

Appendix A
RF Test Data for BT V5.0(DSS) (Conducted Measurement)
Product Name: Wireless headphone
Trade Mark: Origaudio
Test Model: Beebop

Environmental Conditions

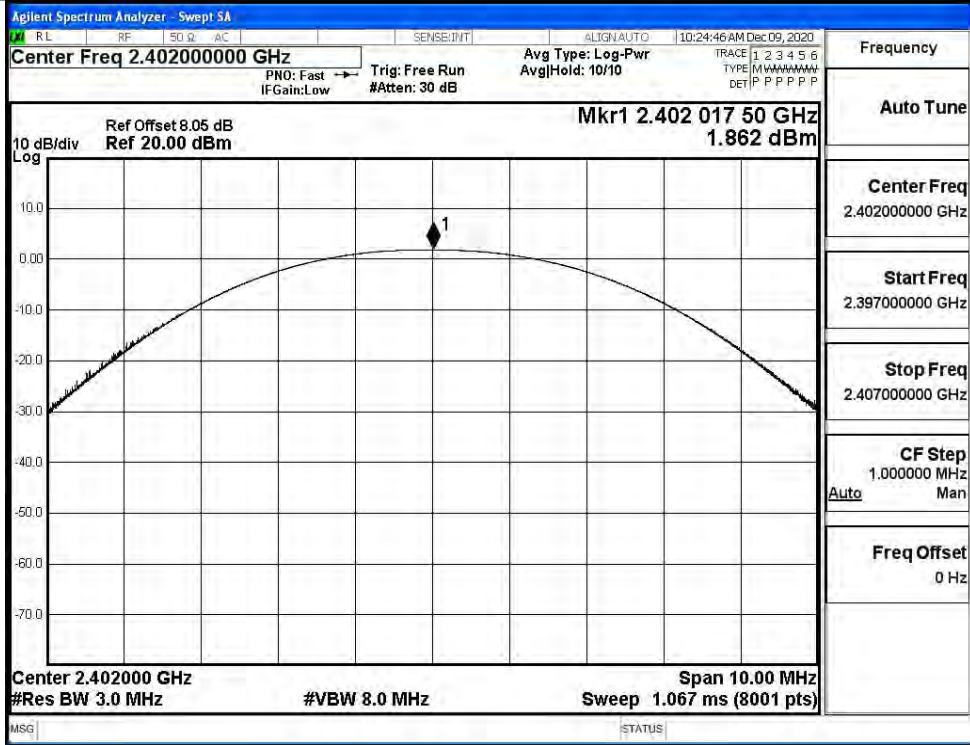
Temperature:	22.3 ° C
Relative Humidity:	53.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Ken He
Supervised by:	Li Huan

A.1 Maxmum Conducted Peak Output Power

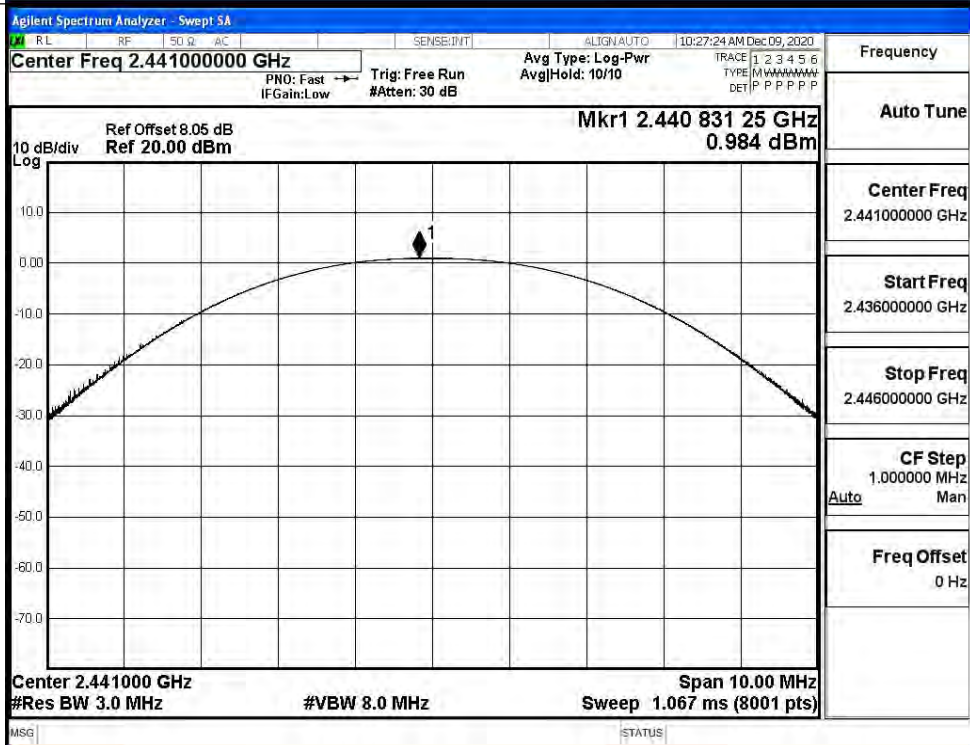
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.862	30	PASS
	MCH	0.984	30	PASS
	HCH	-0.312	30	PASS
$\pi/4$ DQPSK	LCH	4.219	21	PASS
	MCH	3.345	21	PASS
	HCH	2.044	21	PASS
8DPSK	LCH	4.766	21	PASS
	MCH	3.863	21	PASS
	HCH	2.504	21	PASS

