

Appendix A

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

Product Name: Bluetooth Hybrid Amplifier

Trade Mark: DAYTON AUDIO

Test Model: HTA20BT

Environmental Conditions

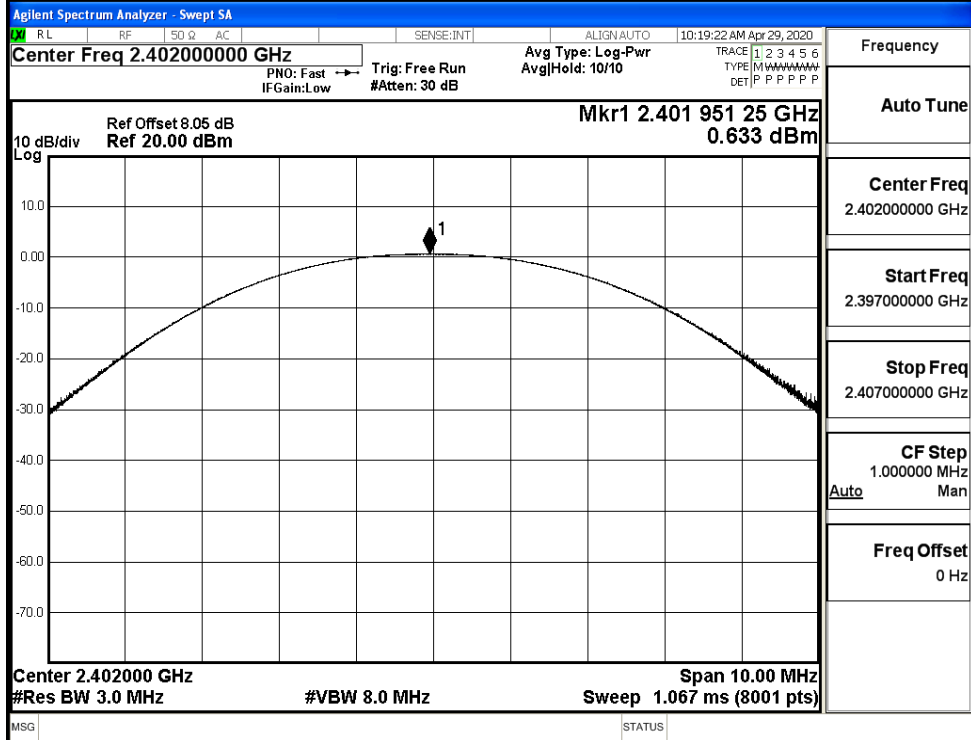
Temperature:	23.7°C
Relative Humidity:	54.5%
ATM Pressure:	100.0 kPa
Test Engineer:	Alisa Huang
Supervised by:	Li Huan

A.1 Maximum Conducted Peak Output Power

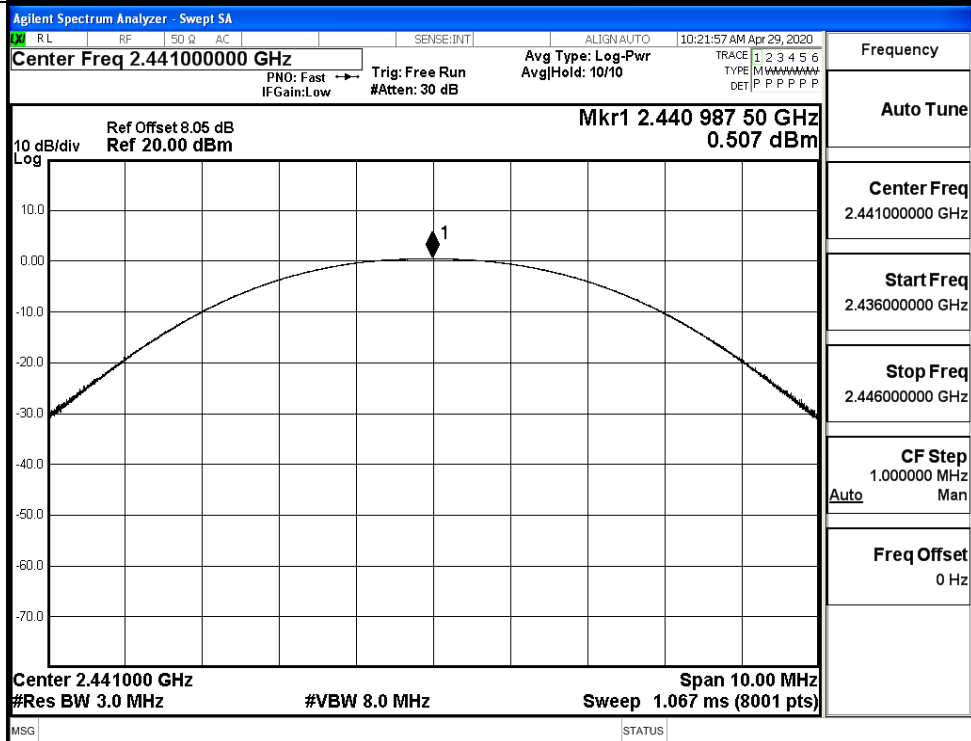
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.633	21	PASS
	MCH	0.507	21	PASS
	HCH	-0.026	21	PASS
$\pi/4$ DQPSK	LCH	0.334	21	PASS
	MCH	0.527	21	PASS
	HCH	-0.285	21	PASS

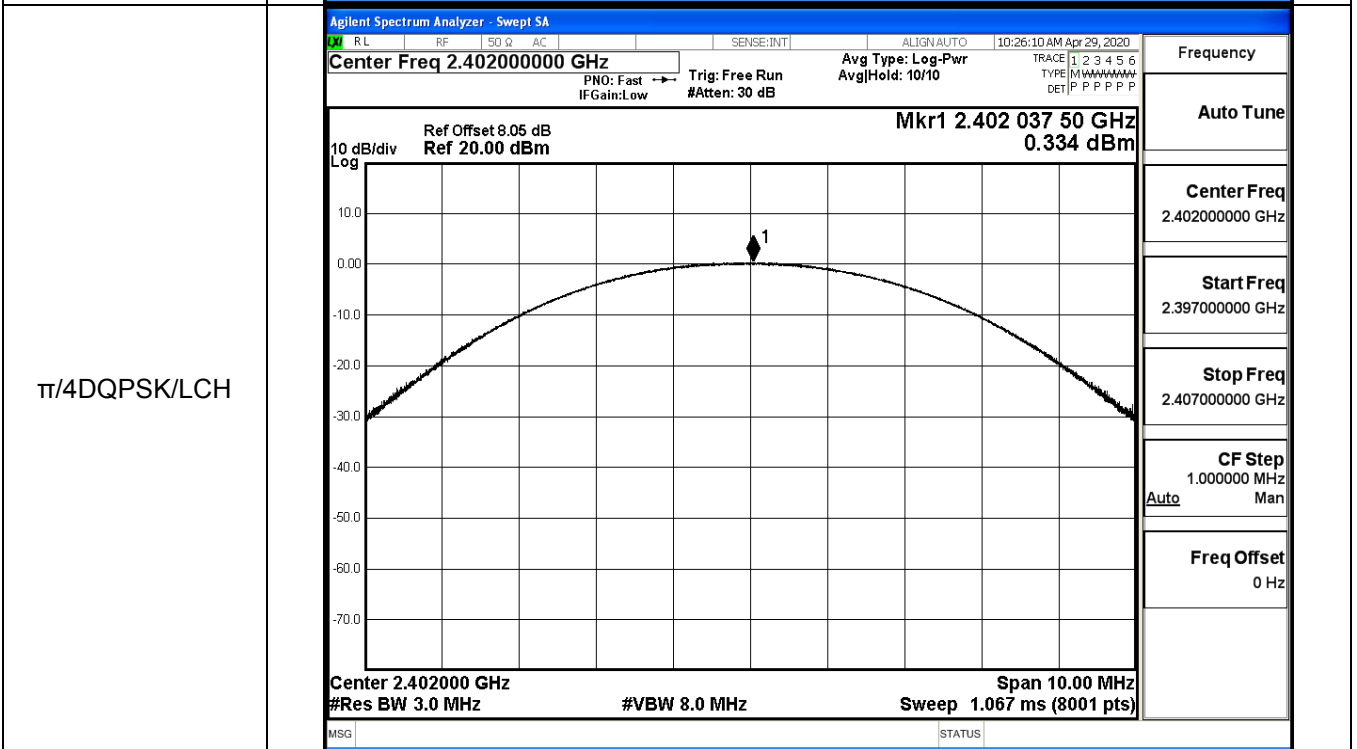
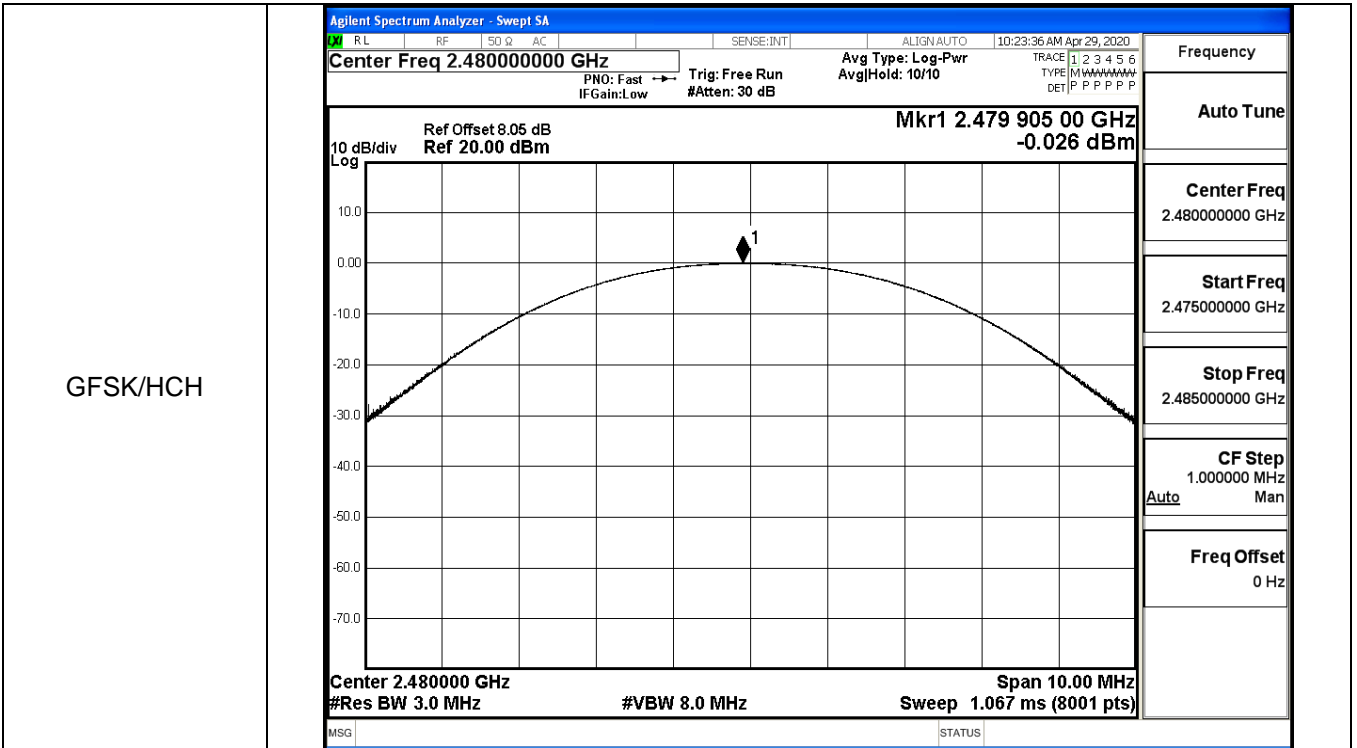
Test Graphs

