

## Appendix A

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

Product Name: Microphone

Trade Mark: Asperx

Test Model: K18

#### Environmental Conditions

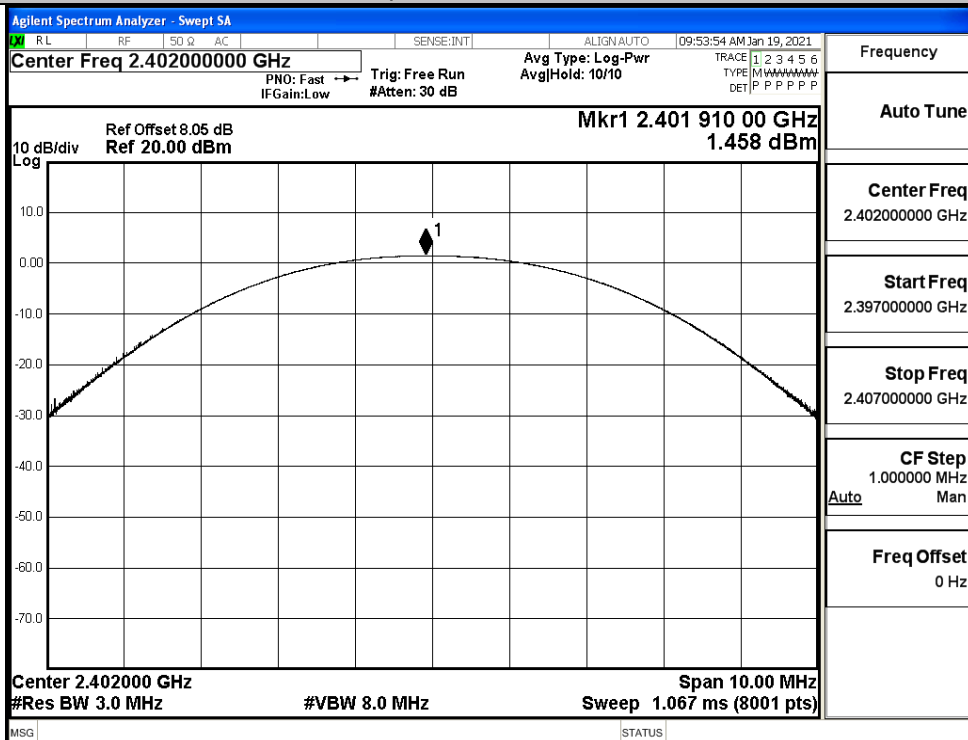
Temperature:	24.6° C
Relative Humidity:	54.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Ben Jin
Supervised by:	Li Huan

#### A.1 Maximum Conducted Peak Output Power

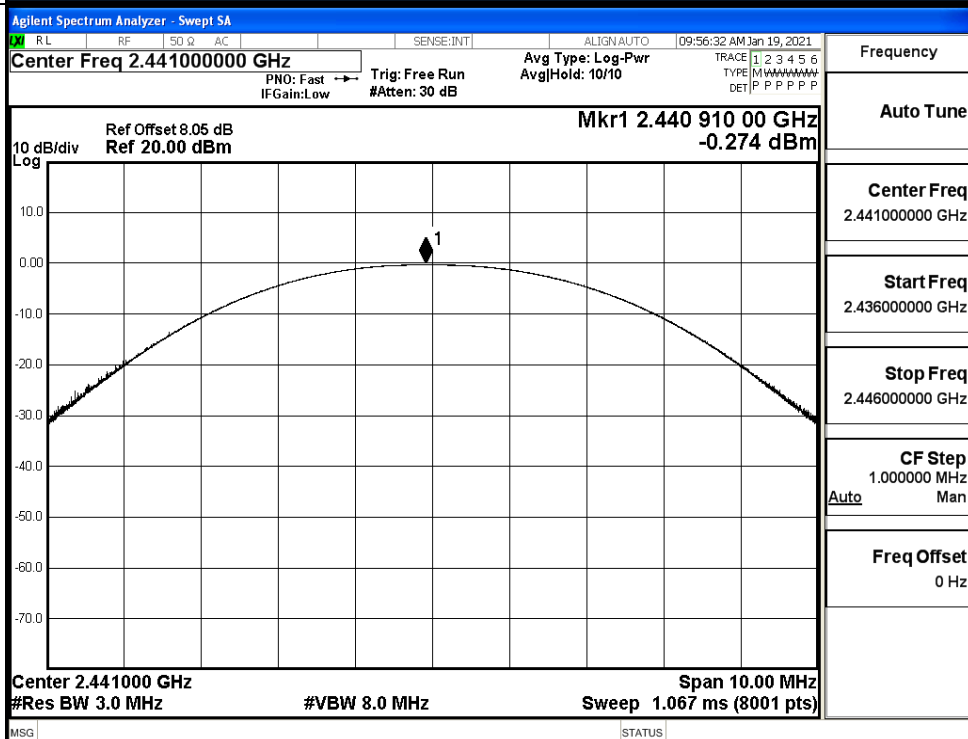
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.458	21	PASS
	MCH	-0.274	21	PASS
	HCH	-2.229	21	PASS
$\pi/4$ DQPSK	LCH	3.778	21	PASS
	MCH	1.917	21	PASS
	HCH	-0.034	21	PASS
8DPSK	LCH	4.268	21	PASS
	MCH	2.442	21	PASS
	HCH	0.512	21	PASS

## Test Graphs

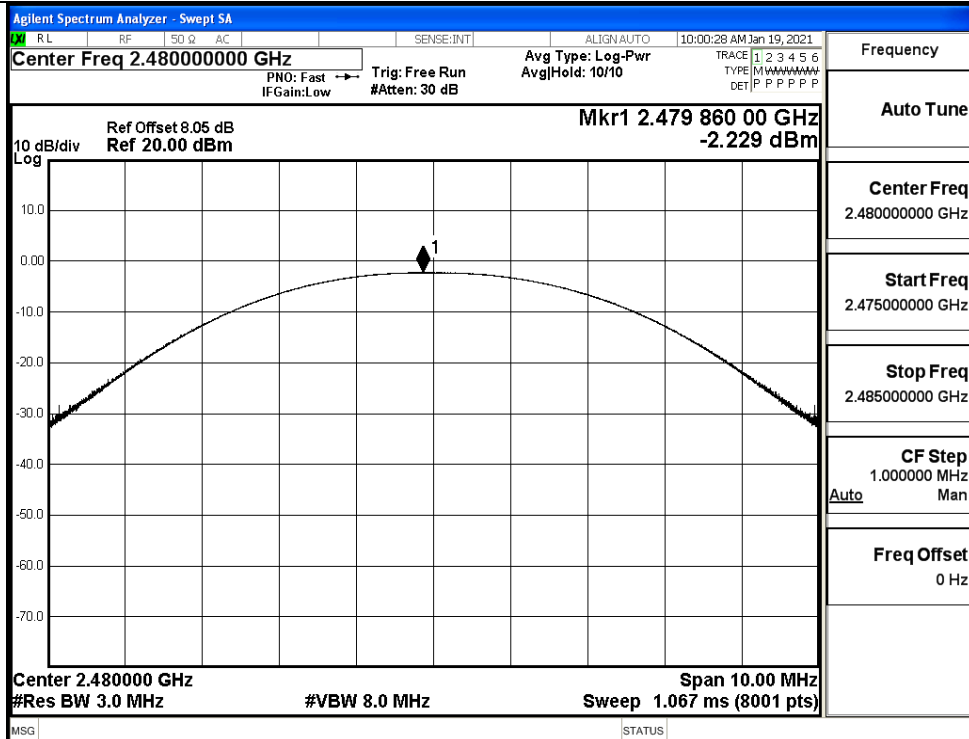
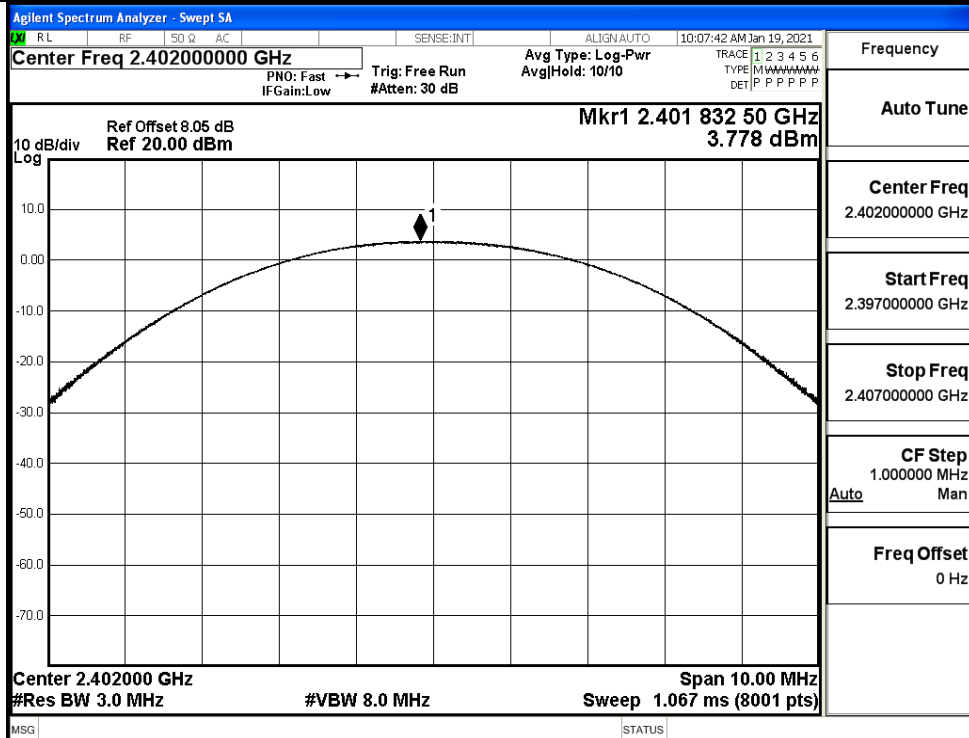
GFSK/LCH

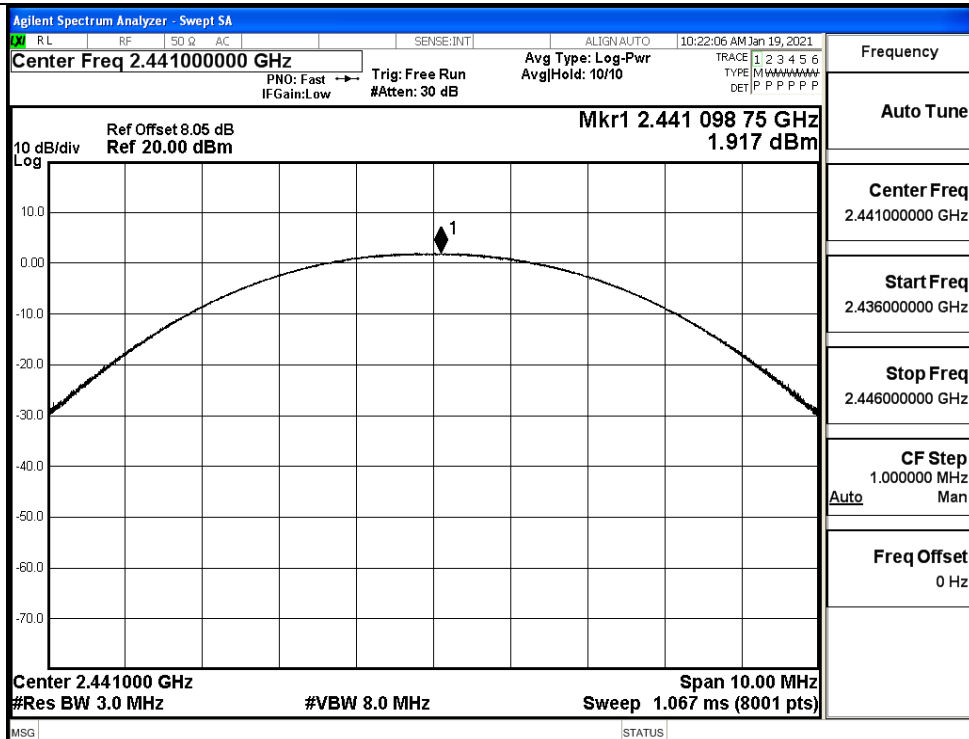
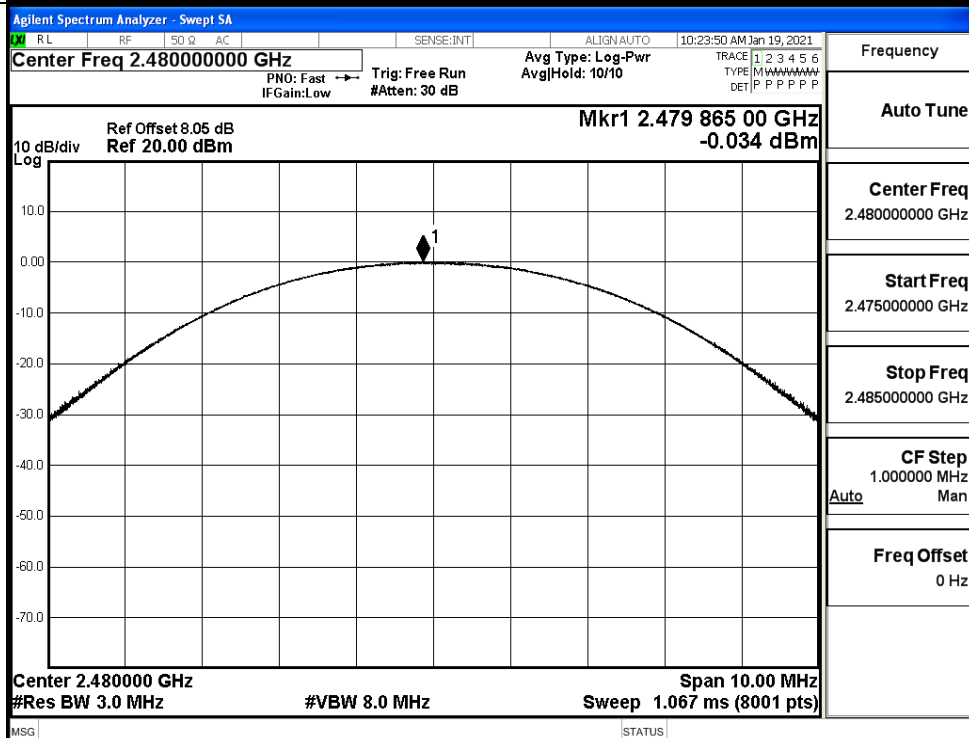


GFSK/MCH

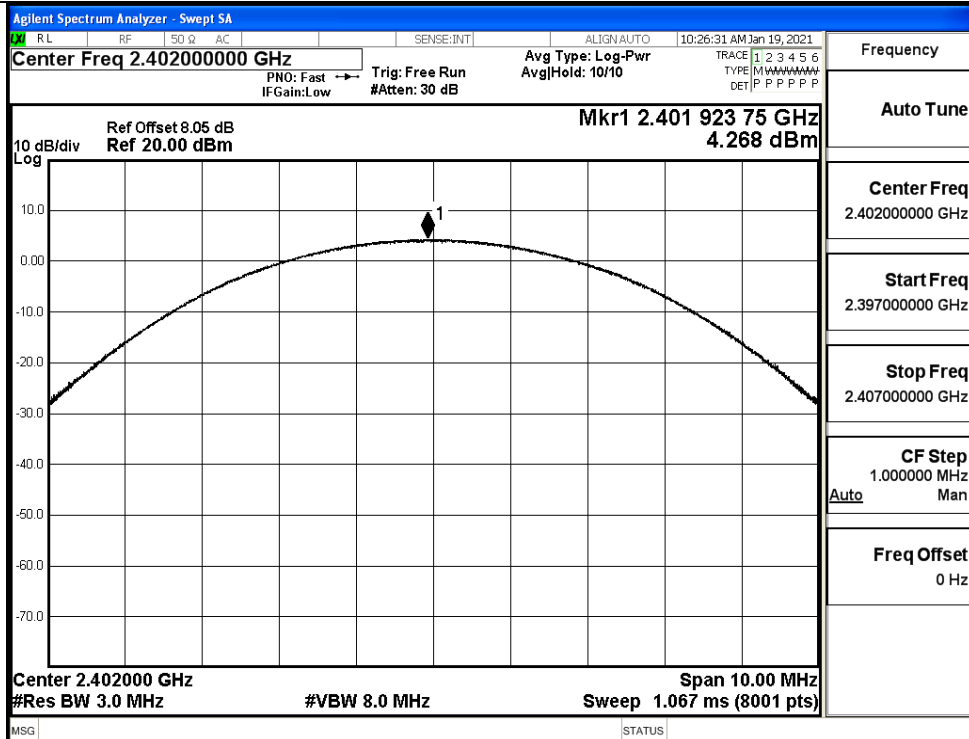


GFSK/HCH

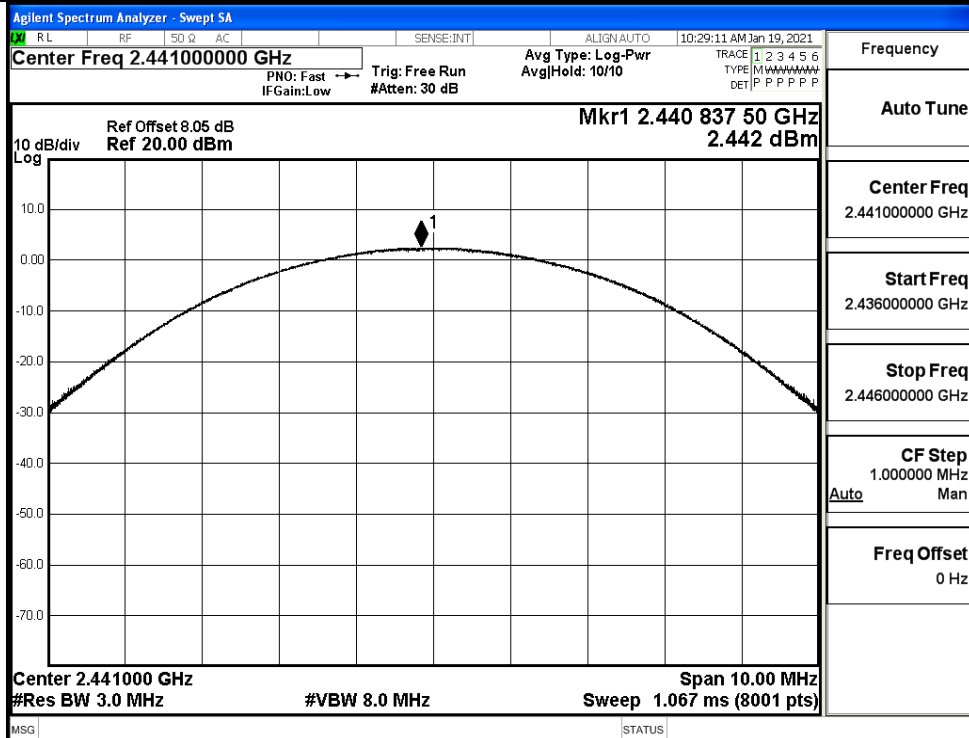
 $\pi/4$ DQPSK/LCH

$\pi/4$ DQPSK/MCH $\pi/4$ DQPSK/HCH

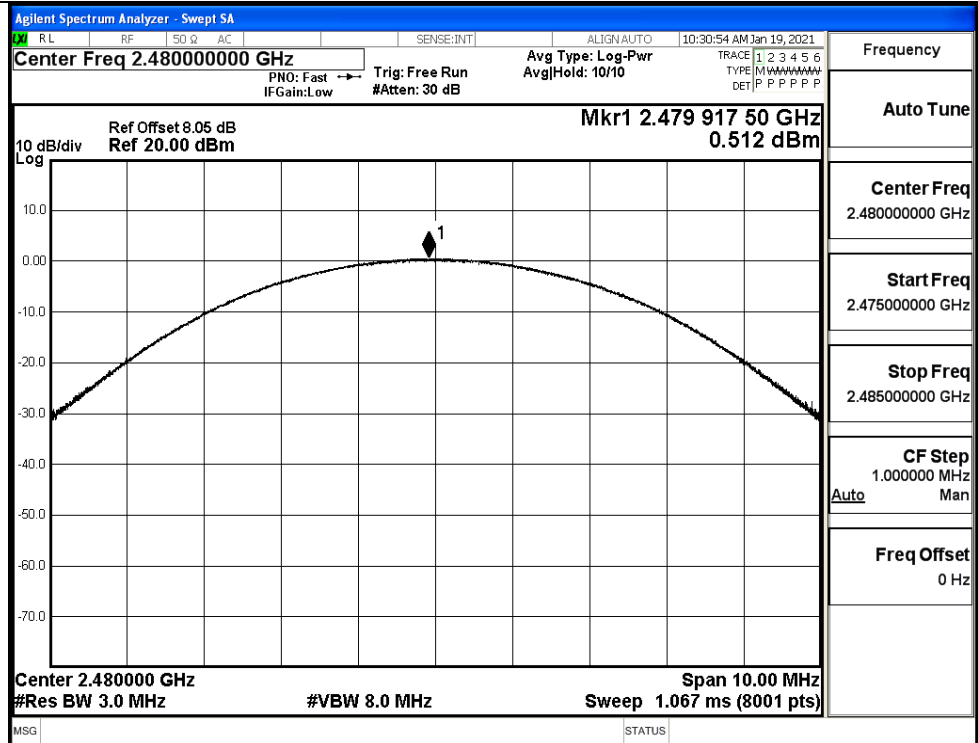
8DPSK/LCH



8DPSK/MCH



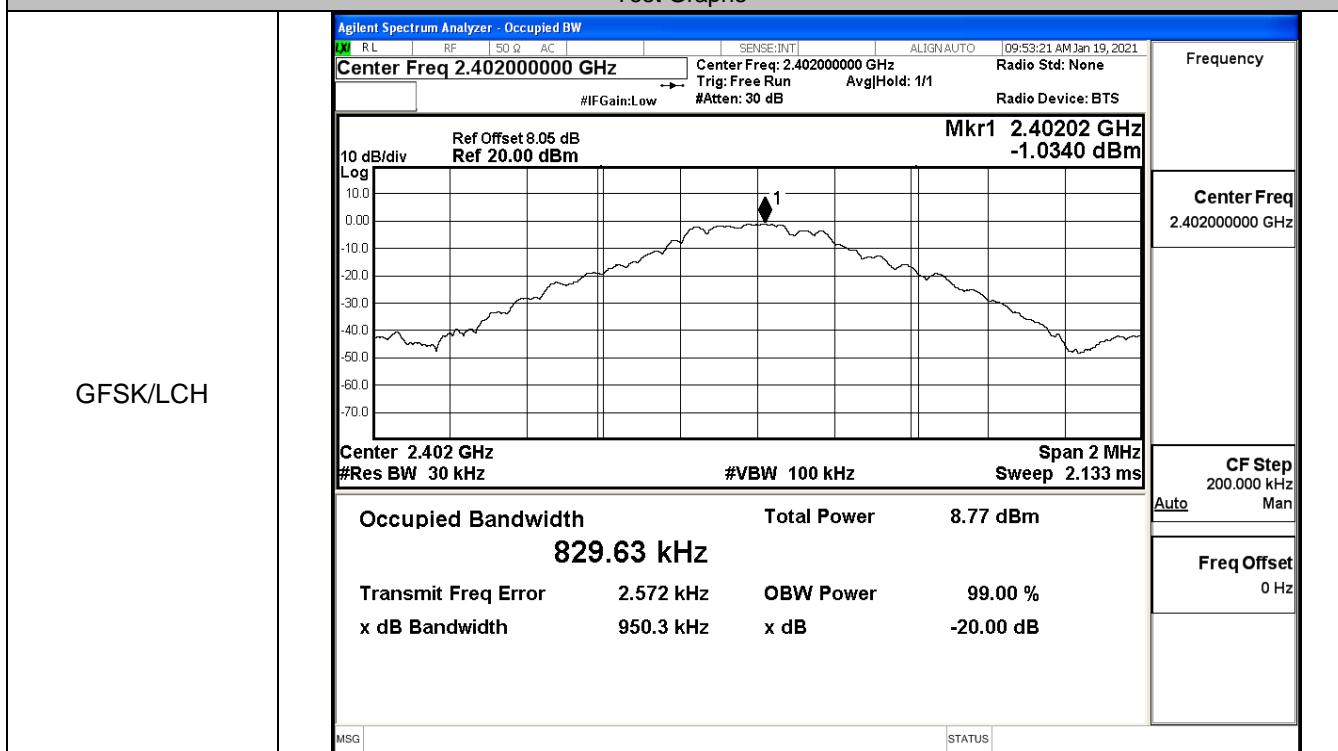
8DPSK/HCH



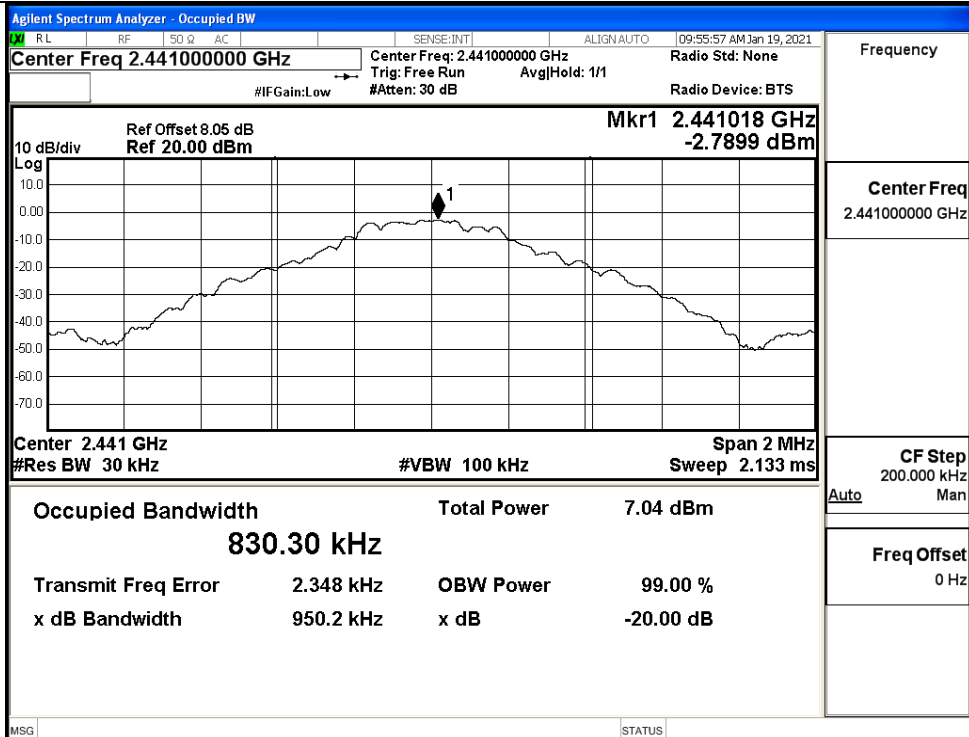
## A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9503	Not Specified	PASS
	MCH	0.9502	Not Specified	PASS
	HCH	0.9504	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.317	Not Specified	PASS
	MCH	1.319	Not Specified	PASS
	HCH	1.319	Not Specified	PASS
8DPSK	LCH	1.289	Not Specified	PASS
	MCH	1.298	Not Specified	PASS
	HCH	1.293	Not Specified	PASS

