

Appendix A

RF Test Data for BT V4.1(BDR/EDR) (Conducted Measurement)

Product Name: Diagnosis System

Trade Mark: XTOOL

Test Model: PS70 Pro

Environmental Conditions

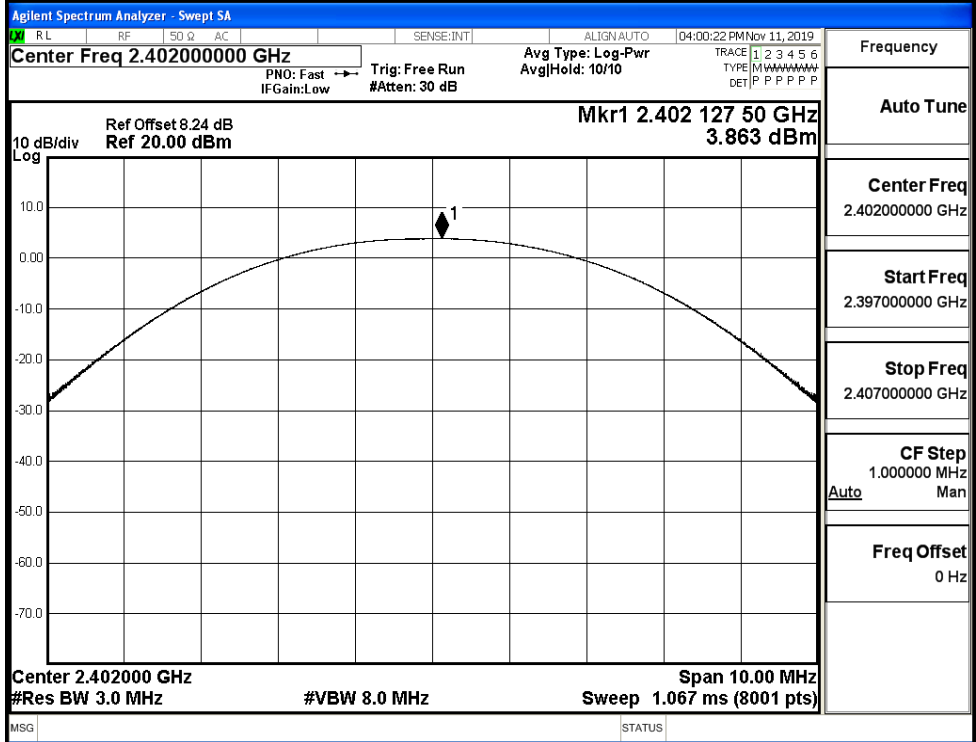
Temperature:	22.5°C
Relative Humidity:	52.7%
ATM Pressure:	100.0 kPa
Test Engineer:	Alisa Huang
Supervised by:	Tom.Liu

A.1 Maxmum Conducted Peak Output Power

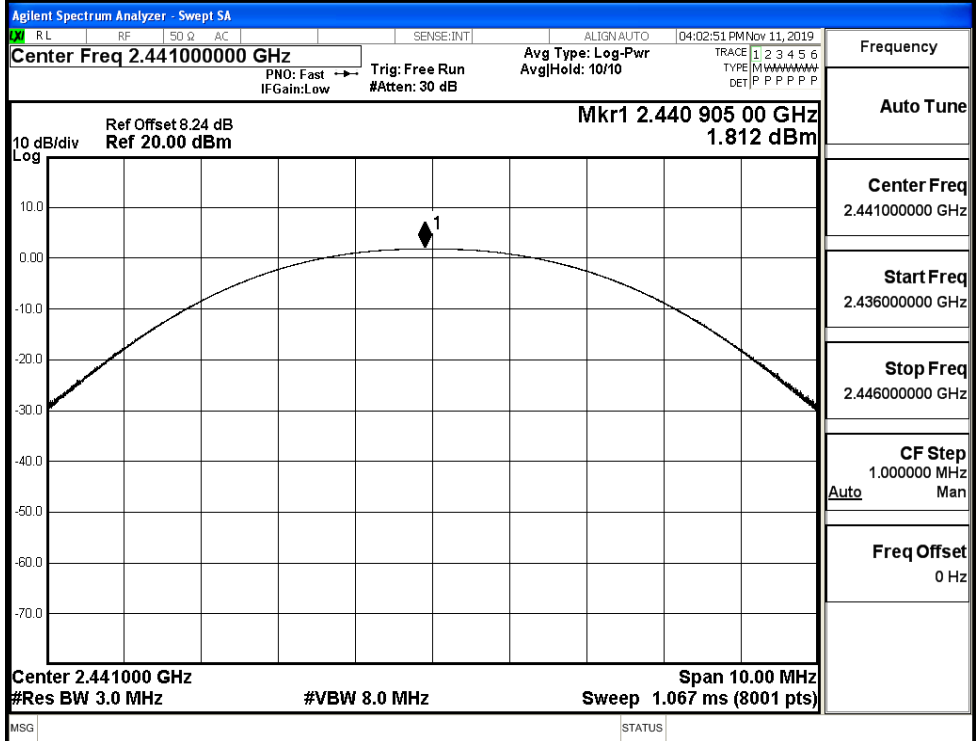
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.863	21	PASS
	MCH	1.812	21	PASS
	HCH	2.776	21	PASS
$\pi/4$ DQPSK	LCH	2.841	21	PASS
	MCH	1.093	21	PASS
	HCH	2.372	21	PASS
8DPSK	LCH	3.051	21	PASS
	MCH	1.437	21	PASS
	HCH	2.270	21	PASS

Test Graphs

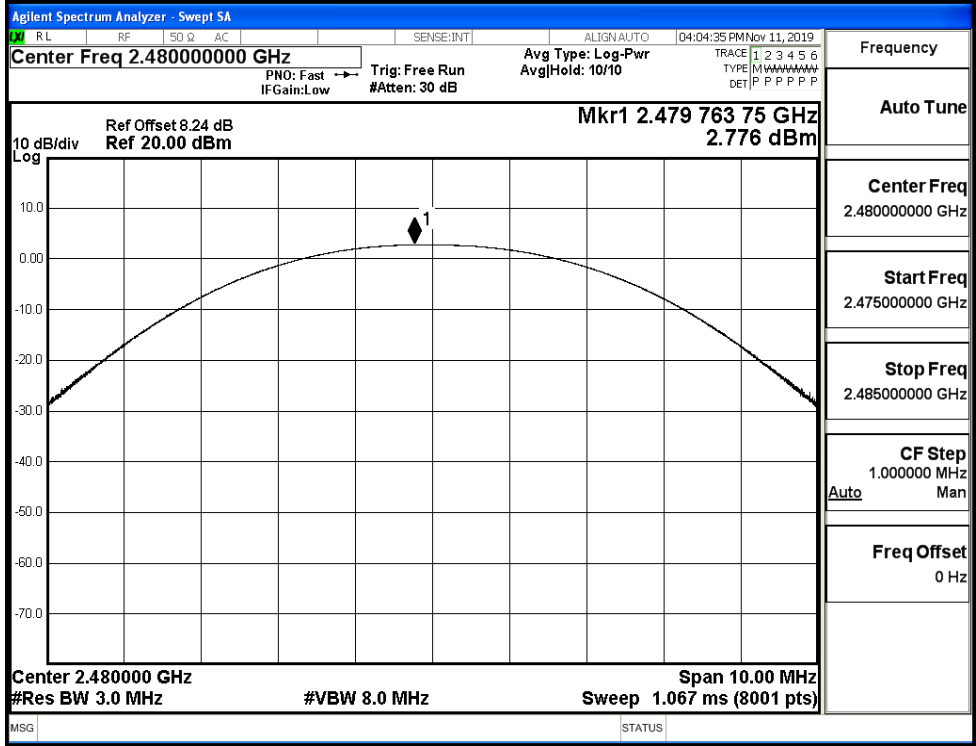
GFSK/LCH



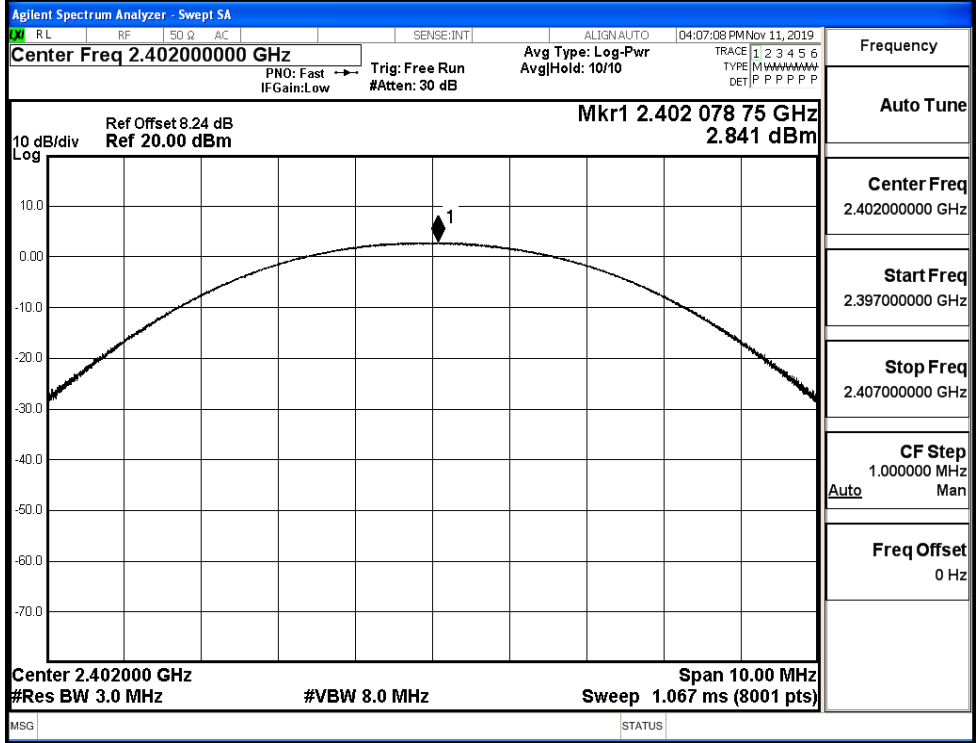
GFSK/MCH



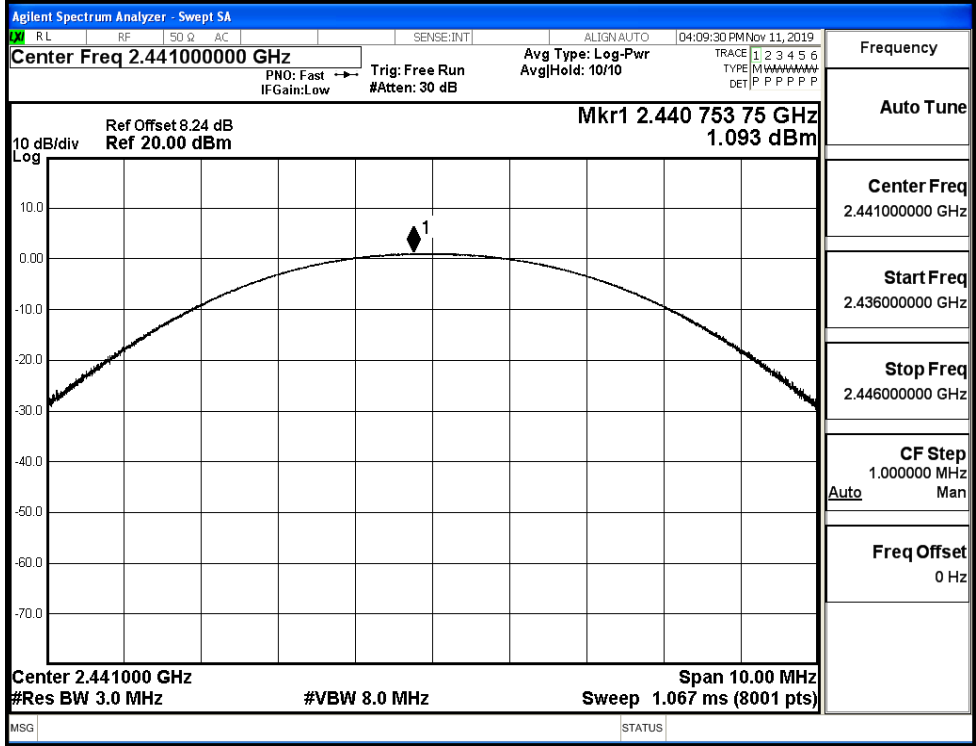
GFSK/HCH



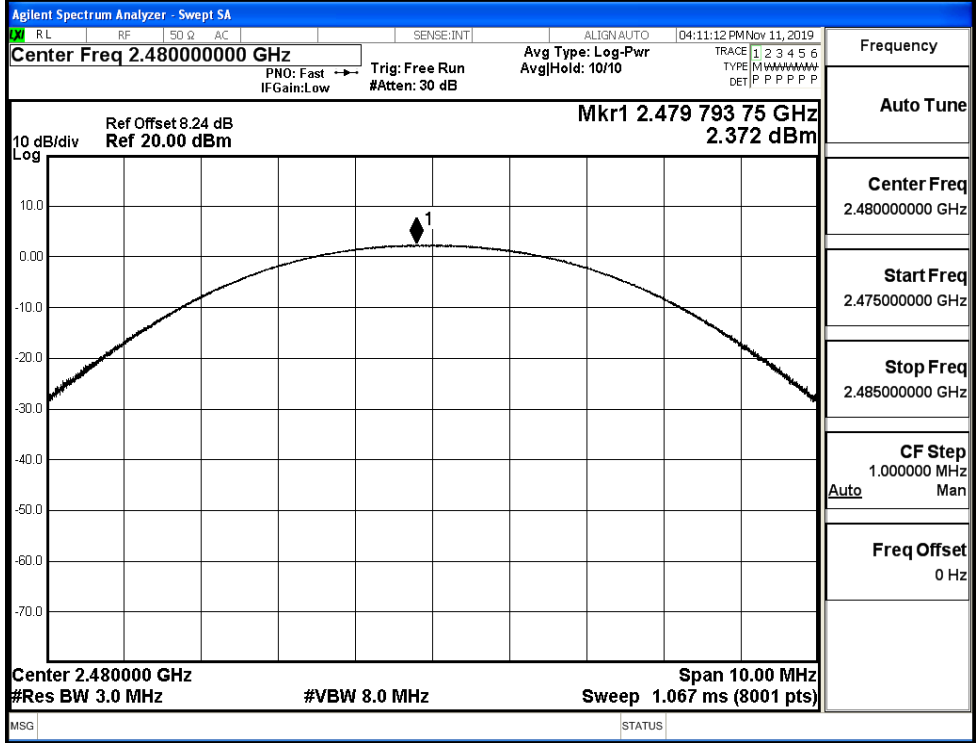
π /4DQPSK/LCH



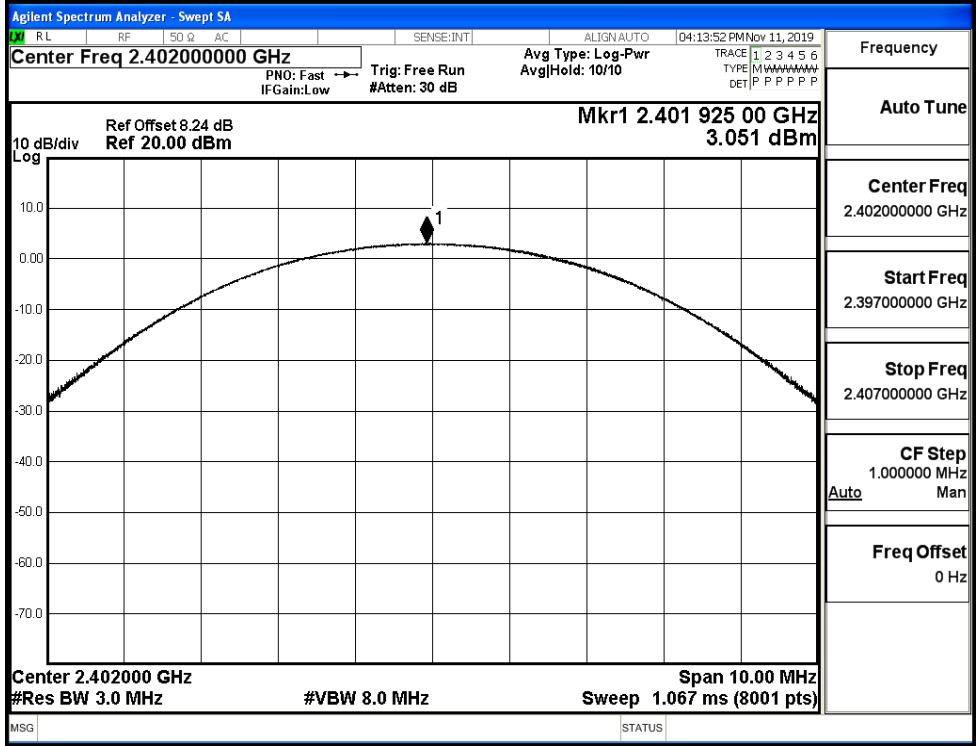
π /4DQPSK/MCH



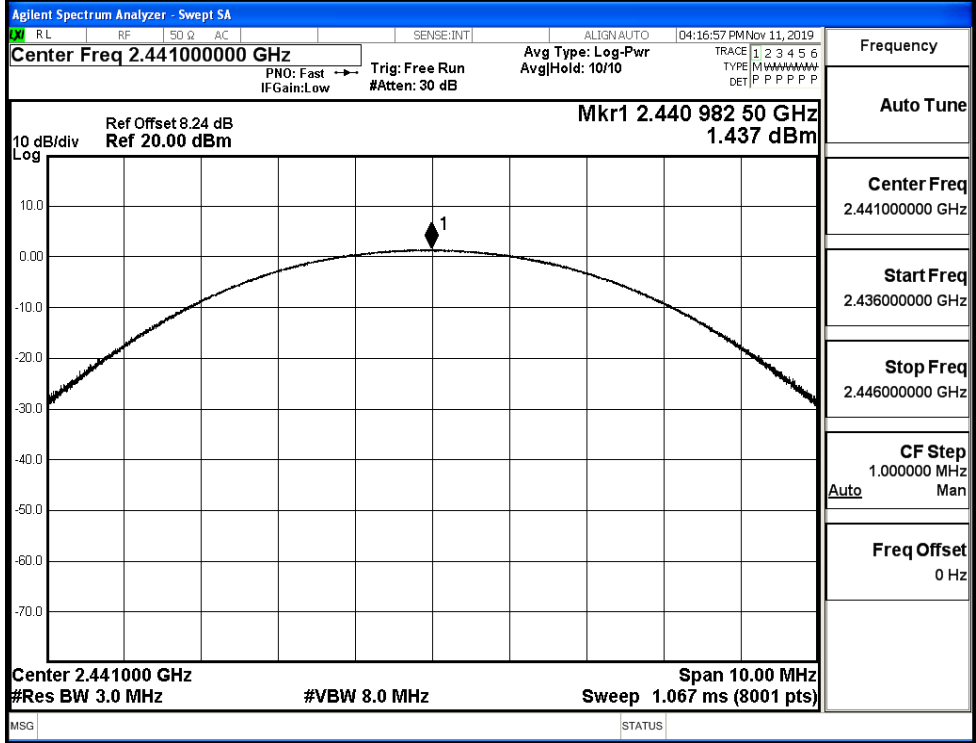
π /4DQPSK/HCH



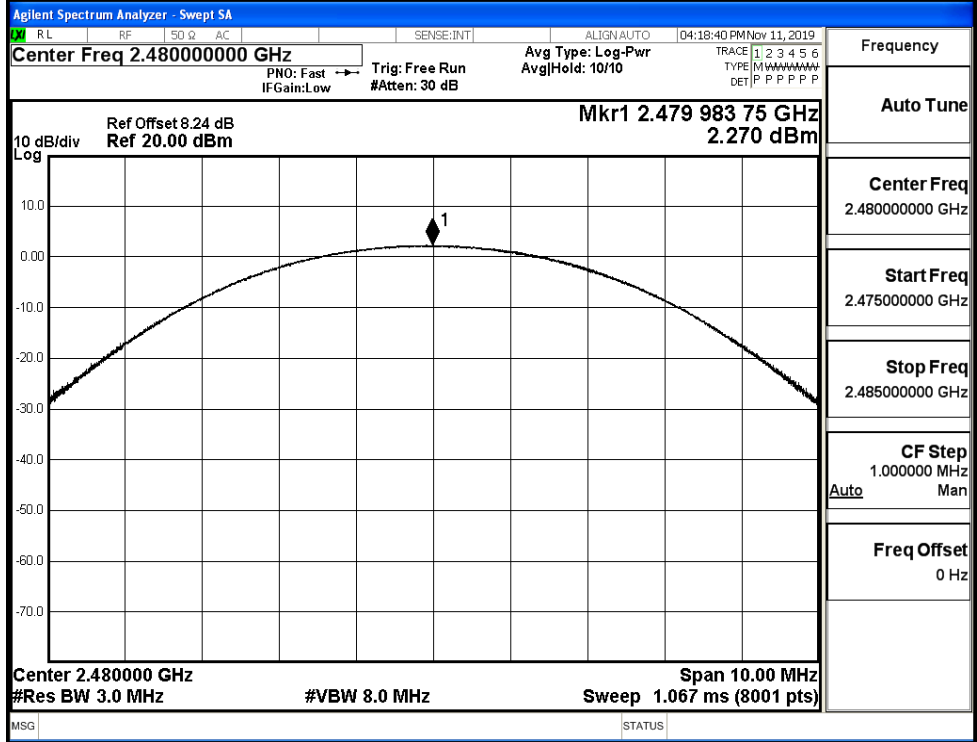
8DPSK/LCH



8DPSK/MCH



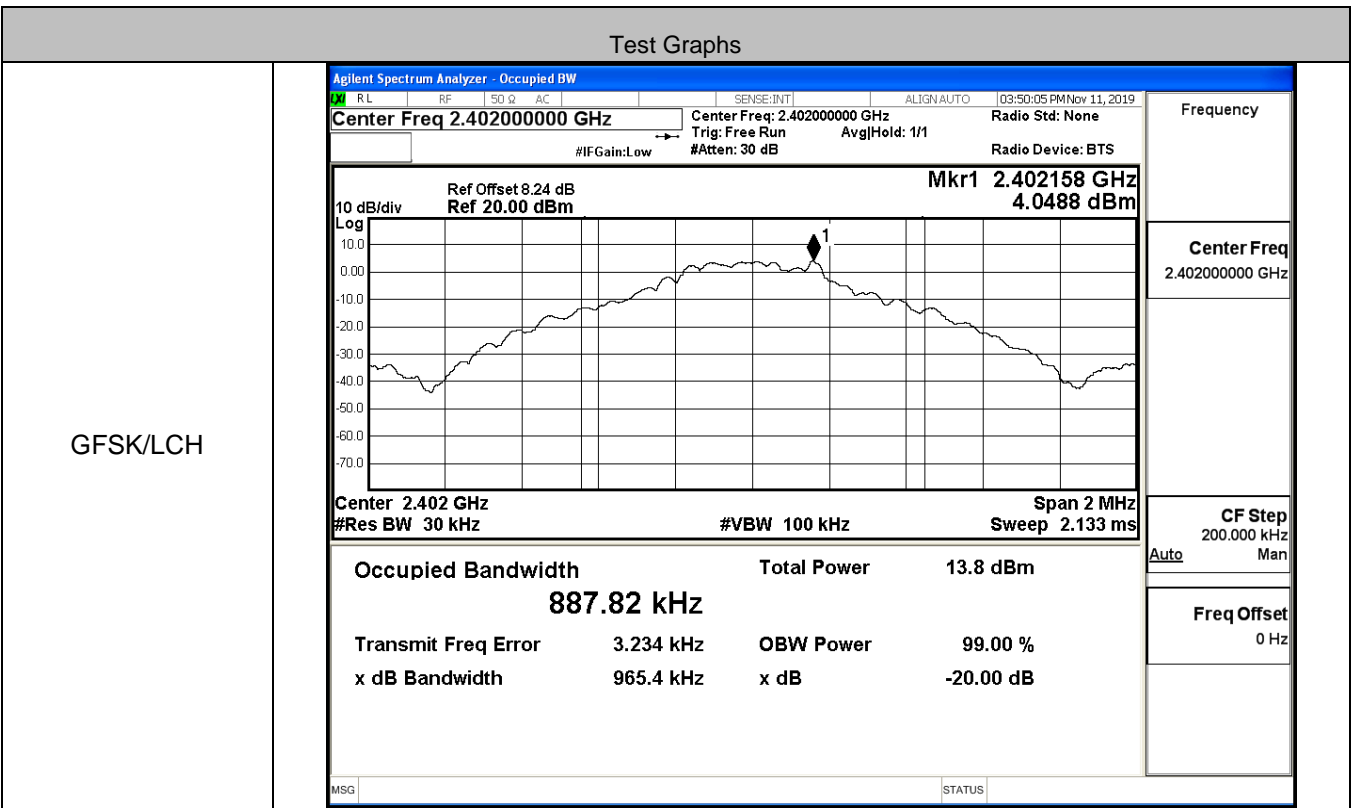
8DPSK/HCH



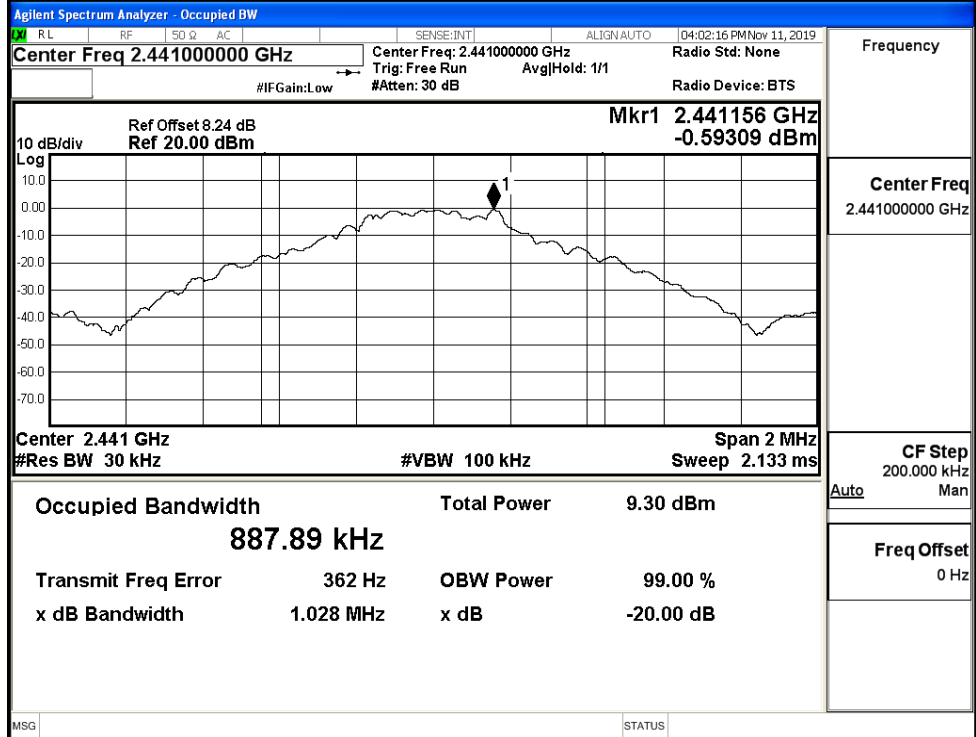
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9654	Not Specified	PASS
	MCH	1.028	Not Specified	PASS
	HCH	1.033	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.291	Not Specified	PASS
	MCH	1.312	Not Specified	PASS
	HCH	1.295	Not Specified	PASS
8DPSK	LCH	1.292	Not Specified	PASS
	MCH	1.300	Not Specified	PASS
	HCH	1.295	Not Specified	PASS

