

Appendix A

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

Product Name: USB Bluetooth adapter

Trade Mark: INNOTRIK, AUCTOPUS

Test Model: BT-31D

Environmental Conditions

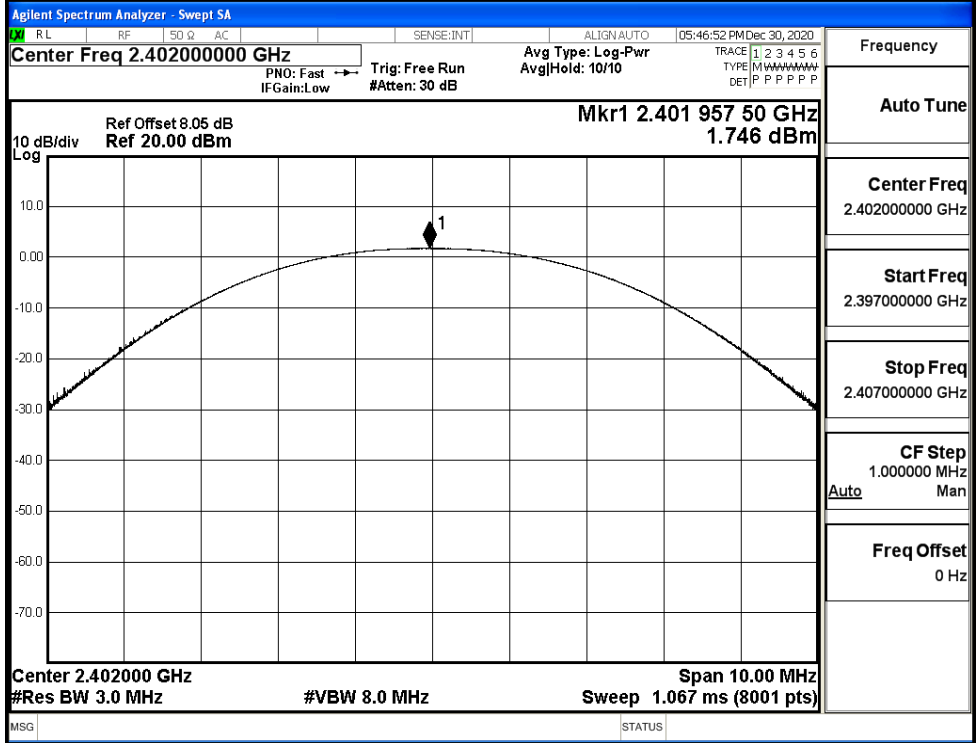
Temperature:	21.3° C
Relative Humidity:	49.6%
ATM Pressure:	100.0 kPa
Test Engineer:	Carl Fu
Supervised by:	Li Huan

B.1 Maxmum Conducted Peak Output Power

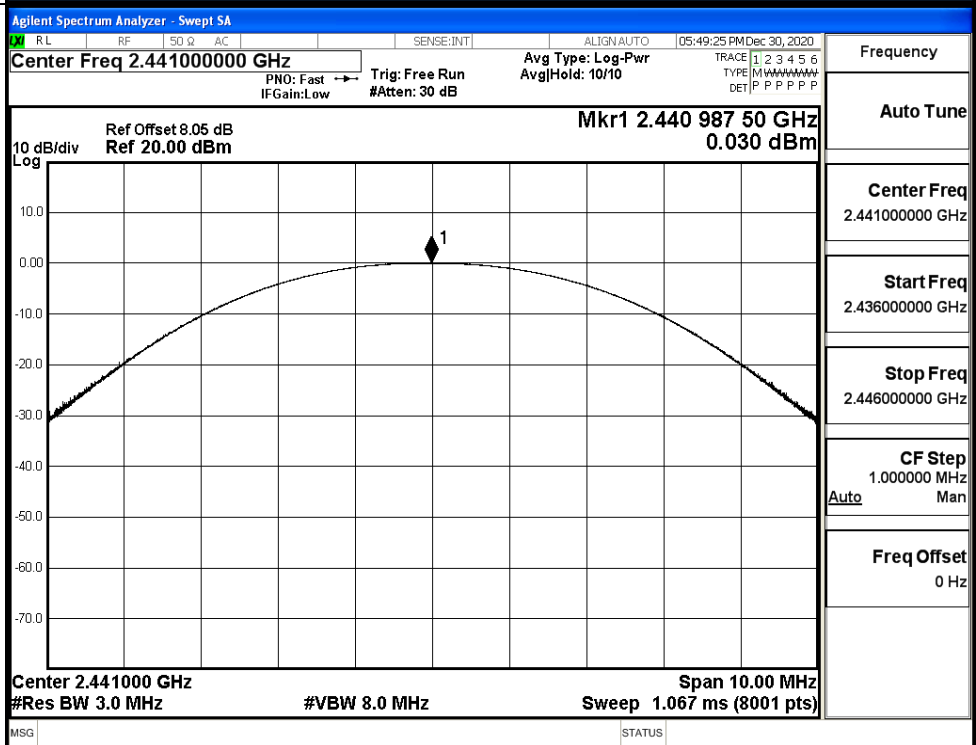
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.746	21	PASS
	MCH	0.030	21	PASS
	HCH	-1.911	21	PASS
$\pi/4$ DQPSK	LCH	4.142	21	PASS
	MCH	2.331	21	PASS
	HCH	0.367	21	PASS
8DPSK	LCH	4.669	21	PASS
	MCH	2.820	21	PASS
	HCH	0.884	21	PASS

Test Graphs

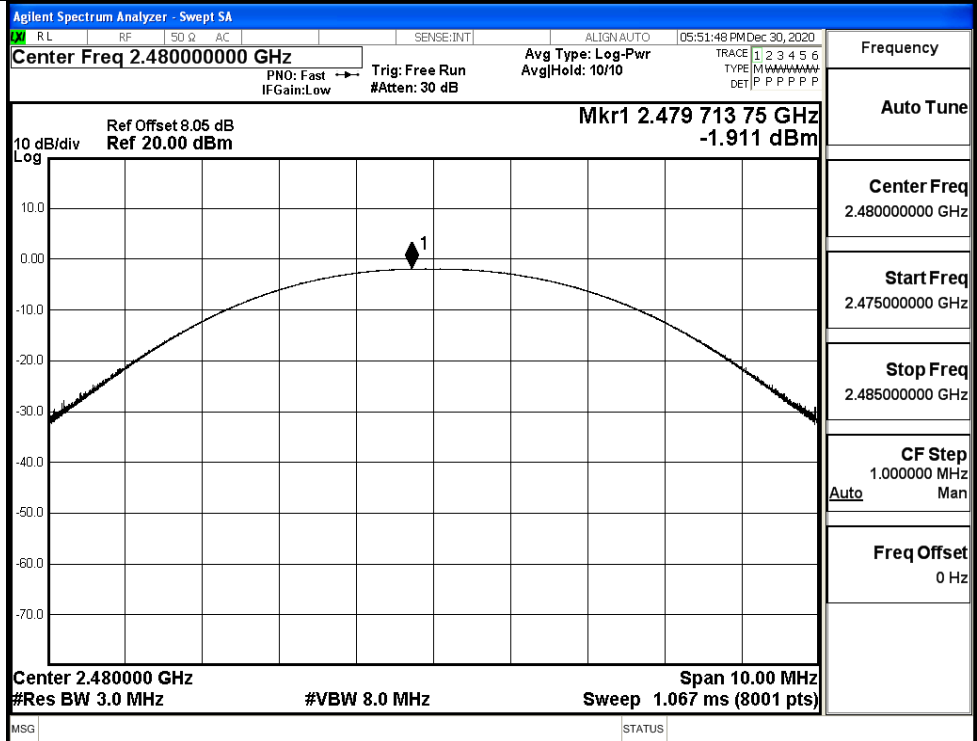
GFSK/LCH



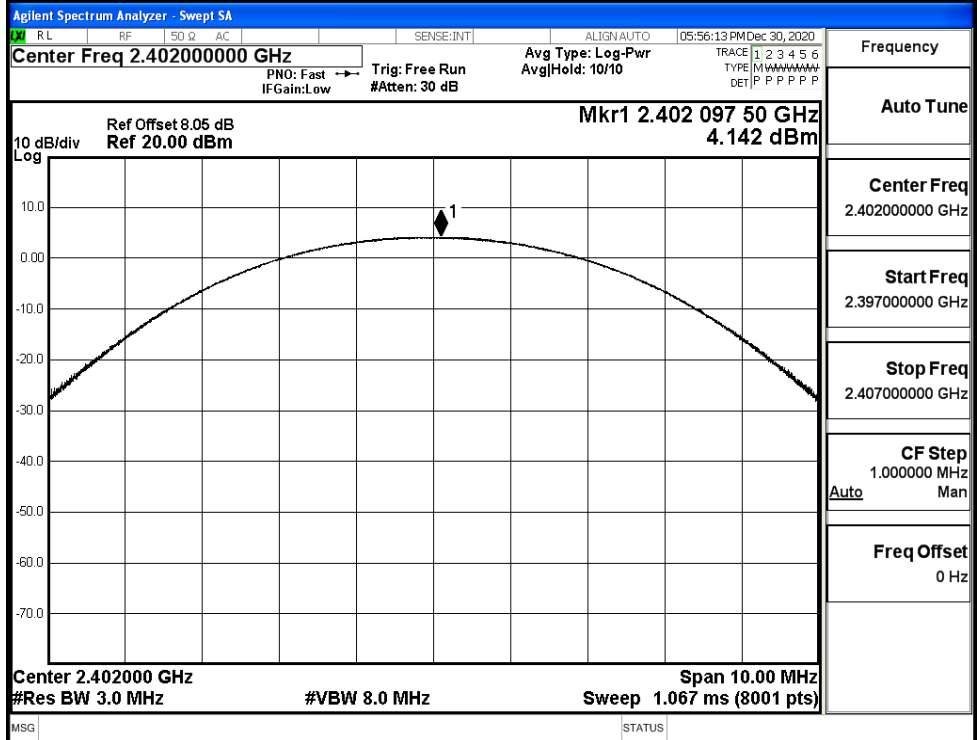
GFSK/MCH

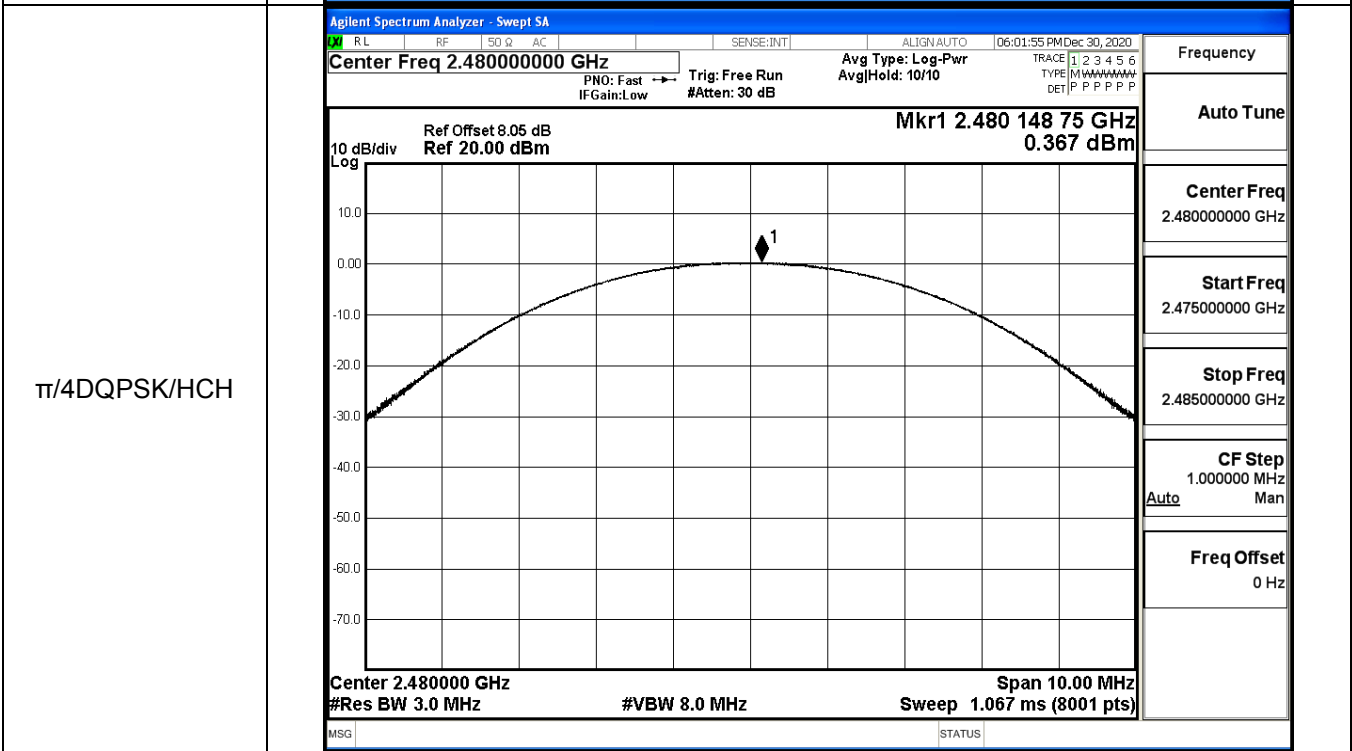
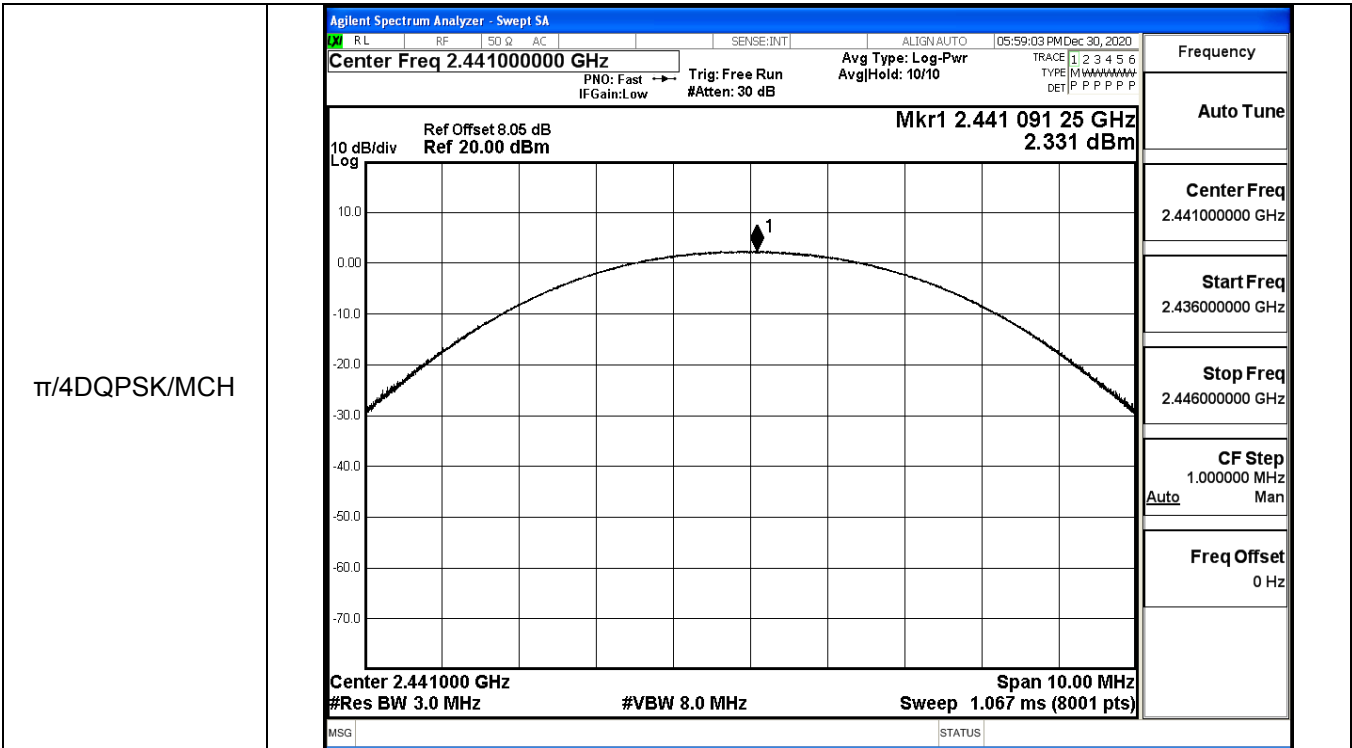


