

Appendix A

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

Product Name: Bluetooth CDG Karaoke with Special Light Effects

Trade Mark: singing machine

FCC Test Model: SML625BTBK

ISED Test Model: SML625BTYY

Environmental Conditions

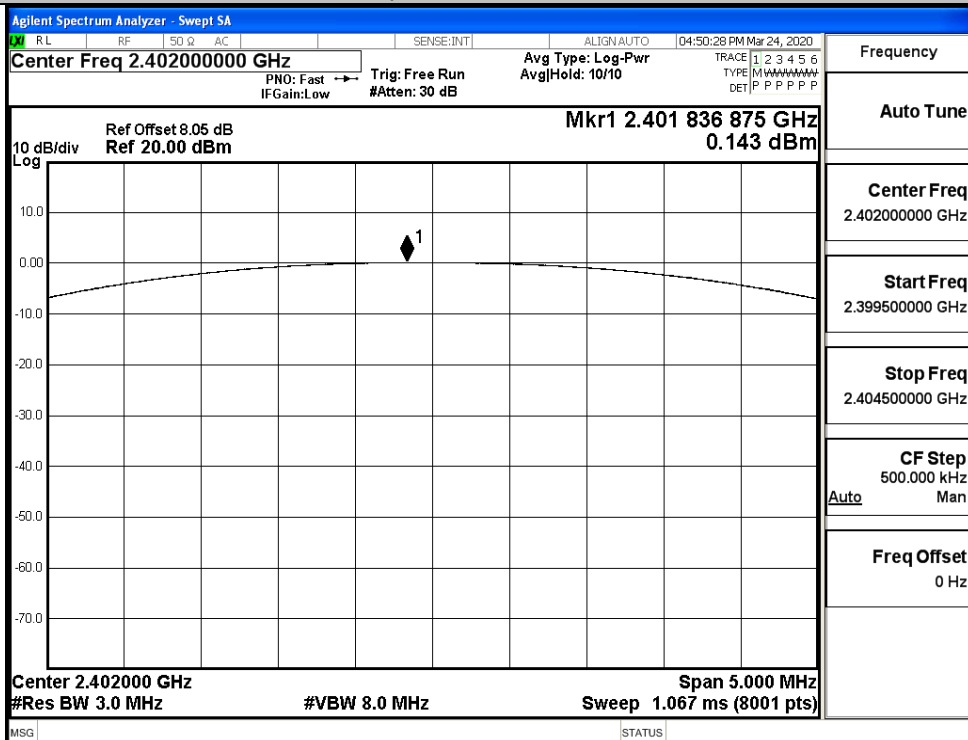
Temperature:	24 °C
Relative Humidity:	53.4%
ATM Pressure:	100.0 kPa
Test Engineer:	SCOUT WU
Supervised by:	Tom.Liu

A.1 Maximum Conducted Peak Output Power

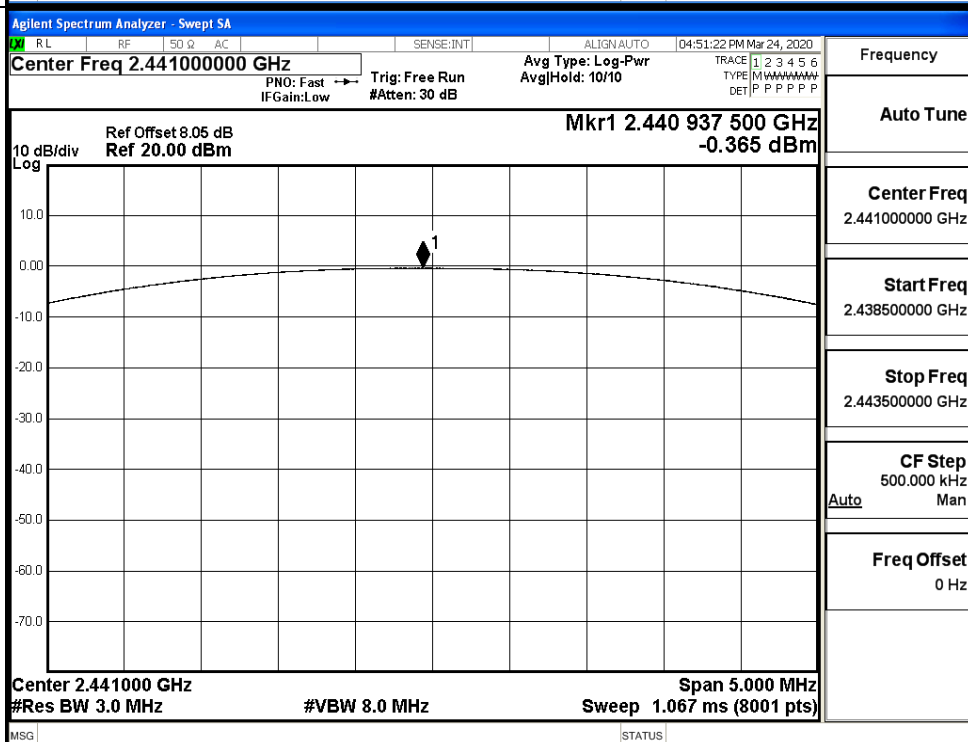
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.143	30	PASS
	MCH	-0.365	30	PASS
	HCH	-0.642	30	PASS
$\pi/4$ DQPSK	LCH	0.515	30	PASS
	MCH	-0.034	30	PASS
	HCH	0.554	30	PASS

Test Graphs

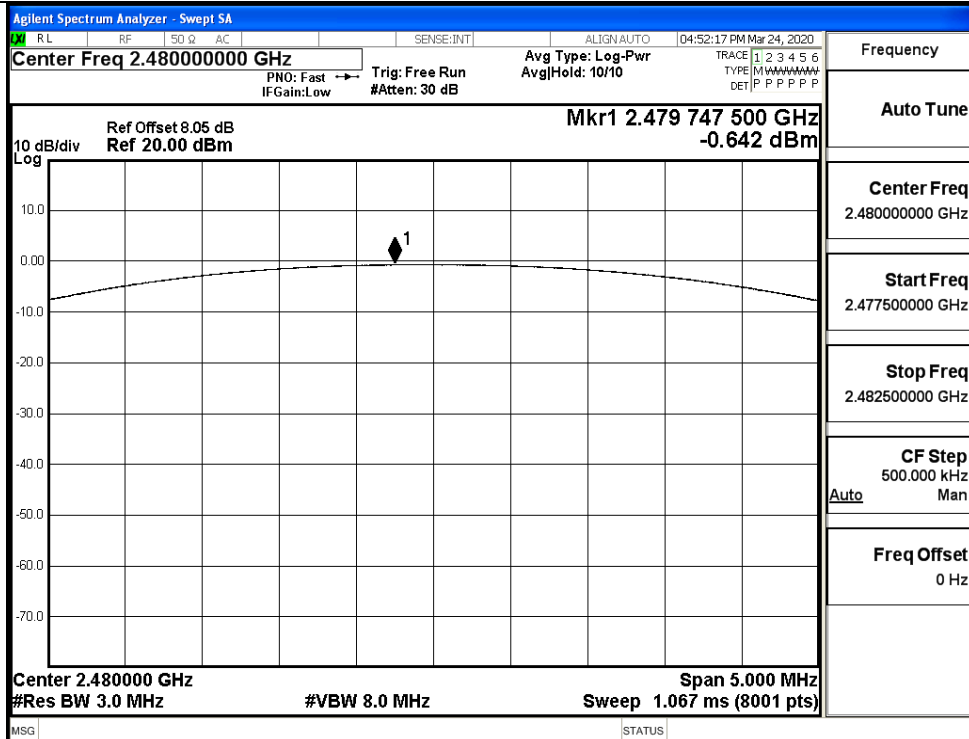
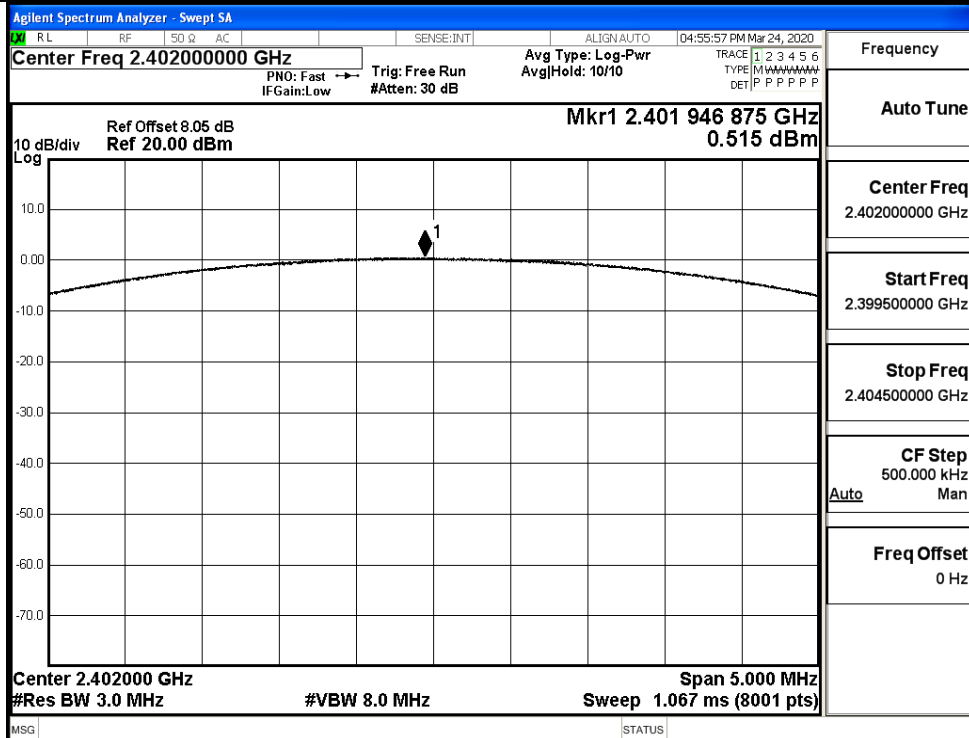
GFSK/LCH