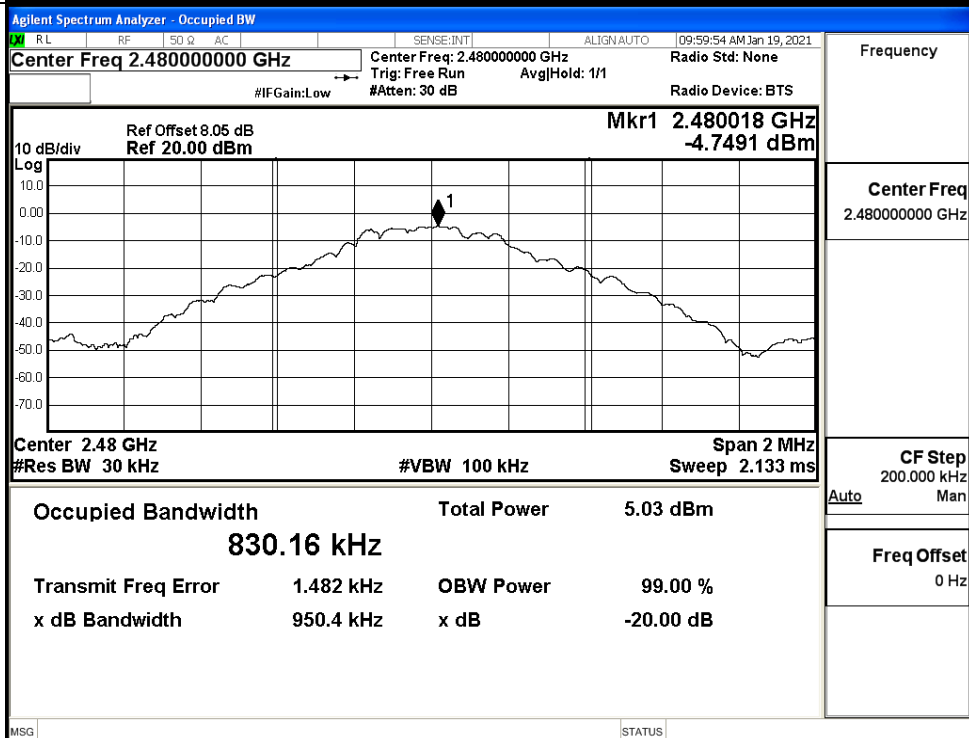
Test Graphs



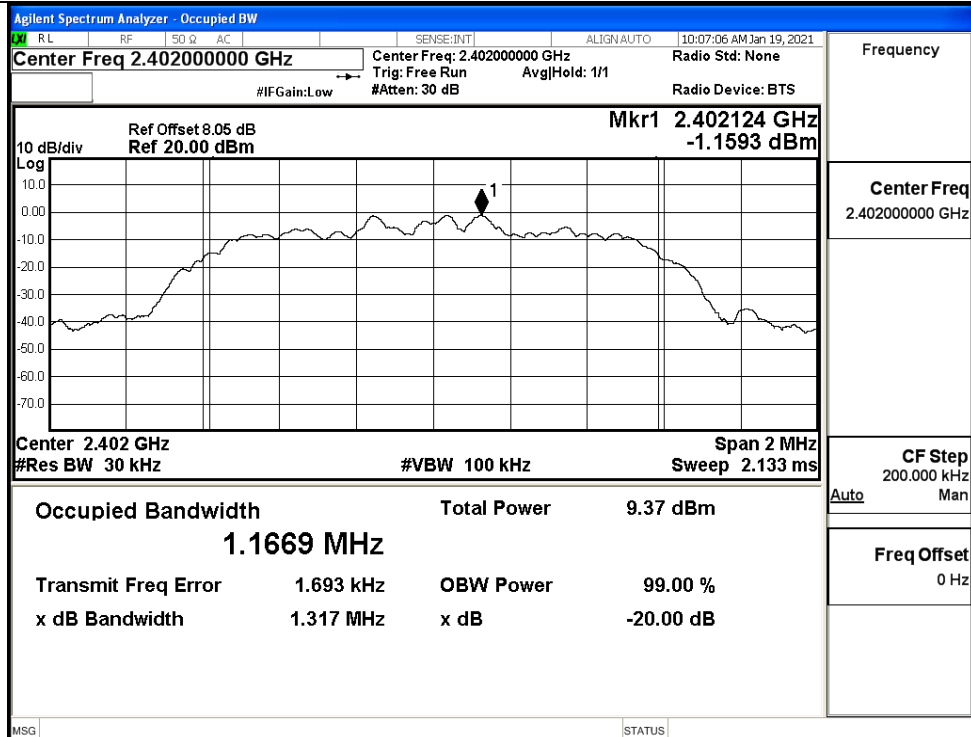
GFSK/MCH



GFSK/HCH



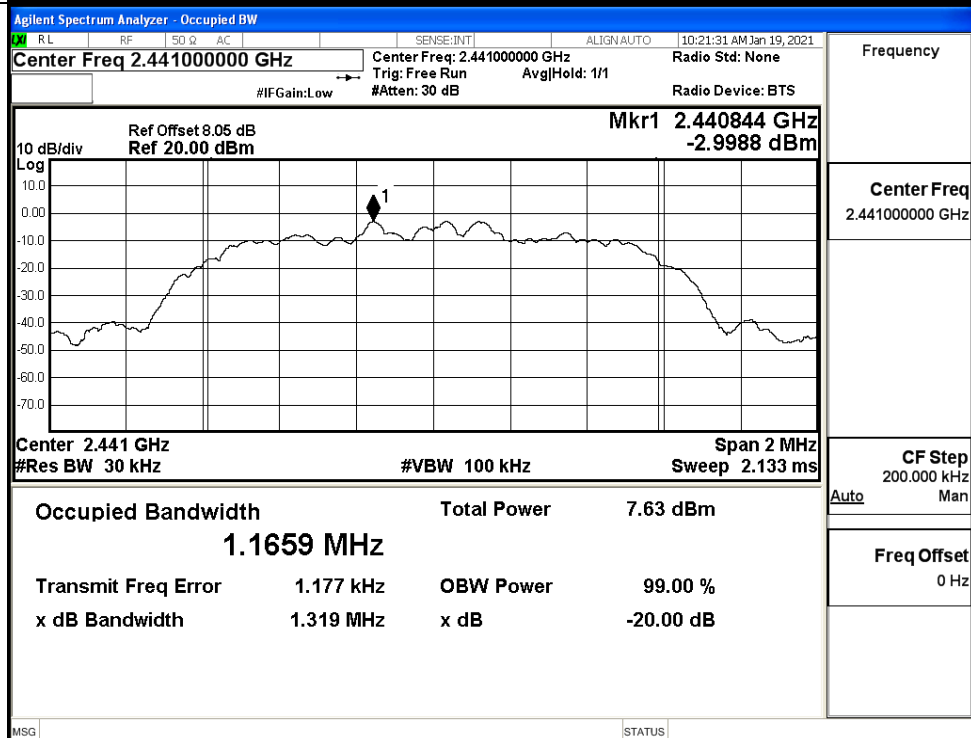


$\pi/4$ DQPSK/LCH

Frequency

Center Freq  
2.40200000 GHzCF Step  
200.000 kHz  
Man

Auto

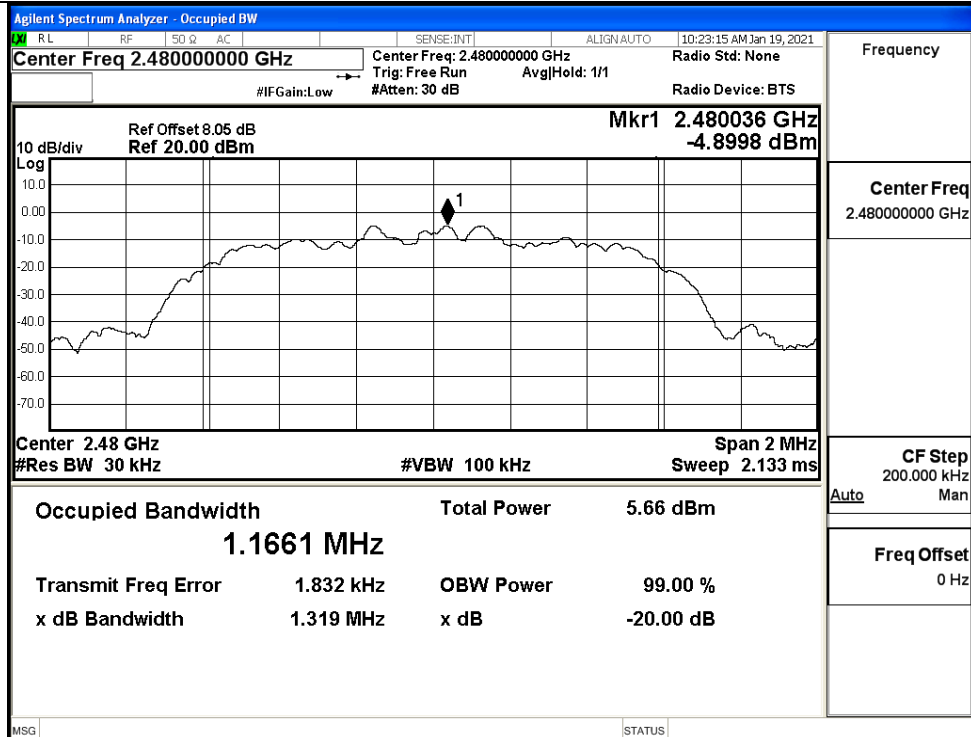
Freq Offset  
0 Hz $\pi/4$ DQPSK/MCH

Frequency

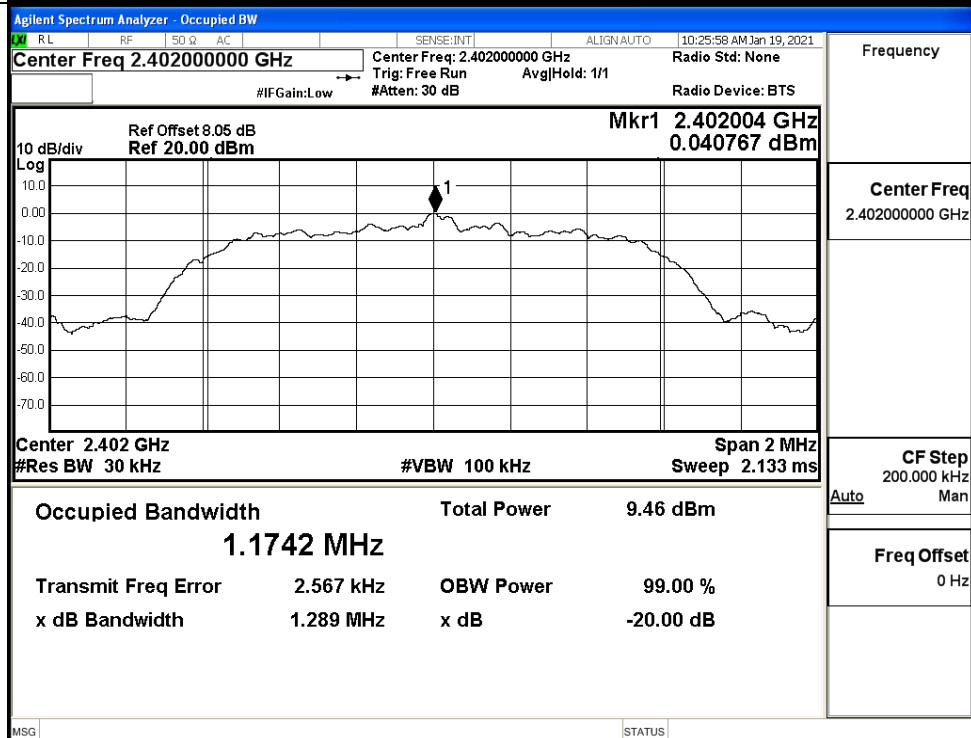
Center Freq  
2.44100000 GHzCF Step  
200.000 kHz  
Man

Auto

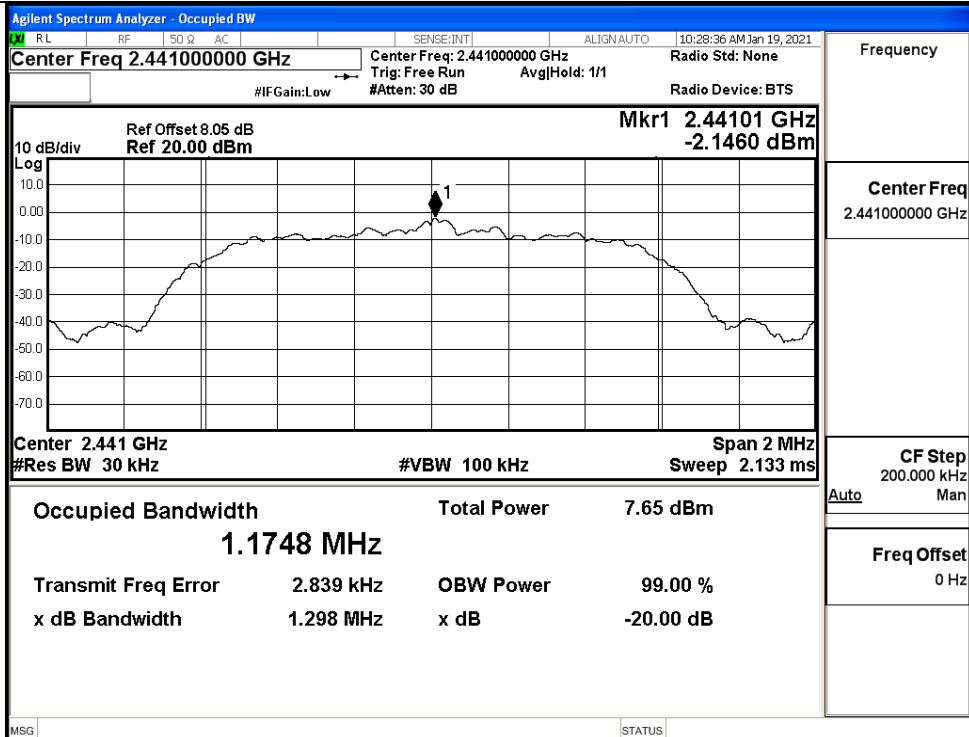
Freq Offset  
0 Hz

$\pi/4$ DQPSK/HCH

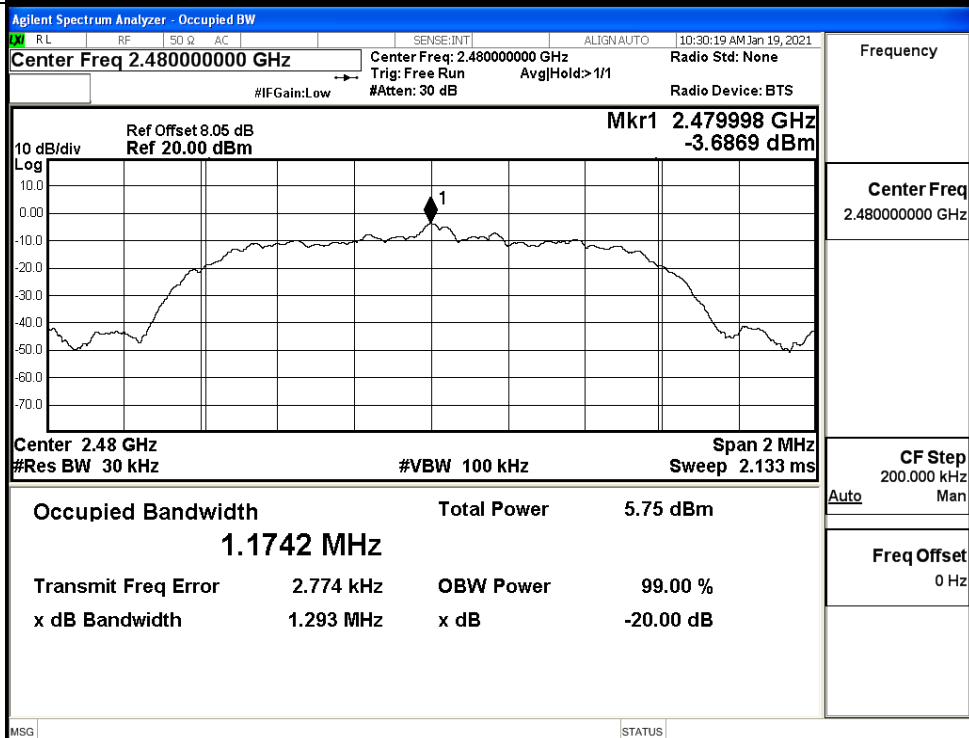
8DPSK/LCH



8DPSK/MCH



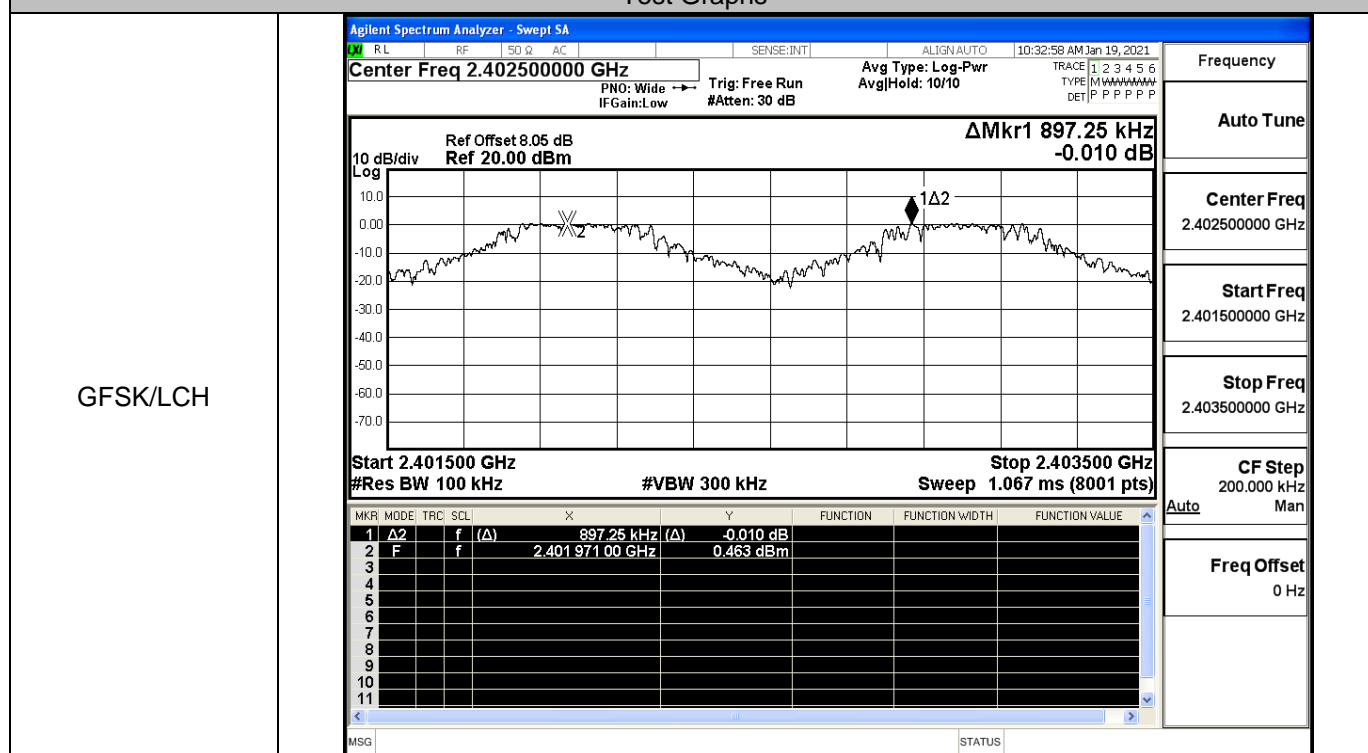
8DPSK/HCH



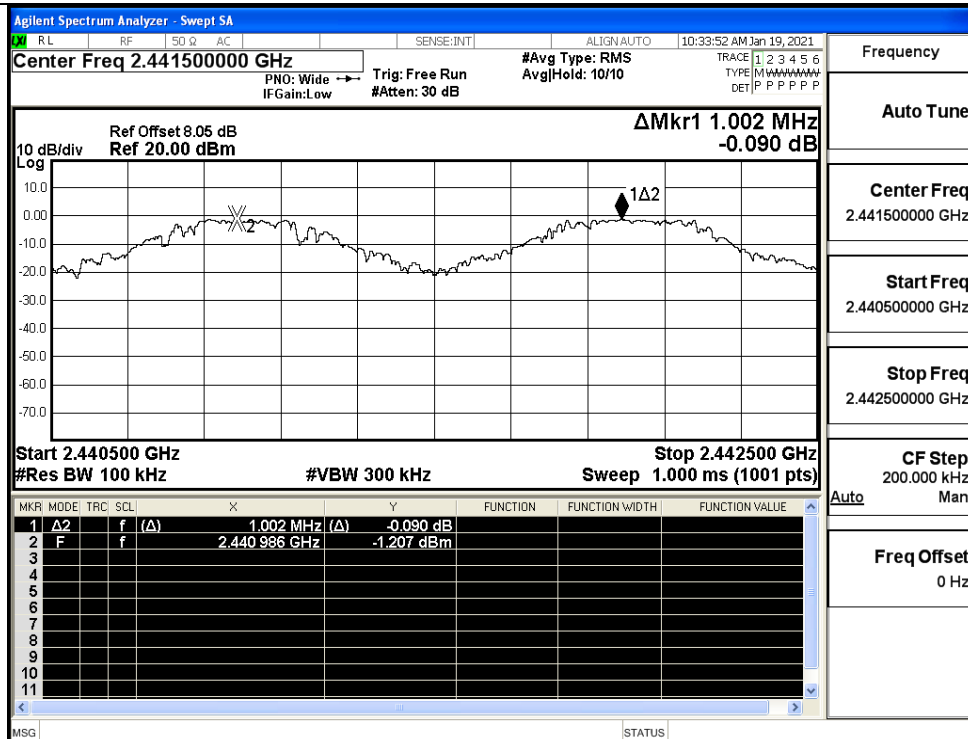
## A.4 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.897	0.634	PASS
	MCH	1.002	0.634	PASS
	HCH	0.978	0.634	PASS
$\pi/4$ DQPSK	LCH	1.126	0.879	PASS
	MCH	1.192	0.879	PASS
	HCH	1.166	0.879	PASS
8DPSK	LCH	1.044	0.865	PASS
	MCH	1.174	0.865	PASS
	HCH	1.078	0.865	PASS

