

Appendix A

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

Product Name: Wireless Speaker
Trade Mark: Bud light Tower Speaker
Test Model: TWG3772

Environmental Conditions

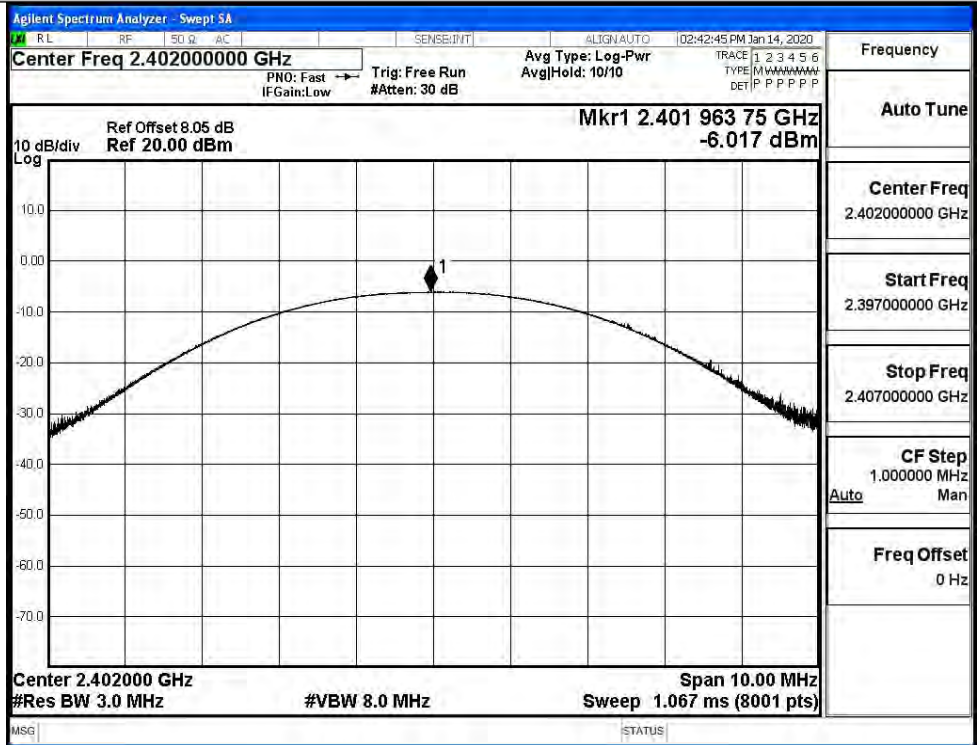
Temperature:	22.9 ° C
Relative Humidity:	54.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Diamond.Lu
Supervised by:	Tom.Liu

A.1 Maxmum Conducted Peak Output Power

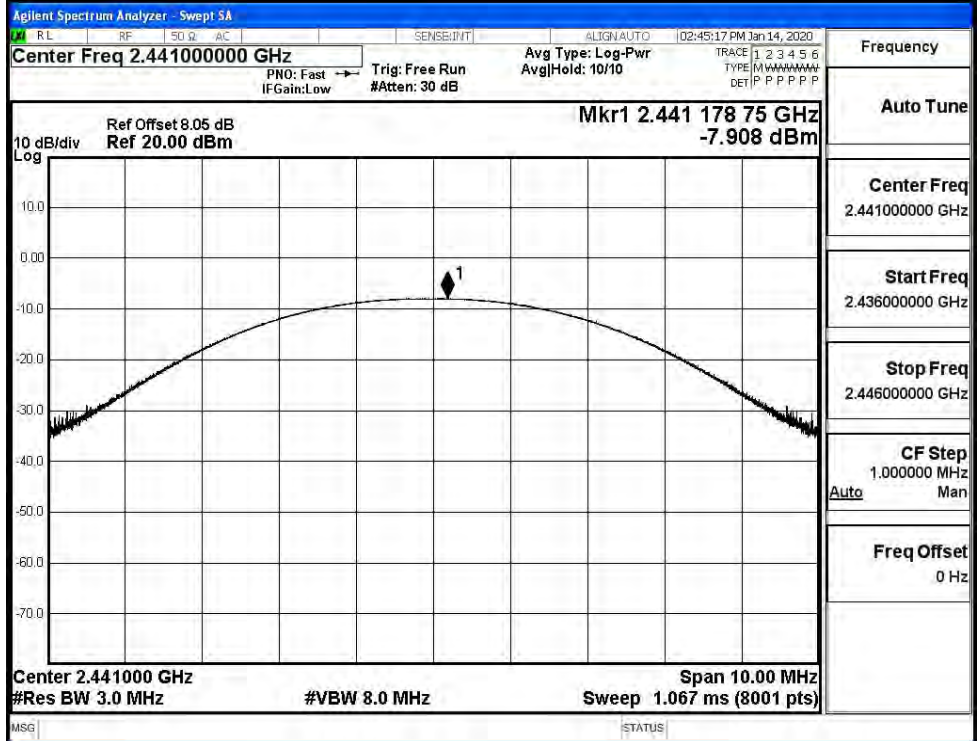
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-6.017	30	PASS
	MCH	-7.908	30	PASS
	HCH	-5.486	30	PASS
$\pi/4$ DQPSK	LCH	-6.829	21	PASS
	MCH	-8.603	21	PASS
	HCH	-6.101	21	PASS
8DPSK	LCH	-6.612	21	PASS
	MCH	-8.347	21	PASS
	HCH	-5.963	21	PASS

Test Graphs

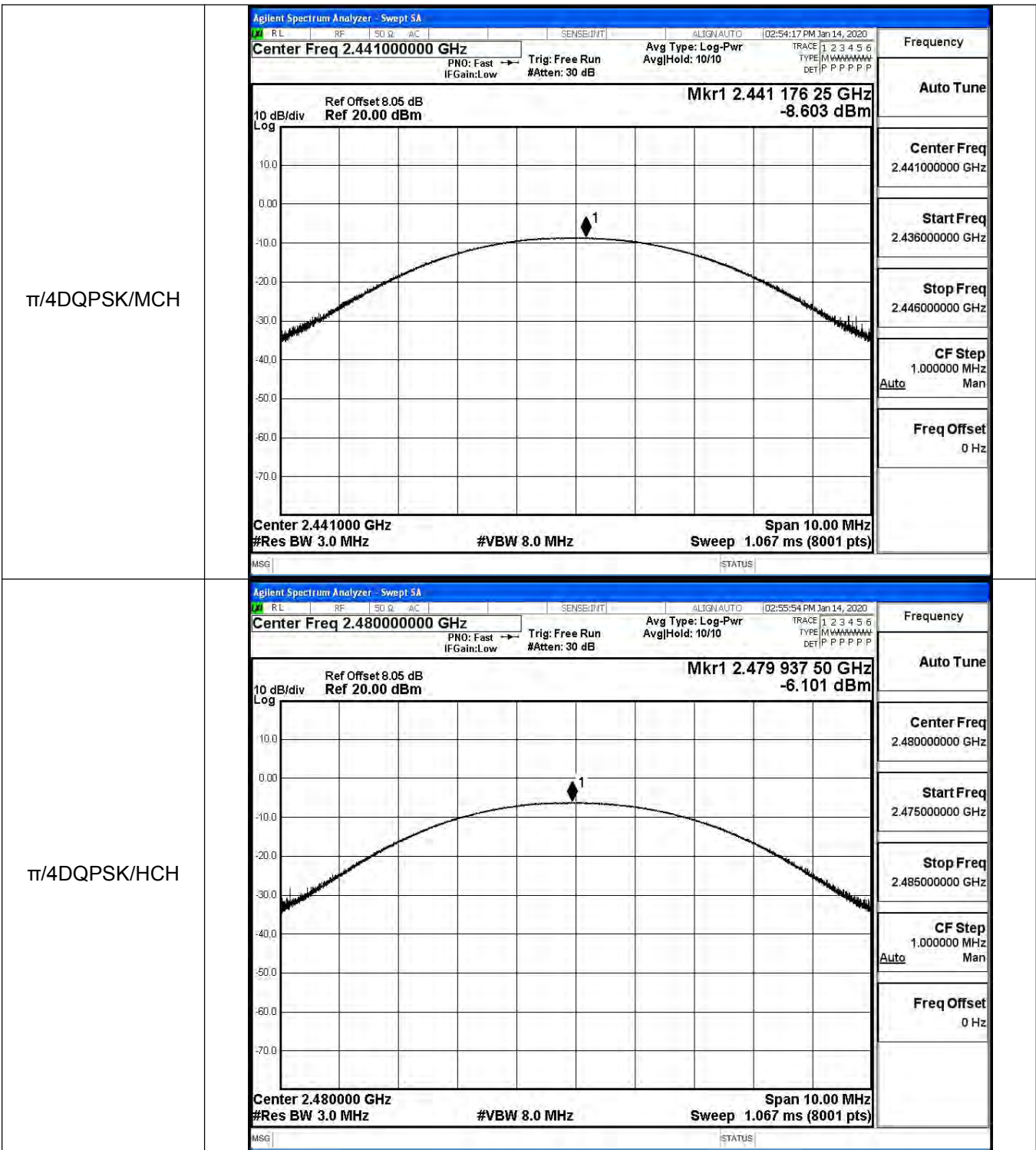
GFSK/LCH



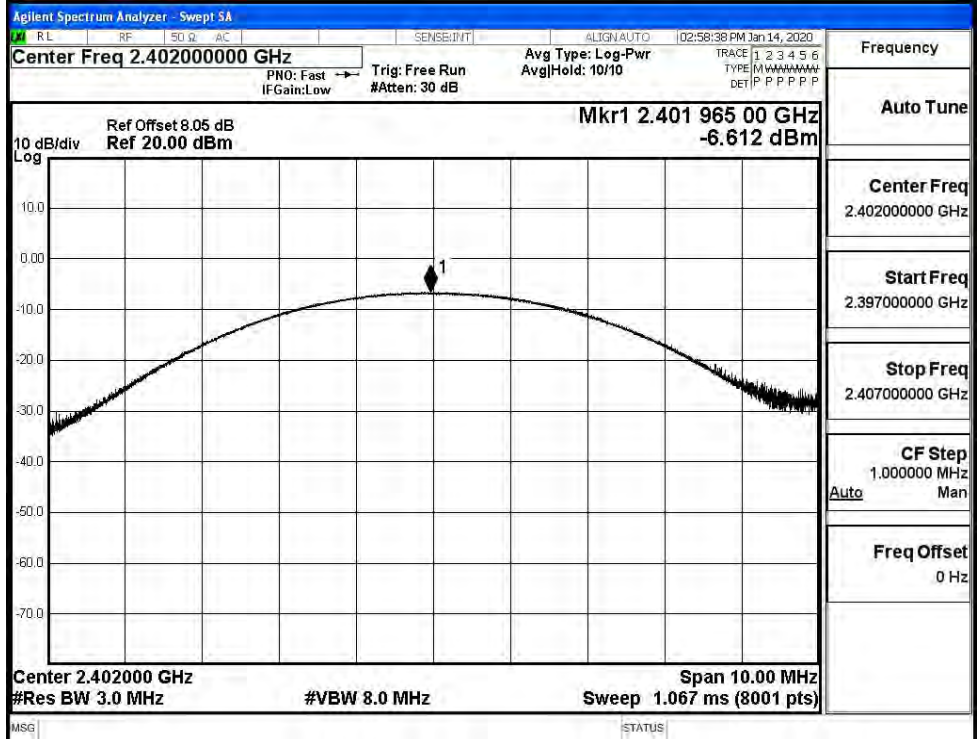
GFSK/MCH



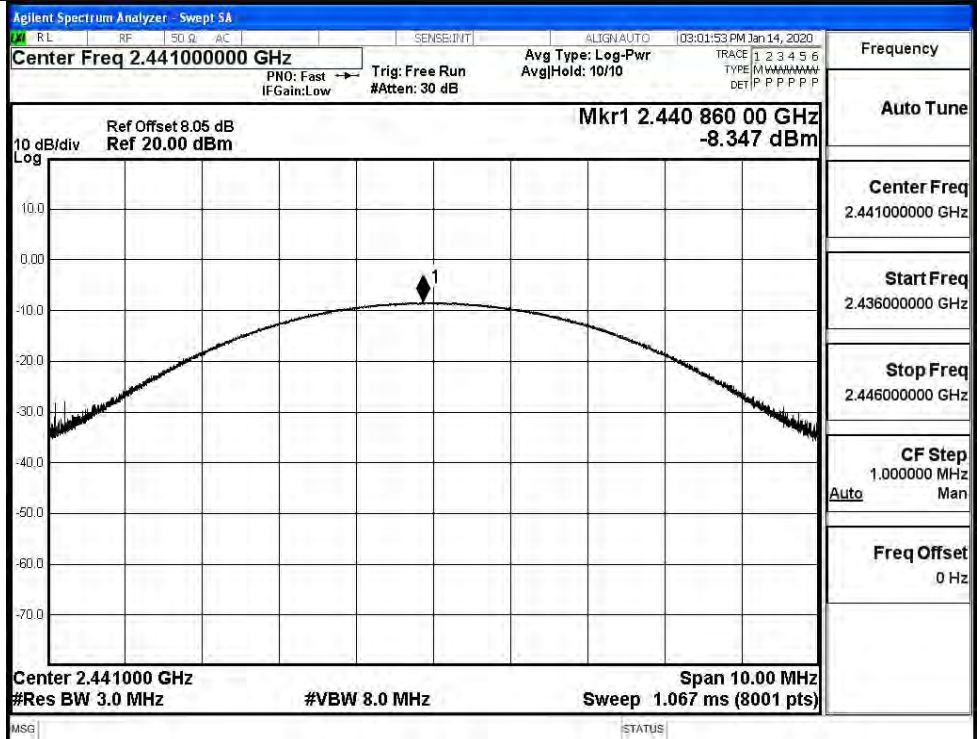
<p>GFSK/HCH</p>	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.48000000 GHz</p> <p>Ref Offset 8.05 dB Ref 20.00 dBm</p> <p>Mkr1 2.479 731 25 GHz -5.486 dBm</p> <p>10 dB/div Log</p> <p>Center 2.480000 GHz #Res BW 3.0 MHz</p> <p>#VBW 8.0 MHz</p> <p>Span 10.00 MHz Sweep 1.067 ms (8001 pts)</p>	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.48000000 GHz</p> <p>Start Freq 2.475000000 GHz</p> <p>Stop Freq 2.485000000 GHz</p> <p>CF Step 1.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>$\pi/4$DQPSK/LCH</p>	<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.40200000 GHz</p> <p>Ref Offset 8.05 dB Ref 20.00 dBm</p> <p>Mkr1 2.402 006 25 GHz -6.829 dBm</p> <p>10 dB/div Log</p> <p>Center 2.402000 GHz #Res BW 3.0 MHz</p> <p>#VBW 8.0 MHz</p> <p>Span 10.00 MHz Sweep 1.067 ms (8001 pts)</p>	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.402000000 GHz</p> <p>Start Freq 2.397000000 GHz</p> <p>Stop Freq 2.407000000 GHz</p> <p>CF Step 1.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>



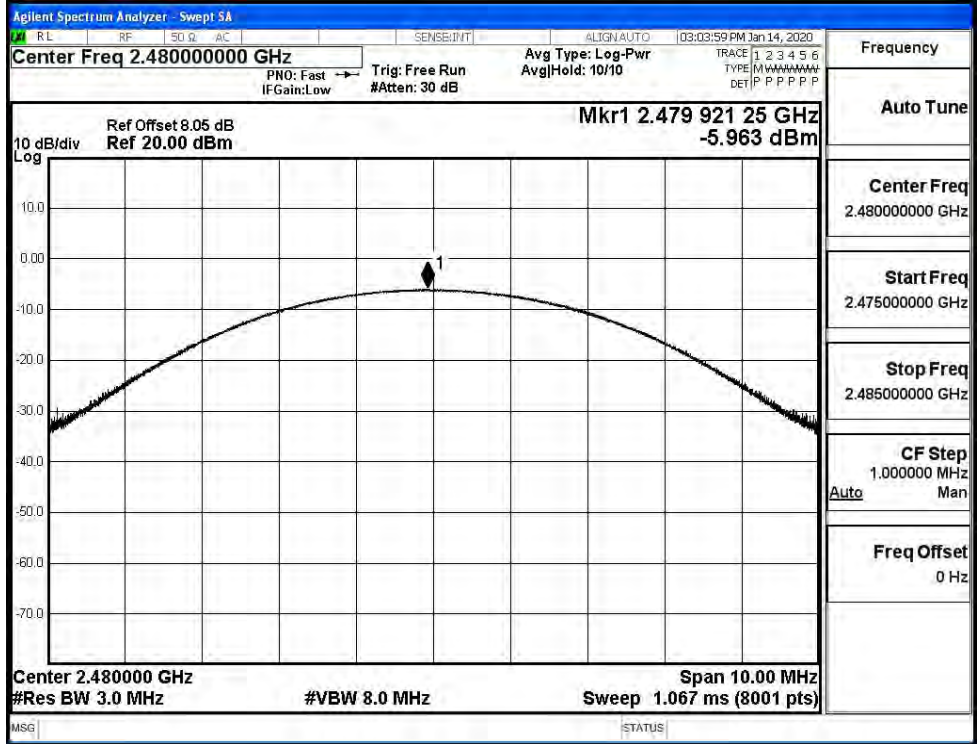
8DPSK/LCH



8DPSK/MCH

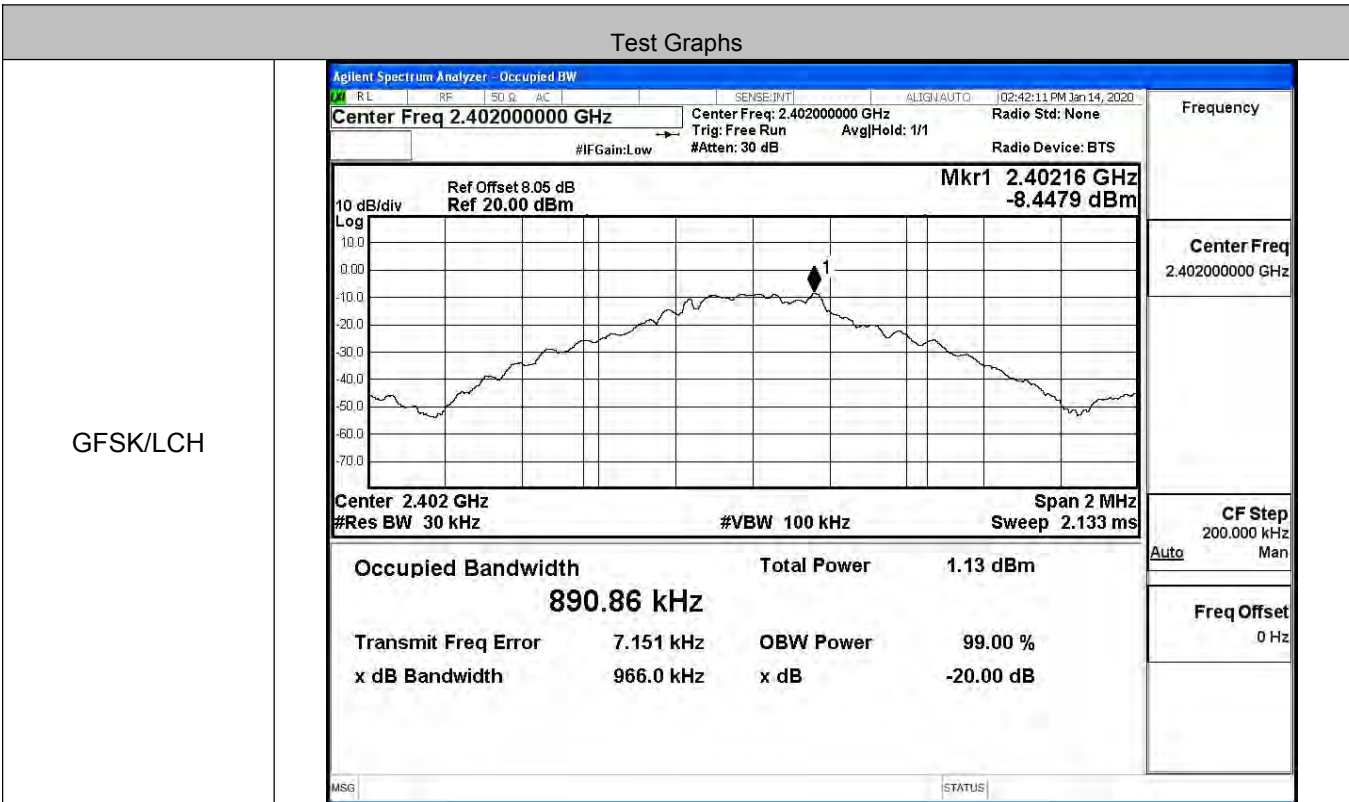


8DPSK/HCH

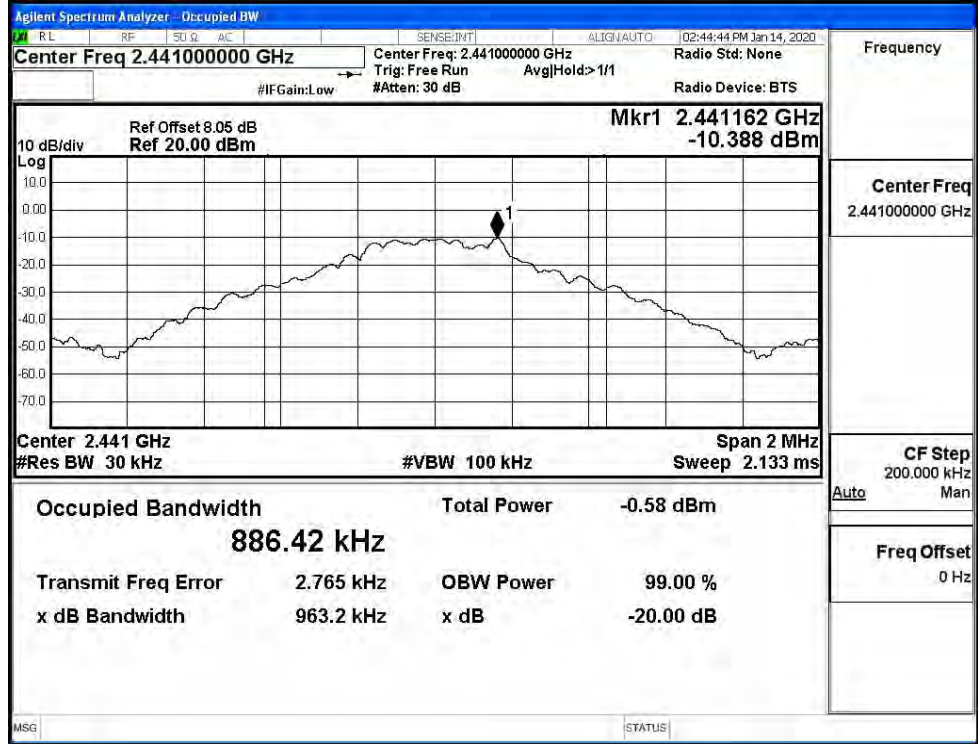


A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9660	Not Specified	PASS
	MCH	0.9632	Not Specified	PASS
	HCH	1.032	Not Specified	PASS
π/4DQPSK	LCH	1.293	Not Specified	PASS
	MCH	1.315	Not Specified	PASS
	HCH	1.310	Not Specified	PASS
8DPSK	LCH	1.293	Not Specified	PASS
	MCH	1.300	Not Specified	PASS
	HCH	1.296	Not Specified	PASS