GFSK/LCH

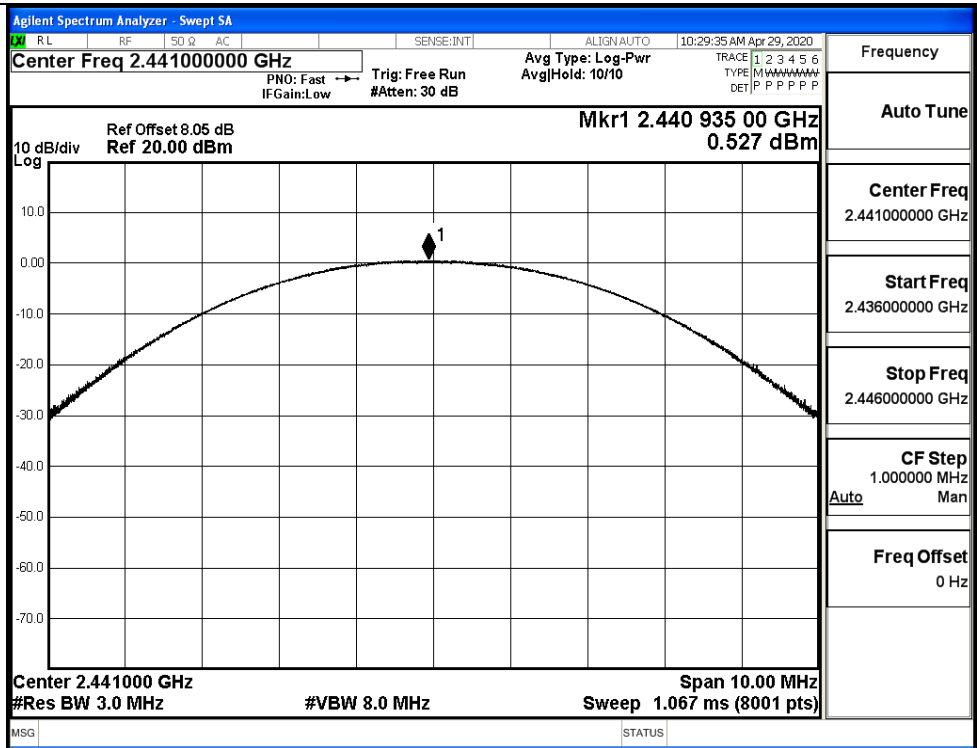


GFSK/MCH

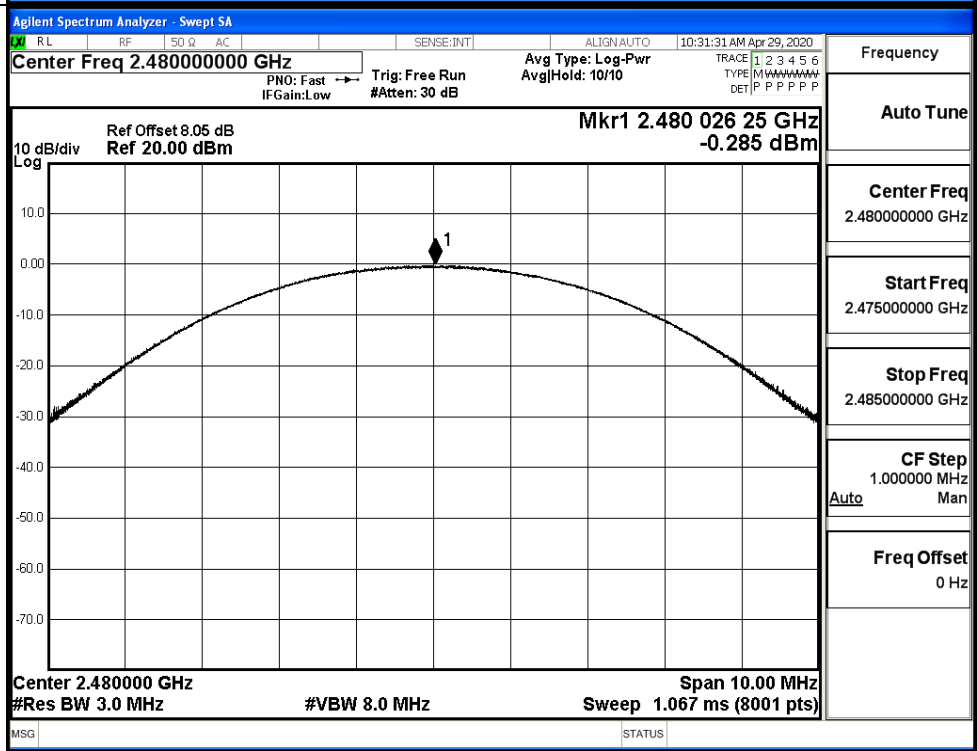




$\pi/4$ DQPSK/MCH



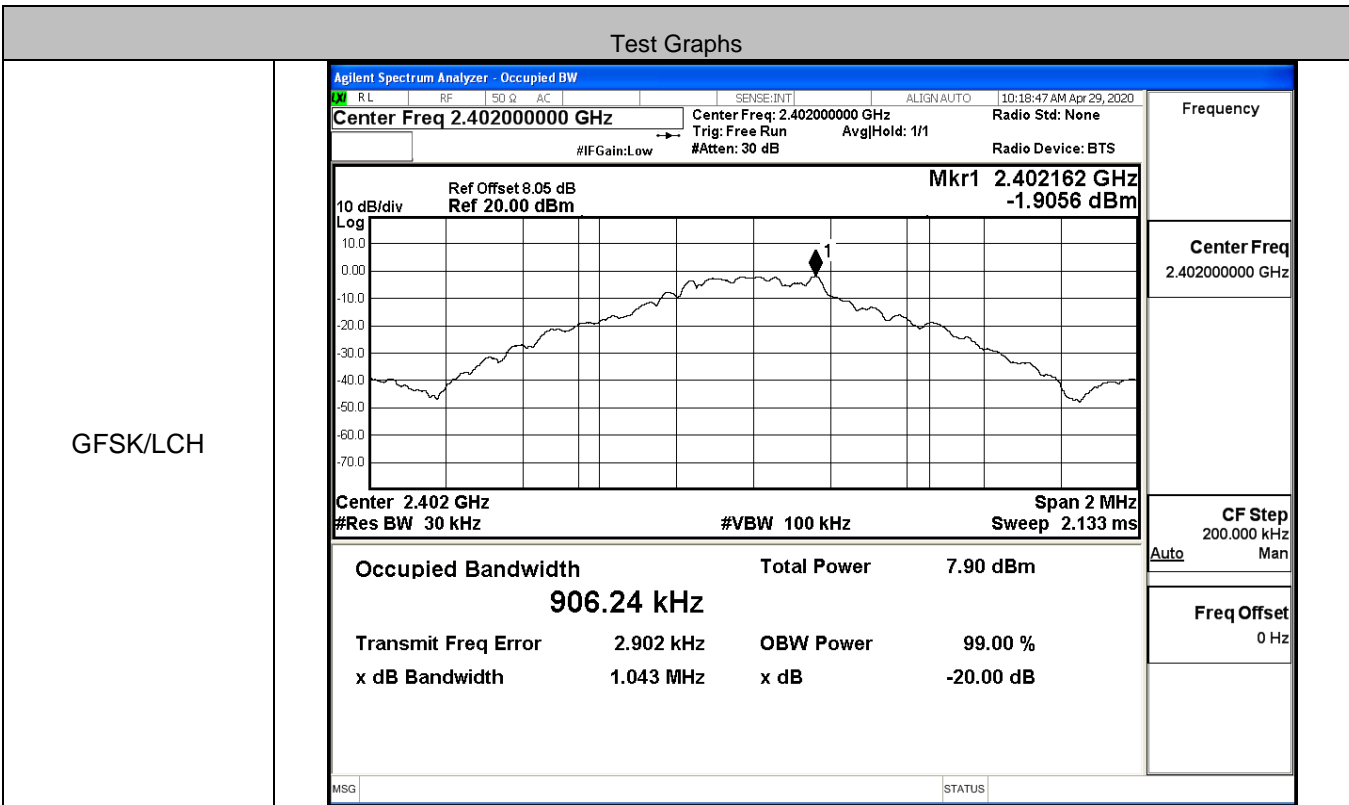
$\pi/4$ DQPSK/HCH



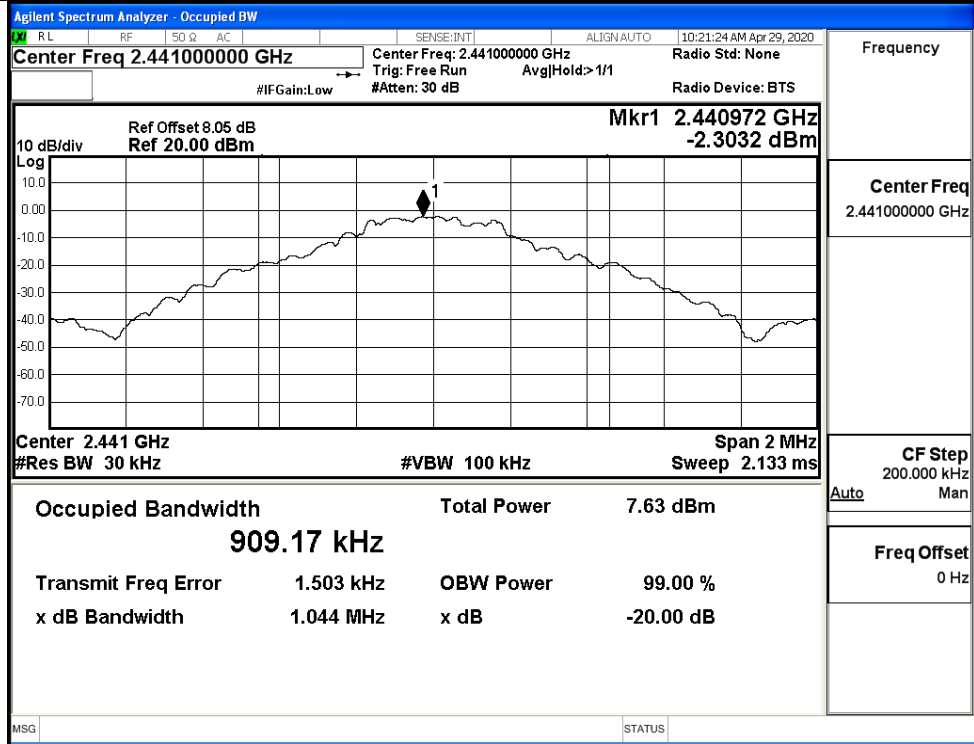
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.043	Not Specified	PASS
	MCH	1.044	Not Specified	PASS
	HCH	1.034	Not Specified	PASS
π/4DQPSK	LCH	1.291	Not Specified	PASS
	MCH	1.291	Not Specified	PASS
	HCH	1.288	Not Specified	PASS

Test Graphs

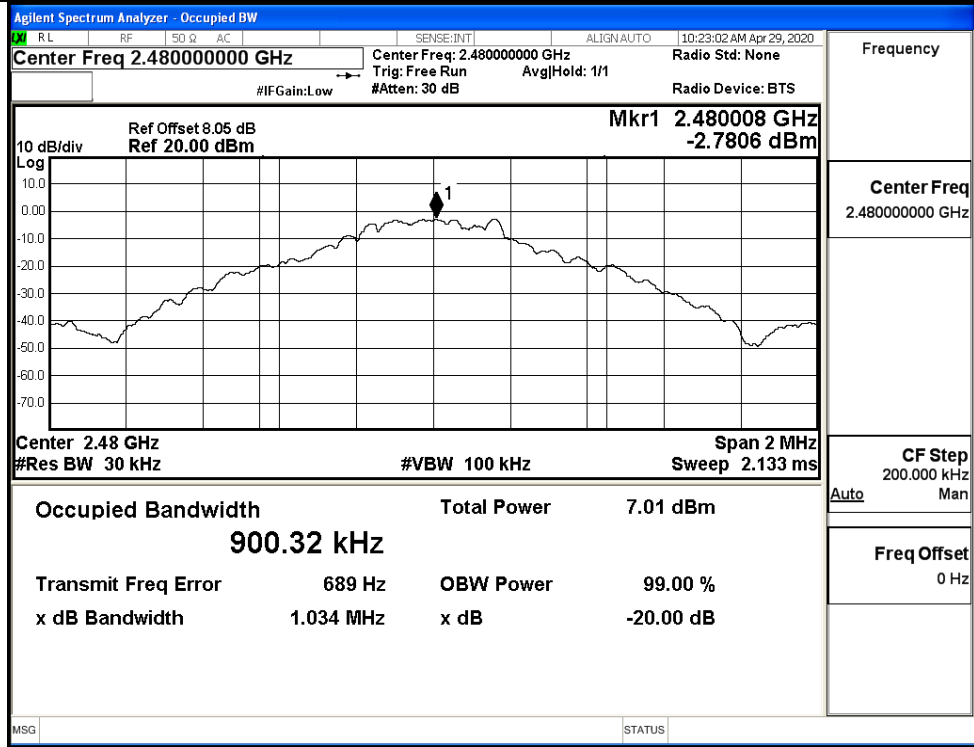


GFSK/MCH



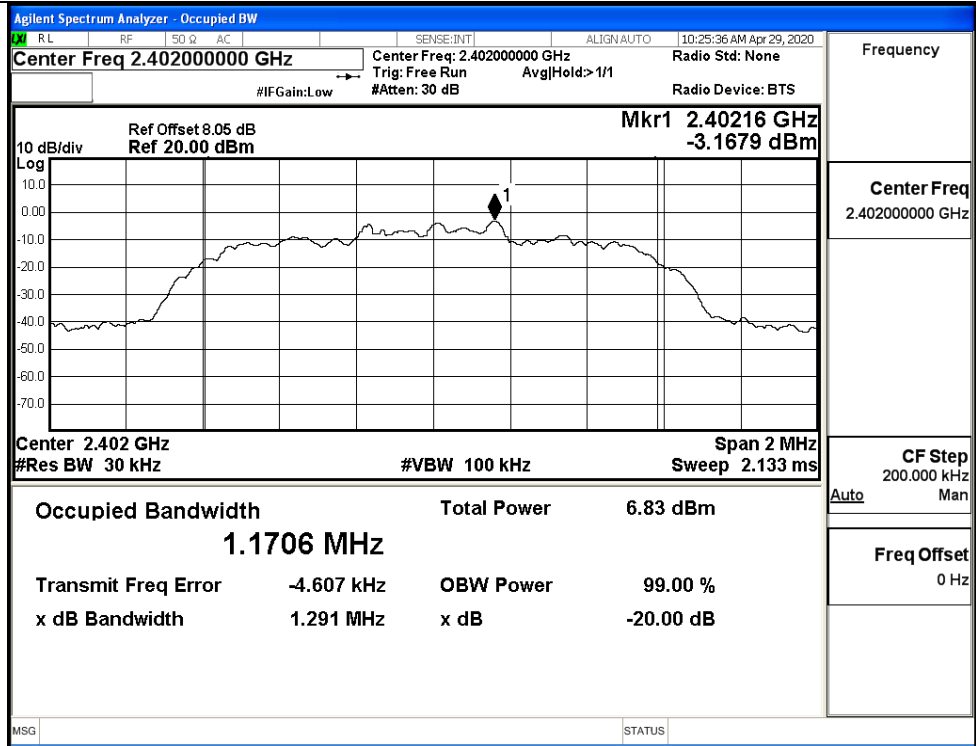
Frequency	2.441000000 GHz
Center Freq	2.441000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

GFSK/HCH



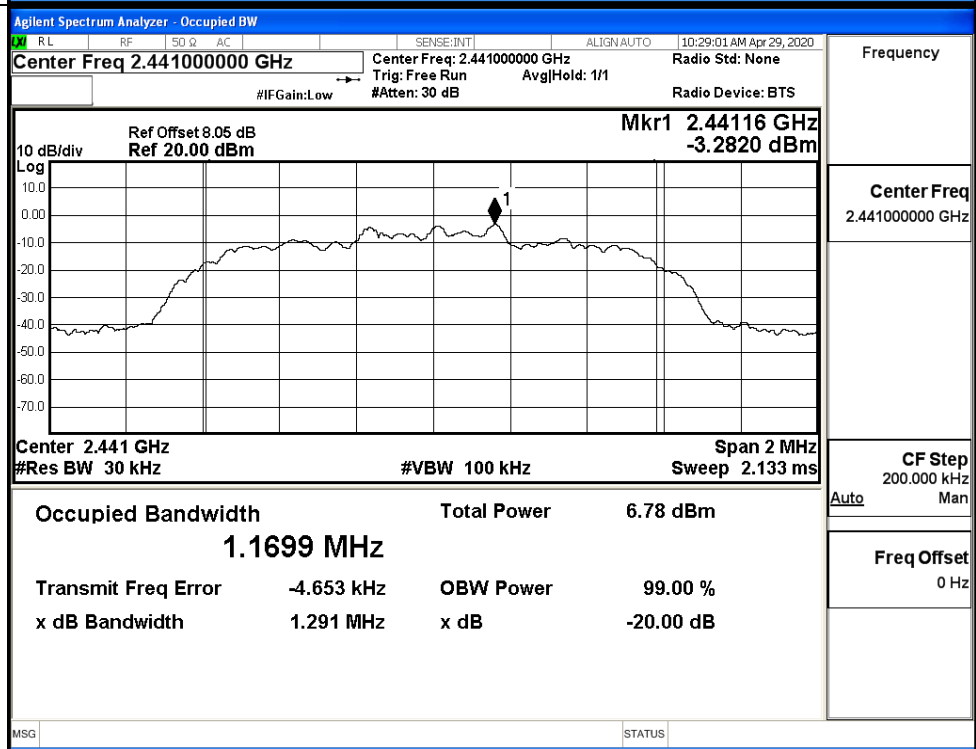
Frequency	2.480000000 GHz
Center Freq	2.480000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

$\pi/4$ DQPSK/LCH

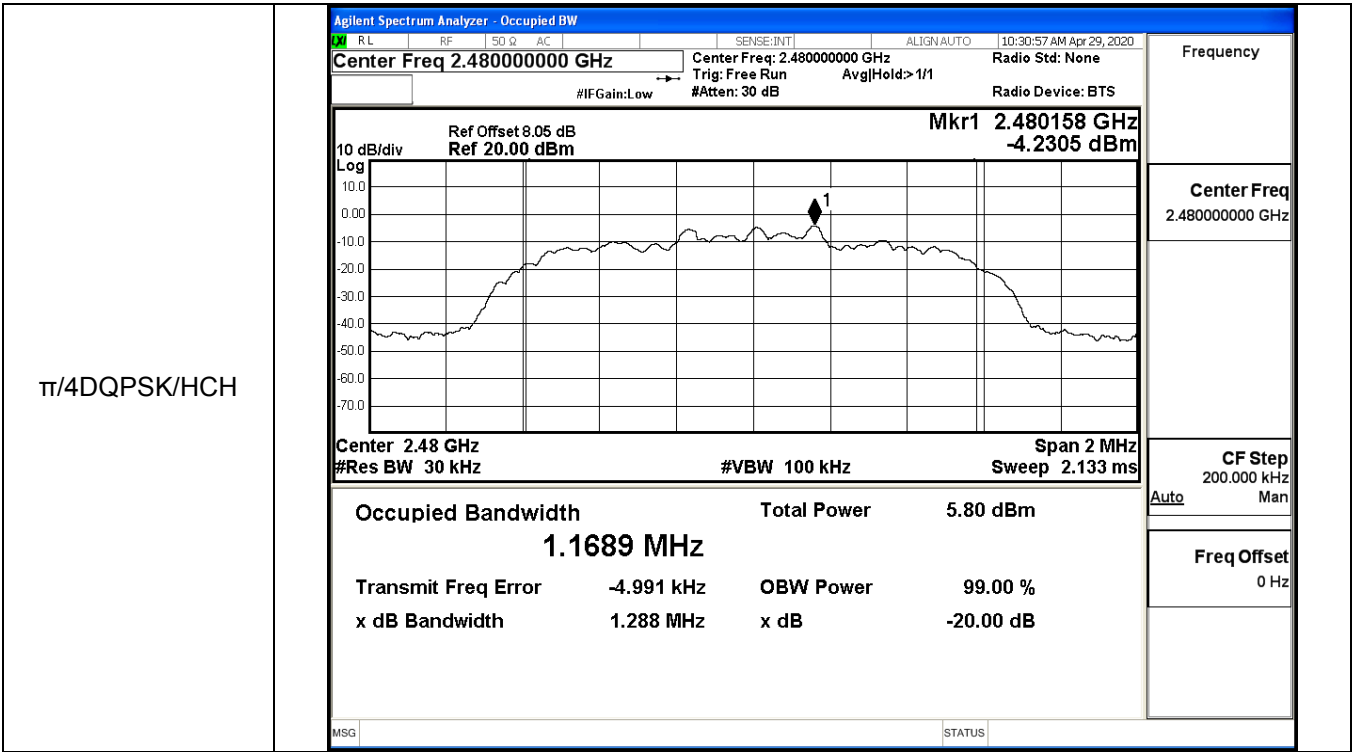


Frequency	2.40200000 GHz
Center Freq	2.40200000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

