

Appendix A

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

Product Name: Bluetooth Beanie

Trade Mark: N/A

Test Model: AC6916A

Environmental Conditions

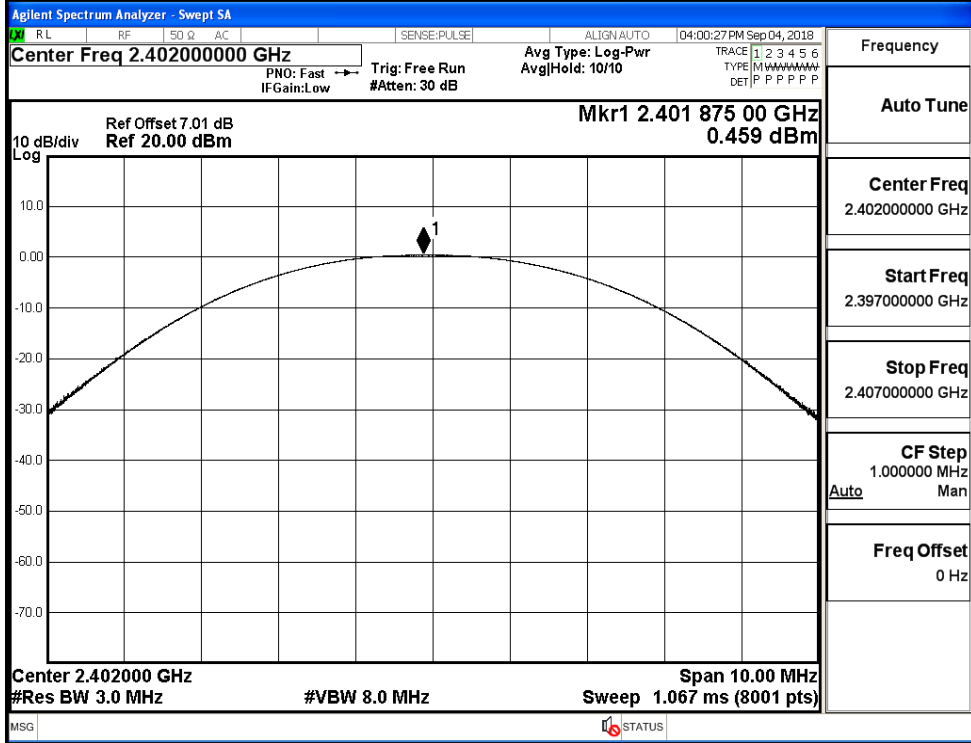
Temperature:	24.5 ° C
Relative Humidity:	54.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Mina.Xu
Supervised by:	Jayden.Zhuo

A.1 Maximum Conducted Peak Output Power

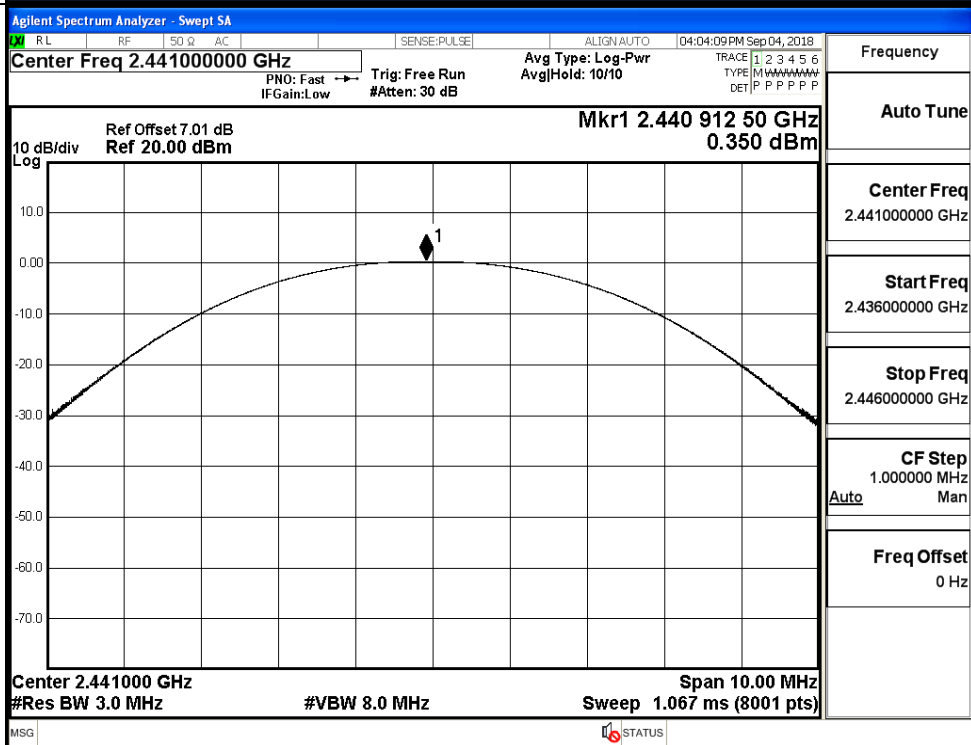
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.459	21	PASS
	MCH	0.350	21	PASS
	HCH	0.238	21	PASS
$\pi/4$ DQPSK	LCH	-0.409	21	PASS
	MCH	-0.487	21	PASS
	HCH	-0.556	21	PASS

