

Appendix A

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

Product Name: Bluetooth CDG Karaoke with Special Light Effects

Trade Mark: singing machine

FCC Test Model: SML625BTBK

ISED Test Model: SML625BTXX

Environmental Conditions

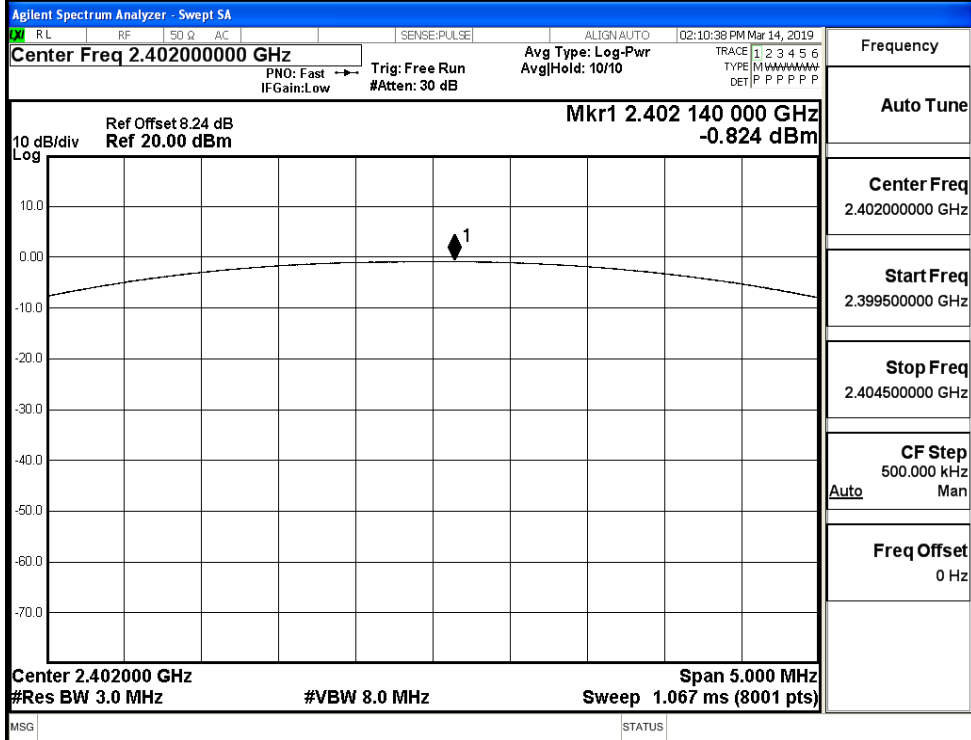
Temperature:	24.5 ° C
Relative Humidity:	53.8%
ATM Pressure:	100.0 kPa
Test Engineer:	JERRY.ZENG
Supervised by:	Tom.Liu

A.1 Maximum Conducted Peak Output Power

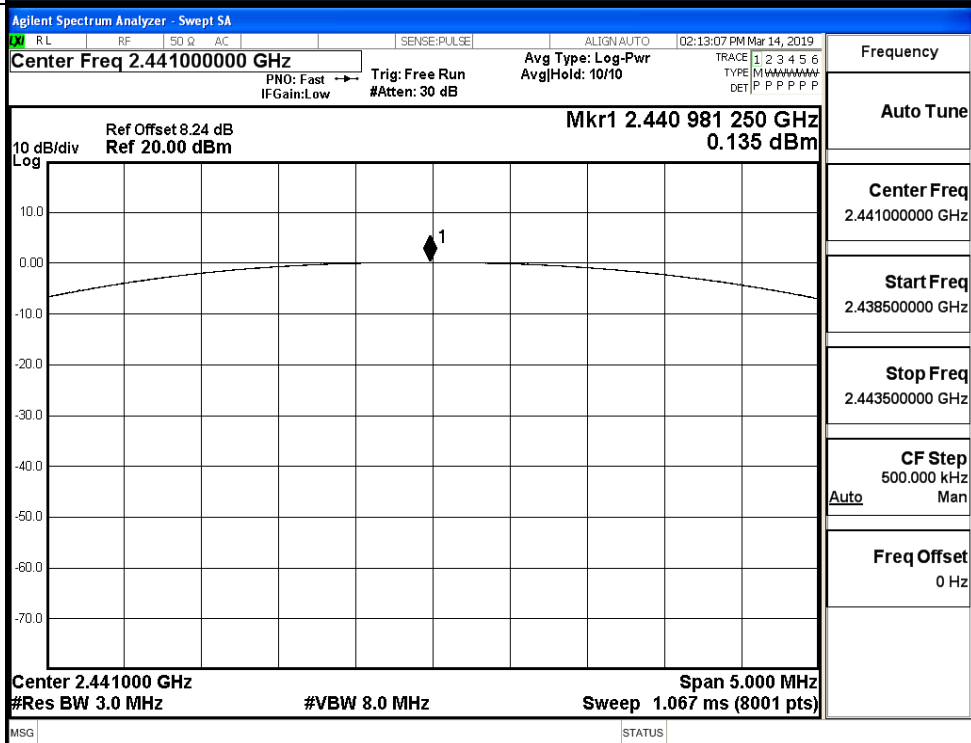
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.824	21	PASS
	MCH	0.135	21	PASS
	HCH	-0.904	21	PASS
$\pi/4$ DQPSK	LCH	-1.408	21	PASS
	MCH	-0.423	21	PASS
	HCH	-1.547	21	PASS

