

**Appendix A**  
**RF Test Data for BT V5.0(DSS) (Conducted Measurement)**  
**Product Name: Bluetooth Speaker**  
**Trade Mark: Origaudio**  
**Test Model: CHYRP**

**Environmental Conditions**

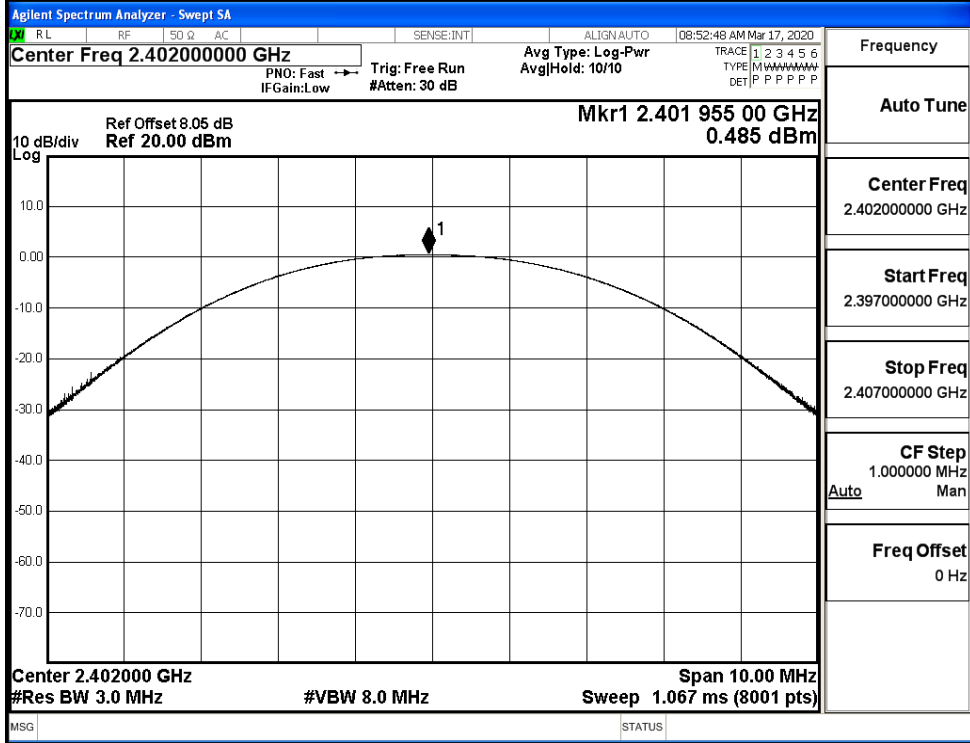
Temperature:	23.3 ° C
Relative Humidity:	53.8%
ATM Pressure:	100.0 kPa
Test Engineer:	Qu Xin
Supervised by:	Wang Chuang

**A.1 Maxmum Conducted Peak Output Power**

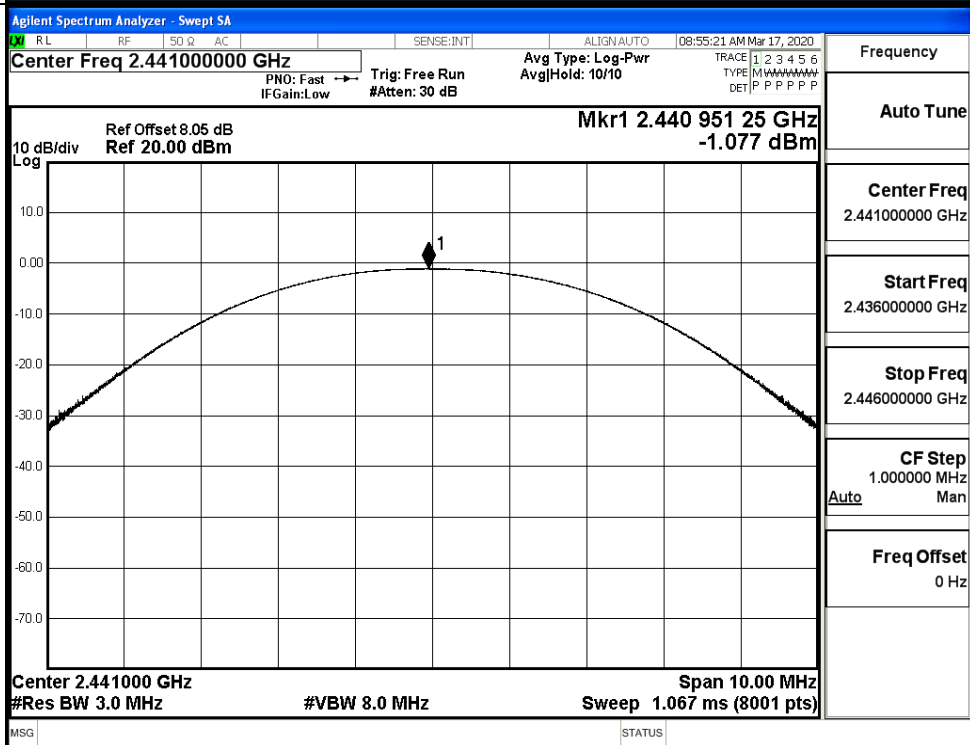
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.485	30	PASS
	MCH	-1.077	30	PASS
	HCH	-2.745	30	PASS
$\pi/4$ DQPSK	LCH	2.663	21	PASS
	MCH	1.064	21	PASS
	HCH	-0.285	21	PASS
8DPSK	LCH	0.509	21	PASS
	MCH	-0.966	21	PASS
	HCH	-2.788	21	PASS

