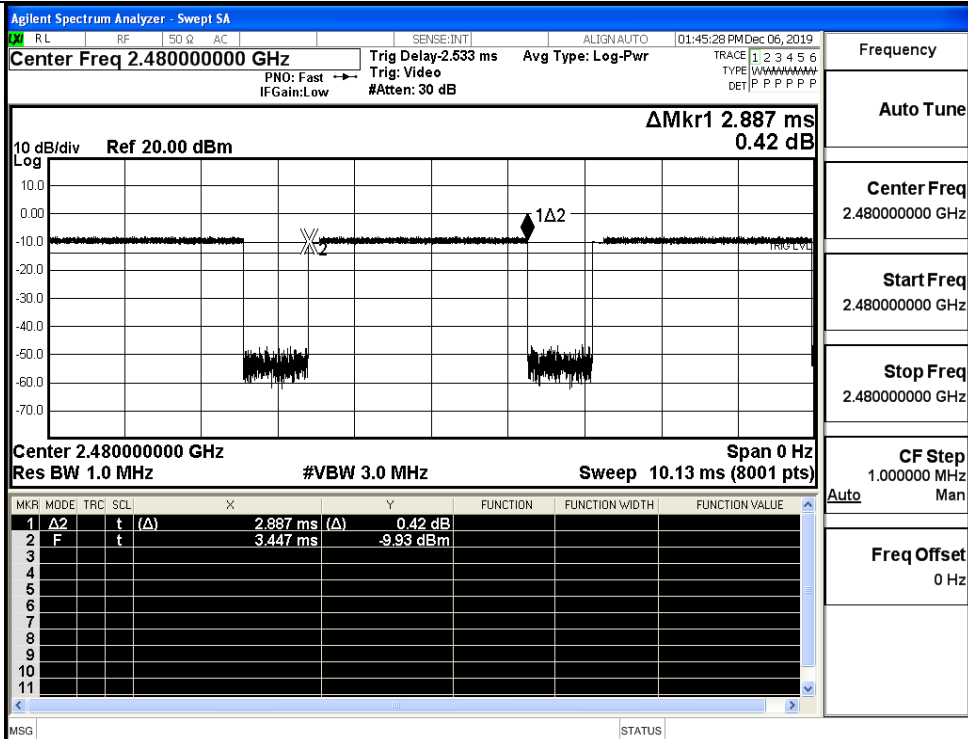
$\pi/4$ DQPSK
_2DH5/LCH



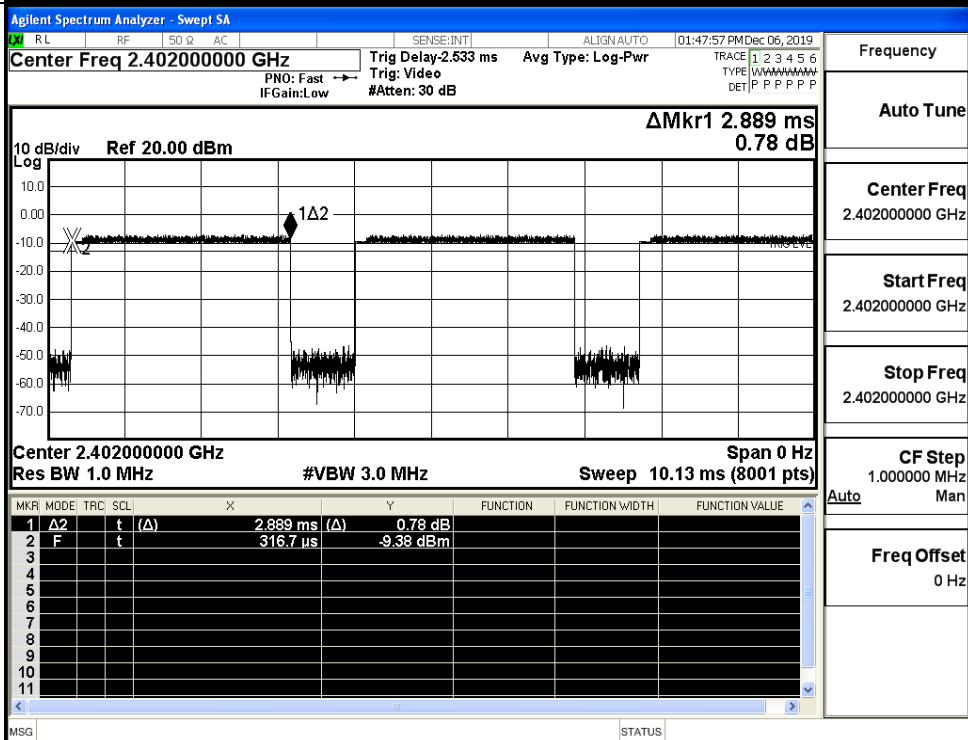
$\pi/4$ DQPSK
_2DH5/MCH



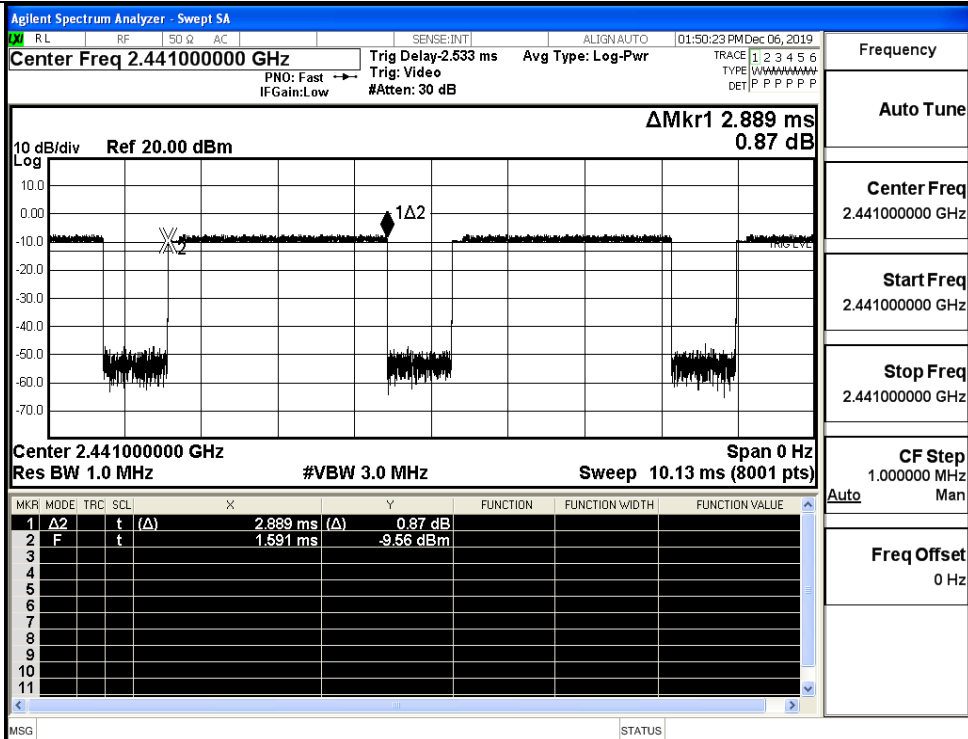
$\pi/4$ DQPSK
_2DH5/HCH



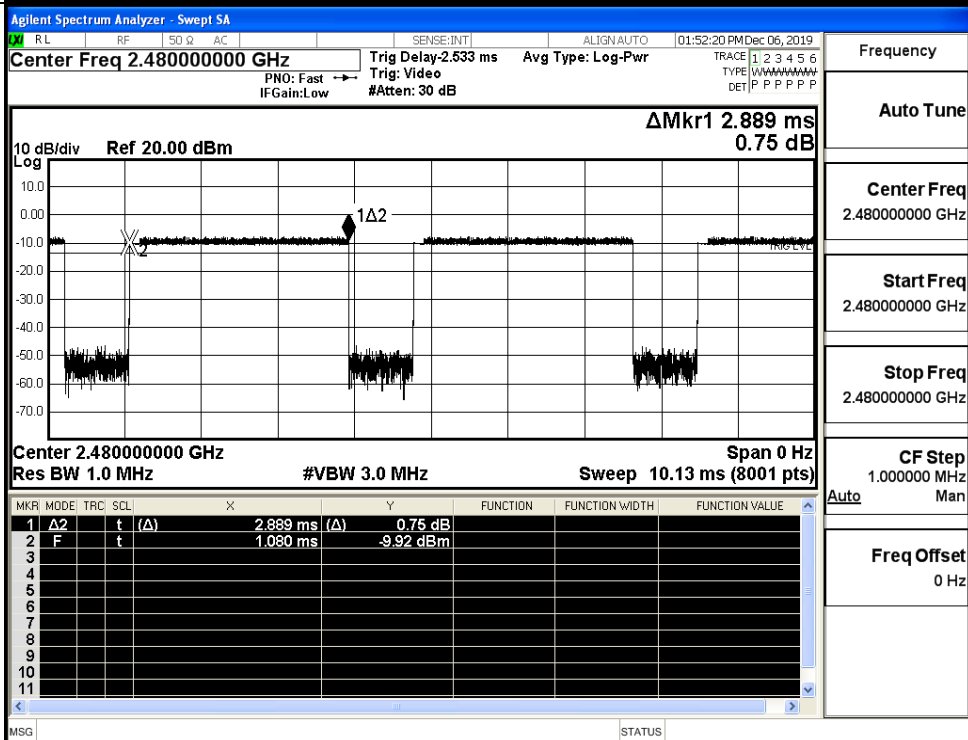
8DPSK _3DH5/LCH



8DPSK_3DH5/MCH



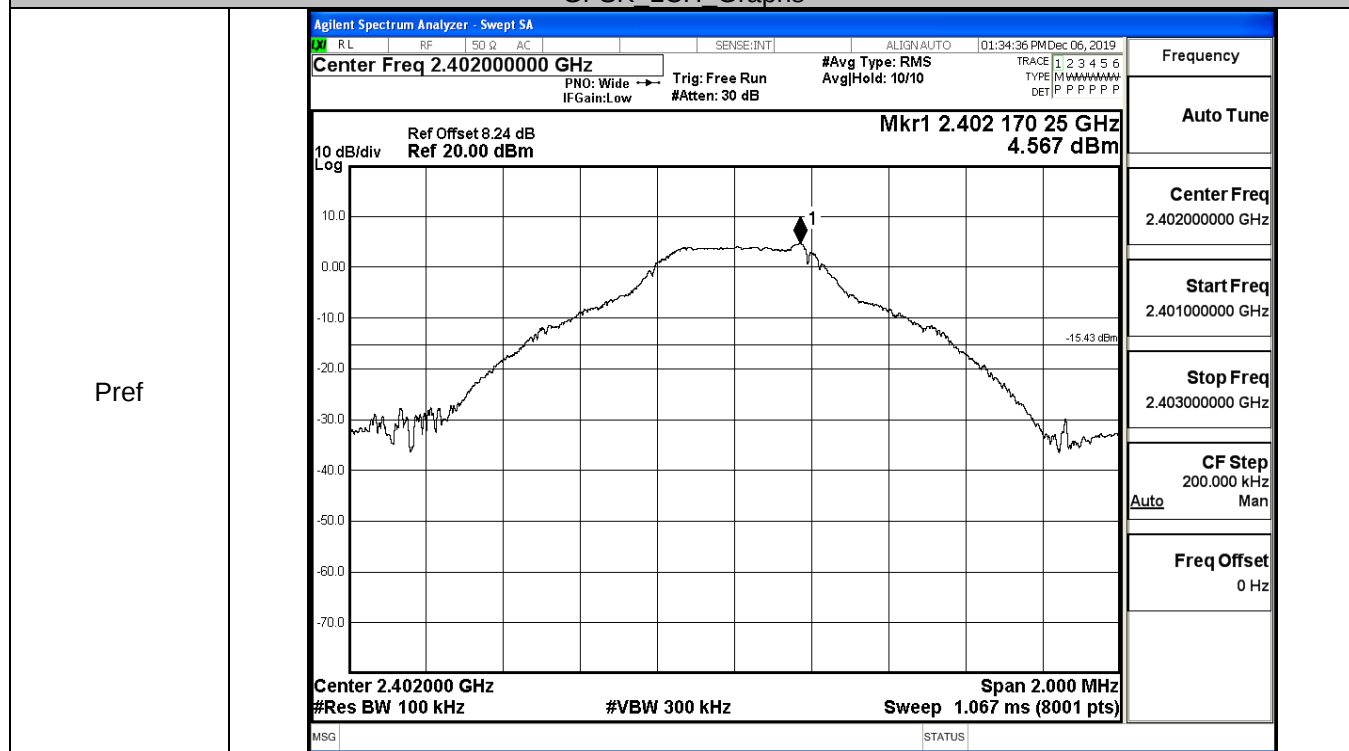
8DPSK_3DH5/HCH



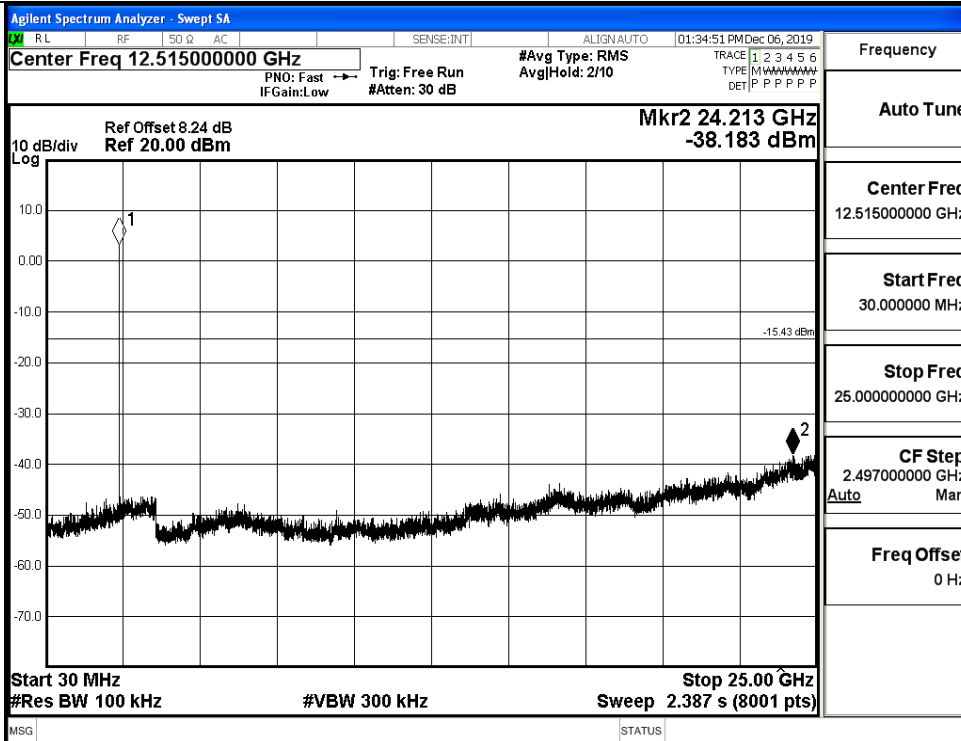
A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	4.567	-38.183	-15.433	PASS
	MCH	4.66	-37.320	-15.340	PASS
