

## Appendix A

### RF Test Data for BT V4.0(BDR/EDR) (Conducted Measurement)

Product Name: Smart Phone

Test Model: ELUGA RAY 800

#### Environmental Conditions

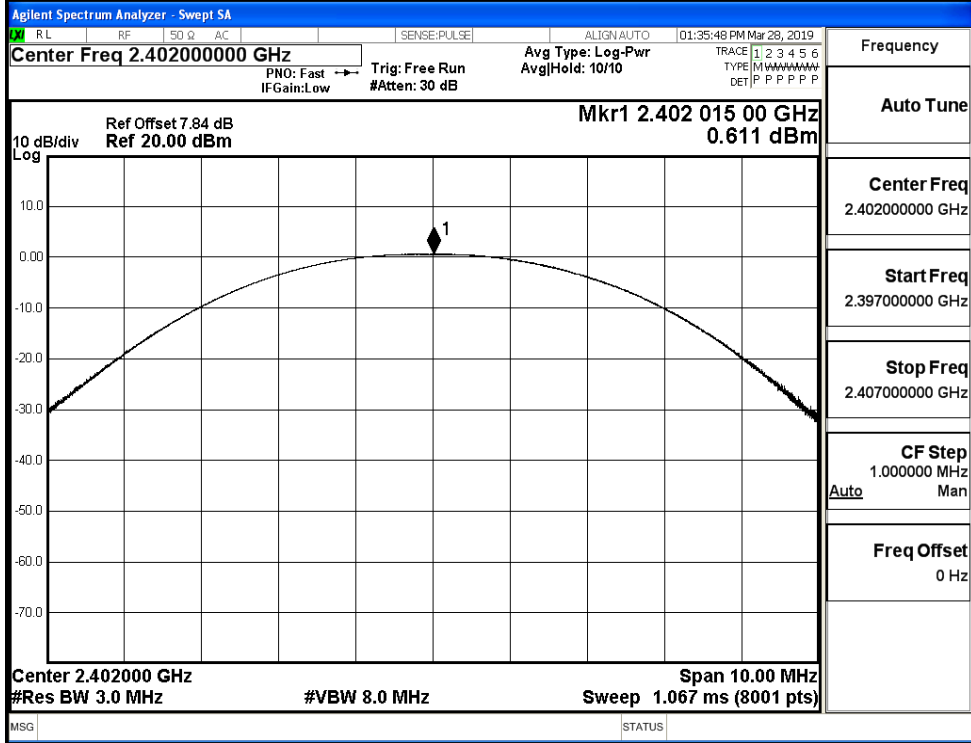
Temperature:	24.5 ° C
Relative Humidity:	52.9%
ATM Pressure:	100.0 kPa
Test Engineer:	Wang Chuang
Supervised by:	Calvin Weng

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

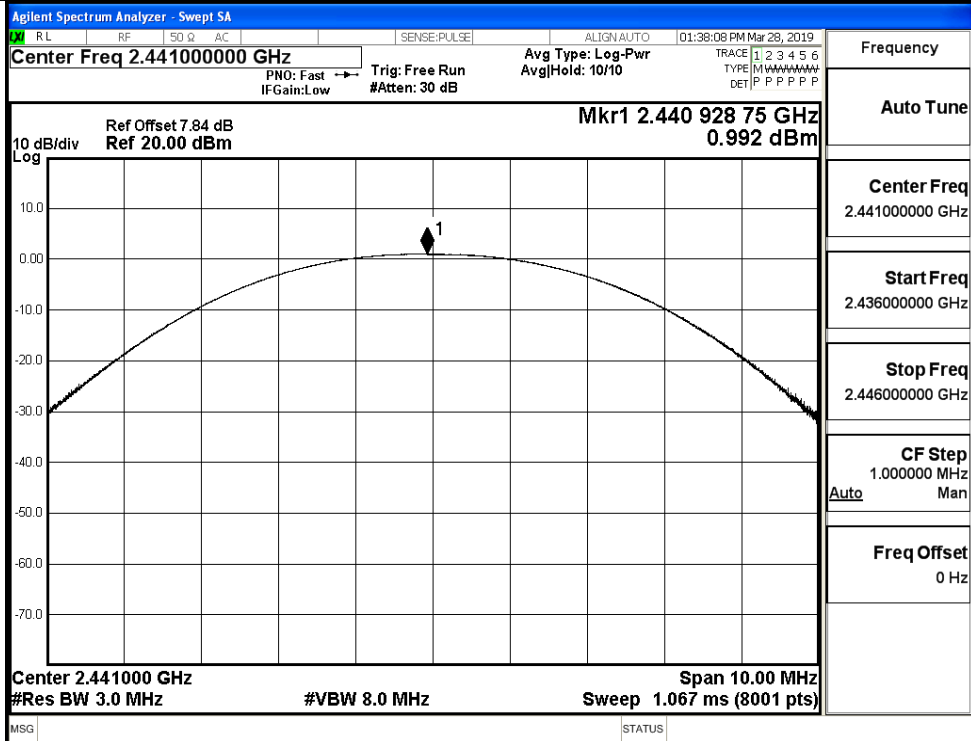
Mode	Channel.	Maximum Peak Output Power [dBm]	Maximum Average Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.611	0.401	30	PASS
	MCH	0.992	0.779	30	PASS
	HCH	0.323	0.116	30	PASS
$\pi/4$ DQPSK	LCH	0.190	-0.011	21	PASS
	MCH	0.492	0.307	21	PASS
	HCH	-0.168	-0.373	21	PASS
8DPSK	LCH	0.344	0.131	21	PASS
	MCH	0.761	0.537	21	PASS
	HCH	0.021	-0.163	21	PASS

Test Graphs

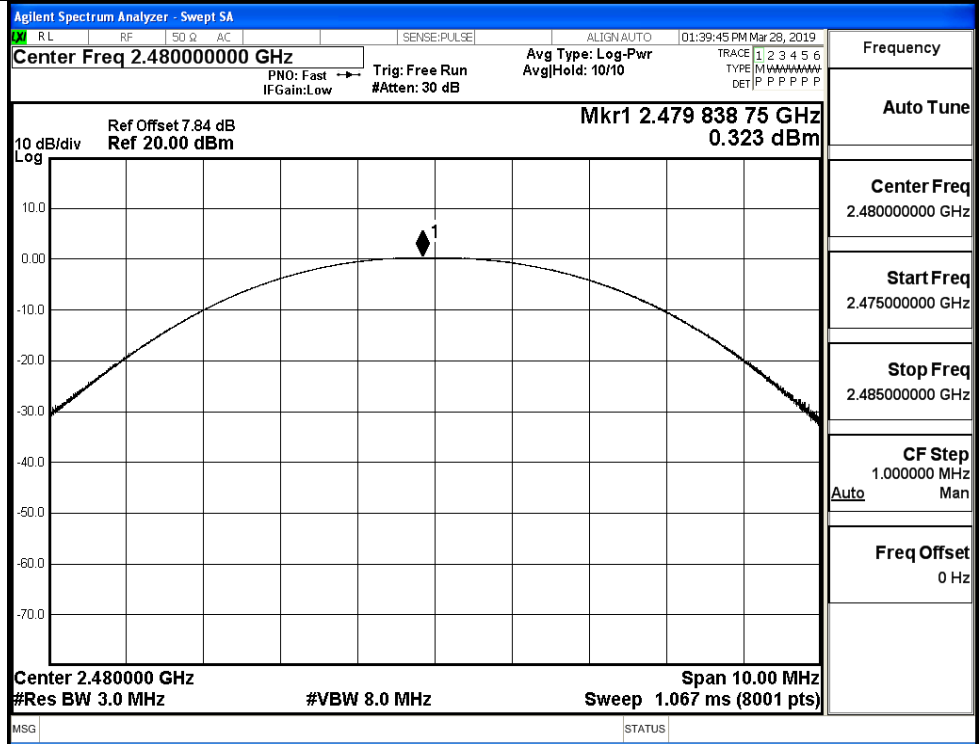
GFSK/LCH



GFSK/MCH

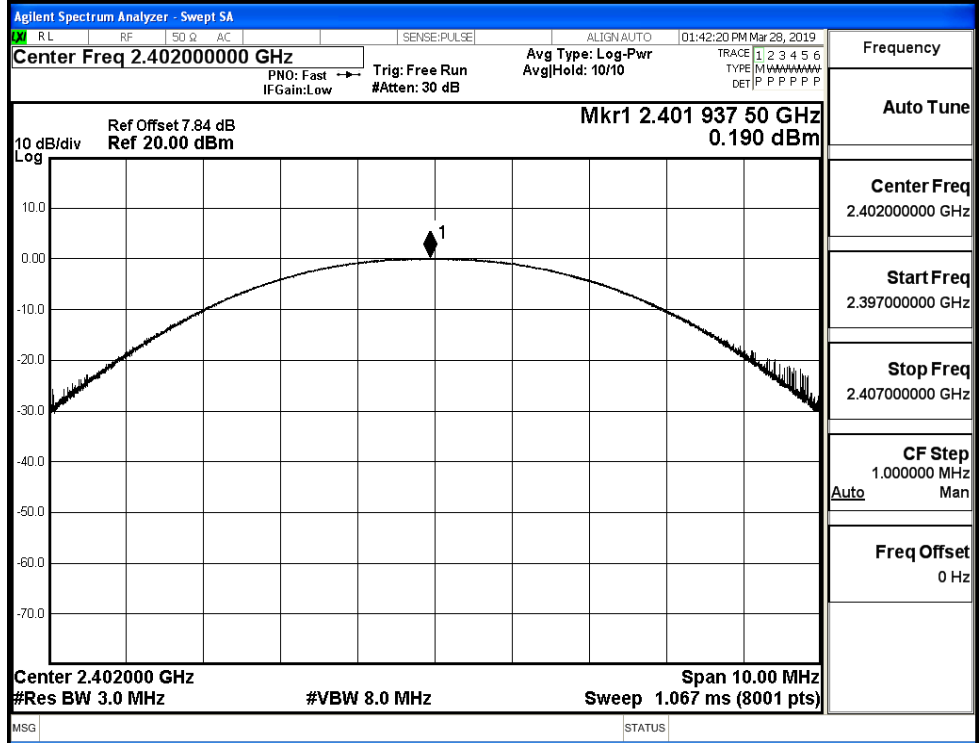


GFSK/HCH

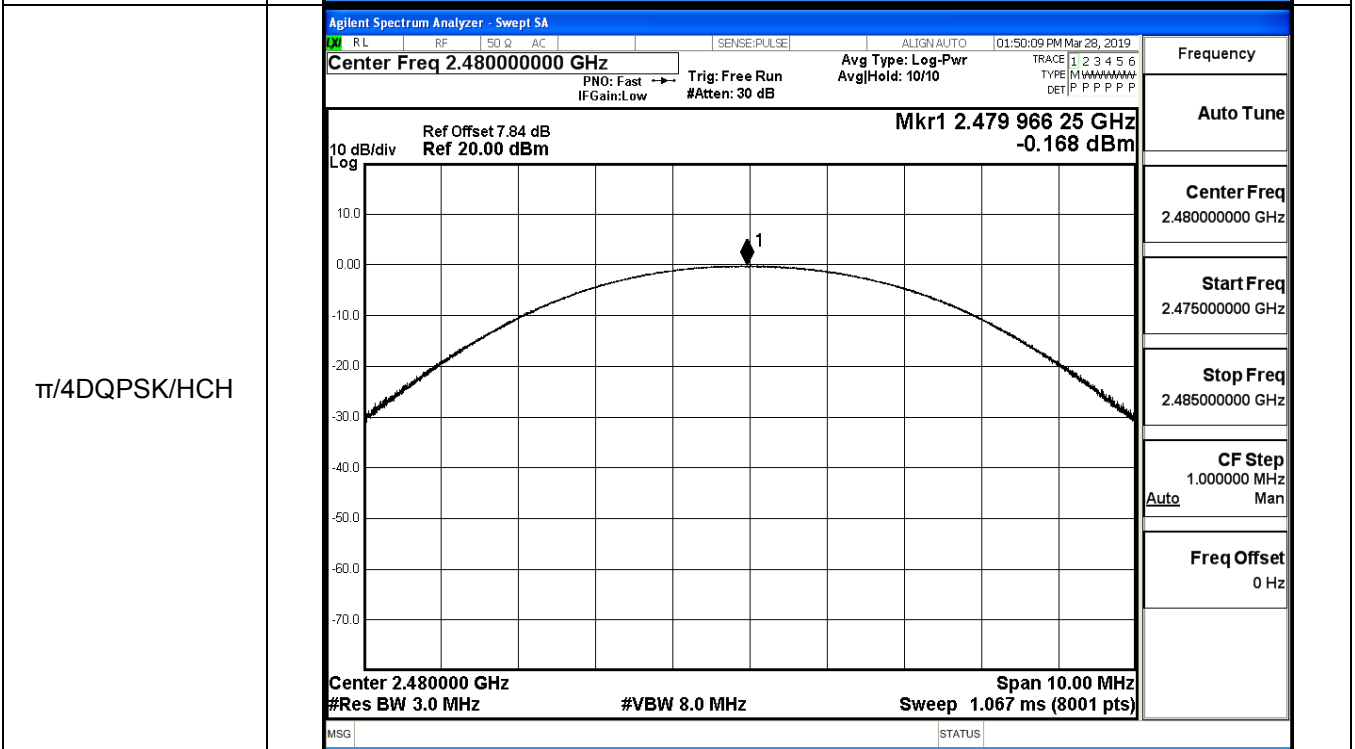
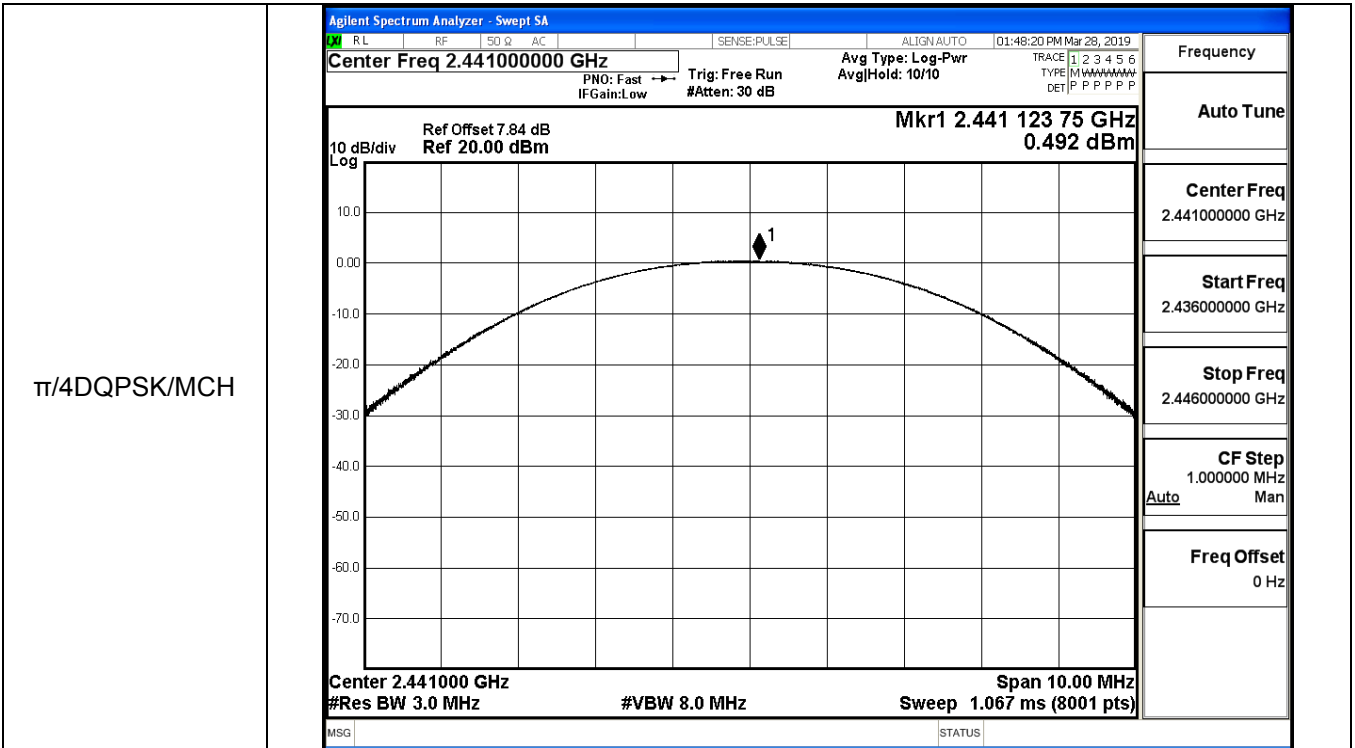


Frequency
Auto Tune
Center Freq 2.480000000 GHz
Start Freq 2.475000000 GHz
Stop Freq 2.485000000 GHz
CF Step 1.000000 MHz Auto Man
Freq Offset 0 Hz

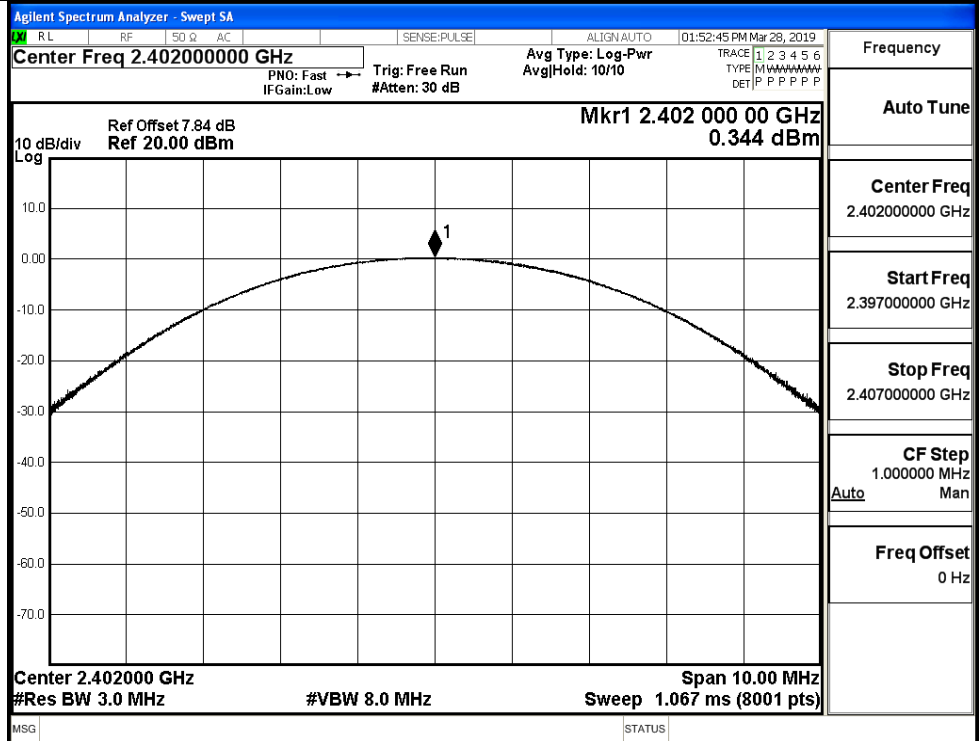
$\pi$ /4DQPSK/LCH



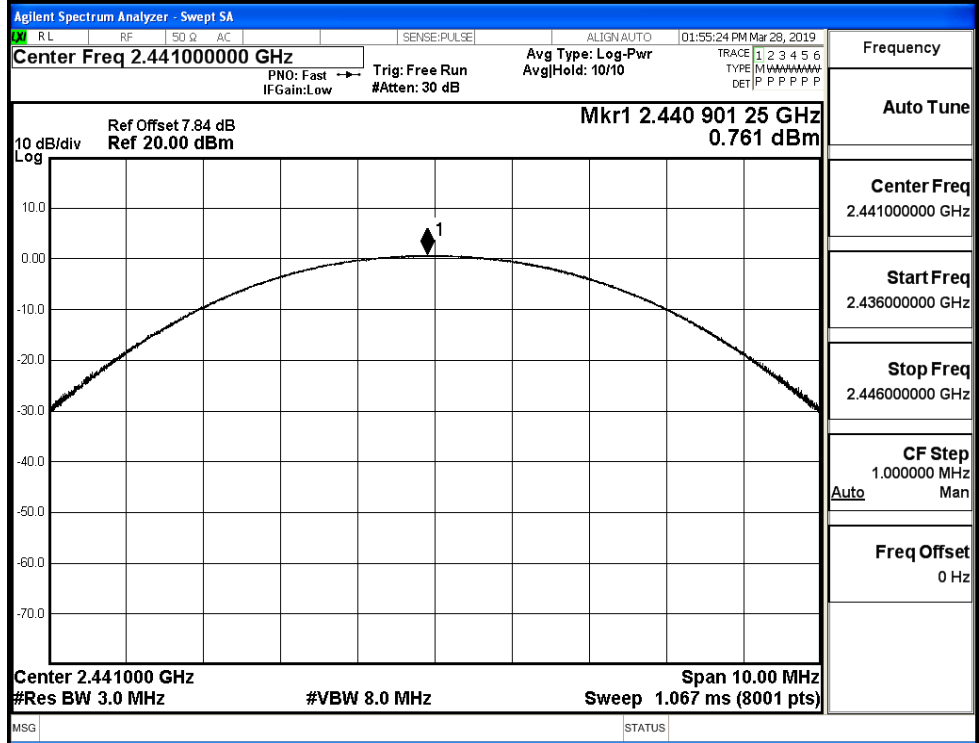
Frequency
Auto Tune
Center Freq 2.402000000 GHz
Start Freq 2.397000000 GHz
Stop Freq 2.407000000 GHz
CF Step 1.000000 MHz Auto Man
Freq Offset 0 Hz



