

## Appendix A

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

Product Name: Bluetooth voice activated GOOGLE/SIRI speaker

Trade Mark: ILIVE

Test Model: ISBV39

#### Environmental Conditions

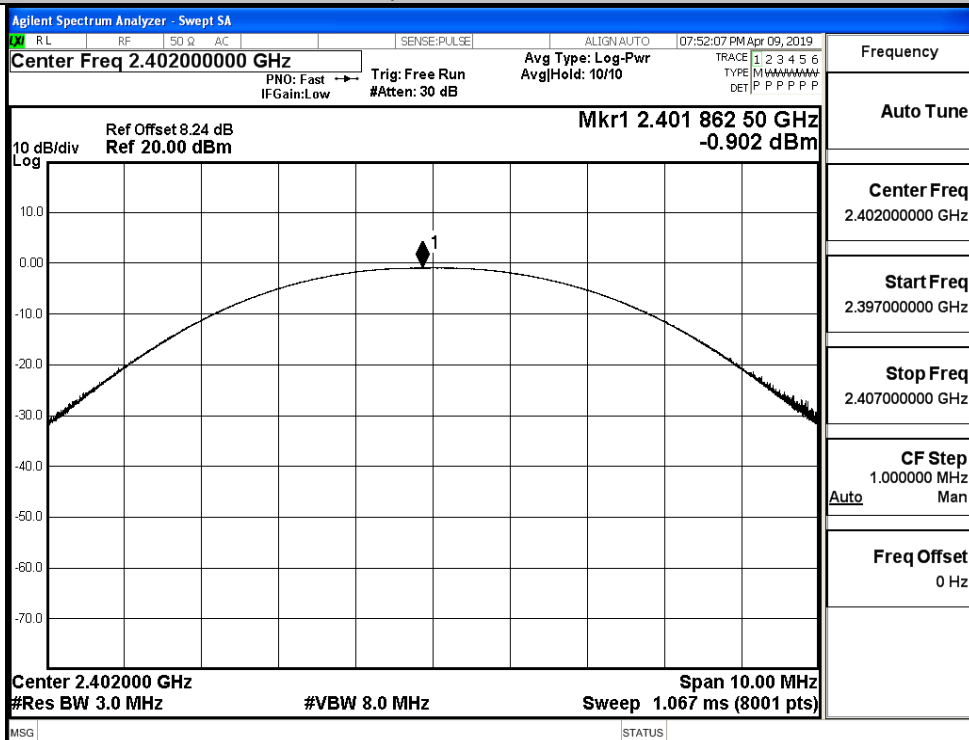
Temperature:	24.5 ° C
Relative Humidity:	52.3%
ATM Pressure:	100.0 kPa
Test Engineer:	JERRY.ZENG
Supervised by:	Tom.Liu

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

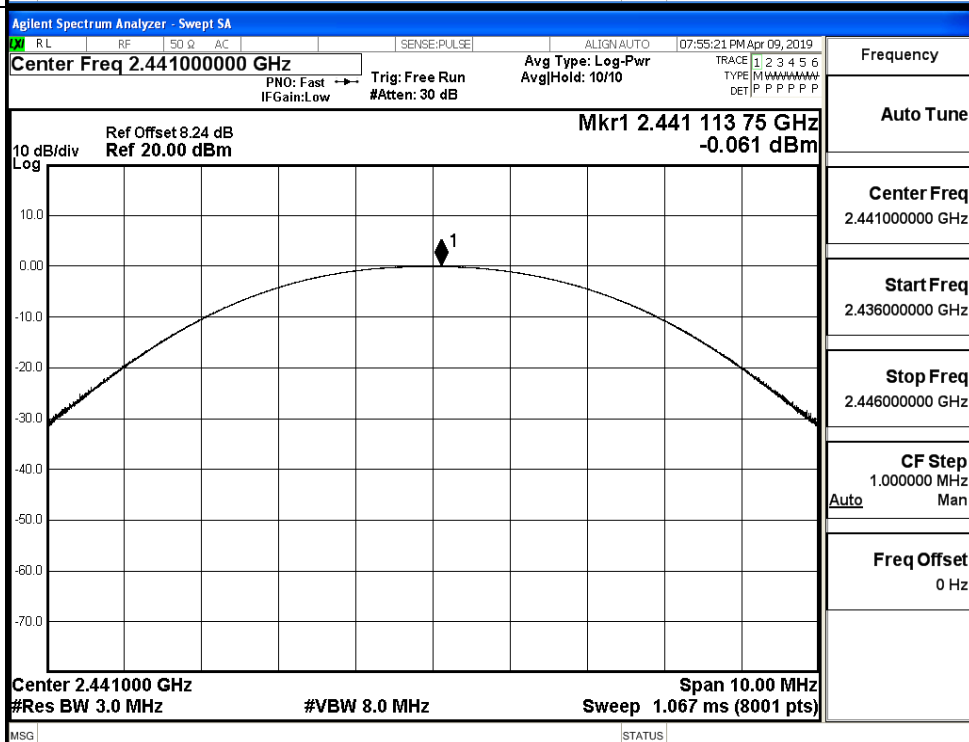
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.902	21	PASS
	MCH	-0.061	21	PASS
	HCH	-1.013	21	PASS
$\pi/4$ DQPSK	LCH	-1.442	21	PASS
	MCH	-0.752	21	PASS
	HCH	-1.635	21	PASS
8DPSK	LCH	-1.294	21	PASS
	MCH	-0.499	21	PASS
	HCH	-1.447	21	PASS

## Test Graphs

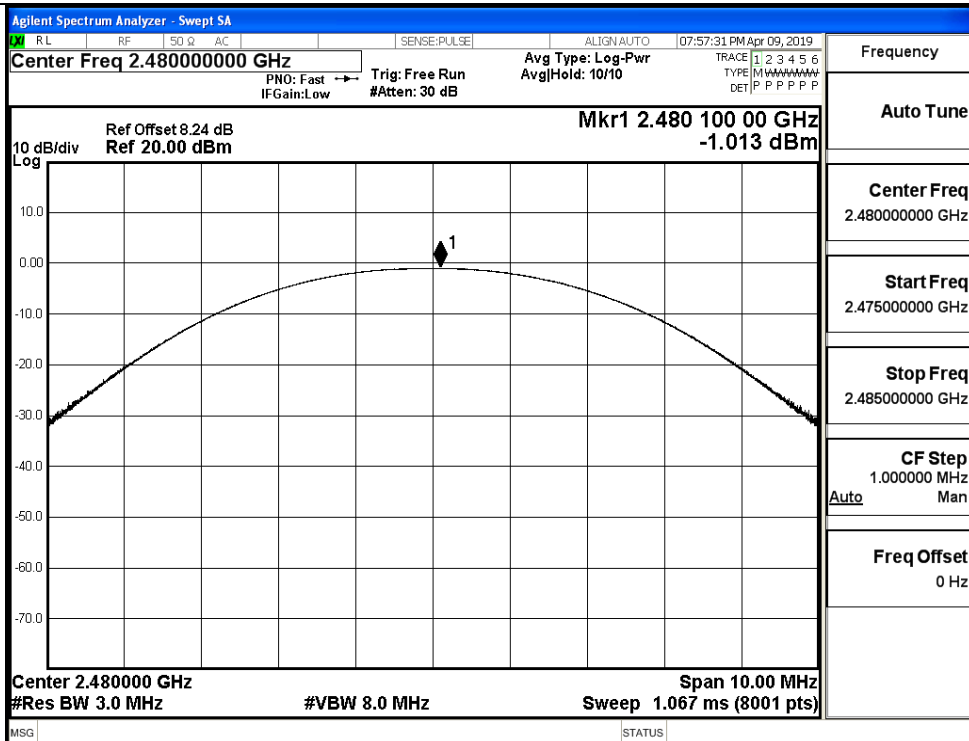
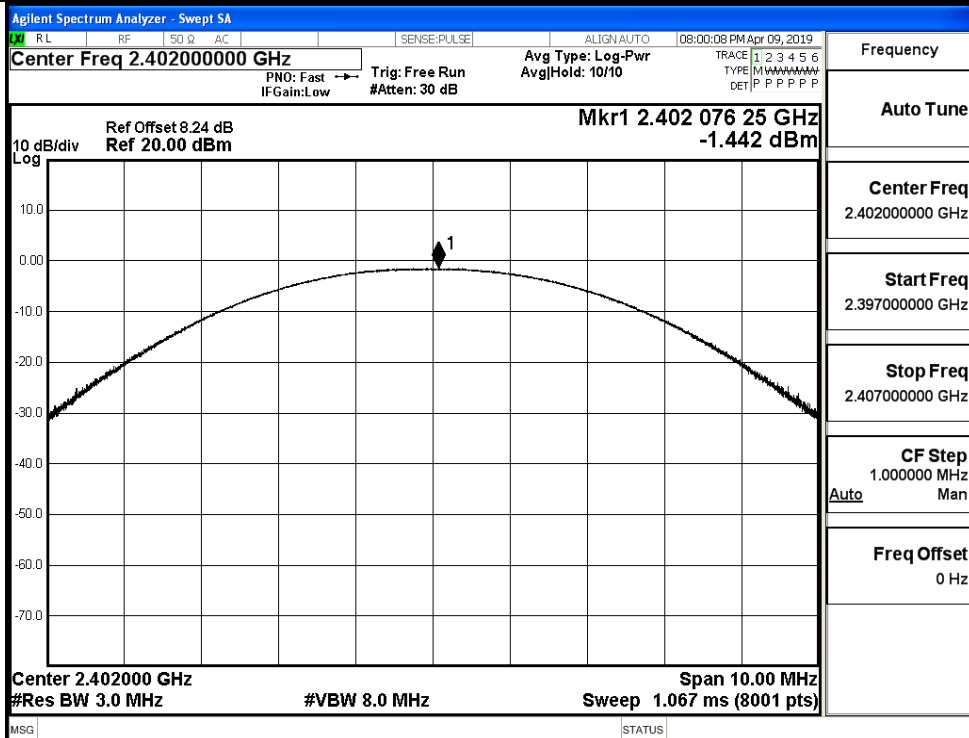
GFSK/LCH

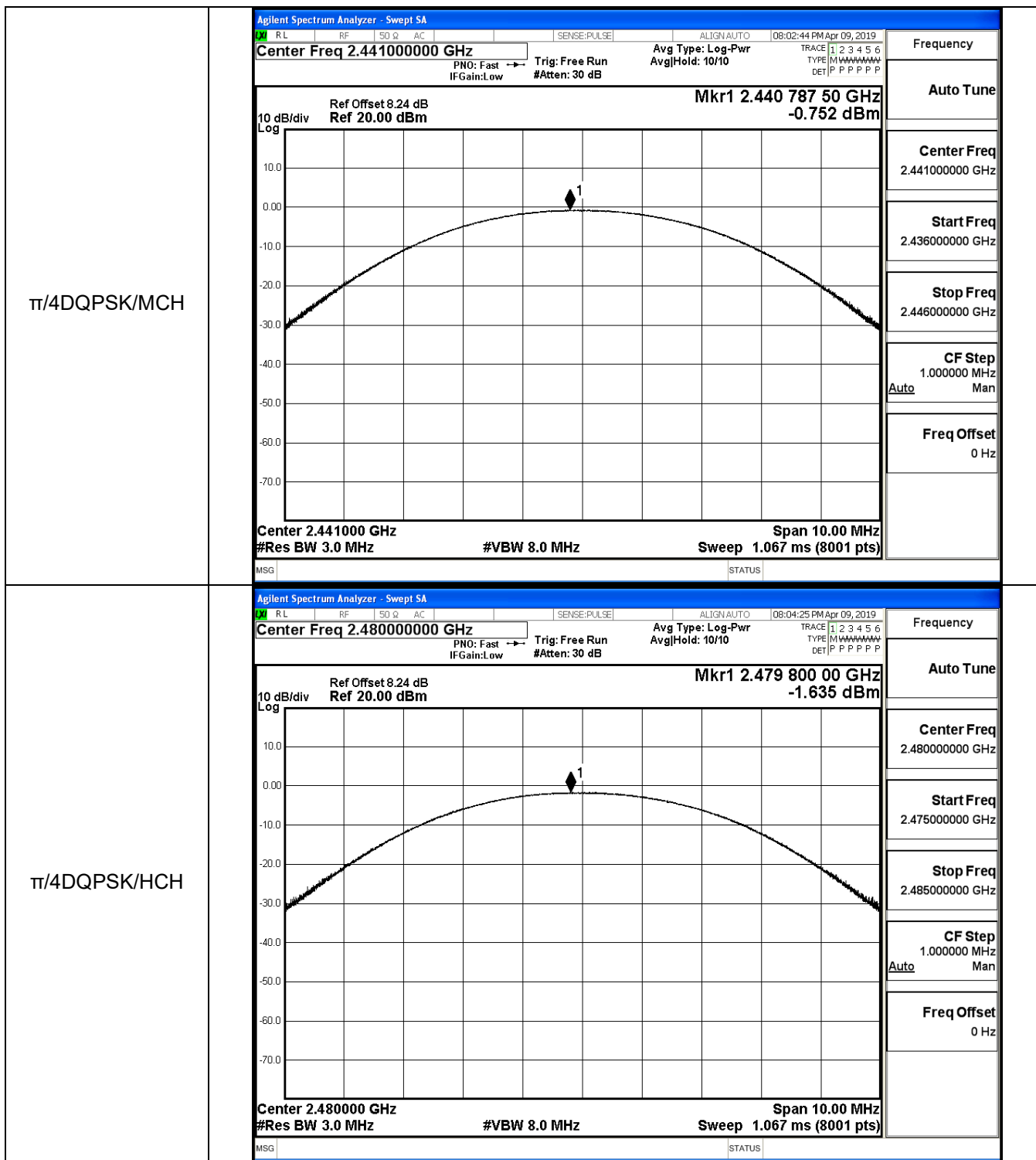


GFSK/MCH

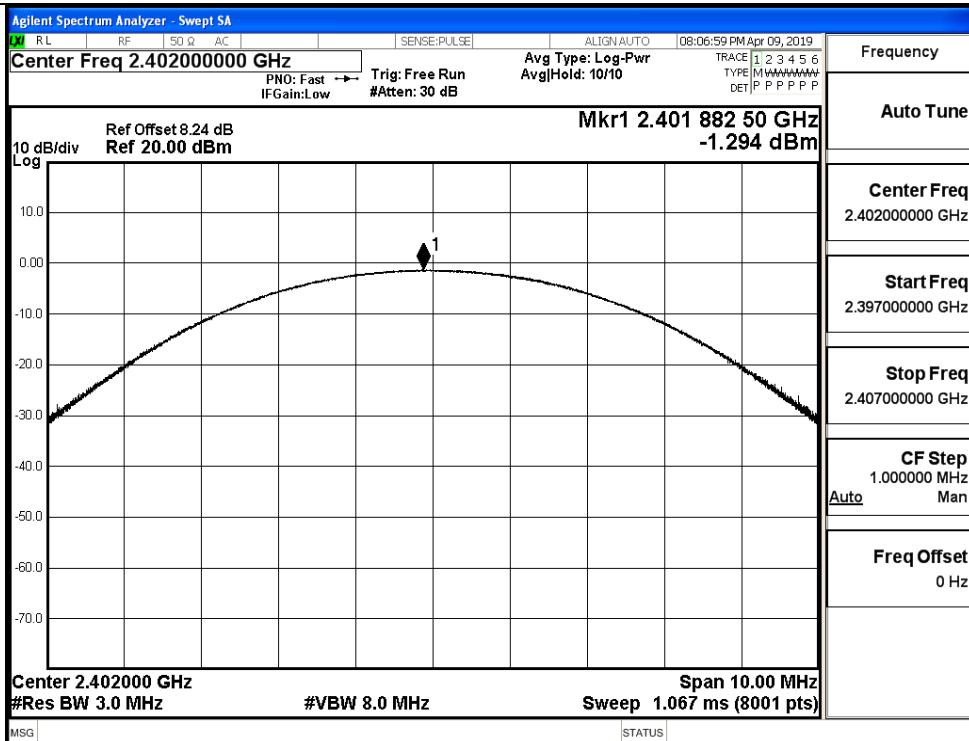


GFSK/HCH

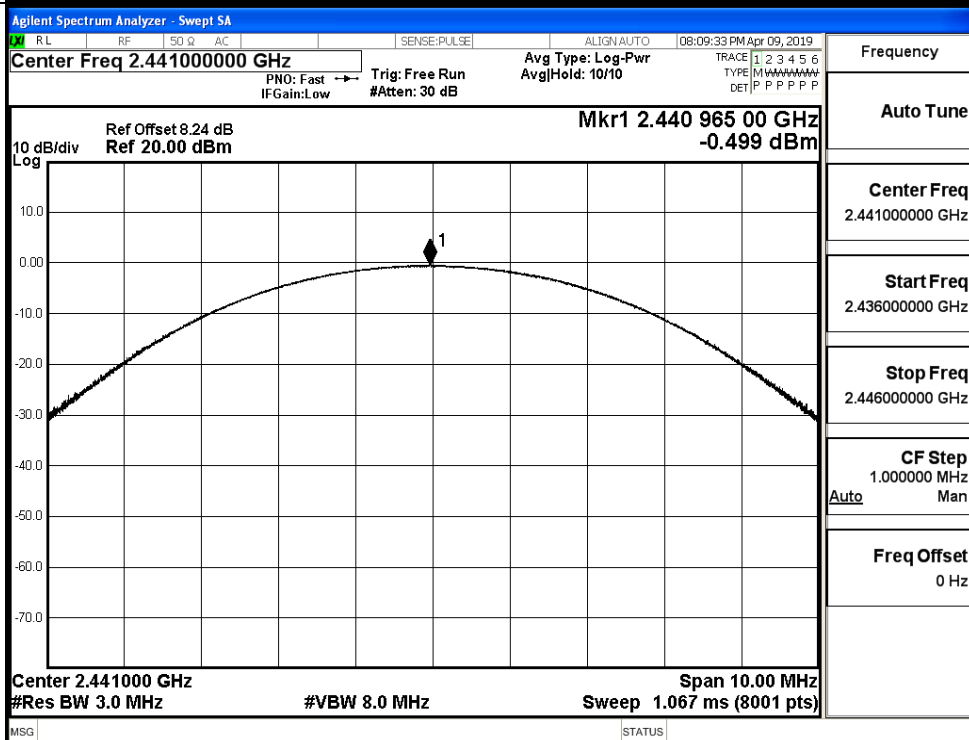
 $\pi$ /4DQPSK/LCH



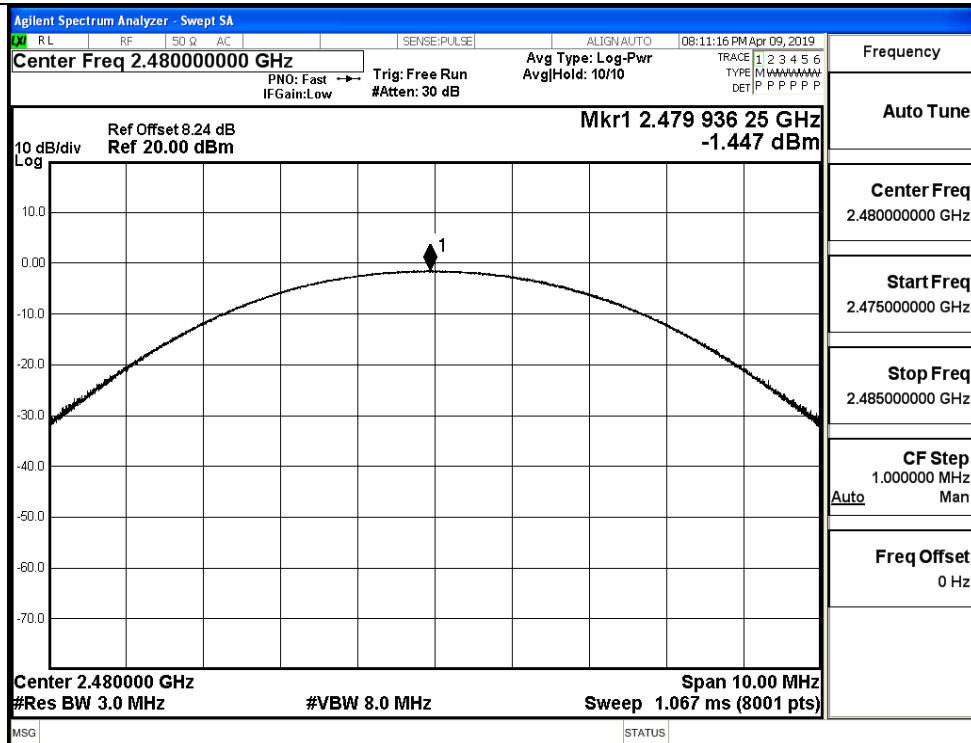
8DPSK/LCH



8DPSK/MCH



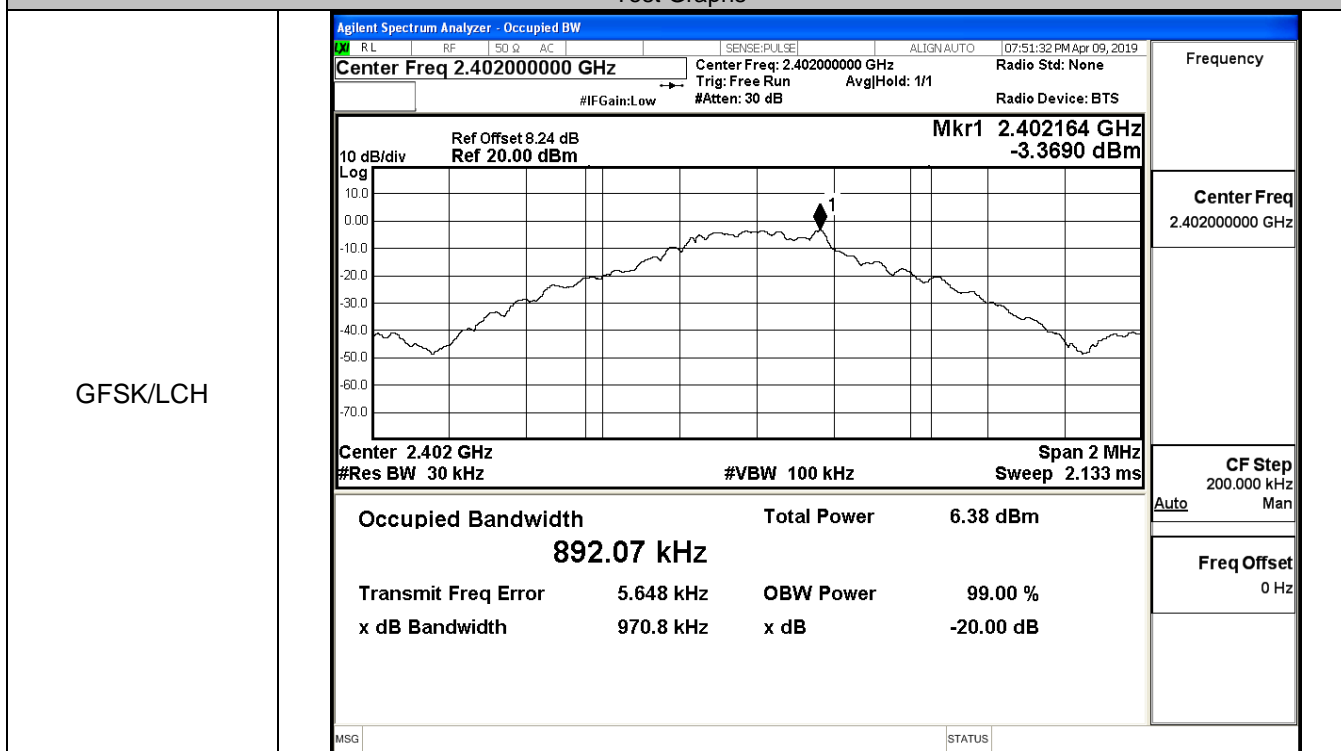
8DPSK/HCH



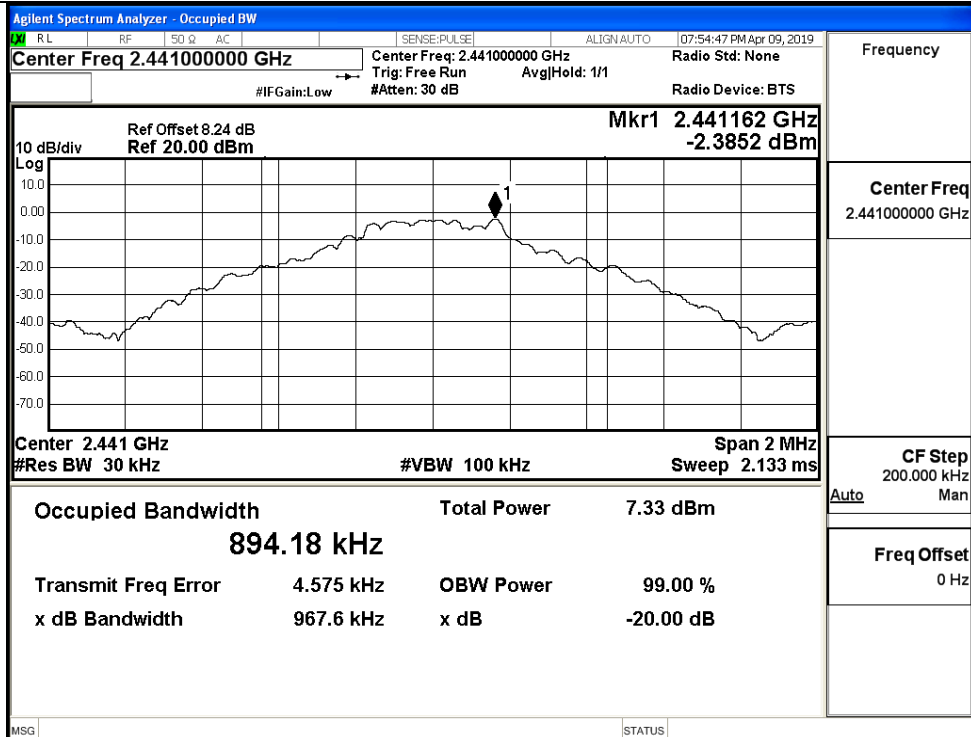
## A.2 99% and 20dB Bandwidth

Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.89207	0.9708	Not Specified	PASS
	MCH	0.89418	0.9676	Not Specified	PASS
	HCH	0.89838	0.9666	Not Specified	PASS
$\pi$ /4DQPSK	LCH	1.1770	1.292	Not Specified	PASS
	MCH	1.1733	1.292	Not Specified	PASS
	HCH	1.1725	1.307	Not Specified	PASS
8DPSK	LCH	1.1892	1.295	Not Specified	PASS
	MCH	1.1863	1.297	Not Specified	PASS
	HCH	1.1855	1.297	Not Specified	PASS