	HCH	-1.782	-37.331	-21.782	PASS
$\pi/4$ DQPSK	LCH	-1.459	-37.490	-21.459	PASS
	MCH	-1.599	-36.827	-21.599	PASS
	HCH	-2.466	-36.211	-22.466	PASS
8DPSK	LCH	-1.29	-37.446	-21.290	PASS
	MCH	-1.401	-37.601	-21.401	PASS
	HCH	-1.826	-37.786	-21.826	PASS

GFSK LCH Graphs

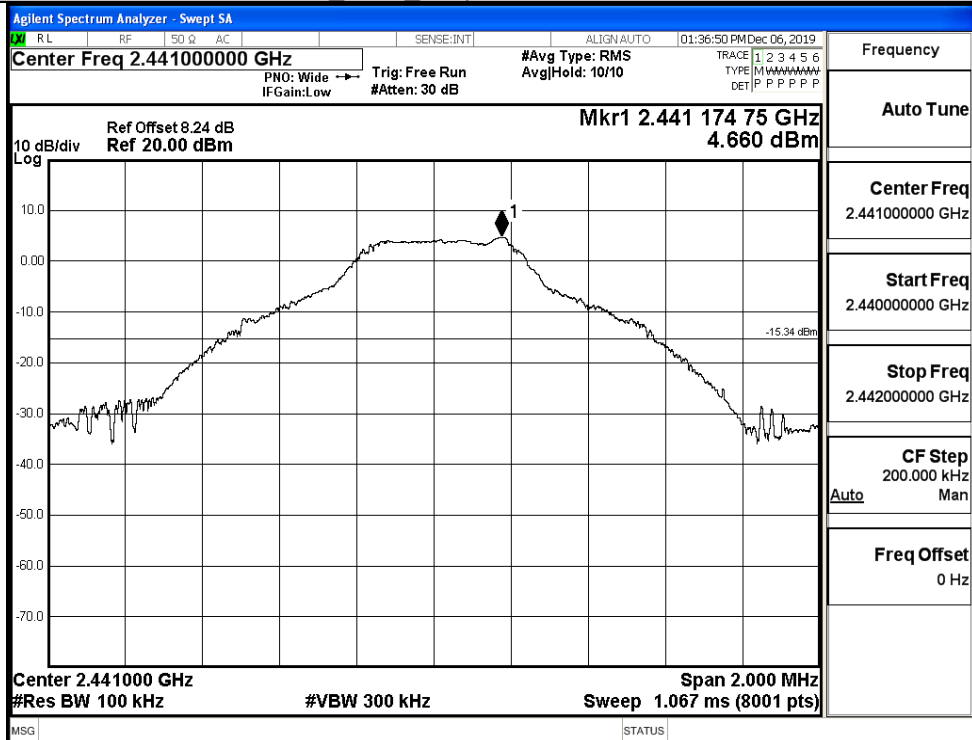


Puw

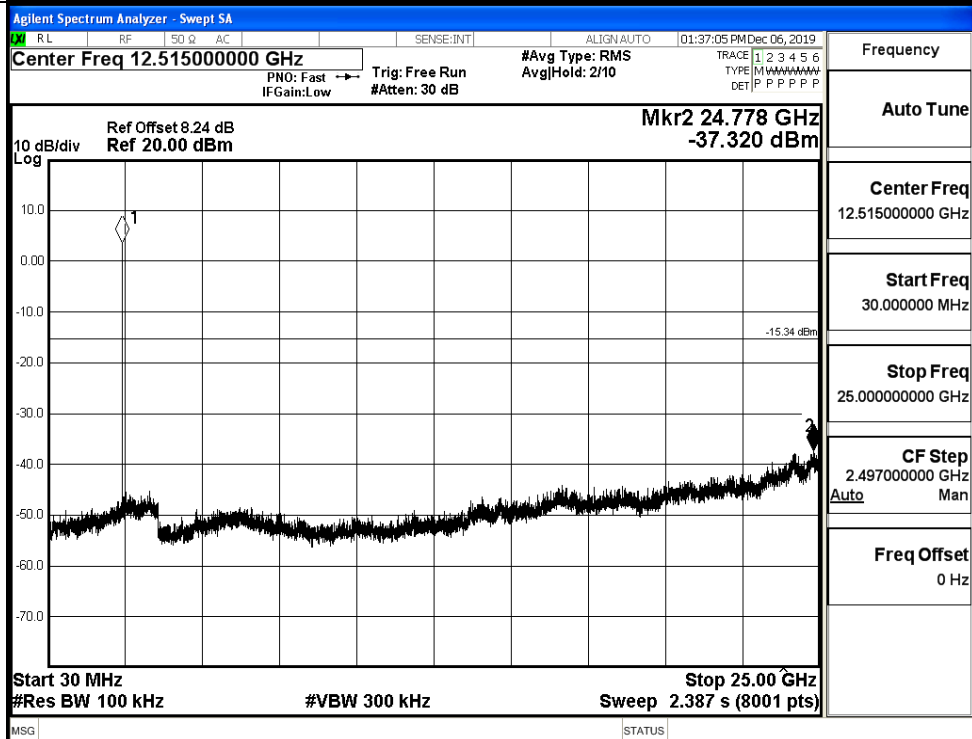


GFSK_MCH_Graphs

Pref

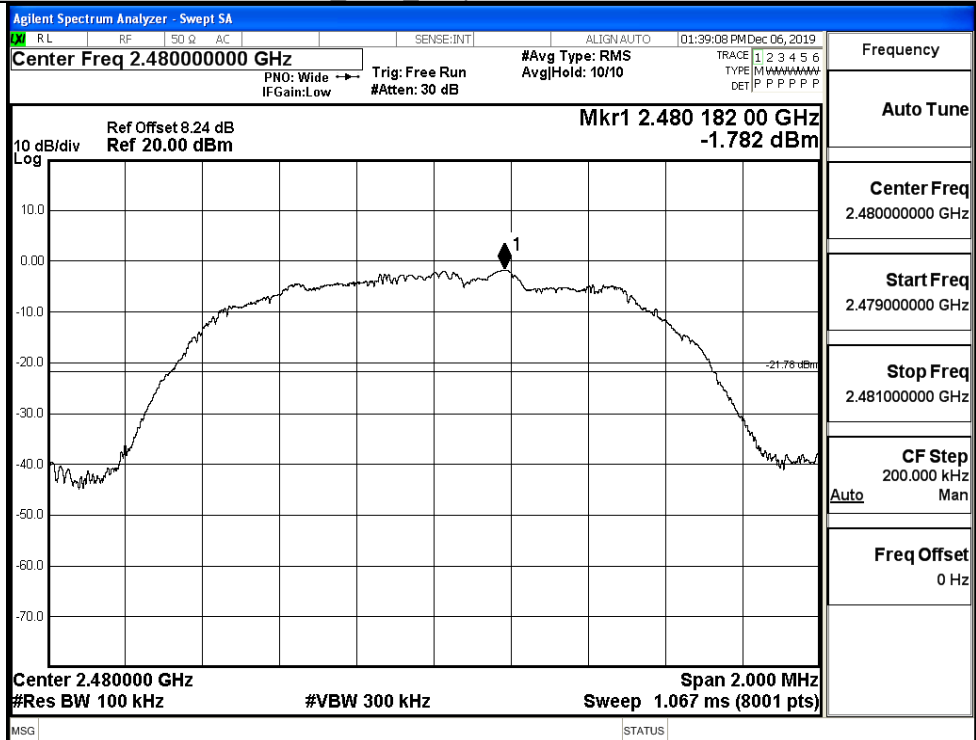


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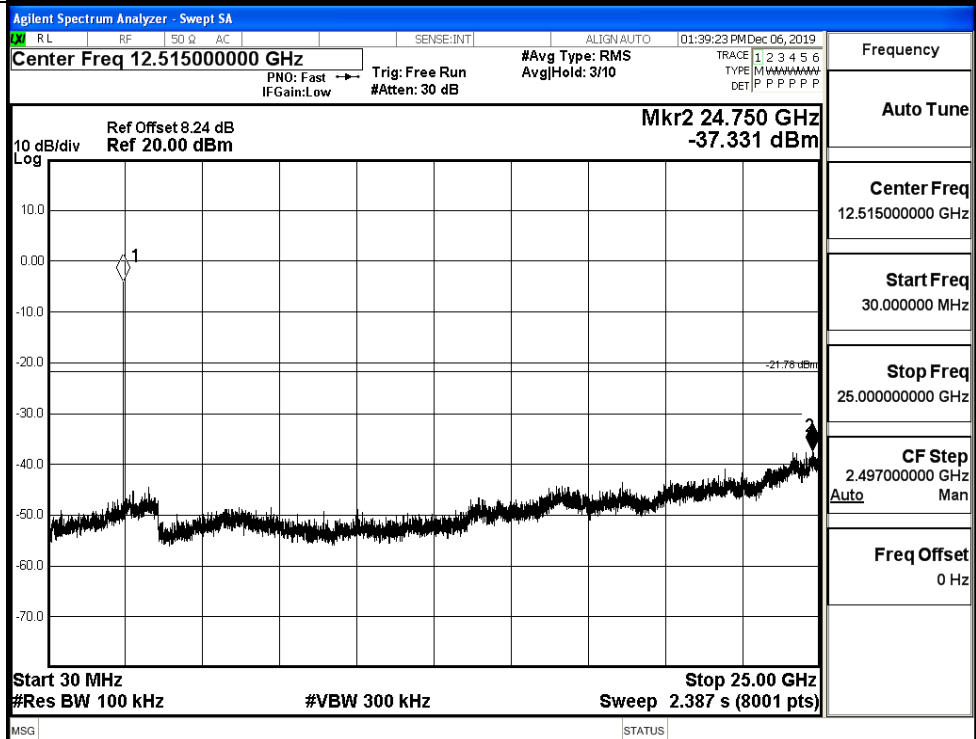


