

Appendix A

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

Product Name: WIRELESS EARBUDS W/MIC

Trade Mark: N/A

Test Model: K20-BT

Environmental Conditions

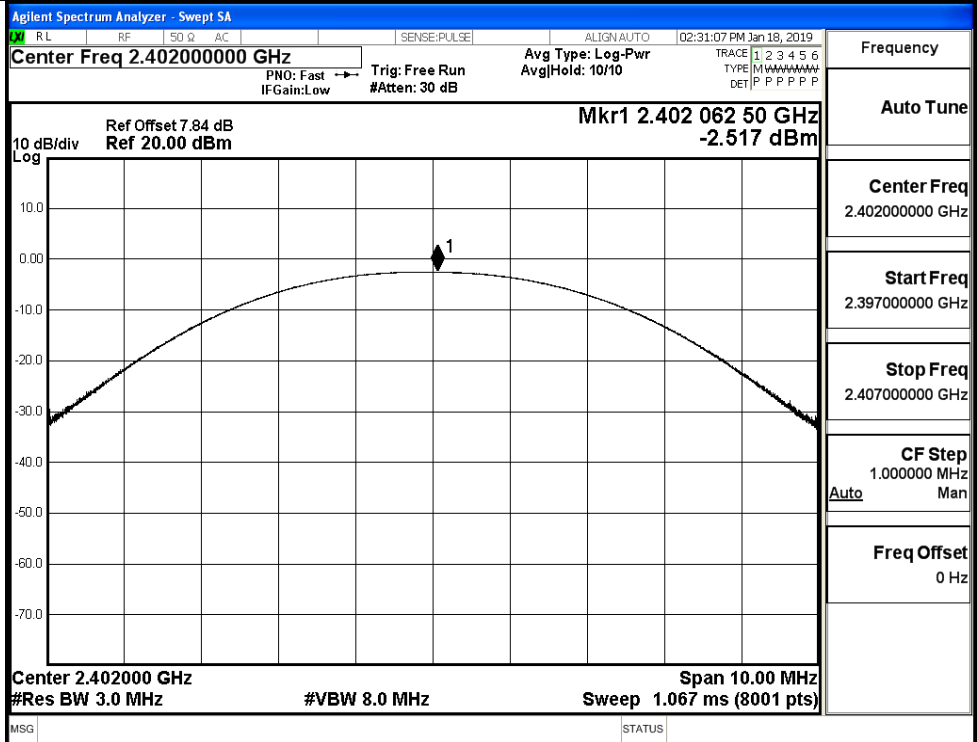
Temperature:	24.1 ° C
Relative Humidity:	54.6%
ATM Pressure:	100.0 kPa
Test Engineer:	David.Luo
Supervised by:	Jayden.Zhuo

A.1 Maximum Conducted Peak Output Power

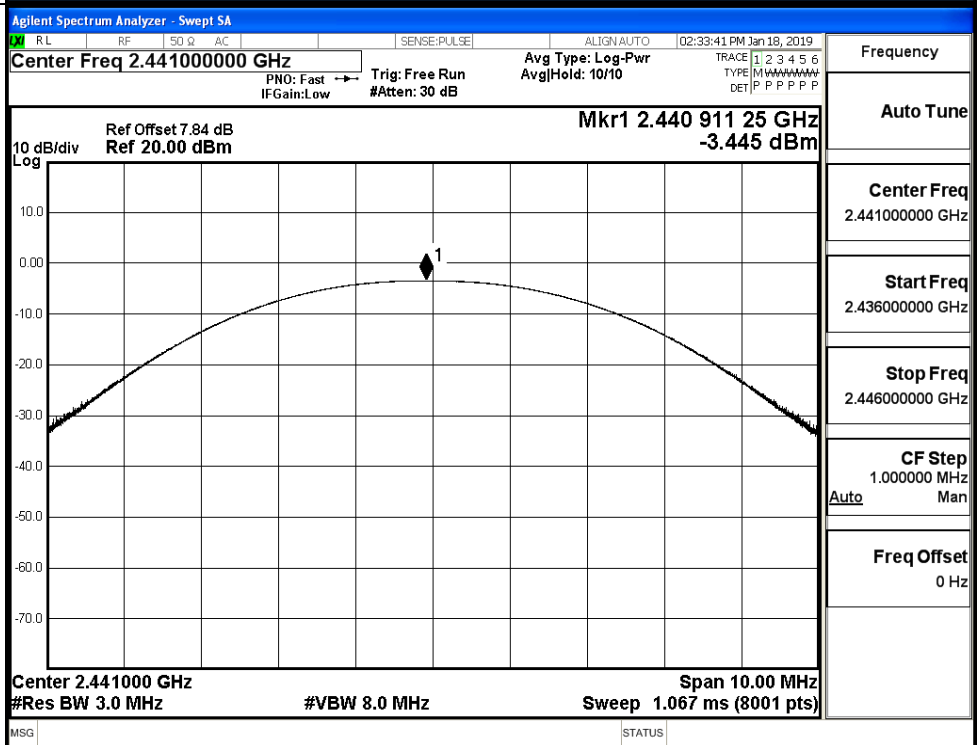
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-2.517	21	PASS
	MCH	-3.445	21	PASS
	HCH	-4.663	21	PASS
$\pi/4$ DQPSK	LCH	-0.317	21	PASS
	MCH	-1.267	21	PASS
	HCH	-2.585	21	PASS
8DPSK	LCH	0.268	21	PASS
	MCH	-0.673	21	PASS
	HCH	-2.005	21	PASS