Test Graphs

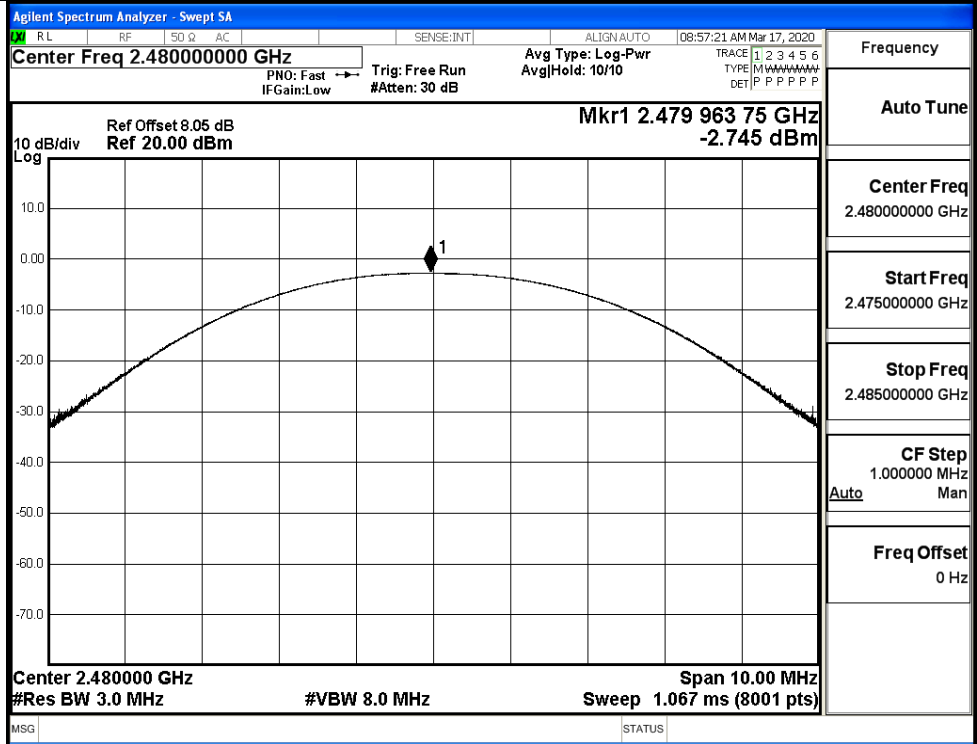
GFSK/LCH



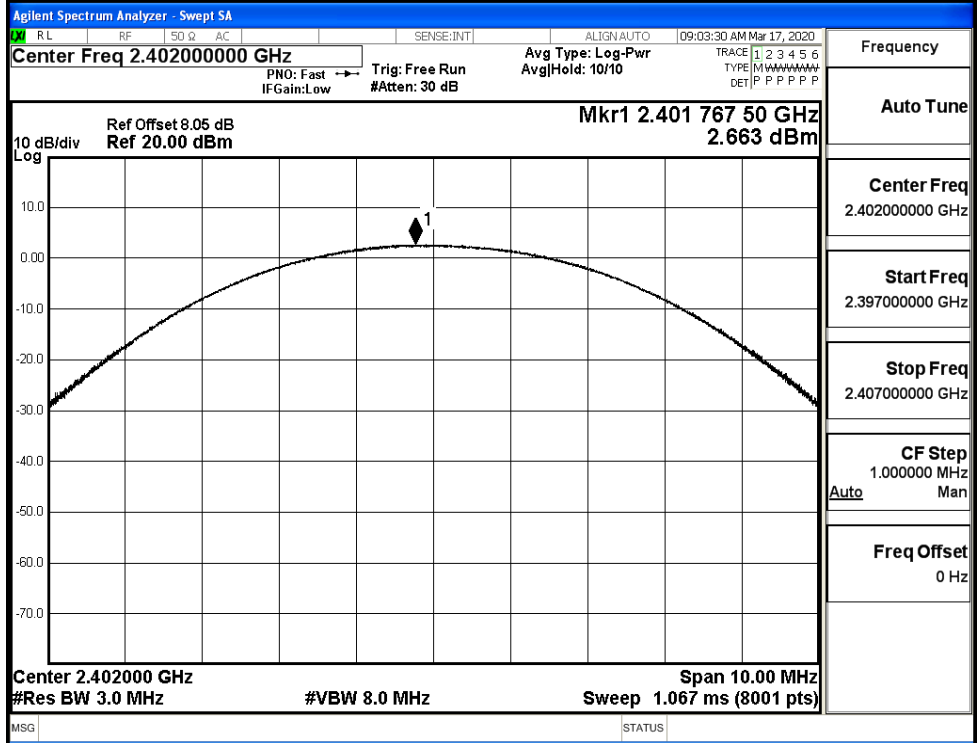
GFSK/MCH



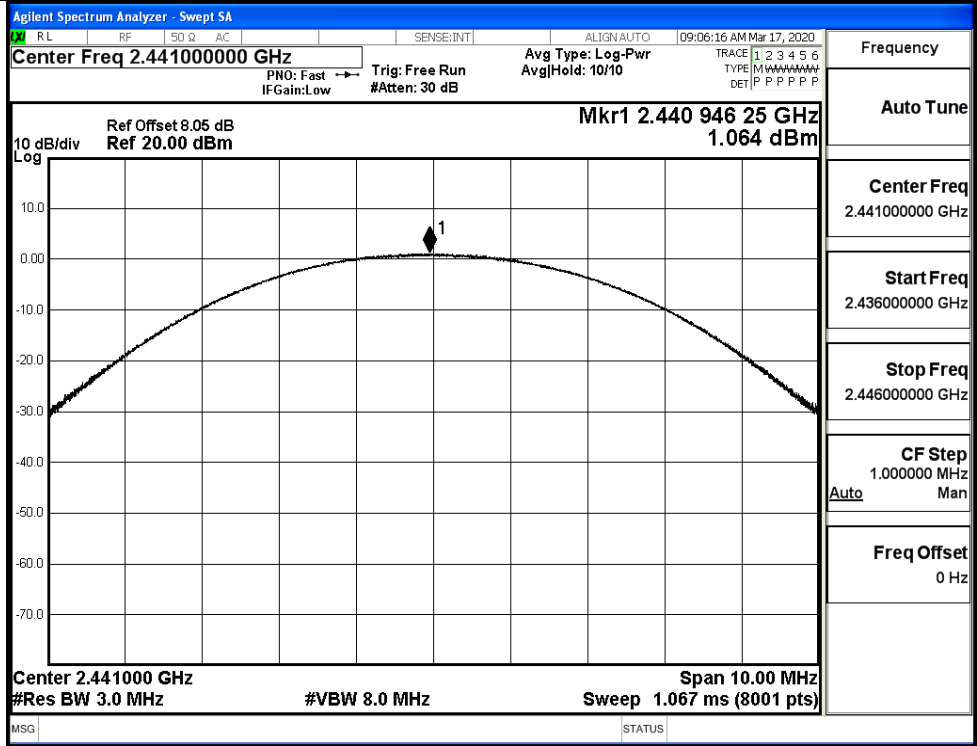
GFSK/HCH



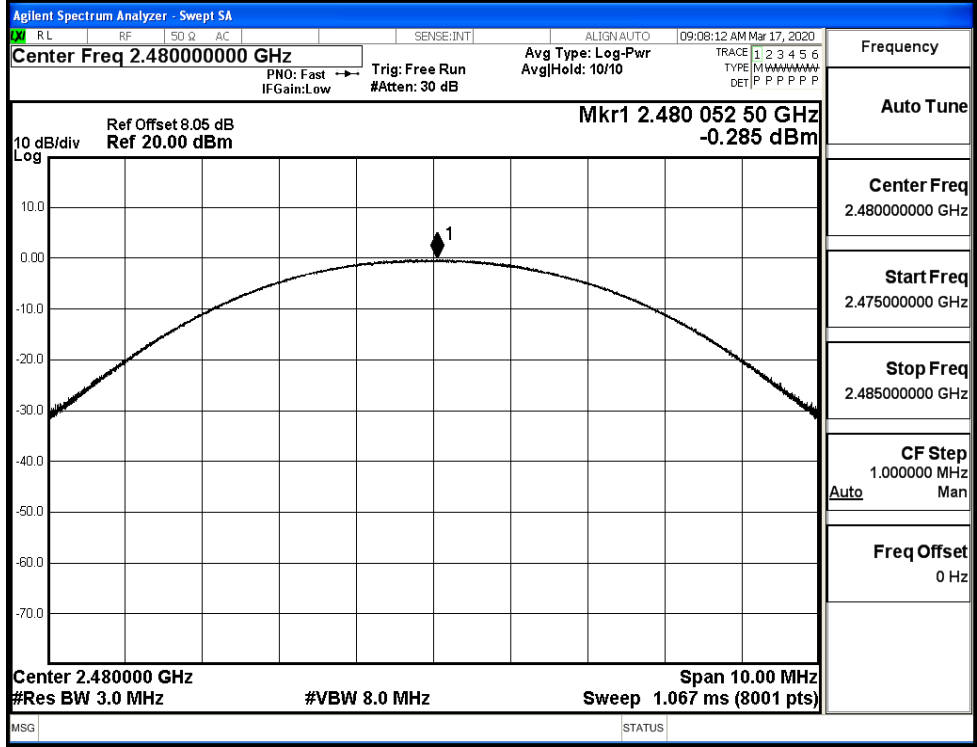
$\pi/4$ DQPSK/LCH



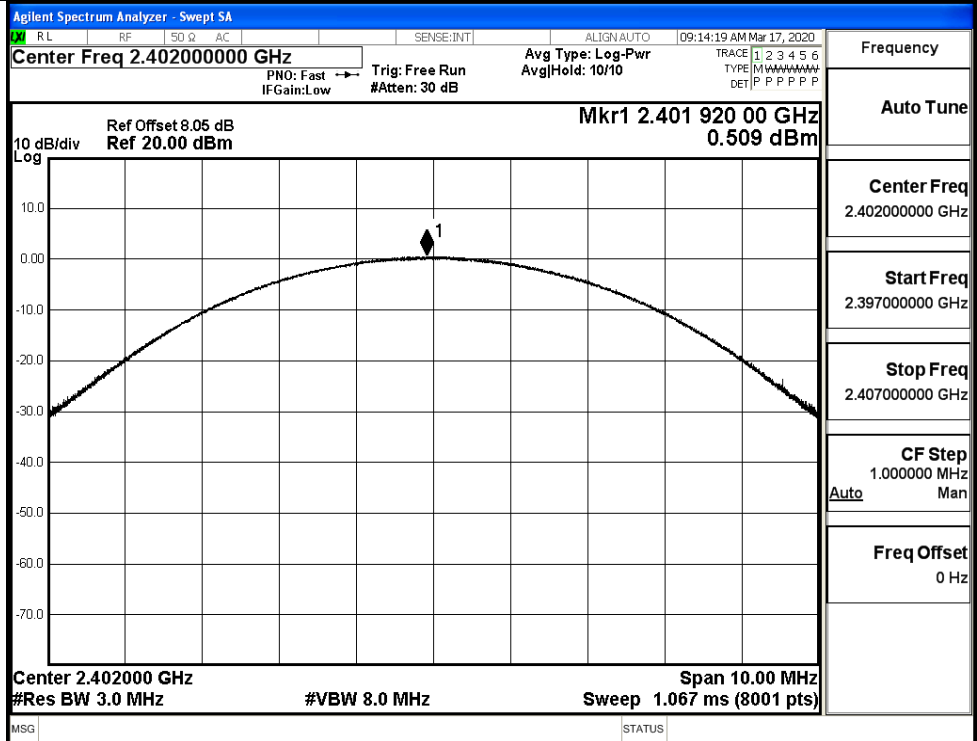
$\pi/4$ DQPSK/MCH



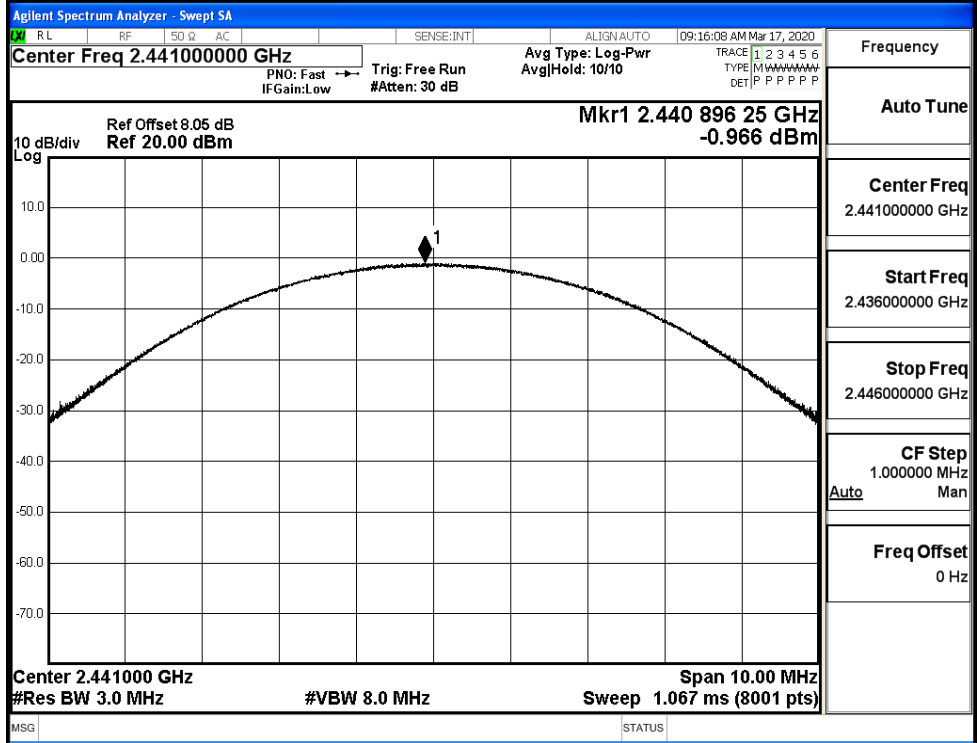
$\pi/4$ DQPSK/HCH



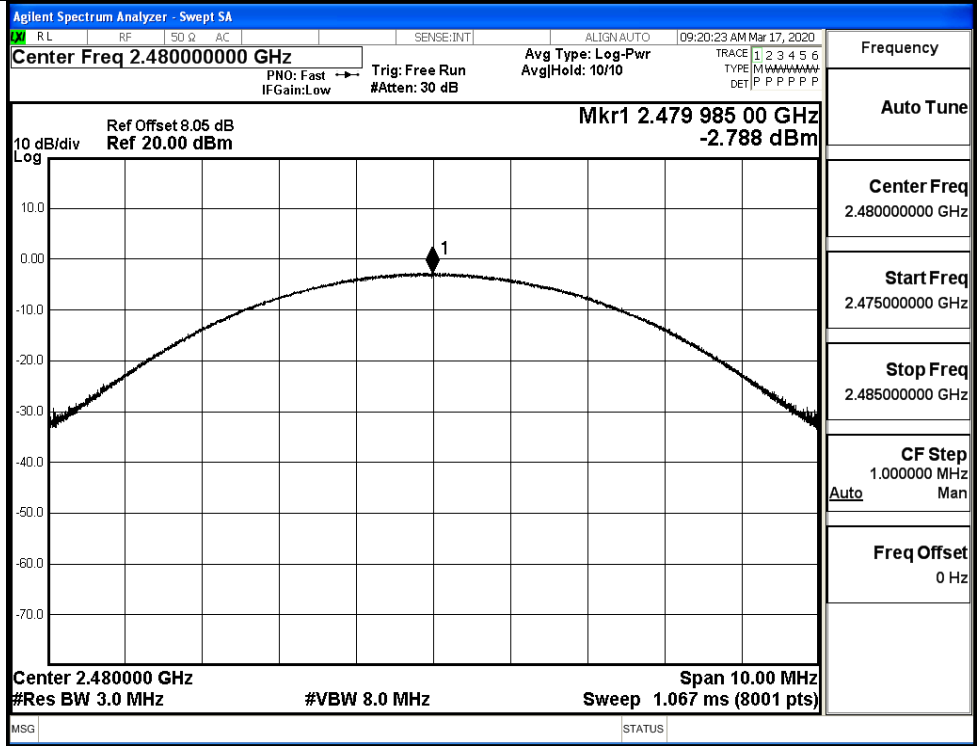
8DPSK/LCH



8DPSK/MCH

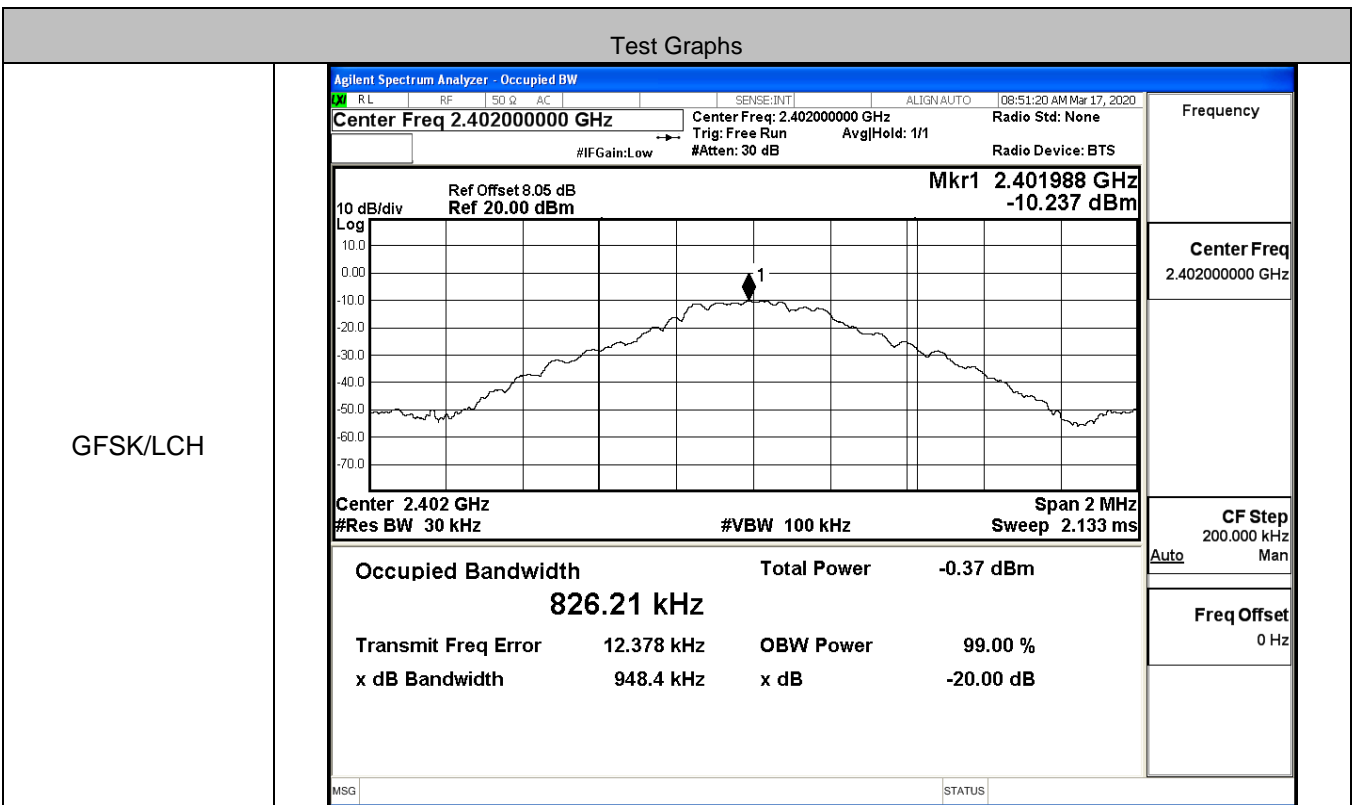


8DPSK/HCH

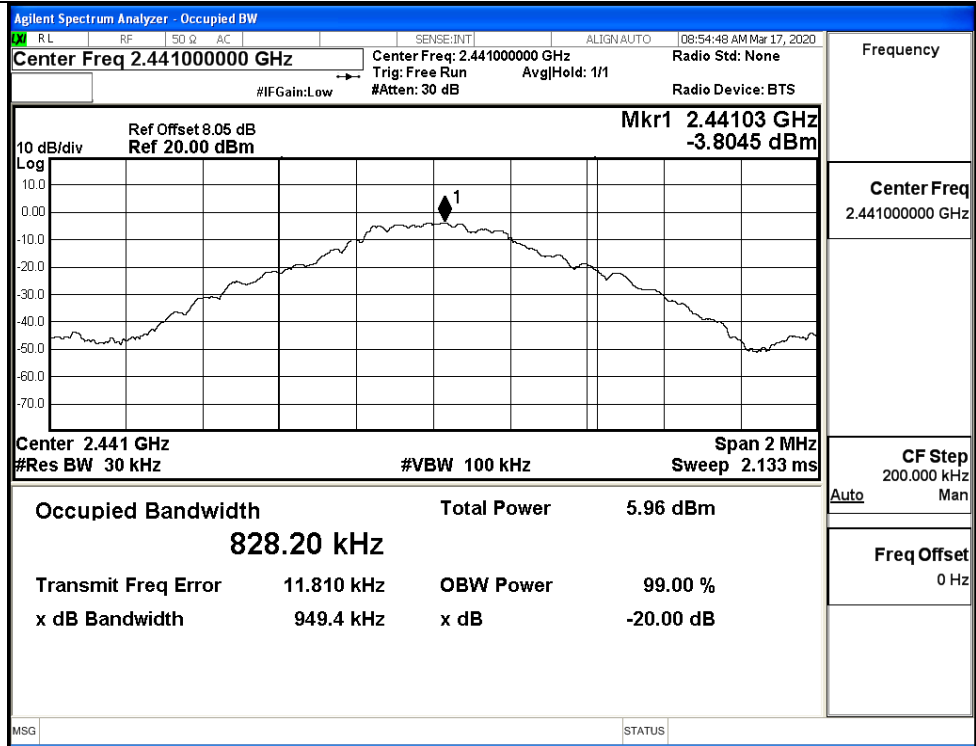


**A.2 20dB Bandwidth**

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9484	Not Specified	PASS
	MCH	0.9494	Not Specified	PASS
	HCH	0.9491	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.323	Not Specified	PASS
	MCH	1.324	Not Specified	PASS
	HCH	1.324	Not Specified	PASS
8DPSK	LCH	1.290	Not Specified	PASS
	MCH	1.294	Not Specified	PASS
	HCH	1.294	Not Specified	PASS

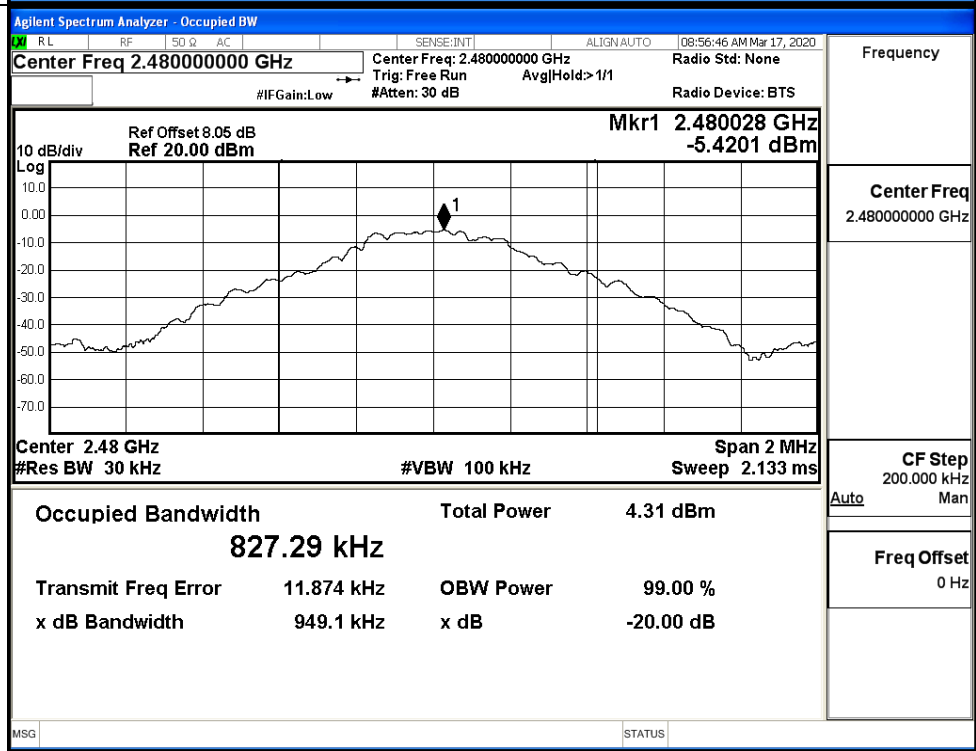


GFSK/MCH



Frequency	2.441000000 GHz
Center Freq	2.441000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

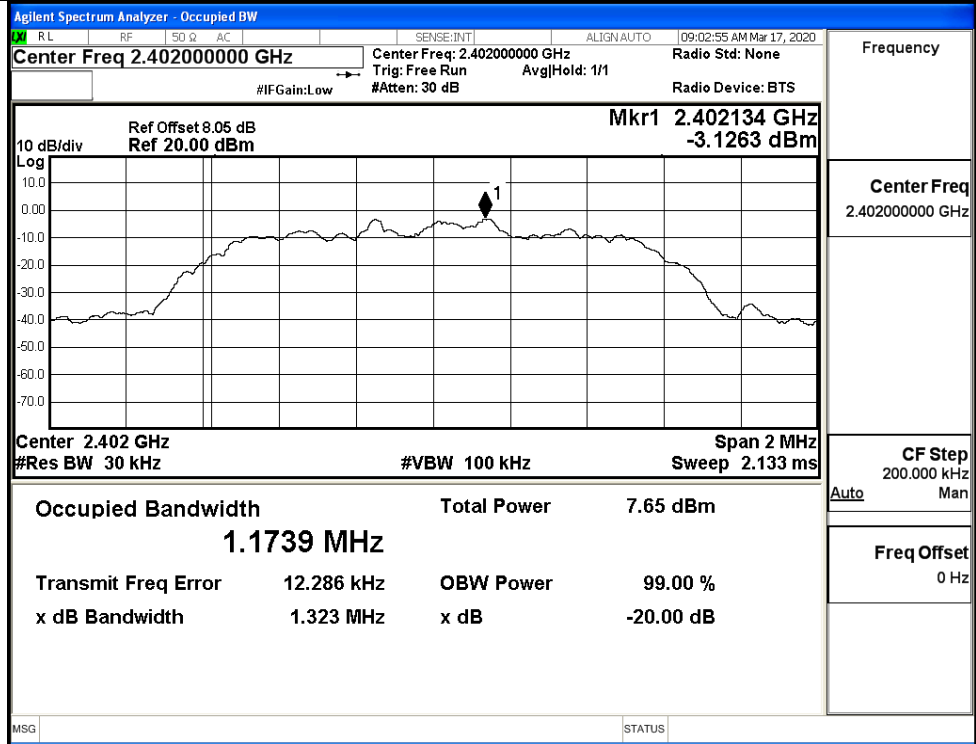
GFSK/HCH



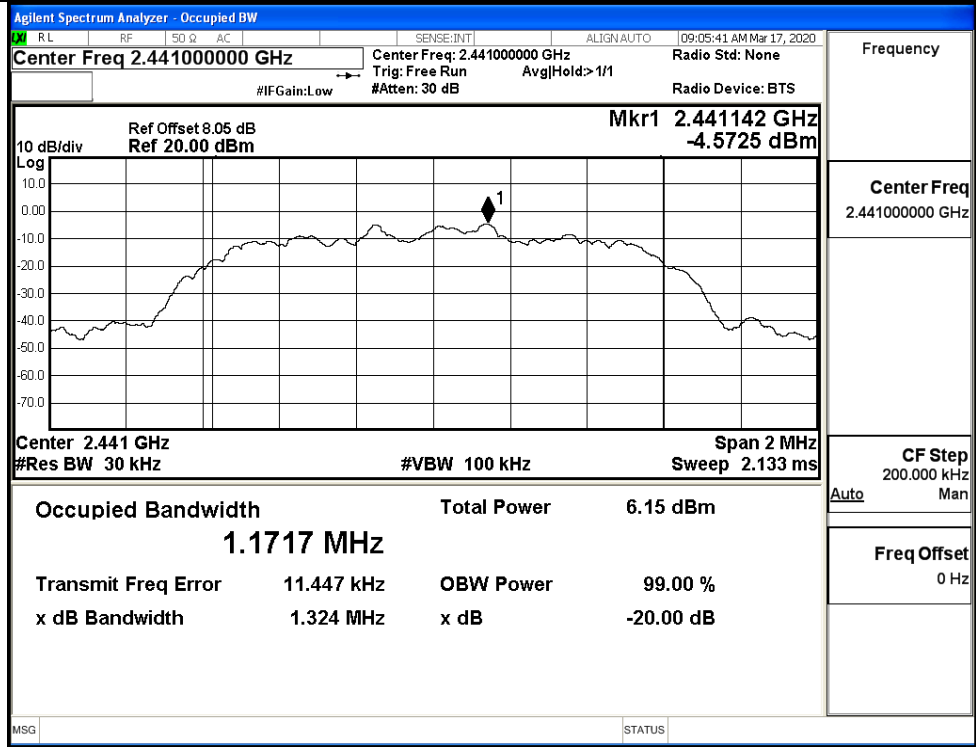
Frequency	2.480000000 GHz
Center Freq	2.480000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz



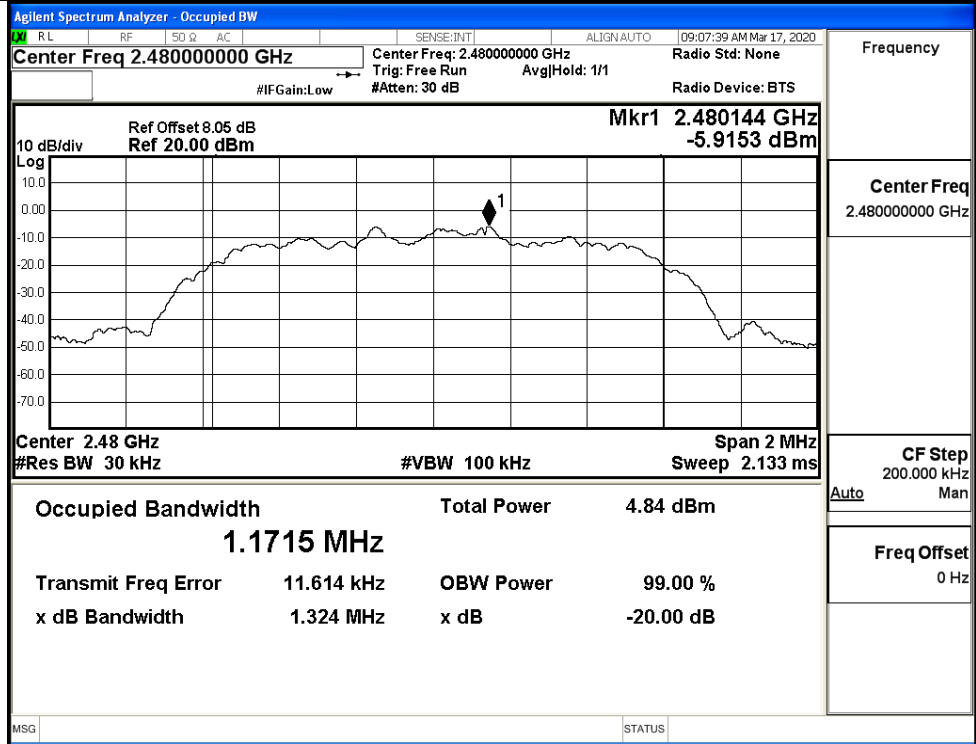
$\pi/4$ DQPSK/LCH



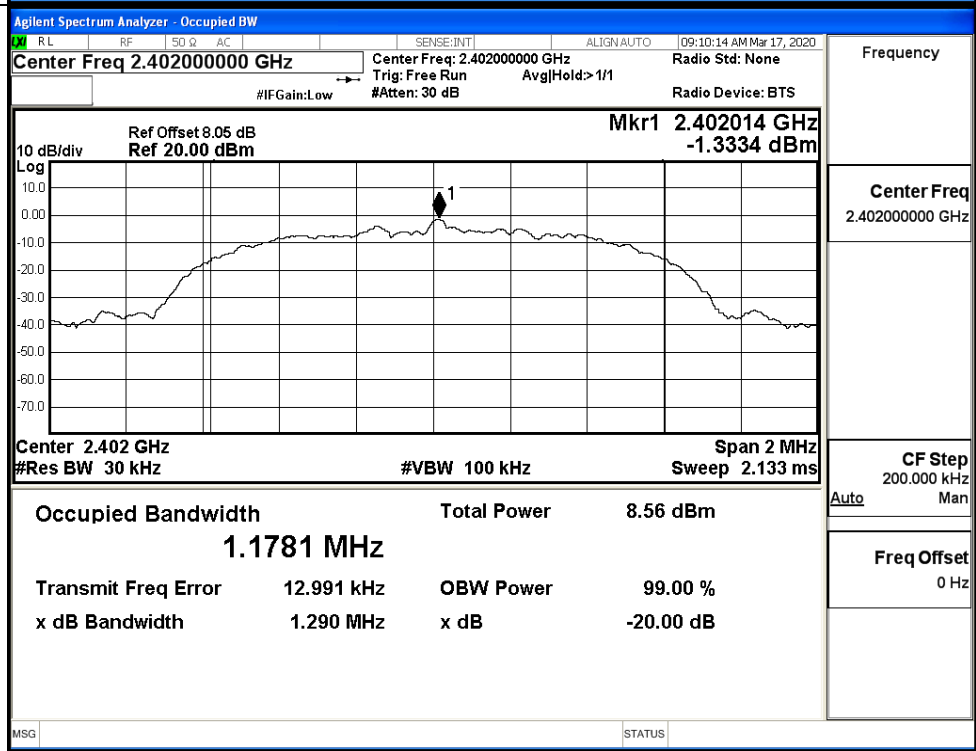
$\pi/4$ DQPSK/MCH



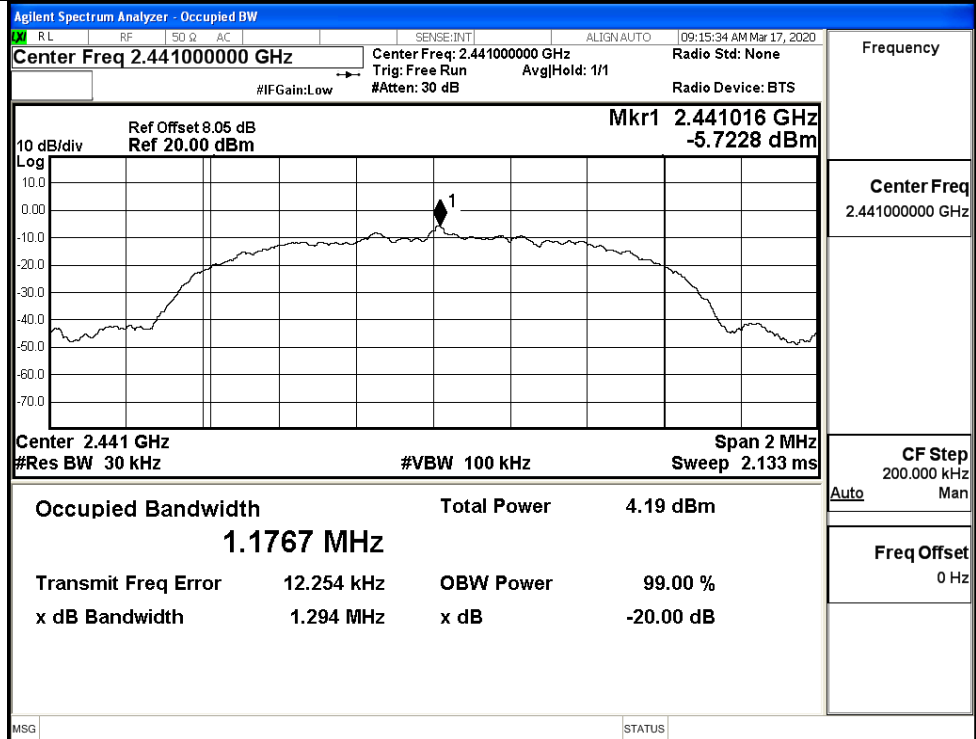
$\pi/4$ DQPSK/HCH



8DPSK/LCH

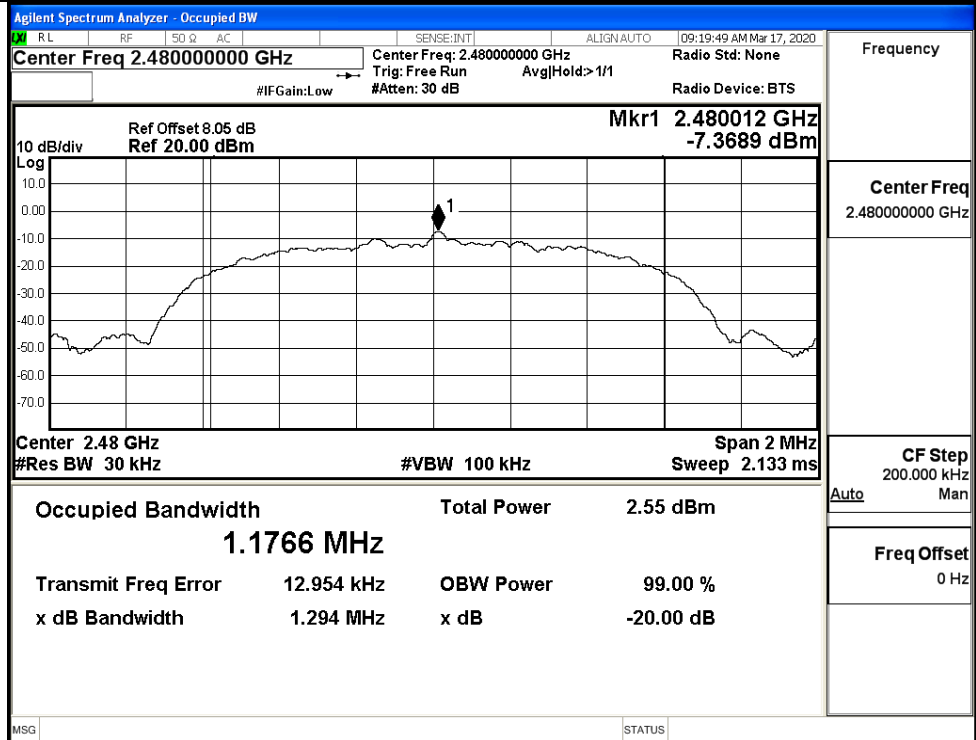


8DPSK/MCH



Frequency	2.44100000 GHz
Center Freq	2.44100000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

8DPSK/HCH



Frequency	2.48000000 GHz
Center Freq	2.48000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

### A.3 Carrier Frequency Separation

Mode	Channel	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.940	0.633	PASS
	MCH	1.194	0.633	PASS
	HCH	0.958	0.633	PASS
π/4DQPSK	LCH	1.018	0.883	PASS
	MCH	1.010	0.883	PASS
	HCH	0.912	0.883	PASS
8DPSK	LCH	1.170	0.863	PASS
	MCH	0.992	0.863	PASS
	HCH	1.066	0.863	PASS

Test Graphs

GFSK/LCH

**Agilent Spectrum Analyzer - Swept SA**

Center Freq 2.402500000 GHz

Ref Offset 8.05 dB  
Ref 20.00 dBm

ΔMkr1 939.75 kHz  
-0.189 dB

Start 2.401500 GHz  
#Res BW 100 kHz

Stop 2.403500 GHz  
#VBW 300 kHz  
Sweep 1.067 ms (8001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ2	f	(Δ)	939.75 kHz (Δ)	-0.189 dB			
2	F	f		2.40204000 GHz	-3.269 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								