Test Graphs

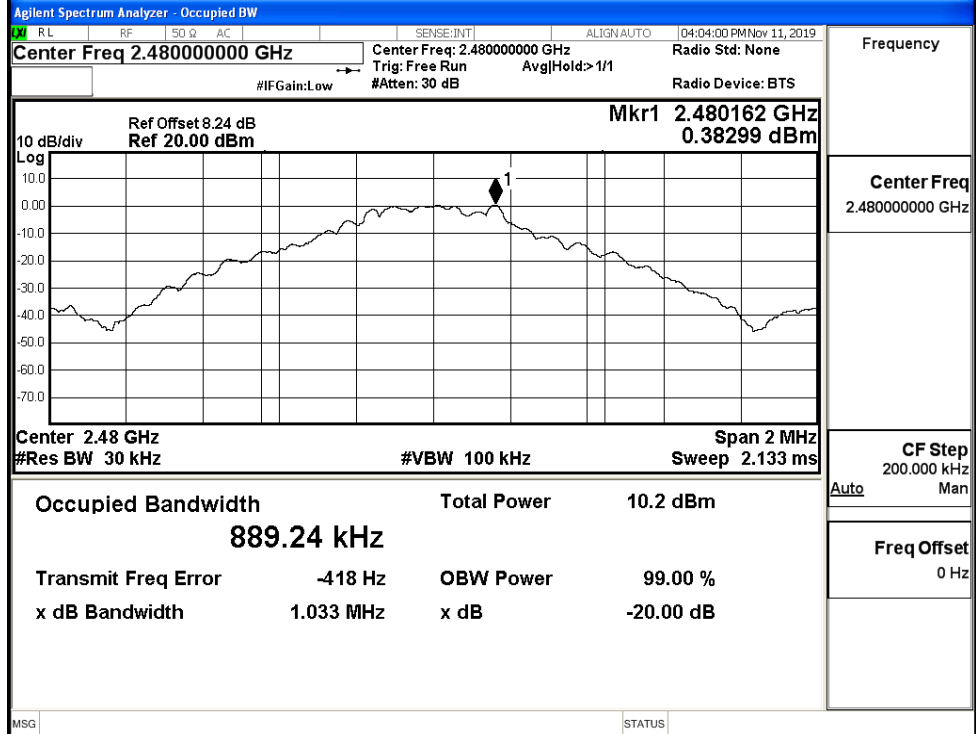


GFSK/MCH



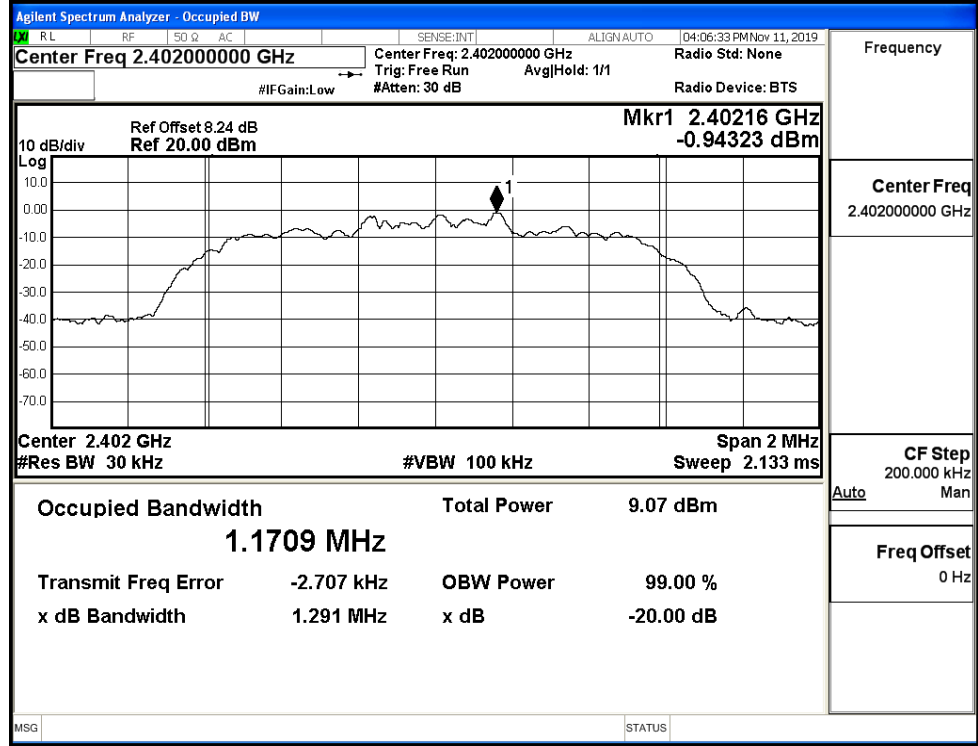
Frequency	2.44100000 GHz
Center Freq	2.44100000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

GFSK/HCH

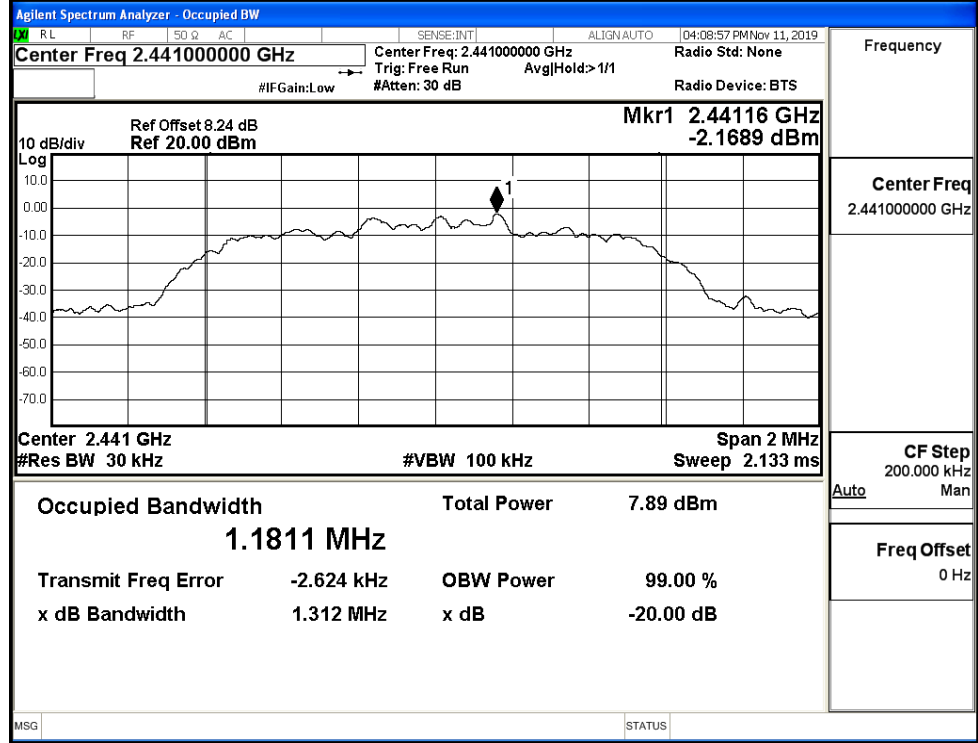


Frequency	2.48000000 GHz
Center Freq	2.48000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

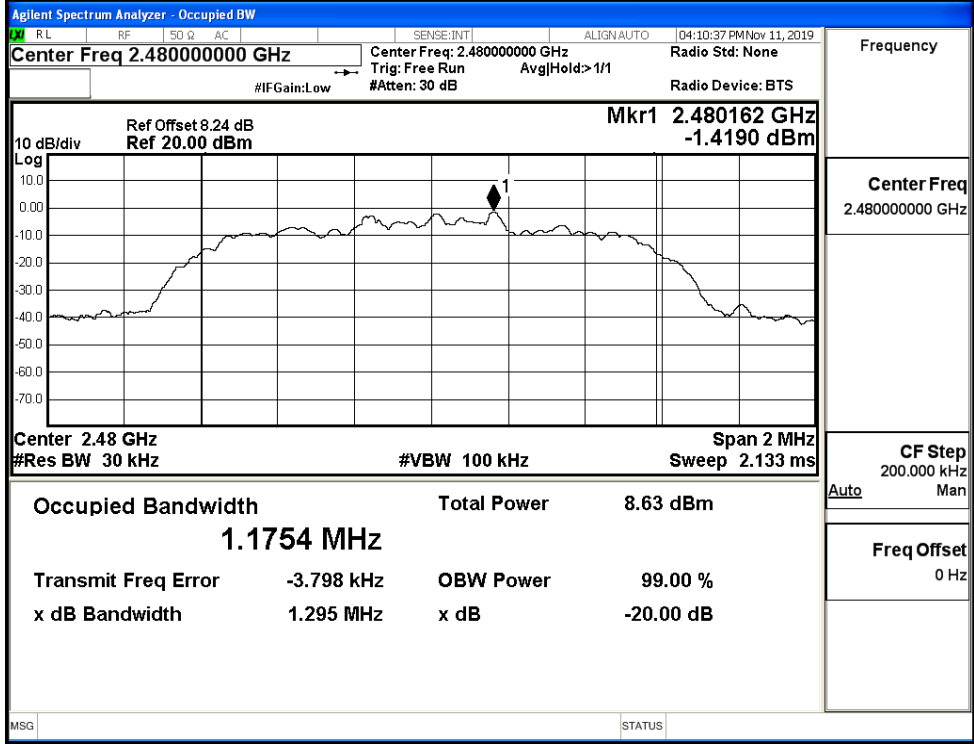
π /4DQPSK/LCH



π /4DQPSK/MCH

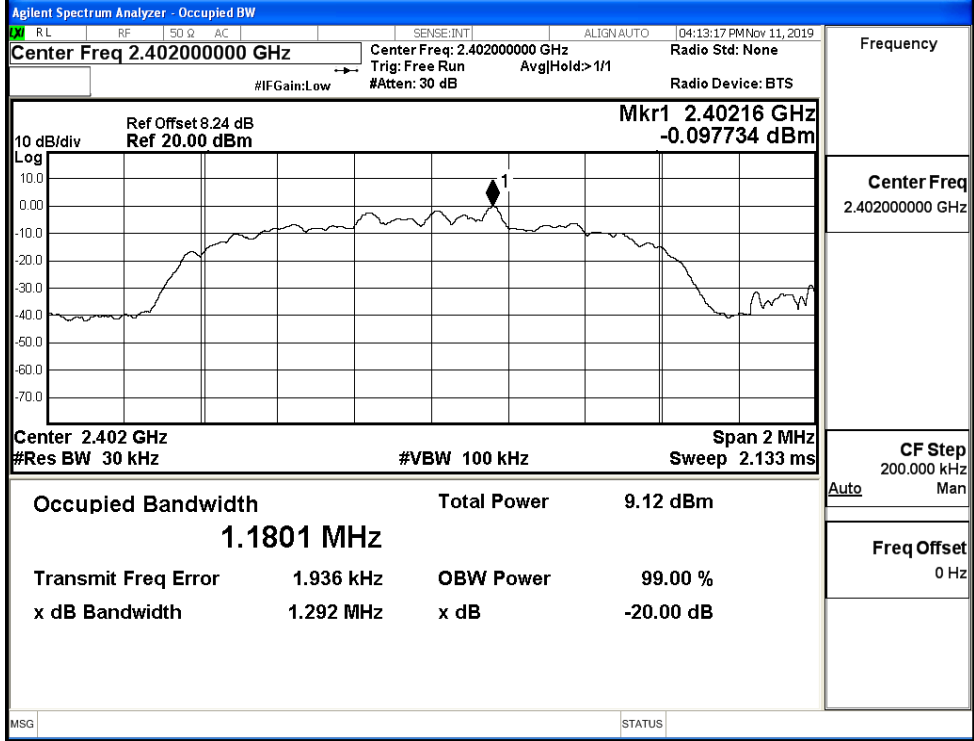


π /4DQPSK/HCH



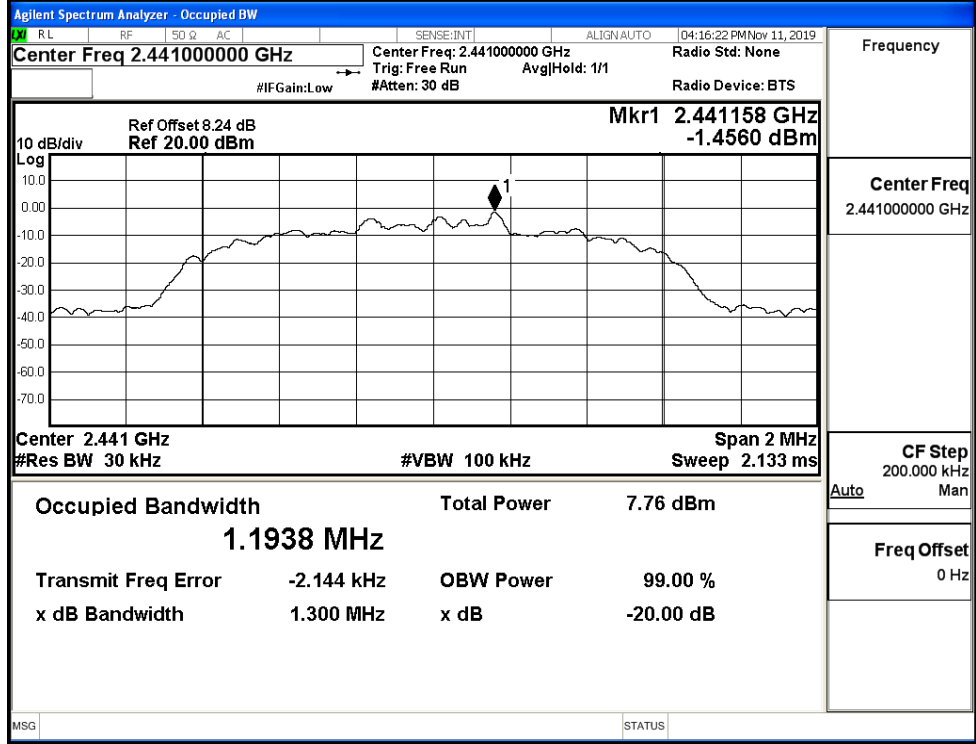
Frequency	
Center Freq	2.48000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

8DPSK/LCH



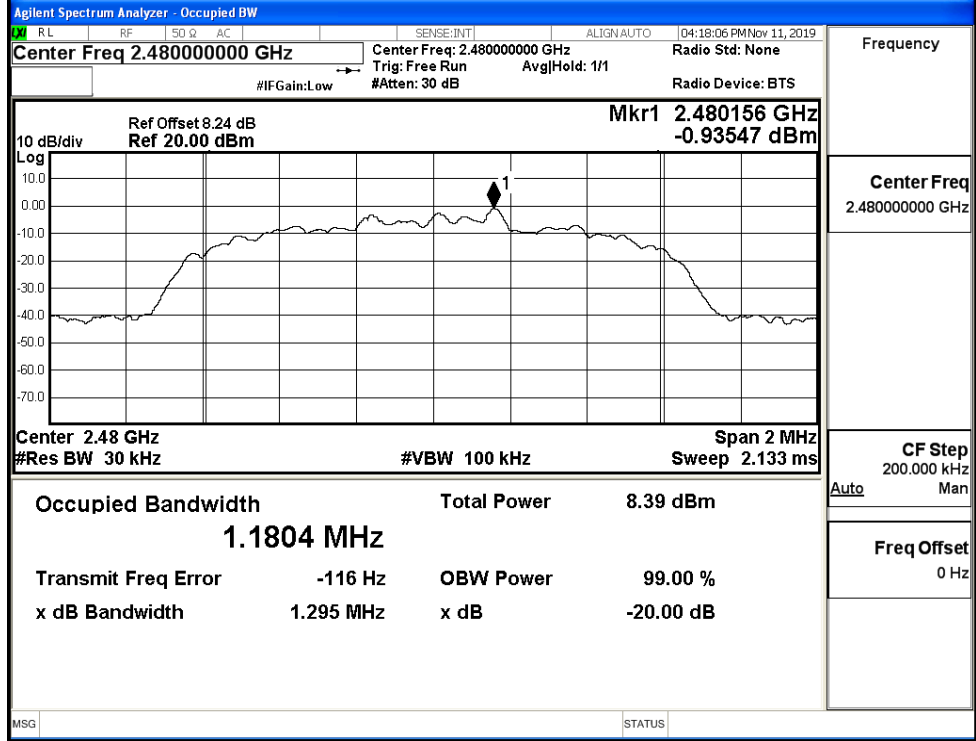
Frequency	
Center Freq	2.40200000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

8DPSK/MCH



Frequency	2.44100000 GHz
Center Freq	2.44100000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

8DPSK/HCH

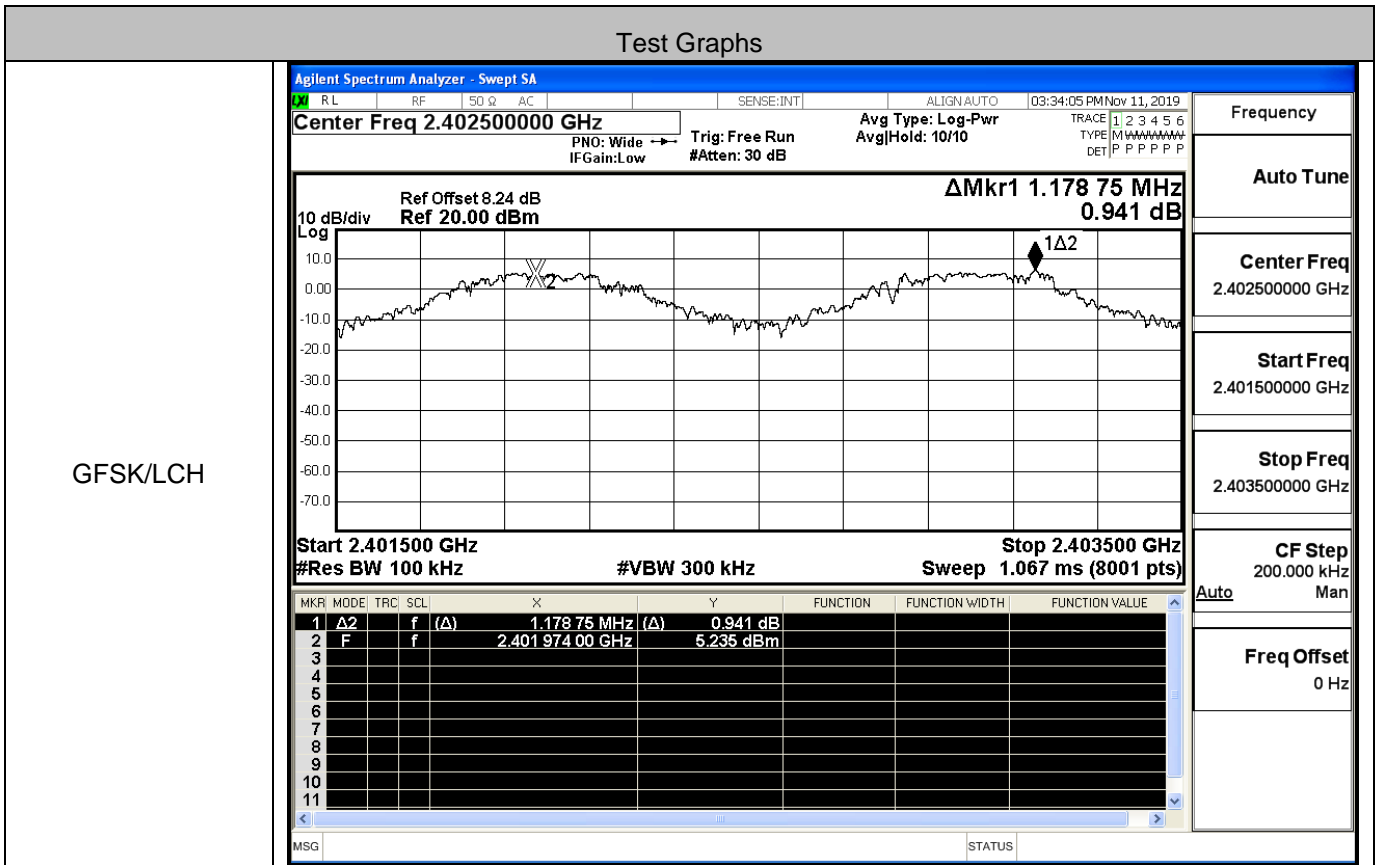


Frequency	2.48000000 GHz
Center Freq	2.48000000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