GFSK HCH Graphs

Pref

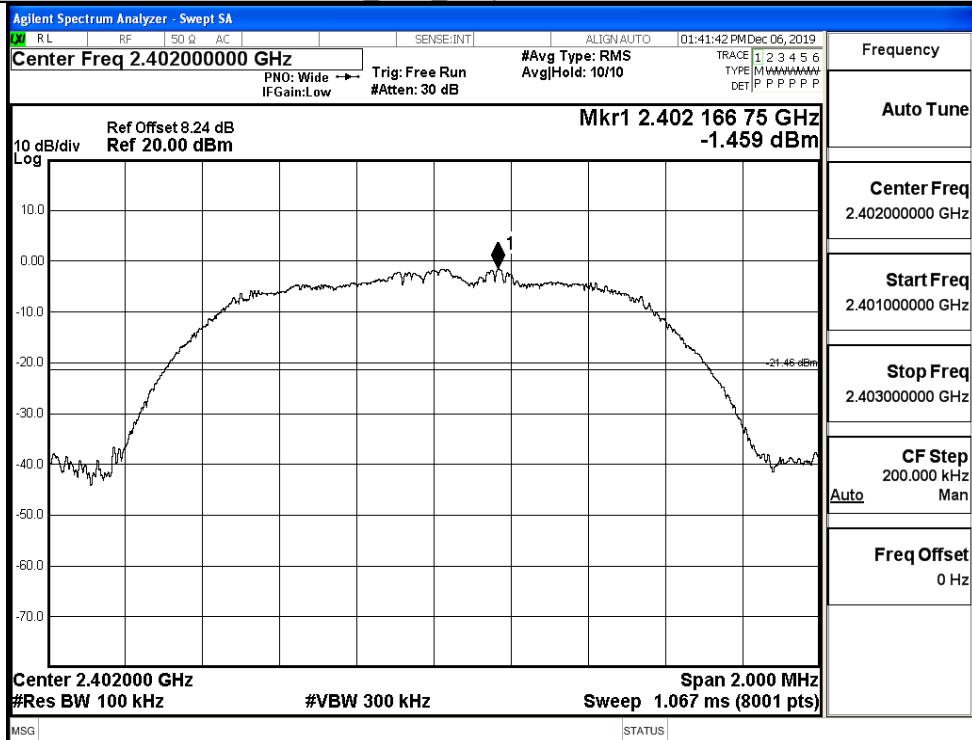


Puw

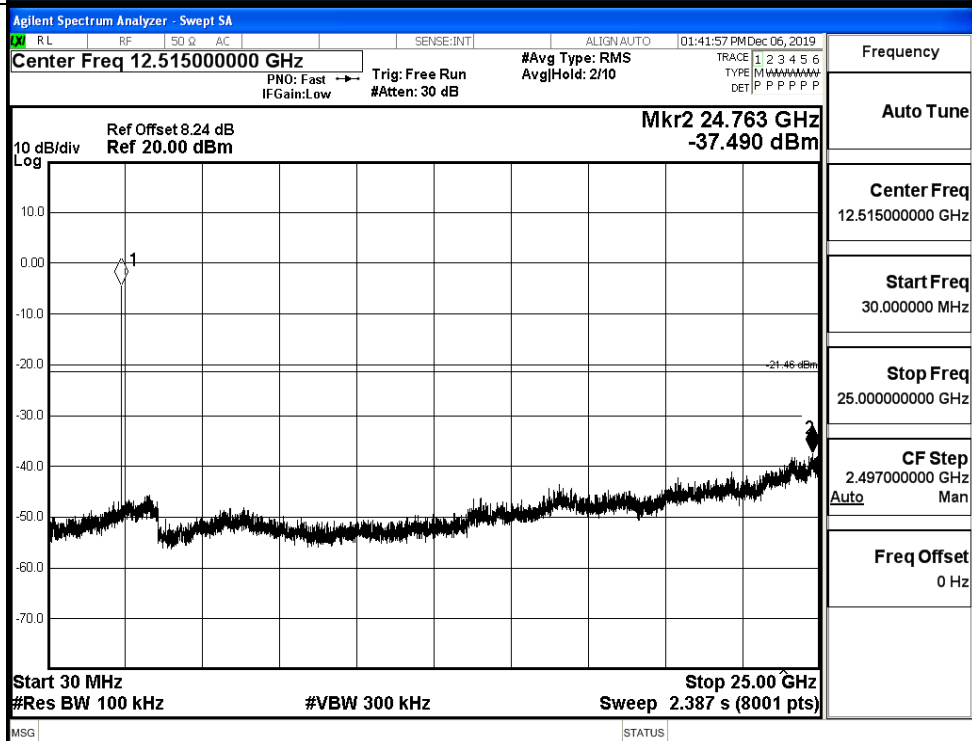


$\pi/4$ DQPSK_LCH_Graphs

Pref

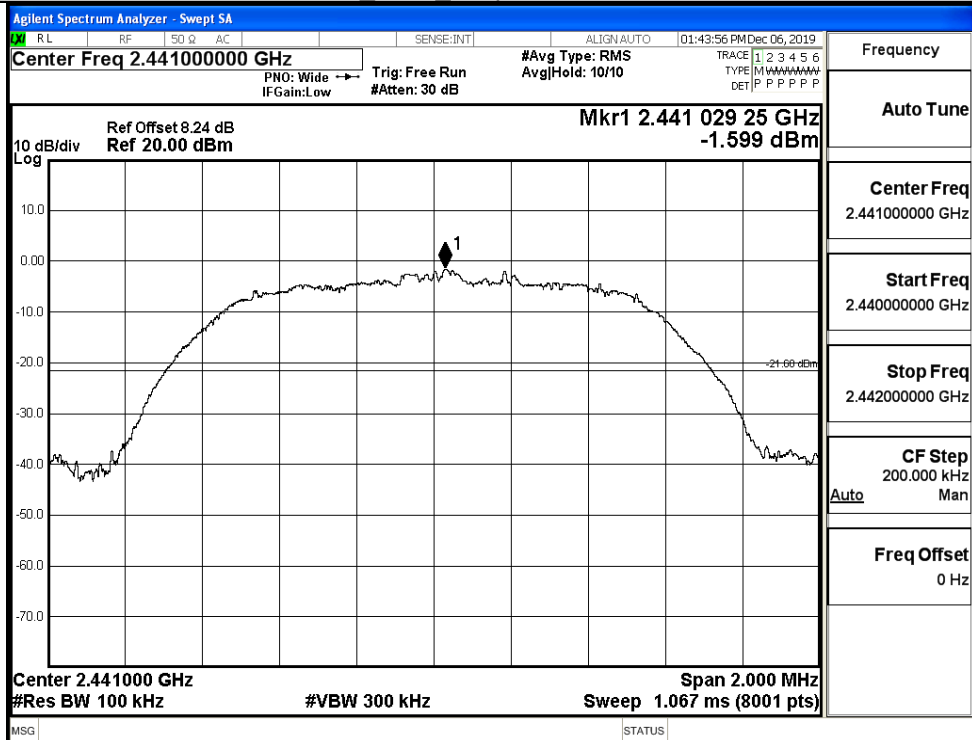


Puw

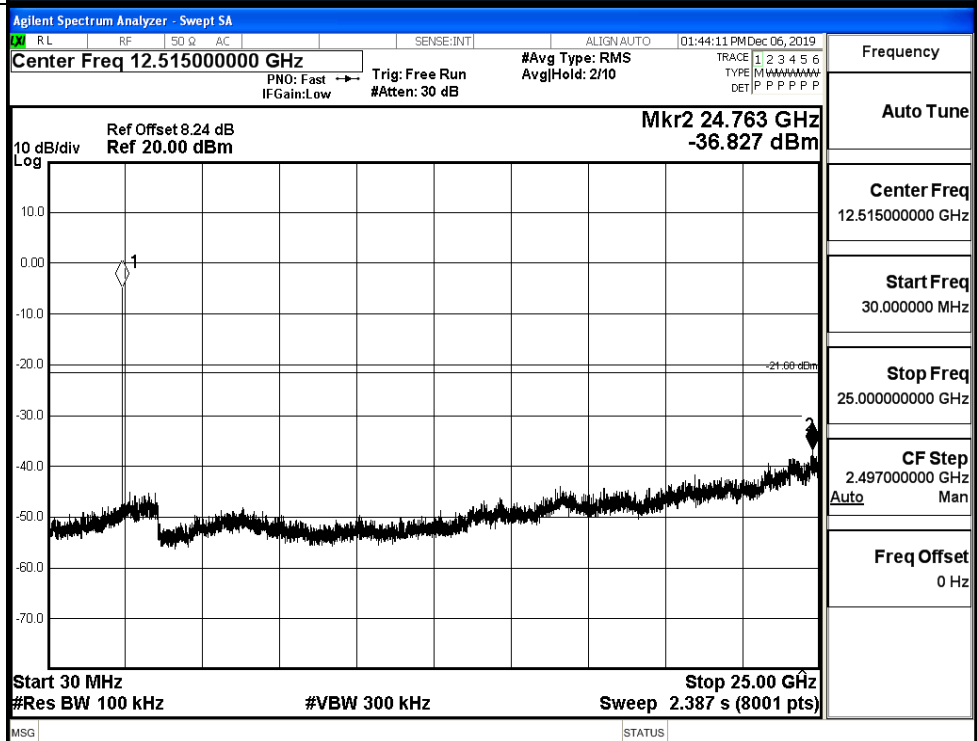


π /4DQPSK_MCH_Graphs

Pref

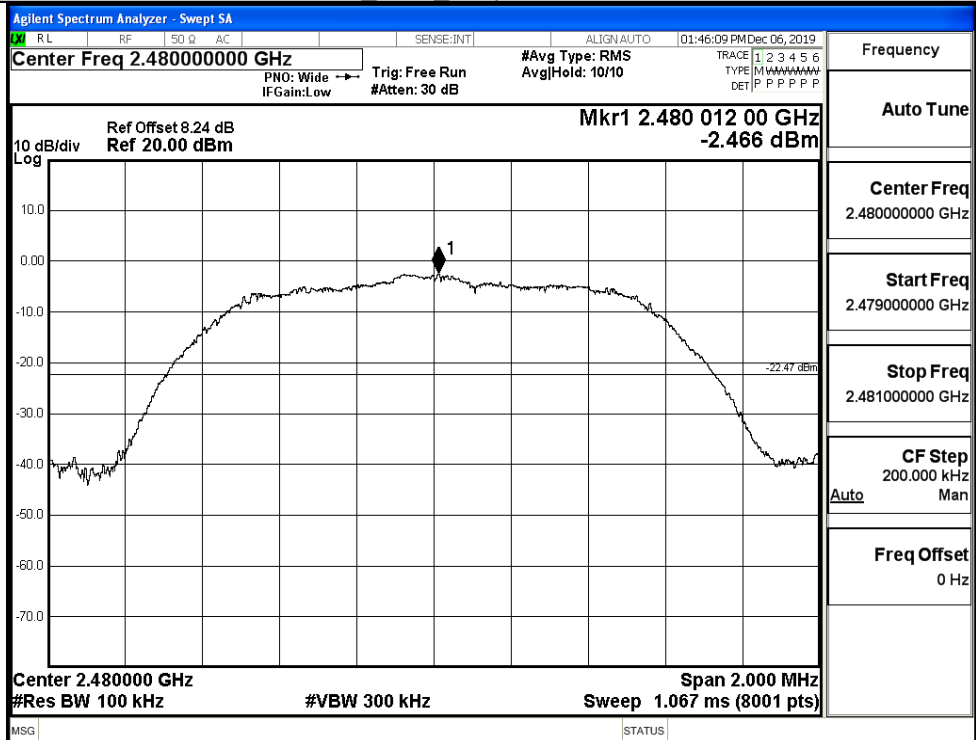


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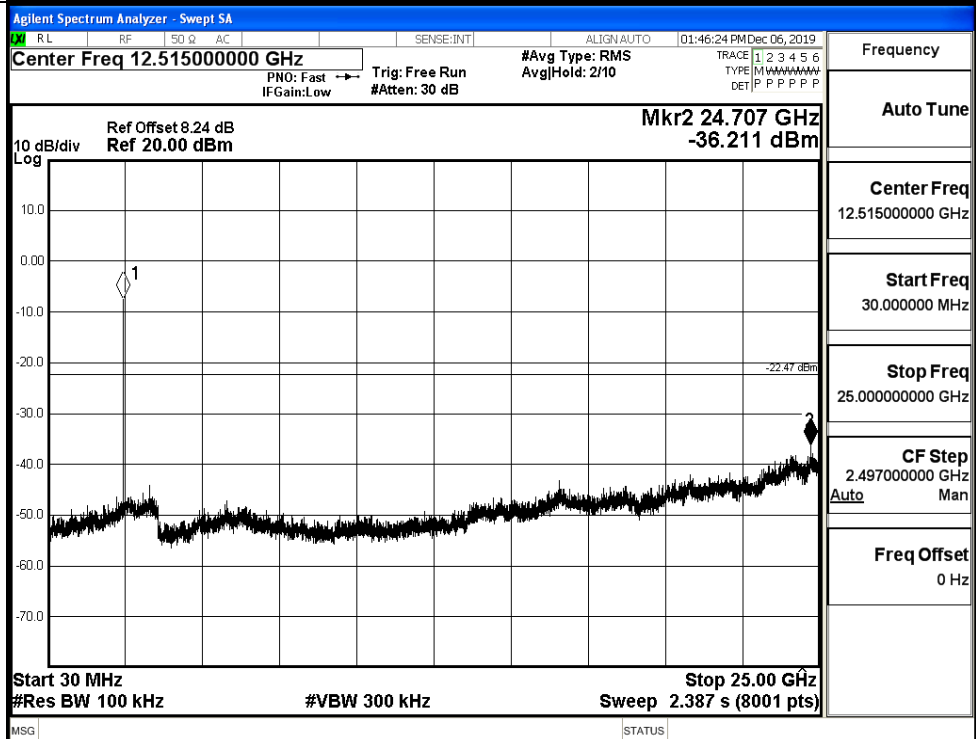