Frequency

Auto Tune

Center Freq  
2.402500000 GHz

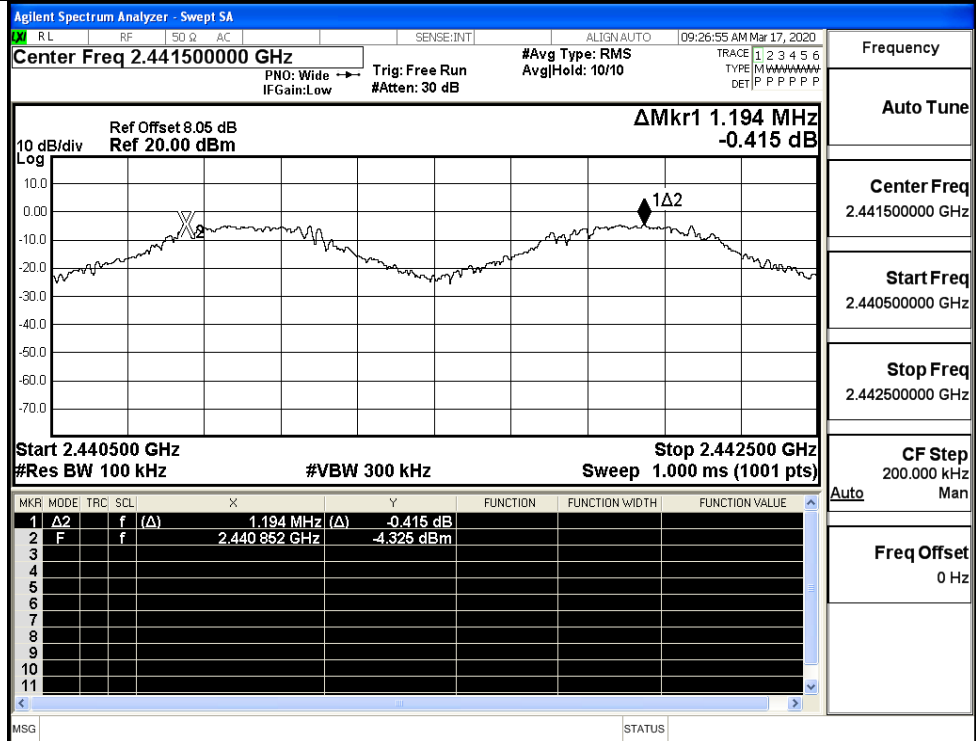
Start Freq  
2.401500000 GHz

Stop Freq  
2.403500000 GHz

CF Step  
200.000 kHz  
Auto Man

Freq Offset  
0 Hz

GFSK/MCH



Frequency

Auto Tune

Center Freq  
2.441500000 GHz

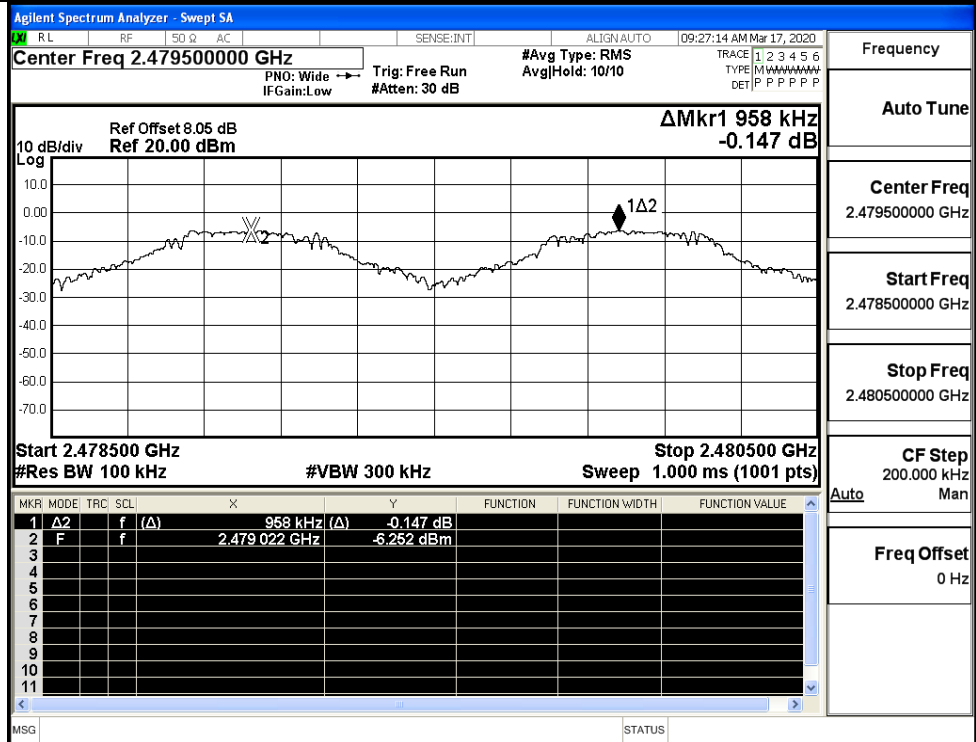
Start Freq  
2.440500000 GHz

Stop Freq  
2.442500000 GHz

CF Step  
200.000 kHz  
Auto Man

Freq Offset  
0 Hz

GFSK/HCH



Frequency

Auto Tune

Center Freq  
2.479500000 GHz

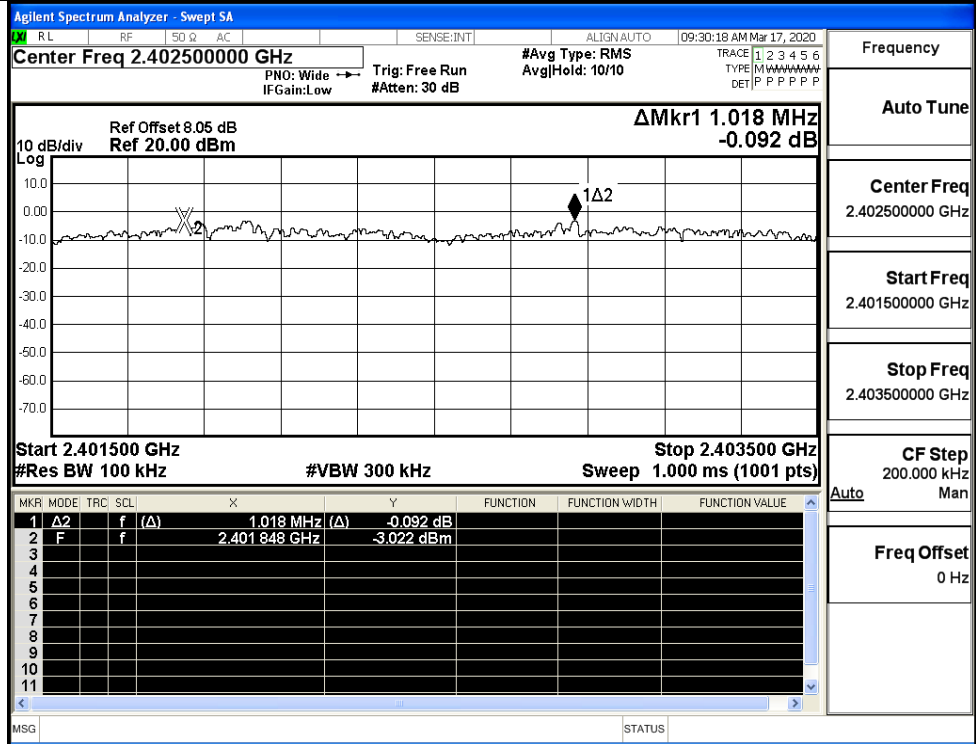
Start Freq  
2.478500000 GHz

Stop Freq  
2.480500000 GHz

CF Step  
200.000 kHz  
Auto Man

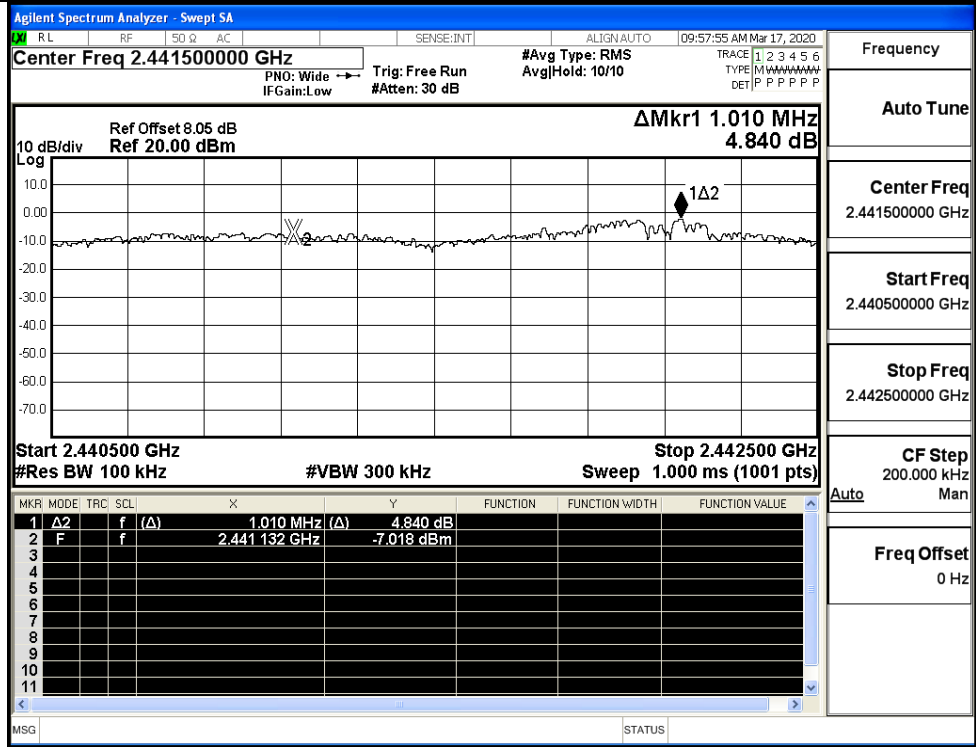
Freq Offset  
0 Hz

$\pi/4$ DQPSK/LCH



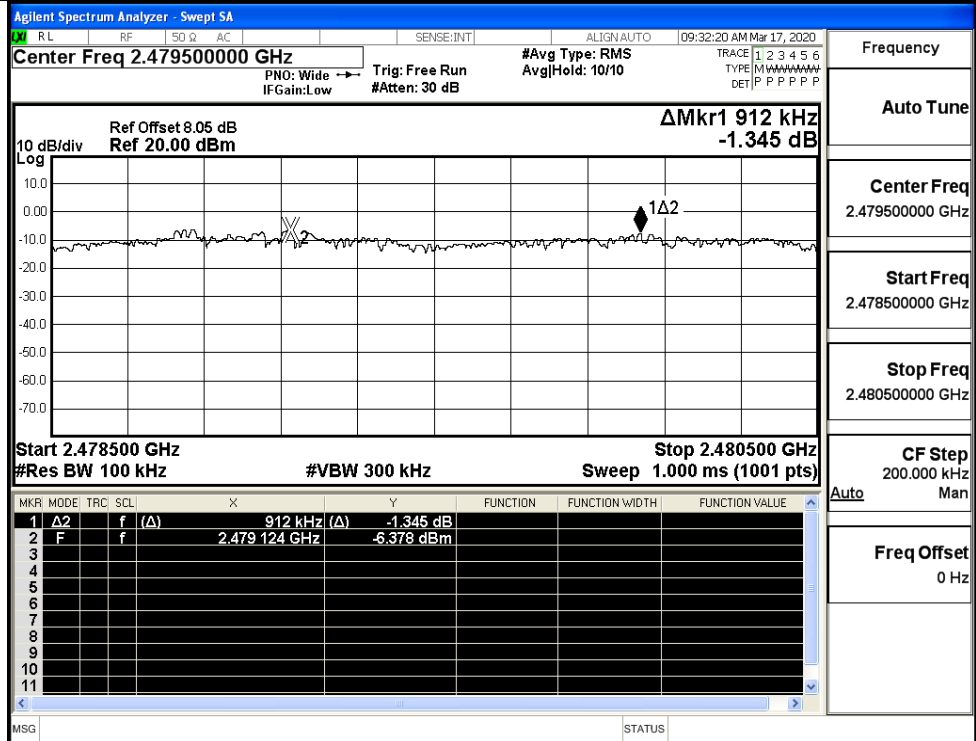
Frequency	2.402500000 GHz
Auto Tune	
Center Freq	2.402500000 GHz
Start Freq	2.401500000 GHz
Stop Freq	2.403500000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

$\pi/4$ DQPSK/MCH



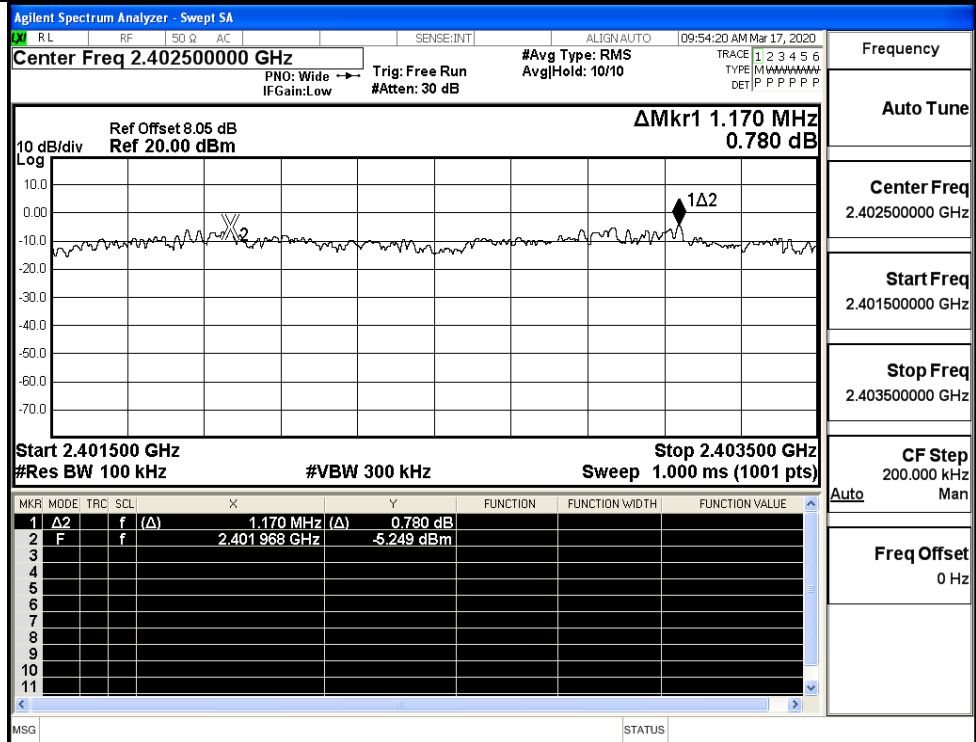
Frequency	2.441500000 GHz
Auto Tune	
Center Freq	2.441500000 GHz
Start Freq	2.440500000 GHz
Stop Freq	2.442500000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

π/4DQPSK/HCH



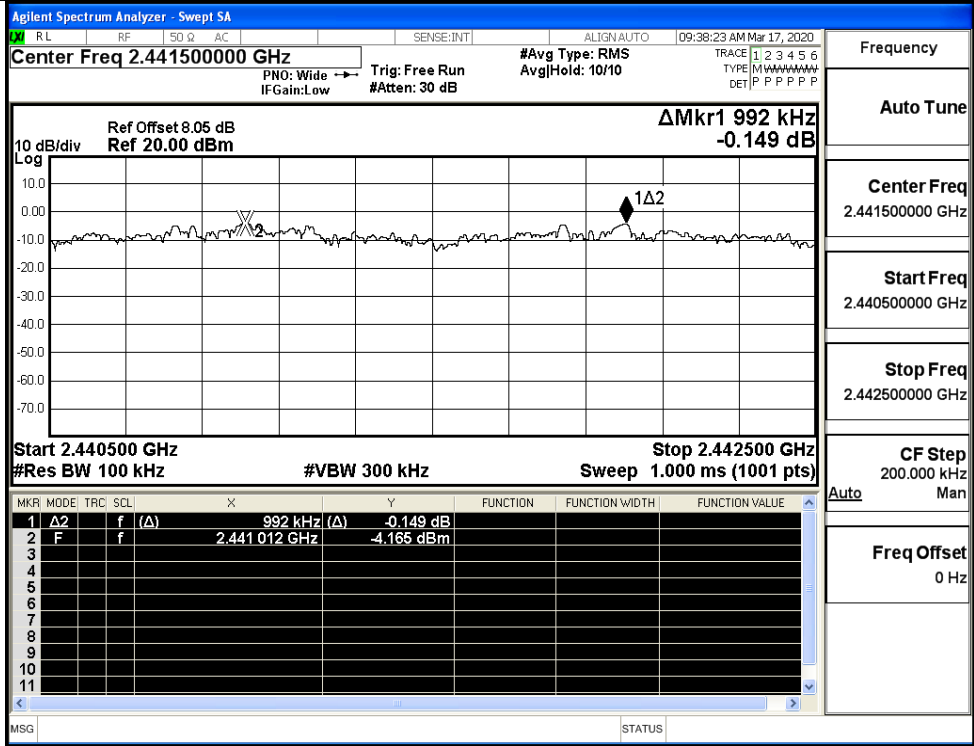
Frequency  
Auto Tune  
Center Freq  
2.479500000 GHz  
Start Freq  
2.478500000 GHz  
Stop Freq  
2.480500000 GHz  
CF Step  
200.000 kHz  
Auto Man  
Freq Offset  
0 Hz

8DPSK/LCH

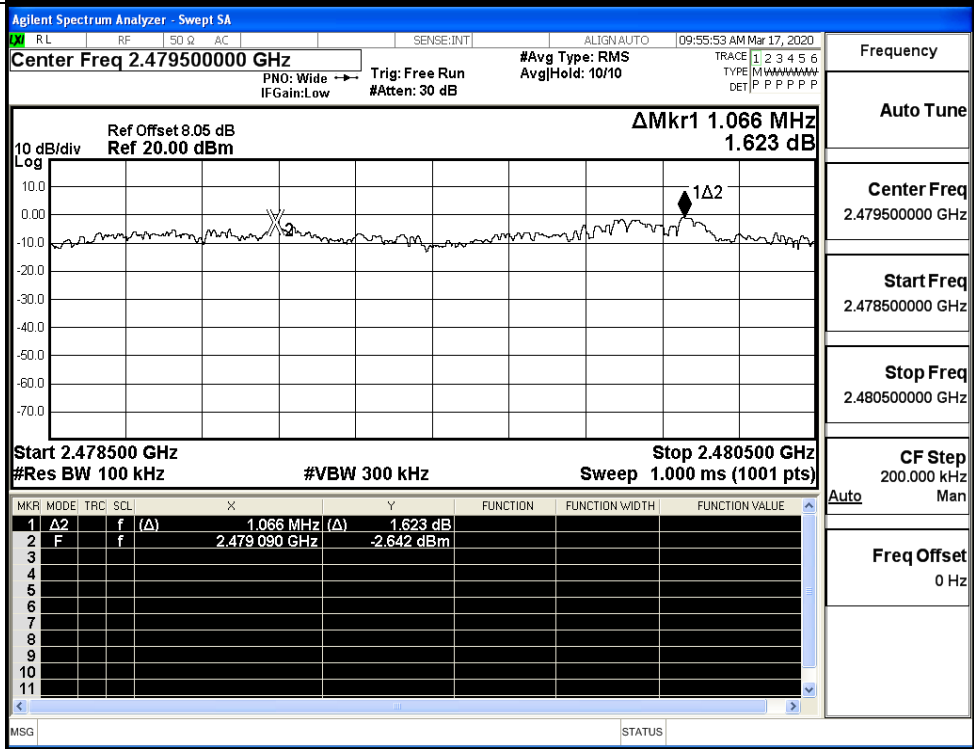


Frequency  
Auto Tune  
Center Freq  
2.402500000 GHz  
Start Freq  
2.401500000 GHz  
Stop Freq  
2.403500000 GHz  
CF Step  
200.000 kHz  
Auto Man  
Freq Offset  
0 Hz

8DPSK/MCH



8DPSK/HCH





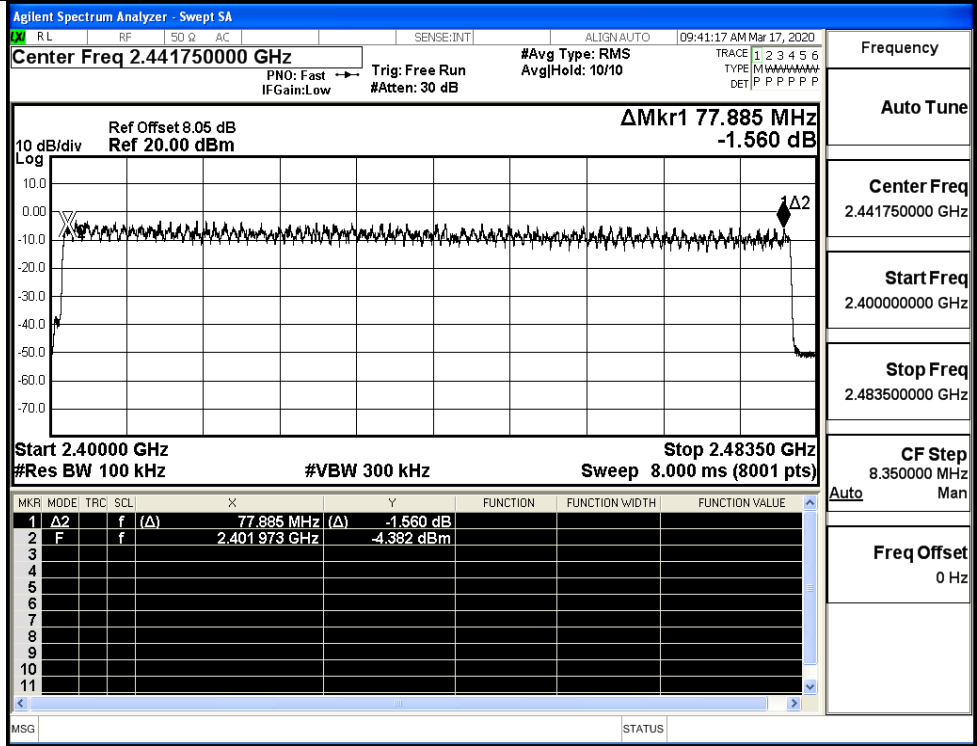
### A.4 Hopping Channel Number

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

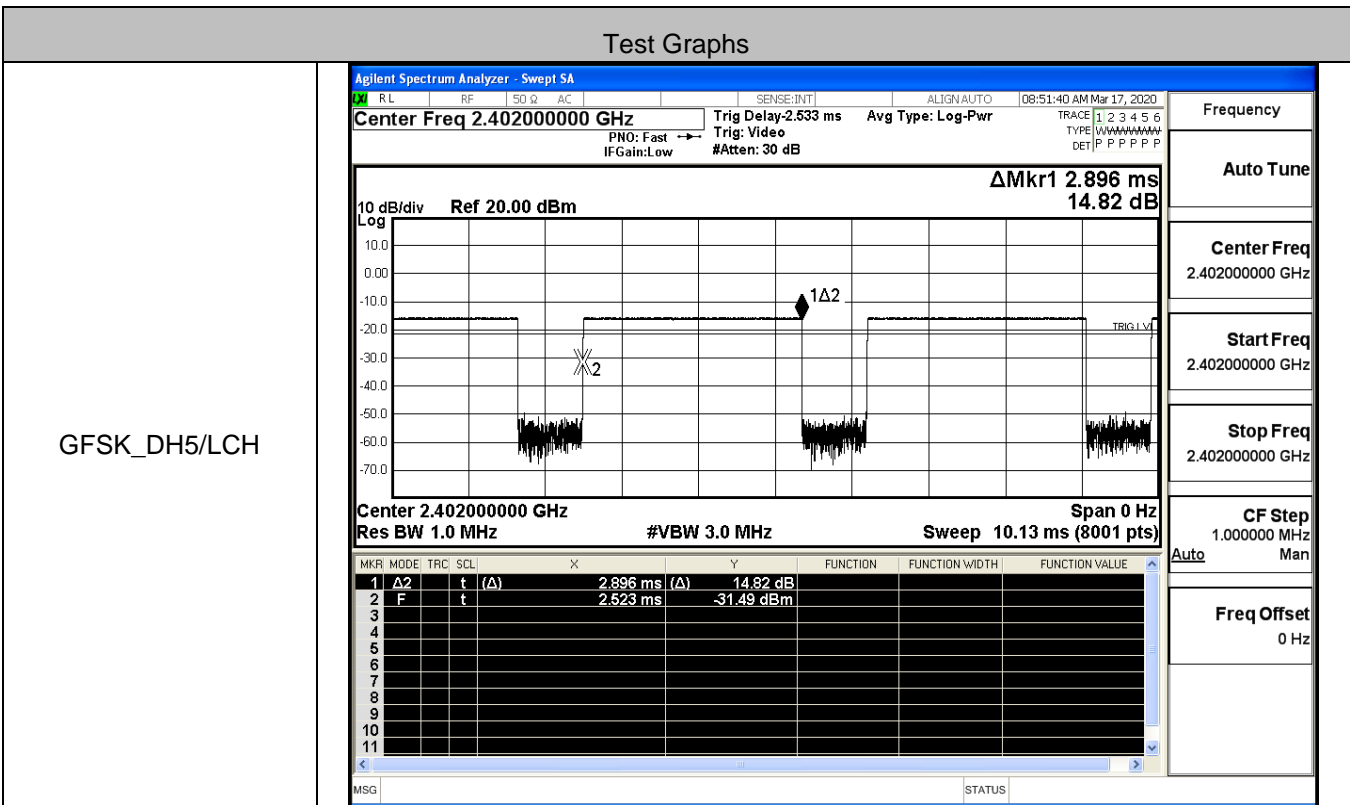
GFSK/Hop	<p>Agilent Spectrum Analyzer - Swept SA                  Center Freq 2.441750000 GHz                  Ref Offset 8.05 dB Ref 20.00 dBm  <math>\Delta</math>Mkr1 78.166 MHz -3.763 dB                  Start 2.40000 GHz Stop 2.48350 GHz                  #Res BW 100 kHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: 0.8em;"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><math>\Delta</math>2</td> <td>f</td> <td>(<math>\Delta</math>)</td> <td>78.166 MHz (<math>\Delta</math>)</td> <td>-3.763 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.401858 GHz</td> <td>-2.879 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	$\Delta$ 2	f	( $\Delta$ )	78.166 MHz ( $\Delta$ )	-3.763 dB				2	F	f		2.401858 GHz	-2.879 dBm			
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	$\Delta$ 2	f	( $\Delta$ )	78.166 MHz ( $\Delta$ )	-3.763 dB																							
2	F	f		2.401858 GHz	-2.879 dBm																							
$\pi/4$ DQPSK/Hop	<p>Agilent Spectrum Analyzer - Swept SA                  Center Freq 2.441750000 GHz                  Ref Offset 8.05 dB Ref 20.00 dBm  <math>\Delta</math>Mkr1 77.958 MHz -3.235 dB                  Start 2.40000 GHz Stop 2.48350 GHz                  #Res BW 100 kHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: 0.8em;"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><math>\Delta</math>2</td> <td>f</td> <td>(<math>\Delta</math>)</td> <td>77.958 MHz (<math>\Delta</math>)</td> <td>-3.235 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.401847 GHz</td> <td>-5.071 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	$\Delta$ 2	f	( $\Delta$ )	77.958 MHz ( $\Delta$ )	-3.235 dB				2	F	f		2.401847 GHz	-5.071 dBm			
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	$\Delta$ 2	f	( $\Delta$ )	77.958 MHz ( $\Delta$ )	-3.235 dB																							
2	F	f		2.401847 GHz	-5.071 dBm																							

