

Appendix A

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

Product Name: Jax Bluetooth® Speaker

Trade Mark: Gemline

Test Model: 100246-001B

Environmental Conditions

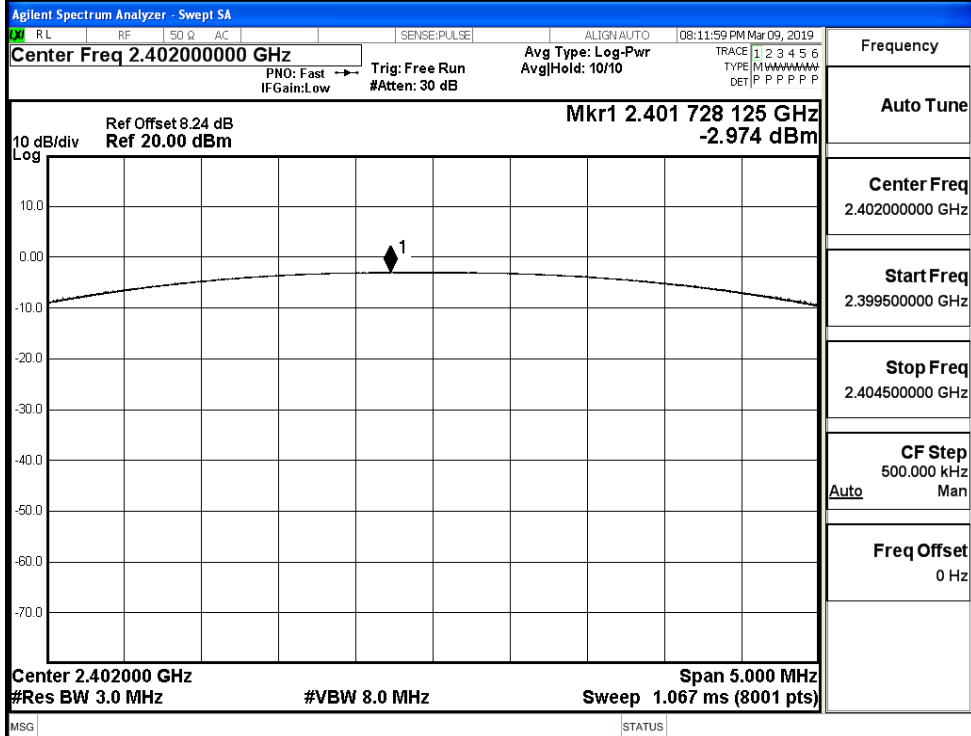
Temperature:	23.5 °C
Relative Humidity:	53.3%
ATM Pressure:	100.0 kPa
Test Engineer:	David.Luo
Supervised by:	Wang Chuang

A.1 Maximum Conducted Peak Output Power

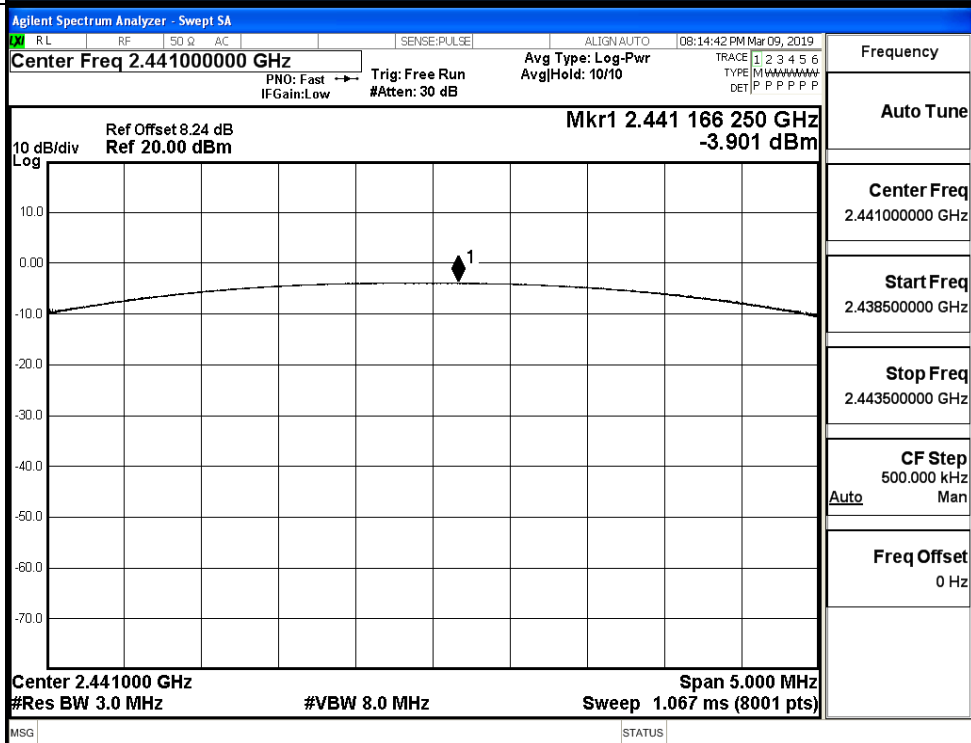
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-2.974	21	PASS
	MCH	-3.901	21	PASS
	HCH	-4.874	21	PASS
$\pi/4$ DQPSK	LCH	-3.044	21	PASS
	MCH	-3.983	21	PASS
	HCH	-4.906	21	PASS
8DPSK	LCH	-3.128	21	PASS
	MCH	-4.024	21	PASS
	HCH	-4.975	21	PASS