GFSK/HCH

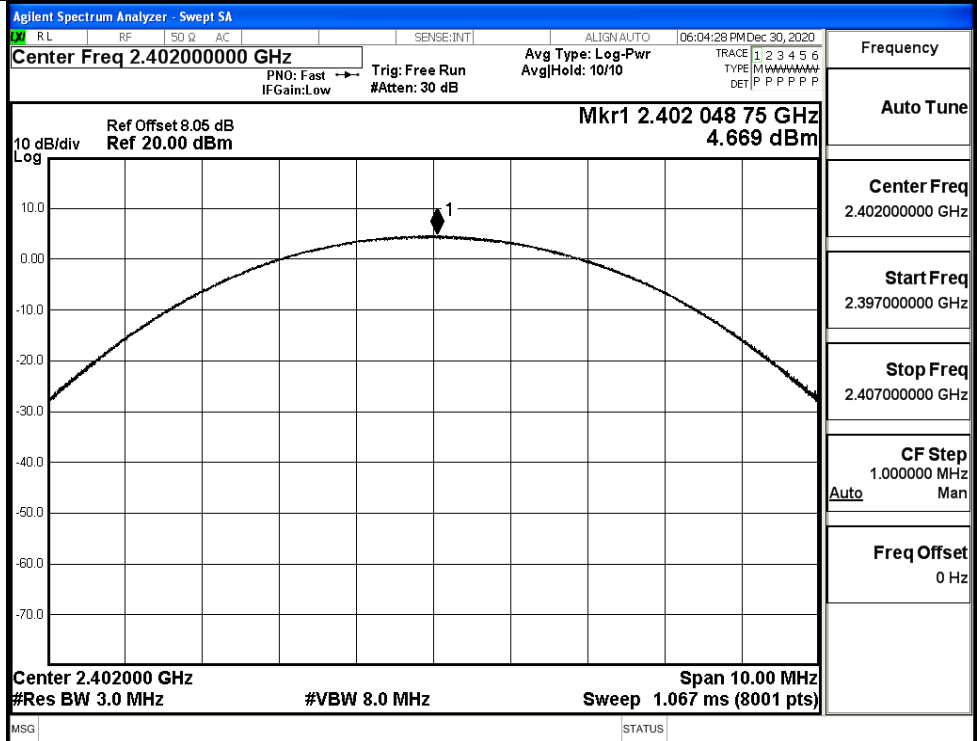


$\pi/4$ DQPSK/LCH

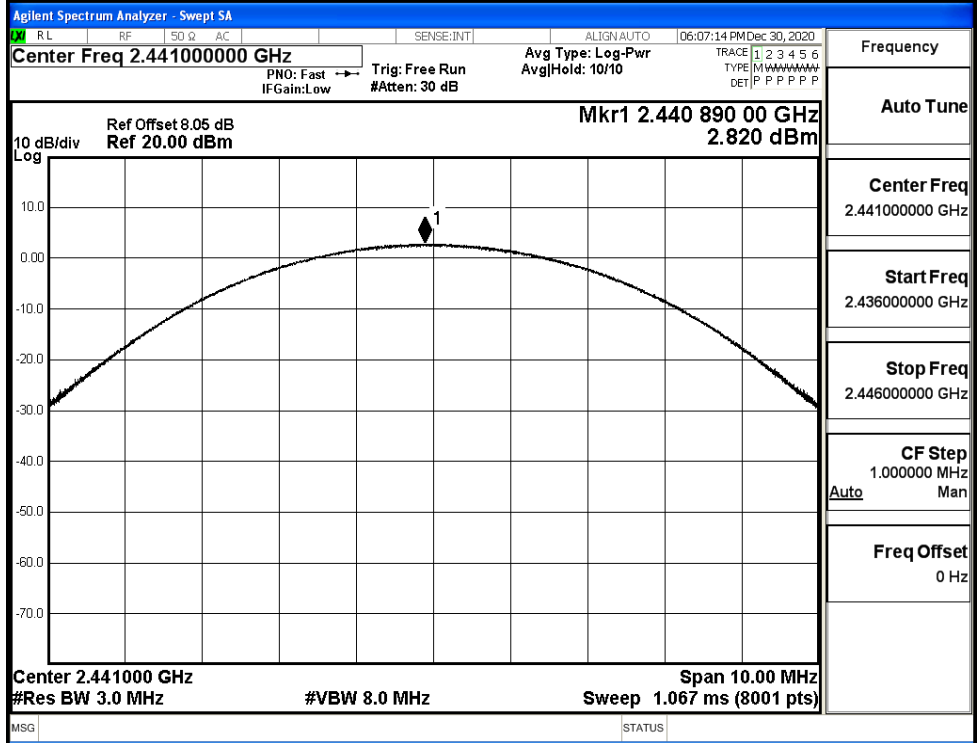




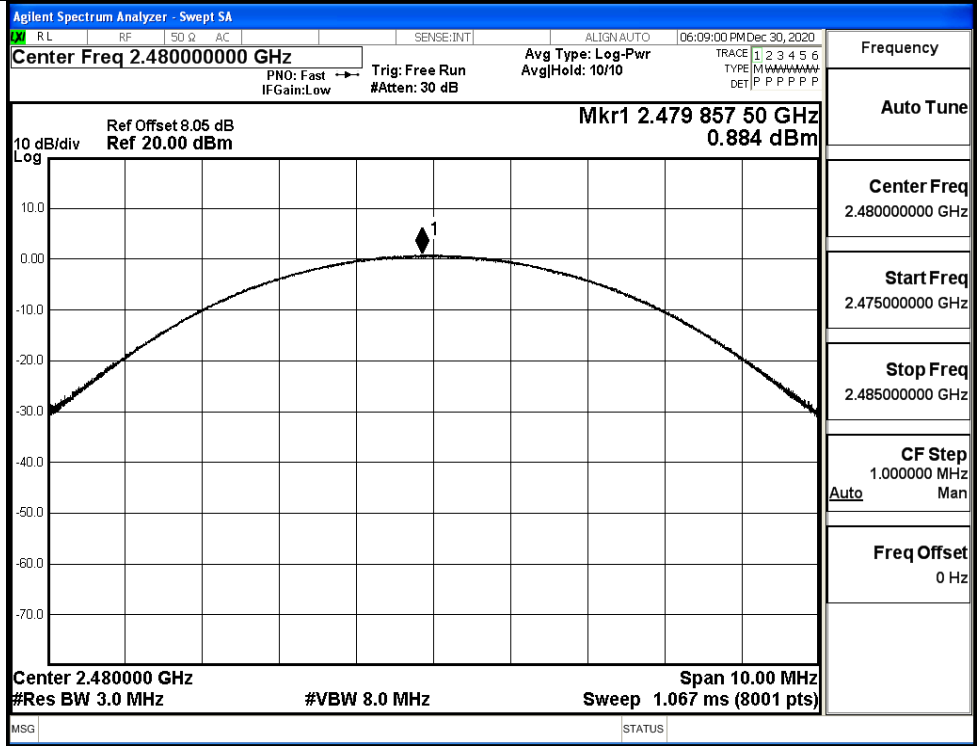
8DPSK/LCH



8DPSK/MCH

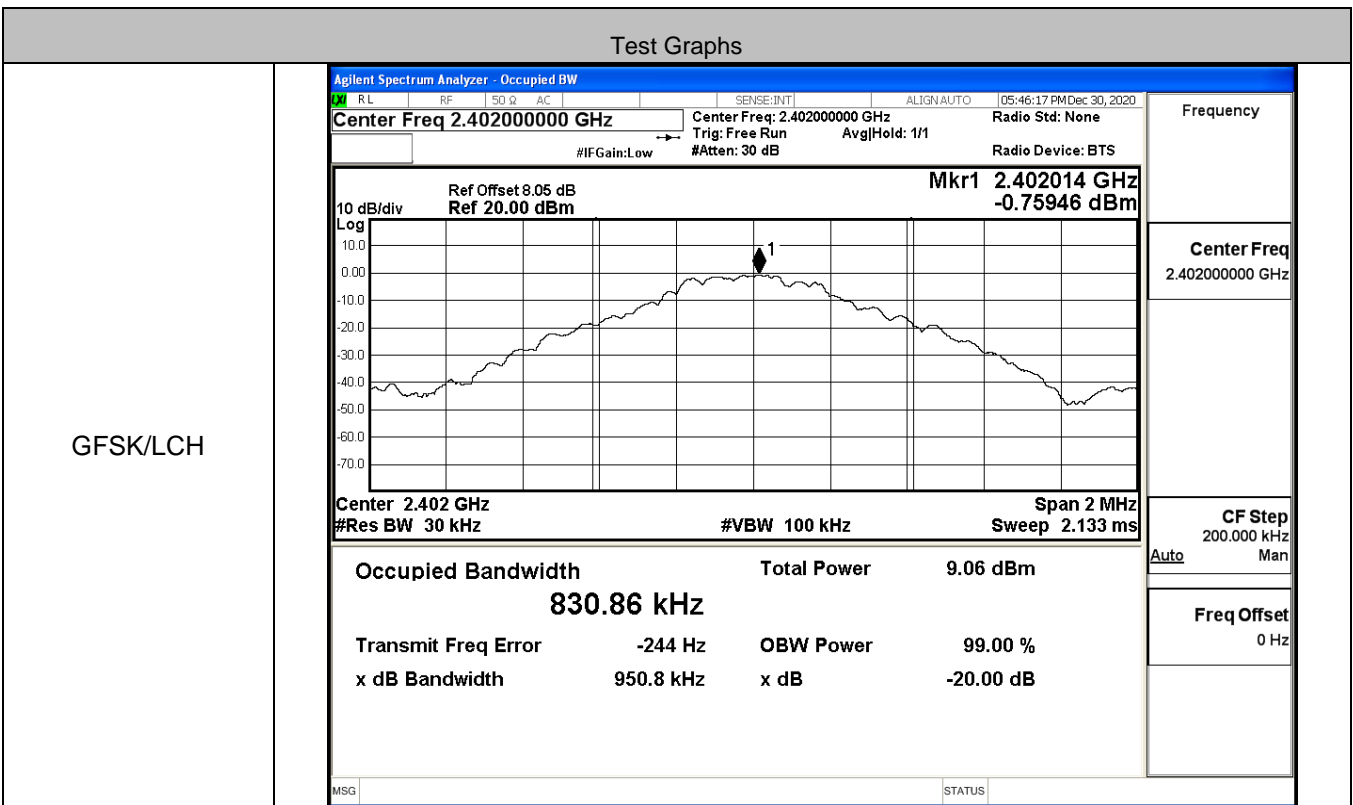


8DPSK/HCH

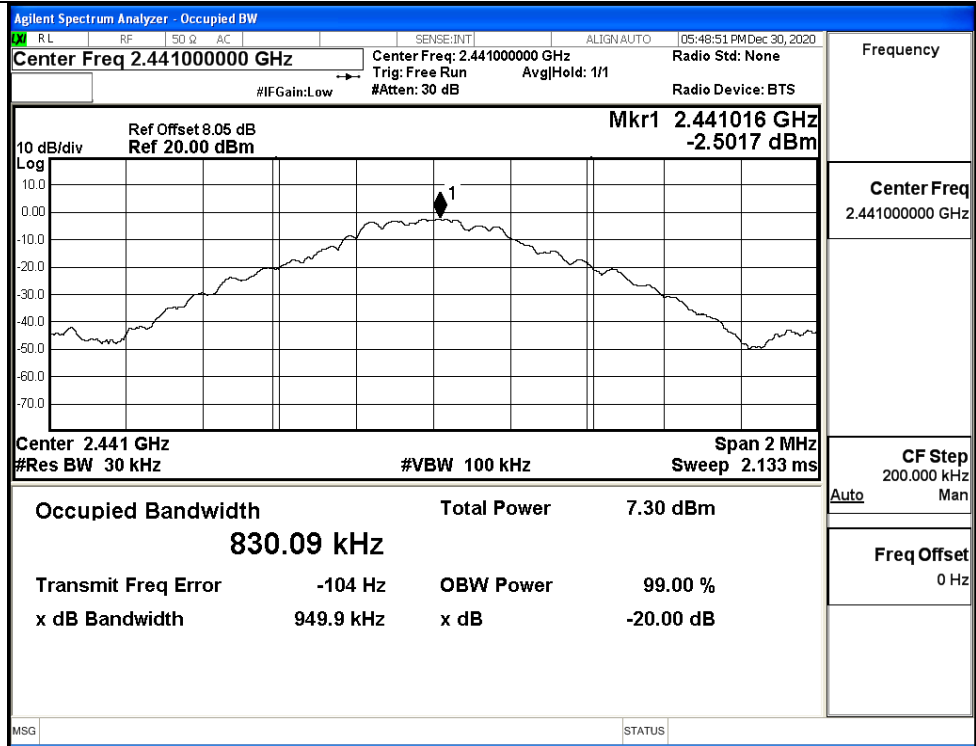


B.2 20dB Bandwidth

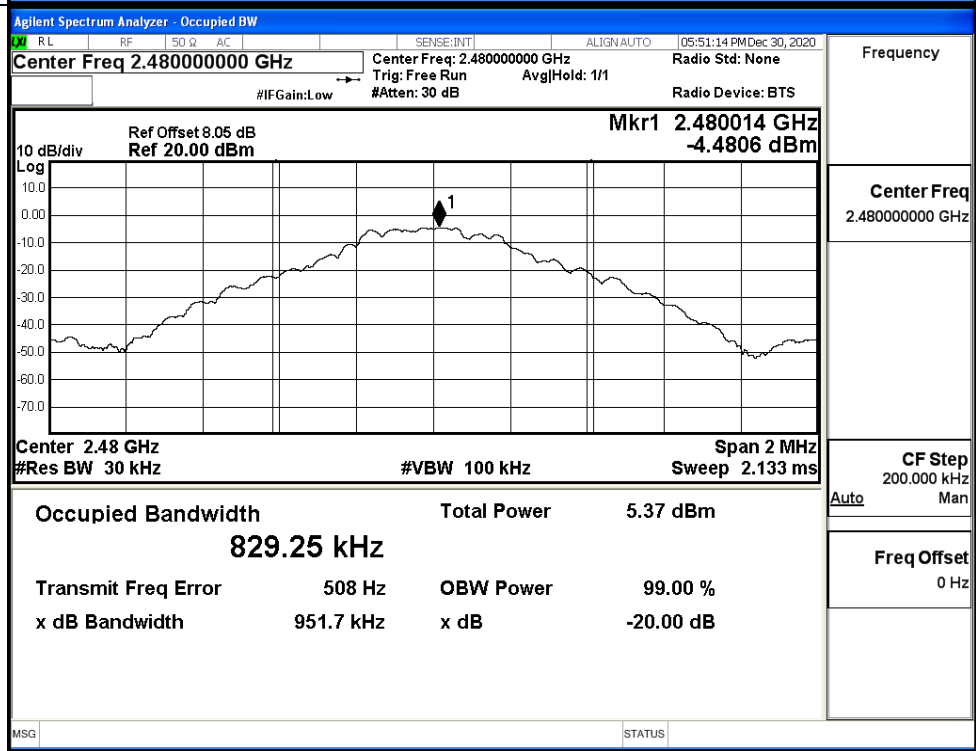
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9508	Not Specified	PASS
	MCH	0.9499	Not Specified	PASS
	HCH	0.9517	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.318	Not Specified	PASS
	MCH	1.320	Not Specified	PASS
	HCH	1.319	Not Specified	PASS
8DPSK	LCH	1.321	Not Specified	PASS
	MCH	1.317	Not Specified	PASS
	HCH	1.322	Not Specified	PASS



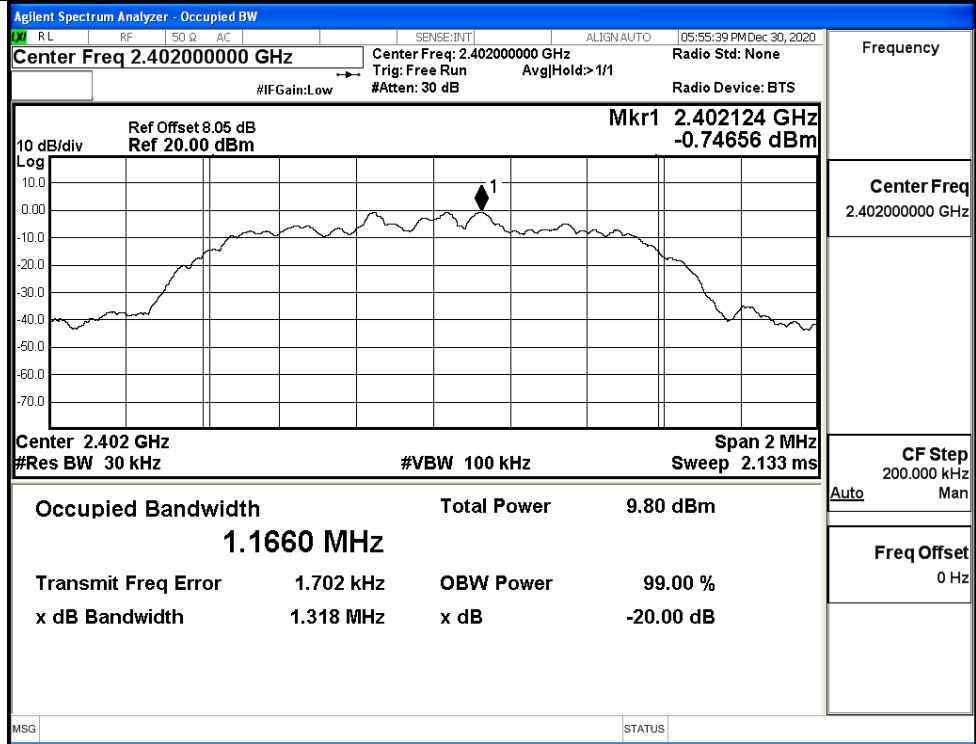
GFSK/MCH



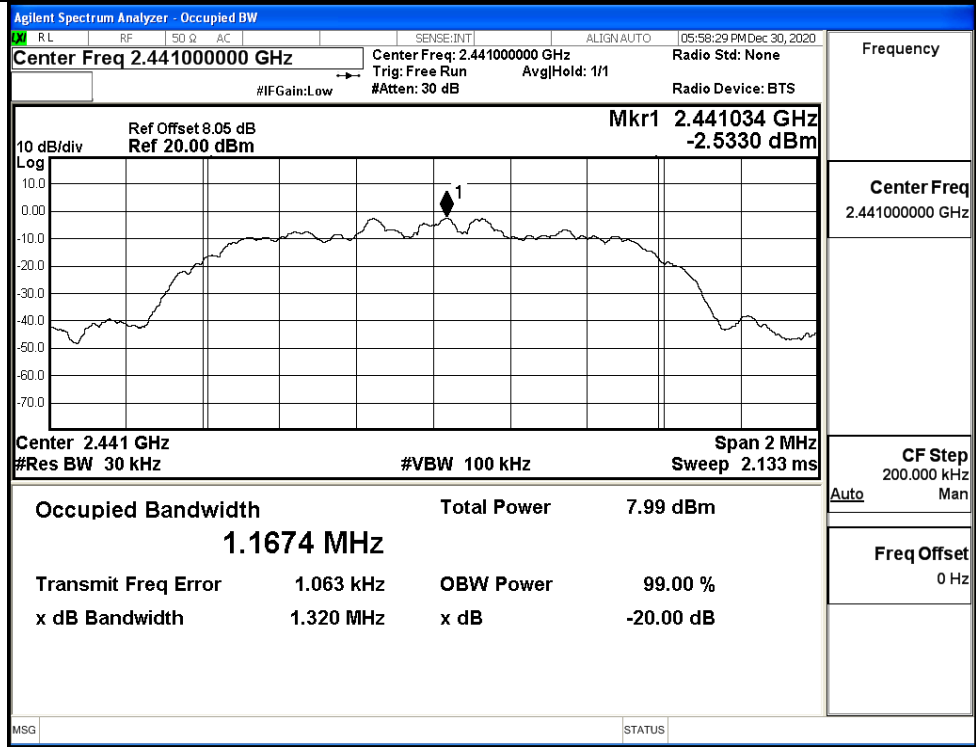
GFSK/HCH



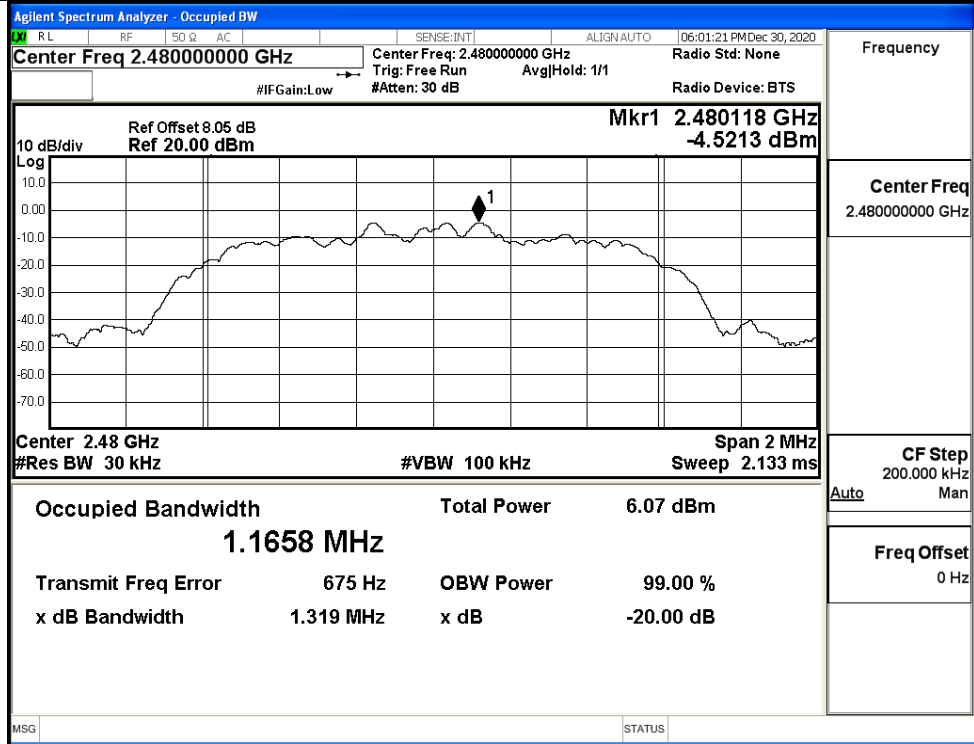
$\pi/4$ DQPSK/LCH



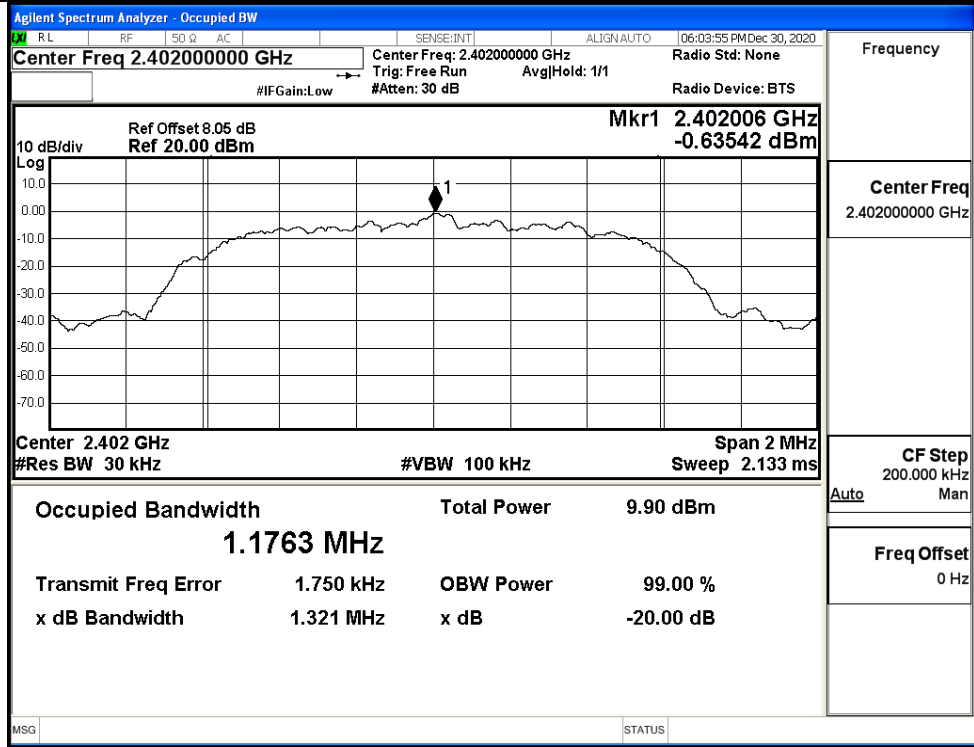
$\pi/4$ DQPSK/MCH



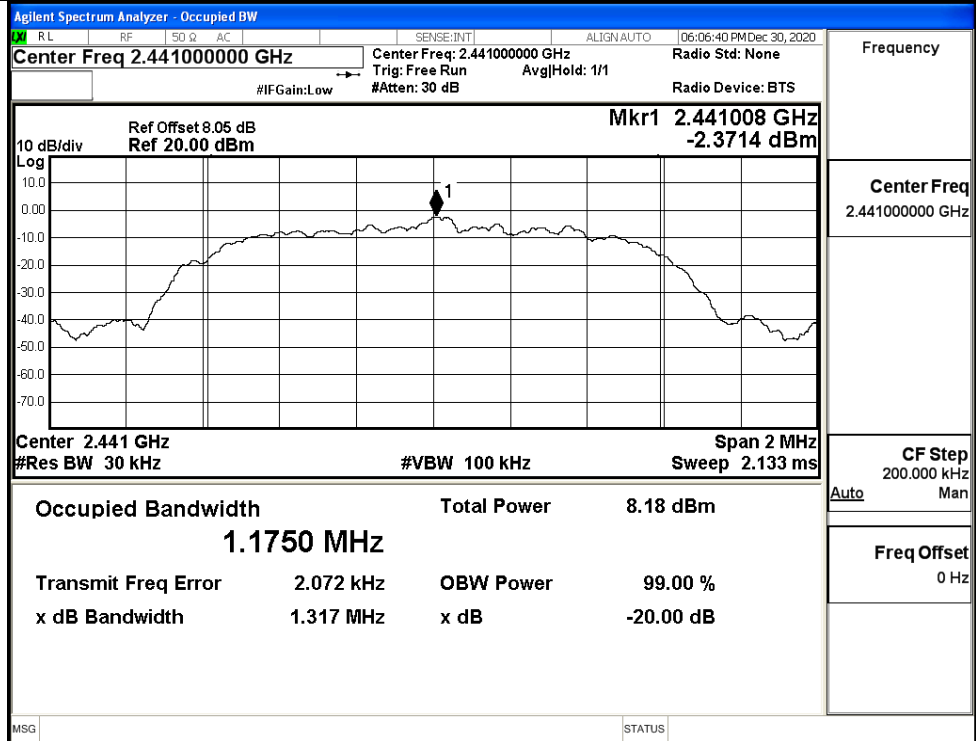
$\pi/4$ DQPSK/HCH



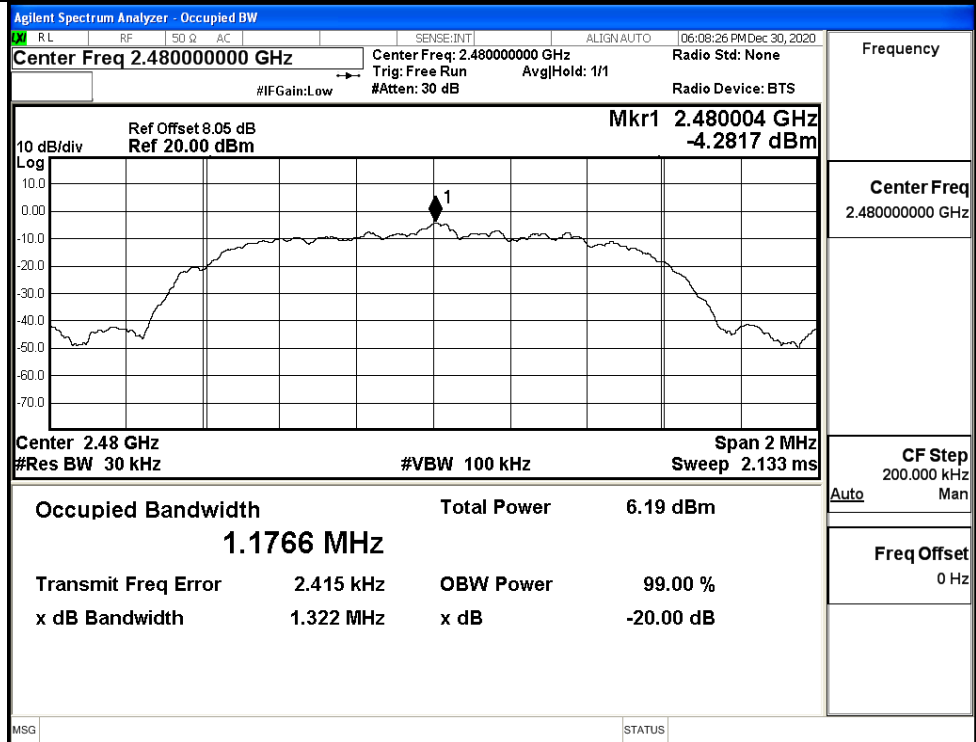
8DPSK/LCH



8DPSK/MCH

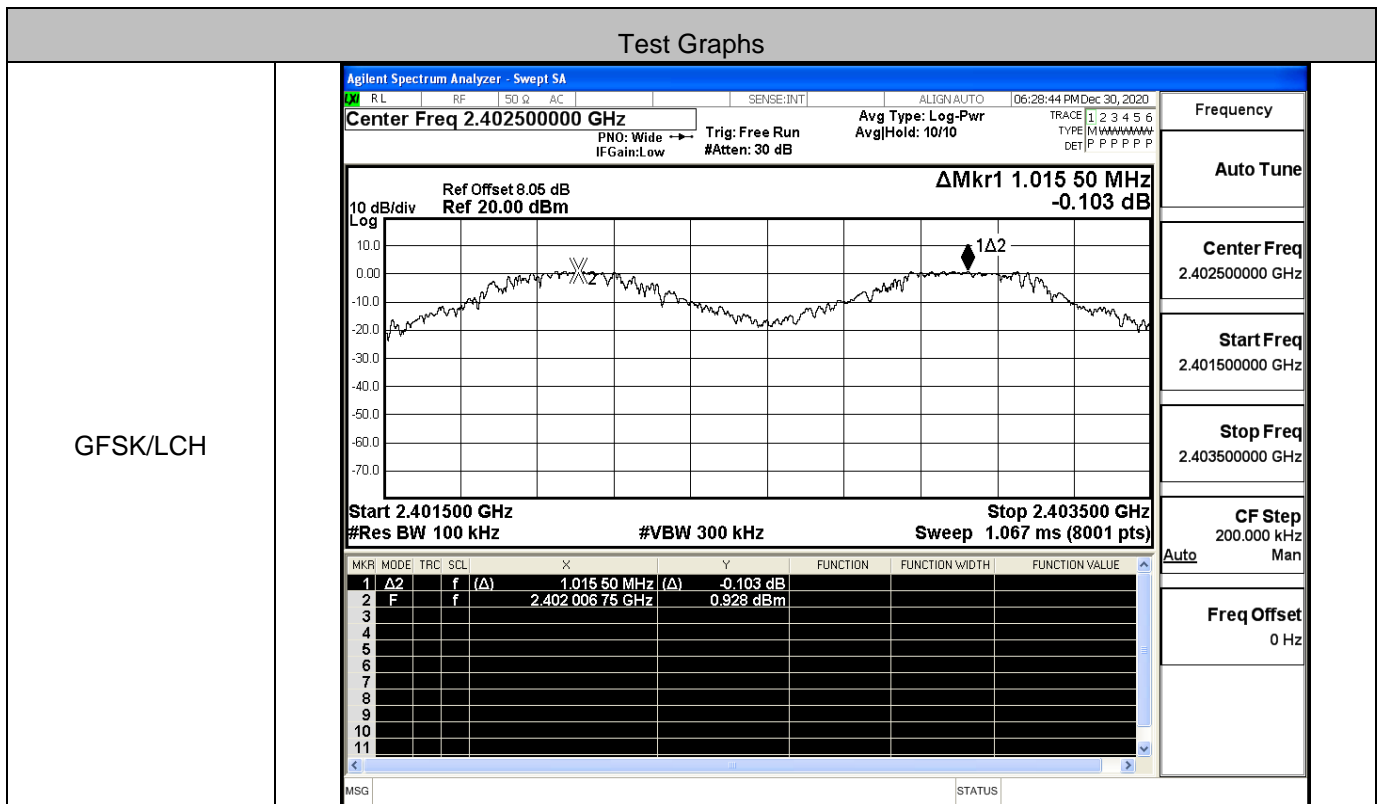


8DPSK/HCH

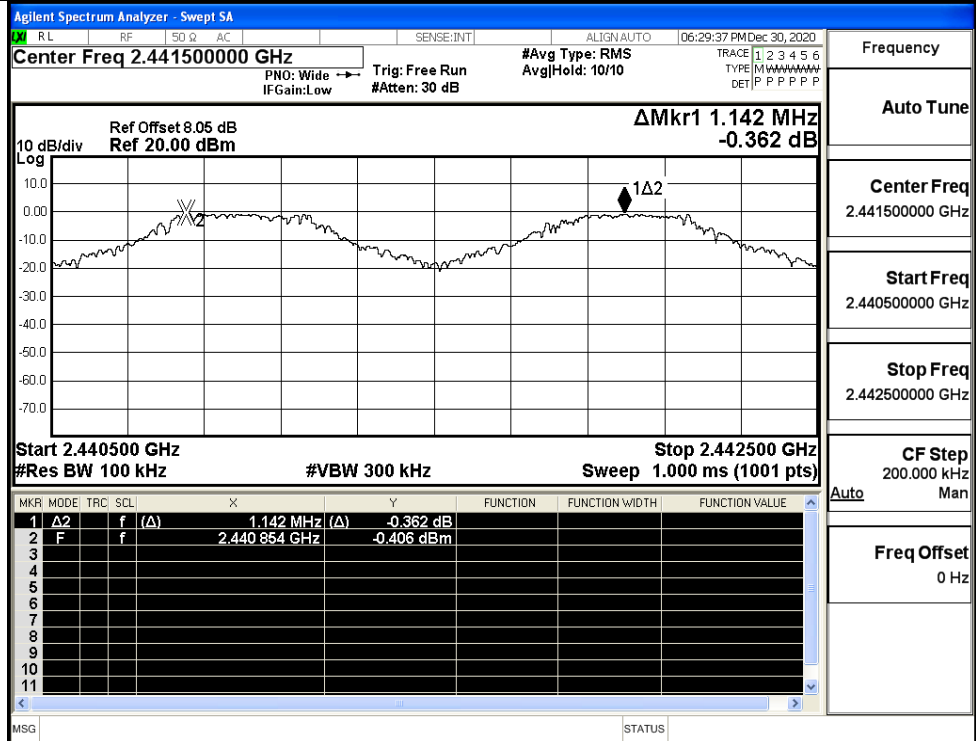


B.3 Carrier Frequency Separation

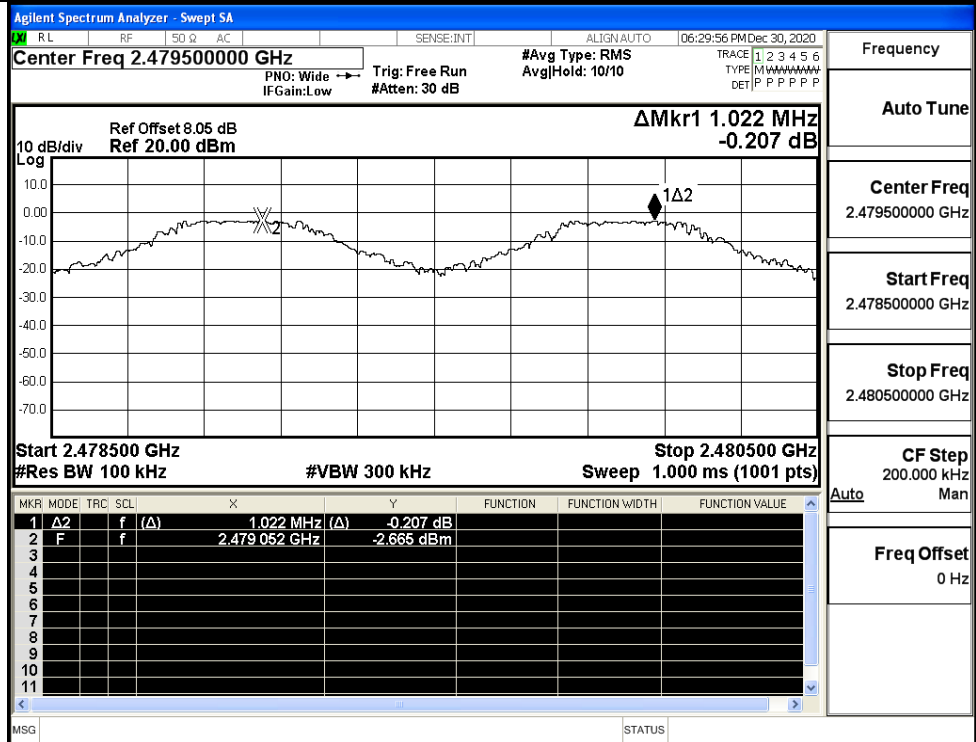
Mode	Channel	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.015	0.634	PASS
	MCH	1.142	0.634	PASS
	HCH	1.022	0.634	PASS
π/4DQPSK	LCH	1.186	0.880	PASS
	MCH	1.062	0.880	PASS
	HCH	0.982	0.880	PASS
8DPSK	LCH	1.004	0.881	PASS
	MCH	0.998	0.881	PASS
	HCH	1.086	0.881	PASS