8DPSK/Hop

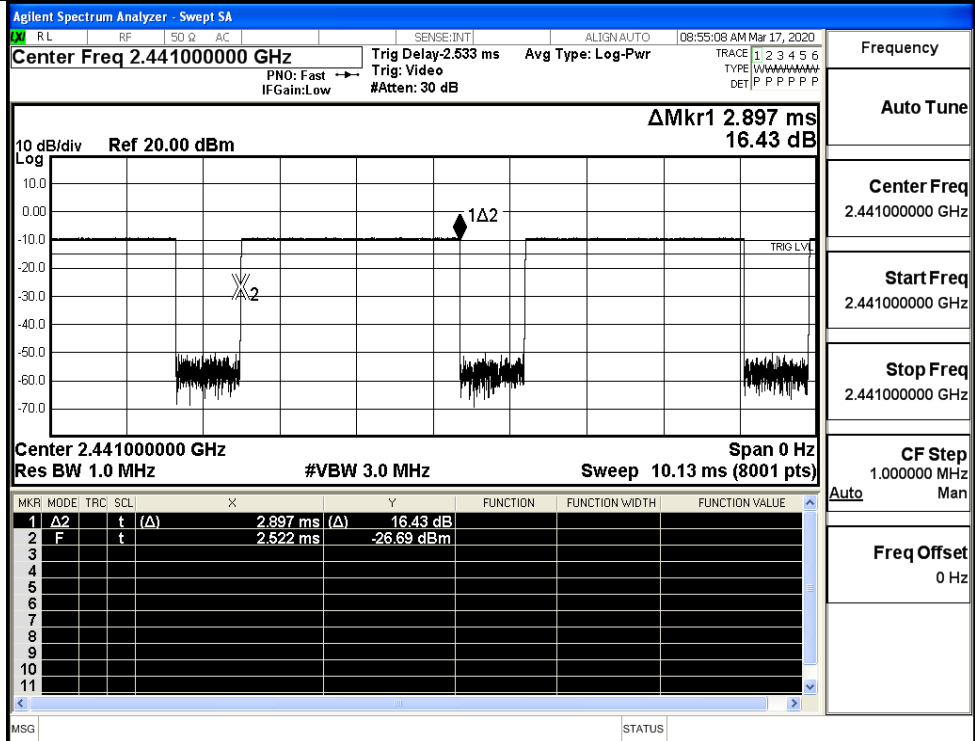


A.5 Dwell Time

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.9	106.7	0.309	0.4	PASS
	DH5	MCH	2.9	106.7	0.309	0.4	PASS
	DH5	HCH	2.9	106.7	0.309	0.4	PASS
π/4DQPSK	2DH5	LCH	2.9	106.7	0.309	0.4	PASS
	2DH5	MCH	2.9	106.7	0.309	0.4	PASS
	2DH5	HCH	2.9	106.7	0.309	0.4	PASS
8DPSK	3DH5	LCH	2.9	106.7	0.309	0.4	PASS
	3DH5	MCH	2.9	106.7	0.309	0.4	PASS
	3DH5	HCH	2.9	106.7	0.309	0.4	PASS

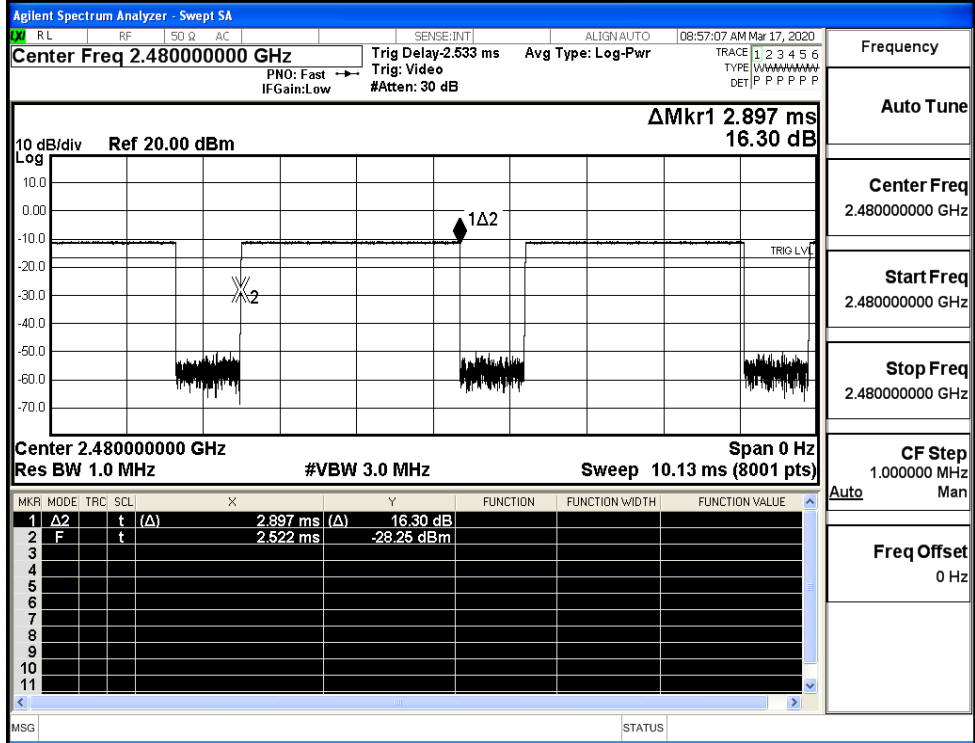


GFSK\_DH5/MCH



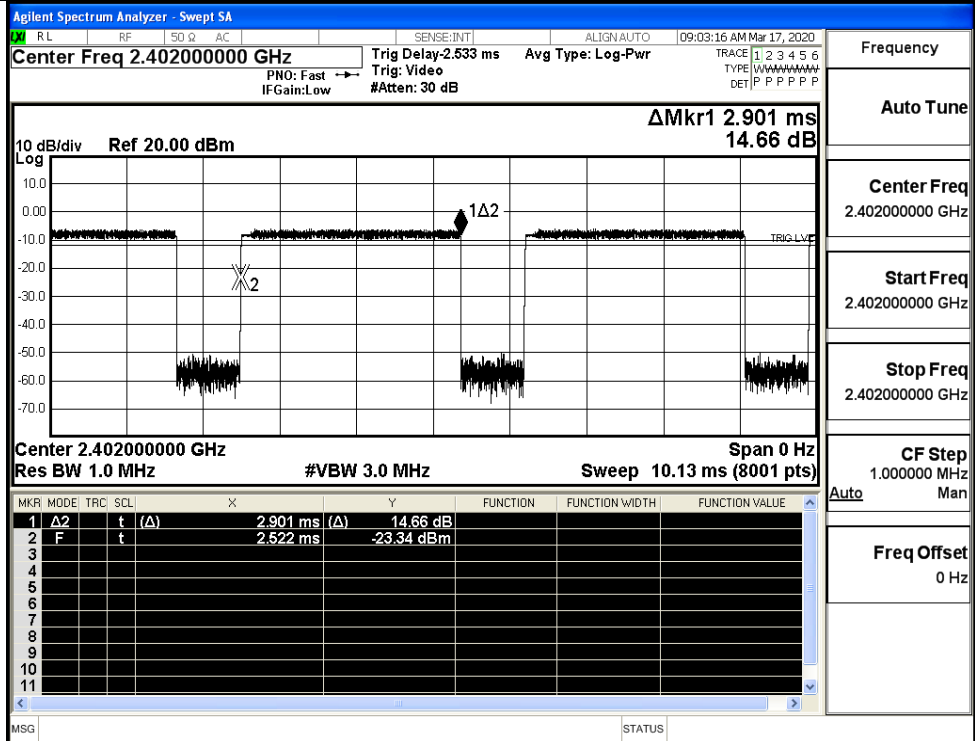
Frequency	
Auto Tune	
Center Freq	2.441000000 GHz
Start Freq	2.441000000 GHz
Stop Freq	2.441000000 GHz
CF Step	1.000000 MHz
Auto	Man
Freq Offset	0 Hz

GFSK\_DH5/HCH

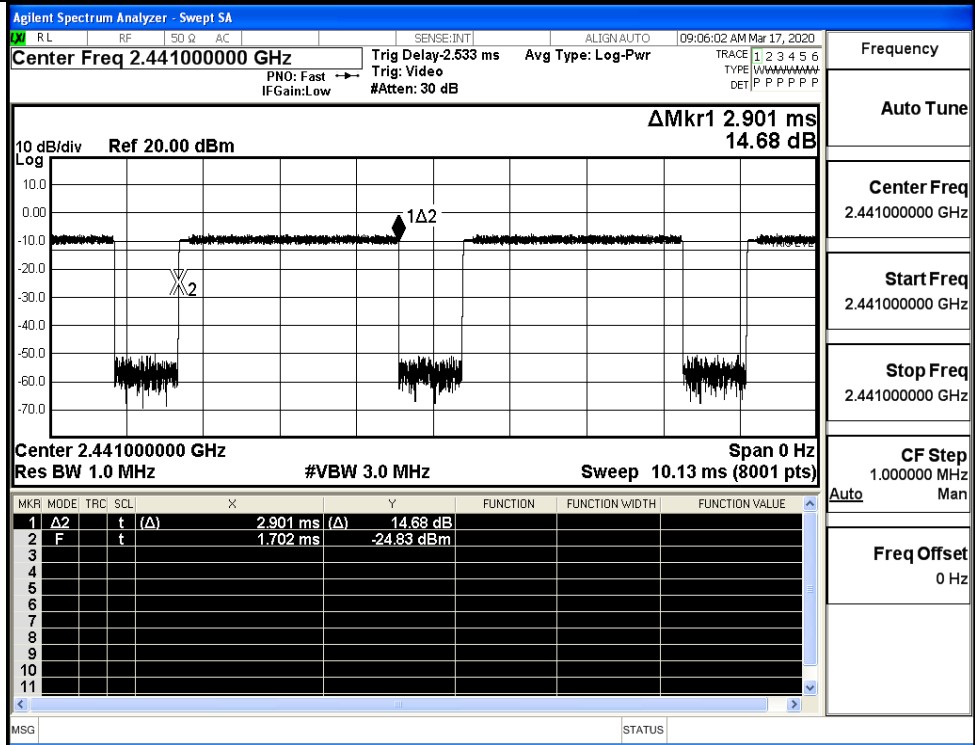


Frequency	
Auto Tune	
Center Freq	2.480000000 GHz
Start Freq	2.480000000 GHz
Stop Freq	2.480000000 GHz
CF Step	1.000000 MHz
Auto	Man
Freq Offset	0 Hz