Test Graphs

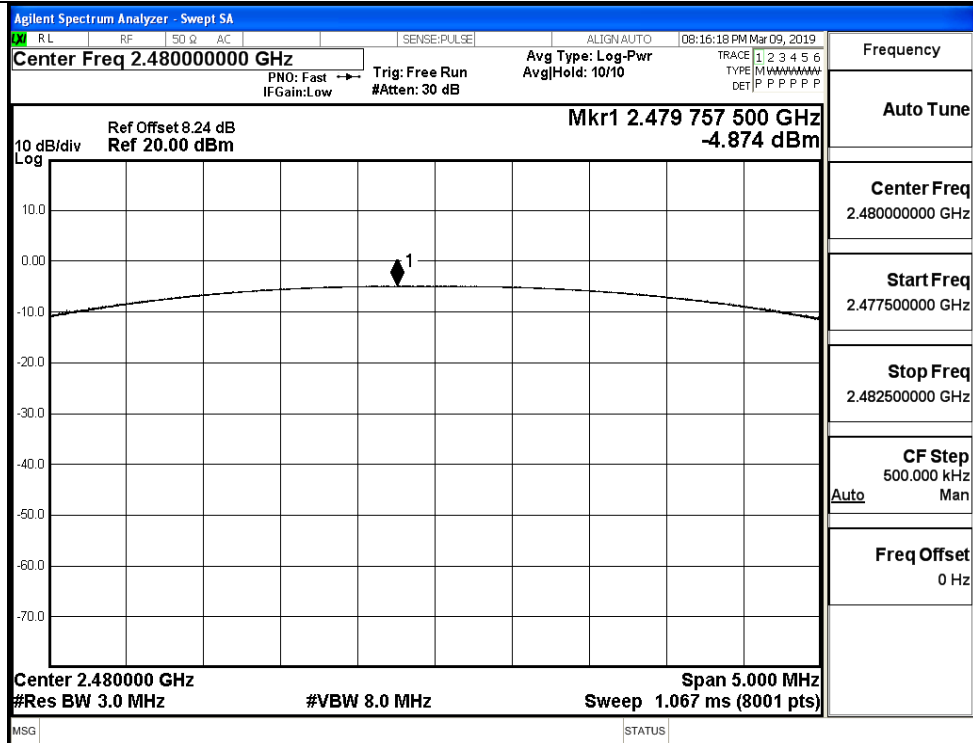
GFSK/LCH



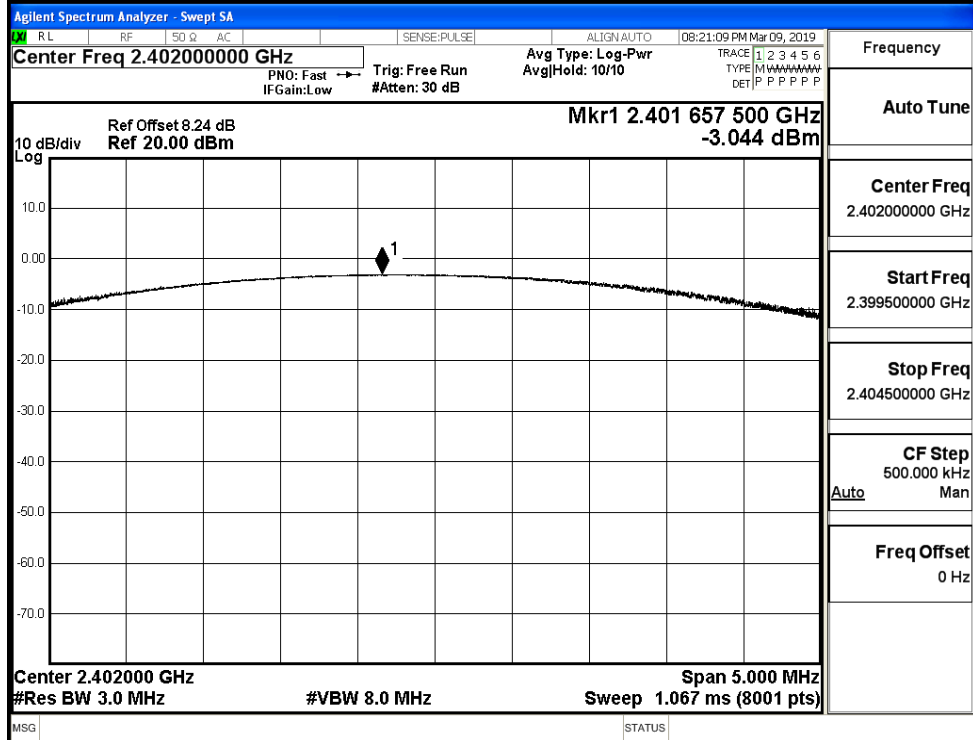
GFSK/MCH



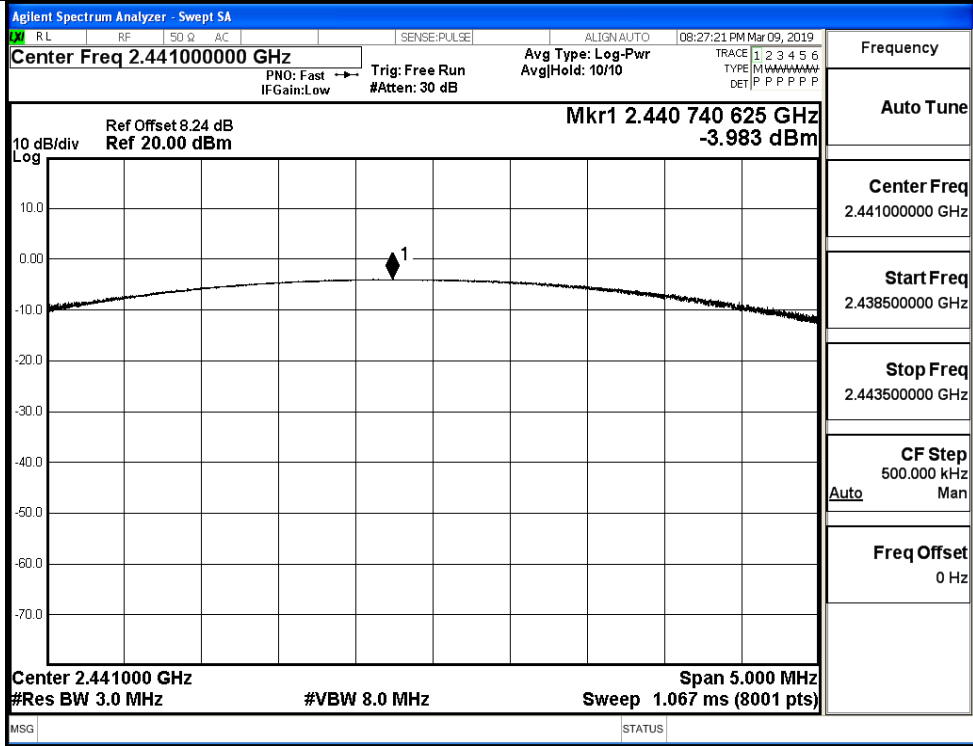
GFSK/HCH



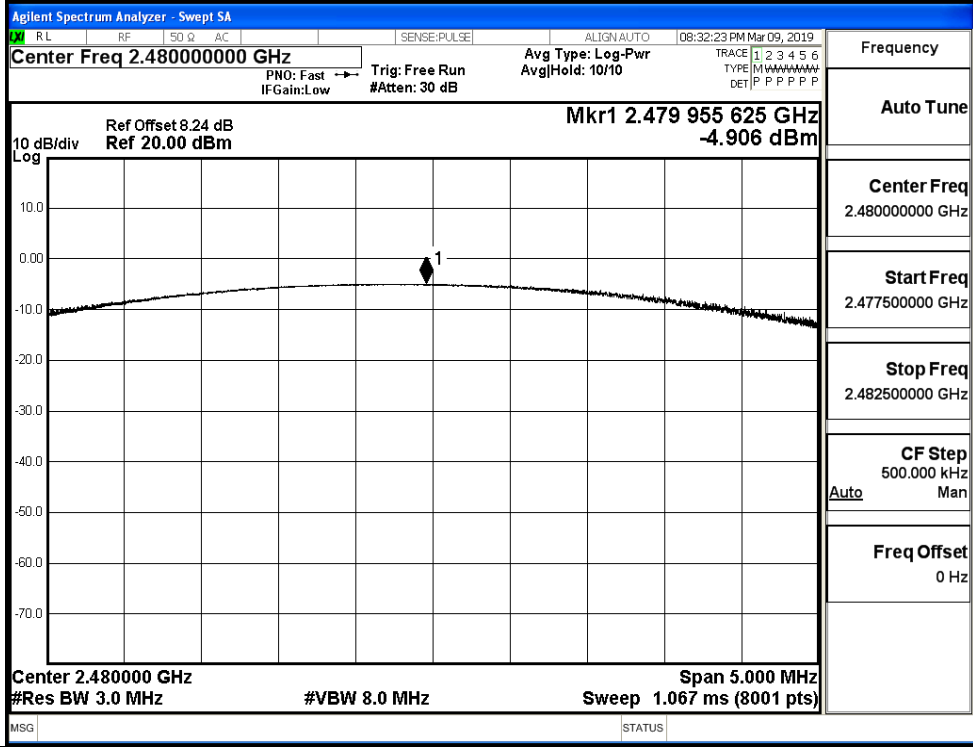
π /4DQPSK/LCH



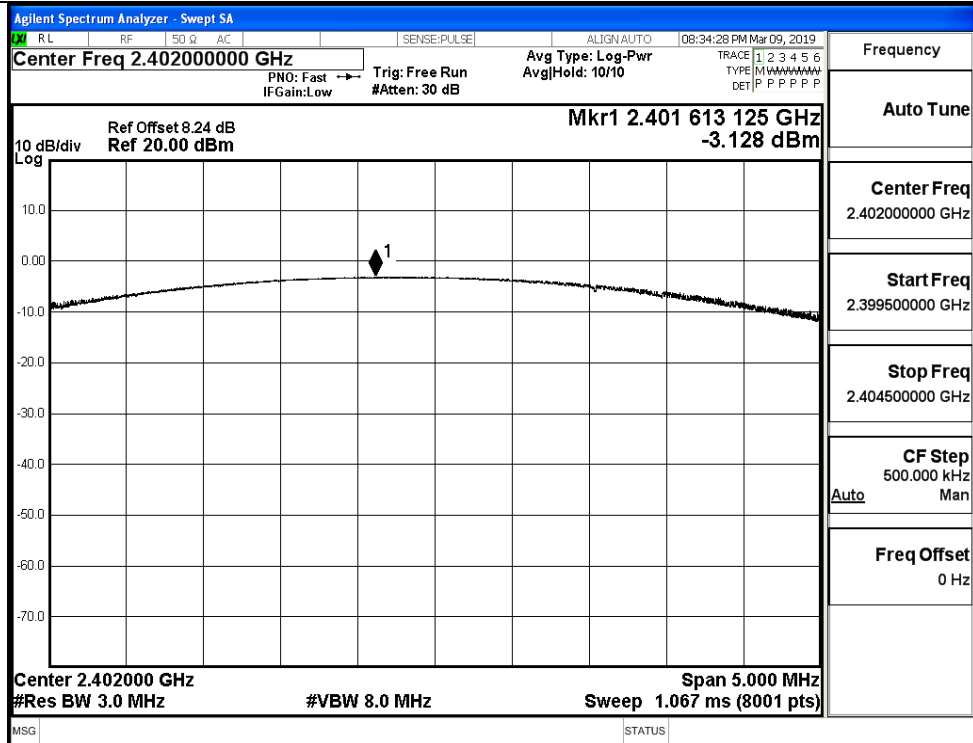
π /4DQPSK/MCH



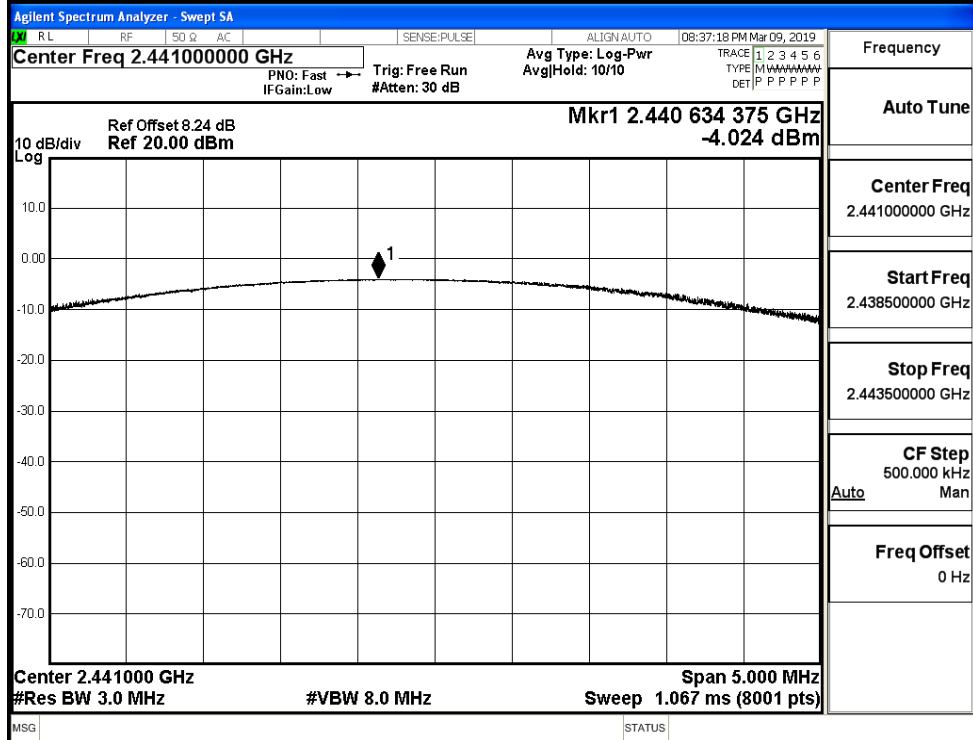
π /4DQPSK/HCH



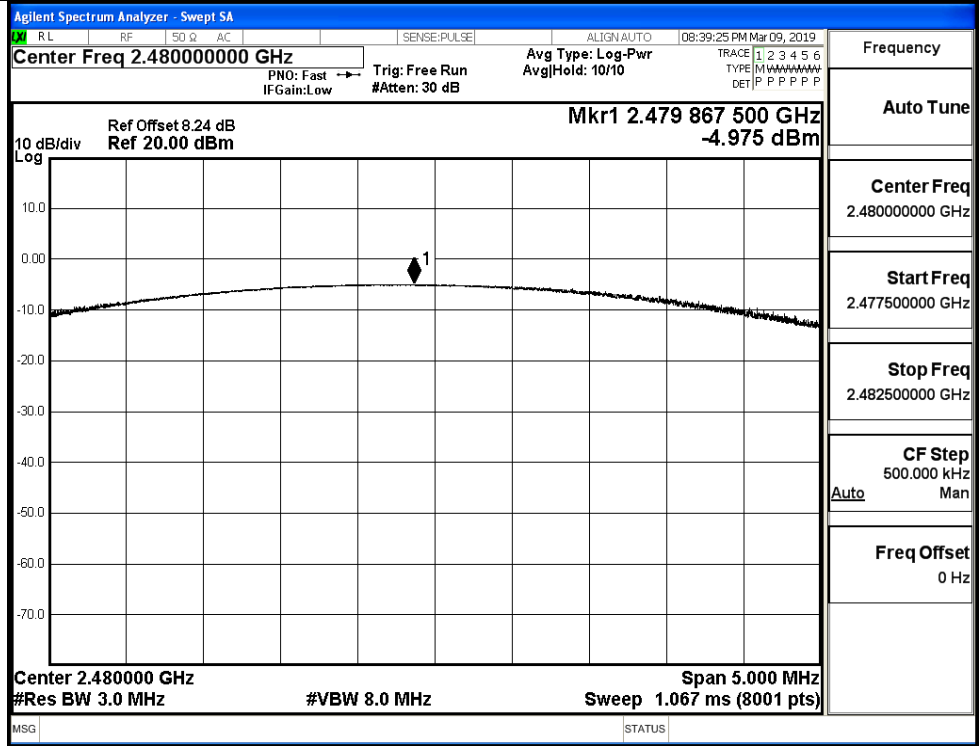
8DPSK/LCH



8DPSK/MCH

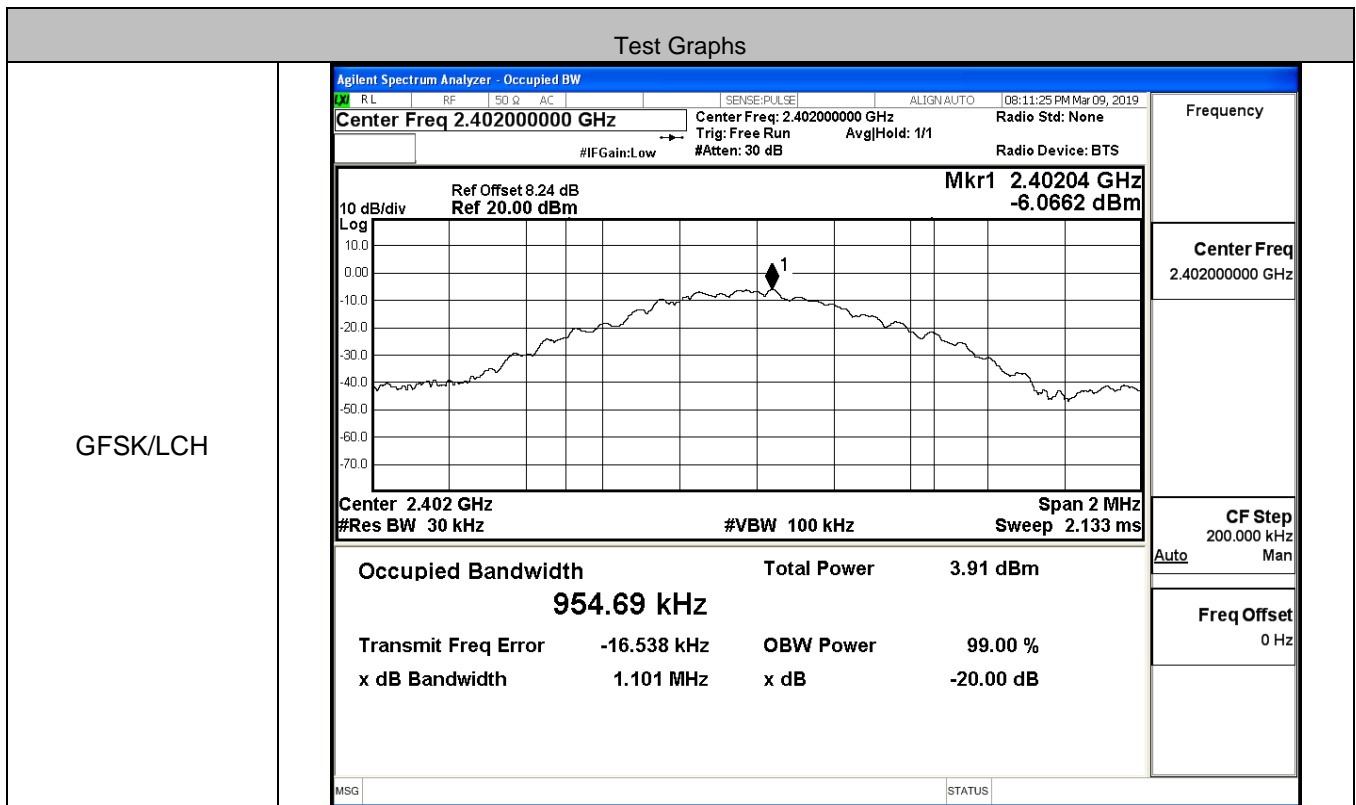


8DPSK/HCH

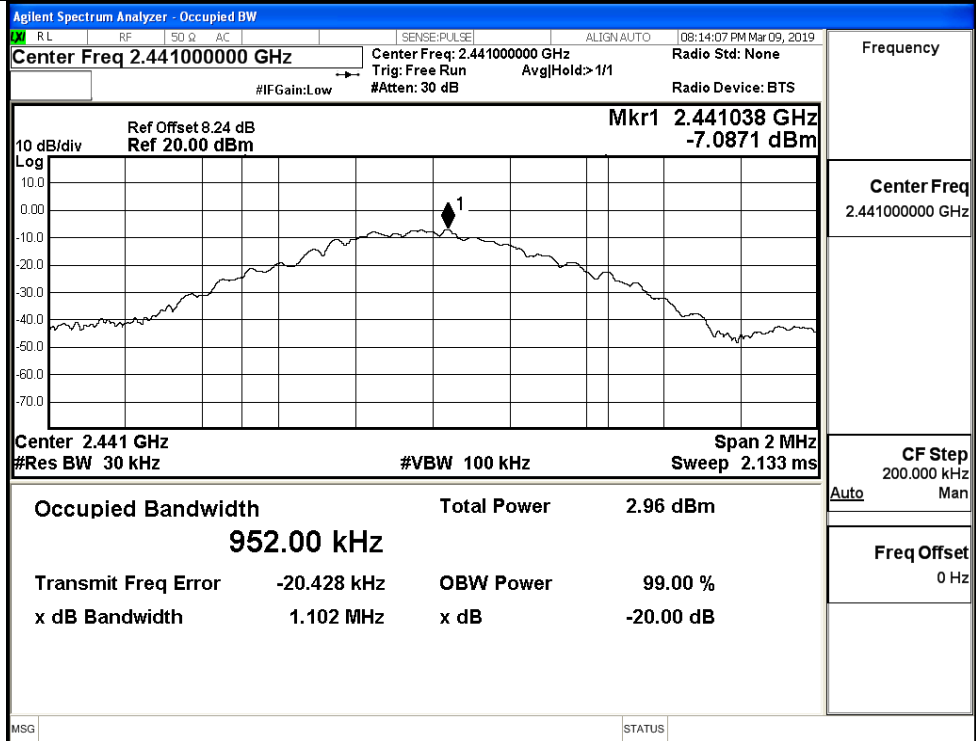


A.2 99% and 20dB Bandwidth

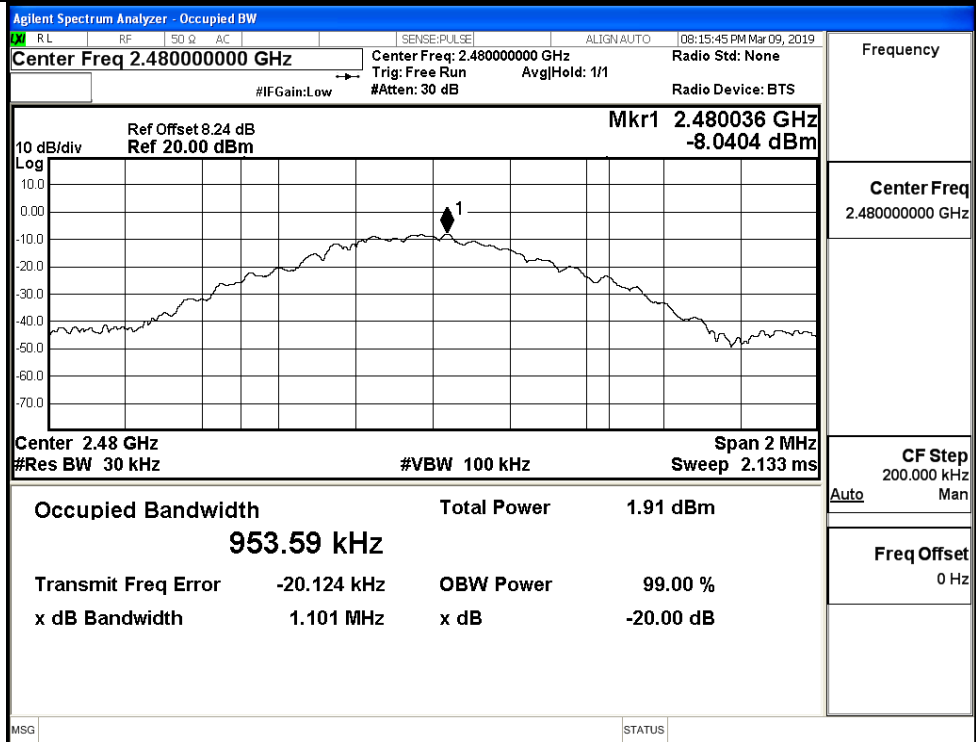
Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.95469	1.101	Not Specified	PASS
	MCH	0.95200	1.102	Not Specified	PASS
	HCH	0.95359	1.101	Not Specified	PASS
π/4DQPSK	LCH	1.2173	1.345	Not Specified	PASS
	MCH	1.2142	1.343	Not Specified	PASS
	HCH	1.2140	1.345	Not Specified	PASS
8DPSK	LCH	1.2221	1.342	Not Specified	PASS
	MCH	1.2205	1.347	Not Specified	PASS
	HCH	1.2207	1.342	Not Specified	PASS



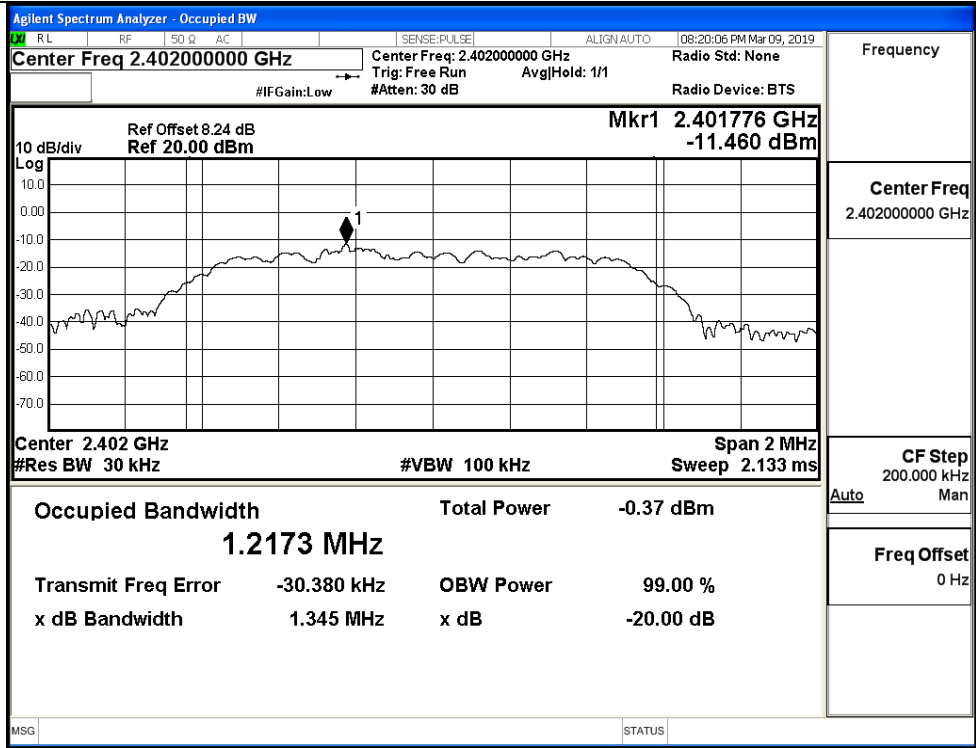
GFSK/MCH



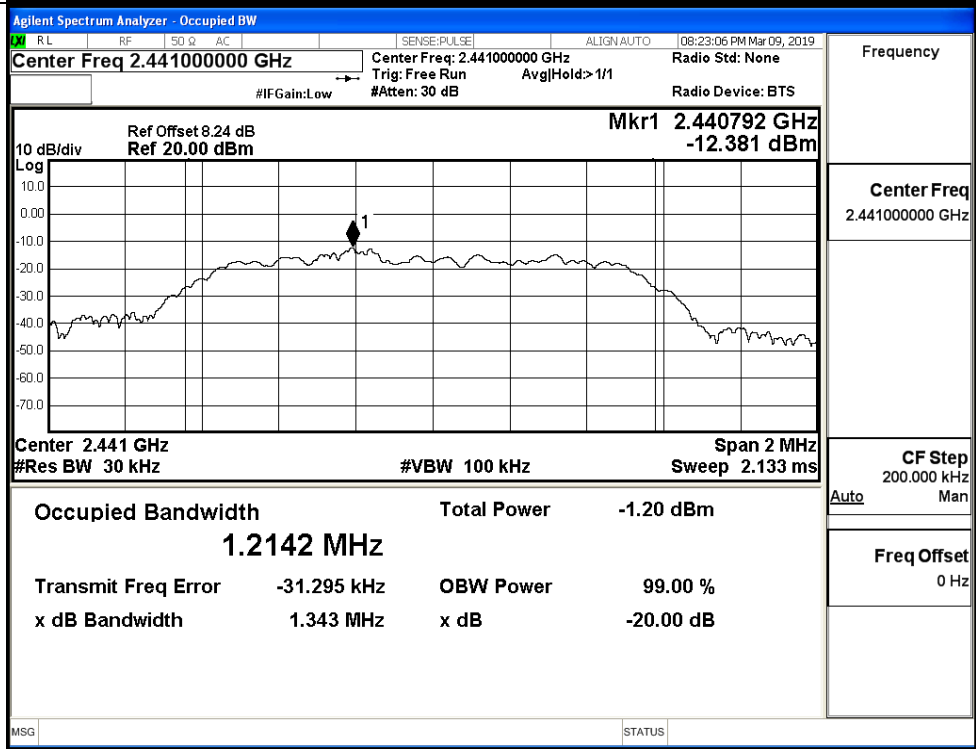
GFSK/HCH



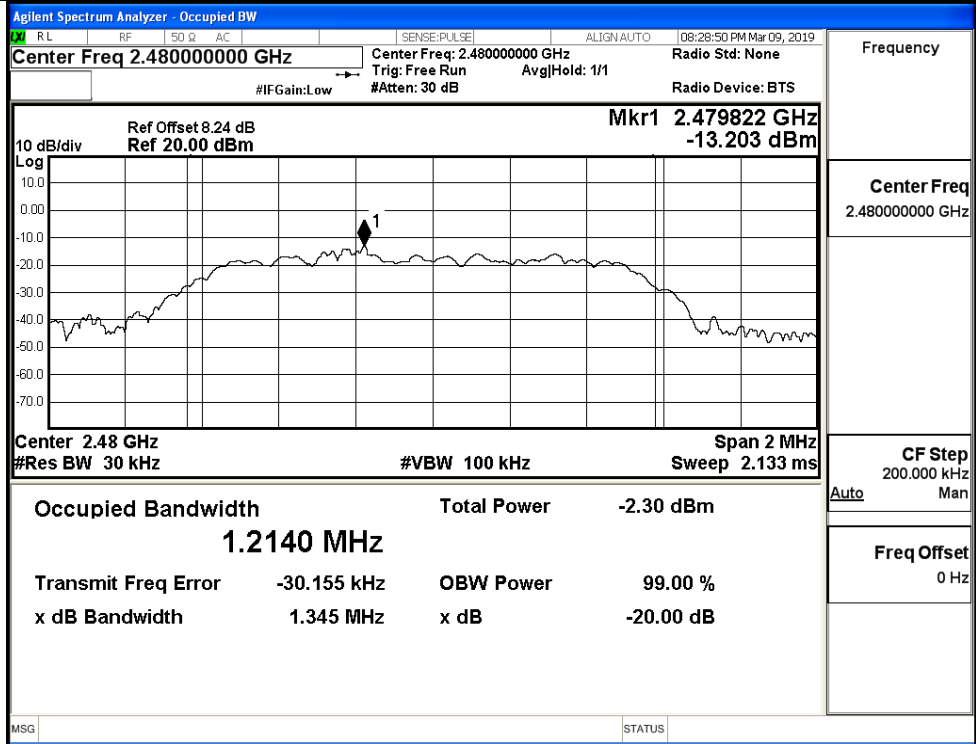
$\pi/4$ DQPSK/LCH



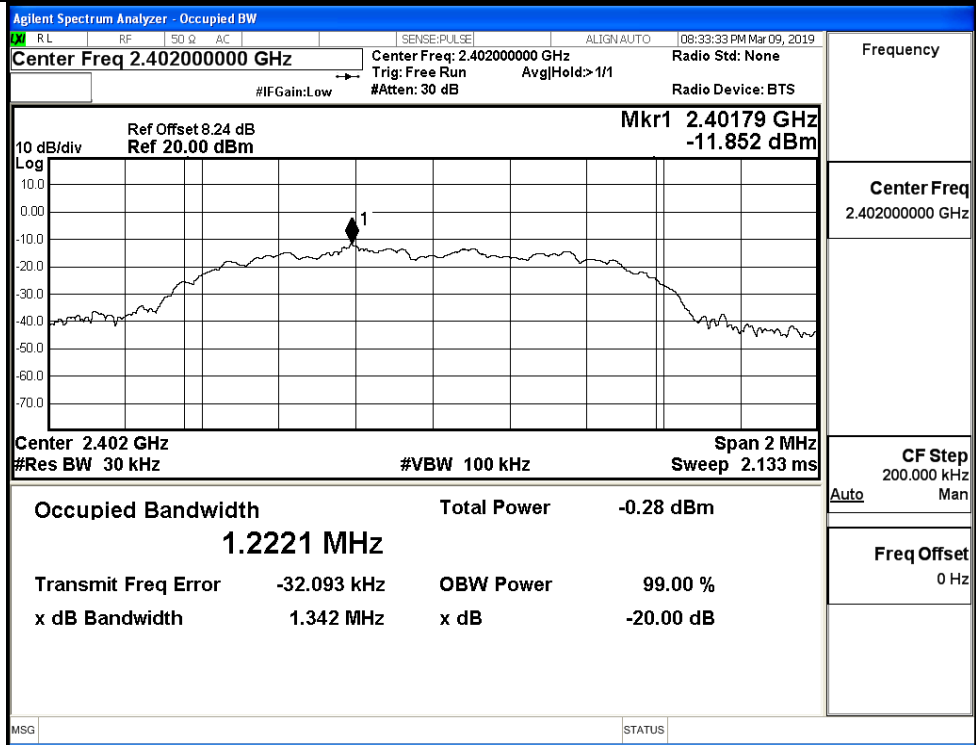
$\pi/4$ DQPSK/MCH



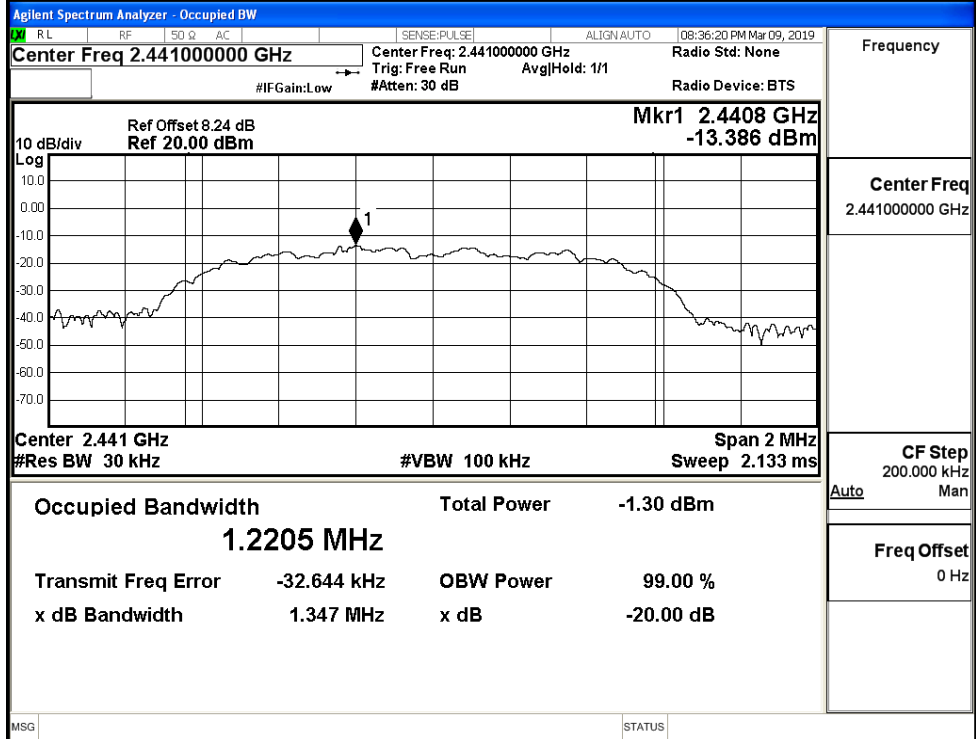
$\pi/4$ DQPSK/HCH



8DPSK/LCH

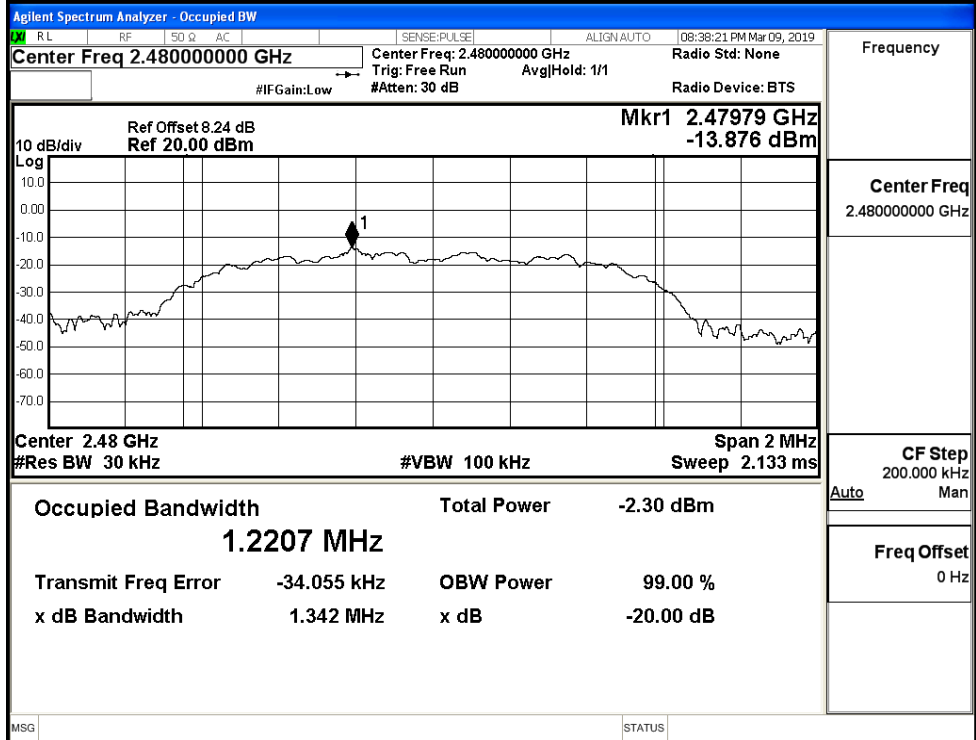


8DPSK/MCH



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

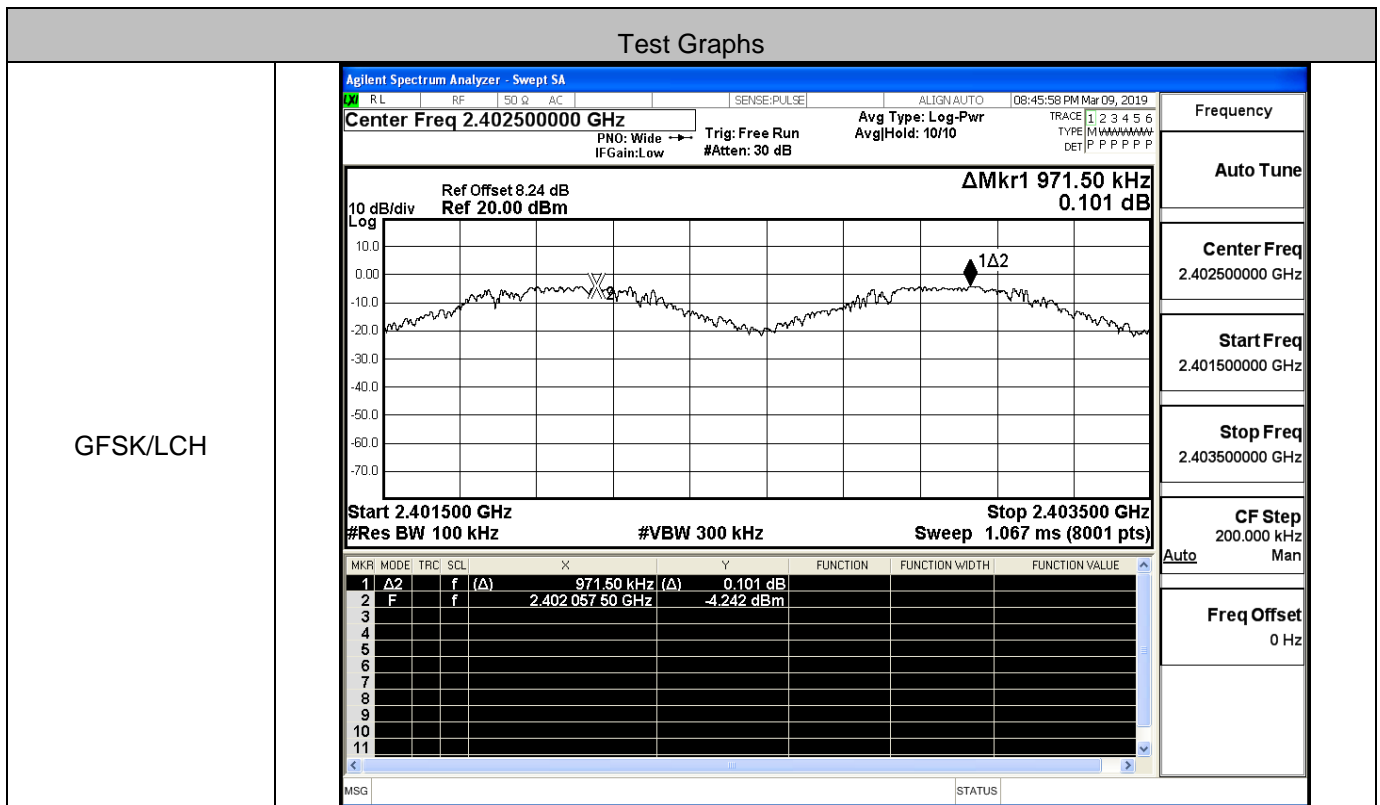
8DPSK/HCH



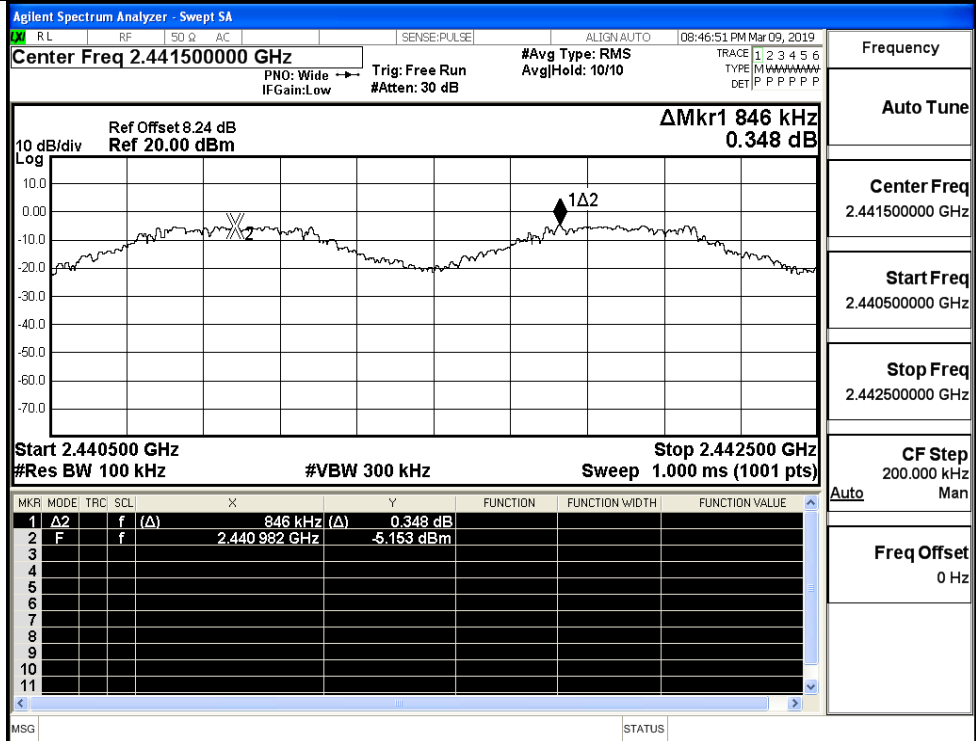
Frequency	2.480000000 GHz
Center Freq	2.480000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

