

Appendix A

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

Product Name: 3G/4G Smart Phone

Trade Mark: DOOGEE

Test Model: N30

Environmental Conditions

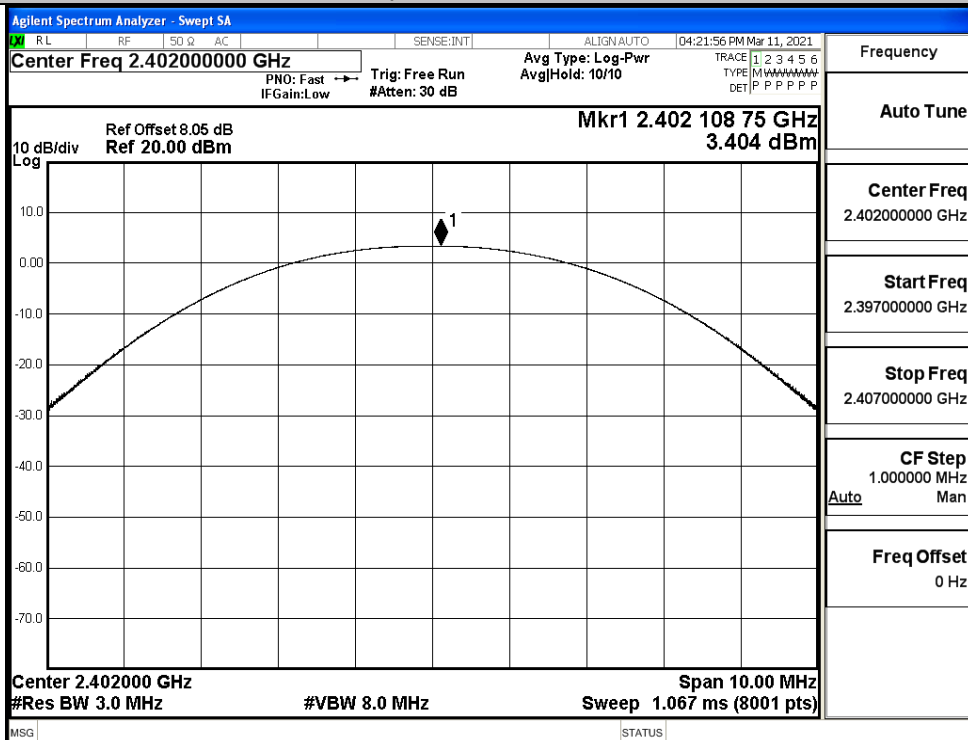
Temperature:	22.9° C
Relative Humidity:	53.3%
ATM Pressure:	100.0 kPa
Test Engineer:	Diamond Lu
Supervised by:	Li Huan

A.1 Maximum Conducted Peak Output Power

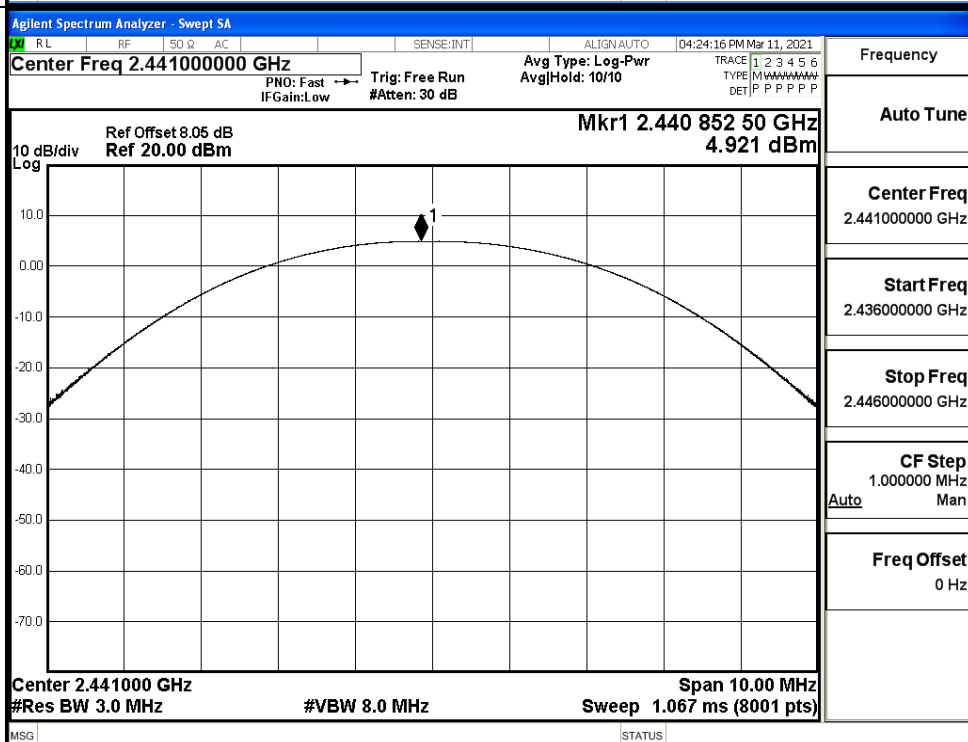
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.404	21	PASS
	MCH	4.921	21	PASS
	HCH	3.343	21	PASS
$\pi/4$ DQPSK	LCH	2.558	21	PASS
	MCH	4.117	21	PASS
	HCH	2.604	21	PASS
8DPSK	LCH	2.713	21	PASS
	MCH	4.272	21	PASS
	HCH	2.772	21	PASS

Test Graphs

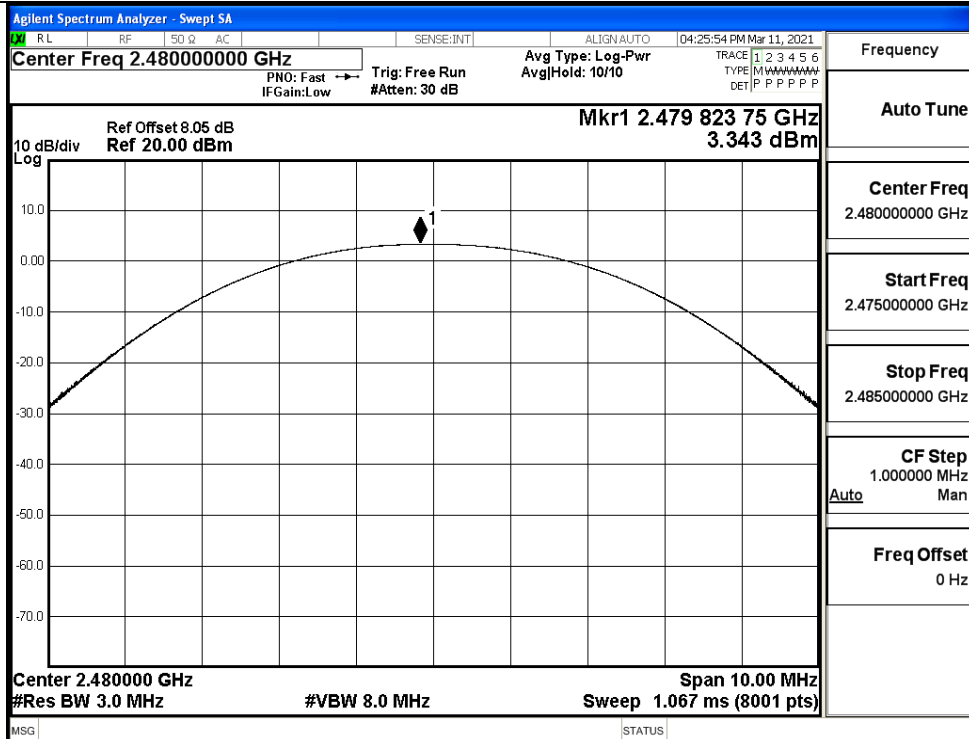
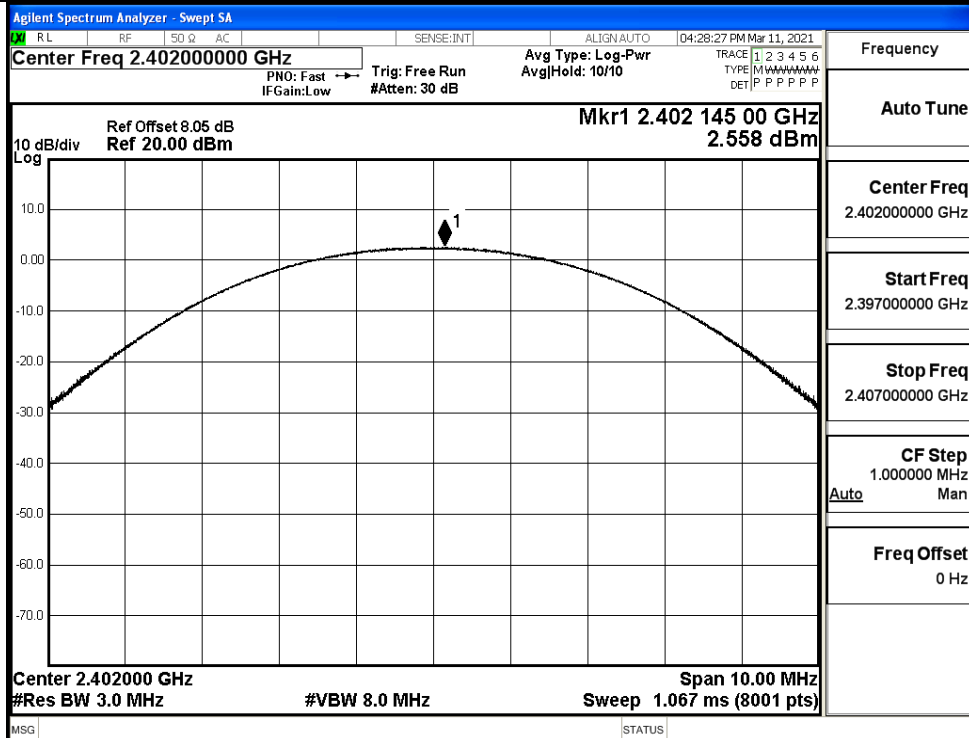
GFSK/LCH

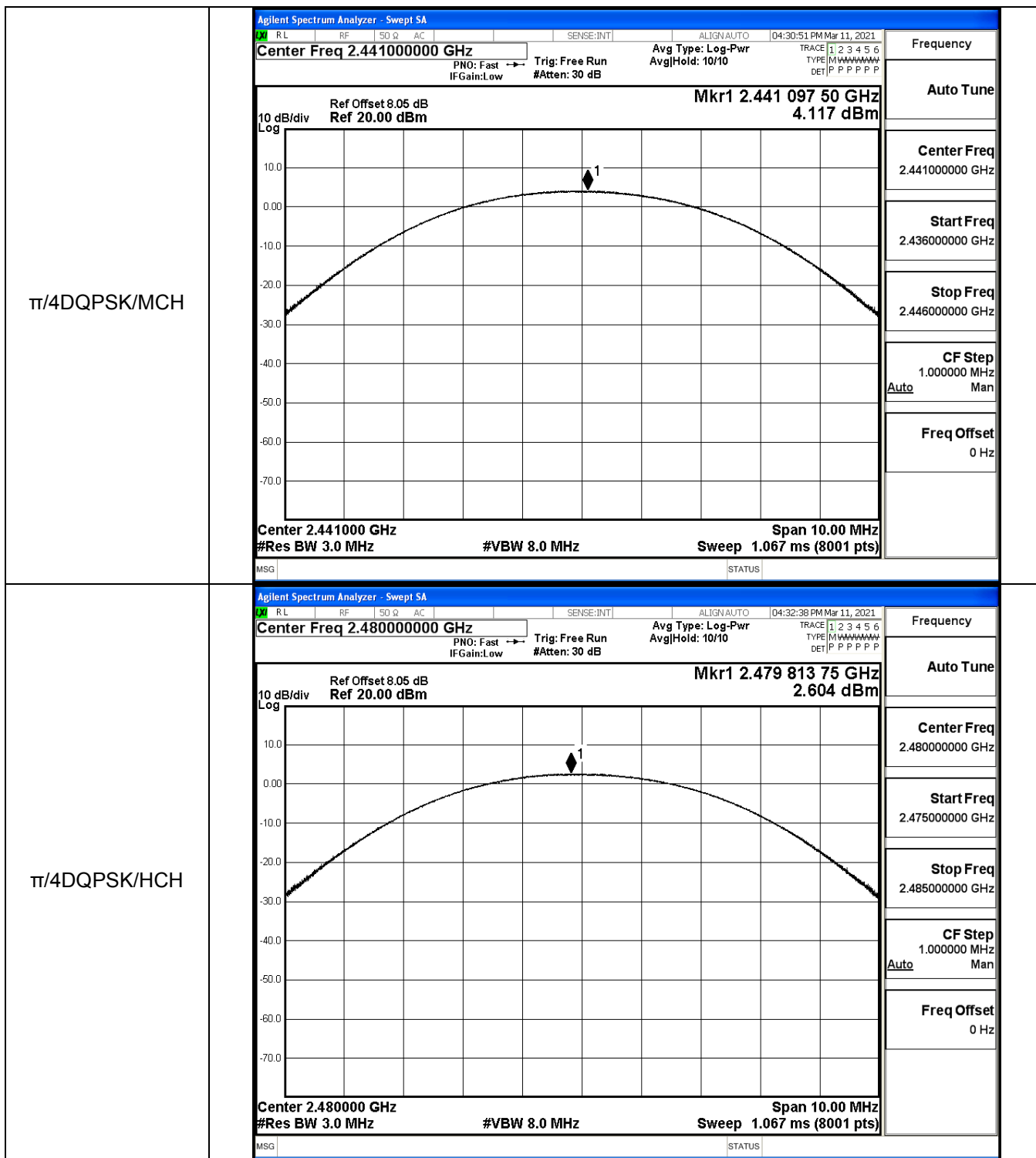


GFSK/MCH

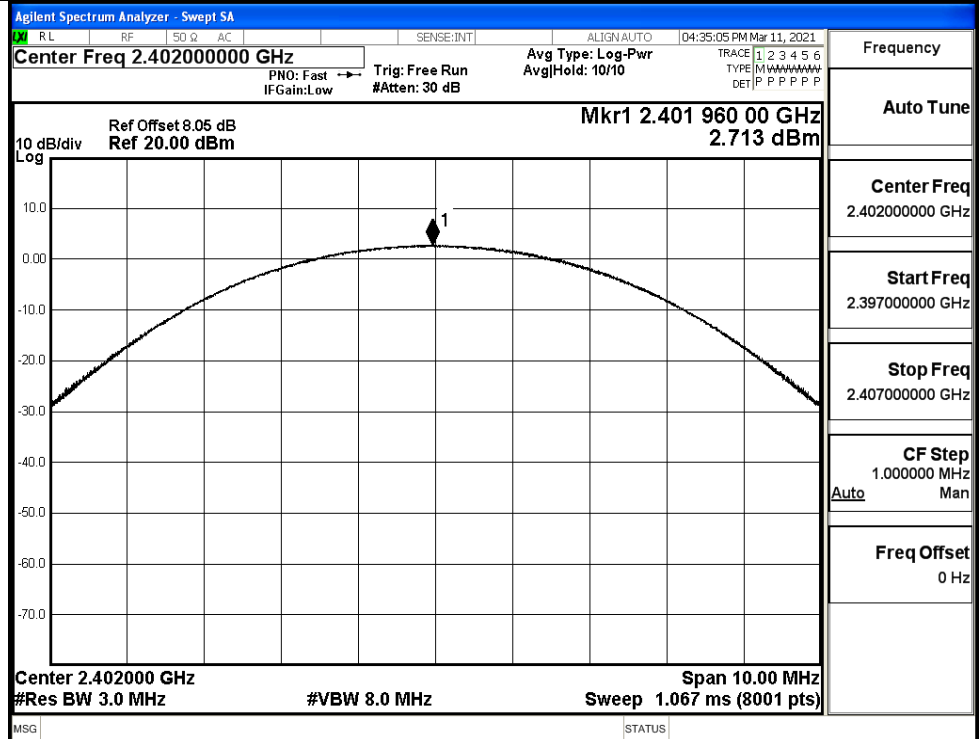


GFSK/HCH

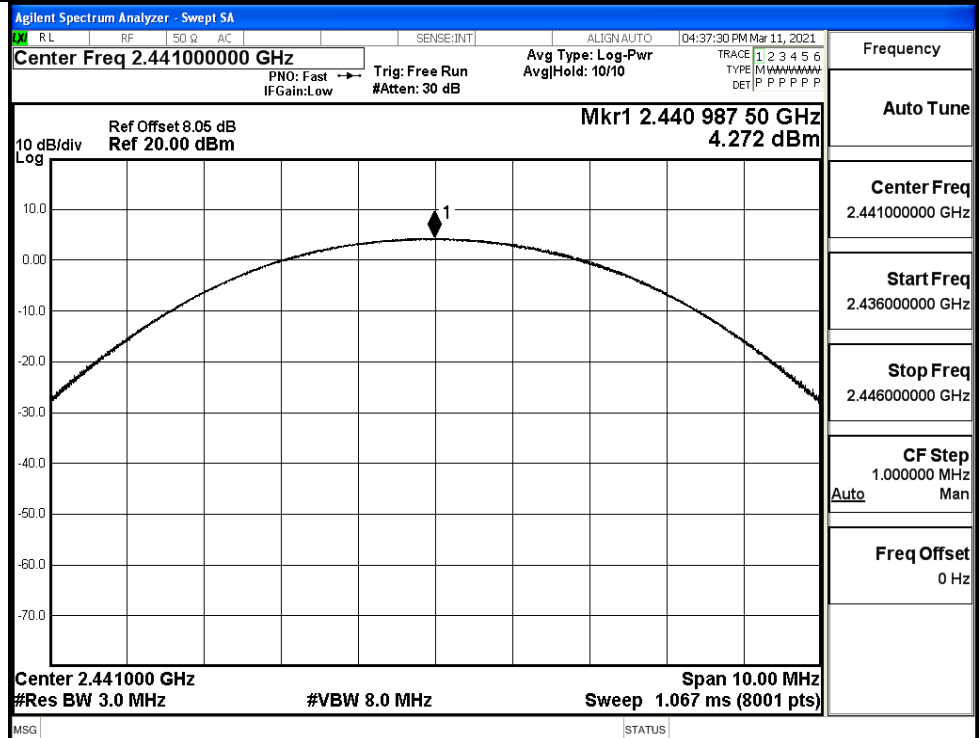
 $\pi/4$ DQPSK/LCH



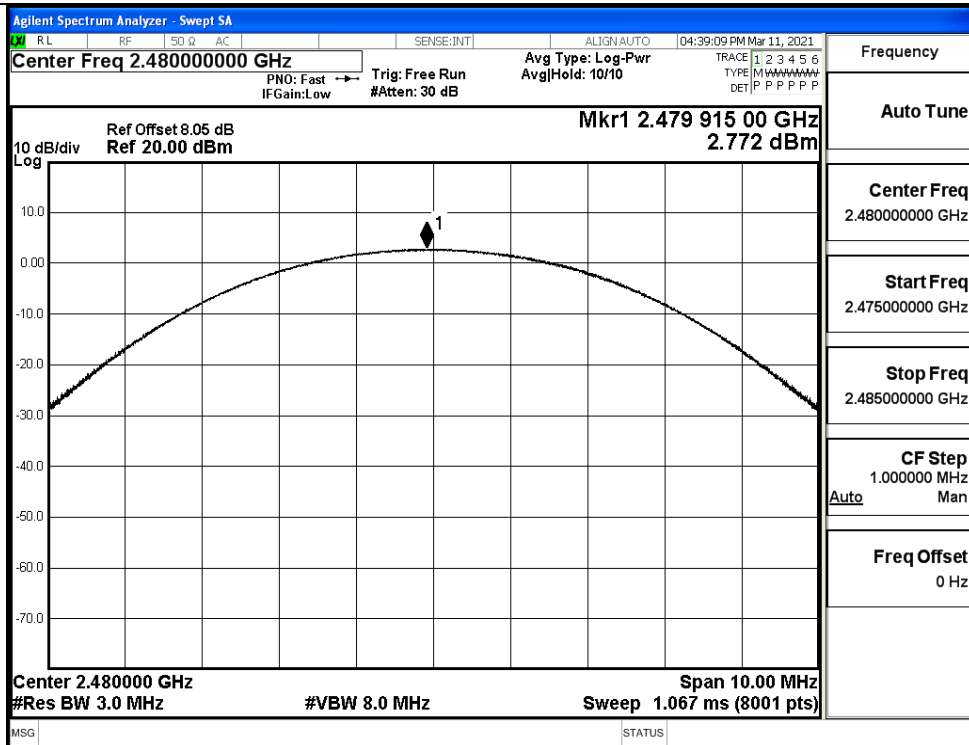
8DPSK/LCH



8DPSK/MCH



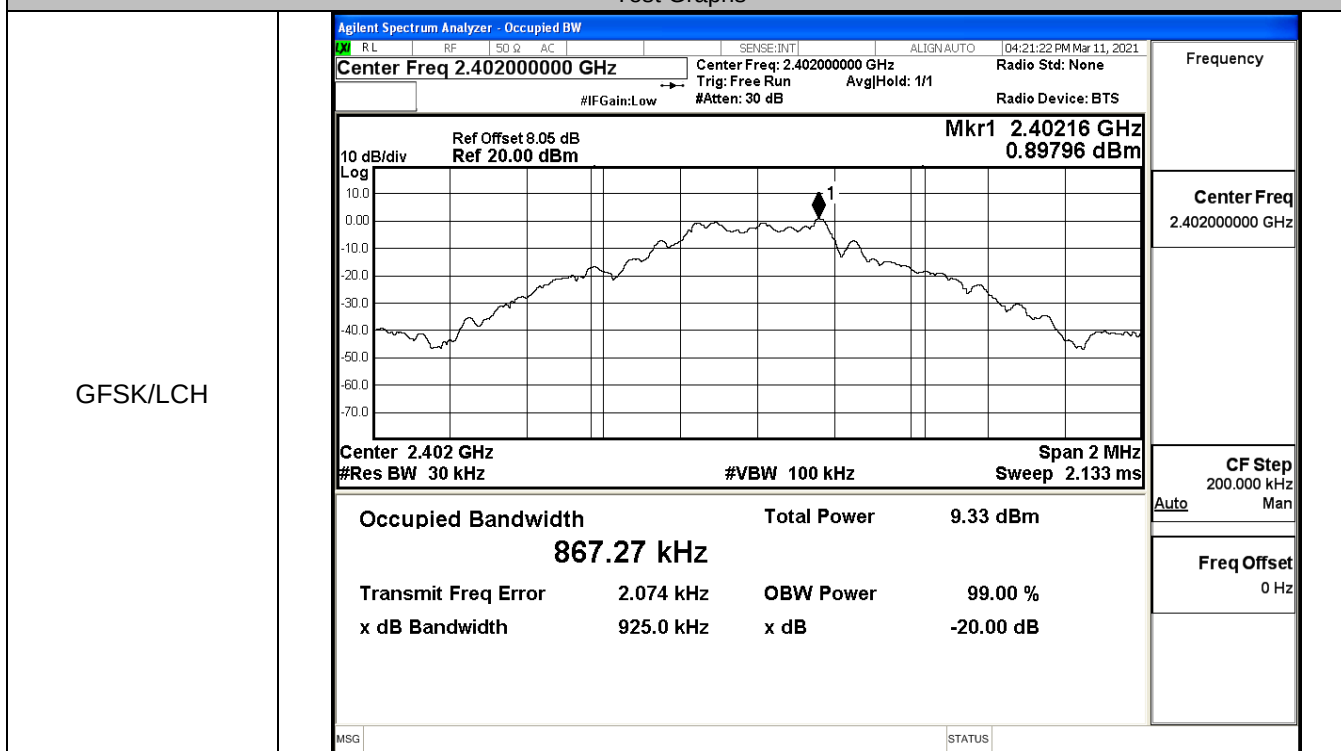
8DPSK/HCH



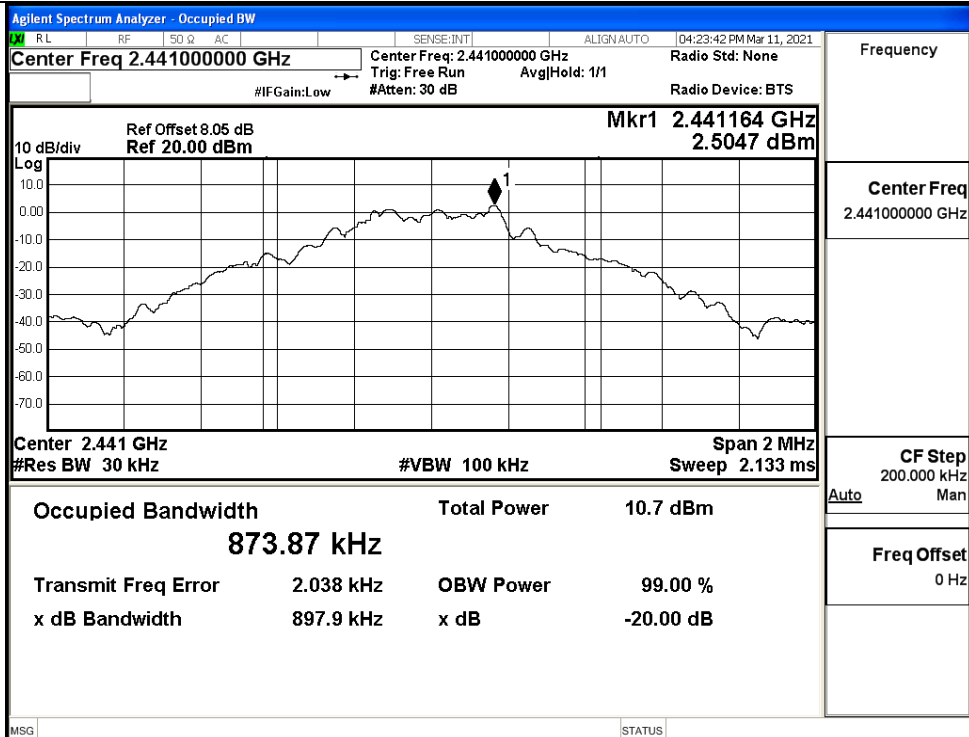
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9250	Not Specified	PASS
	MCH	0.8979	Not Specified	PASS
	HCH	0.8944	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.291	Not Specified	PASS
	MCH	1.287	Not Specified	PASS
	HCH	1.317	Not Specified	PASS
8DPSK	LCH	1.291	Not Specified	PASS
	MCH	1.291	Not Specified	PASS
	HCH	1.296	Not Specified	PASS