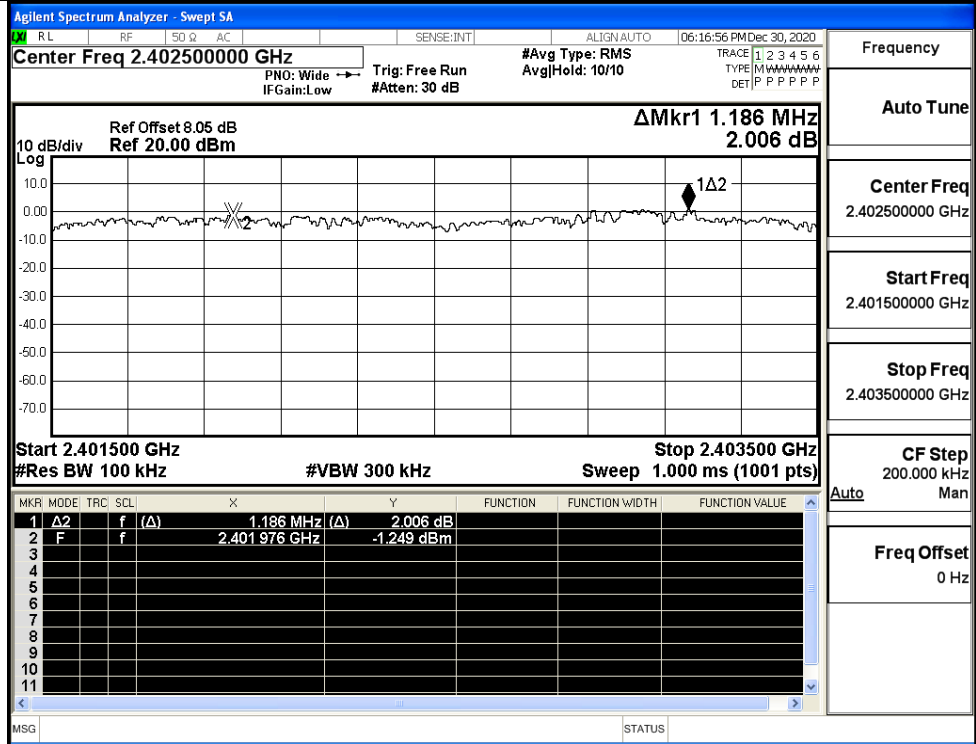
GFSK/MCH



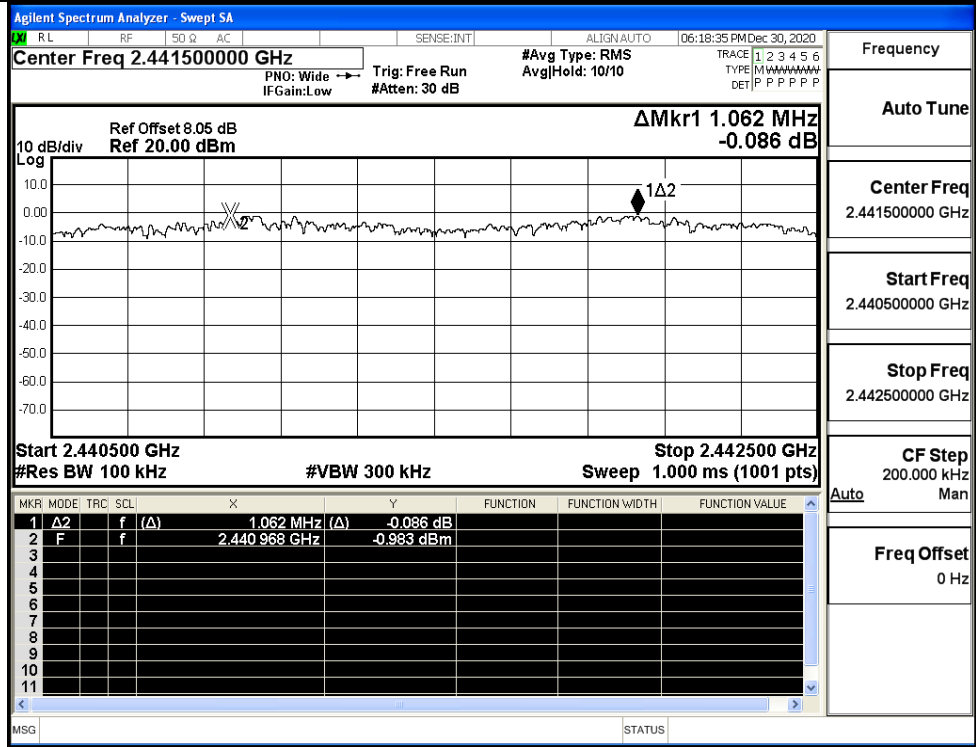
GFSK/HCH



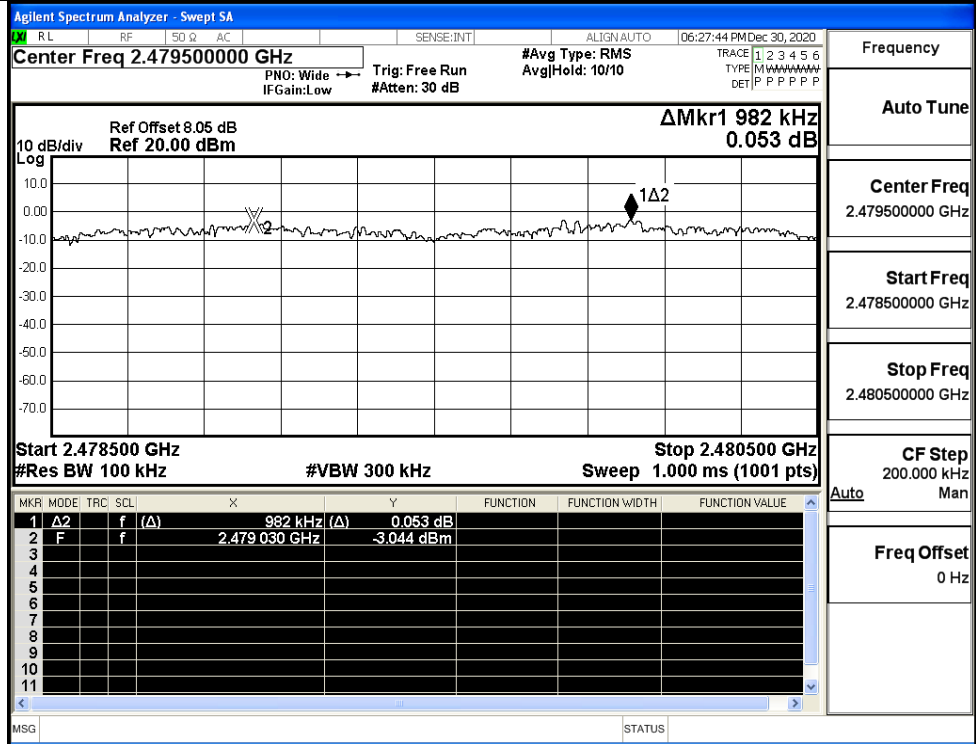
$\pi/4$ DQPSK/LCH



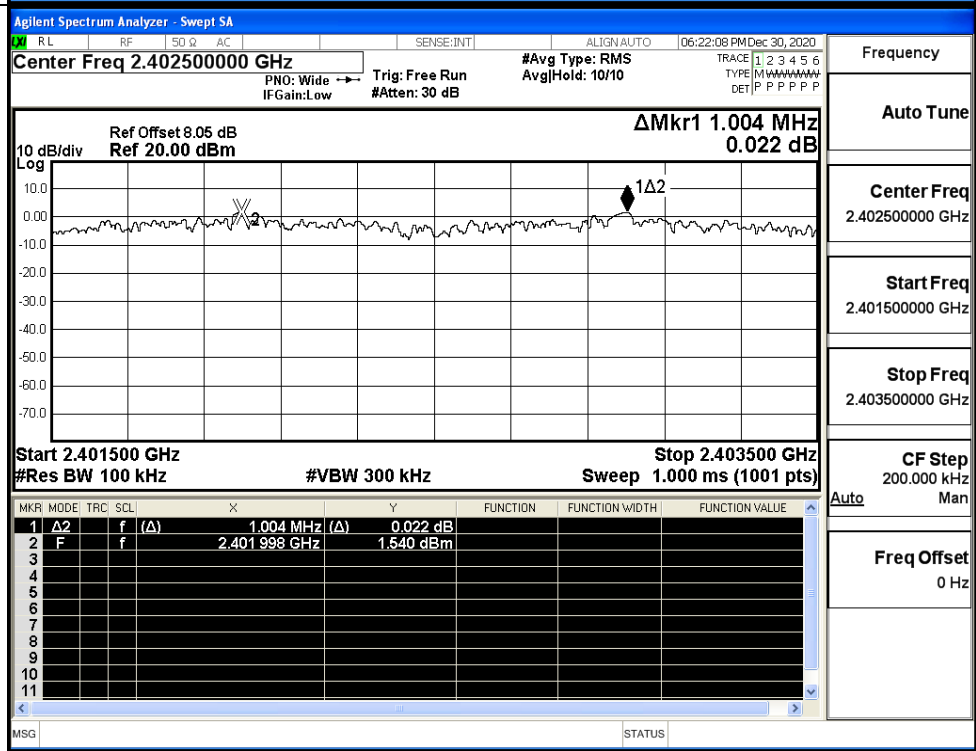
$\pi/4$ DQPSK/MCH



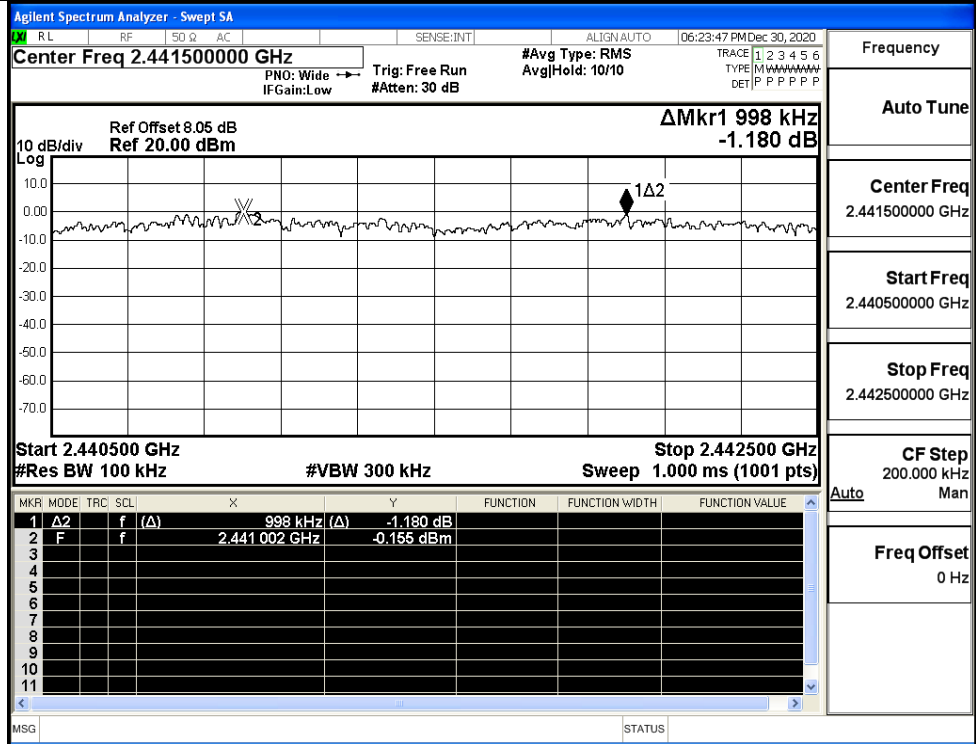
π/4DQPSK/HCH



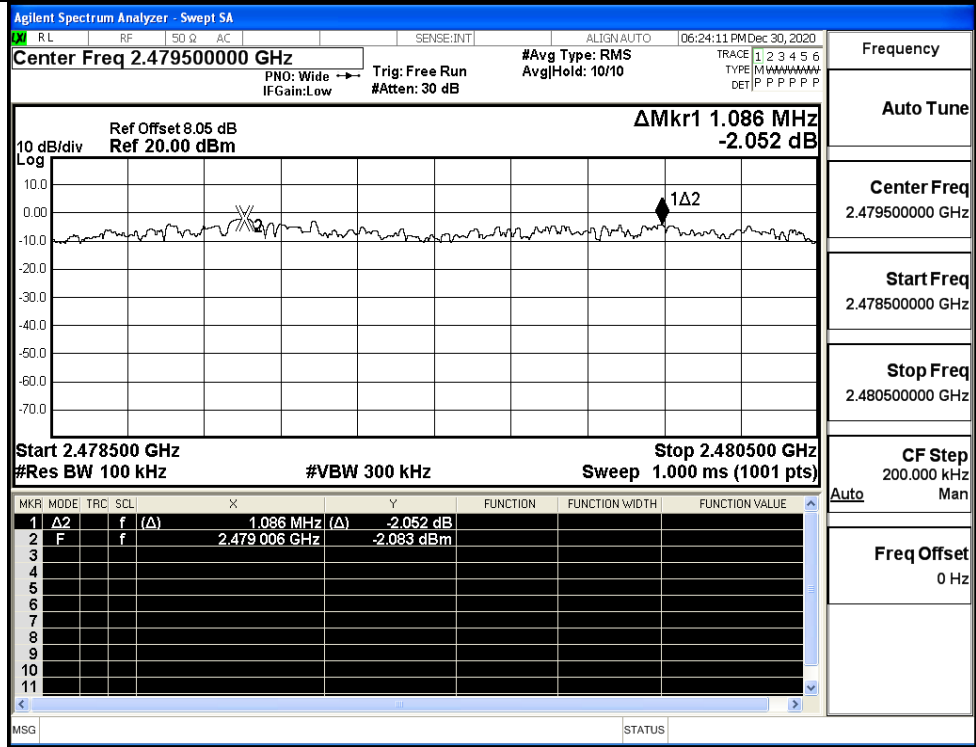
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH



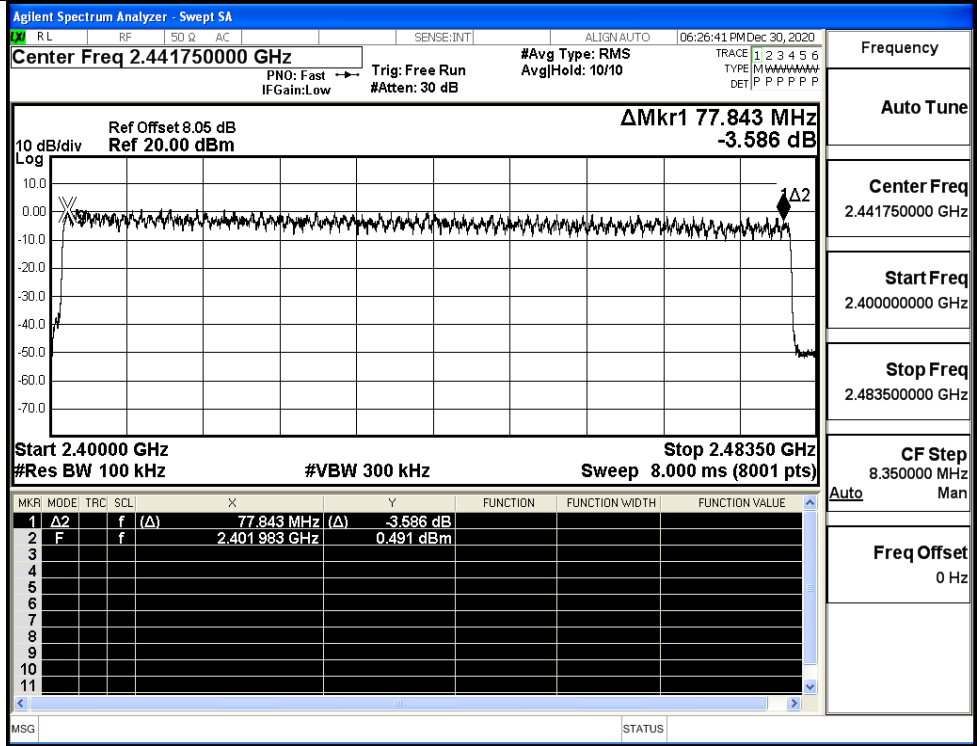
B.4 Hopping Channel Number

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

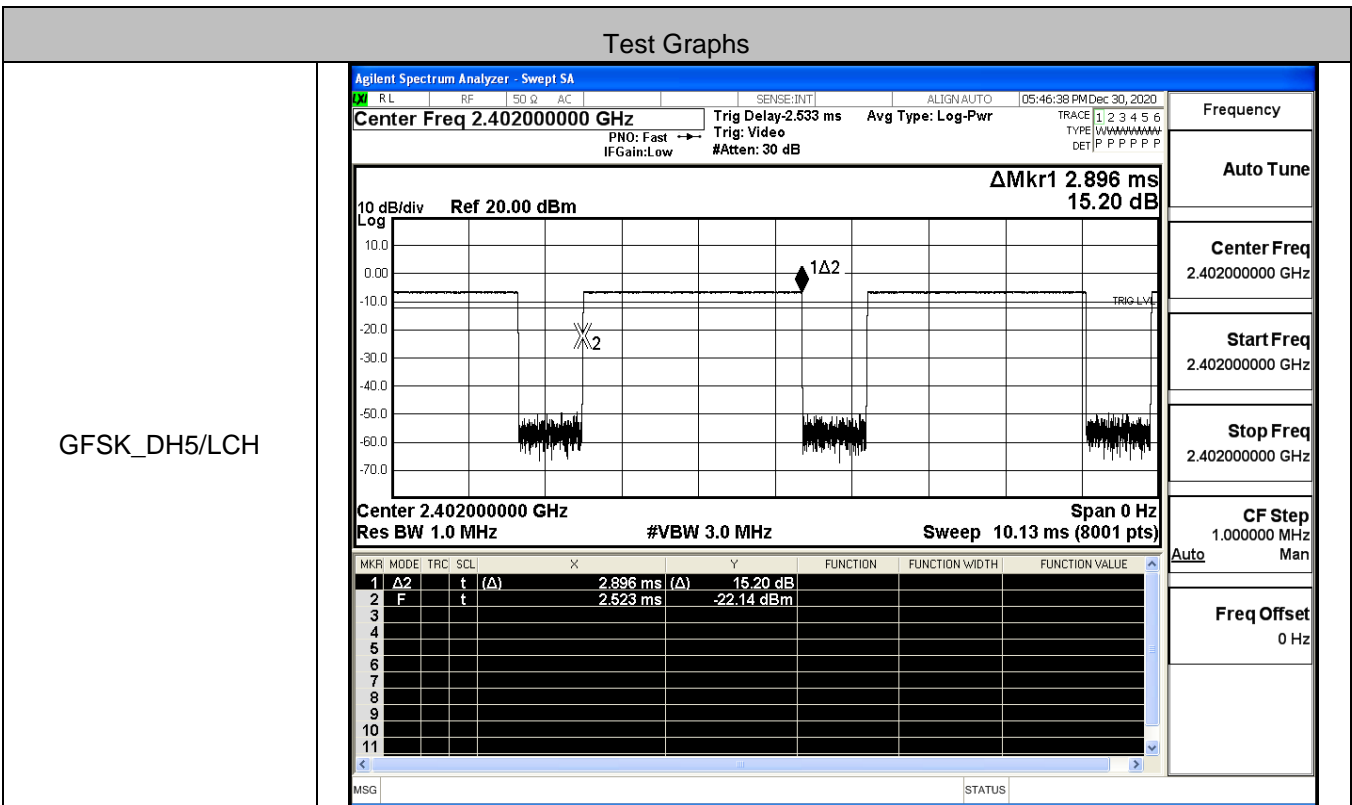
<p>GFSK/Hop</p>	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 8.05 dB Ref 20.00 dBm</p> <p>ΔMkr1 77.885 MHz -3.871 dB</p> <p>Start 2.40000 GHz Stop 2.48350 GHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1"> <thead> <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>f</td> <td>(Δ)</td> <td>77.885 MHz (Δ)</td> <td>-3.871 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td>(Δ)</td> <td>2.402 035 GHz</td> <td>1.123 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ 2	f	(Δ)	77.885 MHz (Δ)	-3.871 dB				2	F	f	(Δ)	2.402 035 GHz	1.123 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 Auto Man</p> <p>Freq Offset 0 Hz</p>
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<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 77.895 MHz -5.506 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>f</td> <td>(Δ)</td> <td>77.895 MHz (Δ)</td> <td>-5.506 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td>(Δ)</td> <td>2.402 129 GHz</td> <td>1.256 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ 2	f	(Δ)	77.895 MHz (Δ)	-5.506 dB				2	F	f	(Δ)	2.402 129 GHz	1.256 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 Auto Man</p> <p>Freq Offset 0 Hz</p>
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1	Δ 2	f	(Δ)	77.895 MHz (Δ)	-5.506 dB																								
2	F	f	(Δ)	2.402 129 GHz	1.256 dBm																								

8DPSK/Hop

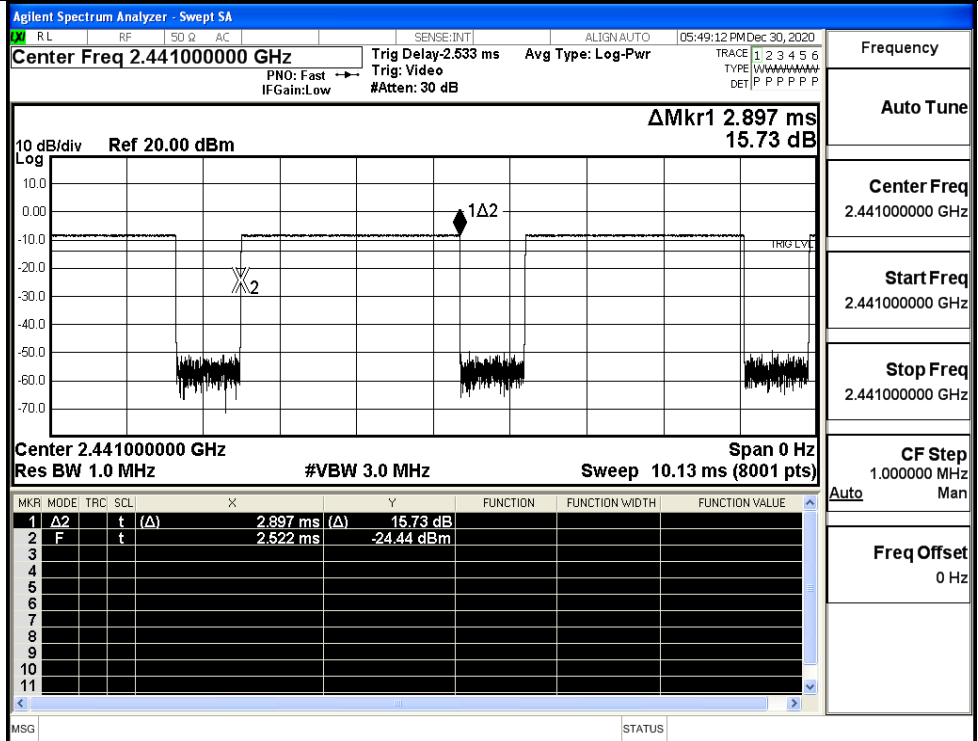


B.5 Dwell Time

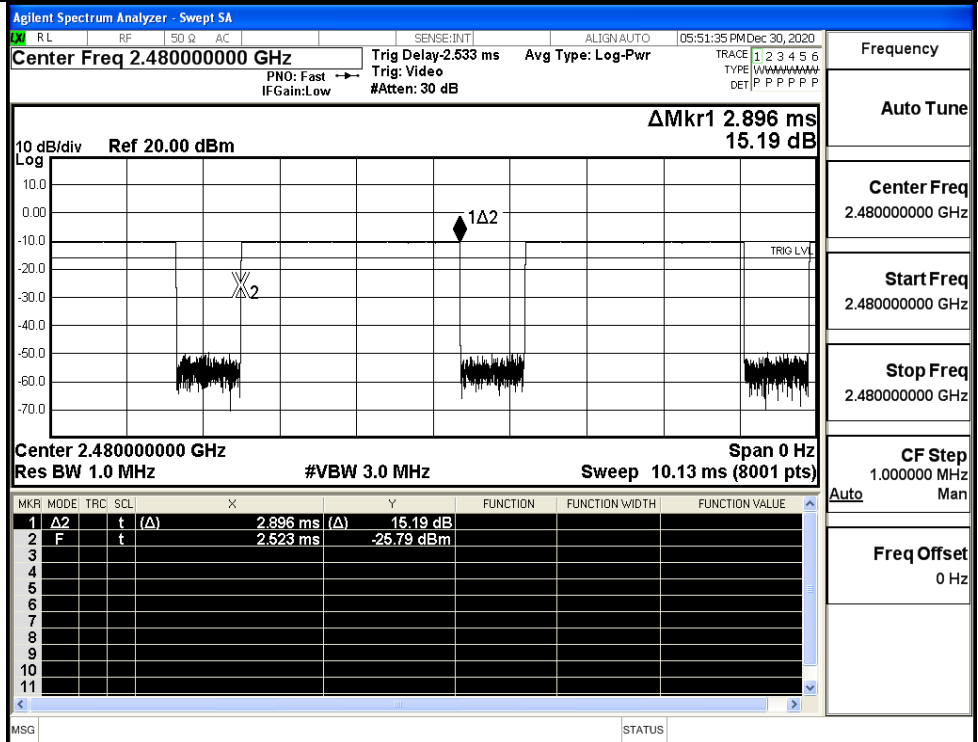
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.9	106.7	0.309	0.4	PASS
	DH5	MCH	2.9	106.7	0.309	0.4	PASS
	DH5	HCH	2.9	106.7	0.309	0.4	PASS
π/4DQPSK	2DH5	LCH	2.9	106.7	0.309	0.4	PASS
	2DH5	MCH	2.9	106.7	0.309	0.4	PASS
	2DH5	HCH	2.9	106.7	0.309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