Test Graphs

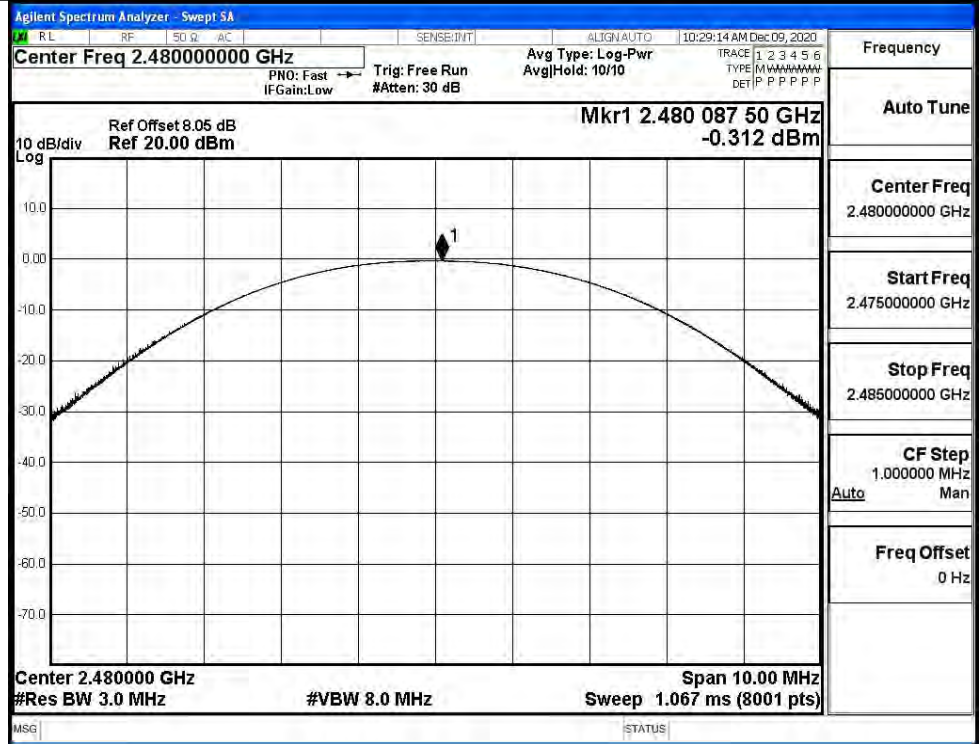
GFSK/LCH



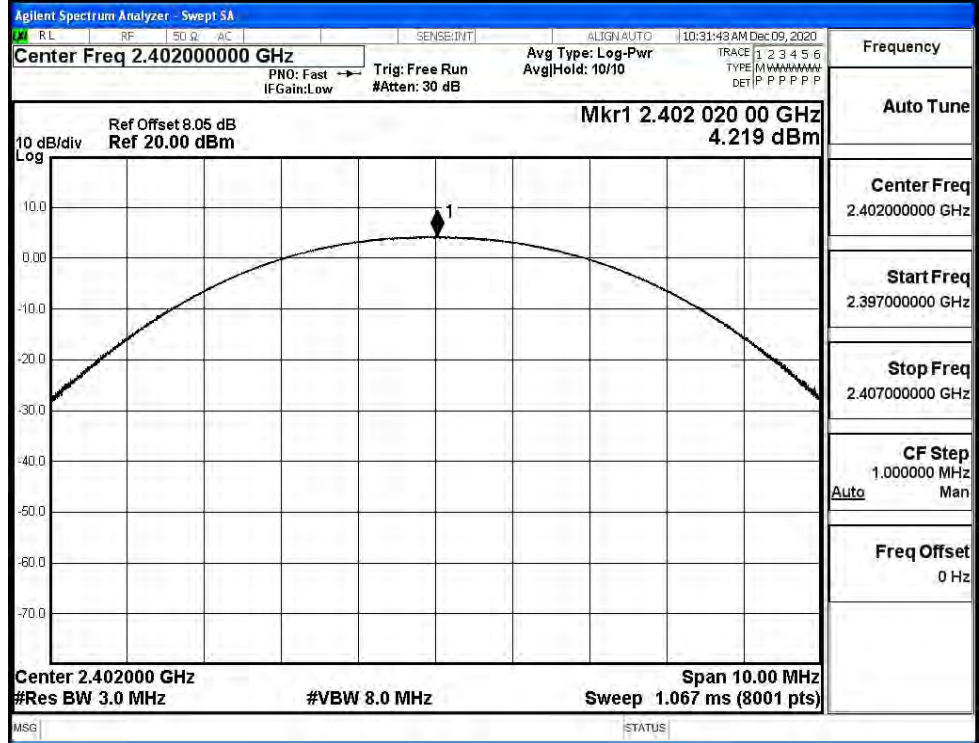
GFSK/MCH



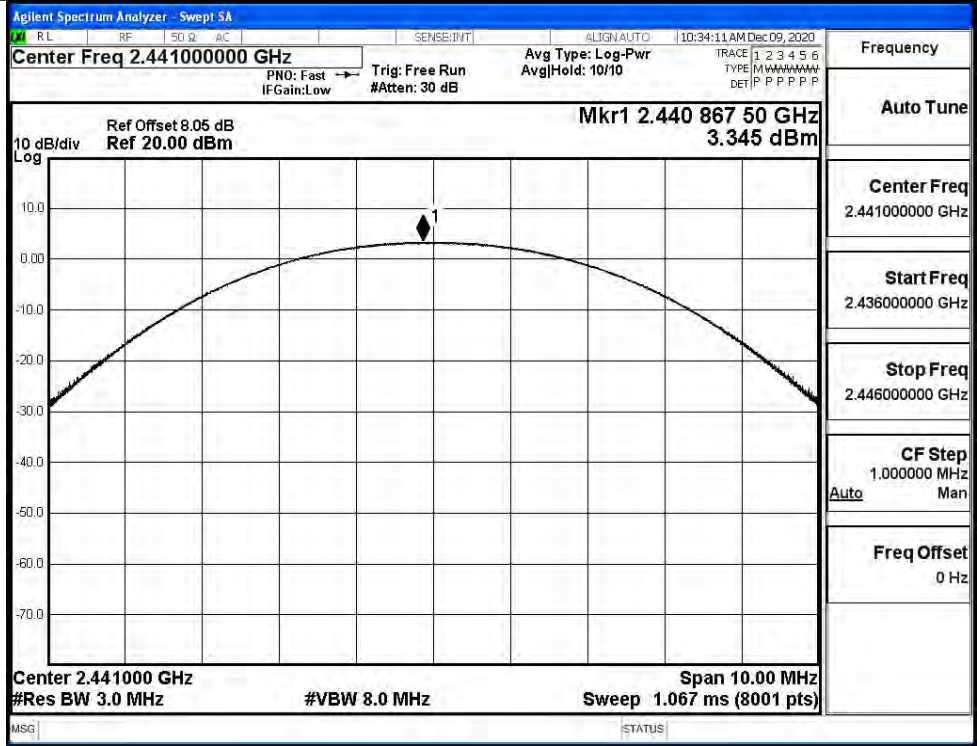
GFSK/HCH



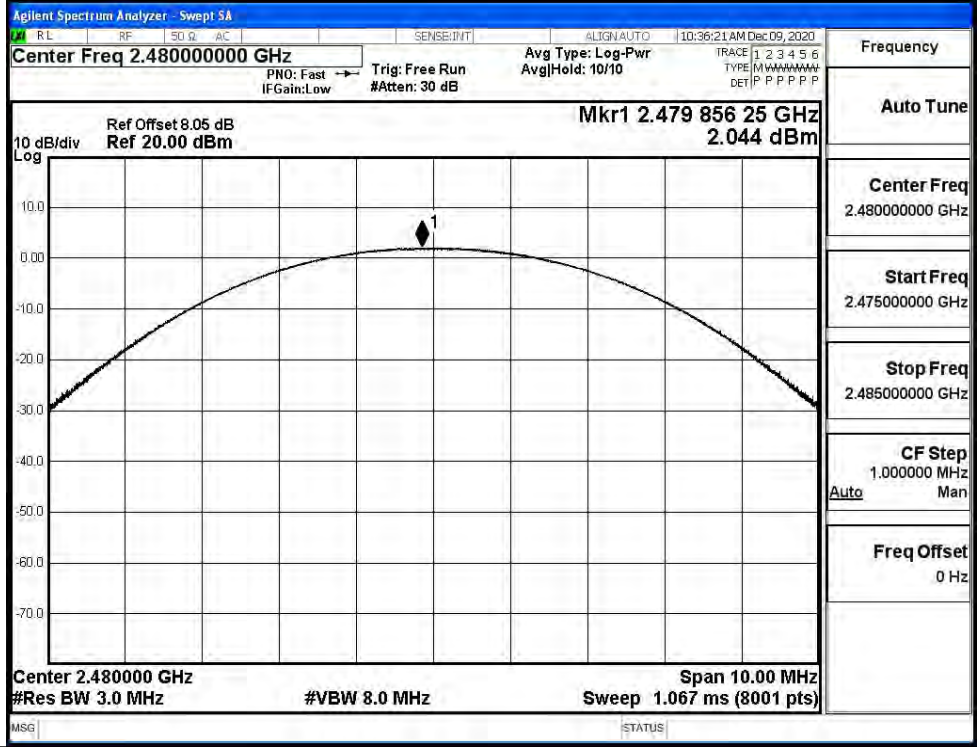
$\pi/4$ DQPSK/LCH



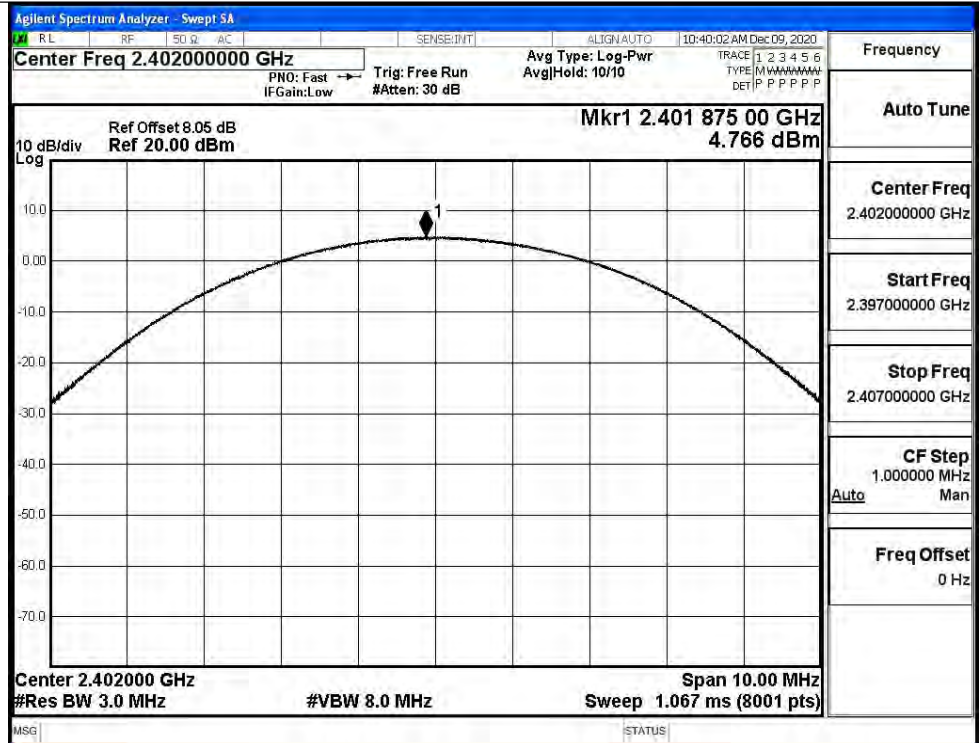
π /4DQPSK/MCH



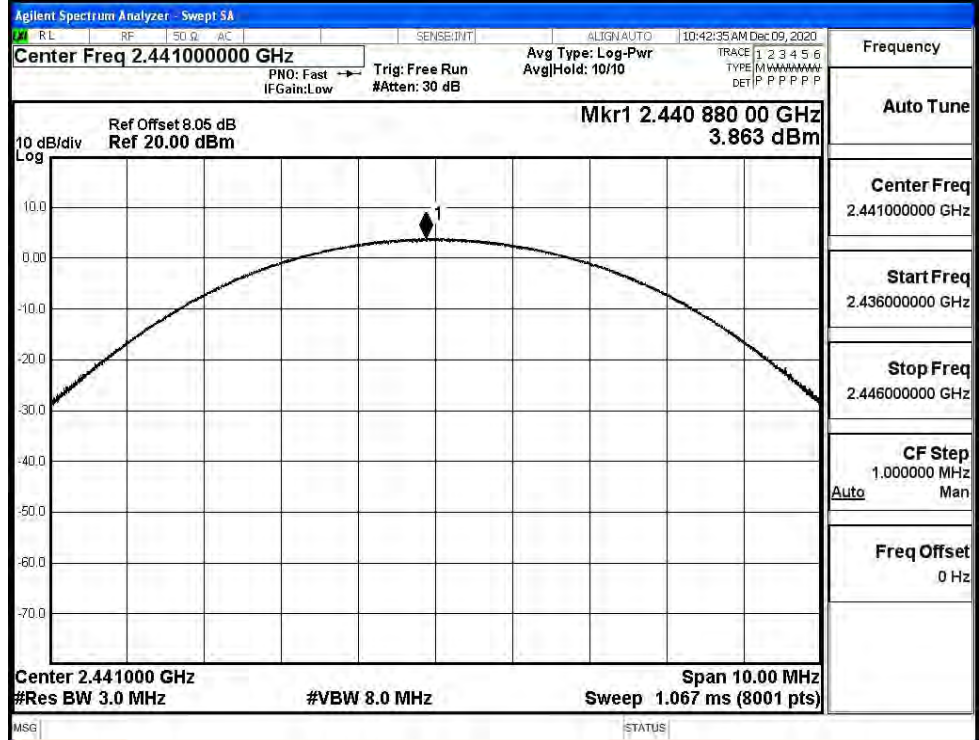
π /4DQPSK/HCH



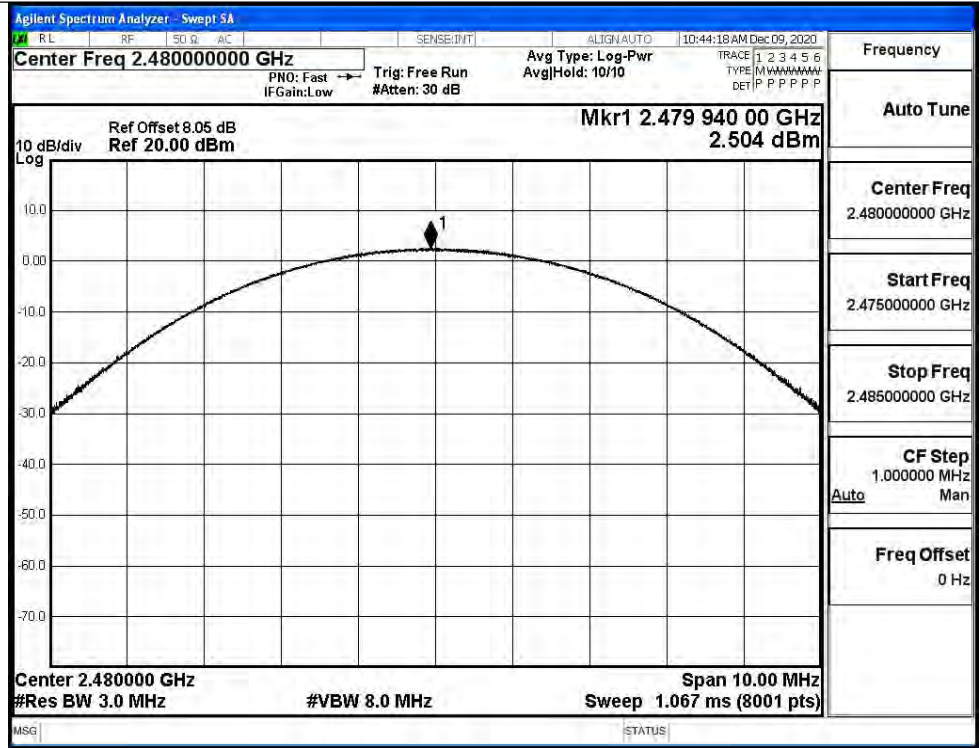
8DPSK/LCH



8DPSK/MCH

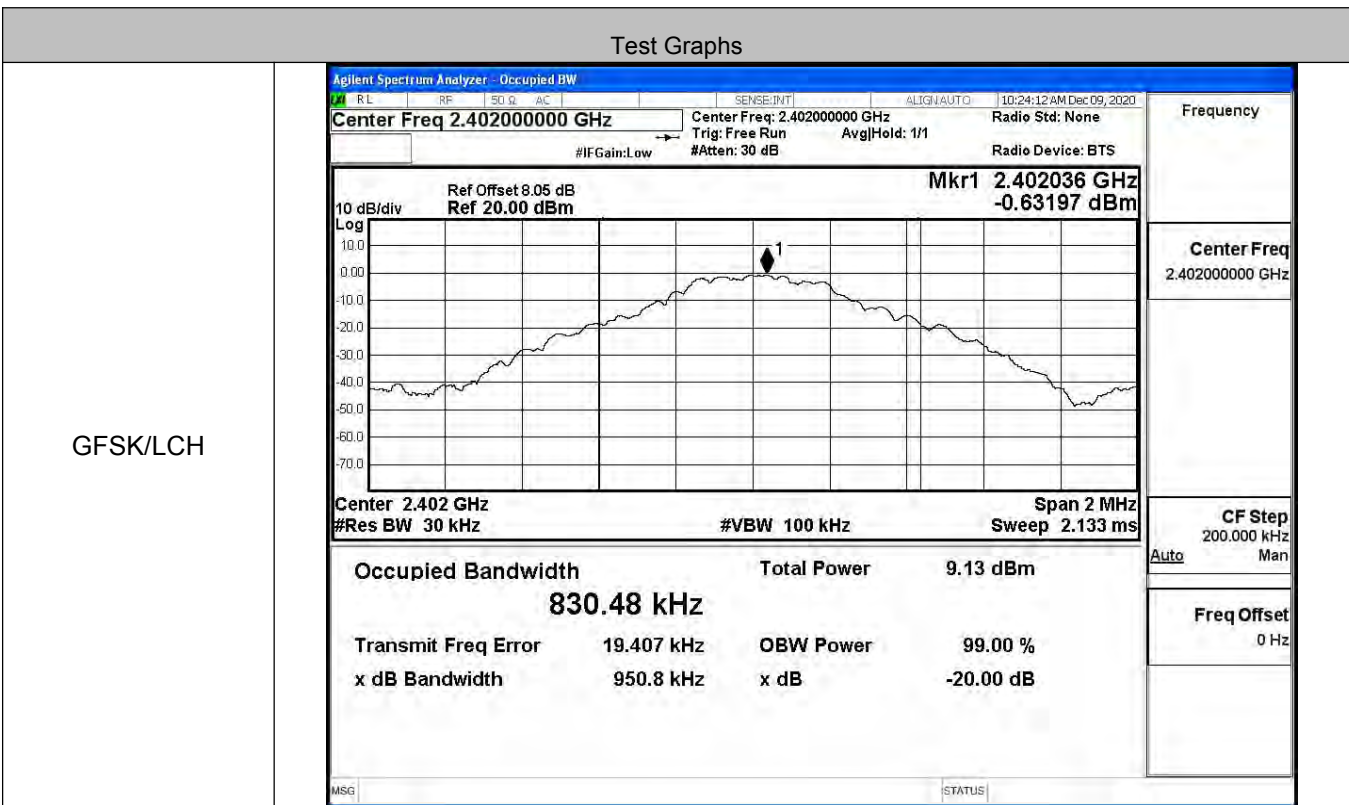


8DPSK/HCH

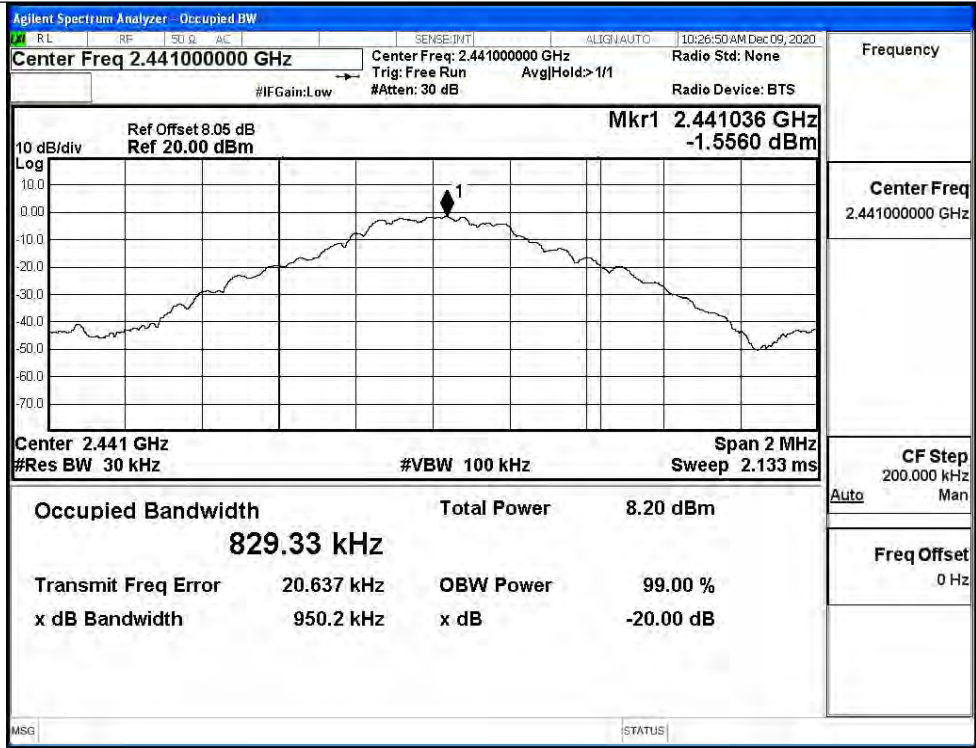


A.2 20dB Bandwidth

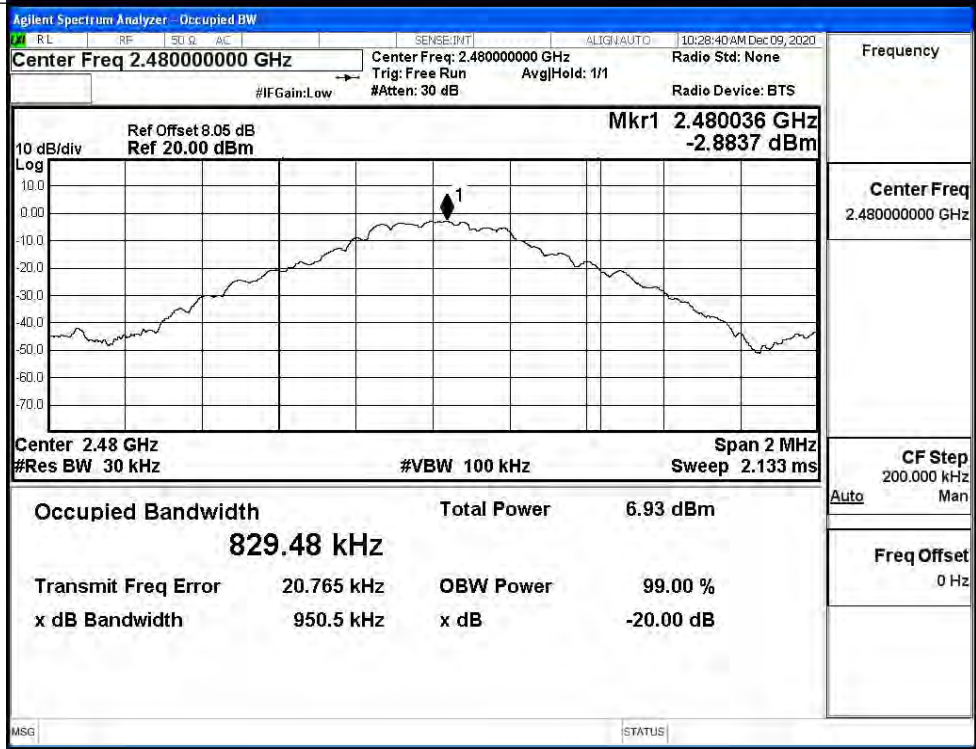
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9508	Not Specified	PASS
	MCH	0.9502	Not Specified	PASS
	HCH	0.9505	Not Specified	PASS
π/4DQPSK	LCH	1.333	Not Specified	PASS
	MCH	1.331	Not Specified	PASS
	HCH	1.334	Not Specified	PASS
8DPSK	LCH	1.306	Not Specified	PASS
	MCH	1.305	Not Specified	PASS
	HCH	1.306	Not Specified	PASS



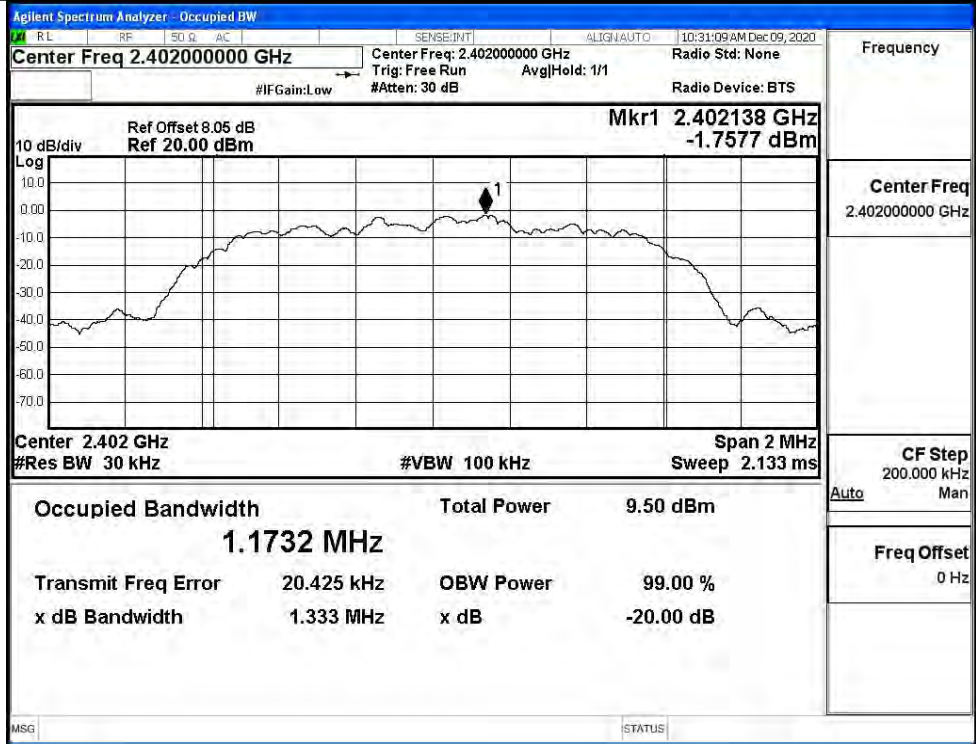
GFSK/MCH



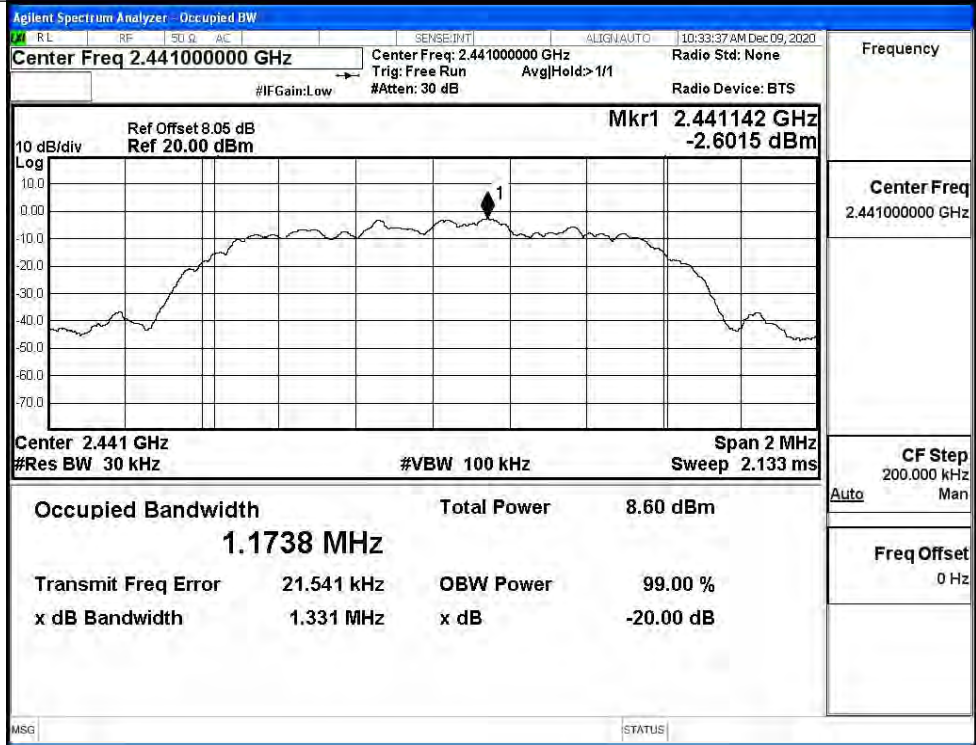
GFSK/HCH



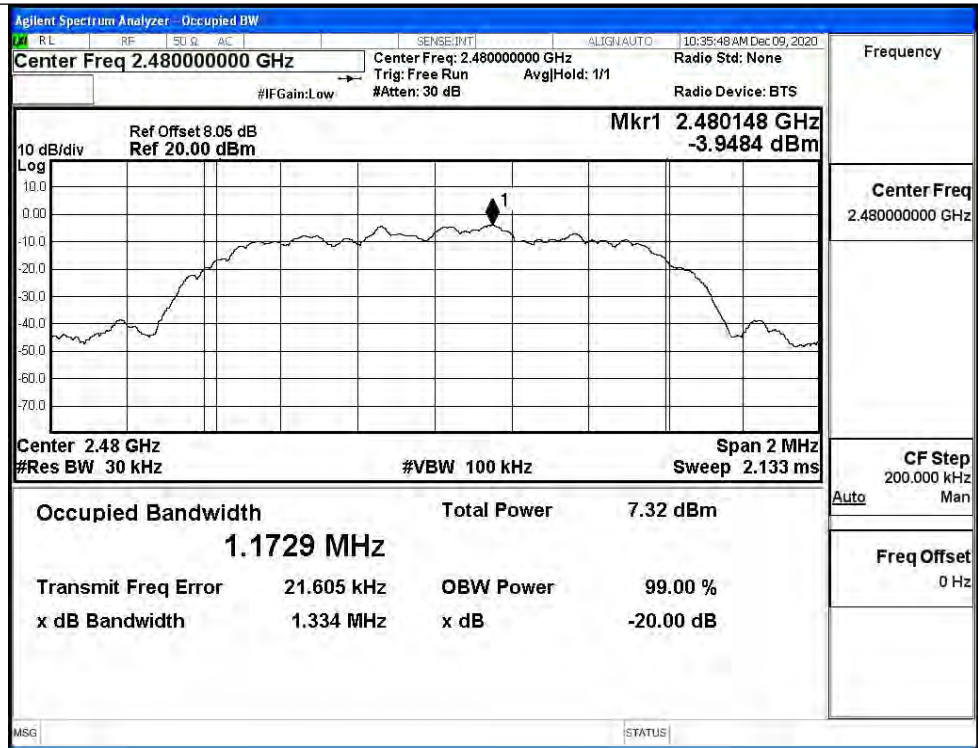
$\pi/4$ DQPSK/LCH



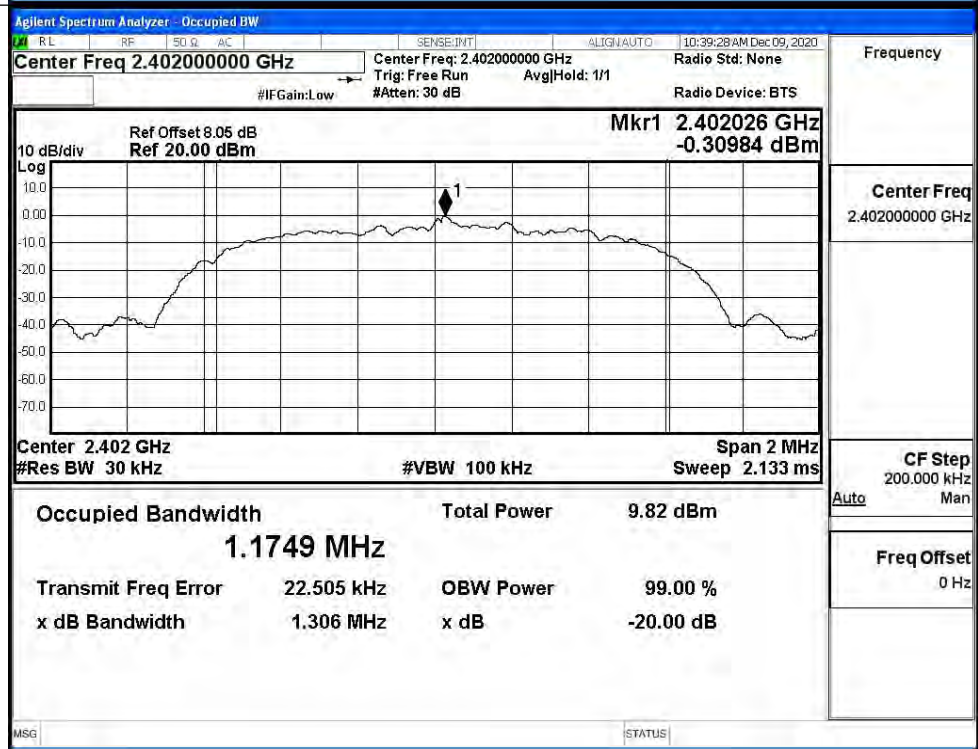
$\pi/4$ DQPSK/MCH



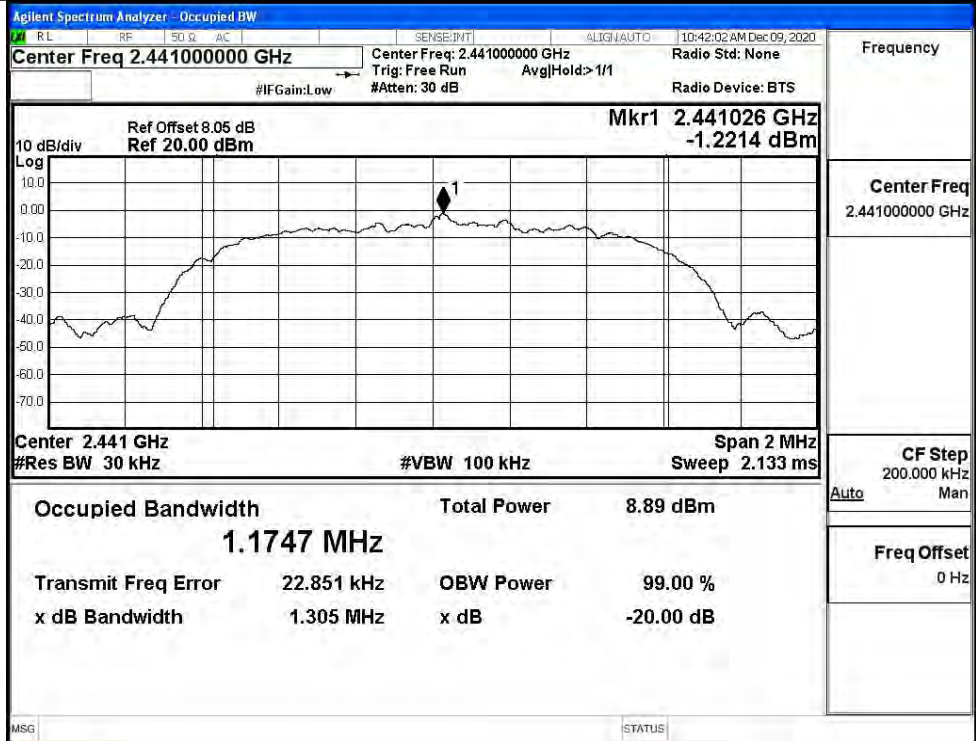
$\pi/4$ DQPSK/HCH



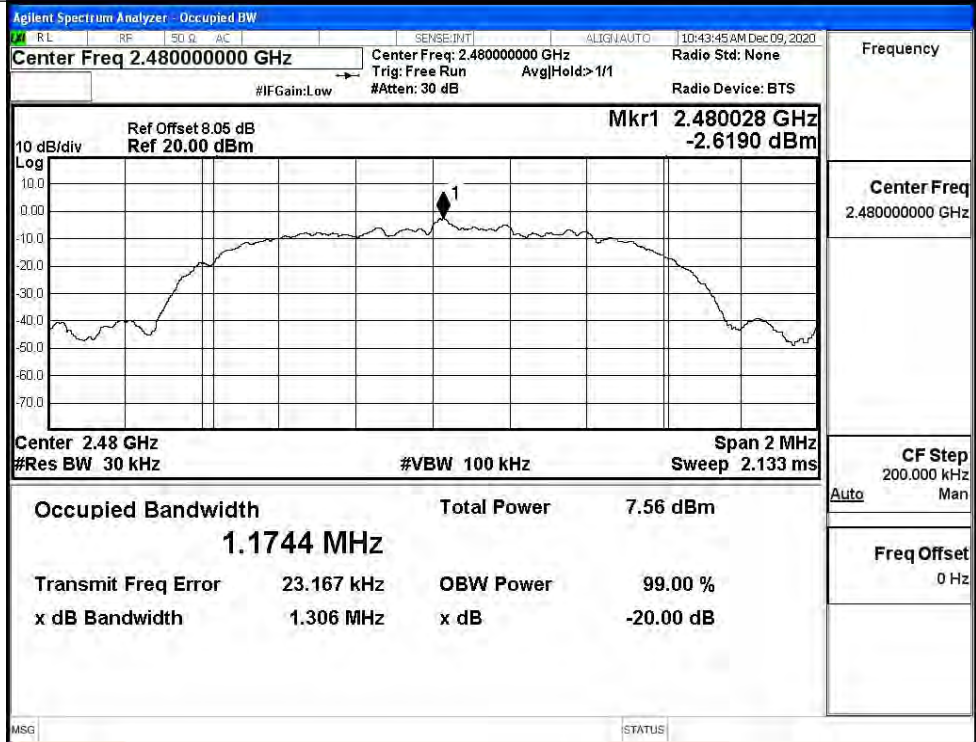
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH



A.3 Carrier Frequency Separation

Mode	Channel	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.999	0.634	PASS
	MCH	0.866	0.634	PASS
	HCH	1.132	0.634	PASS
π/4DQPSK	LCH	0.908	0.889	PASS
	MCH	1.110	0.889	PASS
	HCH	1.012	0.889	PASS
8DPSK	LCH	0.902	0.871	PASS
	MCH	1.052	0.871	PASS
	HCH	1.114	0.871	PASS

Test Graphs

GFSK/LCH

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.402500000 GHz

Ref Offset 8.05 dB
Ref 20.00 dBm

ΔMkr1 999.50 kHz
-0.013 dB

Start 2.401500 GHz
#Res BW 100 kHz

Stop 2.403500 GHz
#VBW 300 kHz
Sweep 1.067 ms (8001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ2	1	f	(Δ)	999.50 kHz (Δ)	-0.013 dB		
2	F	1	f		2.402 063 50 GHz	1.204 dBm		
3								
4								
5								
6								
7								
8								
9								
10								
11								