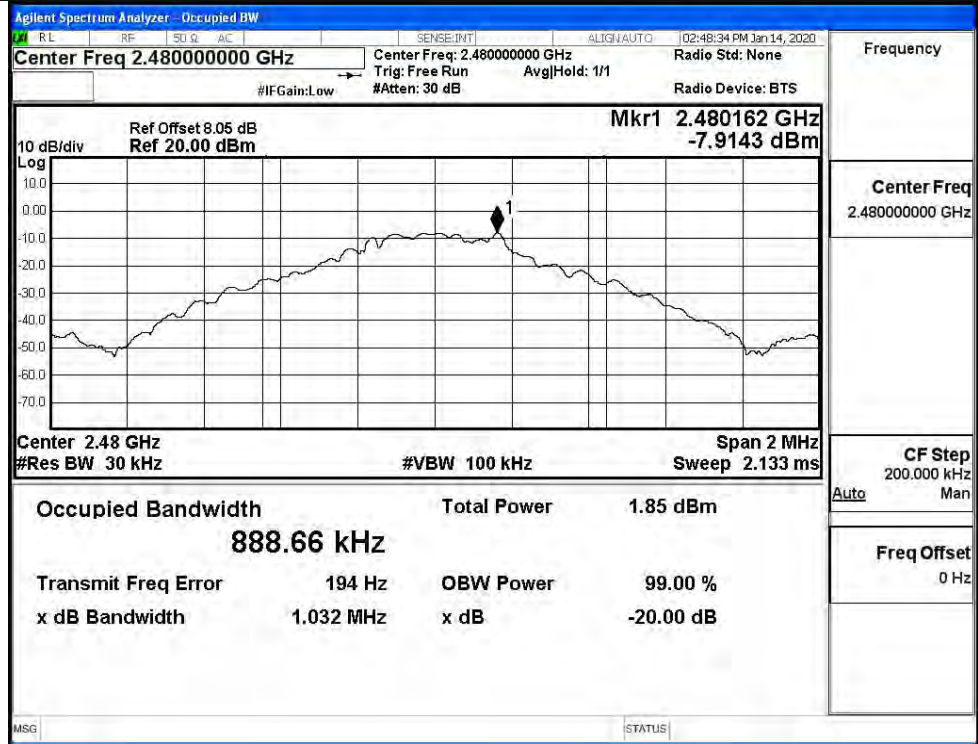


GFSK/MCH



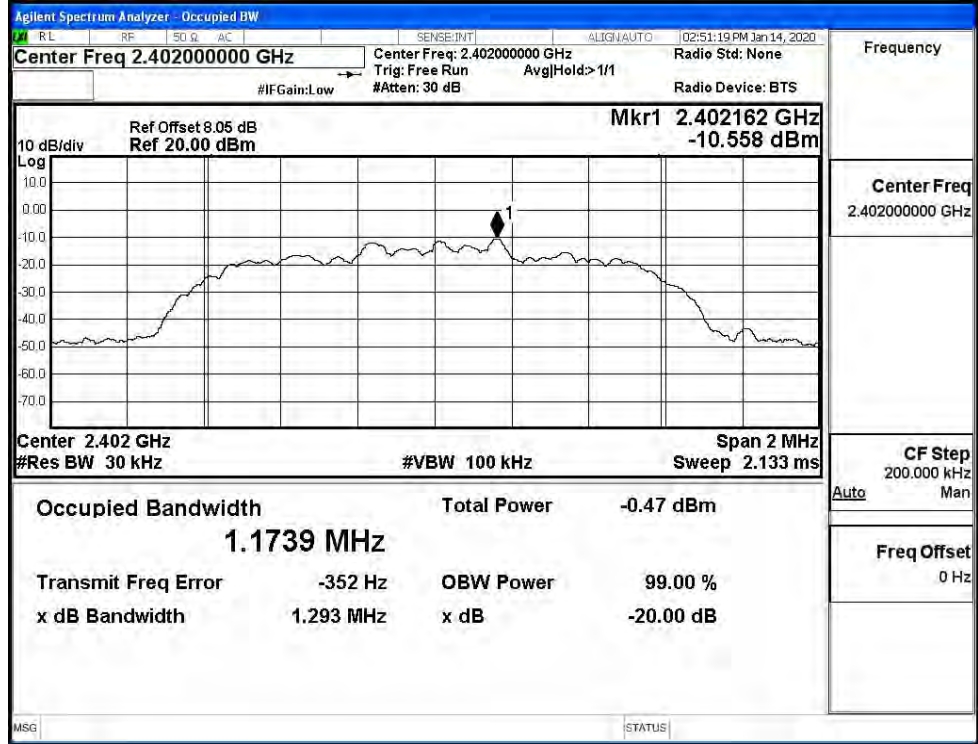
Frequency	2.44100000 GHz
Center Freq	2.44100000 GHz
CF Step	200.000 kHz
Auto Man	
Freq Offset	0 Hz

GFSK/HCH



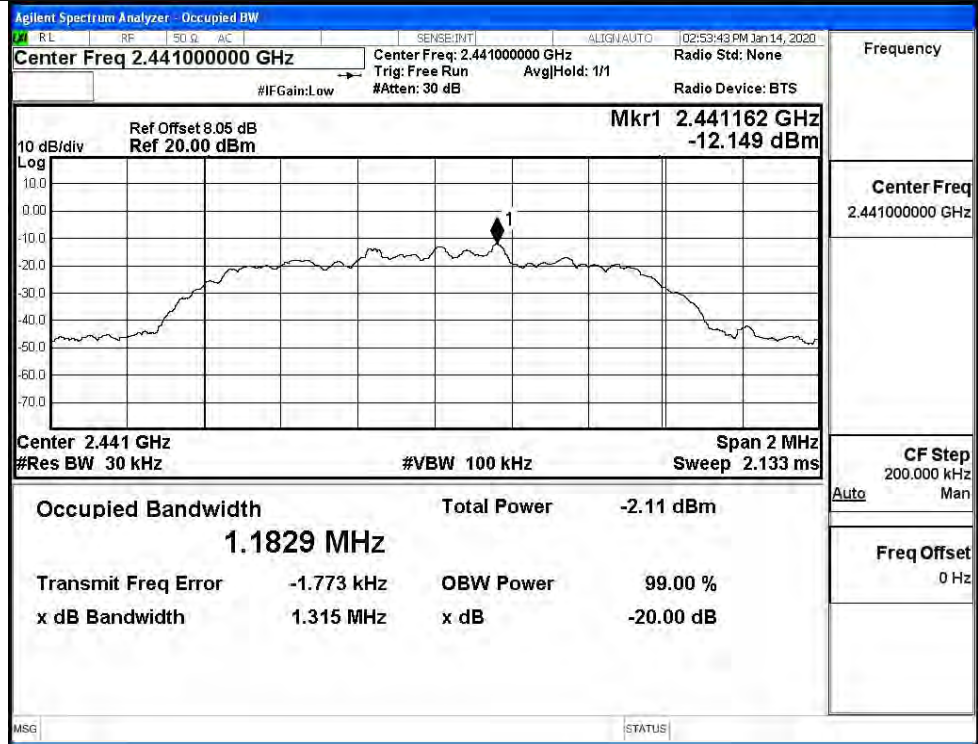
Frequency	2.48000000 GHz
Center Freq	2.48000000 GHz
CF Step	200.000 kHz
Auto Man	
Freq Offset	0 Hz

π /4DQPSK/LCH



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

π /4DQPSK/MCH



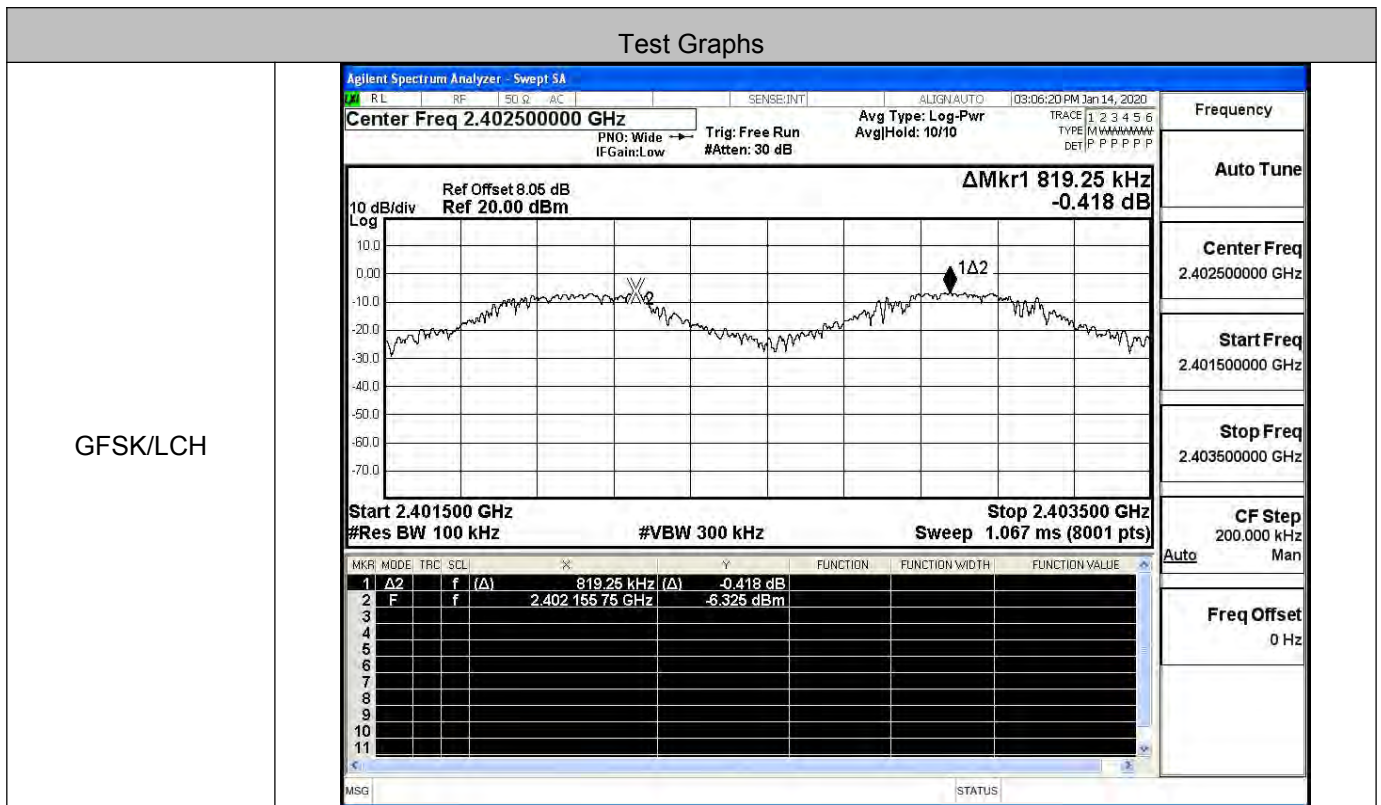
Frequency	
Center Freq	2.44100000 GHz
CF Step	200.000 kHz
Auto	Man
Freq Offset	0 Hz

<p>π/4DQPSK/HCH</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.48000000 GHz Center Freq: 2.48000000 GHz Radio Std: None</p> <p>Mkr1 2.480164 GHz -9.9380 dBm</p> <p>10 dB/div Ref Offset 8.05 dB Ref 20.00 dBm</p> <p>Center 2.48 GHz Span 2 MHz</p> <p>Occupied Bandwidth 1.1759 MHz Total Power 0.14 dBm</p> <p>Transmit Freq Error -2.897 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 1.310 MHz x dB -20.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.48000000 GHz</p> <p>CF Step 200.000 kHz</p> <p>Freq Offset 0 Hz</p>
<p>8DPSK/LCH</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.40200000 GHz Center Freq: 2.40200000 GHz Radio Std: None</p> <p>Mkr1 2.402158 GHz -9.6428 dBm</p> <p>10 dB/div Ref Offset 8.05 dB Ref 20.00 dBm</p> <p>Center 2.402 GHz Span 2 MHz</p> <p>Occupied Bandwidth 1.1819 MHz Total Power -0.45 dBm</p> <p>Transmit Freq Error 2.784 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 1.293 MHz x dB -20.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.40200000 GHz</p> <p>CF Step 200.000 kHz</p> <p>Freq Offset 0 Hz</p>

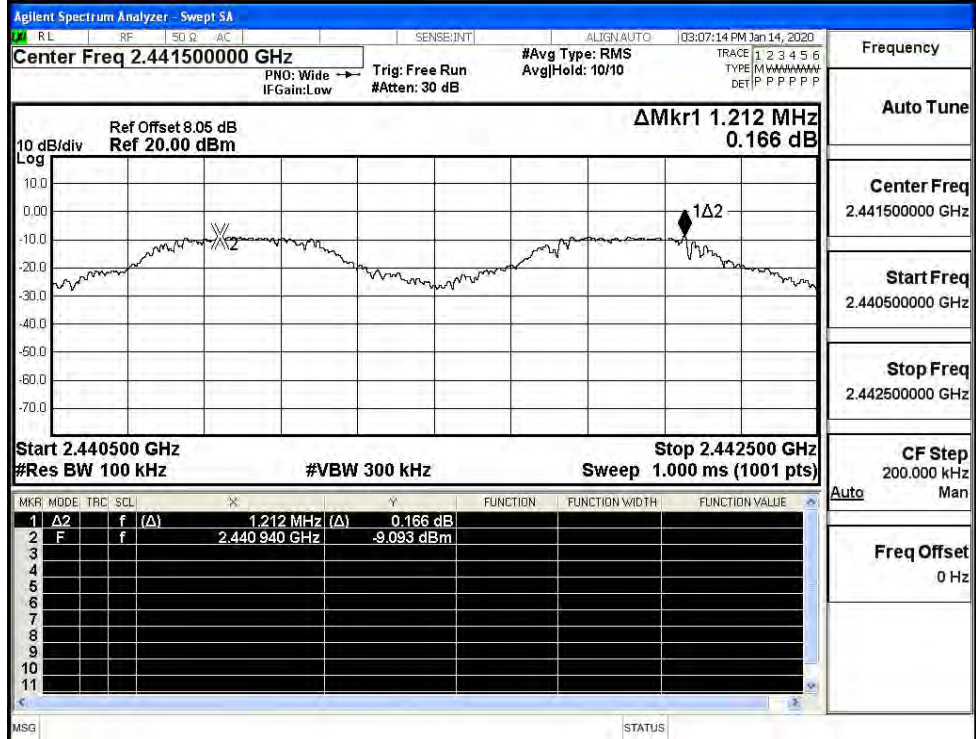
<p>8DPSK/MCH</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.441000000 GHz</p> <p>Center Freq: 2.441000000 GHz</p> <p>Mkr1 2.441164 GHz</p> <p>10 dB/div</p> <p>Log</p> <p>Ref Offset 8.05 dB</p> <p>Ref 20.00 dBm</p> <p>Center 2.441 GHz</p> <p>#Res BW 30 kHz</p> <p>#VBW 100 kHz</p> <p>Span 2 MHz</p> <p>Sweep 2.133 ms</p> <p>Occupied Bandwidth 1.1957 MHz</p> <p>Total Power -2.15 dBm</p> <p>Transmit Freq Error -1.197 kHz</p> <p>x dB Bandwidth 1.300 MHz</p> <p>OBW Power 99.00 %</p> <p>x dB -20.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.441000000 GHz</p> <p>CF Step 200.000 kHz</p> <p>Freq Offset 0 Hz</p>
<p>8DPSK/HCH</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.480000000 GHz</p> <p>Center Freq: 2.480000000 GHz</p> <p>Mkr1 2.48016 GHz</p> <p>10 dB/div</p> <p>Log</p> <p>Ref Offset 8.05 dB</p> <p>Ref 20.00 dBm</p> <p>Center 2.48 GHz</p> <p>#Res BW 30 kHz</p> <p>#VBW 100 kHz</p> <p>Span 2 MHz</p> <p>Sweep 2.133 ms</p> <p>Occupied Bandwidth 1.1853 MHz</p> <p>Total Power 0.15 dBm</p> <p>Transmit Freq Error 60 Hz</p> <p>x dB Bandwidth 1.296 MHz</p> <p>OBW Power 99.00 %</p> <p>x dB -20.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.480000000 GHz</p> <p>CF Step 200.000 kHz</p> <p>Freq Offset 0 Hz</p>

A.3 Carrier Frequency Separation

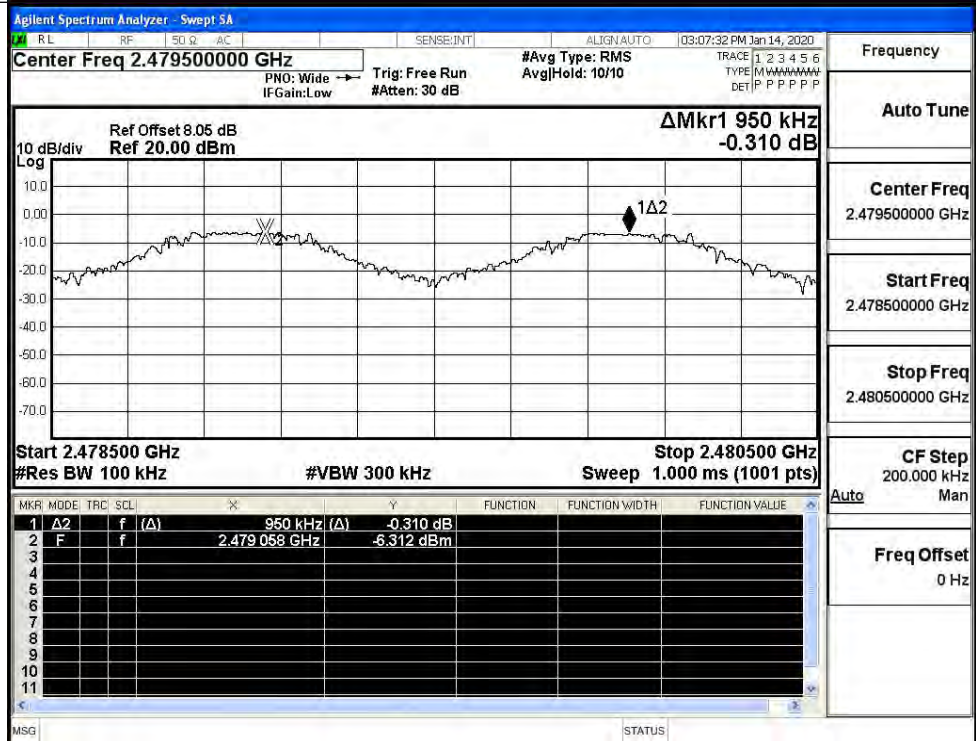
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.819	0.688	PASS
	MCH	1.212	0.688	PASS
	HCH	0.950	0.688	PASS
π/4DQPSK	LCH	1.034	0.877	PASS
	MCH	1.218	0.877	PASS
	HCH	1.066	0.877	PASS
8DPSK	LCH	1.214	0.867	PASS
	MCH	1.282	0.867	PASS
	HCH	1.120	0.867	PASS



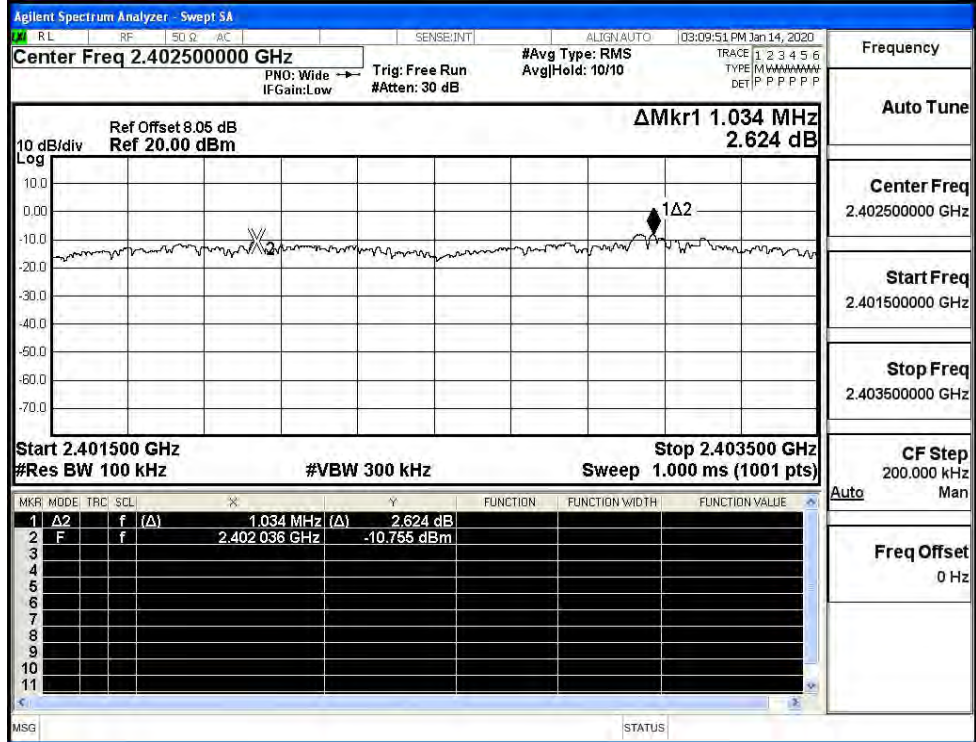
GFSK/MCH



GFSK/HCH

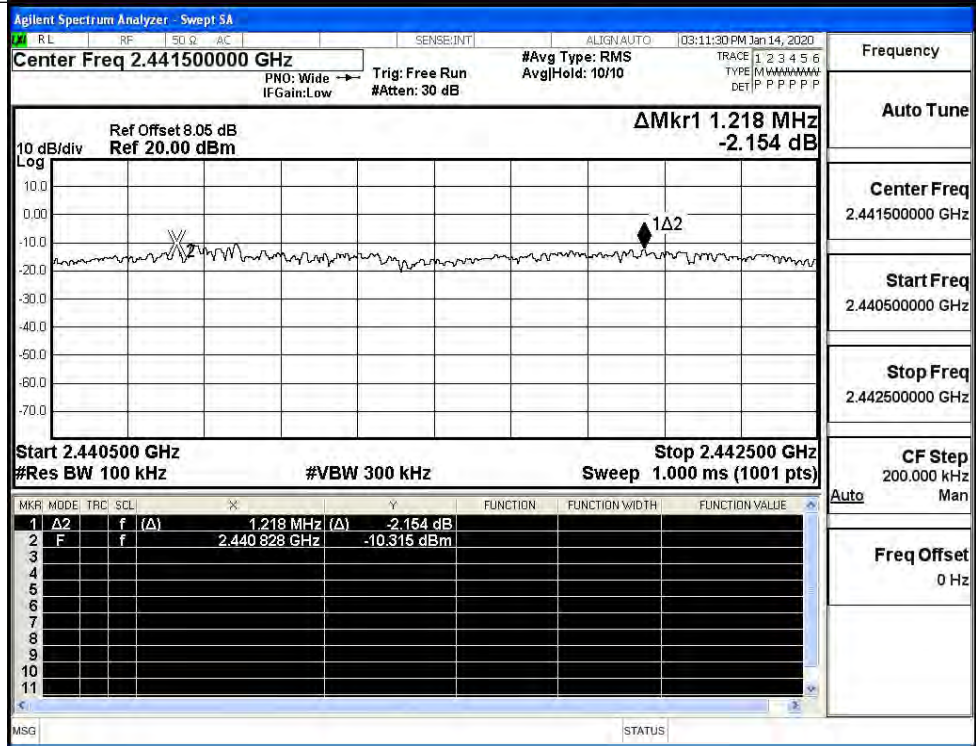


π /4DQPSK/LCH



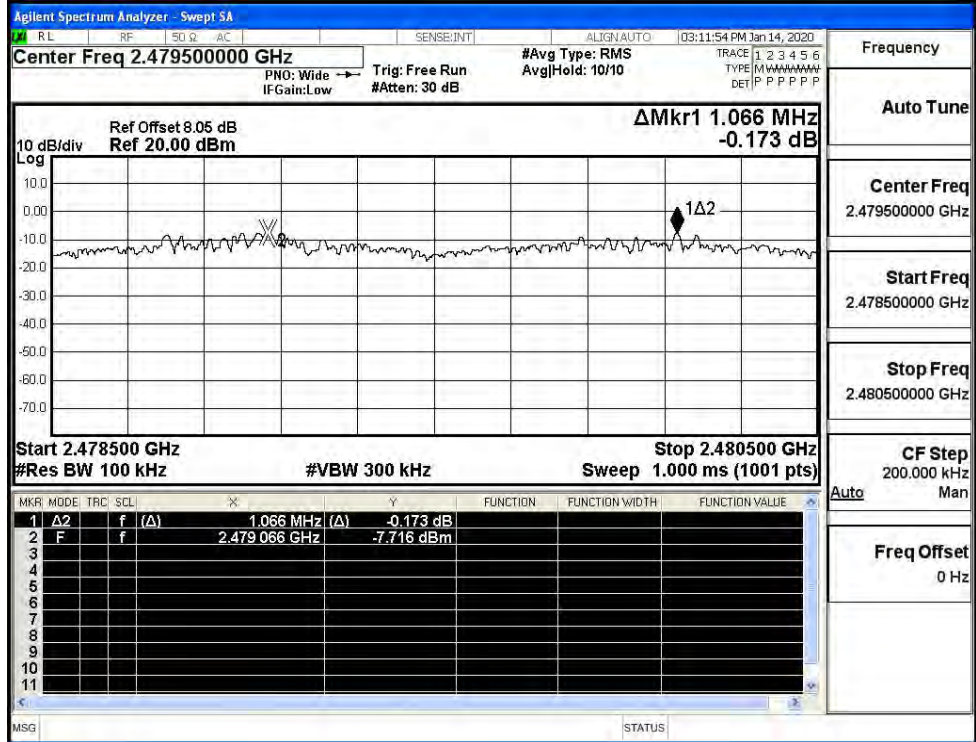
Frequency
Auto Tune
Center Freq 2.402500000 GHz
Start Freq 2.401500000 GHz
Stop Freq 2.403500000 GHz
CF Step 200.000 kHz
Auto Man
Freq Offset 0 Hz