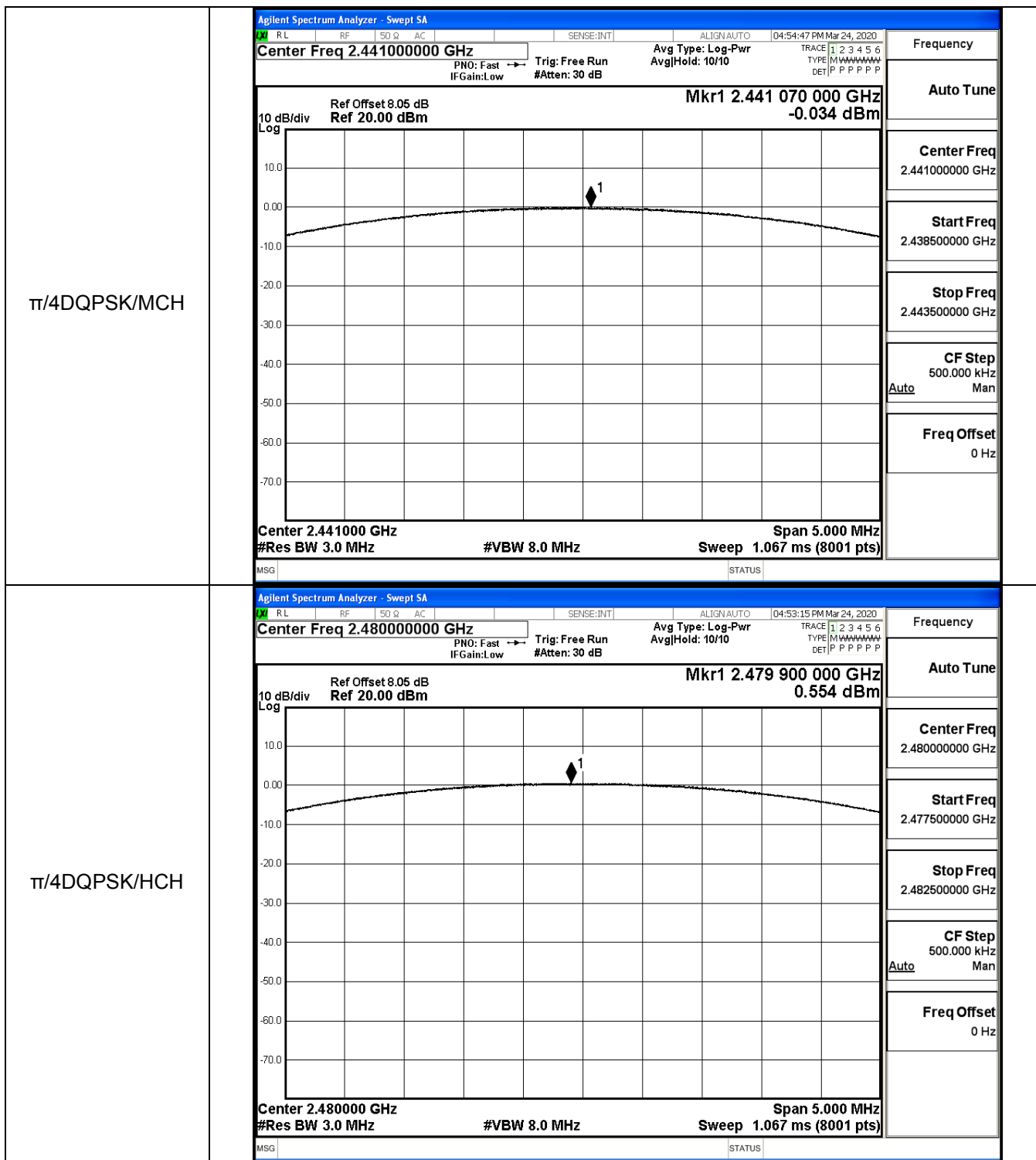


GFSK/MCH



GFSK/HCH

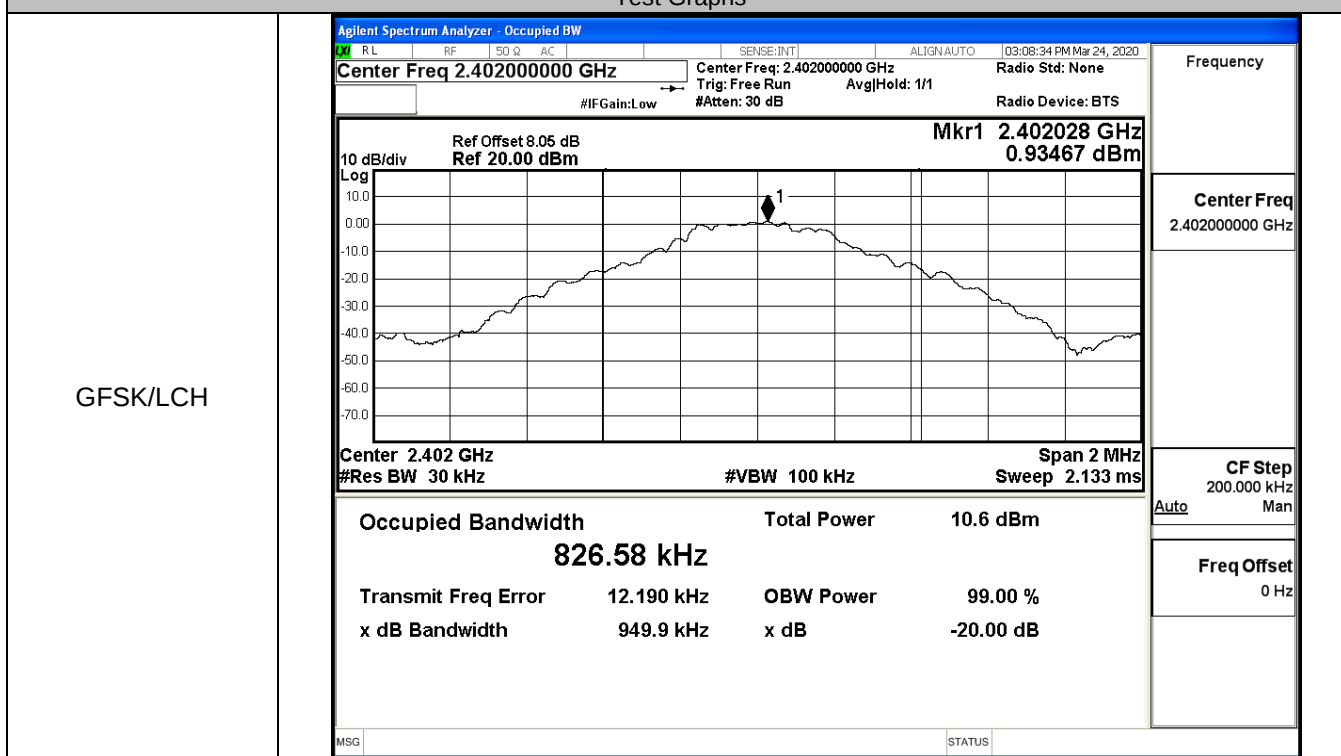
 $\pi/4$ DQPSK/LCH



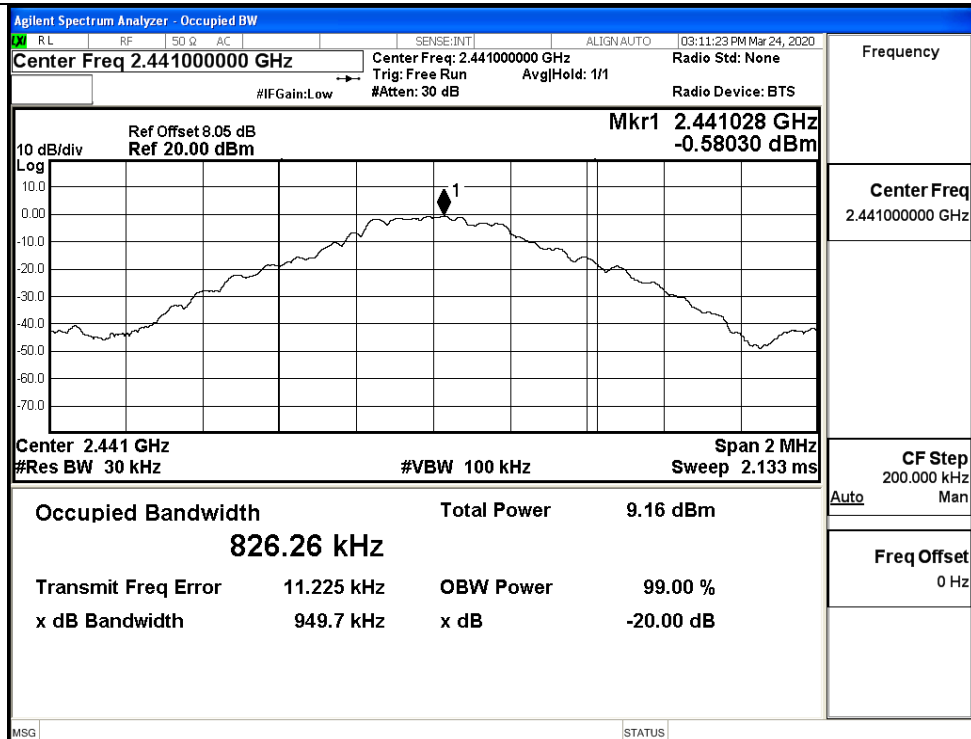
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9499	Not Specified	PASS
	MCH	0.9497	Not Specified	PASS
	HCH	0.9490	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.323	Not Specified	PASS
	MCH	1.323	Not Specified	PASS
	HCH	1.324	Not Specified	PASS

Test Graphs



GFSK/MCH



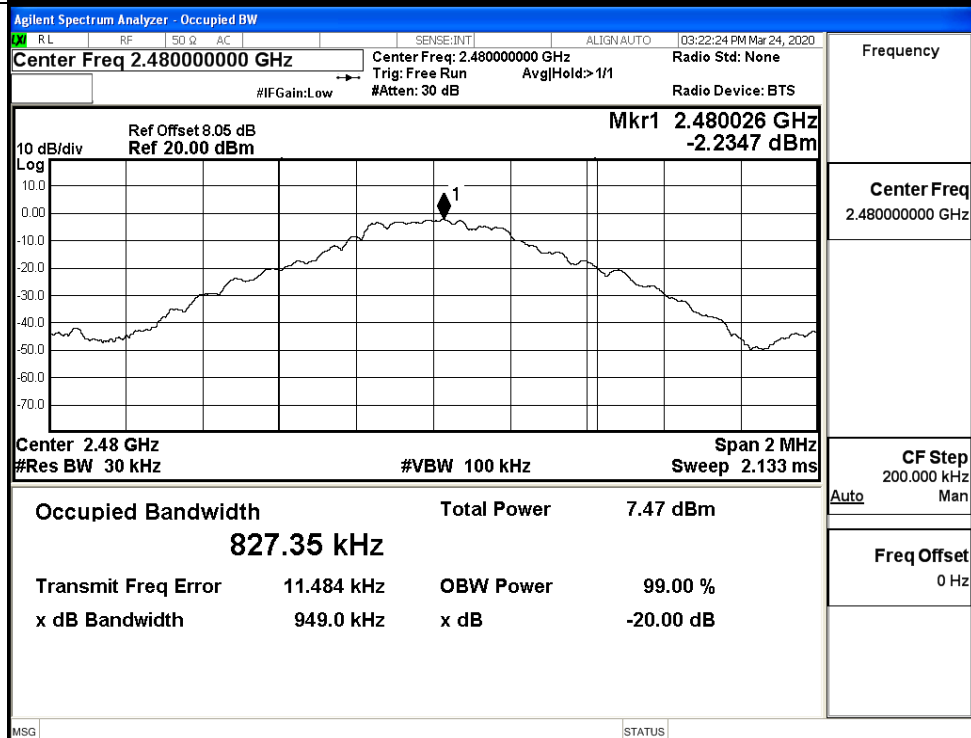
Frequency

Center Freq
2.441000000 GHzCF Step
200.000 kHz
Man

Auto

Freq Offset
0 Hz

GFSK/HCH

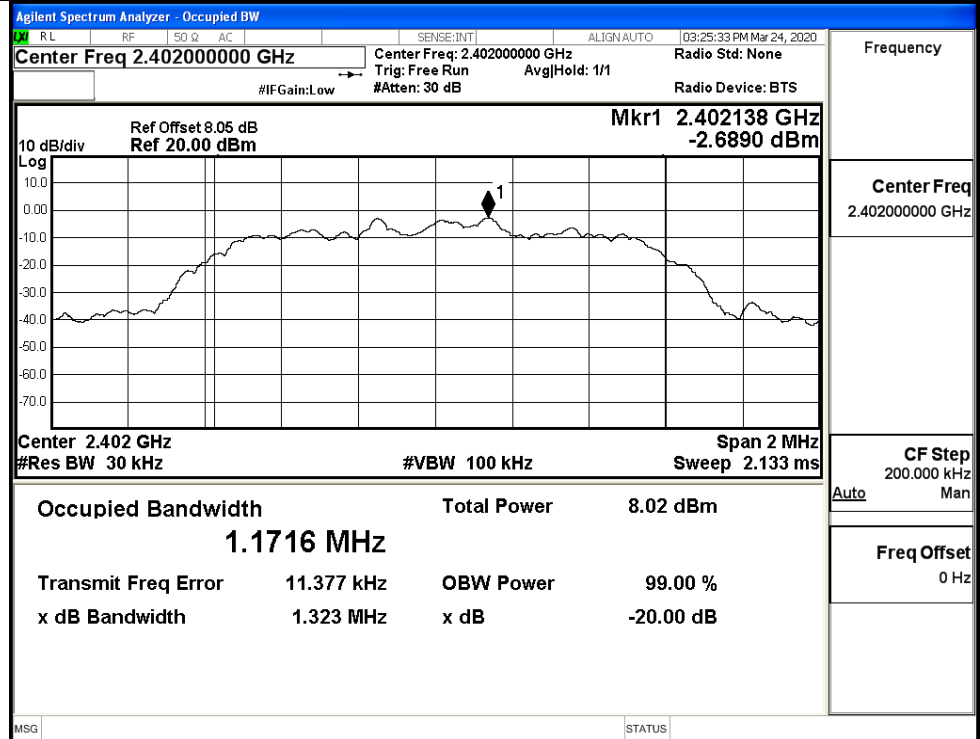
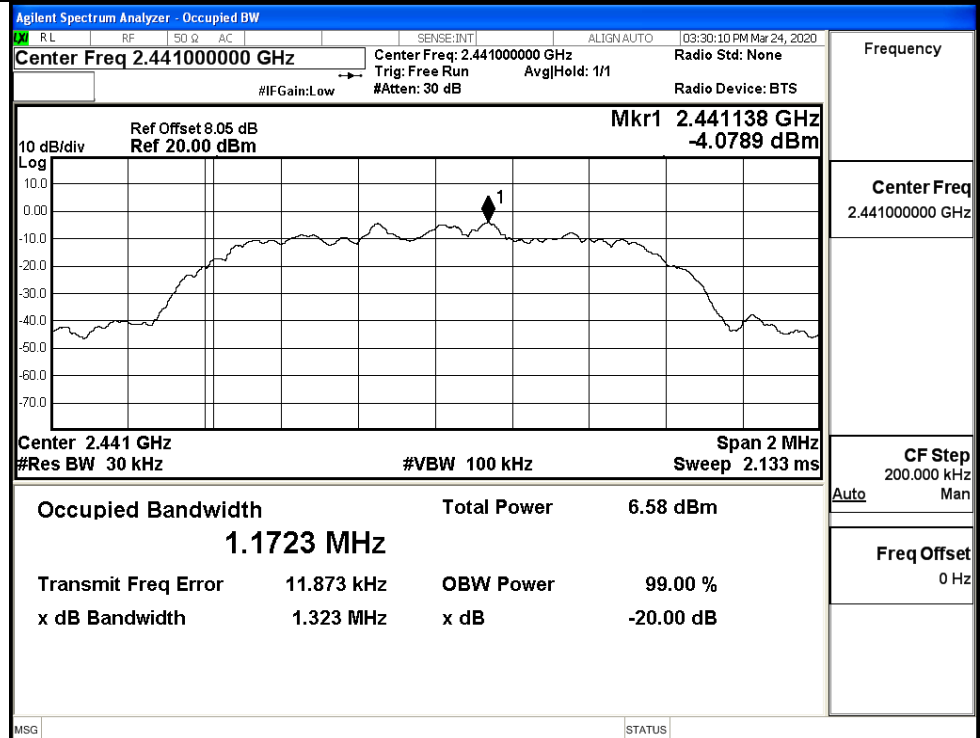


