

Appendix A

RF Test Data for BT V3.0(BDR/EDR) (Conducted Measurement)

Product Name: Digital radio

Trade Mark: SOUTH, KOLIDA, SANDING, RUIDE, TIANYU

Test Model: S6

Environmental Conditions

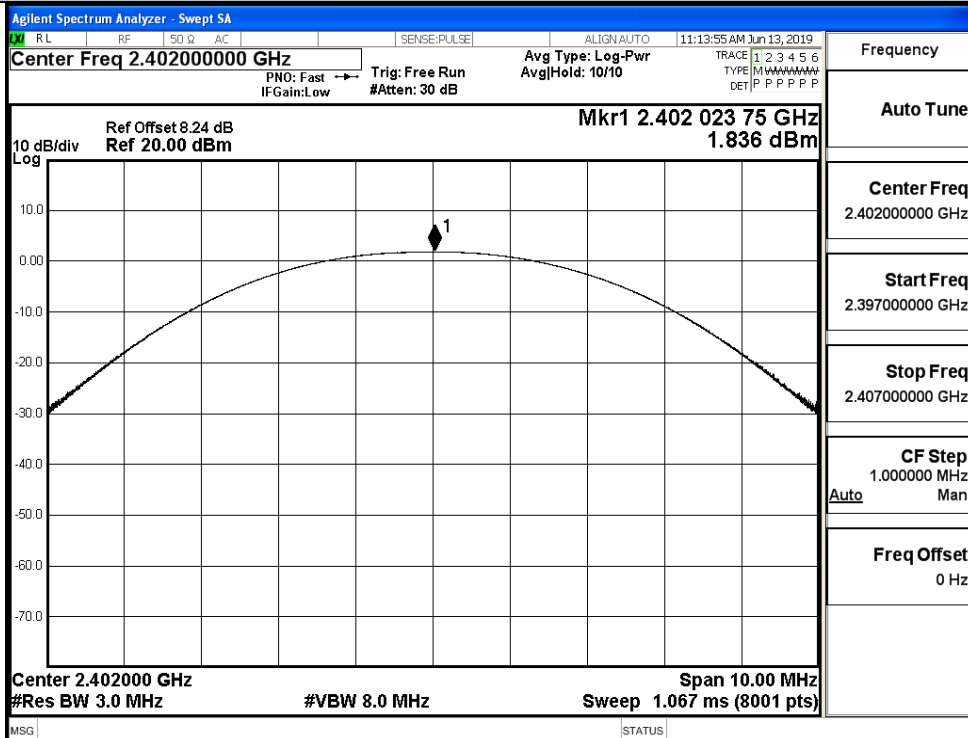
Temperature:	25.4 ° C
Relative Humidity:	52.8 %
ATM Pressure:	100.0 kPa
Test Engineer:	SCENT HU
Supervised by:	Tom.Liu

A.1 Maximum Conducted Peak Output Power

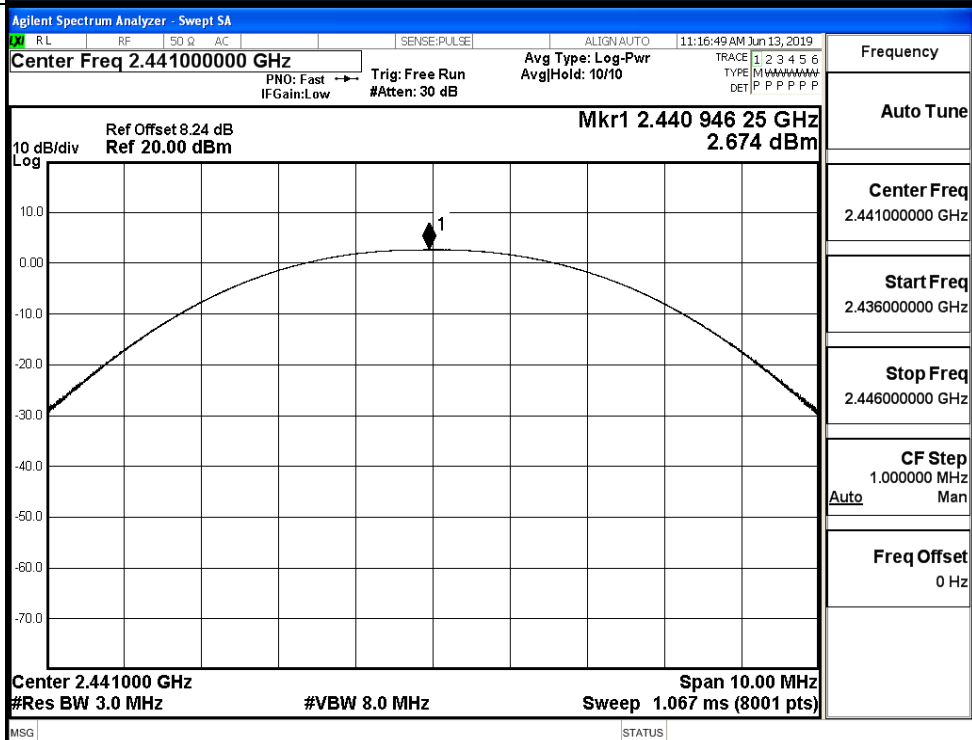
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.836	21	PASS
	MCH	2.674	21	PASS
	HCH	2.516	21	PASS
$\pi/4$ DQPSK	LCH	1.272	21	PASS
	MCH	2.092	21	PASS
	HCH	1.936	21	PASS
8DPSK	LCH	1.359	21	PASS
	MCH	2.218	21	PASS
	HCH	2.050	21	PASS

Test Graphs

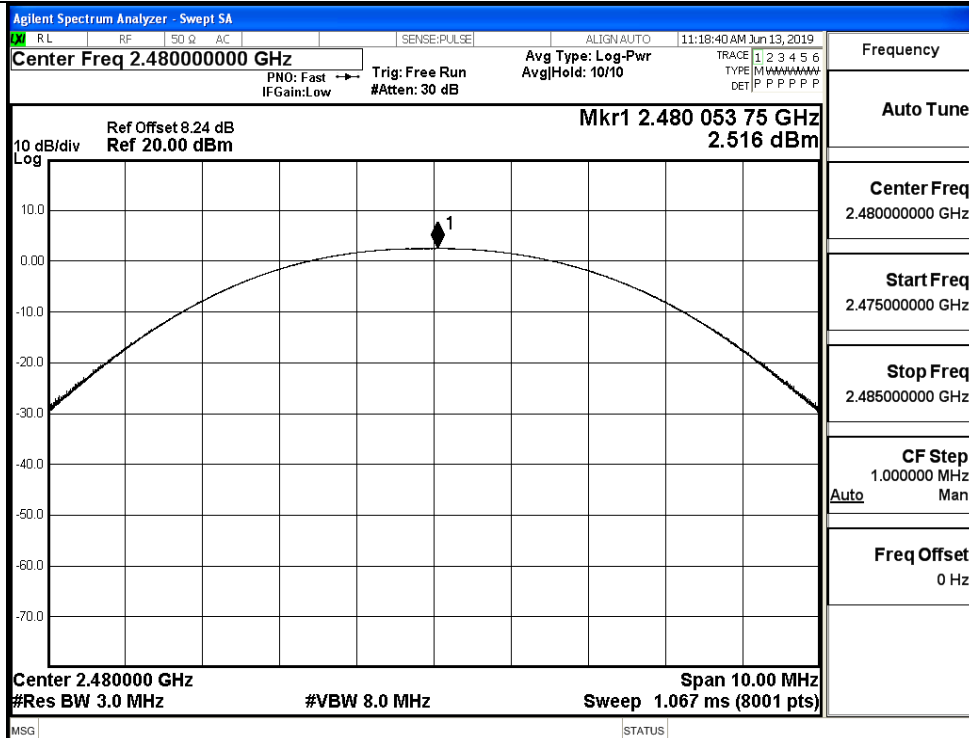
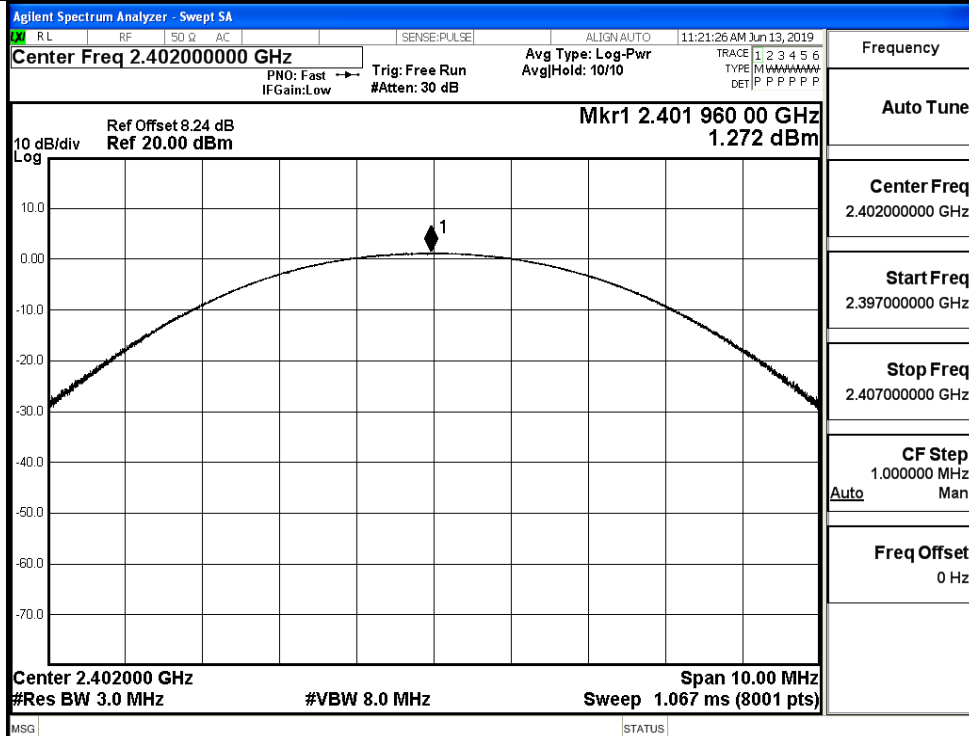
GFSK/LCH

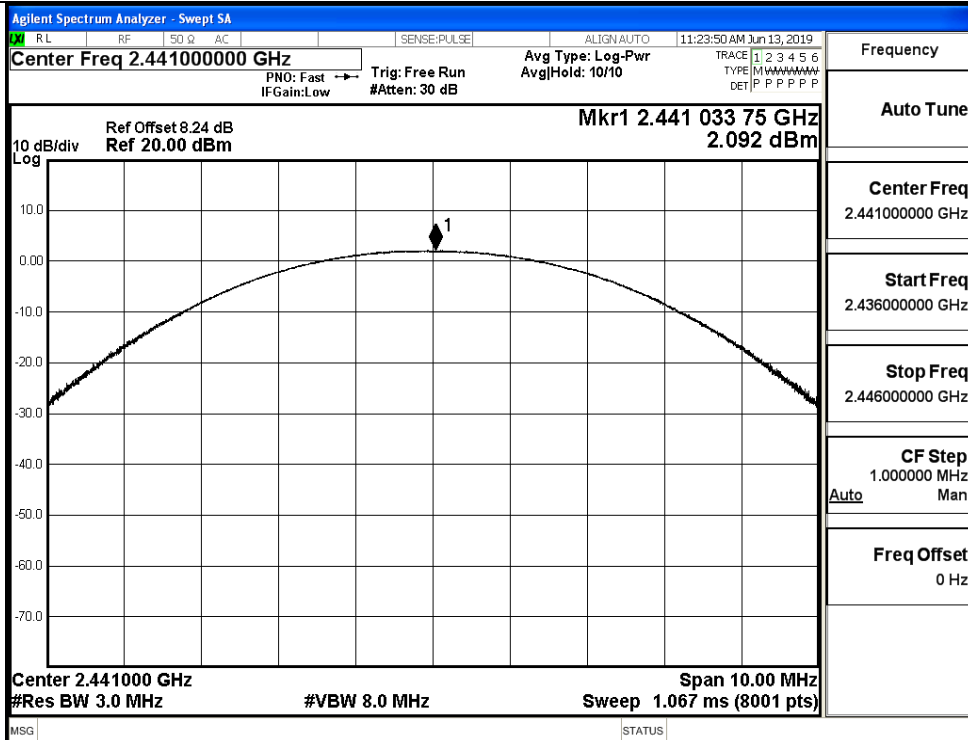
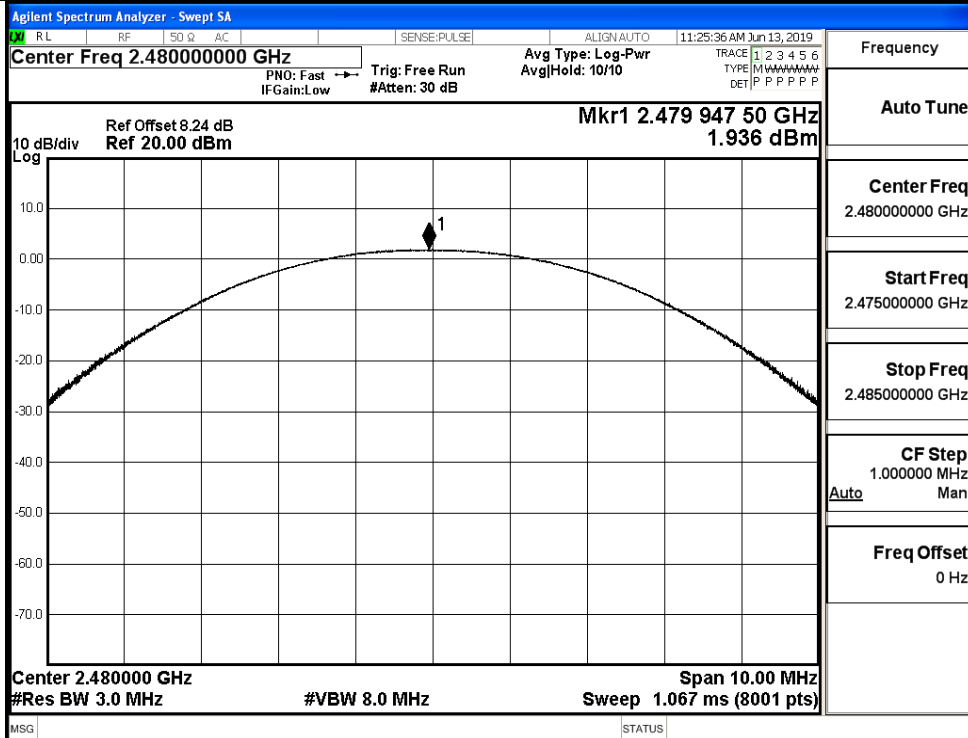


GFSK/MCH

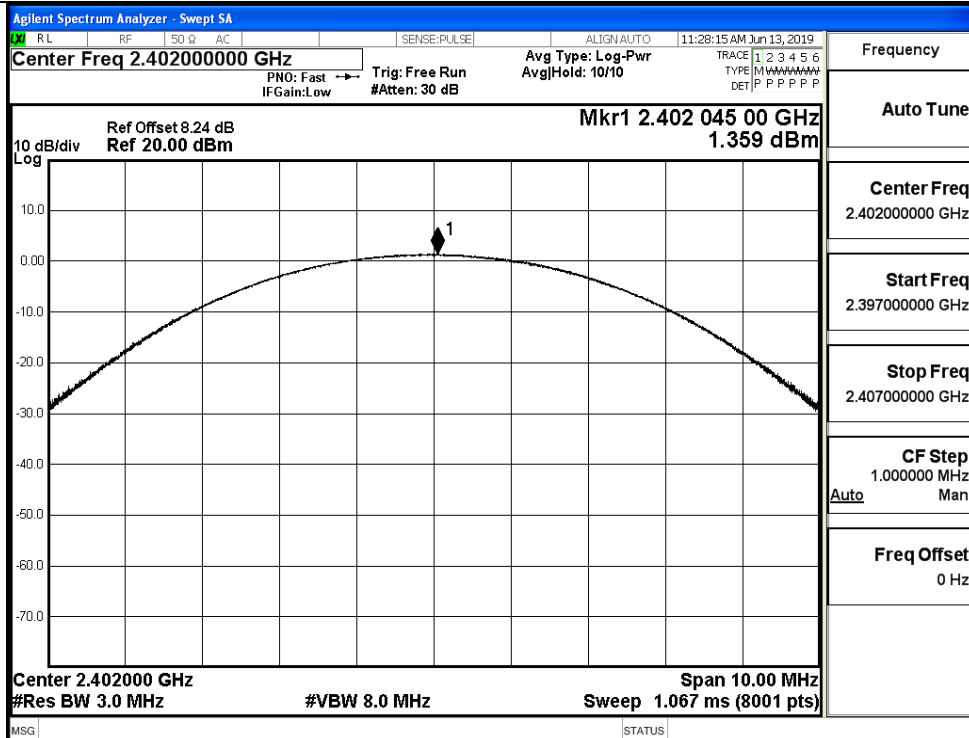


GFSK/HCH

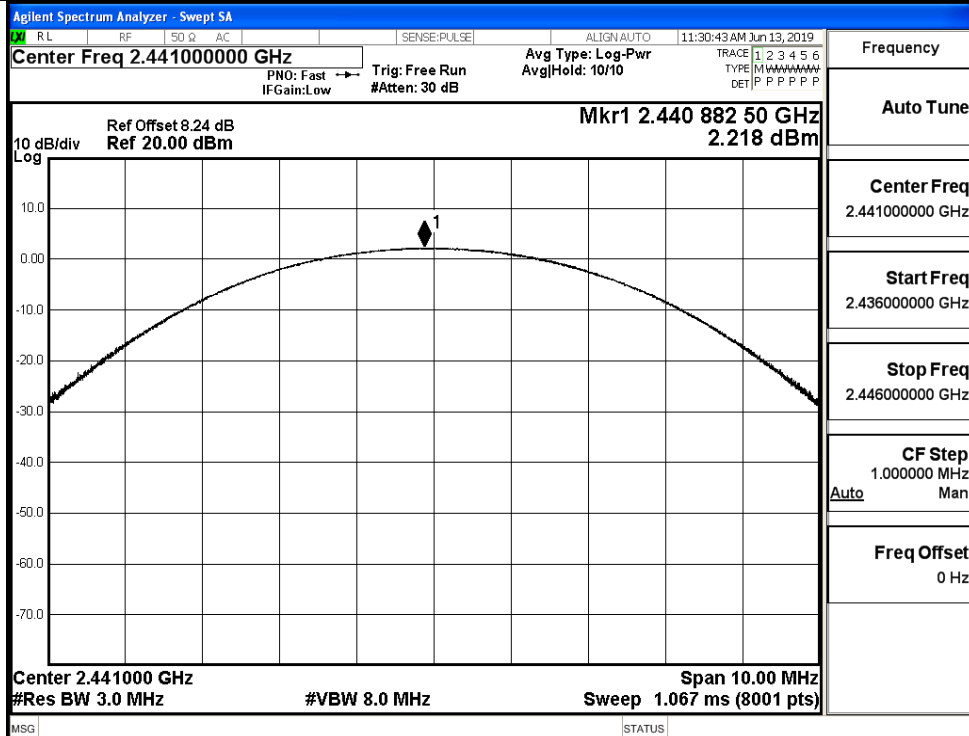
 $\pi/4$ DQPSK/LCH

$\pi/4$ DQPSK/MCH $\pi/4$ DQPSK/HCH

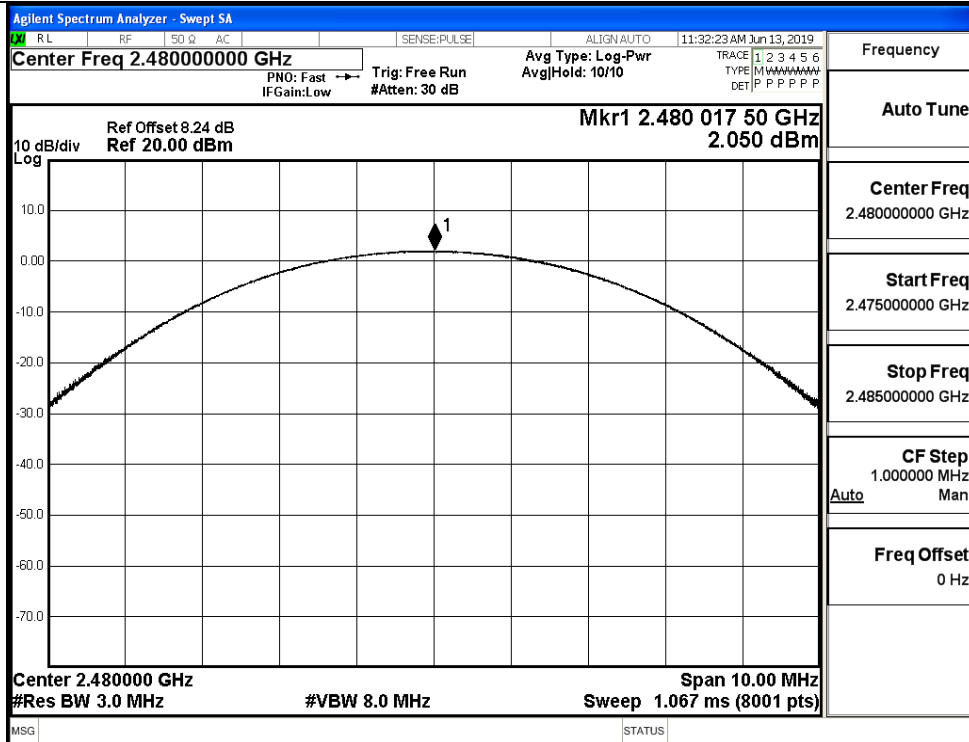
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