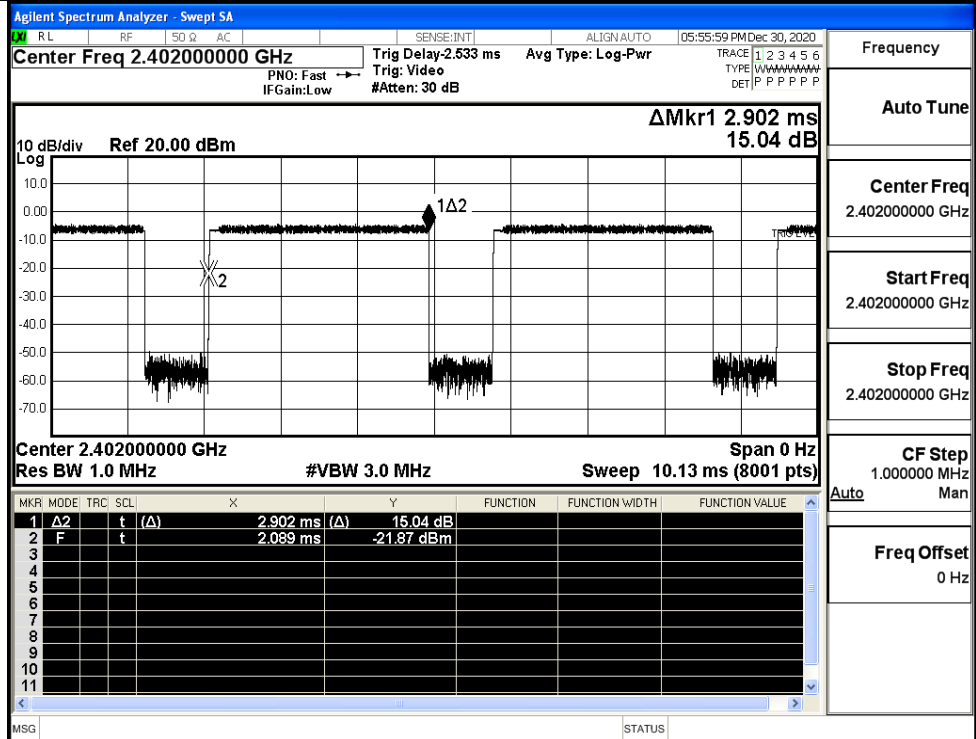
GFSK_DH5/MCH



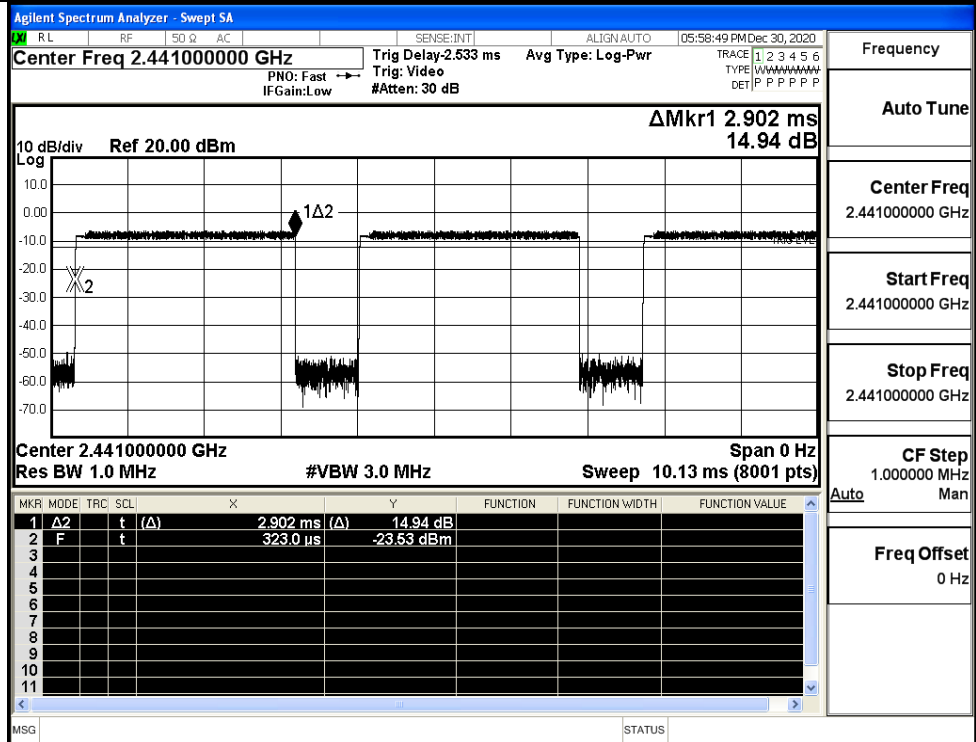
GFSK_DH5/HCH



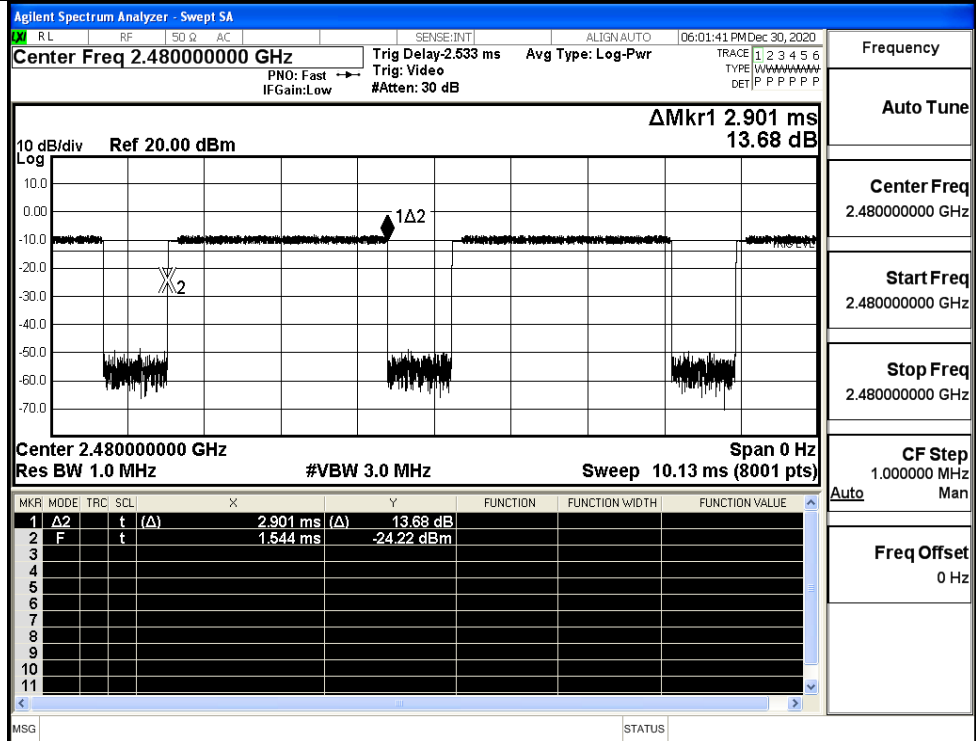
$\pi/4$ DQPSK
_2DH5/LCH



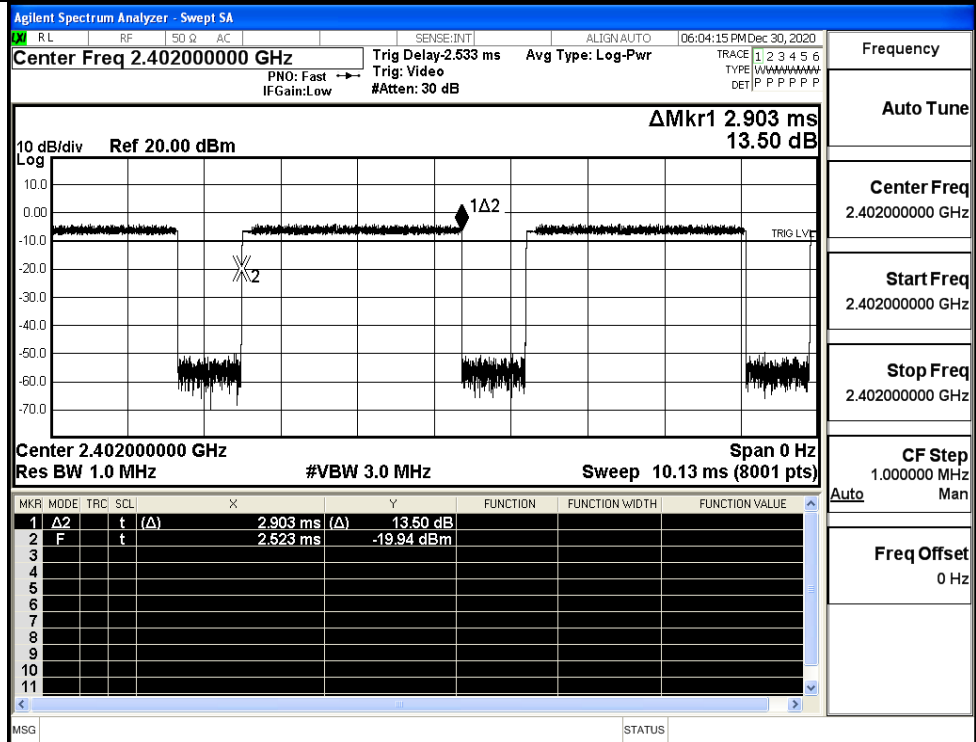
$\pi/4$ DQPSK
_2DH5/MCH



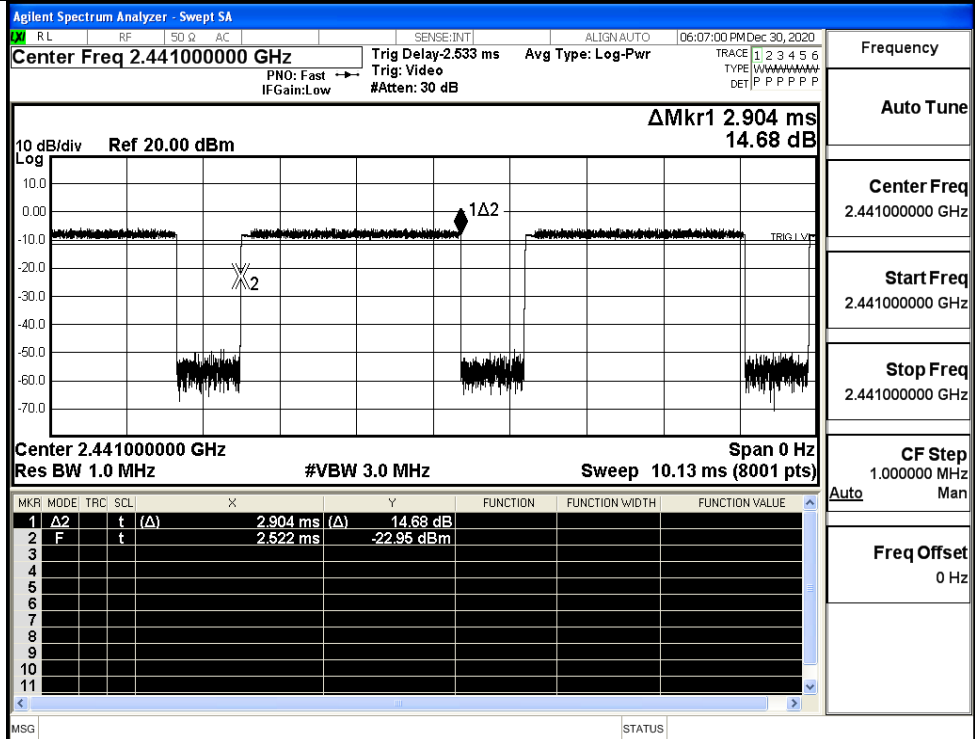
$\pi/4$ DQPSK
_2DH5/HCH



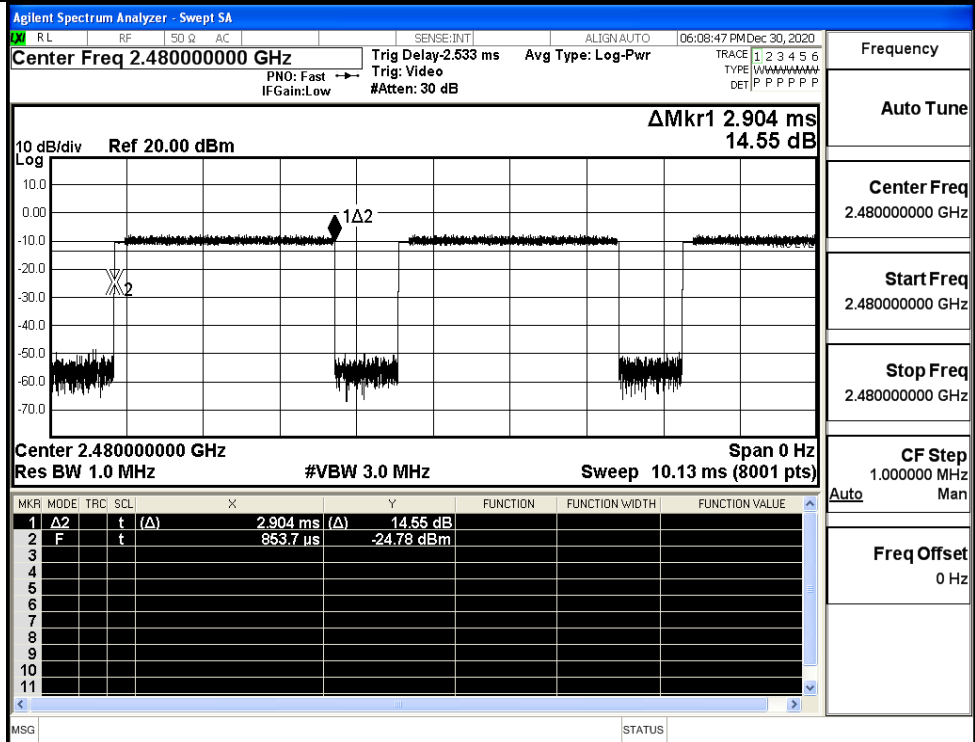
8DPSK_3DH5/LCH



8DPSK_3DH5/MCH



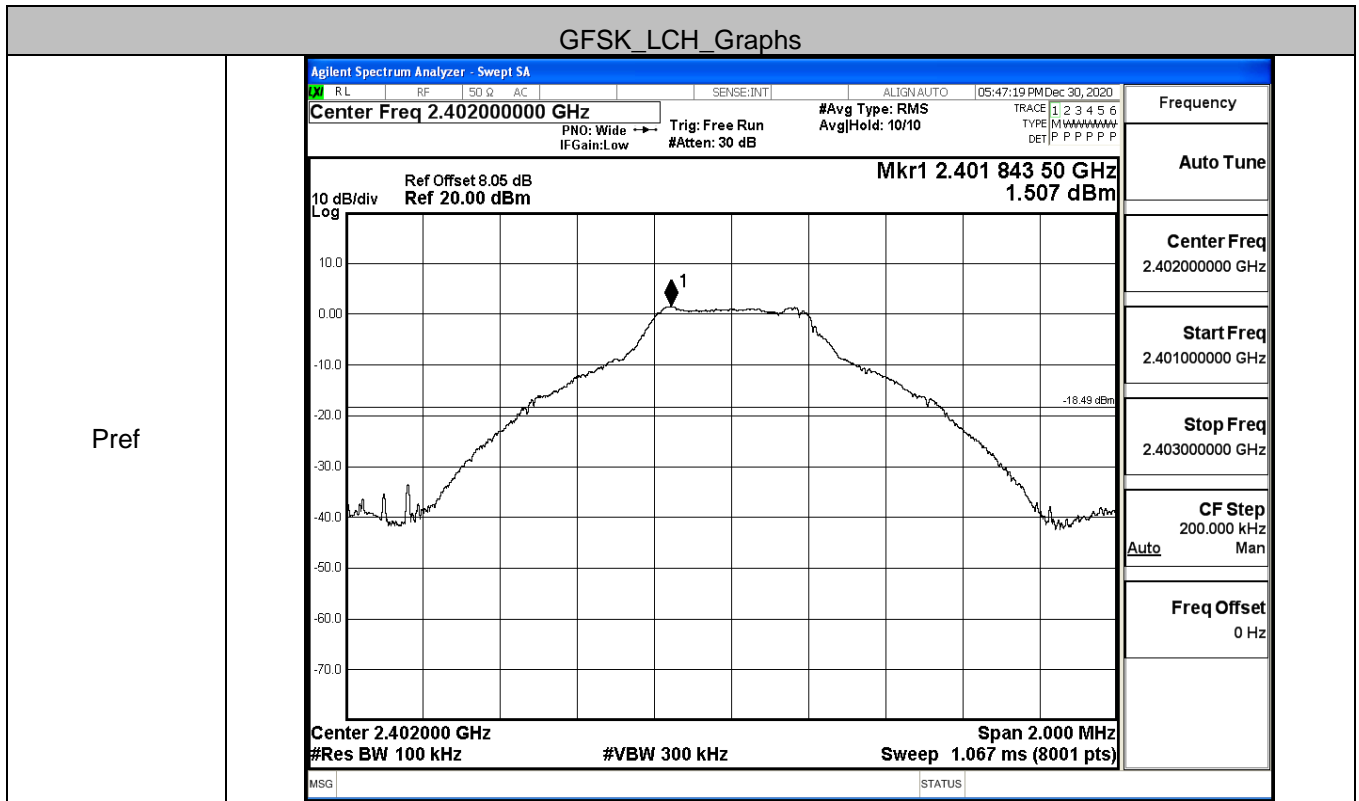
8DPSK_3DH5/HCH



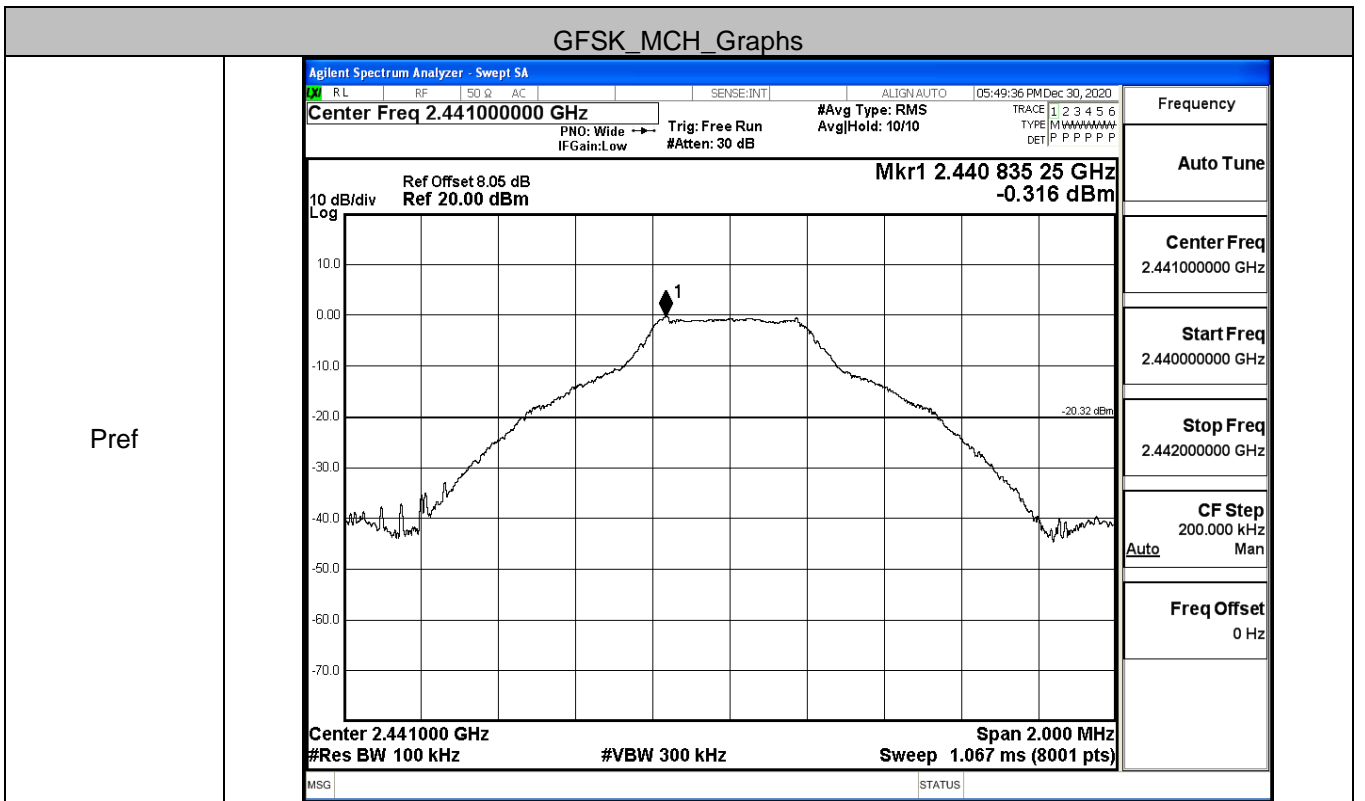
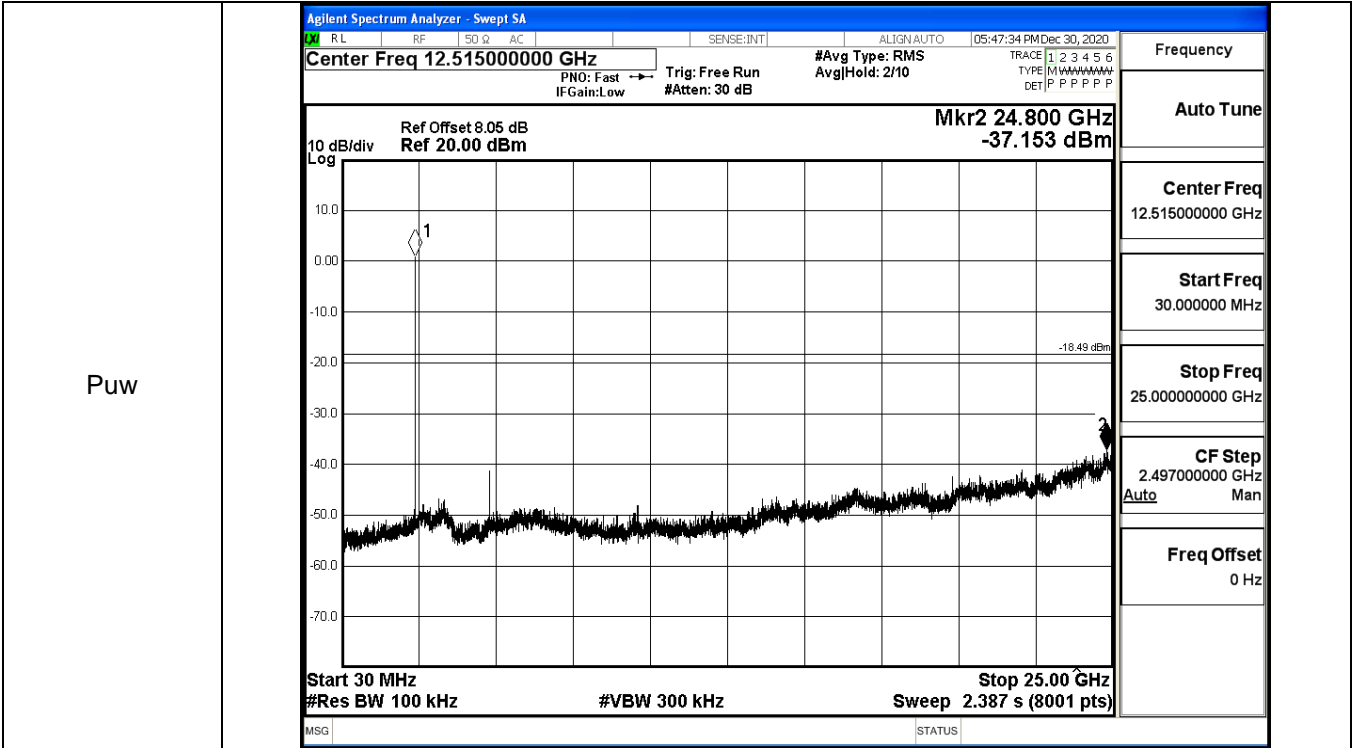
B.6 RF Conducted Spurious Emissions