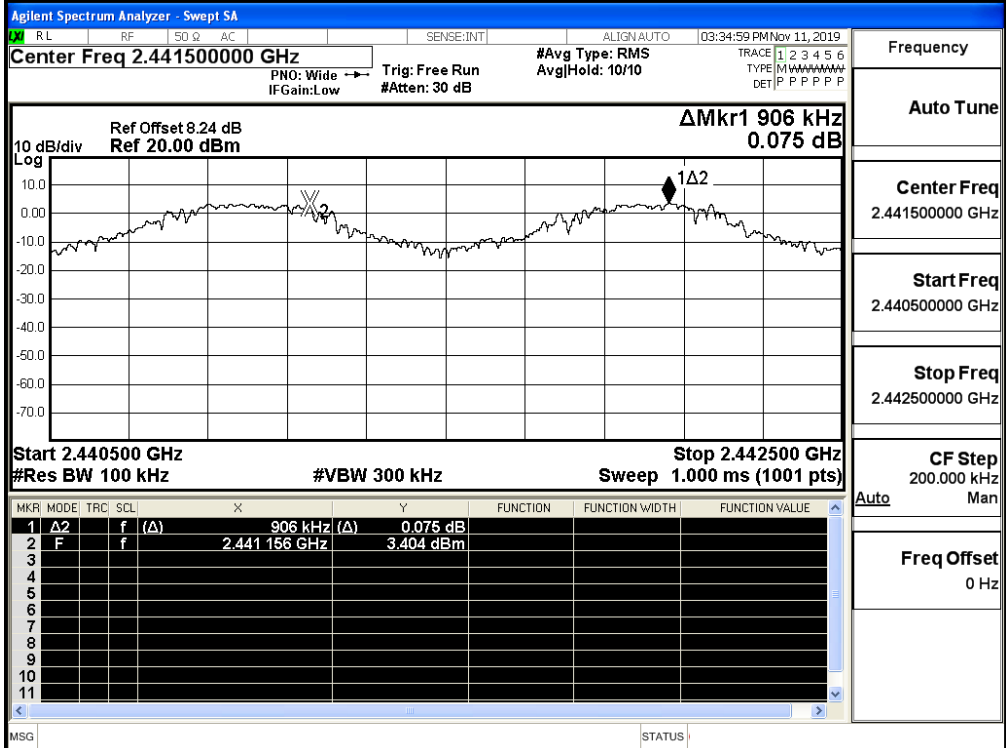
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.179	0.563	PASS
	MCH	0.906	0.563	PASS
	HCH	1.002	0.563	PASS
π/4DQPSK	LCH	1.010	0.849	PASS
	MCH	1.198	0.849	PASS
	HCH	1.076	0.849	PASS
8DPSK	LCH	1.206	0.852	PASS
	MCH	1.078	0.852	PASS
	HCH	1.158	0.852	PASS

Test Graphs

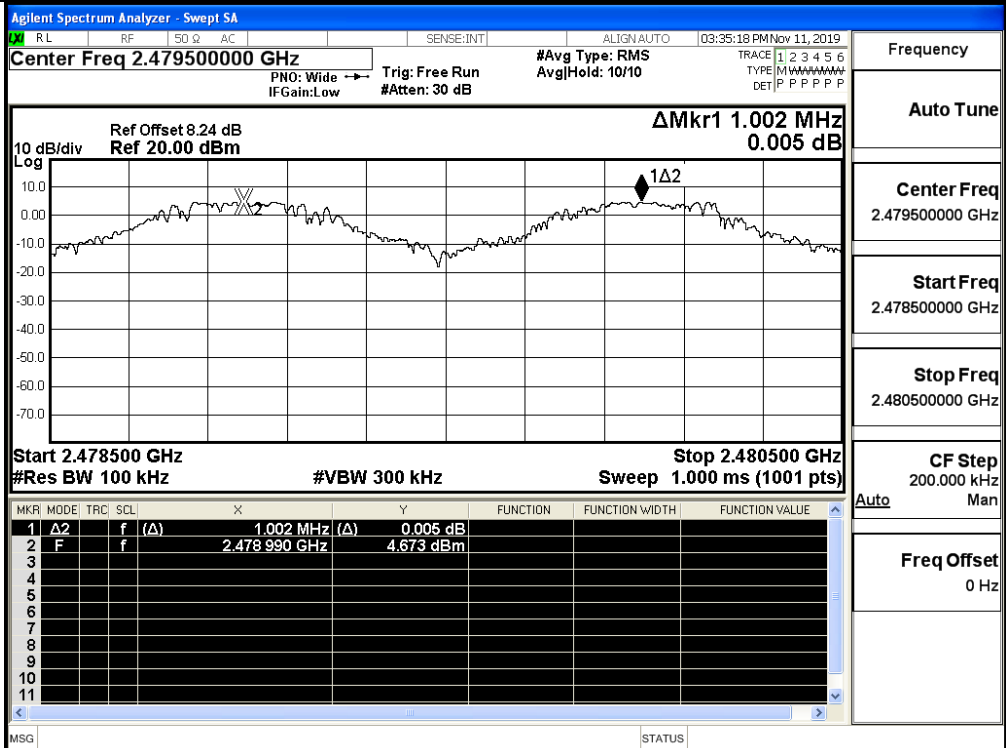


GFSK/MCH



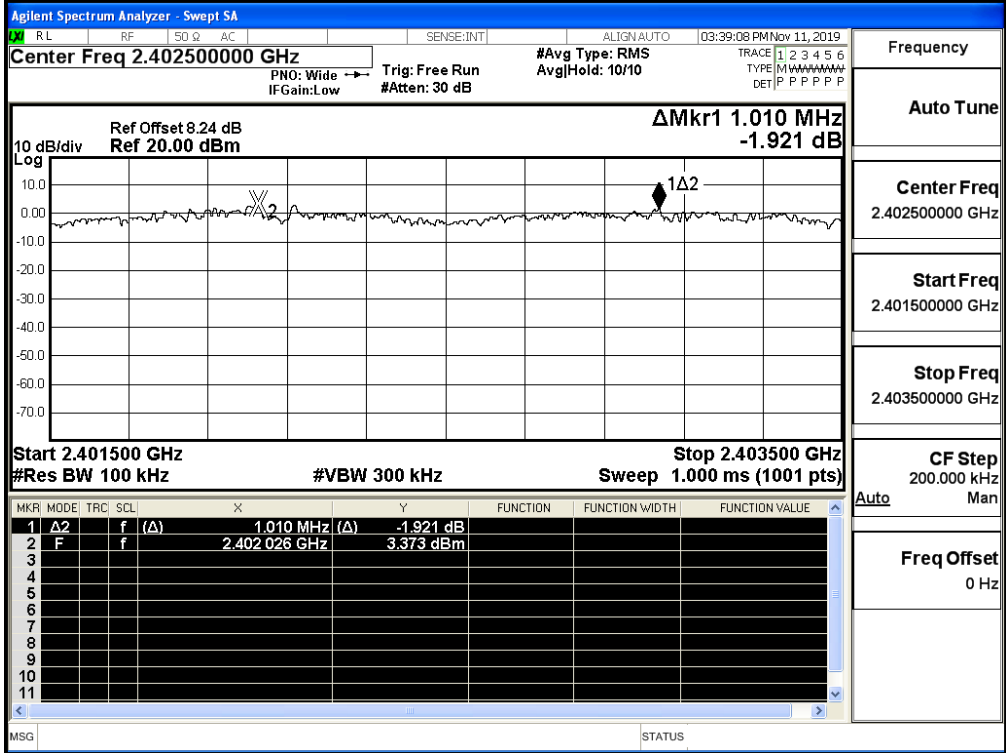
Frequency	
Auto Tune	
Center Freq	2.44150000 GHz
Start Freq	2.44050000 GHz
Stop Freq	2.44250000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

GFSK/HCH

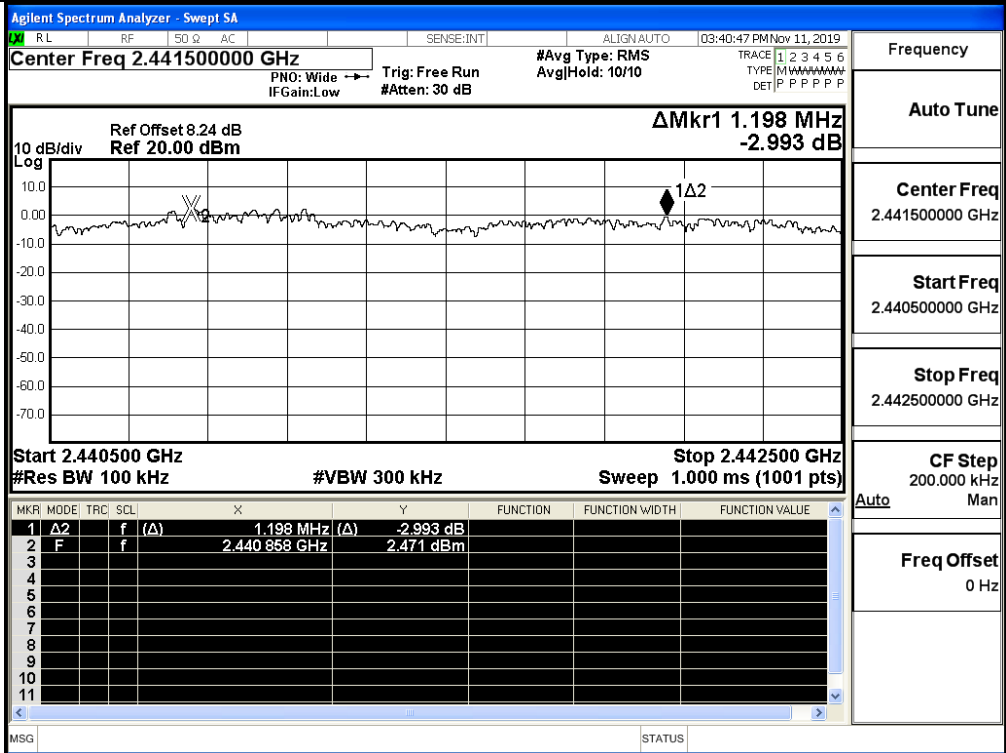


Frequency	
Auto Tune	
Center Freq	2.47950000 GHz
Start Freq	2.47850000 GHz
Stop Freq	2.48050000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

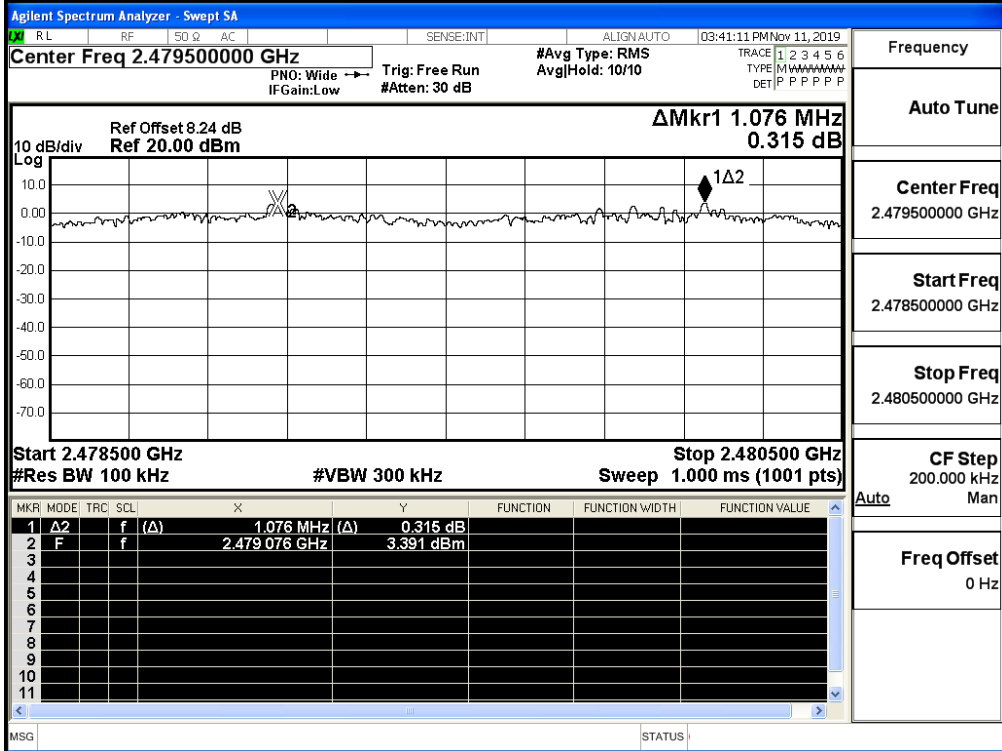
$\pi/4$ DQPSK/LCH



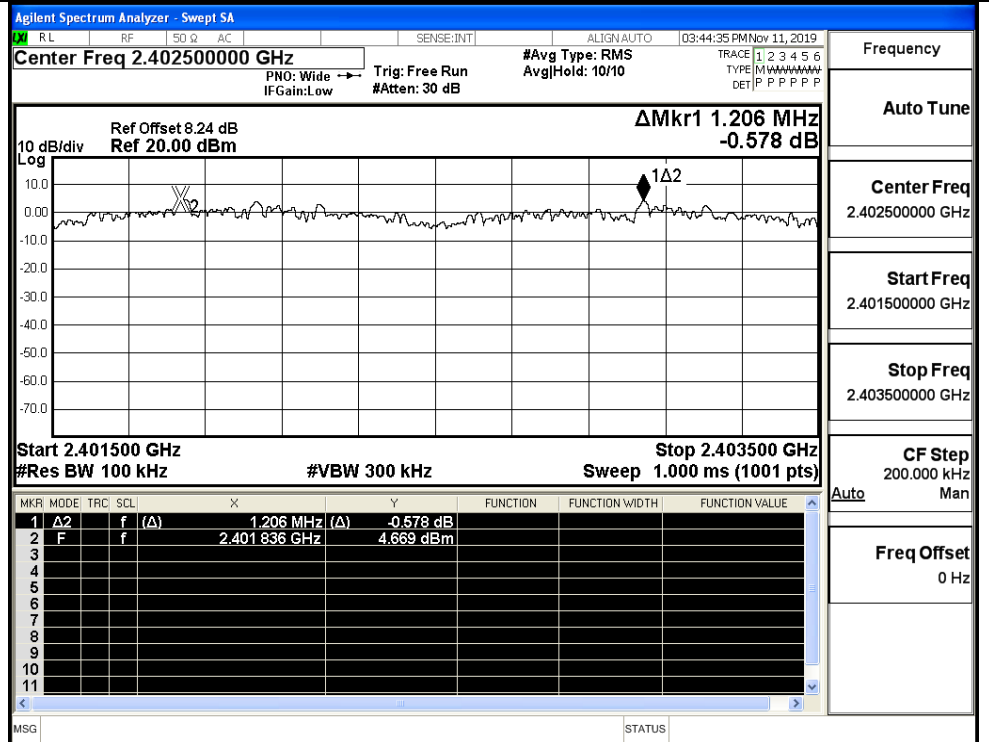
$\pi/4$ DQPSK/MCH



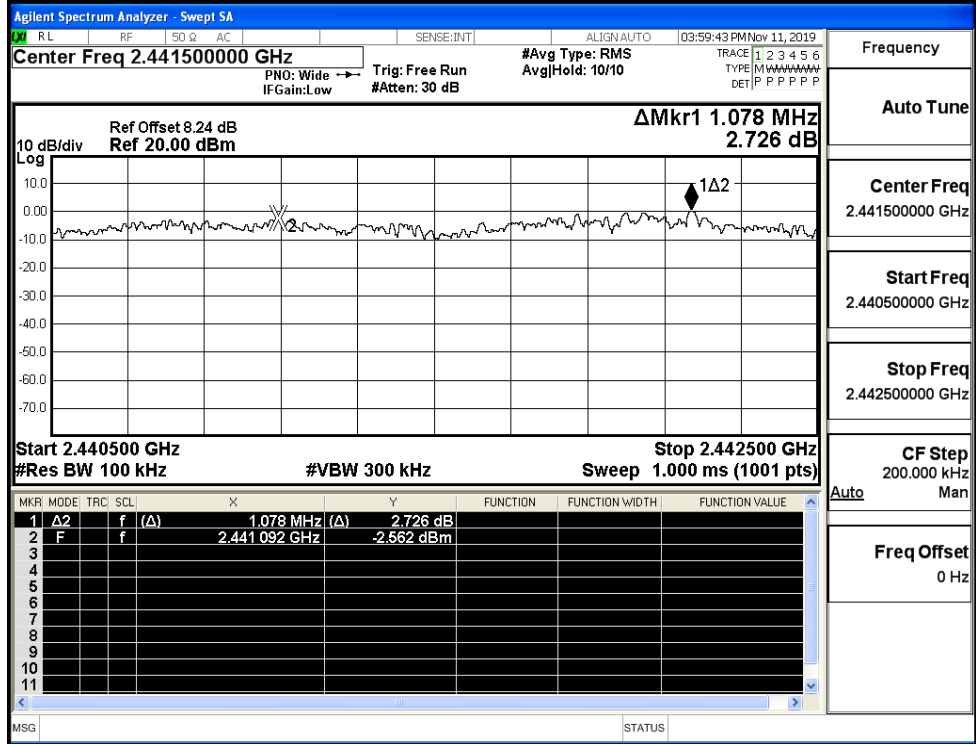
$\pi/4$ DQPSK/HCH



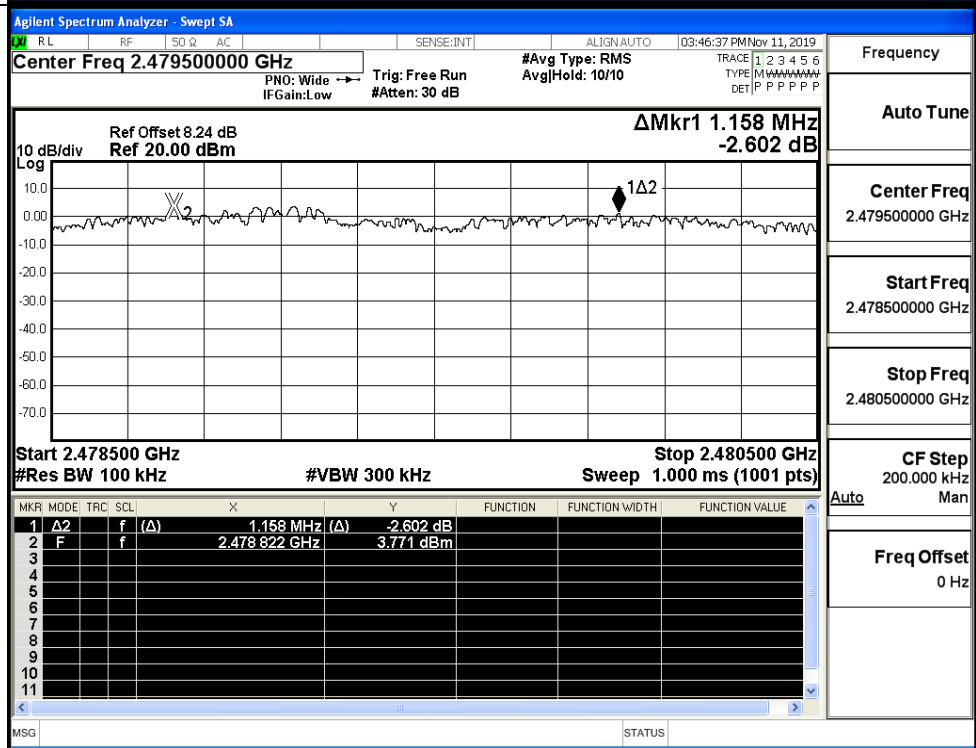
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH



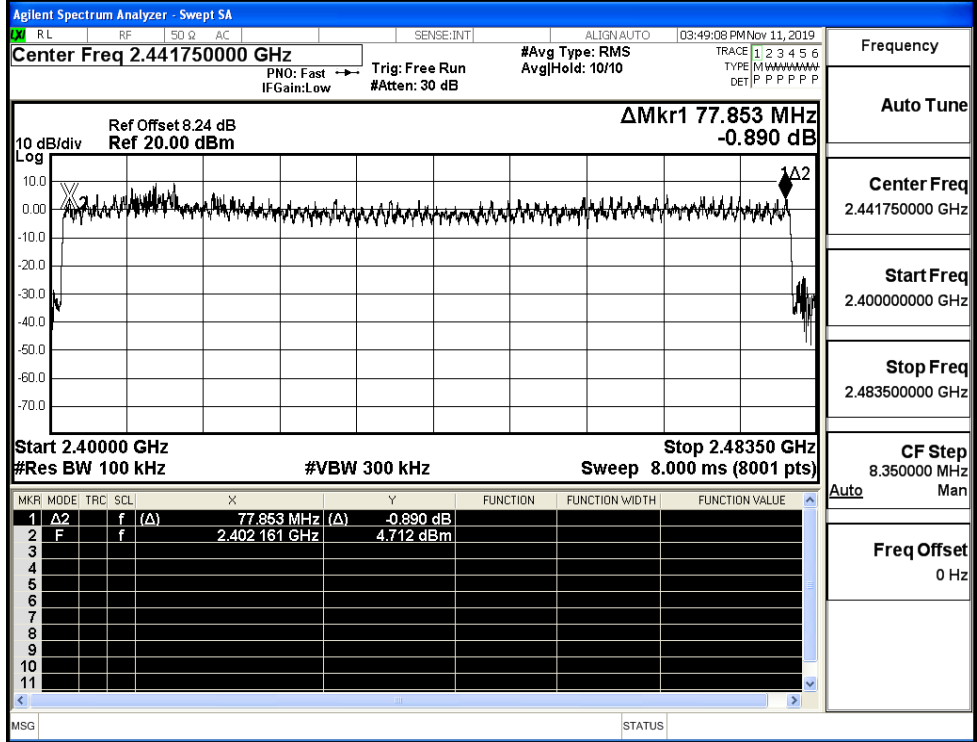
A.4 Hopping Channel Number

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

Test Graphs

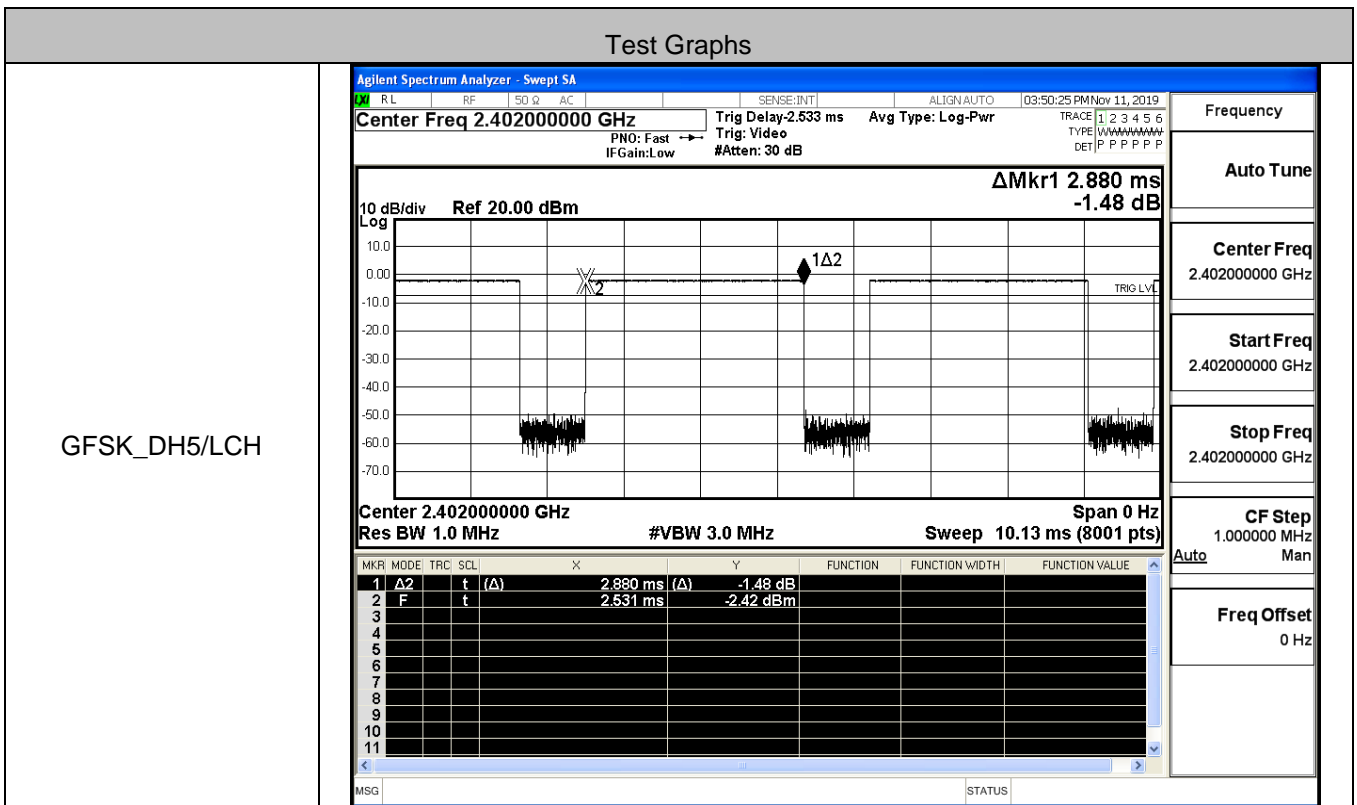
GFSK/Hop		<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.441750000 GHz</p> <p>Ref Offset 8.24 dB Ref 20.00 dBm</p> <p>ΔMkr1 78.104 MHz -0.534 dB</p> <p>Start 2.40000 GHz #Res BW 100 kHz</p> <p>Stop 2.48350 GHz #VBW 300 kHz Sweep 8.000 ms (8001 pts)</p> <table border="1"> <thead> <tr> <th>MKR</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>78.104 MHz (Δ)</td> <td>-0.534 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.402 067 GHz</td> <td>5.329 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)	78.104 MHz (Δ)	-0.534 dB				2	F	f		2.402 067 GHz	5.329 dBm			
	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
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2	F	f		2.402 067 GHz	5.329 dBm																								
$\pi/4$ DQPSK/Hop		<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 78.010 MHz -0.047 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>78.010 MHz (Δ)</td> <td>-0.047 dB</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>F</td> <td>f</td> <td></td> <td>2.402 129 GHz</td> <td>3.168 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)	78.010 MHz (Δ)	-0.047 dB				2	F	f		2.402 129 GHz	3.168 dBm			
	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																				
1	Δ 2	f	(Δ)	78.010 MHz (Δ)	-0.047 dB																								
2	F	f		2.402 129 GHz	3.168 dBm																								

