

Appendix A
RF Test Data for BT V5.0(DSS) (Conducted Measurement)
Product Name: Bluetooth Speaker
Trade Mark: Origaudio
Test Model: CHYRP

Environmental Conditions

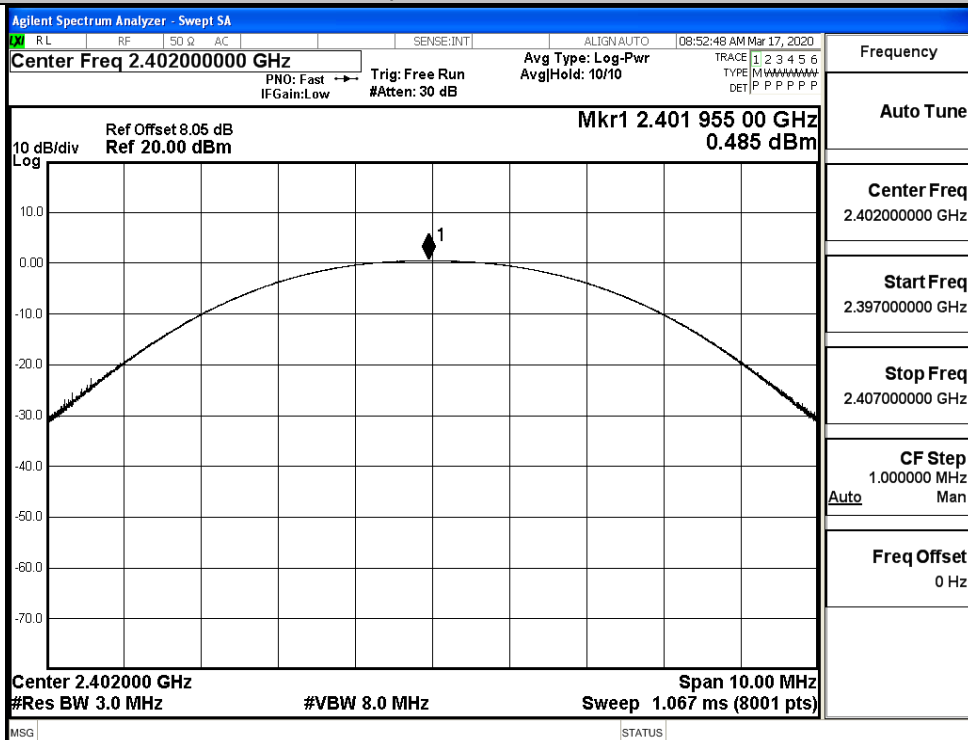
Temperature:	23.3 ° C
Relative Humidity:	53.8%
ATM Pressure:	100.0 kPa
Test Engineer:	Qu Xin
Supervised by:	Wang Chuang

A.1 Maxmum Conducted Peak Output Power

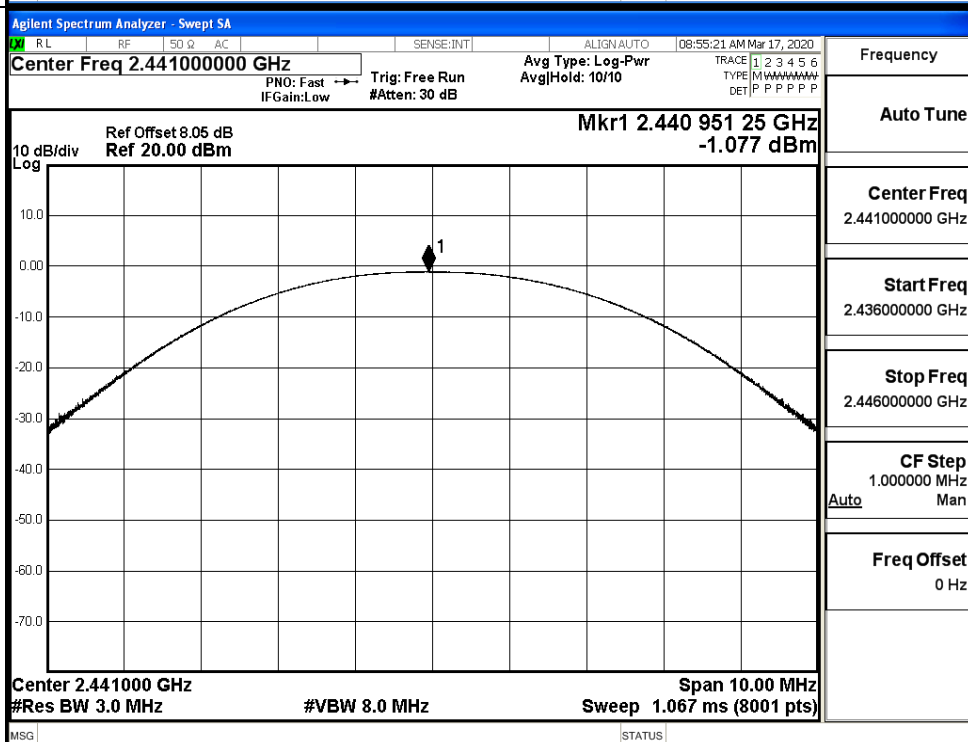
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.485	30	PASS
	MCH	-1.077	30	PASS
	HCH	-2.745	30	PASS
$\pi/4$ DQPSK	LCH	2.663	21	PASS
	MCH	1.064	21	PASS
	HCH	-0.285	21	PASS
8DPSK	LCH	0.509	21	PASS
	MCH	-0.966	21	PASS
	HCH	-2.788	21	PASS

Test Graphs

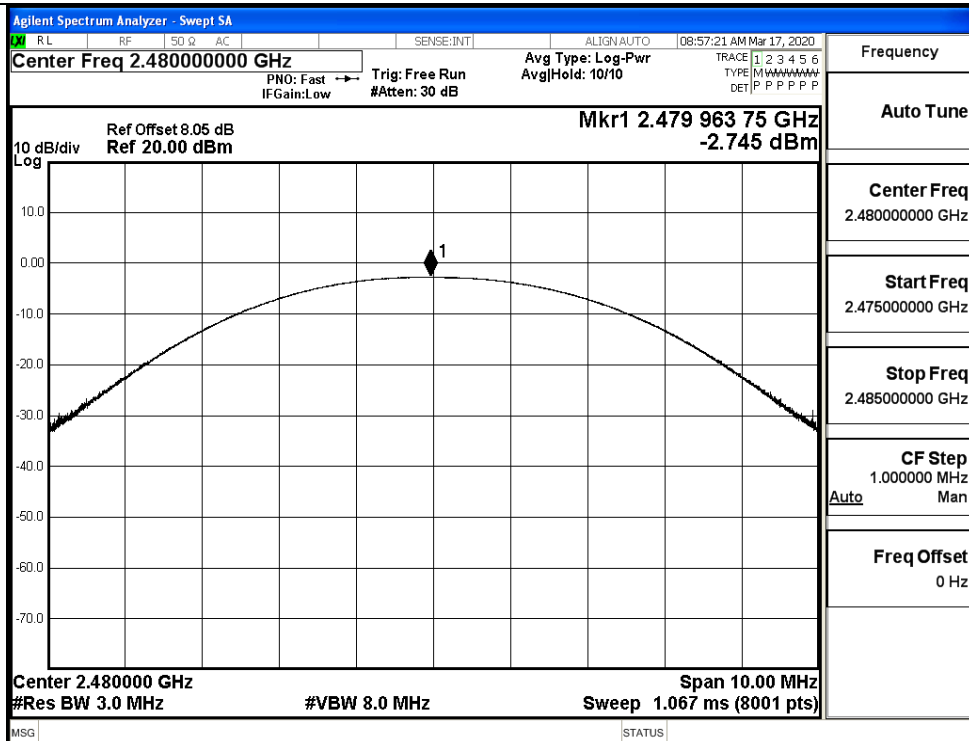
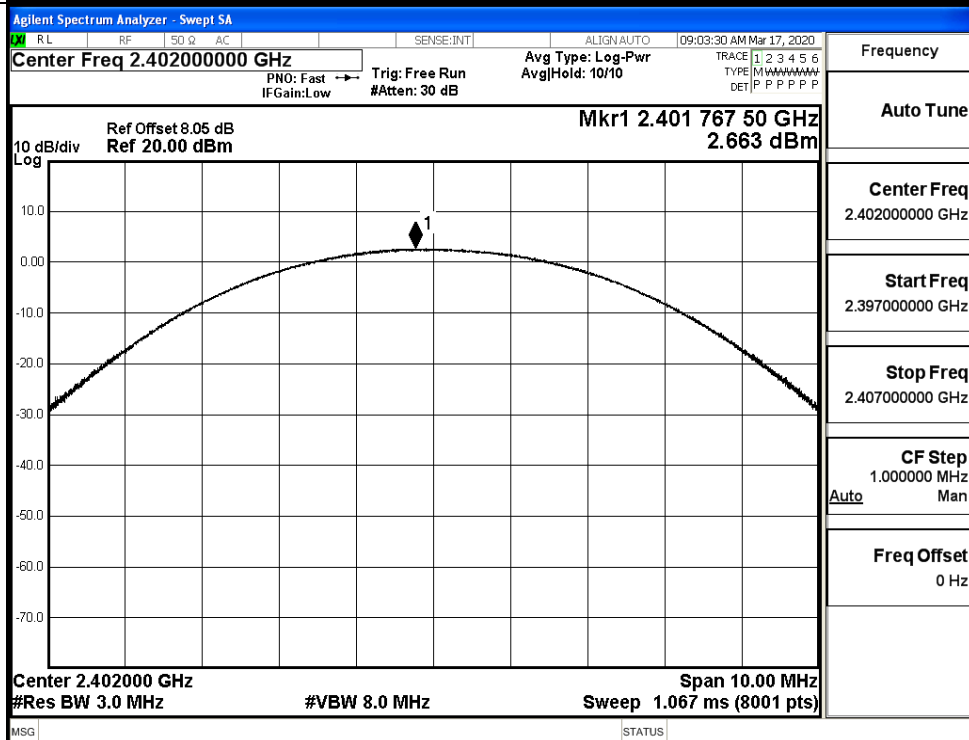
GFSK/LCH

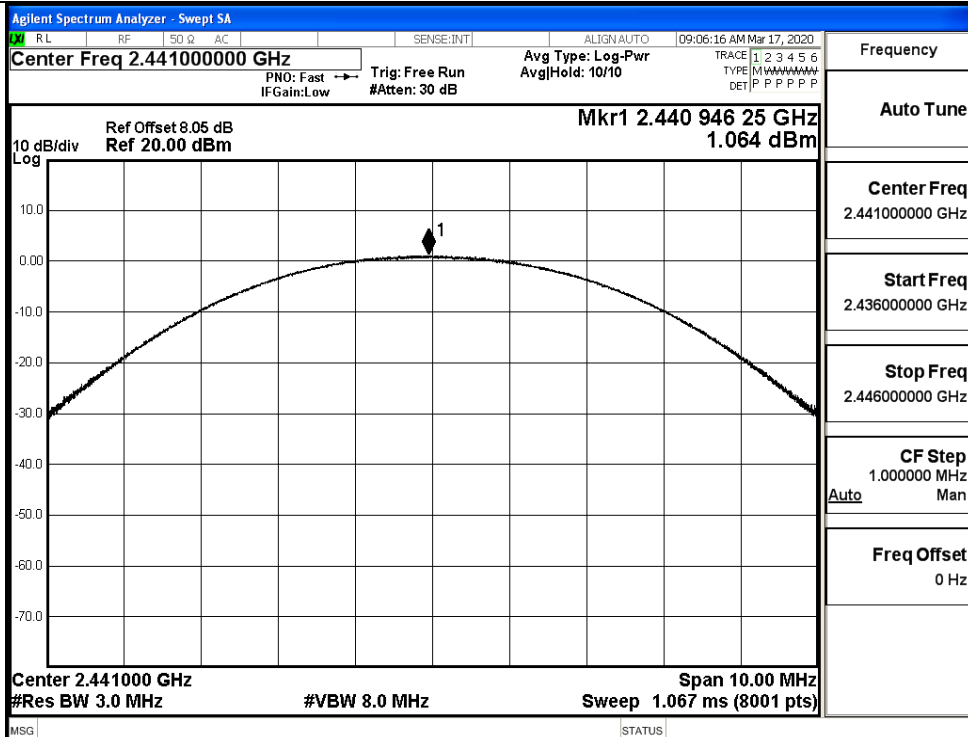
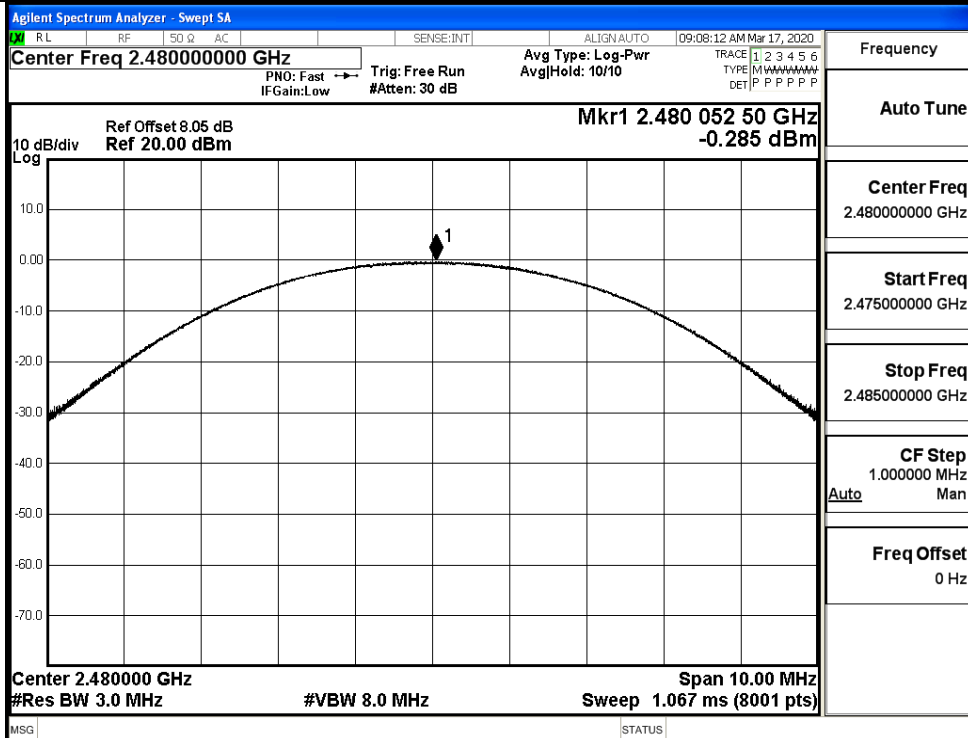