Test Graphs

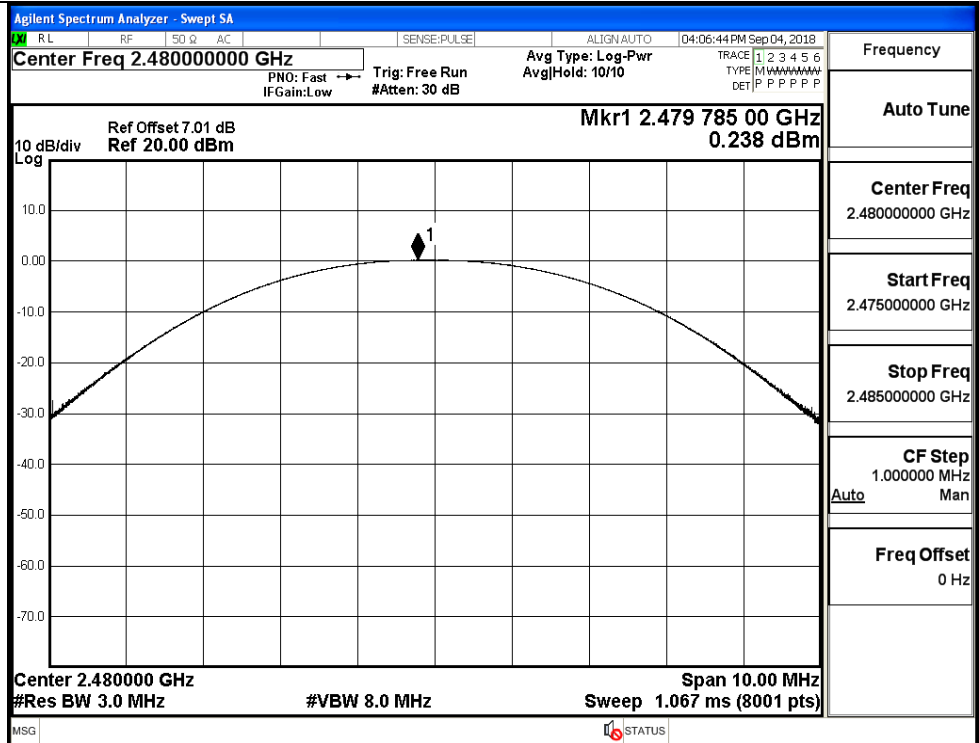
GFSK/LCH



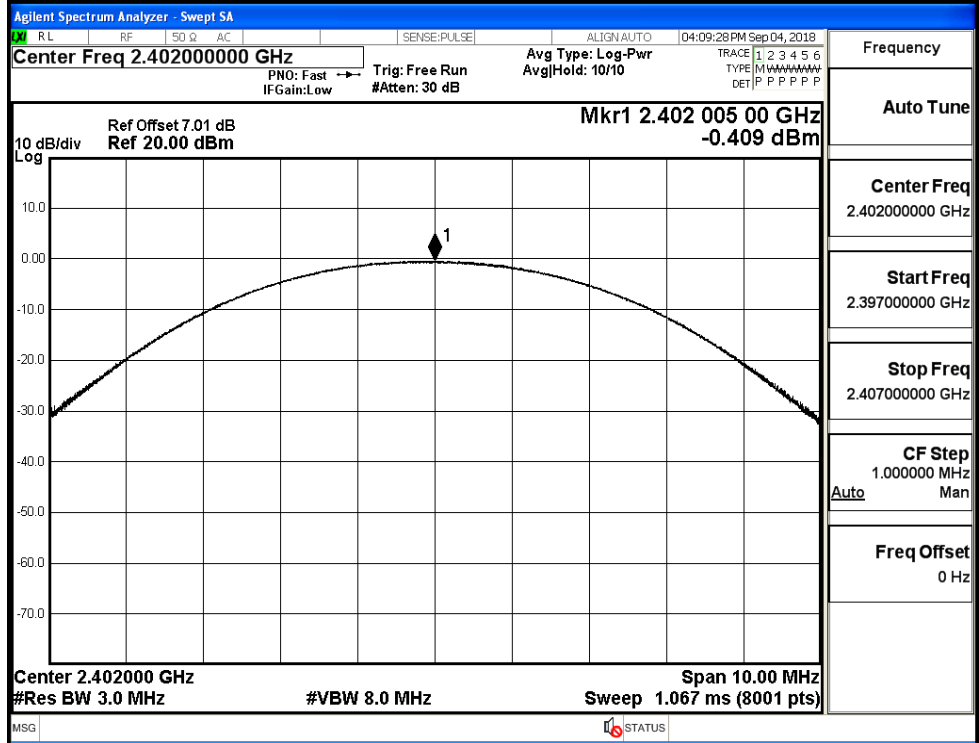
GFSK/MCH



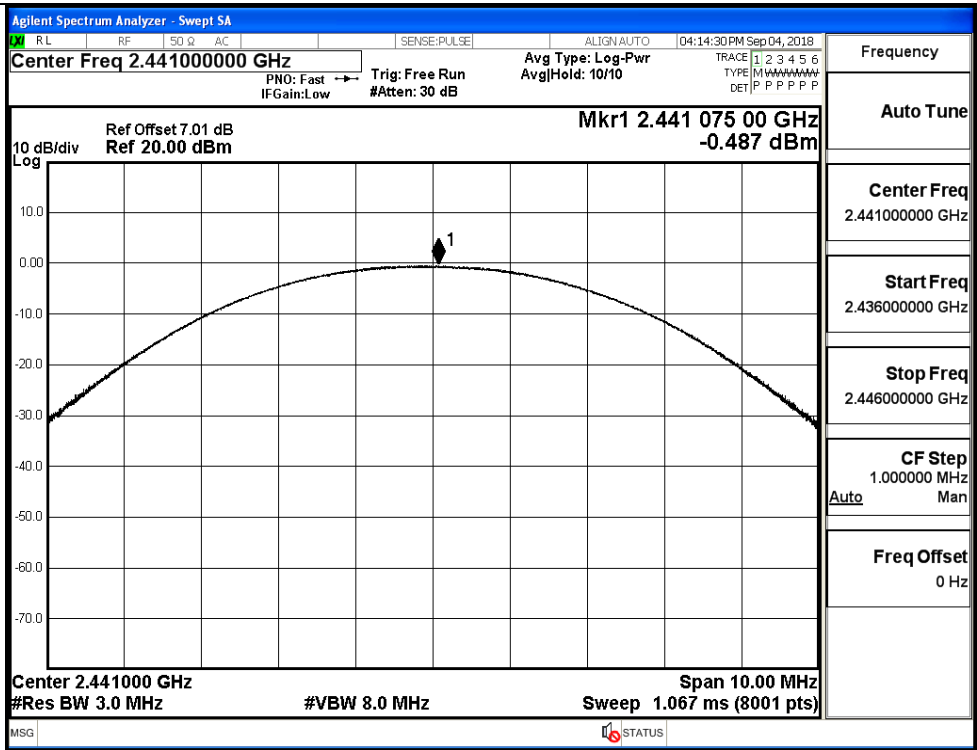
GFSK/HCH



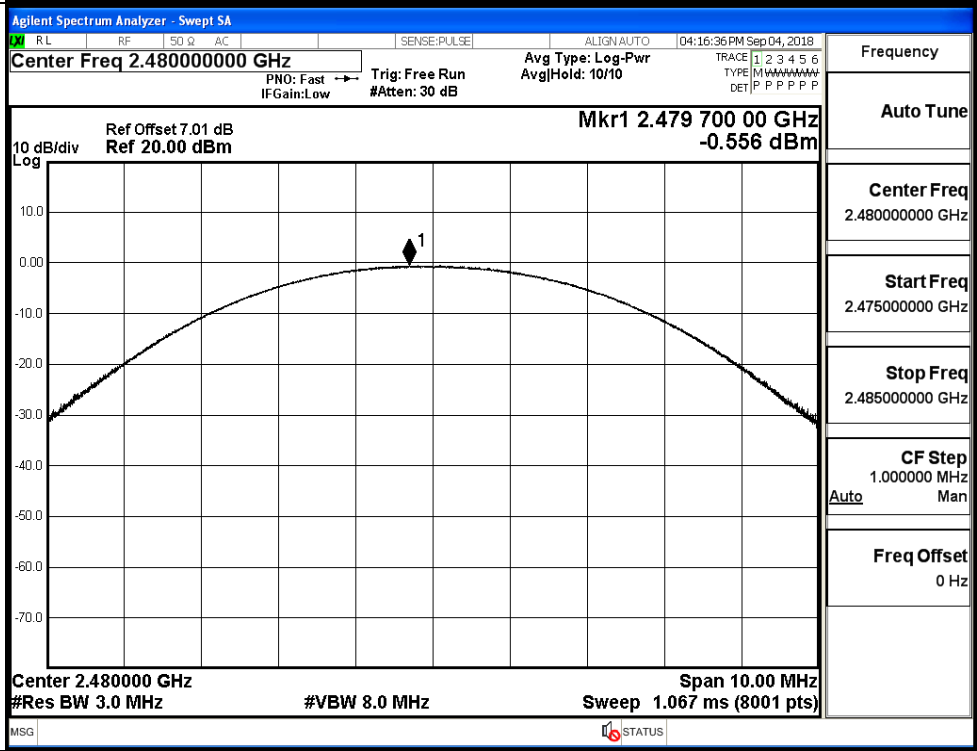
π /4DQPSK/LCH



π /4DQPSK/MCH

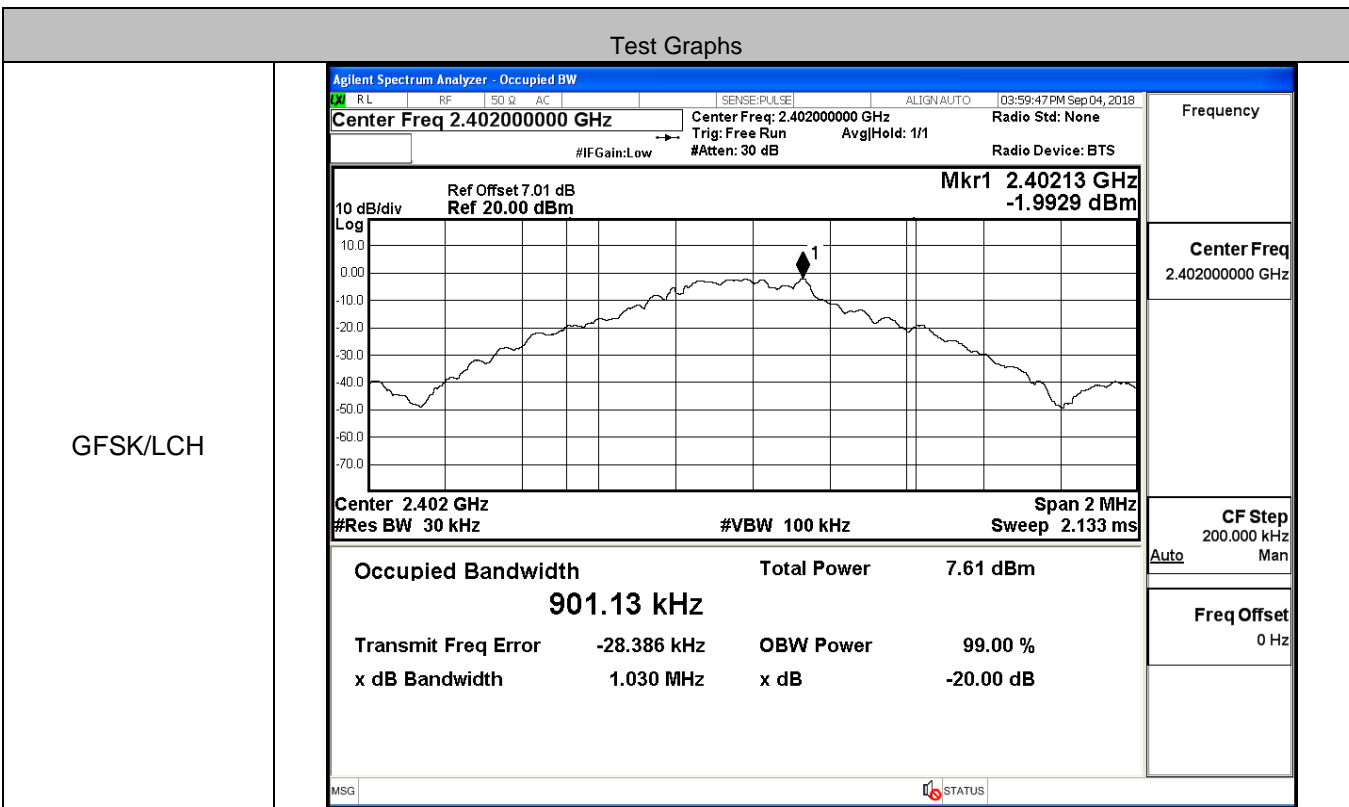


π /4DQPSK/HCH

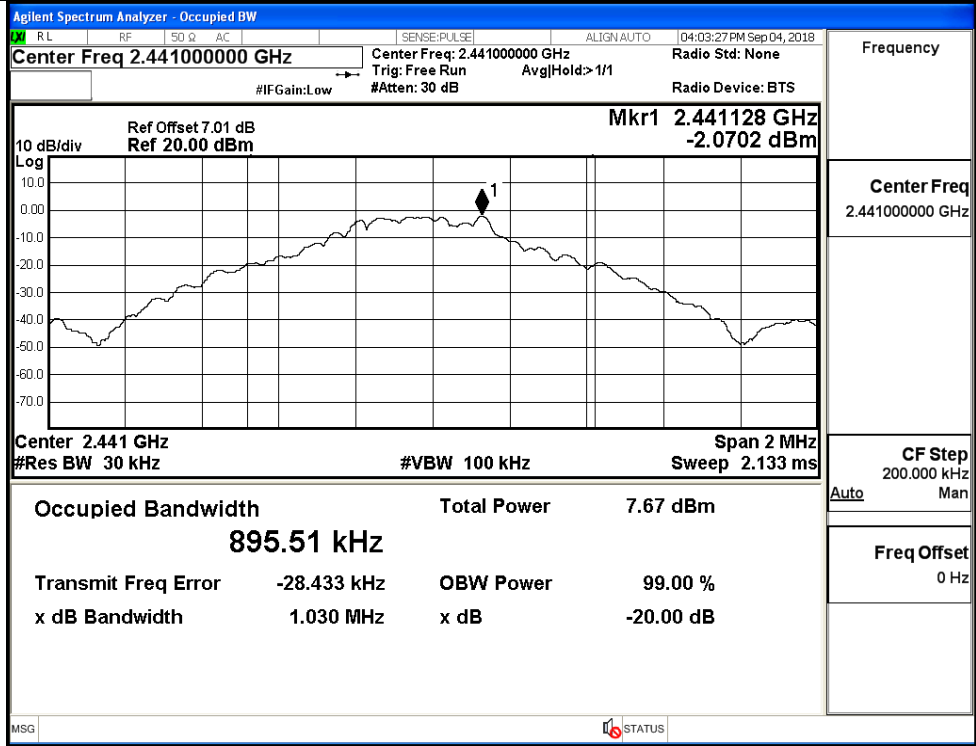


A.2 20dB Bandwidth

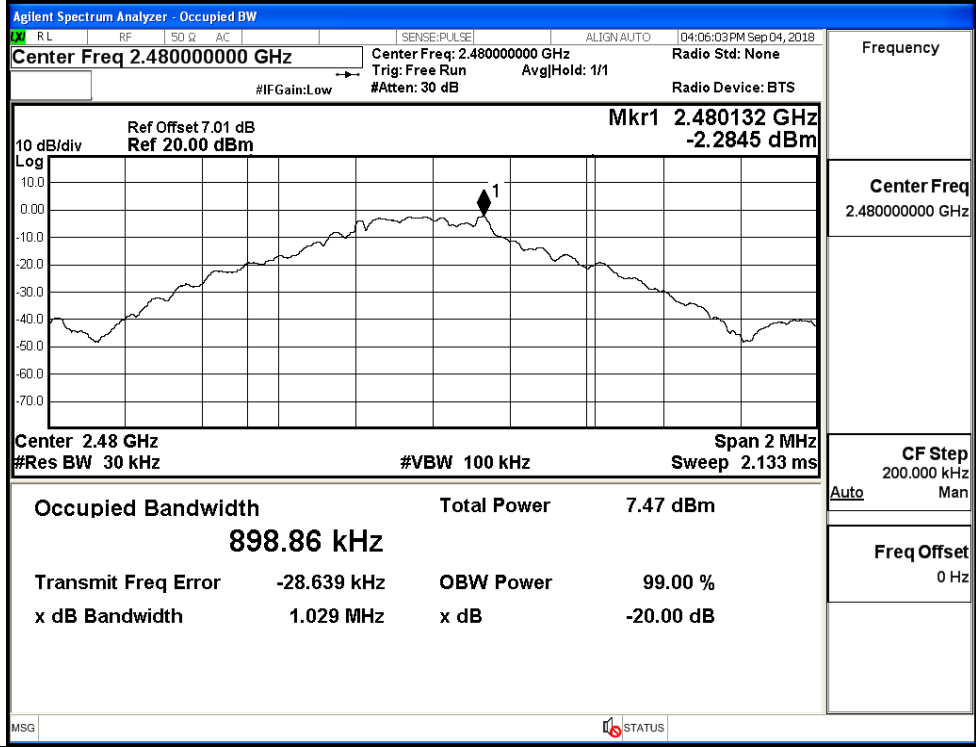
Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.90113	1.030	Not Specified	PASS
	MCH	0.89551	1.030	Not Specified	PASS
	HCH	0.89886	1.029	Not Specified	PASS
π/4DQPSK	LCH	1.1680	1.287	Not Specified	PASS
	MCH	1.1682	1.287	Not Specified	PASS
	HCH	1.1723	1.288	Not Specified	PASS



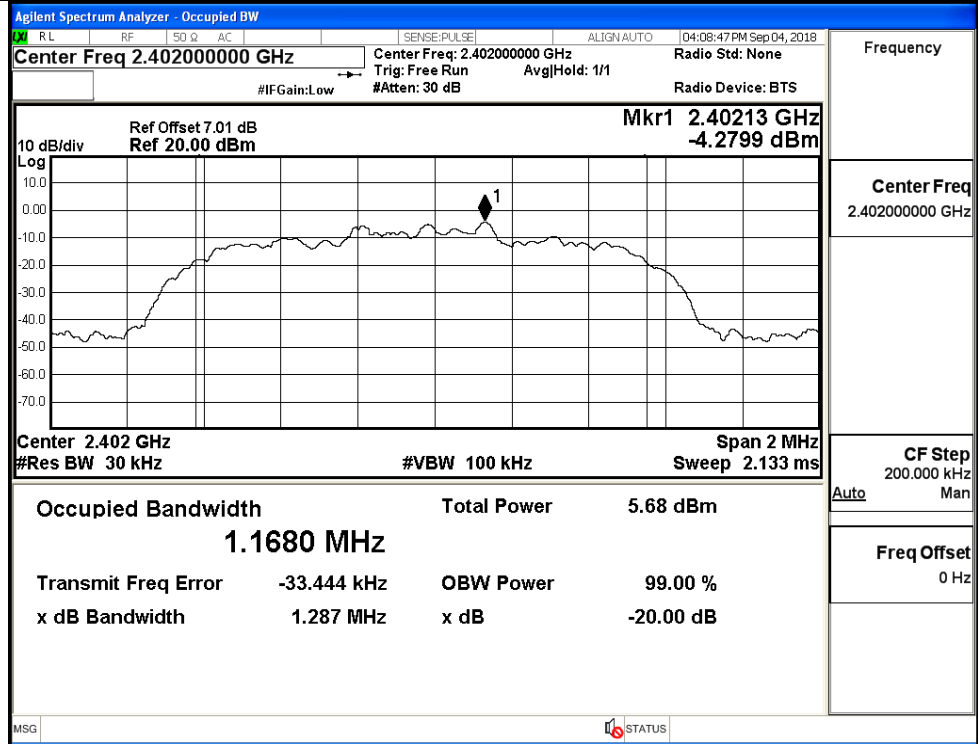
GFSK/MCH



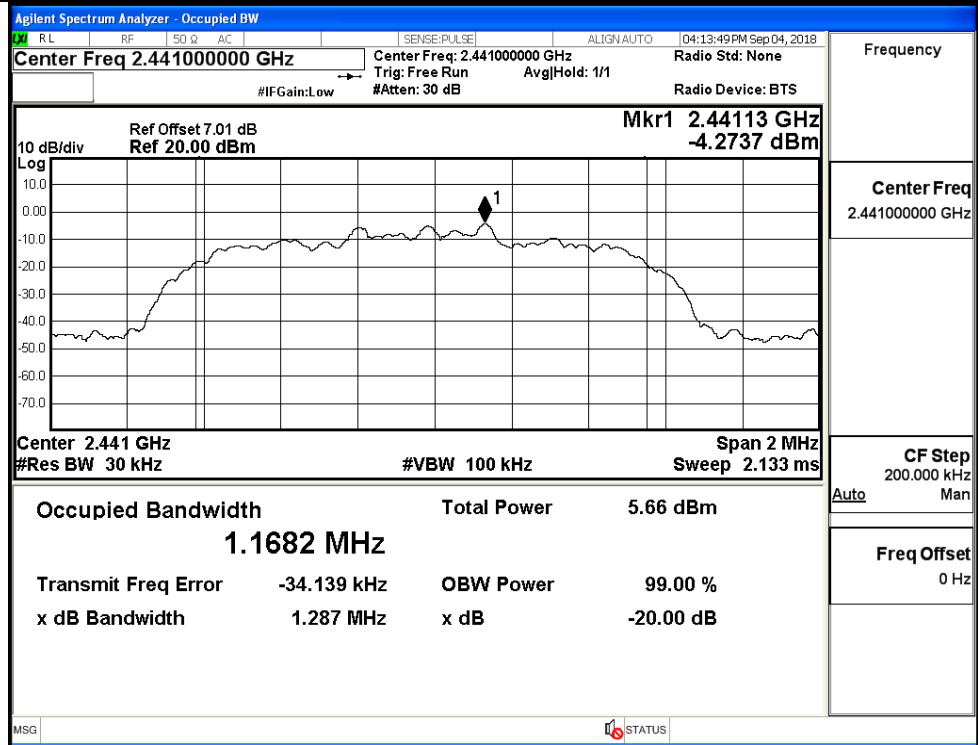
GFSK/HCH



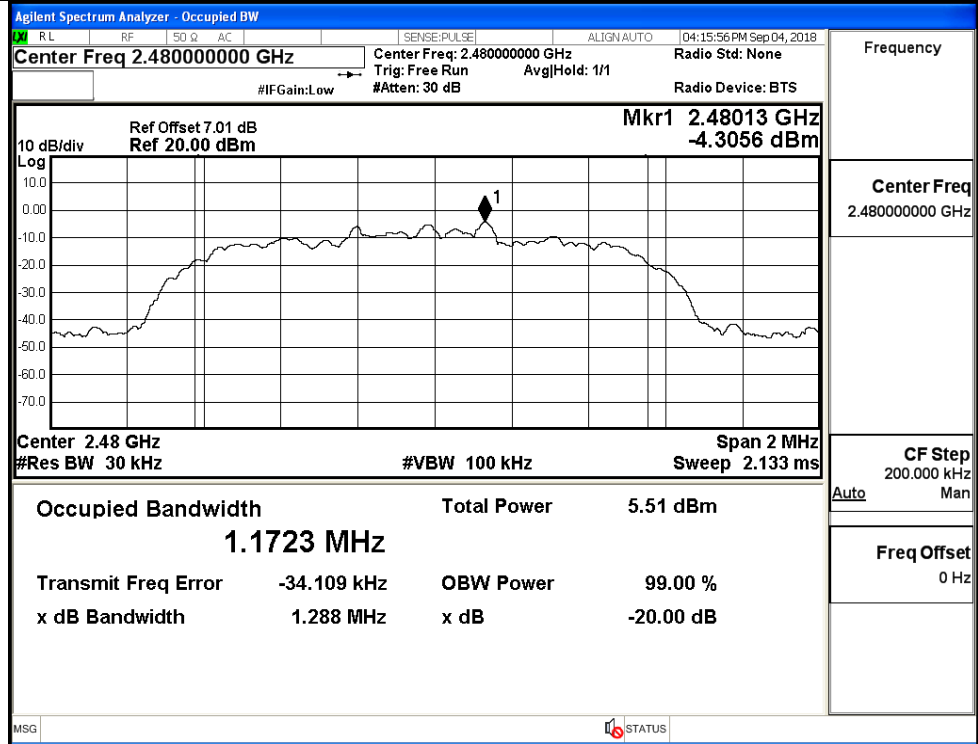
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH

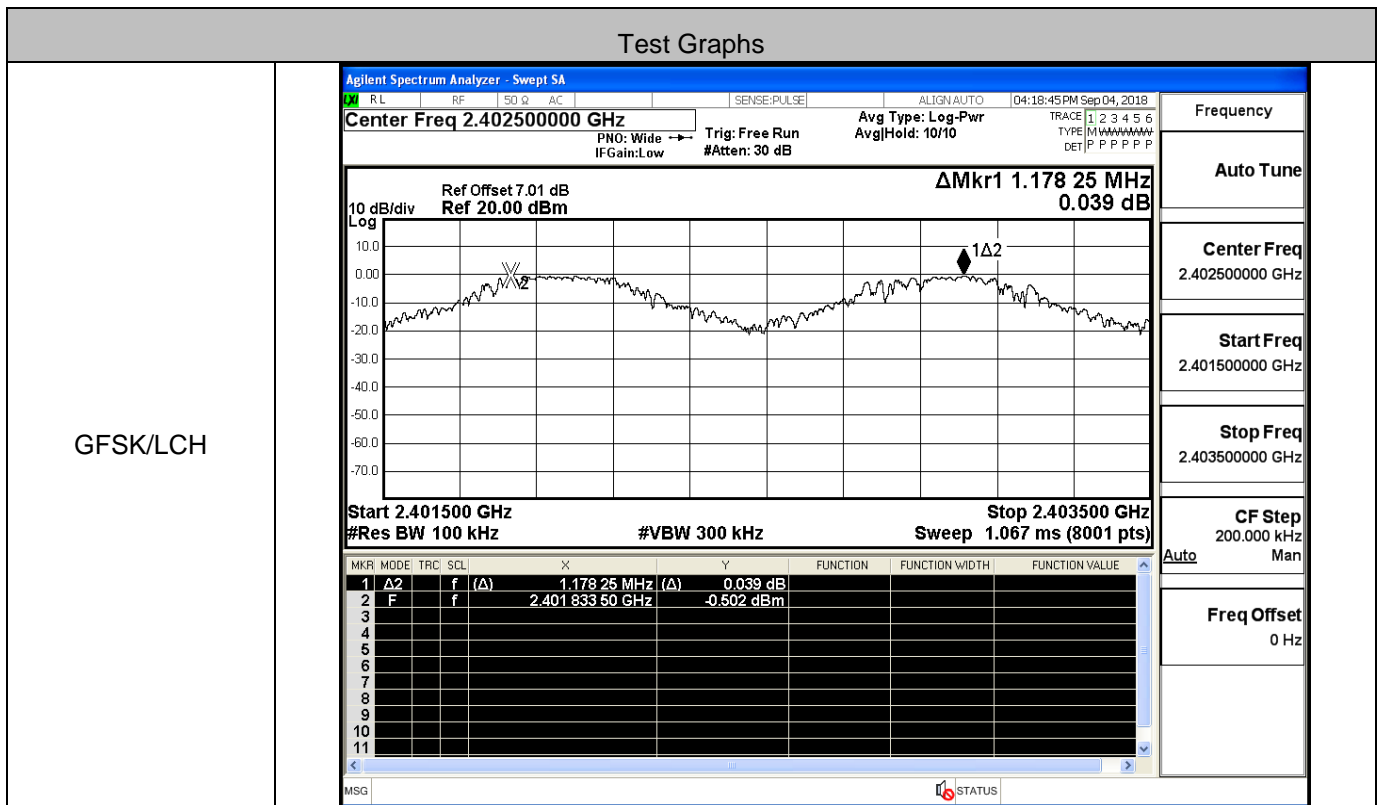


$\pi/4$ DQPSK/HCH

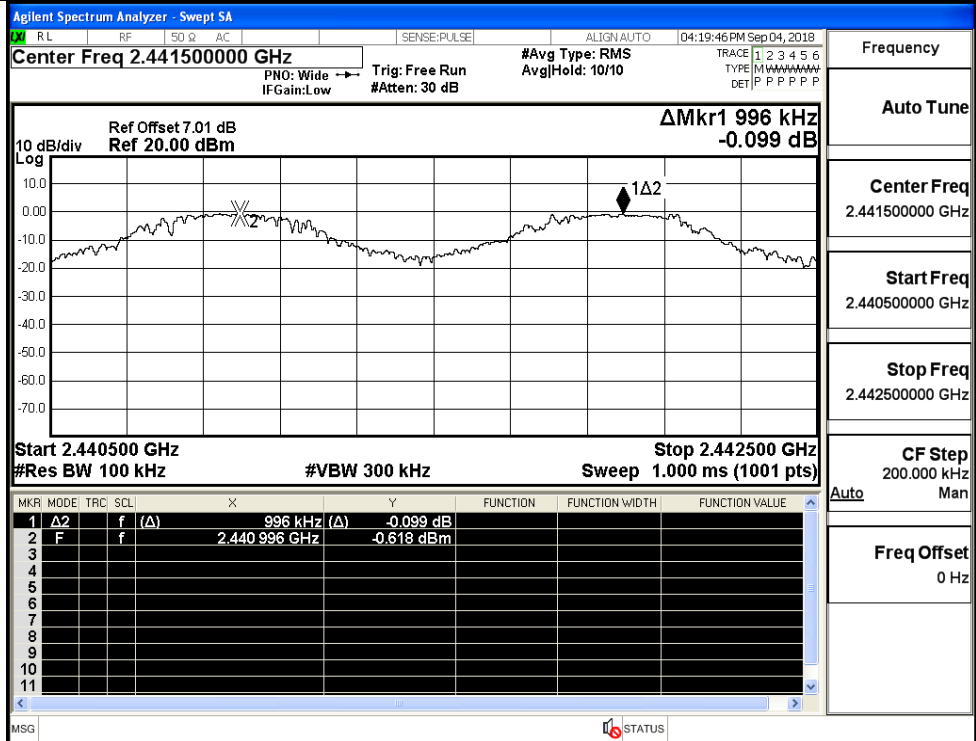


A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.178	0.687	PASS
	MCH	0.996	0.687	PASS
	HCH	0.816	0.687	PASS
π/4DQPSK	LCH	0.980	0.859	PASS
	MCH	0.974	0.859	PASS
	HCH	0.874	0.859	PASS



GFSK/MCH



Frequency

Auto Tune

Center Freq
2.441500000 GHz

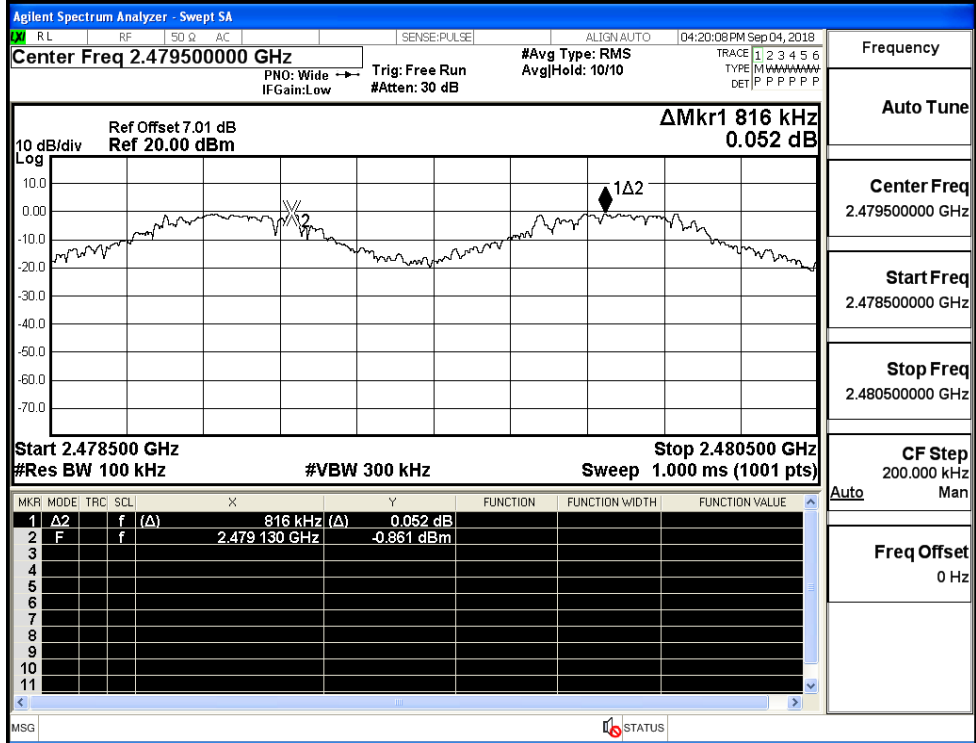
Start Freq
2.440500000 GHz

Stop Freq
2.442500000 GHz

CF Step
200.000 kHz
Man

Freq Offset
0 Hz

GFSK/HCH



Frequency

Auto Tune

Center Freq
2.479500000 GHz

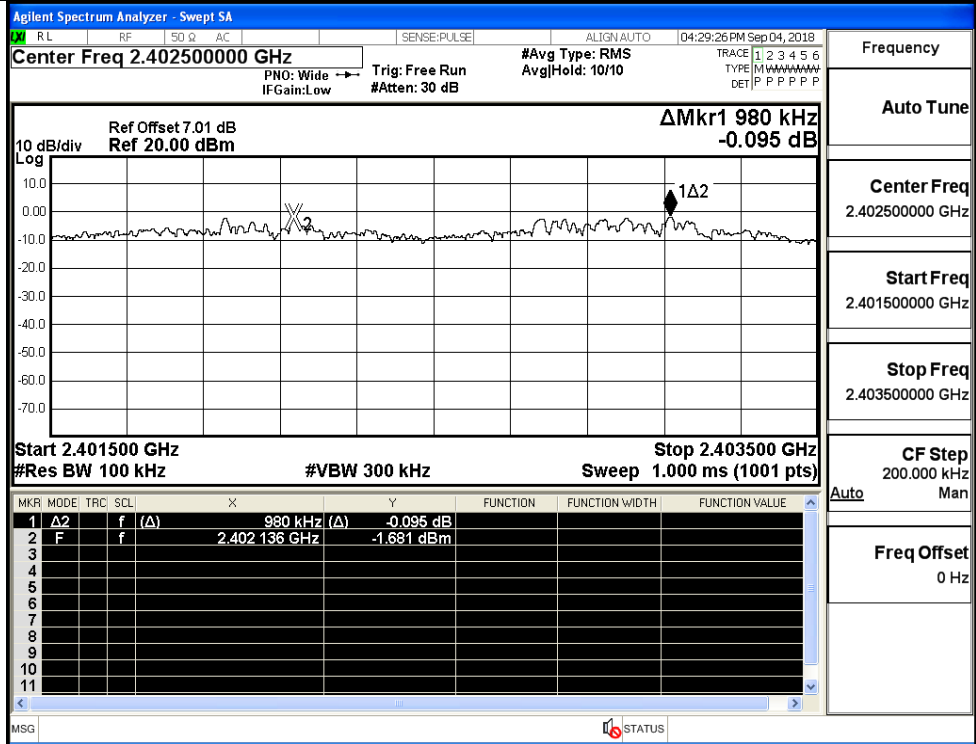
Start Freq
2.478500000 GHz

Stop Freq
2.480500000 GHz

CF Step
200.000 kHz
Man

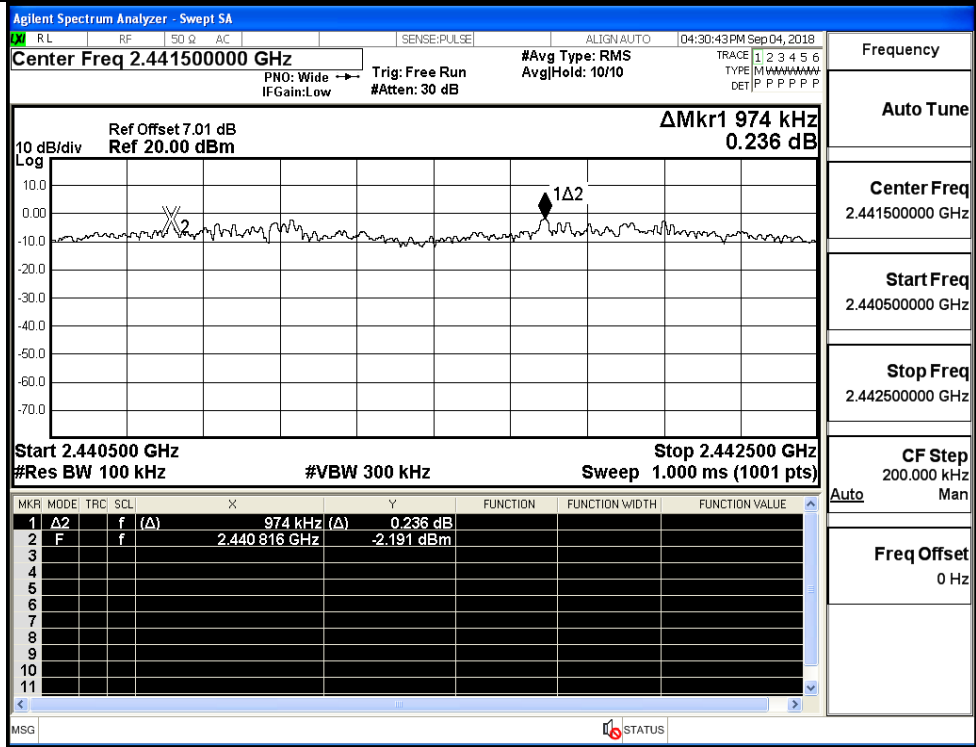
Freq Offset
0 Hz

π/4DQPSK/LCH



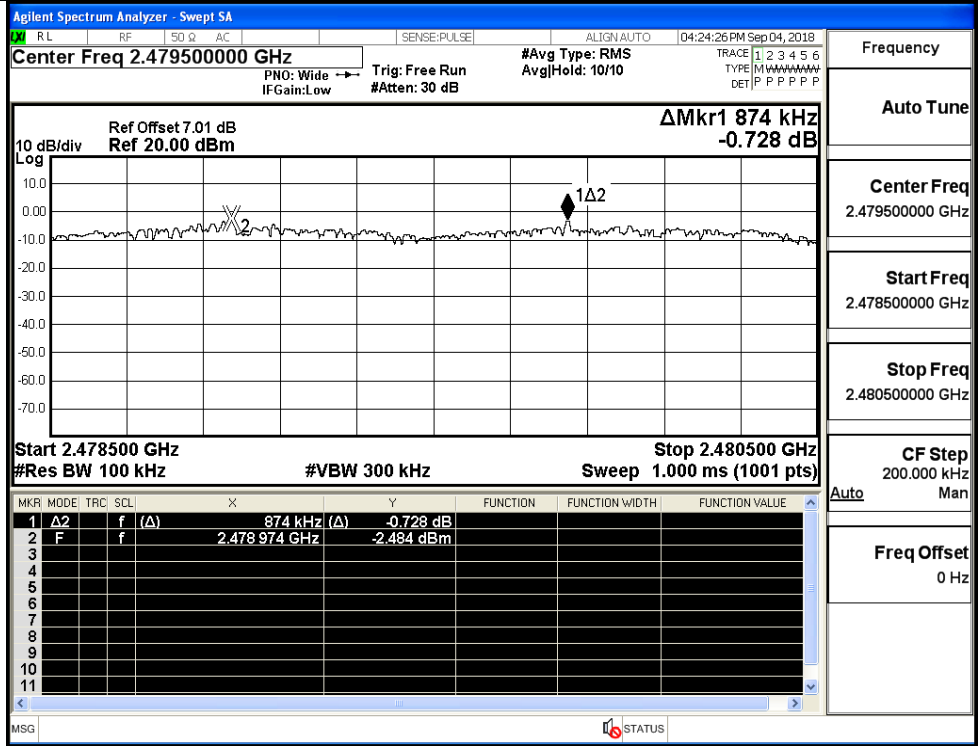
Frequency	2.402500000 GHz
Auto Tune	
Center Freq	2.402500000 GHz
Start Freq	2.401500000 GHz
Stop Freq	2.403500000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