π /4DQPSK/MCH

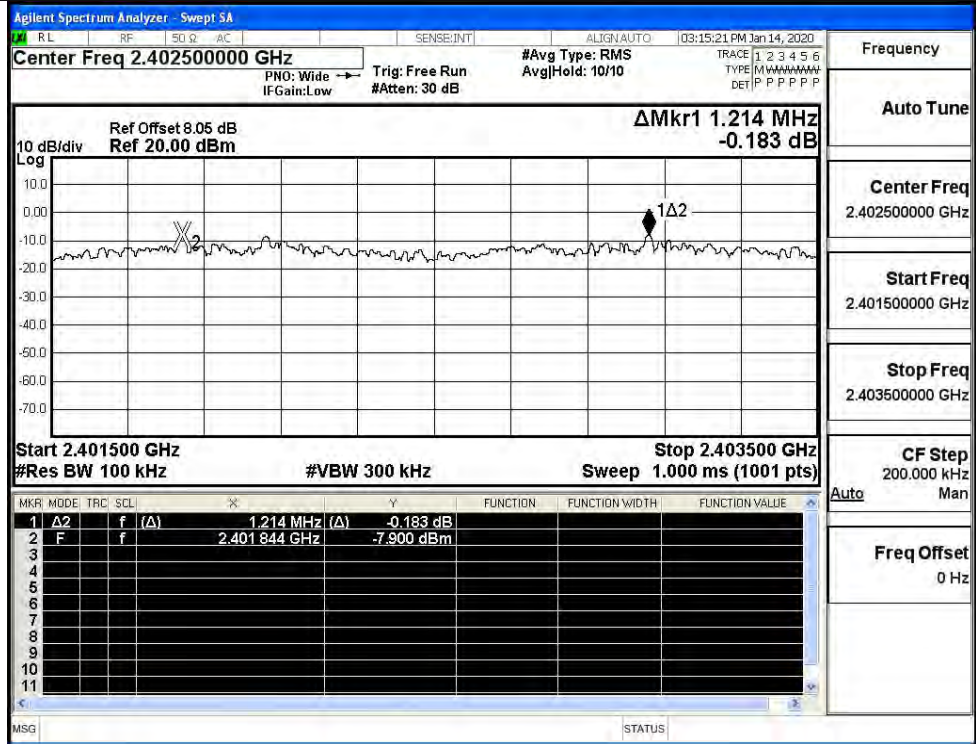


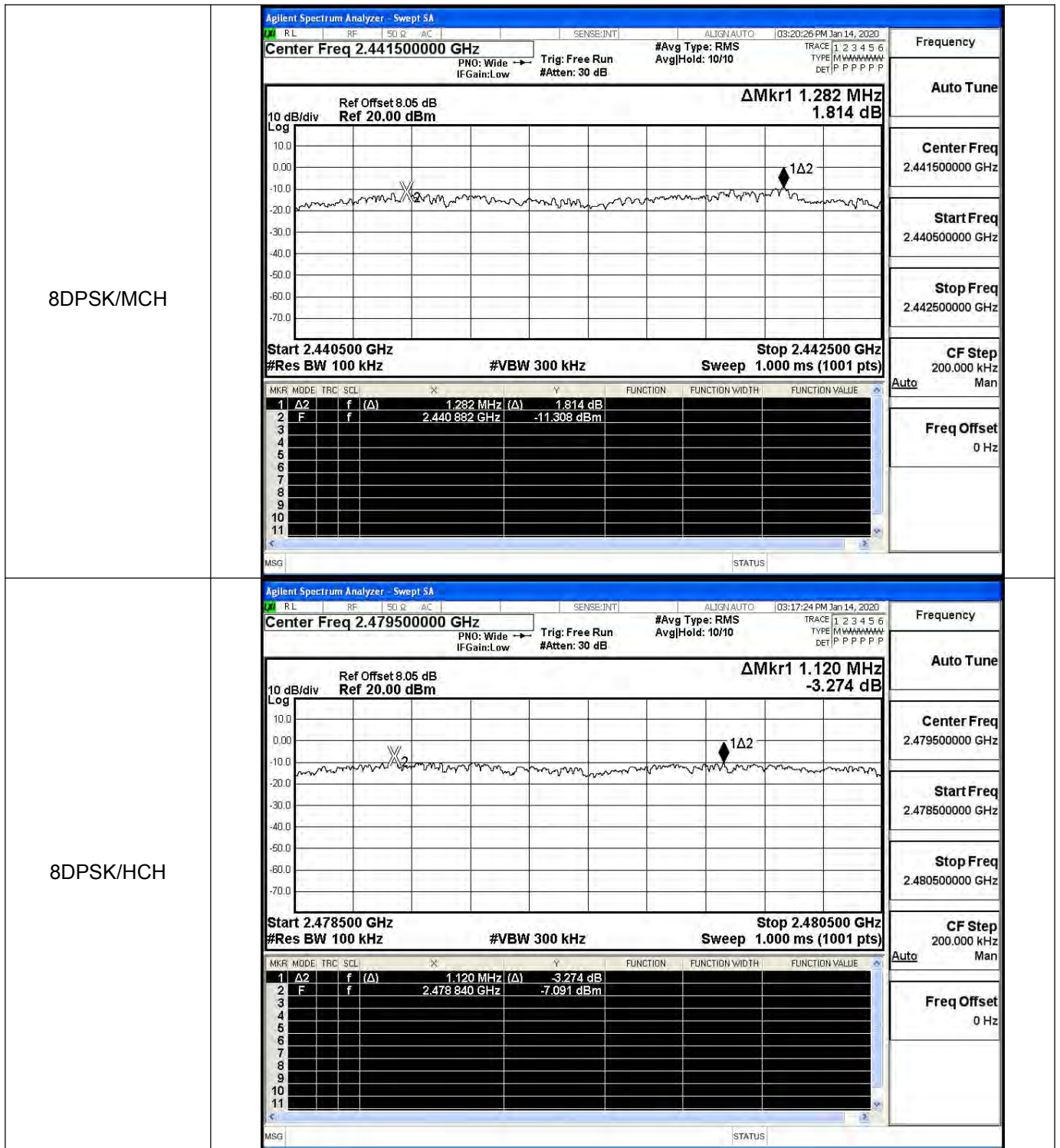
Frequency
Auto Tune
Center Freq 2.441500000 GHz
Start Freq 2.440500000 GHz
Stop Freq 2.442500000 GHz
CF Step 200.000 kHz
Auto Man
Freq Offset 0 Hz

π/4DQPSK/HCH



8DPSK/LCH



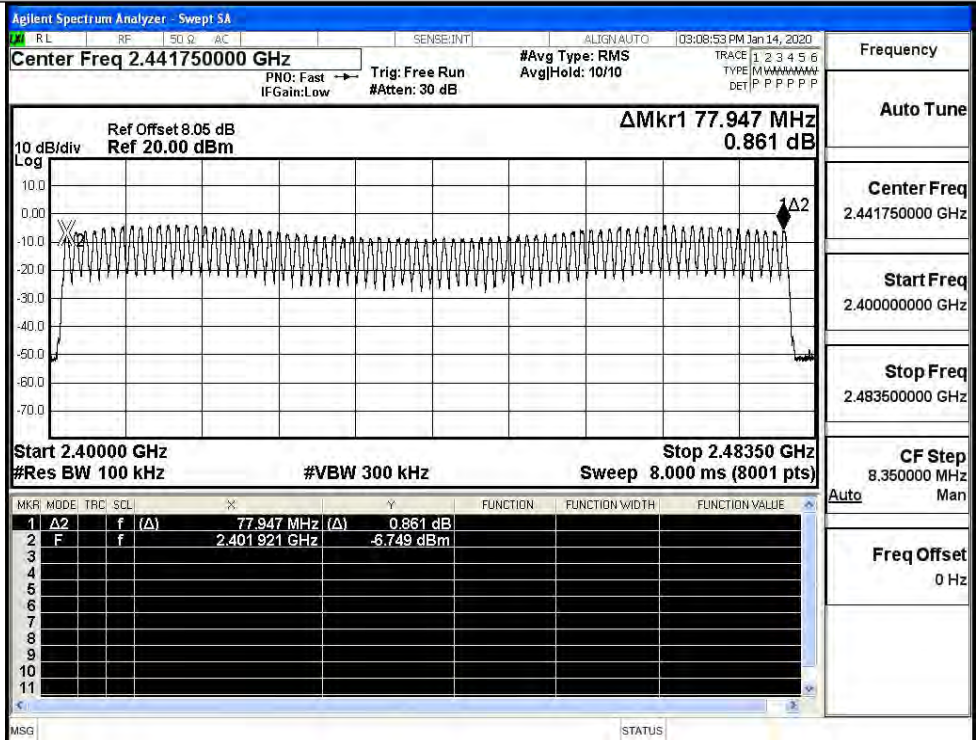


A.4 Hopping Channel Number

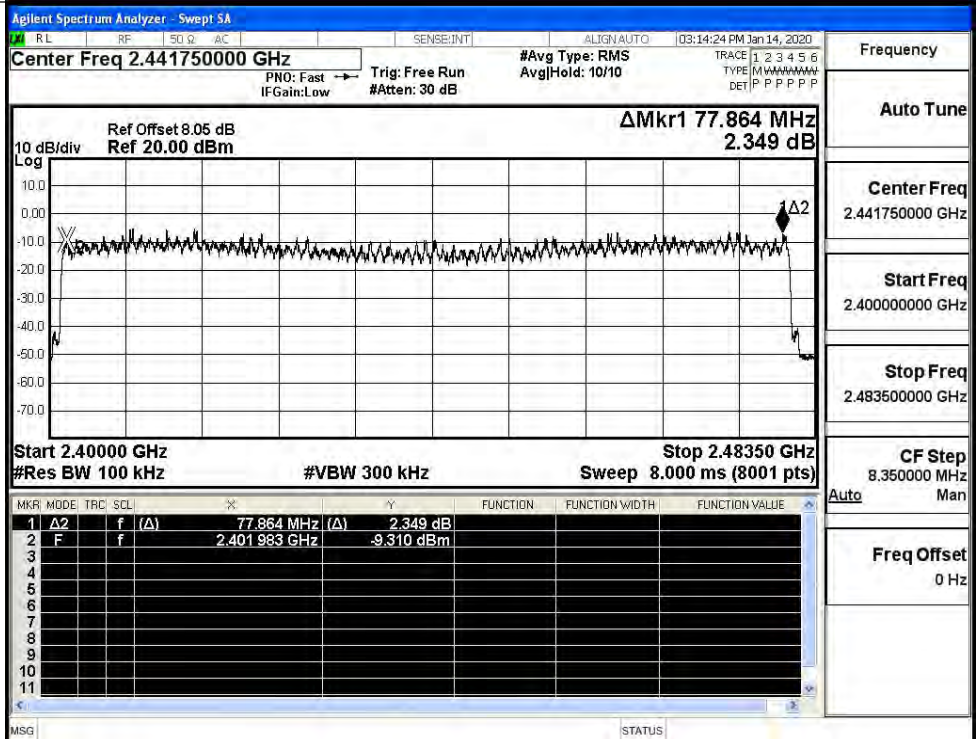
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
π/4DQPSK	Hop	79	>=15	PASS
8DPSK	Hop	79	>=15	PASS

Test Graphs

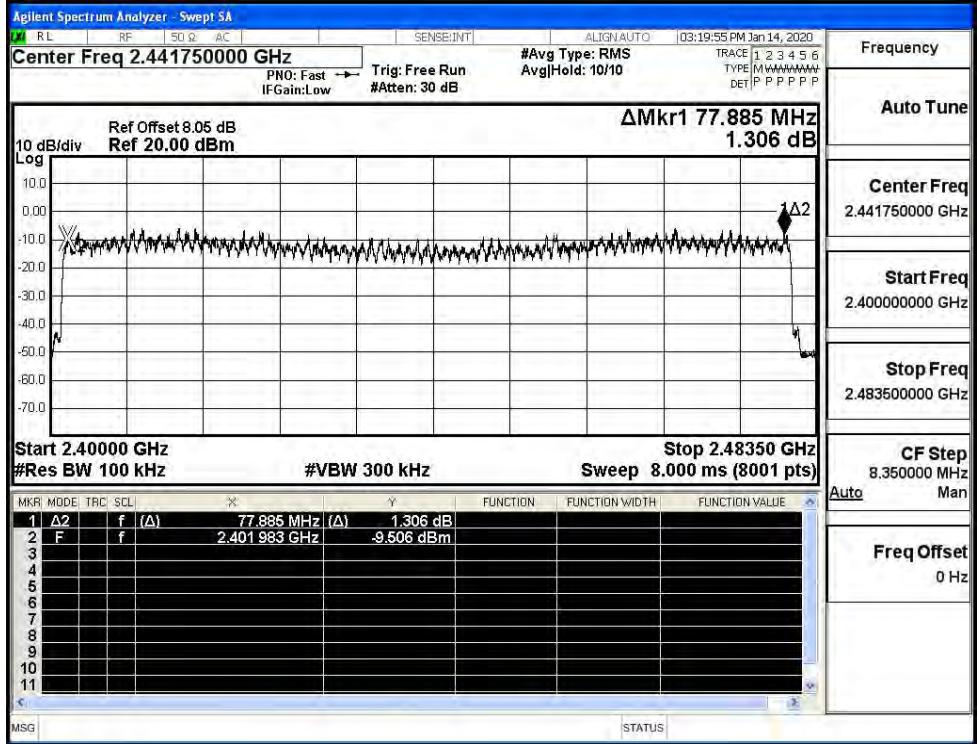
GFSK/Hop



π /4DQPSK/Hop

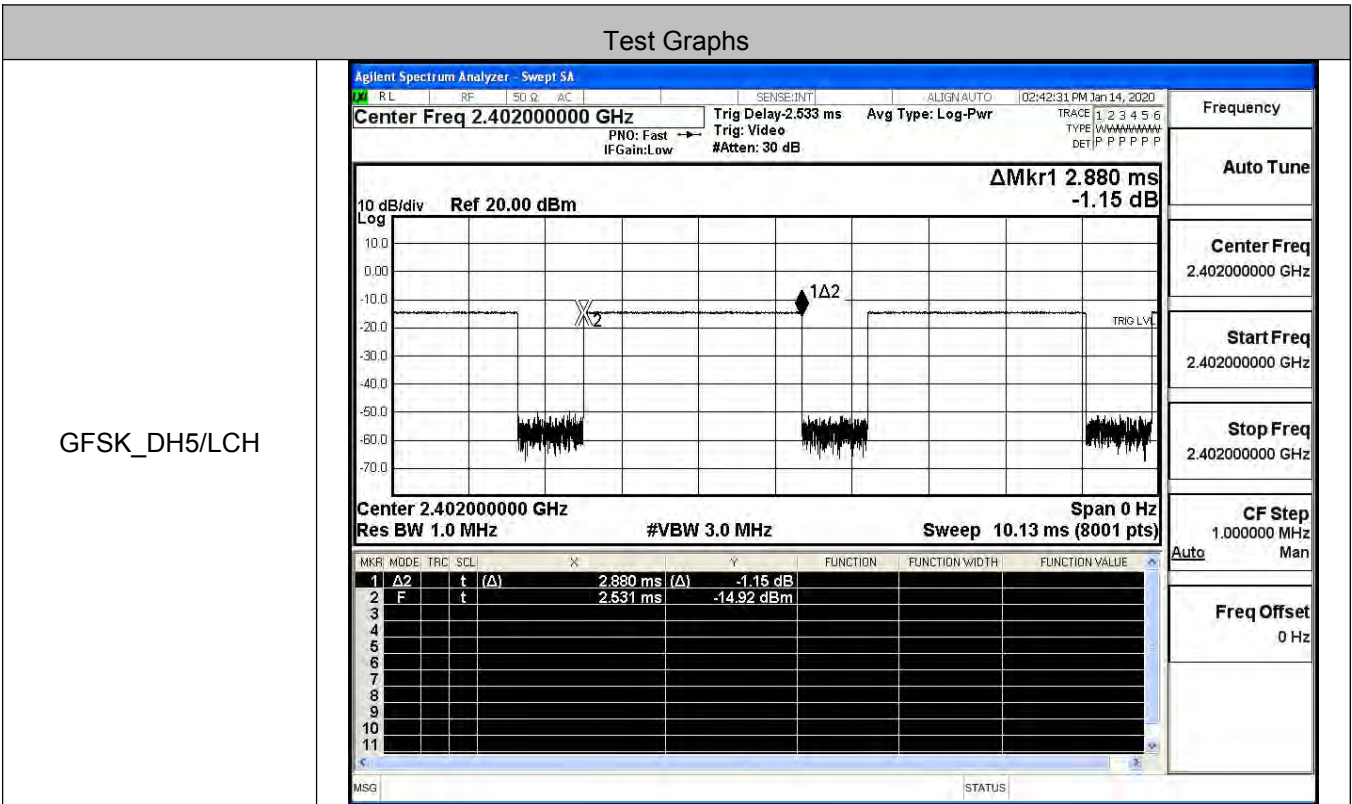


8DPSK/Hop

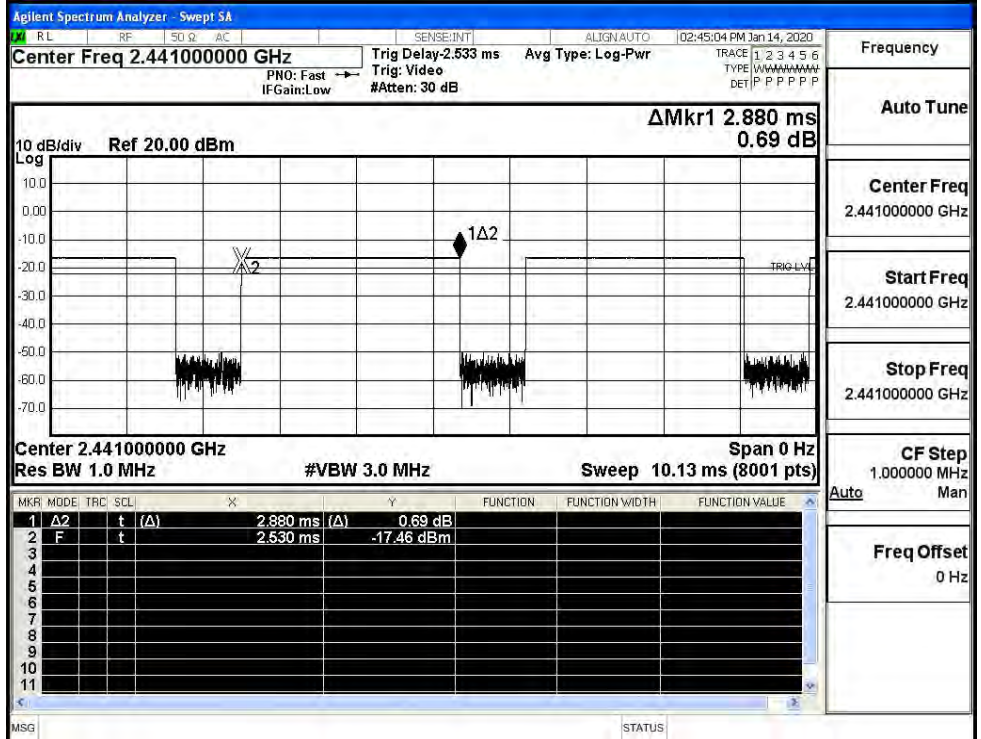


A.5 Dwell Time

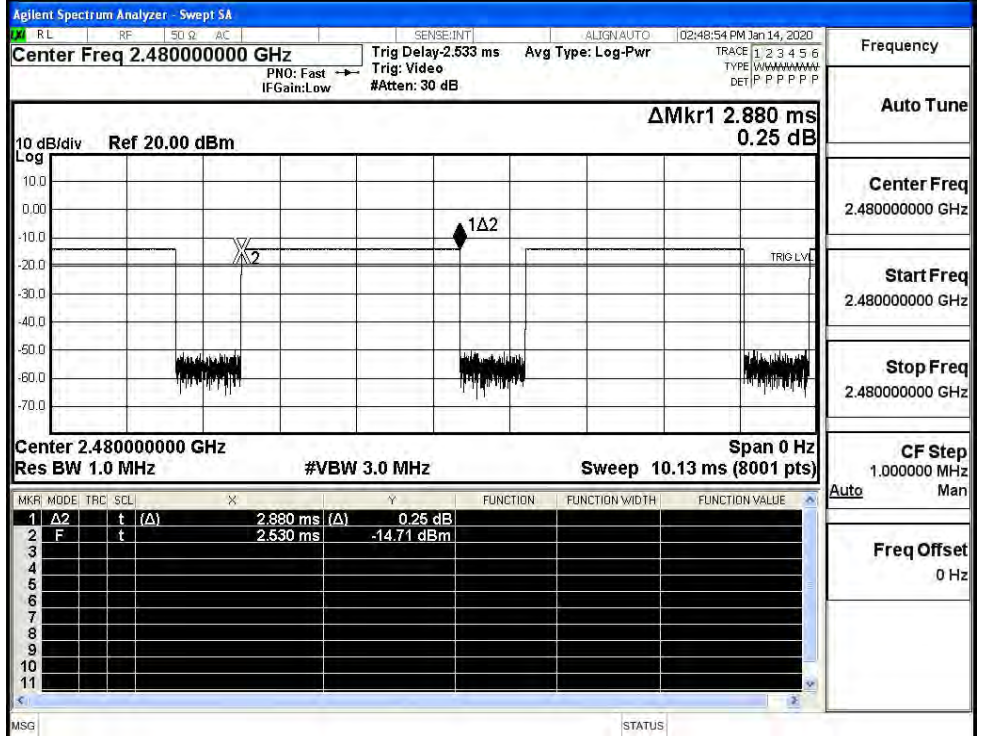
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
π/4DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88	106.7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



