

## Appendix A

### RF Test Data for BT V5.0 (BDR/EDR) (Conducted Measurement)

Product Name: Bluetooth speaker & Bluetooth Boombox

Trade Mark: N/A

Test Model: H07SW

#### Environmental Conditions

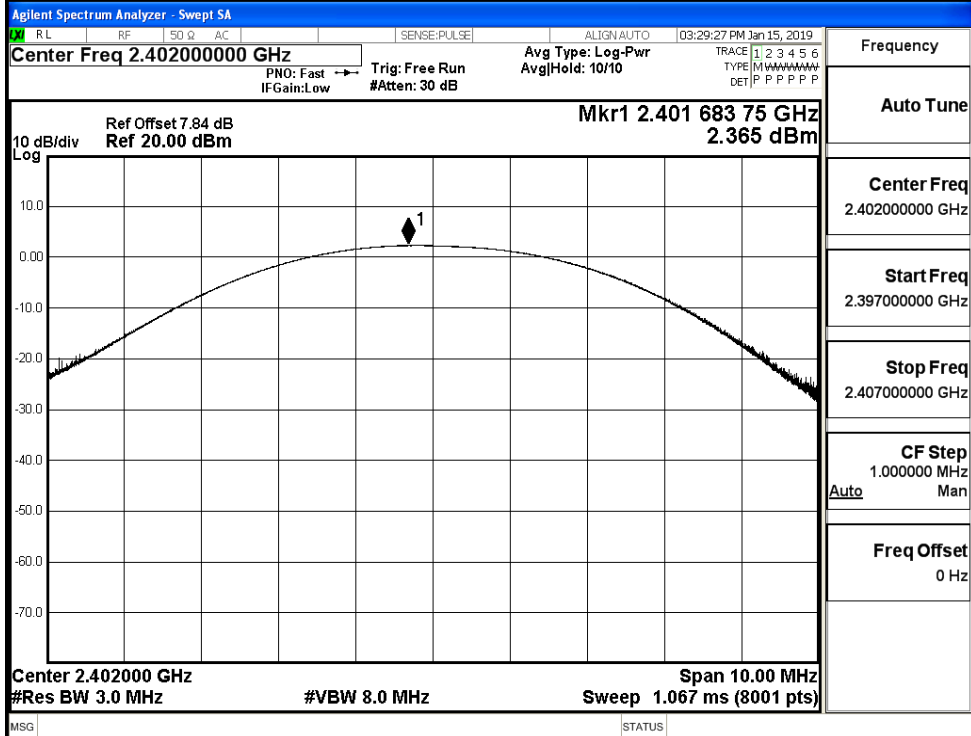
Temperature:	24.3 ° C
Relative Humidity:	52.7%
ATM Pressure:	100.0 kPa
Test Engineer:	JERRY.Zeng
Supervised by:	Jayden.Zhuo

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

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2.365	21	PASS
	MCH	2.437	21	PASS
	HCH	2.643	21	PASS
$\pi/4$ DQPSK	LCH	3.026	21	PASS
	MCH	3.102	21	PASS
	HCH	3.273	21	PASS

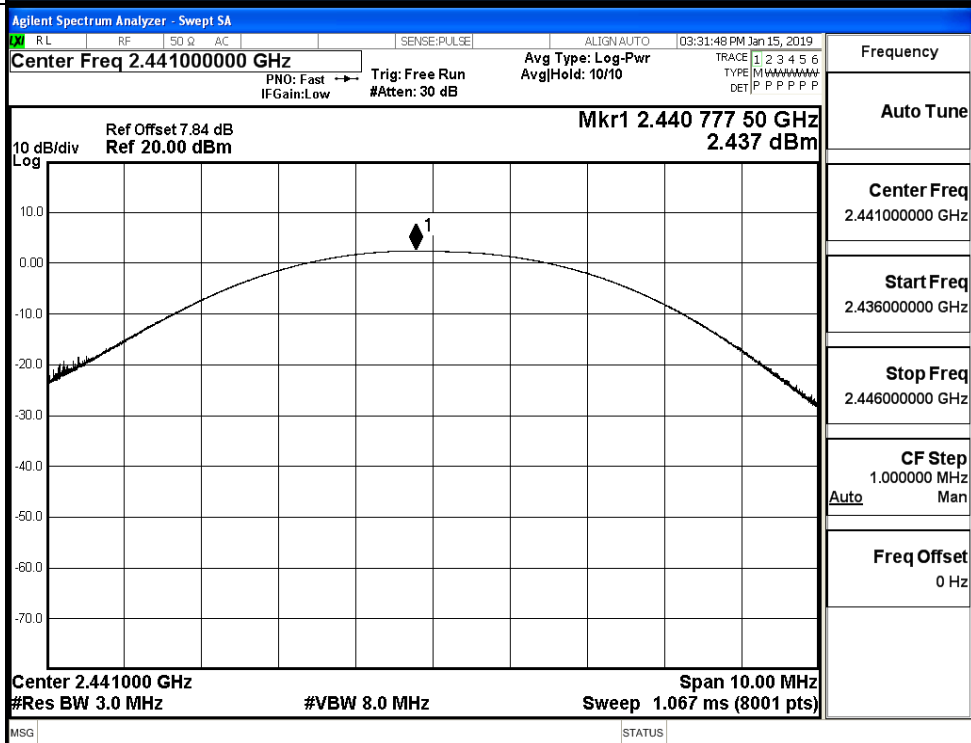
Test Graphs

GFSK/LCH



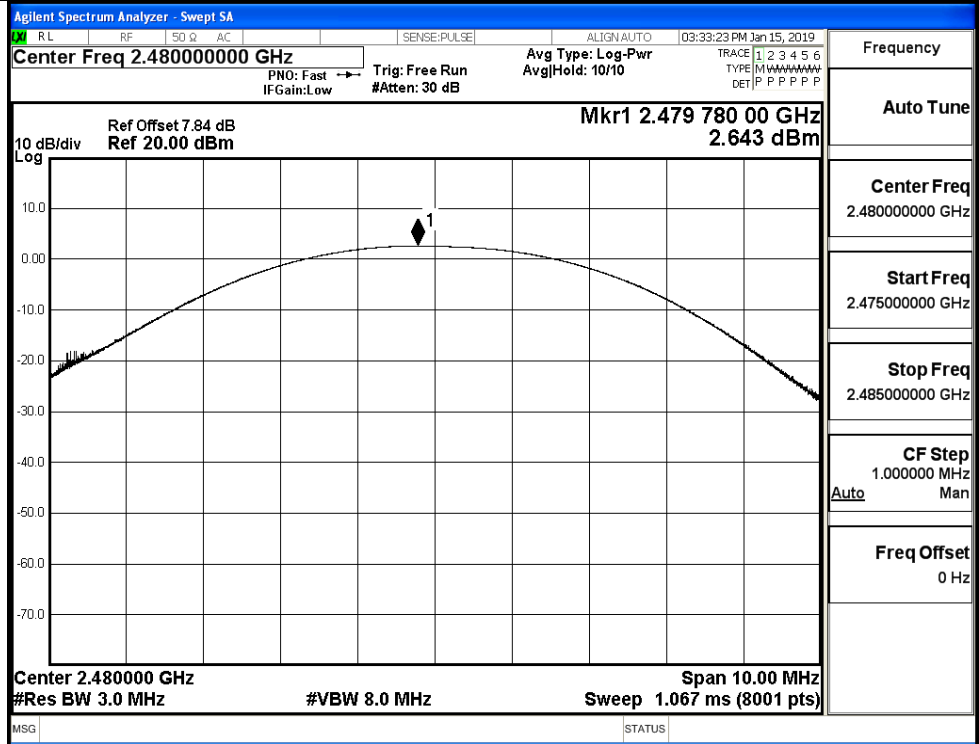
Frequency	2.402000000 GHz
Auto Tune	
Center Freq	2.402000000 GHz
Start Freq	2.397000000 GHz
Stop Freq	2.407000000 GHz
CF Step	1.000000 MHz
Auto	Man
Freq Offset	0 Hz

GFSK/MCH

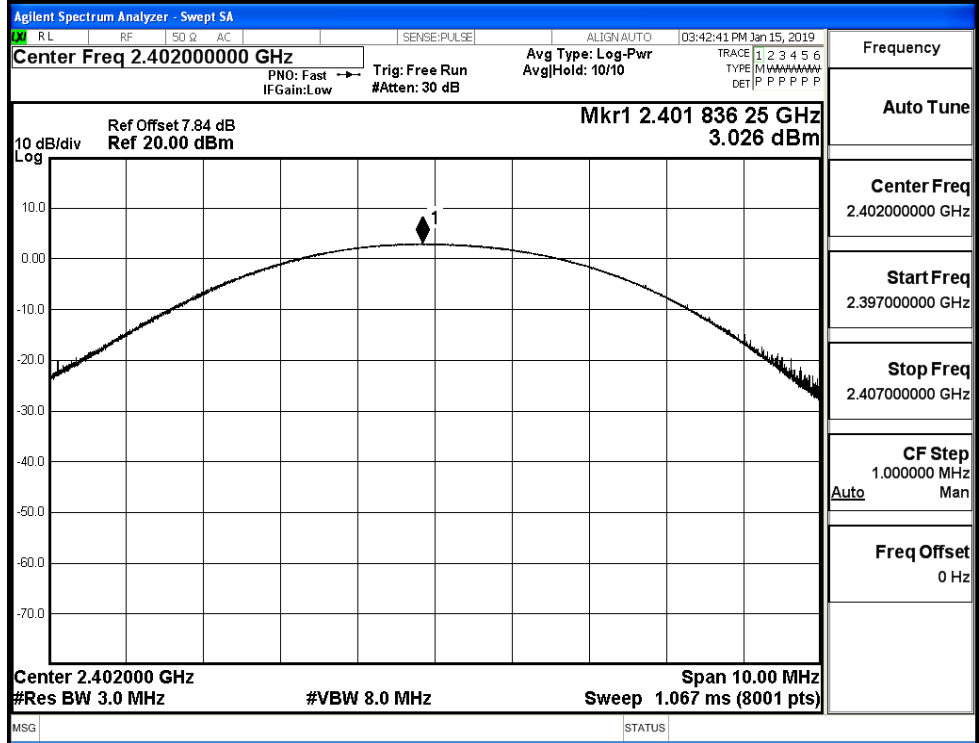


Frequency	2.441000000 GHz
Auto Tune	
Center Freq	2.441000000 GHz
Start Freq	2.436000000 GHz
Stop Freq	2.446000000 GHz
CF Step	1.000000 MHz
Auto	Man
Freq Offset	0 Hz