π/4DQPSK/MCH



Frequency	2.441500000 GHz
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

$\pi/4$ DQPSK/HCH



A.4 Hopping Channel Number

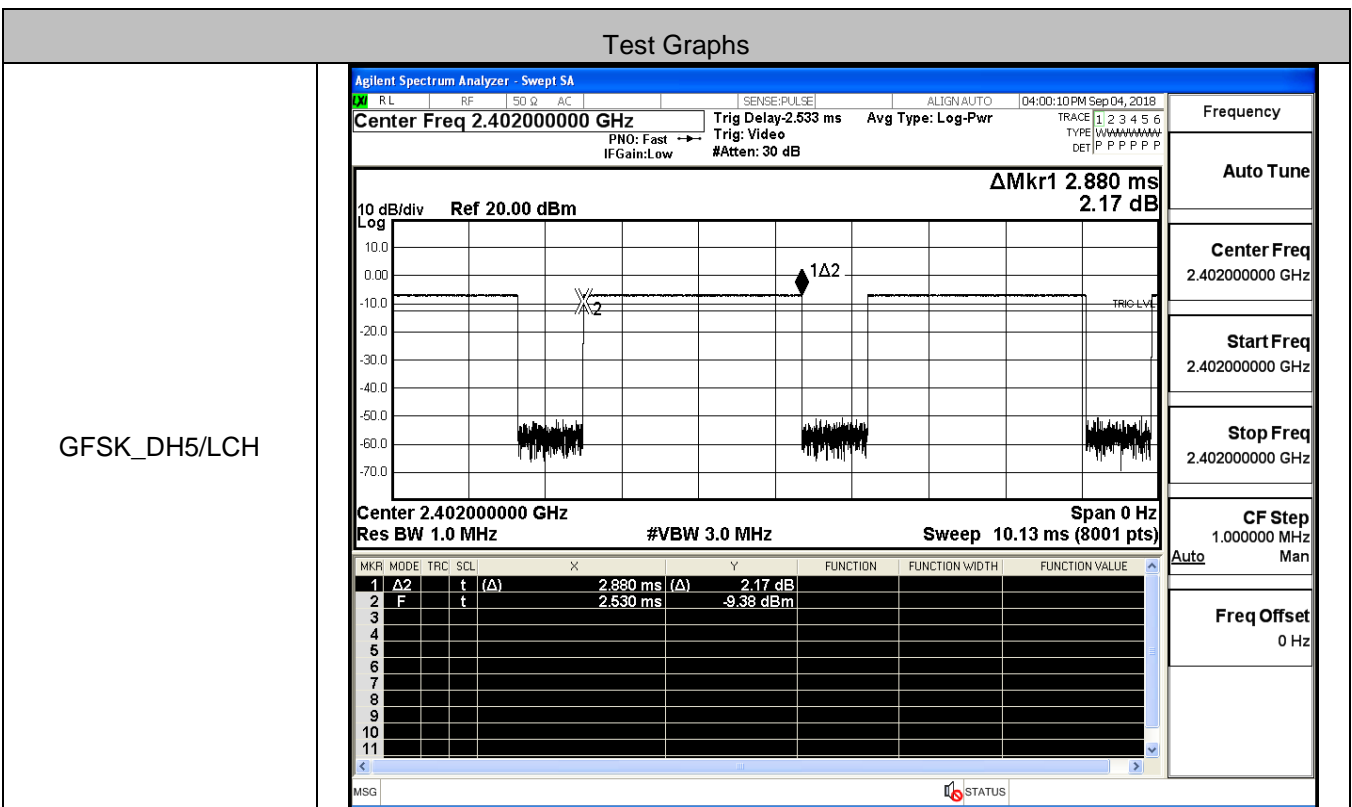
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS

Test Graphs

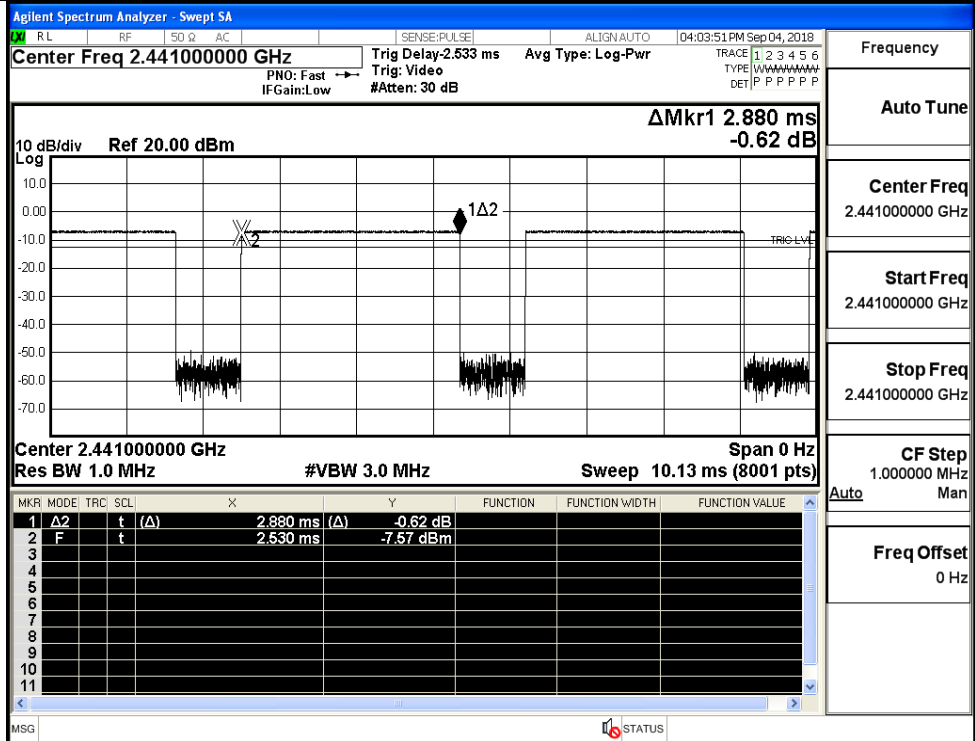
<p>GFSK/Hop</p>	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 7.01 dB Ref 20.00 dBm</p> <p>ΔMkr1 78.041 MHz -0.356 dB</p> <p>Start 2.40000 GHz Stop 2.48350 GHz</p> <p>#Res BW 100 kHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1"> <thead> <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>78.041 MHz (Δ)</td> <td>-0.356 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>-0.194 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)	78.041 MHz (Δ)	-0.356 dB				2	F	f		2.402014 GHz	-0.194 dBm			
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	Δ2	f	(Δ)	78.041 MHz (Δ)	-0.356 dB																							
2	F	f		2.402014 GHz	-0.194 dBm																							
<p>$\pi/4$DQPSK/Hop</p>	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 7.01 dB Ref 20.00 dBm</p> <p>ΔMkr1 77.843 MHz 0.164 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>77.843 MHz (Δ)</td> <td>0.164 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.401973 GHz</td> <td>-1.657 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)	77.843 MHz (Δ)	0.164 dB				2	F	f		2.401973 GHz	-1.657 dBm			
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	Δ2	f	(Δ)	77.843 MHz (Δ)	0.164 dB																							
2	F	f		2.401973 GHz	-1.657 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	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
π/4DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88	106.7	0.307	0.4	PASS