$\pi/4$ DQPSK/MCH

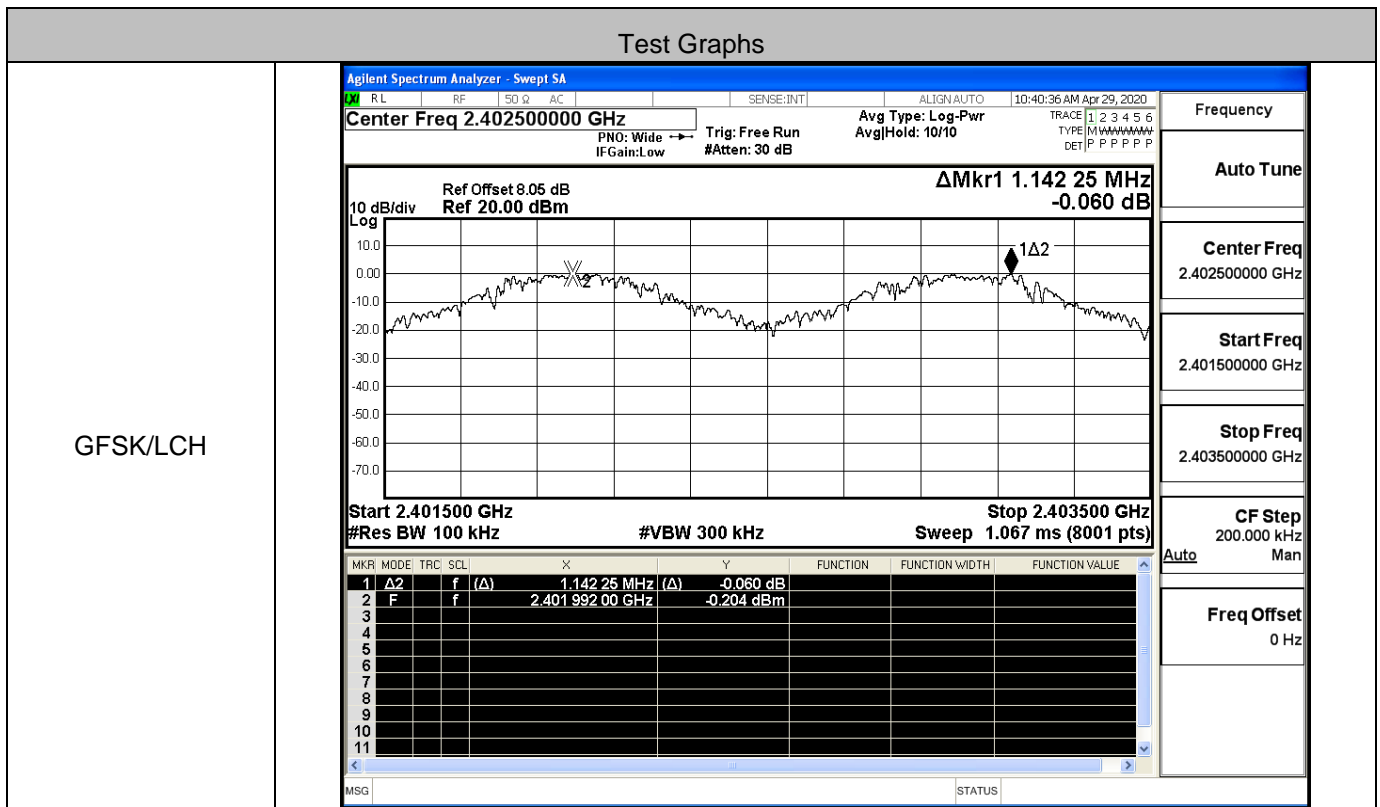


Frequency	2.44100000 GHz
Center Freq	2.44100000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

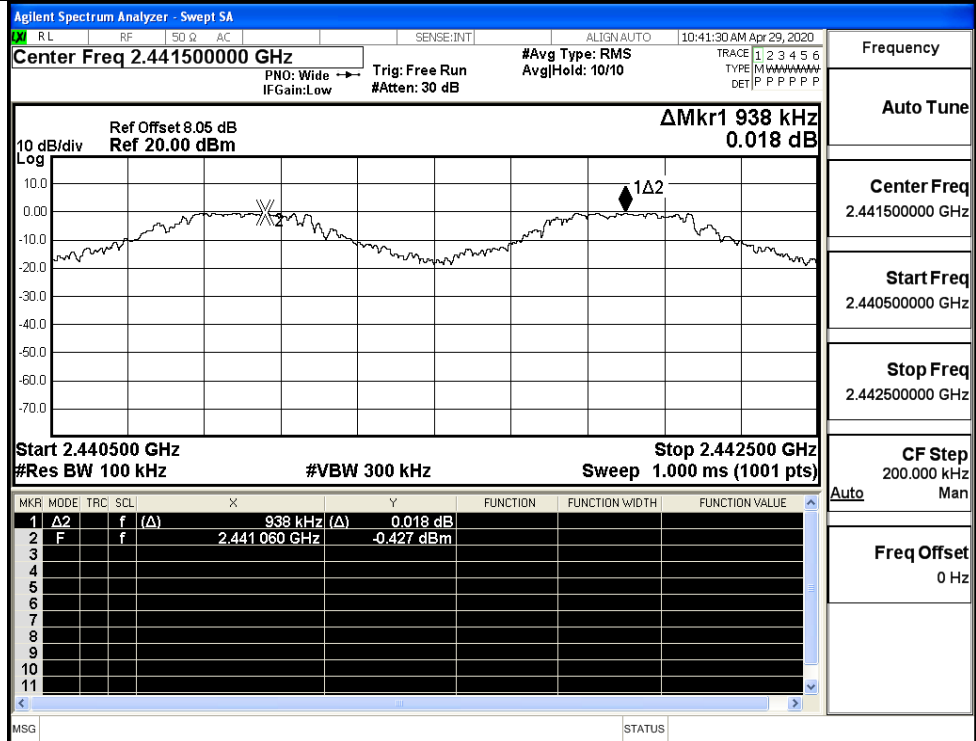


A.3 Carrier Frequency Separation

Mode	Channel	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.142	0.696	PASS
	MCH	0.938	0.696	PASS
	HCH	0.868	0.696	PASS
π/4DQPSK	LCH	0.886	0.861	PASS
	MCH	1.226	0.861	PASS
	HCH	1.174	0.861	PASS

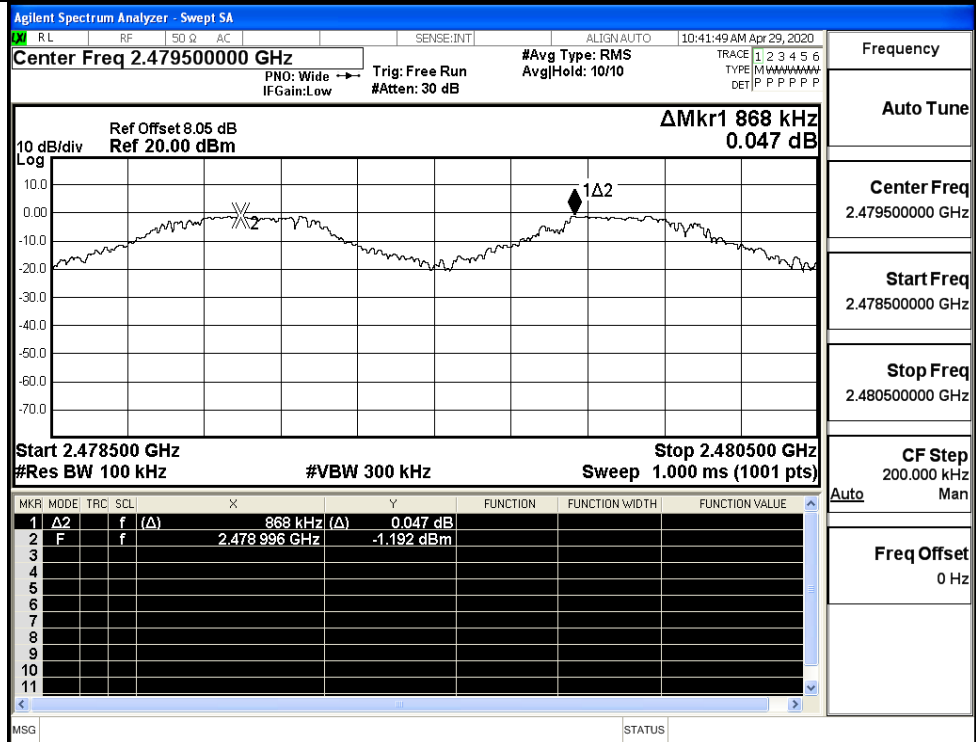


GFSK/MCH



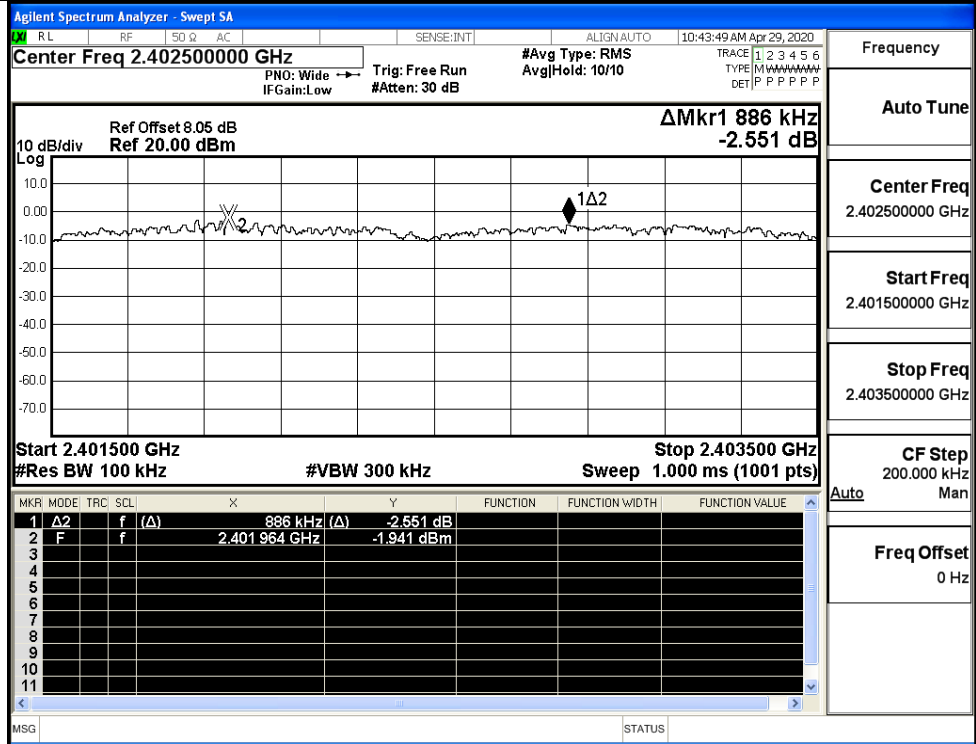
Frequency
Auto Tune
Center Freq
2.441500000 GHz
Start Freq
2.440500000 GHz
Stop Freq
2.442500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

GFSK/HCH

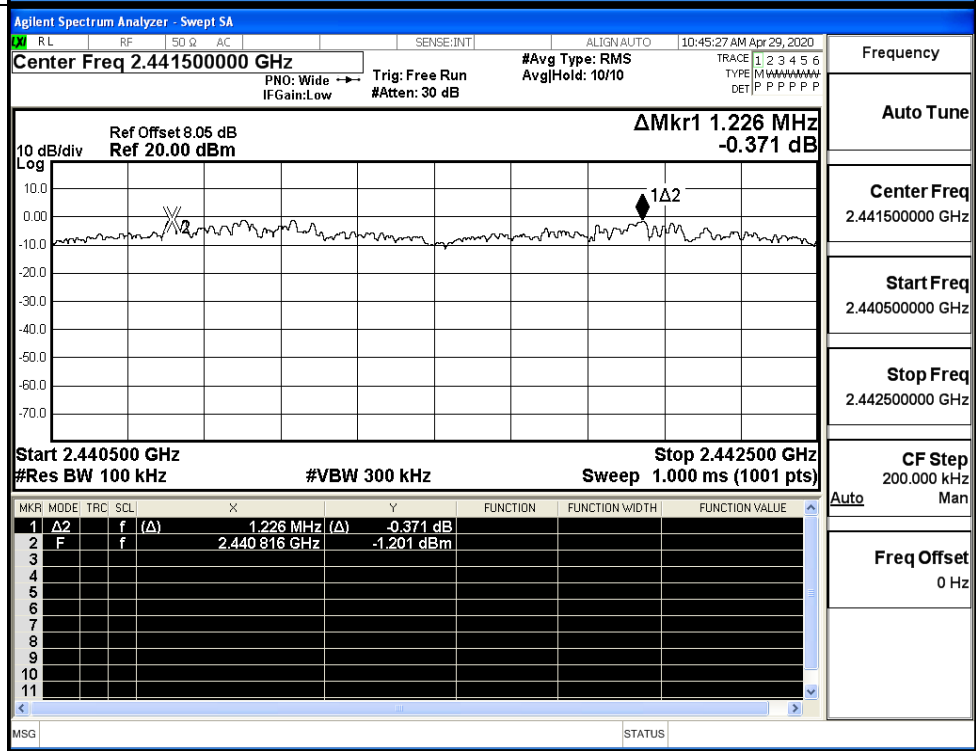


Frequency
Auto Tune
Center Freq
2.479500000 GHz
Start Freq
2.478500000 GHz
Stop Freq
2.480500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

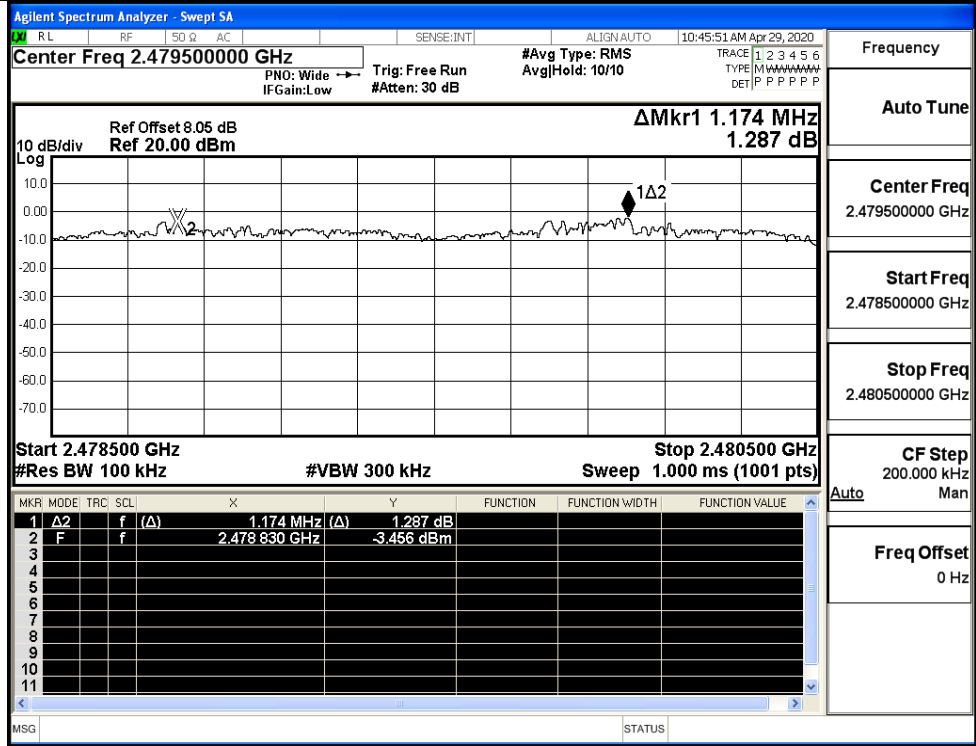
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH



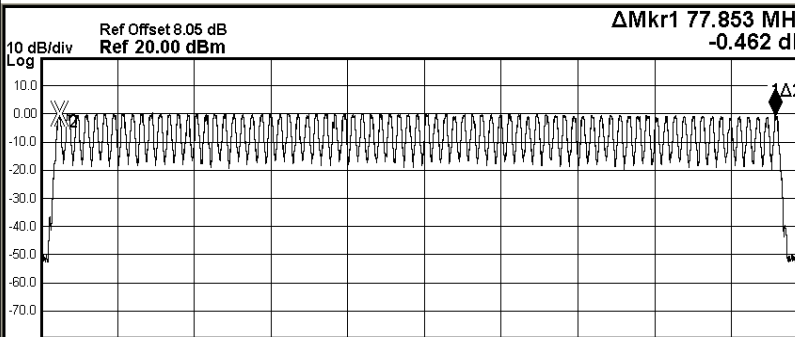
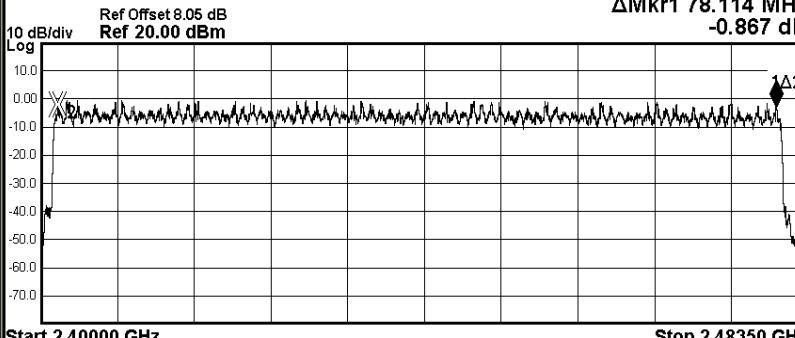
$\pi/4$ DQPSK/HCH