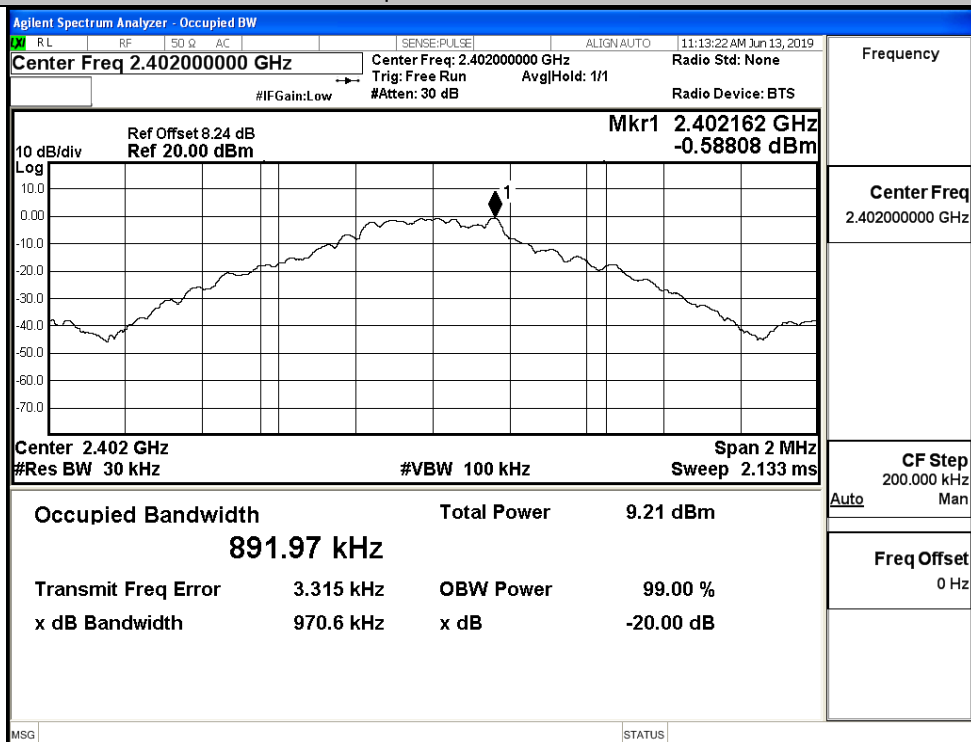


A.2 20dB Bandwidth

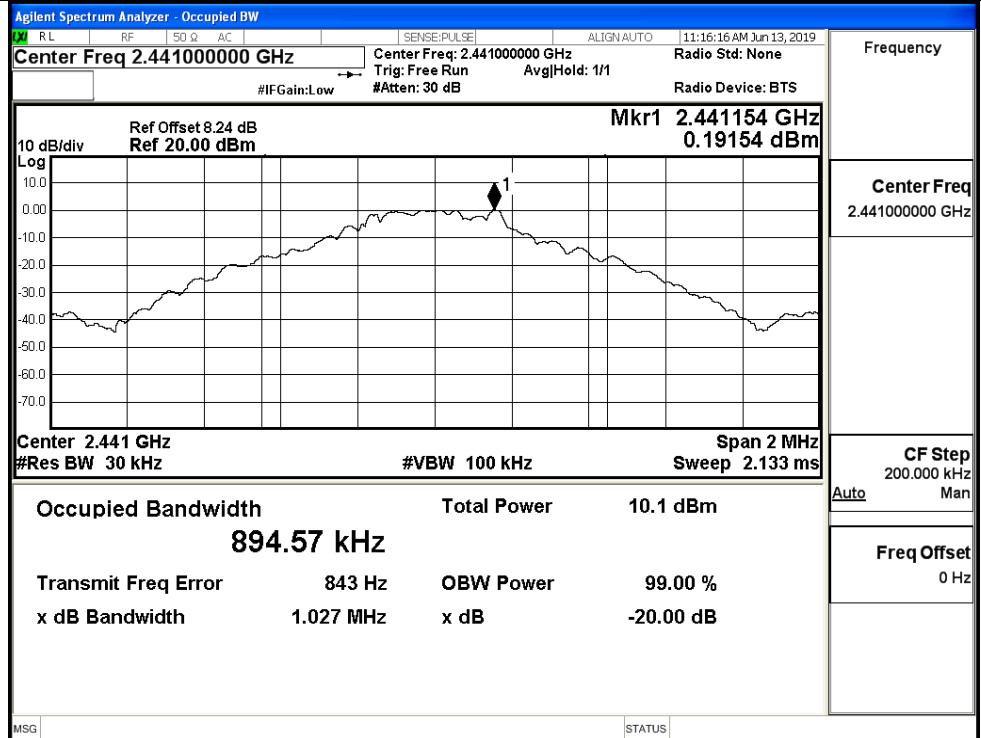
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9706	Not Specified	PASS
	MCH	1.027	Not Specified	PASS
	HCH	1.034	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.293	Not Specified	PASS
	MCH	1.313	Not Specified	PASS
	HCH	1.317	Not Specified	PASS
8DPSK	LCH	1.301	Not Specified	PASS
	MCH	1.302	Not Specified	PASS
	HCH	1.303	Not Specified	PASS

Test Graphs

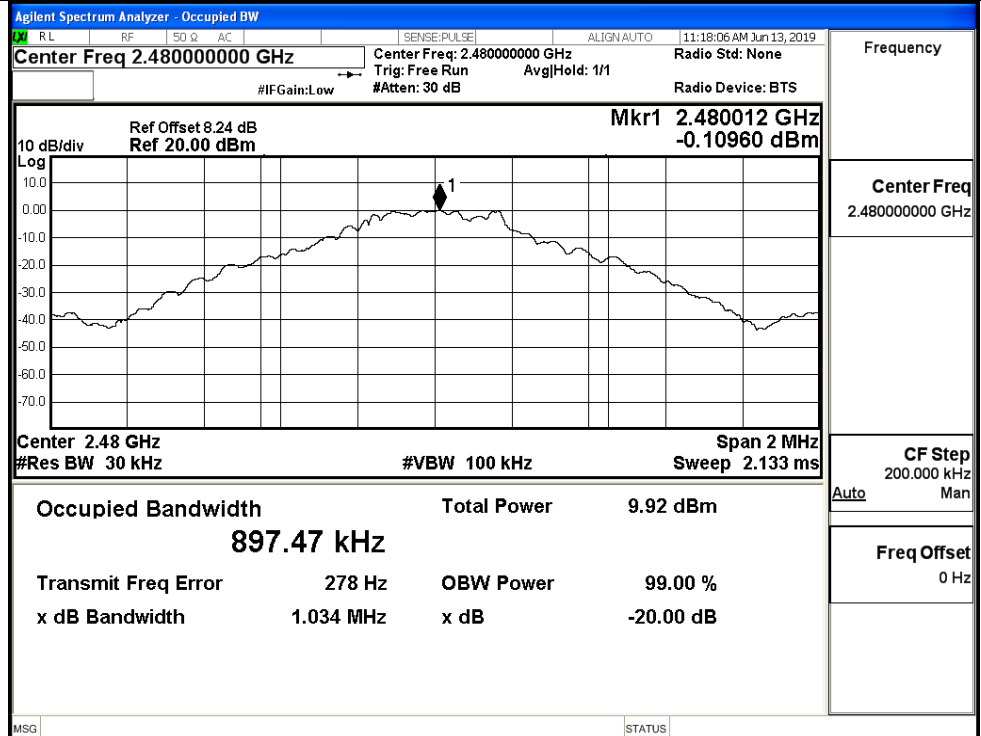
GFSK/LCH

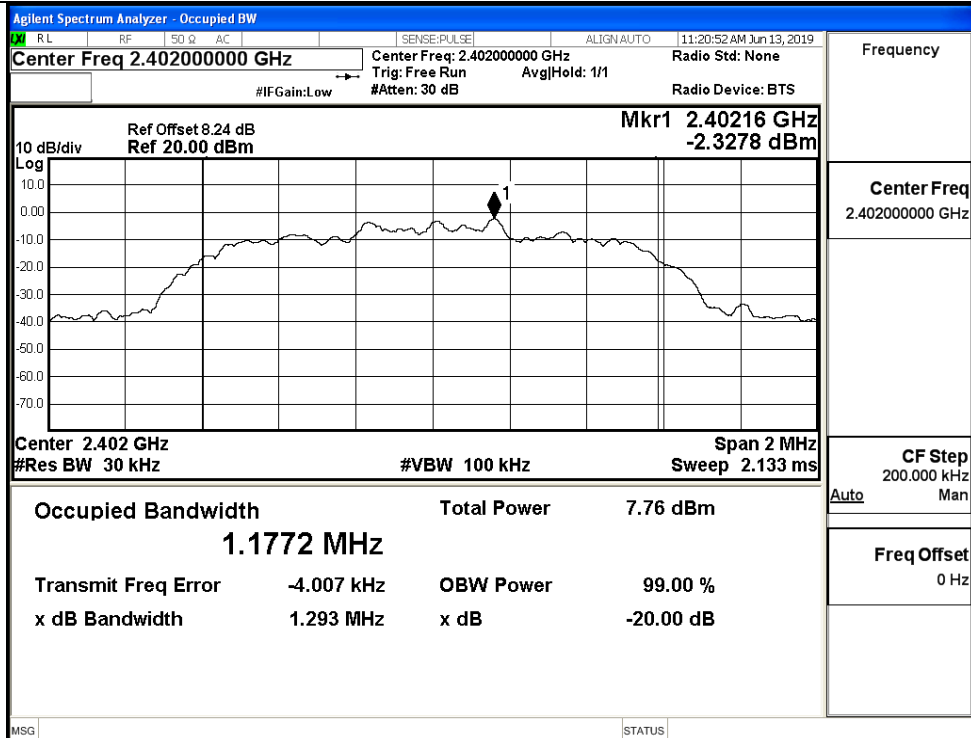
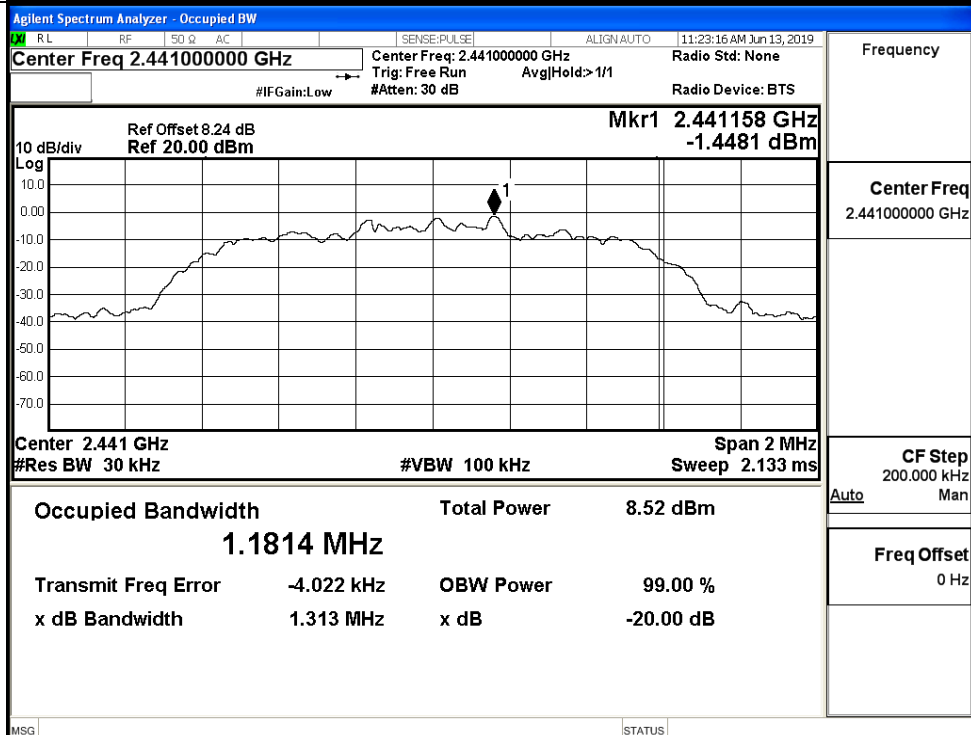


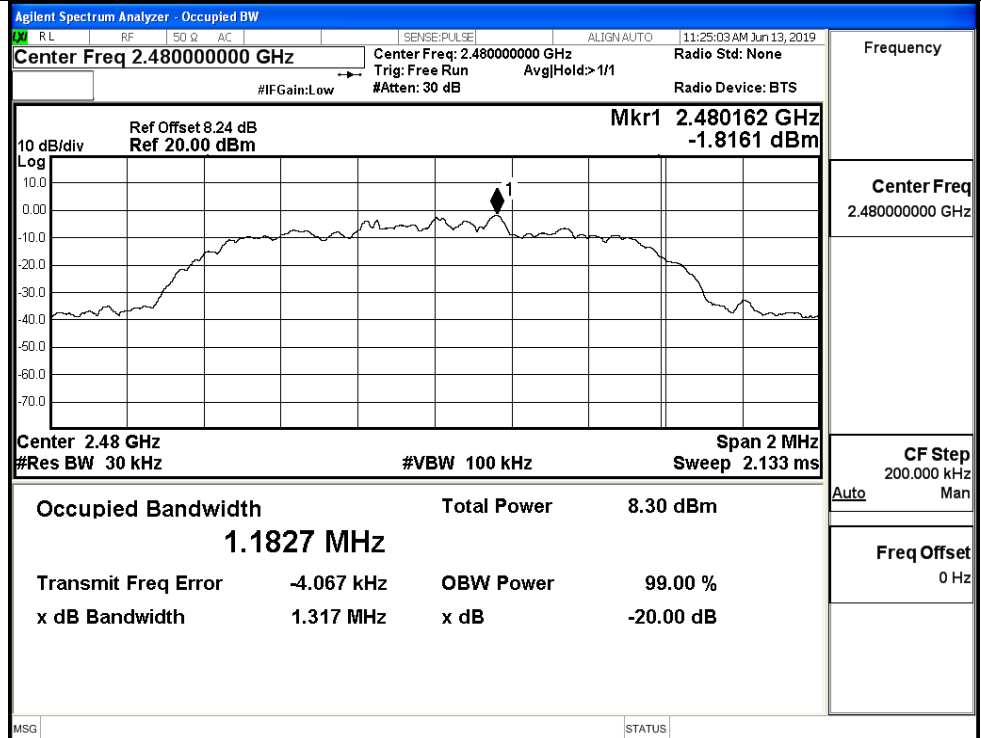
GFSK/MCH



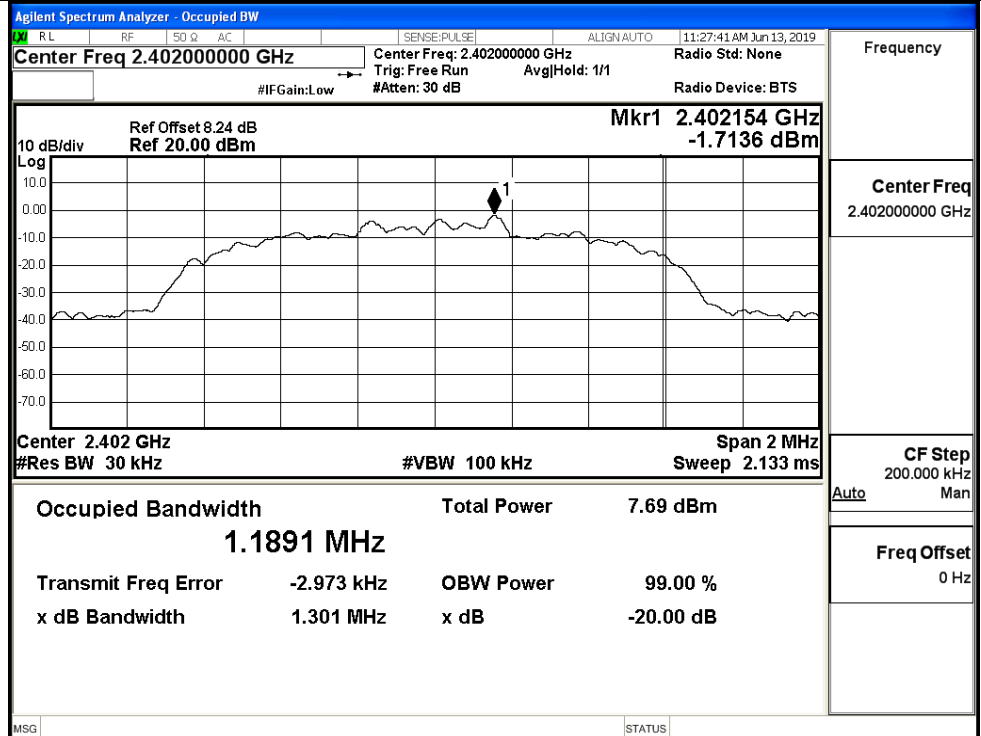
GFSK/HCH



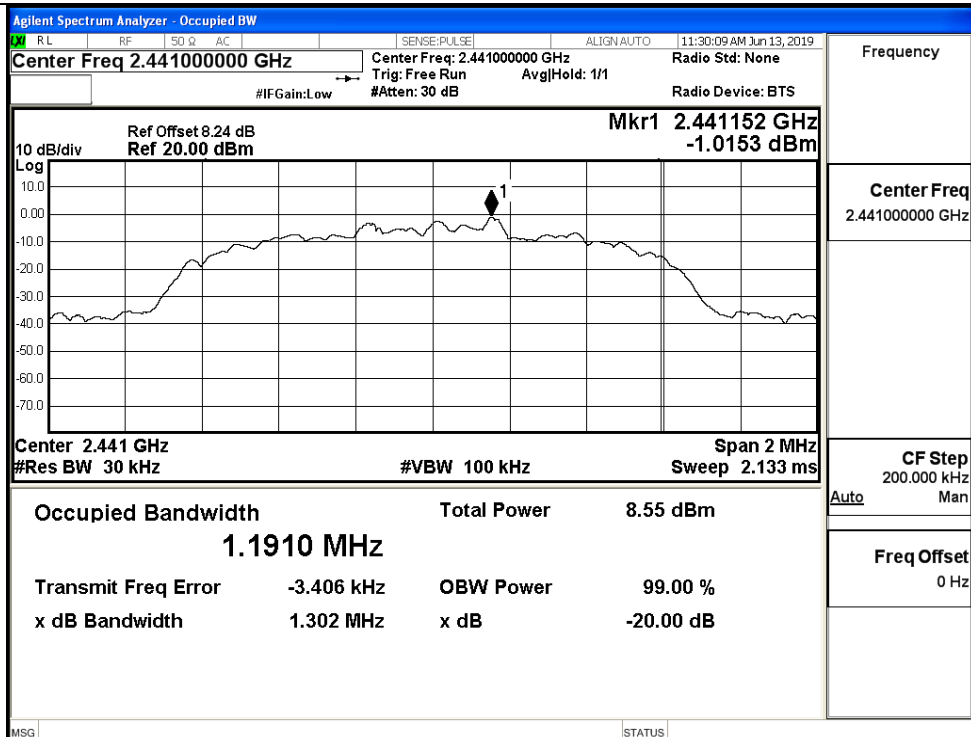
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

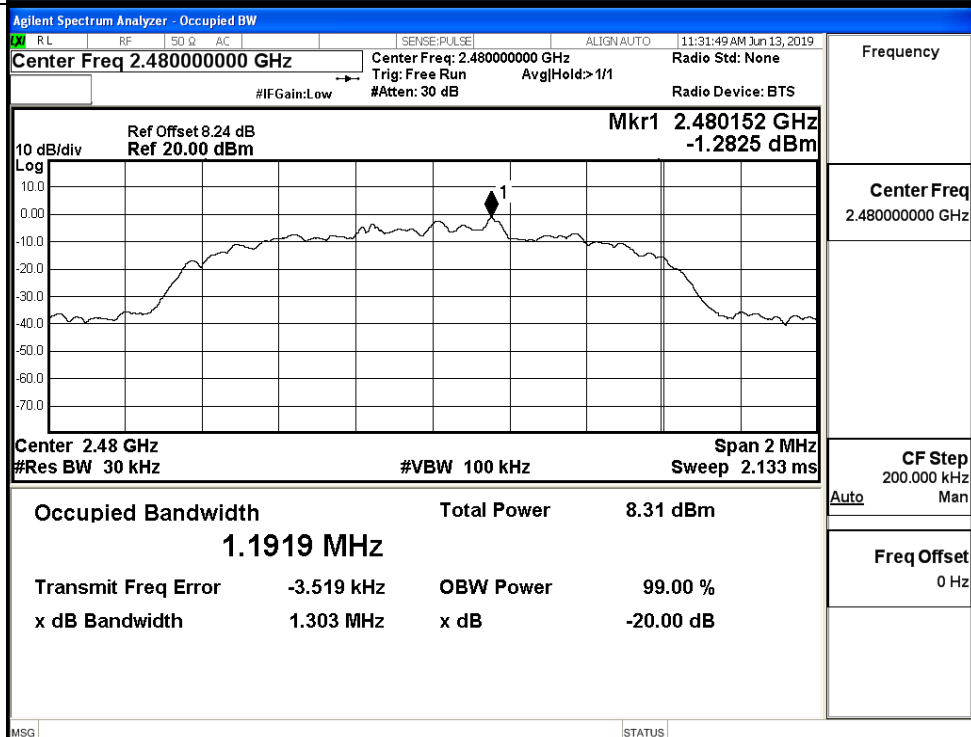
8DPSK/LCH



8DPSK/MCH



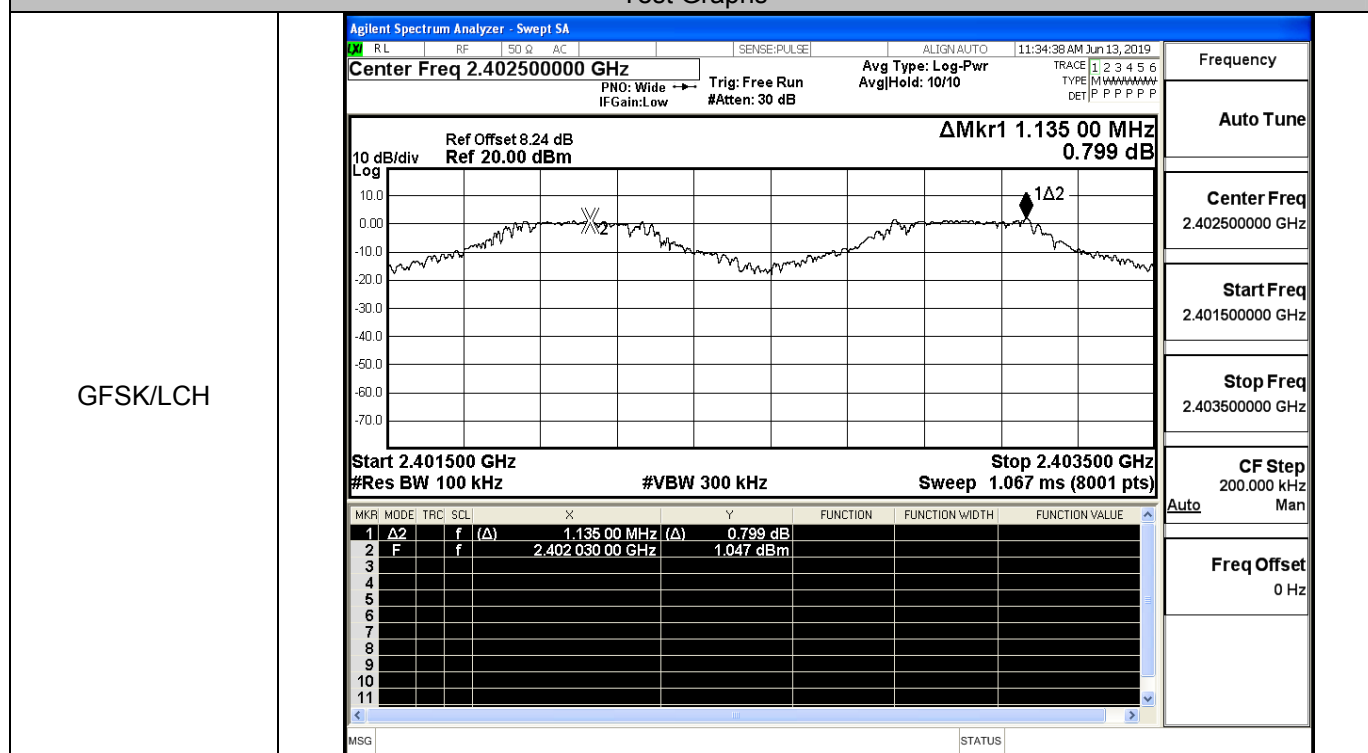
8DPSK/HCH



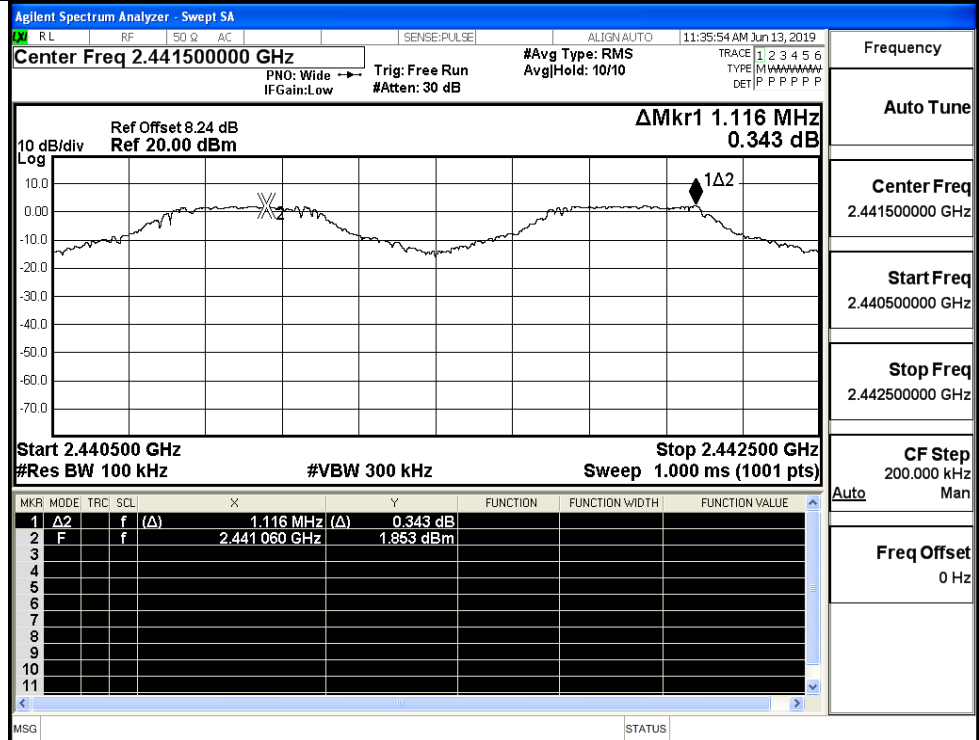
A.3 Carrier Frequency Separation

Mode	Channel	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.135	0.689	PASS
	MCH	1.116	0.689	PASS
	HCH	1.104	0.689	PASS
$\pi/4$ DQPSK	LCH	1.152	0.878	PASS
	MCH	1.164	0.878	PASS
	HCH	1.134	0.878	PASS
8DPSK	LCH	0.906	0.869	PASS
	MCH	0.894	0.869	PASS
	HCH	0.930	0.869	PASS