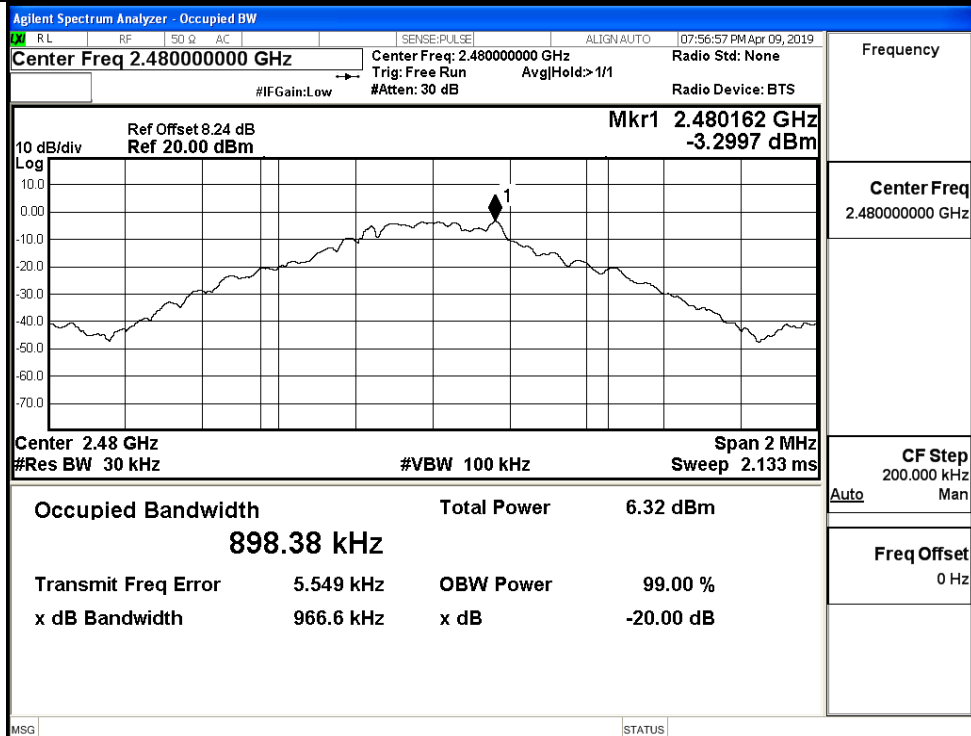
Test Graphs



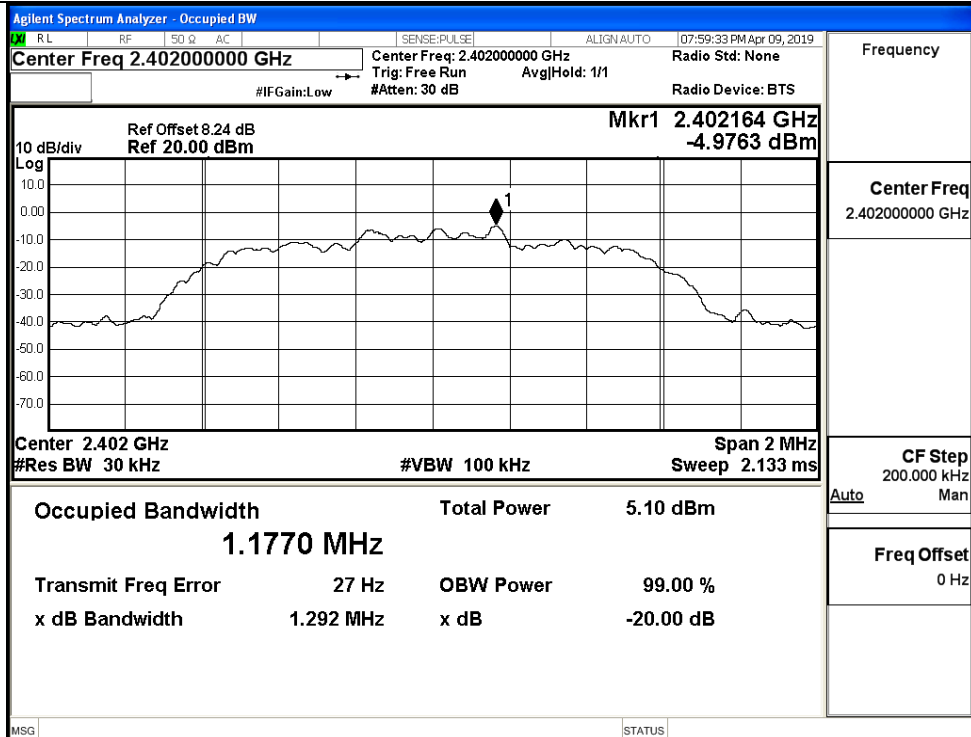
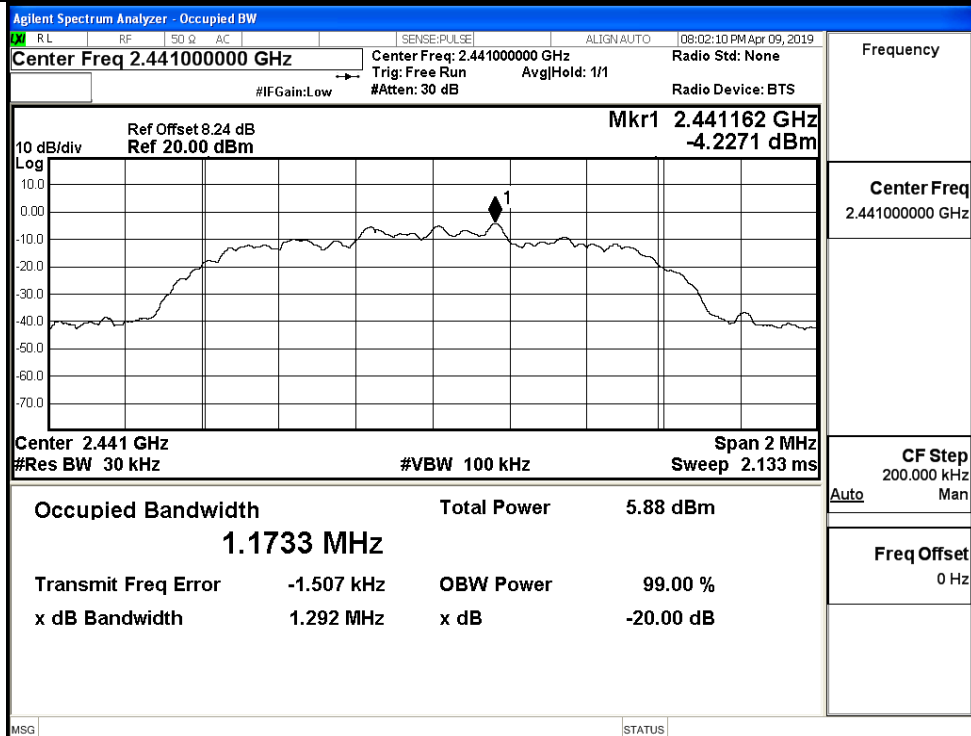
GFSK/MCH

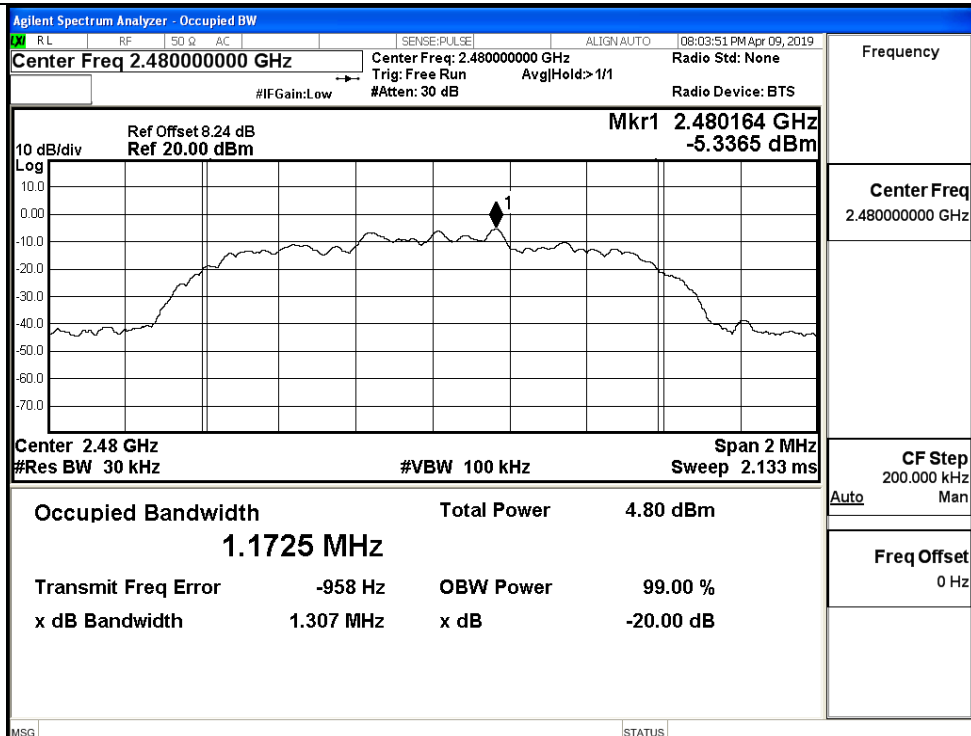


GFSK/HCH

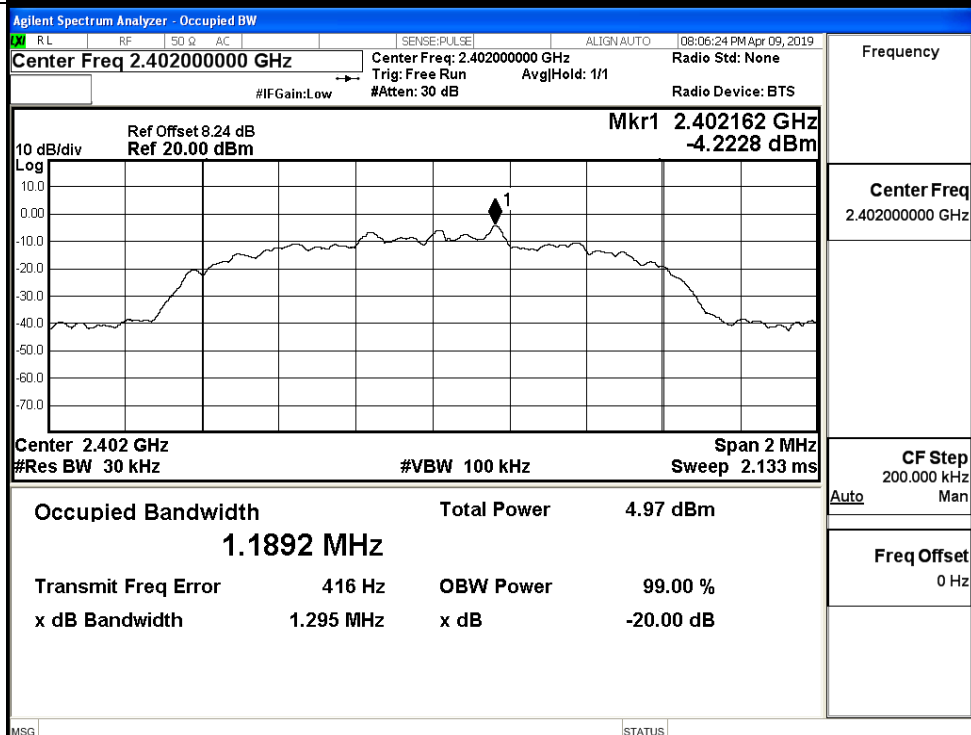




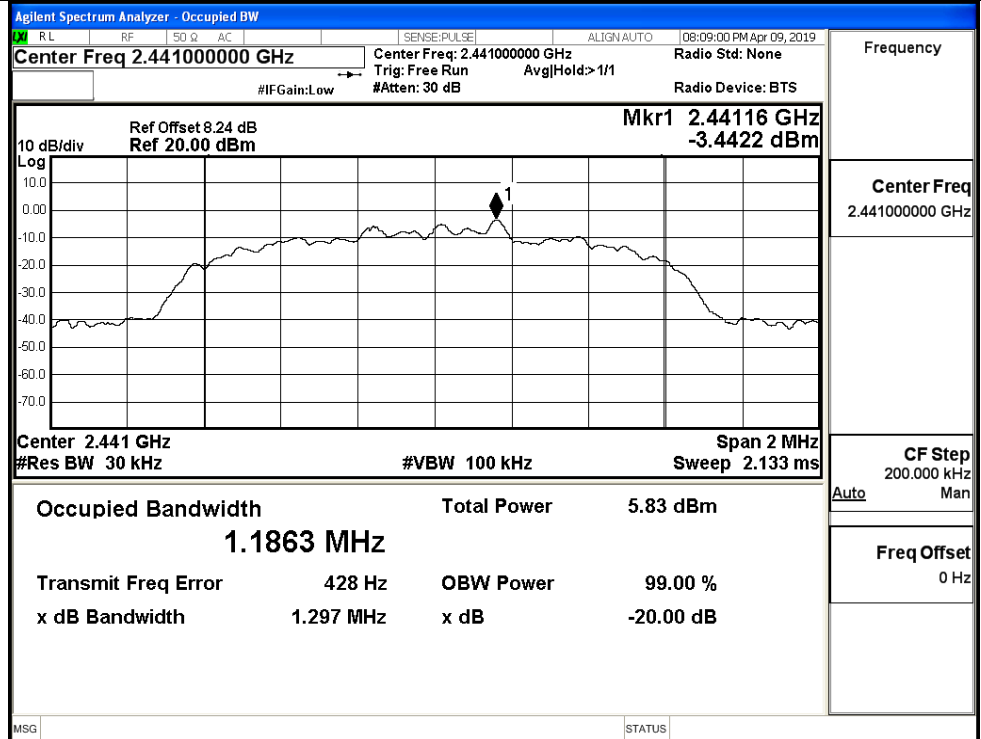
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

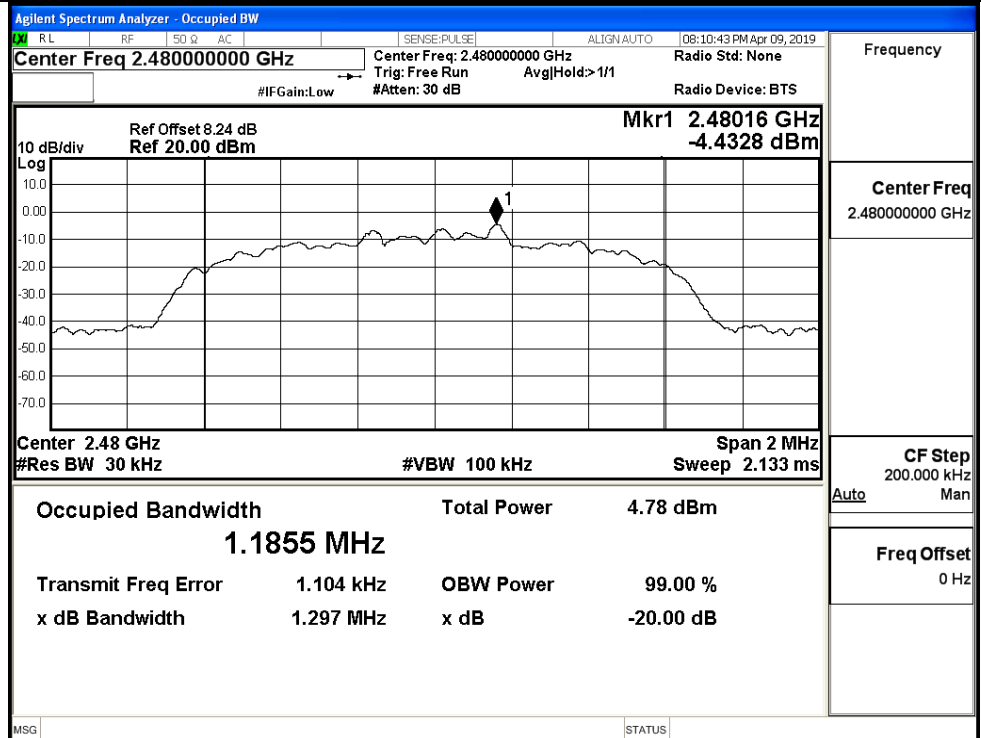
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

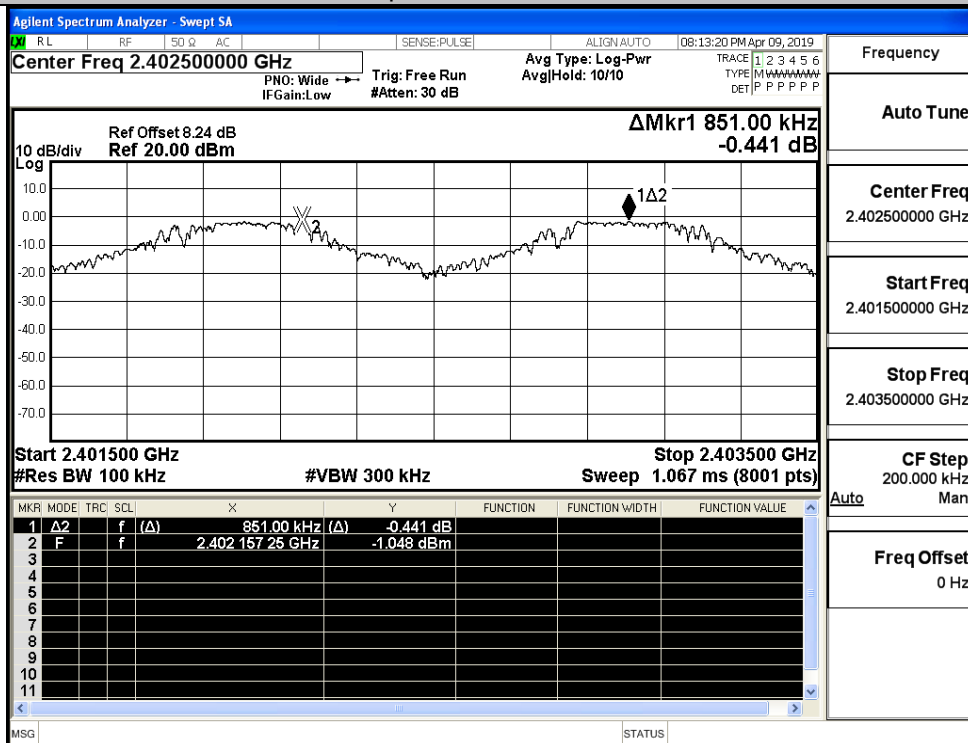


### A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.851	0.647	PASS
	MCH	0.770	0.647	PASS
	HCH	1.070	0.647	PASS
$\pi/4$ DQPSK	LCH	0.934	0.871	PASS
	MCH	1.042	0.871	PASS
	HCH	1.150	0.871	PASS
8DPSK	LCH	0.940	0.865	PASS
	MCH	1.068	0.865	PASS
	HCH	1.054	0.865	PASS