Test Graphs

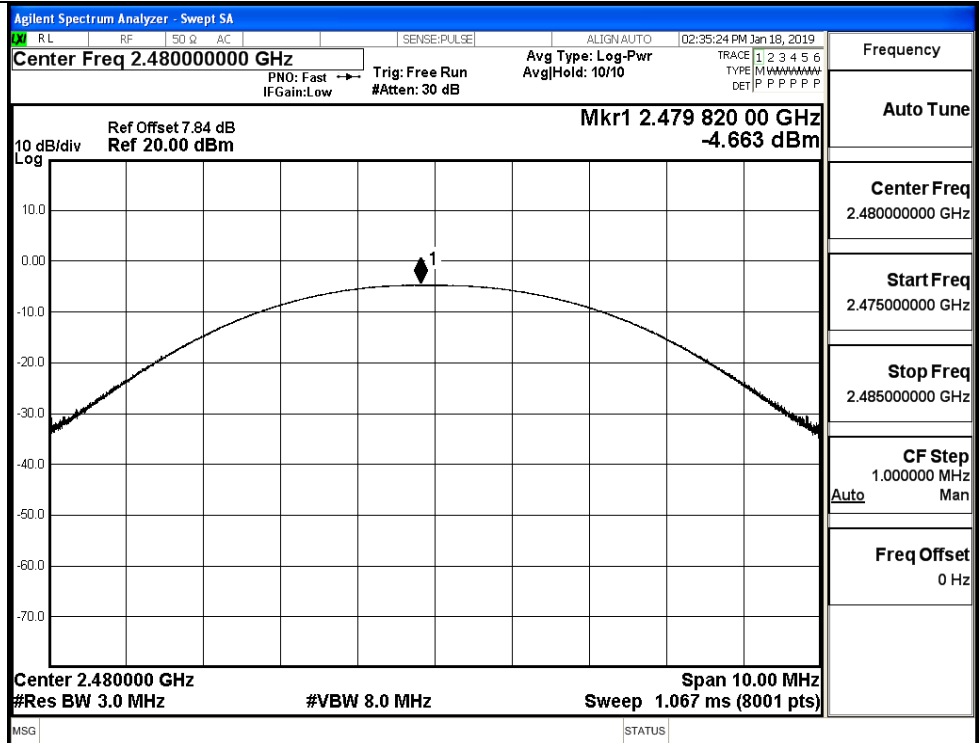
GFSK/LCH



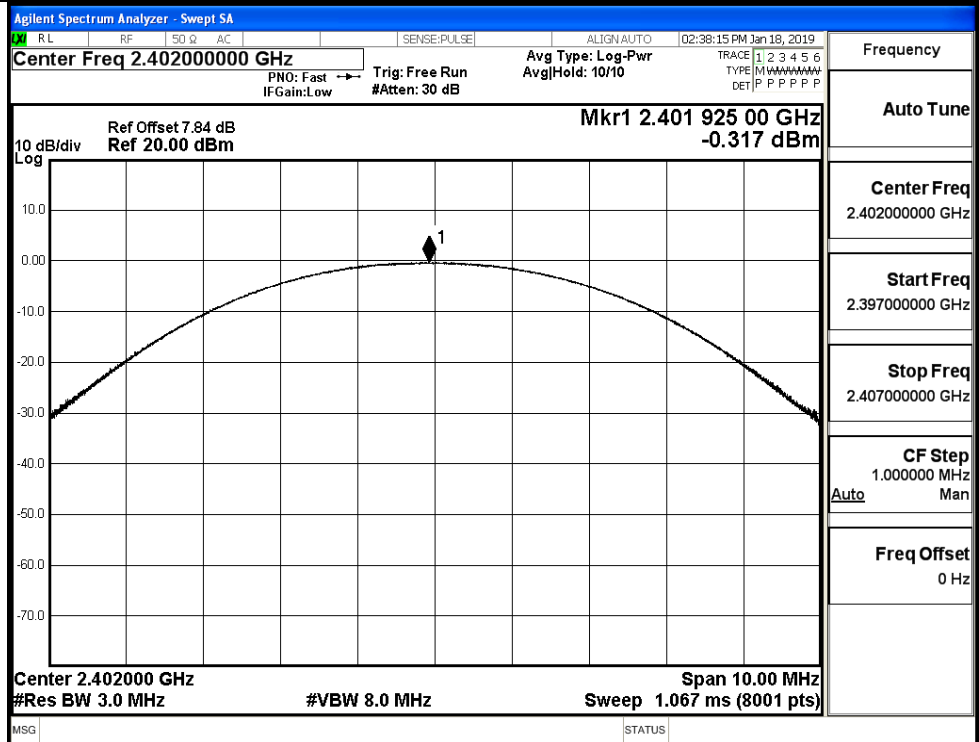
GFSK/MCH



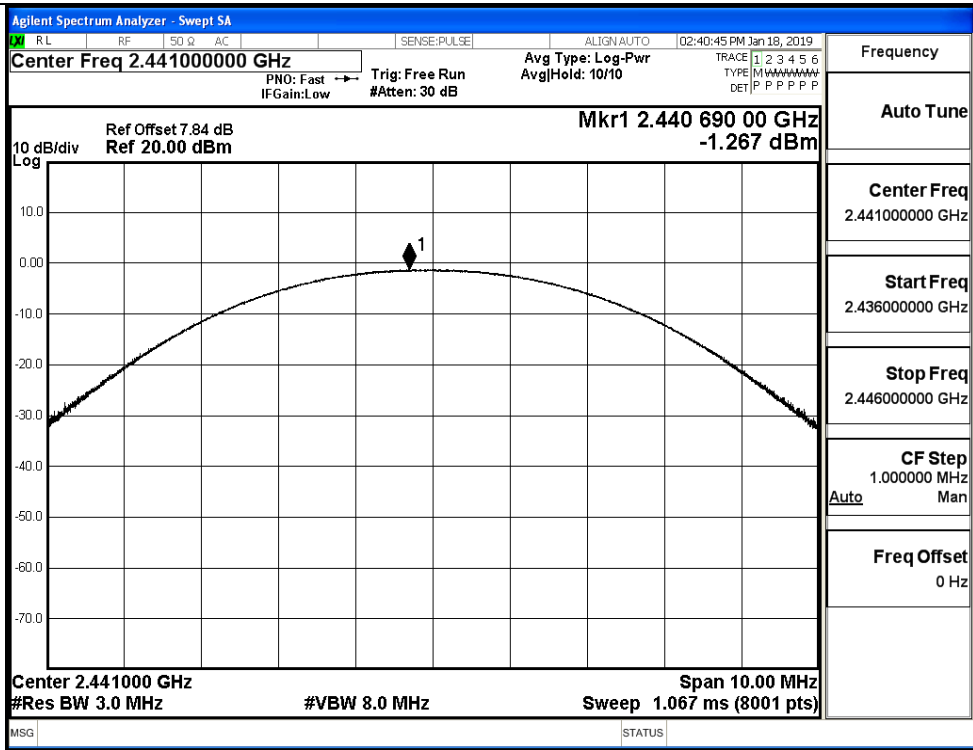
GFSK/HCH



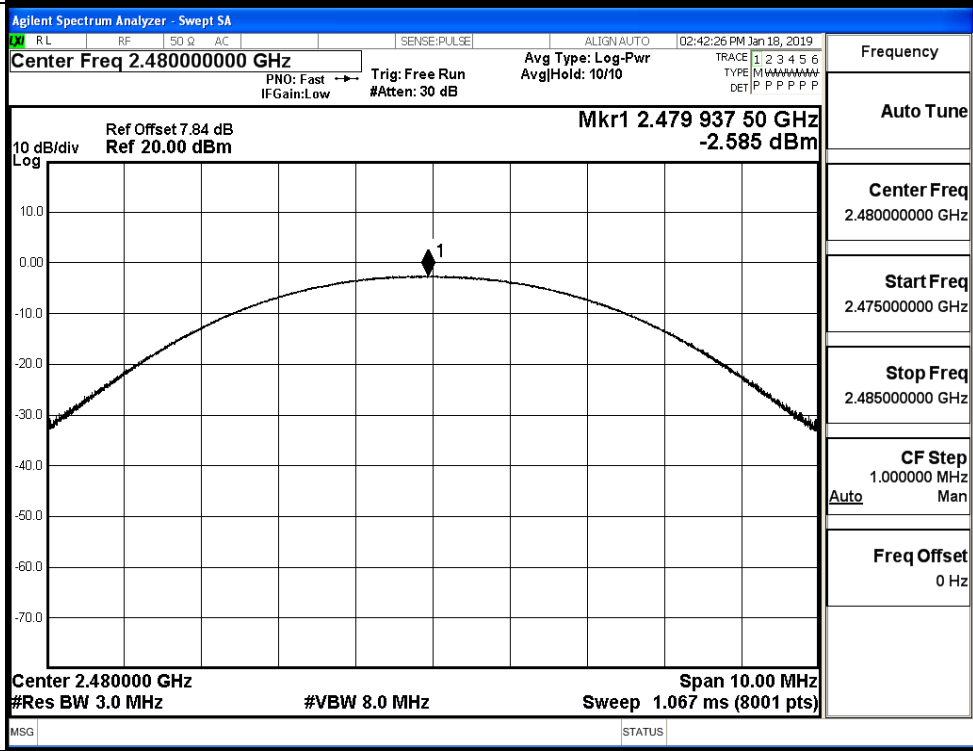
π /4DQPSK/LCH



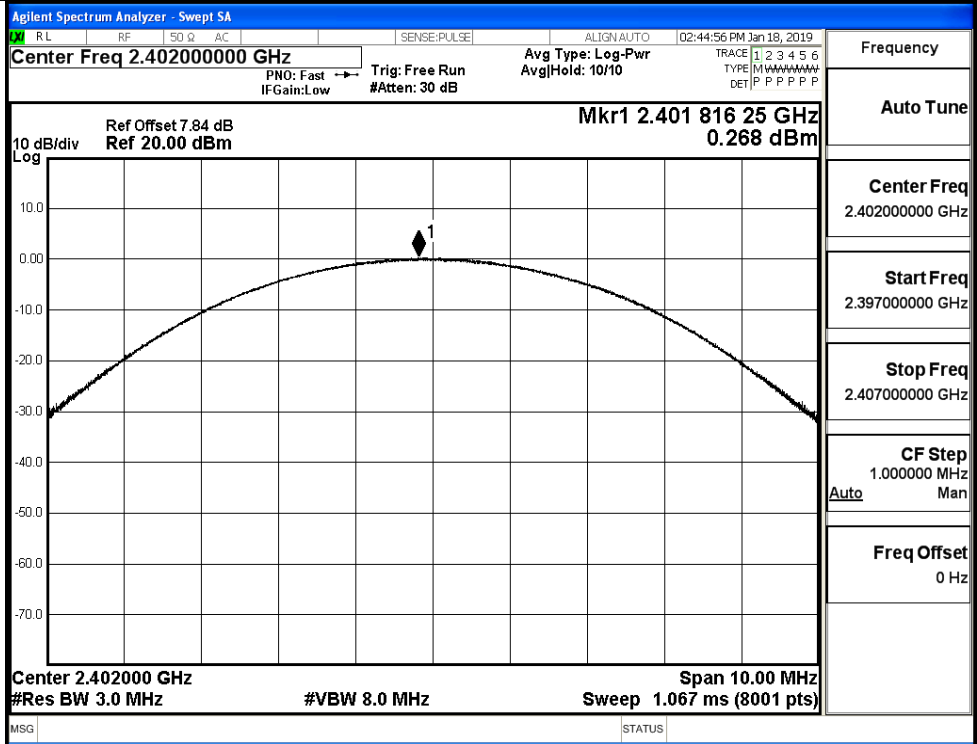
π /4DQPSK/MCH



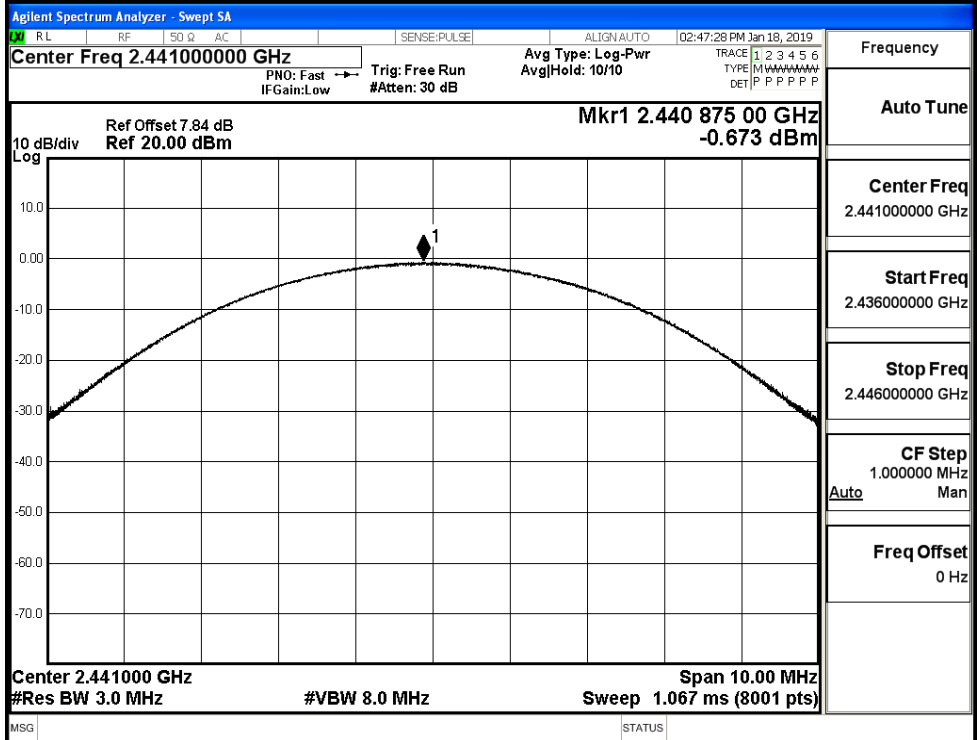
π /4DQPSK/HCH



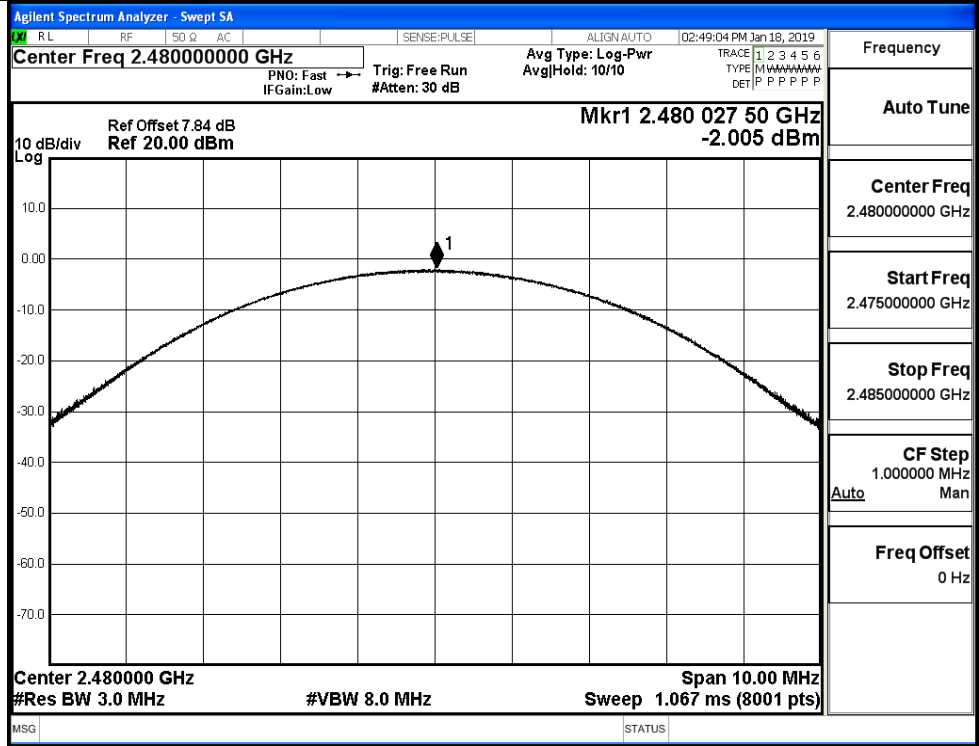
8DPSK/LCH



8DPSK/MCH

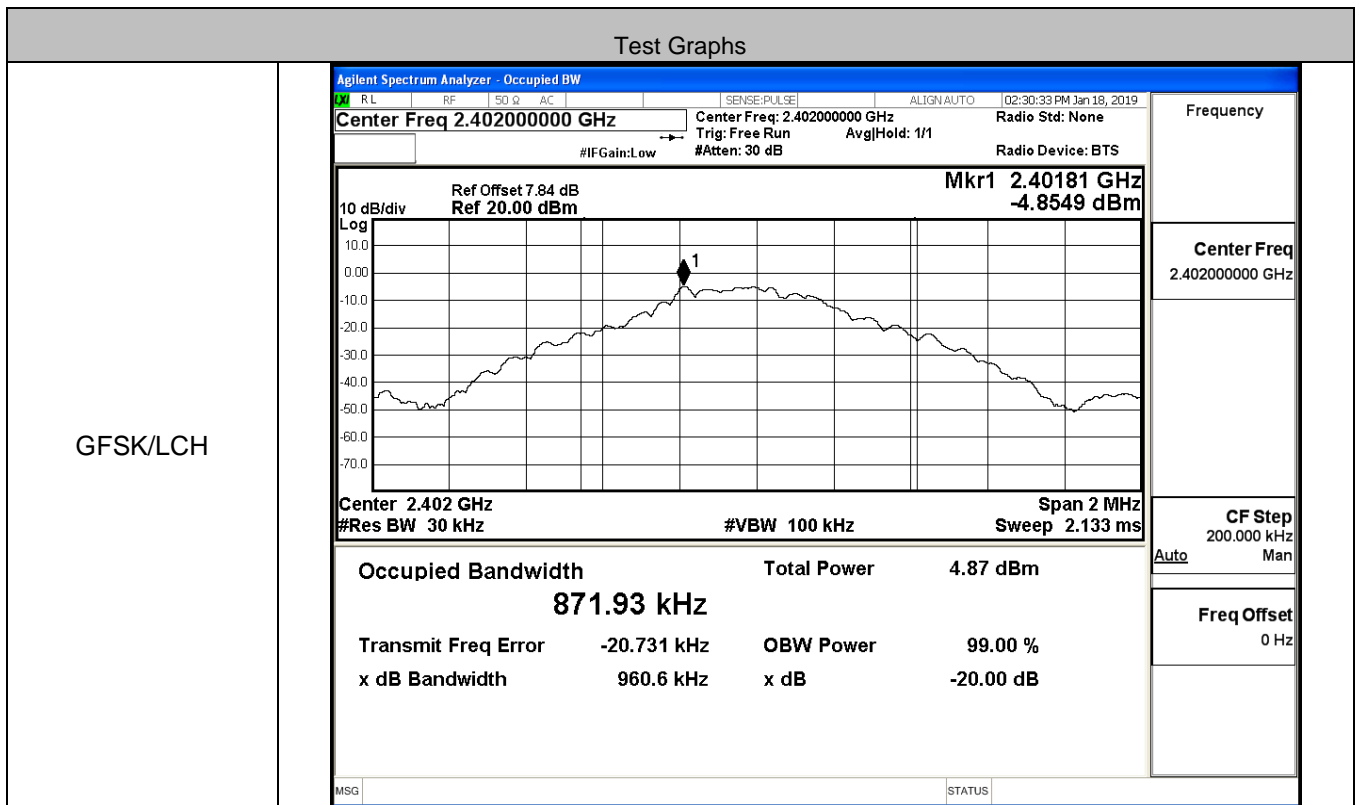


8DPSK/HCH

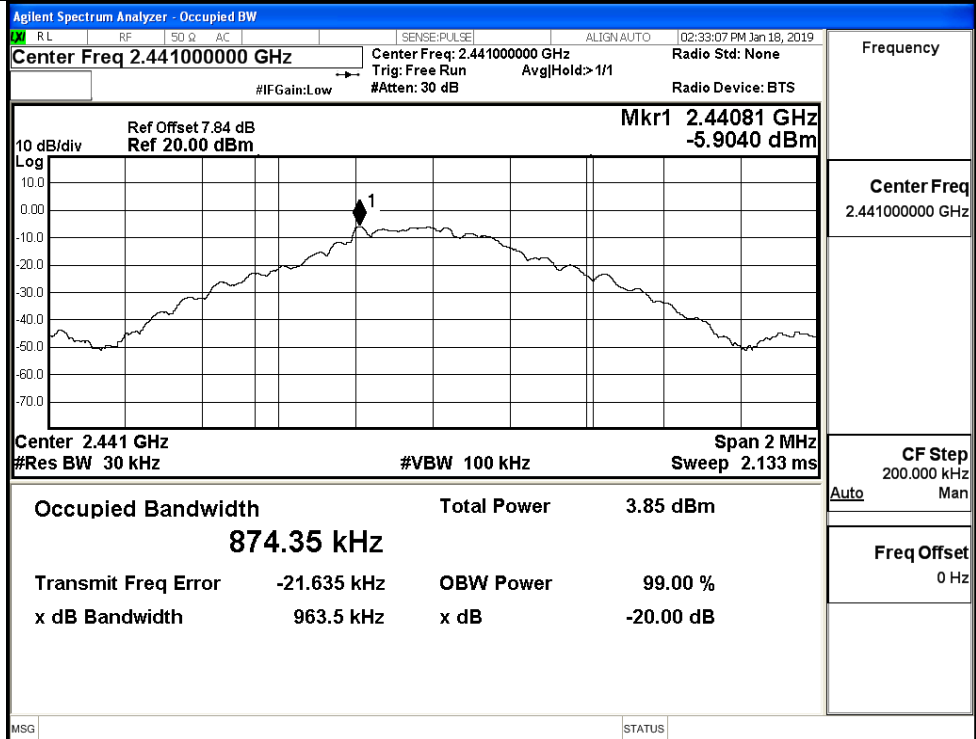


A.2 20dB Bandwidth

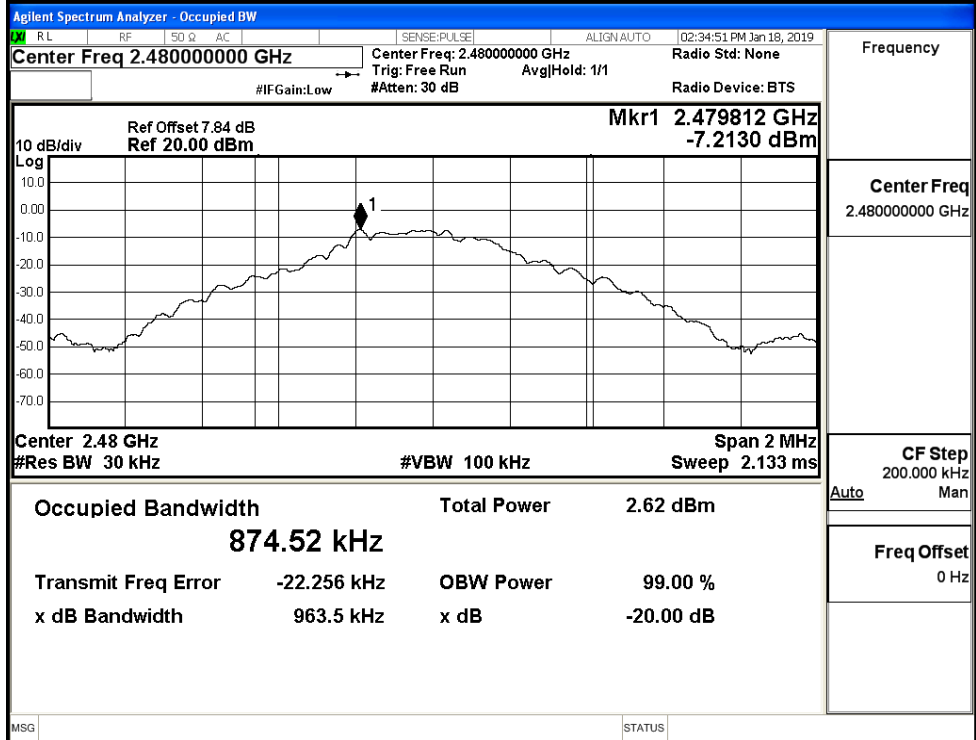
Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.87193	0.9606	Not Specified	PASS
	MCH	0.87435	0.9635	Not Specified	PASS
	HCH	0.87452	0.9635	Not Specified	PASS
π/4DQPSK	LCH	1.1612	1.279	Not Specified	PASS
	MCH	1.1615	1.281	Not Specified	PASS
	HCH	1.1610	1.282	Not Specified	PASS
8DPSK	LCH	1.1684	1.302	Not Specified	PASS
	MCH	1.1686	1.302	Not Specified	PASS
	HCH	1.1688	1.301	Not Specified	PASS



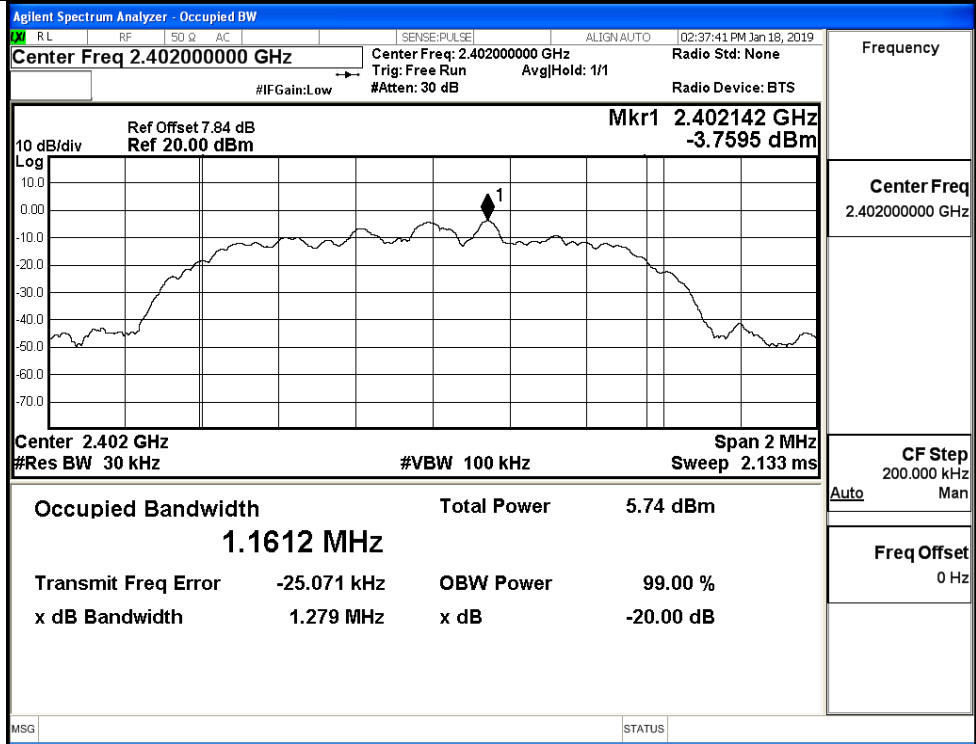
GFSK/MCH



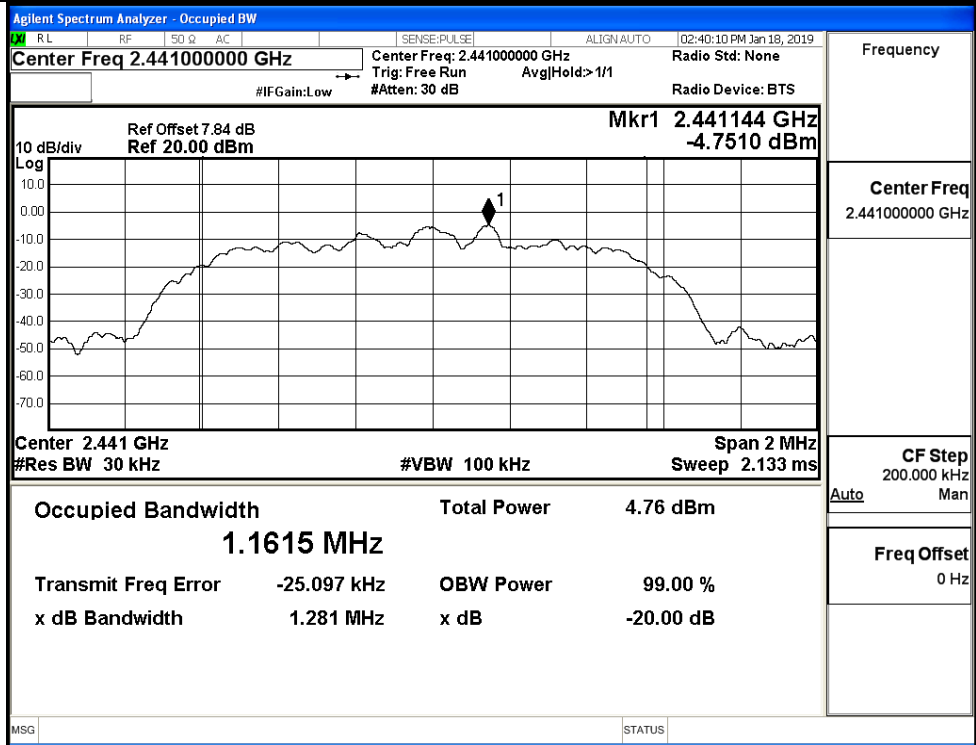
GFSK/HCH



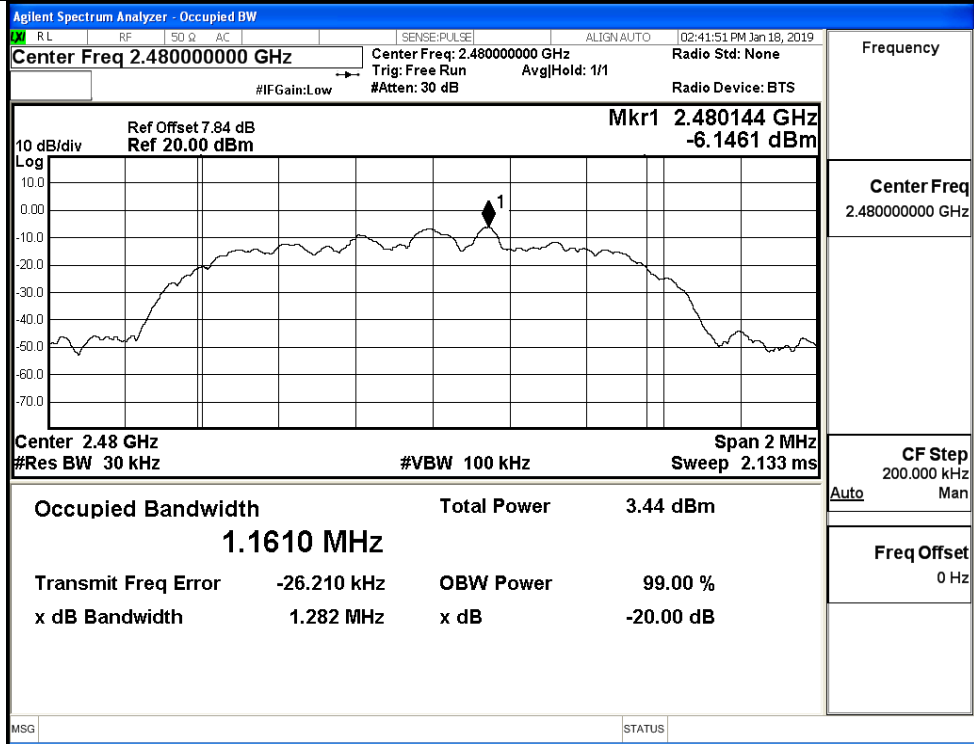
$\pi/4$ DQPSK/LCH



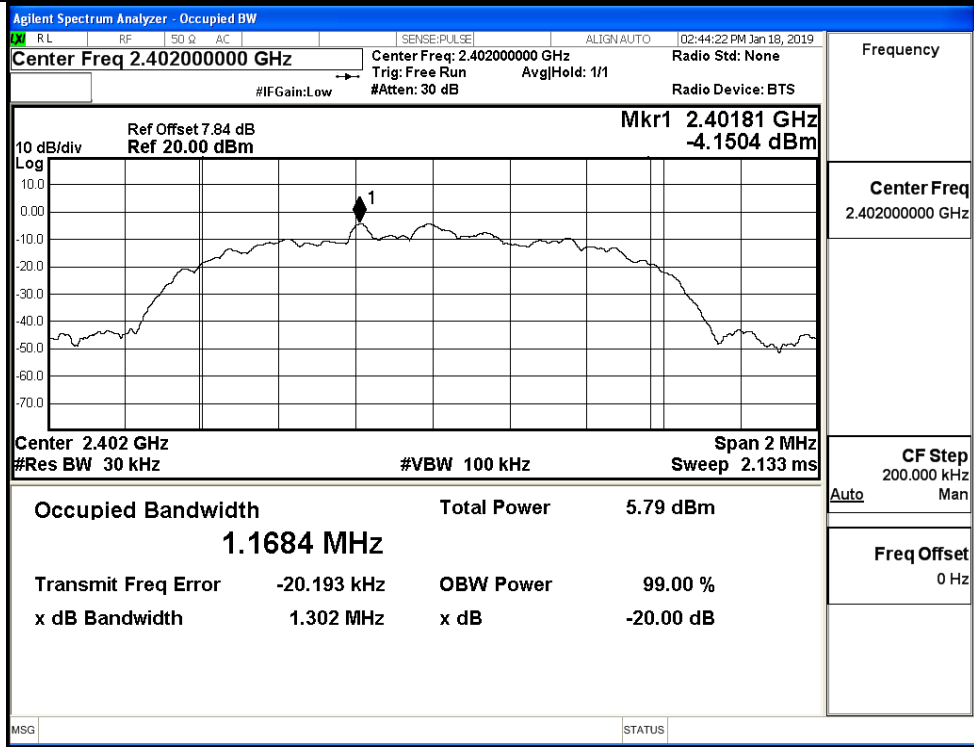
$\pi/4$ DQPSK/MCH



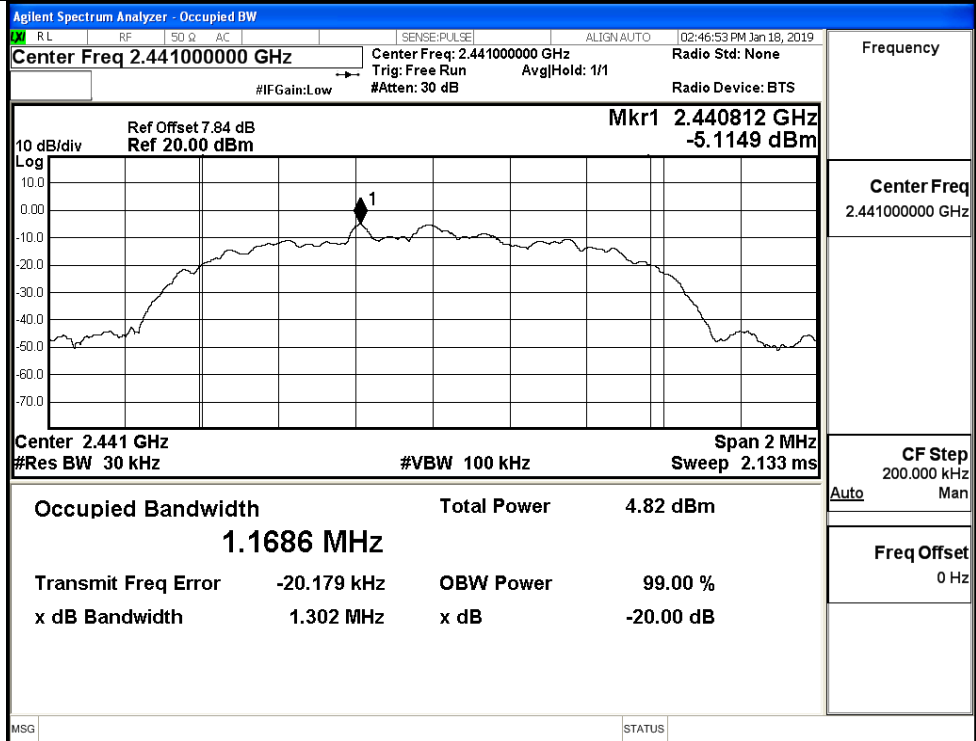
$\pi/4$ DQPSK/HCH



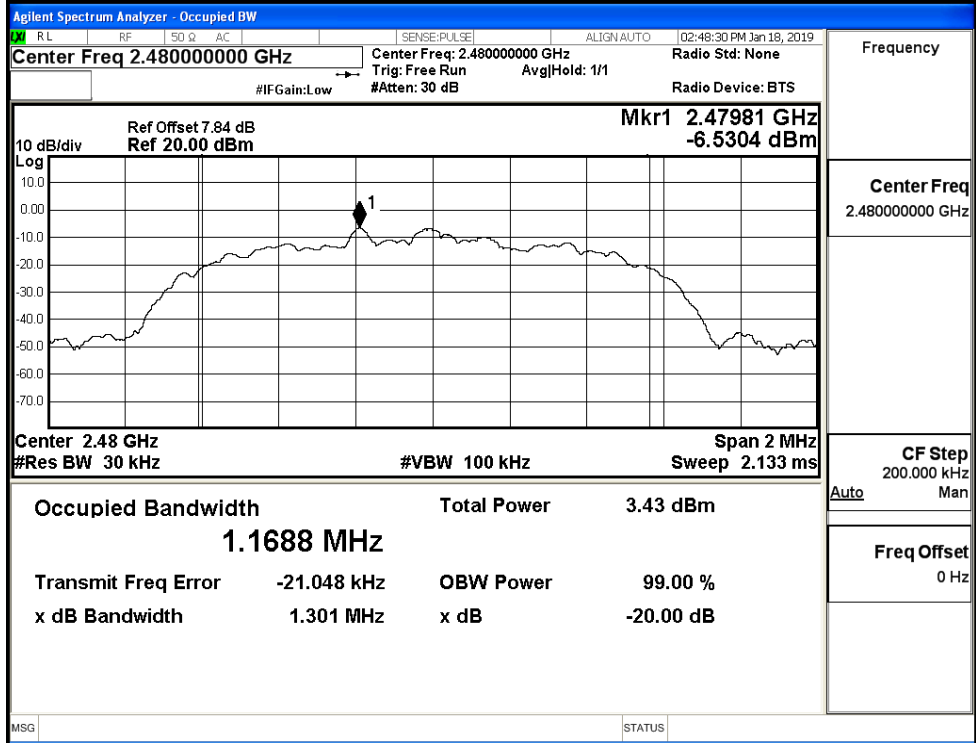
8DPSK/LCH



8DPSK/MCH

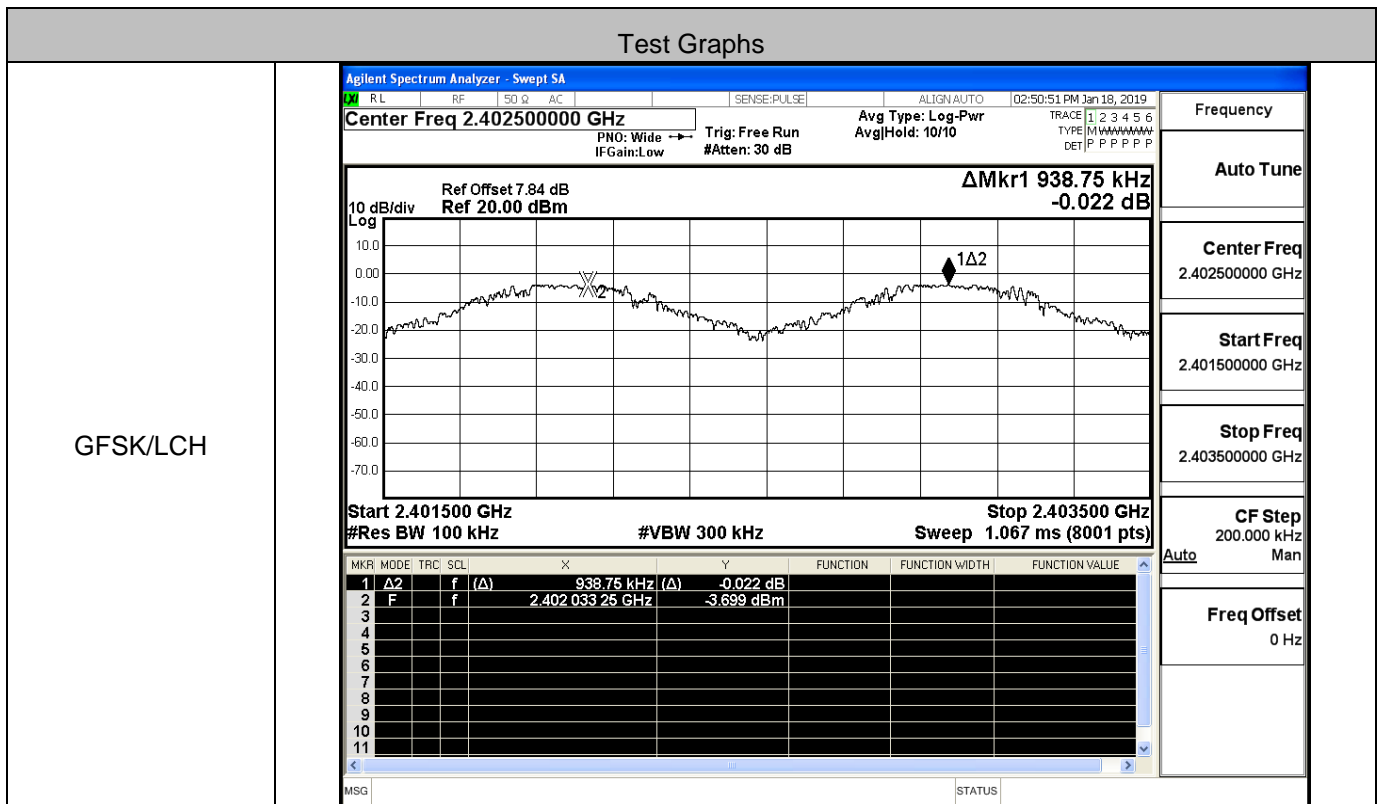


8DPSK/HCH

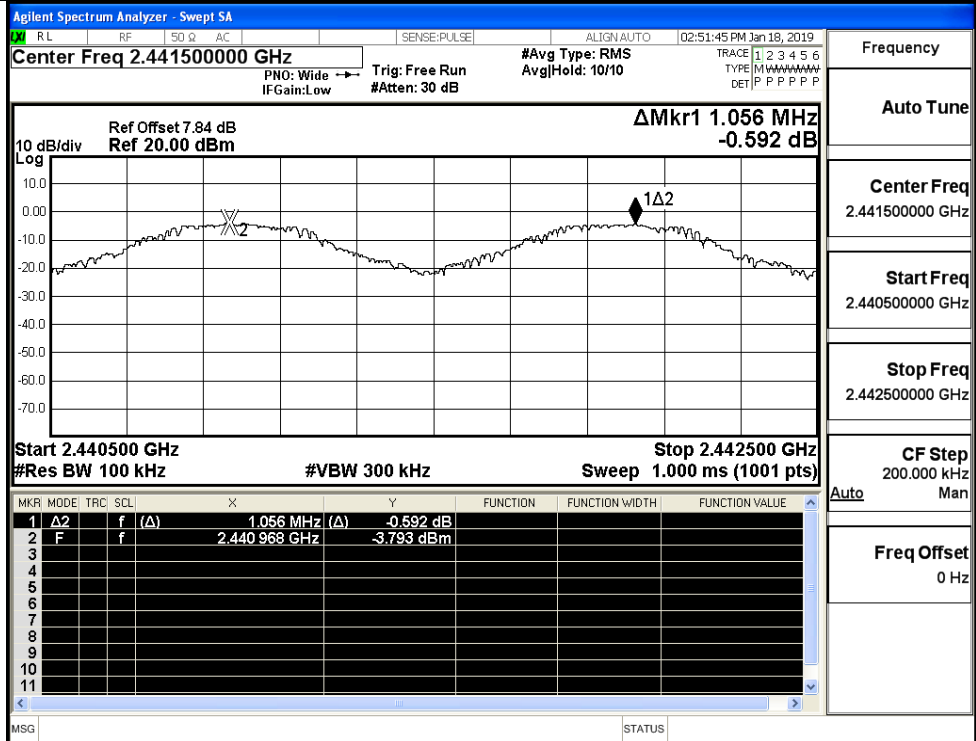


A.3 Carrier Frequency Separation

Mode	Channel	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.939	0.642	PASS
	MCH	1.056	0.642	PASS
	HCH	1.158	0.642	PASS
π/4DQPSK	LCH	0.988	0.855	PASS
	MCH	1.062	0.855	PASS
	HCH	1.002	0.855	PASS
8DPSK	LCH	0.992	0.868	PASS
	MCH	1.016	0.868	PASS
	HCH	1.074	0.868	PASS