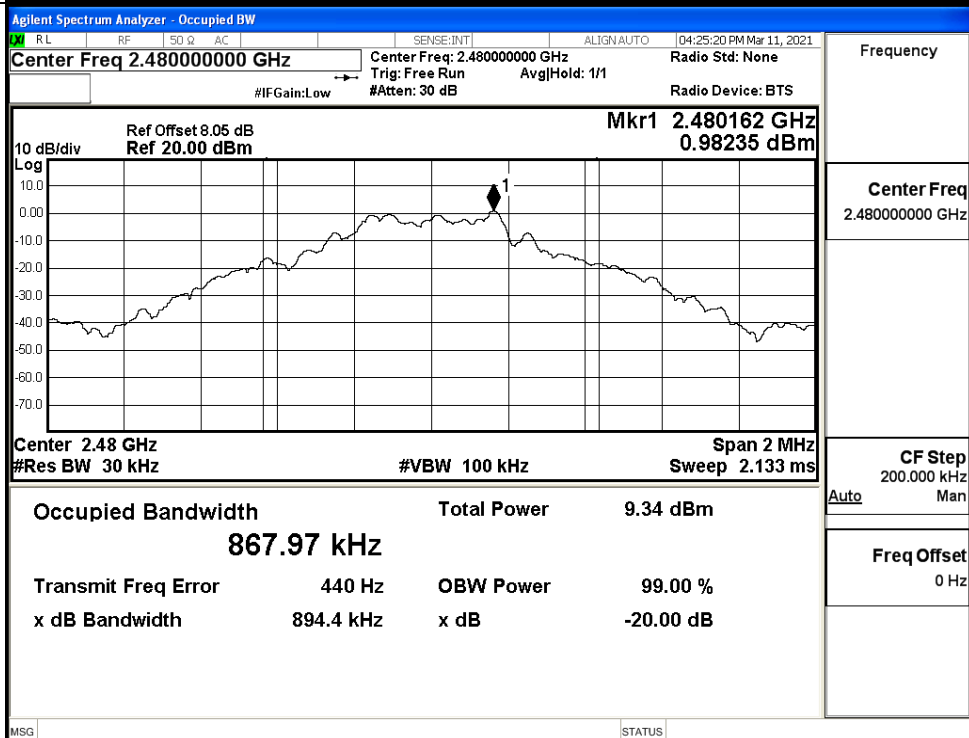
Test Graphs

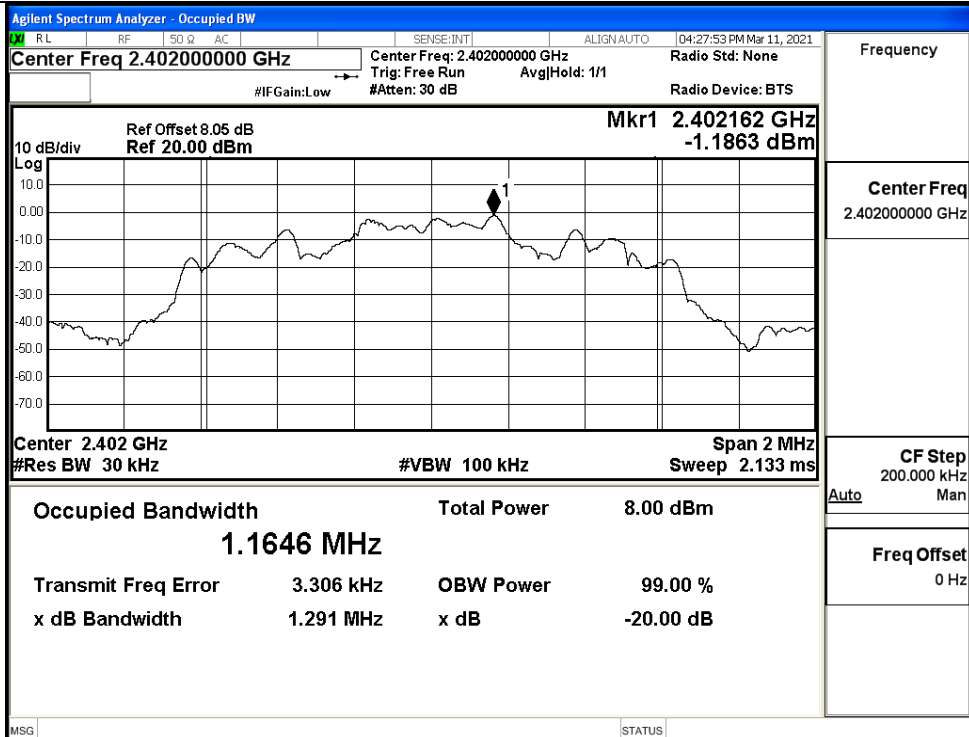
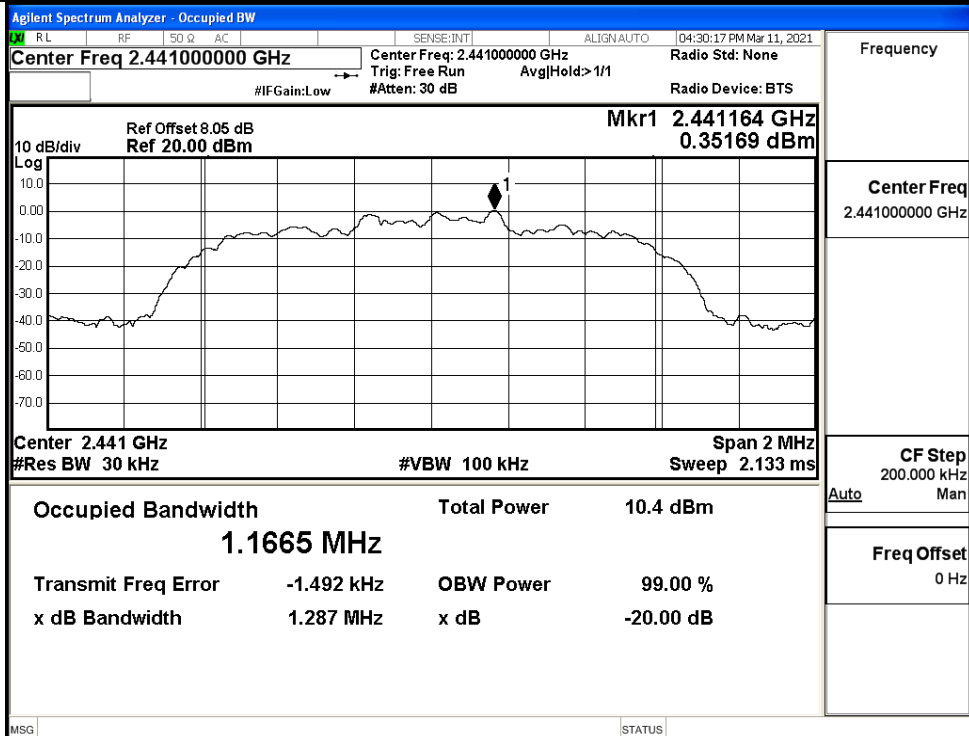


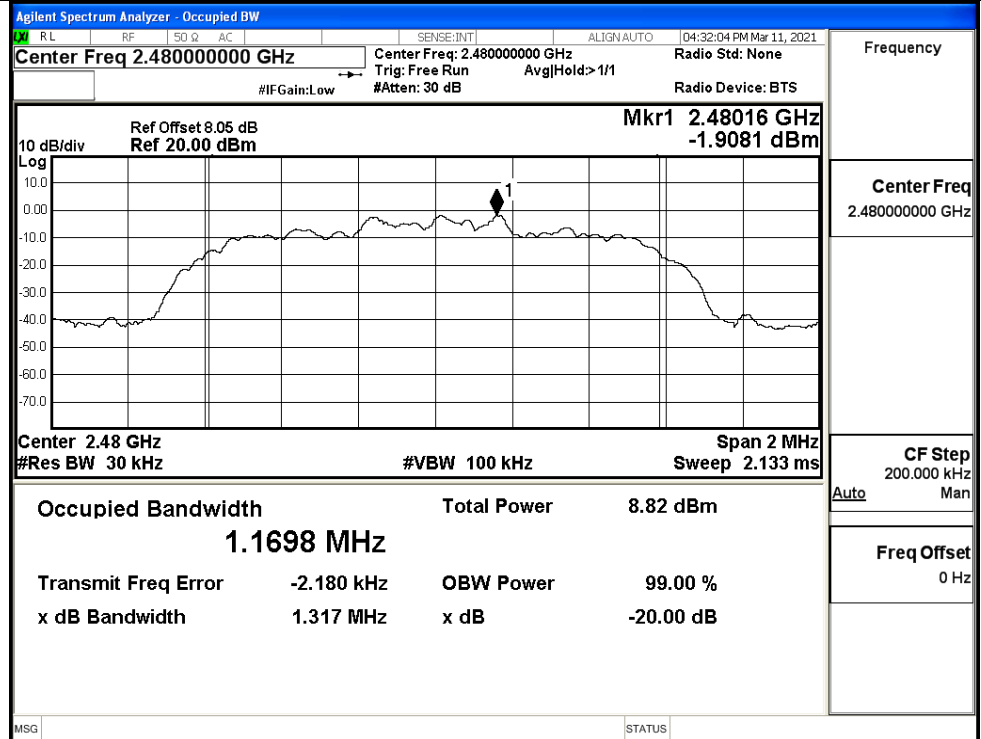
GFSK/MCH



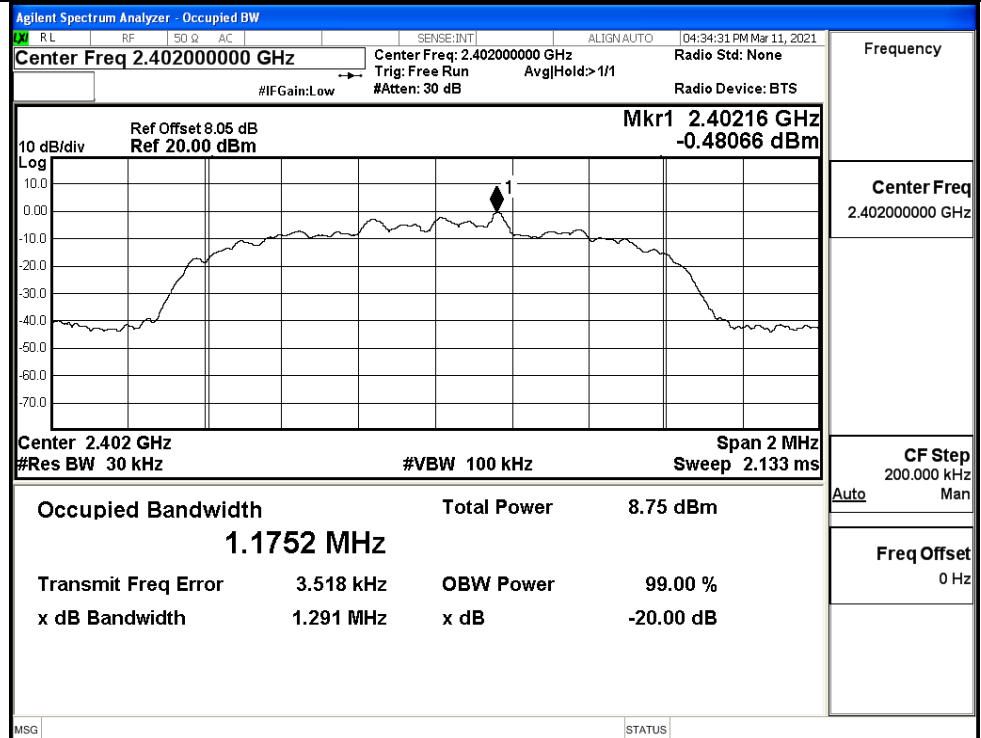
GFSK/HCH



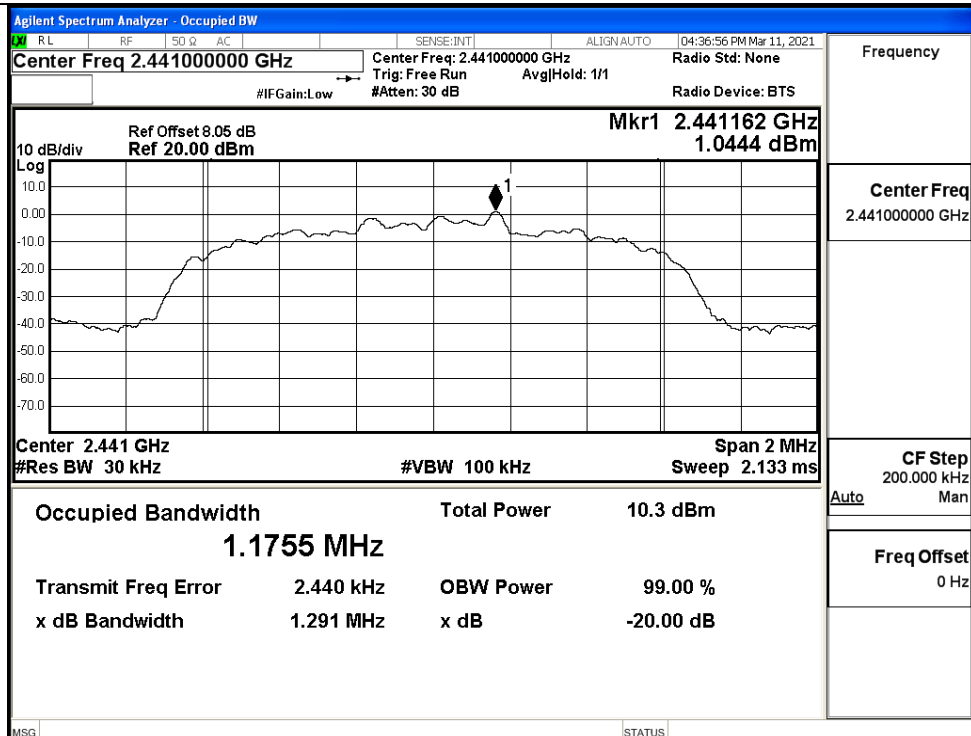
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

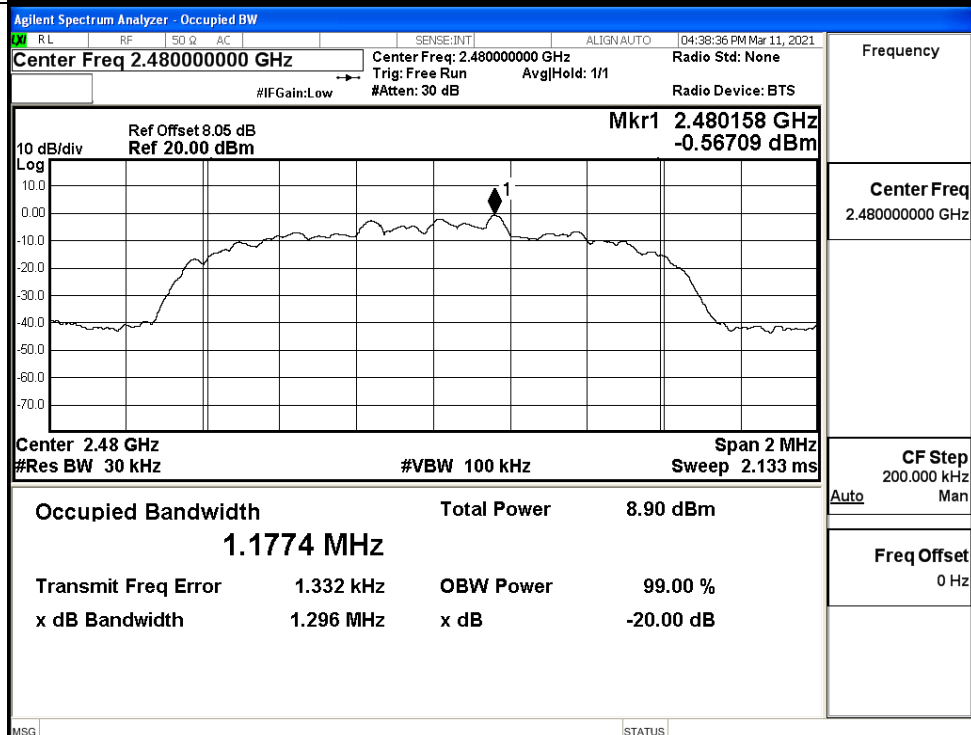
8DPSK/LCH



8DPSK/MCH



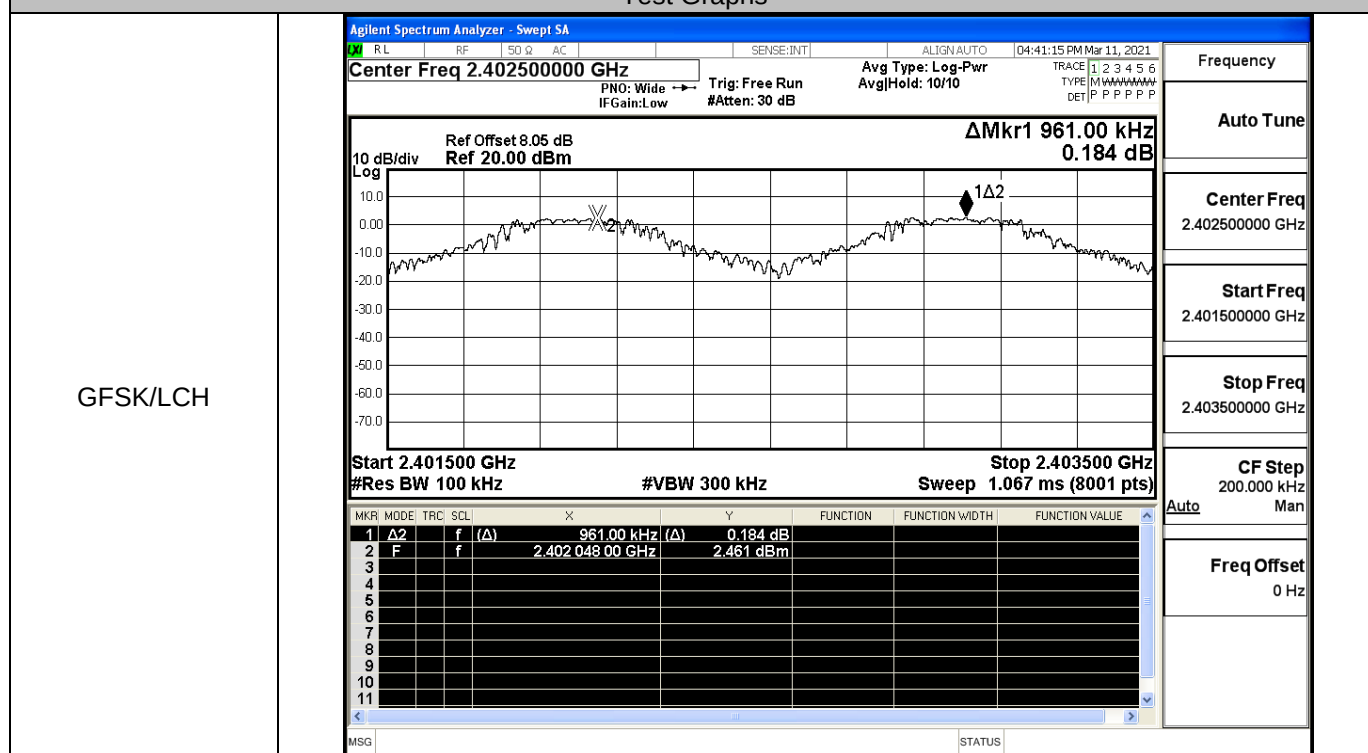
8DPSK/HCH



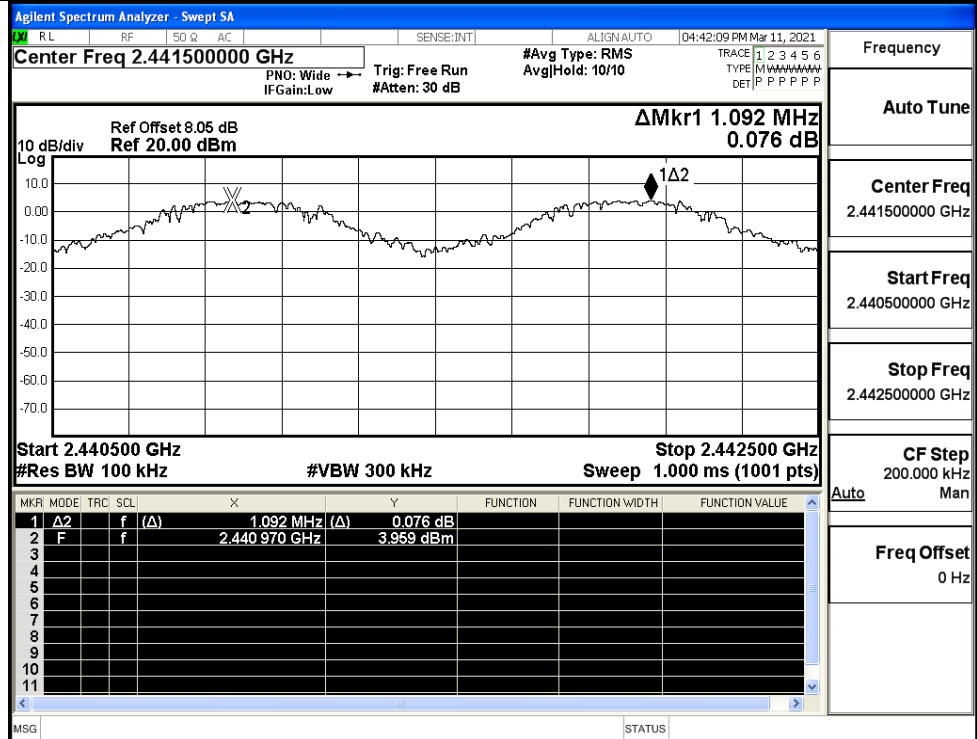
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.961	0.617	PASS
	MCH	1.092	0.617	PASS
	HCH	1.014	0.617	PASS
$\pi/4$ DQPSK	LCH	1.268	0.878	PASS
	MCH	1.242	0.878	PASS
	HCH	1.154	0.878	PASS
8DPSK	LCH	1.074	0.864	PASS
	MCH	1.154	0.864	PASS
	HCH	0.954	0.864	PASS