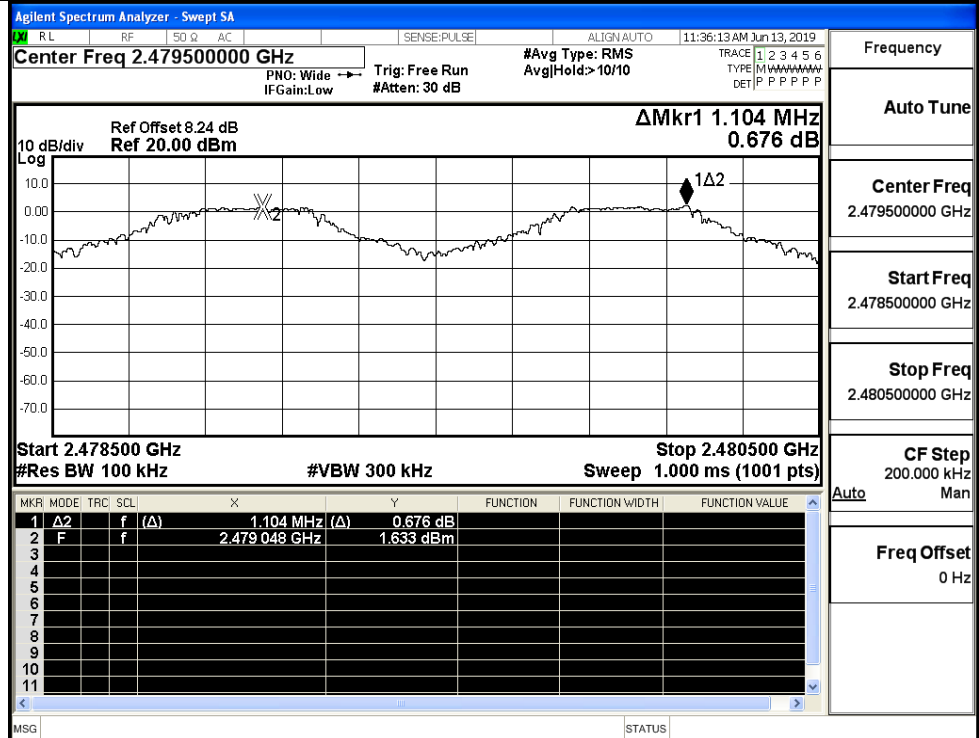
Test Graphs

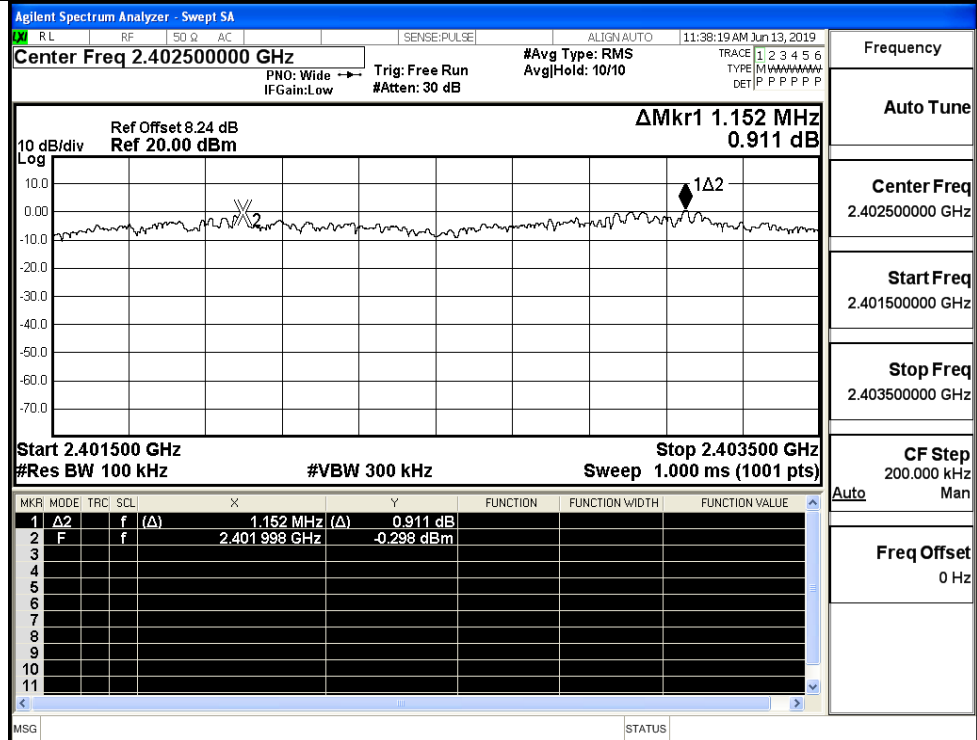
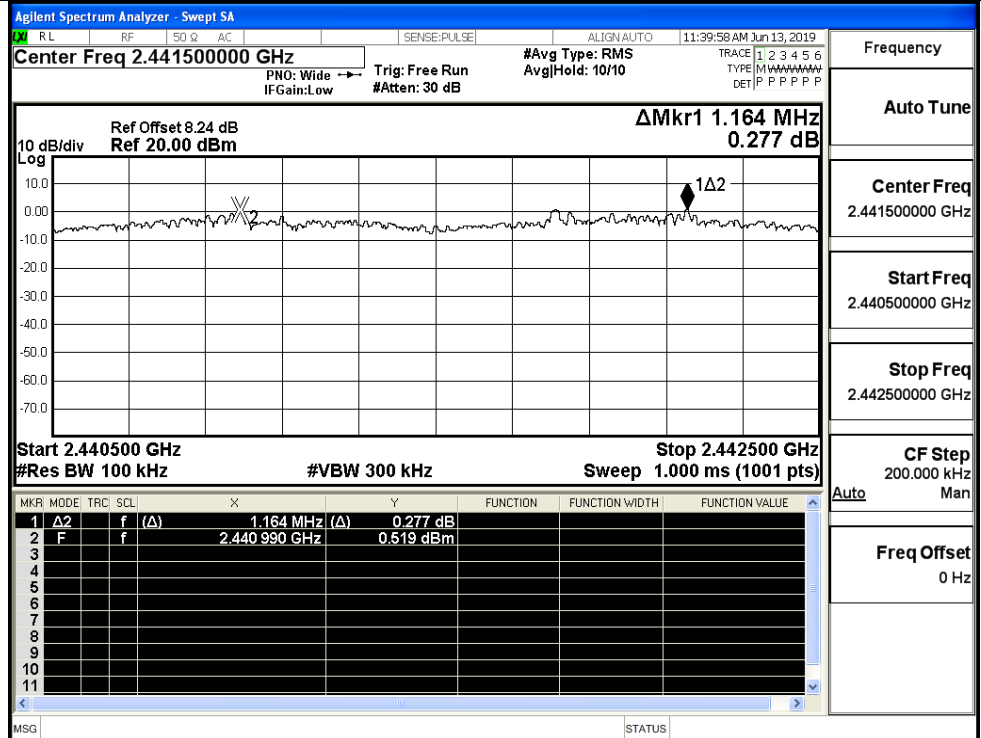


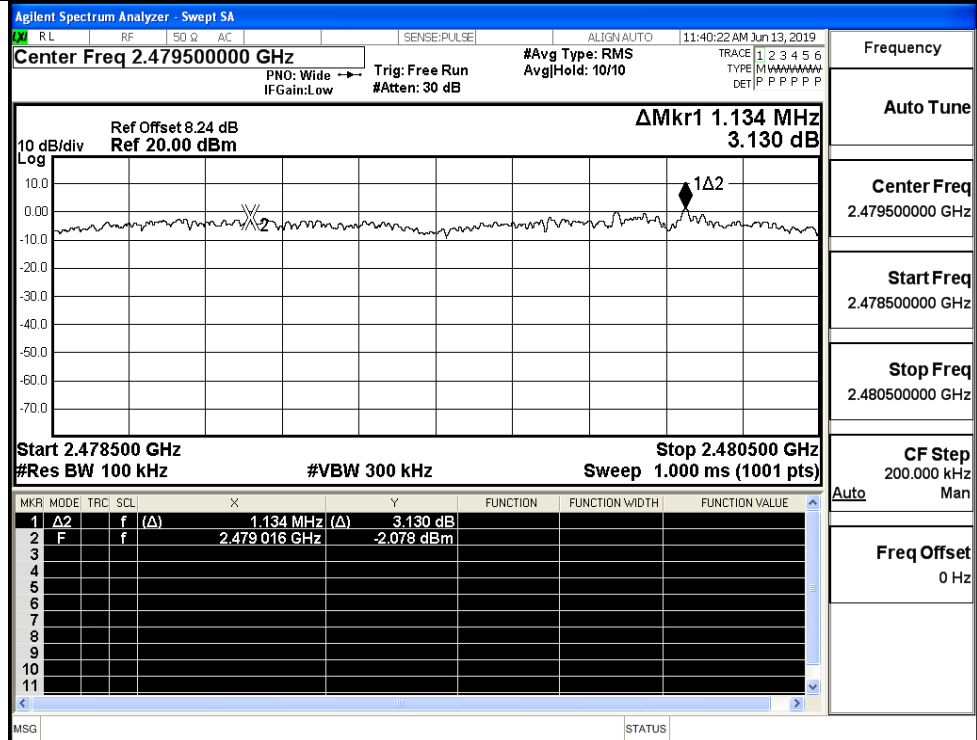
GFSK/MCH



GFSK/HCH



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

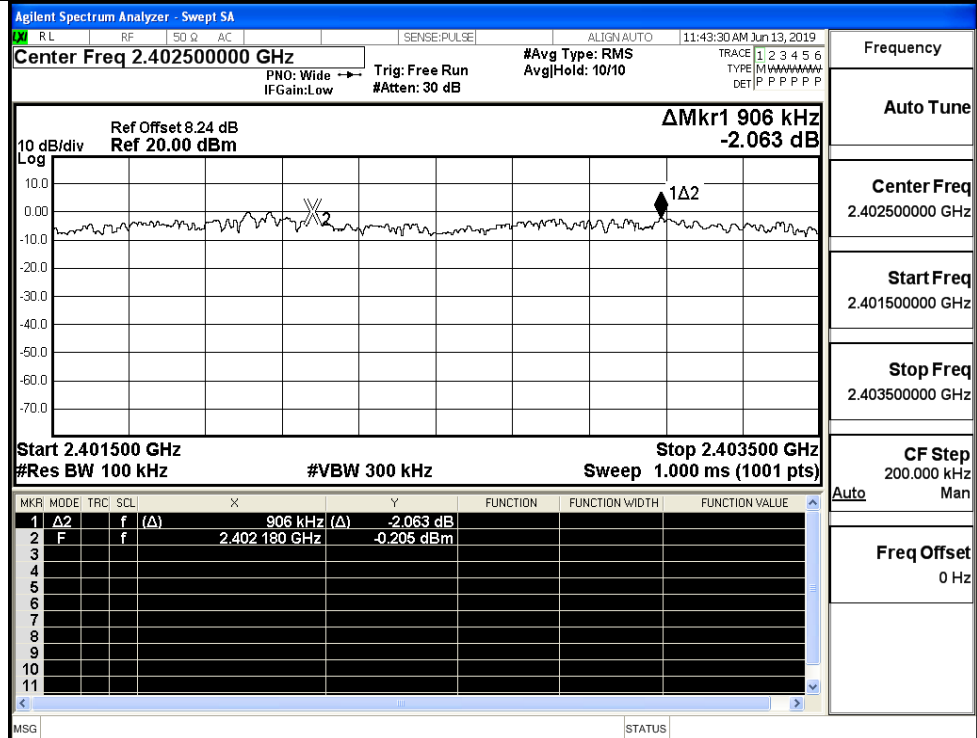
$\pi/4$ DQPSK/HCH

Frequency

Auto Tune

Center Freq
2.479500000 GHzStart Freq
2.478500000 GHzStop Freq
2.480500000 GHzCF Step
200.000 kHz
ManFreq Offset
0 Hz

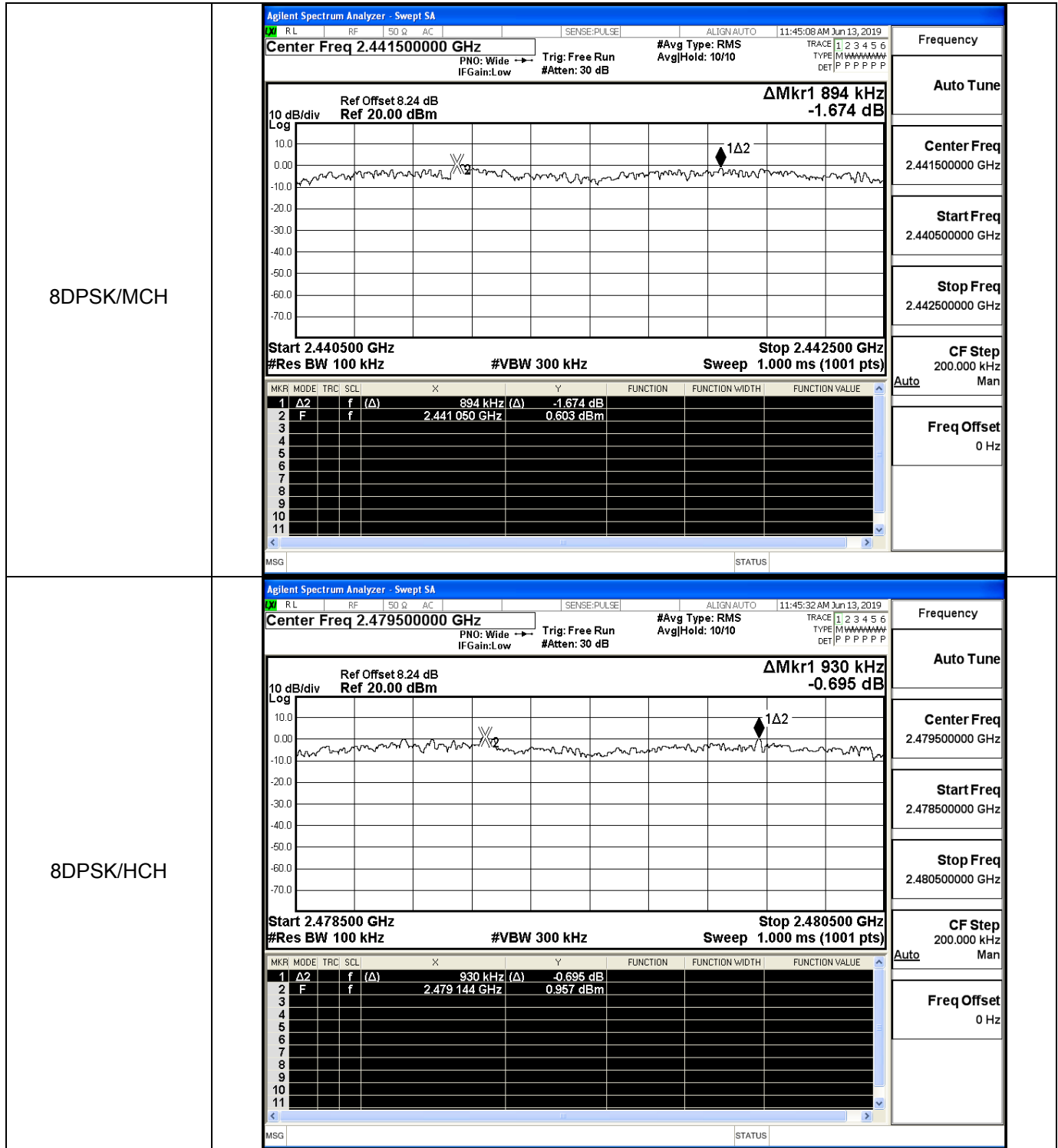
8DPSK/LCH



Frequency

Auto Tune

Center Freq
2.402500000 GHzStart Freq
2.401500000 GHzStop Freq
2.403500000 GHzCF Step
200.000 kHz
ManFreq Offset
0 Hz

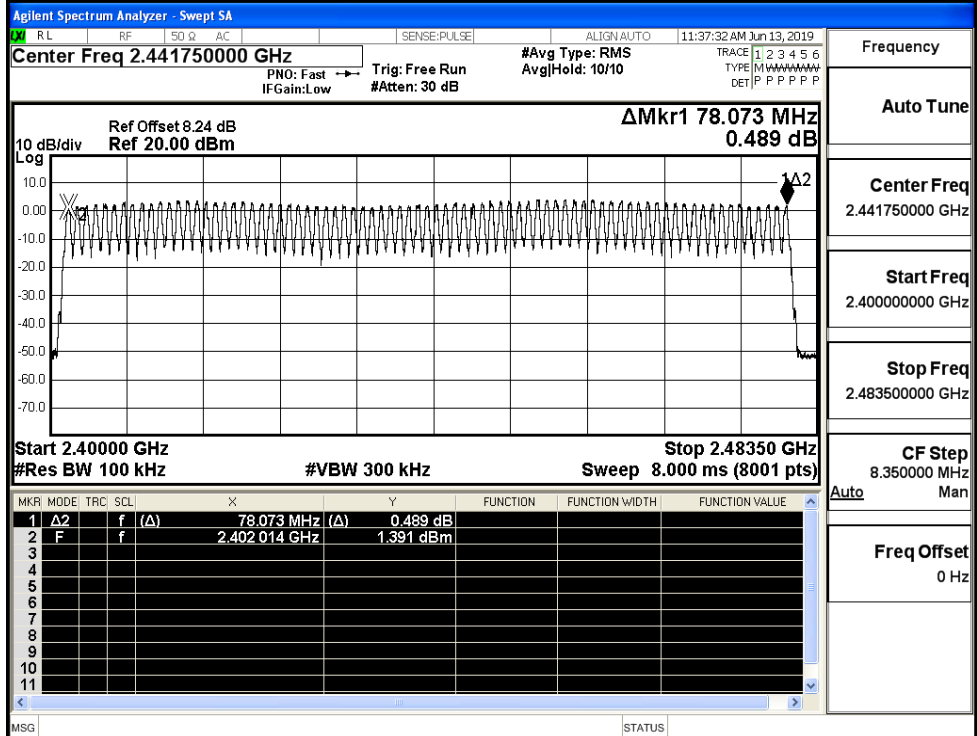
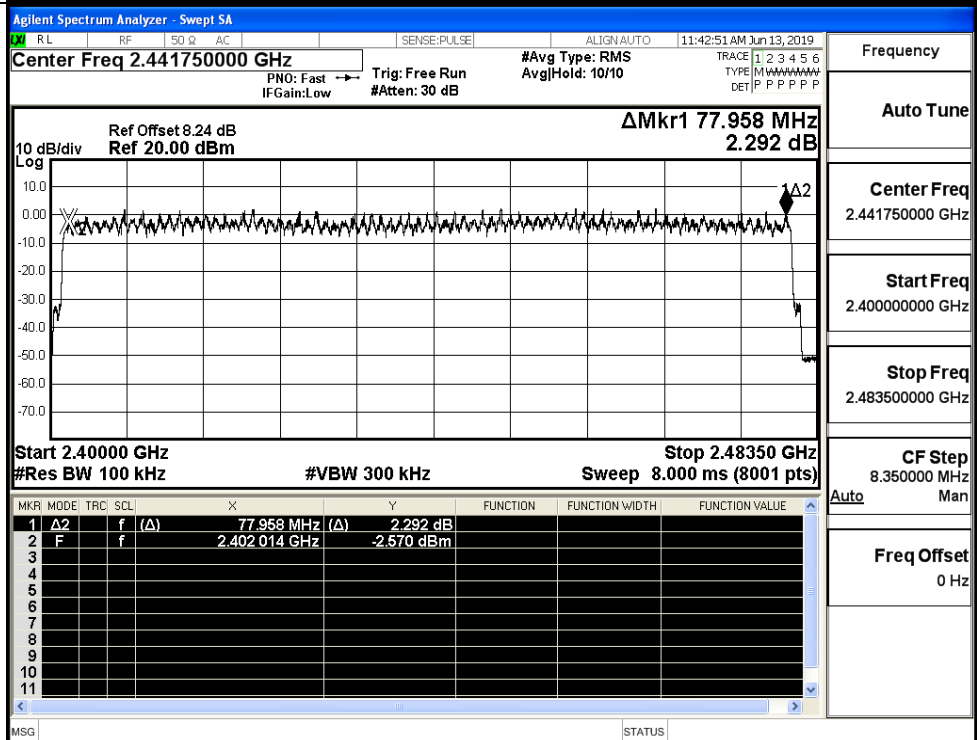


A.4 Hopping Channel Number

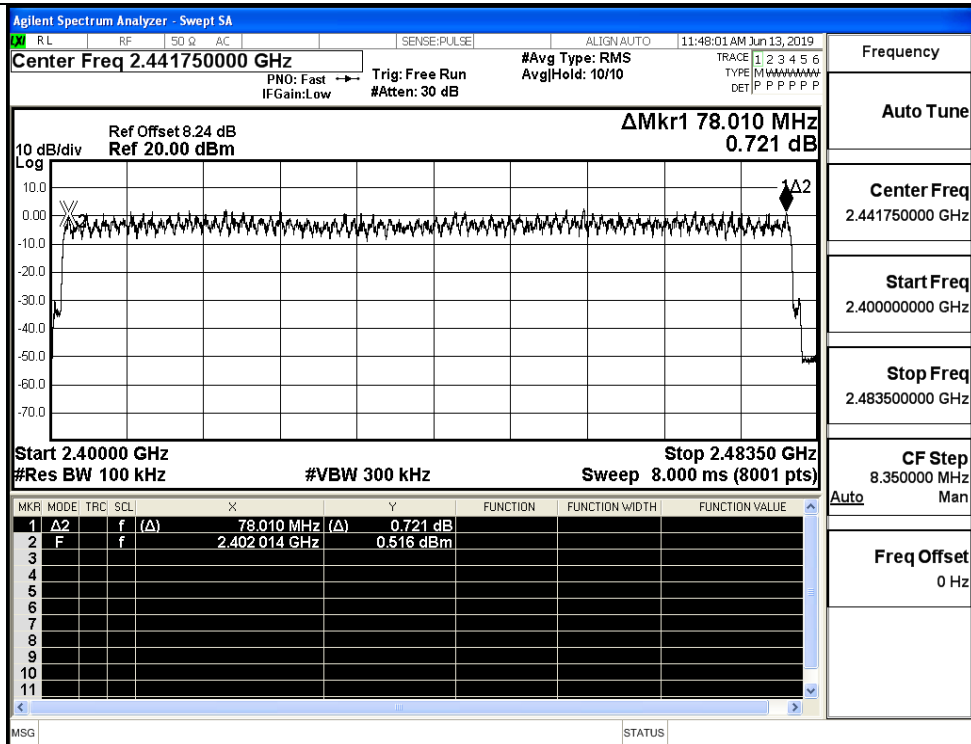
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS
8DPSK	Hop	79	>=15	PASS