A.4 Hopping Channel Number

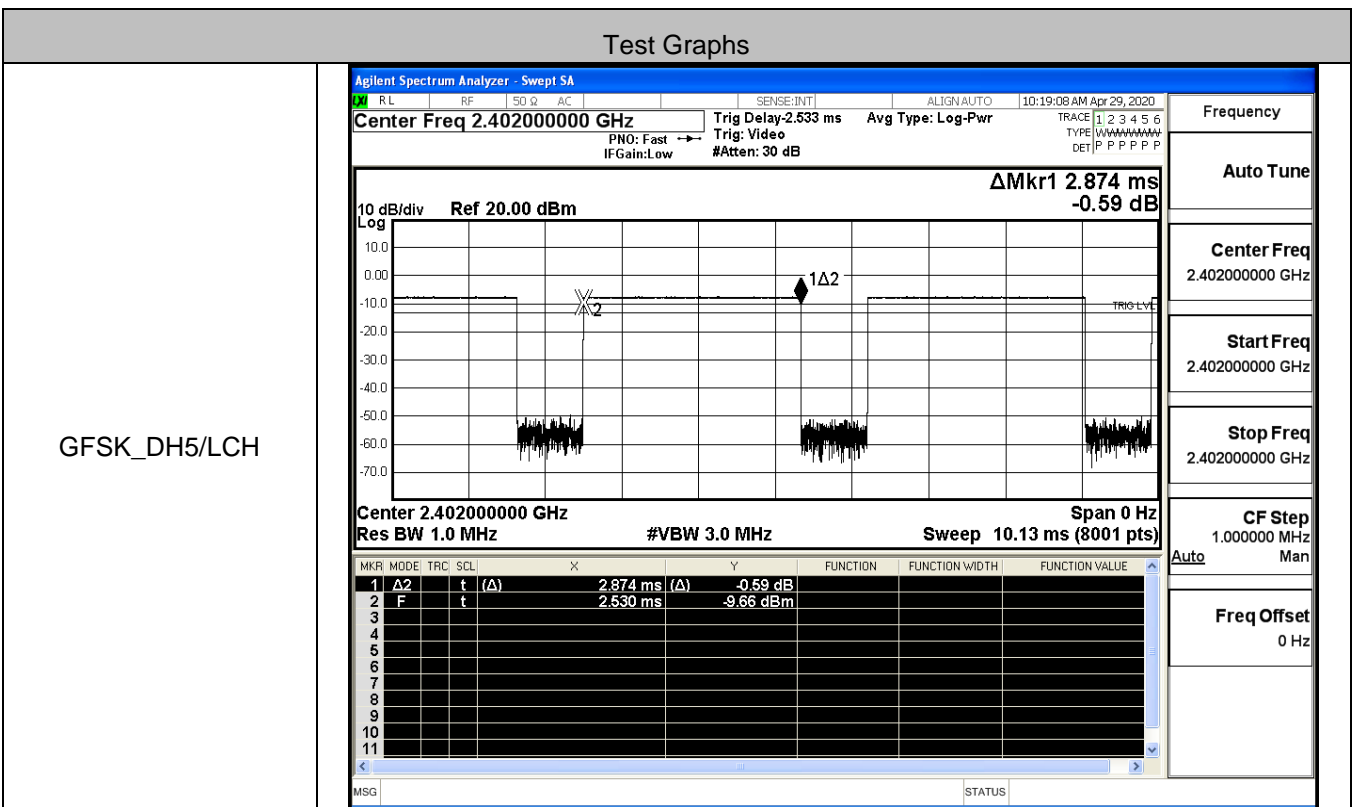
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS

Test Graphs

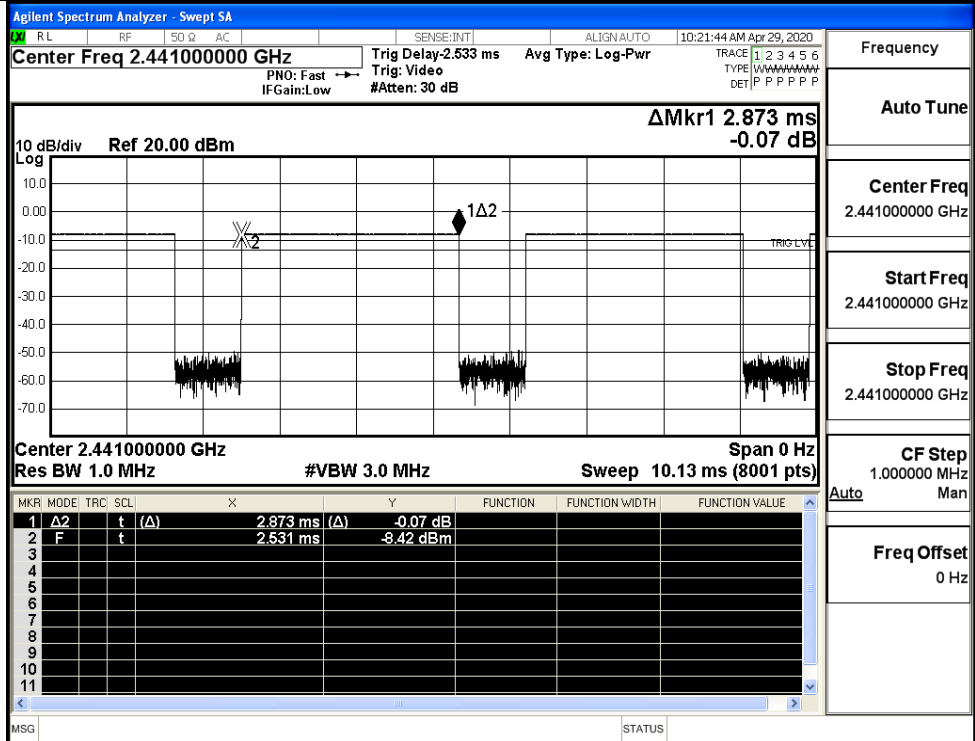
GFSK/Hop	<div style="border: 1px solid black; padding: 5px;"> <p style="font-size: small; margin: 0;">Agilent Spectrum Analyzer - Swept SA</p> <p style="font-size: x-small; margin: 0;">RL RF 50 Q AC SENSE:INT ALIGN: AUTO 10:43:09 AM Apr 29, 2020</p> <p style="font-size: small; margin: 0;">Center Freq 2.441750000 GHz #Avg Type: RMS Trig: Free Run #Atten: 30 dB</p> <p style="font-size: x-small; margin: 0;">PNO: Fast IFGain: Low #Attenu: 30 dB #Avg Hold: 10/10</p> <p style="font-size: small; margin: 0;">Ref Offset 8.05 dB ΔMkr1 77.853 MHz -0.462 dB</p> <p style="font-size: x-small; margin: 0;">10 dB/div Ref 20.00 dBm</p>  <p style="font-size: small; margin: 0;">Start 2.40000 GHz Stop 2.48350 GHz</p> <p style="font-size: x-small; margin: 0;">#Res BW 100 kHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: 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>Δ2</td> <td>f</td> <td>(Δ)</td> <td>77.853 MHz (Δ)</td> <td>-0.462 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.402014 GHz</td> <td>-0.184 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p style="font-size: x-small; margin: 0;">MSG STATUS</p> </div>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ 2	f	(Δ)	77.853 MHz (Δ)	-0.462 dB				2	F	f		2.402014 GHz	-0.184 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</p> <p>Freq Offset 0 Hz</p>
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	Δ 2	f	(Δ)	77.853 MHz (Δ)	-0.462 dB																								
2	F	f		2.402014 GHz	-0.184 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:INT ALIGN: AUTO 10:48:20 AM Apr 29, 2020</p> <p style="font-size: small; margin: 0;">Center Freq 2.441750000 GHz #Avg Type: RMS Trig: Free Run #Atten: 30 dB</p> <p style="font-size: x-small; margin: 0;">PNO: Fast IFGain: Low #Attenu: 30 dB #Avg Hold: 10/10</p> <p style="font-size: small; margin: 0;">Ref Offset 8.05 dB ΔMkr1 78.114 MHz -0.867 dB</p> <p style="font-size: x-small; margin: 0;">10 dB/div Ref 20.00 dBm</p>  <p style="font-size: small; margin: 0;">Start 2.40000 GHz Stop 2.48350 GHz</p> <p style="font-size: x-small; margin: 0;">#Res BW 100 kHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: 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>Δ2</td> <td>f</td> <td>(Δ)</td> <td>78.114 MHz (Δ)</td> <td>-0.867 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.401868 GHz</td> <td>-2.139 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p style="font-size: x-small; margin: 0;">MSG STATUS</p> </div>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ 2	f	(Δ)	78.114 MHz (Δ)	-0.867 dB				2	F	f		2.401868 GHz	-2.139 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</p> <p>Freq Offset 0 Hz</p>
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	Δ 2	f	(Δ)	78.114 MHz (Δ)	-0.867 dB																								
2	F	f		2.401868 GHz	-2.139 dBm																								

A.5 Dwell Time

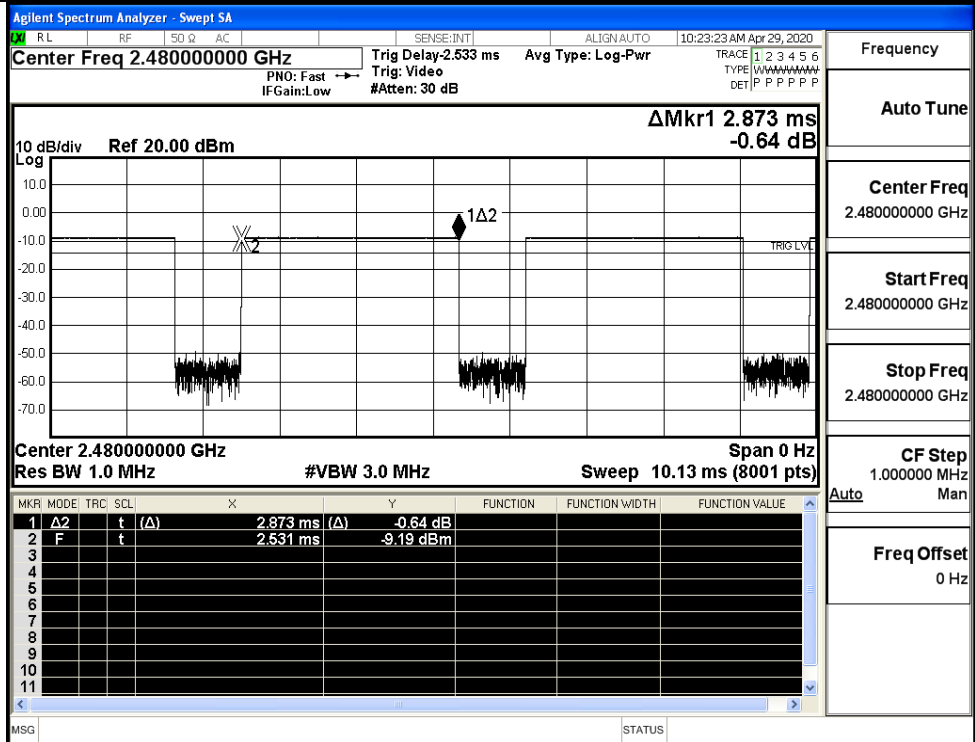
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.87	106.7	0.306	0.4	PASS
	DH5	MCH	2.87	106.7	0.306	0.4	PASS
	DH5	HCH	2.87	106.7	0.306	0.4	PASS
π/4DQPSK	2DH5	LCH	2.87	106.7	0.307	0.4	PASS
	2DH5	MCH	2.87	106.7	0.307	0.4	PASS
	2DH5	HCH	2.87	106.7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