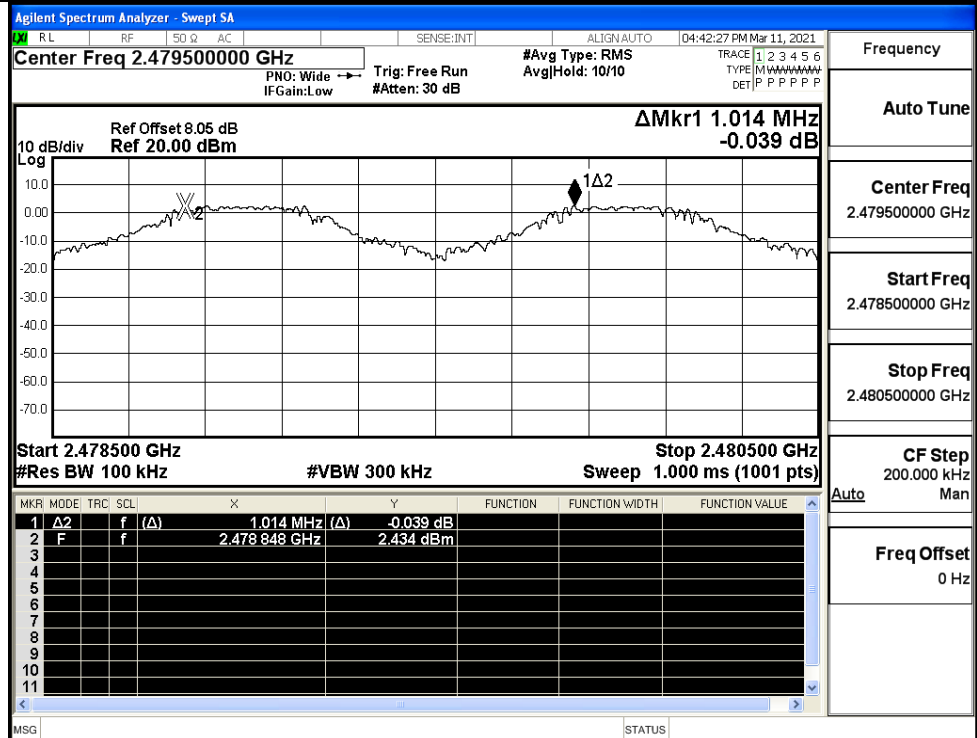
Test Graphs

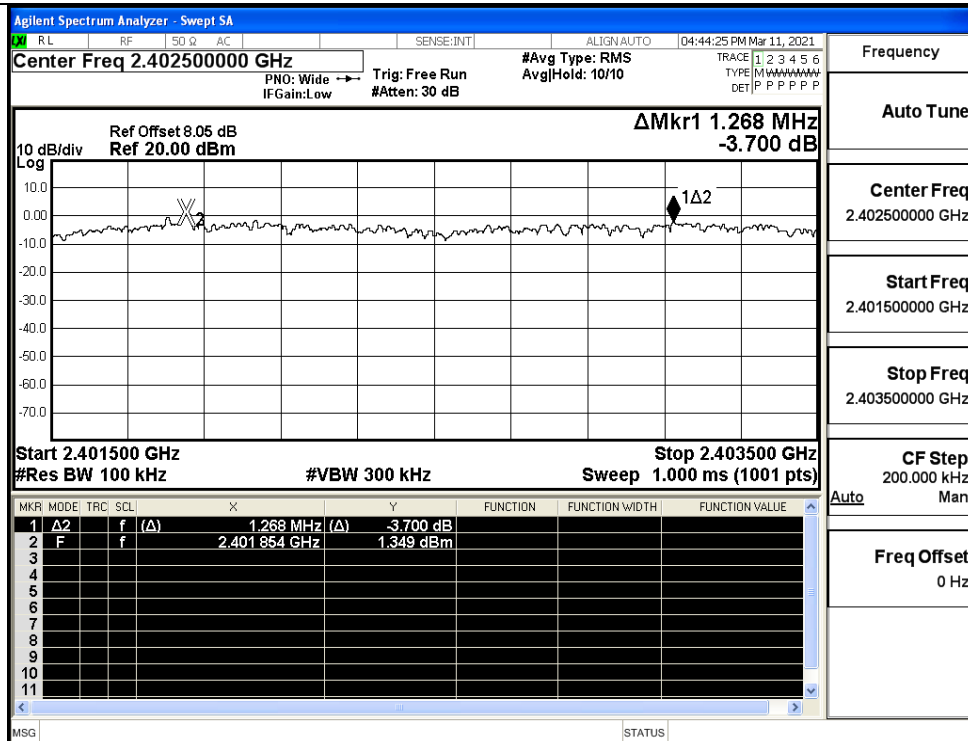


GFSK/MCH



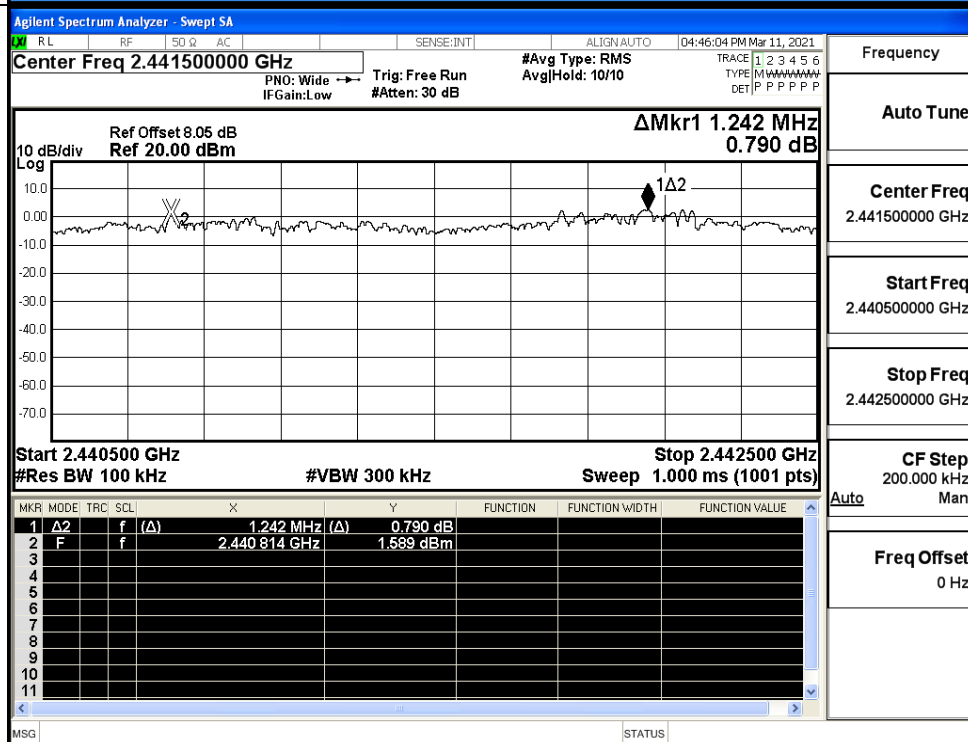
GFSK/HCH



$\pi/4$ DQPSK/LCH

Frequency

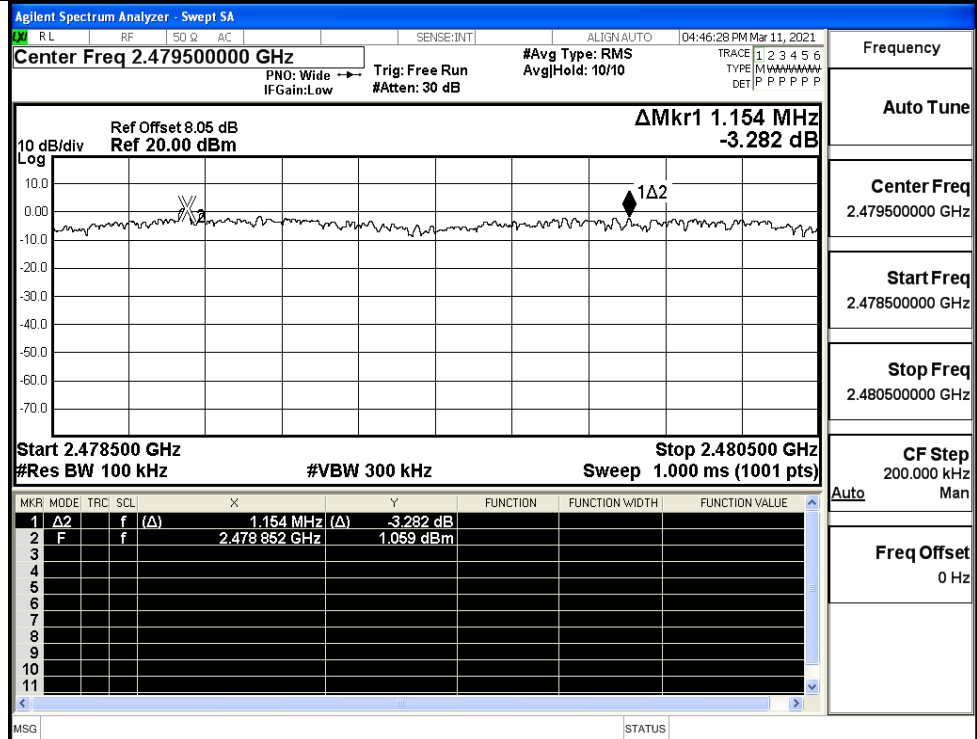
Auto Tune

Center Freq
2.402500000 GHzStart Freq
2.401500000 GHzStop Freq
2.403500000 GHzCF Step
200.000 kHz
ManFreq Offset
0 Hz $\pi/4$ DQPSK/MCH

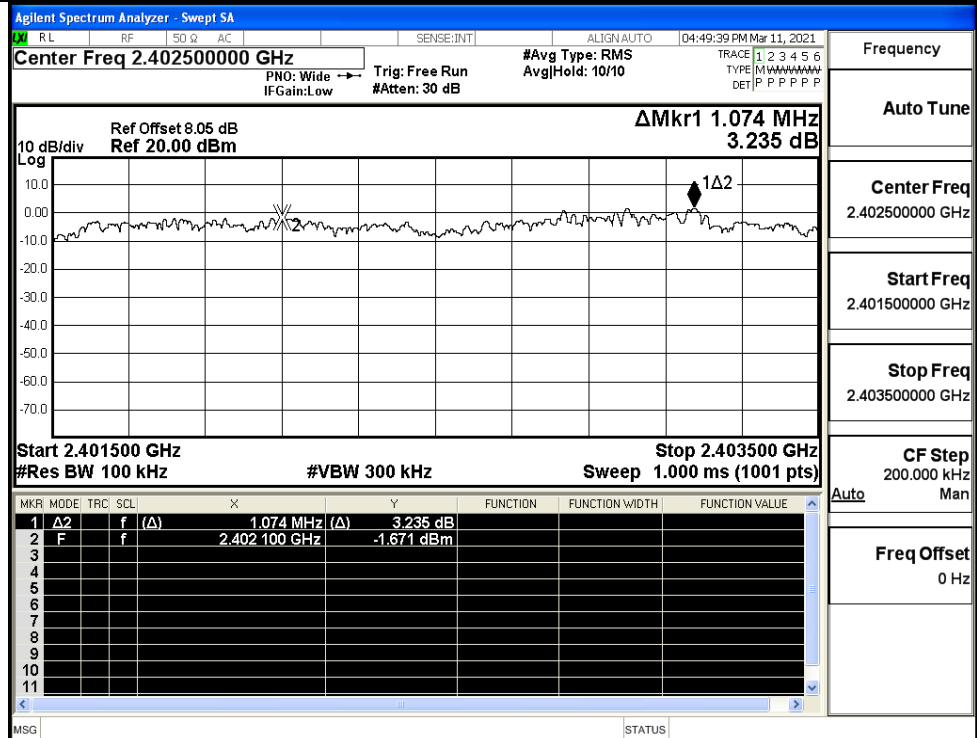
Frequency

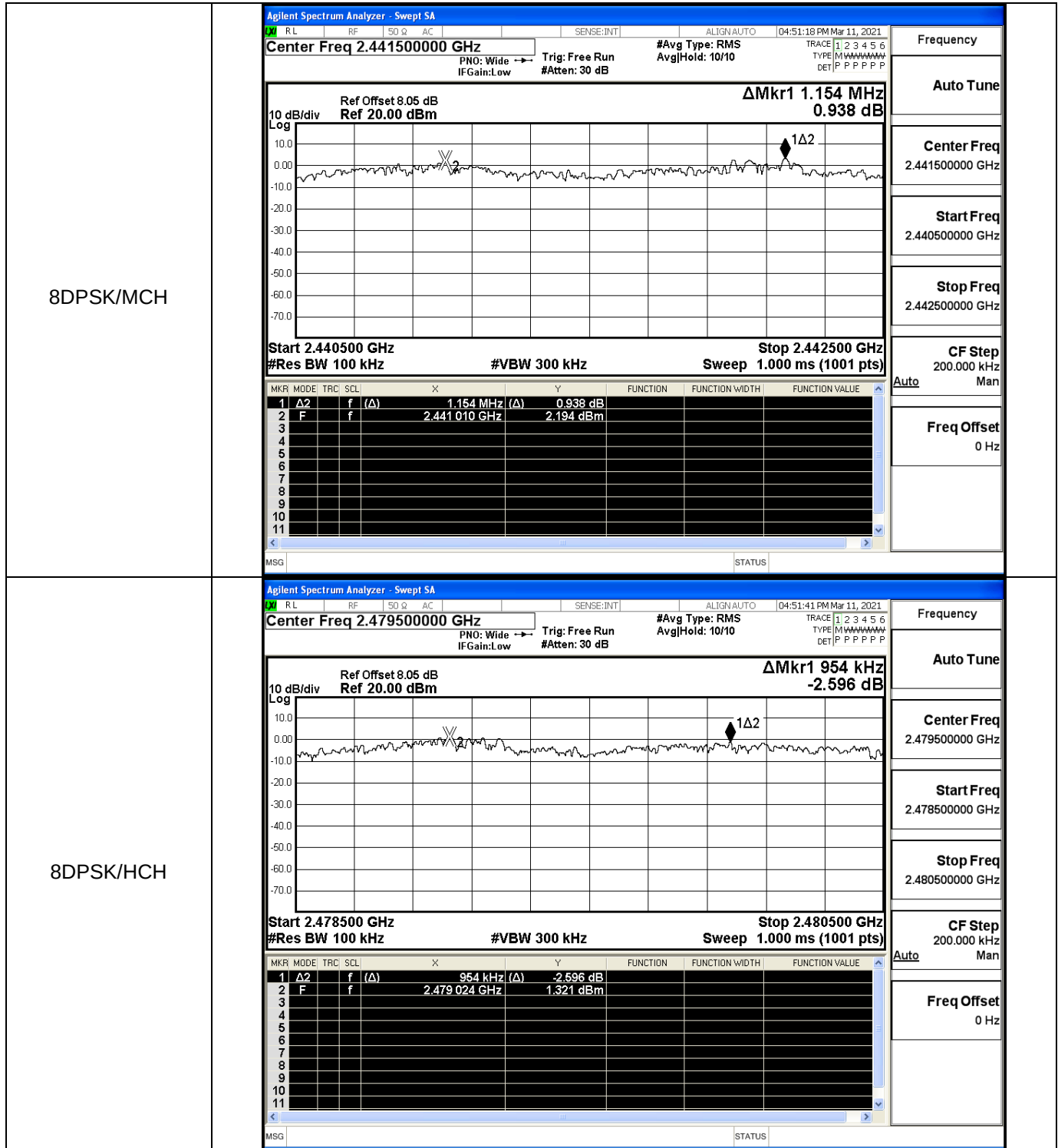
Auto Tune

Center Freq
2.441500000 GHzStart Freq
2.440500000 GHzStop Freq
2.442500000 GHzCF Step
200.000 kHz
ManFreq Offset
0 Hz

$\pi/4$ DQPSK/HCH

8DPSK/LCH



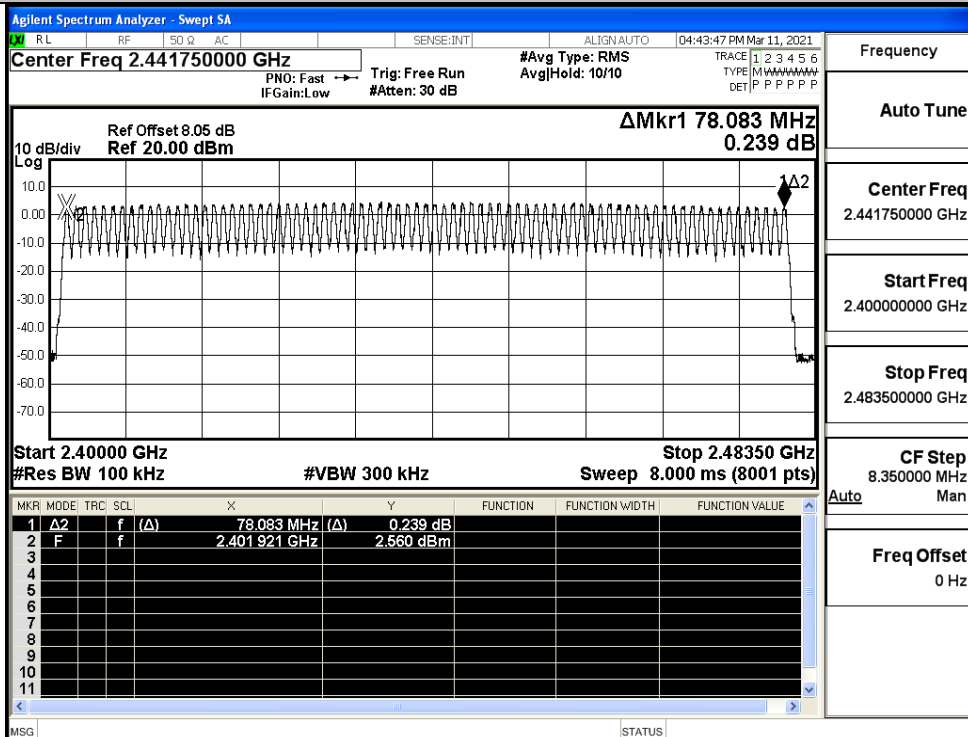
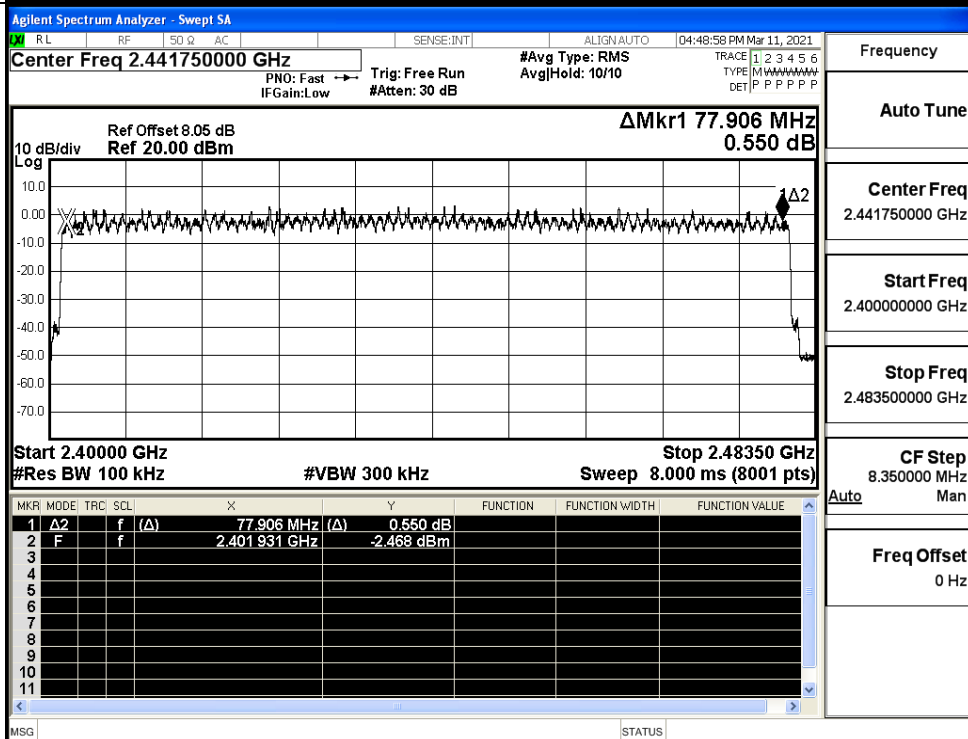


A.4 Hopping Channel Number

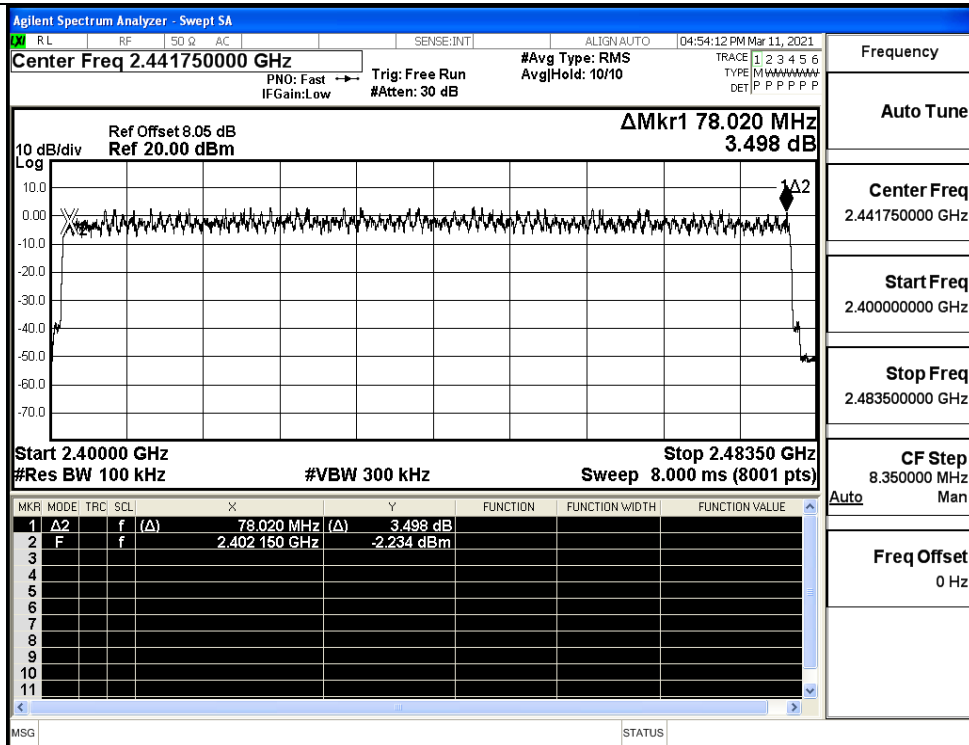
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS
8DPSK	Hop	79	>=15	PASS