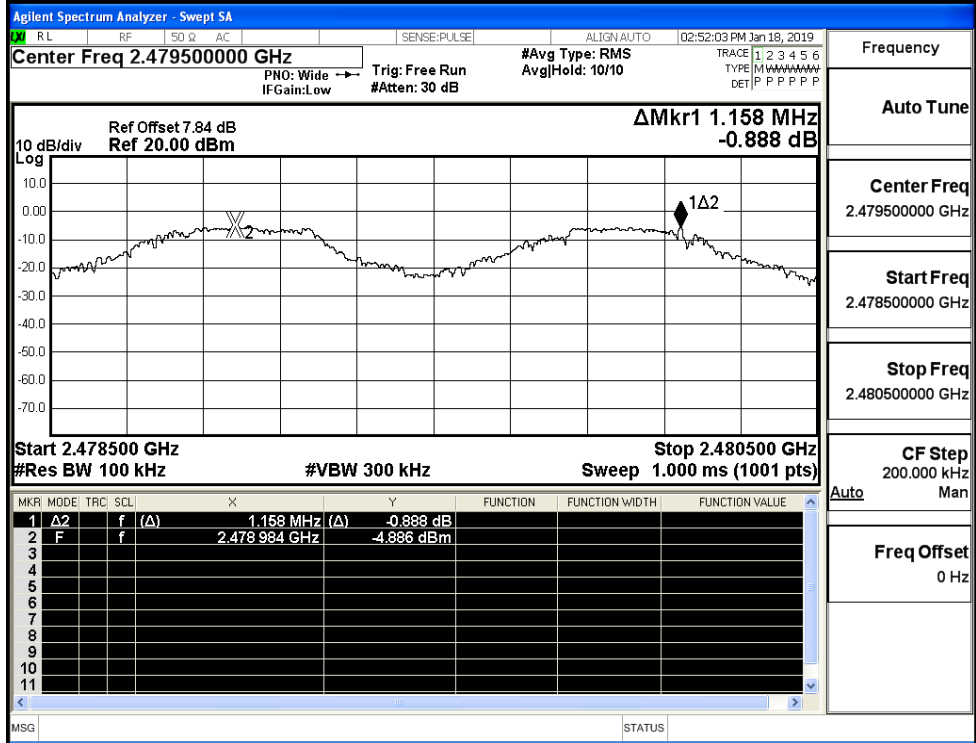


GFSK/MCH



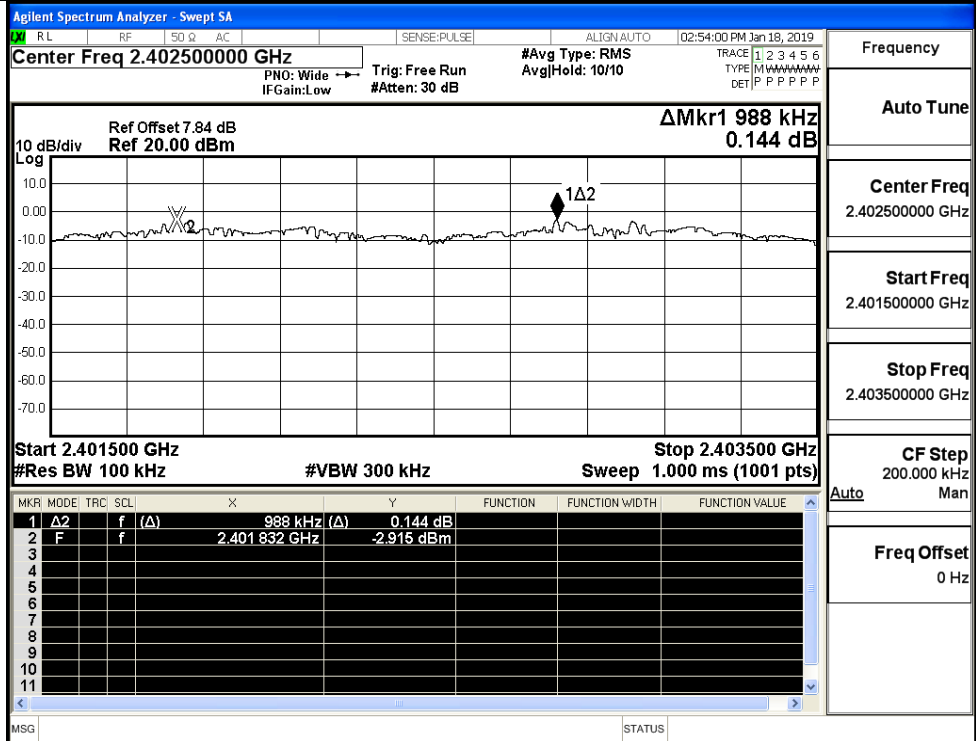
Frequency
Auto Tune
Center Freq
2.441500000 GHz
Start Freq
2.440500000 GHz
Stop Freq
2.442500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

GFSK/HCH

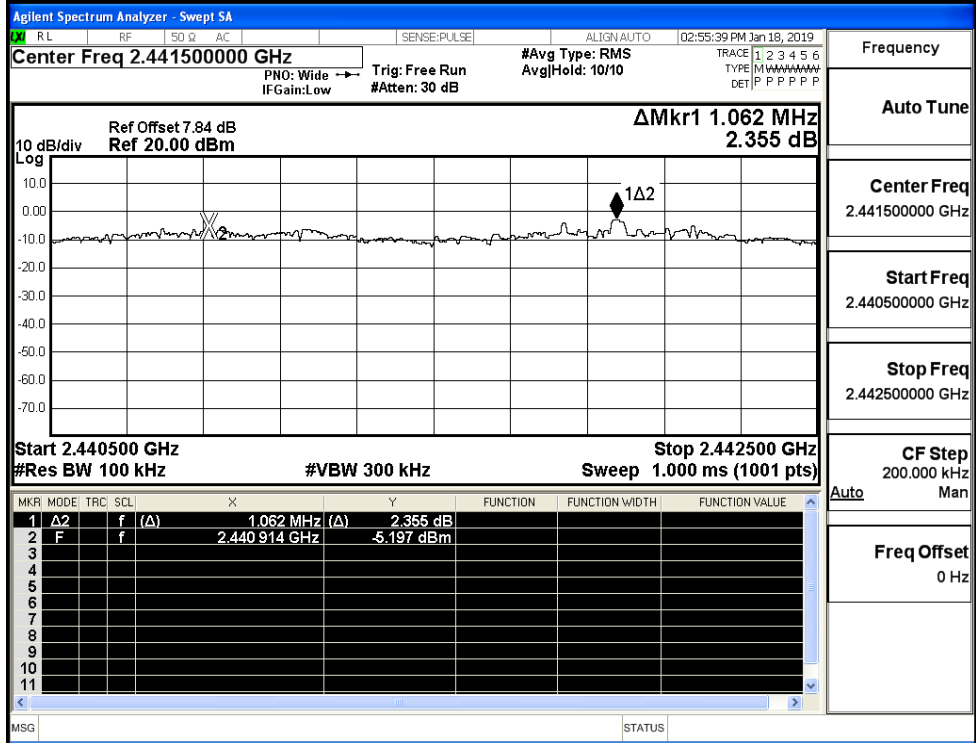


Frequency
Auto Tune
Center Freq
2.479500000 GHz
Start Freq
2.478500000 GHz
Stop Freq
2.480500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

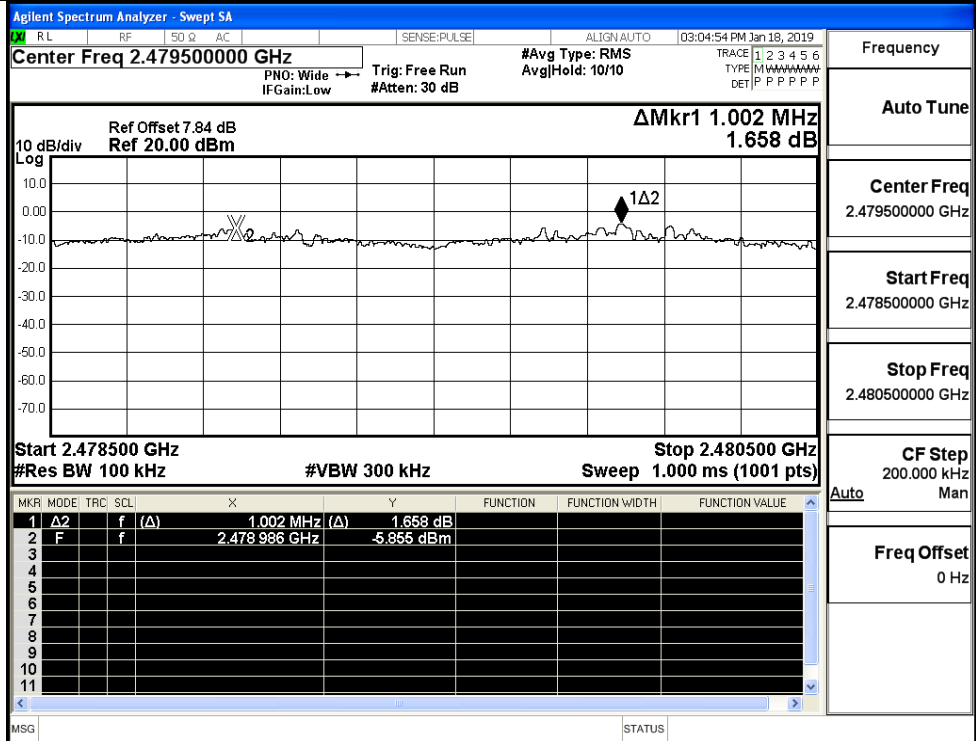
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH



π/4DQPSK/HCH



Frequency

Auto Tune

Center Freq
2.479500000 GHz

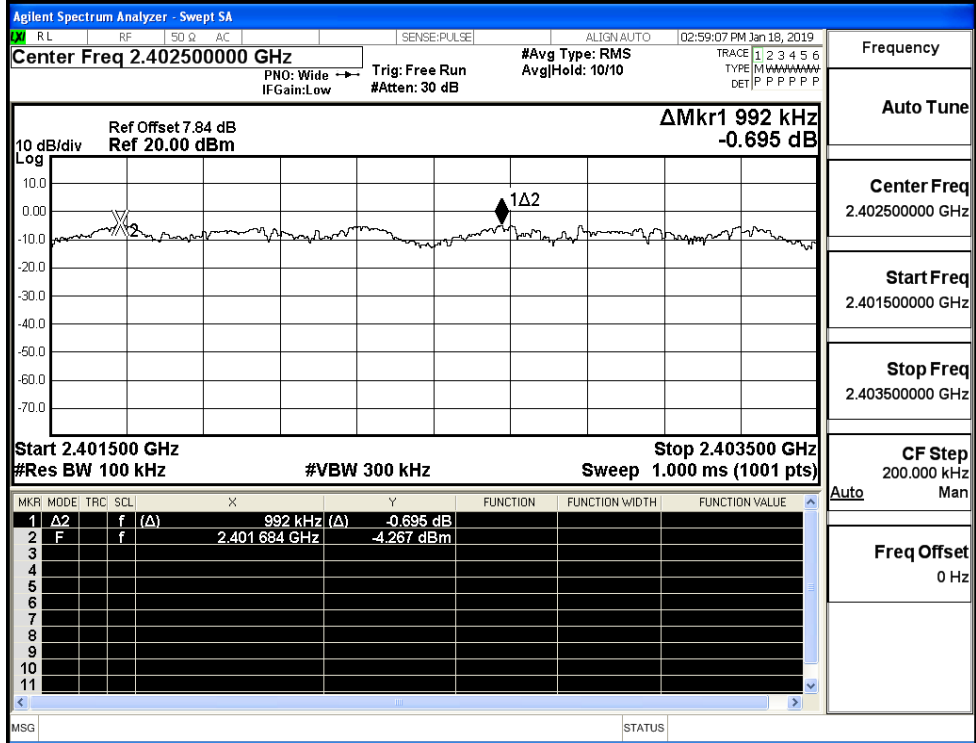
Start Freq
2.478500000 GHz

Stop Freq
2.480500000 GHz

CF Step
200.000 kHz

Freq Offset
0 Hz

8DPSK/LCH



Frequency

Auto Tune

Center Freq
2.402500000 GHz

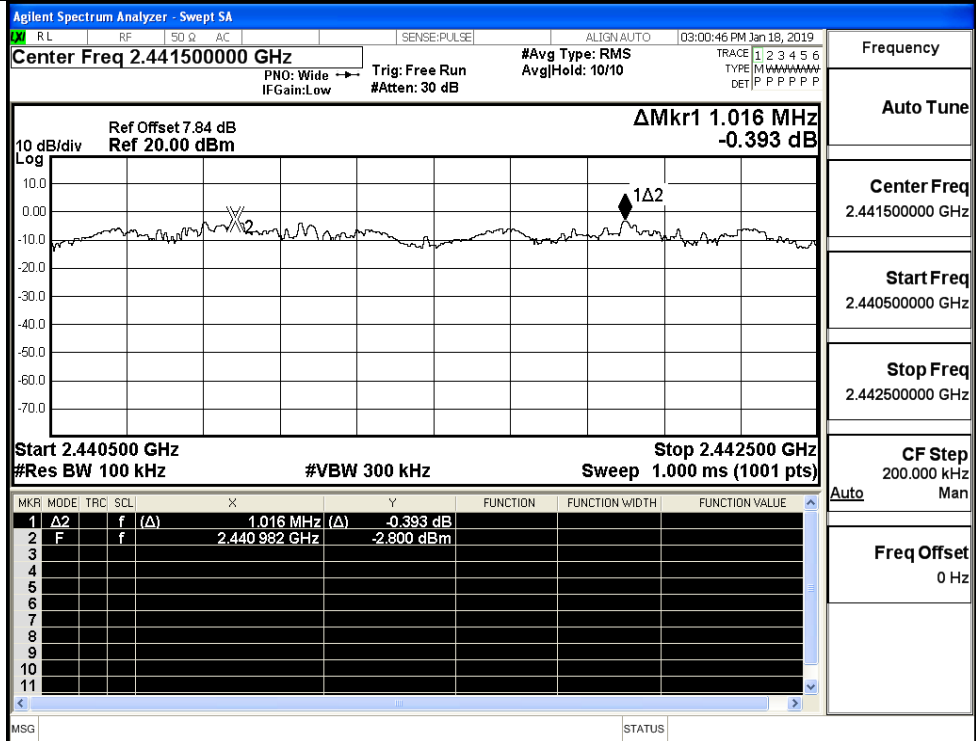
Start Freq
2.401500000 GHz

Stop Freq
2.403500000 GHz

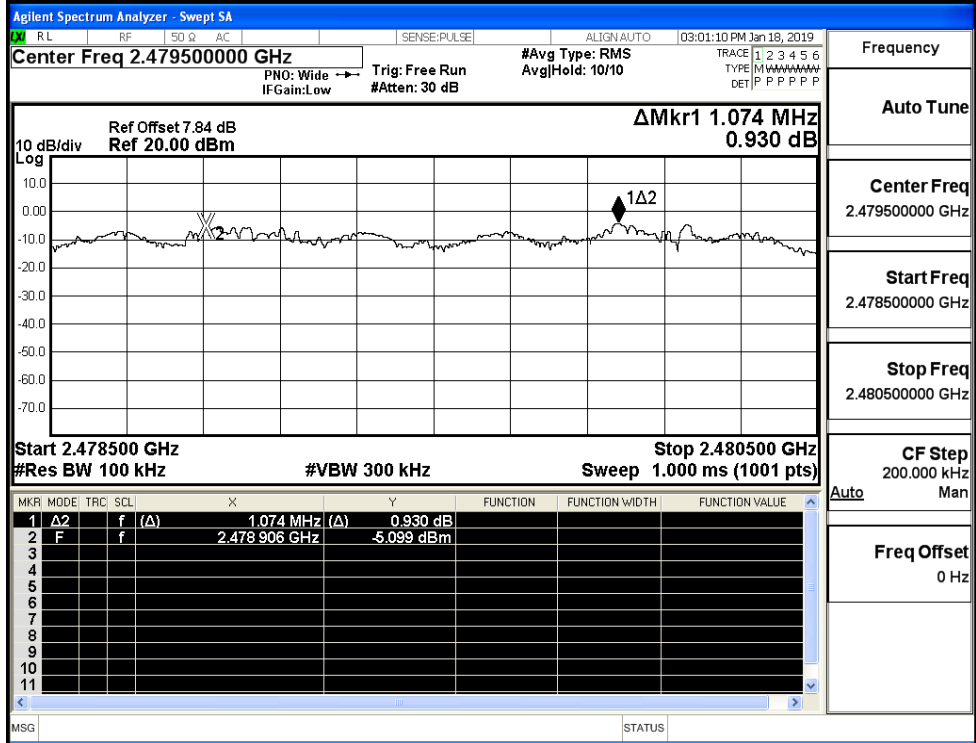
CF Step
200.000 kHz

Freq Offset
0 Hz

8DPSK/MCH



8DPSK/HCH

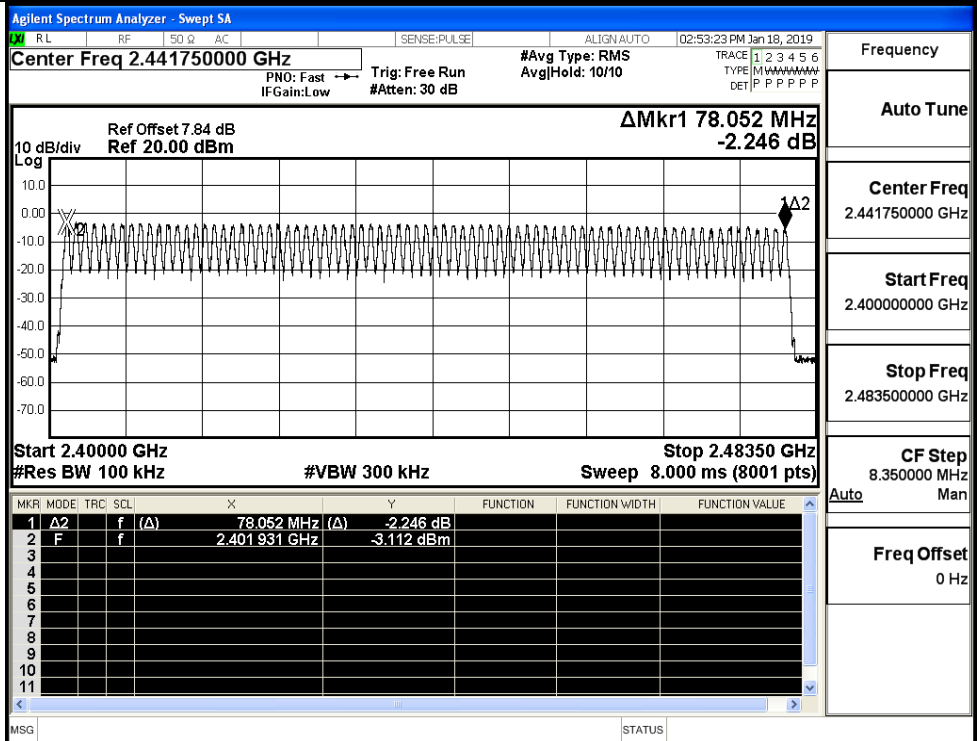


A.4 Hopping Channel Number

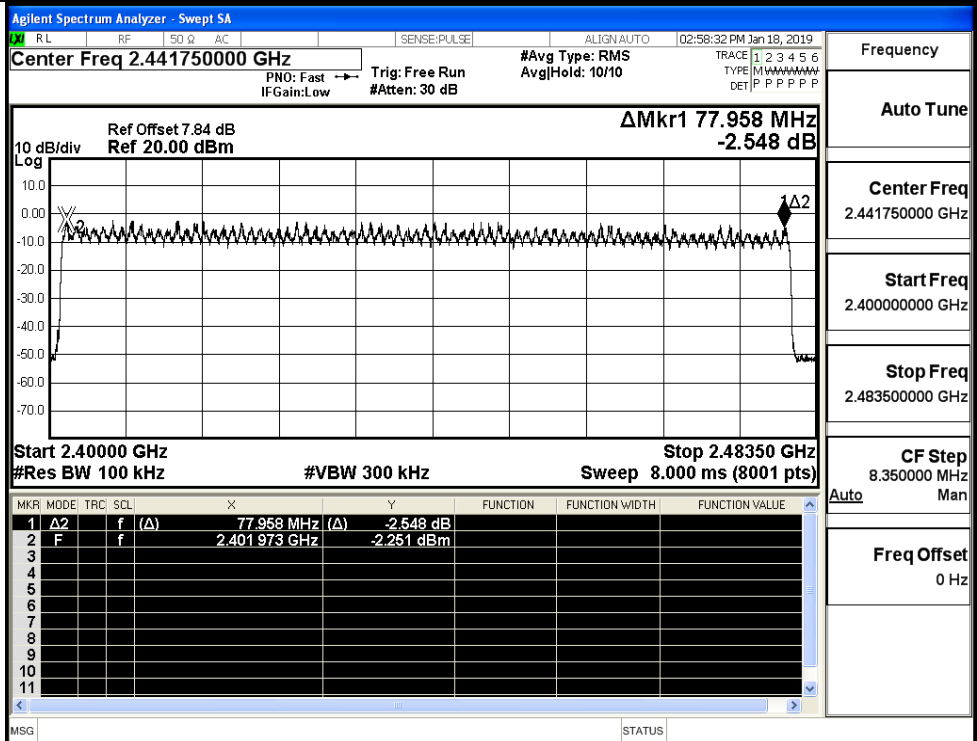
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS
8DPSK	Hop	79	>=15	PASS