$\pi/4$ DQPSK_HCH_Graphs

Pref

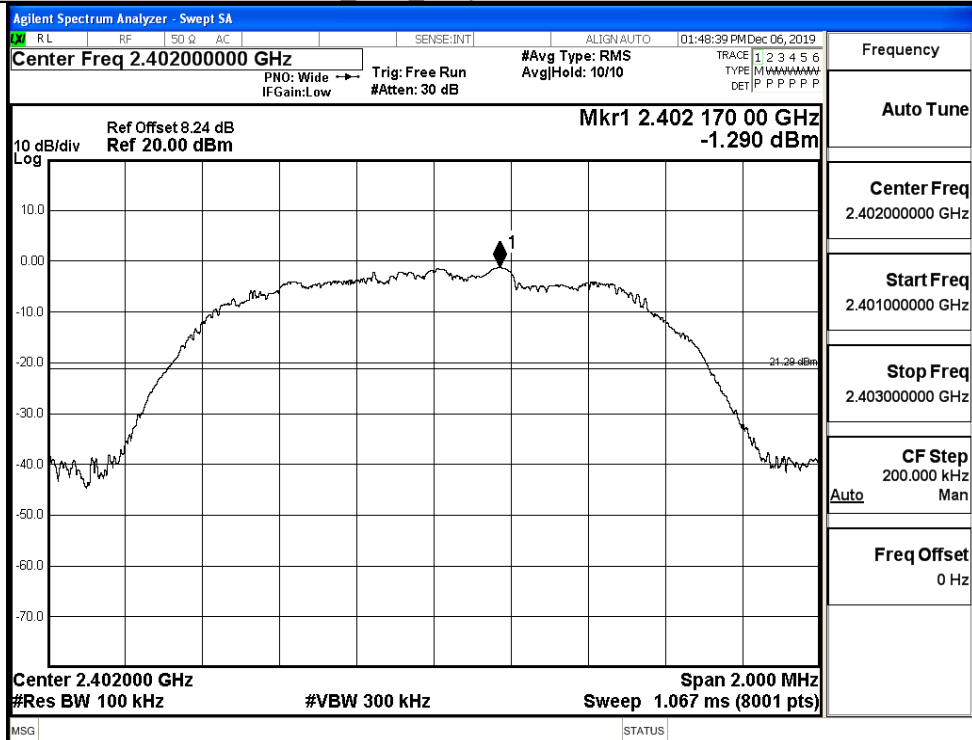


Puw

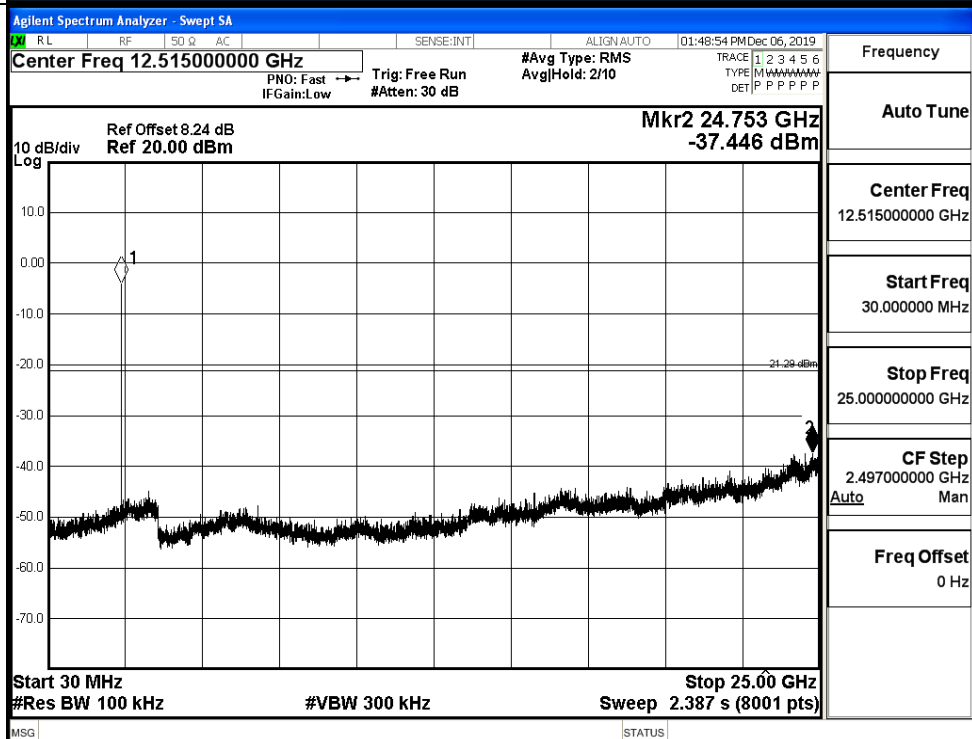


8DPSK_LCH_Graphs

Pref

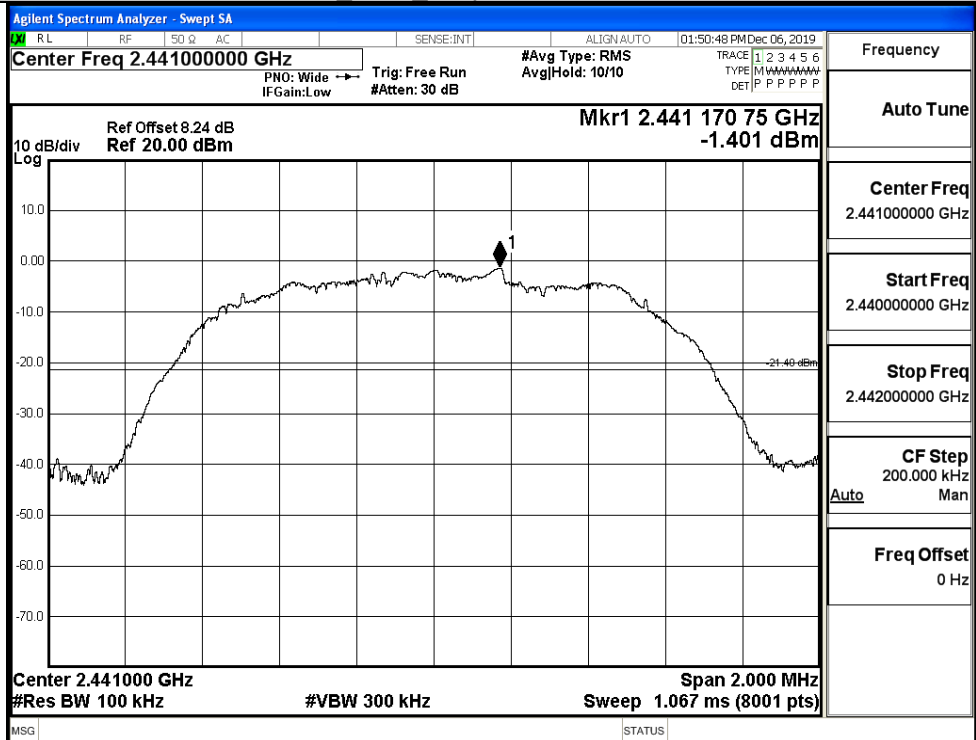


Puw

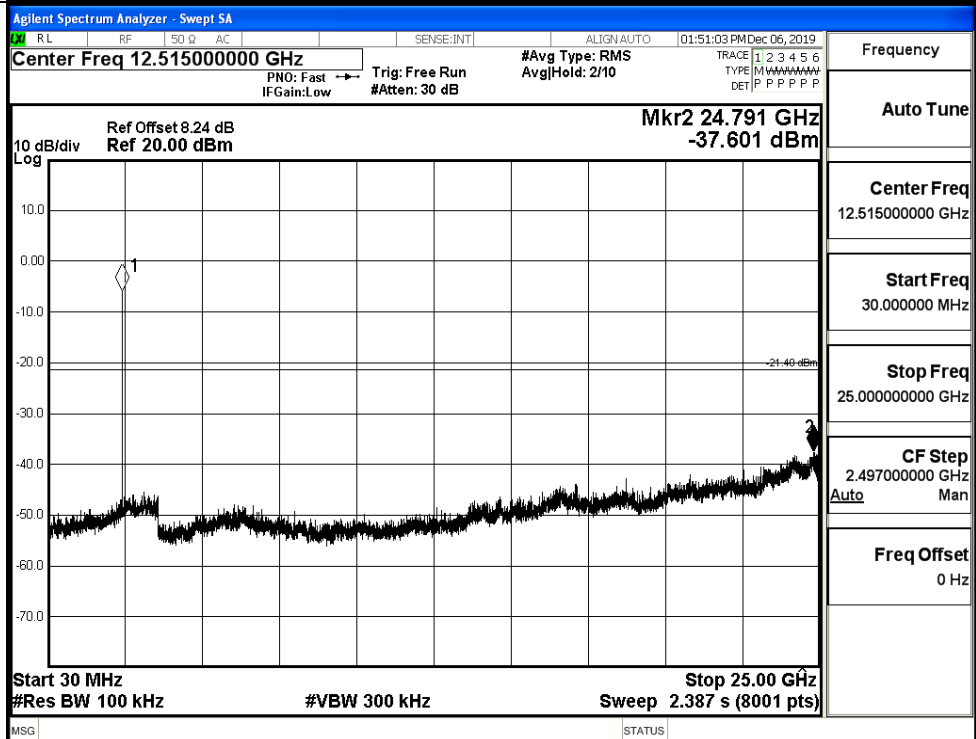


8DPSK_MCH_Graphs

Pref

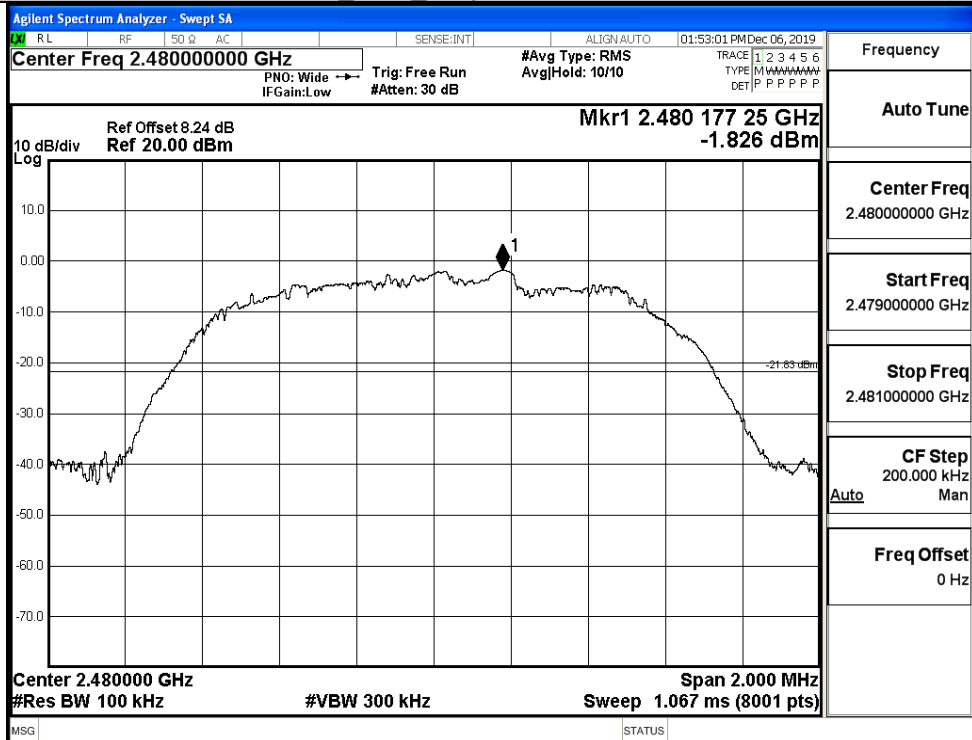


Puw

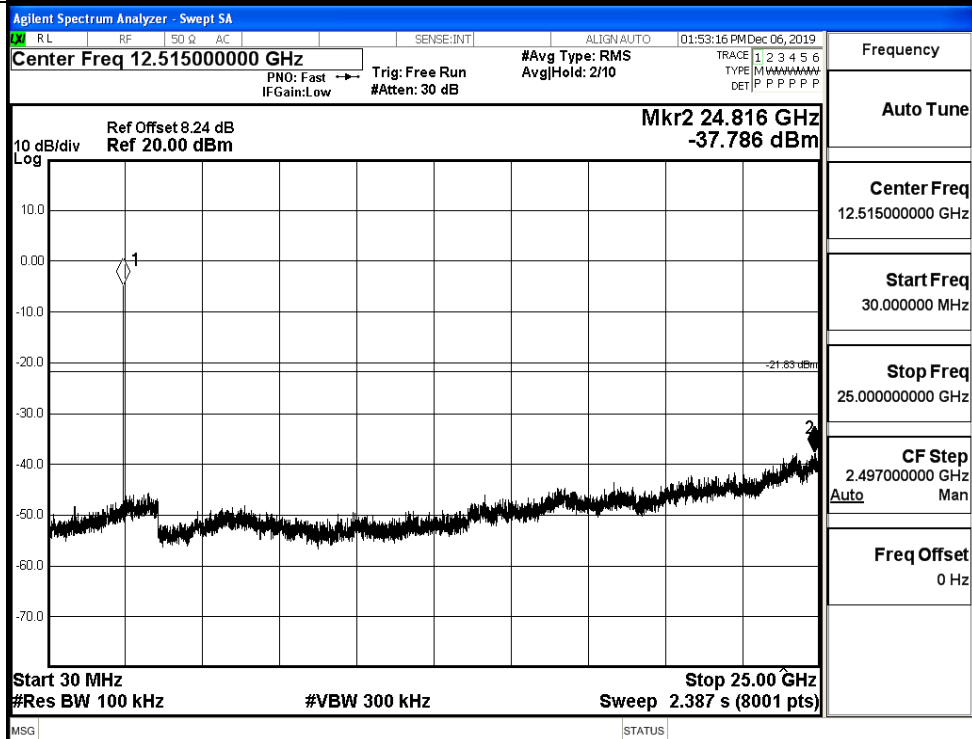


8DPSK_HCH_Graphs

Pref



Puw

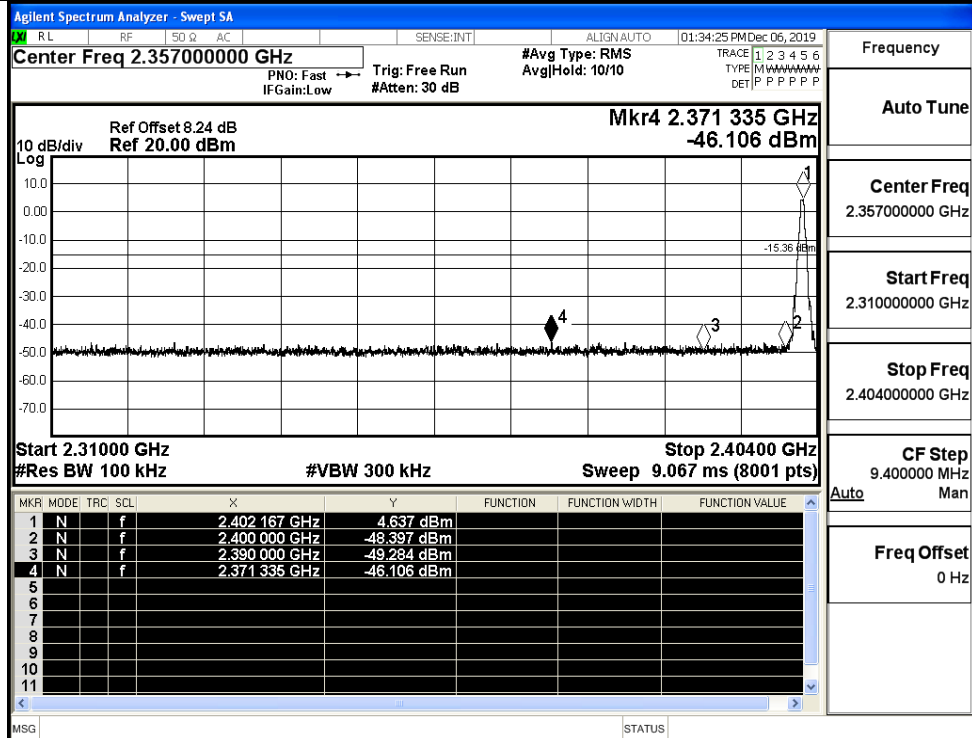


A.7 Band-edge for RF Conducted Emissions

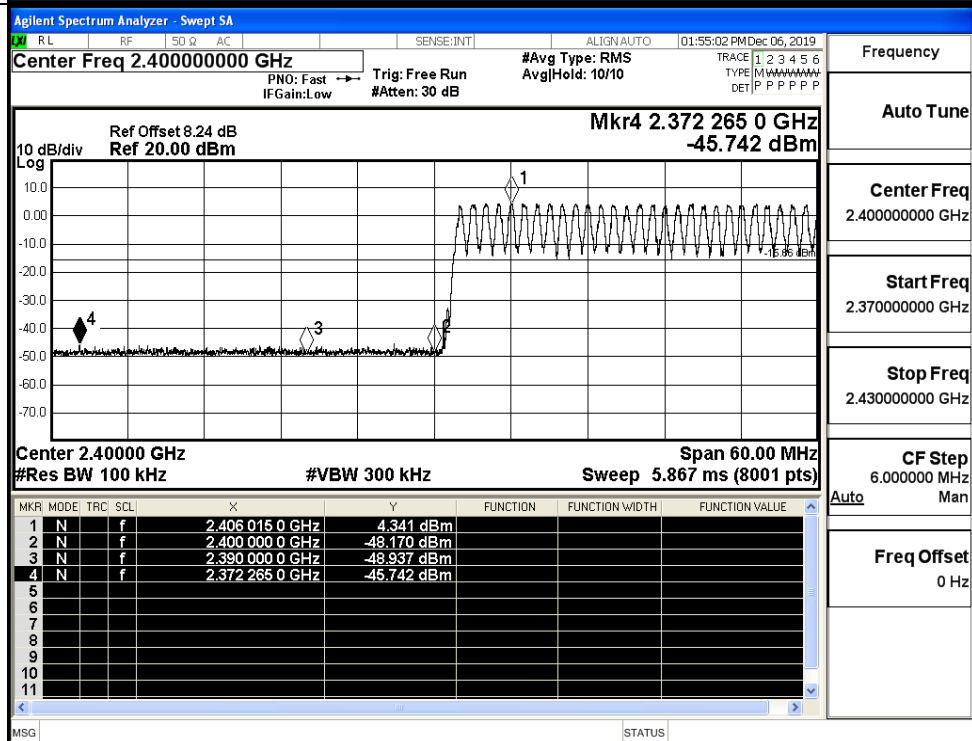
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	4.637	Off	-46.106	-15.36	PASS
			4.341	On	-45.742	-15.66	PASS
	HCH	2480	-1.648	Off	-45.650	-21.65	PASS
			4.632	On	-45.641	-15.37	PASS
$\pi/4$ DQPSK	LCH	2402	-1.681	Off	-46.074	-21.68	PASS
			-1.275	On	-45.265	-21.28	PASS
	HCH	2480	-1.795	Off	-45.960	-21.8	PASS
			-1.634	On	-45.227	-21.63	PASS
8DPSK	LCH	2402	-1.315	Off	-46.211	-21.32	PASS
			-1.300	On	-44.640	-21.3	PASS
	HCH	2480	-2.016	Off	-46.124	-22.02	PASS
			-1.390	On	-45.028	-21.39	PASS