Test Graphs

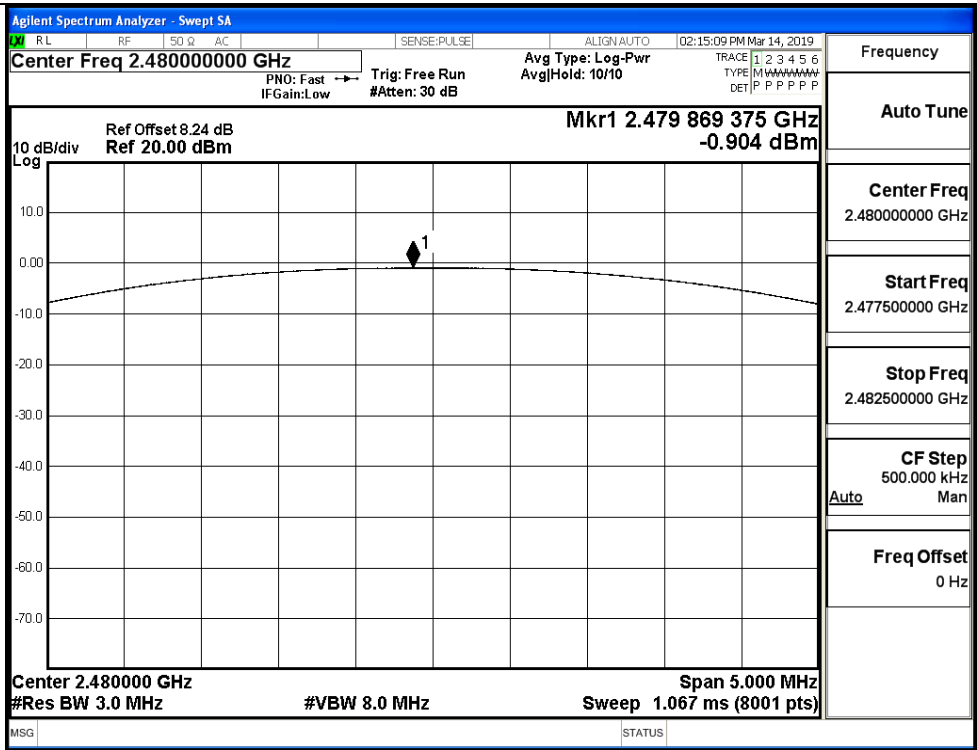
GFSK/LCH



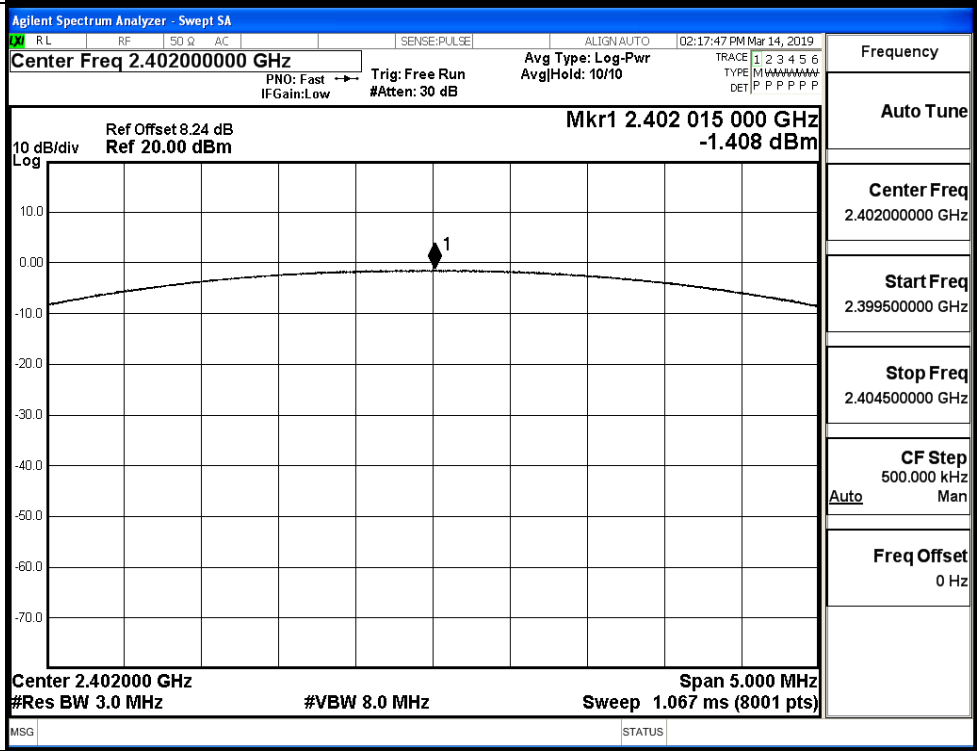
GFSK/MCH



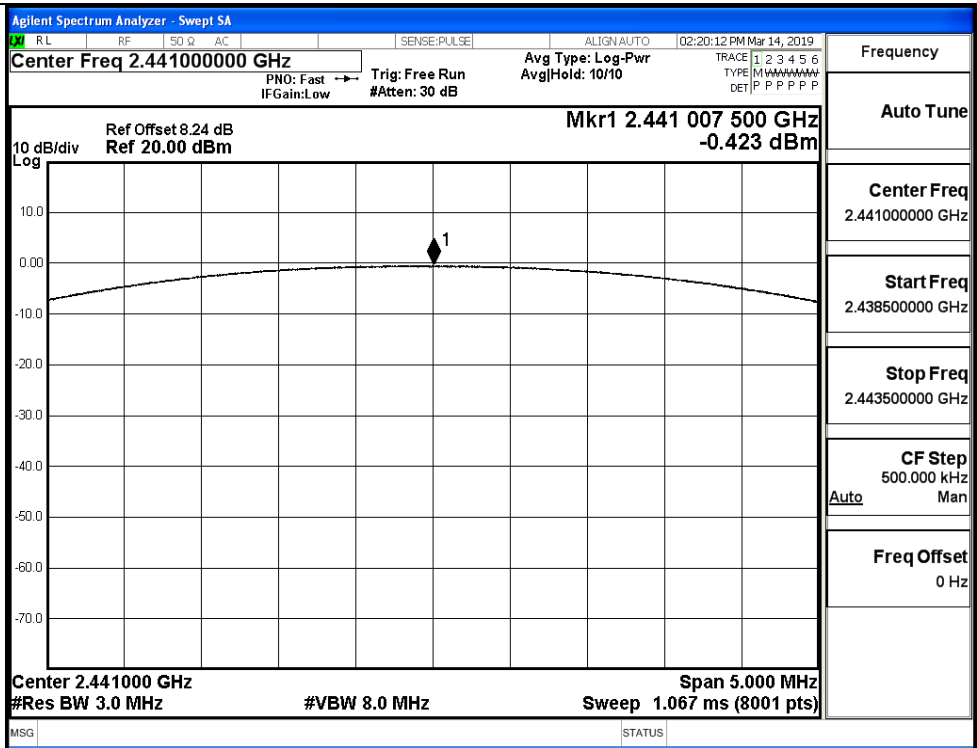
GFSK/HCH



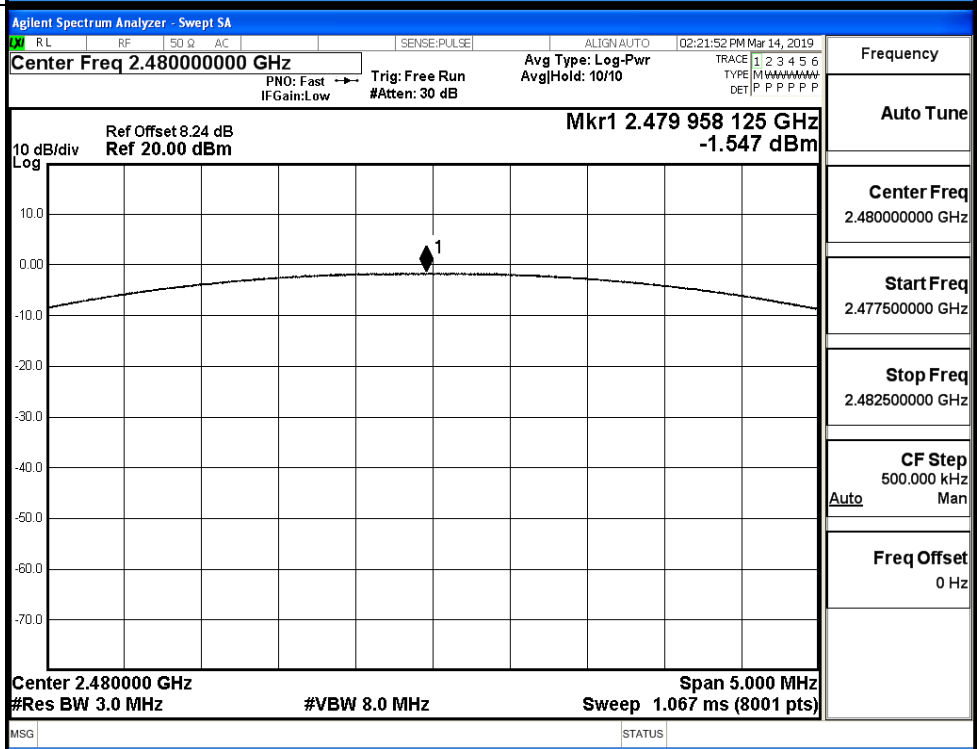
$\pi/4$ DQPSK/LCH



π /4DQPSK/MCH

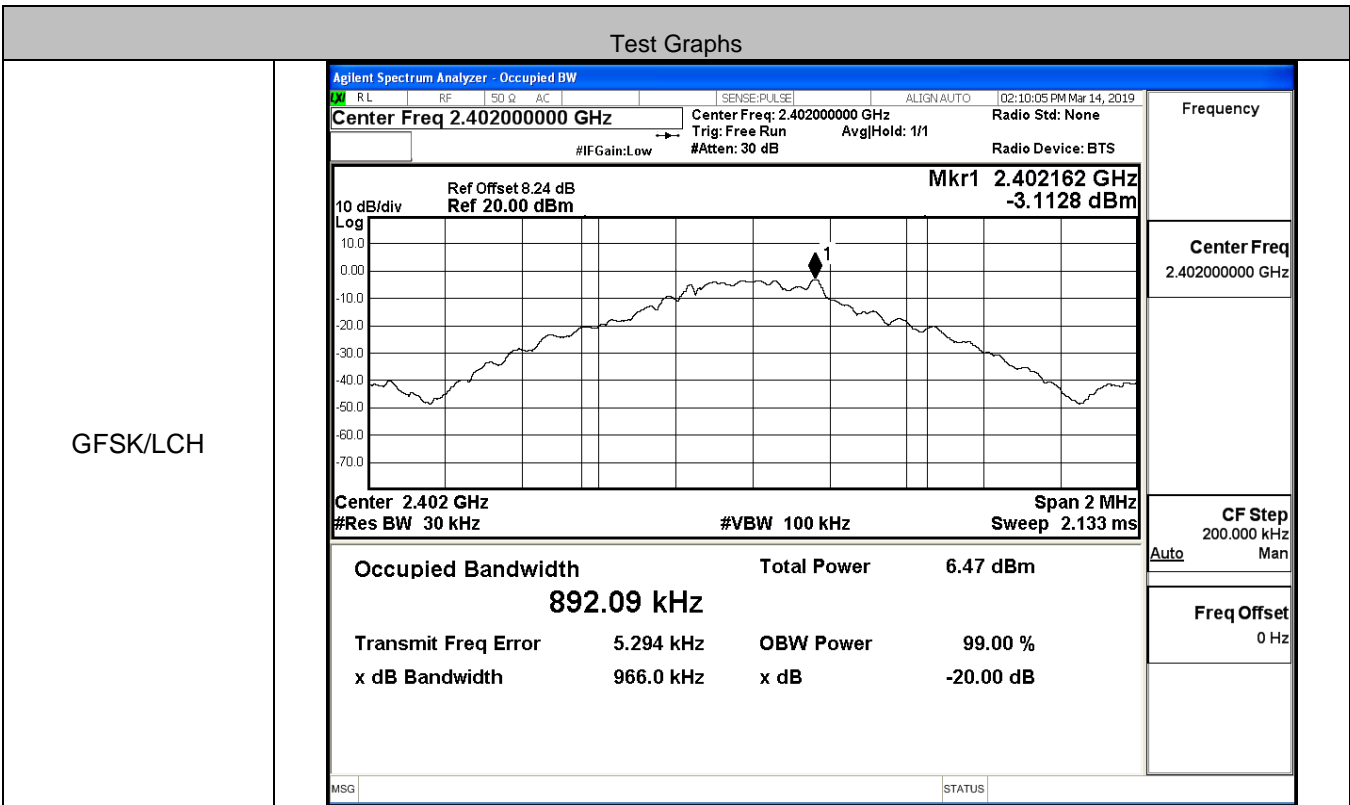


π /4DQPSK/HCH

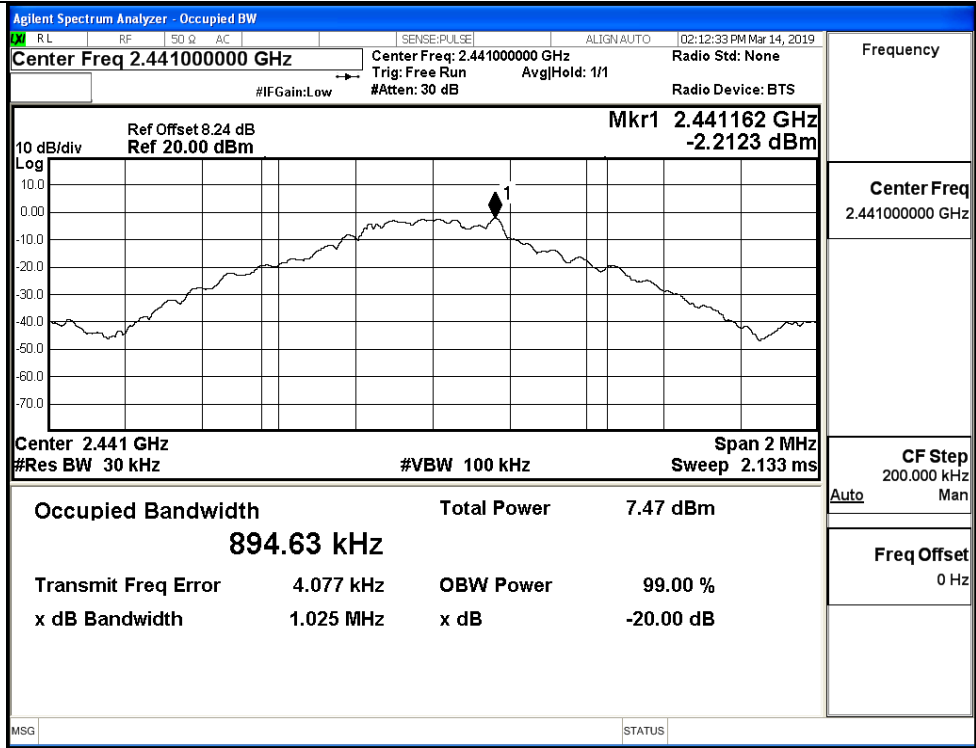


A.2 99% and 20dB Bandwidth

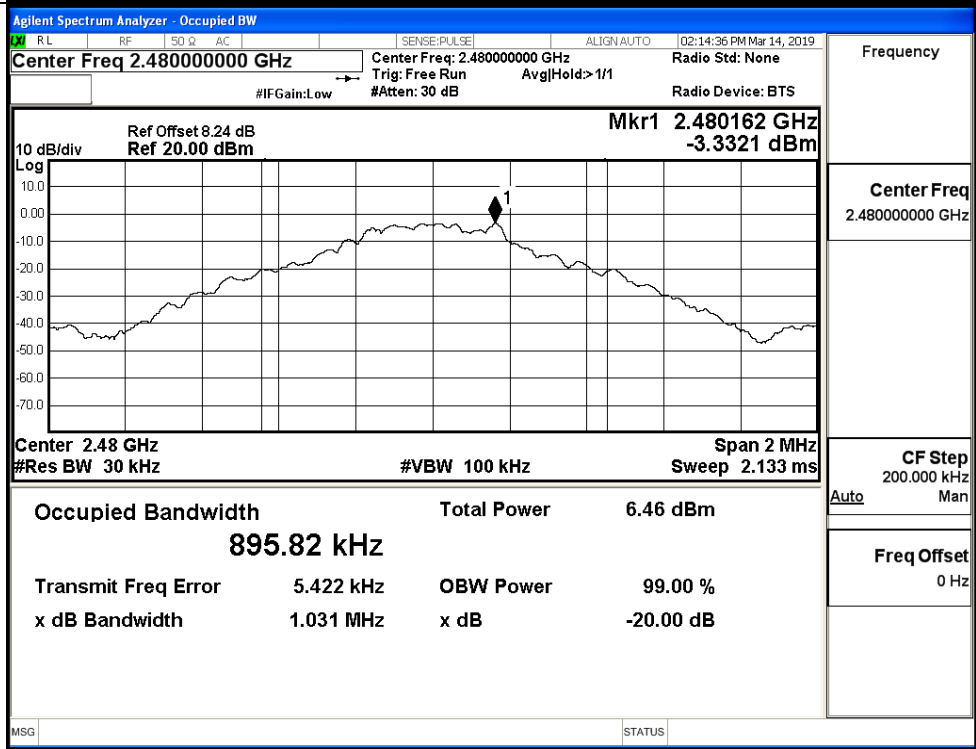
Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.89209	0.9660	Not Specified	PASS
	MCH	0.89463	1.025	Not Specified	PASS
	HCH	0.89582	1.031	Not Specified	PASS
π/4DQPSK	LCH	1.1770	1.294	Not Specified	PASS
	MCH	1.1743	1.292	Not Specified	PASS
	HCH	1.1733	1.292	Not Specified	PASS



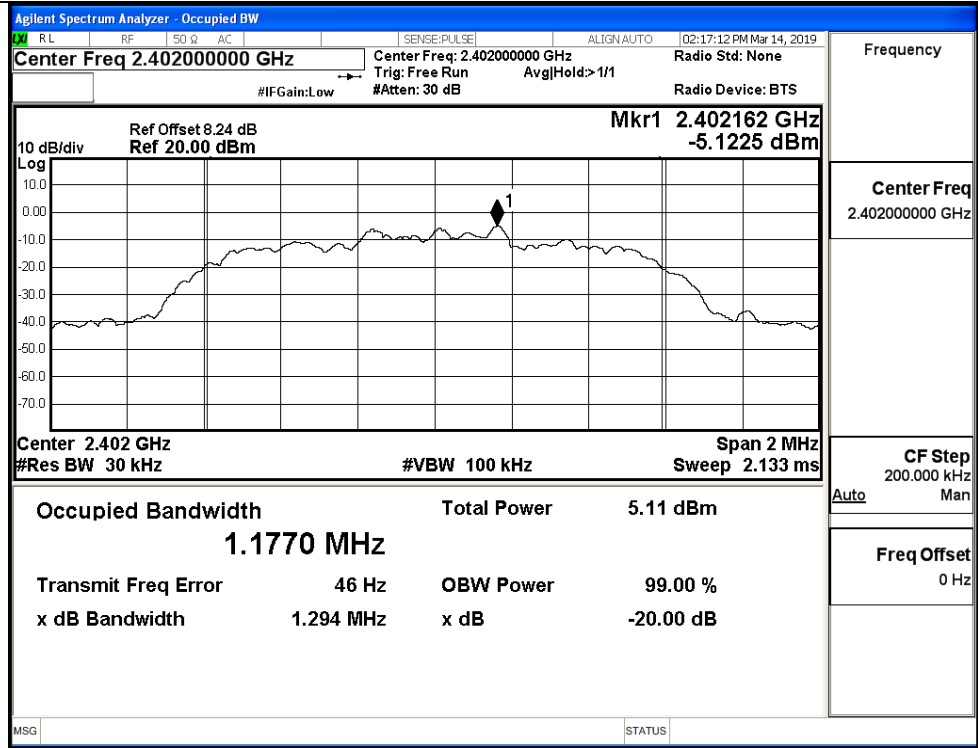
GFSK/MCH



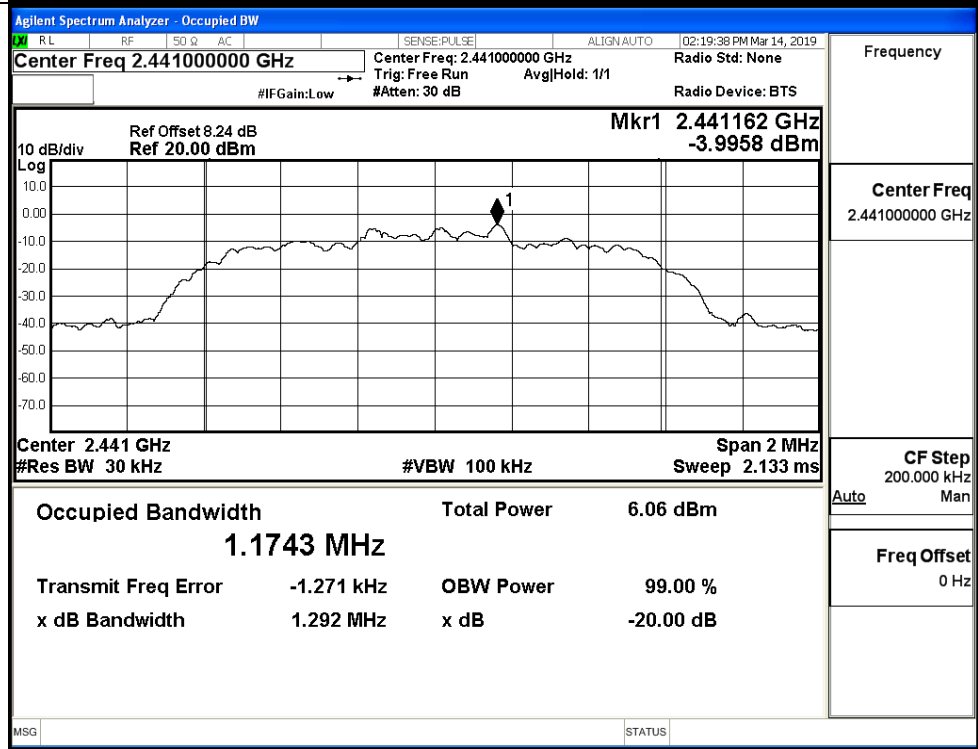
GFSK/HCH



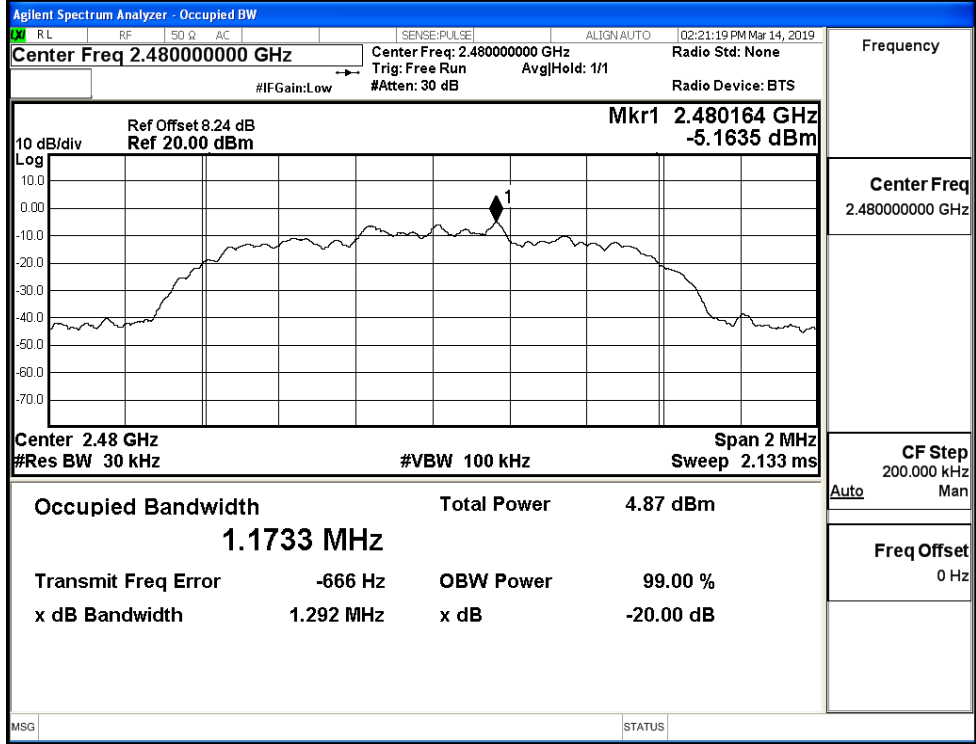
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH

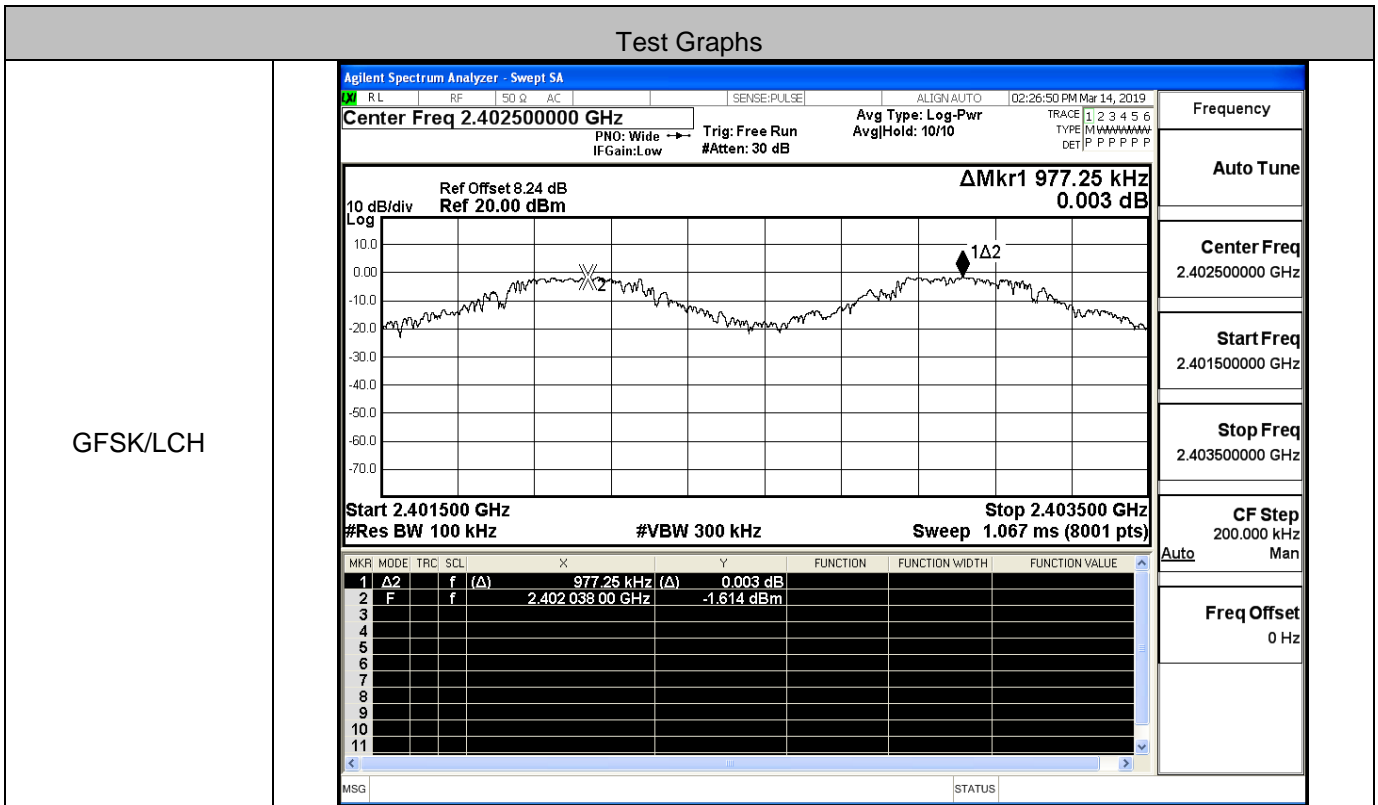


$\pi/4$ DQPSK/HCH

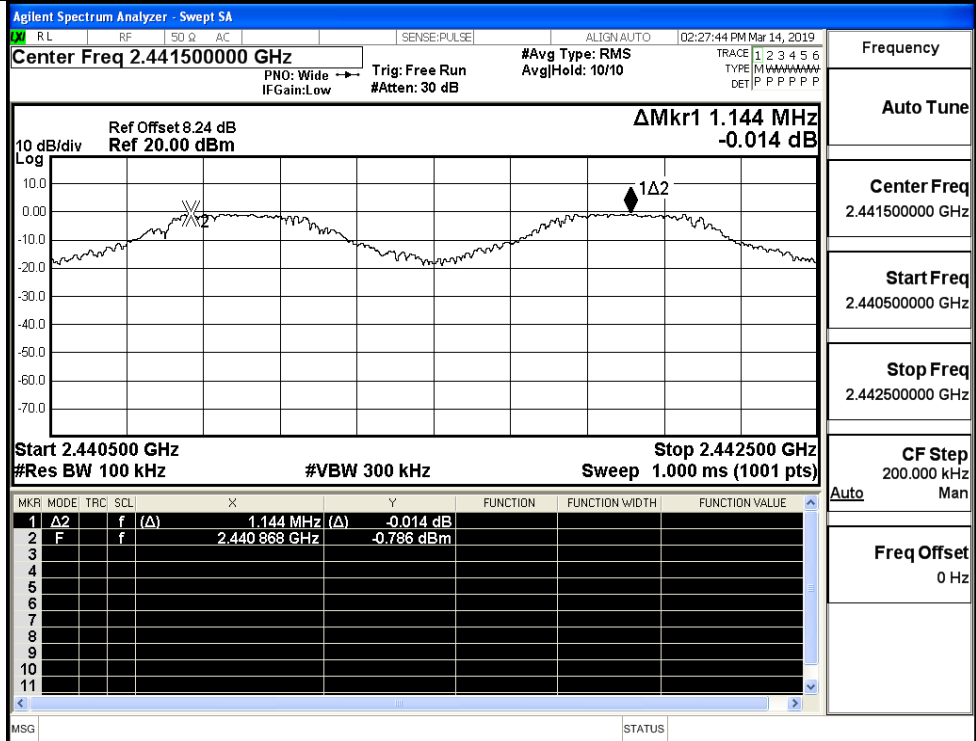


A.3 Carrier Frequency Separation

Mode	Channel	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.977	0.687	PASS
	MCH	1.144	0.687	PASS
	HCH	0.810	0.687	PASS
π/4DQPSK	LCH	1.044	0.863	PASS
	MCH	0.876	0.863	PASS
	HCH	1.178	0.863	PASS

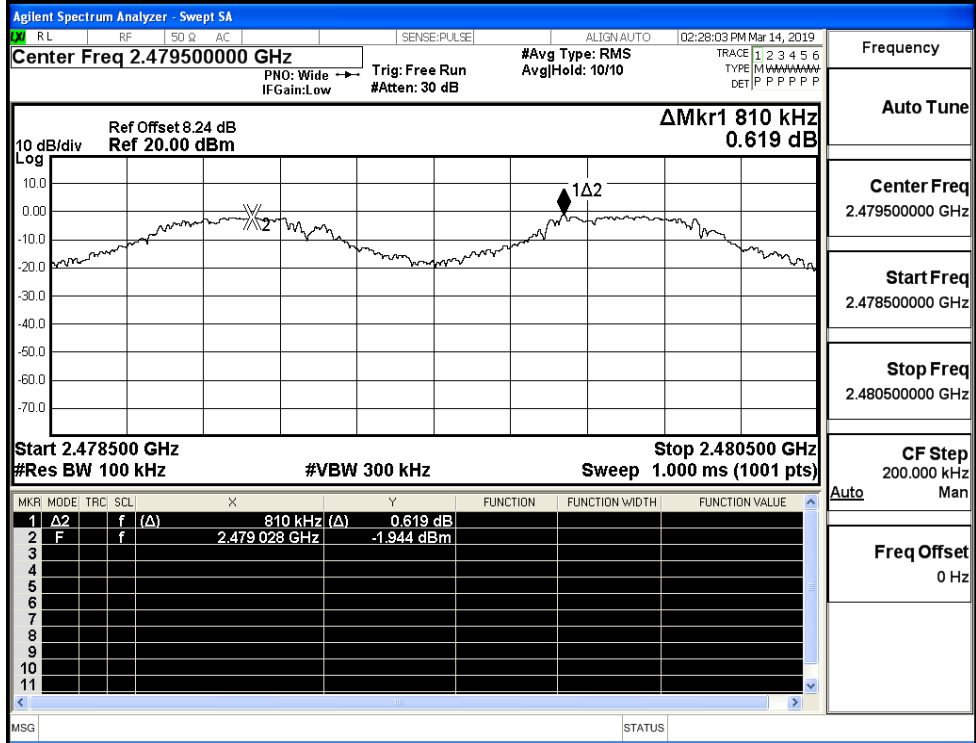


GFSK/MCH



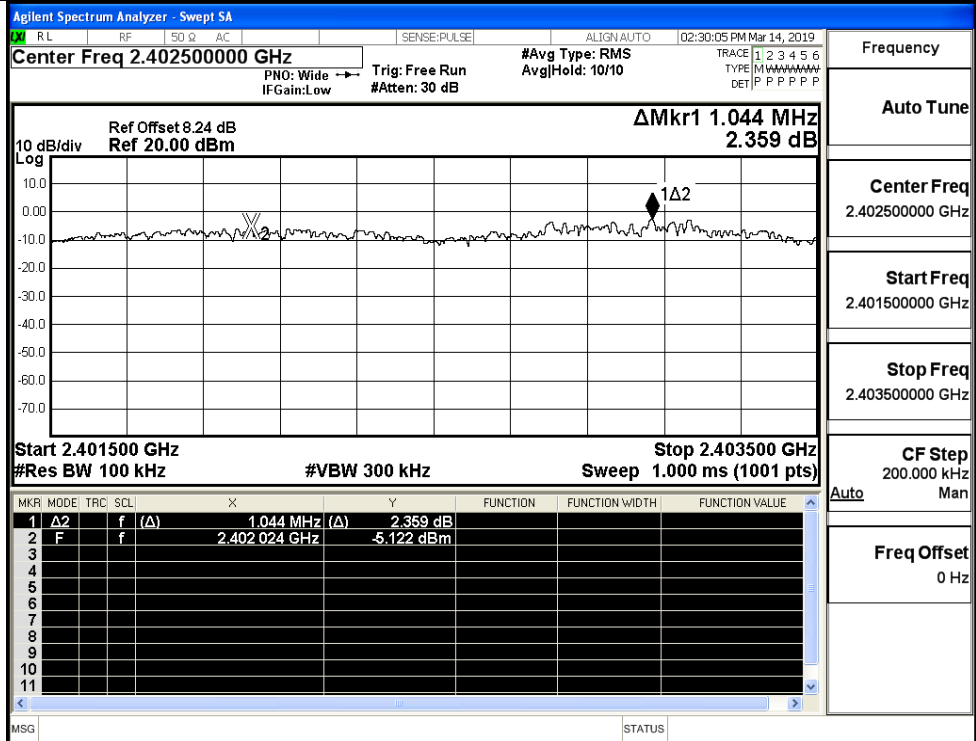
Frequency
Auto Tune
Center Freq
2.441500000 GHz
Start Freq
2.440500000 GHz
Stop Freq
2.442500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

GFSK/HCH

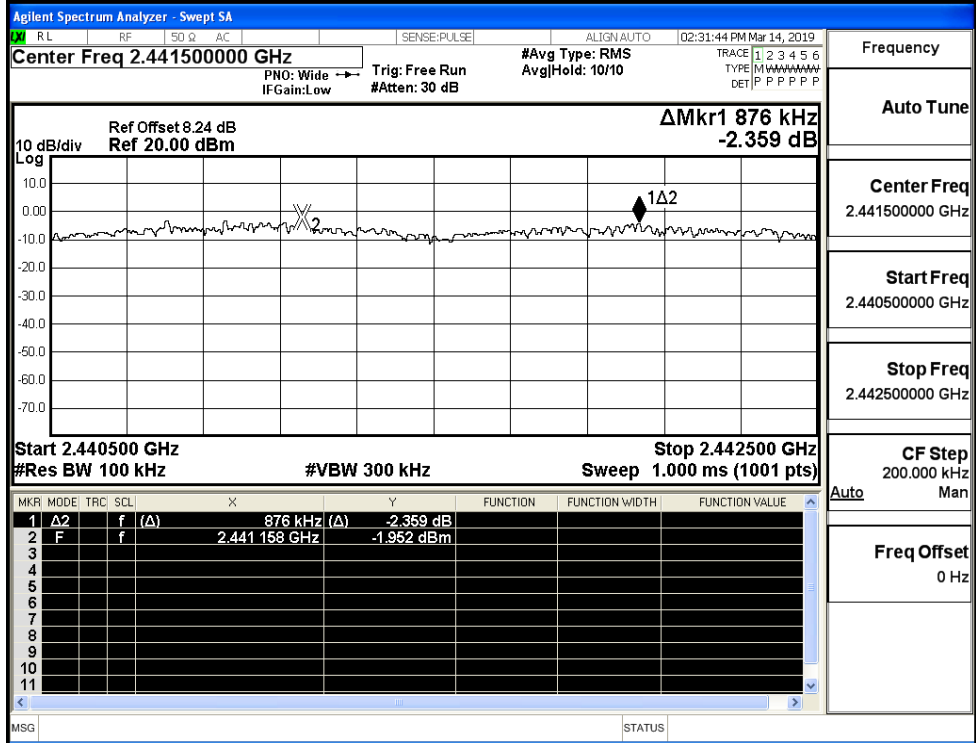


Frequency
Auto Tune
Center Freq
2.479500000 GHz
Start Freq
2.478500000 GHz
Stop Freq
2.480500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