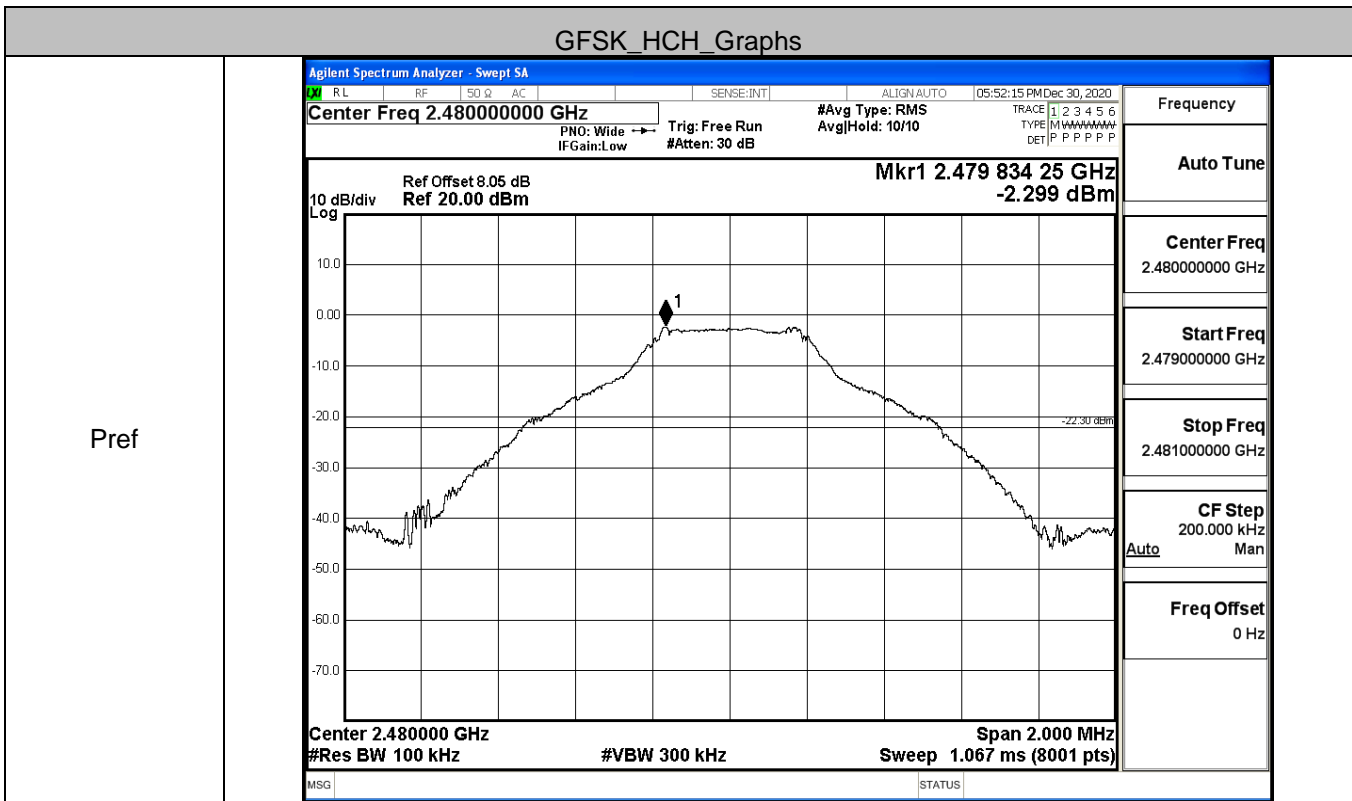
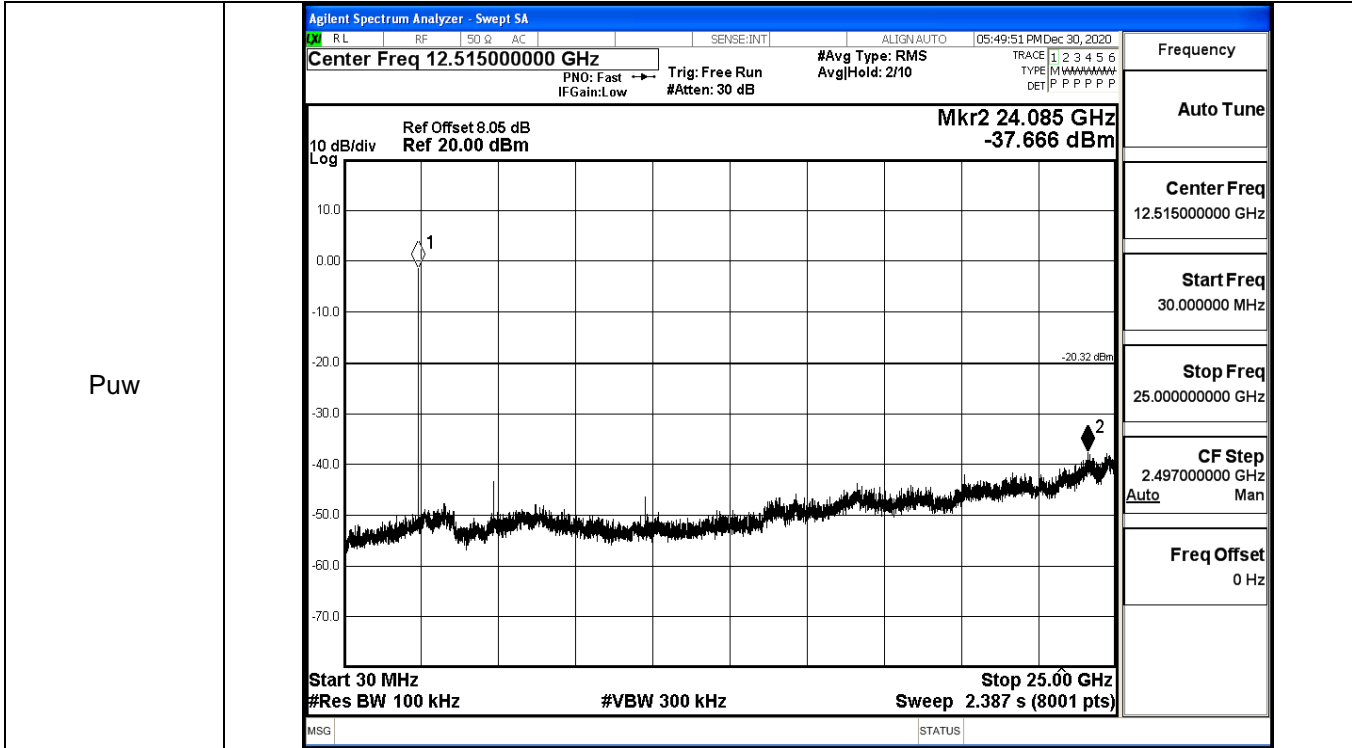
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.507	-37.153	-18.493	PASS
	MCH	-0.316	-37.666	-20.316	PASS
	HCH	-2.299	-36.735	-22.299	PASS
π /4DQPSK	LCH	1.558	-37.194	-18.442	PASS
	MCH	-0.385	-36.771	-20.385	PASS
	HCH	-2.391	-36.829	-22.391	PASS
8DPSK	LCH	1.2	-37.402	-18.800	PASS
	MCH	-0.198	-36.783	-20.198	PASS
	HCH	-2.328	-37.171	-22.328	PASS

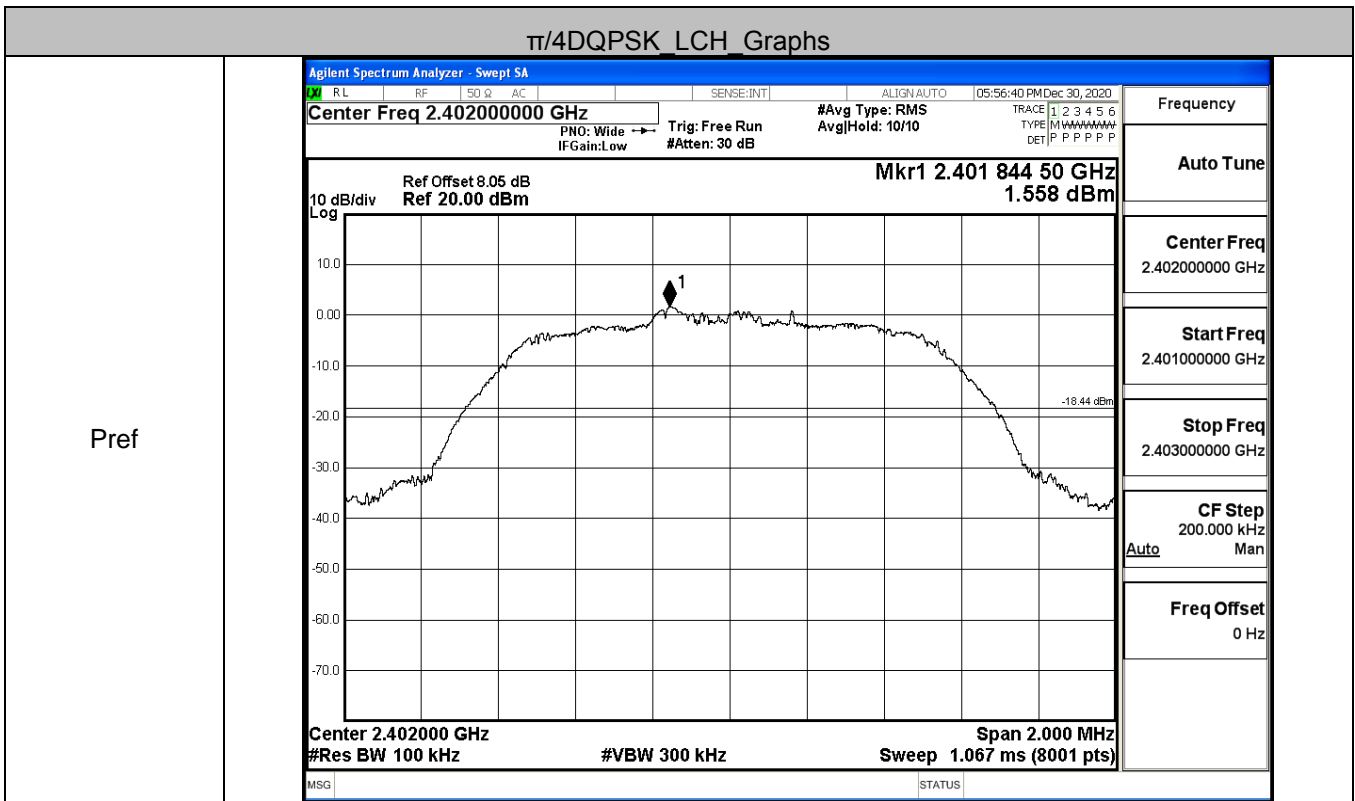
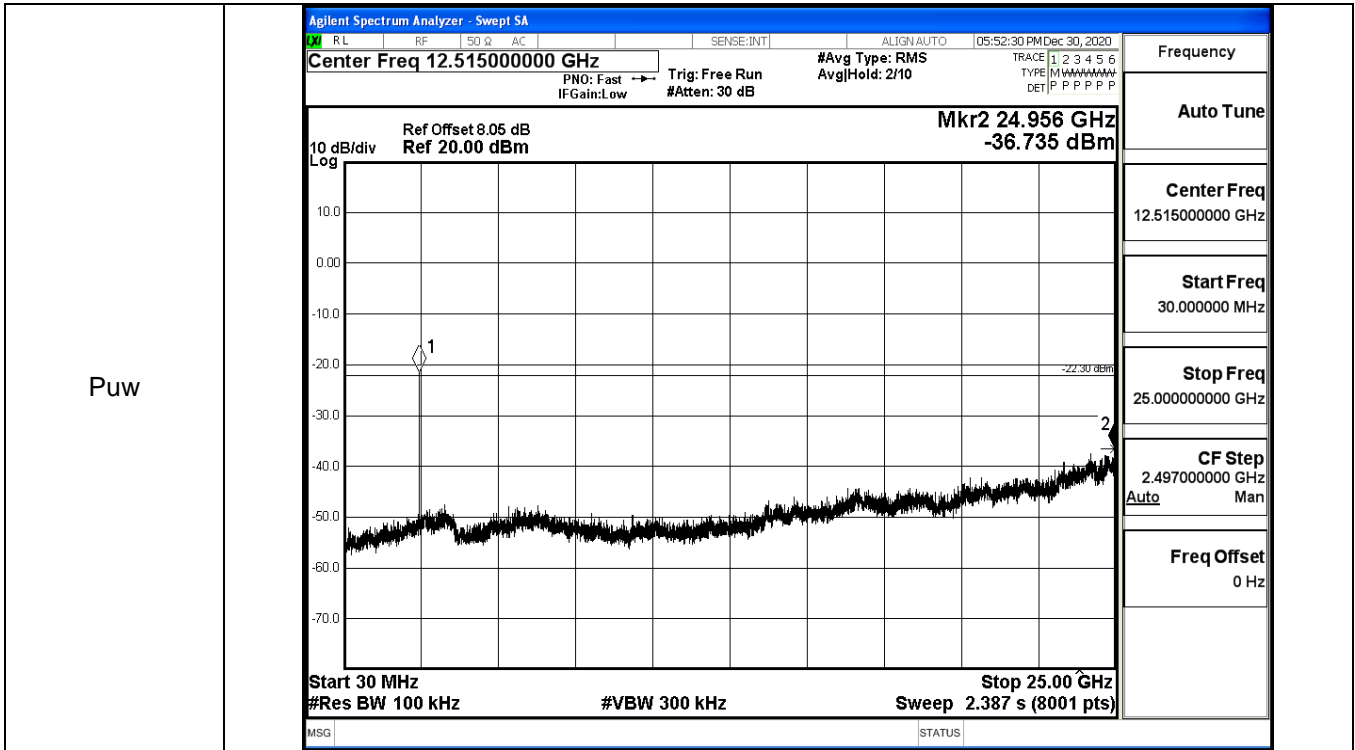
GFSK_LCH_Graphs

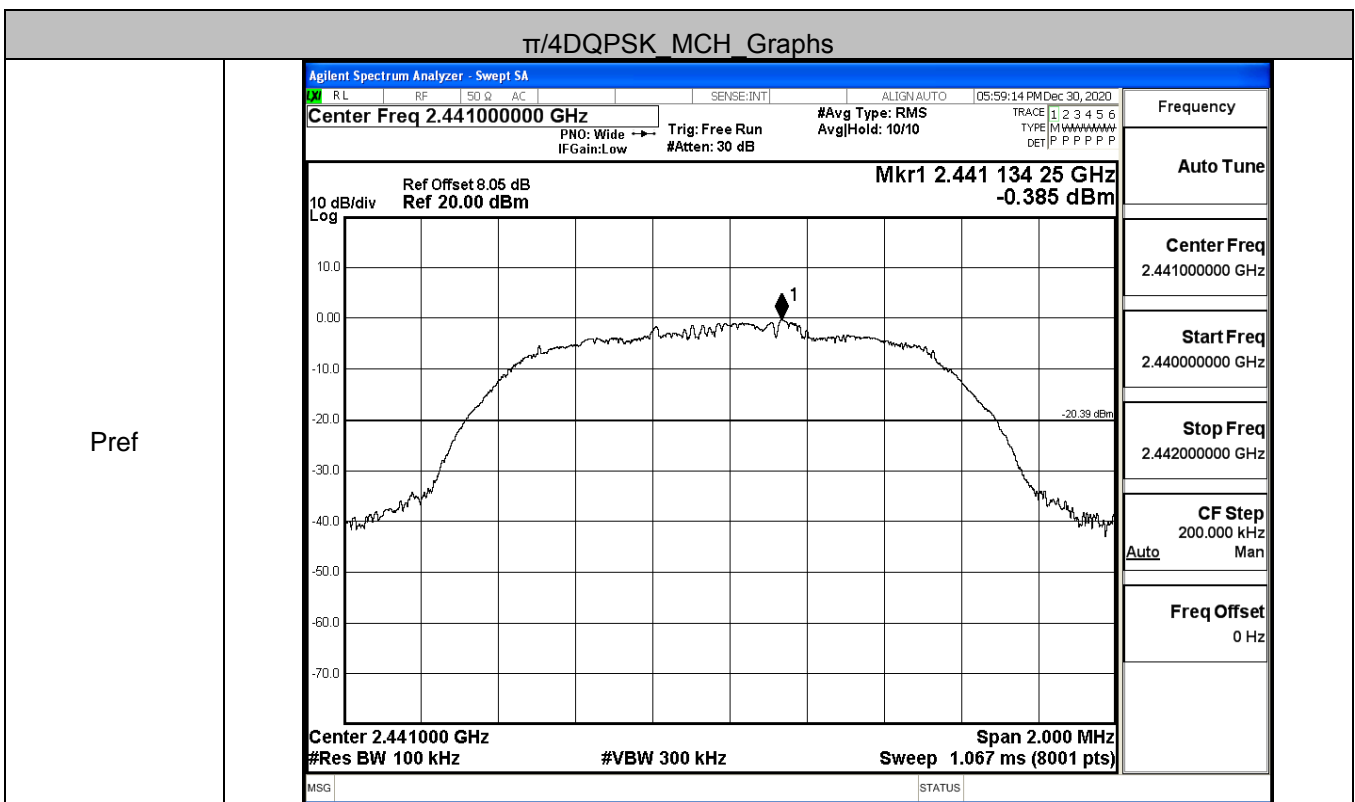
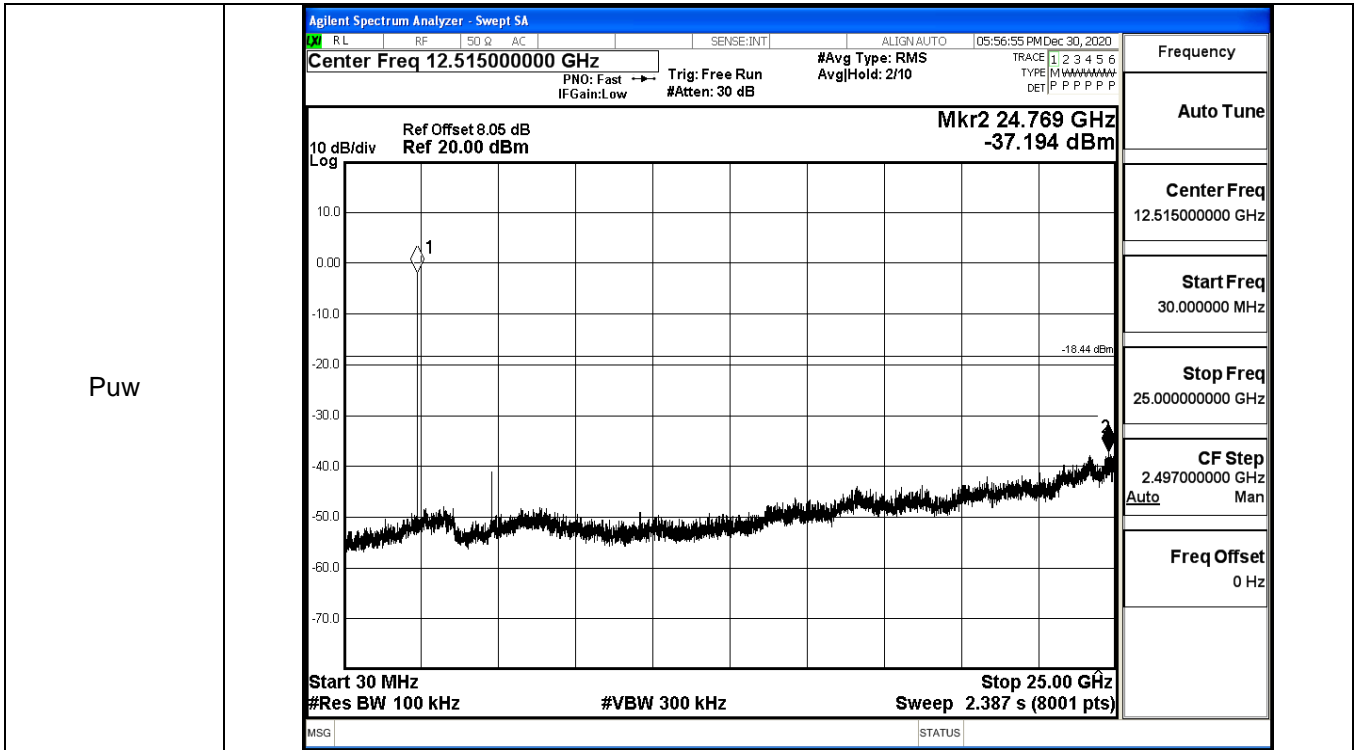