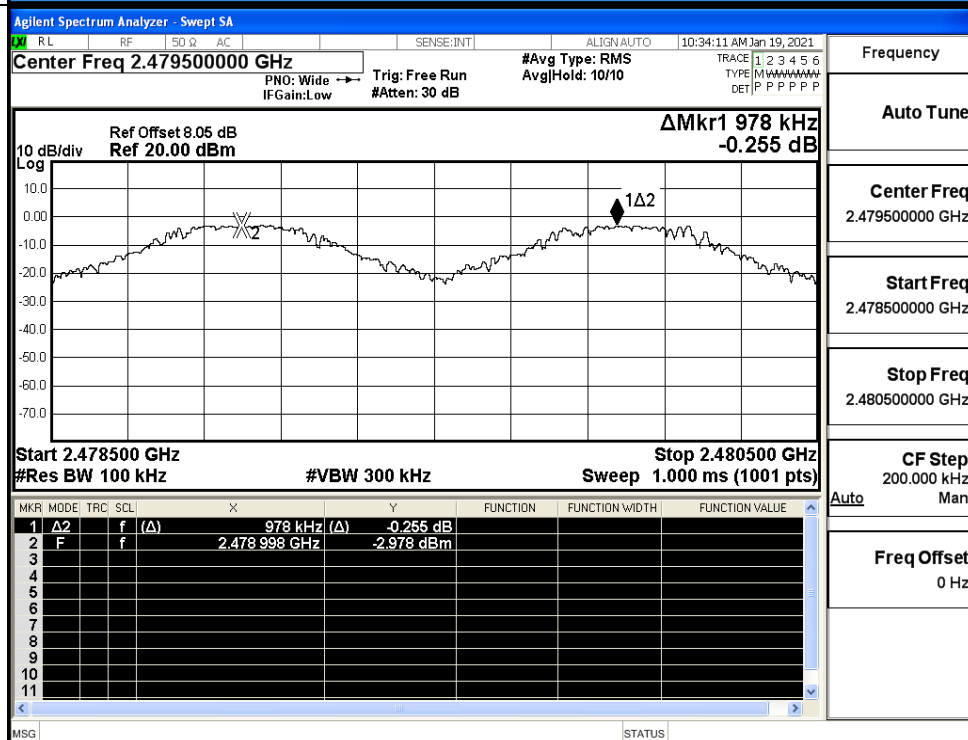
### Test Graphs

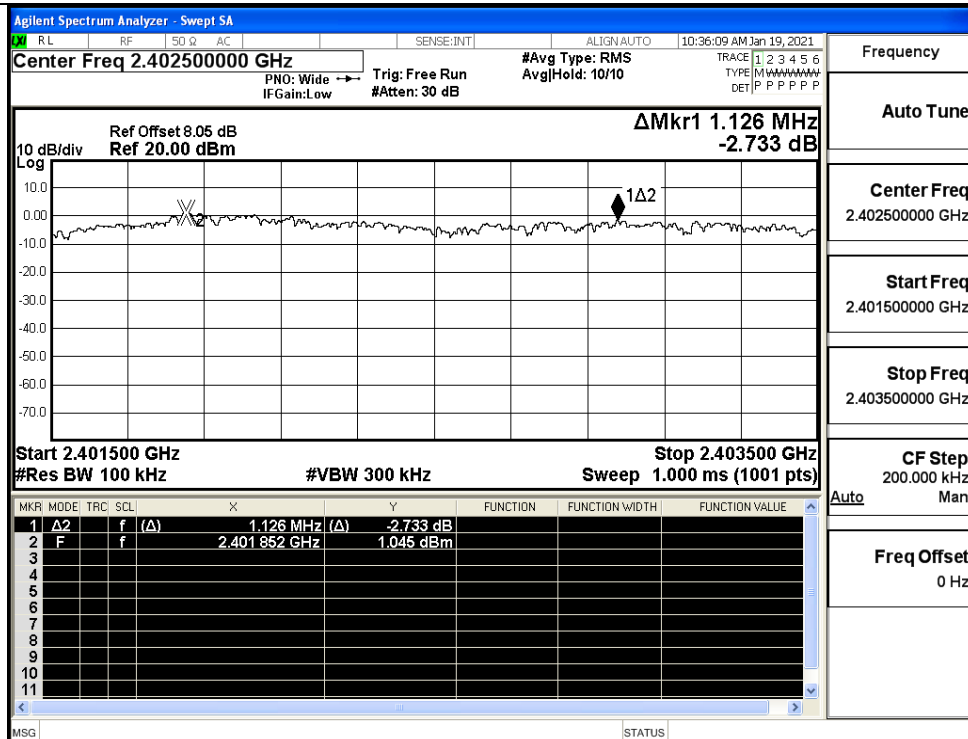
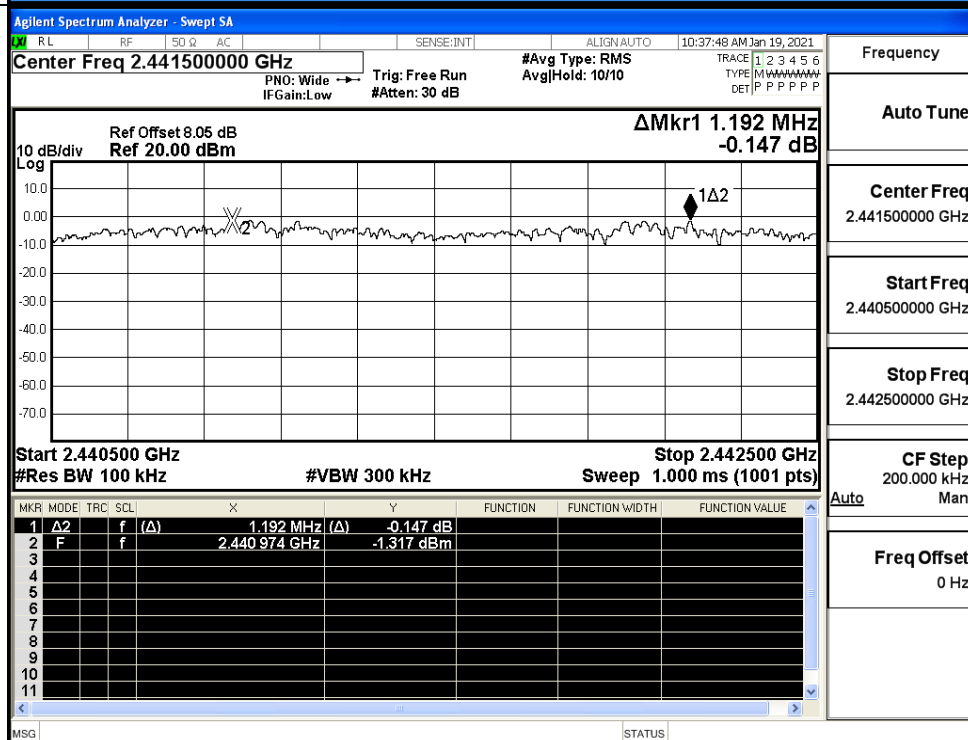


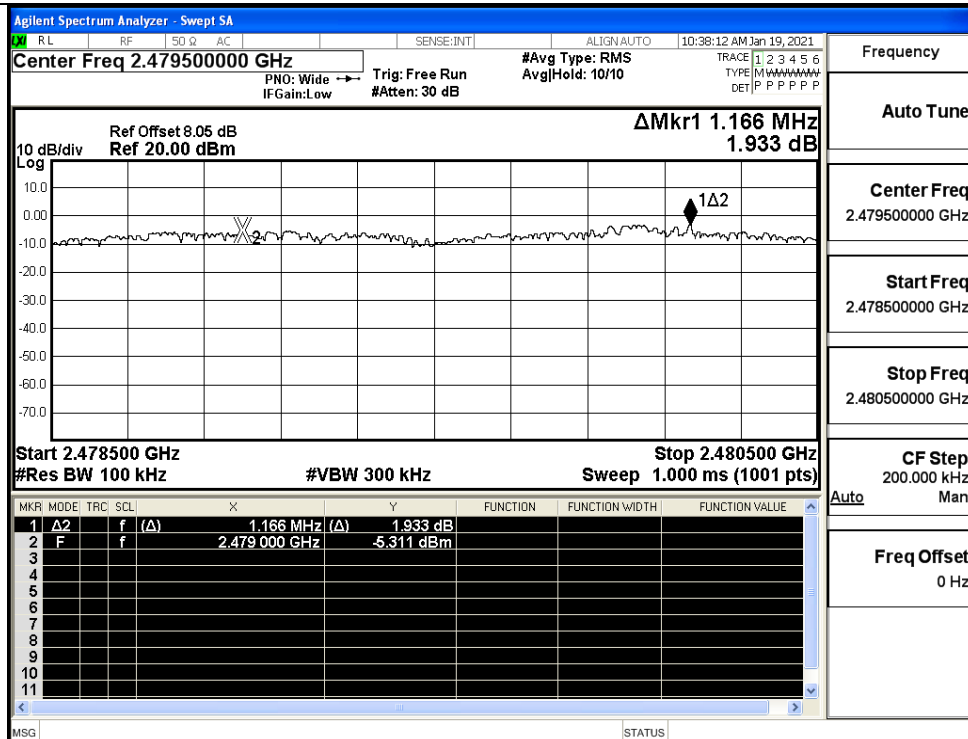
GFSK/MCH



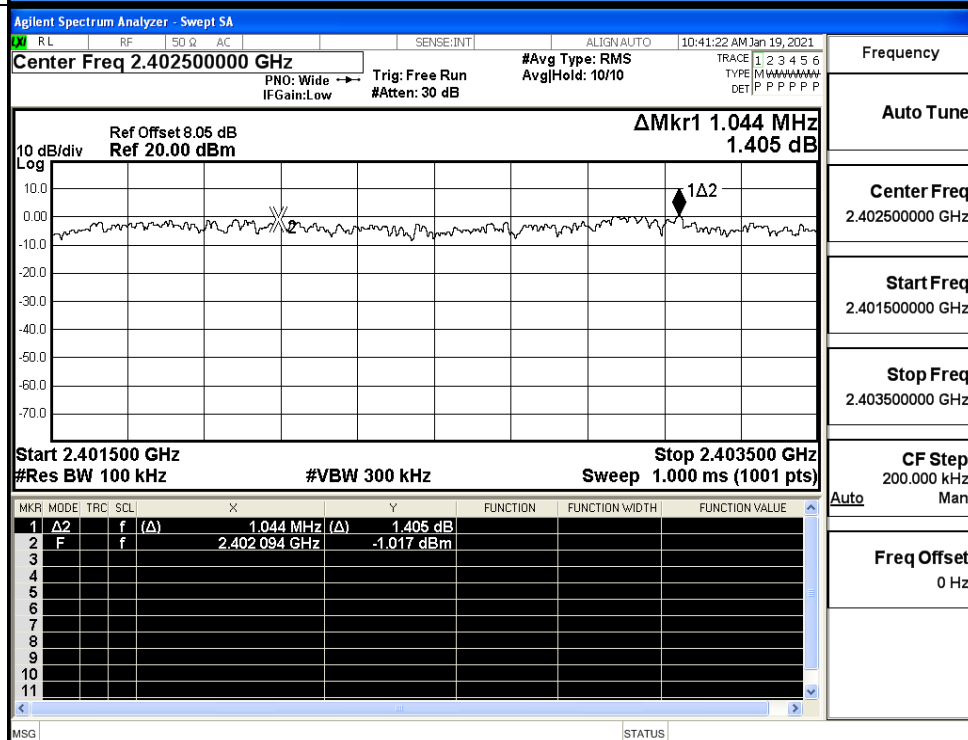
GFSK/HCH



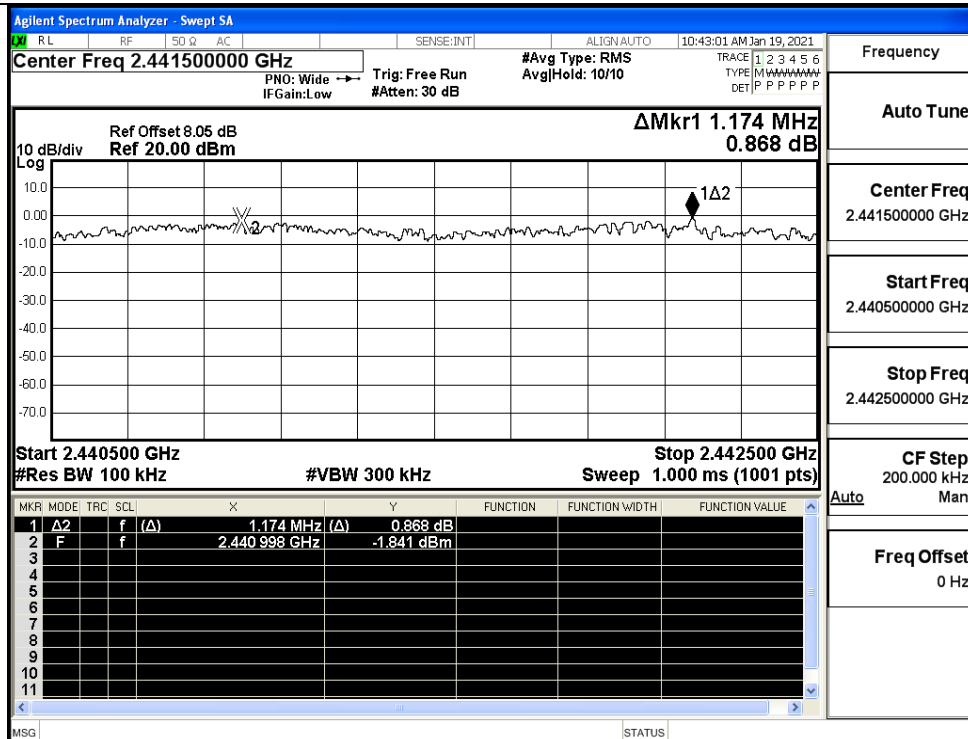
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

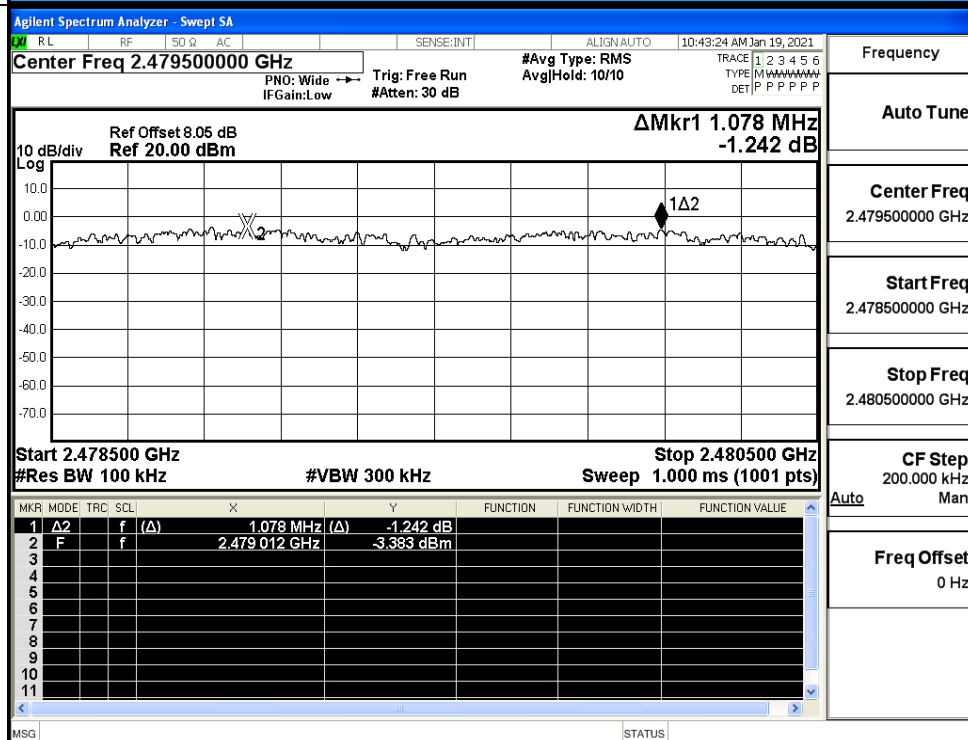
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH



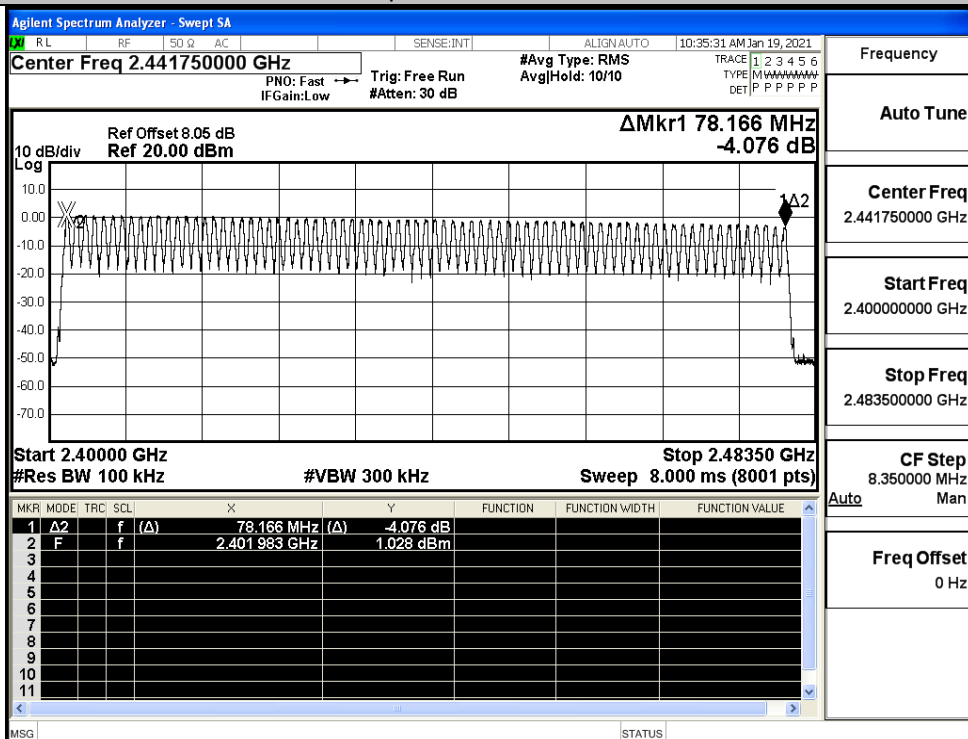


## A.5 Hopping Channel Number

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

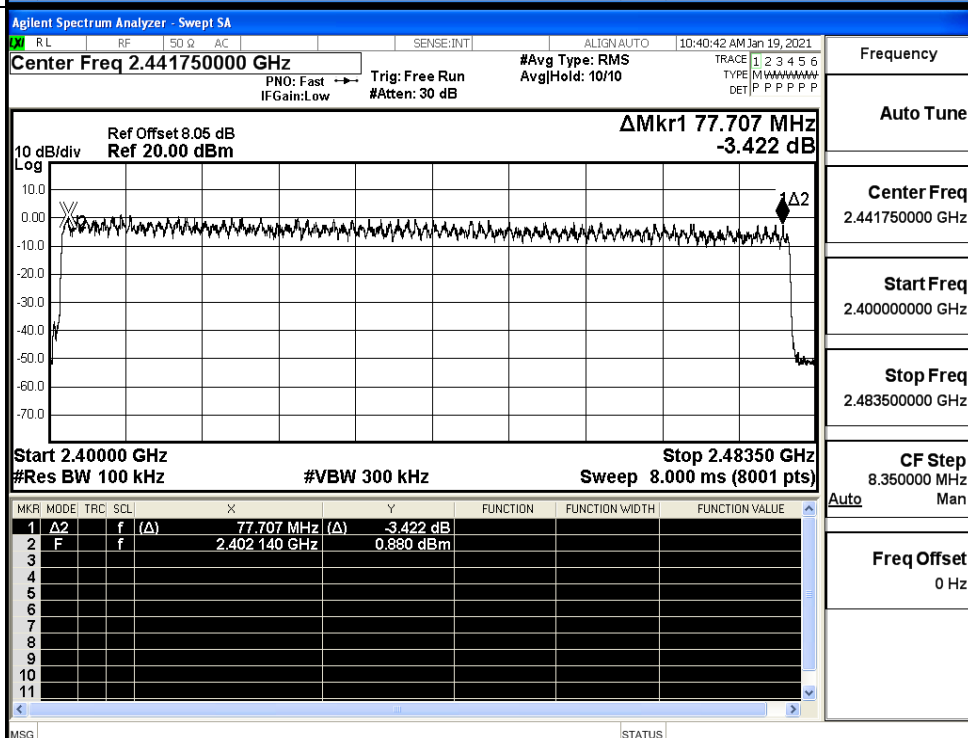
## Test Graphs

GFSK/Hop



Frequency

Auto Tune

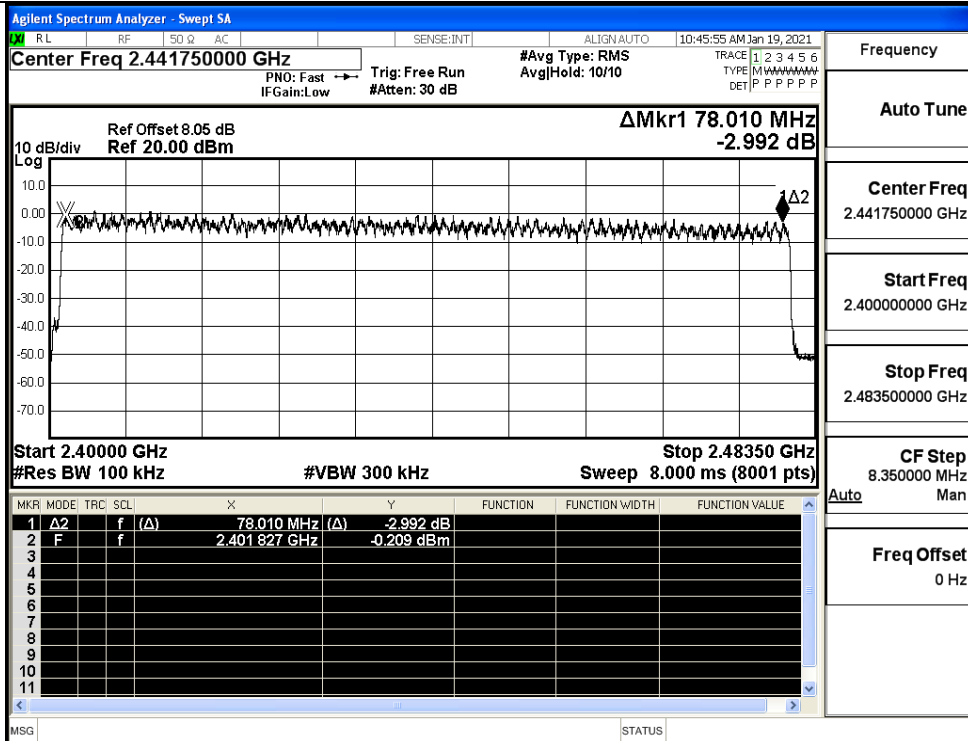
Center Freq  
2.441750000 GHzStart Freq  
2.400000000 GHzStop Freq  
2.483500000 GHzCF Step  
8.350000 MHz  
ManFreq Offset  
0 Hz $\pi/4$ DQPSK/Hop