GFSK/MCH

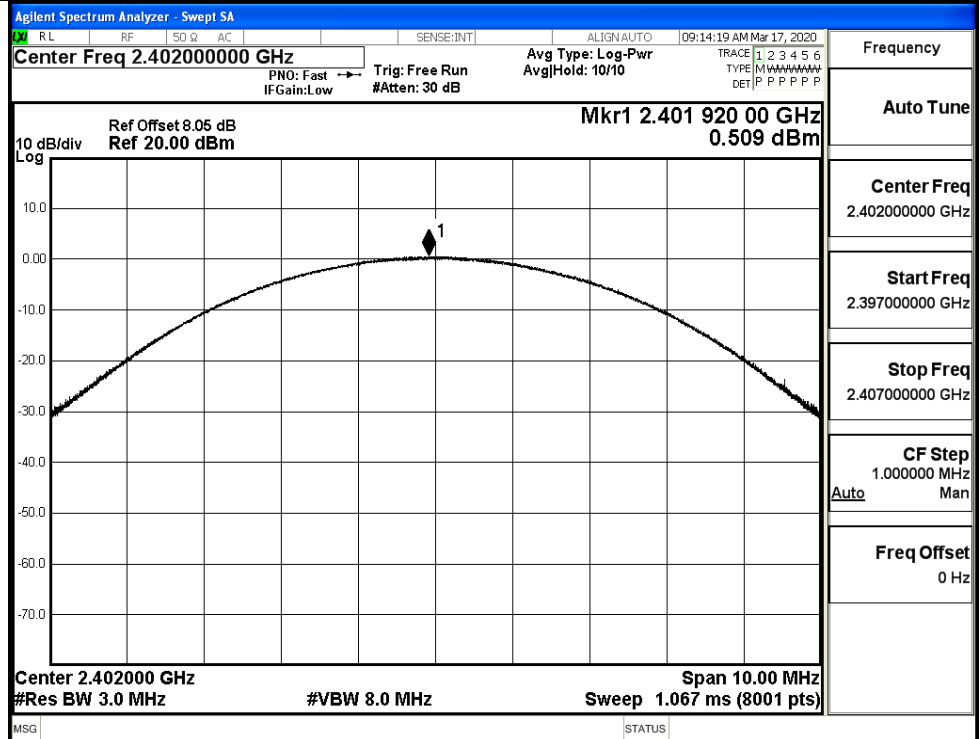


GFSK/HCH

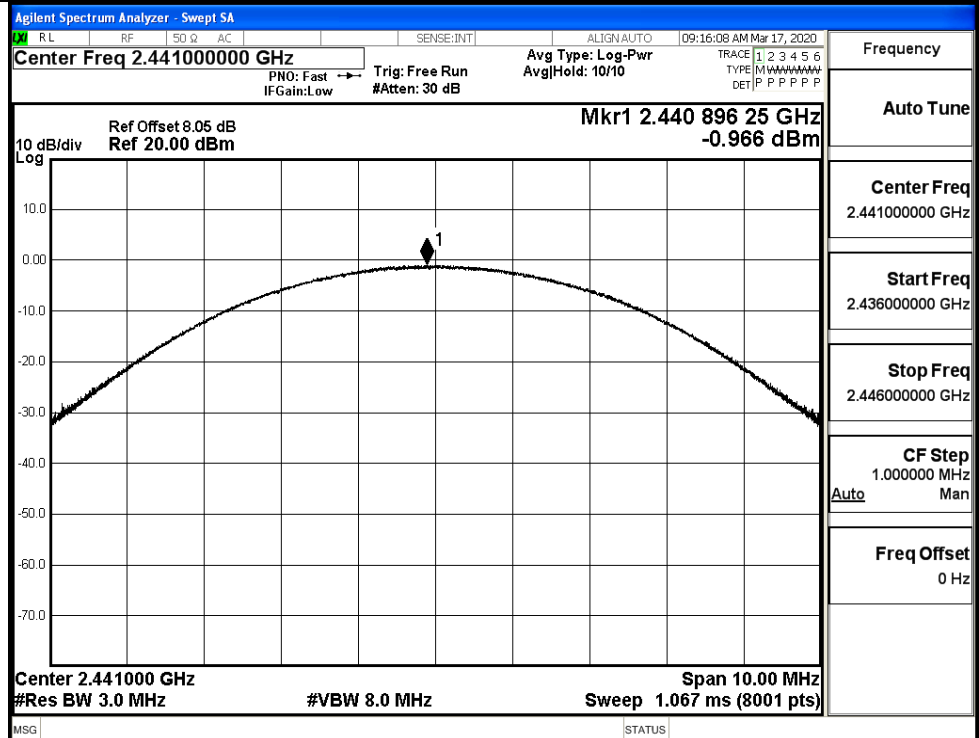
 $\pi/4$ DQPSK/LCH

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

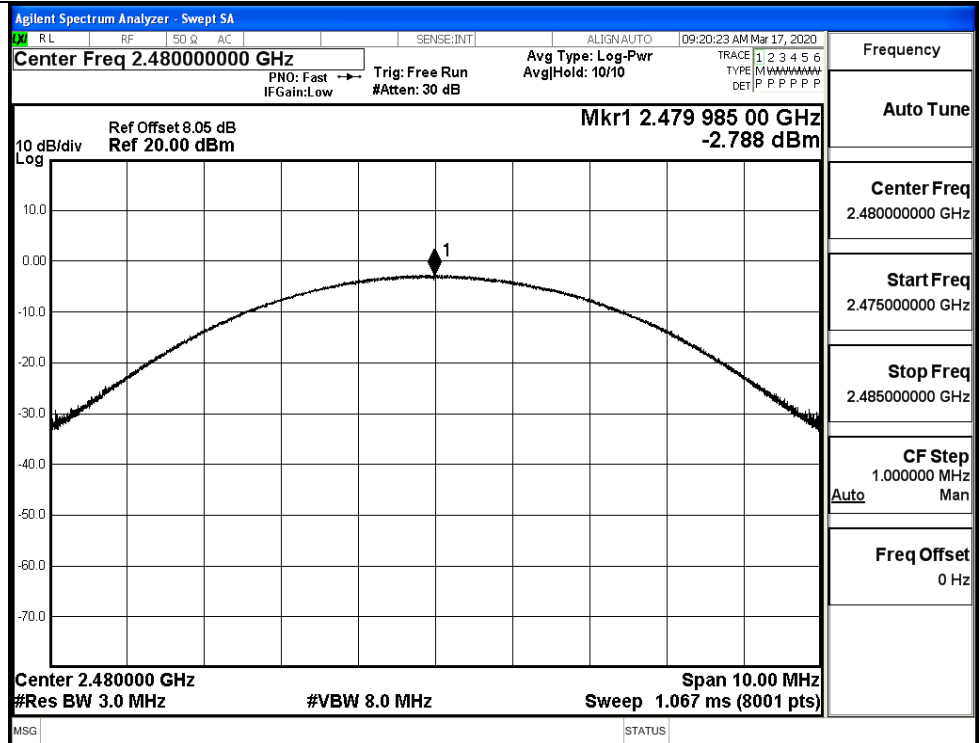
8DPSK/LCH



8DPSK/MCH



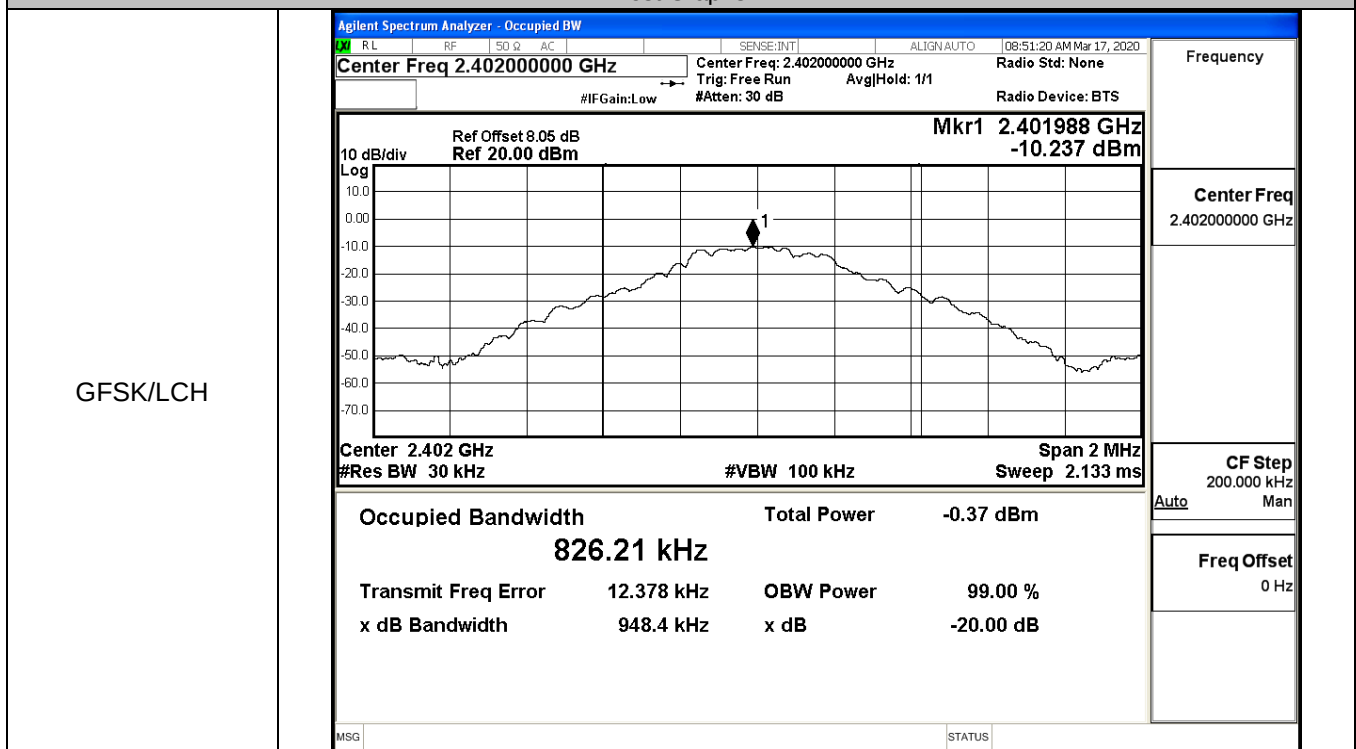
8DPSK/HCH



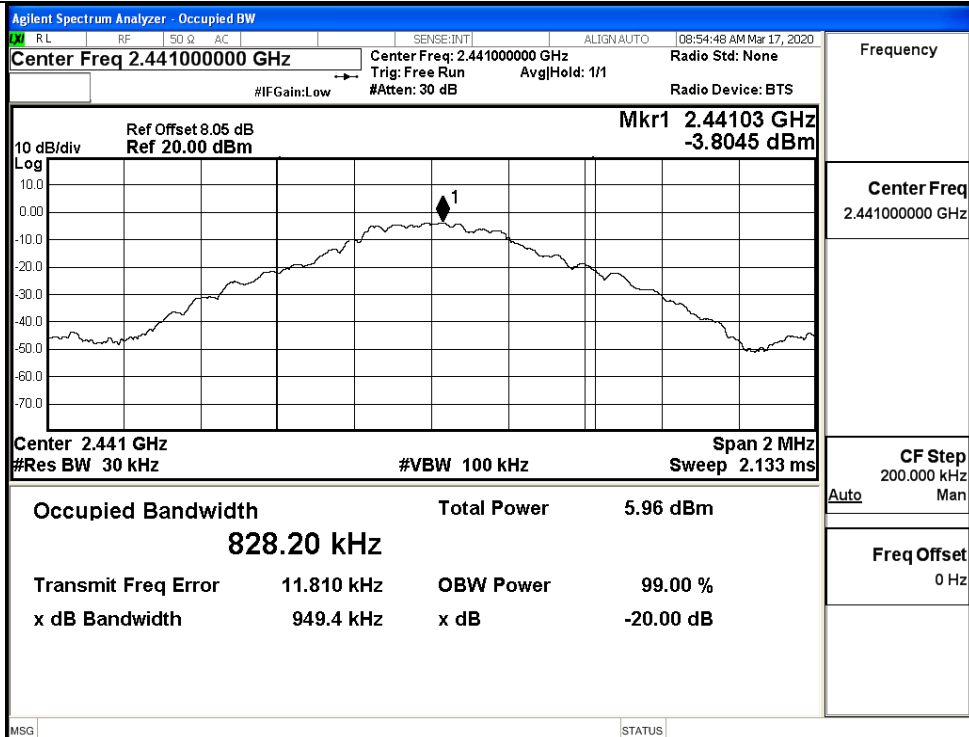
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9484	Not Specified	PASS
	MCH	0.9494	Not Specified	PASS
	HCH	0.9491	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.323	Not Specified	PASS
	MCH	1.324	Not Specified	PASS
	HCH	1.324	Not Specified	PASS
8DPSK	LCH	1.290	Not Specified	PASS
	MCH	1.294	Not Specified	PASS
	HCH	1.294	Not Specified	PASS

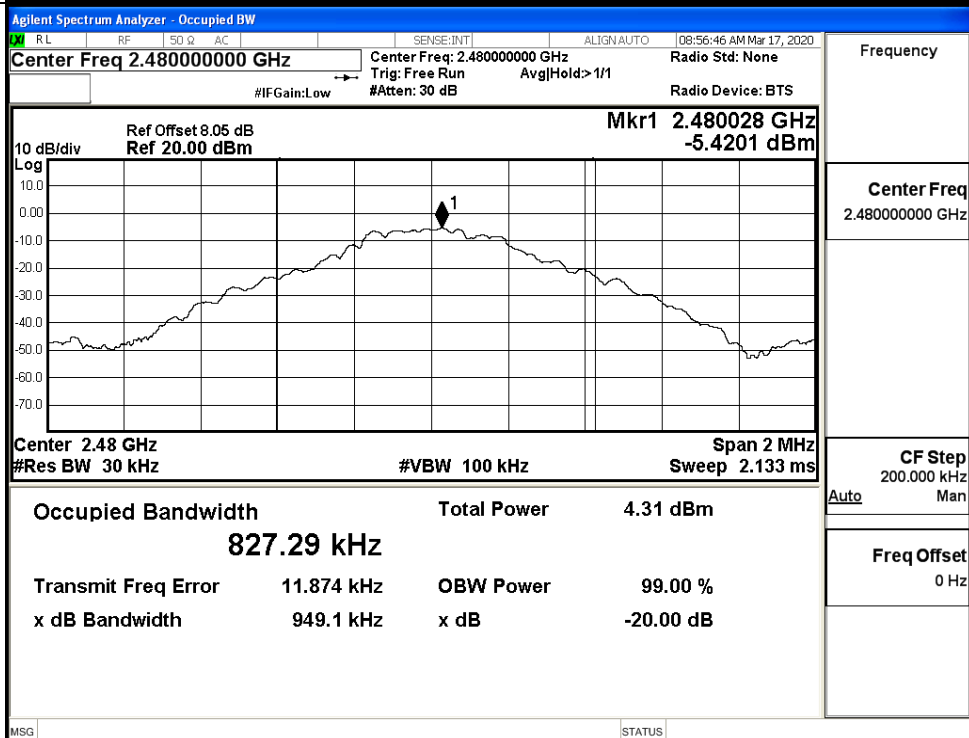
Test Graphs

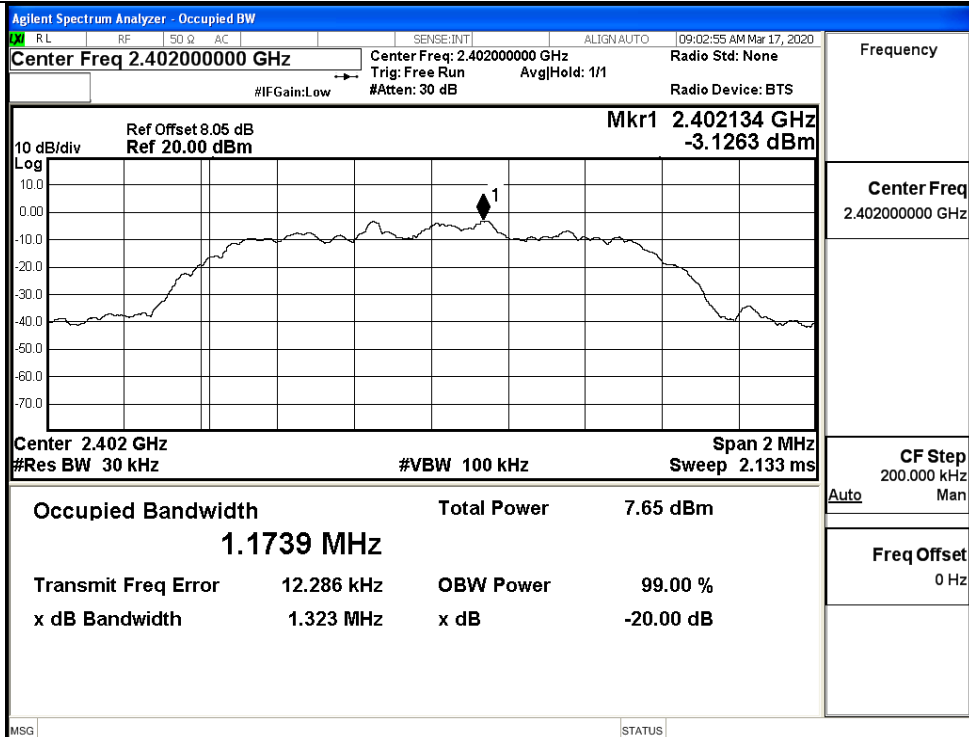


GFSK/MCH

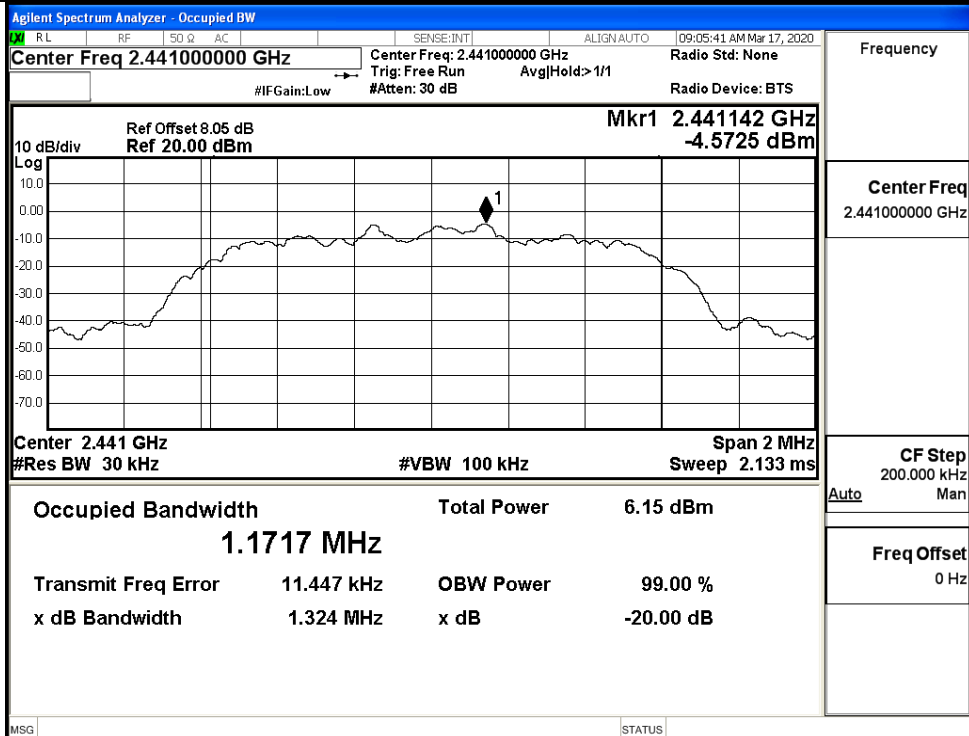


GFSK/HCH



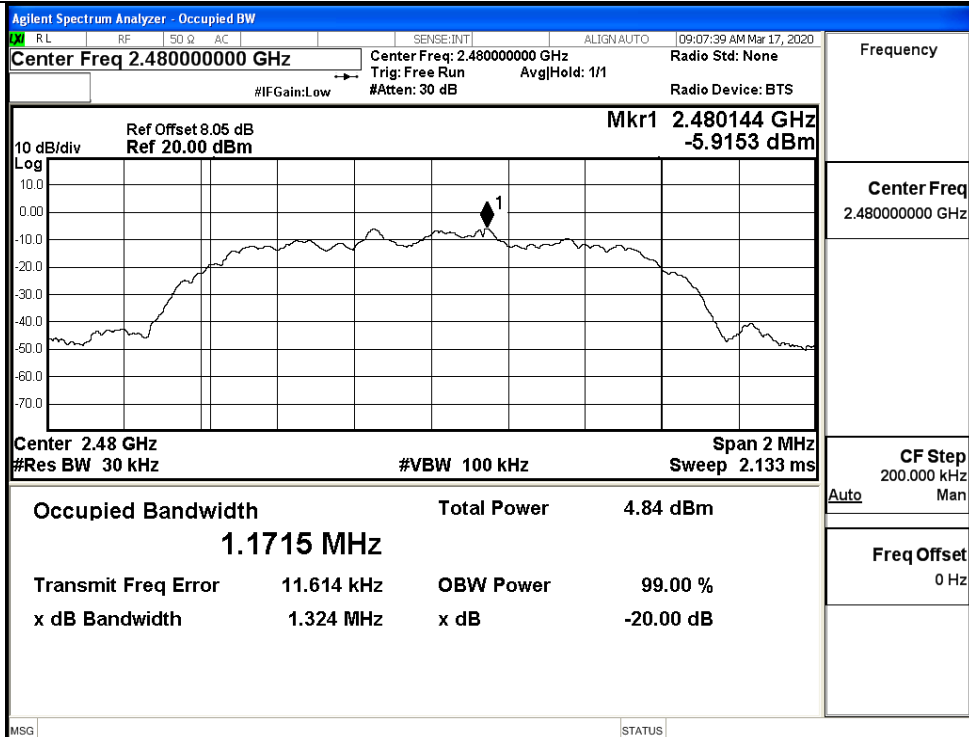
$\pi/4$ DQPSK/LCH

Frequency

Center Freq
2.402000000 GHzCF Step
200.000 kHz
Auto ManFreq Offset
0 Hz $\pi/4$ DQPSK/MCH

Frequency

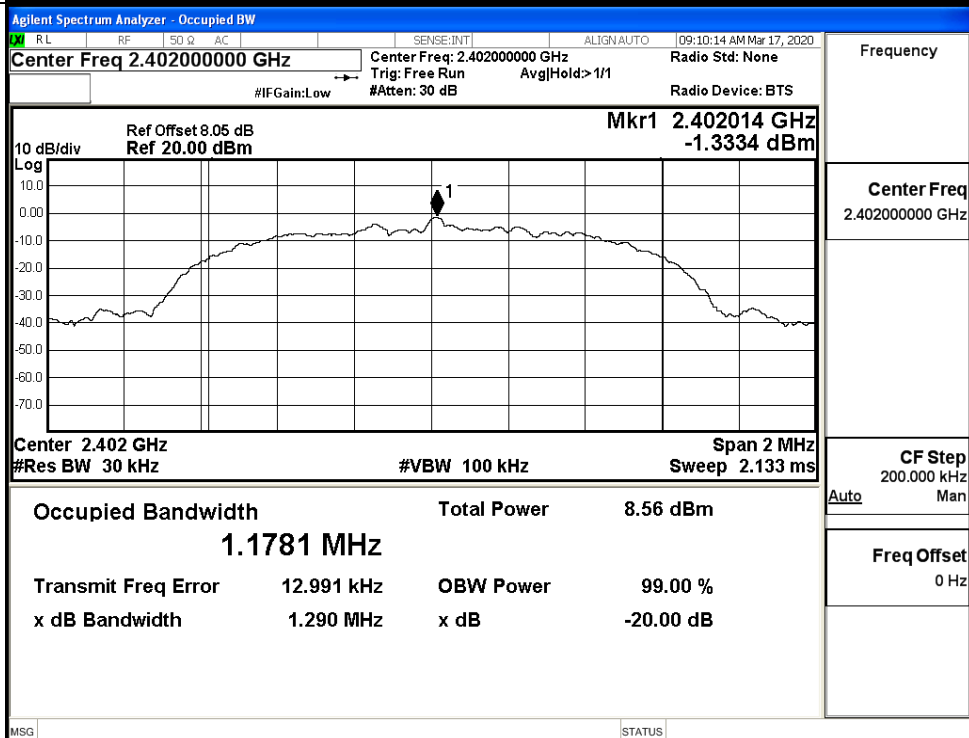
Center Freq
2.441000000 GHzCF Step
200.000 kHz
Auto ManFreq Offset
0 Hz

$\pi/4$ DQPSK/HCH

Frequency

Center Freq
2.48000000 GHzCF Step
200.000 kHz
Auto ManFreq Offset
0 Hz

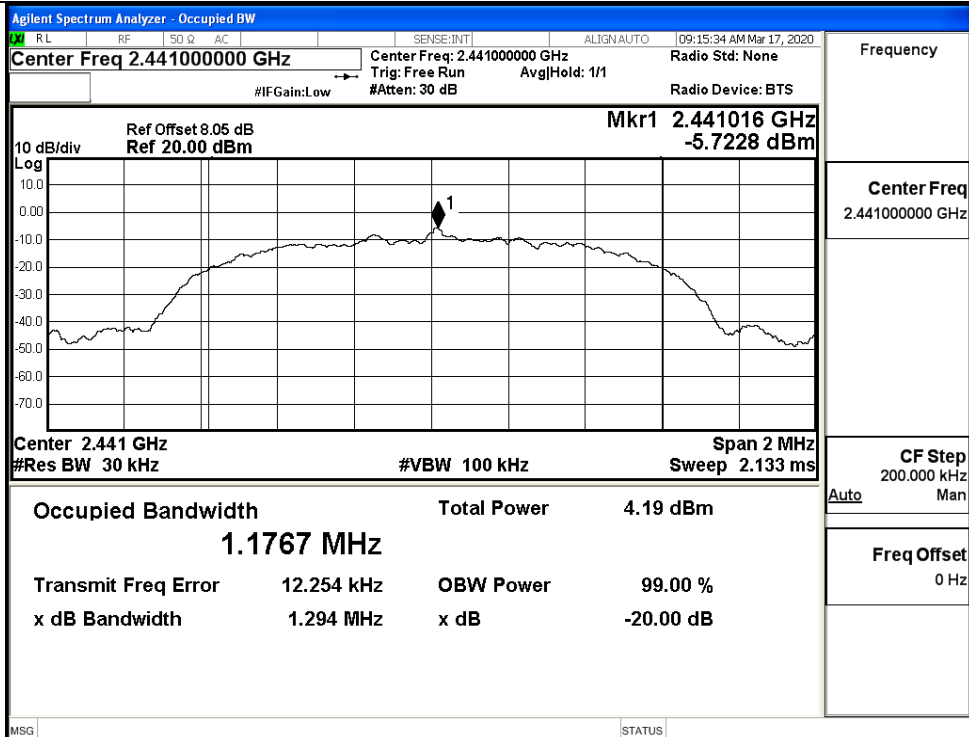
8DPSK/LCH



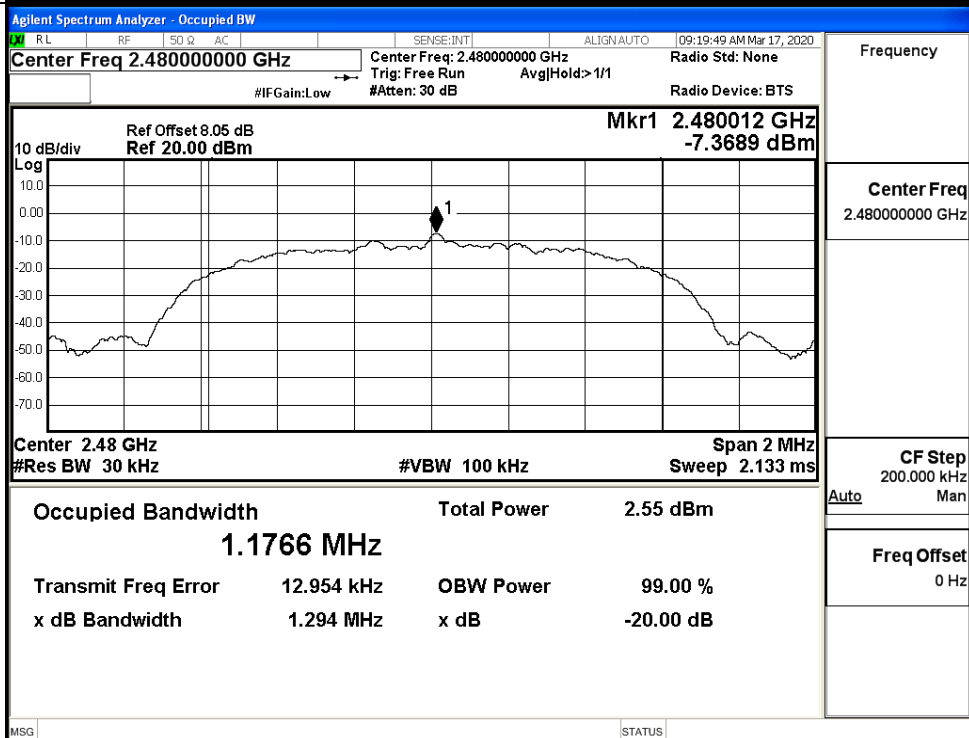
Frequency

Center Freq
2.40200000 GHzCF Step
200.000 kHz
Auto ManFreq Offset
0 Hz

8DPSK/MCH



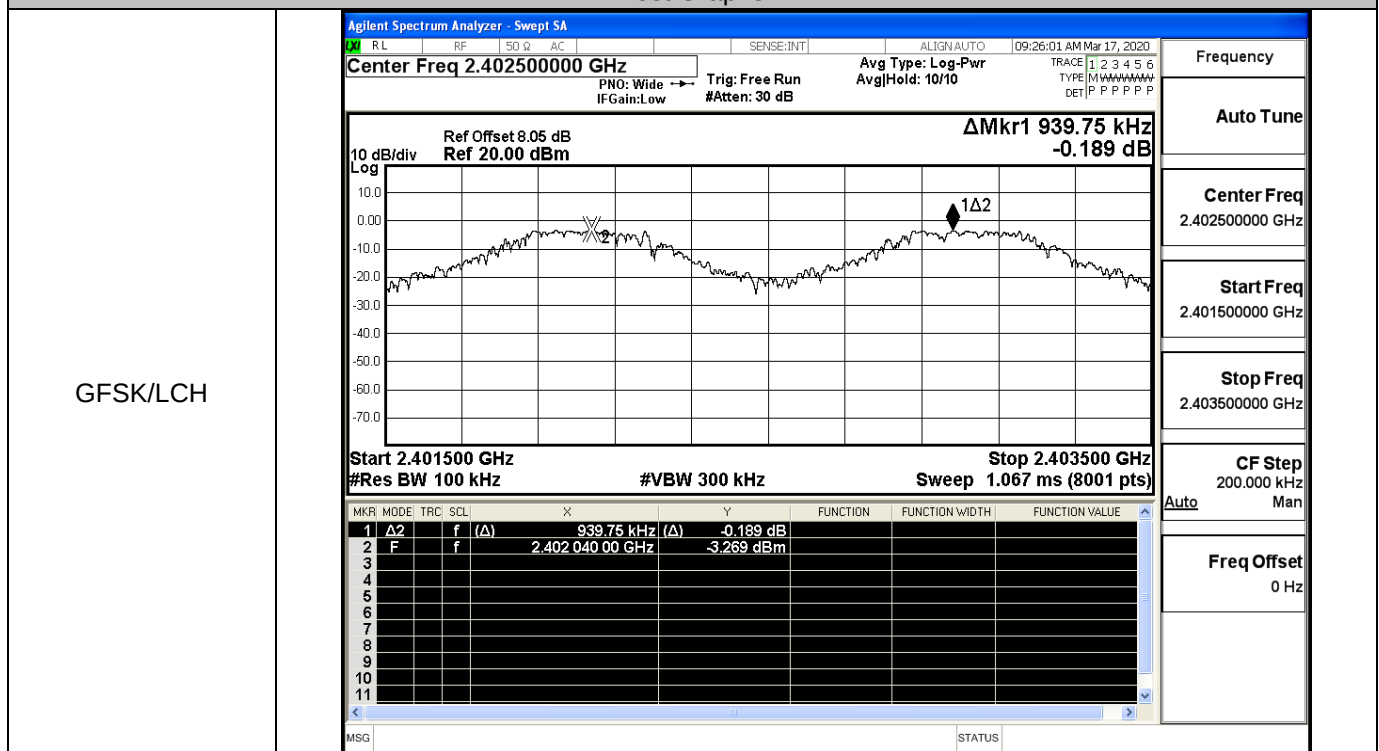
8DPSK/HCH



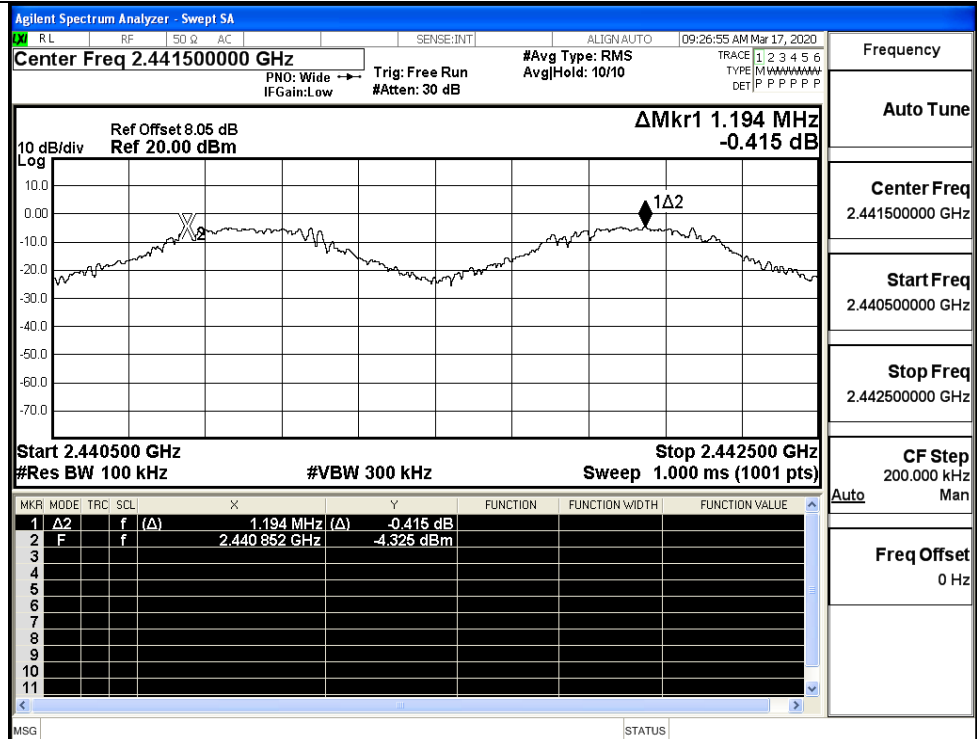
A.3 Carrier Frequency Separation

Mode	Channel	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.940	0.633	PASS
	MCH	1.194	0.633	PASS
	HCH	0.958	0.633	PASS
$\pi/4$ DQPSK	LCH	1.018	0.883	PASS
	MCH	1.010	0.883	PASS
	HCH	0.912	0.883	PASS
8DPSK	LCH	1.170	0.863	PASS
	MCH	0.992	0.863	PASS
	HCH	1.066	0.863	PASS