8DPSK/Hop

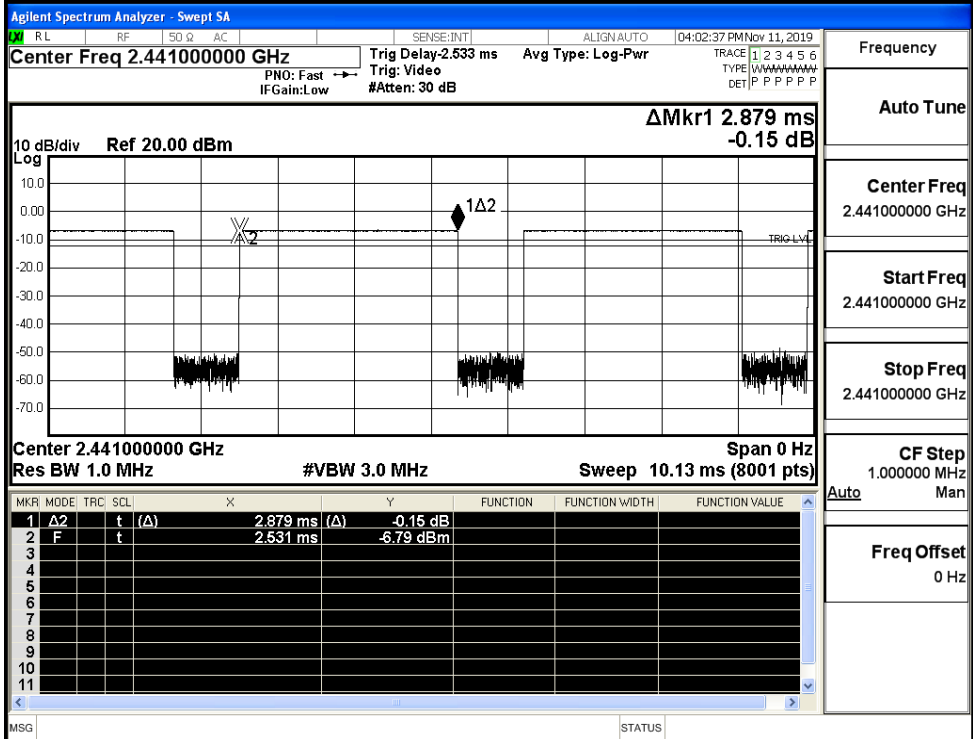


A.5 Dwell Time

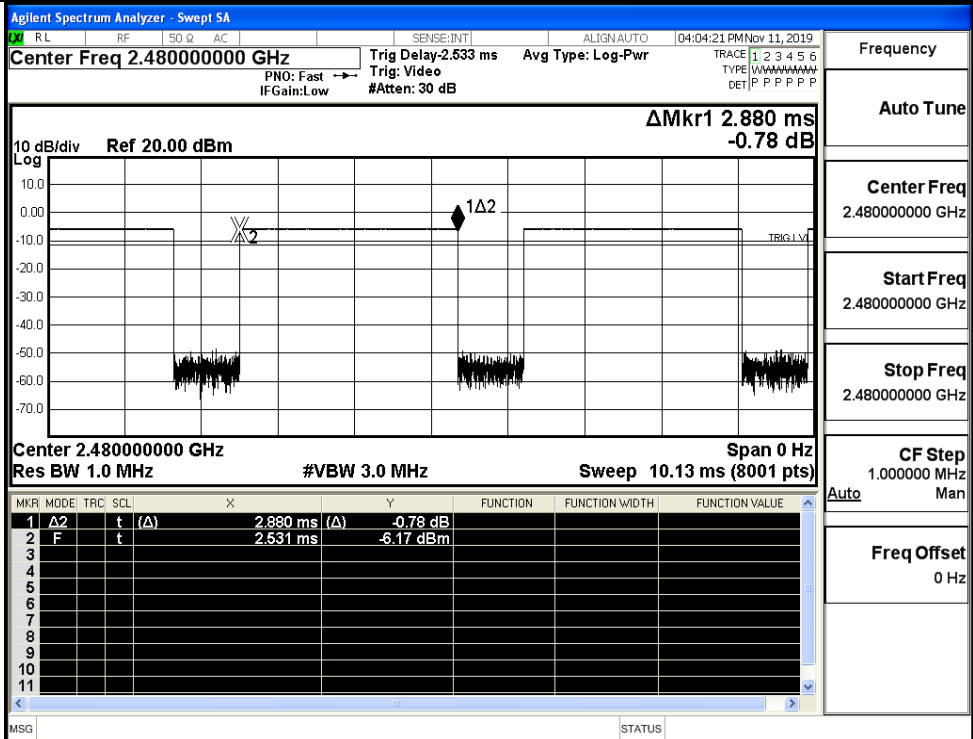
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
π/4DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88	106.7	0.307	0.4	PASS
8DPSK	3DH5	LCH	2.88	106.7	0.308	0.4	PASS
	3DH5	MCH	2.88	106.7	0.308	0.4	PASS
	3DH5	HCH	2.88	106.7	0.308	0.4	PASS