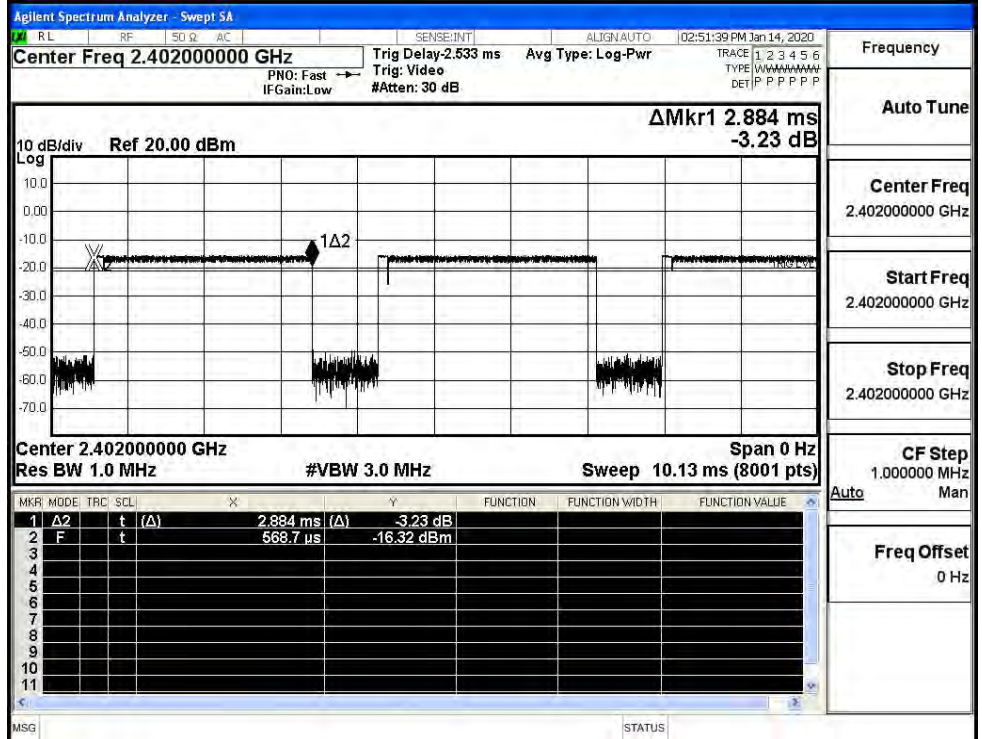
GFSK_DH5/MCH



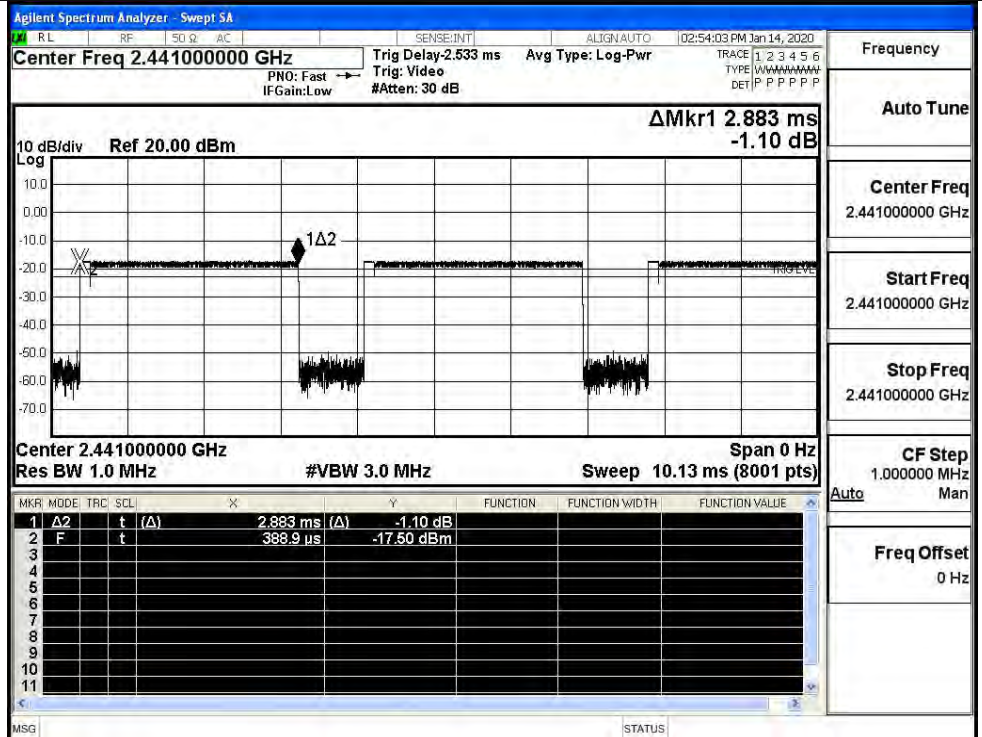
GFSK_DH5/HCH



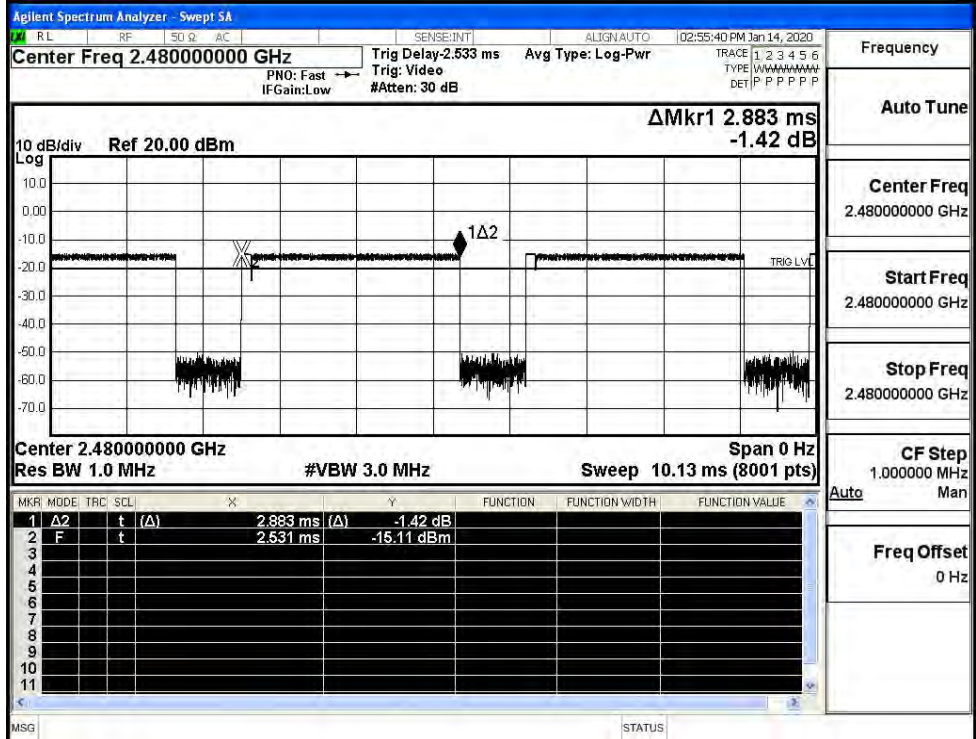
$\pi/4$ DQPSK
_2DH5/LCH



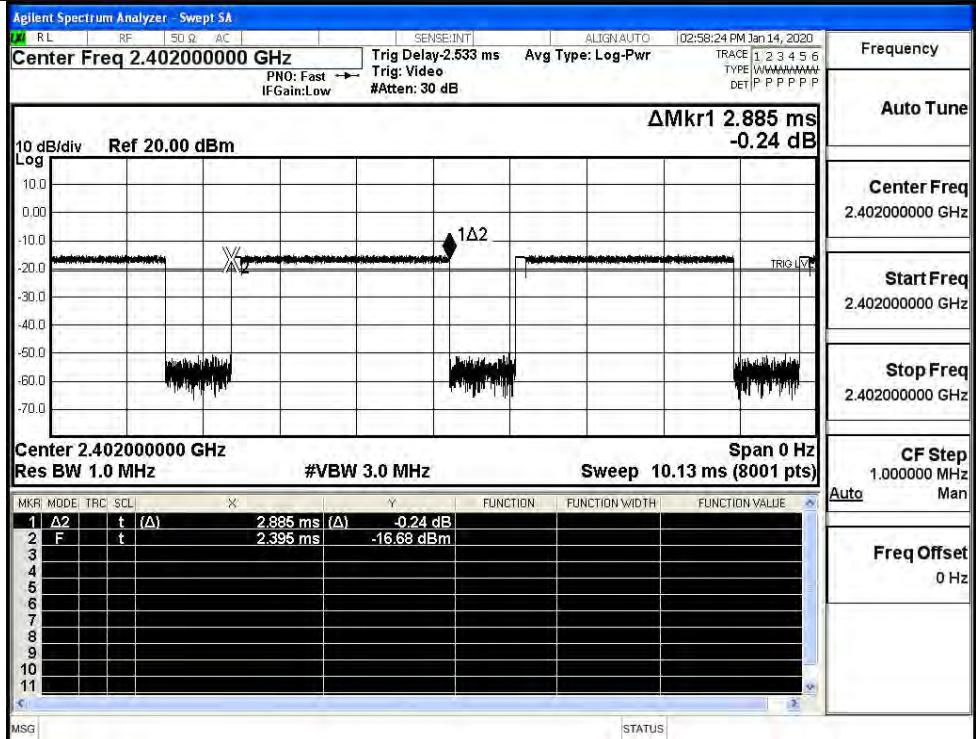
$\pi/4$ DQPSK
_2DH5/MCH



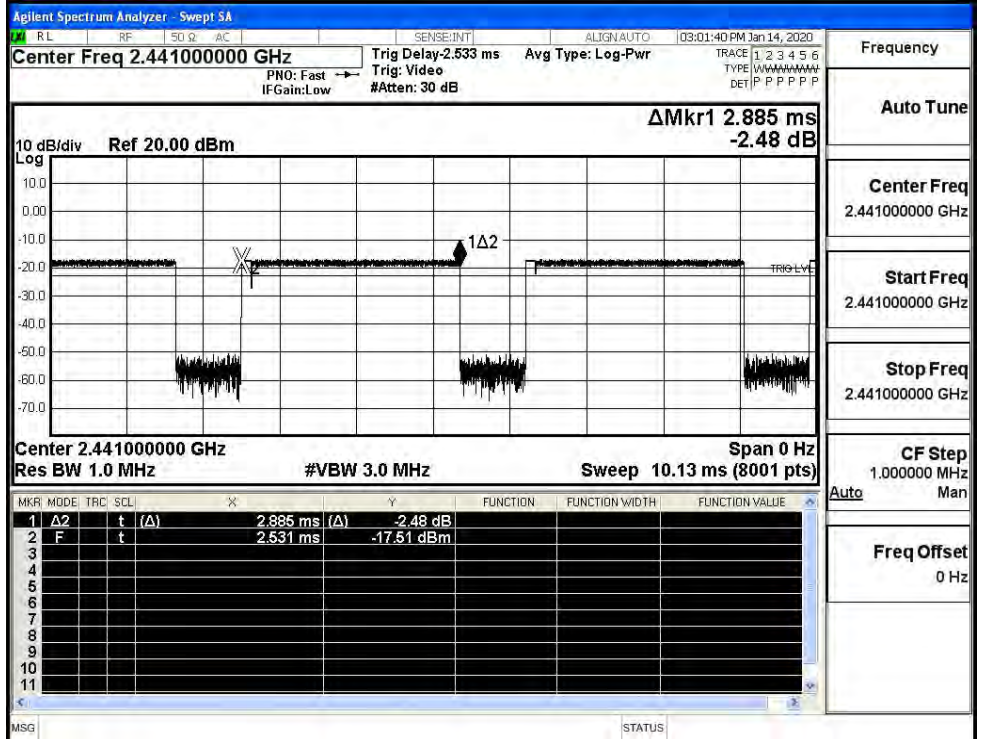
$\pi/4$ DQPSK
_2DH5/HCH



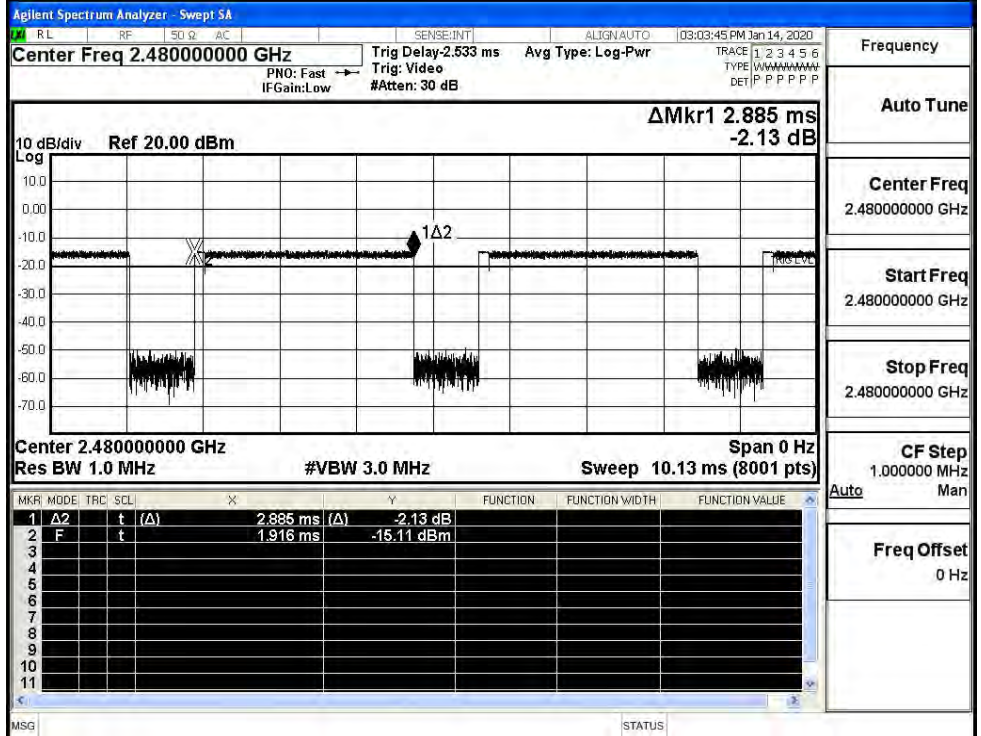
8DPSK_3DH5/LCH



8DPSK_3DH5/MCH



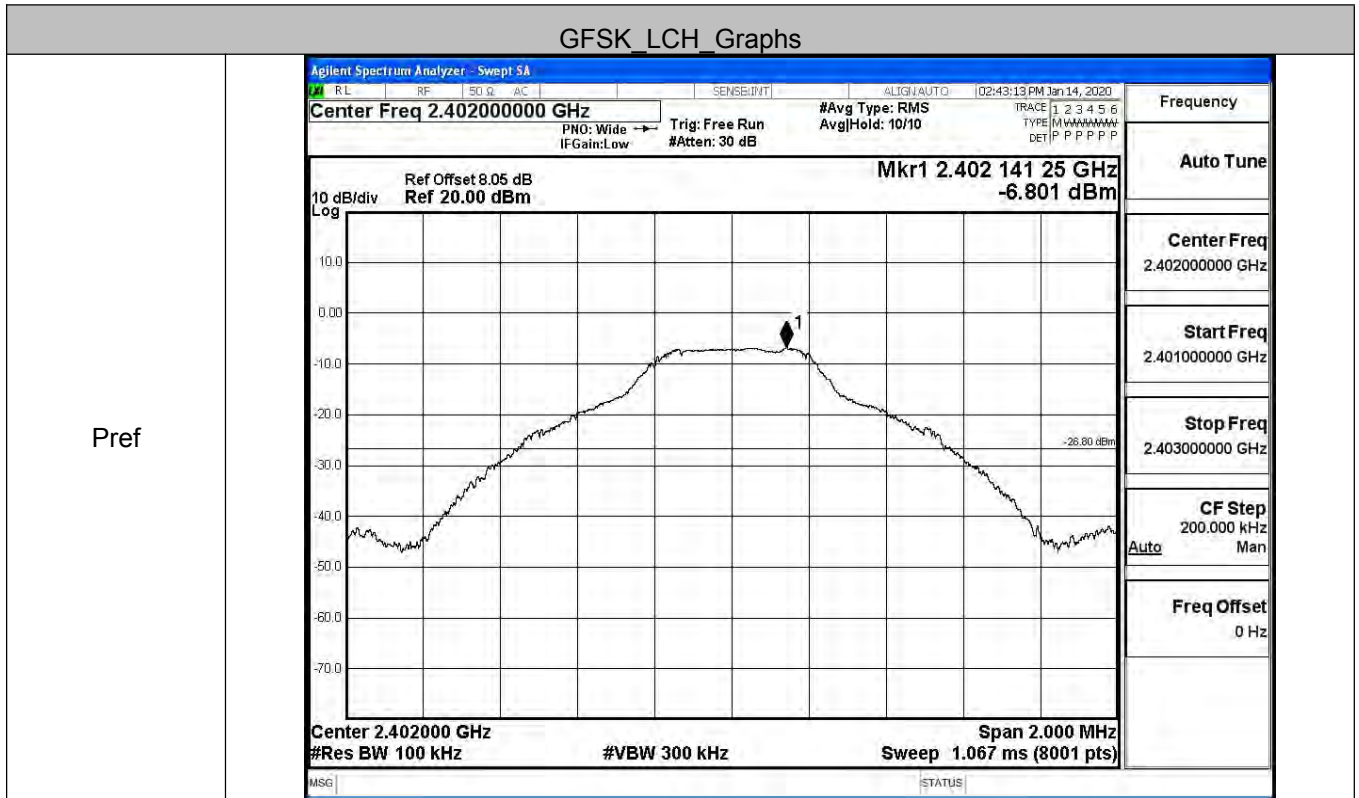
8DPSK_3DH5/HCH



A.6 RF Conducted Spurious Emissions

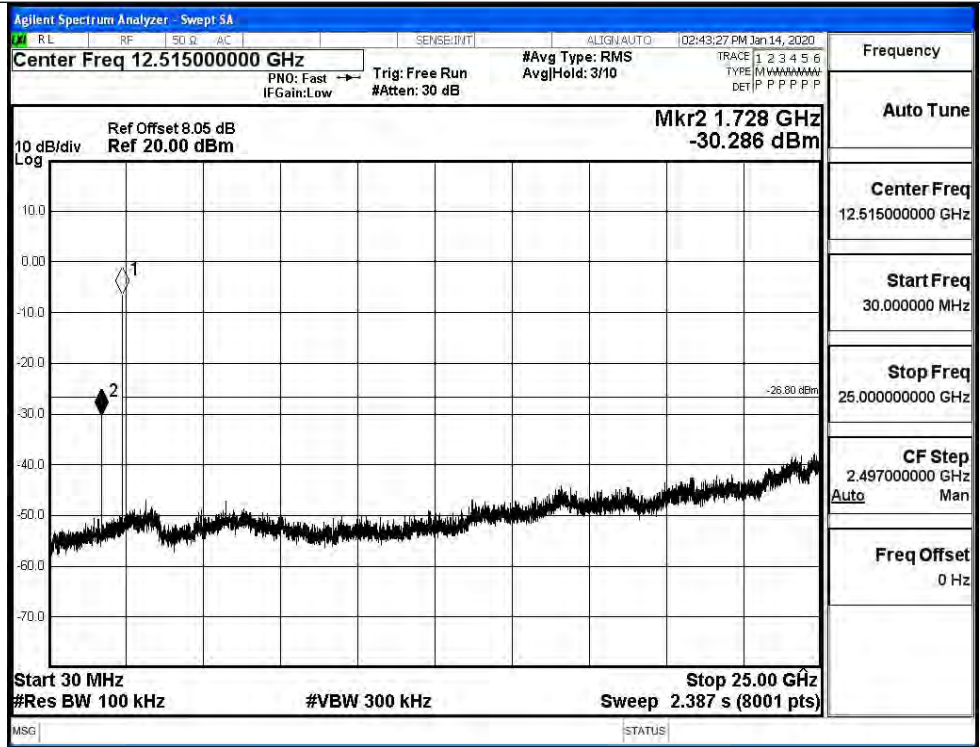
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-6.801	-30.286	-26.801	PASS
	MCH	-8.341	-37.708	-28.341	PASS
	HCH	-5.968	-36.060	-25.968	PASS
π/4DQPSK	LCH	-7.766	-37.987	-27.766	PASS
	MCH	-9.625	-37.710	-29.625	PASS
	HCH	-7.031	-38.106	-27.031	PASS
8DPSK	LCH	-7.827	-37.538	-27.827	PASS
	MCH	-9.361	-37.124	-29.361	PASS
	HCH	-7.729	-37.458	-27.729	PASS