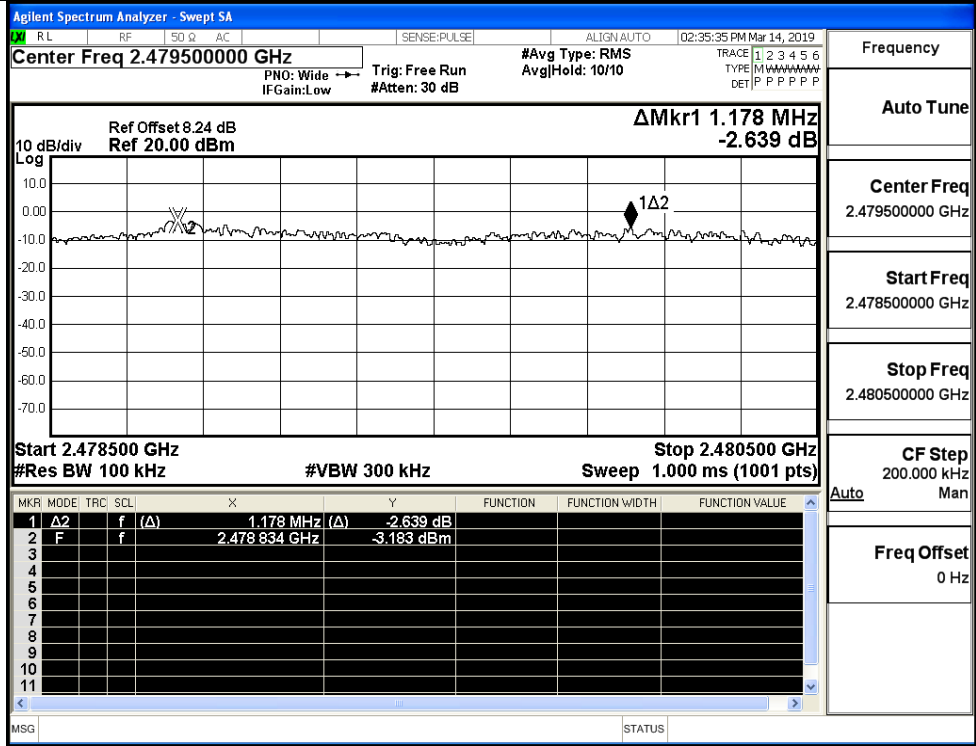
π /4DQPSK/LCH



π /4DQPSK/MCH



$\pi/4$ DQPSK/HCH



A.4 Hopping Channel Number

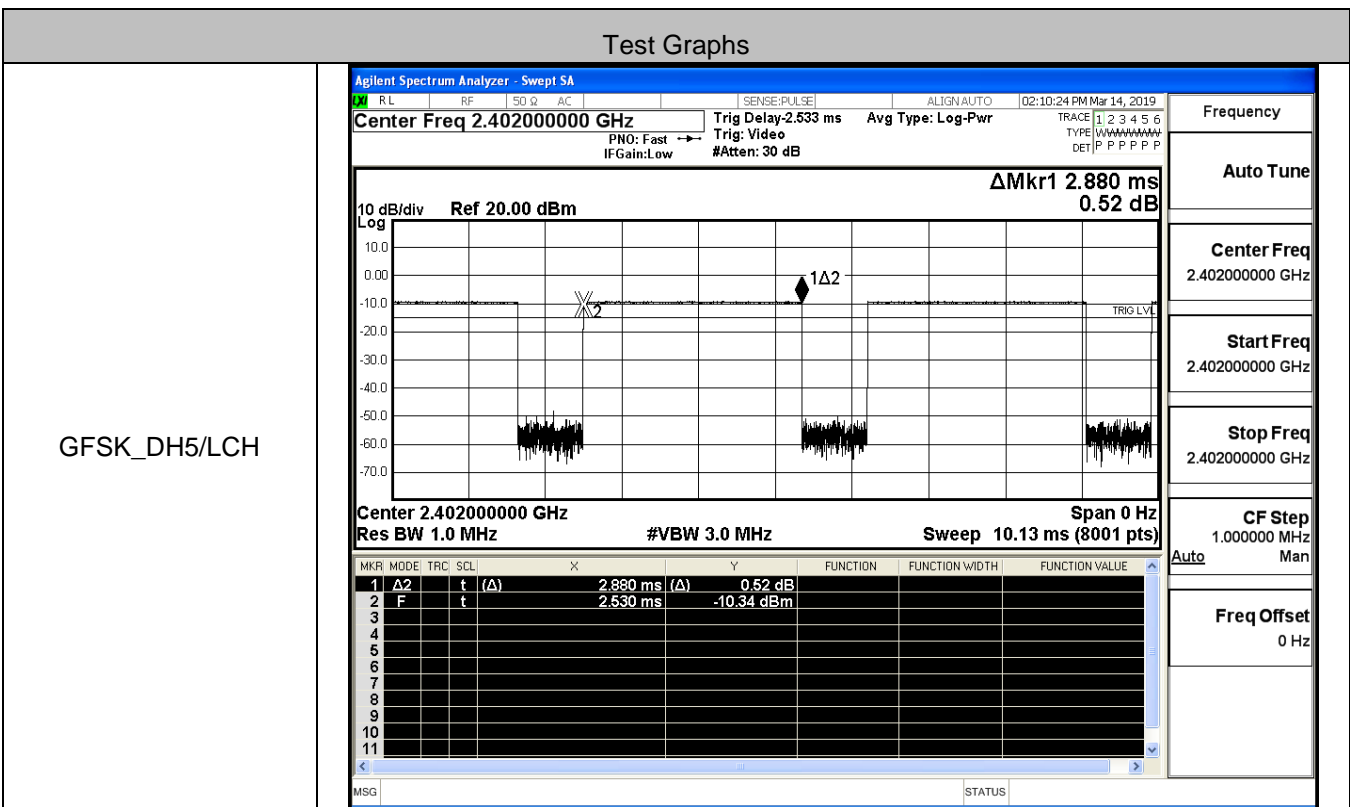
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS

Test Graphs

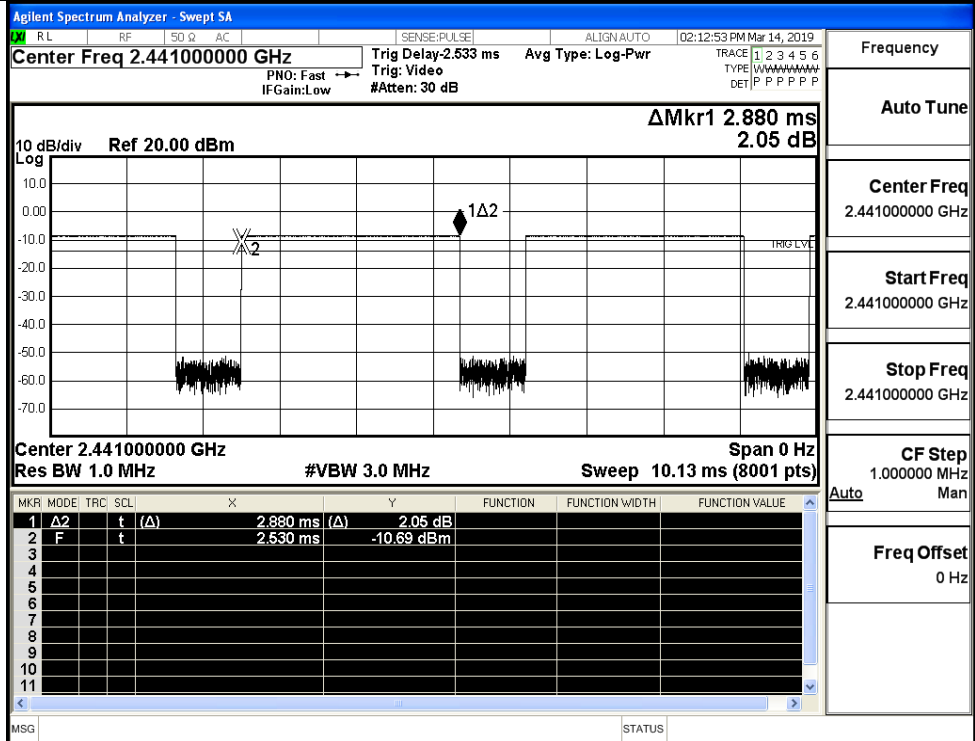
<p>GFSK/Hop</p>	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 8.24 dB Ref 20.00 dBm</p> <p>ΔMkr1 78.020 MHz -0.168 dB</p> <p>Start 2.40000 GHz #Res BW 100 kHz</p> <p>Stop 2.48350 GHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1"> <thead> <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>-0.168 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.401 889 GHz</td> <td>-1.626 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)	78.020 MHz (Δ)	-0.168 dB				2	F	f		2.401 889 GHz	-1.626 dBm			
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
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2	F	f		2.401 889 GHz	-1.626 dBm																							
<p>$\pi/4$DQPSK/Hop</p>	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 8.24 dB Ref 20.00 dBm</p> <p>ΔMkr1 78.093 MHz 2.332 dB</p> <p>Start 2.40000 GHz #Res BW 100 kHz</p> <p>Stop 2.48350 GHz #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>78.093 MHz (Δ)</td> <td>2.332 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.402 077 GHz</td> <td>-5.245 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)	78.093 MHz (Δ)	2.332 dB				2	F	f		2.402 077 GHz	-5.245 dBm			
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2	F	f		2.402 077 GHz	-5.245 dBm																							

A.5 Dwell Time

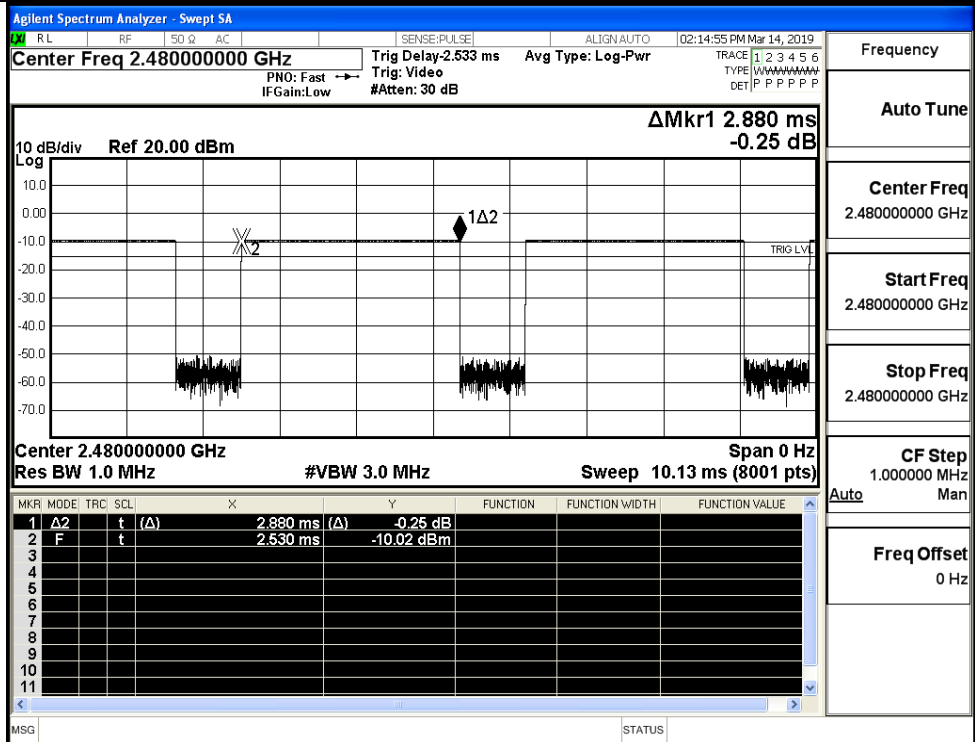
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
π/4DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88	106.7	0.307	0.4	PASS