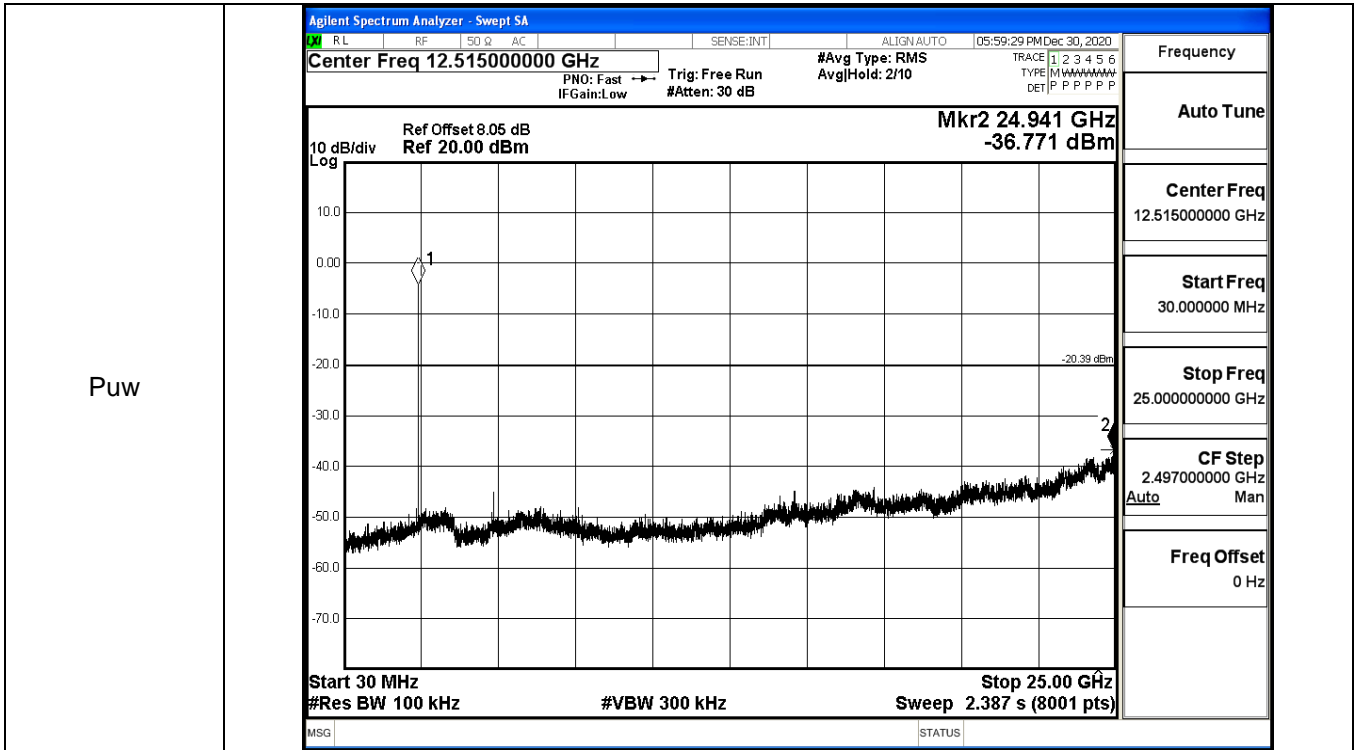
Pref





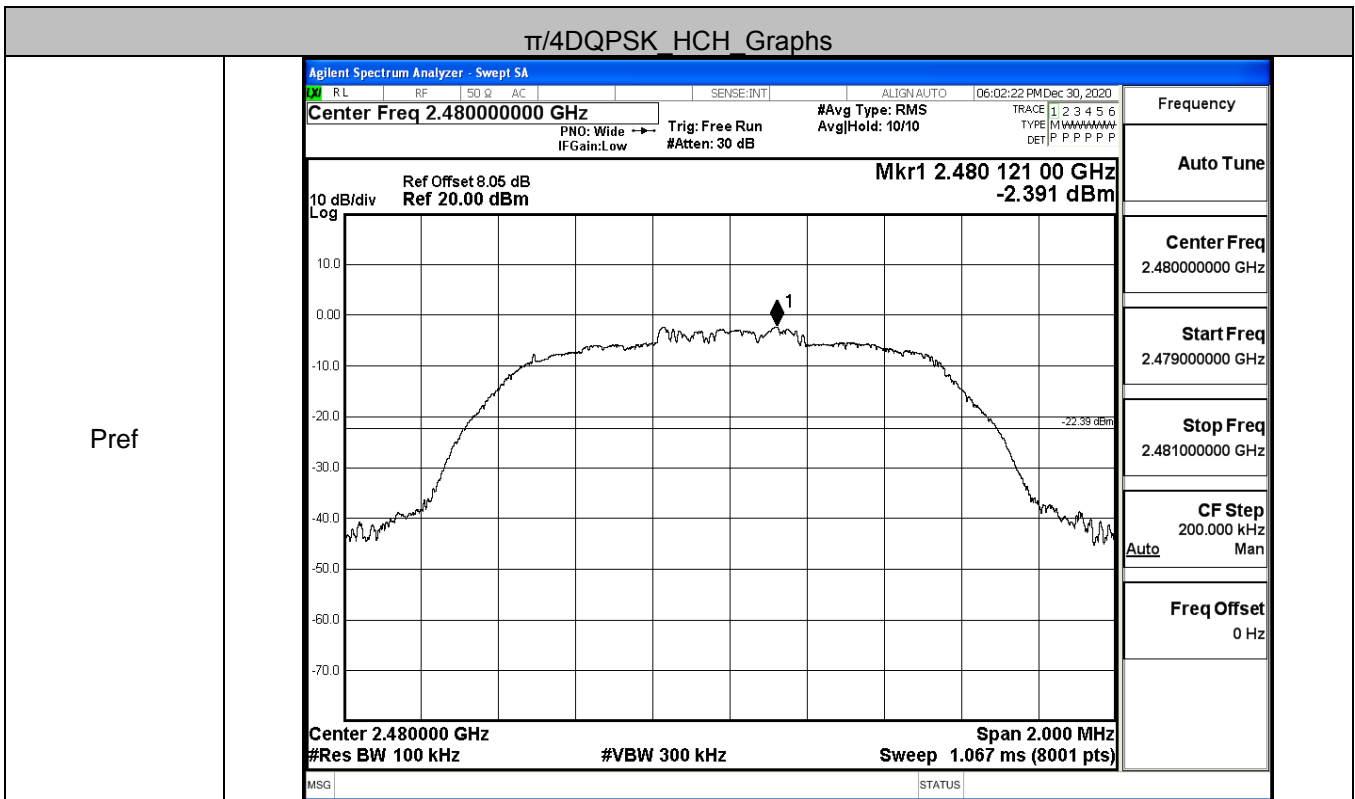




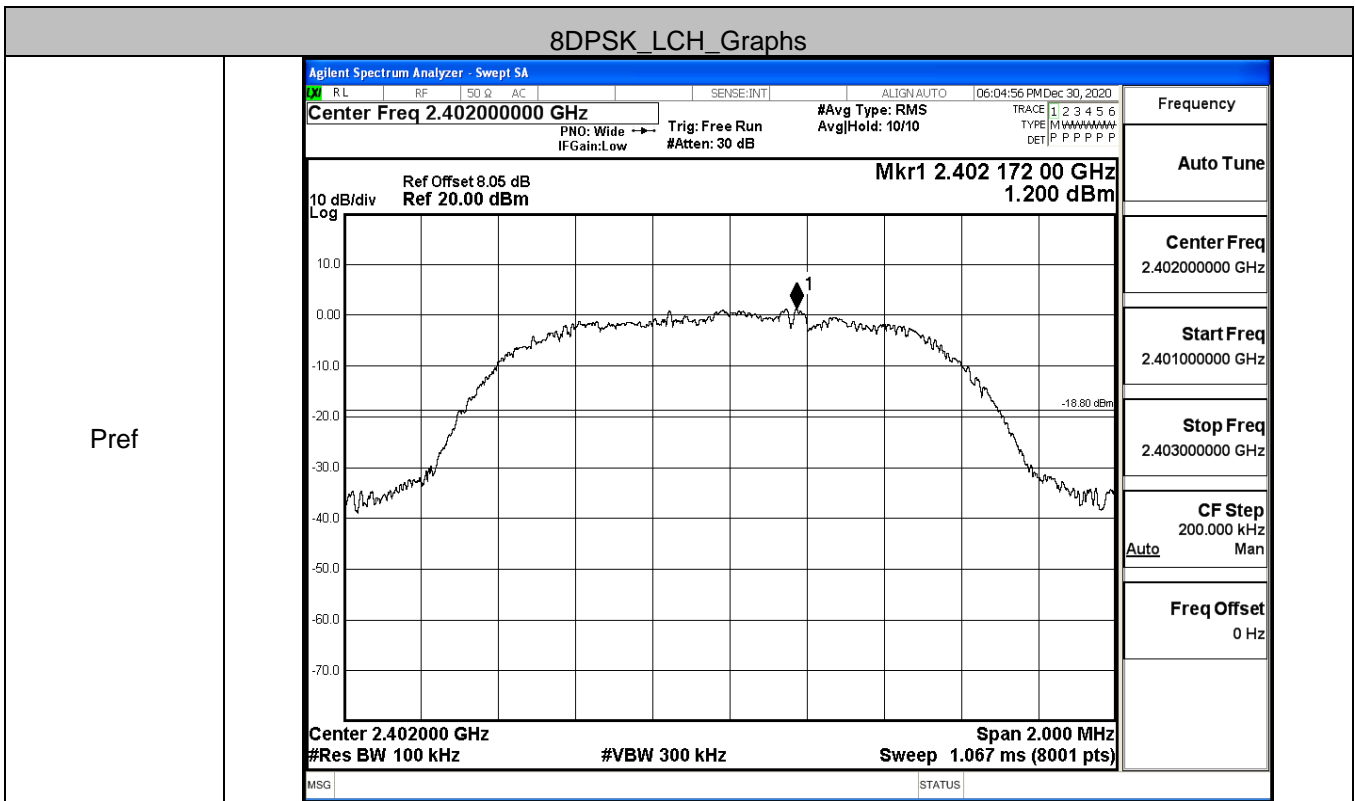
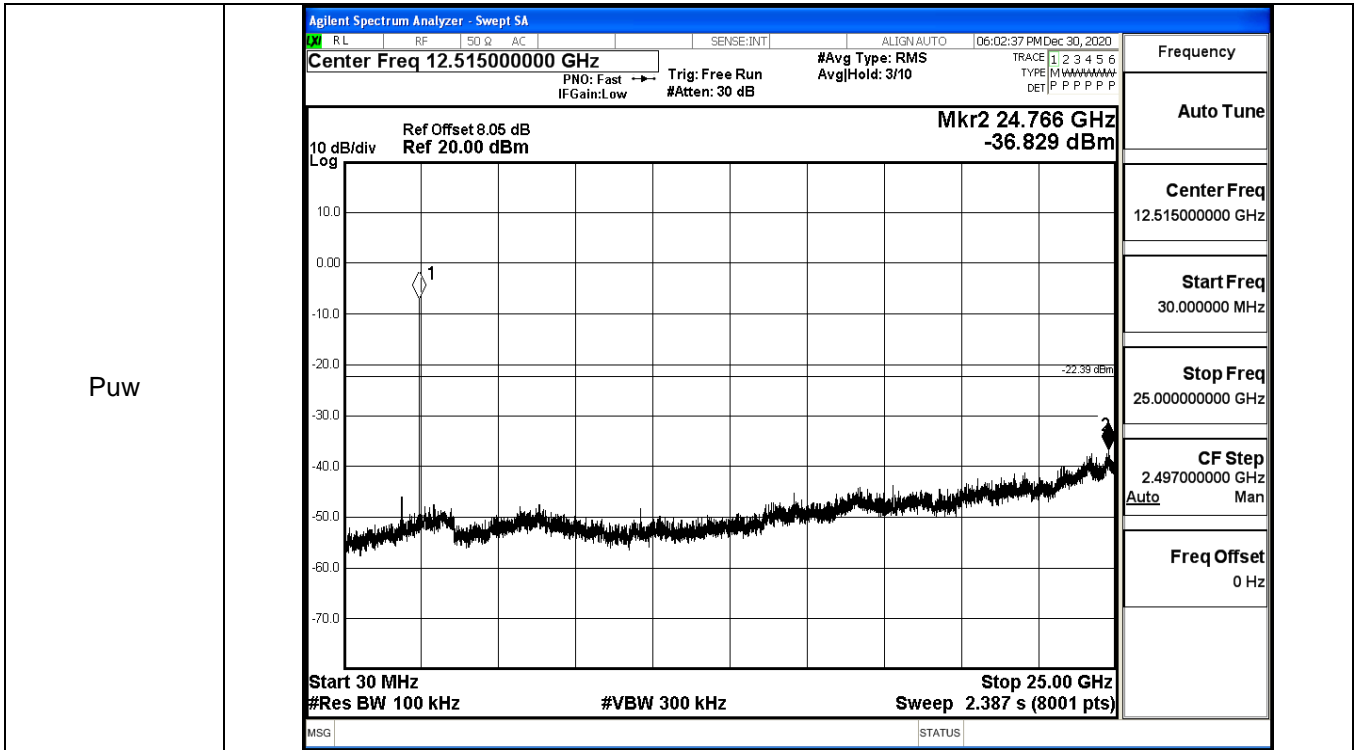


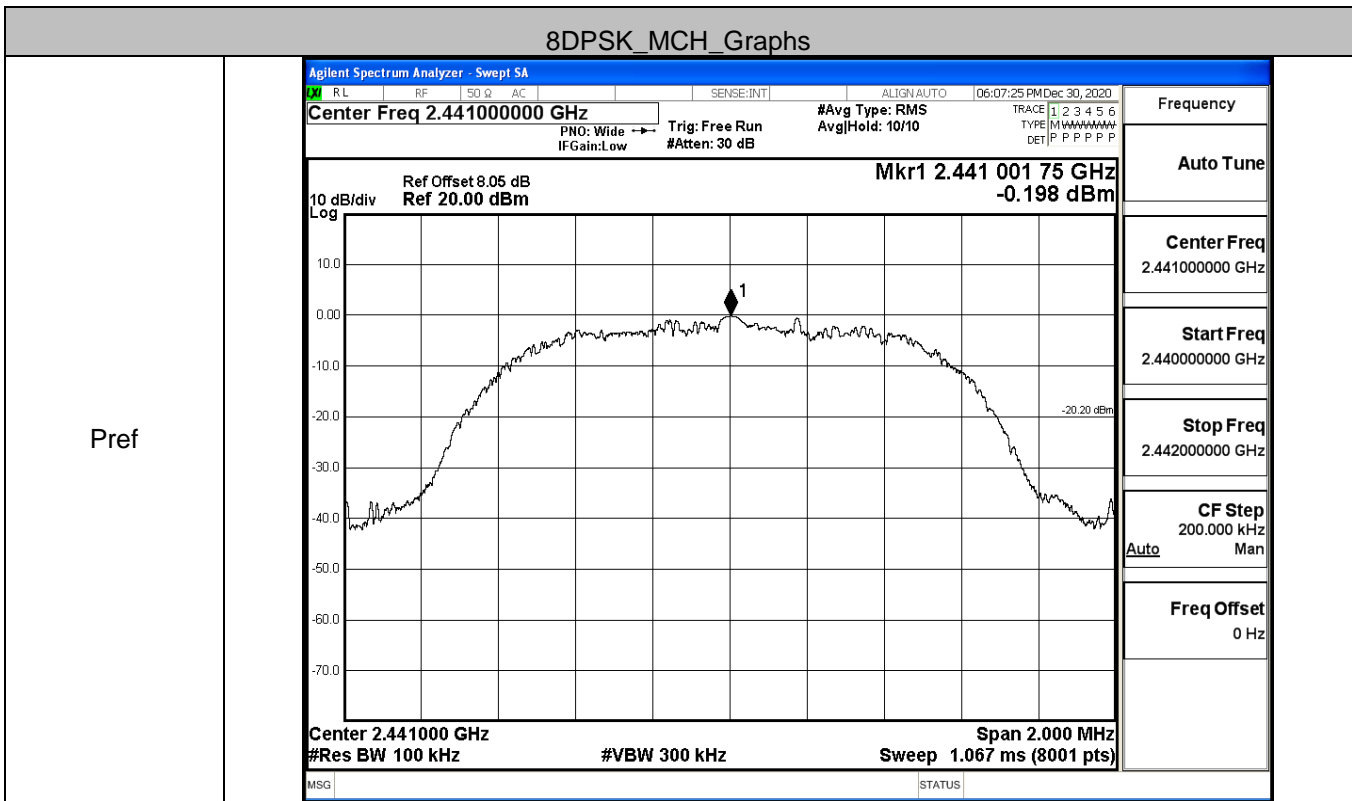
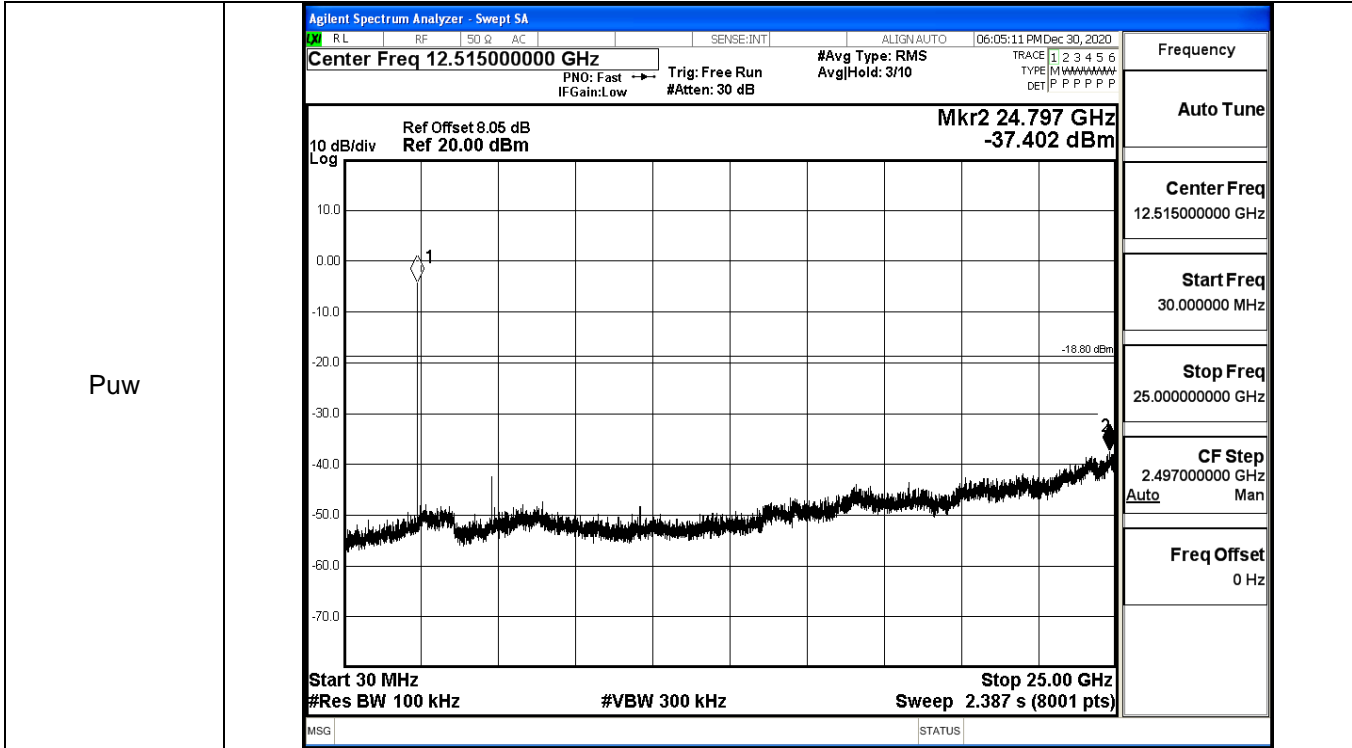
Puw

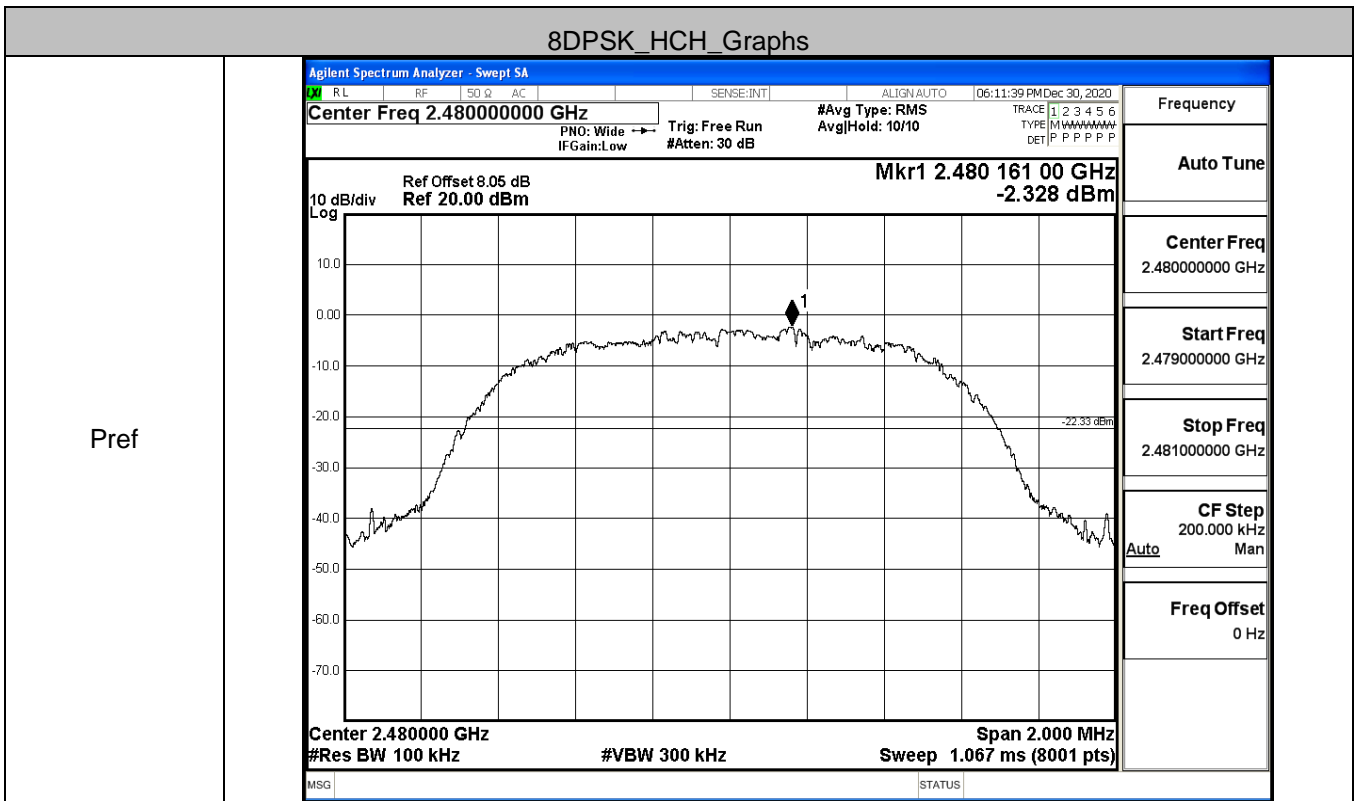
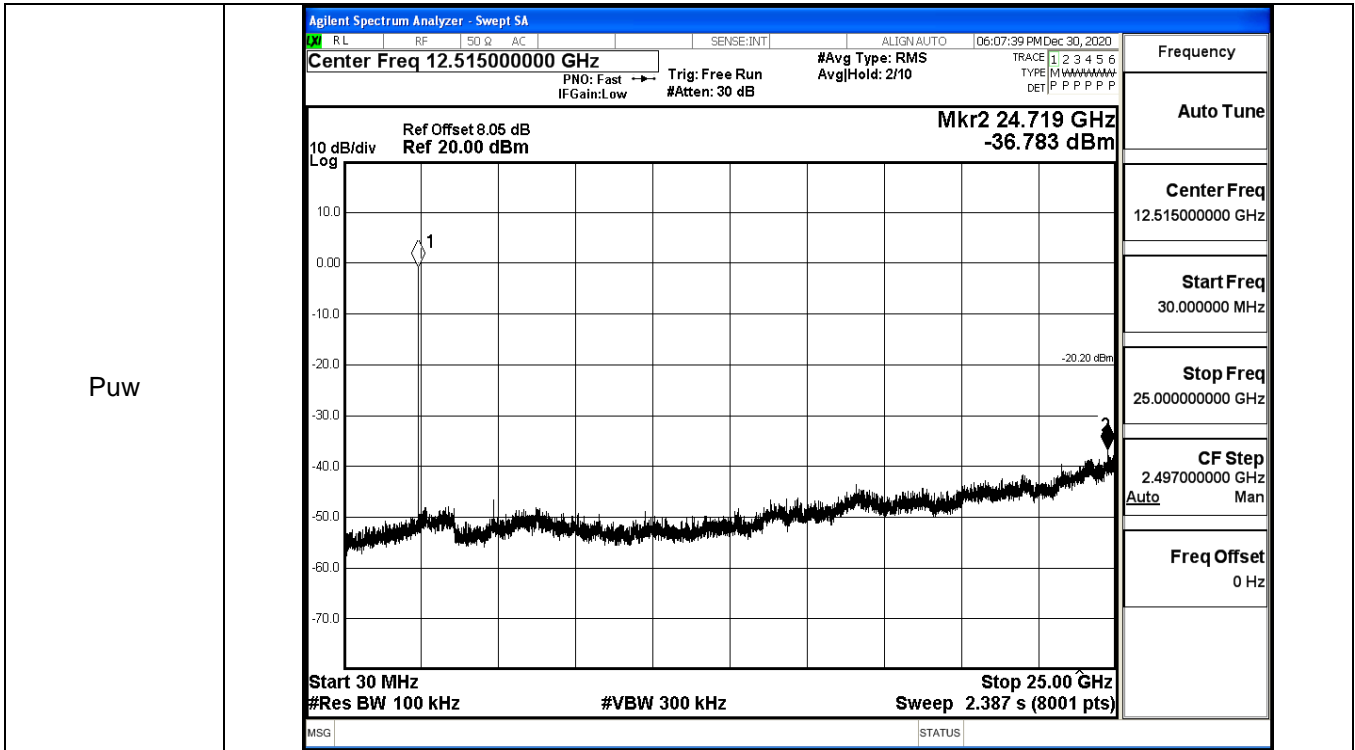
π/4DQPSK HCH Graphs

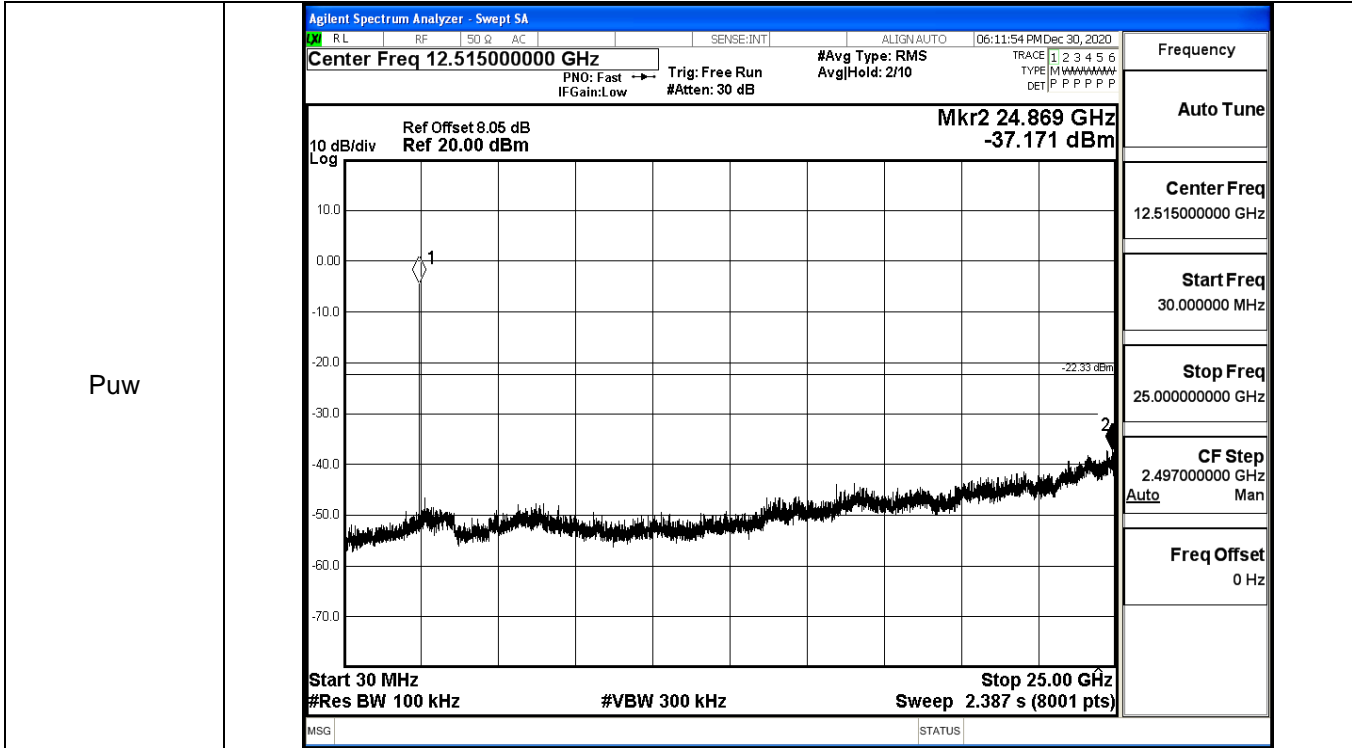


Pref







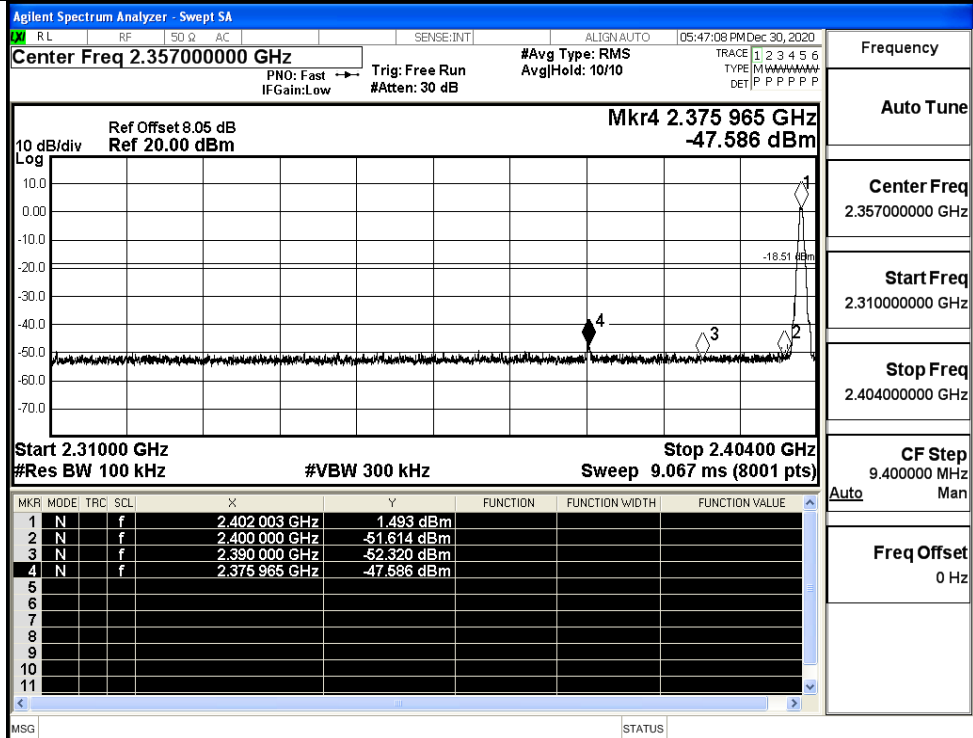


B.7 Band-edge for RF Conducted Emissions

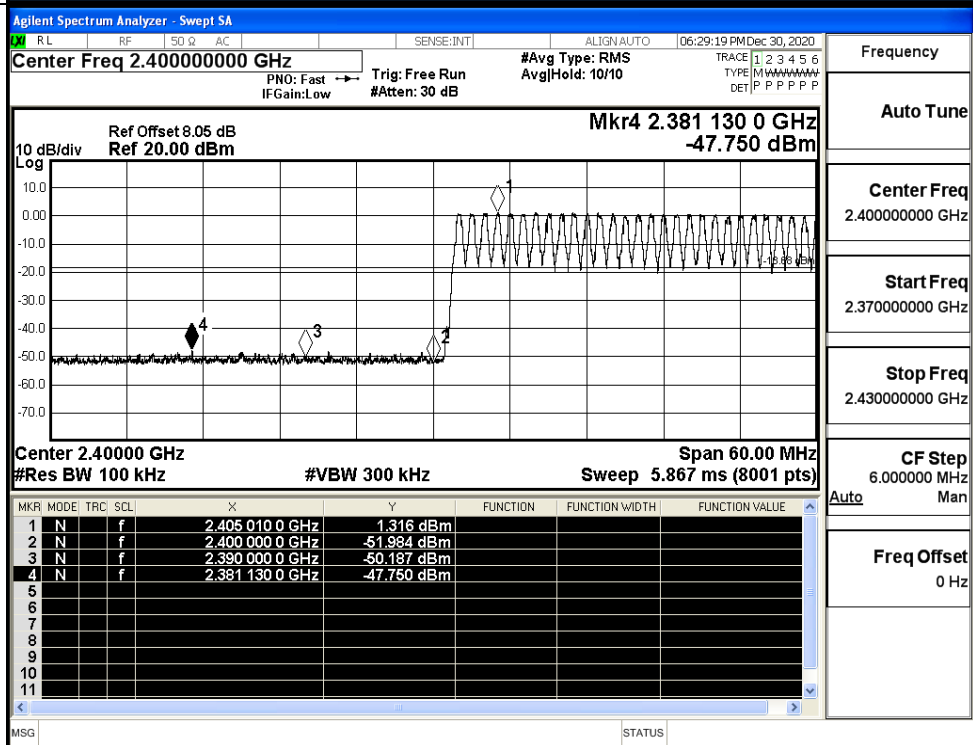
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	1.493	Off	-47.586	-18.51	PASS
			1.316	On	-47.750	-18.68	PASS
	HCH	2480	-2.282	Off	-48.594	-22.28	PASS
			-1.153	On	-48.148	-21.15	PASS
$\pi/4$ DQPSK	LCH	2402	1.686	Off	-48.278	-18.31	PASS
			1.397	On	-47.394	-18.6	PASS
	HCH	2480	-2.221	Off	-48.590	-22.22	PASS
			-0.836	On	-47.938	-20.84	PASS
8DPSK	LCH	2402	1.593	Off	-47.720	-18.41	PASS
			1.602	On	-48.455	-18.4	PASS
	HCH	2480	-2.156	Off	-48.627	-22.16	PASS
			-0.916	On	-46.120	-20.92	PASS