Test Graphs

GFSK/Hop

 $\pi/4$ DQPSK/Hop

8DPSK/Hop

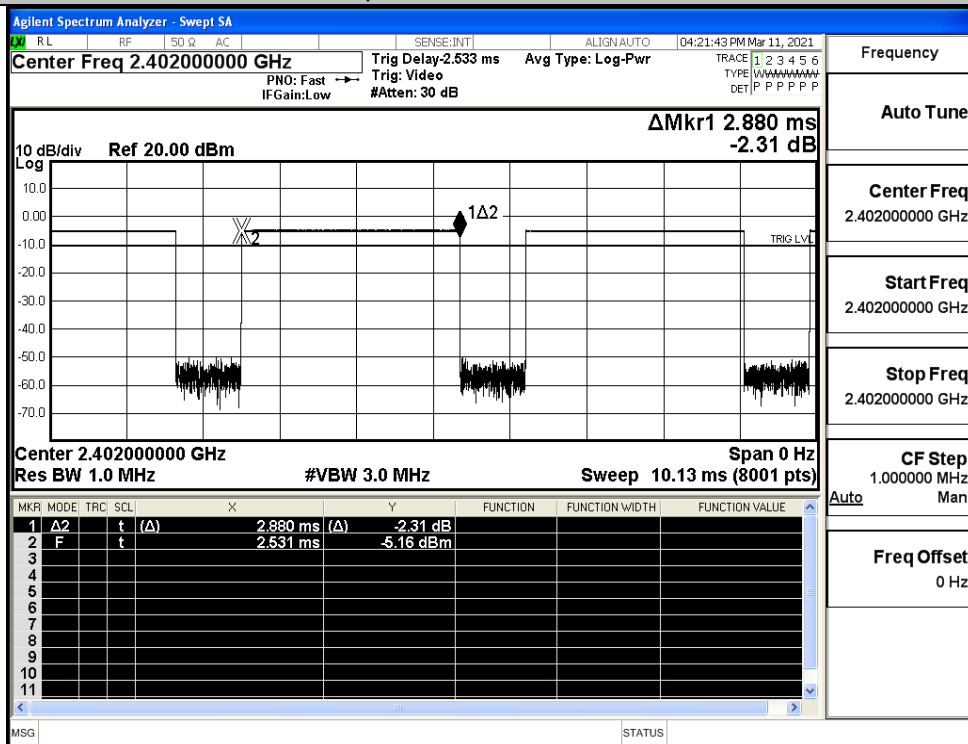


A.5 Dwell Time

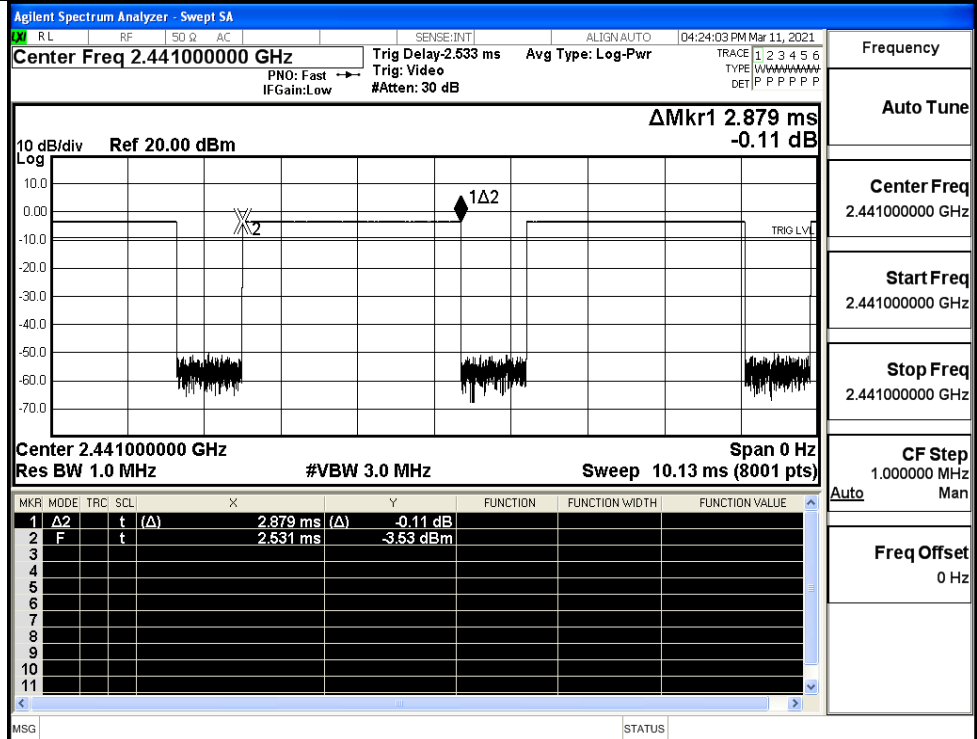
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88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

Test Graphs

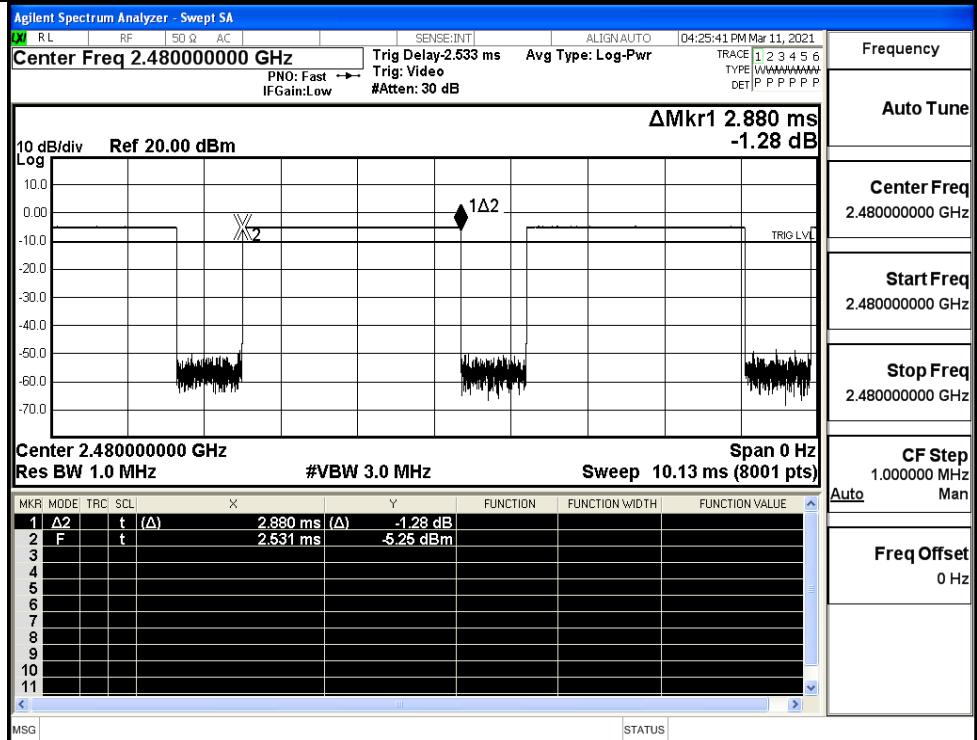
GFSK_DH5/LCH



GFSK_DH5/MCH



GFSK_DH5/HCH



Agilent Spectrum Analyzer - Swept SA

RL RF 50 Q AC SENSE:INT ALIGN:AUTO 04:28:14 PM Mar 11, 2021

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 W W W W W W W W W W DET P P P P P P P P

10 dB/div Ref 20.00 dBm Δ Mkr1 2.883 ms -1.55 dB

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

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ 2	t	(Δ)	2.883 ms	(Δ) -1.55 dB			
2	F	t		3.643 ms	-6.51 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								

MSG STATUS

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

Agilent Spectrum Analyzer - Swept SA

VM RL	RF	SQ Z AC	SENSE INT	ALIGN AUTO	D4:30:38 PM Mar 11, 2021
-------	----	---------	-----------	------------	--------------------------

Center Freq 2.441000000 GHz Trig Delay-2.533 ms Avg Type: Log-Pwr
 PNO: Fast → Trig: Video TYPE: WWWWWWWW
 IF Gain: Low #Atten: 30 dB DET: P P P P P P

ΔMkr1 2.883 ms -1.29 dB

10 dB/div Ref 20.00 dBm

Log

Center Freq 2.441000000 GHz Span 0 Hz
 Res BW 1.0 MHz #VBW 3.0 MHz Sweep 10.13 ms (8001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ2	t	(Δ)	2.883 ms	(Δ) -1.29 dB			
2	F	t		428.1 μs	-5.11 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								

Frequency
Auto Tune

Center Freq
2.441000000 GHz

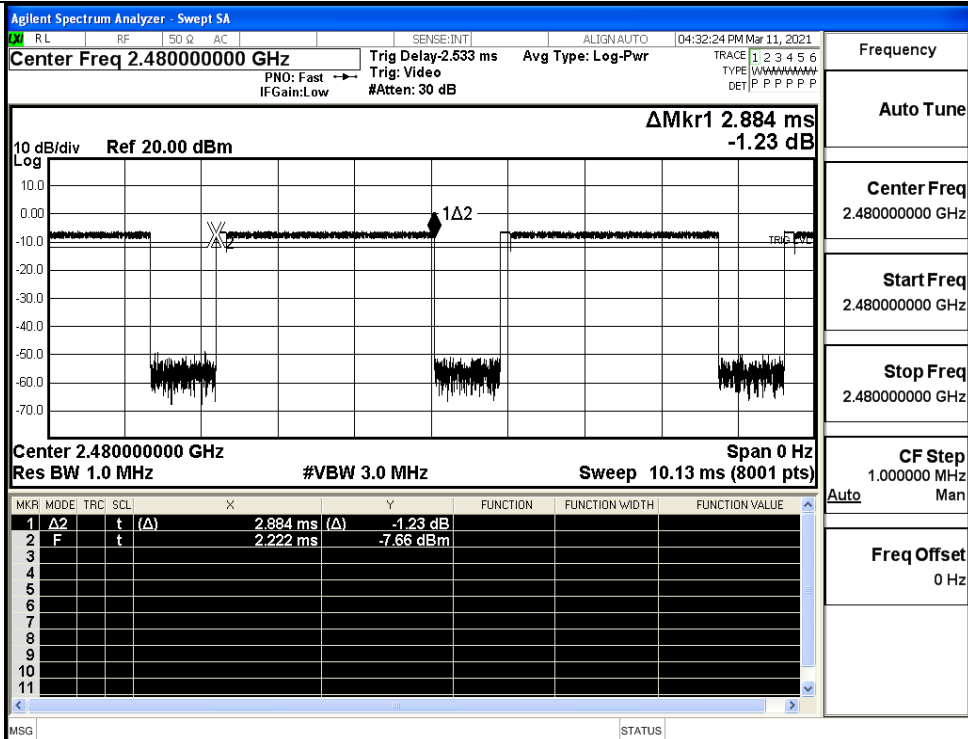
Start Freq
2.441000000 GHz

Stop Freq
2.441000000 GHz

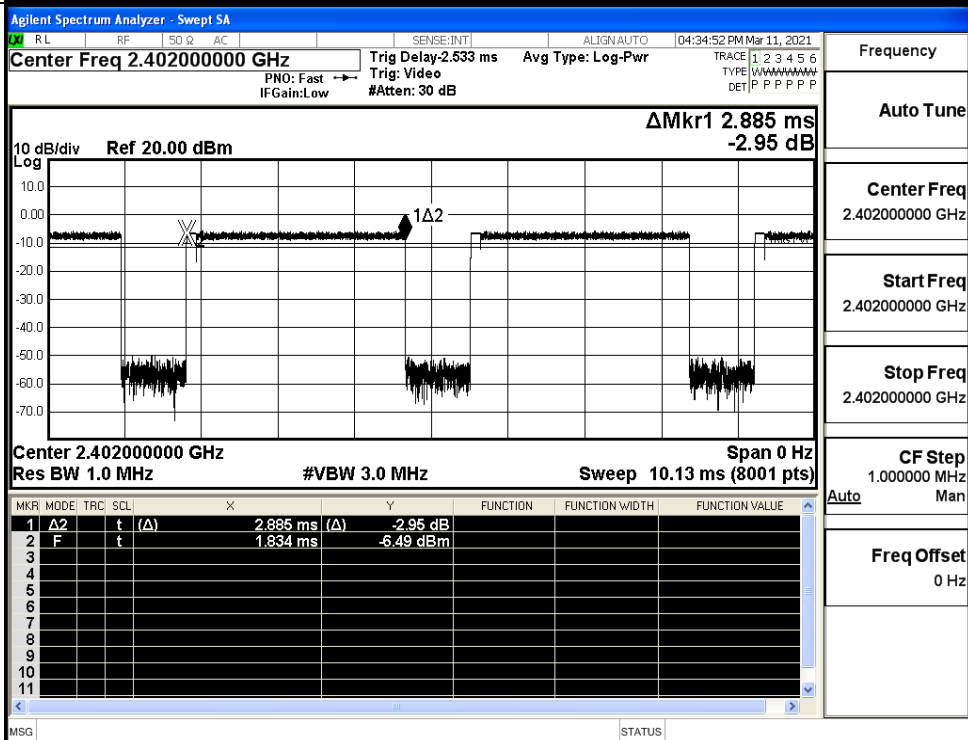
CF Step
1.000000 MHz Man

Freq Offset
0 Hz

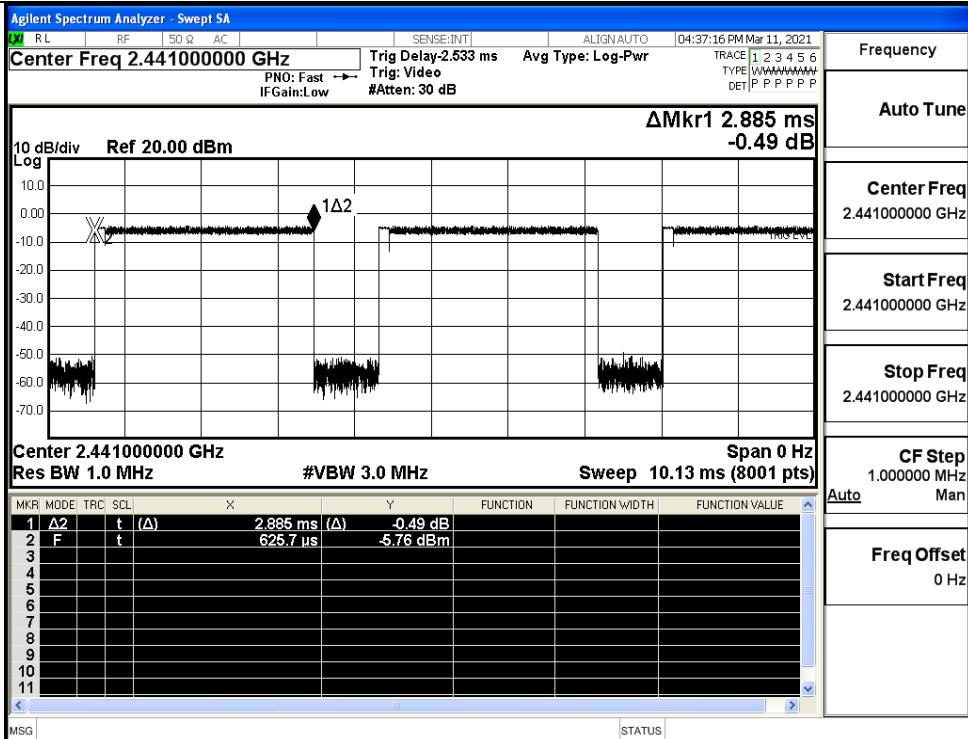
$\pi/4$ DQPSK
_2DH5/HCH



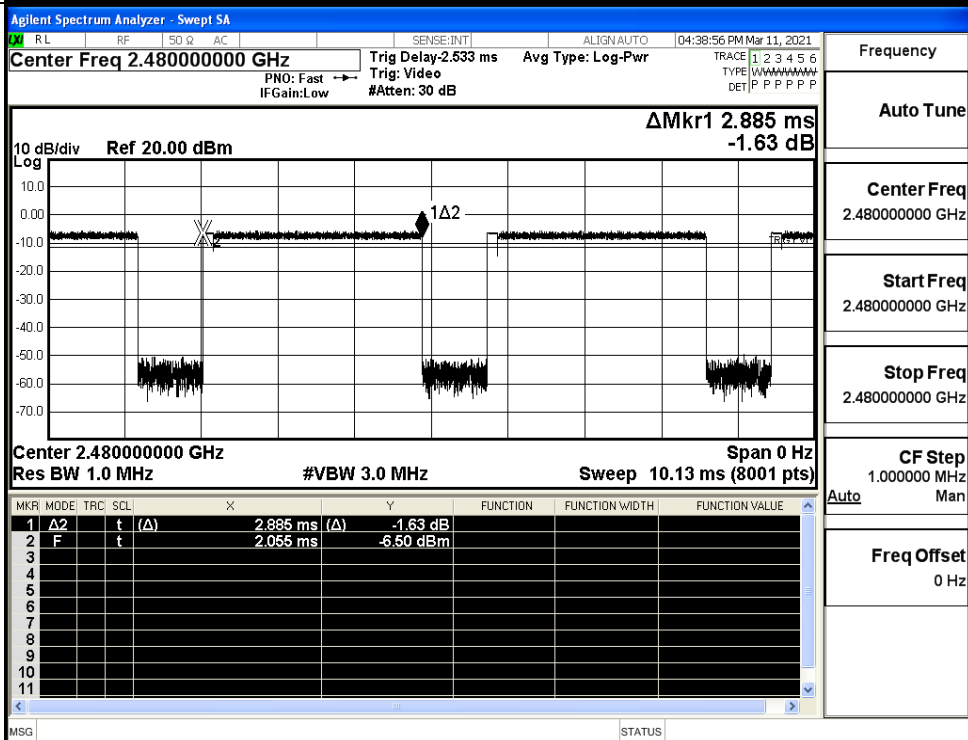
8DPSK _3DH5/LCH



8DPSK_3DH5/MCH



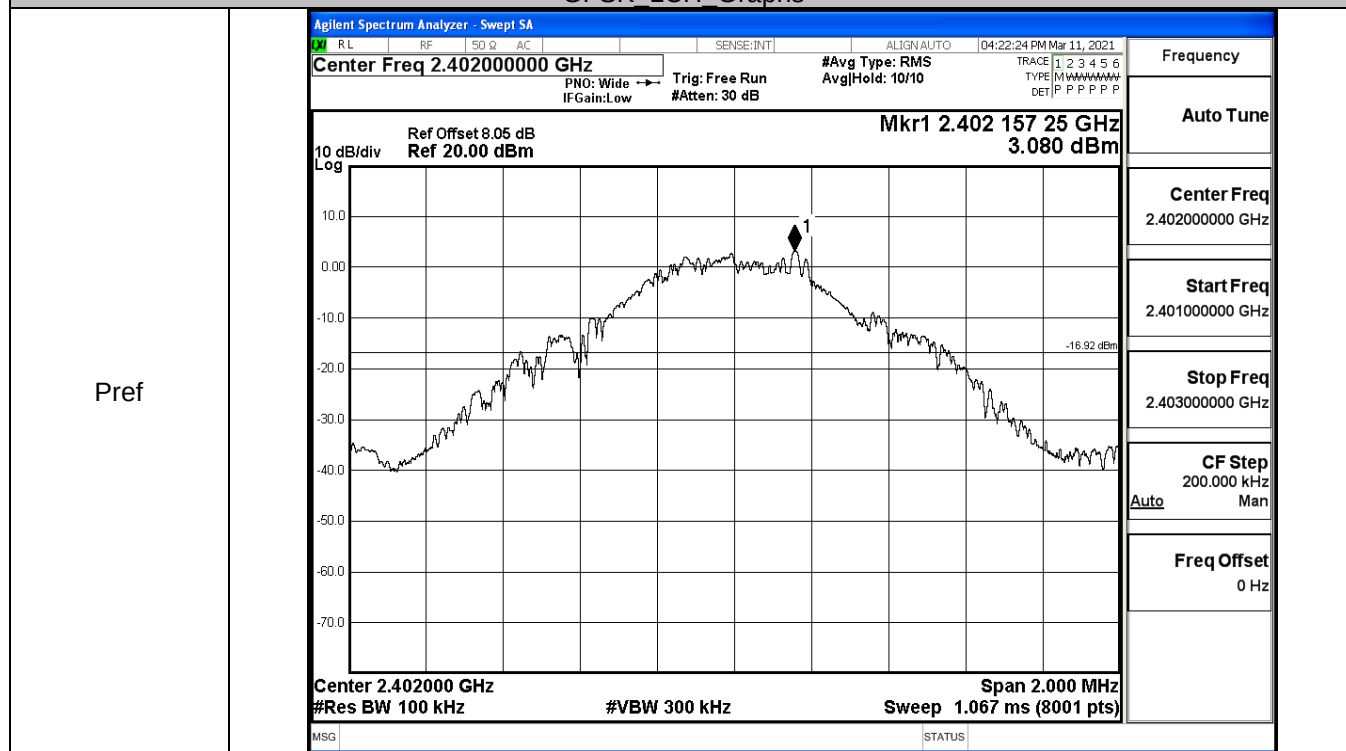
8DPSK_3DH5/HCH



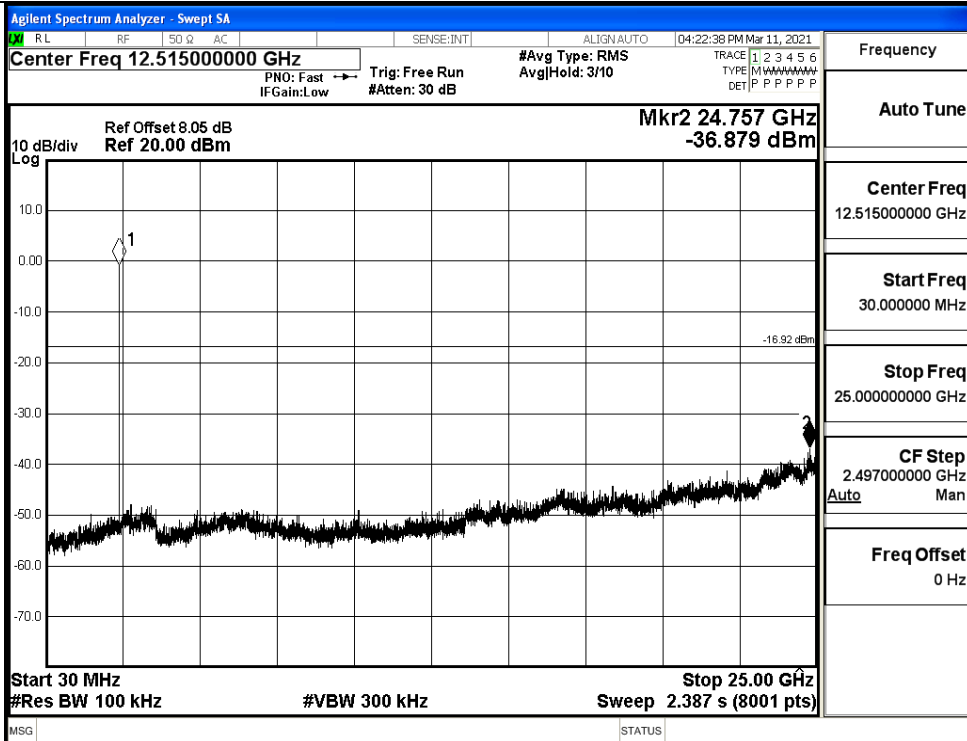
A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.08	-36.879	-16.920	PASS
	MCH	4.568	-38.472	-15.432	PASS
	HCH	3.069	-37.744	-16.931	PASS
$\pi/4$ DQPSK	LCH	1.469	-37.978	-18.531	PASS
	MCH	2.942	-36.361	-17.058	PASS
	HCH	1.683	-37.899	-18.317	PASS
8DPSK	LCH	1.641	-37.607	-18.359	PASS
	MCH	2.979	-37.211	-17.021	PASS
	HCH	1.69	-37.828	-18.310	PASS