A.3 Carrier Frequency Separation

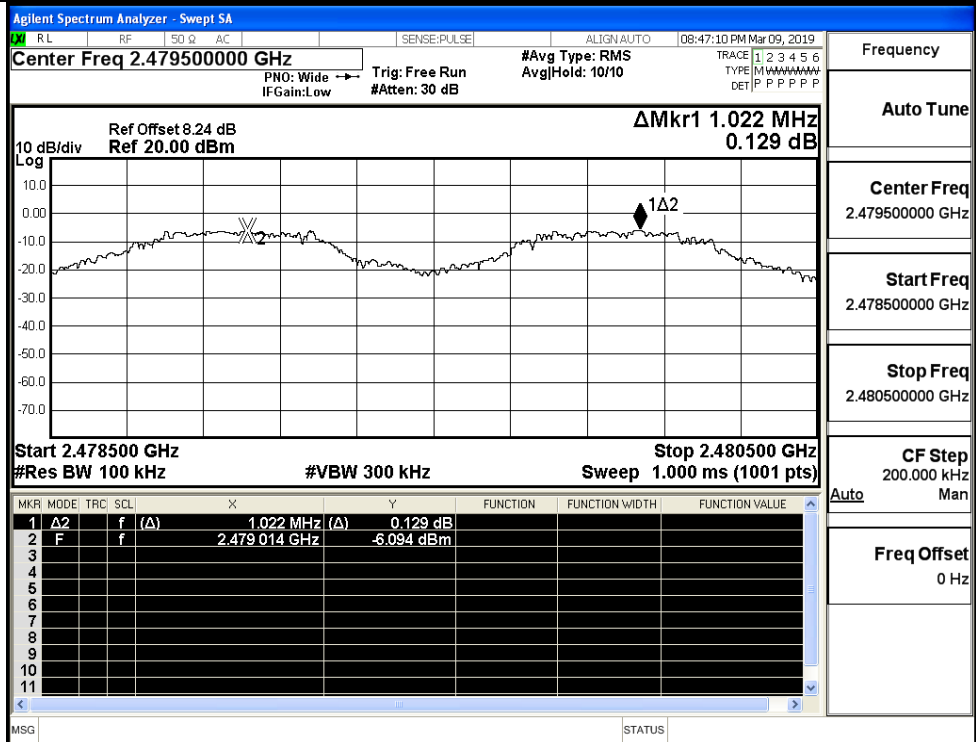
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.972	0.735	PASS
	MCH	0.846	0.735	PASS
	HCH	1.022	0.735	PASS
π/4DQPSK	LCH	0.984	0.897	PASS
	MCH	0.984	0.897	PASS
	HCH	1.004	0.897	PASS
8DPSK	LCH	0.916	0.898	PASS
	MCH	1.006	0.898	PASS
	HCH	0.990	0.898	PASS



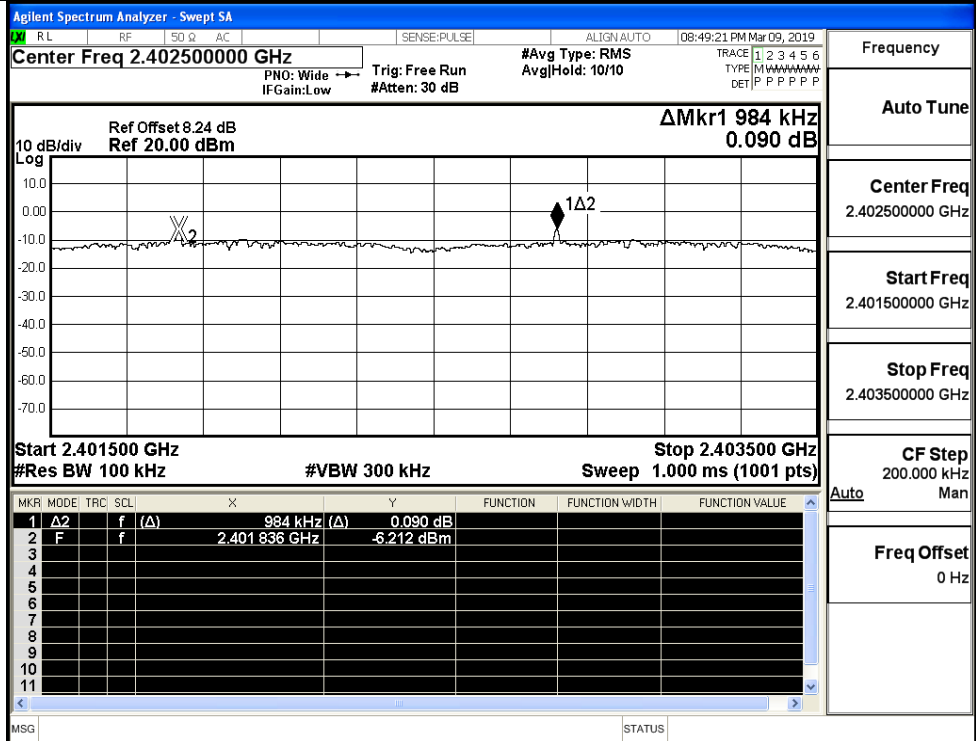
GFSK/MCH



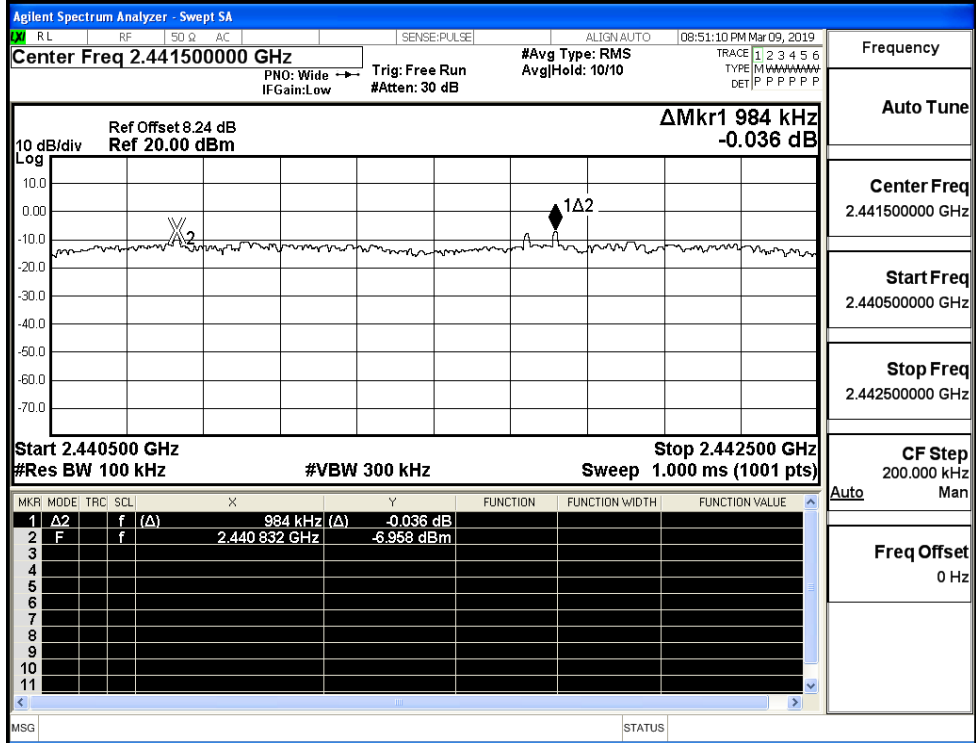
GFSK/HCH



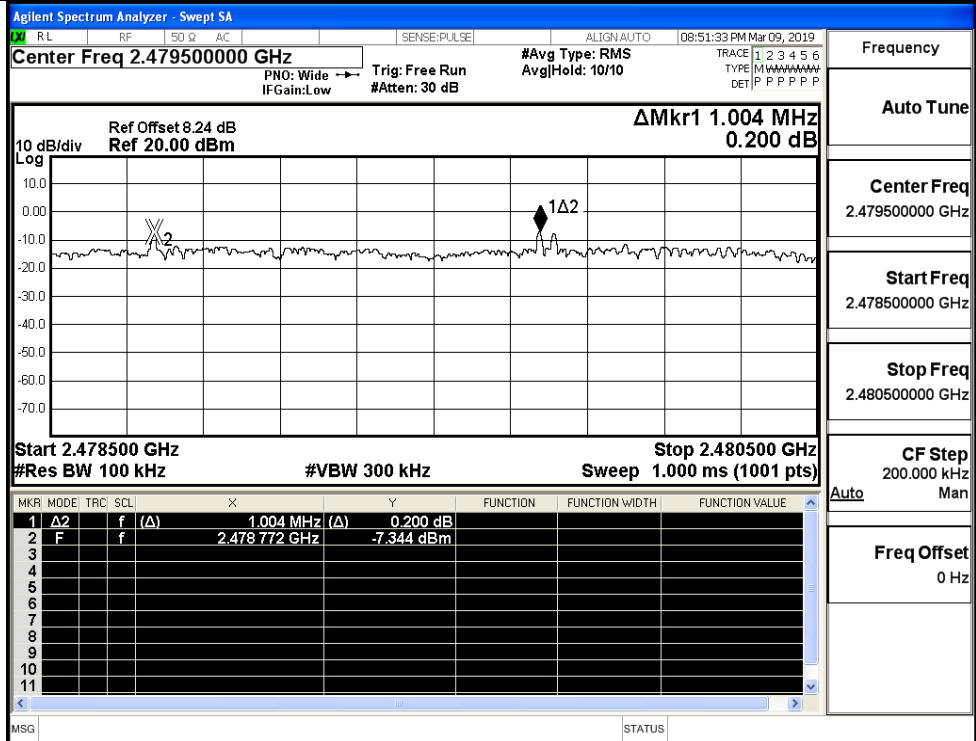
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH

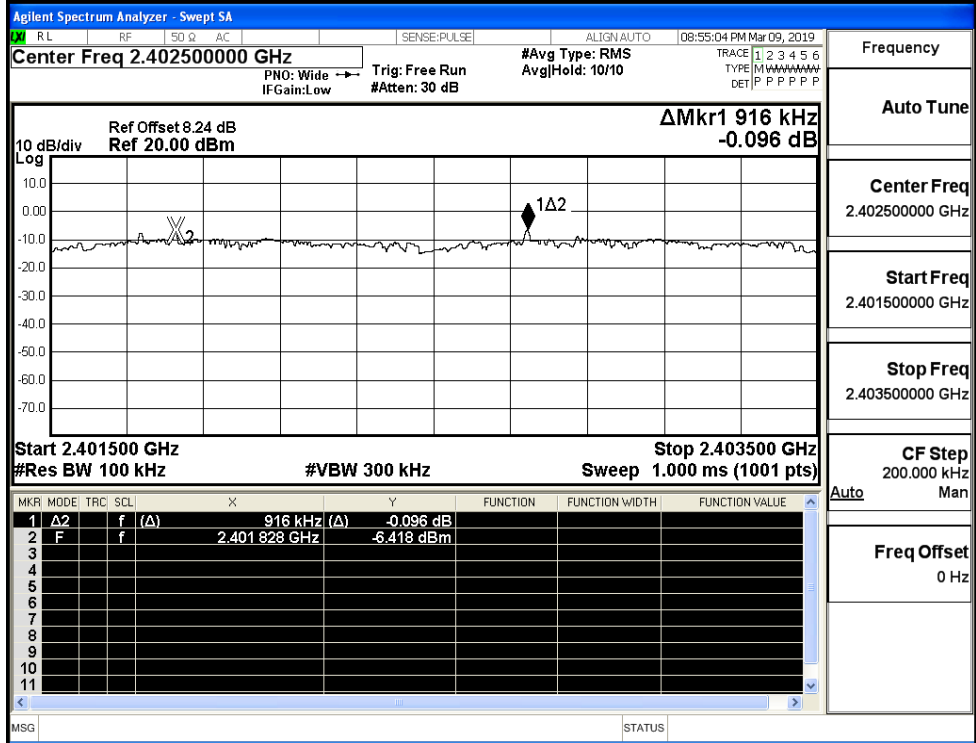


π/4DQPSK/HCH



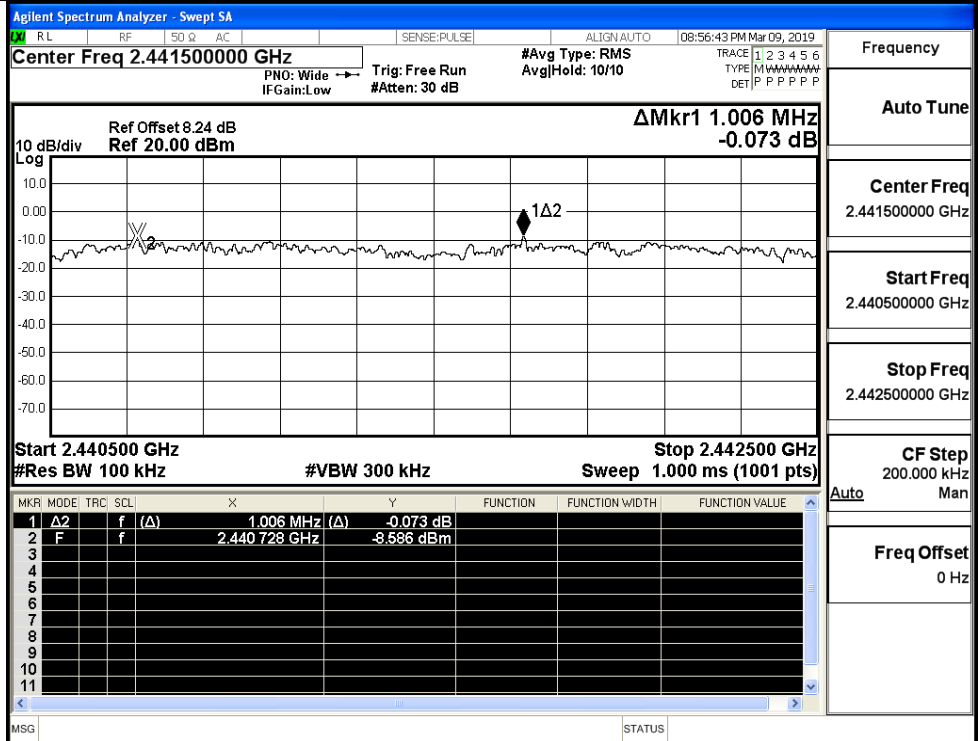
Frequency
Auto Tune
Center Freq 2.479500000 GHz
Start Freq 2.478500000 GHz
Stop Freq 2.480500000 GHz
CF Step 200.000 kHz Auto Man
Freq Offset 0 Hz

8DPSK/LCH

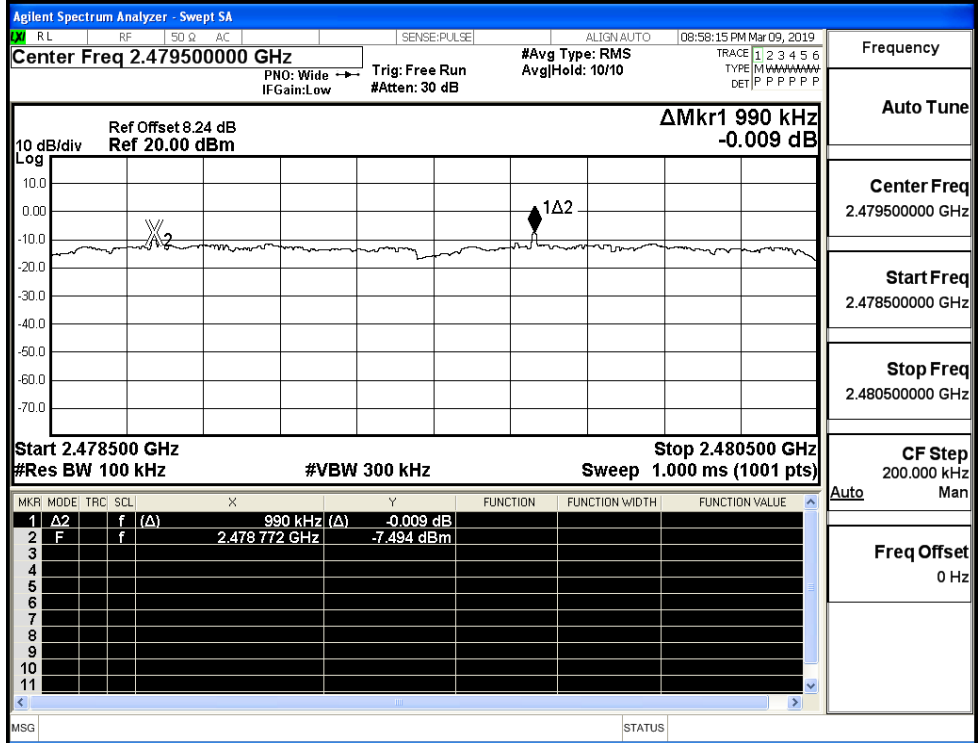


Frequency
Auto Tune
Center Freq 2.402500000 GHz
Start Freq 2.401500000 GHz
Stop Freq 2.403500000 GHz
CF Step 200.000 kHz Auto Man
Freq Offset 0 Hz

8DPSK/MCH



8DPSK/HCH



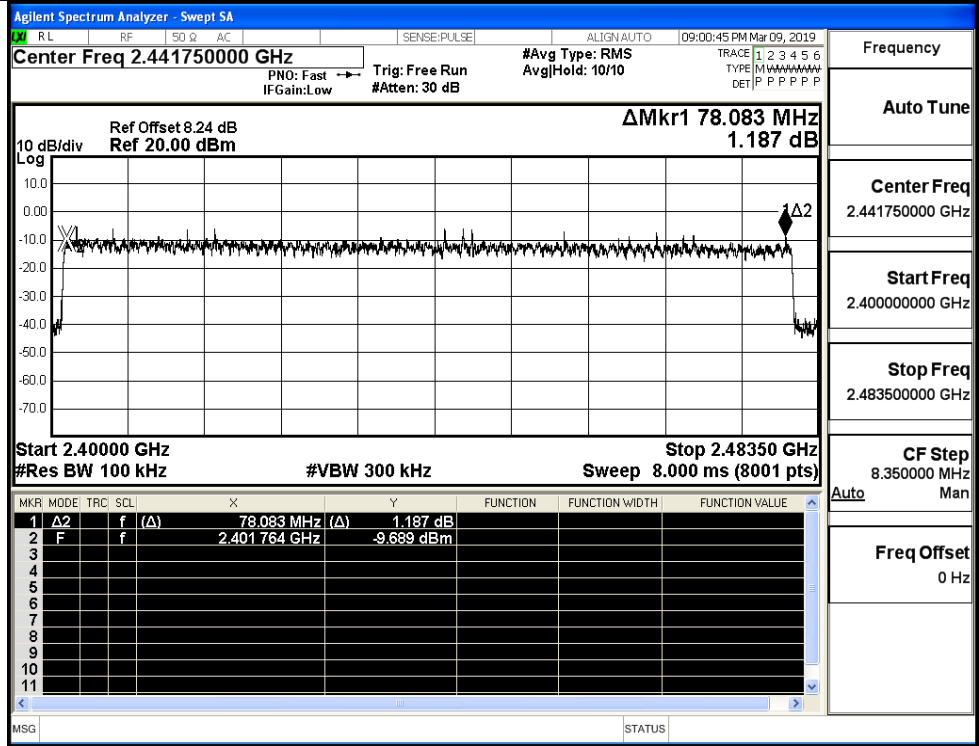
A.4 Hopping Channel Number

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

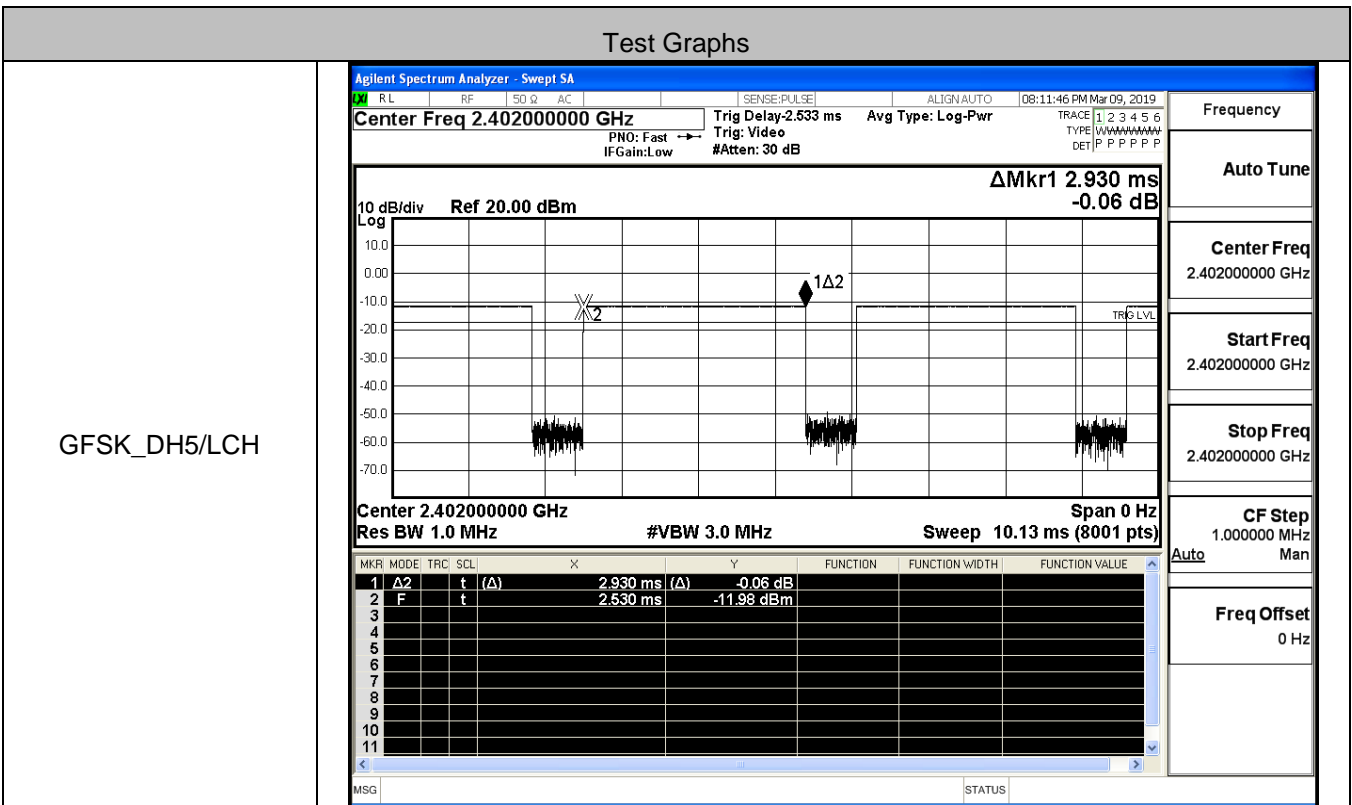
GFSK/Hop	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.441750000 GHz Ref Offset 8.24 dB Ref 20.00 dBm ΔMkr1 78.020 MHz -1.672 dB Start 2.40000 GHz Stop 2.48350 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRC</th> <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>78.020 MHz (Δ)</td> <td>-1.672 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.401962 GHz</td> <td>-3.903 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ2	f	(Δ)	78.020 MHz (Δ)	-1.672 dB				2	F	f		2.401962 GHz	-3.903 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 Man</p> <p>Freq Offset 0 Hz</p>
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	Δ2	f	(Δ)	78.020 MHz (Δ)	-1.672 dB																								
2	F	f		2.401962 GHz	-3.903 dBm																								
$\pi/4$ DQPSK/Hop	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.441750000 GHz Ref Offset 8.24 dB Ref 20.00 dBm ΔMkr1 78.208 MHz -1.377 dB Start 2.40000 GHz Stop 2.48350 GHz #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>78.208 MHz (Δ)</td> <td>-1.377 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.401816 GHz</td> <td>-9.935 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	Δ2	f	(Δ)	78.208 MHz (Δ)	-1.377 dB				2	F	f		2.401816 GHz	-9.935 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 Man</p> <p>Freq Offset 0 Hz</p>
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																					
1	Δ2	f	(Δ)	78.208 MHz (Δ)	-1.377 dB																								
2	F	f		2.401816 GHz	-9.935 dBm																								