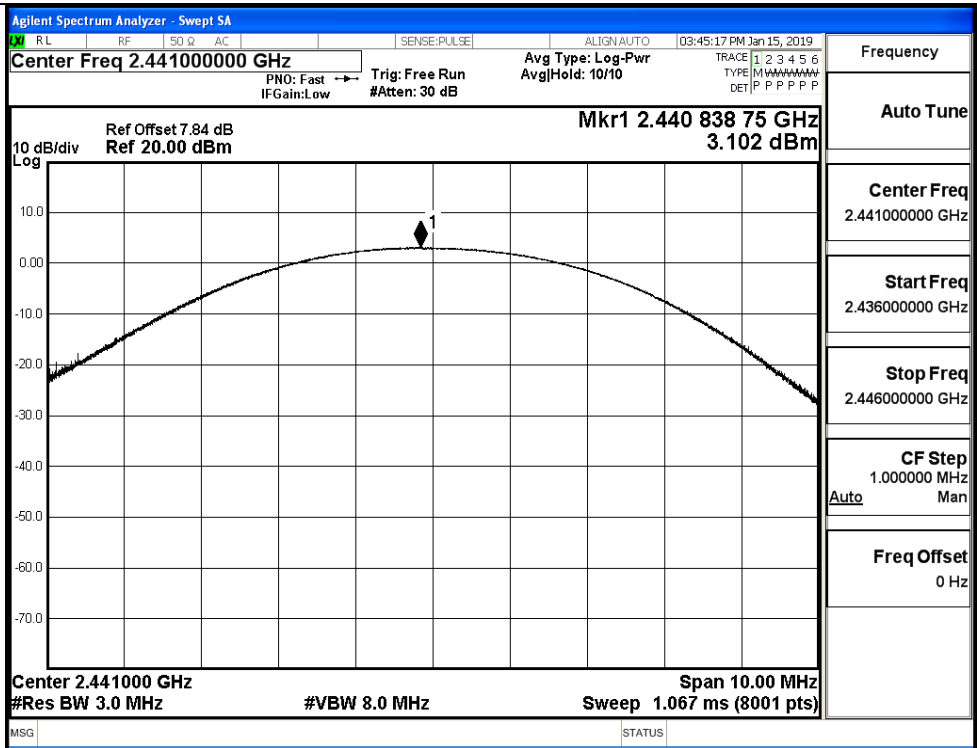
GFSK/HCH



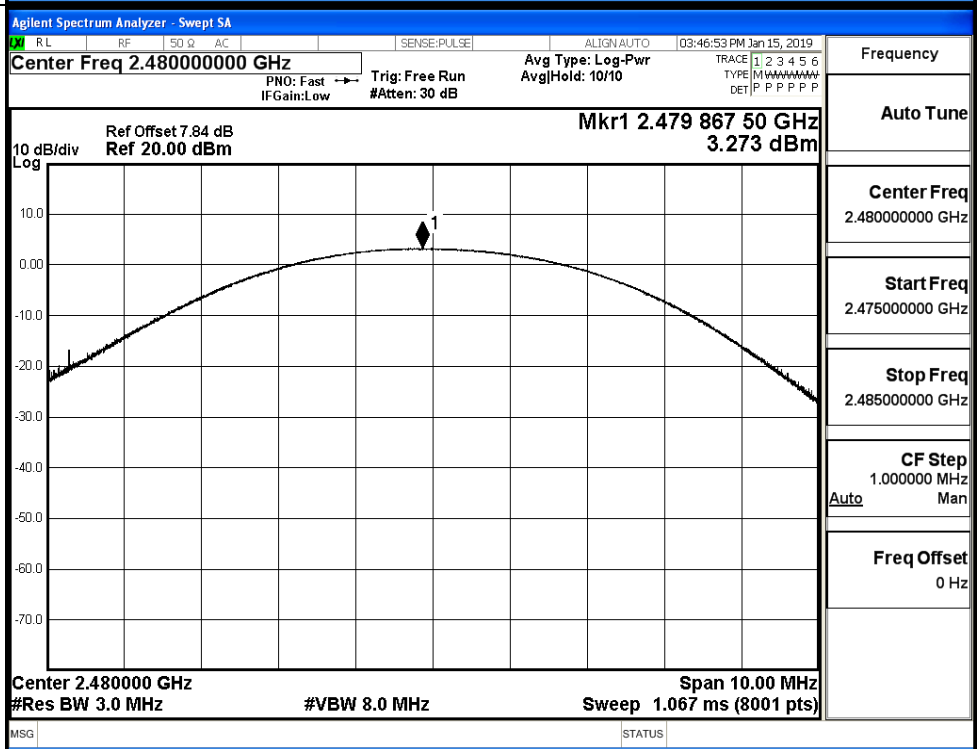
$\pi/4$ DQPSK/LCH



$\pi$ /4DQPSK/MCH

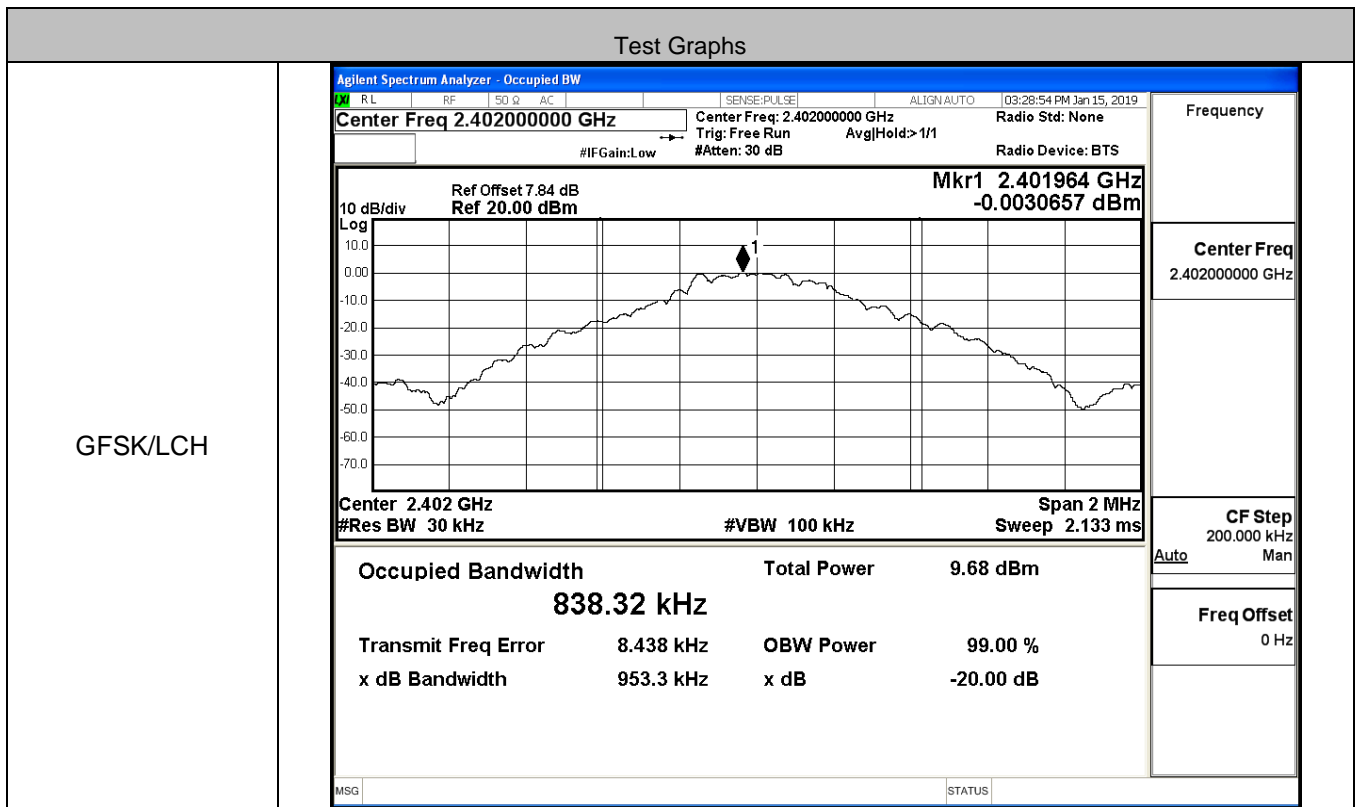


$\pi$ /4DQPSK/HCH

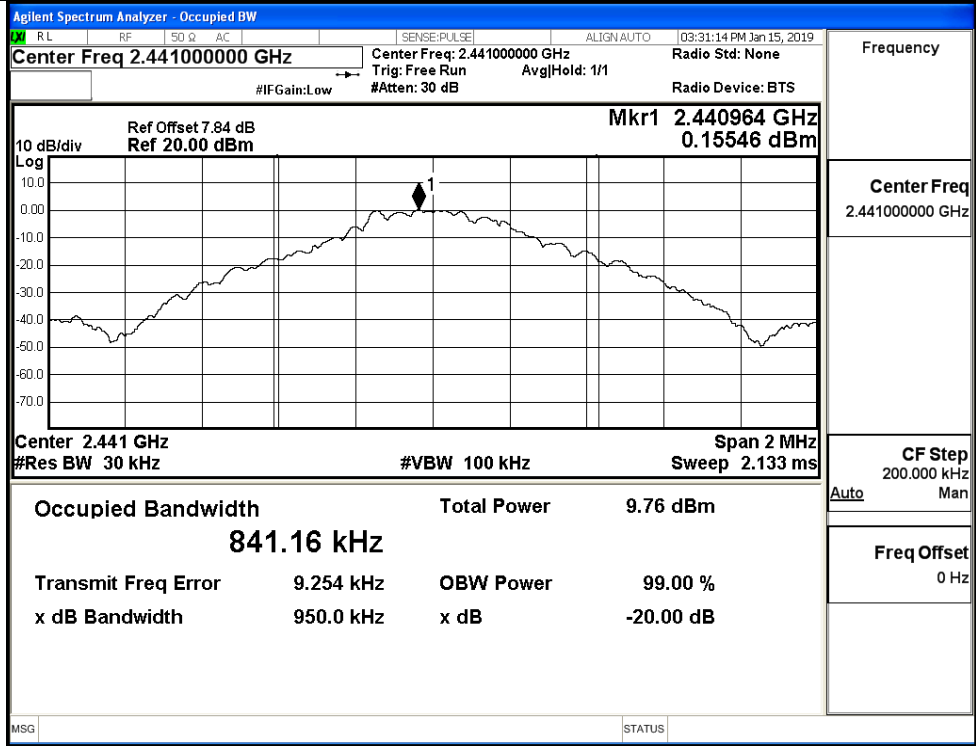


**A.2 99% and 20dB Bandwidth**

Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.83832	0.9533	Not Specified	PASS
	MCH	0.84116	0.9500	Not Specified	PASS
	HCH	0.84238	0.9509	Not Specified	PASS
π/4DQPSK	LCH	1.1745	1.314	Not Specified	PASS
	MCH	1.1775	1.315	Not Specified	PASS
	HCH	1.1776	1.315	Not Specified	PASS

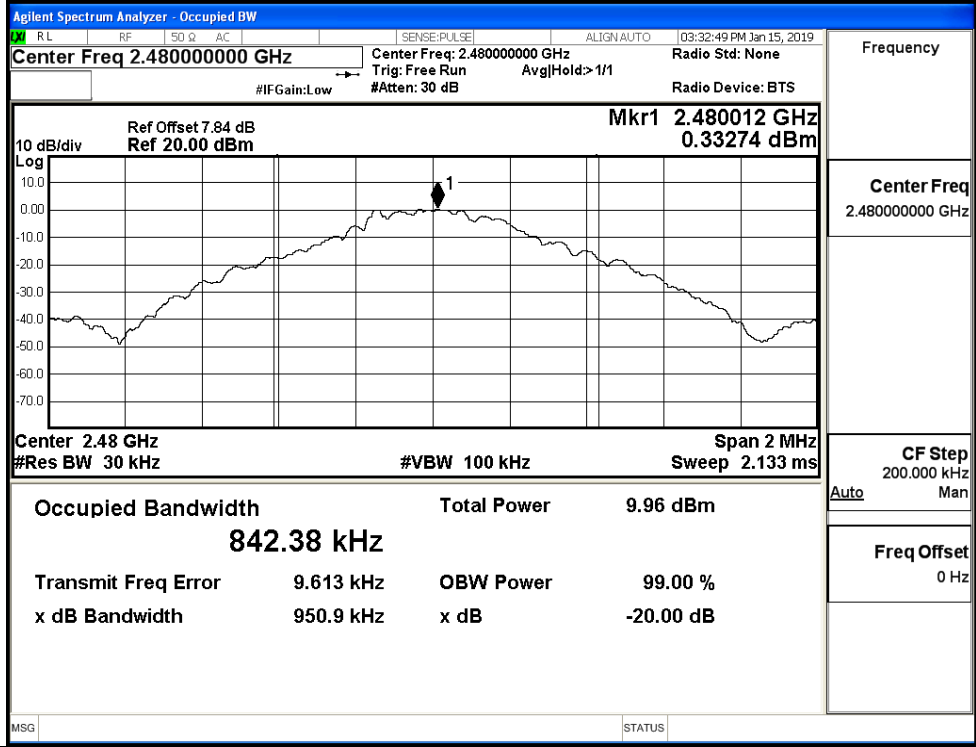


GFSK/MCH



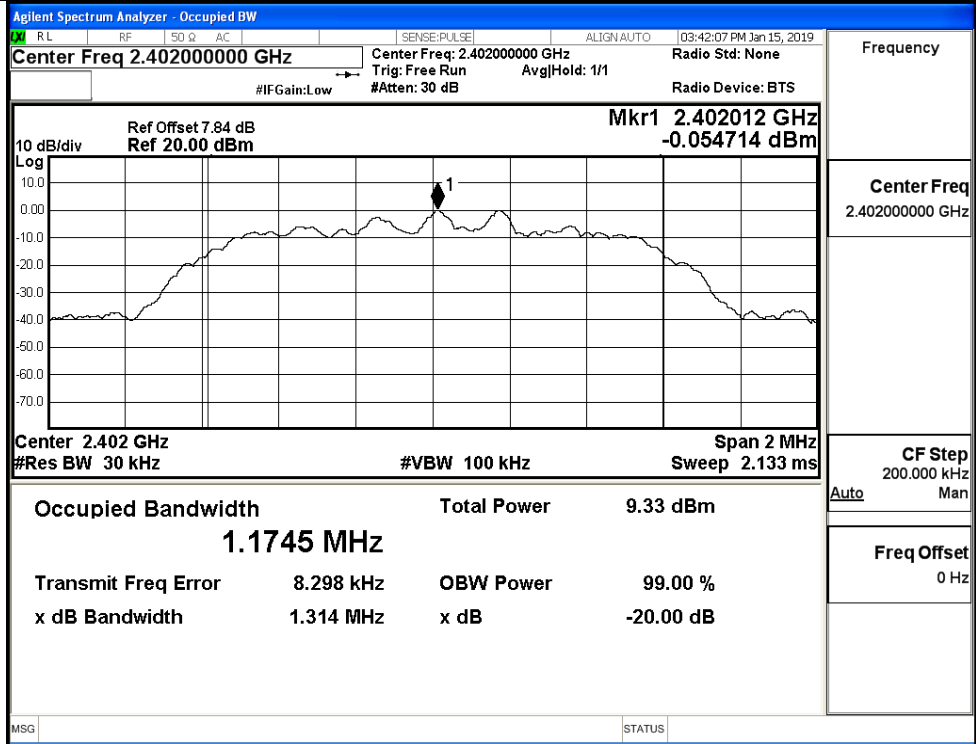
Frequency	2.441000000 GHz
Center Freq	2.441000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

GFSK/HCH

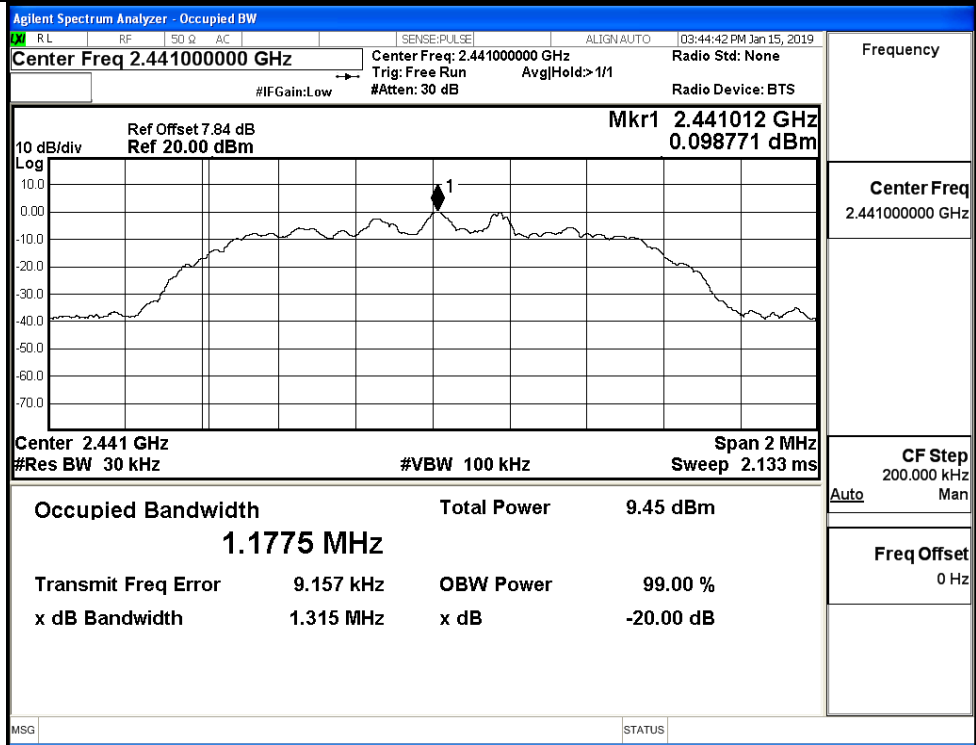


Frequency	2.480000000 GHz
Center Freq	2.480000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

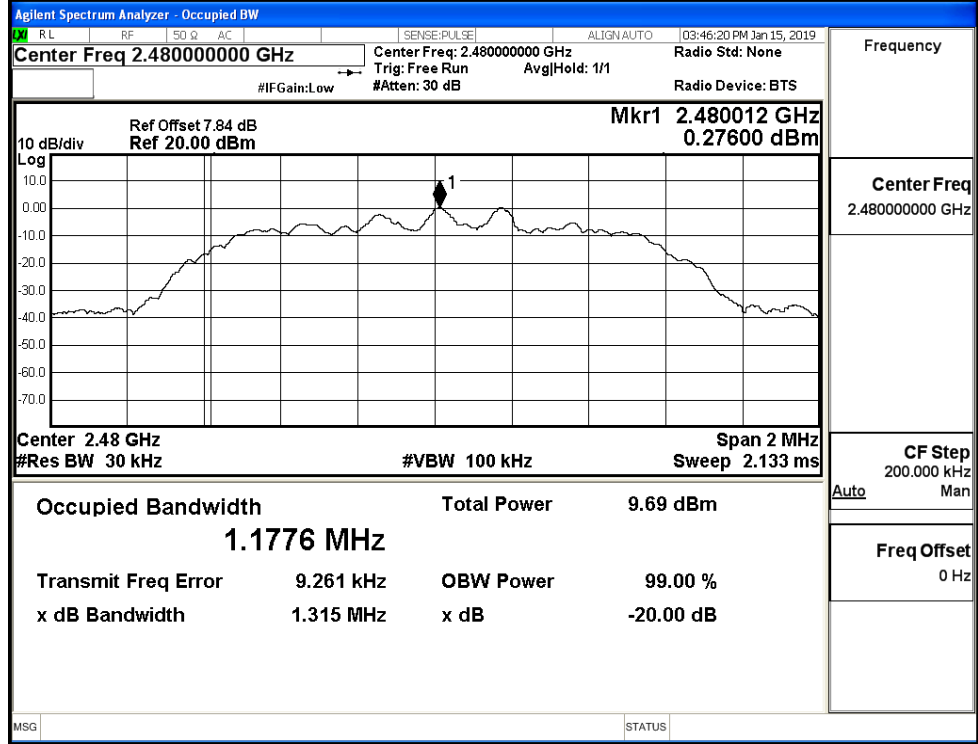
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH



$\pi/4$ DQPSK/HCH

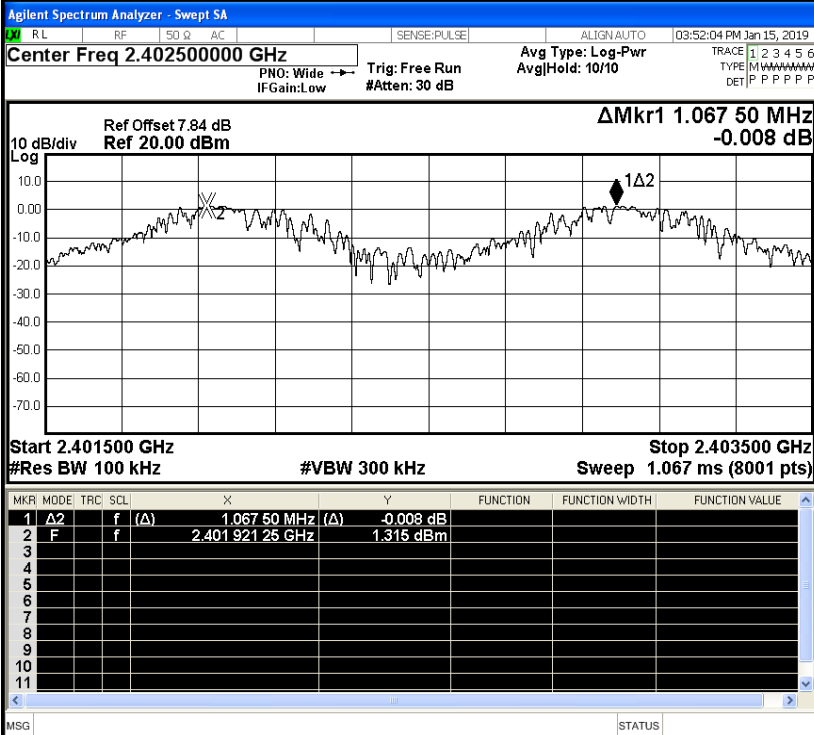




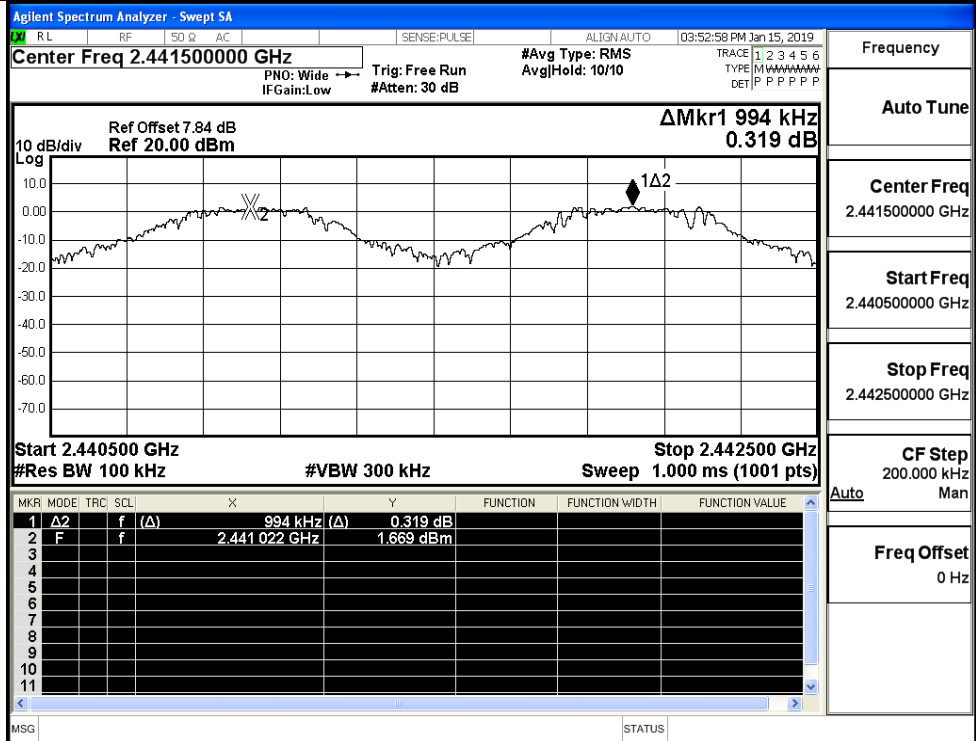
### A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.068	0.636	PASS
	MCH	0.994	0.636	PASS
	HCH	0.932	0.636	PASS
π/4DQPSK	LCH	1.202	0.877	PASS
	MCH	1.070	0.877	PASS
	HCH	1.000	0.877	PASS

Test Graphs

GFSK/LCH	 <p style="font-size: 0.8em; margin-top: 5px;">                 Agilent Spectrum Analyzer - Swept SA                  Center Freq 2.402500000 GHz                  Ref Offset 7.94 dB, Ref 20.00 dBm                  ΔMkr1 1.067 50 MHz, -0.008 dB                  Start 2.401500 GHz, Stop 2.403500 GHz                  #Res BW 100 kHz, #VBW 300 kHz, Sweep 1.067 ms (8001 pts)             </p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: 0.7em;"> <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>Δ2</td> <td>f</td> <td>(Δ)</td> <td>1.067 50 MHz (Δ)</td> <td>-0.008 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.401 921 25 GHz</td> <td>1.315 dBm</td> <td></td> <td></td> <td></td> </tr> <tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ2	f	(Δ)	1.067 50 MHz (Δ)	-0.008 dB				2	F	f		2.401 921 25 GHz	1.315 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
	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																																																																																																					
1	Δ2	f	(Δ)	1.067 50 MHz (Δ)	-0.008 dB																																																																																																									
2	F	f		2.401 921 25 GHz	1.315 dBm																																																																																																									
3																																																																																																														
4																																																																																																														
5																																																																																																														
6																																																																																																														
7																																																																																																														
8																																																																																																														
9																																																																																																														
10																																																																																																														
11																																																																																																														

GFSK/MCH



Frequency

Auto Tune

Center Freq  
2.441500000 GHz

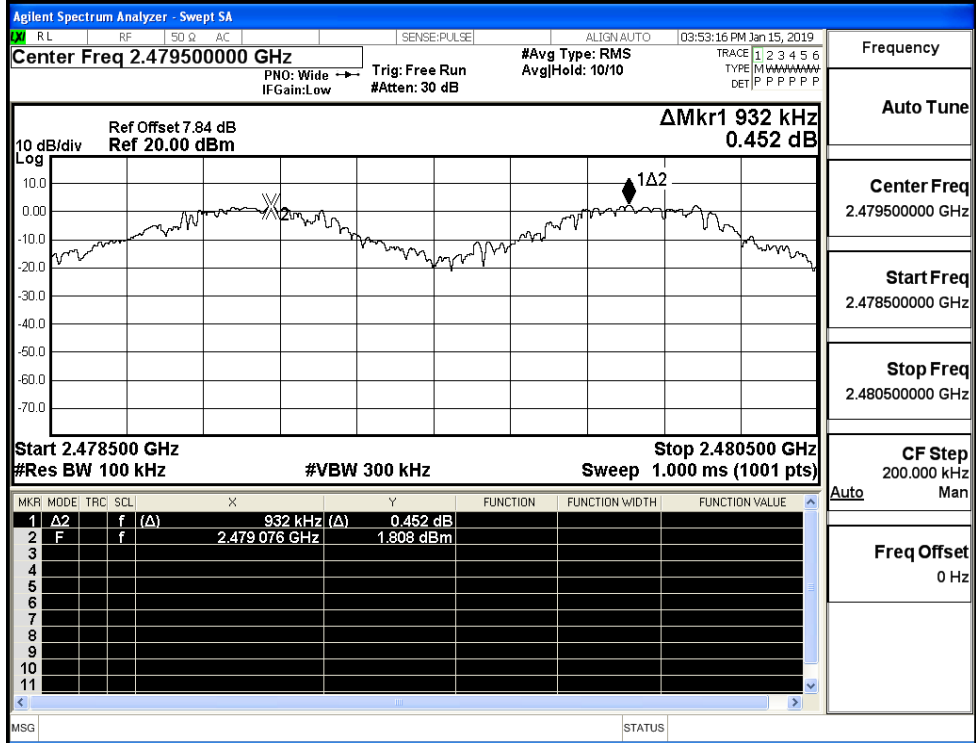
Start Freq  
2.440500000 GHz

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

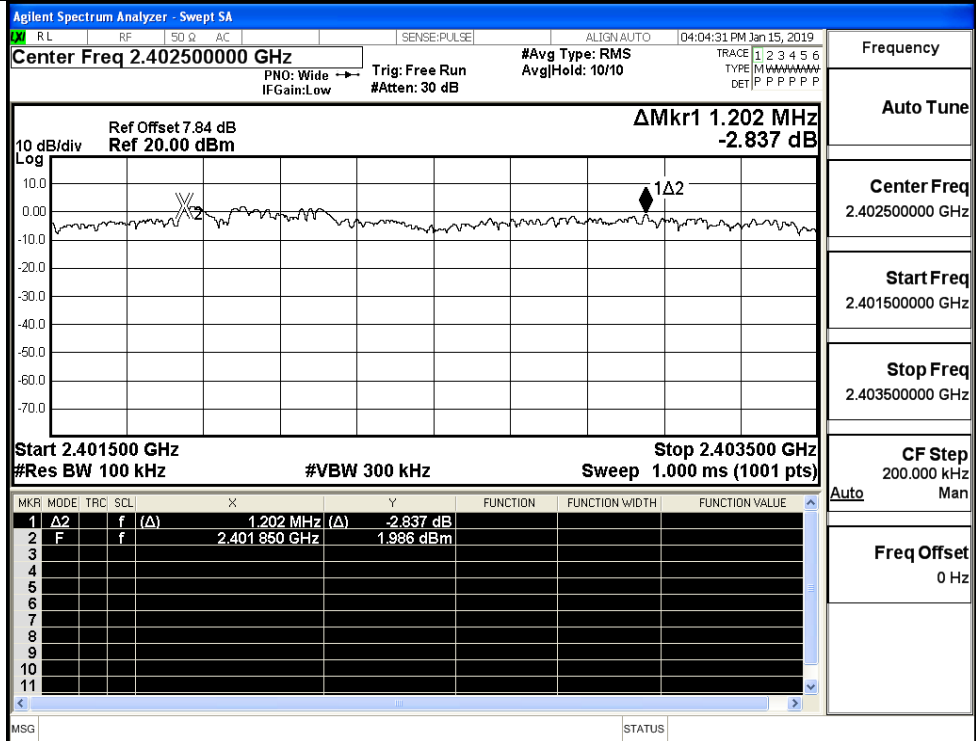
Start Freq  
2.478500000 GHz

Stop Freq  
2.480500000 GHz

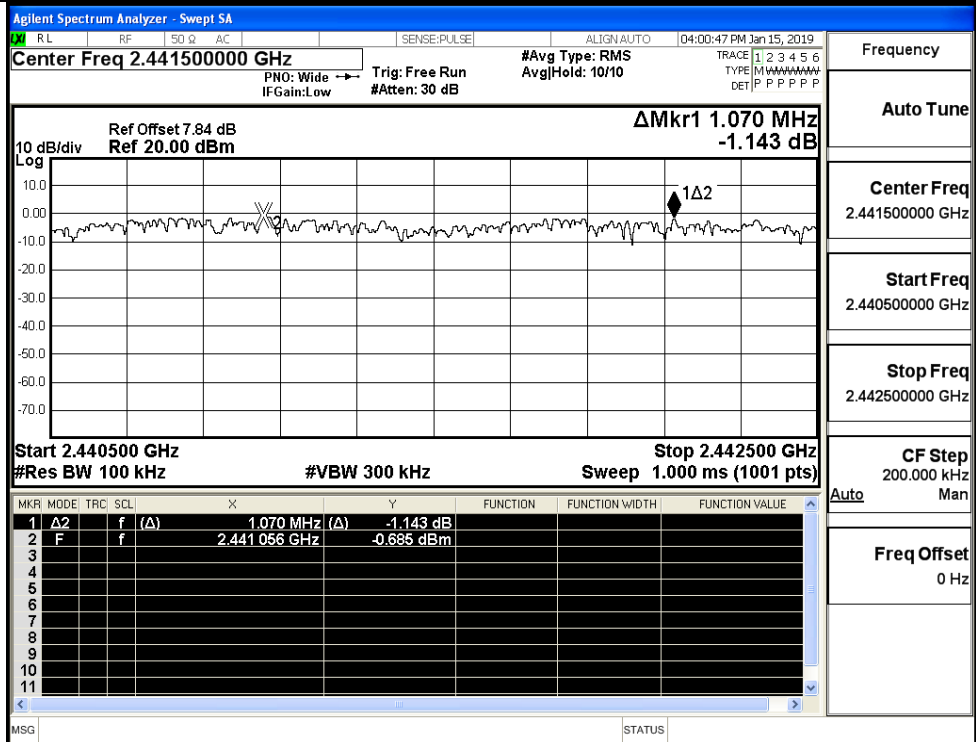
CF Step  
200.000 kHz  
Auto Man

Freq Offset  
0 Hz

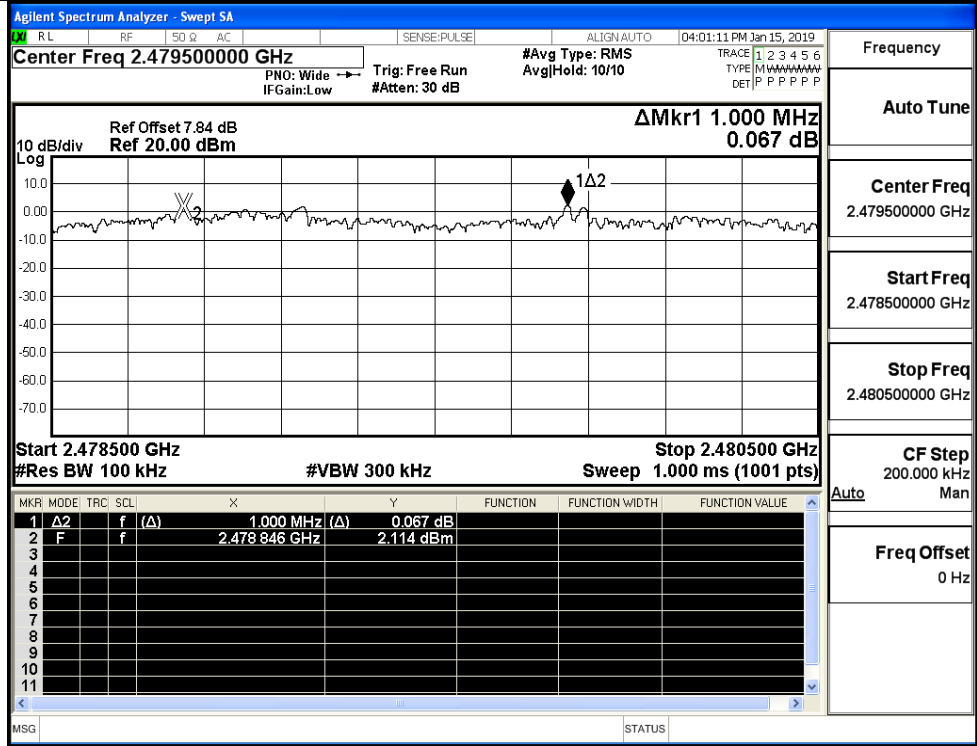
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH



$\pi/4$ DQPSK/HCH



### A.4 Hopping Channel Number

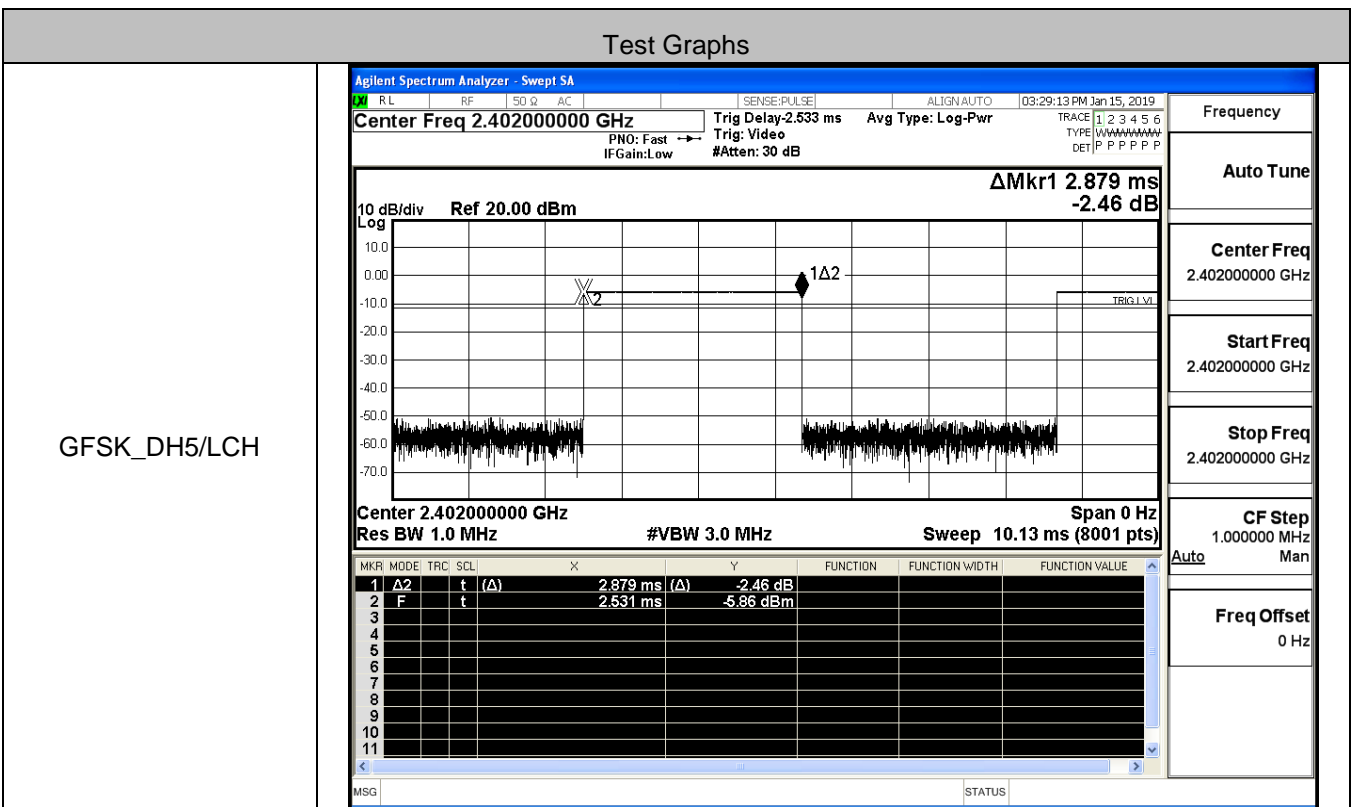
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS

#### Test Graphs

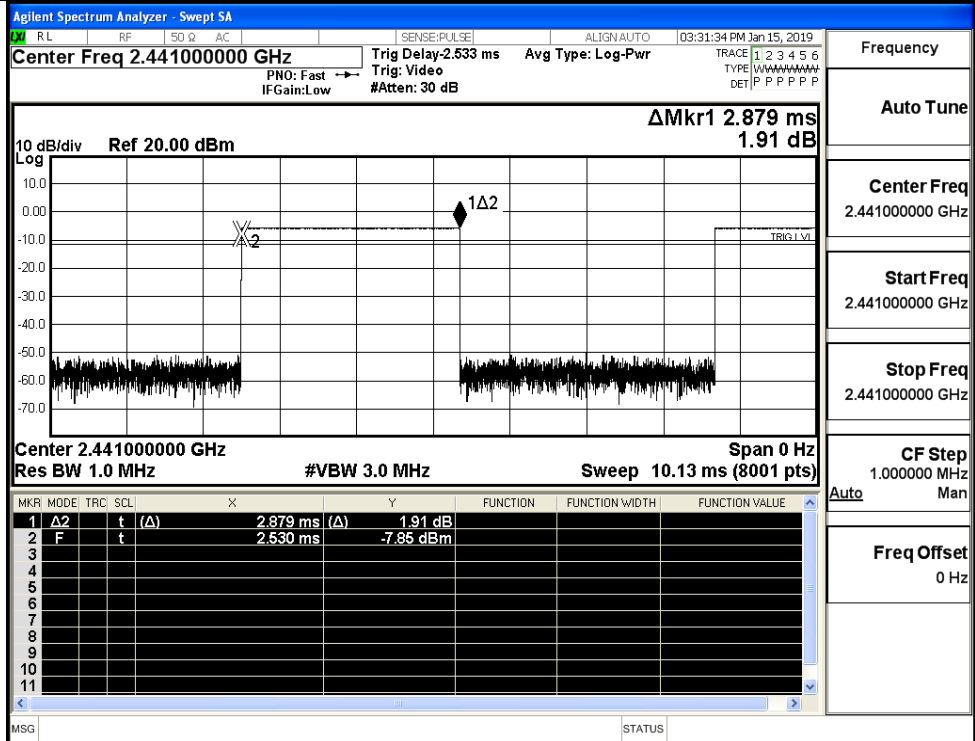
<p>GFSK/Hop</p>	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 7.84 dB Ref 20.00 dBm</p> <p><math>\Delta</math>Mkr1 77.832 MHz 1.048 dB</p> <p>Start 2.40000 GHz #Res BW 100 kHz</p> <p>Stop 2.48350 GHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1"> <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></td> <td>f</td> <td>(<math>\Delta</math>)</td> <td>77.832 MHz (<math>\Delta</math>)</td> <td>1.048 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.402056 GHz</td> <td>1.193 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	$\Delta$	f	( $\Delta$ )	77.832 MHz ( $\Delta$ )	1.048 dB				2	F	f		2.402056 GHz	1.193 dBm			
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	$\Delta$	f	( $\Delta$ )	77.832 MHz ( $\Delta$ )	1.048 dB																							
2	F	f		2.402056 GHz	1.193 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 78.323 MHz 0.520 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></td> <td>f</td> <td>(<math>\Delta</math>)</td> <td>78.323 MHz (<math>\Delta</math>)</td> <td>0.520 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.401816 GHz</td> <td>-0.863 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	$\Delta$	f	( $\Delta$ )	78.323 MHz ( $\Delta$ )	0.520 dB				2	F	f		2.401816 GHz	-0.863 dBm			
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	$\Delta$	f	( $\Delta$ )	78.323 MHz ( $\Delta$ )	0.520 dB																							
2	F	f		2.401816 GHz	-0.863 dBm																							

### A.5 Dwell Time

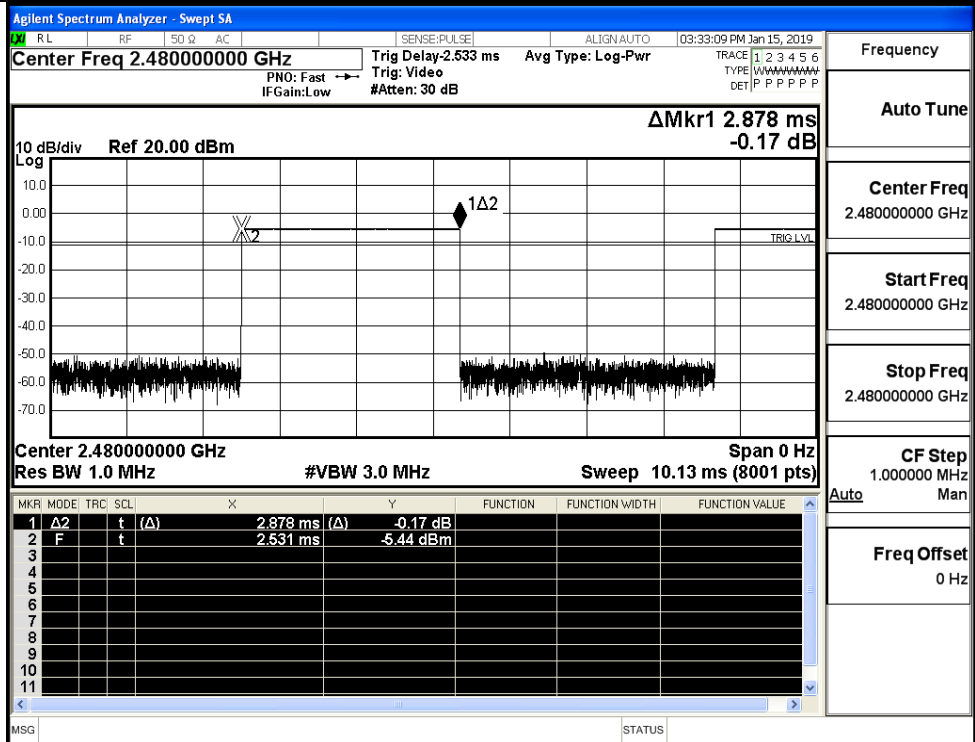
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
π/4DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.89	106.7	0.308	0.4	PASS
	2DH5	HCH	2.89	106.7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



