

**Appendix A**  
**RF Test Data for BT V5.0(BDR/EDR) (Conducted Measurement)**  
**Product Name: Bluetooth headset**  
**Trade Mark: N/A**  
**Test Model: T19**

**Environmental Conditions**

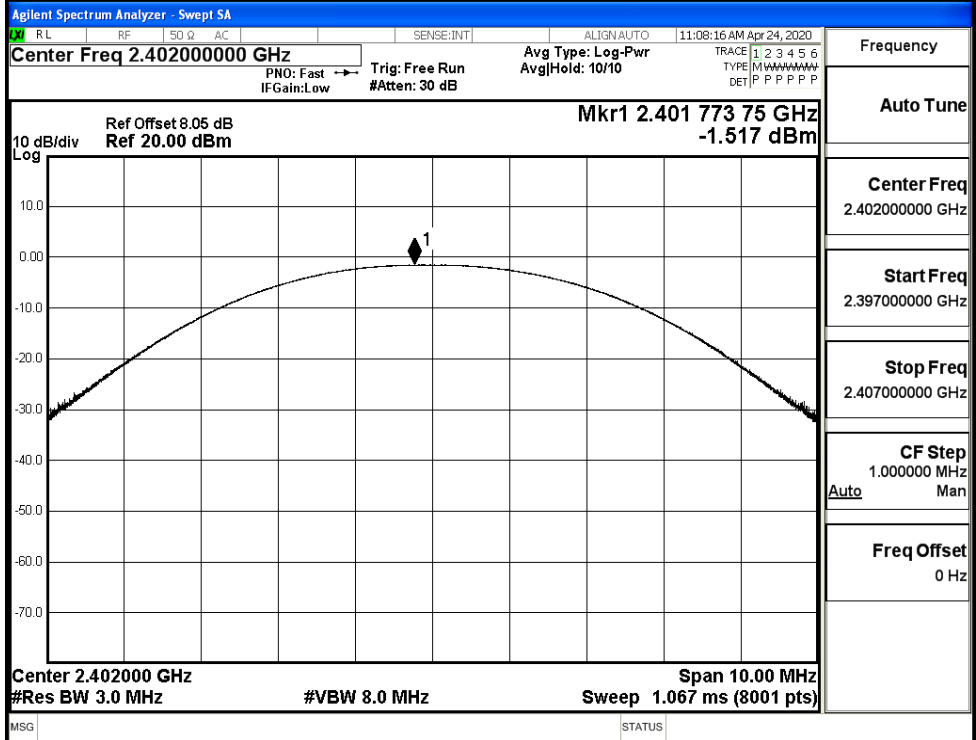
Temperature:	25 °C
Relative Humidity:	50%
ATM Pressure:	100.0 kPa
Test Engineer:	Qu Xin
Supervised by:	Tom Liu

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

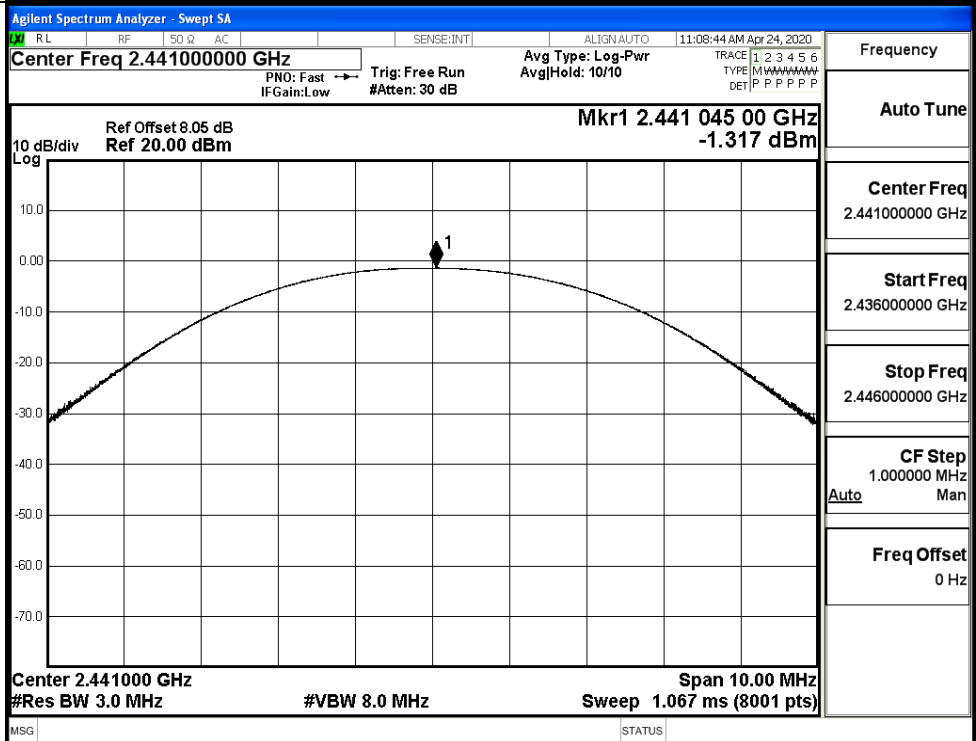
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-1.517	21	PASS
	MCH	-1.317	21	PASS
	HCH	-1.935	21	PASS
$\pi/4$ DQPSK	LCH	0.029	21	PASS
	MCH	0.104	21	PASS
	HCH	-0.473	21	PASS
8DPSK	LCH	0.102	21	PASS
	MCH	0.243	21	PASS
	HCH	-0.361	21	PASS