8DPSK/Hop

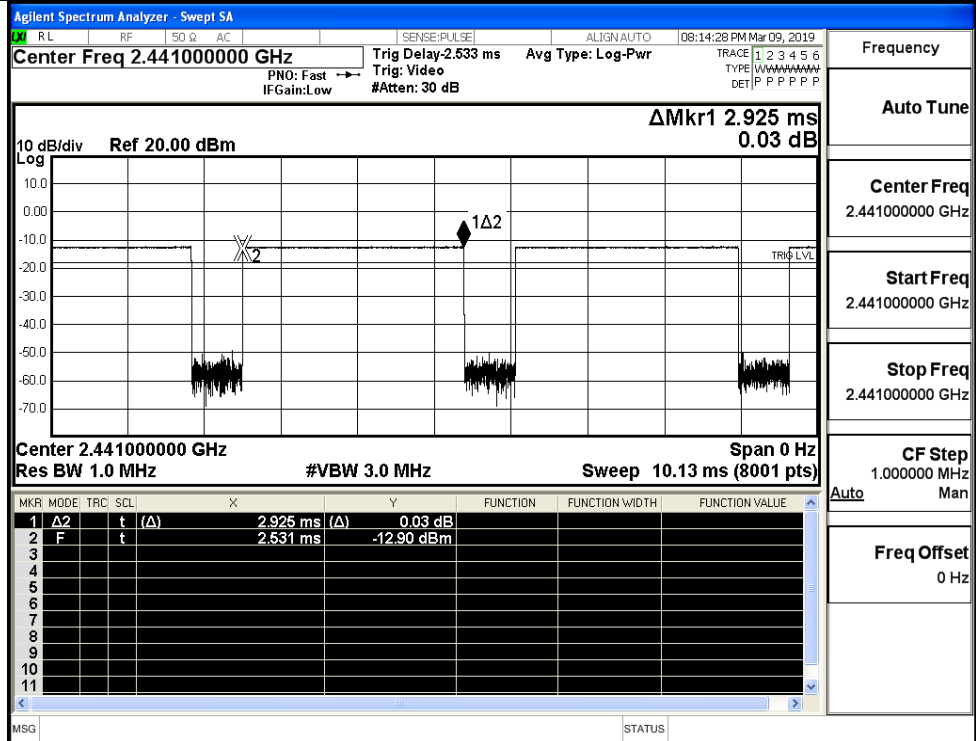


A.5 Dwell Time

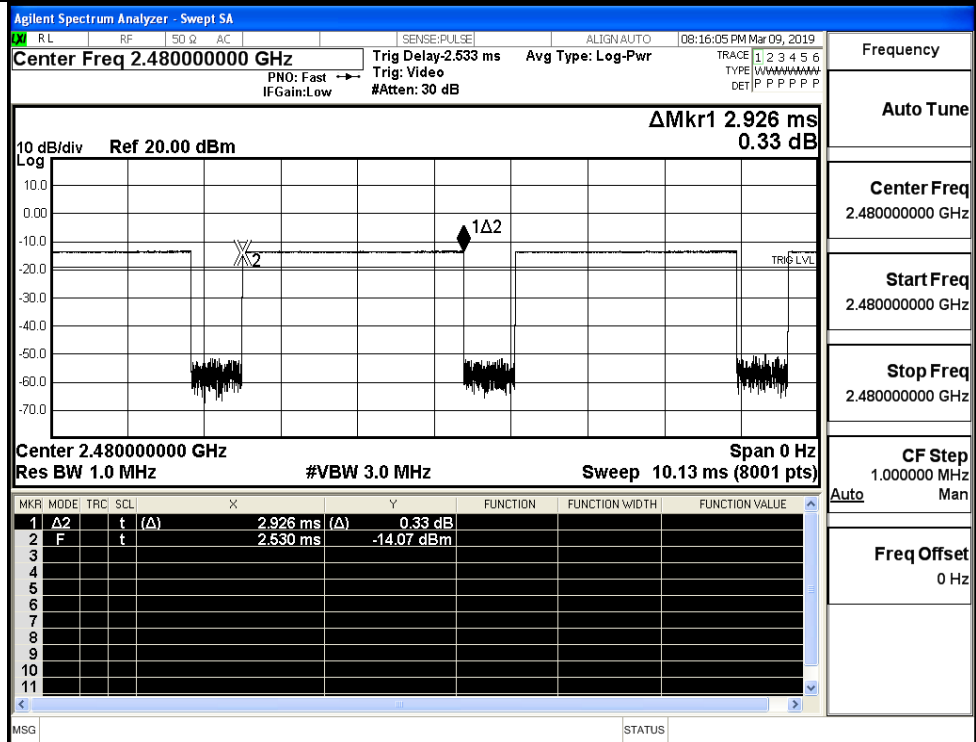
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.93	106.7	0.313	0.4	PASS
	DH5	MCH	2.93	106.7	0.313	0.4	PASS
	DH5	HCH	2.93	106.7	0.313	0.4	PASS
π/4DQPSK	2DH5	LCH	2.93	106.7	0.313	0.4	PASS
	2DH5	MCH	2.93	106.7	0.313	0.4	PASS
	2DH5	HCH	2.93	106.7	0.313	0.4	PASS
8DPSK	3DH5	LCH	2.93	106.7	0.313	0.4	PASS
	3DH5	MCH	2.93	106.7	0.313	0.4	PASS
	3DH5	HCH	2.93	106.7	0.313	0.4	PASS



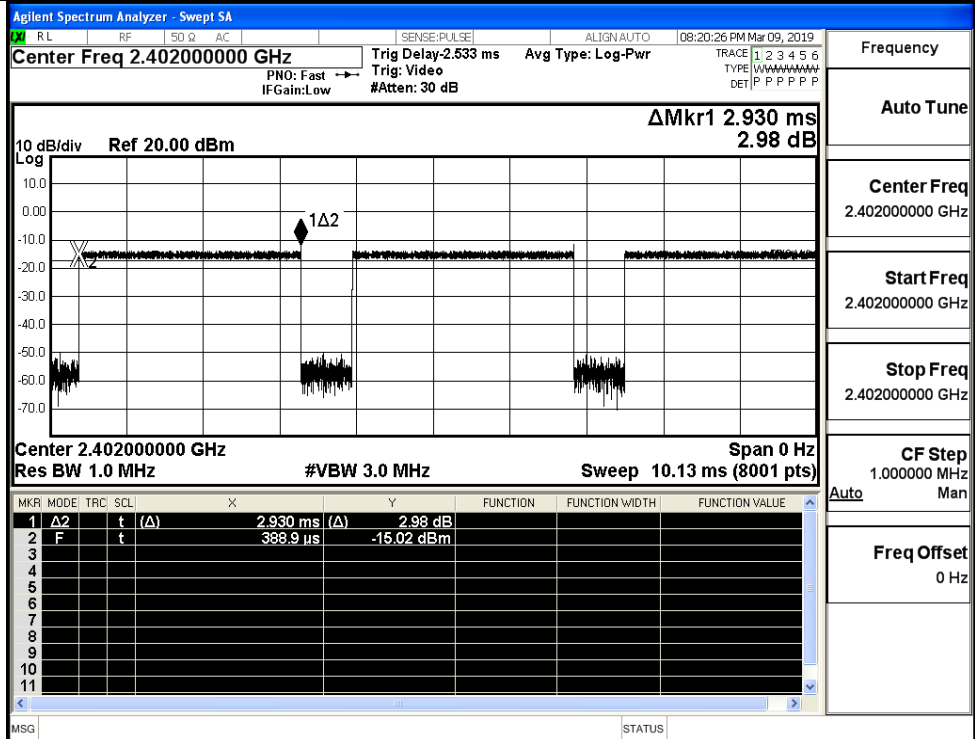
GFSK_DH5/MCH



GFSK_DH5/HCH

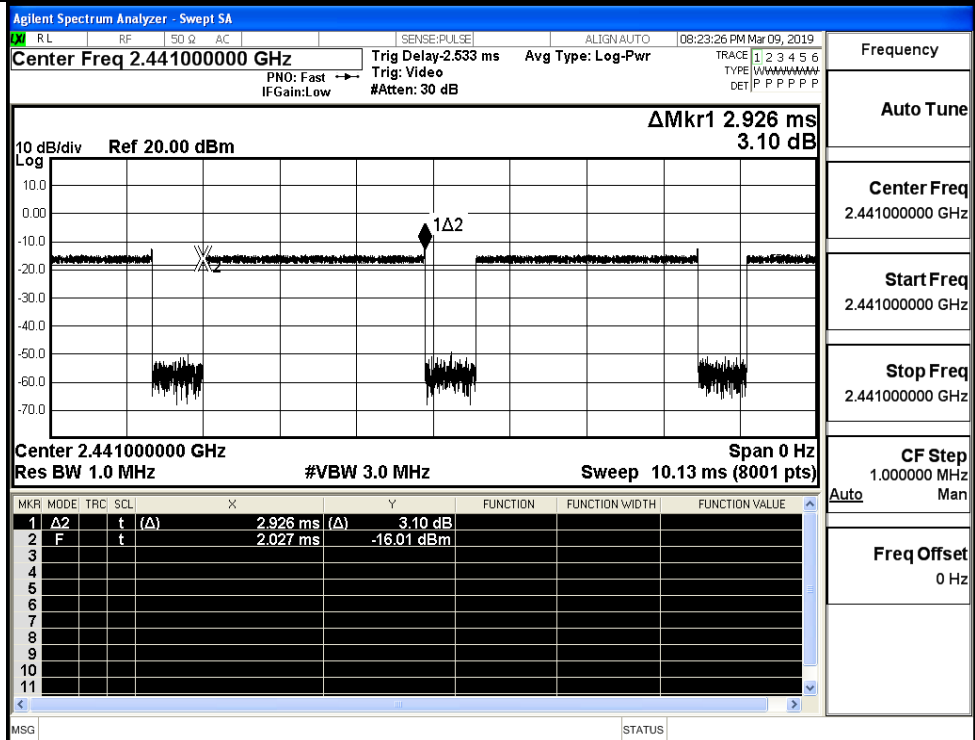


$\pi/4$ DQPSK
_2DH5/LCH



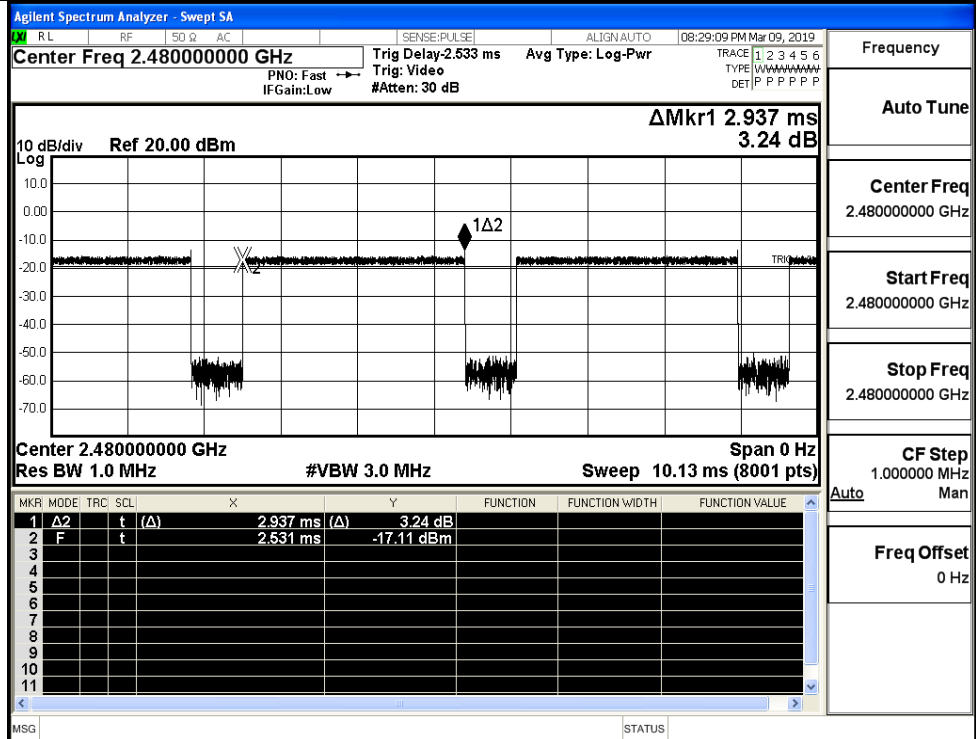
Frequency	2.402000000 GHz
Auto Tune	
Center Freq	2.402000000 GHz
Start Freq	2.402000000 GHz
Stop Freq	2.402000000 GHz
CF Step	1.000000 MHz
Auto	Man
Freq Offset	0 Hz

$\pi/4$ DQPSK
_2DH5/MCH

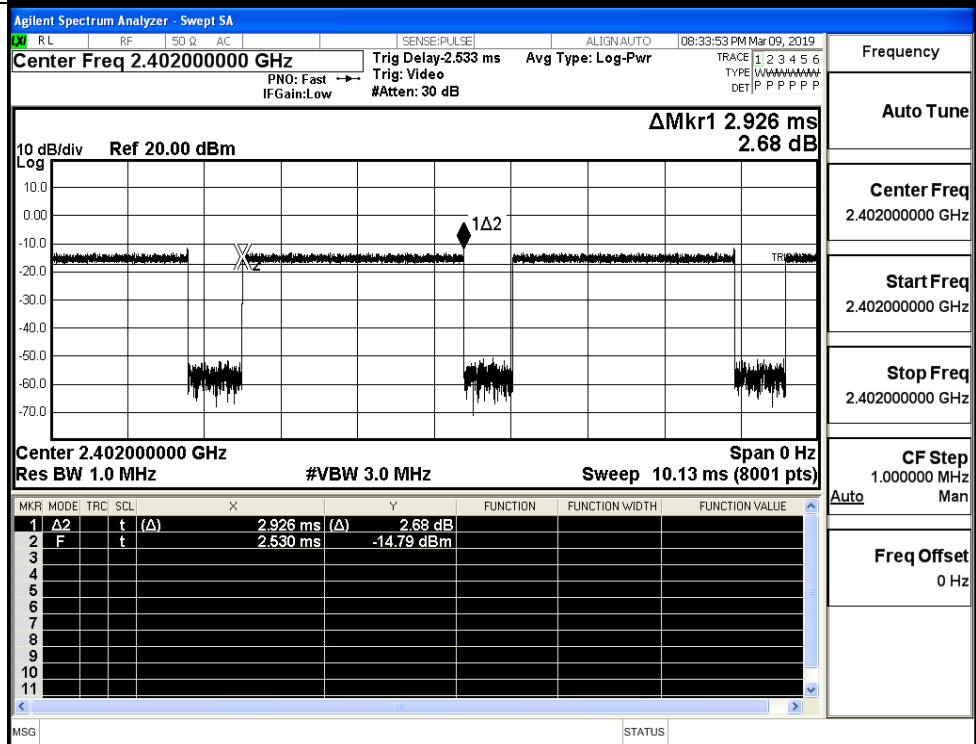


Frequency	2.441000000 GHz
Auto Tune	
Center Freq	2.441000000 GHz
Start Freq	2.441000000 GHz
Stop Freq	2.441000000 GHz
CF Step	1.000000 MHz
Auto	Man
Freq Offset	0 Hz

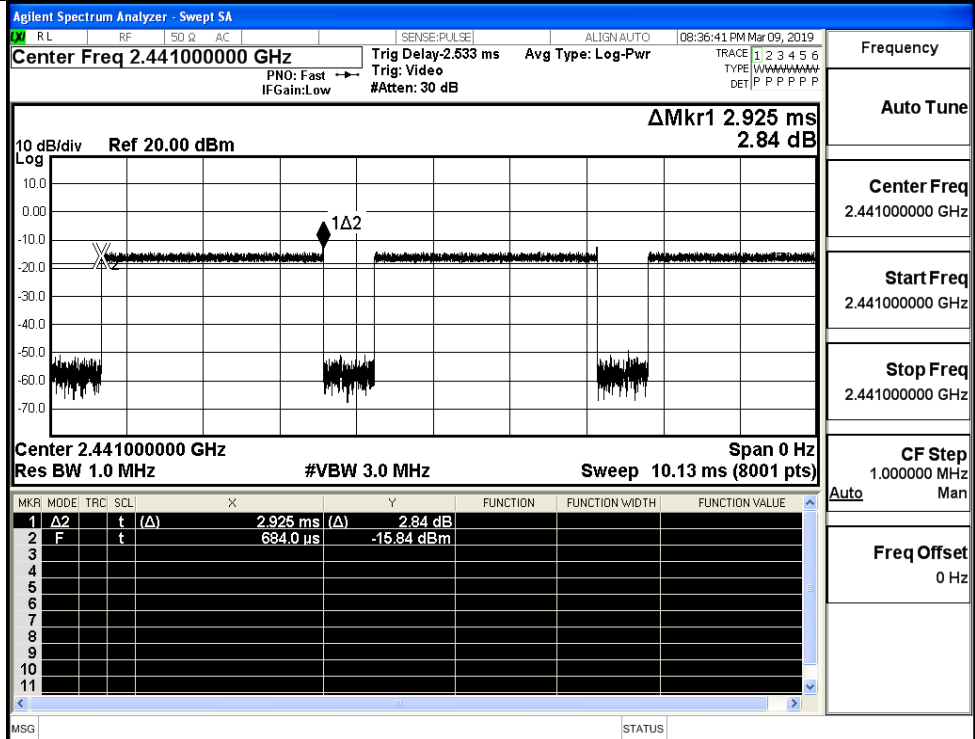
$\pi/4$ DQPSK
_2DH5/HCH



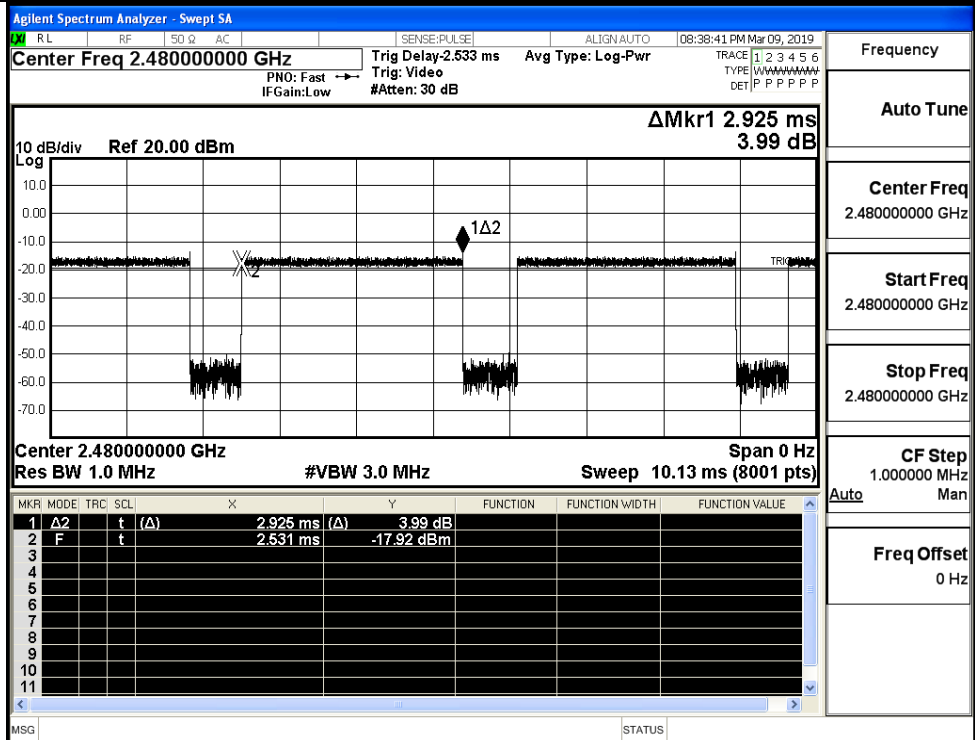
8DPSK_3DH5/LCH



8DPSK_3DH5/MCH



8DPSK_3DH5/HCH

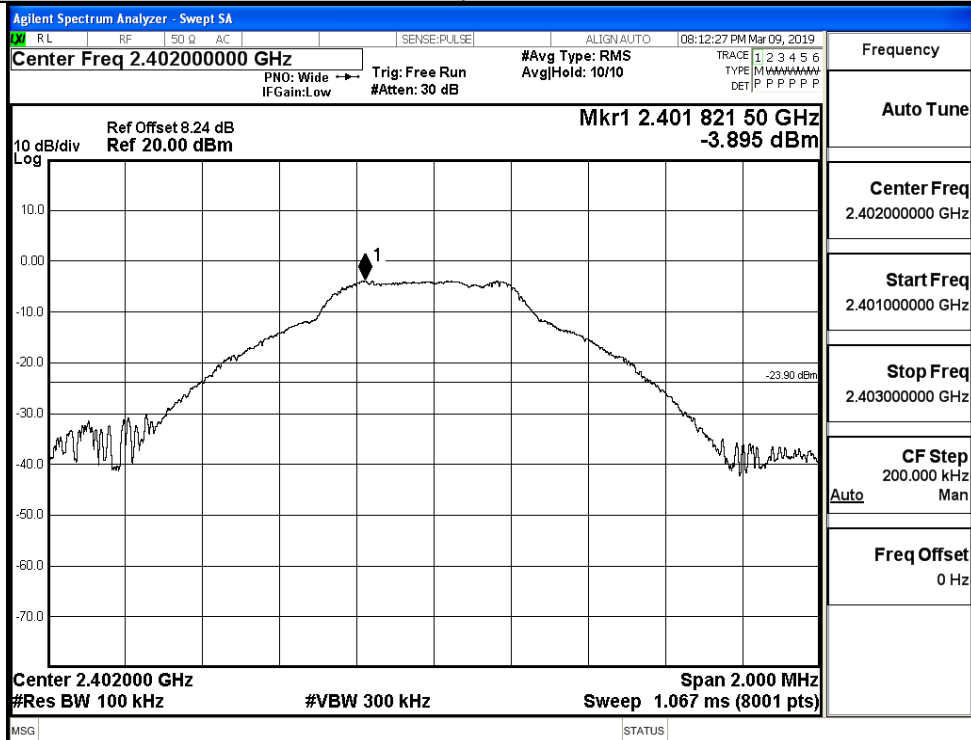


A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-3.895	-31.861	-23.895	PASS
	MCH	-4.704	-31.563	-24.704	PASS
	HCH	-5.71	-30.547	-25.710	PASS
$\pi/4$ DQPSK	LCH	-5.356	-29.891	-25.356	PASS
	MCH	-6.311	-27.971	-26.311	PASS
	HCH	-7.276	-31.607	-27.276	PASS
8DPSK	LCH	-4.997	-29.984	-24.997	PASS
	MCH	-6.064	-30.951	-26.064	PASS
	HCH	-8.067	-31.080	-28.067	PASS

