

## Appendix A

### RF Test Data for BT V4.2 (BDR/EDR) (Conducted Measurement)

Product Name: ACOUSTIC GUITAR AMP

Trade Mark: AROMA, Tom'sline

Test Model: AG-26A

#### Environmental Conditions

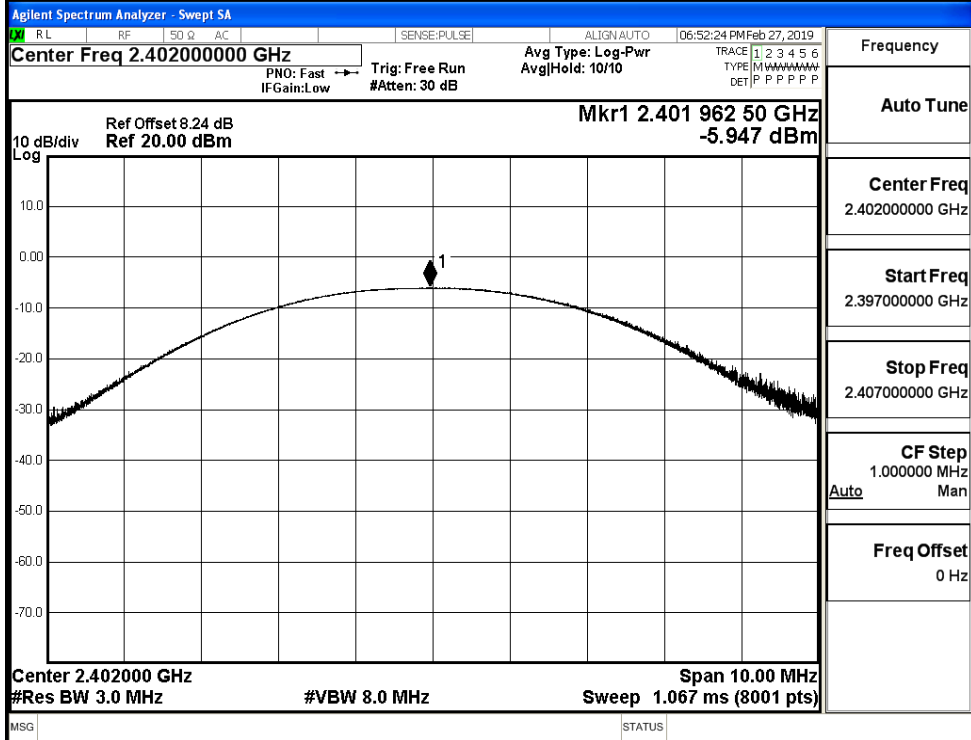
Temperature:	22.8 ° C
Relative Humidity:	53.3%
ATM Pressure:	100.0 kPa
Test Engineer:	David.Luo
Supervised by:	Jayden.Zhuo

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

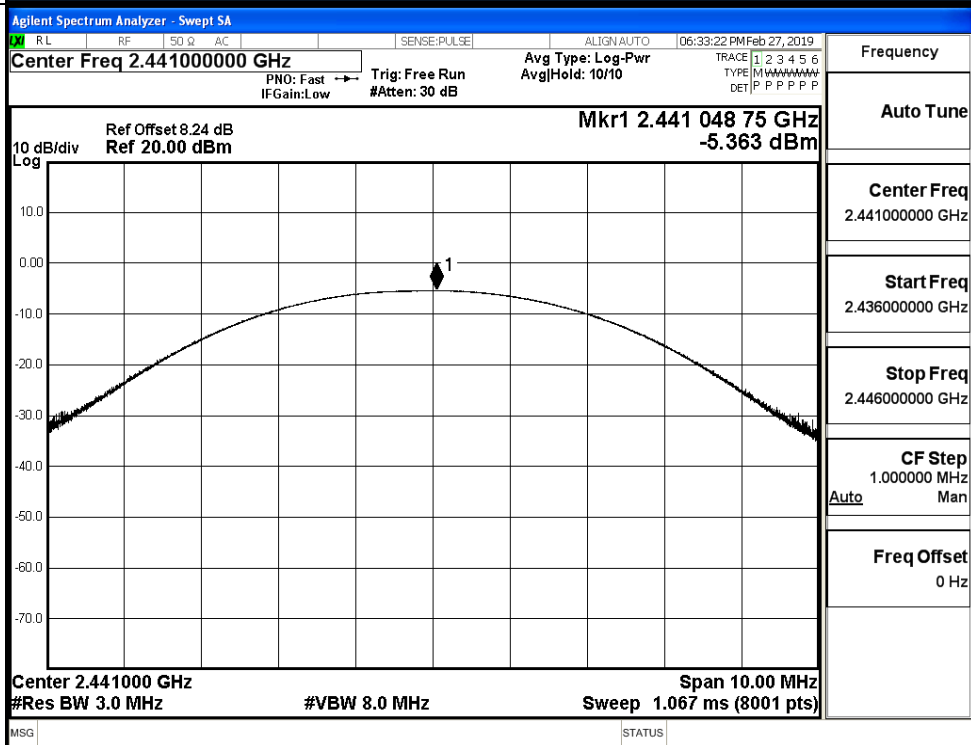
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-5.947	21	PASS
	MCH	-5.363	21	PASS
	HCH	-5.450	21	PASS
$\pi/4$ DQPSK	LCH	-4.852	21	PASS
	MCH	-4.170	21	PASS
	HCH	-4.331	21	PASS