GFSK LCH Graphs

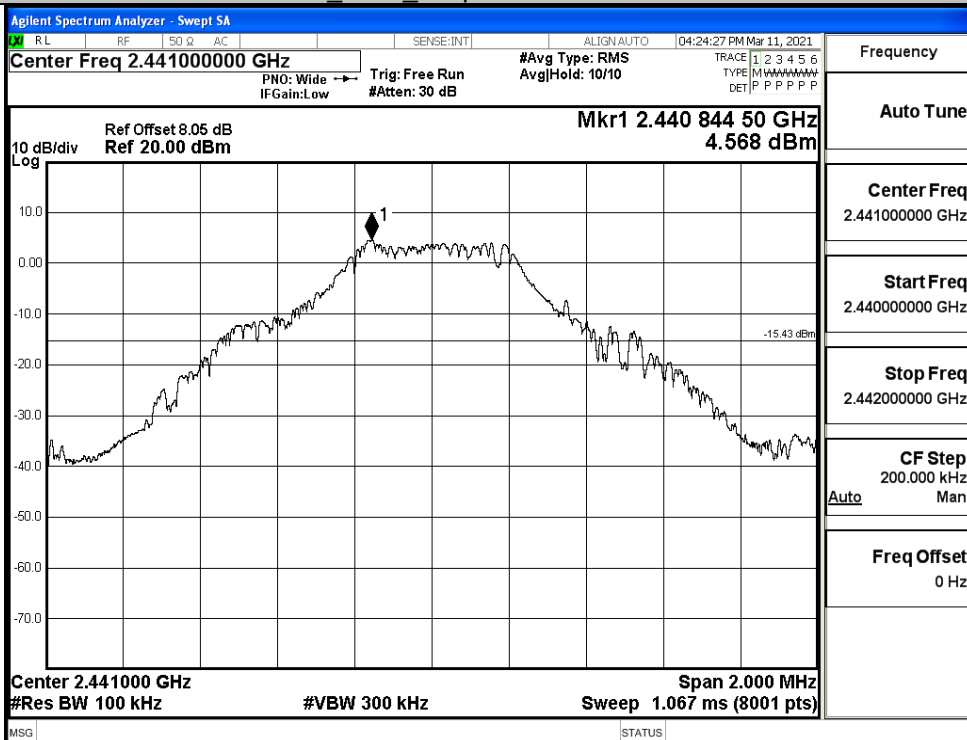


Puw

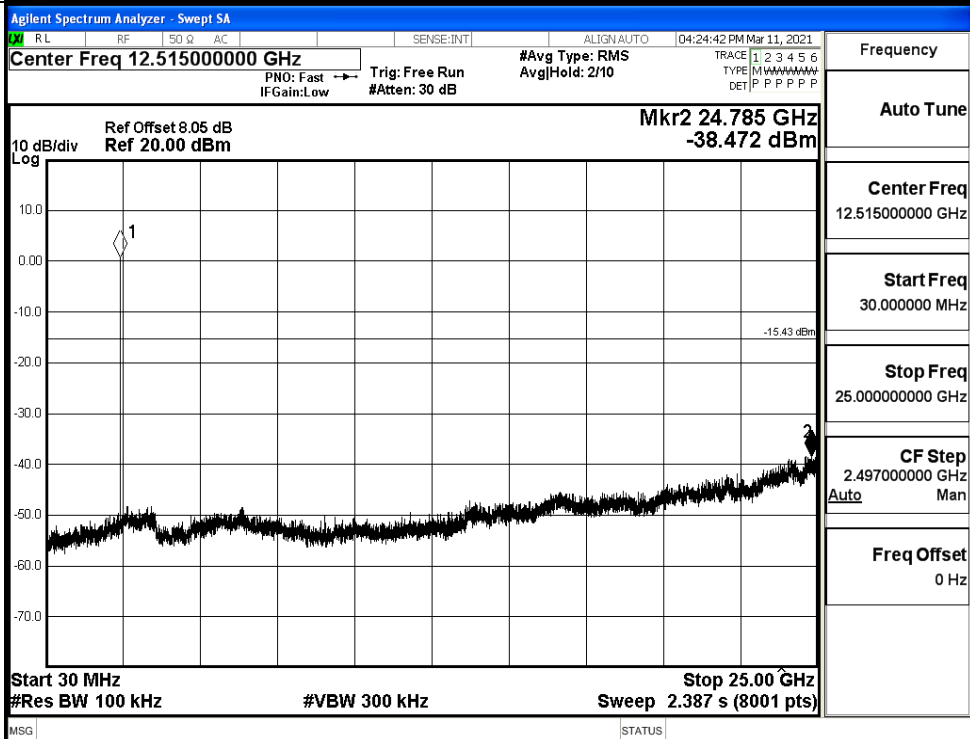


GFSK_MCH_Graphs

Pref

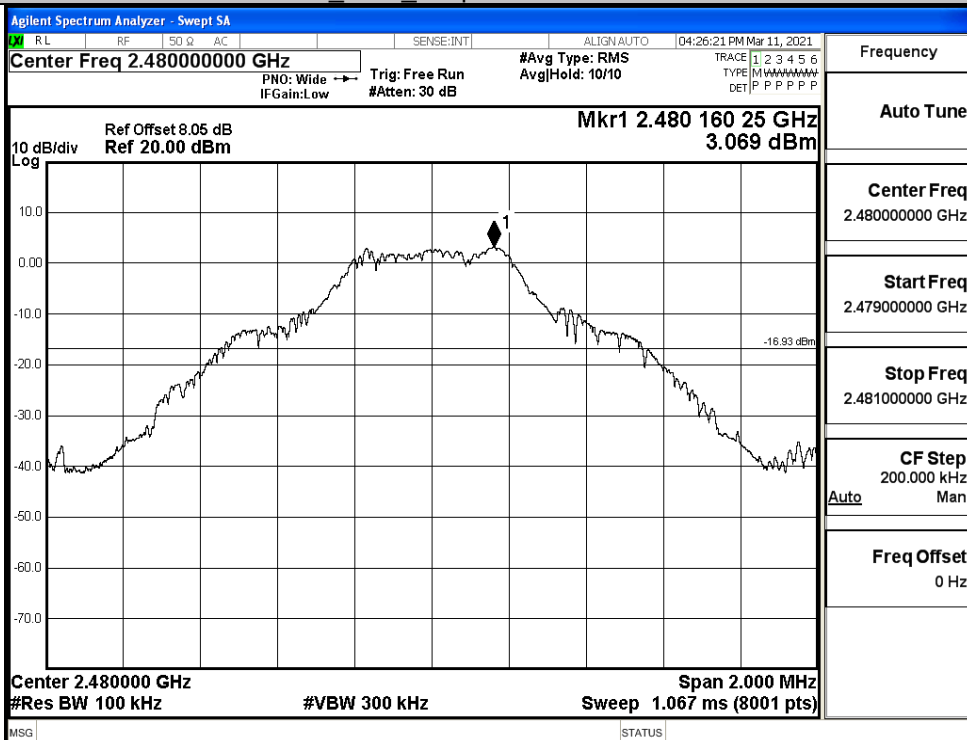


Puw

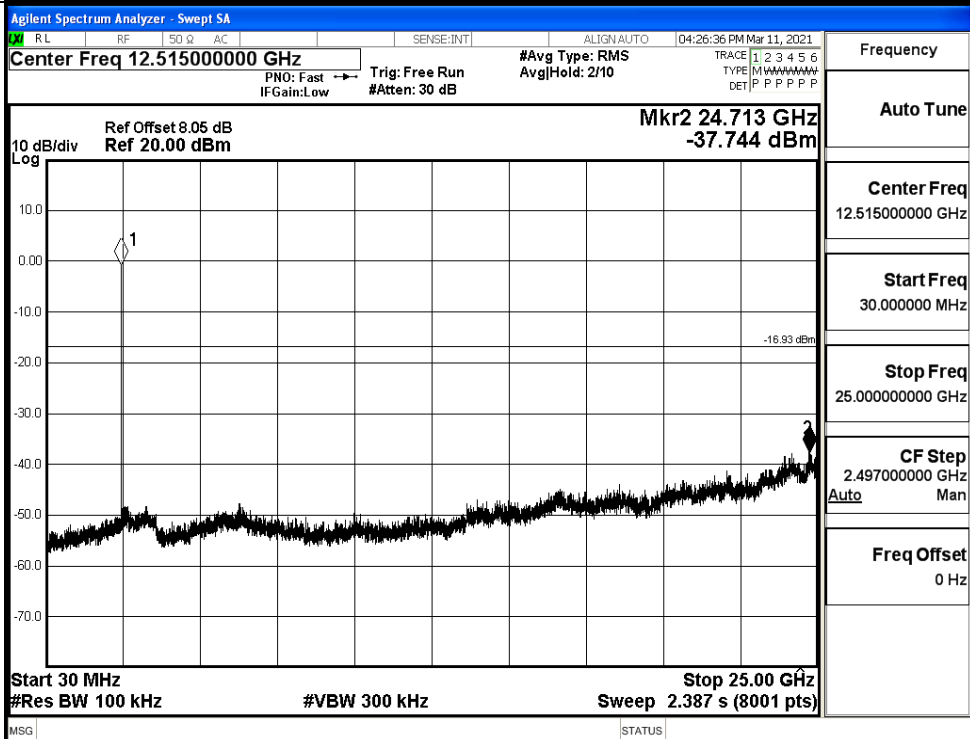


GFSK HCH_Graphs

Pref

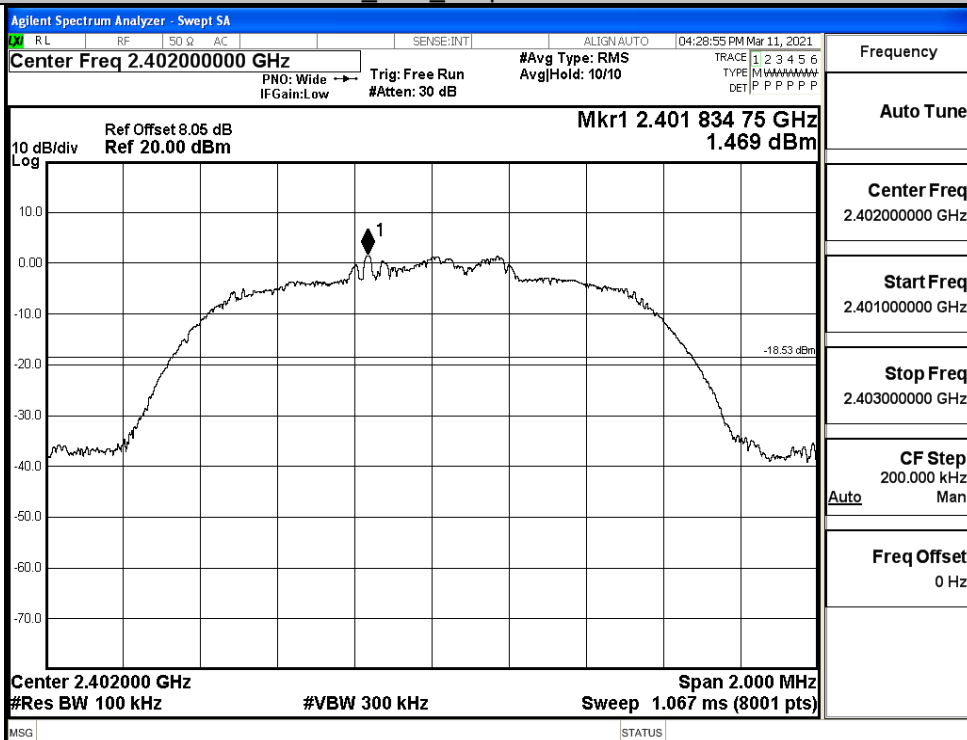


Puw

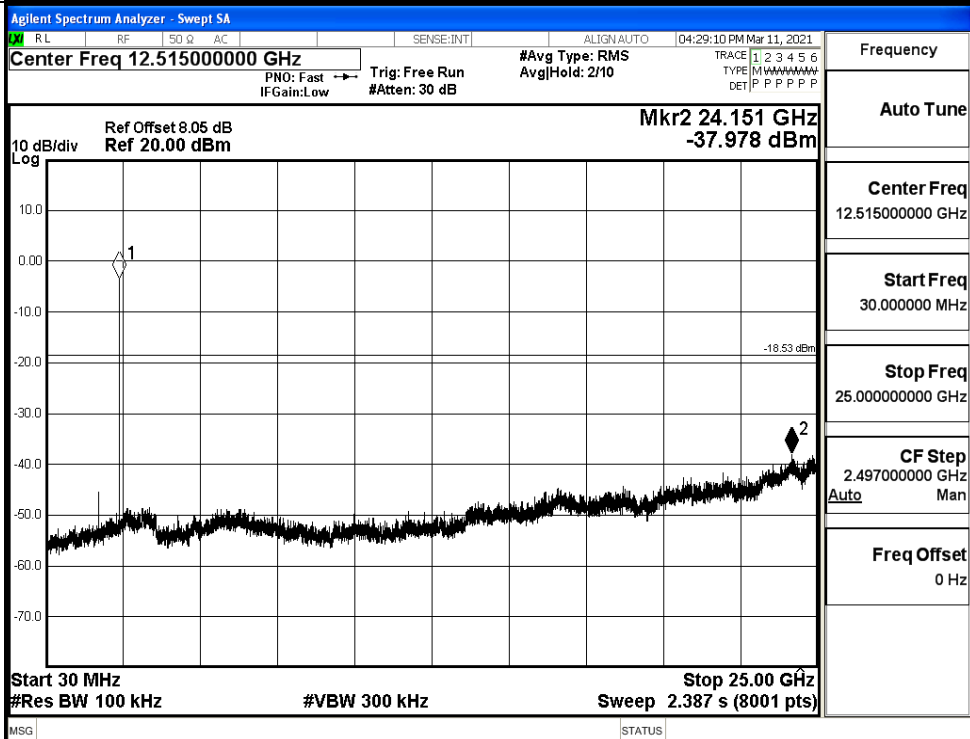


$\pi/4$ DQPSK_LCH_Graphs

Pref

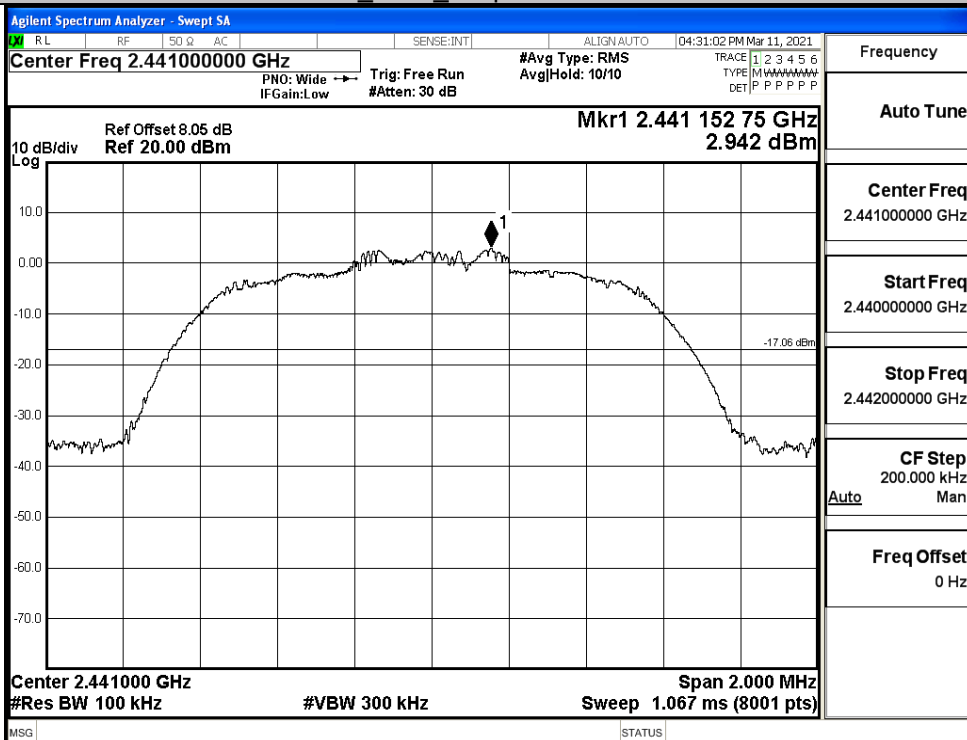


Puw

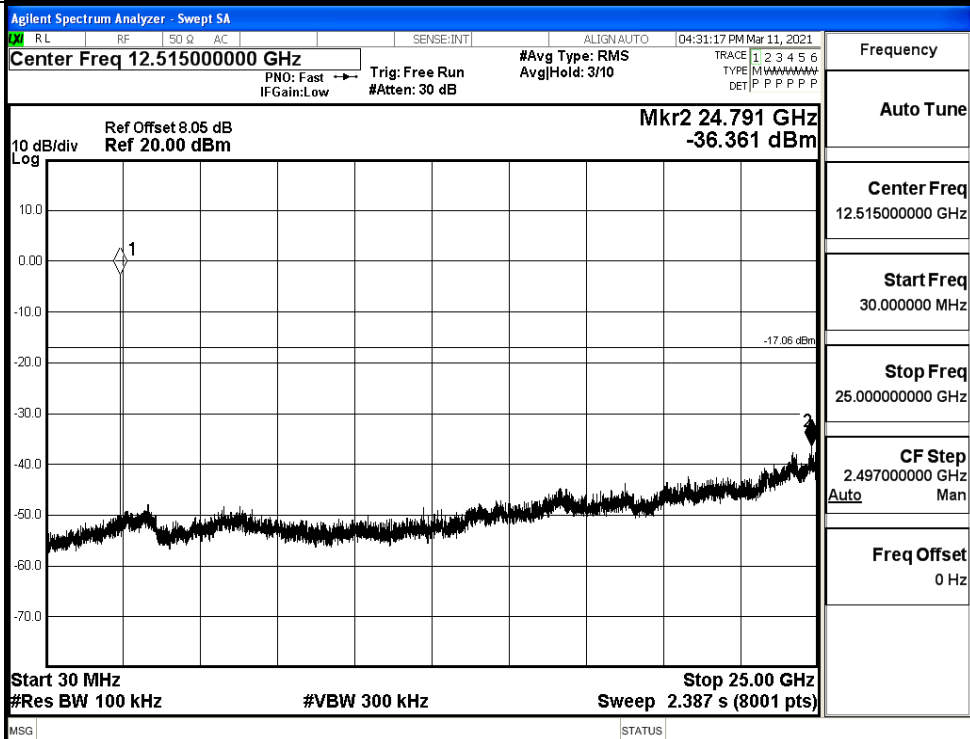


π /4DQPSK_MCH_Graphs

Pref

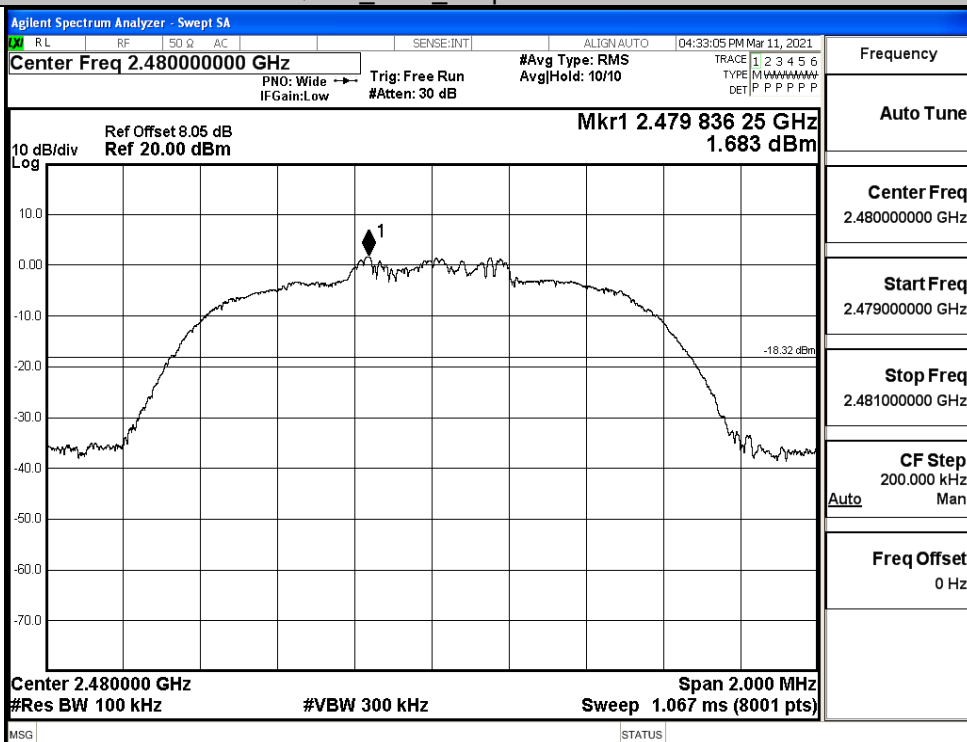


Puw

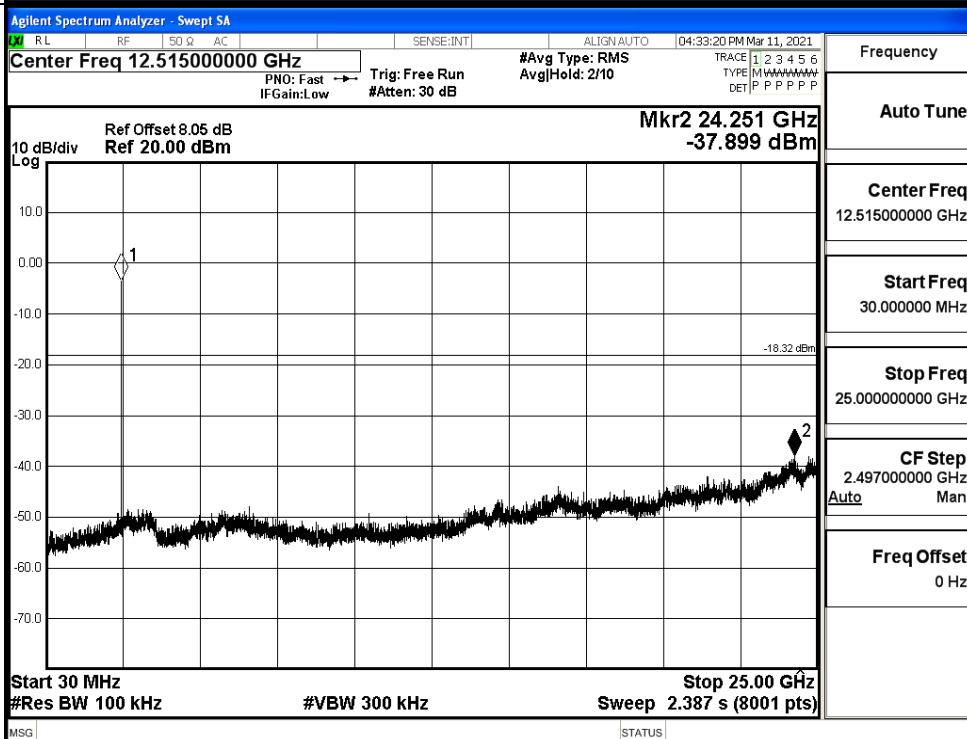


π /4DQPSK_HCH_Graphs

Pref

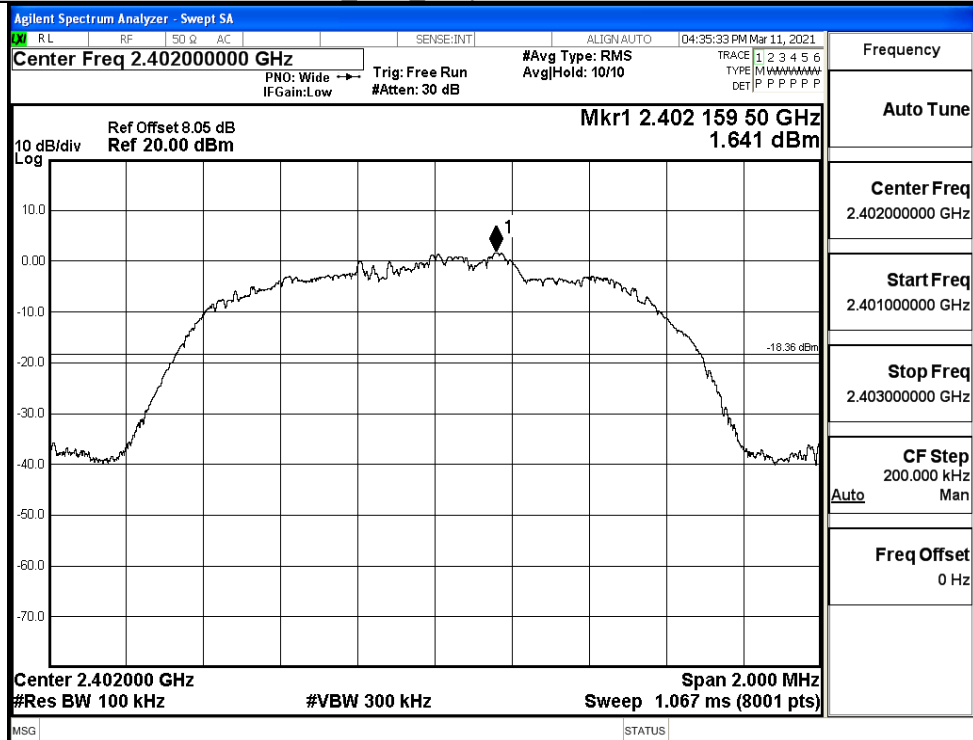


Puw

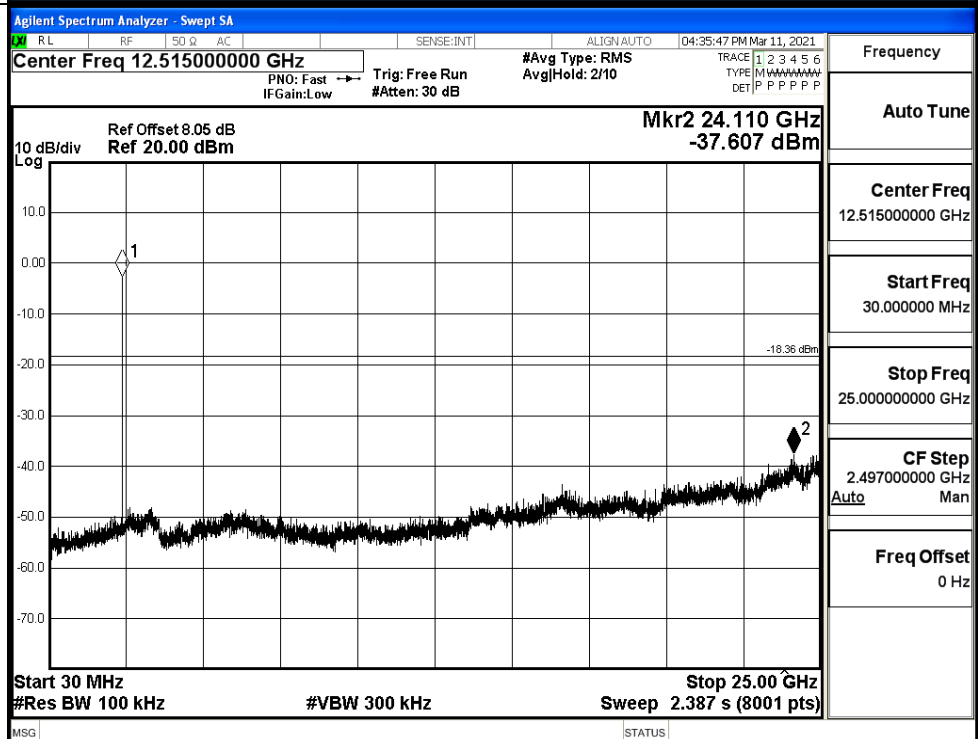


8DPSK_LCH_Graphs

Pref

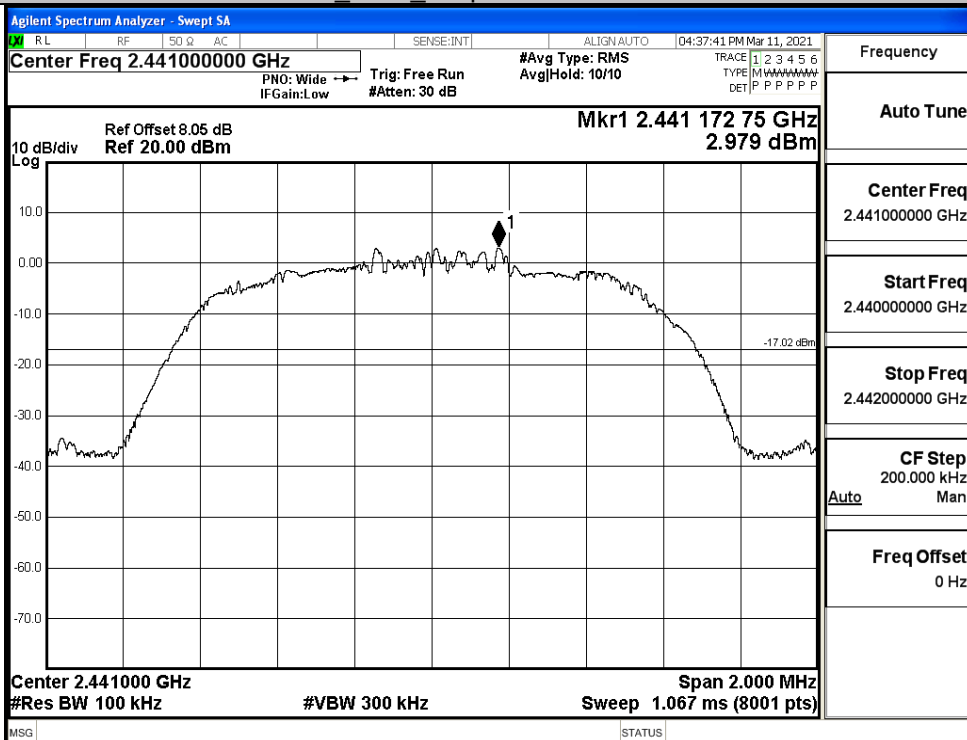


Puw