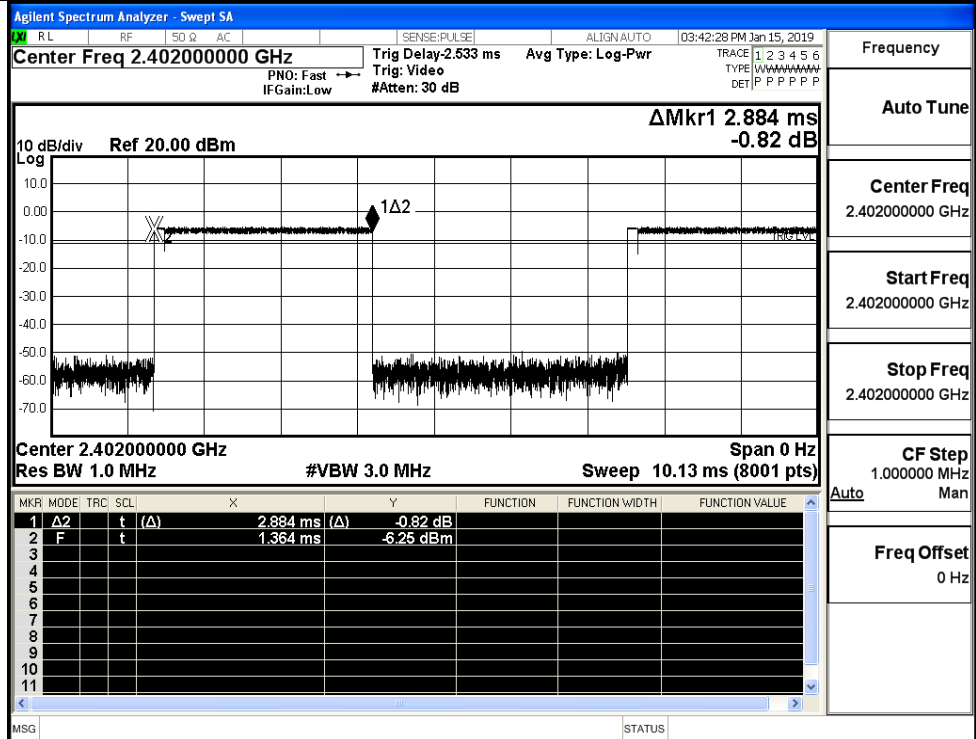
GFSK\_DH5/MCH



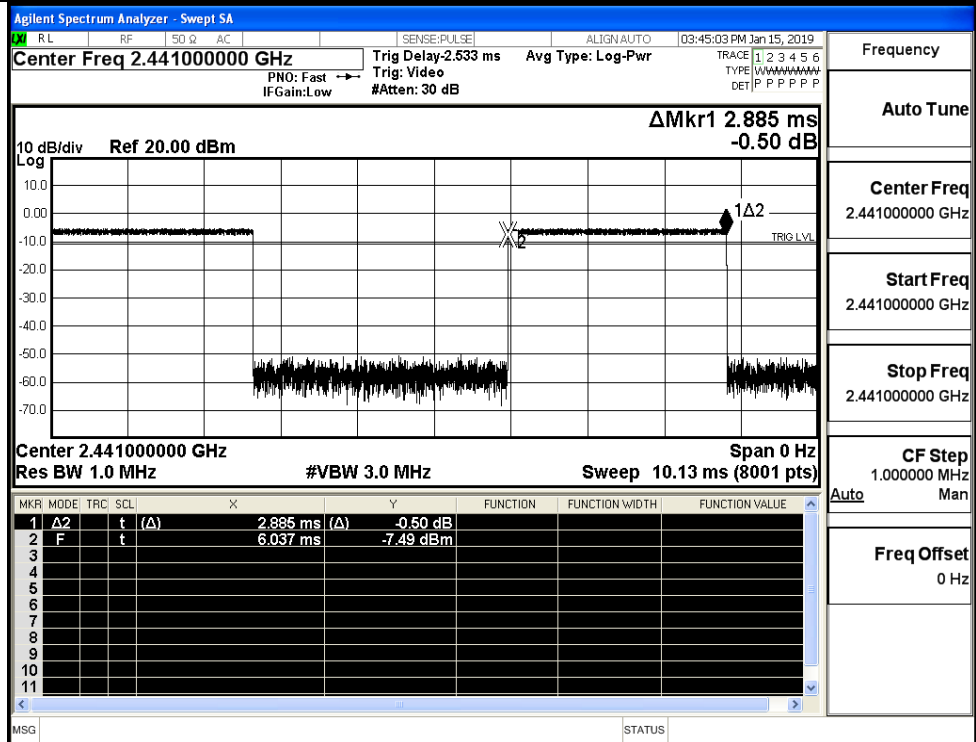
GFSK\_DH5/HCH



$\pi/4$ DQPSK  
\_2DH5/LCH

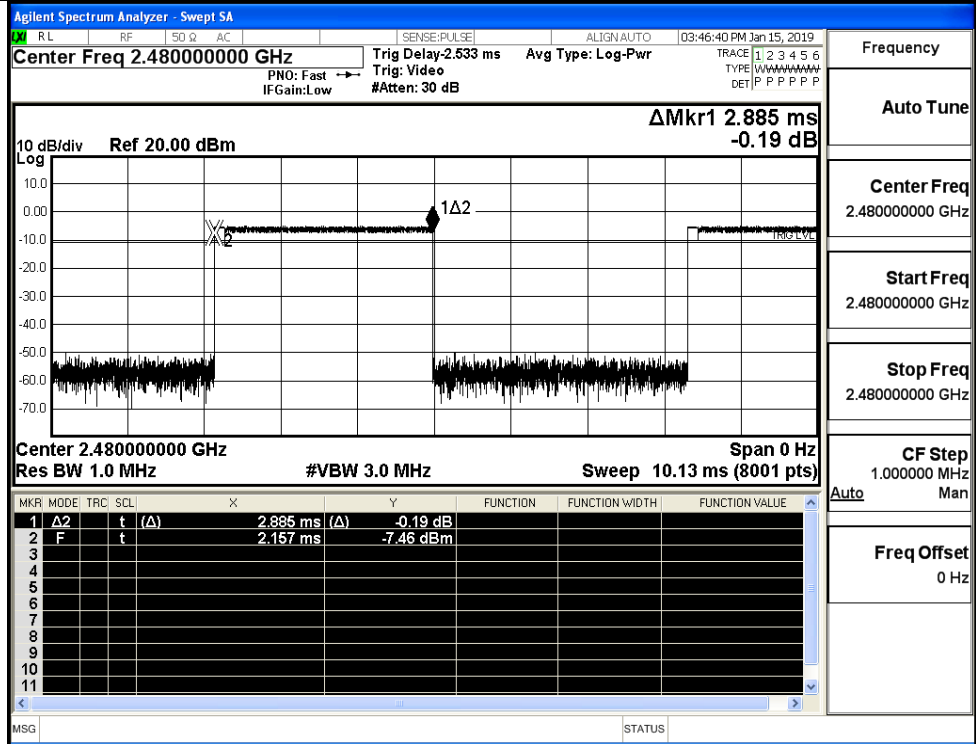


$\pi/4$ DQPSK  
\_2DH5/MCH





$\pi/4$ DQPSK  
\_2DH5/HCH

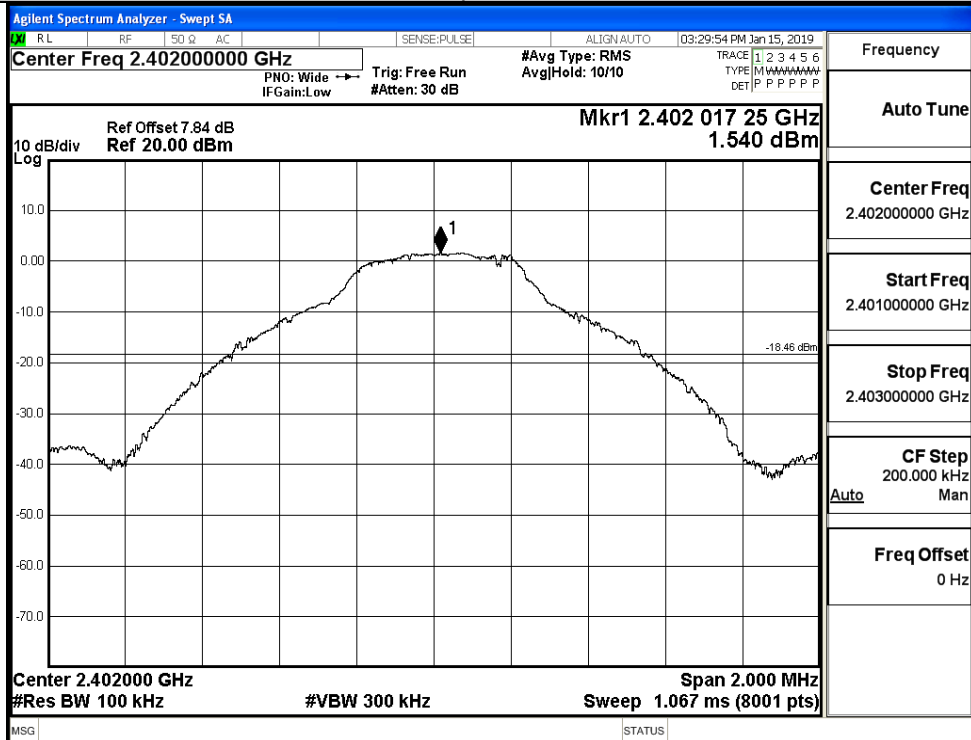


**A.6 RF Conducted Spurious Emissions**

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.540	-43.657	-18.460	PASS
	MCH	2.043	-43.761	-17.957	PASS
	HCH	2.446	-44.572	-17.554	PASS
$\pi/4$ DQPSK	LCH	0.835	-44.900	-19.165	PASS
	MCH	1.213	-44.780	-18.787	PASS
	HCH	2.248	-44.578	-17.752	PASS

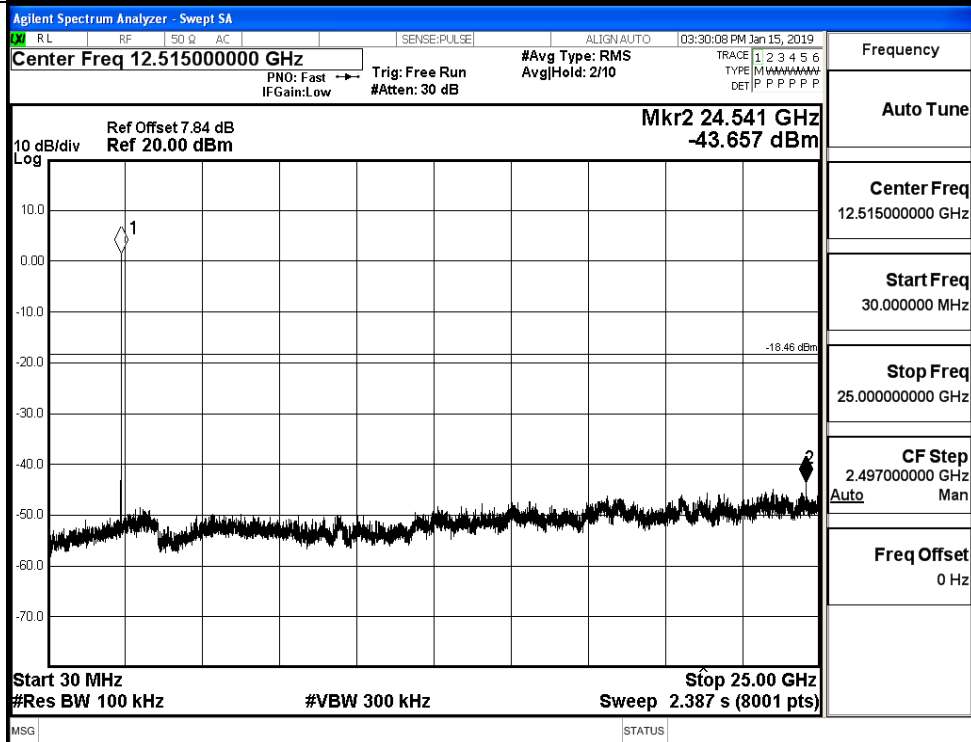
GFSK\_LCH\_Graphs

Pref



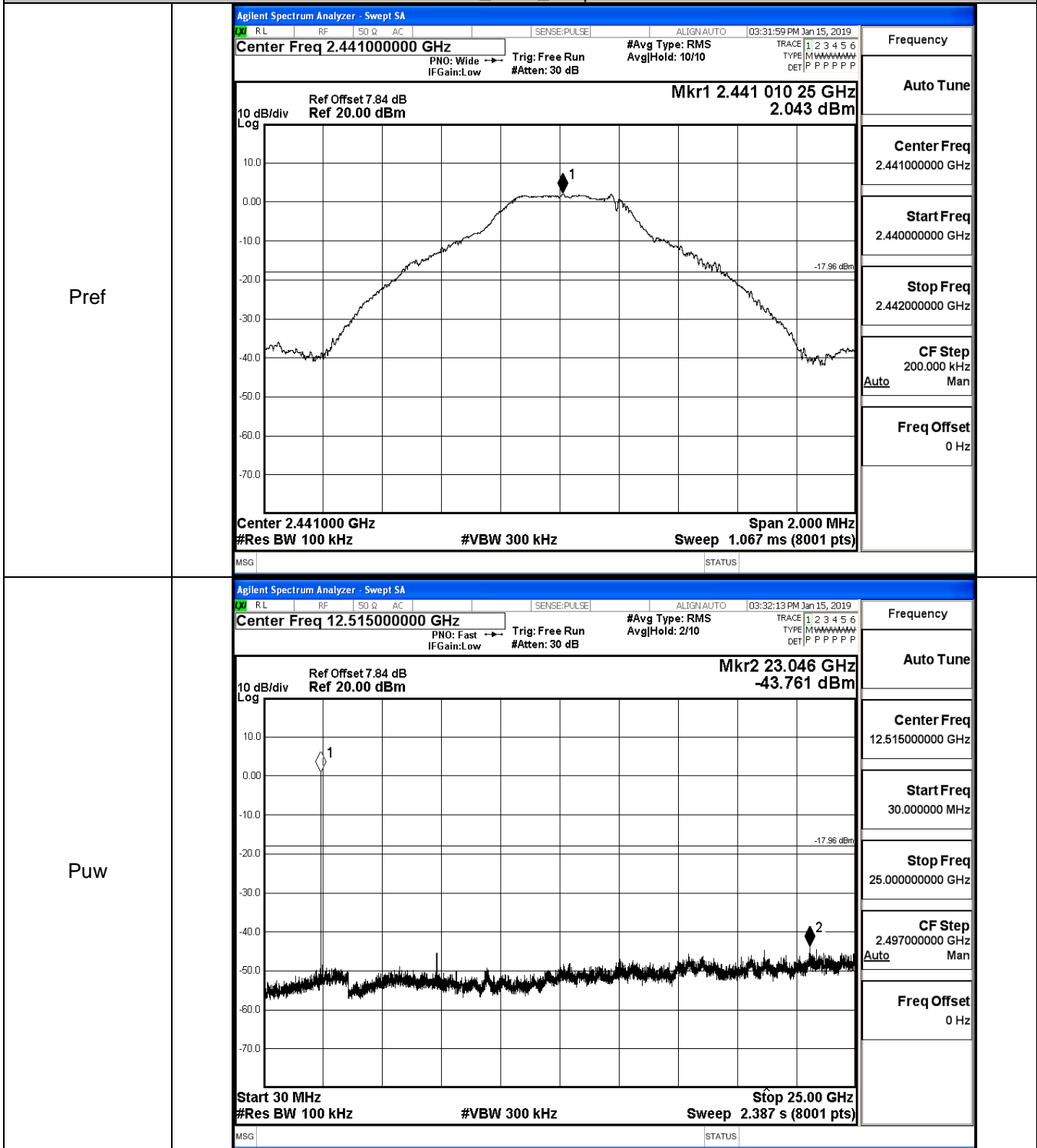
Frequency	
Auto Tune	
Center Freq	2.402000000 GHz
Start Freq	2.401000000 GHz
Stop Freq	2.403000000 GHz
CF Step	200.000 kHz Auto
Freq Offset	0 Hz

Puw

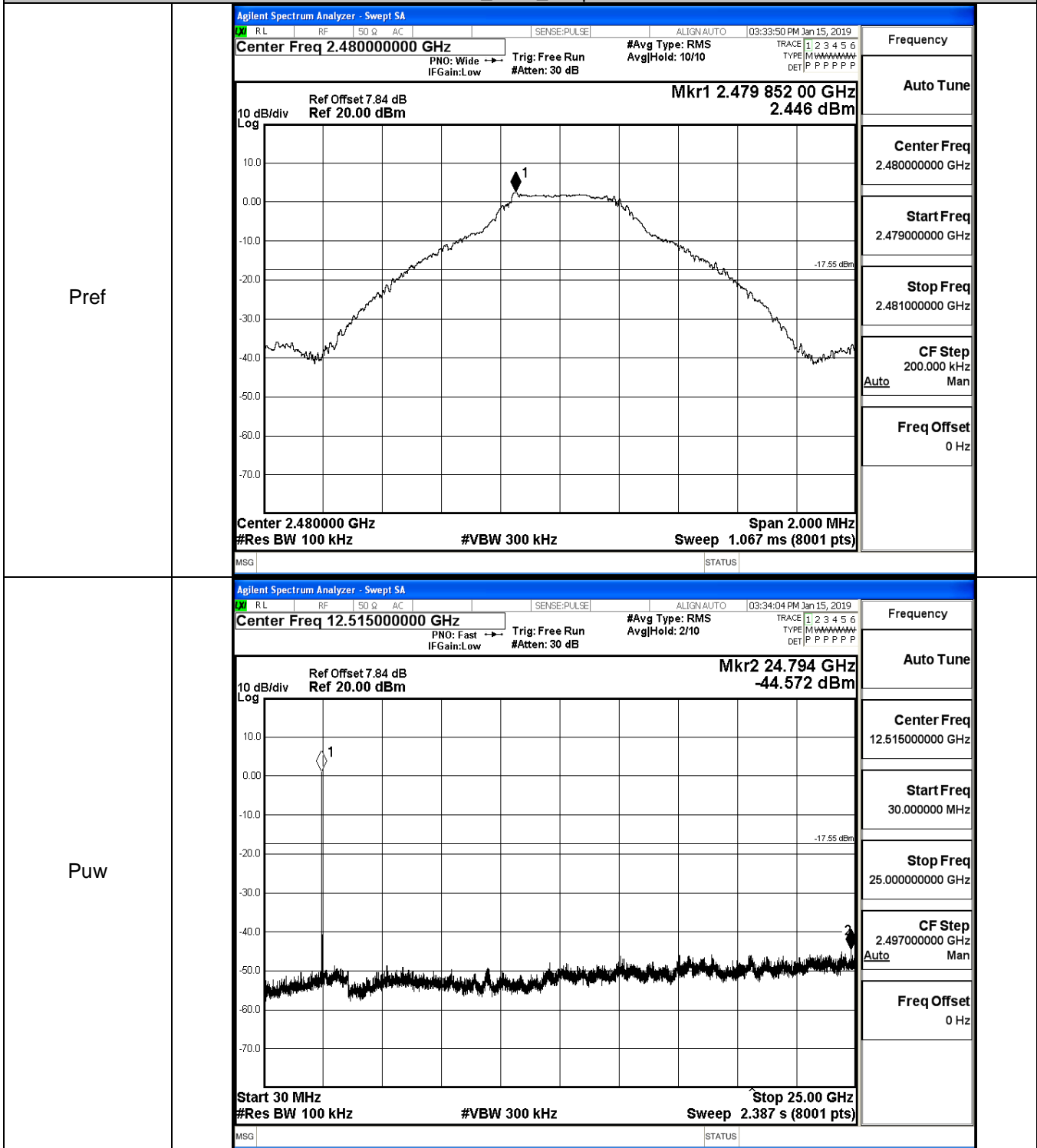


Frequency	
Auto Tune	
Center Freq	12.515000000 GHz
Start Freq	30.0000000 MHz
Stop Freq	25.000000000 GHz
CF Step	2.497000000 GHz Auto
Freq Offset	0 Hz