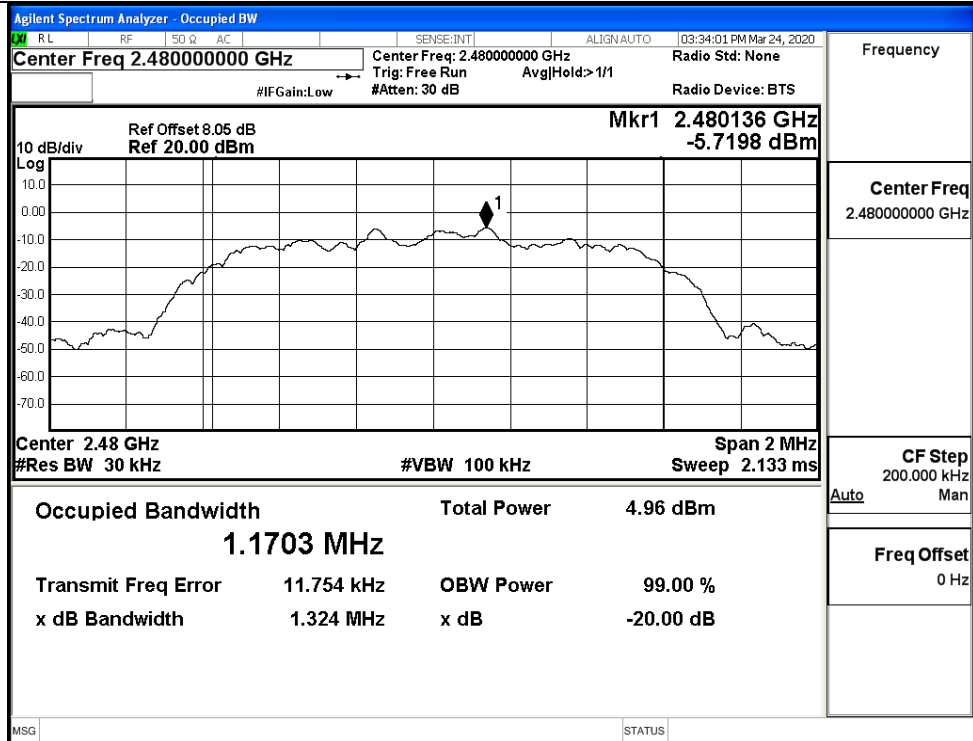
Frequency

Center Freq
2.480000000 GHzCF Step
200.000 kHz
Man

Auto

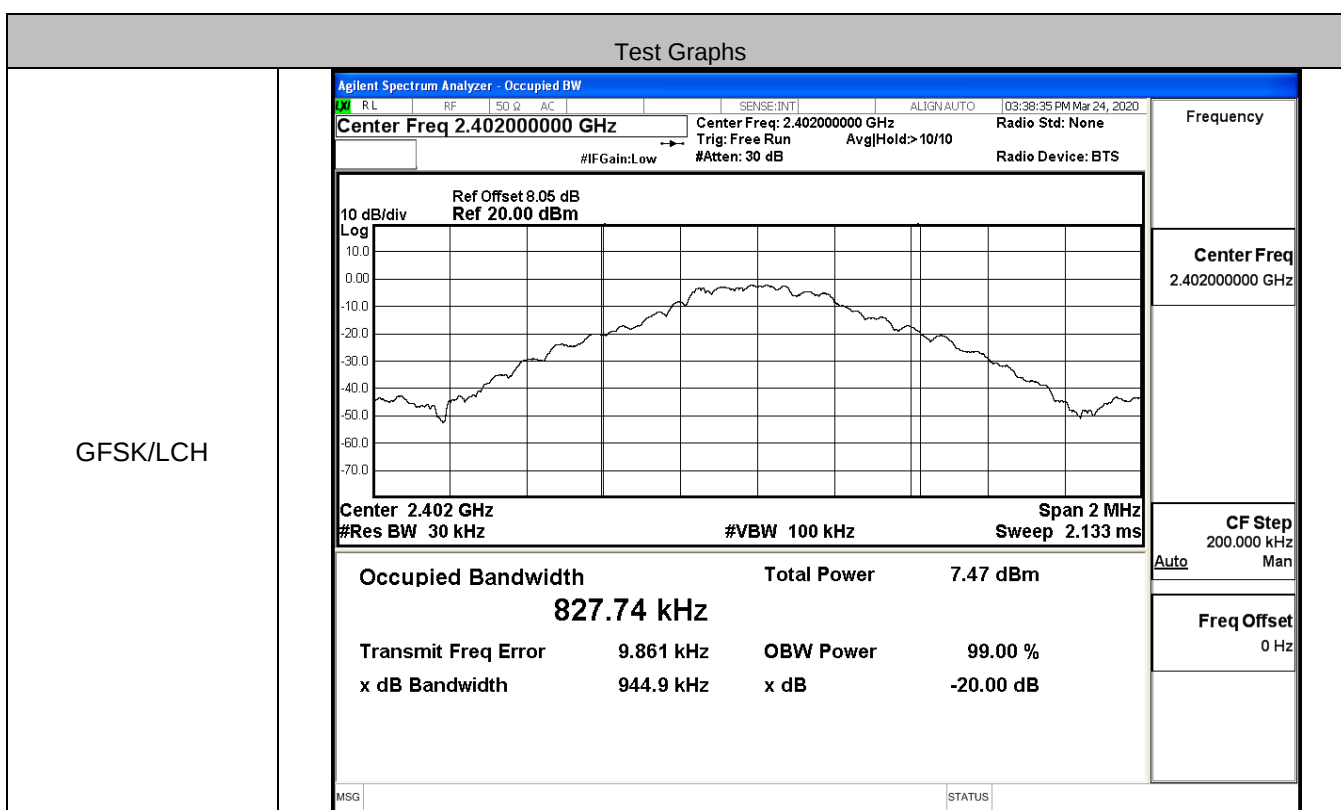
Freq Offset
0 Hz

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

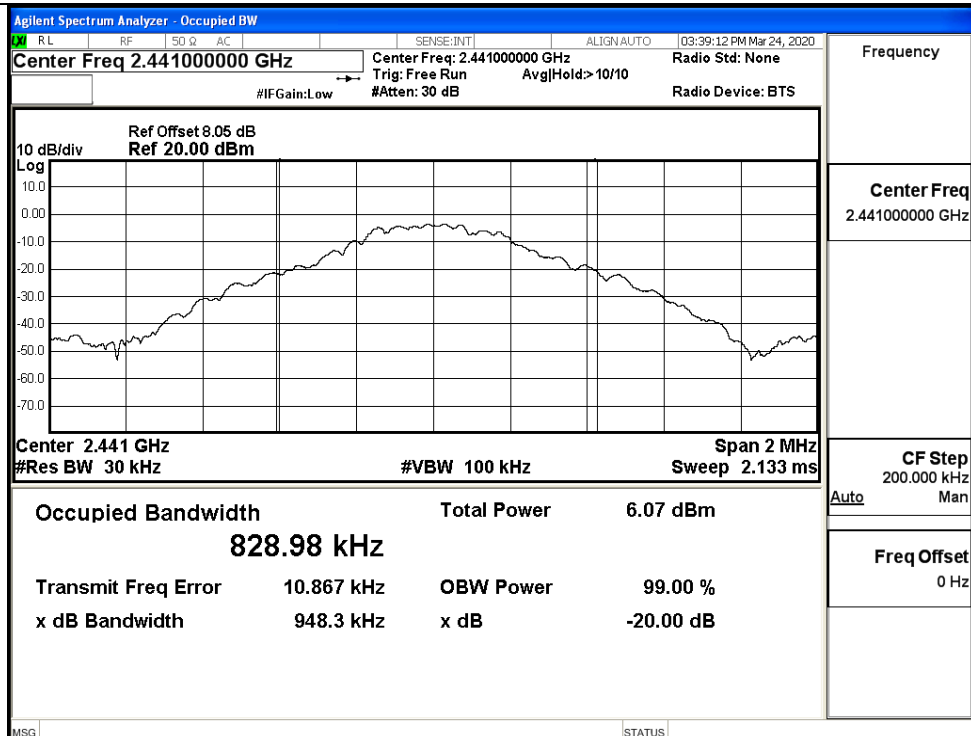
$\pi/4$ DQPSK/HCH

A.3 Occupied Bandwidth

Mode	Channel.	Occupied Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.82774	Not Specified	PASS
	MCH	0.82898	Not Specified	PASS
	HCH	0.82842	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.1733	Not Specified	PASS
	MCH	1.1740	Not Specified	PASS
	HCH	1.1718	Not Specified	PASS



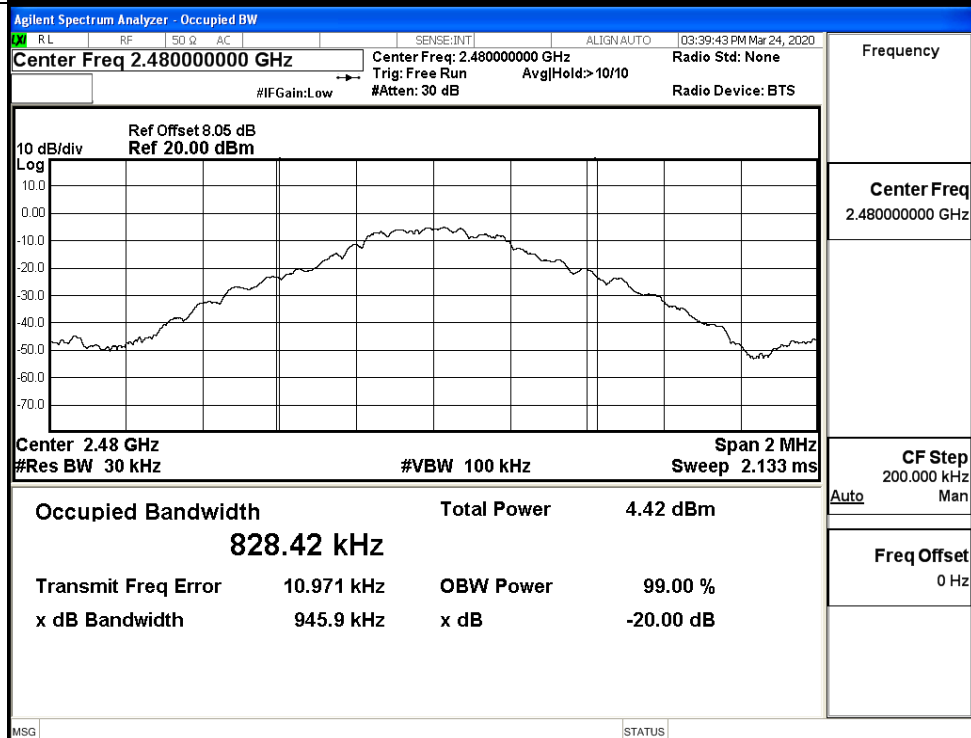
GFSK/MCH



Frequency

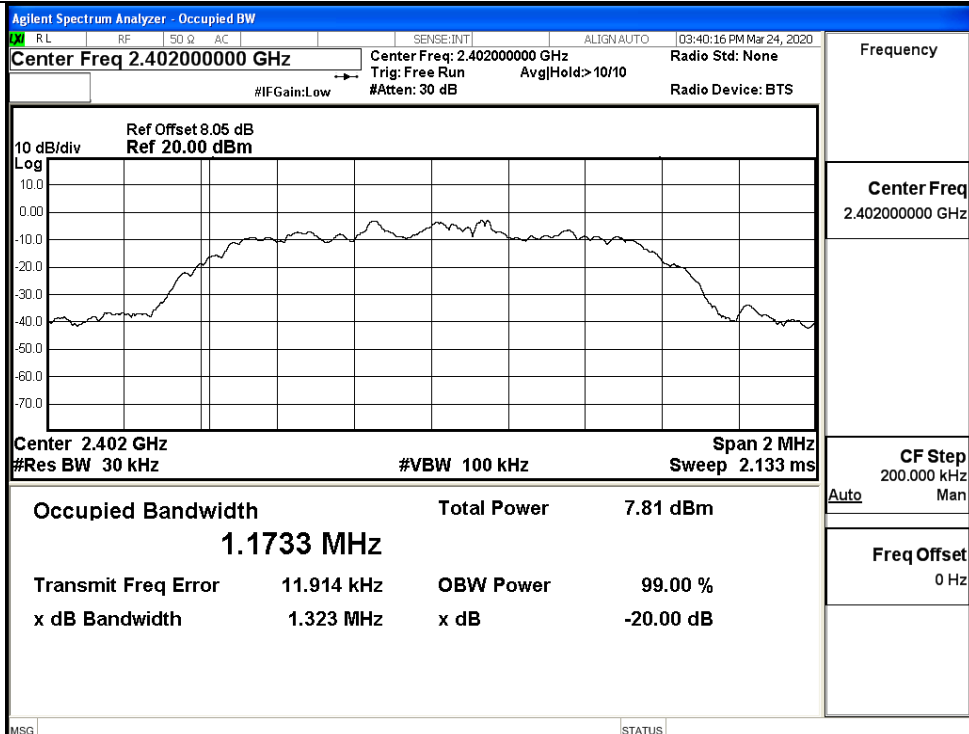
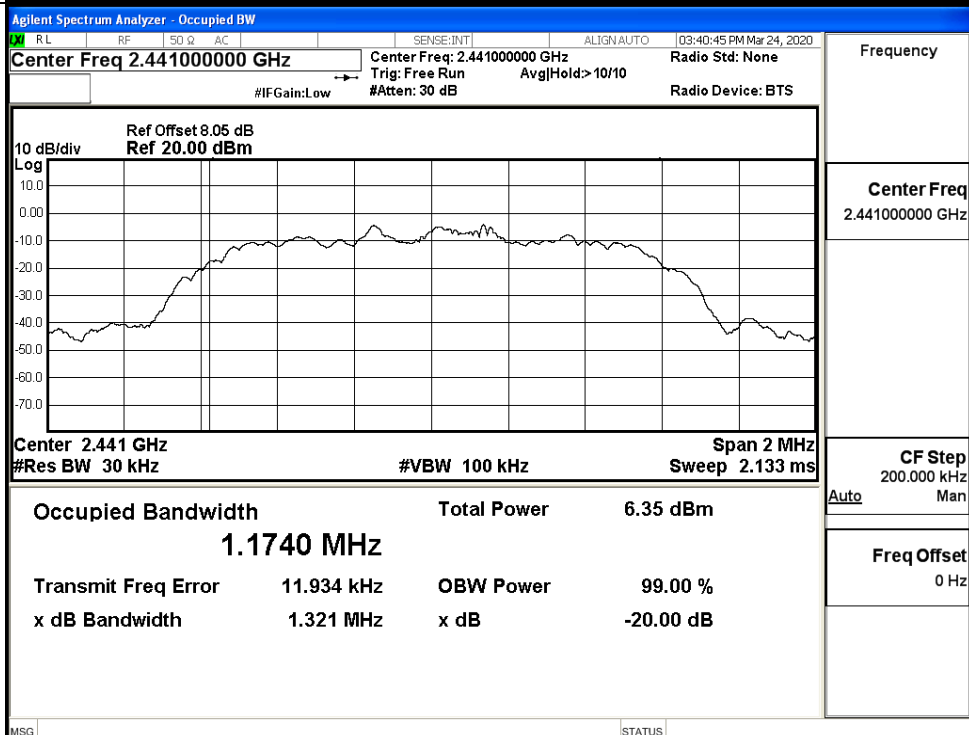
Center Freq
2.441000000 GHzCF Step
200.000 kHz
Auto ManFreq Offset
0 Hz

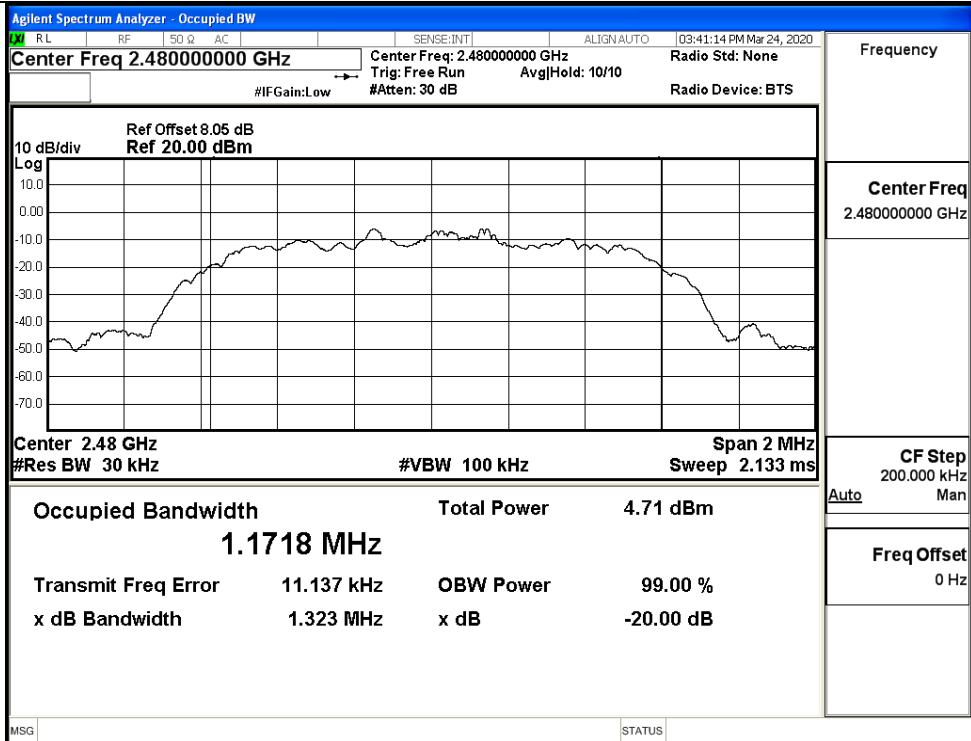
GFSK/HCH



Frequency

Center Freq
2.480000000 GHzCF Step
200.000 kHz
Auto ManFreq Offset
0 Hz

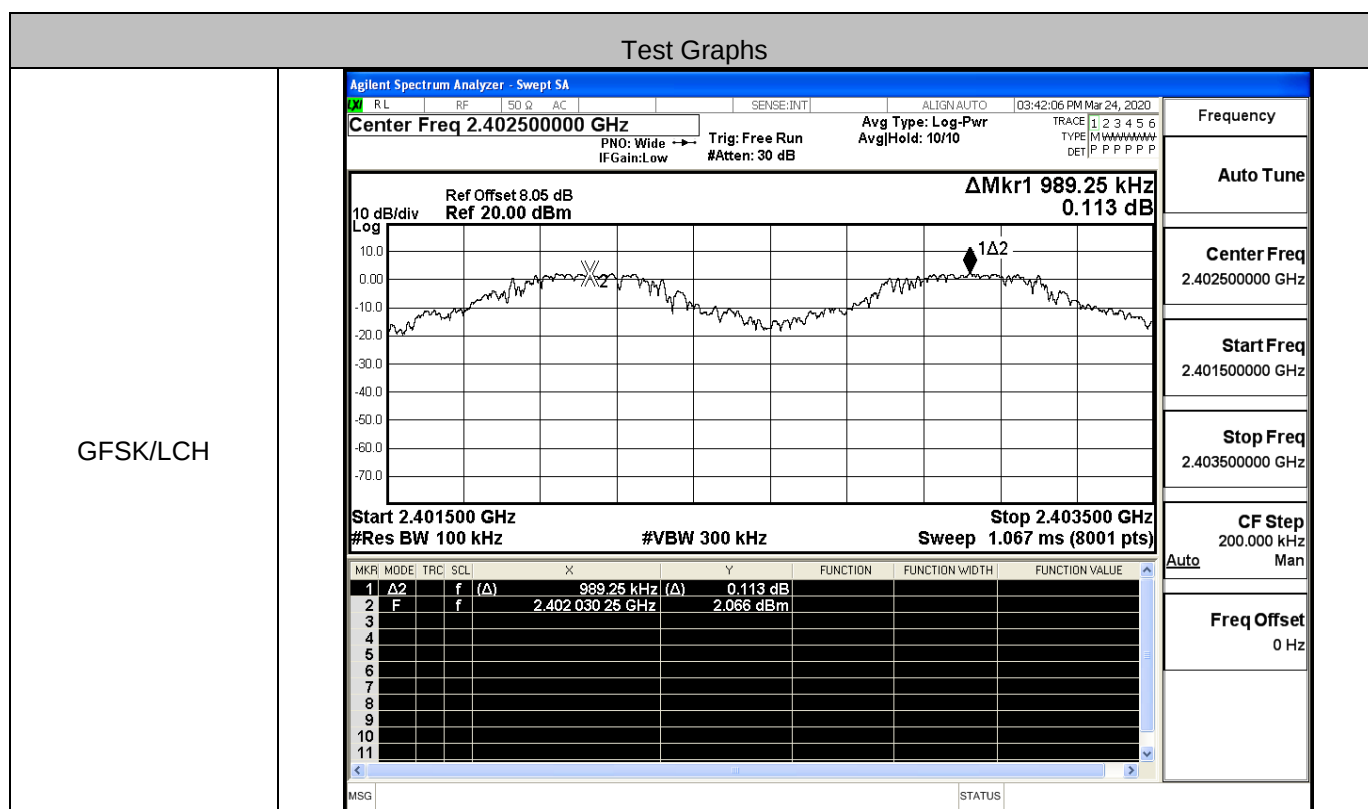
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