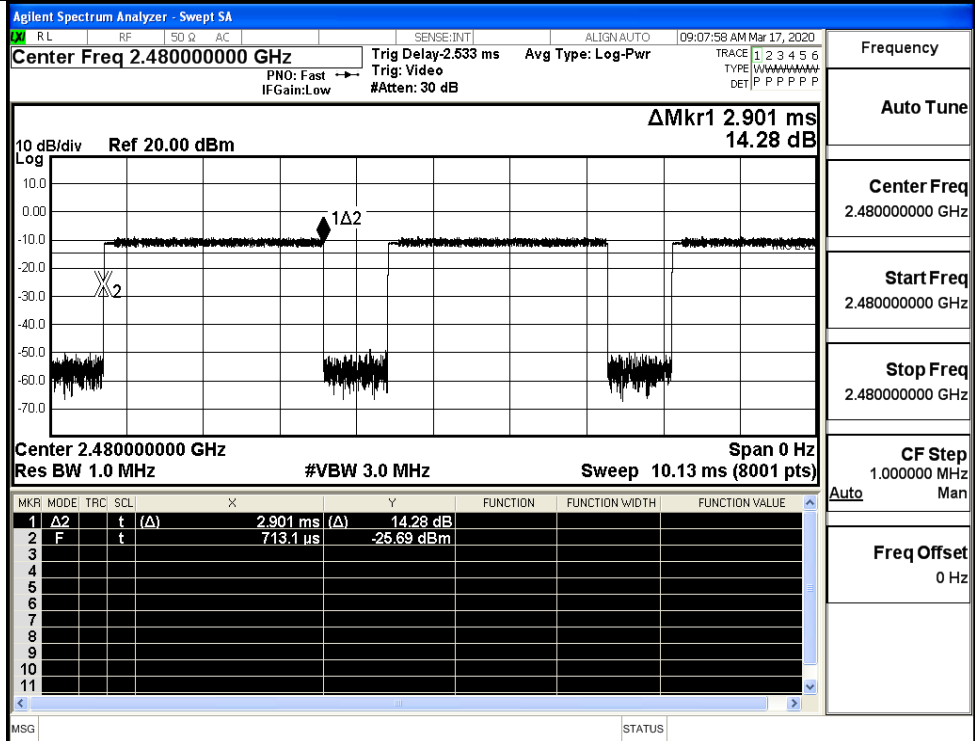
$\pi/4$ DQPSK  
\_2DH5/LCH



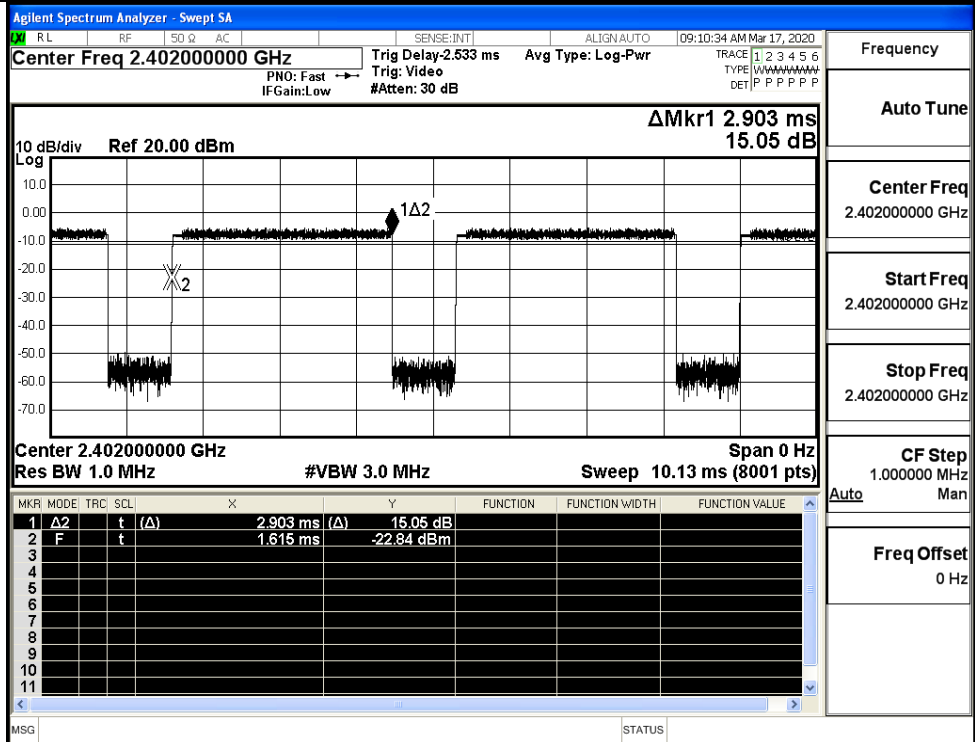
$\pi/4$ DQPSK  
\_2DH5/MCH



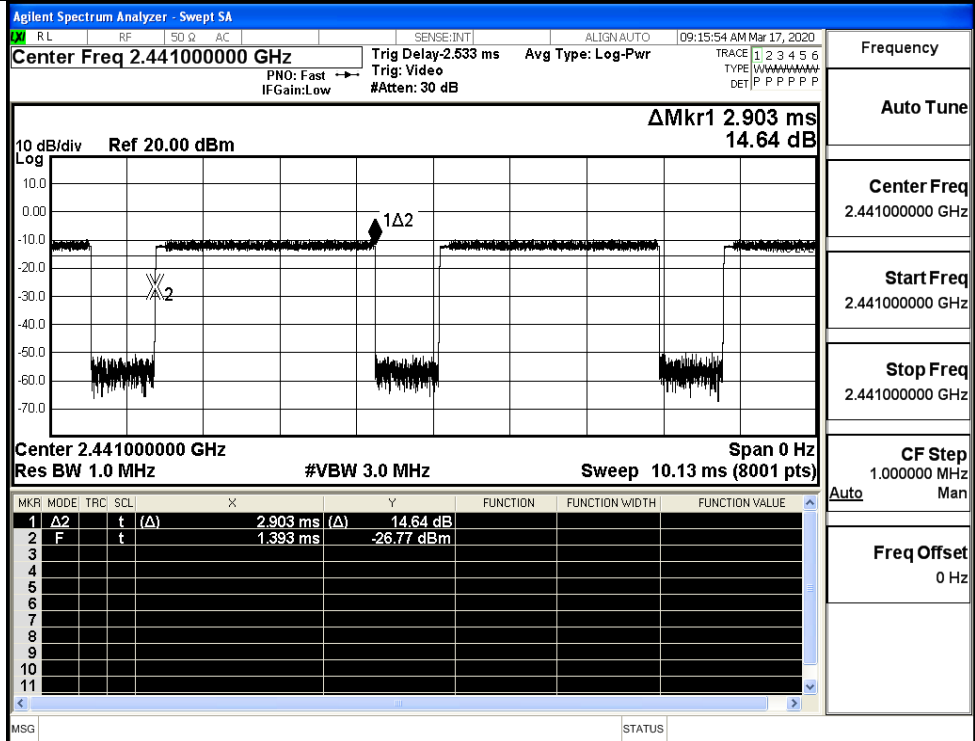
$\pi/4$ DQPSK  
\_2DH5/HCH



8DPSK\_3DH5/LCH



8DPSK\_3DH5/MCH



Frequency

Auto Tune

Center Freq 2.441000000 GHz

Start Freq 2.441000000 GHz

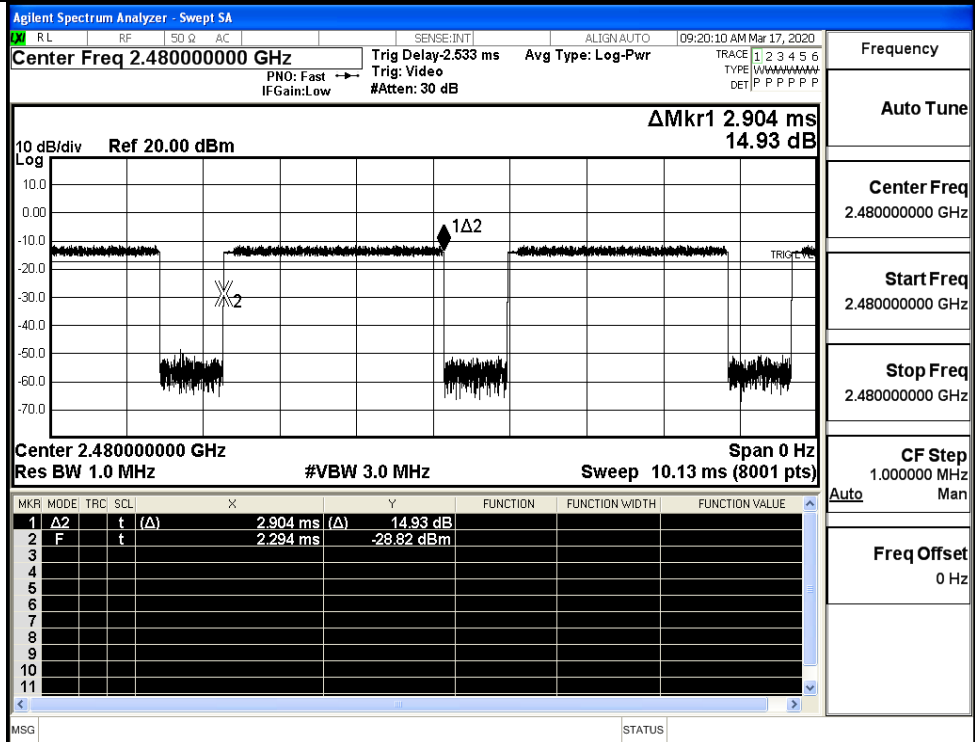
Stop Freq 2.441000000 GHz

CF Step 1.000000 MHz

Auto Man

Freq Offset 0 Hz

8DPSK\_3DH5/HCH



Frequency

Auto Tune

Center Freq 2.480000000 GHz

Start Freq 2.480000000 GHz

Stop Freq 2.480000000 GHz

CF Step 1.000000 MHz

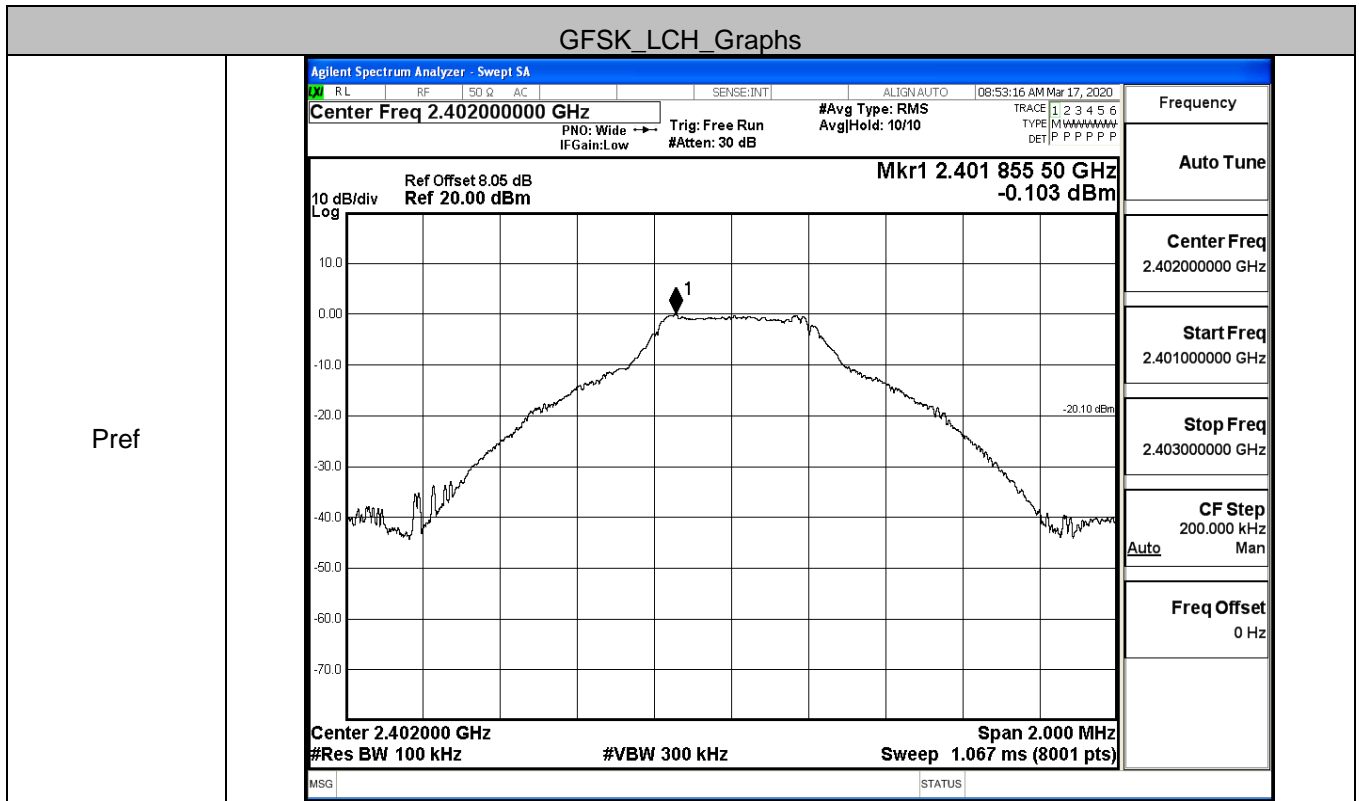
Auto Man

Freq Offset 0 Hz

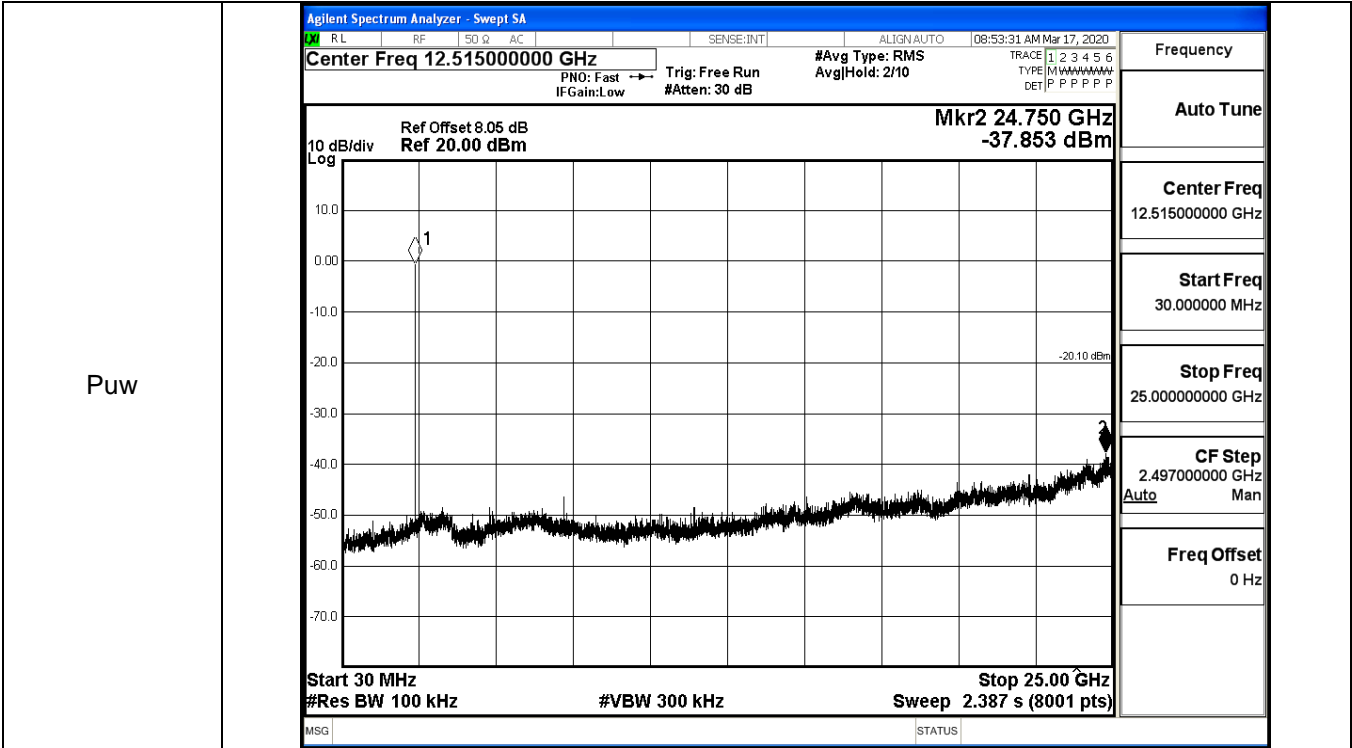
**A.6 RF Conducted Spurious Emissions**

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.103	-37.853	-20.103	PASS
	MCH	-1.611	-29.486	-21.611	PASS
	HCH	-3.434	-31.208	-23.434	PASS
$\pi$ /4DQPSK	LCH	-0.459	-35.045	-20.459	PASS
	MCH	-1.928	-38.443	-21.928	PASS
	HCH	-3.208	-37.785	-23.208	PASS
8DPSK	LCH	0.013	-37.979	-19.987	PASS
	MCH	-4.135	-36.796	-24.135	PASS
	HCH	-5.861	-37.132	-25.861	PASS