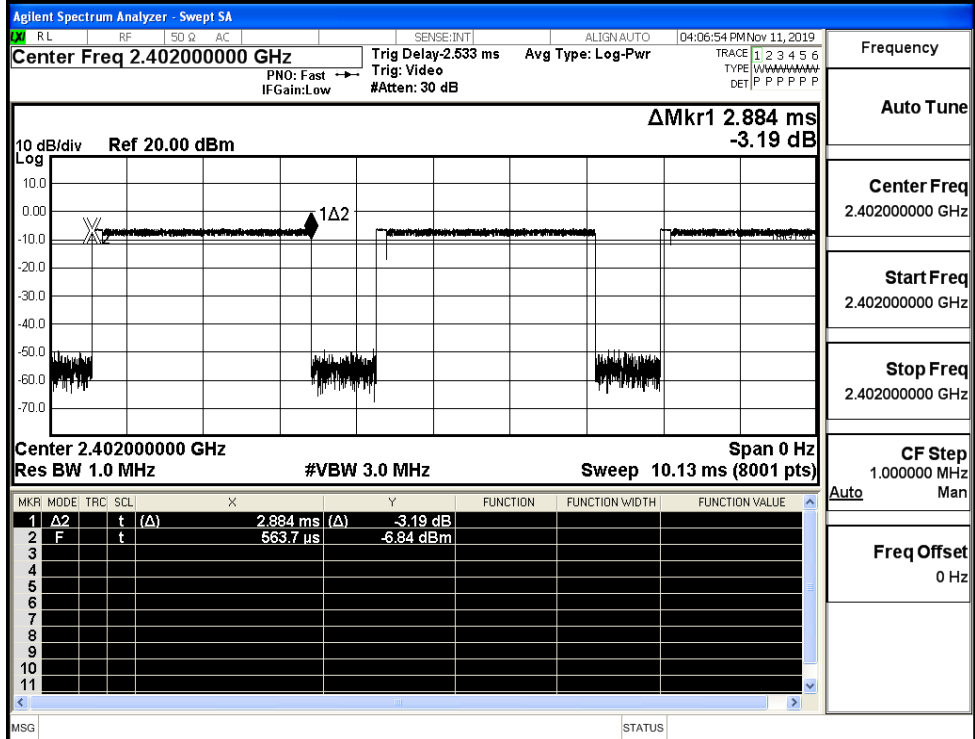
GFSK_DH5/MCH



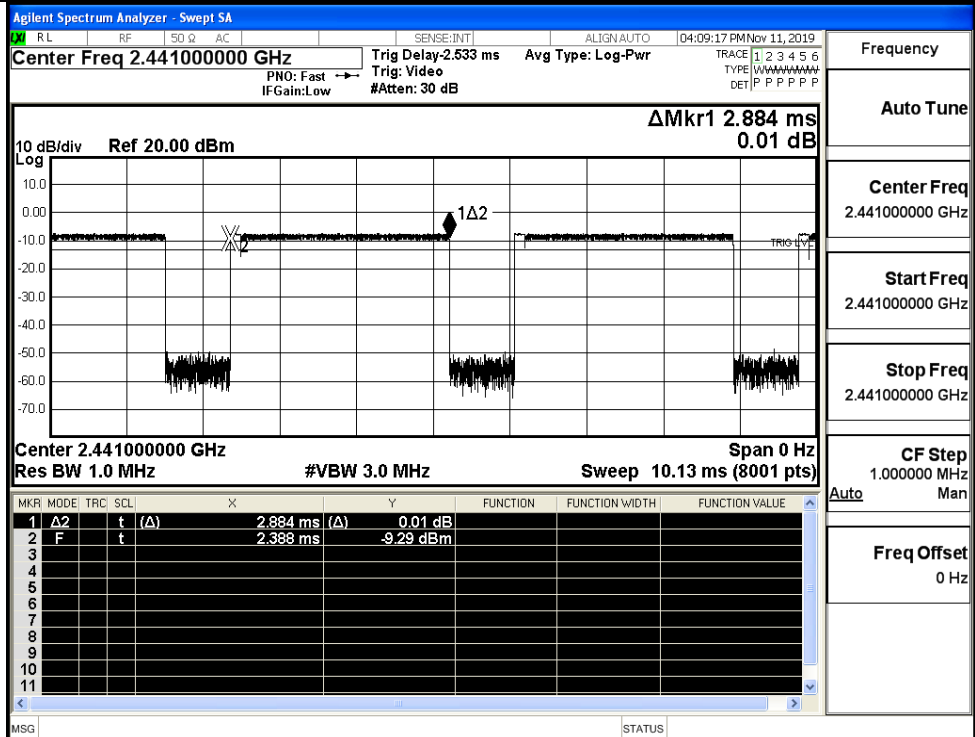
GFSK_DH5/HCH



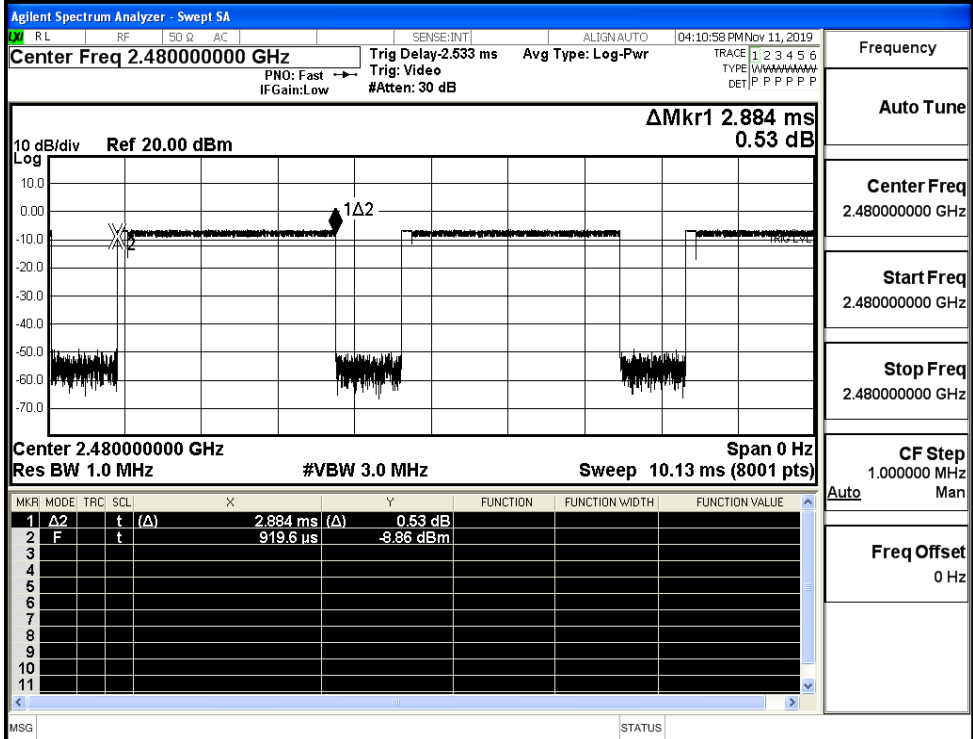
$\pi/4$ DQPSK
_2DH5/LCH



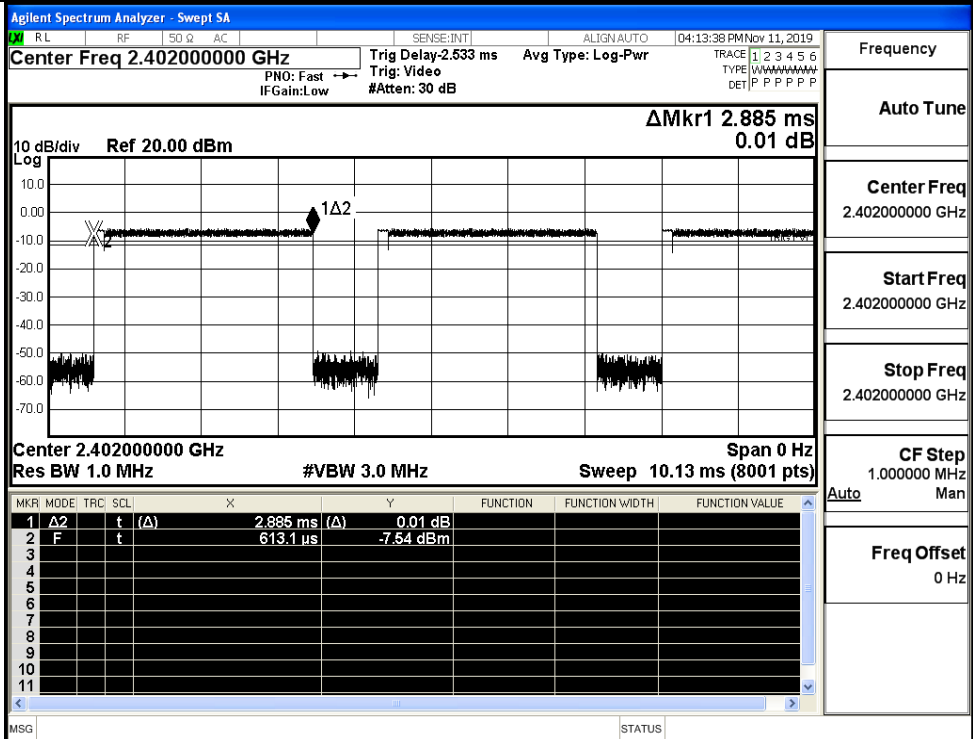
$\pi/4$ DQPSK
_2DH5/MCH



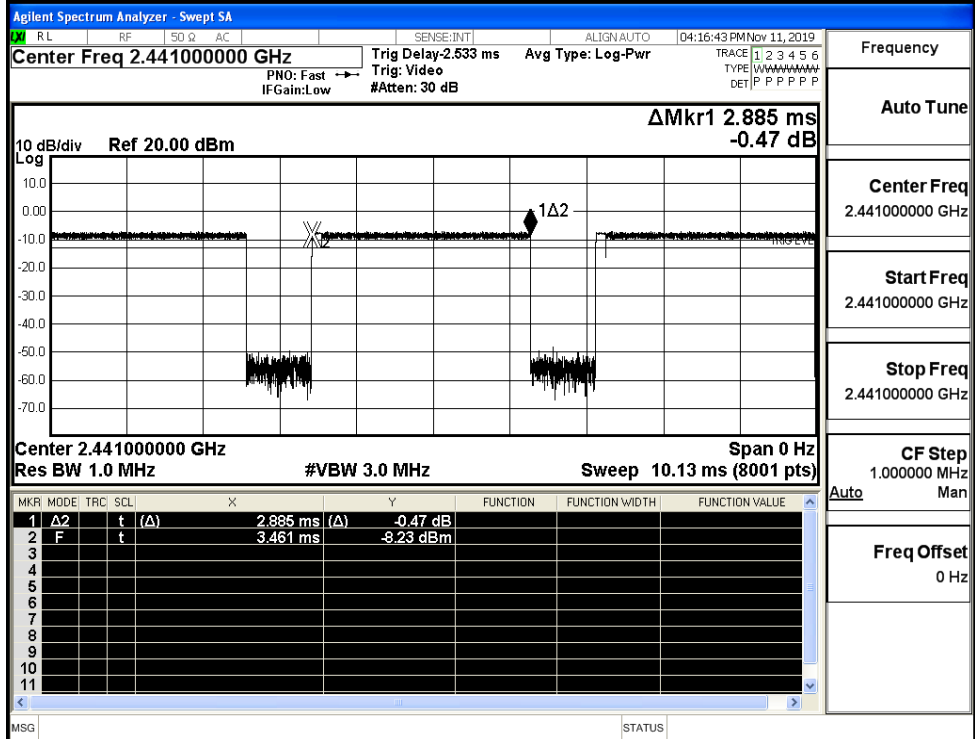
$\pi/4$ DQPSK
_2DH5/HCH



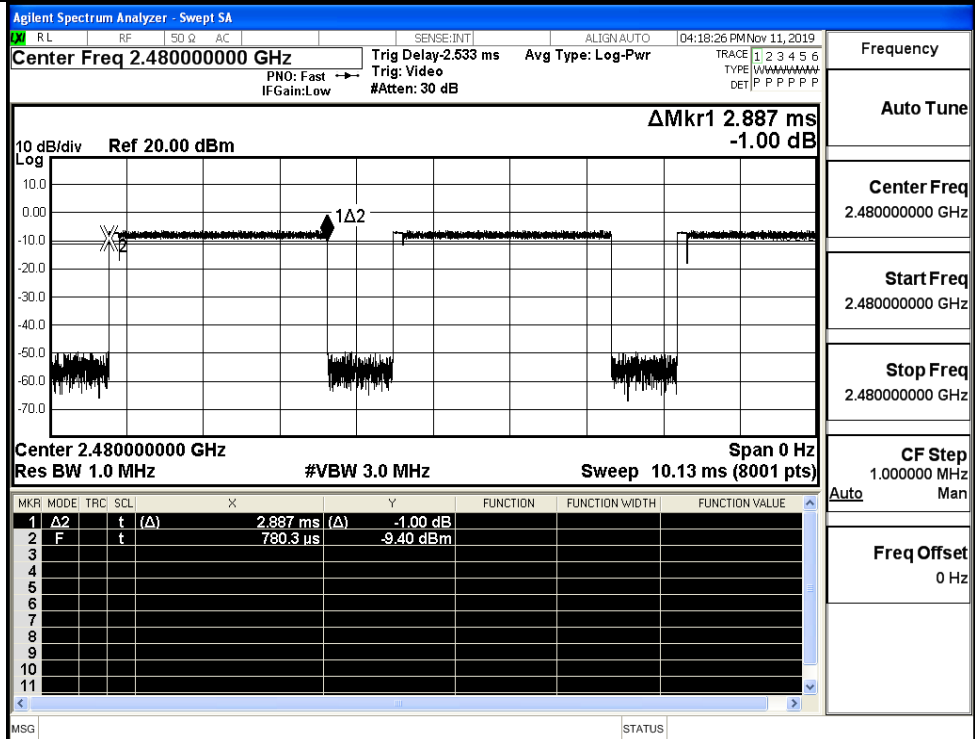
8DPSK_3DH5/LCH



8DPSK_3DH5/MCH

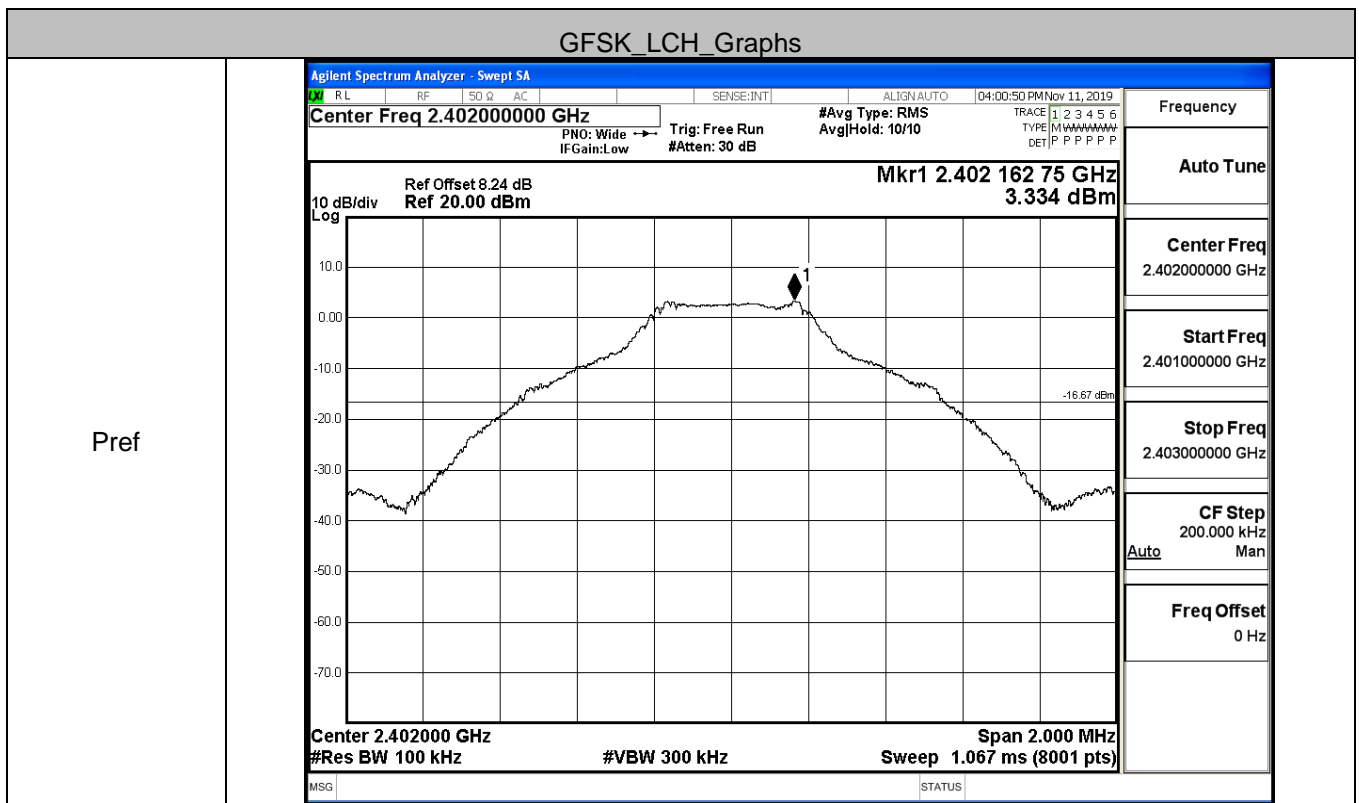


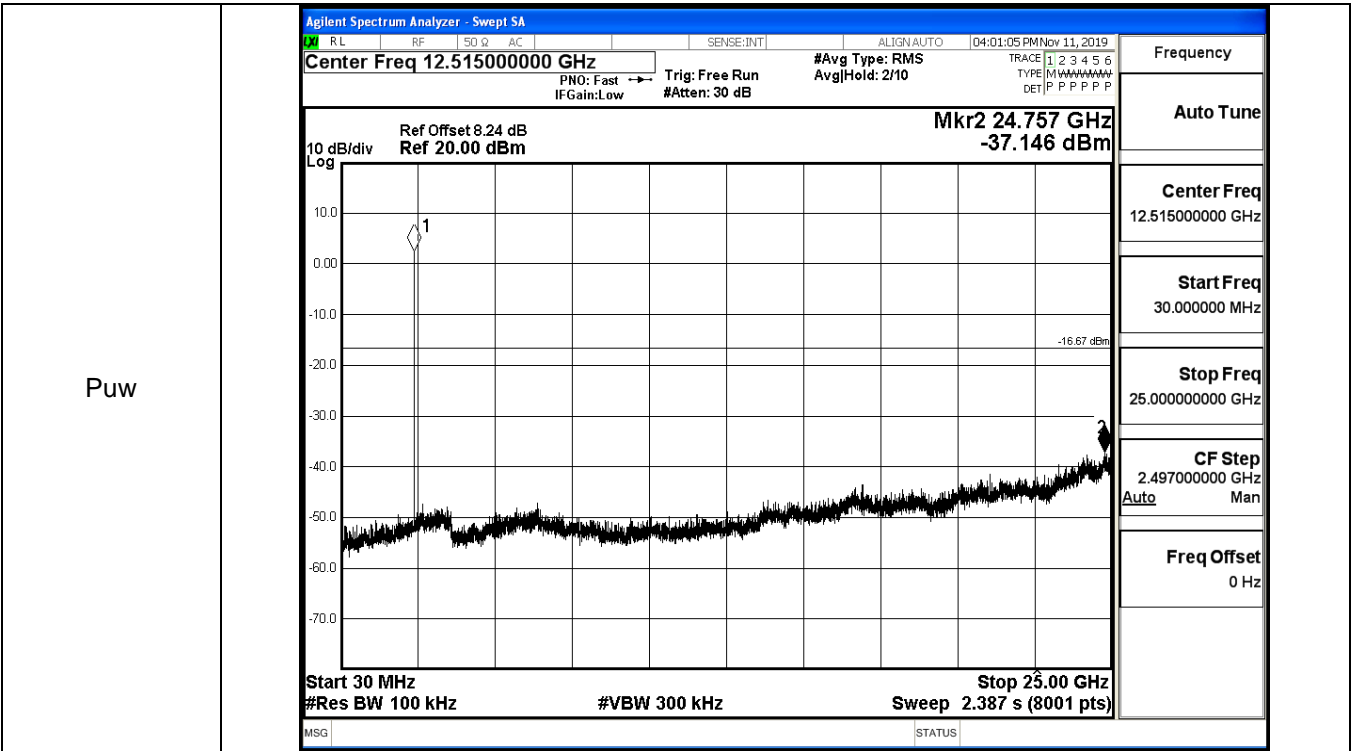
8DPSK_3DH5/HCH



A.6 RF Conducted Spurious Emissions

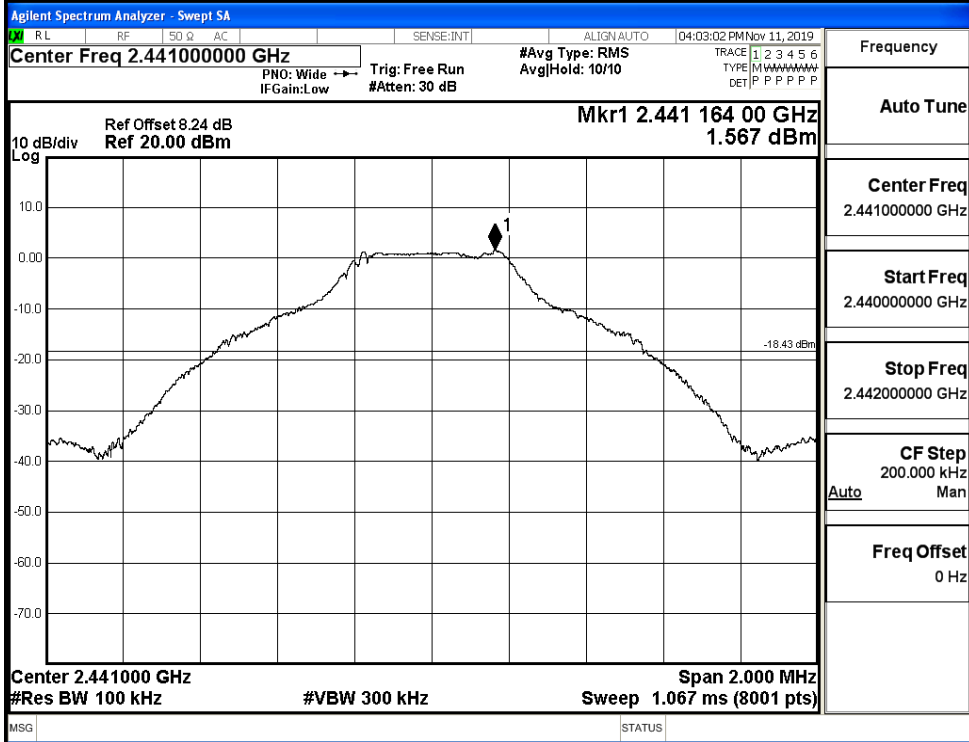
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.334	-37.146	-16.666	PASS
	MCH	1.567	-36.923	-18.433	PASS
	HCH	2.448	-37.948	-17.552	PASS
π/4DQPSK	LCH	1.924	-37.767	-18.076	PASS
	MCH	-0.362	-36.470	-20.362	PASS
	HCH	0.844	-36.817	-19.156	PASS
8DPSK	LCH	1.95	-37.362	-18.050	PASS
	MCH	0.578	-36.024	-19.422	PASS
	HCH	0.531	-36.835	-19.469	PASS