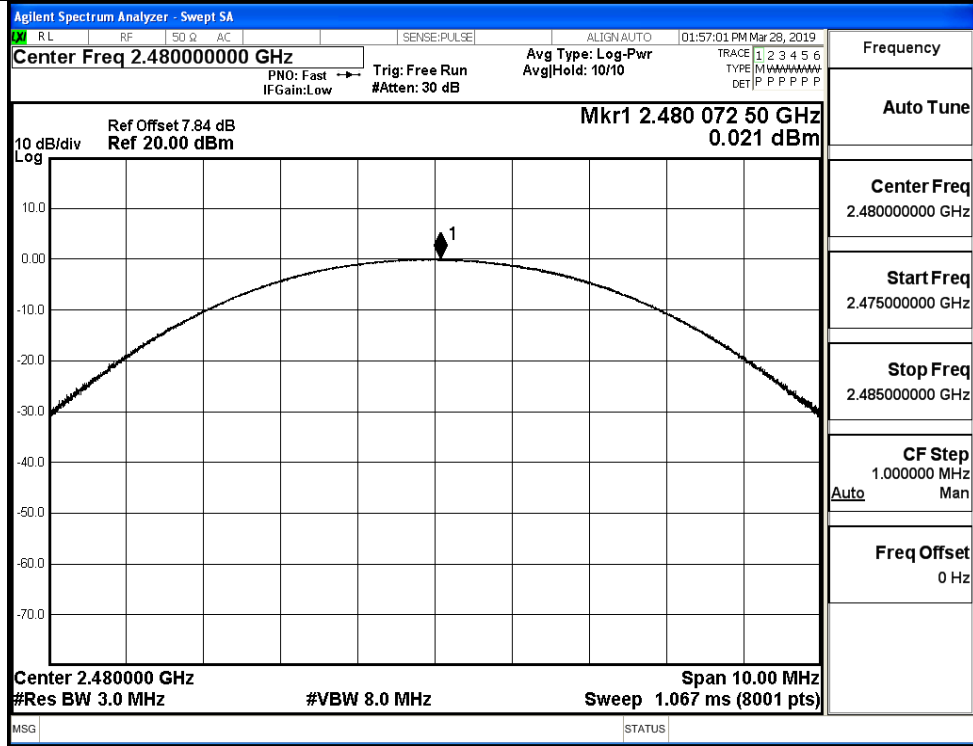
8DPSK/LCH



8DPSK/MCH

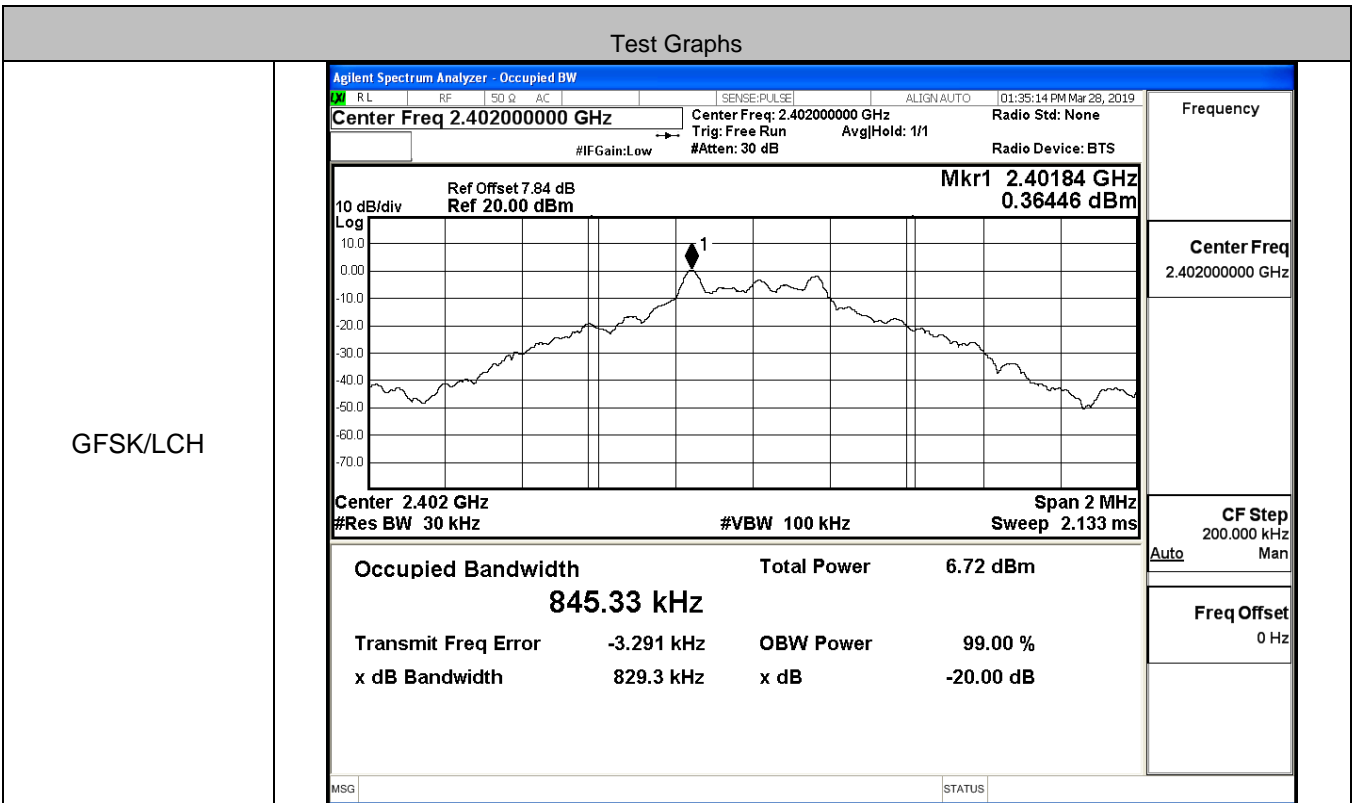


8DPSK/HCH

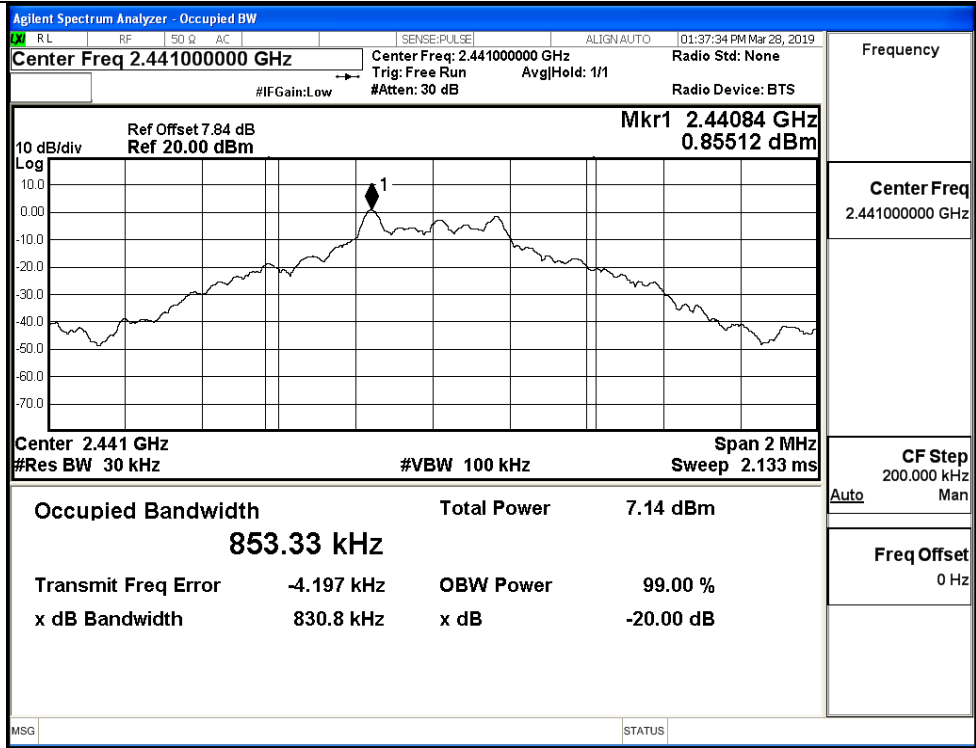


**A.2 20dB Bandwidth**

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.8293	Not Specified	PASS
	MCH	0.8308	Not Specified	PASS
	HCH	0.8310	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.319	Not Specified	PASS
	MCH	1.315	Not Specified	PASS
	HCH	1.310	Not Specified	PASS
8DPSK	LCH	1.300	Not Specified	PASS
	MCH	1.297	Not Specified	PASS
	HCH	1.299	Not Specified	PASS

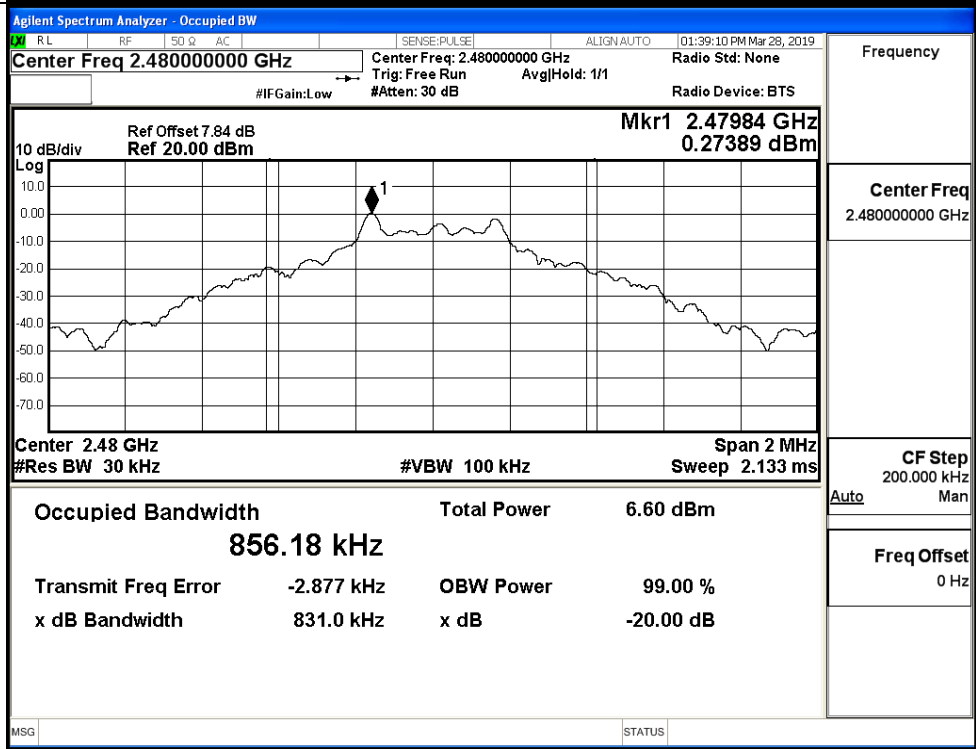


GFSK/MCH



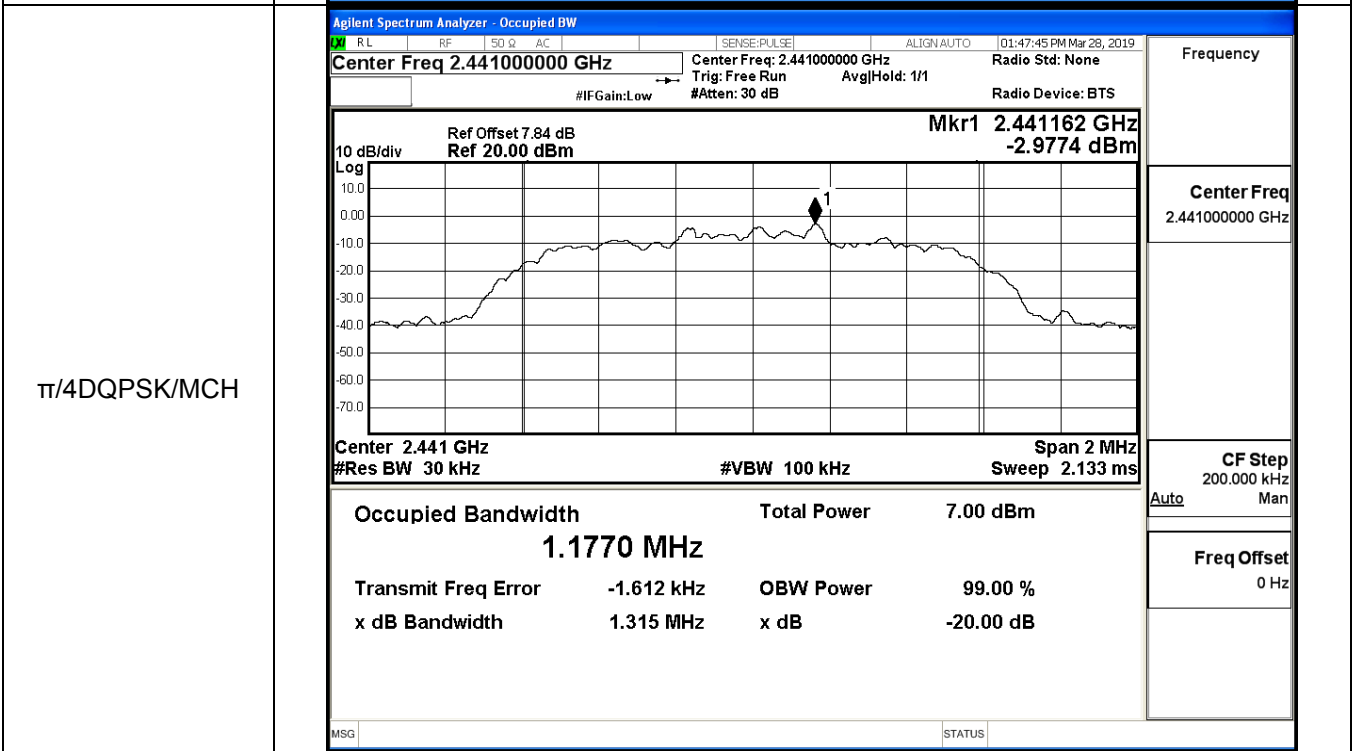
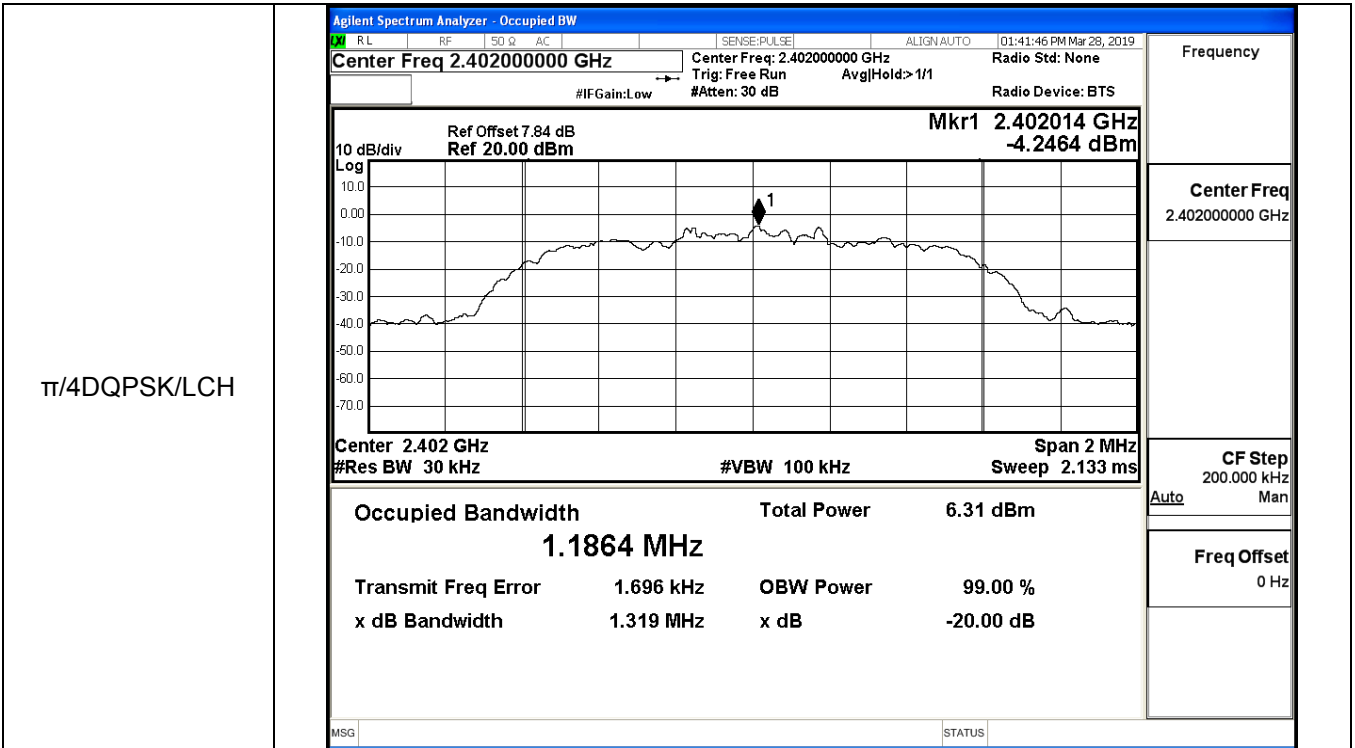
Frequency	2.441000000 GHz
Center Freq	2.441000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

GFSK/HCH

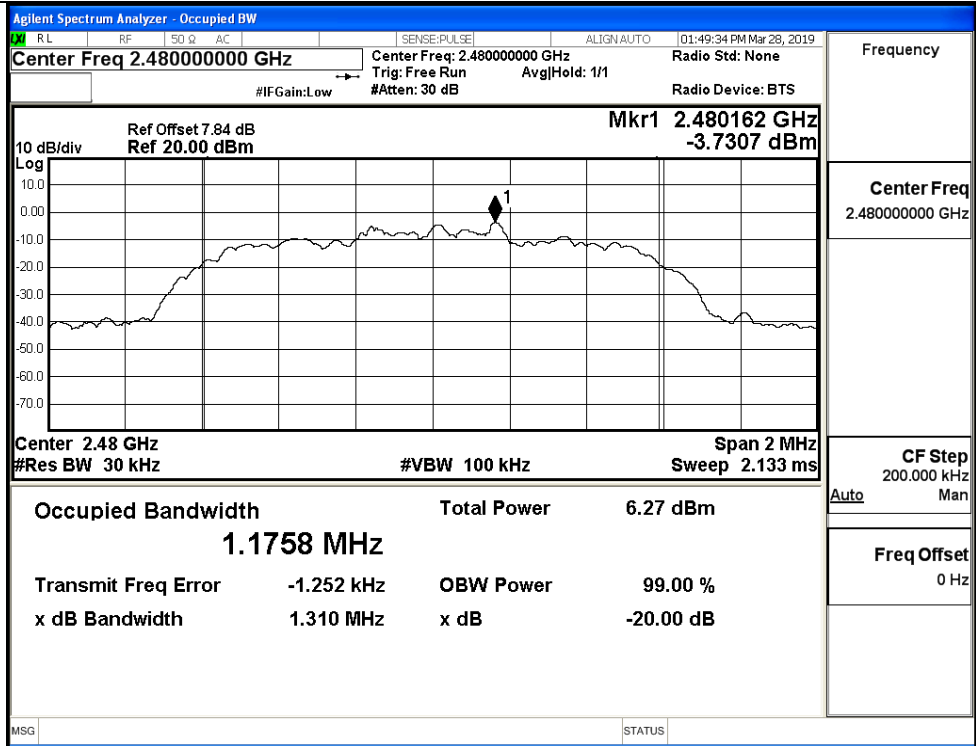


Frequency	2.480000000 GHz
Center Freq	2.480000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