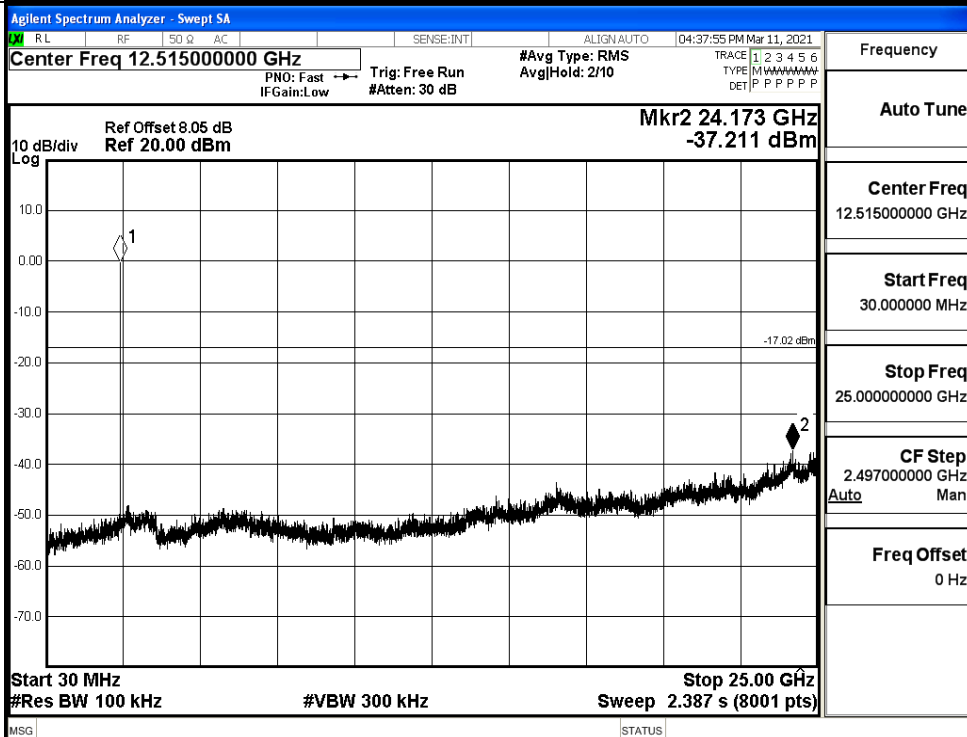


8DPSK_MCH_Graphs

Pref

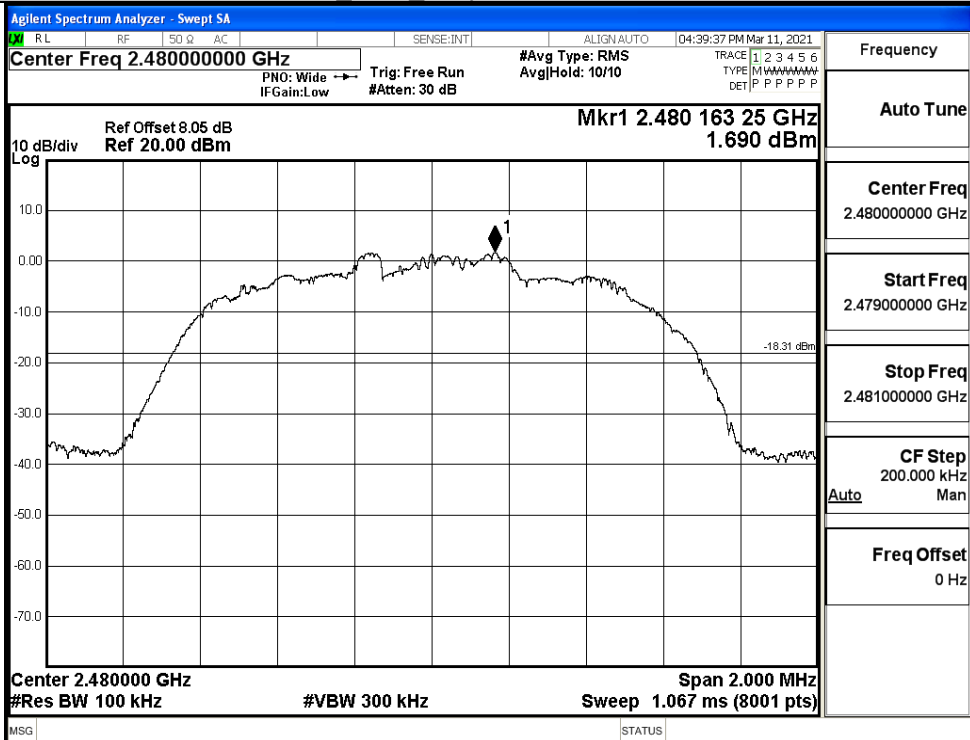


Puw

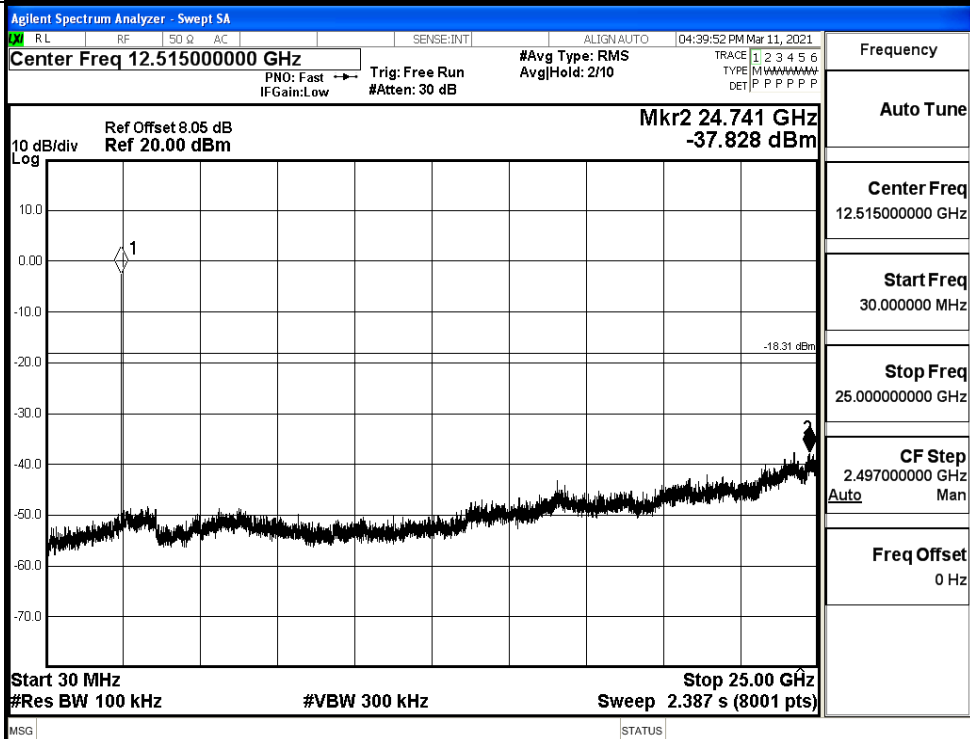


8DPSK_HCH_Graphs

Pref



Puw

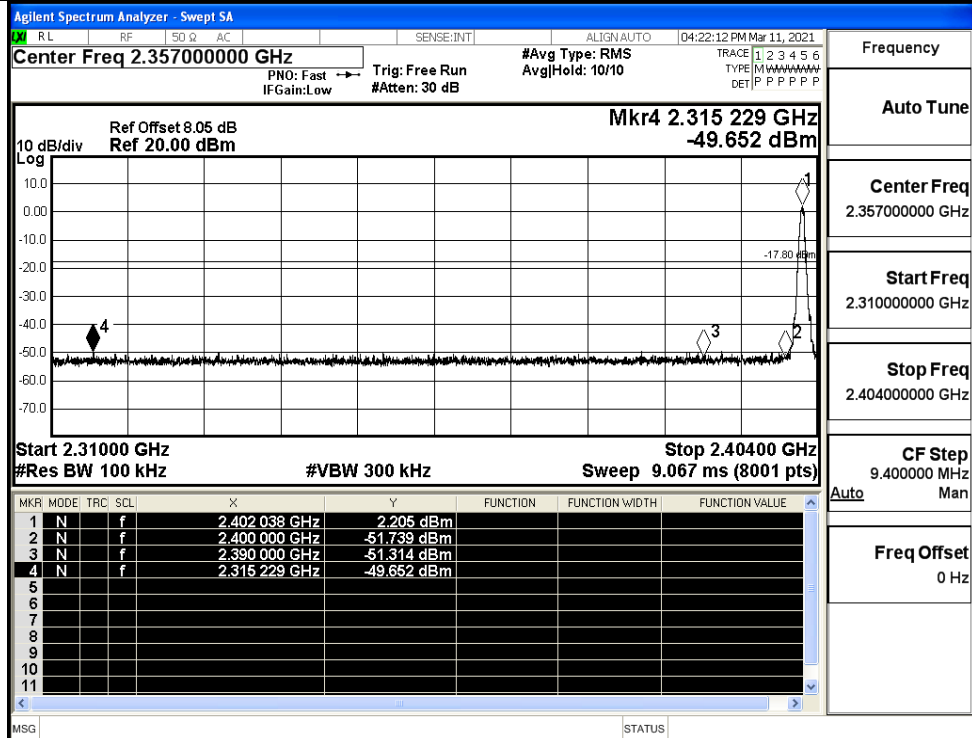


A.7 Band-edge for RF Conducted Emissions

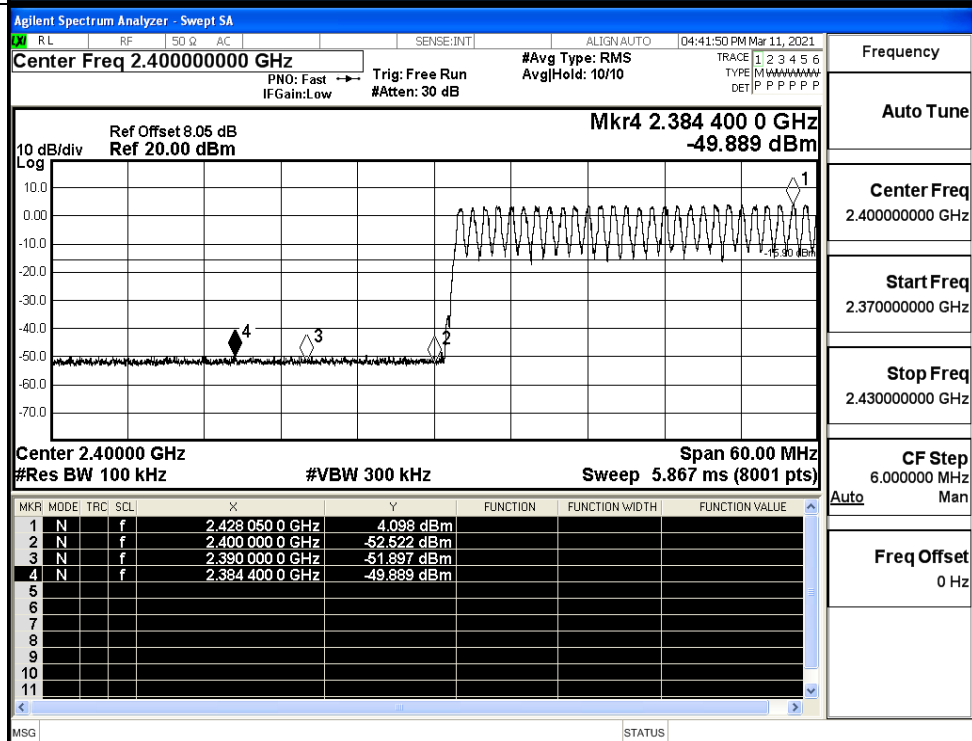
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	2.205	Off	-49.652	-17.8	PASS
			4.098	On	-49.889	-15.9	PASS
	HCH	2480	3.223	Off	-48.599	-16.78	PASS
			4.171	On	-48.534	-15.83	PASS
$\pi/4$ DQPSK	LCH	2402	1.402	Off	-49.506	-18.6	PASS
			2.753	On	-48.538	-17.25	PASS
	HCH	2480	1.177	Off	-49.378	-18.82	PASS
			2.652	On	-48.758	-17.35	PASS
8DPSK	LCH	2402	0.215	Off	-49.493	-19.79	PASS
			3.090	On	-48.721	-16.91	PASS
	HCH	2480	1.814	Off	-49.136	-18.19	PASS
			2.874	On	-48.393	-17.13	PASS