Test Graphs

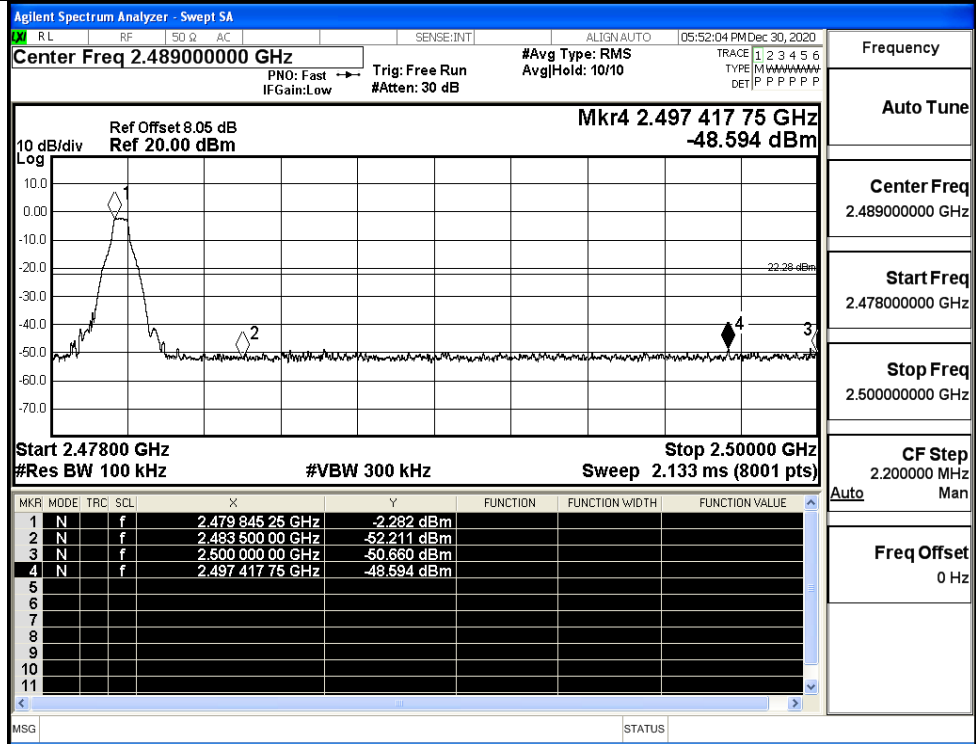
GFSK/LCH/No Hop



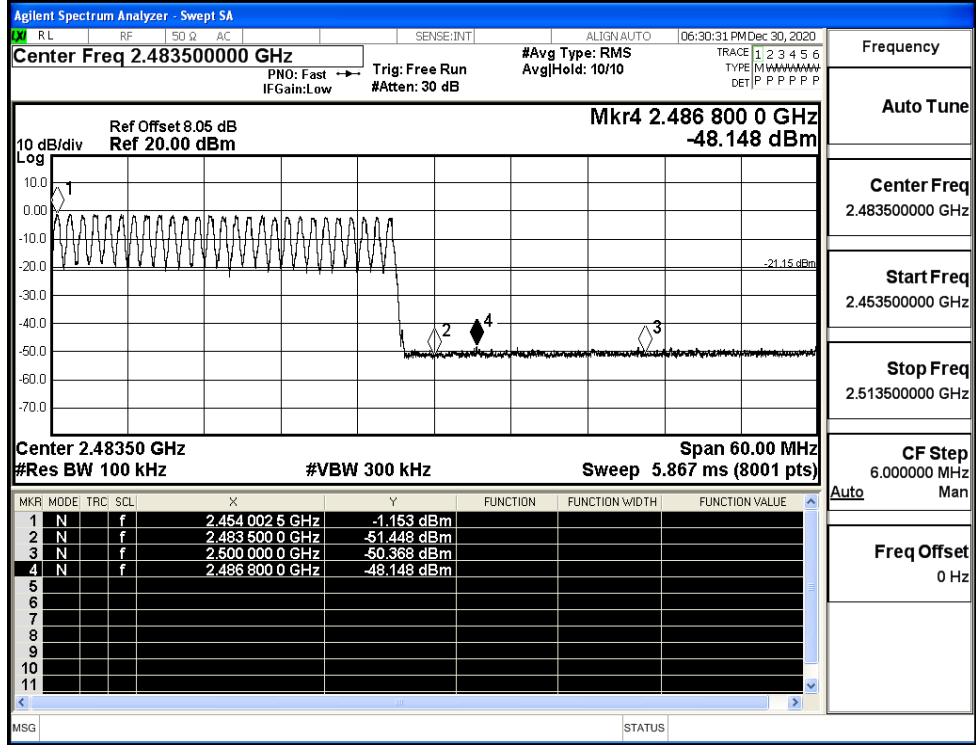
GFSK/LCH/Hop



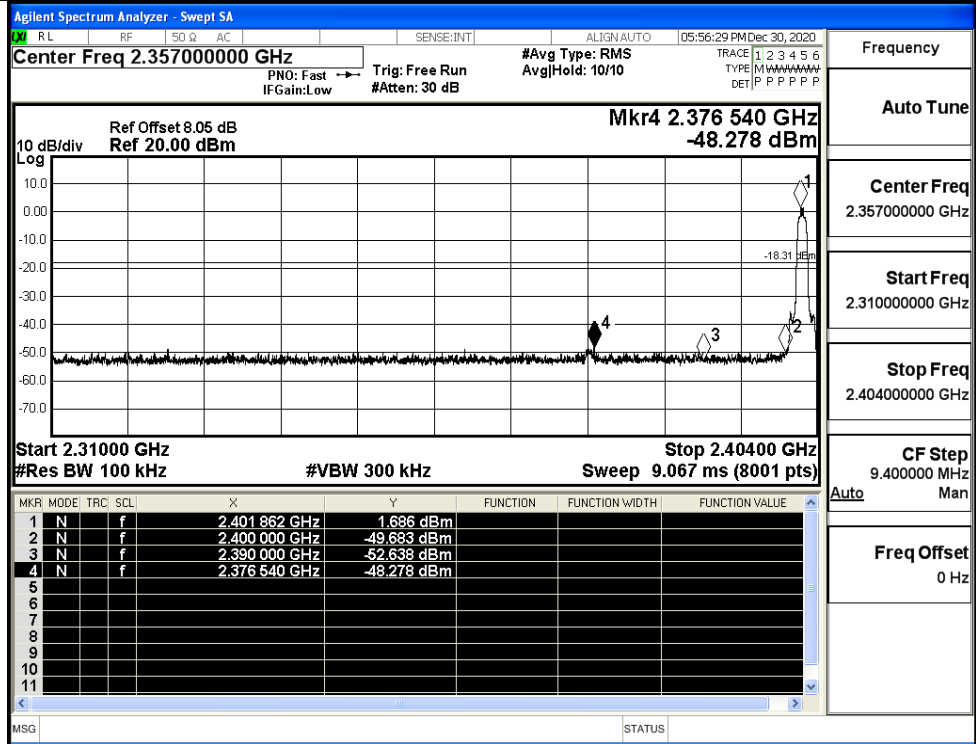
GFSK/HCH/No Hop



GFSK/HCH/Hop

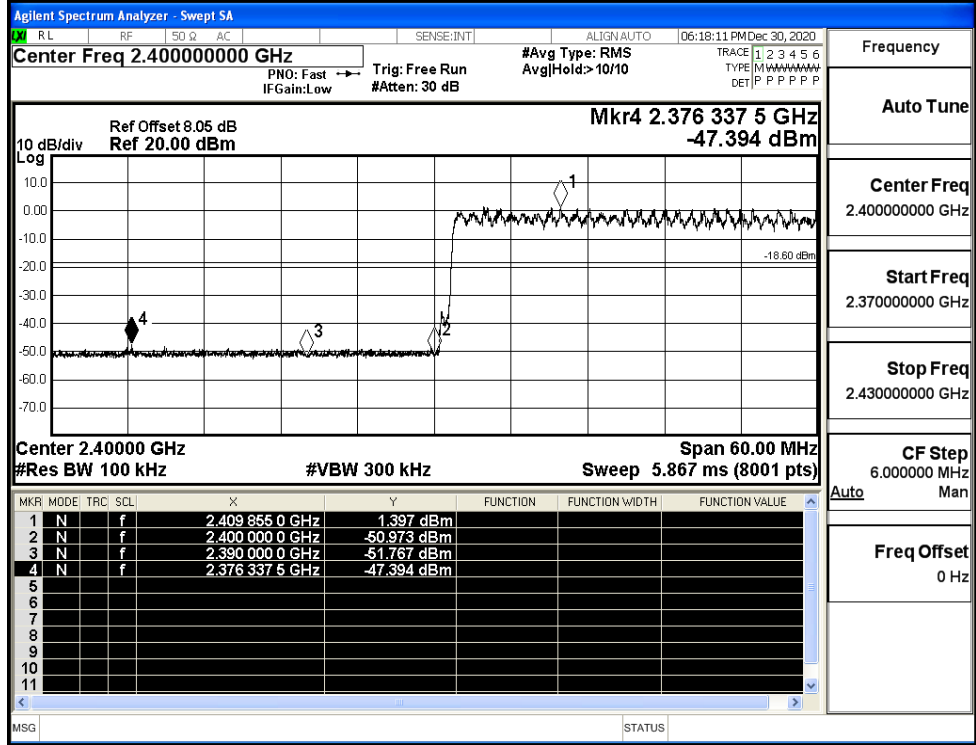


$\pi/4$ DQPSK/LCH/No Hop



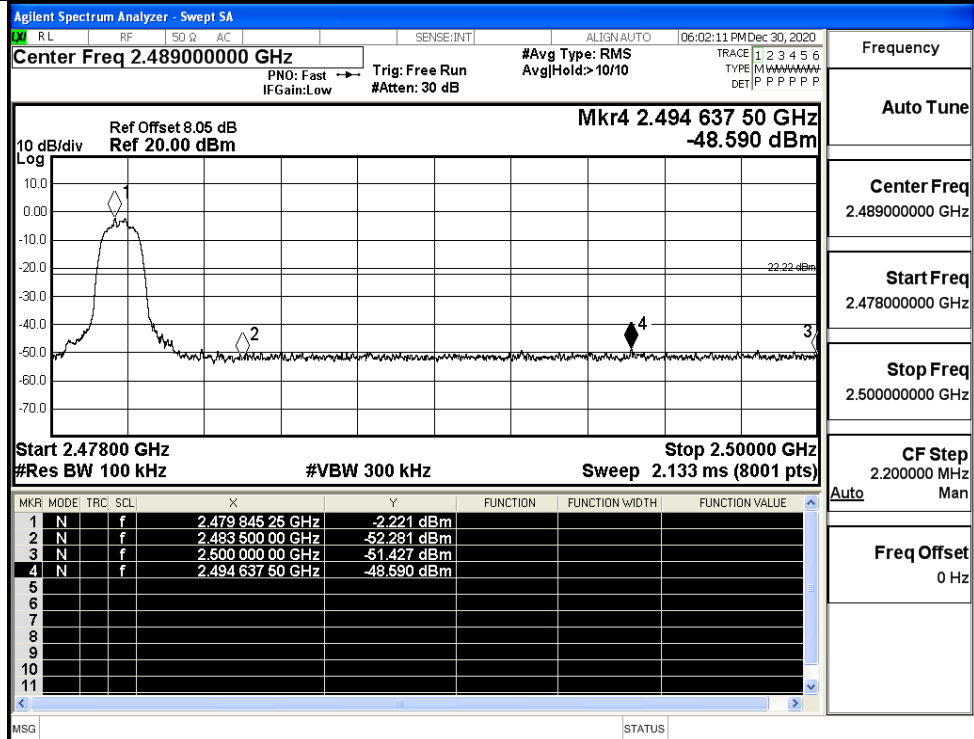
Frequency
Auto Tune
Center Freq
2.357000000 GHz
Start Freq
2.310000000 GHz
Stop Freq
2.404000000 GHz
CF Step
9.400000 MHz
Auto Man
Freq Offset
0 Hz

$\pi/4$ DQPSK/LCH/Hop



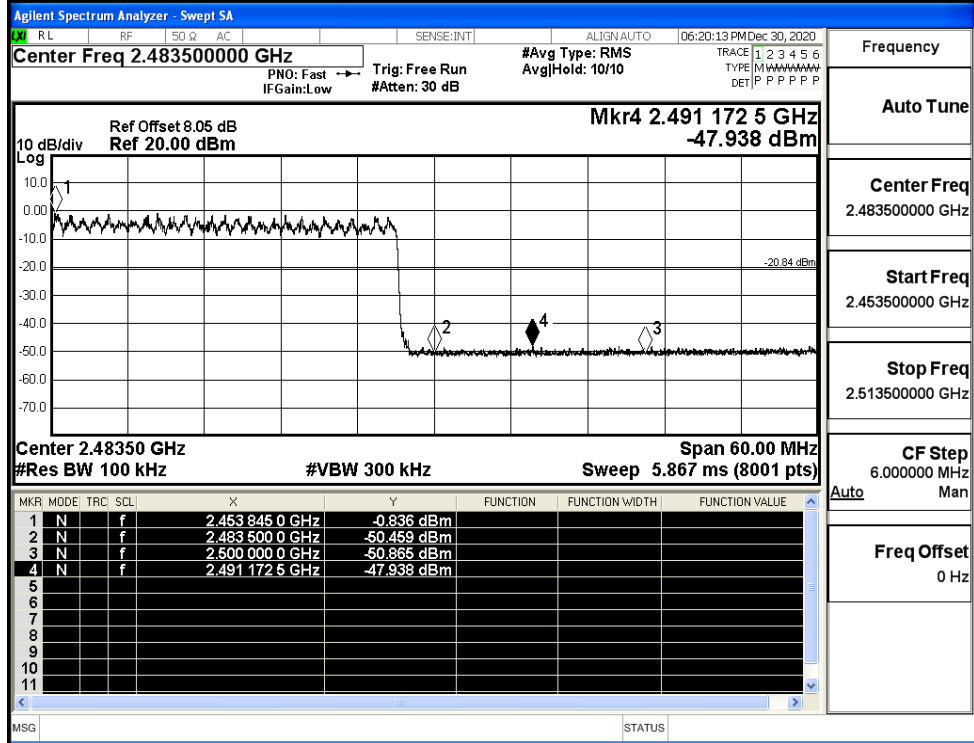
Frequency
Auto Tune
Center Freq
2.400000000 GHz
Start Freq
2.370000000 GHz
Stop Freq
2.430000000 GHz
CF Step
6.000000 MHz
Auto Man
Freq Offset
0 Hz

π /4DQPSK/HCH/No
Hop



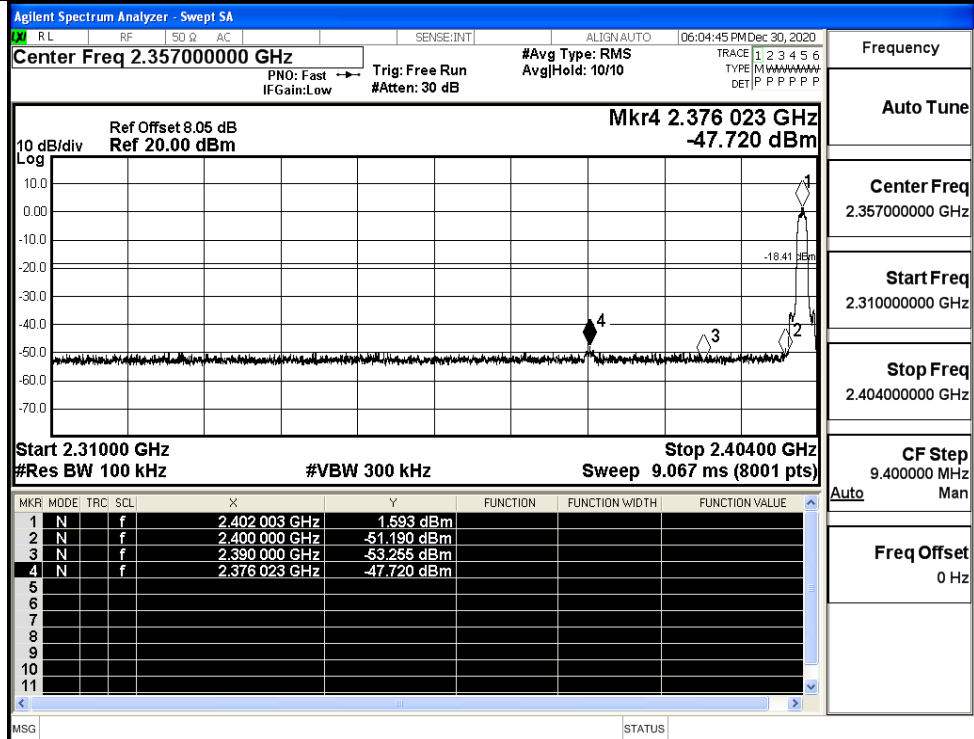
Frequency	2.489000000 GHz
Auto Tune	
Center Freq	2.489000000 GHz
Start Freq	2.478000000 GHz
Stop Freq	2.500000000 GHz
CF Step	2.200000 MHz
Freq Offset	0 Hz

π /4DQPSK/HCH/Hop



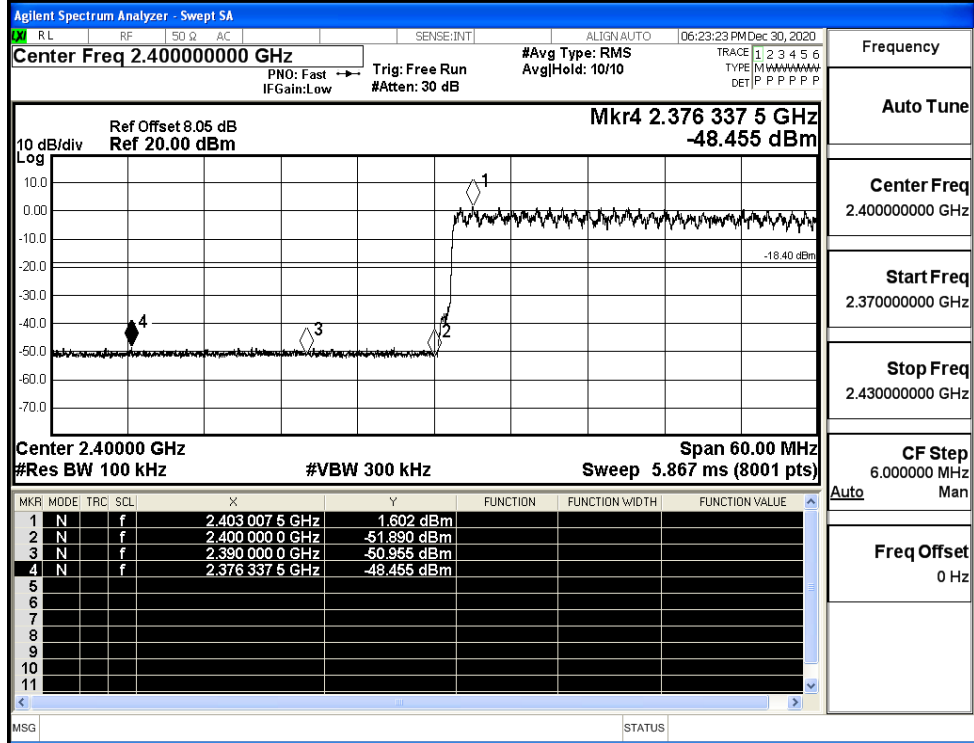
Frequency	2.483500000 GHz
Auto Tune	
Center Freq	2.483500000 GHz
Start Freq	2.453500000 GHz
Stop Freq	2.513500000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz

8DPSK/LCH/No Hop



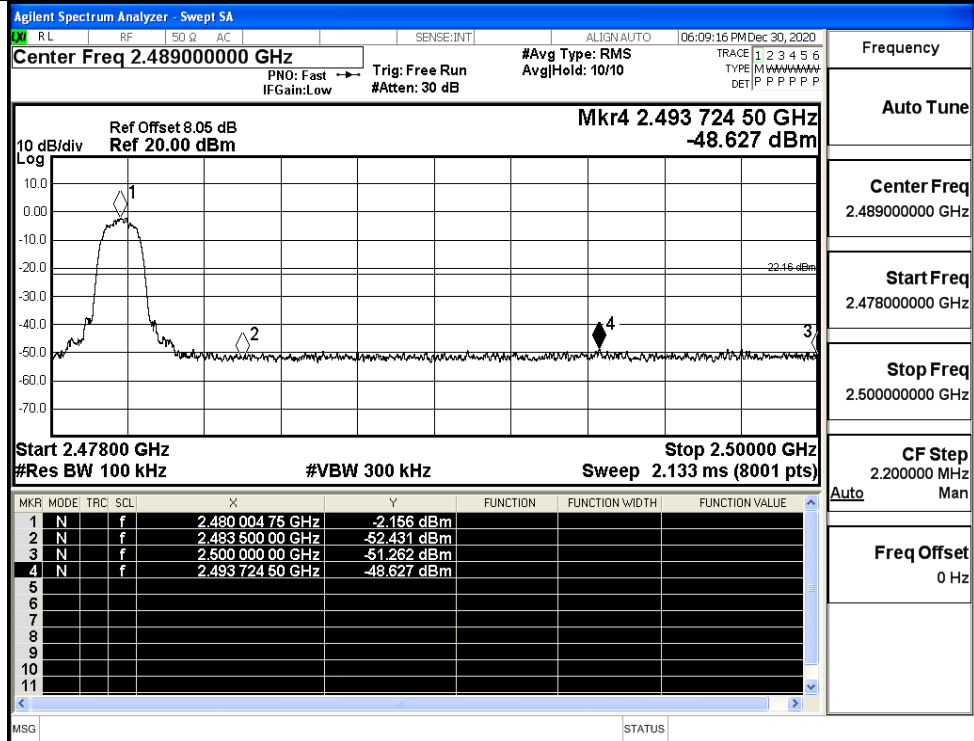
Frequency
Auto Tune
Center Freq
2.357000000 GHz
Start Freq
2.310000000 GHz
Stop Freq
2.404000000 GHz
CF Step
9.400000 MHz
Auto Man
Freq Offset
0 Hz

8DPSK/LCH/Hop



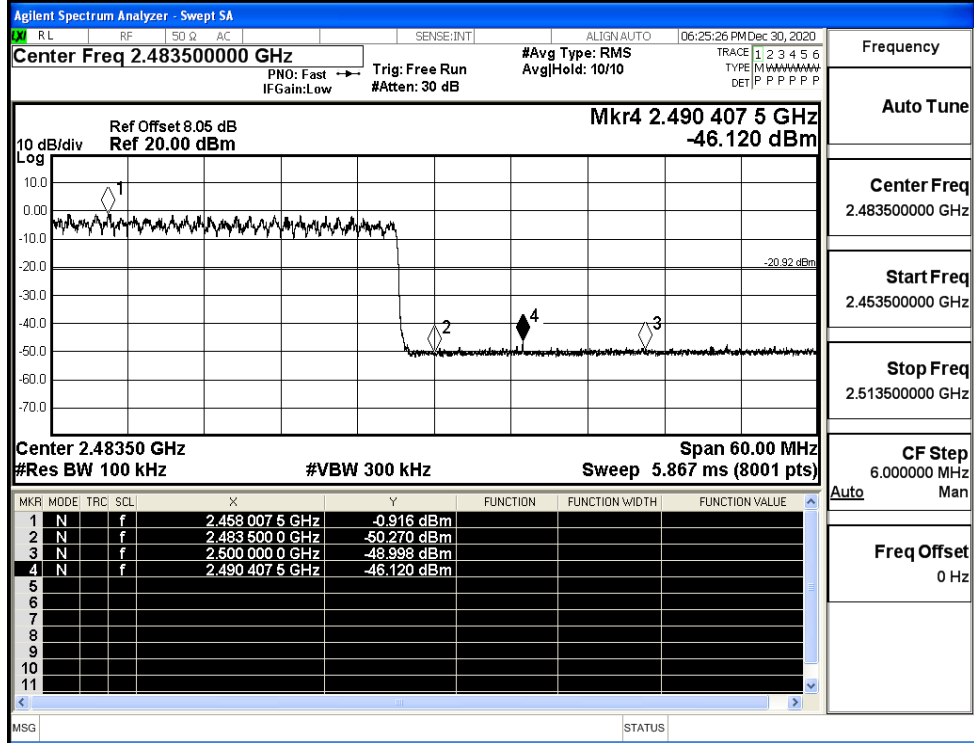
Frequency
Auto Tune
Center Freq
2.400000000 GHz
Start Freq
2.370000000 GHz
Stop Freq
2.430000000 GHz
CF Step
6.000000 MHz
Auto Man
Freq Offset
0 Hz