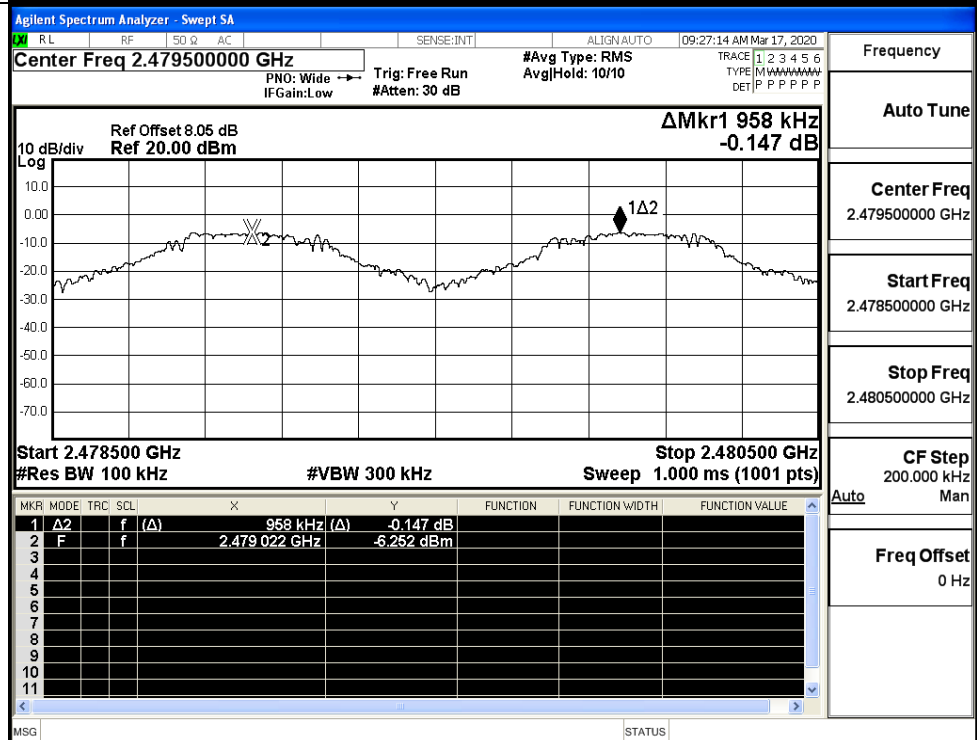
Test Graphs

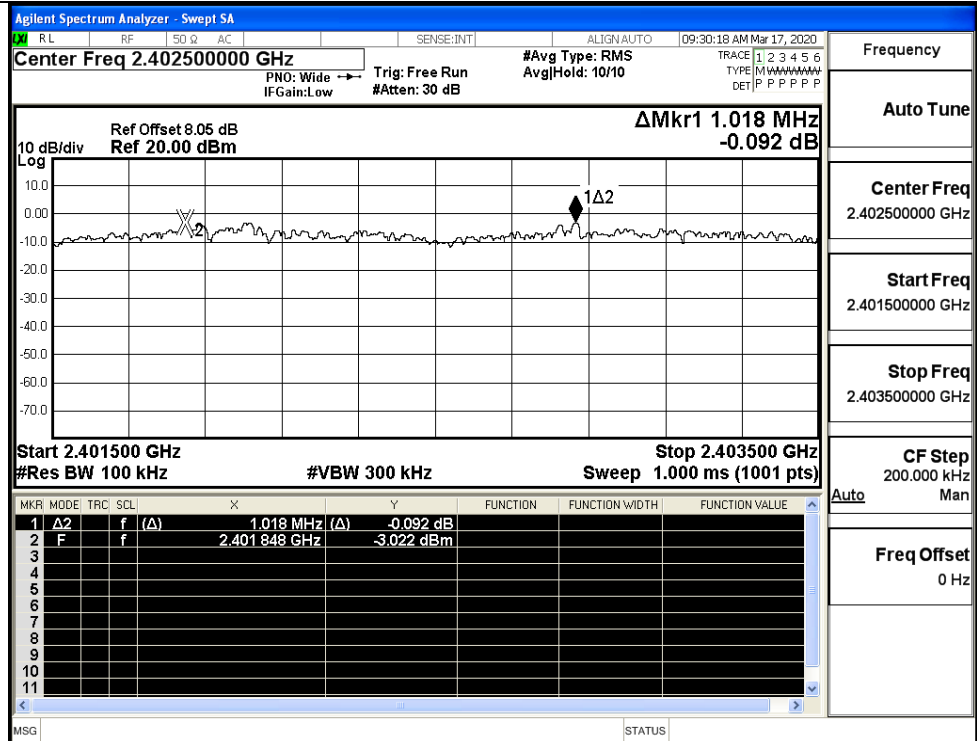
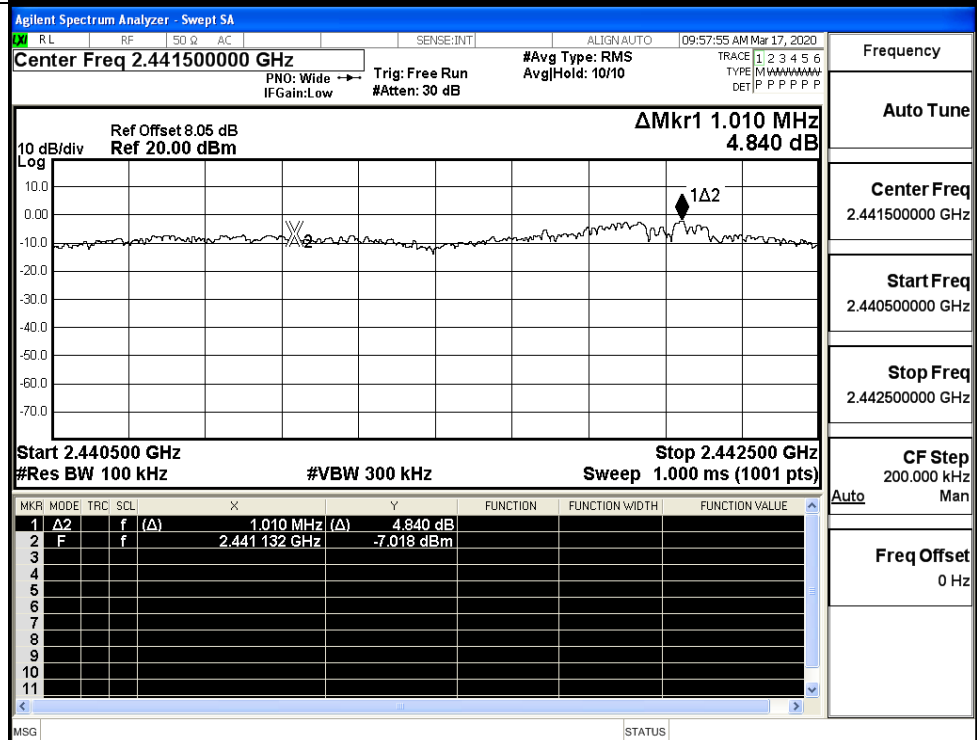


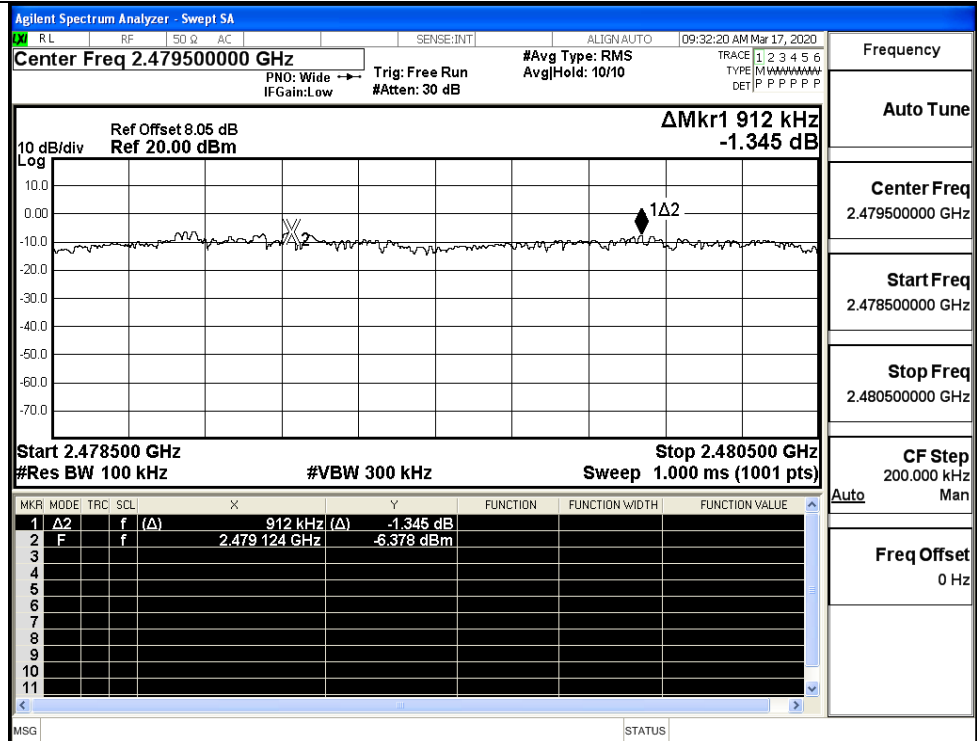
GFSK/MCH



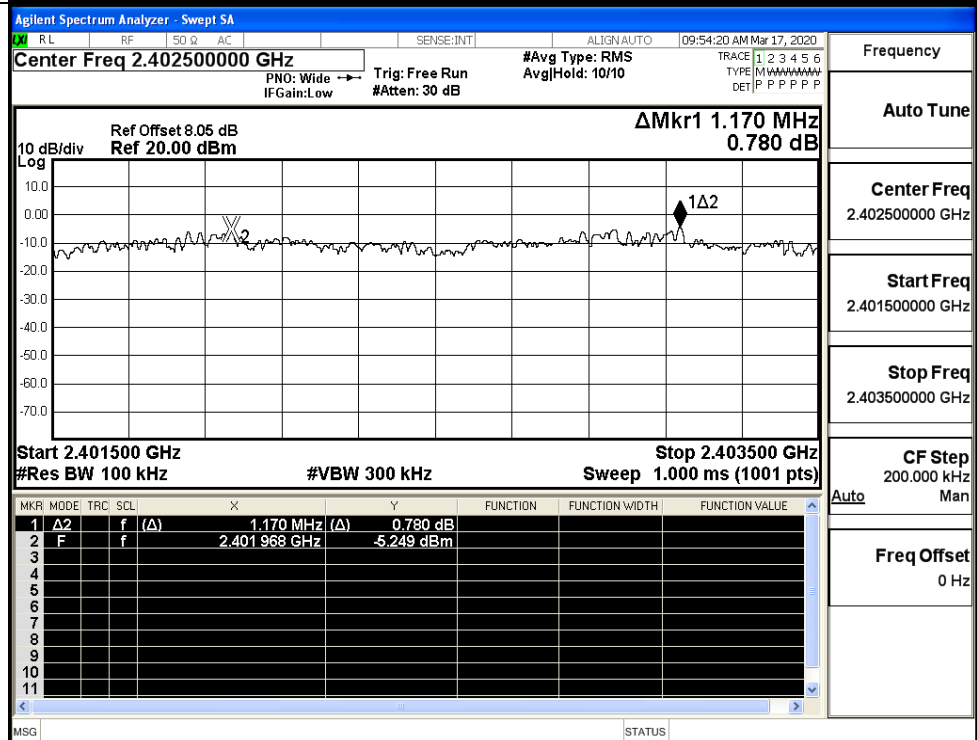
GFSK/HCH



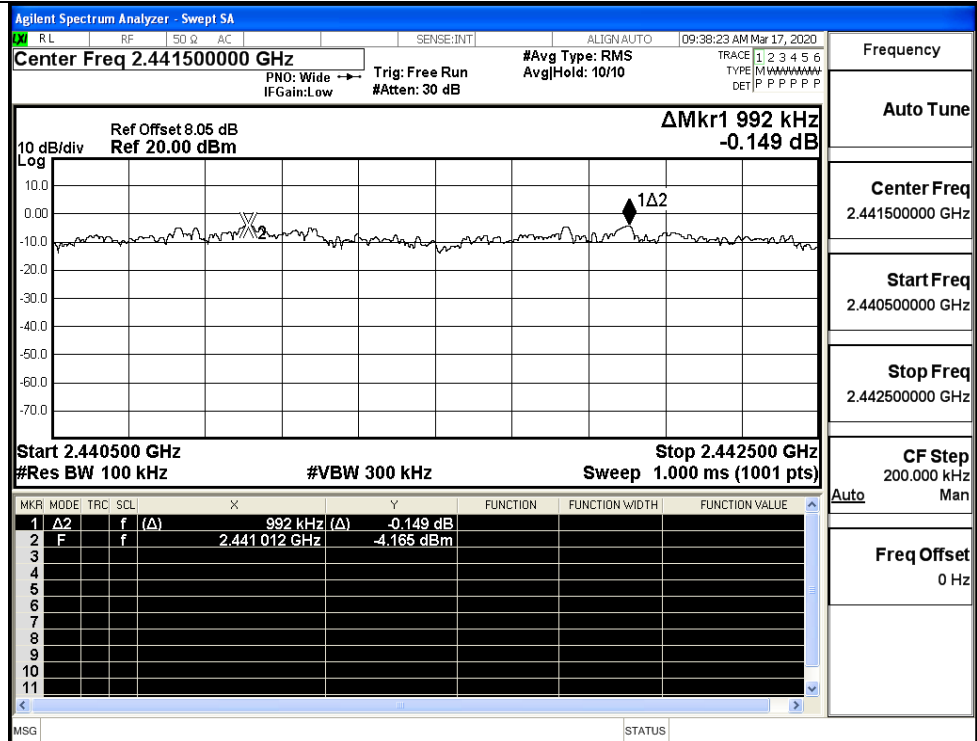
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

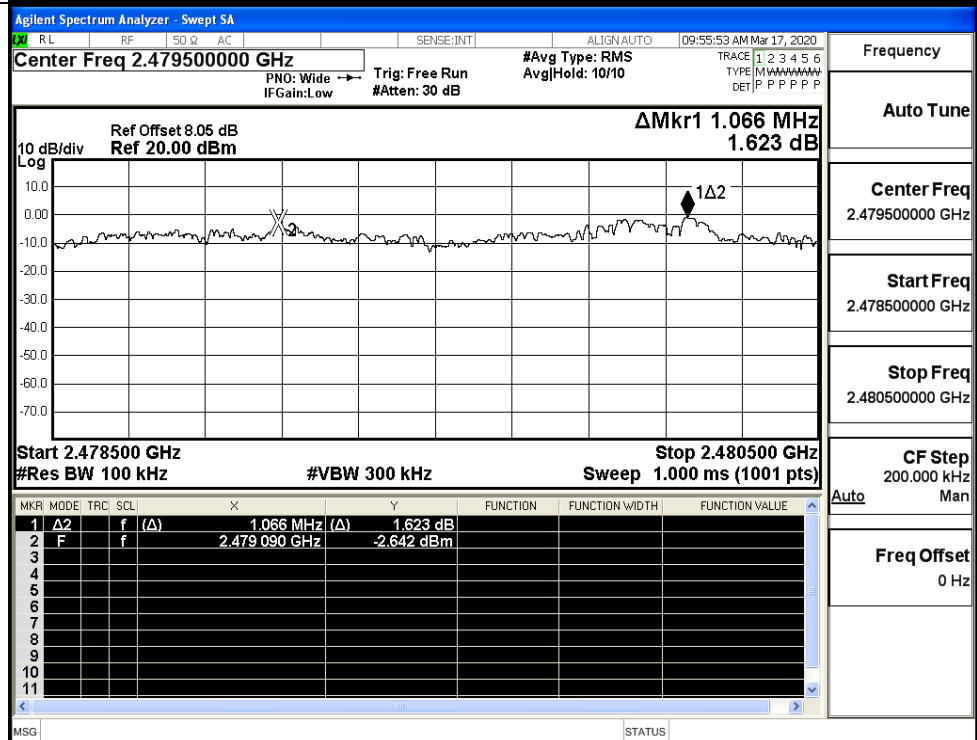
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

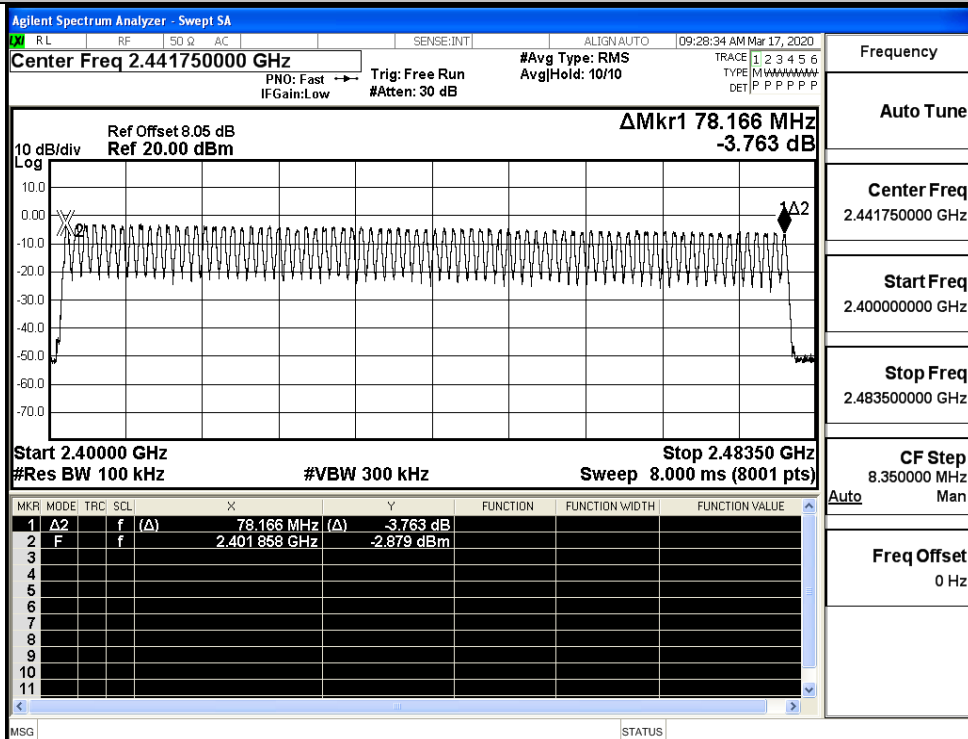
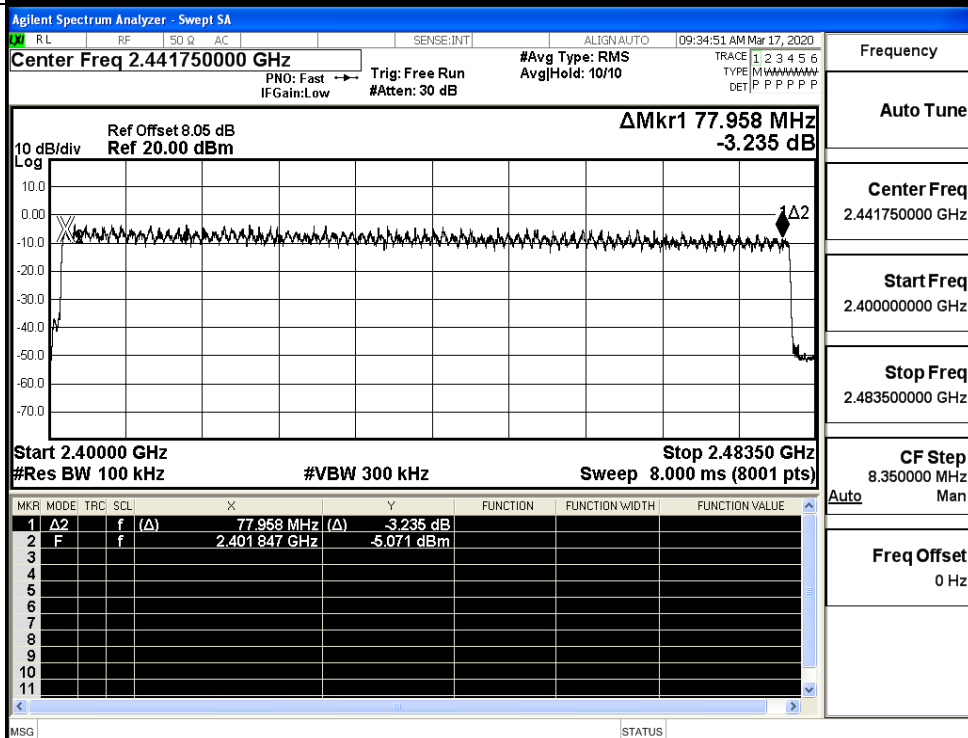