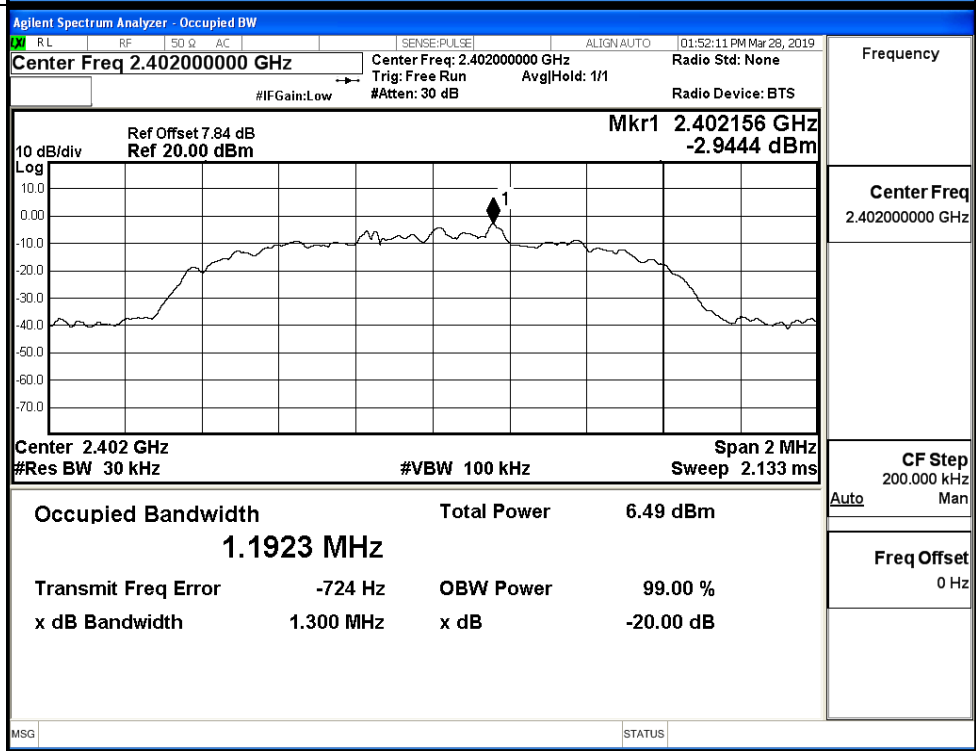




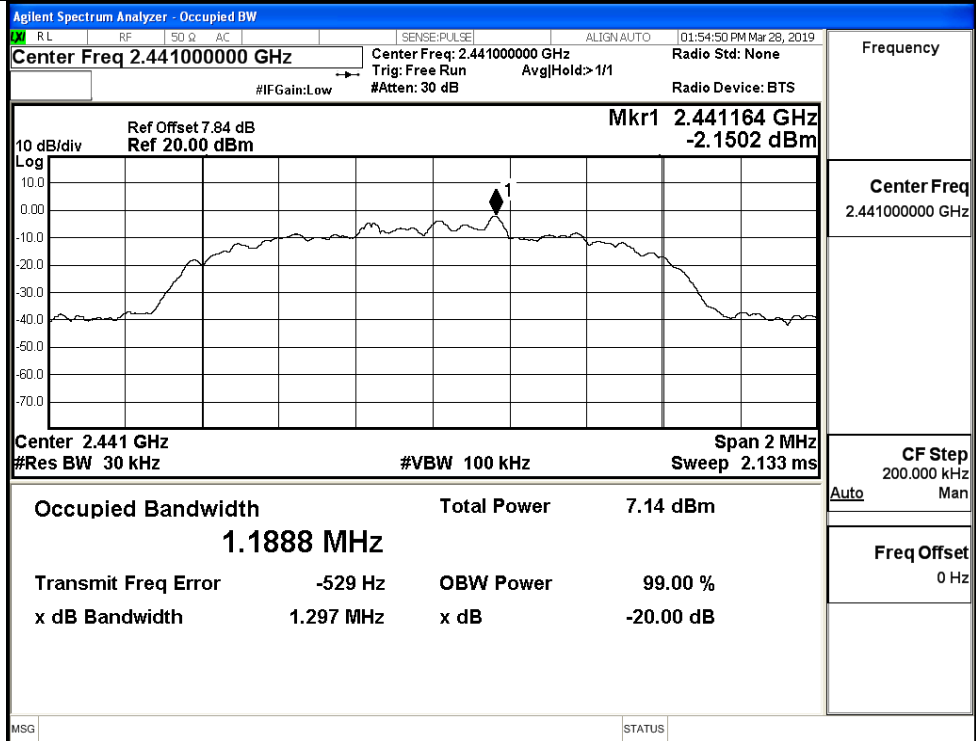
$\pi/4$ DQPSK/HCH



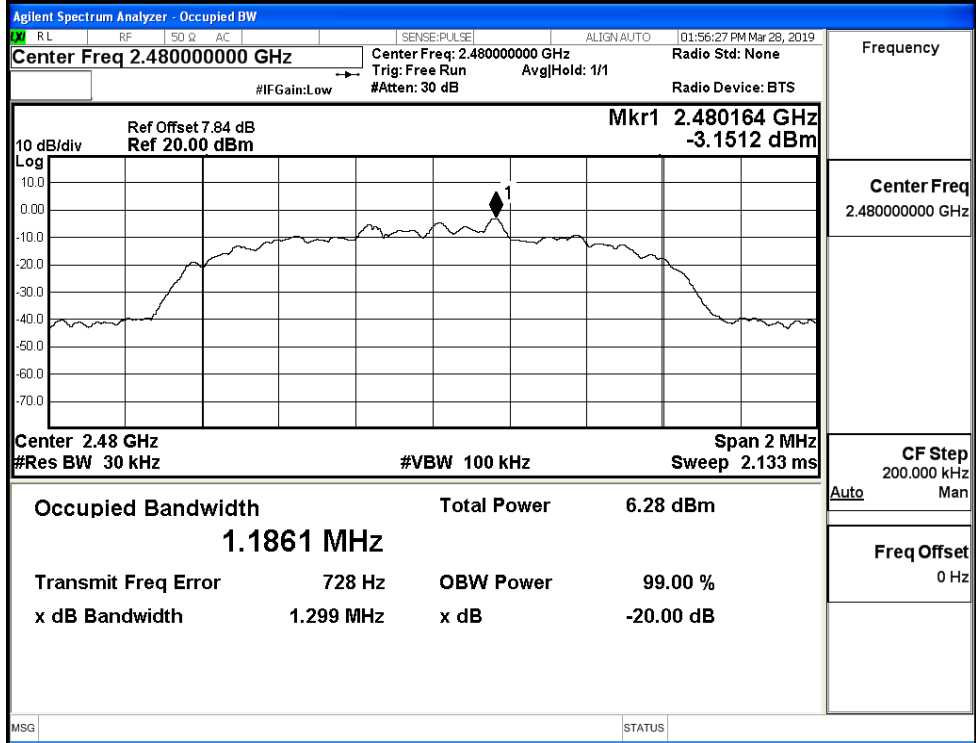
8DPSK/LCH



8DPSK/MCH

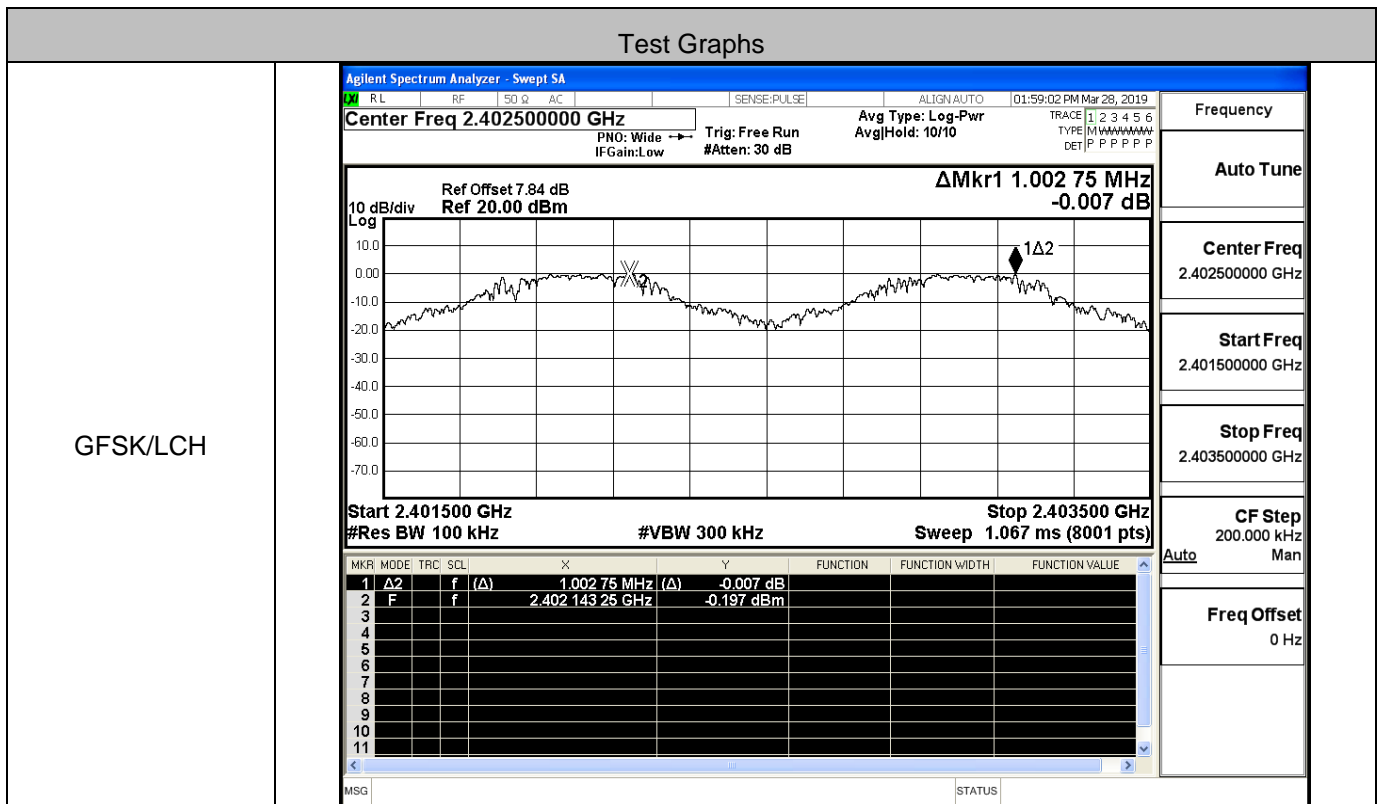


8DPSK/HCH

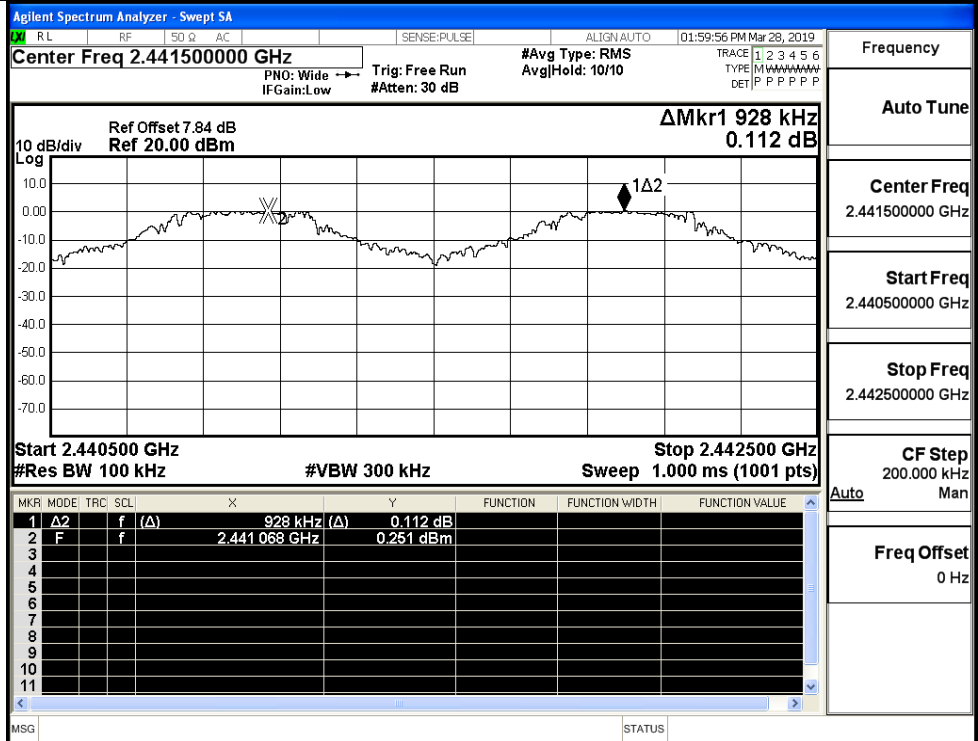


### A.3 Carrier Frequency Separation

Mode	Channel	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.003	0.8293	PASS
	MCH	0.928	0.8308	PASS
	HCH	0.834	0.8310	PASS
π/4DQPSK	LCH	0.890	0.879	PASS
	MCH	0.978	0.879	PASS
	HCH	1.330	0.879	PASS
8DPSK	LCH	1.250	0.867	PASS
	MCH	1.084	0.867	PASS
	HCH	1.148	0.867	PASS

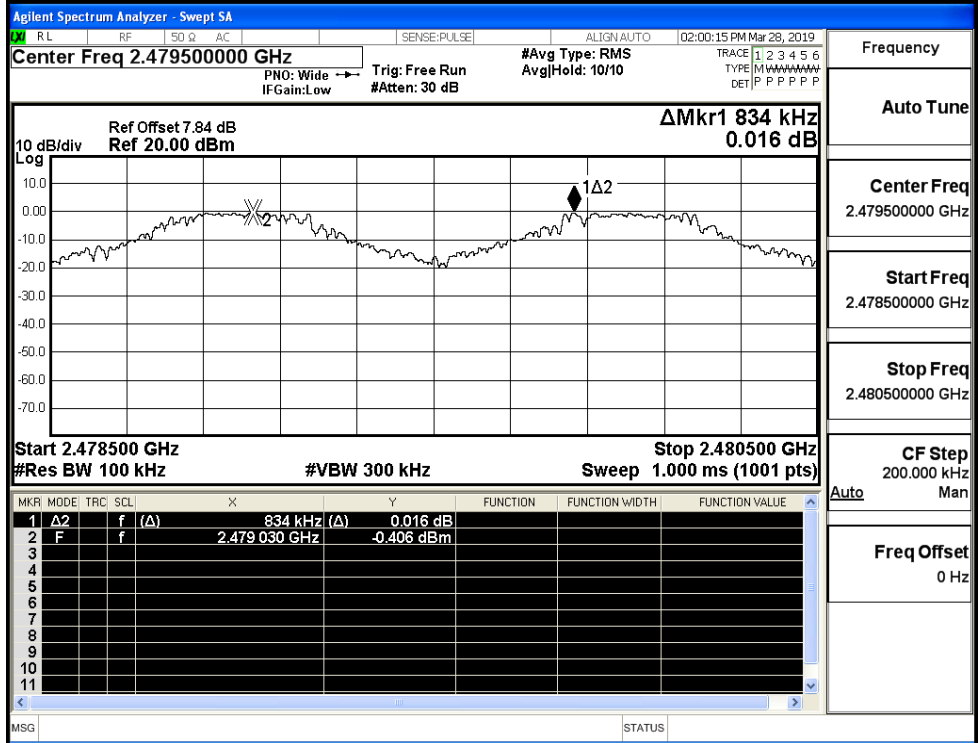


GFSK/MCH



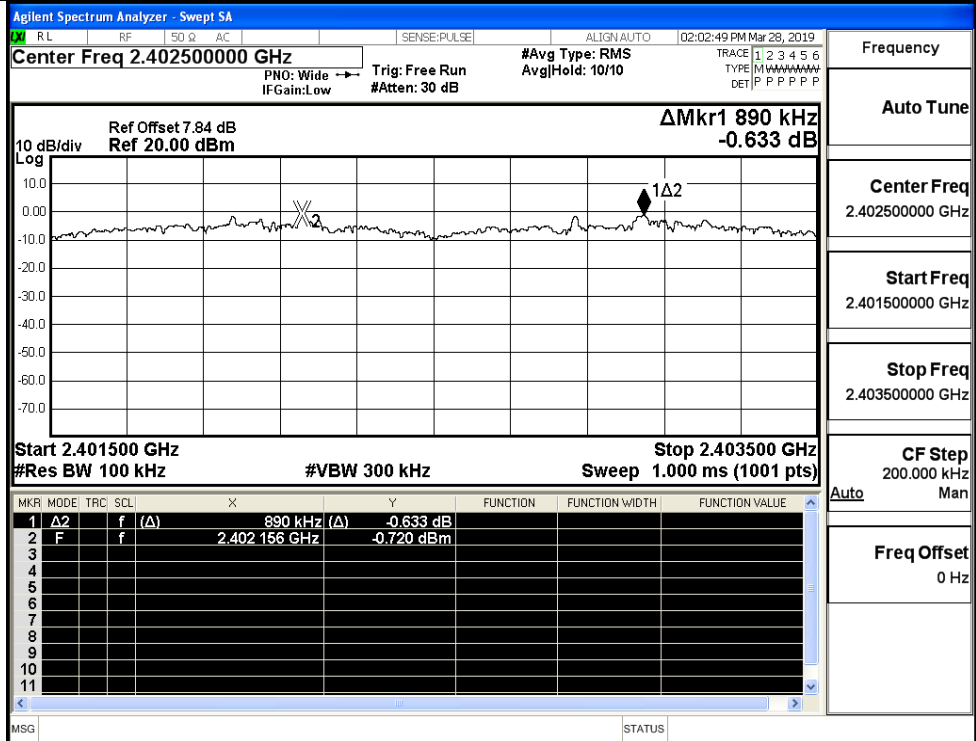
Frequency  
Auto Tune  
Center Freq  
2.441500000 GHz  
Start Freq  
2.440500000 GHz  
Stop Freq  
2.442500000 GHz  
CF Step  
200.000 kHz  
Auto  
Man  
Freq Offset  
0 Hz