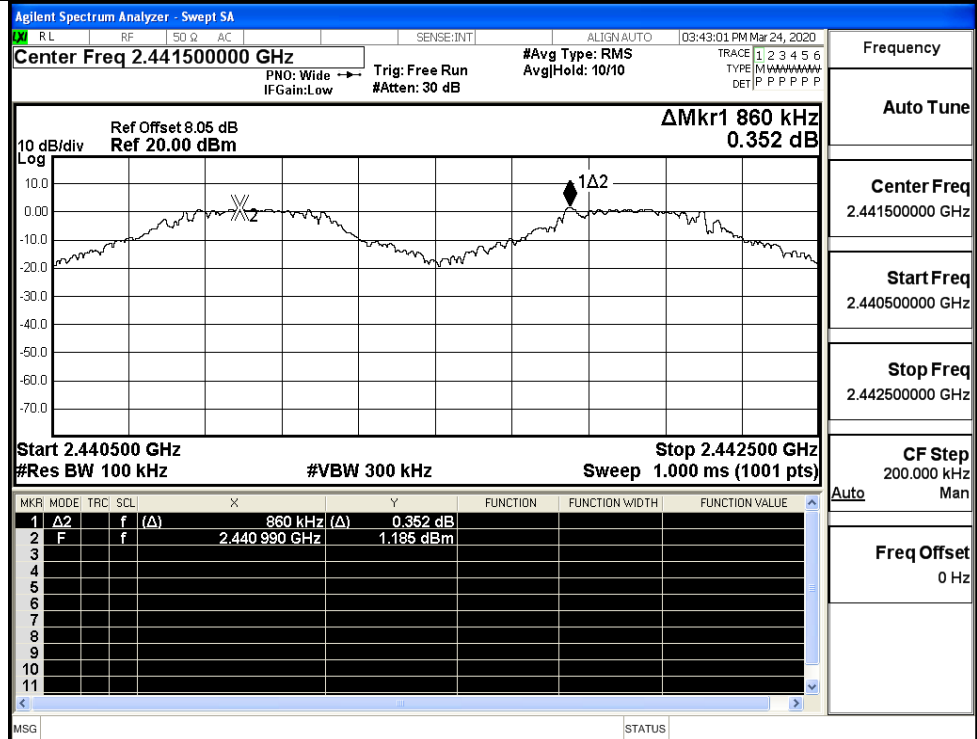
A.4 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.989	0.633	PASS
	MCH	0.860	0.633	PASS
	HCH	0.882	0.633	PASS
$\pi/4$ DQPSK	LCH	1.040	0.883	PASS
	MCH	0.988	0.883	PASS
	HCH	0.990	0.883	PASS

Test Graphs



GFSK/MCH

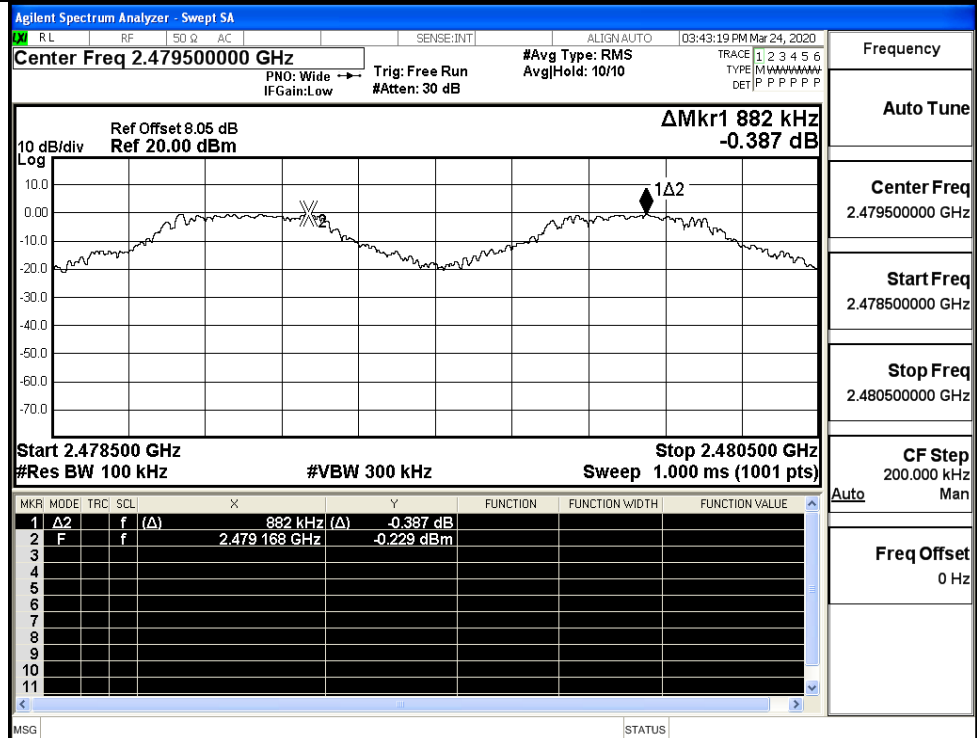


Frequency

Auto Tune

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

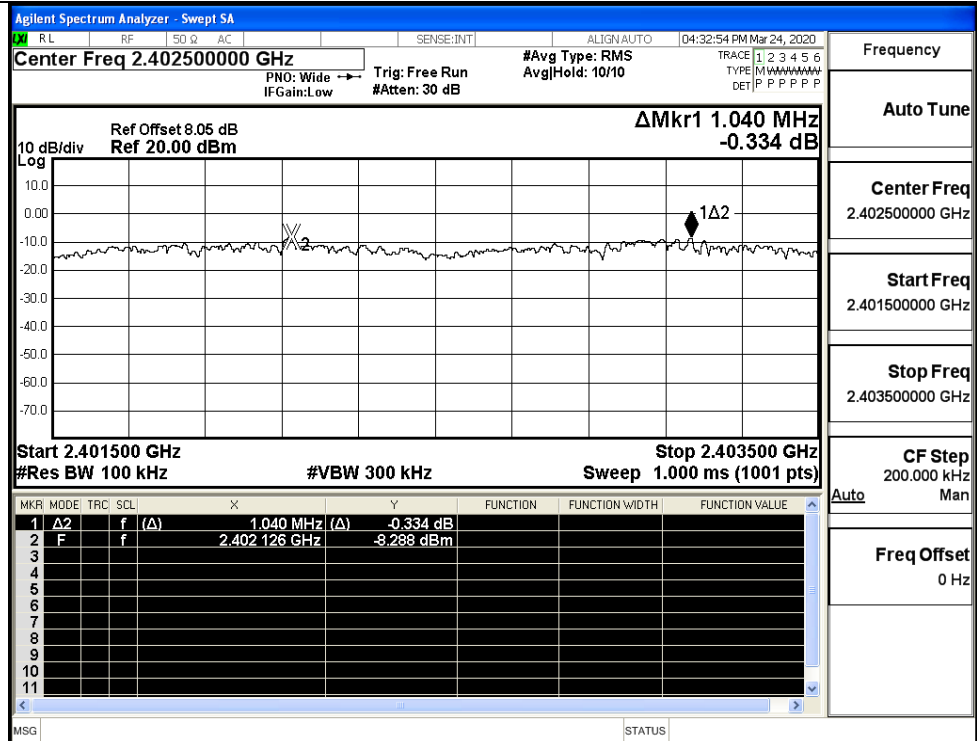
GFSK/HCH



Frequency

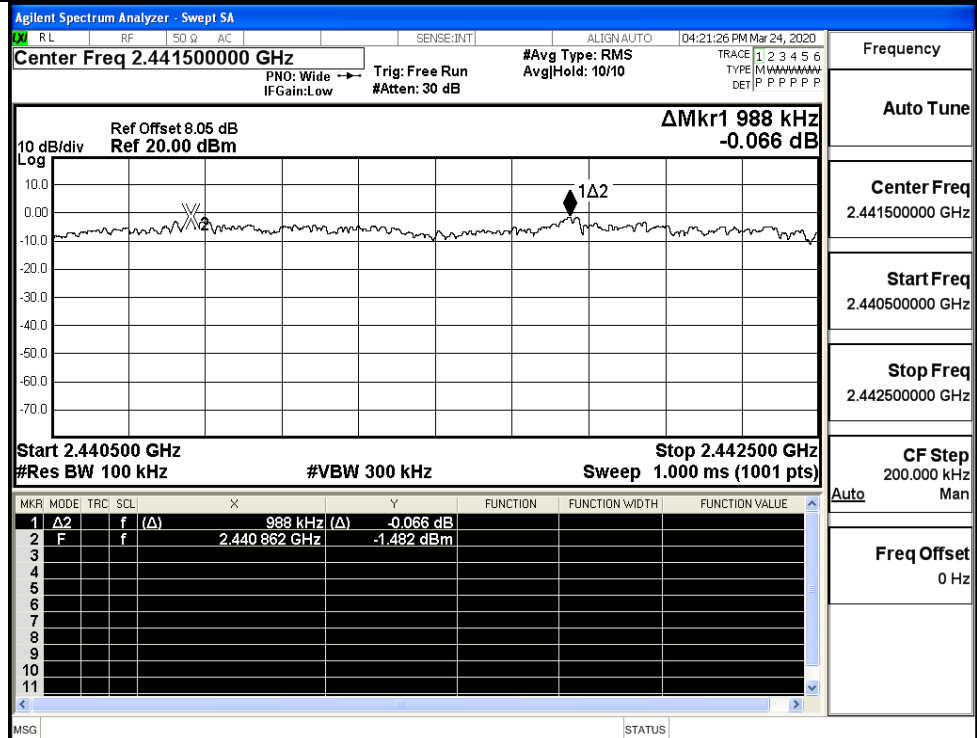
Auto Tune

Center Freq
2.479500000 GHzStart Freq
2.478500000 GHzStop Freq
2.480500000 GHzCF Step
200.000 kHz
ManFreq Offset
0 Hz