8DPSK/HCH/No Hop



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

8DPSK/HCH/Hop

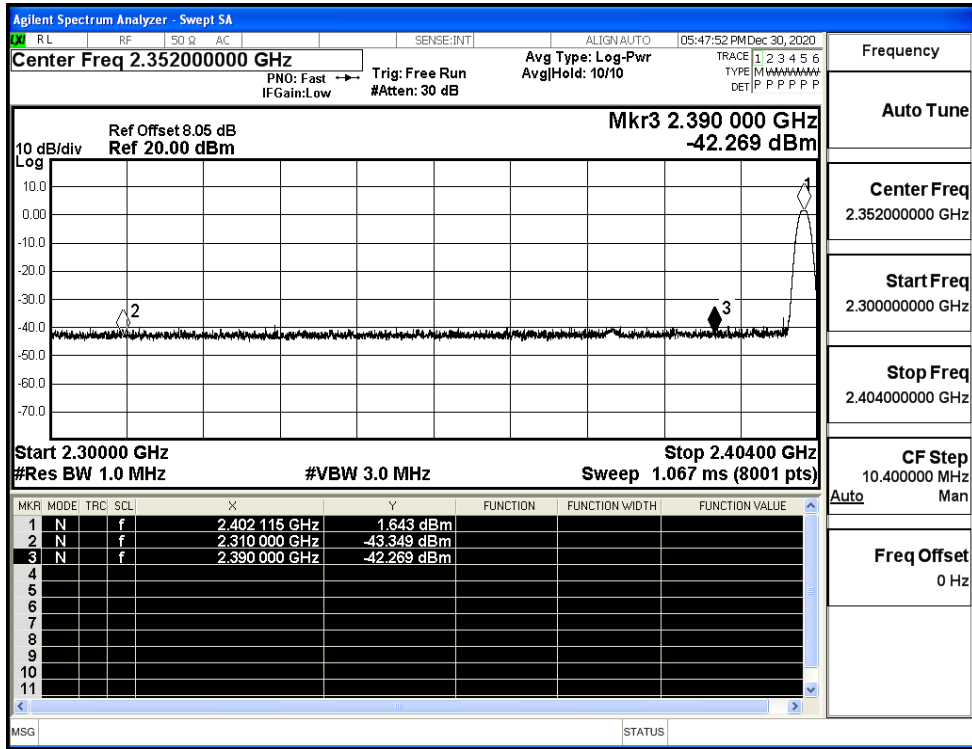


Frequency
Auto Tune
Center Freq
2.483500000 GHz
Start Freq
2.453500000 GHz
Stop Freq
2.513500000 GHz
CF Step
6.000000 MHz
Freq Offset
0 Hz

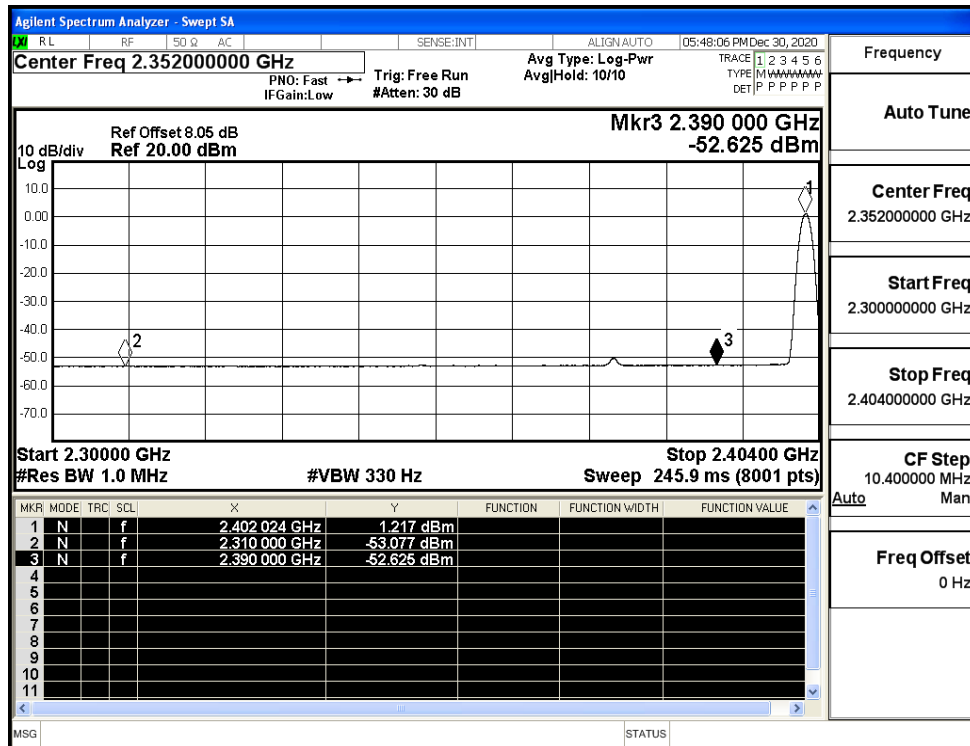
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.35	2.0	0	53.91	PEAK	74	PASS
	Off	2310.0	-53.08	2.0	0	44.18	AV	54	PASS
	Off	2390.0	-42.27	2.0	0	54.99	PEAK	74	PASS
	Off	2390.0	-52.63	2.0	0	44.63	AV	54	PASS
	Off	2483.5	-42.78	2.0	0	54.48	PEAK	74	PASS
	Off	2483.5	-52.18	2.0	0	45.08	AV	54	PASS
	Off	2500.0	-39.91	2.0	0	57.35	PEAK	74	PASS
	Off	2500.0	-51.99	2.0	0	45.27	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-42.14	2.0	0	55.12	PEAK	74	PASS
	Off	2310.0	-53.07	2.0	0	44.18	AV	54	PASS
	Off	2390.0	-41.50	2.0	0	55.76	PEAK	74	PASS
	Off	2390.0	-52.68	2.0	0	44.58	AV	54	PASS
	Off	2483.5	-42.40	2.0	0	54.86	PEAK	74	PASS
	Off	2483.5	-52.14	2.0	0	45.12	AV	54	PASS
	Off	2500.0	-41.84	2.0	0	55.42	PEAK	74	PASS
	Off	2500.0	-52.00	2.0	0	45.26	AV	54	PASS
8DPSK	Off	2310.0	-43.09	2.0	0	54.16	PEAK	74	PASS
	Off	2310.0	-52.98	2.0	0	44.27	AV	54	PASS
	Off	2390.0	-43.17	2.0	0	54.09	PEAK	74	PASS
	Off	2390.0	-52.75	2.0	0	44.51	AV	54	PASS
	Off	2483.5	-42.00	2.0	0	55.26	PEAK	74	PASS
	Off	2483.5	-52.19	2.0	0	45.07	AV	54	PASS
	Off	2500.0	-41.45	2.0	0	55.81	PEAK	74	PASS
	Off	2500.0	-52.05	2.0	0	45.21	AV	54	PASS

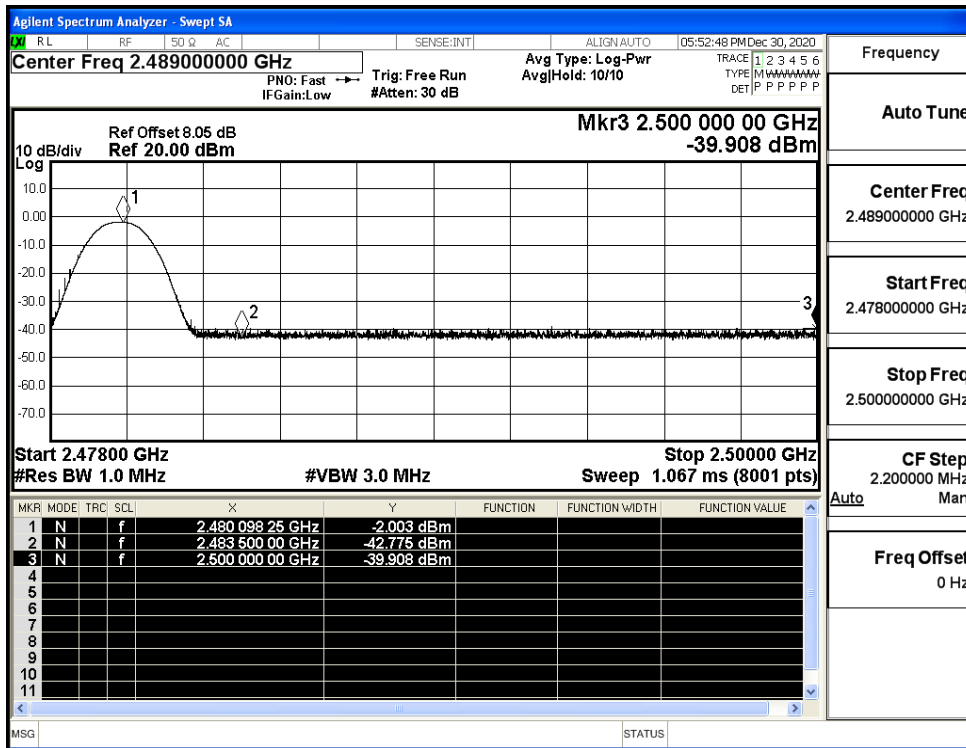
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



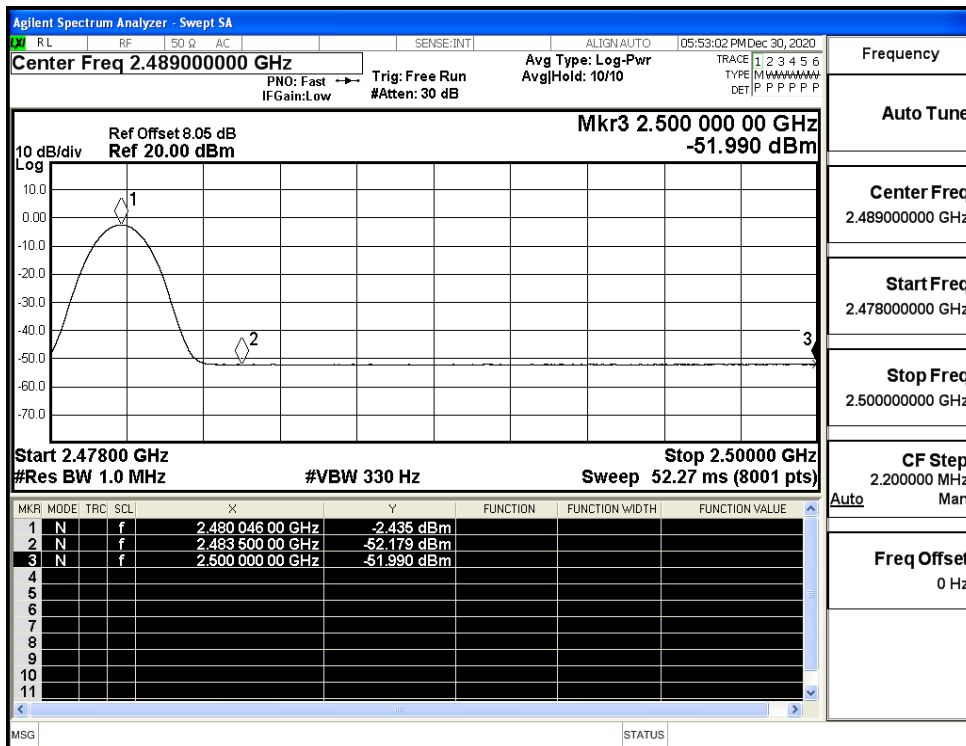
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



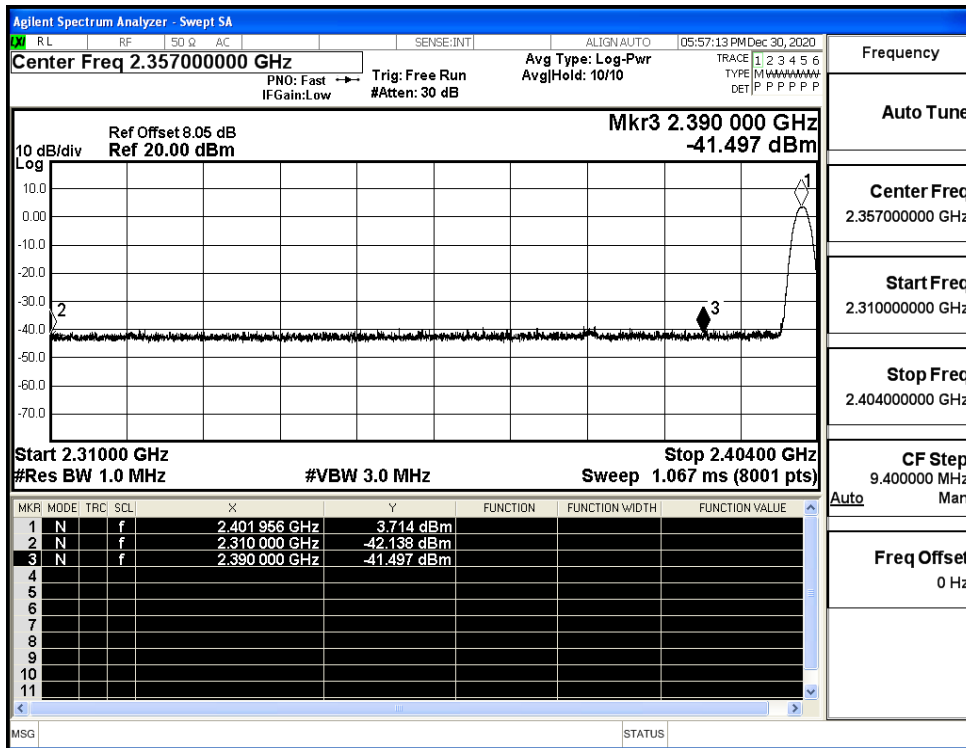
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



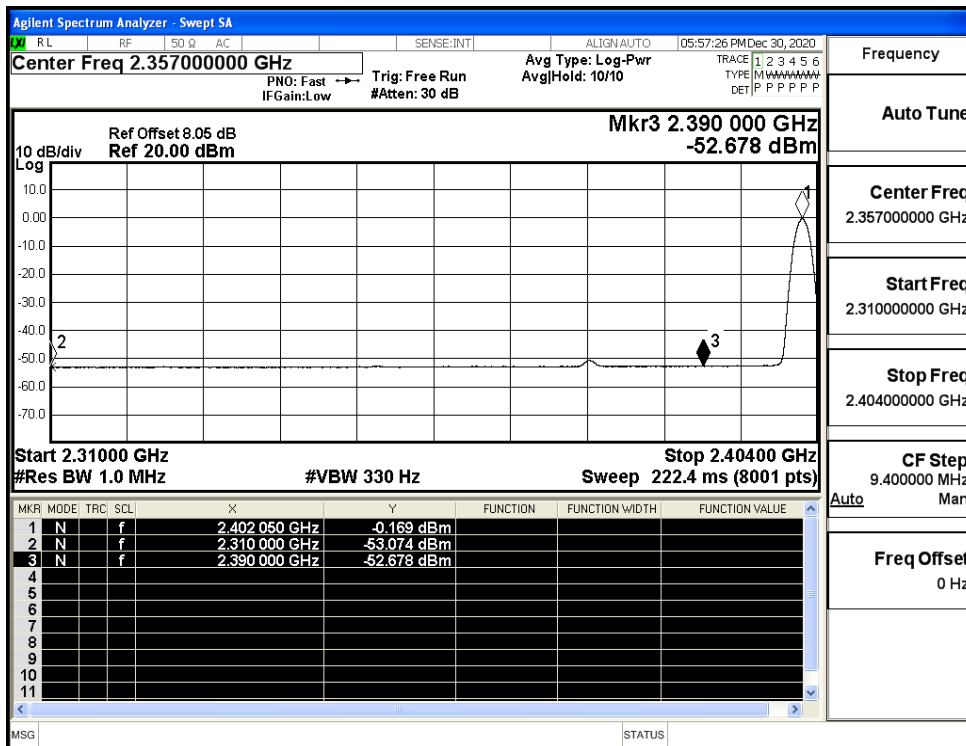
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



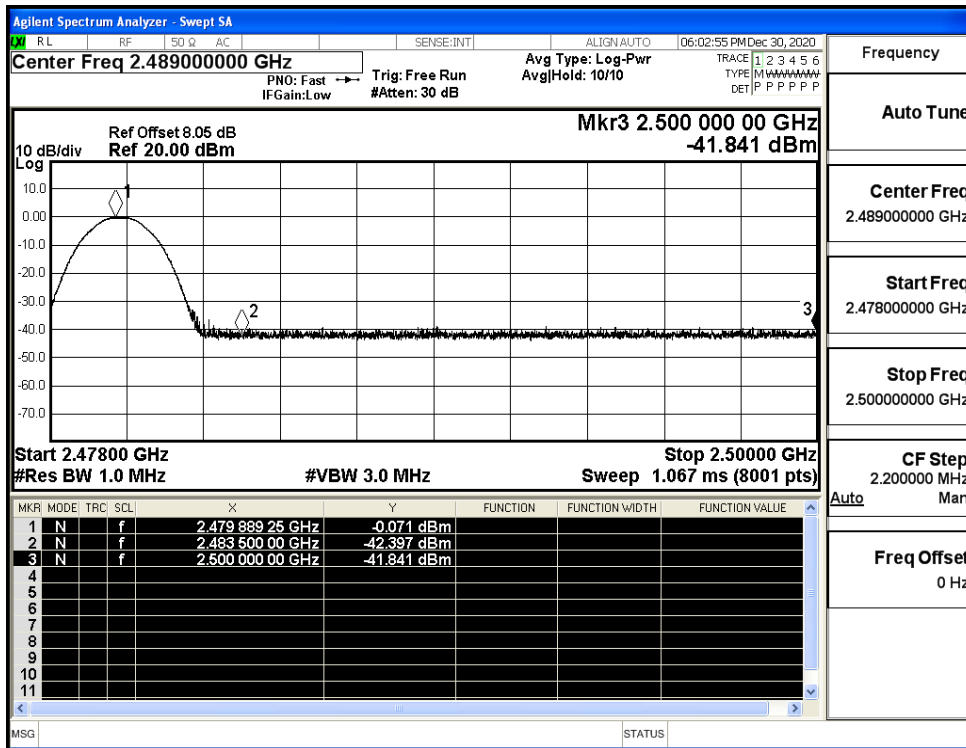
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)



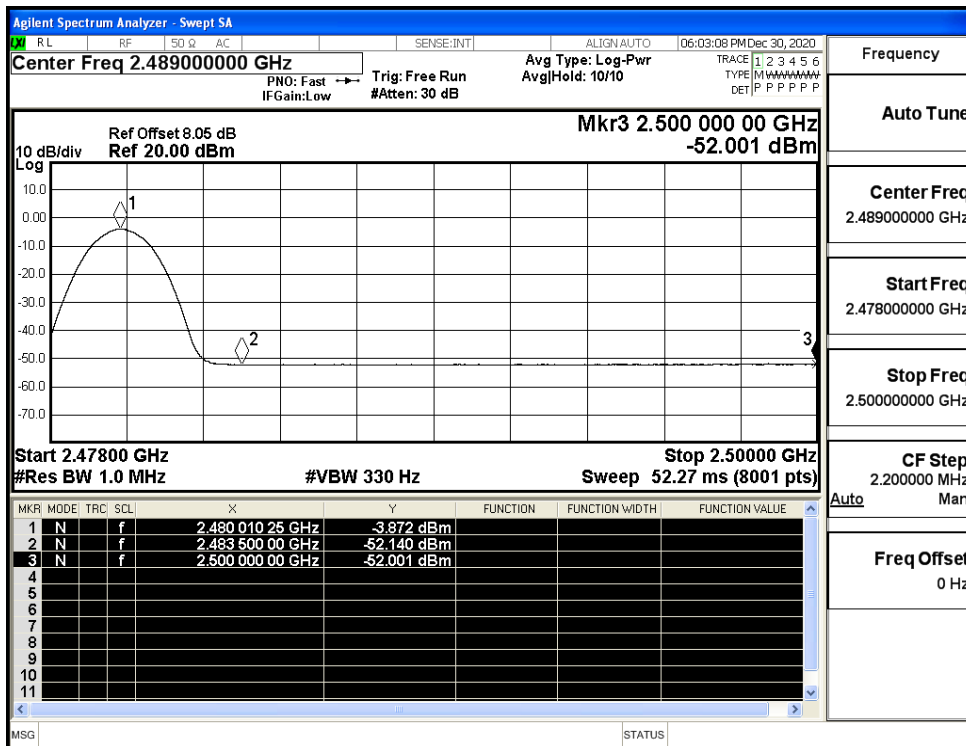
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)



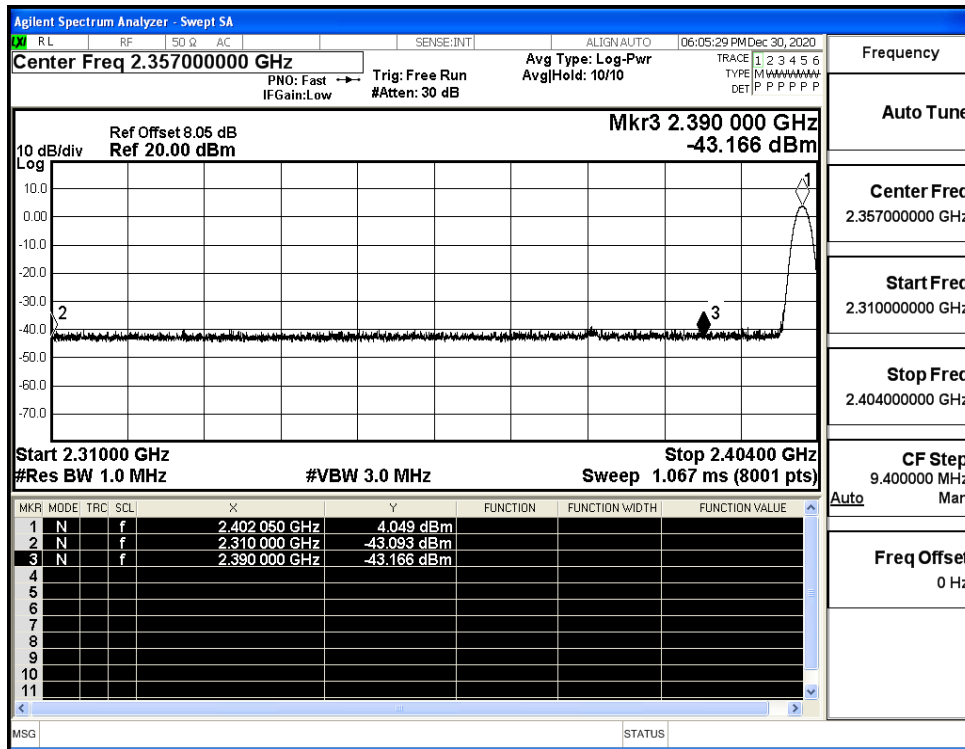
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



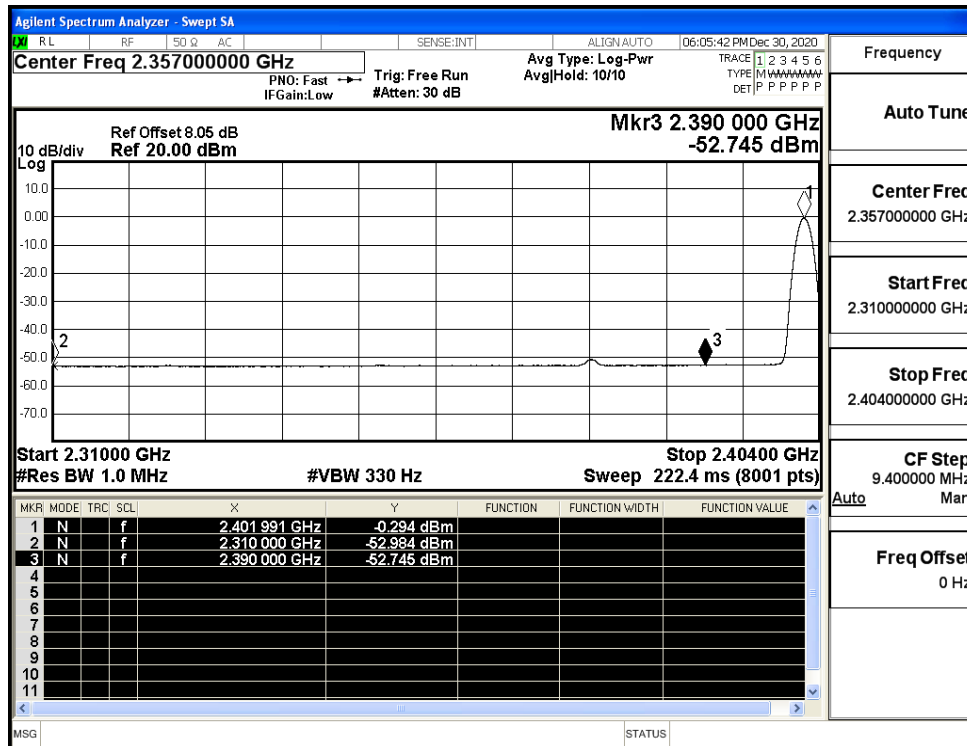
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



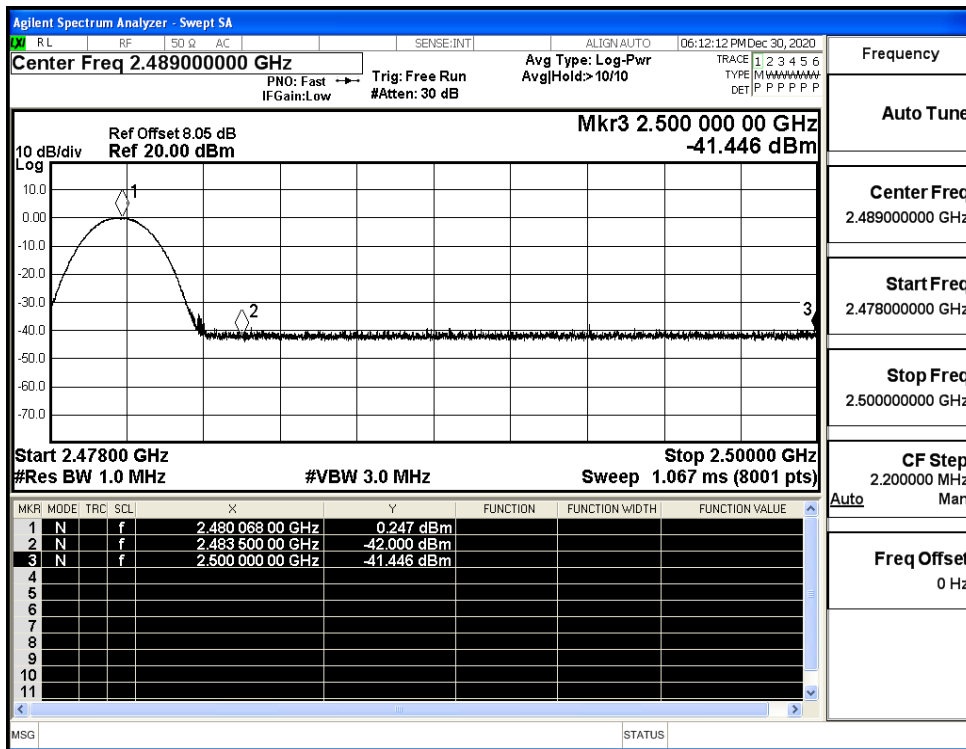
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (Low Channel)



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



Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (High Channel)