GFSK LCH Graphs



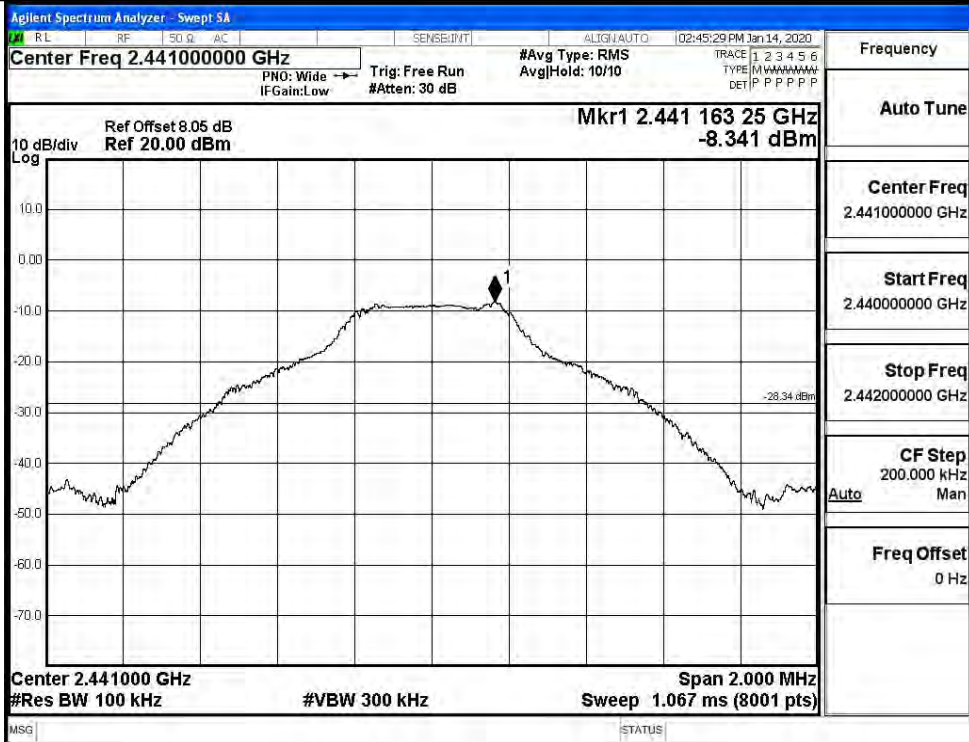
Pref

P_{uw}

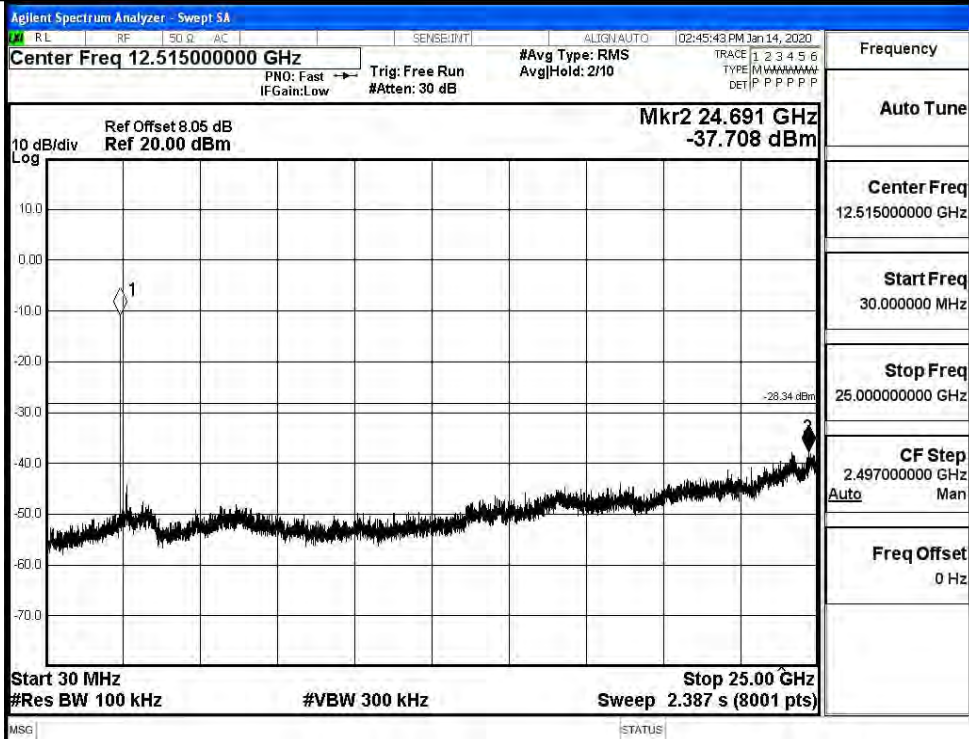


GFSK_MCH_Graphs

Pref

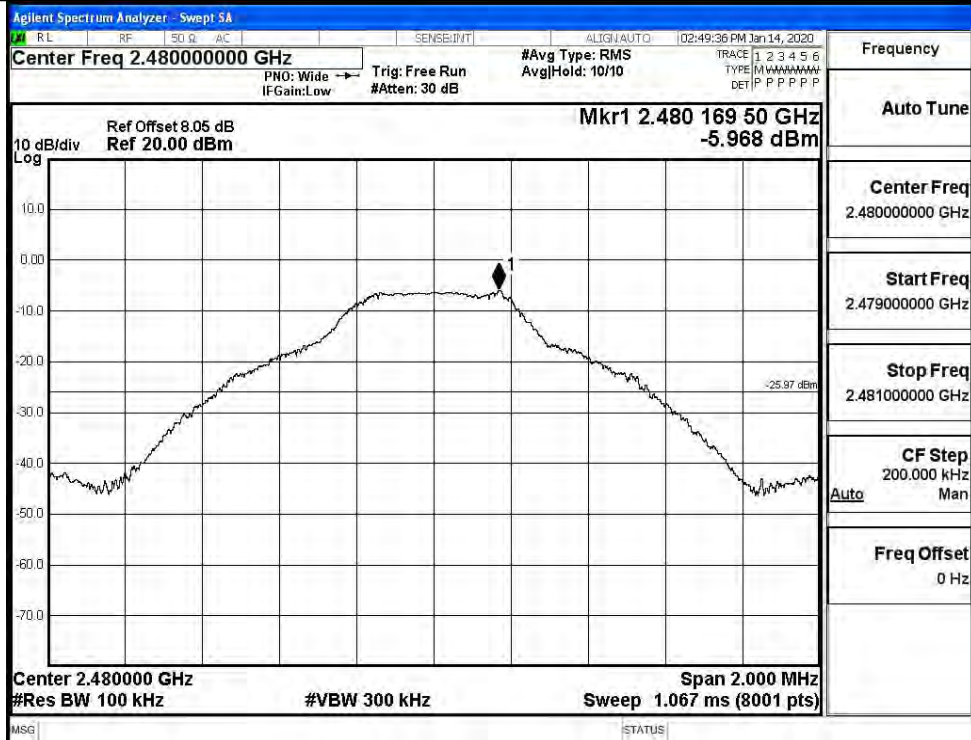


Puw

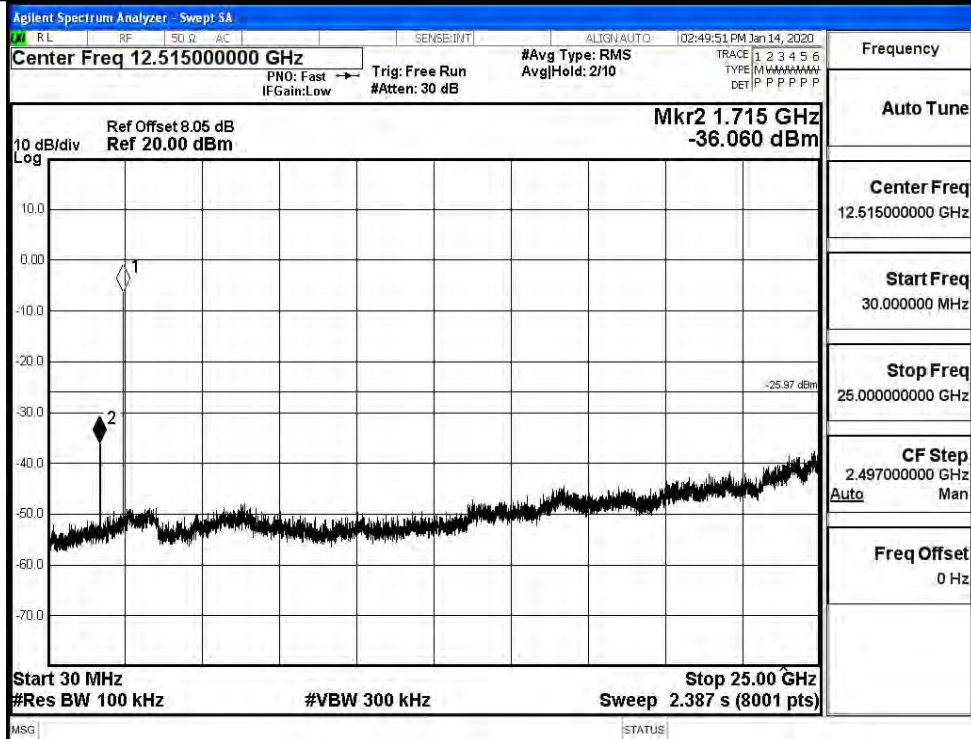


GFSK HCH Graphs

Pref

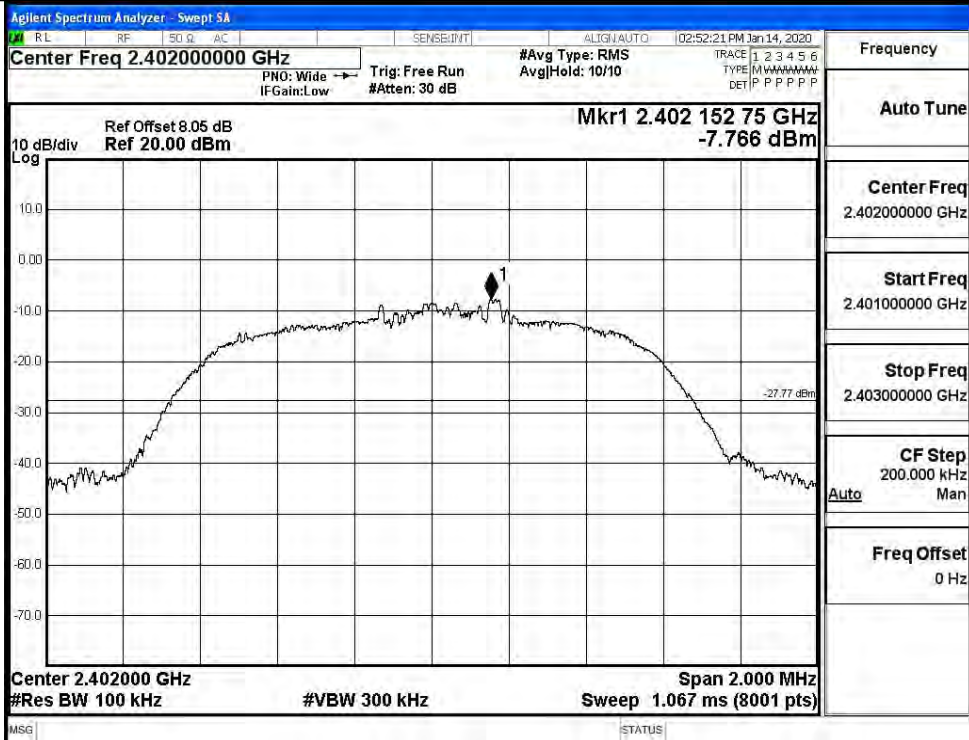


Puw

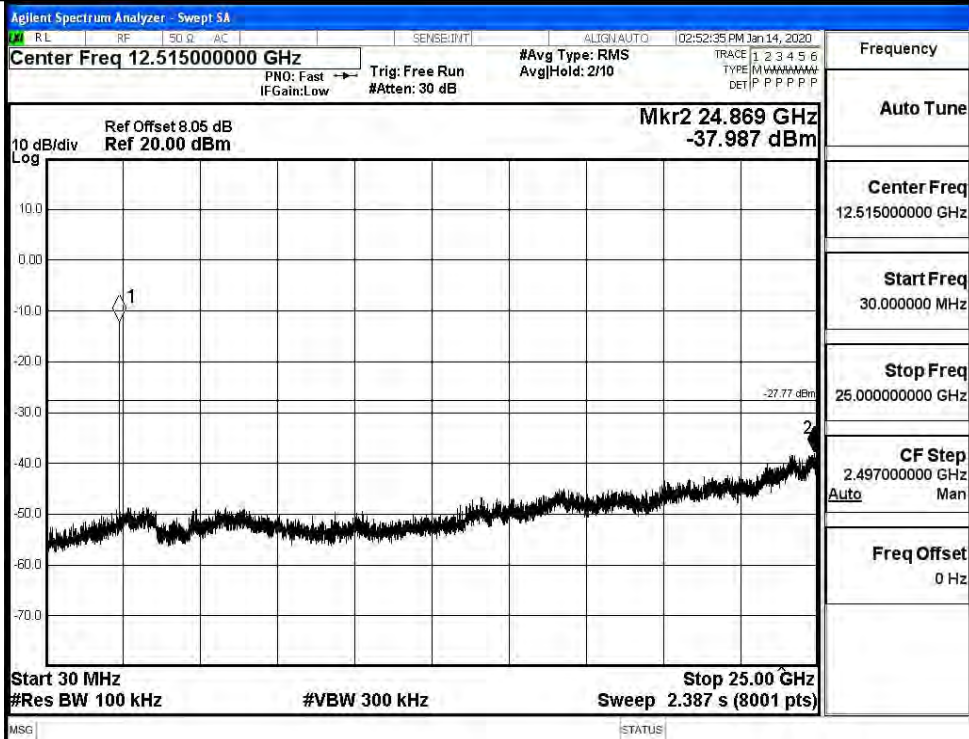


$\pi/4$ DQPSK LCH Graphs

Pref

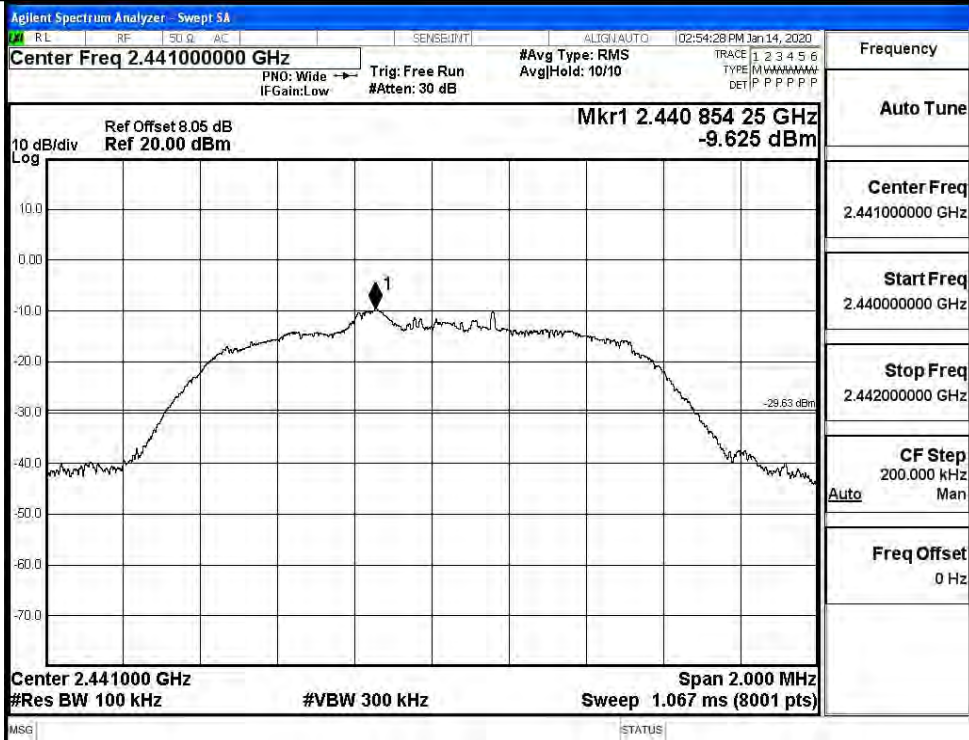


Puw

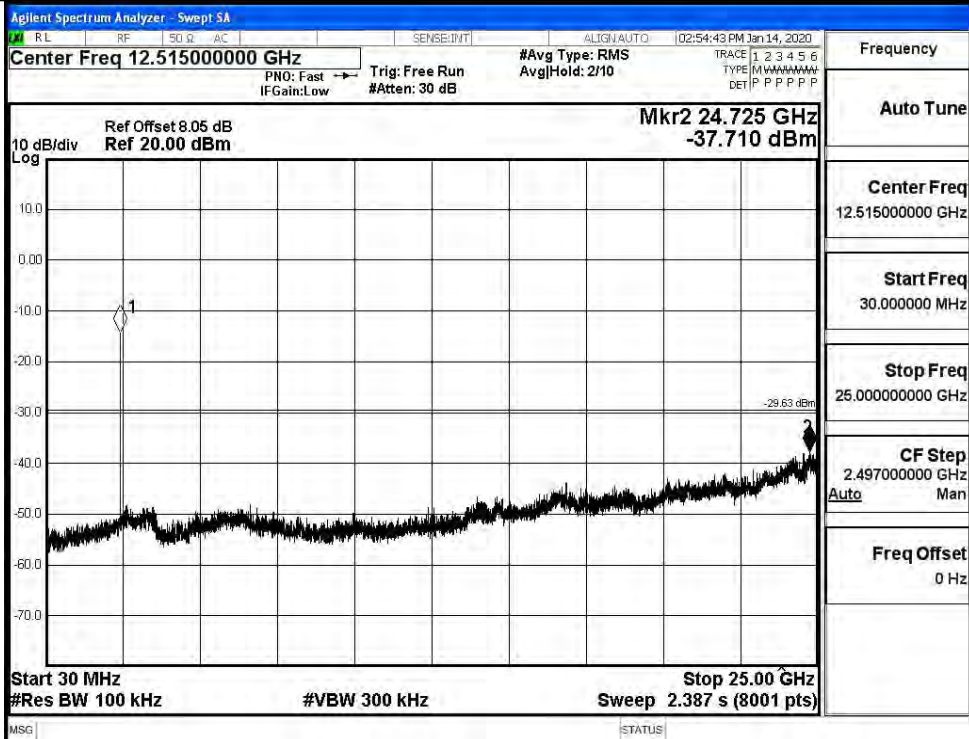


$\pi/4$ DQPSK_MCH_Graphs

Pref

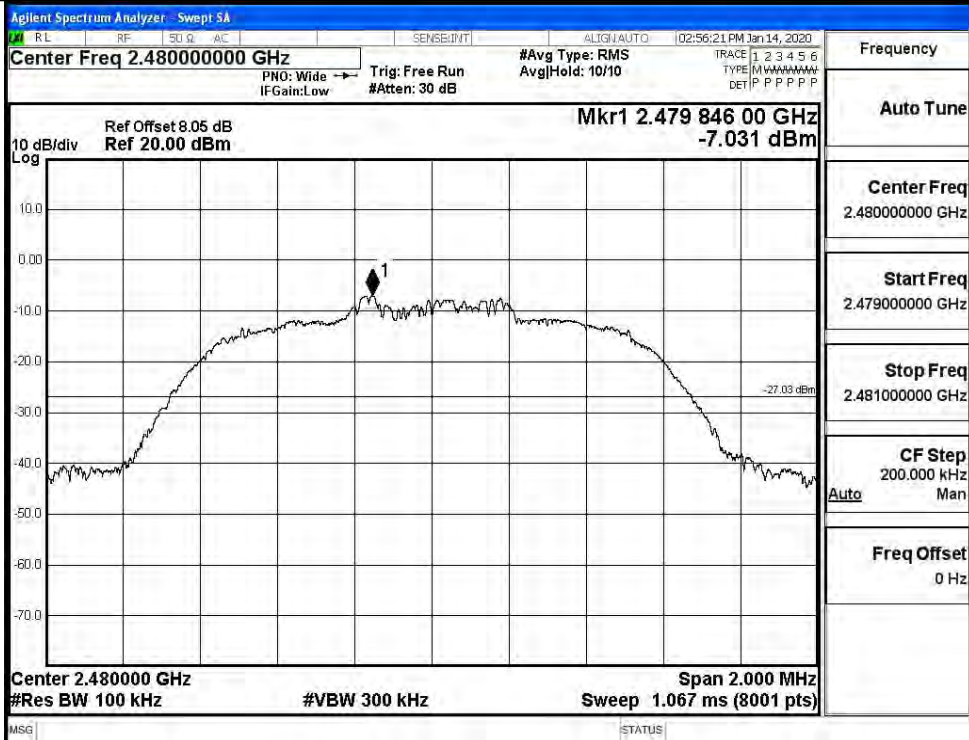


Puw

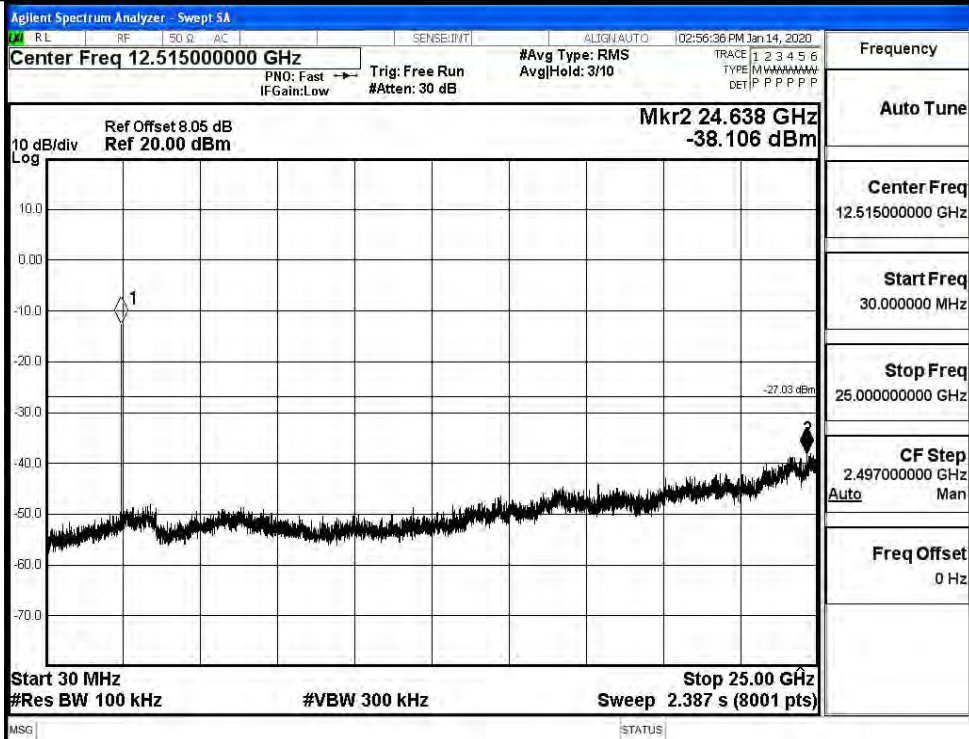


$\pi/4$ DQPSK HCH Graphs

Pref

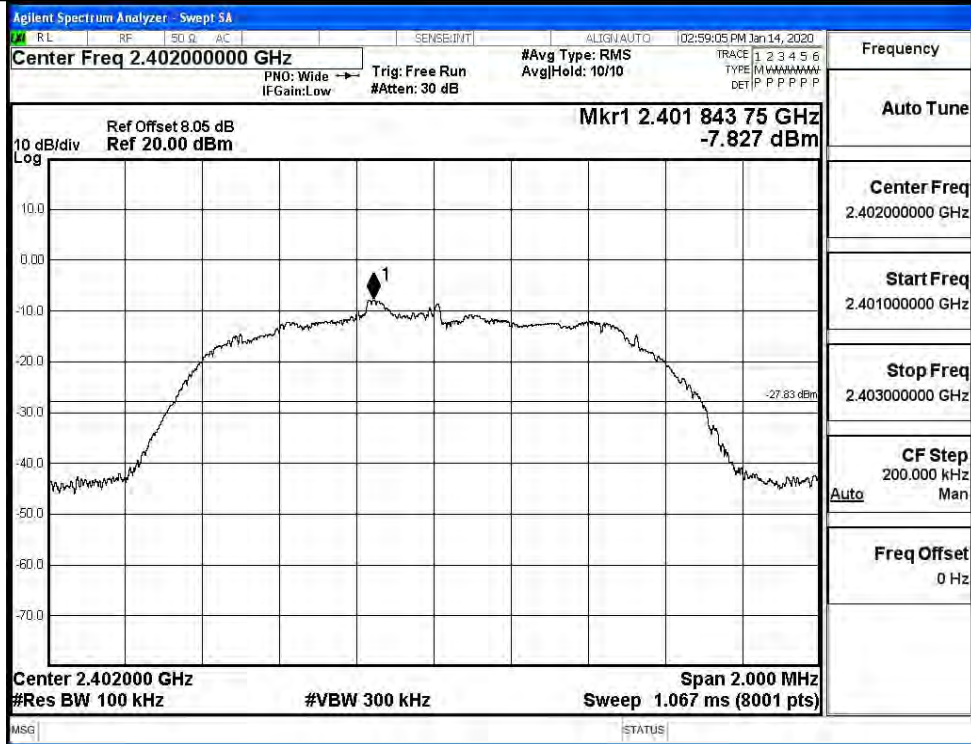


Puw

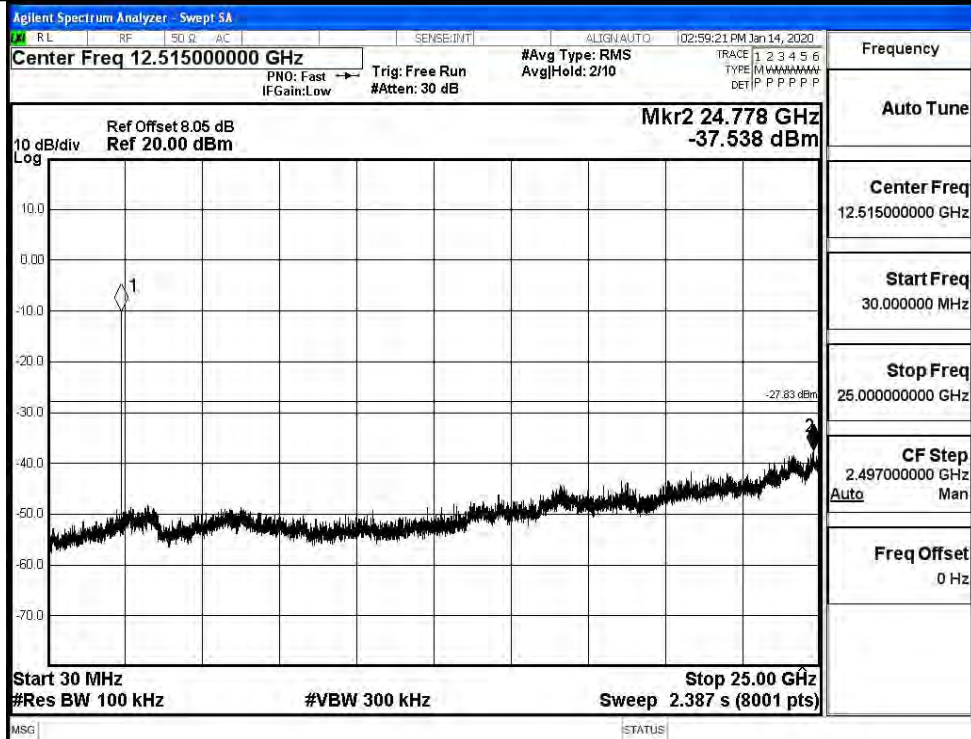


8DPSK LCH Graphs

Pref

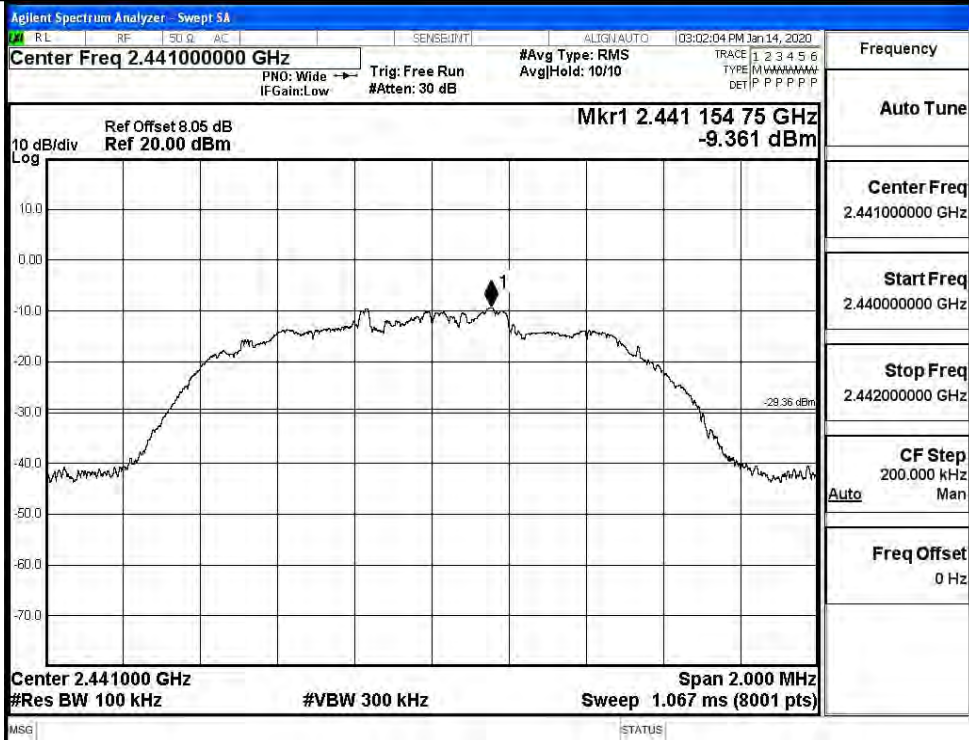


Puw

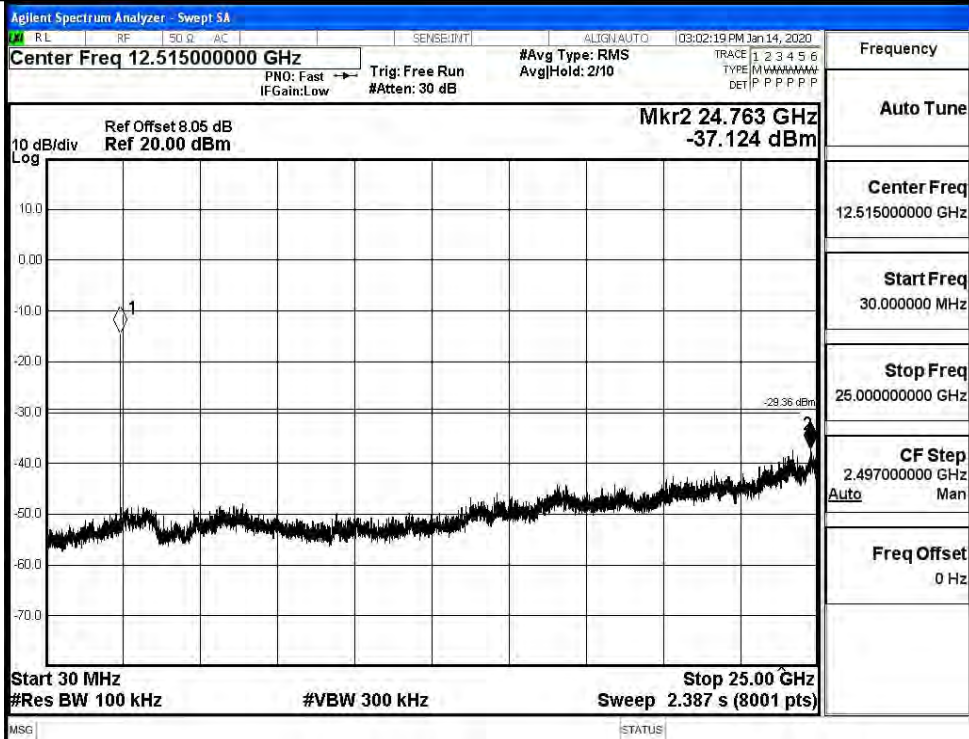


8DPSK MCH_Graphs

Pref

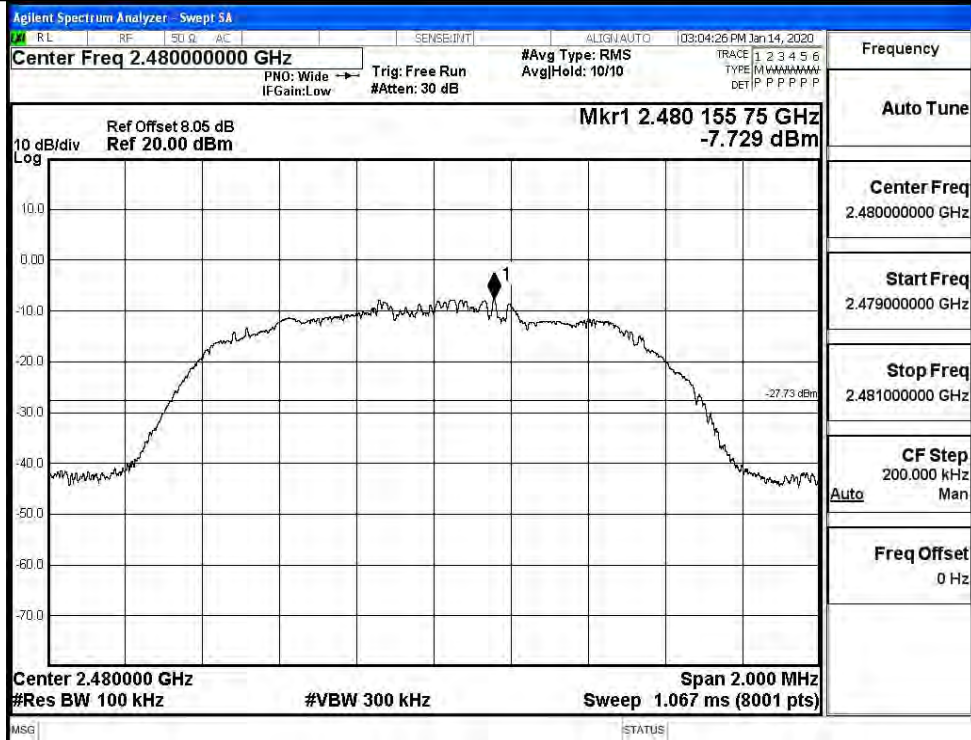


Puw

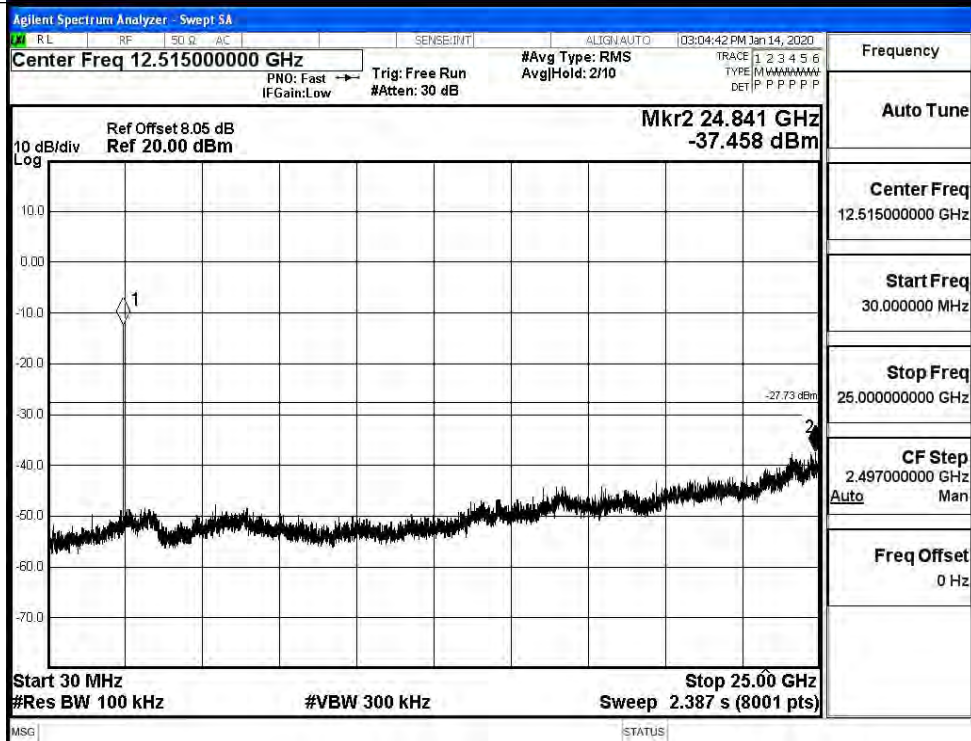


8DPSK_HCH_Graphs

Pref



Puw

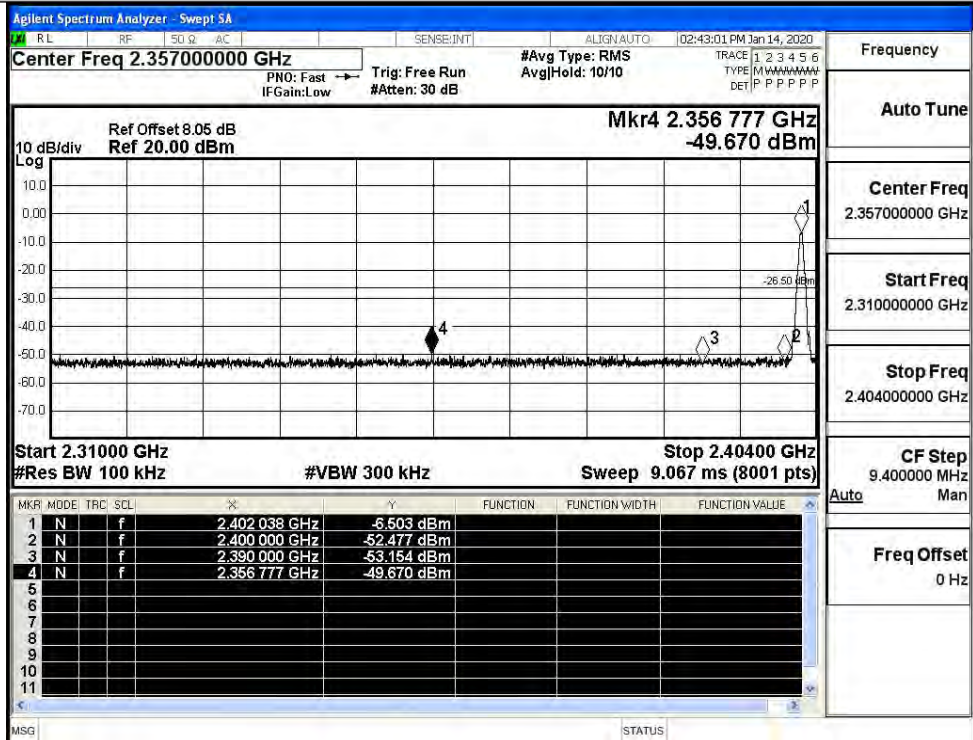