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

Auto Tune

Center Freq  
2.402500000 GHz

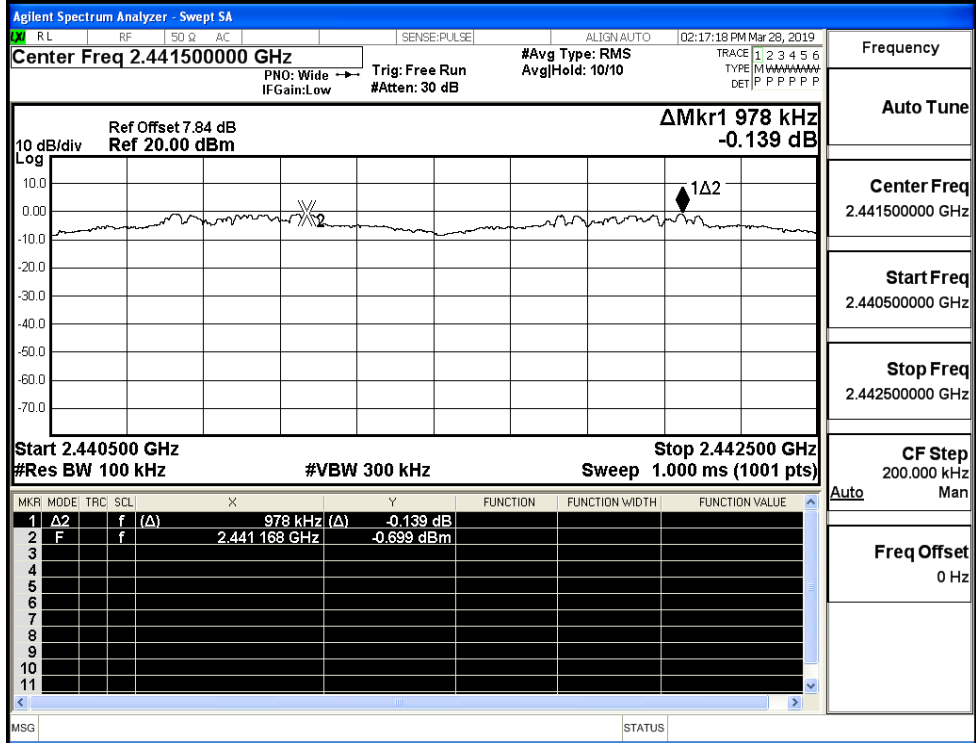
Start Freq  
2.401500000 GHz

Stop Freq  
2.403500000 GHz

CF Step  
200.000 kHz  
Man

Freq Offset  
0 Hz

$\pi/4$ DQPSK/MCH



Frequency

Auto Tune

Center Freq  
2.441500000 GHz

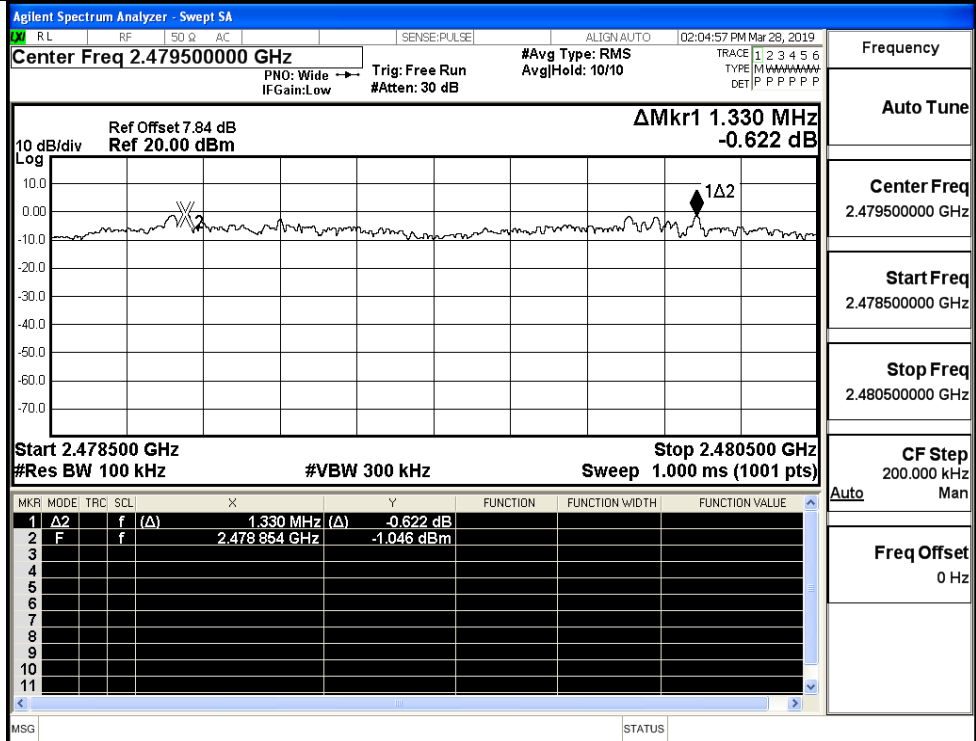
Start Freq  
2.440500000 GHz

Stop Freq  
2.442500000 GHz

CF Step  
200.000 kHz  
Man

Freq Offset  
0 Hz

π/4DQPSK/HCH



Frequency

Auto Tune

Center Freq  
2.479500000 GHz

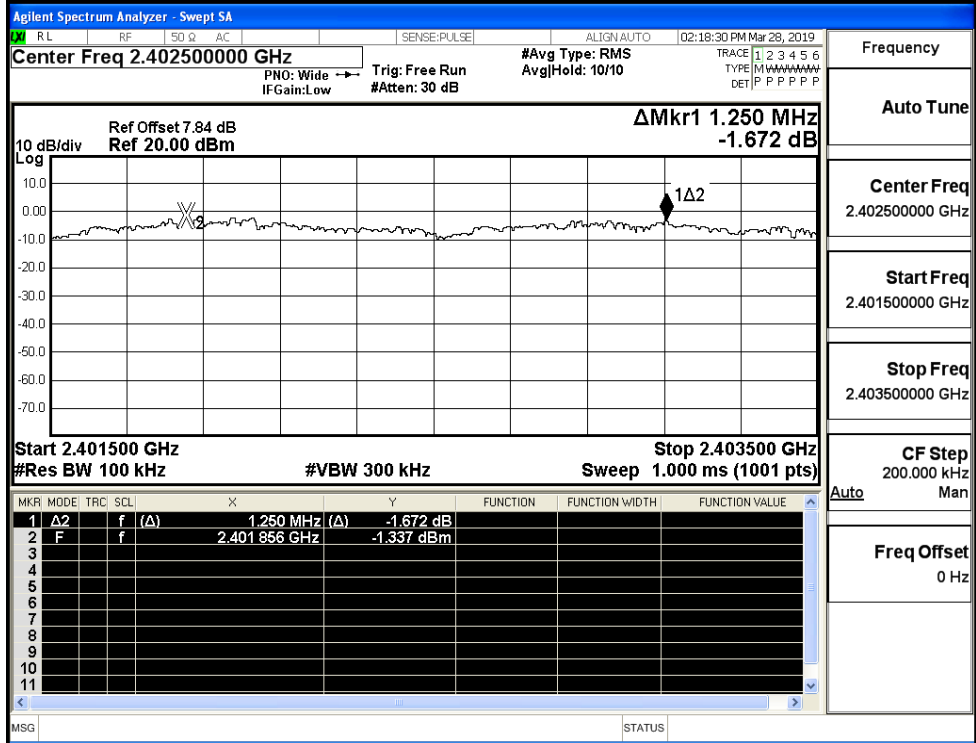
Start Freq  
2.478500000 GHz

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

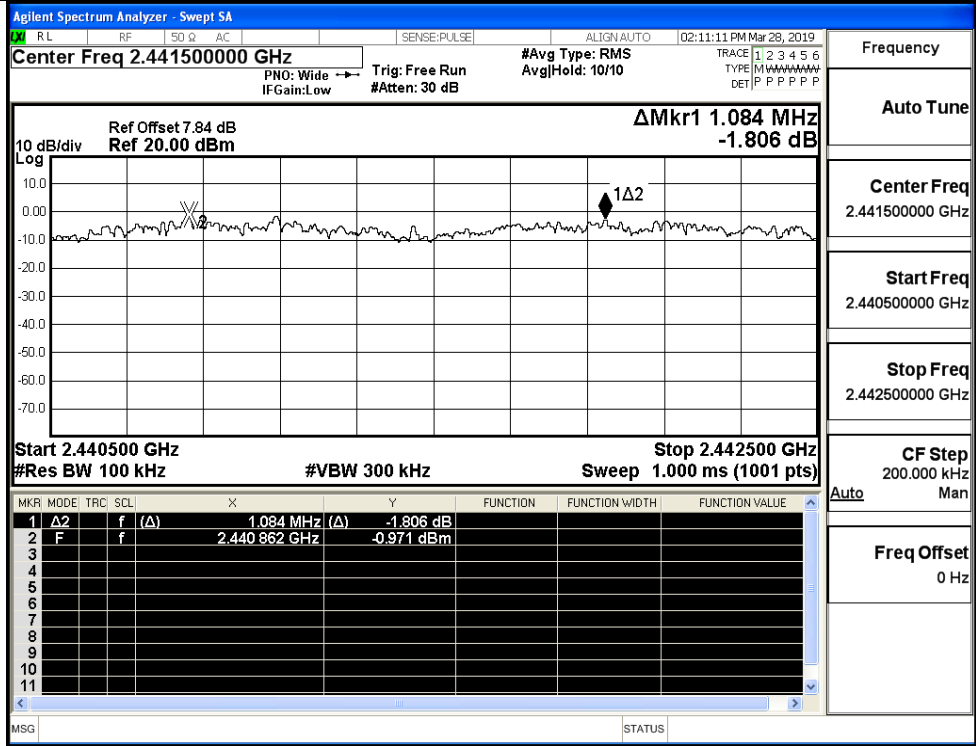
Start Freq  
2.401500000 GHz

Stop Freq  
2.403500000 GHz

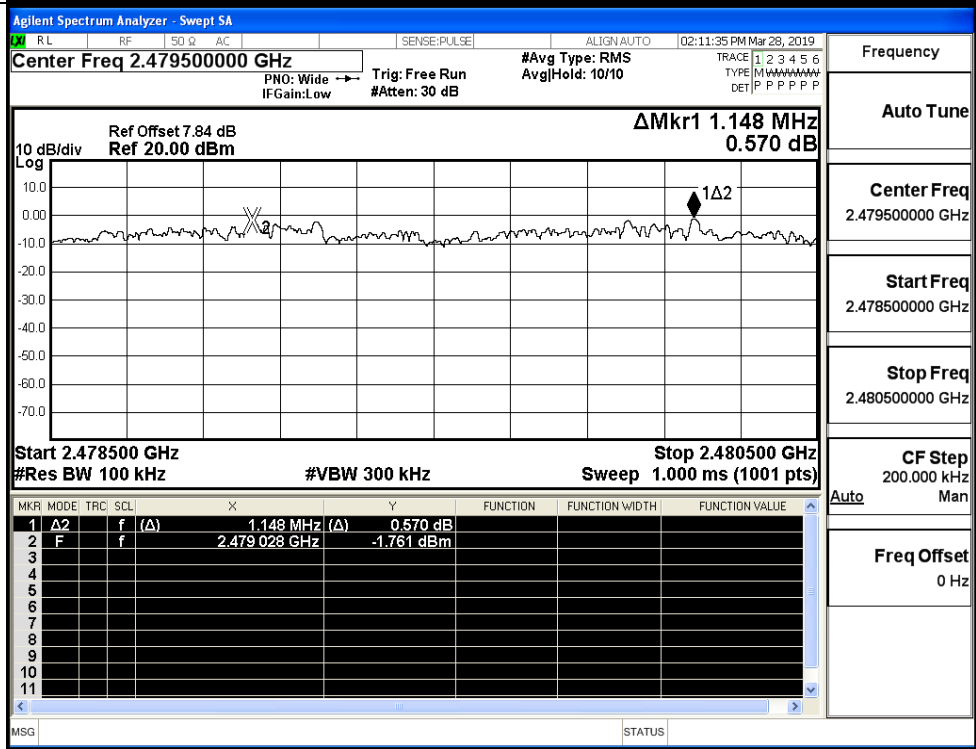
CF Step  
200.000 kHz  
Auto Man

Freq Offset  
0 Hz

8DPSK/MCH



8DPSK/HCH





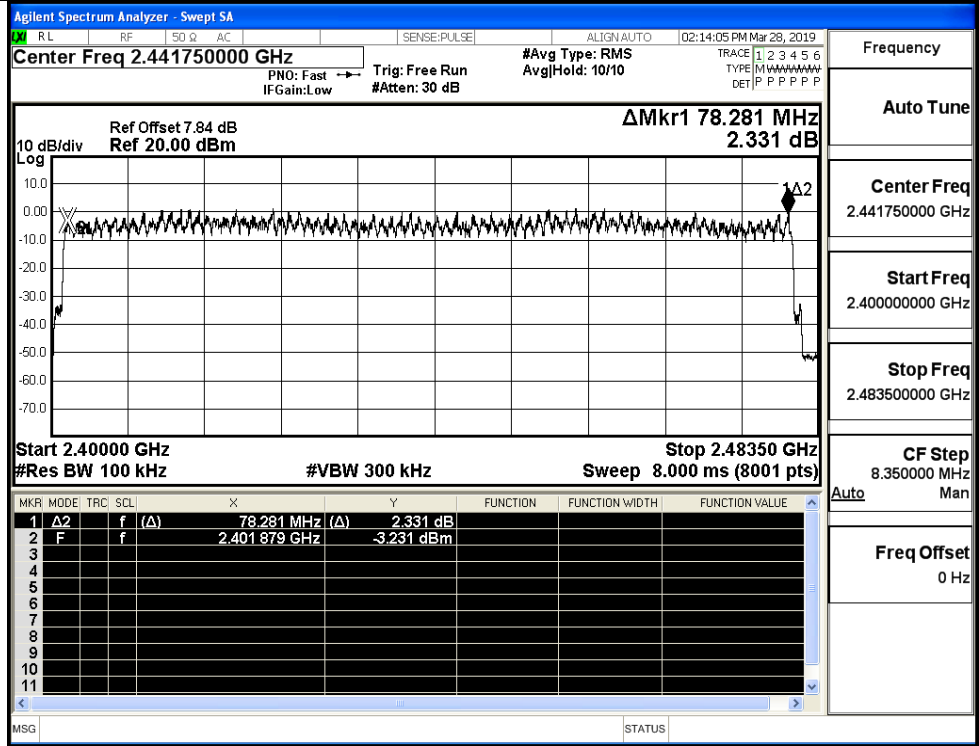
### A.4 Hopping Channel Number

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

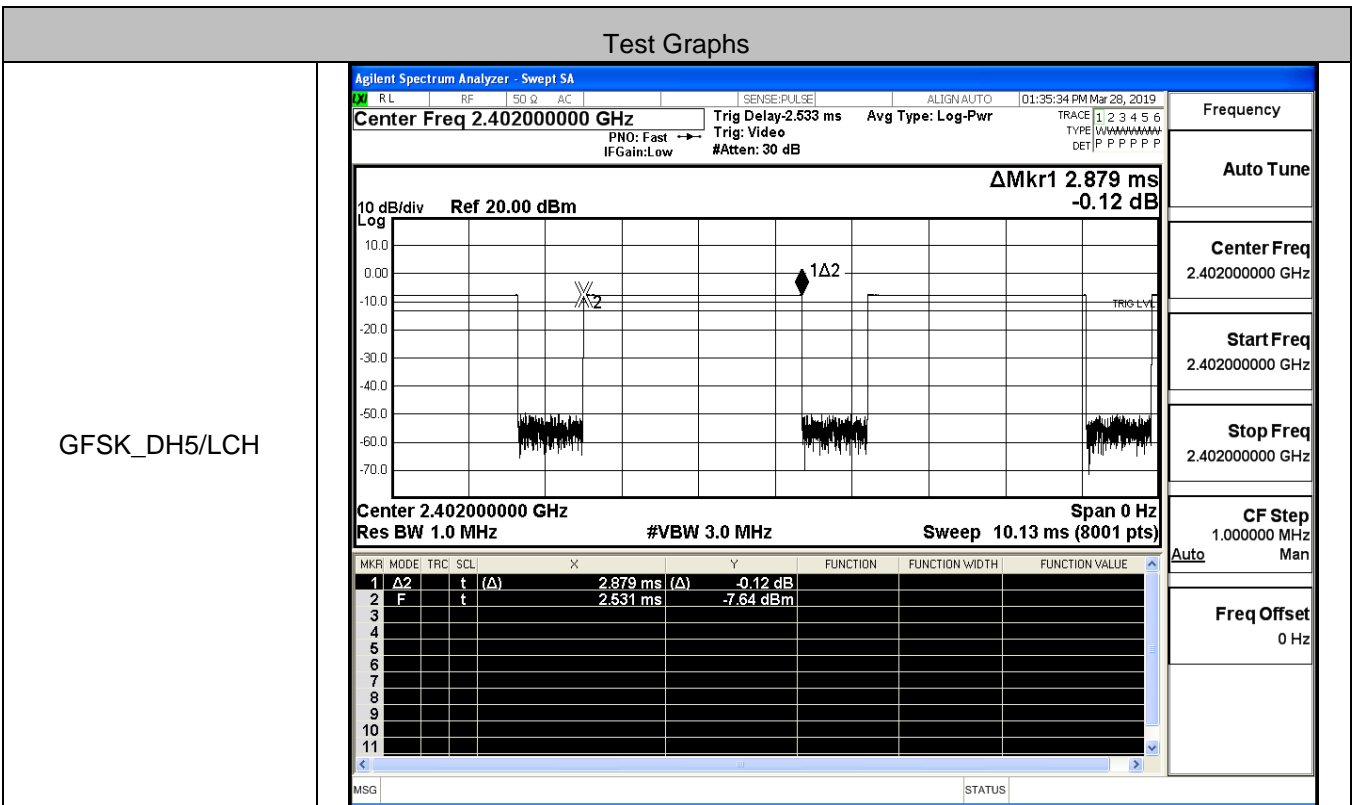
<p>GFSK/Hop</p>	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 7.84 dB Ref 20.00 dBm</p> <p><math>\Delta</math>Mkr1 77.885 MHz -0.021 dB</p> <p>Start 2.40000 GHz #Res BW 100 kHz</p> <p>Stop 2.48350 GHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1"> <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>77.885 MHz (<math>\Delta</math>)</td> <td>-0.021 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.402161 GHz</td> <td>0.083 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	( $\Delta$ )	77.885 MHz ( $\Delta$ )	-0.021 dB				2	F	f		2.402161 GHz	0.083 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	( $\Delta$ )	77.885 MHz ( $\Delta$ )	-0.021 dB																								
2	F	f		2.402161 GHz	0.083 dBm																								
<p><math>\pi/4</math>DQPSK/Hop</p>	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 7.84 dB Ref 20.00 dBm</p> <p><math>\Delta</math>Mkr1 78.177 MHz -1.660 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>78.177 MHz (<math>\Delta</math>)</td> <td>-1.660 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.401837 GHz</td> <td>-2.478 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	( $\Delta$ )	78.177 MHz ( $\Delta$ )	-1.660 dB				2	F	f		2.401837 GHz	-2.478 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	( $\Delta$ )	78.177 MHz ( $\Delta$ )	-1.660 dB																								
2	F	f		2.401837 GHz	-2.478 dBm																								

8DPSK/Hop

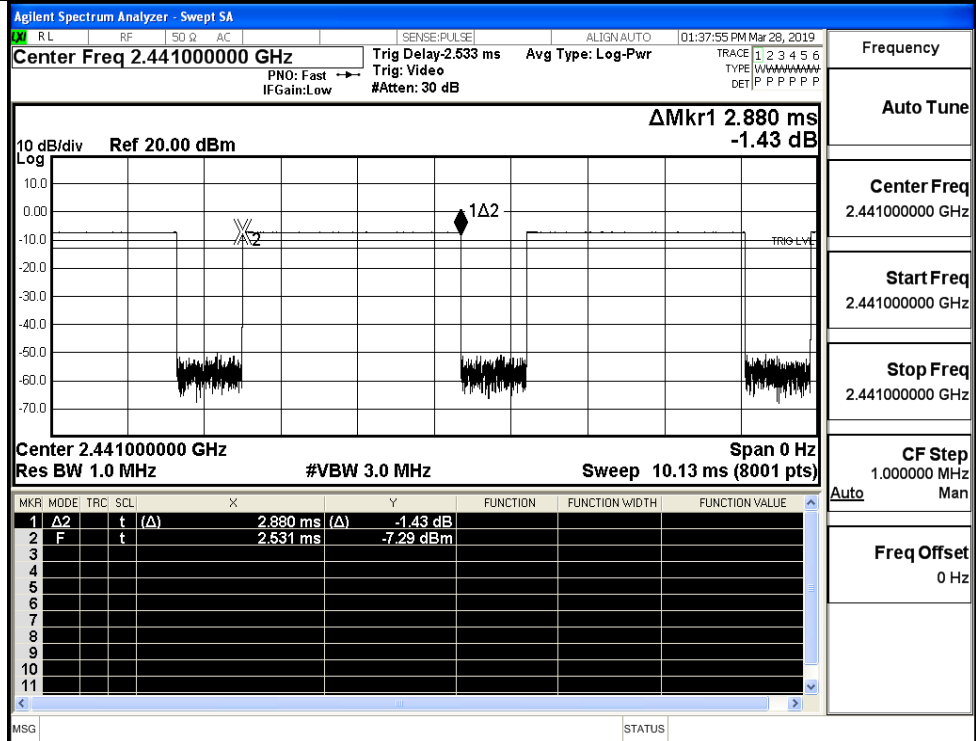


A.5 Dwell Time

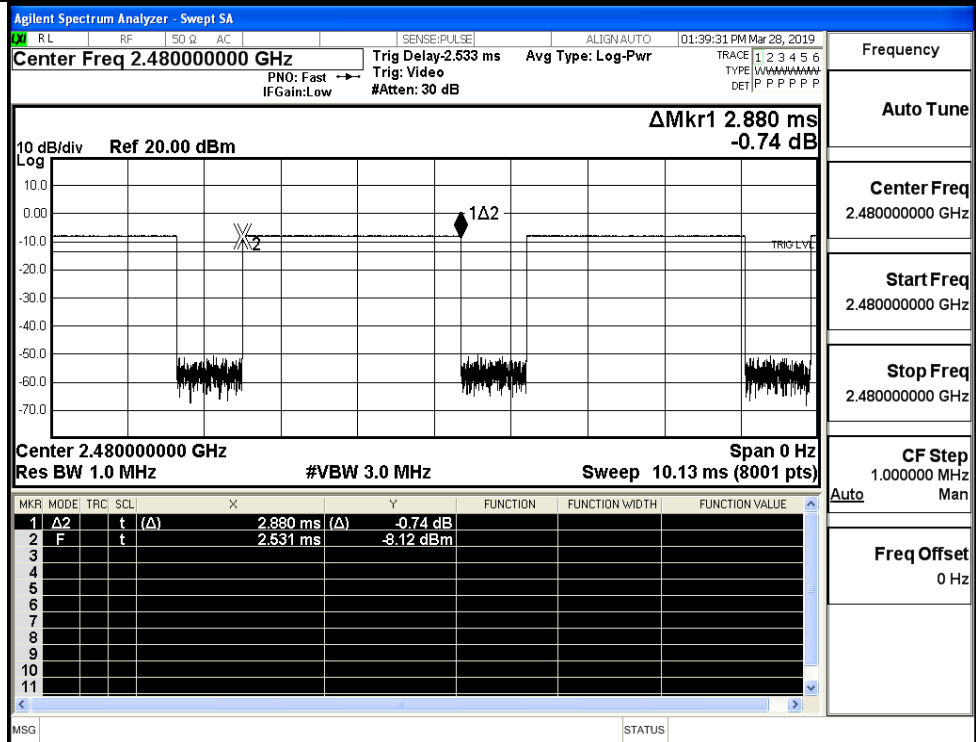
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
π/4DQPSK	2DH5	LCH	2.88	106.7	0.33	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88	106.7	0.307	0.4	PASS
8DPSK	3DH5	LCH	2.89	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



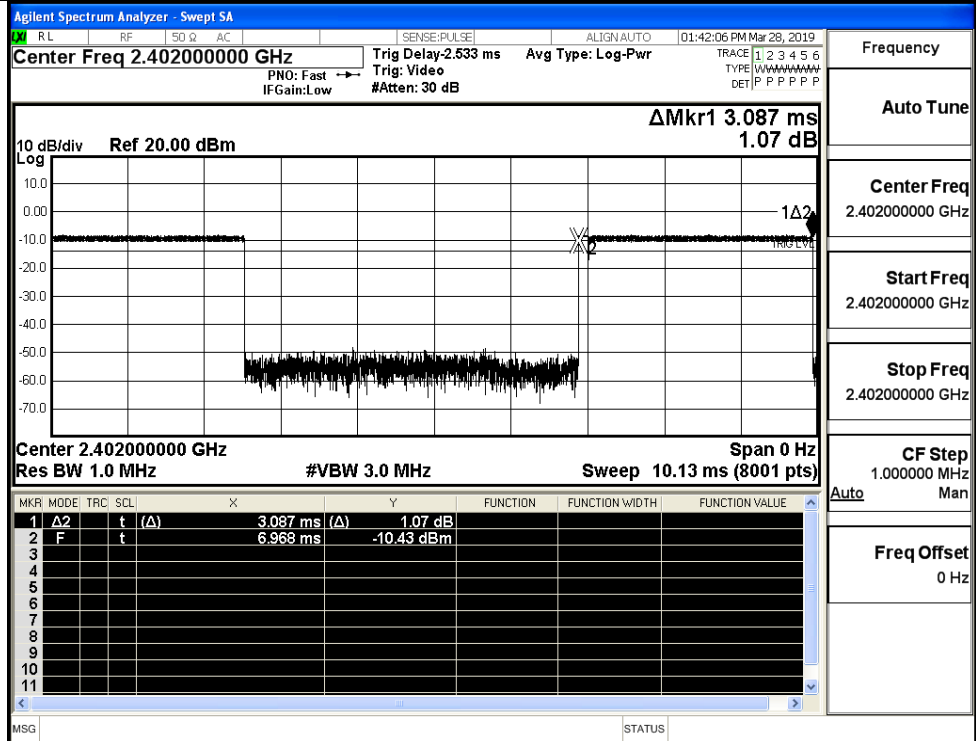
GFSK\_DH5/MCH



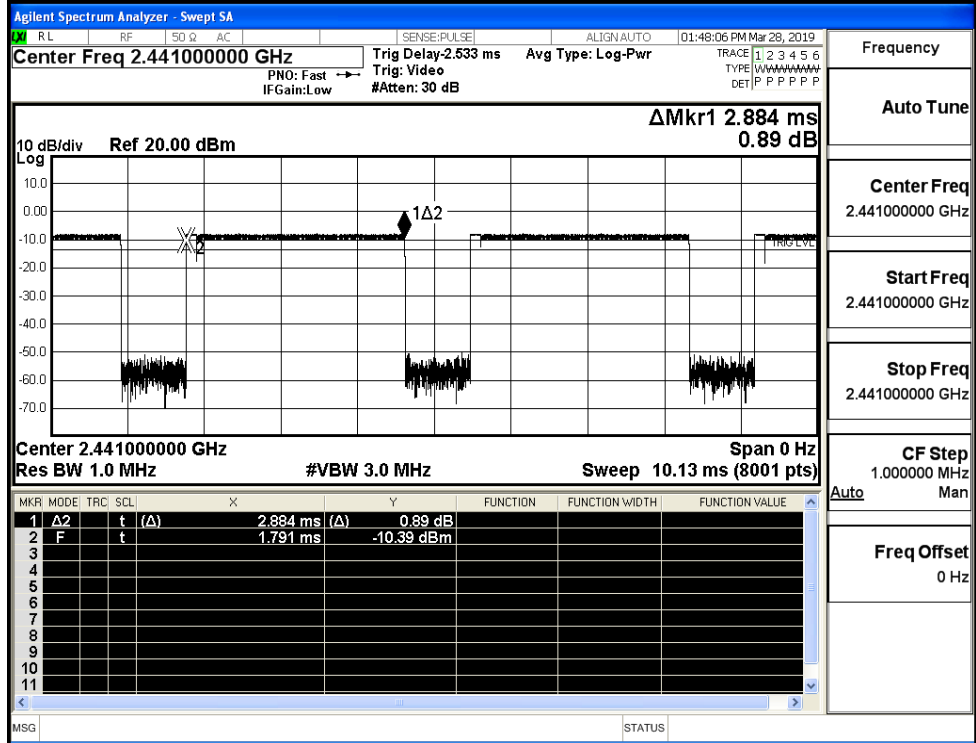
GFSK\_DH5/HCH



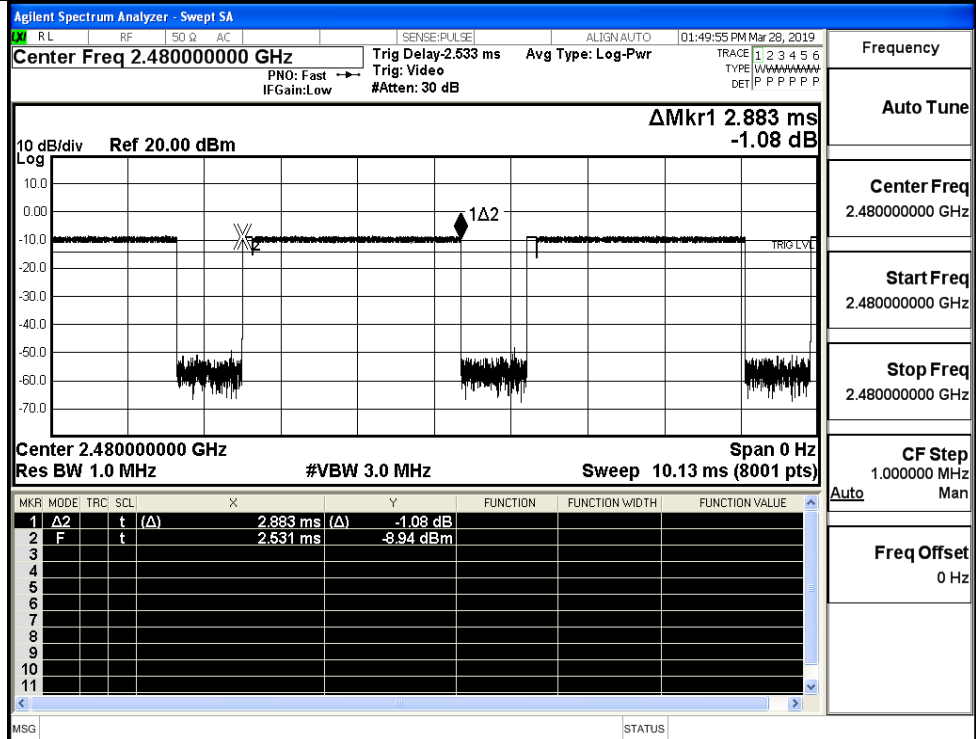
$\pi/4$ DQPSK  
\_2DH5/LCH



$\pi/4$ DQPSK  
\_2DH5/MCH

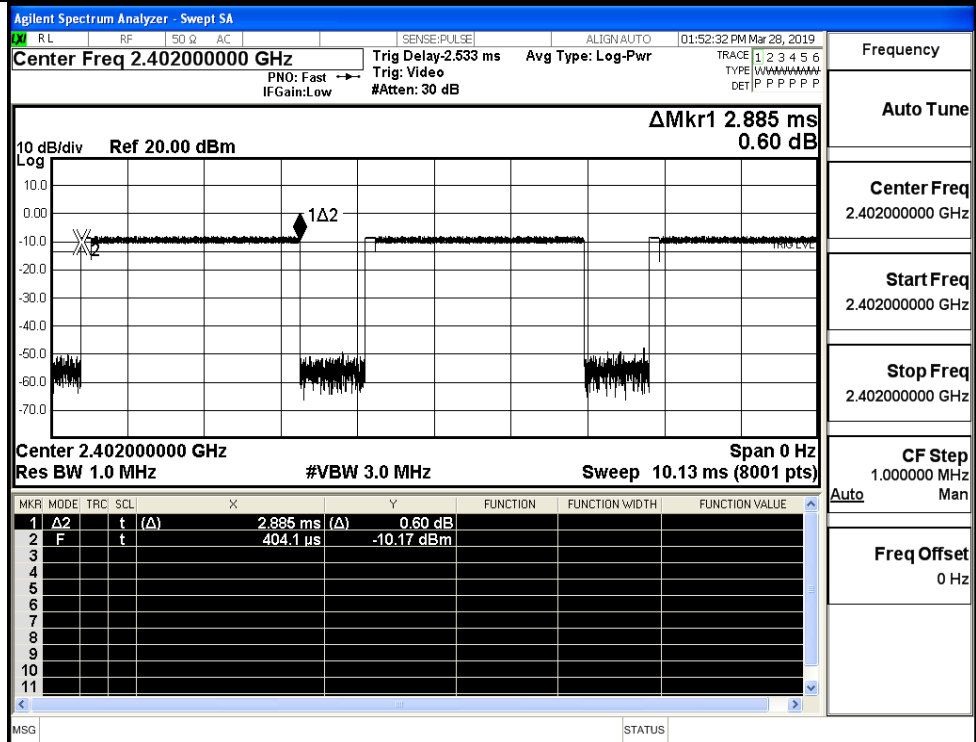


$\pi/4$ DQPSK  
\_2DH5/HCH



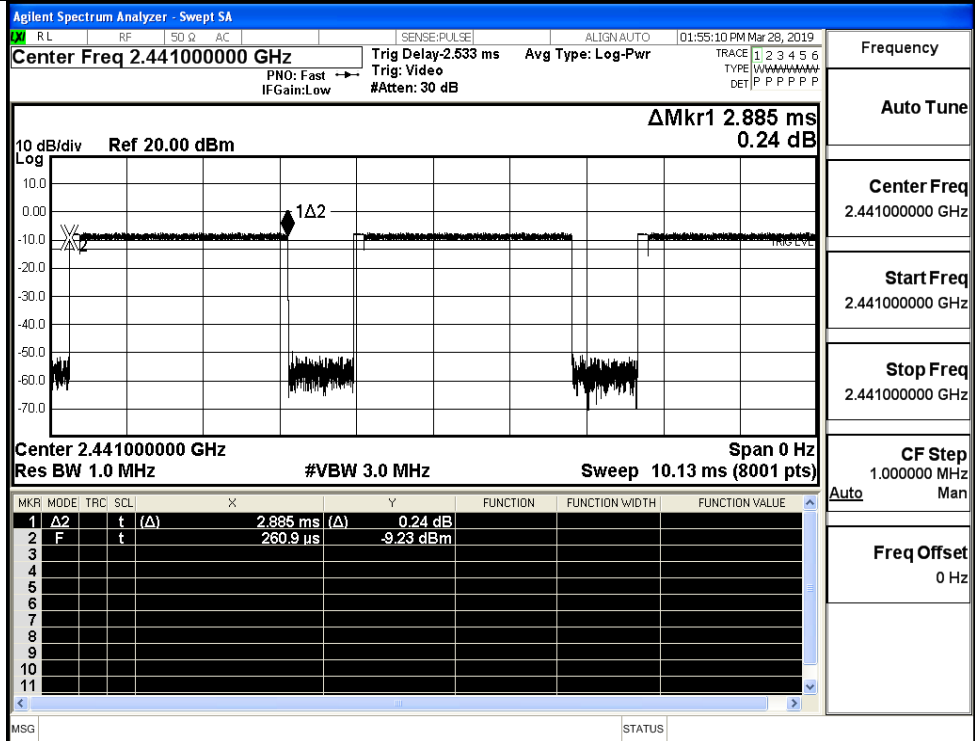
Frequency	2.480000000 GHz
Auto Tune	
Center Freq	2.480000000 GHz
Start Freq	2.480000000 GHz
Stop Freq	2.480000000 GHz
CF Step	1.000000 MHz
Auto	Man
Freq Offset	0 Hz

8DPSK\_3DH5/LCH



Frequency	2.402000000 GHz
Auto Tune	
Center Freq	2.402000000 GHz
Start Freq	2.402000000 GHz
Stop Freq	2.402000000 GHz
CF Step	1.000000 MHz
Auto	Man
Freq Offset	0 Hz