$\pi/4$ DQPSK/LCH

Frequency

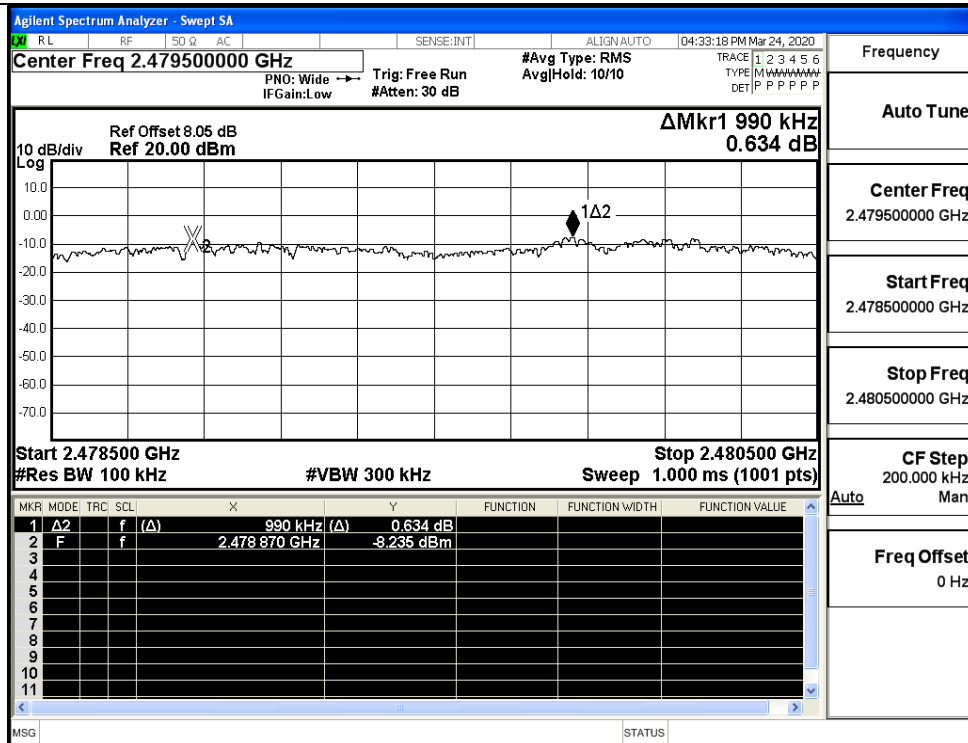
Auto Tune

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

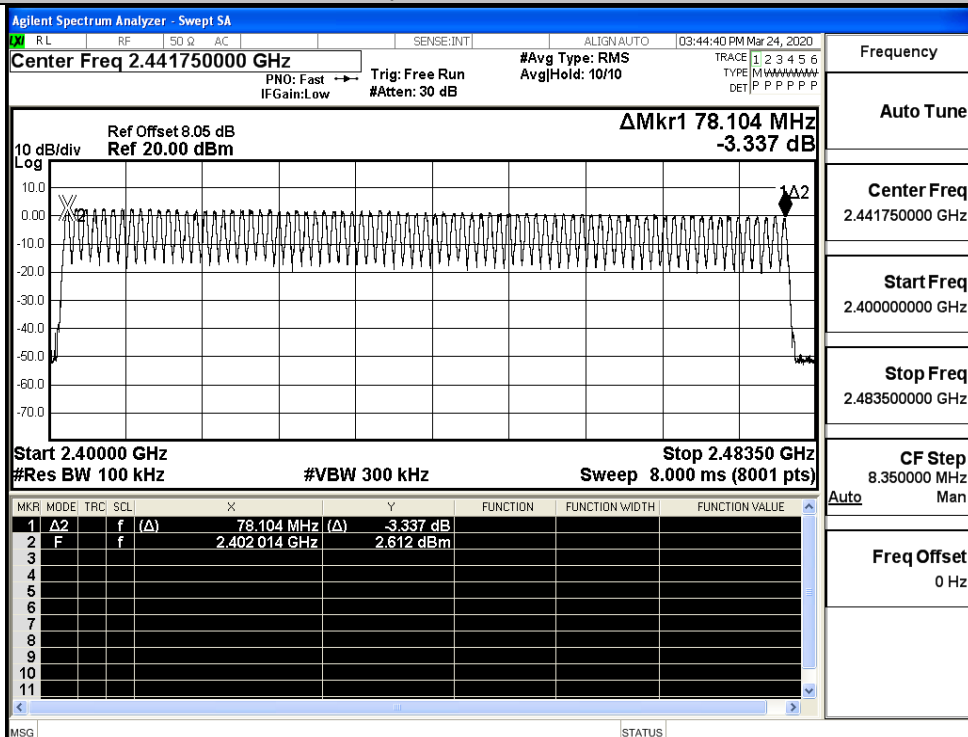
$\pi/4$ DQPSK/HCH

A.5 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

Test Graphs

GFSK/Hop



Frequency

Auto Tune

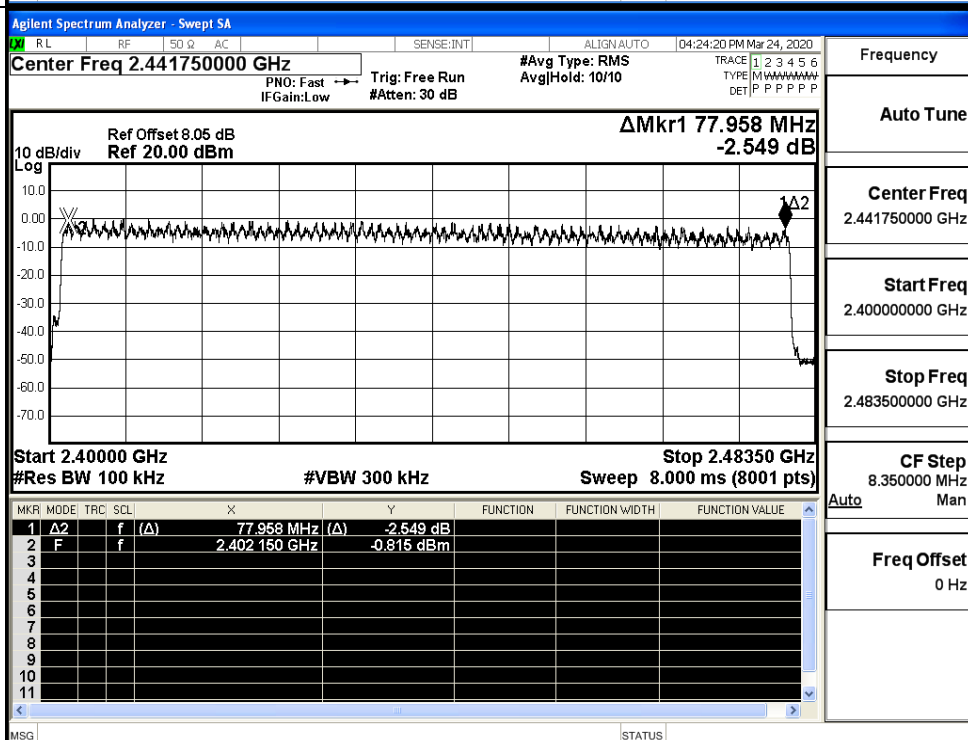
Center Freq
2.441750000 GHz

Start Freq
2.400000000 GHz

Stop Freq
2.483500000 GHz

CF Step
8.350000 MHz
Man

Freq Offset
0 Hz

 $\pi/4$ DQPSK/Hop

Frequency

Auto Tune

Center Freq
2.441750000 GHz

Start Freq
2.400000000 GHz

Stop Freq
2.483500000 GHz

CF Step
8.350000 MHz
Man

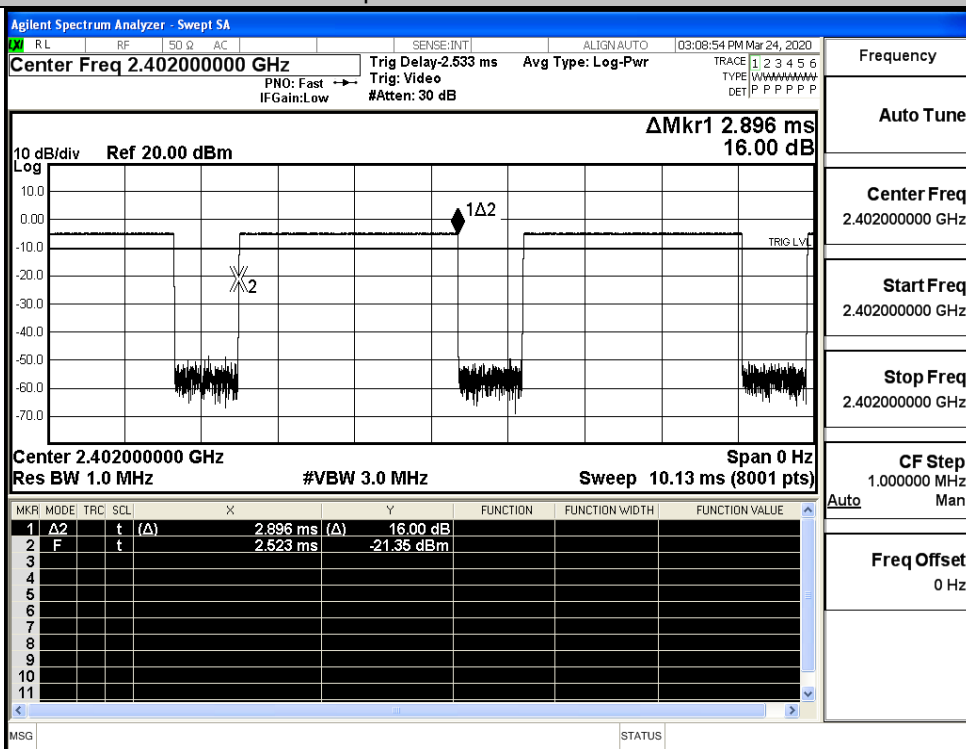
Freq Offset
0 Hz

A.6 Dwell Time

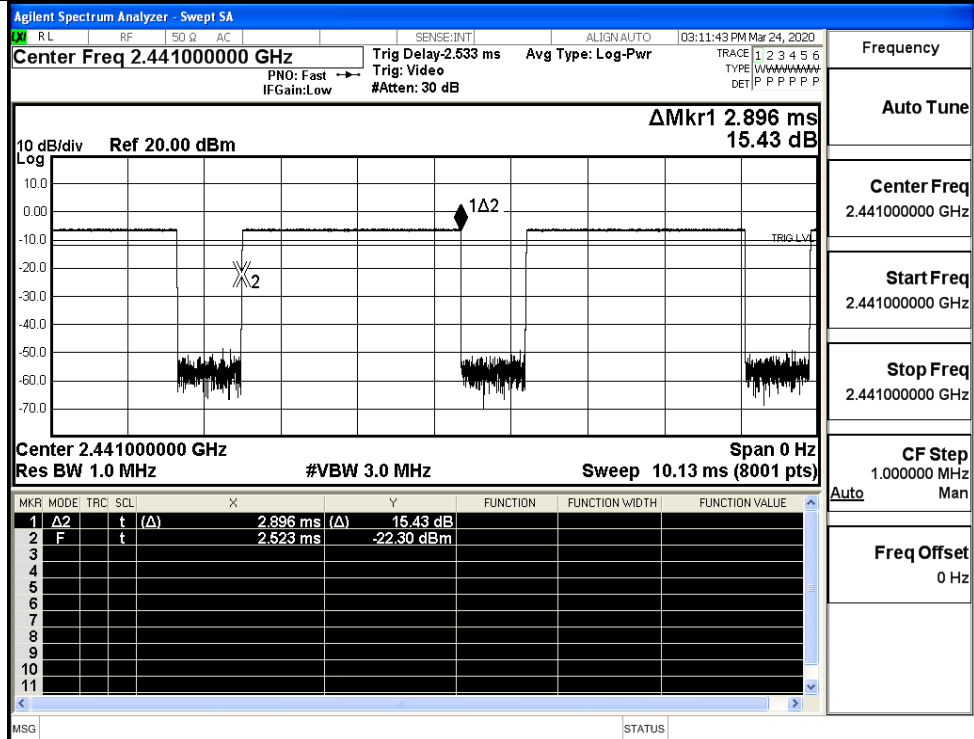
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.9	106.7	0.309	0.4	PASS
	DH5	MCH	2.9	106.7	0.309	0.4	PASS
	DH5	HCH	2.9	106.7	0.309	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.9	106.7	0.309	0.4	PASS
	2DH5	MCH	2.9	106.7	0.309	0.4	PASS
	2DH5	HCH	2.9	106.7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

Test Graphs

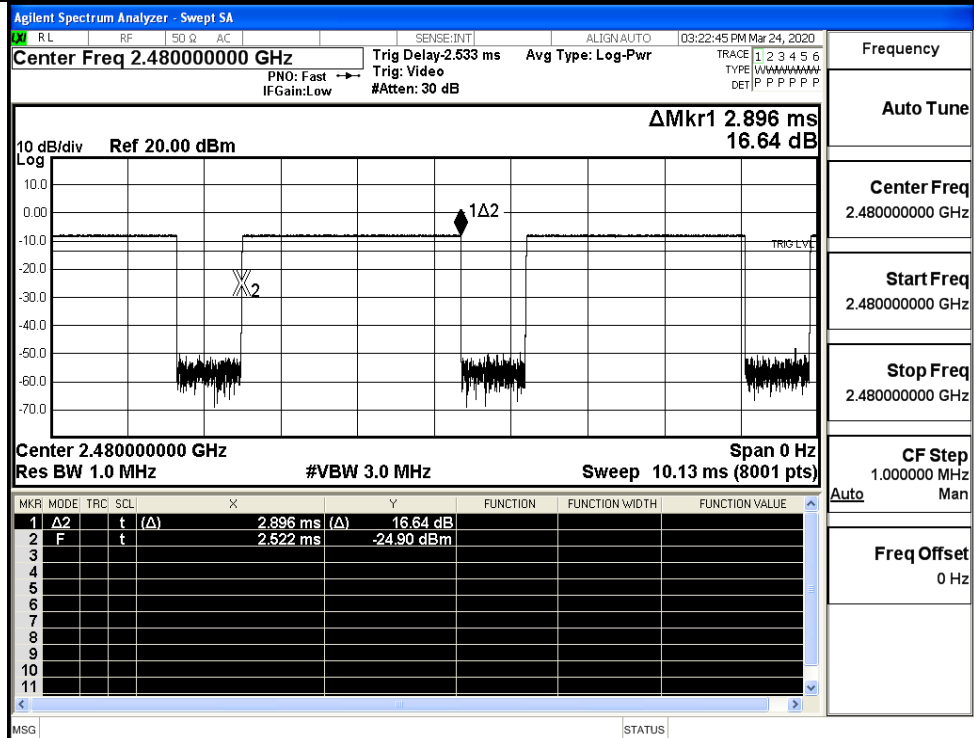
GFSK_DH5/LCH



GFSK_DH5/MCH



GFSK_DH5/HCH



[illegible]

Agilent Spectrum Analyzer - Swept SA

RL RF 50 Ω AC SENSE:INT ALIGN:AUTO 03:30:29 PM Mar 24, 2020

Center Freq 2.441000000 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 P P DET P P P P P P P P

10 dB/div Ref 20.00 dBm Δ Mkr1 2.901 ms 13.49 dB

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

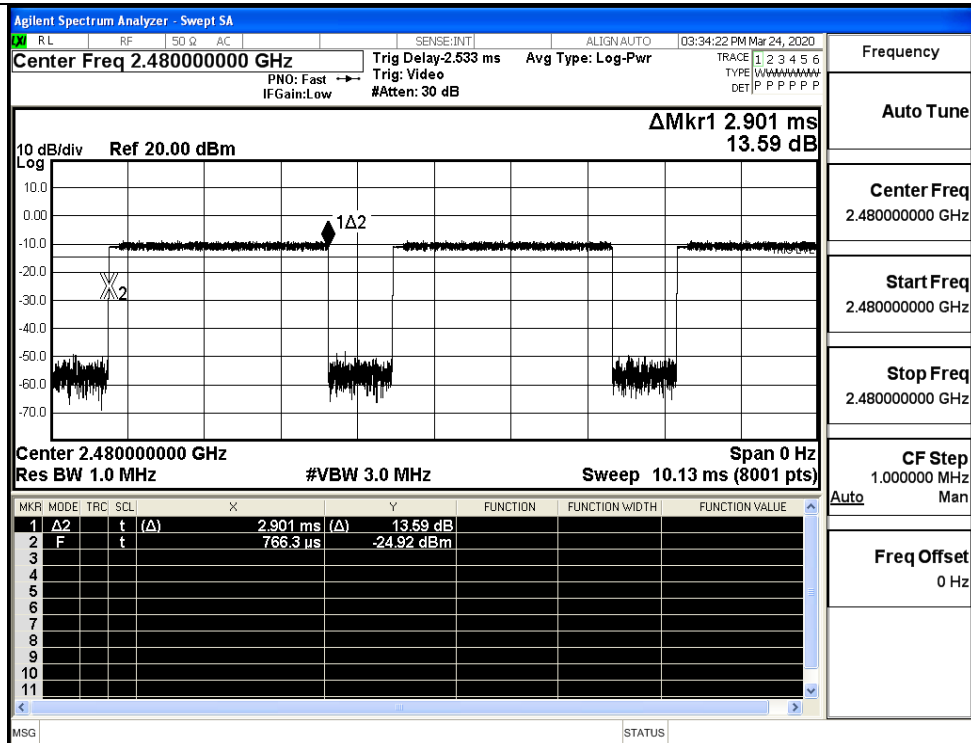
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ 2	t	(Δ)	2.901 ms	(Δ) 13.49 dB			
2	F	t		1.072 ms	-23.15 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								