#### Test Graphs

GFSK/LCH



Frequency

Auto Tune

Center Freq

2.402500000 GHz

Start Freq

2.401500000 GHz

Stop Freq

2.403500000 GHz

CF Step

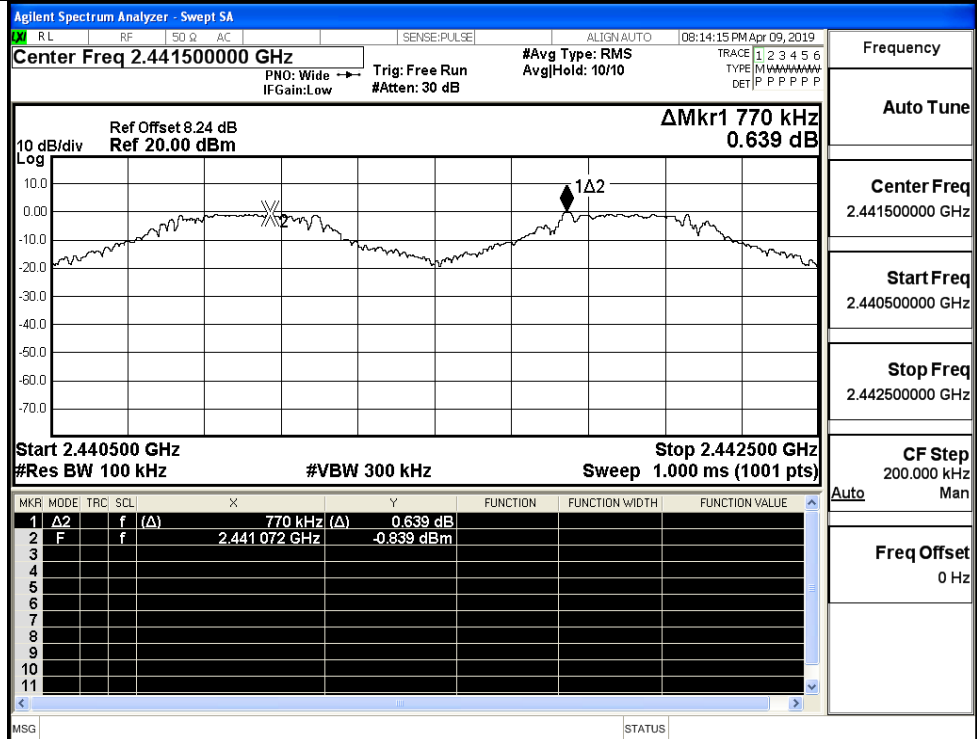
200.000 kHz

Man

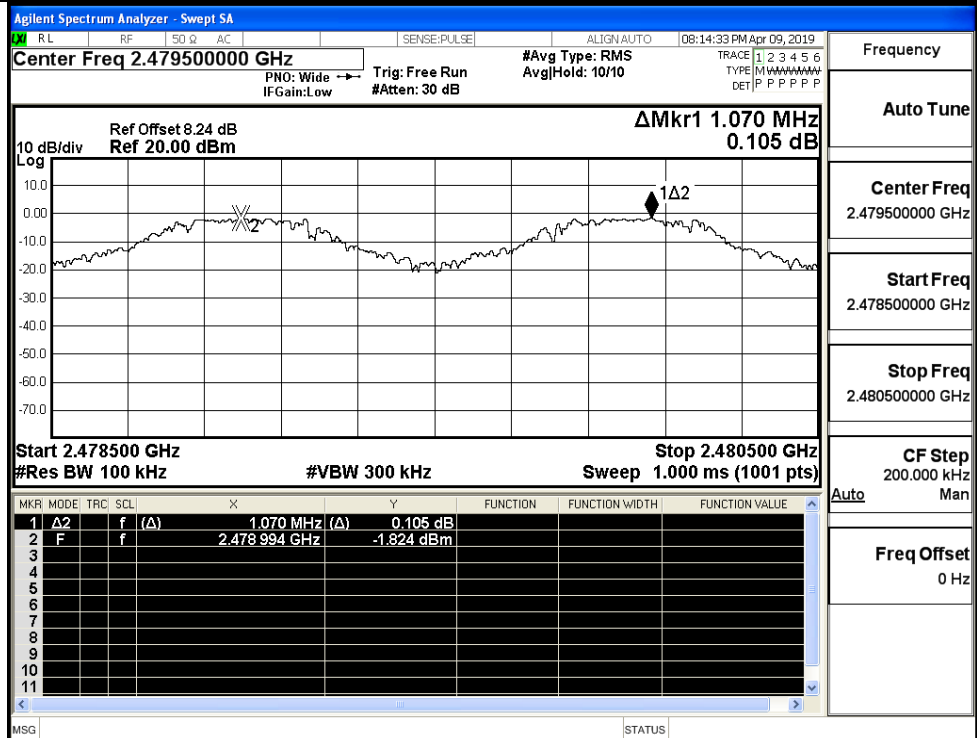
Freq Offset

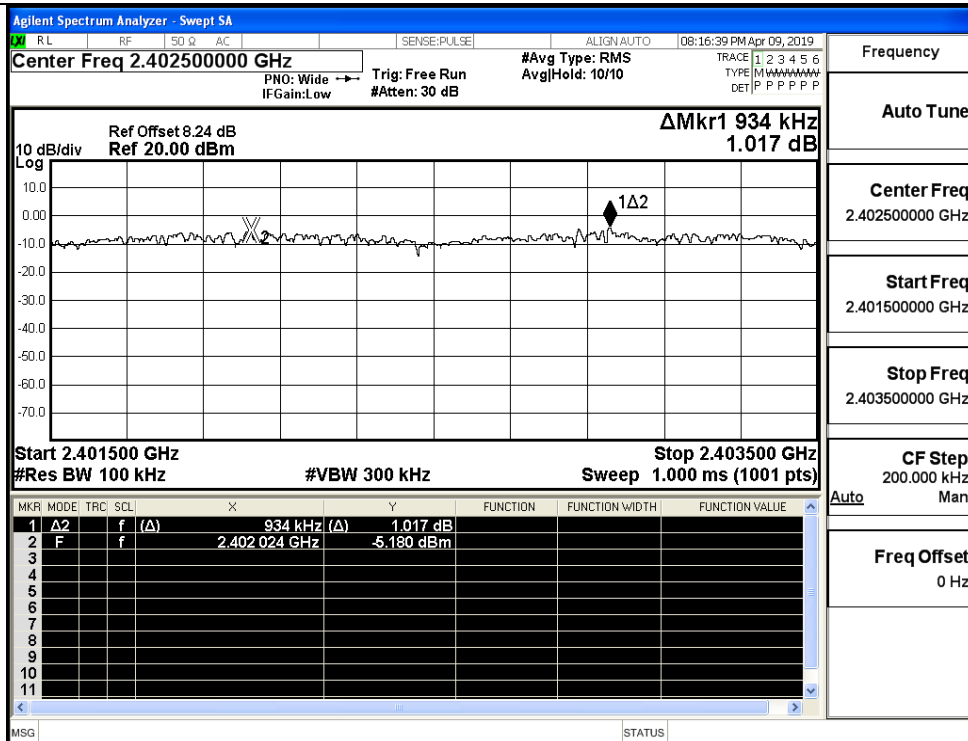
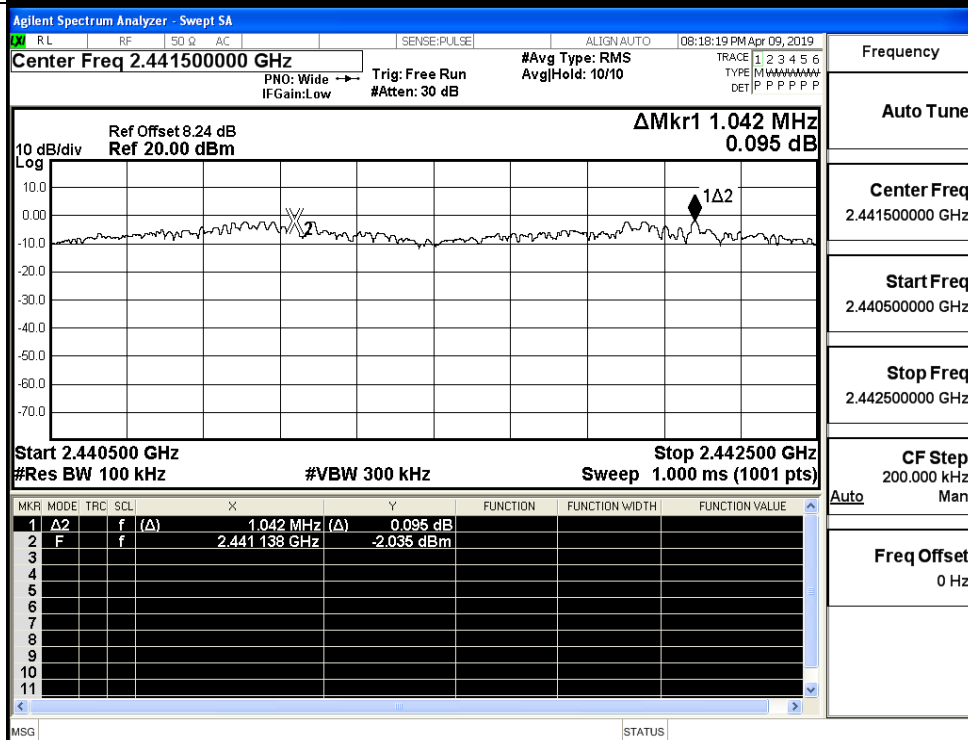
0 Hz

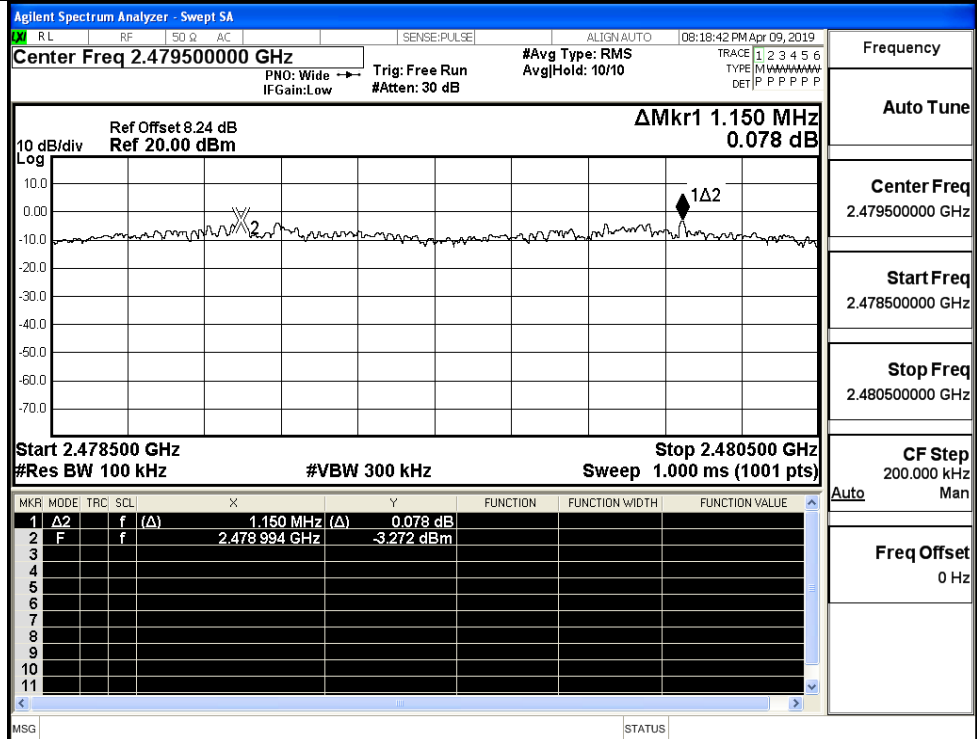
GFSK/MCH



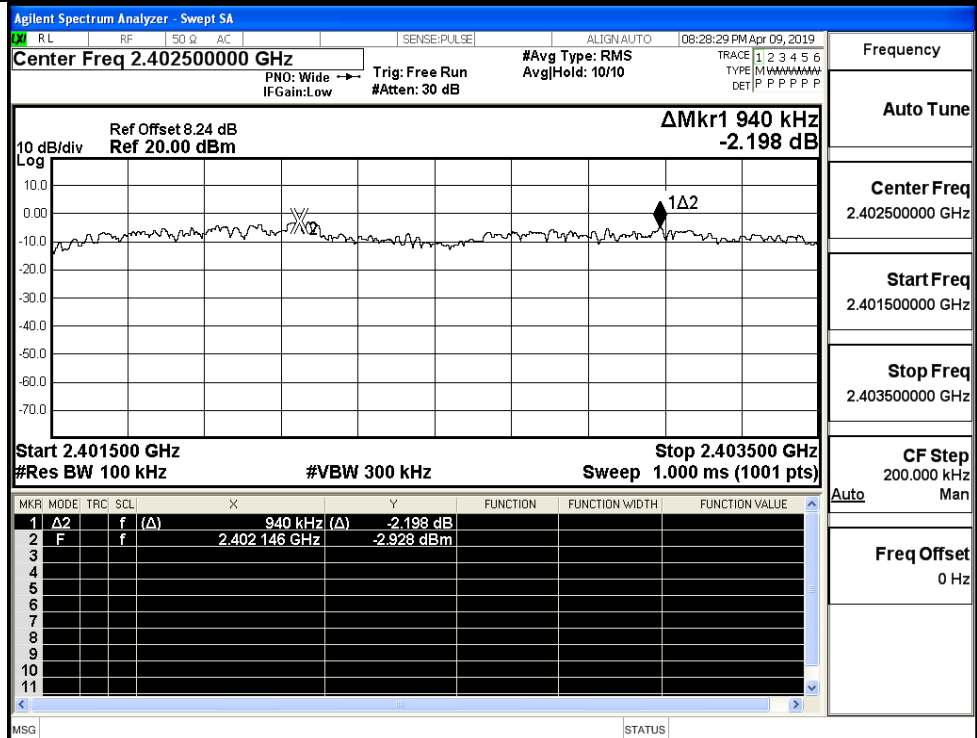
GFSK/HCH



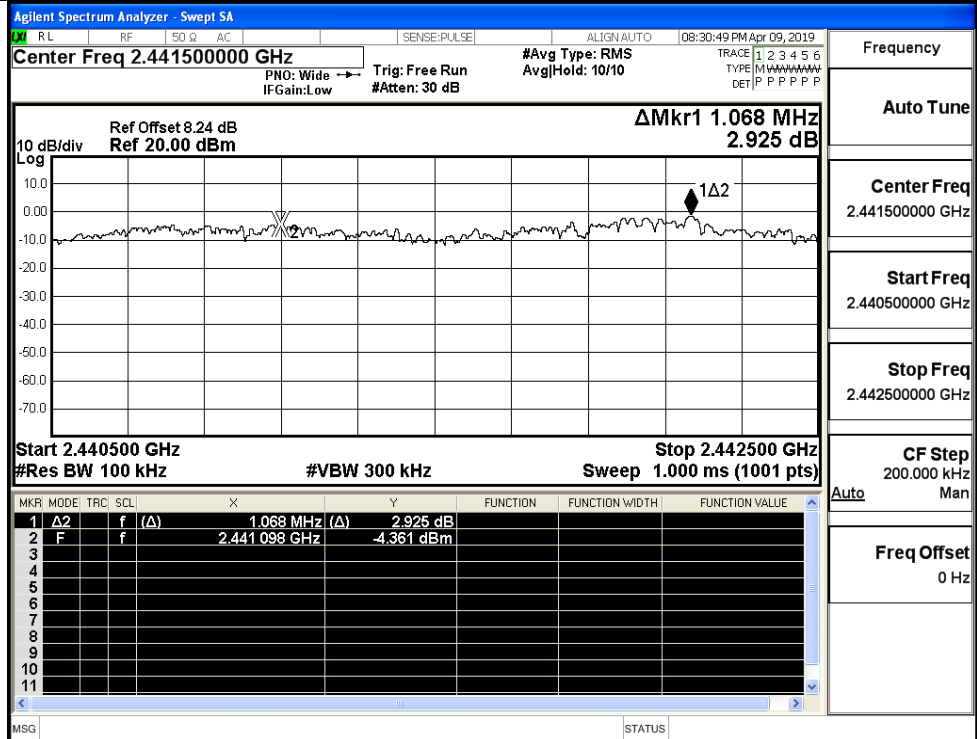
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

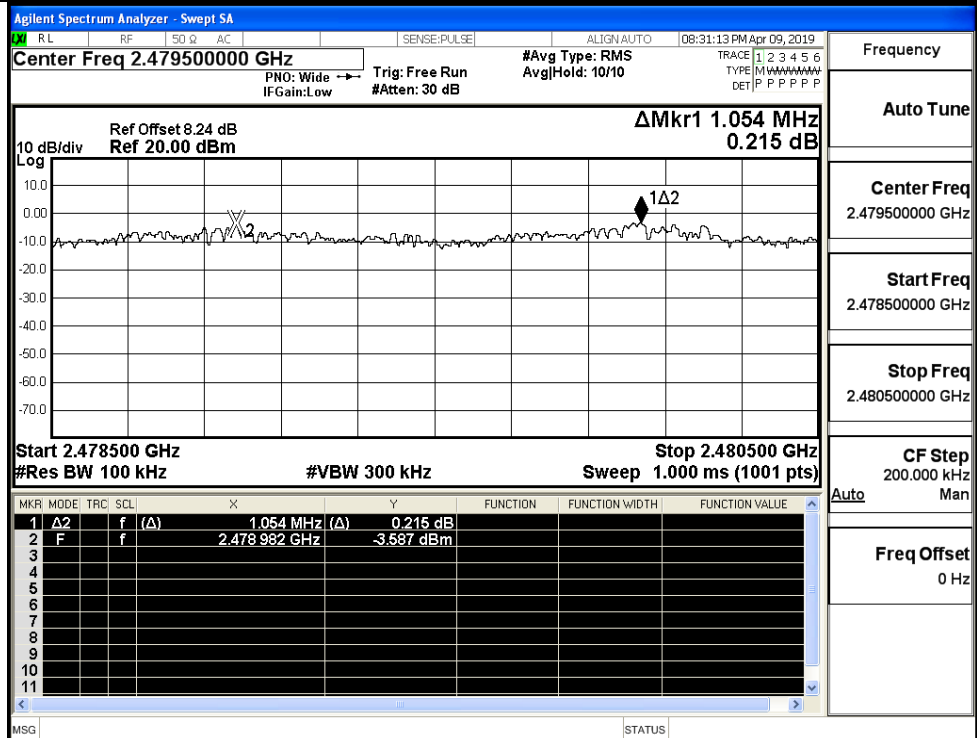
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH



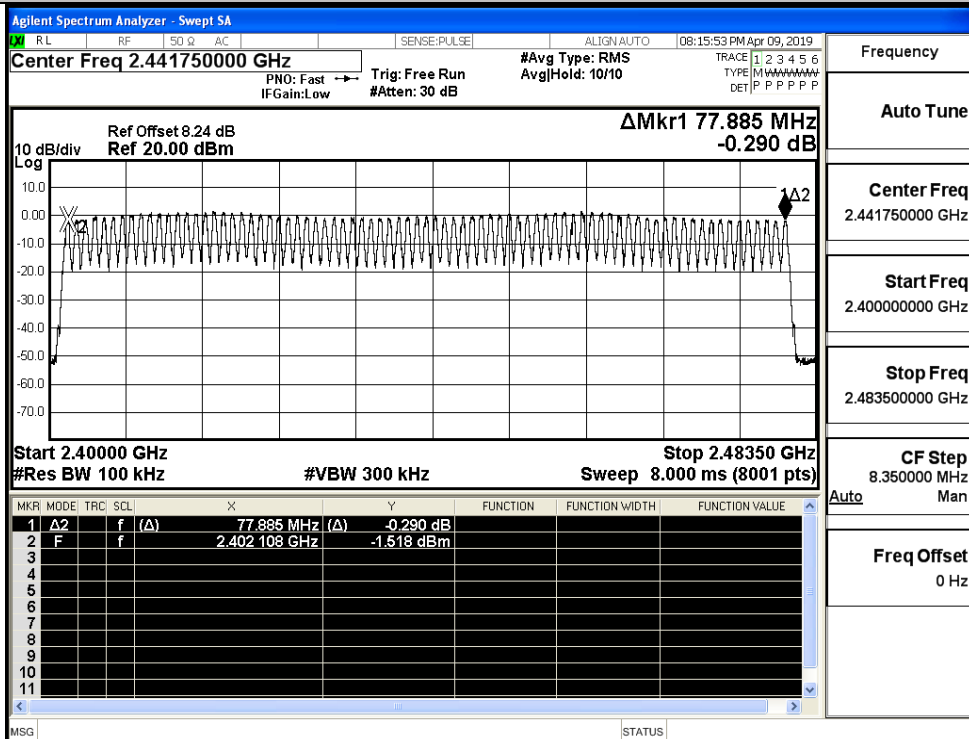
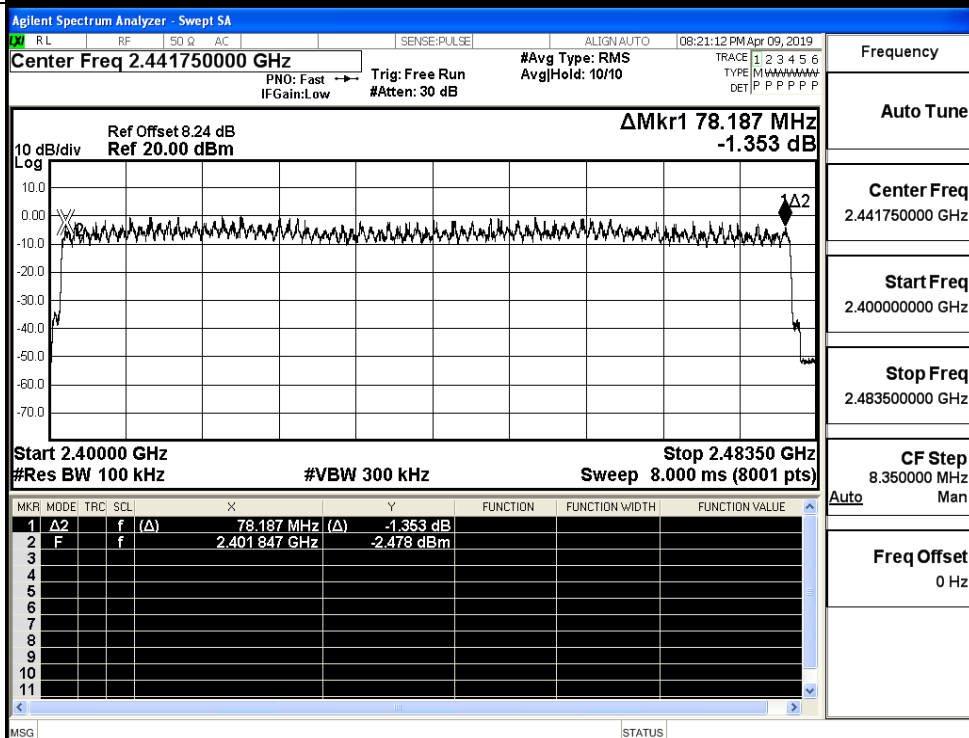


## A.4 Hopping Channel Number

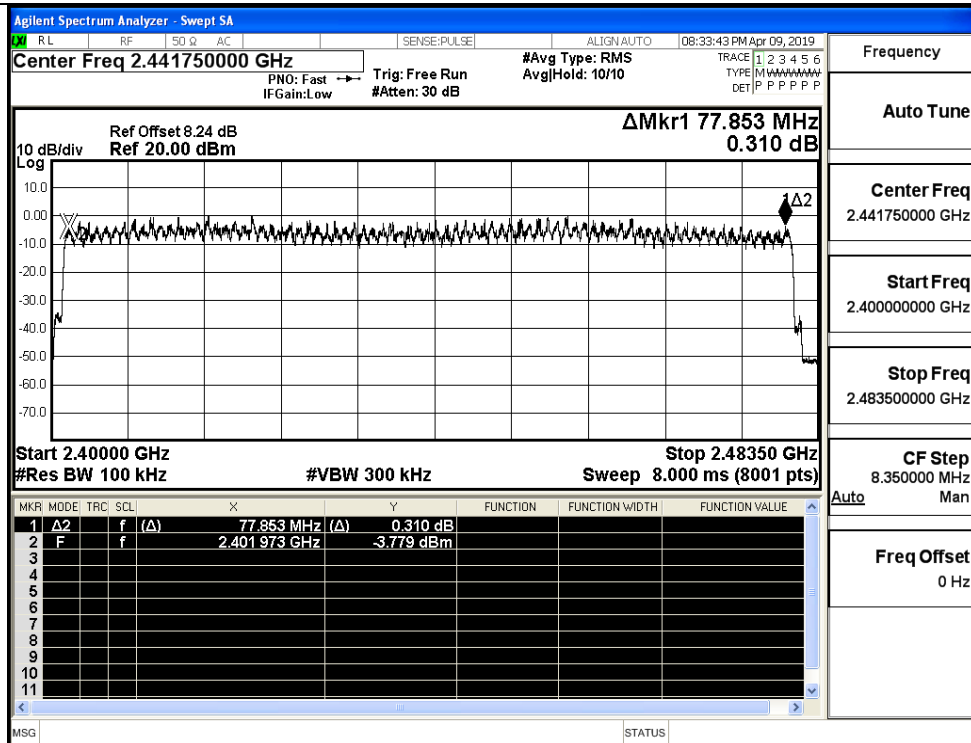
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	$\geq 15$	PASS
$\pi/4$ DQPSK	Hop	79	$\geq 15$	PASS
8DPSK	Hop	79	$\geq 15$	PASS