8DPSK\_3DH5/MCH



Frequency

Auto Tune

Center Freq  
2.441000000 GHz

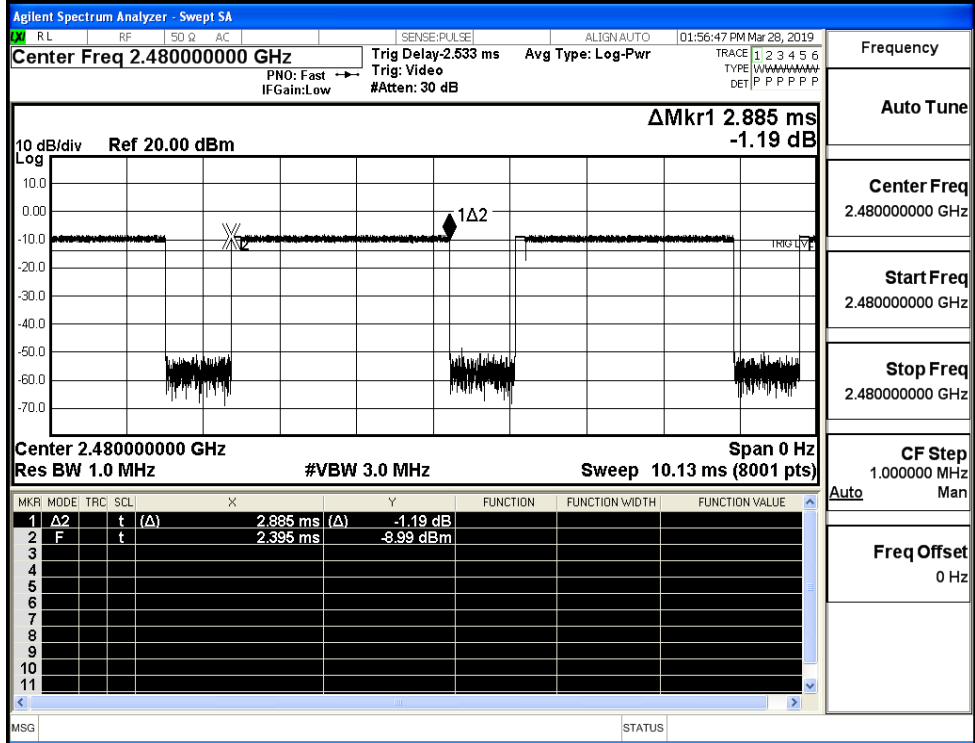
Start Freq  
2.441000000 GHz

Stop Freq  
2.441000000 GHz

CF Step  
1.000000 MHz

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

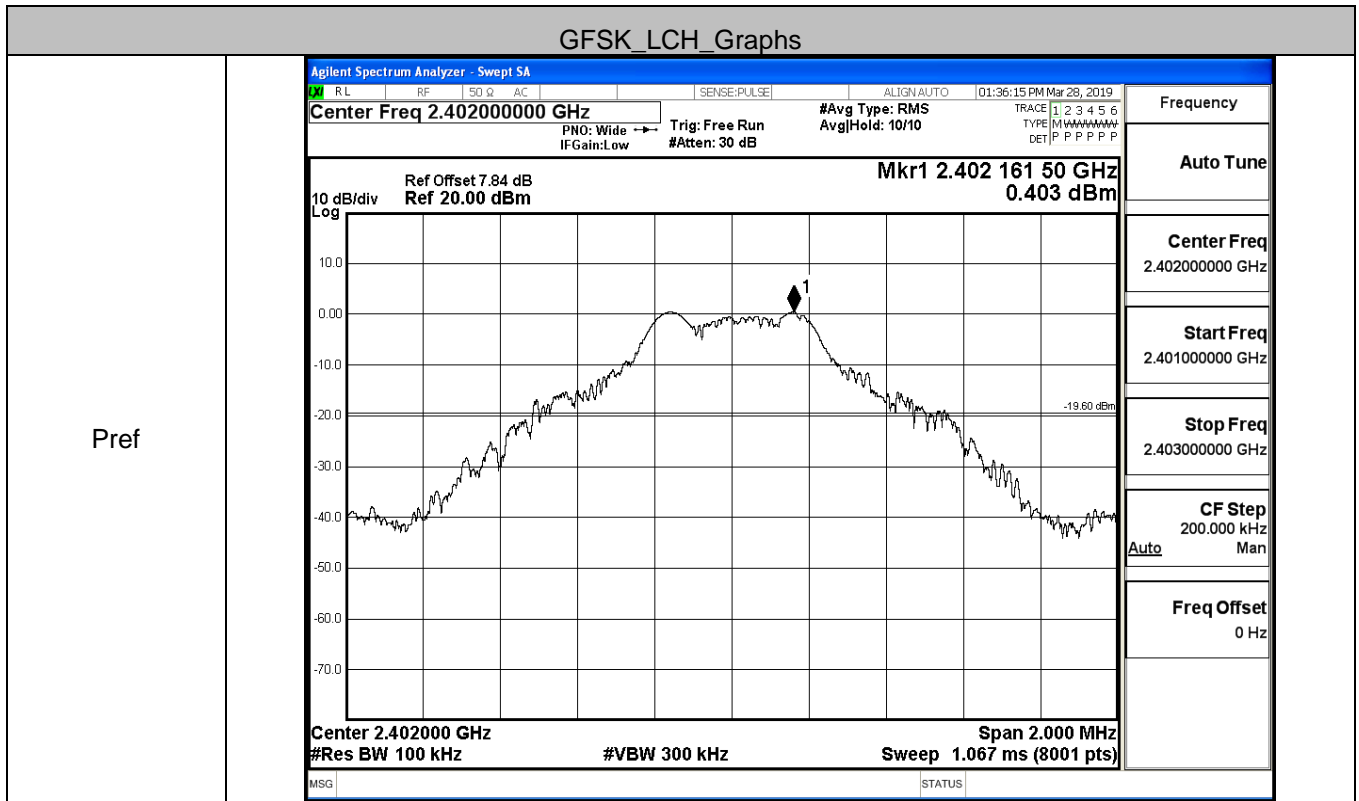
CF Step  
1.000000 MHz

Freq Offset  
0 Hz

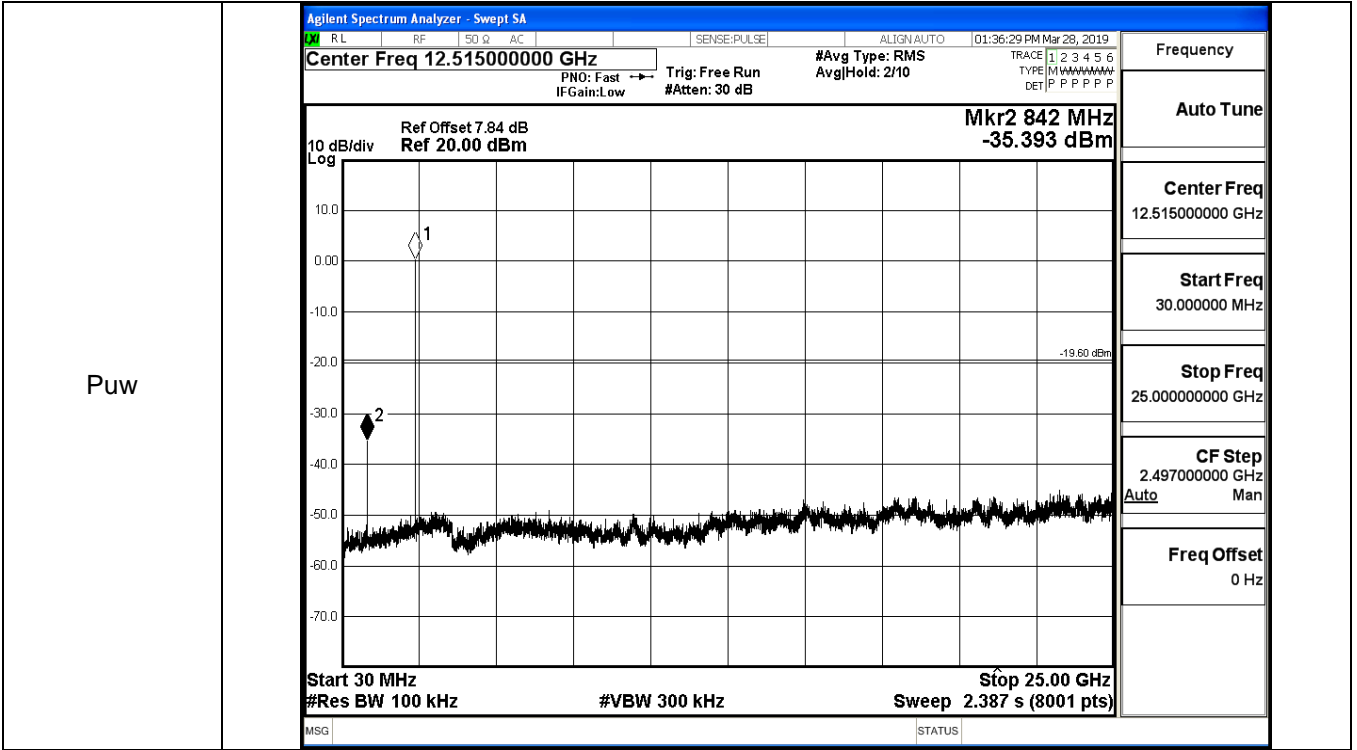
**A.6 RF Conducted Spurious Emissions**

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.403	-35.393	-19.597	PASS
	MCH	0.974	-43.746	-19.026	PASS
	HCH	0.215	-45.258	-19.785	PASS
$\pi$ /4DQPSK	LCH	-0.877	-44.678	-20.877	PASS
	MCH	-0.937	-44.812	-20.937	PASS
	HCH	-0.926	-45.140	-20.926	PASS
8DPSK	LCH	-0.491	-45.254	-20.491	PASS
	MCH	-0.13	-37.822	-20.130	PASS
	HCH	-0.878	-45.256	-20.878	PASS