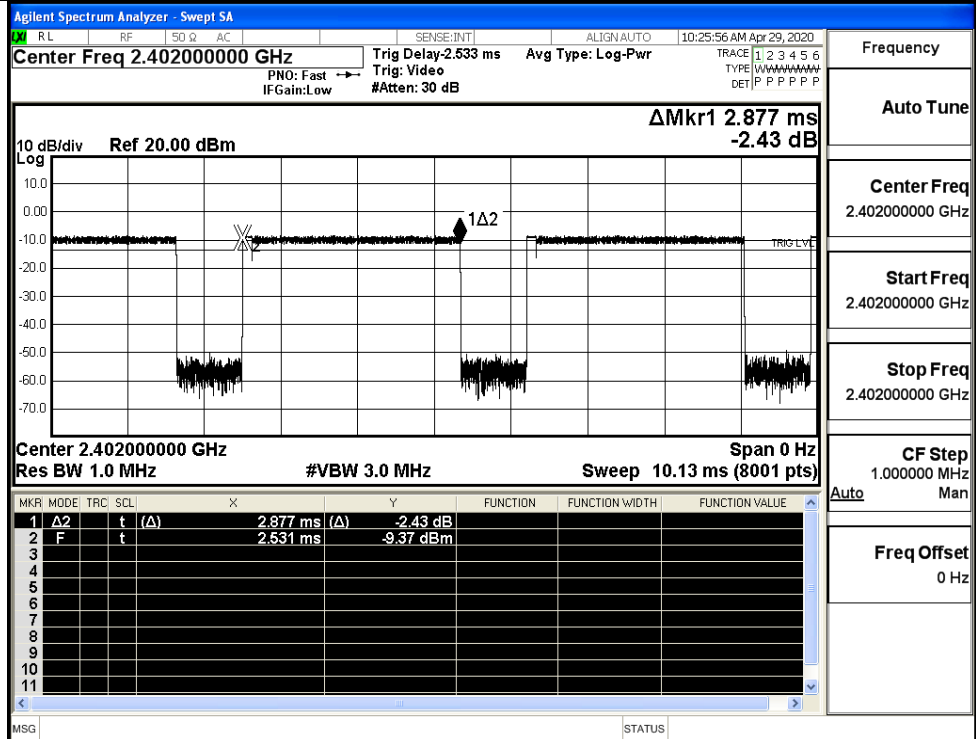
GFSK_DH5/MCH



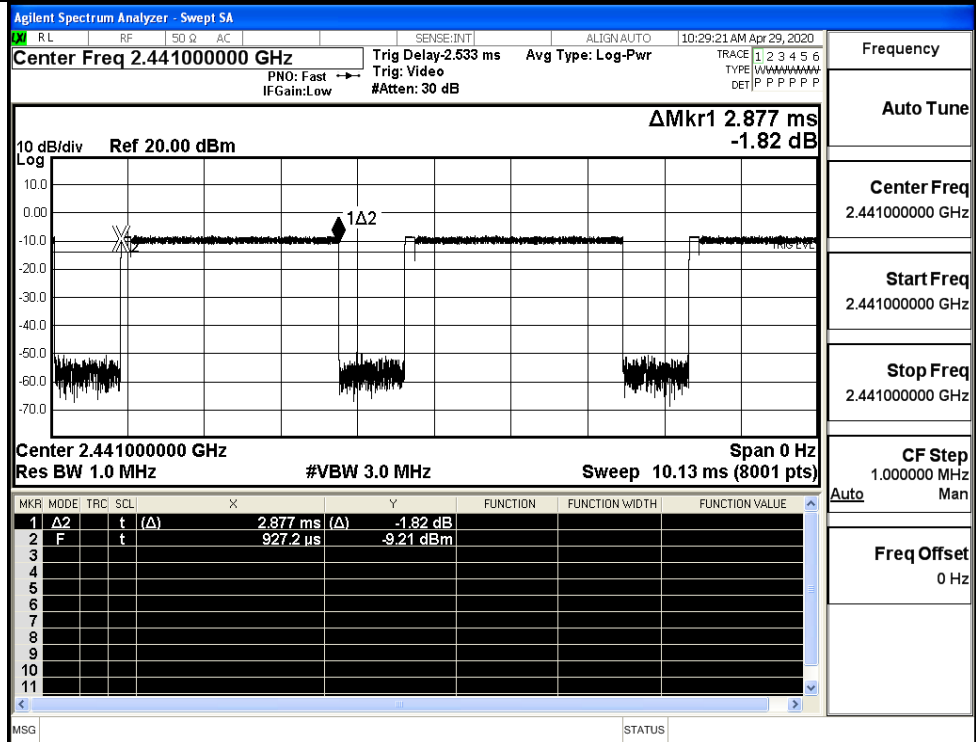
GFSK_DH5/HCH



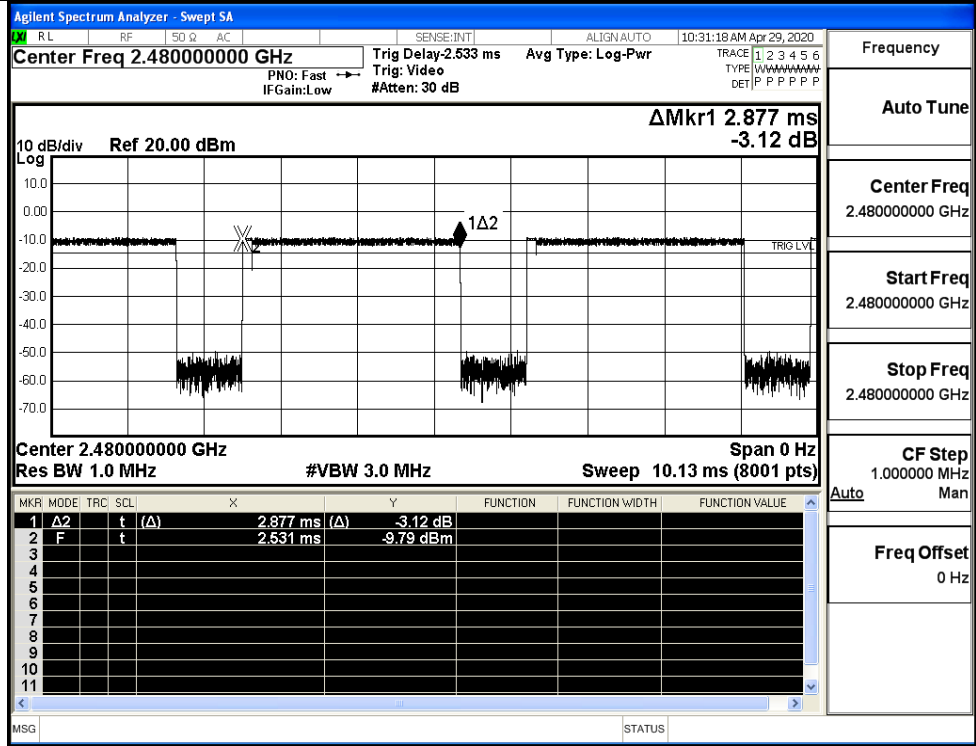
$\pi/4$ DQPSK
_2DH5/LCH



$\pi/4$ DQPSK
_2DH5/MCH



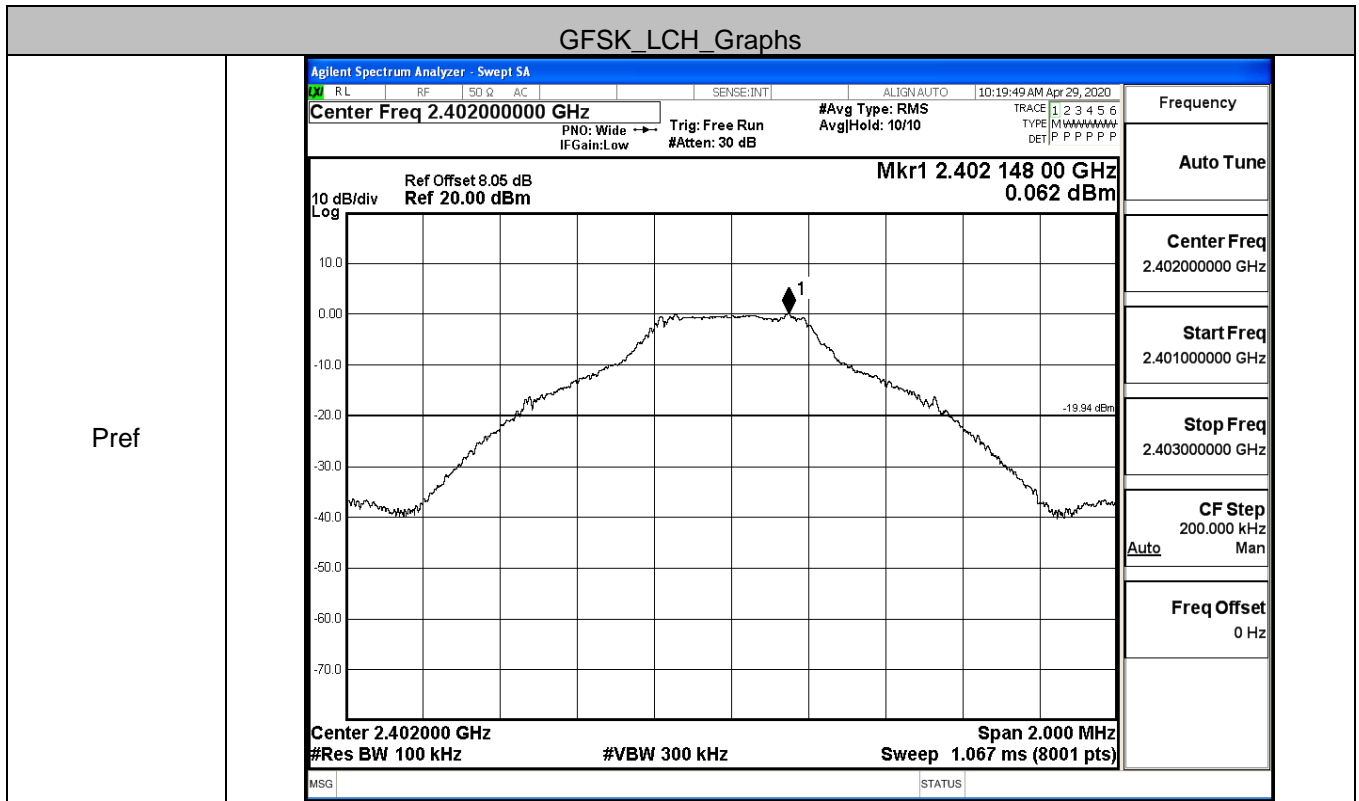
$\pi/4$ DQPSK
_2DH5/HCH



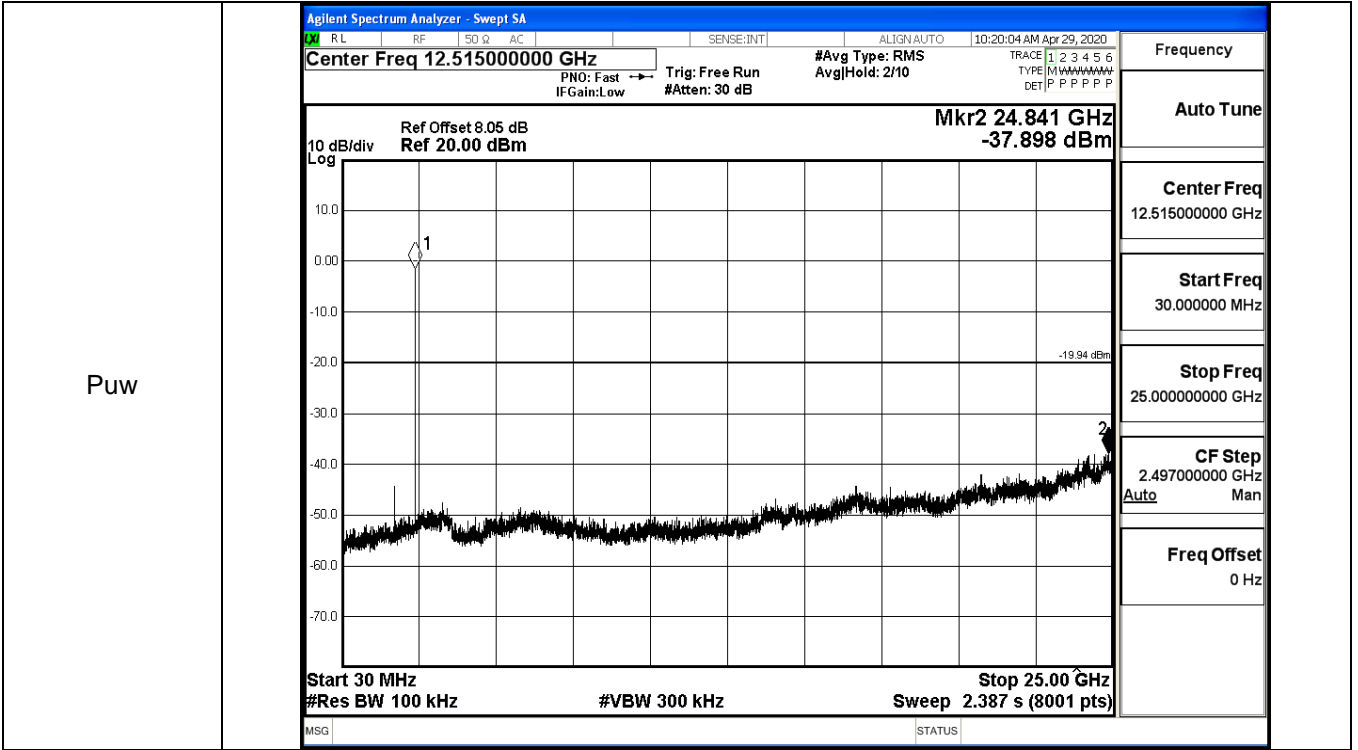
A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.062	-37.898	-19.938	PASS
	MCH	0.071	-37.016	-19.929	PASS
	HCH	-0.463	-34.527	-20.463	PASS
$\pi/4$ DQPSK	LCH	-0.779	-37.360	-20.779	PASS
	MCH	-1.082	-37.588	-21.082	PASS
	HCH	-1.407	-35.639	-21.407	PASS