### Test Graphs

GFSK/Hop

 $\pi/4$ DQPSK/Hop

8DPSK/Hop

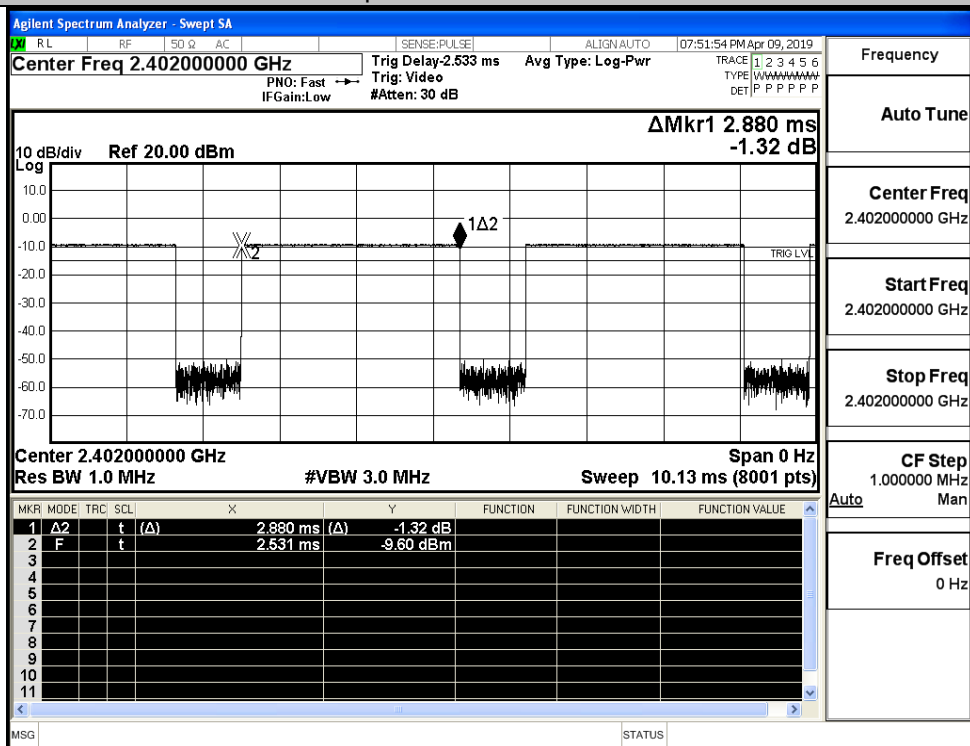


## A.5 Dwell Time

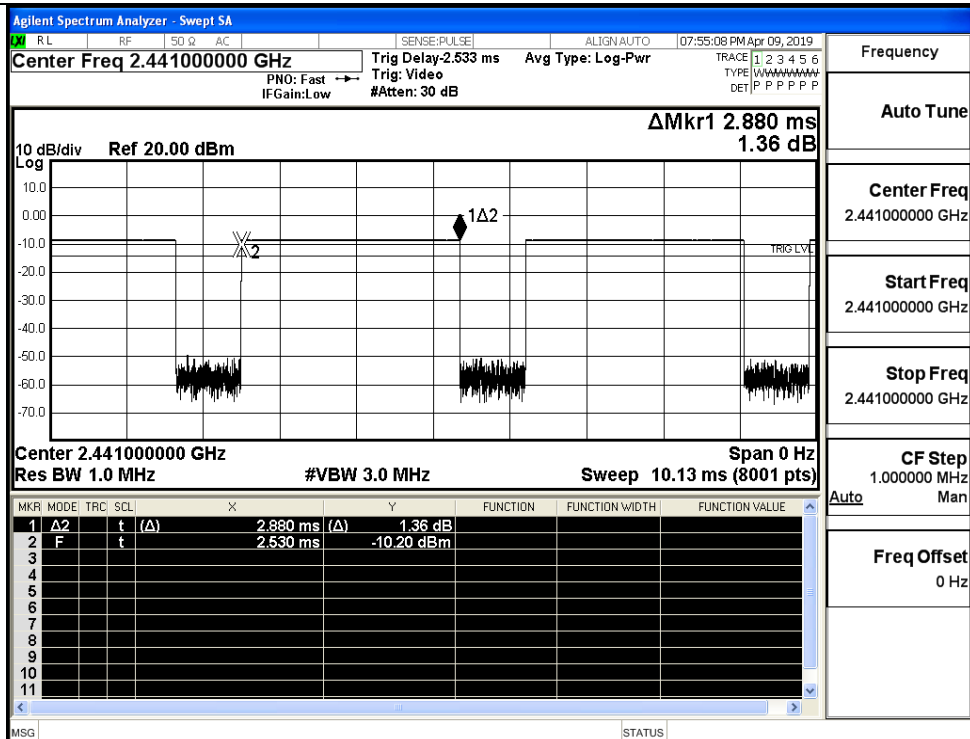
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88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

## Test Graphs

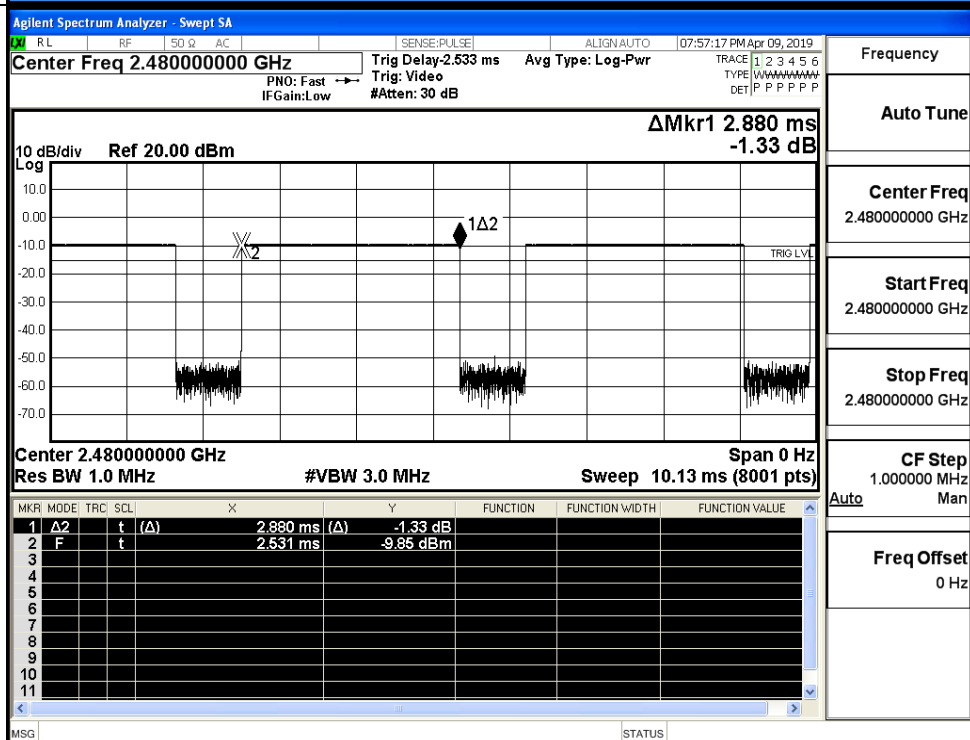
GFSK\_DH5/LCH



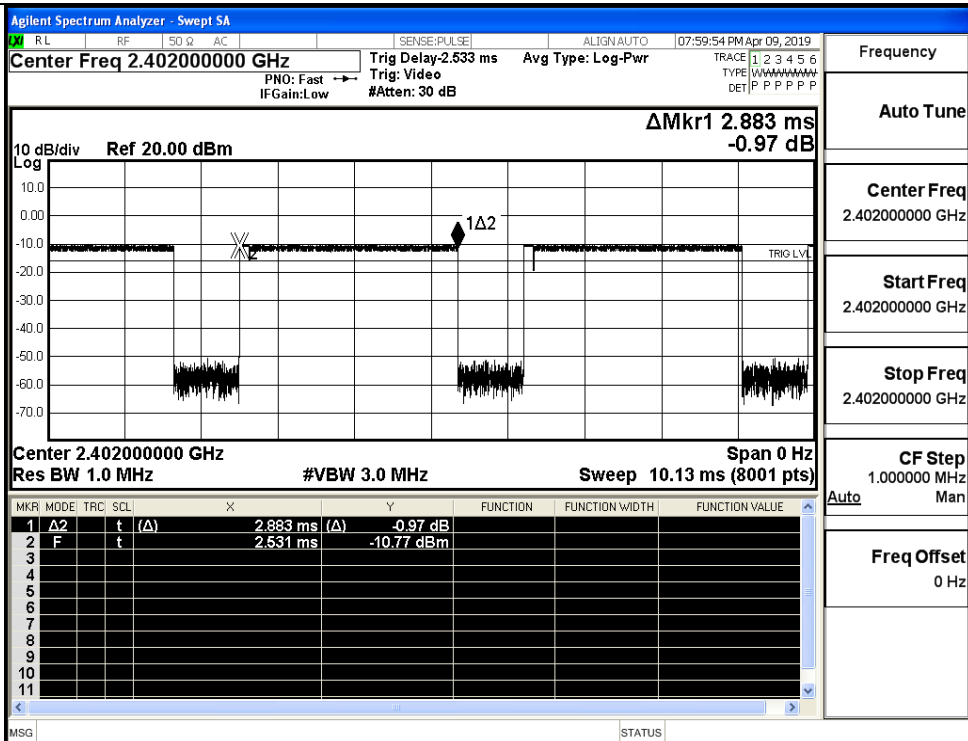
GFSK\_DH5/MCH



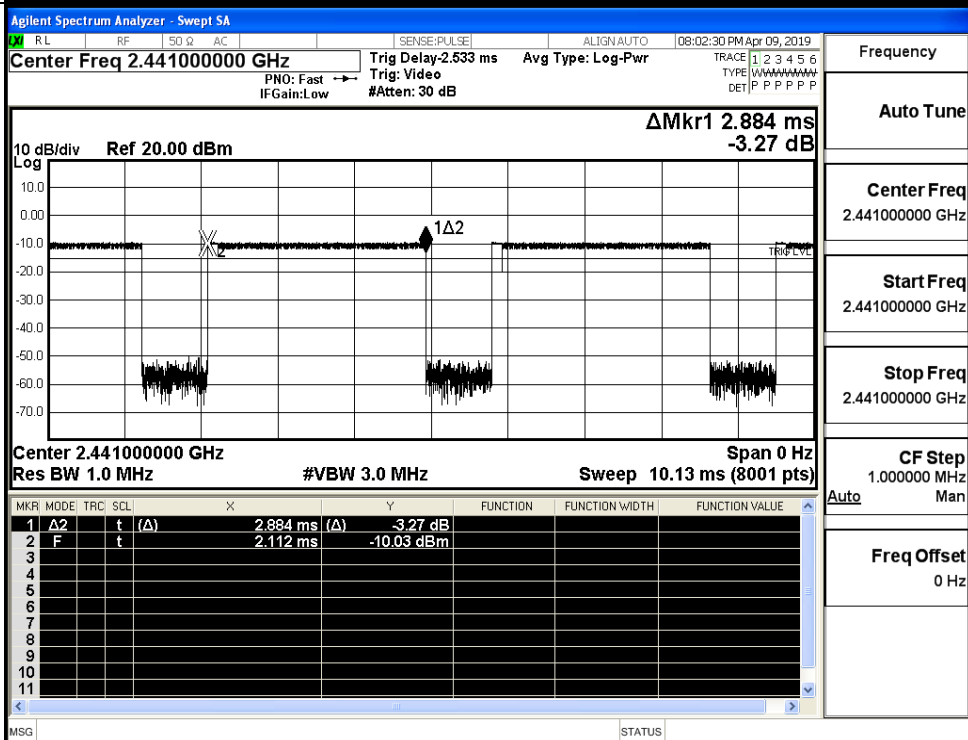
GFSK\_DH5/HCH



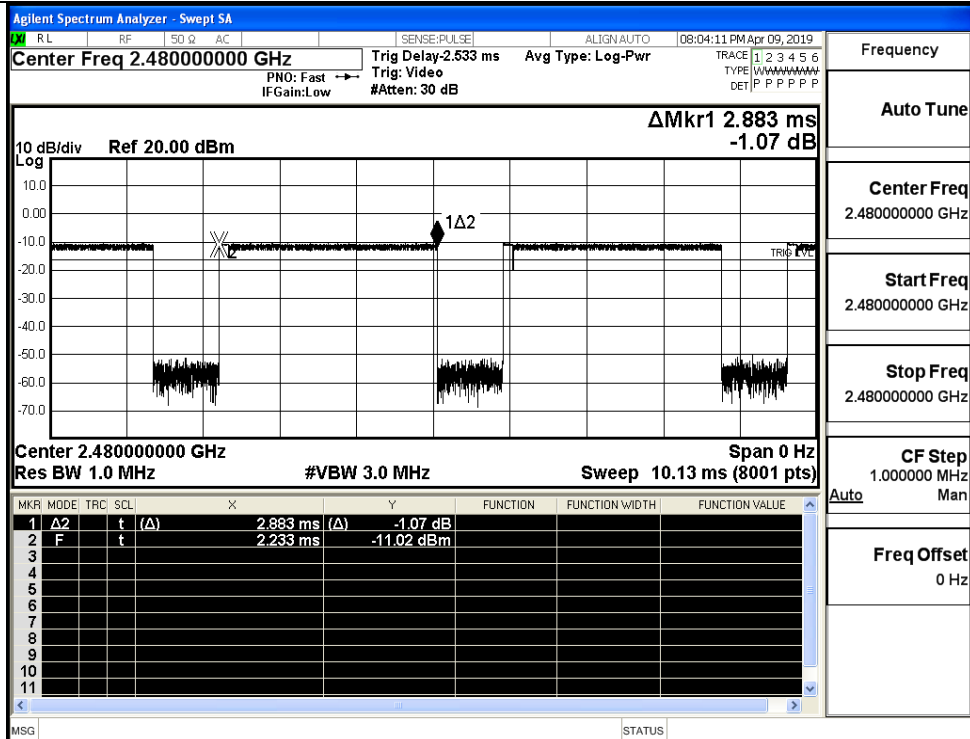
$\pi/4$ DQPSK  
\_2DH5/LCH



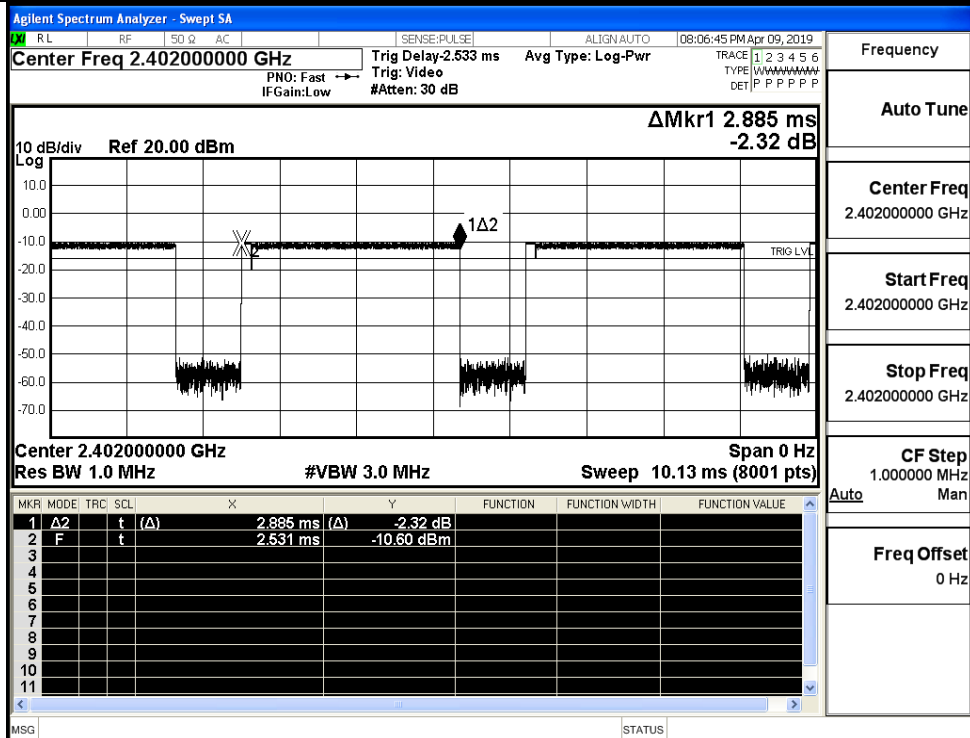
$\pi/4$ DQPSK  
\_2DH5/MCH



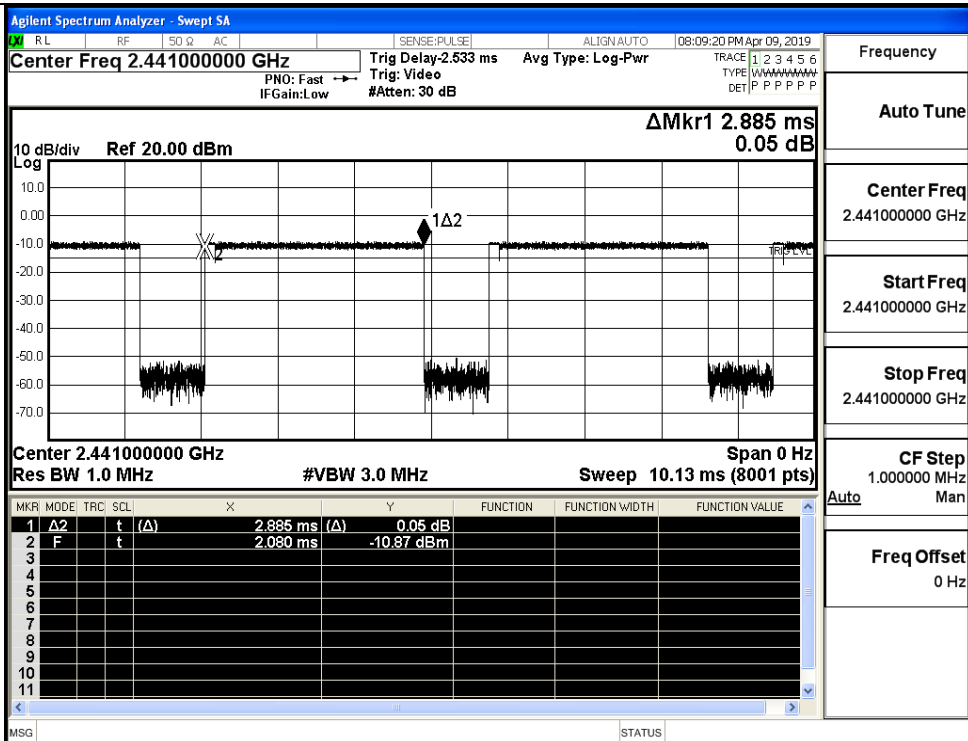
$\pi/4$ DQPSK  
\_2DH5/HCH



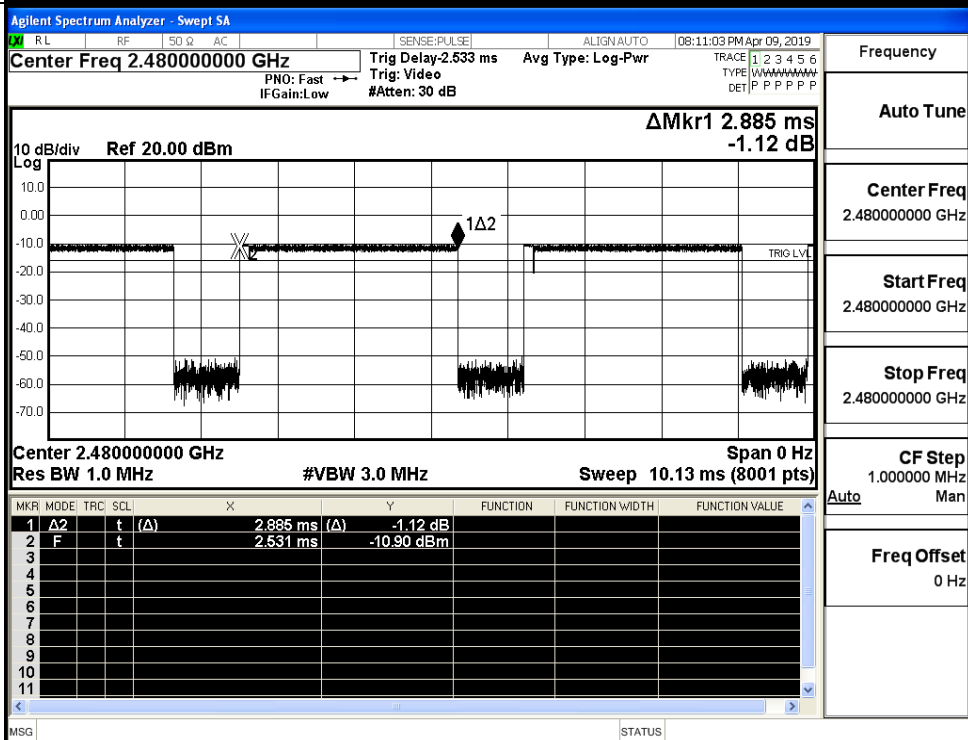
8DPSK \_3DH5/LCH



8DPSK\_3DH5/MCH



8DPSK\_3DH5/HCH

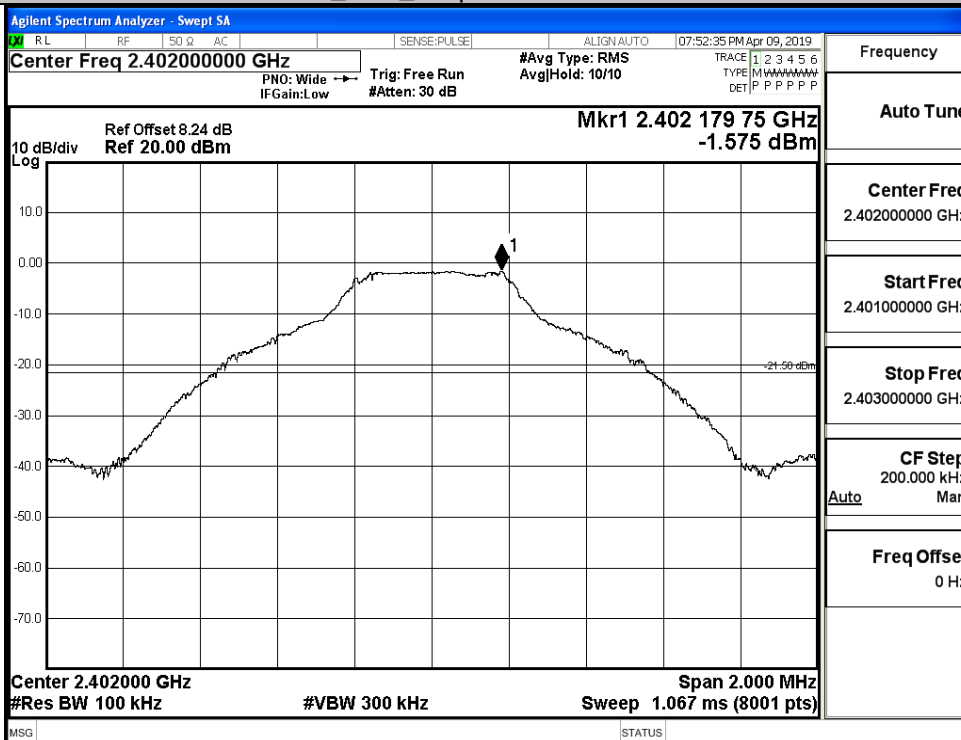


**A.6 RF Conducted Spurious Emissions**

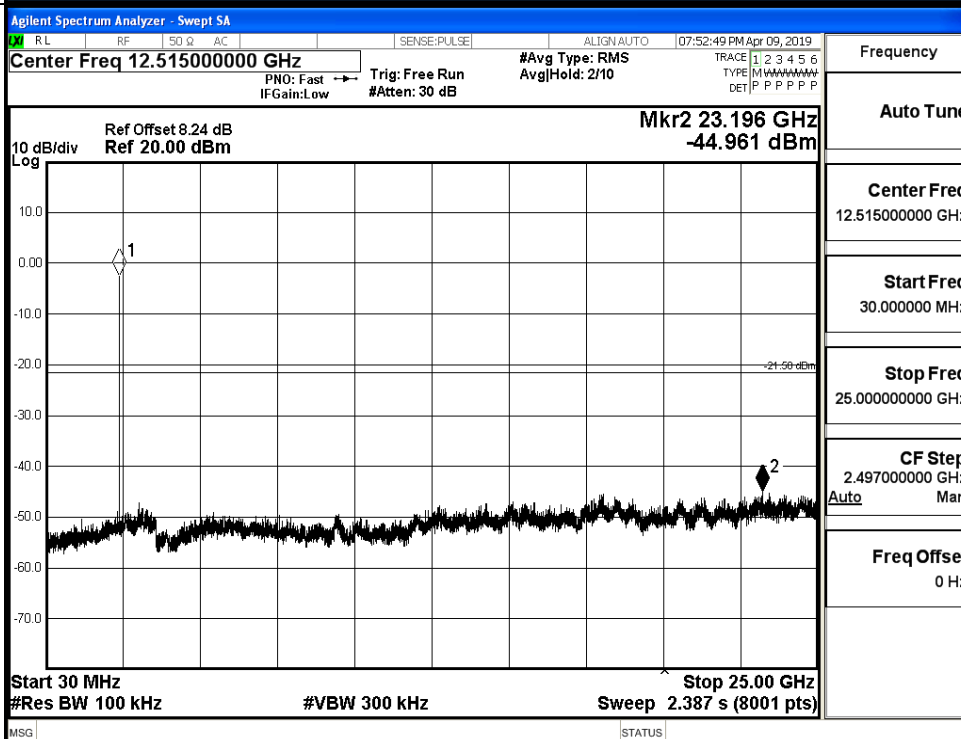
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-1.575	-44.961	-21.575	PASS
	MCH	-0.604	-44.401	-20.604	PASS
	HCH	-1.426	-33.111	-21.426	PASS
$\pi/4$ DQPSK	LCH	-2.25	-44.415	-22.250	PASS
	MCH	-1.458	-45.083	-21.458	PASS
	HCH	-2.457	-44.068	-22.457	PASS
8DPSK	LCH	-2.175	-44.666	-22.175	PASS
	MCH	-1.364	-44.678	-21.364	PASS
	HCH	-2.368	-44.466	-22.368	PASS