Frequency

Auto Tune

Center Freq
2.402500000 GHz

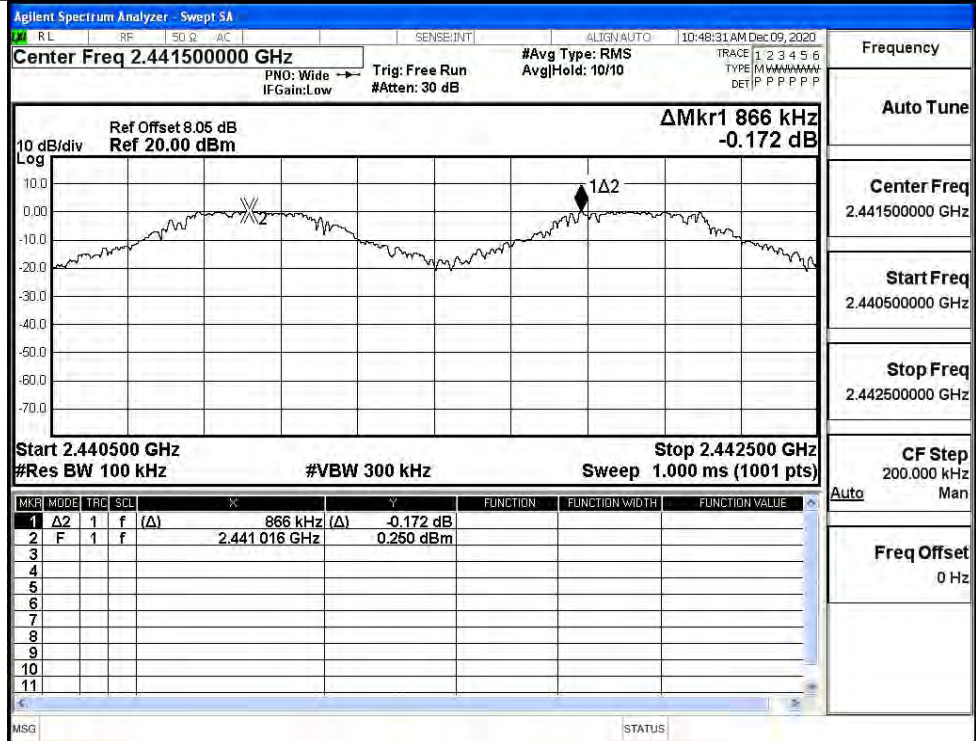
Start Freq
2.401500000 GHz

Stop Freq
2.403500000 GHz

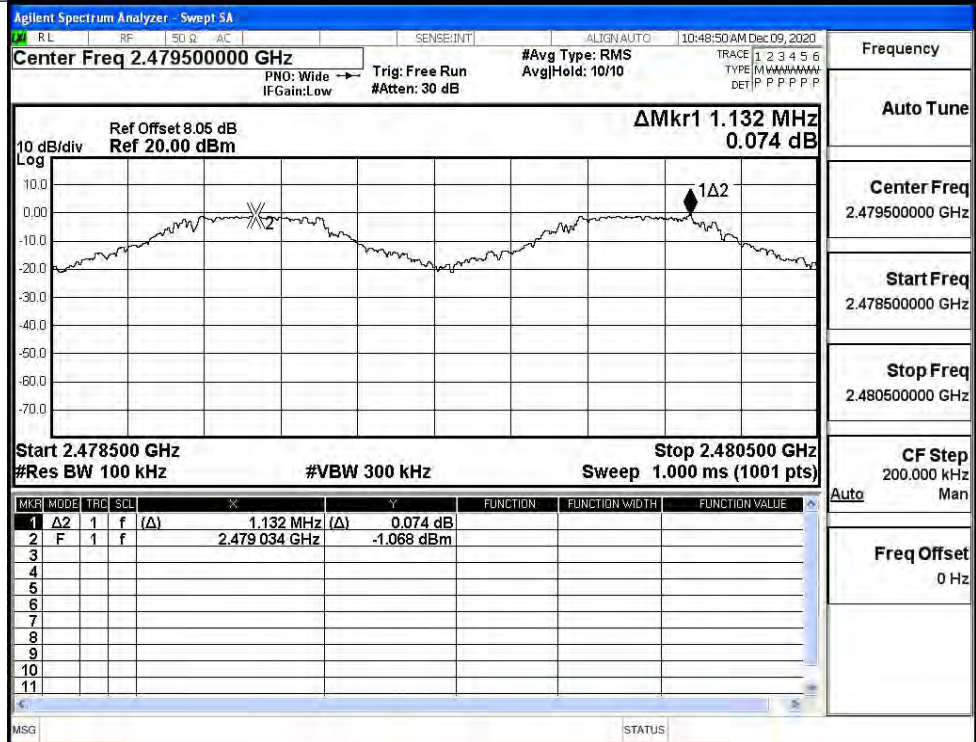
CF Step
200.000 kHz
Auto Man

Freq Offset
0 Hz

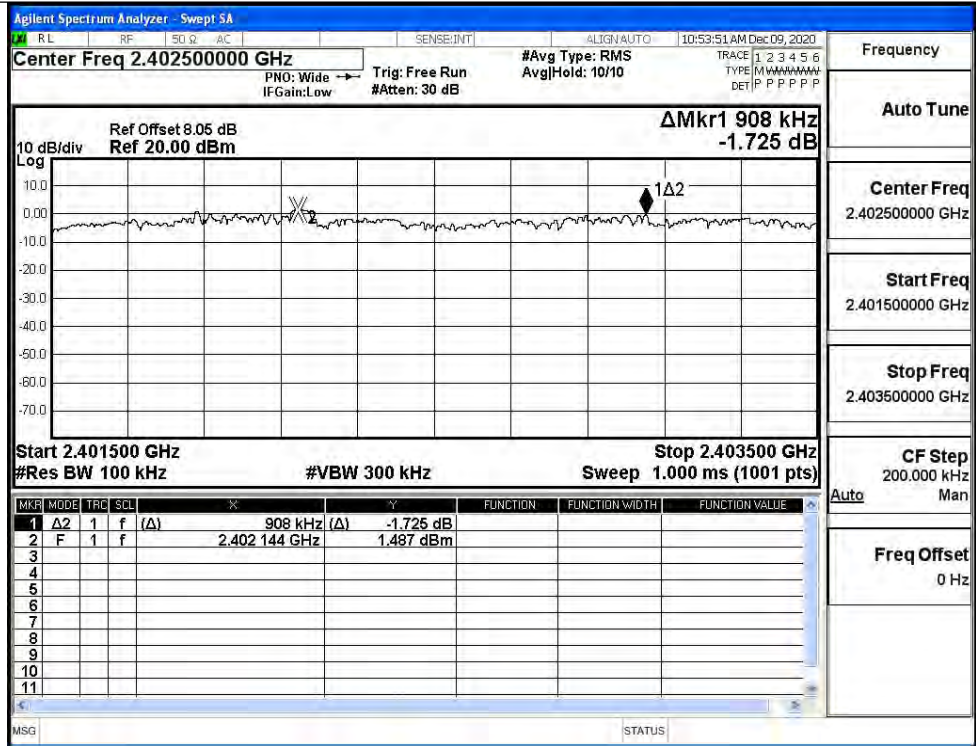
GFSK/MCH



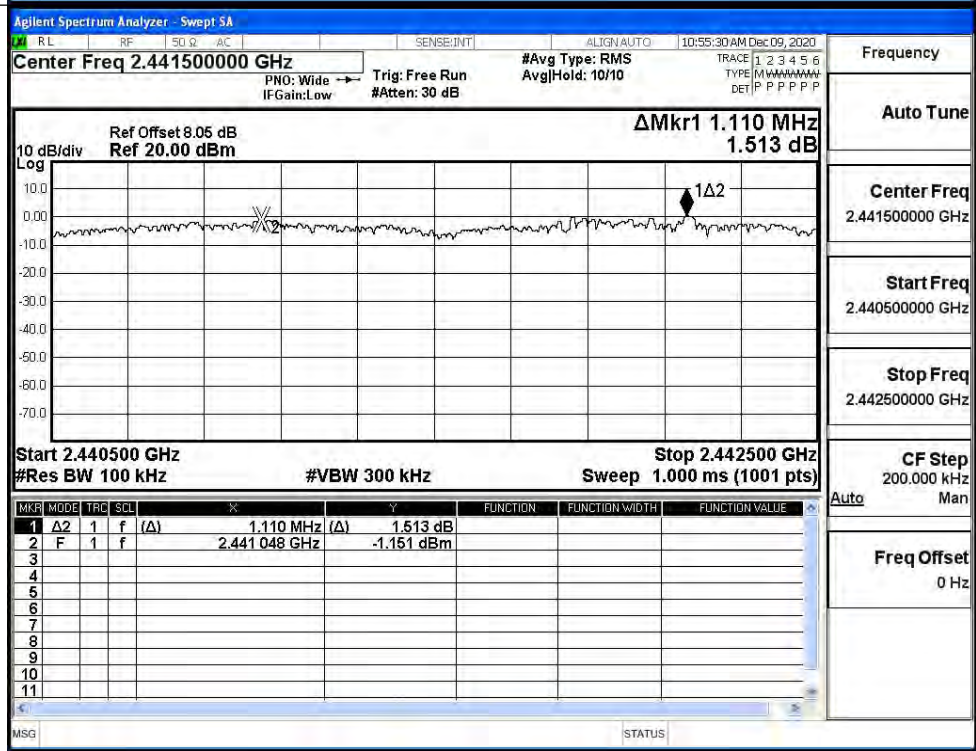
GFSK/HCH



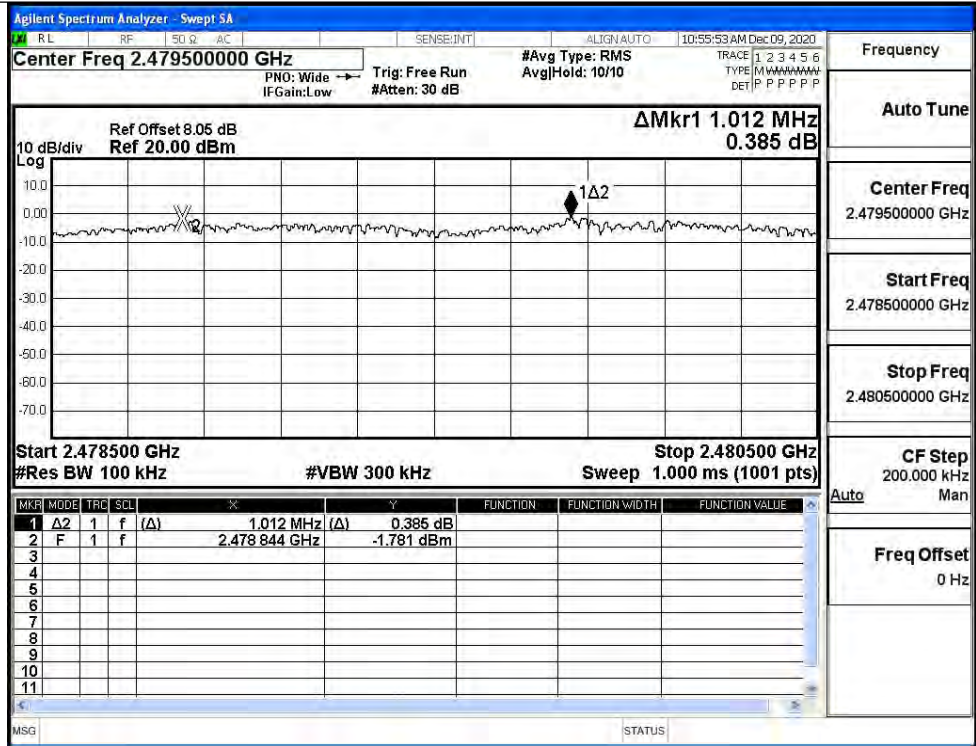
$\pi/4$ DQPSK/LCH



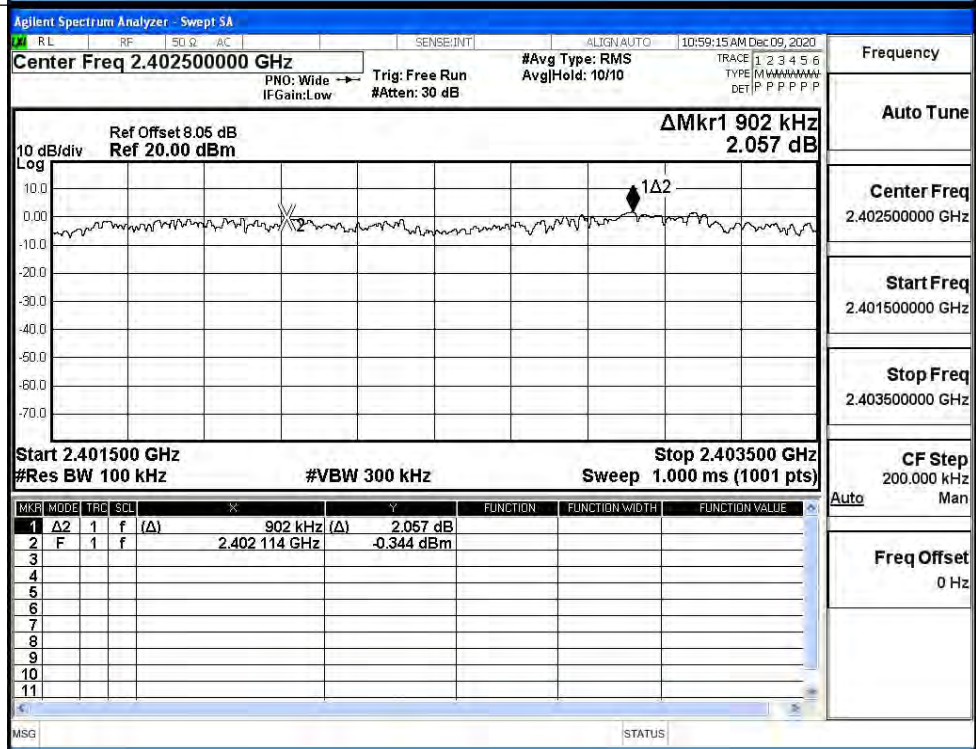
$\pi/4$ DQPSK/MCH



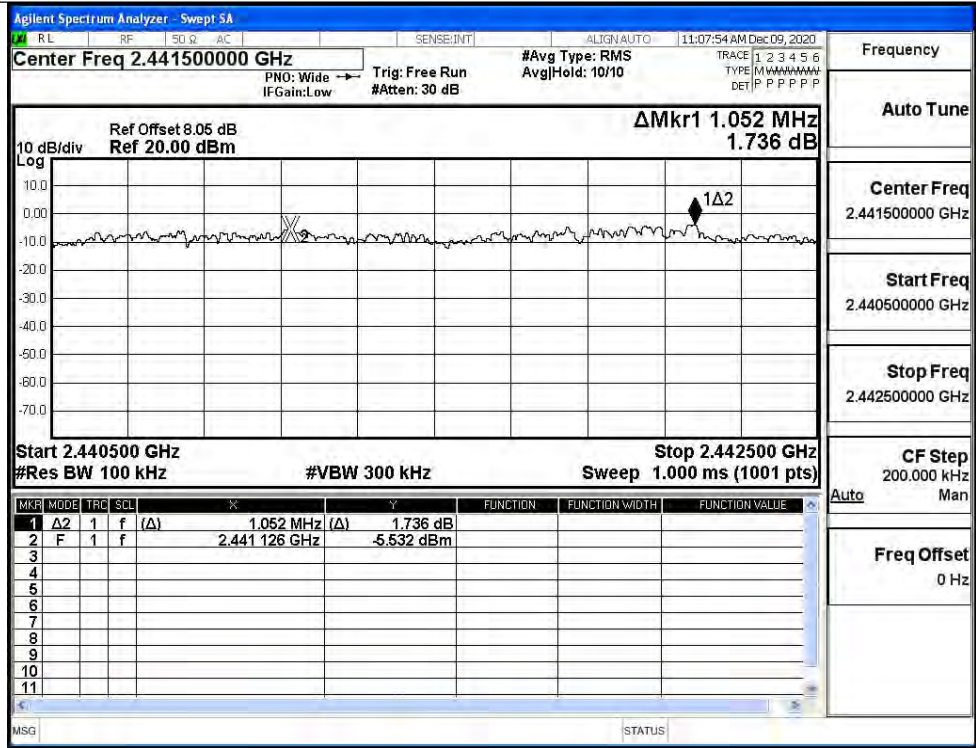
π/4DQPSK/HCH



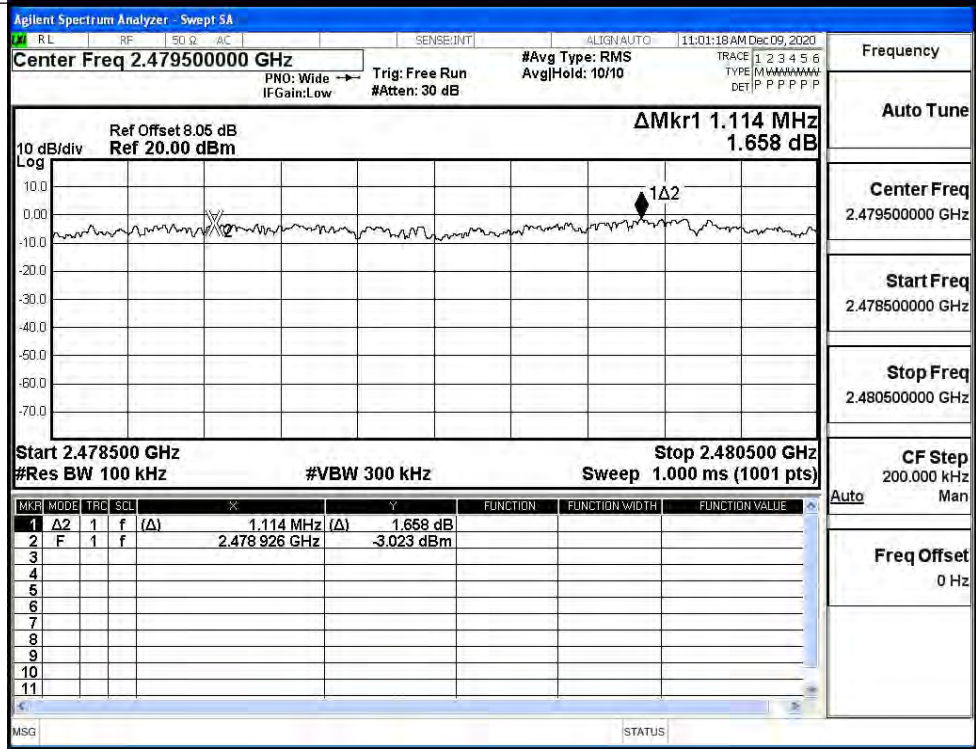
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH



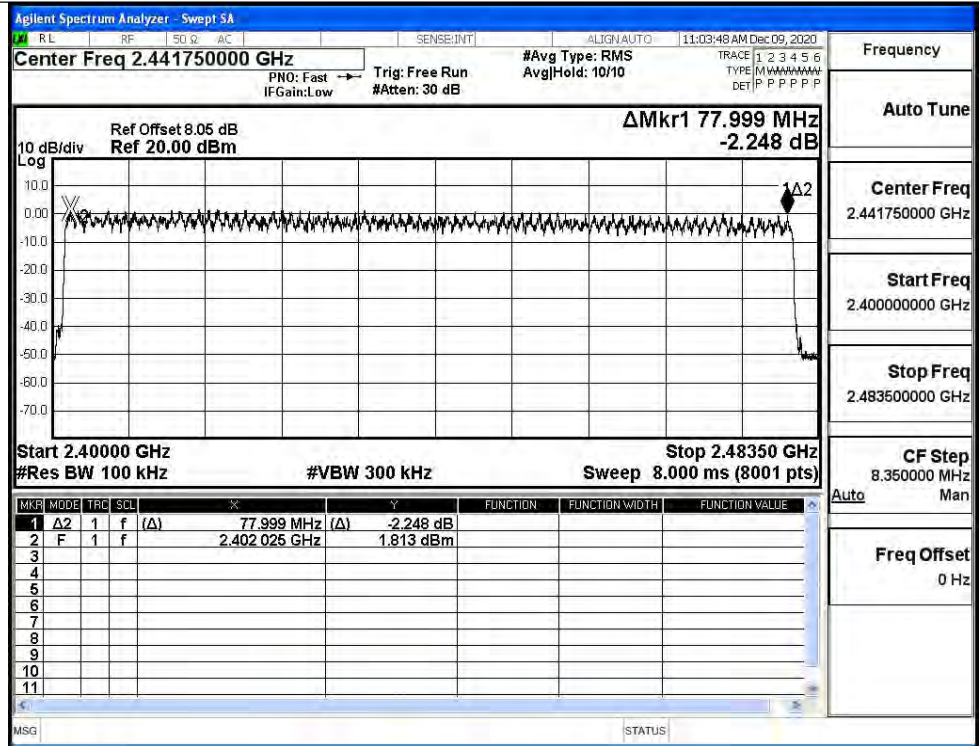
A.4 Hopping Channel Number

Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS
8DPSK	Hop	79	>=15	PASS

Test Graphs

<p>GFSK/Hop</p>	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 8.05 dB Ref 20.00 dBm</p> <p>ΔMkr1 77.895 MHz -2.282 dB</p> <p>Start 2.40000 GHz Stop 2.48350 GHz</p> <p>#Res BW 100 kHz #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>Δ2</td> <td>1</td> <td>f</td> <td>(Δ)</td> <td>77.895 MHz (Δ)</td> <td>-2.282 dB</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>1</td> <td>f</td> <td></td> <td>2.402067 GHz</td> <td>1.527 dBm</td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ 2	1	f	(Δ)	77.895 MHz (Δ)	-2.282 dB			2	F	1	f		2.402067 GHz	1.527 dBm		
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	Δ 2	1	f	(Δ)	77.895 MHz (Δ)	-2.282 dB																						
2	F	1	f		2.402067 GHz	1.527 dBm																						
<p>$\pi/4$DQPSK/Hop</p>	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 8.05 dB Ref 20.00 dBm</p> <p>ΔMkr1 77.780 MHz -3.952 dB</p> <p>Start 2.40000 GHz Stop 2.48350 GHz</p> <p>#Res BW 100 kHz #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>Δ2</td> <td>1</td> <td>f</td> <td>(Δ)</td> <td>77.780 MHz (Δ)</td> <td>-3.952 dB</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>1</td> <td>f</td> <td></td> <td>2.402056 GHz</td> <td>1.185 dBm</td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ 2	1	f	(Δ)	77.780 MHz (Δ)	-3.952 dB			2	F	1	f		2.402056 GHz	1.185 dBm		
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	Δ 2	1	f	(Δ)	77.780 MHz (Δ)	-3.952 dB																						
2	F	1	f		2.402056 GHz	1.185 dBm																						

8DPSK/Hop



A.5 Dwell Time

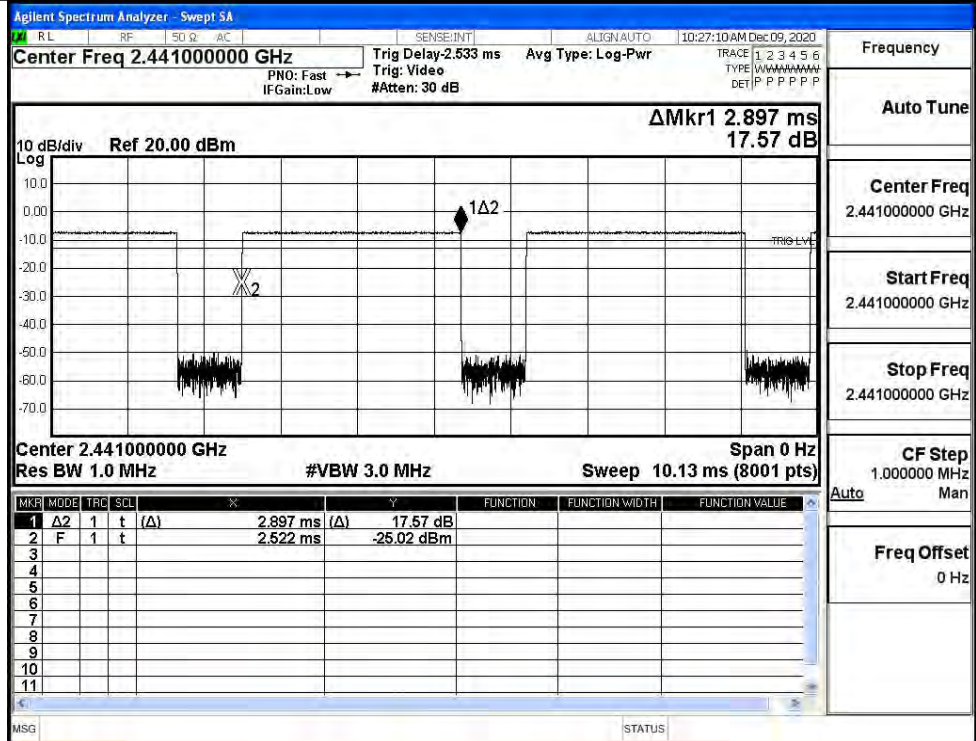
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.9	106.7	0.309	0.4	PASS
	DH5	MCH	2.9	106.7	0.309	0.4	PASS
	DH5	HCH	2.9	106.7	0.309	0.4	PASS
π/4DQPSK	2DH5	LCH	2.9	106.7	0.309	0.4	PASS
	2DH5	MCH	2.9	106.7	0.309	0.4	PASS
	2DH5	HCH	2.9	106.7	0.309	0.4	PASS
8DPSK	3DH5	LCH	2.9	106.7	0.309	0.4	PASS
	3DH5	MCH	2.9	106.7	0.309	0.4	PASS
	3DH5	HCH	2.9	106.7	0.309	0.4	PASS