Frequency

Auto Tune

Center Freq  
2.441750000 GHzStart Freq  
2.400000000 GHzStop Freq  
2.483500000 GHzCF Step  
8.350000 MHz  
ManFreq Offset  
0 Hz

8DPSK/Hop

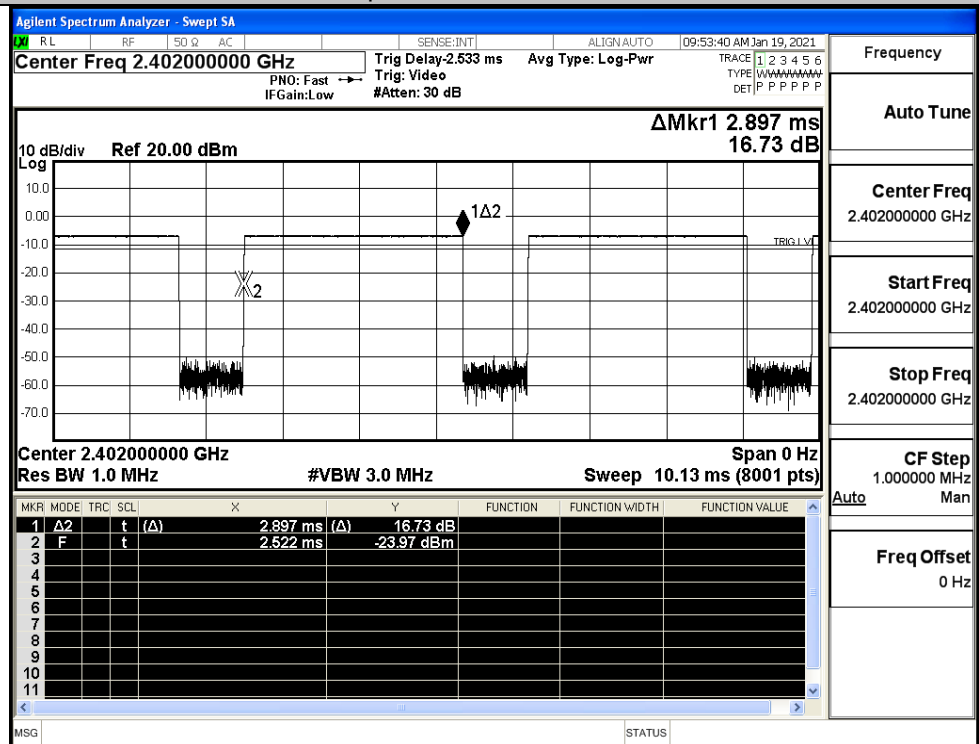


## A.6 Dwell Time

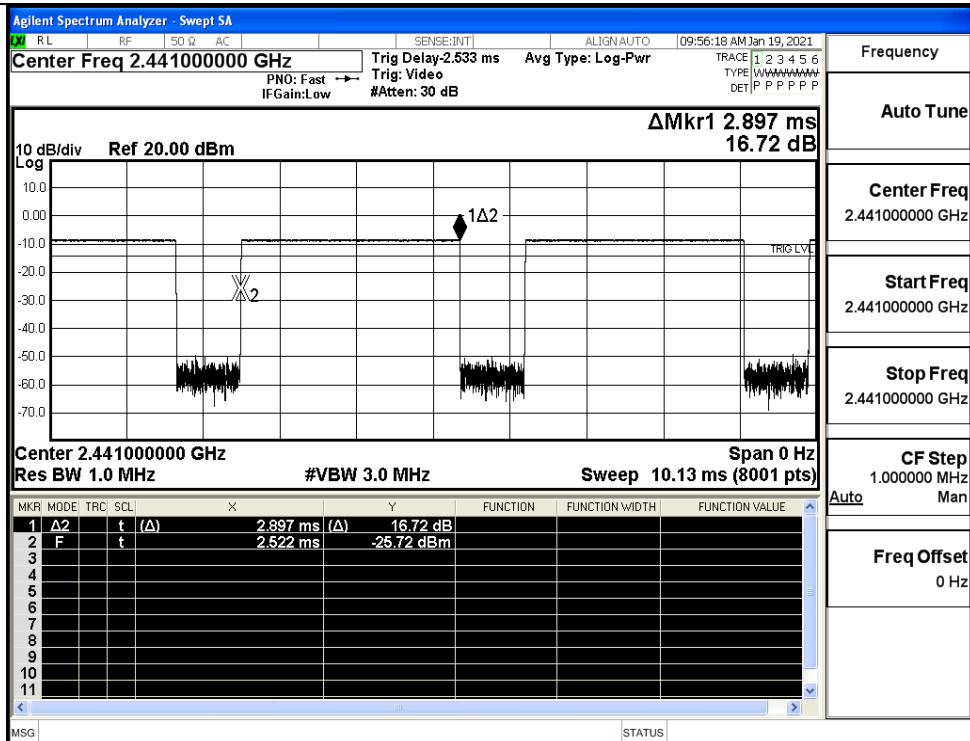
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.9	106.7	0.309	0.4	PASS
	DH5	MCH	2.9	106.7	0.309	0.4	PASS
	DH5	HCH	2.9	106.7	0.309	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.9	106.7	0.309	0.4	PASS
	2DH5	MCH	2.9	106.7	0.309	0.4	PASS
	2DH5	HCH	2.9	106.7	0.309	0.4	PASS
8DPSK	3DH5	LCH	2.9	106.7	0.309	0.4	PASS
	3DH5	MCH	2.9	106.7	0.309	0.4	PASS
	3DH5	HCH	2.9	106.7	0.309	0.4	PASS

Test Graphs

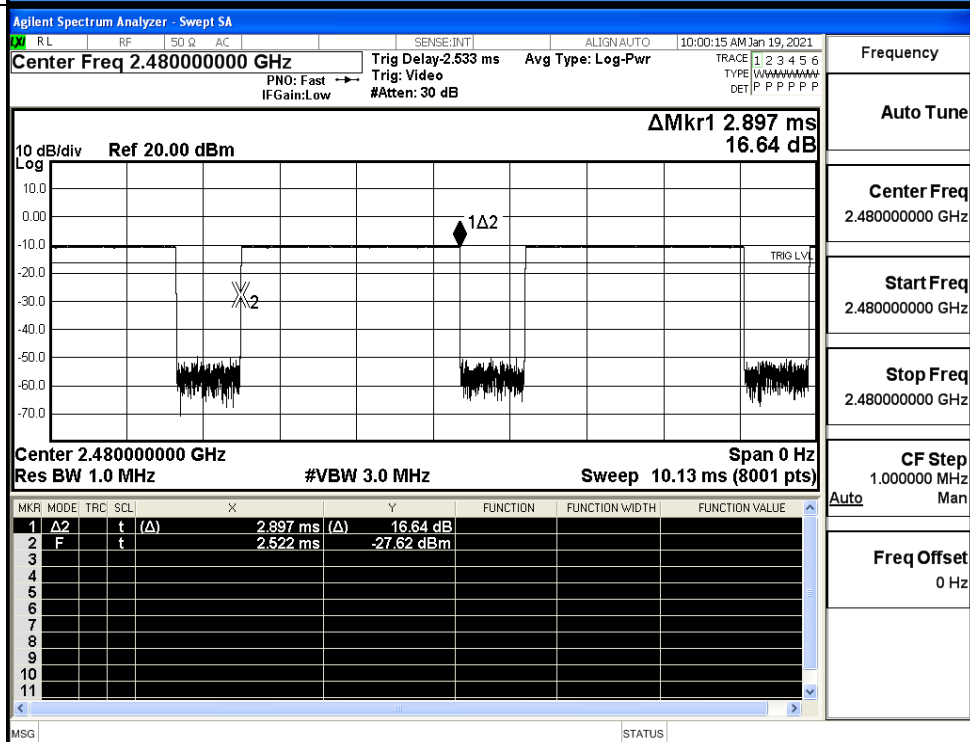
GFSK\_DH5/LCH



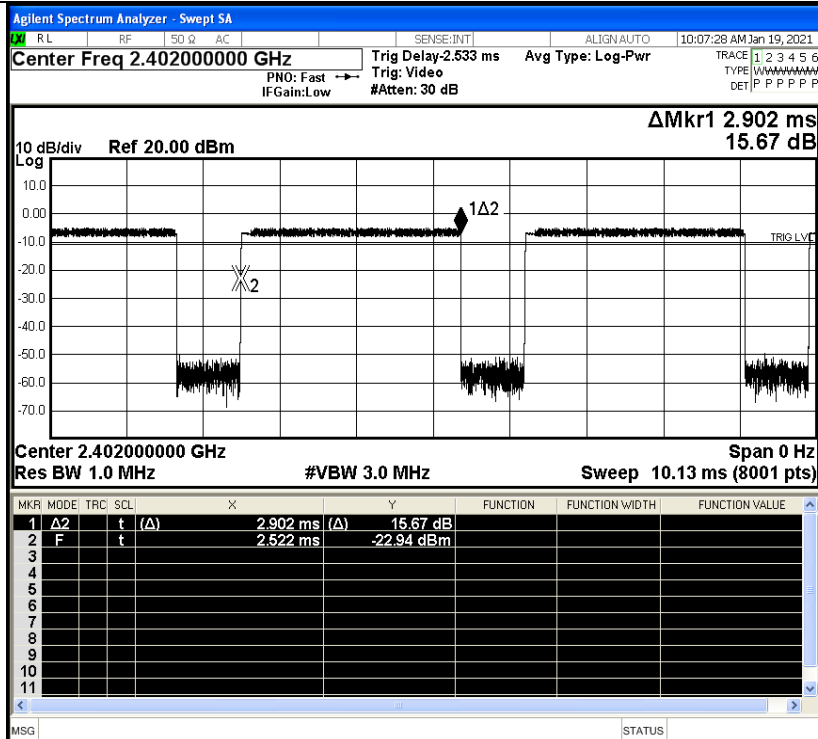
GFSK\_DH5/MCH



GFSK\_DH5/HCH



$\pi/4$ DQPSK  
\_2DH5/LCH

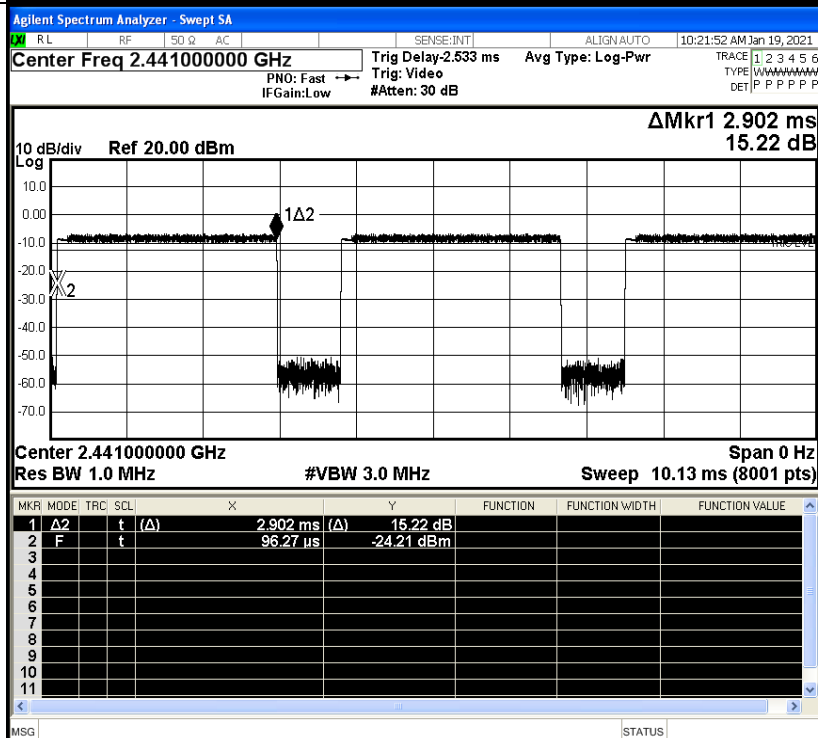


Frequency

Auto Tune

Center Freq  
2.402000000 GHzStart Freq  
2.402000000 GHzStop Freq  
2.402000000 GHzCF Step  
1.000000 MHz  
Auto ManFreq Offset  
0 Hz

$\pi/4$ DQPSK  
\_2DH5/MCH

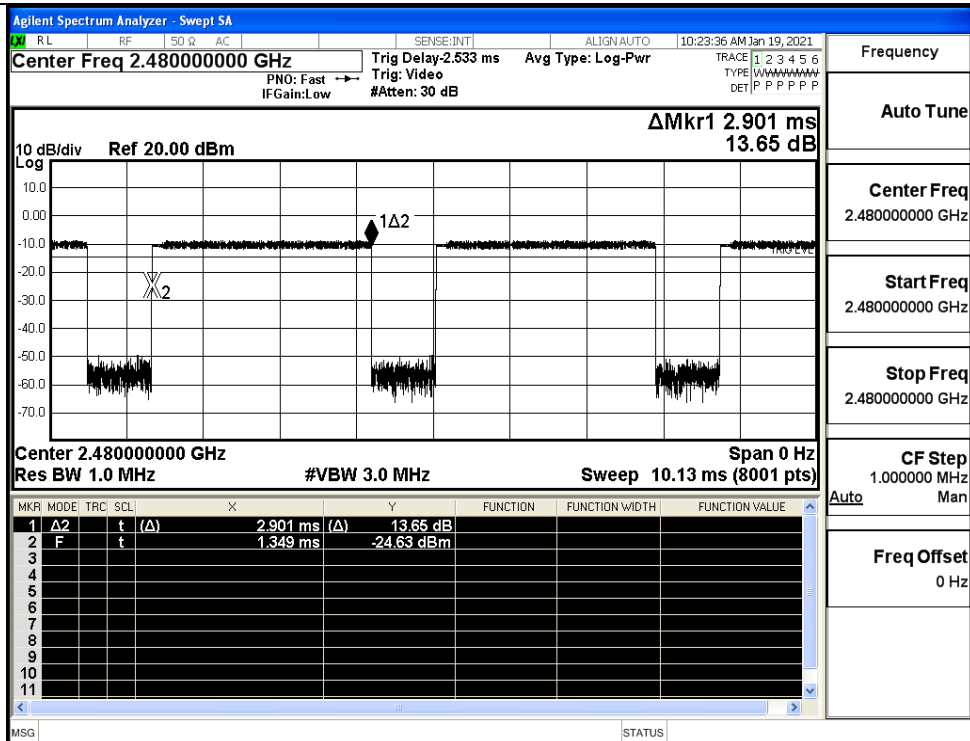


Frequency

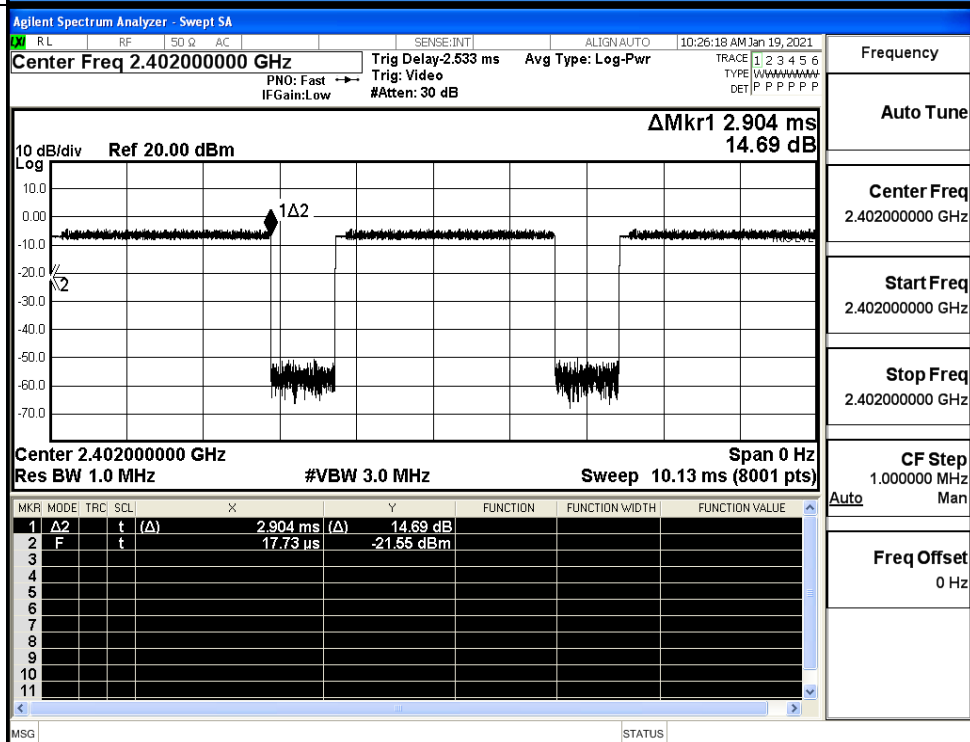
Auto Tune

Center Freq  
2.441000000 GHzStart Freq  
2.441000000 GHzStop Freq  
2.441000000 GHzCF Step  
1.000000 MHz  
Auto ManFreq Offset  
0 Hz

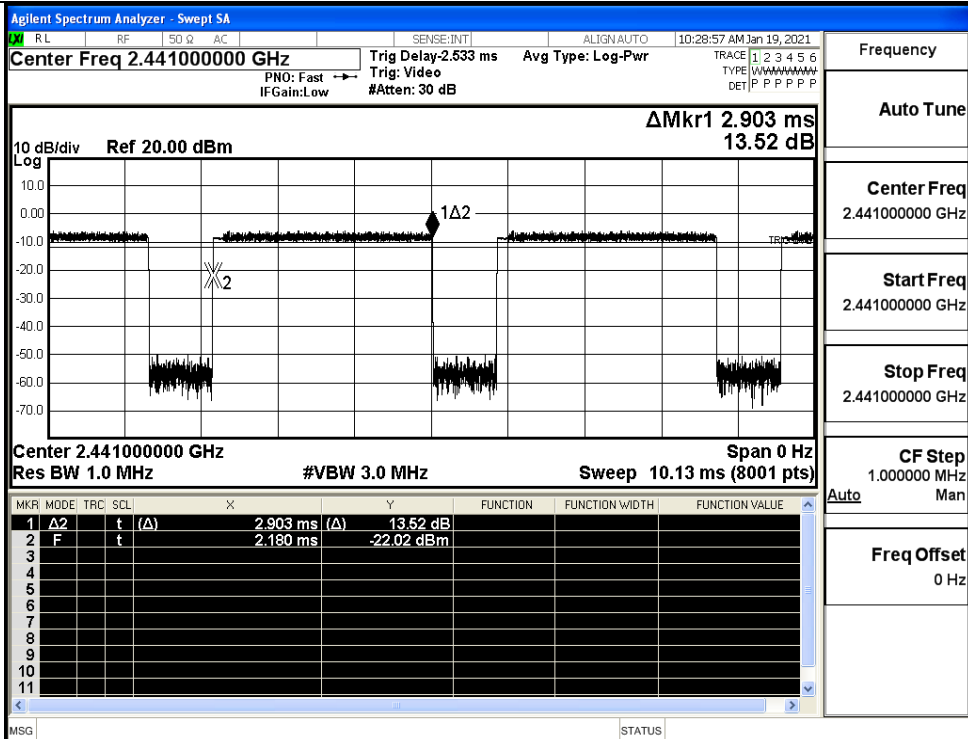
$\pi/4$ DQPSK  
\_2DH5/HCH



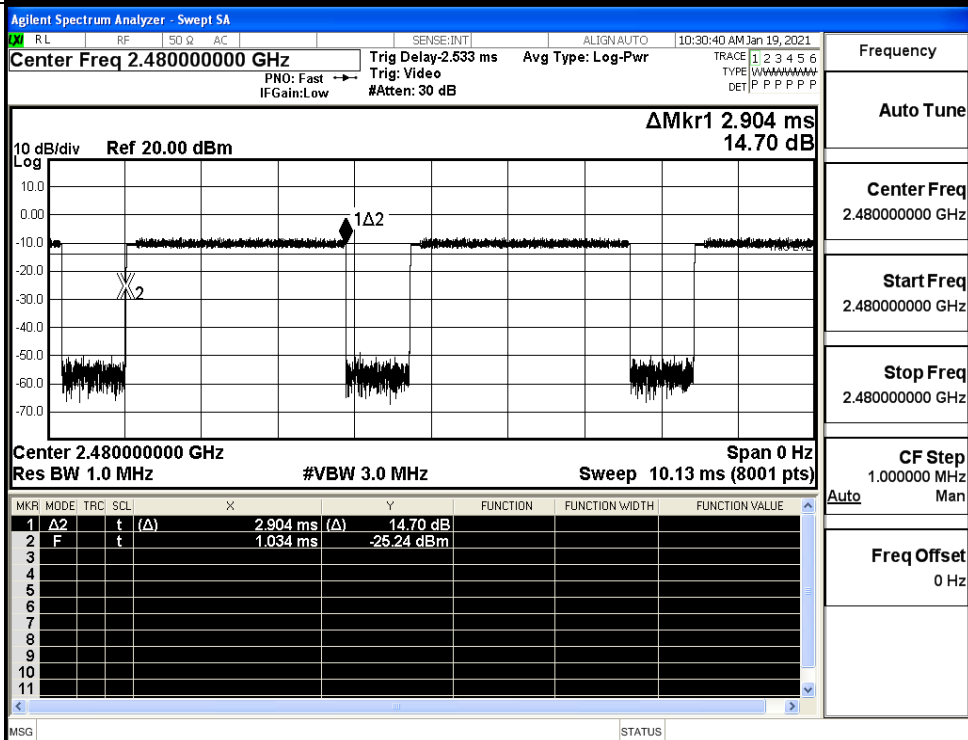
8DPSK \_3DH5/LCH



8DPSK\_3DH5/MCH



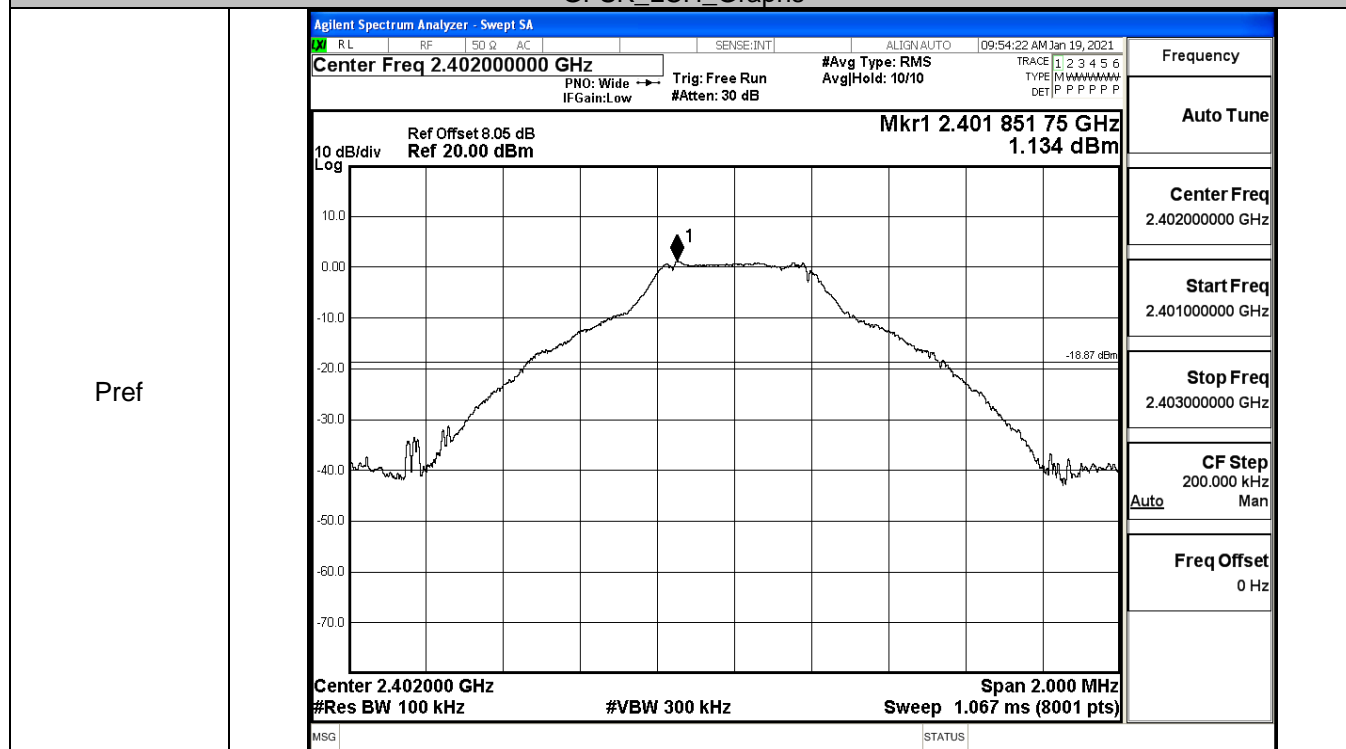
8DPSK\_3DH5/HCH



## A.7 RF Conducted Spurious Emissions

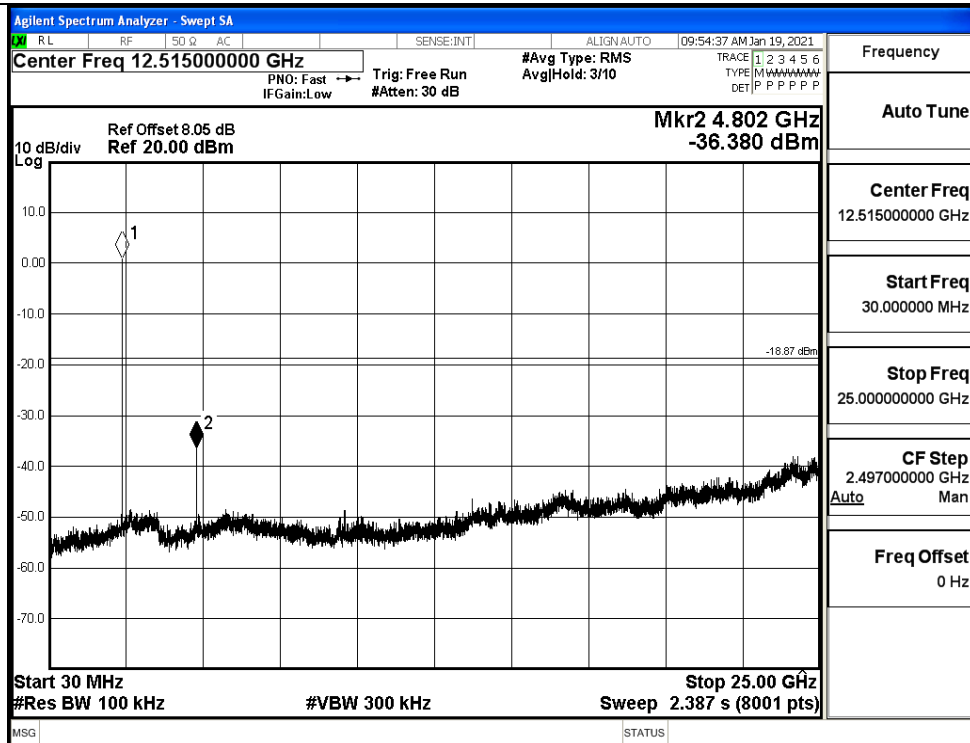
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.134	-36.380	-18.866	PASS
	MCH	-0.621	-38.504	-20.621	PASS
	HCH	-2.535	-35.528	-22.535	PASS
$\pi/4$ DQPSK	LCH	0.959	-37.596	-19.041	PASS
	MCH	-0.575	-36.732	-20.575	PASS
	HCH	-2.537	-37.860	-22.537	PASS
8DPSK	LCH	0.95	-37.567	-19.050	PASS
	MCH	-0.729	-37.891	-20.729	PASS
	HCH	-2.456	-37.770	-22.456	PASS