Test Graphs

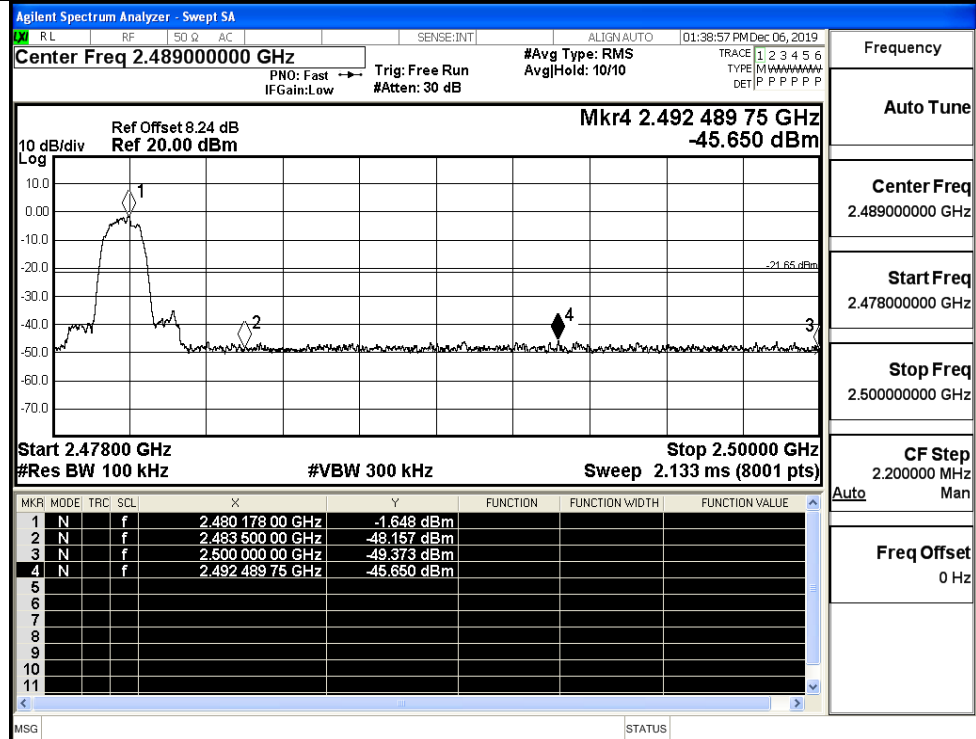
GFSK/LCH/No Hop



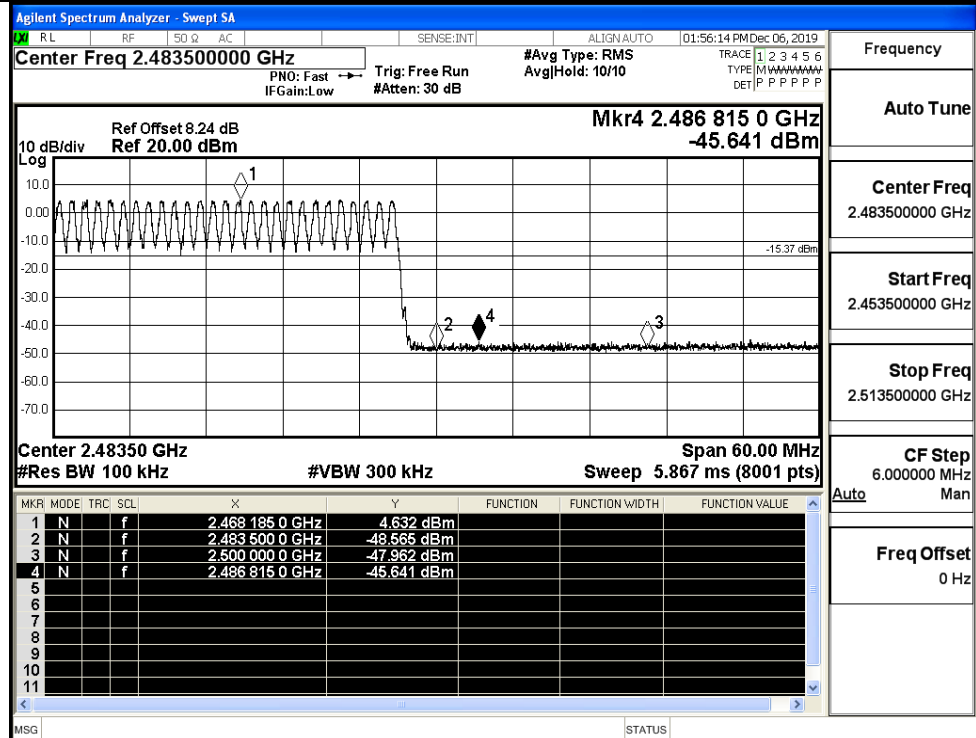
GFSK/LCH/Hop



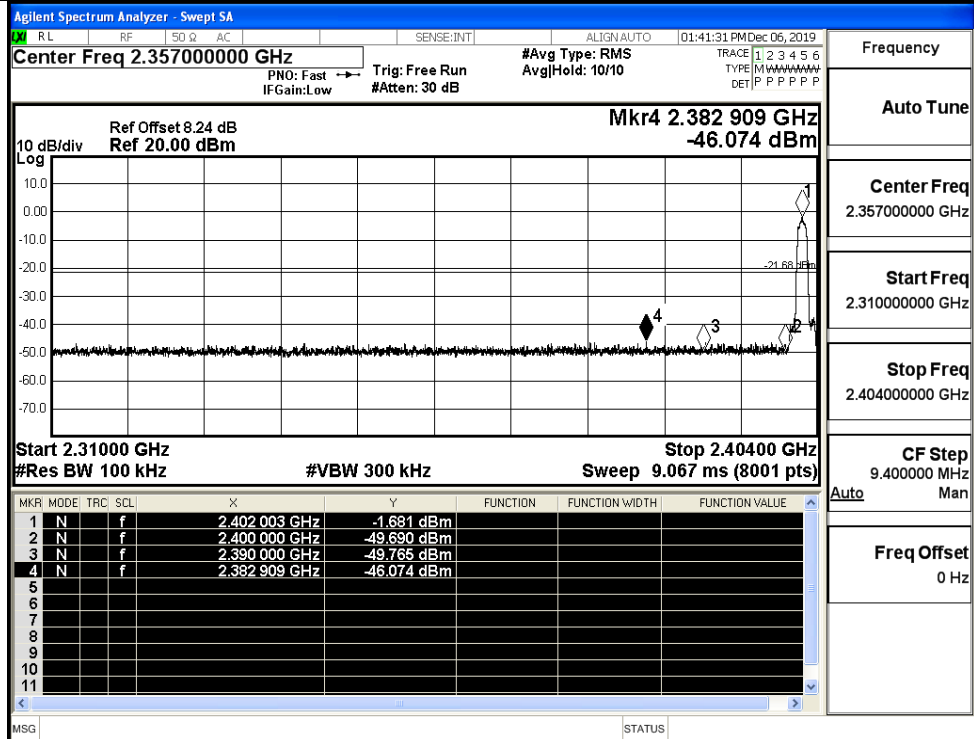
GFSK/HCH/No Hop



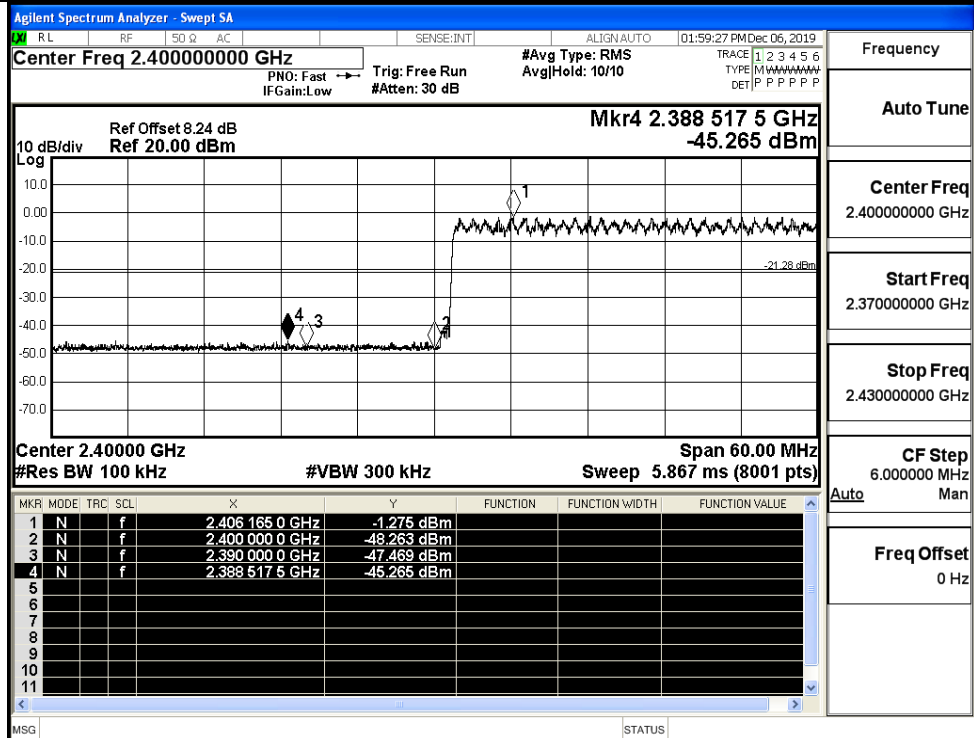
GFSK/HCH/Hop



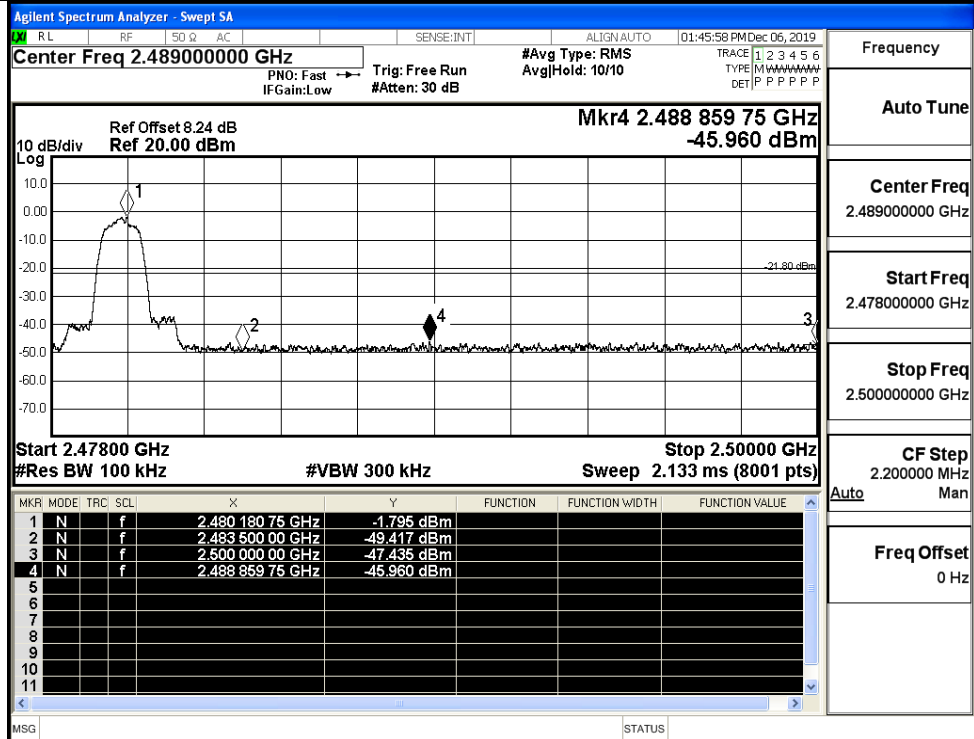
$\pi/4$ DQPSK/LCH/No
Hop



$\pi/4$ DQPSK/LCH/Hop



$\pi/4$ DQPSK/HCH/No
Hop

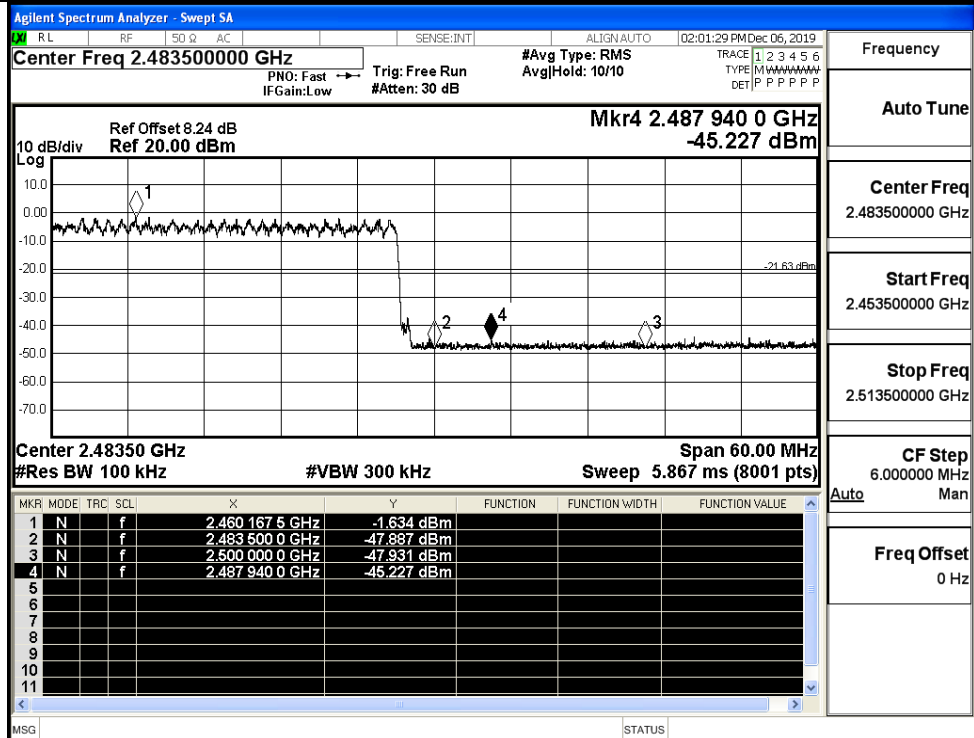


Frequency

Auto Tune

Center Freq
2.489000000 GHzStart Freq
2.478000000 GHzStop Freq
2.500000000 GHzCF Step
2.200000 MHz
Auto ManFreq Offset
0 Hz

$\pi/4$ DQPSK/HCH/Hop

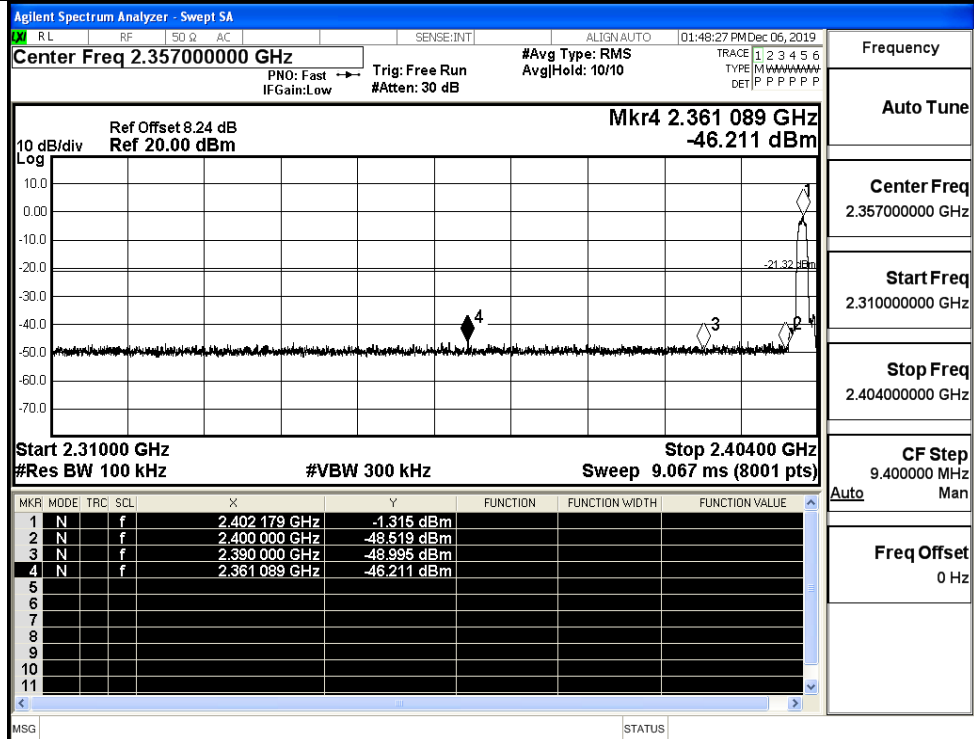


Frequency

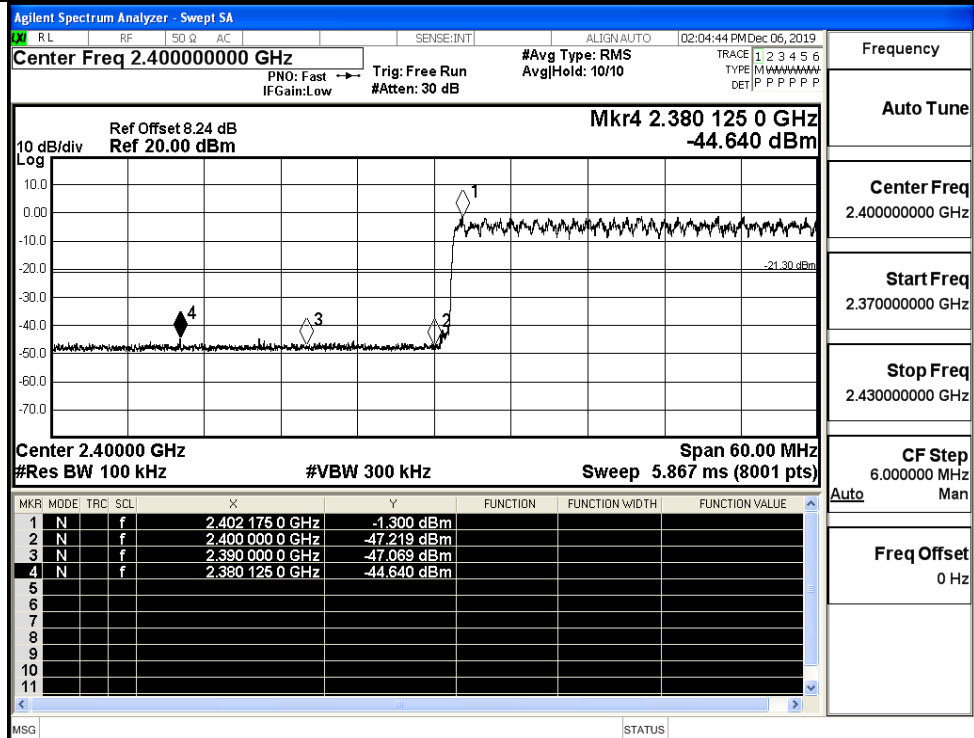
Auto Tune

Center Freq
2.483500000 GHzStart Freq
2.453500000 GHzStop Freq
2.513500000 GHzCF Step
6.000000 MHz
Auto ManFreq Offset
0 Hz