Test Graphs

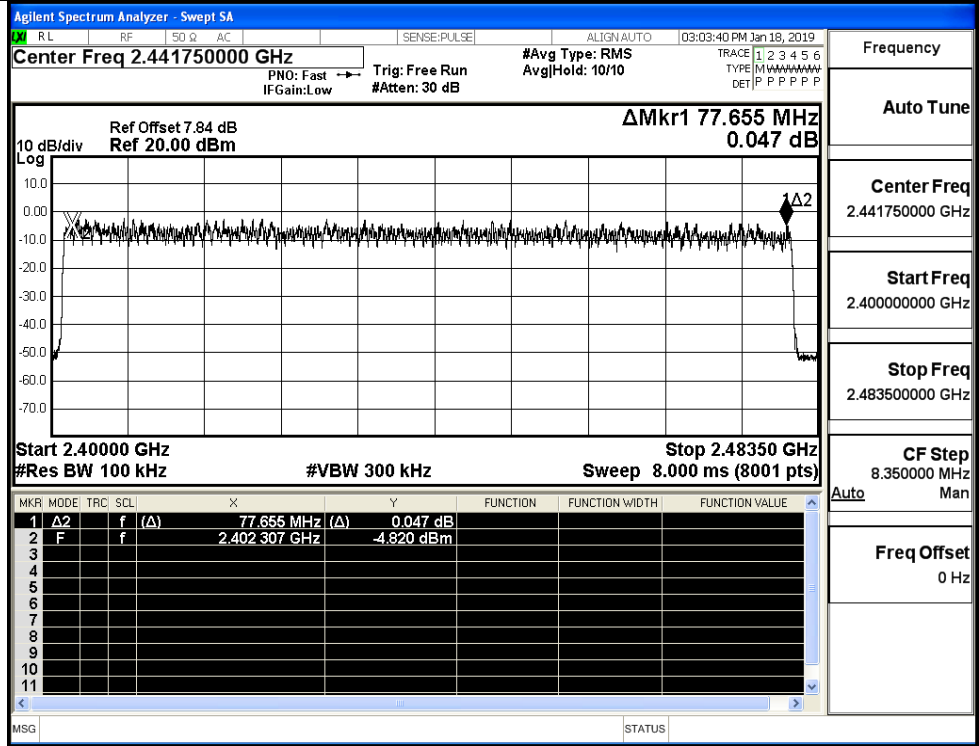
GFSK/Hop



$\pi/4$ DQPSK/Hop

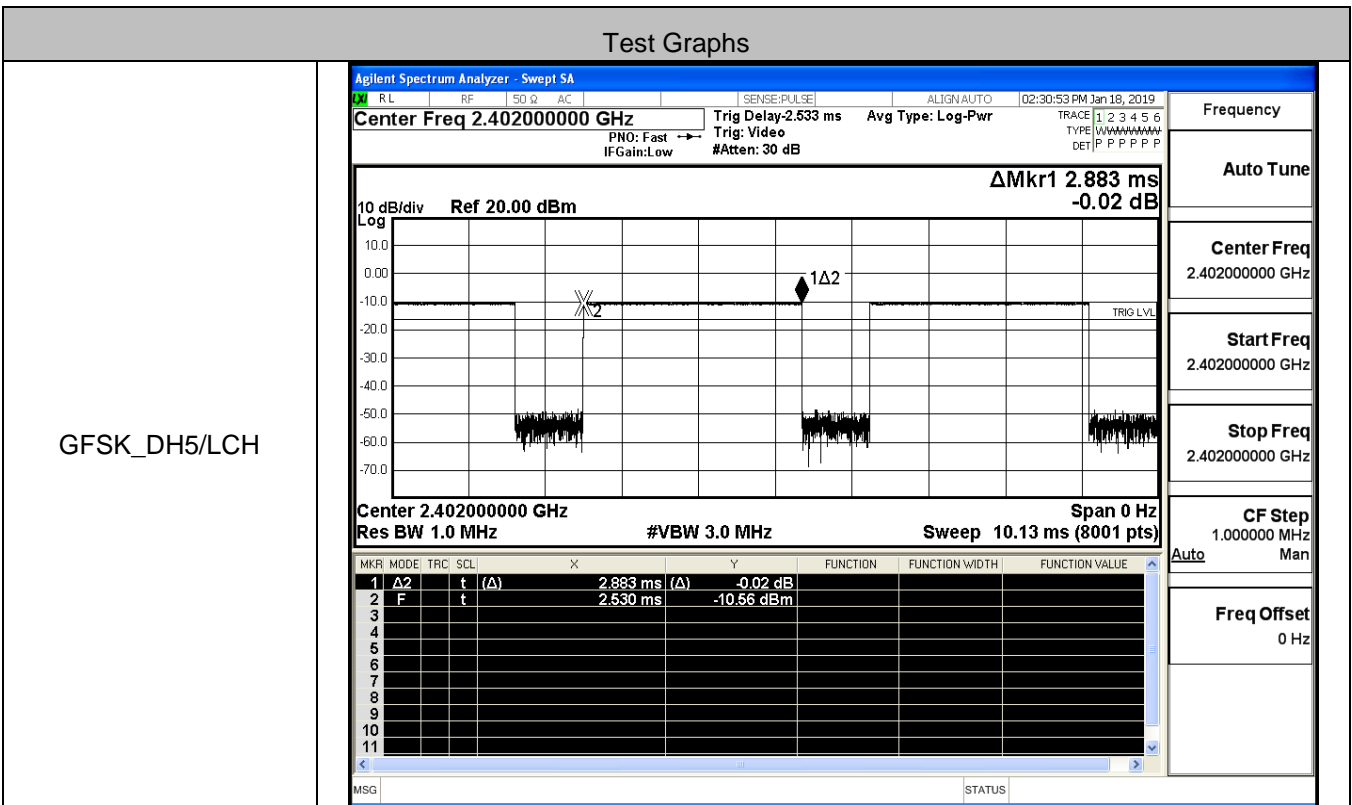


8DPSK/Hop

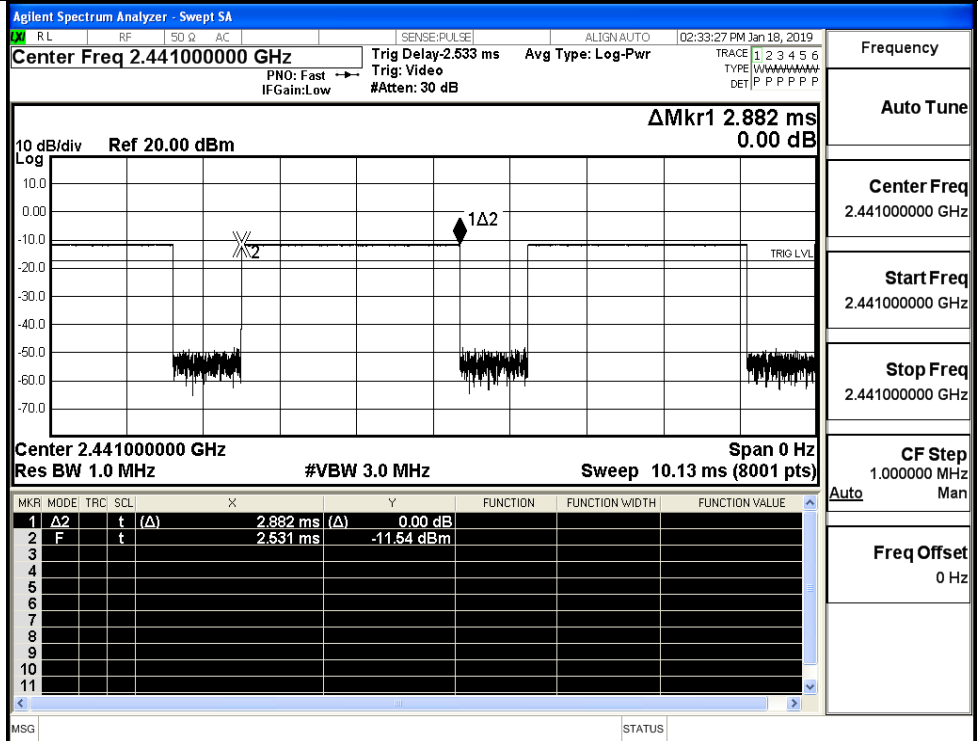


A.5 Dwell Time

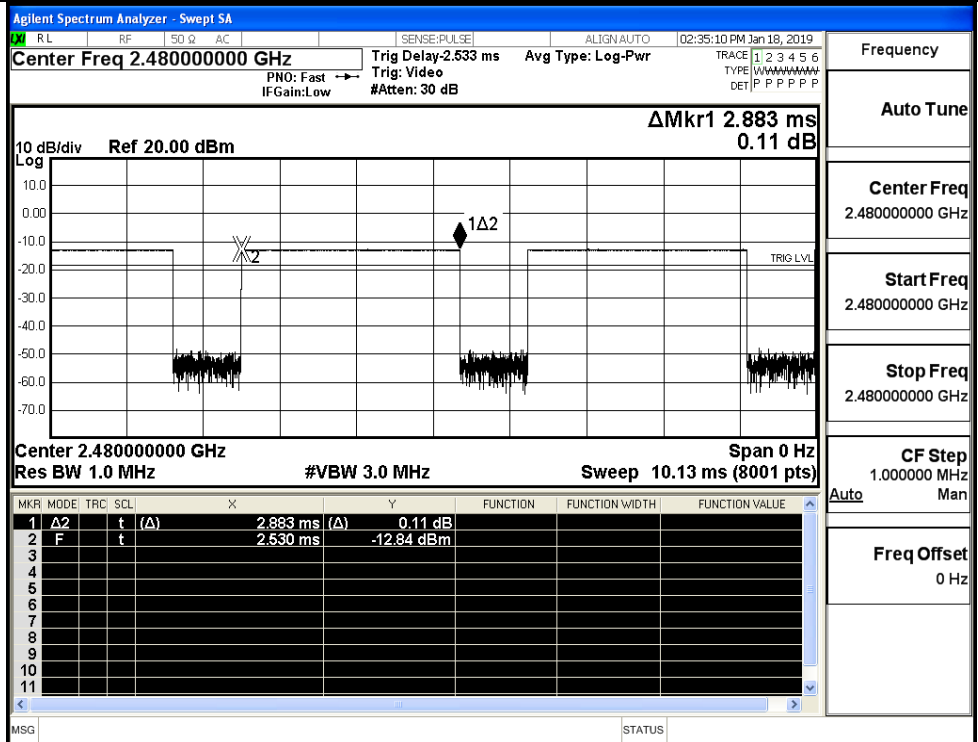
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
π/4DQPSK	2DH5	LCH	2.89	106.7	0.308	0.4	PASS
	2DH5	MCH	2.89	106.7	0.308	0.4	PASS
	2DH5	HCH	2.89	106.7	0.308	0.4	PASS
8DPSK	3DH5	LCH	2.89	106.7	0.308	0.4	PASS
	3DH5	MCH	2.89	106.7	0.308	0.4	PASS
	3DH5	HCH	2.89	106.7	0.308	0.4	PASS



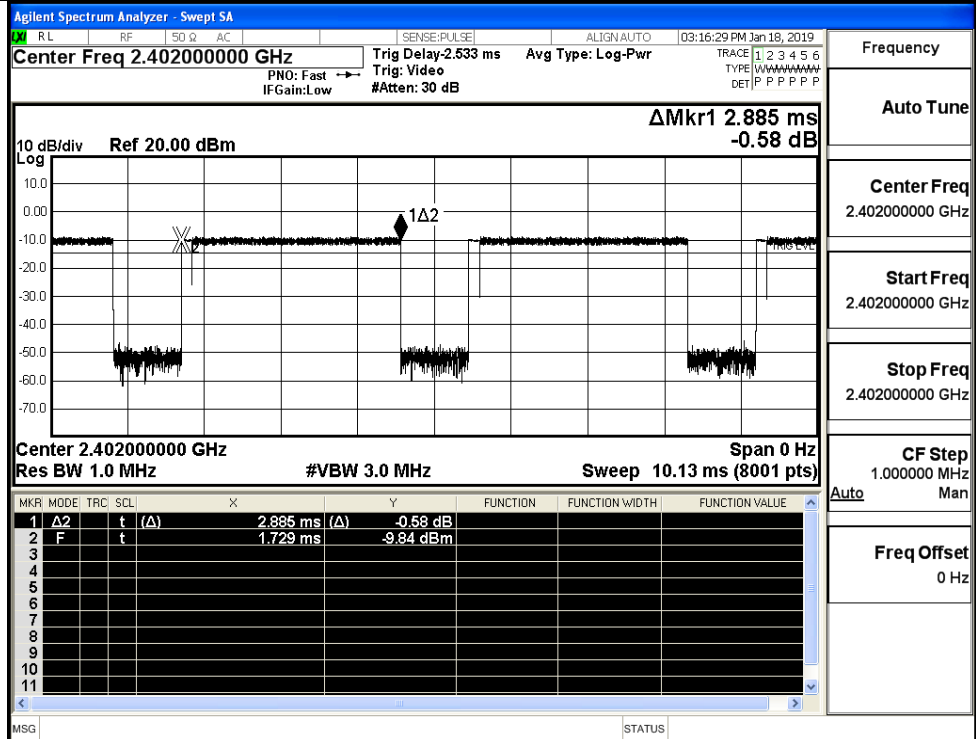
GFSK_DH5/MCH



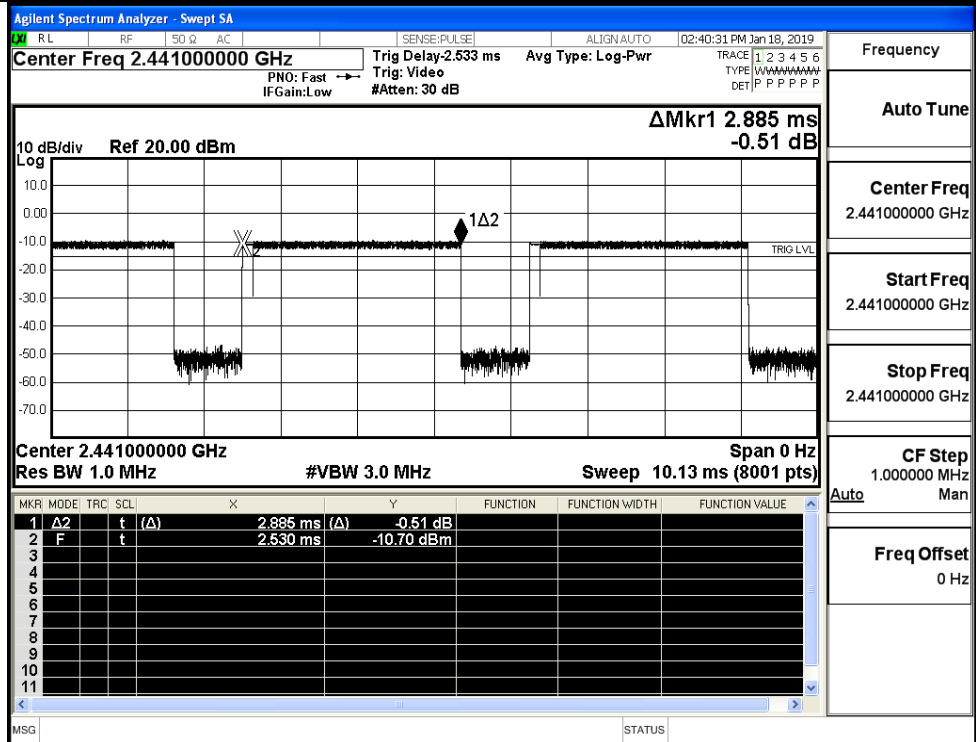
GFSK_DH5/HCH



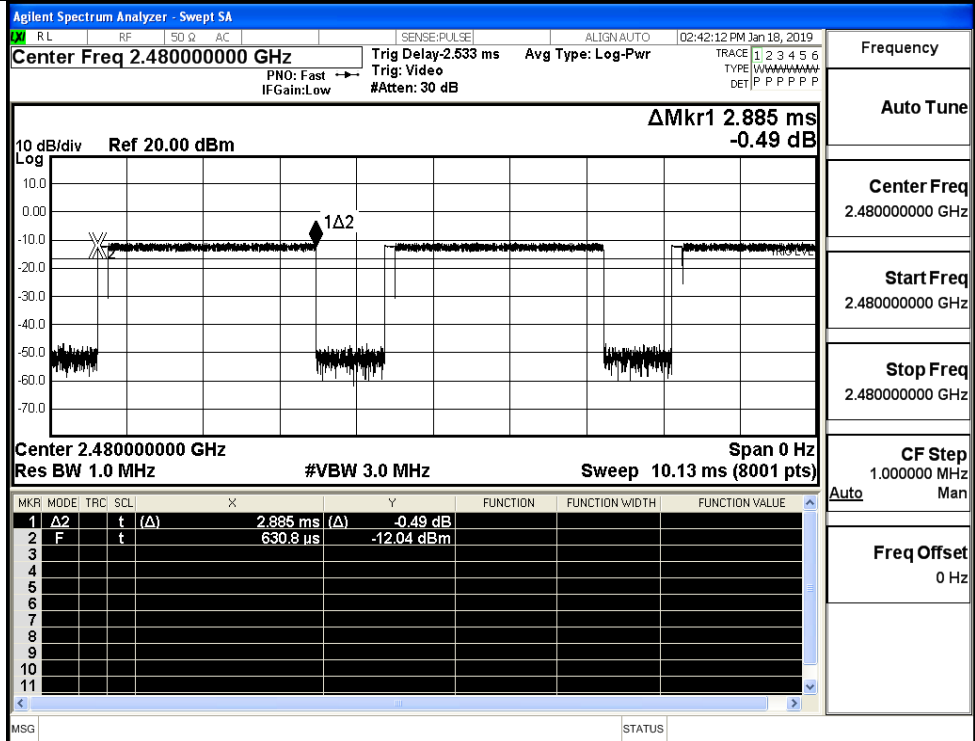
$\pi/4$ DQPSK
_2DH5/LCH



$\pi/4$ DQPSK
_2DH5/MCH

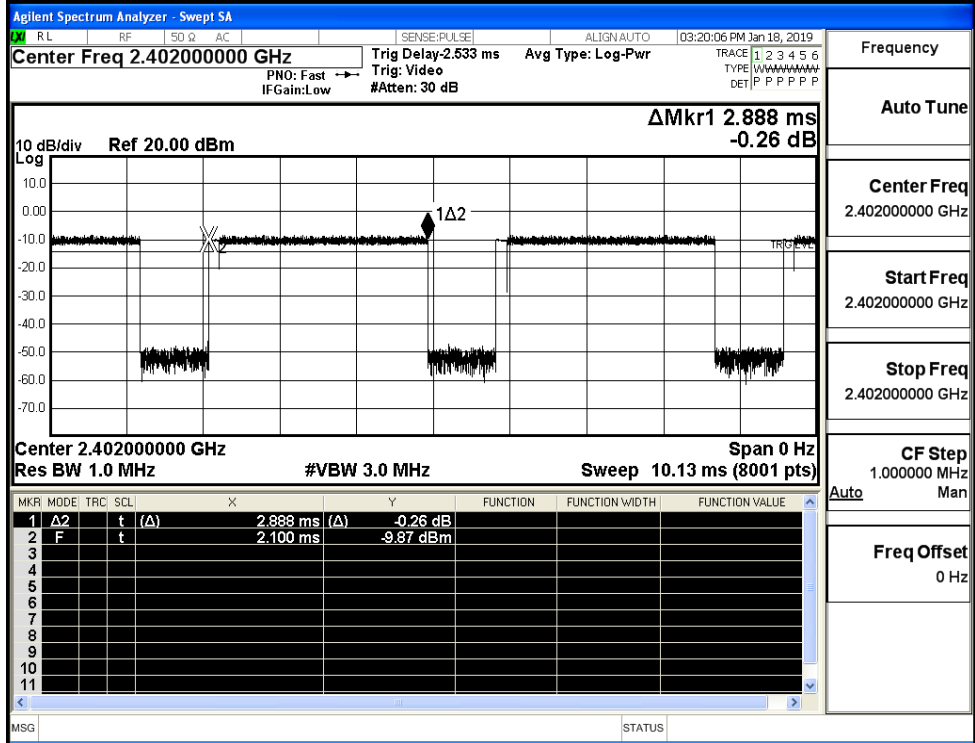


$\pi/4$ DQPSK
_2DH5/HCH



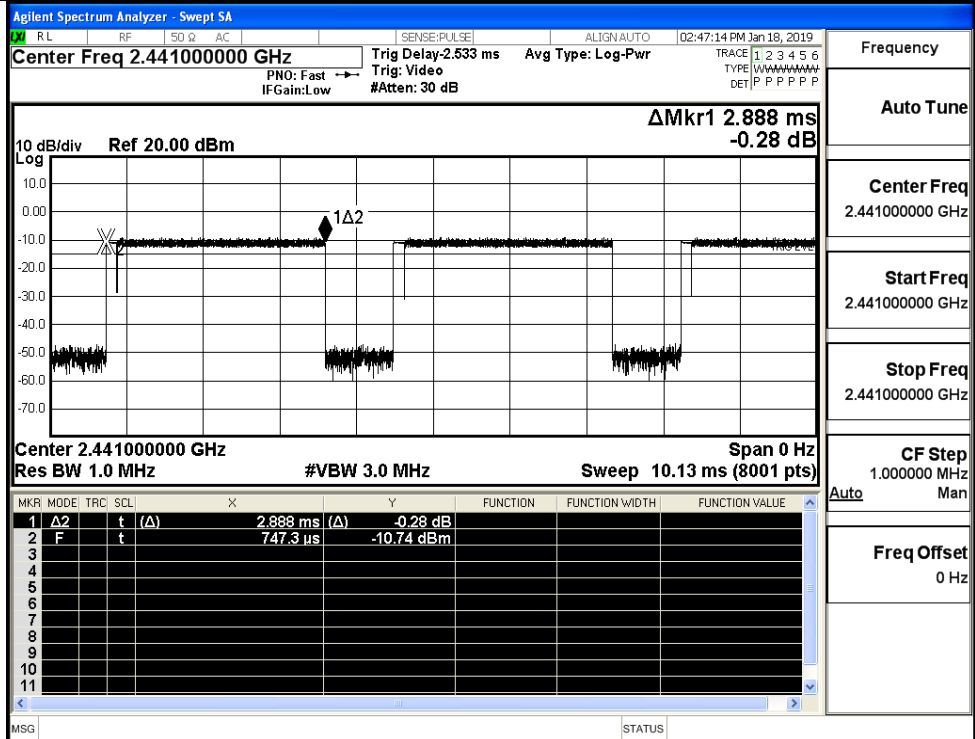
Frequency	2.480000000 GHz
Auto Tune	
Center Freq	2.480000000 GHz
Start Freq	2.480000000 GHz
Stop Freq	2.480000000 GHz
CF Step	1.000000 MHz
Auto	Man
Freq Offset	0 Hz