GFSK\_LCH\_Graphs



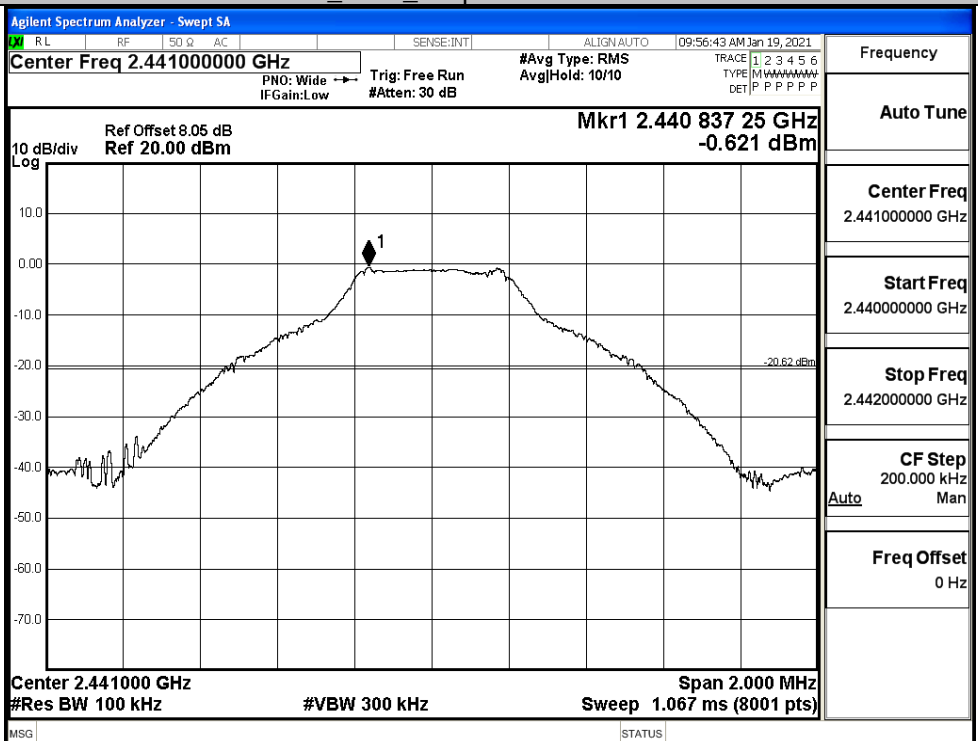


Puw

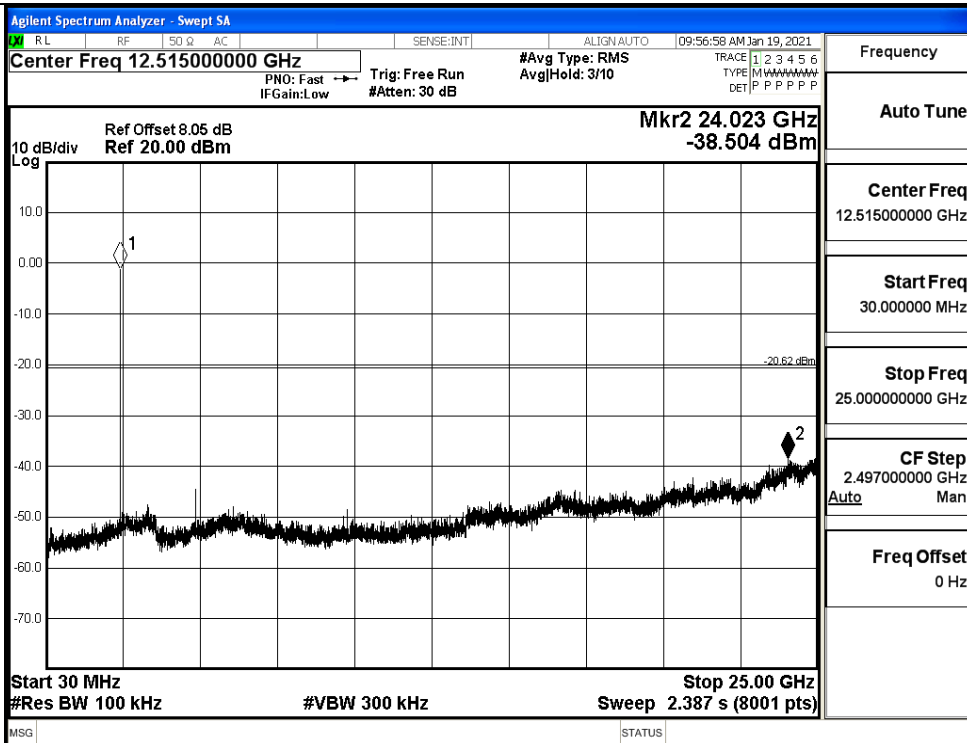


## GFSK\_MCH\_Graphs

Pref

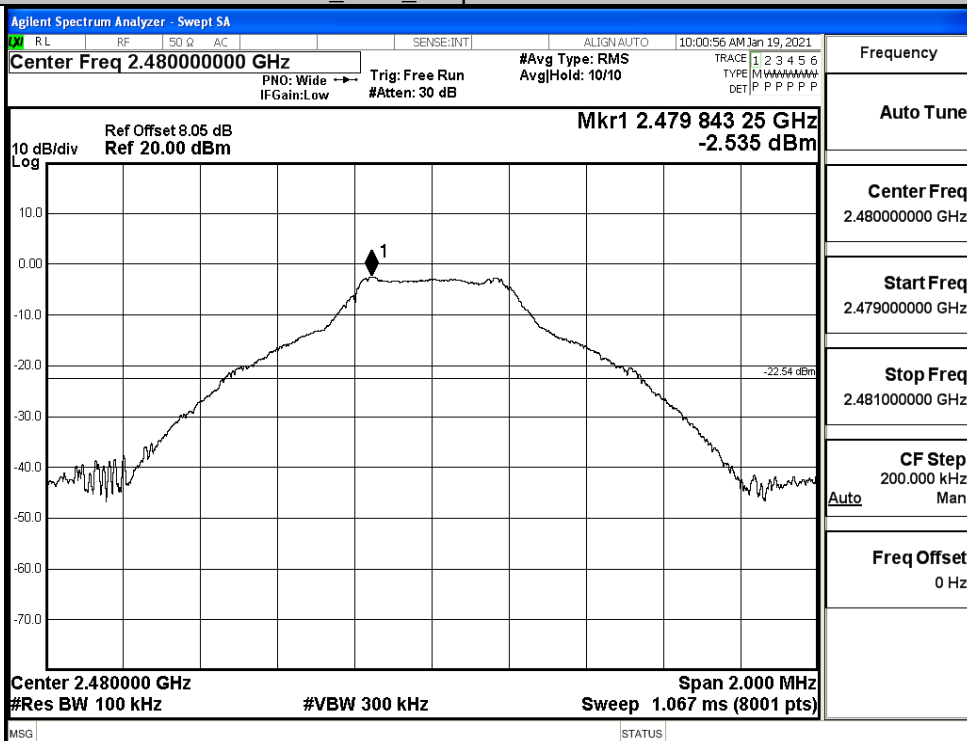


Puw

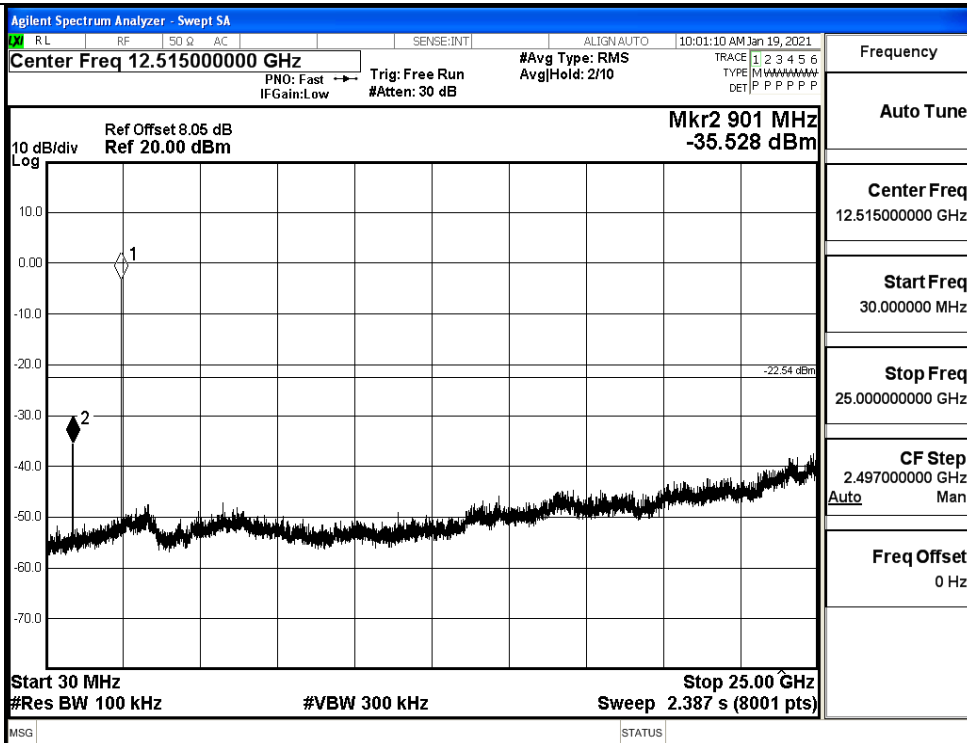


## GFSK\_HCH\_Graphs

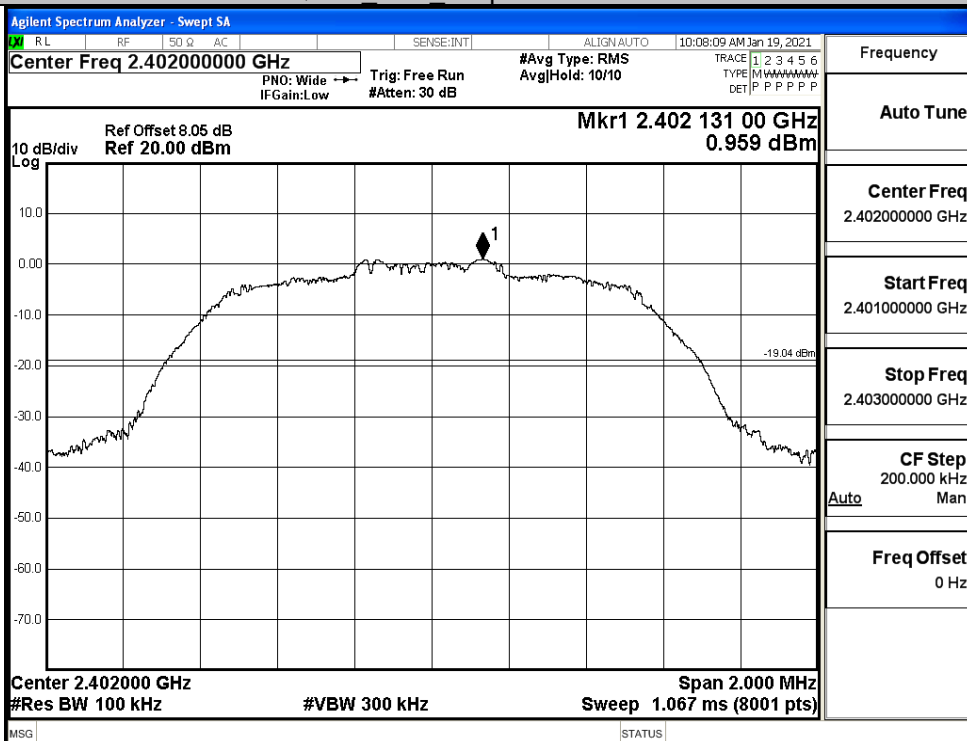
Pref



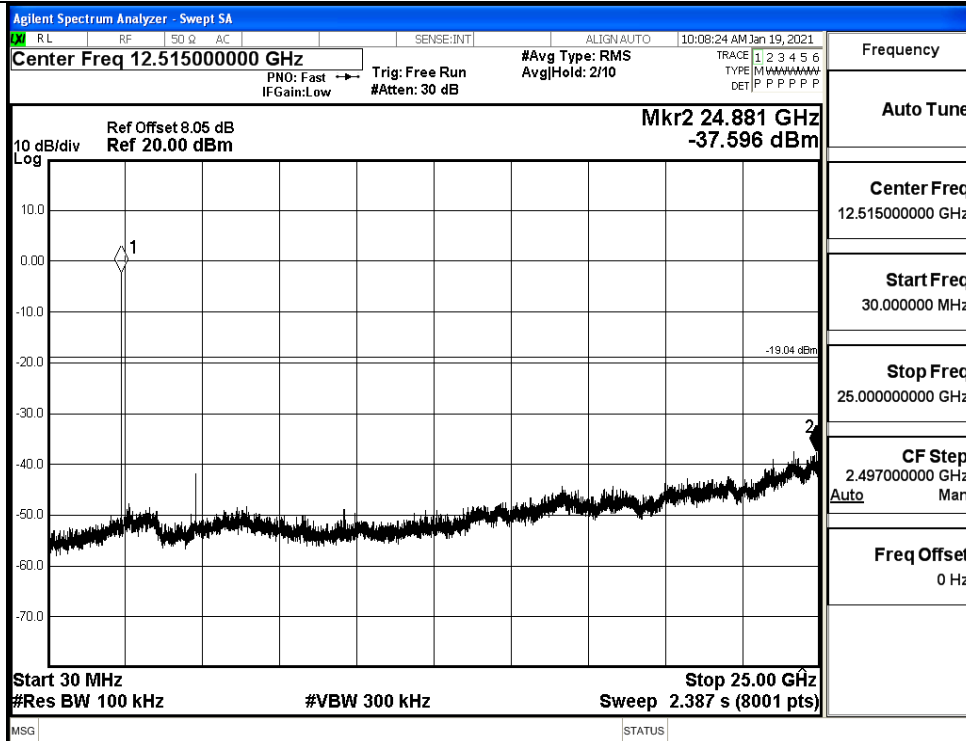
Puw

 $\pi/4$ DQPSK LCH Graphs

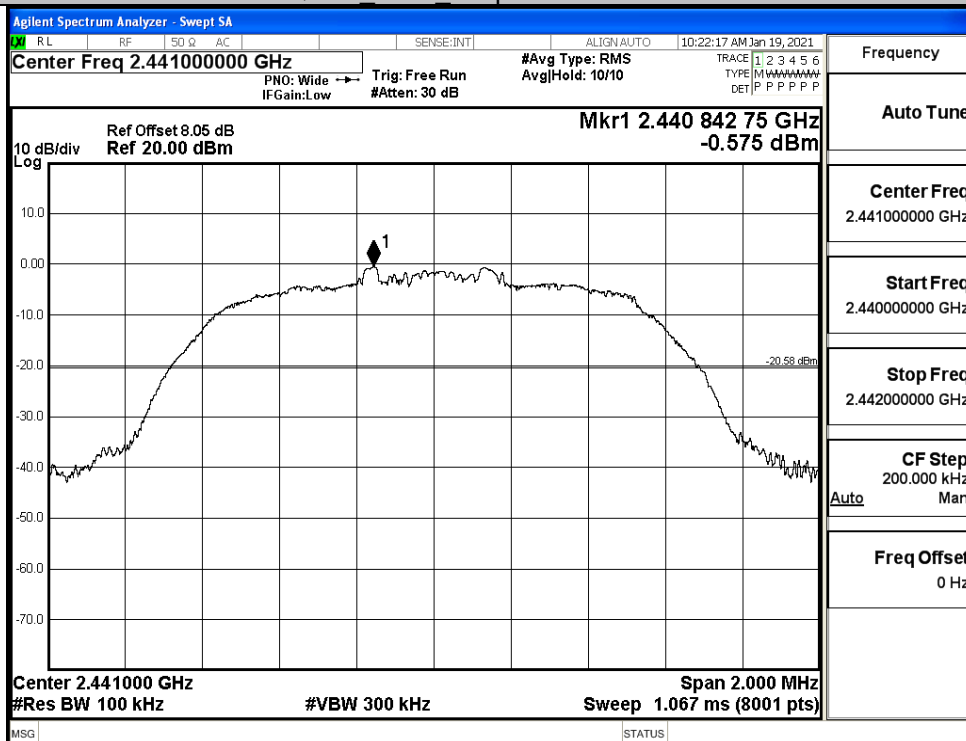
Pref



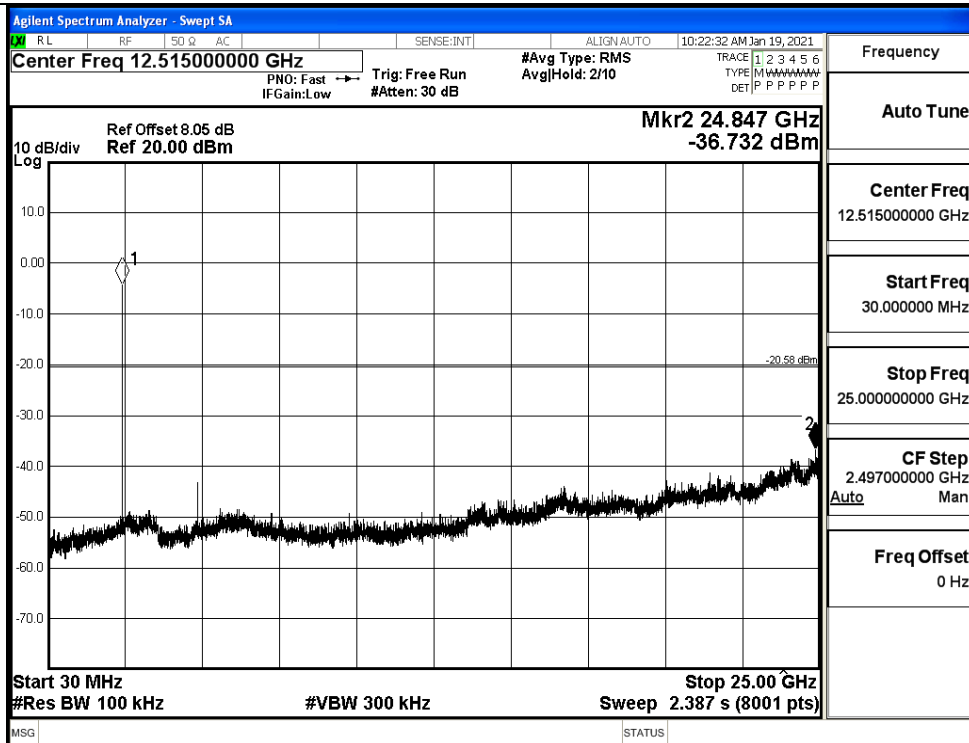
Puw

 $\pi/4$ DQPSK MCH Graphs

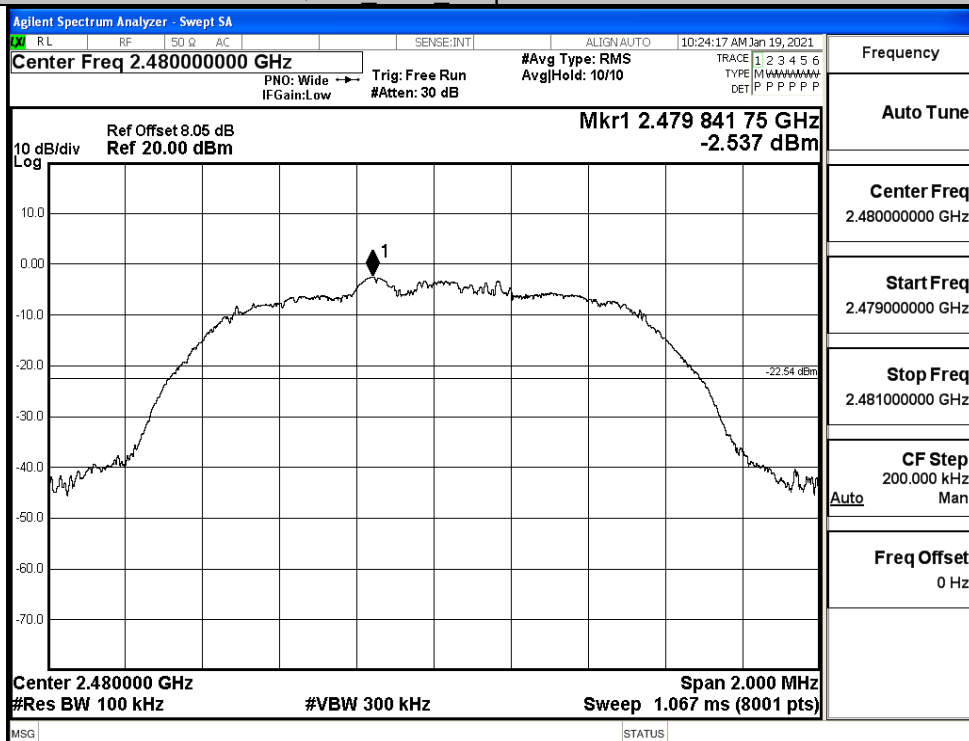
Pref



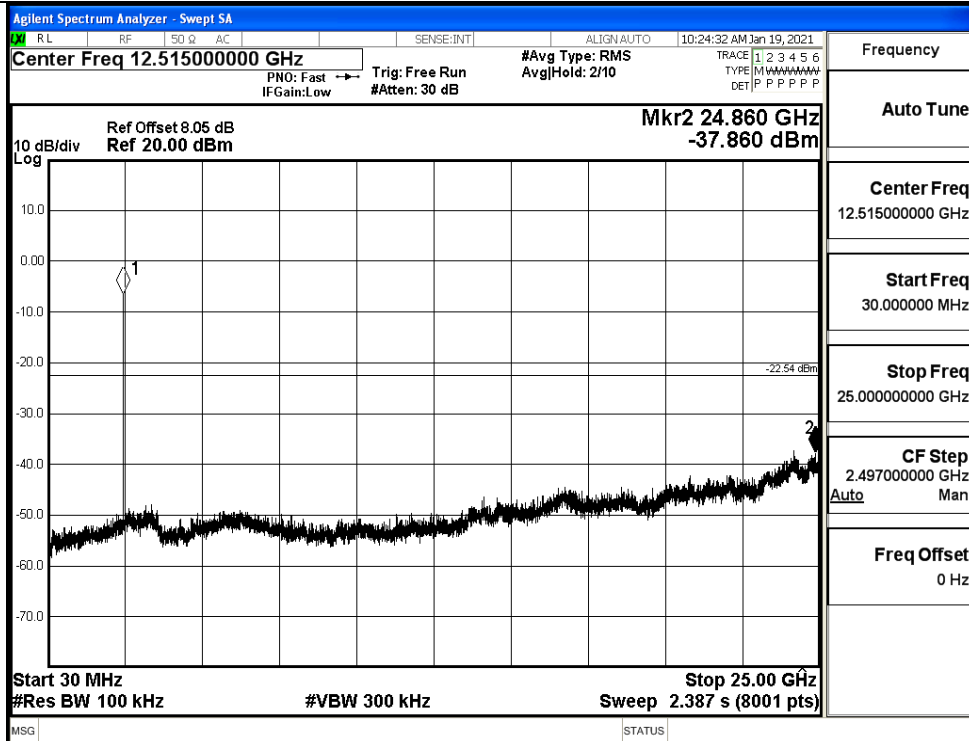
Puw

 $\pi/4$ DQPSK HCH Graphs

Pref

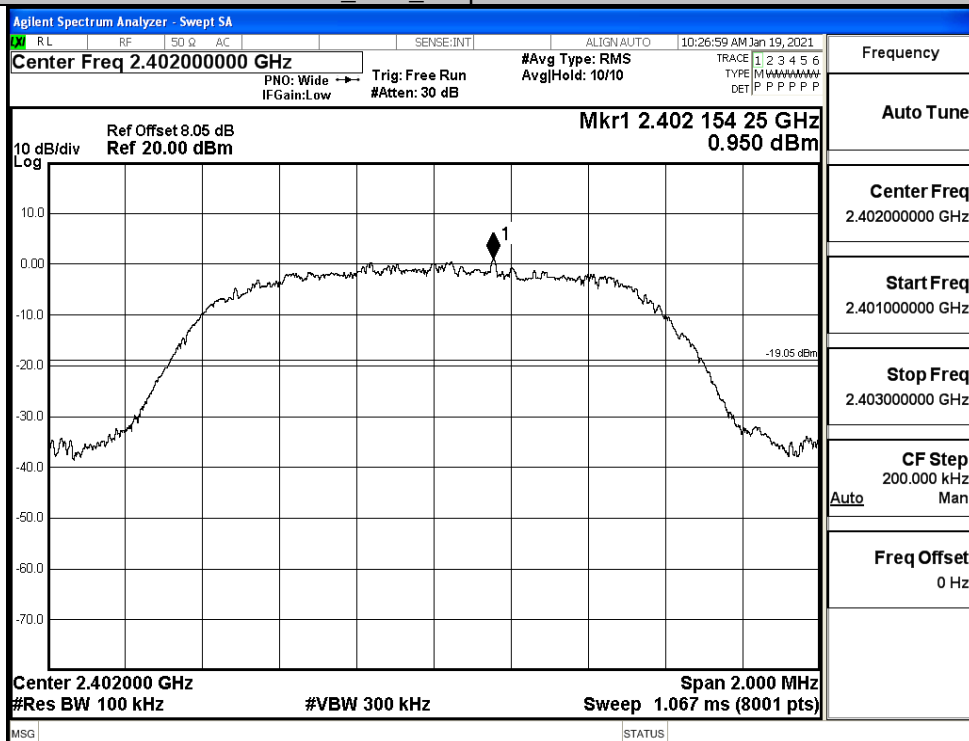


Puw

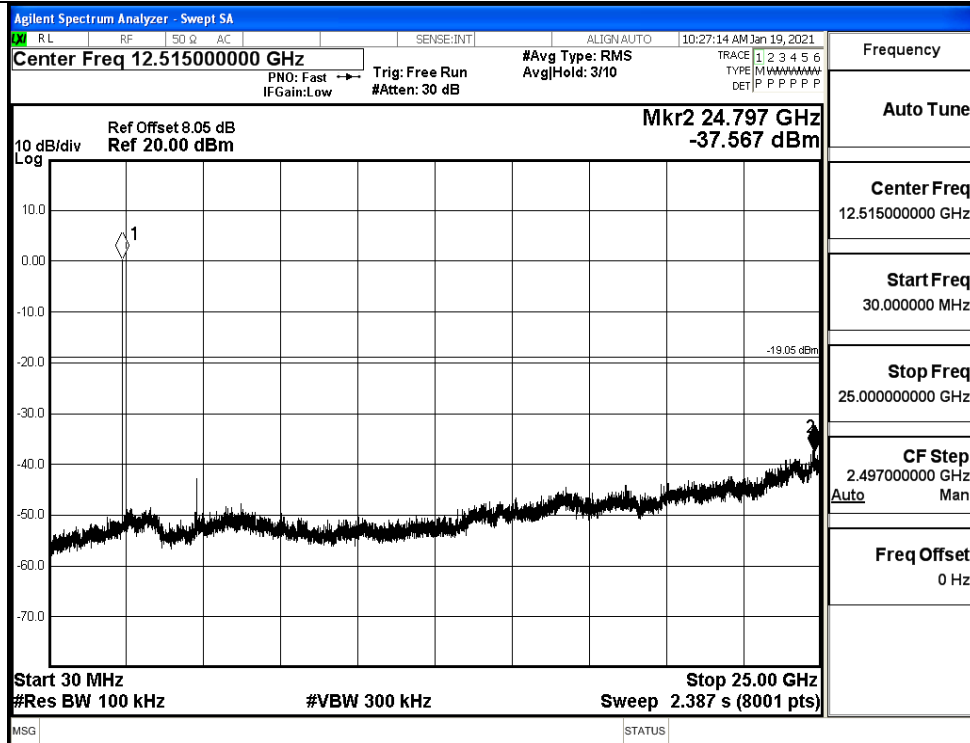


## 8DPSK\_LCH\_Graphs

Pref

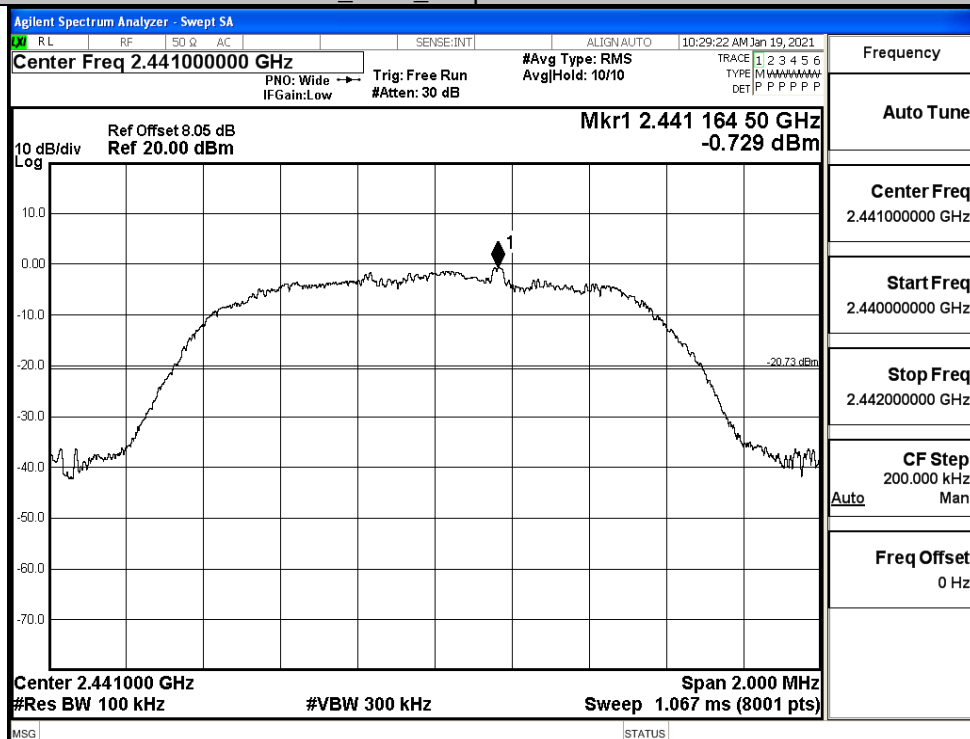


Puw

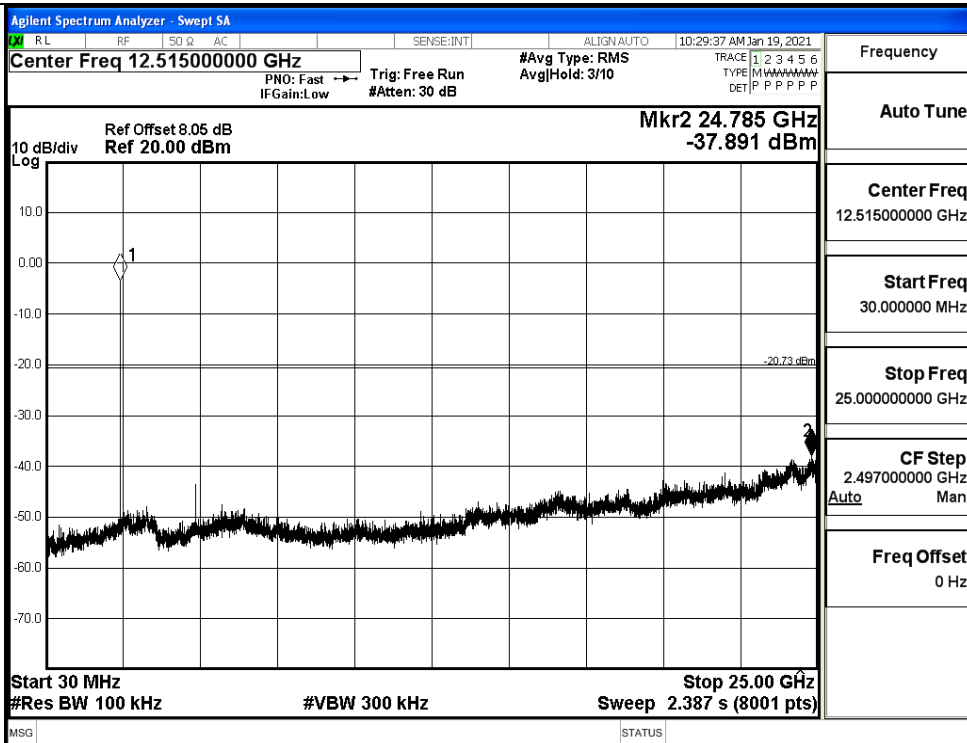