Test Graphs

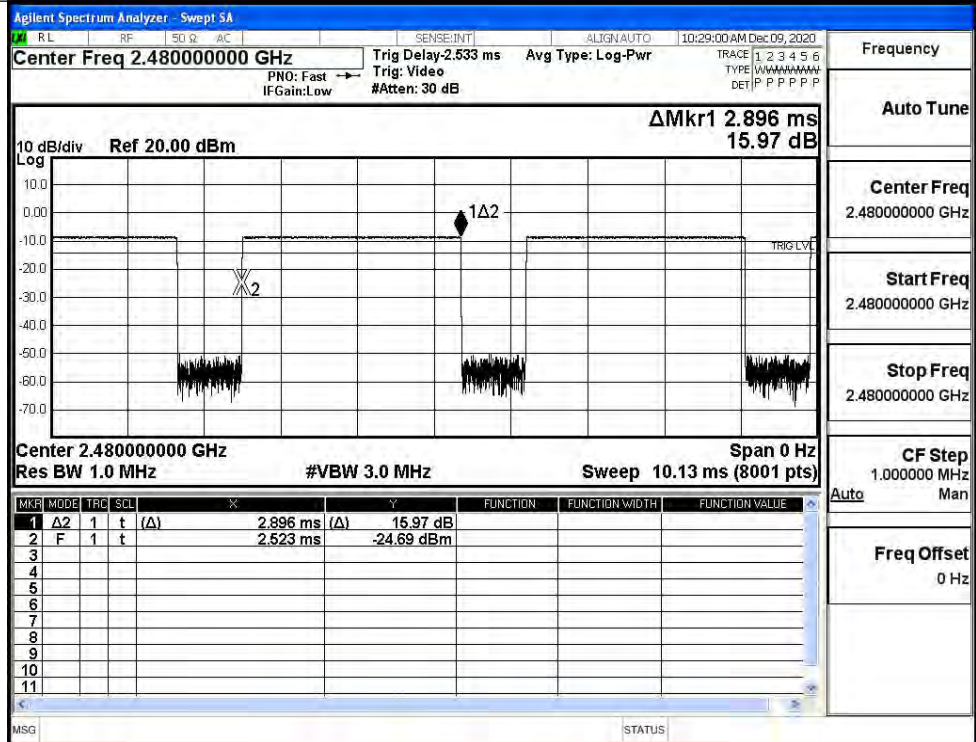
GFSK_DH5/LCH

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ2	1	t	2.897 ms (Δ)	16.14 dB			
2	F	1	t	2.523 ms	-22.88 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								

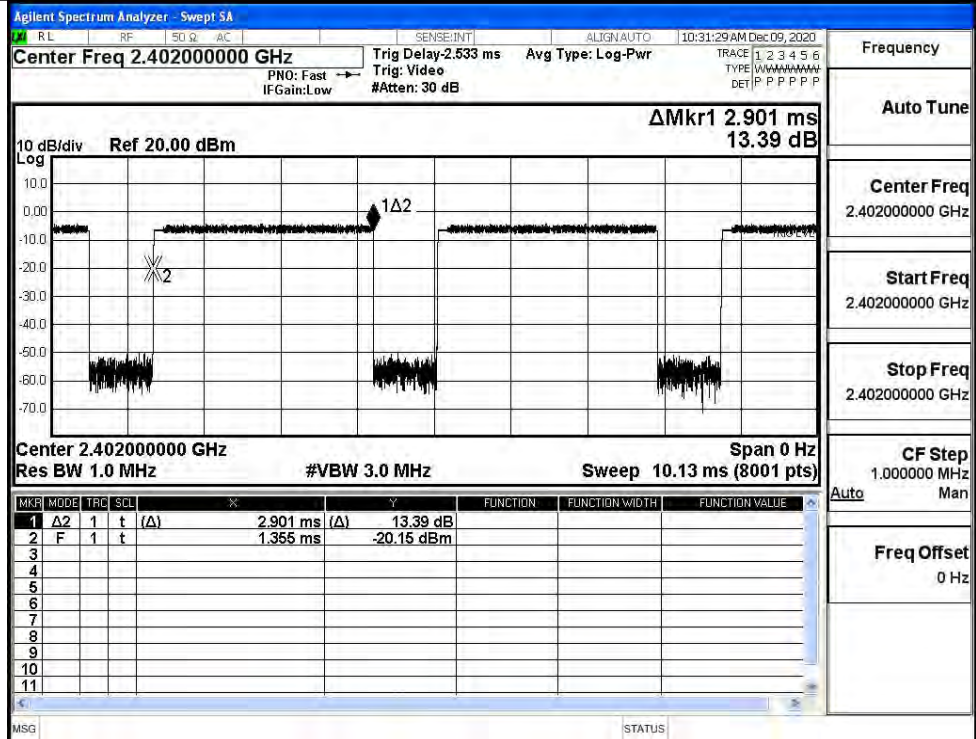
GFSK_DH5/MCH



GFSK_DH5/HCH

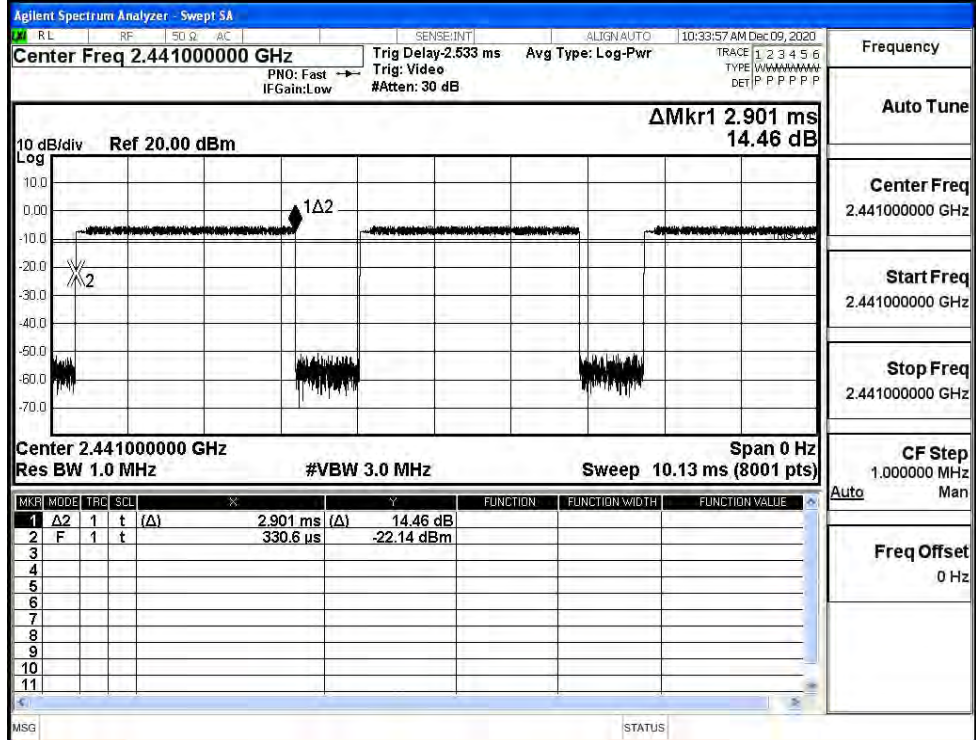


$\pi/4$ DQPSK
_2DH5/LCH



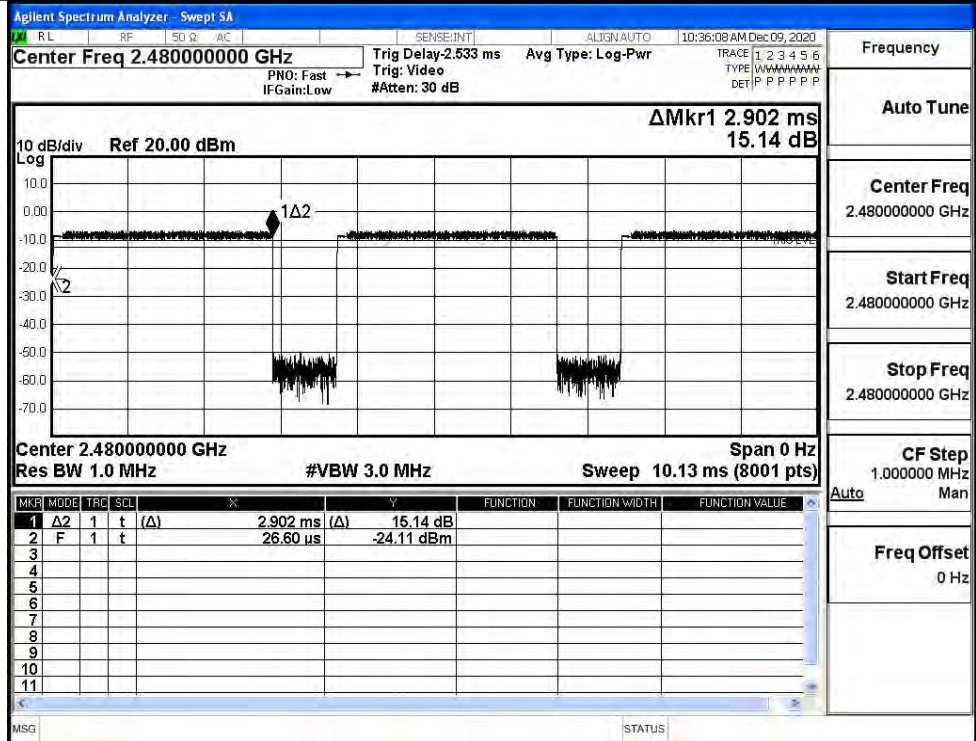
Frequency	2.40200000 GHz
Auto Tune	
Center Freq	2.40200000 GHz
Start Freq	2.40200000 GHz
Stop Freq	2.40200000 GHz
CF Step	1.000000 MHz
Auto	Man
Freq Offset	0 Hz

$\pi/4$ DQPSK
_2DH5/MCH

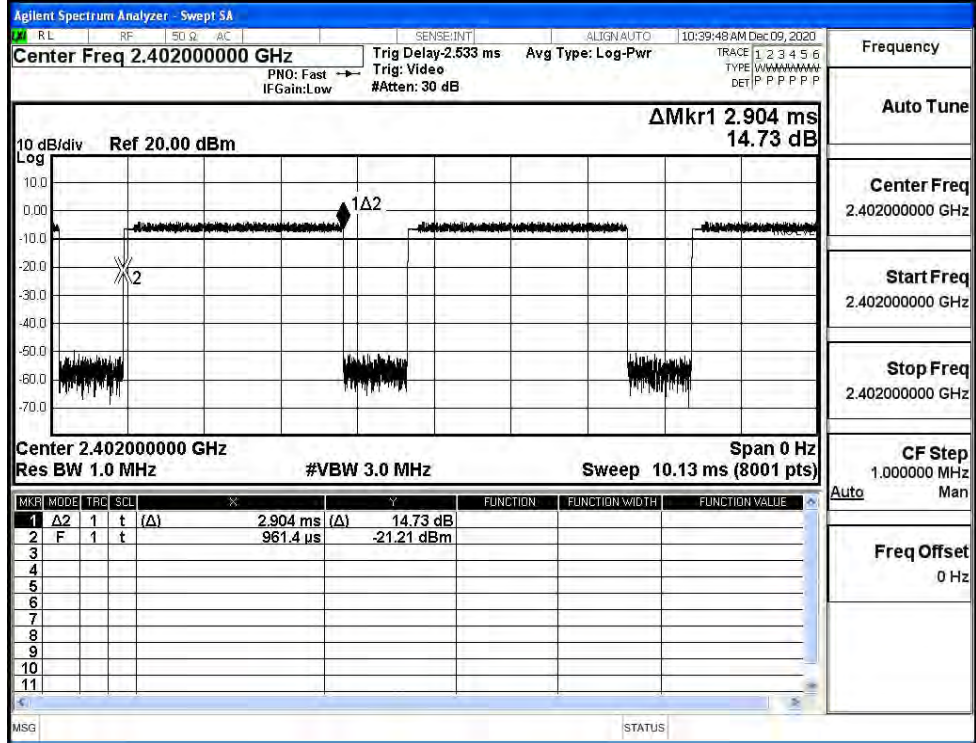


Frequency	2.44100000 GHz
Auto Tune	
Center Freq	2.44100000 GHz
Start Freq	2.44100000 GHz
Stop Freq	2.44100000 GHz
CF Step	1.000000 MHz
Auto	Man
Freq Offset	0 Hz

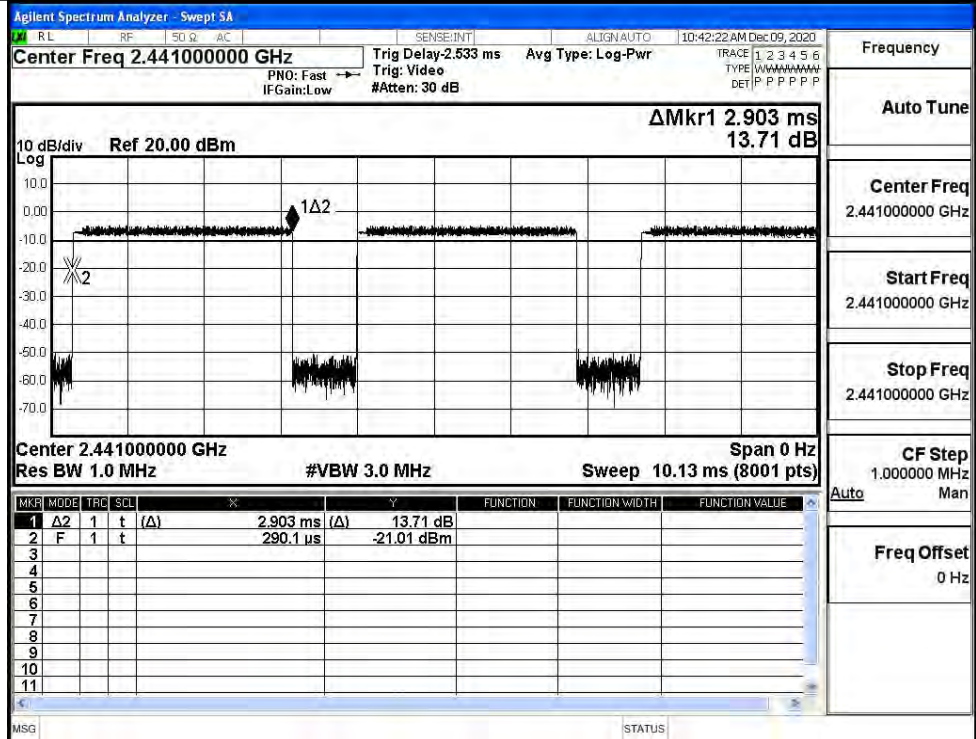
$\pi/4$ DQPSK
_2DH5/HCH



8DPSK_3DH5/LCH

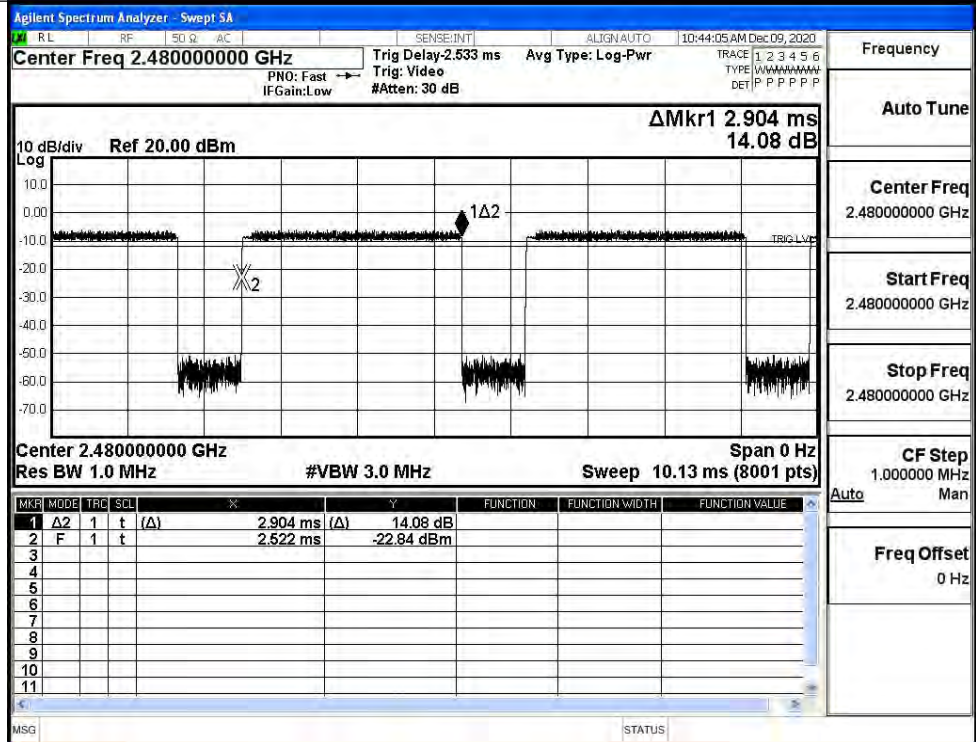


8DPSK_3DH5/MCH



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

8DPSK_3DH5/HCH

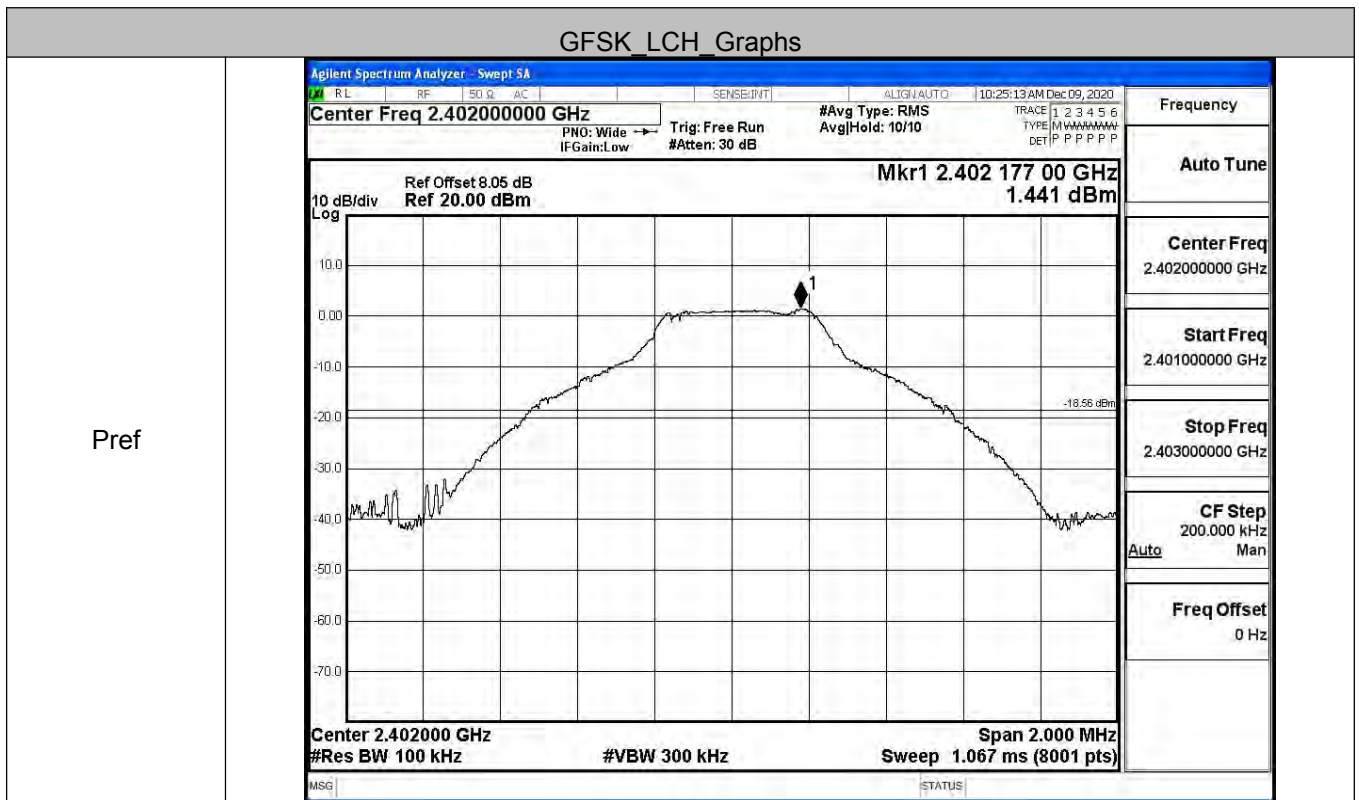


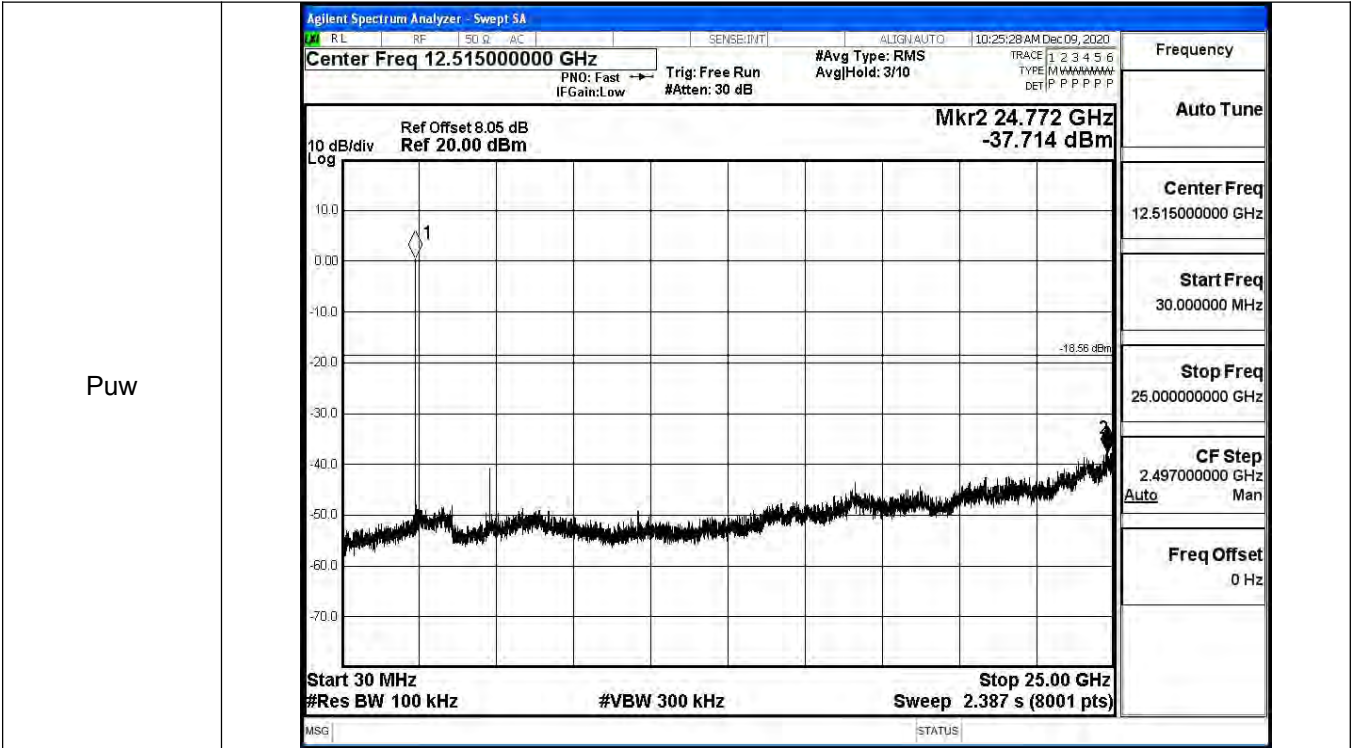
Frequency	
Auto Tune	
Center Freq	2.480000000 GHz
Start Freq	2.480000000 GHz
Stop Freq	2.480000000 GHz
CF Step	1.000000 MHz
Auto	Man
Freq Offset	0 Hz