A.4 Hopping Channel Number

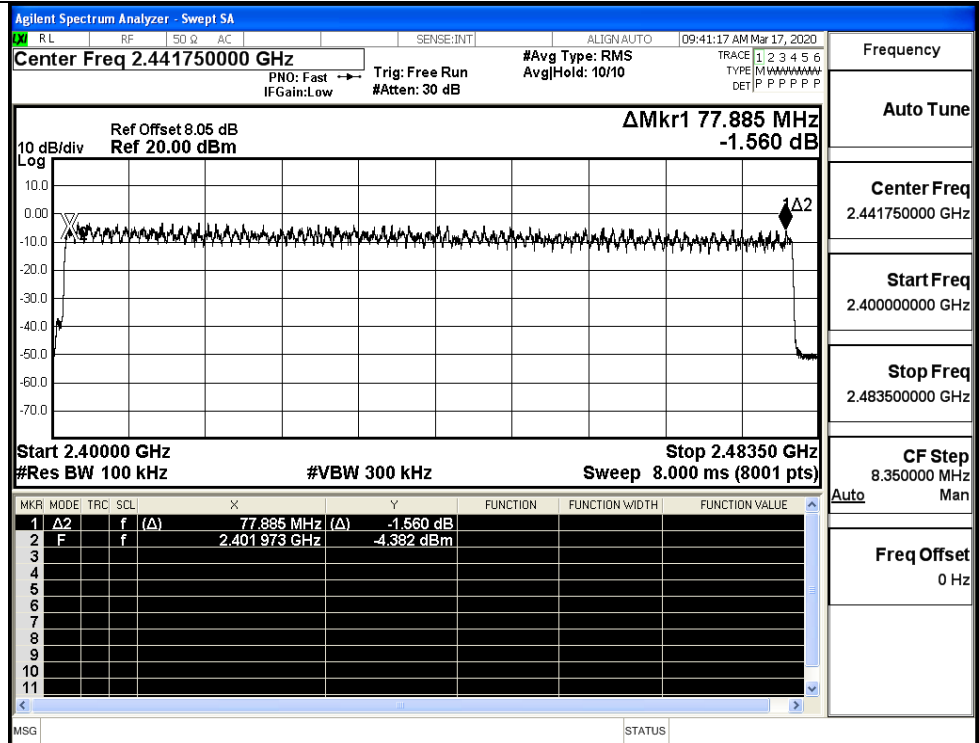
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS
8DPSK	Hop	79	>=15	PASS

Test Graphs

GFSK/Hop

 $\pi/4$ DQPSK/Hop

8DPSK/Hop

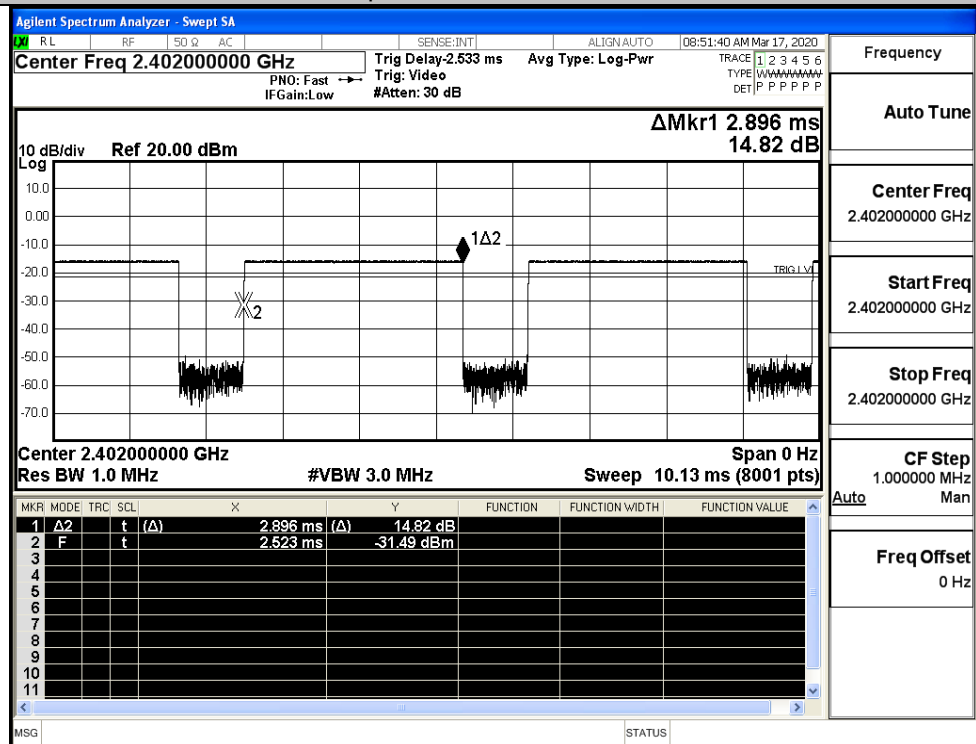


A.5 Dwell Time

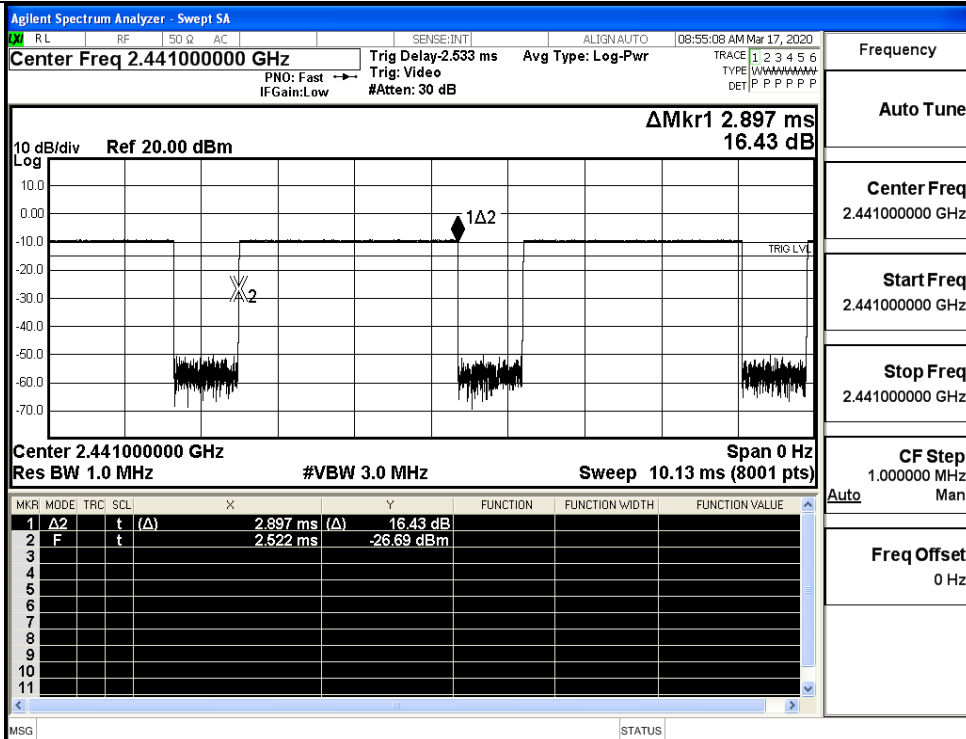
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.9	106.7	0.309	0.4	PASS
	DH5	MCH	2.9	106.7	0.309	0.4	PASS
	DH5	HCH	2.9	106.7	0.309	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.9	106.7	0.309	0.4	PASS
	2DH5	MCH	2.9	106.7	0.309	0.4	PASS
	2DH5	HCH	2.9	106.7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

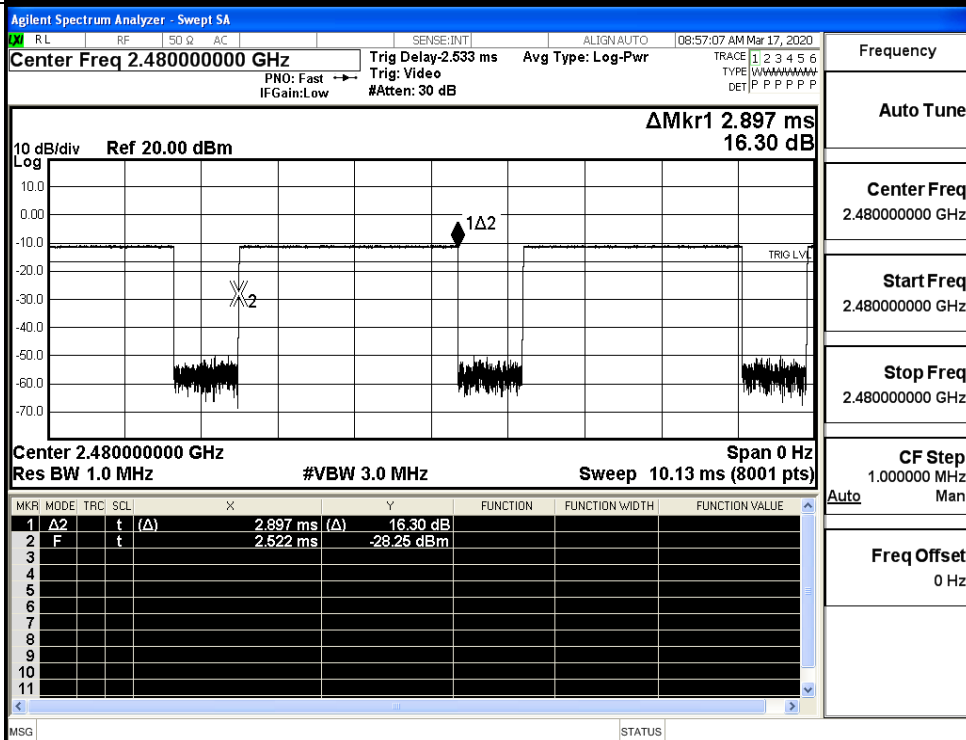
GFSK_DH5/LCH



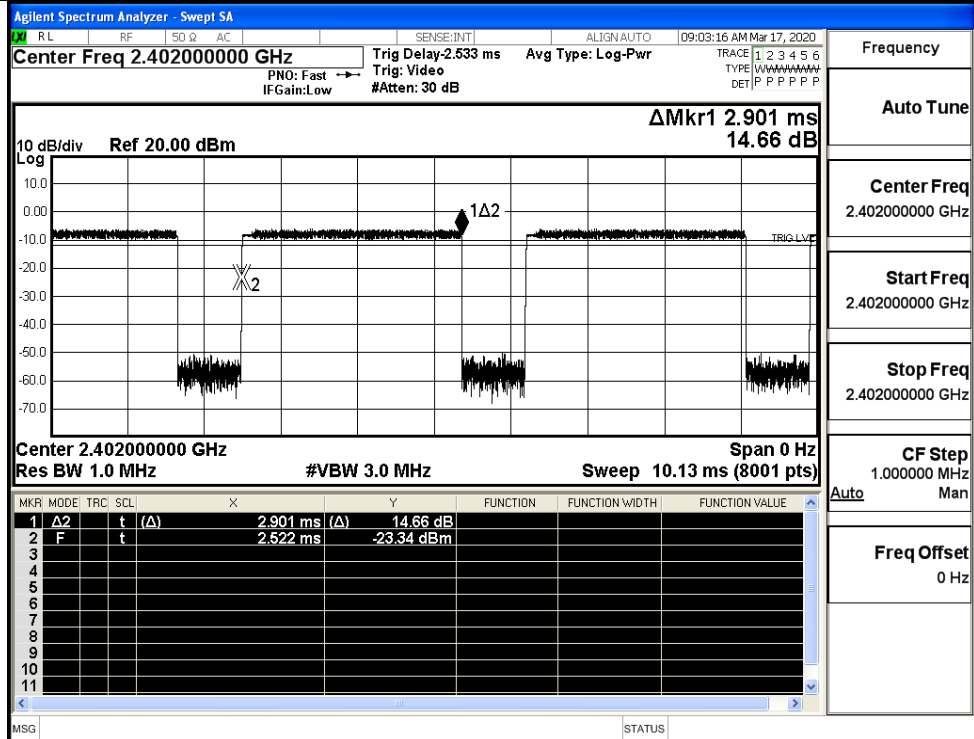
GFSK_DH5/MCH



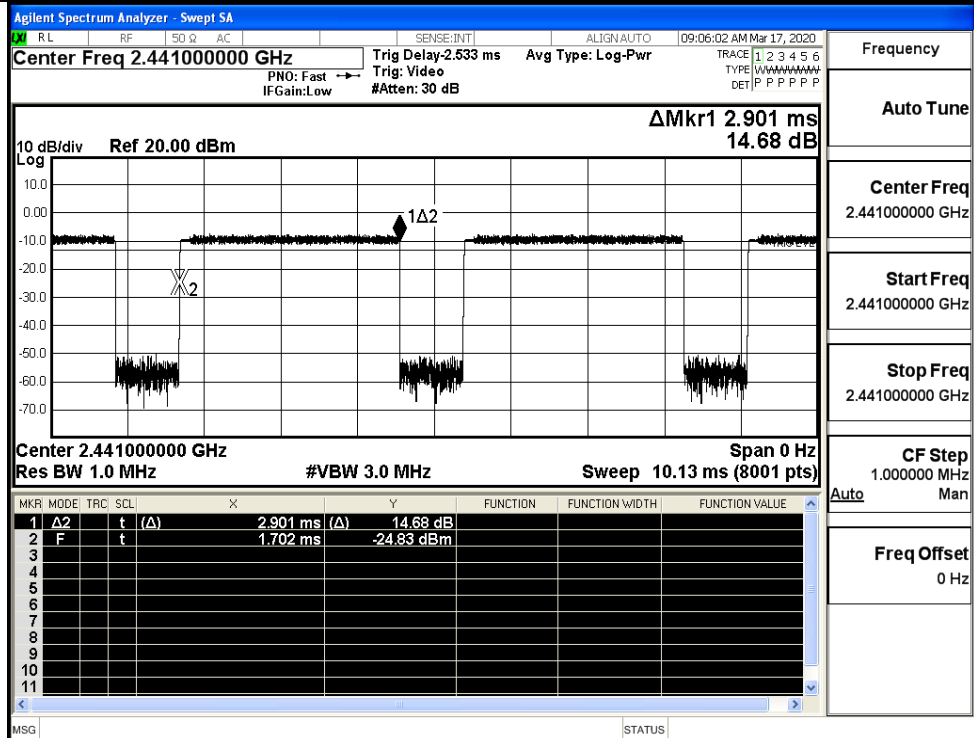
GFSK_DH5/HCH



$\pi/4$ DQPSK
_2DH5/LCH



$\pi/4$ DQPSK
_2DH5/MCH



[illegible]

Agilent Spectrum Analyzer - Swept SA

RL RF SO Q AC SENSE: INT ALIGN AUTO 09:10:34 AM Mar 17, 2020

Center Freq 2.402000000 GHz Trig Delay: 2.533 ms Avg Type: Log-Pwr
PNO: Fast IF Gain: Low Trig: Video #Atten: 30 dB TRACE 1 2 3 4 5 6 TYPE P P P P P P DET P P P P P P

ΔMkr1 2.903 ms
15.05 dB

10 dB/div Ref 20.00 dBm

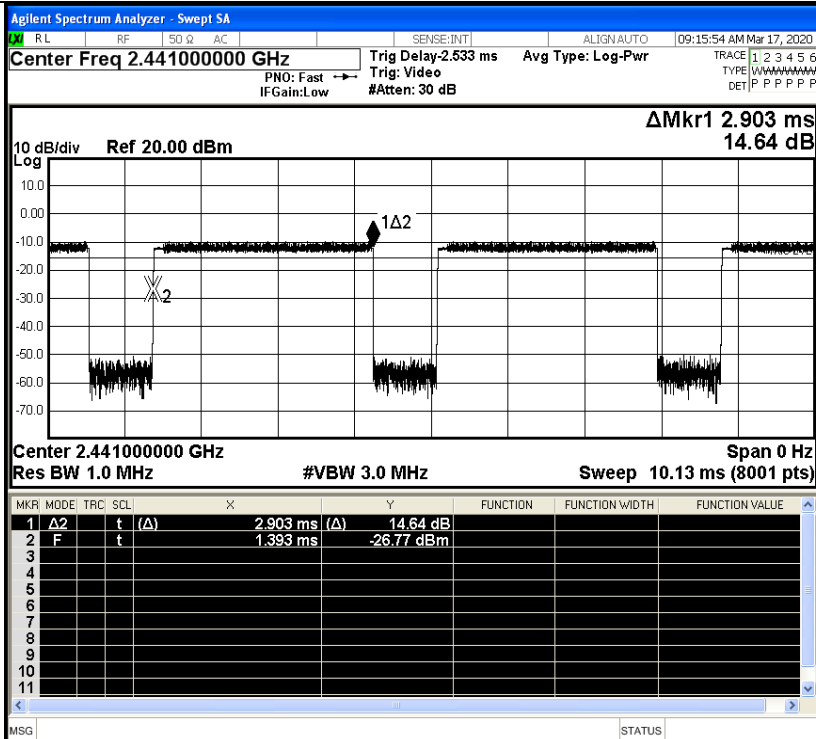
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ2	t	(Δ)	2.903 ms	(Δ) 15.05 dB			
2	F	t		1.615 ms	-22.84 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								

Center 2.402000000 GHz Span 0 Hz
Res BW 1.0 MHz #VBW 3.0 MHz Sweep 10.13 ms (8001 pts)

Auto Auto Man

Freq Offset 0 Hz

8DPSK_3DH5/MCH

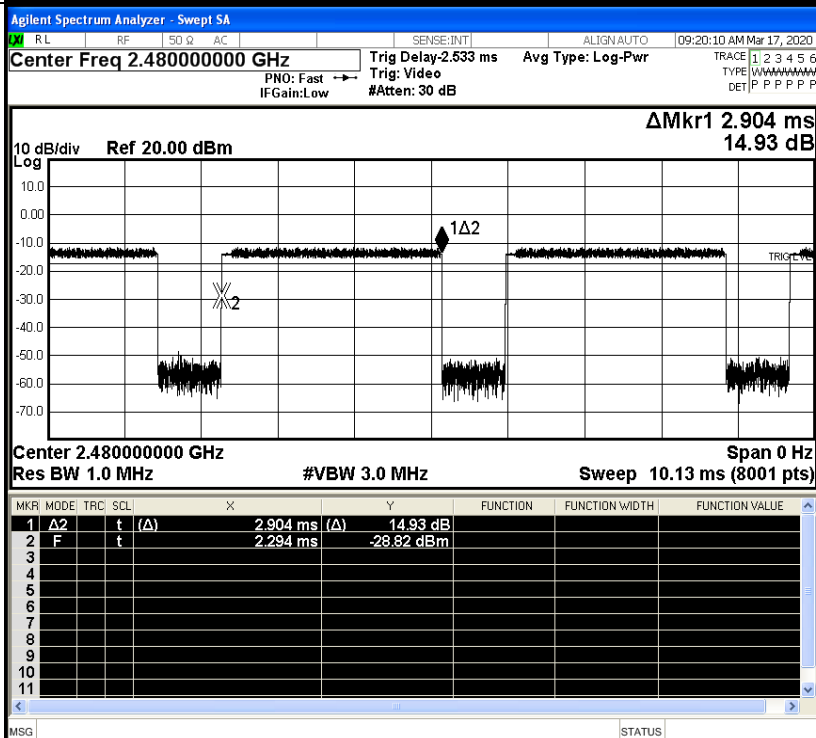


Frequency

Auto Tune

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

8DPSK_3DH5/HCH



Frequency

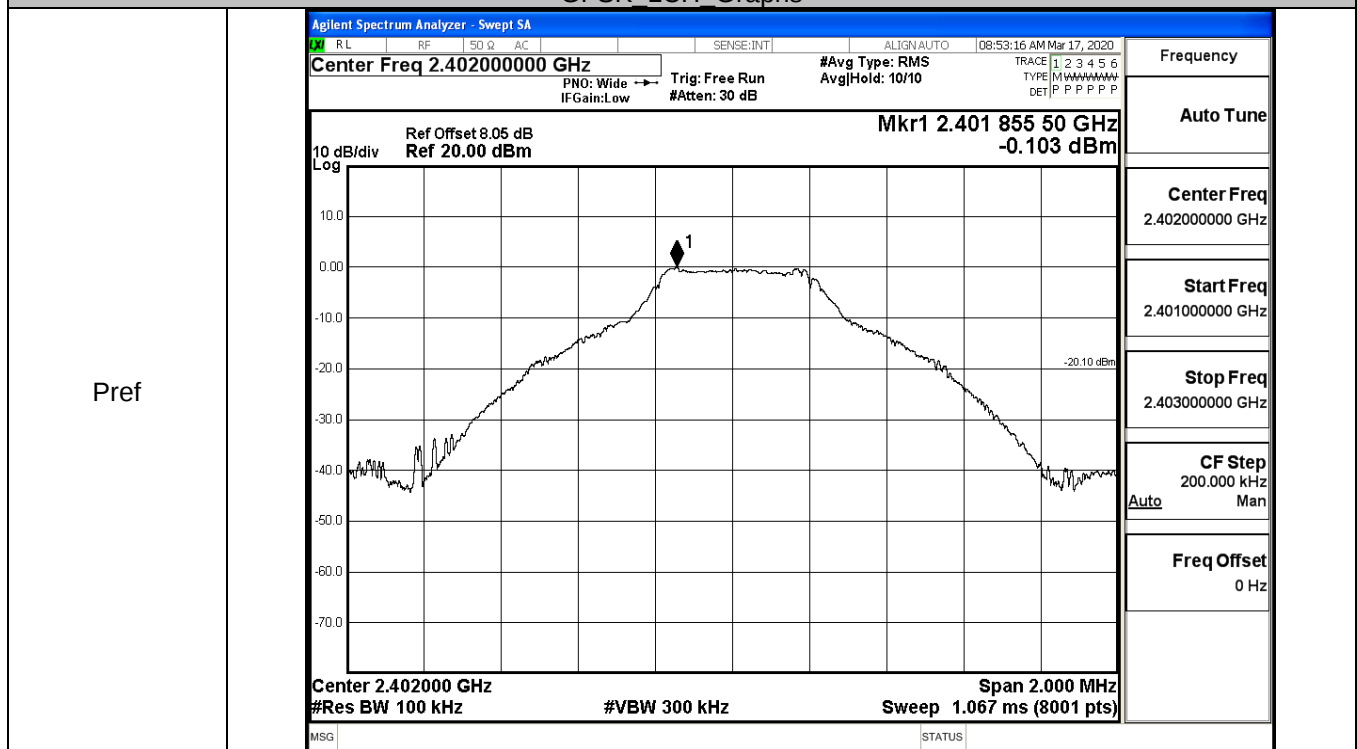
Auto Tune

Center Freq
2.480000000 GHzStart Freq
2.480000000 GHzStop Freq
2.480000000 GHzCF Step
1.000000 MHz
Auto ManFreq Offset
0 Hz