Pref

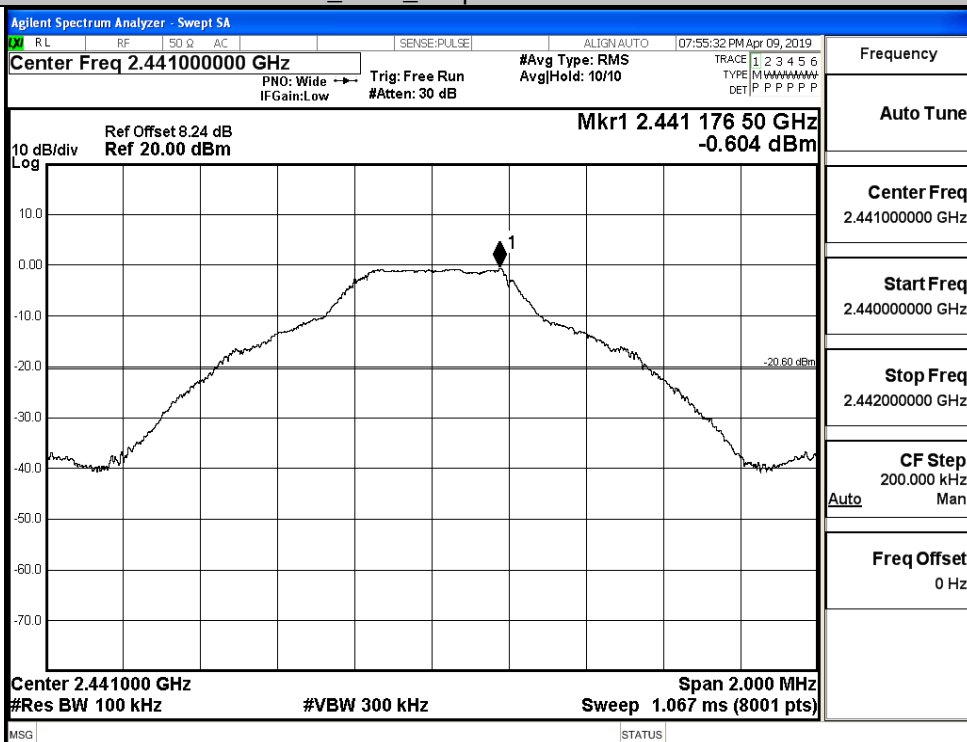


Puw

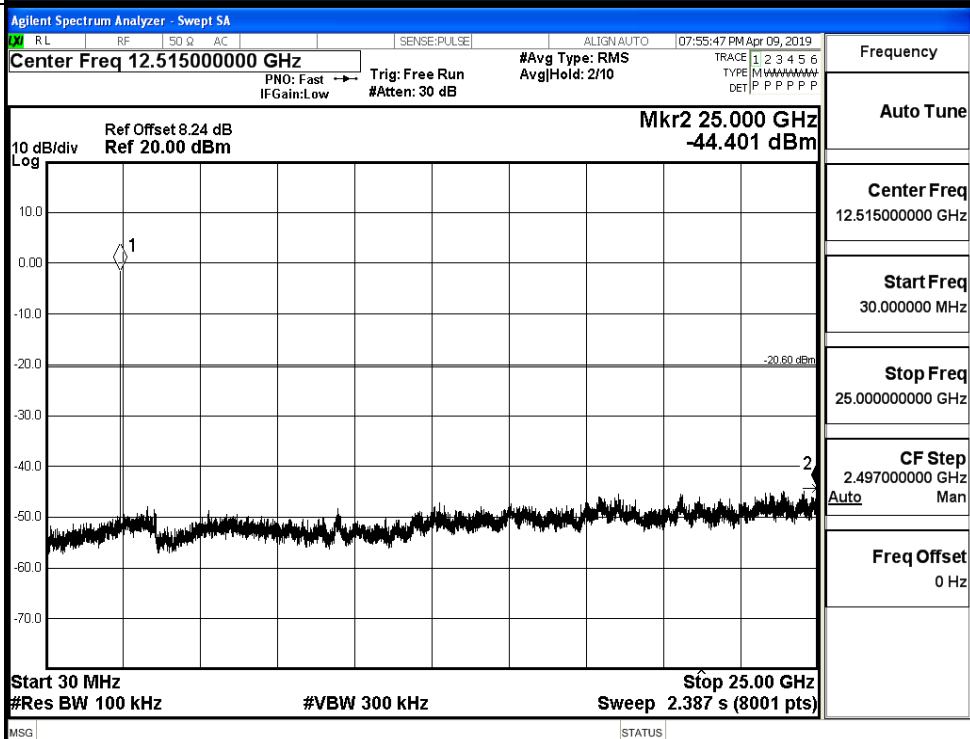


## GFSK\_MCH\_Graphs

Pref

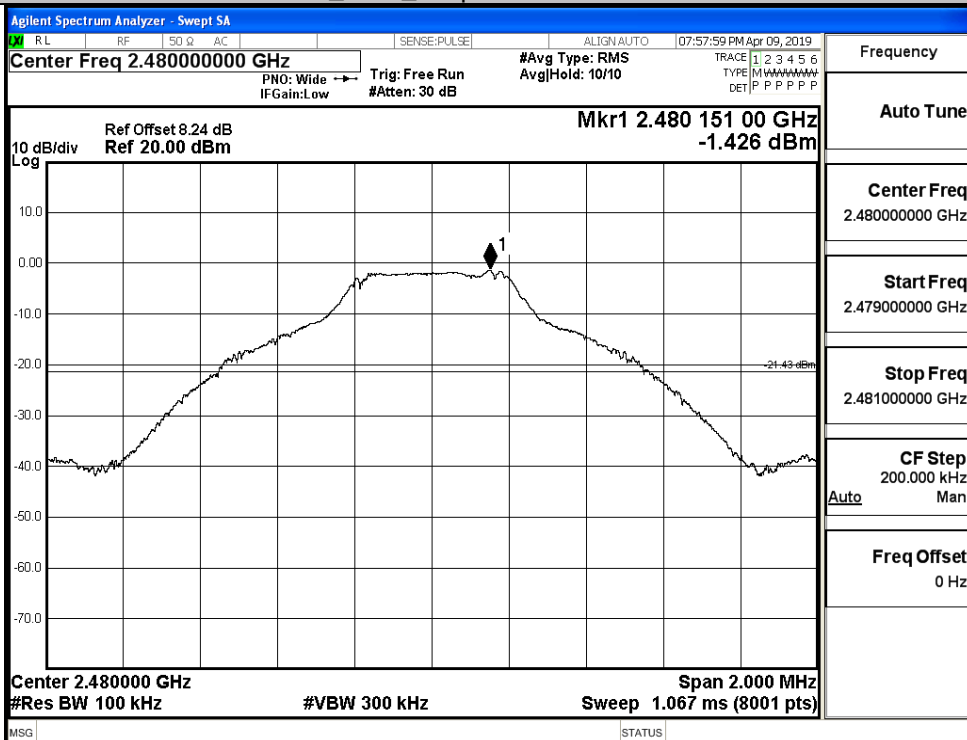


Puw

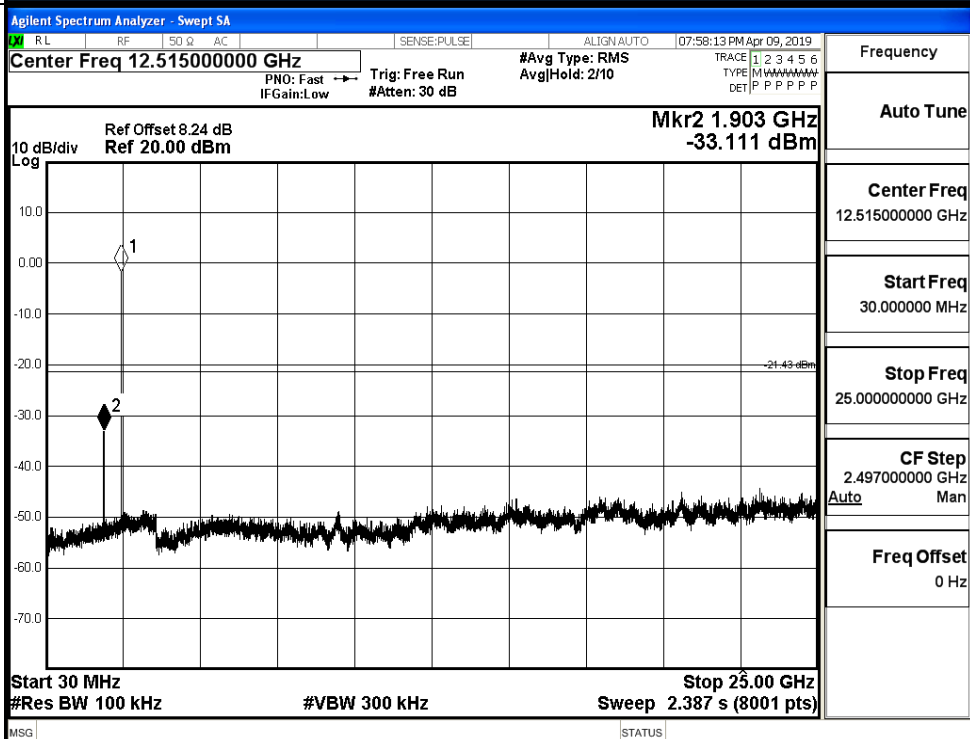


## GFSK\_HCH\_Graphs

Pref

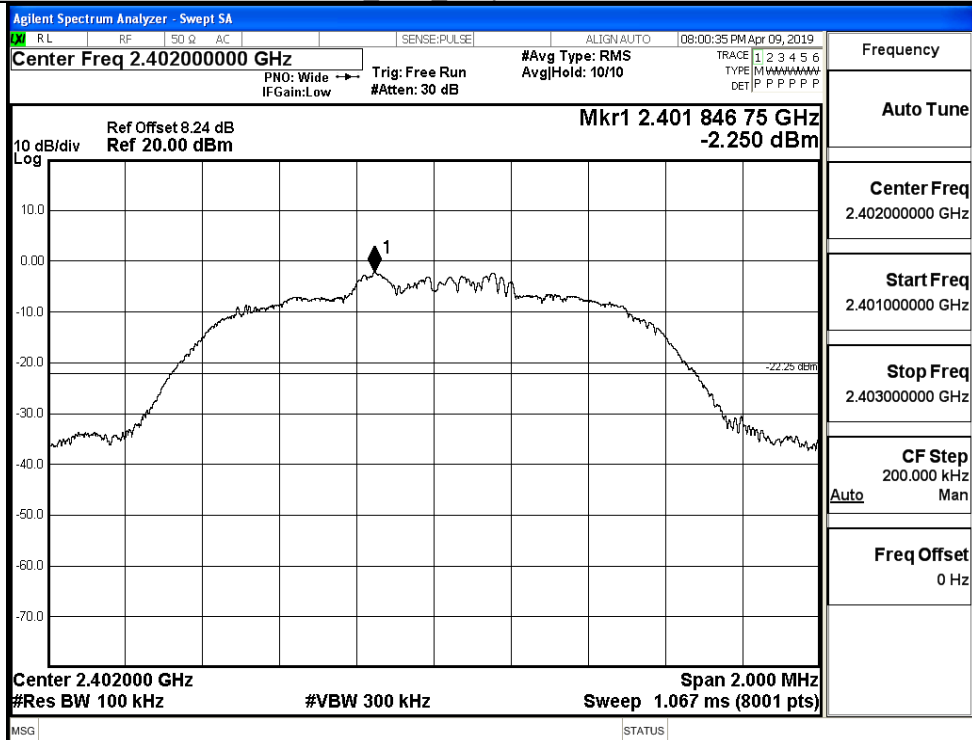


Puw

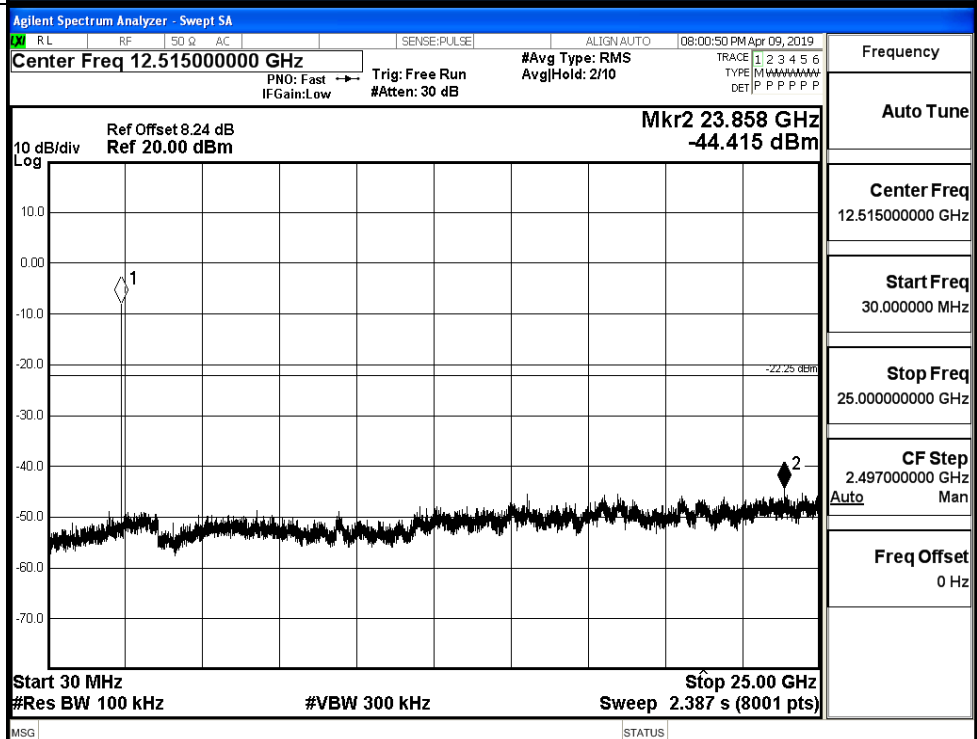


$\pi/4$ DQPSK LCH\_Graphs

Pref

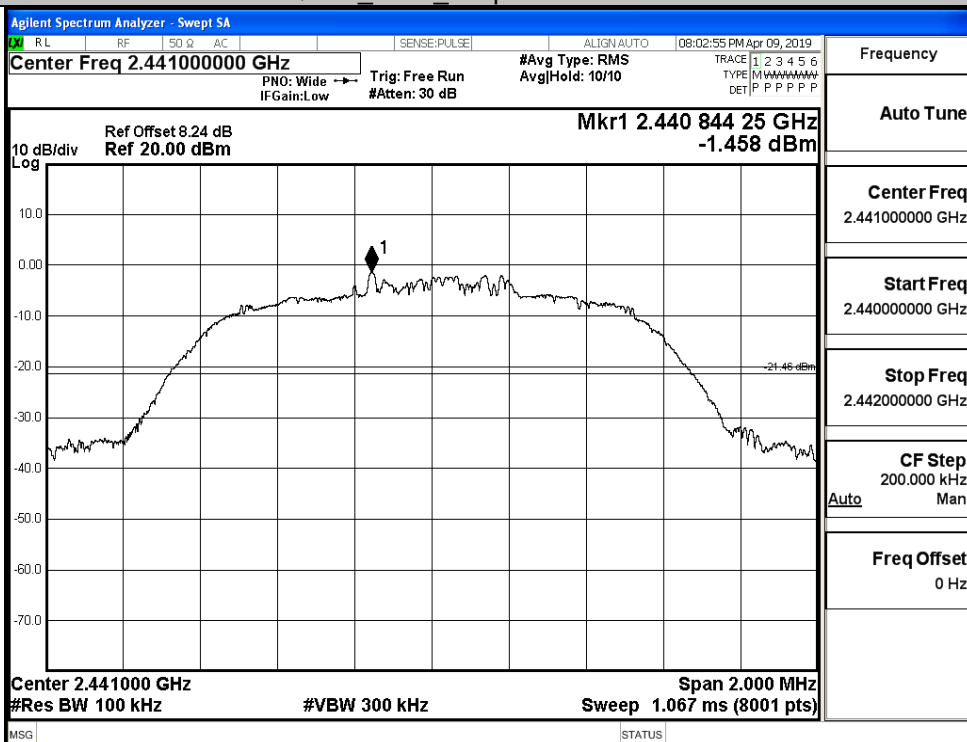


Puw

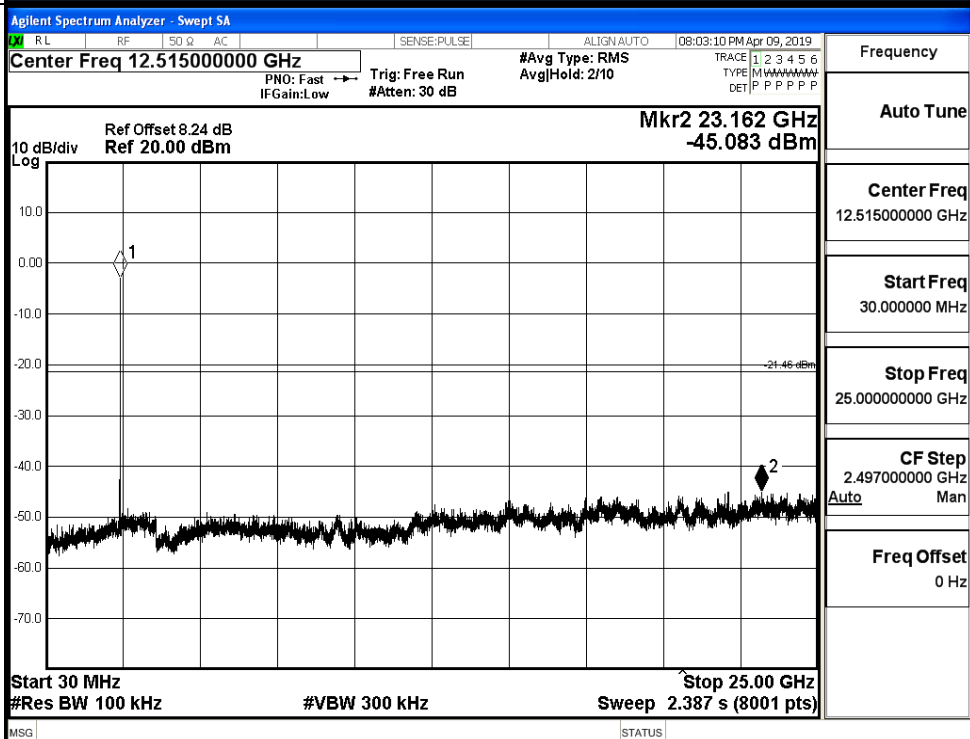


$\pi$ /4DQPSK\_MCH\_Graphs

Pref

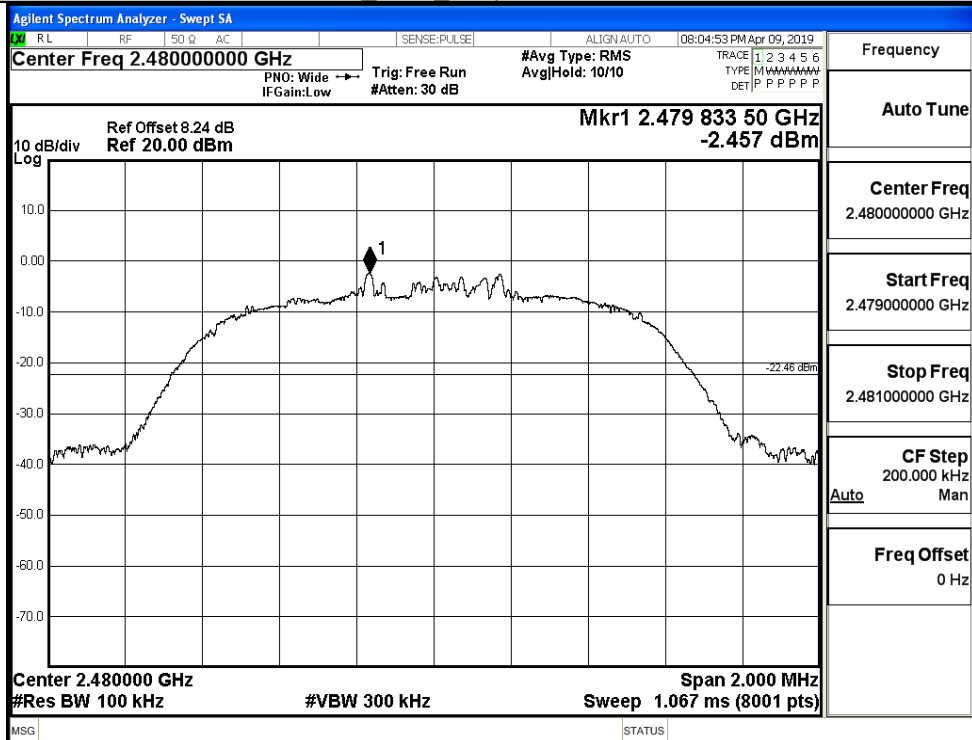


Puw

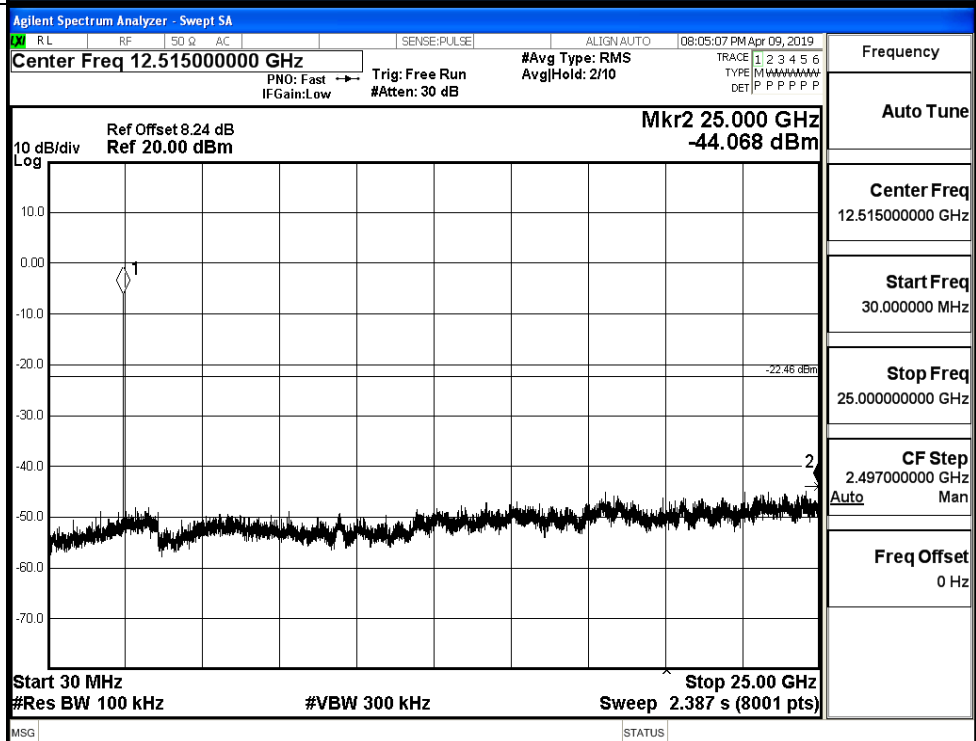


$\pi$ /4DQPSK\_HCH\_Graphs

Pref

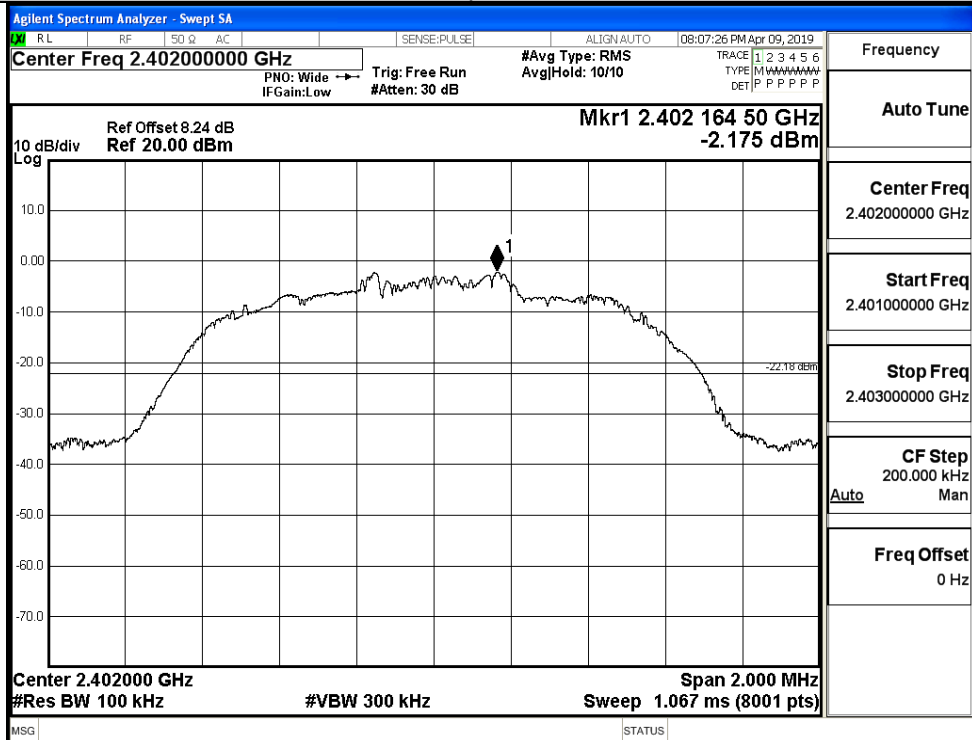


Puw

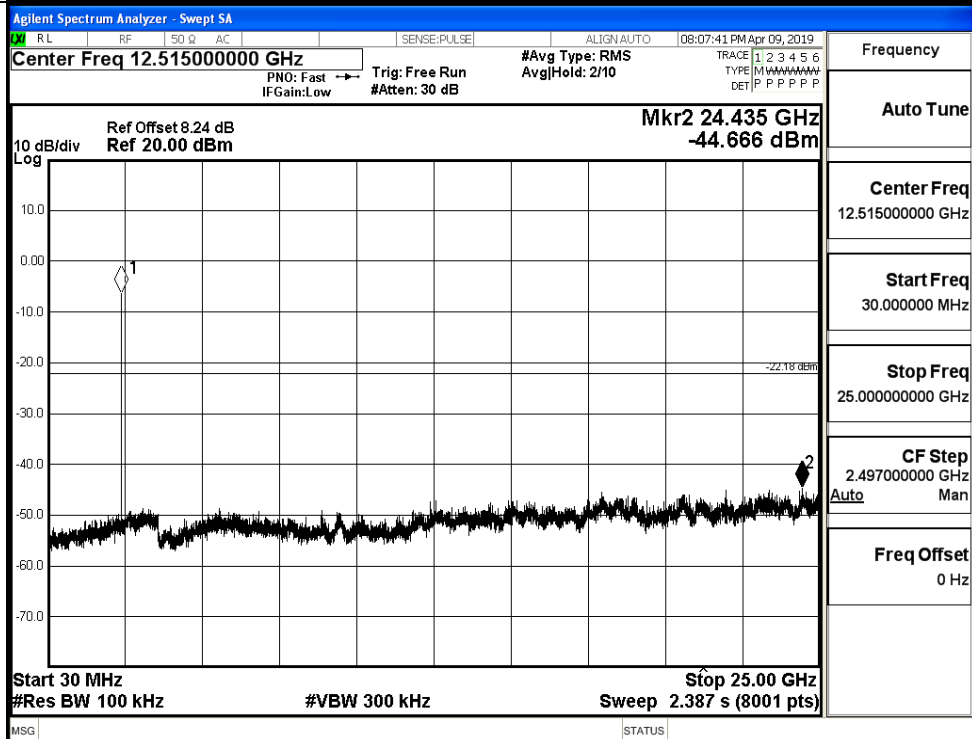


## 8DPSK\_LCH\_Graphs

Pref

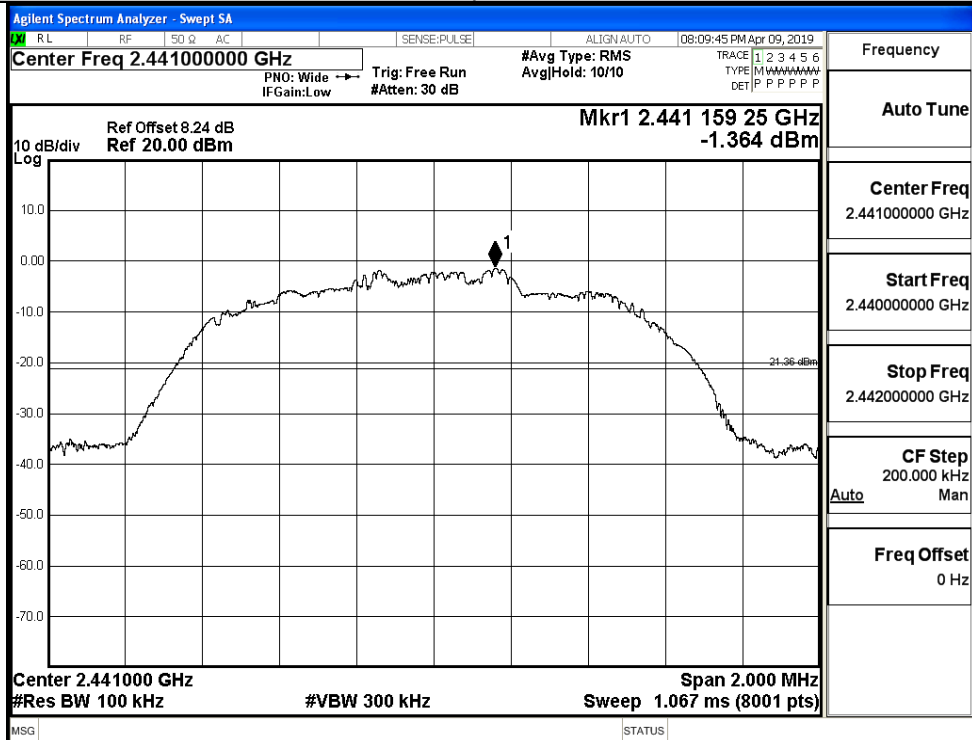


Puw

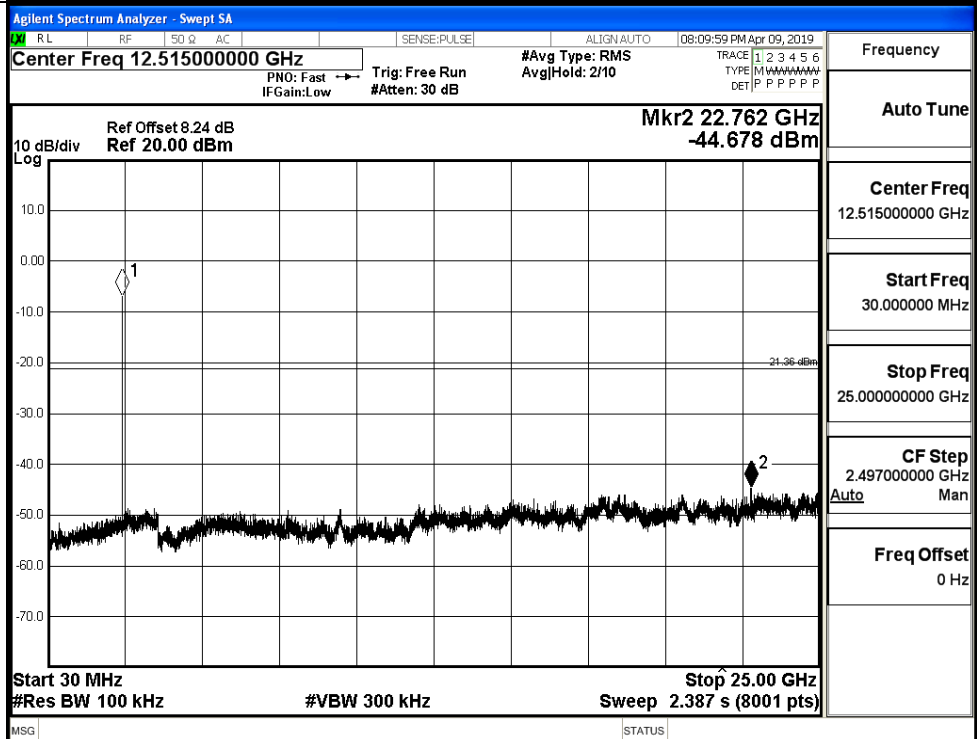