GFSK_DH5/MCH



Frequency

Auto Tune

Center Freq 2.441000000 GHz

Start Freq 2.441000000 GHz

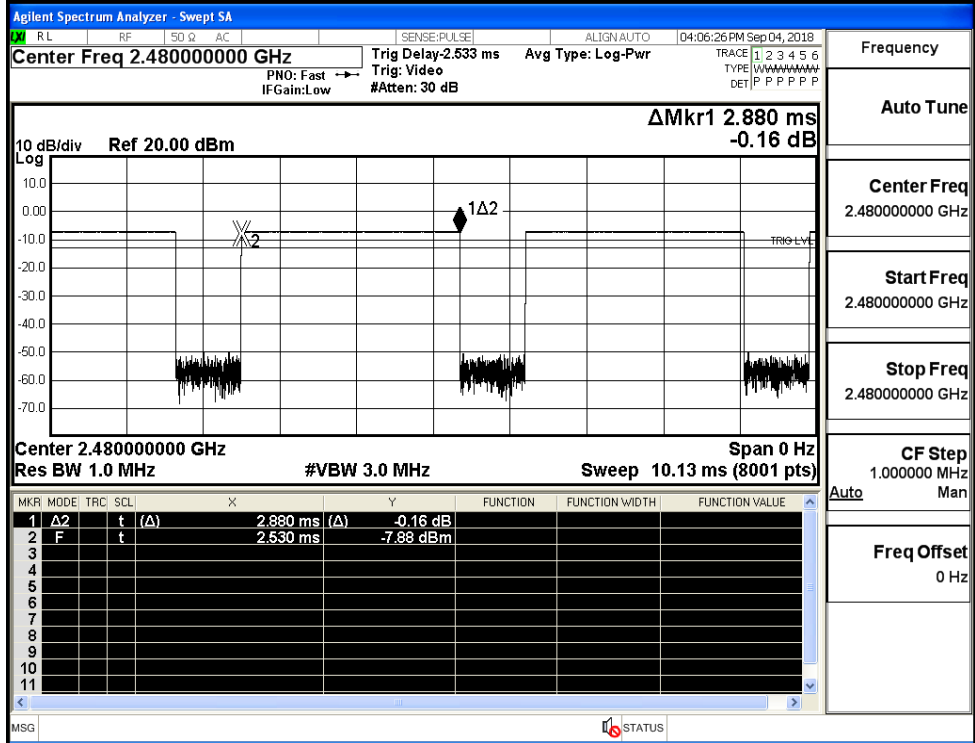
Stop Freq 2.441000000 GHz

CF Step 1.000000 MHz

Auto Man

Freq Offset 0 Hz

GFSK_DH5/HCH



Frequency

Auto Tune

Center Freq 2.480000000 GHz

Start Freq 2.480000000 GHz

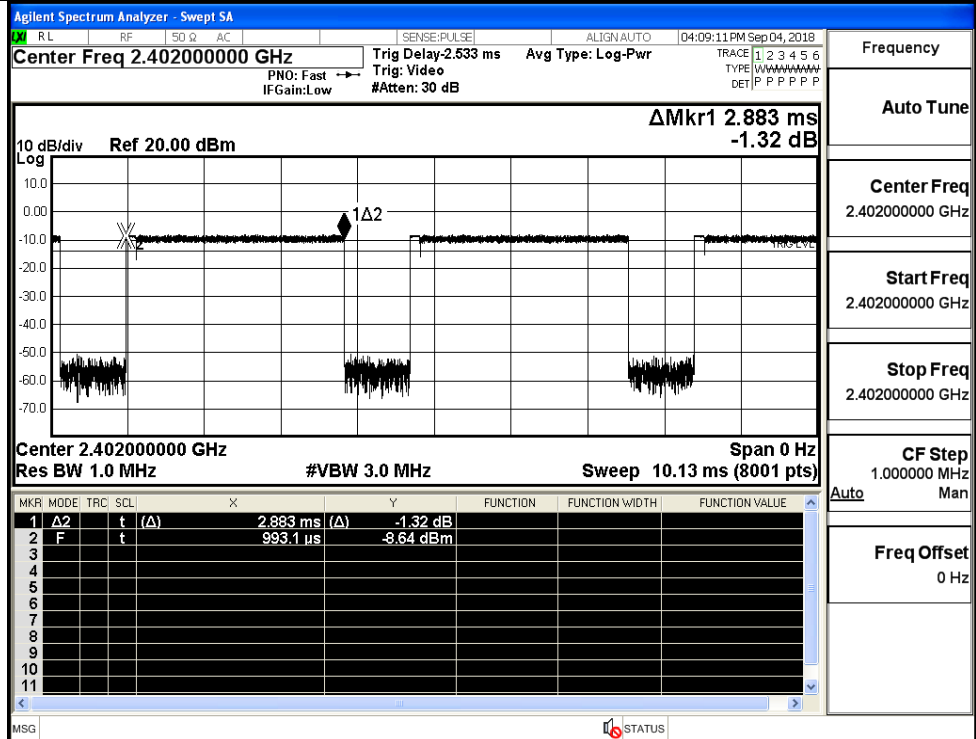
Stop Freq 2.480000000 GHz

CF Step 1.000000 MHz

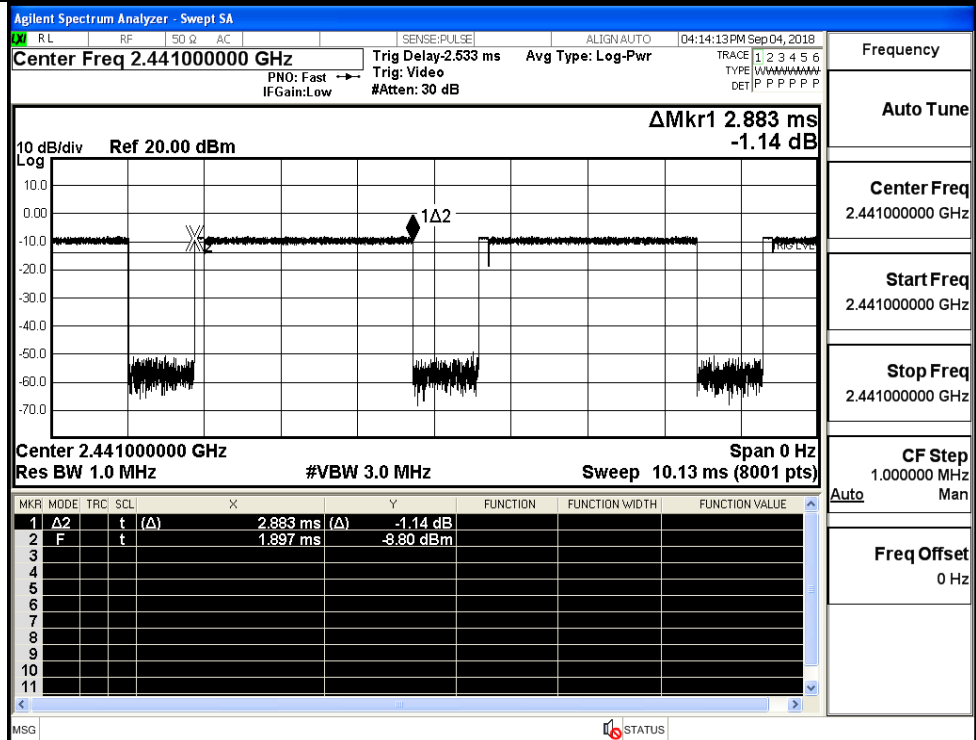
Auto Man

Freq Offset 0 Hz

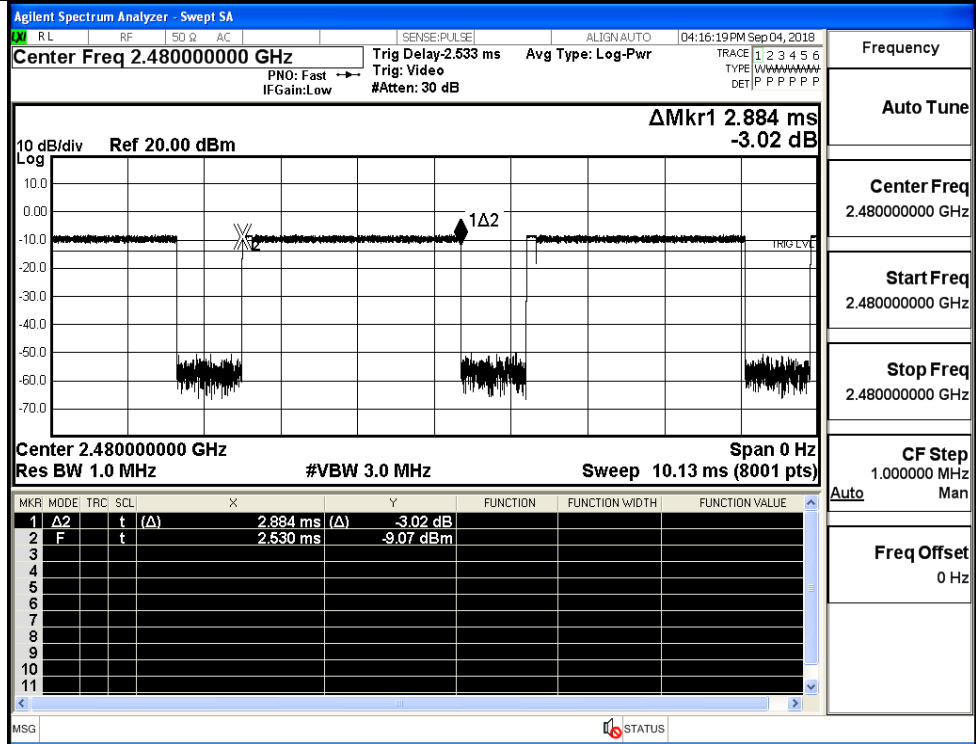
$\pi/4$ DQPSK
_2DH5/LCH



$\pi/4$ DQPSK
_2DH5/MCH



$\pi/4$ DQPSK
_2DH5/HCH



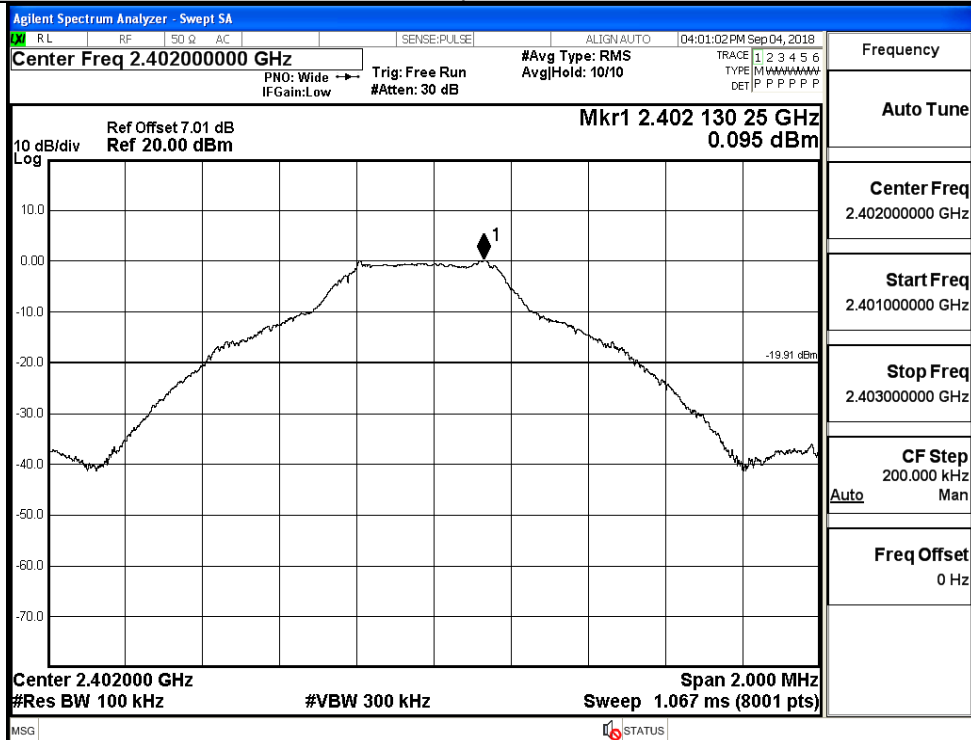
Frequency	
Auto Tune	
Center Freq	2.480000000 GHz
Start Freq	2.480000000 GHz
Stop Freq	2.480000000 GHz
CF Step	1.000000 MHz
Auto	Man
Freq Offset	0 Hz

A.6 RF Conducted Spurious Emissions

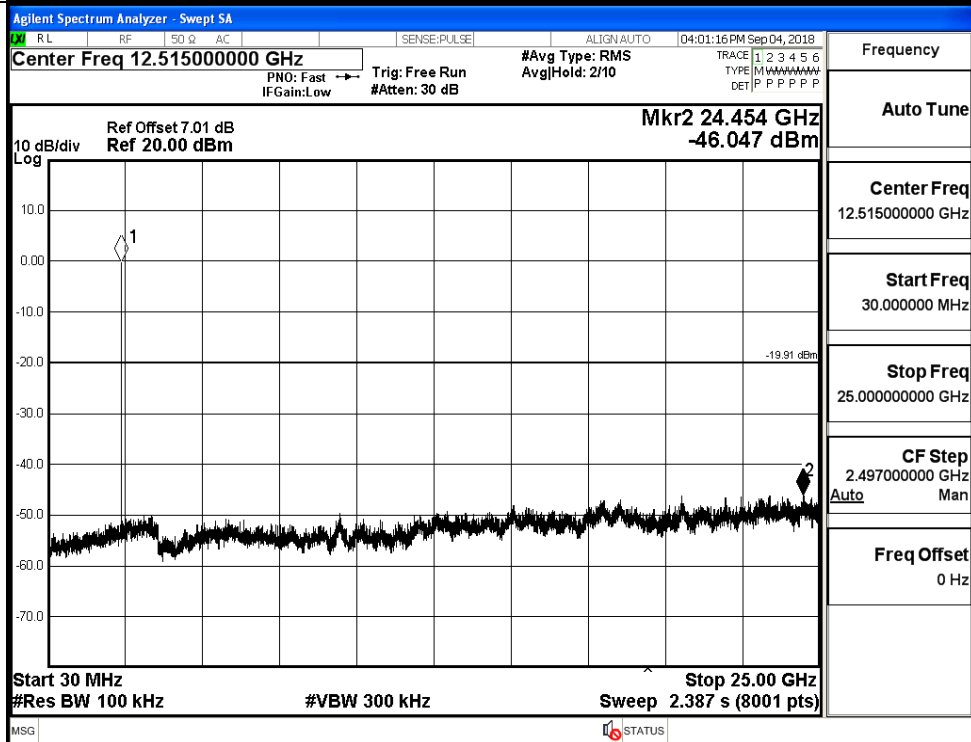
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.095	-46.047	-19.905	PASS
	MCH	-0.086	-45.995	-20.086	PASS
	HCH	-0.077	-44.916	-20.077	PASS
$\pi/4$ DQPSK	LCH	-1.591	-45.689	-21.591	PASS
	MCH	-1.929	-45.918	-21.929	PASS
	HCH	-1.574	-45.951	-21.574	PASS