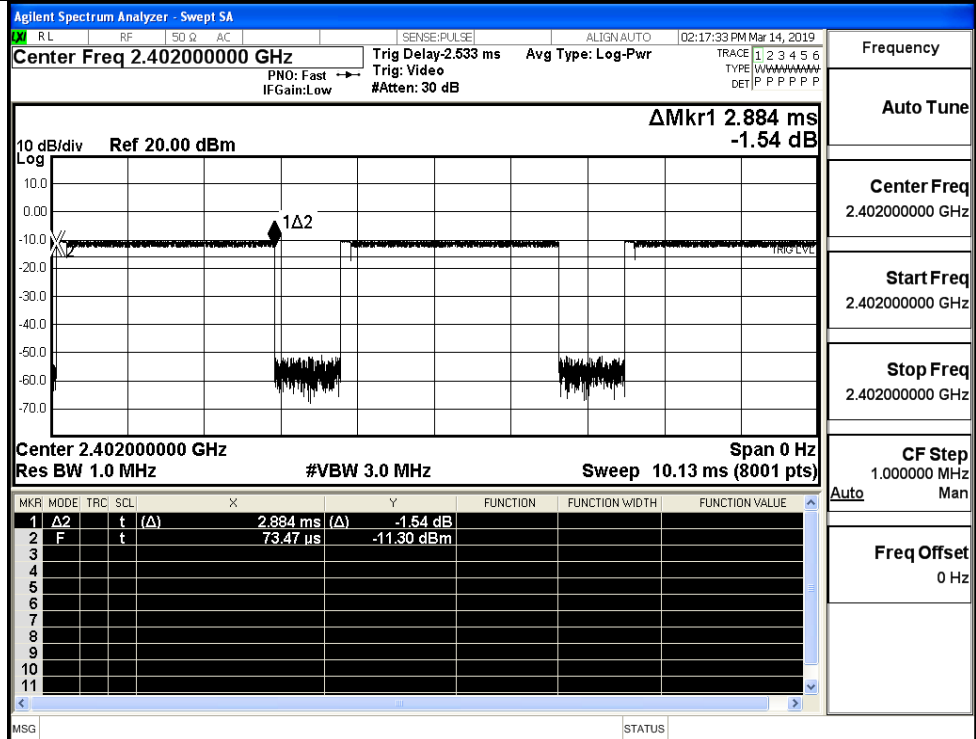
GFSK_DH5/MCH



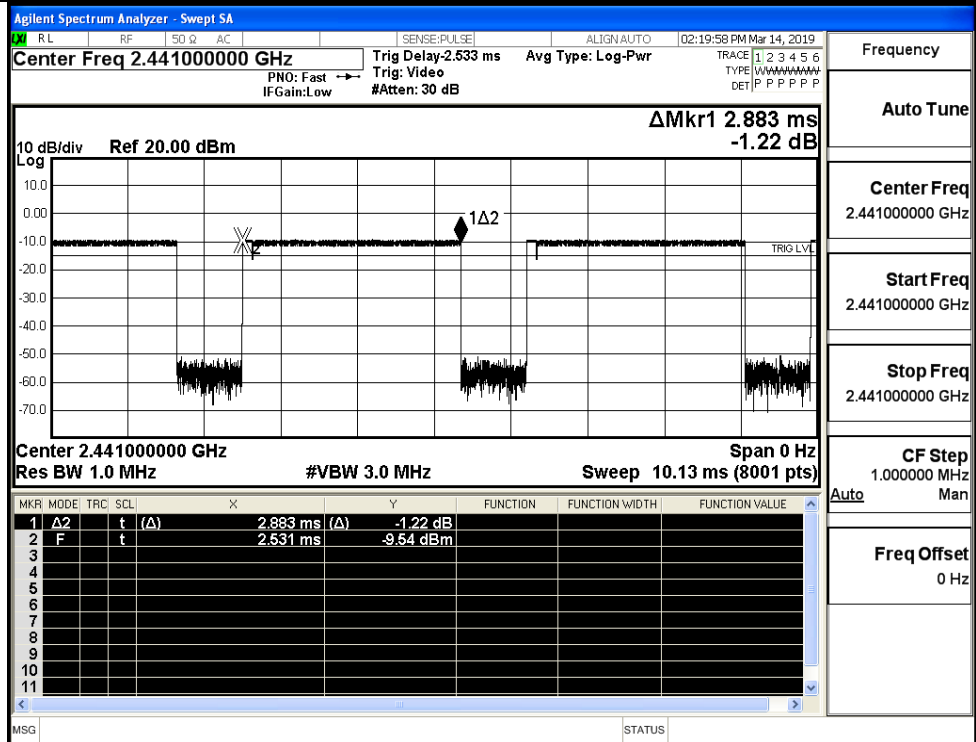
GFSK_DH5/HCH



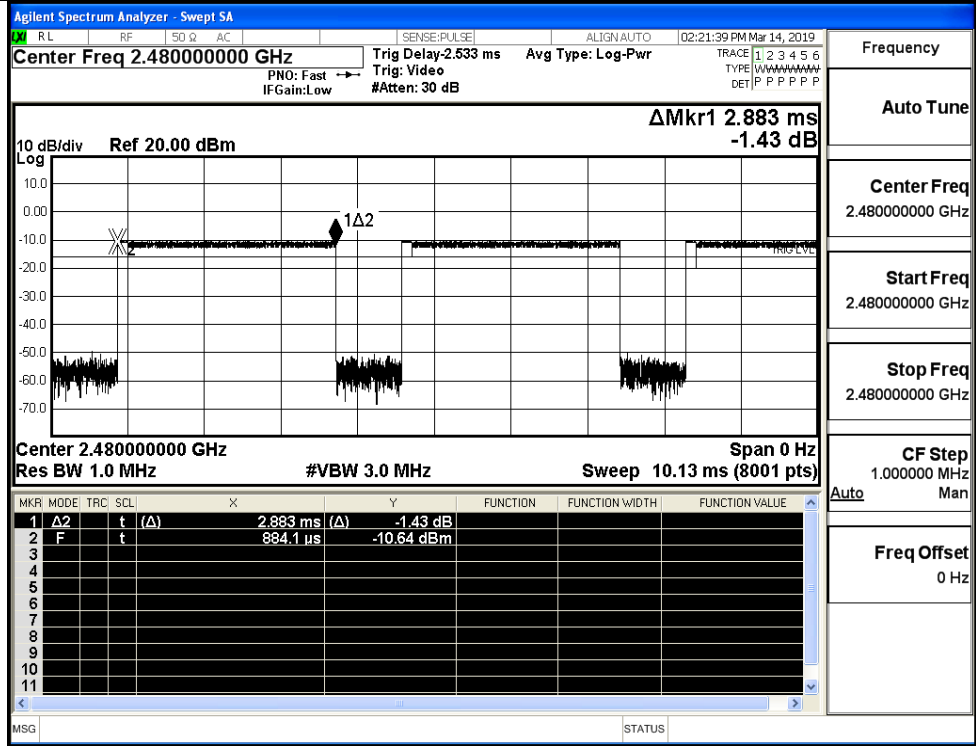
$\pi/4$ DQPSK
_2DH5/LCH



$\pi/4$ DQPSK
_2DH5/MCH



$\pi/4$ DQPSK
_2DH5/HCH

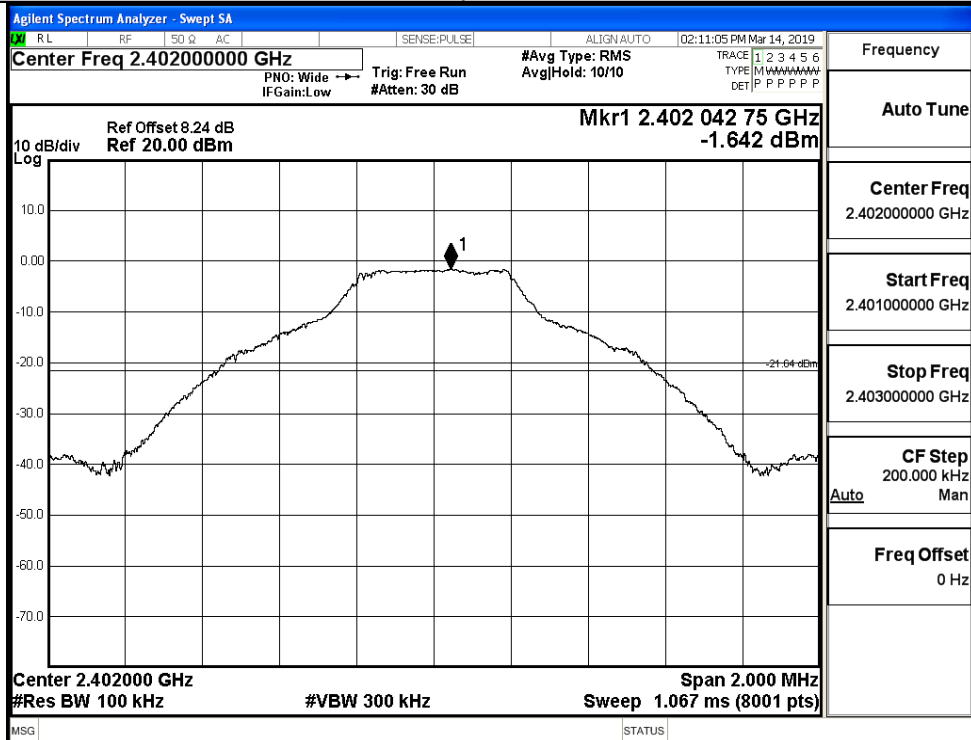


A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-1.642	-45.171	-21.642	PASS
	MCH	-0.169	-44.643	-20.169	PASS
	HCH	-1.212	-44.682	-21.212	PASS
$\pi/4$ DQPSK	LCH	-2.181	-44.517	-22.181	PASS
	MCH	-1.145	-44.411	-21.145	PASS
	HCH	-2.535	-44.879	-22.535	PASS

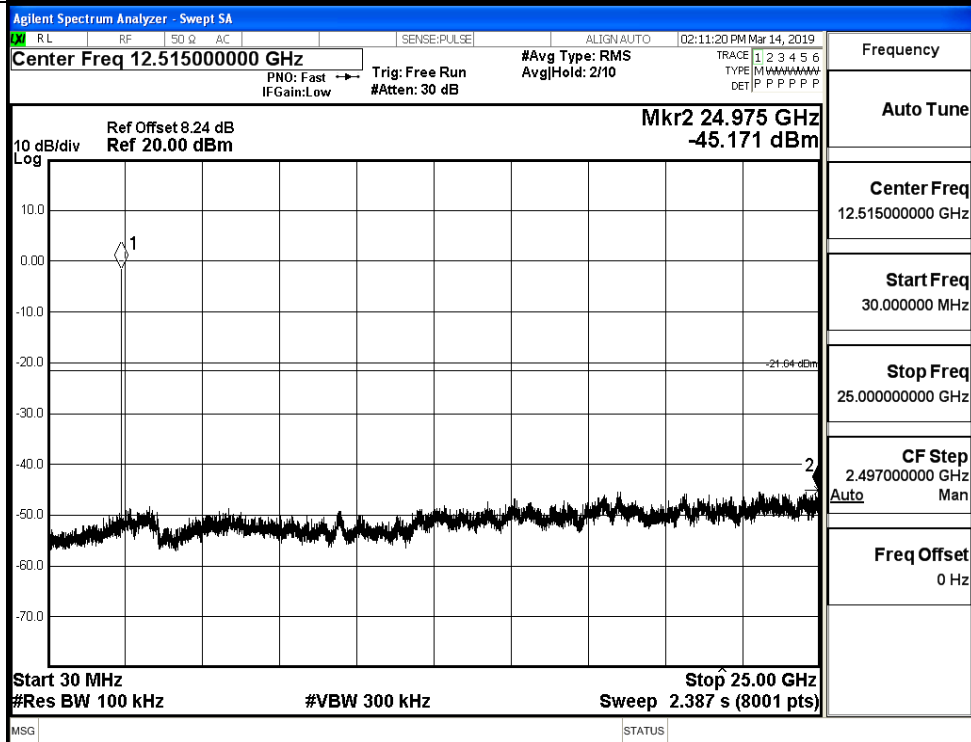
GFSK_LCH_Graphs

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

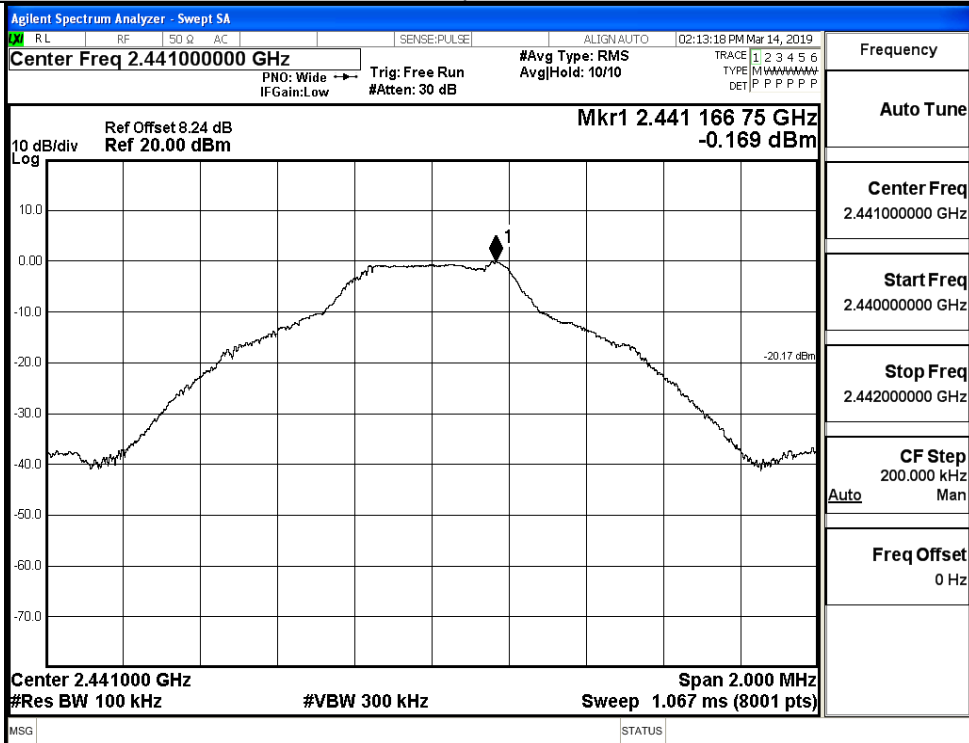
Puw



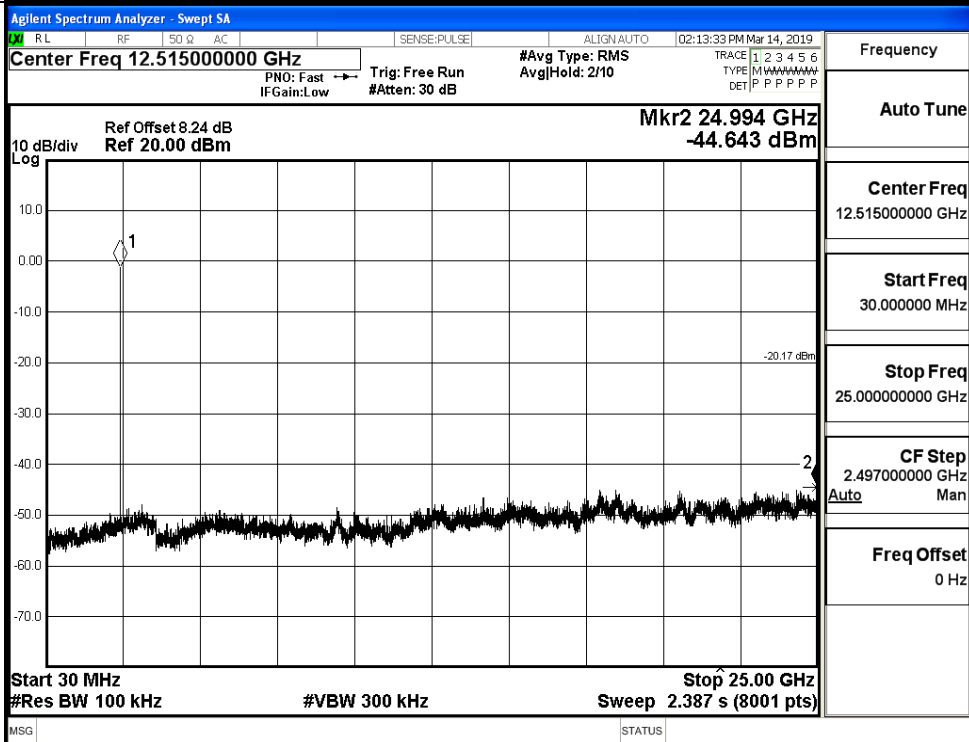
Frequency	
Auto Tune	
Center Freq	12.515000000 GHz
Start Freq	30.000000 MHz
Stop Freq	25.000000000 GHz
CF Step	2.497000000 GHz Auto Man
Freq Offset	0 Hz