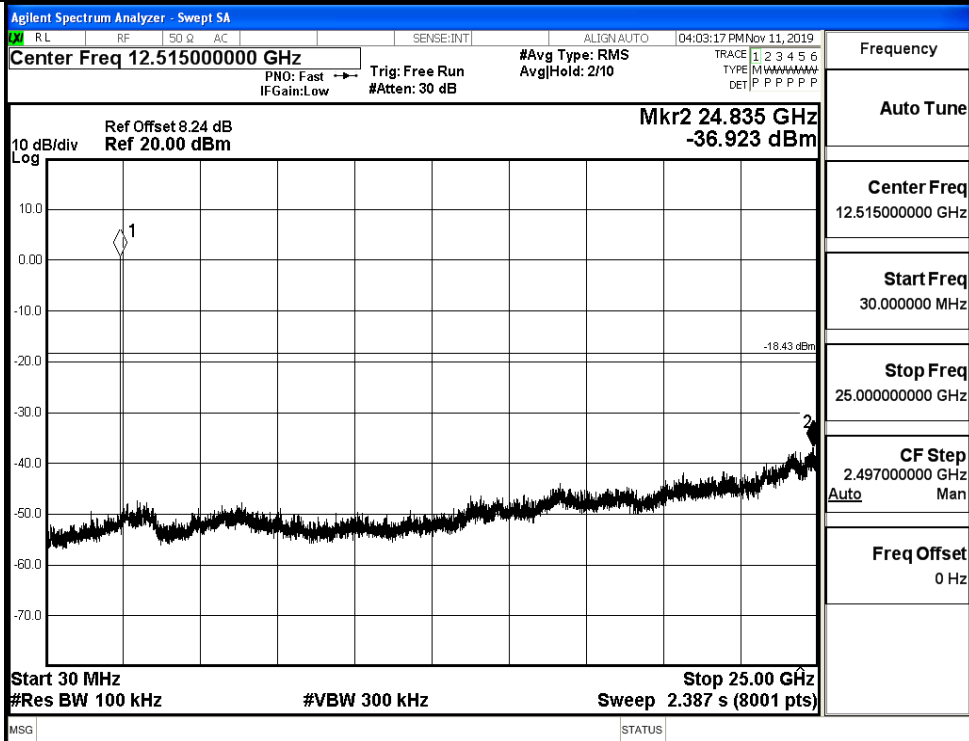


GFSK_MCH_Graphs

Pref

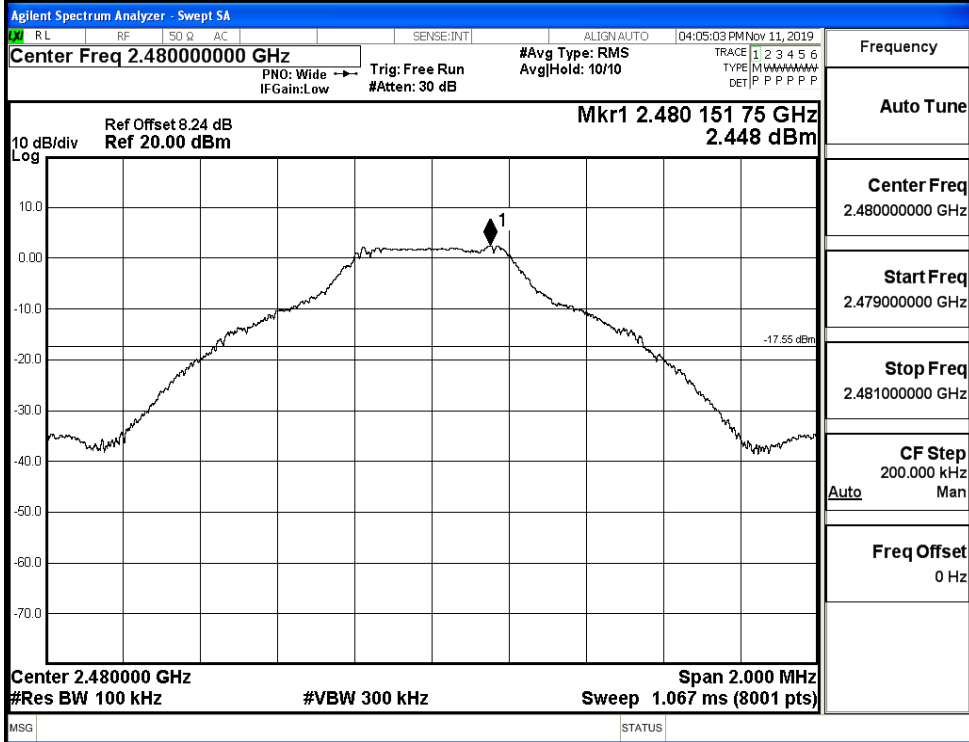


Puw

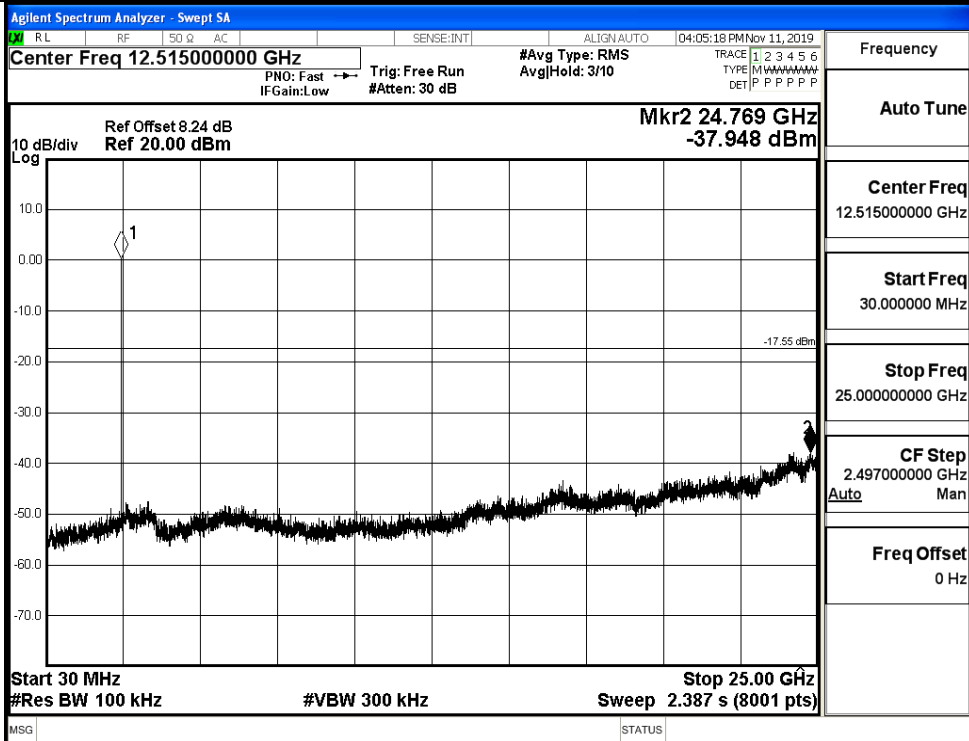


GFSK_HCH_Graphs

Pref

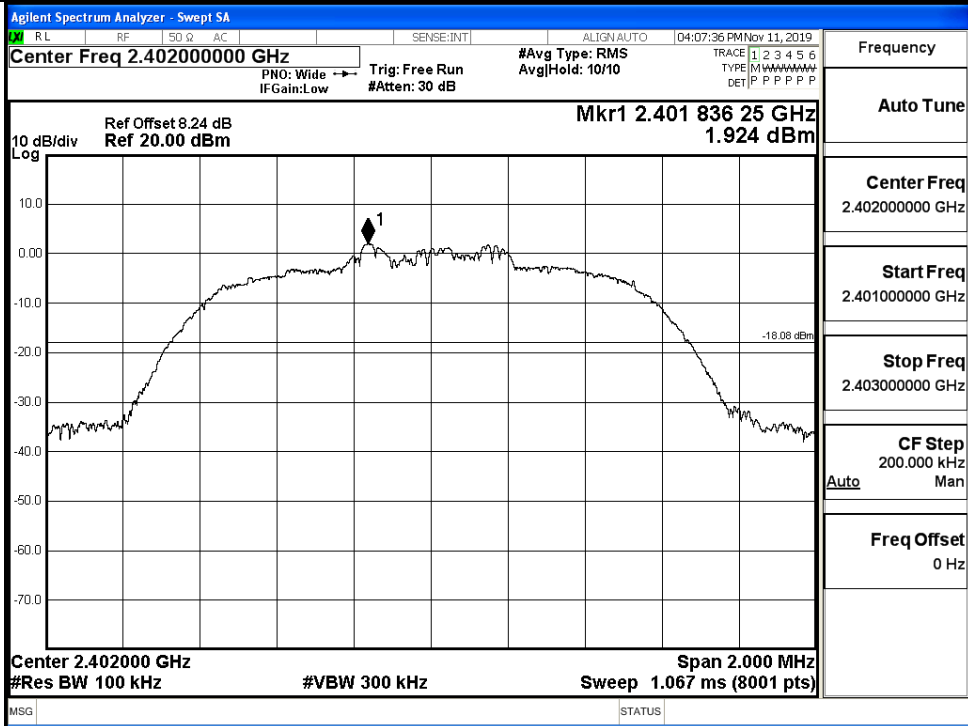


Puw

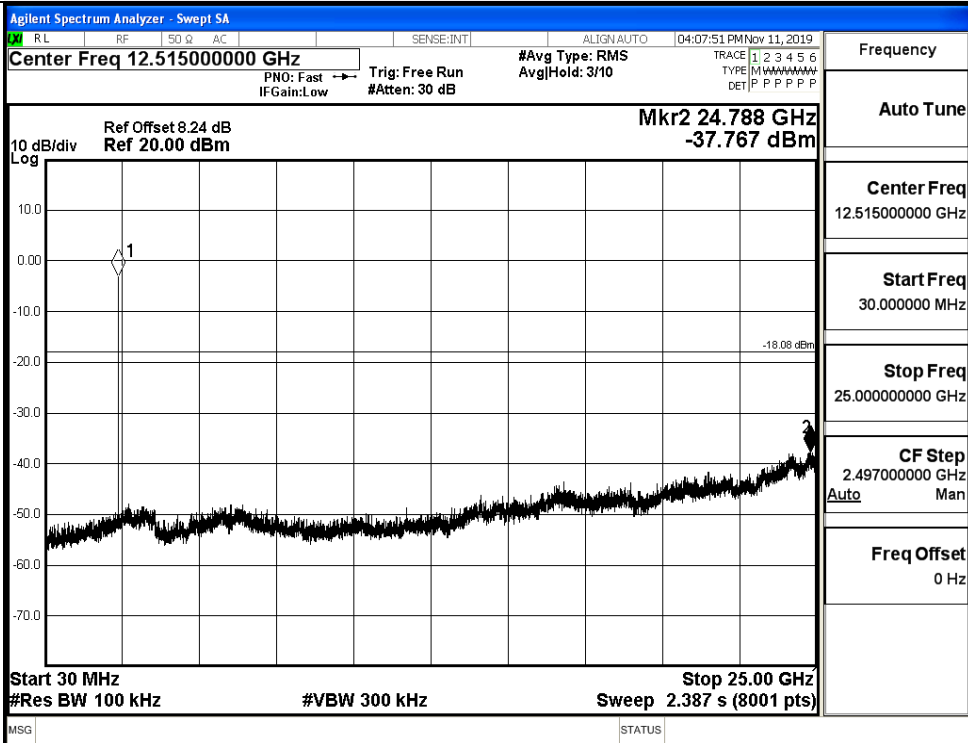


$\pi/4$ DQPSK LCH_Graphs

Pref

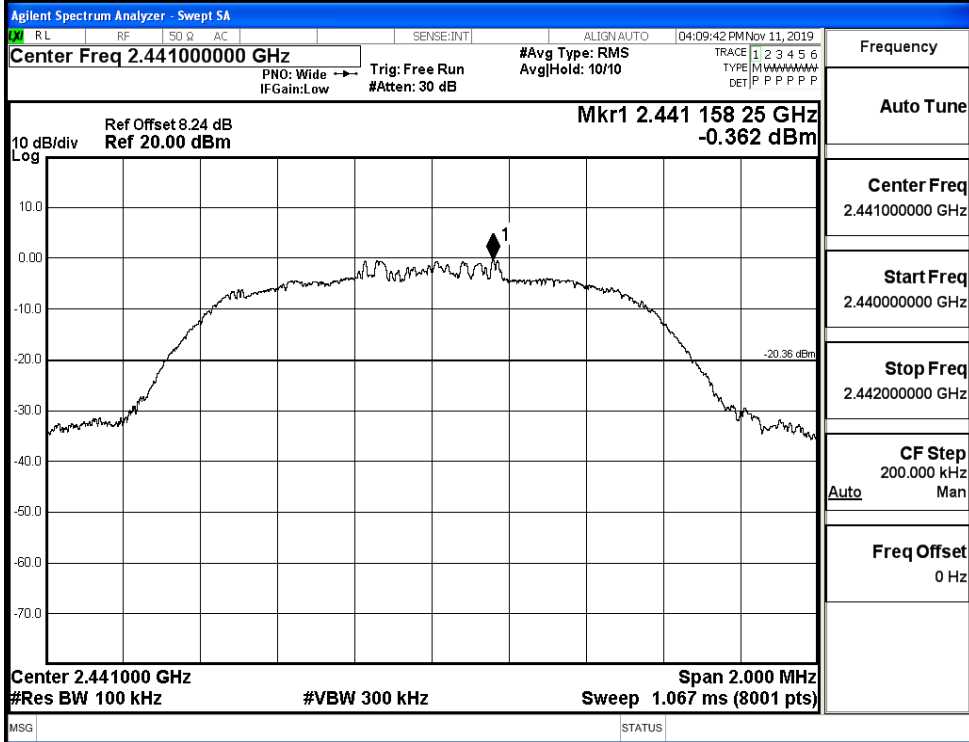


Puw

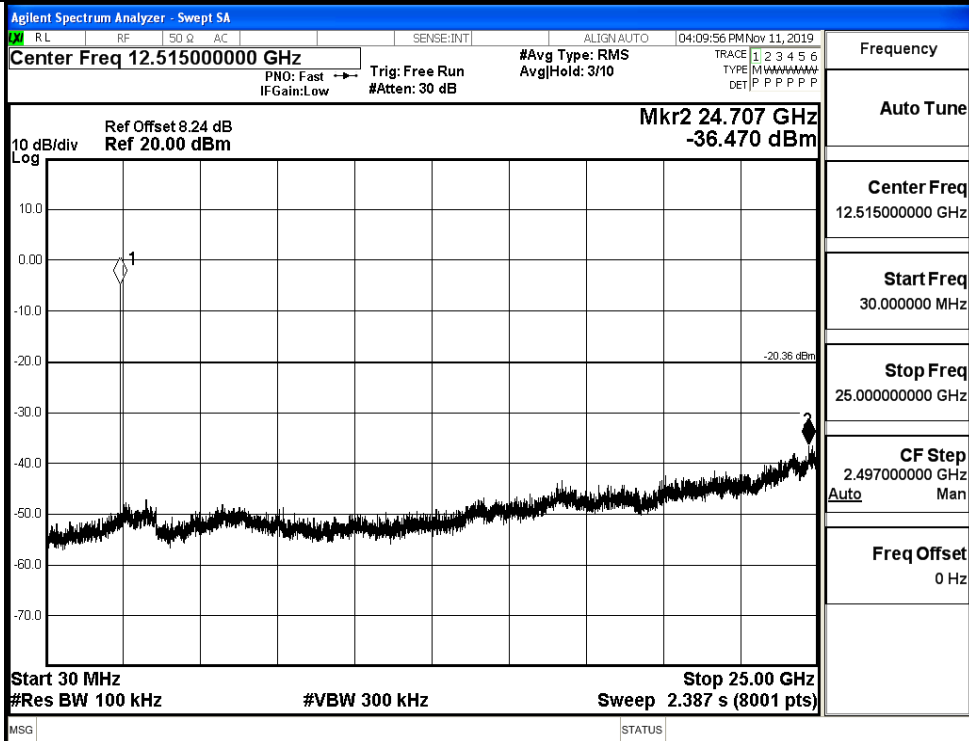


$\pi/4$ DQPSK_MCH_Graphs

Pref

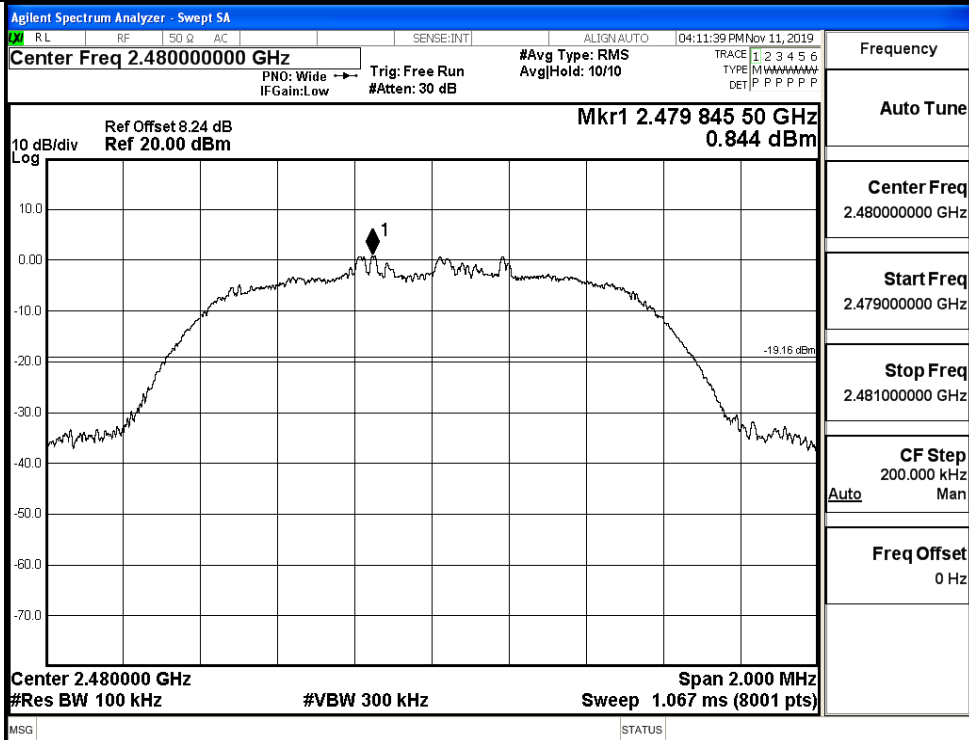


Puw

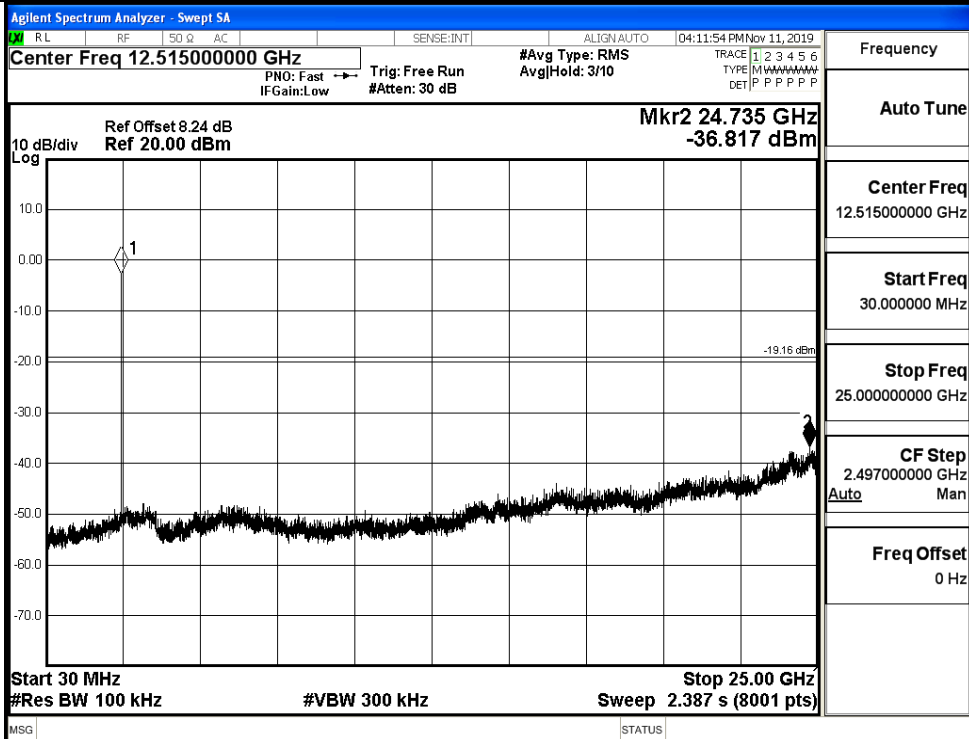


$\pi/4$ DQPSK_HCH_Graphs

Pref

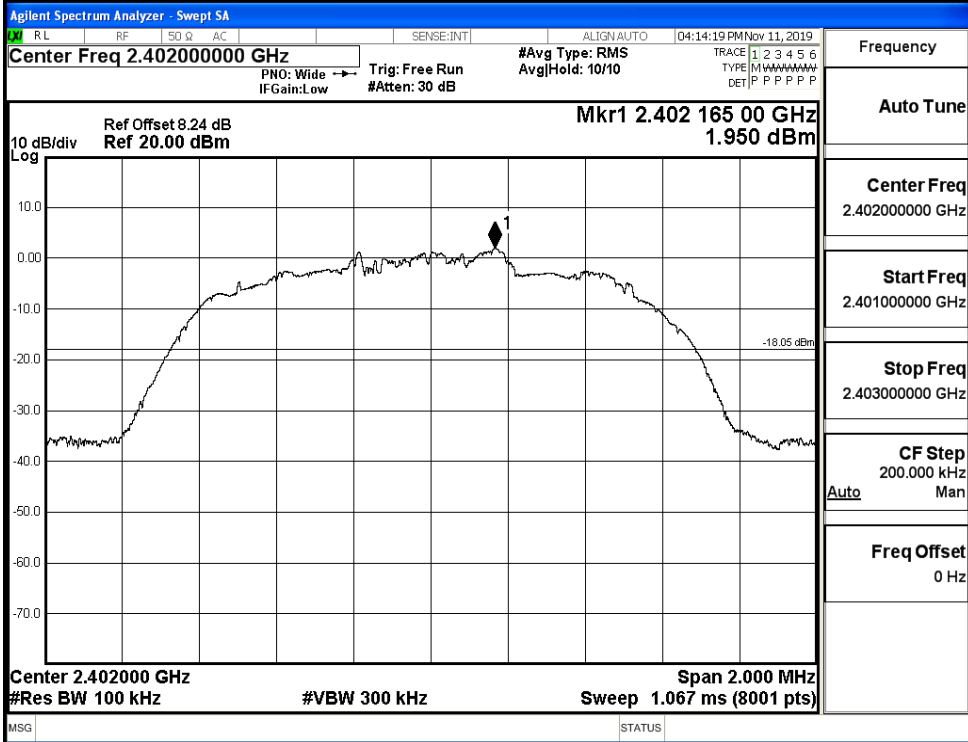


Puw

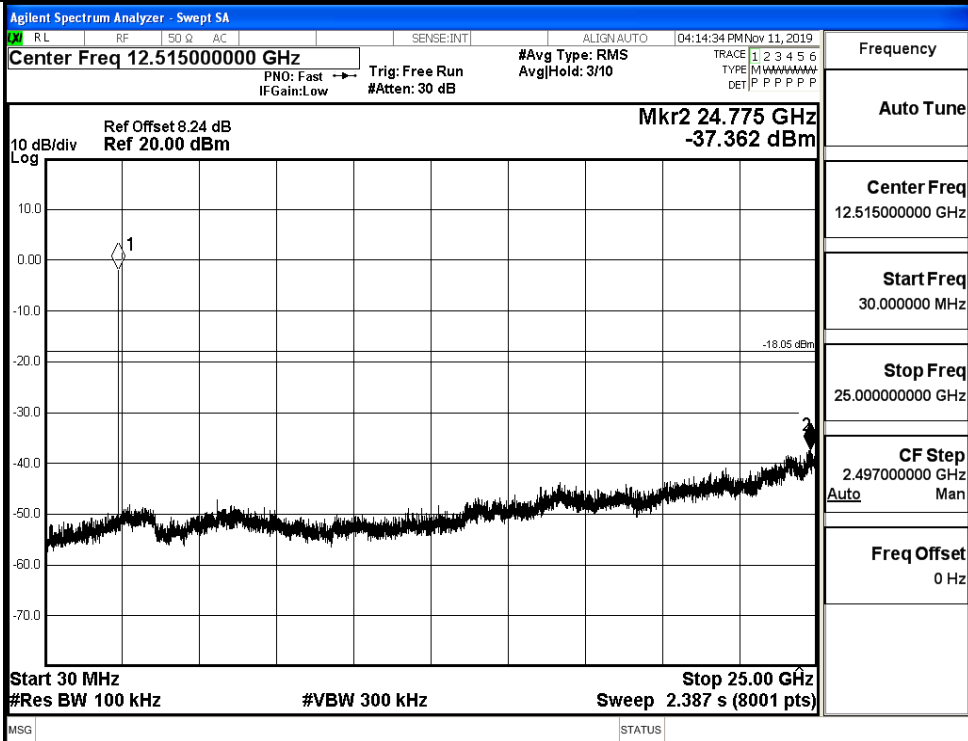


8DPSK_LCH_Graphs

Pref

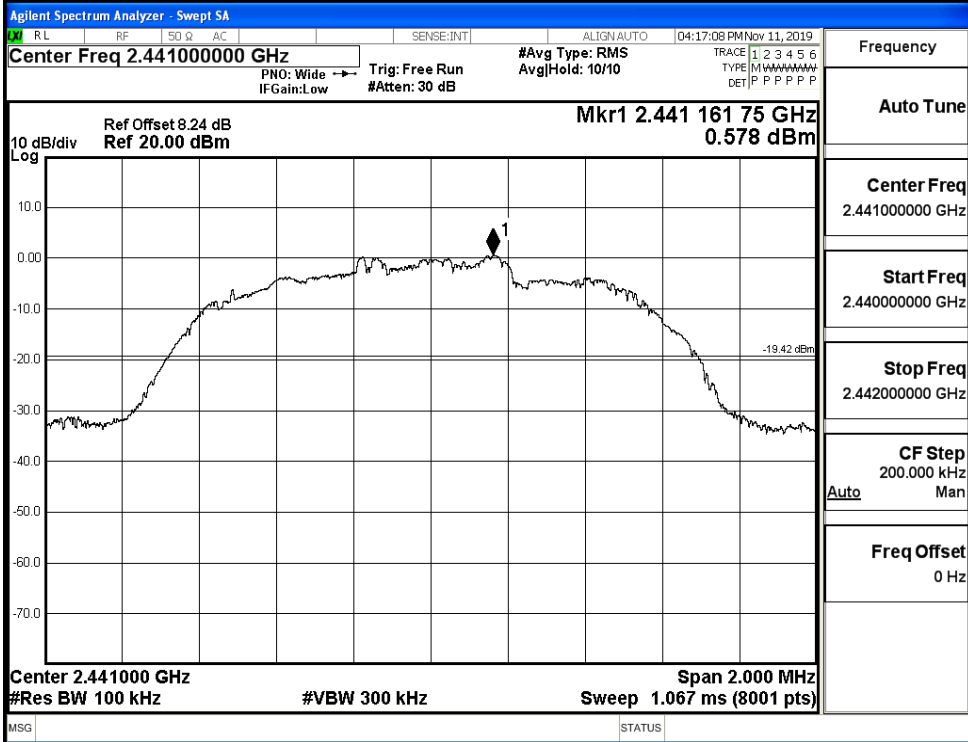


Puw

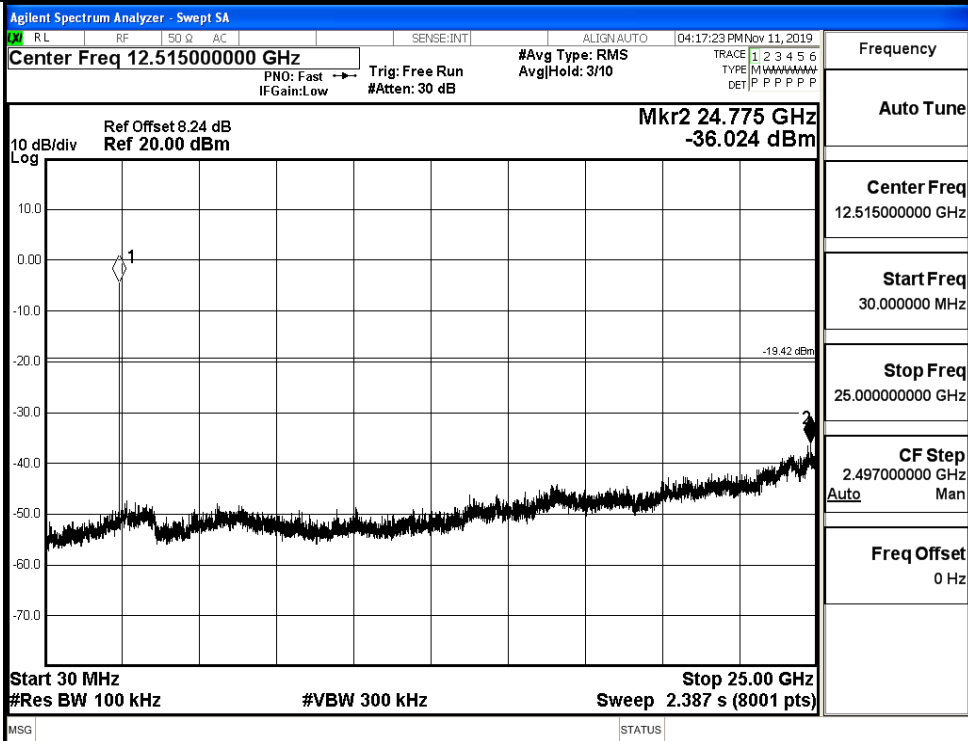


8DPSK_MCH_Graphs

Pref

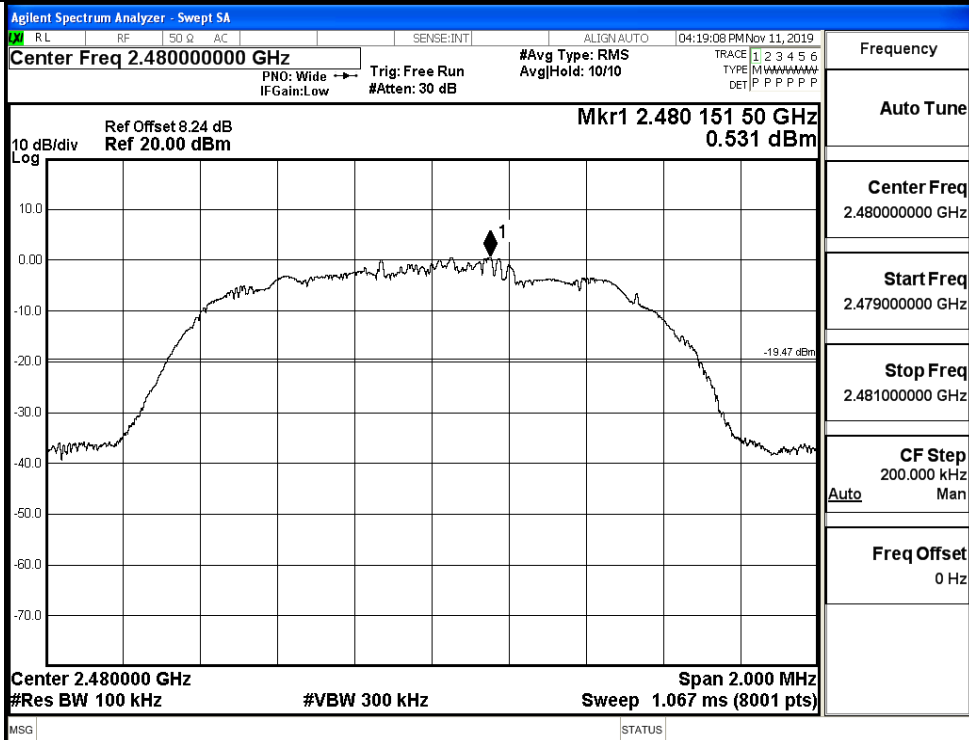


Puw

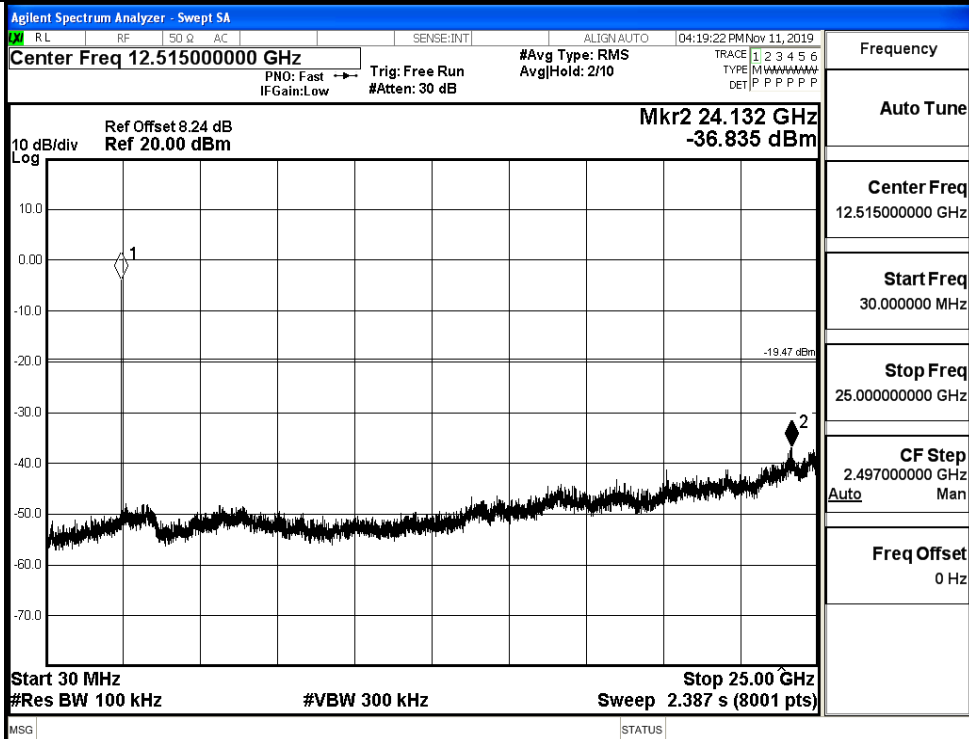


8DPSK_HCH_Graphs

Pref

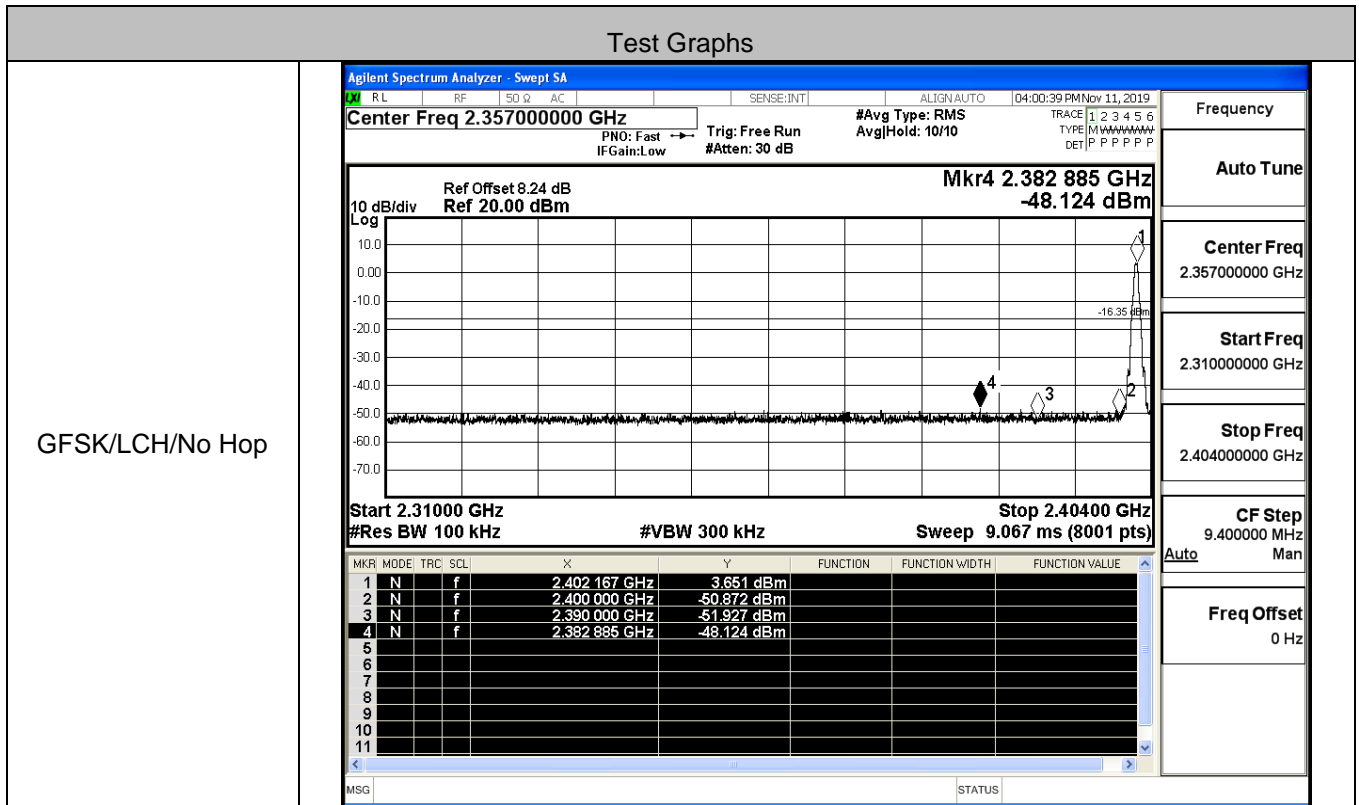


Puw

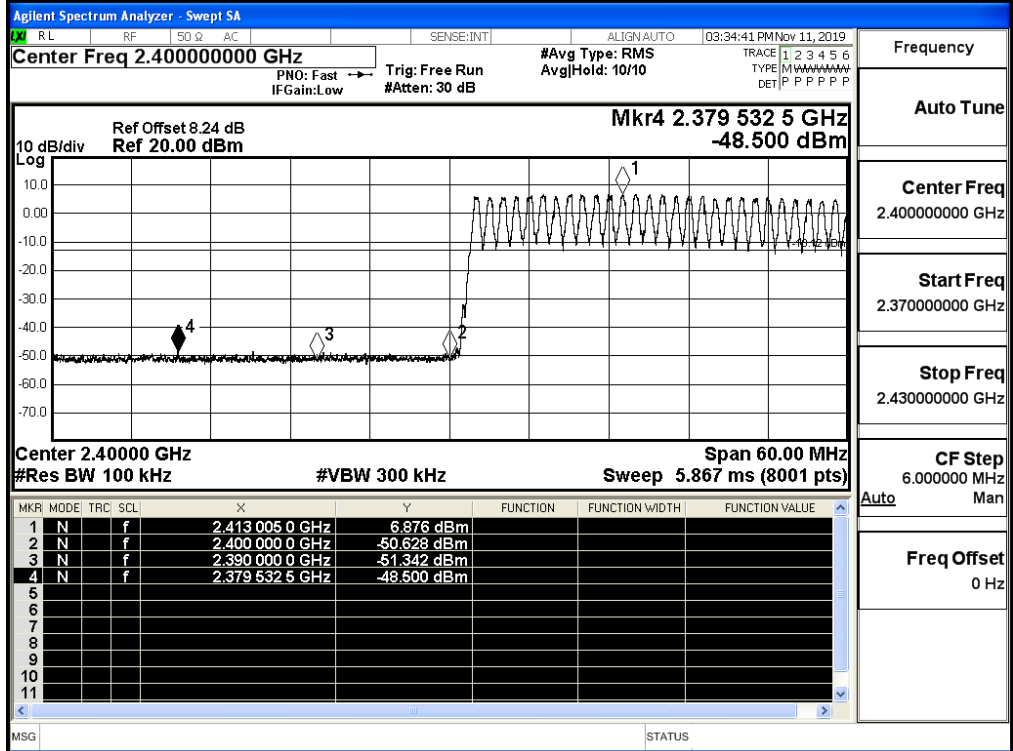


A.7 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	3.651	Off	-48.124	-16.35	PASS
			6.876	On	-48.500	-13.12	PASS
	HCH	2480	2.465	Off	-48.341	-17.54	PASS
			6.544	On	-42.919	-13.46	PASS
π/4DQPSK	LCH	2402	0.390	Off	-48.761	-19.61	PASS
			5.004	On	-48.551	-15	PASS
	HCH	2480	1.234	Off	-48.411	-18.77	PASS
			5.326	On	-47.191	-14.67	PASS
8DPSK	LCH	2402	0.697	Off	-48.947	-19.3	PASS
			5.494	On	-48.262	-14.51	PASS
	HCH	2480	1.023	Off	-48.671	-18.98	PASS
			5.339	On	-47.897	-14.66	PASS

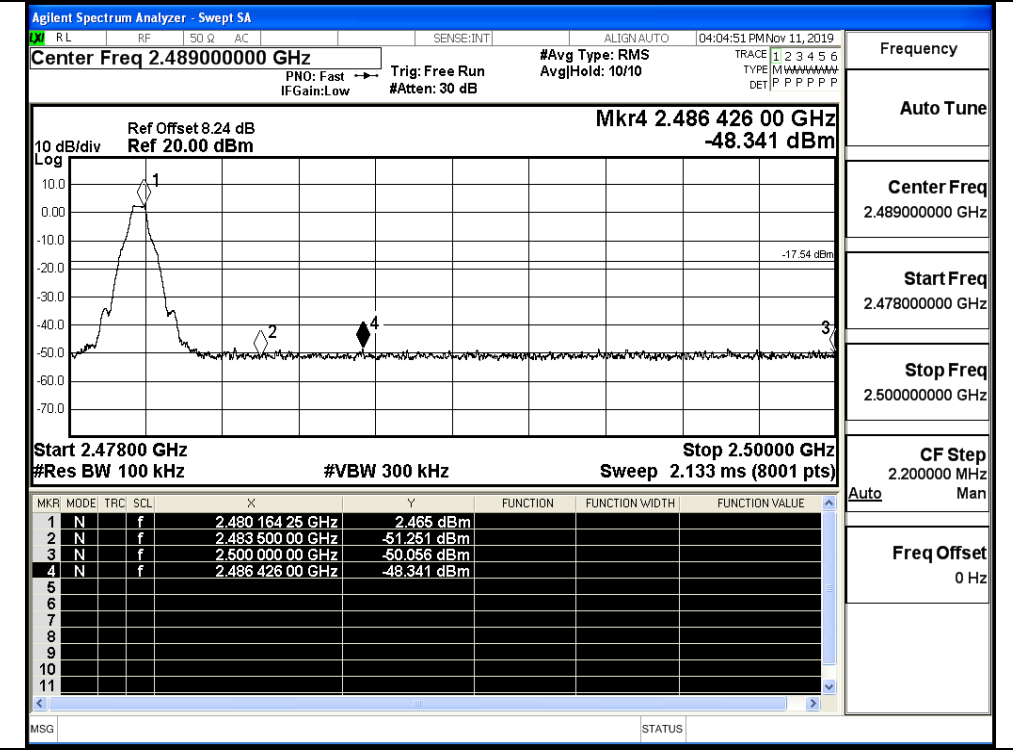


GFSK/LCH/Hop



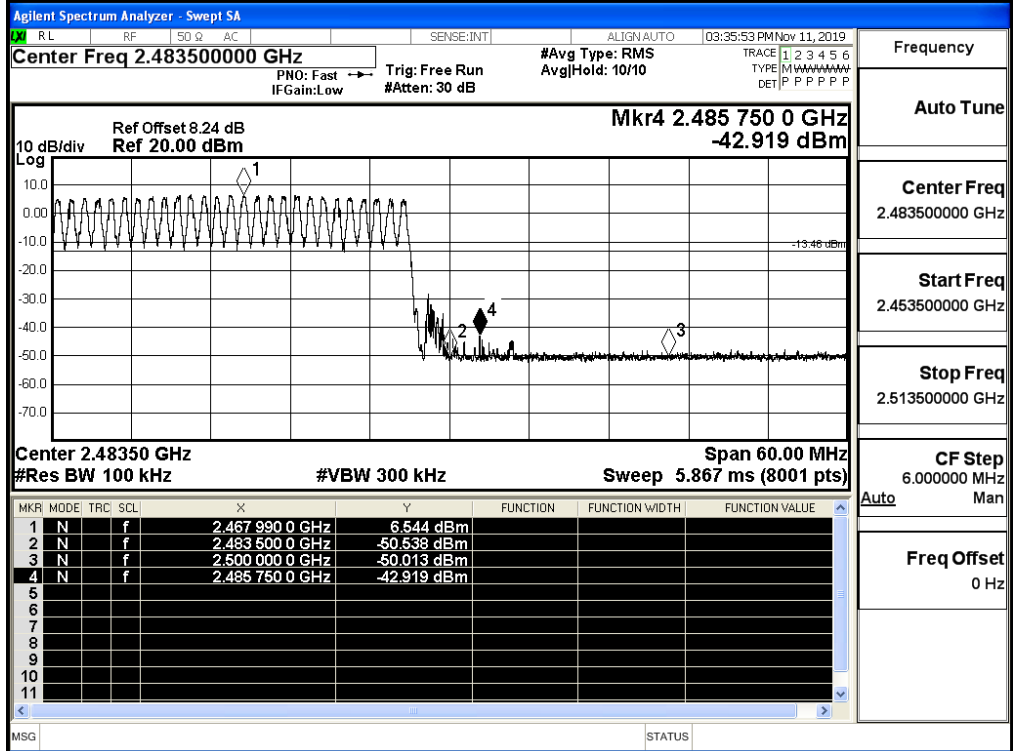
Frequency
Auto Tune
Center Freq 2.40000000 GHz
Start Freq 2.37000000 GHz
Stop Freq 2.43000000 GHz
CF Step 6.000000 MHz
Auto Man
Freq Offset 0 Hz