GFSK_LCH_Graphs

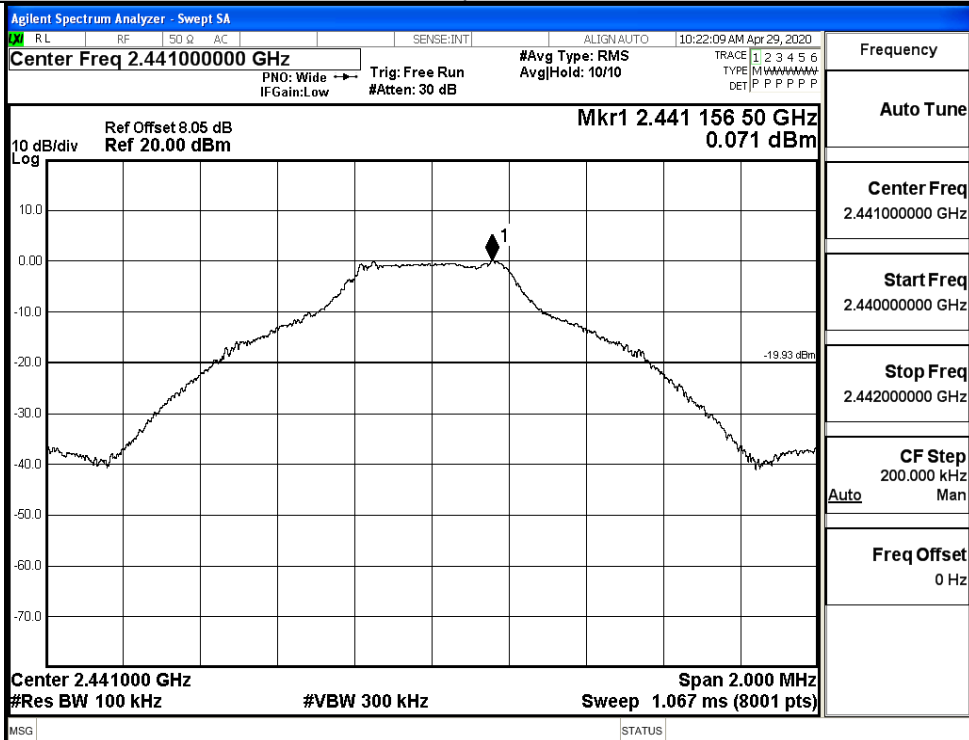


Pref

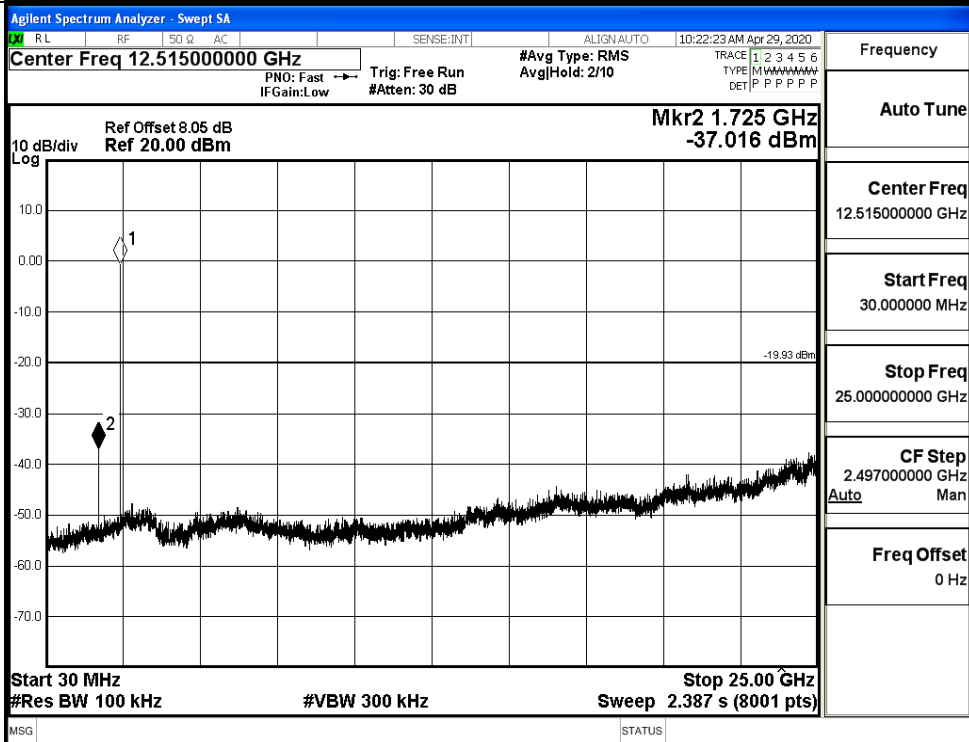


GFSK_MCH_Graphs

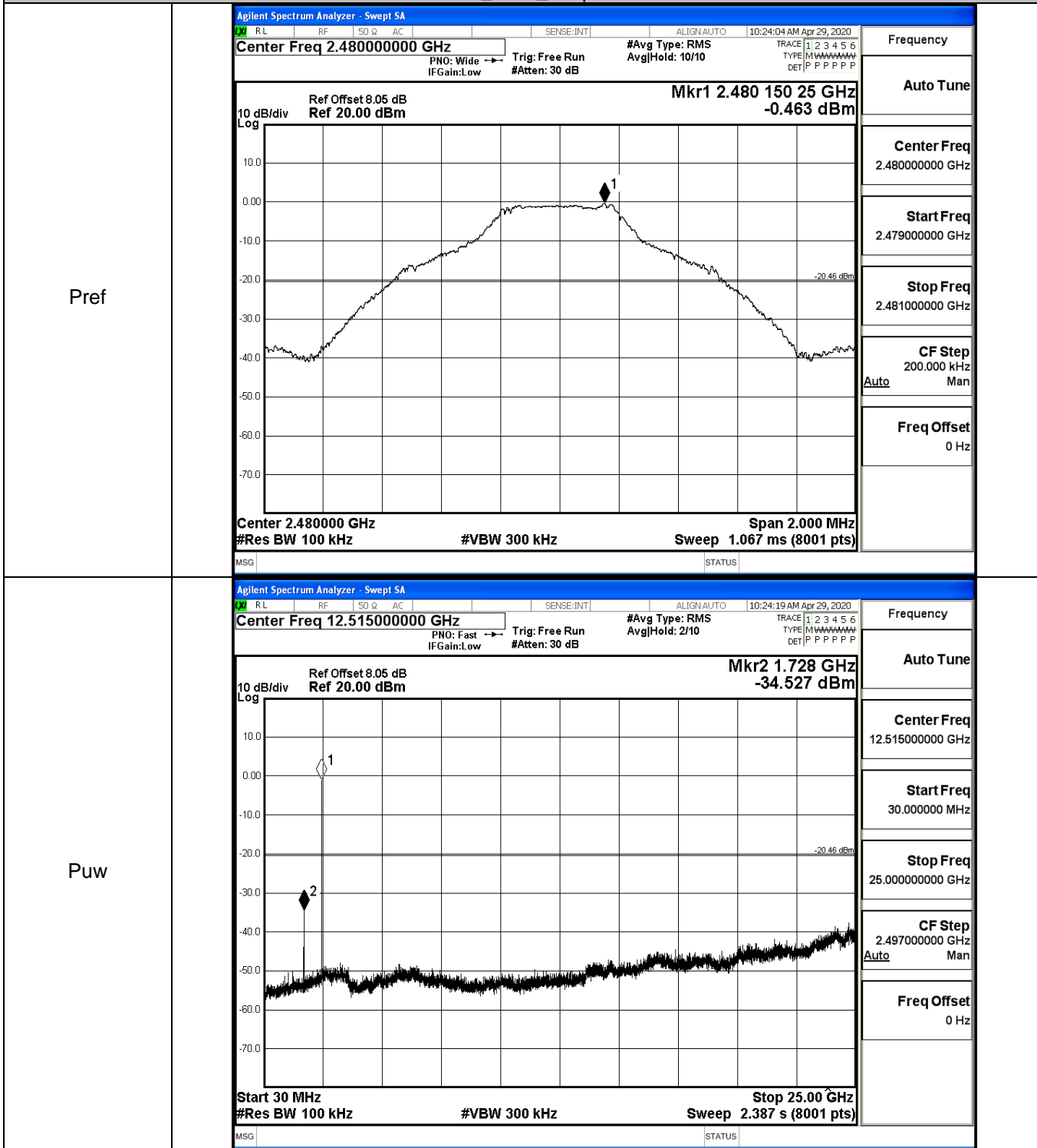
Pref



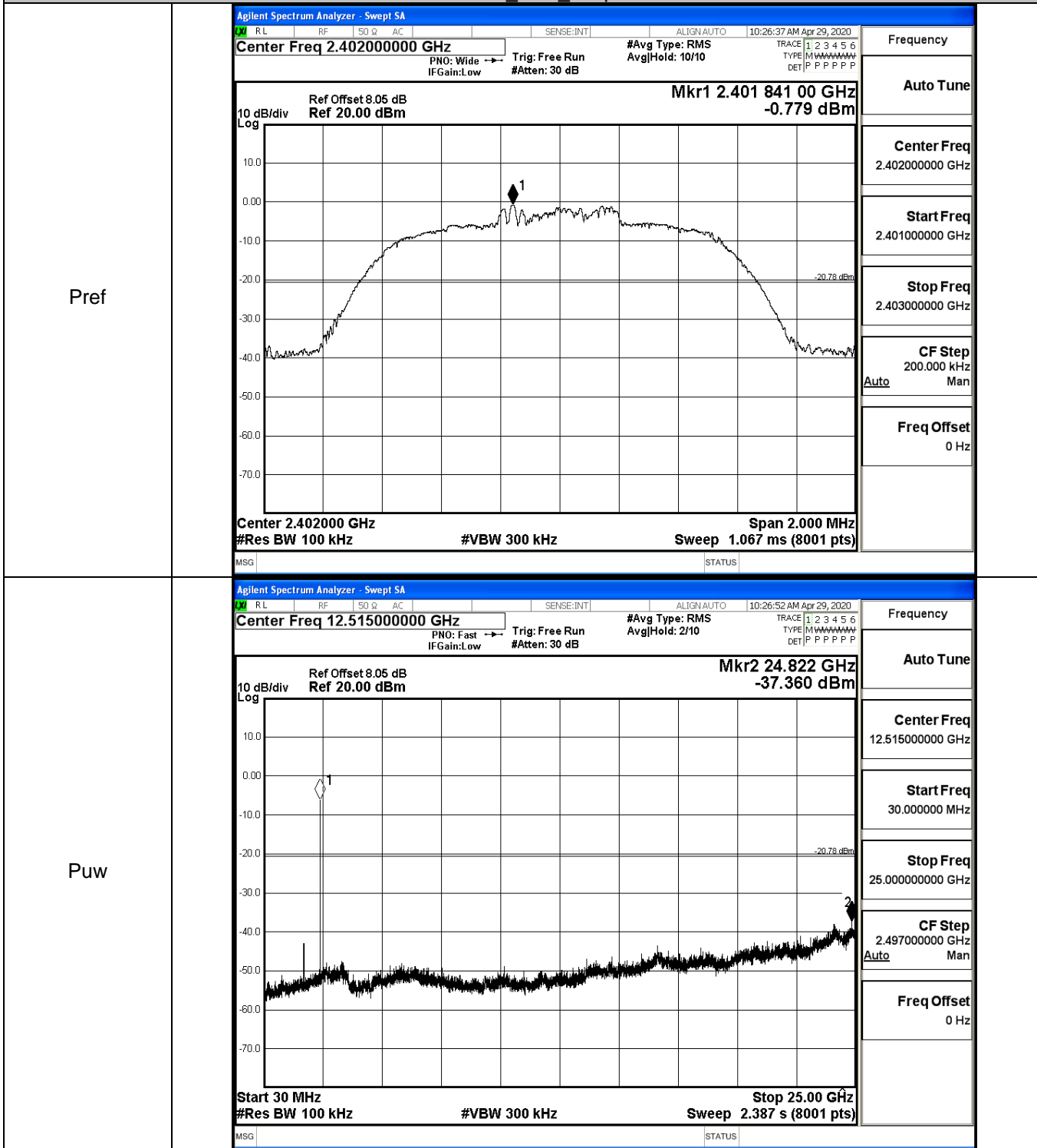
Puw



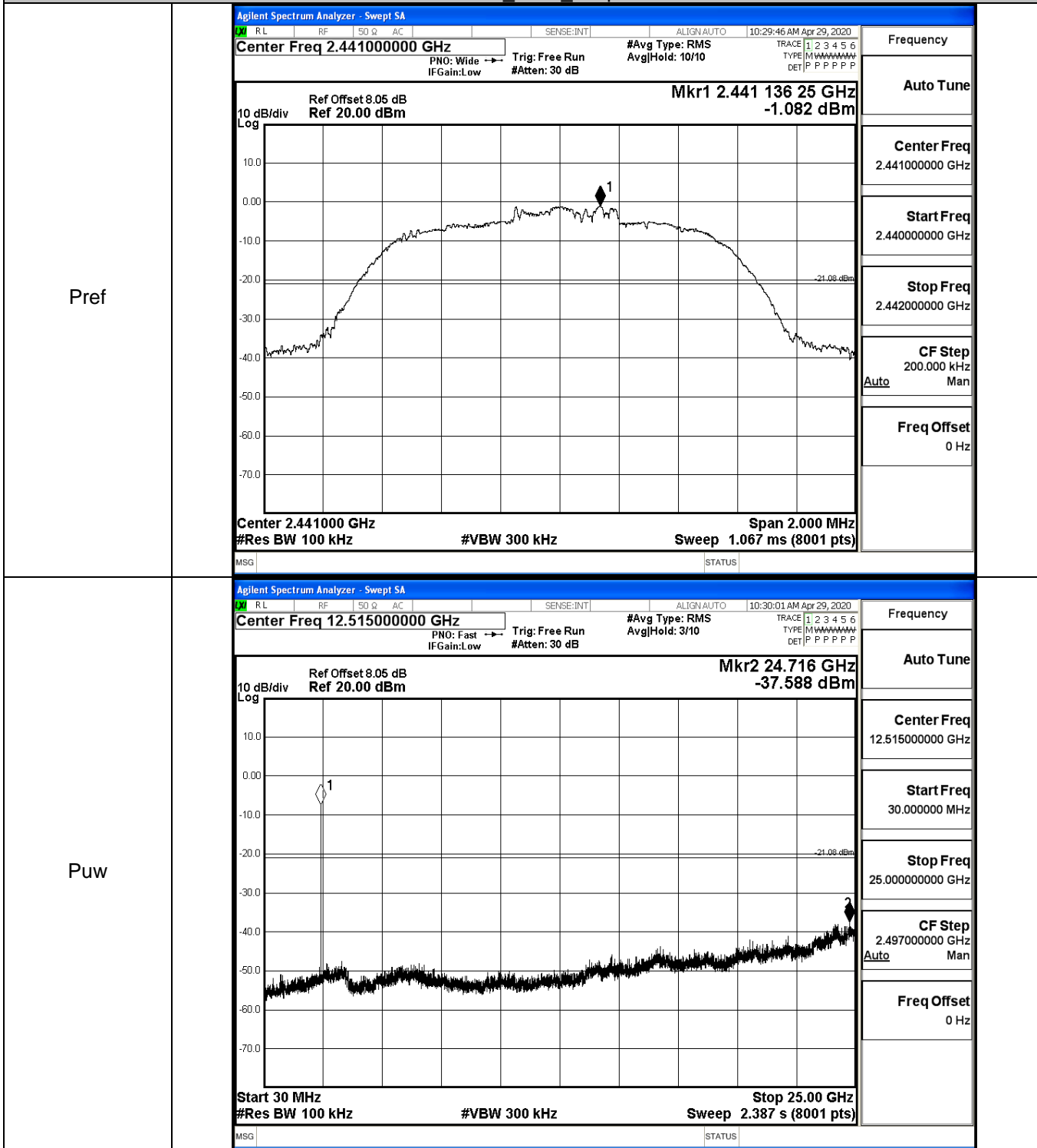
GFSK_HCH_Graphs



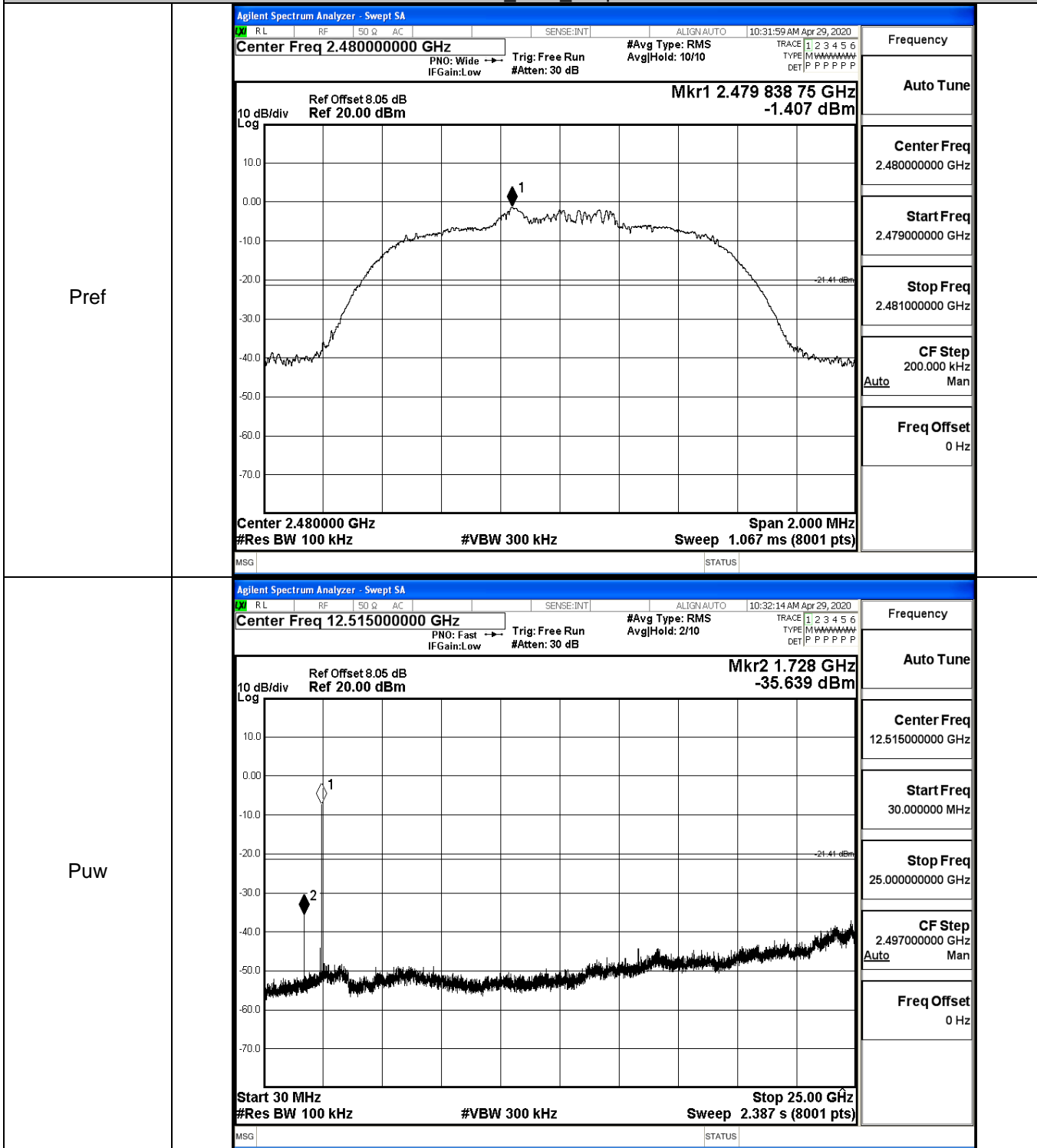
$\pi/4$ DQPSK_LCH_Graphs



$\pi/4$ DQPSK_MCH_Graphs



$\pi/4$ DQPSK_HCH_Graphs

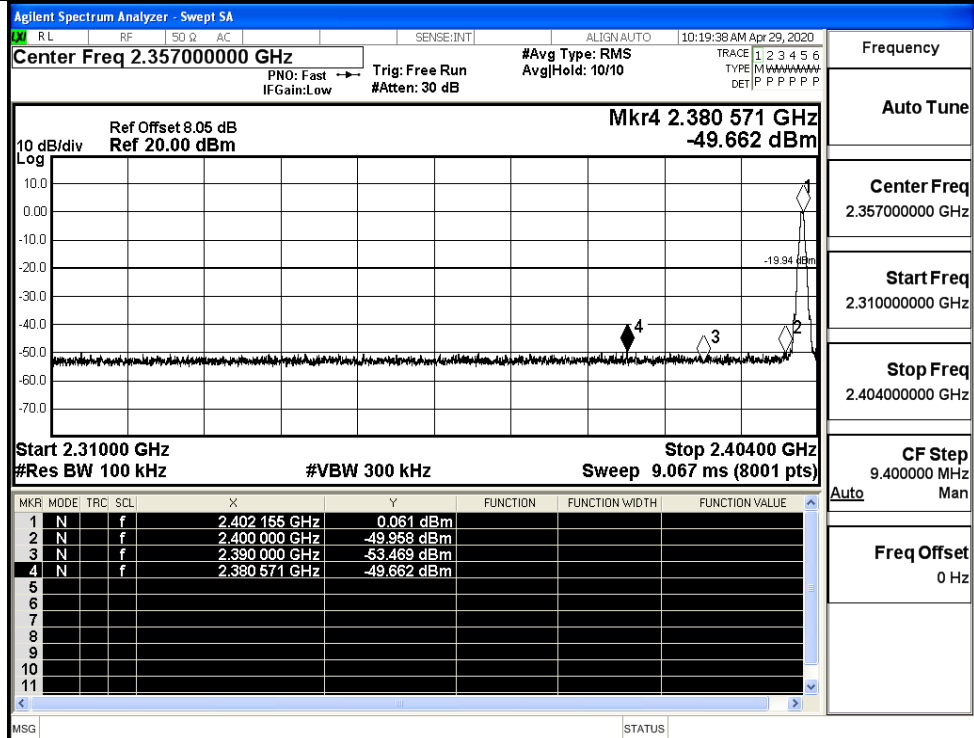


A.7 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	0.061	Off	-49.662	-19.94	PASS
			0.180	On	-49.872	-19.82	PASS
	HCH	2480	-0.373	Off	-49.044	-20.37	PASS
			-0.210	On	-48.381	-20.21	PASS
$\pi/4$ DQPSK	LCH	2402	-2.381	Off	-49.272	-22.38	PASS
			-0.617	On	-48.964	-20.62	PASS
	HCH	2480	-1.428	Off	-49.222	-21.43	PASS
			-0.986	On	-48.161	-20.99	PASS