A.6 RF Conducted Spurious Emissions

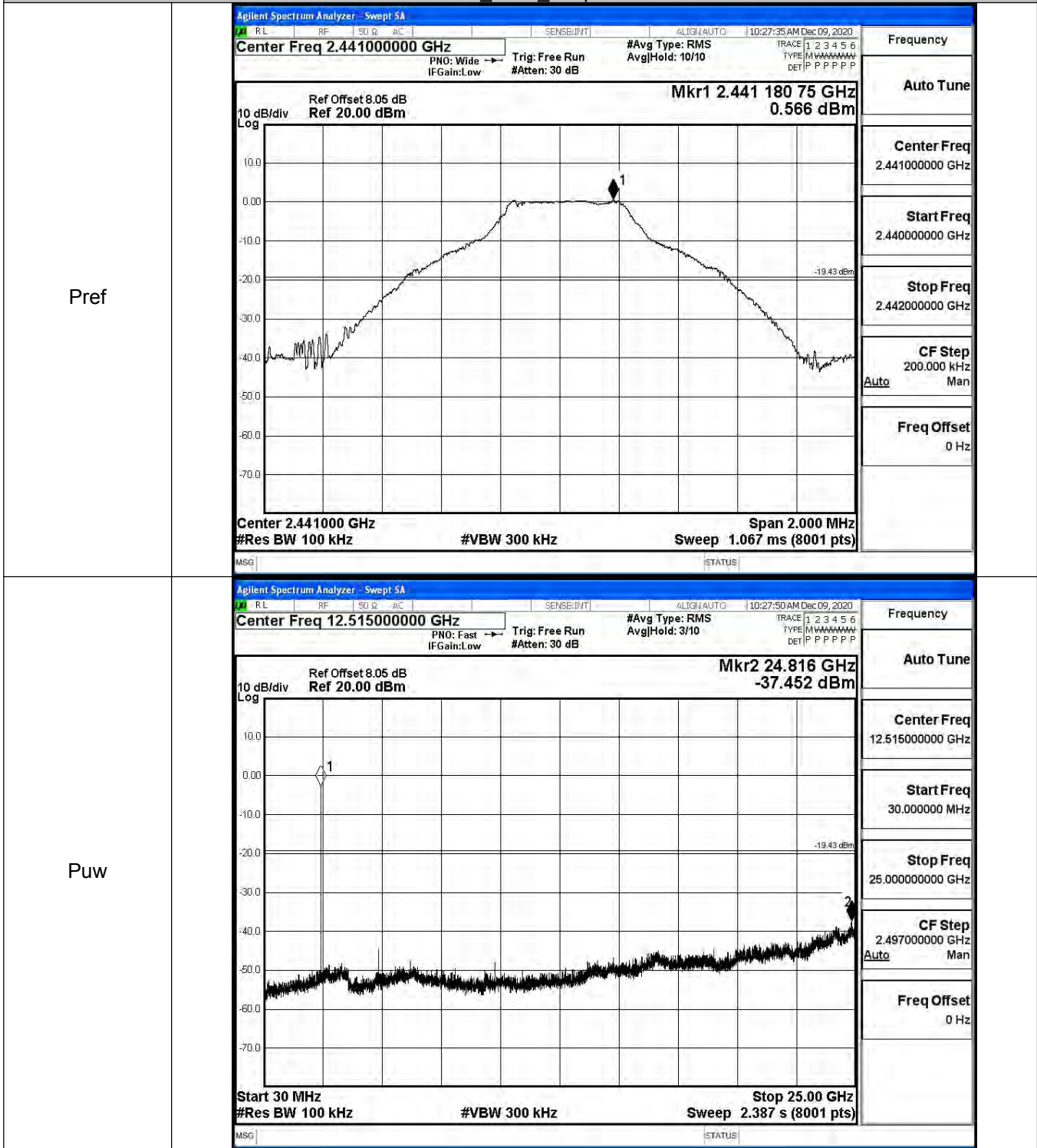
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.441	-37.714	-18.559	PASS
	MCH	0.566	-37.452	-19.434	PASS
	HCH	-0.857	-37.691	-20.857	PASS
π/4DQPSK	LCH	1.396	-37.841	-18.604	PASS
	MCH	0.603	-38.026	-19.397	PASS
	HCH	-1.303	-37.784	-21.303	PASS
8DPSK	LCH	1.631	-37.741	-18.369	PASS
	MCH	0.59	-37.334	-19.410	PASS
	HCH	-0.927	-37.836	-20.927	PASS