## 8DPSK\_MCH\_Graphs

Pref

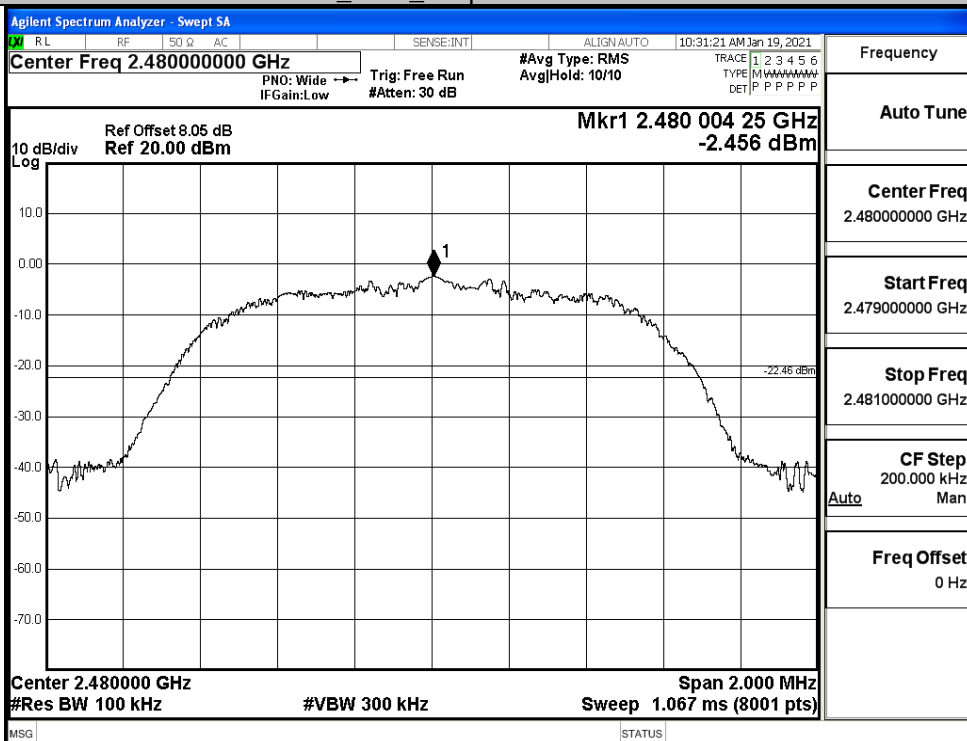


Puw

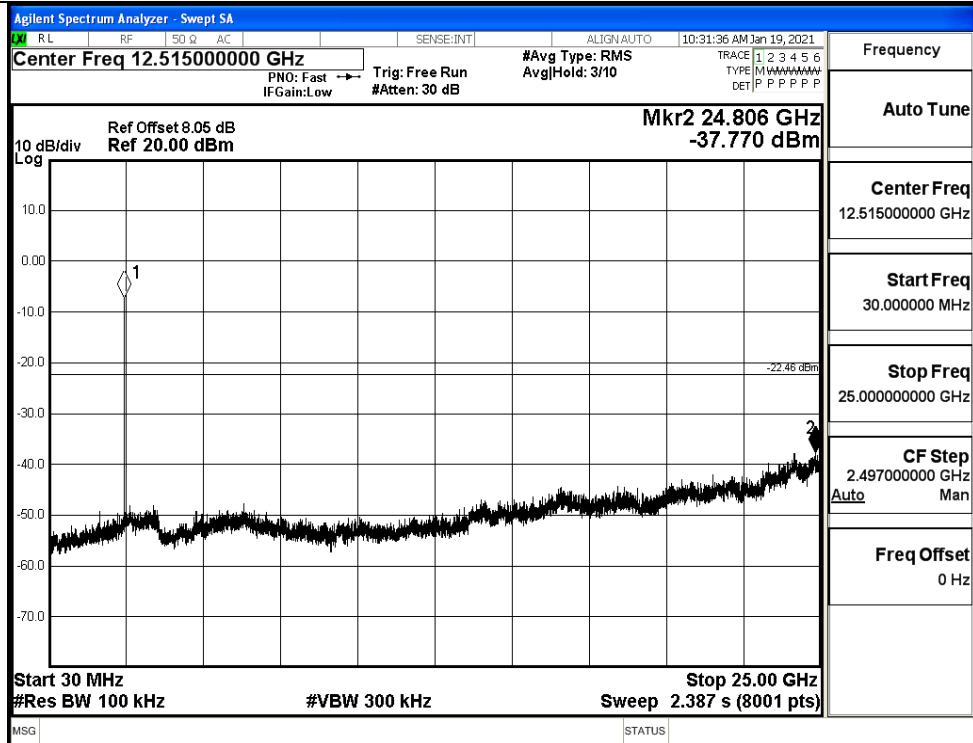


## 8DPSK\_HCH\_Graphs

Pref





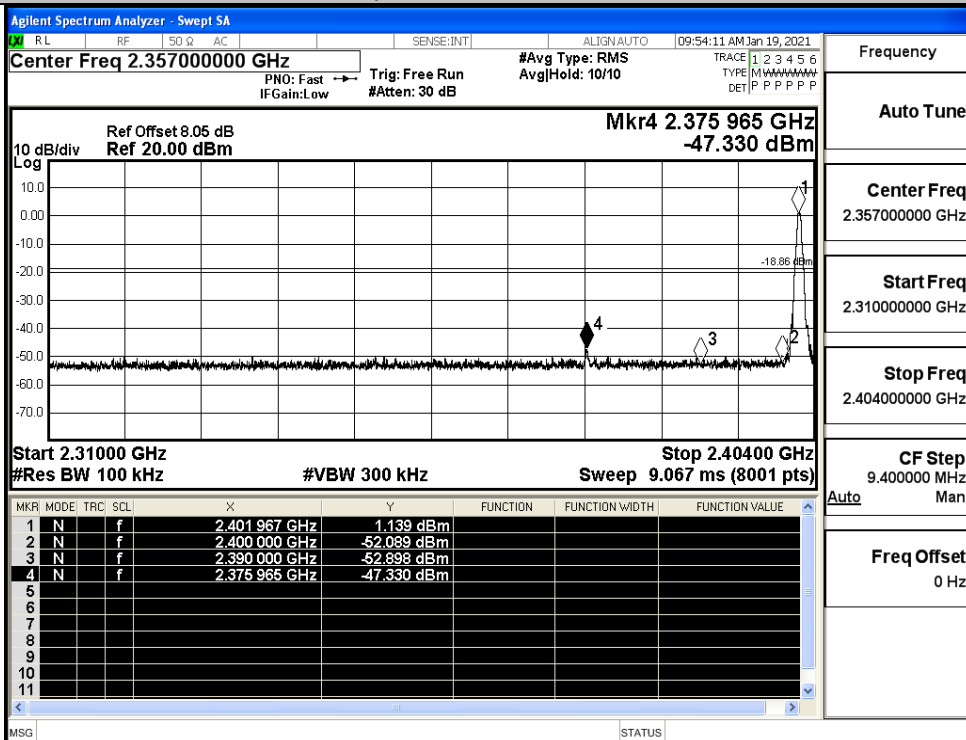
P<sub>u</sub>w

## A.8 Band-edge for RF Conducted Emissions

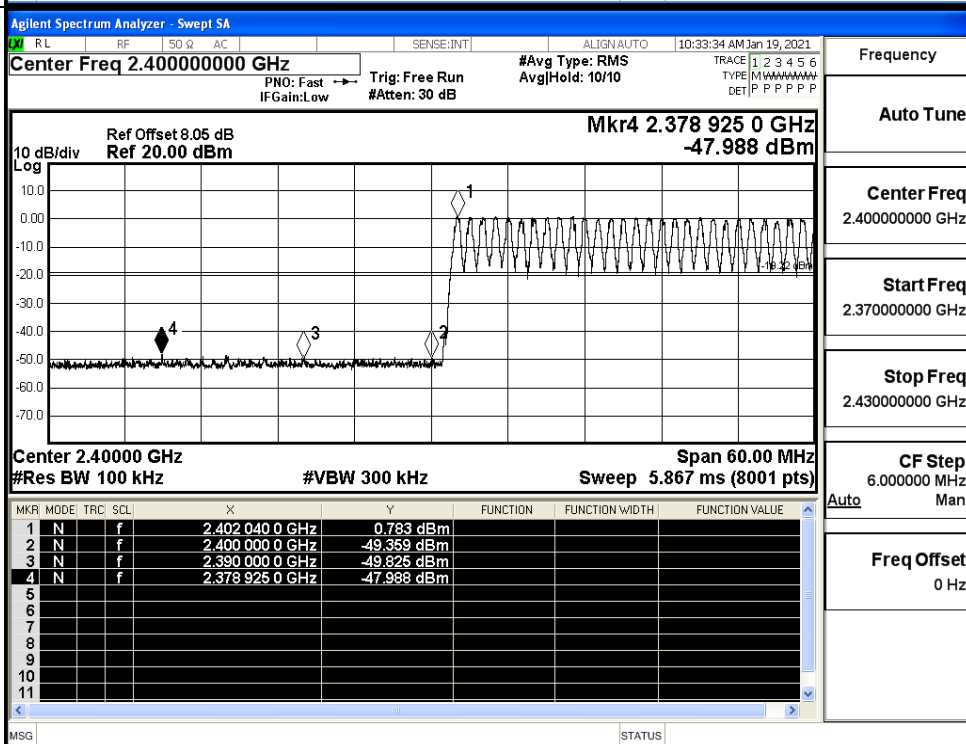
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	1.139	Off	-47.330	-18.86	PASS
			0.783	On	-47.988	-19.22	PASS
	HCH	2480	-2.540	Off	-49.056	-22.54	PASS
			-1.392	On	-48.407	-21.39	PASS
$\pi/4$ DQPSK	LCH	2402	0.992	Off	-48.938	-19.01	PASS
			1.164	On	-48.416	-18.84	PASS
	HCH	2480	-2.504	Off	-49.576	-22.5	PASS
			-1.511	On	-48.343	-21.51	PASS
8DPSK	LCH	2402	1.343	Off	-48.179	-18.66	PASS
			1.072	On	-47.418	-18.93	PASS
	HCH	2480	-2.387	Off	-49.636	-22.39	PASS
			-1.254	On	-48.026	-21.25	PASS