Test Graphs

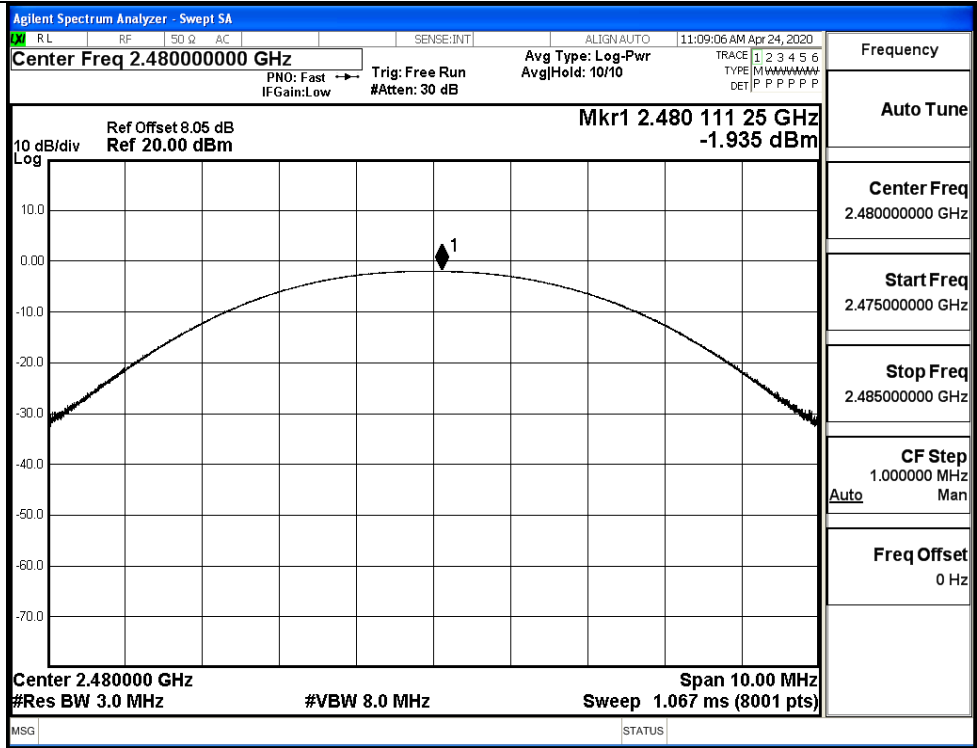
GFSK/LCH



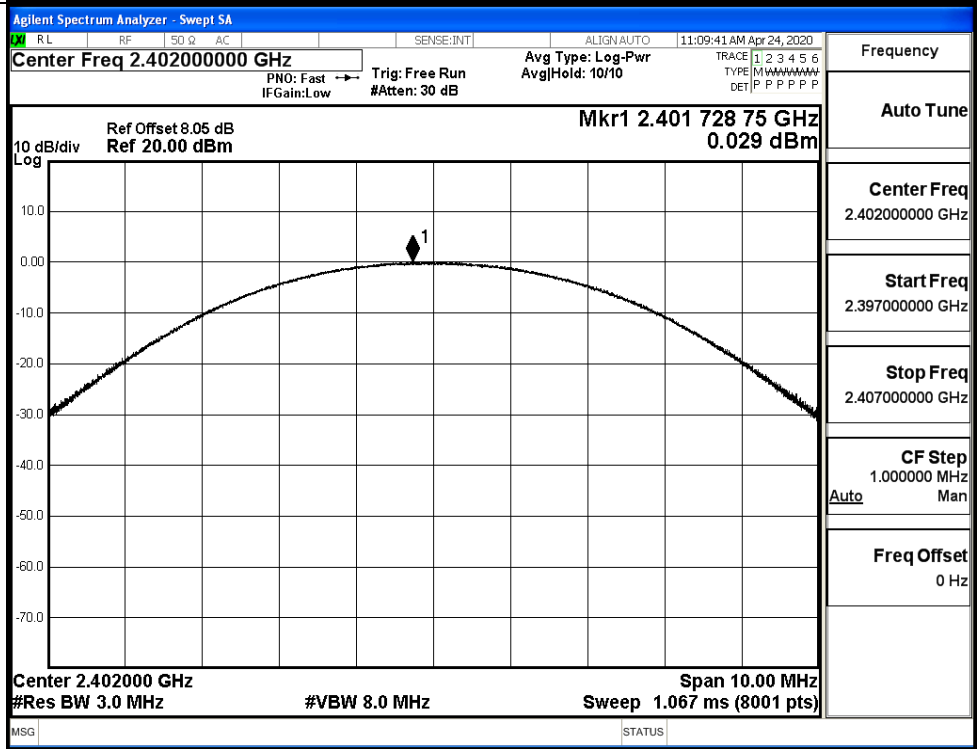
GFSK/MCH



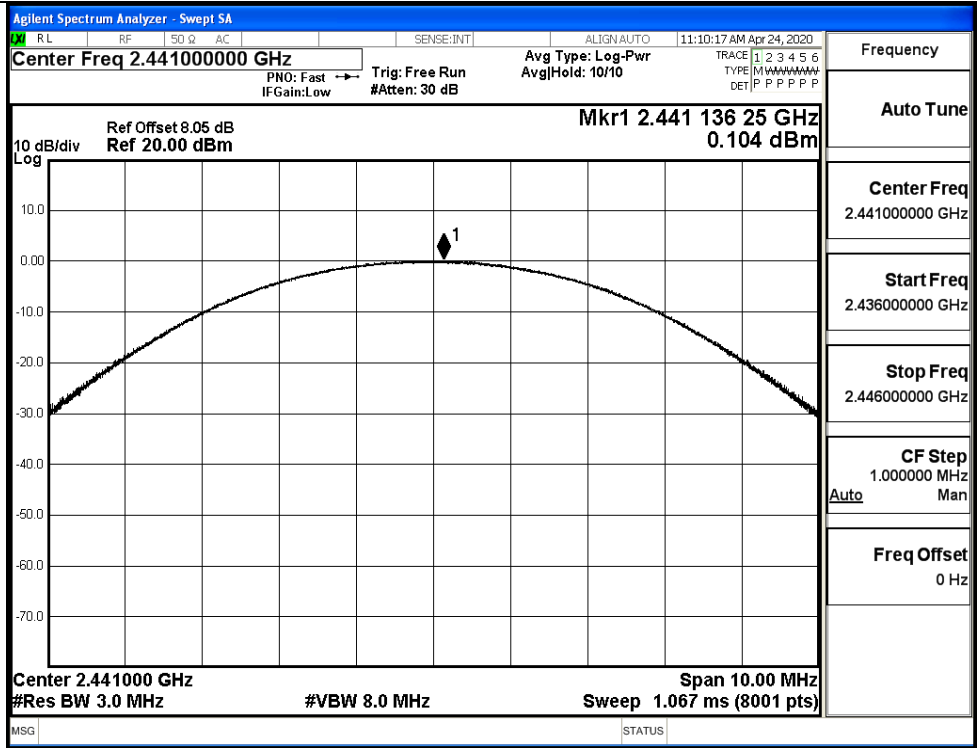
GFSK/HCH



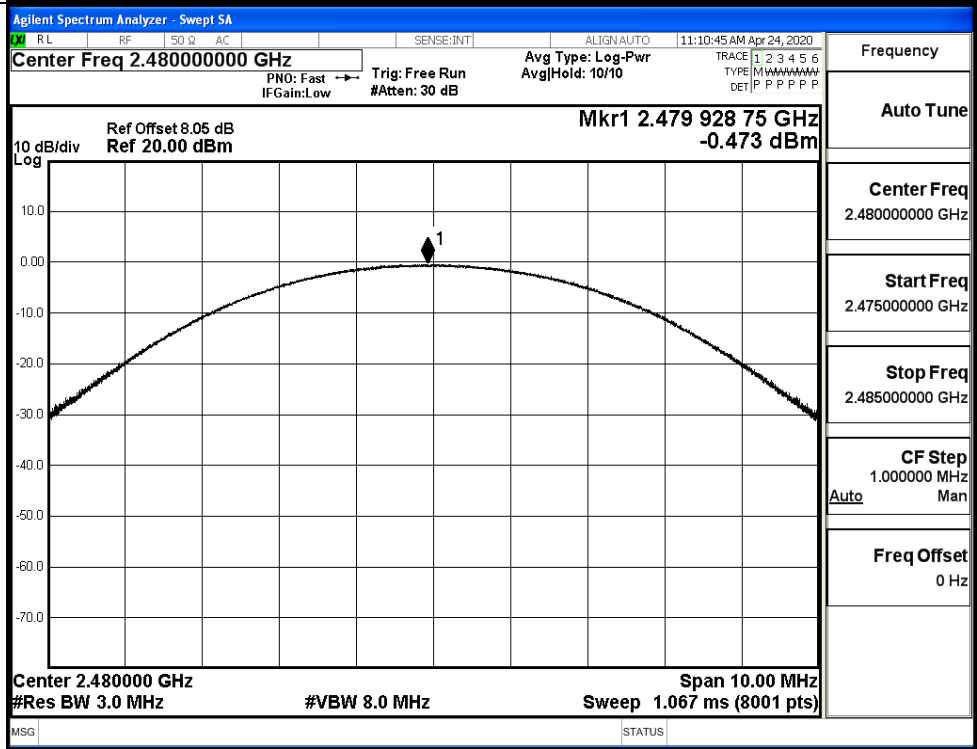
$\pi/4$ DQPSK/LCH



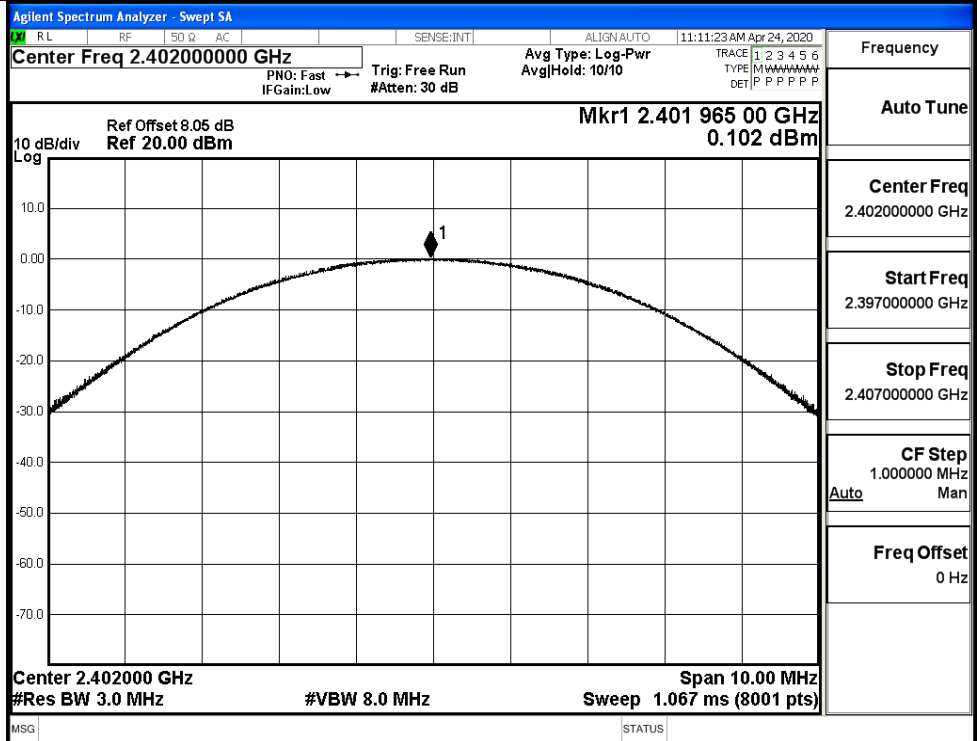
$\pi/4$ DQPSK/MCH



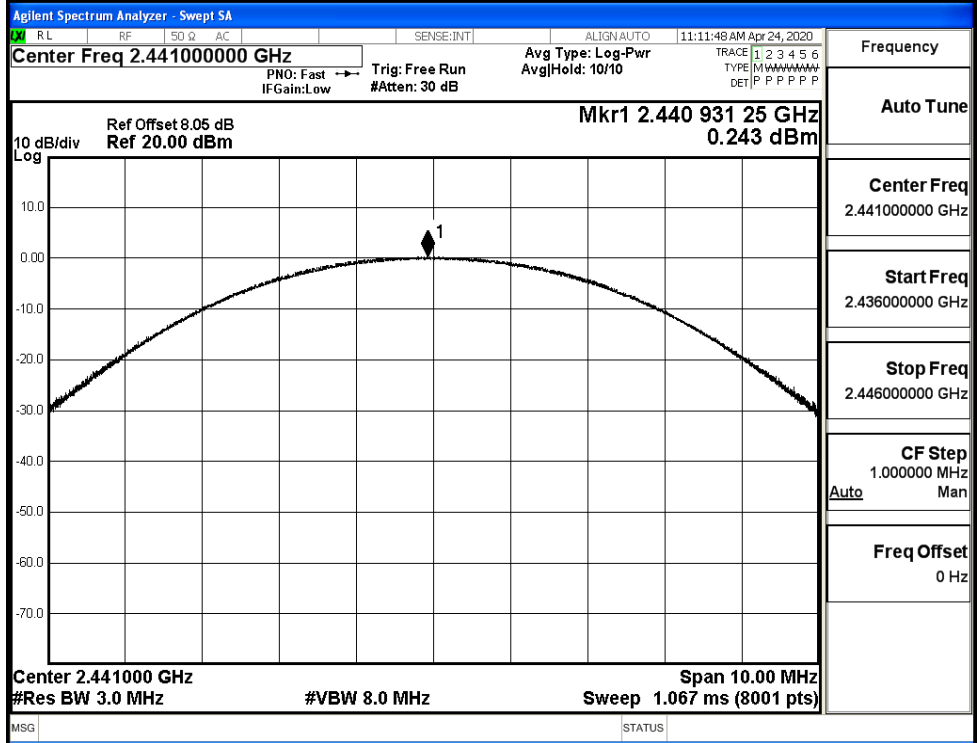
$\pi/4$ DQPSK/HCH



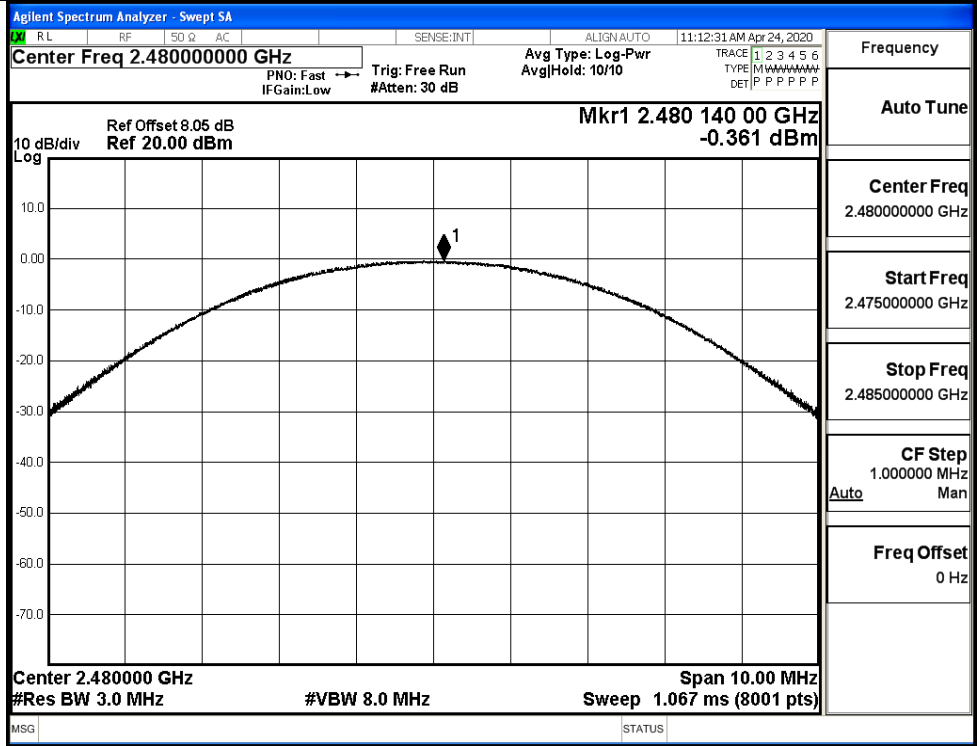
8DPSK/LCH



8DPSK/MCH

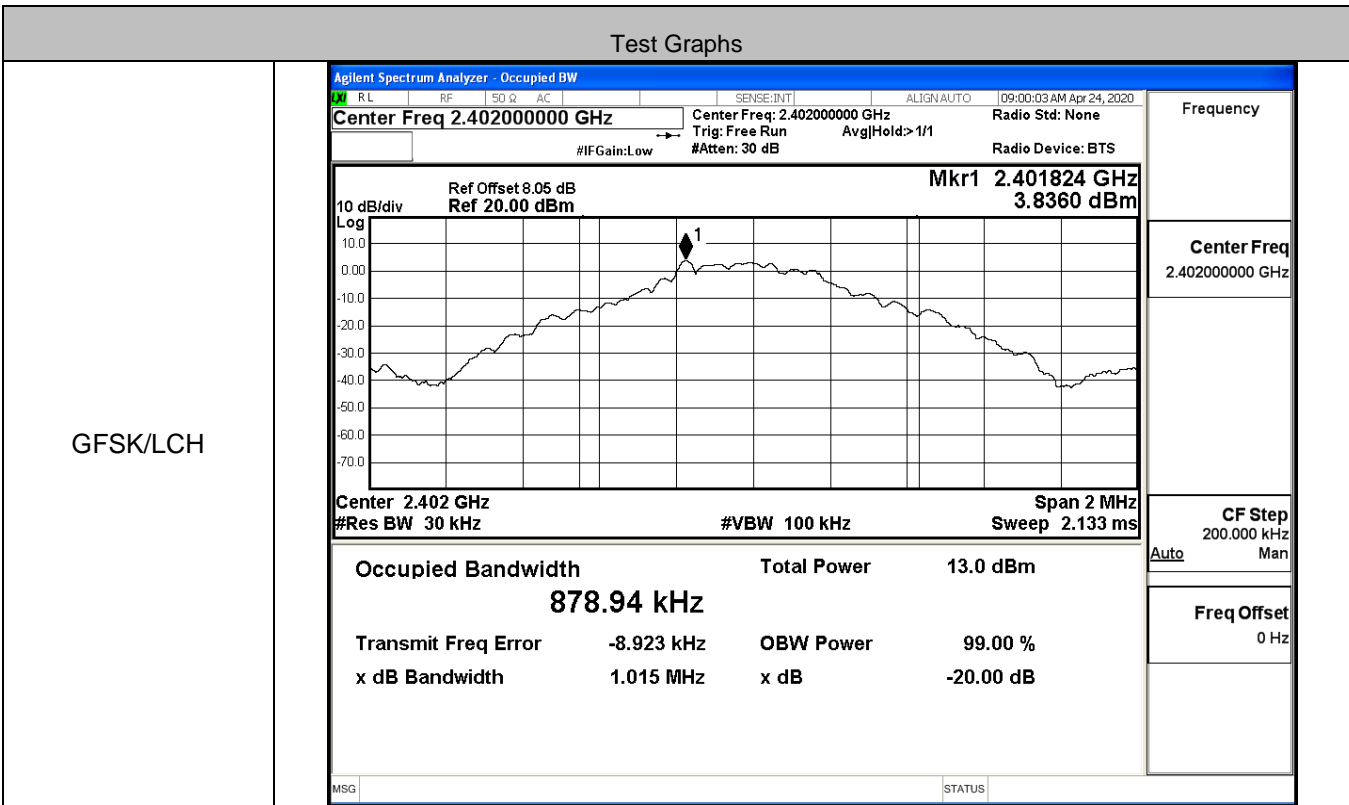


8DPSK/HCH

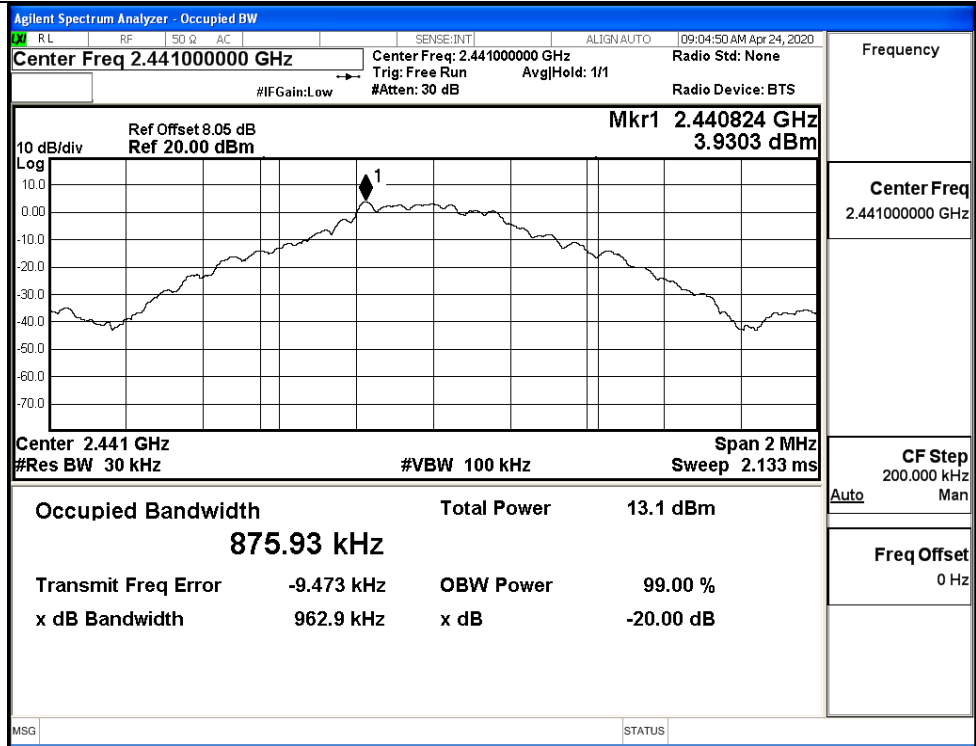


**A.2 20dB Bandwidth**

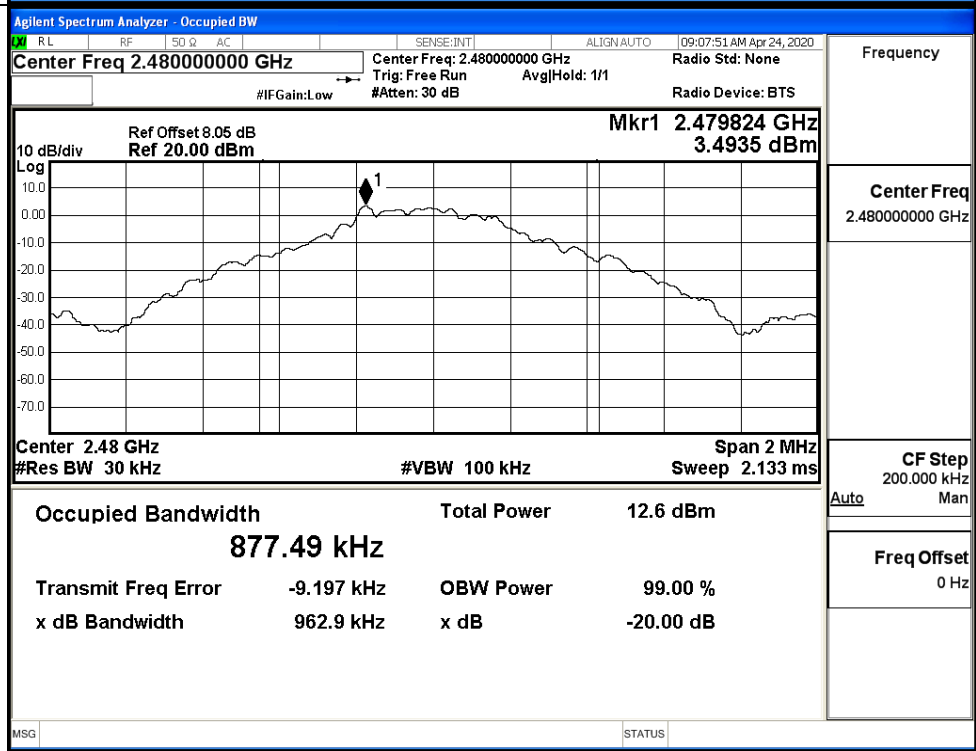
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.015	Not Specified	PASS
	MCH	0.9629	Not Specified	PASS
	HCH	0.9629	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.318	Not Specified	PASS
	MCH	1.317	Not Specified	PASS
	HCH	1.319	Not Specified	PASS
8DPSK	LCH	1.303	Not Specified	PASS
	MCH	1.303	Not Specified	PASS
	HCH	1.305	Not Specified	PASS



GFSK/MCH

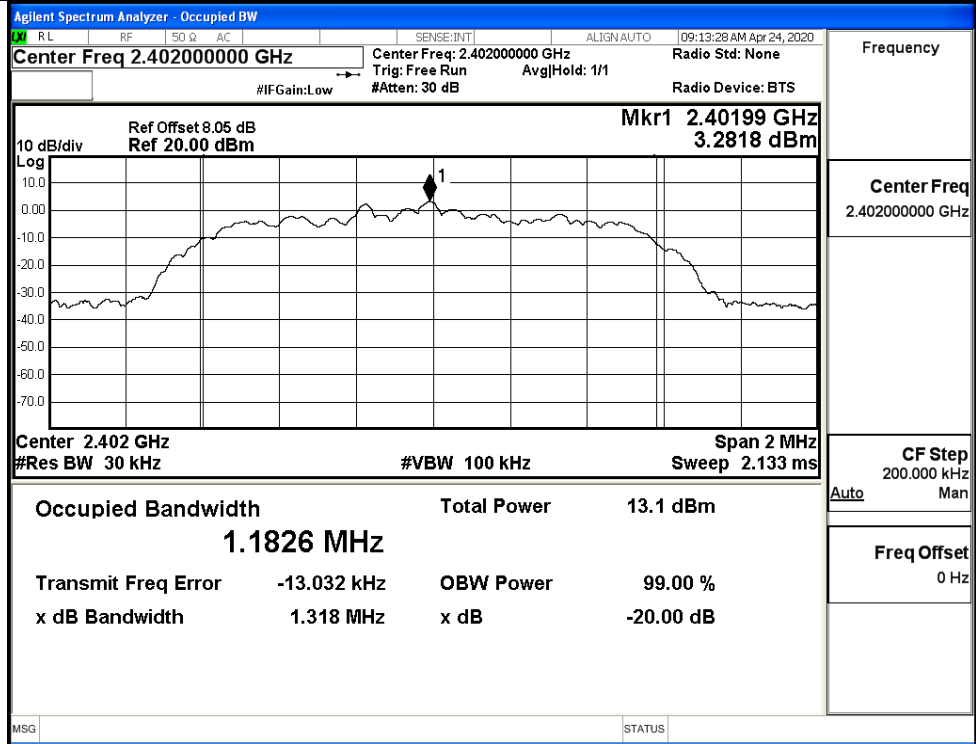


GFSK/HCH

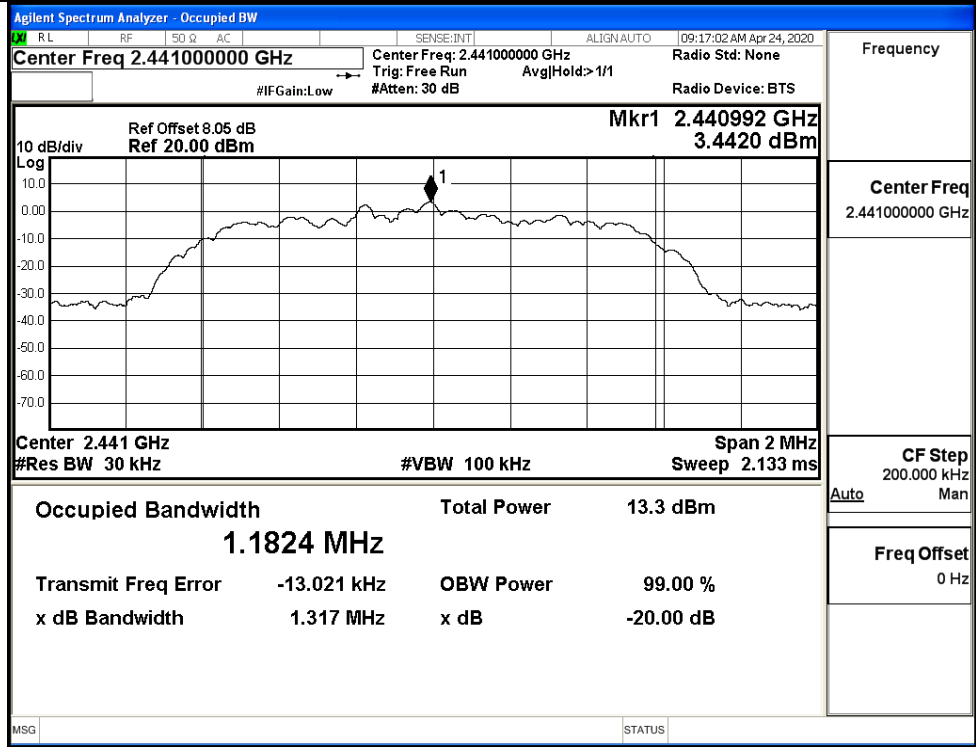




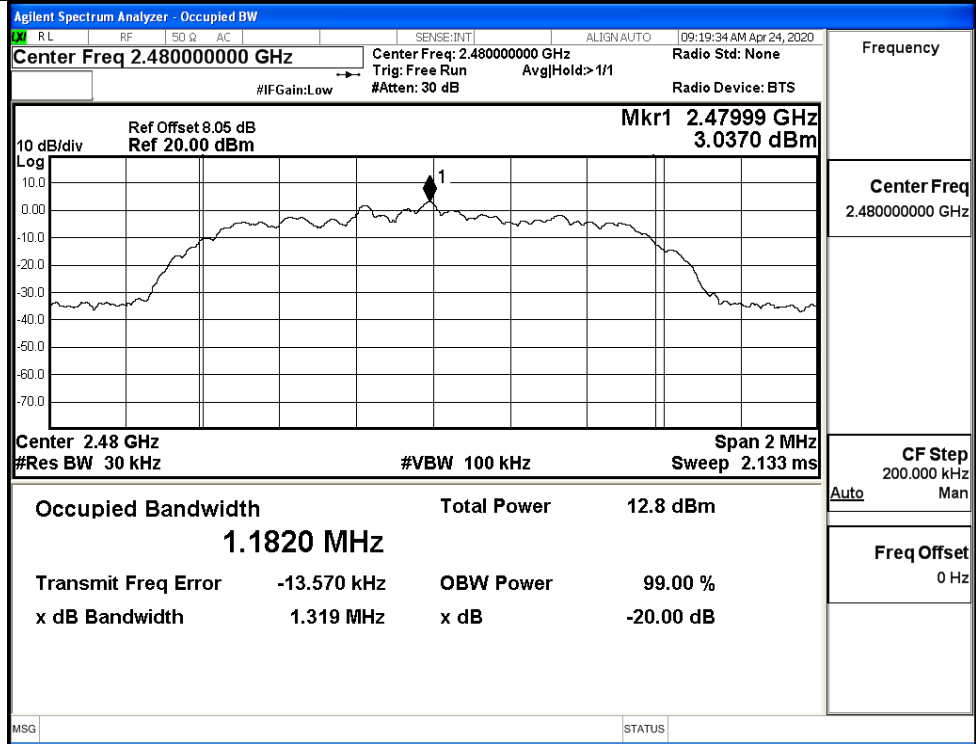
$\pi/4$ DQPSK/LCH



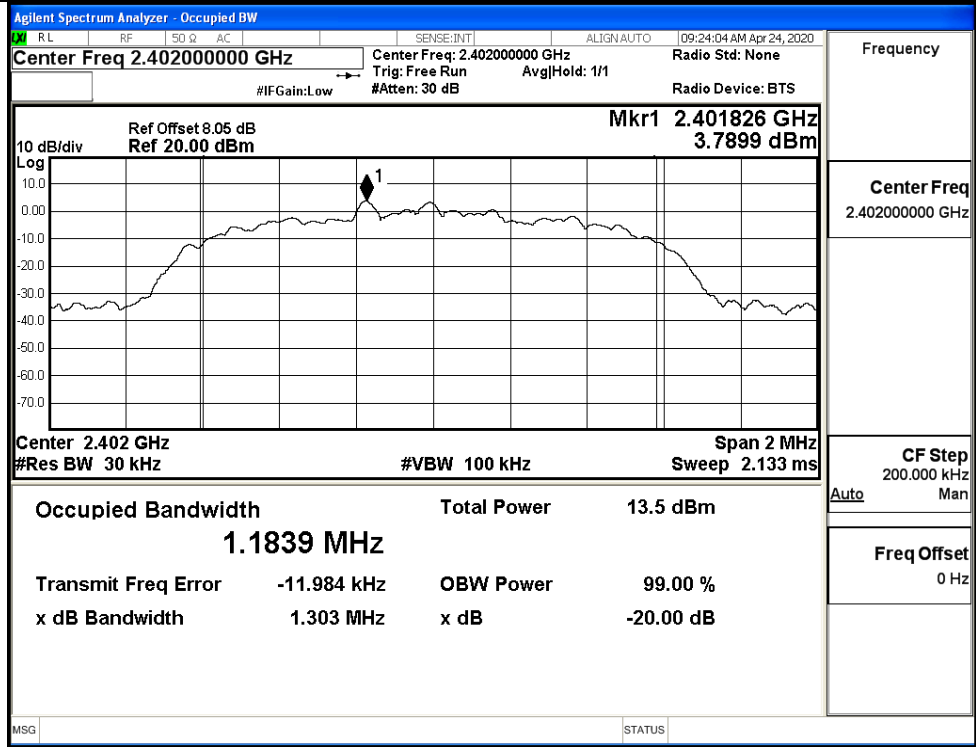
$\pi/4$ DQPSK/MCH



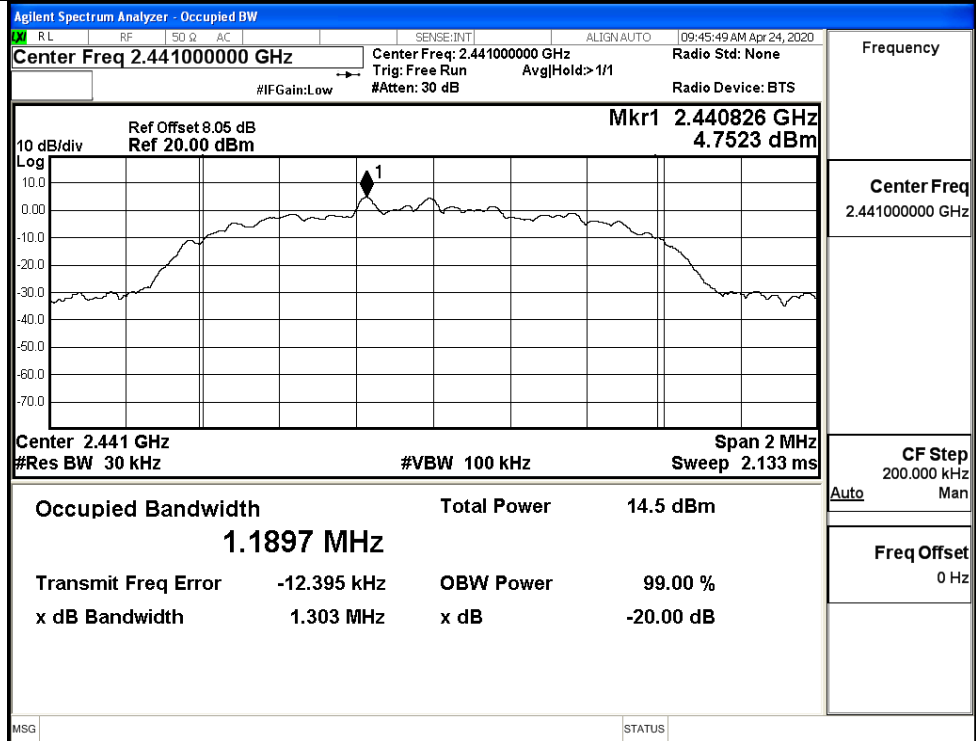
$\pi/4$ DQPSK/HCH



8DPSK/LCH

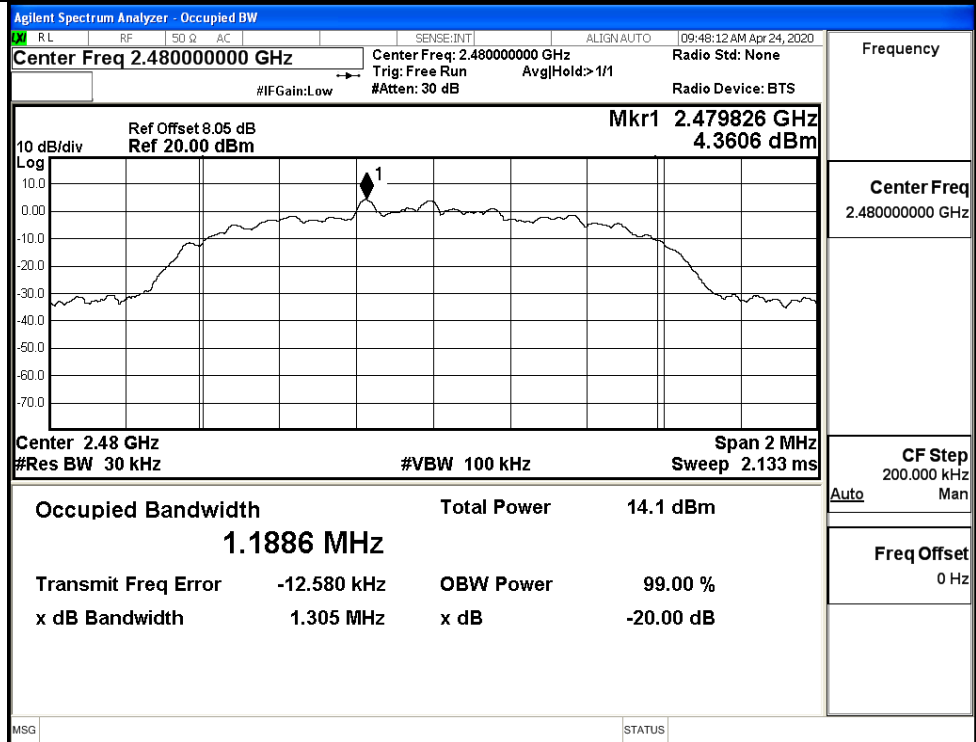


8DPSK/MCH



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

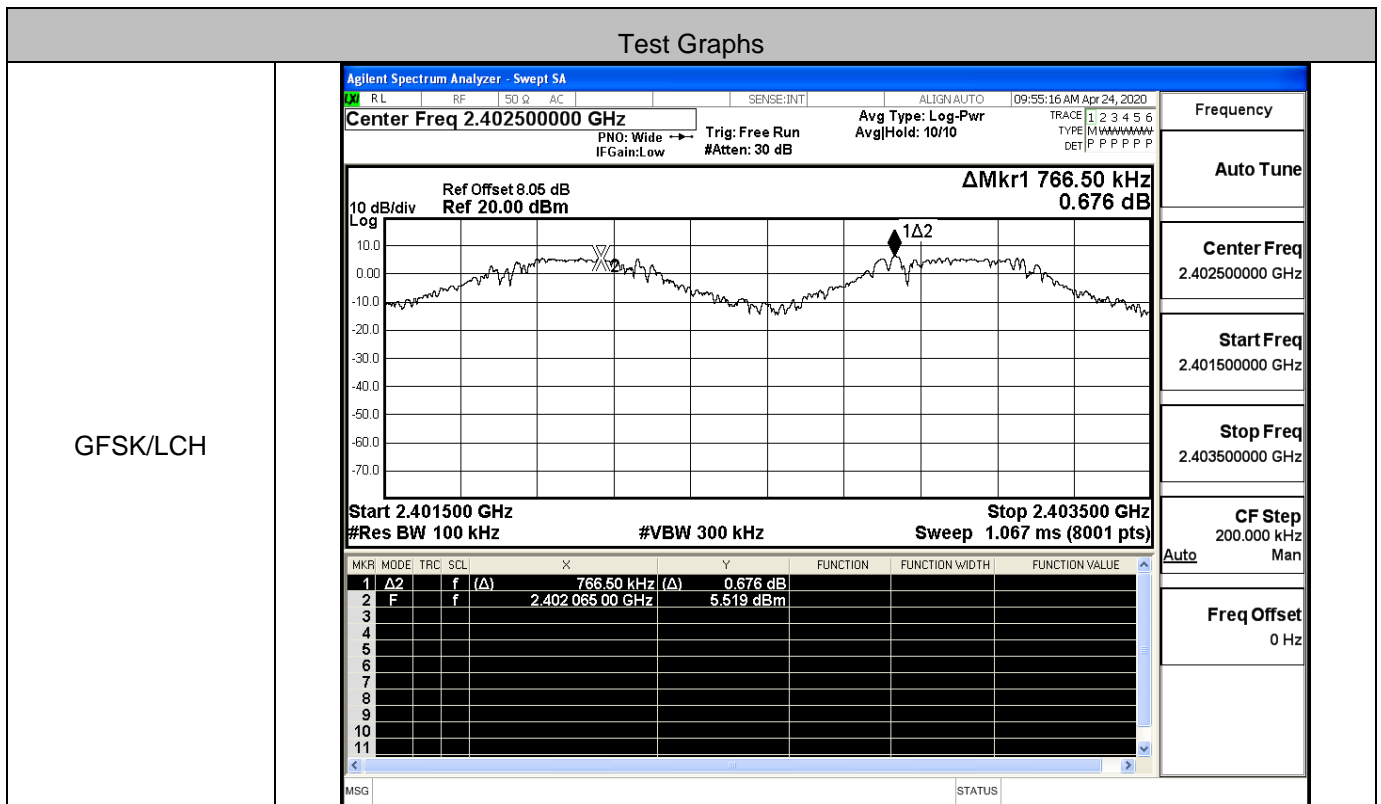
8DPSK/HCH



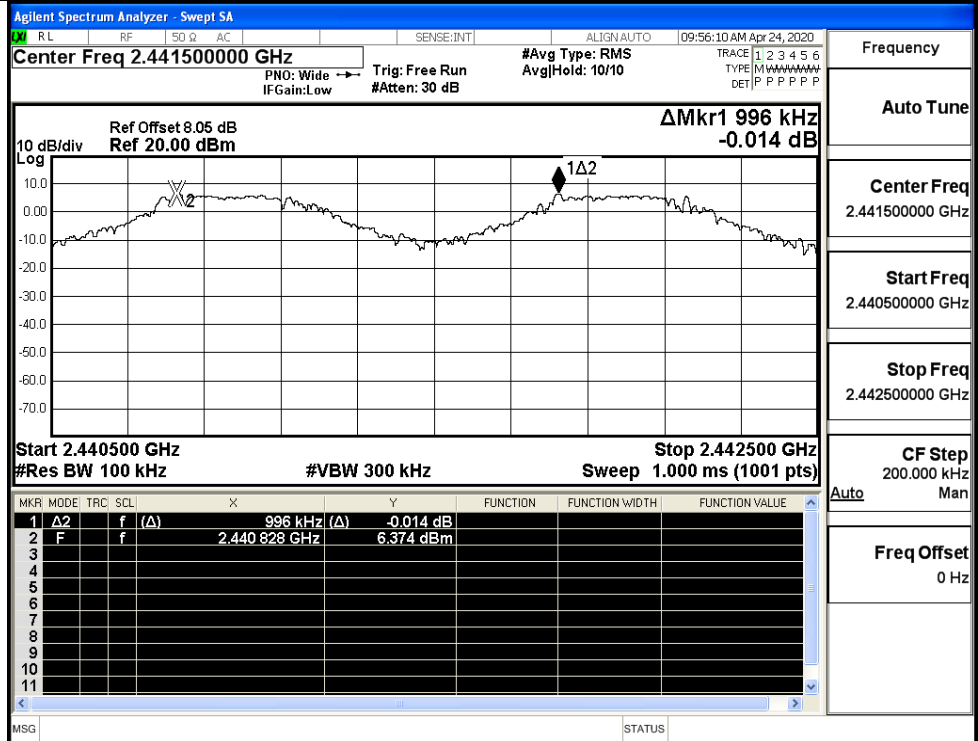
Frequency	2.480000000 GHz
Center Freq	2.480000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