GFSK LCH Graphs



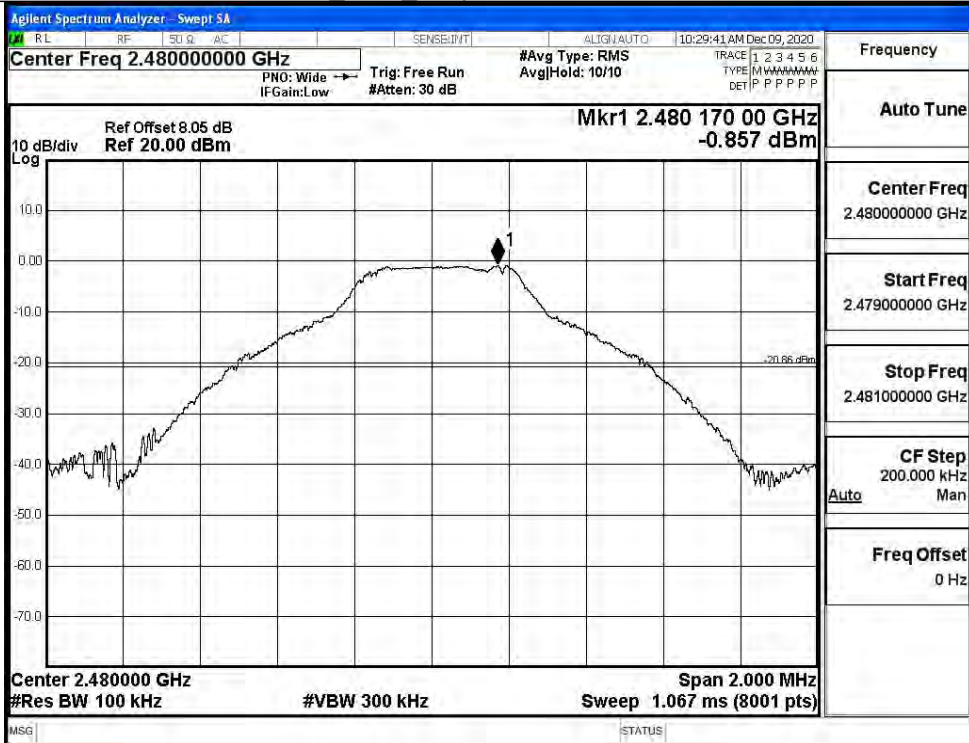


GFSK_MCH_Graphs

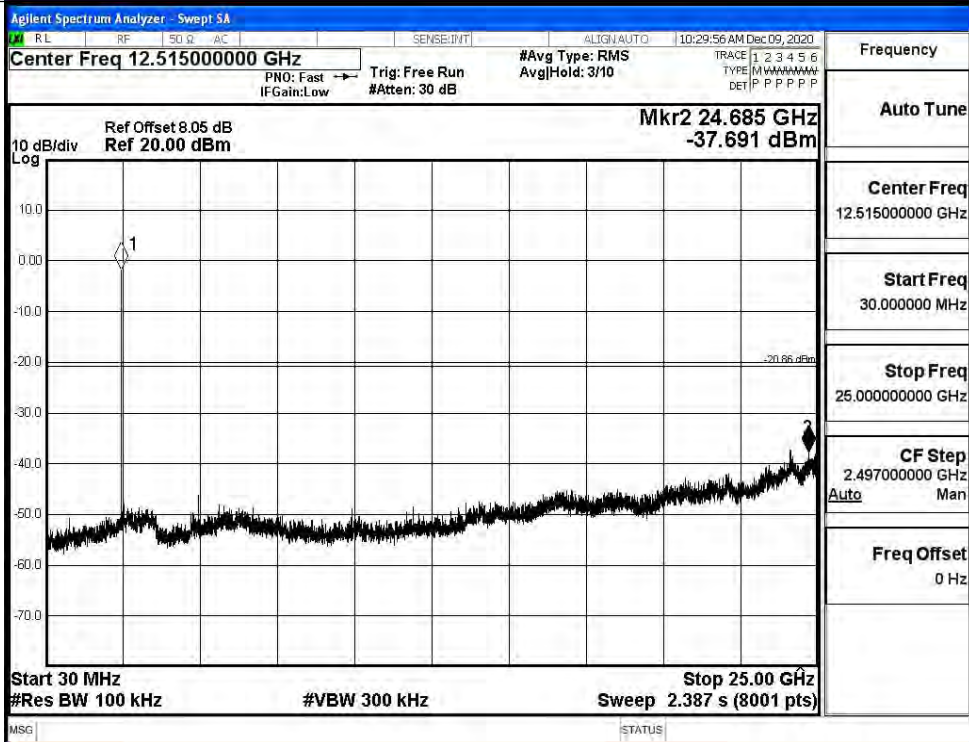


GFSK_HCH_Graphs

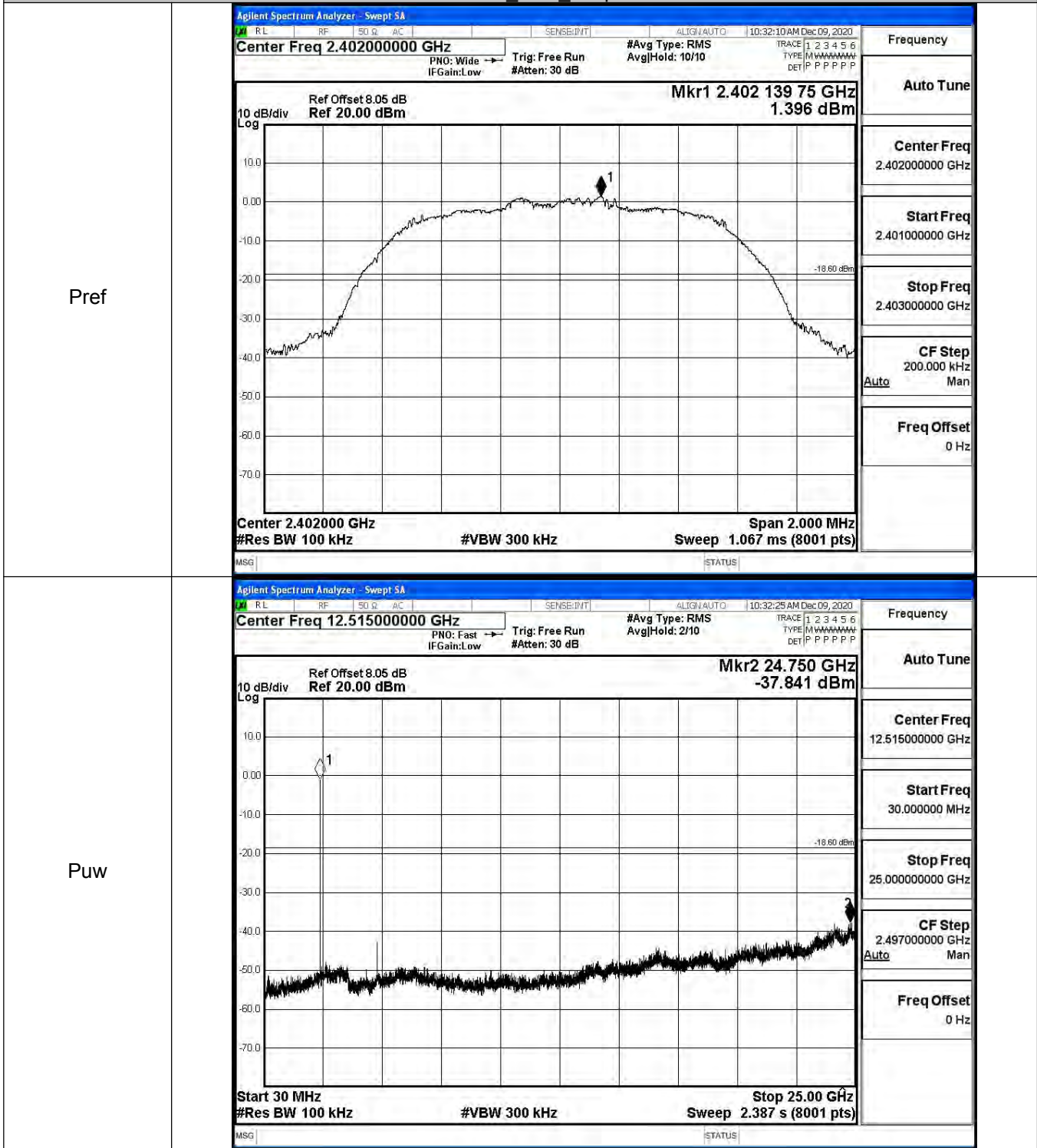
Pref



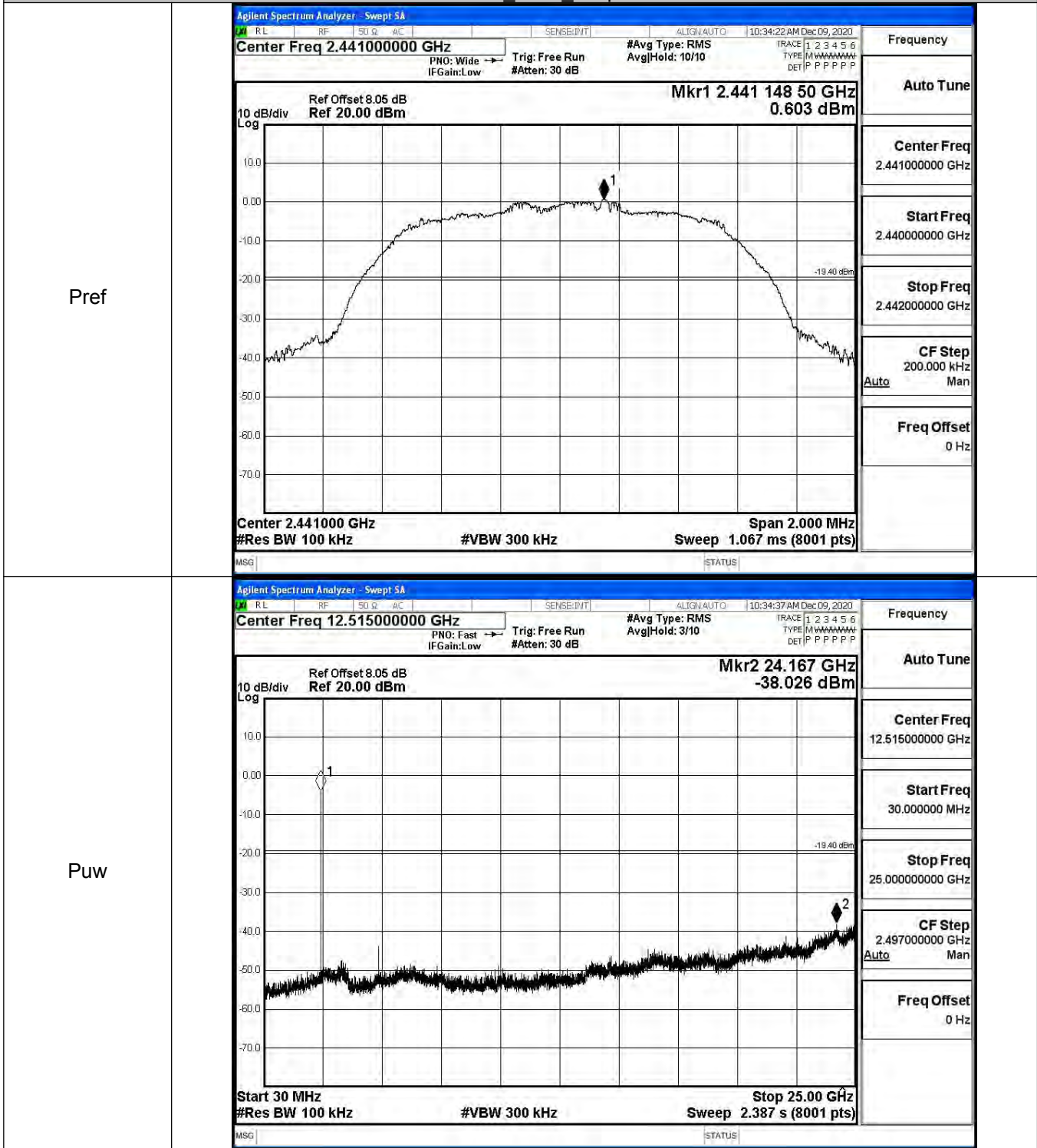
Puw



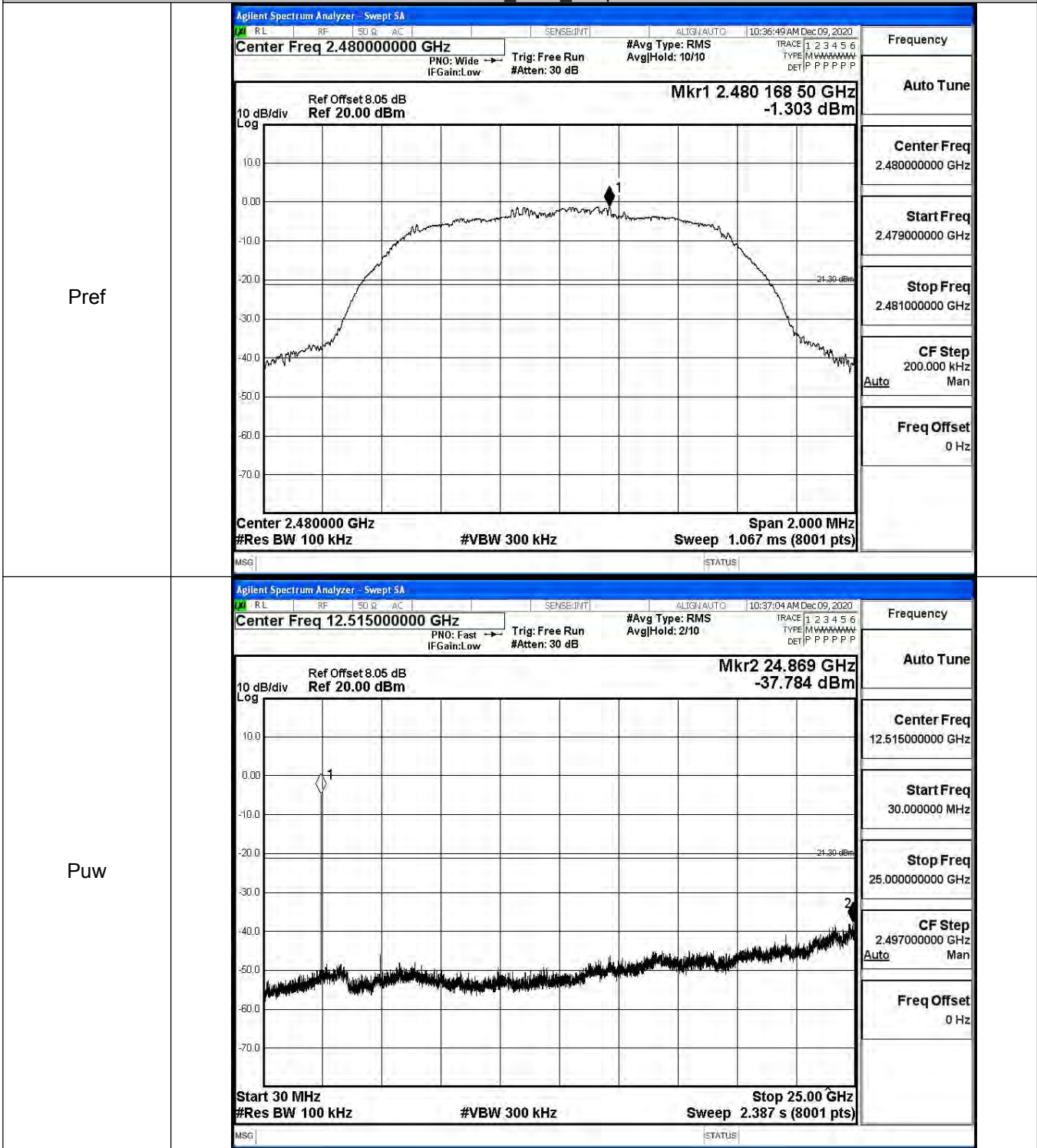
$\pi/4$ DQPSK_LCH_Graphs



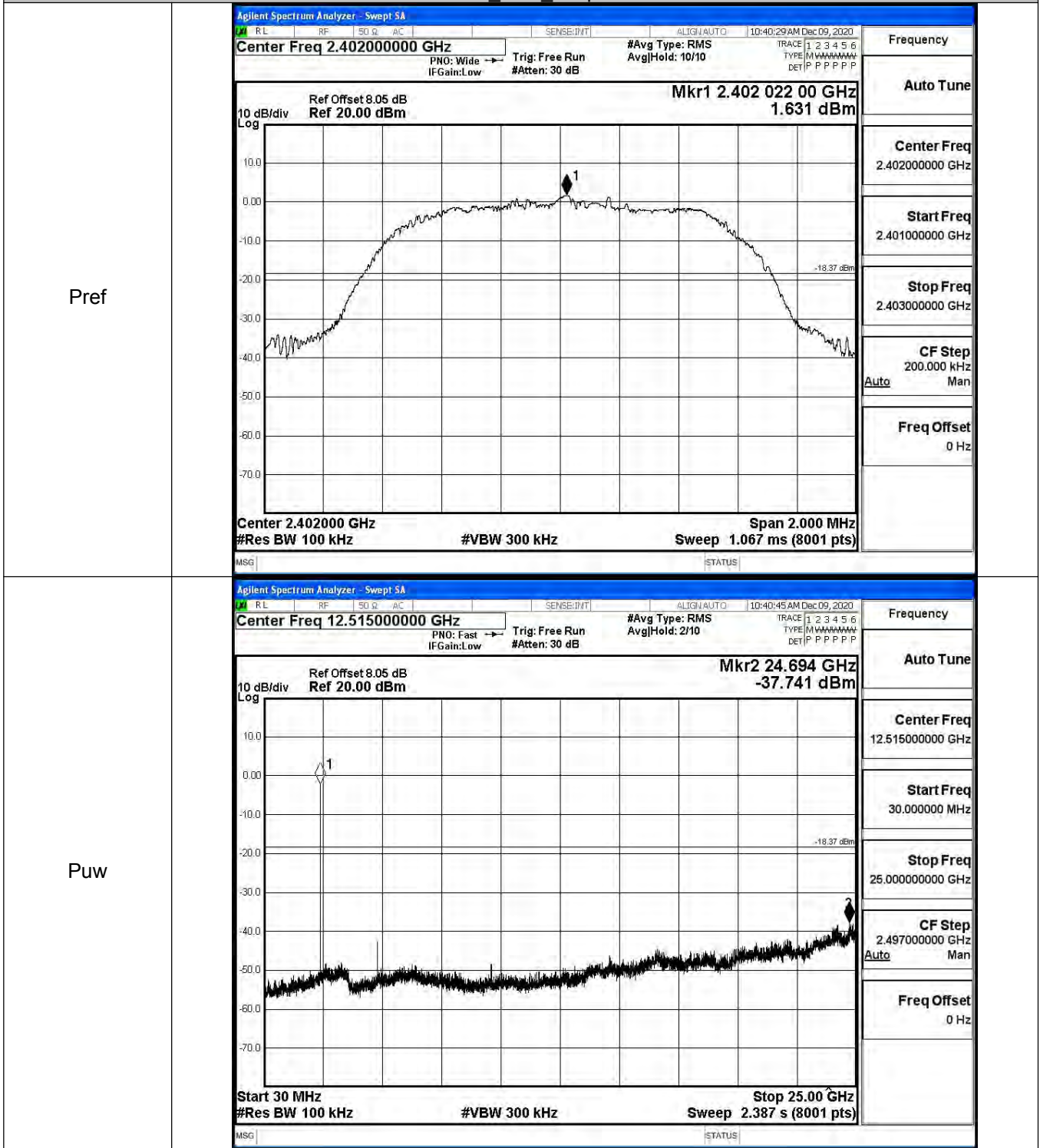
$\pi/4$ DQPSK_MCH_Graphs



$\pi/4$ DQPSK_HCH_Graphs

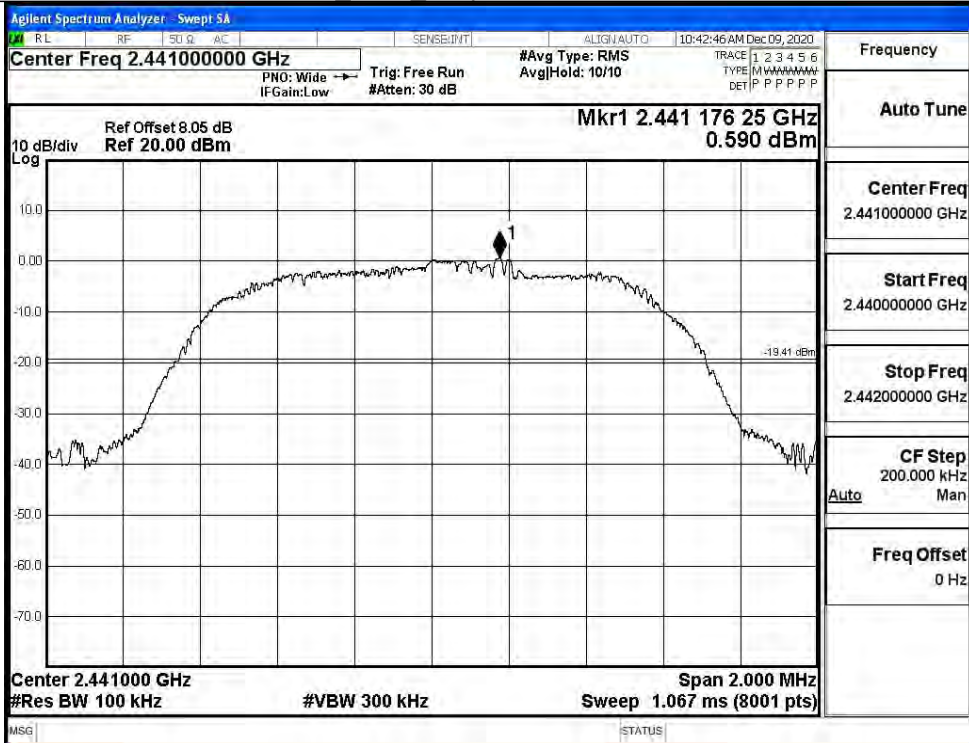


8DPSK_LCH_Graphs

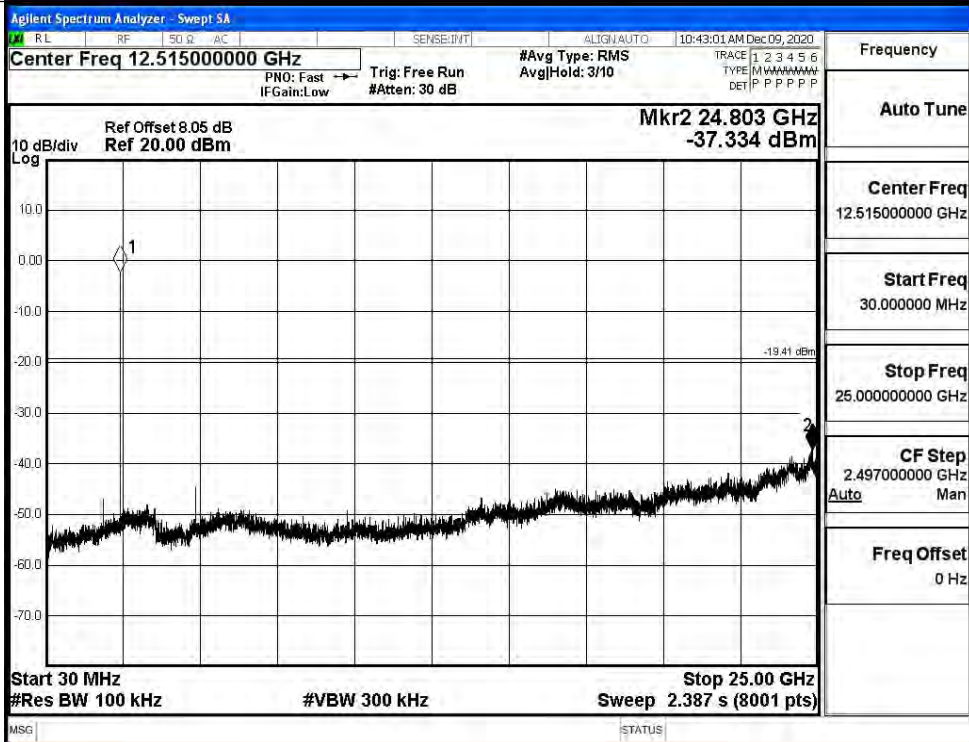


8DPSK_MCH_Graphs

Pref

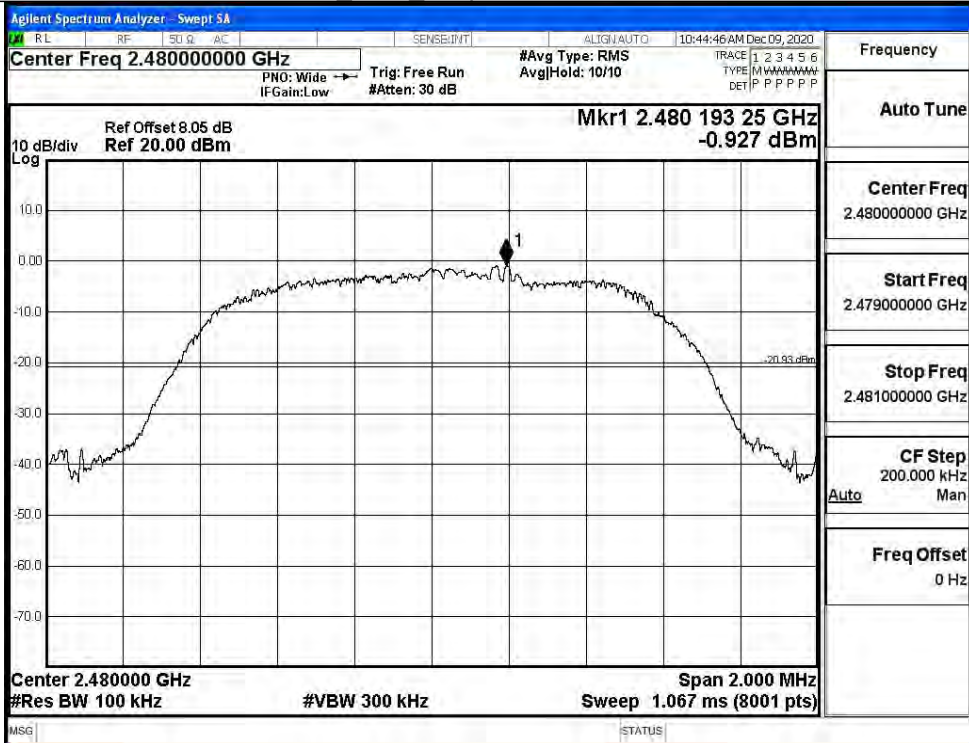


Puw

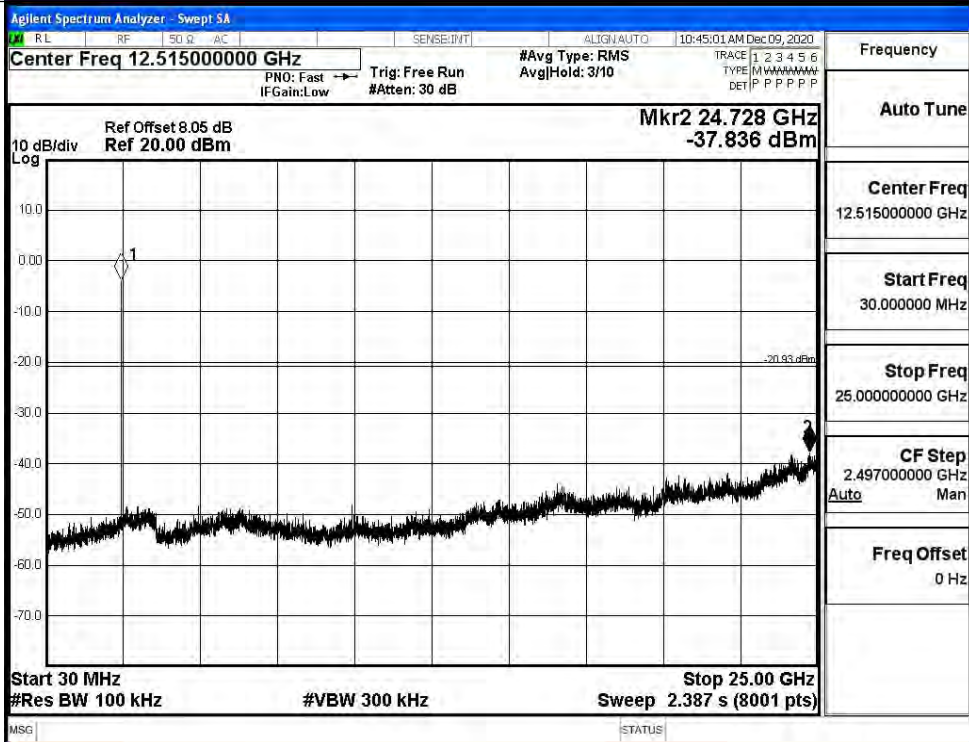


8DPSK_HCH_Graphs

Pref



Puw

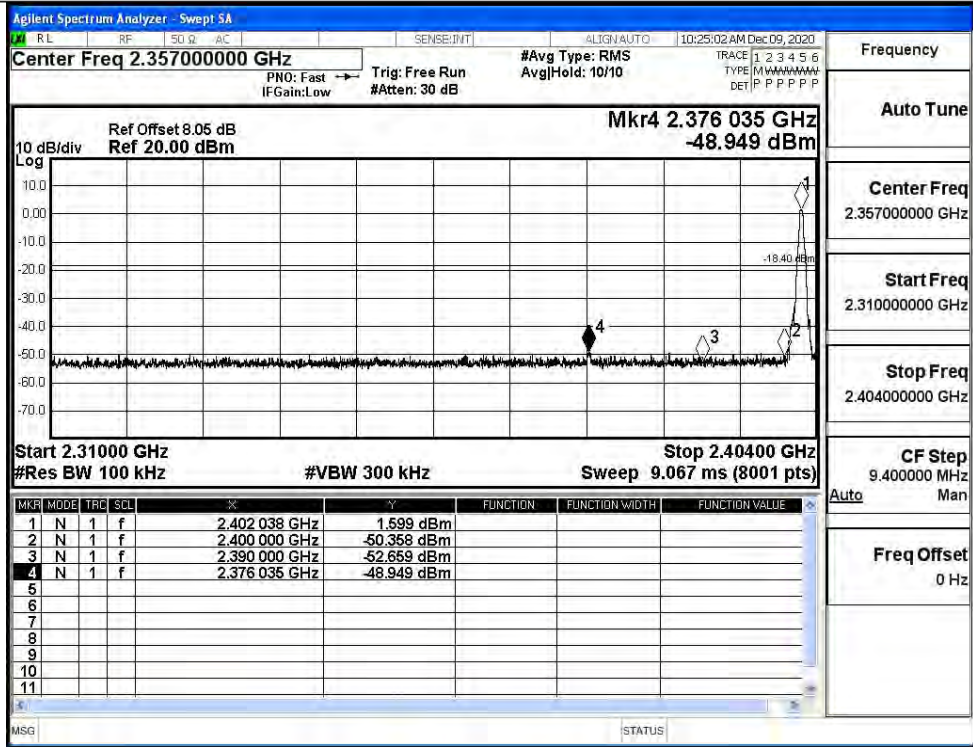


A.7 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	1.599	Off	-48.949	-18.4	PASS
			1.667	On	-47.819	-18.33	PASS
	HCH	2480	-0.589	Off	-48.952	-20.59	PASS
			0.224	On	-47.238	-19.78	PASS
$\pi/4$ DQPSK	LCH	2402	1.303	Off	-49.029	-18.7	PASS
			1.413	On	-48.964	-18.59	PASS
	HCH	2480	-0.691	Off	-49.360	-20.69	PASS
			-0.007	On	-48.597	-20.01	PASS
8DPSK	LCH	2402	1.681	Off	-44.603	-18.32	PASS
			1.630	On	-48.723	-18.37	PASS
	HCH	2480	-0.611	Off	-49.467	-20.61	PASS
			0.207	On	-48.602	-19.79	PASS

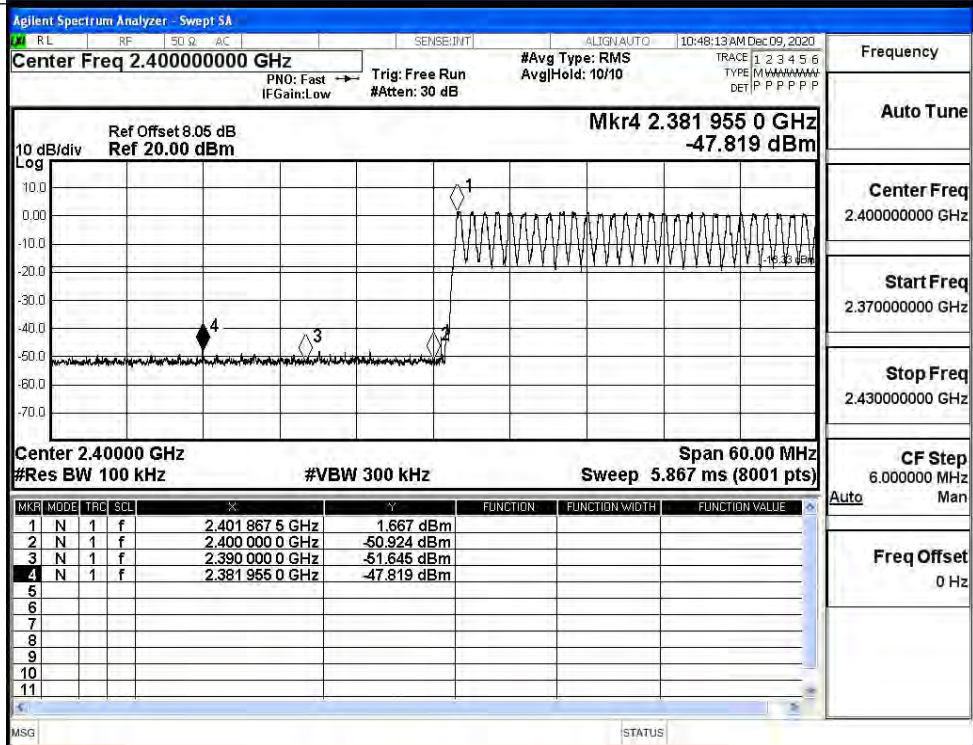
Test Graphs

GFSK/LCH/No Hop



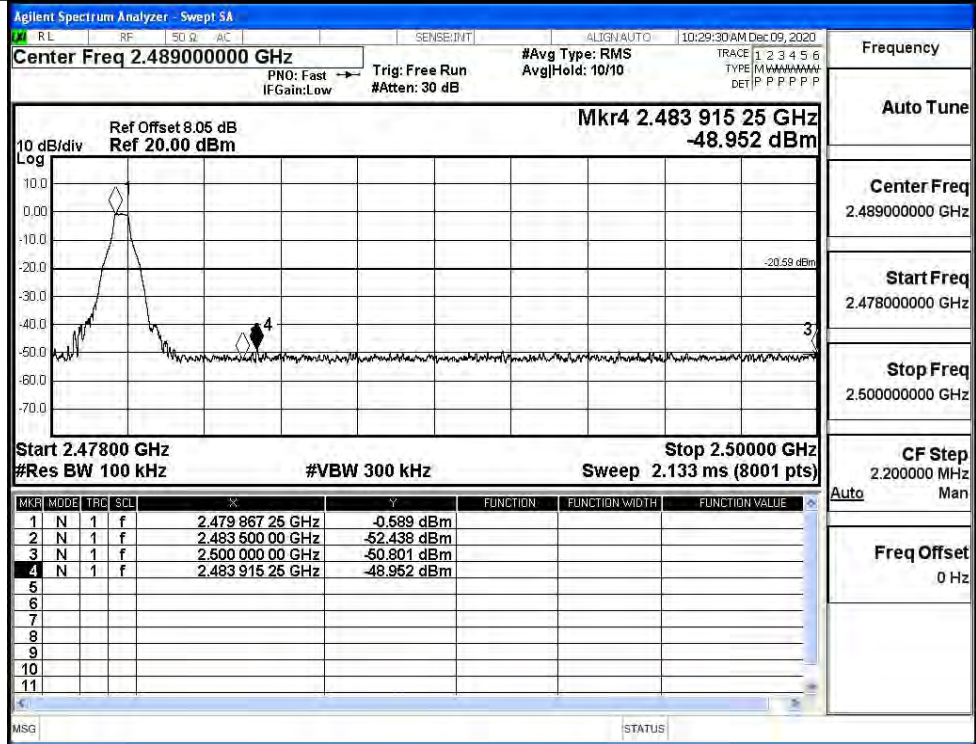
Frequency	
Auto Tune	
Center Freq	2.357000000 GHz
Start Freq	2.310000000 GHz
Stop Freq	2.404000000 GHz
CF Step	9.400000 MHz
Auto	Man
Freq Offset	0 Hz

GFSK/LCH/Hop

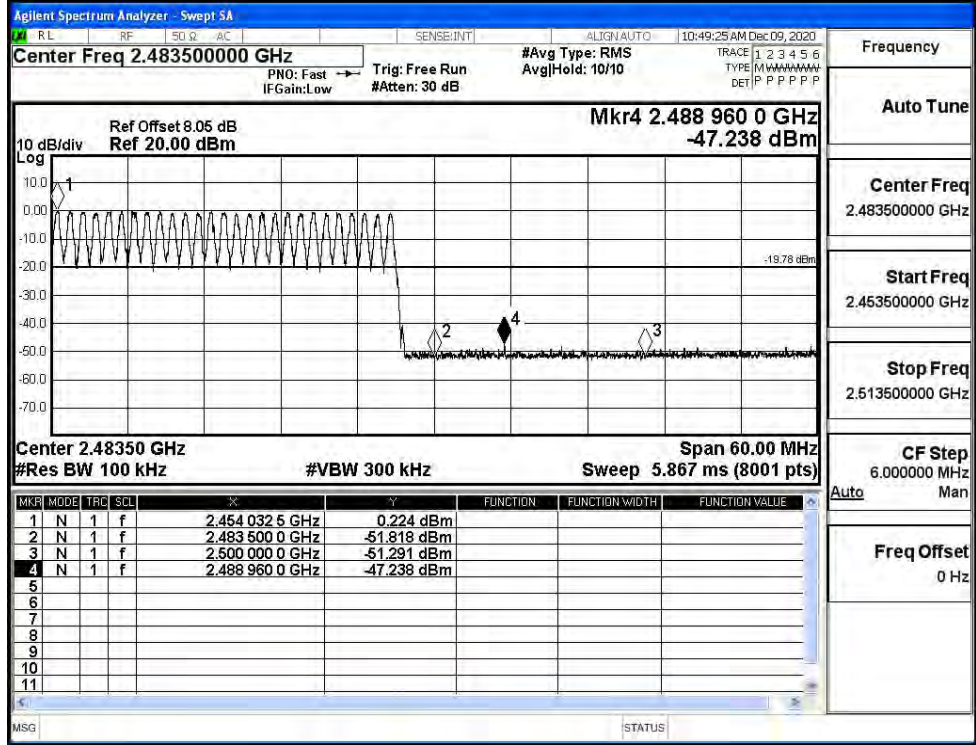


Frequency	
Auto Tune	
Center Freq	2.400000000 GHz
Start Freq	2.370000000 GHz
Stop Freq	2.430000000 GHz
CF Step	6.000000 MHz
Auto	Man
Freq Offset	0 Hz