MSG STATUS

Auto Man

Freq Offset 0 Hz

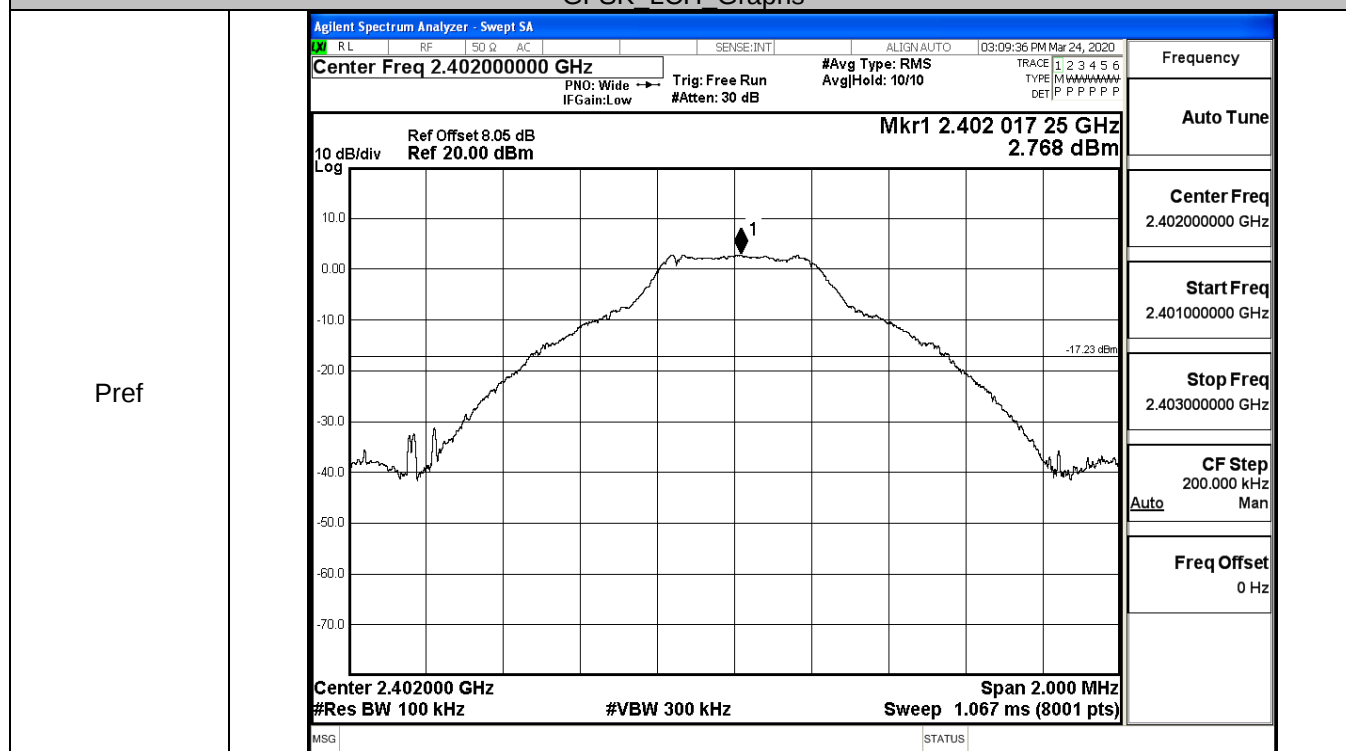
π/4DQPSK
_2DH5/HCH



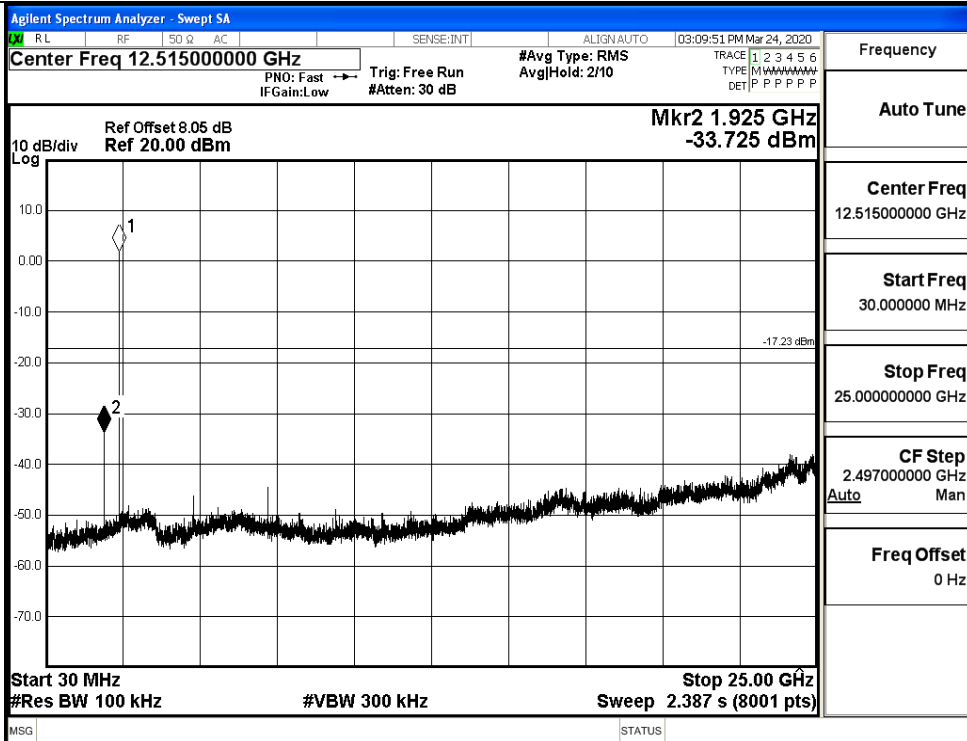
A.7 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2.768	-33.725	-17.232	PASS
	MCH	1.57	-31.144	-18.430	PASS
	HCH	-0.128	-34.819	-20.128	PASS
$\pi/4$ DQPSK	LCH	-0.297	-37.330	-20.297	PASS
	MCH	-1.466	-37.483	-21.466	PASS
	HCH	-3.124	-37.476	-23.124	PASS