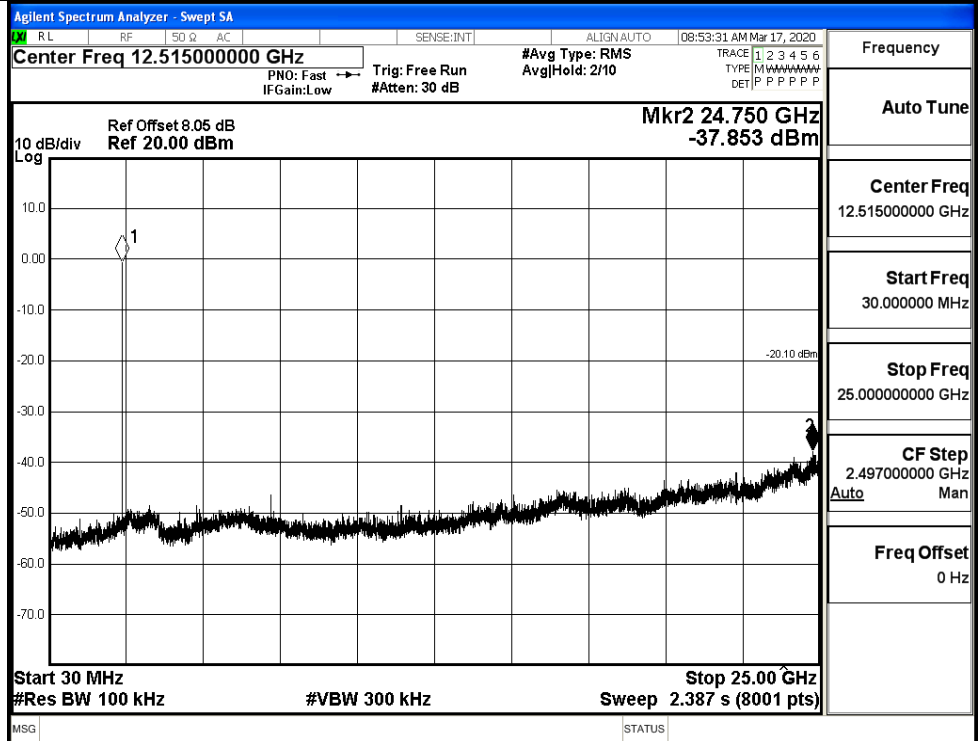
A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.103	-37.853	-20.103	PASS
	MCH	-1.611	-29.486	-21.611	PASS
	HCH	-3.434	-31.208	-23.434	PASS
$\pi/4$ DQPSK	LCH	-0.459	-35.045	-20.459	PASS
	MCH	-1.928	-38.443	-21.928	PASS
	HCH	-3.208	-37.785	-23.208	PASS
8DPSK	LCH	0.013	-37.979	-19.987	PASS
	MCH	-4.135	-36.796	-24.135	PASS
	HCH	-5.861	-37.132	-25.861	PASS