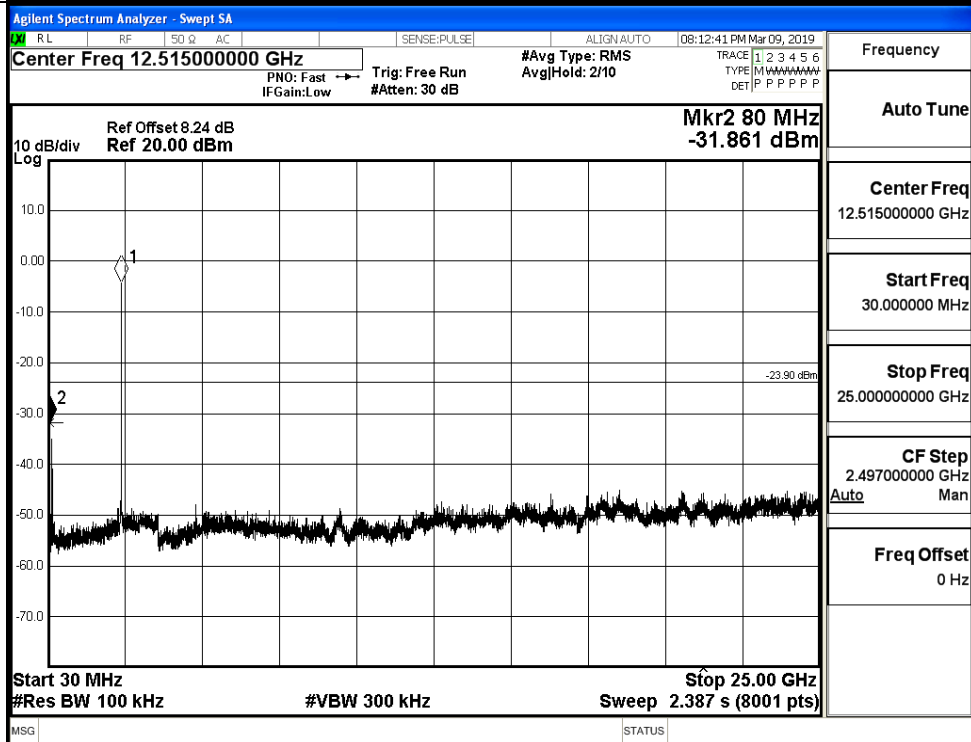
GFSK_LCH_Graphs

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

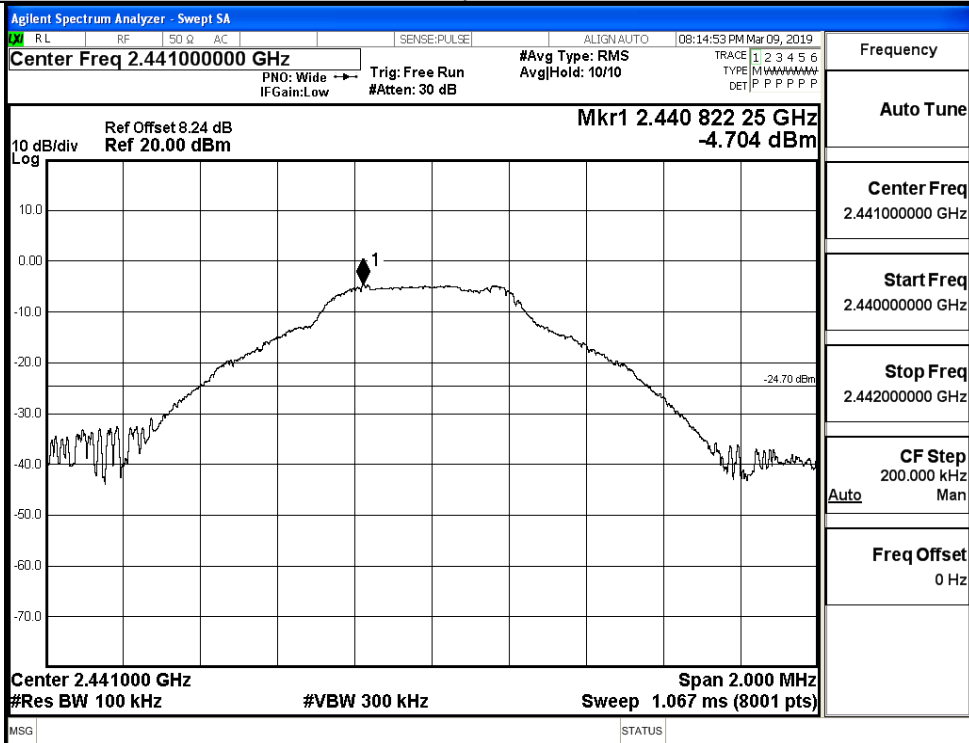
Puw



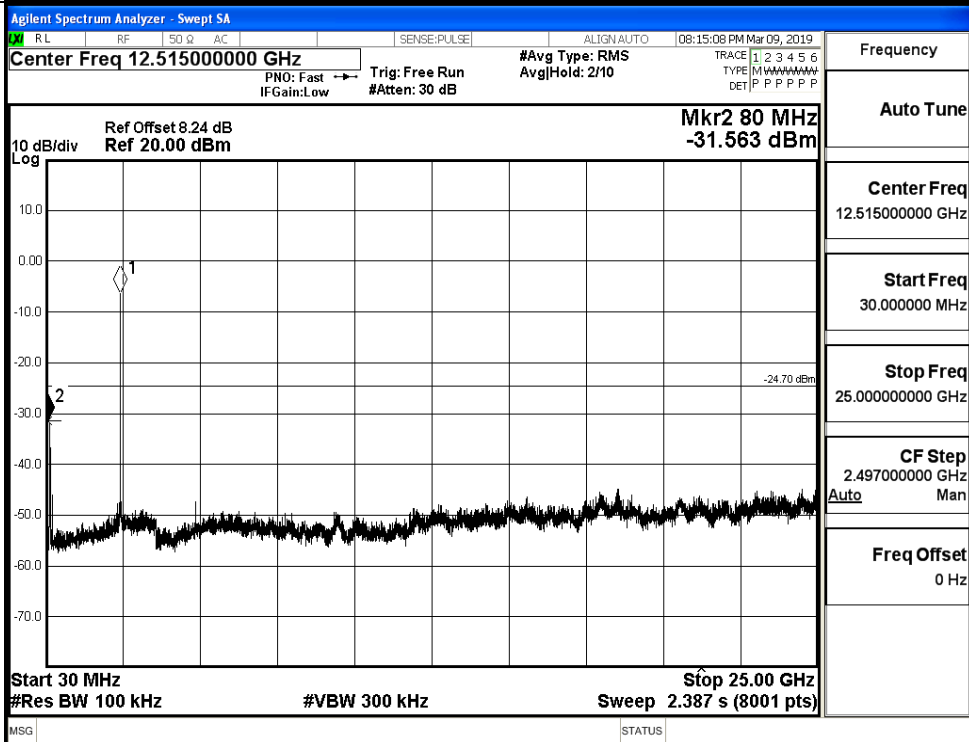
Frequency	
Auto Tune	
Center Freq	12.515000000 GHz
Start Freq	30.000000 MHz
Stop Freq	25.000000000 GHz
CF Step	2.497000000 GHz Auto Man
Freq Offset	0 Hz