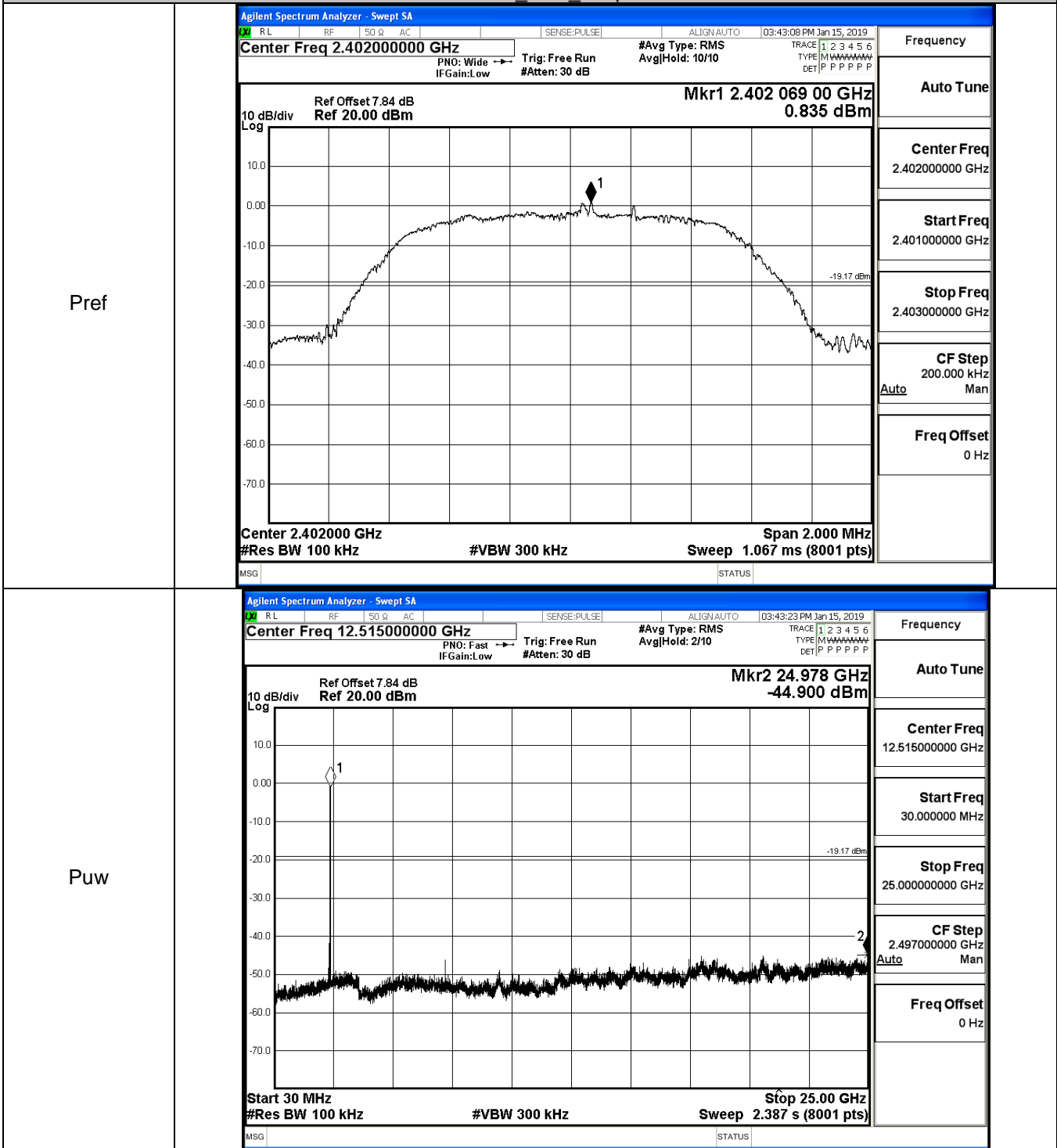
GFSK\_MCH\_Graphs



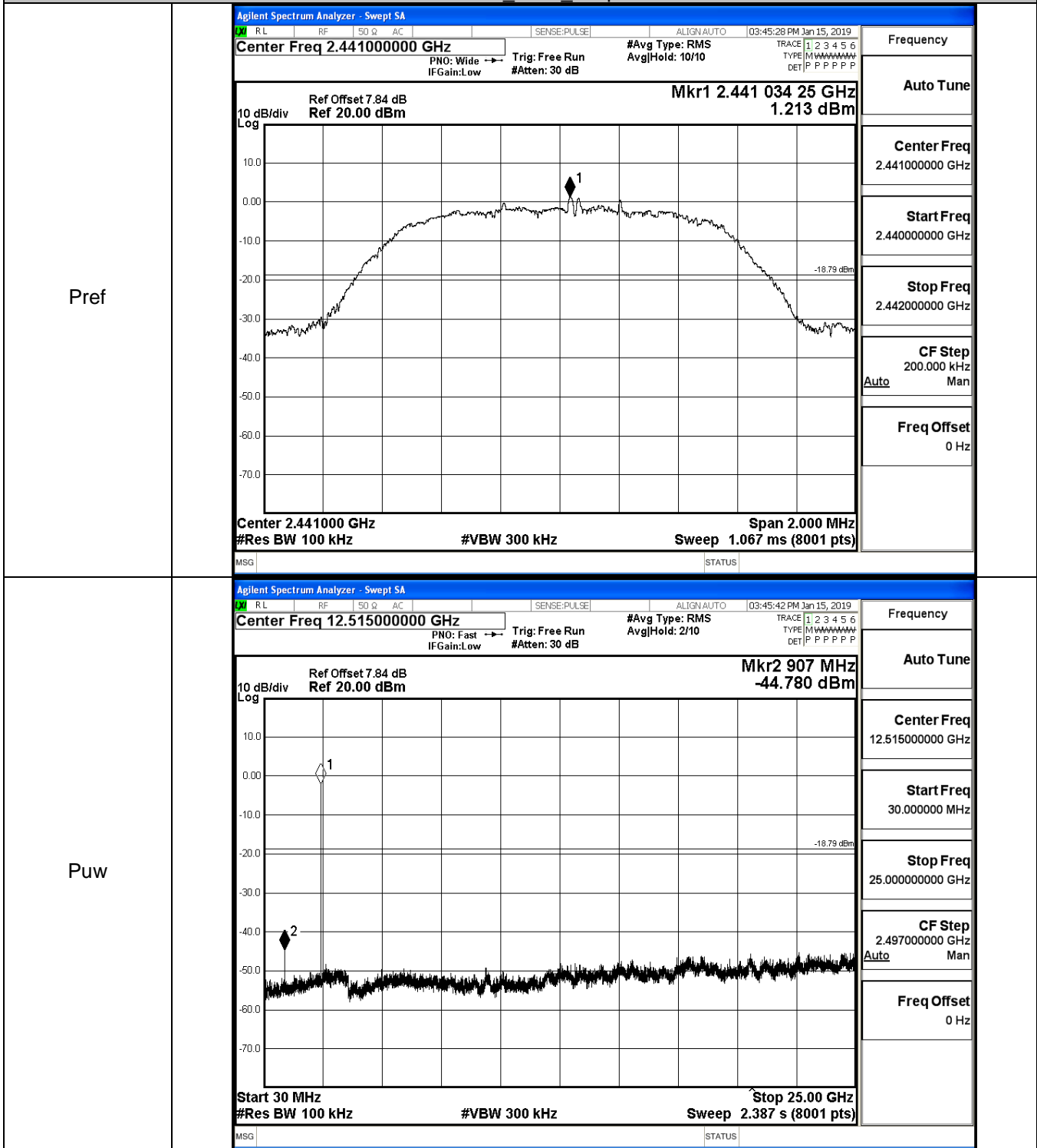
GFSK\_HCH\_Graphs



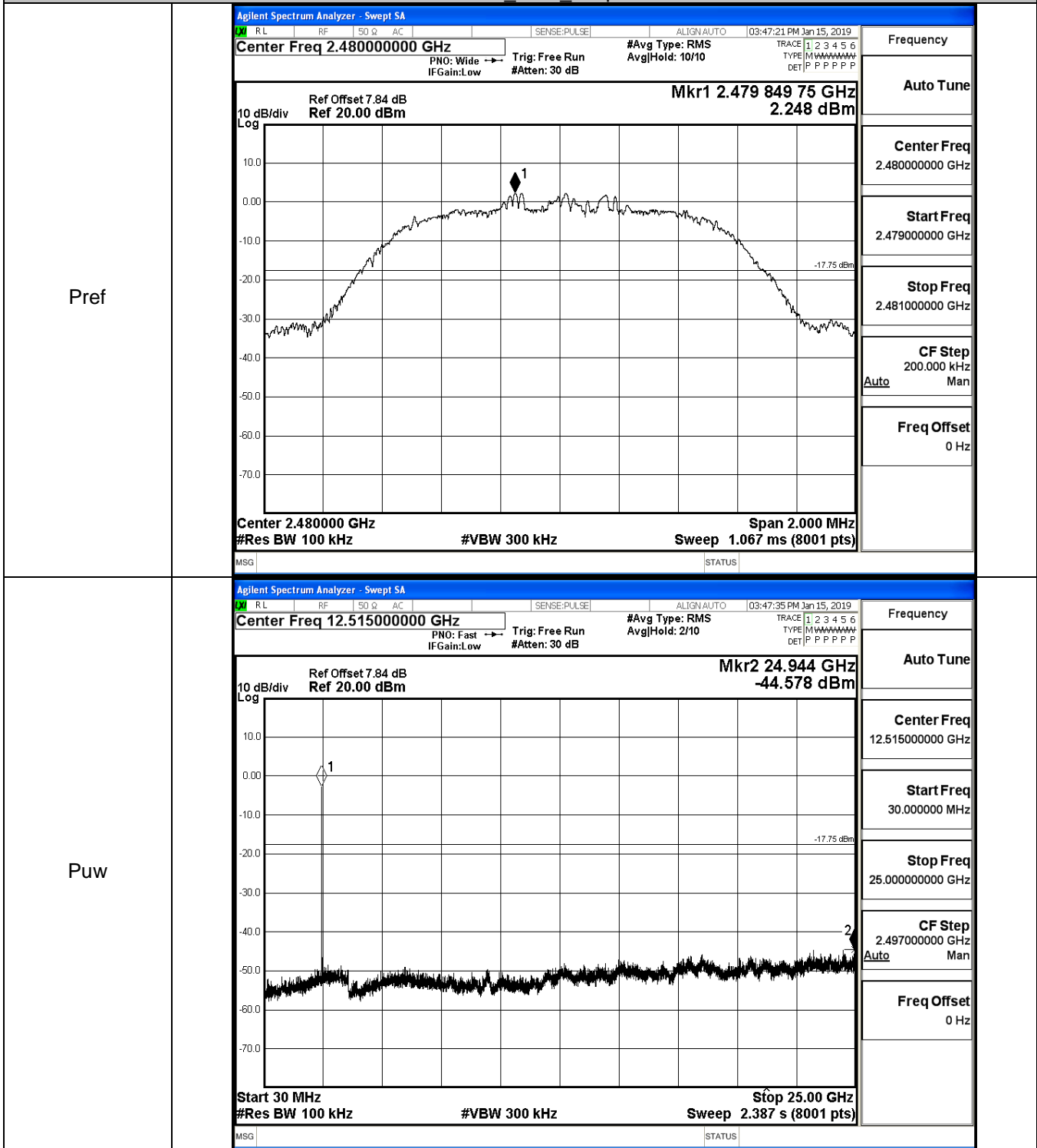
$\pi/4$ DQPSK LCH\_Graphs



$\pi/4$ DQPSK\_MCH\_Graphs



$\pi/4$ DQPSK\_HCH\_Graphs



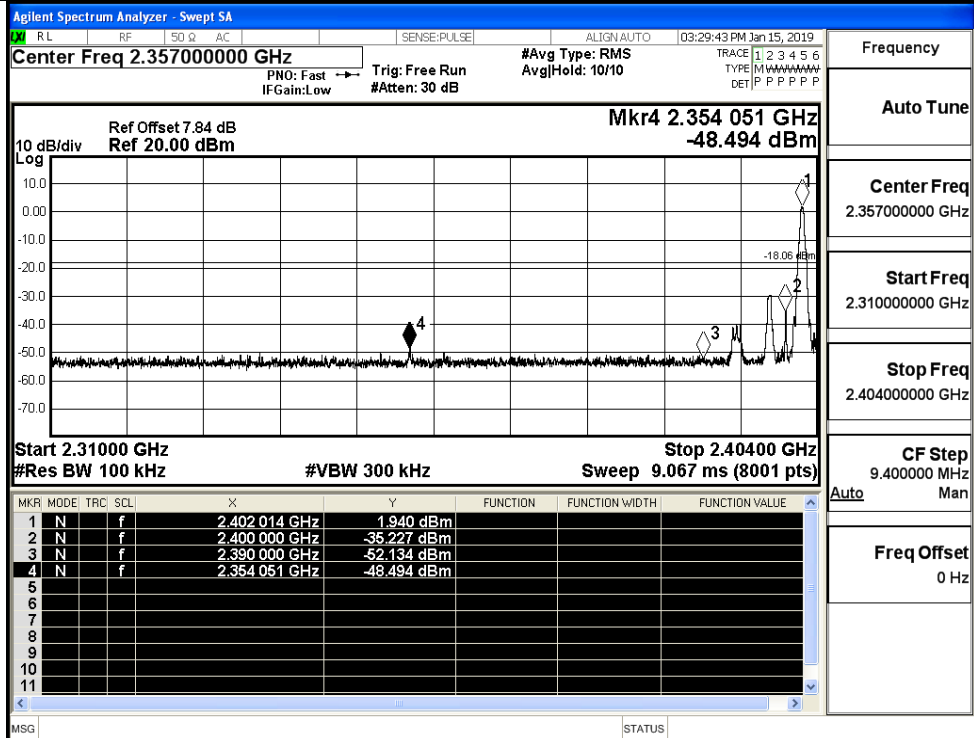


## A.7 Band-edge for RF Conducted Emissions

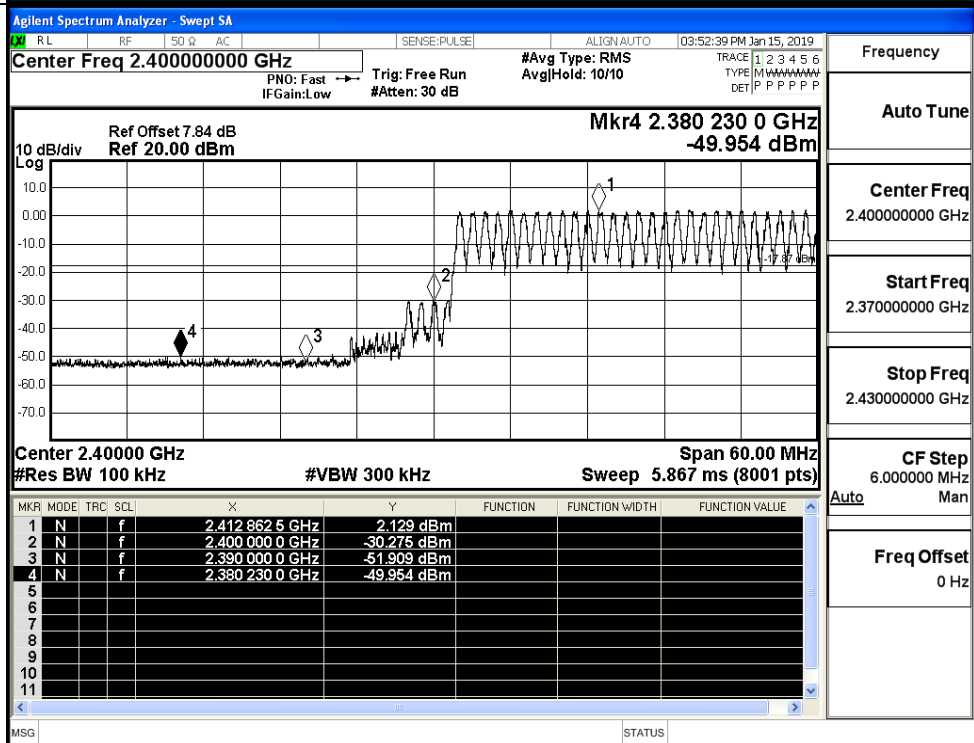
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	1.940	Off	-48.494	-18.06	PASS
			2.129	On	-49.954	-17.87	PASS
	HCH	2480	2.329	Off	-40.501	-17.67	PASS
			2.469	On	-41.617	-17.53	PASS
$\pi/4$ DQPSK	LCH	2402	1.806	Off	-50.076	-18.19	PASS
			2.186	On	-49.626	-17.81	PASS
	HCH	2480	1.271	Off	-43.737	-18.73	PASS
			2.352	On	-41.804	-17.65	PASS