## 8DPSK\_MCH\_Graphs

Pref



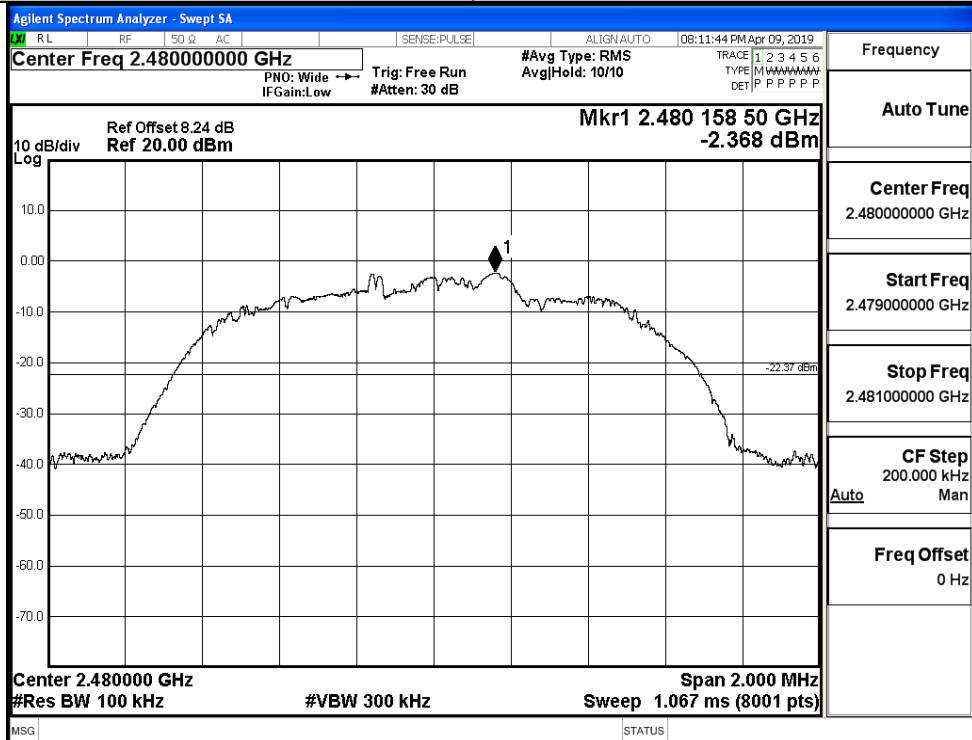
Puw



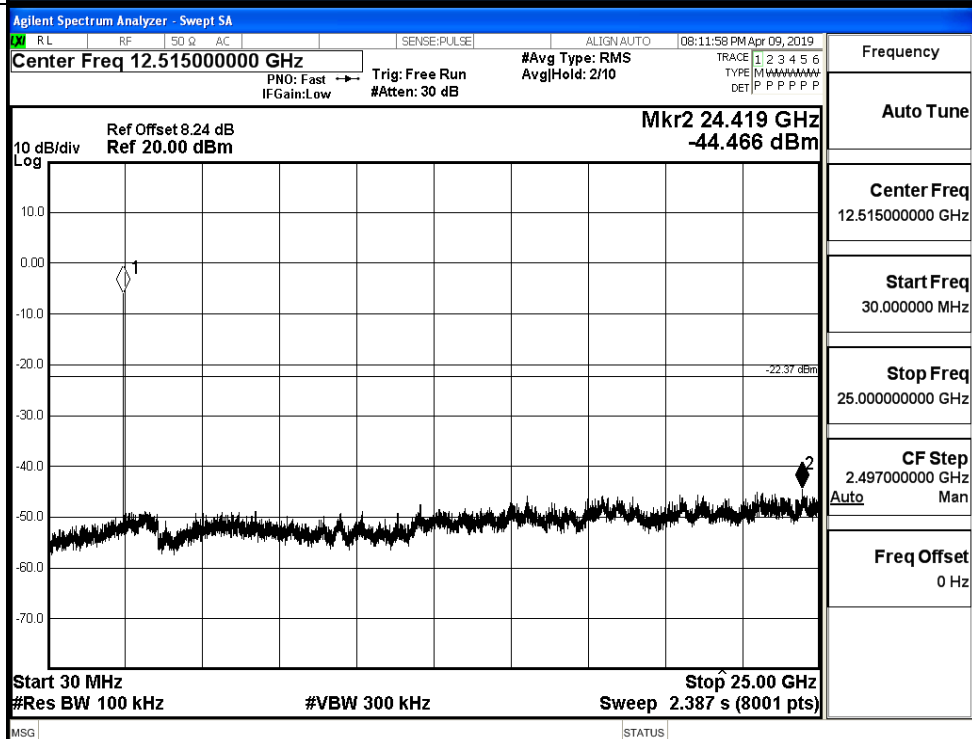


## 8DPSK\_HCH\_Graphs

Pref



Puw

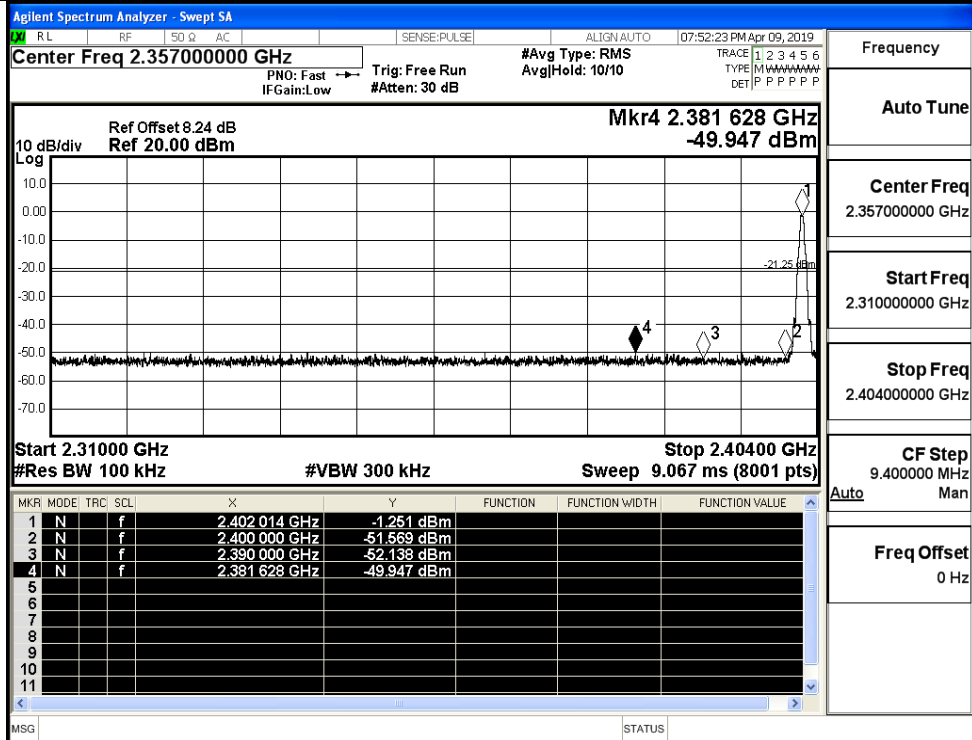


## A.7 Band-edge for RF Conducted Emissions

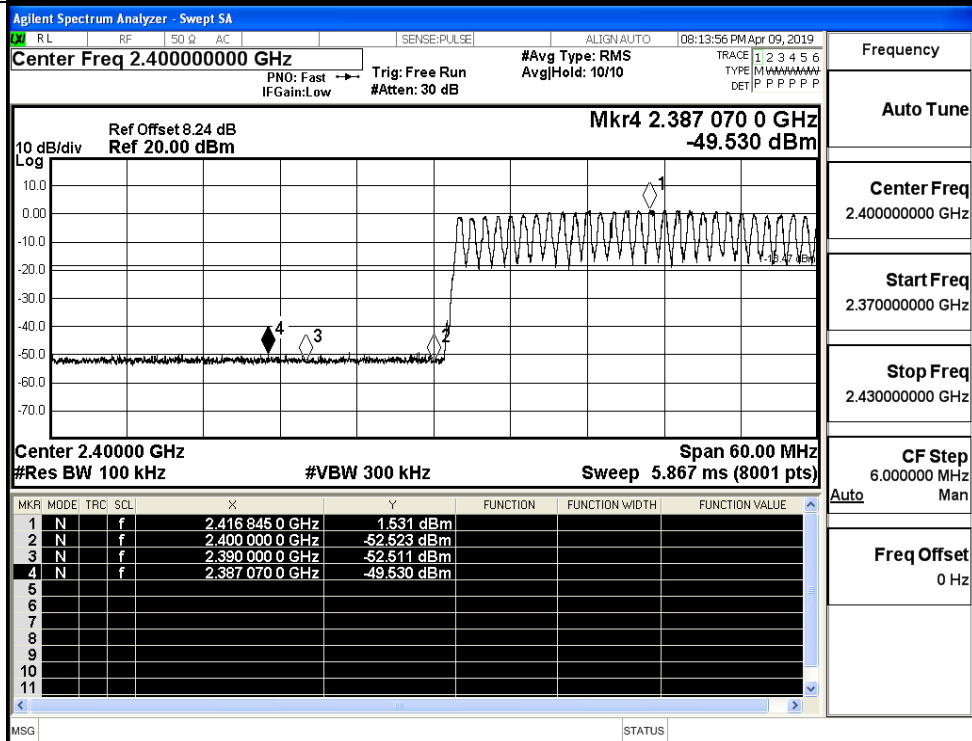
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-1.251	Off	-49.947	-21.25	PASS
			1.531	On	-49.530	-18.47	PASS
	HCH	2480	-1.387	Off	-49.968	-21.39	PASS
			1.381	On	-48.771	-18.62	PASS
$\pi/4$ DQPSK	LCH	2402	-4.186	Off	-49.904	-24.19	PASS
			-0.164	On	-48.895	-20.16	PASS
	HCH	2480	-2.405	Off	-49.321	-22.41	PASS
			-0.256	On	-49.199	-20.26	PASS
8DPSK	LCH	2402	-2.979	Off	-49.190	-22.98	PASS
			-0.095	On	-49.417	-20.1	PASS
	HCH	2480	-2.324	Off	-50.063	-22.32	PASS
			0.012	On	-49.193	-19.99	PASS