## Test Graphs

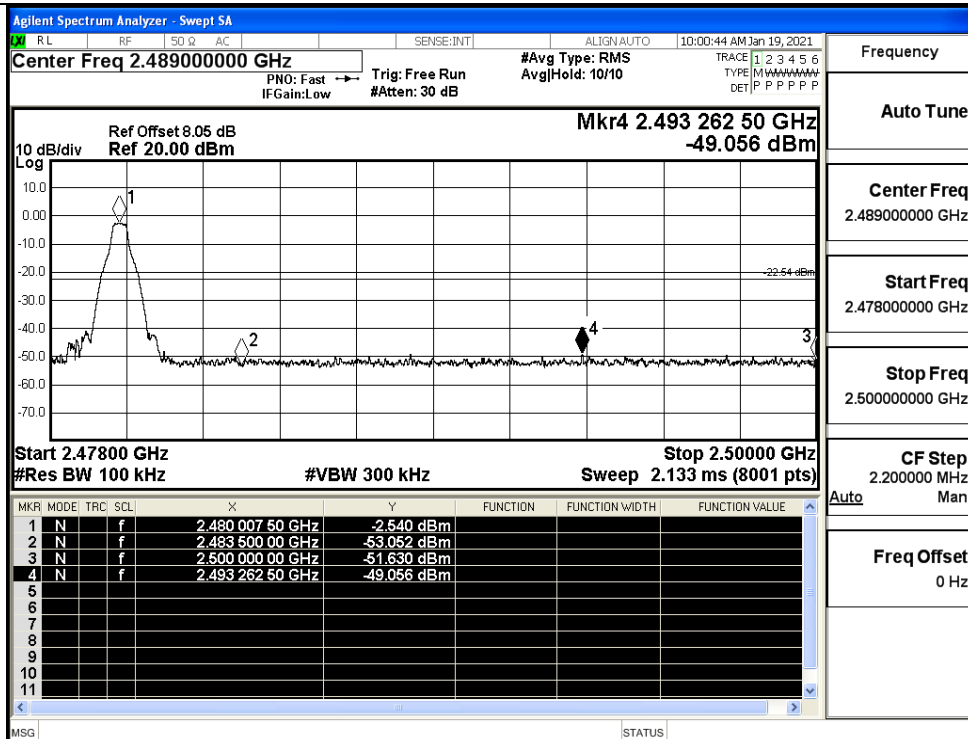
GFSK/LCH/No Hop



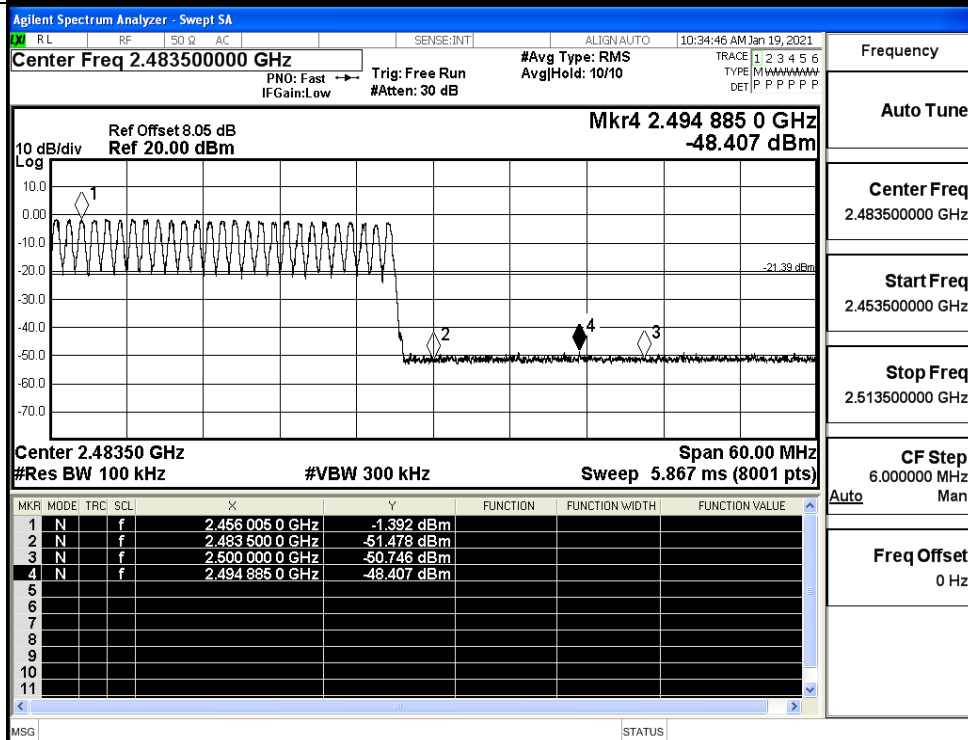
GFSK/LCH/Hop



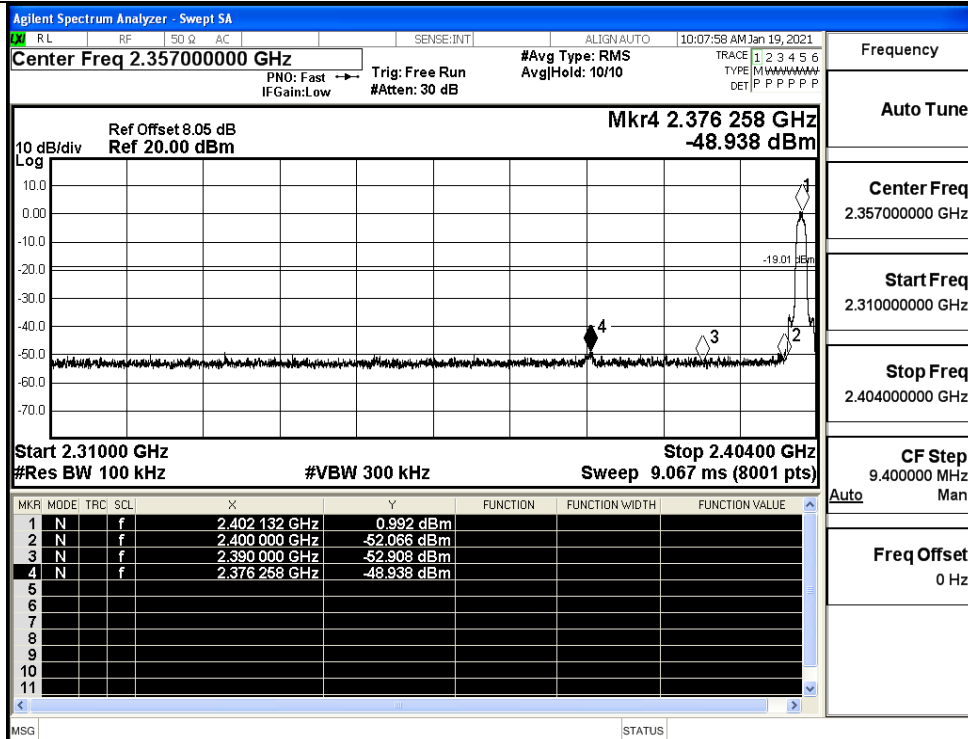
GFSK/HCH/No Hop



GFSK/HCH/Hop



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

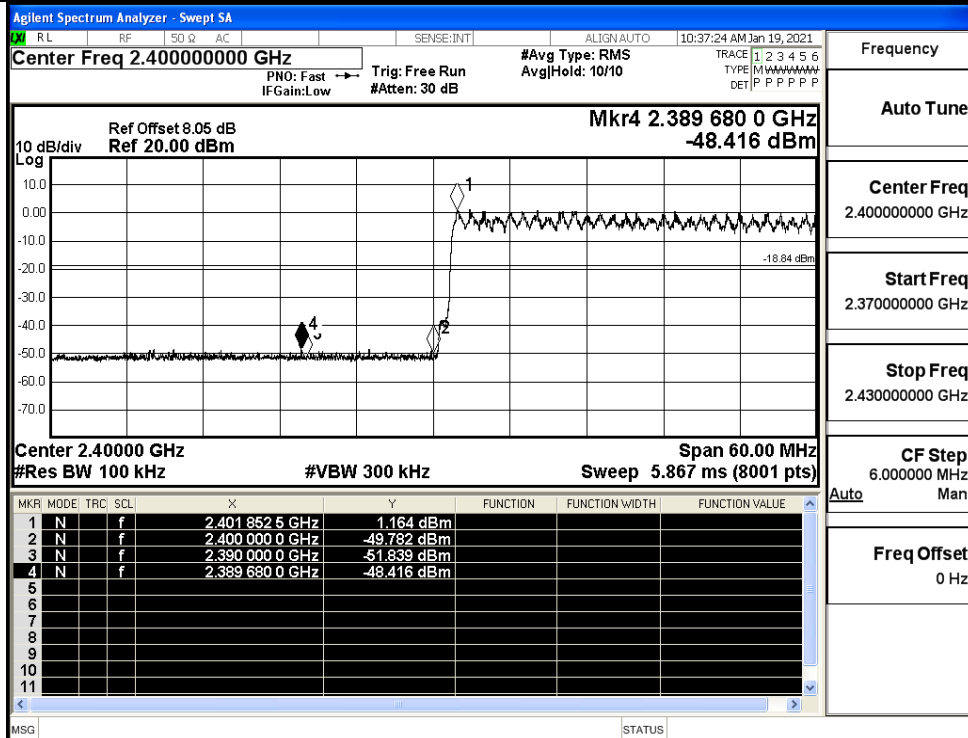


Frequency

Auto Tune

Center Freq  
2.357000000 GHzStart Freq  
2.310000000 GHzStop Freq  
2.404000000 GHzCF Step  
9.400000 MHz  
Auto ManFreq Offset  
0 Hz

$\pi/4$ DQPSK/LCH/Hop

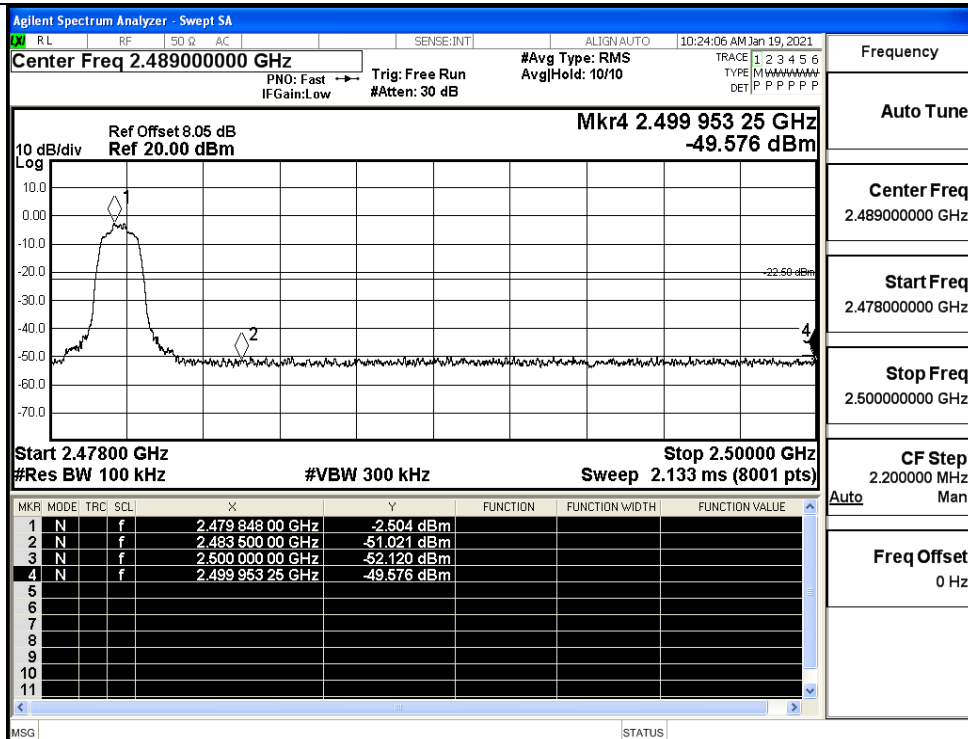


Frequency

Auto Tune

Center Freq  
2.400000000 GHzStart Freq  
2.370000000 GHzStop Freq  
2.430000000 GHzCF Step  
6.000000 MHz  
Auto ManFreq Offset  
0 Hz

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

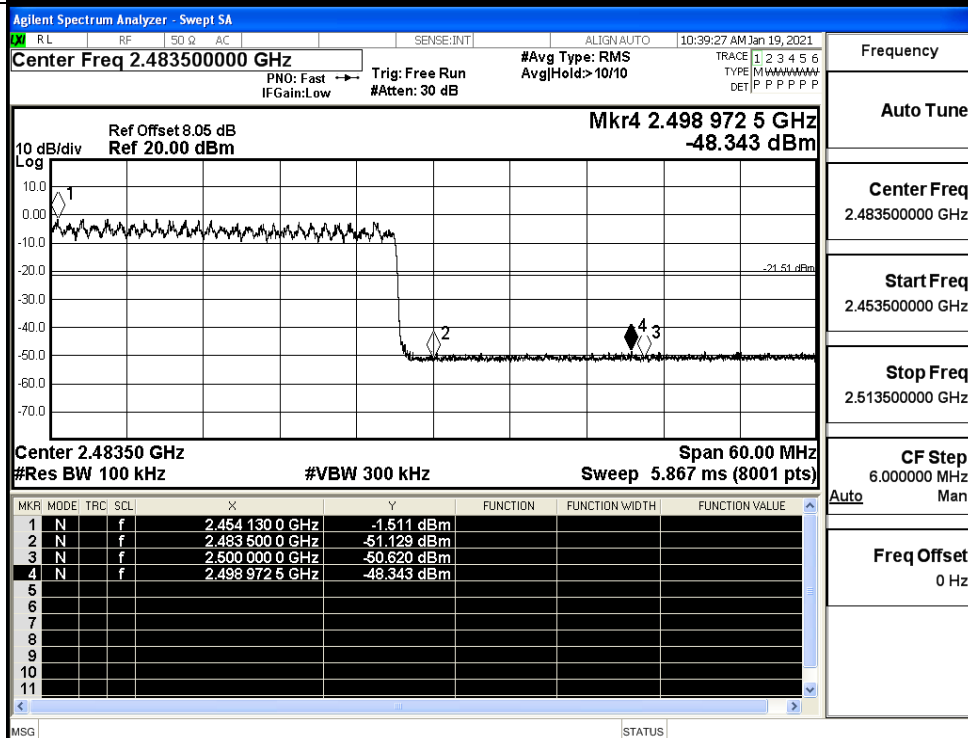


Frequency

Auto Tune

Center Freq  
2.489000000 GHzStart Freq  
2.478000000 GHzStop Freq  
2.500000000 GHzCF Step  
2.200000 MHz  
Auto ManFreq Offset  
0 Hz

$\pi/4$ DQPSK/HCH/Hop

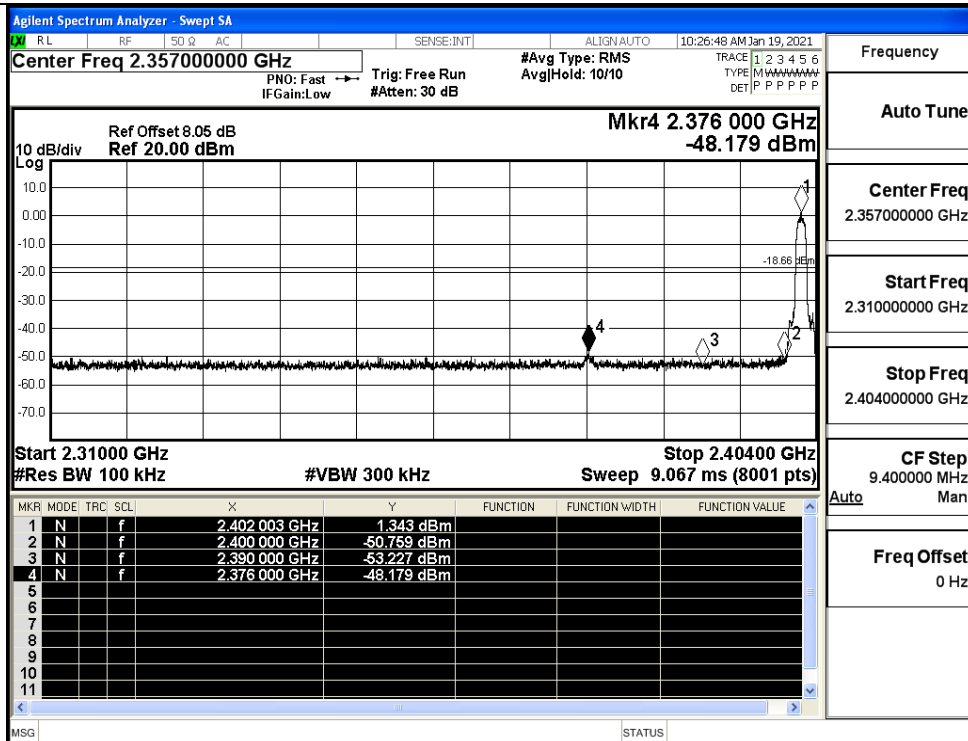


Frequency

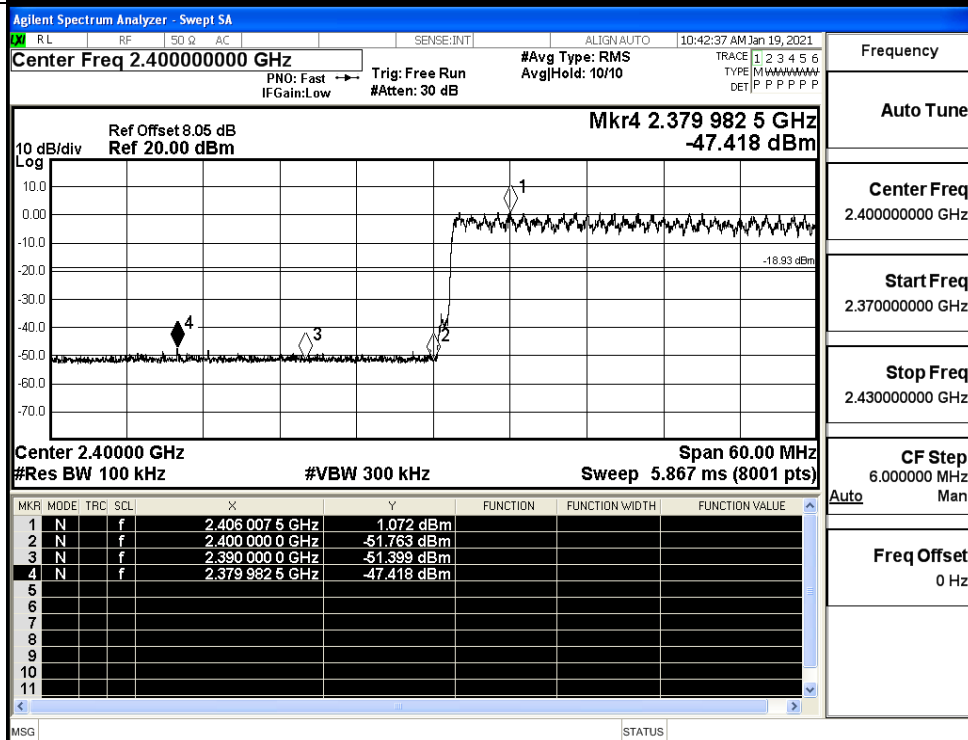
Auto Tune

Center Freq  
2.483500000 GHzStart Freq  
2.453500000 GHzStop Freq  
2.513500000 GHzCF Step  
6.000000 MHz  
Auto ManFreq Offset  
0 Hz

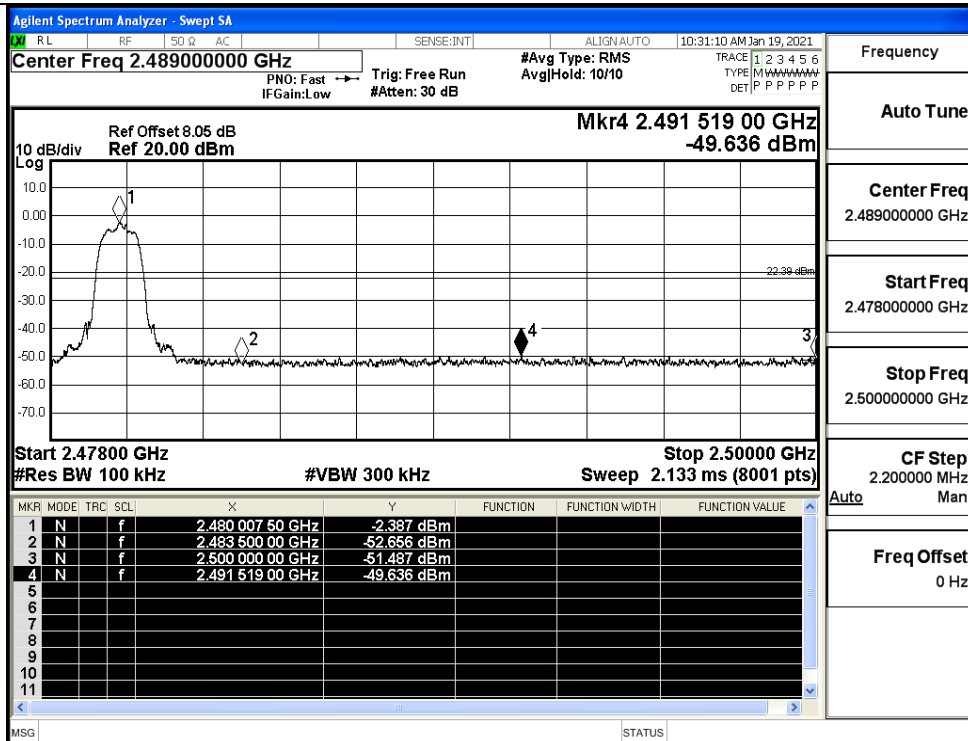
8DPSK/LCH/No Hop



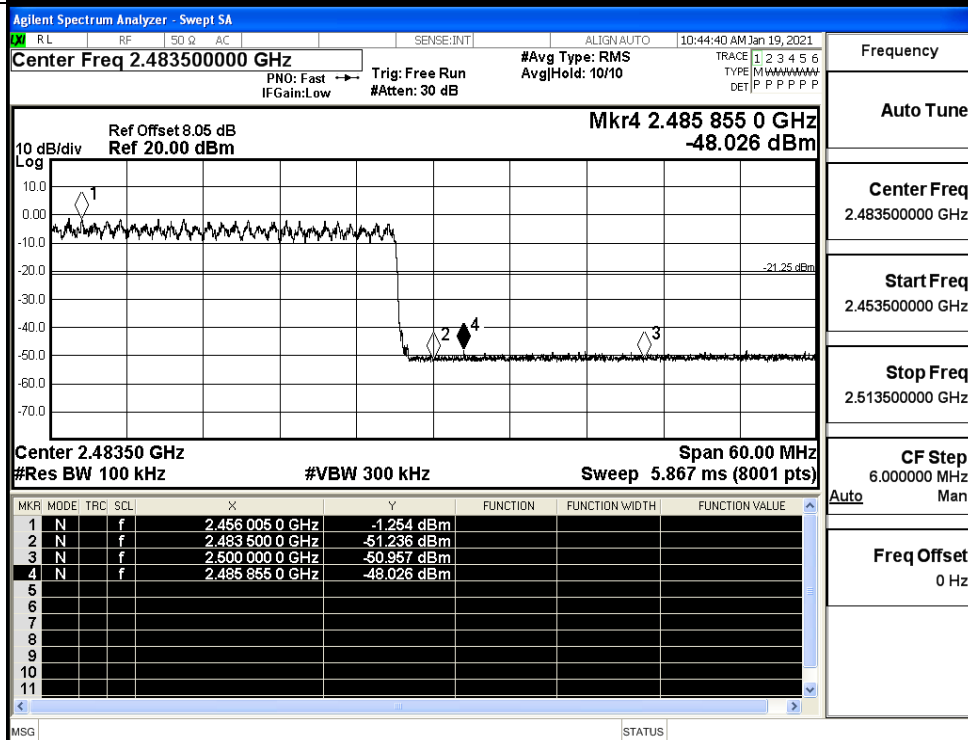
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