8DPSK_3DH5/LCH



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

8DPSK_3DH5/MCH



Frequency

Auto Tune

Center Freq 2.441000000 GHz

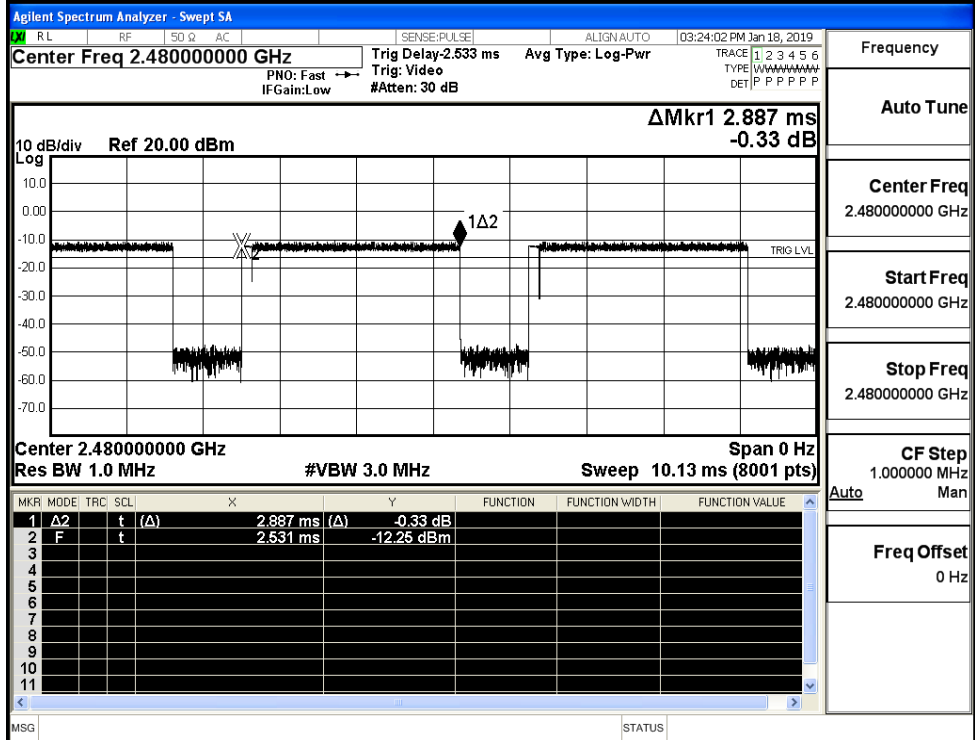
Start Freq 2.441000000 GHz

Stop Freq 2.441000000 GHz

CF Step 1.000000 MHz

Freq Offset 0 Hz

8DPSK_3DH5/HCH



Frequency

Auto Tune

Center Freq 2.480000000 GHz

Start Freq 2.480000000 GHz

Stop Freq 2.480000000 GHz

CF Step 1.000000 MHz

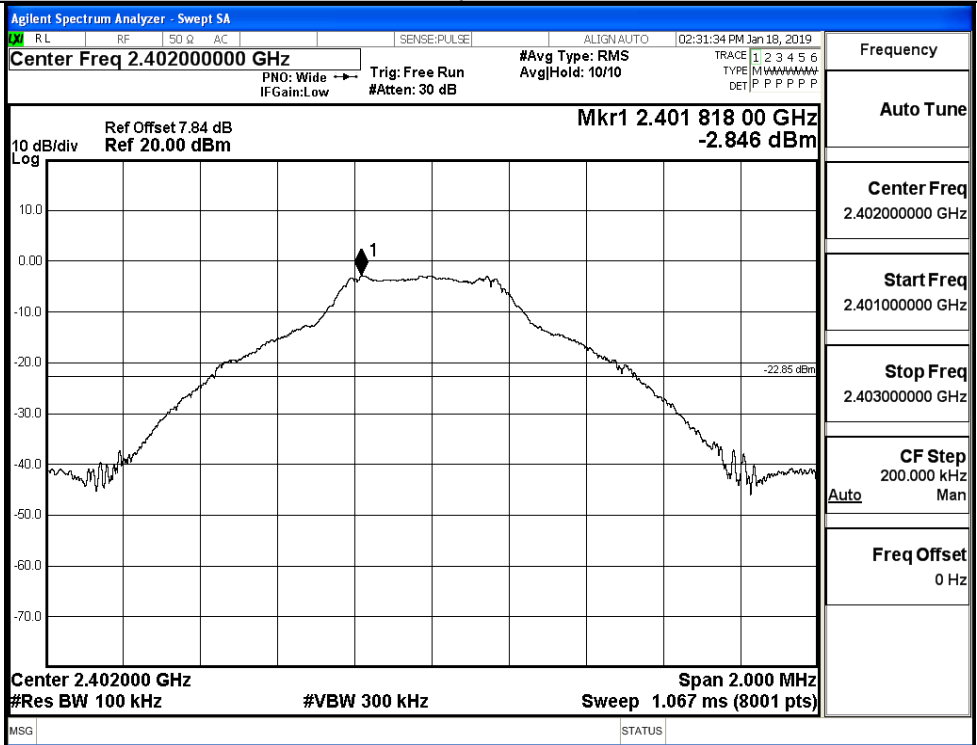
Freq Offset 0 Hz

A.6 RF Conducted Spurious Emissions

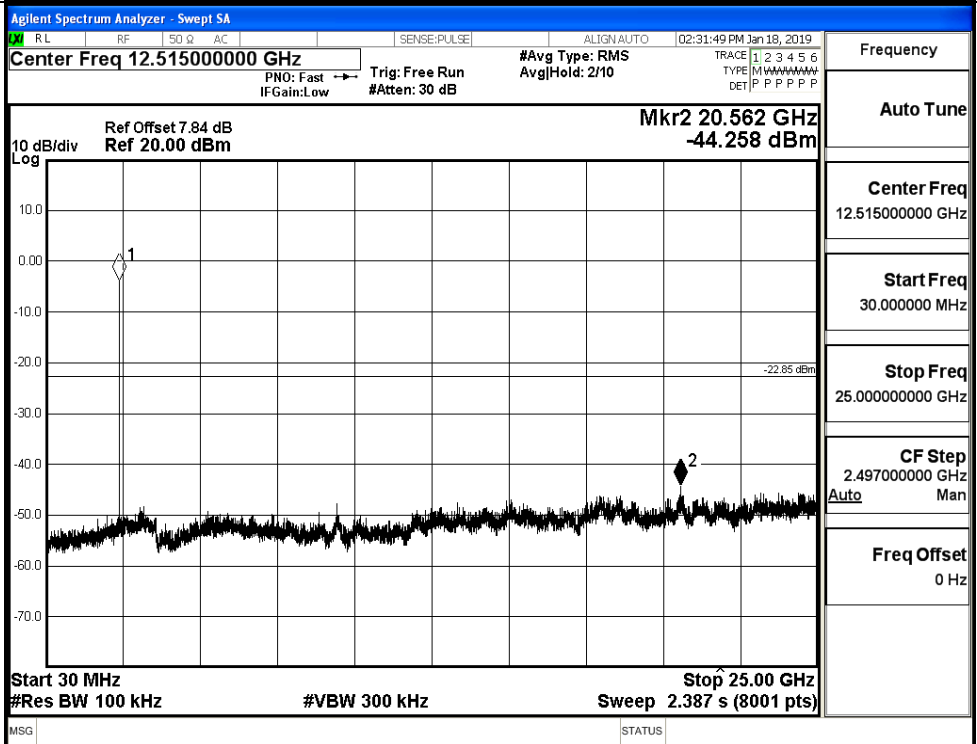
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-2.846	-44.258	-22.846	PASS
	MCH	-3.926	-44.994	-23.926	PASS
	HCH	-4.982	-45.183	-24.982	PASS
$\pi/4$ DQPSK	LCH	-1.948	-44.915	-21.948	PASS
	MCH	-2.9	-45.426	-22.900	PASS
	HCH	-4.274	-45.302	-24.274	PASS
8DPSK	LCH	-1.997	-43.645	-21.997	PASS
	MCH	-3.059	-45.115	-23.059	PASS
	HCH	-4.272	-44.981	-24.272	PASS