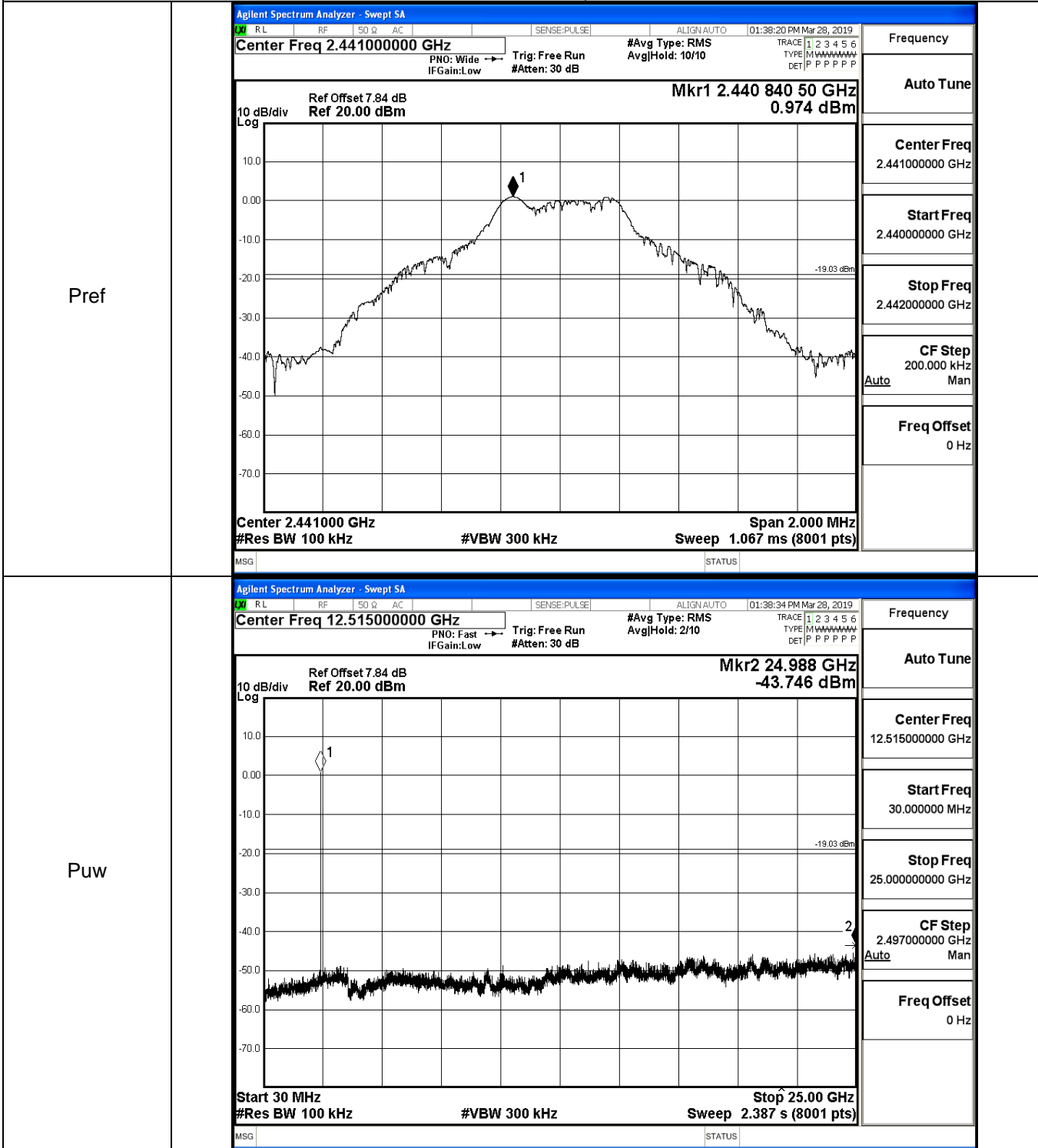
GFSK\_LCH\_Graphs



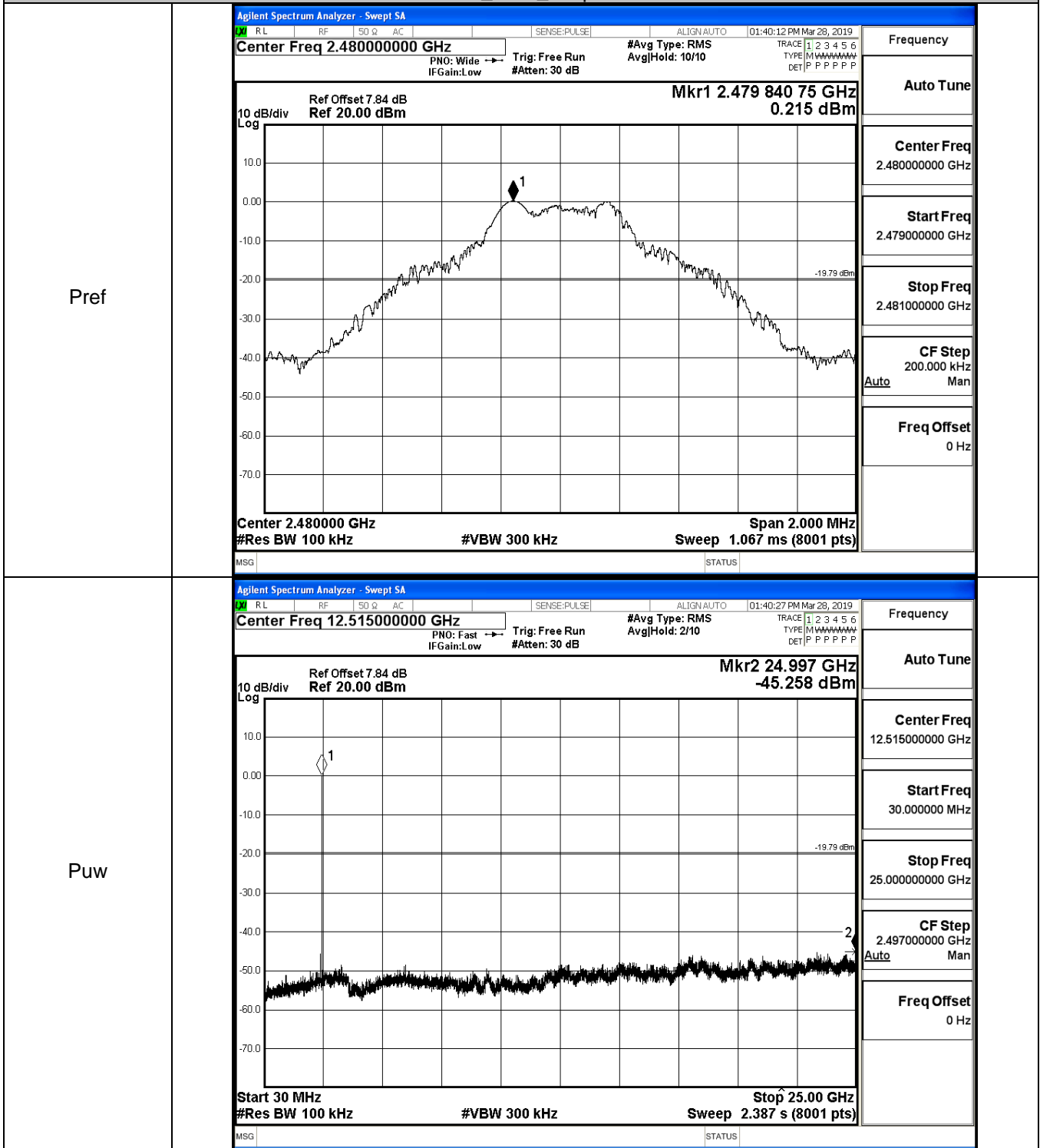




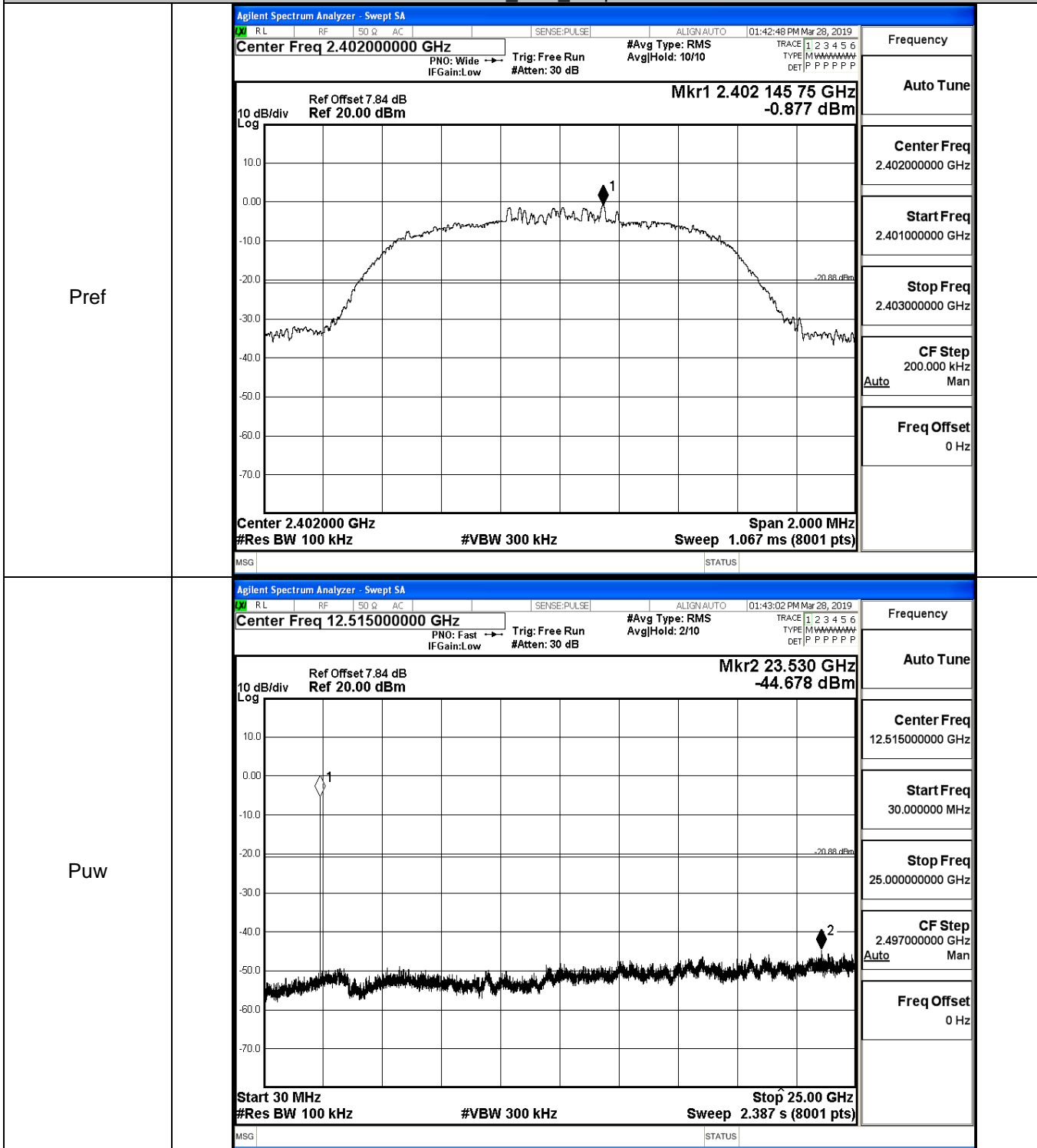
GFSK\_MCH\_Graphs



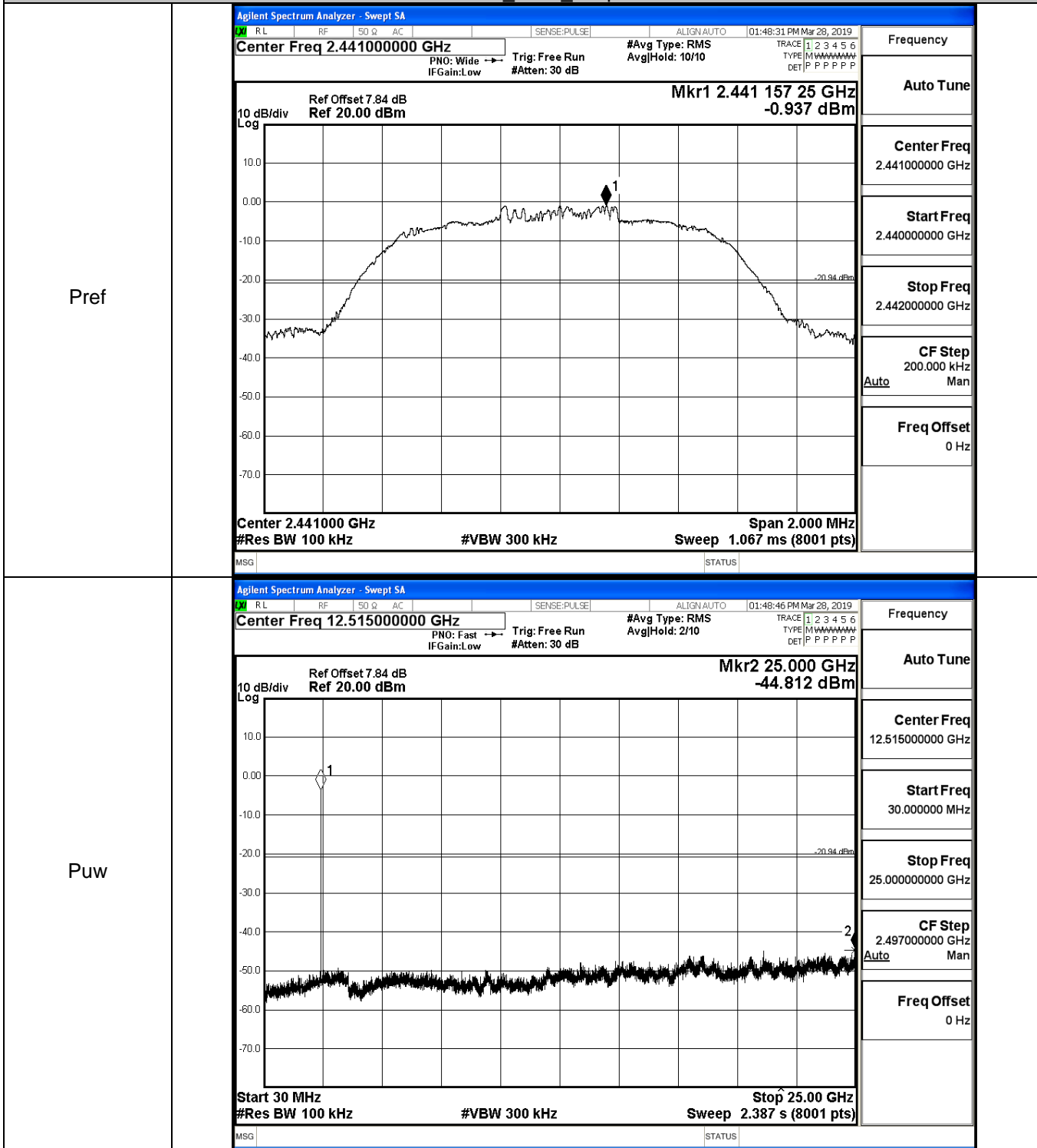
GFSK\_HCH\_Graphs



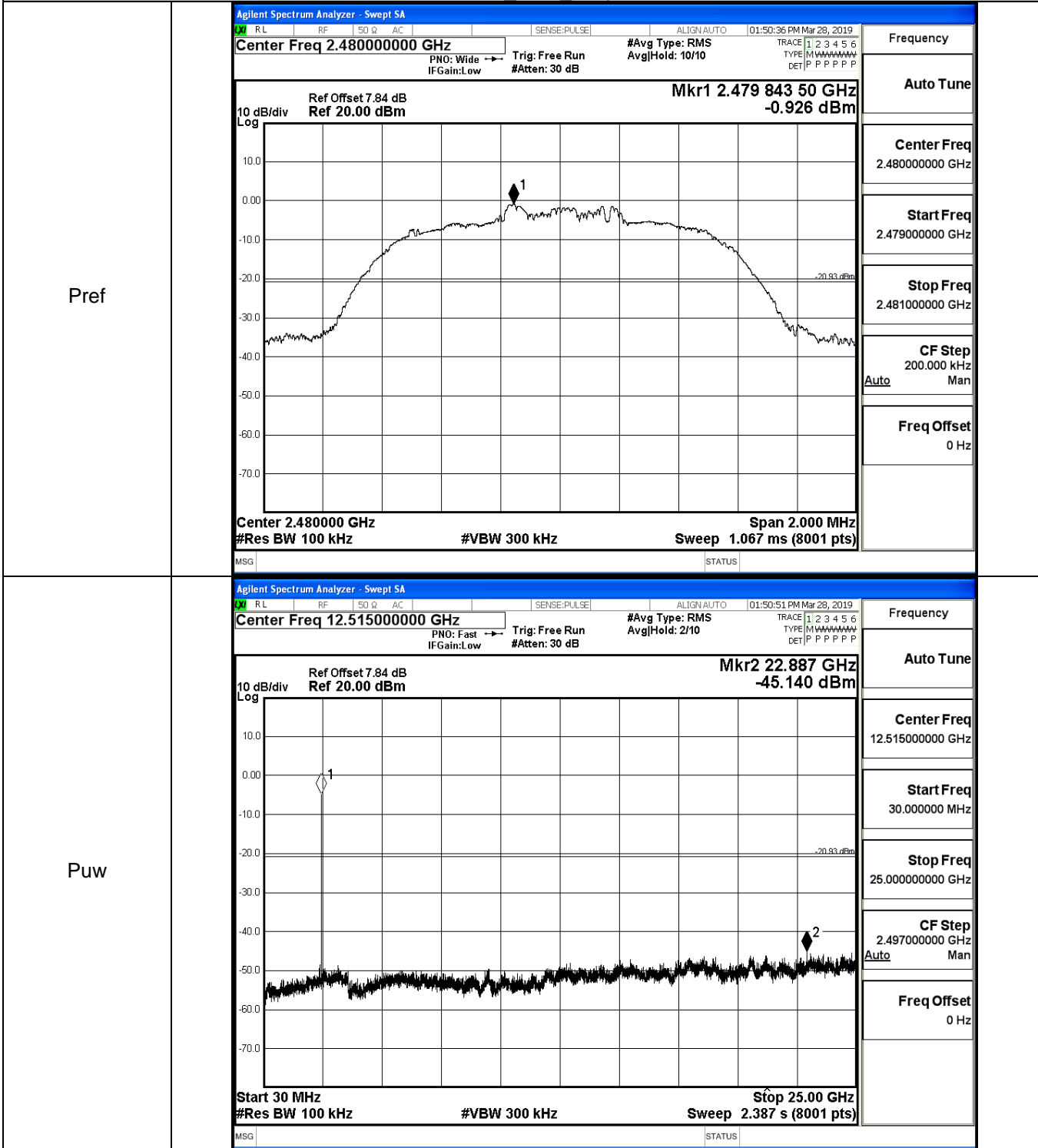
$\pi/4$ DQPSK\_LCH\_Graphs



$\pi/4$ DQPSK\_MCH\_Graphs

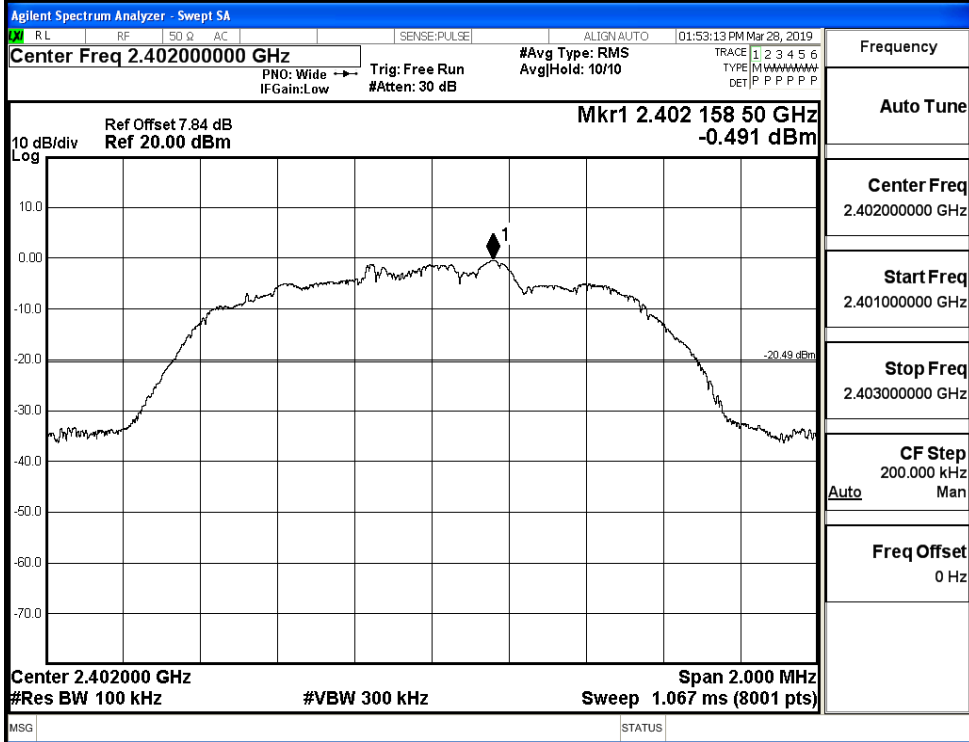


$\pi/4$ DQPSK\_HCH\_Graphs

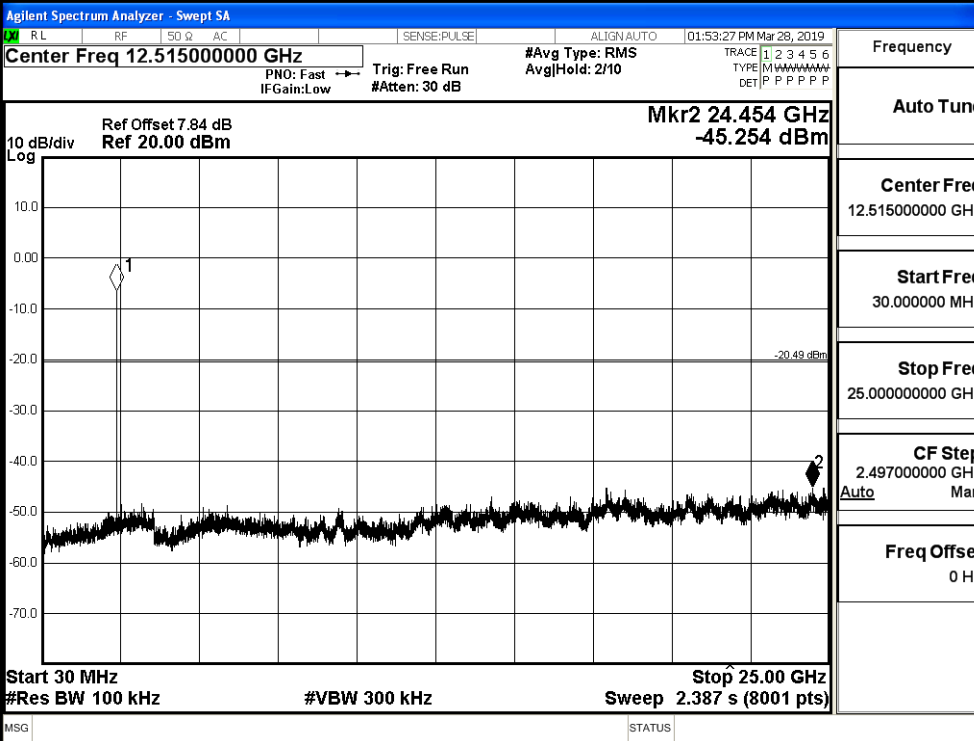


8DPSK\_LCH\_Graphs

Pref

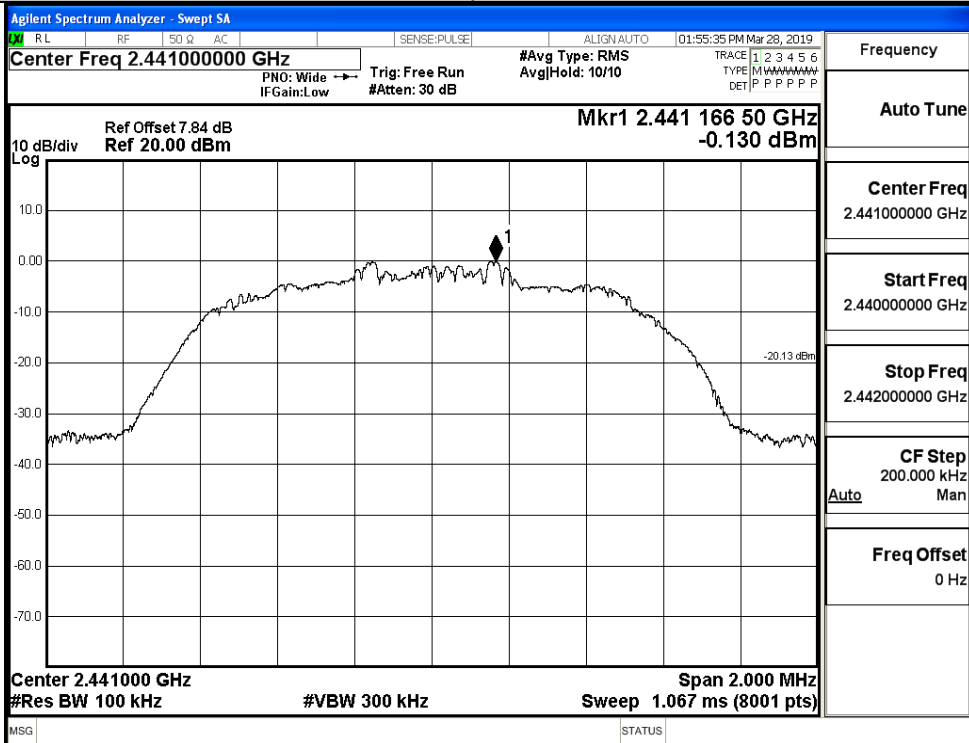


Puw

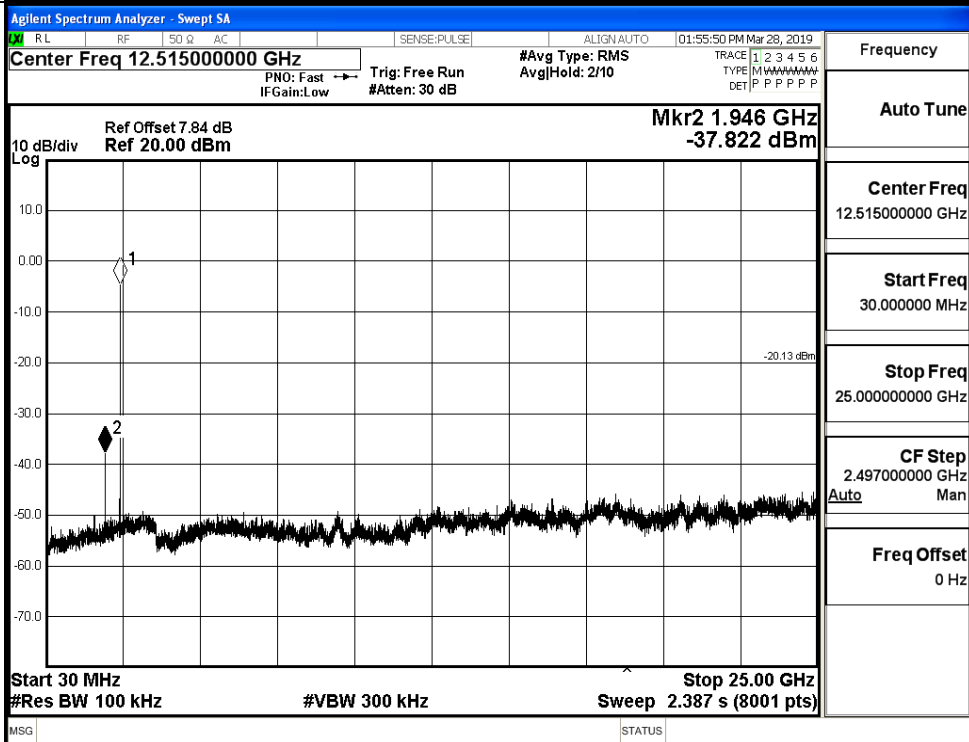


8DPSK\_MCH\_Graphs

Pref



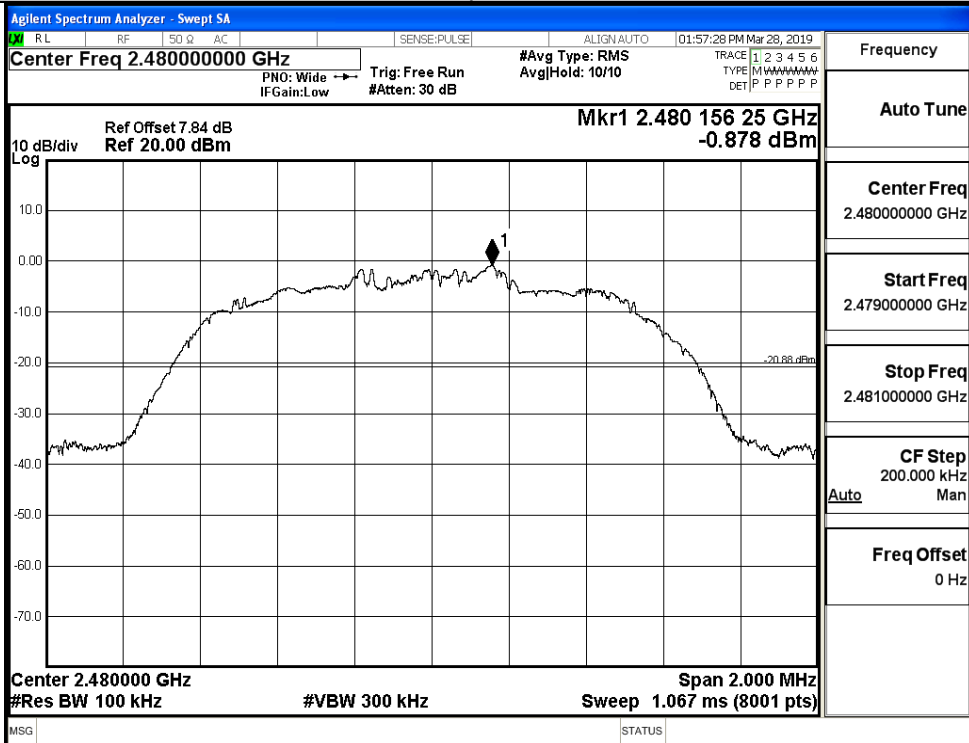
Puw



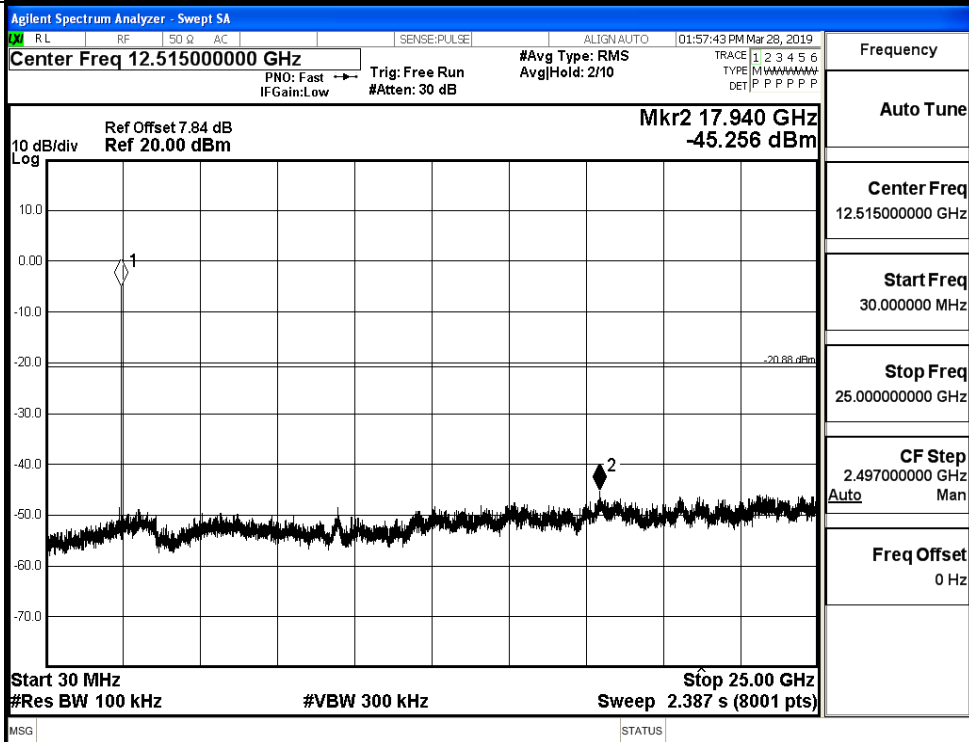


8DPSK\_HCH\_Graphs

Pref



Puw

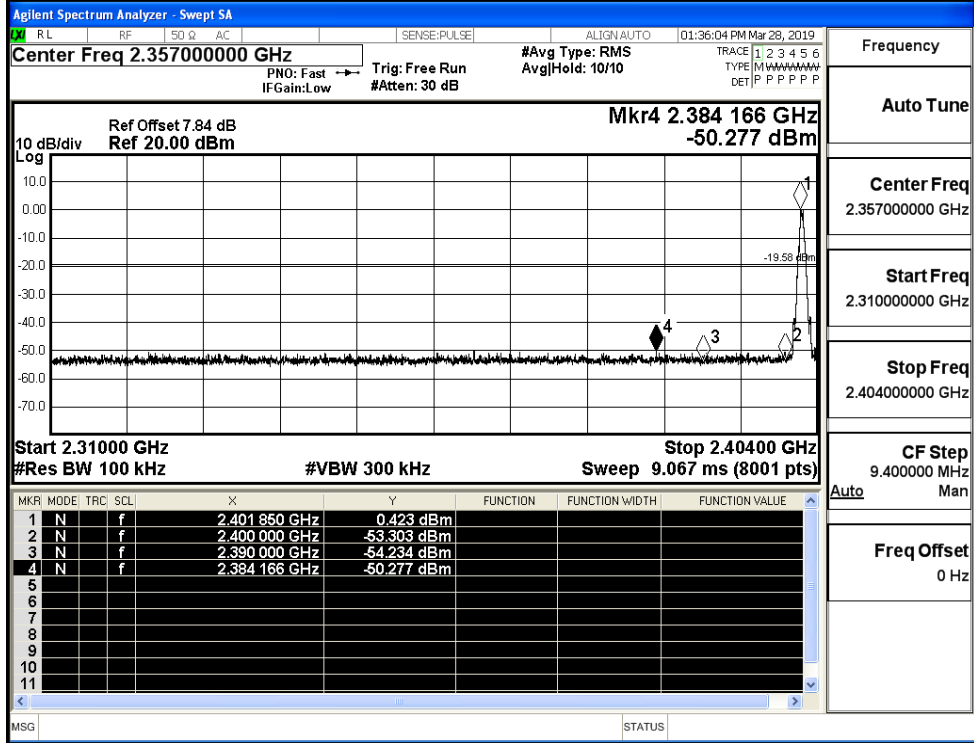


## A.7 Band-edge for RF Conducted Emissions

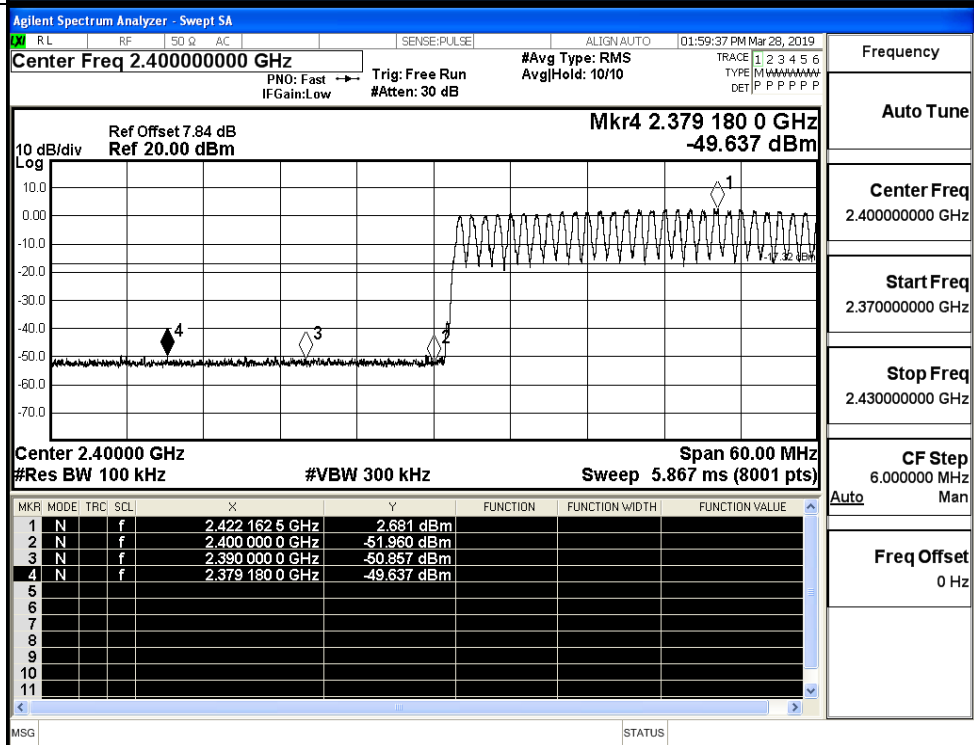
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	0.423	Off	-50.277	-19.58	PASS
			2.681	On	-49.637	-17.32	PASS
	HCH	2480	0.165	Off	-50.342	-19.84	PASS
			2.510	On	-49.456	-17.49	PASS
$\pi/4$ DQPSK	LCH	2402	-1.563	Off	-50.511	-21.56	PASS
			1.246	On	-50.024	-18.75	PASS
	HCH	2480	-1.297	Off	-49.884	-21.3	PASS
			1.182	On	-49.469	-18.82	PASS
8DPSK	LCH	2402	-0.636	Off	-50.080	-20.64	PASS
			1.235	On	-49.864	-18.77	PASS
	HCH	2480	-0.849	Off	-50.211	-20.85	PASS
			1.263	On	-49.256	-18.74	PASS