Test Graphs

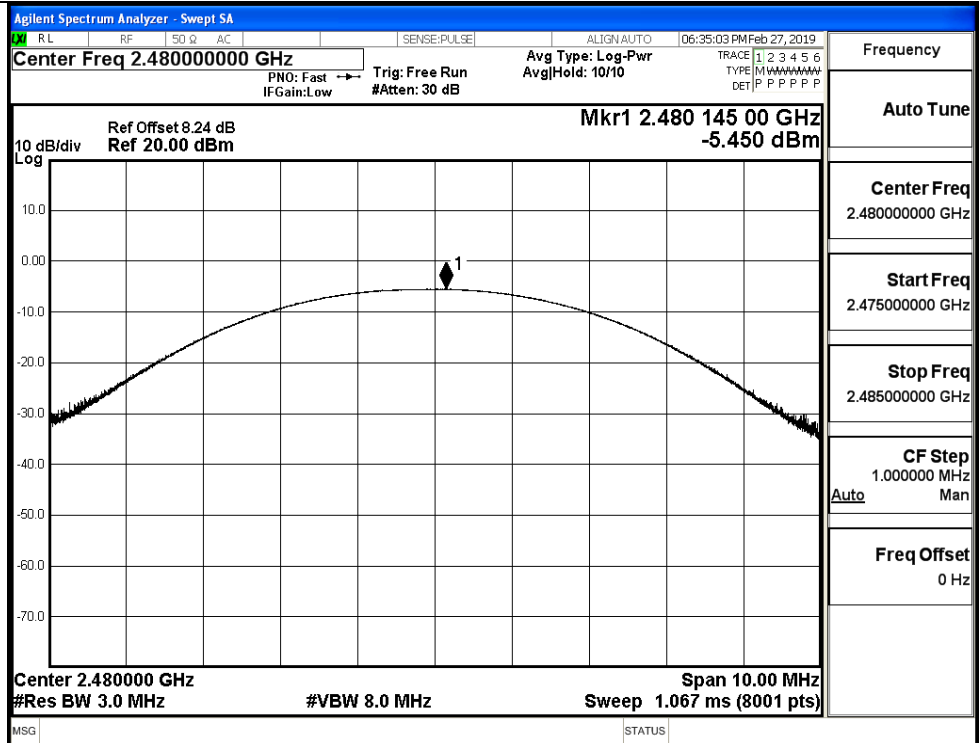
GFSK/LCH



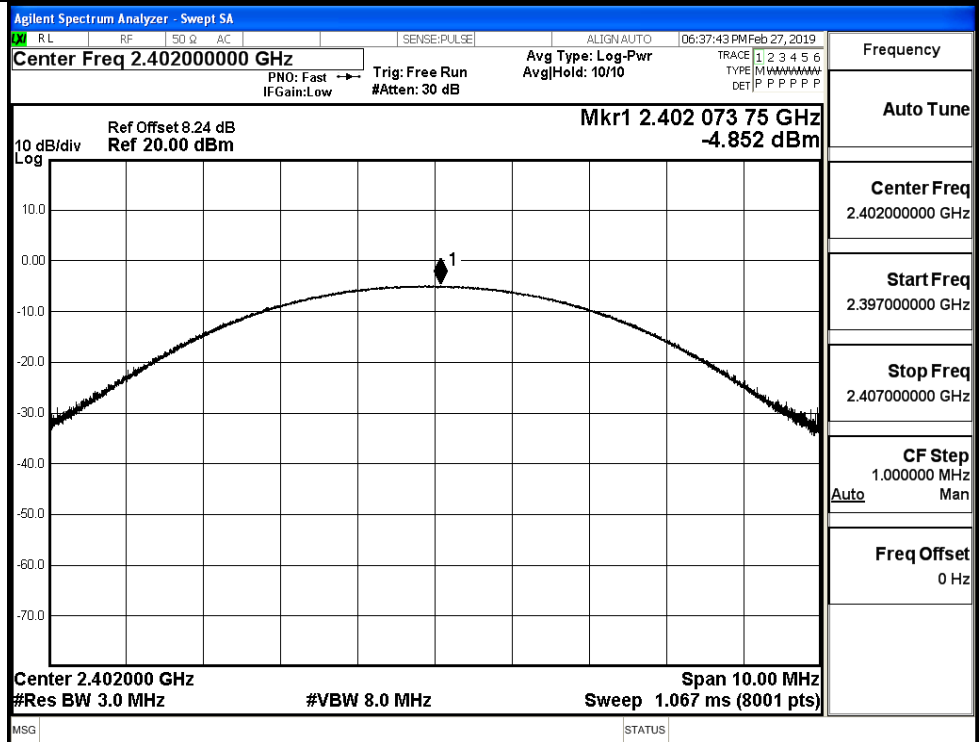
GFSK/MCH



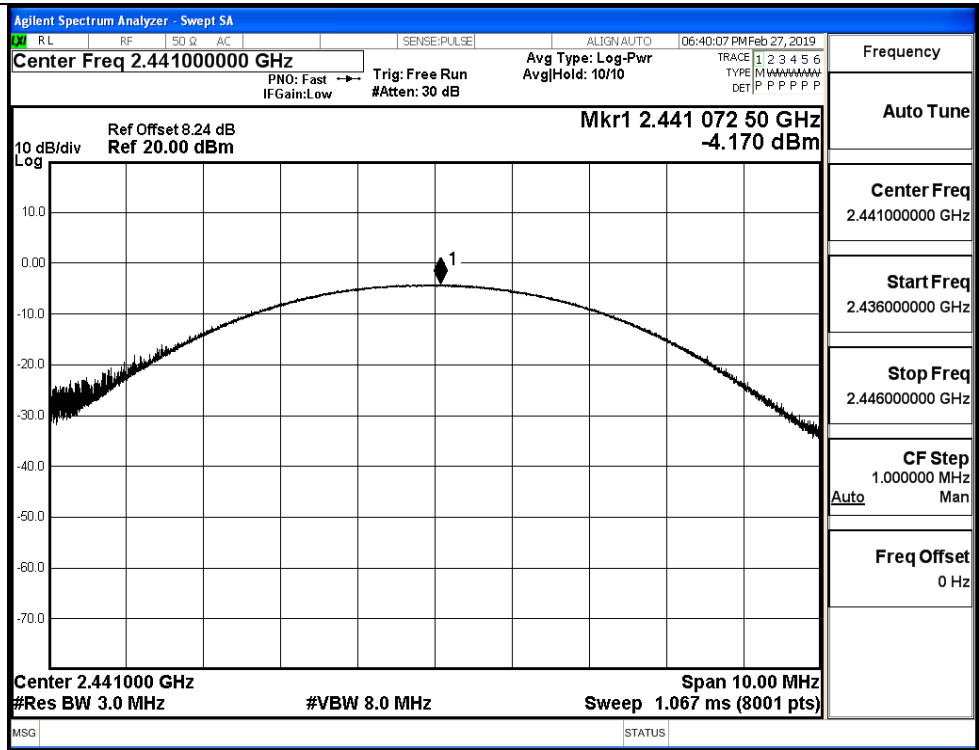
GFSK/HCH



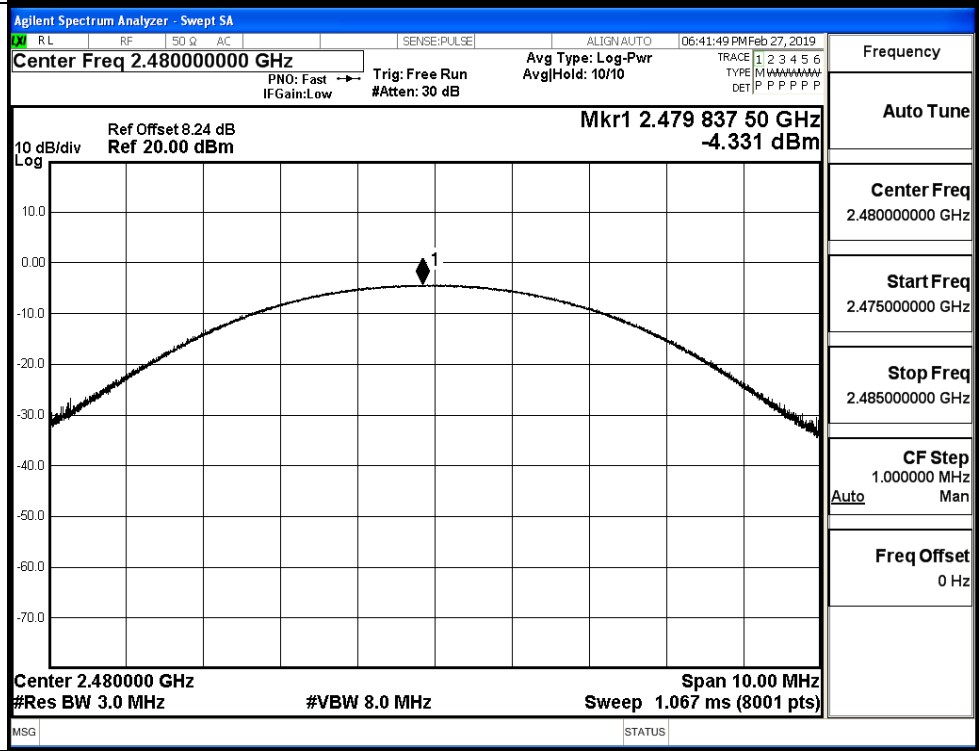
$\pi$ /4DQPSK/LCH



$\pi$ /4DQPSK/MCH

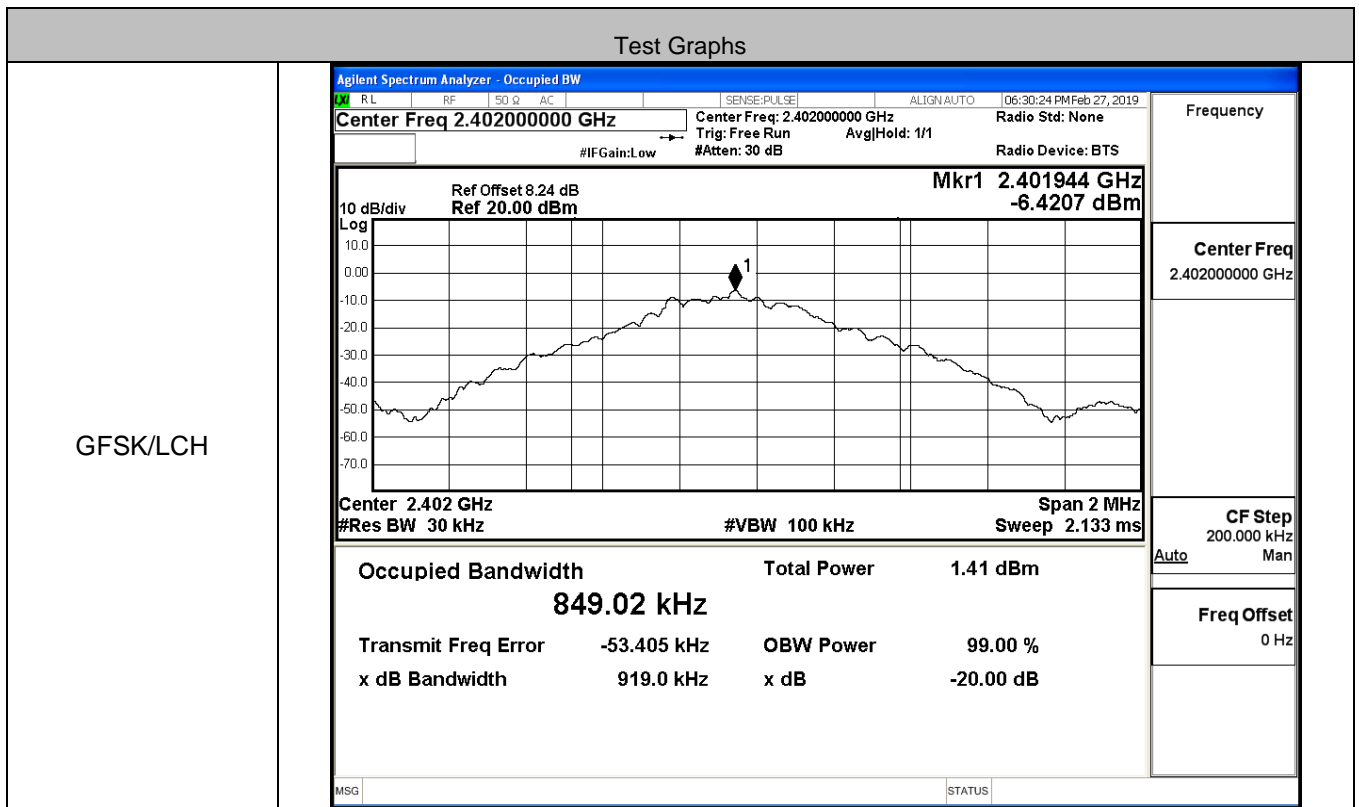


$\pi$ /4DQPSK/HCH

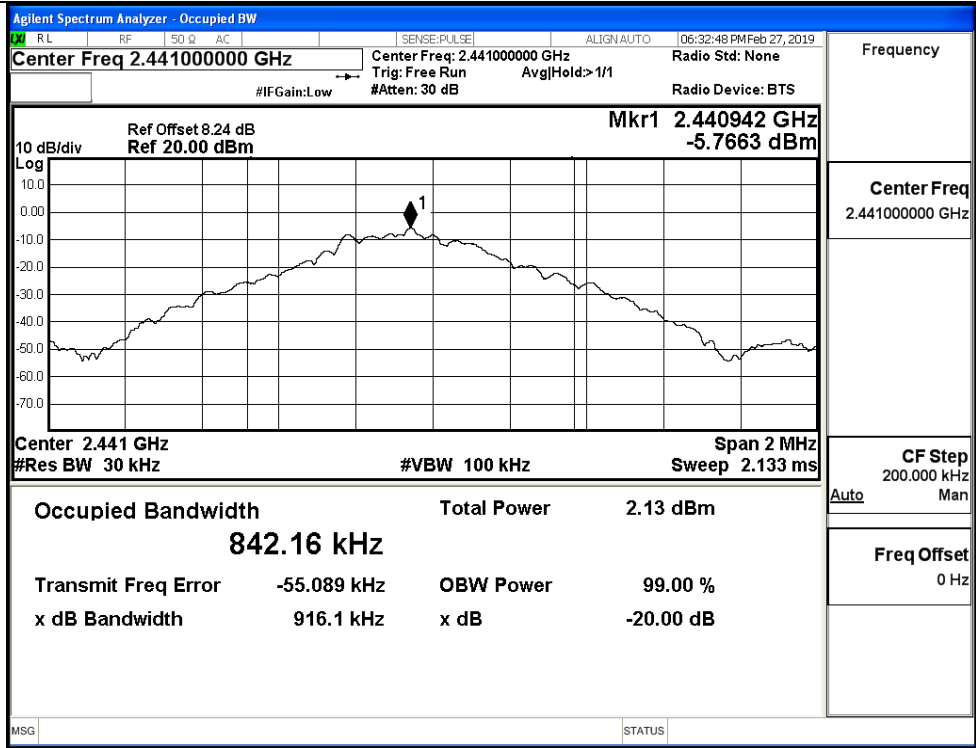


**A.2 99% and 20dB Bandwidth**

Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.84902	0.9190	Not Specified	PASS
	MCH	0.84216	0.9161	Not Specified	PASS
	HCH	0.84661	0.9224	Not Specified	PASS
π/4DQPSK	LCH	1.1642	1.228	Not Specified	PASS
	MCH	1.1643	1.227	Not Specified	PASS
	HCH	1.1640	1.229	Not Specified	PASS

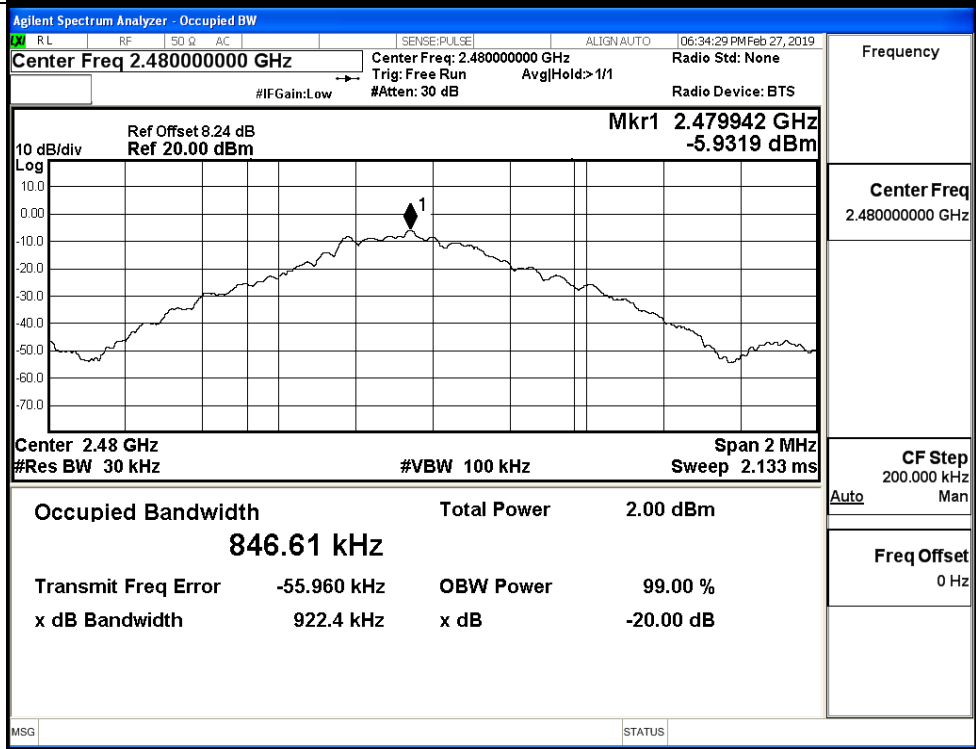


GFSK/MCH



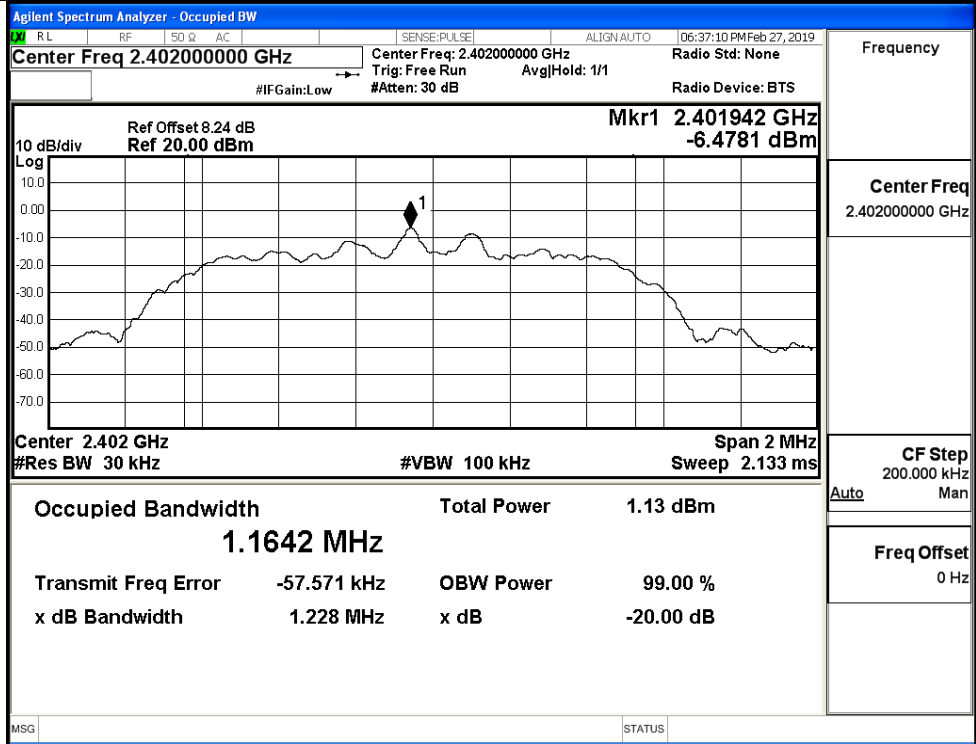
Frequency	2.441000000 GHz
Center Freq	2.441000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

GFSK/HCH

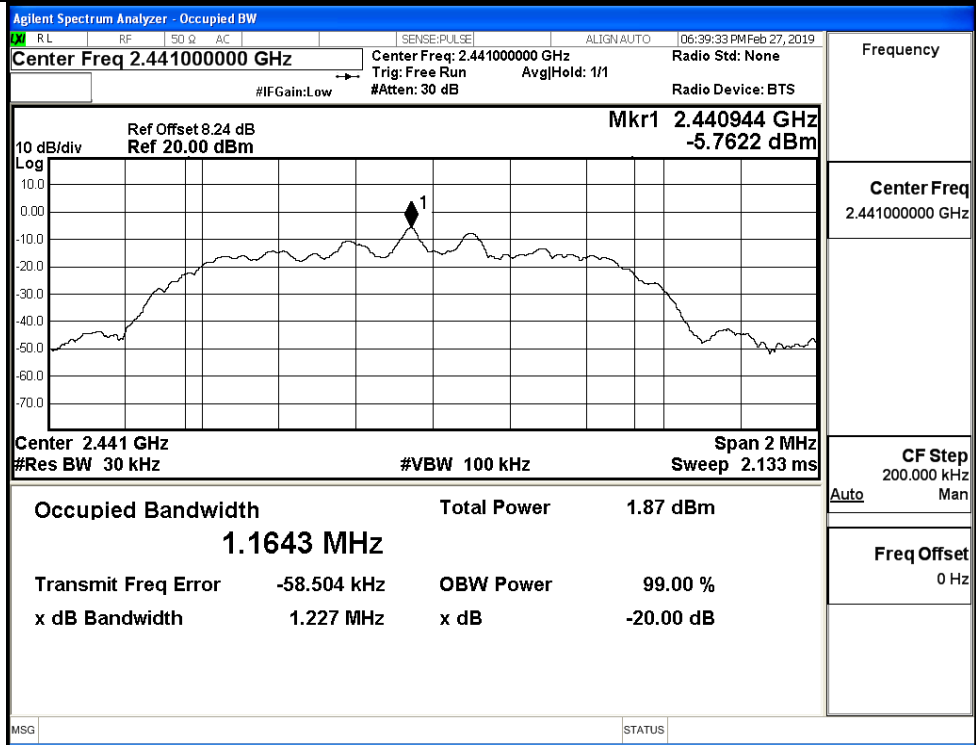


Frequency	2.480000000 GHz
Center Freq	2.480000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

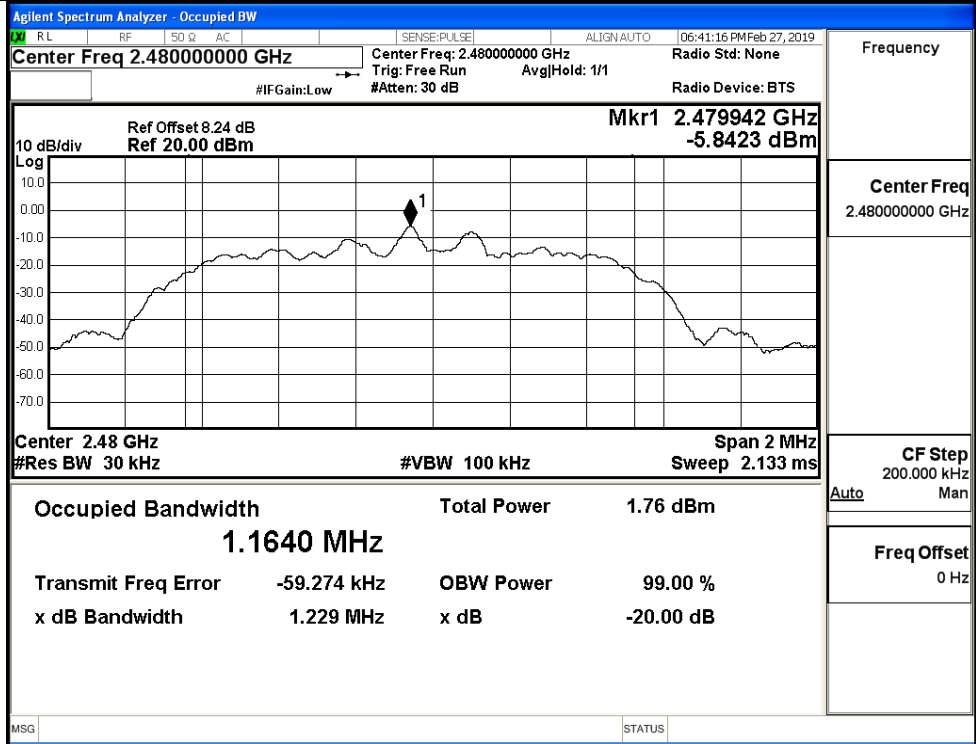
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH



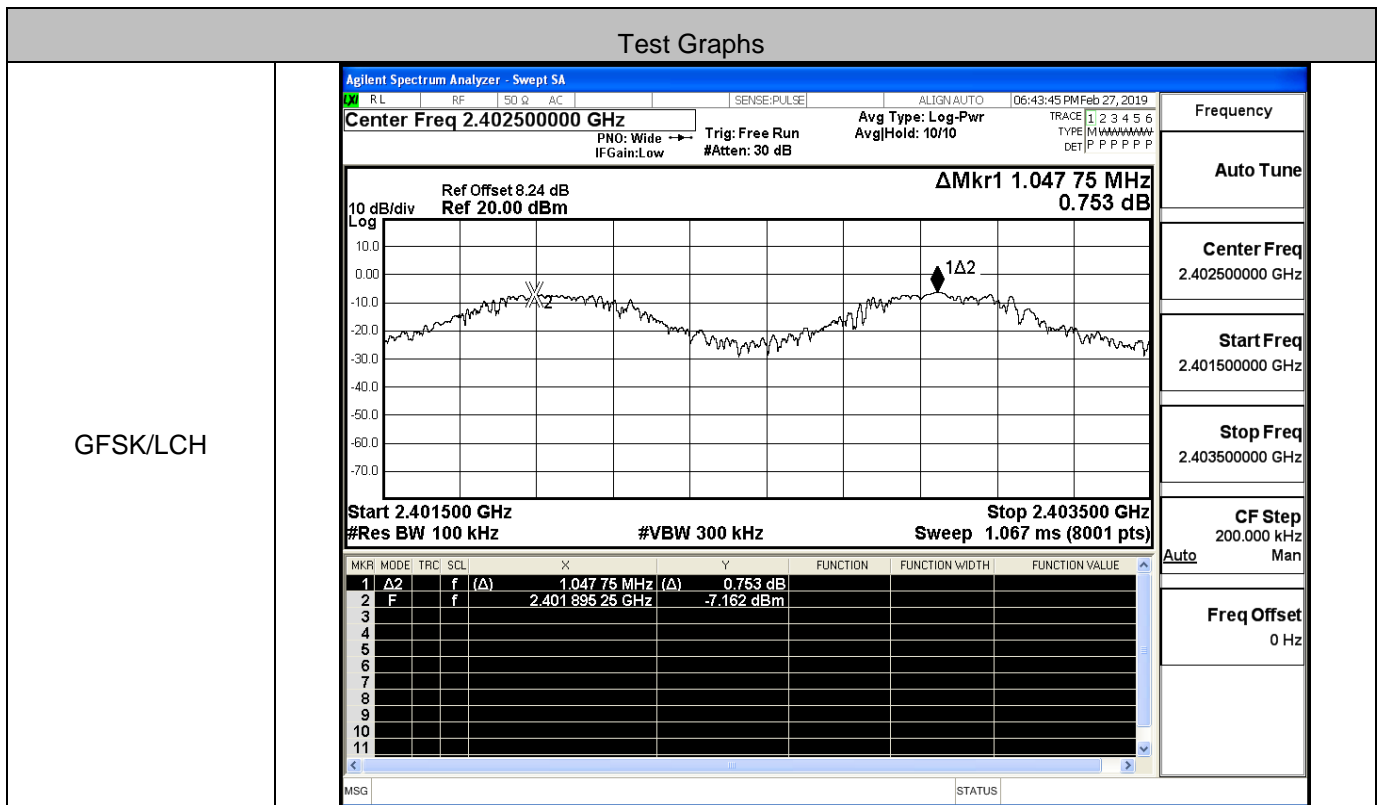
$\pi/4$ DQPSK/HCH



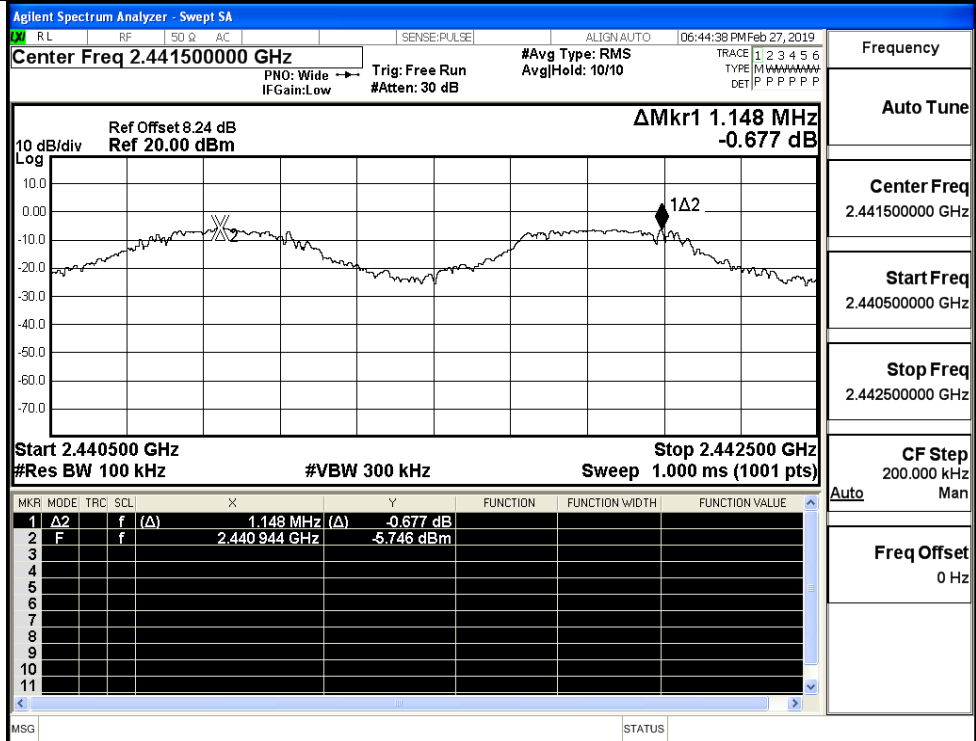


### A.3 Carrier Frequency Separation

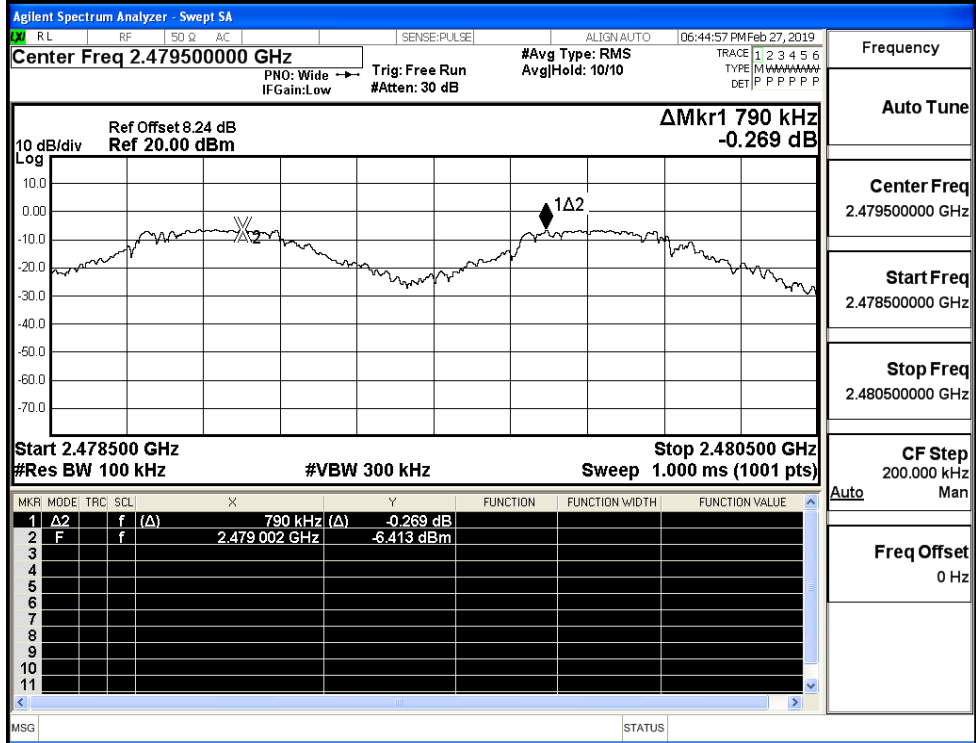
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.048	0.615	PASS
	MCH	1.148	0.615	PASS
	HCH	0.790	0.615	PASS
π/4DQPSK	LCH	1.146	0.819	PASS
	MCH	0.976	0.819	PASS
	HCH	1.326	0.819	PASS



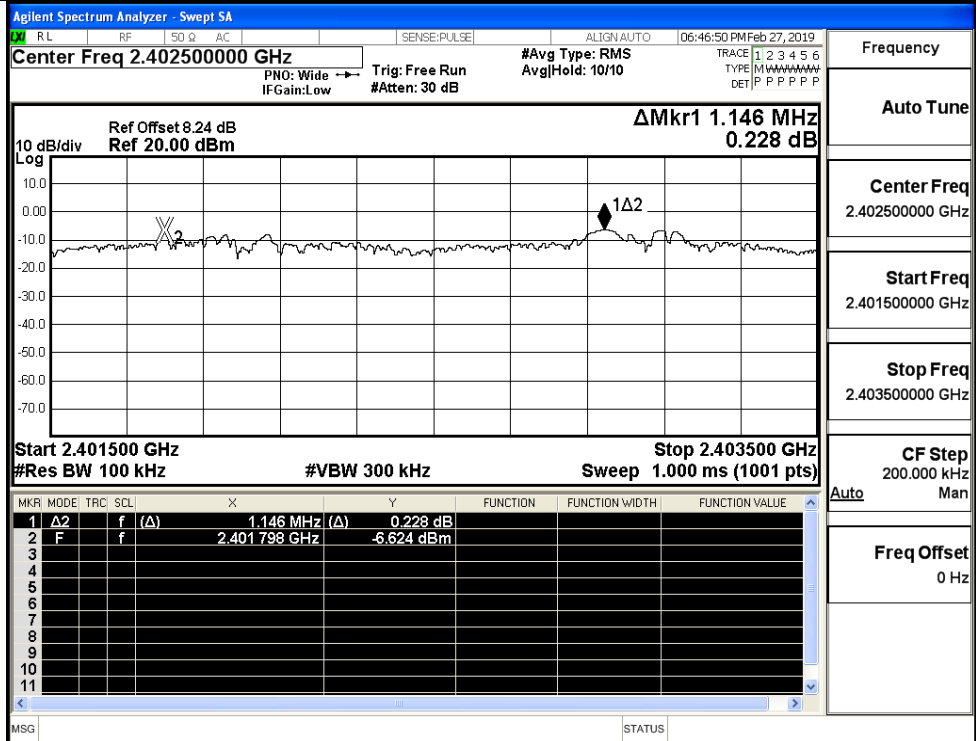
GFSK/MCH



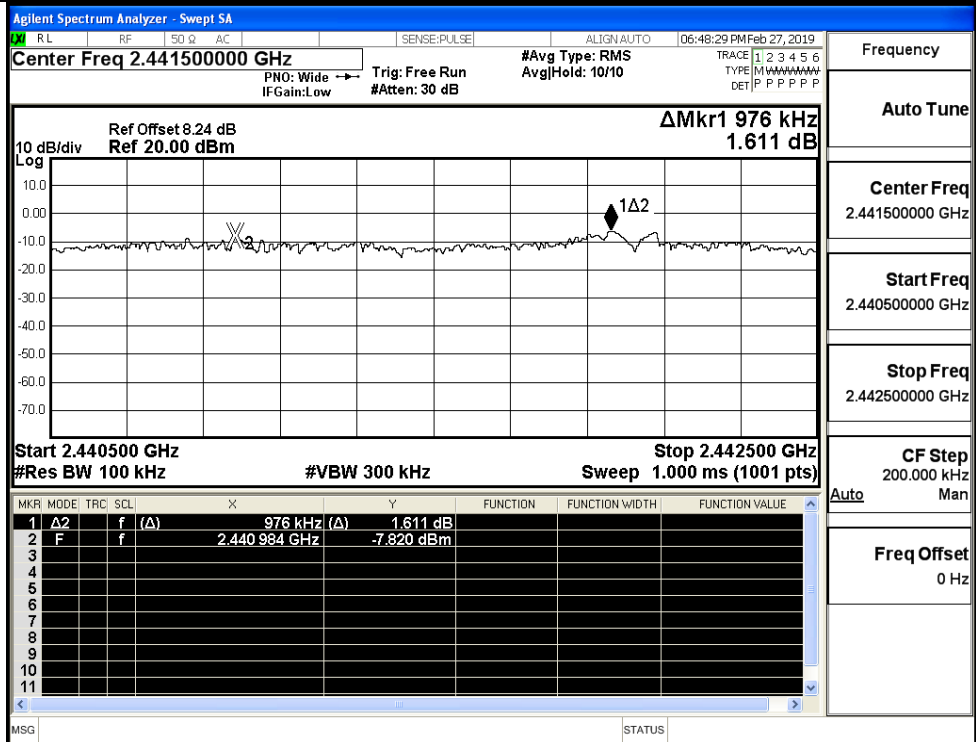
GFSK/HCH



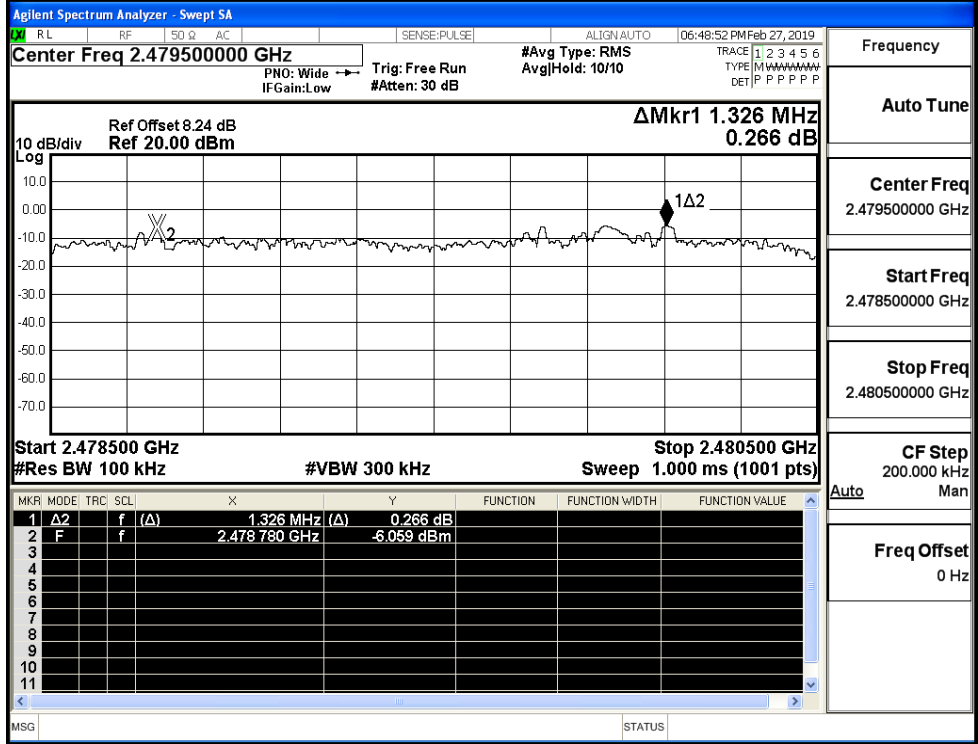
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH



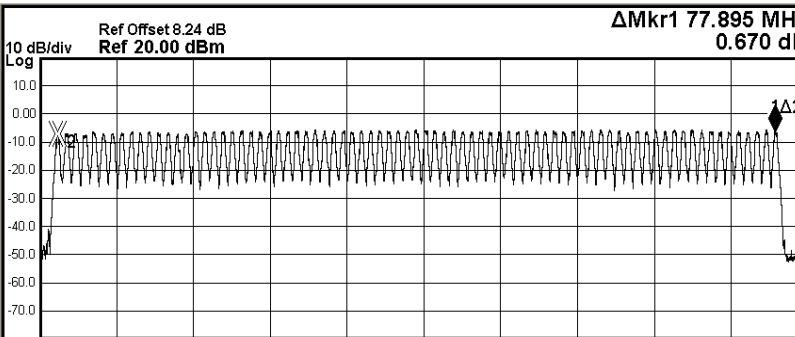
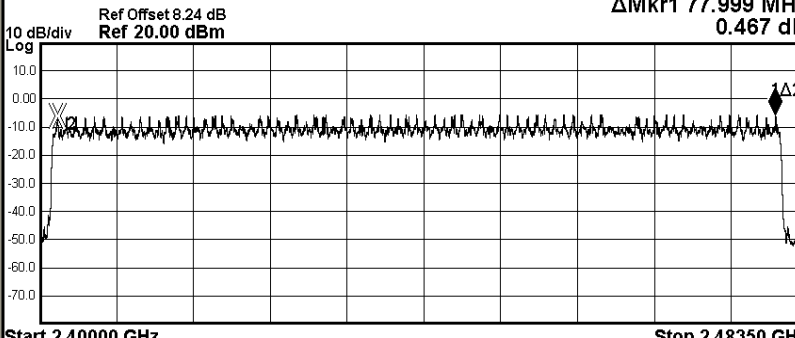
$\pi/4$ DQPSK/HCH