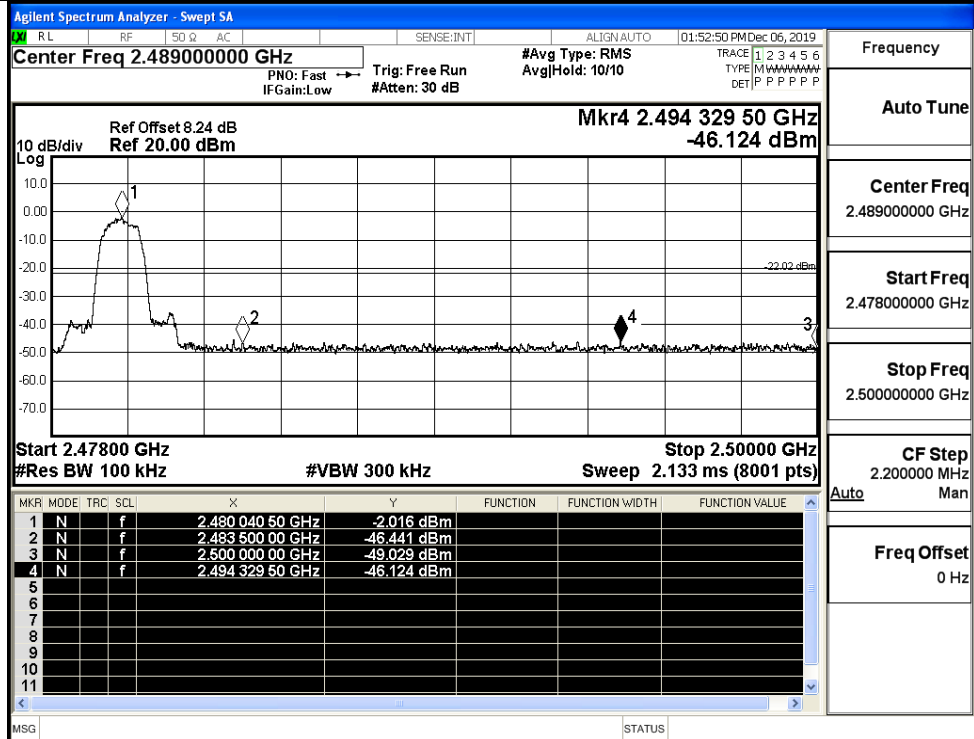
8DPSK/LCH/No Hop



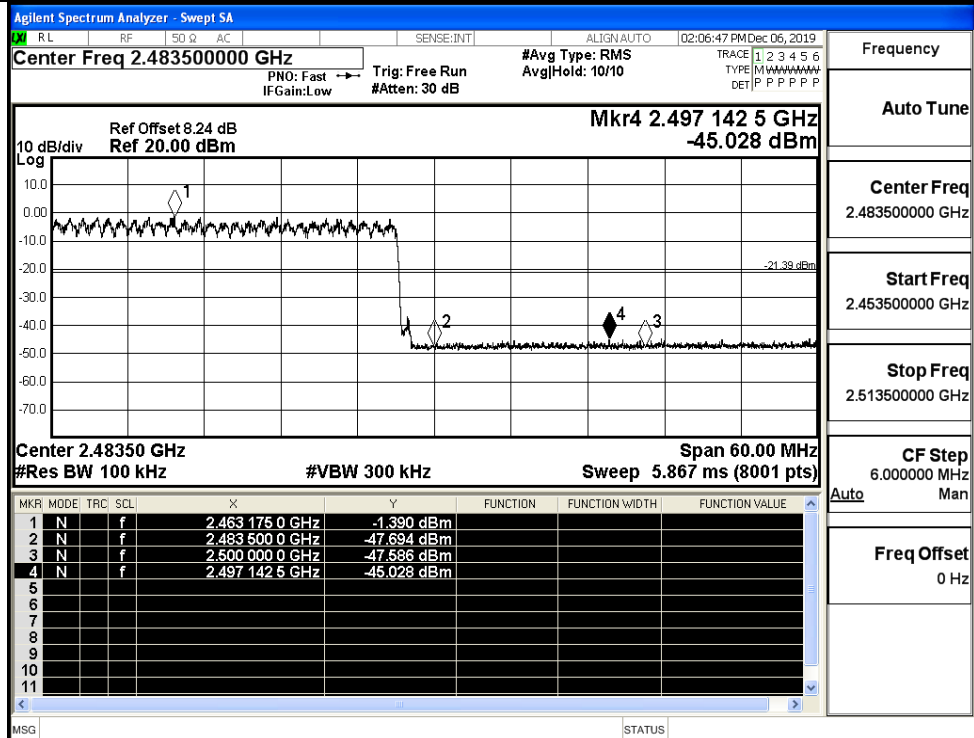
8DPSK/LCH/Hop



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	-39.79	2.0	0	55.47	PEAK	74	PASS
	Off	2310.0	-50.08	2.0	0	45.18	AV	54	PASS
	Off	2390.0	-38.11	2.0	0	57.15	PEAK	74	PASS
	Off	2390.0	-49.70	2.0	0	45.56	AV	54	PASS
	Off	2483.5	-38.72	2.0	0	56.54	PEAK	74	PASS
	Off	2483.5	-49.16	2.0	0	46.10	AV	54	PASS
	Off	2500.0	-38.45	2.0	0	56.81	PEAK	74	PASS
	Off	2500.0	-48.94	2.0	0	46.32	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-40.60	2.0	0	54.66	PEAK	74	PASS
	Off	2310.0	-49.98	2.0	0	45.28	AV	54	PASS
	Off	2390.0	-40.12	2.0	0	55.14	PEAK	74	PASS
	Off	2390.0	-49.68	2.0	0	45.57	AV	54	PASS
	Off	2483.5	-39.35	2.0	0	55.91	PEAK	74	PASS
	Off	2483.5	-49.15	2.0	0	46.11	AV	54	PASS
	Off	2500.0	-40.00	2.0	0	55.25	PEAK	74	PASS
	Off	2500.0	-48.96	2.0	0	46.30	AV	54	PASS
8DPSK	Off	2310.0	-37.86	2.0	0	57.39	PEAK	74	PASS
	Off	2310.0	-49.88	2.0	0	45.38	AV	54	PASS
	Off	2390.0	-38.19	2.0	0	57.07	PEAK	74	PASS
	Off	2390.0	-49.49	2.0	0	45.77	AV	54	PASS
	Off	2483.5	-39.31	2.0	0	55.95	PEAK	74	PASS
	Off	2483.5	-49.16	2.0	0	46.10	AV	54	PASS
	Off	2500.0	-38.13	2.0	0	57.13	PEAK	74	PASS
	Off	2500.0	-49.07	2.0	0	46.19	AV	54	PASS

Agilent Spectrum Analyzer - Swept SA

RL RF 50 Ω AC SENSE:INT ALIGN:AUTO [01:35:09 PM Dec 06, 2019]

Center Freq 2.352000000 GHz

PNO: Fast → Trig: Free Run Avg Type: Log-Pwr
IFGain: Low #Atten: 30 dB AvgHld: 10/10

TRACE 1 2 3 4 5 6 TYPE M W I V P P DET P P P P P P

Mkr3 2.390 000 GHz -38.107 dBm

Ref Offset 8.24 dB Ref 20.00 dBm

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f		2.401894 GHz	-46.15 dBm			
2	N	f		2.310000 GHz	-39.787 dBm			
3	N	f		2.390000 GHz	-38.107 dBm			
4								
5								
6								
7								
8								
9								
10								
11								

Start 2.30000 GHz Res BW 1.0 MHz #VBW 3.0 MHz Sweep 1.067 ms (8001 pts) Stop 2.40400 GHz

Frequency Auto Tune

Center Freq 2.352000000 GHz

Start Freq 2.300000000 GHz

Stop Freq 2.404000000 GHz

CF Step 10.400000 MHz

Freq Offset 0 Hz

Agilent Spectrum Analyzer - Swept SA

RL RF 50 Q AC SENSE:INT ALIGN AUTO 01:35:23 PM Dec 06, 2019

Center Freq 2.352000000 GHz PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 10/10

TRACE 1 2 3 4 5 6 TYPE M W A W A W A W DET P P P P P P P

Frequency Auto Tune

Center Freq 2.352000000 GHz

Start Freq 2.300000000 GHz

Stop Freq 2.404000000 GHz

CF Step 10.400000 MHz Man

Freq Offset 0 Hz

Ref Offset 8.24 dB Ref 20.00 dBm Mkr3 2.390 000 GHz -49.701 dBm

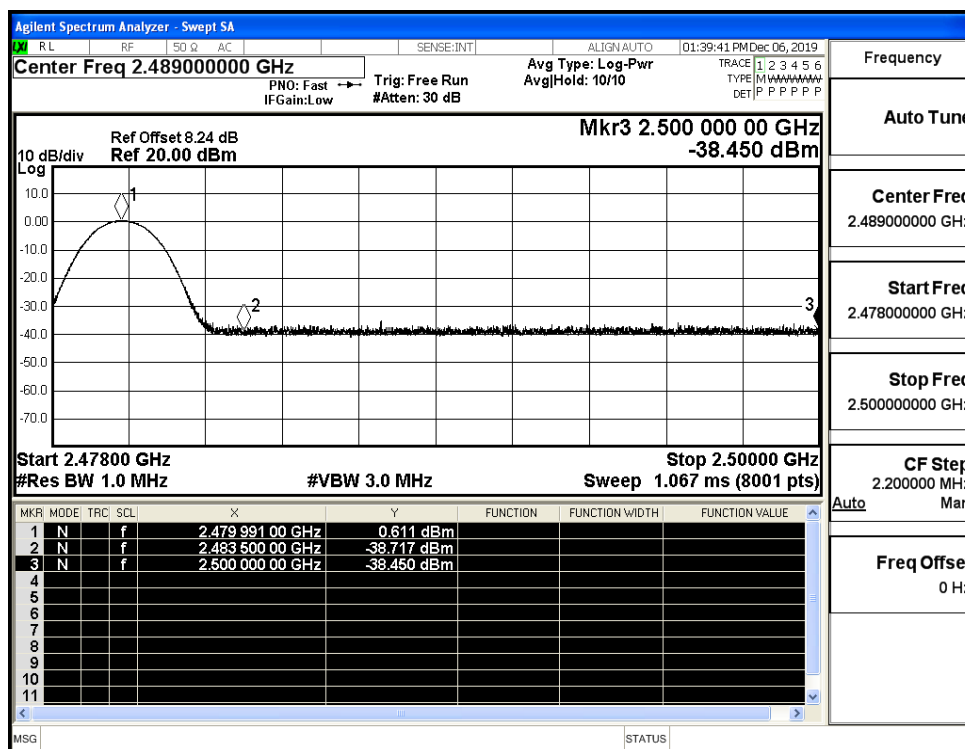
10 dB/div Log

Start 2.30000 GHz #Res BW 1.0 MHz #VBW 330 Hz Stop 2.40400 GHz Sweep 245.9 ms (8001 pts)

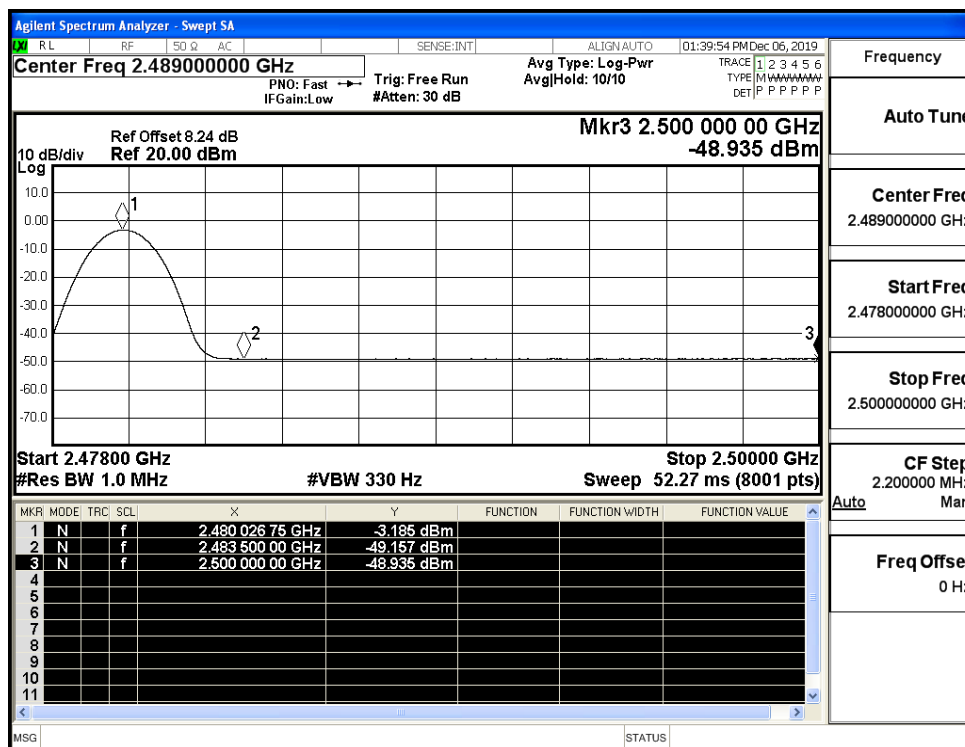
MkR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f		2.402 063 GHz	4.264 dBm			
2	N	f		2.310 000 GHz	-50.076 dBm			
3	N	f		2.390 000 GHz	-49.701 dBm			
4								
5								
6								
7								
8								
9								
10								
11								

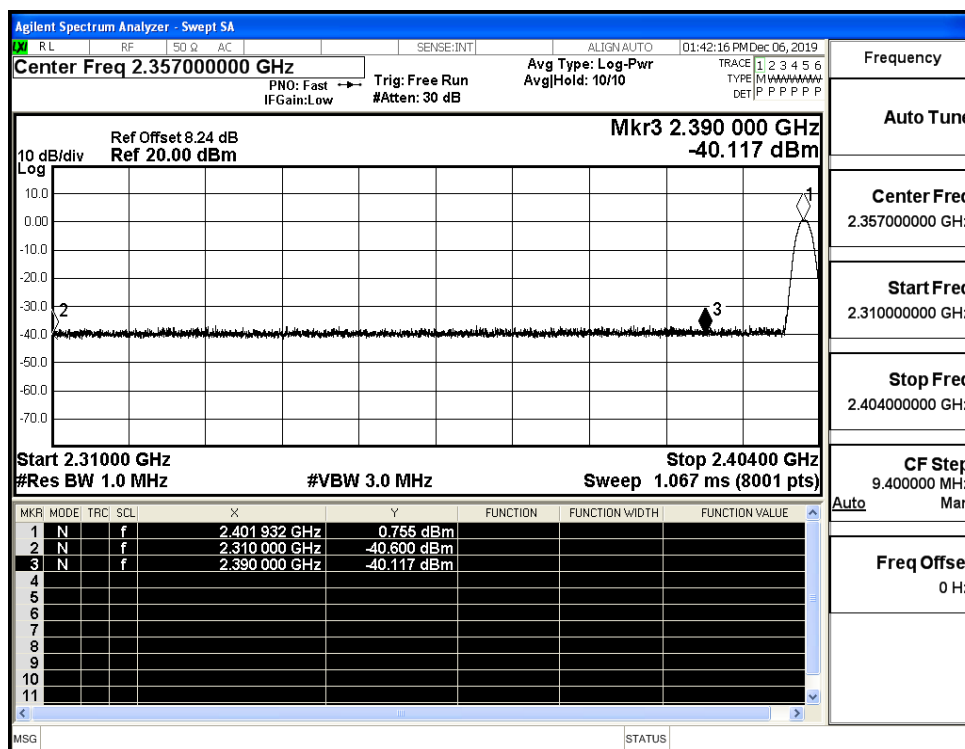
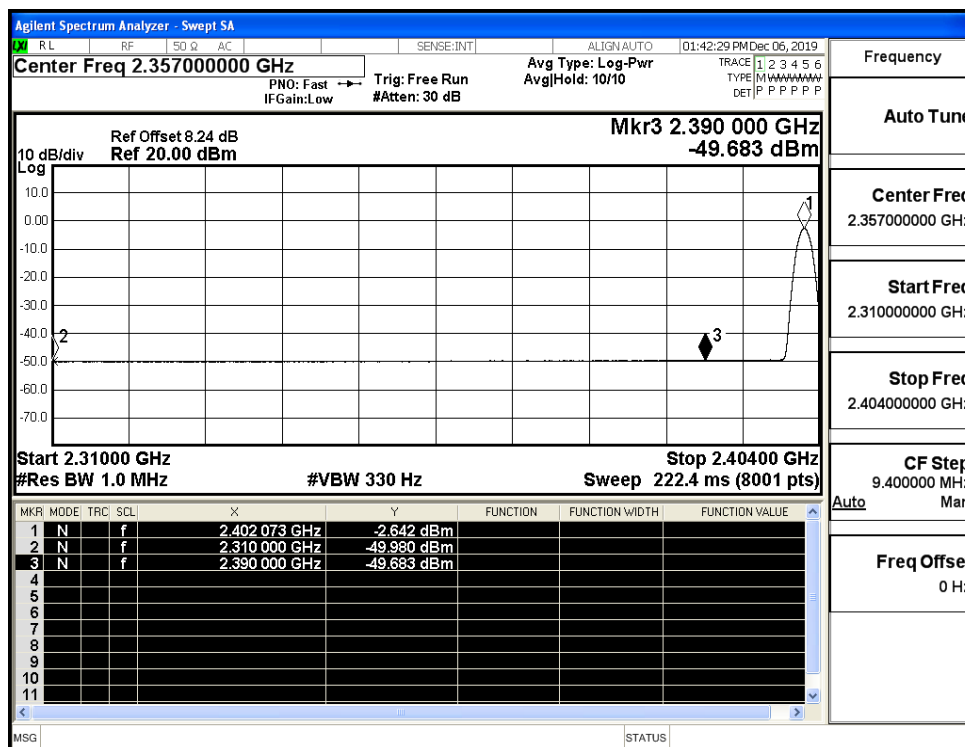
MSG STATUS