Test Graphs

GFSK/Hop

 $\pi/4$ DQPSK/Hop

8DPSK/Hop

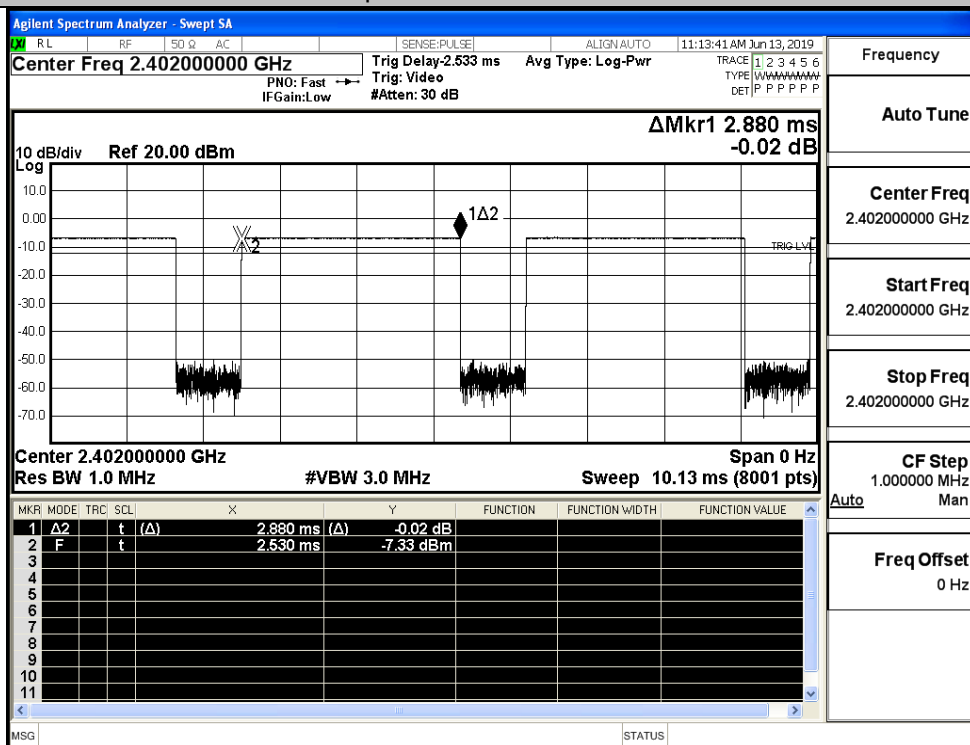


A.5 Dwell Time

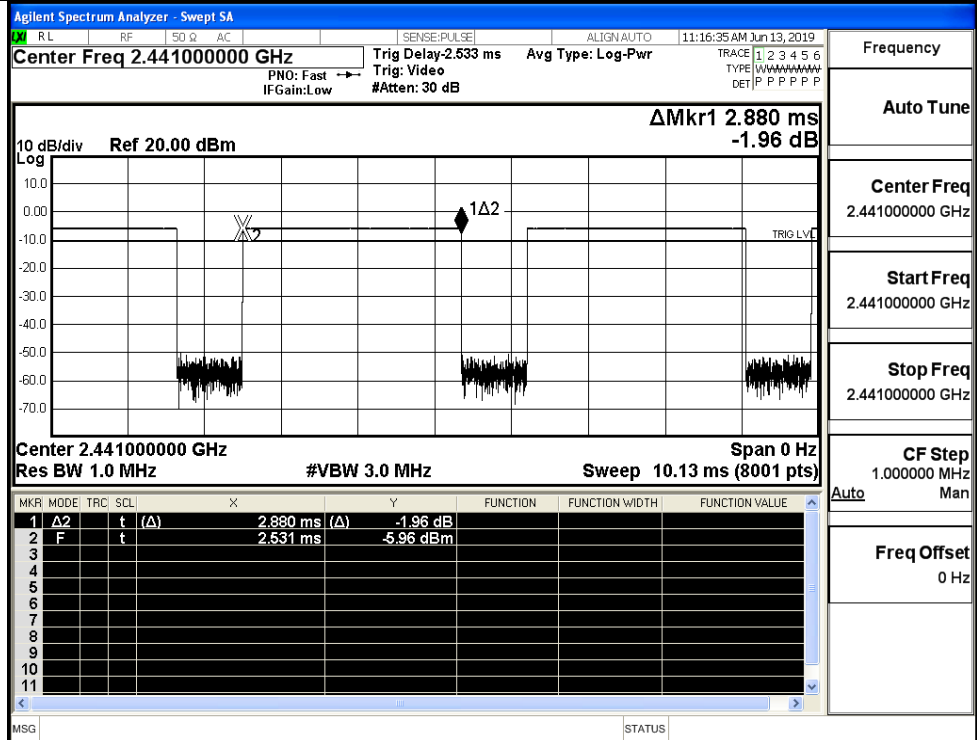
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88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