### A.4 Hopping Channel Number

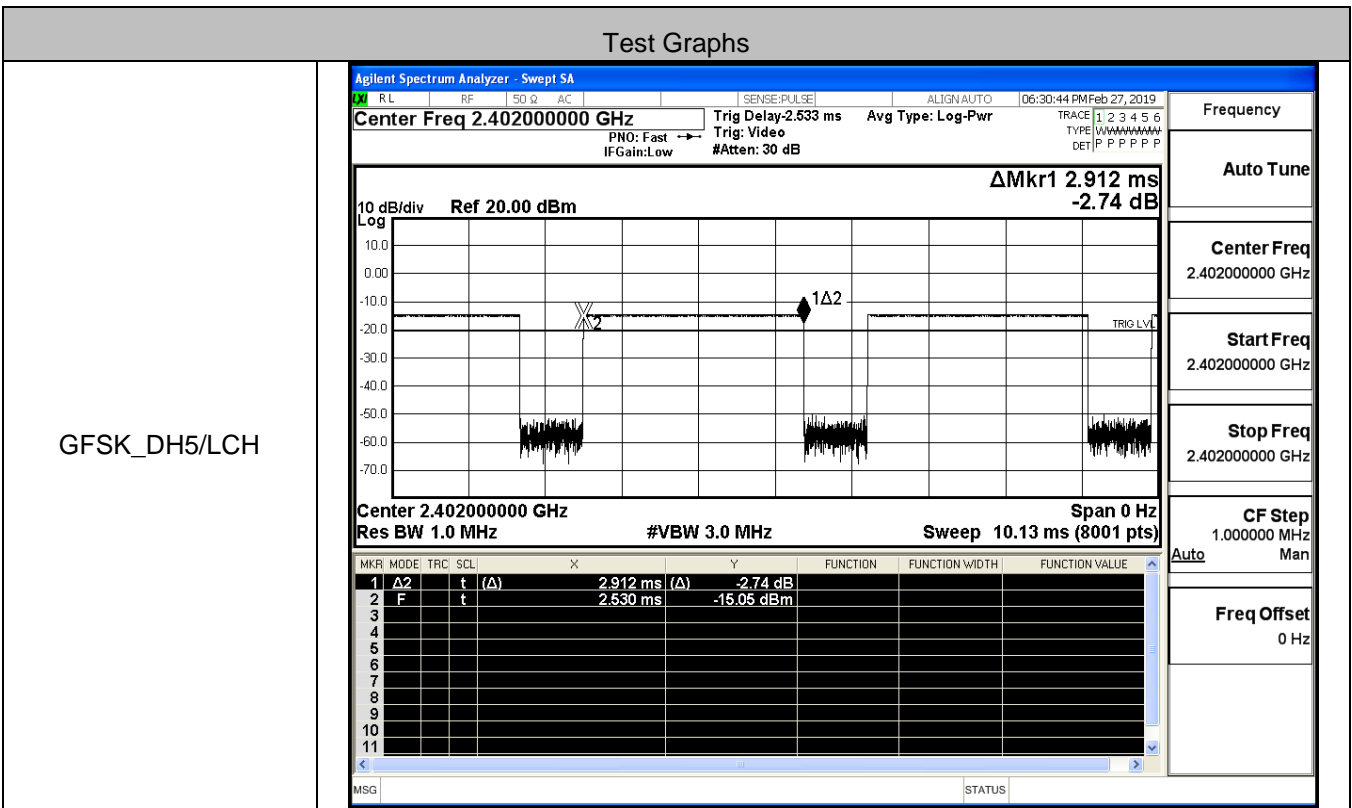
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS

Test Graphs

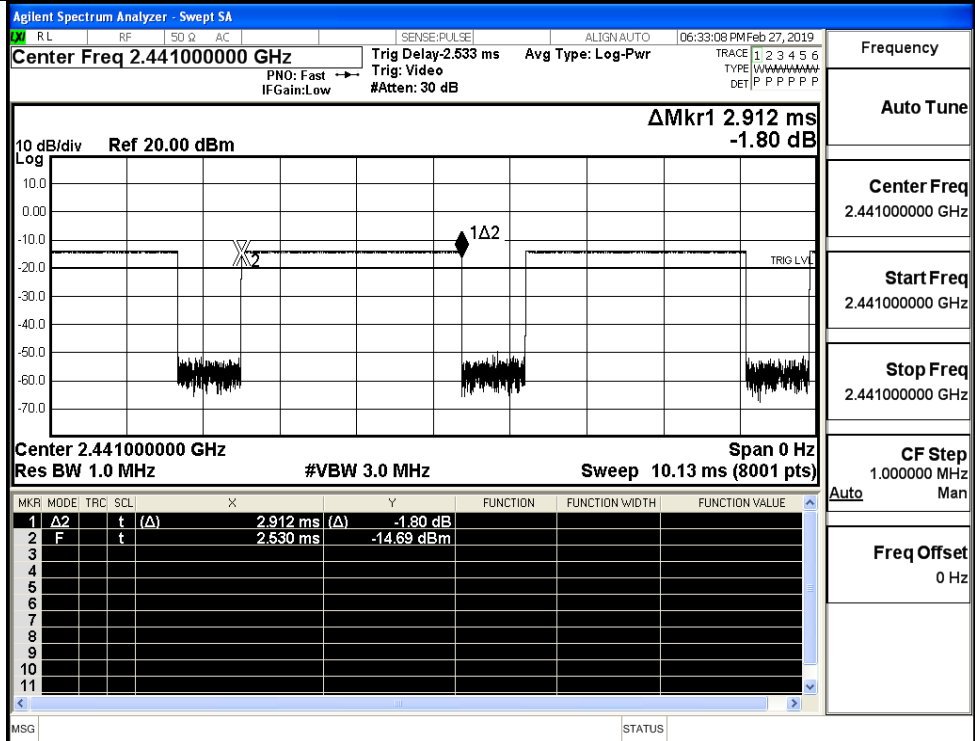
GFSK/Hop	<div style="border: 1px solid black; padding: 5px;"> <p style="font-size: small; margin: 0;">Agilent Spectrum Analyzer - Swept SA</p> <p style="font-size: x-small; margin: 0;">RL RF 50 Q AC SENSE:PULSE ALIGN:AUTO 06:46:16 PM Feb 27, 2019</p> <p style="font-size: small; margin: 0;">Center Freq 2.441750000 GHz #Avg Type: RMS PNO: Fast IFGain:Low Trig: Free Run #Atten: 30 dB #Res BW 100 kHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <p style="font-size: x-small; margin: 0;">Ref Offset 8.24 dB Ref 20.00 dBm <math>\Delta</math>Mkr1 77.895 MHz 0.670 dB</p>  <p style="font-size: x-small; margin: 0;">Start 2.40000 GHz Stop 2.48350 GHz</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <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>77.895 MHz (<math>\Delta</math>)</td> <td>0.670 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.401983 GHz</td> <td>-7.161 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> </div>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	$\Delta$ 2	f	( $\Delta$ )	77.895 MHz ( $\Delta$ )	0.670 dB				2	F	f		2.401983 GHz	-7.161 dBm			
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	$\Delta$ 2	f	( $\Delta$ )	77.895 MHz ( $\Delta$ )	0.670 dB																							
2	F	f		2.401983 GHz	-7.161 dBm																							
$\pi/4$ DQPSK/Hop	<div style="border: 1px solid black; padding: 5px;"> <p style="font-size: small; margin: 0;">Agilent Spectrum Analyzer - Swept SA</p> <p style="font-size: x-small; margin: 0;">RL RF 50 Q AC SENSE:PULSE ALIGN:AUTO 06:51:22 PM Feb 27, 2019</p> <p style="font-size: small; margin: 0;">Center Freq 2.441750000 GHz #Avg Type: RMS PNO: Fast IFGain:Low Trig: Free Run #Atten: 30 dB #Res BW 100 kHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <p style="font-size: x-small; margin: 0;">Ref Offset 8.24 dB Ref 20.00 dBm <math>\Delta</math>Mkr1 77.999 MHz 0.467 dB</p>  <p style="font-size: x-small; margin: 0;">Start 2.40000 GHz Stop 2.48350 GHz</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <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>77.999 MHz (<math>\Delta</math>)</td> <td>0.467 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.401952 GHz</td> <td>-6.309 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> </div>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	$\Delta$ 2	f	( $\Delta$ )	77.999 MHz ( $\Delta$ )	0.467 dB				2	F	f		2.401952 GHz	-6.309 dBm			
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	$\Delta$ 2	f	( $\Delta$ )	77.999 MHz ( $\Delta$ )	0.467 dB																							
2	F	f		2.401952 GHz	-6.309 dBm																							

**A.5 Dwell Time**

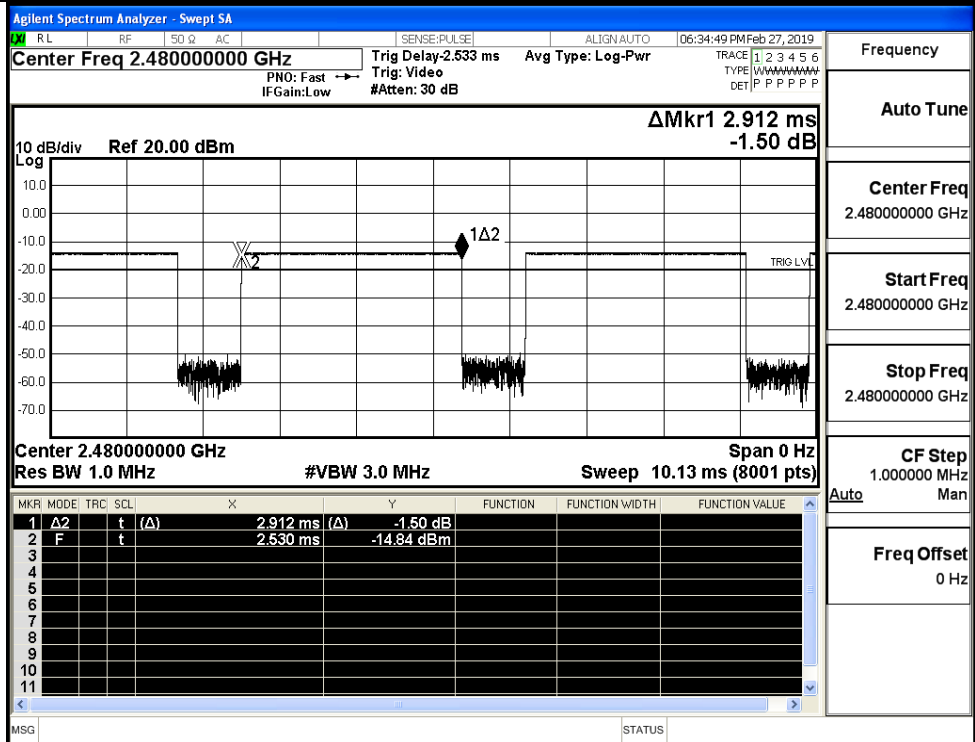
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.912	106.7	0.31	0.4	PASS
	DH5	MCH	2.912	106.7	0.31	0.4	PASS
	DH5	HCH	2.912	106.7	0.31	0.4	PASS
π/4DQPSK	2DH5	LCH	2.917	106.7	0.312	0.4	PASS
	2DH5	MCH	2.918	106.7	0.312	0.4	PASS
	2DH5	HCH	2.917	106.7	0.312	0.4	PASS