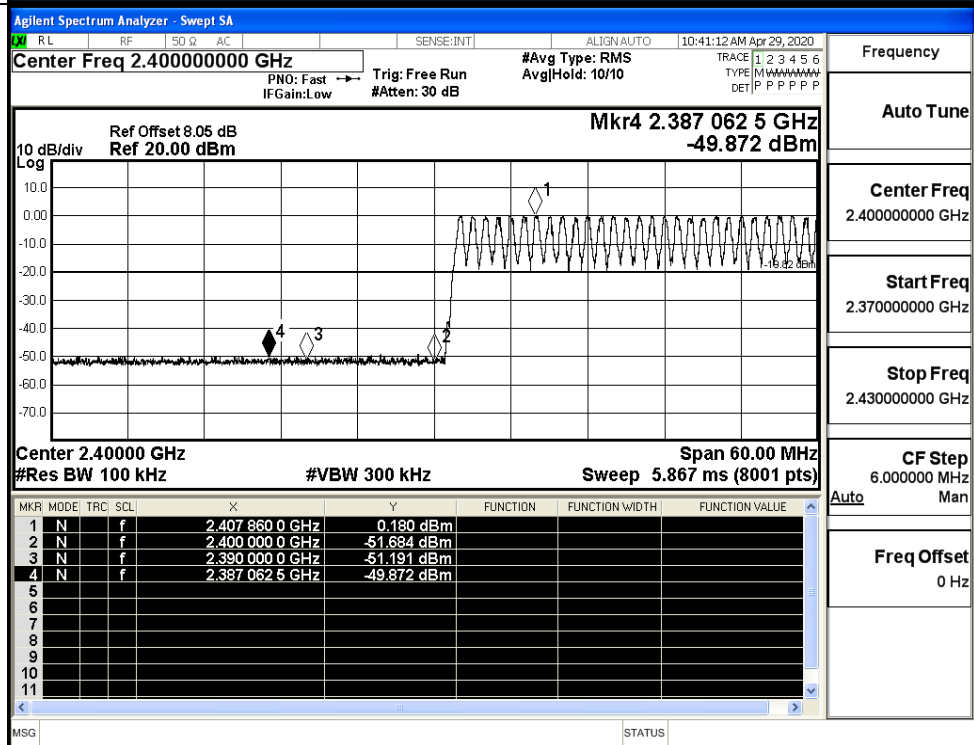
Test Graphs

GFSK/LCH/No Hop



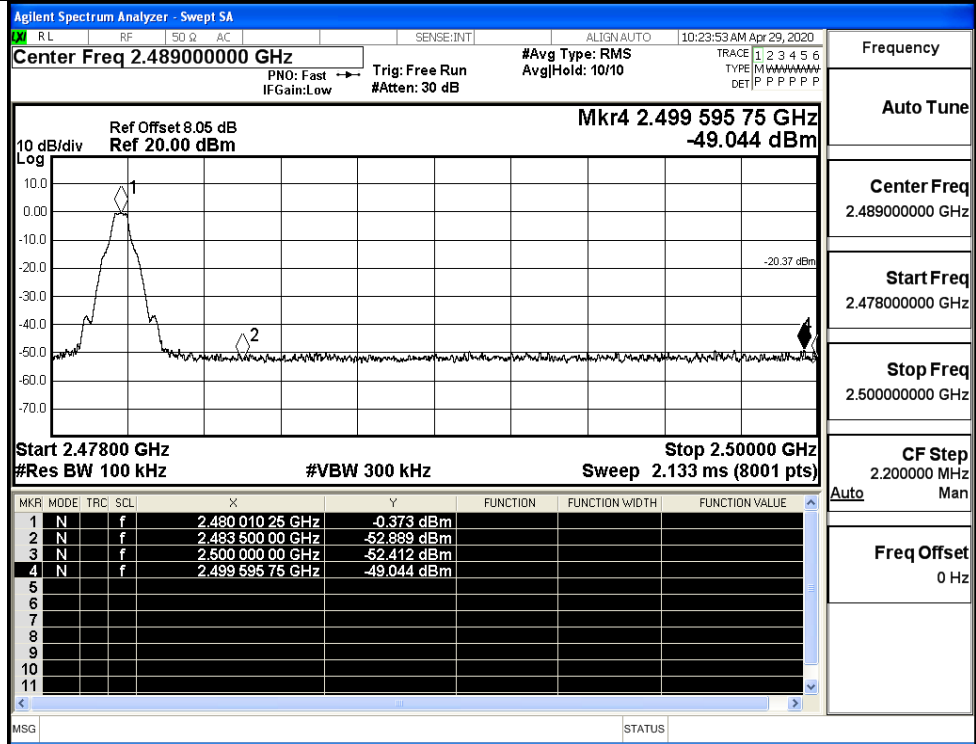
Frequency	
Auto Tune	
Center Freq	2.357000000 GHz
Start Freq	2.310000000 GHz
Stop Freq	2.404000000 GHz
CF Step	9.400000 MHz
Auto	Man
Freq Offset	0 Hz

GFSK/LCH/Hop

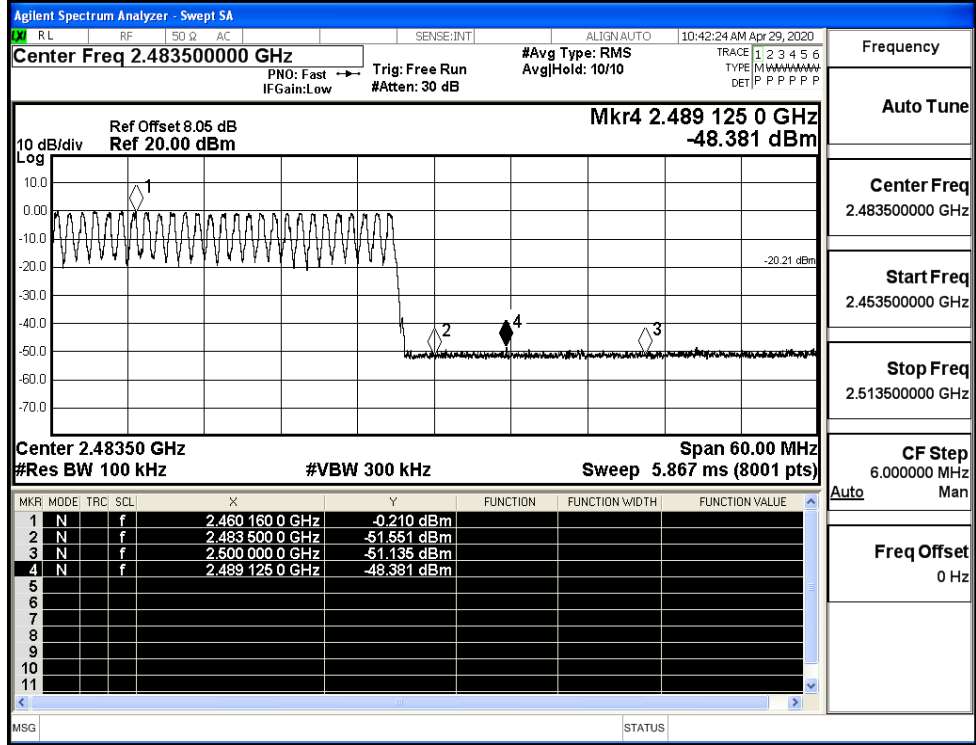


Frequency	
Auto Tune	
Center Freq	2.400000000 GHz
Start Freq	2.370000000 GHz
Stop Freq	2.430000000 GHz
CF Step	6.000000 MHz
Auto	Man
Freq Offset	0 Hz

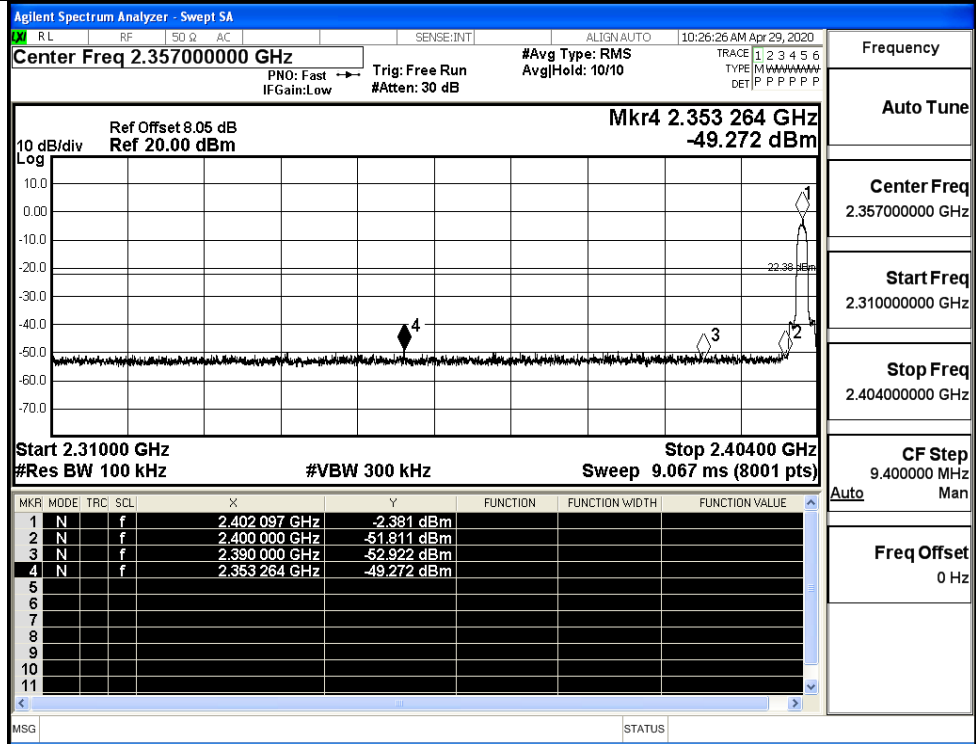
GFSK/HCH/No Hop



GFSK/HCH/Hop

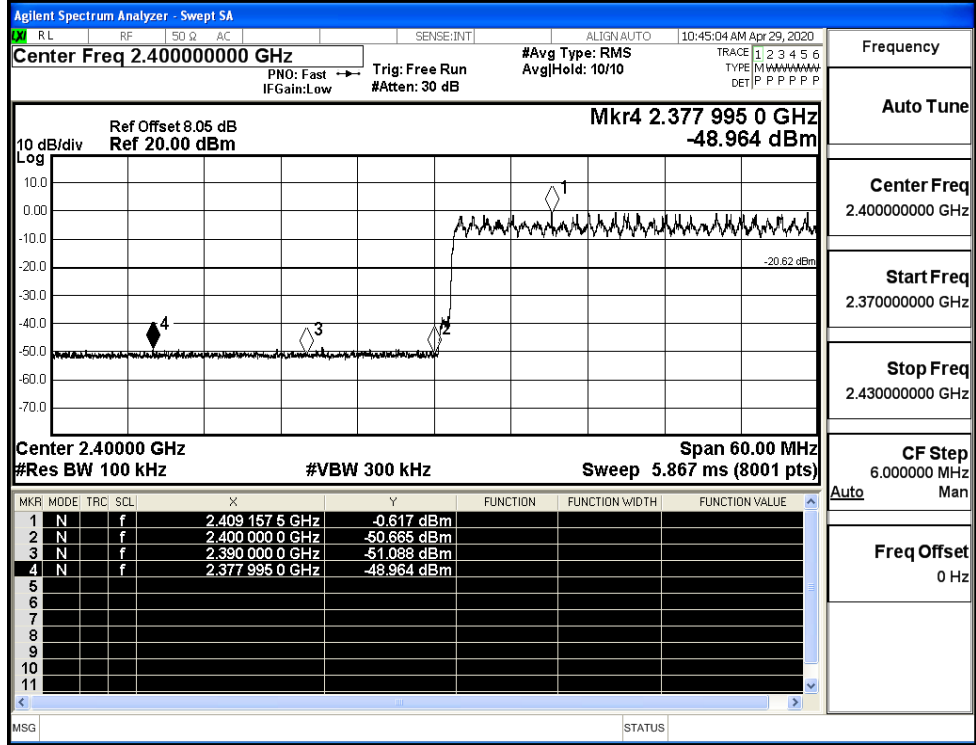


$\pi/4$ DQPSK/LCH/No
Hop



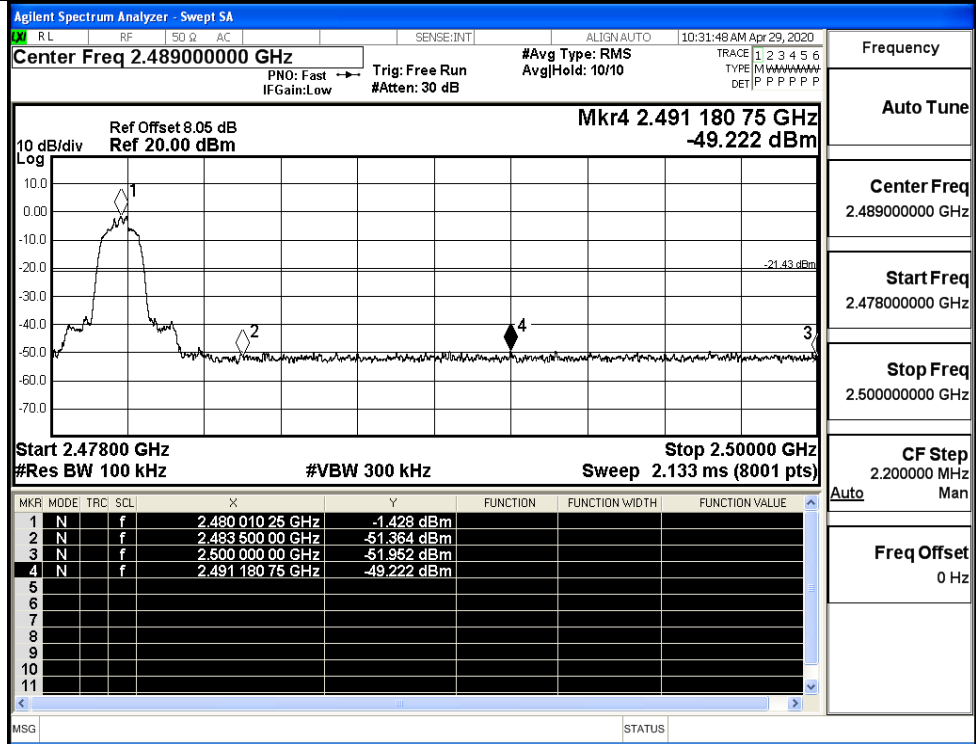
Frequency	
Auto Tune	
Center Freq	2.357000000 GHz
Start Freq	2.310000000 GHz
Stop Freq	2.404000000 GHz
CF Step	9.400000 MHz
Freq Offset	0 Hz

$\pi/4$ DQPSK/LCH/Hop



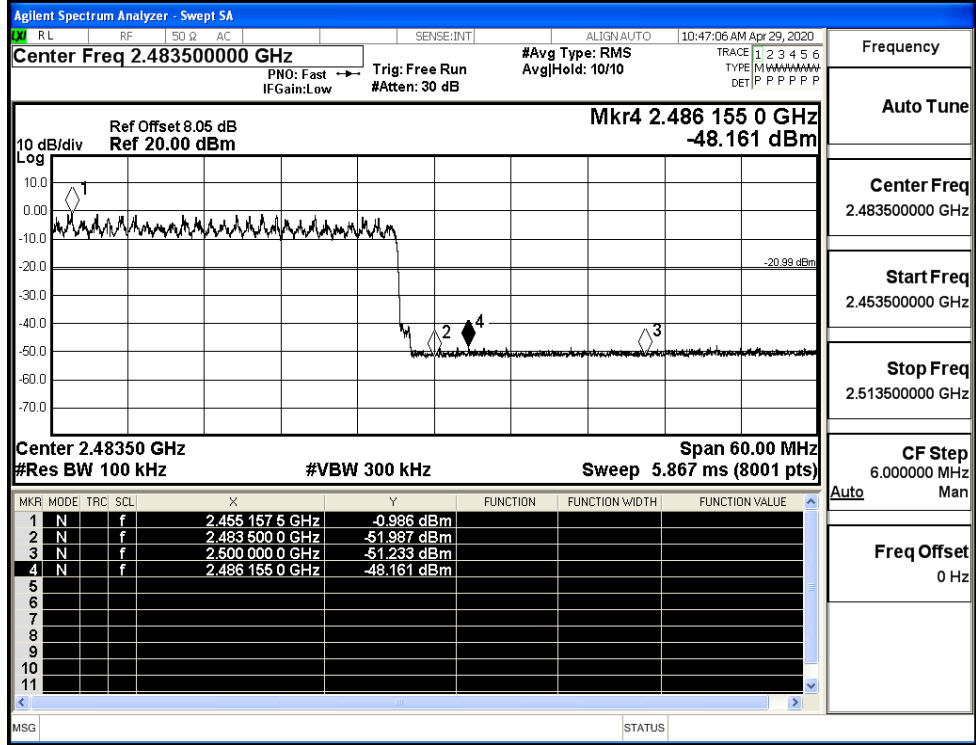
Frequency	
Auto Tune	
Center Freq	2.400000000 GHz
Start Freq	2.370000000 GHz
Stop Freq	2.430000000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz

π /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
Auto Man
Freq Offset
0 Hz