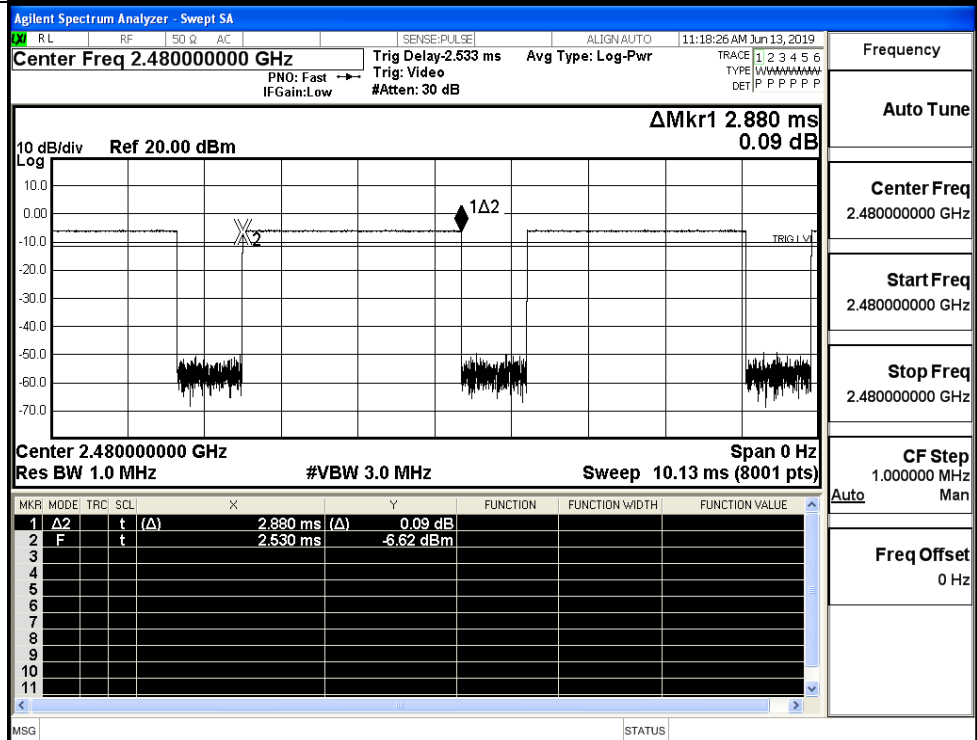
GFSK_DH5/LCH



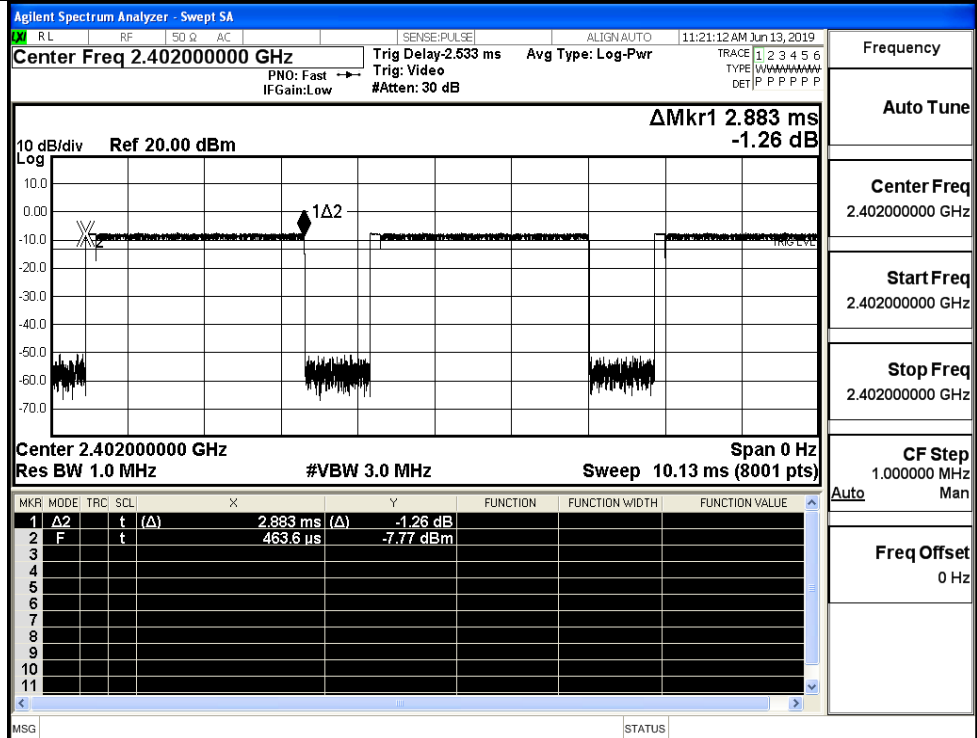
GFSK_DH5/MCH



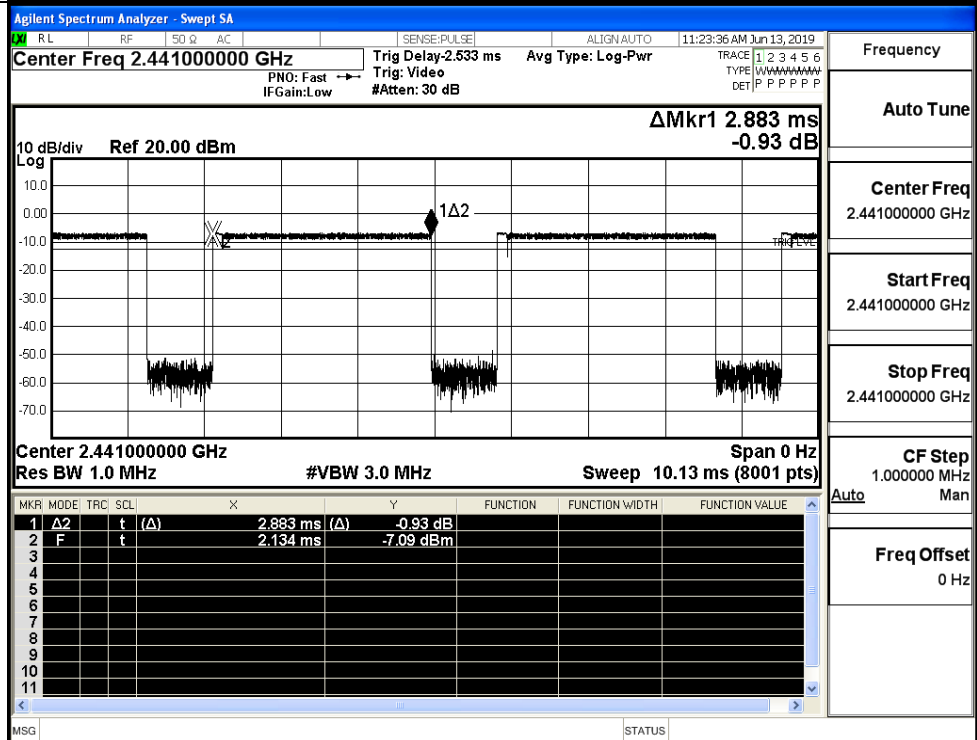
GFSK_DH5/HCH



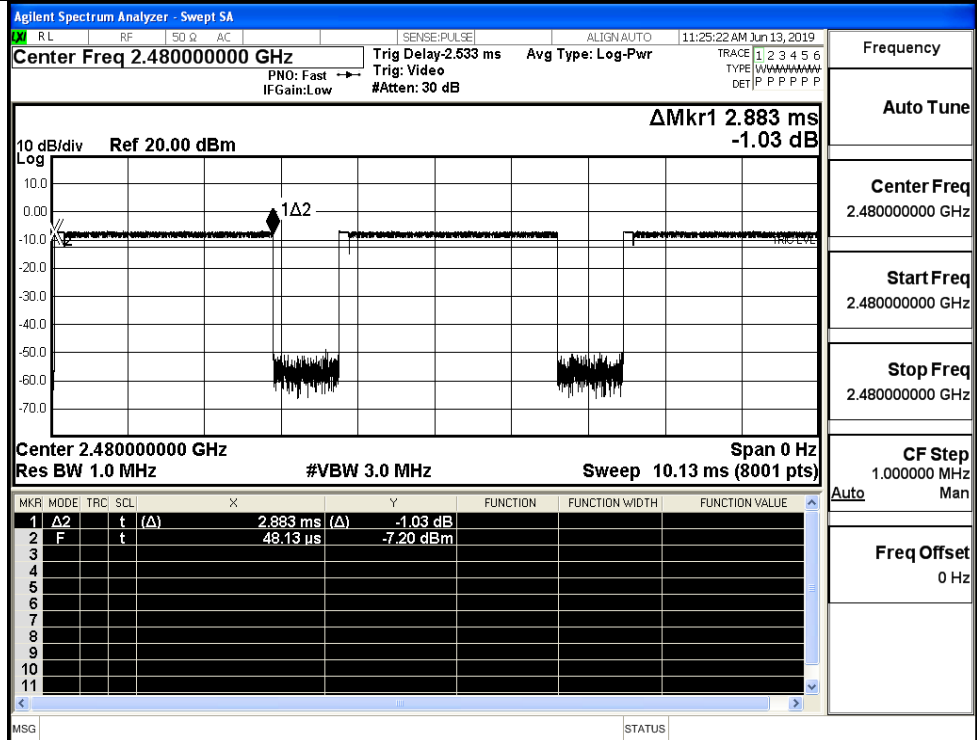
$\pi/4$ DQPSK
_2DH5/LCH



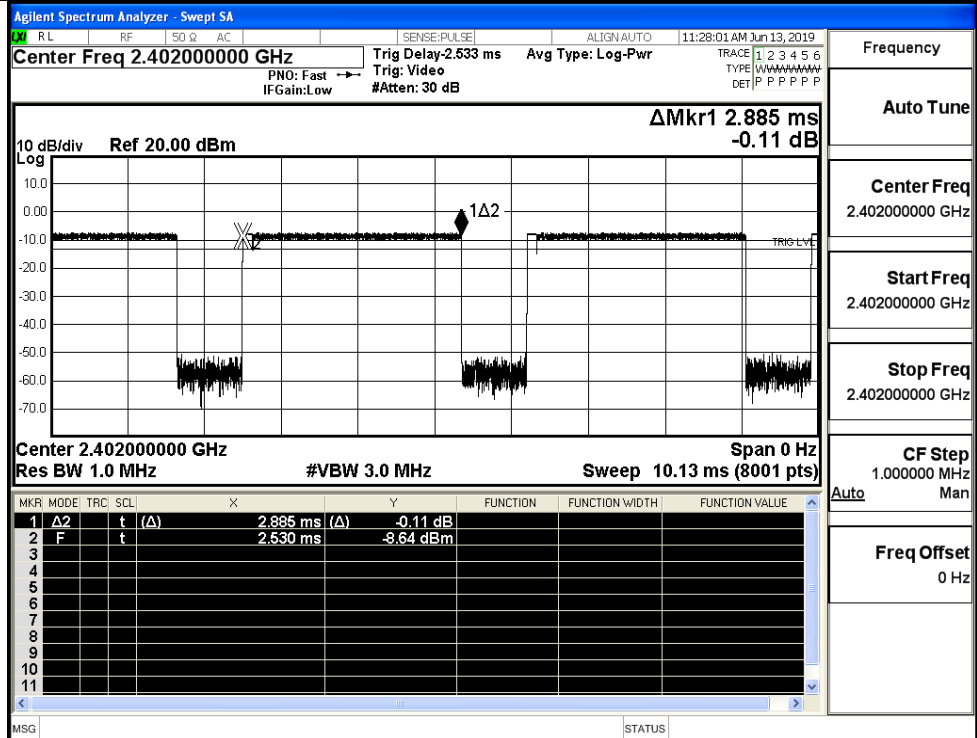
$\pi/4$ DQPSK
_2DH5/MCH



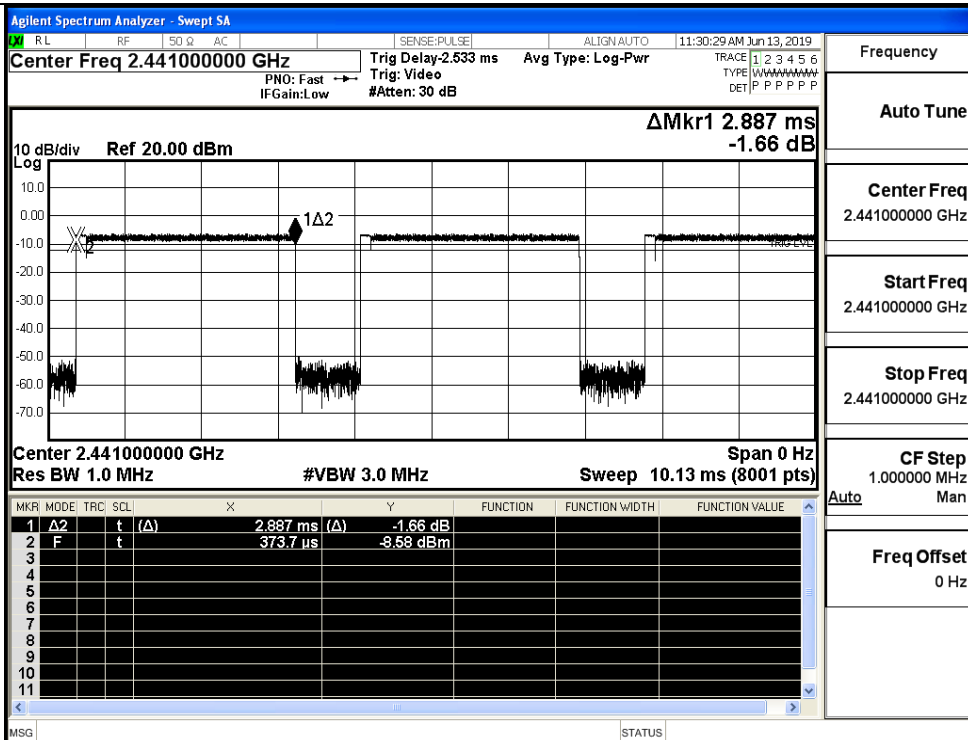
$\pi/4$ DQPSK
_2DH5/HCH



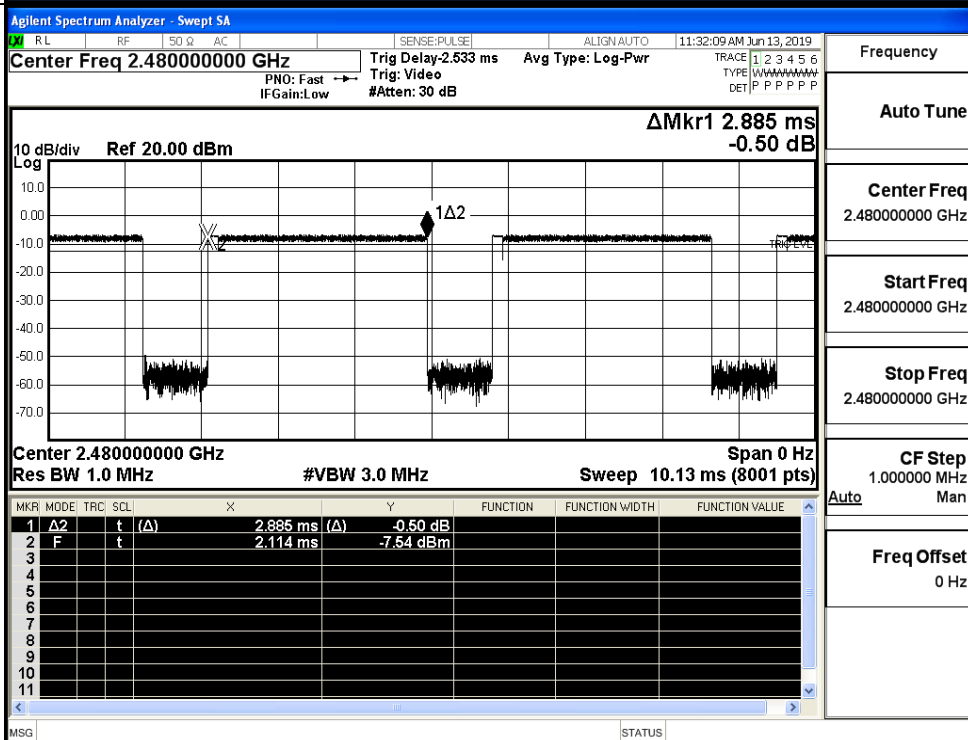
8DPSK _3DH5/LCH



8DPSK_3DH5/MCH



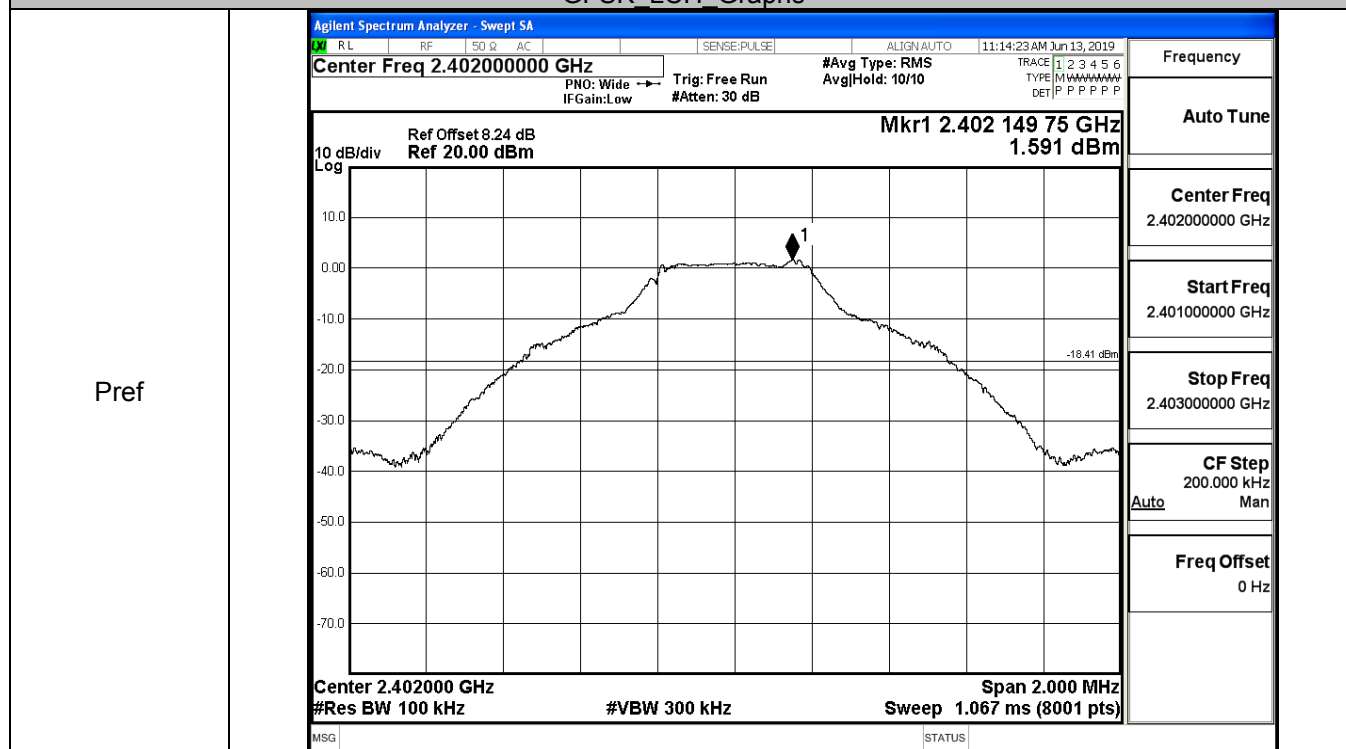
8DPSK_3DH5/HCH



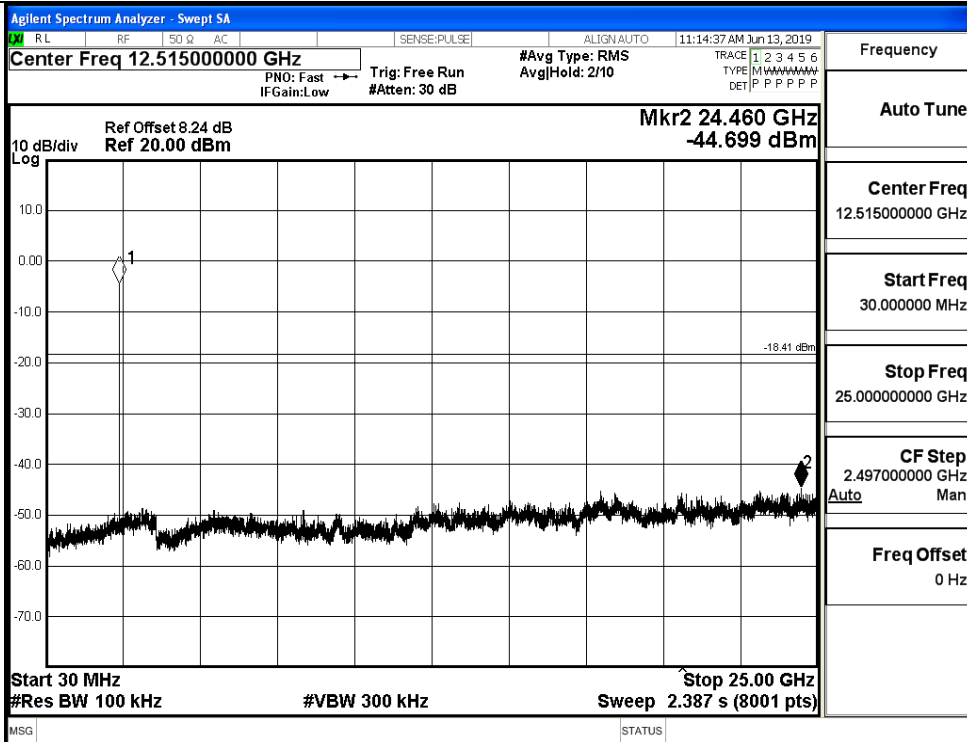
A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.591	-44.699	-18.409	PASS
	MCH	2.488	-45.056	-17.512	PASS
	HCH	2.062	-44.296	-17.938	PASS
$\pi/4$ DQPSK	LCH	0.425	-44.176	-19.575	PASS
	MCH	1.244	-44.350	-18.756	PASS
	HCH	0.461	-41.689	-19.539	PASS
8DPSK	LCH	0.525	-44.532	-19.475	PASS
	MCH	1.391	-44.919	-18.609	PASS
	HCH	1.231	-44.784	-18.769	PASS