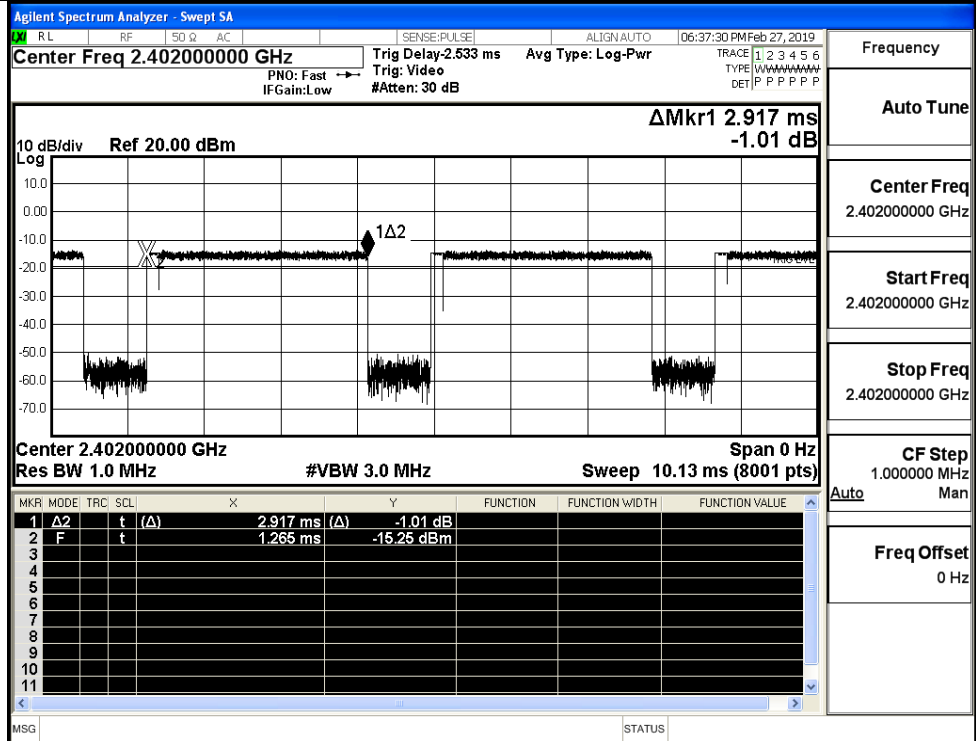
GFSK\_DH5/MCH



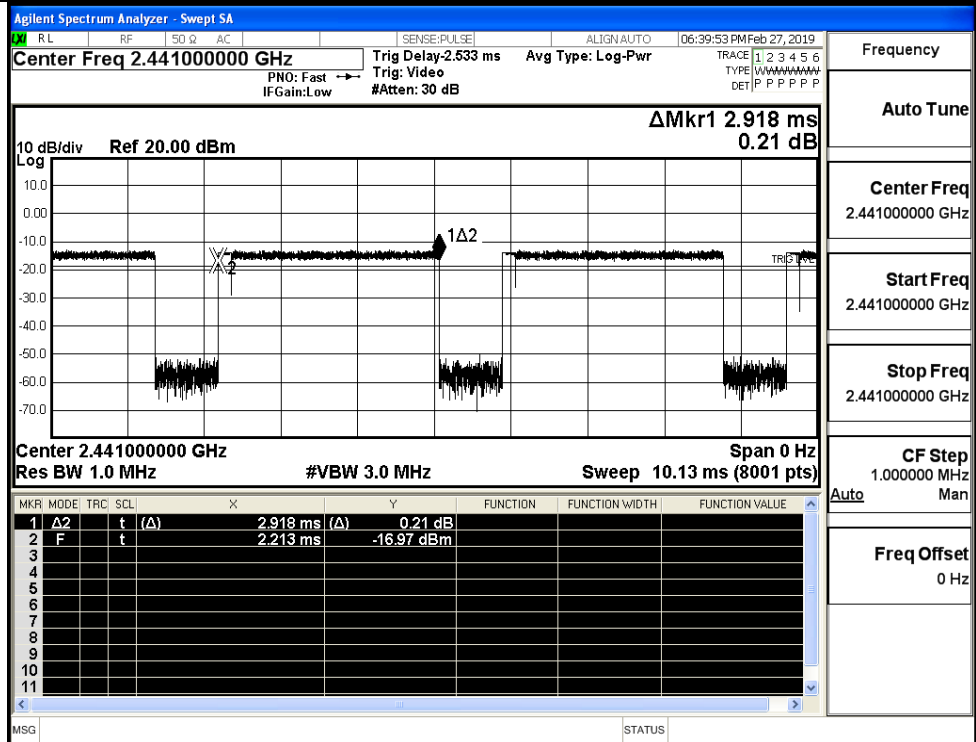
GFSK\_DH5/HCH



$\pi/4$ DQPSK  
\_2DH5/LCH

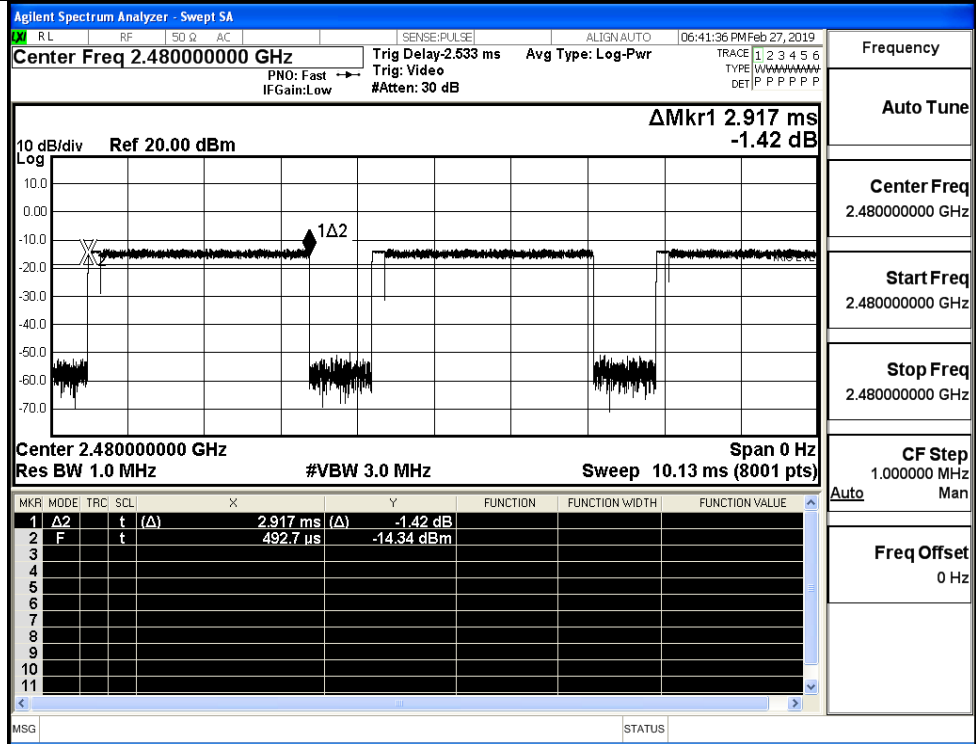


$\pi/4$ DQPSK  
\_2DH5/MCH





$\pi/4$ DQPSK  
\_2DH5/HCH

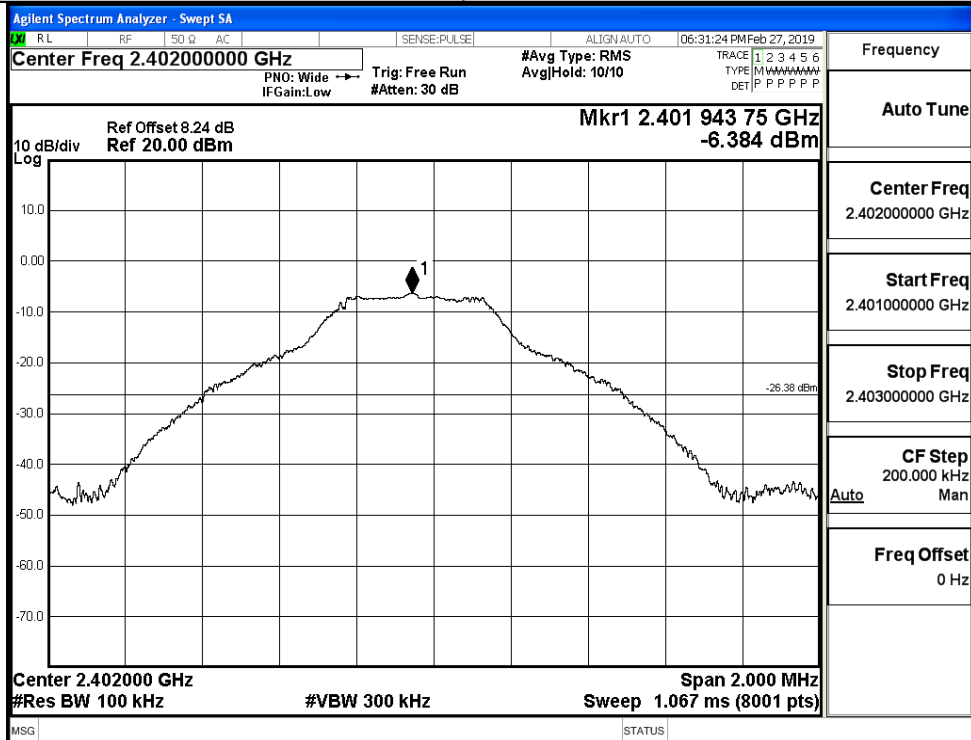


## A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-6.384	-41.145	-26.384	PASS
	MCH	-5.701	-39.439	-25.701	PASS
	HCH	-5.802	-45.017	-25.802	PASS
$\pi/4$ DQPSK	LCH	-6.357	-44.589	-26.357	PASS
	MCH	-5.714	-43.787	-25.714	PASS
	HCH	-5.762	-44.242	-25.762	PASS

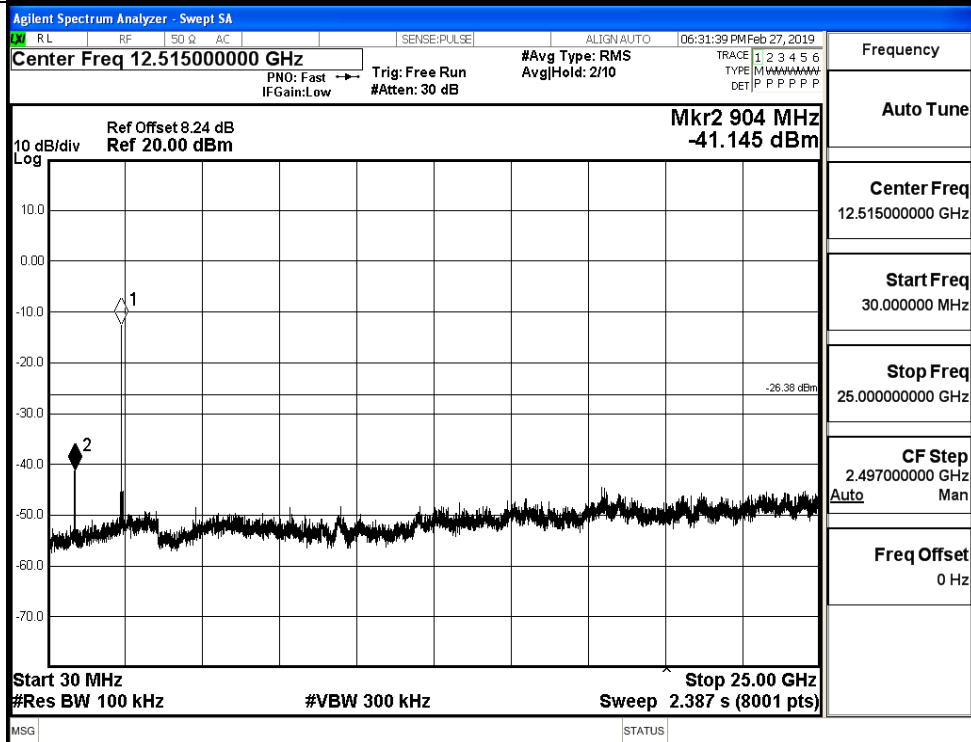
GFSK\_LCH\_Graphs

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 Man
Freq Offset	0 Hz

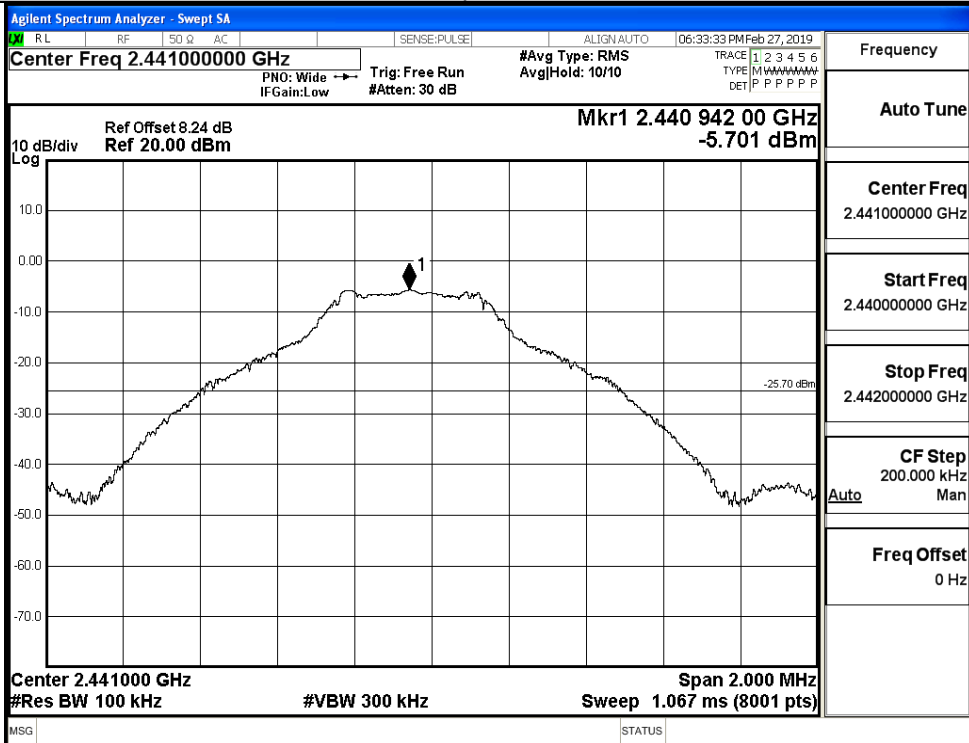
Puw



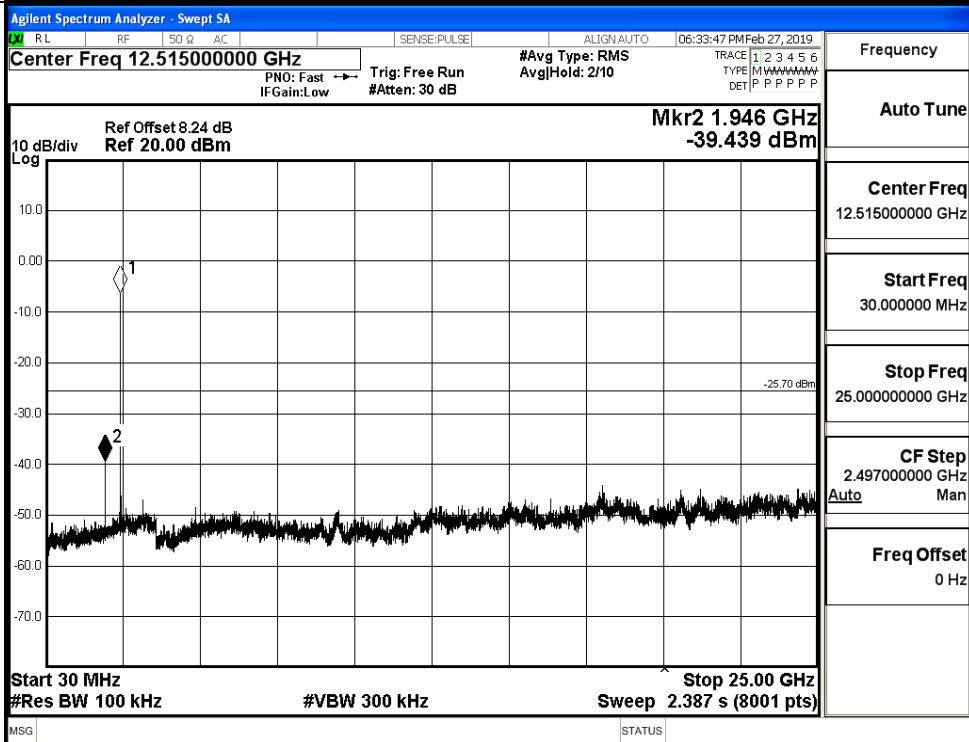
Frequency	
Auto Tune	
Center Freq	12.515000000 GHz
Start Freq	30.000000 MHz
Stop Freq	25.000000000 GHz
CF Step	2.497000000 GHz Auto Man
Freq Offset	0 Hz