GFSK_MCH_Graphs

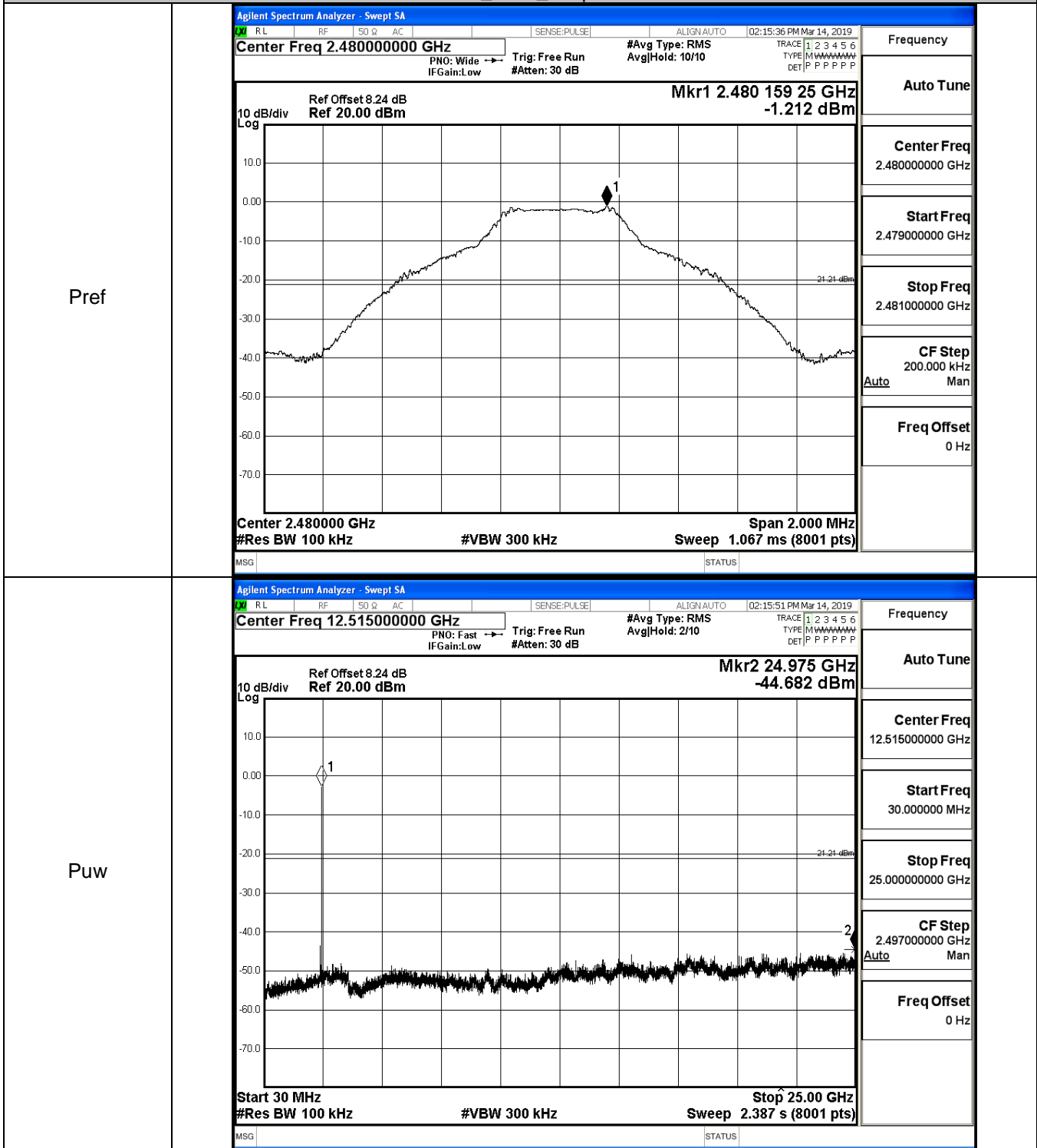
Pref



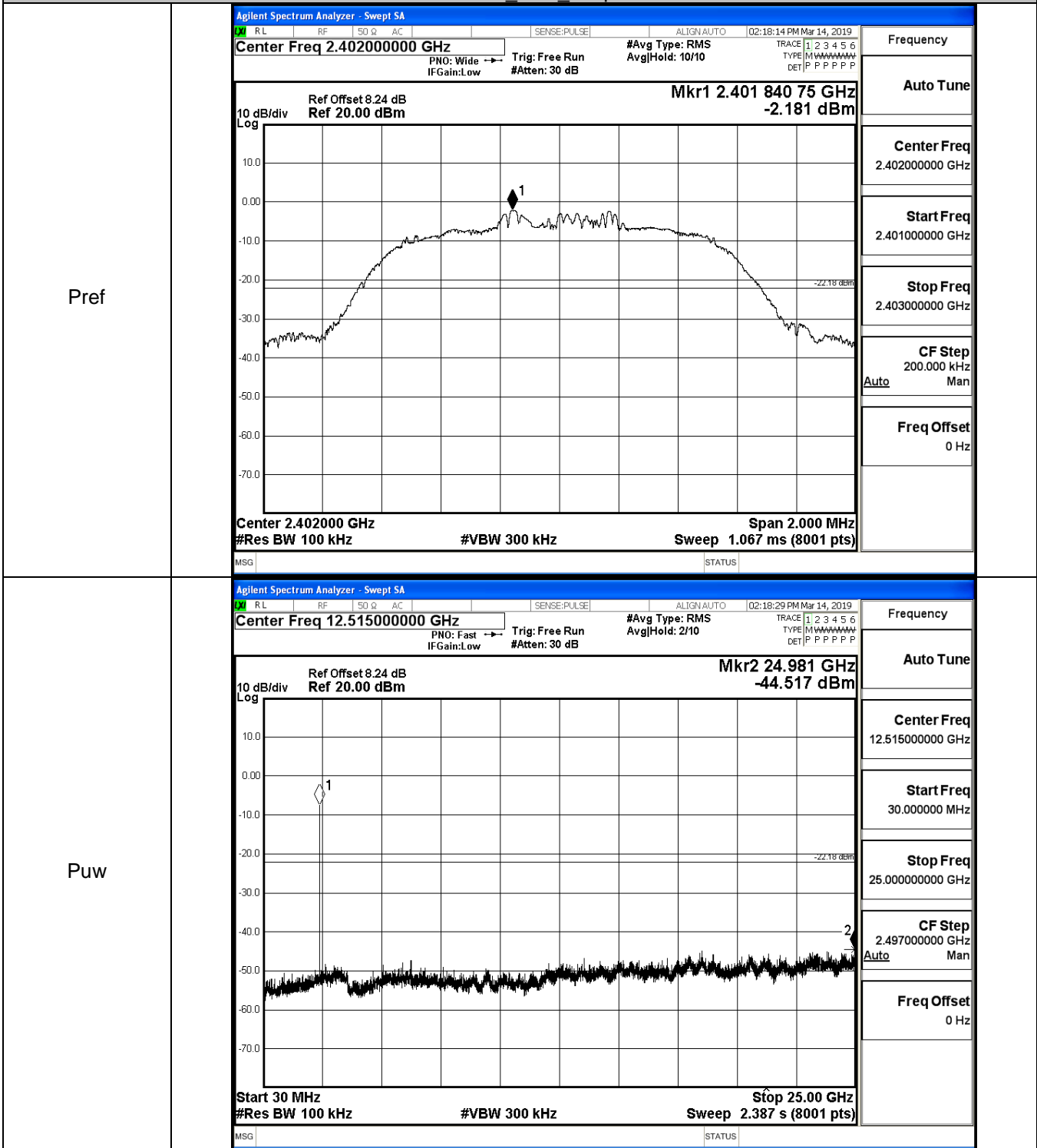
Puw



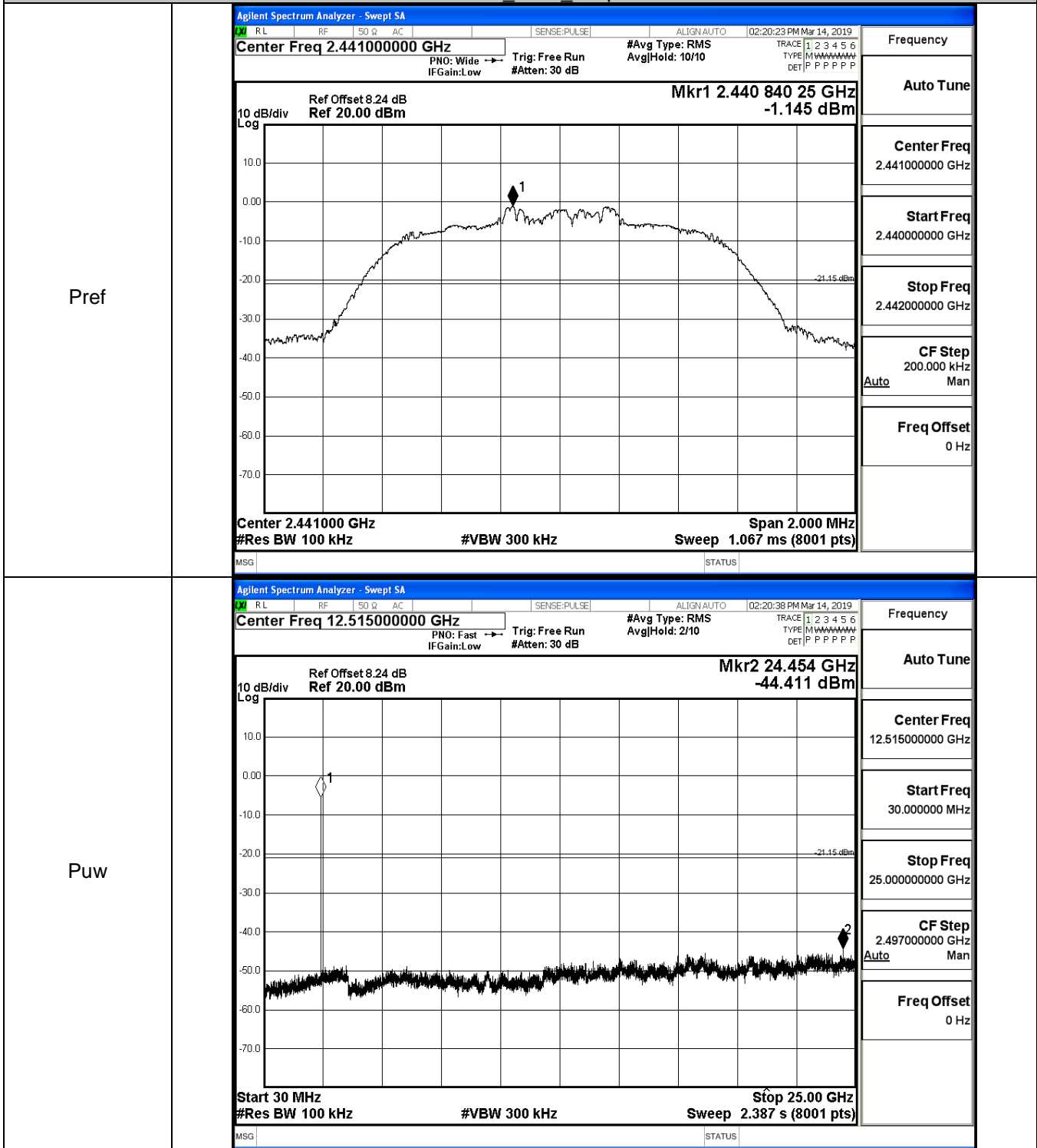
GFSK_HCH_Graphs



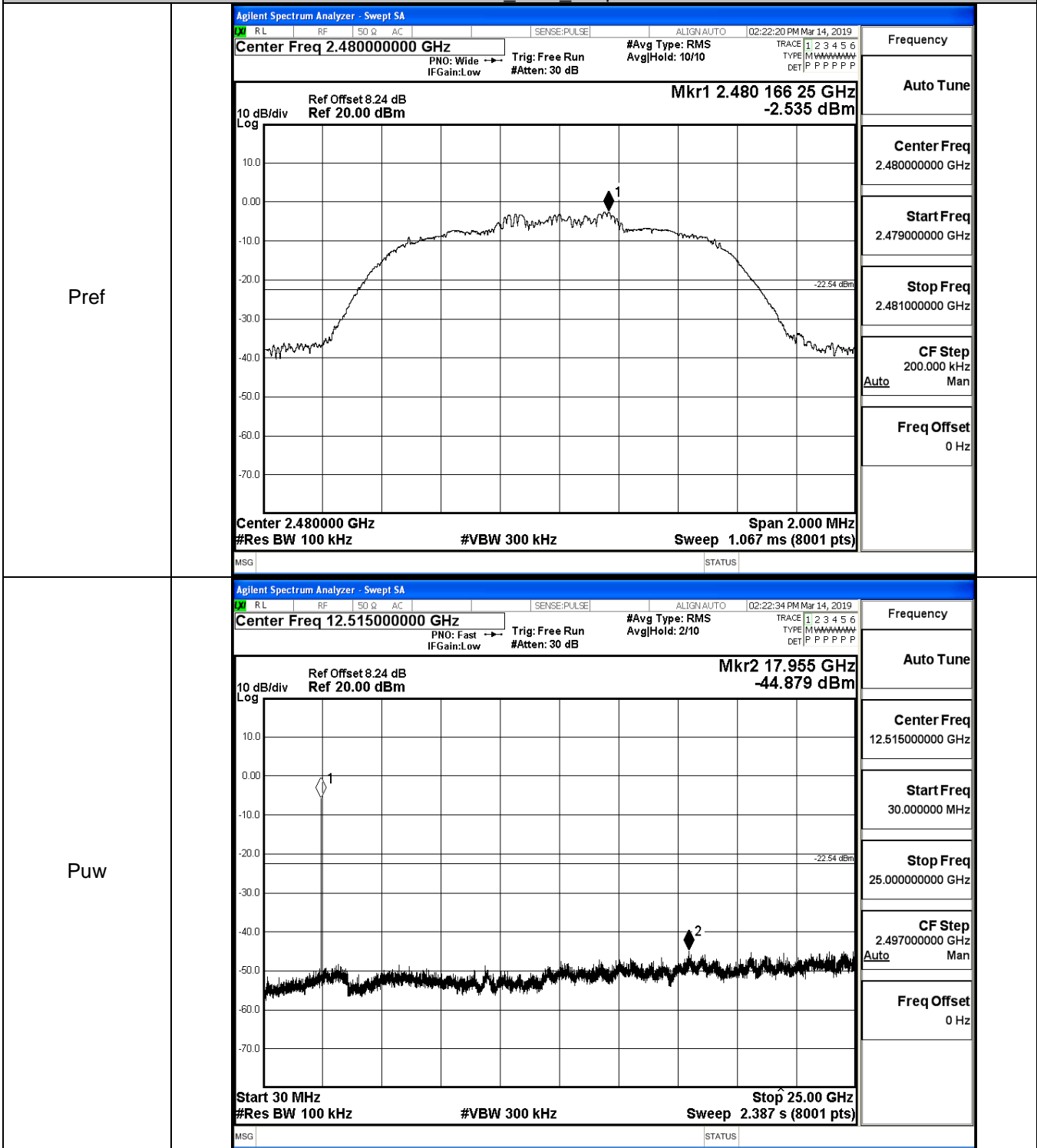
$\pi/4$ DQPSK LCH_Graphs



π /4DQPSK_MCH_Graphs



$\pi/4$ DQPSK_HCH_Graphs

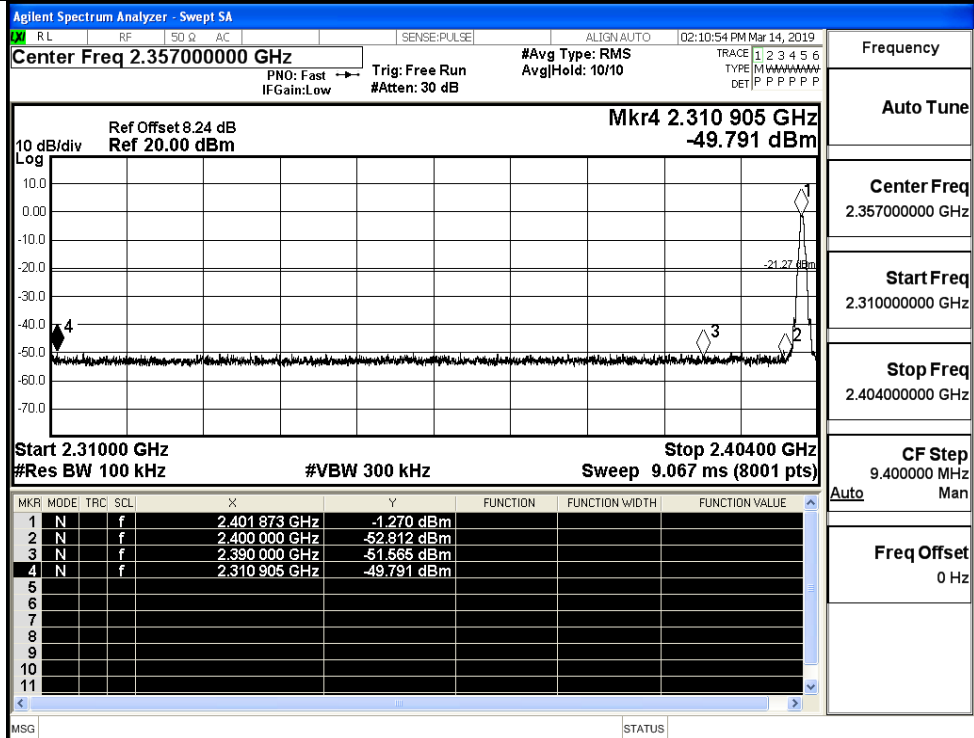


A.7 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-1.270	Off	-49.791	-21.27	PASS
			1.207	On	-48.979	-18.79	PASS
	HCH	2480	-1.433	Off	-49.452	-21.43	PASS
			1.493	On	-42.538	-18.51	PASS
$\pi/4$ DQPSK	LCH	2402	-2.367	Off	-50.000	-22.37	PASS
			0.034	On	-48.976	-19.97	PASS
	HCH	2480	-2.328	Off	-49.475	-22.33	PASS
			0.112	On	-44.601	-19.89	PASS

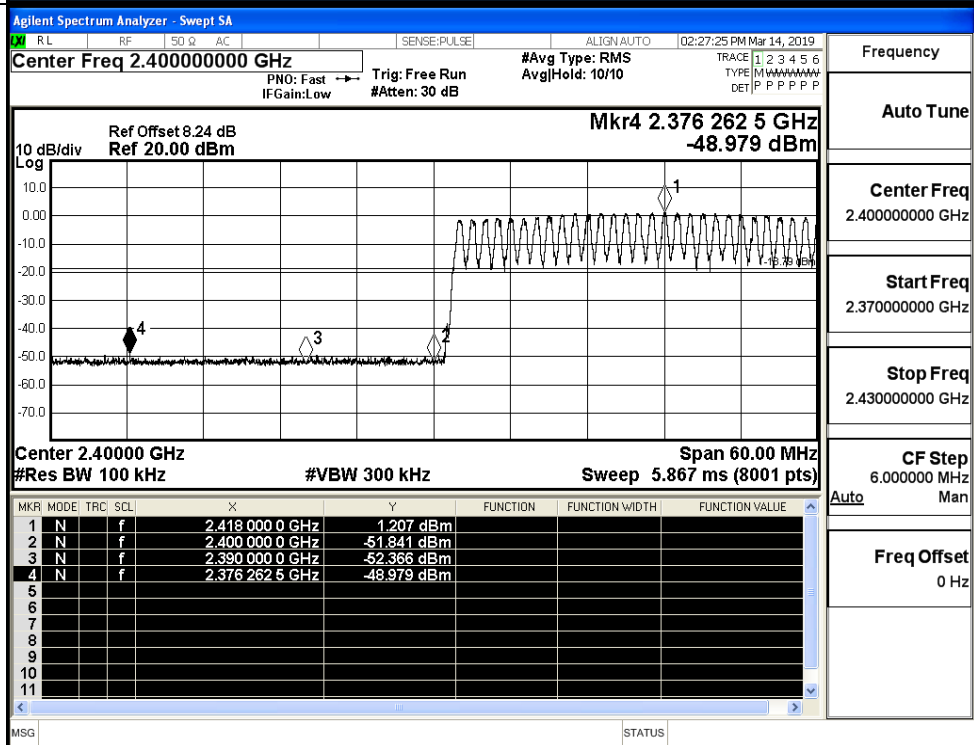
Test Graphs

GFSK/LCH/No Hop



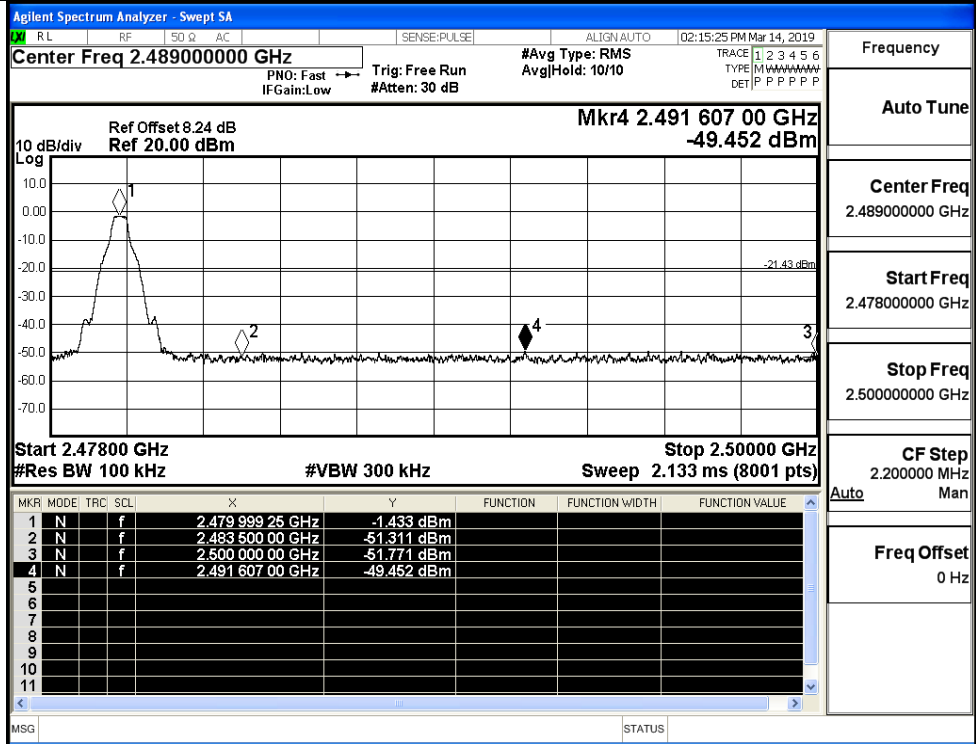
Frequency	
Auto Tune	
Center Freq	2.357000000 GHz
Start Freq	2.310000000 GHz
Stop Freq	2.404000000 GHz
CF Step	9.400000 MHz
Auto	Man
Freq Offset	0 Hz