GFSK LCH Graphs

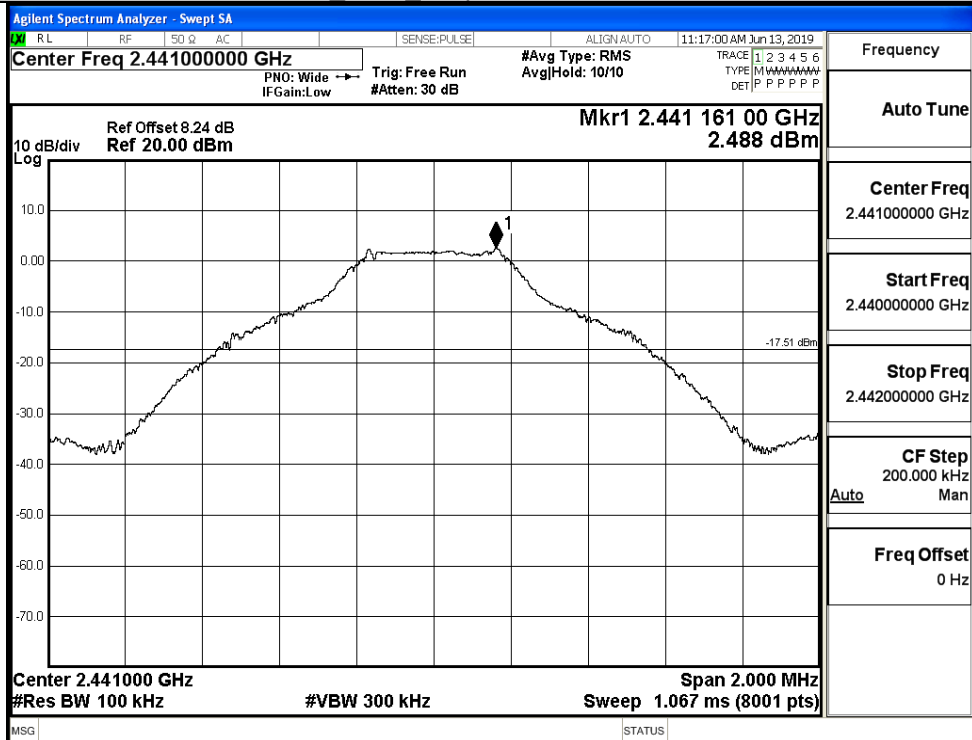


Puw

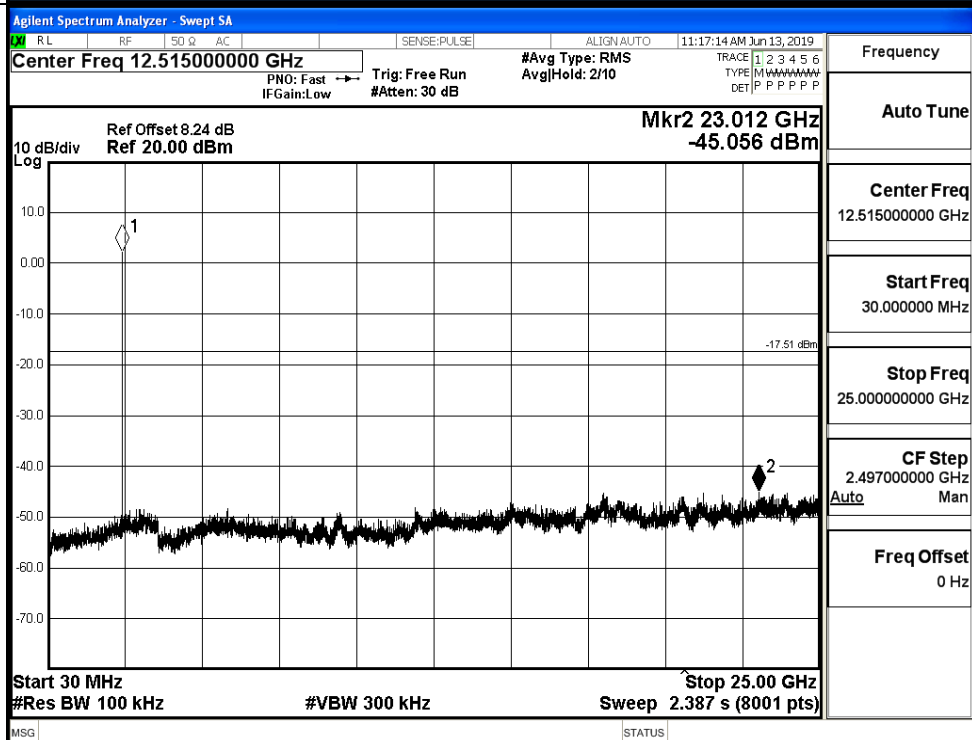


GFSK_MCH_Graphs

Pref

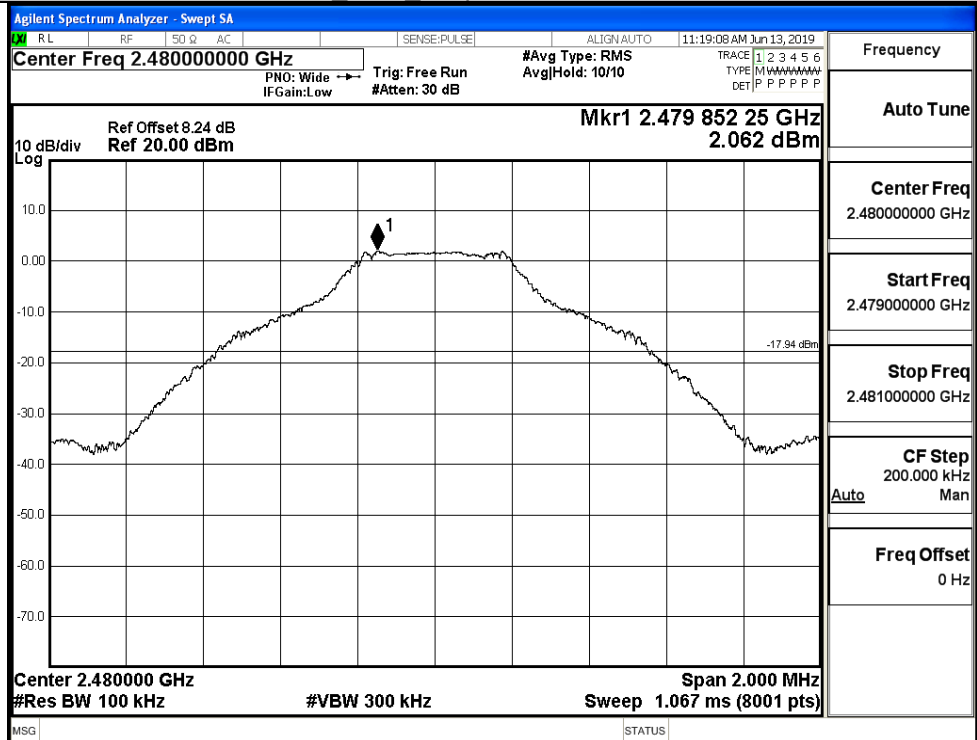


Puw

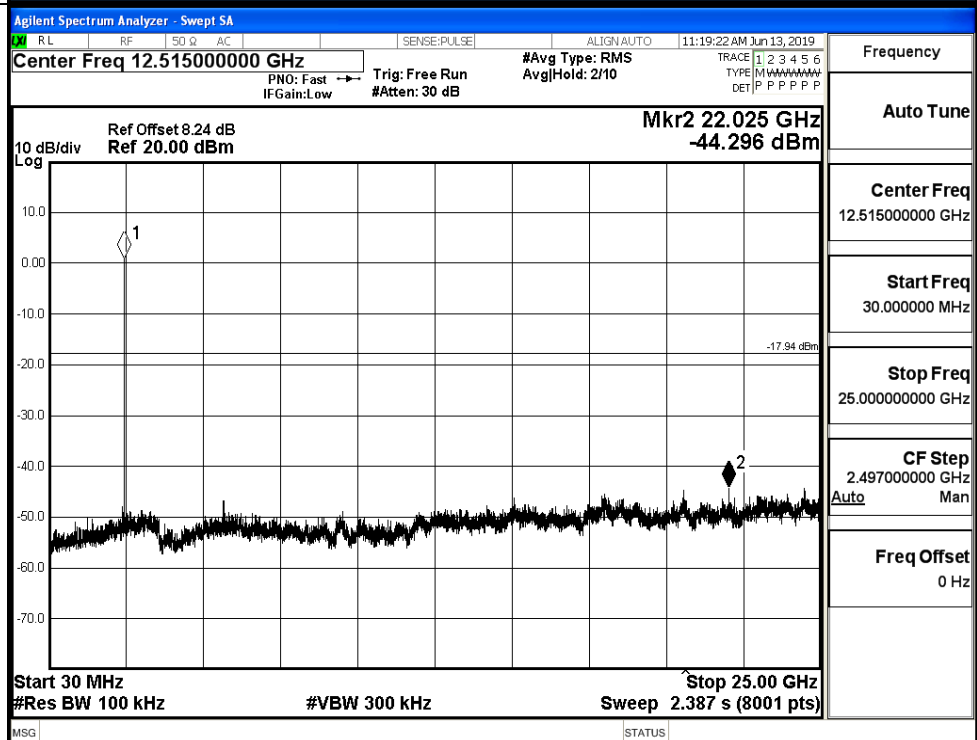


GFSK_HCH_Graphs

Pref

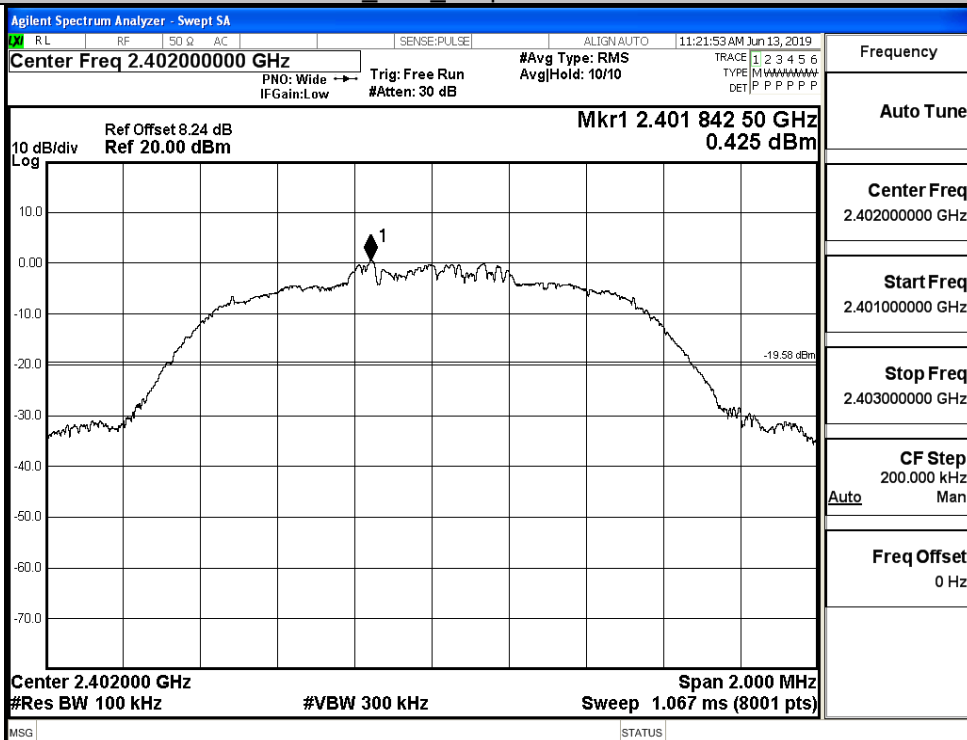


Puw

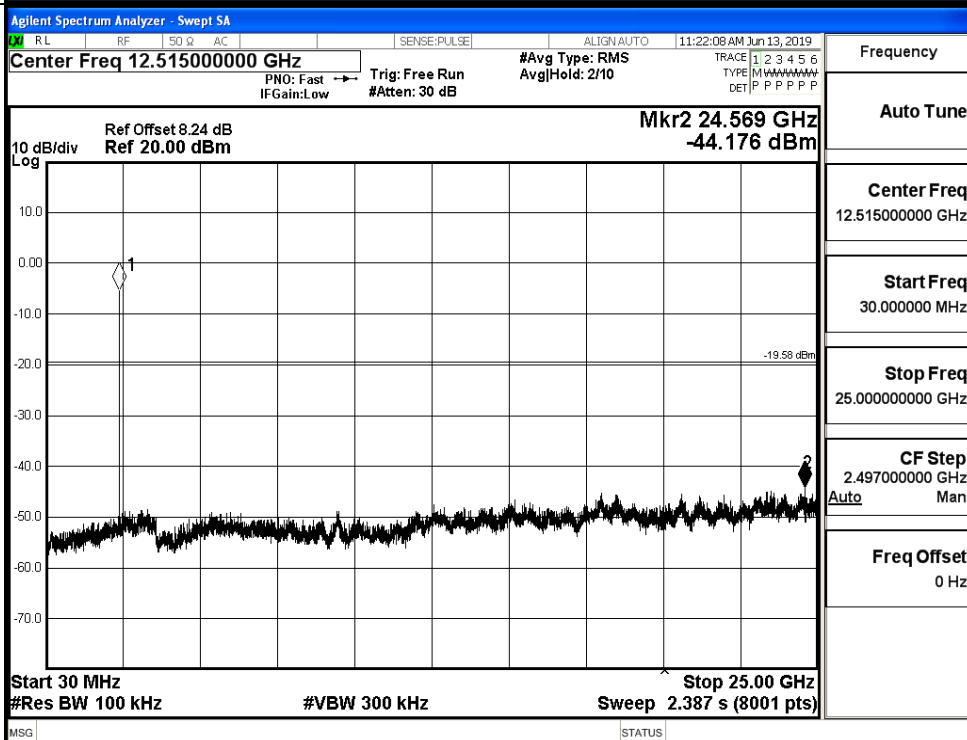


$\pi/4$ DQPSK_LCH_Graphs

Pref

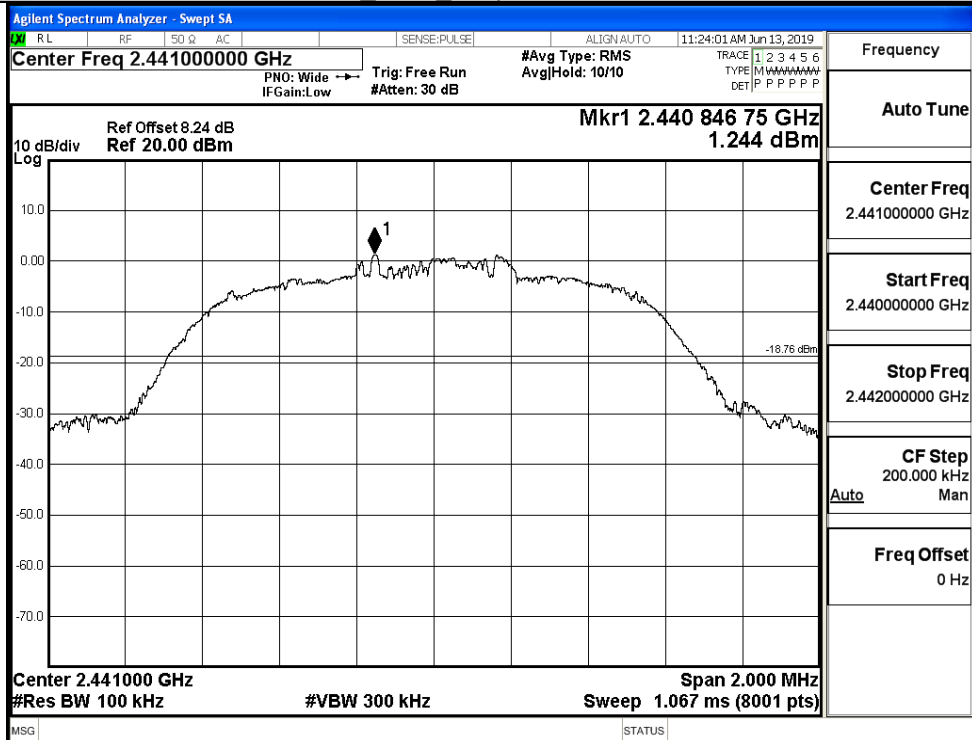


Puw

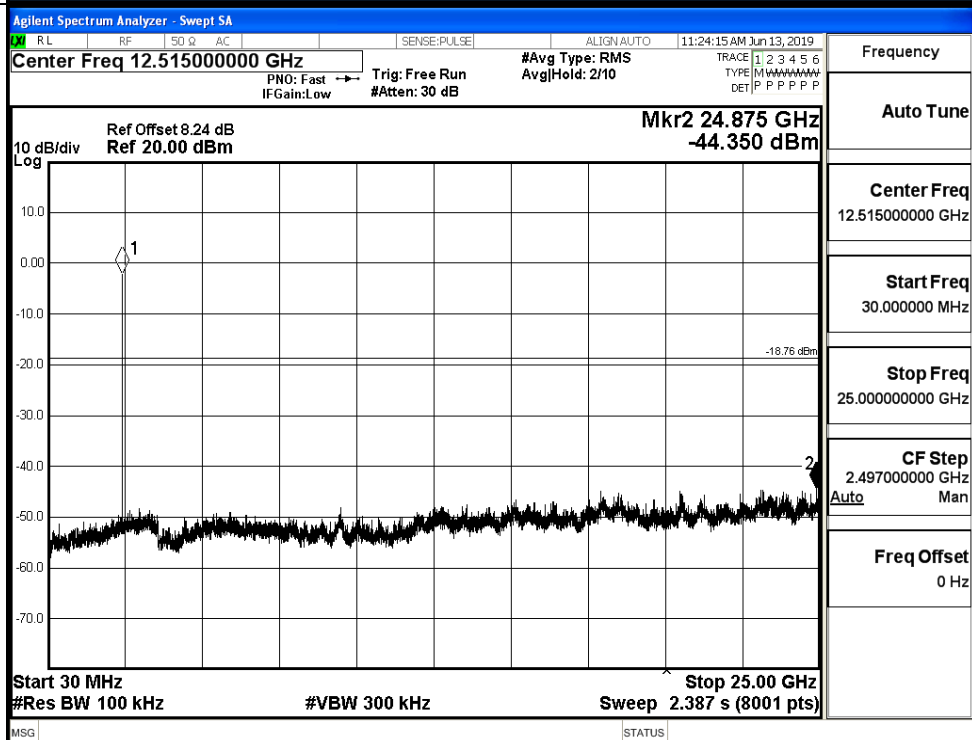


π /4DQPSK_MCH_Graphs

Pref

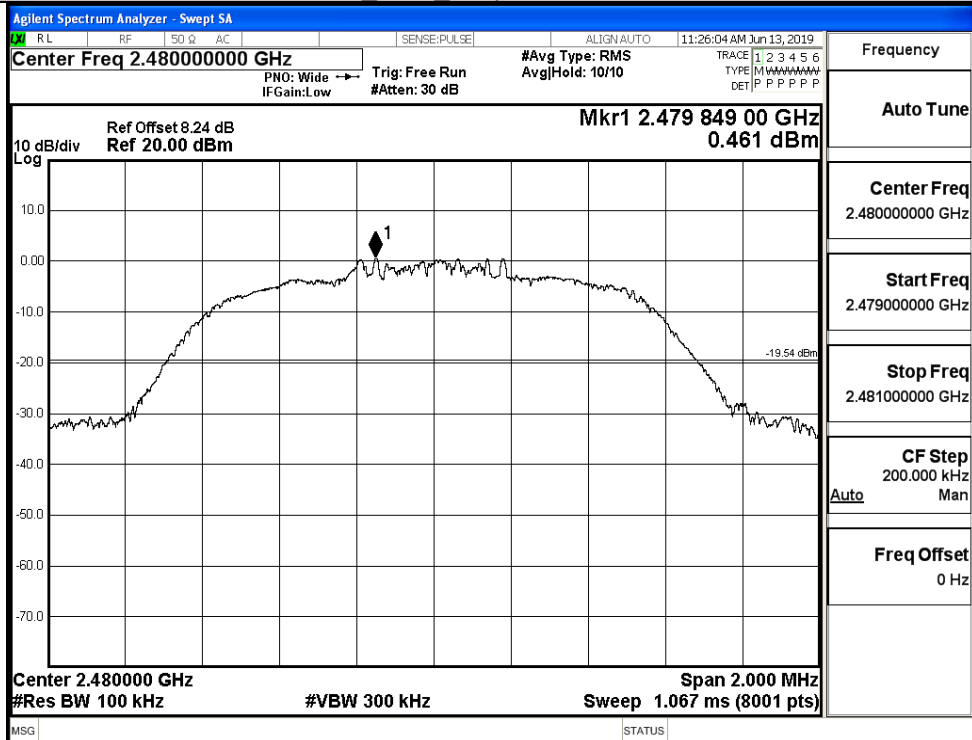


Puw

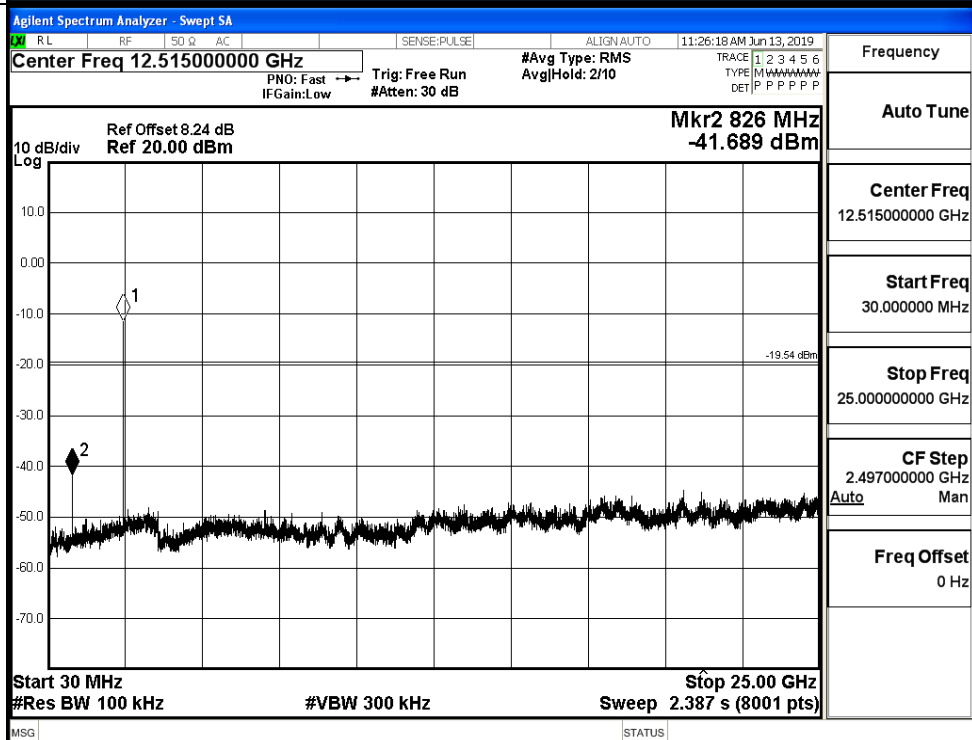


$\pi/4$ DQPSK_HCH_Graphs

Pref

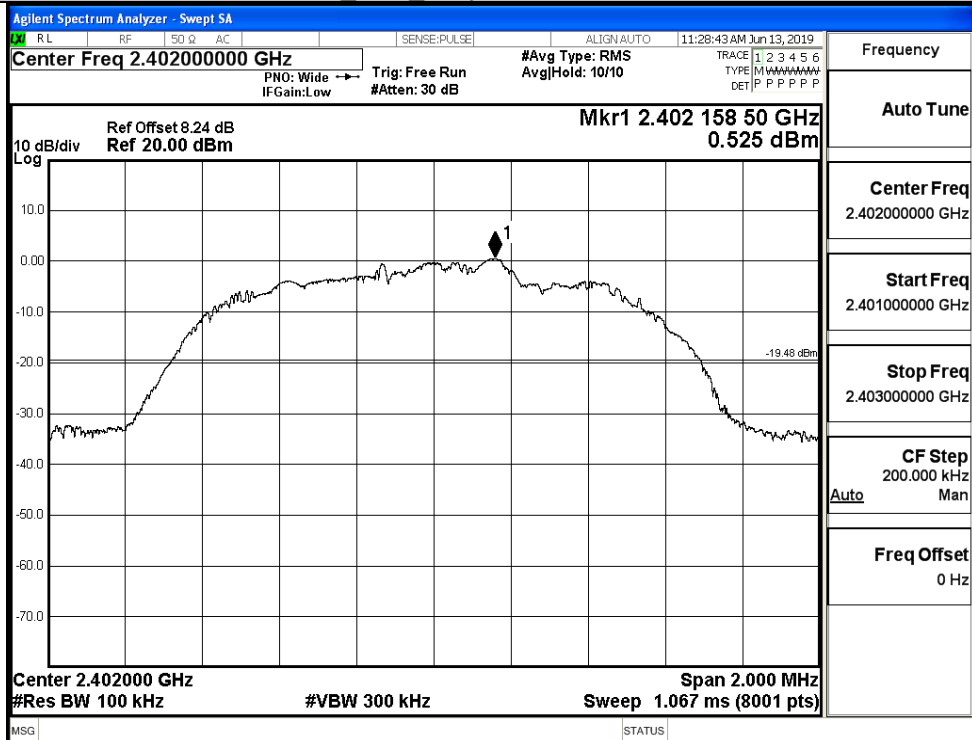


Puw

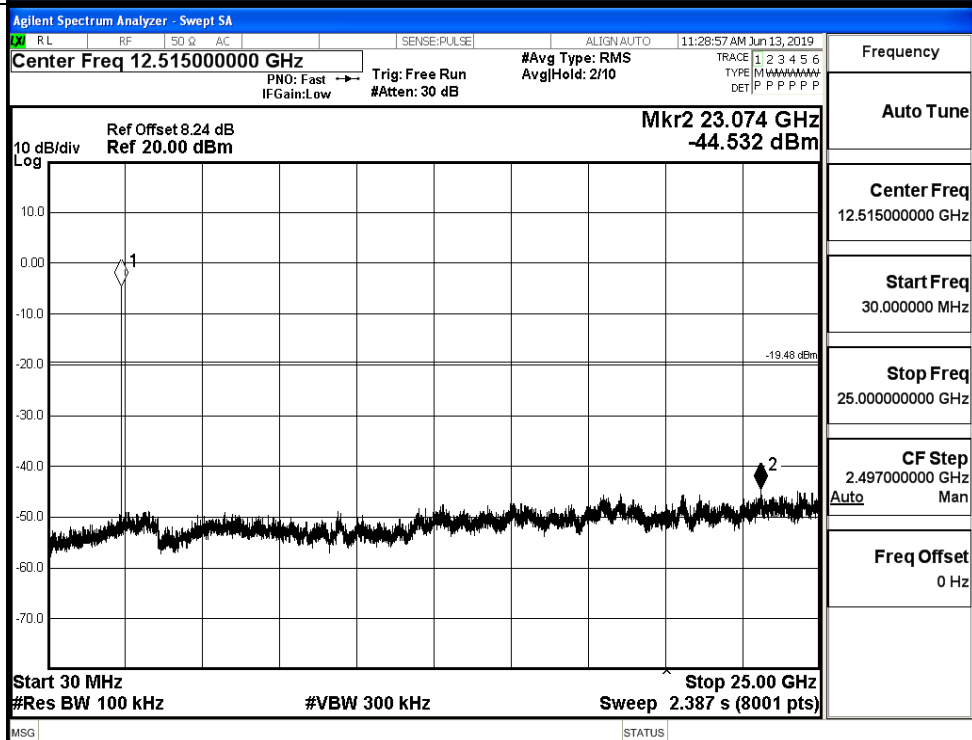


8DPSK_LCH_Graphs

Pref

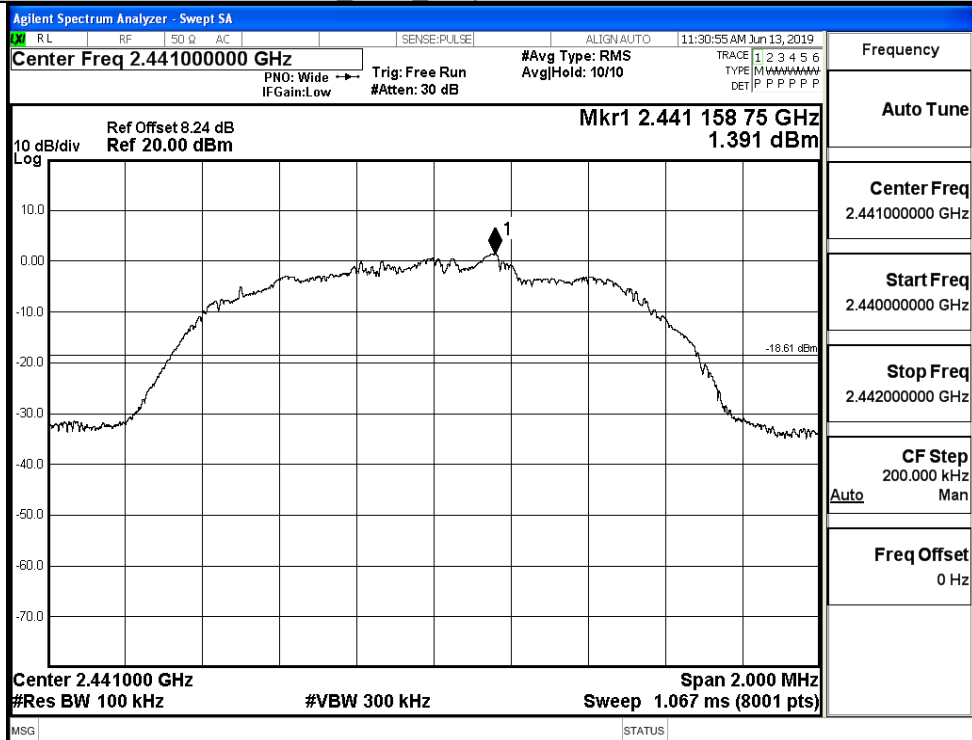


Puw

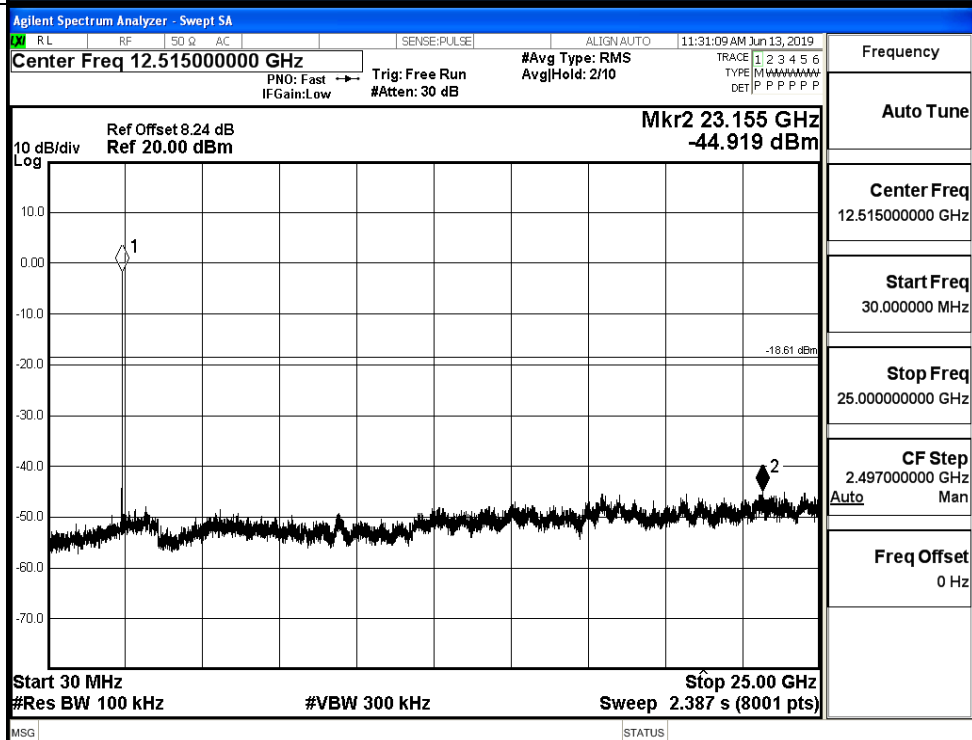


8DPSK_MCH_Graphs

Pref

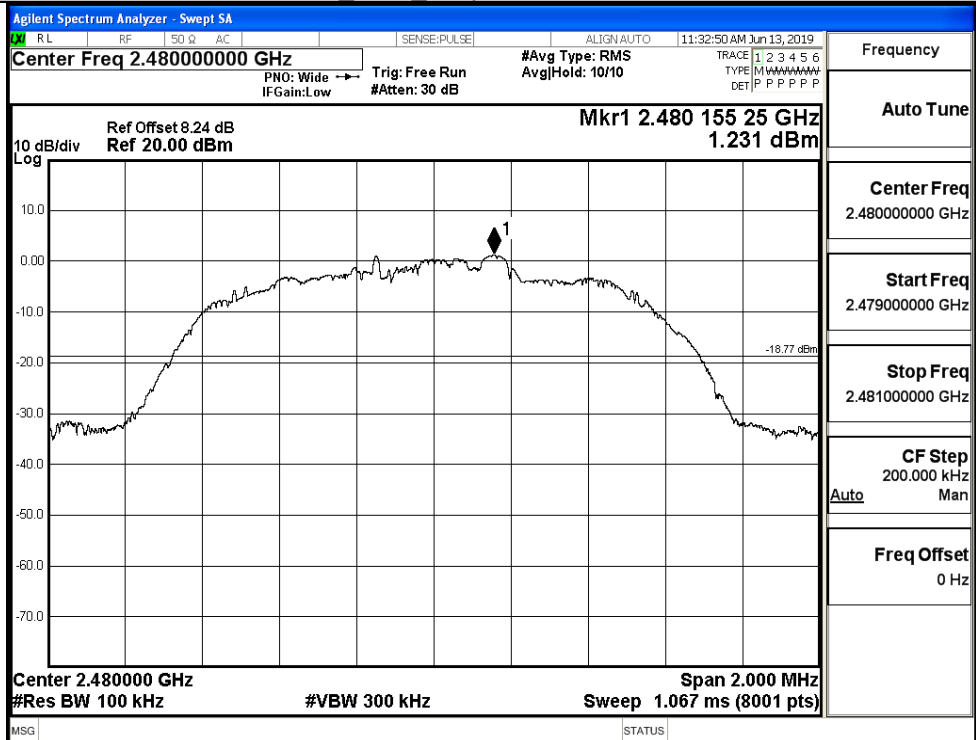


Puw

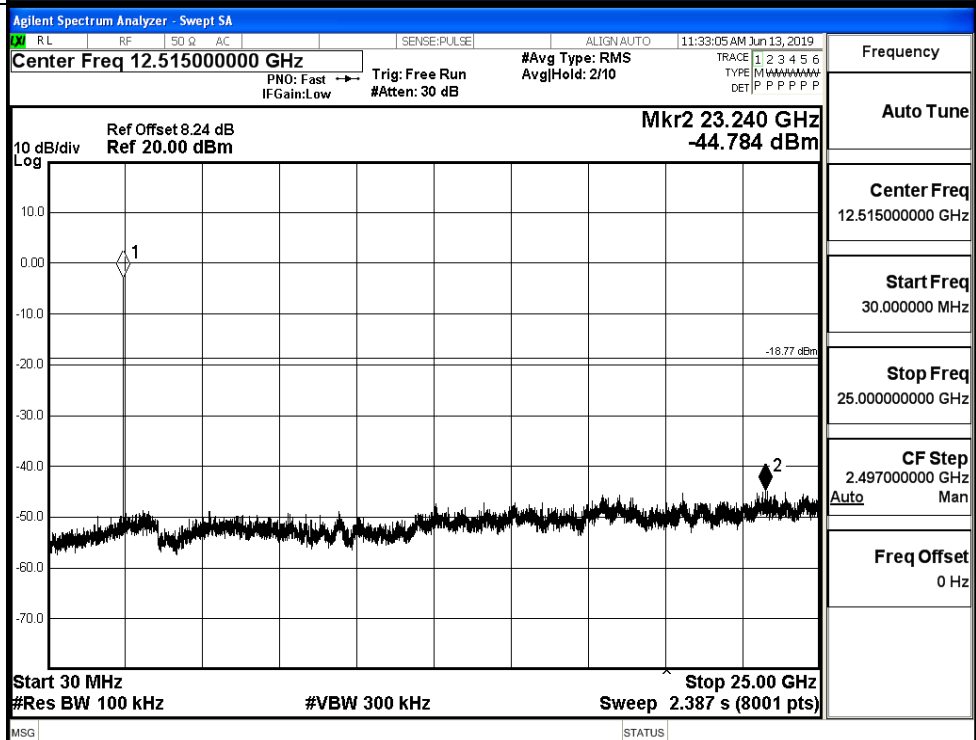


8DPSK_HCH_Graphs

Pref



Puw

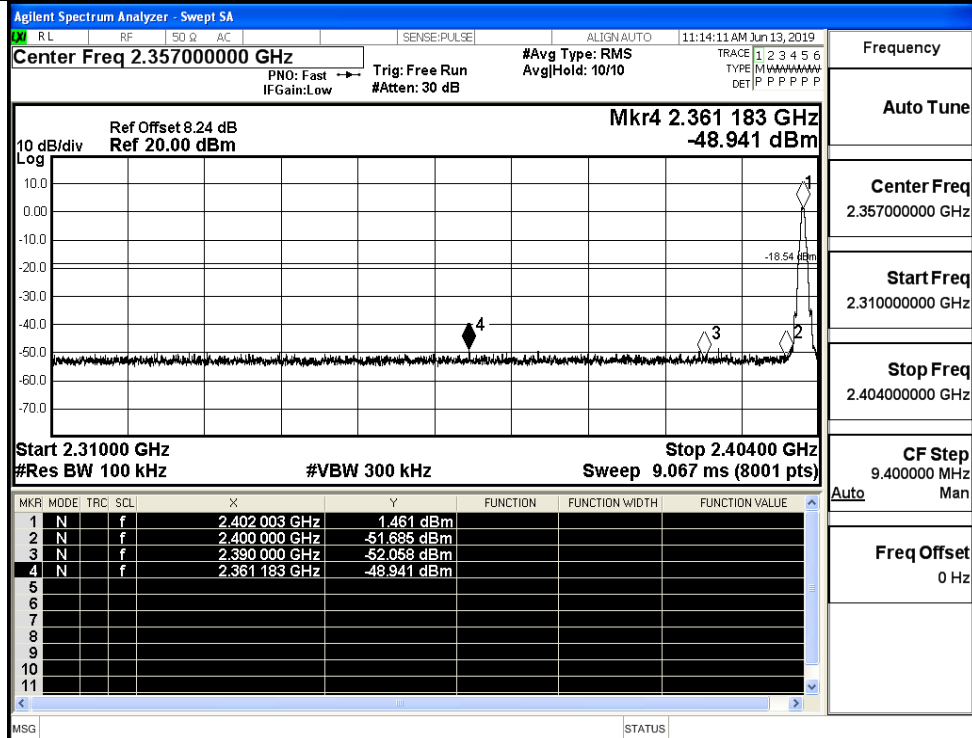


A.7 Band-edge for RF Conducted Emissions

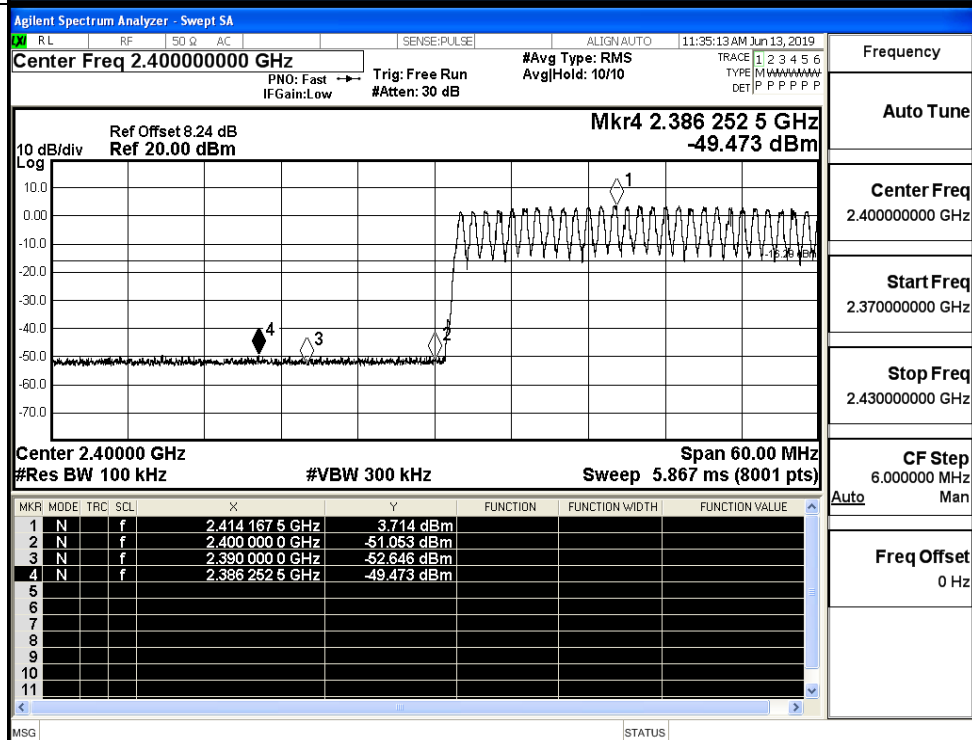
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	1.461	Off	-48.941	-18.54	PASS
			3.714	On	-49.473	-16.29	PASS
	HCH	2480	2.129	Off	-49.117	-17.87	PASS
			4.259	On	-49.271	-15.74	PASS
$\pi/4$ DQPSK	LCH	2402	-1.499	Off	-49.094	-21.5	PASS
			2.295	On	-48.548	-17.71	PASS
	HCH	2480	1.183	Off	-48.905	-18.82	PASS
			2.745	On	-48.705	-17.26	PASS
8DPSK	LCH	2402	-0.127	Off	-48.917	-20.13	PASS
			2.067	On	-48.430	-17.93	PASS
	HCH	2480	1.307	Off	-50.005	-18.69	PASS
			2.336	On	-48.773	-17.66	PASS