GFSK_LCH_Graphs

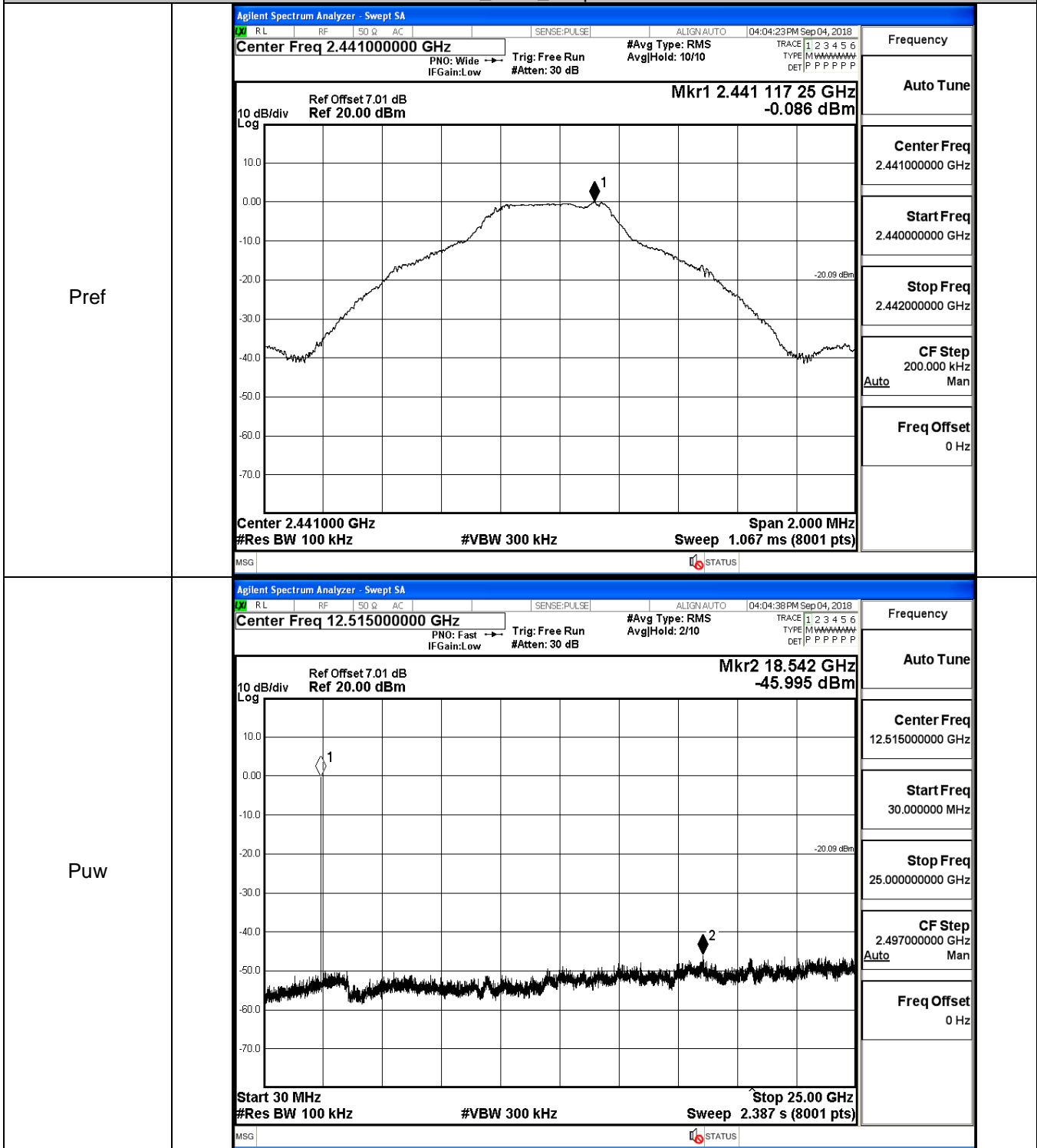
Pref



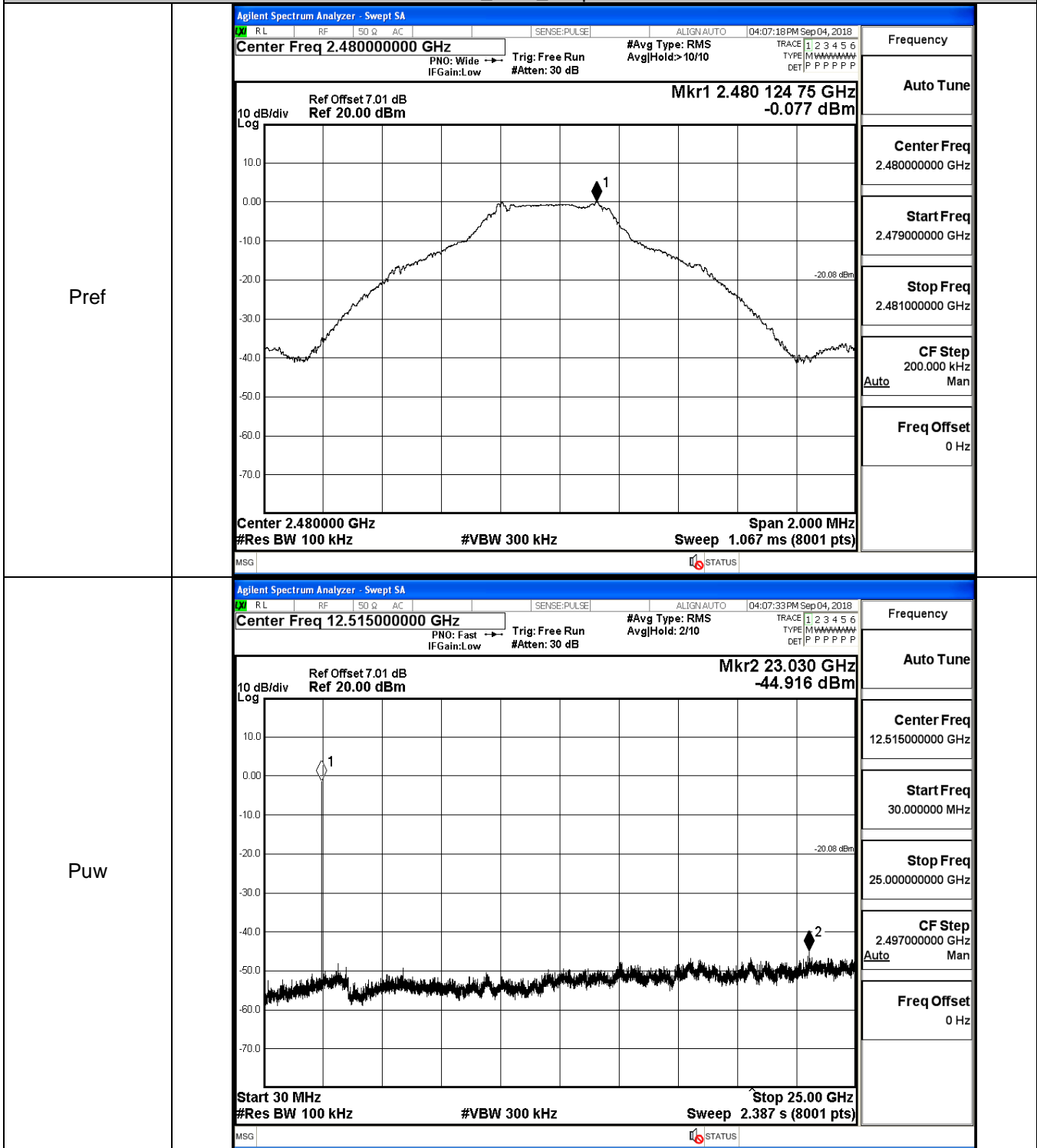
Puw



GFSK_MCH_Graphs

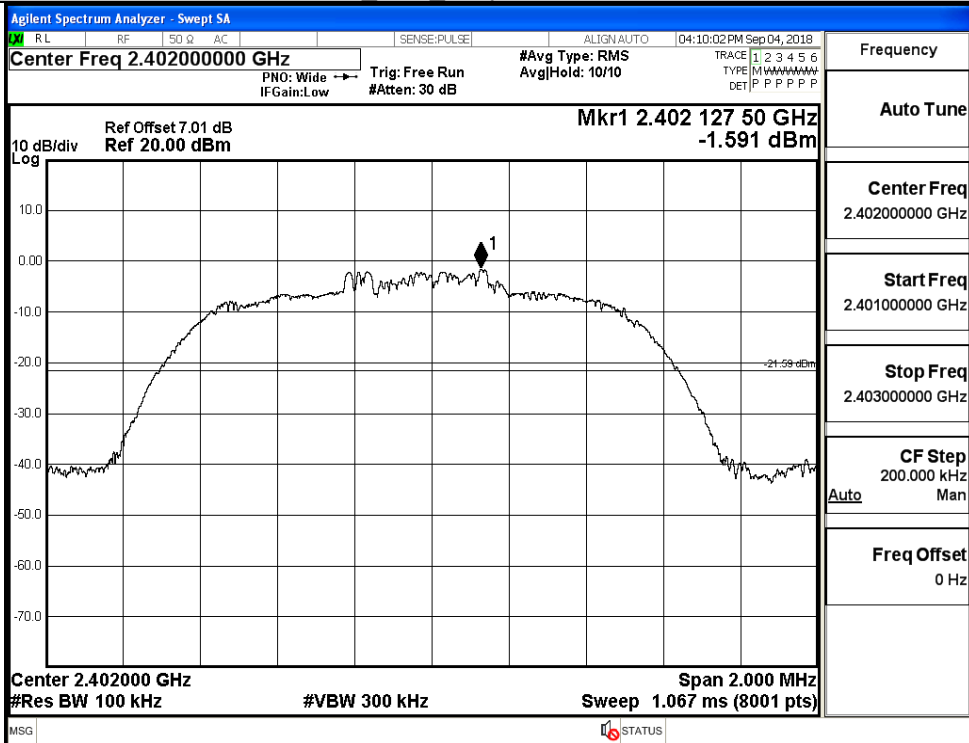


GFSK_HCH_Graphs

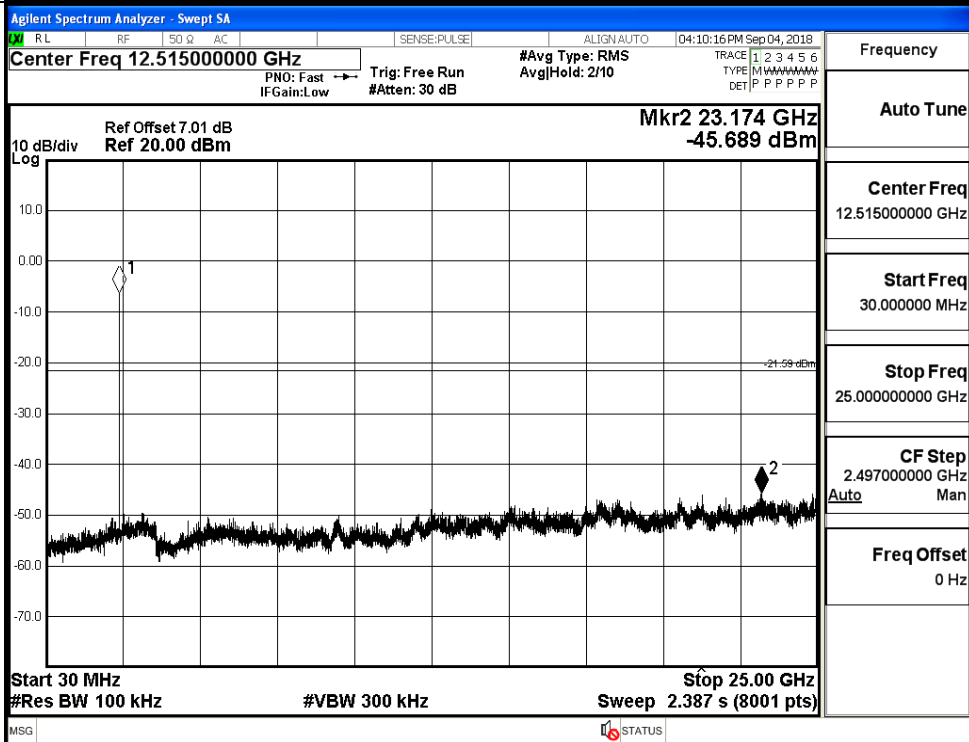


$\pi/4$ DQPSK LCH_Graphs

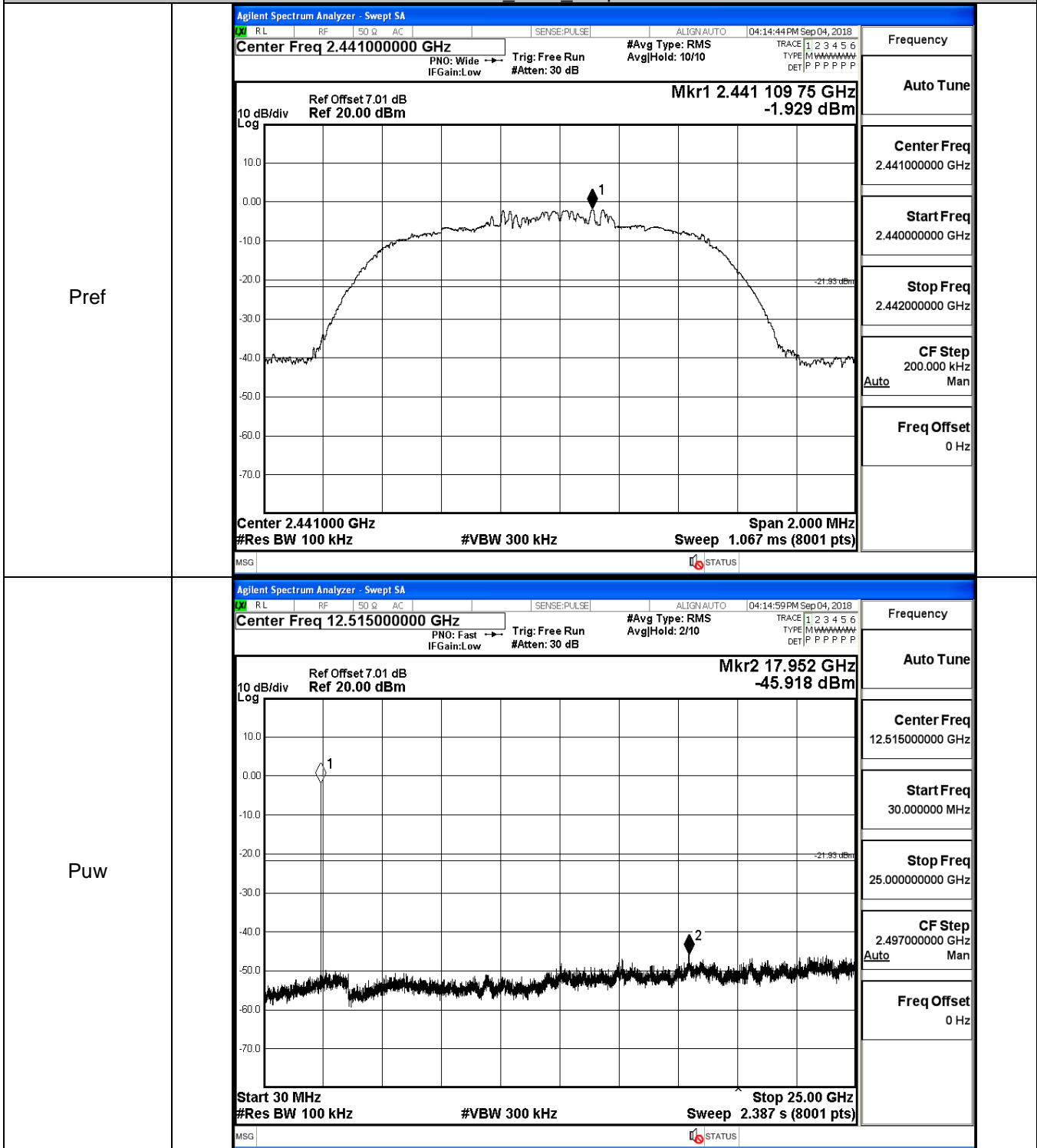
Pref



Puw

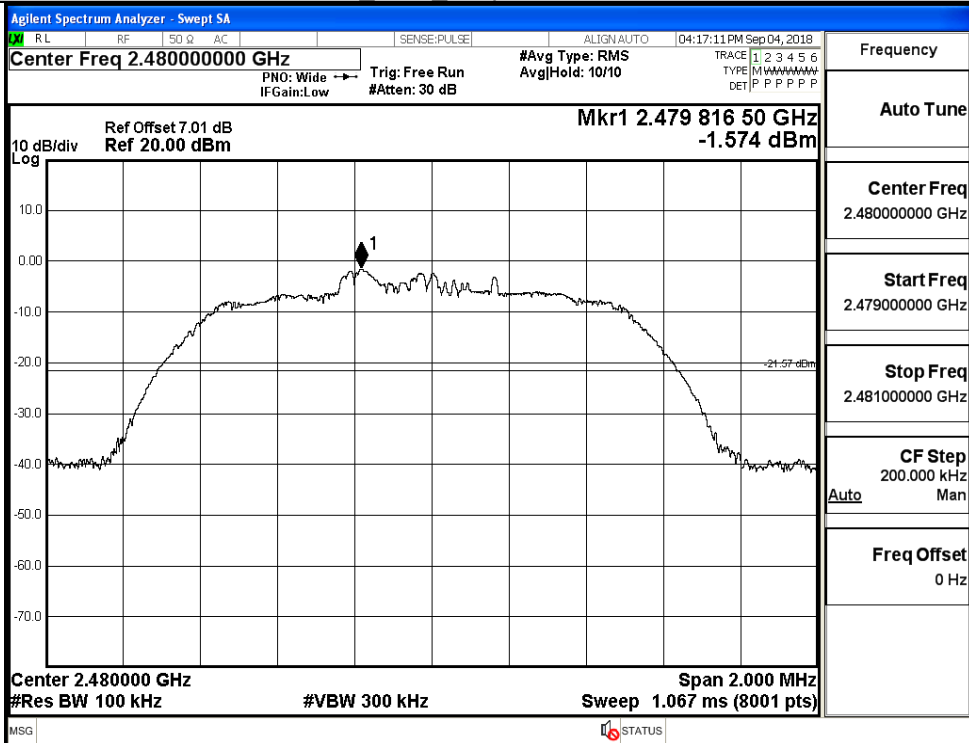


π /4DQPSK_MCH_Graphs

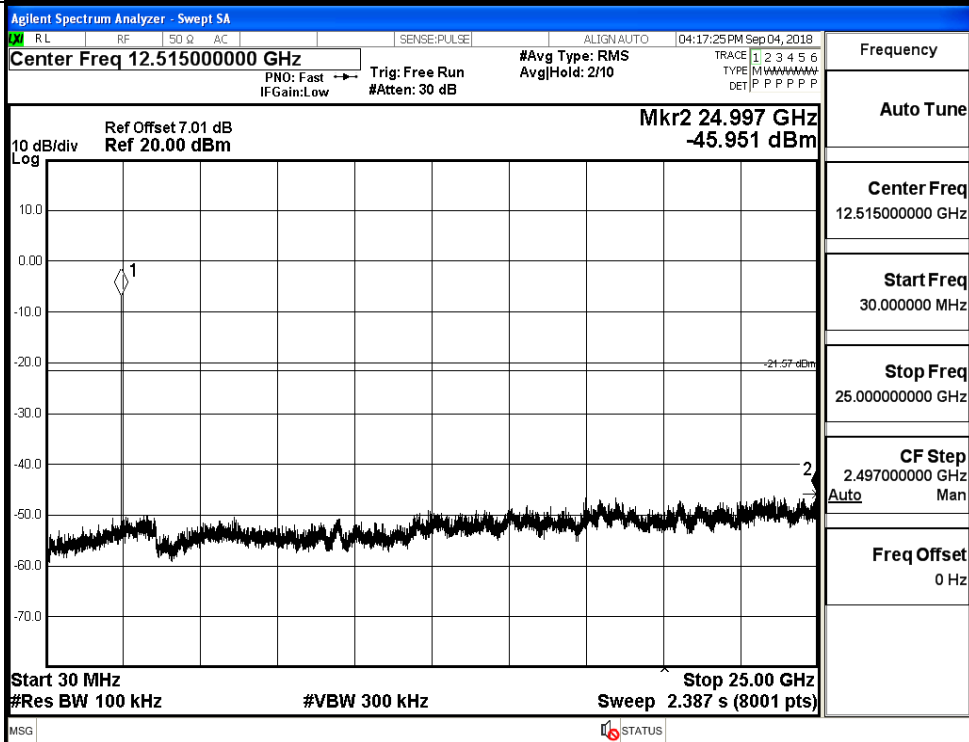


$\pi/4$ DQPSK_HCH_Graphs

Pref



Puw

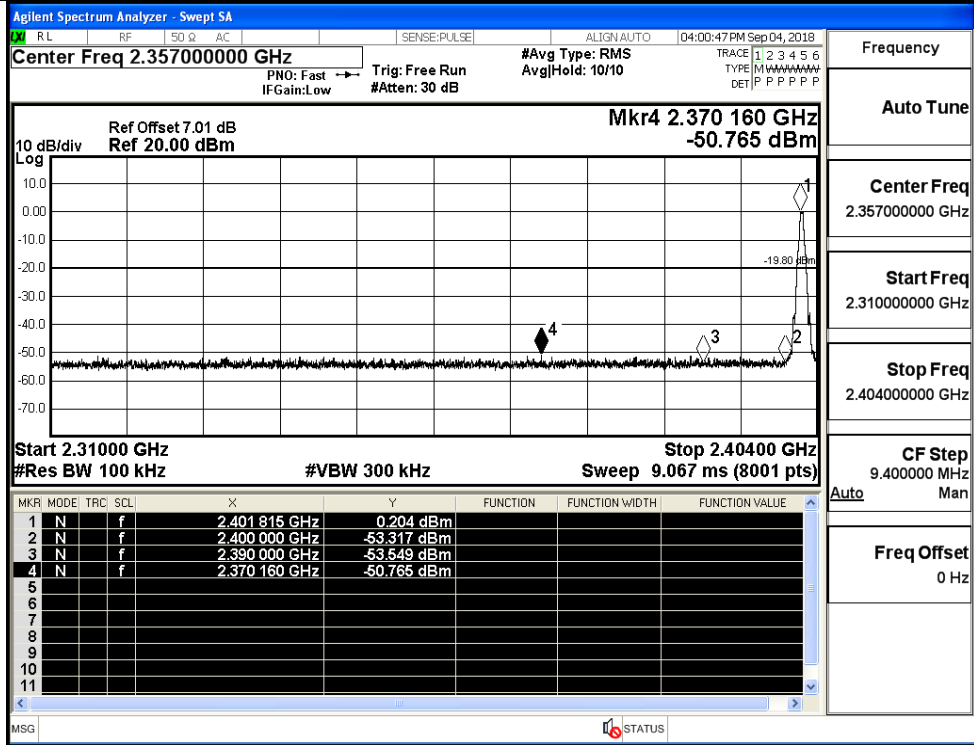


A.7 Band-edge for RF Conducted Emissions

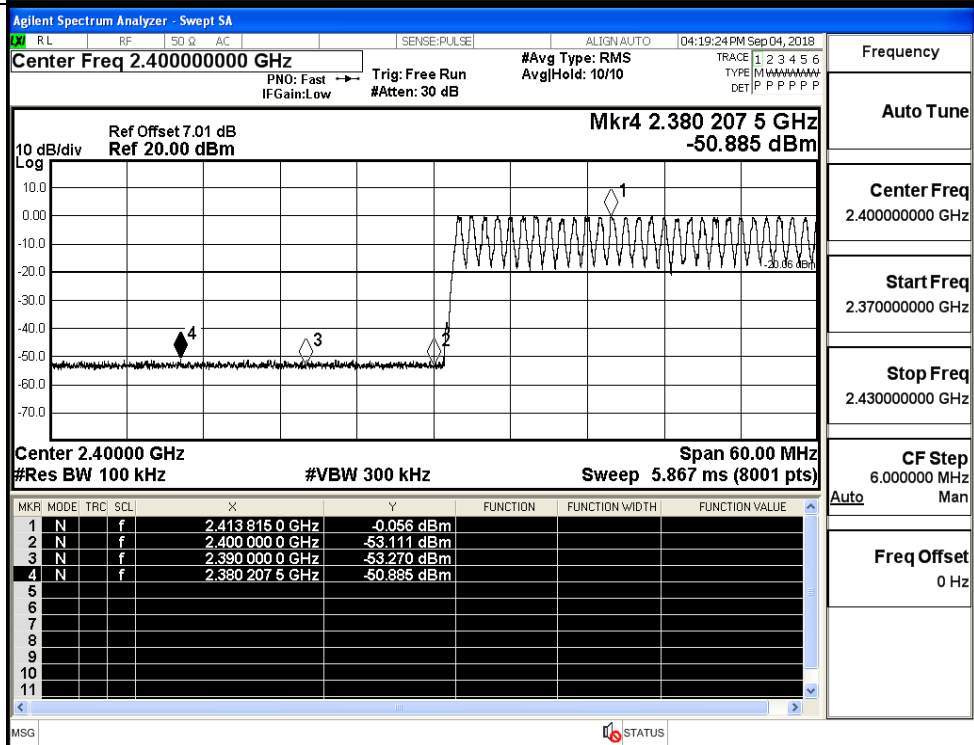
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	0.204	Off	-50.765	-19.8	PASS
			-0.056	On	-50.885	-20.06	PASS
	HCH	2480	-0.113	Off	-50.585	-20.11	PASS
			0.067	On	-50.217	-19.93	PASS
$\pi/4$ DQPSK	LCH	2402	-2.527	Off	-51.048	-22.53	PASS
			-1.740	On	-50.584	-21.74	PASS
	HCH	2480	-1.623	Off	-50.757	-21.62	PASS
			-1.509	On	-50.123	-21.51	PASS