GFSK/LCH/Hop

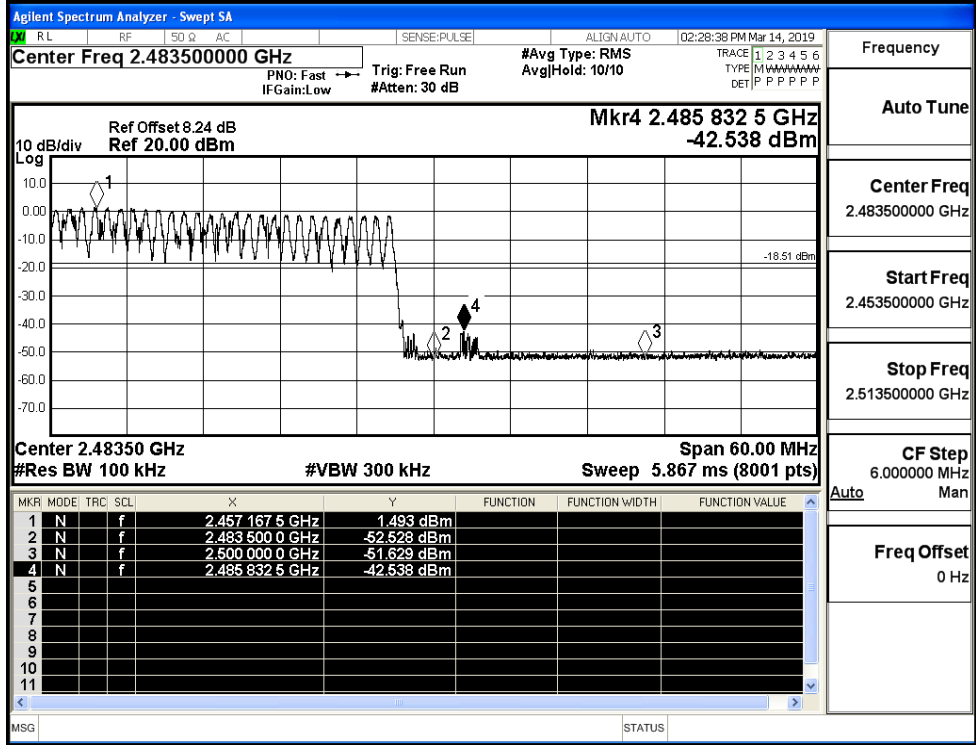


Frequency	
Auto Tune	
Center Freq	2.400000000 GHz
Start Freq	2.370000000 GHz
Stop Freq	2.430000000 GHz
CF Step	6.000000 MHz
Auto	Man
Freq Offset	0 Hz

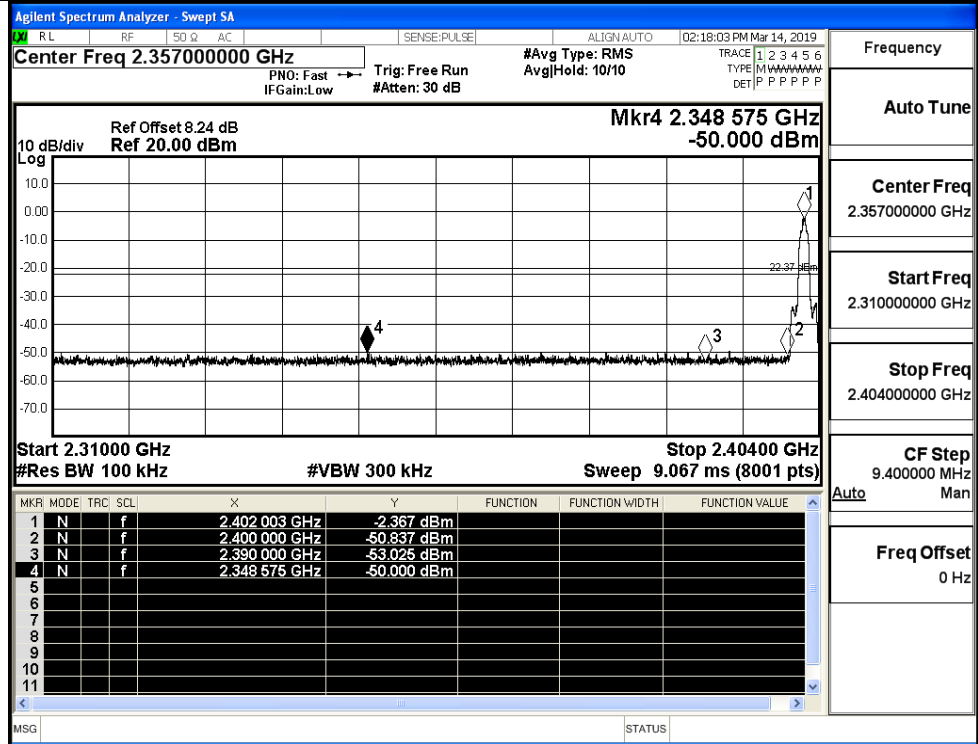
GFSK/HCH/No Hop



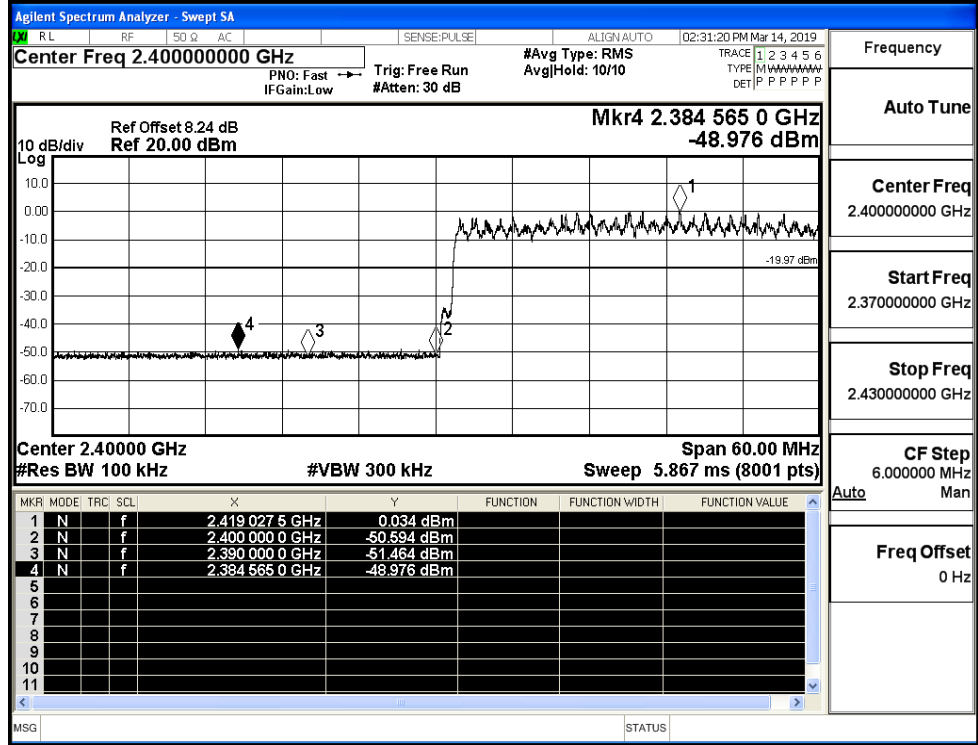
GFSK/HCH/Hop



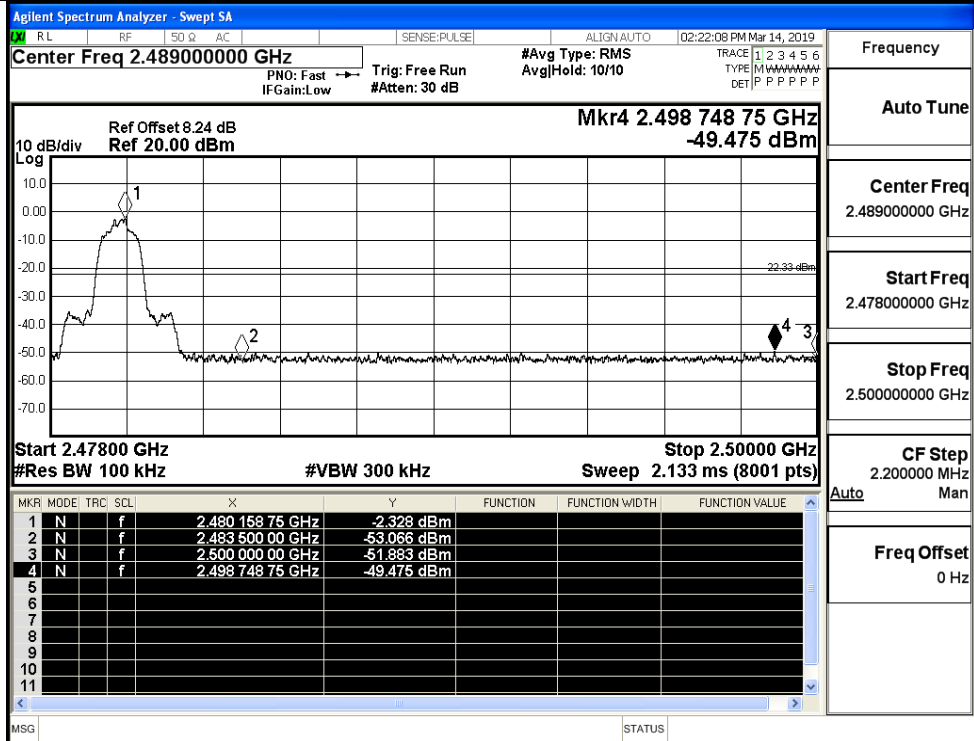
$\pi/4$ DQPSK/LCH/No
Hop



$\pi/4$ DQPSK/LCH/Hop

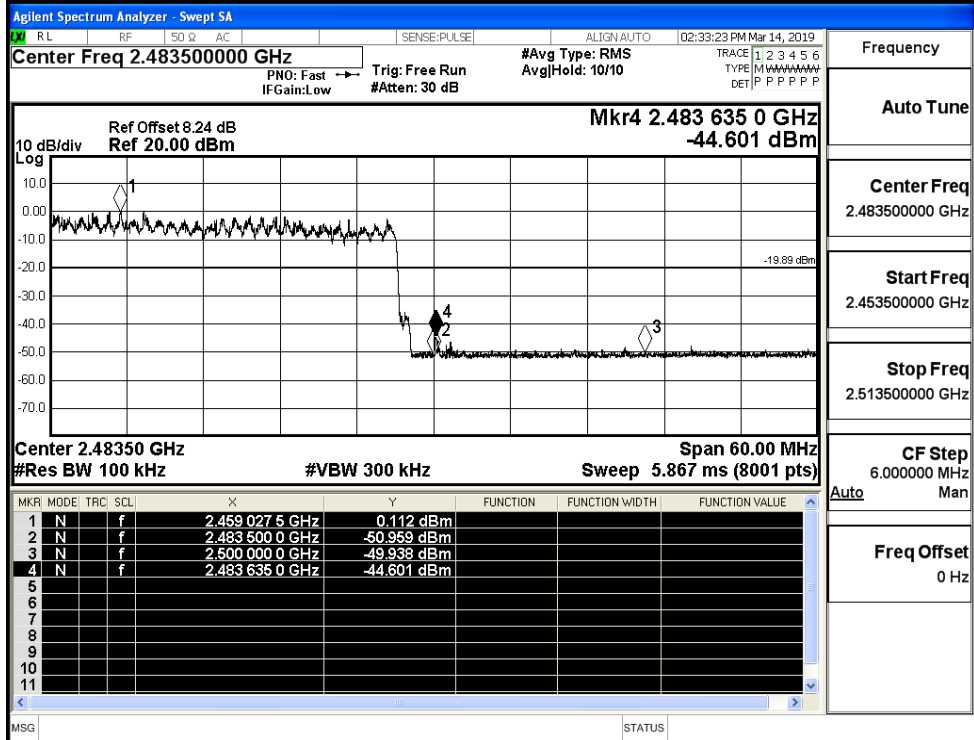


π /4DQPSK/HCH/No
Hop



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

π /4DQPSK/HCH/Hop

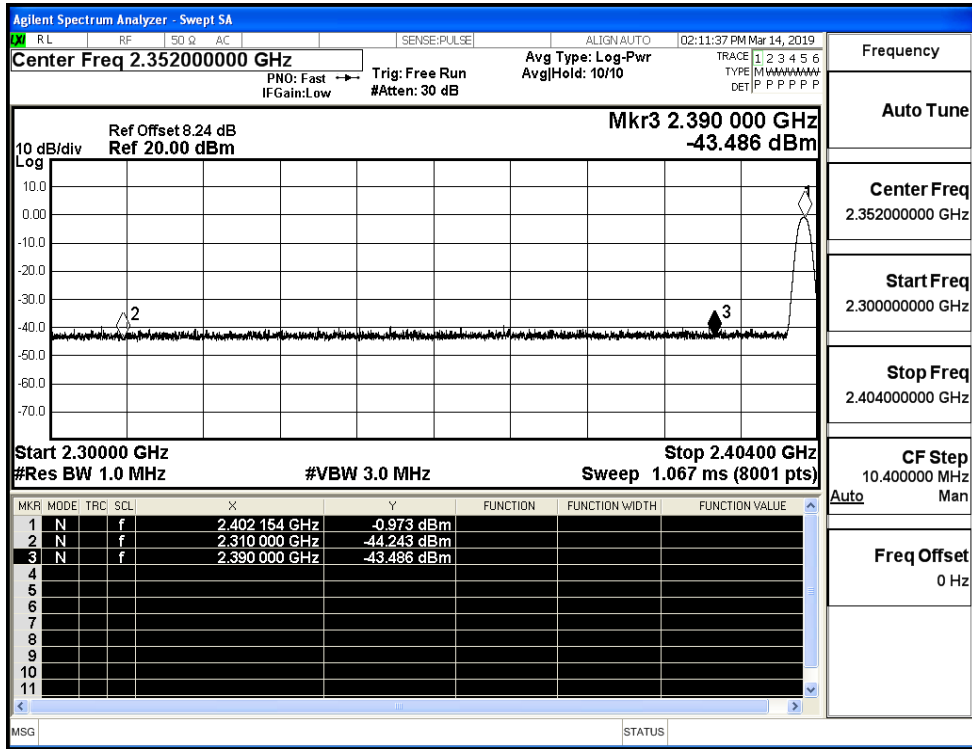


Frequency	
Auto Tune	
Center Freq	2.483500000 GHz
Start Freq	2.453500000 GHz
Stop Freq	2.513500000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz

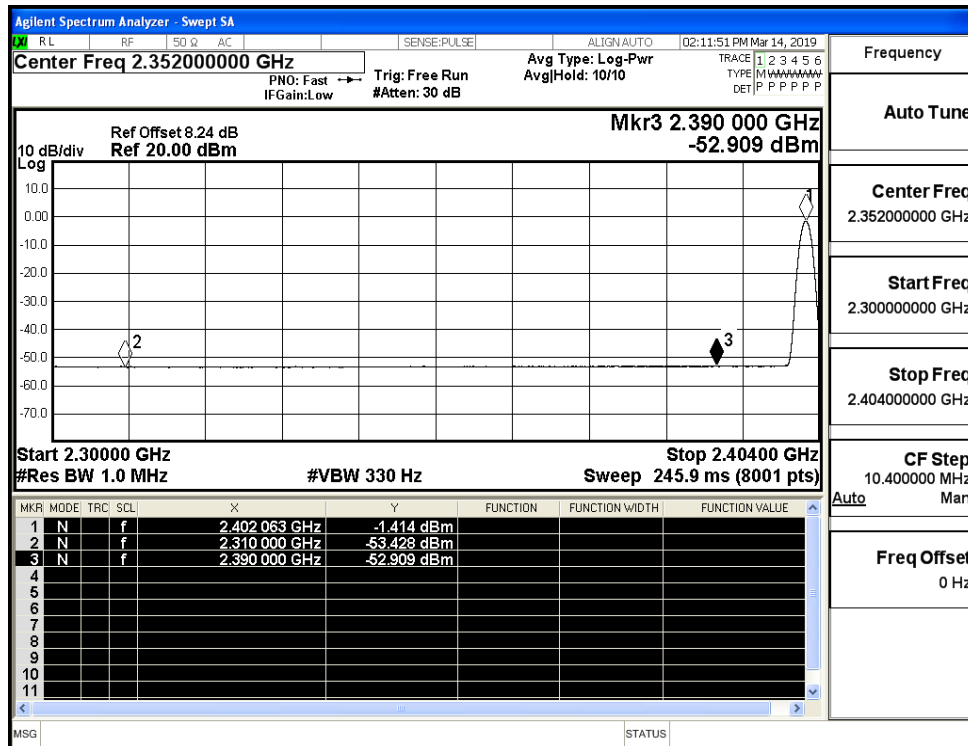
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-44.24	2.0	0	53.01	PEAK	74	PASS
	Off	2310.0	-53.43	2.0	0	43.83	AV	54	PASS
	Off	2390.0	-43.49	2.0	0	53.77	PEAK	74	PASS
	Off	2390.0	-52.91	2.0	0	44.35	AV	54	PASS
	Off	2483.5	-43.33	2.0	0	53.93	PEAK	74	PASS
	Off	2483.5	-52.77	2.0	0	44.48	AV	54	PASS
	Off	2500.0	-42.59	2.0	0	54.67	PEAK	74	PASS
	Off	2500.0	-52.56	2.0	0	44.70	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.32	2.0	0	53.94	PEAK	74	PASS
	Off	2310.0	-53.29	2.0	0	43.96	AV	54	PASS
	Off	2390.0	-41.94	2.0	0	55.31	PEAK	74	PASS
	Off	2390.0	-53.07	2.0	0	44.18	AV	54	PASS
	Off	2483.5	-42.86	2.0	0	54.40	PEAK	74	PASS
	Off	2483.5	-52.76	2.0	0	44.50	AV	54	PASS
	Off	2500.0	-41.68	2.0	0	55.58	PEAK	74	PASS
	Off	2500.0	-52.71	2.0	0	44.54	AV	54	PASS

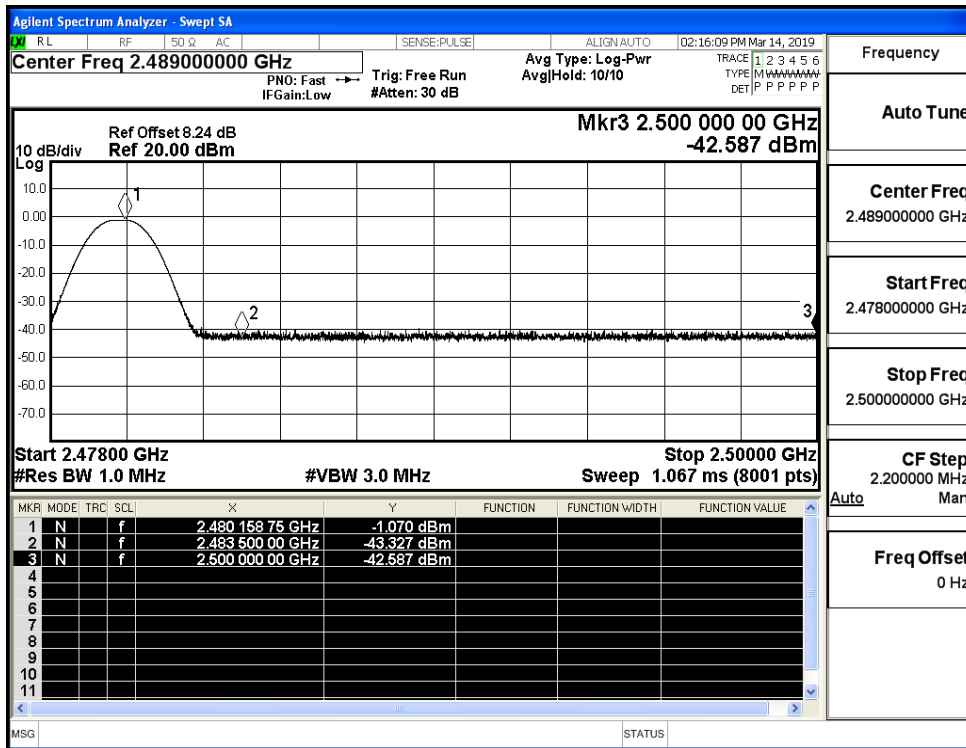
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



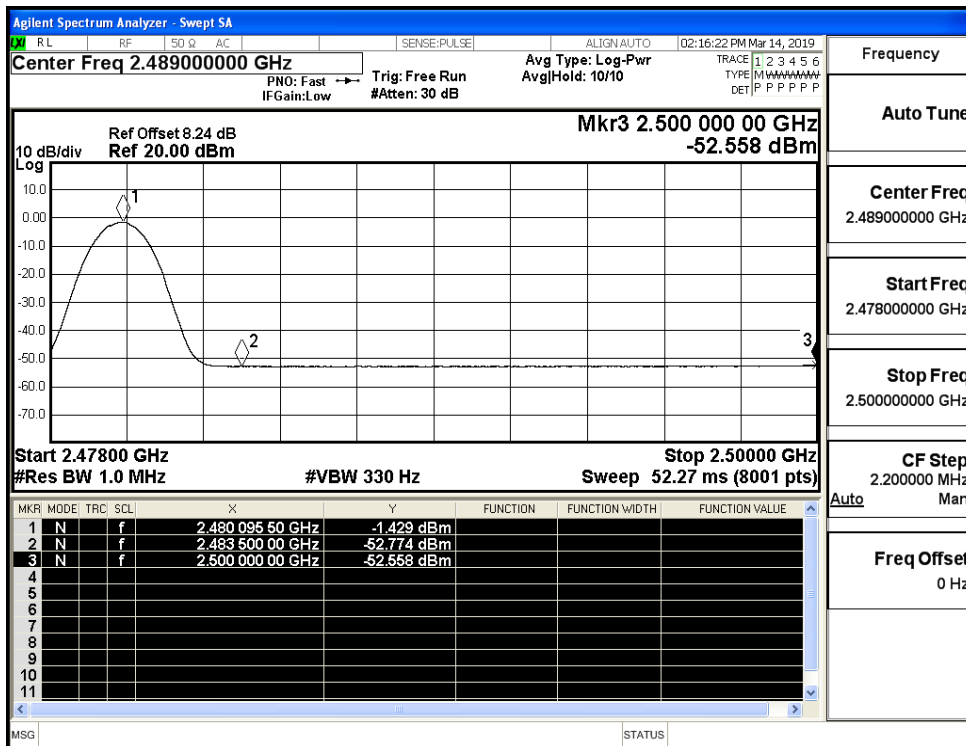
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



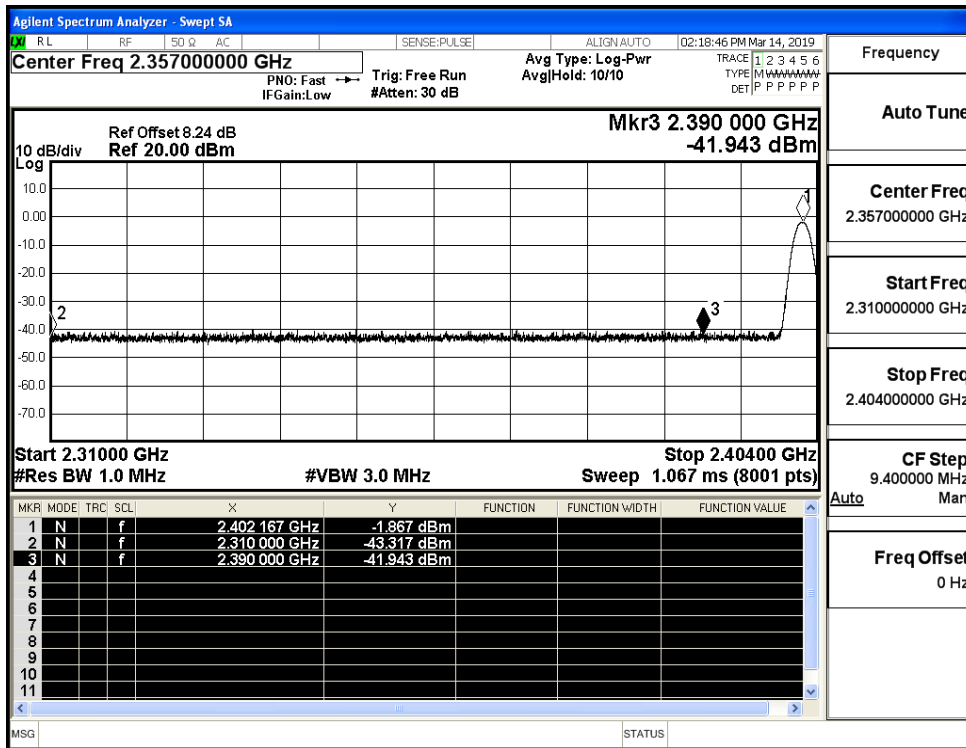
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



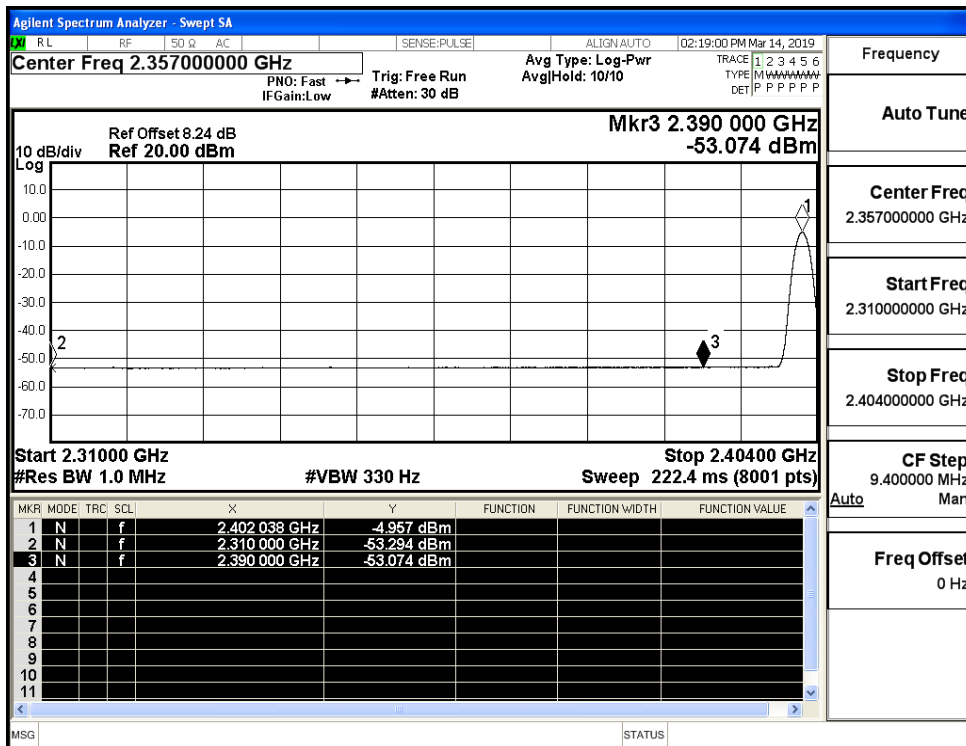
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



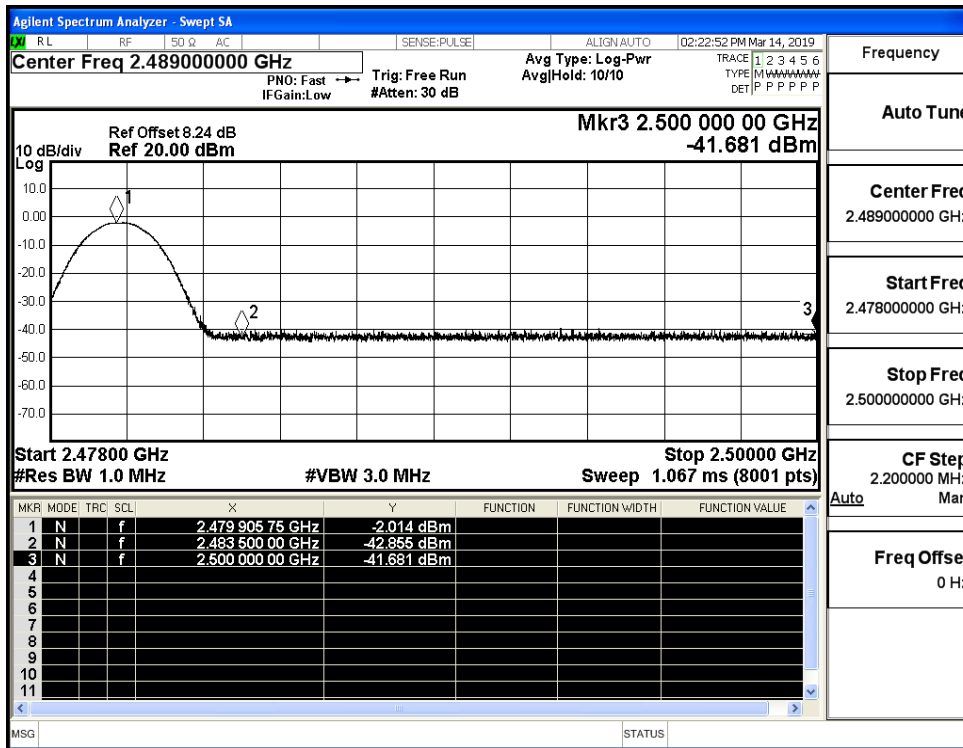
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)



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)