## Test Graphs

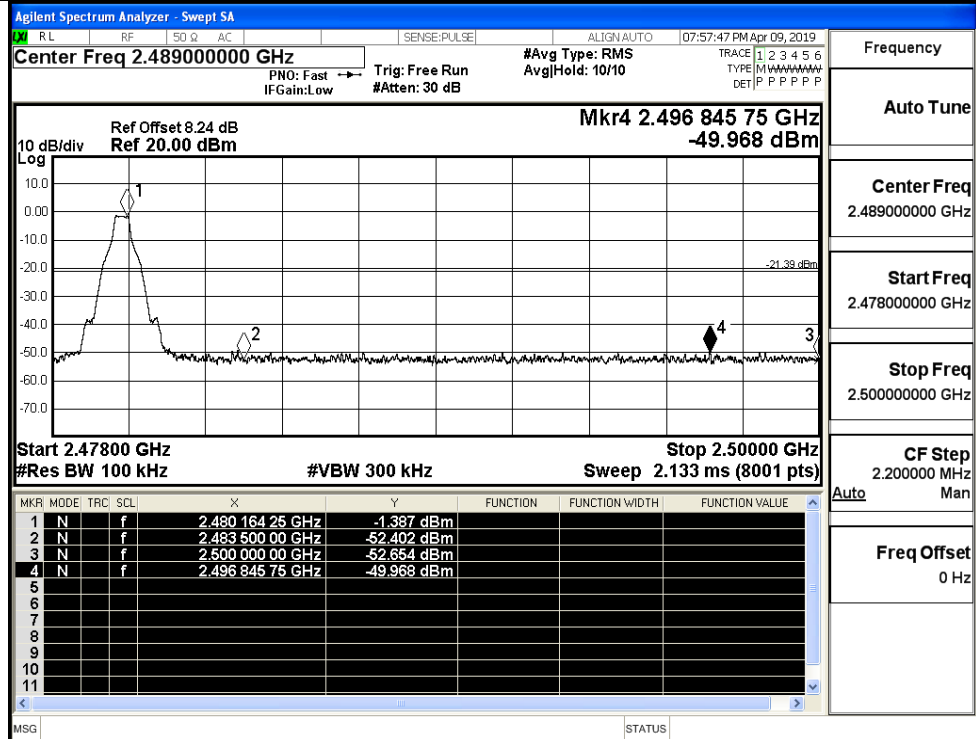
GFSK/LCH/No Hop



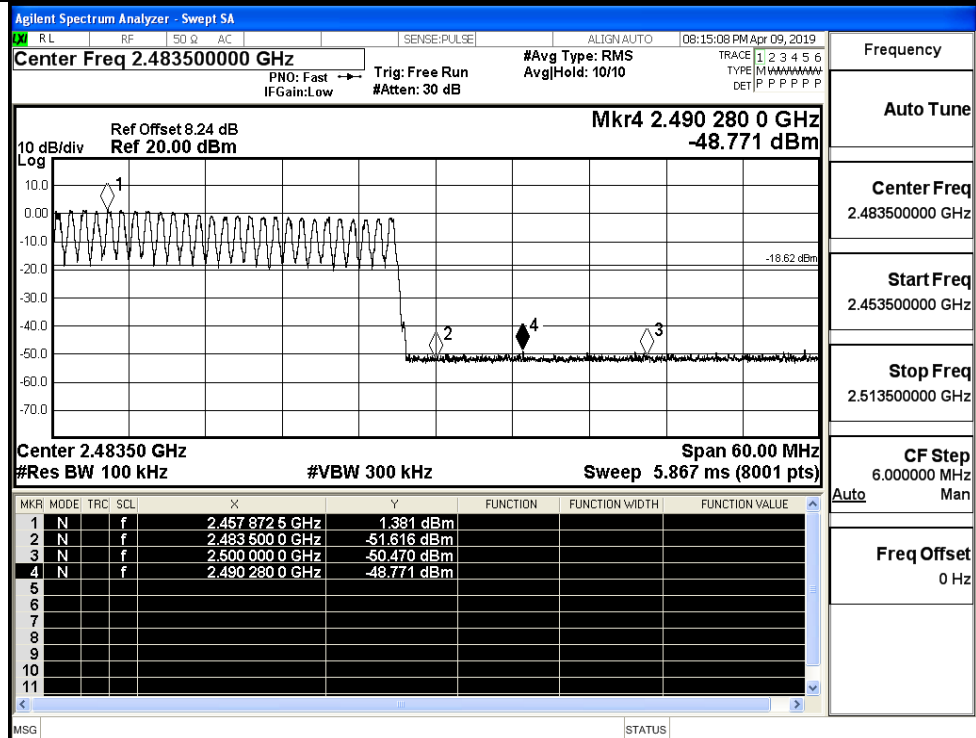
GFSK/LCH/Hop



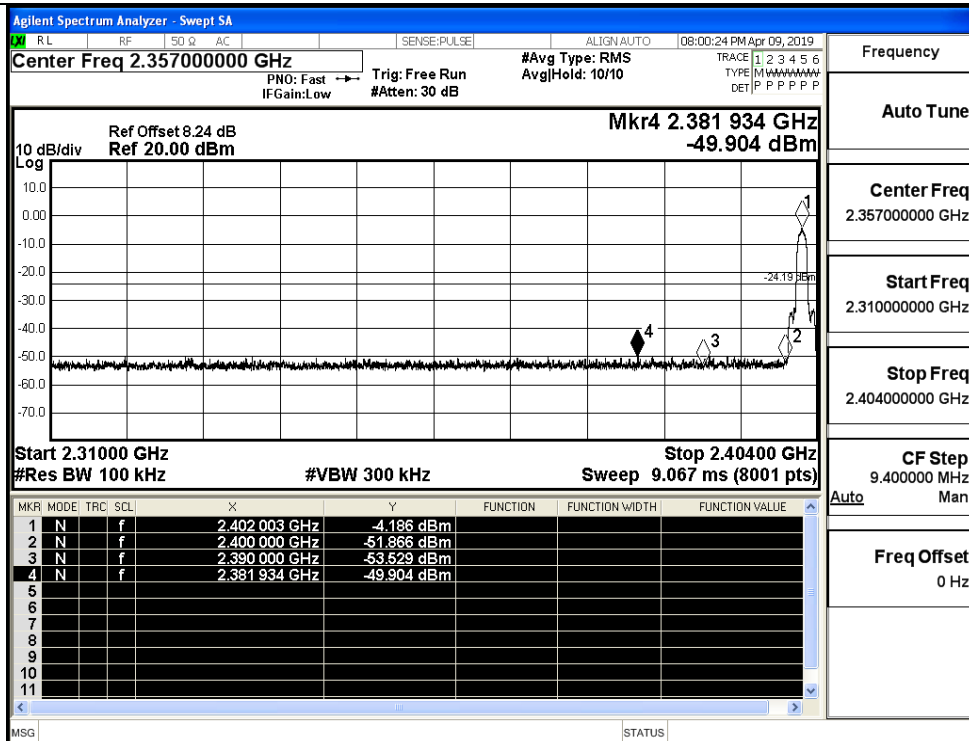
GFSK/HCH/No Hop



GFSK/HCH/Hop



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



Frequency

Auto Tune

Center Freq  
2.357000000 GHz

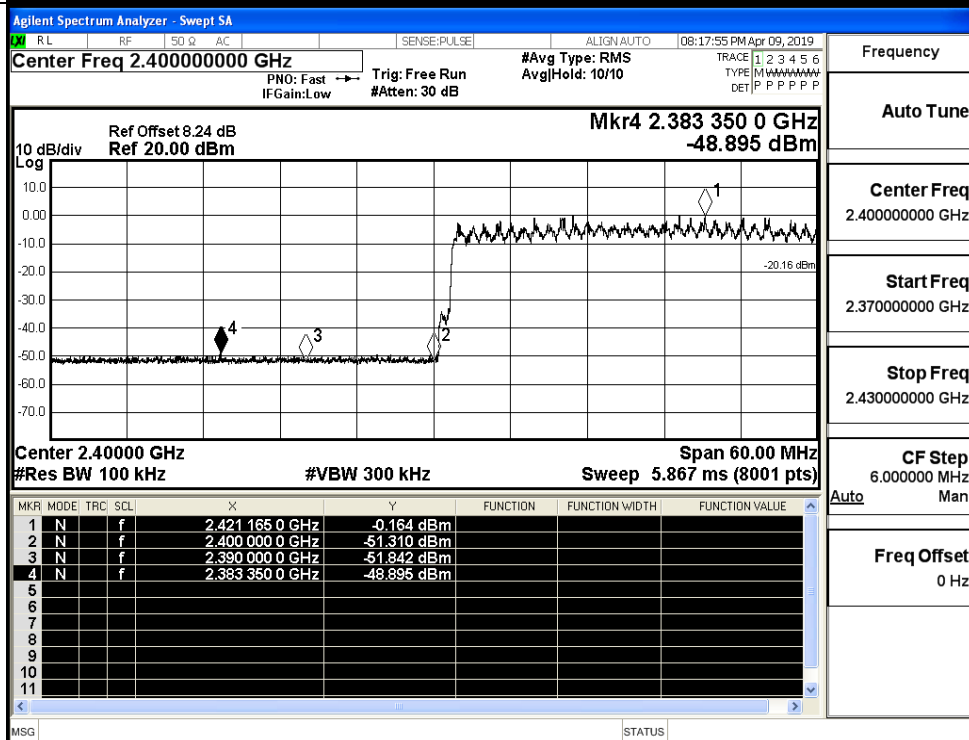
Start Freq  
2.310000000 GHz

Stop Freq  
2.404000000 GHz

CF Step  
9.400000 MHz  
Auto Man

Freq Offset  
0 Hz

$\pi/4$ DQPSK/LCH/Hop



Frequency

Auto Tune

Center Freq  
2.400000000 GHz

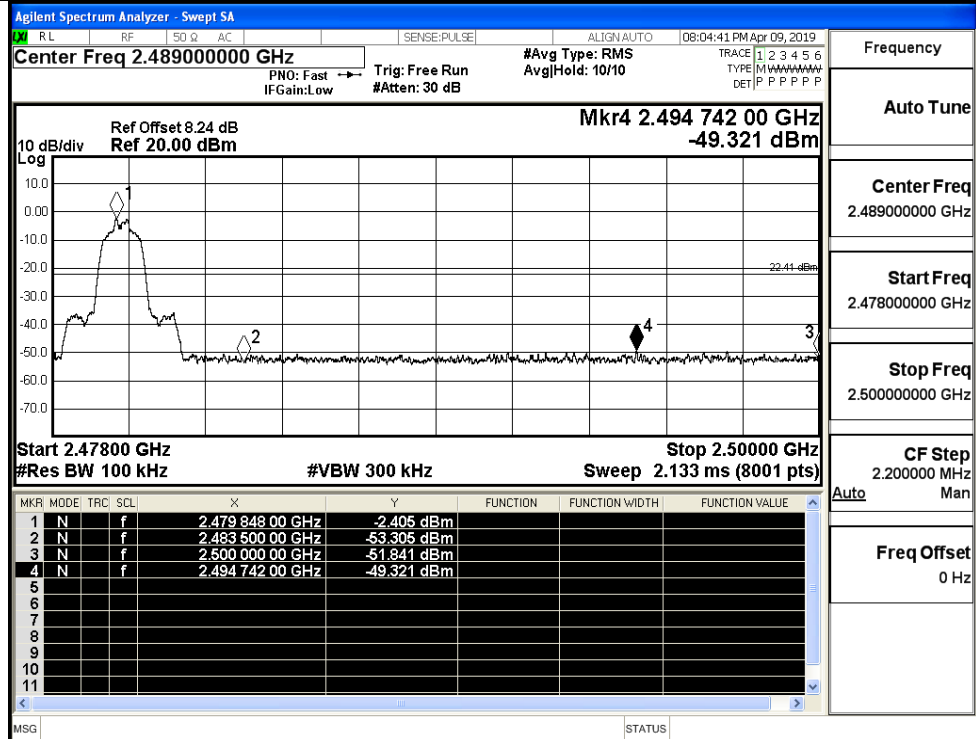
Start Freq  
2.370000000 GHz

Stop Freq  
2.430000000 GHz

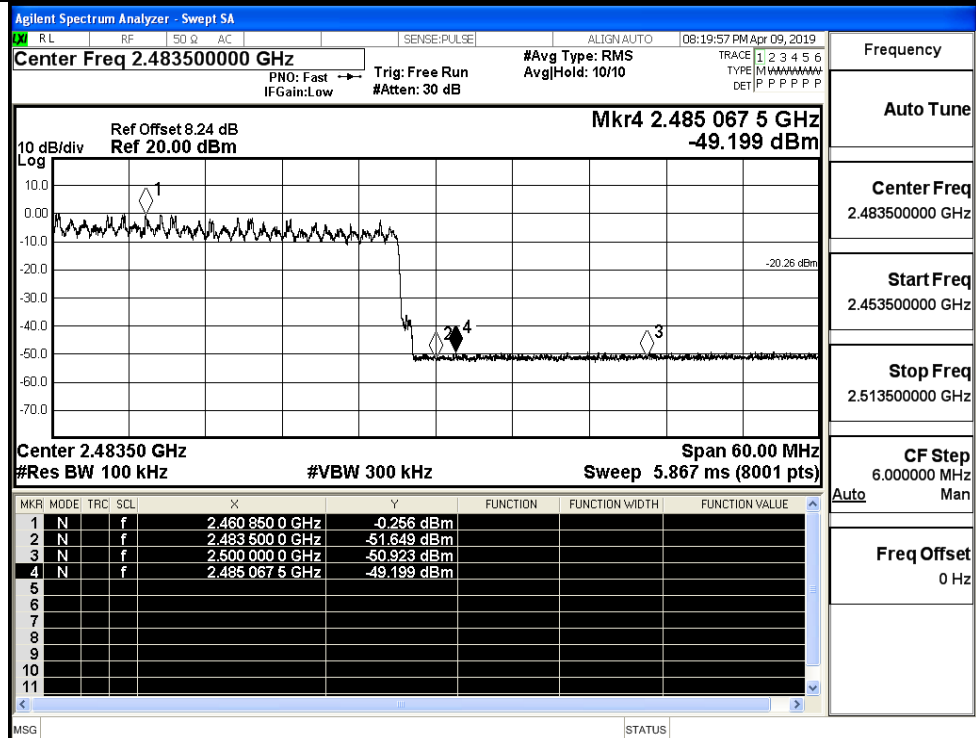
CF Step  
6.000000 MHz  
Auto Man

Freq Offset  
0 Hz

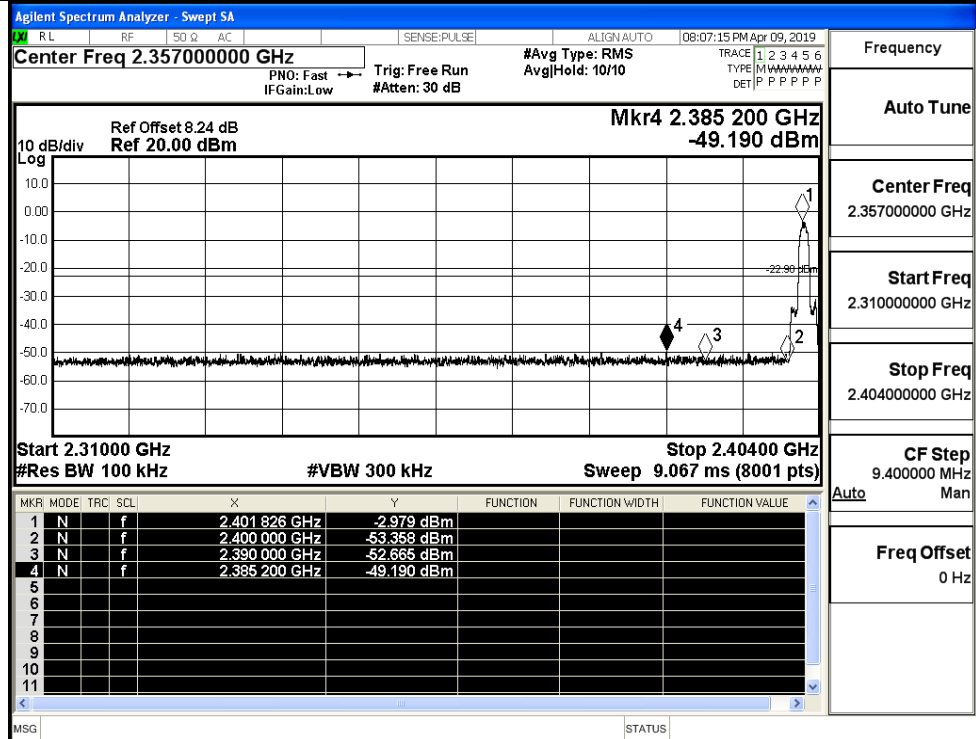
$\pi/4$ DQPSK/HCH/No  
Hop



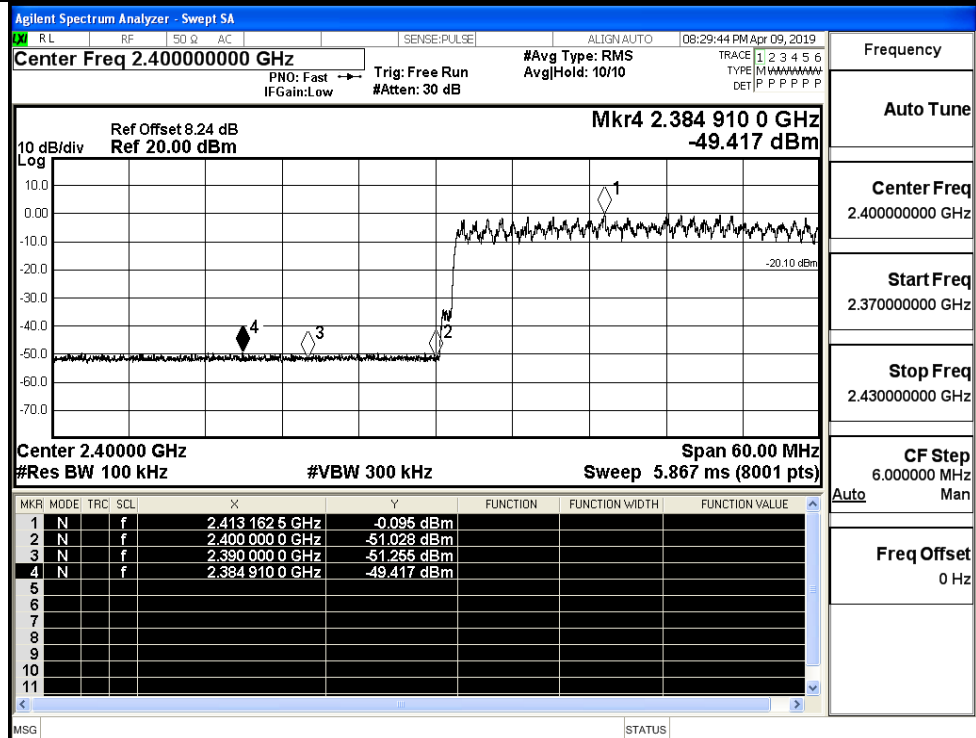
$\pi/4$ DQPSK/HCH/Hop



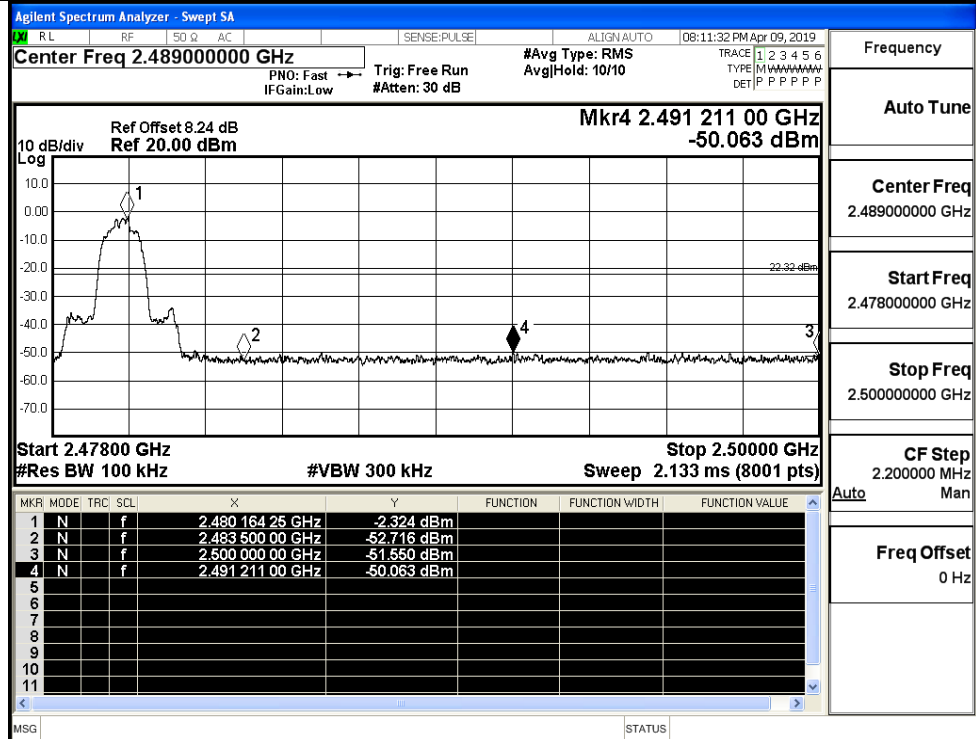
8DPSK/LCH/No Hop



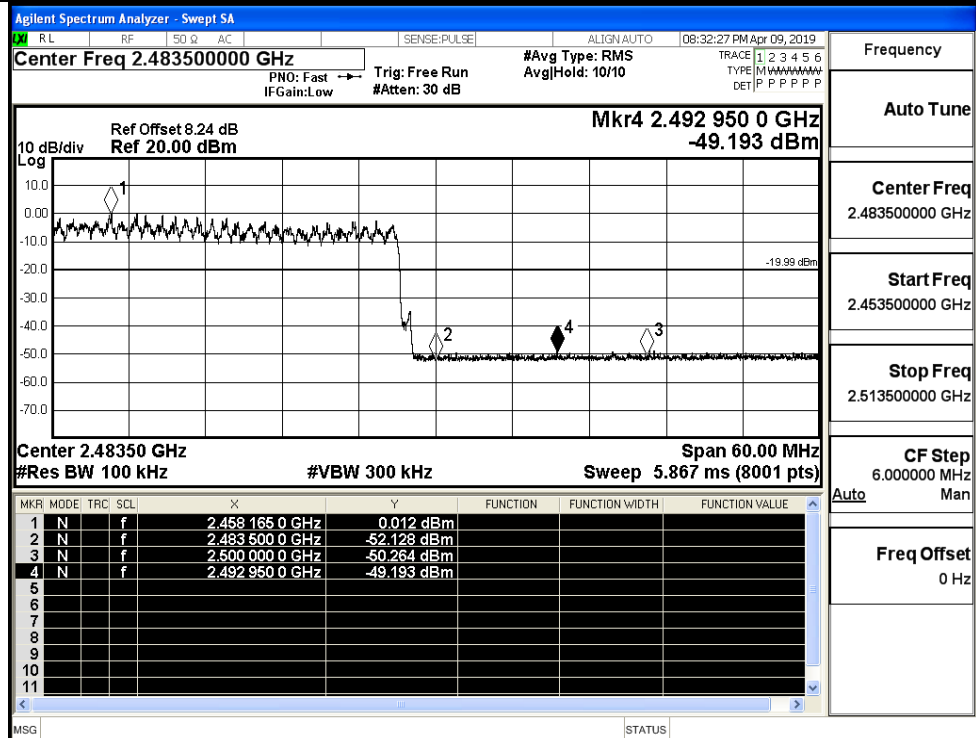
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



8DPSK/HCH/Hop

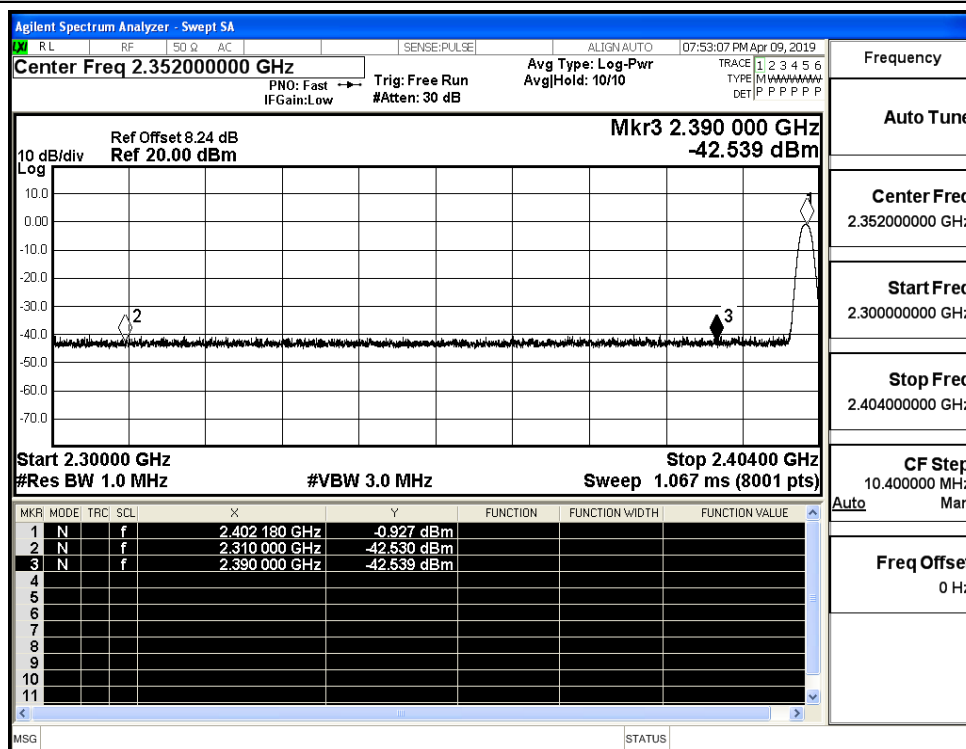




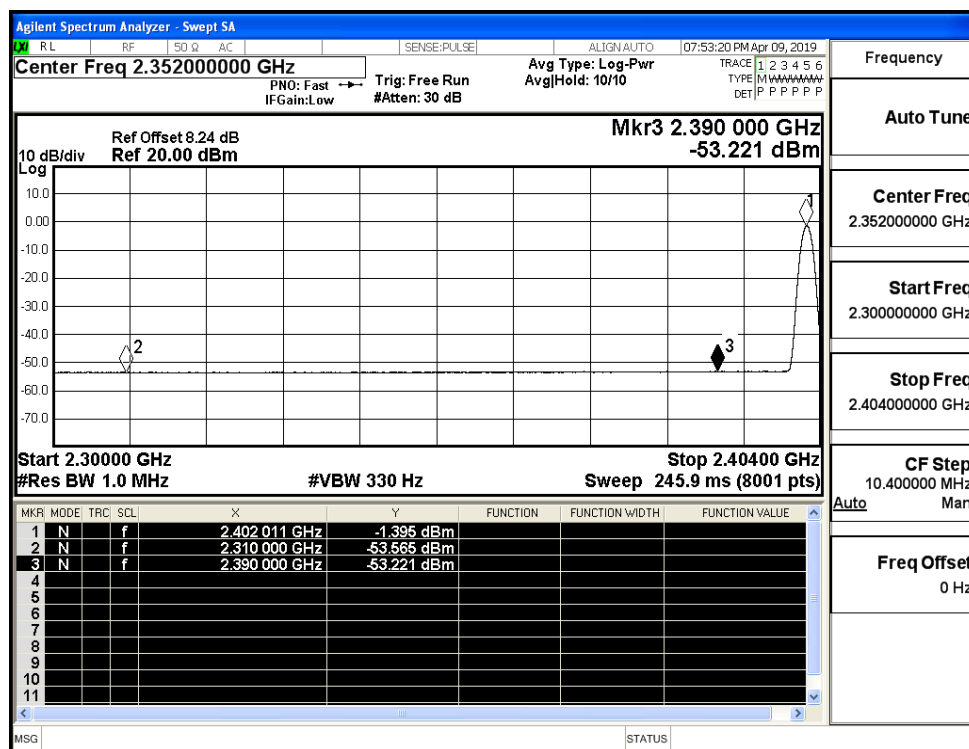
## A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-42.53	2.0	0	54.73	PEAK	74	PASS
	Off	2310.0	-53.57	2.0	0	43.69	AV	54	PASS
	Off	2390.0	-42.54	2.0	0	54.72	PEAK	74	PASS
	Off	2390.0	-53.22	2.0	0	44.04	AV	54	PASS
	Off	2483.5	-42.07	2.0	0	55.19	PEAK	74	PASS
	Off	2483.5	-52.96	2.0	0	44.30	AV	54	PASS
	Off	2500.0	-42.06	2.0	0	55.20	PEAK	74	PASS
	Off	2500.0	-52.80	2.0	0	44.46	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-42.46	2.0	0	54.80	PEAK	74	PASS
	Off	2310.0	-53.38	2.0	0	43.88	AV	54	PASS
	Off	2390.0	-42.94	2.0	0	54.31	PEAK	74	PASS
	Off	2390.0	-53.28	2.0	0	43.97	AV	54	PASS
	Off	2483.5	-42.40	2.0	0	54.86	PEAK	74	PASS
	Off	2483.5	-52.94	2.0	0	44.32	AV	54	PASS
	Off	2500.0	-42.35	2.0	0	54.91	PEAK	74	PASS
	Off	2500.0	-52.84	2.0	0	44.42	AV	54	PASS
8DPSK	Off	2310.0	-42.51	2.0	0	54.75	PEAK	74	PASS
	Off	2310.0	-53.41	2.0	0	43.85	AV	54	PASS
	Off	2390.0	-41.91	2.0	0	55.35	PEAK	74	PASS
	Off	2390.0	-53.29	2.0	0	43.97	AV	54	PASS
	Off	2483.5	-42.70	2.0	0	54.56	PEAK	74	PASS
	Off	2483.5	-52.99	2.0	0	44.27	AV	54	PASS
	Off	2500.0	-42.40	2.0	0	54.86	PEAK	74	PASS
	Off	2500.0	-52.82	2.0	0	44.44	AV	54	PASS