Test Graphs

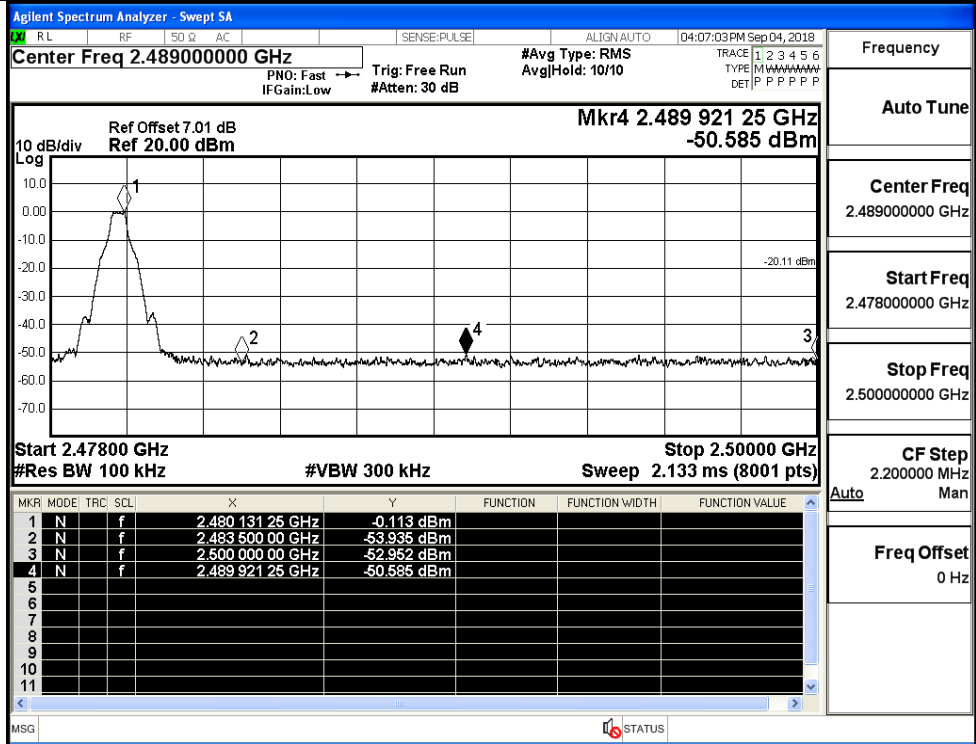
GFSK/LCH/No Hop



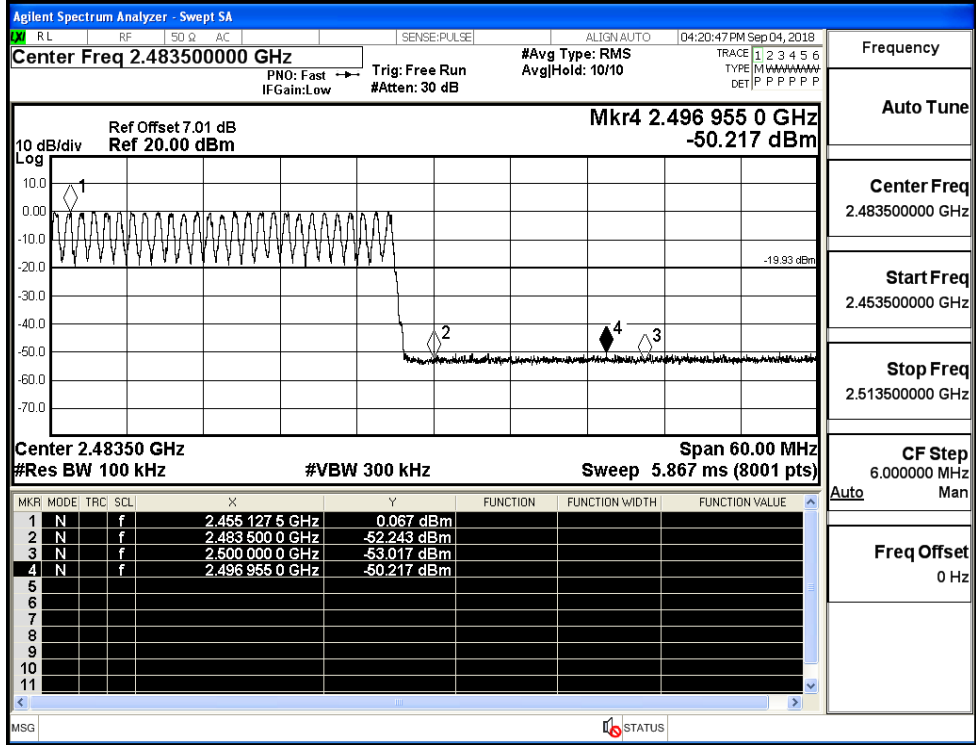
GFSK/LCH/Hop



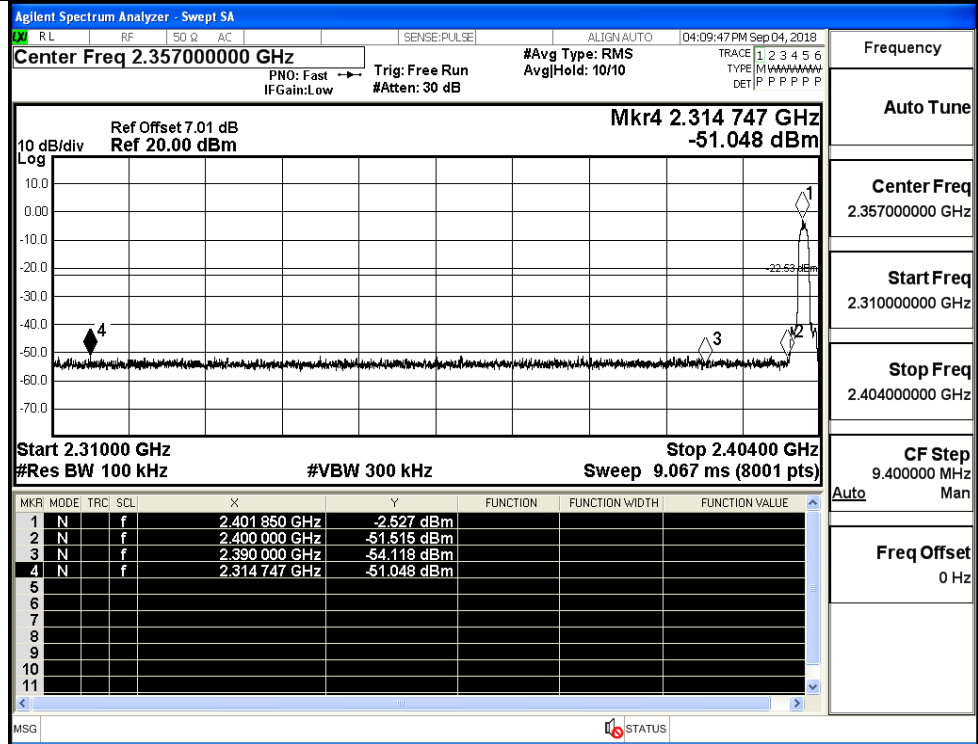
GFSK/HCH/No Hop



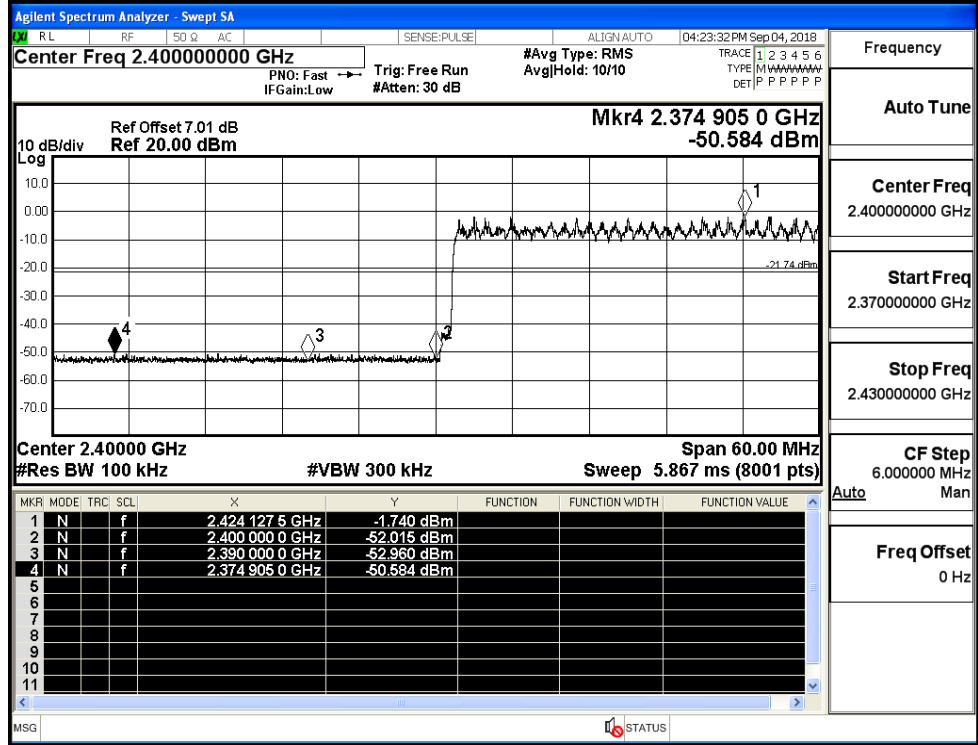
GFSK/HCH/Hop



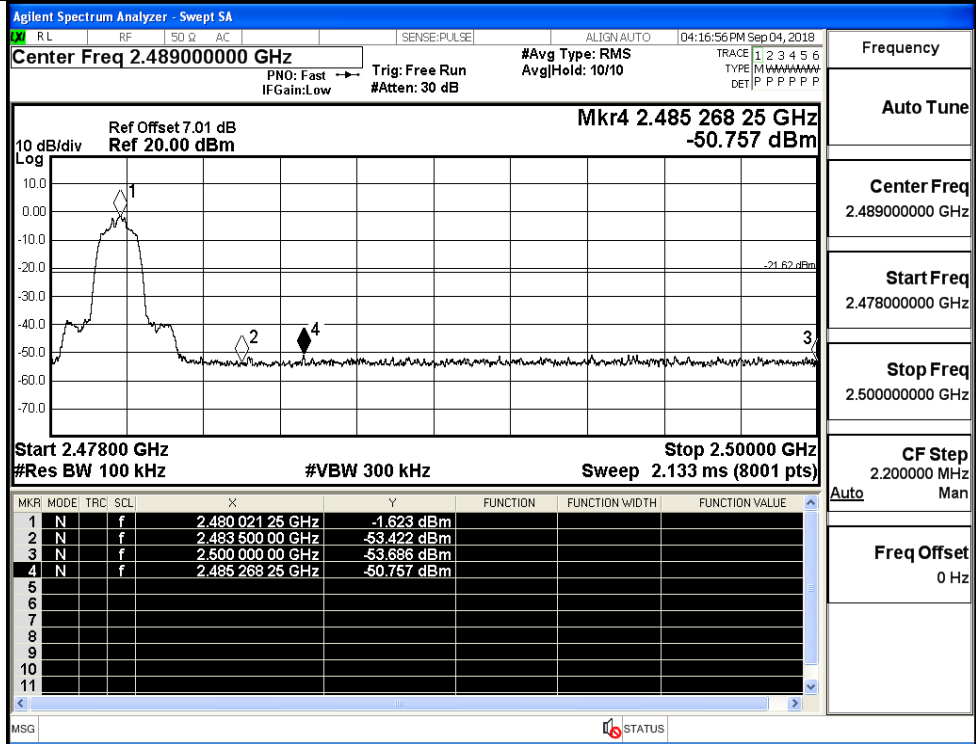
$\pi/4$ DQPSK/LCH/No
Hop



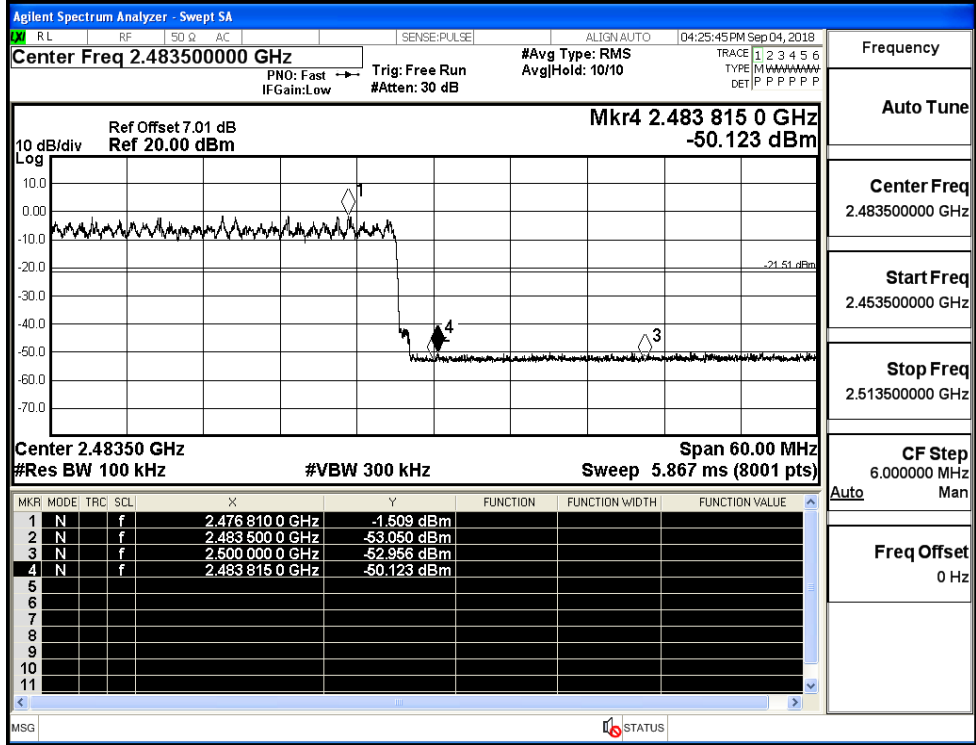
$\pi/4$ DQPSK/LCH/Hop



π /4DQPSK/HCH/No
Hop



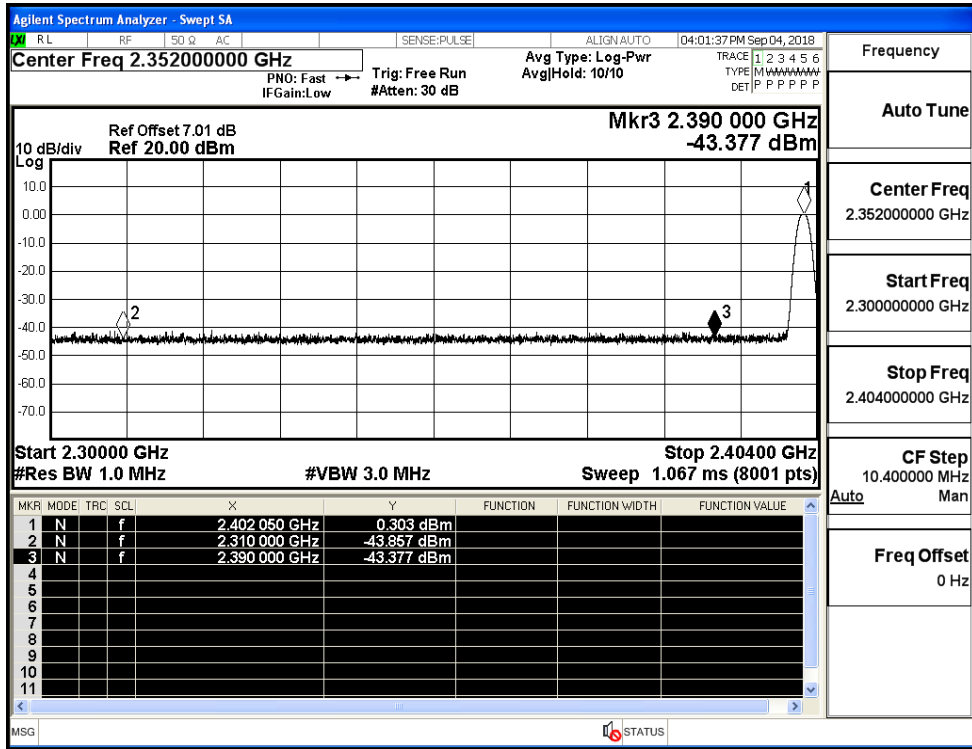
π /4DQPSK/HCH/Hop



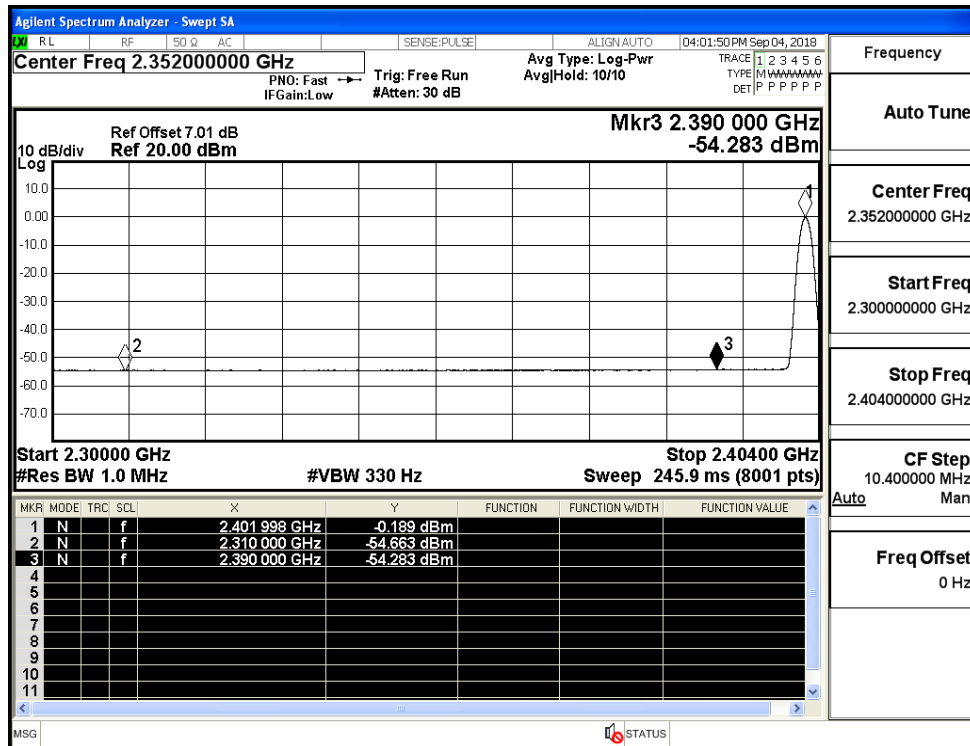
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.86	2.0	0	53.40	PEAK	74	PASS
	Off	2310.0	-54.66	2.0	0	42.59	AV	54	PASS
	Off	2390.0	-43.38	2.0	0	53.88	PEAK	74	PASS
	Off	2390.0	-54.28	2.0	0	42.97	AV	54	PASS
	Off	2483.5	-44.22	2.0	0	53.04	PEAK	74	PASS
	Off	2483.5	-53.94	2.0	0	43.32	AV	54	PASS
	Off	2500.0	-43.91	2.0	0	53.35	PEAK	74	PASS