GFSK\_LCH\_Graphs

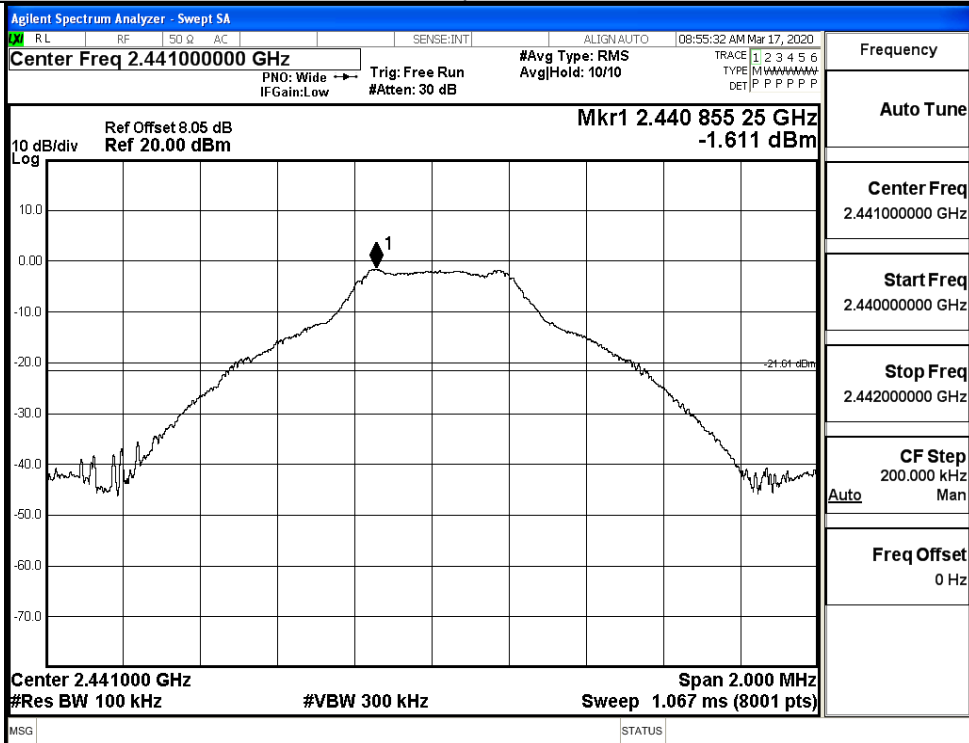




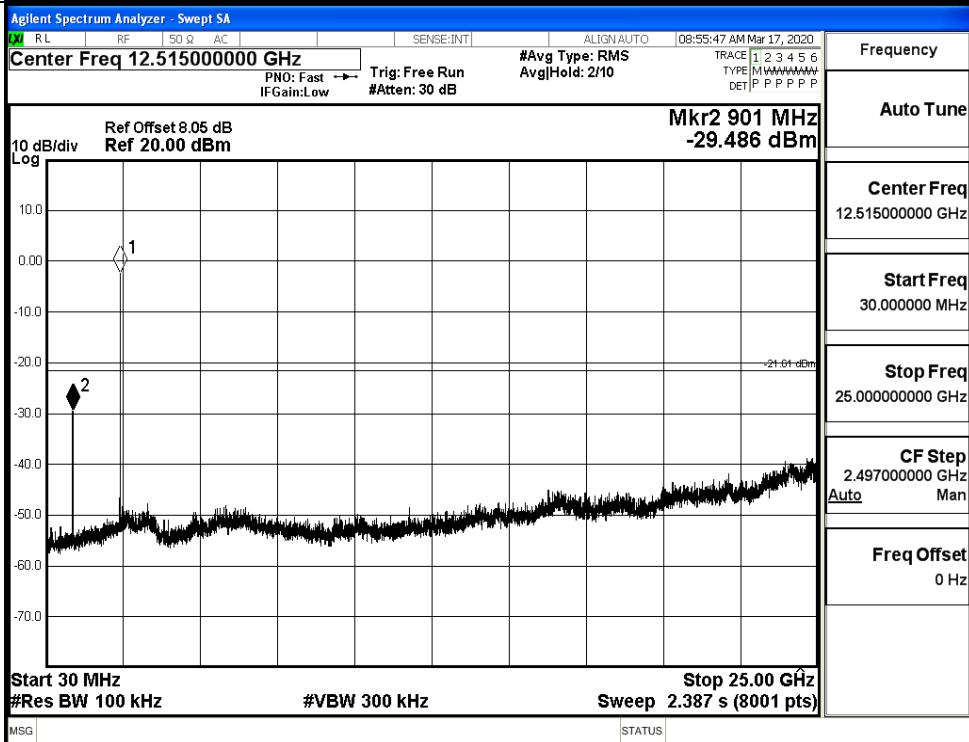


GFSK\_MCH\_Graphs

Pref

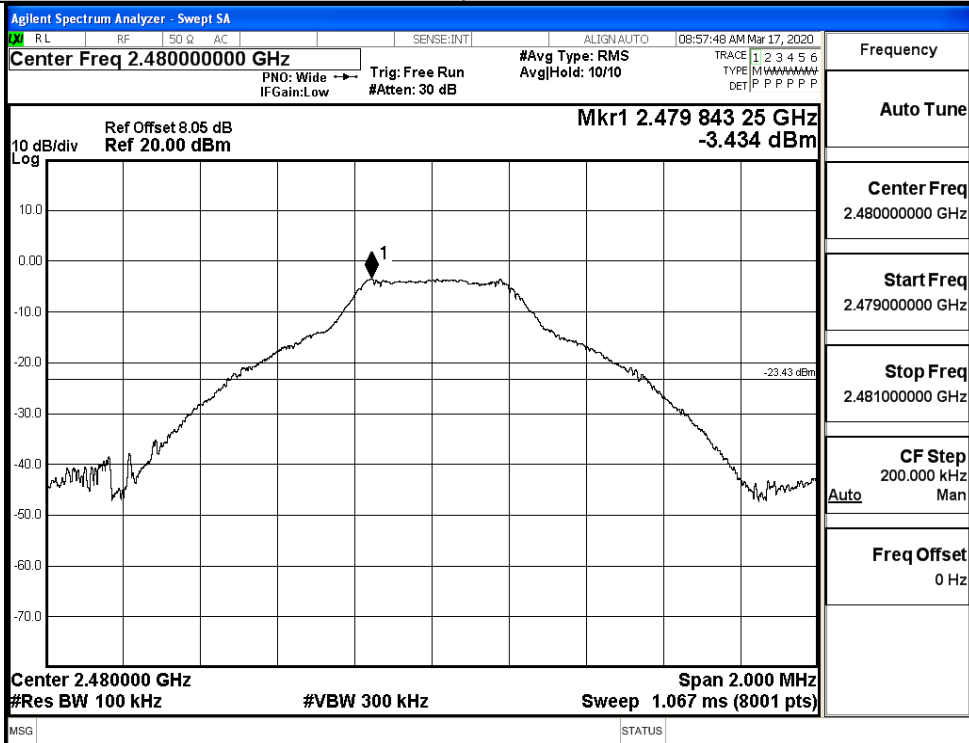


Puw

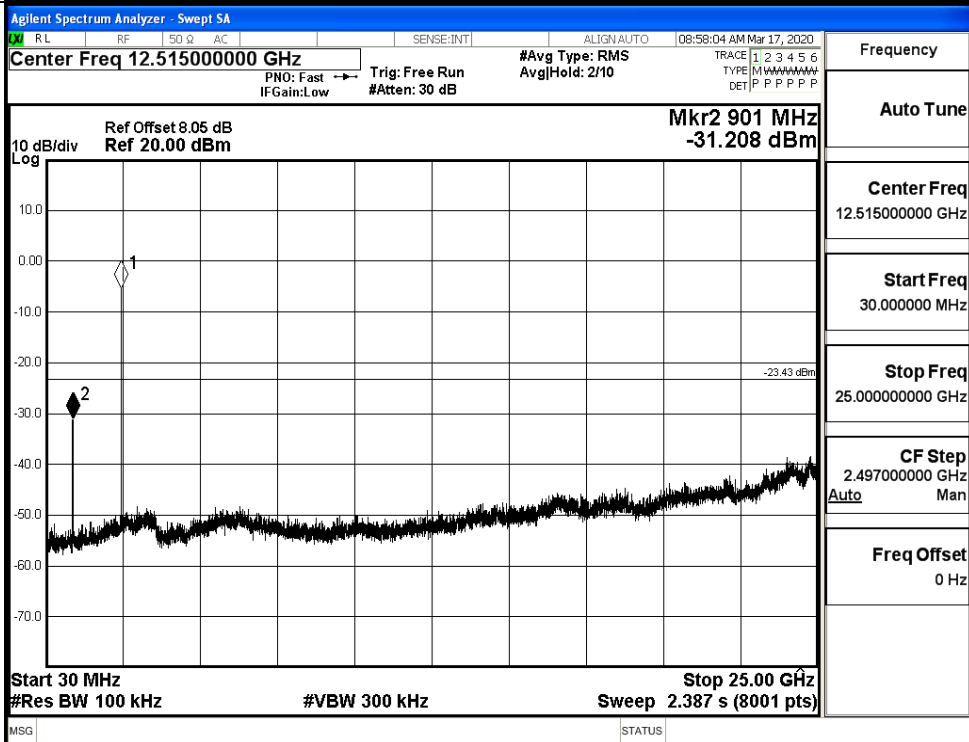


GFSK\_HCH\_Graphs

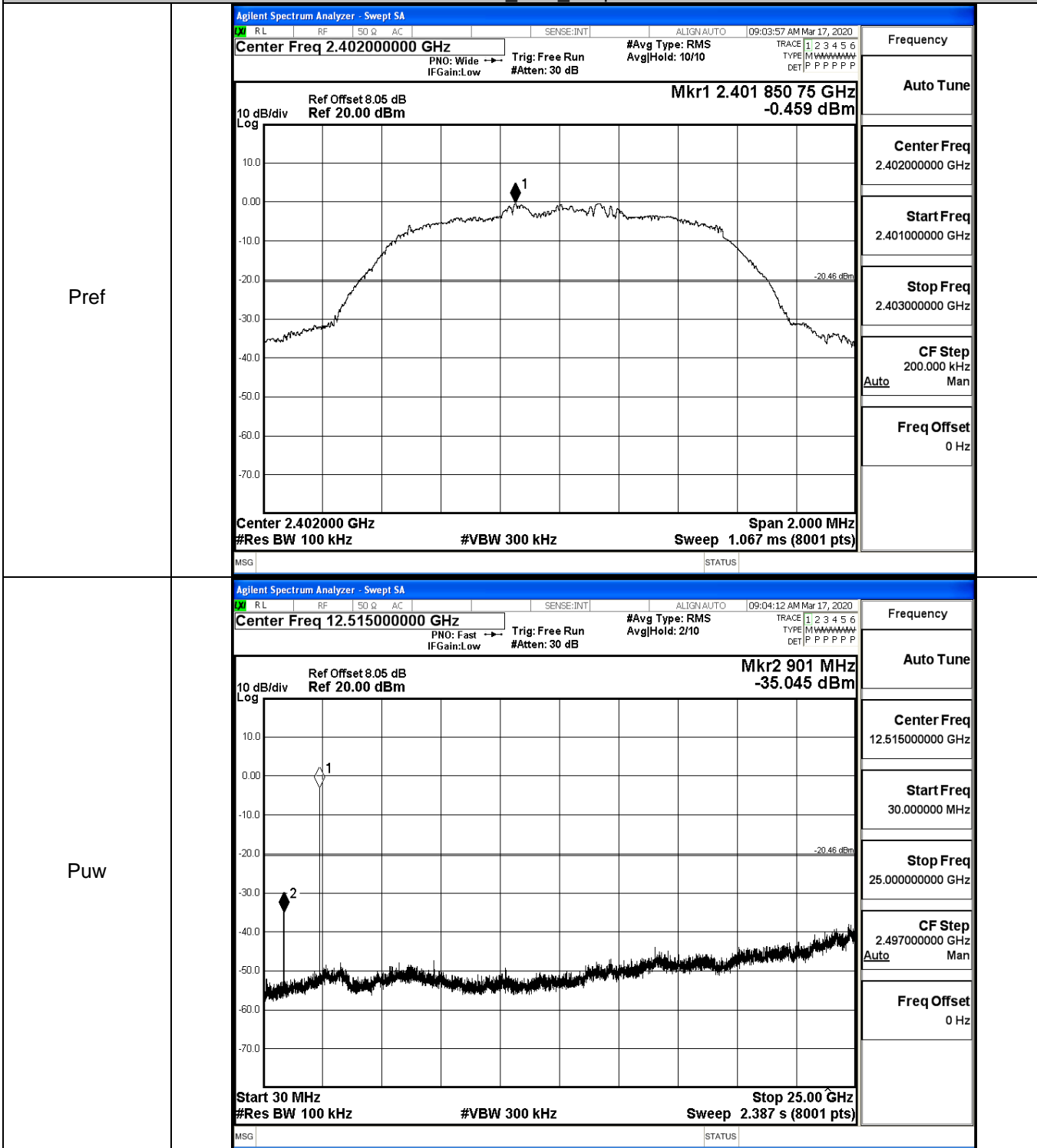
Pref



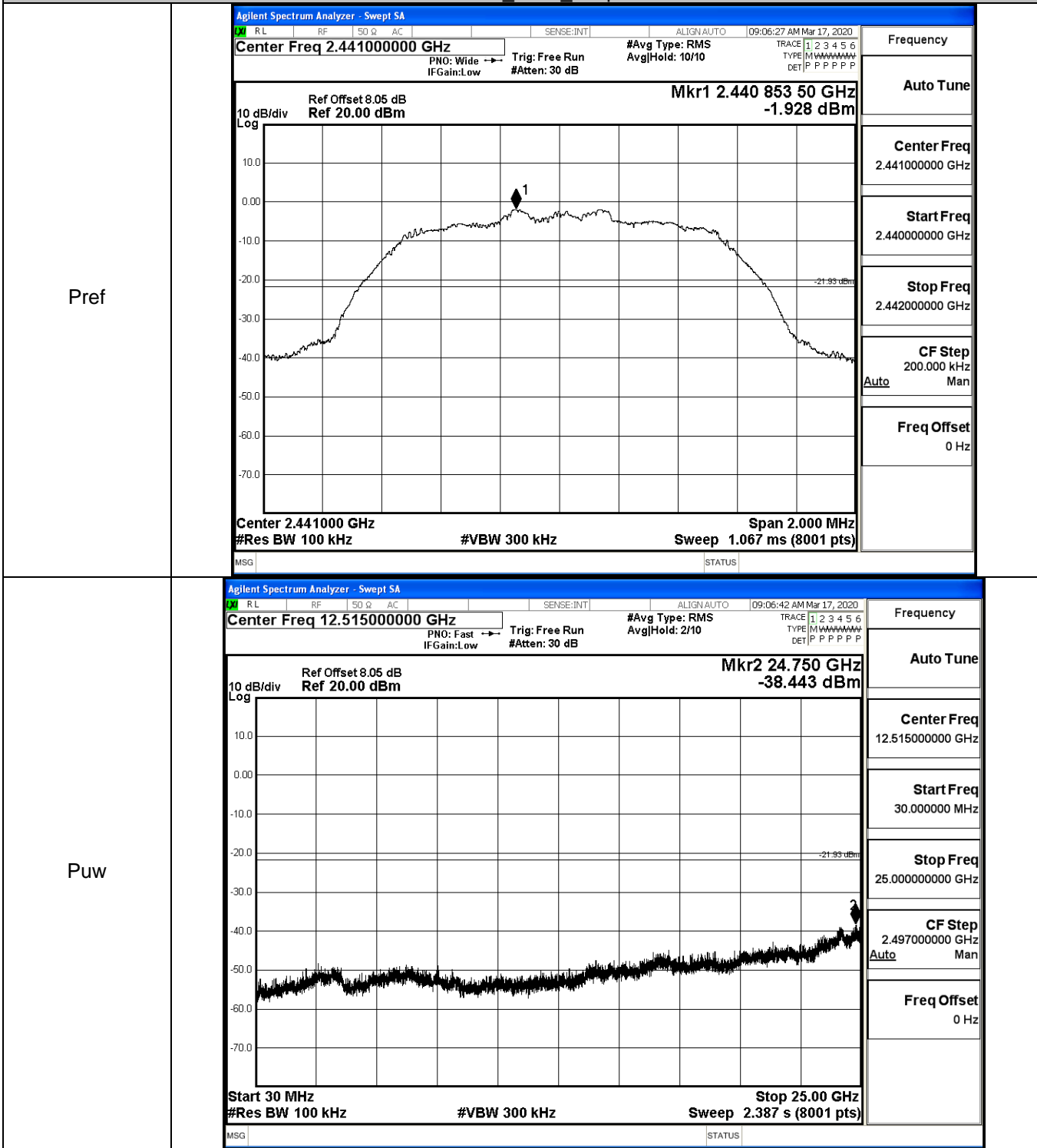
Puw



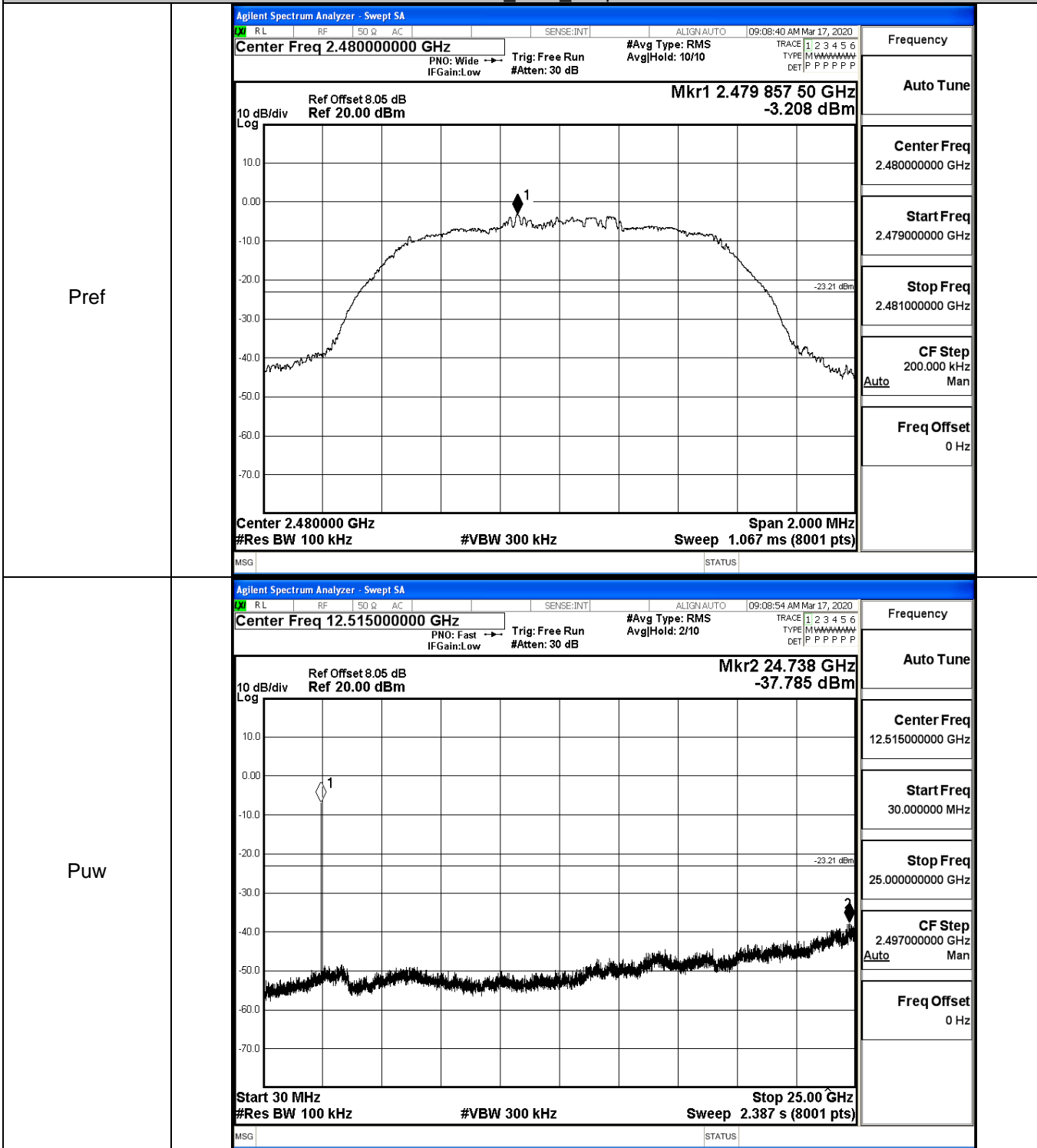
$\pi/4$ DQPSK\_LCH\_Graphs



$\pi$ /4DQPSK\_MCH\_Graphs

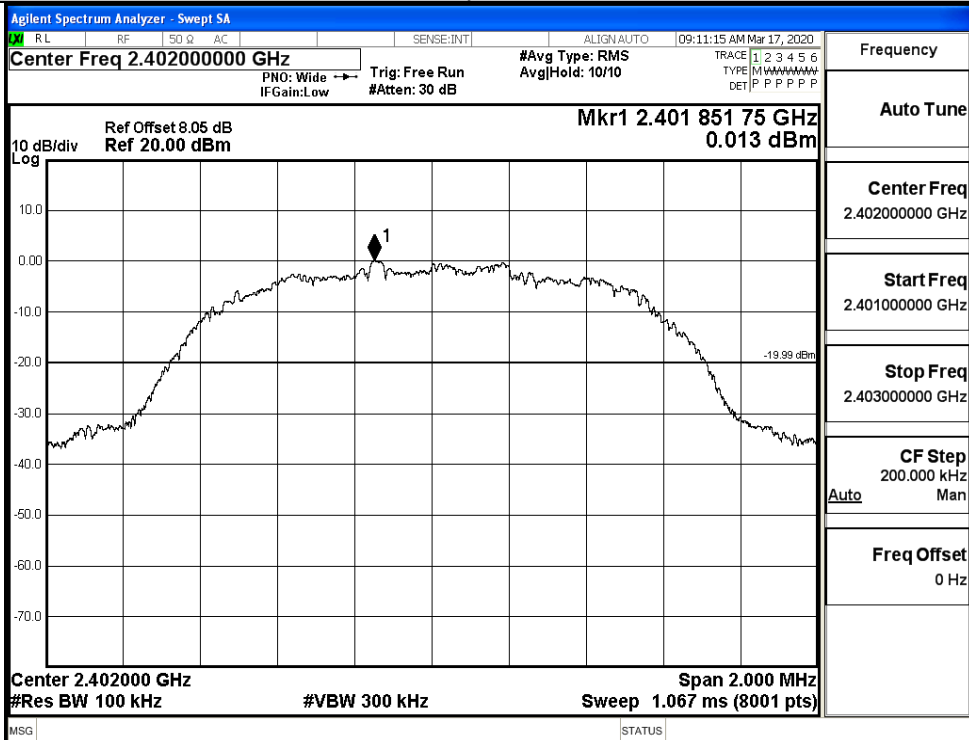


$\pi/4$ DQPSK\_HCH\_Graphs

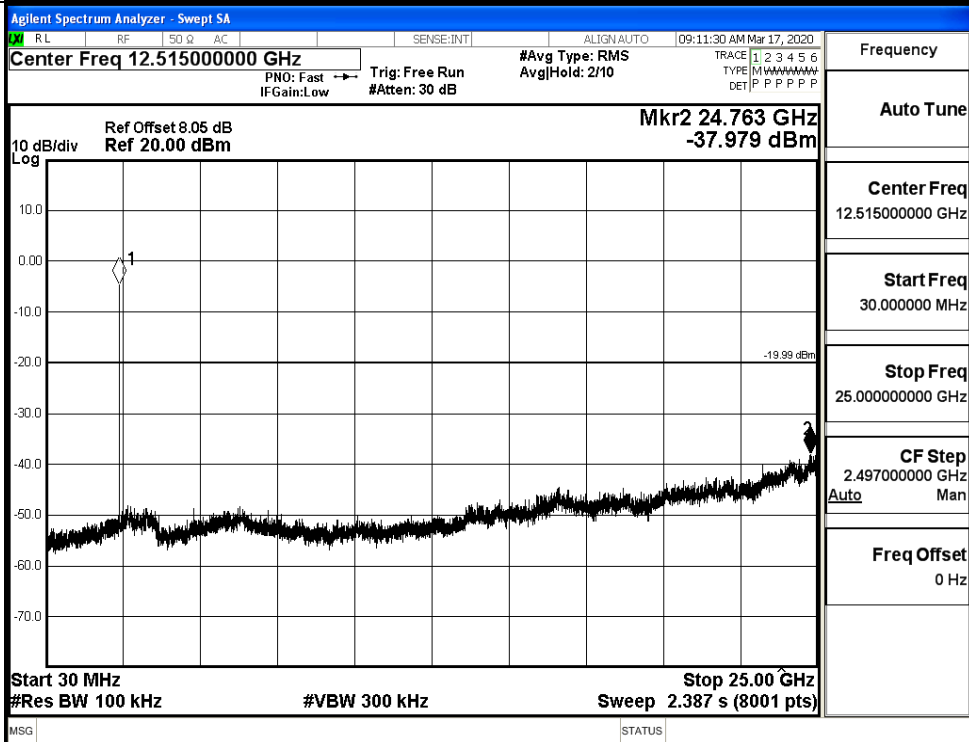


8DPSK\_LCH\_Graphs

Pref

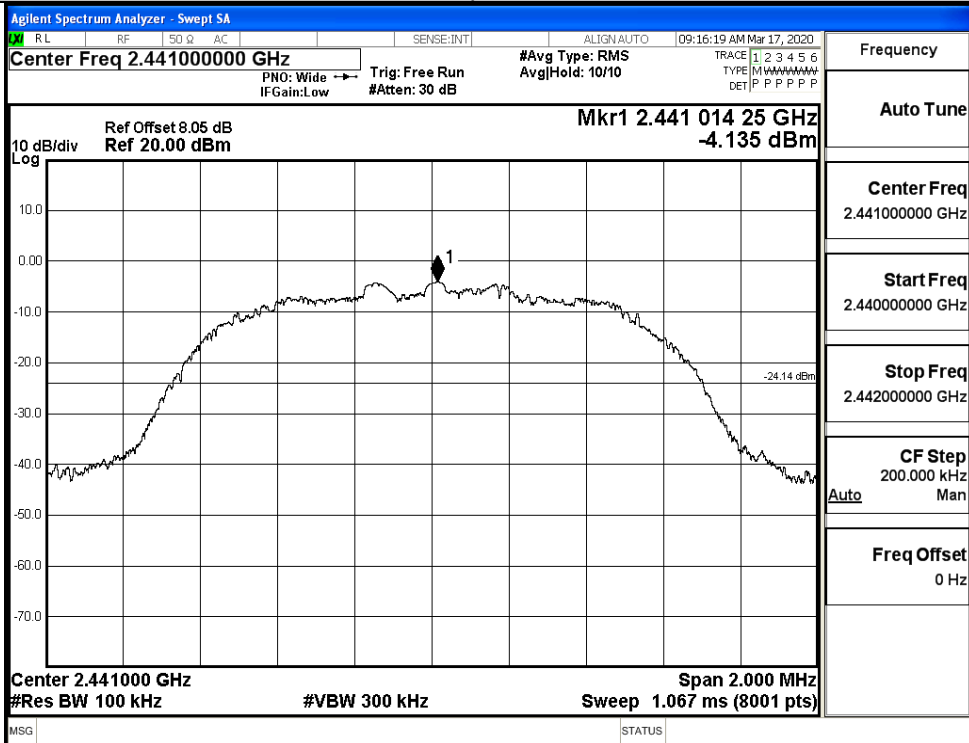


Puw

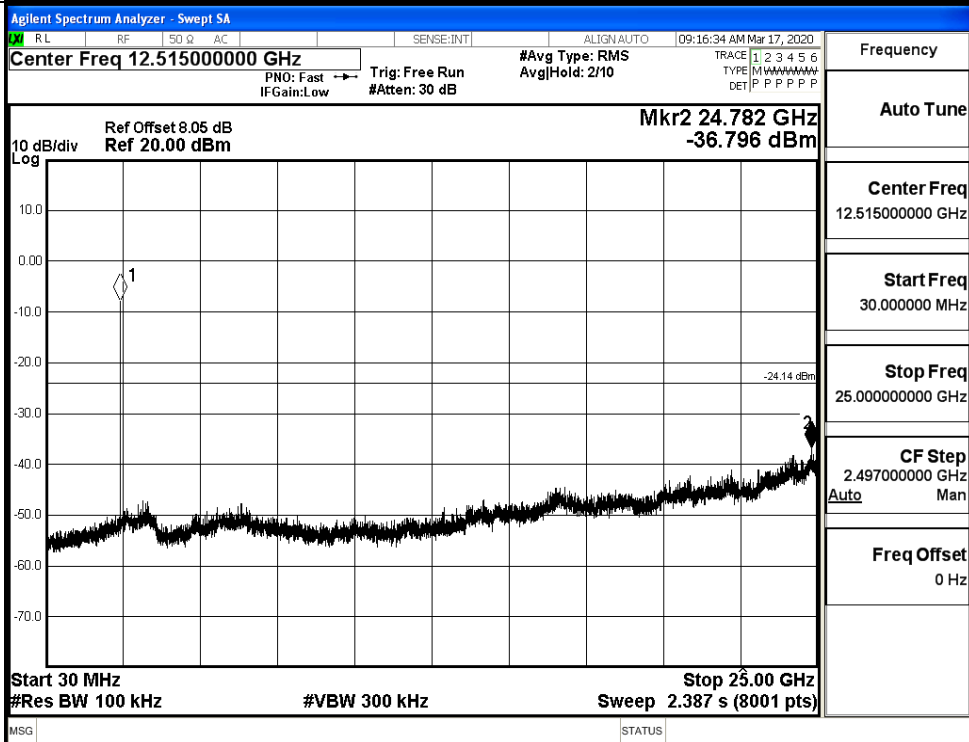


8DPSK\_MCH\_Graphs

Pref



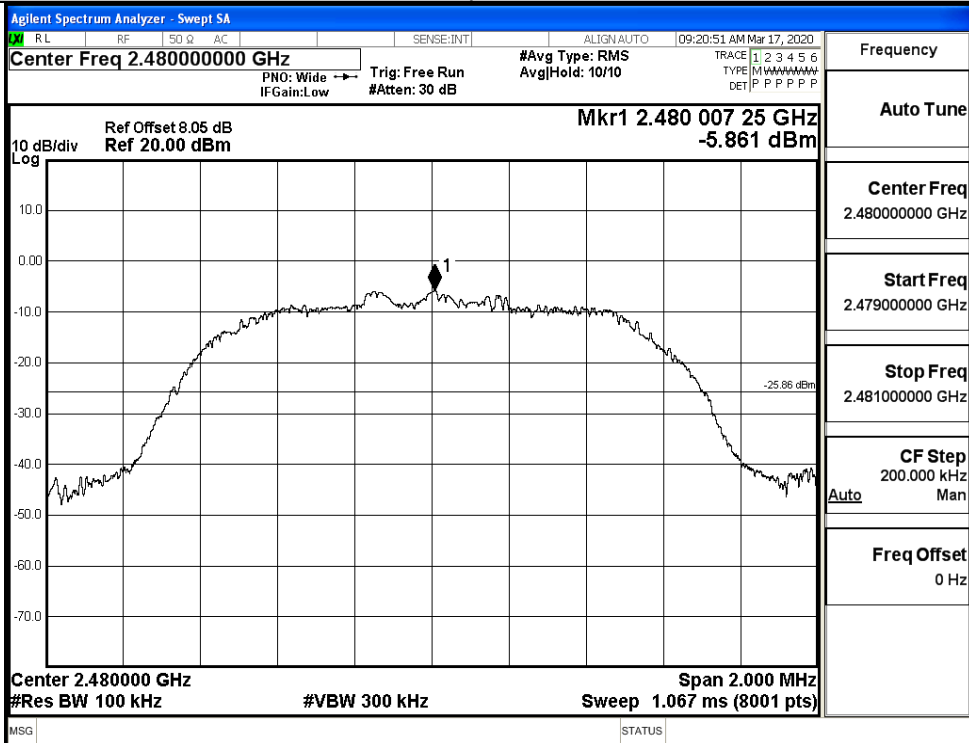
Puw



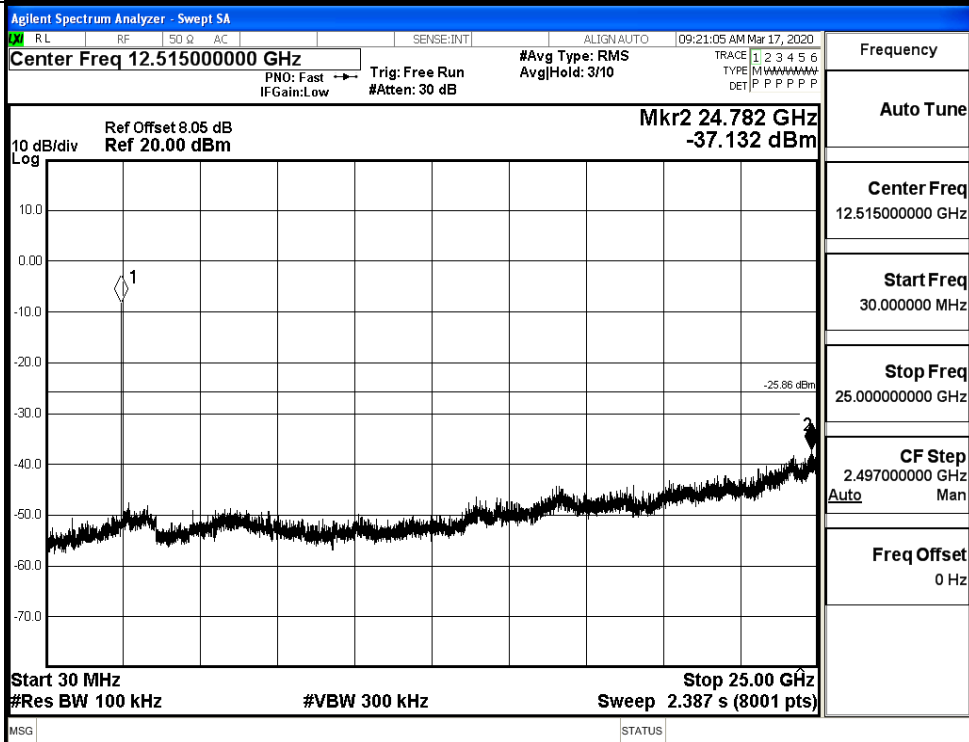


8DPSK\_HCH\_Graphs

Pref



Puw

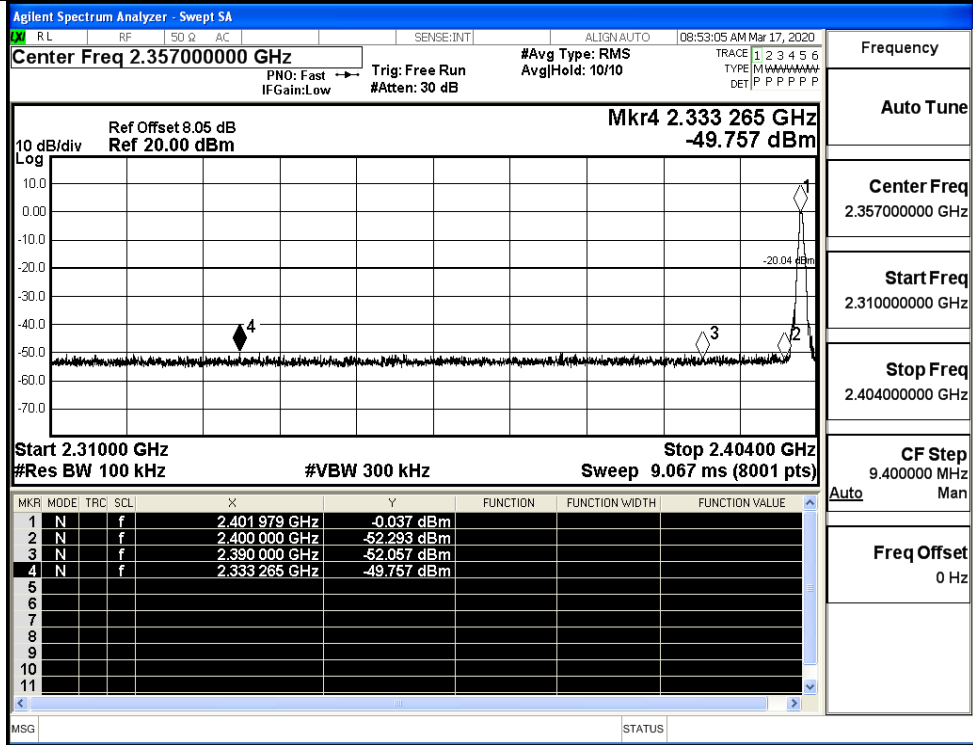


## A.7 Band-edge for RF Conducted Emissions

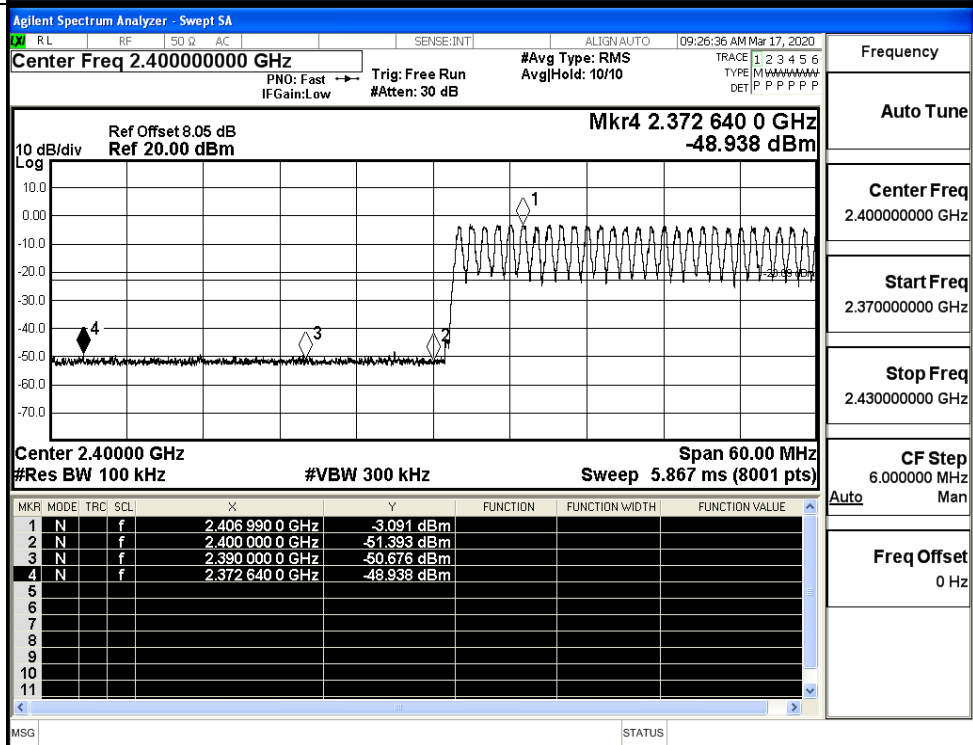
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-0.037	Off	-49.757	-20.04	PASS
			-3.091	On	-48.938	-23.09	PASS
	HCH	2480	-3.239	Off	-49.173	-23.24	PASS
			-4.926	On	-48.594	-24.93	PASS
$\pi/4$ DQPSK	LCH	2402	-0.697	Off	-49.548	-20.7	PASS
			-2.938	On	-48.716	-22.94	PASS
	HCH	2480	-2.957	Off	-49.254	-22.96	PASS
			-4.857	On	-47.889	-24.86	PASS
8DPSK	LCH	2402	0.190	Off	-48.925	-19.81	PASS
			-2.742	On	-47.716	-22.74	PASS
	HCH	2480	-5.748	Off	-49.020	-25.75	PASS
			-4.863	On	-48.961	-24.86	PASS