Test Graphs

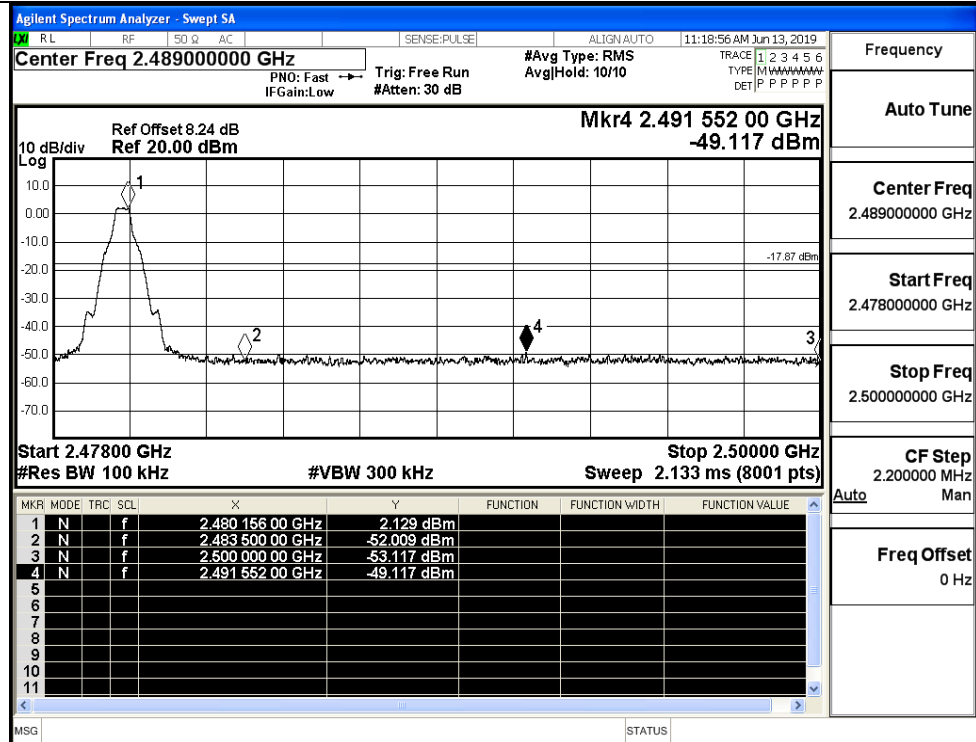
GFSK/LCH/No Hop



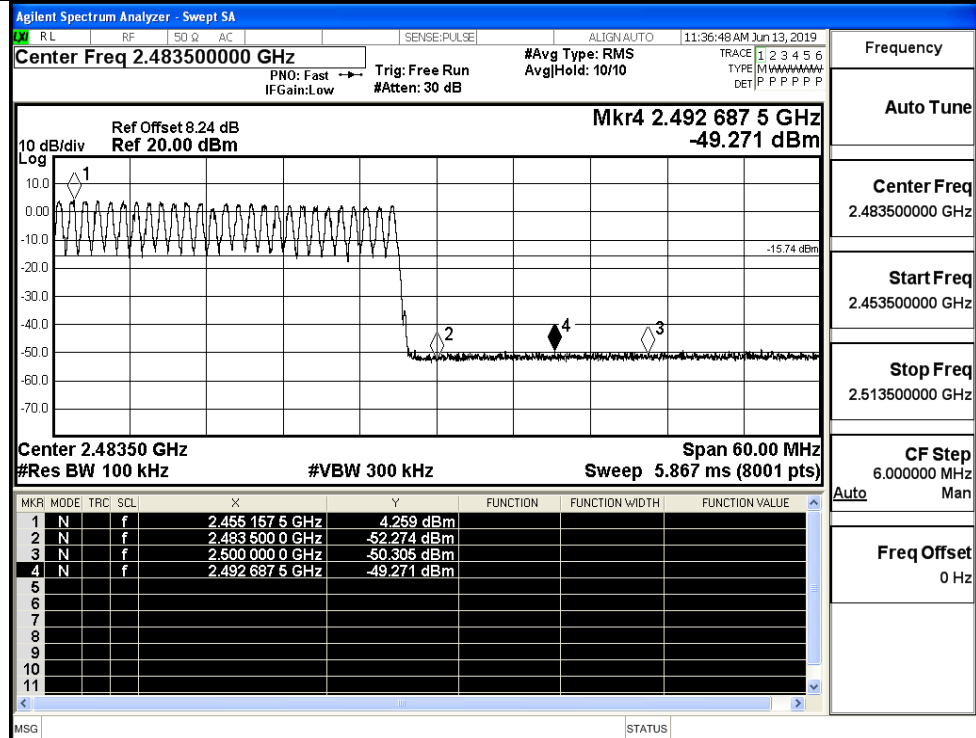
GFSK/LCH/Hop



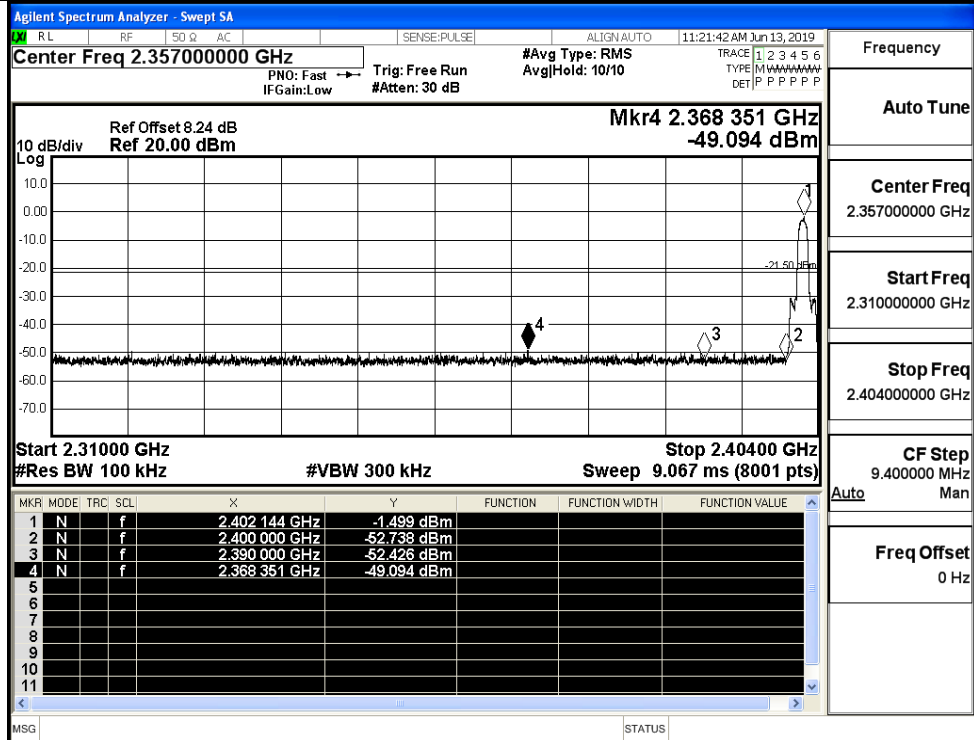
GFSK/HCH/No Hop



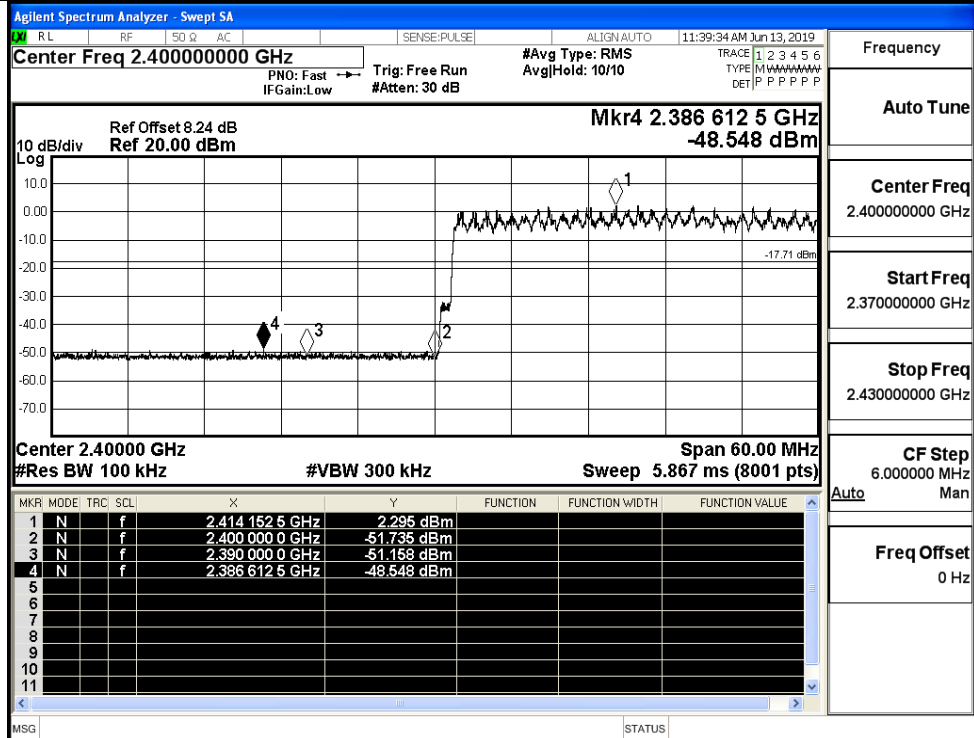
GFSK/HCH/Hop



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



$\pi/4$ DQPSK/LCH/Hop



Agilent Spectrum Analyzer - Swept SA

RL RF 50 Q AC SENSE:PULSE ALIGN AUTO 11:25:52 AM Jun 13, 2019

Center Freq 2.489000000 GHz PNO: Fast Trg: Free Run #Avg Type: RMS AvgHld: 10/10 TRACE 1 2 3 4 5 6 TYPE M W I A V F DET P P P P P P IF Gain: Low #Atten: 30 dB

Ref Offset 8.24 dB Ref 20.00 dBm Mkr4 2.494 959 25 GHz -48.905 dBm

10 dB/div Log

Start 2.47800 GHz Stop 2.50000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.133 ms (8001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N		f	2.480 156 00 GHz	1.183 dBm			
2	N		f	2.483 500 00 GHz	-52.128 dBm			
3	N		f	2.500 000 00 GHz	-53.189 dBm			
4	N		f	2.494 959 25 GHz	-48.905 dBm			
5								
6								
7								
8								
9								
10								
11								

MSG STATUS

Frequency Auto Tune Center Freq 2.489000000 GHz Start Freq 2.478000000 GHz Stop Freq 2.500000000 GHz CF Step 2.200000 MHz Man Freq Offset 0 Hz

Agilent Spectrum Analyzer - Swept SA

RL RF 50 Ω AC SENSE/PULSE ALIGN AUTO 11:41:36 AM Jun 13, 2019

Center Freq 2.48350000 GHz #Avg Type: RMS Avg/Hold: 10/10
 PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB

TRACE 1 2 3 4 5 6 TYPE M W A V I N T E R DET P P P P P P

Mkr4 2.493 722 5 GHz -48.705 dBm

Ref Offset 8.24 dB Ref 20.00 dBm

FREQ	PWR	SF	RFLX	TOTL	REFL	LOSS	UNIT
2.48350000	-17.26	dBm					
2.49372250	-48.705	dBm					

Center 2.48350 GHz Span 60.00 MHz
#Res BW 100 kHz Sweep 5.867 ms (8001 pts)
#VBW 300 kHz

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	f		2.455 840 0 GHz	2.745 dBm			
2	N	f		2.483 500 0 GHz	-50.635 dBm			
3	N	f		2.500 000 0 GHz	-51.074 dBm			
4	N	f		2.493 722 5 GHz	-48.705 dBm			
5								
6								
7								
8								
9								
10								
11								

Frequency

Auto Tune

Center Freq
2.483500000 GHz

Start Freq
2.453500000 GHz

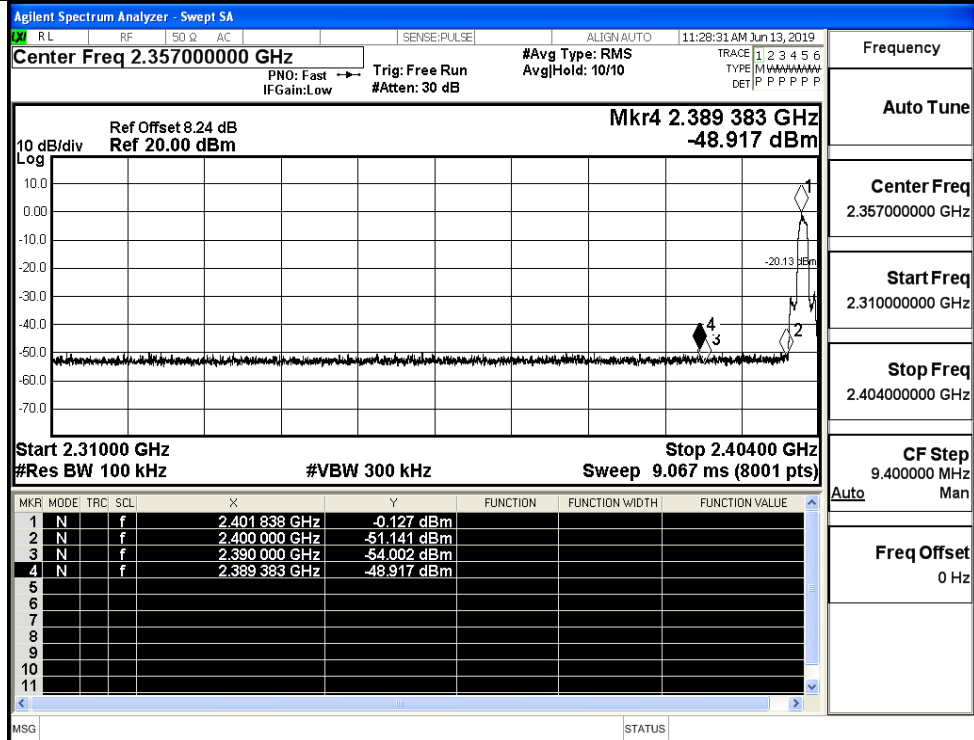
Stop Freq
2.513500000 GHz

CF Step
6.000000 MHz

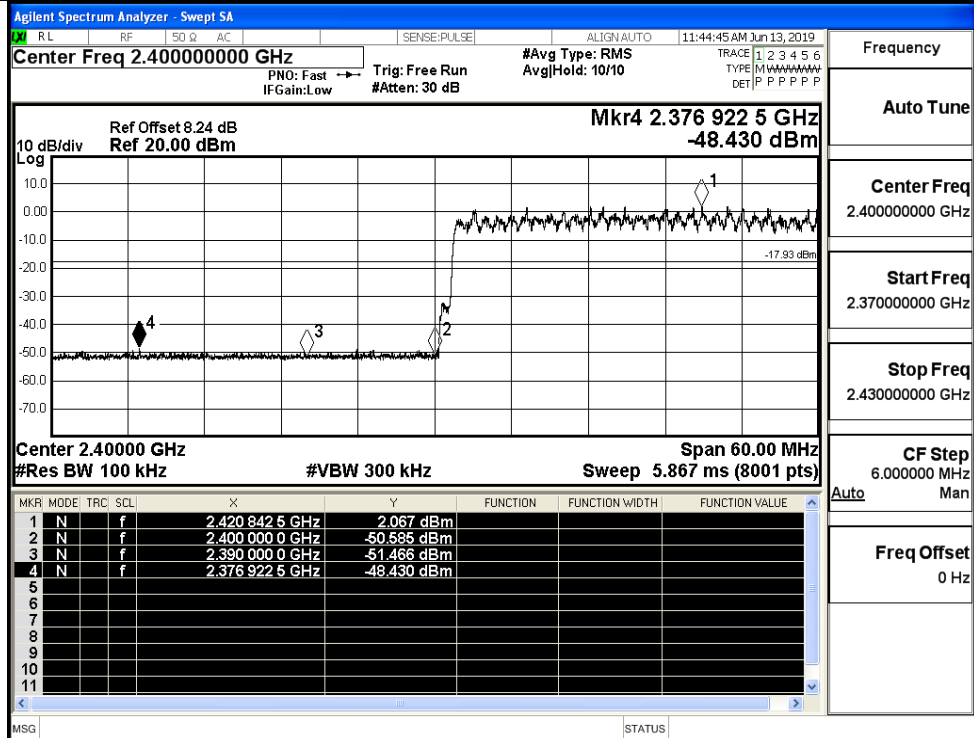
Auto Man

Freq Offset
0 Hz

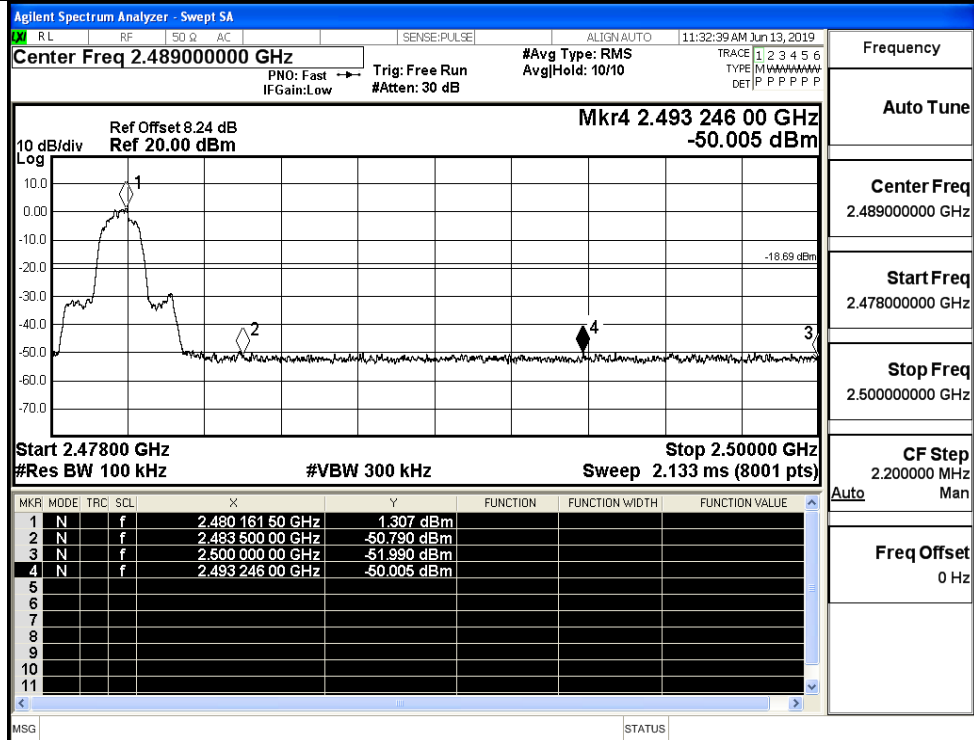
8DPSK/LCH/No Hop



8DPSK/LCH/Hop



8DPSK/HCH/No Hop



Frequency

Auto Tune

Center Freq
2.489000000 GHz

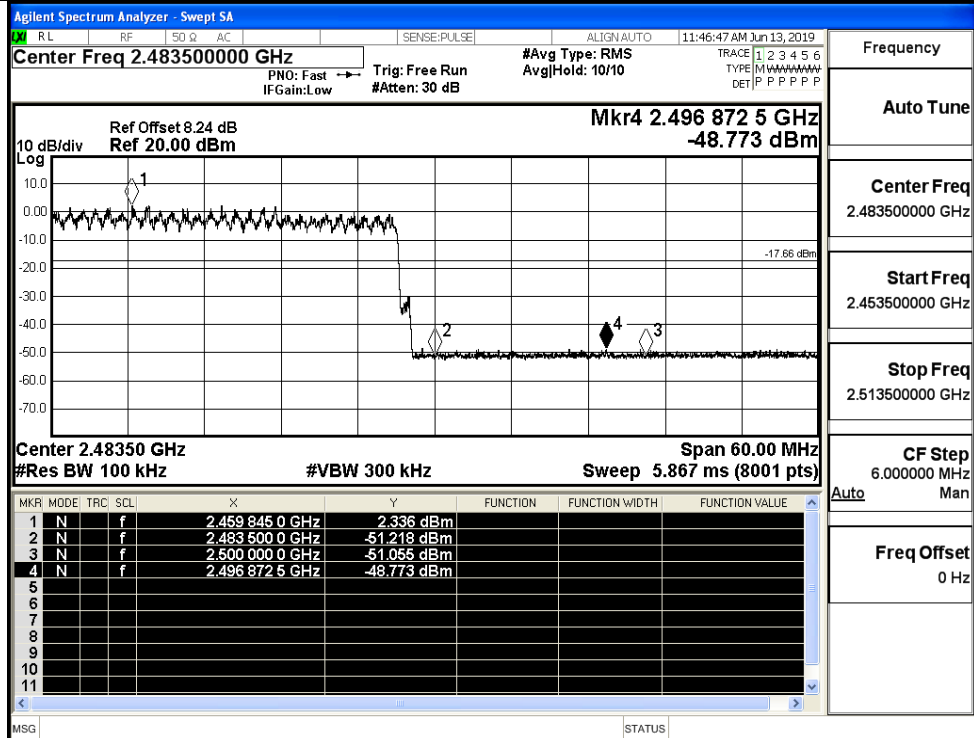
Start Freq
2.478000000 GHz

Stop Freq
2.500000000 GHz

CF Step
2.200000 MHz
Auto Man

Freq Offset
0 Hz

8DPSK/HCH/Hop



Frequency

Auto Tune

Center Freq
2.483500000 GHz

Start Freq
2.453500000 GHz

Stop Freq
2.513500000 GHz

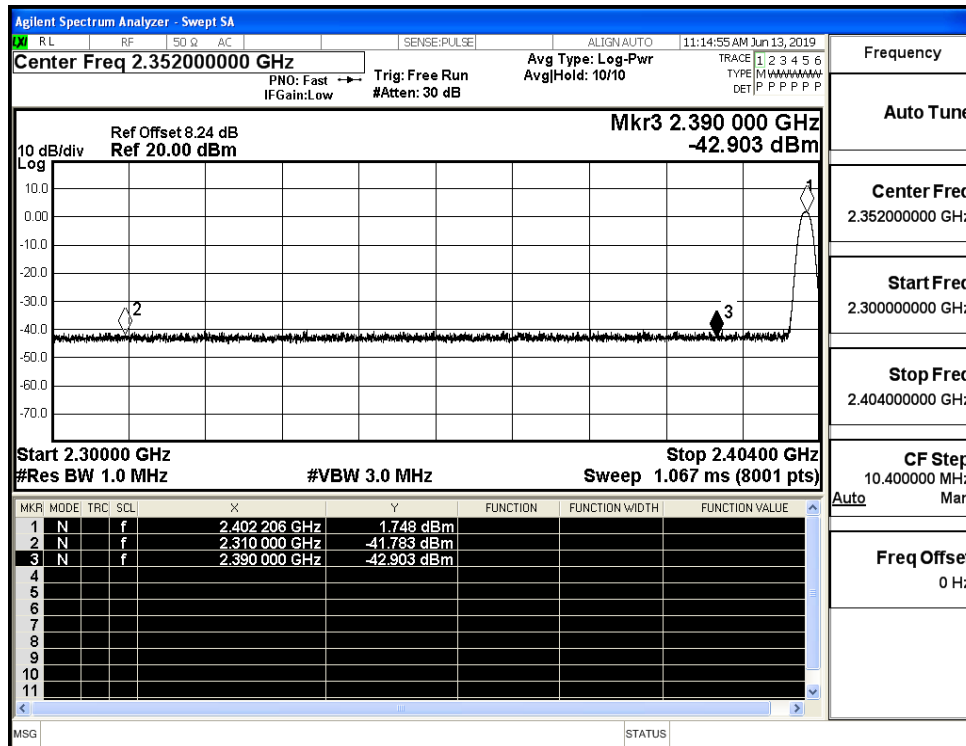
CF Step
6.000000 MHz
Auto Man

Freq Offset
0 Hz

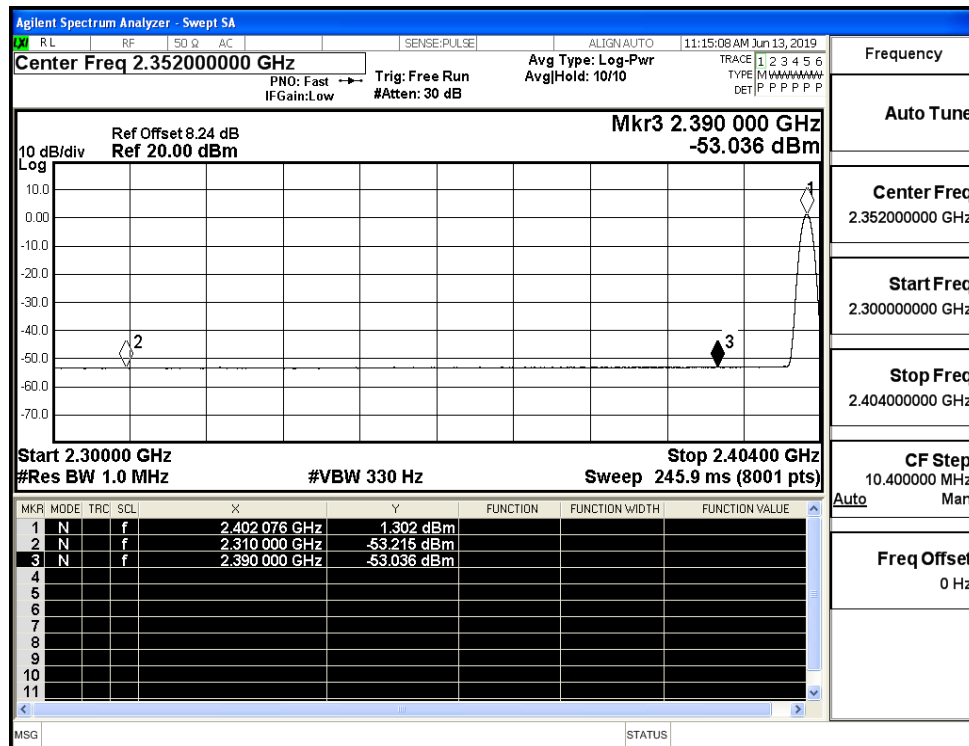
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-41.78	2.0	0	55.47	PEAK	74	PASS
	Off	2310.0	-53.22	2.0	0	44.04	AV	54	PASS
	Off	2390.0	-42.90	2.0	0	54.35	PEAK	74	PASS
	Off	2390.0	-53.04	2.0	0	44.22	AV	54	PASS
	Off	2483.5	-43.36	2.0	0	53.90	PEAK	74	PASS
	Off	2483.5	-52.66	2.0	0	44.59	AV	54	PASS
	Off	2500.0	-41.39	2.0	0	55.87	PEAK	74	PASS
	Off	2500.0	-52.63	2.0	0	44.63	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.51	2.0	0	53.75	PEAK	74	PASS
	Off	2310.0	-53.36	2.0	0	43.90	AV	54	PASS
	Off	2390.0	-42.59	2.0	0	54.67	PEAK	74	PASS
	Off	2390.0	-52.95	2.0	0	44.30	AV	54	PASS
	Off	2483.5	-42.27	2.0	0	54.99	PEAK	74	PASS
	Off	2483.5	-52.56	2.0	0	44.70	AV	54	PASS
	Off	2500.0	-43.09	2.0	0	54.17	PEAK	74	PASS
	Off	2500.0	-52.72	2.0	0	44.53	AV	54	PASS
8DPSK	Off	2310.0	-42.71	2.0	0	54.54	PEAK	74	PASS
	Off	2310.0	-53.41	2.0	0	43.85	AV	54	PASS
	Off	2390.0	-42.59	2.0	0	54.67	PEAK	74	PASS
	Off	2390.0	-53.09	2.0	0	44.17	AV	54	PASS
	Off	2483.5	-43.32	2.0	0	53.93	PEAK	74	PASS
	Off	2483.5	-52.54	2.0	0	44.72	AV	54	PASS
	Off	2500.0	-43.27	2.0	0	53.99	PEAK	74	PASS
	Off	2500.0	-52.72	2.0	0	44.53	AV	54	PASS