GFSK\_MCH\_Graphs

Pref

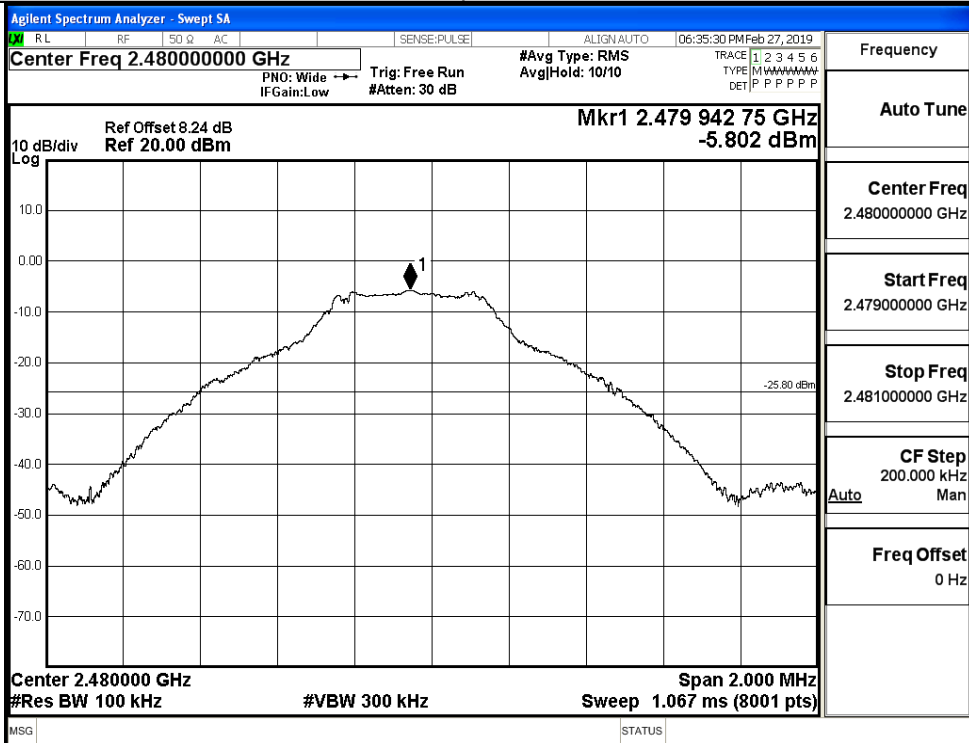


Puw

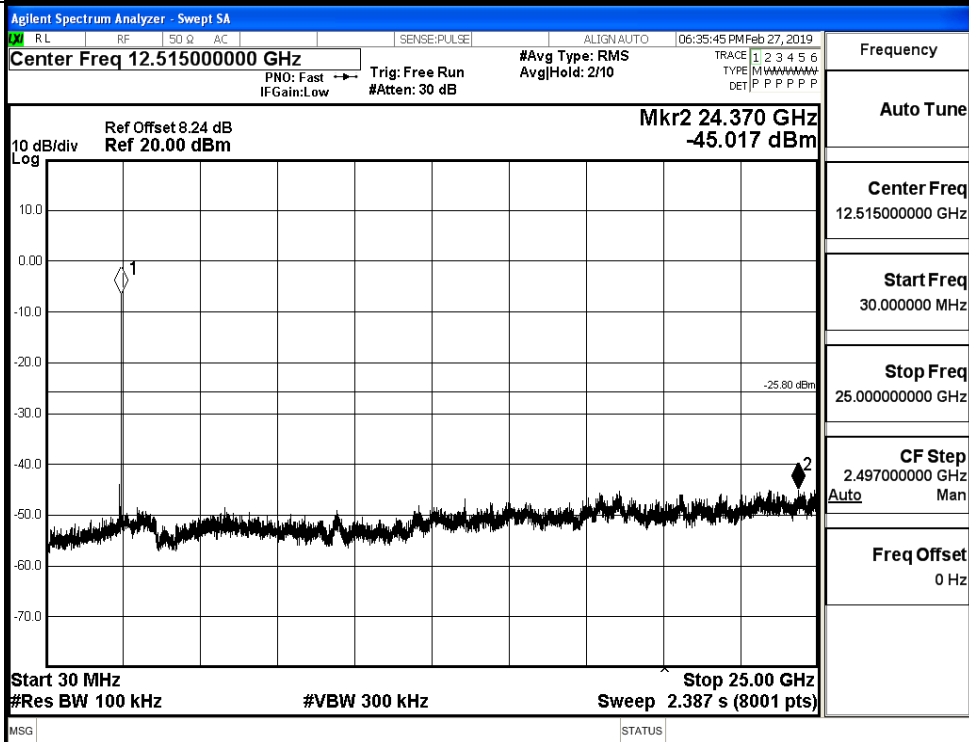


GFSK\_HCH\_Graphs

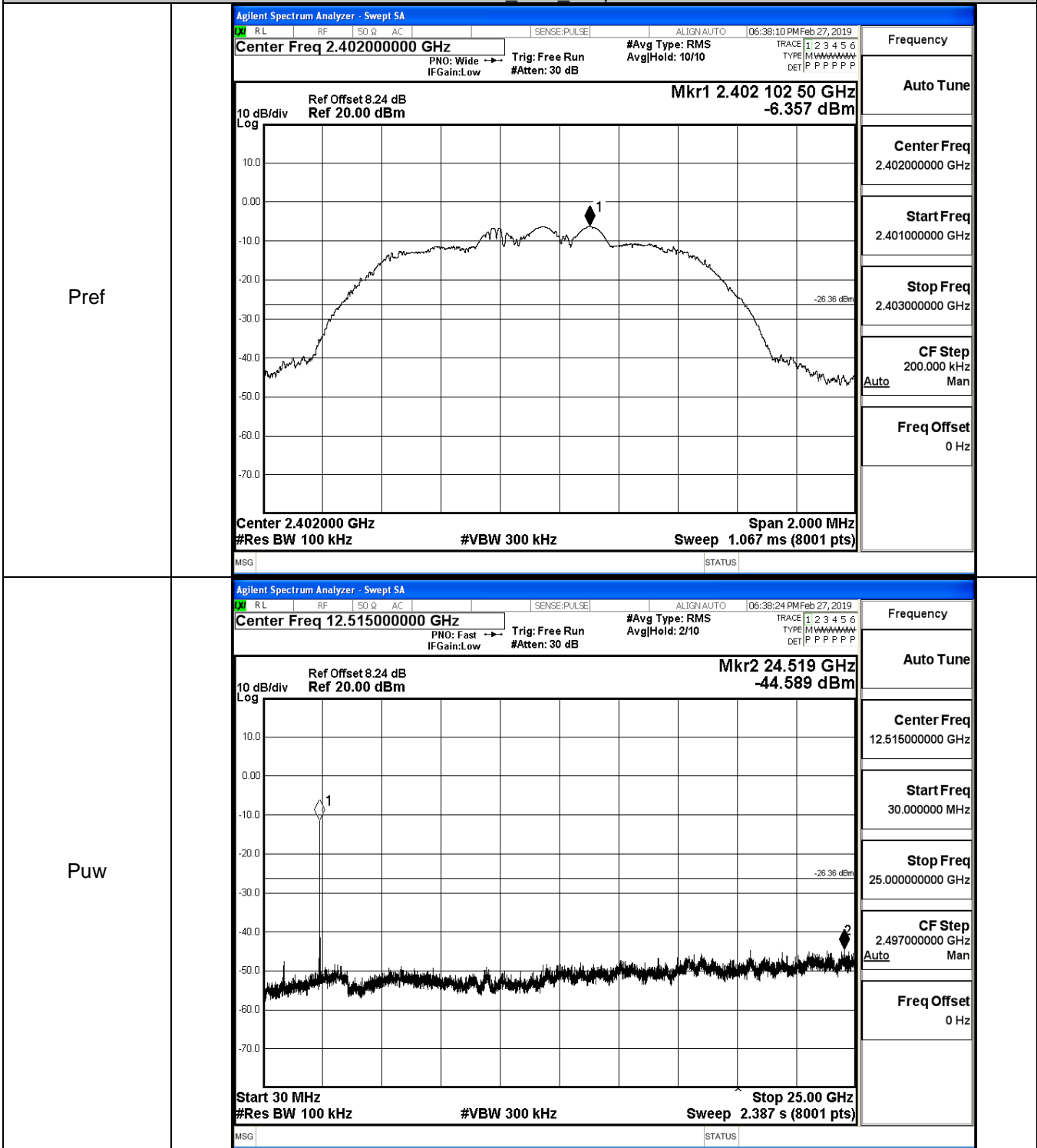
Pref



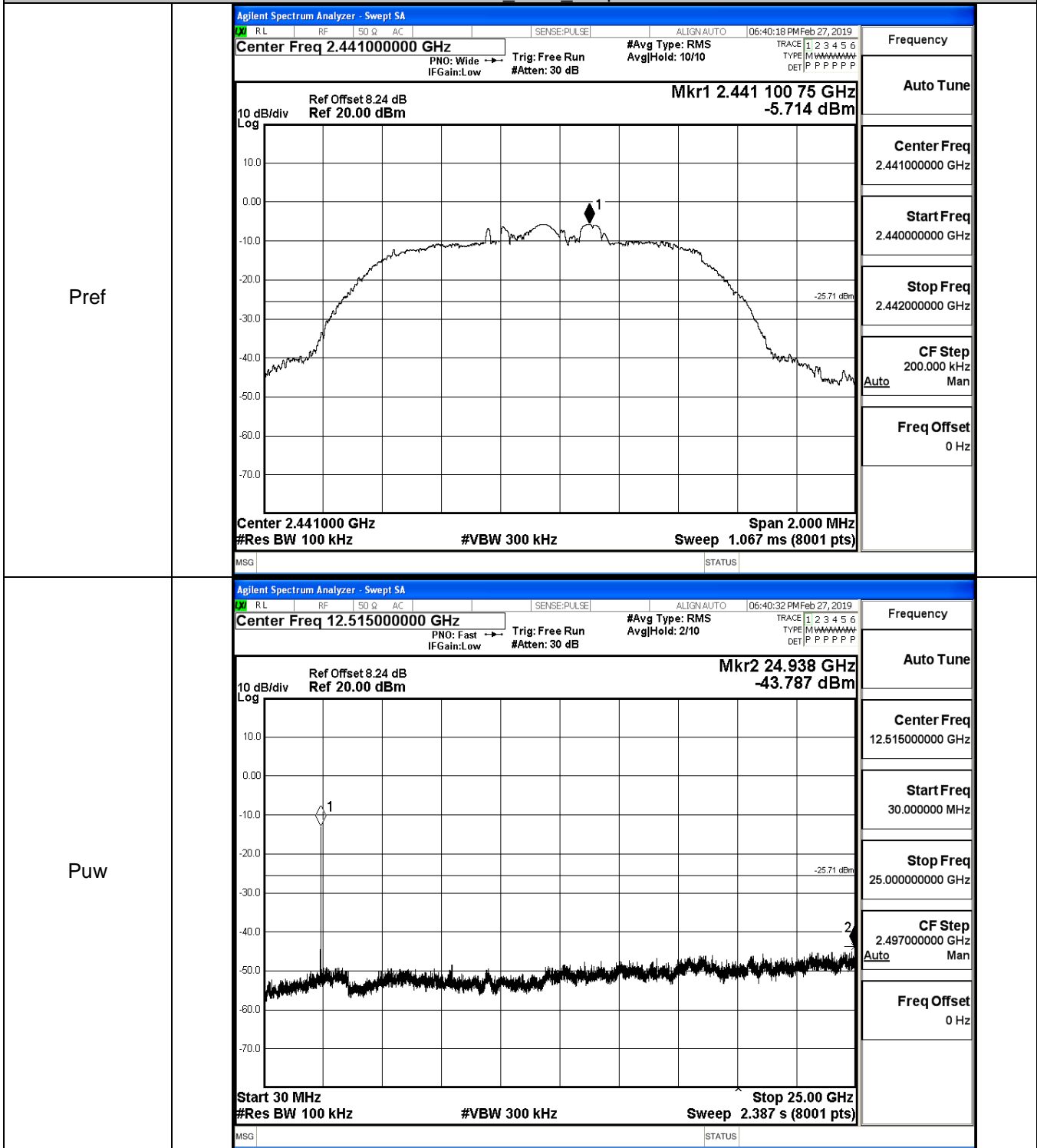
Puw



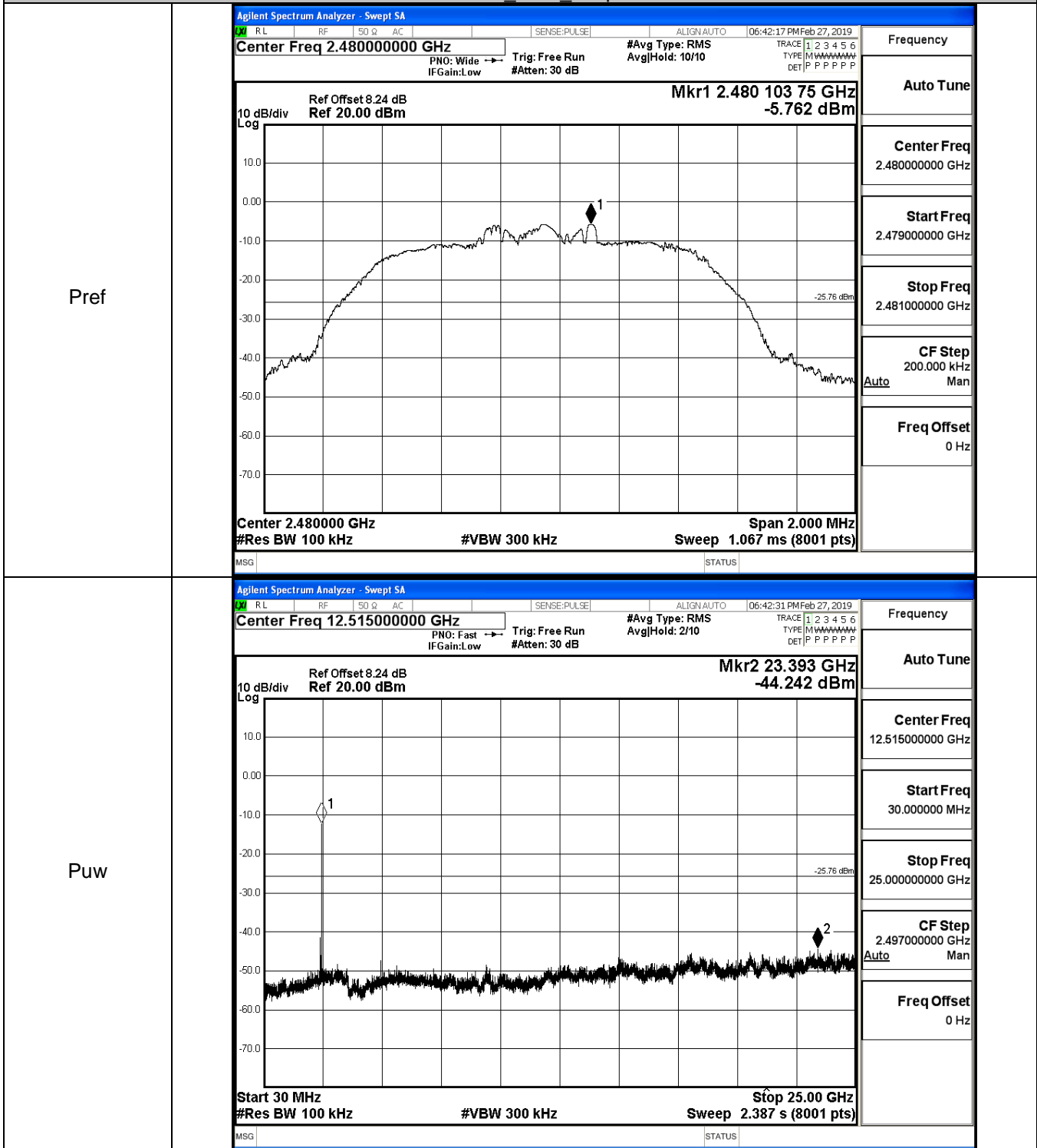
$\pi/4$ DQPSK LCH\_Graphs



$\pi/4$ DQPSK\_MCH\_Graphs



$\pi/4$ DQPSK\_HCH\_Graphs



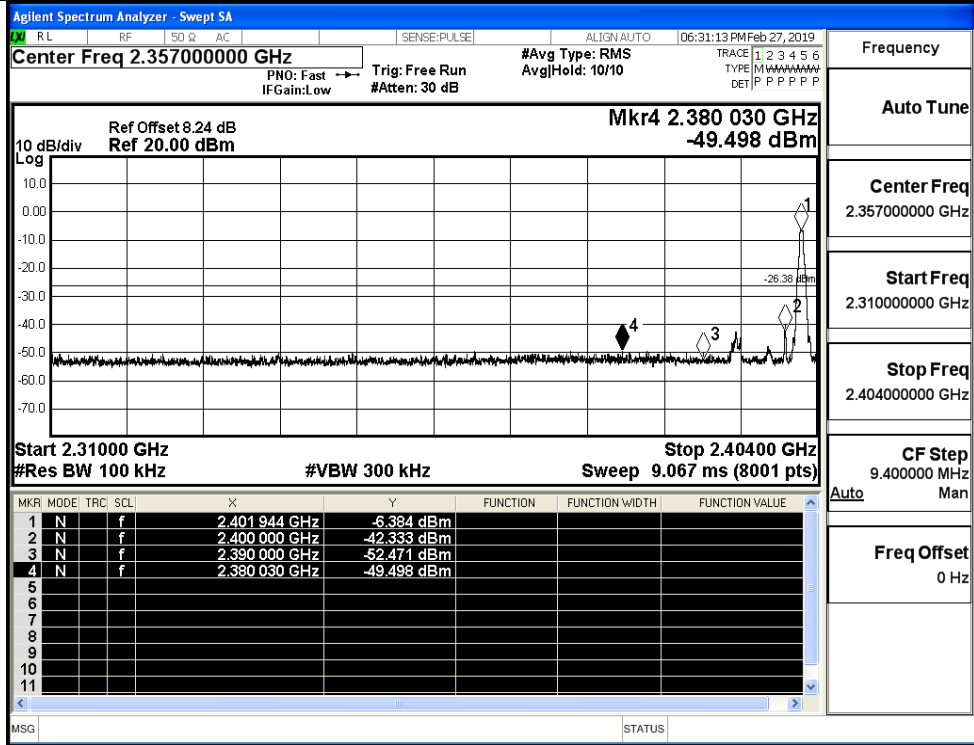


## A.7 Band-edge for RF Conducted Emissions

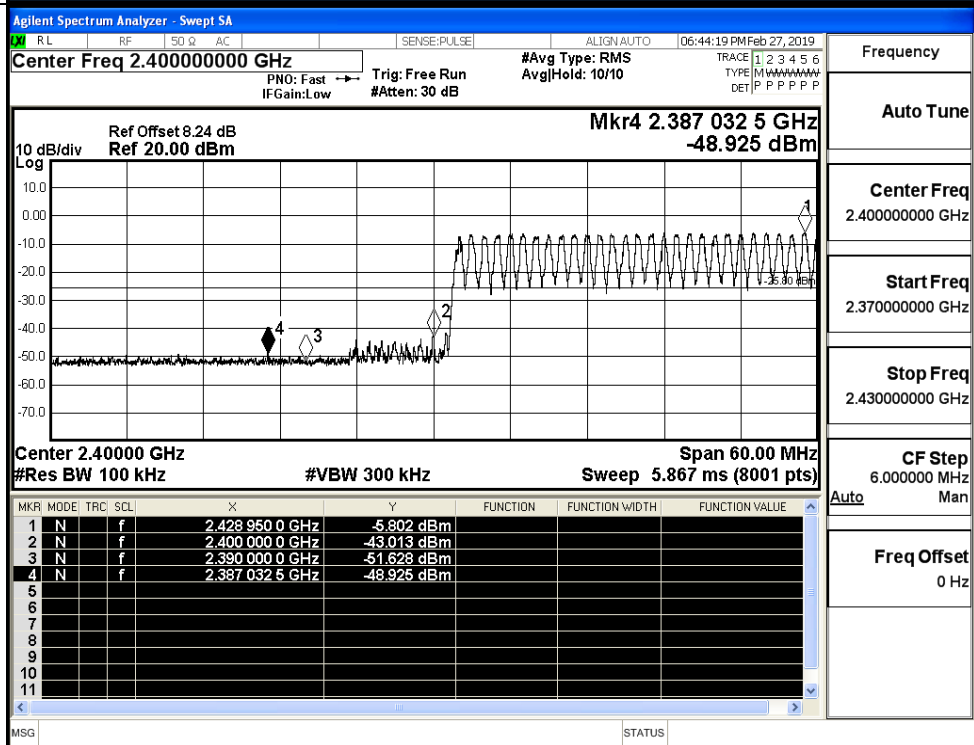
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-6.384	Off	-49.498	-26.38	PASS
			-5.802	On	-48.925	-25.8	PASS
	HCH	2480	-5.793	Off	-48.517	-25.79	PASS
			-5.700	On	-47.910	-25.7	PASS
$\pi/4$ DQPSK	LCH	2402	-6.534	Off	-49.569	-26.53	PASS
			-5.715	On	-48.802	-25.72	PASS
	HCH	2480	-5.733	Off	-48.232	-25.73	PASS
			-5.708	On	-49.072	-25.71	PASS