GFSK_MCH_Graphs

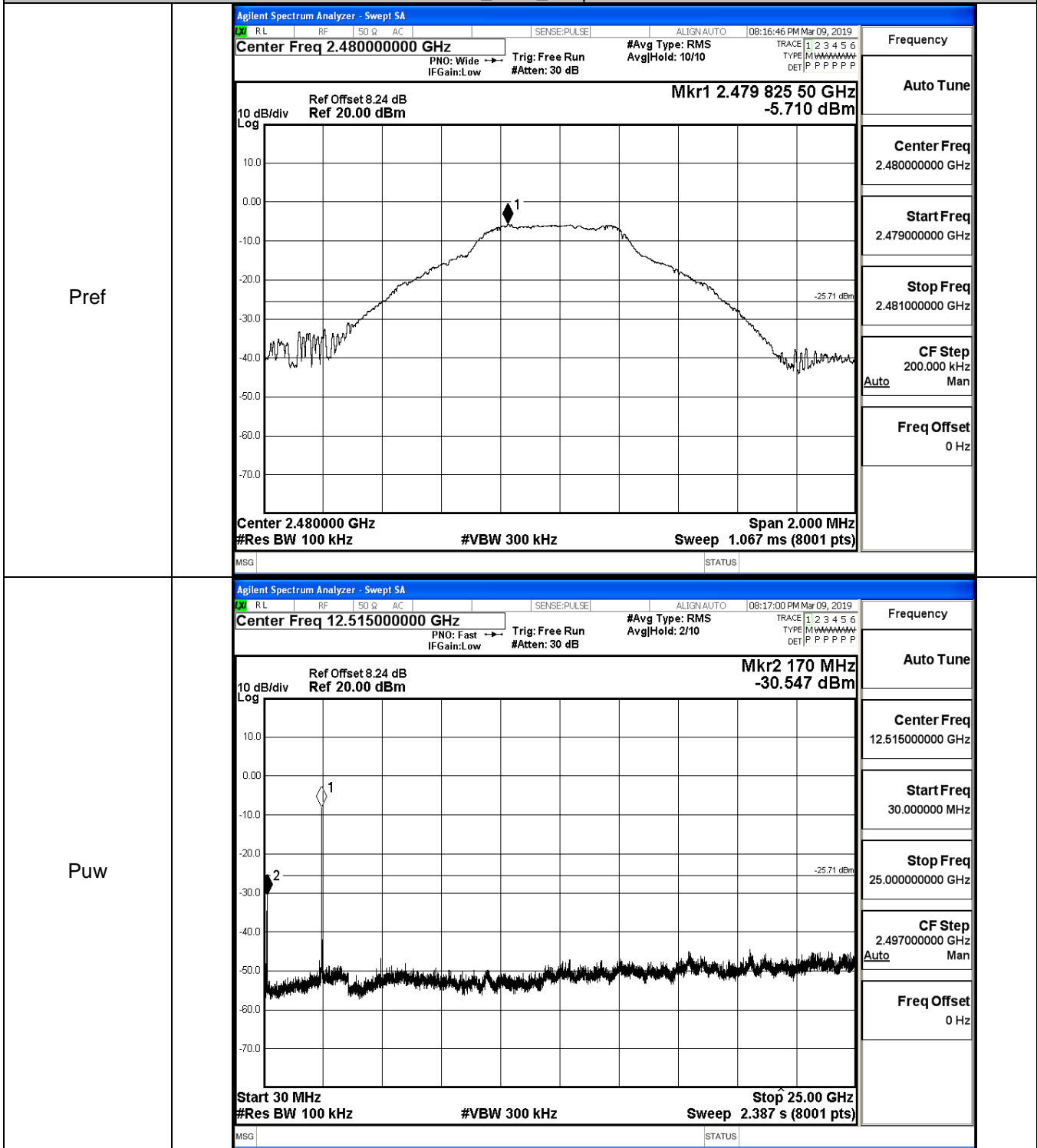
Pref



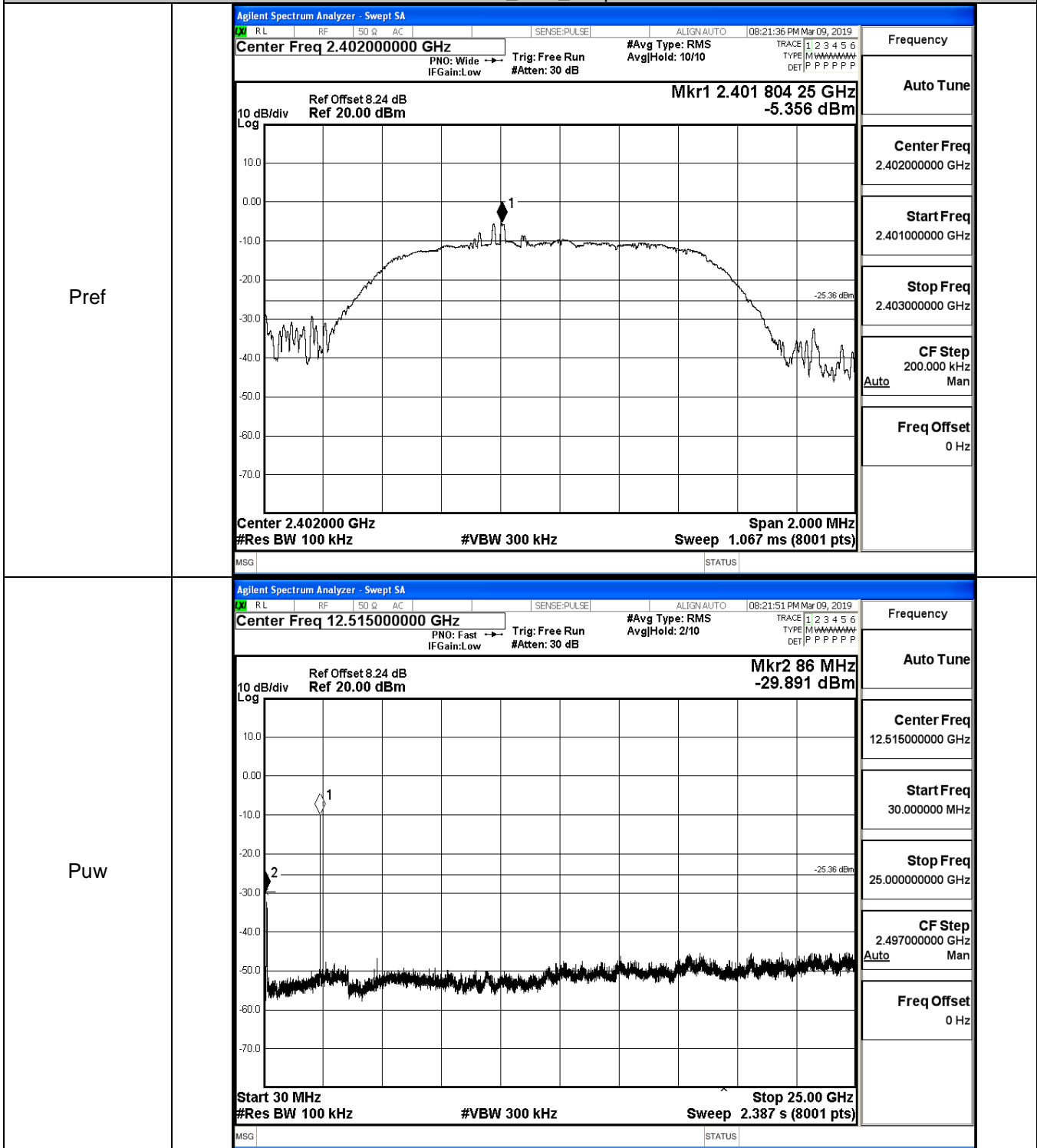
Puw



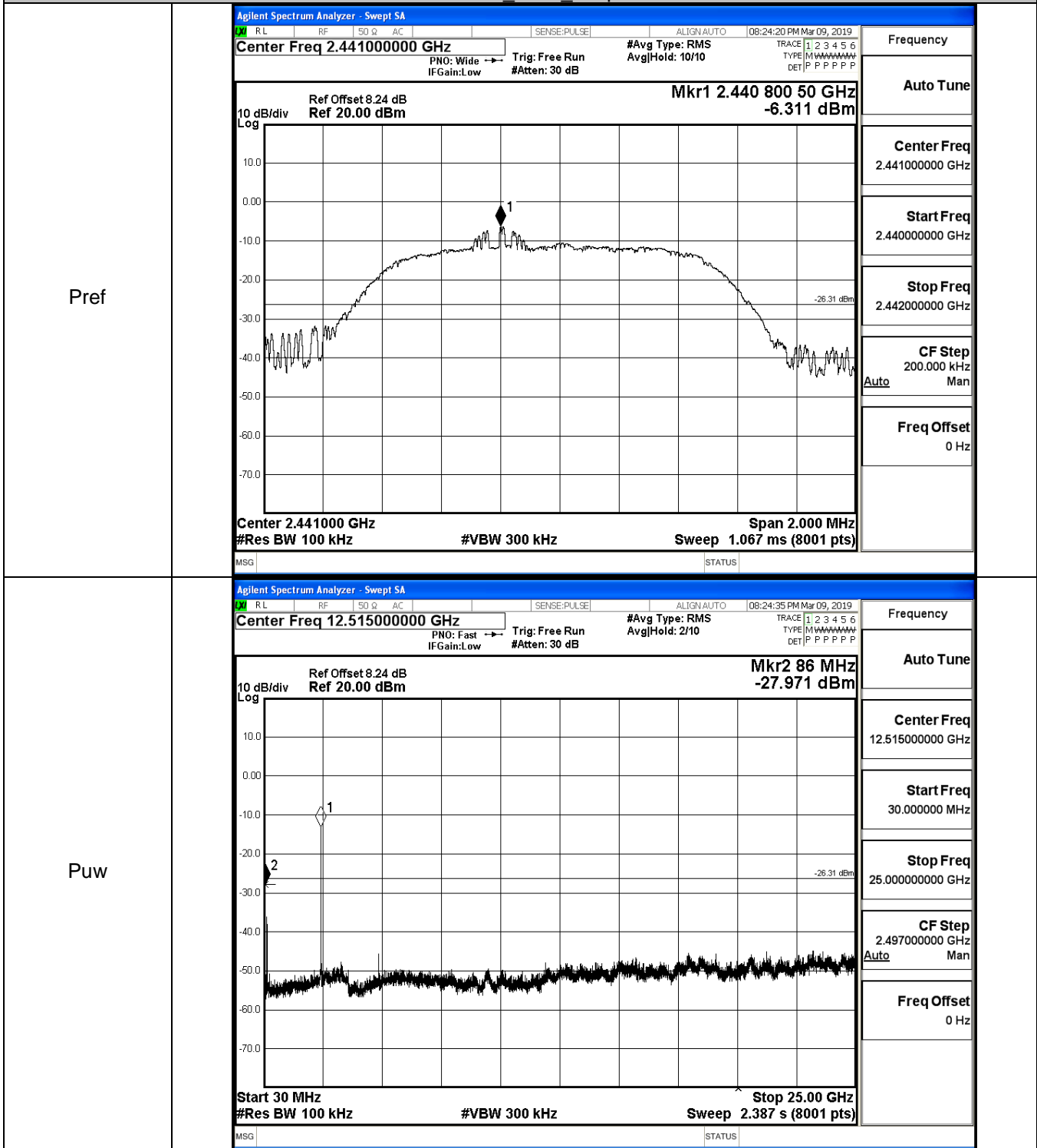
GFSK_HCH_Graphs



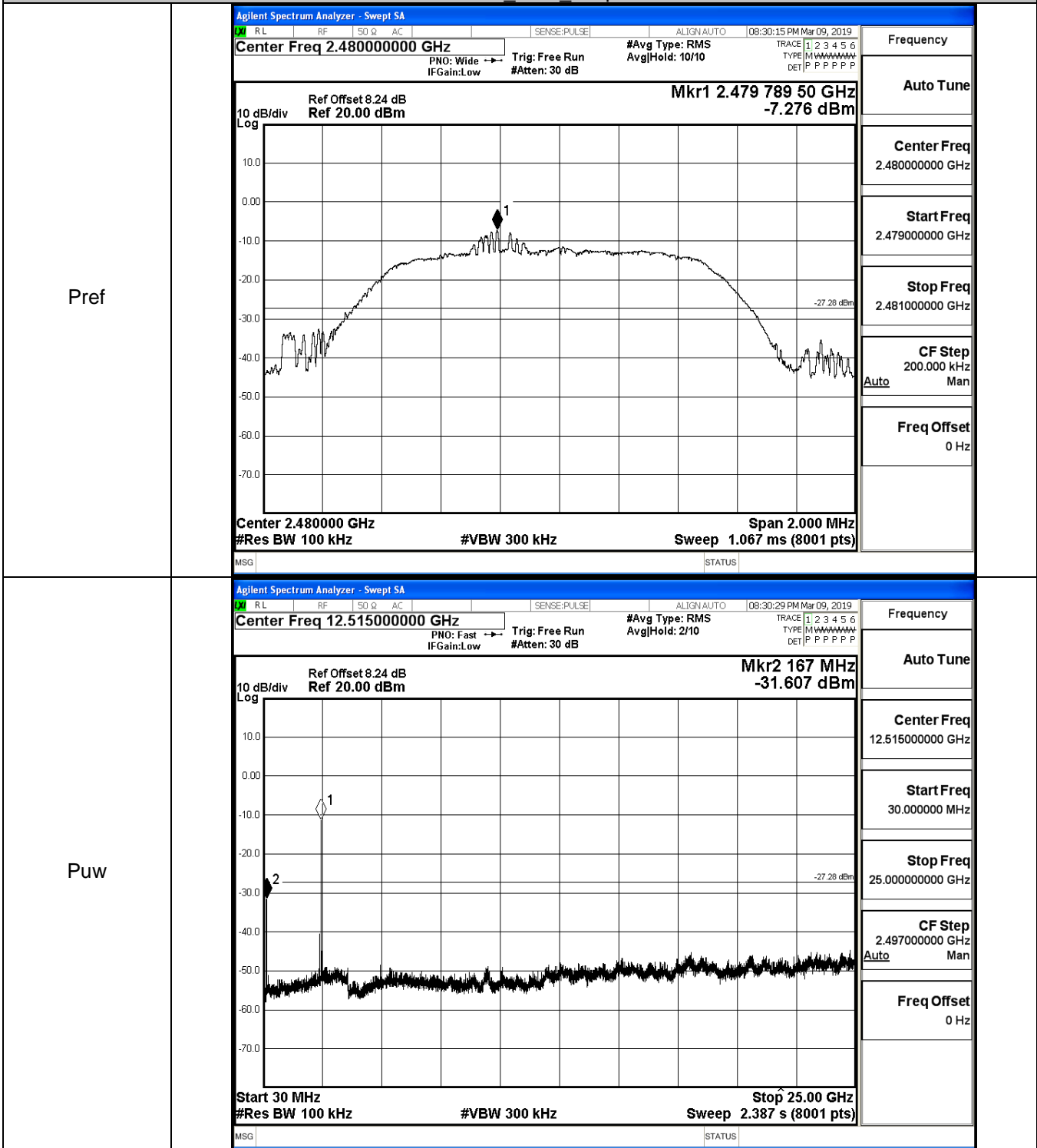
$\pi/4$ DQPSK_LCH_Graphs



$\pi/4$ DQPSK_MCH_Graphs

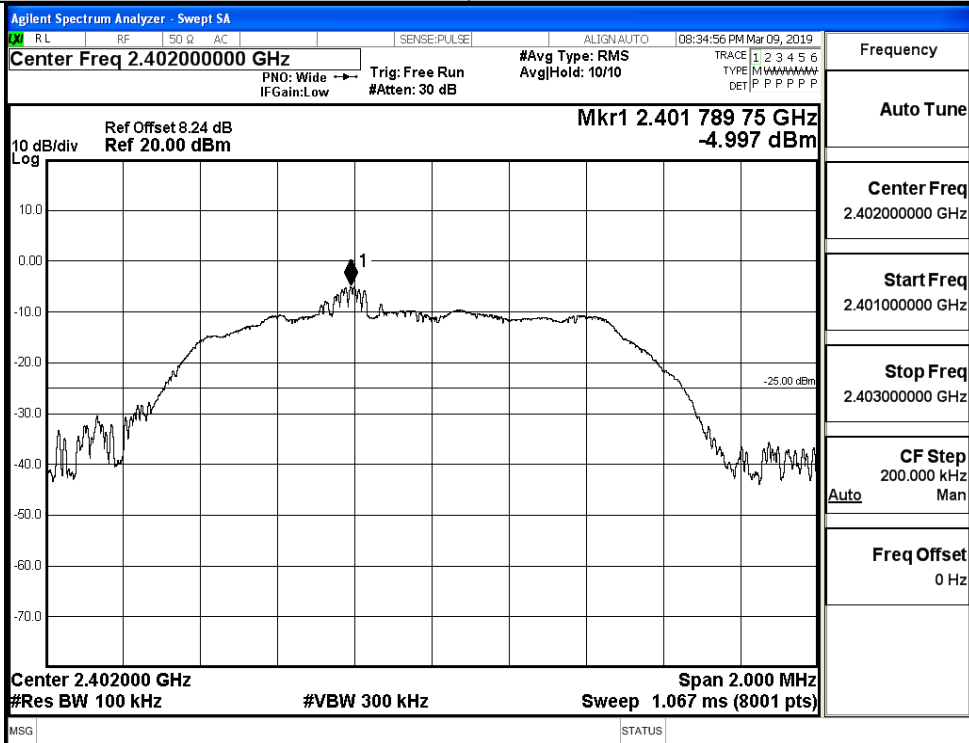


$\pi/4$ DQPSK_HCH_Graphs

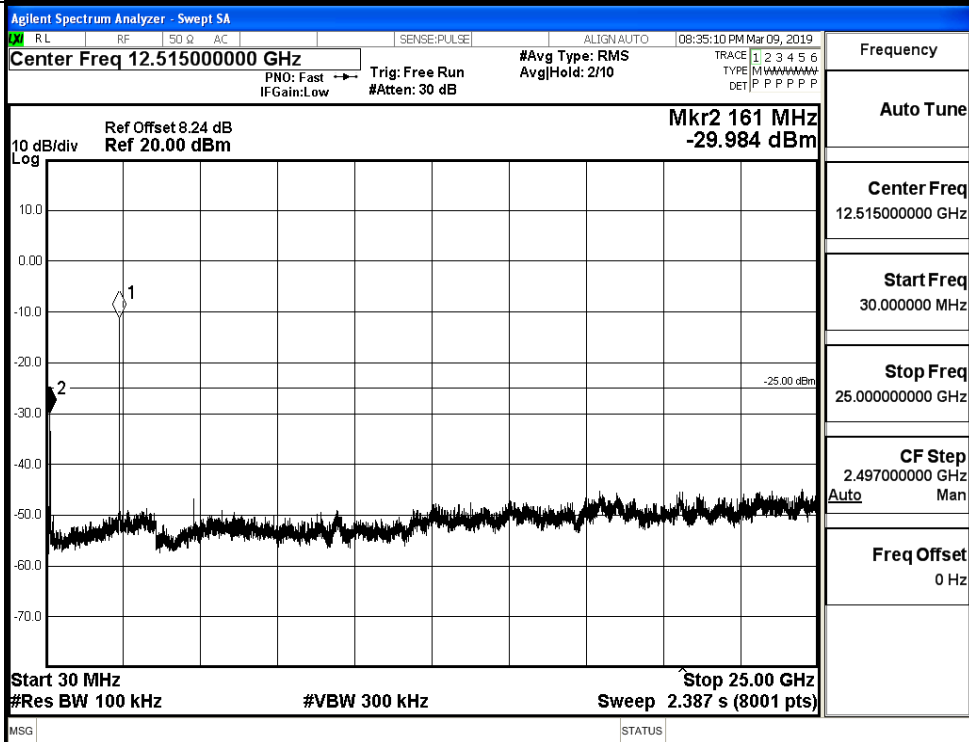


8DPSK_LCH_Graphs

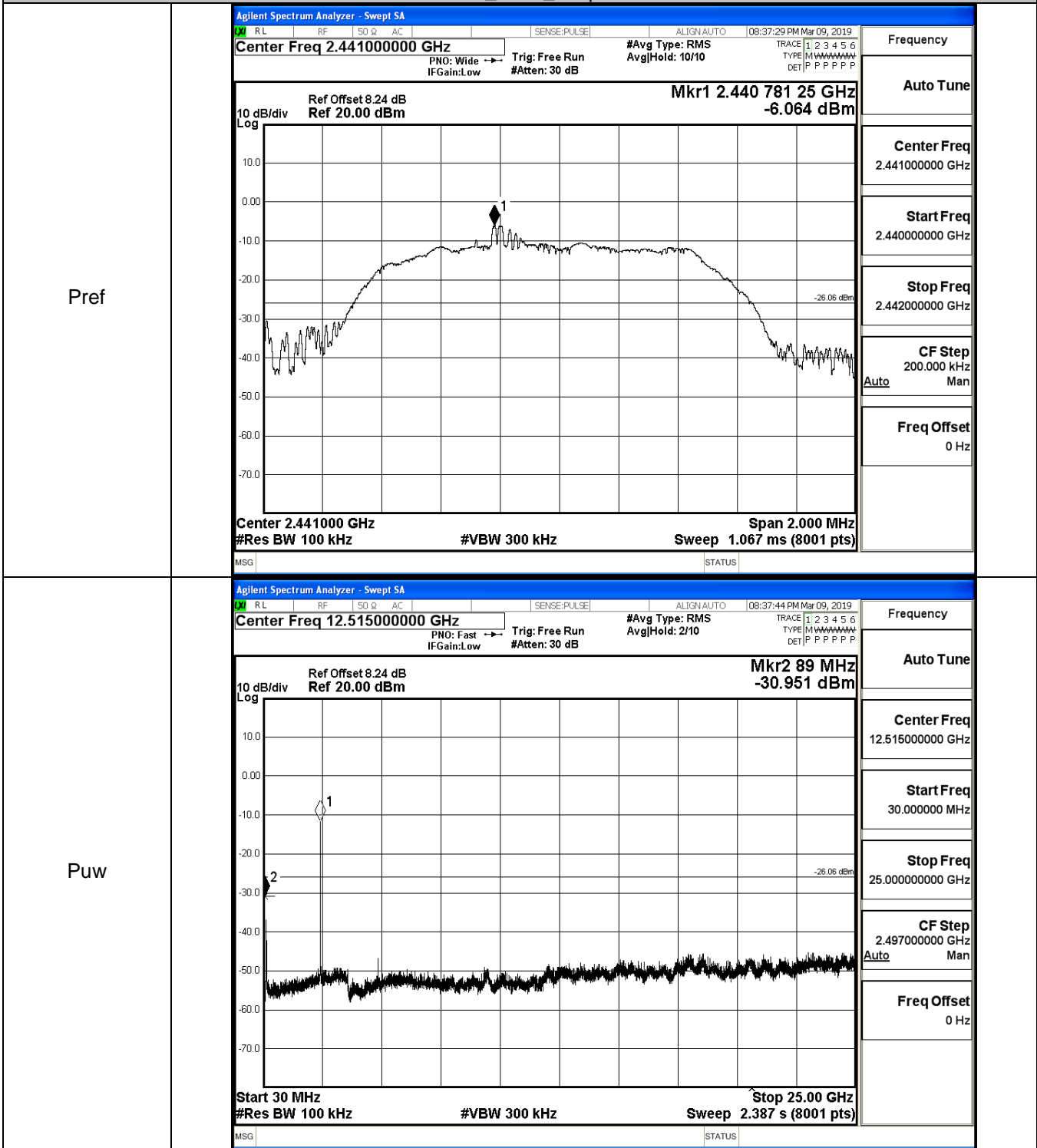
Pref



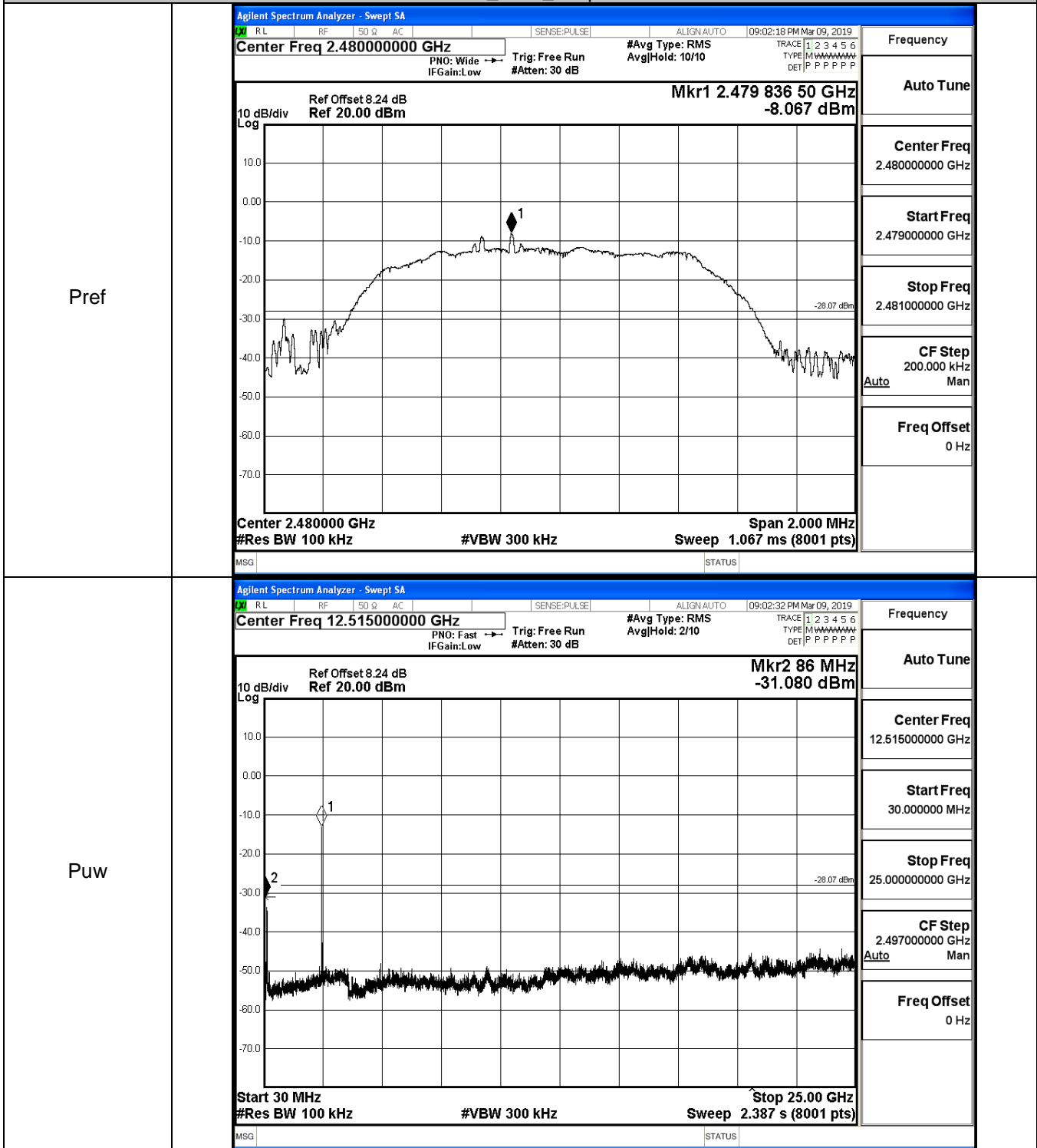
Puw



8DPSK_MCH_Graphs



8DPSK_HCH_Graphs

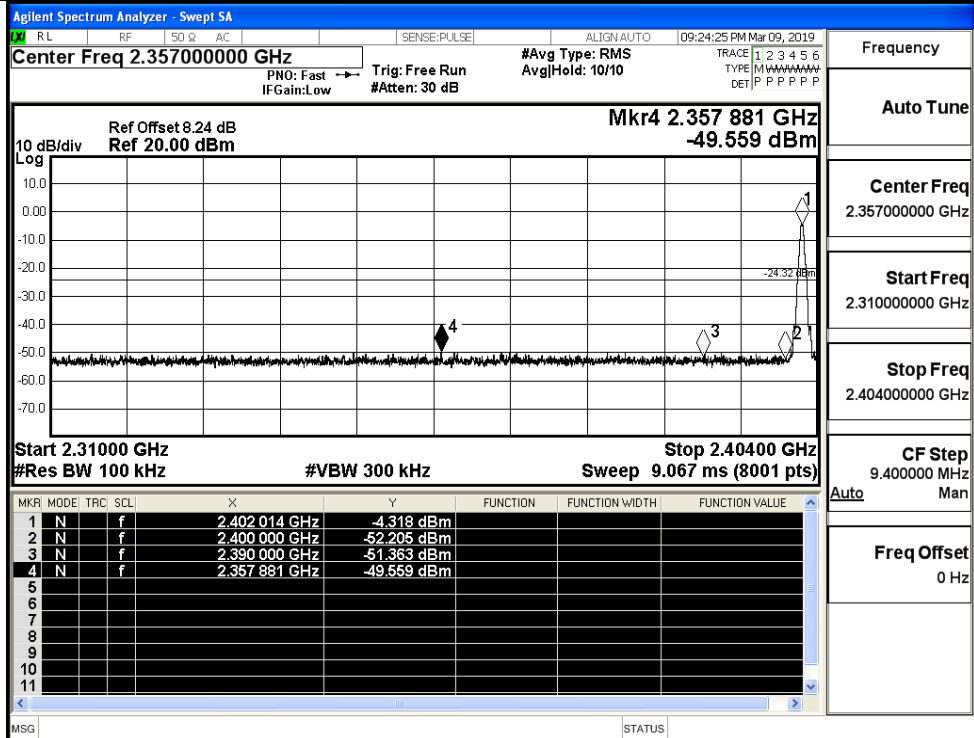


A.7 Band-edge for RF Conducted Emissions

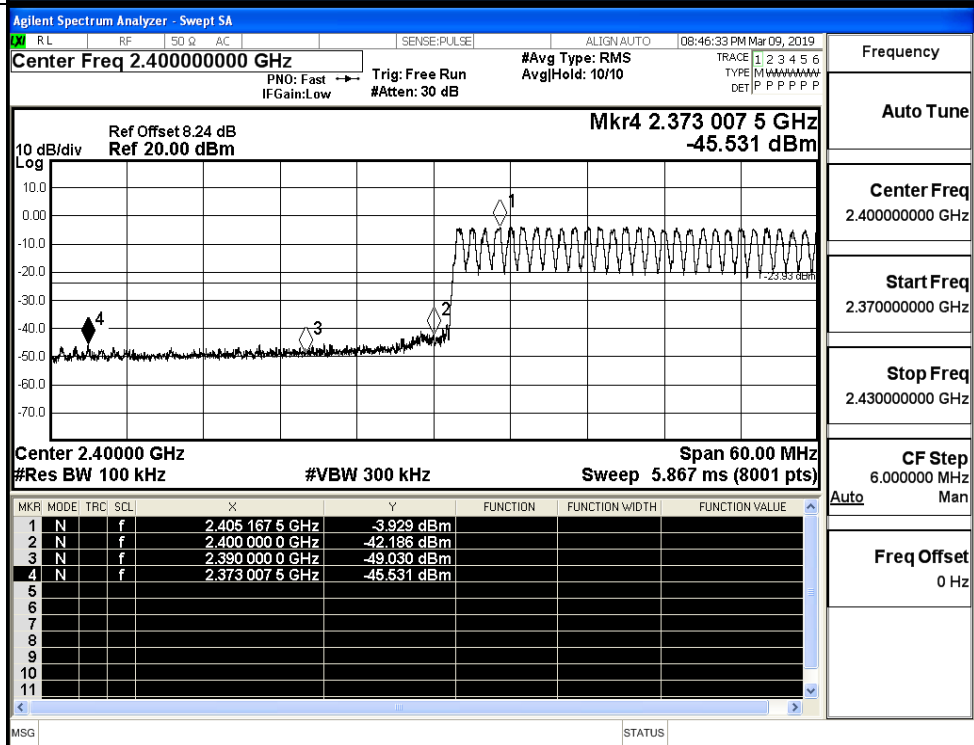
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-4.318	Off	-49.559	-24.32	PASS
			-3.929	On	-45.531	-23.93	PASS
	HCH	2480	-4.801	Off	-49.766	-24.8	PASS
			-5.241	On	-40.650	-25.24	PASS
$\pi/4$ DQPSK	LCH	2402	-5.401	Off	-49.201	-25.4	PASS
			-5.260	On	-47.236	-25.26	PASS
	HCH	2480	-5.883	Off	-49.634	-25.88	PASS
			-6.877	On	-40.012	-26.88	PASS
8DPSK	LCH	2402	-5.872	Off	-49.690	-25.87	PASS
			-5.445	On	-45.812	-25.45	PASS
	HCH	2480	-5.740	Off	-49.647	-25.74	PASS
			-6.418	On	-42.555	-26.42	PASS