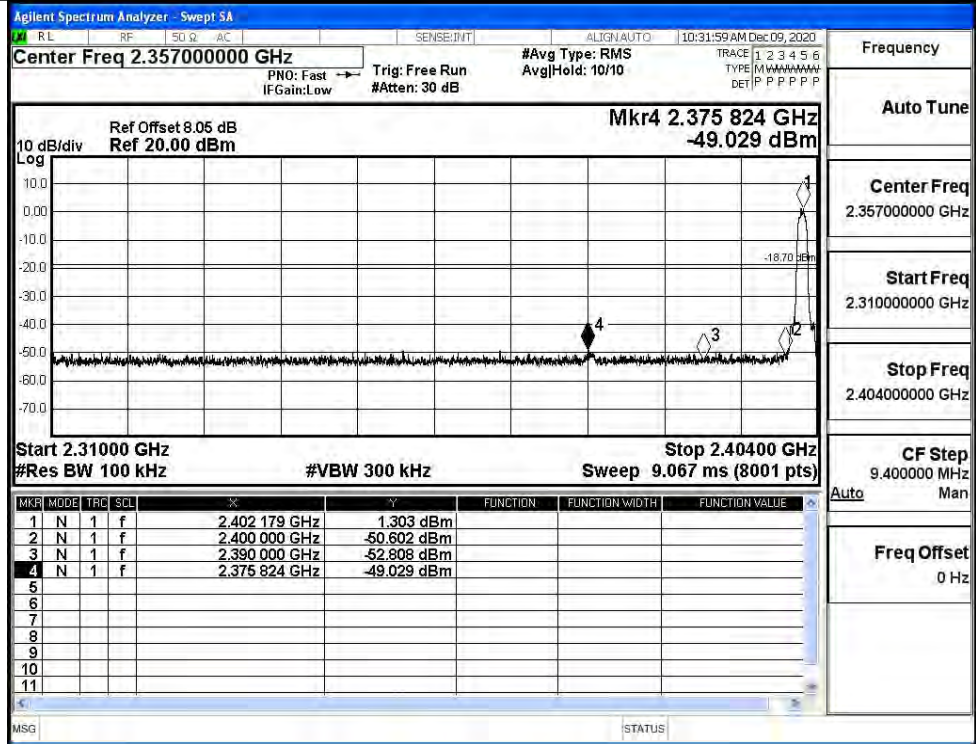
GFSK/HCH/No Hop



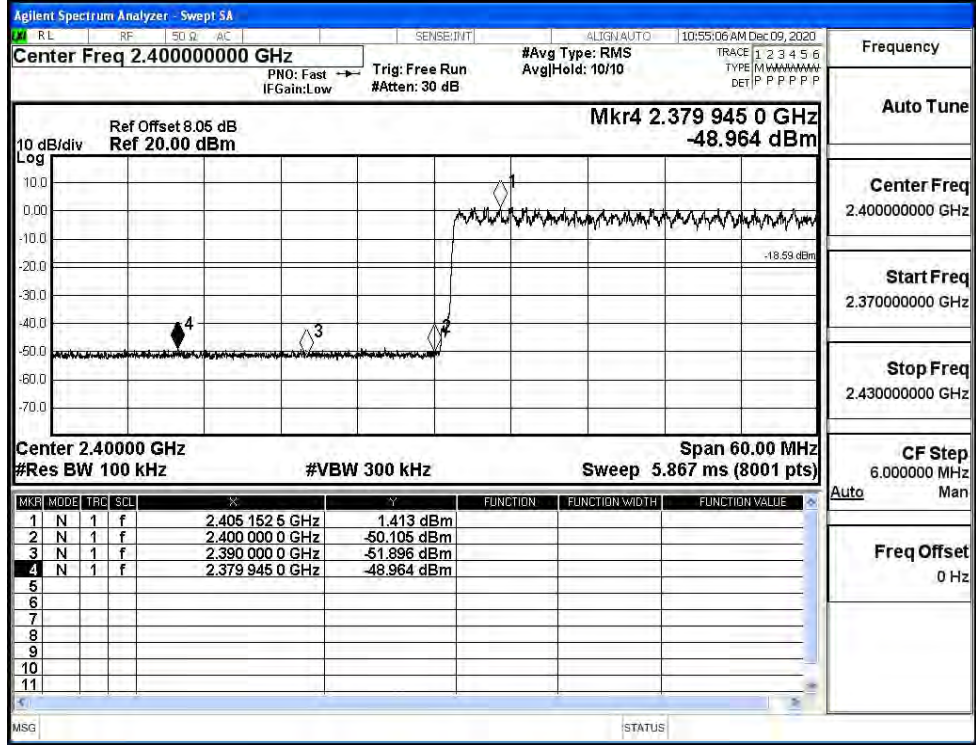
GFSK/HCH/Hop



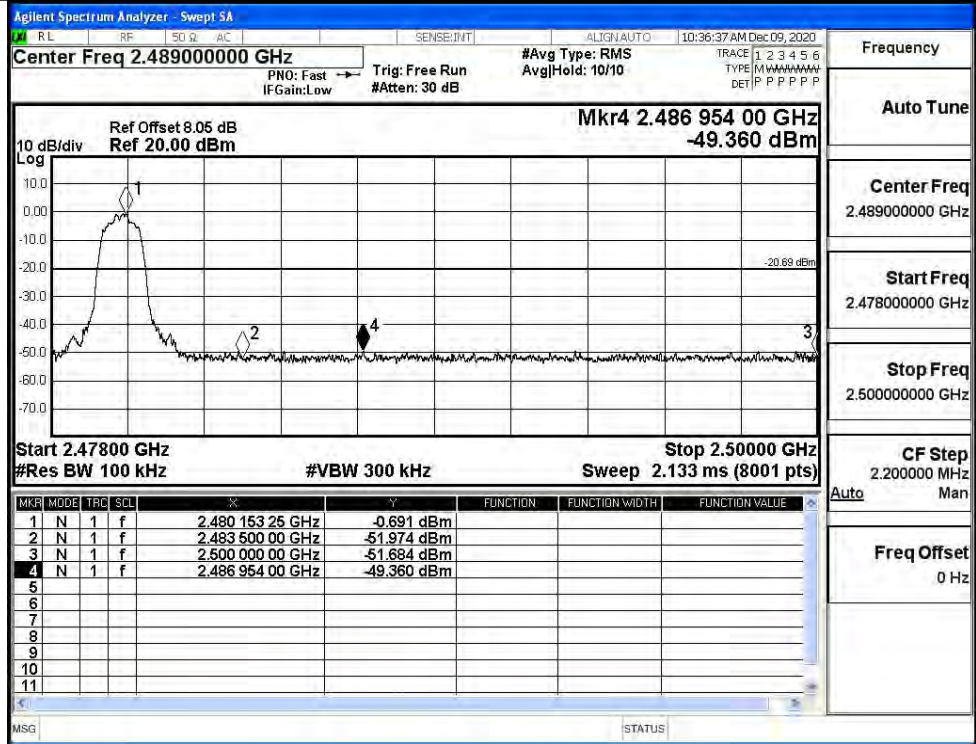
$\pi/4$ DQPSK/LCH/No Hop



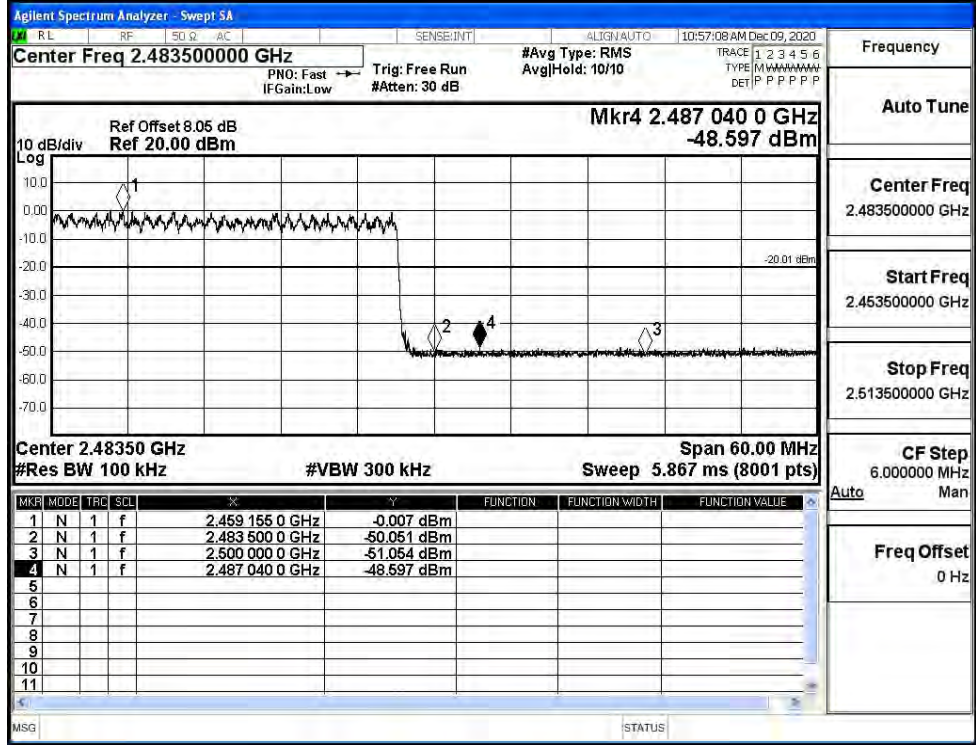
$\pi/4$ DQPSK/LCH/Hop



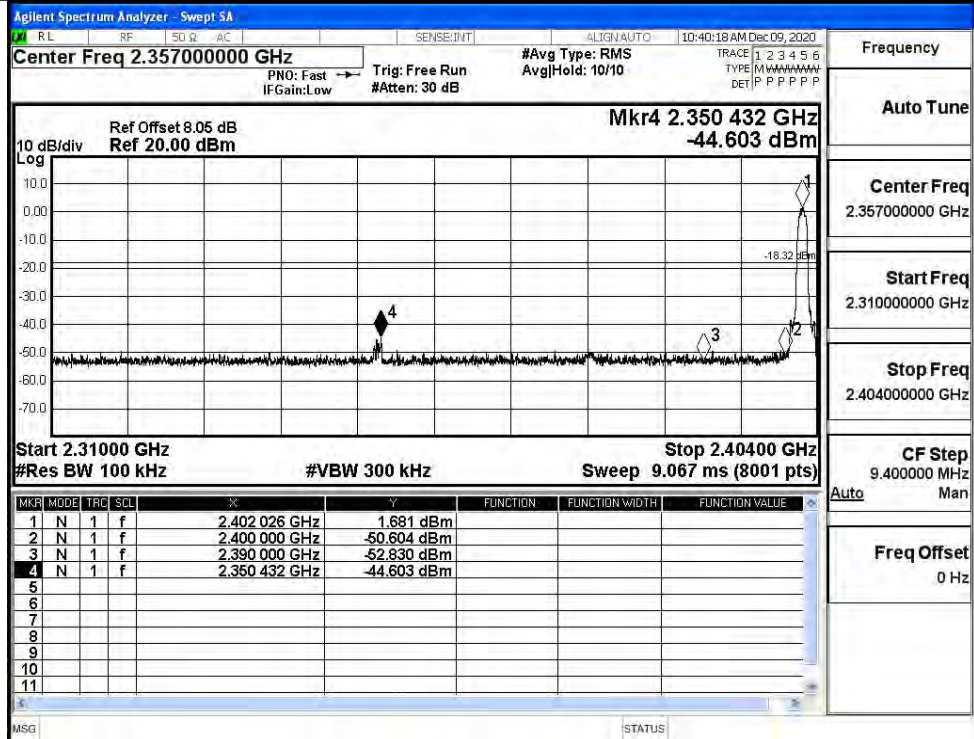
π /4DQPSK/HCH/No
Hop



π /4DQPSK/HCH/Hop

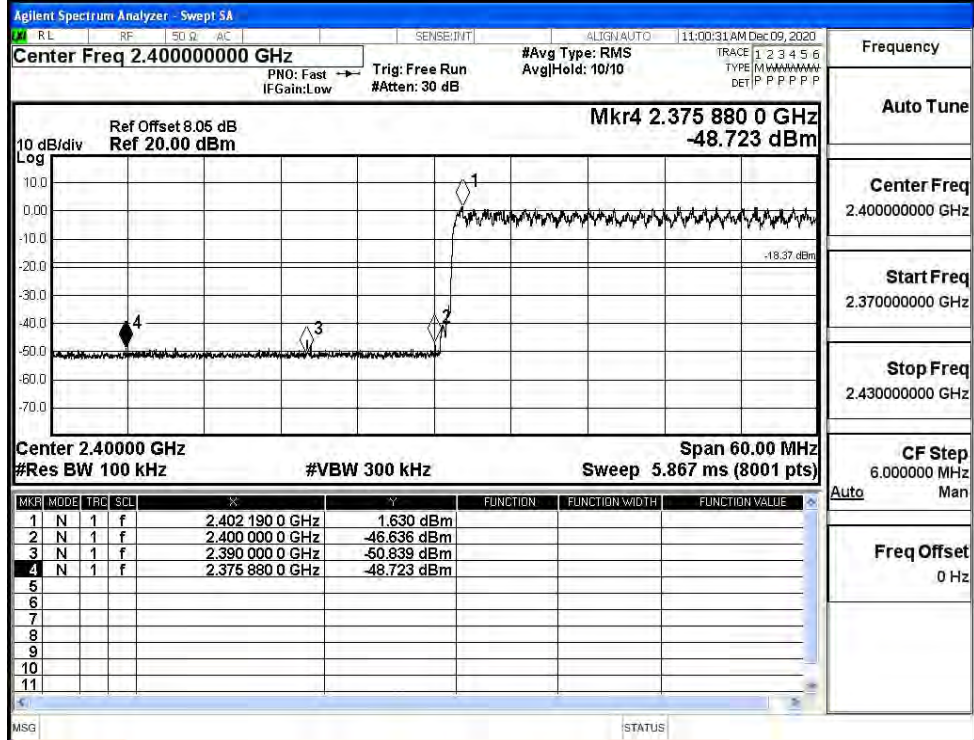


8DPSK/LCH/No Hop



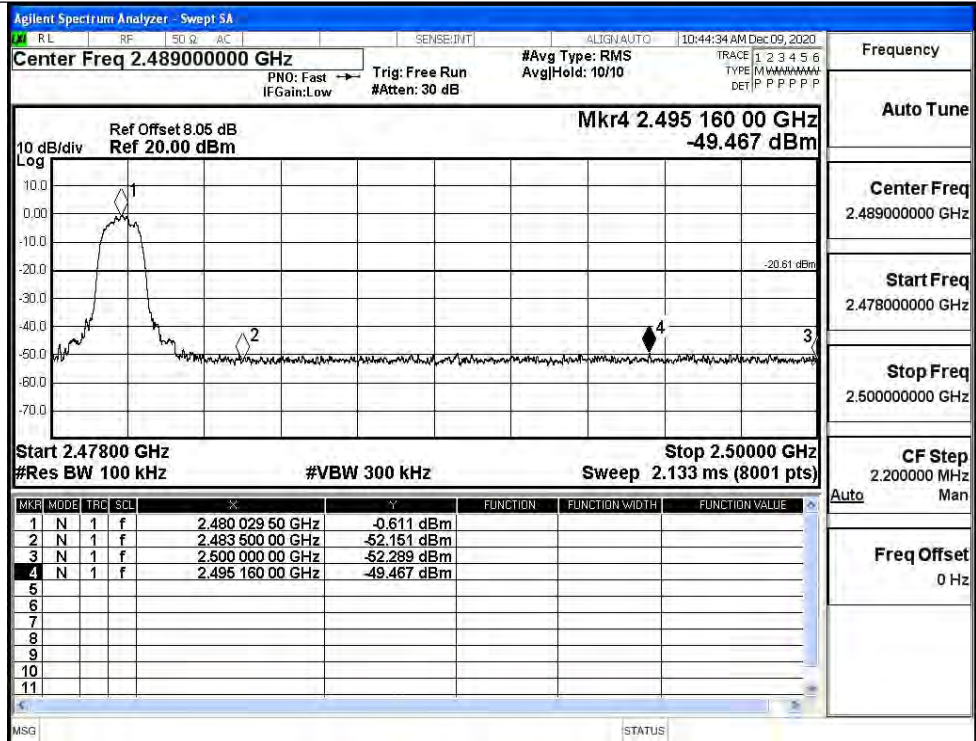
Frequency	2.357000000 GHz
Auto Tune	
Center Freq	2.357000000 GHz
Start Freq	2.310000000 GHz
Stop Freq	2.404000000 GHz
CF Step	9.400000 MHz
Auto	Man
Freq Offset	0 Hz

8DPSK/LCH/Hop



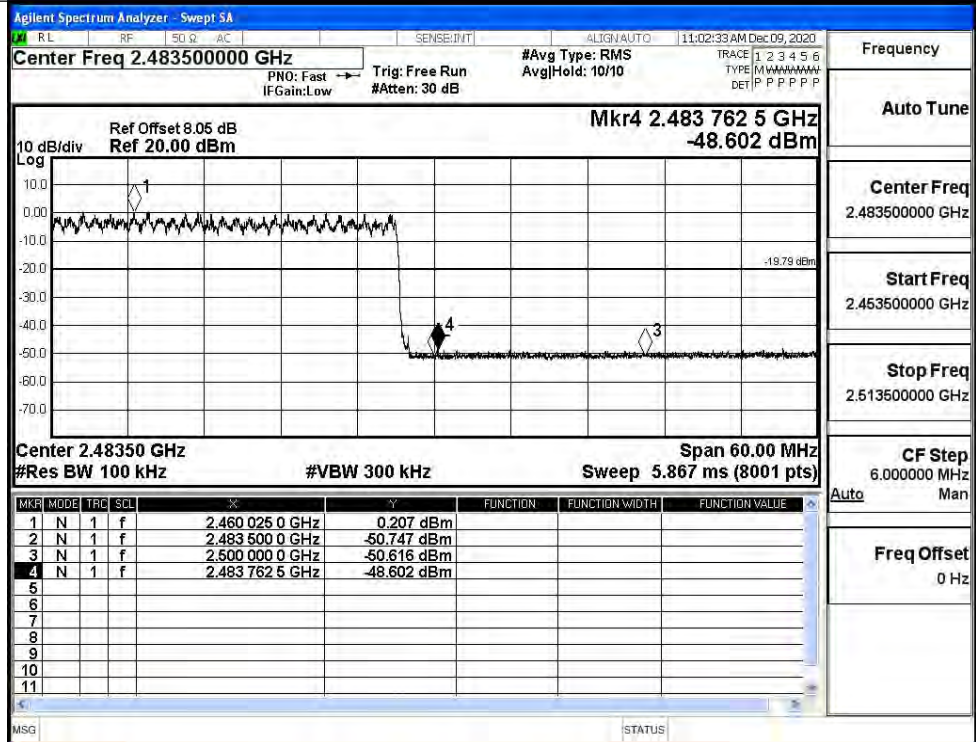
Frequency	2.400000000 GHz
Auto Tune	
Center Freq	2.400000000 GHz
Start Freq	2.370000000 GHz
Stop Freq	2.430000000 GHz
CF Step	6.000000 MHz
Auto	Man
Freq Offset	0 Hz

8DPSK/HCH/No Hop



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

8DPSK/HCH/Hop

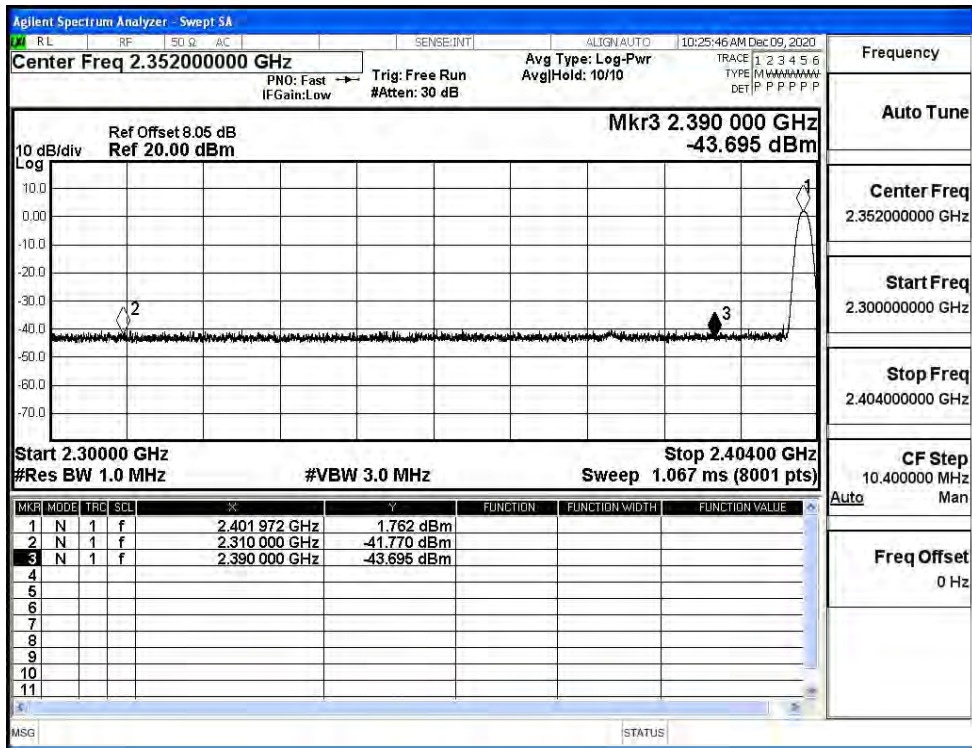


Frequency
Auto Tune
Center Freq
2.483500000 GHz
Start Freq
2.463500000 GHz
Stop Freq
2.513500000 GHz
CF Step
6.000000 MHz
Auto Man
Freq Offset
0 Hz