### A.3 Carrier Frequency Separation

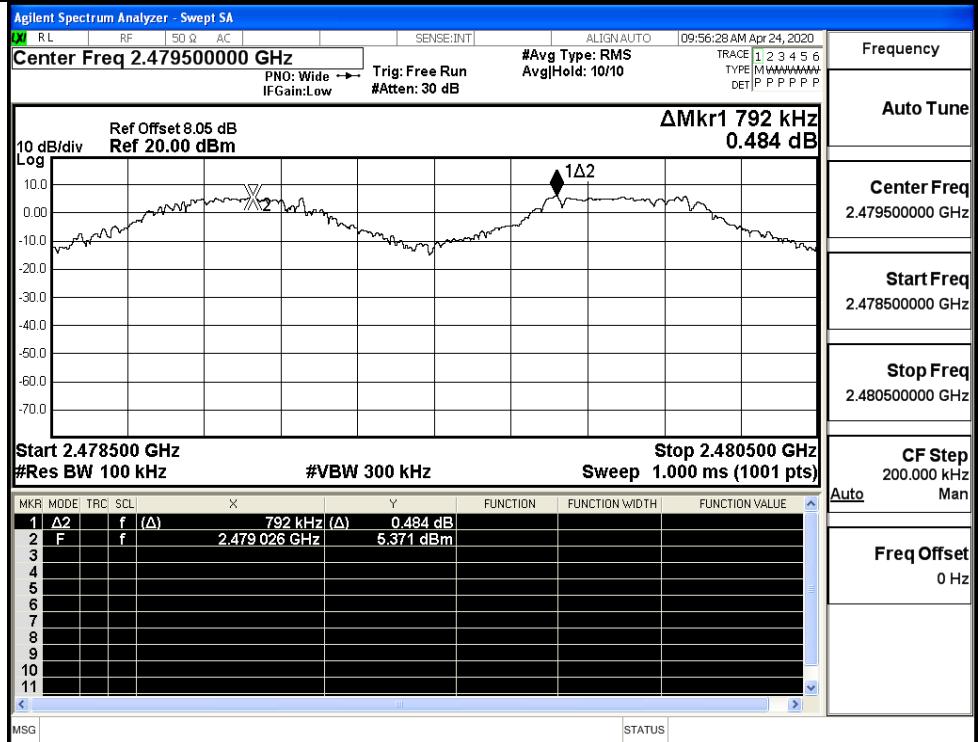
Mode	Channel	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.766	0.677	PASS
	MCH	0.996	0.677	PASS
	HCH	0.792	0.677	PASS
π/4DQPSK	LCH	1.254	0.879	PASS
	MCH	0.896	0.879	PASS
	HCH	0.888	0.879	PASS
8DPSK	LCH	0.870	0.870	PASS
	MCH	1.228	0.870	PASS
	HCH	1.136	0.870	PASS



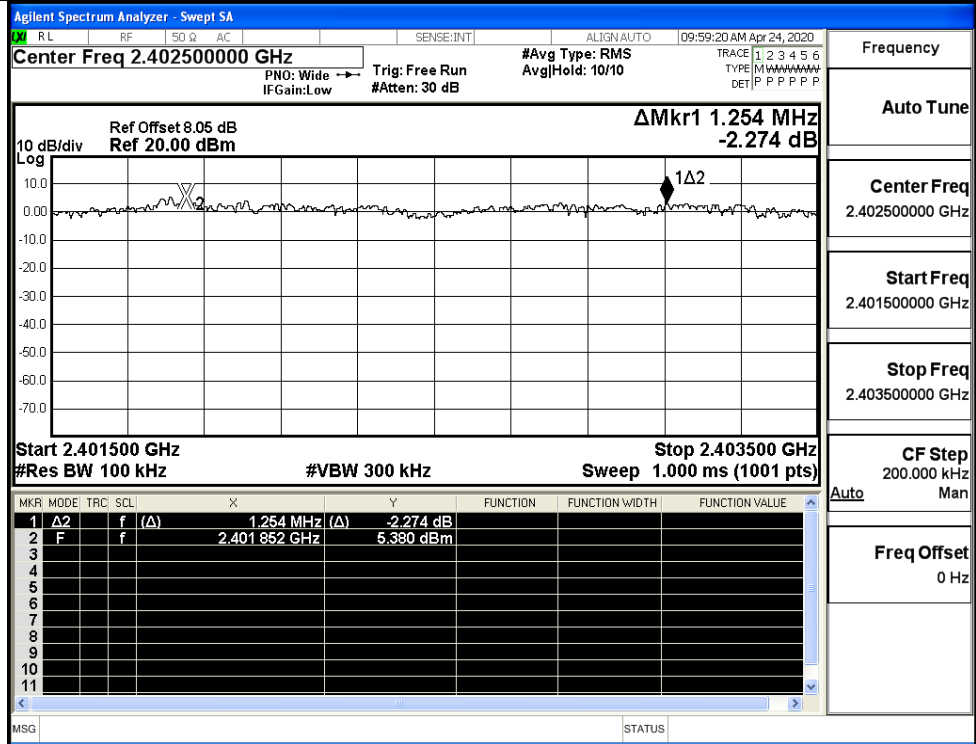
GFSK/MCH



GFSK/HCH

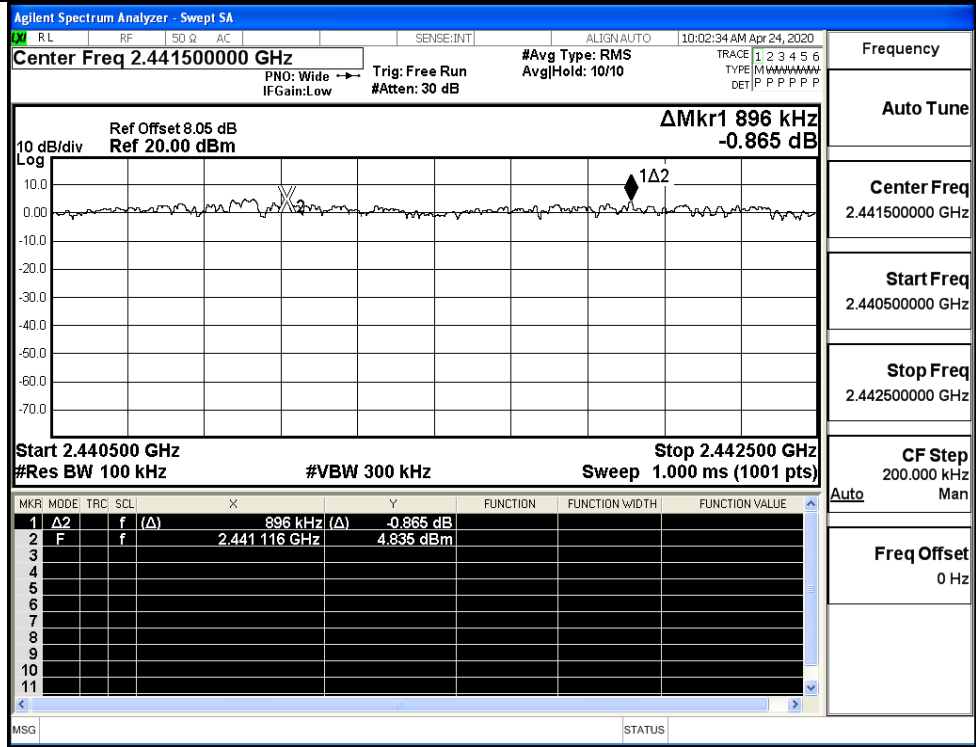


$\pi/4$ DQPSK/LCH



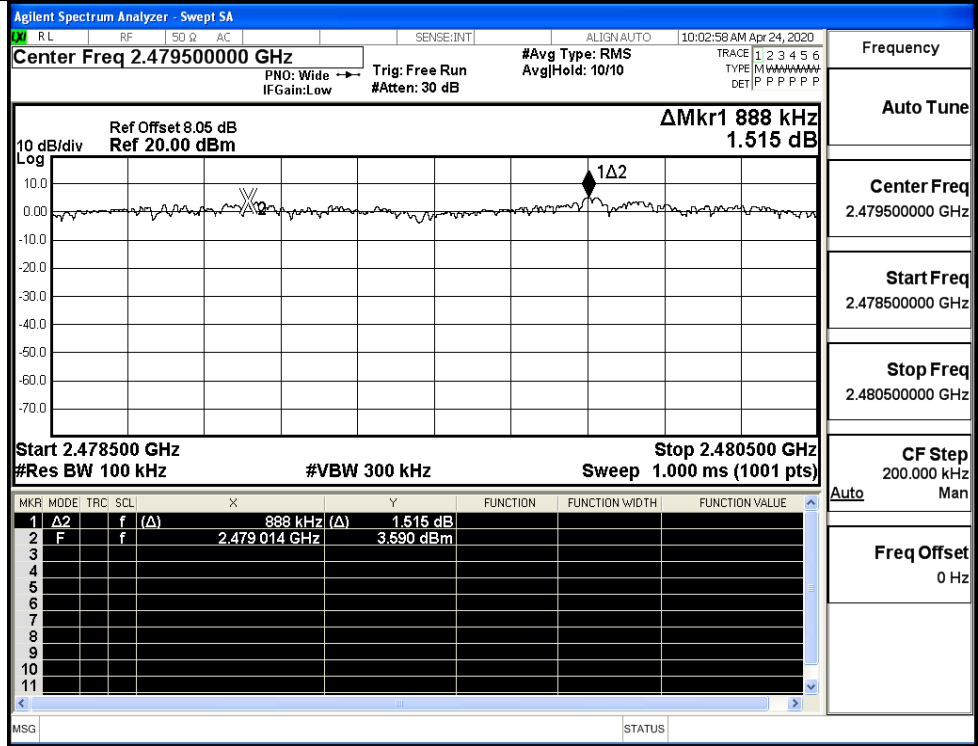
Frequency	2.402500000 GHz
Auto Tune	
Center Freq	2.402500000 GHz
Start Freq	2.401500000 GHz
Stop Freq	2.403500000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

$\pi/4$ DQPSK/MCH

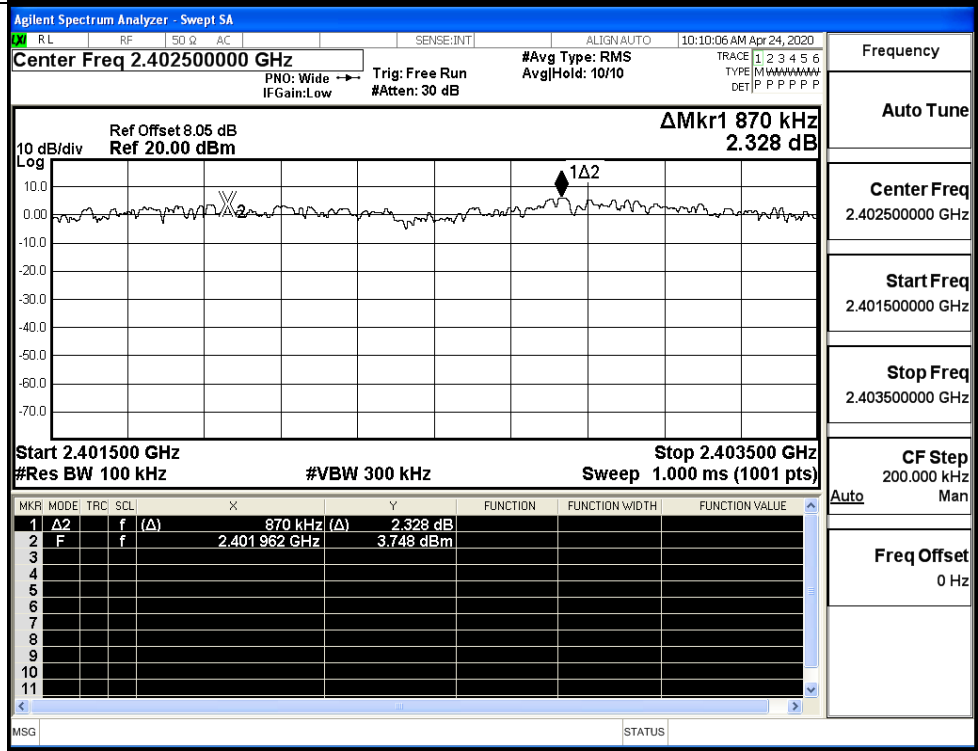


Frequency	2.441500000 GHz
Auto Tune	
Center Freq	2.441500000 GHz
Start Freq	2.440500000 GHz
Stop Freq	2.442500000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

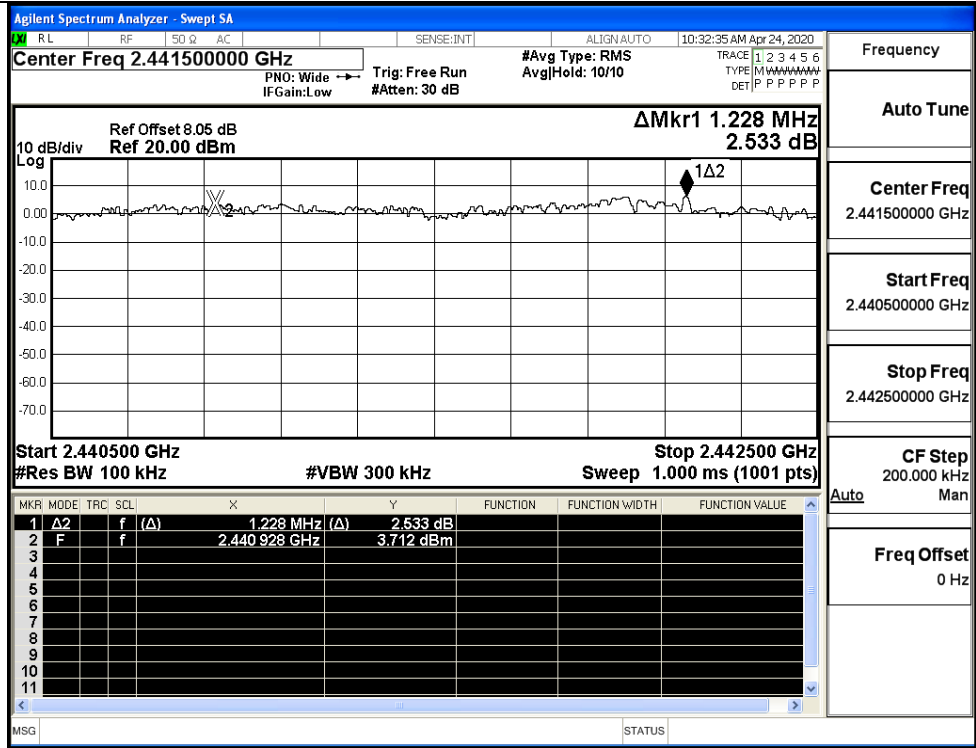
π/4DQPSK/HCH



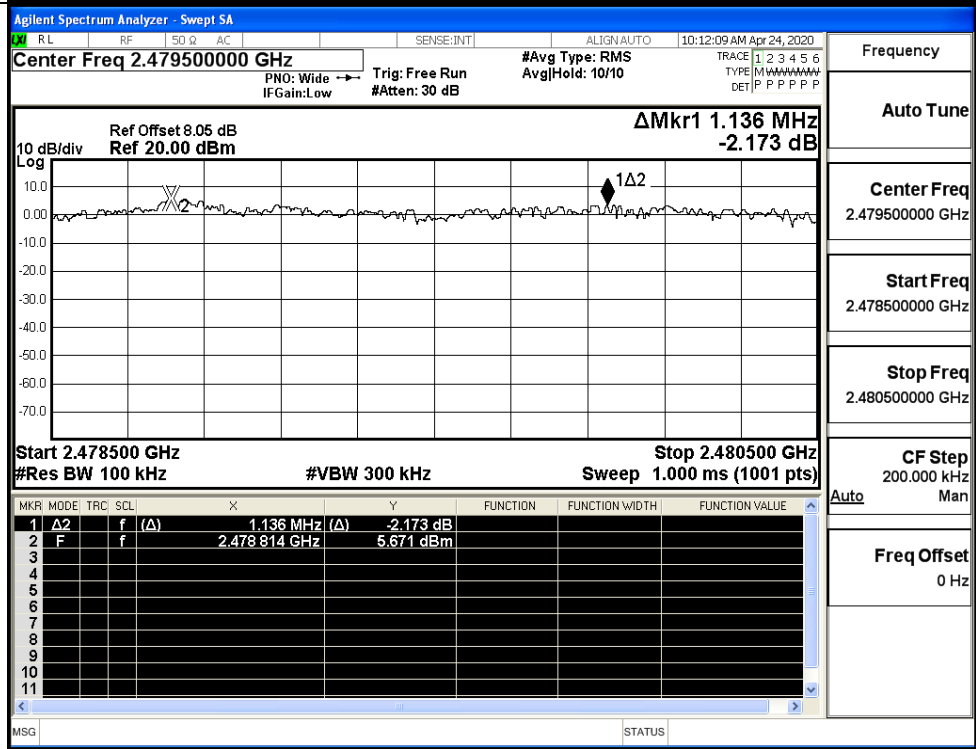
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH





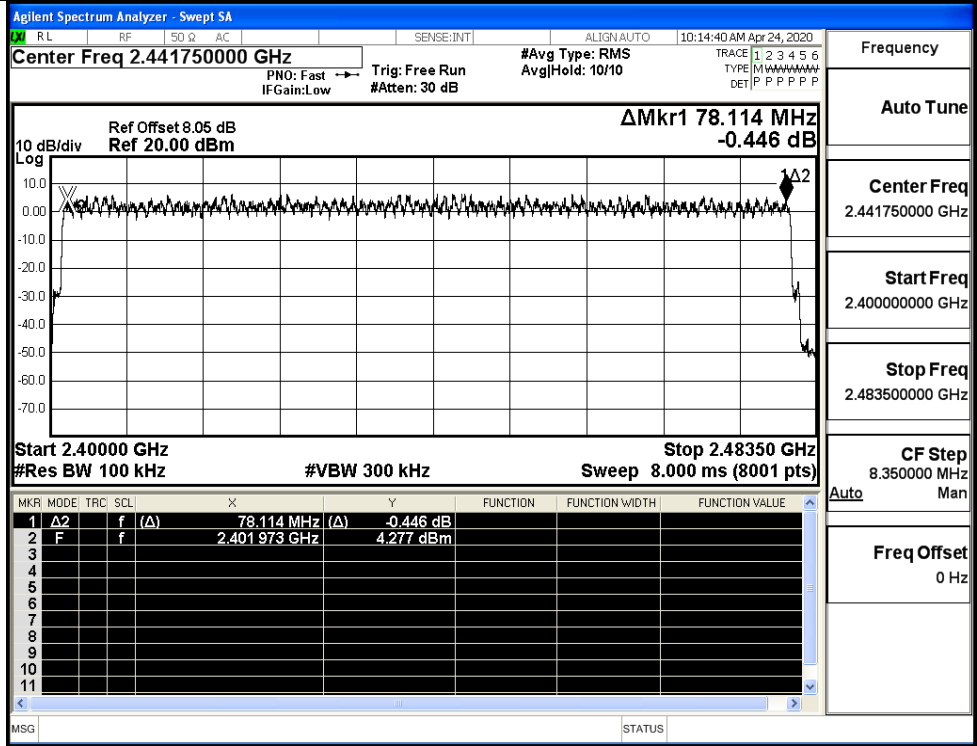
### A.4 Hopping Channel Number

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

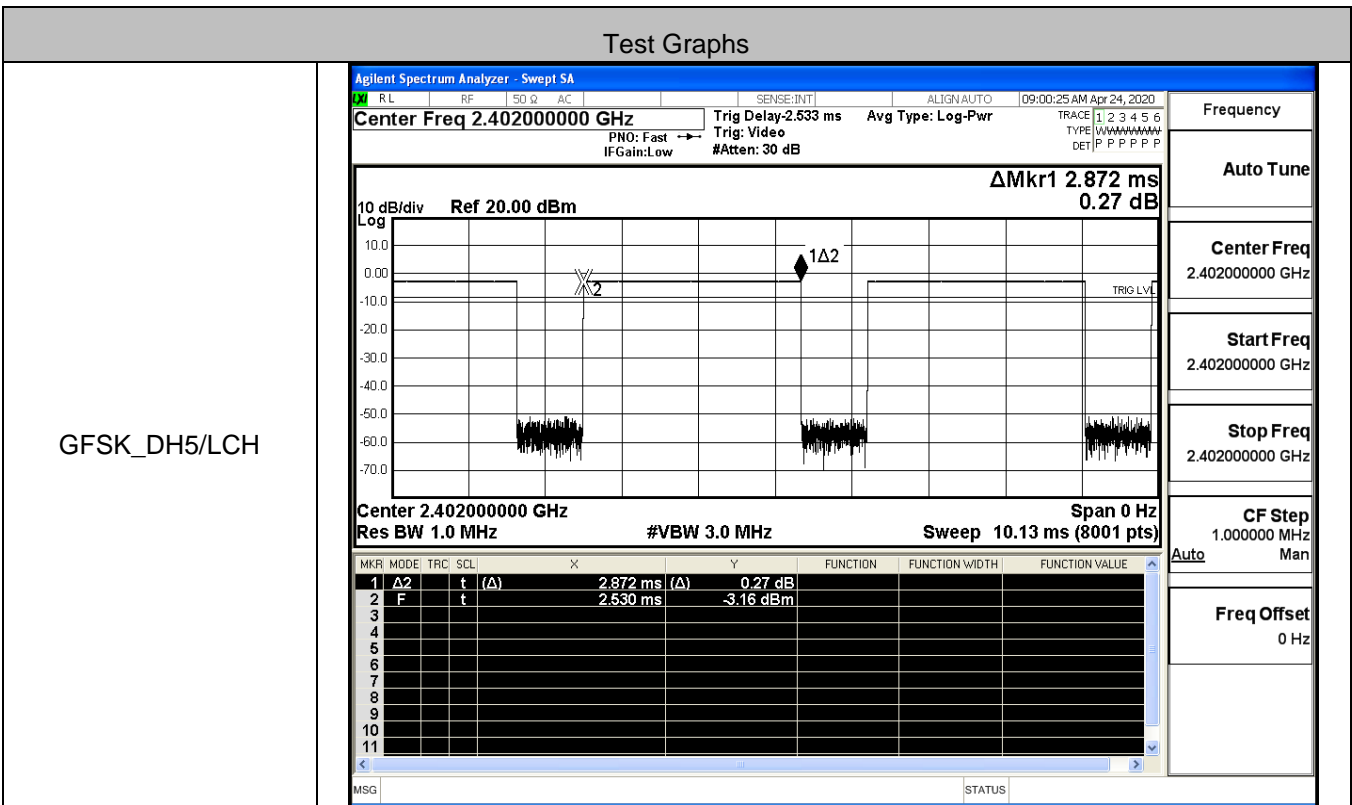
GFSK/Hop	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 8.05 dB Ref 20.00 dBm</p> <p><math>\Delta</math>Mkr1 77.780 MHz -0.056 dB</p> <p>Start 2.40000 GHz #Res BW 100 kHz</p> <p>Stop 2.48350 GHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1"> <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>77.780 MHz</td> <td>(<math>\Delta</math>)</td> <td>-0.056 dB</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.402046 GHz</td> <td></td> <td>6.014 dBm</td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	$\Delta$ 2	f	( $\Delta$ )	77.780 MHz	( $\Delta$ )	-0.056 dB			2	F	f		2.402046 GHz		6.014 dBm			<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.441750000 GHz</p> <p>Start Freq 2.400000000 GHz</p> <p>Stop Freq 2.483500000 GHz</p> <p>CF Step 8.350000 MHz Man</p> <p>Freq Offset 0 Hz</p>
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	$\Delta$ 2	f	( $\Delta$ )	77.780 MHz	( $\Delta$ )	-0.056 dB																							
2	F	f		2.402046 GHz		6.014 dBm																							
$\pi/4$ DQPSK/Hop	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 8.05 dB Ref 20.00 dBm</p> <p><math>\Delta</math>Mkr1 78.208 MHz 0.395 dB</p> <p>Start 2.40000 GHz #Res BW 100 kHz</p> <p>Stop 2.48350 GHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1"> <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>78.208 MHz</td> <td>(<math>\Delta</math>)</td> <td>0.395 dB</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.401816 GHz</td> <td></td> <td>3.484 dBm</td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	$\Delta$ 2	f	( $\Delta$ )	78.208 MHz	( $\Delta$ )	0.395 dB			2	F	f		2.401816 GHz		3.484 dBm			<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.441750000 GHz</p> <p>Start Freq 2.400000000 GHz</p> <p>Stop Freq 2.483500000 GHz</p> <p>CF Step 8.350000 MHz Man</p> <p>Freq Offset 0 Hz</p>
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	$\Delta$ 2	f	( $\Delta$ )	78.208 MHz	( $\Delta$ )	0.395 dB																							
2	F	f		2.401816 GHz		3.484 dBm																							

8DPSK/Hop

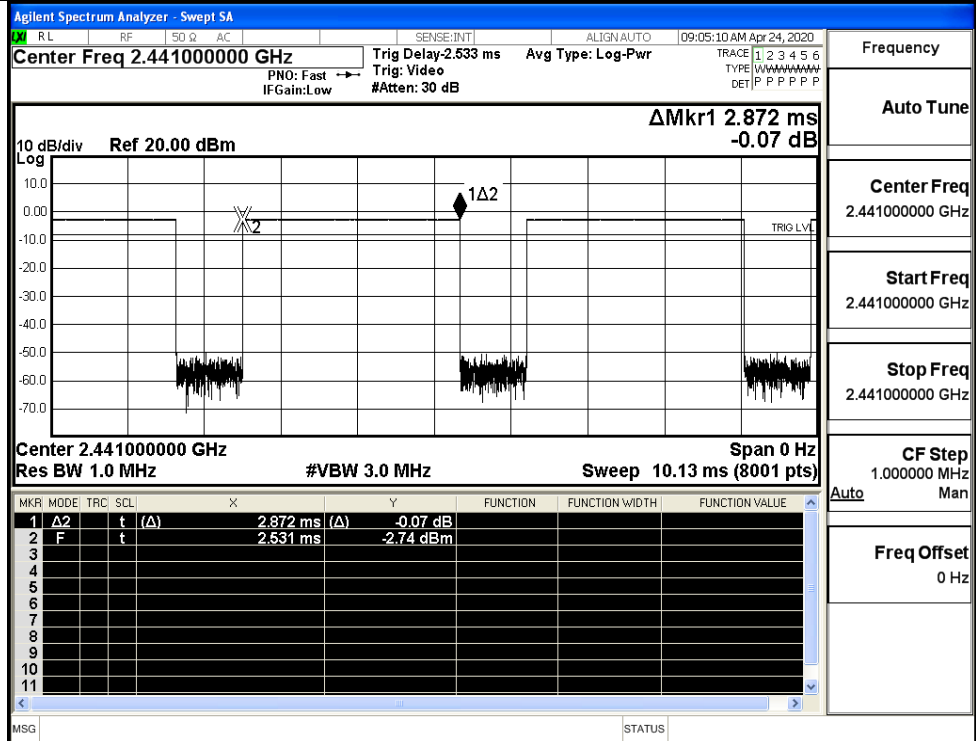


**A.5 Dwell Time**

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.87	106.7	0.306	0.4	PASS
	DH5	MCH	2.87	106.7	0.306	0.4	PASS
	DH5	HCH	2.87	106.7	0.306	0.4	PASS
π/4DQPSK	2DH5	LCH	2.87	106.7	0.307	0.4	PASS
	2DH5	MCH	2.87	106.7	0.307	0.4	PASS
	2DH5	HCH	2.87	106.7	0.307	0.4	PASS
8DPSK	3DH5	LCH	2.87	106.7	0.307	0.4	PASS
	3DH5	MCH	2.87	106.7	0.307	0.4	PASS
	3DH5	HCH	2.87	106.7	0.307	0.4	PASS