GFSK LCH Graphs

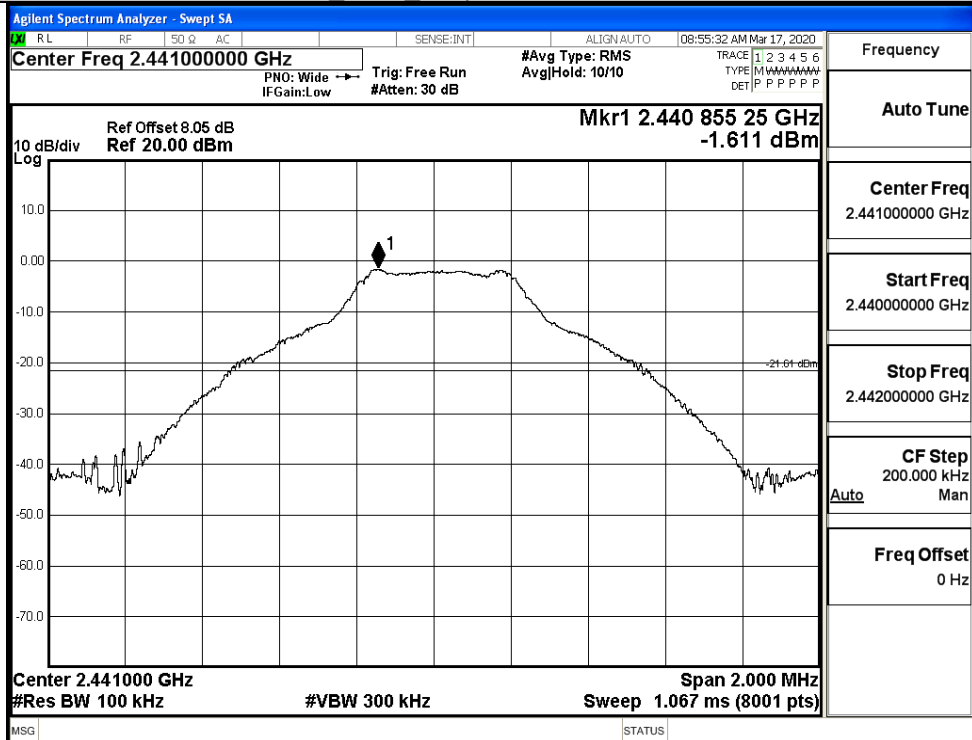


Puw

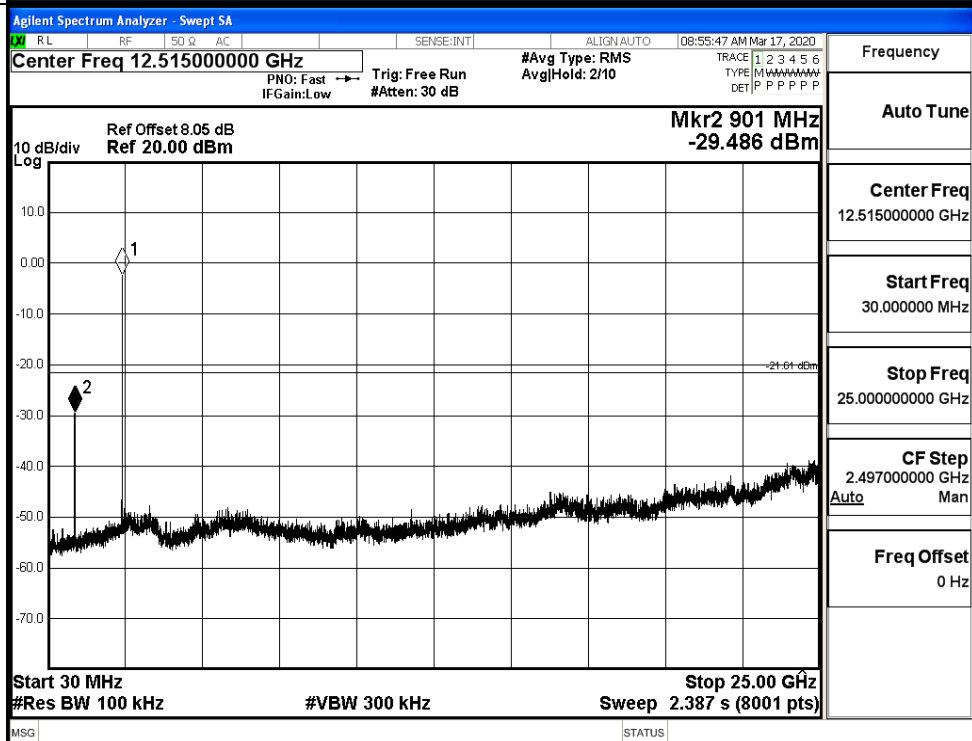


GFSK_MCH_Graphs

Pref

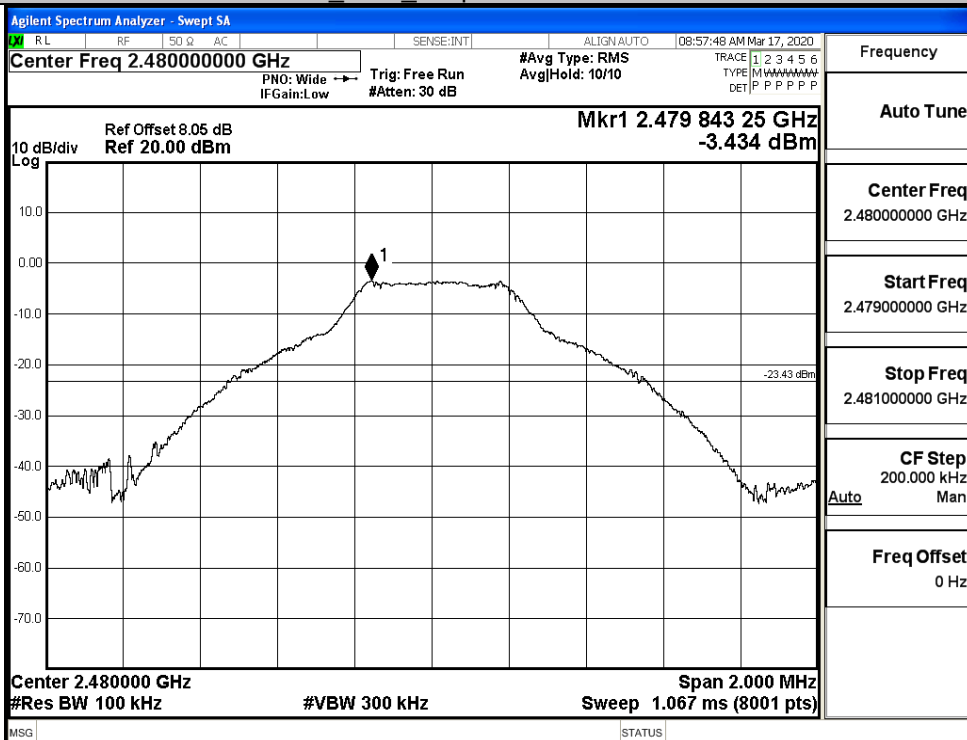


Puw

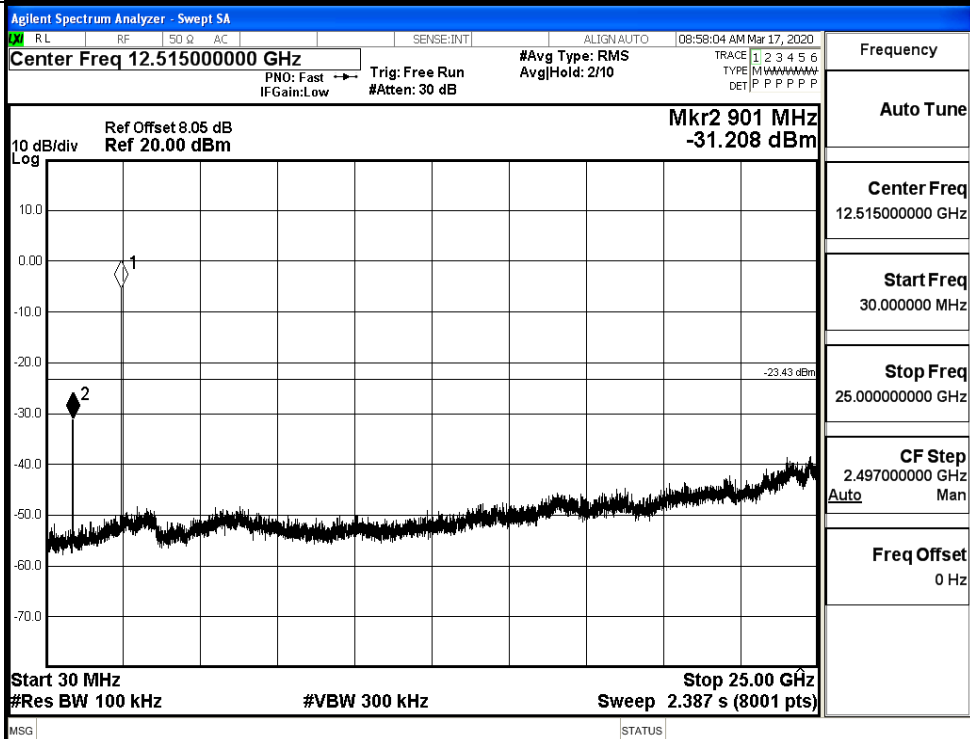


GFSK_HCH_Graphs

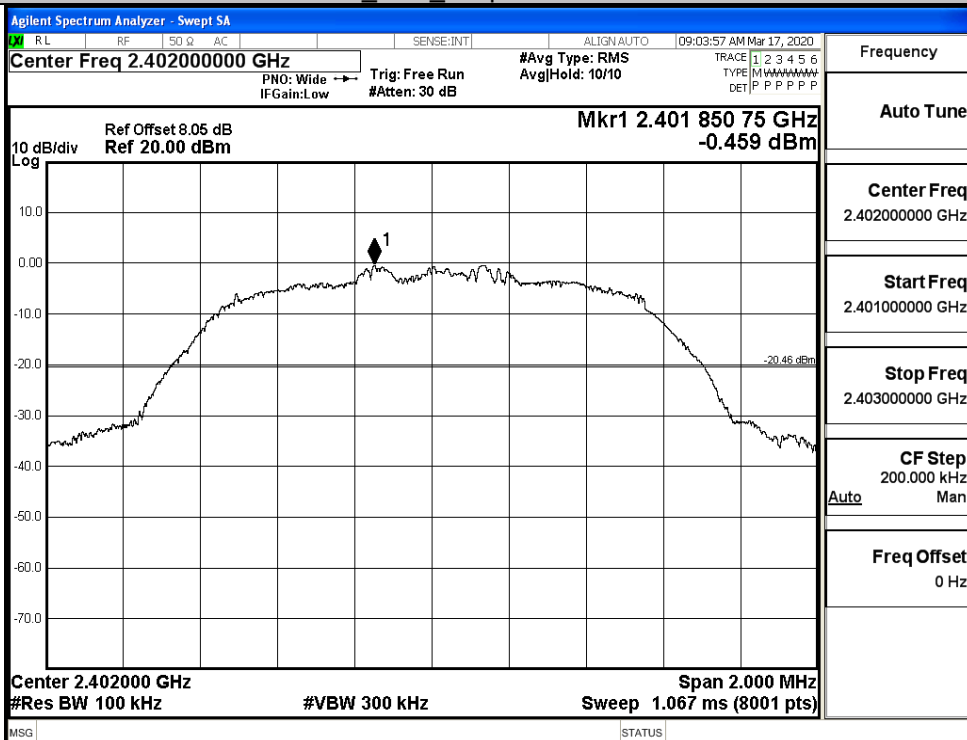
Pref



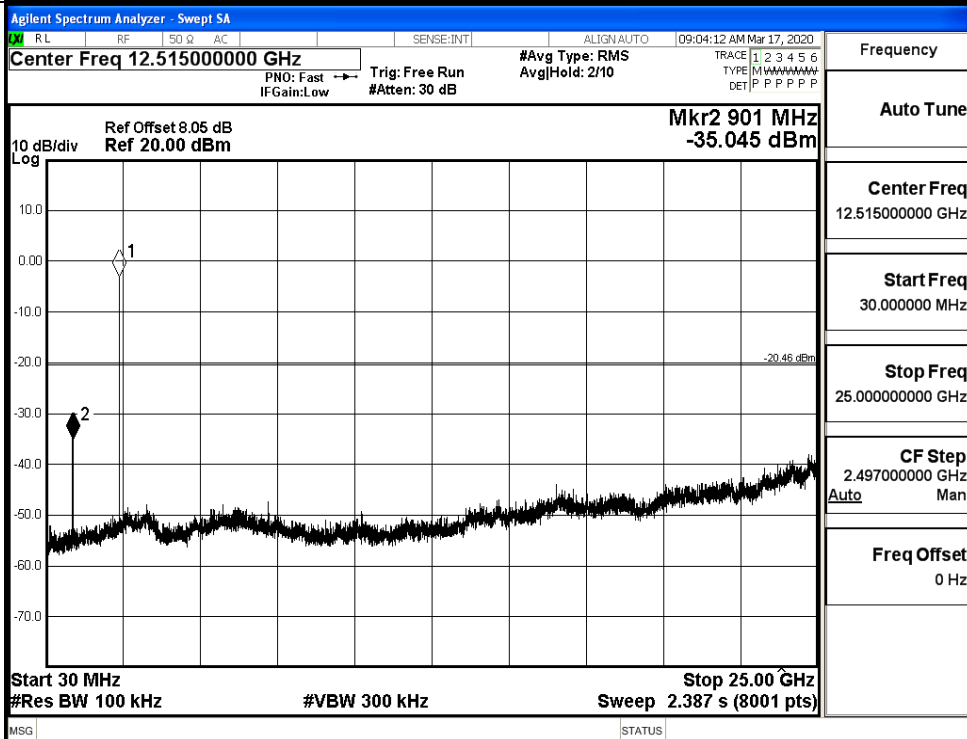
Puw



Pref

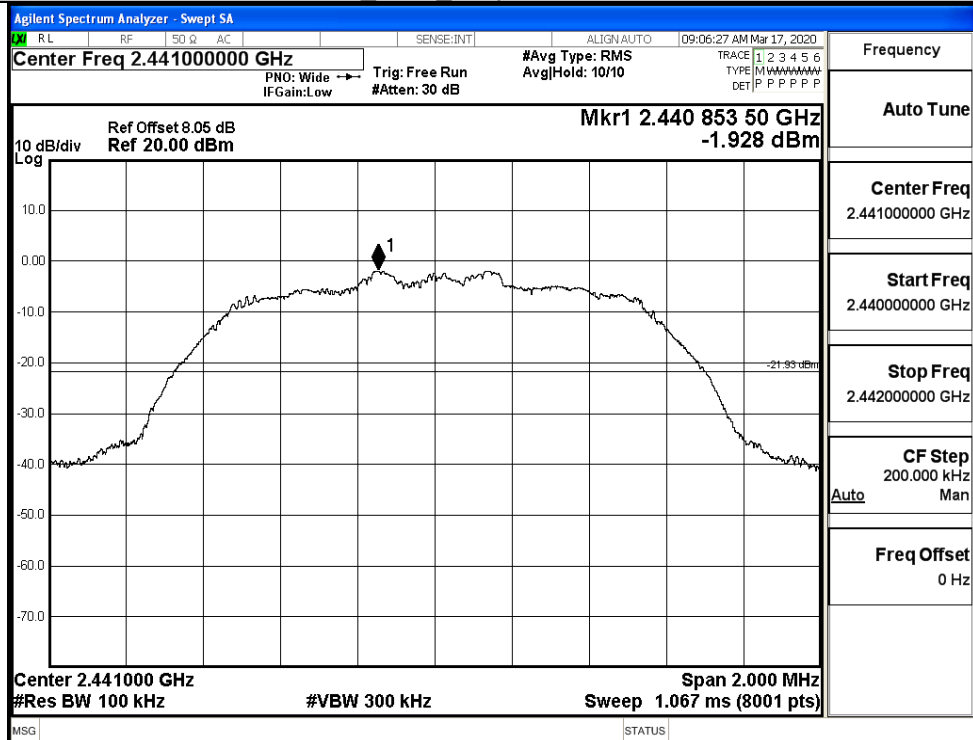


PuW

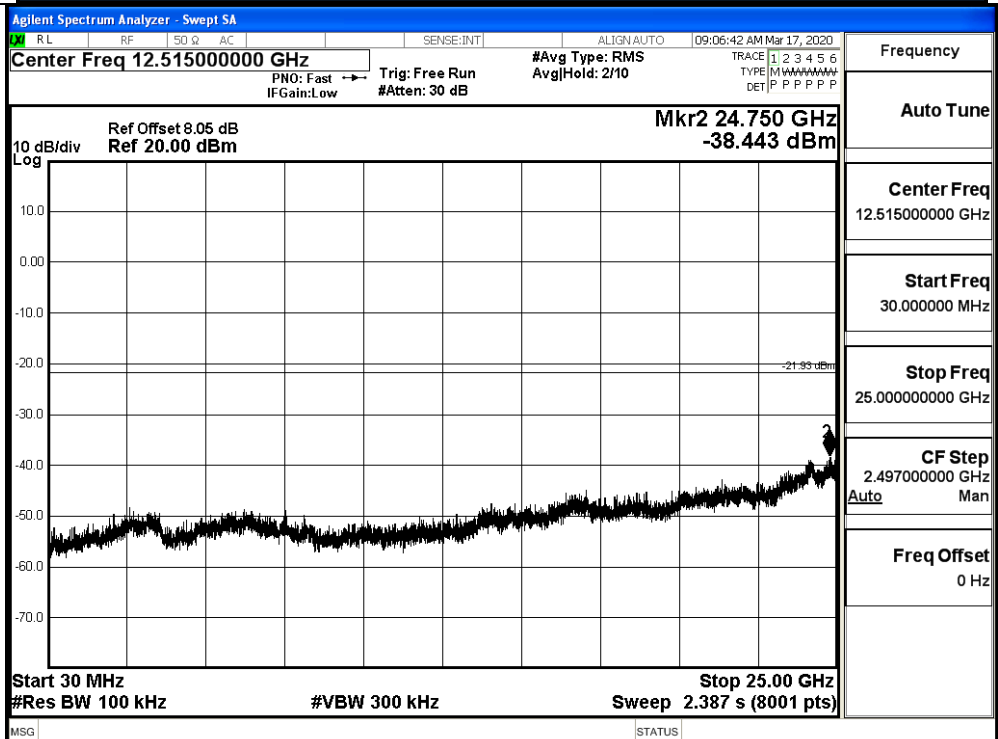


$\pi/4$ DQPSK_MCH_Graphs

Pref

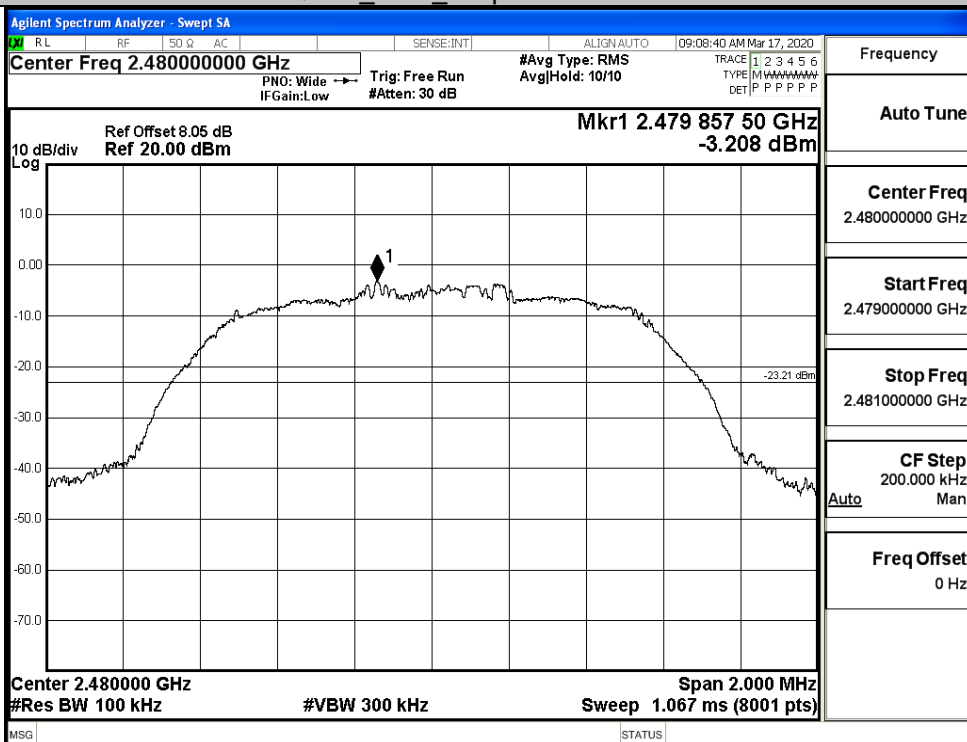


Puw

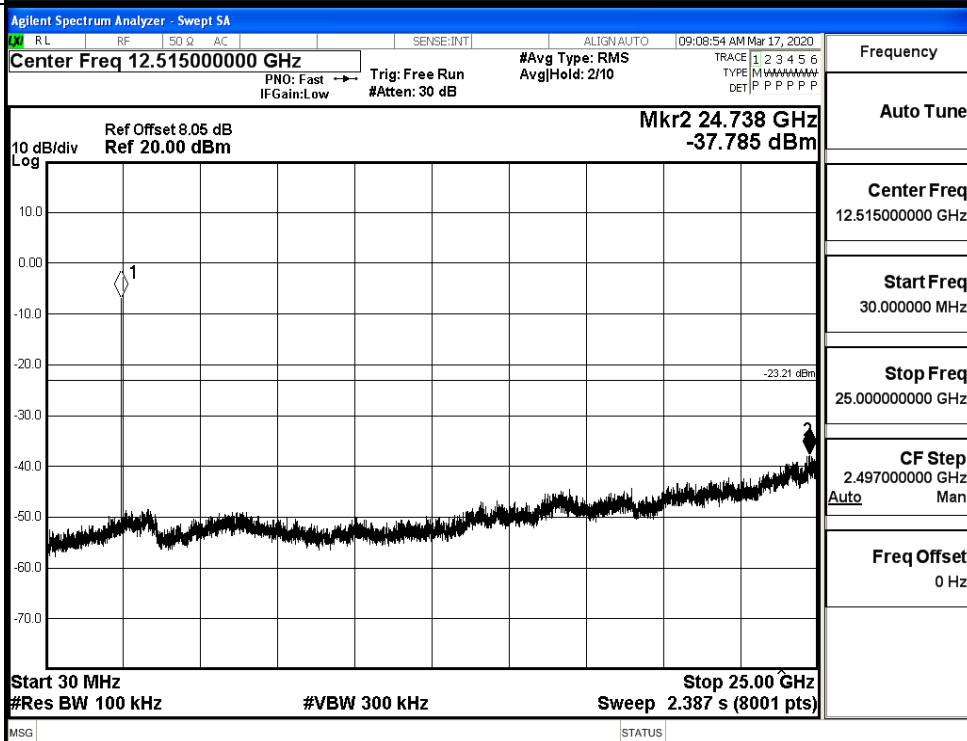


π /4DQPSK_HCH_Graphs

Pref

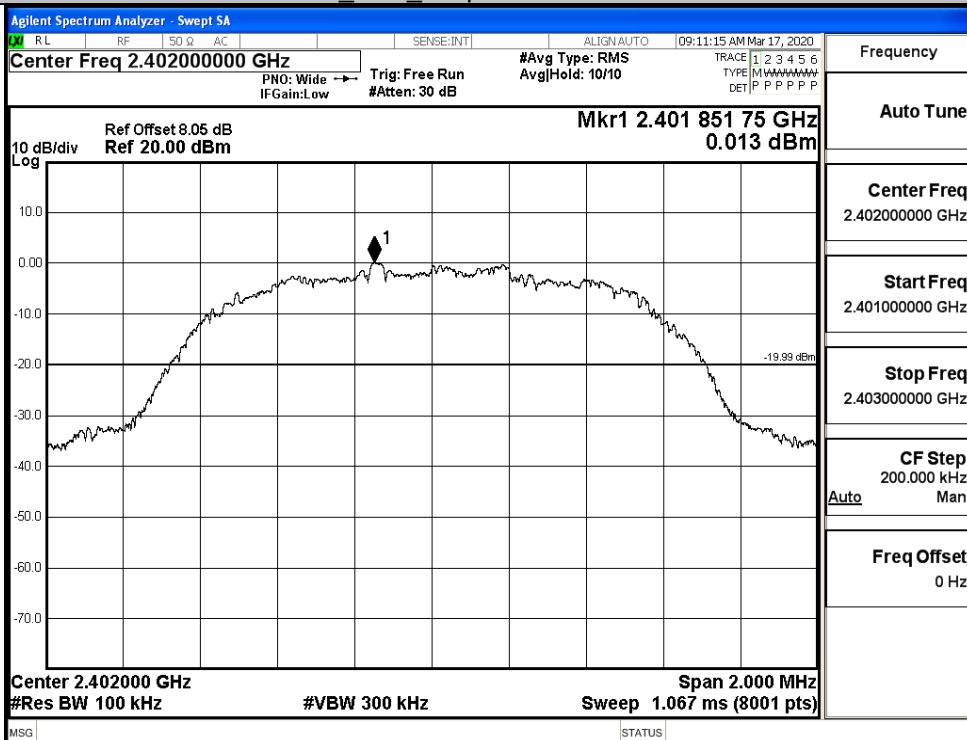


Puw

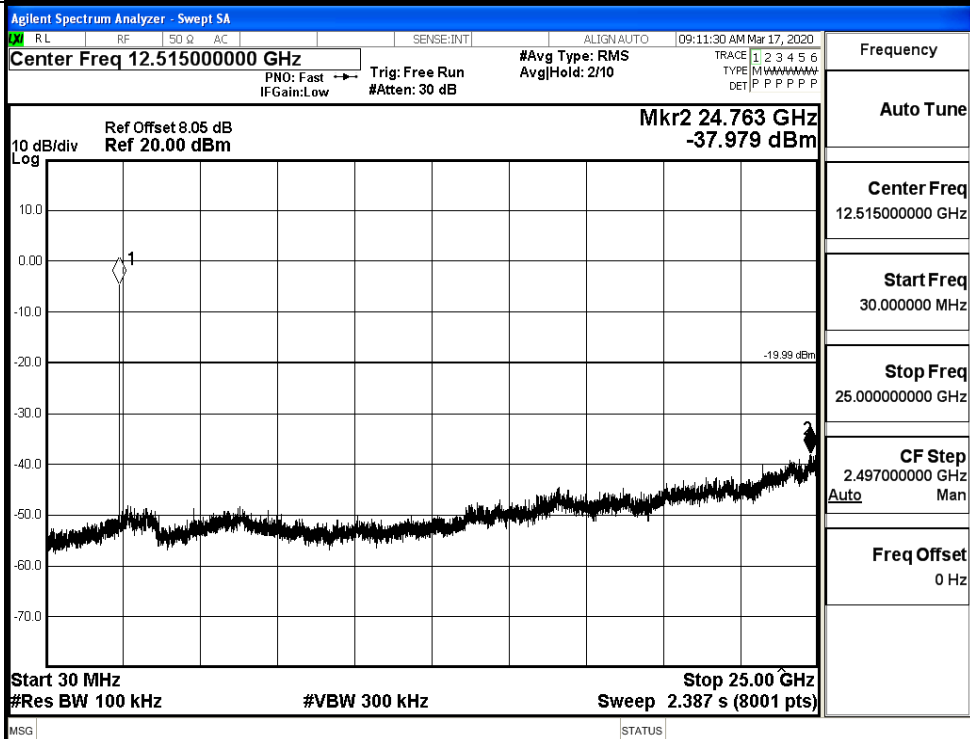


8DPSK_LCH_Graphs

Pref

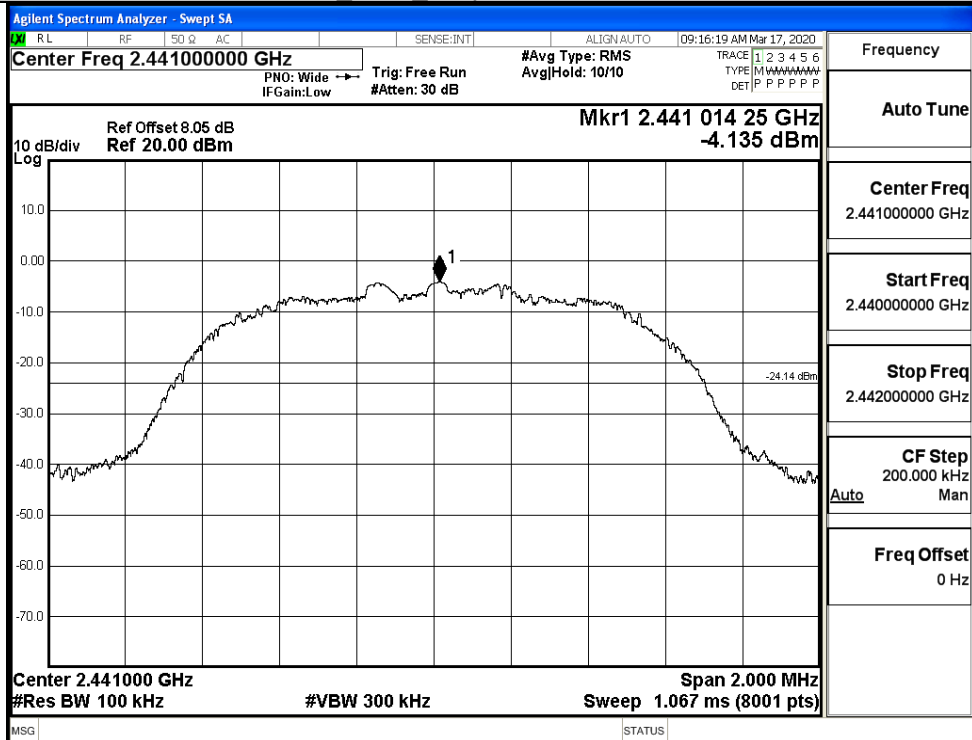


Puw

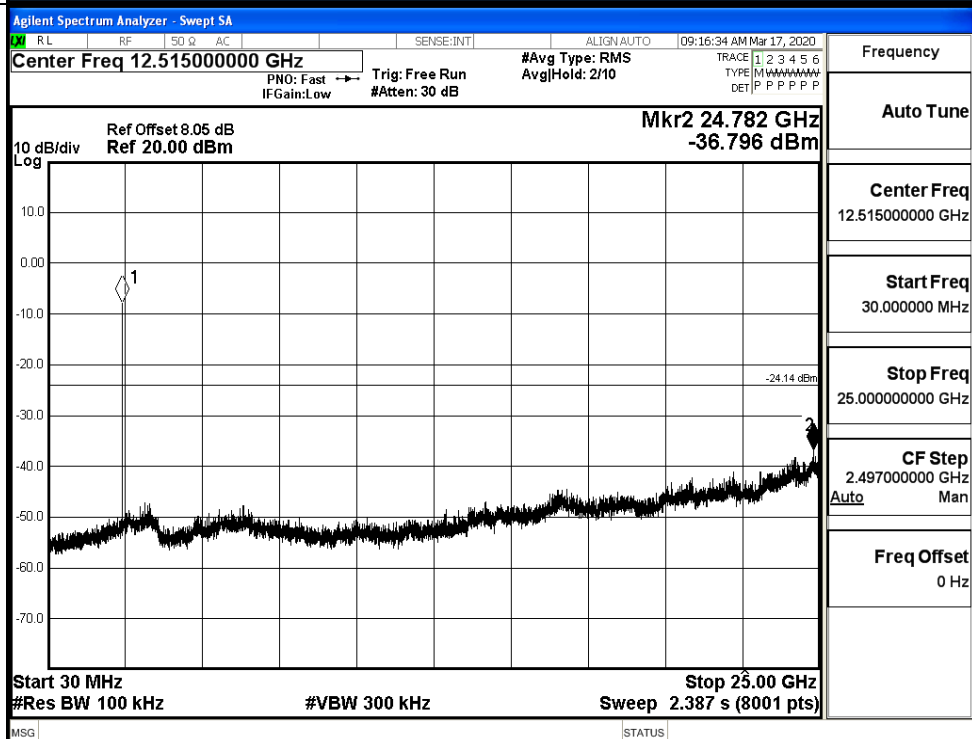


8DPSK_MCH_Graphs

Pref

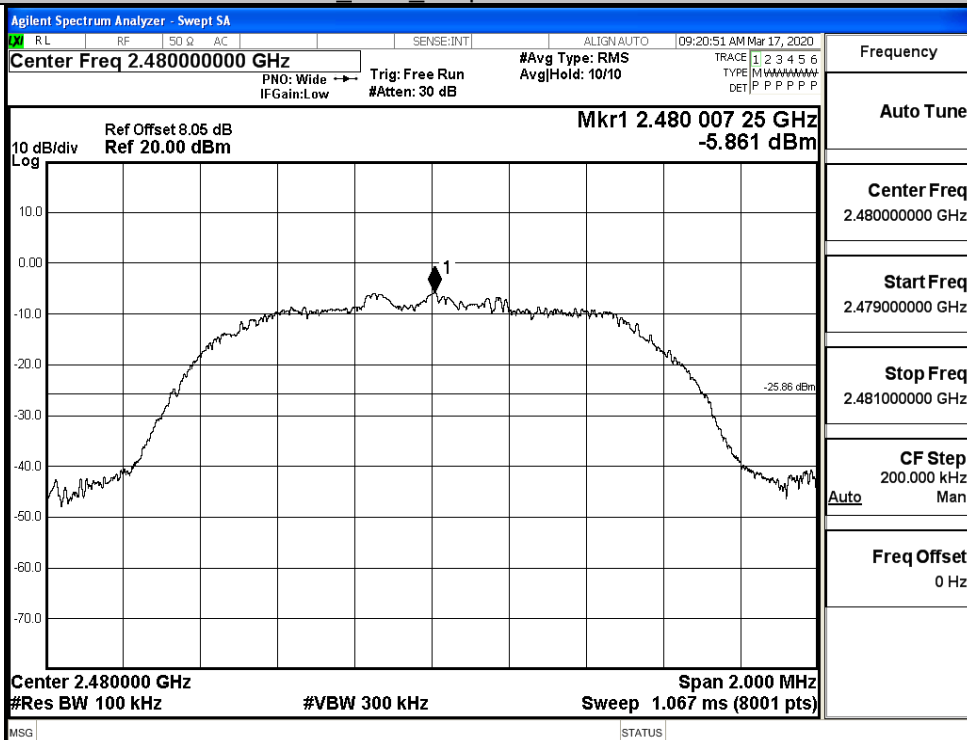


Puw

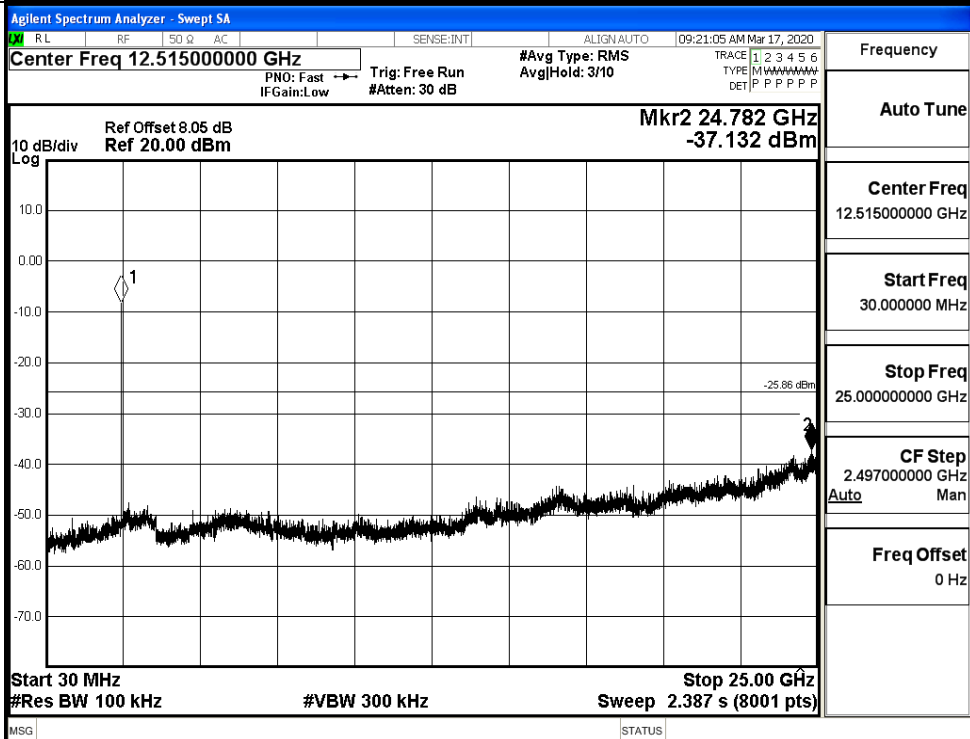


8DPSK_HCH_Graphs

Pref



Puw

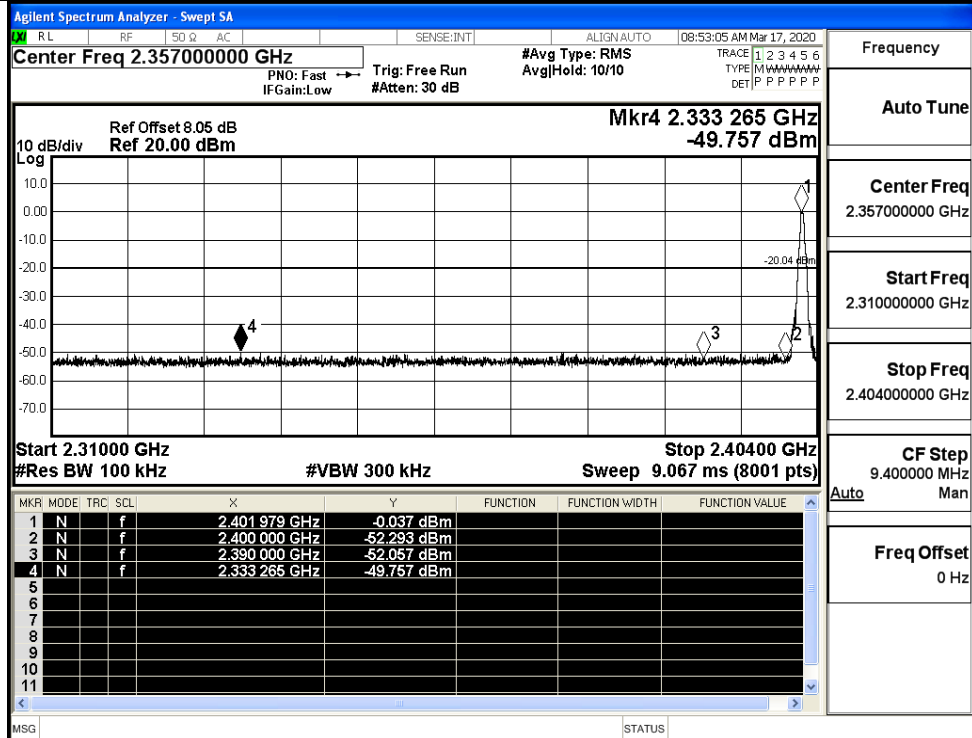


A.7 Band-edge for RF Conducted Emissions

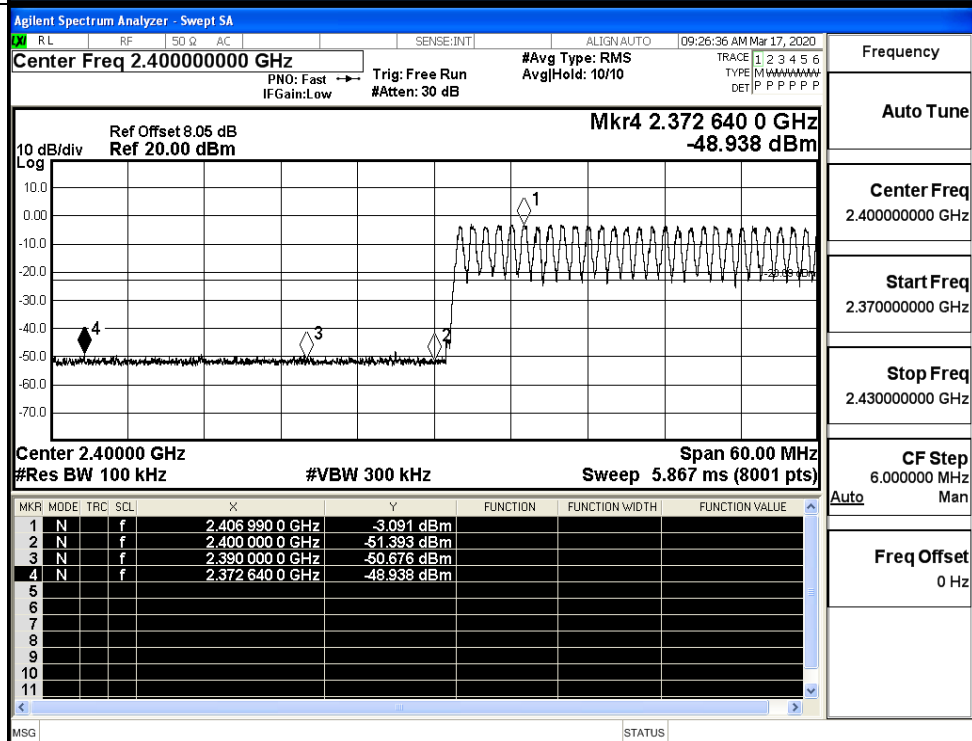
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-0.037	Off	-49.757	-20.04	PASS
			-3.091	On	-48.938	-23.09	PASS
	HCH	2480	-3.239	Off	-49.173	-23.24	PASS
			-4.926	On	-48.594	-24.93	PASS
$\pi/4$ DQPSK	LCH	2402	-0.697	Off	-49.548	-20.7	PASS
			-2.938	On	-48.716	-22.94	PASS
	HCH	2480	-2.957	Off	-49.254	-22.96	PASS
			-4.857	On	-47.889	-24.86	PASS
8DPSK	LCH	2402	0.190	Off	-48.925	-19.81	PASS
			-2.742	On	-47.716	-22.74	PASS
	HCH	2480	-5.748	Off	-49.020	-25.75	PASS
			-4.863	On	-48.961	-24.86	PASS