GFSK LCH Graphs

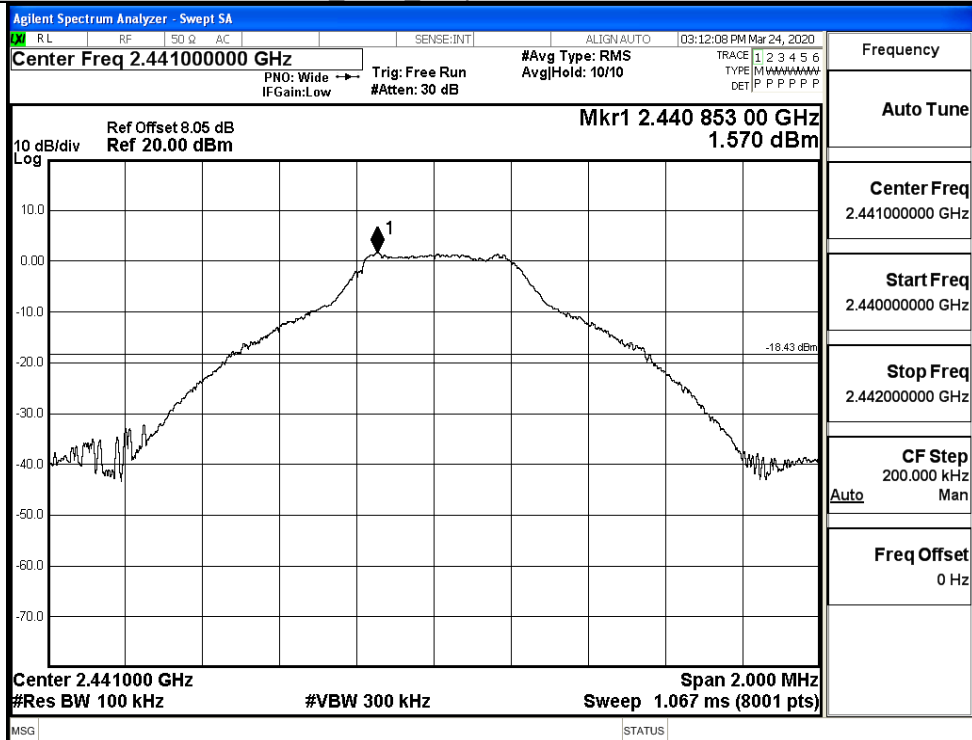


Puw

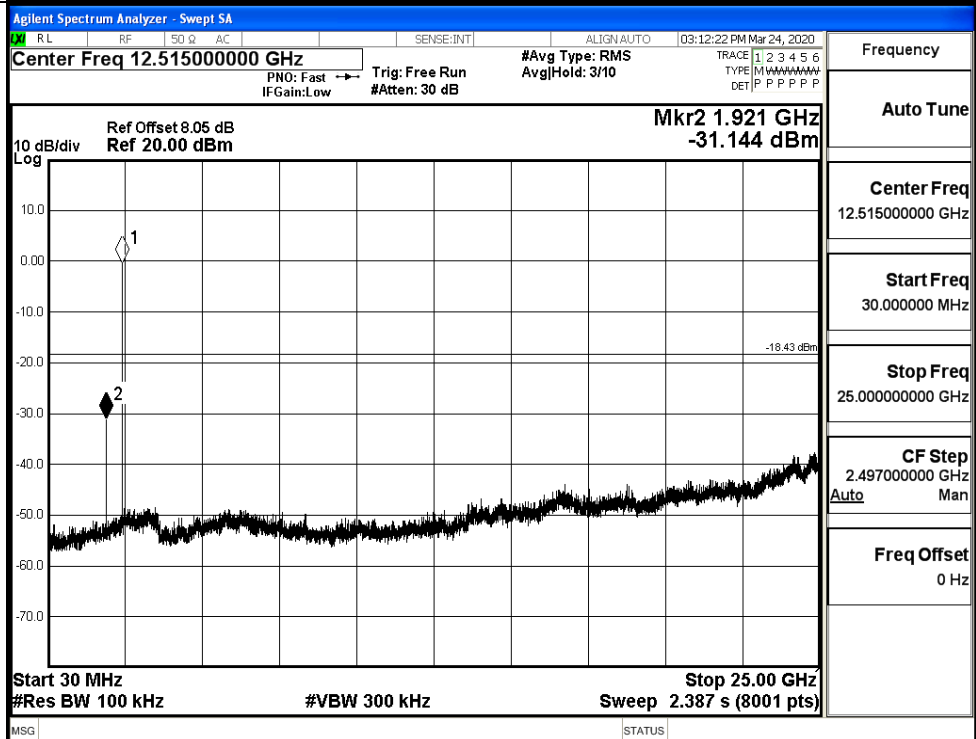


GFSK_MCH_Graphs

Pref

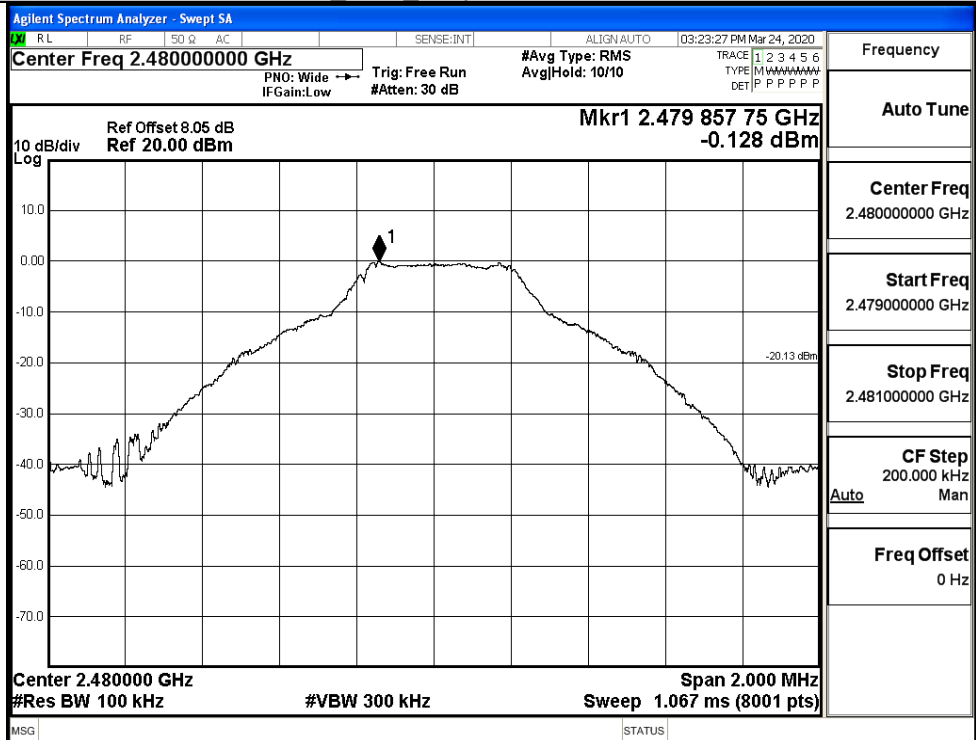


Puw

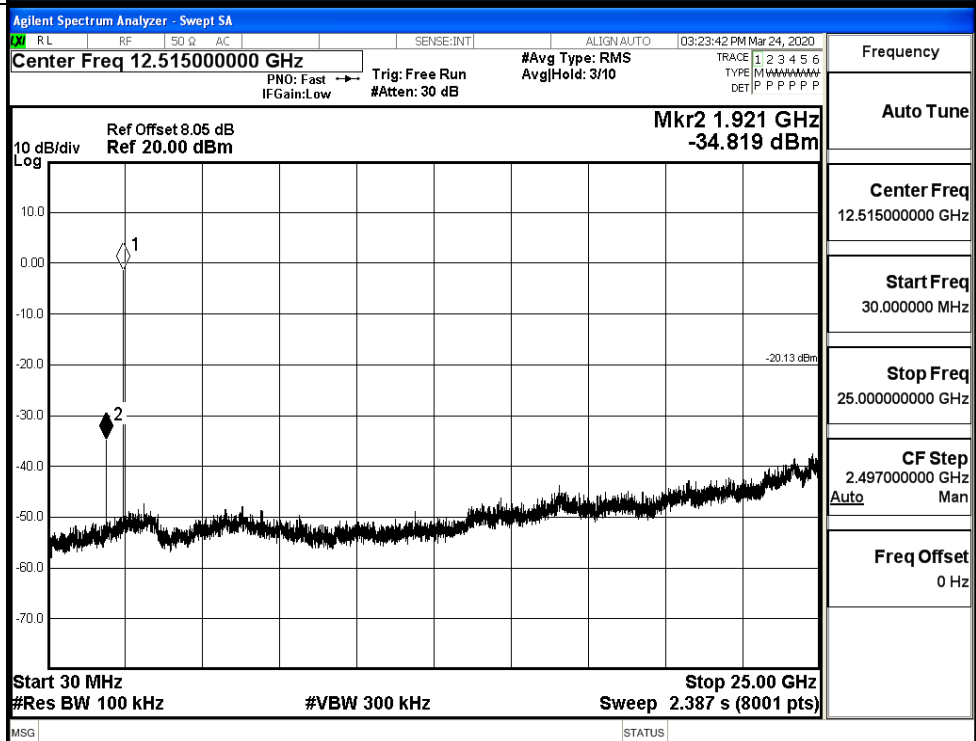


GFSK HCH_Graphs

Pref

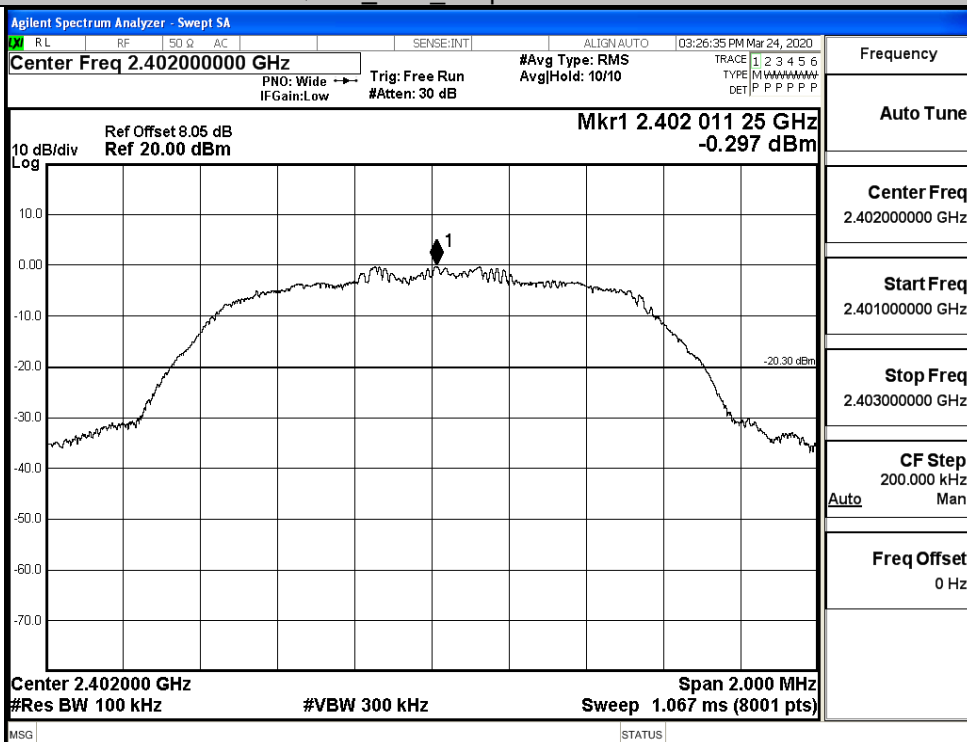


Puw

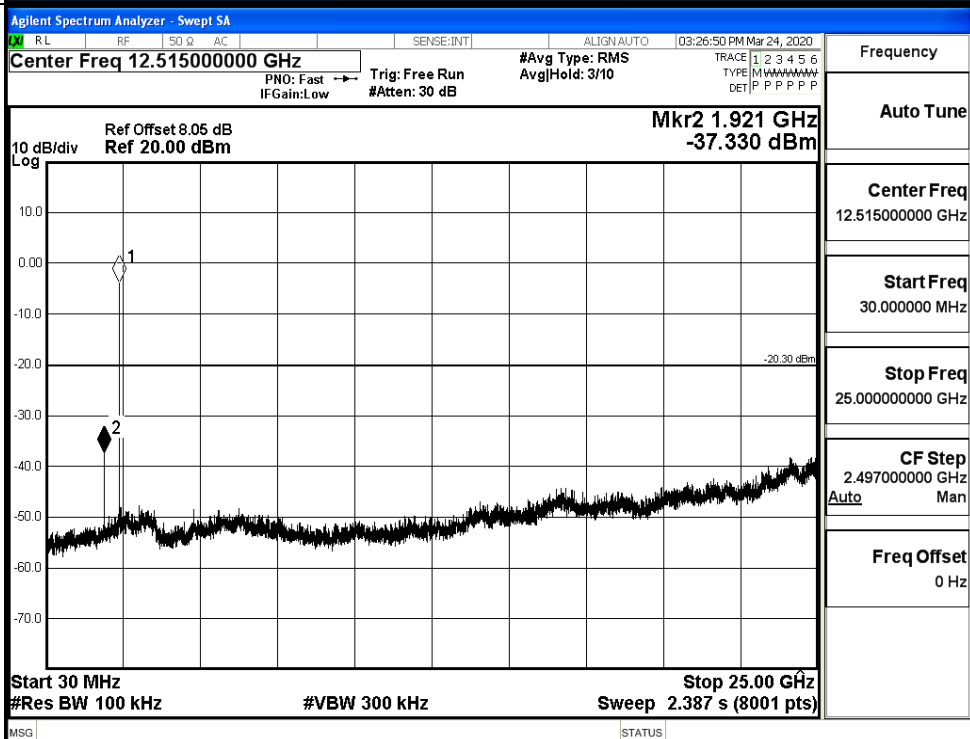


$\pi/4$ DQPSK_LCH_Graphs

Pref

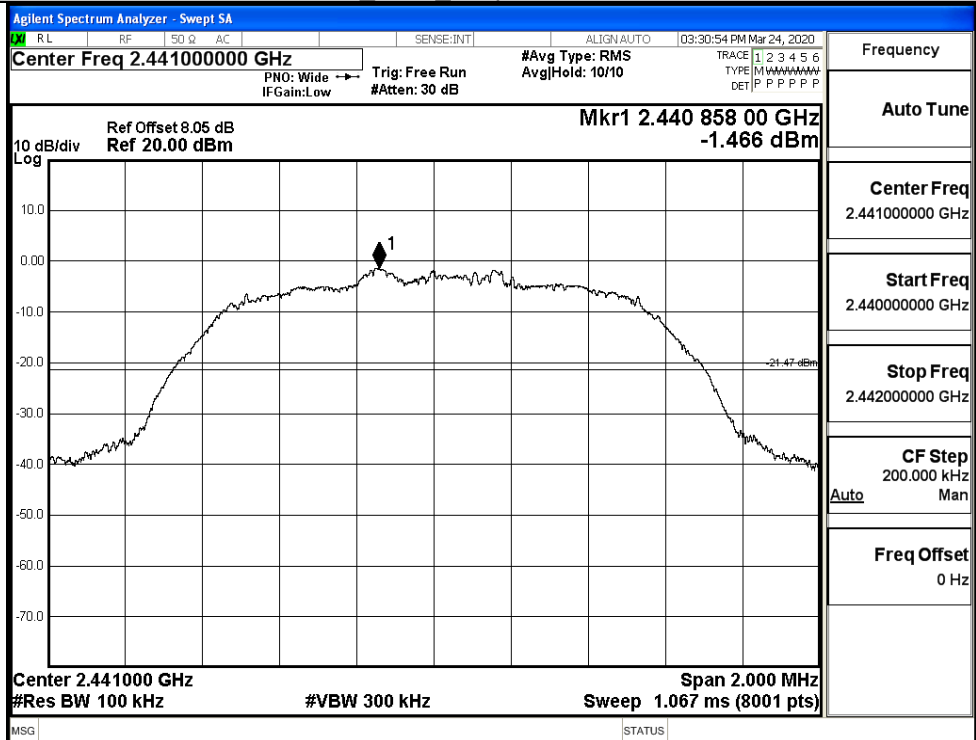


Puw

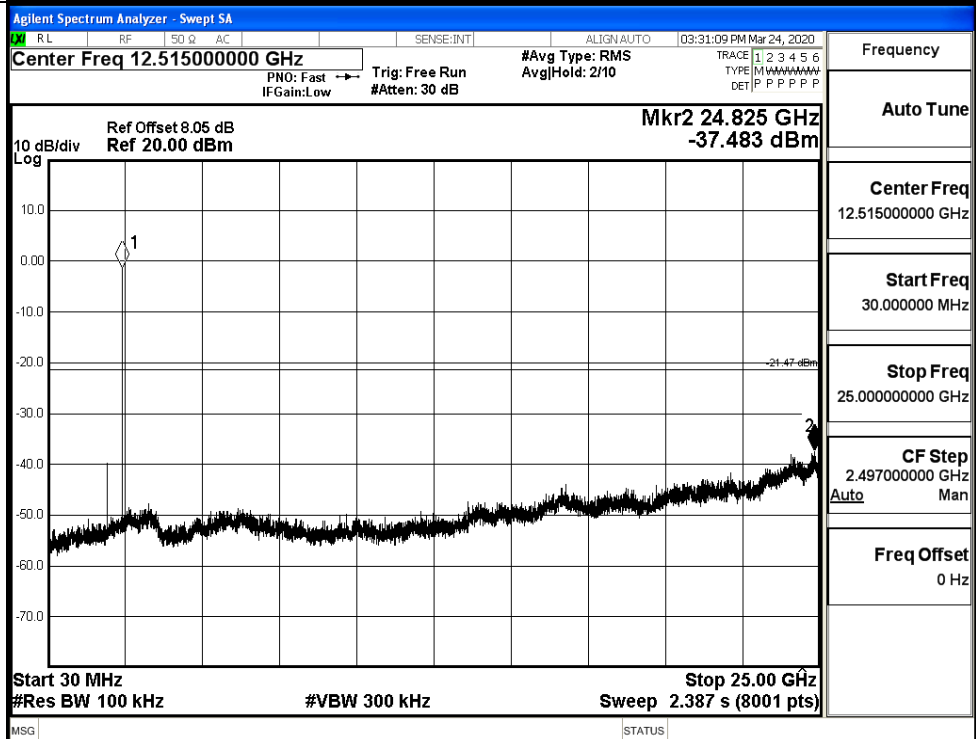


$\pi/4$ DQPSK_MCH_Graphs

Pref

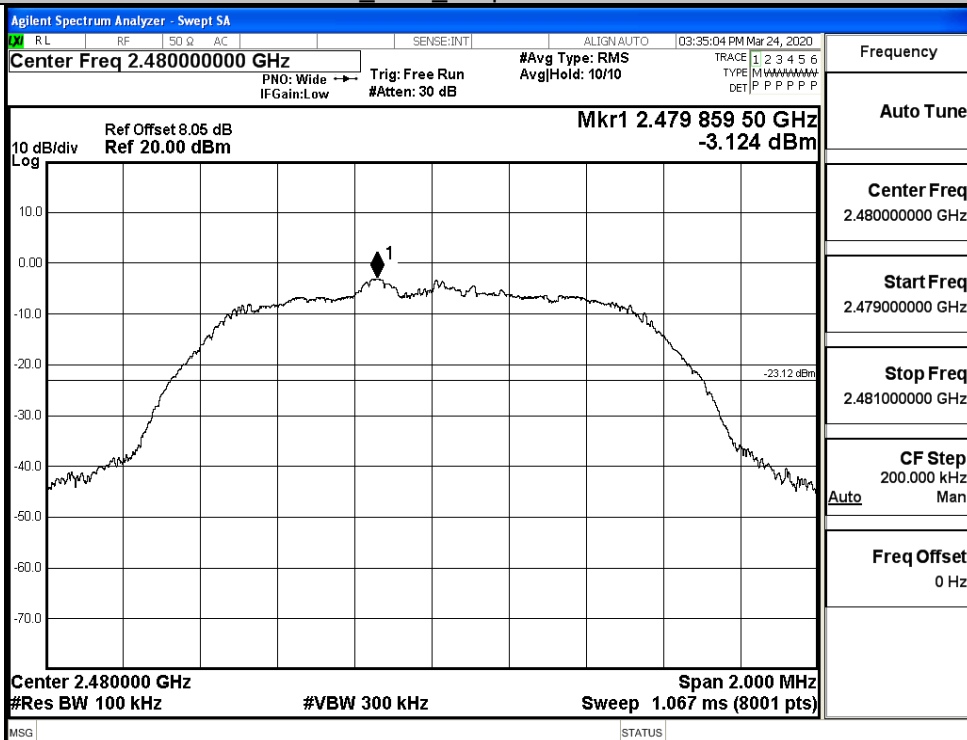


Puw

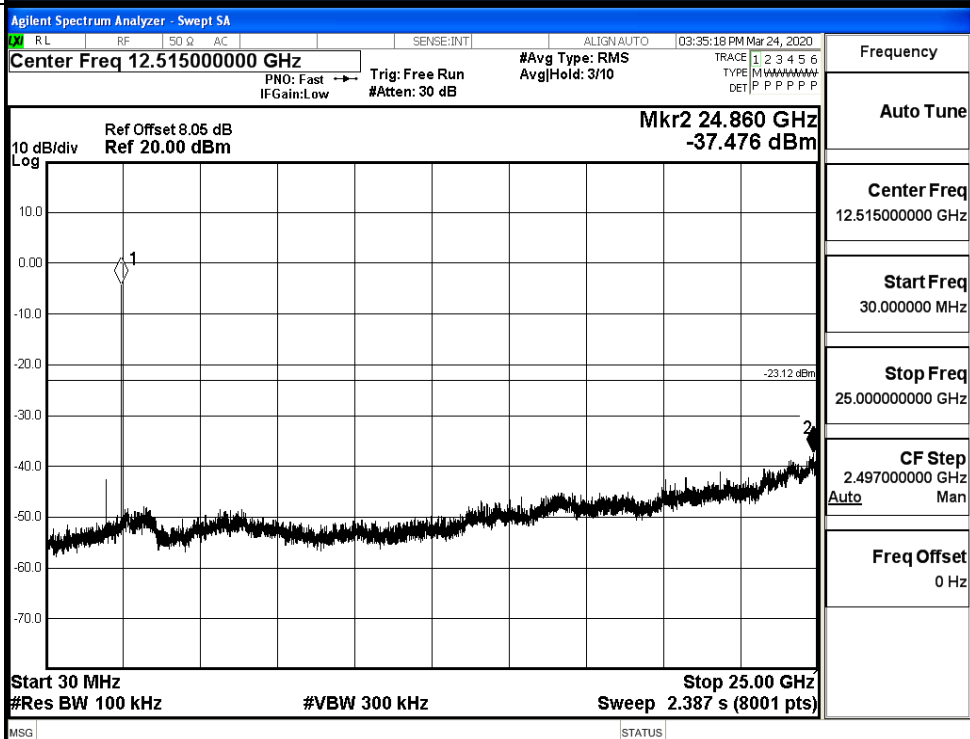


$\pi/4$ DQPSK_HCH_Graphs

Pref



Puw

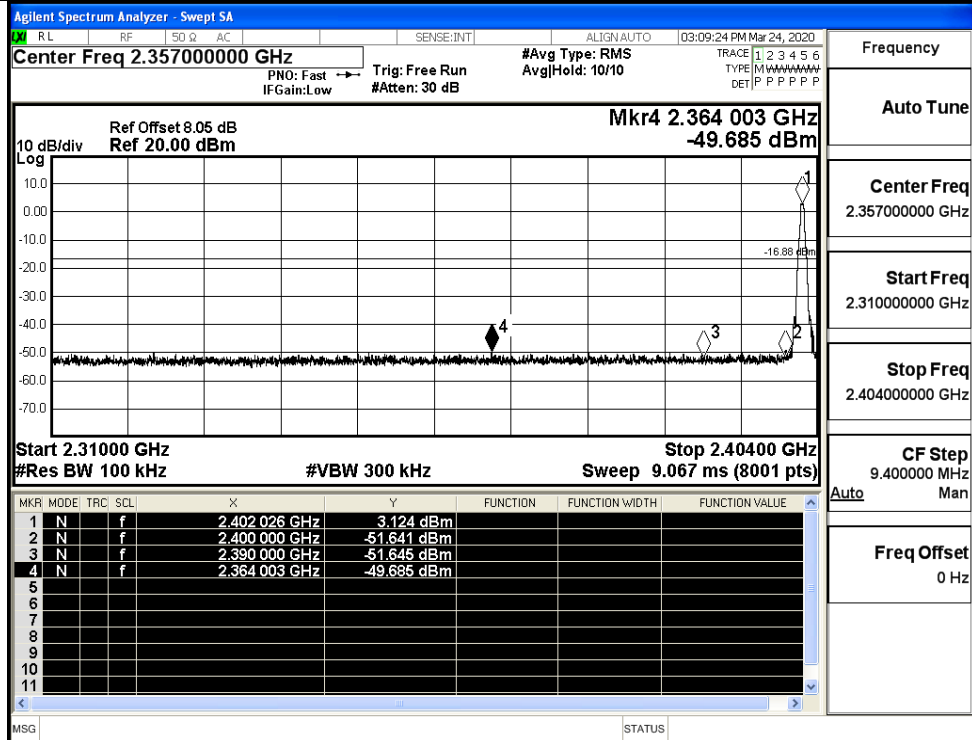


A.8 Band-edge for RF Conducted Emissions

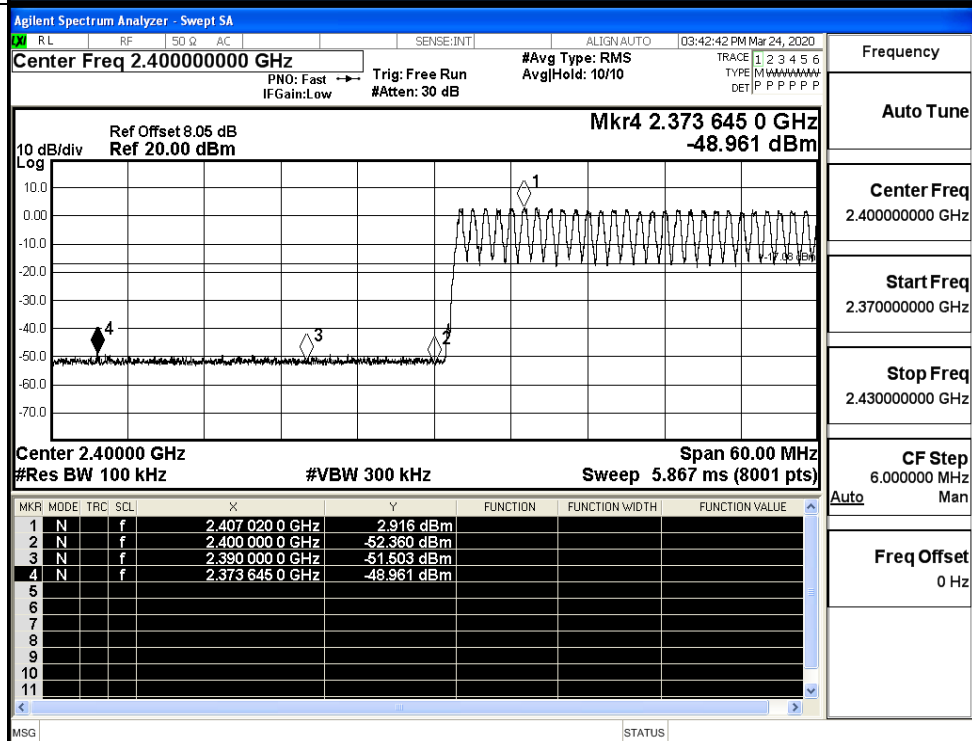
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	3.124	Off	-49.685	-16.88	PASS
			2.916	On	-48.961	-17.08	PASS
	HCH	2480	0.007	Off	-49.333	-19.99	PASS
			0.768	On	-48.844	-19.23	PASS
$\pi/4$ DQPSK	LCH	2402	0.143	Off	-49.989	-19.86	PASS
			-0.070	On	-49.196	-20.07	PASS
	HCH	2480	-2.955	Off	-49.136	-22.96	PASS
			-2.055	On	-48.656	-22.06	PASS