GFSK\_DH5/MCH



Frequency

Auto Tune

Center Freq  
2.441000000 GHz

Start Freq  
2.441000000 GHz

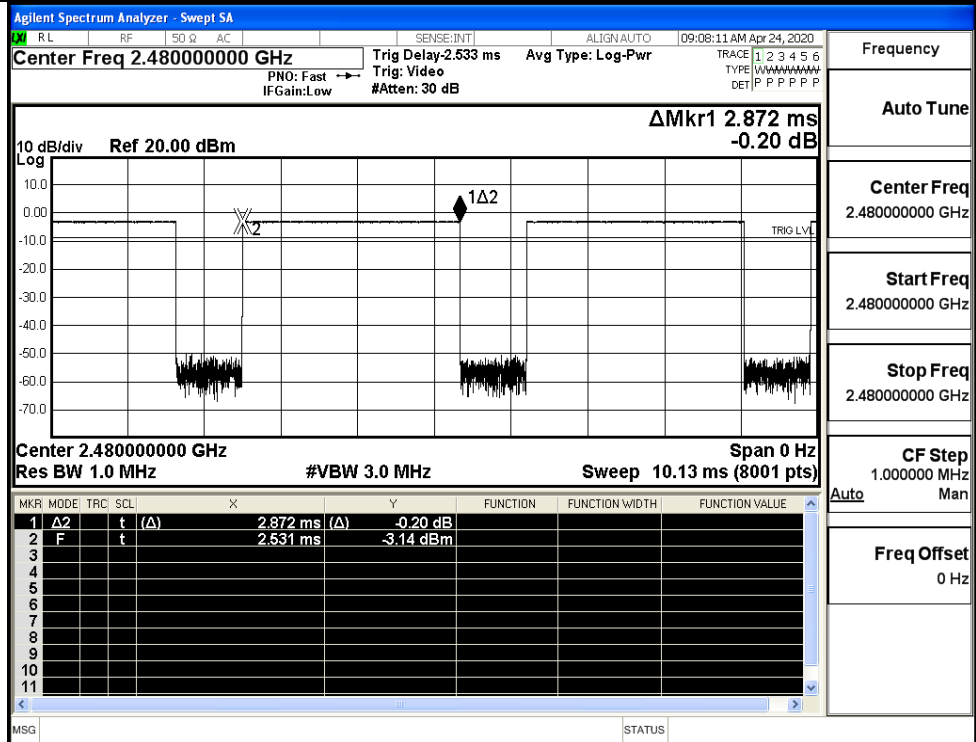
Stop Freq  
2.441000000 GHz

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

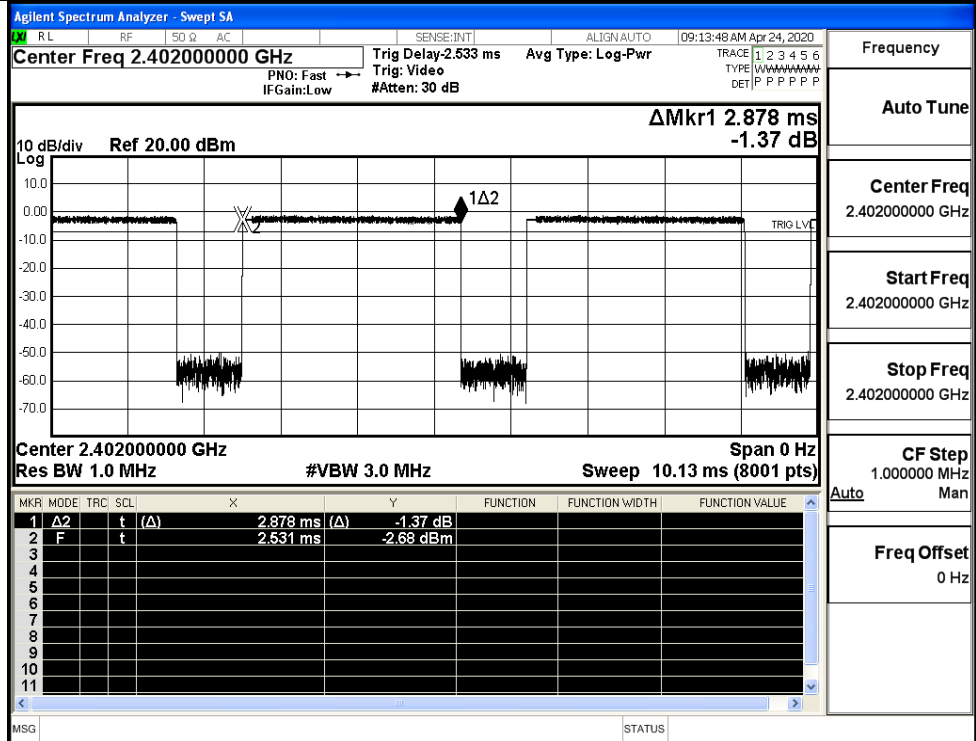
Stop Freq  
2.480000000 GHz

CF Step  
1.000000 MHz

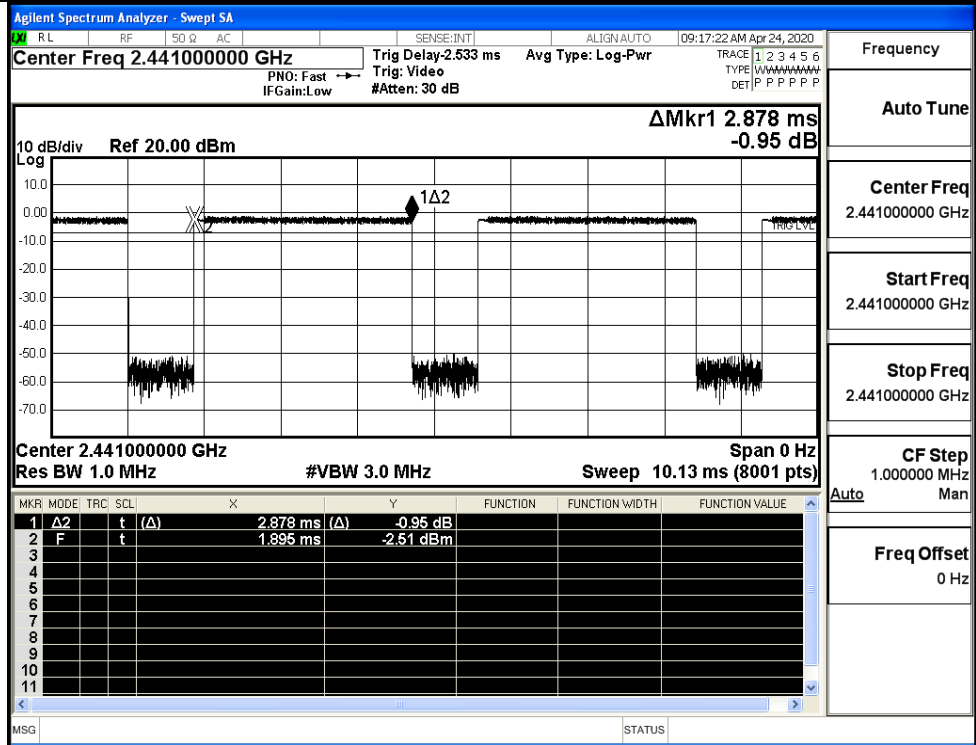
Auto Man

Freq Offset  
0 Hz

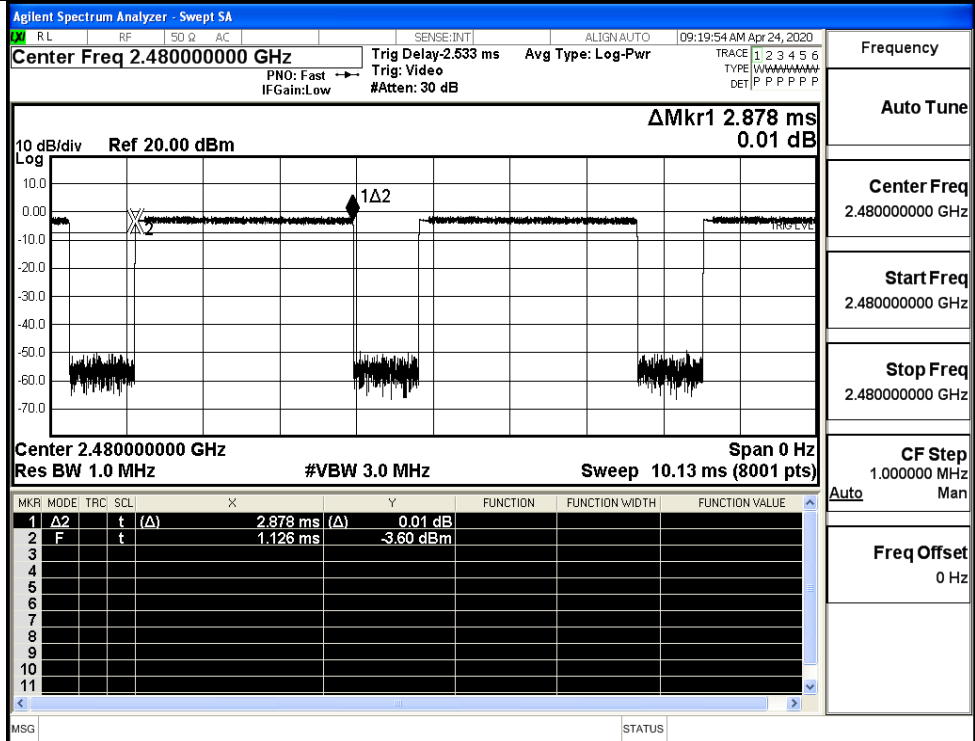
$\pi/4$ DQPSK  
\_2DH5/LCH



$\pi/4$ DQPSK  
\_2DH5/MCH



$\pi/4$ DQPSK  
\_2DH5/HCH



Frequency

Auto Tune

Center Freq  
2.48000000 GHz

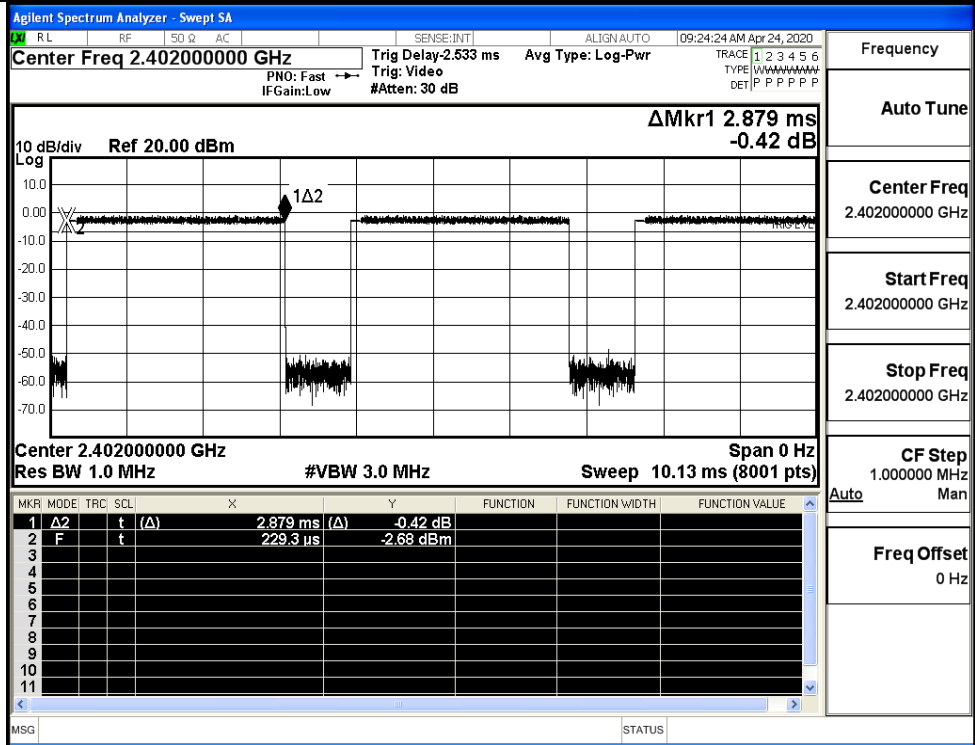
Start Freq  
2.48000000 GHz

Stop Freq  
2.48000000 GHz

CF Step  
1.000000 MHz  
Auto Man

Freq Offset  
0 Hz

8DPSK\_3DH5/LCH



Frequency

Auto Tune

Center Freq  
2.40200000 GHz

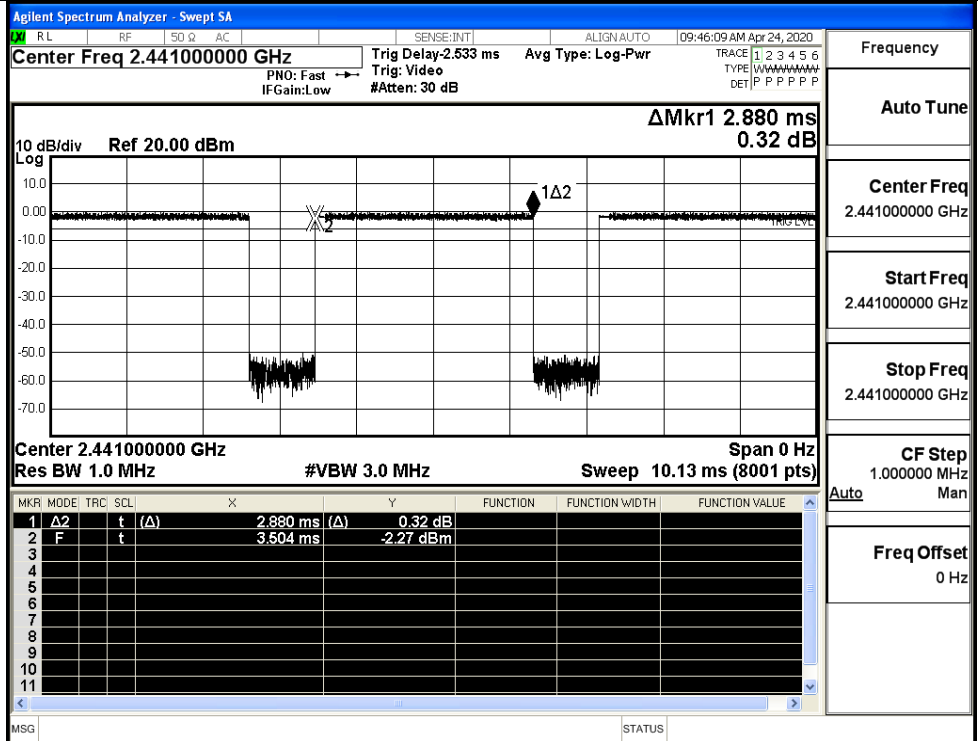
Start Freq  
2.40200000 GHz

Stop Freq  
2.40200000 GHz

CF Step  
1.000000 MHz  
Auto Man

Freq Offset  
0 Hz

8DPSK\_3DH5/MCH



Frequency

Auto Tune

Center Freq 2.441000000 GHz

Start Freq 2.441000000 GHz

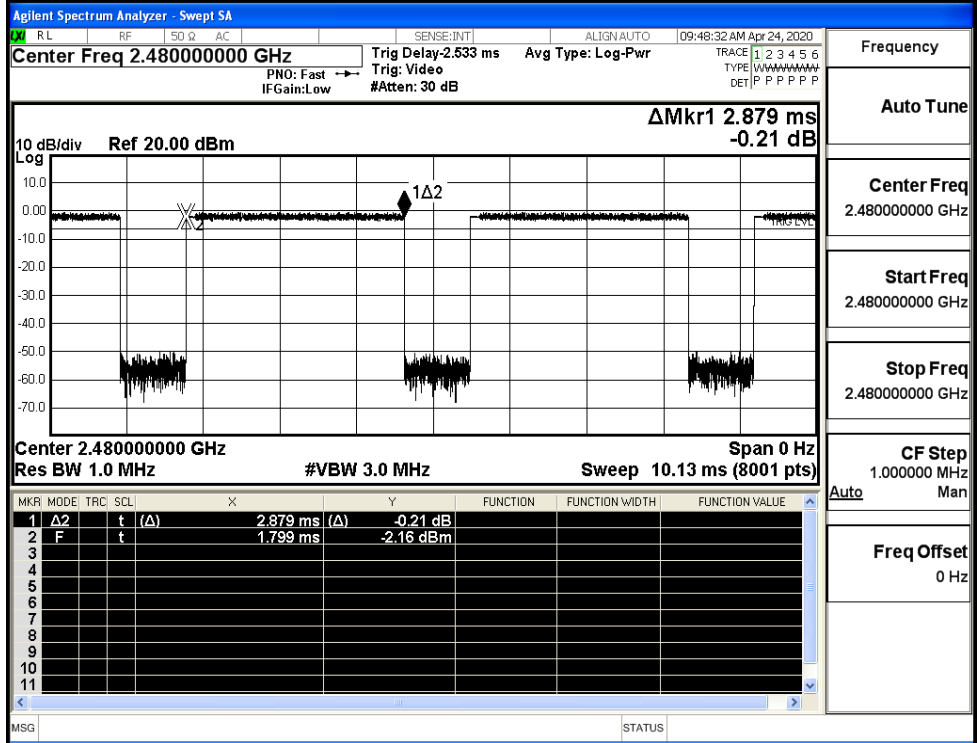
Stop Freq 2.441000000 GHz

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

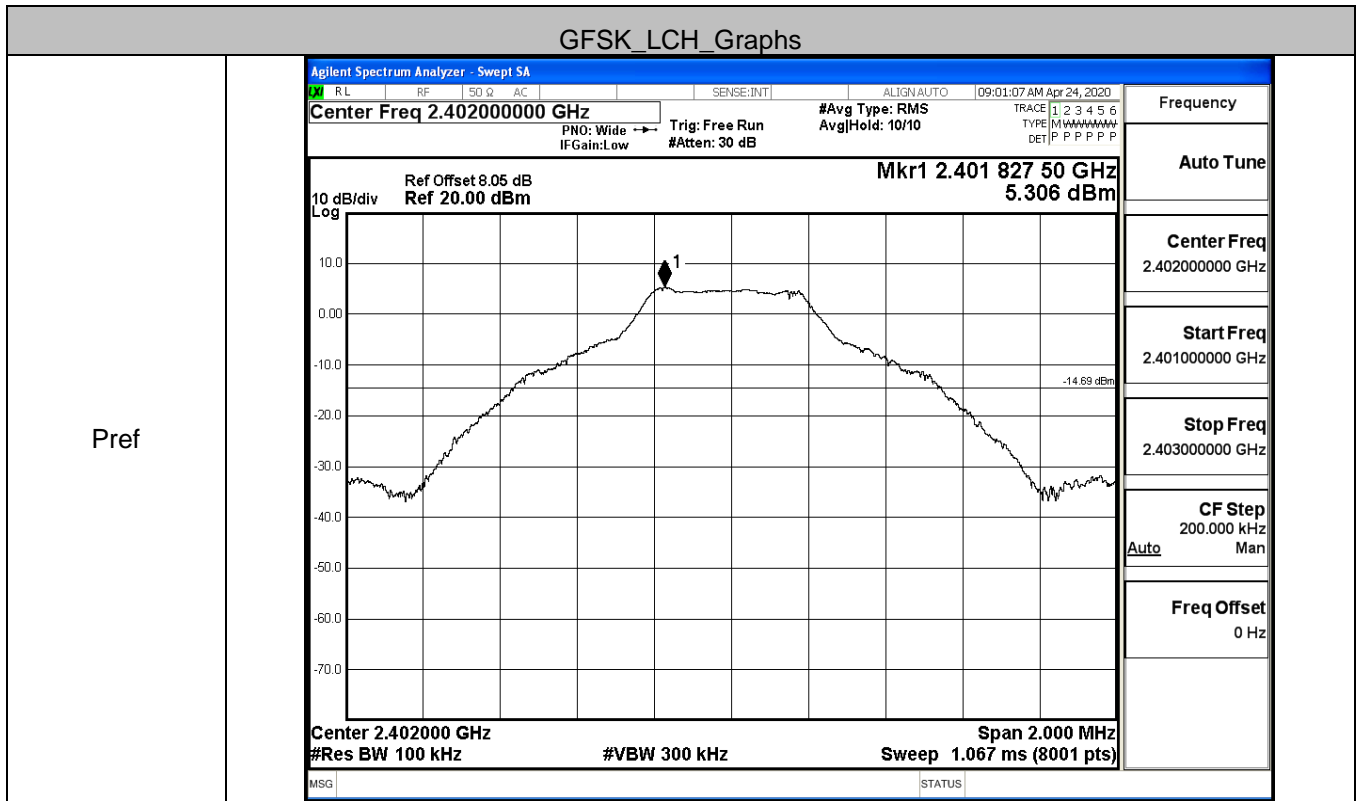
Auto Man

Freq Offset 0 Hz

### A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	5.306	-38.243	-14.694	PASS
	MCH	5.405	-38.360	-14.595	PASS
	HCH	-2.755	-37.796	-22.755	PASS
$\pi$ /4DQPSK	LCH	5.195	-36.873	-14.805	PASS
	MCH	5.099	-37.478	-14.901	PASS
	HCH	4.976	-38.000	-15.024	PASS
8DPSK	LCH	5.348	-37.979	-14.652	PASS
	MCH	6.446	-37.883	-13.554	PASS
	HCH	6.015	-37.781	-13.985	PASS

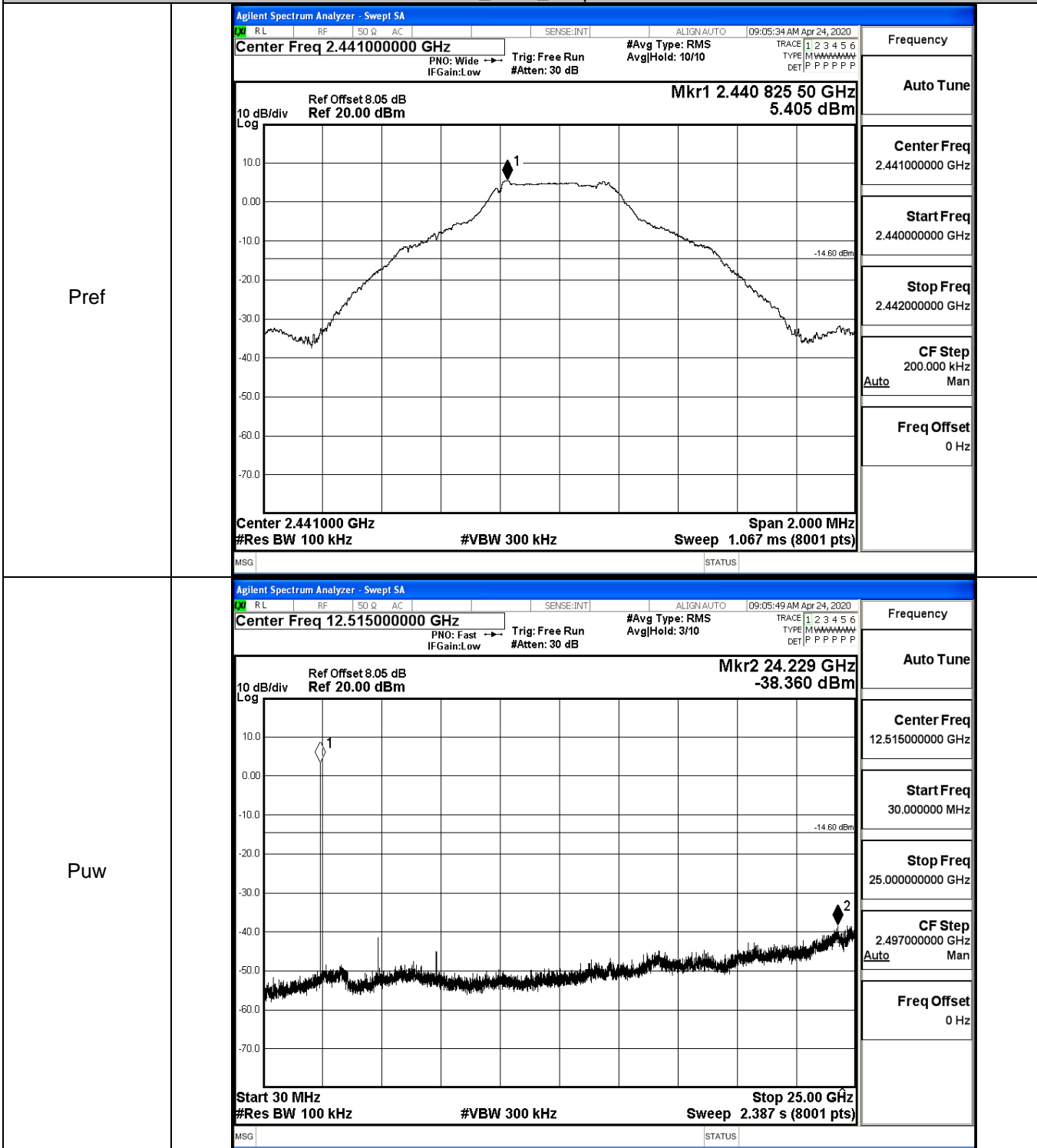
GFSK\_LCH\_Graphs





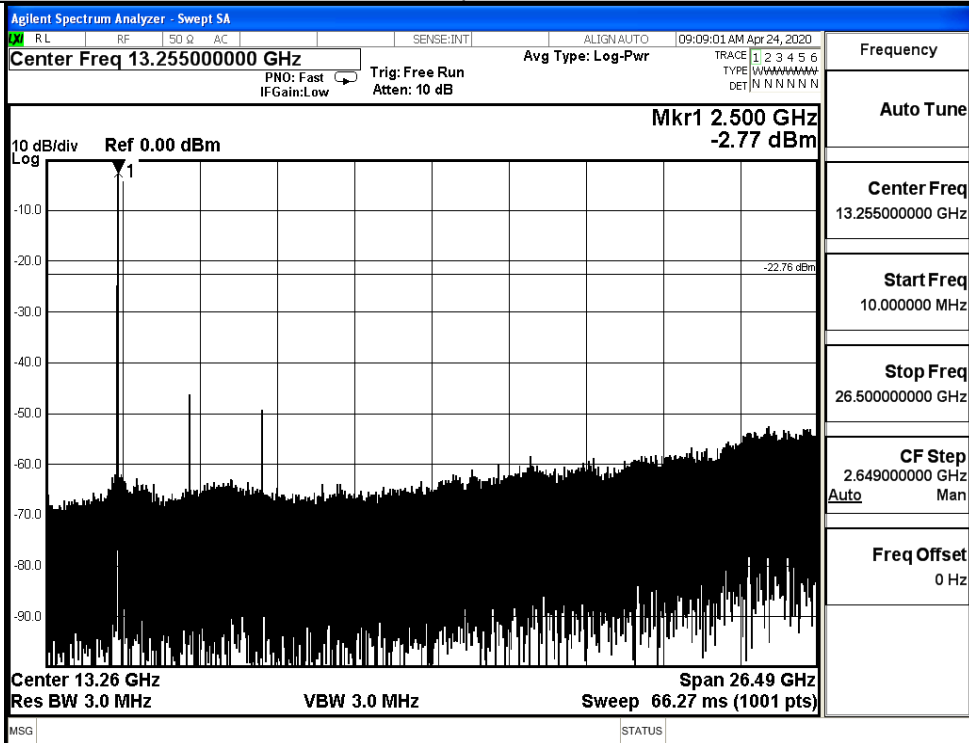


GFSK\_MCH\_Graphs

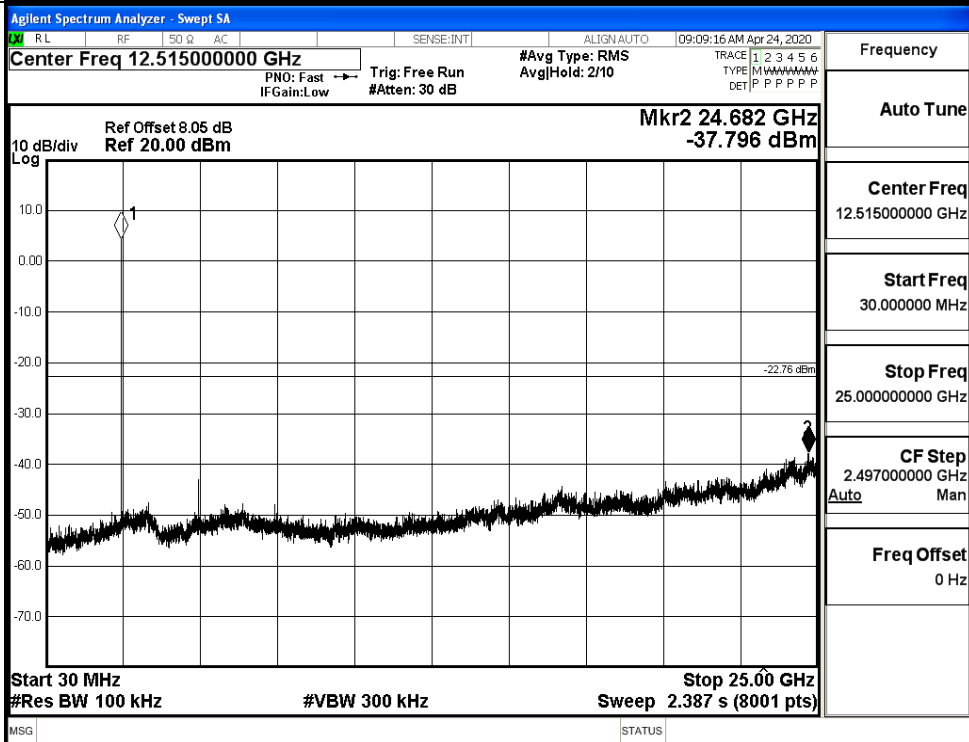


GFSK\_HCH\_Graphs

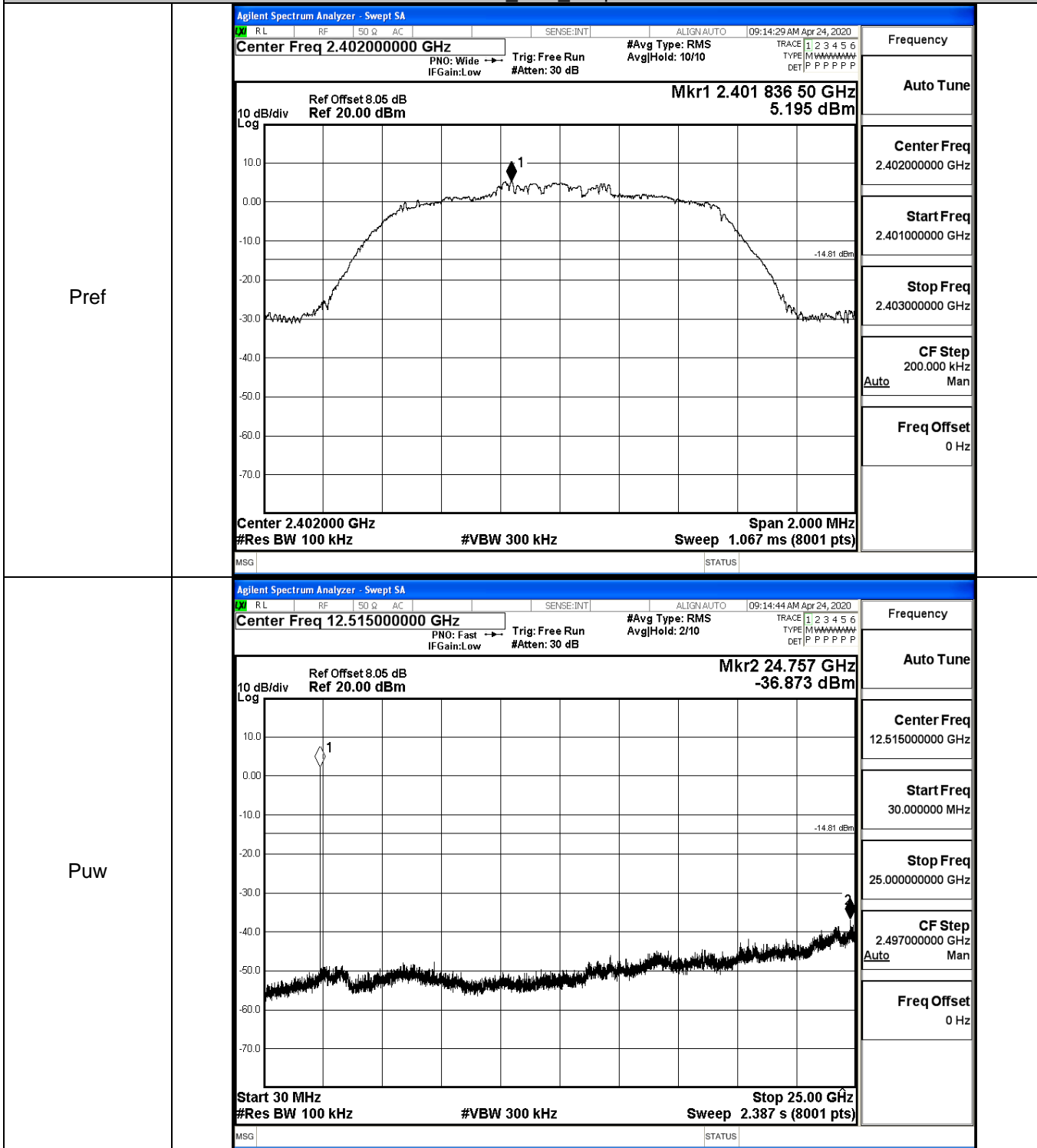
Pref



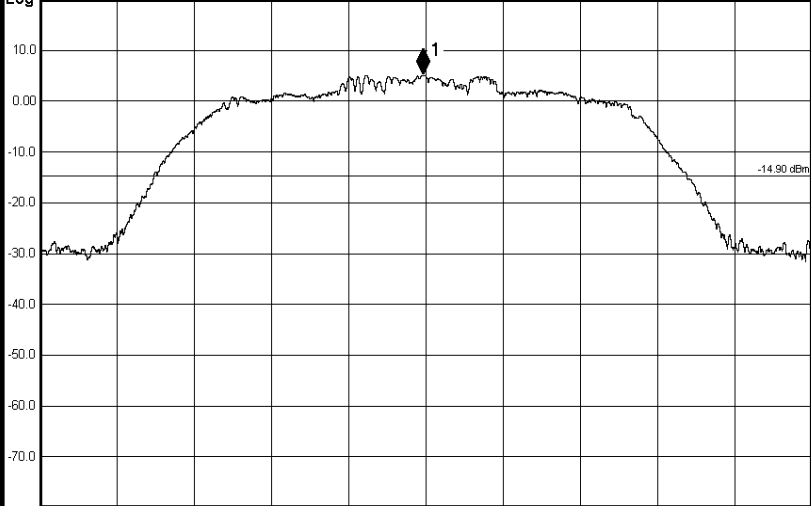
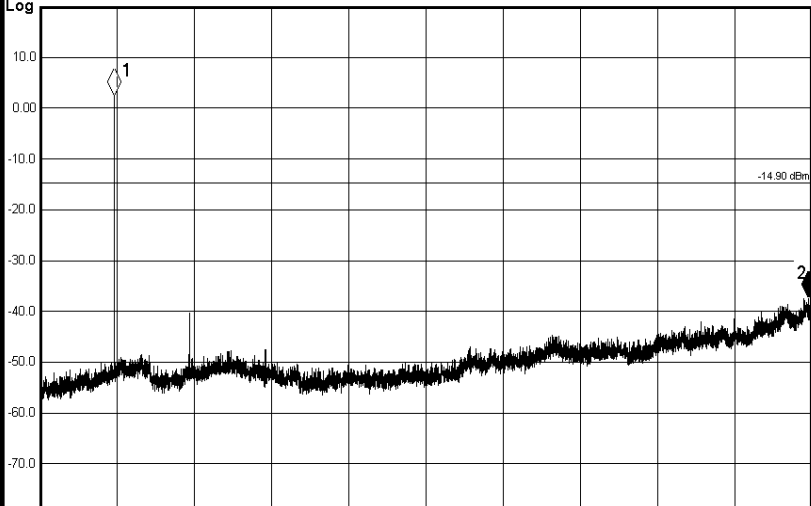
Puw