Test Graphs

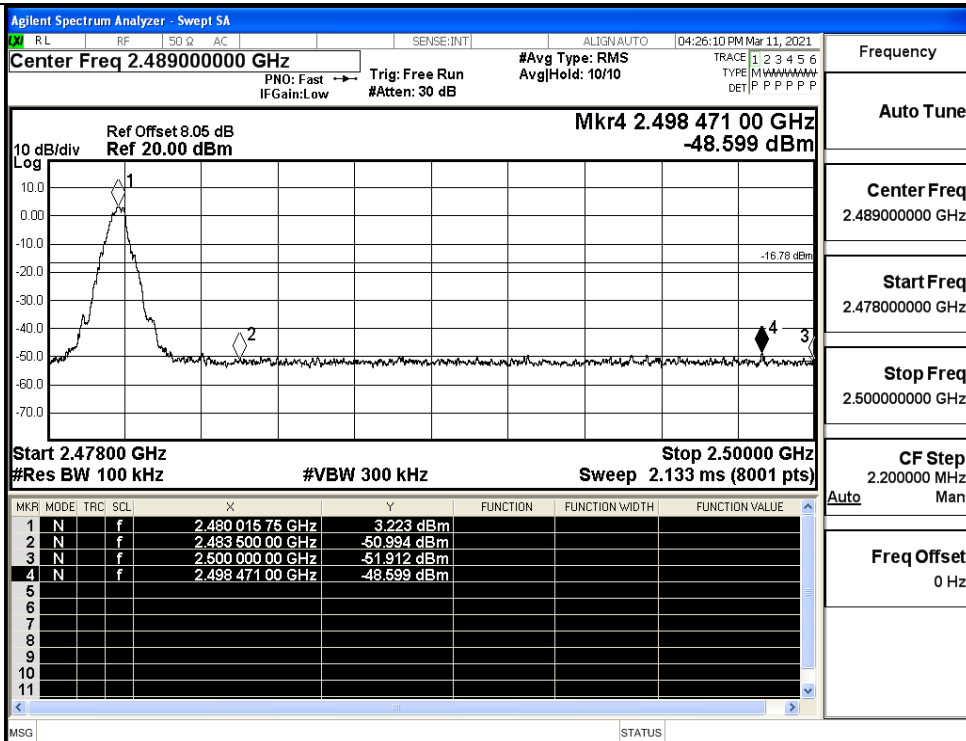
GFSK/LCH/No Hop



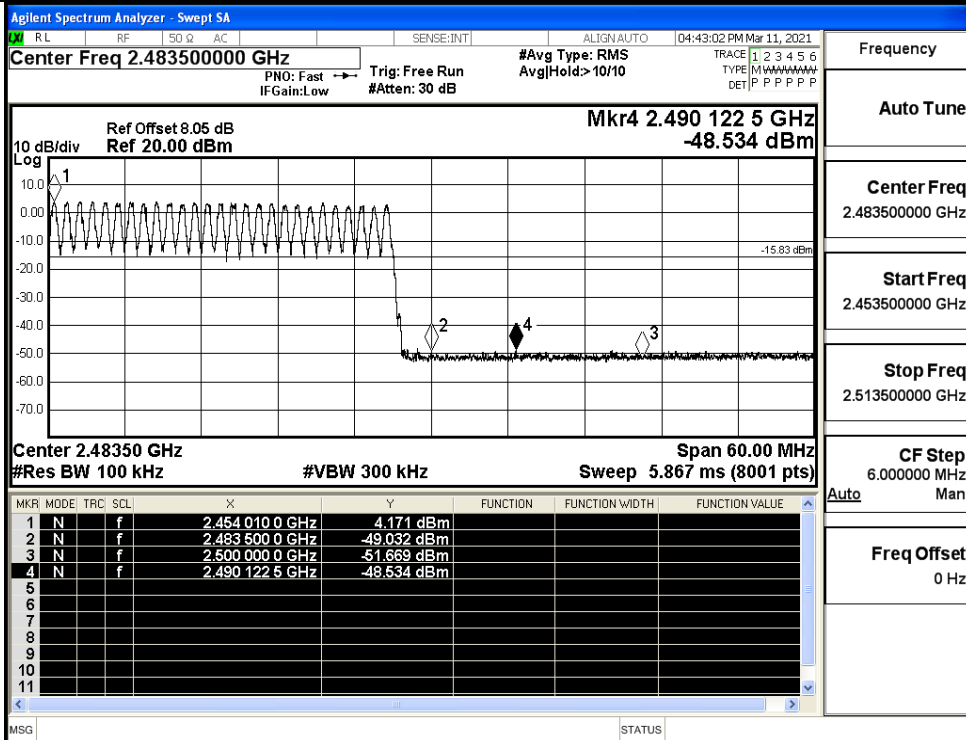
GFSK/LCH/Hop



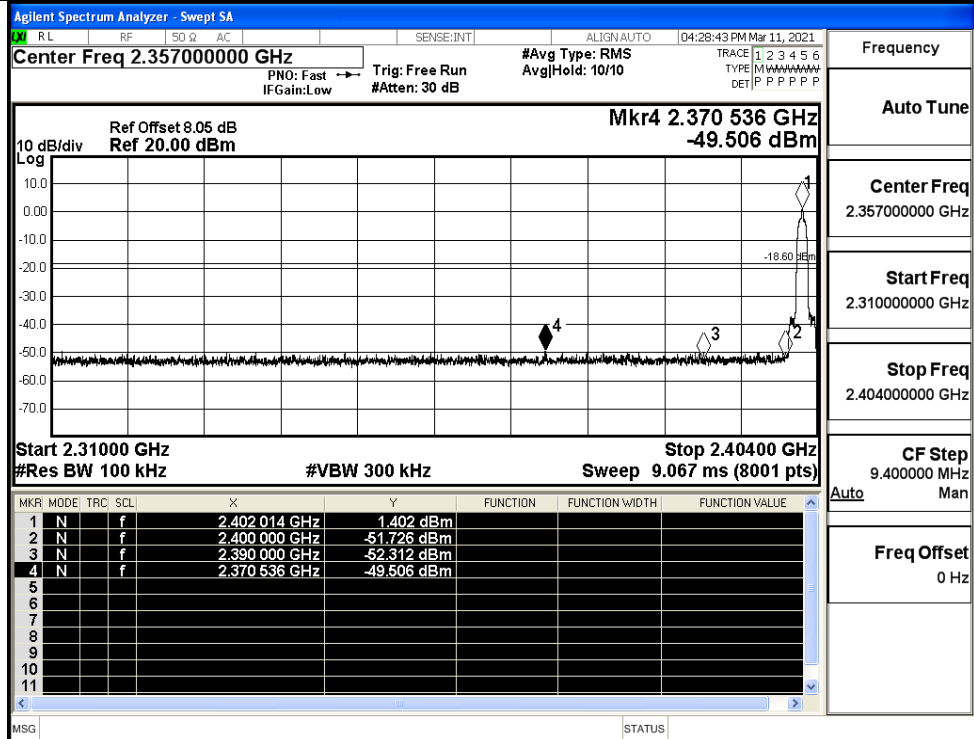
GFSK/HCH/No Hop



GFSK/HCH/Hop



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



Frequency

Auto Tune

Center Freq
2.357000000 GHz

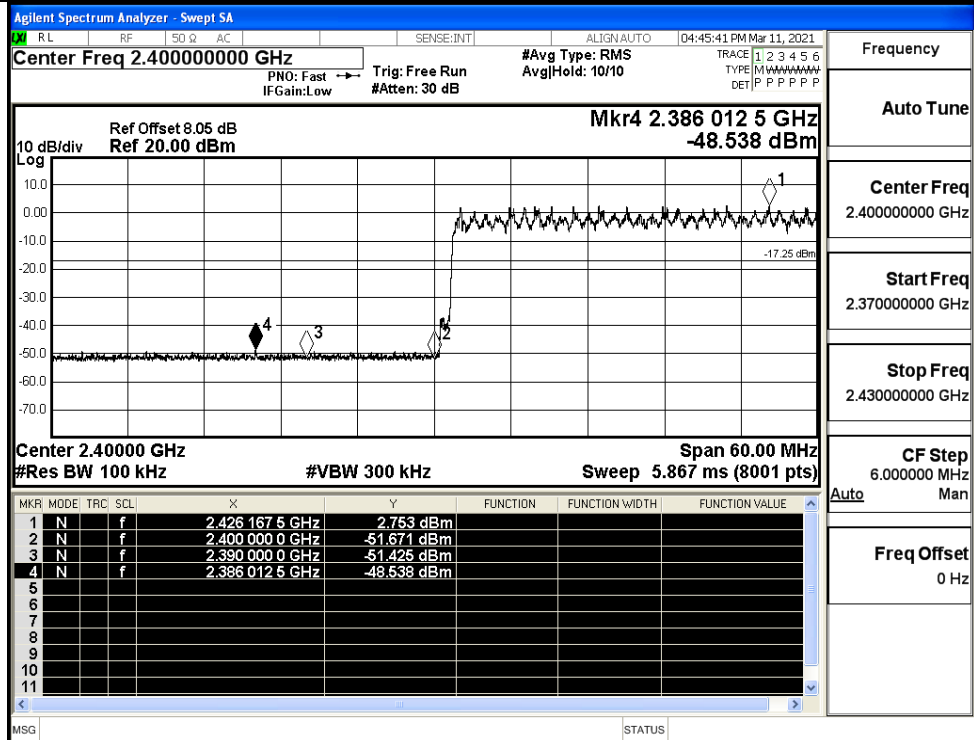
Start Freq
2.310000000 GHz

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

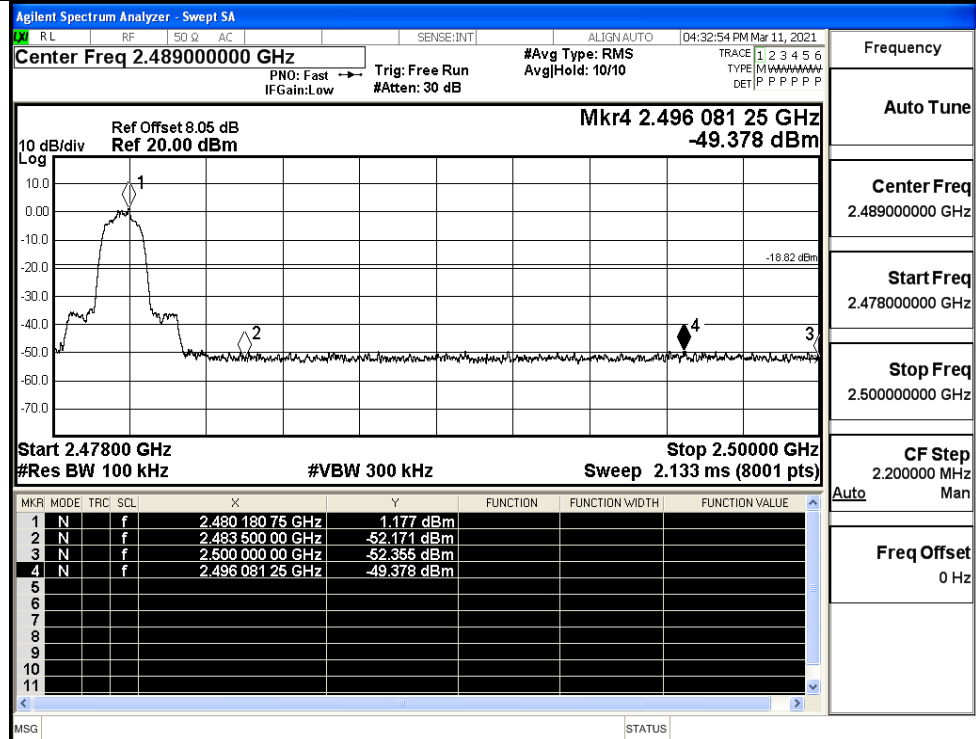
Start Freq
2.370000000 GHz

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

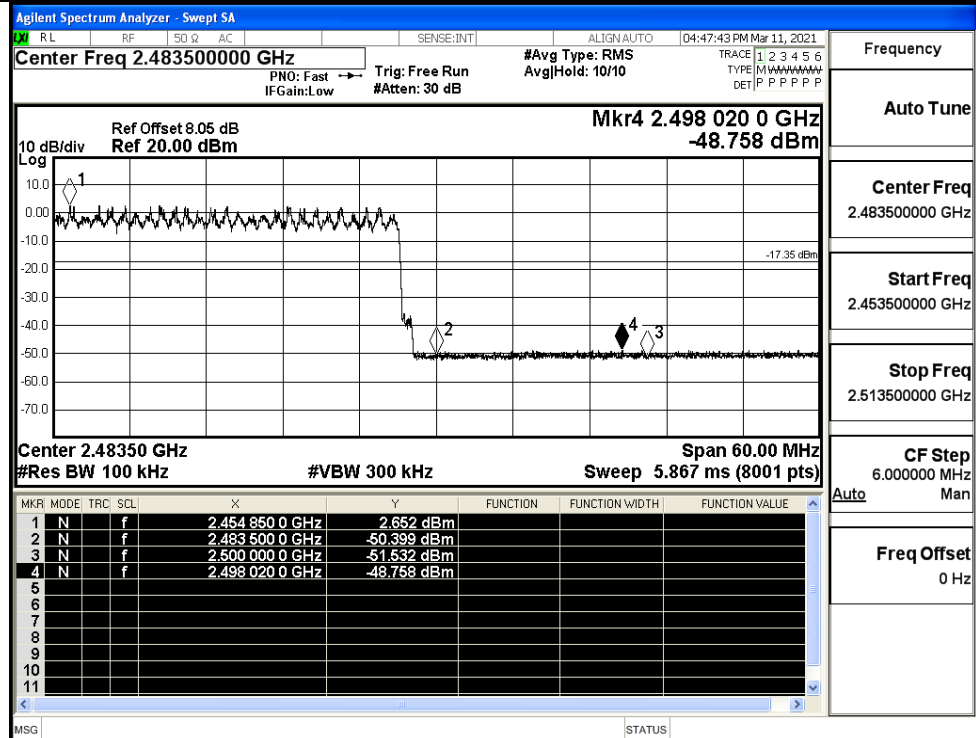
Stop Freq
2.500000000 GHz

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

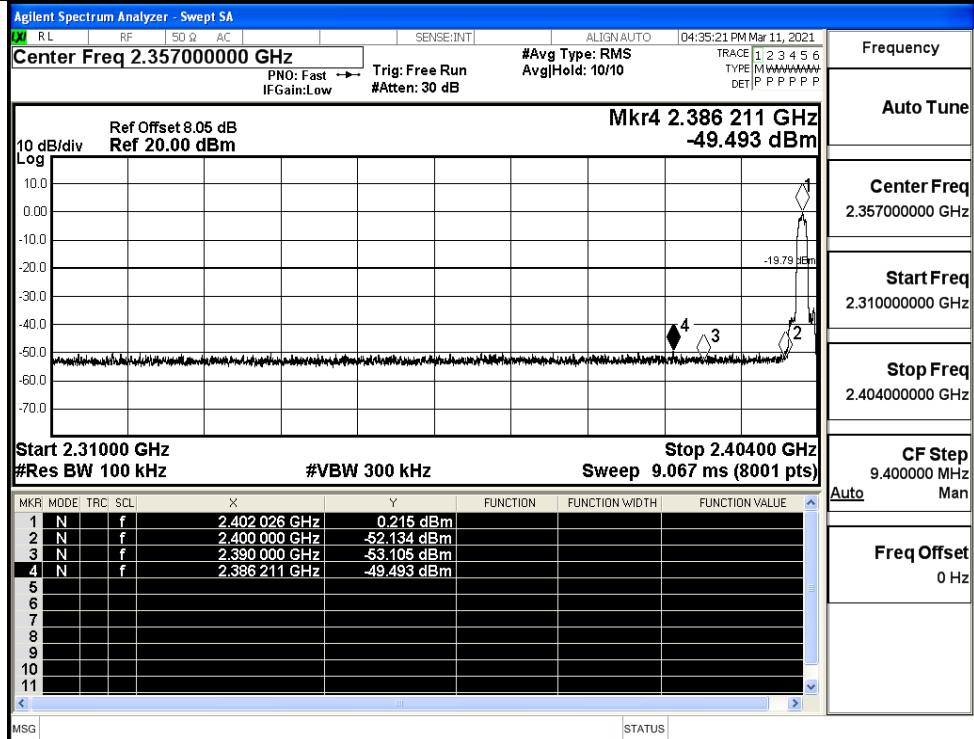
Stop Freq
2.513500000 GHz

CF Step
6.000000 MHz

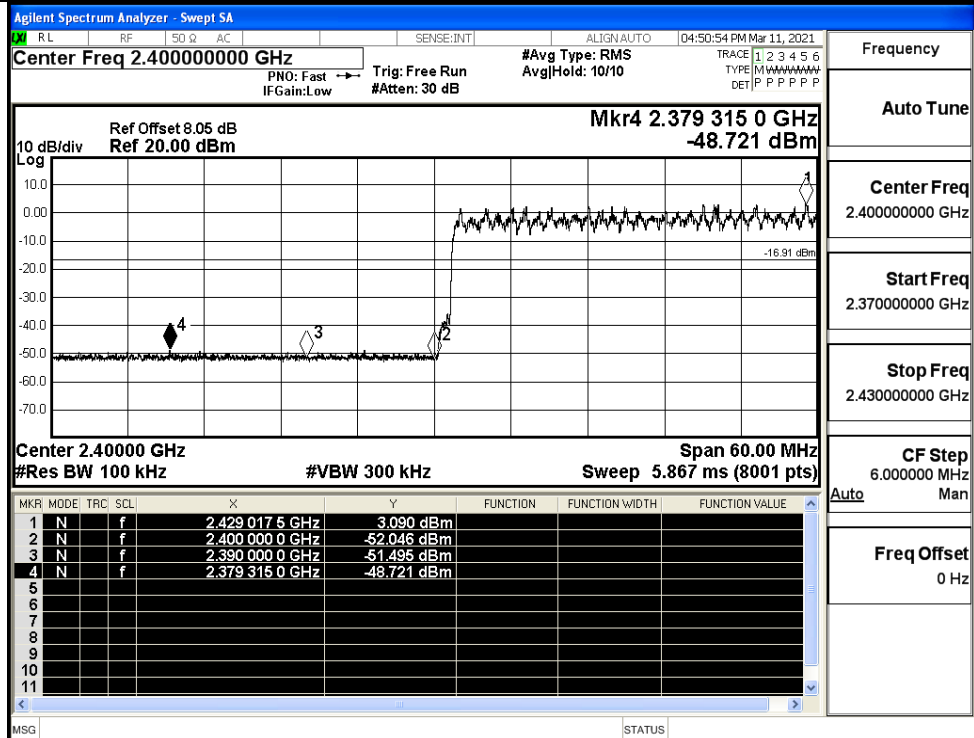
Auto Man

Freq Offset
0 Hz

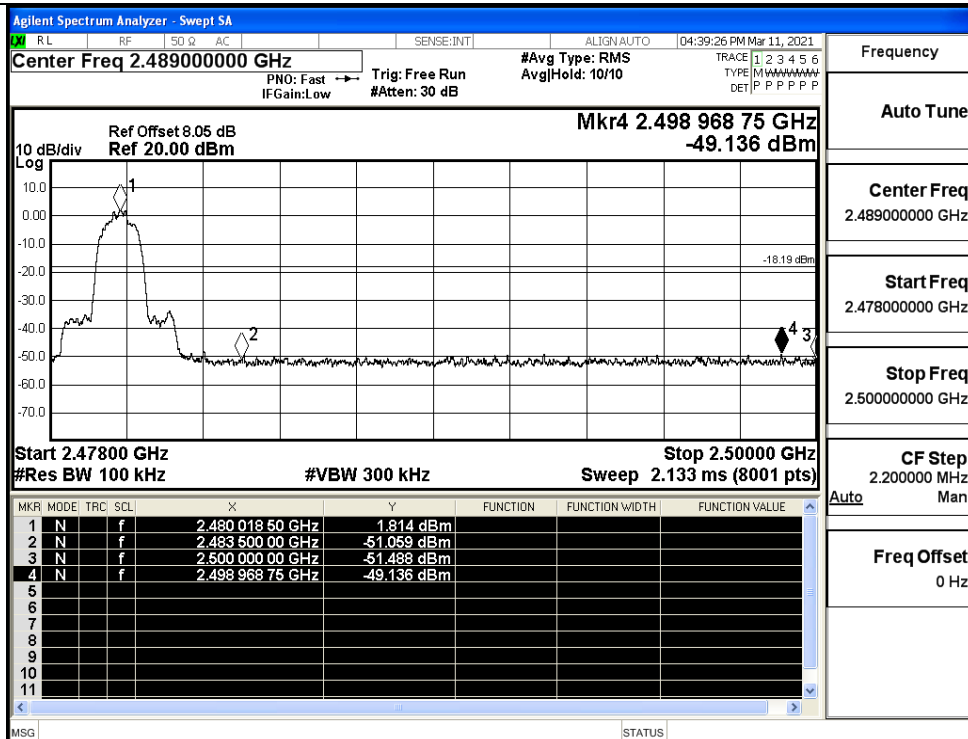
8DPSK/LCH/No Hop



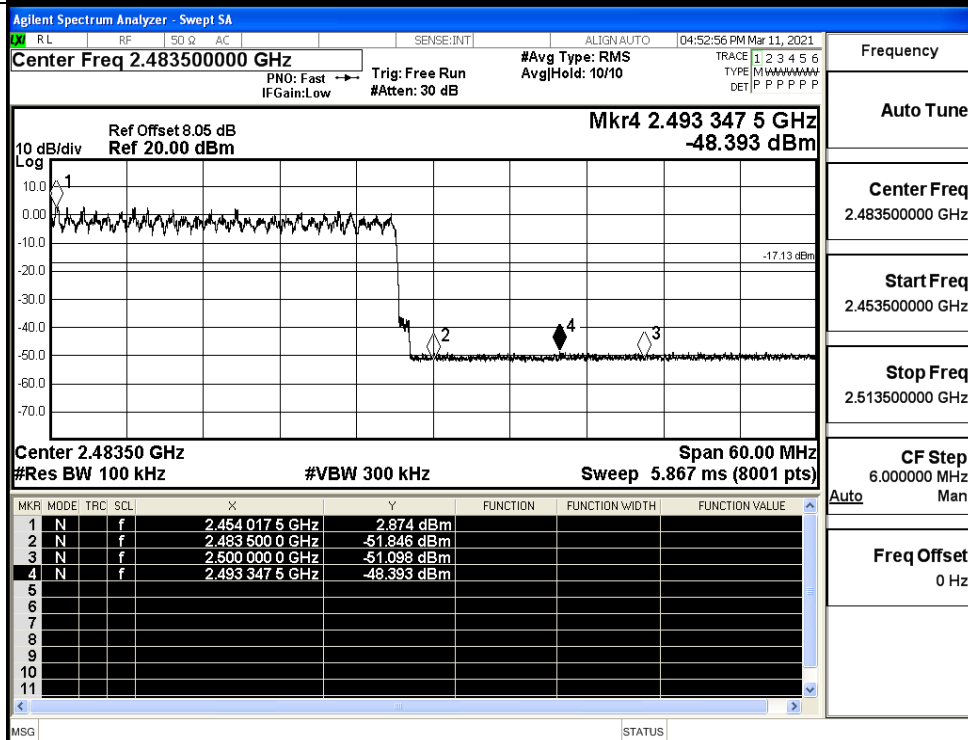
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



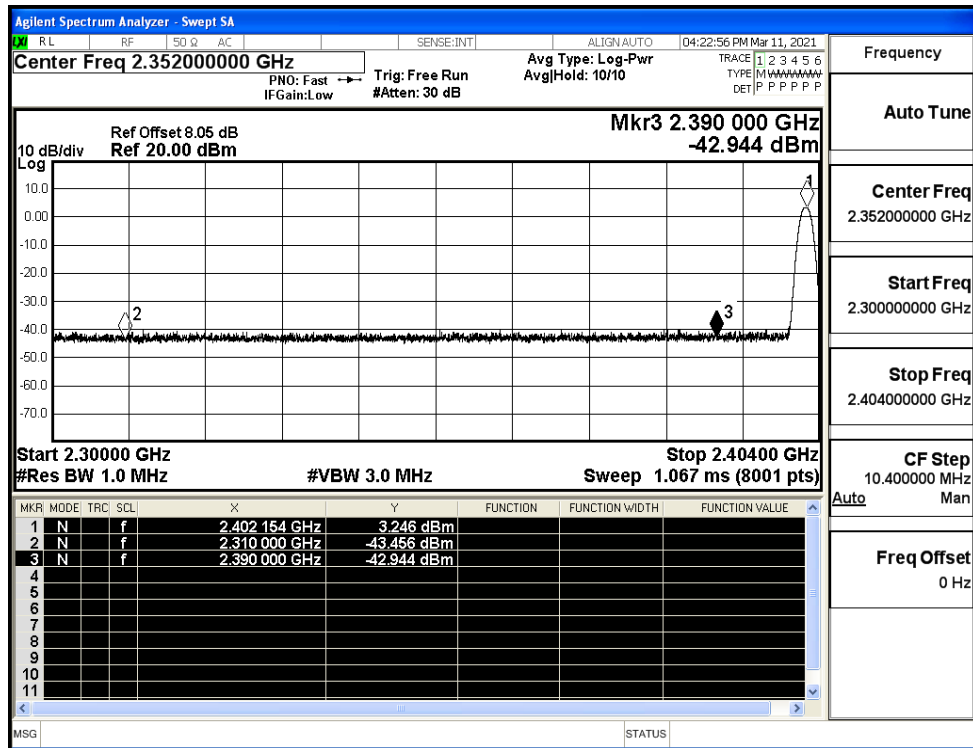
8DPSK/HCH/Hop



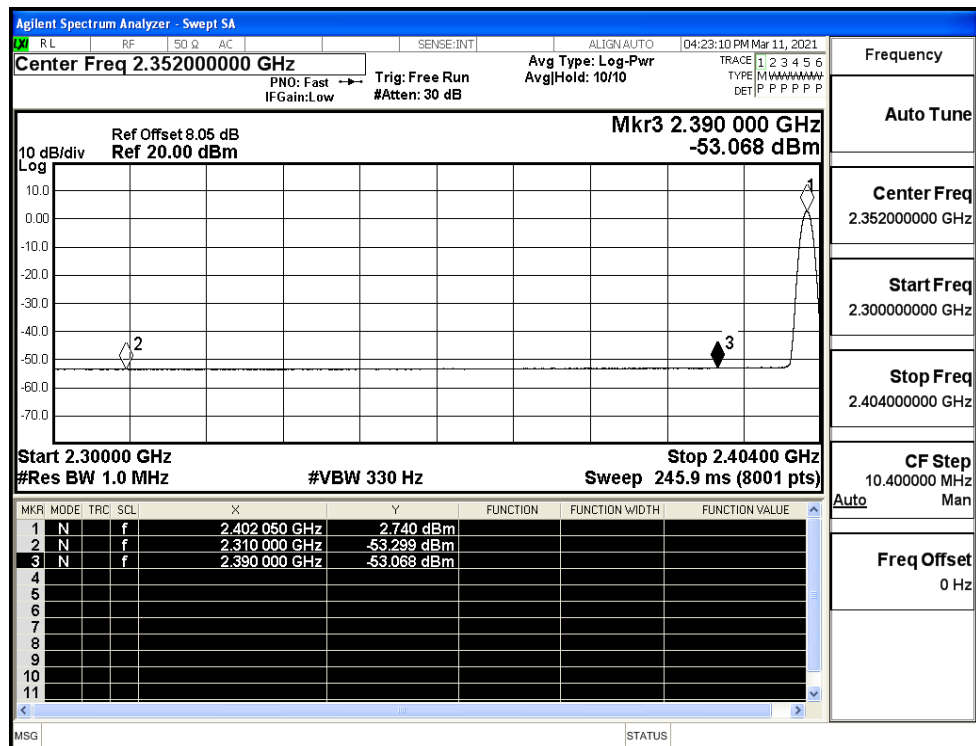
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.46	2.0	0	51.80	PEAK	74	PASS
	Off	2310.0	-53.30	2.0	0	41.96	AV	54	PASS
	Off	2390.0	-42.94	2.0	0	52.31	PEAK	74	PASS
	Off	2390.0	-53.07	2.0	0	42.19	AV	54	PASS
	Off	2483.5	-42.81	2.0	0	52.44	PEAK	74	PASS
	Off	2483.5	-52.39	2.0	0	42.86	AV	54	PASS
	Off	2500.0	-41.69	2.0	0	53.57	PEAK	74	PASS
	Off	2500.0	-52.41	2.0	0	42.84	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-42.68	2.0	0	52.58	PEAK	74	PASS
	Off	2310.0	-53.38	2.0	0	41.88	AV	54	PASS
	Off	2390.0	-42.90	2.0	0	52.35	PEAK	74	PASS
	Off	2390.0	-53.10	2.0	0	42.16	AV	54	PASS
	Off	2483.5	-42.01	2.0	0	53.25	PEAK	74	PASS
	Off	2483.5	-52.39	2.0	0	42.87	AV	54	PASS
	Off	2500.0	-42.21	2.0	0	53.05	PEAK	74	PASS
	Off	2500.0	-52.43	2.0	0	42.83	AV	54	PASS
8DPSK	Off	2310.0	-43.04	2.0	0	52.22	PEAK	74	PASS
	Off	2310.0	-53.39	2.0	0	41.87	AV	54	PASS
	Off	2390.0	-42.60	2.0	0	52.65	PEAK	74	PASS
	Off	2390.0	-53.03	2.0	0	42.23	AV	54	PASS
	Off	2483.5	-40.77	2.0	0	54.49	PEAK	74	PASS
	Off	2483.5	-52.39	2.0	0	42.87	AV	54	PASS
	Off	2500.0	-42.37	2.0	0	52.89	PEAK	74	PASS
	Off	2500.0	-52.33	2.0	0	42.92	AV	54	PASS