Test Graphs

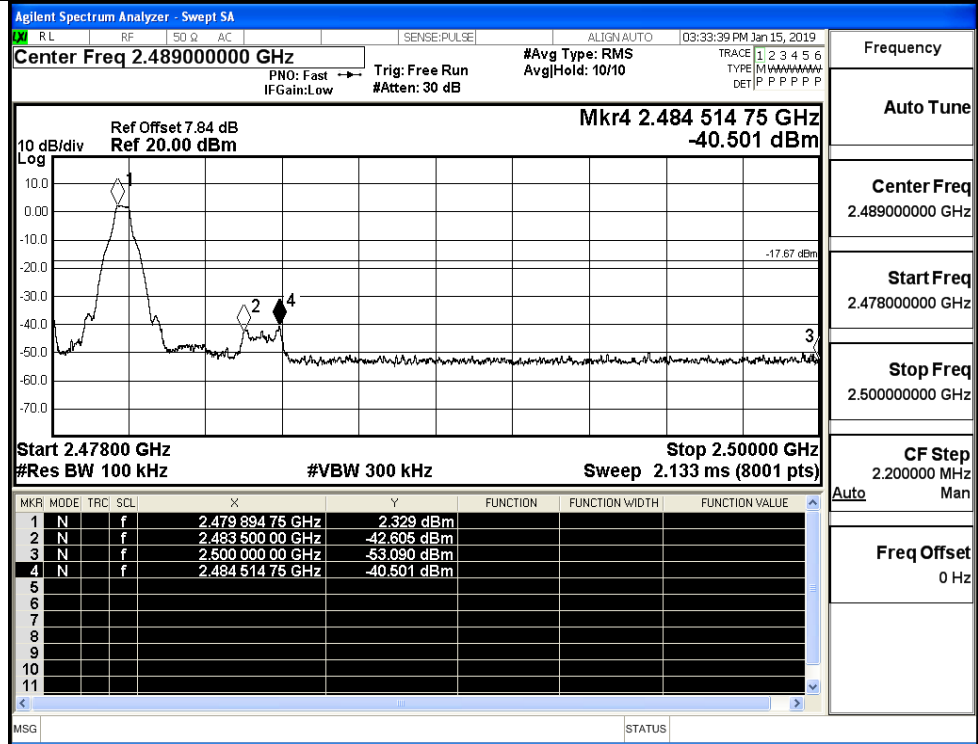
GFSK/LCH/No Hop



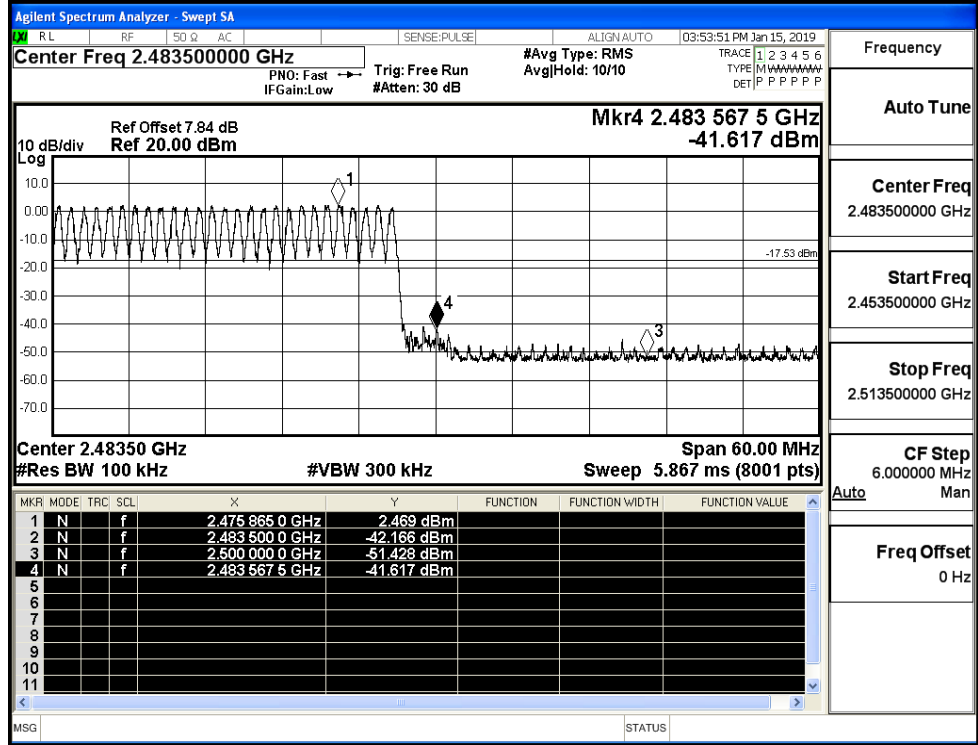
GFSK/LCH/Hop



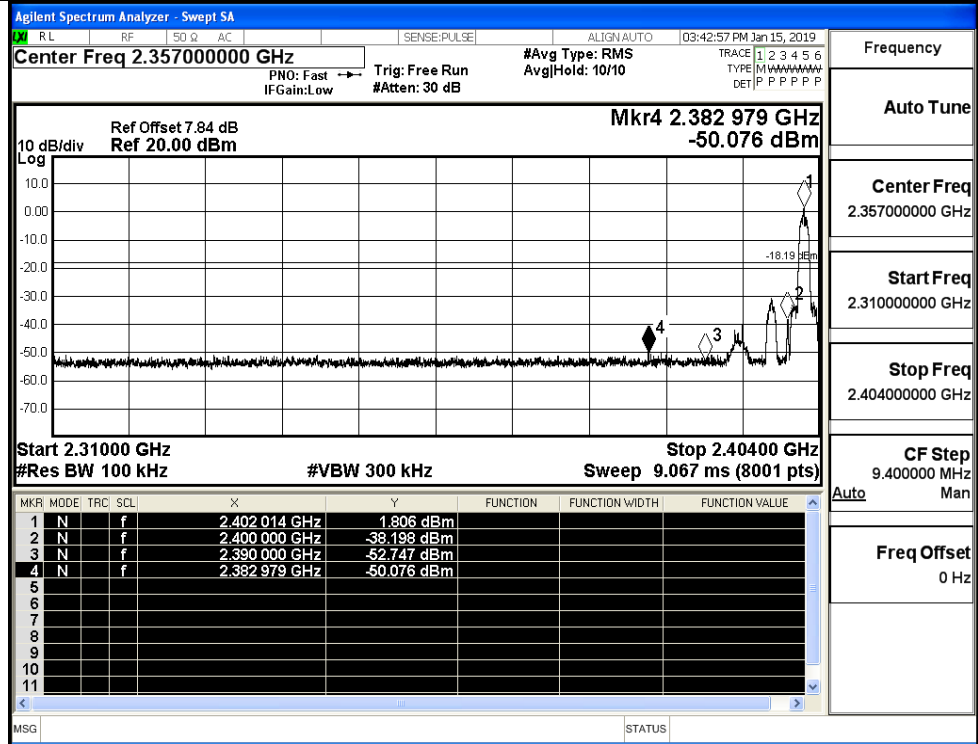
GFSK/HCH/No Hop



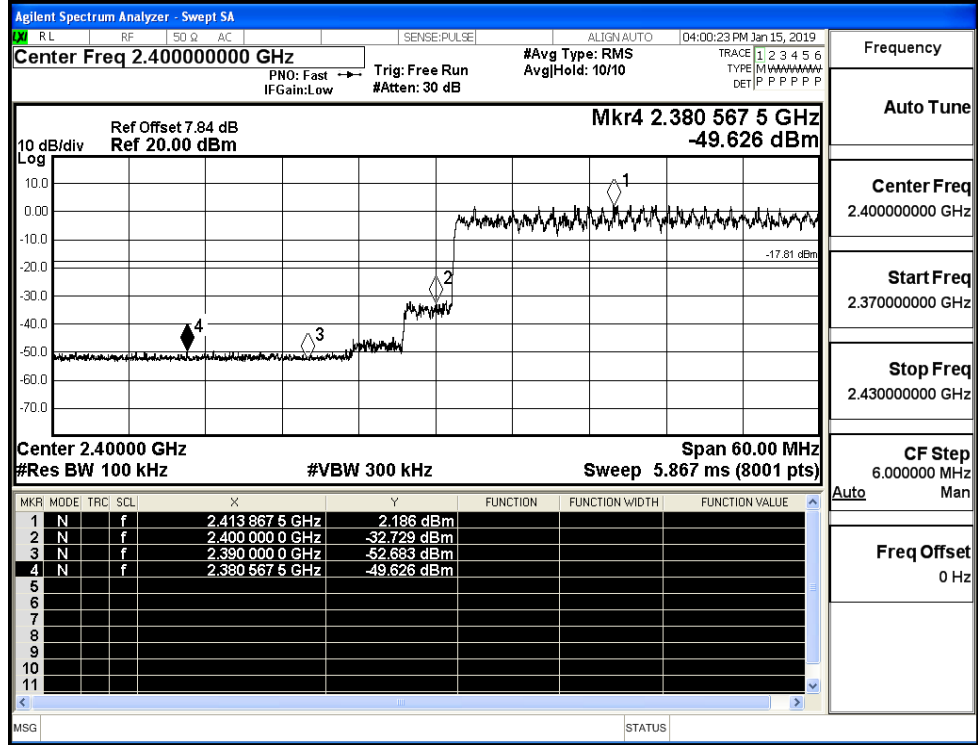
GFSK/HCH/Hop



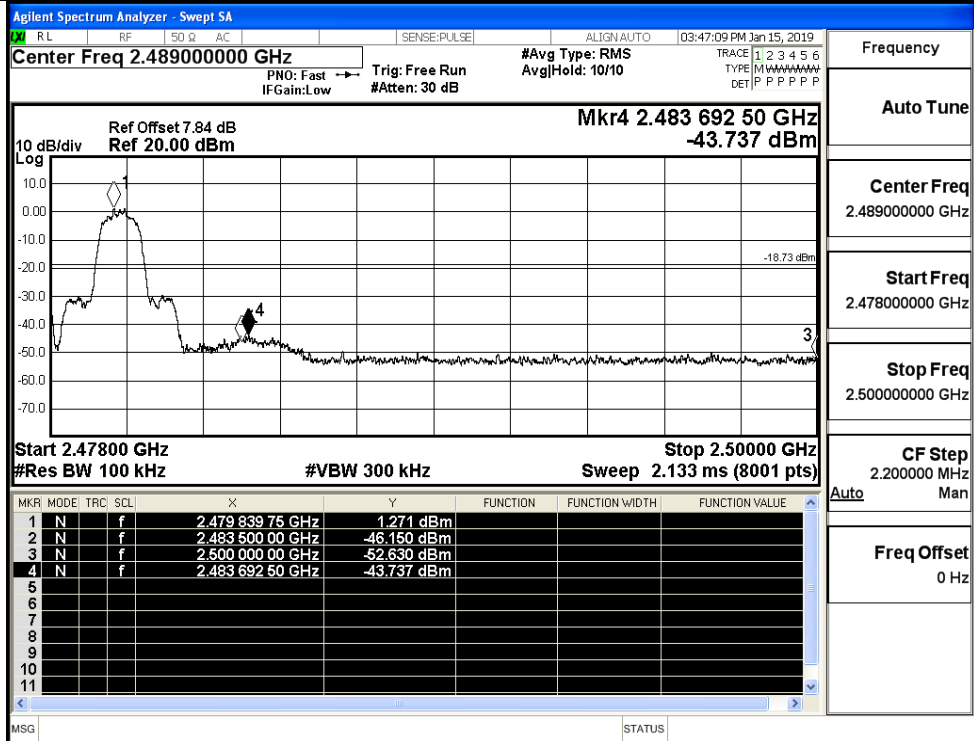
$\pi/4$ DQPSK/LCH/No Hop



$\pi/4$ DQPSK/LCH/Hop

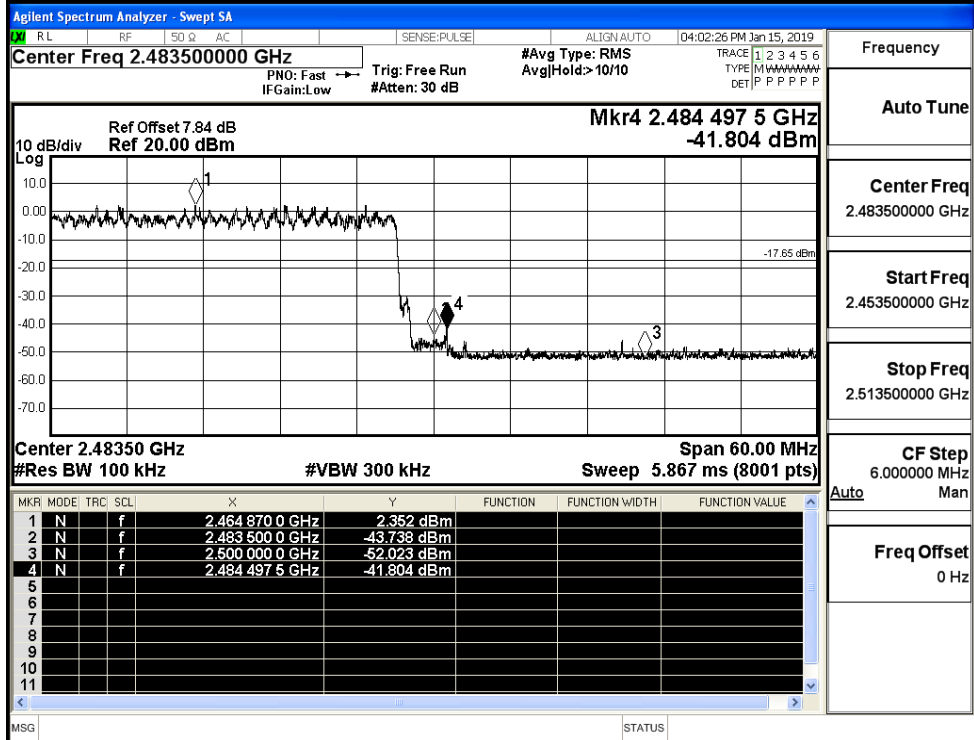


$\pi/4$ DQPSK/HCH/No  
Hop



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

$\pi/4$ DQPSK/HCH/Hop

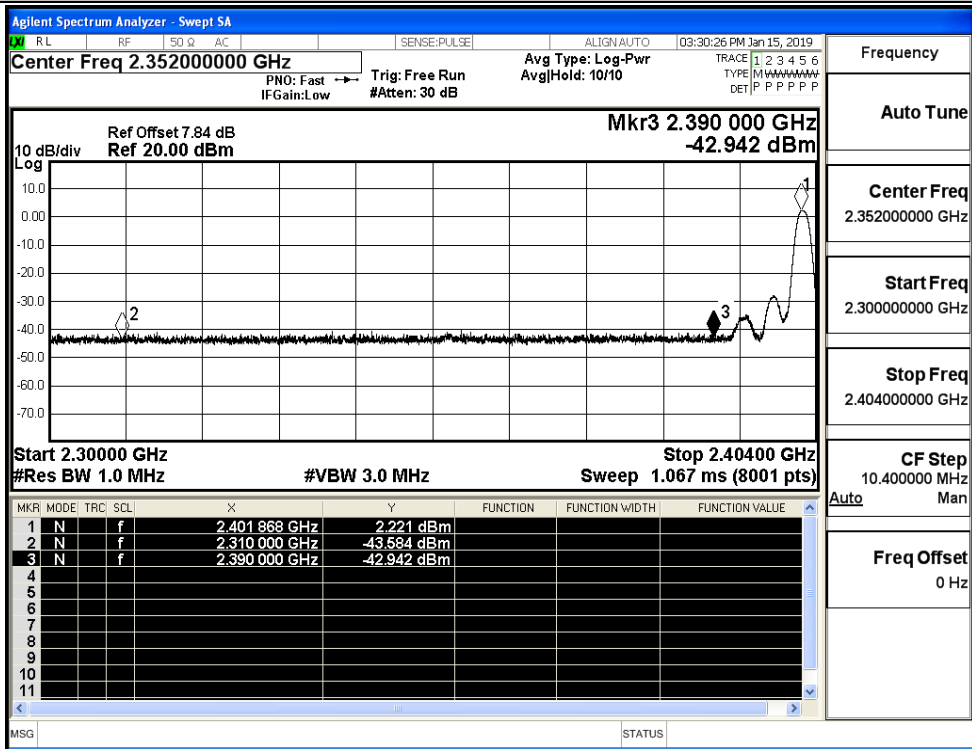


Frequency	
Auto Tune	
Center Freq	2.483500000 GHz
Start Freq	2.453500000 GHz
Stop Freq	2.513500000 GHz
CF Step	6.000000 MHz
Auto	Man
Freq Offset	0 Hz