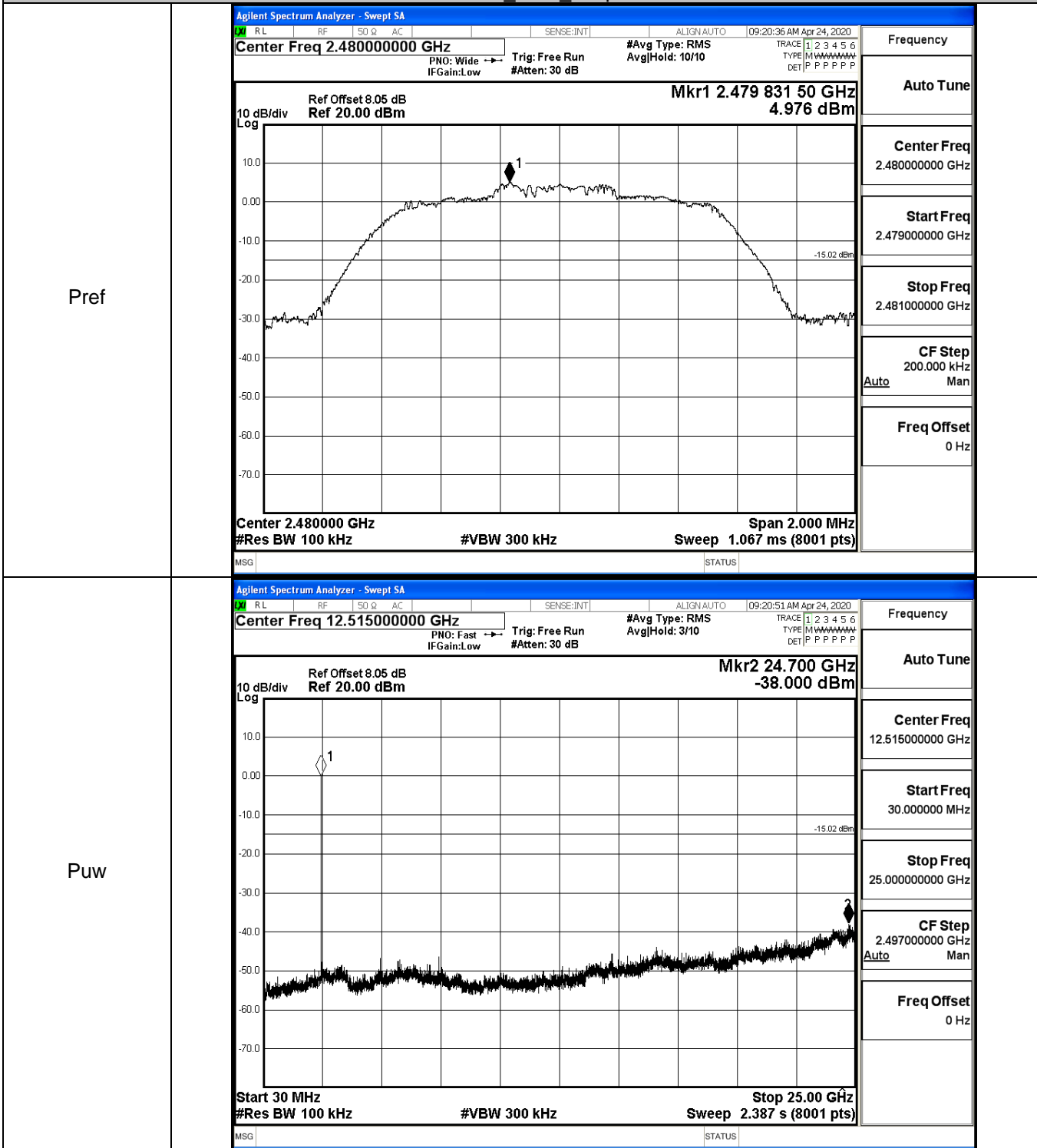
$\pi/4$ DQPSK\_LCH\_Graphs



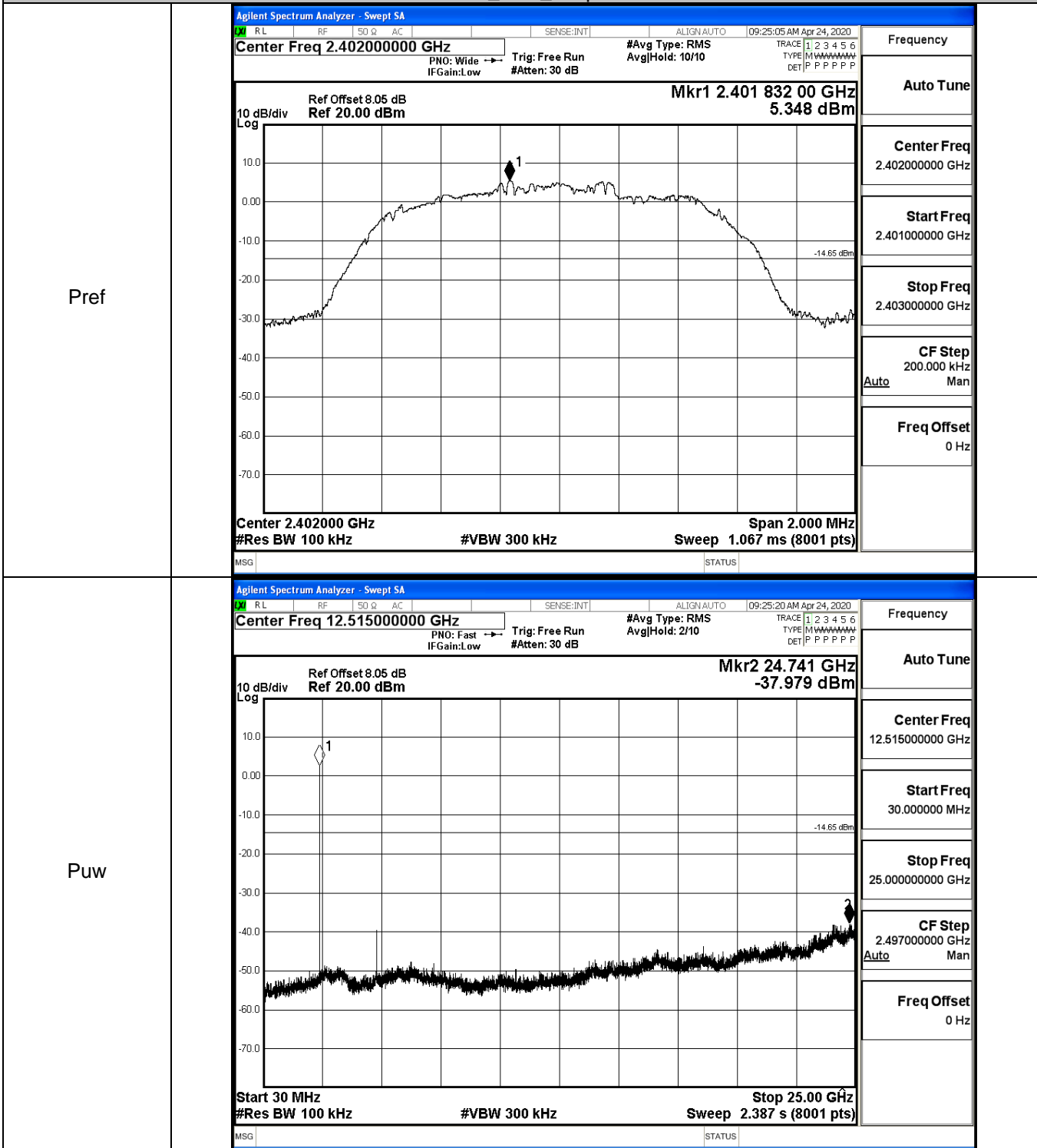
$\pi/4$ DQPSK\_MCH\_Graphs

Pref	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>RL RF SO Q AC SENSE:INT ALIGN:AUTO 09:17:47 AM Apr 24, 2020</p> <p>Center Freq 2.441000000 GHz #Avg Type: RMS #Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms (8001 pts)</p> <p>Trig: Free Run #Atten: 30 dB</p> <p>Ref Offset 8.05 dB Ref 20.00 dBm Mkr1 2.440 993 75 GHz 5.099 dBm</p>  <p>Center 2.441000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms (8001 pts)</p>	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.441000000 GHz</p> <p>Start Freq 2.440000000 GHz</p> <p>Stop Freq 2.442000000 GHz</p> <p>CF Step 200.000 kHz Auto Man</p> <p>Freq Offset 0 Hz</p>
Puw	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>RL RF SO Q AC SENSE:INT ALIGN:AUTO 09:18:02 AM Apr 24, 2020</p> <p>Center Freq 12.515000000 GHz #Avg Type: RMS #Res BW 100 kHz #VBW 300 kHz Sweep 2.387 s (8001 pts)</p> <p>Trig: Free Run #Atten: 30 dB</p> <p>Ref Offset 8.05 dB Ref 20.00 dBm Mkr2 24.875 GHz -37.478 dBm</p>  <p>Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.387 s (8001 pts)</p>	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 12.515000000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 25.000000000 GHz</p> <p>CF Step 2.497000000 GHz Auto Man</p> <p>Freq Offset 0 Hz</p>

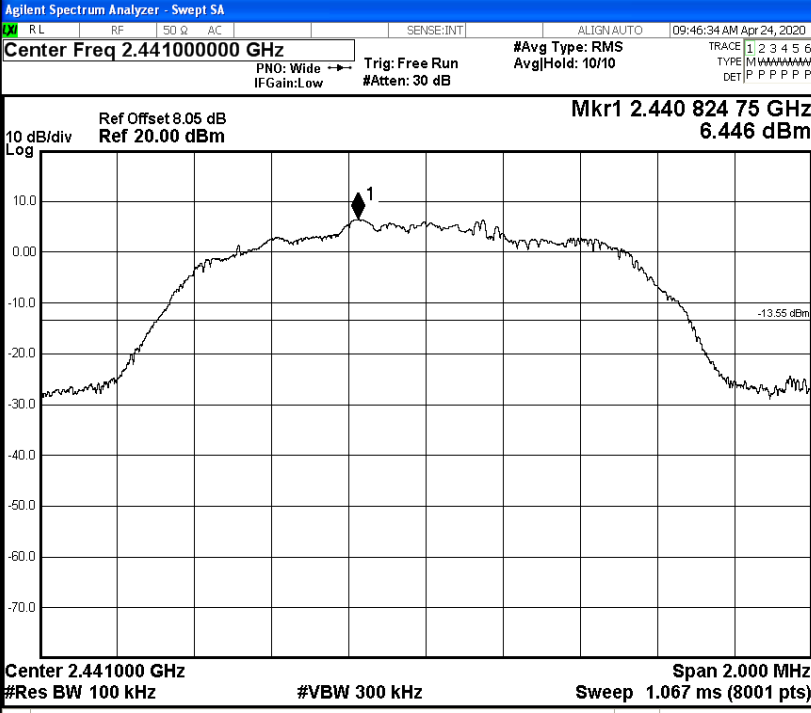
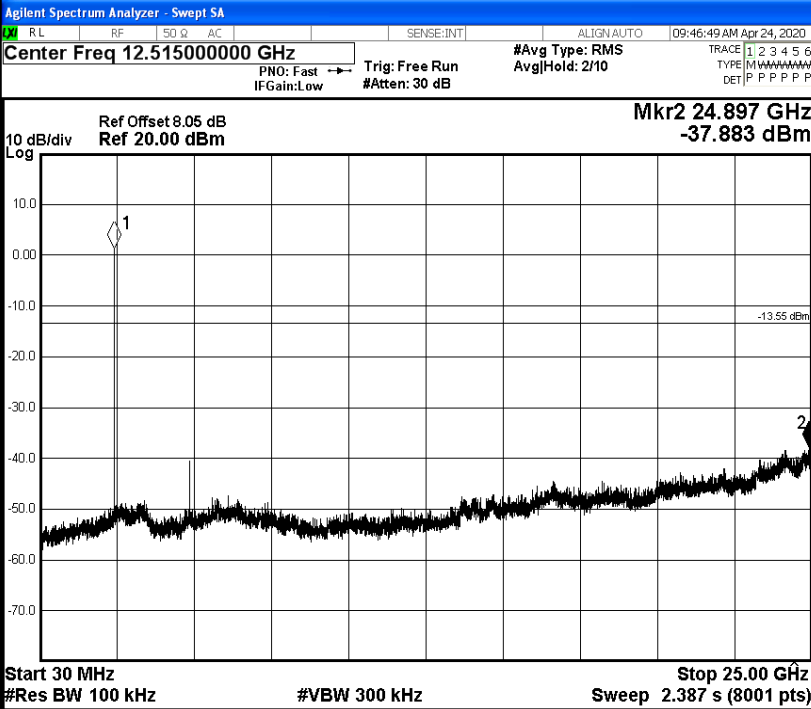
$\pi/4$ DQPSK\_HCH\_Graphs



8DPSK\_LCH\_Graphs

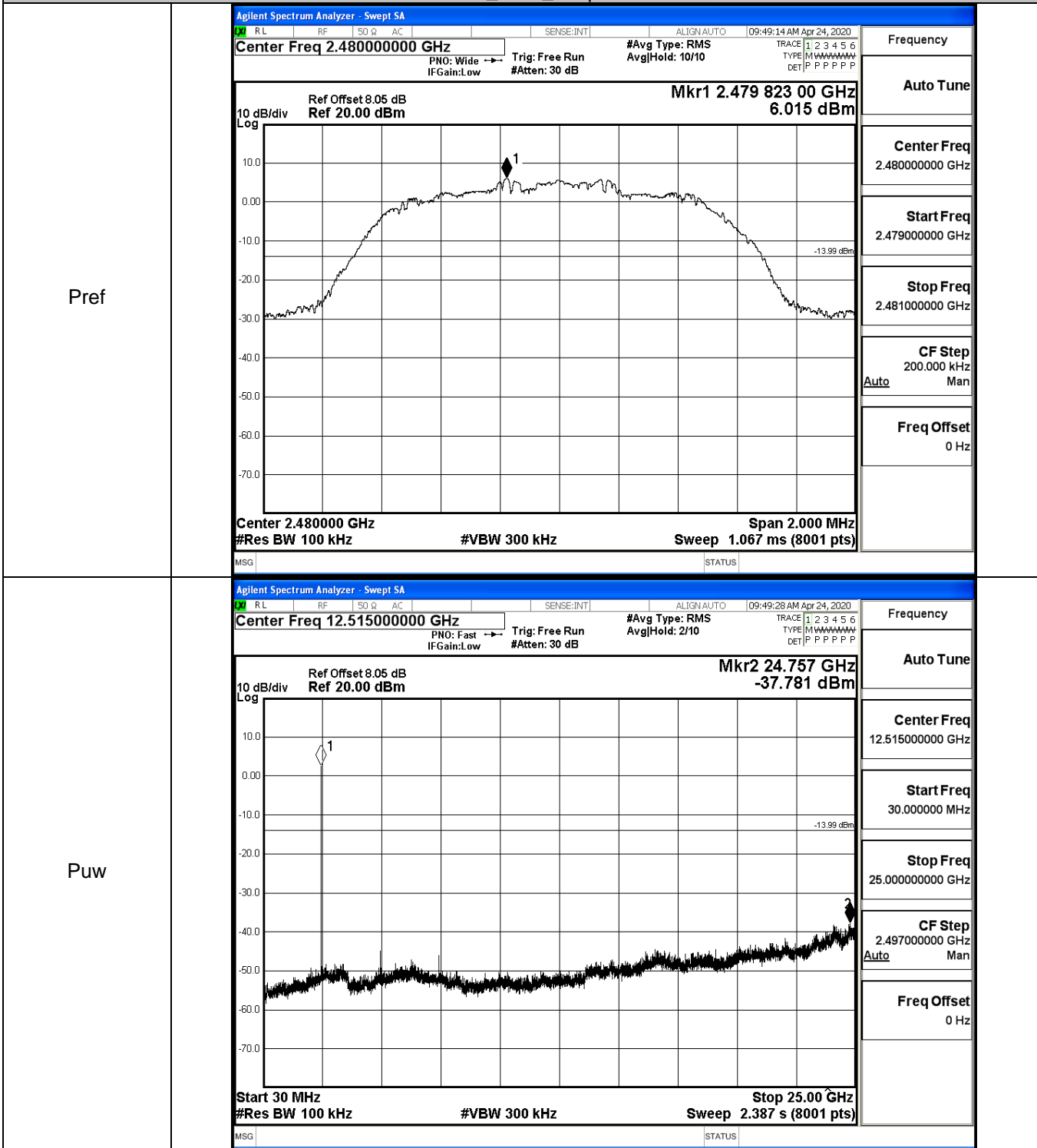


8DPSK\_MCH\_Graphs

<p>Pref</p>		<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.44100000 GHz</p> <p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.441000000 GHz</p> <p>Start Freq 2.440000000 GHz</p> <p>Stop Freq 2.442000000 GHz</p> <p>CF Step 200.000 kHz Auto Man</p> <p>Freq Offset 0 Hz</p>
	<p>Puw</p>	



8DPSK\_HCH\_Graphs

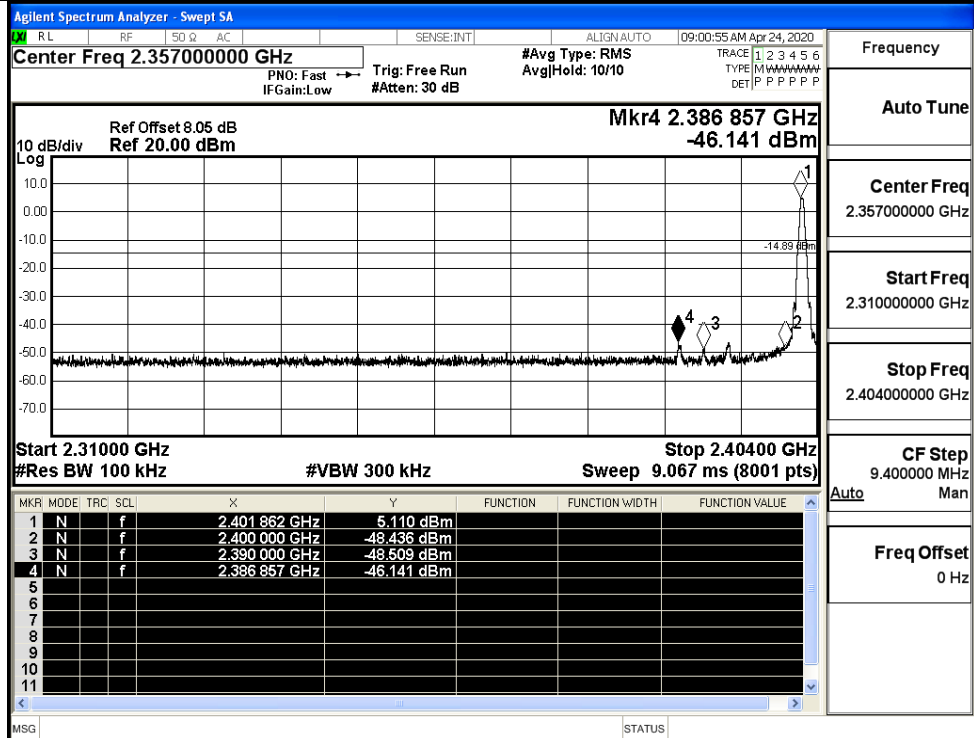


## A.7 Band-edge for RF Conducted Emissions

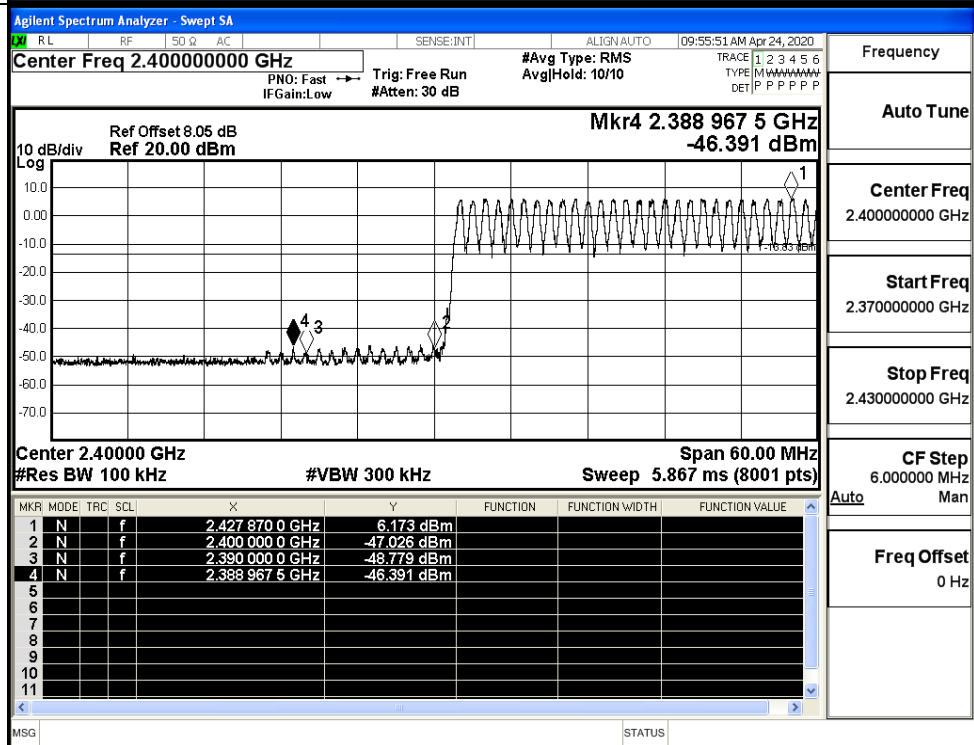
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	5.110	Off	-46.141	-14.89	PASS
			6.173	On	-46.391	-13.83	PASS
	HCH	2480	4.826	Off	-45.822	-15.17	PASS
			6.208	On	-46.179	-13.79	PASS
$\pi/4$ DQPSK	LCH	2402	4.673	Off	-48.423	-15.33	PASS
			6.197	On	-48.410	-13.8	PASS
	HCH	2480	5.059	Off	-47.626	-14.94	PASS
			6.095	On	-47.377	-13.91	PASS
8DPSK	LCH	2402	5.102	Off	-48.161	-14.9	PASS
			6.179	On	-46.693	-13.82	PASS
	HCH	2480	6.075	Off	-47.406	-13.93	PASS
			6.134	On	-46.832	-13.87	PASS