Test Graphs

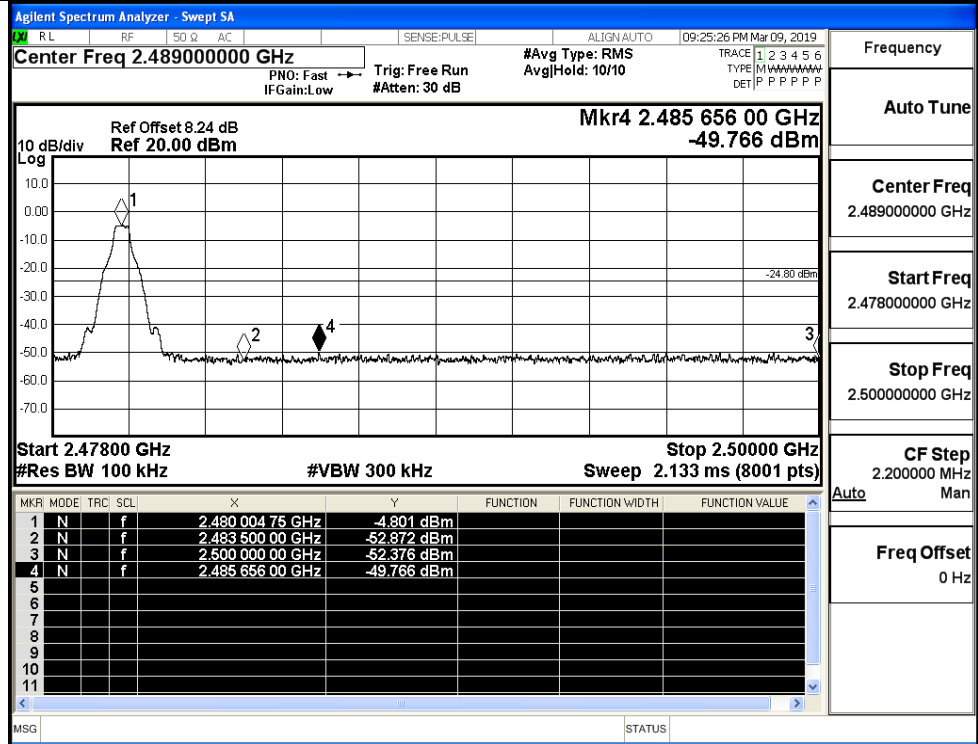
GFSK/LCH/No Hop



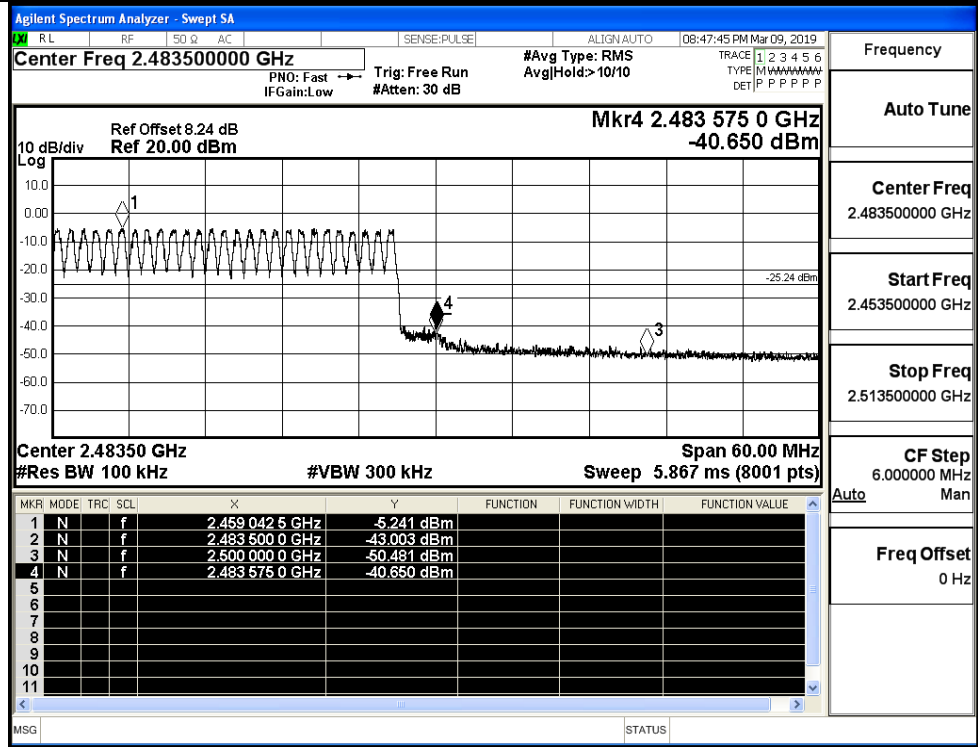
GFSK/LCH/Hop



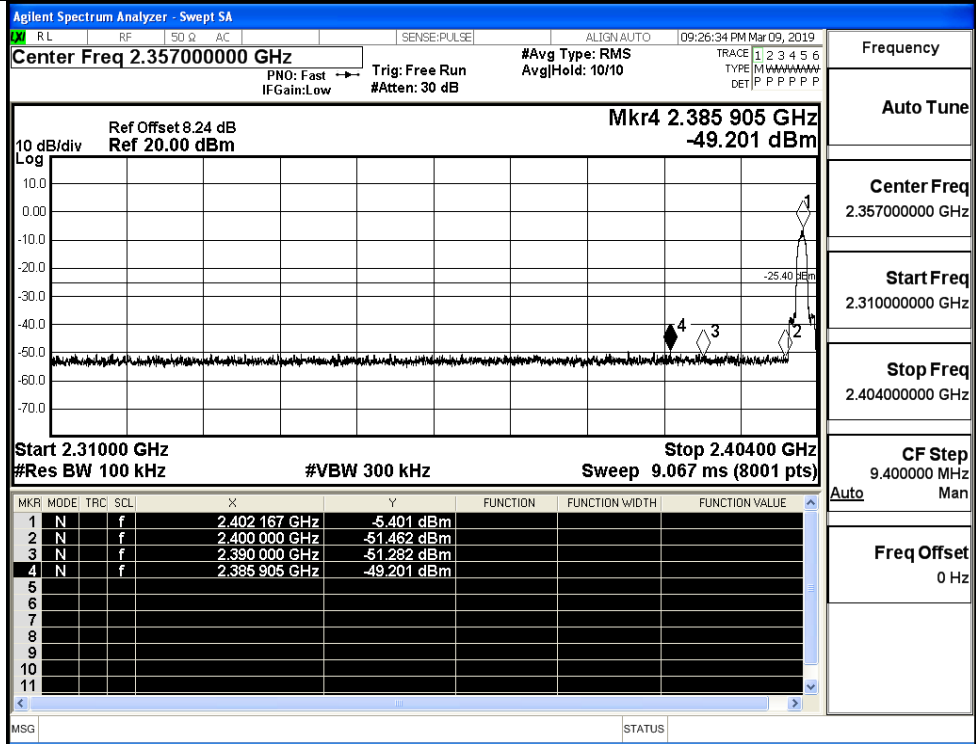
GFSK/HCH/No Hop



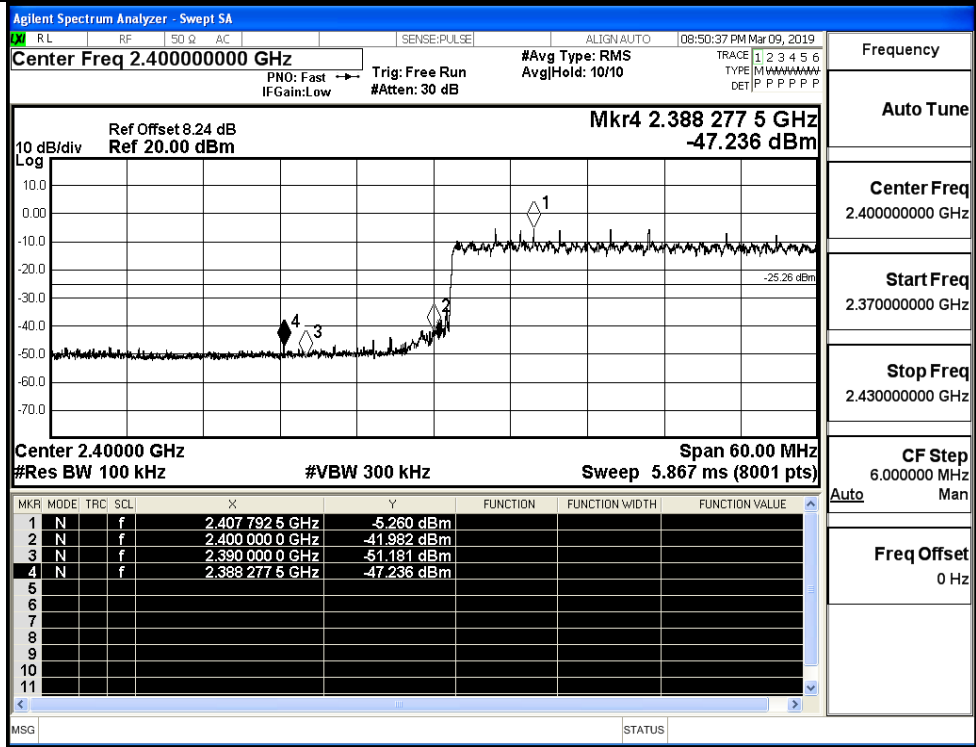
GFSK/HCH/Hop



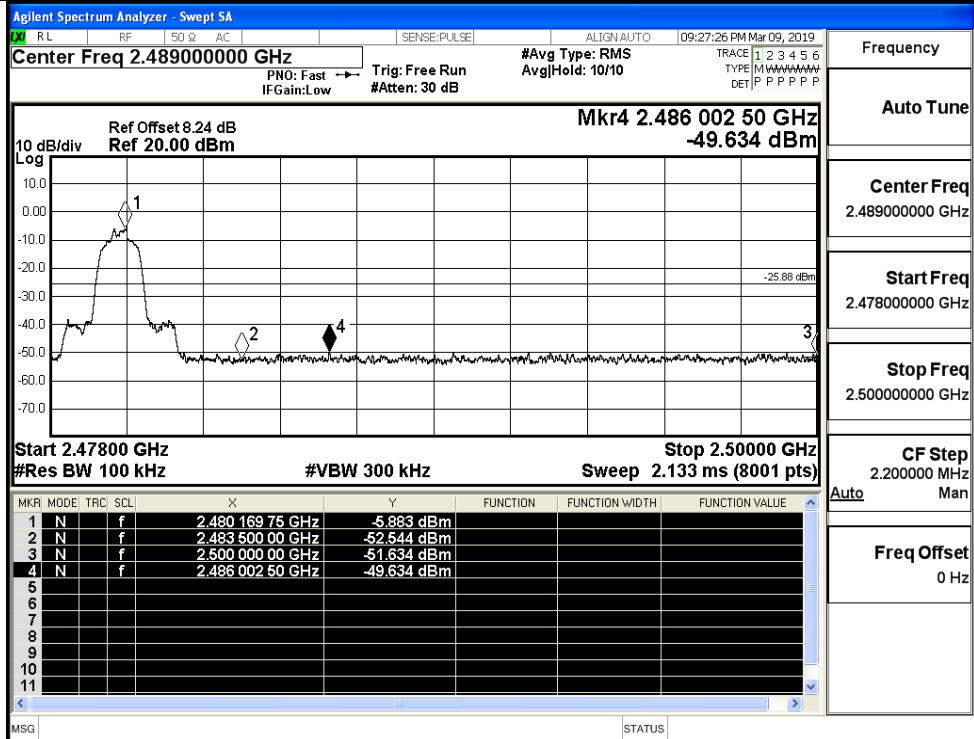
$\pi/4$ DQPSK/LCH/No
Hop



$\pi/4$ DQPSK/LCH/Hop

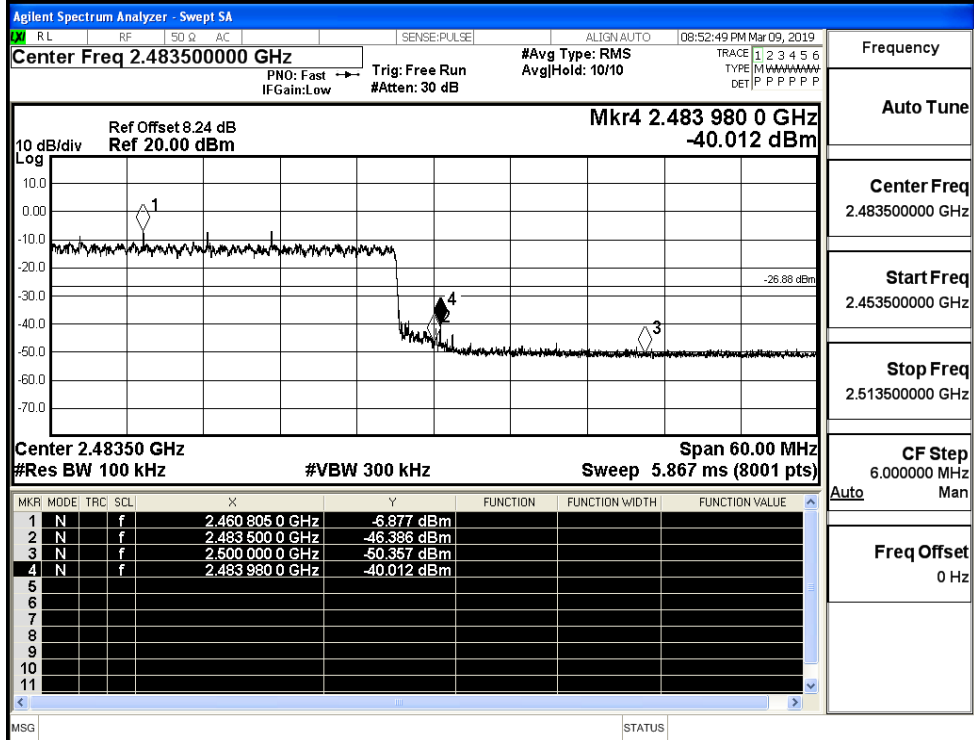


$\pi/4$ DQPSK/HCH/No
Hop



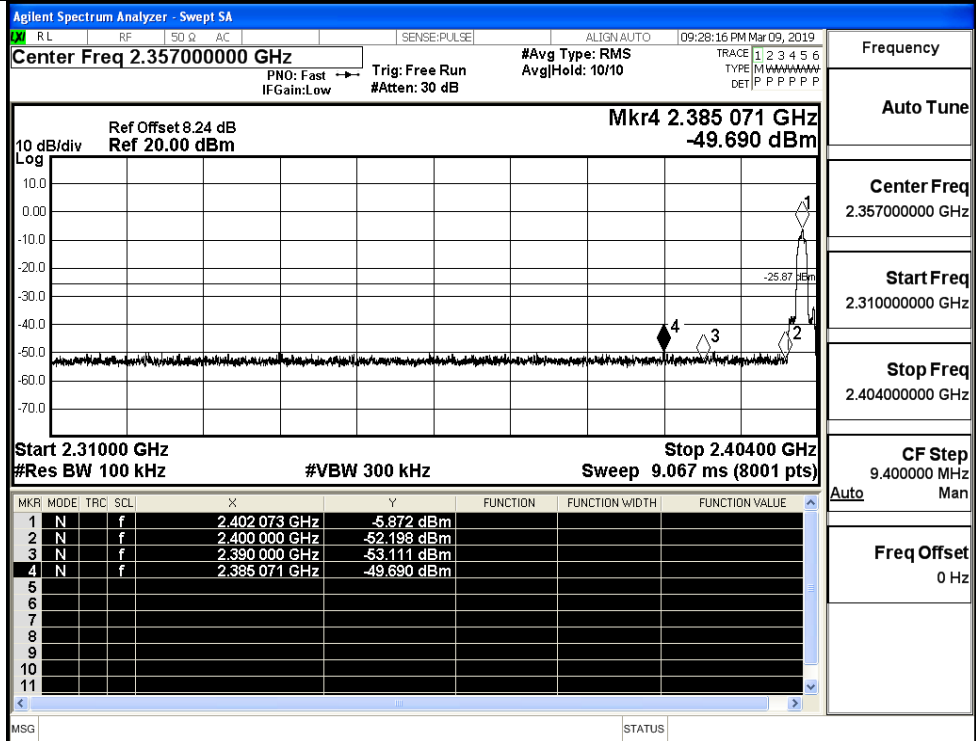
Frequency	
Auto Tune	
Center Freq	2.489000000 GHz
Start Freq	2.478000000 GHz
Stop Freq	2.500000000 GHz
CF Step	2.200000 MHz
Freq Offset	0 Hz

$\pi/4$ DQPSK/HCH/Hop



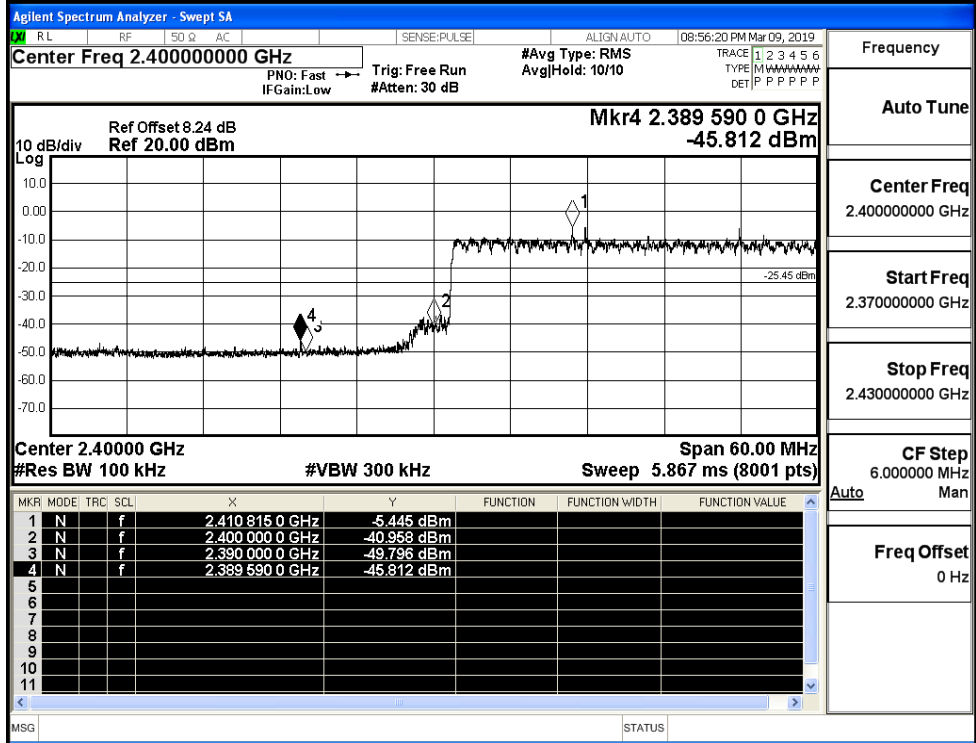
Frequency	
Auto Tune	
Center Freq	2.483500000 GHz
Start Freq	2.453500000 GHz
Stop Freq	2.513500000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz

8DPSK/LCH/No Hop



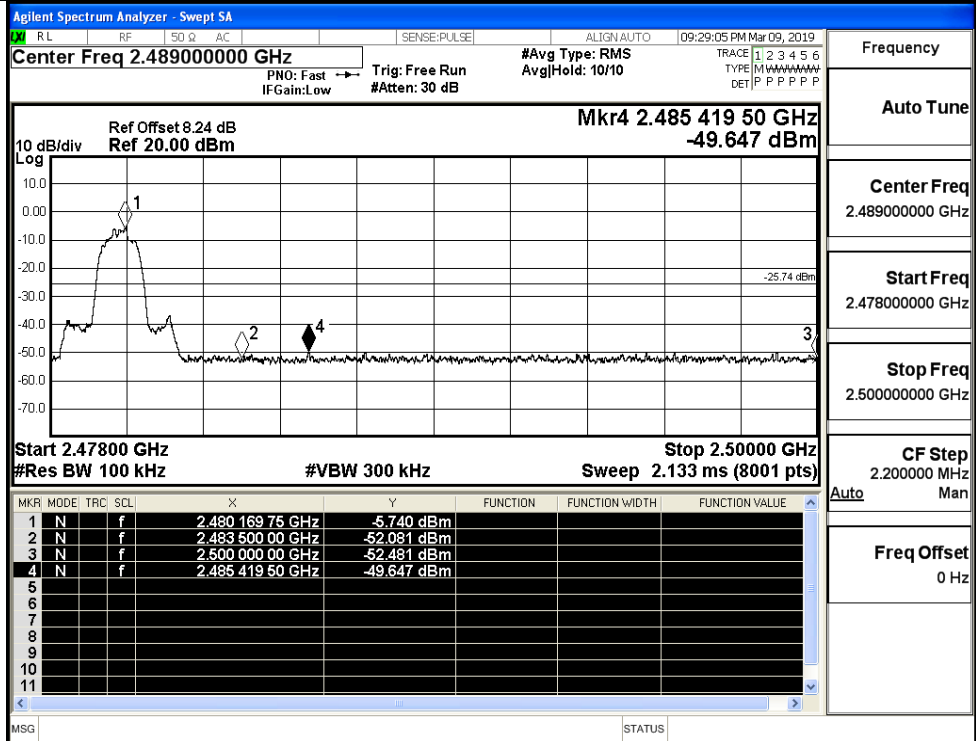
Frequency
Auto Tune
Center Freq
2.357000000 GHz
Start Freq
2.310000000 GHz
Stop Freq
2.404000000 GHz
CF Step
9.400000 MHz
Auto Man
Freq Offset
0 Hz

8DPSK/LCH/Hop



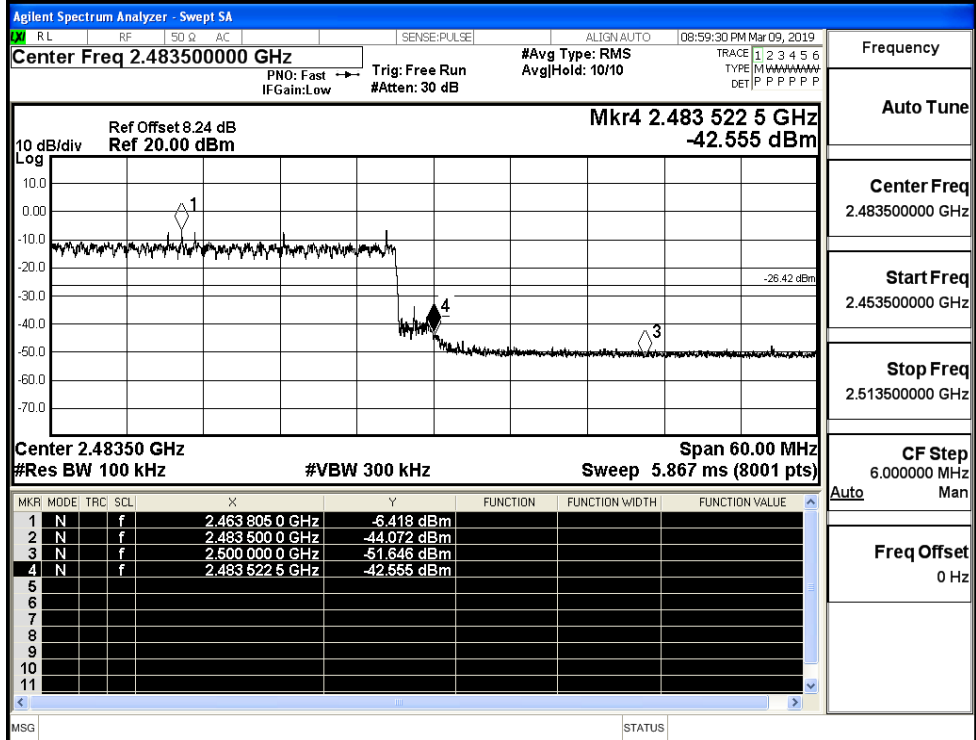
Frequency
Auto Tune
Center Freq
2.400000000 GHz
Start Freq
2.370000000 GHz
Stop Freq
2.430000000 GHz
CF Step
6.000000 MHz
Auto Man
Freq Offset
0 Hz

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

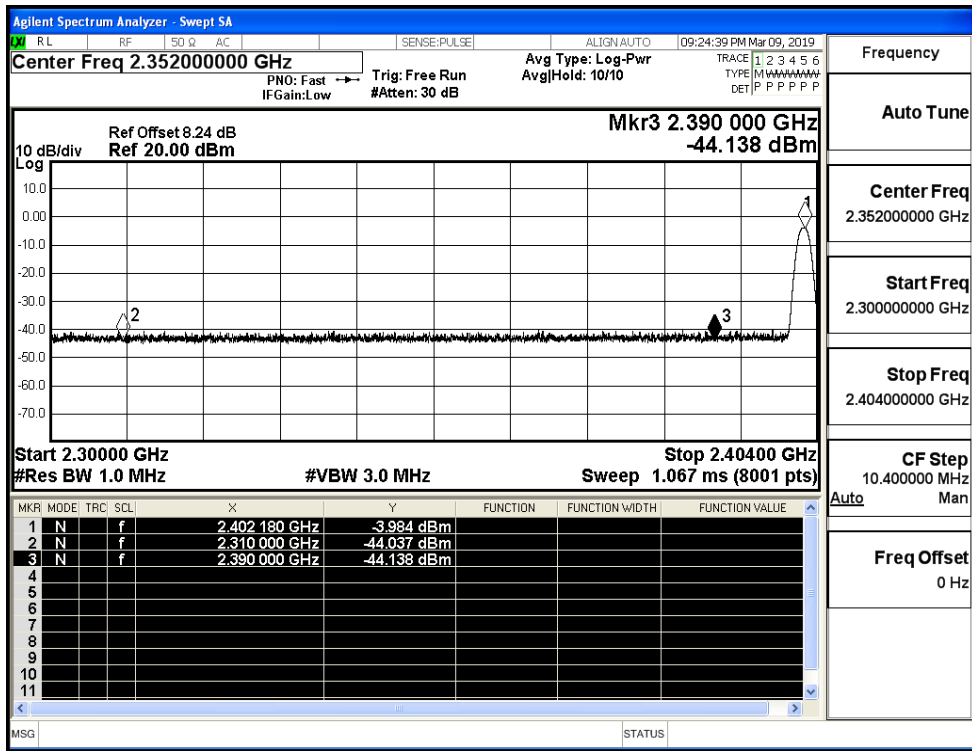


Frequency	
Auto Tune	
Center Freq	2.483500000 GHz
Start Freq	2.463500000 GHz
Stop Freq	2.513500000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz

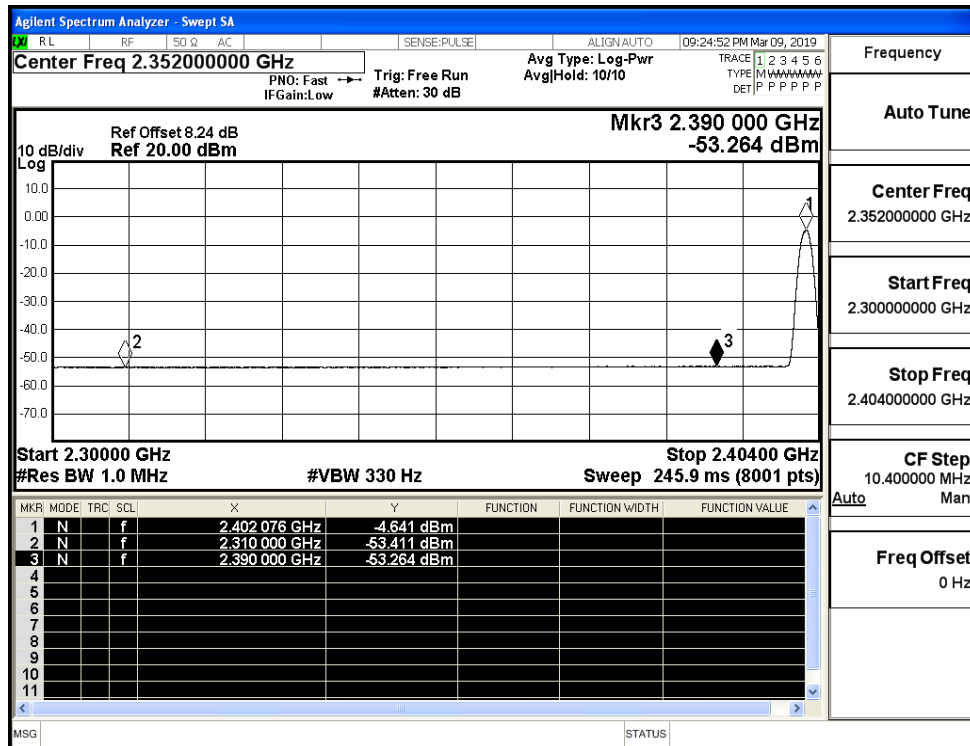
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-44.04	2.0	0	53.22	PEAK	74	PASS
	Off	2310.0	-53.41	2.0	0	43.85	AV	54	PASS
	Off	2390.0	-44.14	2.0	0	53.12	PEAK	74	PASS
	Off	2390.0	-53.26	2.0	0	43.99	AV	54	PASS
	Off	2483.5	-41.94	2.0	0	55.32	PEAK	74	PASS
	Off	2483.5	-52.95	2.0	0	44.31	AV	54	PASS
	Off	2500.0	-42.09	2.0	0	55.17	PEAK	74	PASS
	Off	2500.0	-52.86	2.0	0	44.40	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.71	2.0	0	53.55	PEAK	74	PASS
	Off	2310.0	-53.37	2.0	0	43.89	AV	54	PASS
	Off	2390.0	-42.78	2.0	0	54.47	PEAK	74	PASS
	Off	2390.0	-53.20	2.0	0	44.06	AV	54	PASS
	Off	2483.5	-43.20	2.0	0	54.06	PEAK	74	PASS
	Off	2483.5	-52.98	2.0	0	44.28	AV	54	PASS
	Off	2500.0	-42.94	2.0	0	54.32	PEAK	74	PASS
	Off	2500.0	-52.78	2.0	0	44.47	AV	54	PASS
8DPSK	Off	2310.0	-43.95	2.0	0	53.30	PEAK	74	PASS
	Off	2310.0	-53.51	2.0	0	43.74	AV	54	PASS
	Off	2390.0	-43.09	2.0	0	54.17	PEAK	74	PASS
	Off	2390.0	-53.25	2.0	0	44.01	AV	54	PASS
	Off	2483.5	-42.23	2.0	0	55.03	PEAK	74	PASS
	Off	2483.5	-52.93	2.0	0	44.33	AV	54	PASS
	Off	2500.0	-43.31	2.0	0	53.95	PEAK	74	PASS
	Off	2500.0	-52.85	2.0	0	44.41	AV	54	PASS

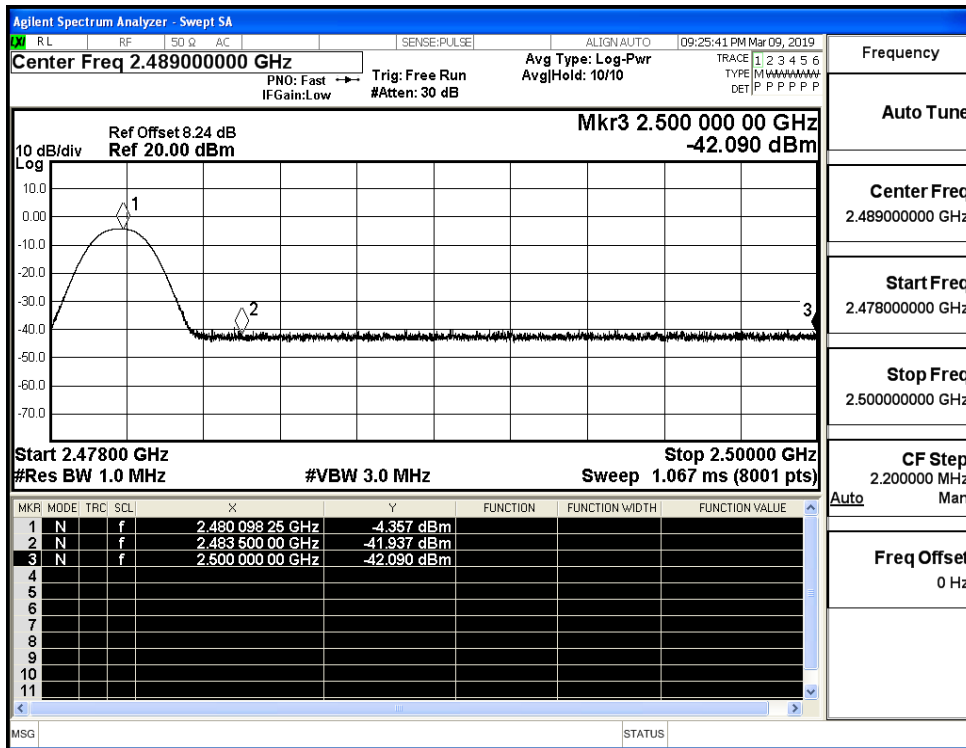
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



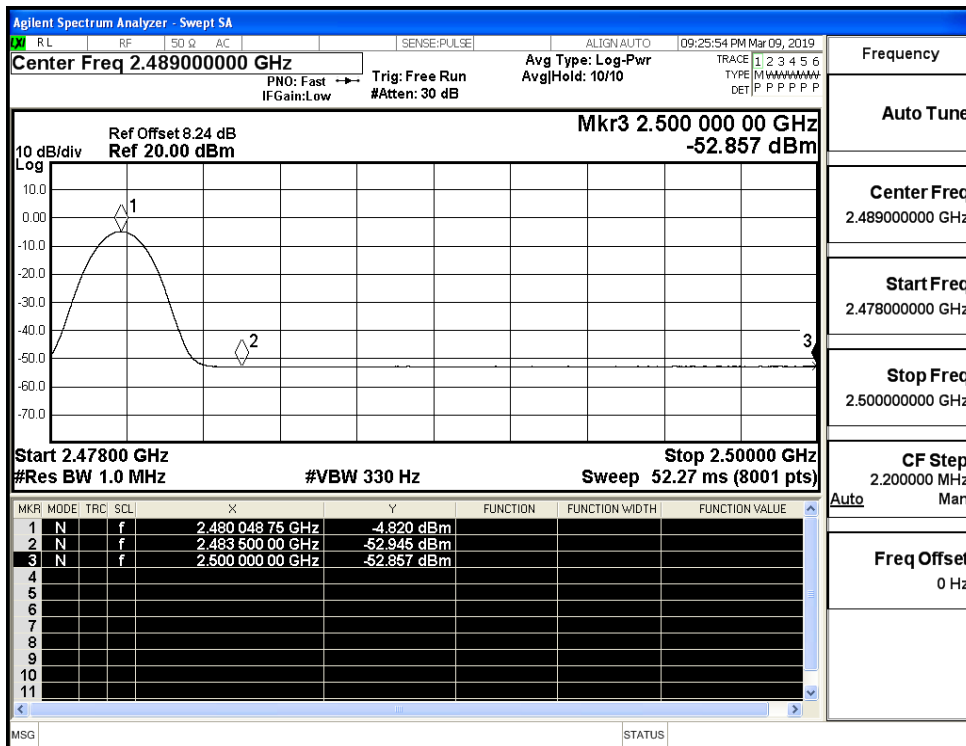
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



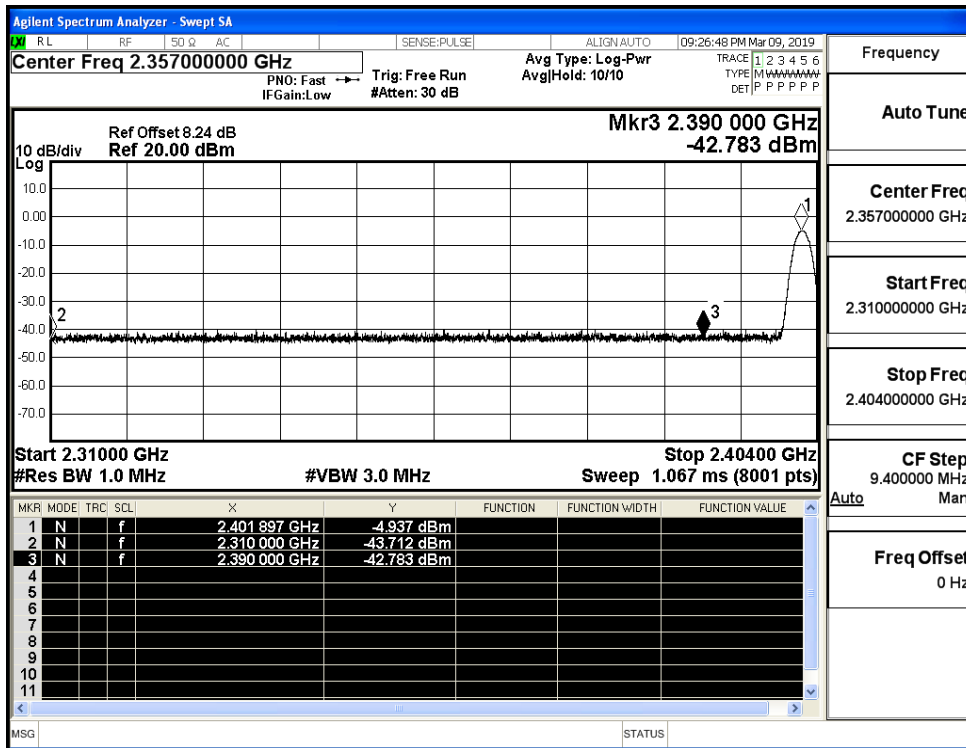
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



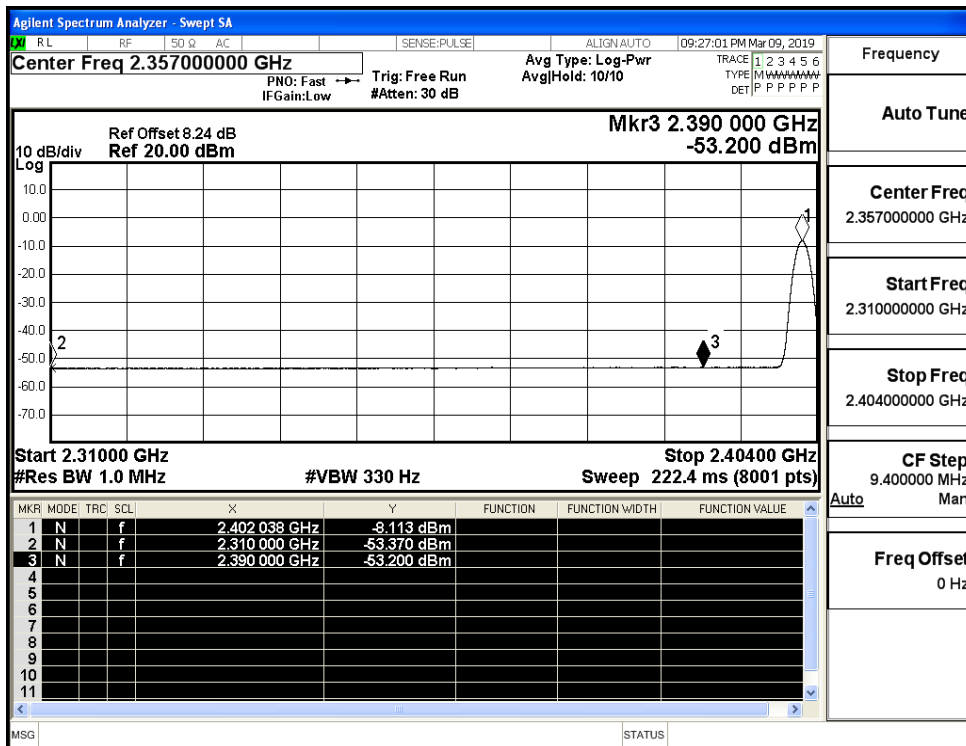
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



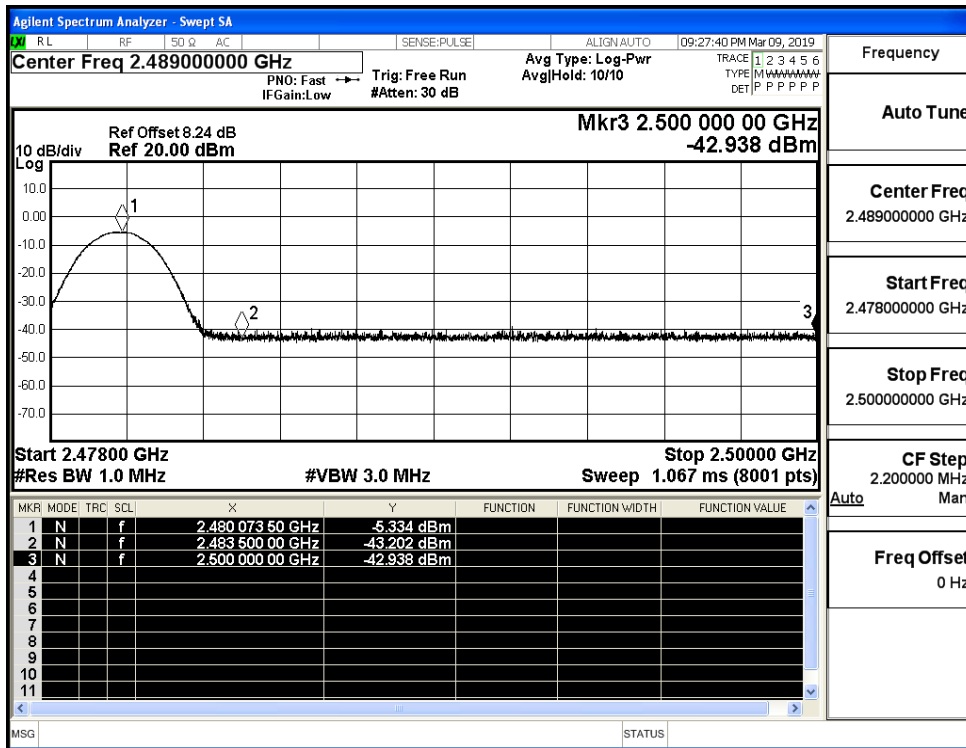
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)



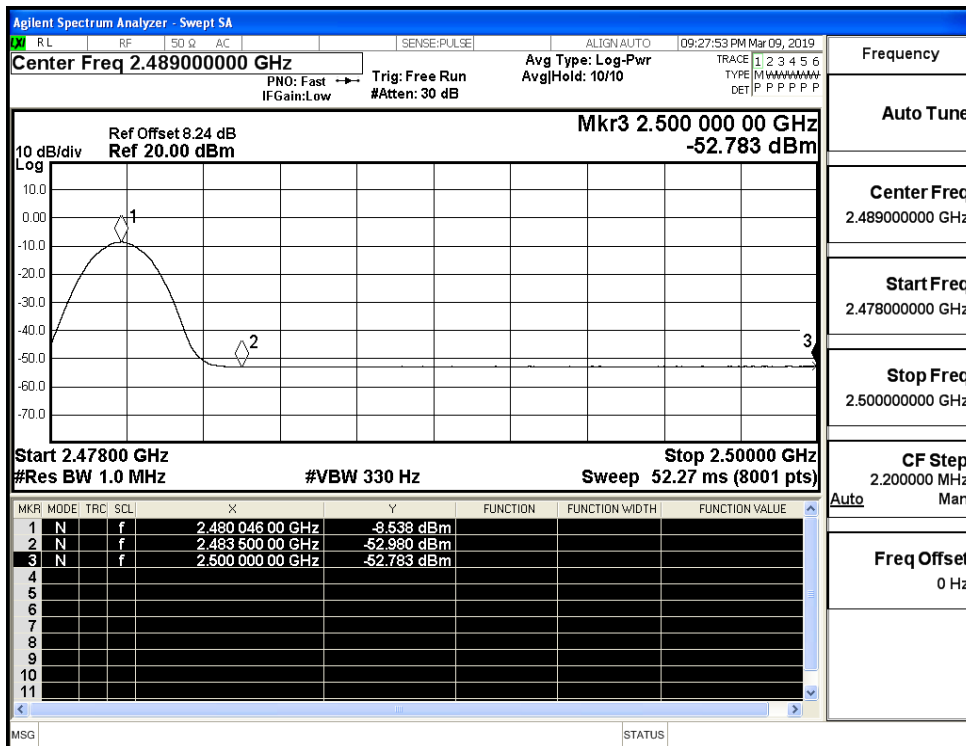
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)



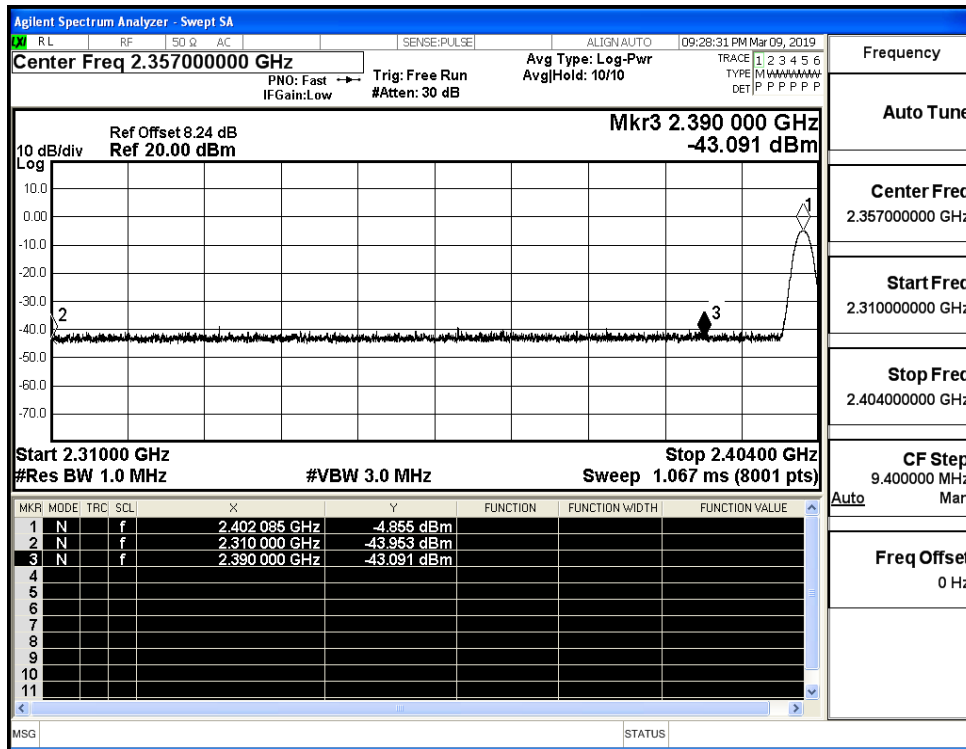
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (High Channel)



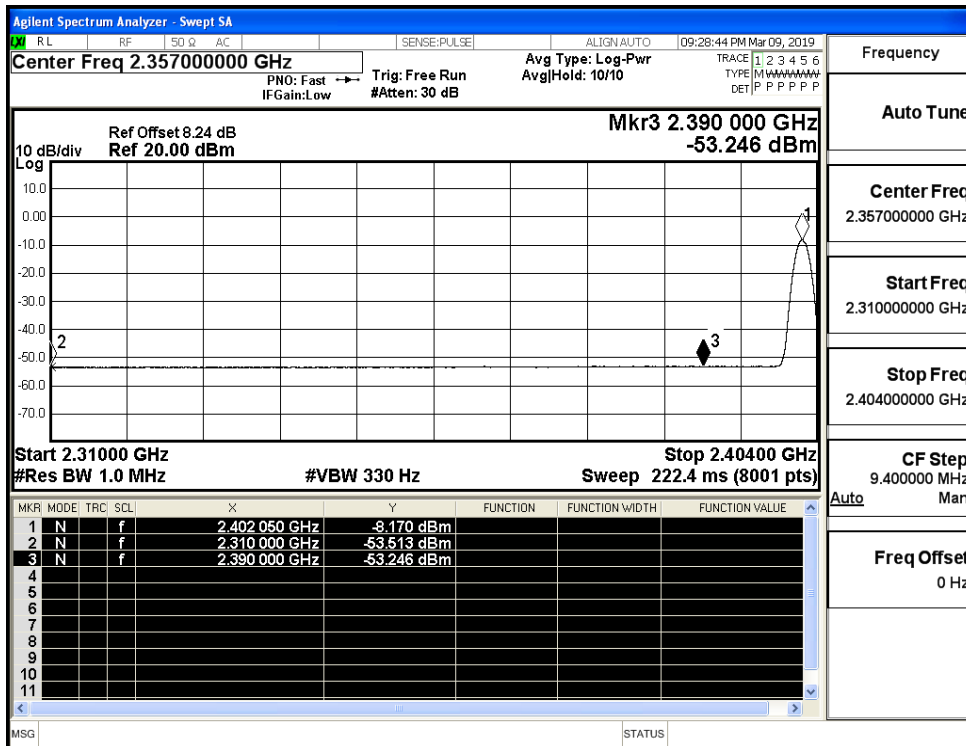
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (High Channel)



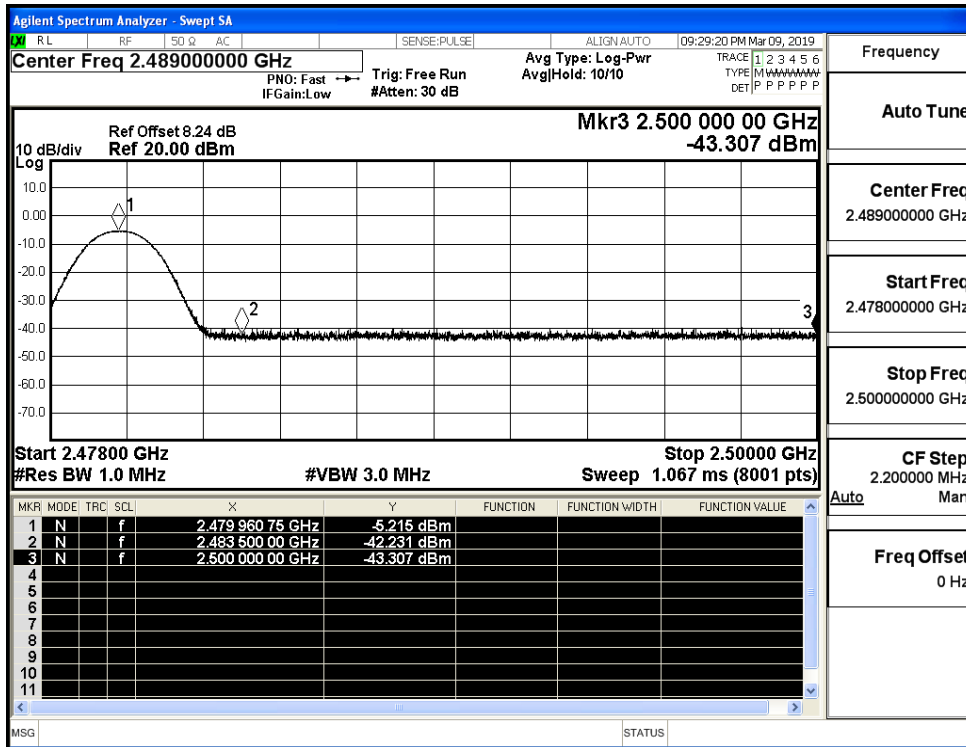
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