Test Graphs

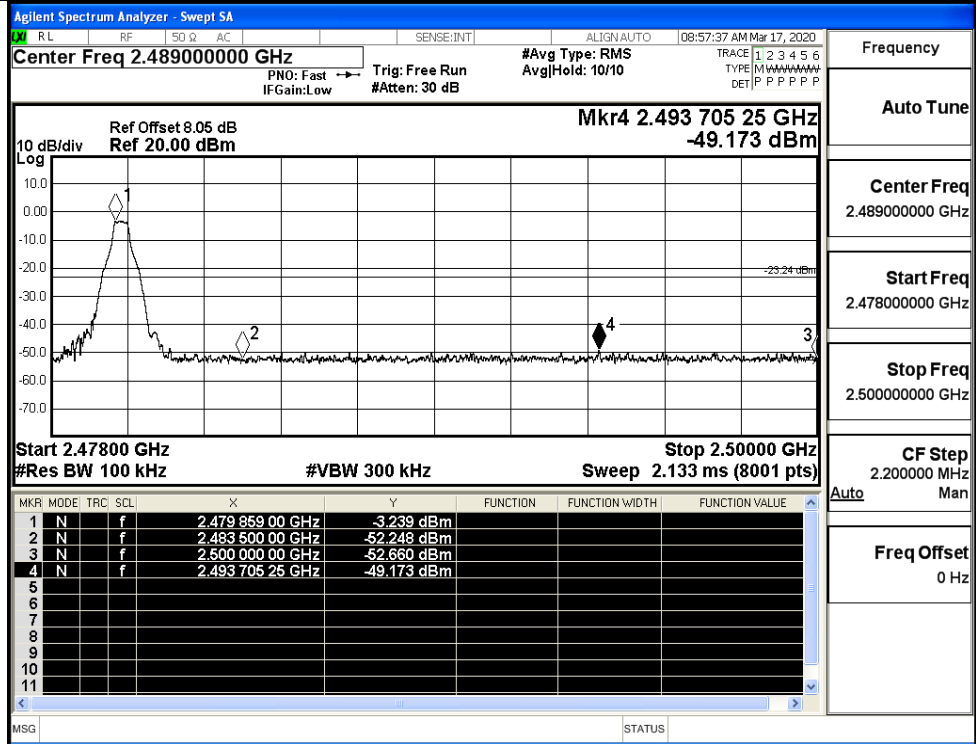
GFSK/LCH/No Hop



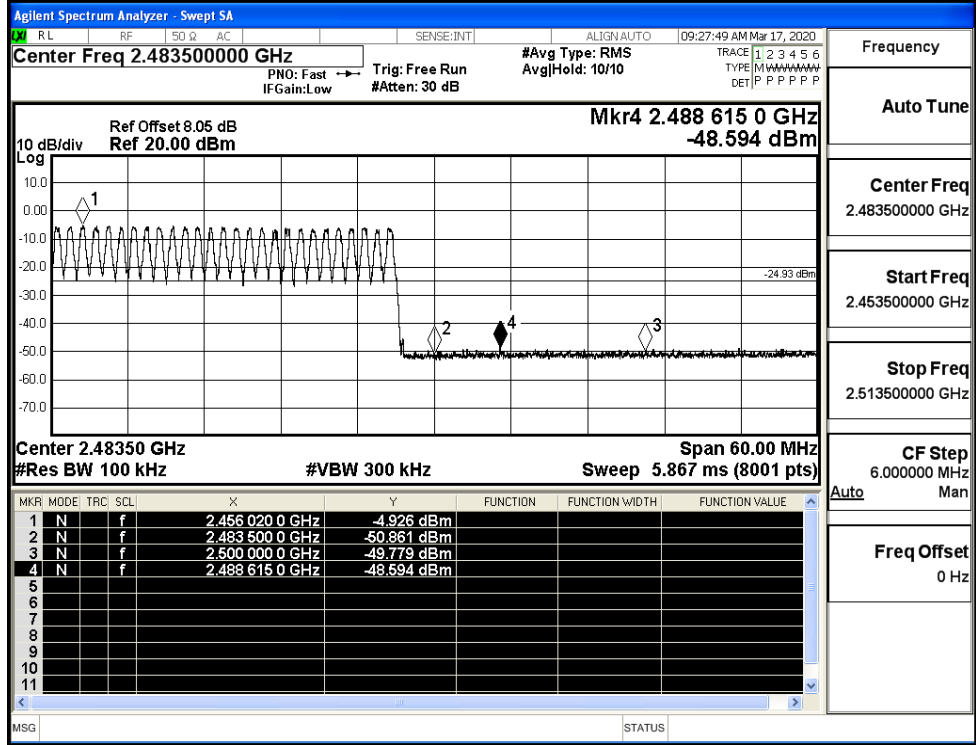
GFSK/LCH/Hop



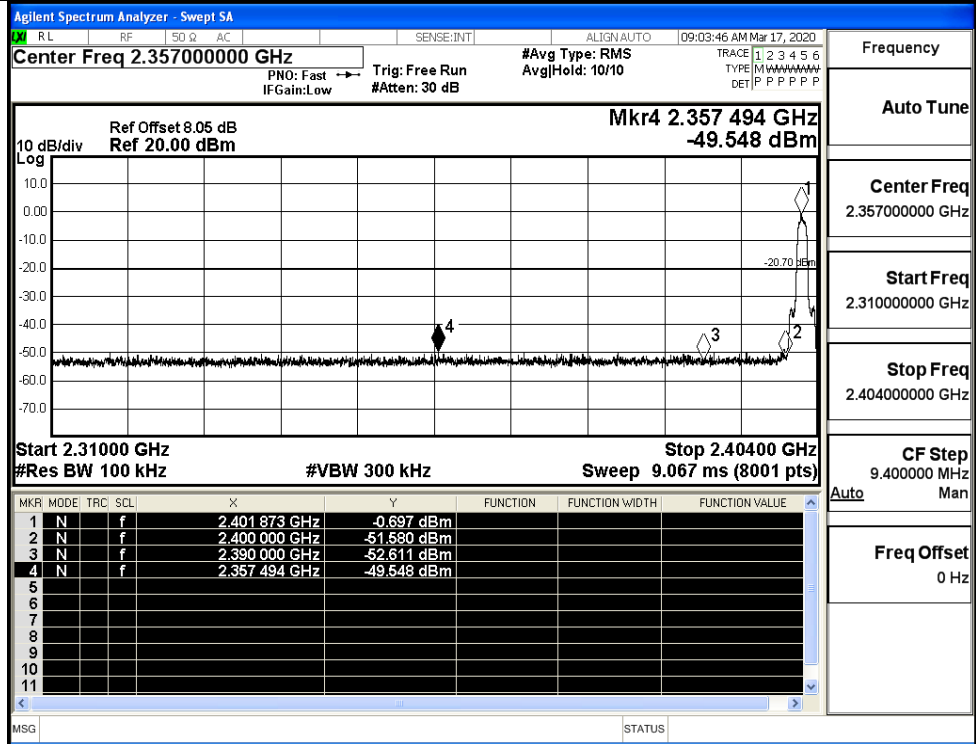
GFSK/HCH/No Hop



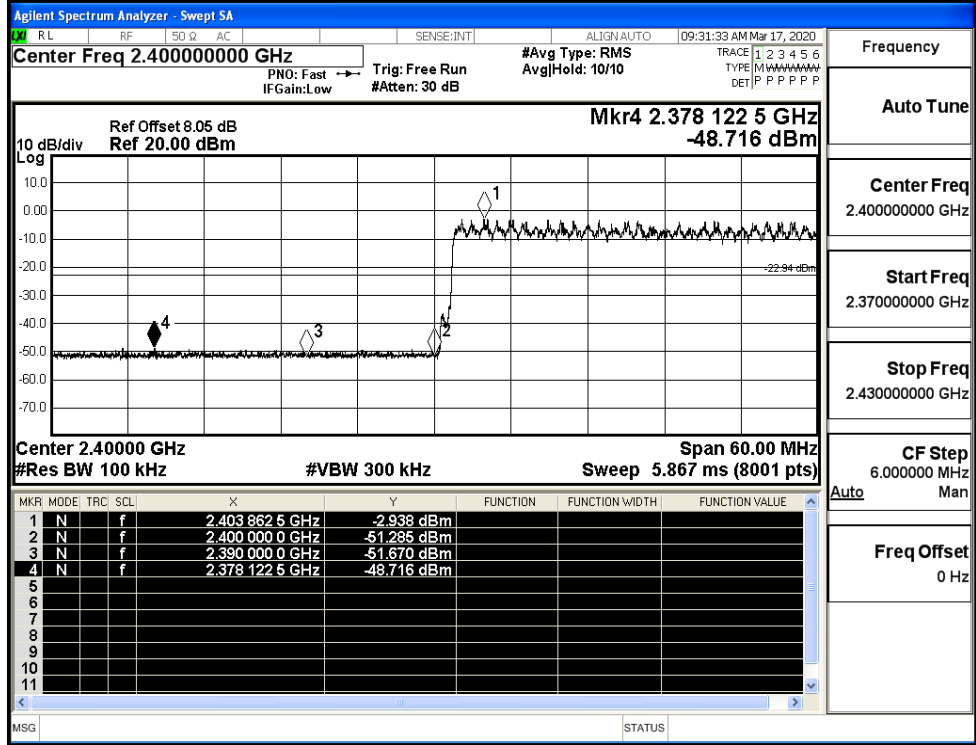
GFSK/HCH/Hop



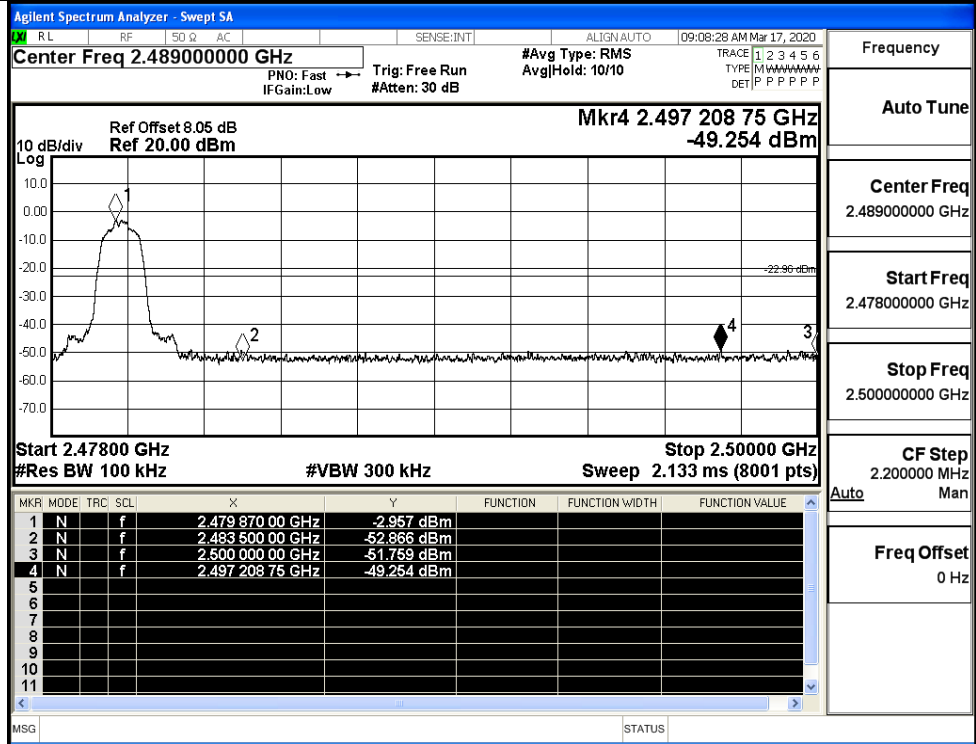
$\pi/4$ DQPSK/LCH/No  
Hop



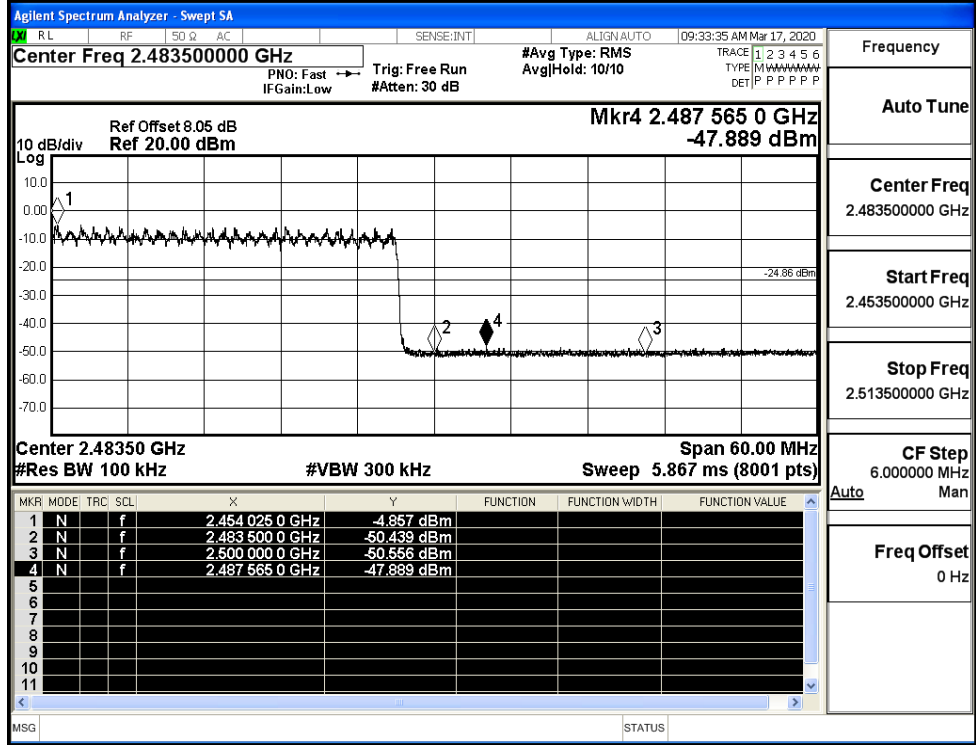
$\pi/4$ DQPSK/LCH/Hop



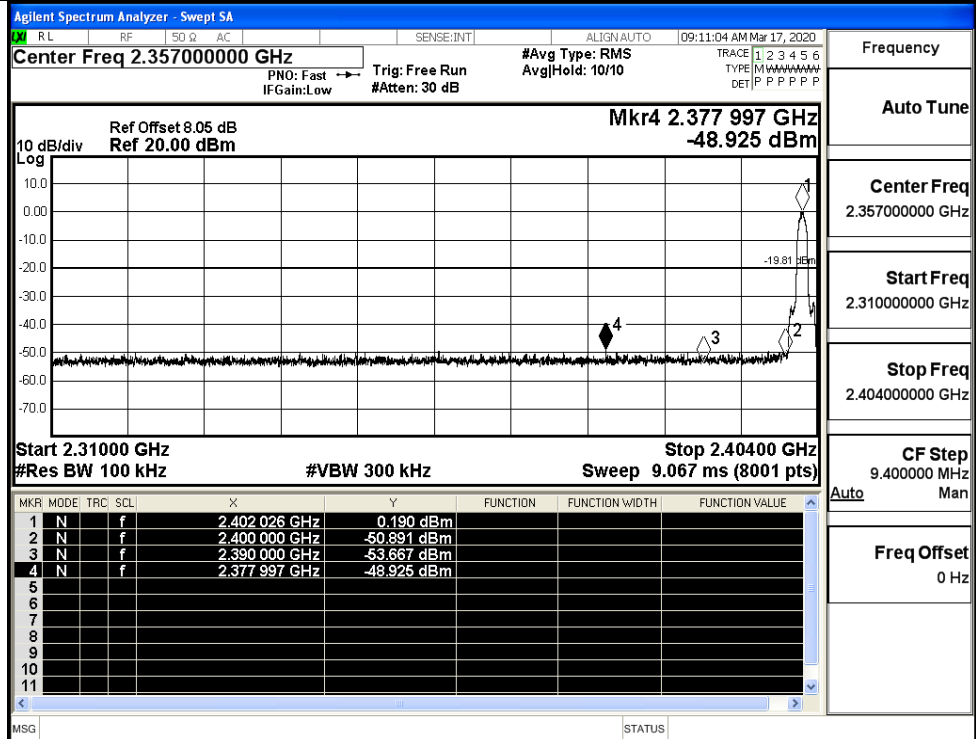
$\pi$ /4DQPSK/HCH/No  
Hop



$\pi$ /4DQPSK/HCH/Hop

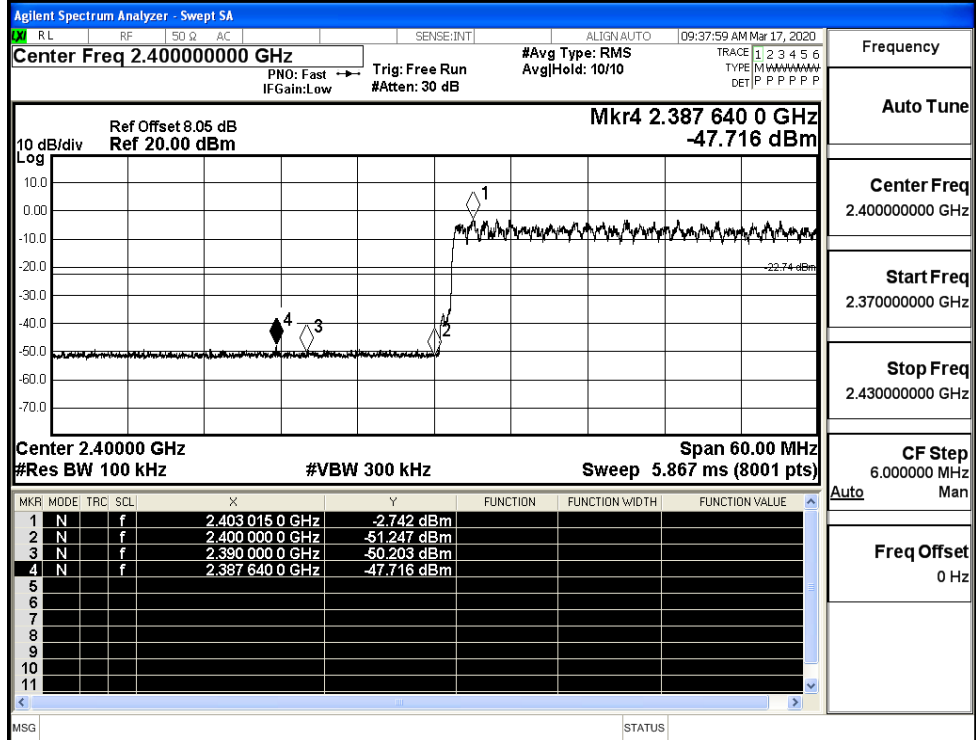


8DPSK/LCH/No Hop



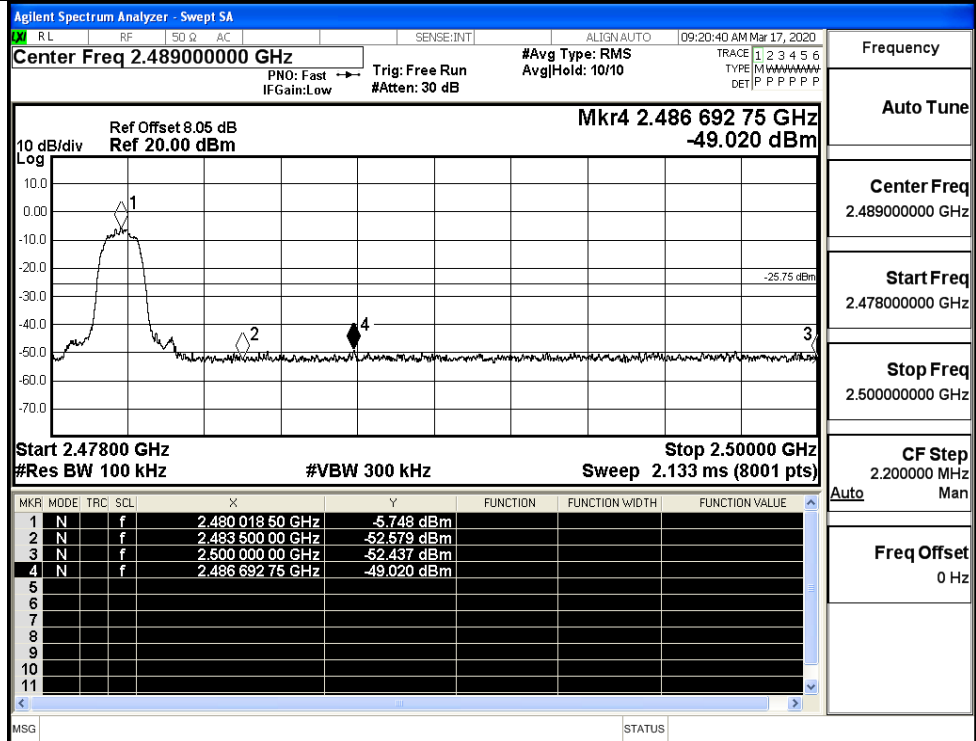
Frequency  
Auto Tune  
Center Freq  
2.357000000 GHz  
Start Freq  
2.310000000 GHz  
Stop Freq  
2.404000000 GHz  
CF Step  
9.400000 MHz  
Freq Offset  
0 Hz

8DPSK/LCH/Hop



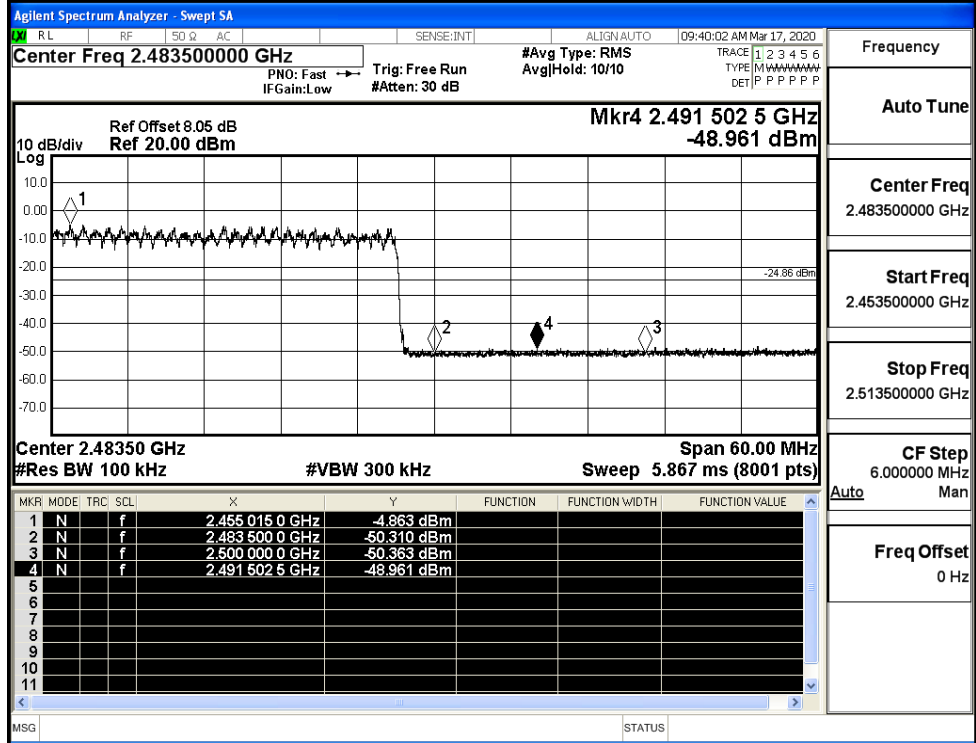
Frequency  
Auto Tune  
Center Freq  
2.400000000 GHz  
Start Freq  
2.370000000 GHz  
Stop Freq  
2.430000000 GHz  
CF Step  
6.000000 MHz  
Freq Offset  
0 Hz

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



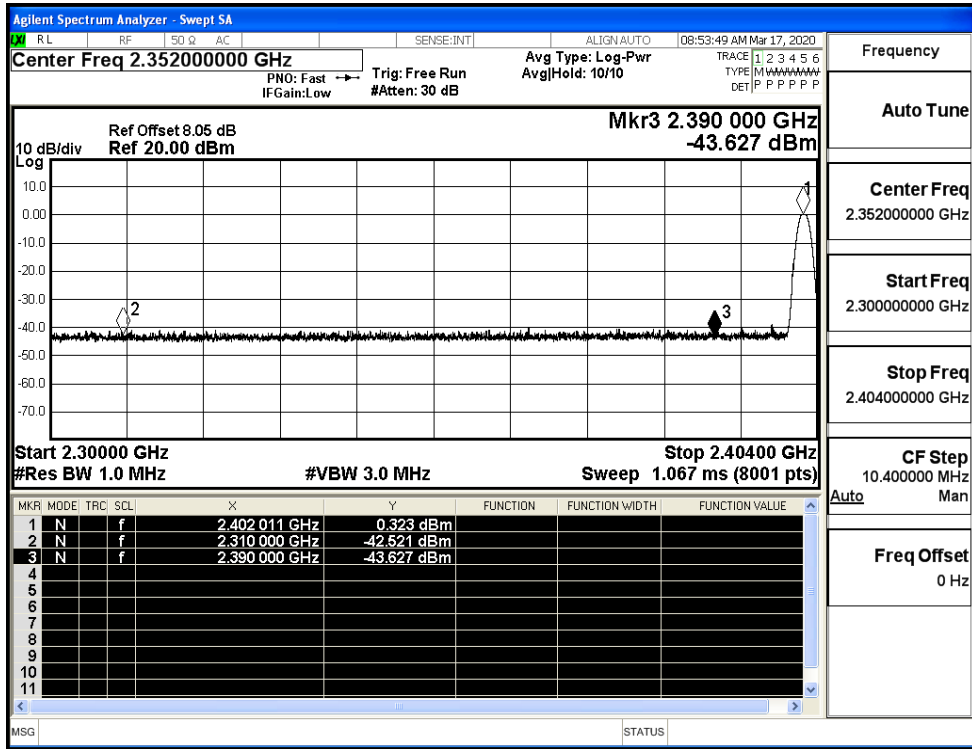
Frequency  
Auto Tune  
Center Freq  
2.483500000 GHz  
Start Freq  
2.453500000 GHz  
Stop Freq  
2.513500000 GHz  
CF Step  
6.000000 MHz  
Auto Man  
Freq Offset  
0 Hz