Test Graphs

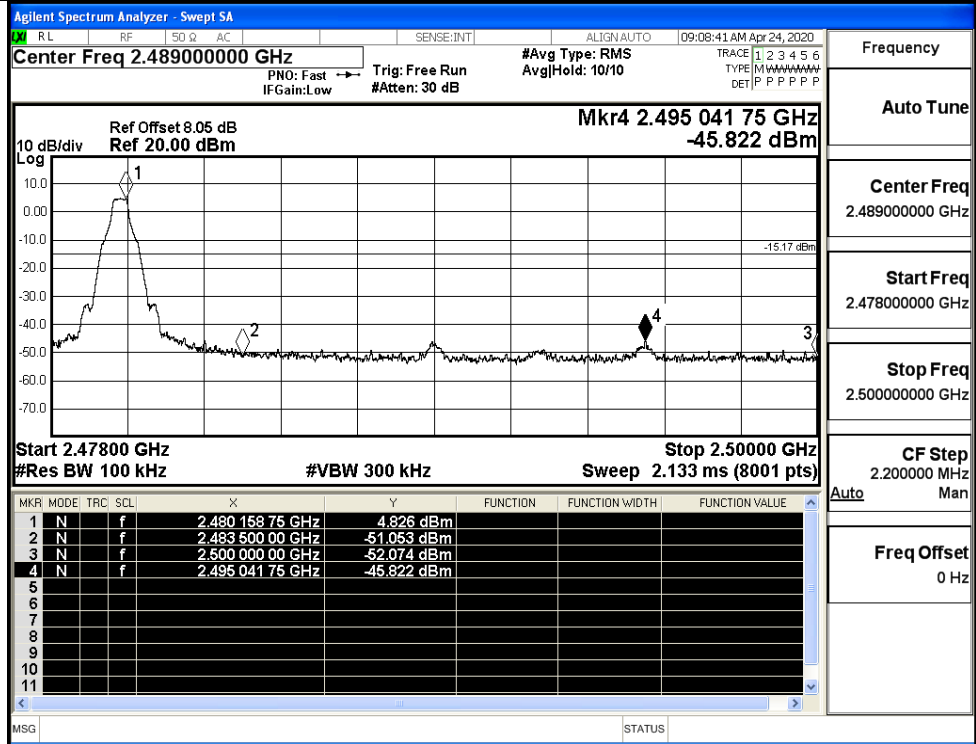
GFSK/LCH/No Hop



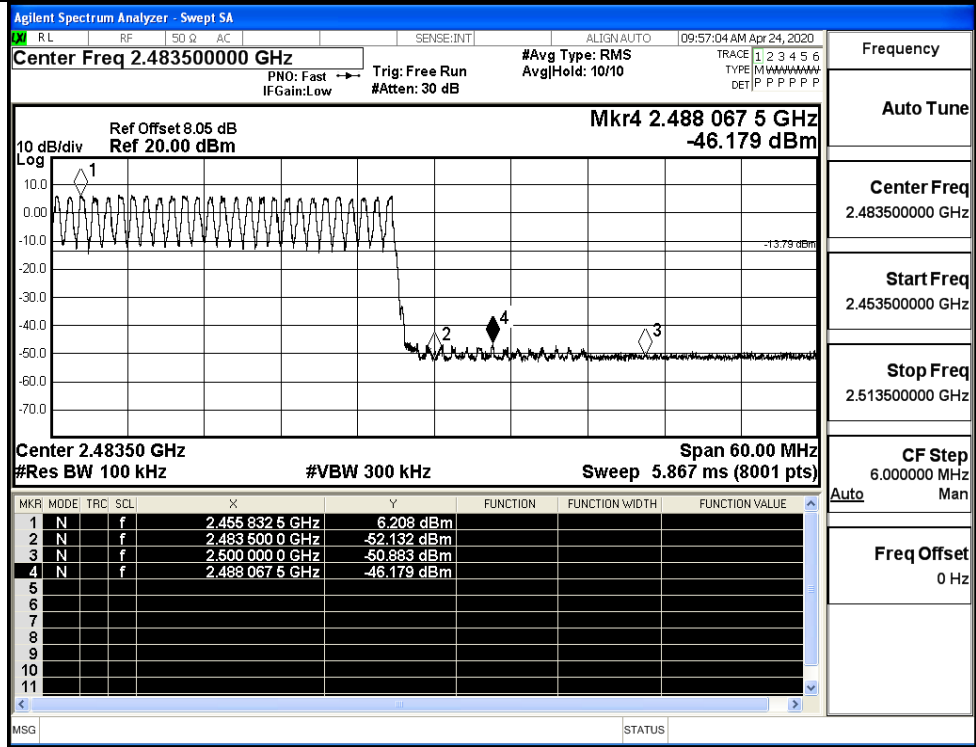
GFSK/LCH/Hop



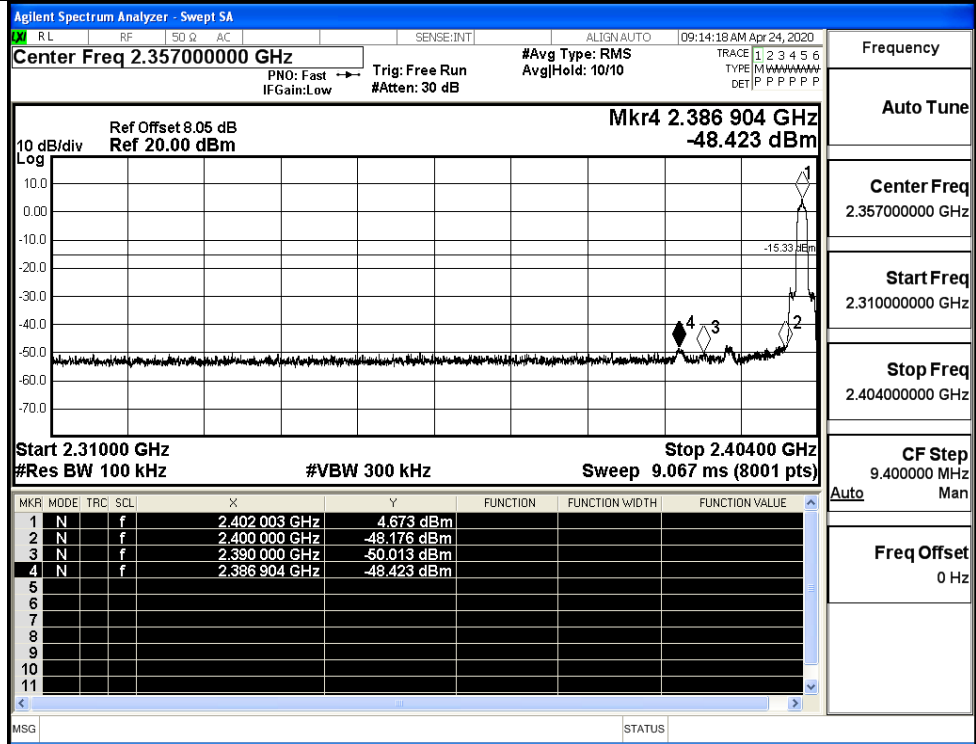
GFSK/HCH/No Hop



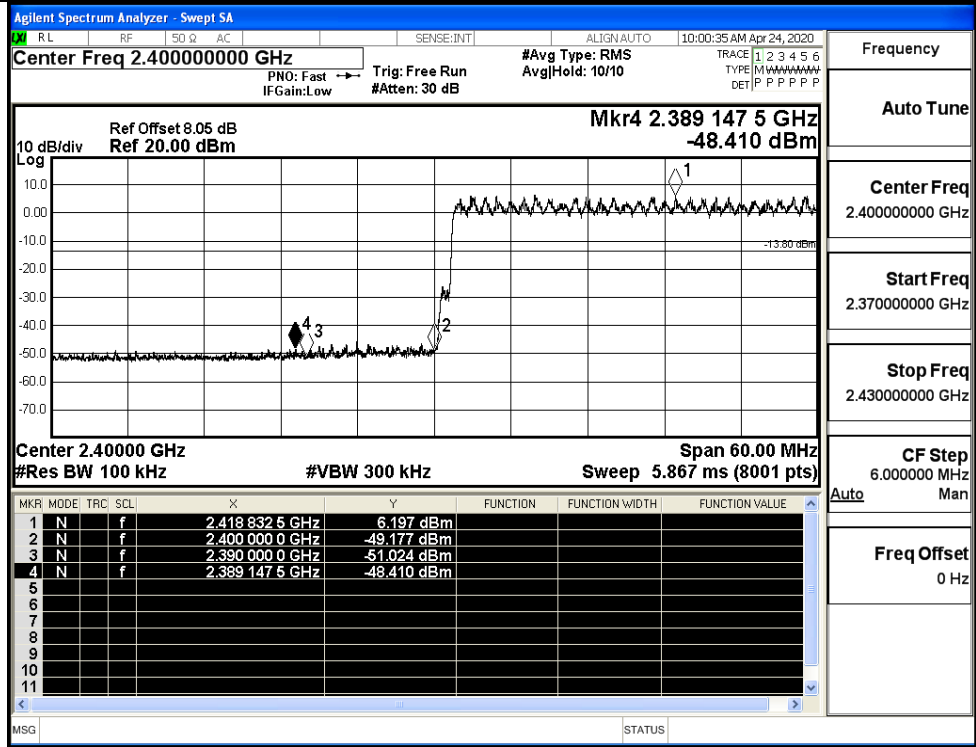
GFSK/HCH/Hop



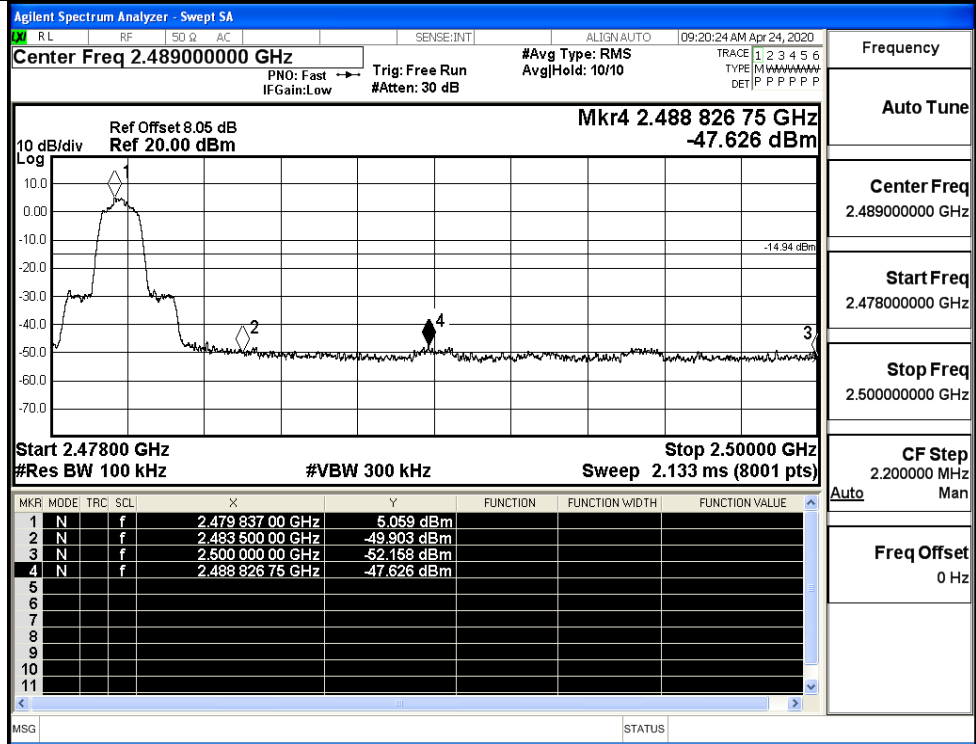
$\pi/4$ DQPSK/LCH/No Hop



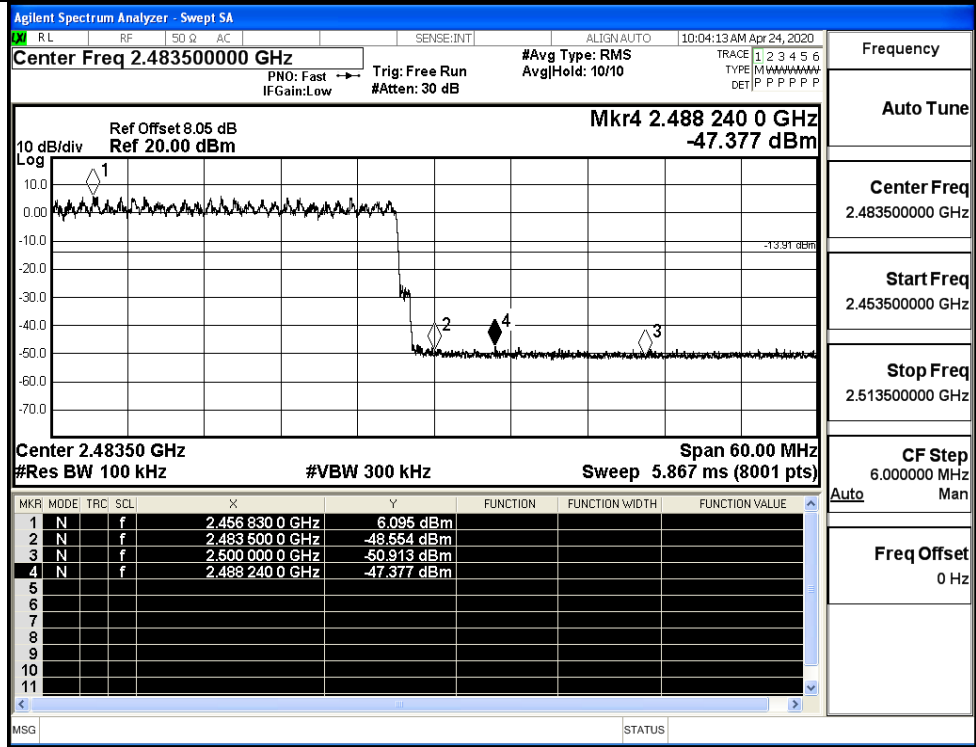
$\pi/4$ DQPSK/LCH/Hop



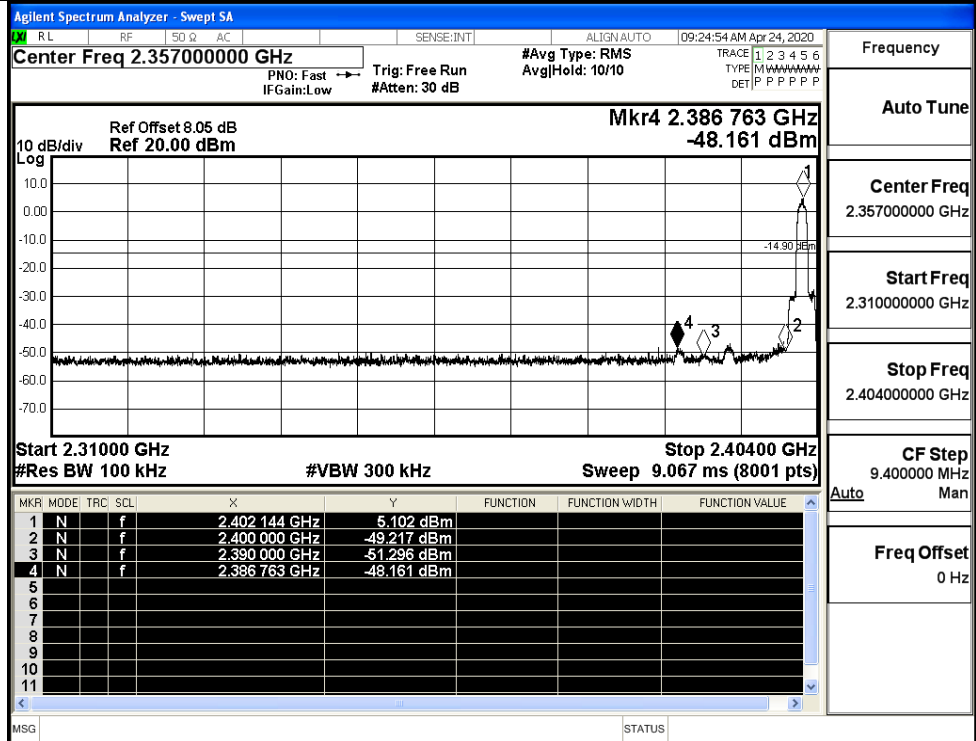
$\pi$ /4DQPSK/HCH/No Hop



$\pi$ /4DQPSK/HCH/Hop

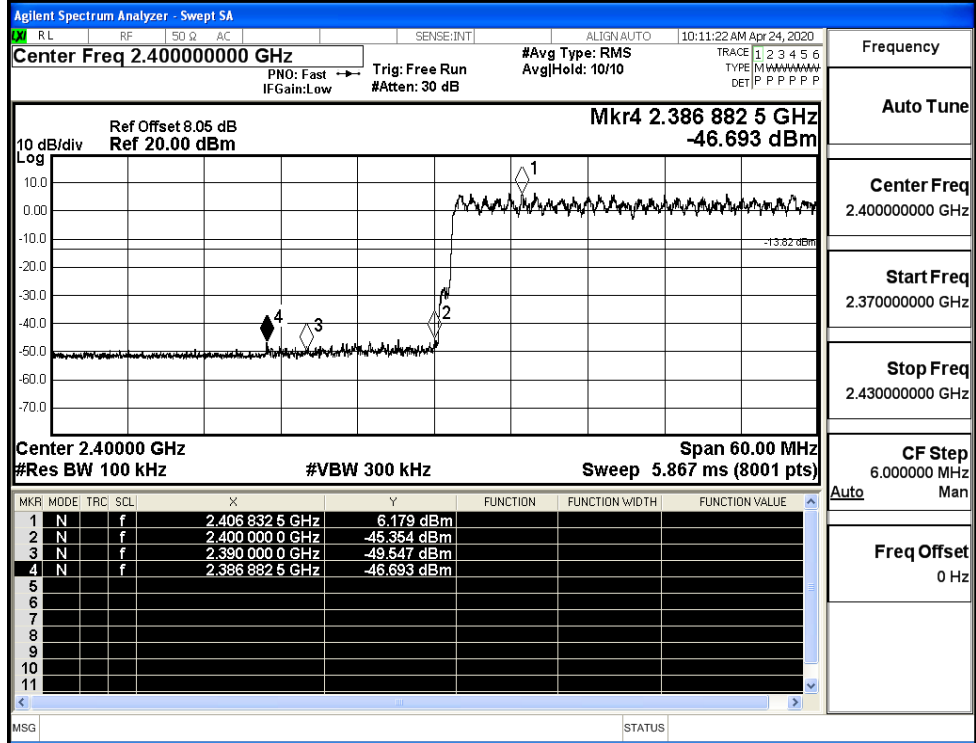


8DPSK/LCH/No Hop



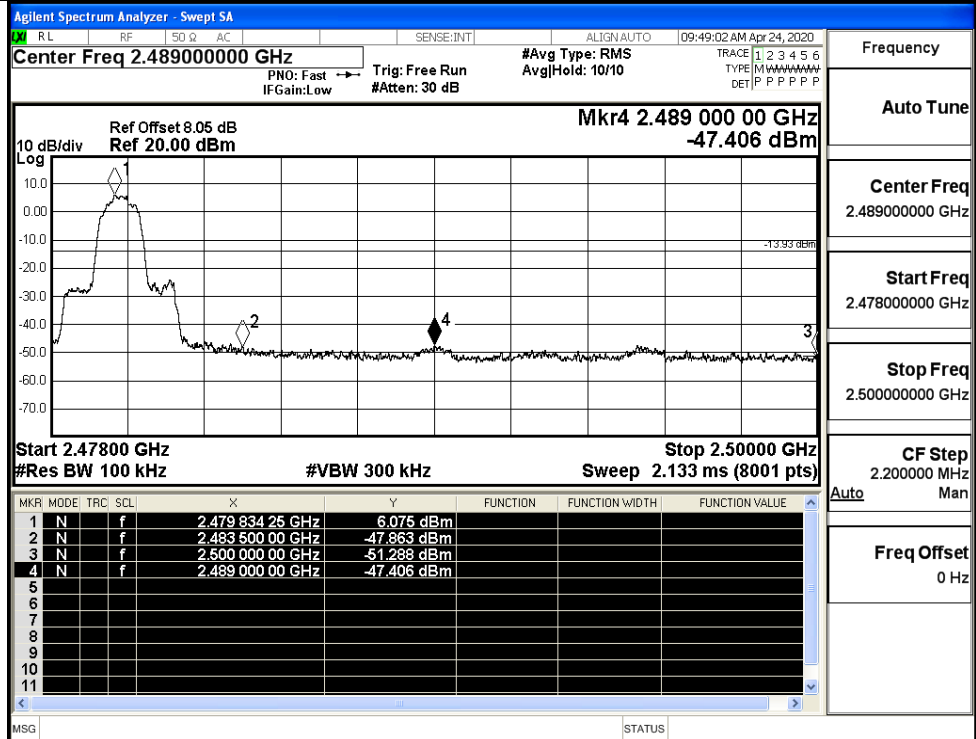
Frequency  
Auto Tune  
Center Freq  
2.357000000 GHz  
Start Freq  
2.310000000 GHz  
Stop Freq  
2.404000000 GHz  
CF Step  
9.400000 MHz  
Auto Man  
Freq Offset  
0 Hz

8DPSK/LCH/Hop



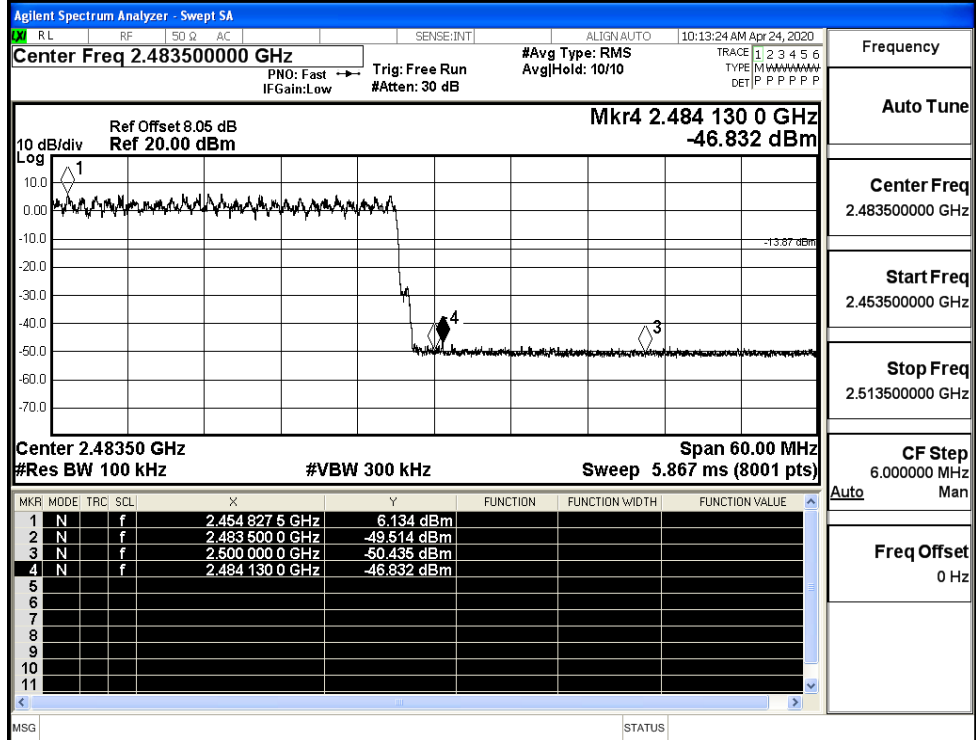
Frequency  
Auto Tune  
Center Freq  
2.400000000 GHz  
Start Freq  
2.370000000 GHz  
Stop Freq  
2.430000000 GHz  
CF Step  
6.000000 MHz  
Auto Man  
Freq Offset  
0 Hz

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  
Freq Offset  
0 Hz

8DPSK/HCH/Hop



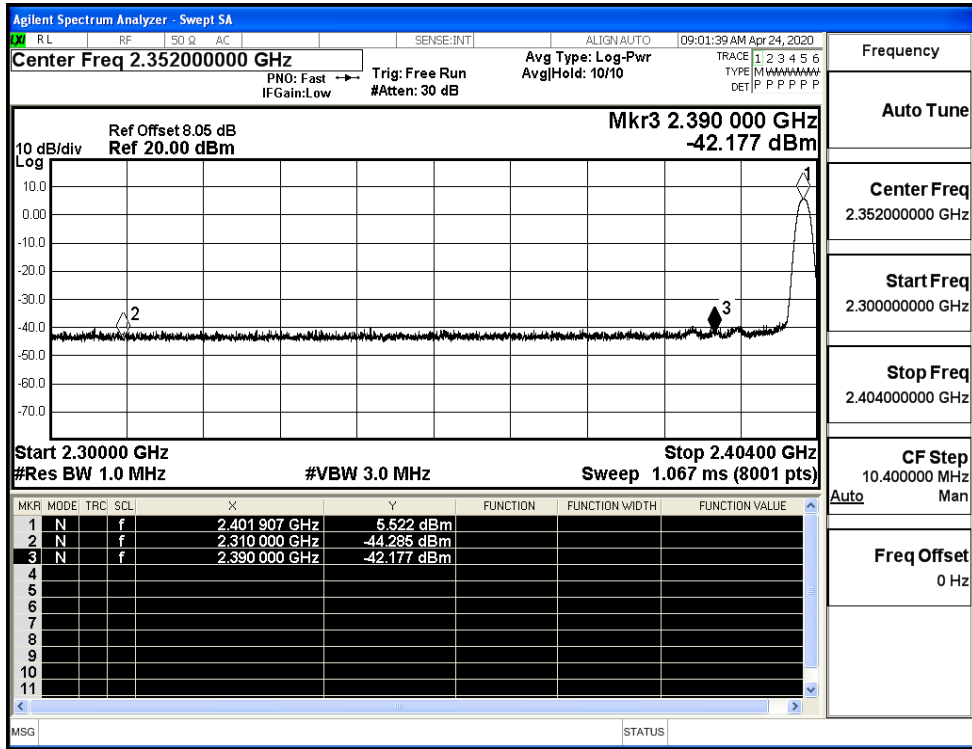
Frequency  
Auto Tune  
Center Freq  
2.483500000 GHz  
Start Freq  
2.453500000 GHz  
Stop Freq  
2.513500000 GHz  
CF Step  
6.000000 MHz  
Freq Offset  
0 Hz