A.7 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-6.503	Off	-49.670	-26.5	PASS
			-3.604	On	-48.780	-23.6	PASS
	HCH	2480	-5.917	Off	-49.075	-25.92	PASS
			-4.252	On	-49.263	-24.25	PASS
π/4DQPSK	LCH	2402	-7.871	Off	-49.609	-27.87	PASS
			-5.406	On	-48.830	-25.41	PASS
	HCH	2480	-6.932	Off	-49.223	-26.93	PASS
			-5.874	On	-48.591	-25.87	PASS
8DPSK	LCH	2402	-7.889	Off	-49.392	-27.89	PASS
			-5.633	On	-49.027	-25.63	PASS
	HCH	2480	-7.676	Off	-48.793	-27.68	PASS
			-5.950	On	-48.402	-25.95	PASS

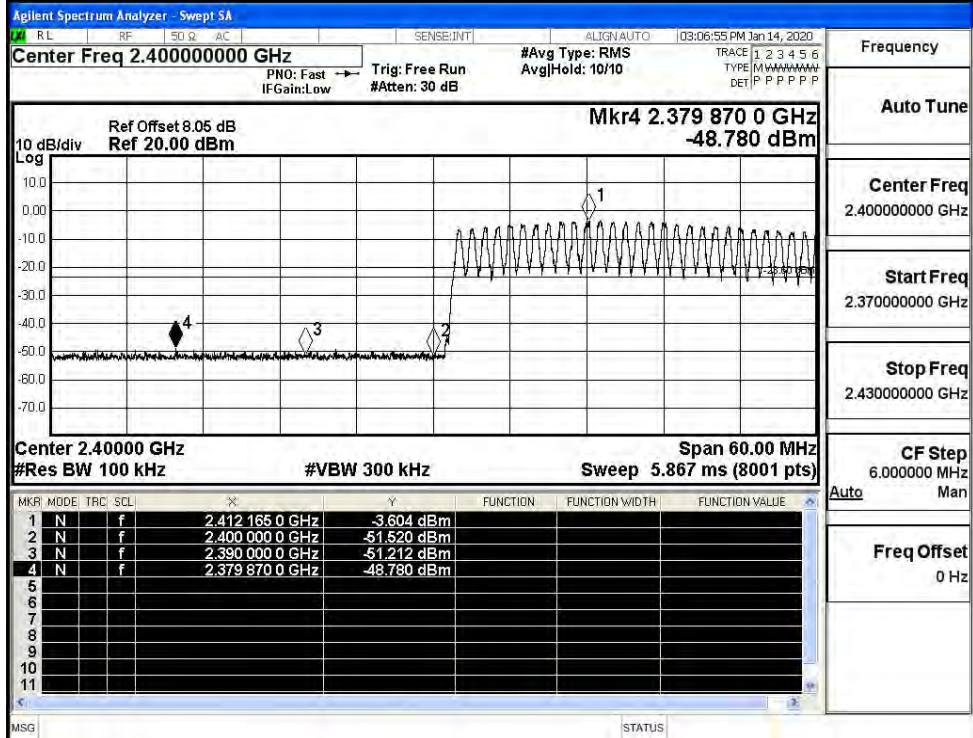
Test Graphs

GFSK/LCH/No Hop



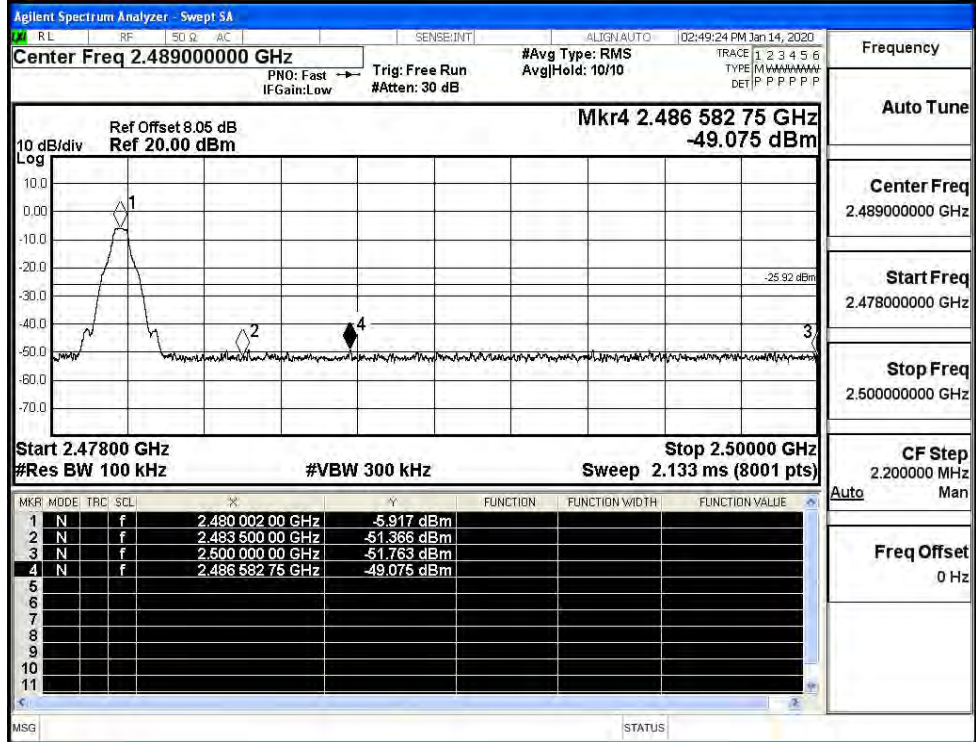
Frequency	2.357000000 GHz
Auto Tune	
Center Freq	2.357000000 GHz
Start Freq	2.310000000 GHz
Stop Freq	2.404000000 GHz
CF Step	9.400000 MHz
Auto	Man
Freq Offset	0 Hz

GFSK/LCH/Hop

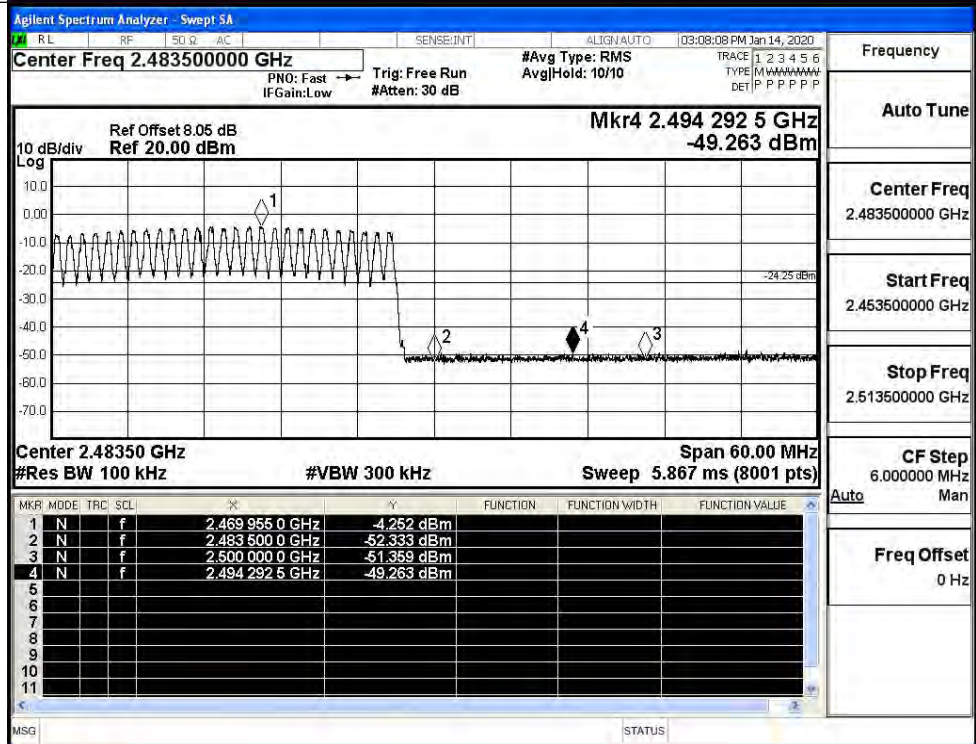


Frequency	2.400000000 GHz
Auto Tune	
Center Freq	2.400000000 GHz
Start Freq	2.370000000 GHz
Stop Freq	2.430000000 GHz
CF Step	6.000000 MHz
Auto	Man
Freq Offset	0 Hz