GFSK_LCH_Graphs

Pref

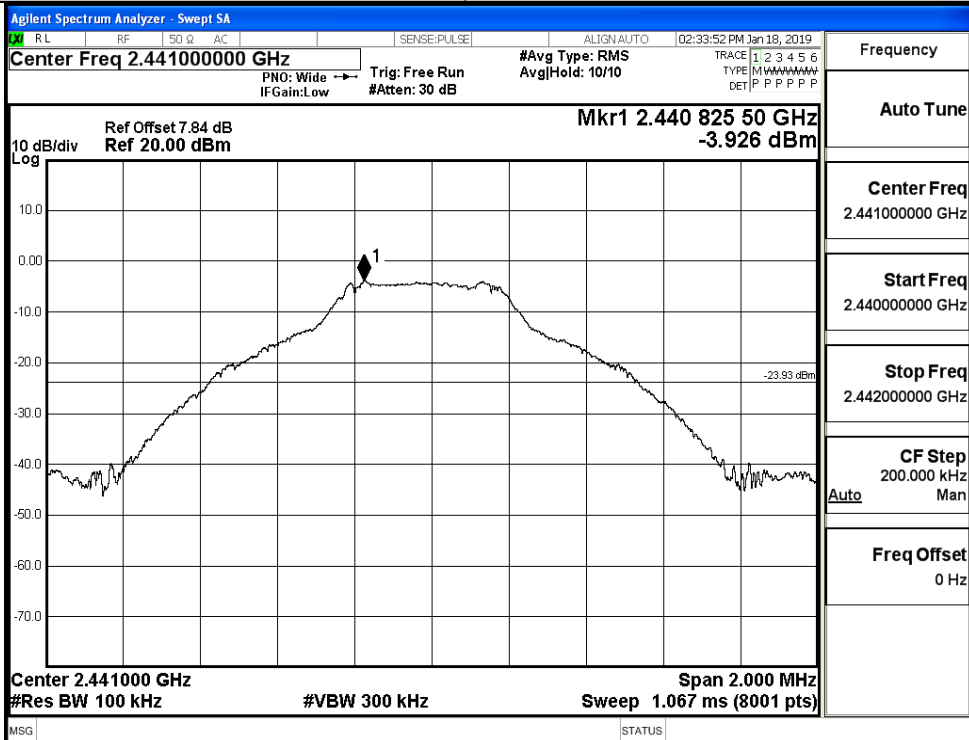


Puw

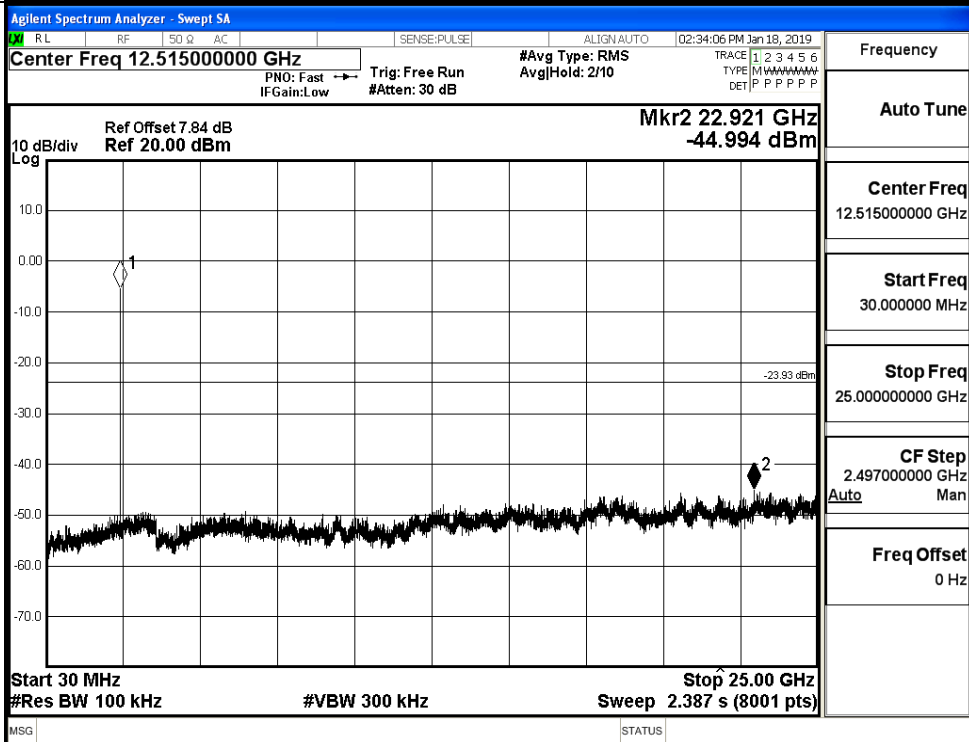


GFSK_MCH_Graphs

Pref

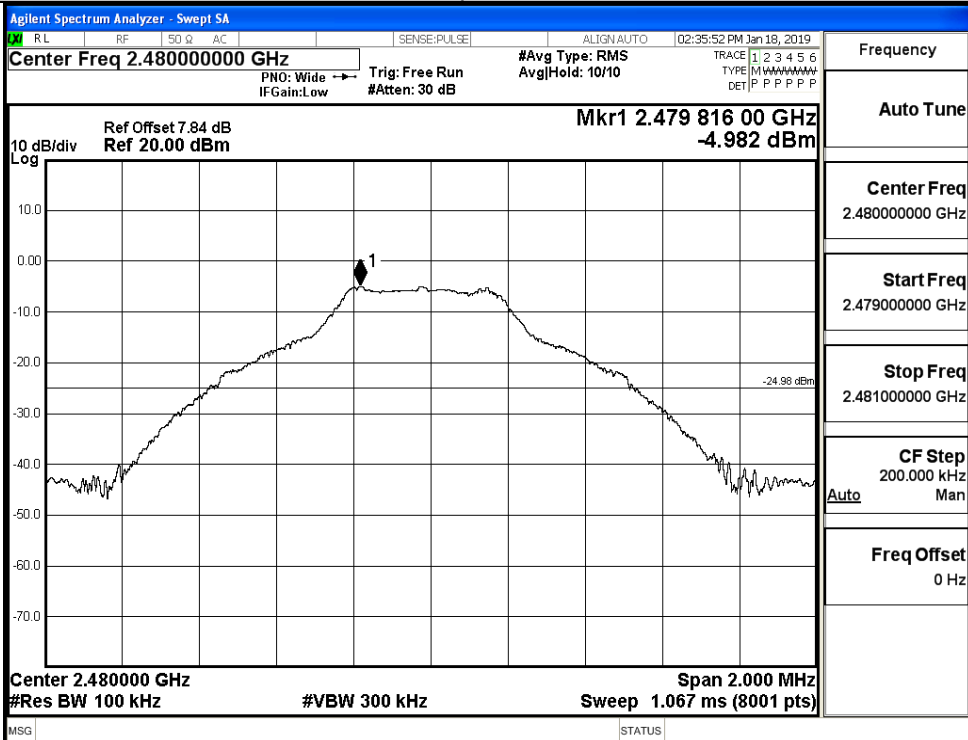


Puw

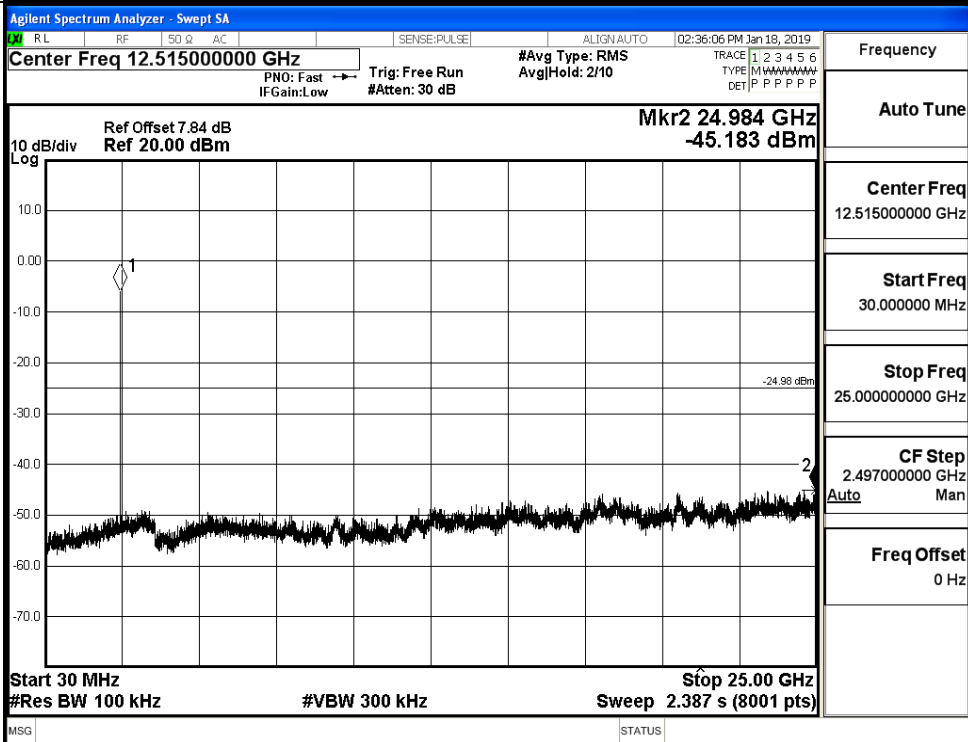


GFSK_HCH_Graphs

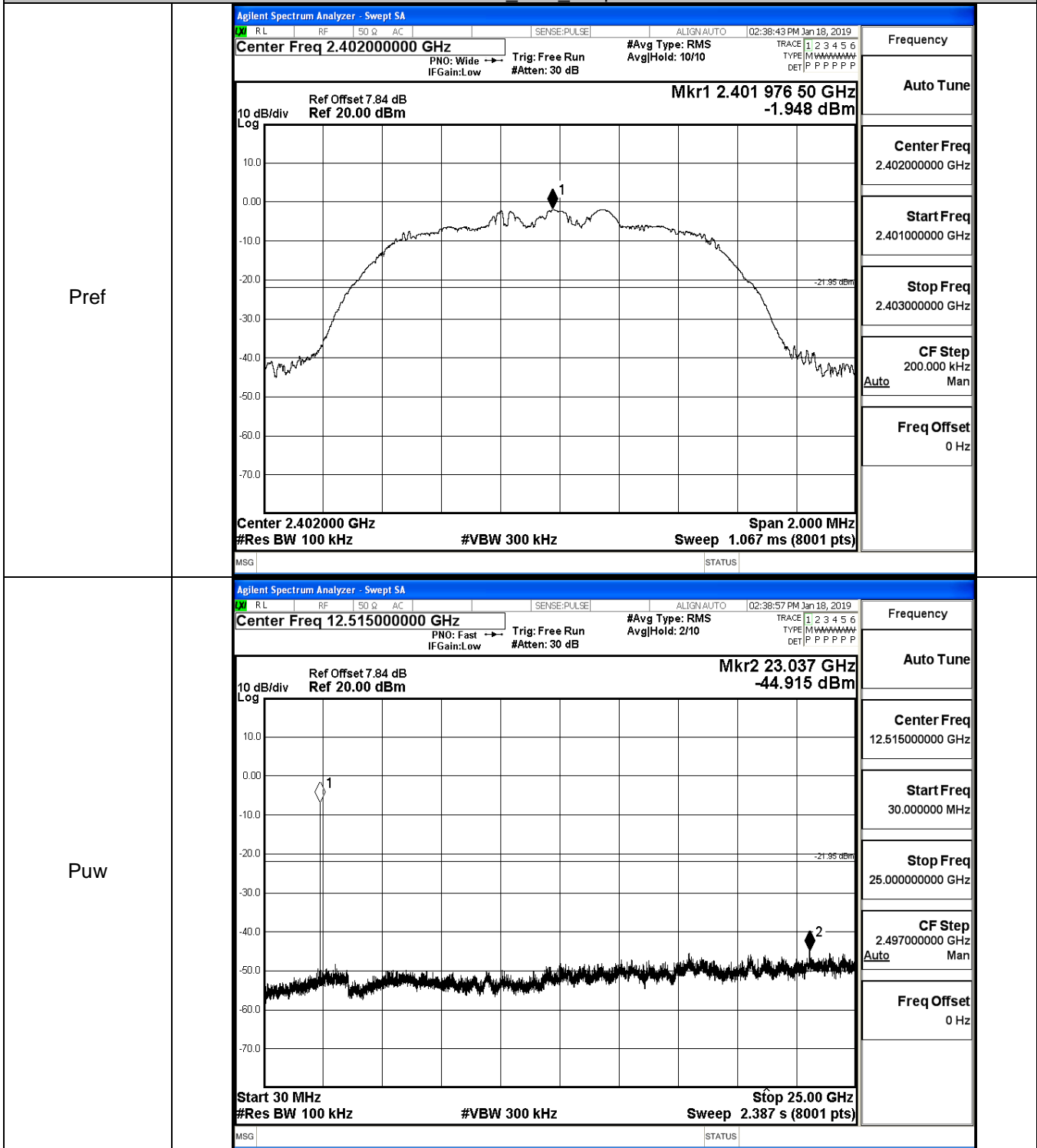
Pref



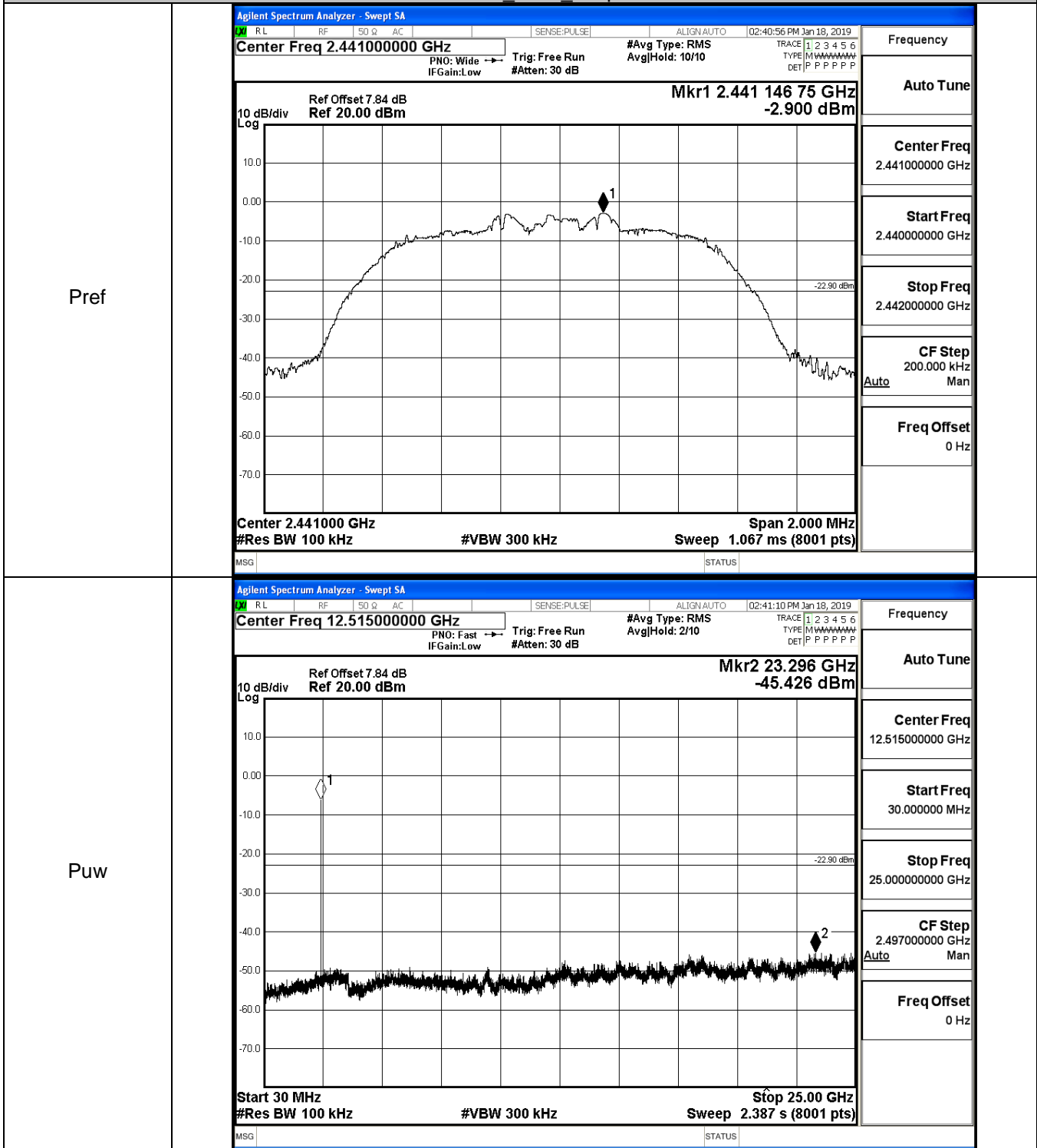
Puw



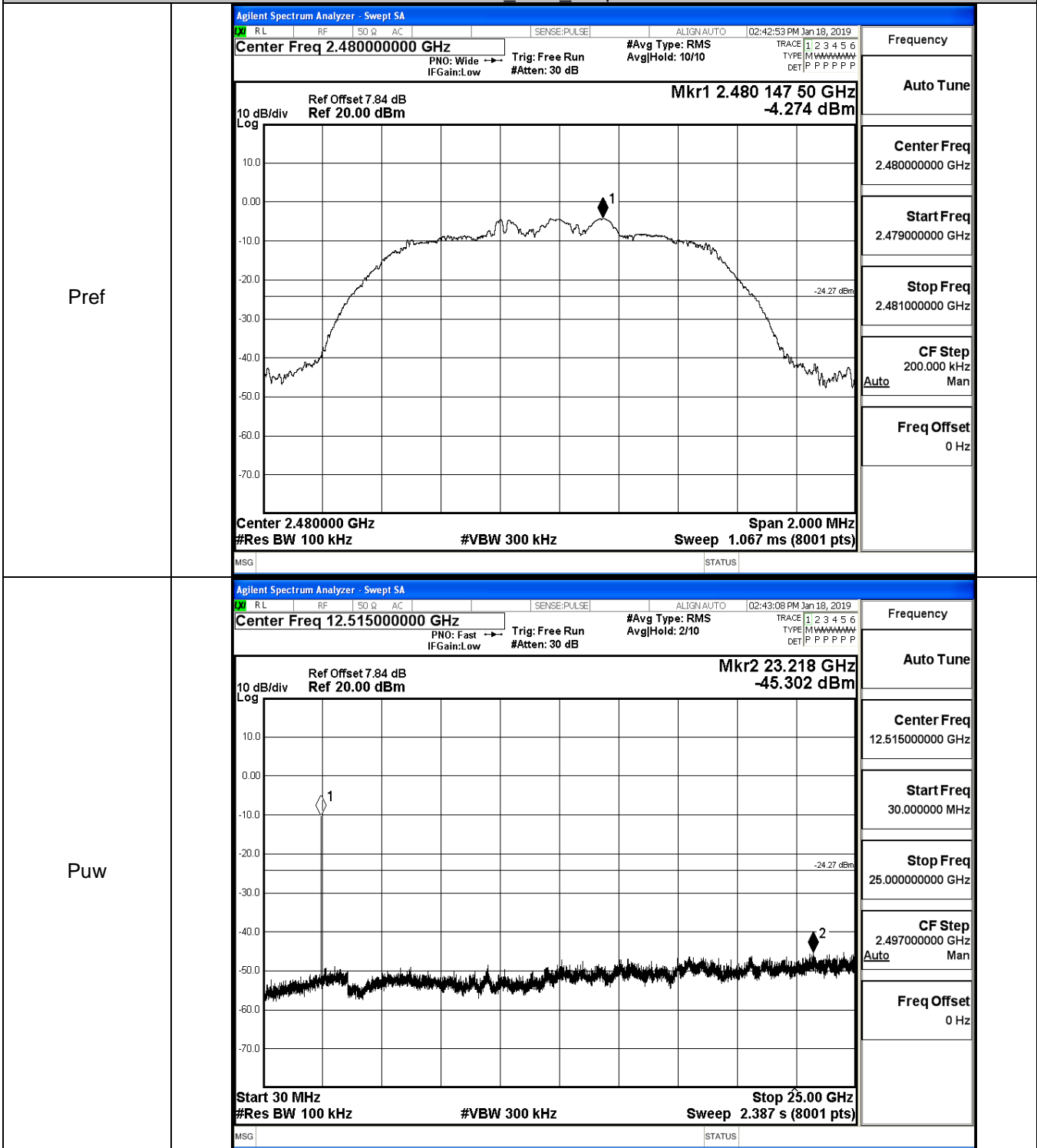
$\pi/4$ DQPSK LCH_Graphs



$\pi/4$ DQPSK_MCH_Graphs

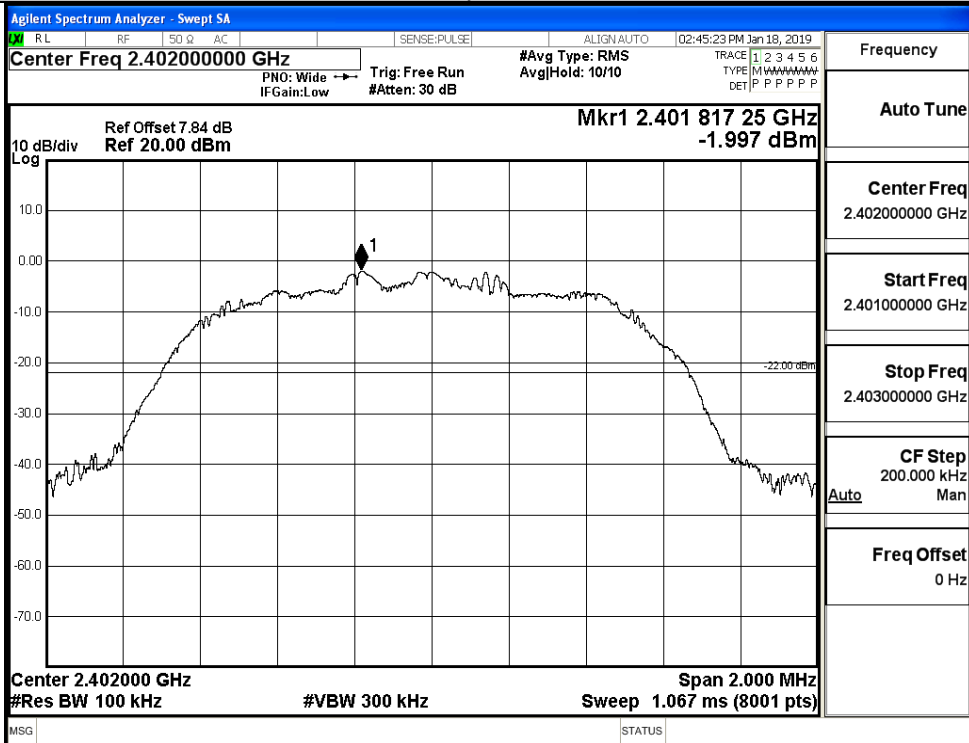


$\pi/4$ DQPSK_HCH_Graphs

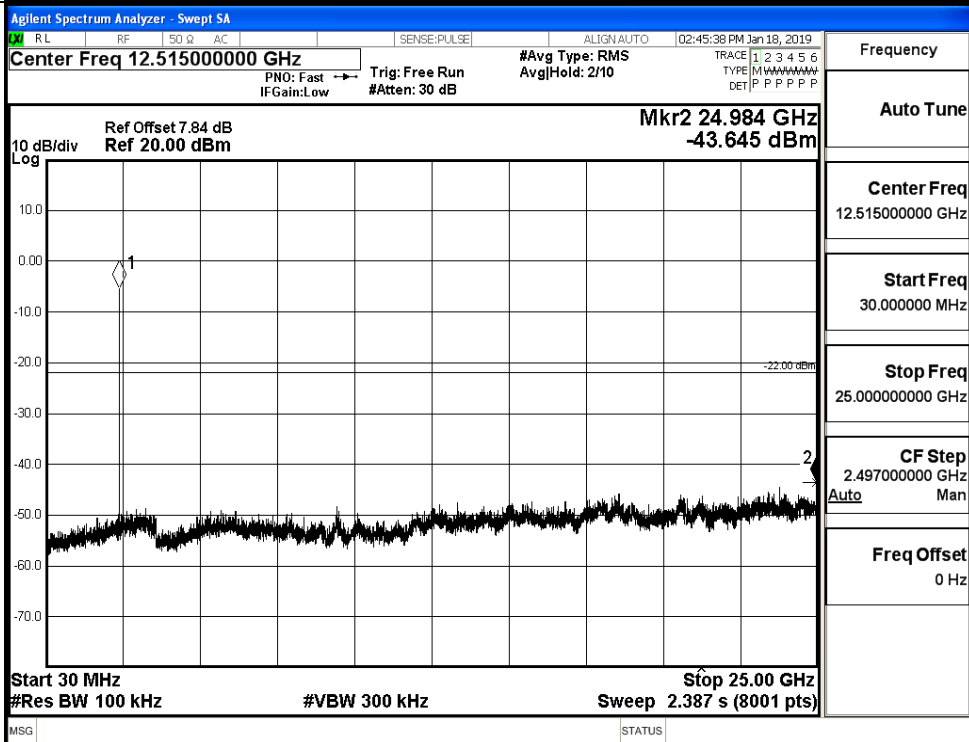


8DPSK_LCH_Graphs

Pref

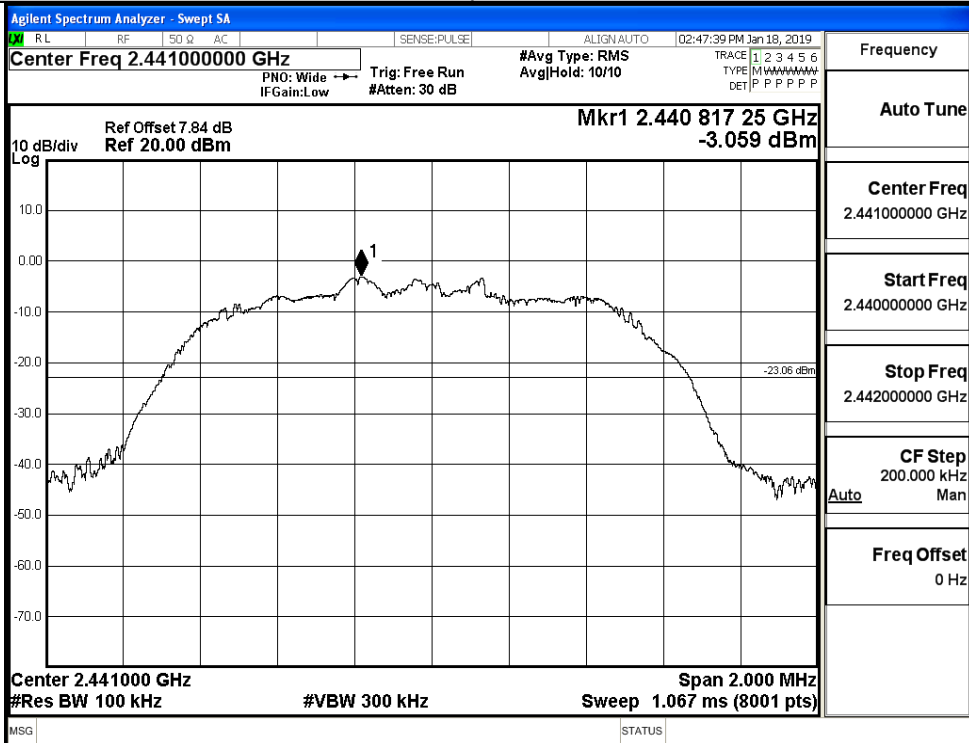


Puw

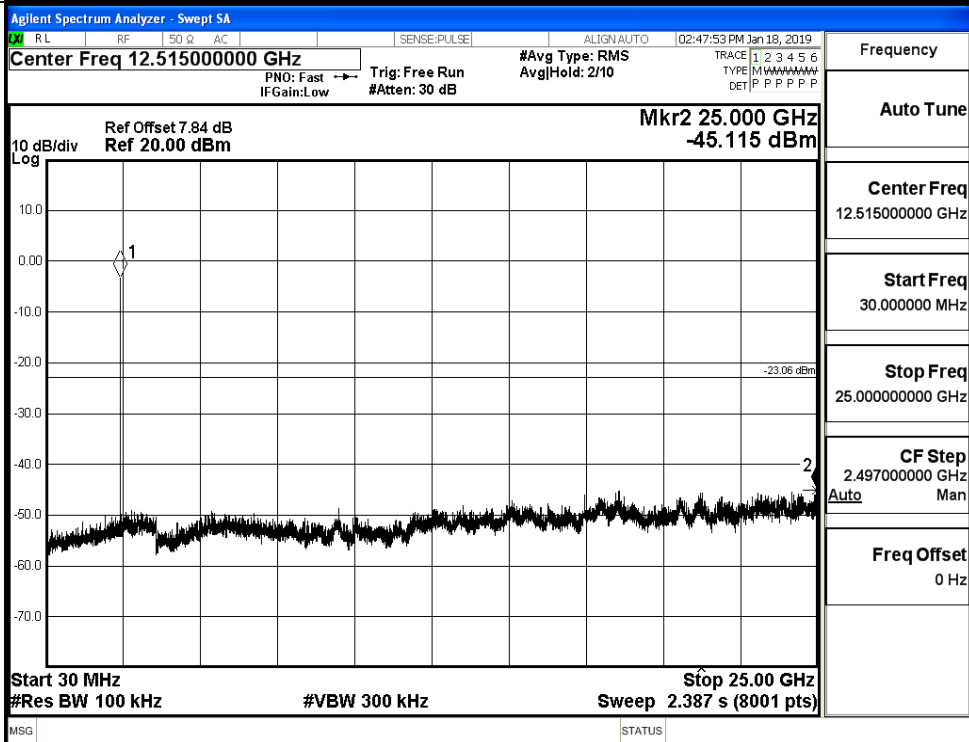


8DPSK_MCH_Graphs

Pref

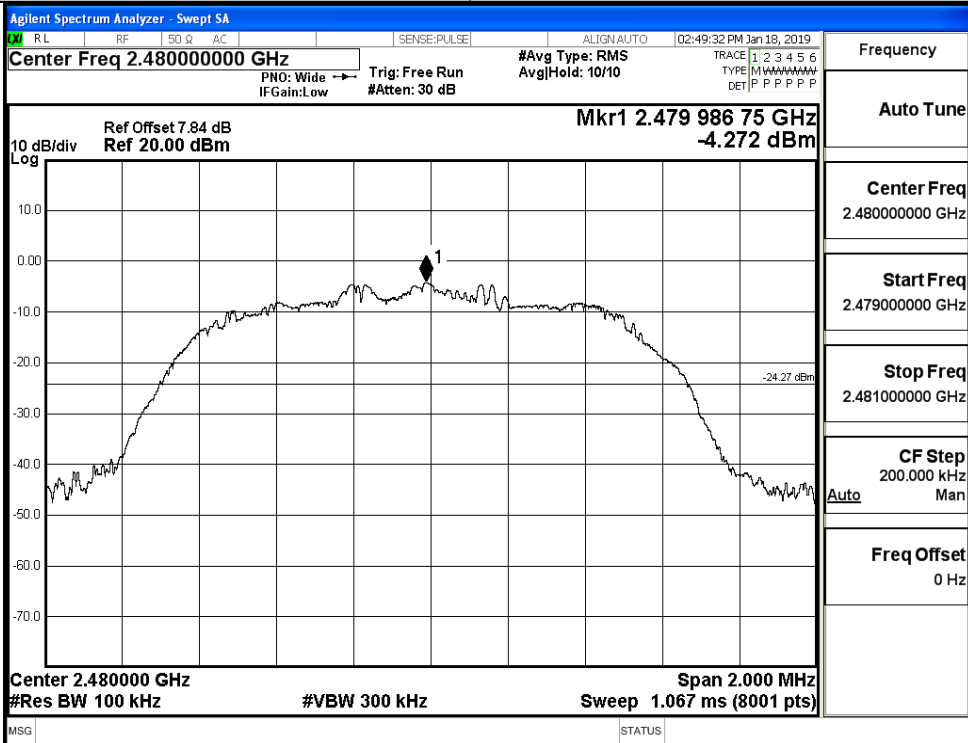


Puw

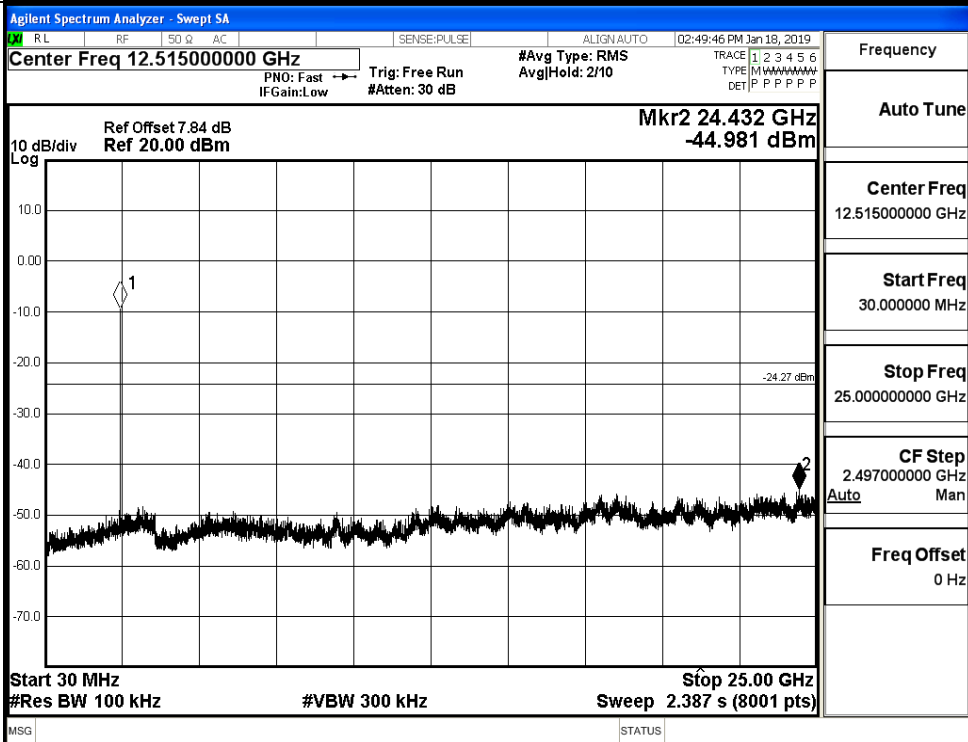


8DPSK_HCH_Graphs

Pref



Puw

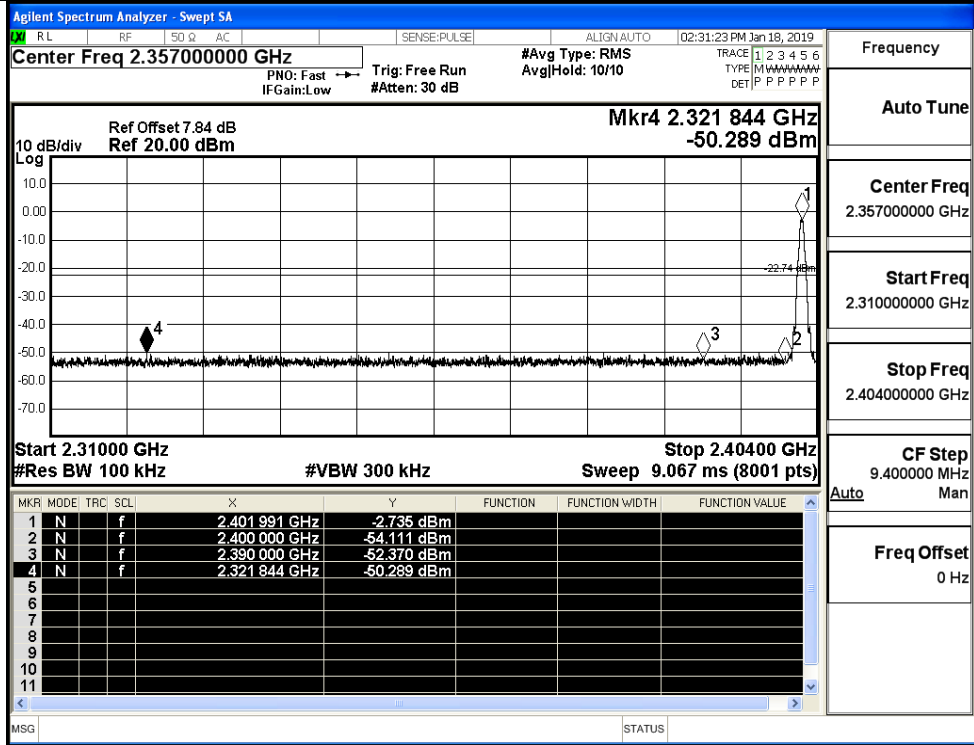


A.7 Band-edge for RF Conducted Emissions

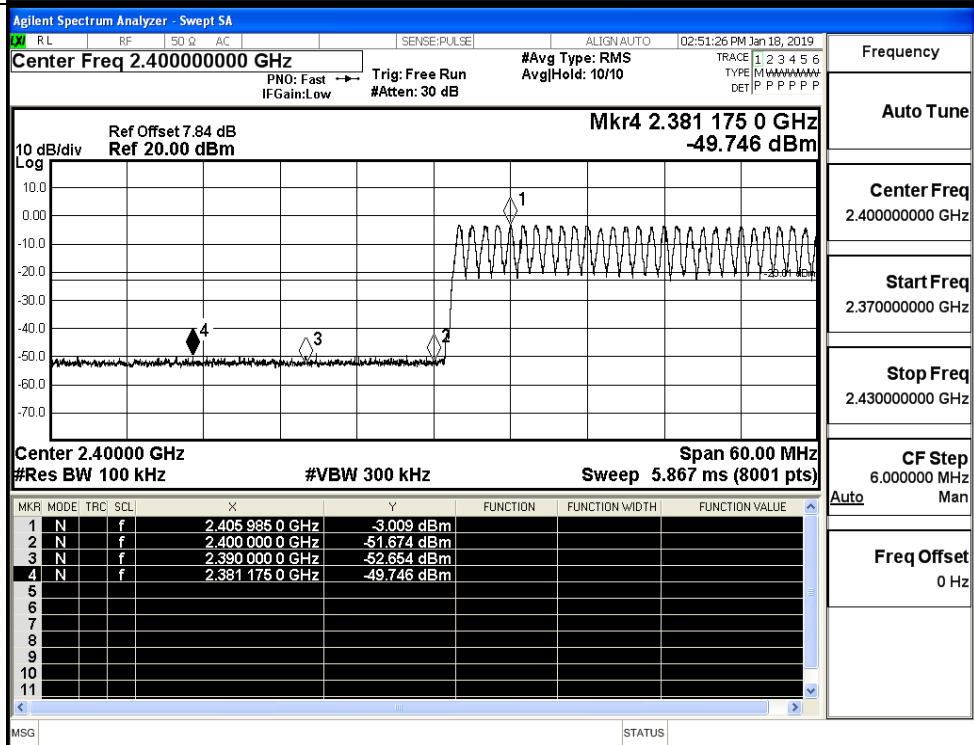
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-2.735	Off	-50.289	-22.74	PASS
			-3.009	On	-49.746	-23.01	PASS
	HCH	2480	-5.005	Off	-49.535	-25.01	PASS
			-3.944	On	-49.961	-23.94	PASS
$\pi/4$ DQPSK	LCH	2402	-1.972	Off	-50.141	-21.97	PASS
			-1.965	On	-49.308	-21.97	PASS
	HCH	2480	-4.233	Off	-50.174	-24.23	PASS
			-3.024	On	-49.313	-23.02	PASS
8DPSK	LCH	2402	-1.775	Off	-50.052	-21.78	PASS
			-2.509	On	-49.165	-22.51	PASS
	HCH	2480	-4.126	Off	-50.012	-24.13	PASS
			-3.174	On	-49.570	-23.17	PASS