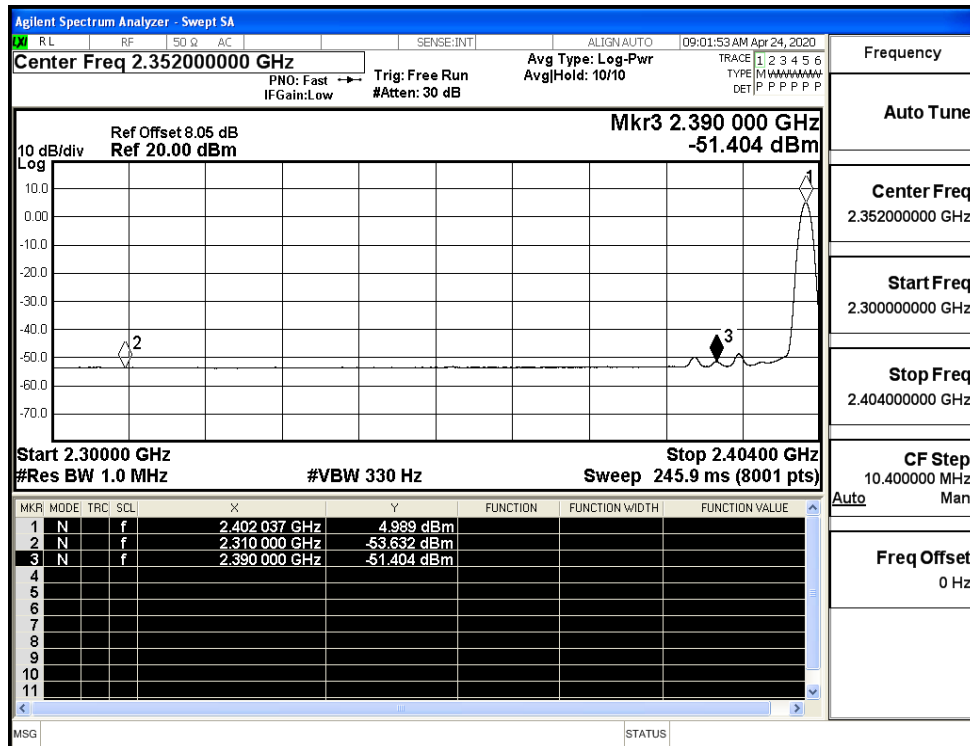
## A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-44.29	2.0	0	50.97	PEAK	74	PASS
	Off	2310.0	-53.63	2.0	0	41.63	AV	54	PASS
	Off	2390.0	-42.18	2.0	0	53.08	PEAK	74	PASS
	Off	2390.0	-51.40	2.0	0	43.85	AV	54	PASS
	Off	2483.5	-40.38	2.0	0	54.88	PEAK	74	PASS
	Off	2483.5	-50.12	2.0	0	45.14	AV	54	PASS
	Off	2500.0	-41.96	2.0	0	53.30	PEAK	74	PASS
	Off	2500.0	-52.27	2.0	0	42.99	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.91	2.0	0	51.35	PEAK	74	PASS
	Off	2310.0	-53.52	2.0	0	41.73	AV	54	PASS
	Off	2390.0	-41.58	2.0	0	53.68	PEAK	74	PASS
	Off	2390.0	-51.54	2.0	0	43.72	AV	54	PASS
	Off	2483.5	-40.92	2.0	0	54.34	PEAK	74	PASS
	Off	2483.5	-50.27	2.0	0	44.98	AV	54	PASS
	Off	2500.0	-43.41	2.0	0	51.85	PEAK	74	PASS
	Off	2500.0	-52.43	2.0	0	42.83	AV	54	PASS
8DPSK	Off	2310.0	-41.95	2.0	0	53.31	PEAK	74	PASS
	Off	2310.0	-53.46	2.0	0	41.79	AV	54	PASS
	Off	2390.0	-42.33	2.0	0	52.92	PEAK	74	PASS
	Off	2390.0	-51.58	2.0	0	43.67	AV	54	PASS
	Off	2483.5	-39.14	2.0	0	56.11	PEAK	74	PASS
	Off	2483.5	-49.98	2.0	0	45.28	AV	54	PASS
	Off	2500.0	-42.79	2.0	0	52.47	PEAK	74	PASS
	Off	2500.0	-52.32	2.0	0	42.94	AV	54	PASS

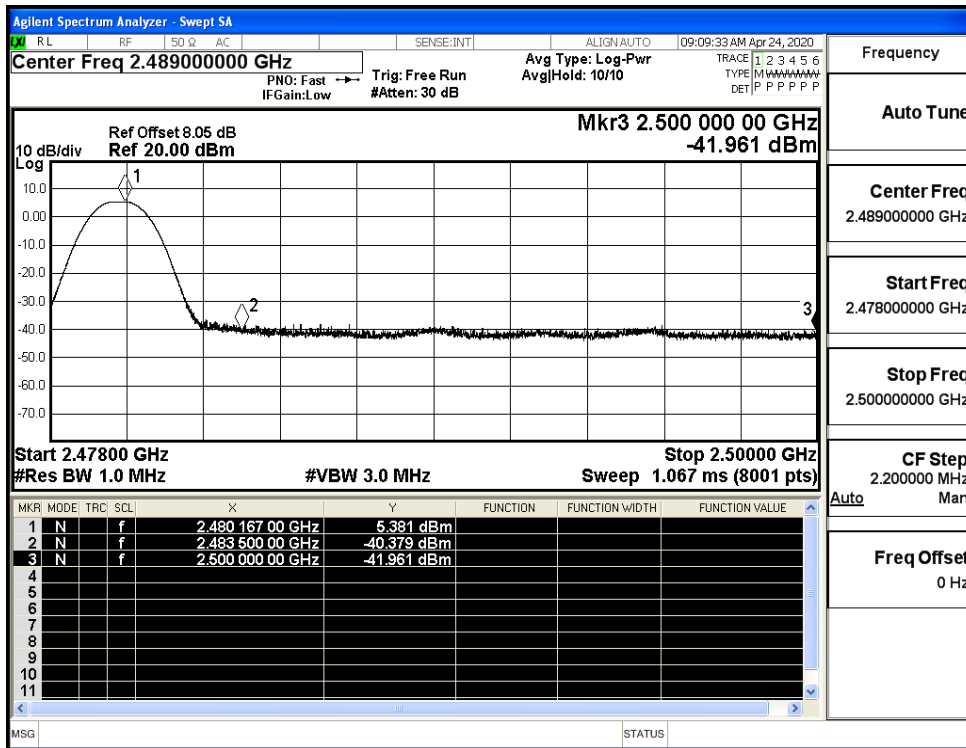
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (Low Channel)



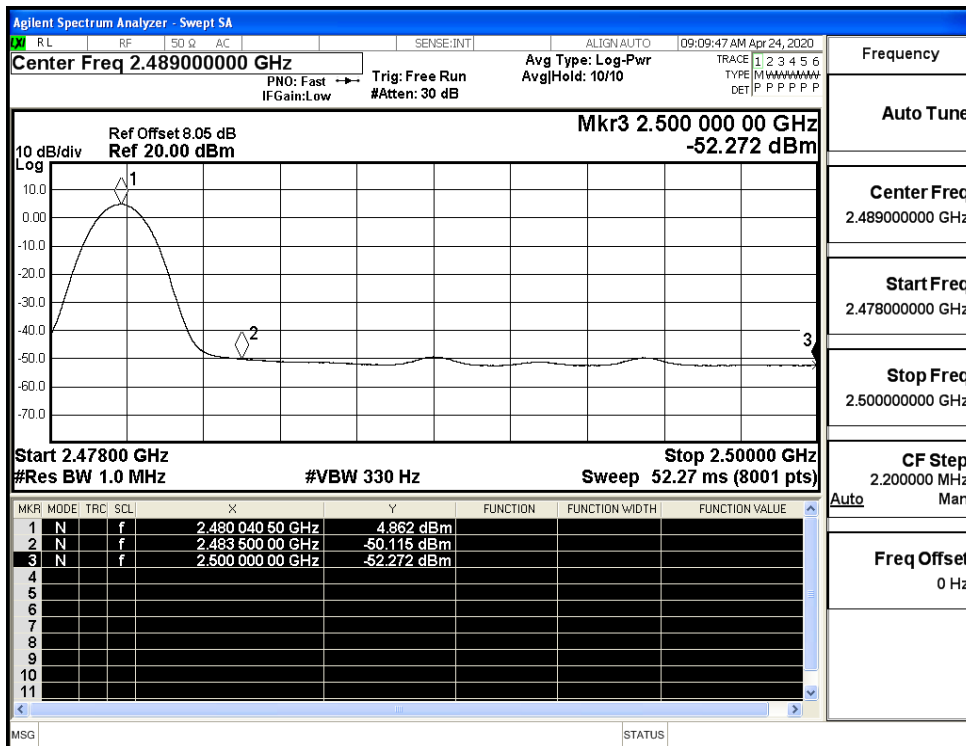
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (Low Channel)



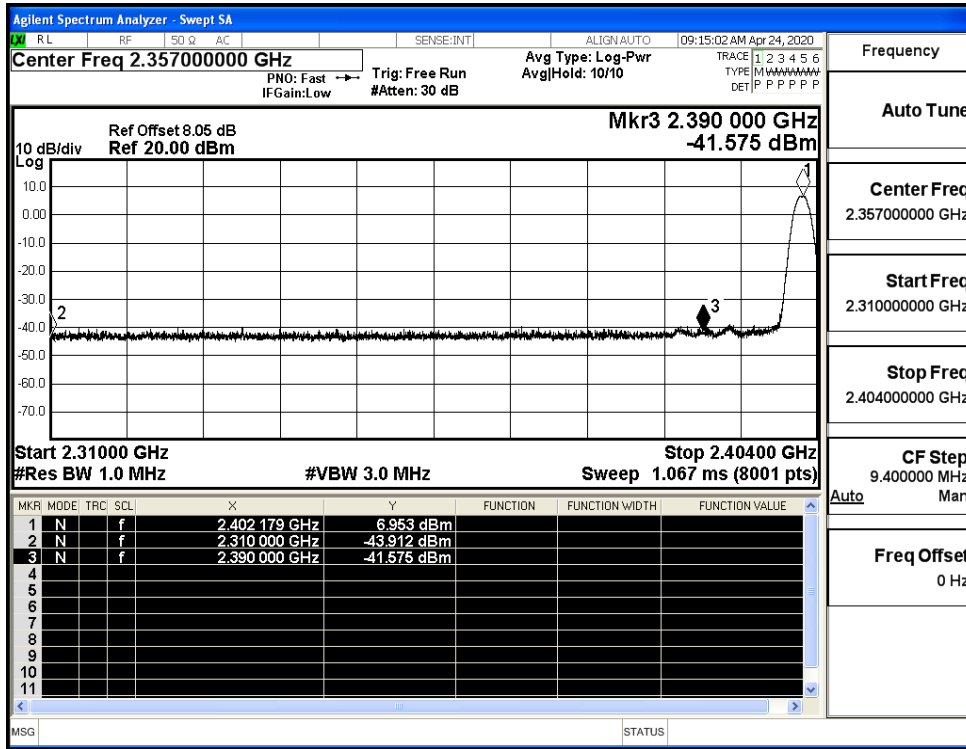
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (High Channel)



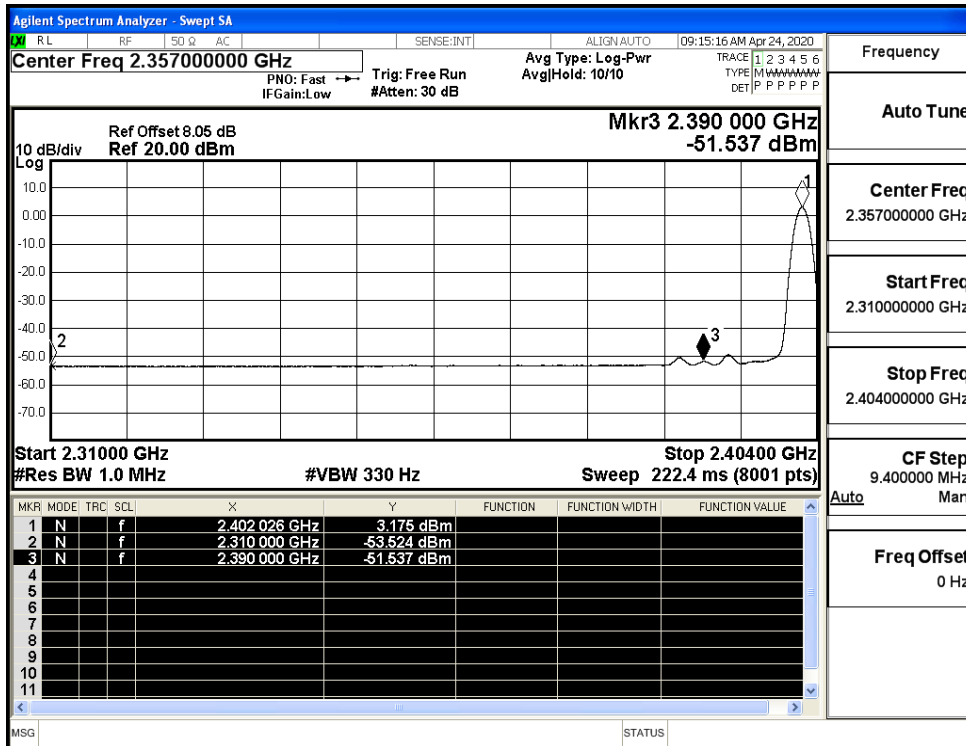
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (High Channel)



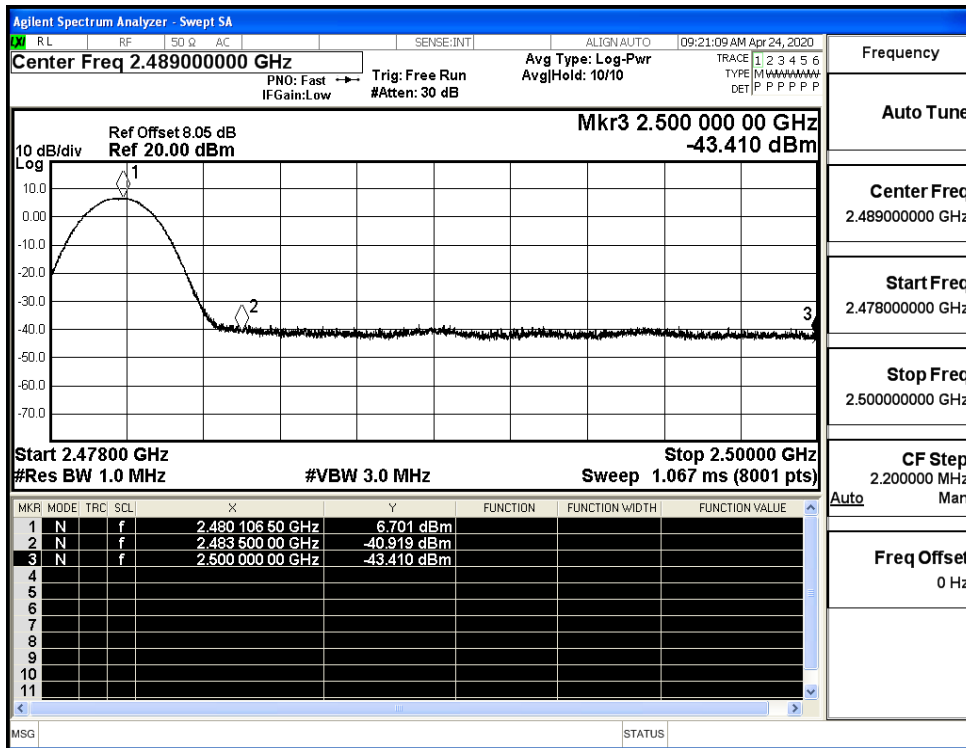
Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_PEAK (Low Channel)



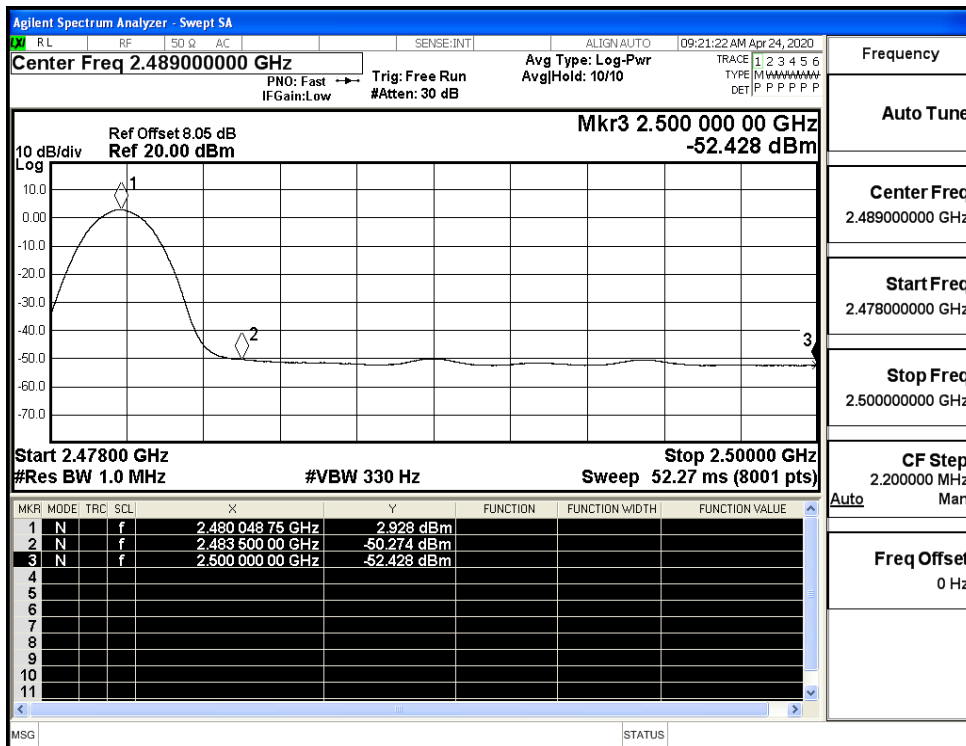
Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_Average (Low Channel)



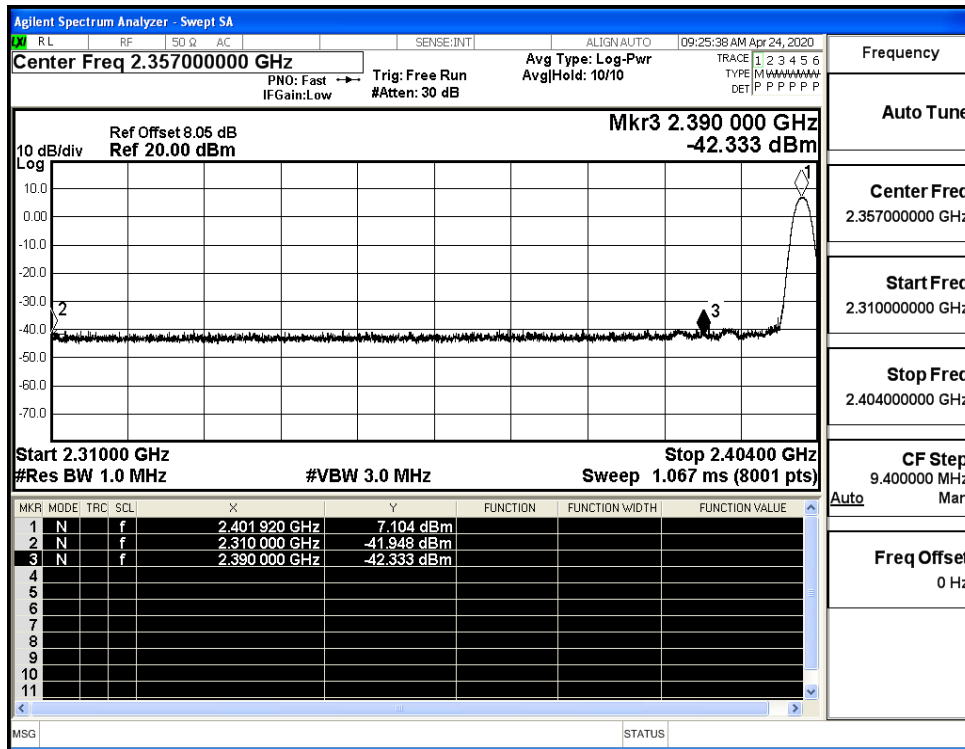
Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_PEAK (High Channel)



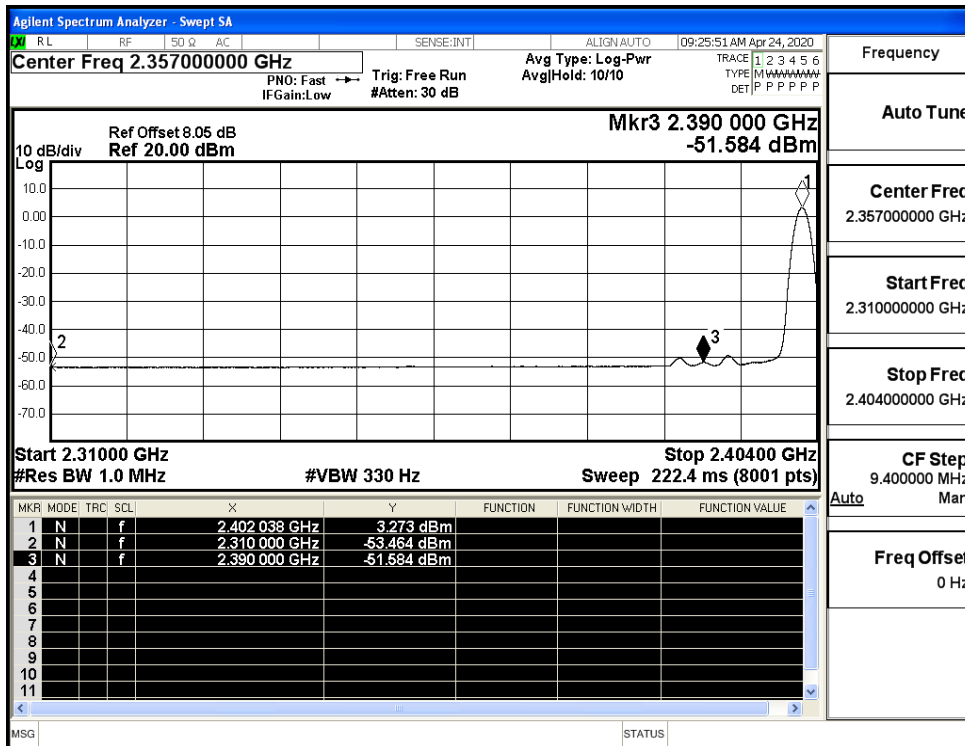
Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_Average (High Channel)



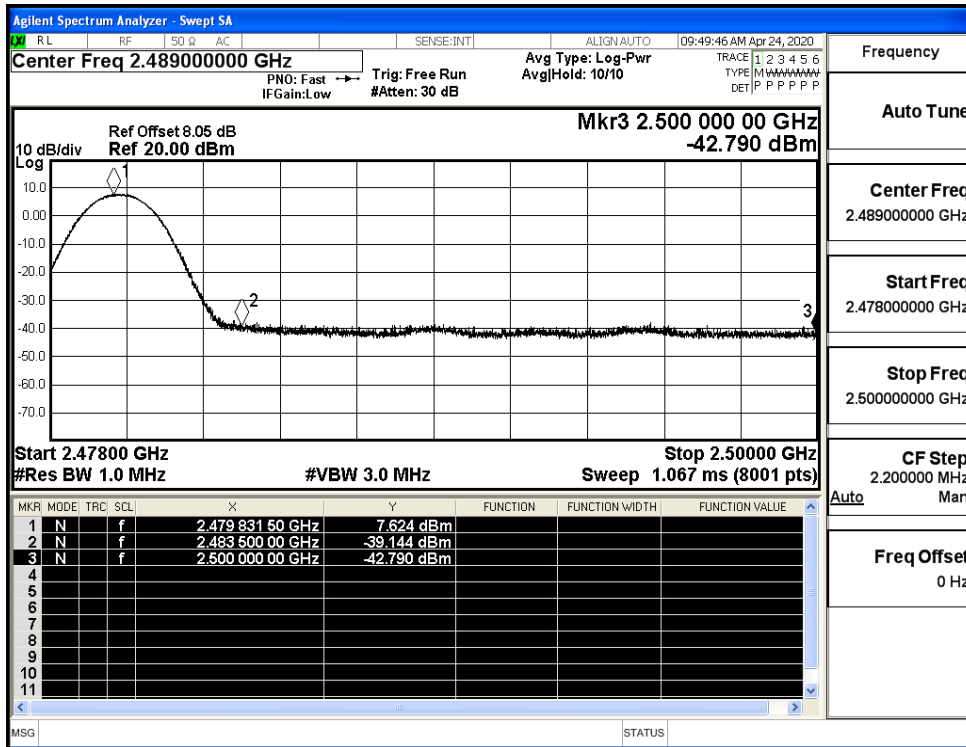
Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_PEAK (Low Channel)



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)