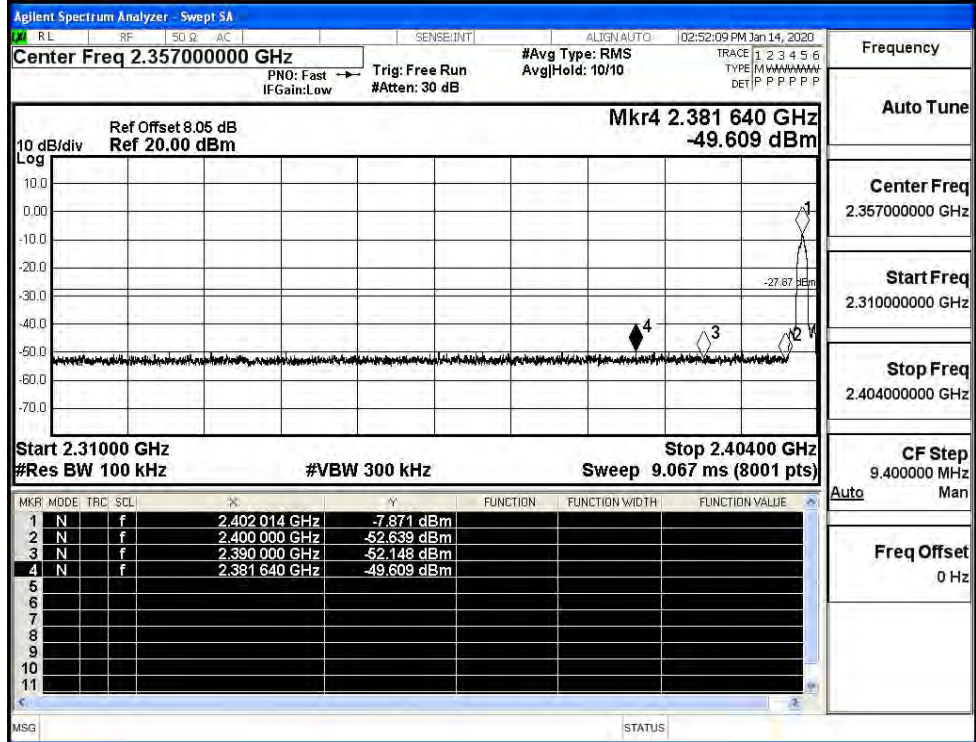
GFSK/HCH/No Hop



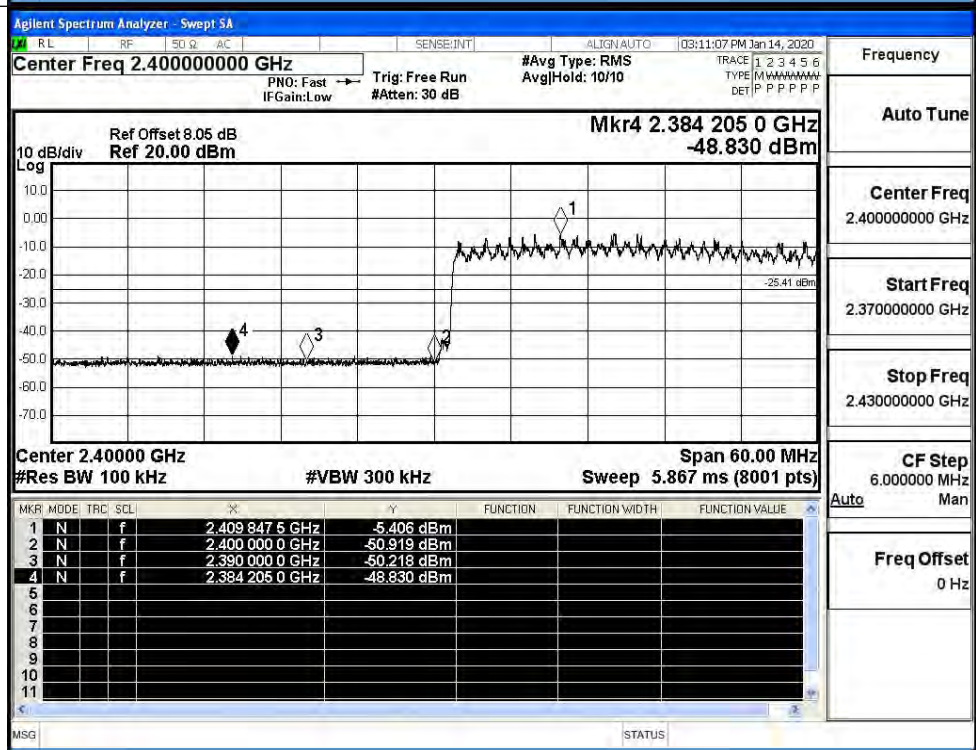
GFSK/HCH/Hop



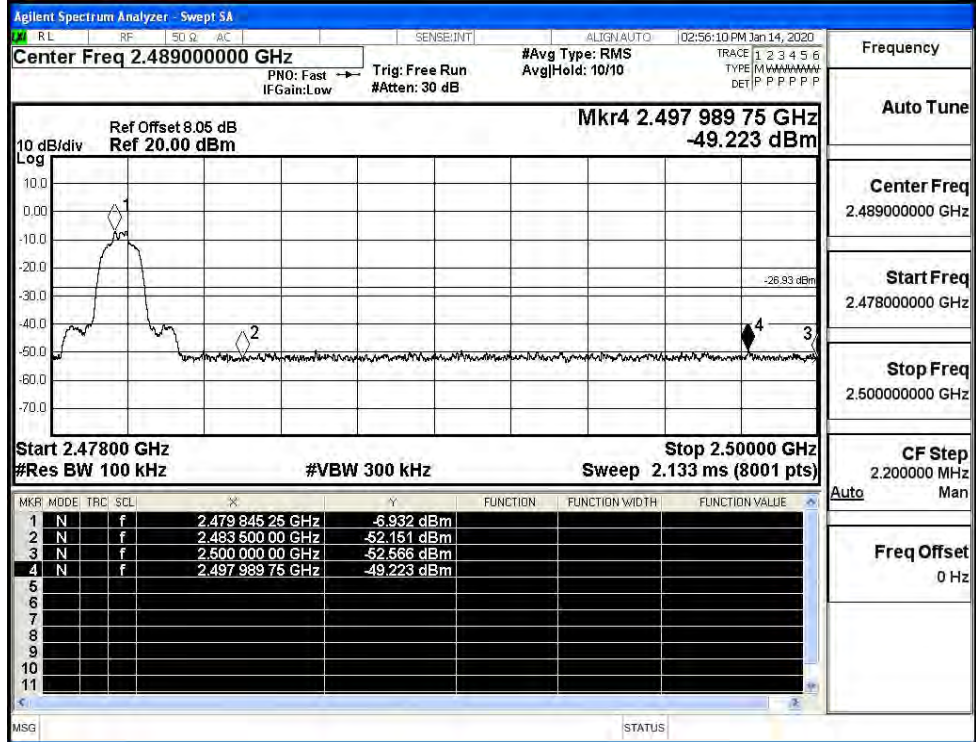
$\pi/4$ DQPSK/LCH/No
Hop



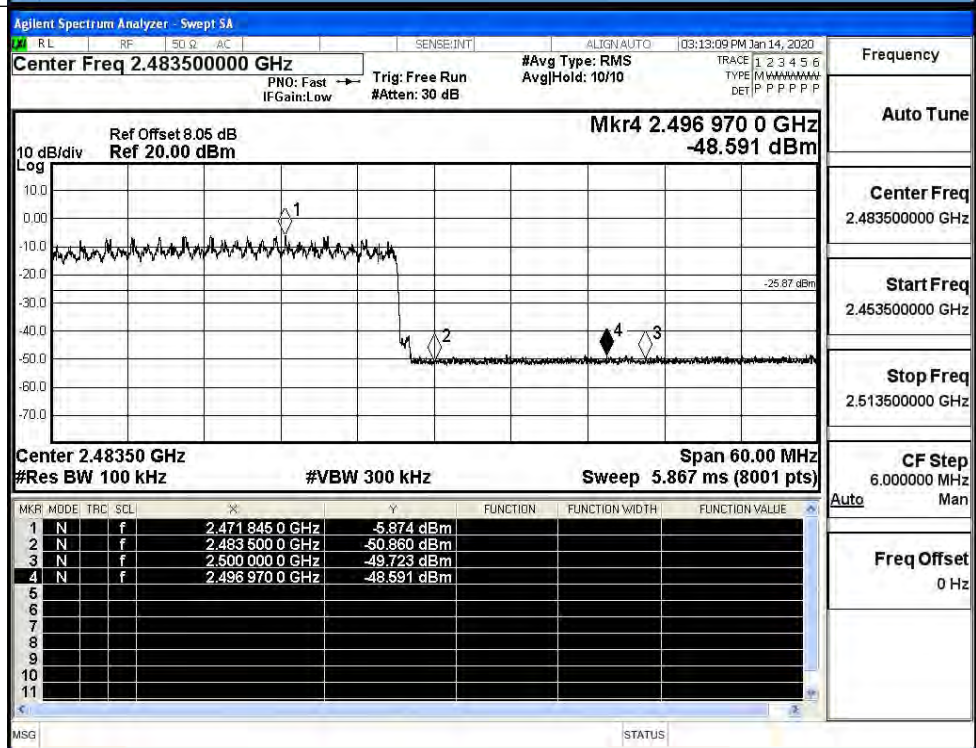
$\pi/4$ DQPSK/LCH/Hop



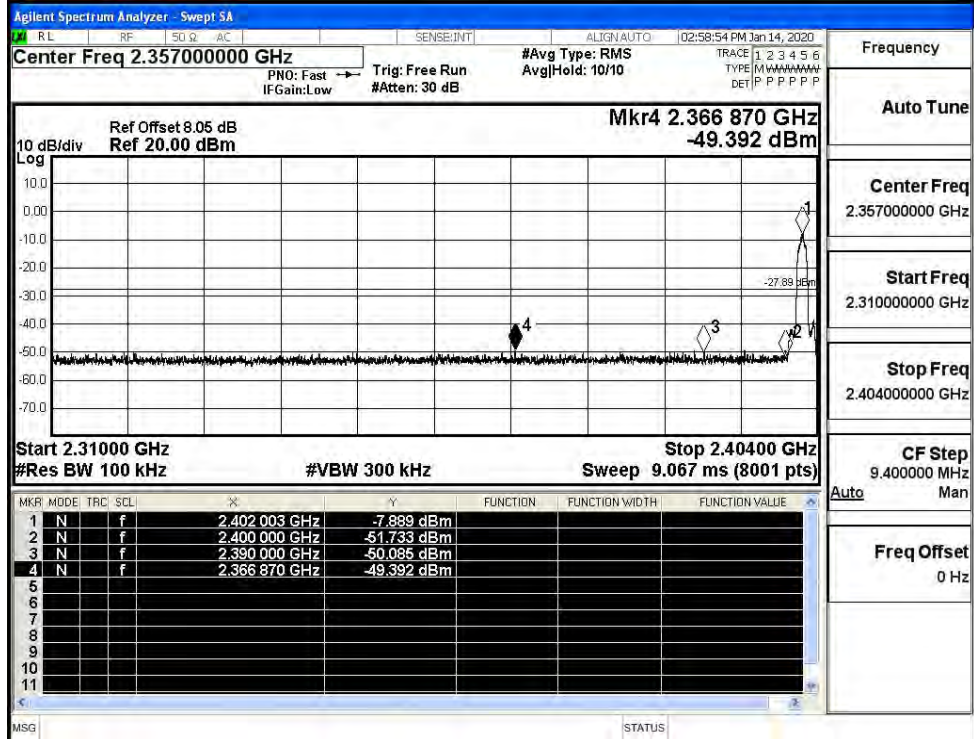
π /4DQPSK/HCH/No
Hop



π /4DQPSK/HCH/Hop

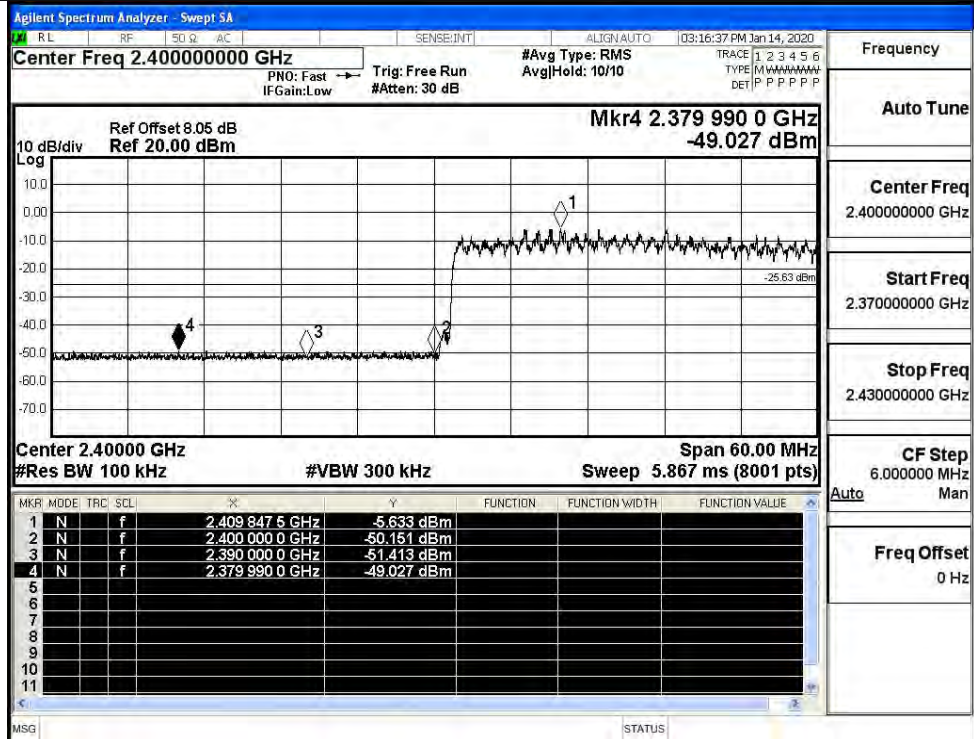


8DPSK/LCH/No Hop



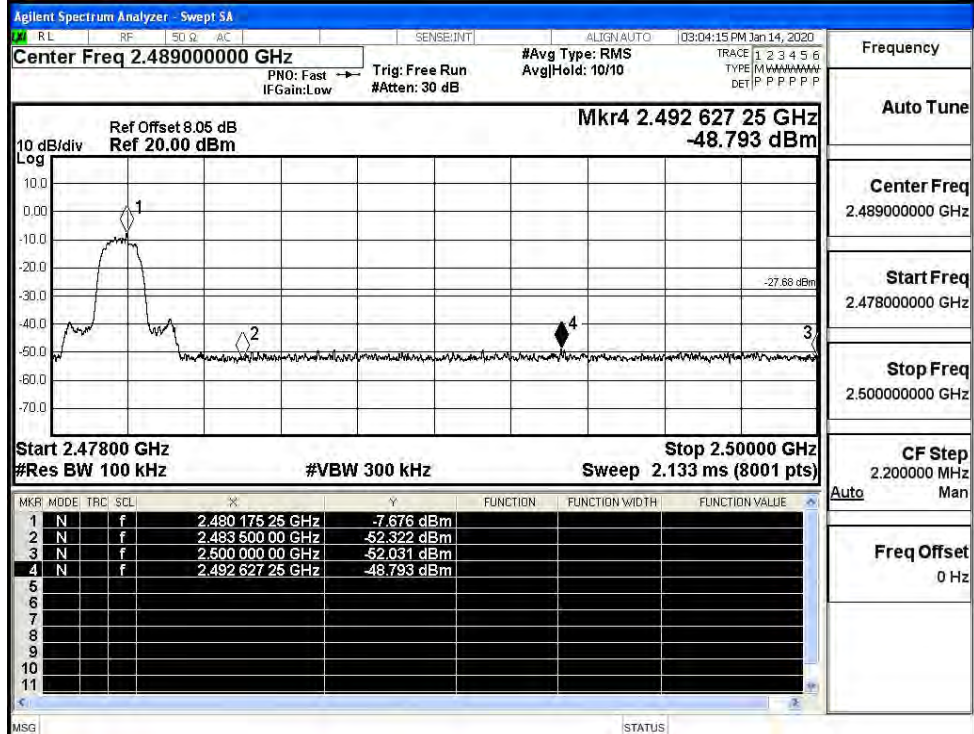
Frequency	
Auto Tune	
Center Freq	2.357000000 GHz
Start Freq	2.310000000 GHz
Stop Freq	2.404000000 GHz
CF Step	9.400000 MHz
Auto	Man
Freq Offset	0 Hz

8DPSK/LCH/Hop

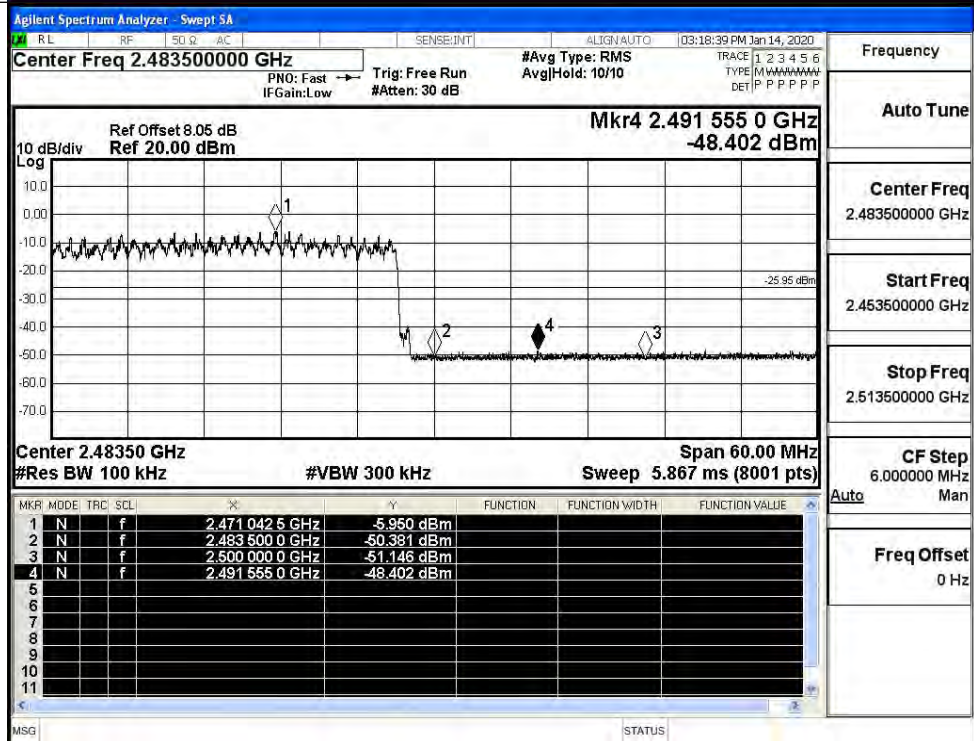


Frequency	
Auto Tune	
Center Freq	2.400000000 GHz
Start Freq	2.370000000 GHz
Stop Freq	2.430000000 GHz
CF Step	6.000000 MHz
Auto	Man
Freq Offset	0 Hz

8DPSK/HCH/No Hop



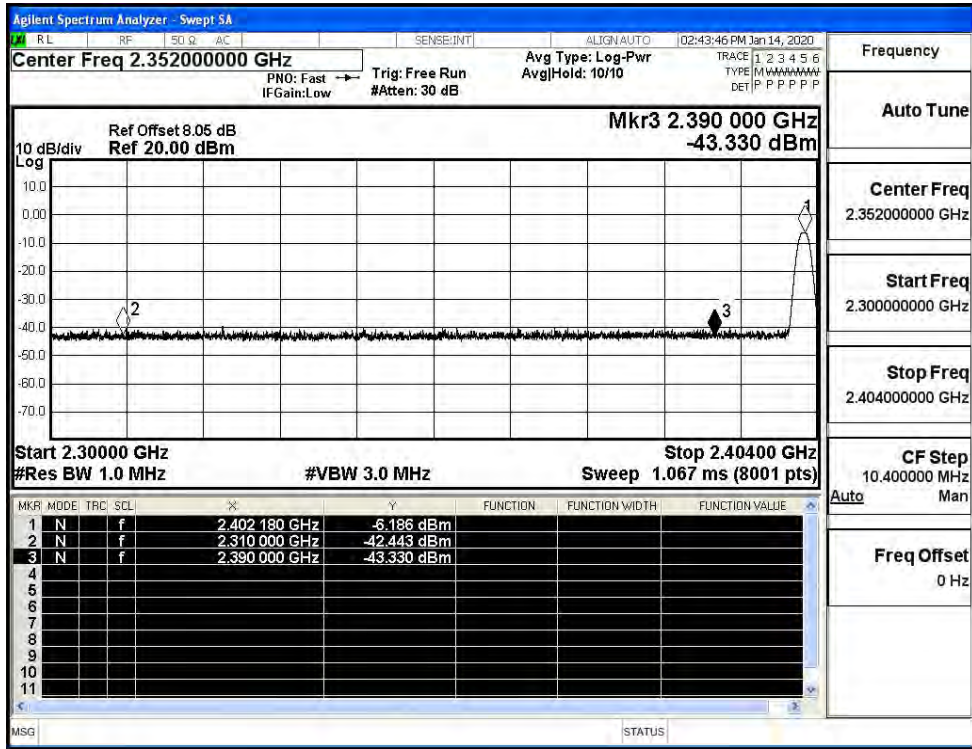
8DPSK/HCH/Hop



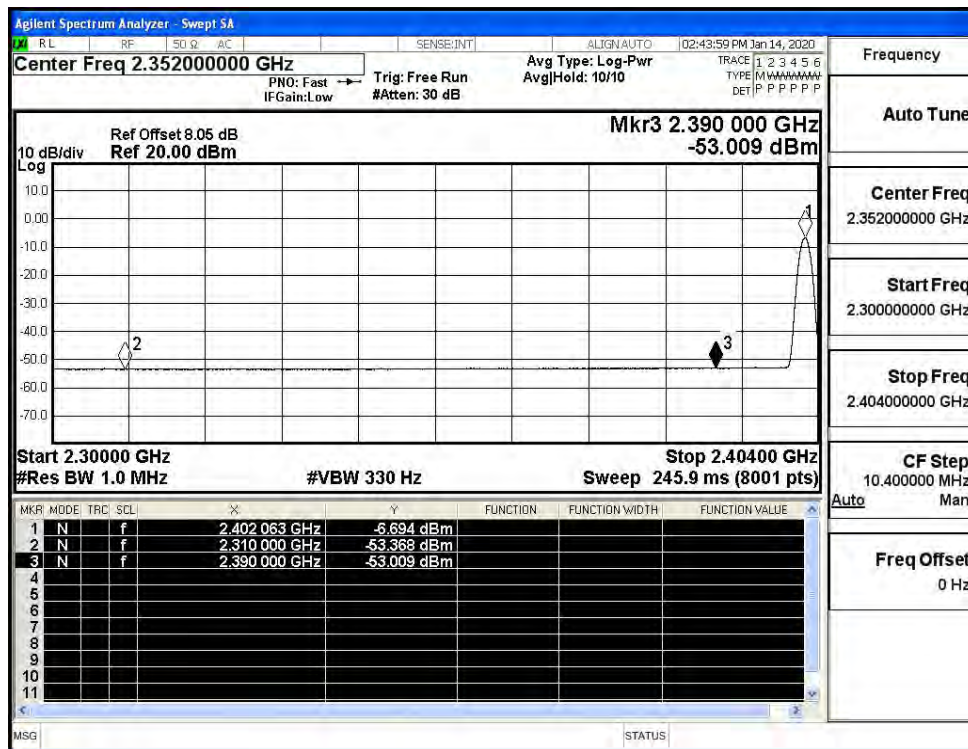
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-42.44	2.0	0	54.79	PEAK	74	PASS
	Off	2310.0	-53.37	2.0	0	43.86	AV	54	PASS
	Off	2390.0	-43.33	2.0	0	53.9	PEAK	74	PASS
	Off	2390.0	-53.01	2.0	0	44.22	AV	54	PASS
	Off	2483.5	-42.85	2.0	0	54.38	PEAK	74	PASS
	Off	2483.5	-52.55	2.0	0	40.68	AV	54	PASS
	Off	2500.0	-40.54	2.0	0	56.69	PEAK	74	PASS
	Off	2500.0	-52.38	2.0	0	44.85	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.09	2.0	0	54.14	PEAK	74	PASS
	Off	2310.0	-53.43	2.0	0	43.8	AV	54	PASS
	Off	2390.0	-40.55	2.0	0	56.68	PEAK	74	PASS
	Off	2390.0	-53.04	2.0	0	44.19	AV	54	PASS
	Off	2483.5	-42.02	2.0	0	55.21	PEAK	74	PASS
	Off	2483.5	-52.57	2.0	0	40.66	AV	54	PASS
	Off	2500.0	-41.10	2.0	0	56.13	PEAK	74	PASS
	Off	2500.0	-52.33	2.0	0	44.9	AV	54	PASS
8DPSK	Off	2310.0	-43.23	2.0	0	54	PEAK	74	PASS
	Off	2310.0	-53.39	2.0	0	43.84	AV	54	PASS
	Off	2390.0	-42.36	2.0	0	54.87	PEAK	74	PASS
	Off	2390.0	-52.93	2.0	0	44.3	AV	54	PASS
	Off	2483.5	-42.96	2.0	0	54.27	PEAK	74	PASS
	Off	2483.5	-52.59	2.0	0	40.64	AV	54	PASS
	Off	2500.0	-42.47	2.0	0	54.76	PEAK	74	PASS
	Off	2500.0	-52.35	2.0	0	44.88	AV	54	PASS