	Off	2500.0	-54.01	2.0	0	43.25	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-44.84	2.0	0	52.42	PEAK	74	PASS
	Off	2310.0	-54.58	2.0	0	42.67	AV	54	PASS
	Off	2390.0	-44.17	2.0	0	53.08	PEAK	74	PASS
	Off	2390.0	-54.34	2.0	0	42.92	AV	54	PASS
	Off	2483.5	-43.76	2.0	0	53.49	PEAK	74	PASS
	Off	2483.5	-54.03	2.0	0	43.23	AV	54	PASS
	Off	2500.0	-43.75	2.0	0	53.51	PEAK	74	PASS
	Off	2500.0	-53.87	2.0	0	43.39	AV	54	PASS

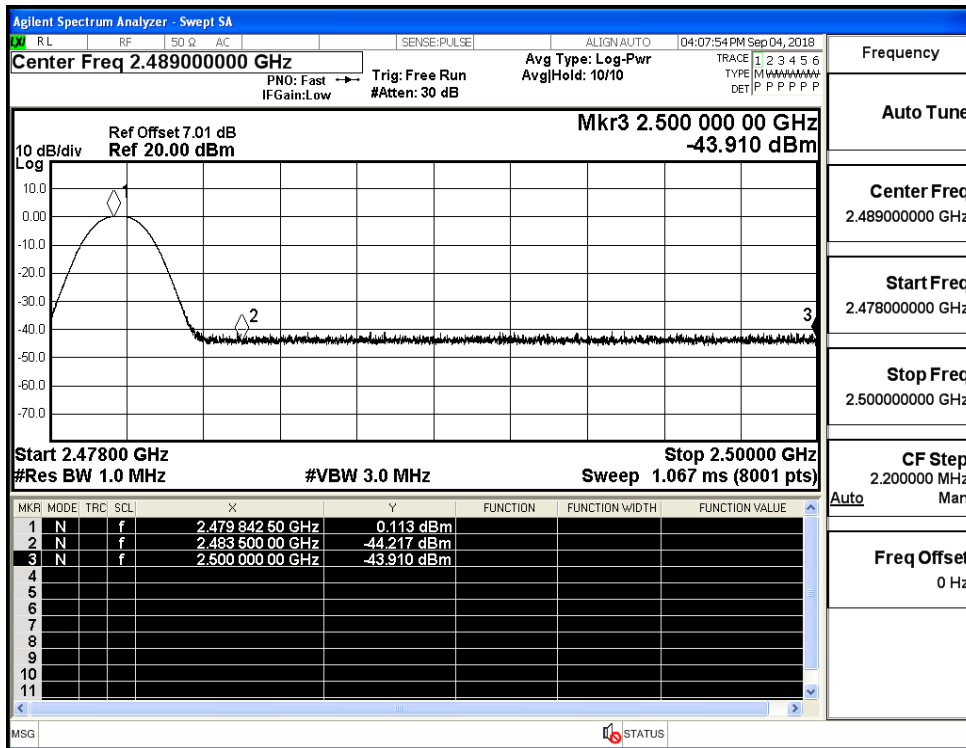
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



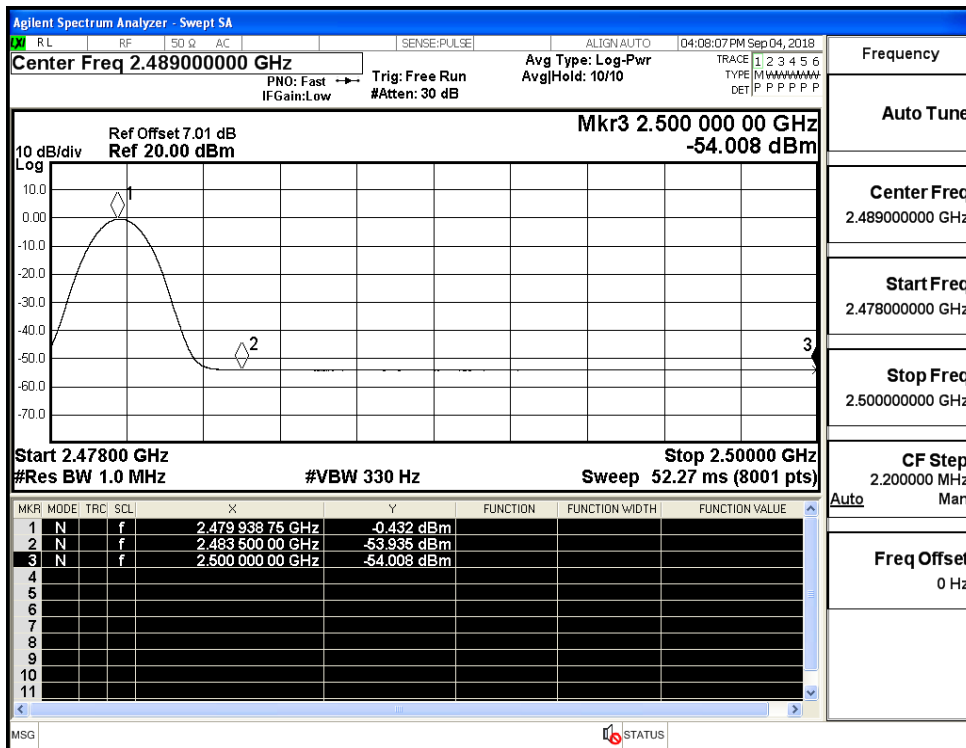
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



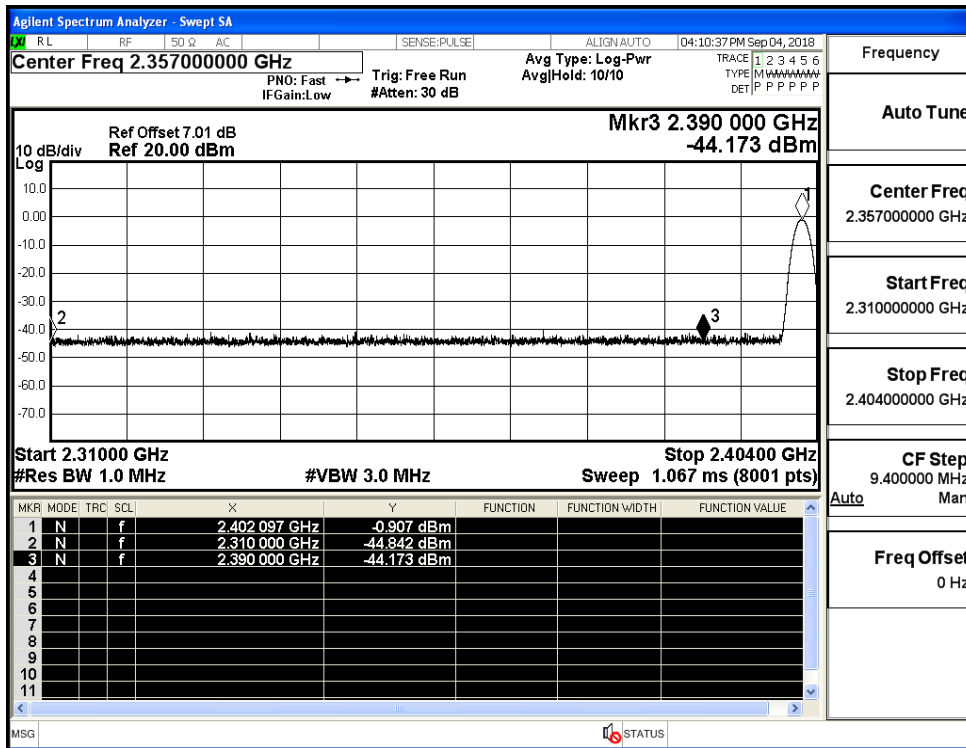
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



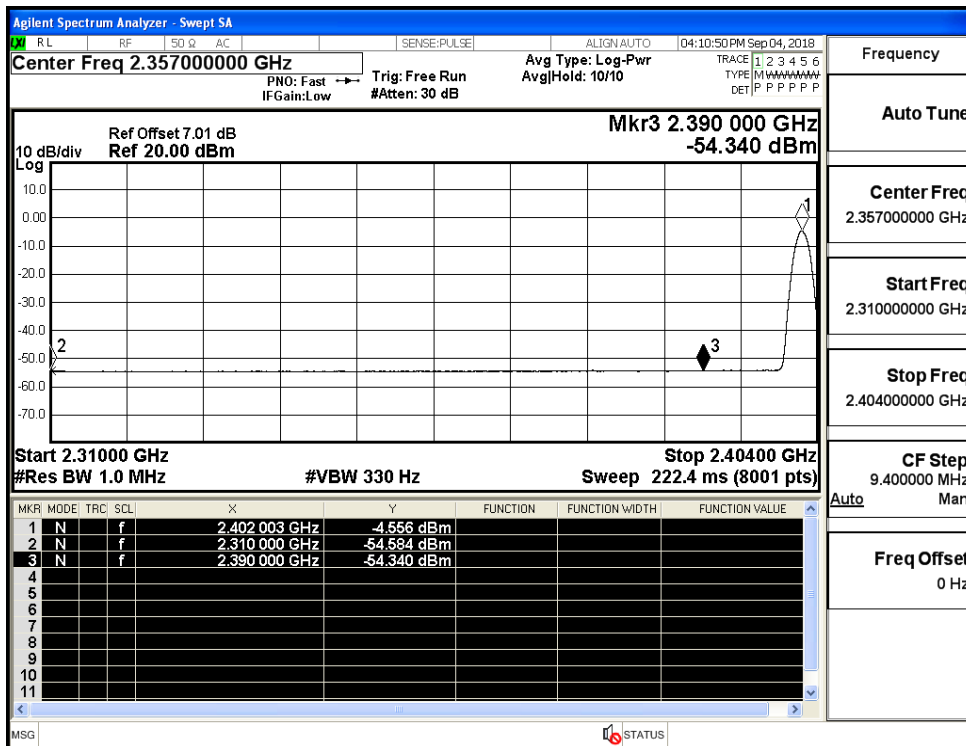
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



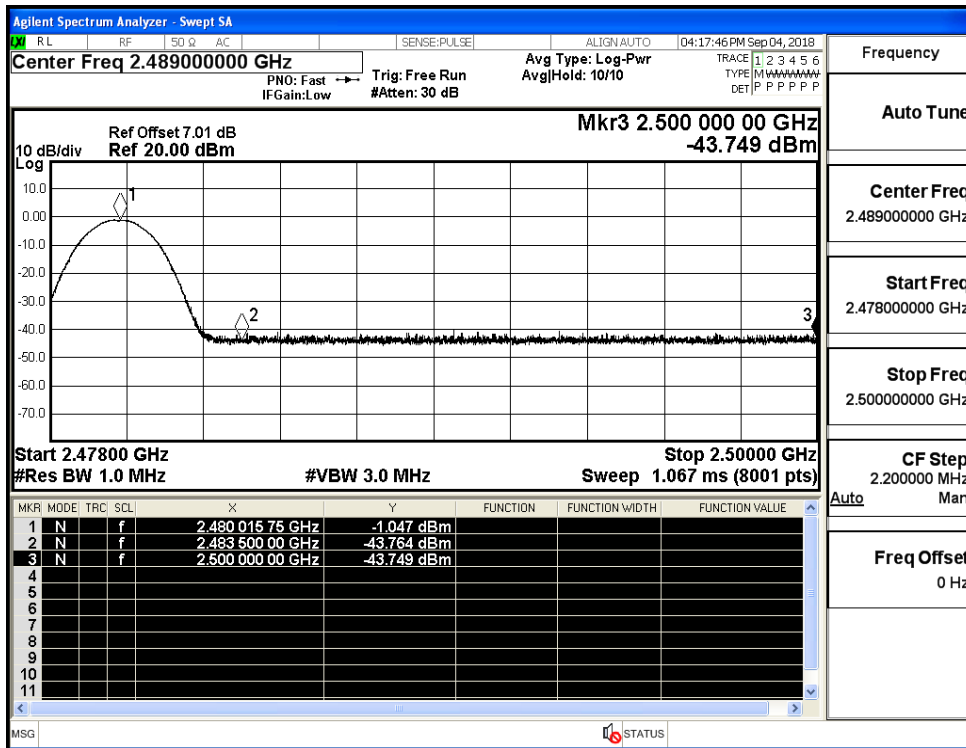
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)



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)