Test Graphs

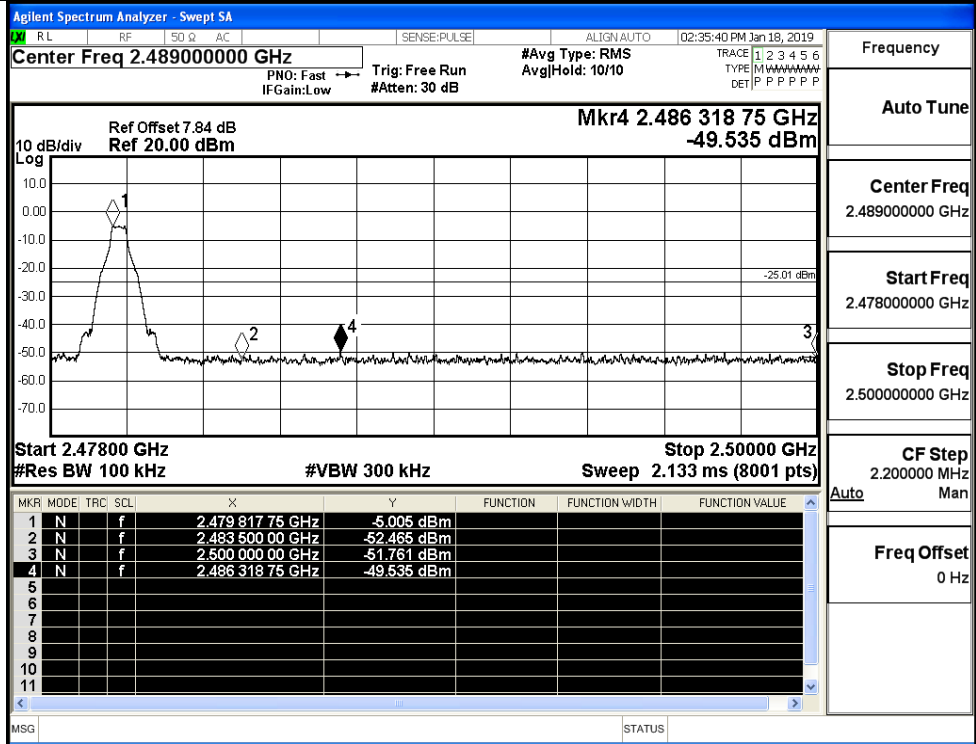
GFSK/LCH/No Hop



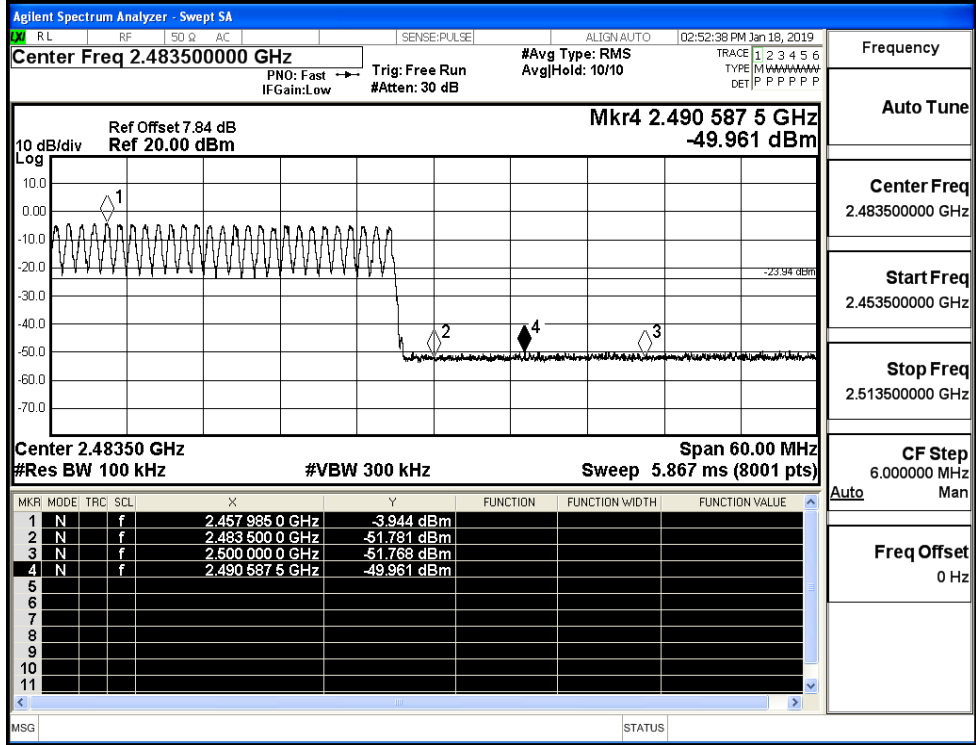
GFSK/LCH/Hop



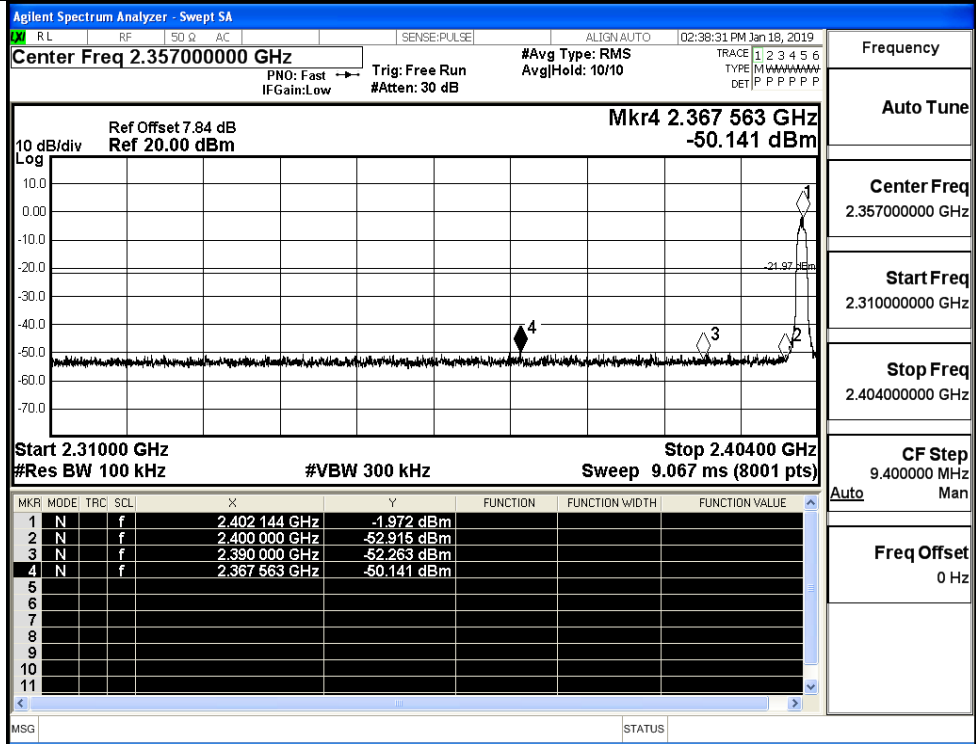
GFSK/HCH/No Hop



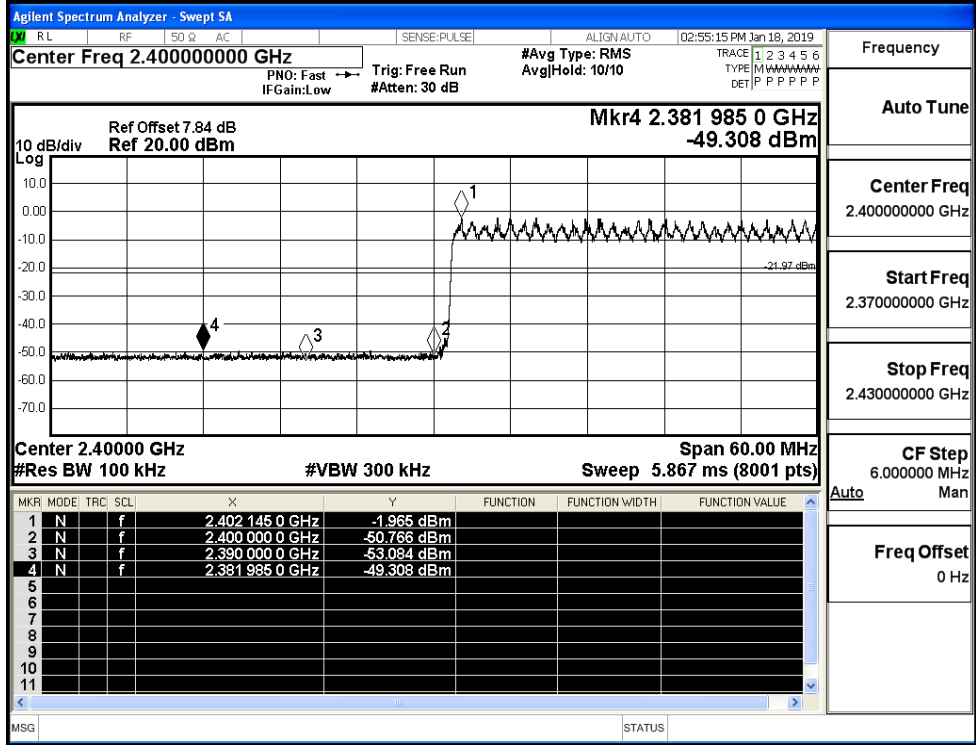
GFSK/HCH/Hop



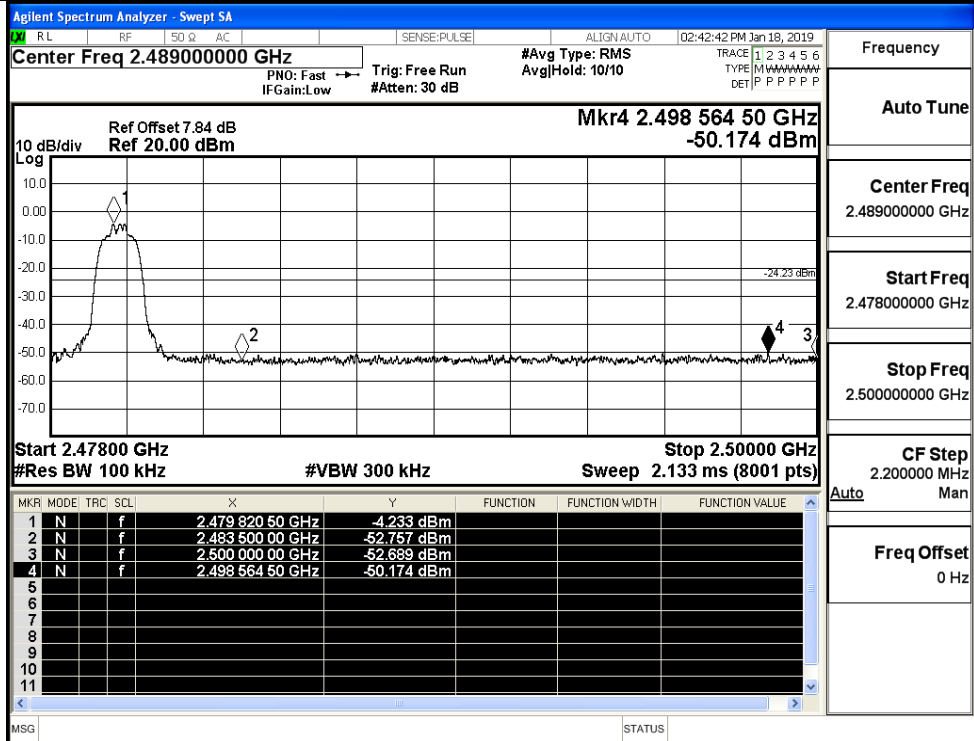
$\pi/4$ DQPSK/LCH/No
Hop



$\pi/4$ DQPSK/LCH/Hop

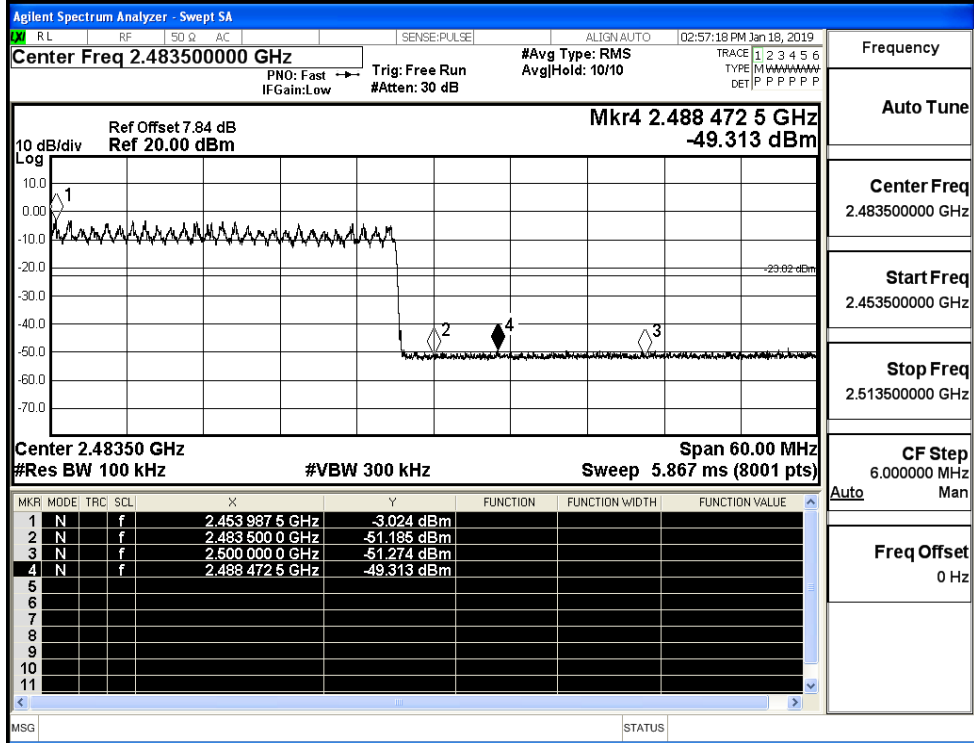


$\pi/4$ DQPSK/HCH/No
Hop



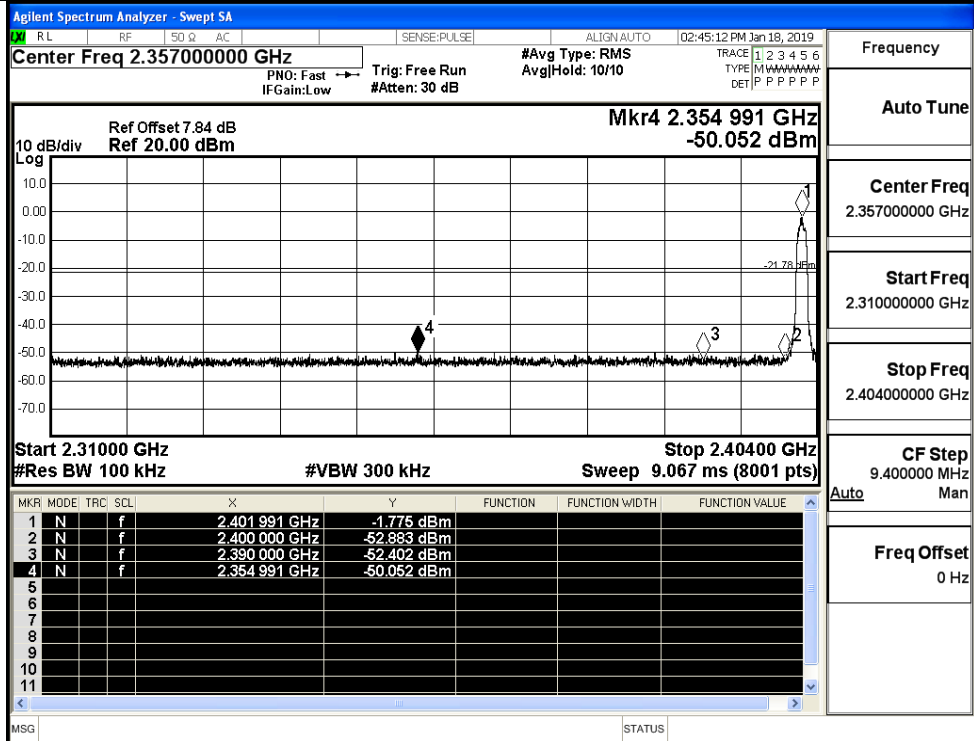
Frequency	
Auto Tune	
Center Freq	2.489000000 GHz
Start Freq	2.478000000 GHz
Stop Freq	2.500000000 GHz
CF Step	2.200000 MHz
Freq Offset	0 Hz

$\pi/4$ DQPSK/HCH/Hop



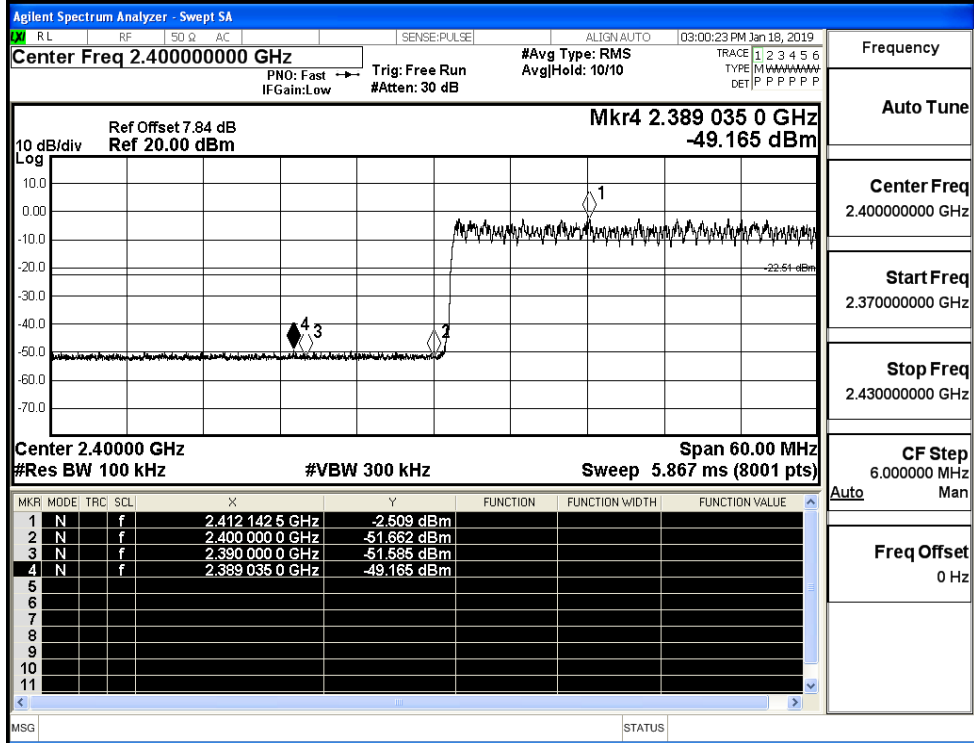
Frequency	
Auto Tune	
Center Freq	2.483500000 GHz
Start Freq	2.453500000 GHz
Stop Freq	2.513500000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz

8DPSK/LCH/No Hop



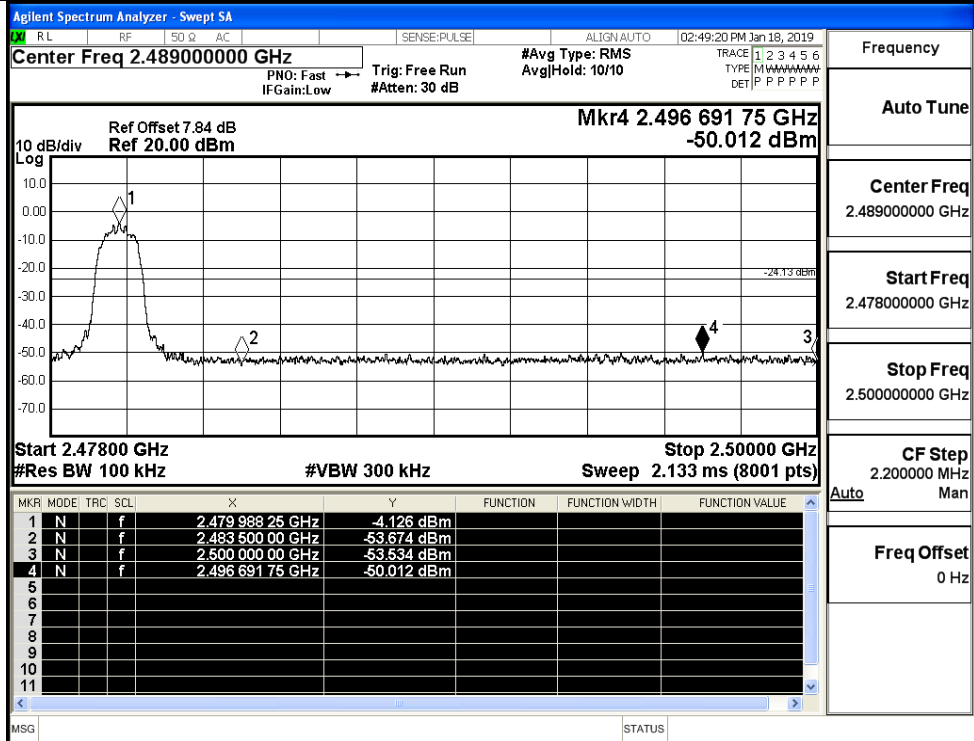
Frequency	2.357000000 GHz
Auto Tune	
Center Freq	2.357000000 GHz
Start Freq	2.310000000 GHz
Stop Freq	2.404000000 GHz
CF Step	9.400000 MHz
Freq Offset	0 Hz

8DPSK/LCH/Hop



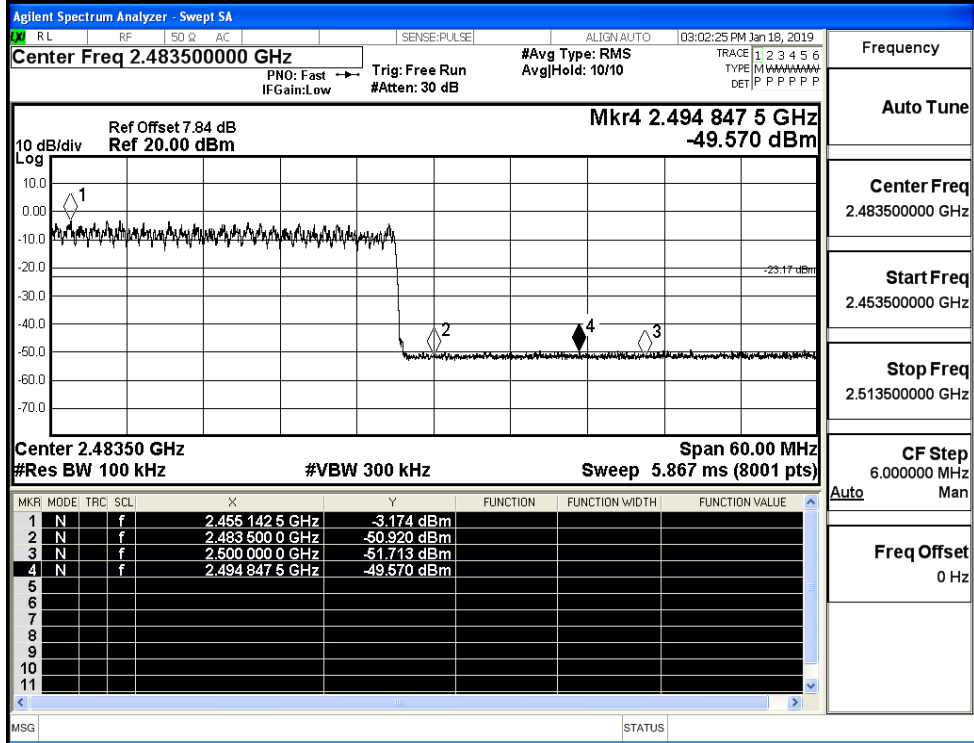
Frequency	2.400000000 GHz
Auto Tune	
Center Freq	2.400000000 GHz
Start Freq	2.370000000 GHz
Stop Freq	2.430000000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz

8DPSK/HCH/No Hop



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

8DPSK/HCH/Hop

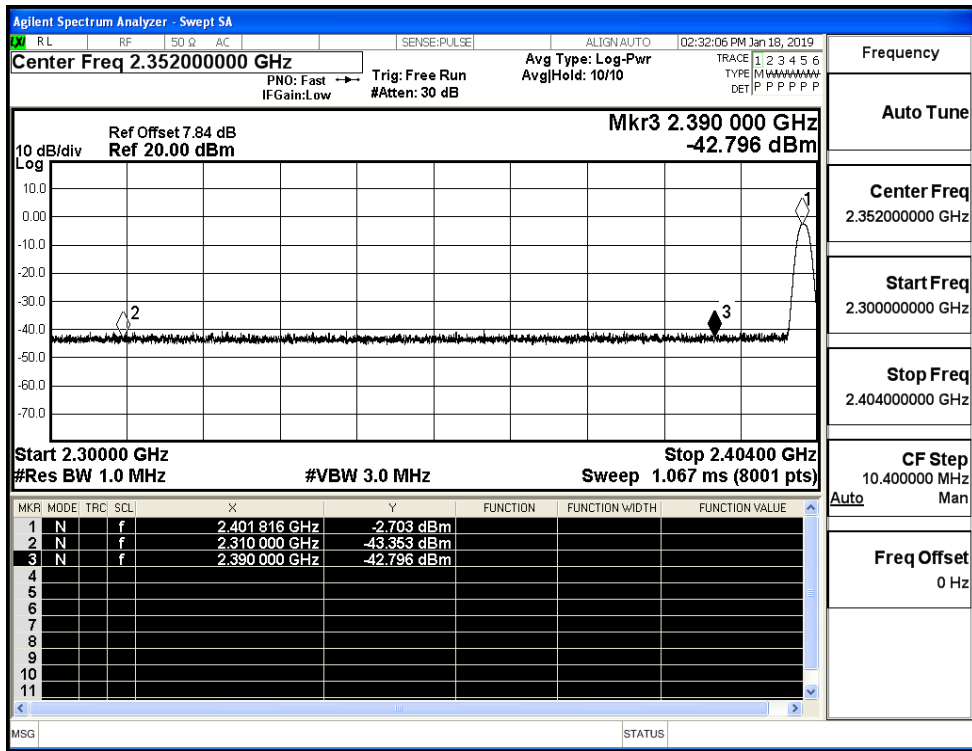


Frequency	
Auto Tune	
Center Freq	2.483500000 GHz
Start Freq	2.453500000 GHz
Stop Freq	2.513500000 GHz
CF Step	6.000000 MHz
Freq Offset	0 Hz