GFSK/HCH/No Hop



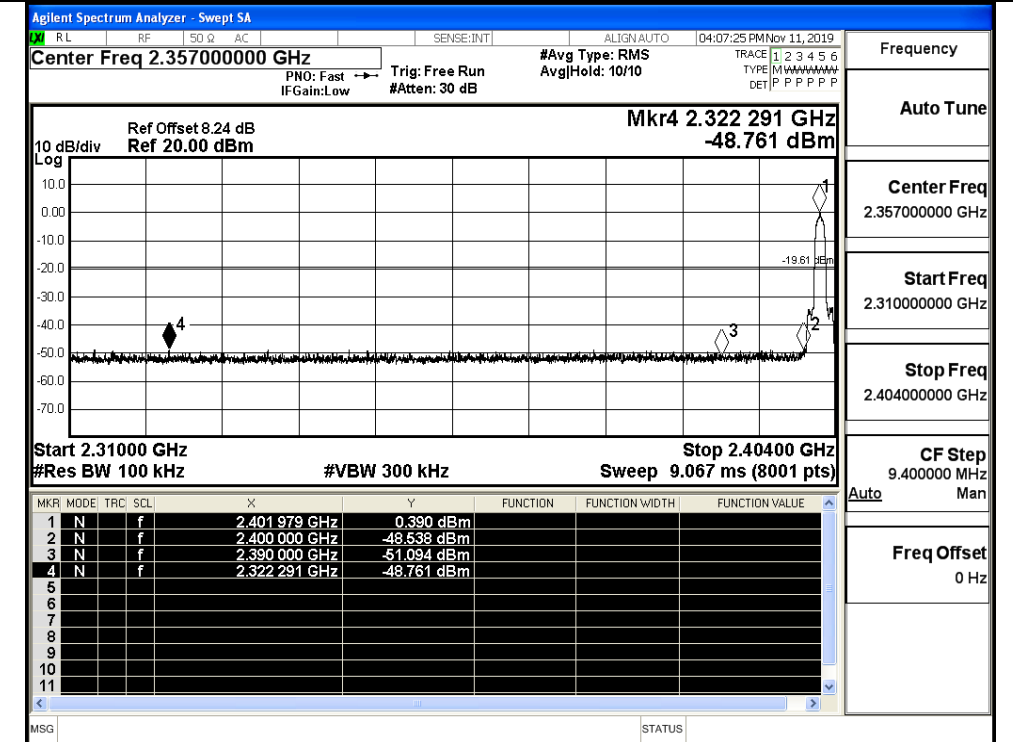
Frequency
Auto Tune
Center Freq 2.48900000 GHz
Start Freq 2.47800000 GHz
Stop Freq 2.50000000 GHz
CF Step 2.200000 MHz
Auto Man
Freq Offset 0 Hz

GFSK/HCH/Hop



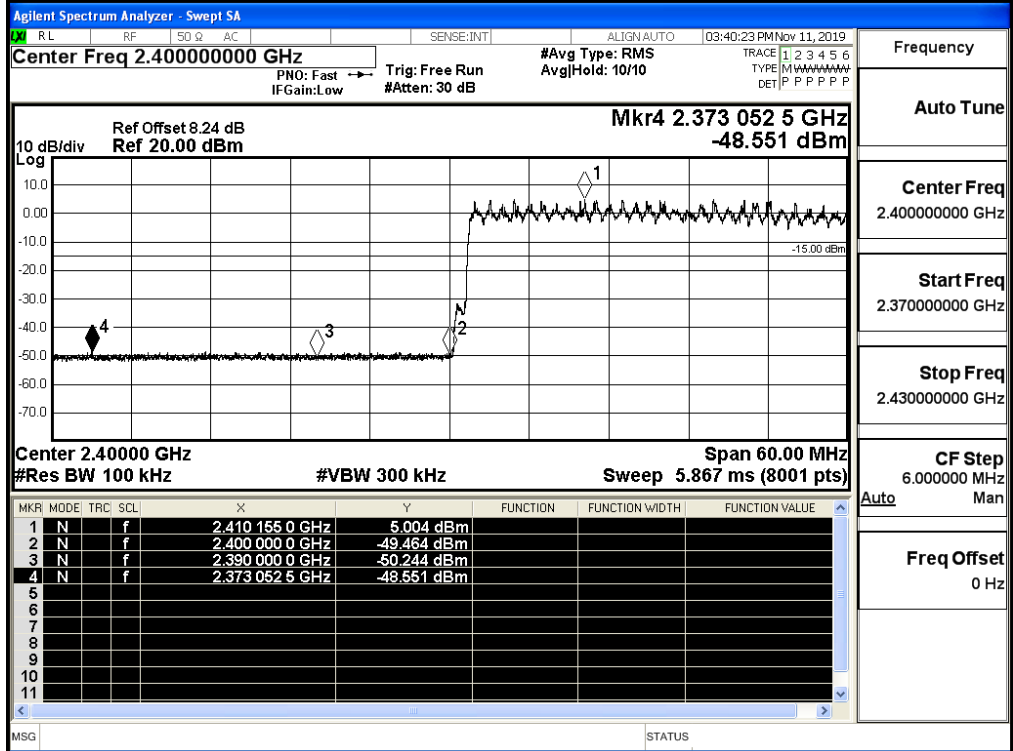
Frequency
Auto Tune
Center Freq 2.483500000 GHz
Start Freq 2.453500000 GHz
Stop Freq 2.513500000 GHz
CF Step 6.000000 MHz Auto Man
Freq Offset 0 Hz

π /4DQPSK/LCH/No Hop

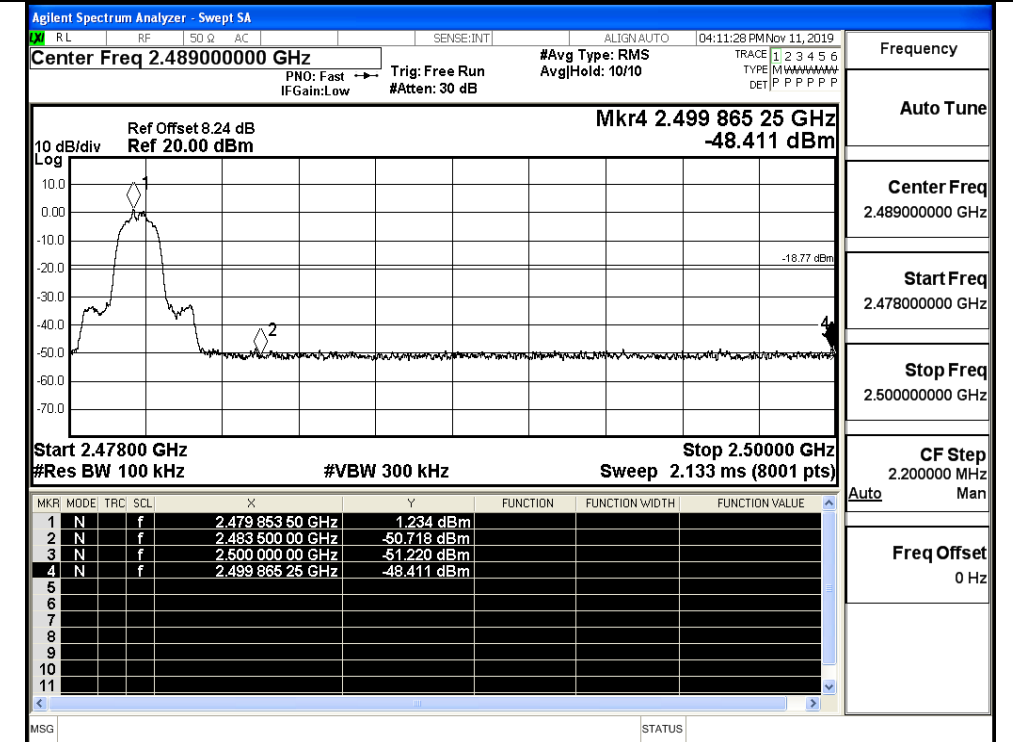


Frequency
Auto Tune
Center Freq 2.357000000 GHz
Start Freq 2.310000000 GHz
Stop Freq 2.404000000 GHz
CF Step 9.400000 MHz Auto Man
Freq Offset 0 Hz

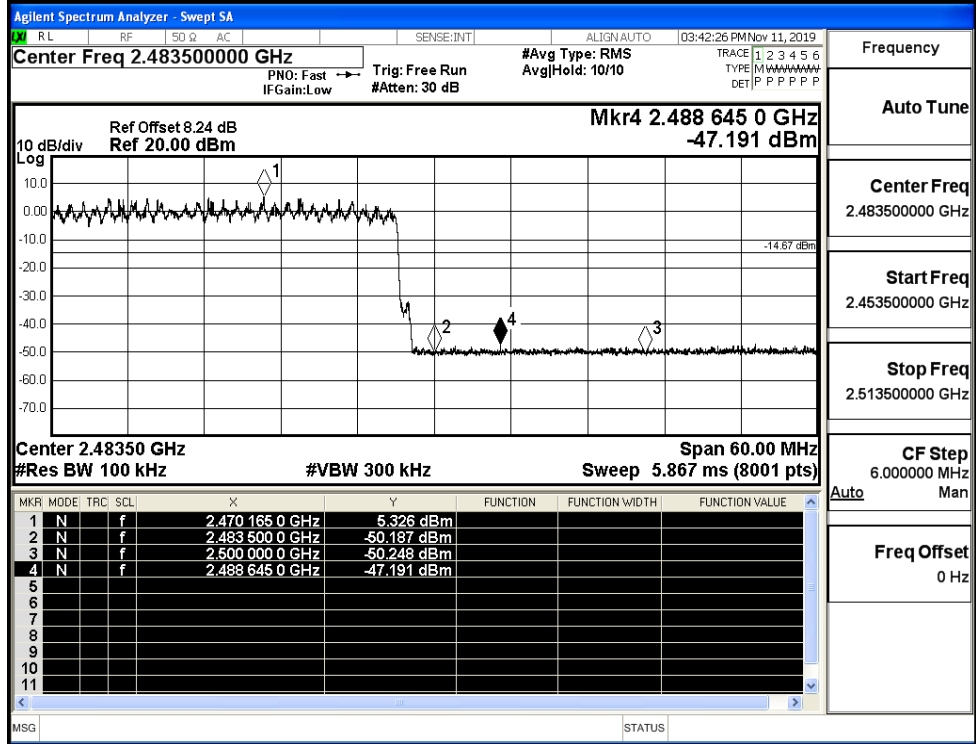
π /4DQPSK/LCH/Hop



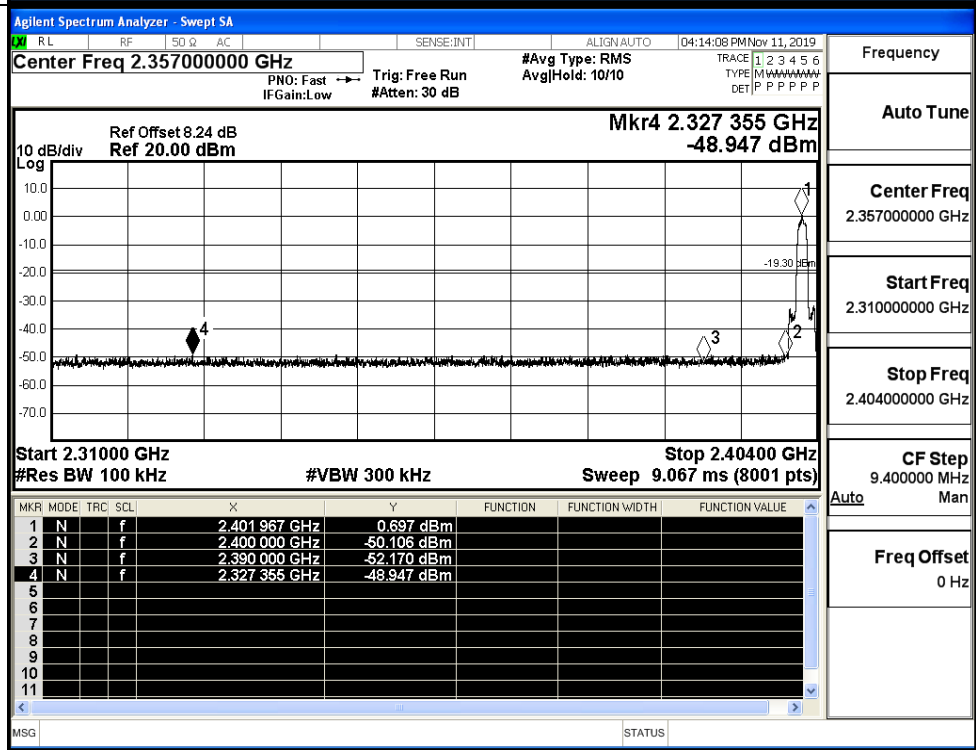
π /4DQPSK/HCH/No Hop



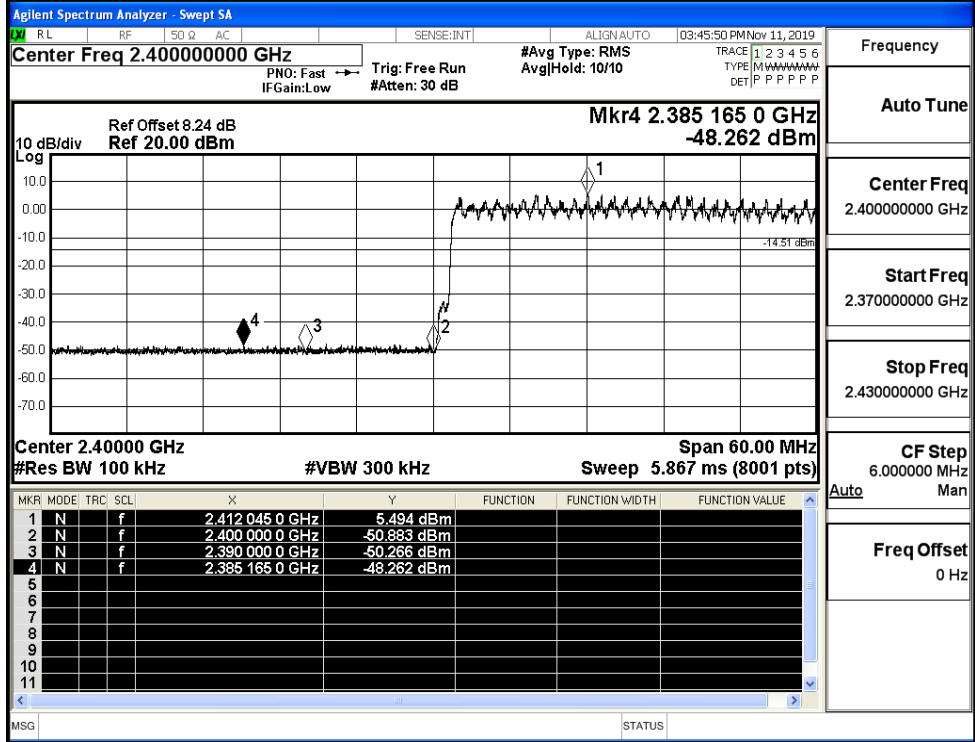
$\pi/4$ DQPSK/HCH/Hop



8DPSK/LCH/No Hop

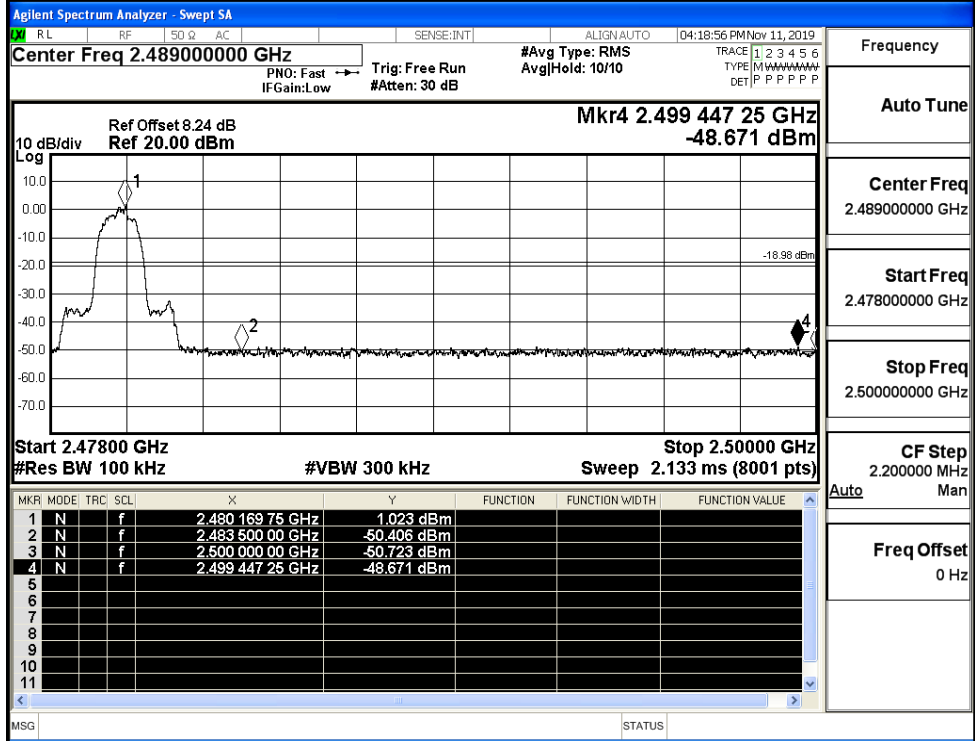


8DPSK/LCH/Hop



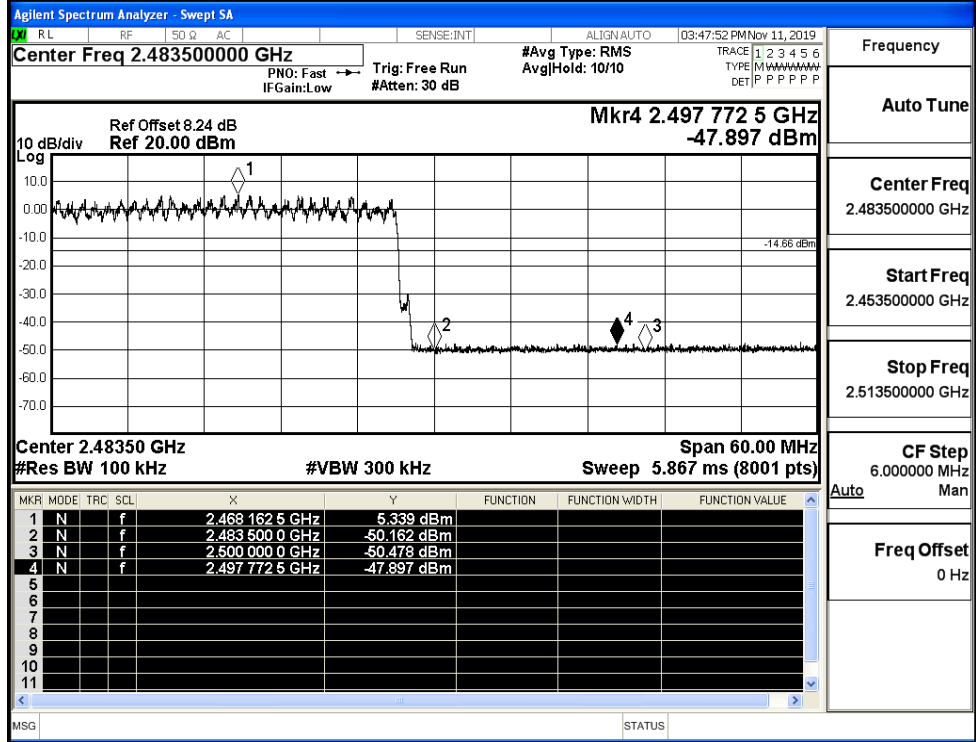
Frequency	
Auto Tune	
Center Freq	2.40000000 GHz
Start Freq	2.370000000 GHz
Stop Freq	2.430000000 GHz
CF Step	6.000000 MHz
Auto	Man
Freq Offset	0 Hz

8DPSK/HCH/No Hop



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

8DPSK/HCH/Hop

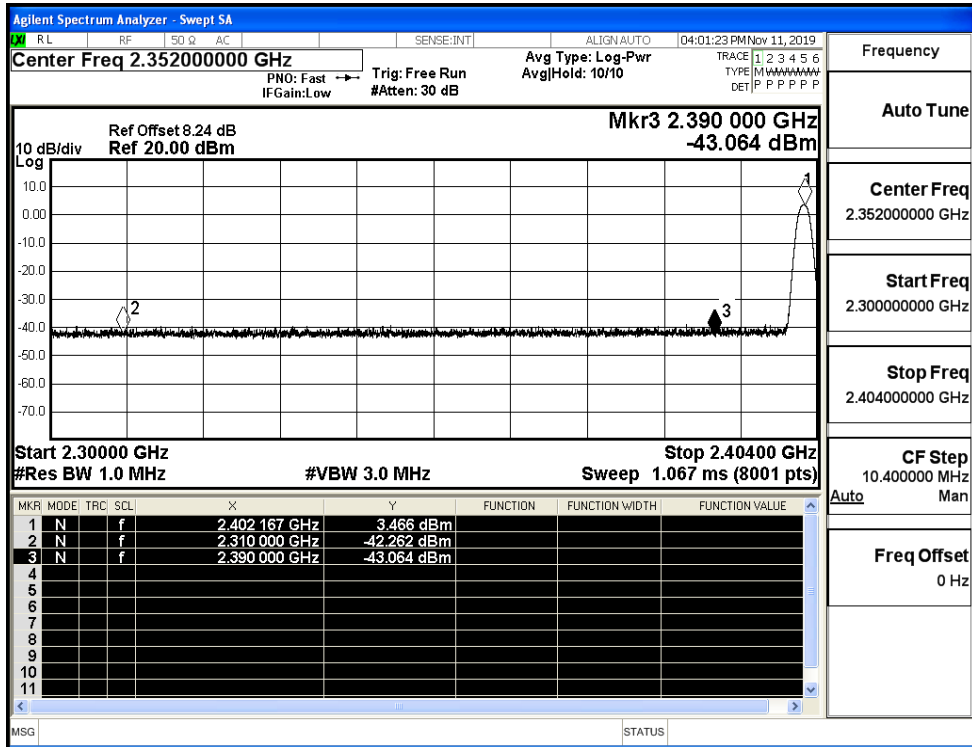


Frequency
Auto Tune
Center Freq 2.483500000 GHz
Start Freq 2.453500000 GHz
Stop Freq 2.513500000 GHz
CF Step 6.000000 MHz
Auto Man
Freq Offset 0 Hz