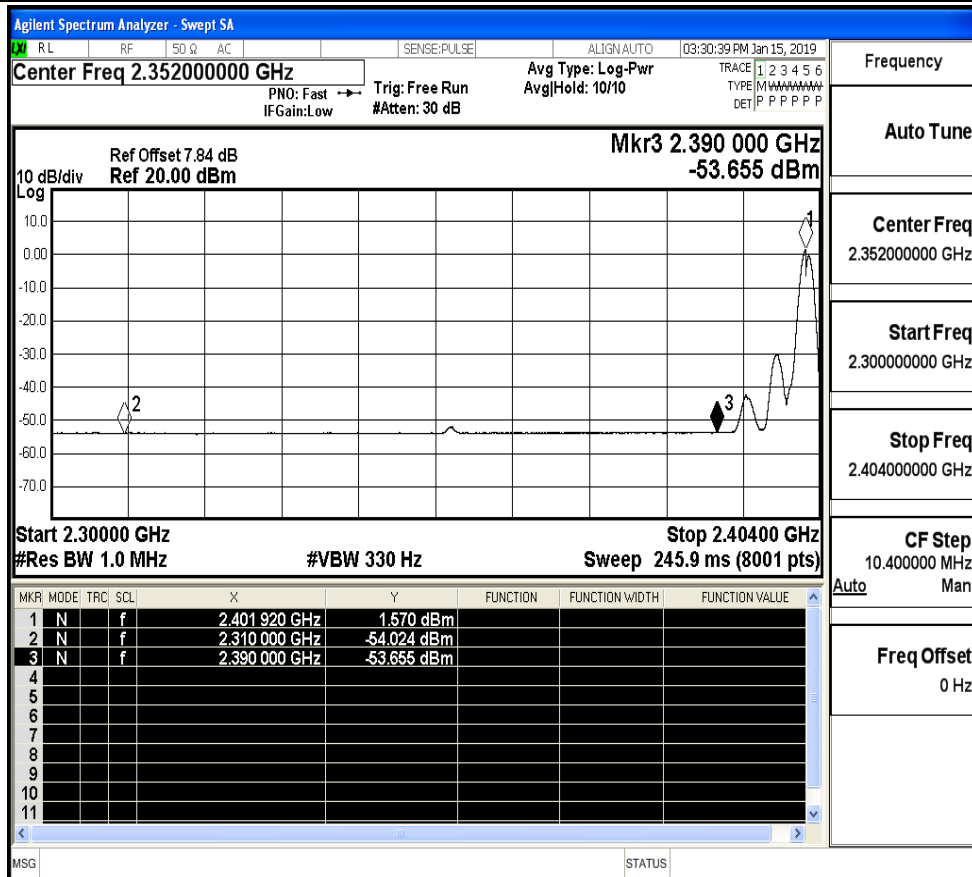
## A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.58	2.0	0	51.67	PEAK	74	PASS
	Off	2310.0	-54.02	2.0	0	41.23	AV	54	PASS
	Off	2390.0	-42.94	2.0	0	52.32	PEAK	74	PASS
	Off	2390.0	-53.66	2.0	0	41.60	AV	54	PASS
	Off	2483.5	-35.62	2.0	0	59.64	PEAK	74	PASS
	Off	2483.5	-44.07	2.0	0	51.19	AV	54	PASS
	Off	2500.0	-43.41	2.0	0	51.85	PEAK	74	PASS
	Off	2500.0	-53.32	2.0	0	41.94	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-44.48	2.0	0	50.78	PEAK	74	PASS
	Off	2310.0	-53.86	2.0	0	41.39	AV	54	PASS
	Off	2390.0	-44.45	2.0	0	50.81	PEAK	74	PASS
	Off	2390.0	-53.72	2.0	0	41.54	AV	54	PASS
	Off	2483.5	-36.57	2.0	0	58.69	PEAK	74	PASS
	Off	2483.5	-46.41	2.0	0	48.85	AV	54	PASS
	Off	2500.0	-43.09	2.0	0	52.17	PEAK	74	PASS
	Off	2500.0	-53.31	2.0	0	41.95	AV	54	PASS

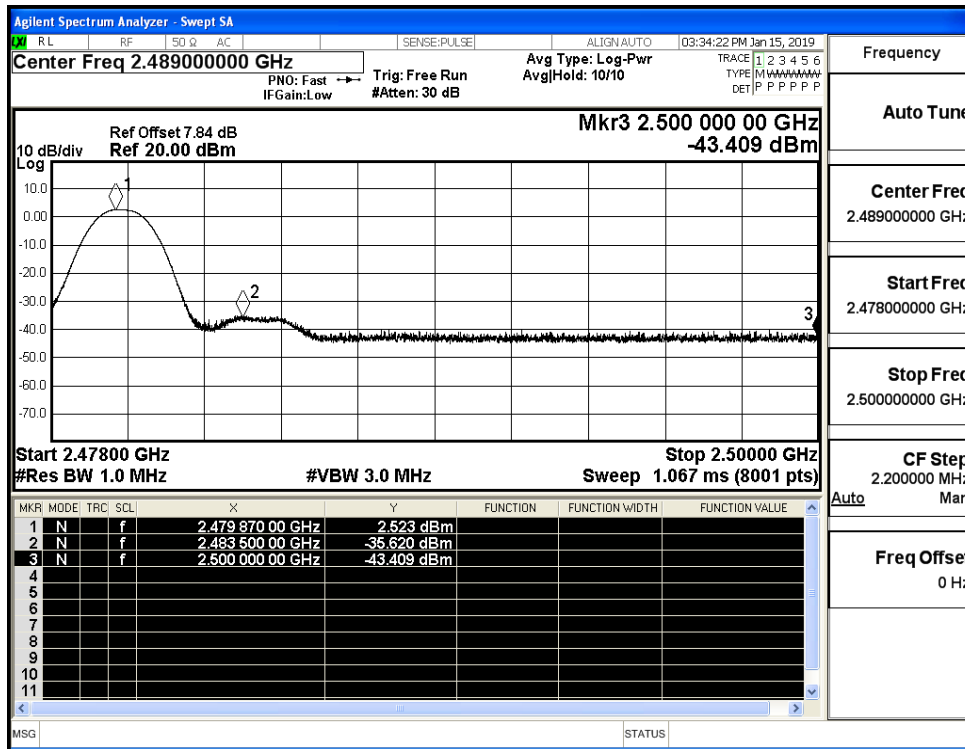
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (Low Channel)



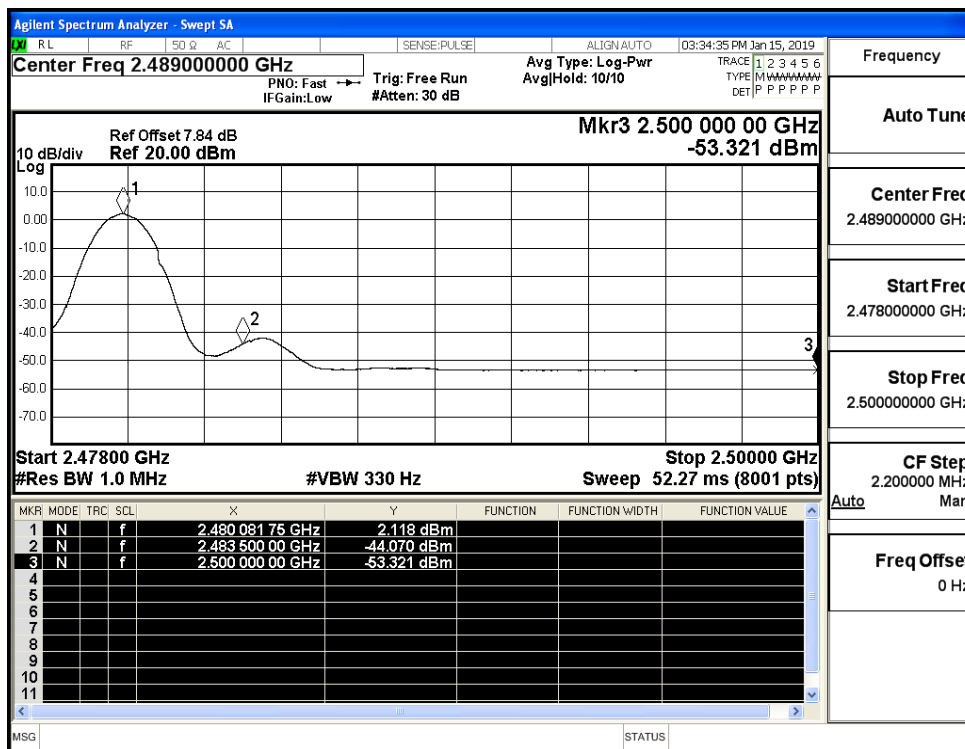
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (Low Channel)



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

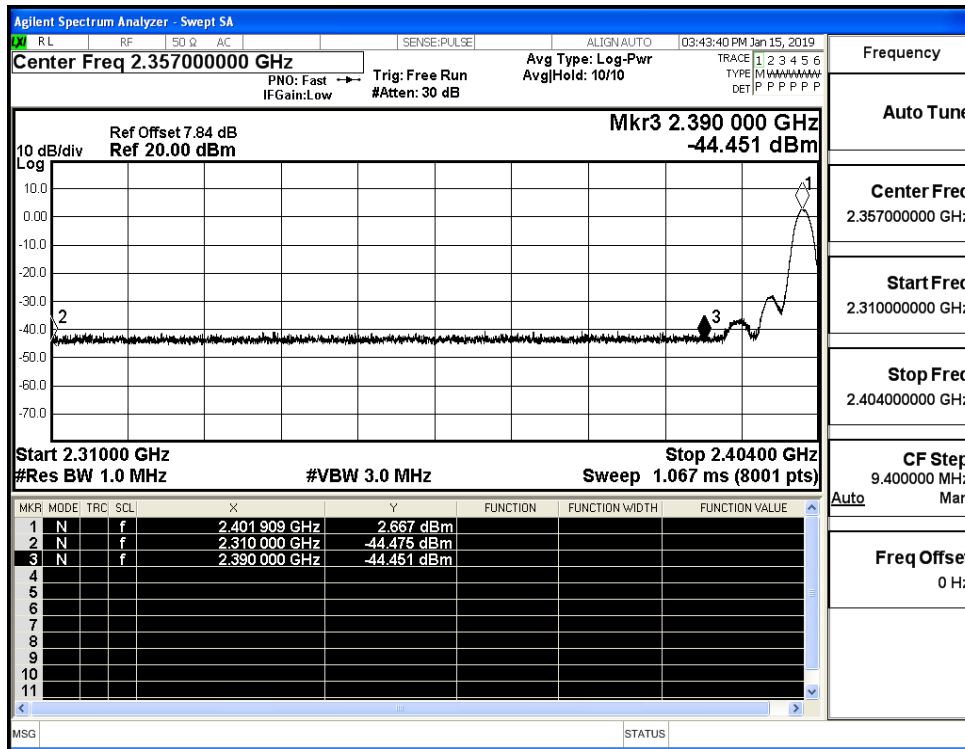


Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (High Channel)

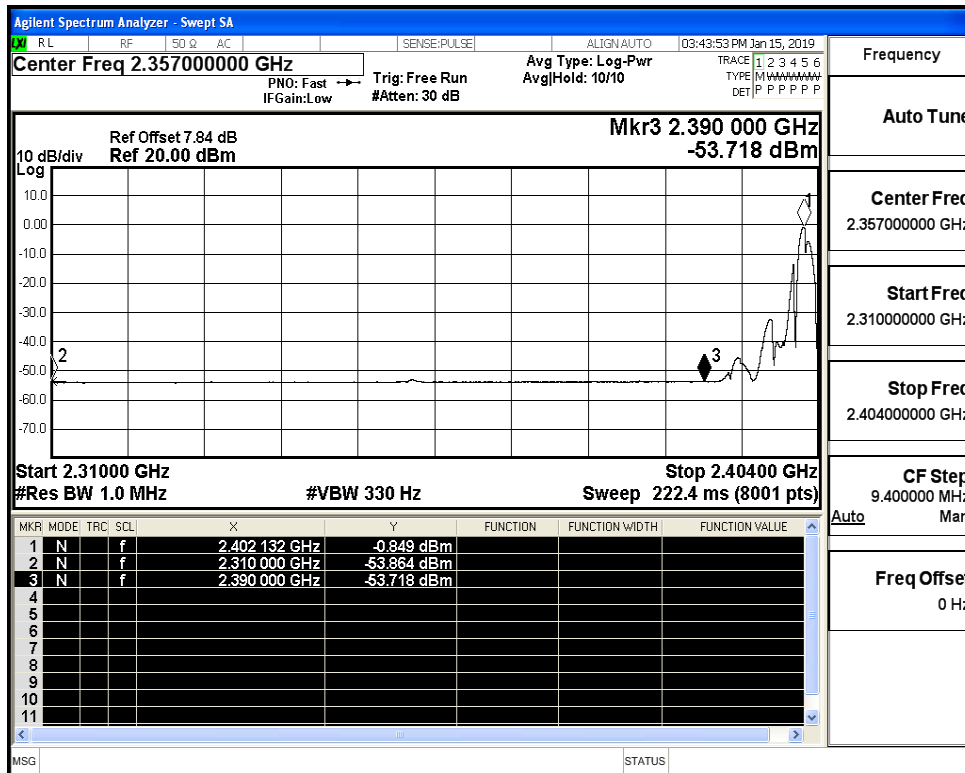




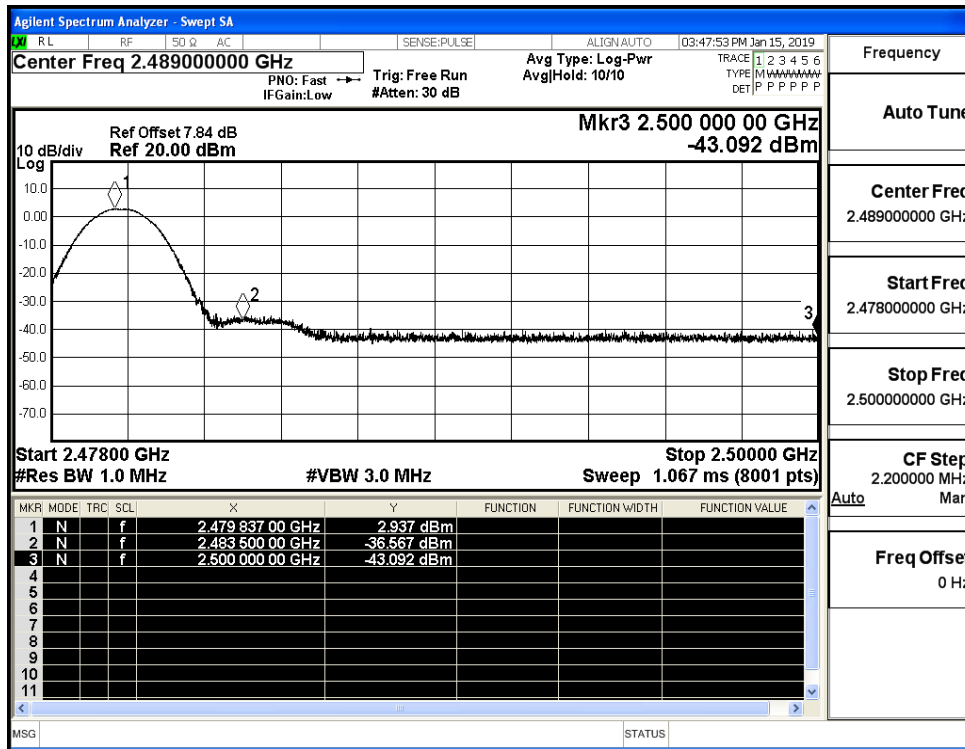
Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_PEAK (Low Channel)



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)