Test Graphs

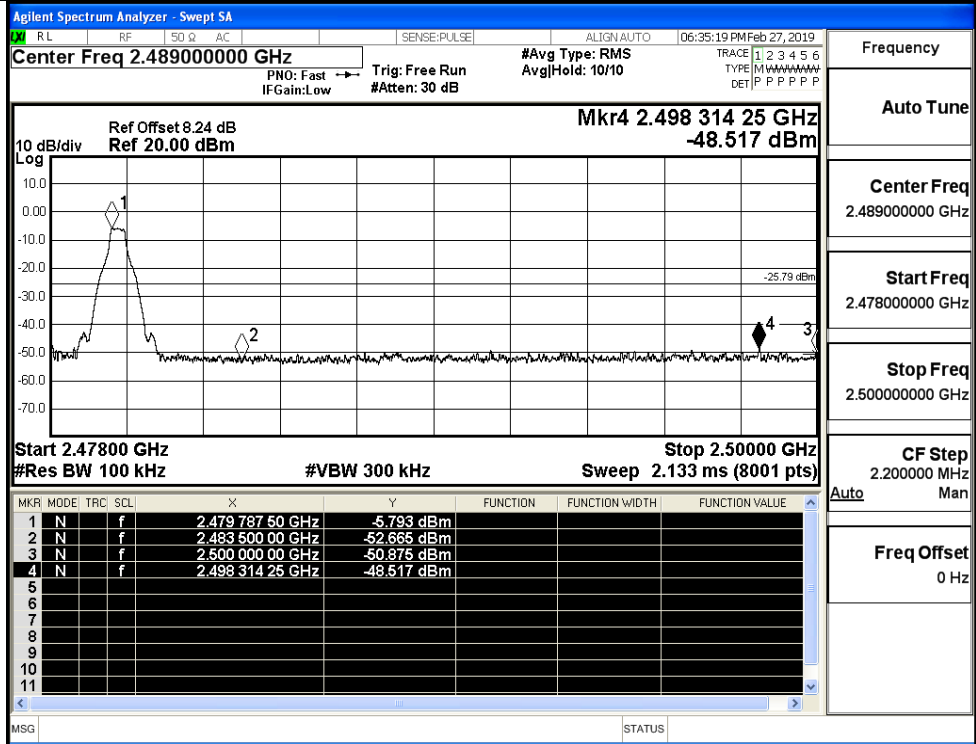
GFSK/LCH/No Hop



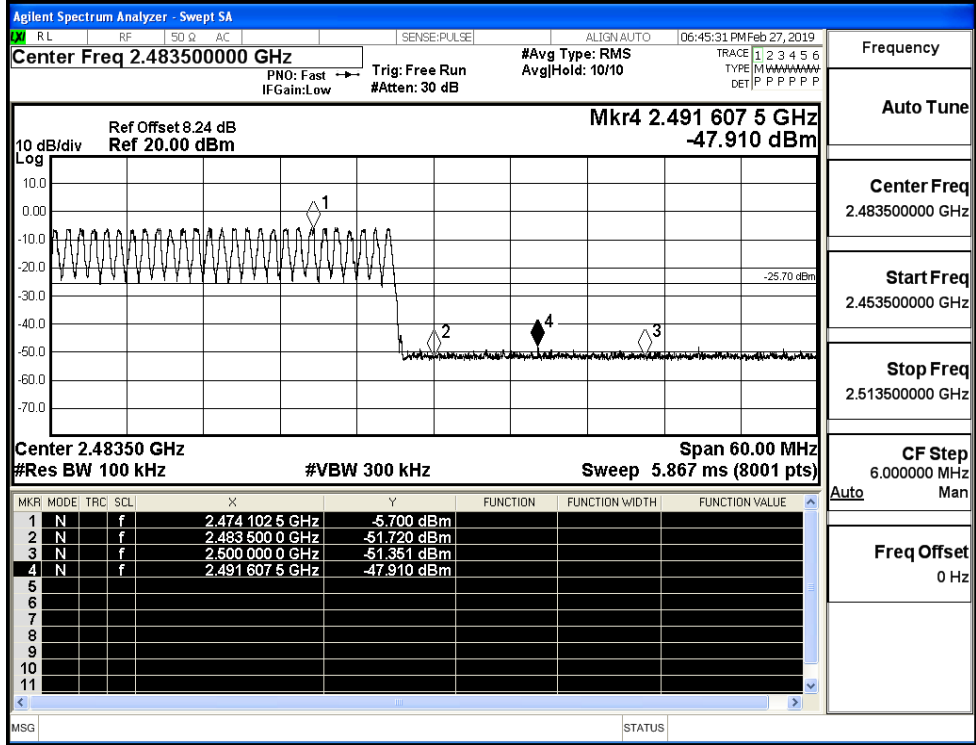
GFSK/LCH/Hop



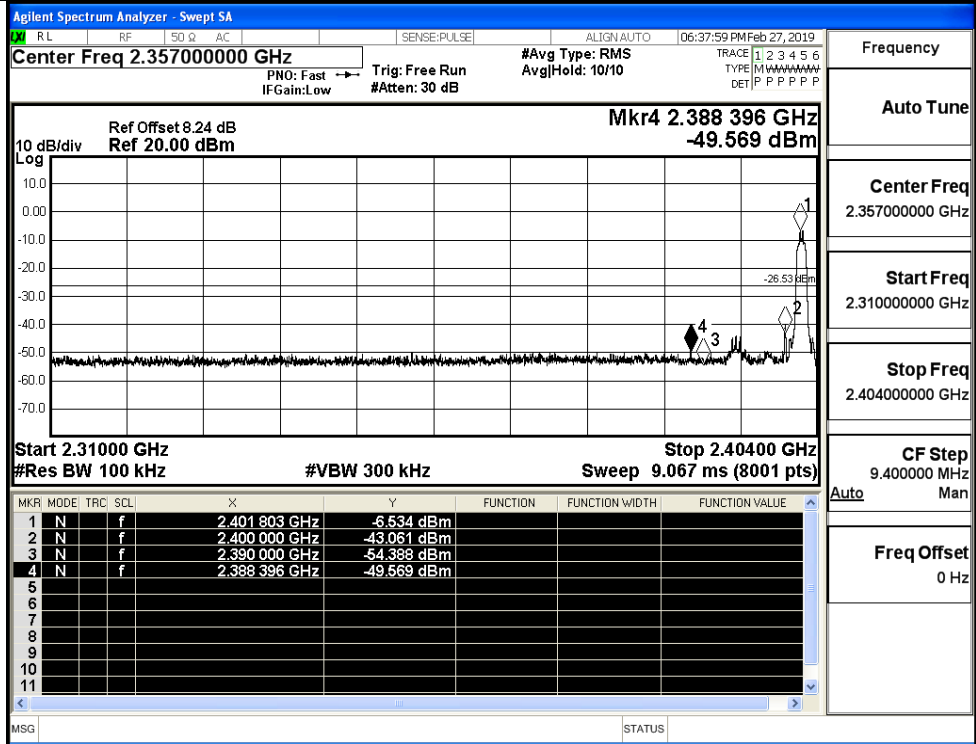
GFSK/HCH/No Hop



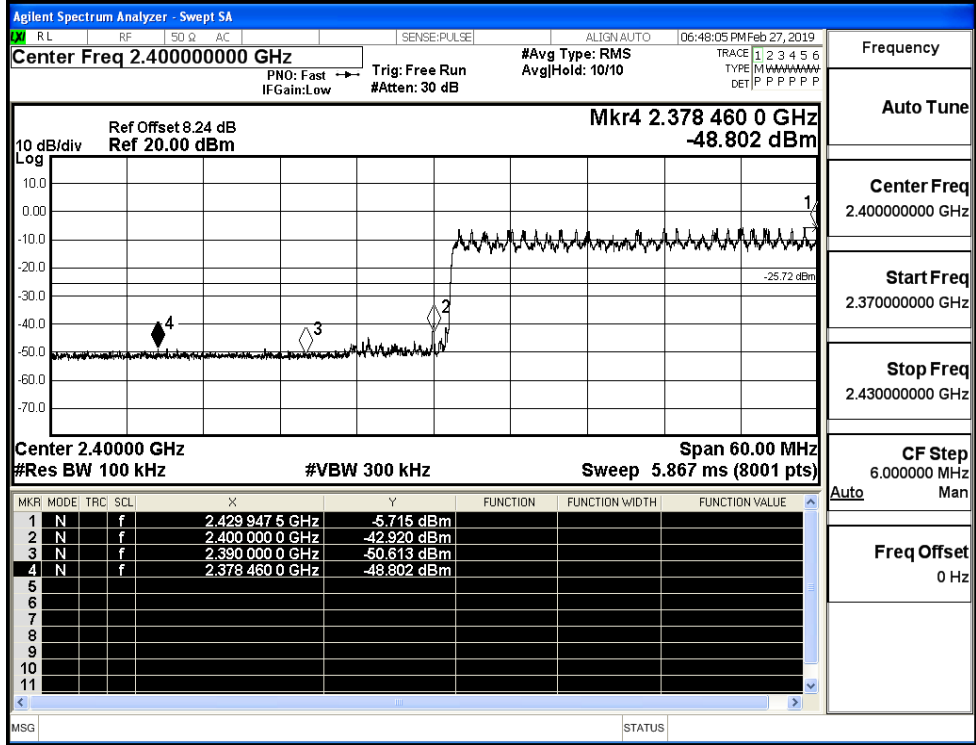
GFSK/HCH/Hop



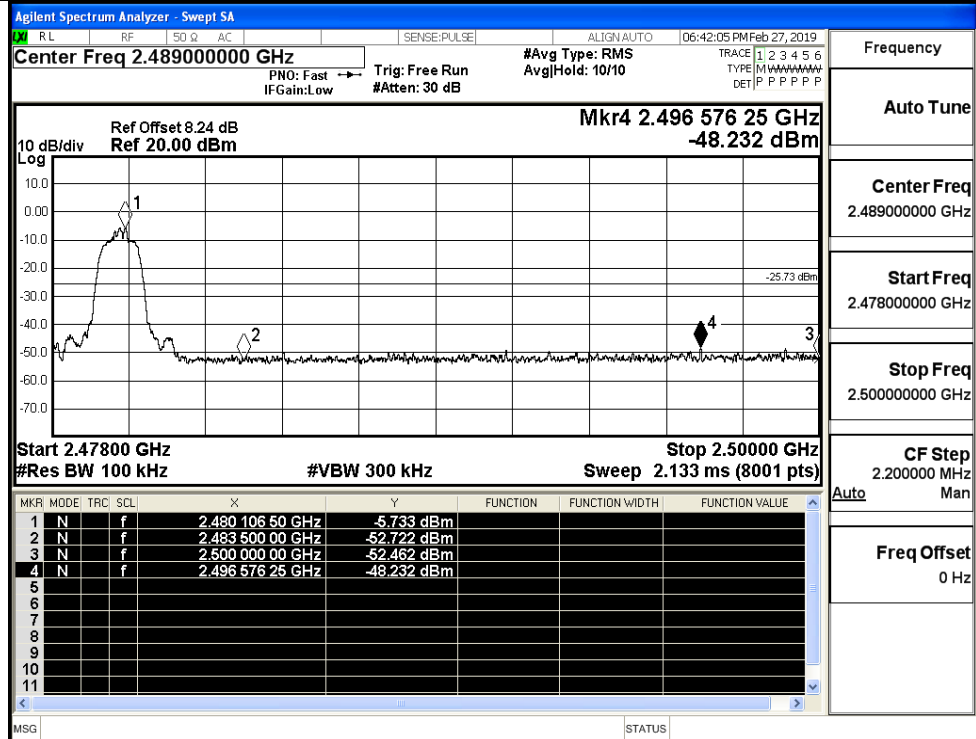
$\pi/4$ DQPSK/LCH/No Hop



$\pi/4$ DQPSK/LCH/Hop

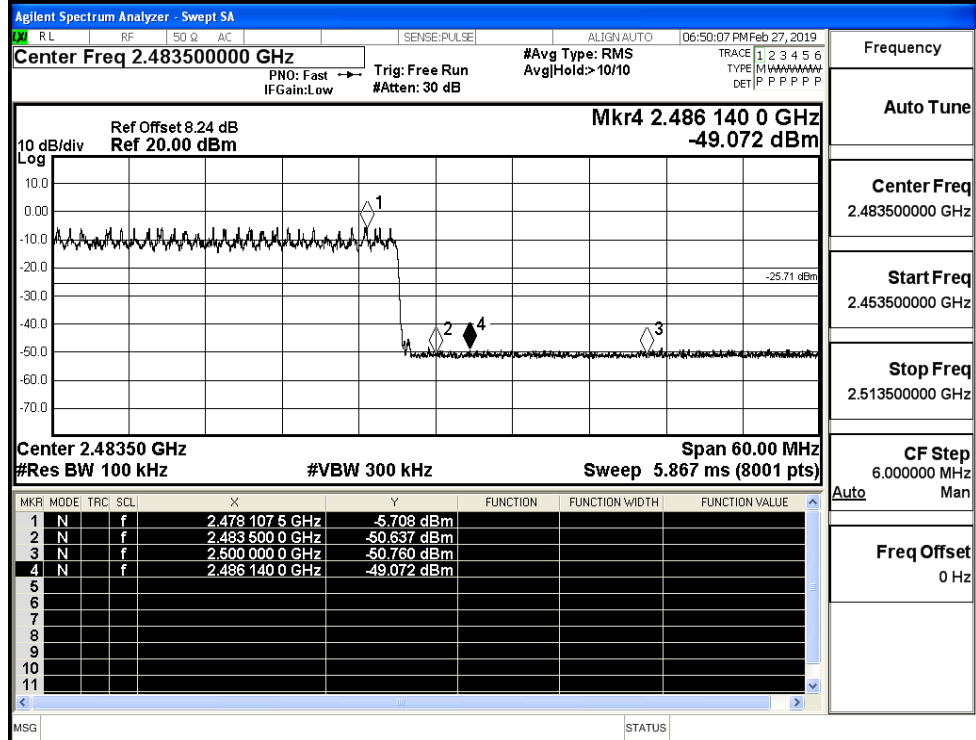


$\pi$ /4DQPSK/HCH/No  
Hop



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

$\pi$ /4DQPSK/HCH/Hop

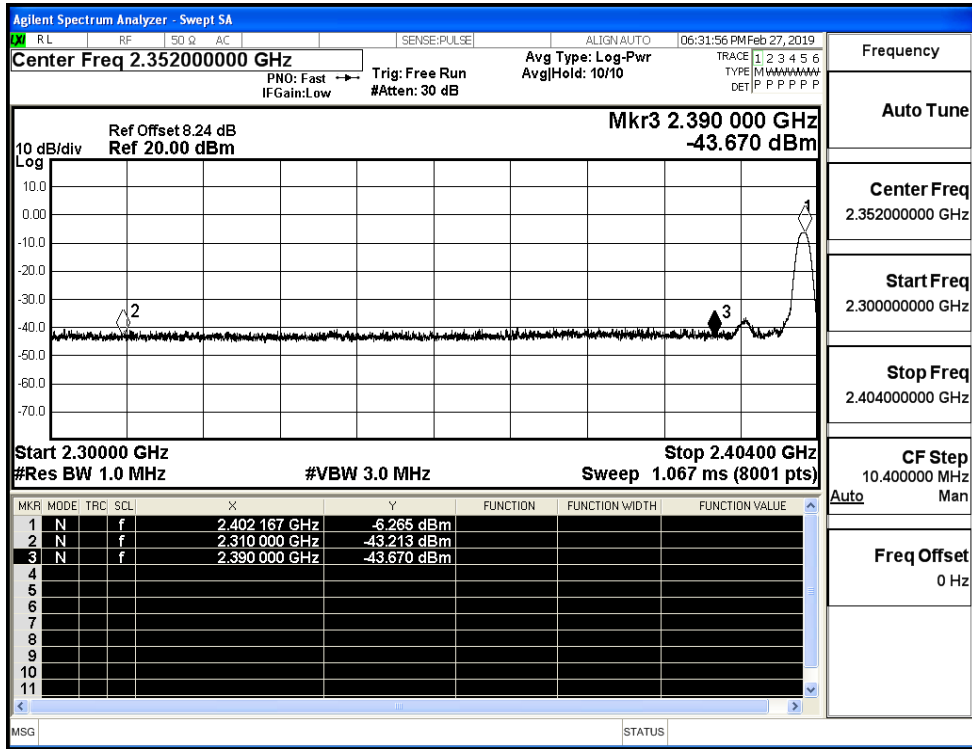


Frequency	
Auto Tune	
Center Freq	2.483500000 GHz
Start Freq	2.453500000 GHz
Stop Freq	2.513500000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz

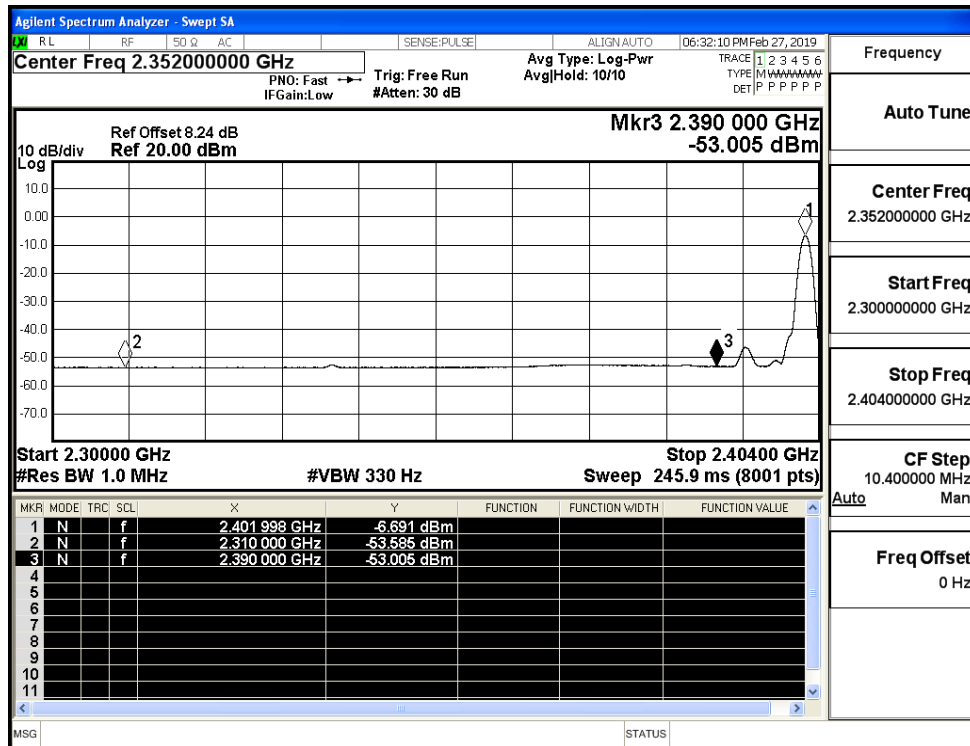
## A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.21	2.0	0	54.04	PEAK	74	PASS
	Off	2310.0	-53.59	2.0	0	43.67	AV	54	PASS
	Off	2390.0	-43.67	2.0	0	53.59	PEAK	74	PASS
	Off	2390.0	-53.01	2.0	0	44.25	AV	54	PASS
	Off	2483.5	-41.75	2.0	0	55.51	PEAK	74	PASS
	Off	2483.5	-52.78	2.0	0	44.48	AV	54	PASS
	Off	2500.0	-42.24	2.0	0	55.02	PEAK	74	PASS
	Off	2500.0	-52.10	2.0	0	45.15	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-42.02	2.0	0	55.24	PEAK	74	PASS
	Off	2310.0	-53.54	2.0	0	43.72	AV	54	PASS
	Off	2390.0	-43.36	2.0	0	53.89	PEAK	74	PASS
	Off	2390.0	-53.01	2.0	0	44.25	AV	54	PASS
	Off	2483.5	-42.82	2.0	0	54.44	PEAK	74	PASS
	Off	2483.5	-52.93	2.0	0	44.32	AV	54	PASS
	Off	2500.0	-40.34	2.0	0	56.92	PEAK	74	PASS
	Off	2500.0	-52.18	2.0	0	45.07	AV	54	PASS

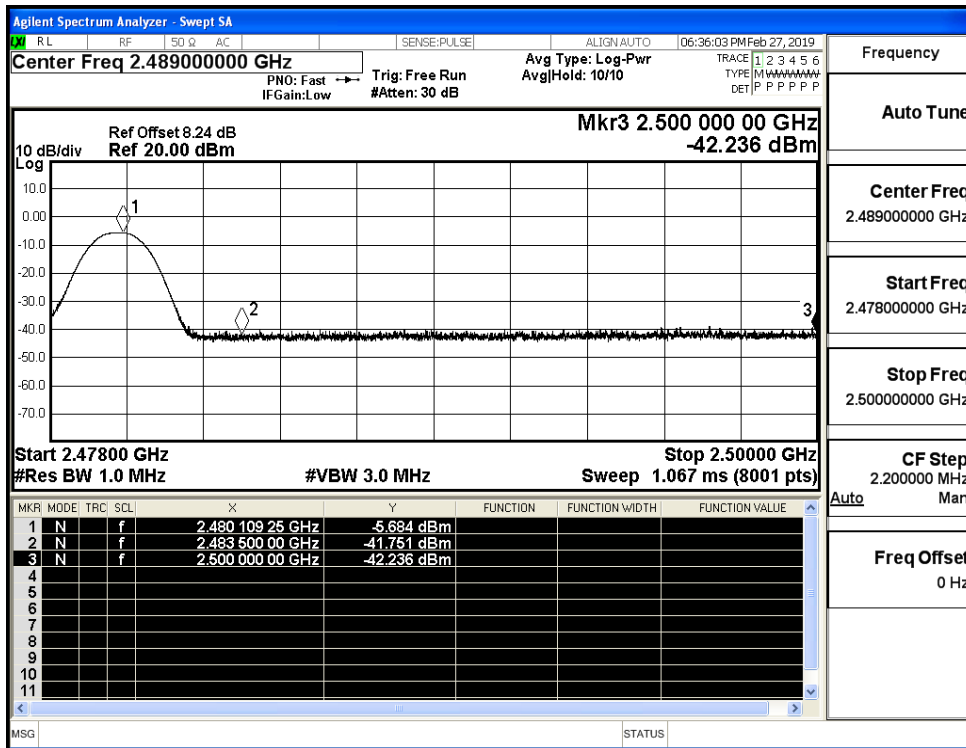
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (Low Channel)



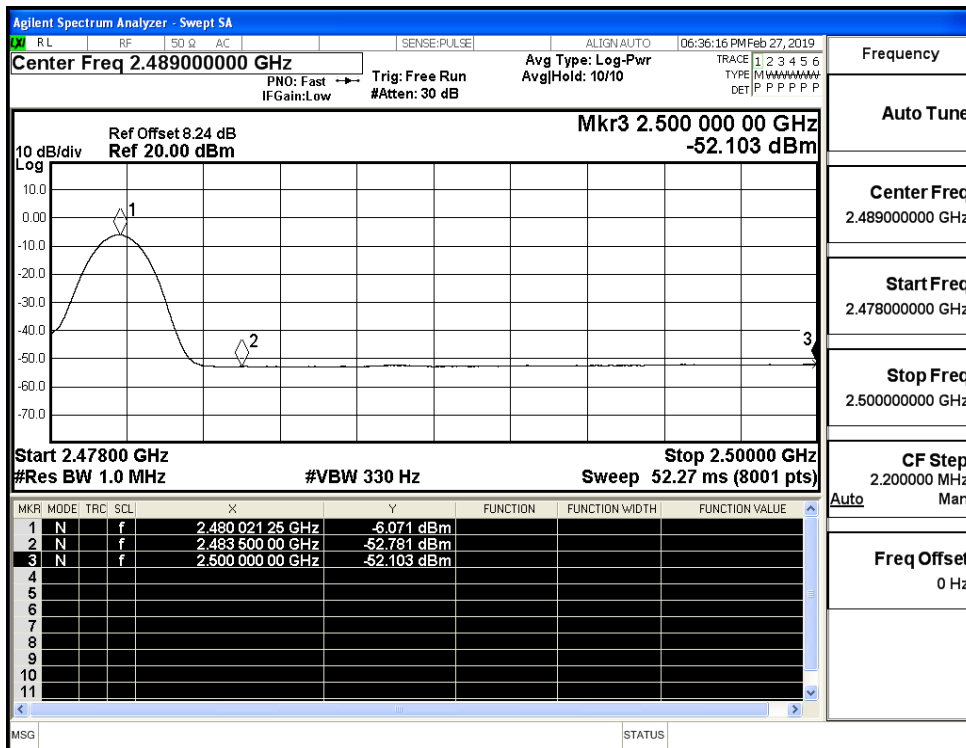
Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (Low Channel)



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

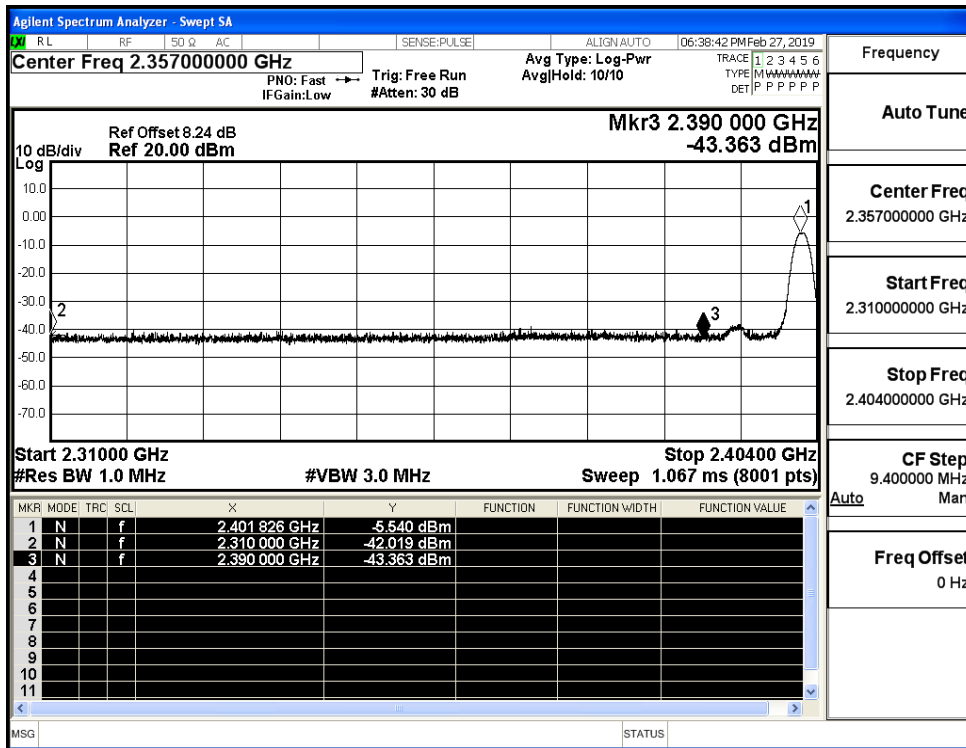


Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (High Channel)

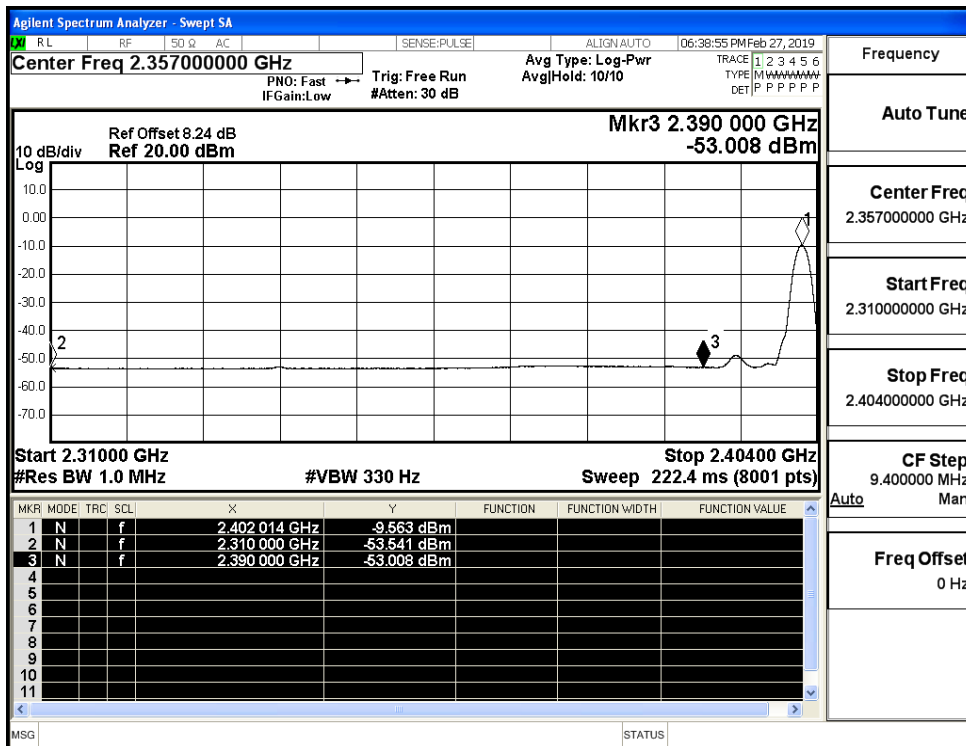




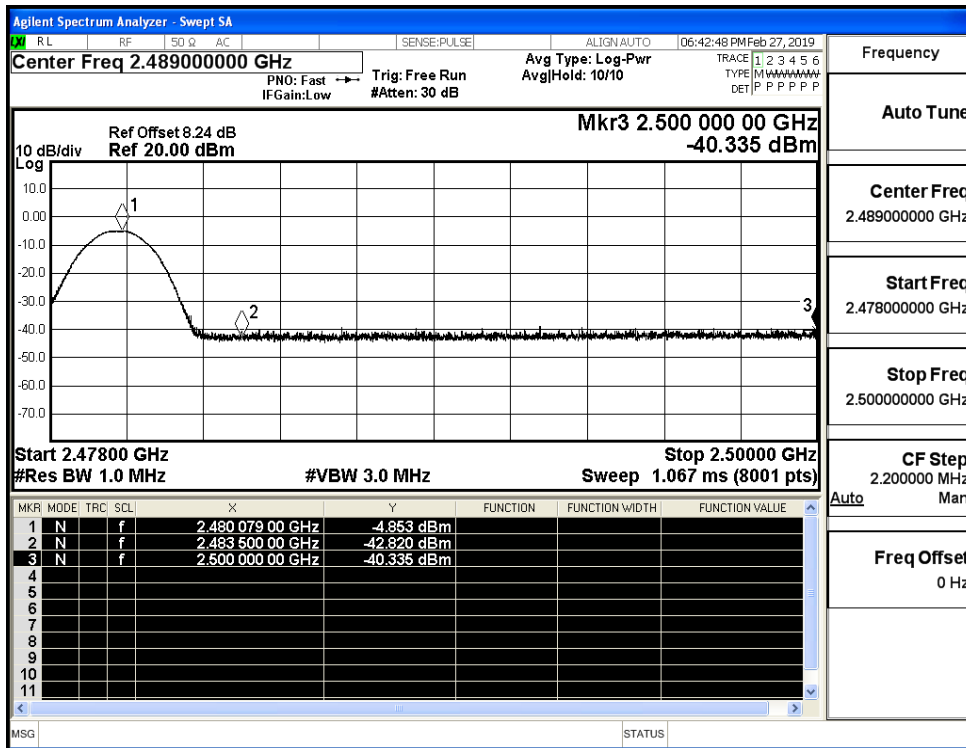
Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_PEAK (Low Channel)



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



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



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