Test Graphs

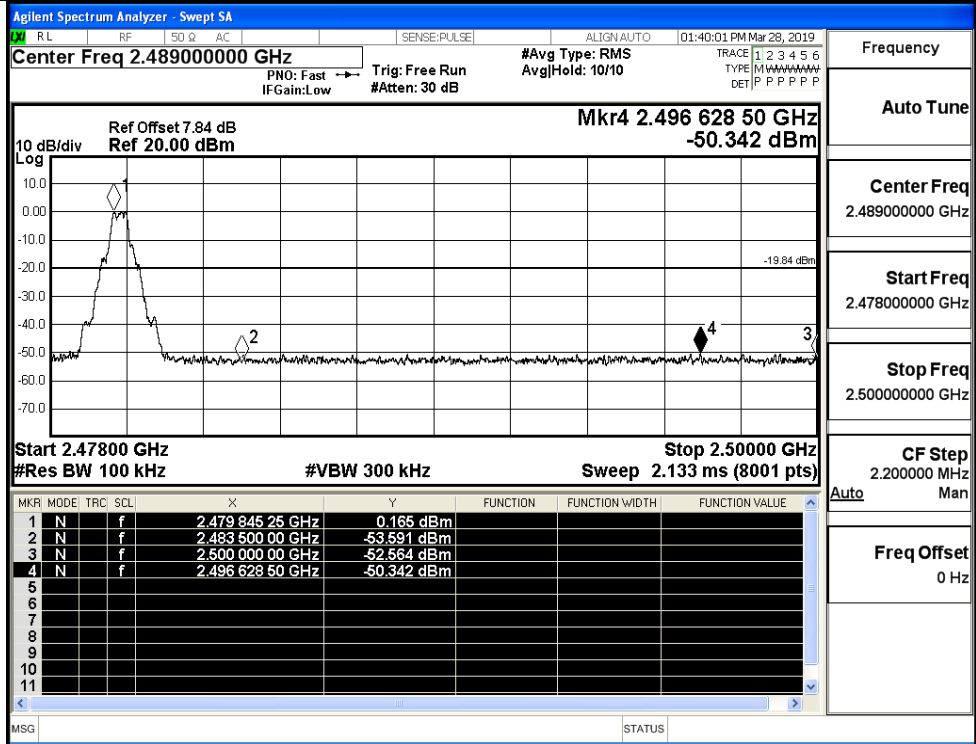
GFSK/LCH/No Hop



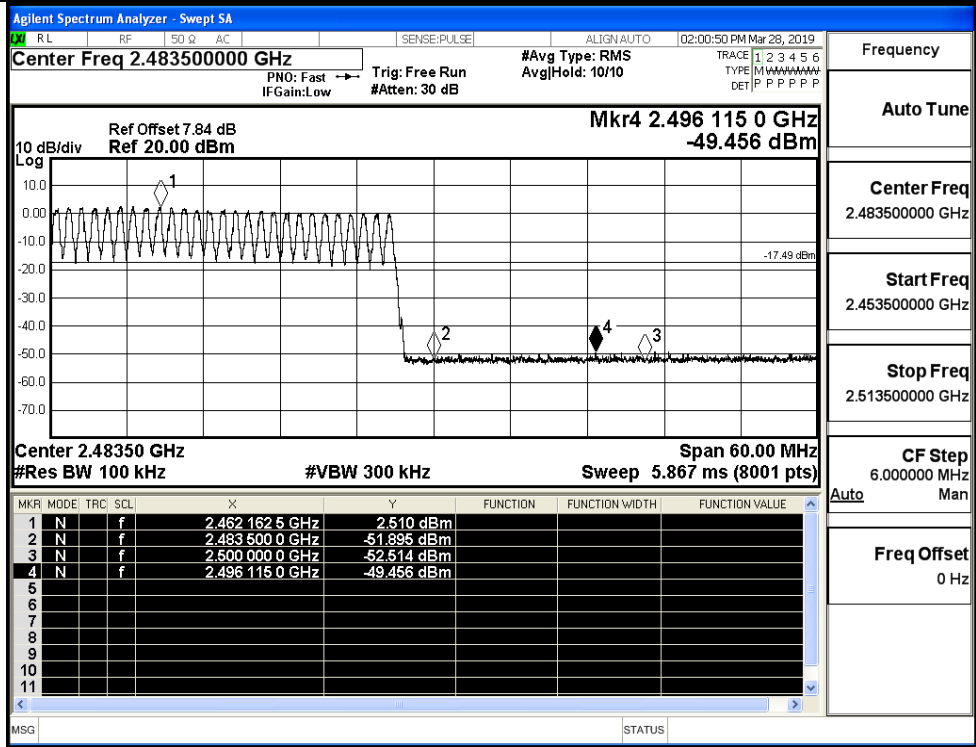
GFSK/LCH/Hop



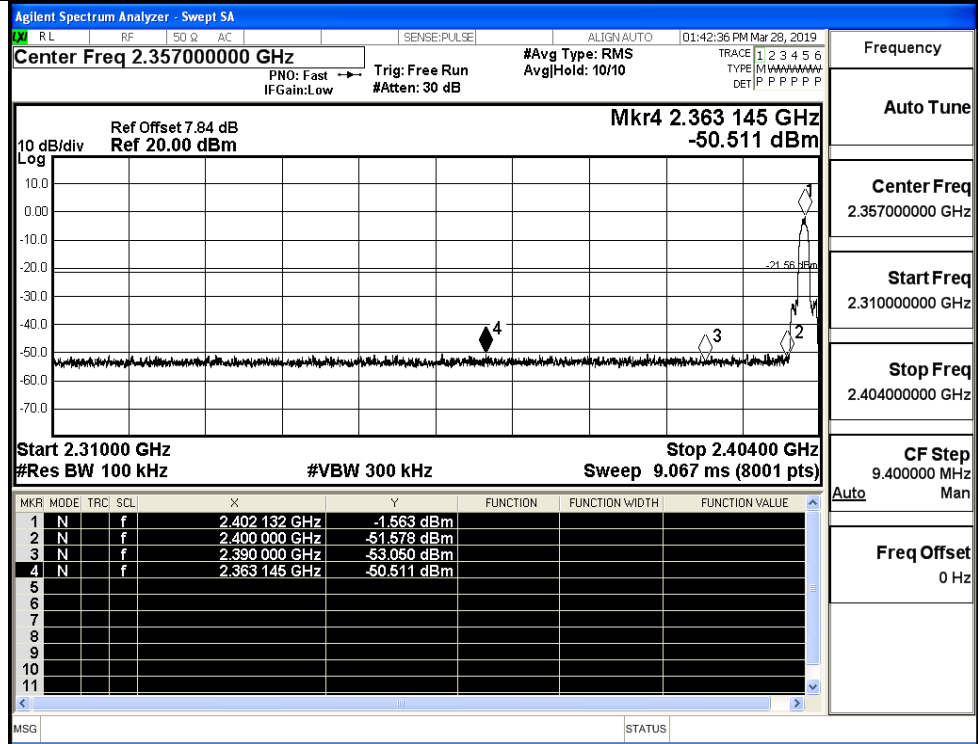
GFSK/HCH/No Hop



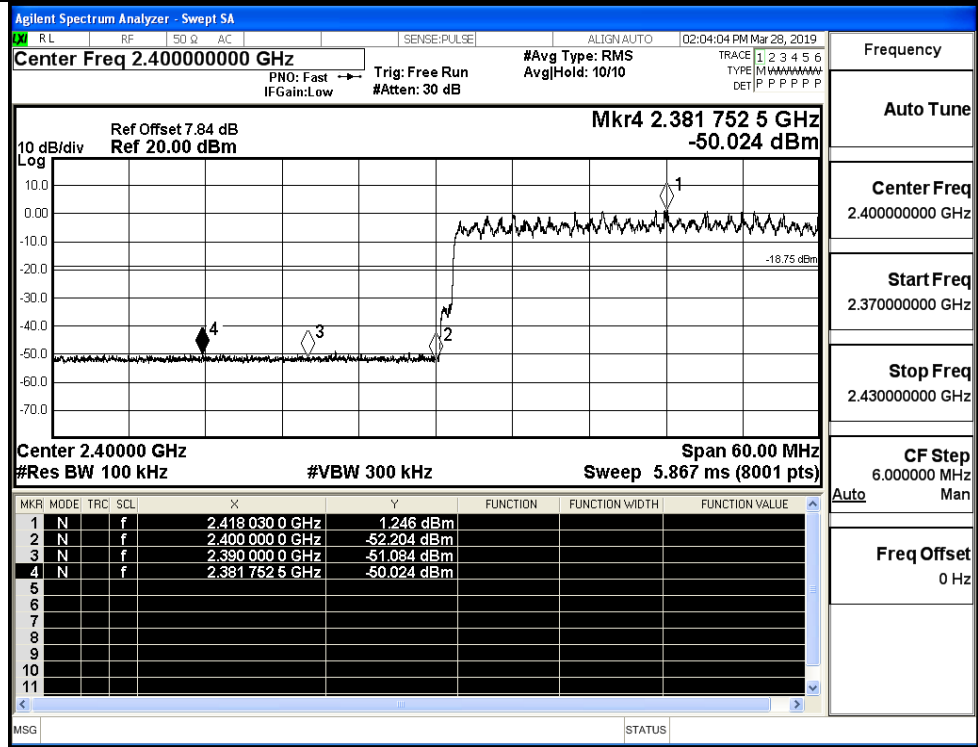
GFSK/HCH/Hop



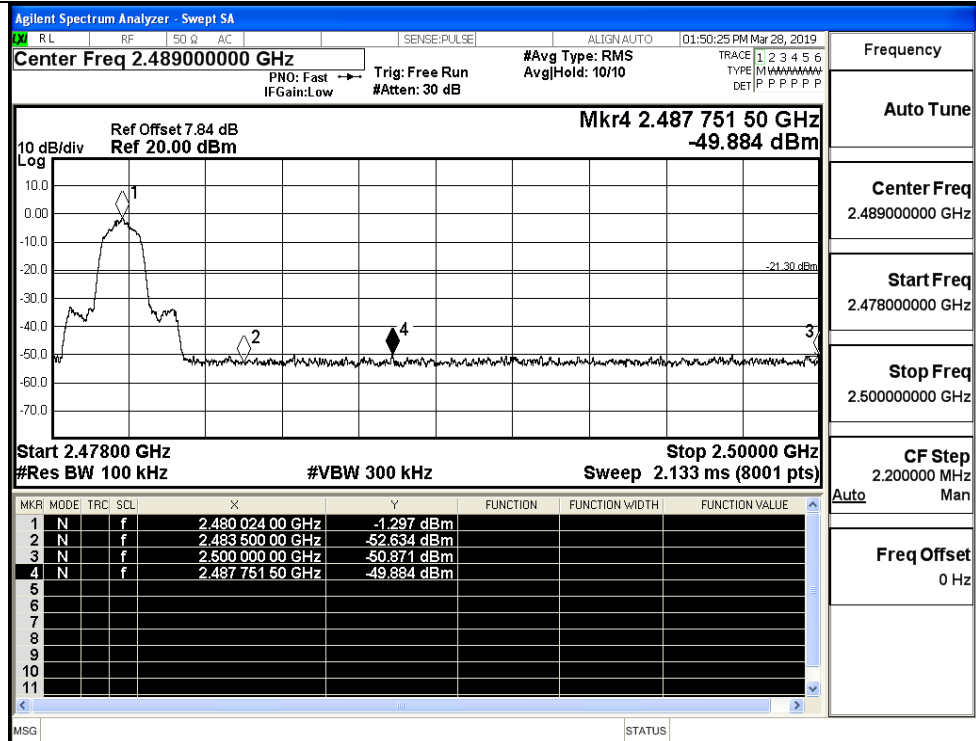
$\pi/4$ DQPSK/LCH/No  
Hop



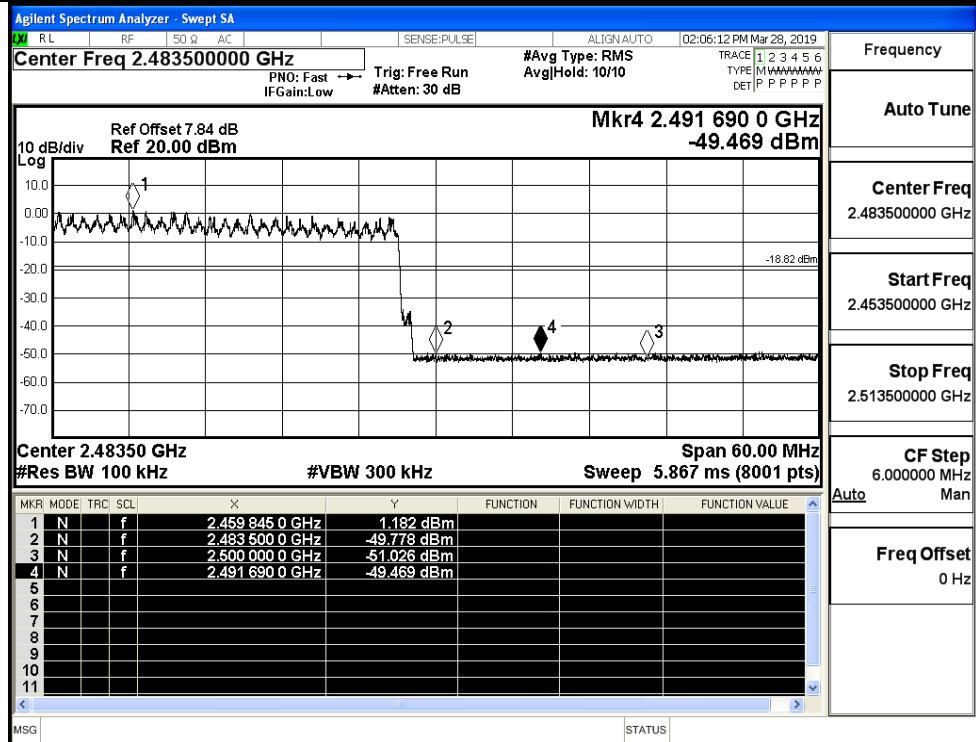
$\pi/4$ DQPSK/LCH/Hop



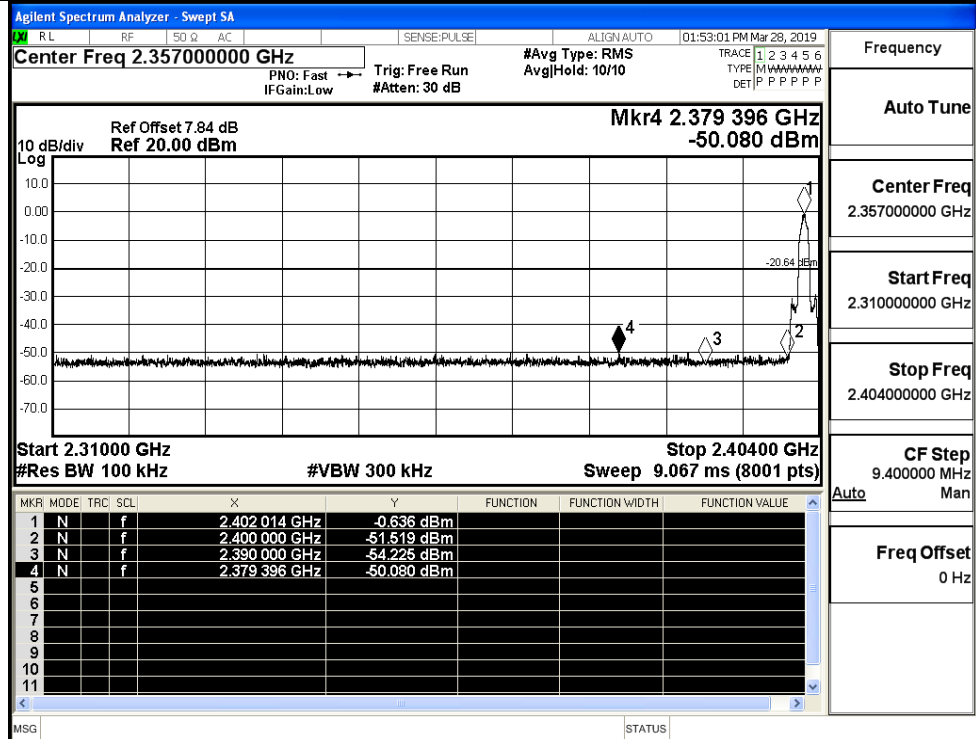
$\pi$ /4DQPSK/HCH/No  
Hop



$\pi$ /4DQPSK/HCH/Hop

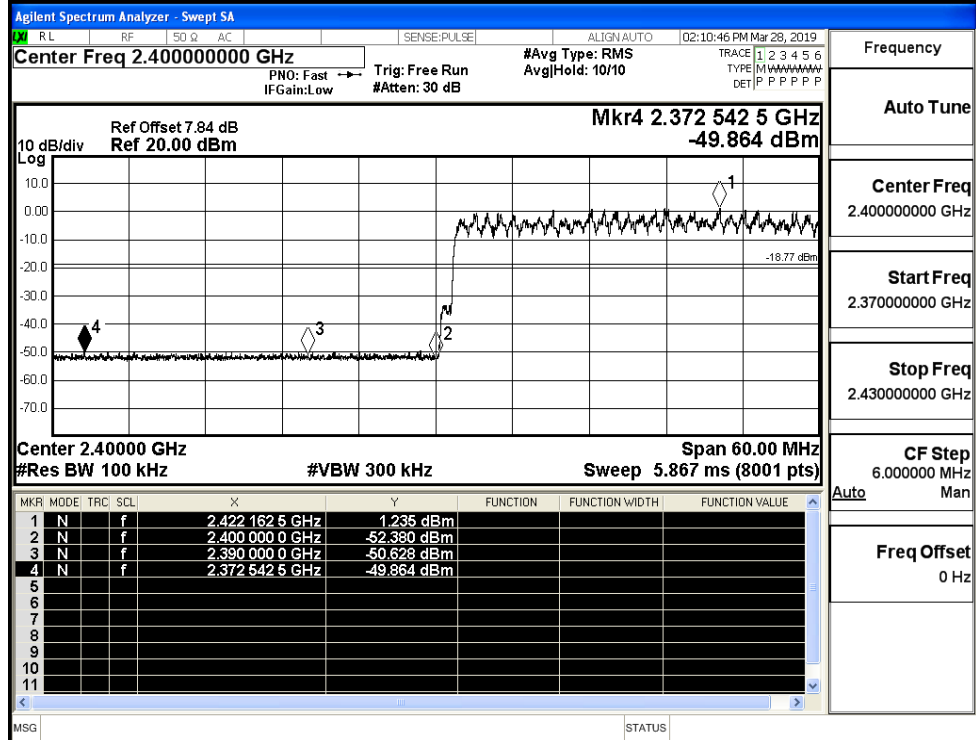


8DPSK/LCH/No Hop



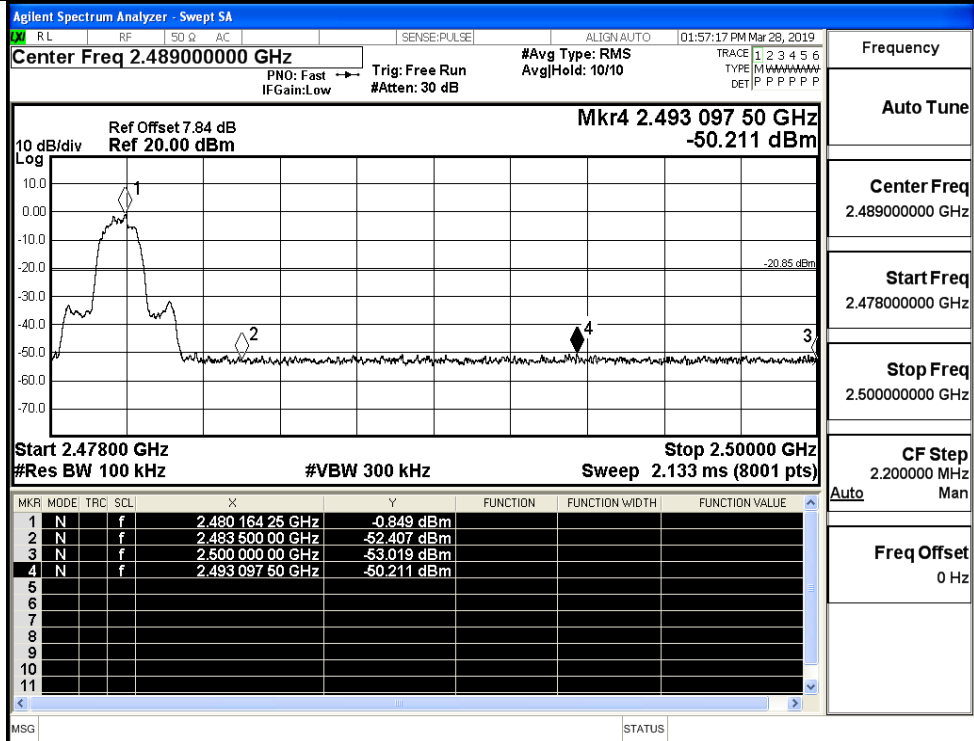
Frequency  
Auto Tune  
Center Freq  
2.357000000 GHz  
Start Freq  
2.310000000 GHz  
Stop Freq  
2.404000000 GHz  
CF Step  
9.400000 MHz  
Auto Man  
Freq Offset  
0 Hz

8DPSK/LCH/Hop



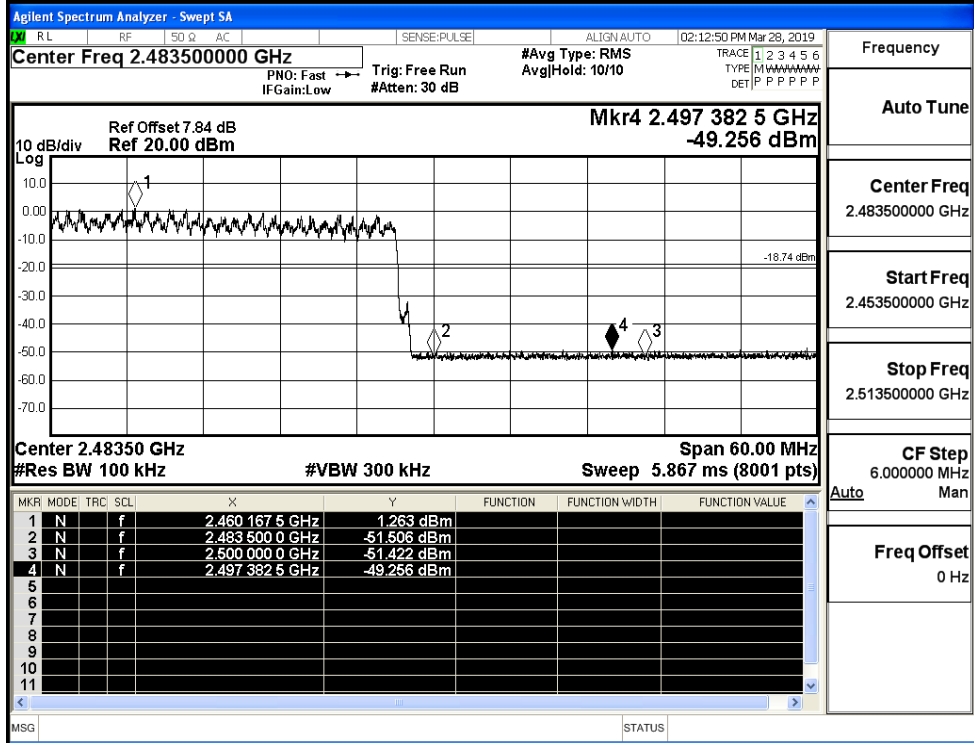
Frequency  
Auto Tune  
Center Freq  
2.400000000 GHz  
Start Freq  
2.370000000 GHz  
Stop Freq  
2.430000000 GHz  
CF Step  
6.000000 MHz  
Auto Man  
Freq Offset  
0 Hz

8DPSK/HCH/No Hop



Frequency	2.489000000 GHz
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



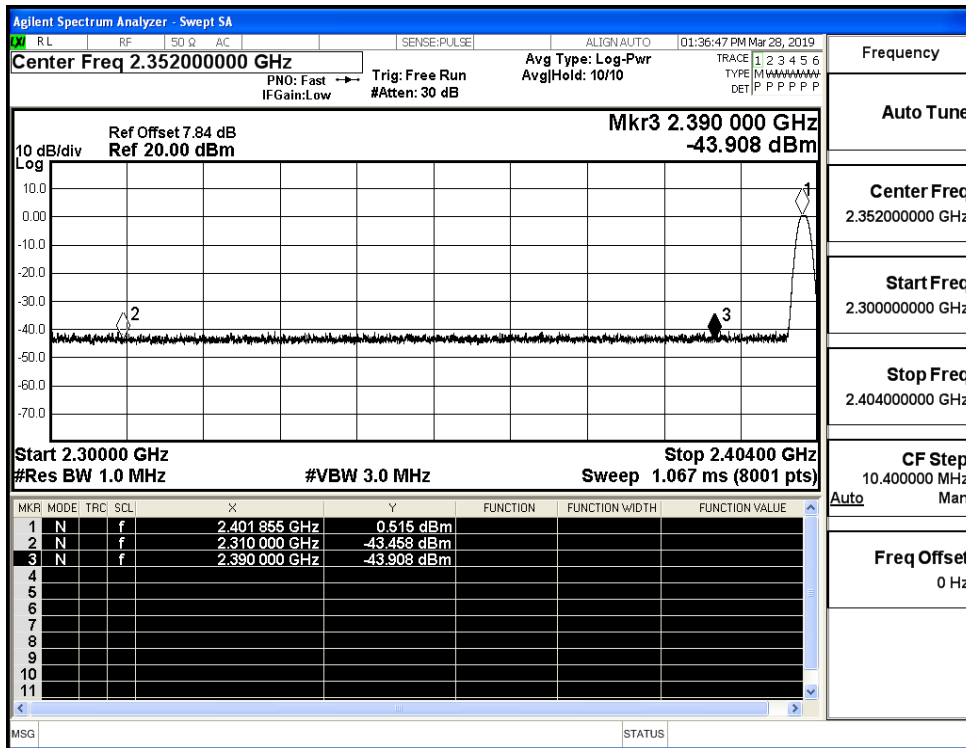
Frequency	2.483500000 GHz
Auto Tune	
Center Freq	2.483500000 GHz
Start Freq	2.453500000 GHz
Stop Freq	2.513500000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz



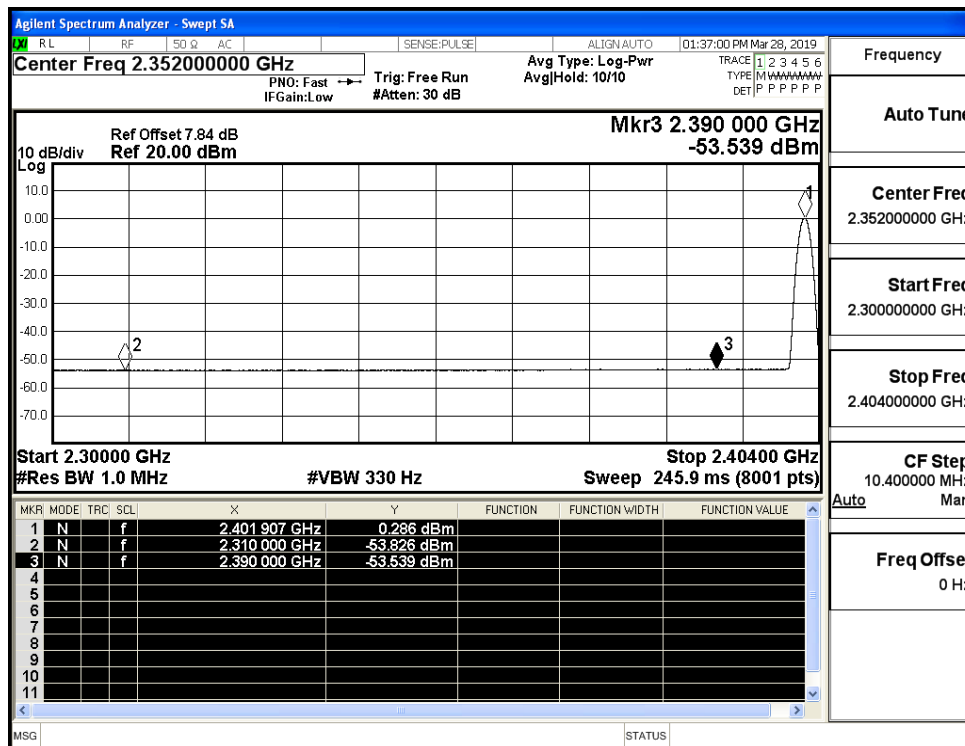
## A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.46	2.0	0	51.80	PEAK	74	PASS
	Off	2310.0	-53.83	2.0	0	41.43	AV	54	PASS
	Off	2390.0	-43.91	2.0	0	51.35	PEAK	74	PASS
	Off	2390.0	-53.54	2.0	0	41.72	AV	54	PASS
	Off	2483.5	-43.85	2.0	0	51.40	PEAK	74	PASS
	Off	2483.5	-53.20	2.0	0	42.06	AV	54	PASS
	Off	2500.0	-42.92	2.0	0	52.34	PEAK	74	PASS
	Off	2500.0	-53.18	2.0	0	42.08	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.60	2.0	0	51.66	PEAK	74	PASS
	Off	2310.0	-53.76	2.0	0	41.50	AV	54	PASS
	Off	2390.0	-44.02	2.0	0	51.24	PEAK	74	PASS
	Off	2390.0	-53.43	2.0	0	41.82	AV	54	PASS
	Off	2483.5	-43.00	2.0	0	52.26	PEAK	74	PASS
	Off	2483.5	-53.25	2.0	0	42.01	AV	54	PASS
	Off	2500.0	-42.31	2.0	0	52.95	PEAK	74	PASS
	Off	2500.0	-53.14	2.0	0	42.12	AV	54	PASS
8DPSK	Off	2310.0	-43.10	2.0	0	52.16	PEAK	74	PASS
	Off	2310.0	-53.85	2.0	0	41.41	AV	54	PASS
	Off	2390.0	-43.49	2.0	0	51.77	PEAK	74	PASS
	Off	2390.0	-53.56	2.0	0	41.69	AV	54	PASS
	Off	2483.5	-42.46	2.0	0	52.79	PEAK	74	PASS
	Off	2483.5	-53.22	2.0	0	42.03	AV	54	PASS
	Off	2500.0	-42.08	2.0	0	53.18	PEAK	74	PASS
	Off	2500.0	-53.20	2.0	0	42.06	AV	54	PASS

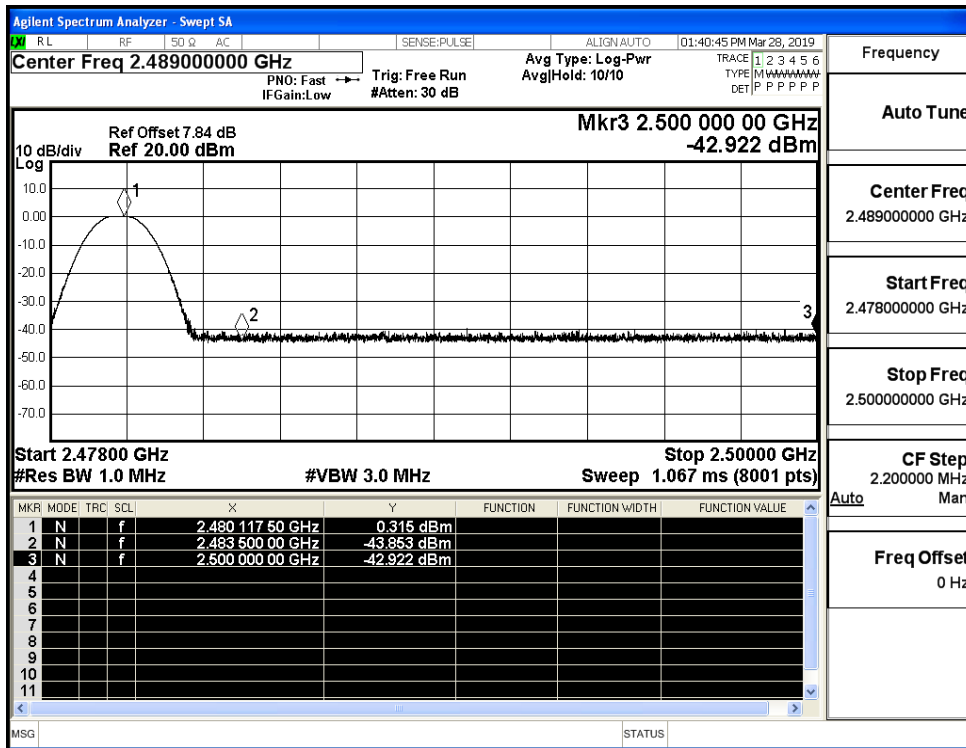
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (Low Channel)



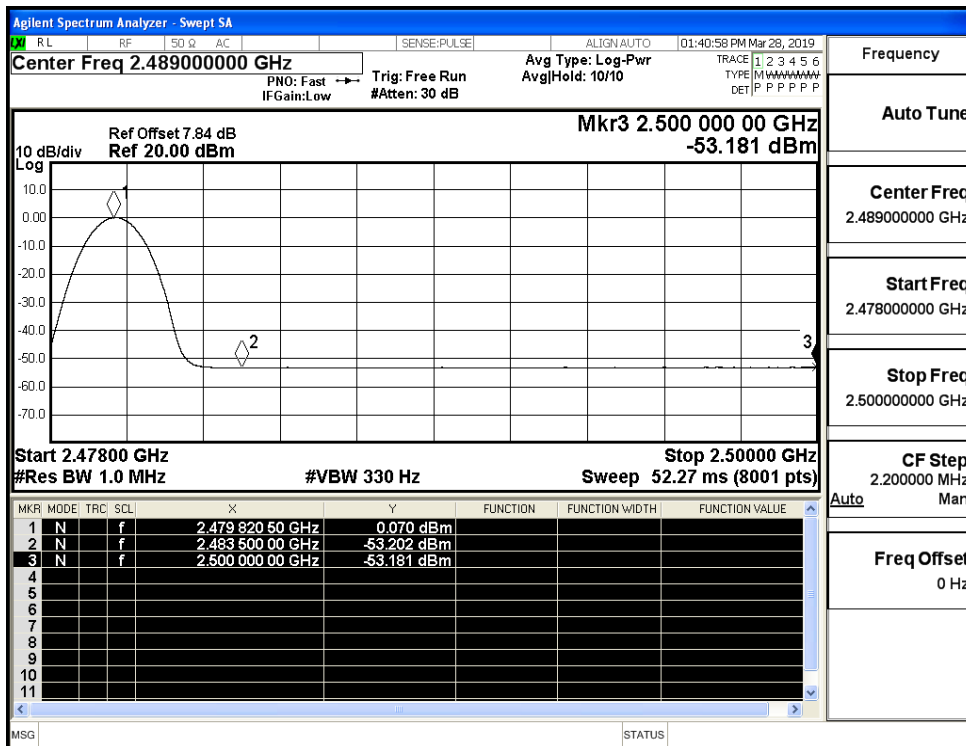
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (Low Channel)



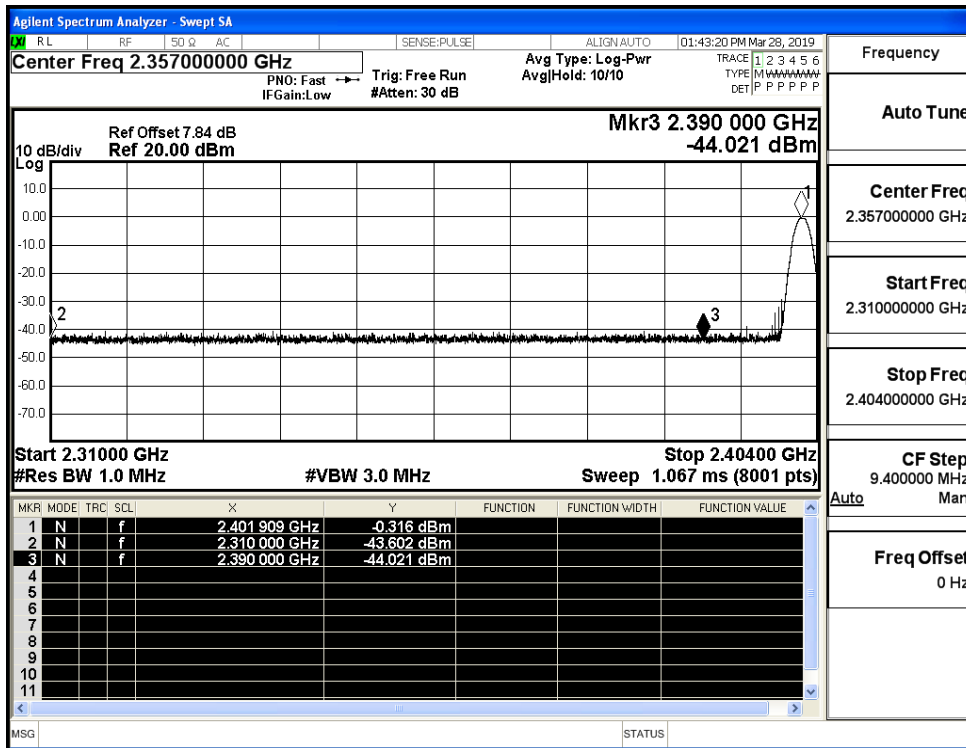
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (High Channel)



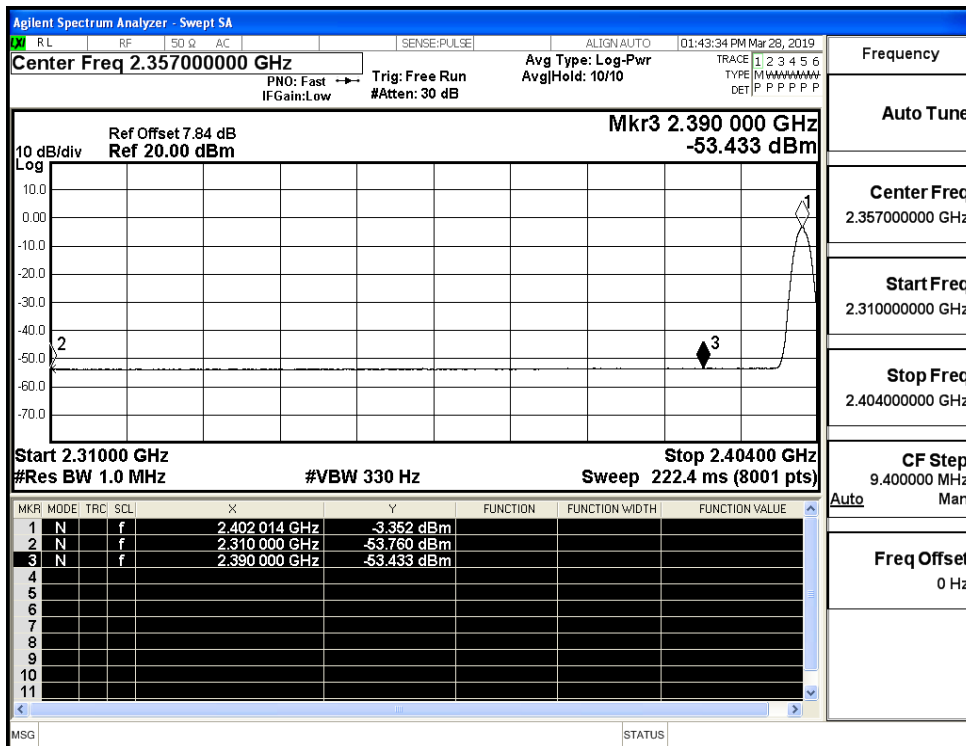
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (High Channel)



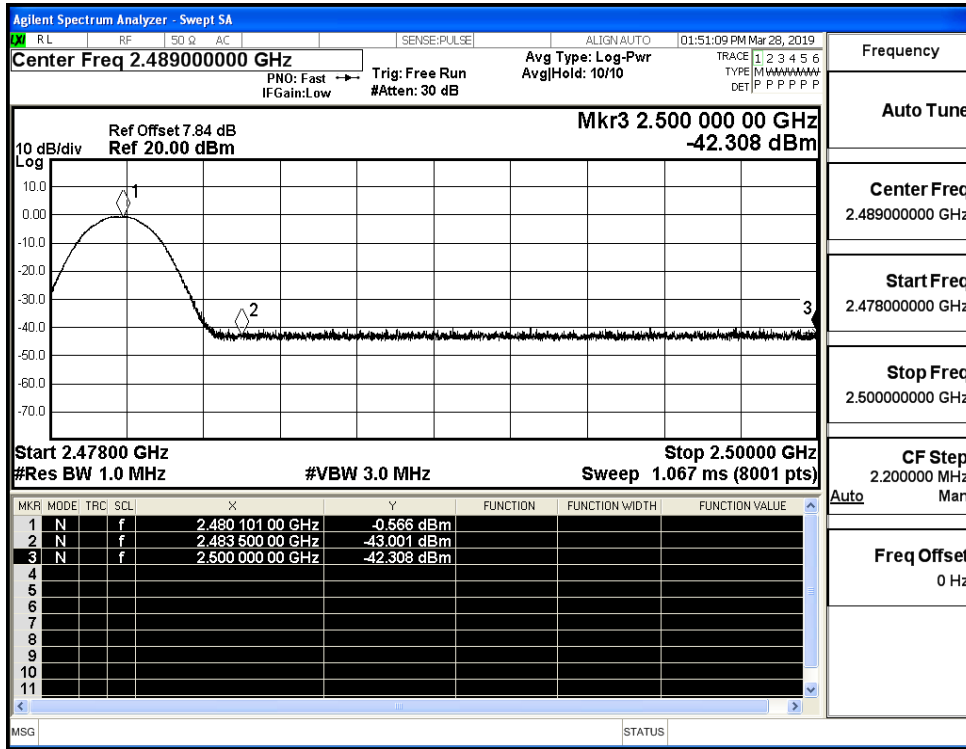
Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_PEAK (Low Channel)



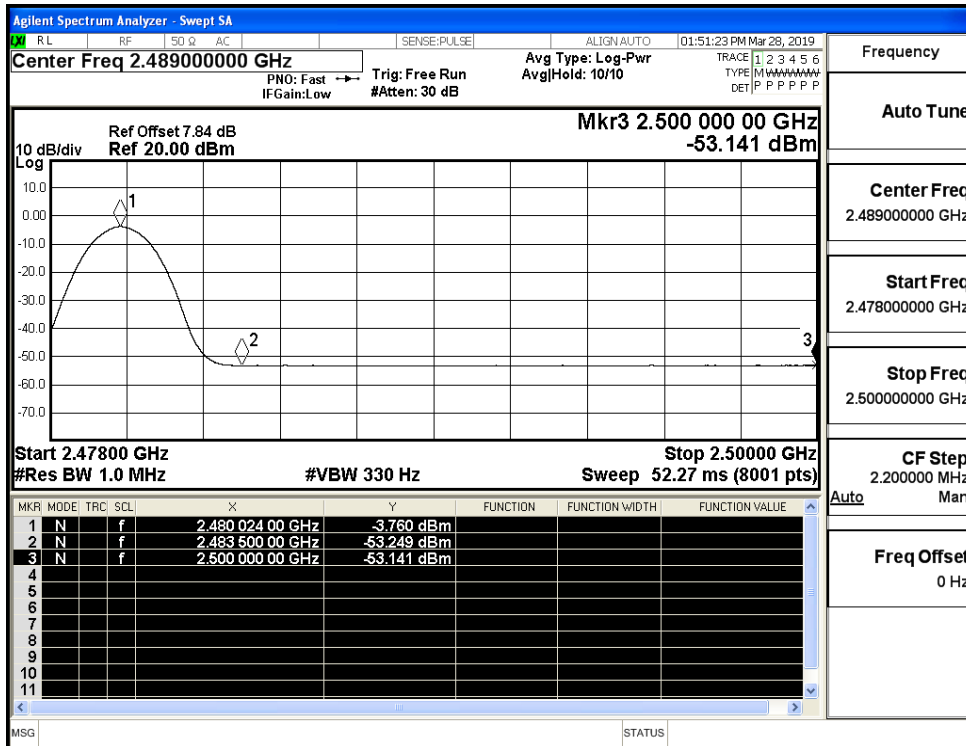
Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_Average (Low Channel)



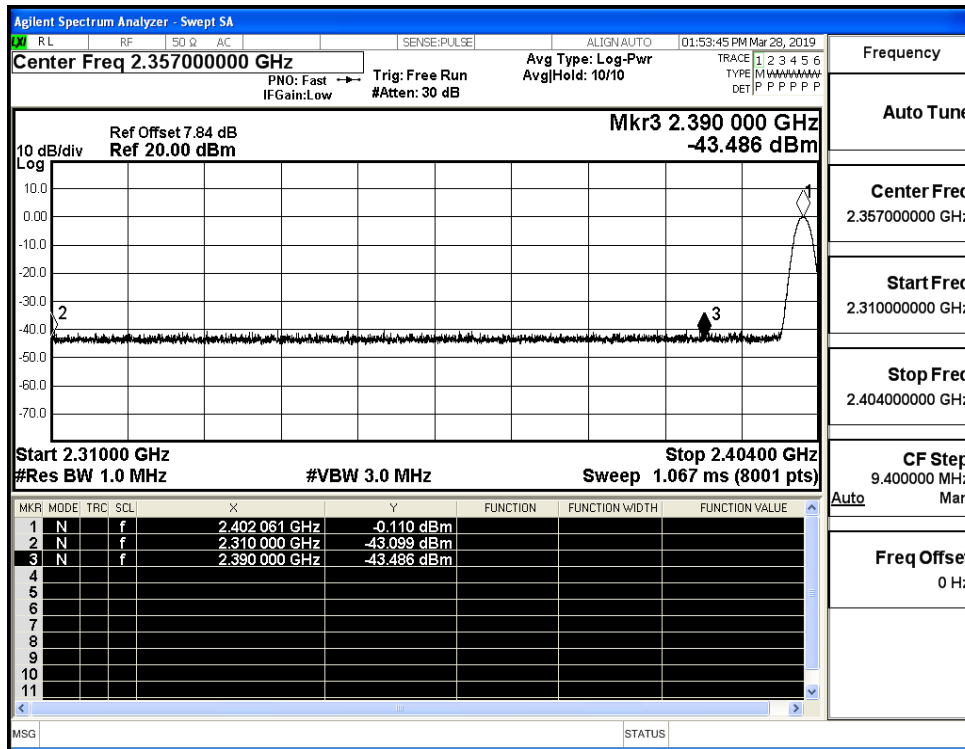
Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_PEAK (High Channel)



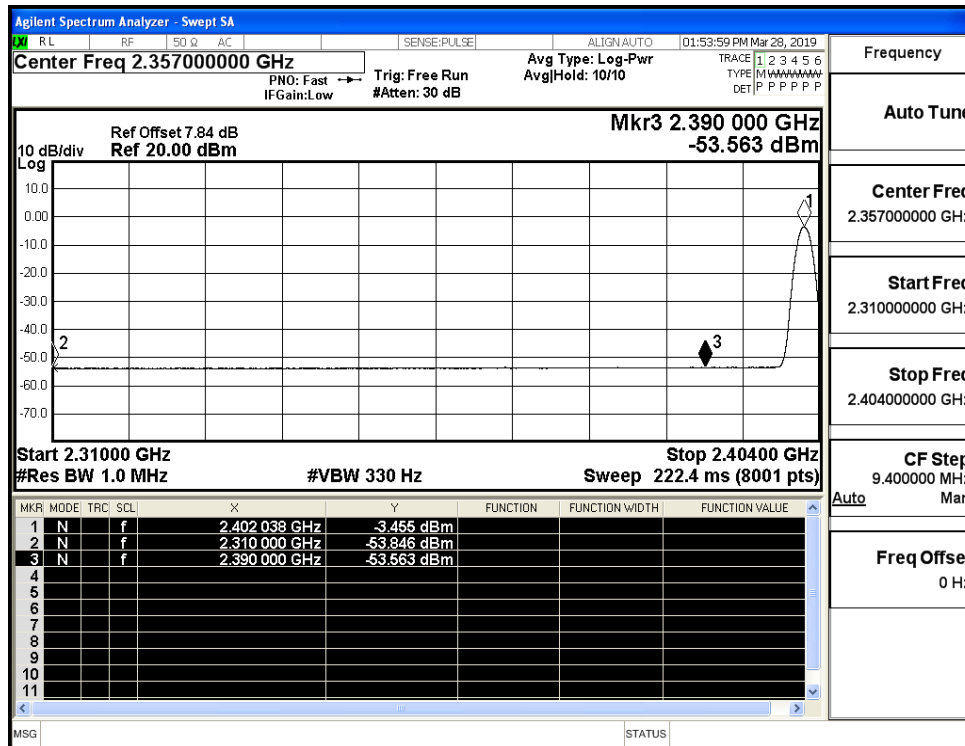
Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_Average (High Channel)



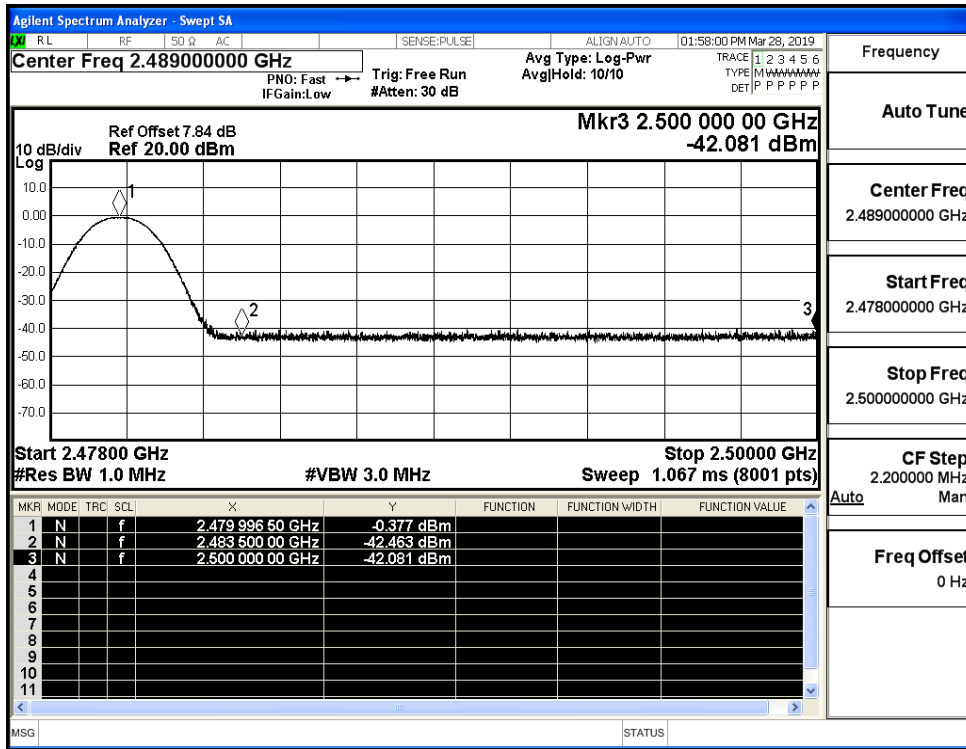
Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_PEAK (Low Channel)



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)