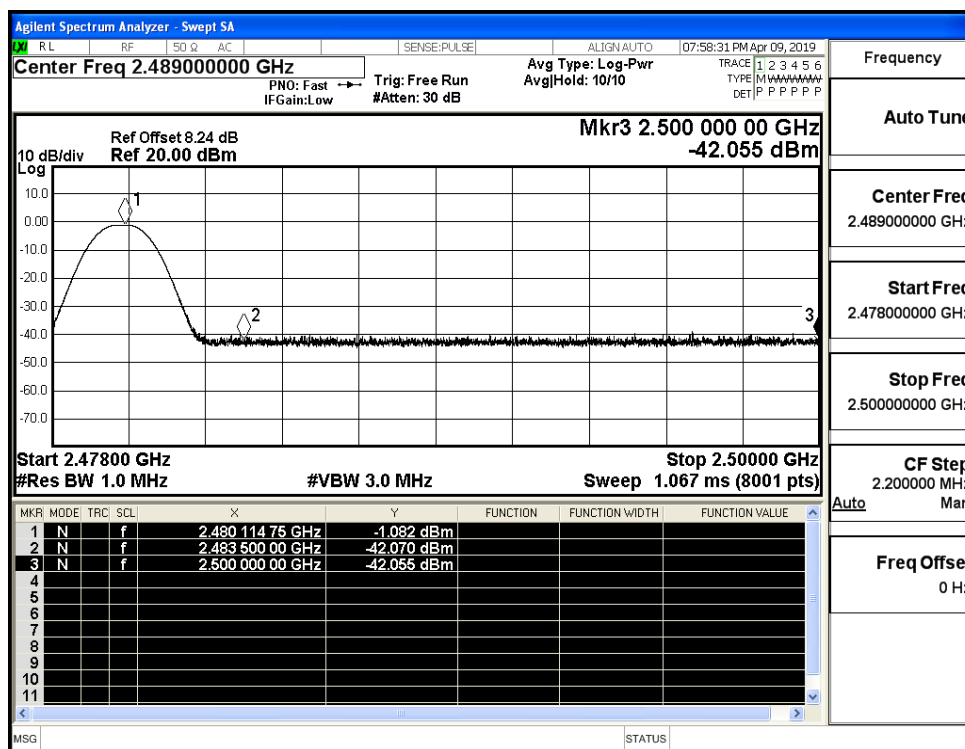
## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (Low Channel)



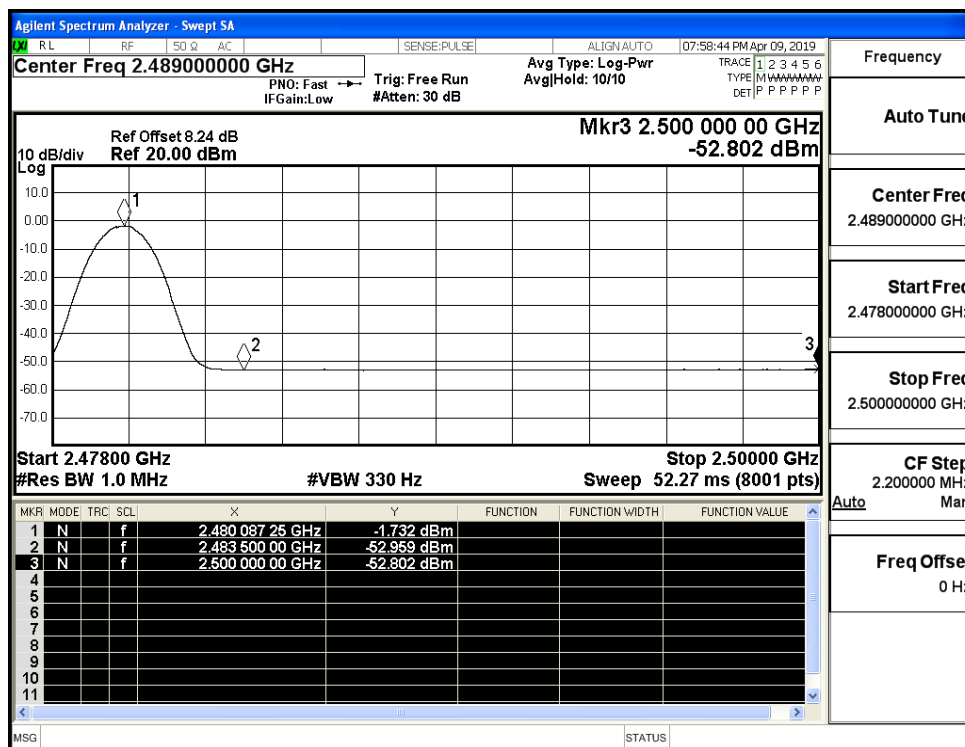
## Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (Low Channel)

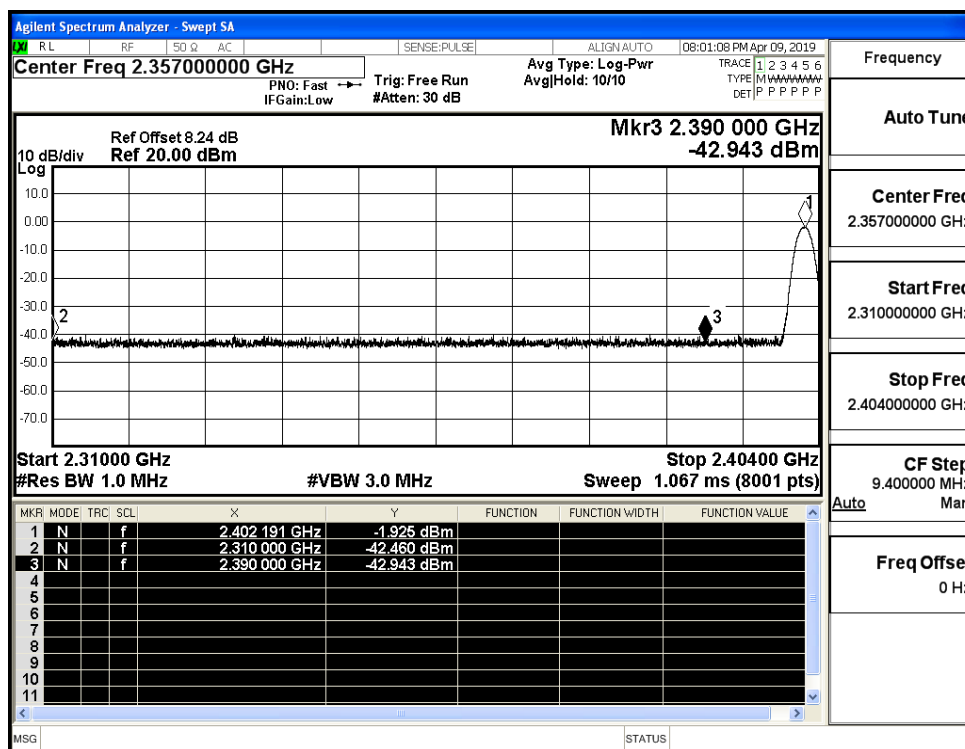
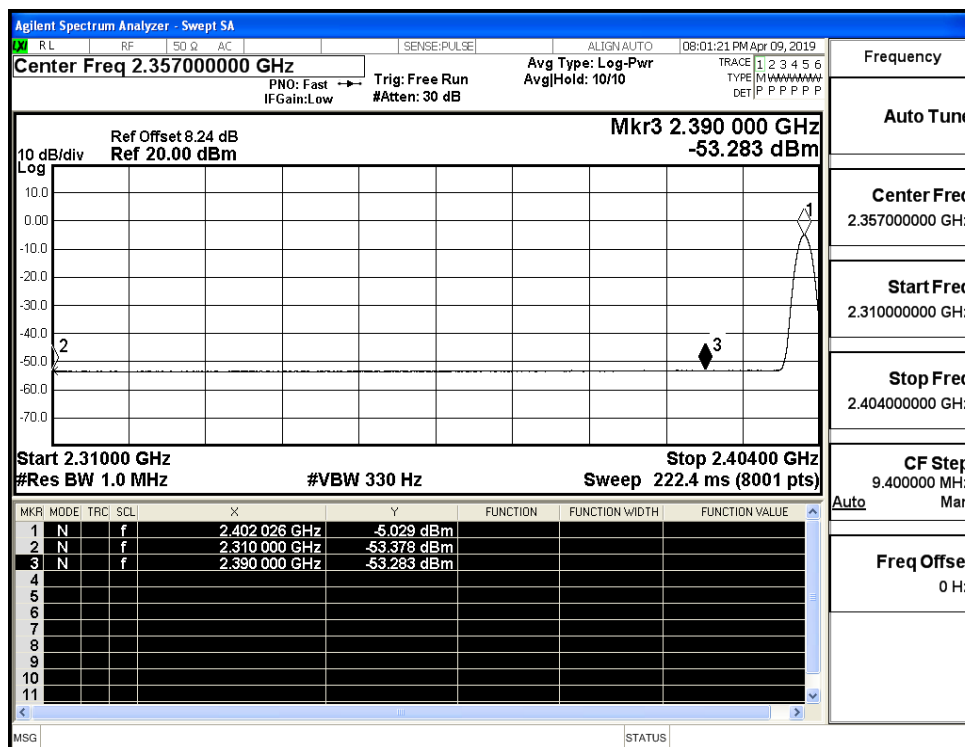


## Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_PEAK (High Channel)

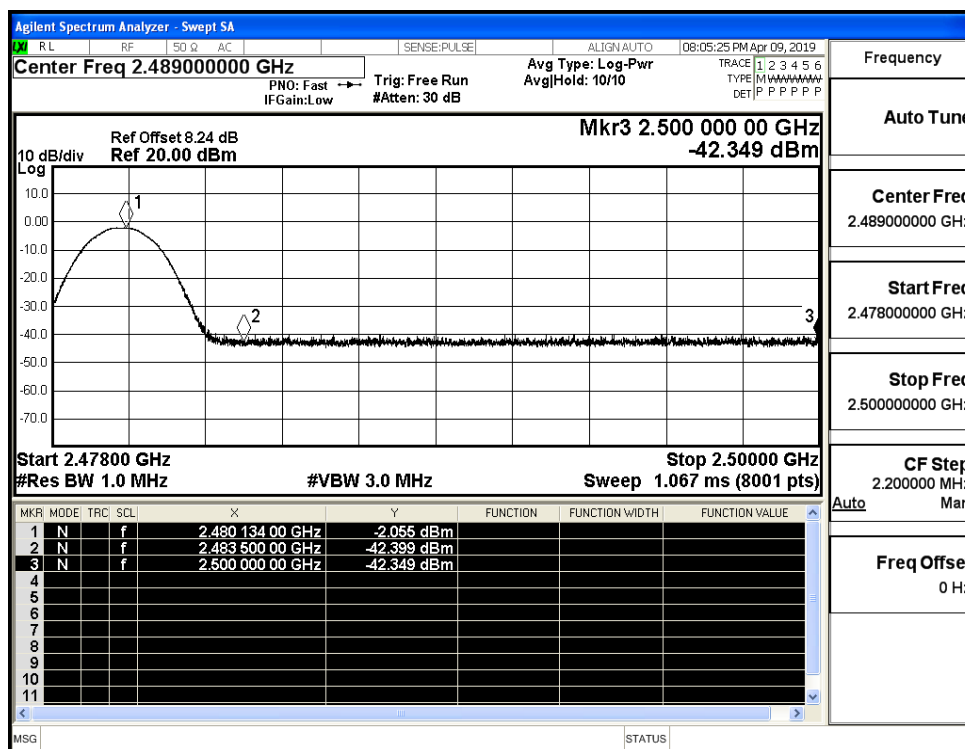


## Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_Average (High Channel)

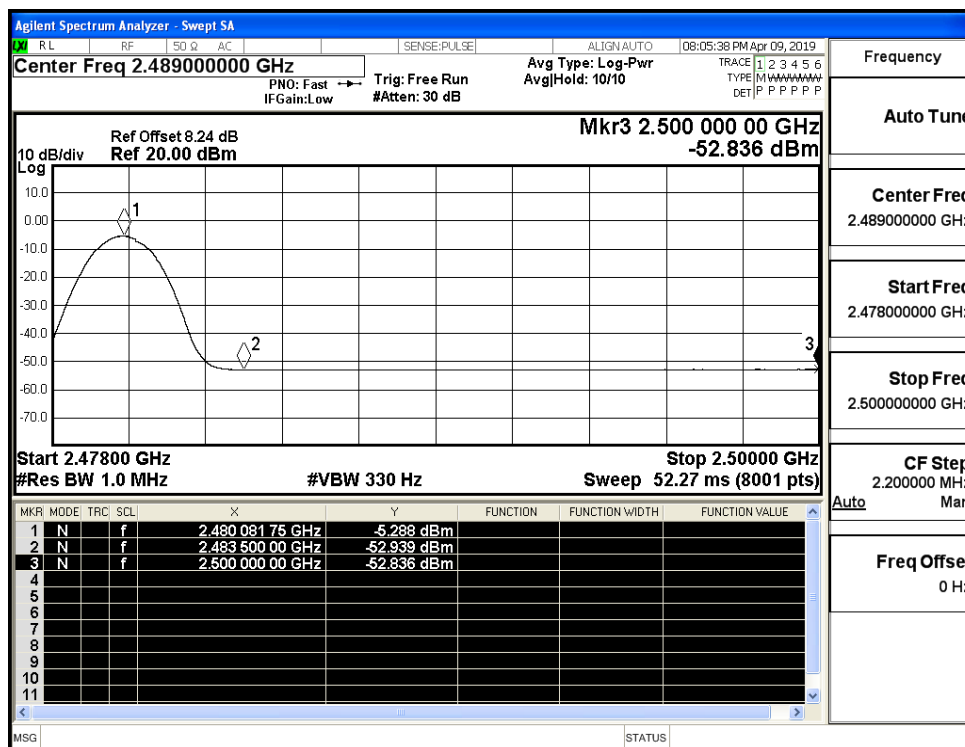


Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_PEAK (Low Channel)Restrict-band band-edge measurements\_Hopping Off  $\pi/4$ -DQPSK\_Average (Low Channel)

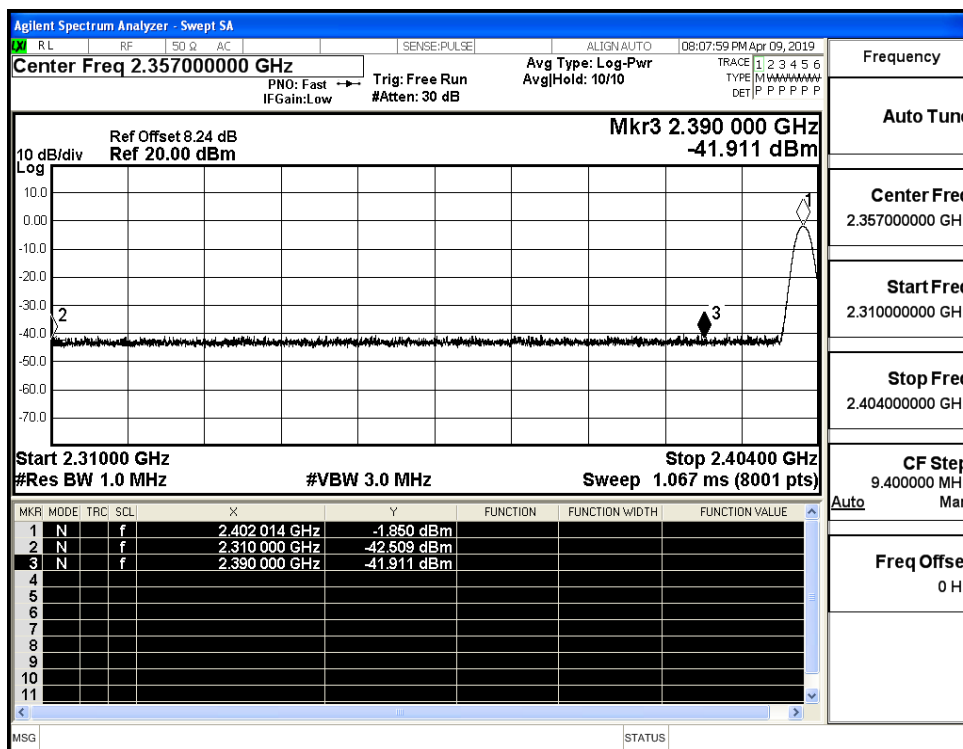
## Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_PEAK (High Channel)



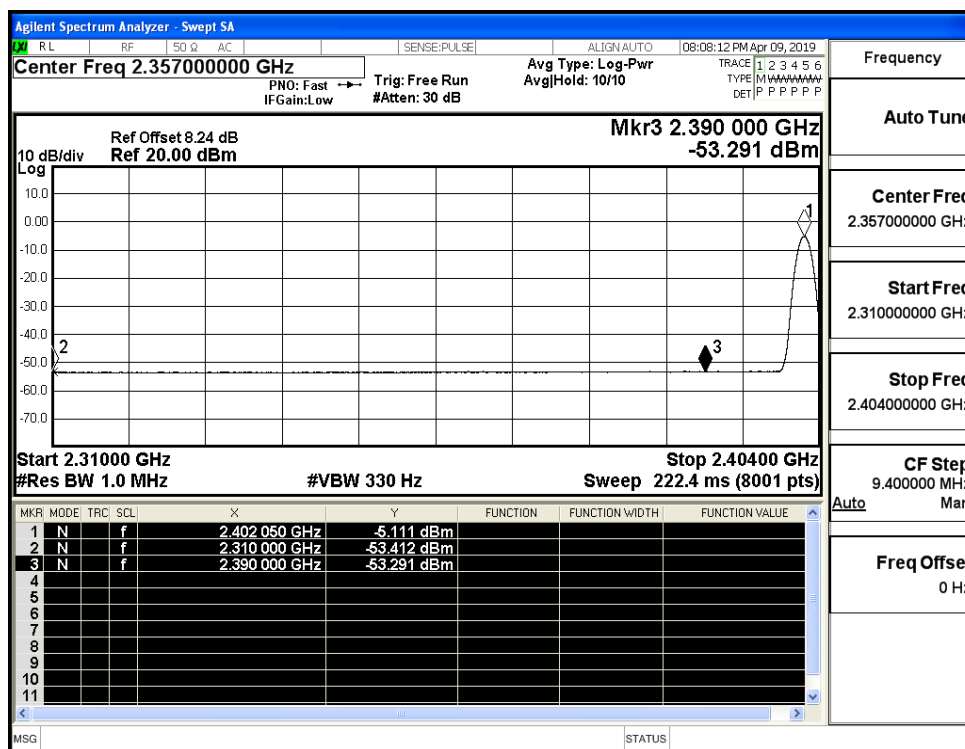
## Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_Average (High Channel)



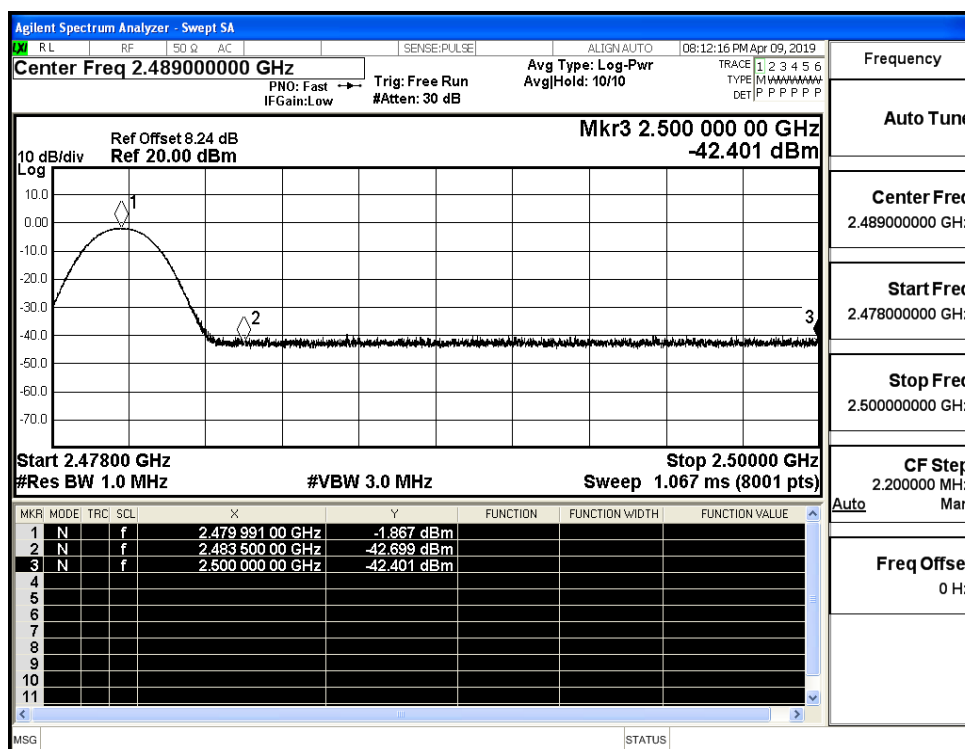
## Restrict-band band-edge measurements\_Hopping Off\_8DPSK\_PEAK (Low Channel)



## 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)