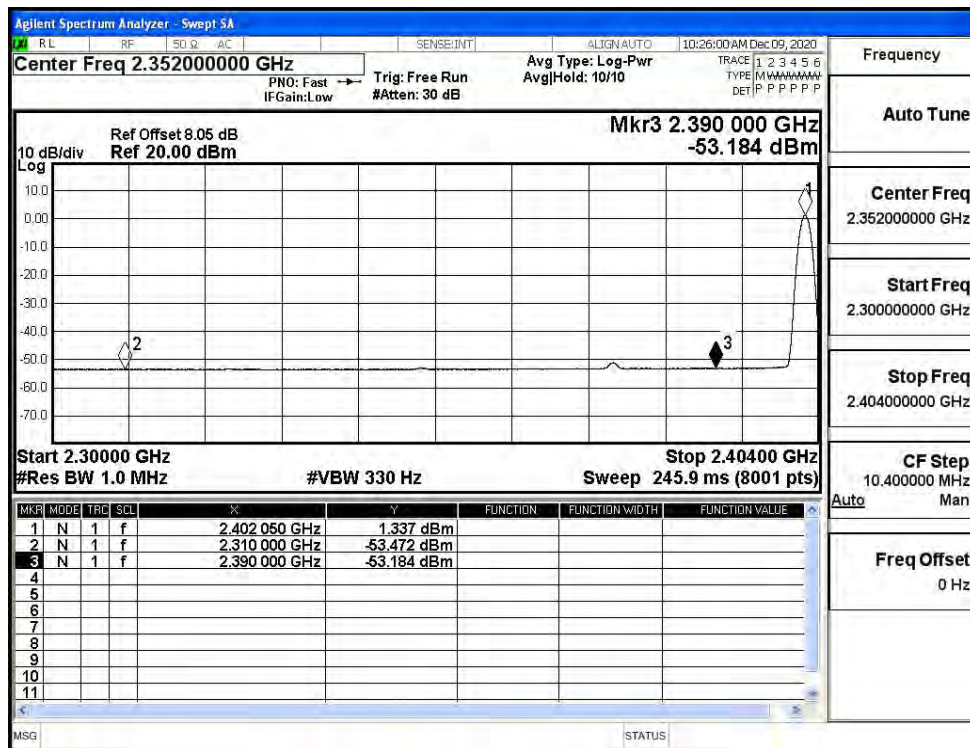
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-41.77	3.19	0	56.65	PEAK	74	PASS
	Off	2310.0	-53.47	3.19	0	44.95	AV	54	PASS
	Off	2390.0	-43.70	3.19	0	54.72	PEAK	74	PASS
	Off	2390.0	-53.18	3.19	0	45.24	AV	54	PASS
	Off	2483.5	-41.70	3.19	0	56.72	PEAK	74	PASS
	Off	2483.5	-52.50	3.19	0	45.92	AV	54	PASS
	Off	2500.0	-42.70	3.19	0	55.72	PEAK	74	PASS
	Off	2500.0	-52.41	3.19	0	46.01	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.46	3.19	0	54.96	PEAK	74	PASS
	Off	2310.0	-53.56	3.19	0	44.86	AV	54	PASS
	Off	2390.0	-42.28	3.19	0	56.14	PEAK	74	PASS
	Off	2390.0	-53.15	3.19	0	45.27	AV	54	PASS
	Off	2483.5	-41.87	3.19	0	56.55	PEAK	74	PASS
	Off	2483.5	-52.47	3.19	0	45.95	AV	54	PASS
	Off	2500.0	-41.06	3.19	0	57.36	PEAK	74	PASS
	Off	2500.0	-52.45	3.19	0	45.97	AV	54	PASS
8DPSK	Off	2310.0	-42.72	3.19	0	55.70	PEAK	74	PASS
	Off	2310.0	-53.38	3.19	0	45.04	AV	54	PASS
	Off	2390.0	-43.55	3.19	0	54.87	PEAK	74	PASS
	Off	2390.0	-53.02	3.19	0	45.40	AV	54	PASS
	Off	2483.5	-42.20	3.19	0	56.22	PEAK	74	PASS
	Off	2483.5	-52.53	3.19	0	45.89	AV	54	PASS
	Off	2500.0	-42.05	3.19	0	56.37	PEAK	74	PASS
	Off	2500.0	-52.44	3.19	0	45.98	AV	54	PASS

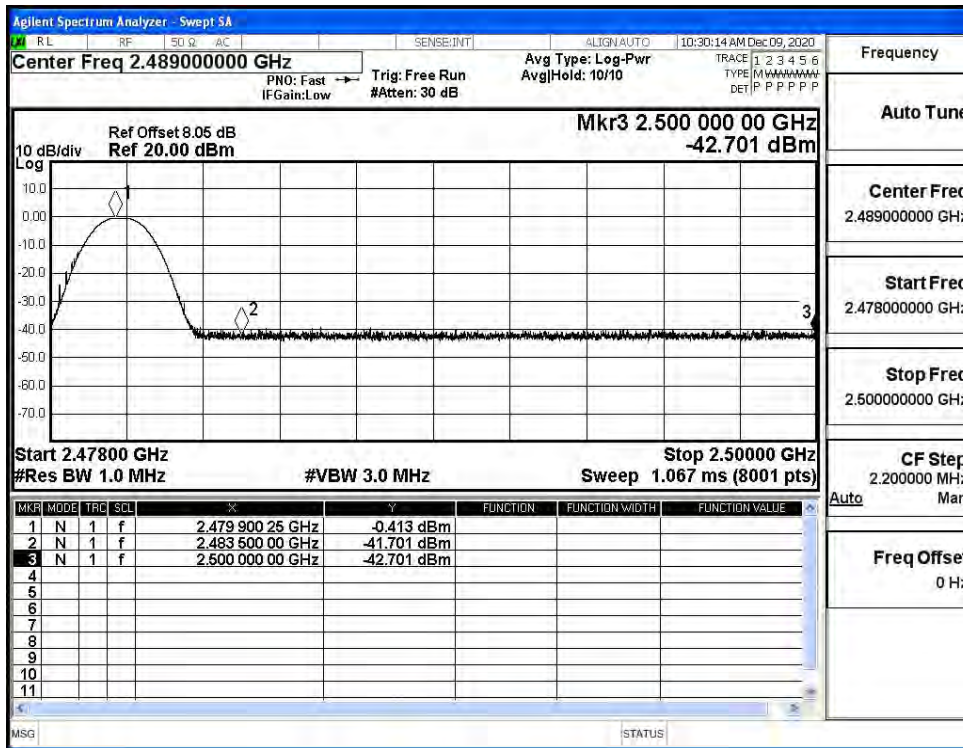
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



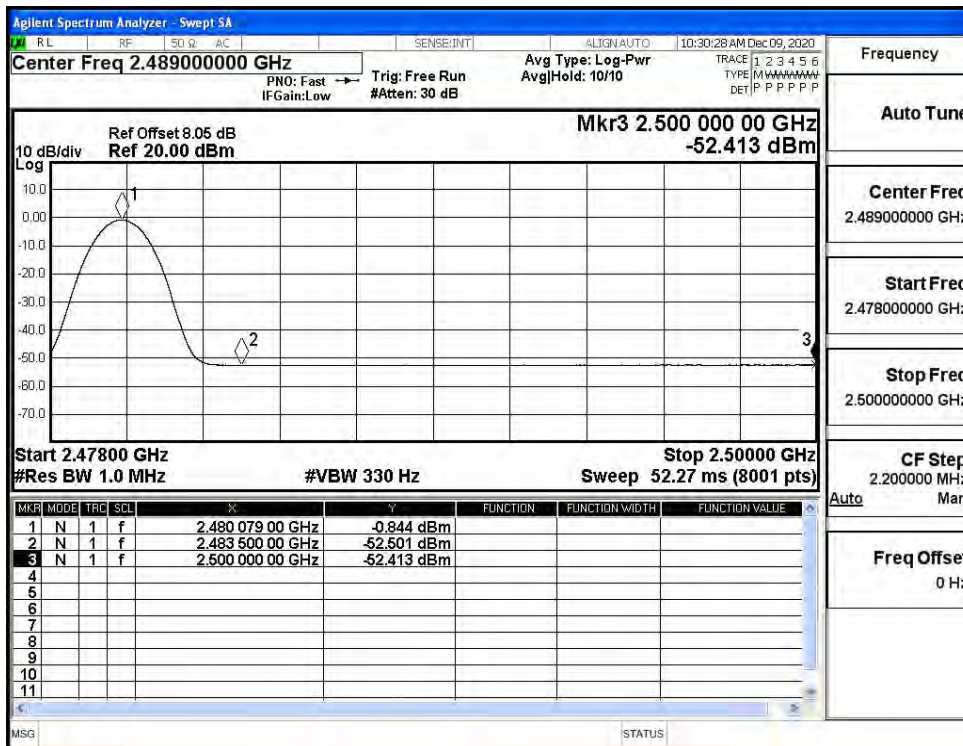
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



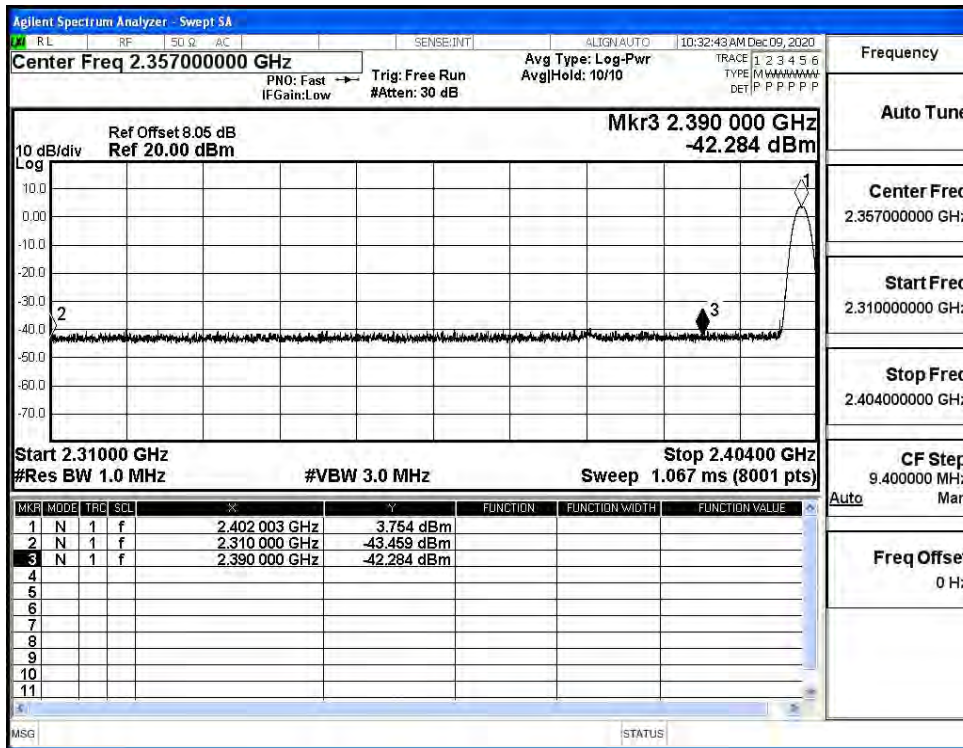
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



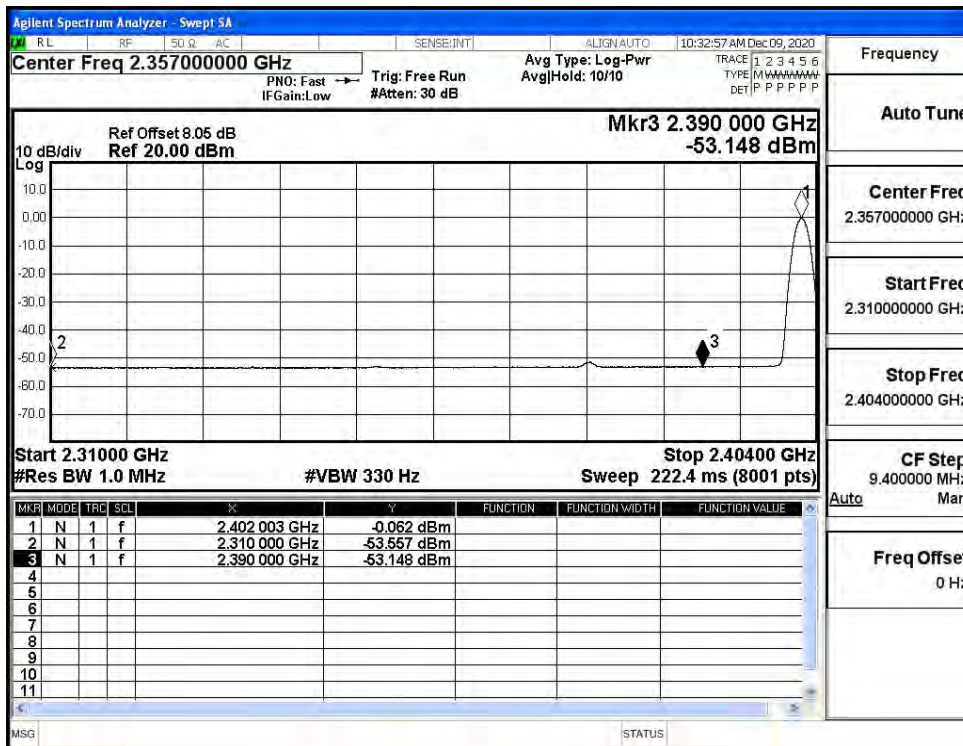
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



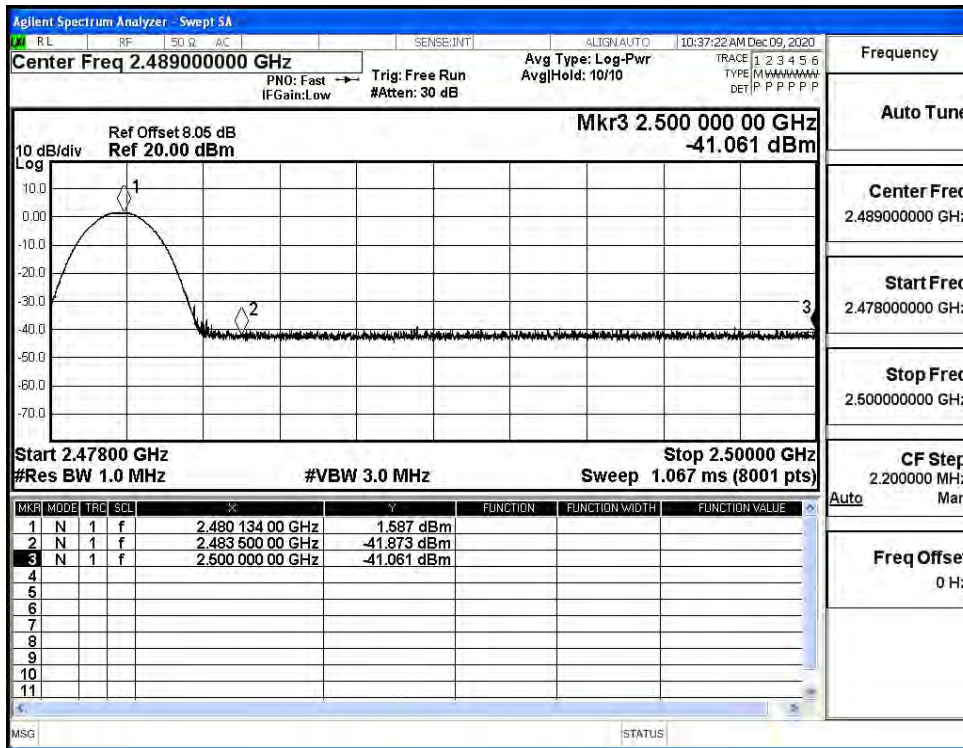
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)



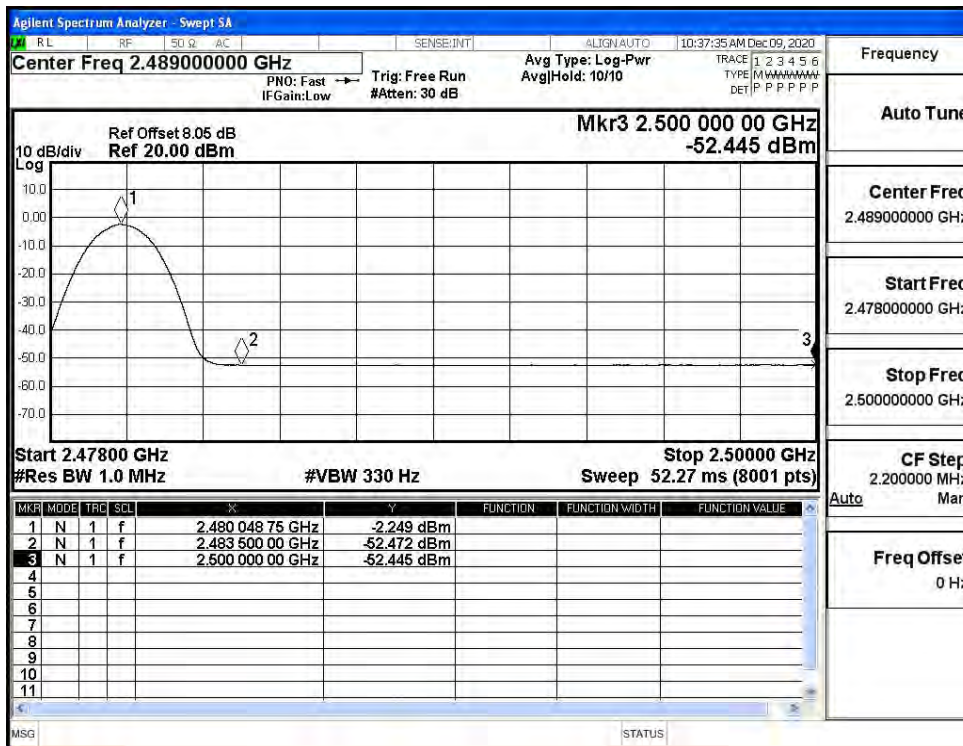
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)



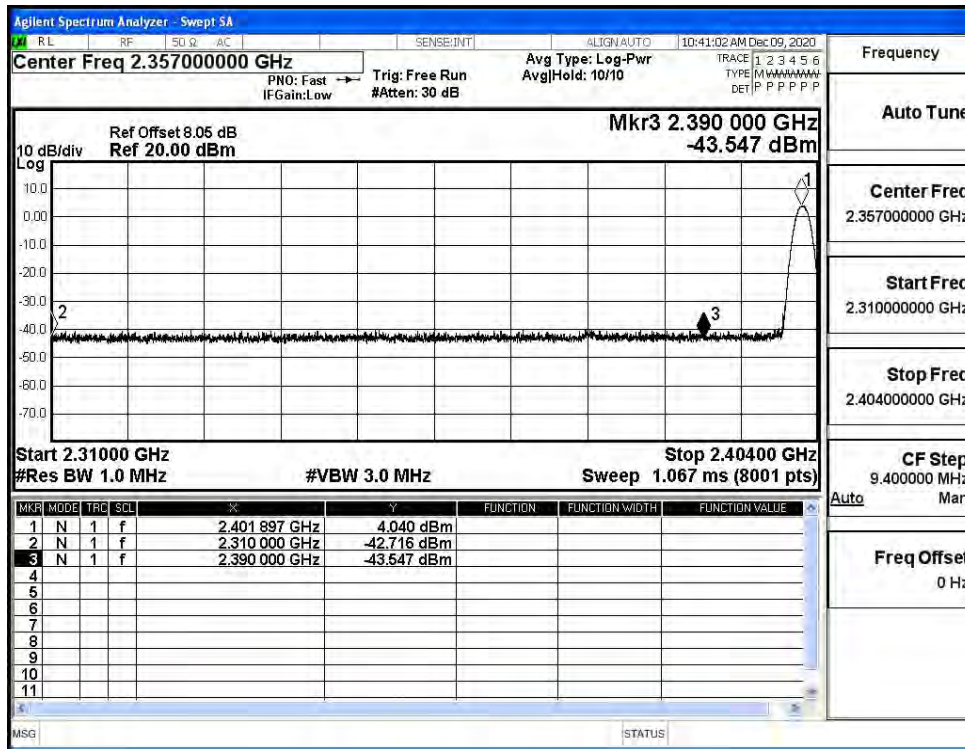
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (High Channel)



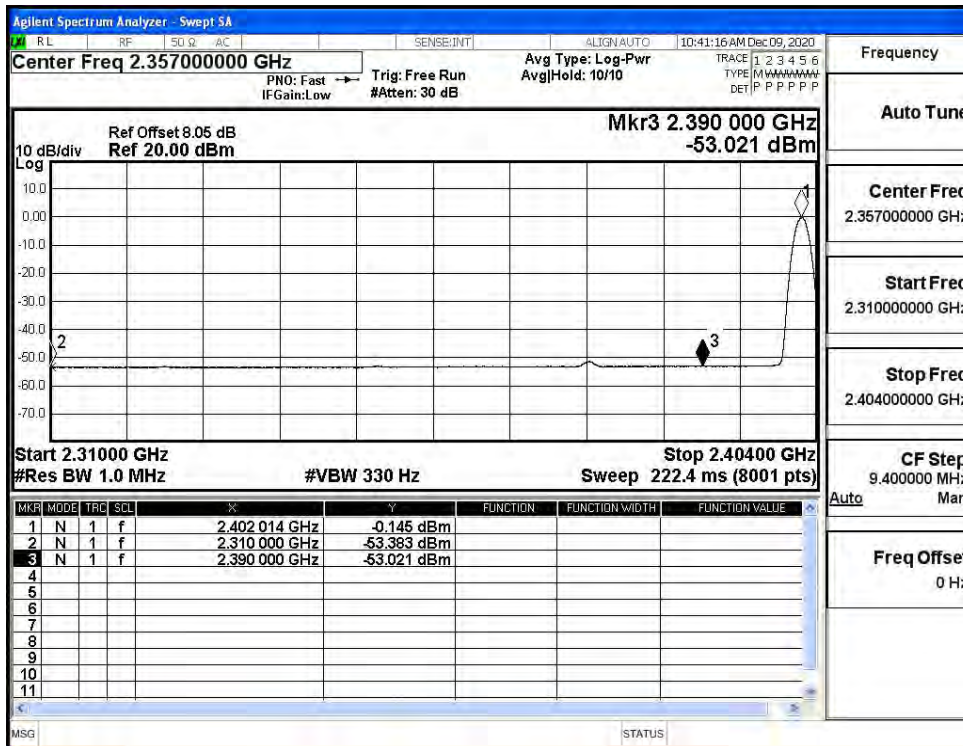
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (High Channel)



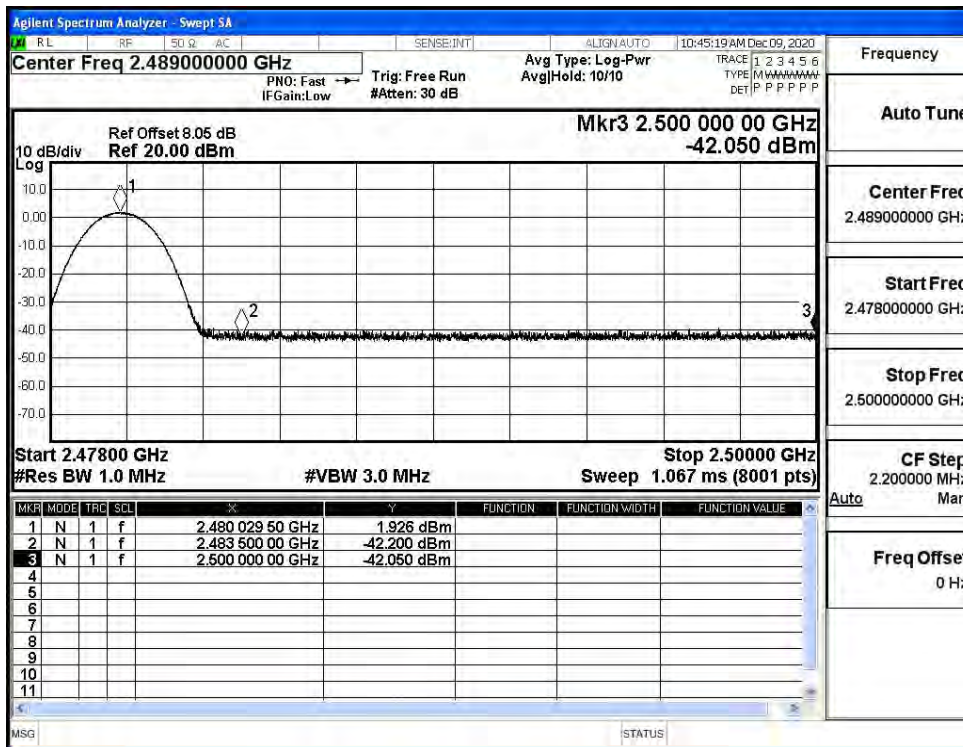
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