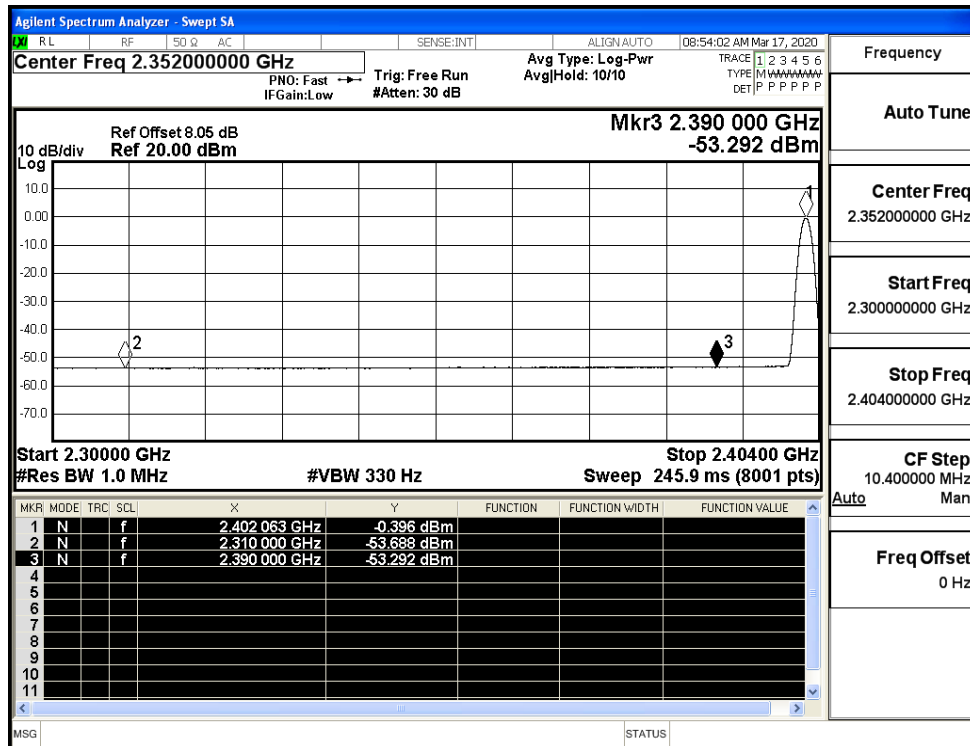
## A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-42.52	2.0	0	54.71	PEAK	74	PASS
	Off	2310.0	-53.69	2.0	0	43.54	AV	54	PASS
	Off	2390.0	-43.63	2.0	0	53.60	PEAK	74	PASS
	Off	2390.0	-53.29	2.0	0	43.94	AV	54	PASS
	Off	2483.5	-41.94	2.0	0	55.29	PEAK	74	PASS
	Off	2483.5	-52.82	2.0	0	44.41	AV	54	PASS
	Off	2500.0	-42.28	2.0	0	54.95	PEAK	74	PASS
	Off	2500.0	-52.62	2.0	0	44.61	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.96	2.0	0	53.27	PEAK	74	PASS
	Off	2310.0	-53.75	2.0	0	43.48	AV	54	PASS
	Off	2390.0	-43.44	2.0	0	53.79	PEAK	74	PASS
	Off	2390.0	-53.33	2.0	0	43.90	AV	54	PASS
	Off	2483.5	-42.29	2.0	0	54.94	PEAK	74	PASS
	Off	2483.5	-52.40	2.0	0	44.83	AV	54	PASS
	Off	2500.0	-42.78	2.0	0	54.45	PEAK	74	PASS
	Off	2500.0	-52.38	2.0	0	44.85	AV	54	PASS
8DPSK	Off	2310.0	-43.07	2.0	0	54.16	PEAK	74	PASS
	Off	2310.0	-53.48	2.0	0	43.75	AV	54	PASS
	Off	2390.0	-43.19	2.0	0	54.04	PEAK	74	PASS
	Off	2390.0	-52.96	2.0	0	44.27	AV	54	PASS
	Off	2483.5	-43.39	2.0	0	53.84	PEAK	74	PASS
	Off	2483.5	-52.57	2.0	0	44.66	AV	54	PASS
	Off	2500.0	-42.11	2.0	0	55.12	PEAK	74	PASS
	Off	2500.0	-52.42	2.0	0	44.81	AV	54	PASS

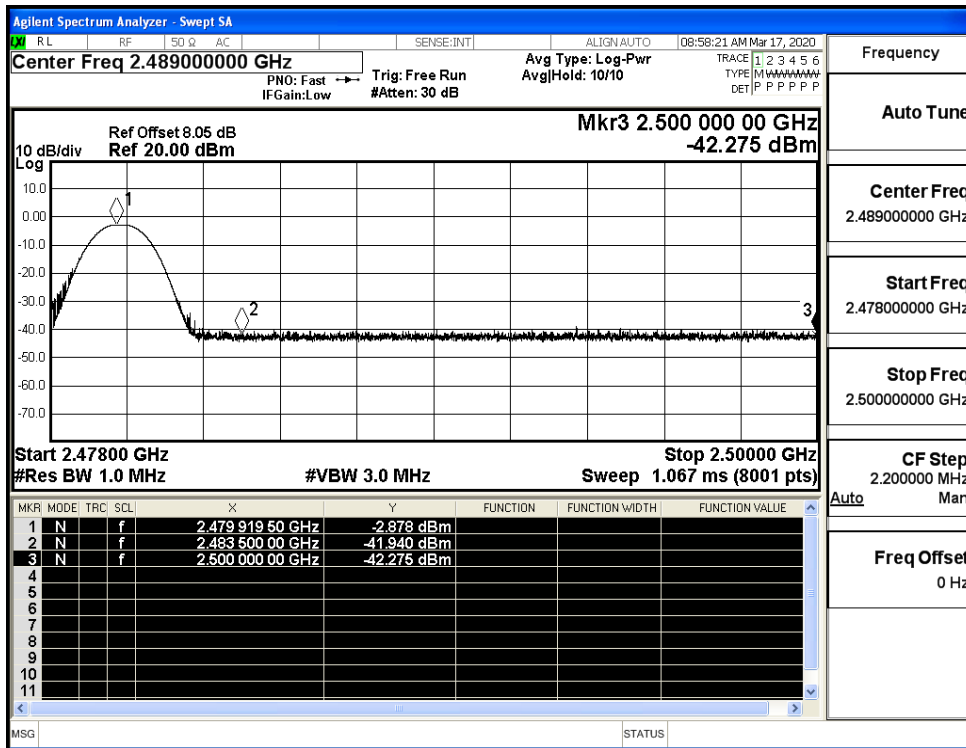
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (Low Channel)



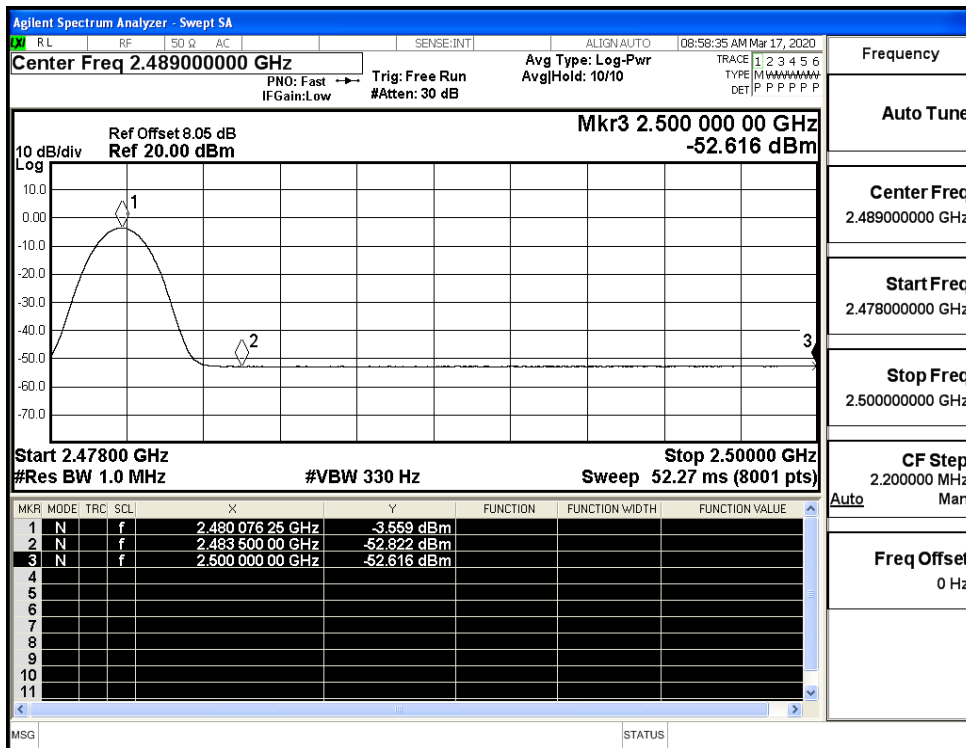
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (Low Channel)



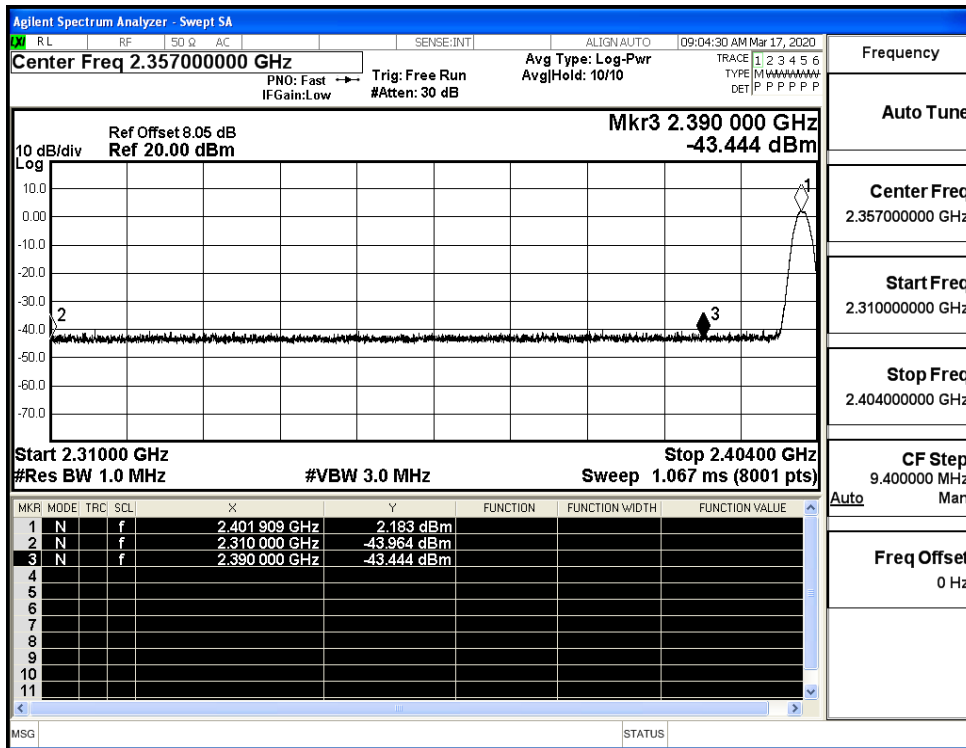
Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_PEAK (High Channel)



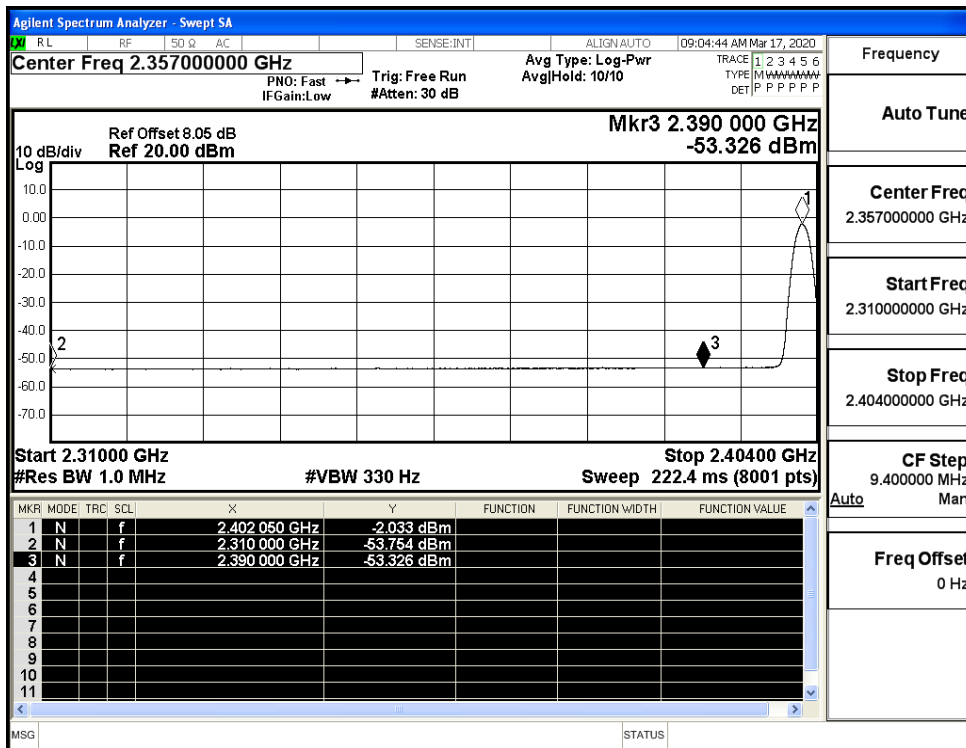
Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_Average (High Channel)



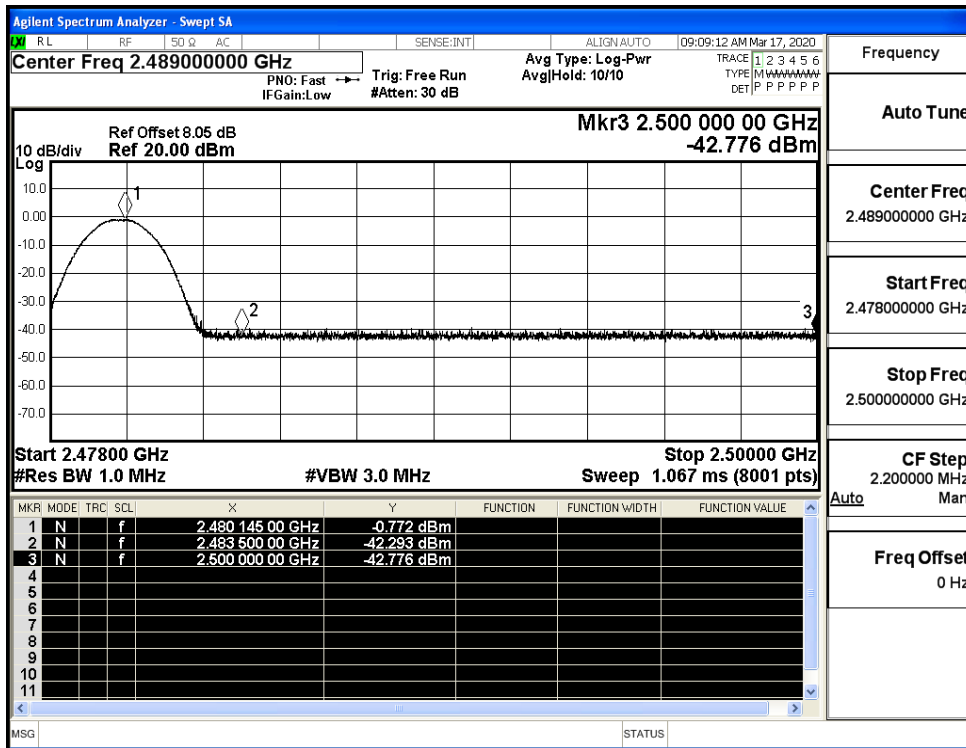
Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_PEAK (Low Channel)



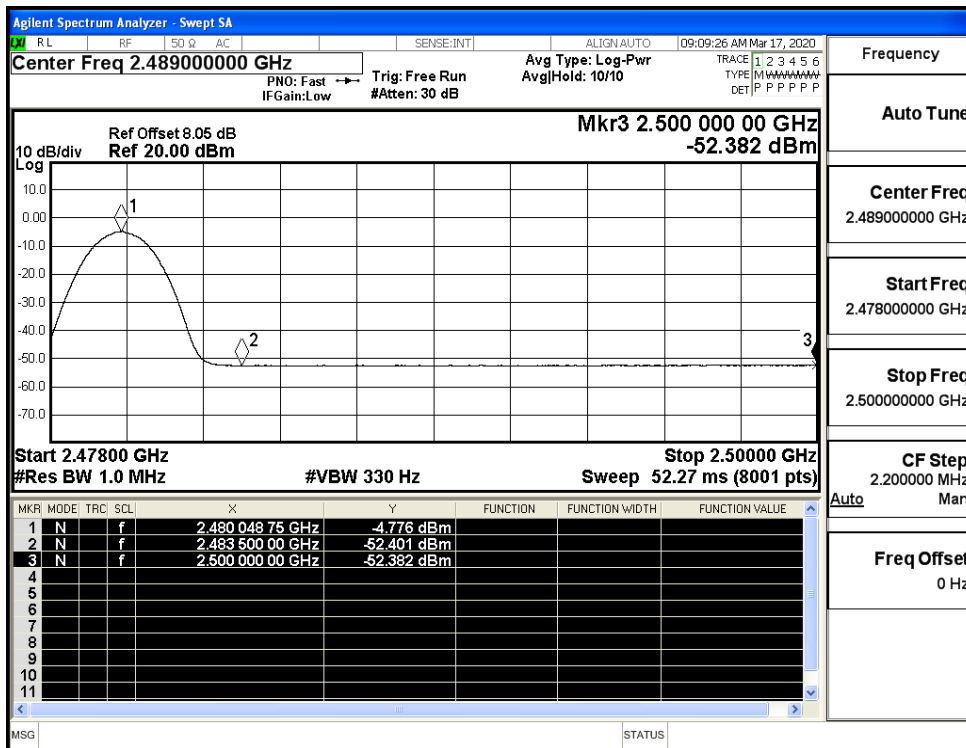
Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_Average (Low Channel)



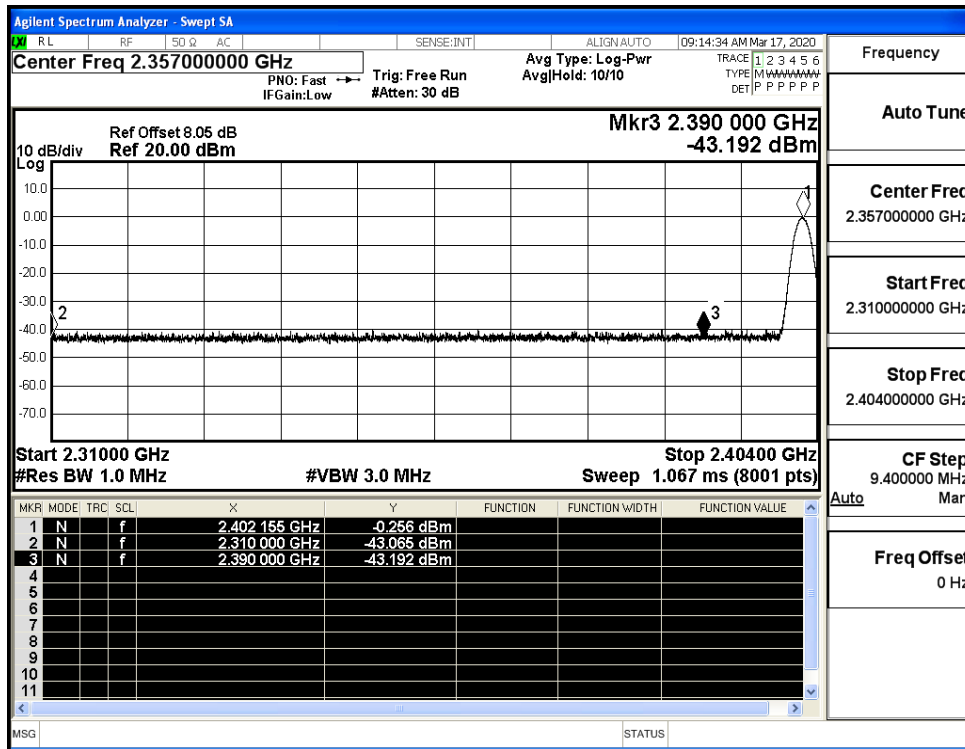
Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_PEAK (High Channel)



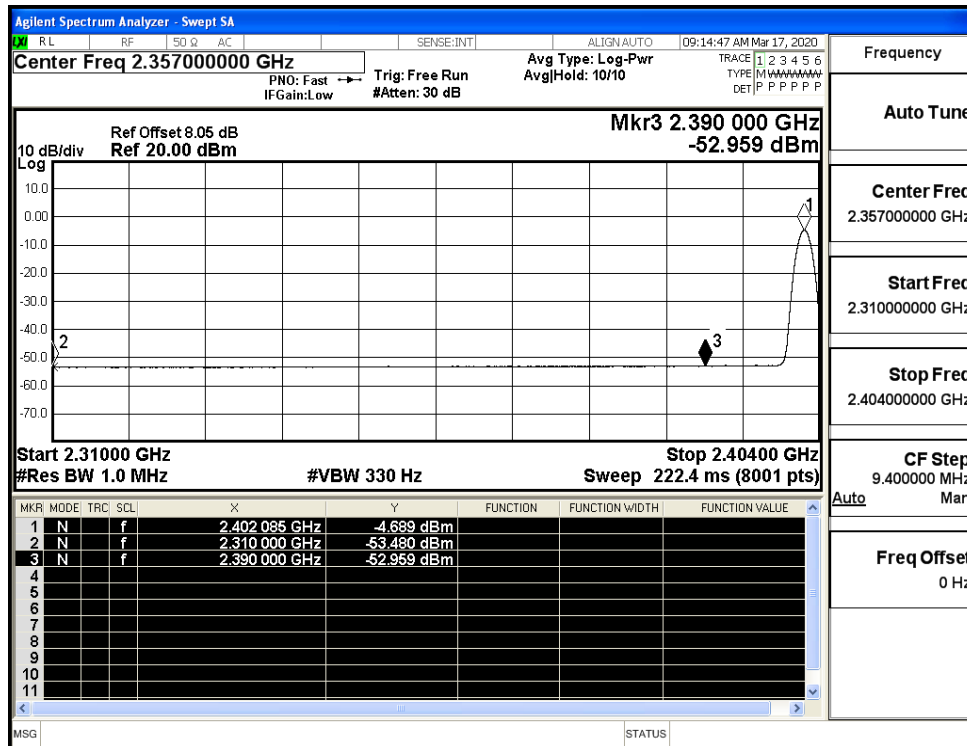
Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_Average (High Channel)



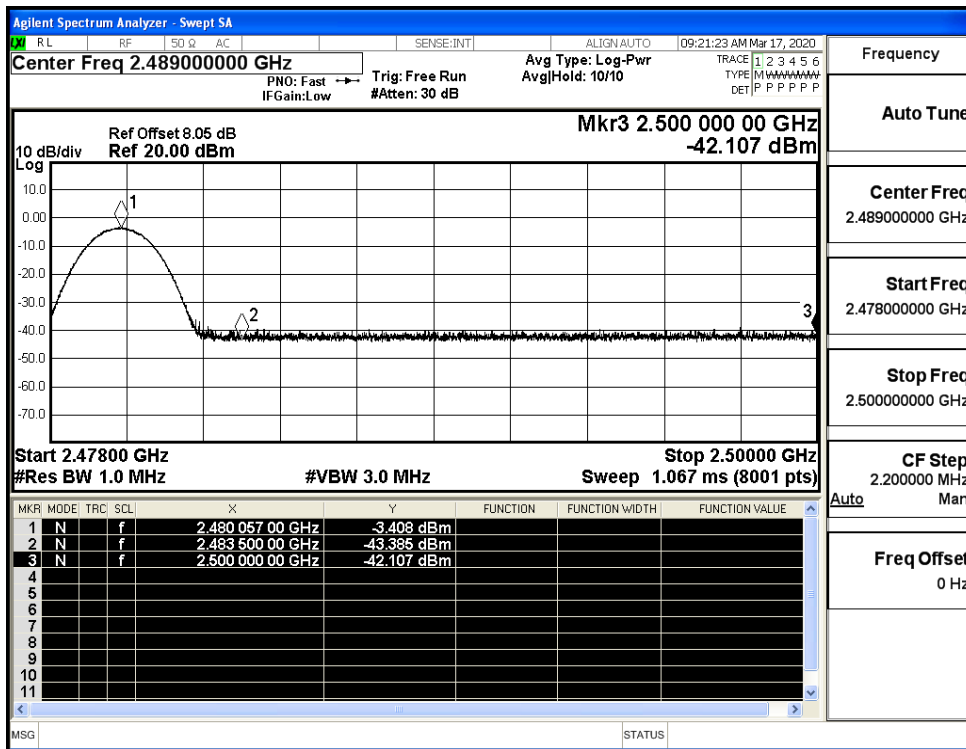
Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_PEAK (Low Channel)



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)