π /4DQPSK/HCH/Hop

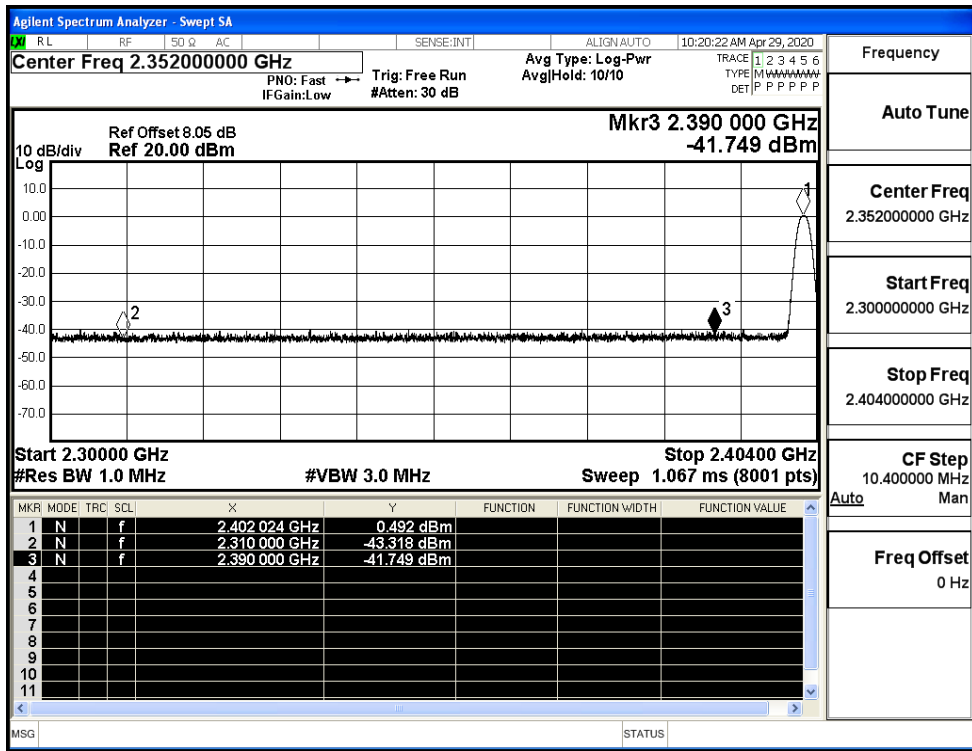


Frequency
Auto Tune
Center Freq
2.483500000 GHz
Start Freq
2.453500000 GHz
Stop Freq
2.513500000 GHz
CF Step
6.000000 MHz
Auto Man
Freq Offset
0 Hz

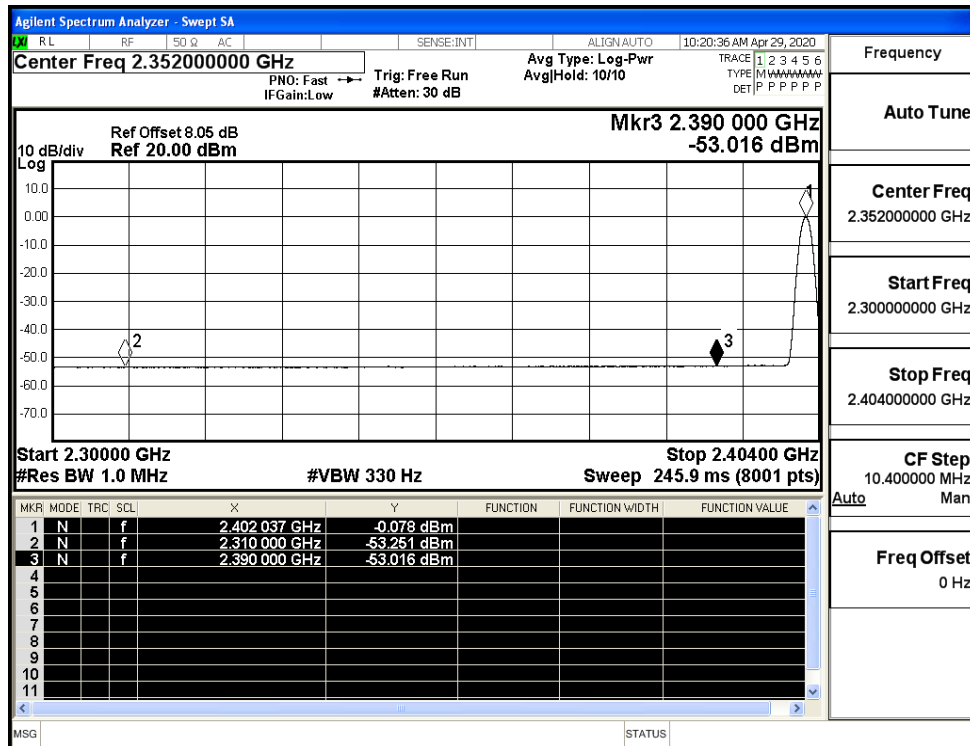
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.32	2.0	0	53.91	PEAK	74	PASS
	Off	2310.0	-53.25	2.0	0	43.98	AV	54	PASS
	Off	2390.0	-41.75	2.0	0	55.48	PEAK	74	PASS
	Off	2390.0	-53.02	2.0	0	44.21	AV	54	PASS
	Off	2483.5	-41.69	2.0	0	55.54	PEAK	74	PASS
	Off	2483.5	-52.51	2.0	0	44.72	AV	54	PASS
	Off	2500.0	-43.03	2.0	0	54.20	PEAK	74	PASS
	Off	2500.0	-52.27	2.0	0	44.96	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.90	2.0	0	53.33	PEAK	74	PASS
	Off	2310.0	-53.37	2.0	0	43.86	AV	54	PASS
	Off	2390.0	-43.14	2.0	0	54.09	PEAK	74	PASS
	Off	2390.0	-53.08	2.0	0	44.15	AV	54	PASS
	Off	2483.5	-42.63	2.0	0	54.60	PEAK	74	PASS
	Off	2483.5	-52.49	2.0	0	44.74	AV	54	PASS
	Off	2500.0	-42.26	2.0	0	54.97	PEAK	74	PASS
	Off	2500.0	-52.34	2.0	0	44.89	AV	54	PASS

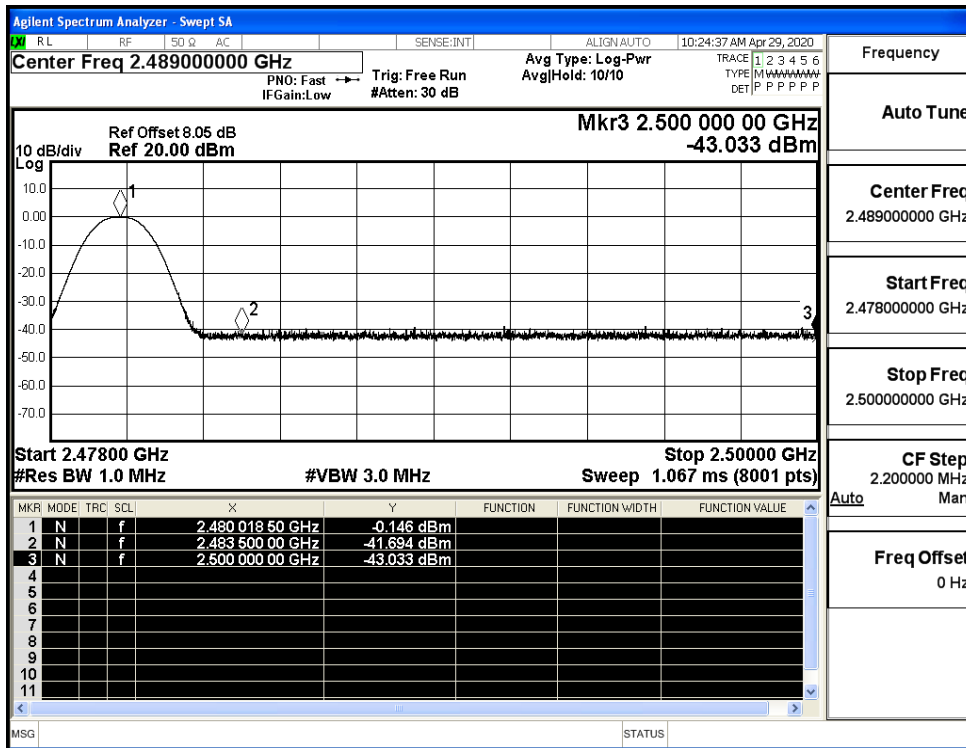
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



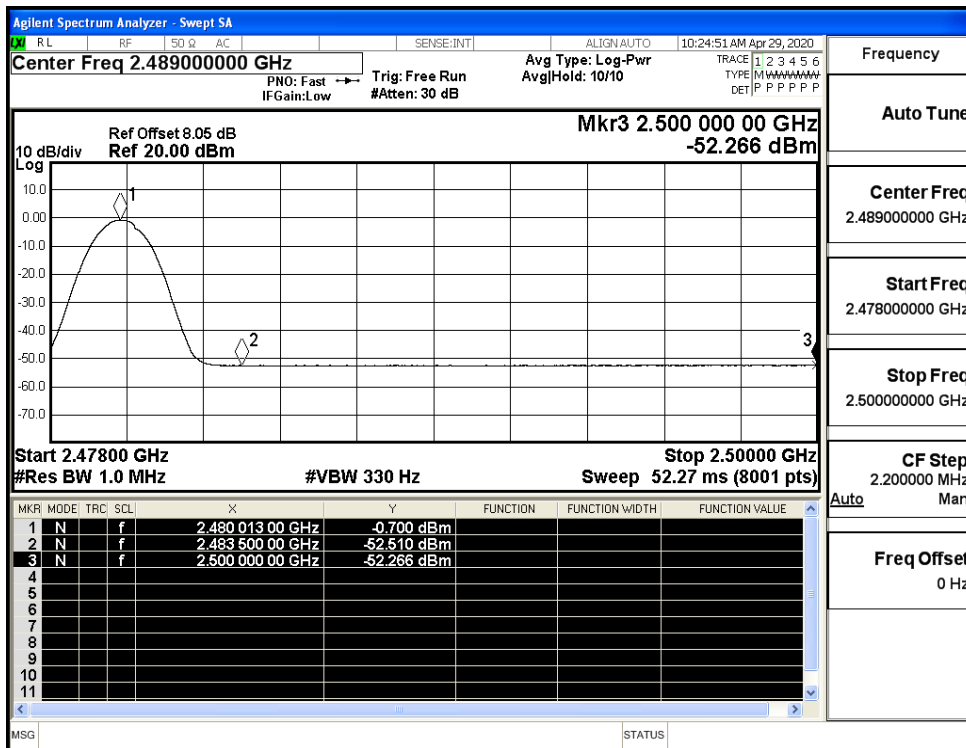
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



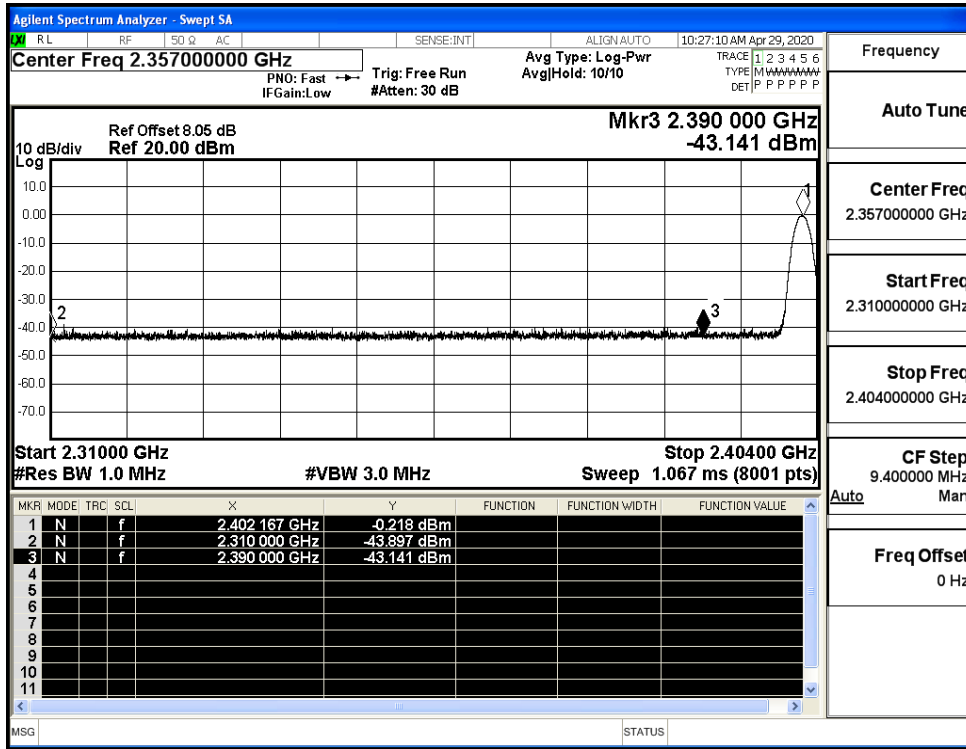
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



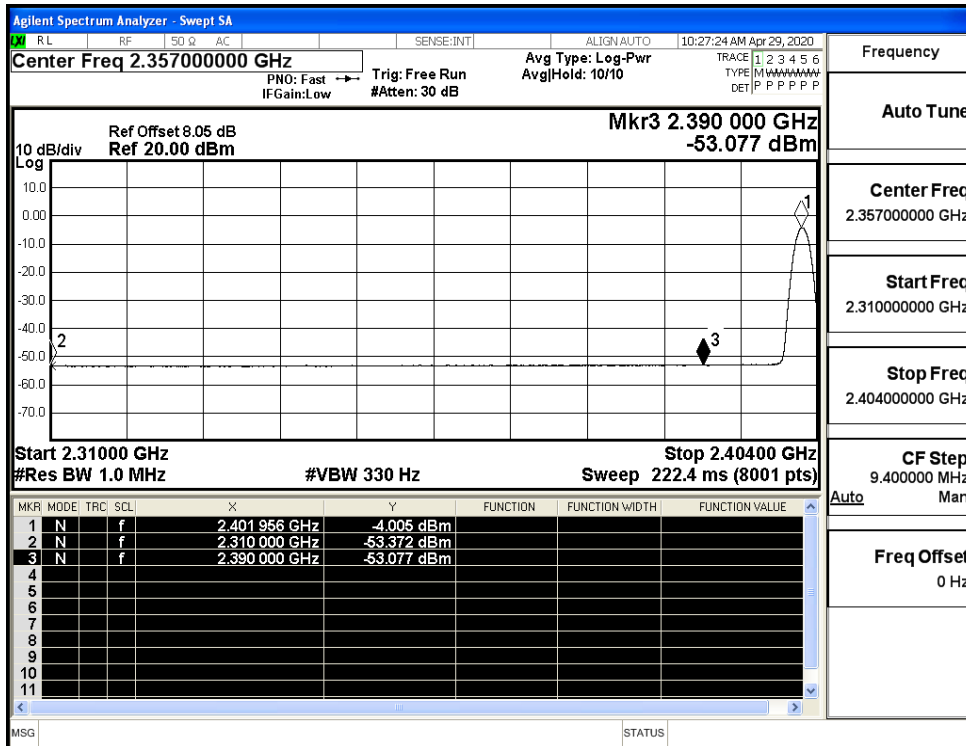
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



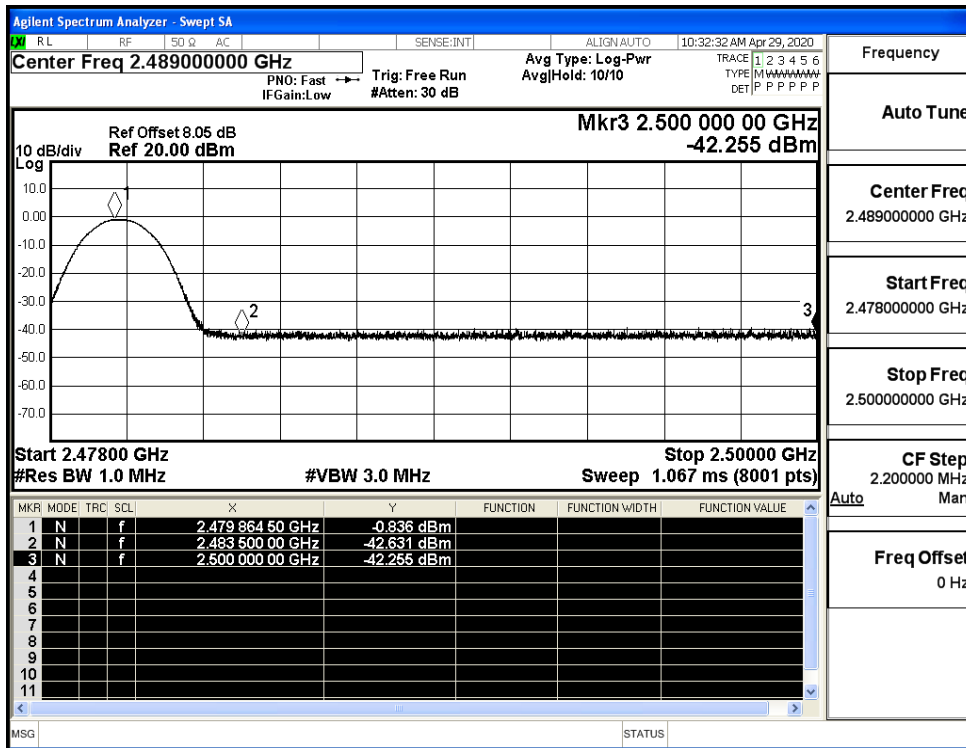
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)



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)