8DPSK/HCH/Hop

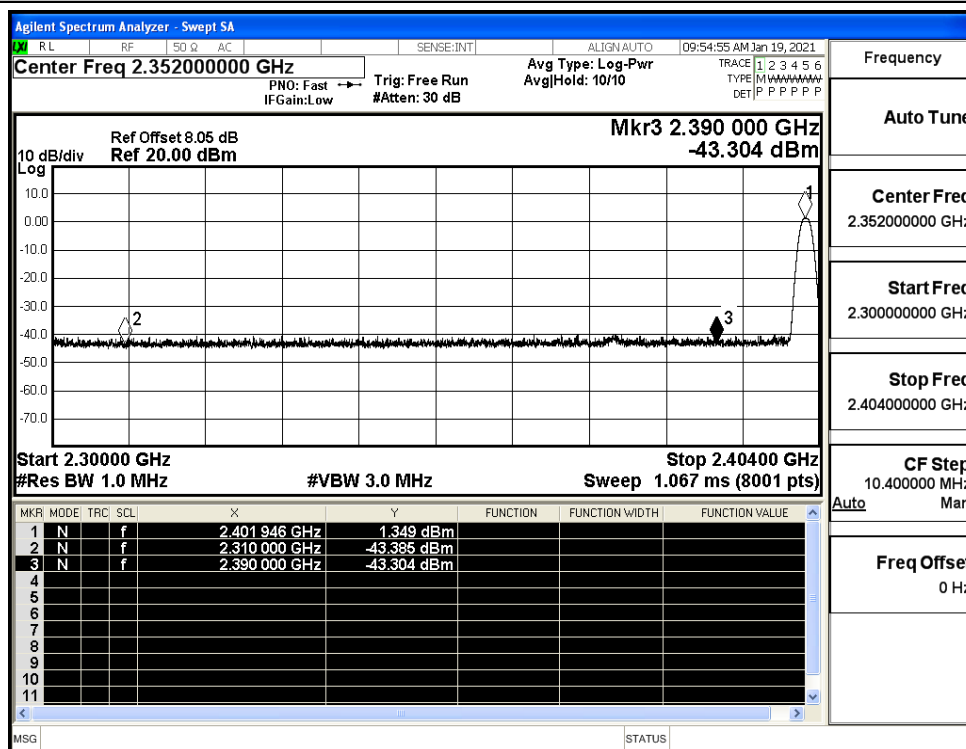




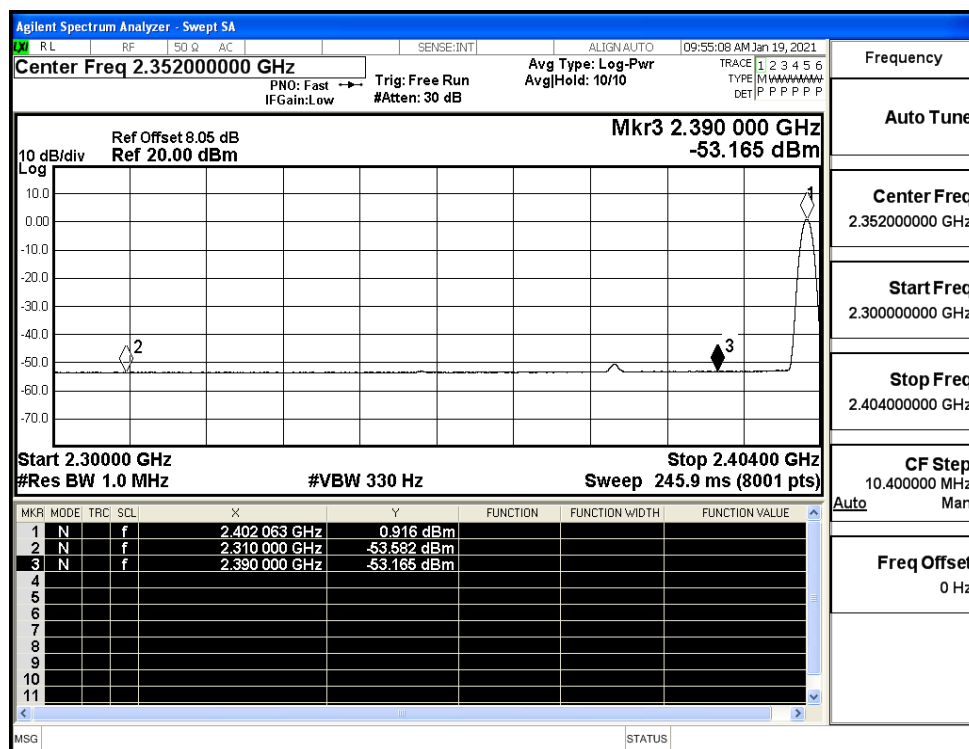
## A.9 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.39	3.0	0	54.87	PEAK	74	PASS
	Off	2310.0	-53.58	3.0	0	44.68	AV	54	PASS
	Off	2390.0	-43.30	3.0	0	54.96	PEAK	74	PASS
	Off	2390.0	-53.17	3.0	0	45.09	AV	54	PASS
	Off	2483.5	-42.85	3.0	0	55.41	PEAK	74	PASS
	Off	2483.5	-52.71	3.0	0	45.55	AV	54	PASS
	Off	2500.0	-42.26	3.0	0	56	PEAK	74	PASS
	Off	2500.0	-52.58	3.0	0	45.68	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.03	3.0	0	55.23	PEAK	74	PASS
	Off	2310.0	-53.54	3.0	0	44.72	AV	54	PASS
	Off	2390.0	-43.32	3.0	0	54.94	PEAK	74	PASS
	Off	2390.0	-53.16	3.0	0	45.1	AV	54	PASS
	Off	2483.5	-42.34	3.0	0	55.92	PEAK	74	PASS
	Off	2483.5	-52.62	3.0	0	45.64	AV	54	PASS
	Off	2500.0	-42.75	3.0	0	55.51	PEAK	74	PASS
	Off	2500.0	-52.47	3.0	0	45.79	AV	54	PASS
8DPSK	Off	2310.0	-43.23	3.0	0	55.03	PEAK	74	PASS
	Off	2310.0	-53.57	3.0	0	44.69	AV	54	PASS
	Off	2390.0	-43.51	3.0	0	54.75	PEAK	74	PASS
	Off	2390.0	-53.18	3.0	0	45.08	AV	54	PASS
	Off	2483.5	-41.85	3.0	0	56.41	PEAK	74	PASS
	Off	2483.5	-52.67	3.0	0	45.59	AV	54	PASS
	Off	2500.0	-41.63	3.0	0	56.63	PEAK	74	PASS
	Off	2500.0	-52.55	3.0	0	45.71	AV	54	PASS

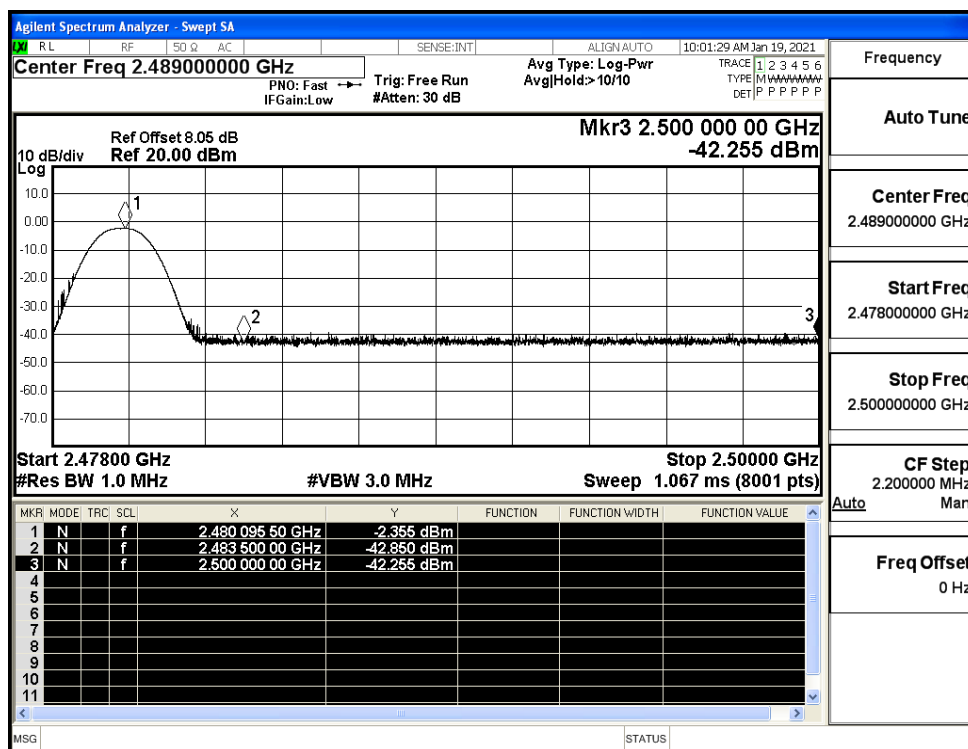
## Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_PEAK (Low Channel)



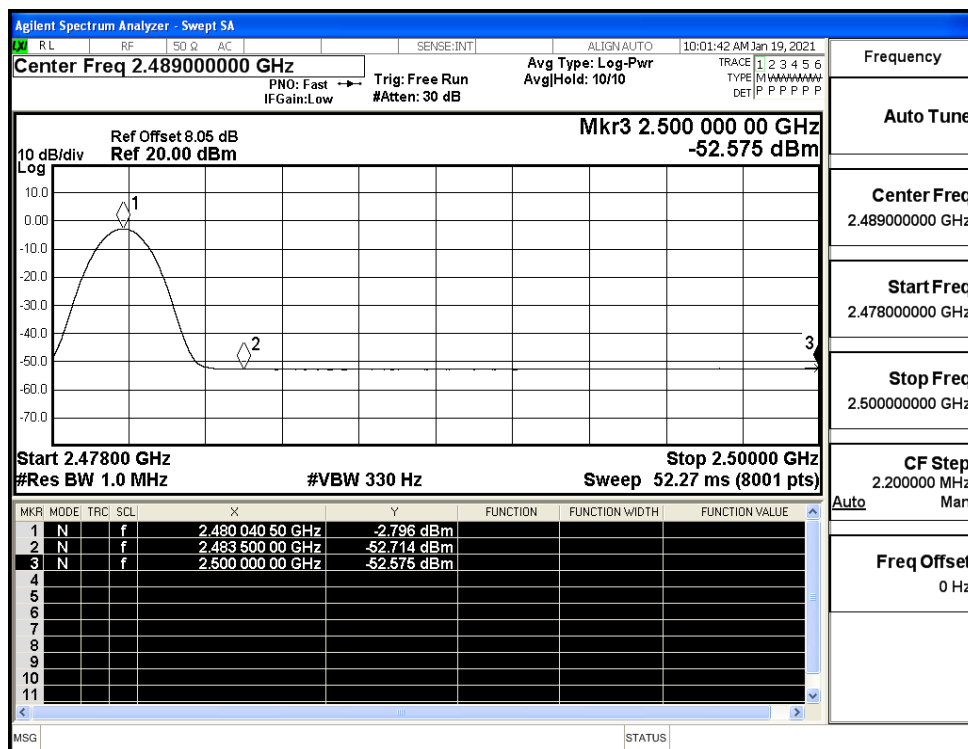
## Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_Average (Low Channel)

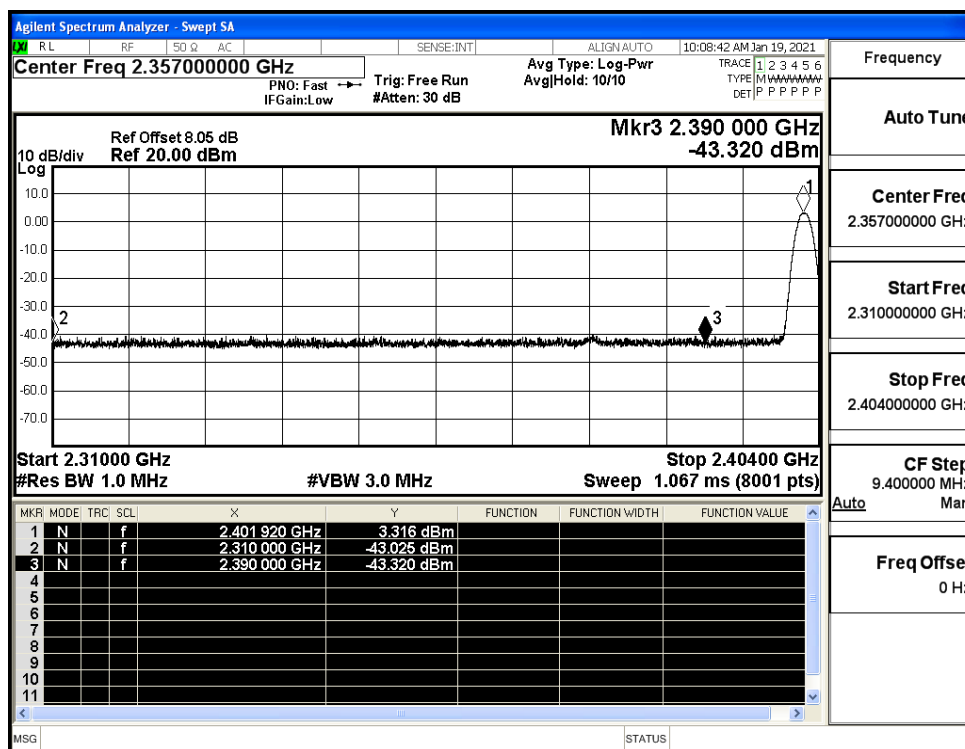
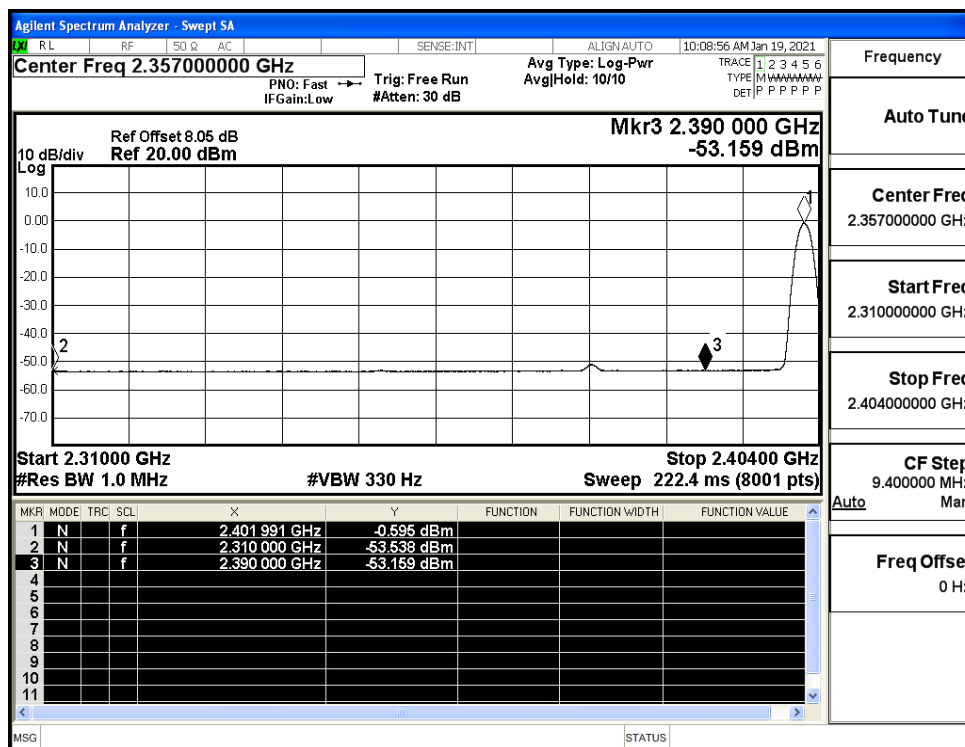


## Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_PEAK (High Channel)

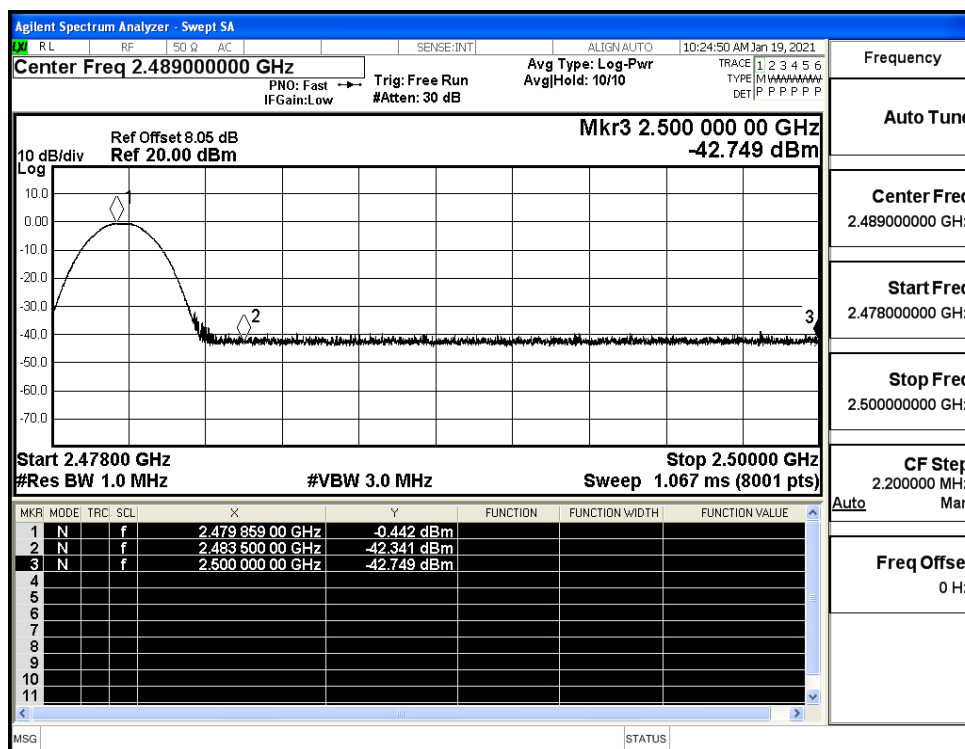


## Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_Average (High Channel)

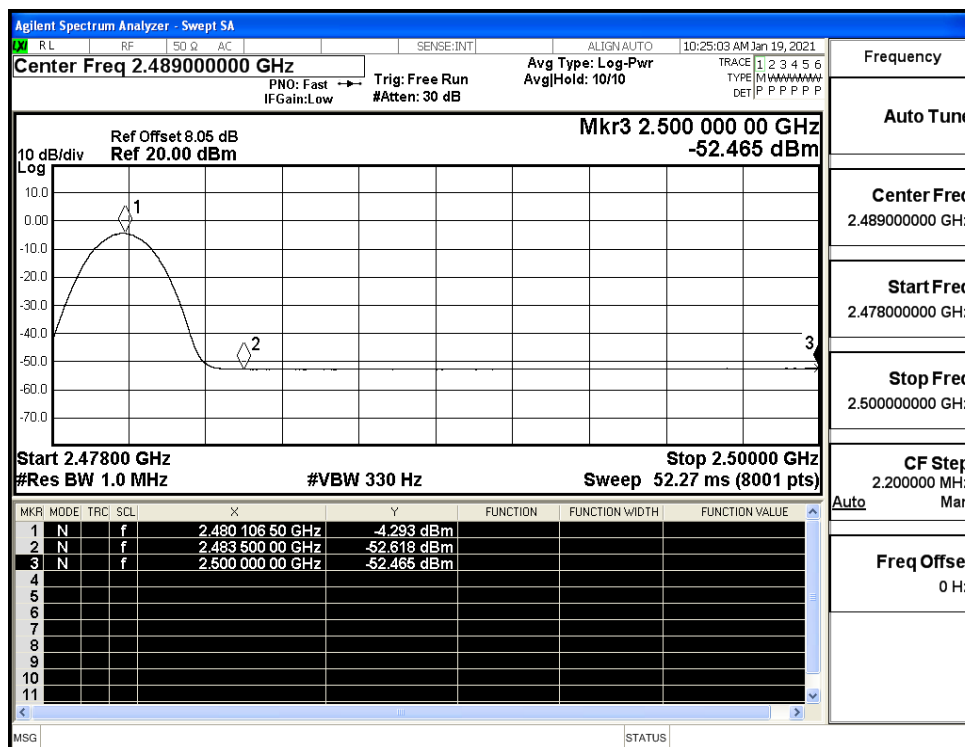


Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_PEAK (Low Channel)Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_Average (Low Channel)

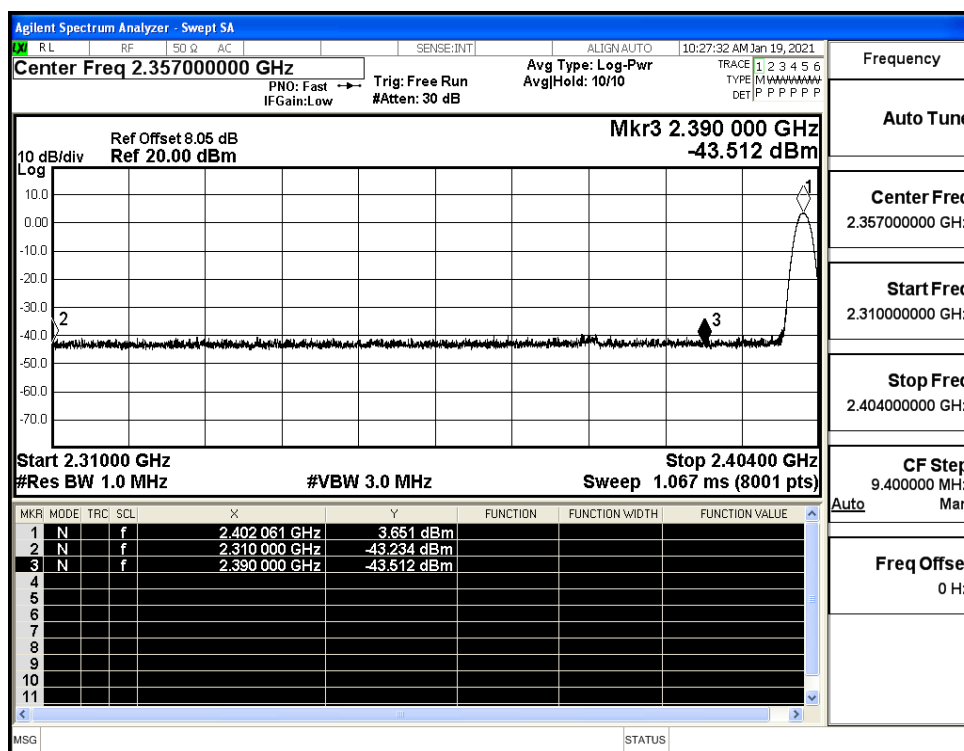
## Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_PEAK (High Channel)



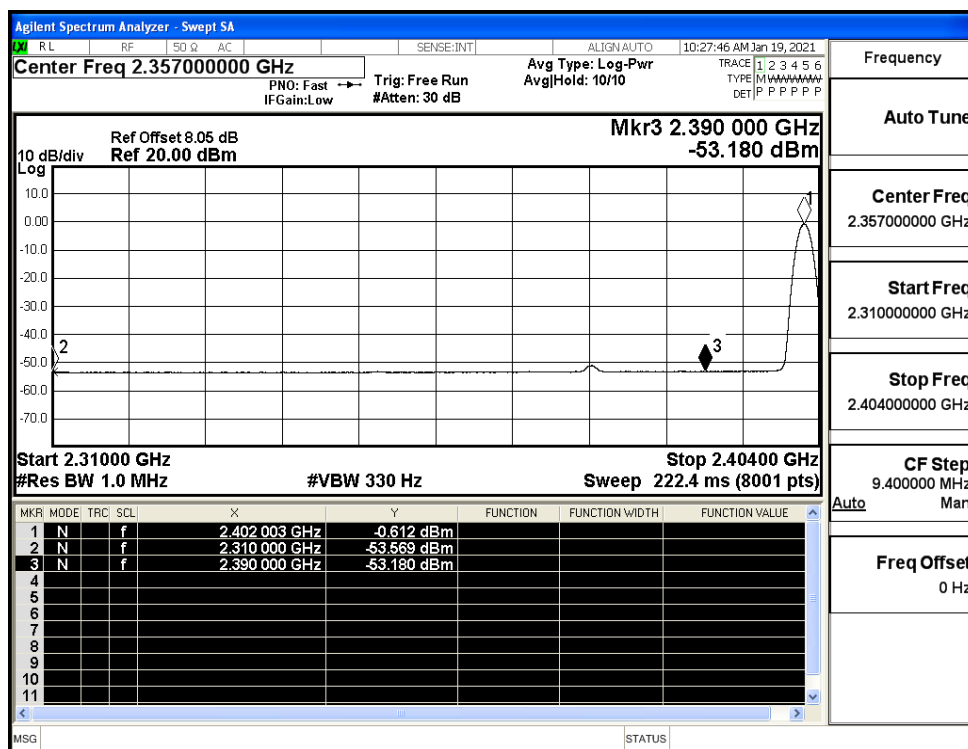
## Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_Average (High Channel)



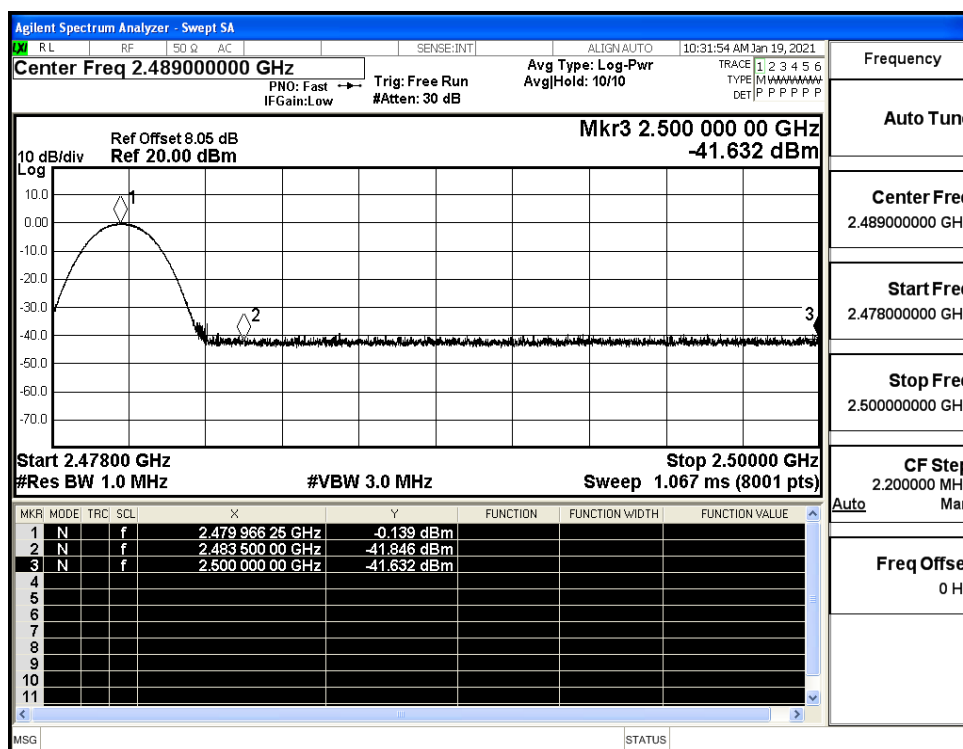
## Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_PEAK (Low Channel)



## 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)