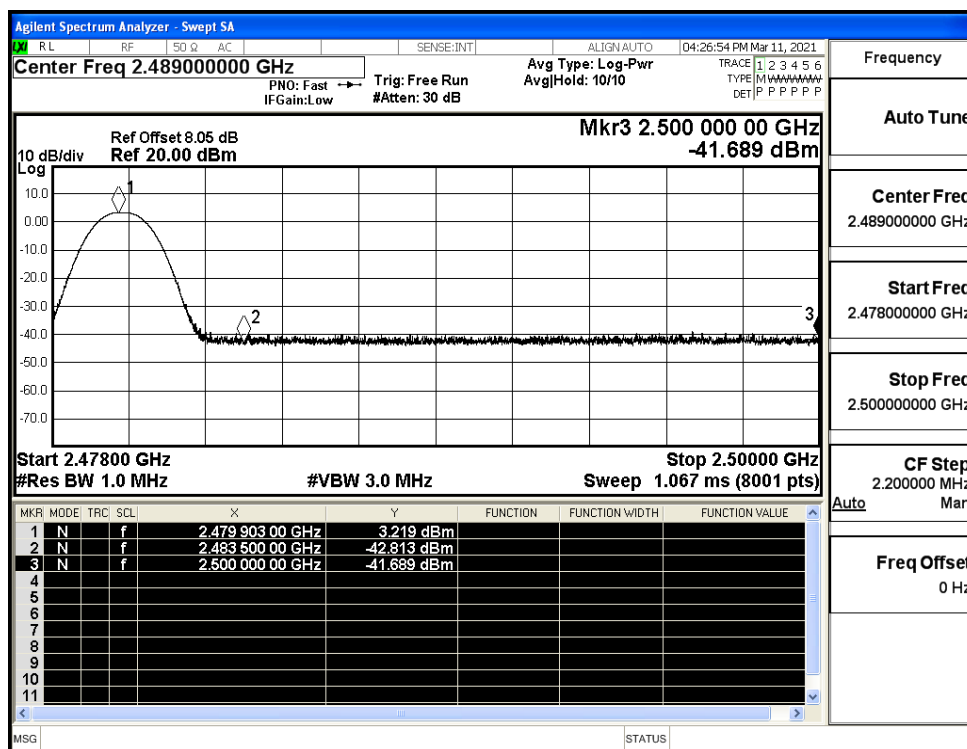
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



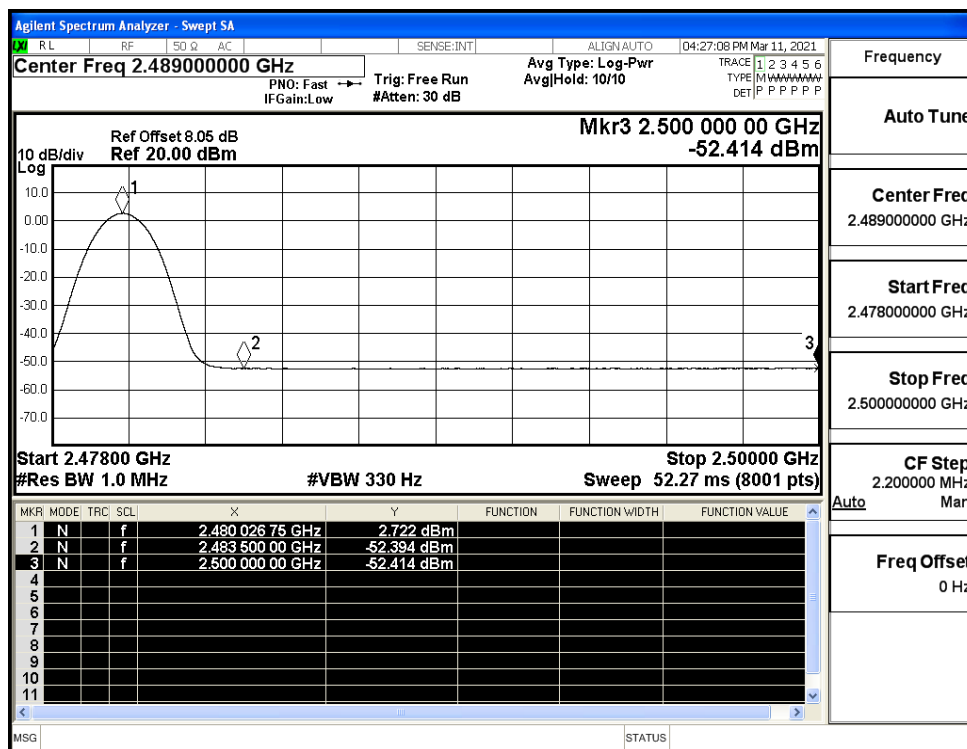
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

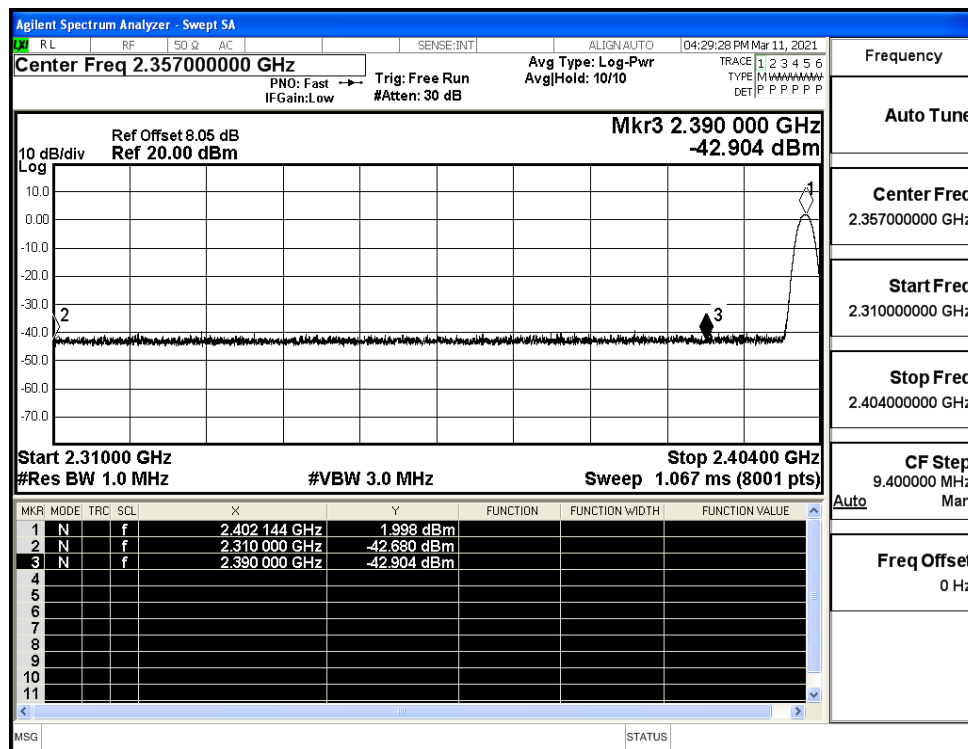
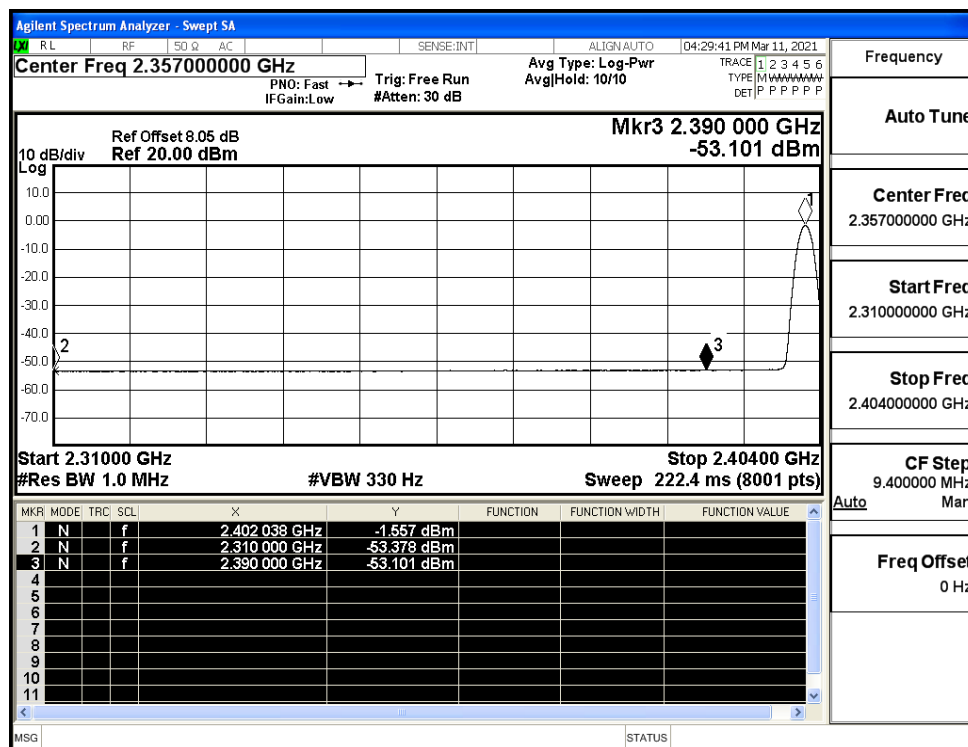


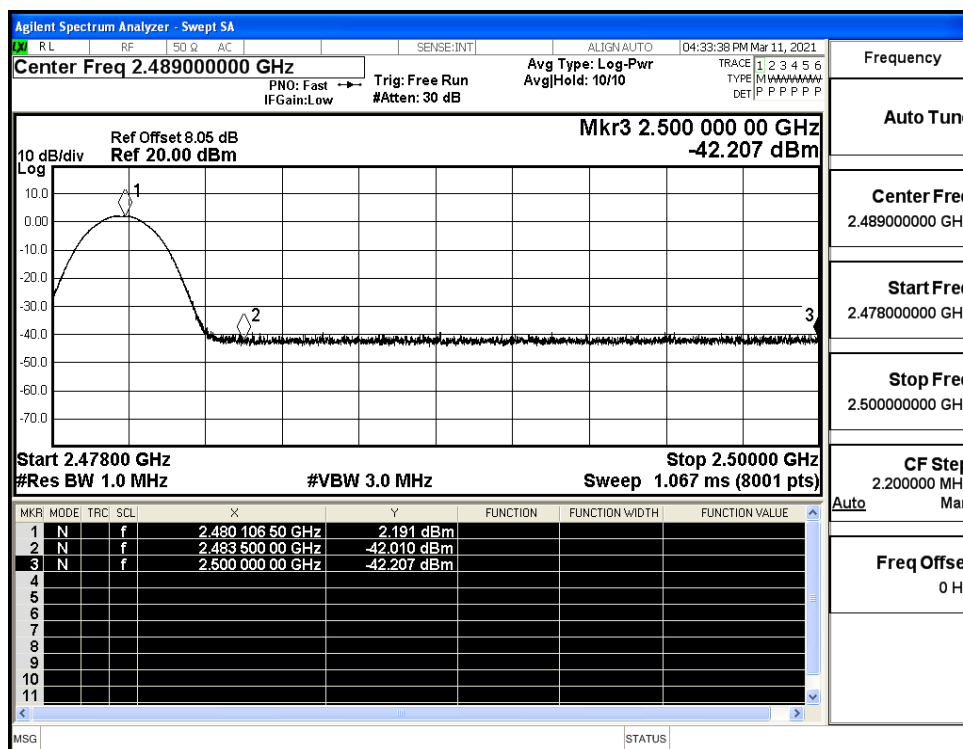
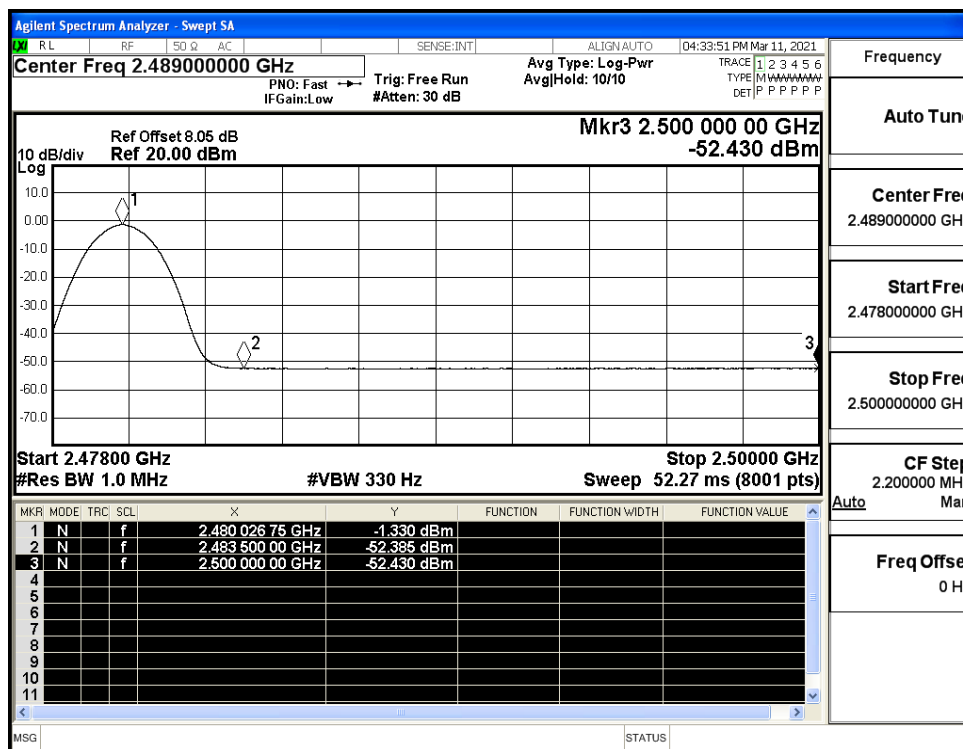
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



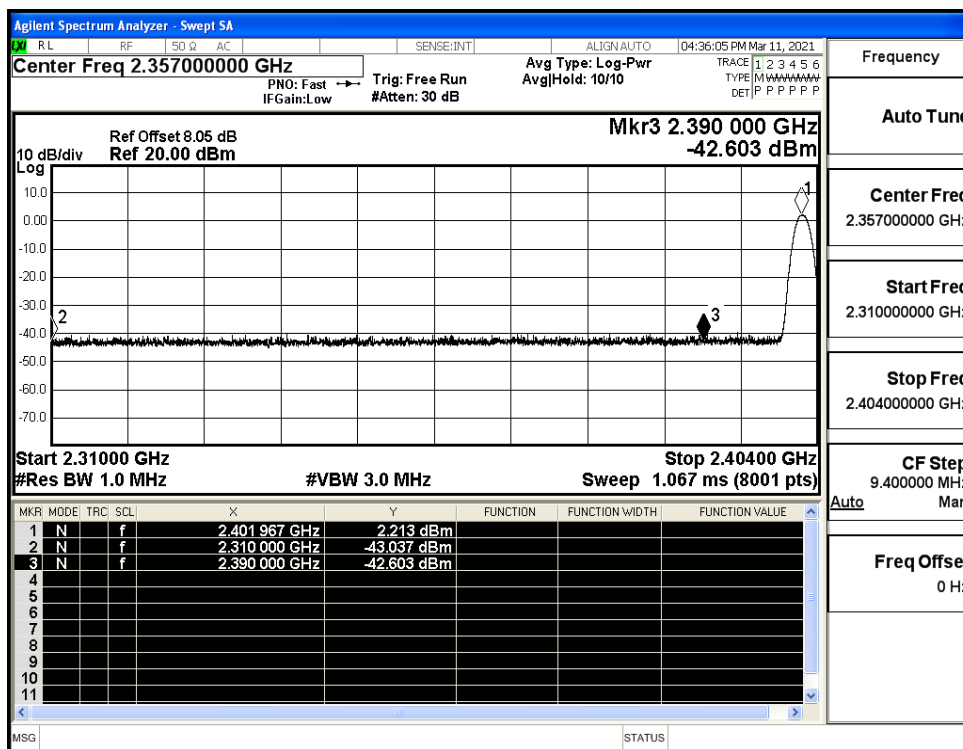
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



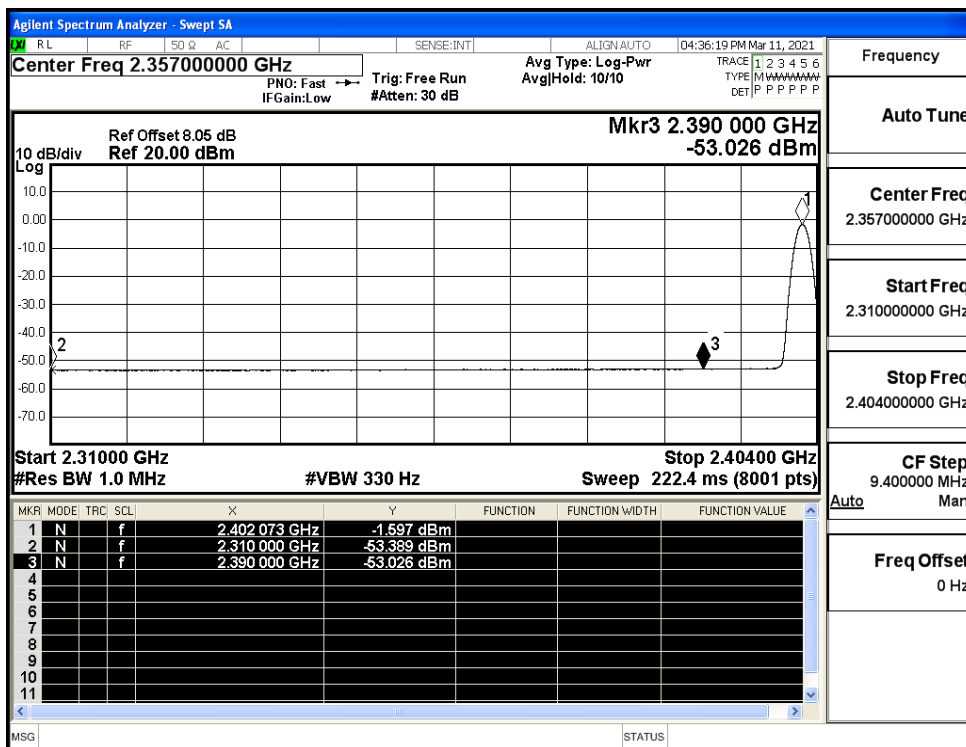
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

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)

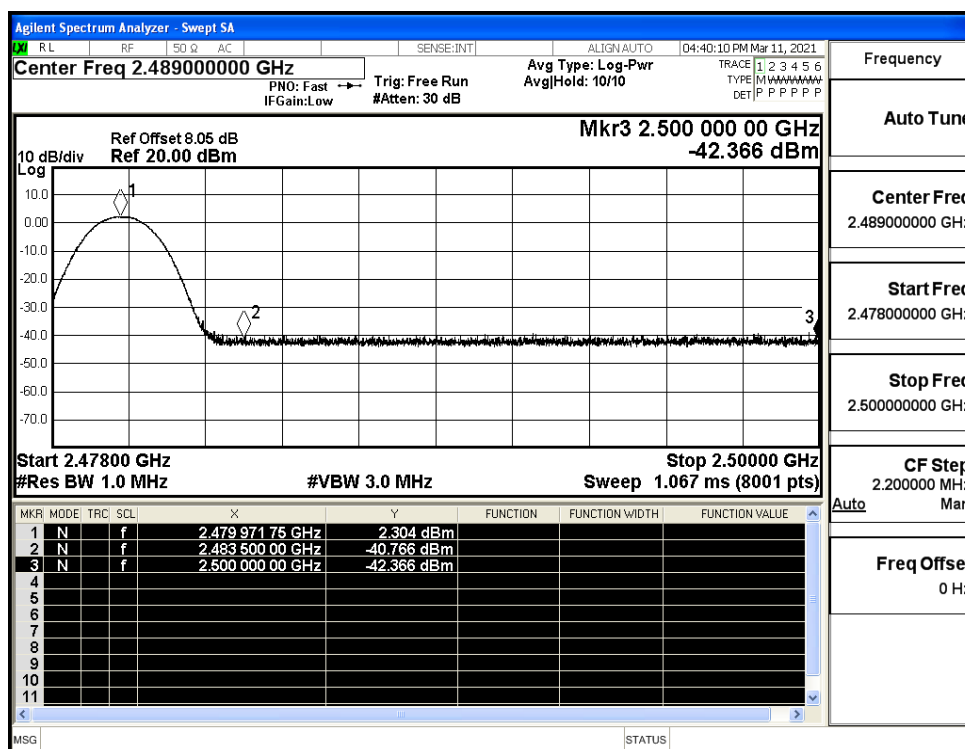
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