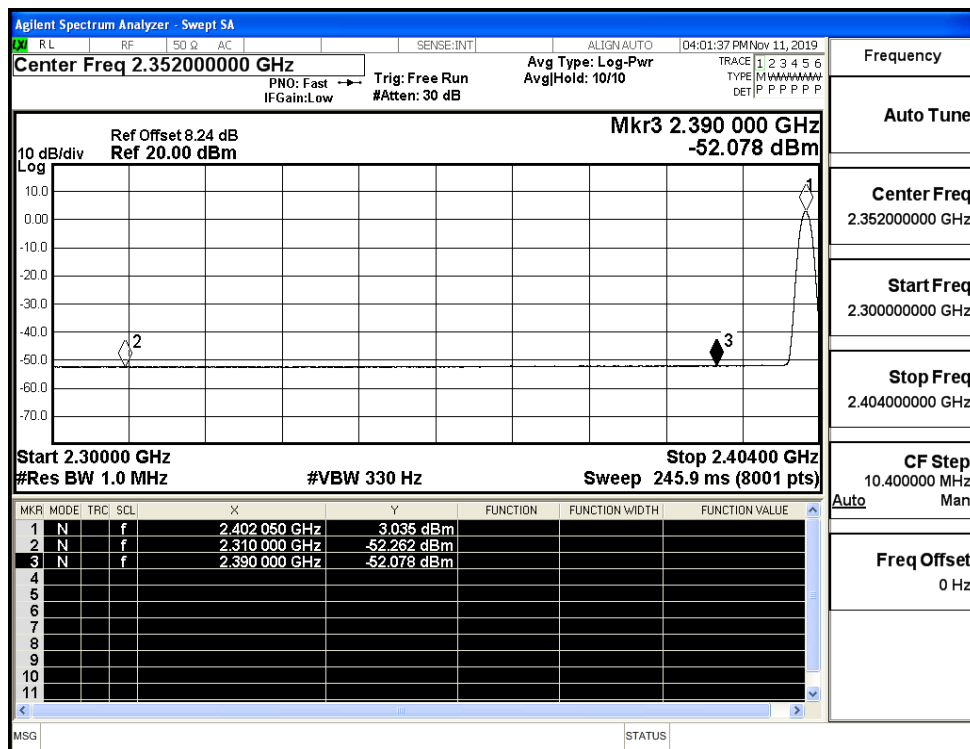
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-42.26	2.0	0	54.97	PEAK	74	PASS
	Off	2310.0	-52.26	2.0	0	44.97	AV	54	PASS
	Off	2390.0	-43.06	2.0	0	54.17	PEAK	74	PASS
	Off	2390.0	-52.08	2.0	0	45.15	AV	54	PASS
	Off	2483.5	-42.22	2.0	0	55.01	PEAK	74	PASS
	Off	2483.5	-51.60	2.0	0	45.63	AV	54	PASS
	Off	2500.0	-41.37	2.0	0	55.86	PEAK	74	PASS
	Off	2500.0	-51.36	2.0	0	45.87	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-41.83	2.0	0	55.40	PEAK	74	PASS
	Off	2310.0	-52.24	2.0	0	44.99	AV	54	PASS
	Off	2390.0	-41.84	2.0	0	55.39	PEAK	74	PASS
	Off	2390.0	-51.94	2.0	0	45.29	AV	54	PASS
	Off	2483.5	-40.71	2.0	0	56.52	PEAK	74	PASS
	Off	2483.5	-51.52	2.0	0	45.71	AV	54	PASS
	Off	2500.0	-41.32	2.0	0	55.91	PEAK	74	PASS
	Off	2500.0	-51.33	2.0	0	45.90	AV	54	PASS
8DPSK	Off	2310.0	-42.92	2.0	0	54.31	PEAK	74	PASS
	Off	2310.0	-52.28	2.0	0	44.95	AV	54	PASS
	Off	2390.0	-41.94	2.0	0	55.29	PEAK	74	PASS
	Off	2390.0	-51.96	2.0	0	45.27	AV	54	PASS
	Off	2483.5	-40.37	2.0	0	56.86	PEAK	74	PASS
	Off	2483.5	-51.50	2.0	0	45.73	AV	54	PASS
	Off	2500.0	-41.86	2.0	0	55.37	PEAK	74	PASS
	Off	2500.0	-51.38	2.0	0	45.85	AV	54	PASS

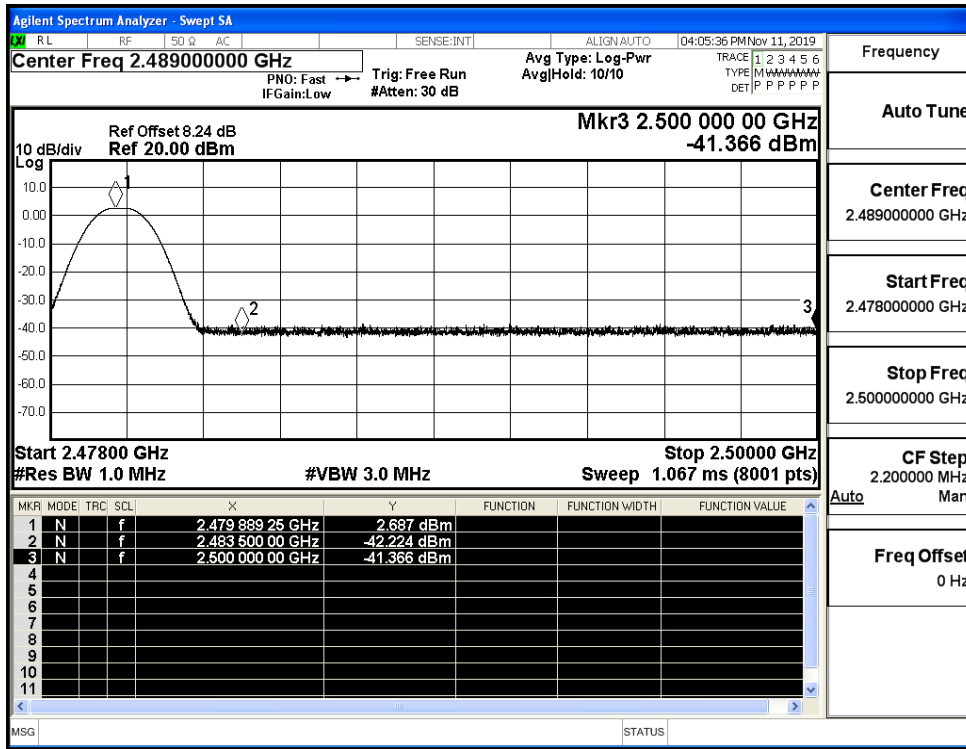
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



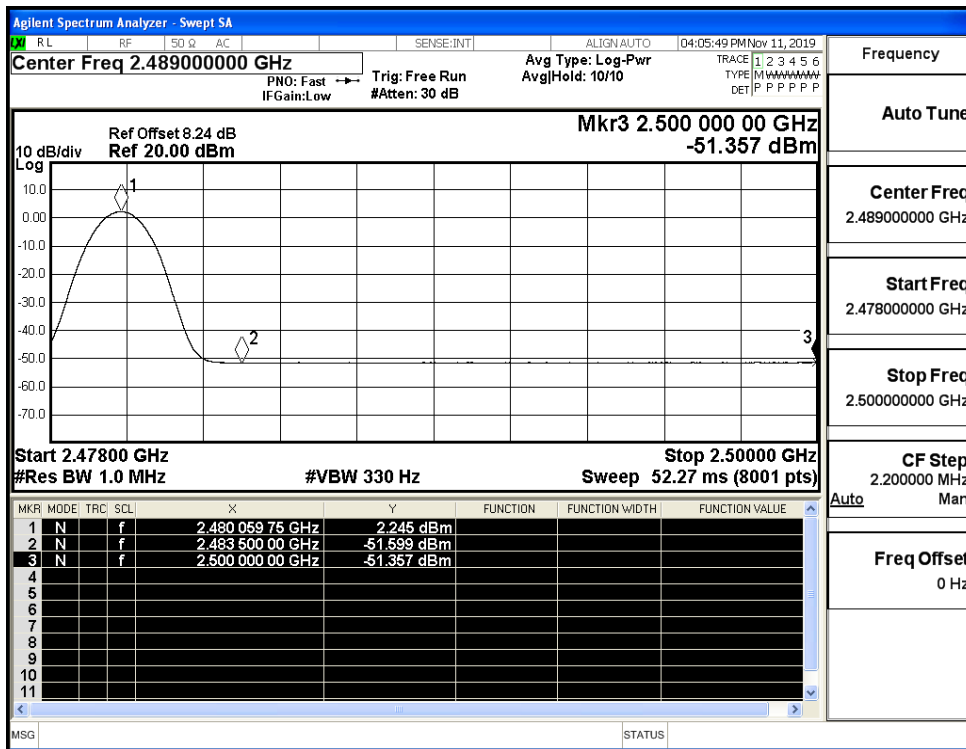
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



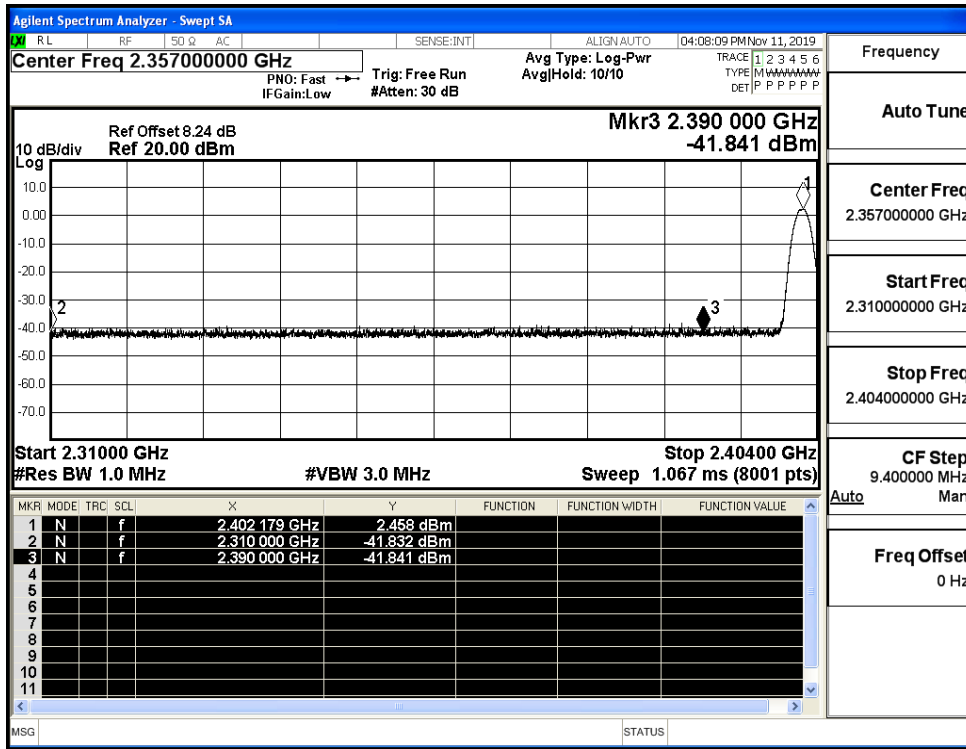
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



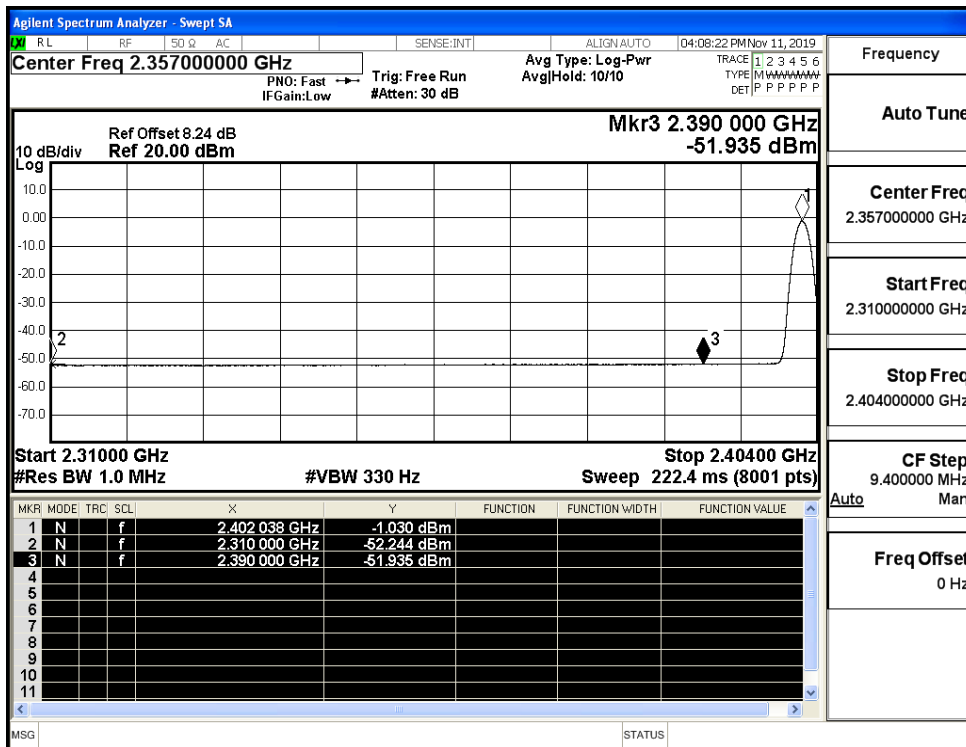
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



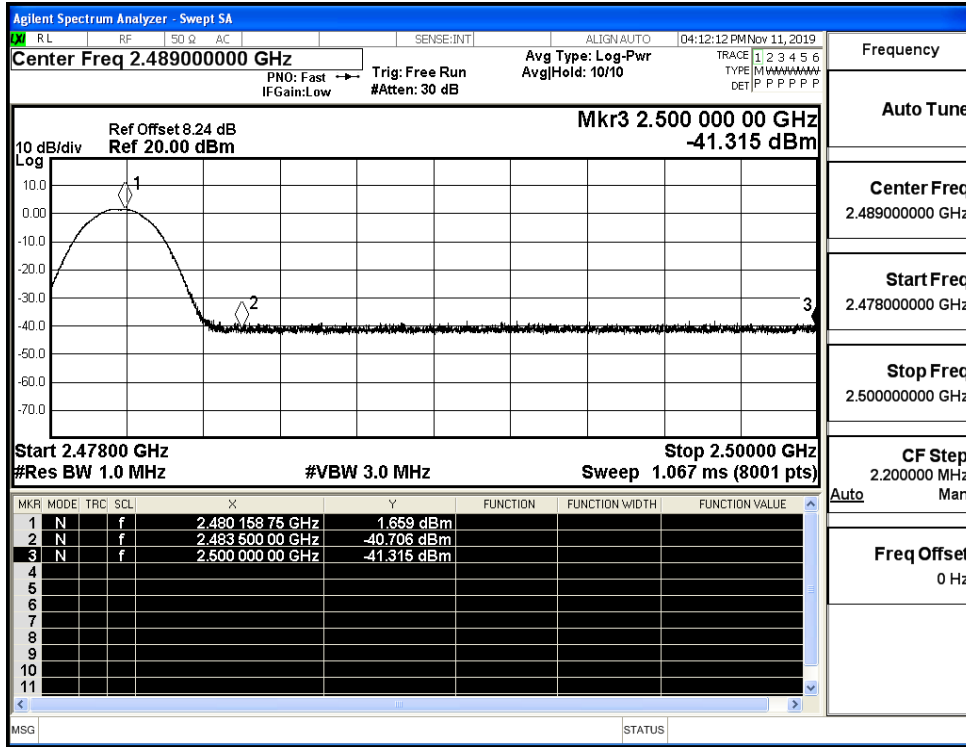
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



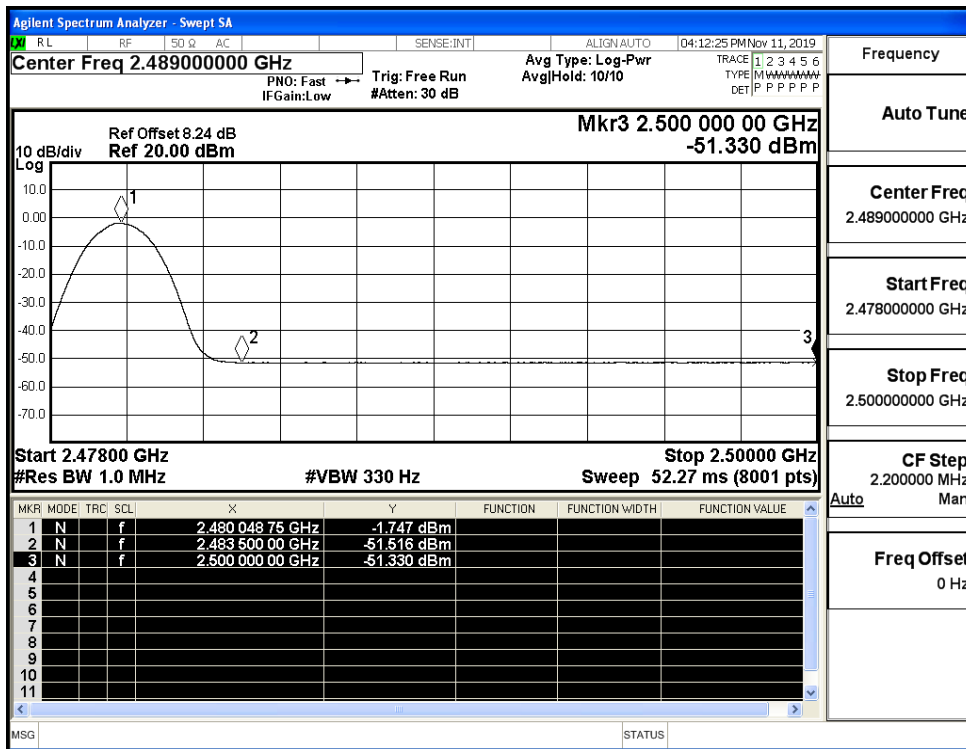
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



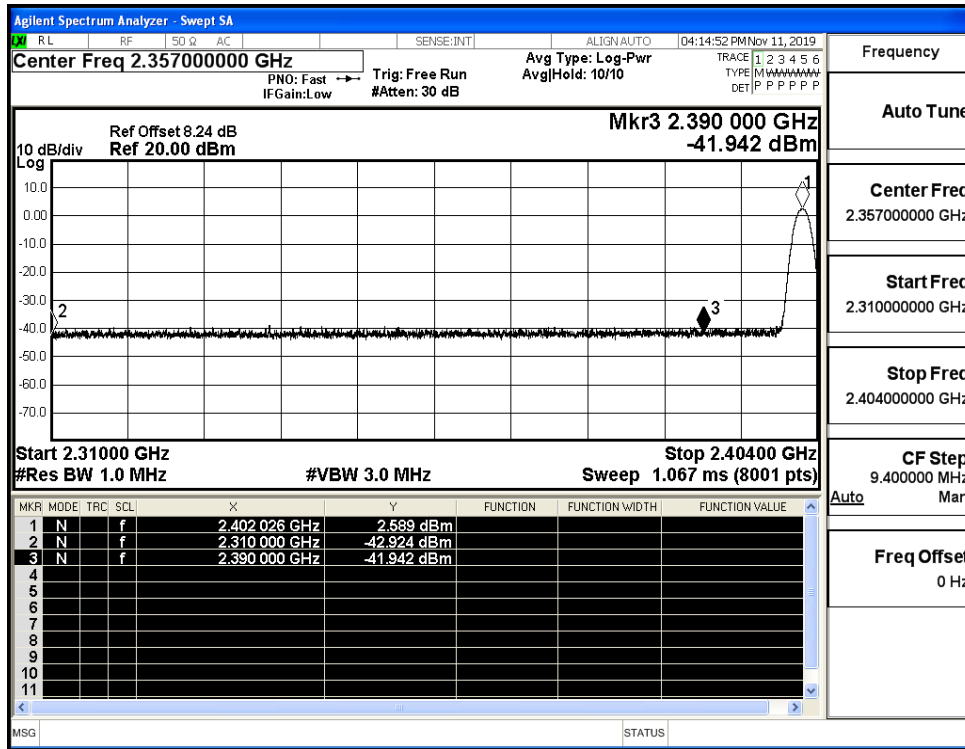
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



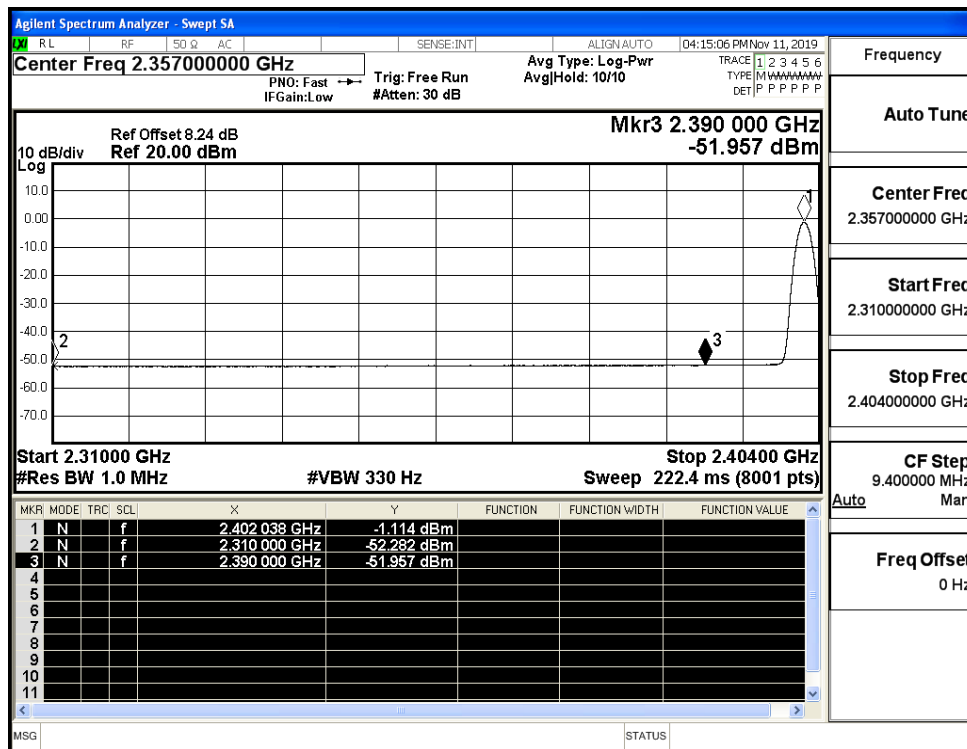
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



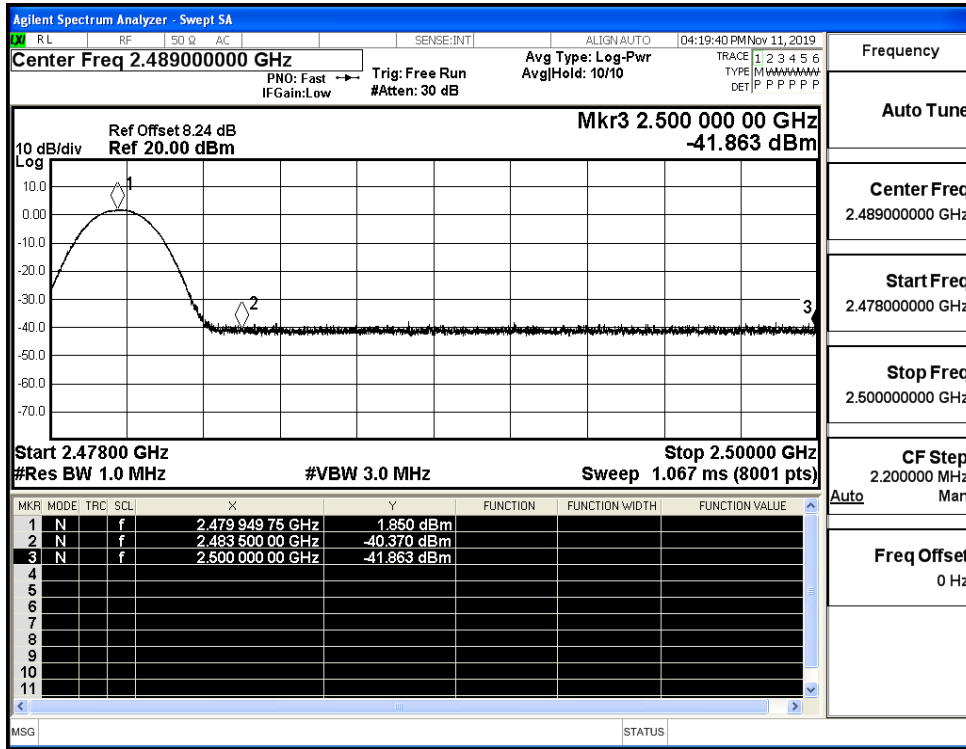
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