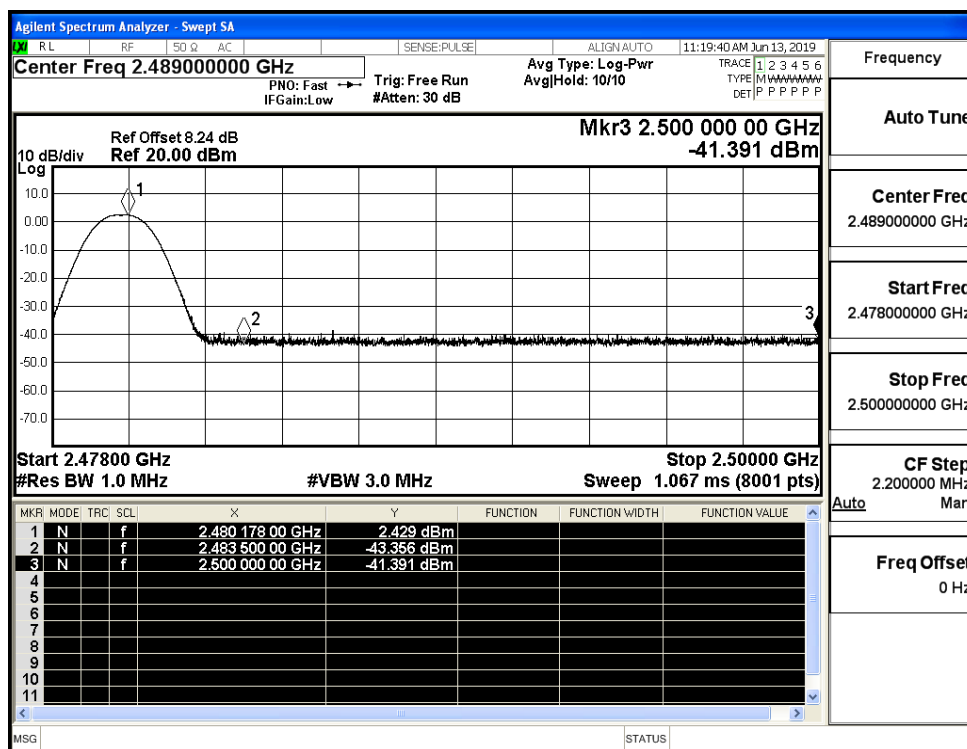
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



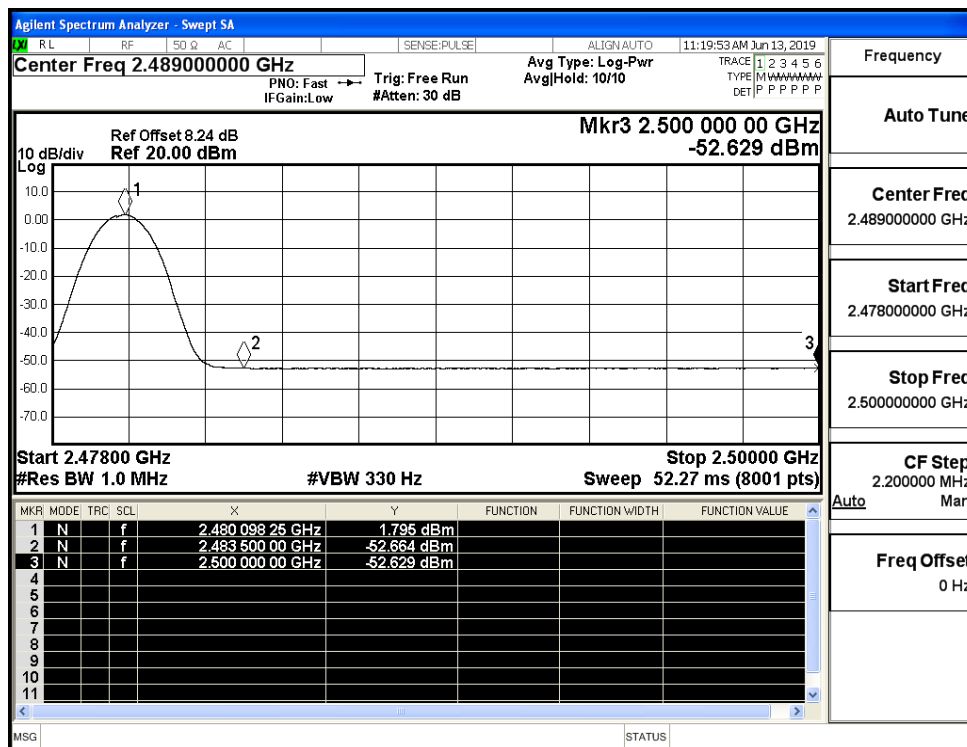
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

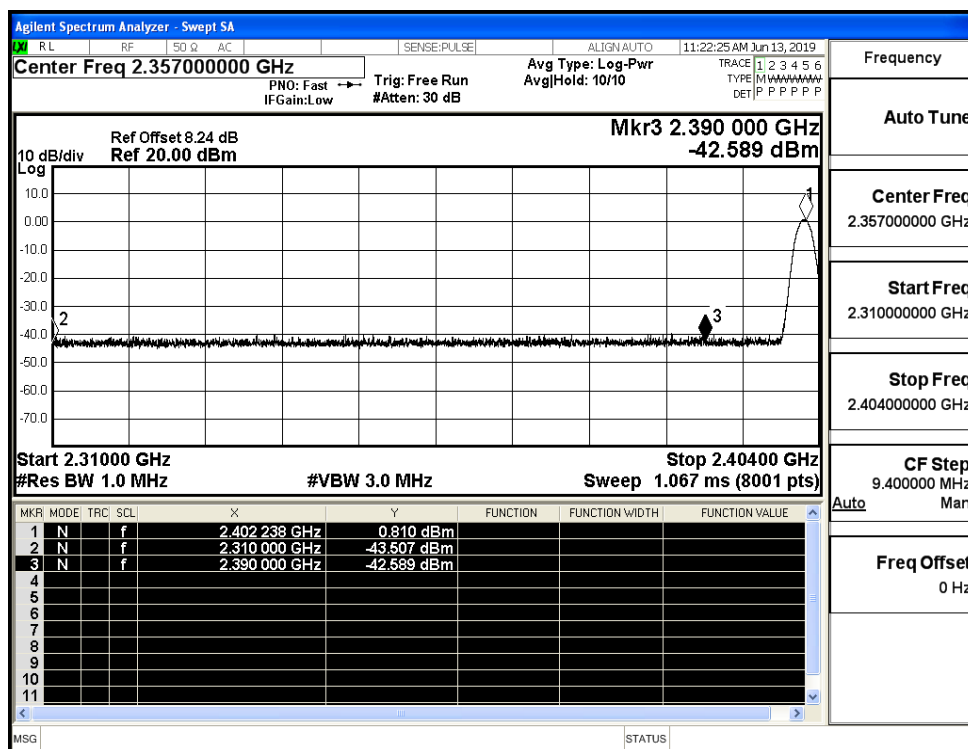
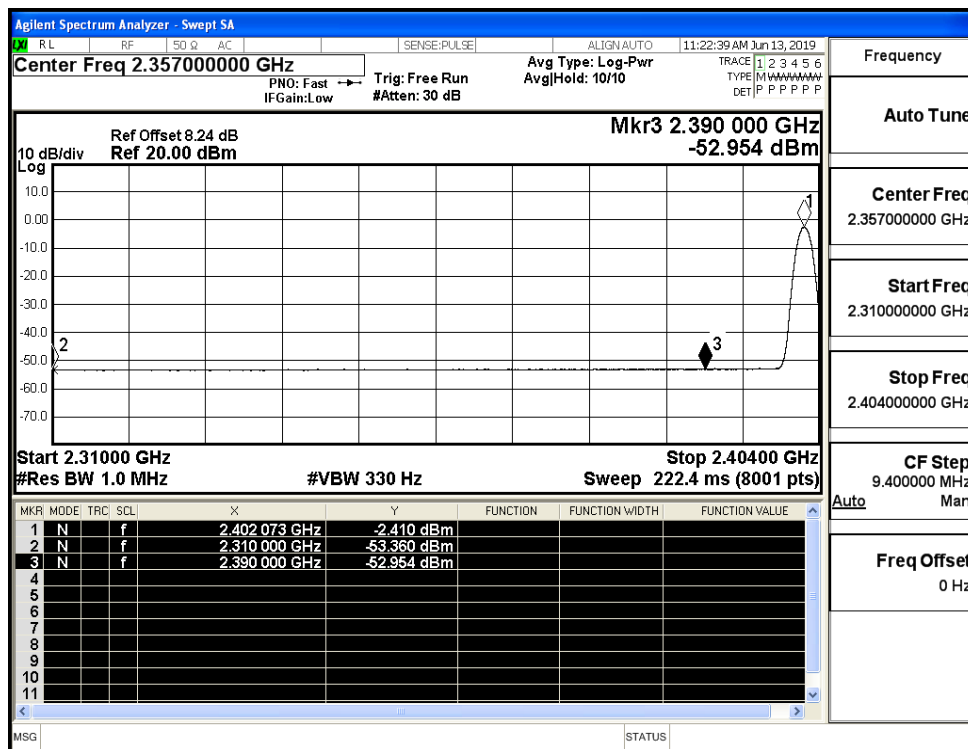


Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)

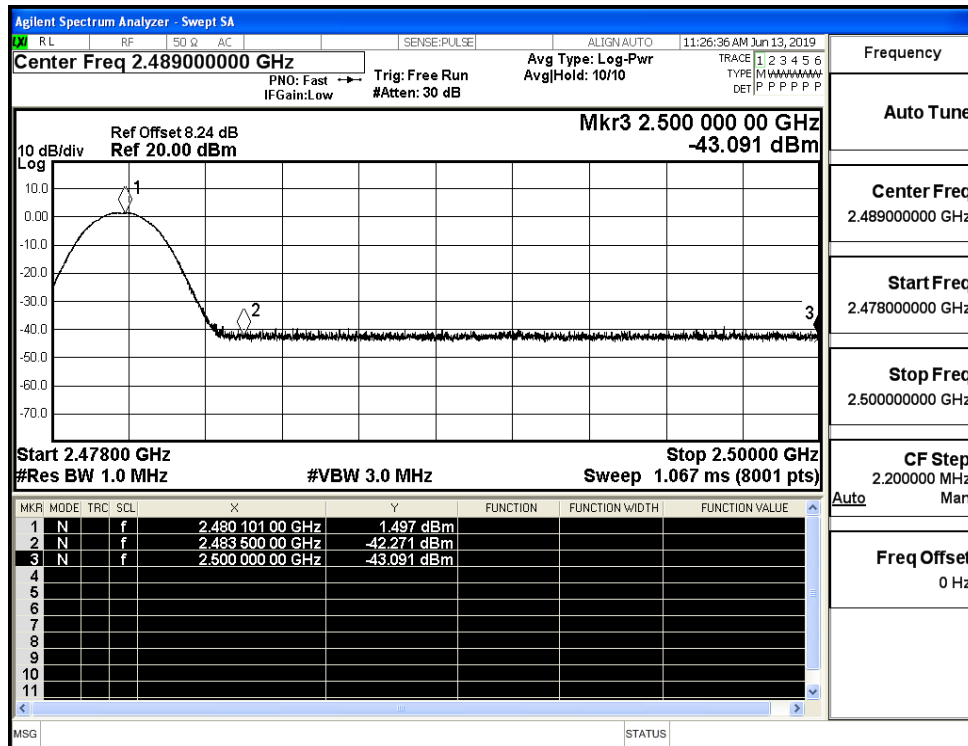


Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)

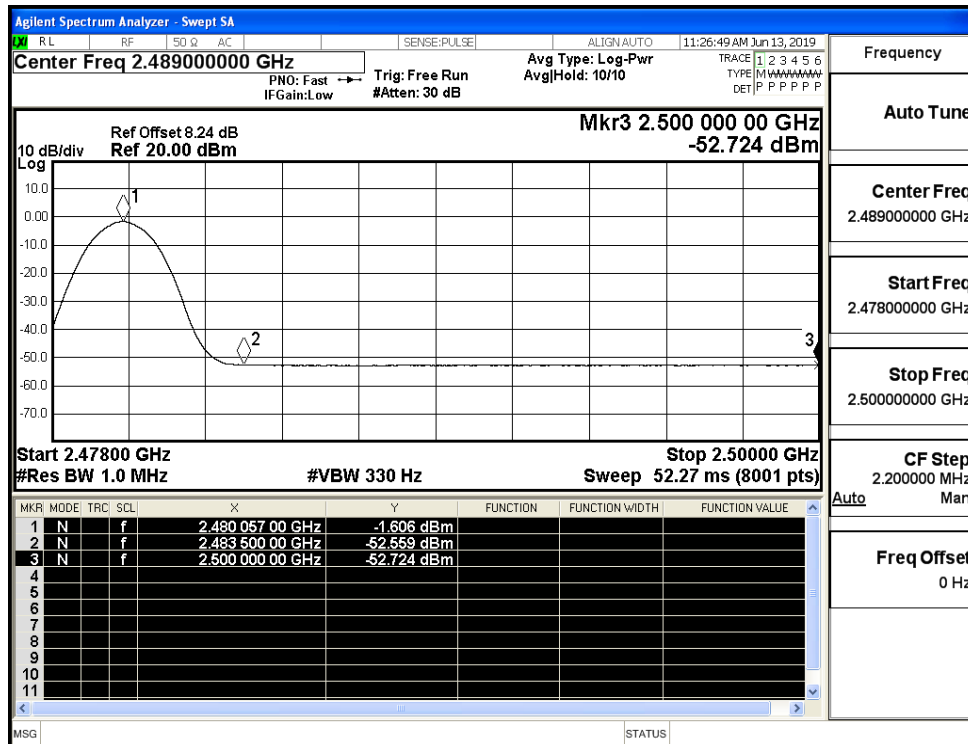


Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

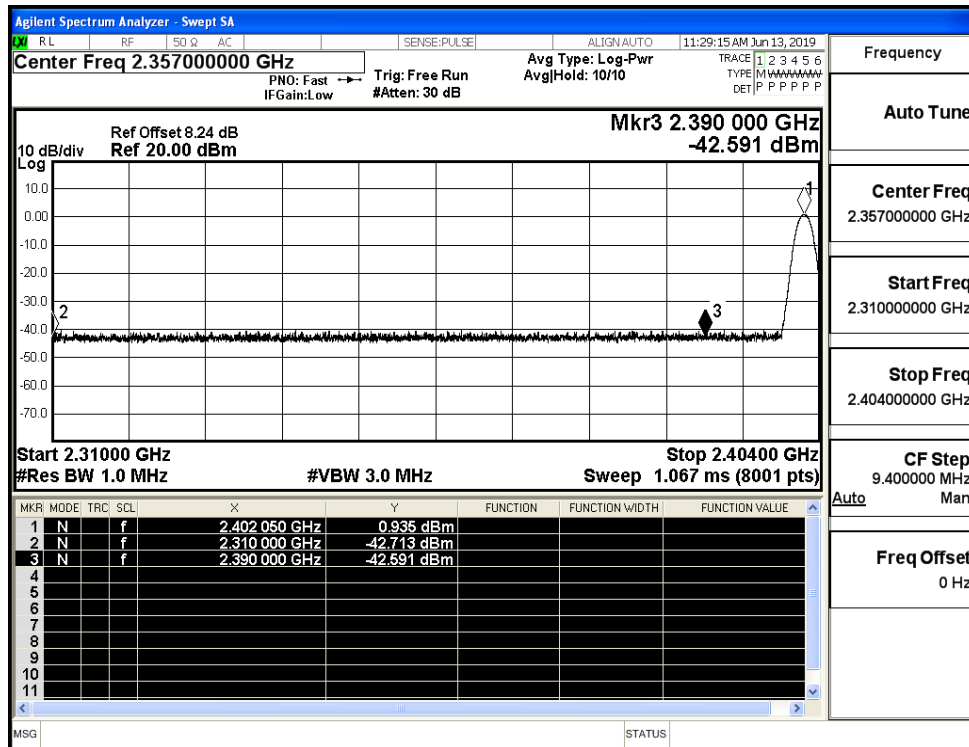
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



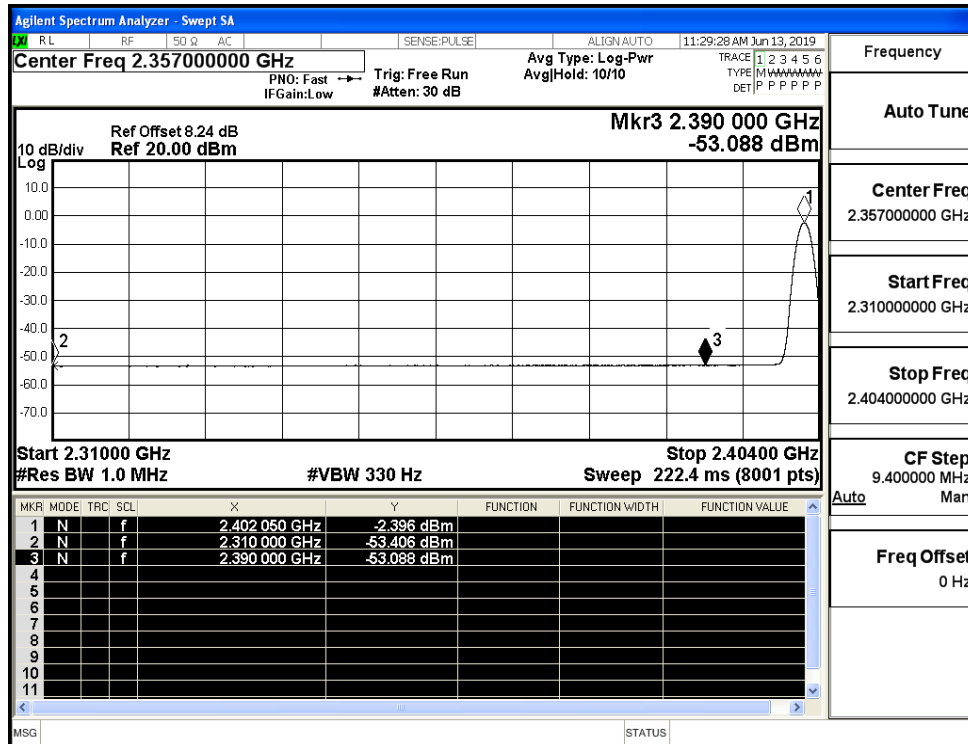
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



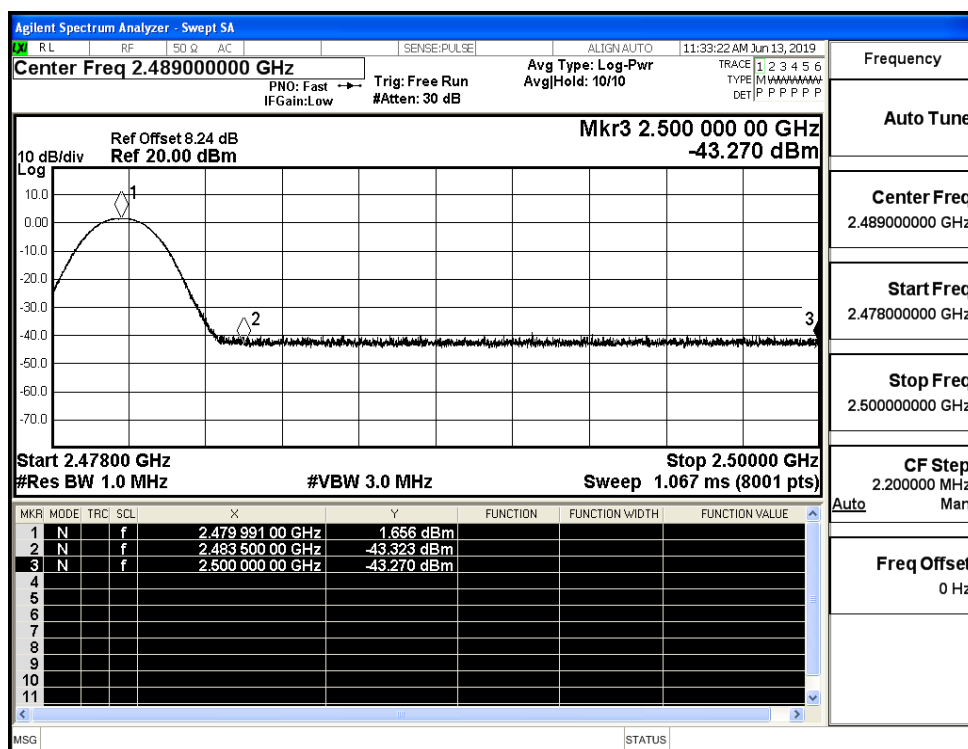
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