Test Graphs

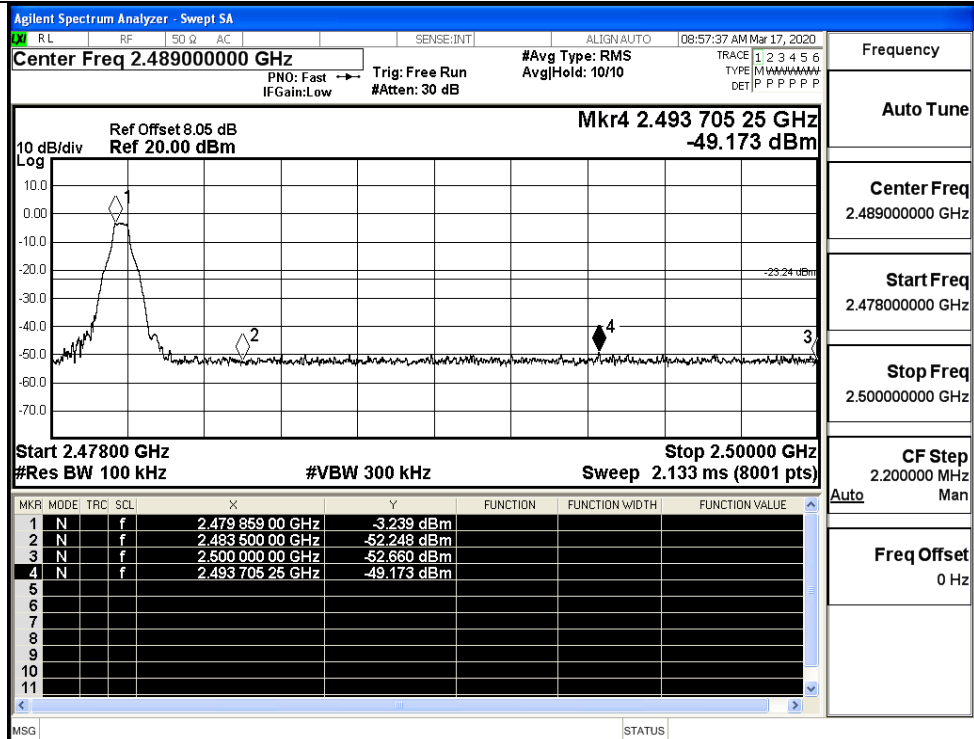
GFSK/LCH/No Hop



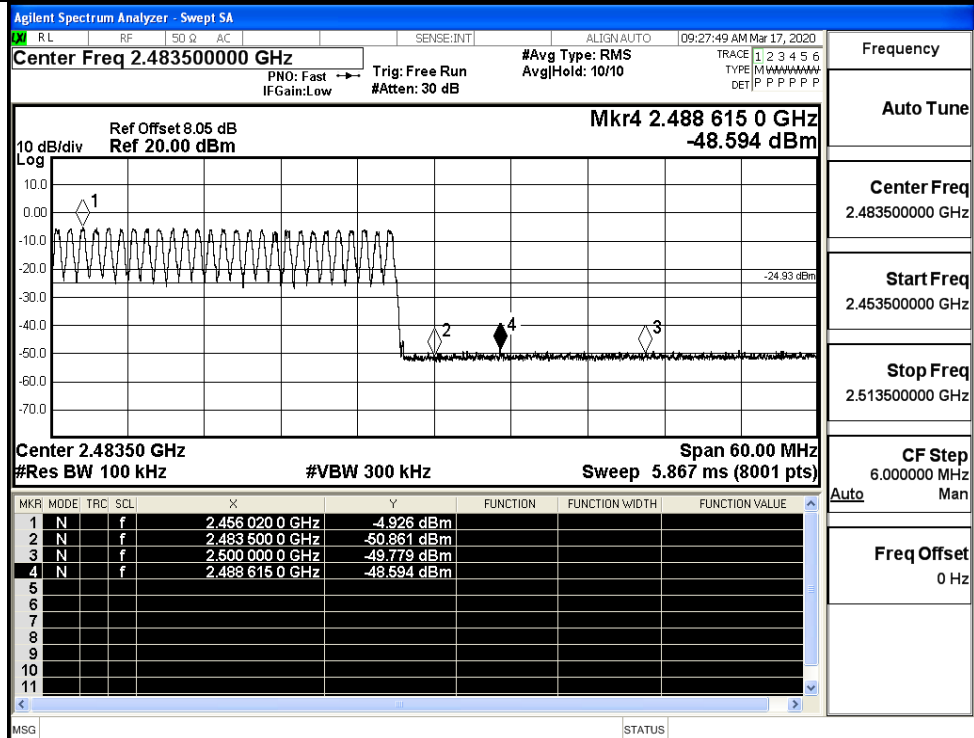
GFSK/LCH/Hop



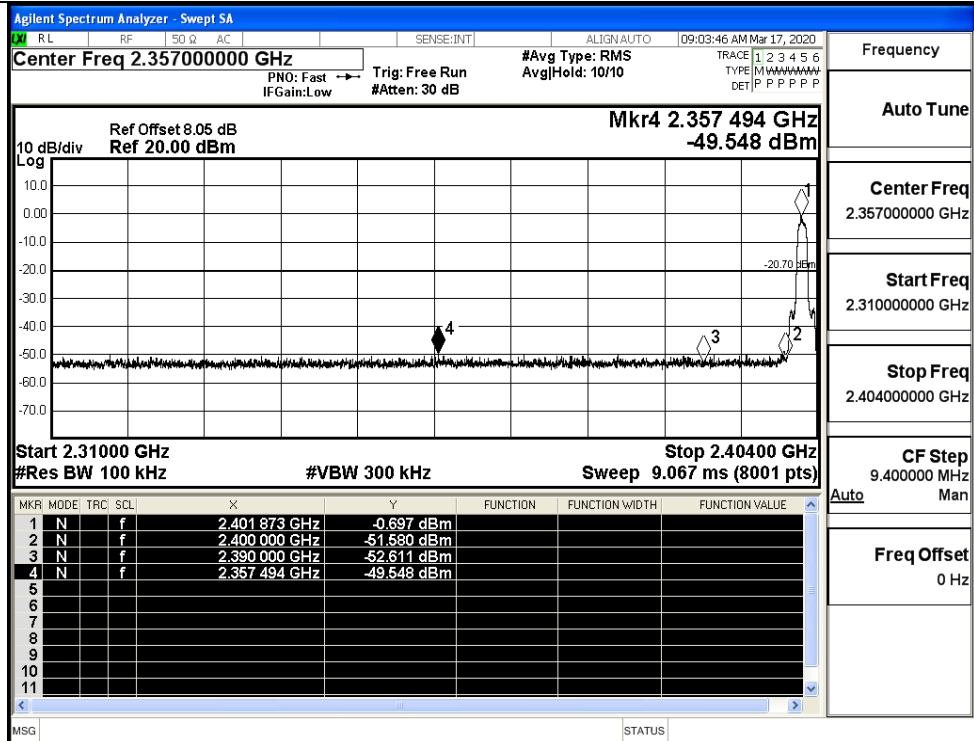
GFSK/HCH/No Hop



GFSK/HCH/Hop



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



Frequency

Auto Tune

Center Freq
2.357000000 GHz

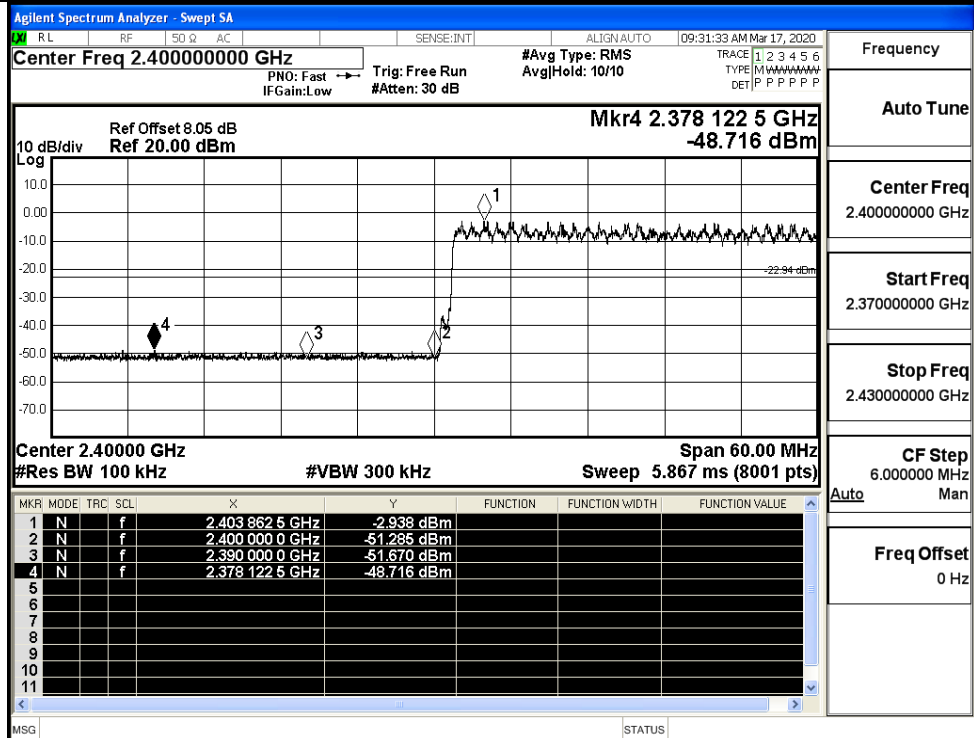
Start Freq
2.310000000 GHz

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

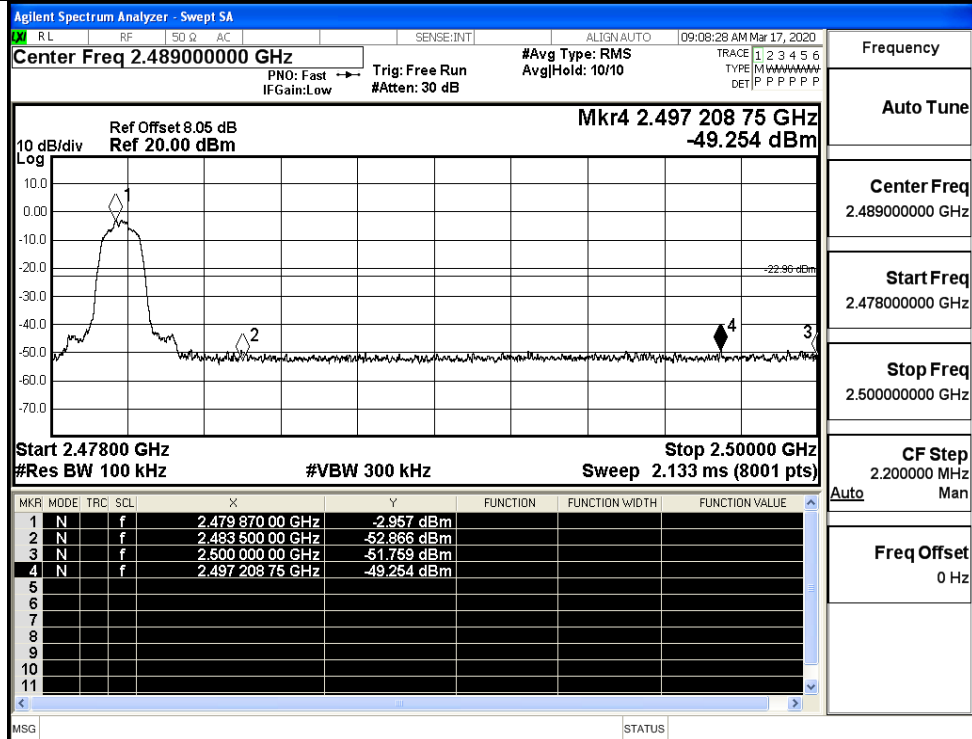
Start Freq
2.370000000 GHz

Stop Freq
2.430000000 GHz

CF Step
6.000000 MHz
Auto Man

Freq Offset
0 Hz

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



Frequency

Auto Tune

Center Freq
2.489000000 GHz

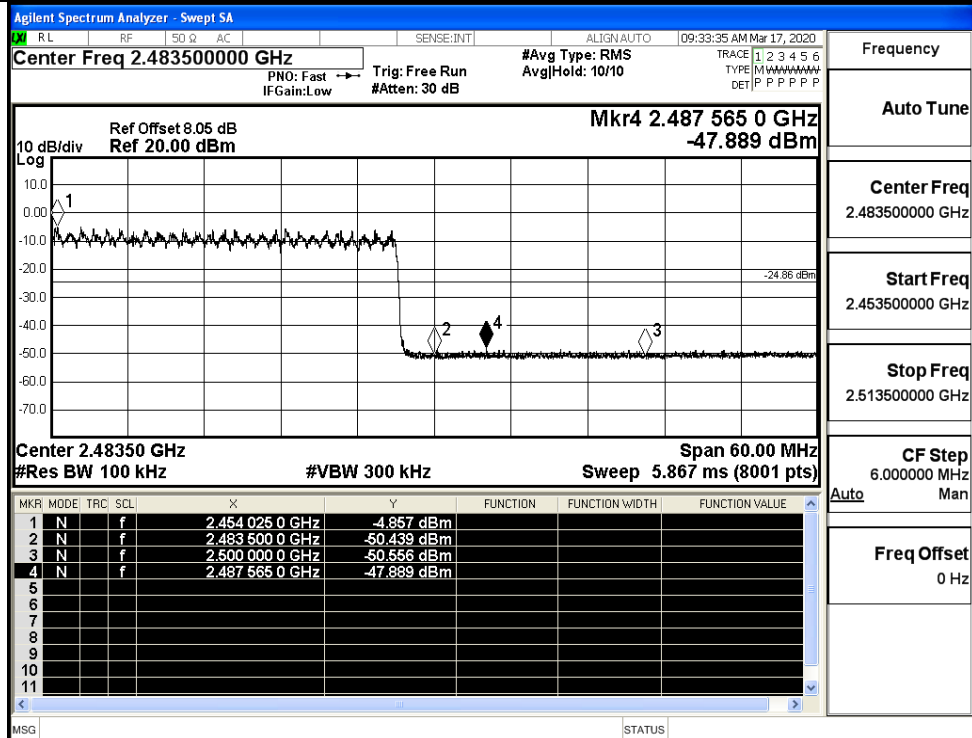
Start Freq
2.478000000 GHz

Stop Freq
2.500000000 GHz

CF Step
2.200000 MHz
Auto Man

Freq Offset
0 Hz

$\pi/4$ DQPSK/HCH/Hop



Frequency

Auto Tune

Center Freq
2.483500000 GHz

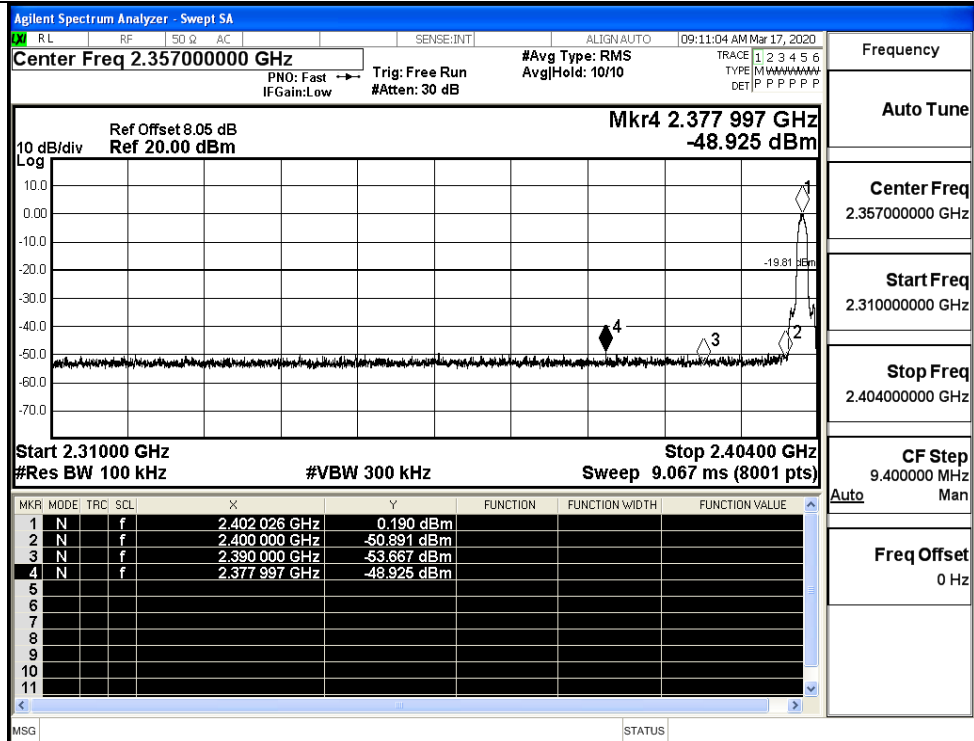
Start Freq
2.453500000 GHz

Stop Freq
2.513500000 GHz

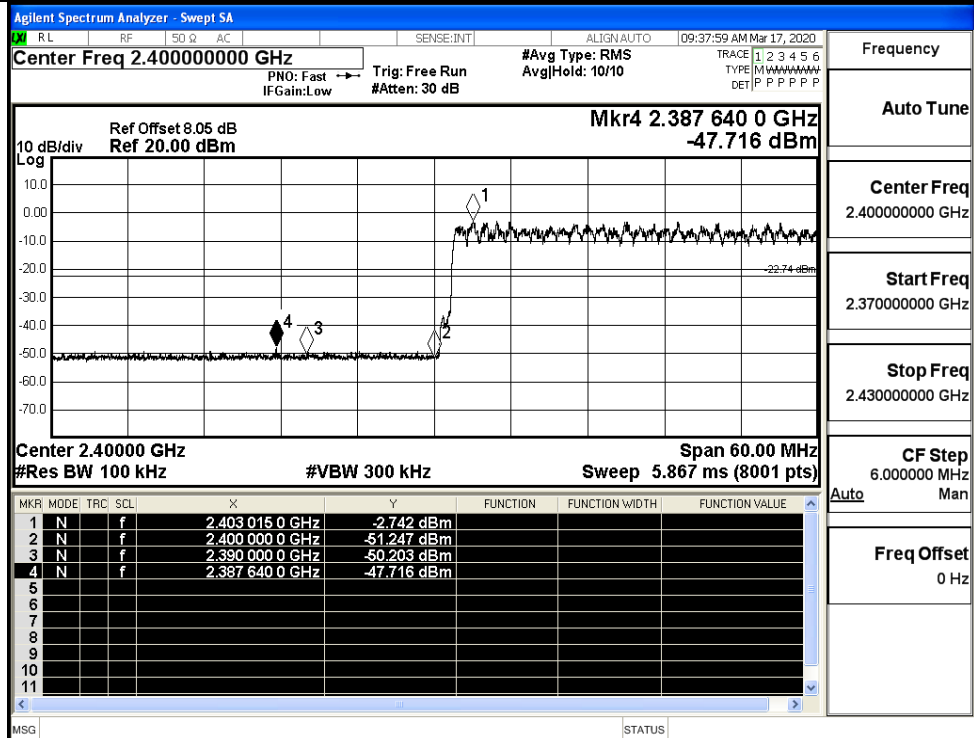
CF Step
6.000000 MHz
Auto Man

Freq Offset
0 Hz

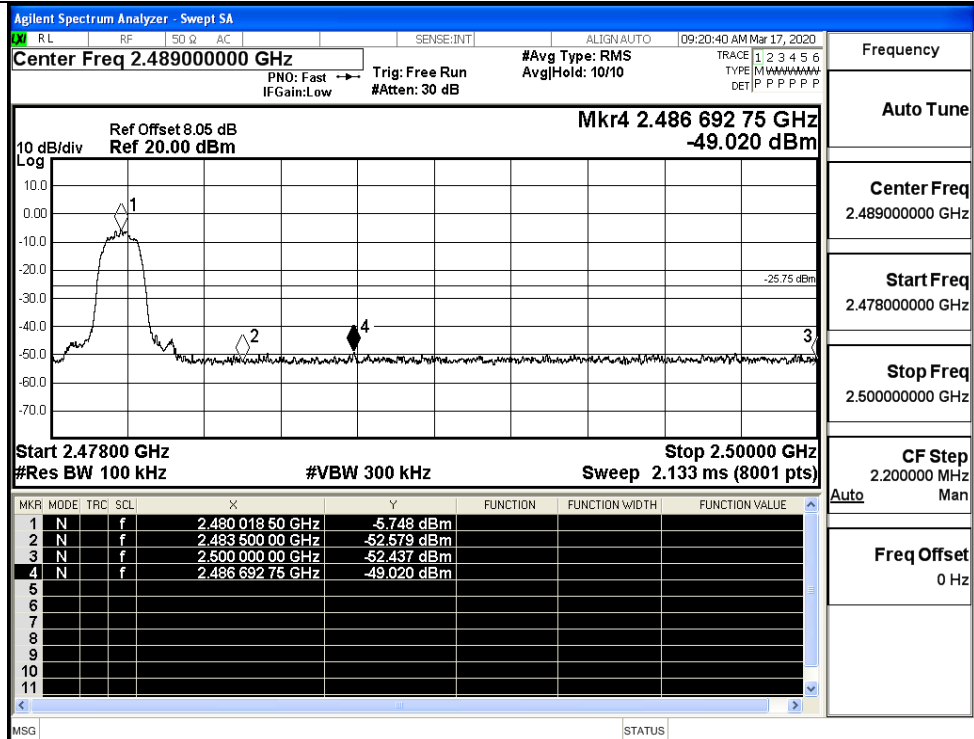
8DPSK/LCH/No Hop



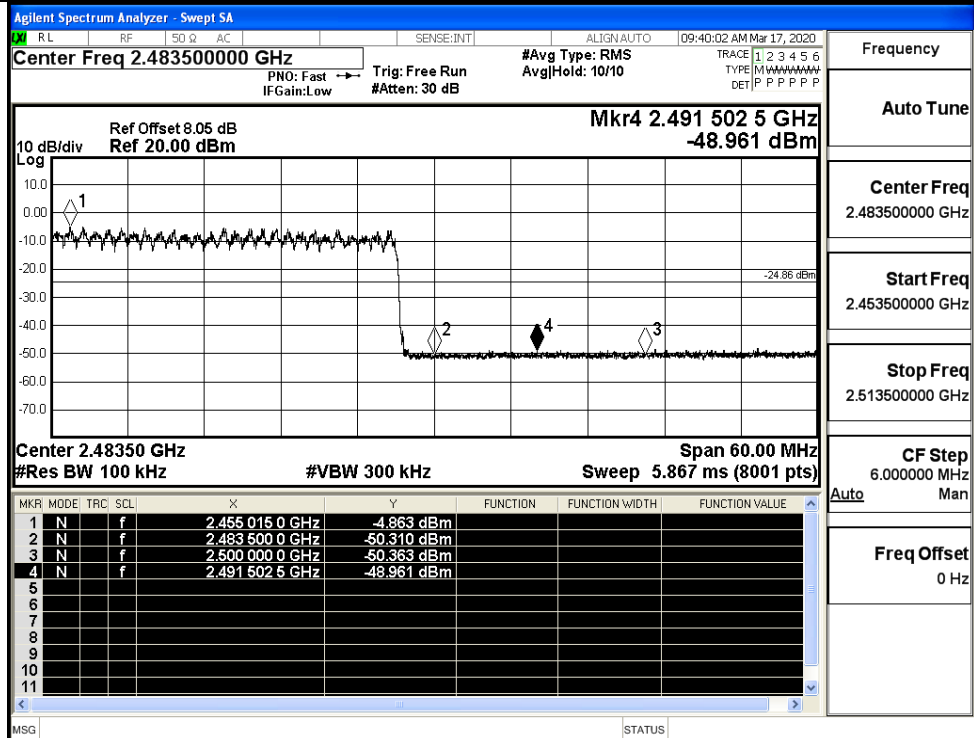
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



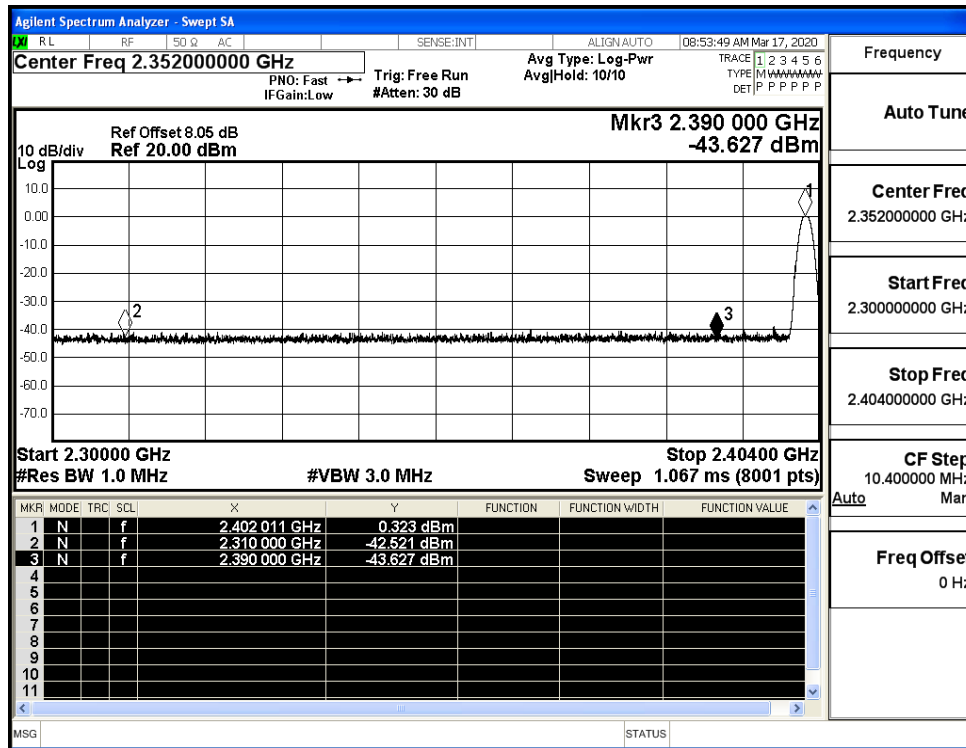
8DPSK/HCH/Hop



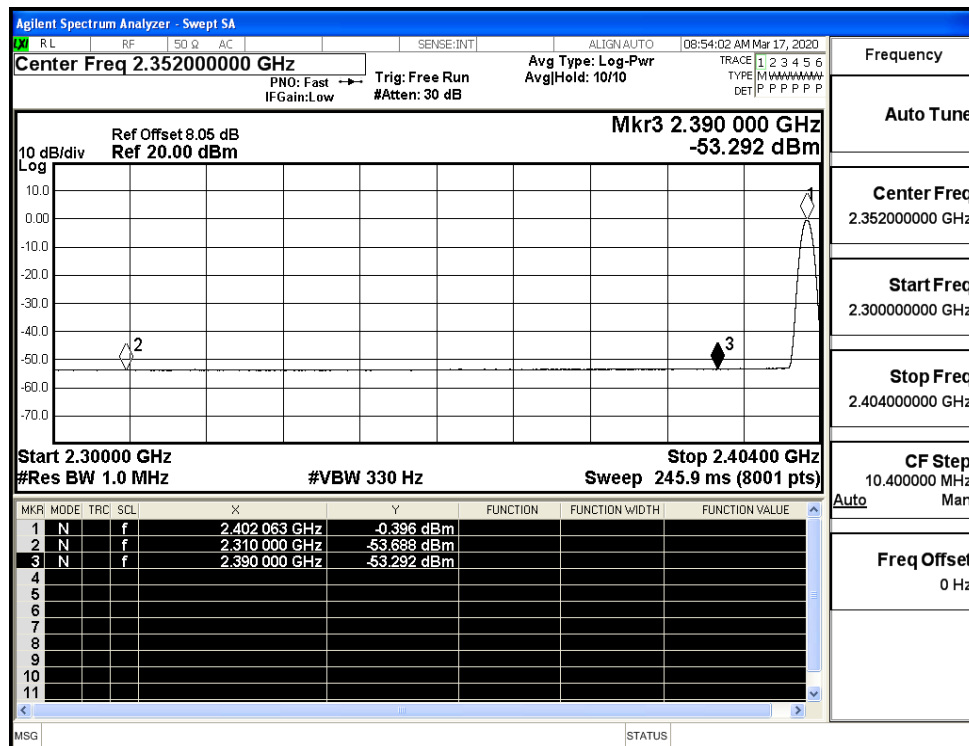
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-42.52	2.0	0	54.71	PEAK	74	PASS
	Off	2310.0	-53.69	2.0	0	43.54	AV	54	PASS
	Off	2390.0	-43.63	2.0	0	53.60	PEAK	74	PASS
	Off	2390.0	-53.29	2.0	0	43.94	AV	54	PASS
	Off	2483.5	-41.94	2.0	0	55.29	PEAK	74	PASS
	Off	2483.5	-52.82	2.0	0	44.41	AV	54	PASS
	Off	2500.0	-42.28	2.0	0	54.95	PEAK	74	PASS
	Off	2500.0	-52.62	2.0	0	44.61	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.96	2.0	0	53.27	PEAK	74	PASS
	Off	2310.0	-53.75	2.0	0	43.48	AV	54	PASS
	Off	2390.0	-43.44	2.0	0	53.79	PEAK	74	PASS
	Off	2390.0	-53.33	2.0	0	43.90	AV	54	PASS
	Off	2483.5	-42.29	2.0	0	54.94	PEAK	74	PASS
	Off	2483.5	-52.40	2.0	0	44.83	AV	54	PASS
	Off	2500.0	-42.78	2.0	0	54.45	PEAK	74	PASS
	Off	2500.0	-52.38	2.0	0	44.85	AV	54	PASS
8DPSK	Off	2310.0	-43.07	2.0	0	54.16	PEAK	74	PASS
	Off	2310.0	-53.48	2.0	0	43.75	AV	54	PASS
	Off	2390.0	-43.19	2.0	0	54.04	PEAK	74	PASS
	Off	2390.0	-52.96	2.0	0	44.27	AV	54	PASS
	Off	2483.5	-43.39	2.0	0	53.84	PEAK	74	PASS
	Off	2483.5	-52.57	2.0	0	44.66	AV	54	PASS
	Off	2500.0	-42.11	2.0	0	55.12	PEAK	74	PASS
	Off	2500.0	-52.42	2.0	0	44.81	AV	54	PASS