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

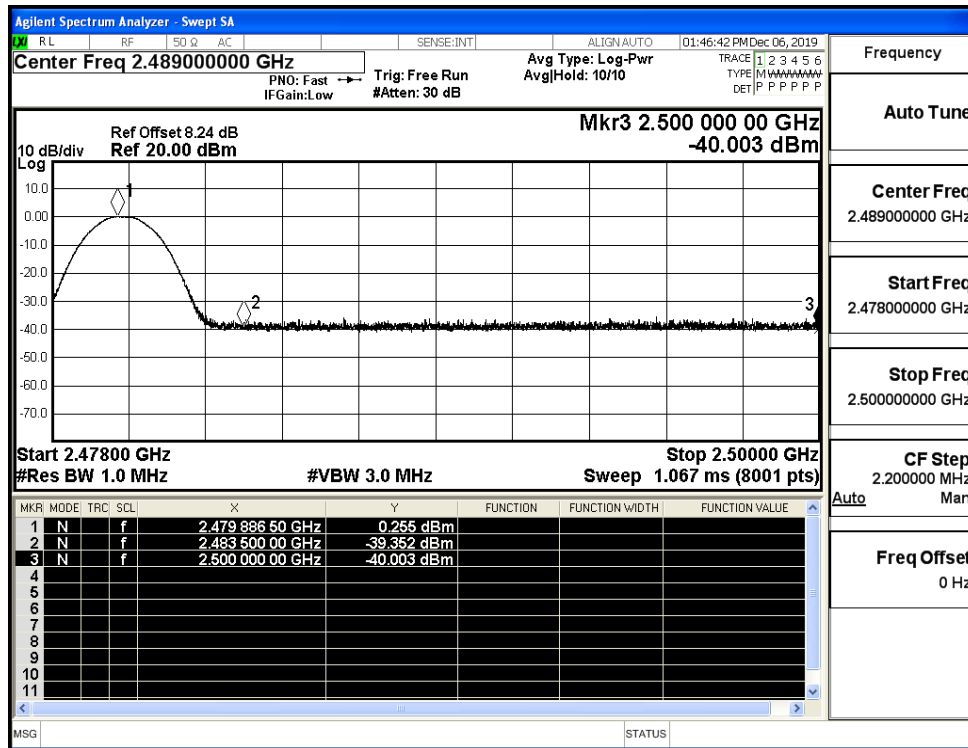


Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)

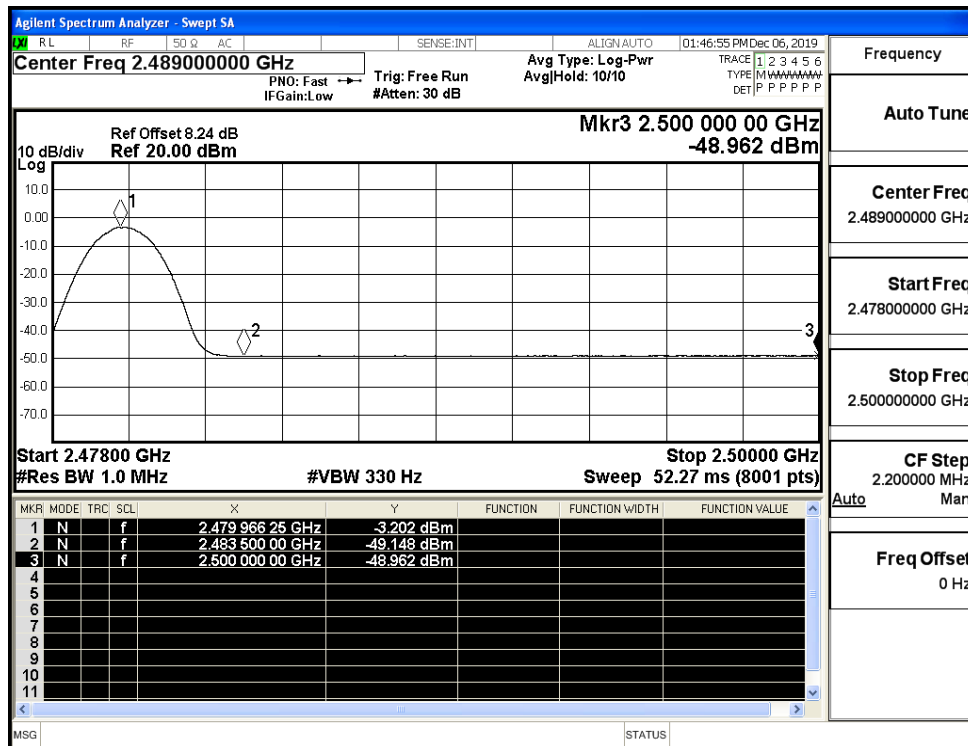


Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

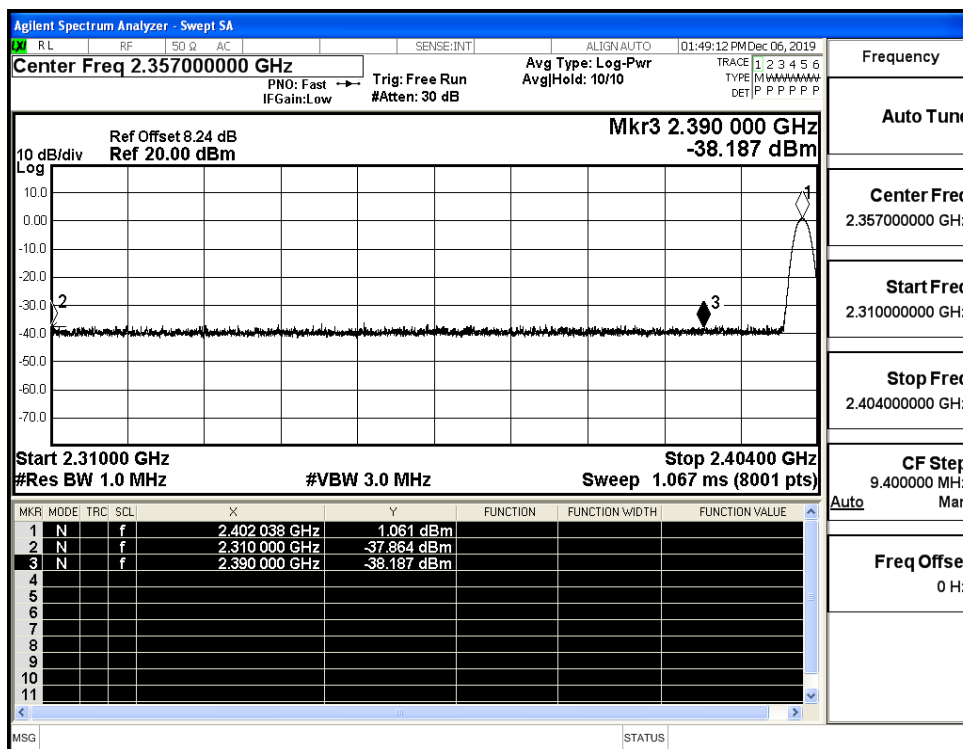
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



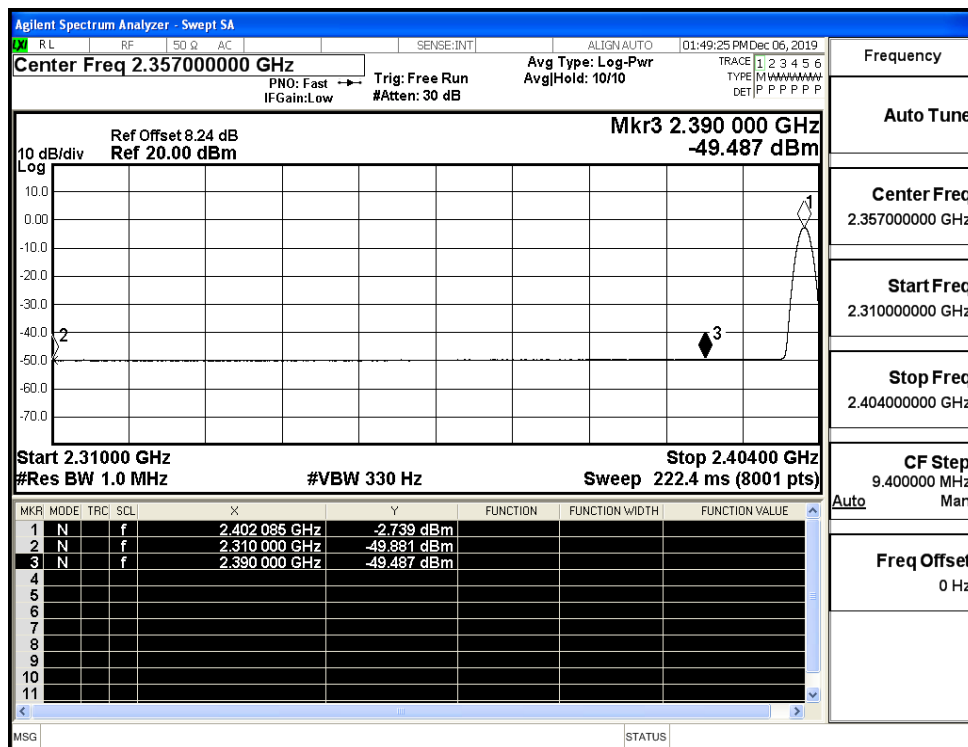
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



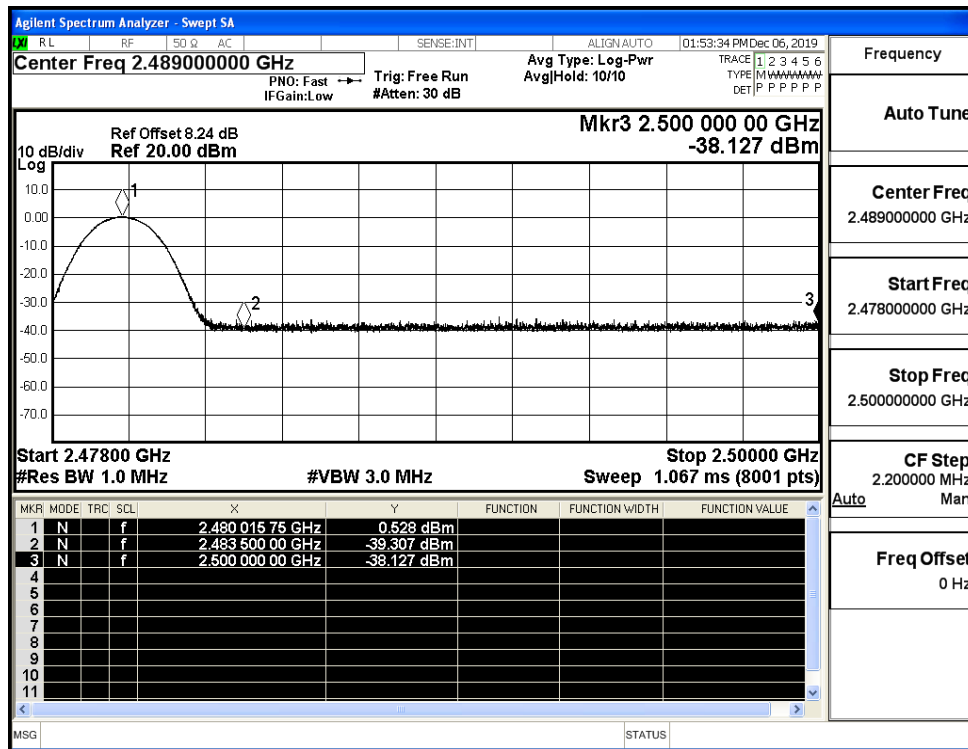
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