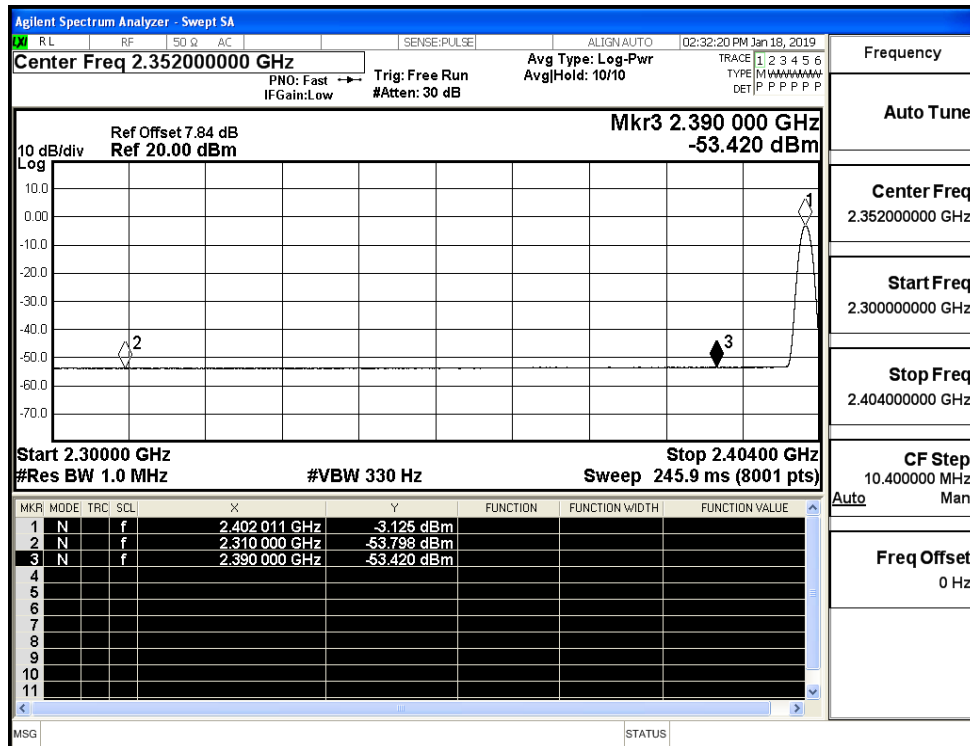
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.35	2.0	0	54.90	PEAK	74	PASS
	Off	2310.0	-53.80	2.0	0	44.46	AV	54	PASS
	Off	2390.0	-42.80	2.0	0	55.46	PEAK	74	PASS
	Off	2390.0	-53.42	2.0	0	44.84	AV	54	PASS
	Off	2483.5	-43.00	2.0	0	55.26	PEAK	74	PASS
	Off	2483.5	-53.27	2.0	0	44.99	AV	54	PASS
	Off	2500.0	-43.37	2.0	0	54.89	PEAK	74	PASS
	Off	2500.0	-53.07	2.0	0	45.19	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-44.01	2.0	0	54.24	PEAK	74	PASS
	Off	2310.0	-53.86	2.0	0	44.40	AV	54	PASS
	Off	2390.0	-42.54	2.0	0	55.71	PEAK	74	PASS
	Off	2390.0	-53.51	2.0	0	44.74	AV	54	PASS
	Off	2483.5	-41.02	2.0	0	57.23	PEAK	74	PASS
	Off	2483.5	-53.17	2.0	0	45.08	AV	54	PASS
	Off	2500.0	-43.72	2.0	0	54.53	PEAK	74	PASS
	Off	2500.0	-53.12	2.0	0	45.13	AV	54	PASS
8DPSK	Off	2310.0	-44.26	2.0	0	54.00	PEAK	74	PASS
	Off	2310.0	-53.76	2.0	0	44.50	AV	54	PASS
	Off	2390.0	-44.03	2.0	0	54.23	PEAK	74	PASS
	Off	2390.0	-53.58	2.0	0	44.68	AV	54	PASS
	Off	2483.5	-43.78	2.0	0	54.48	PEAK	74	PASS
	Off	2483.5	-53.29	2.0	0	44.97	AV	54	PASS
	Off	2500.0	-42.94	2.0	0	55.32	PEAK	74	PASS
	Off	2500.0	-53.17	2.0	0	45.09	AV	54	PASS

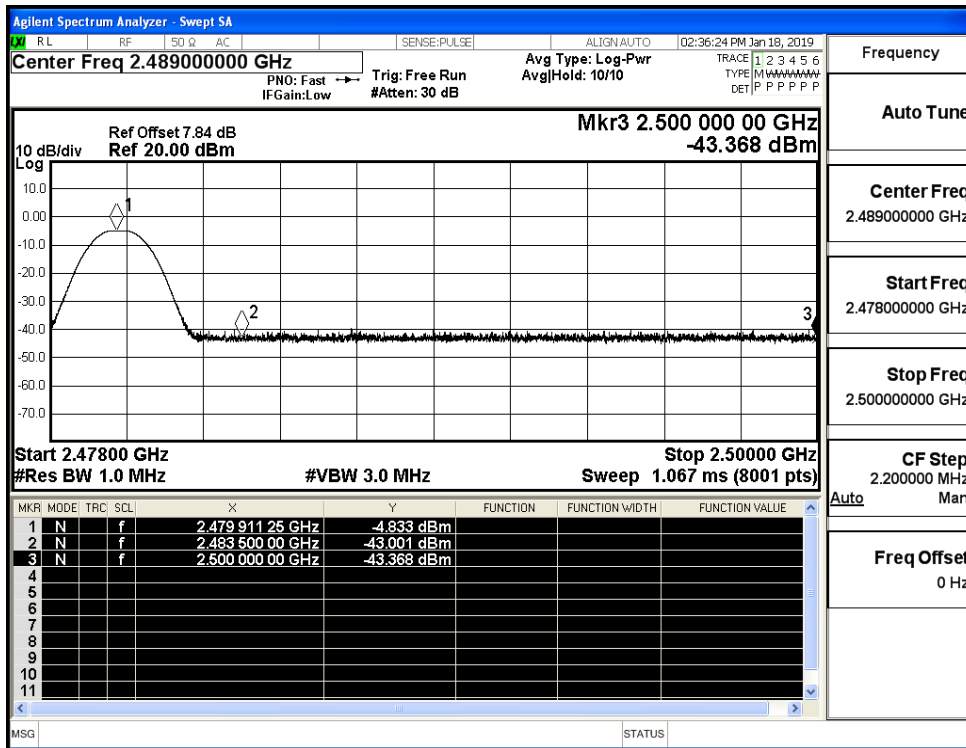
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



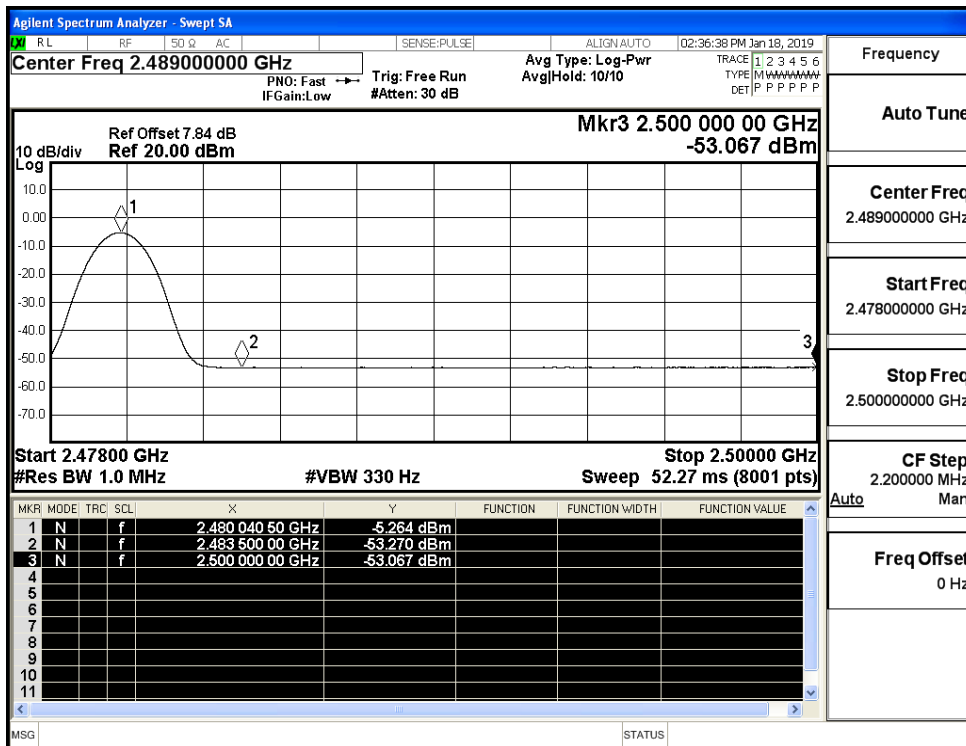
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



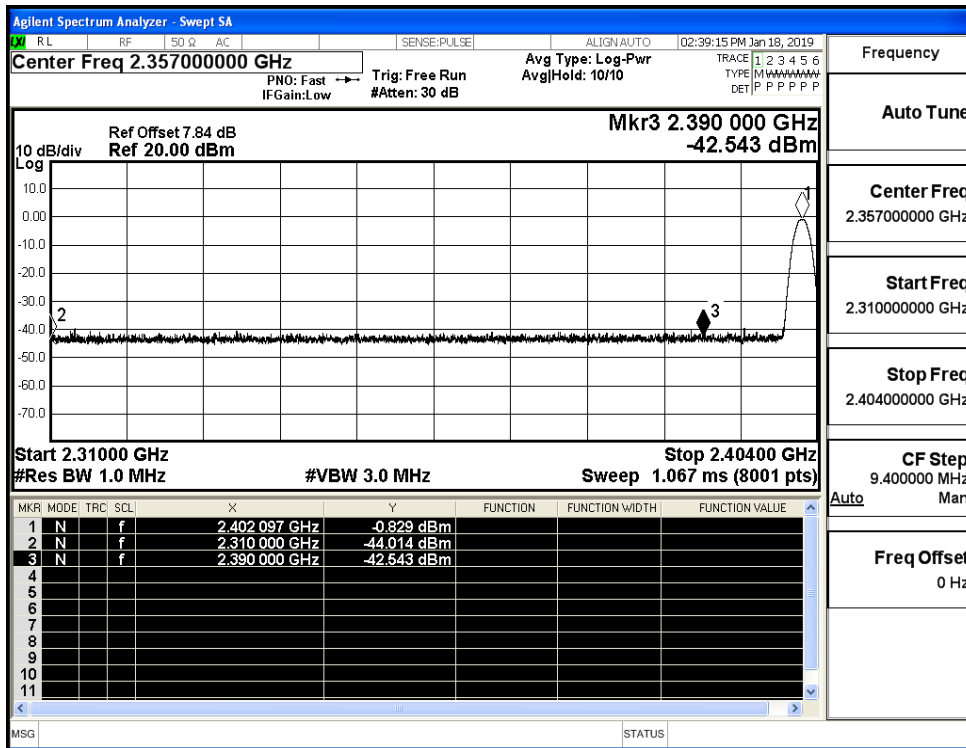
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



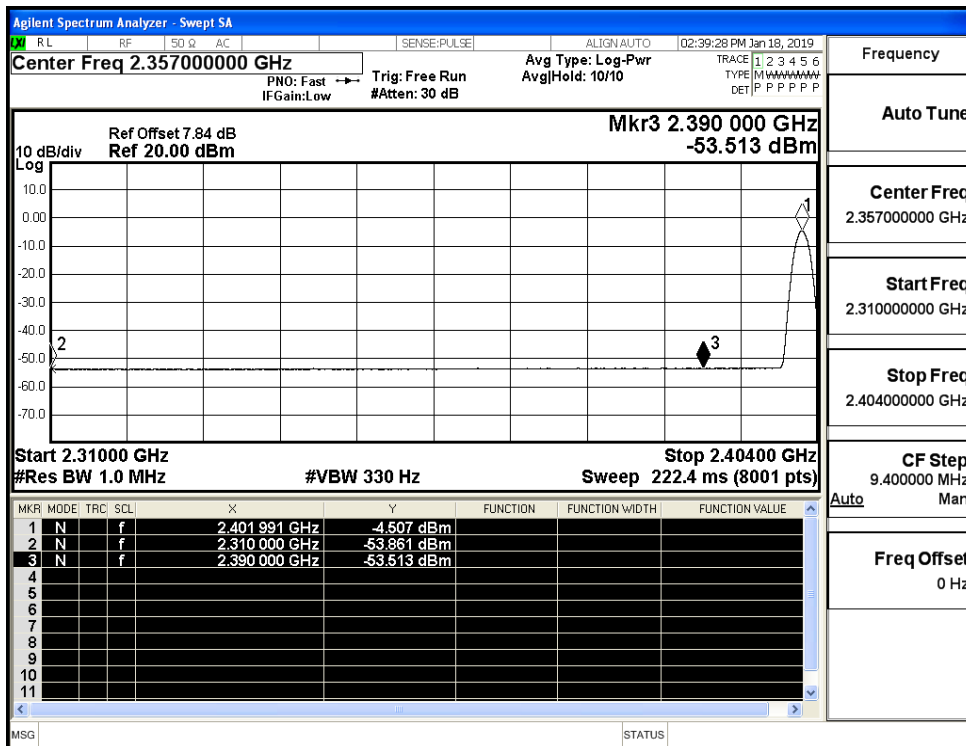
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



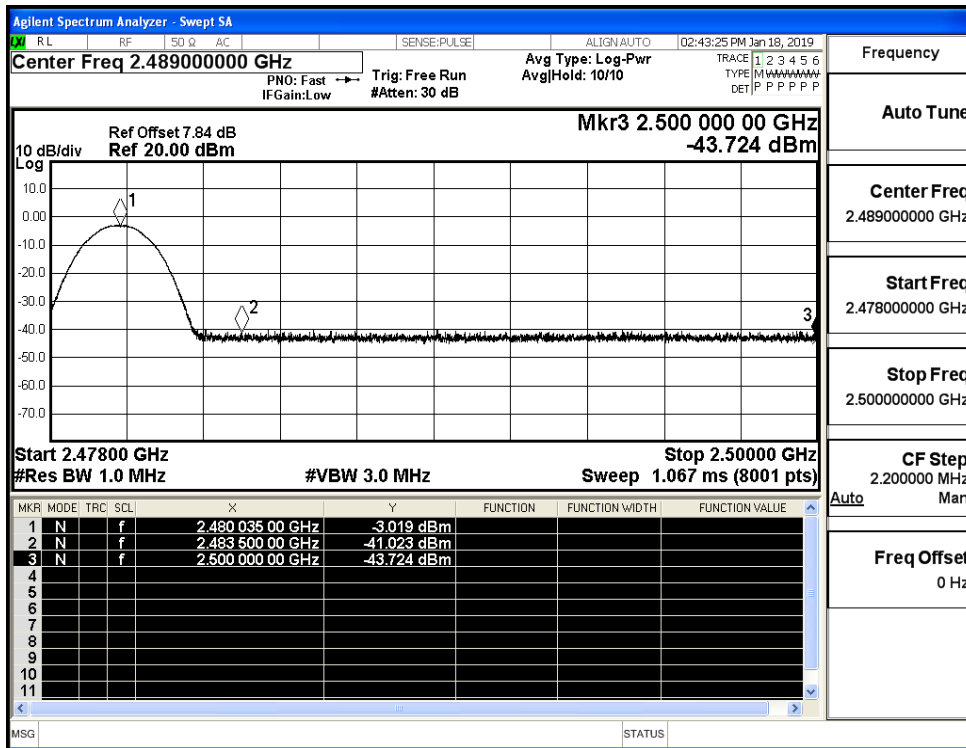
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)



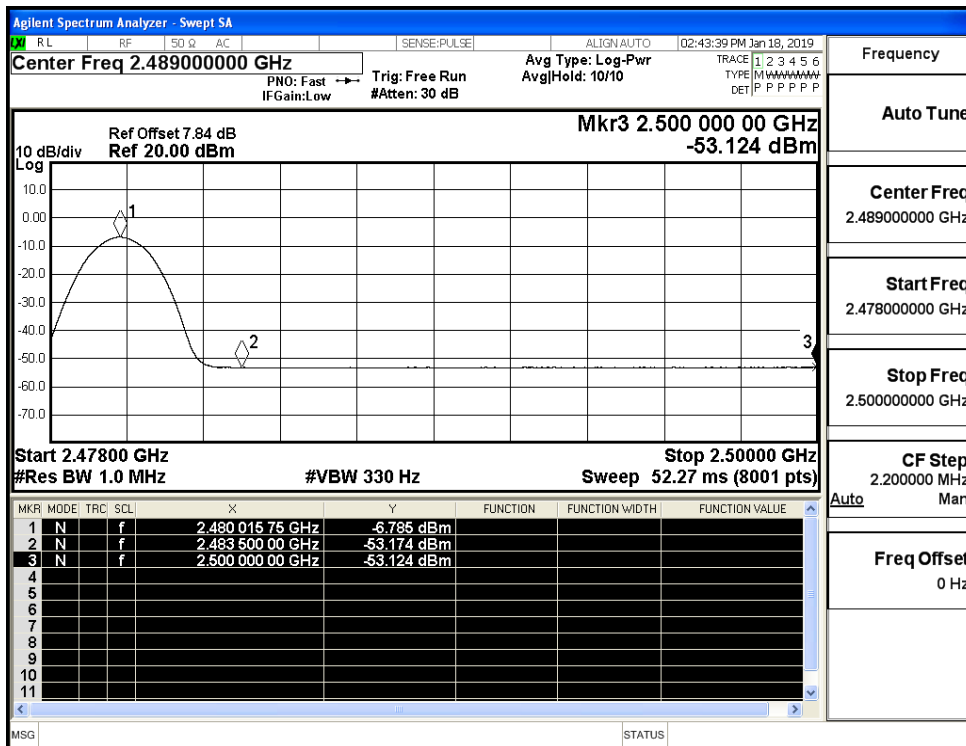
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)



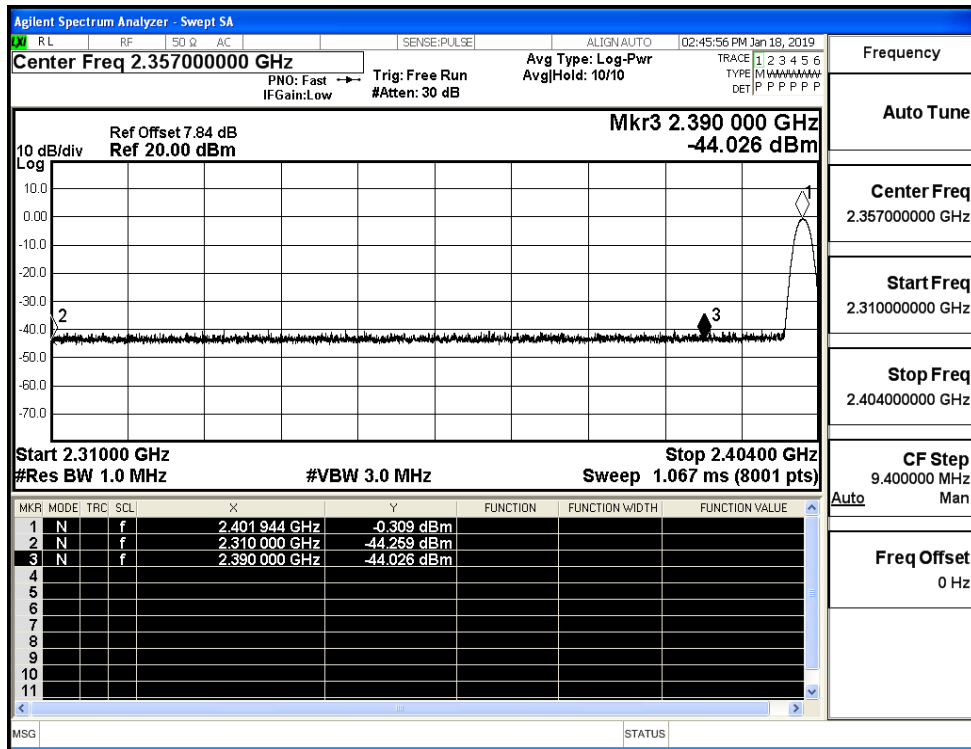
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (High Channel)



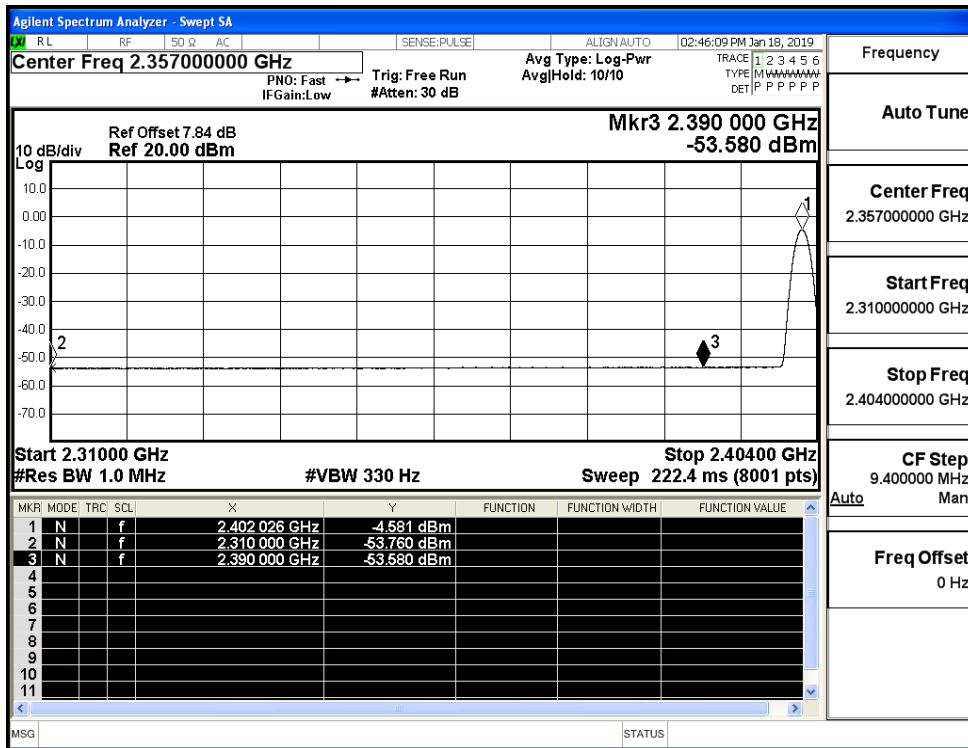
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (High Channel)



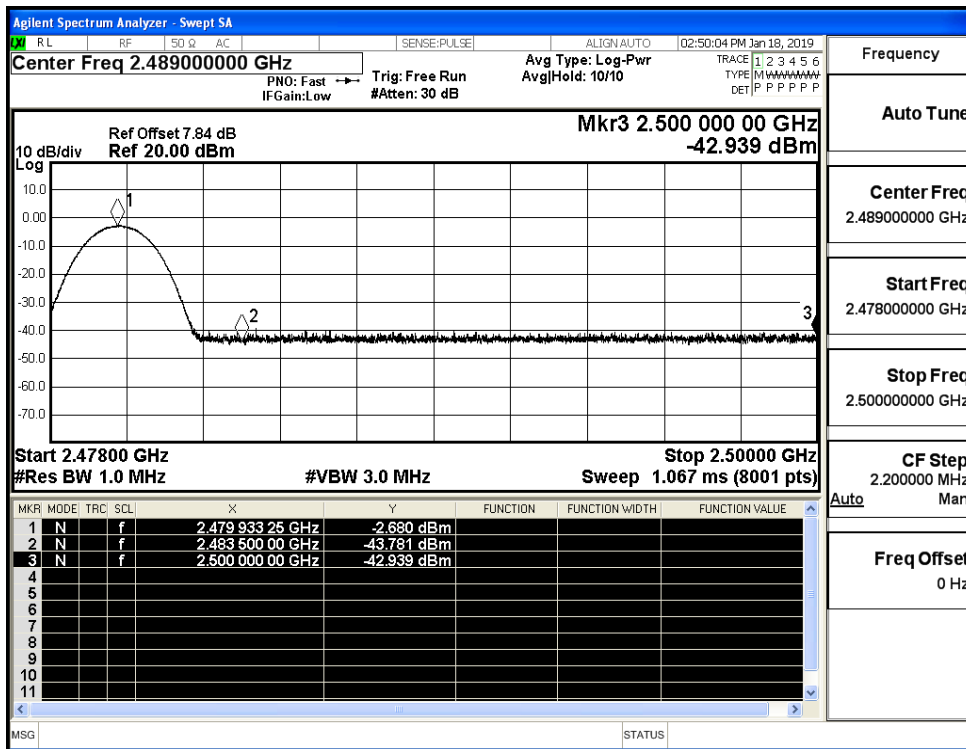
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (Low Channel)



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



Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (High Channel)