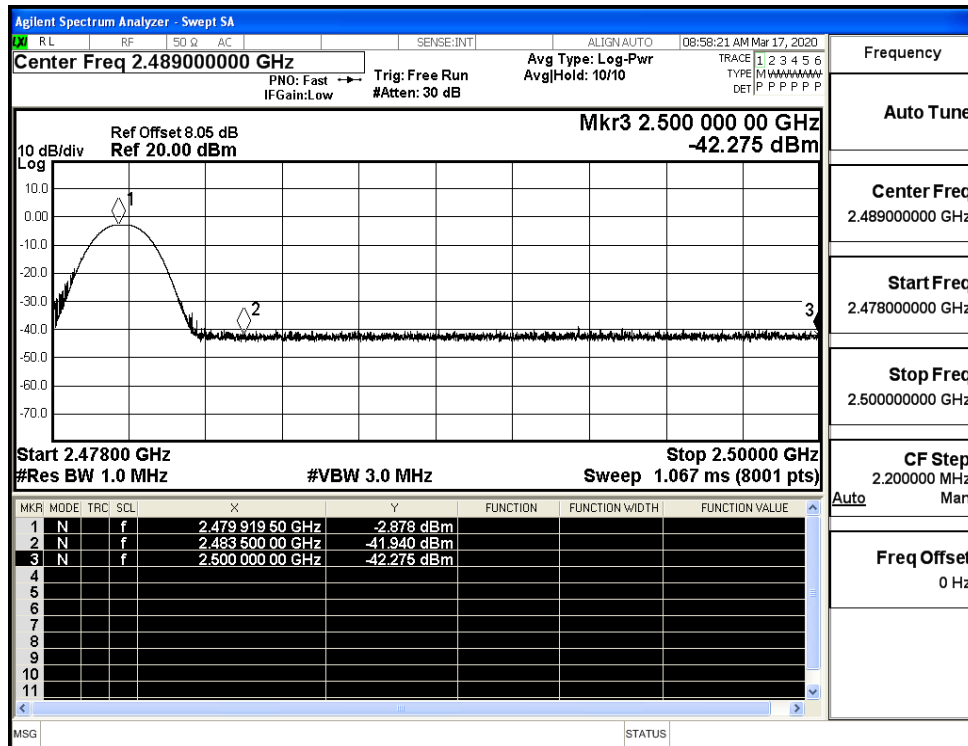
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



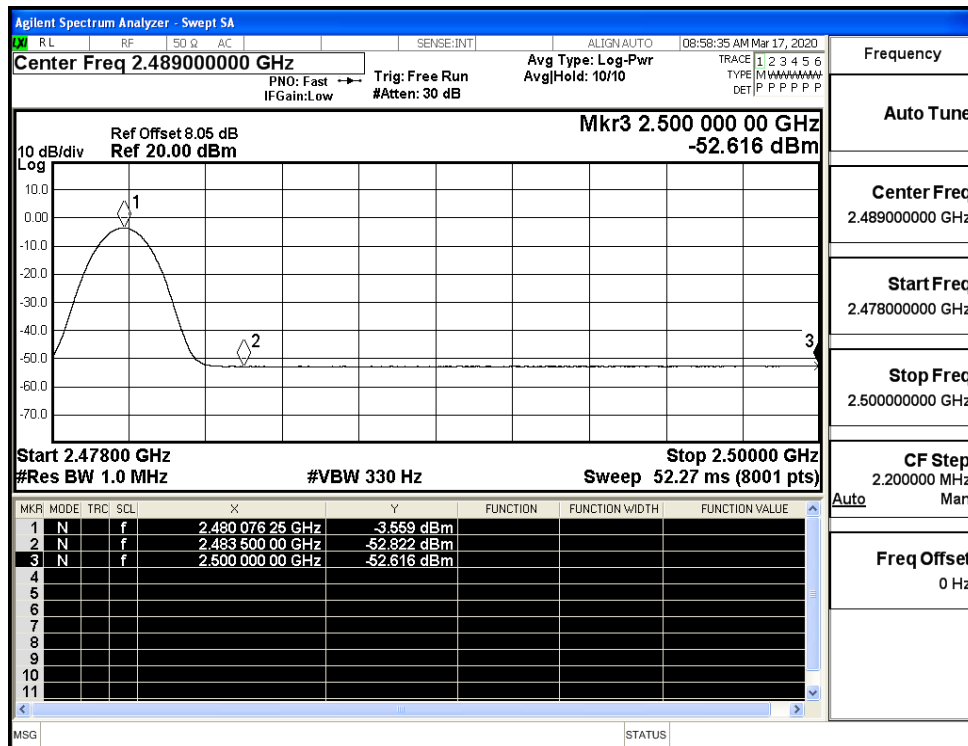
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

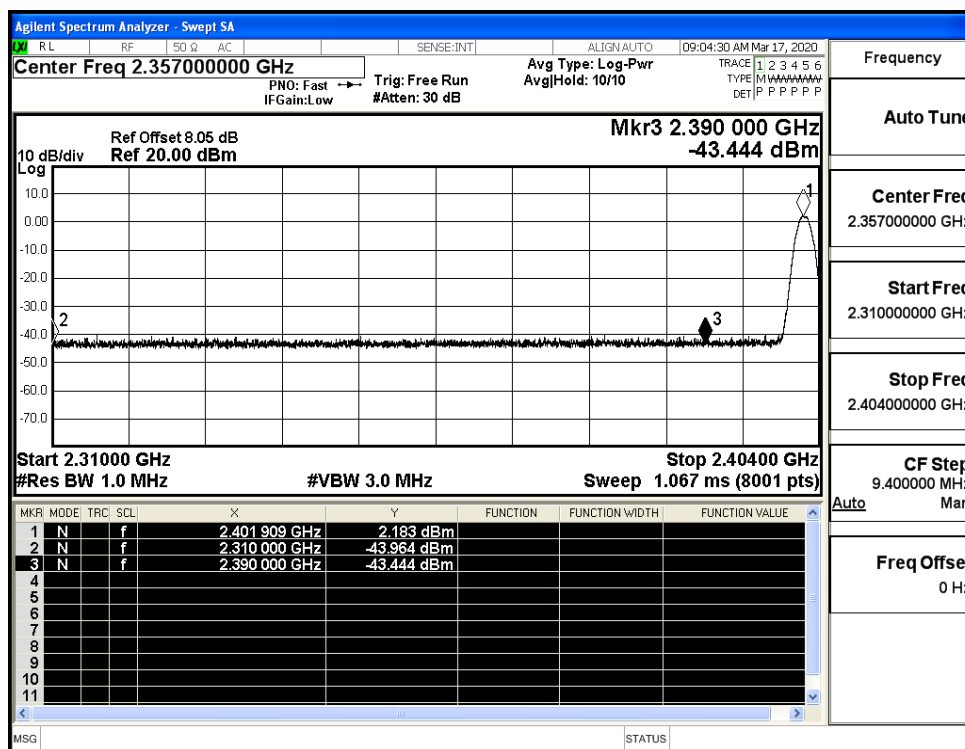
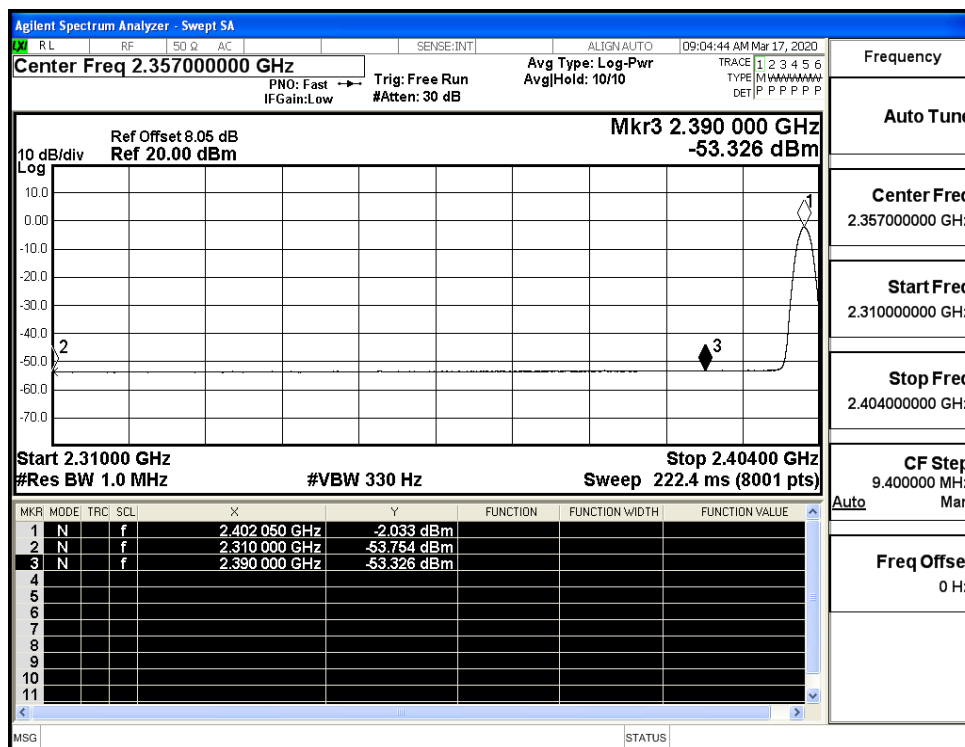


Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)

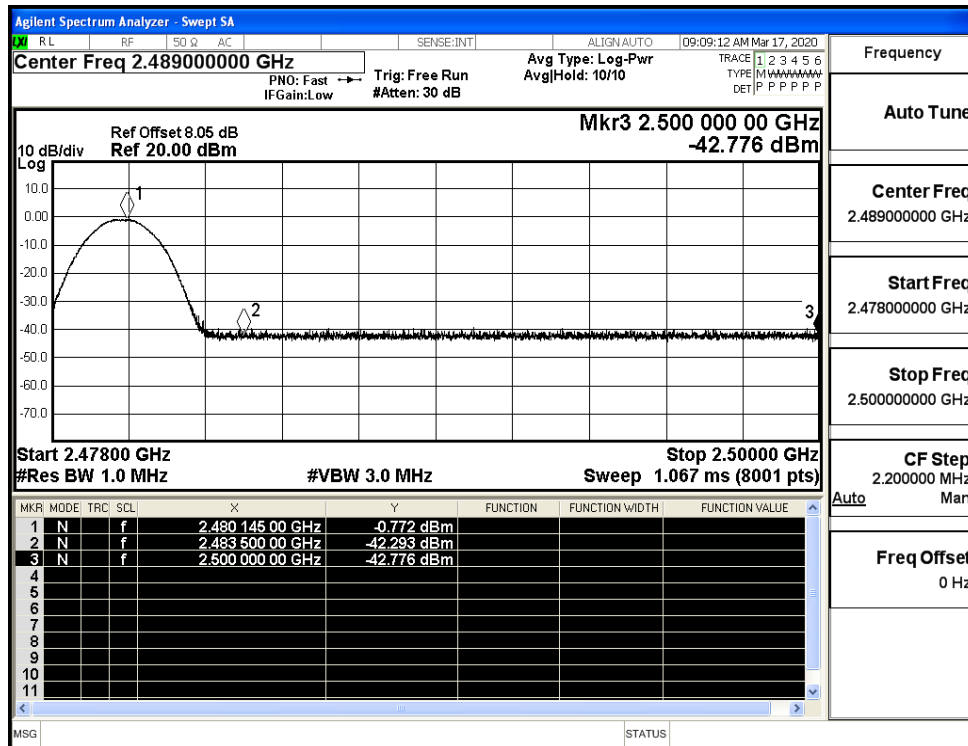


Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)

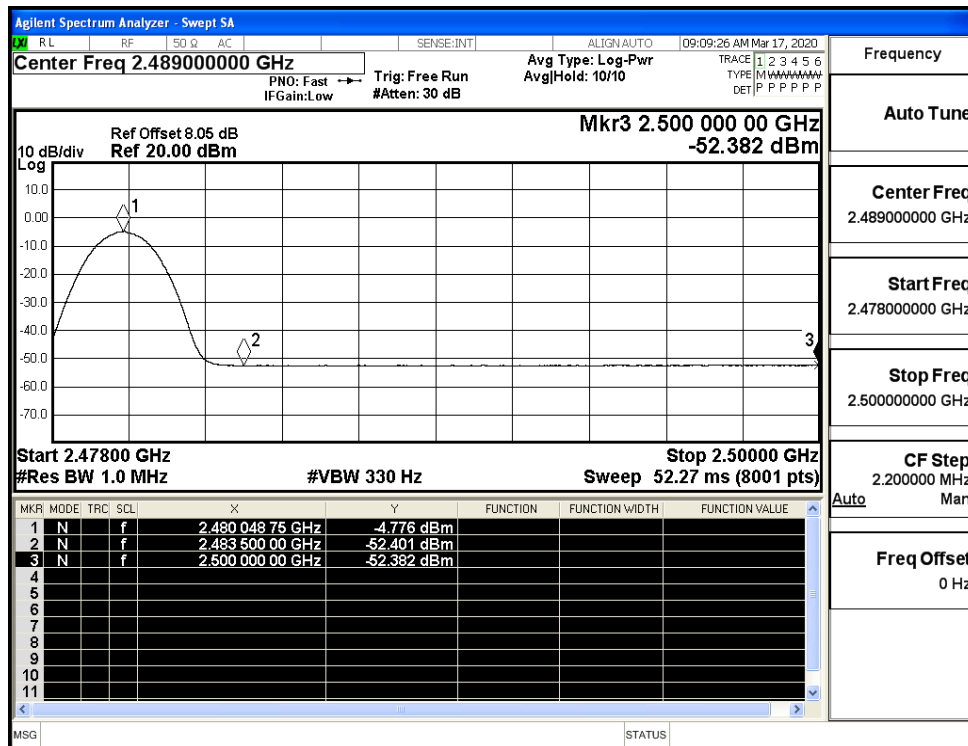


Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

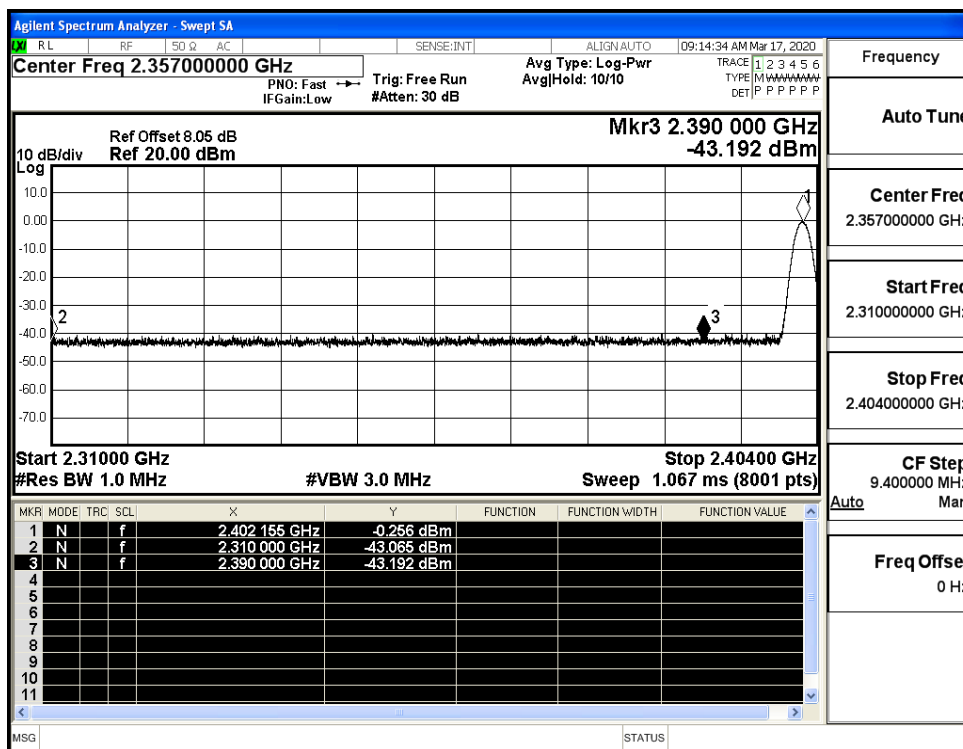
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



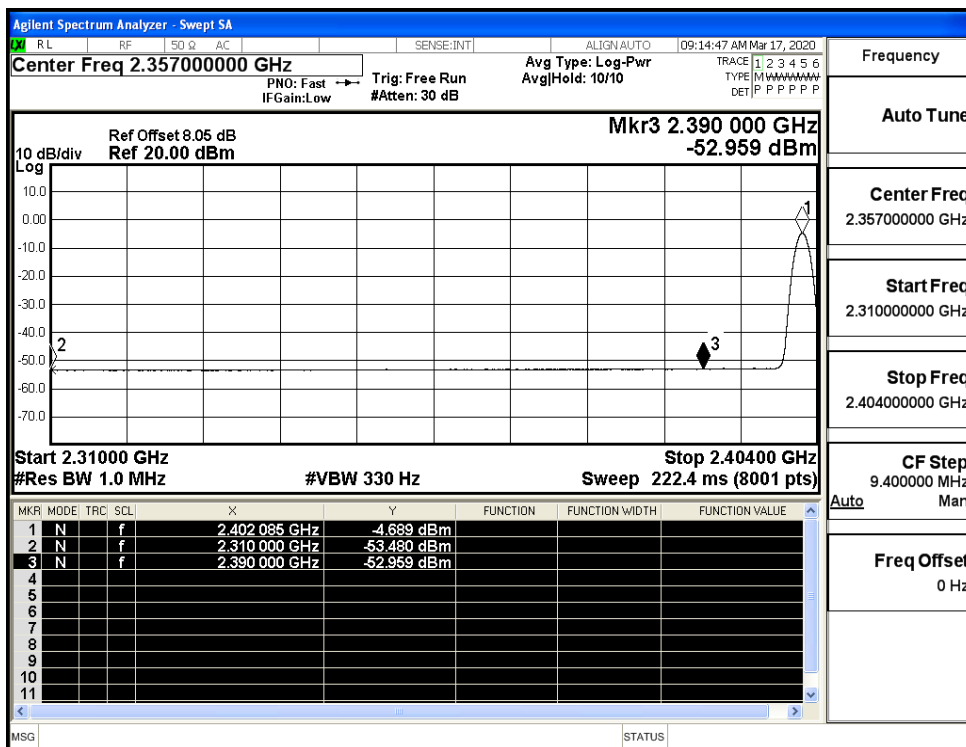
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



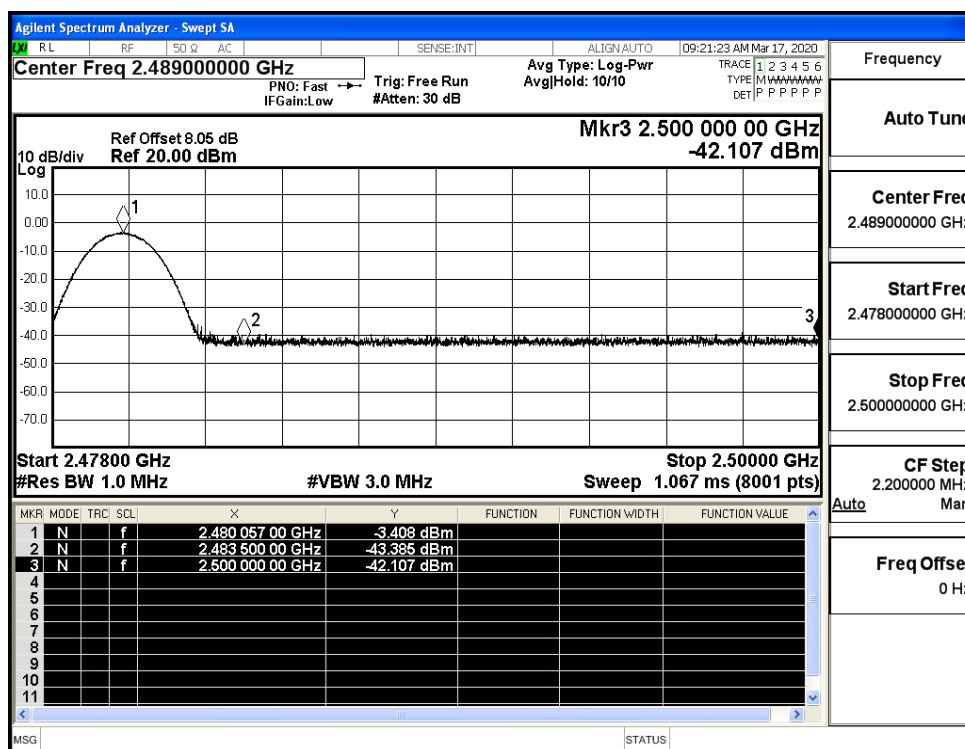
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