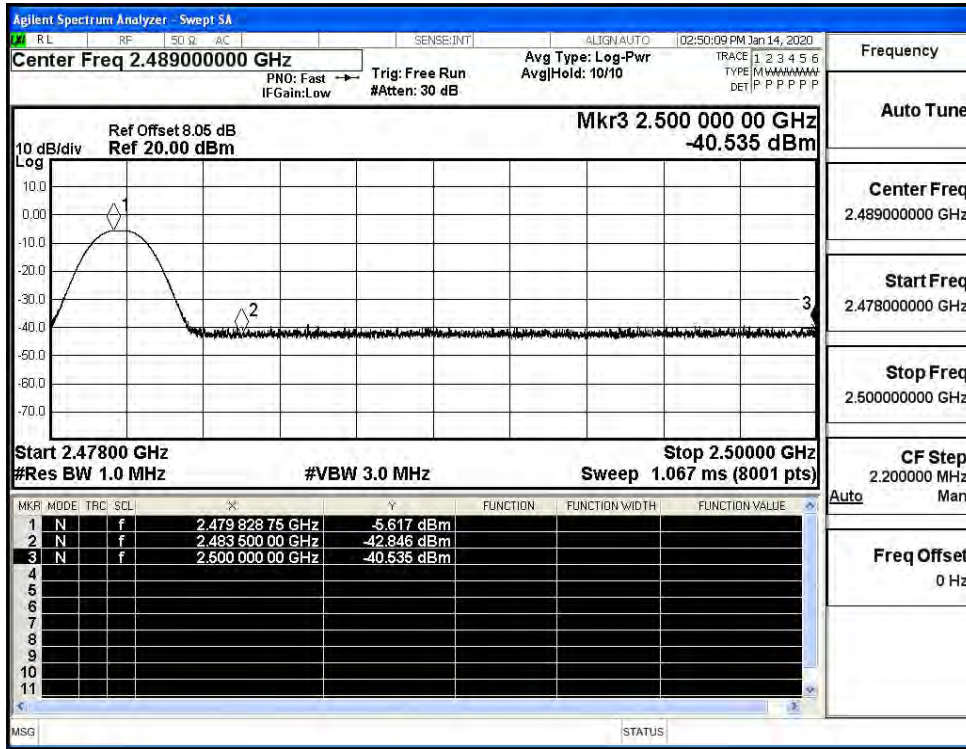
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



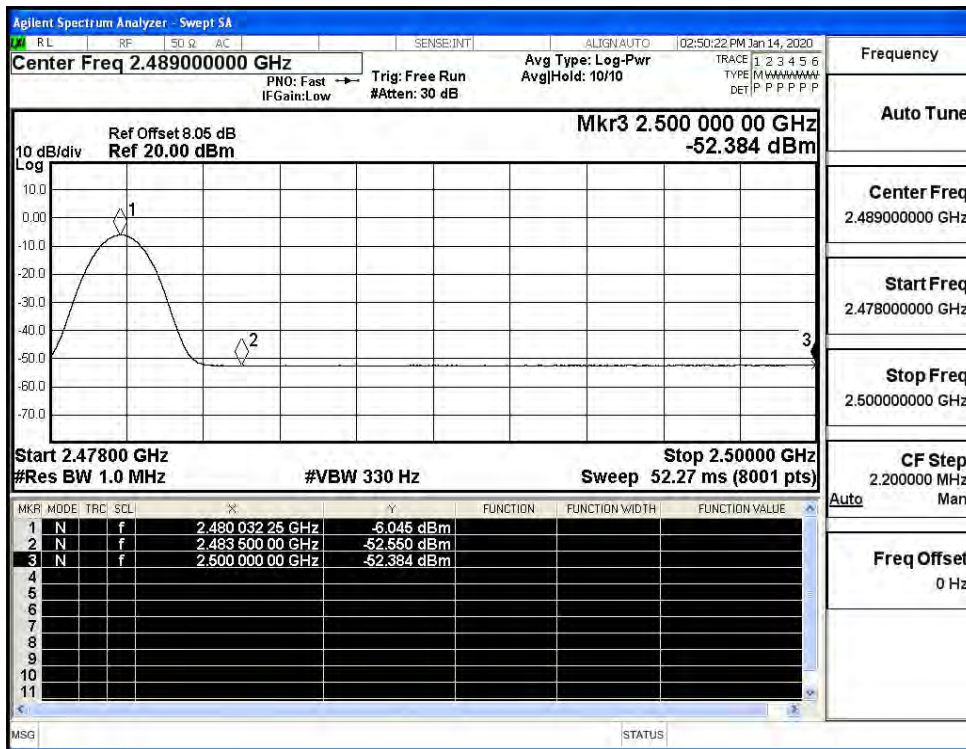
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



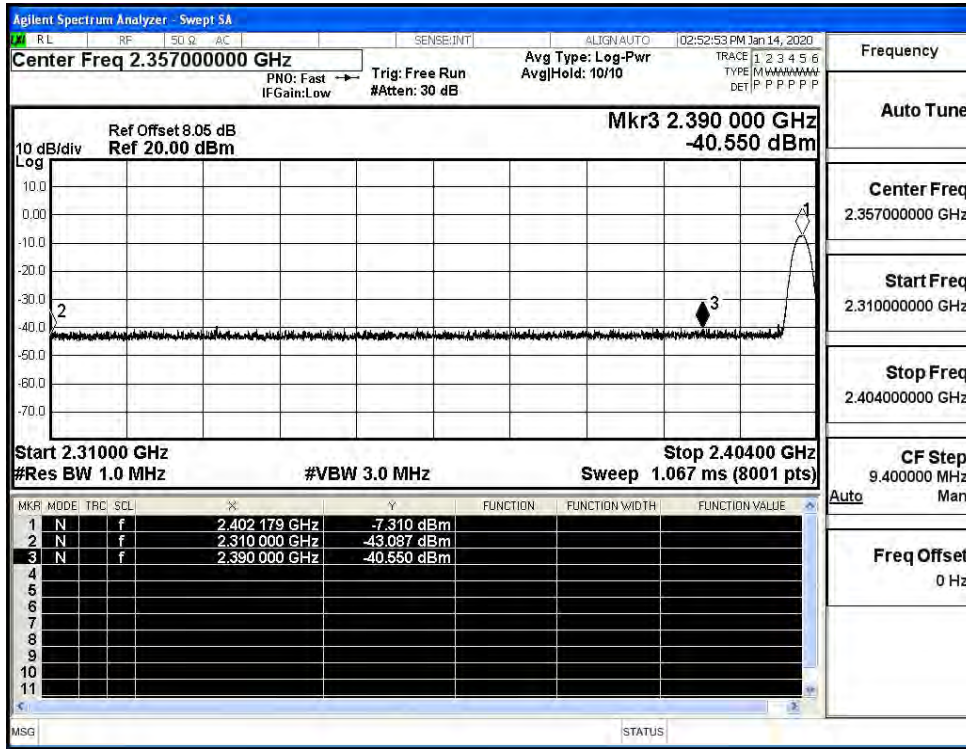
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



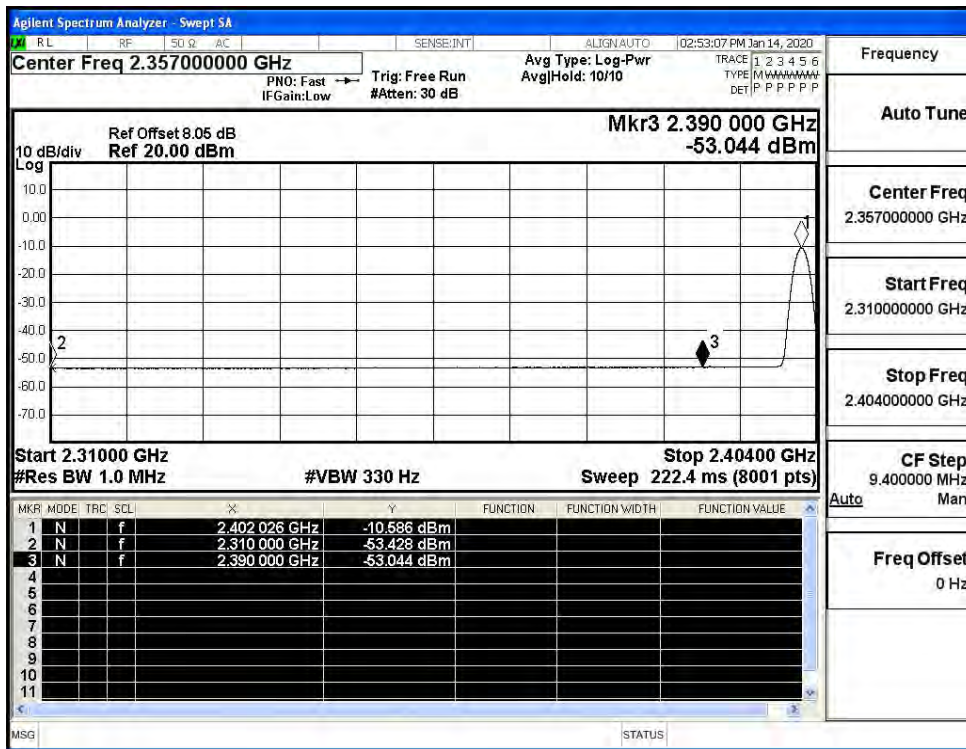
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



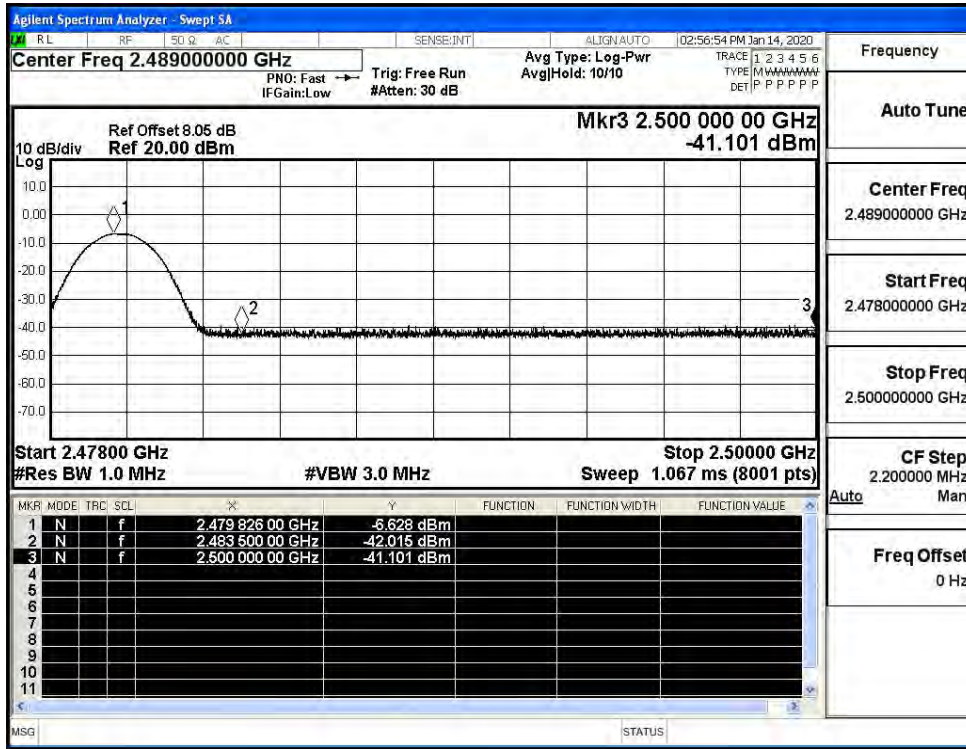
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



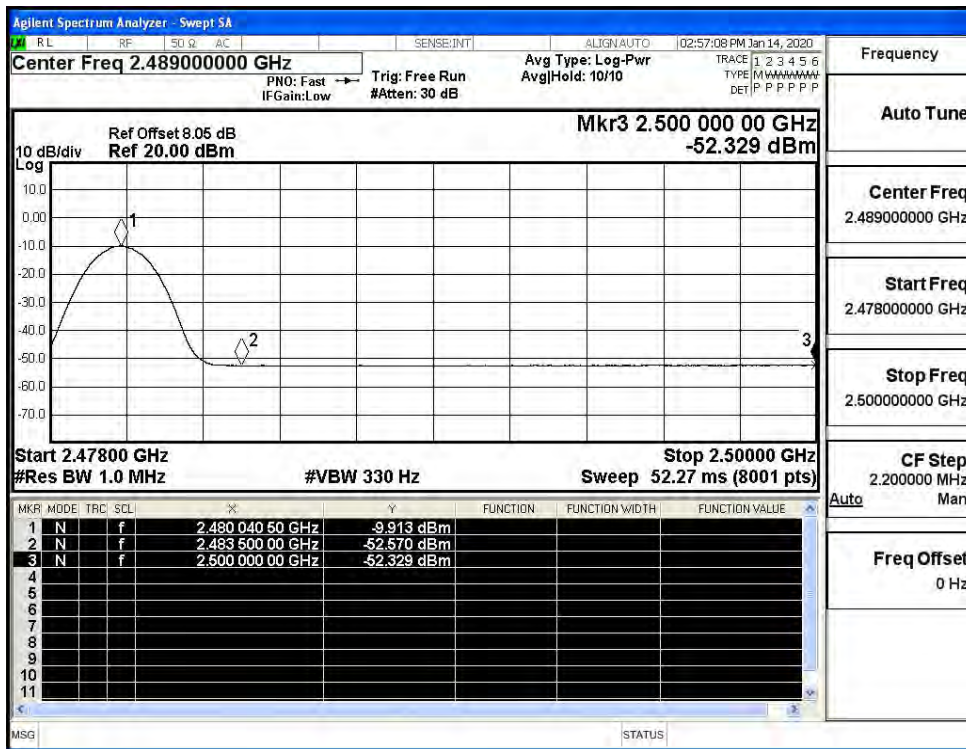
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



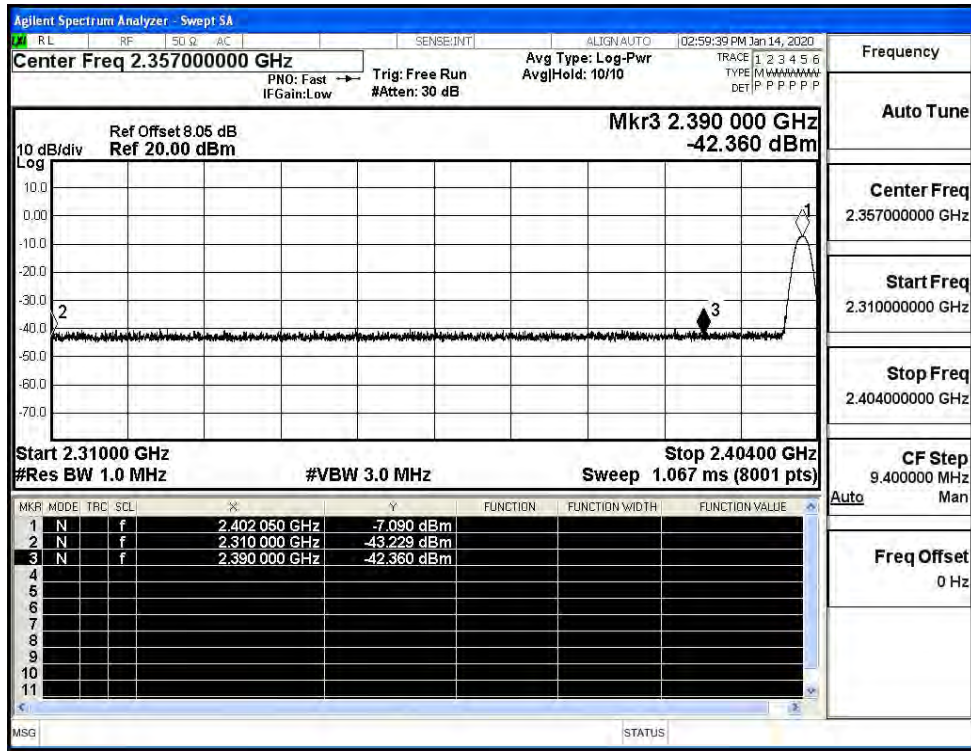
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



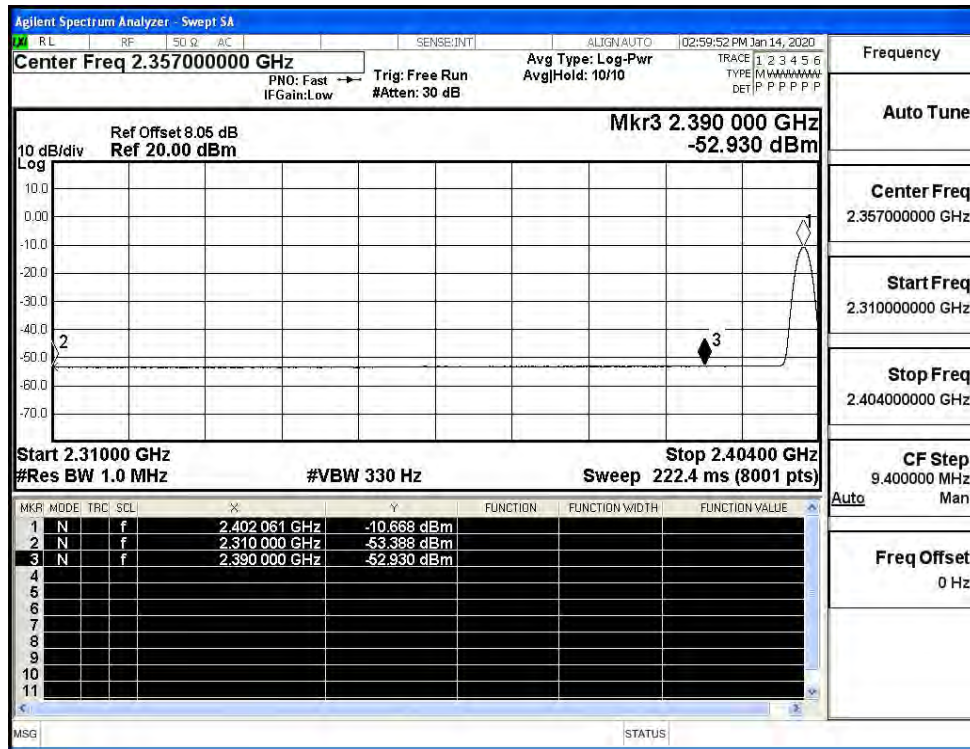
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



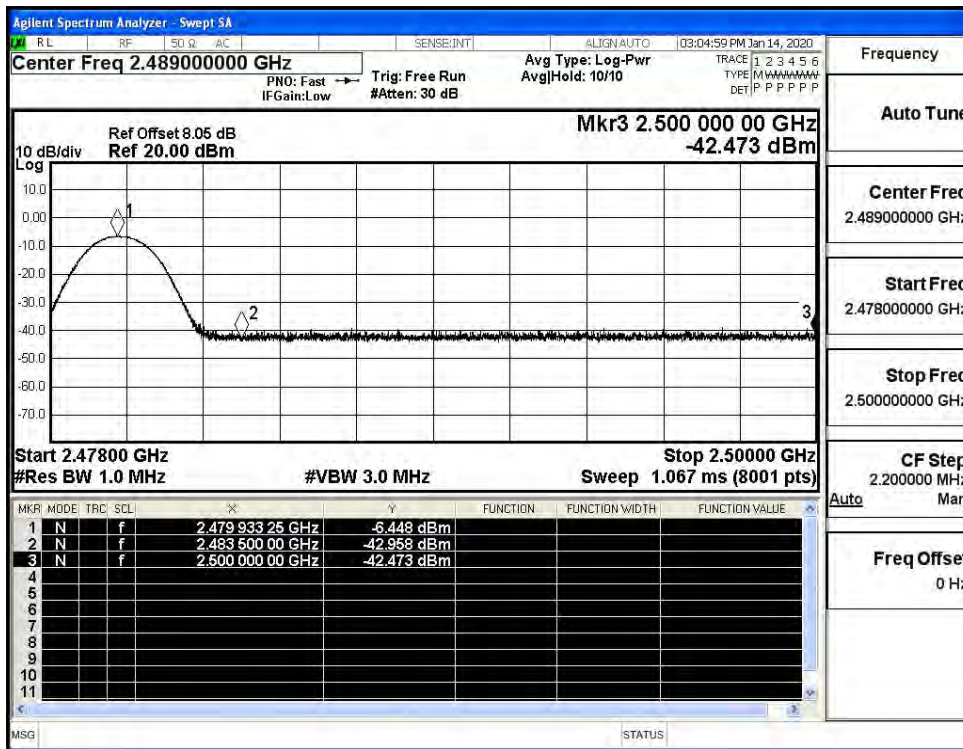
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