Test Graphs

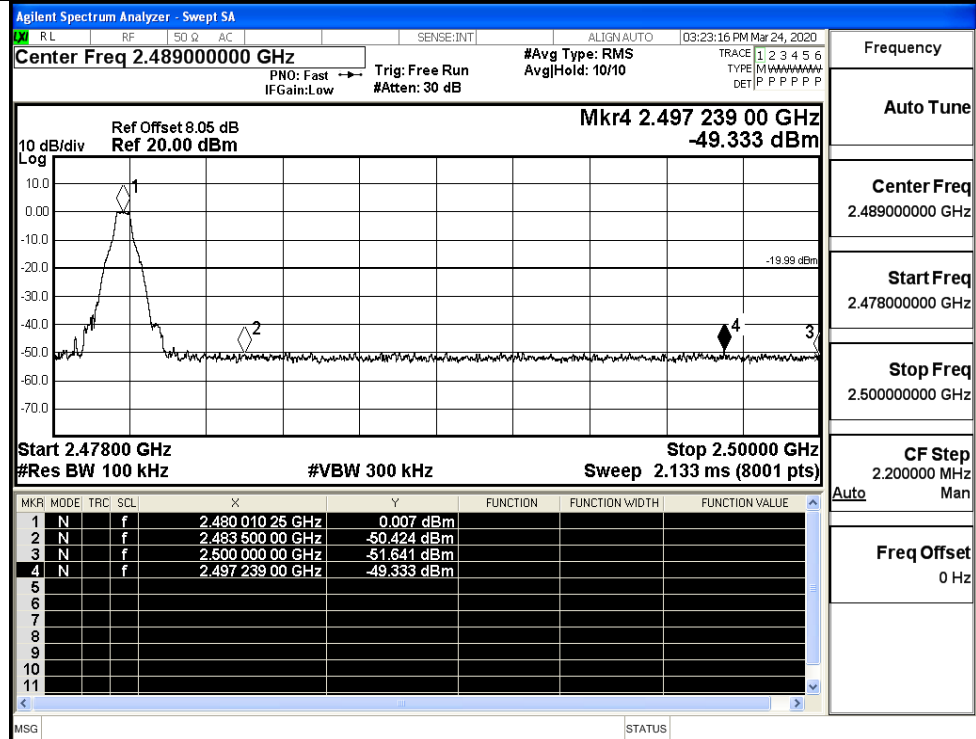
GFSK/LCH/No Hop



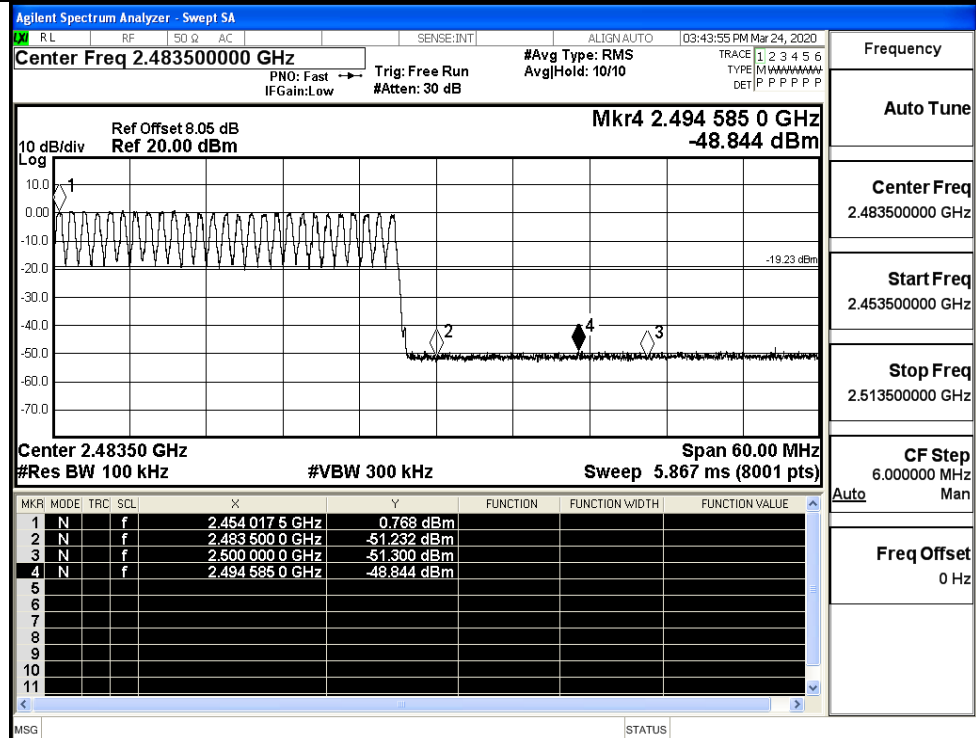
GFSK/LCH/Hop



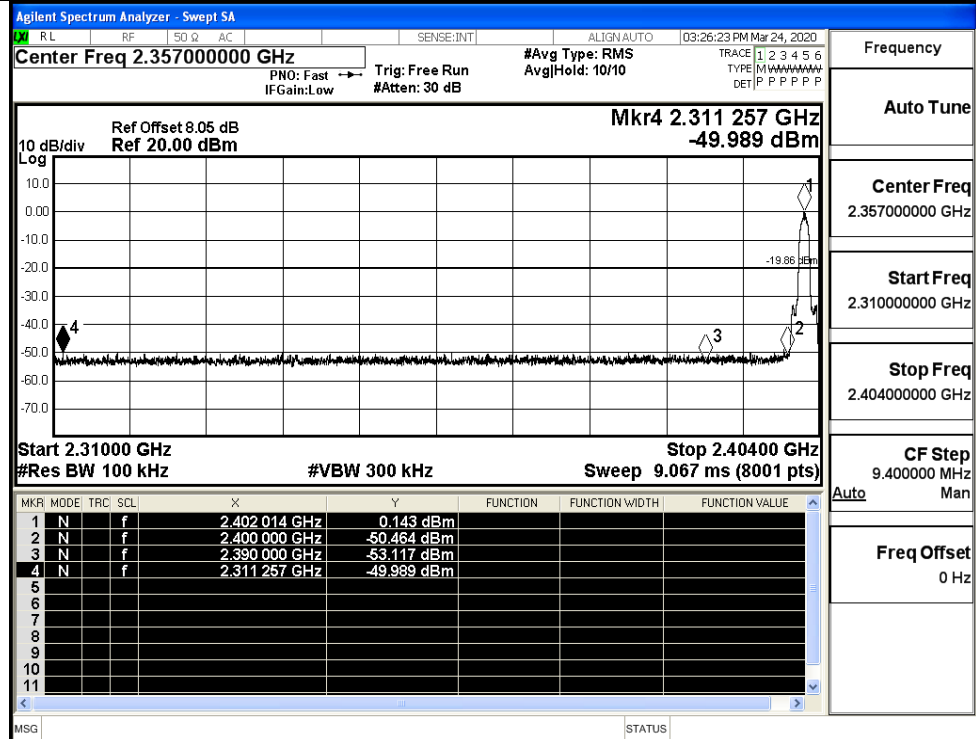
GFSK/HCH/No Hop



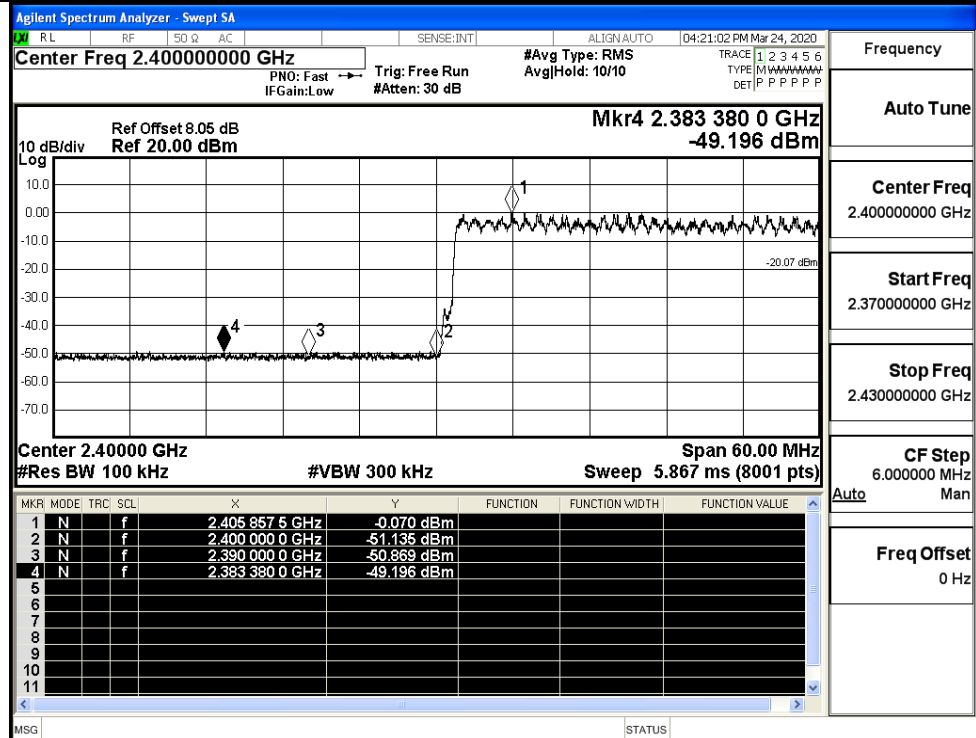
GFSK/HCH/Hop



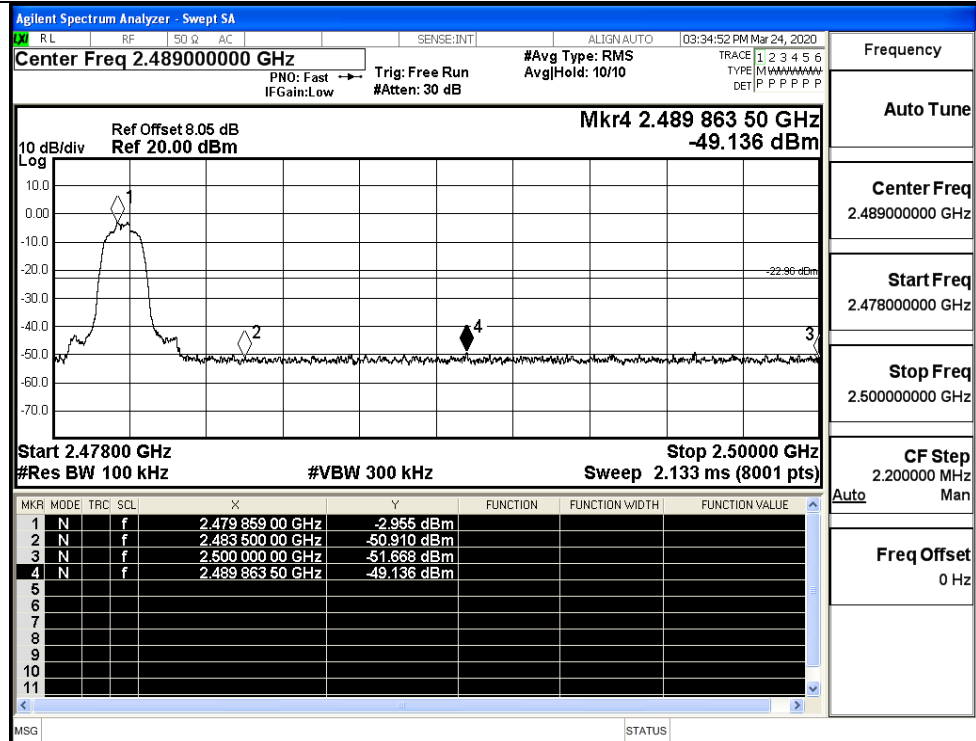
$\pi/4$ DQPSK/LCH/No
Hop



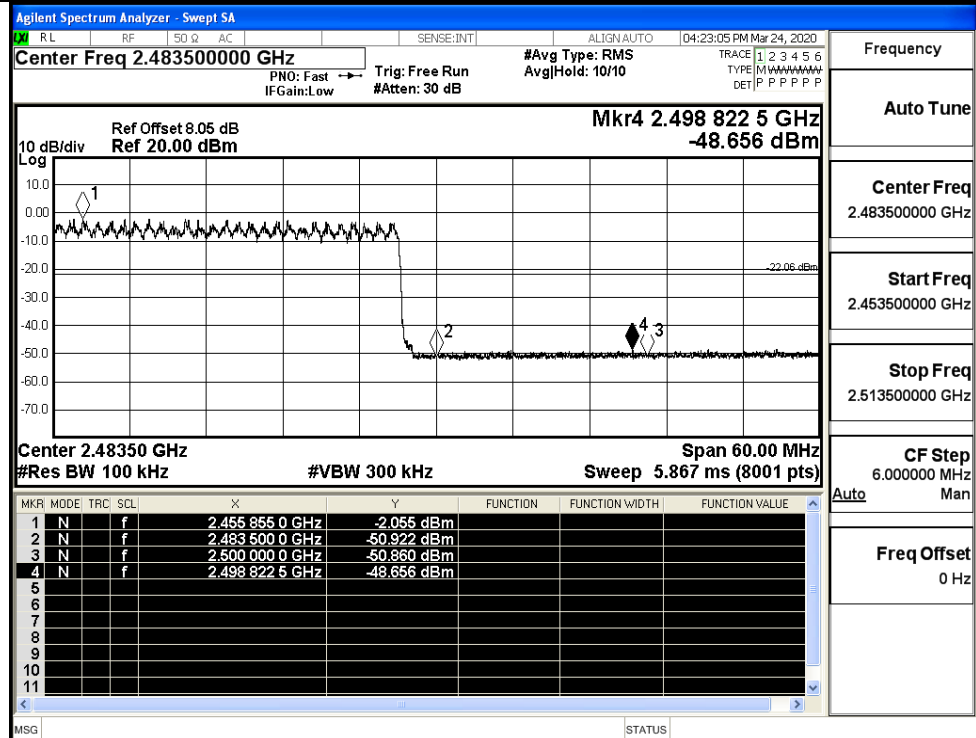
$\pi/4$ DQPSK/LCH/Hop



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



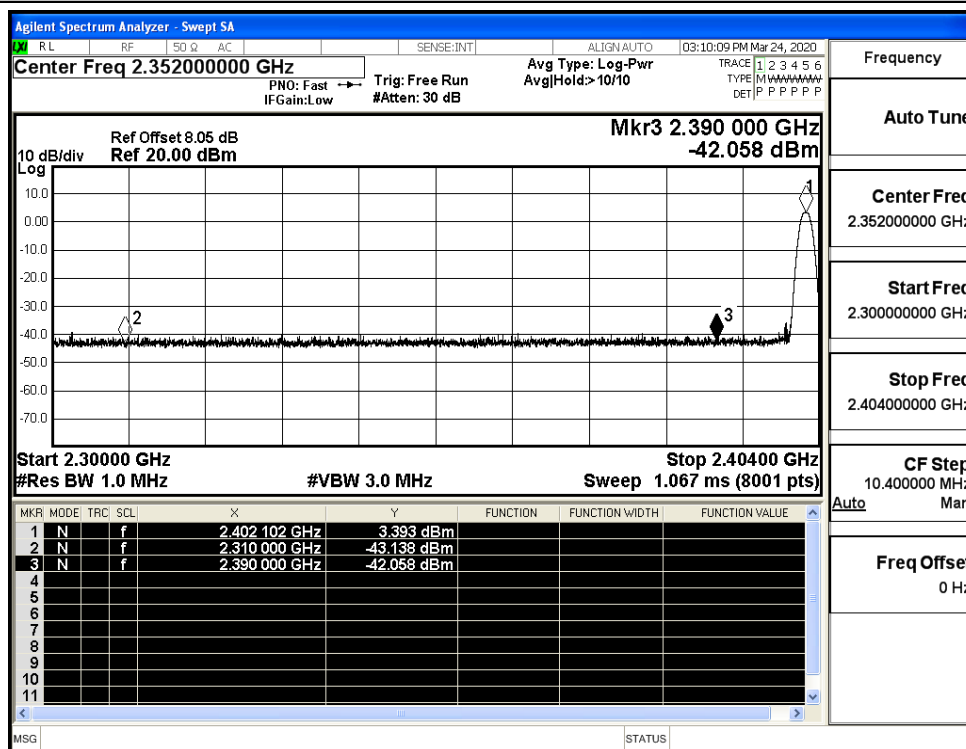
$\pi/4$ DQPSK/HCH/Hop



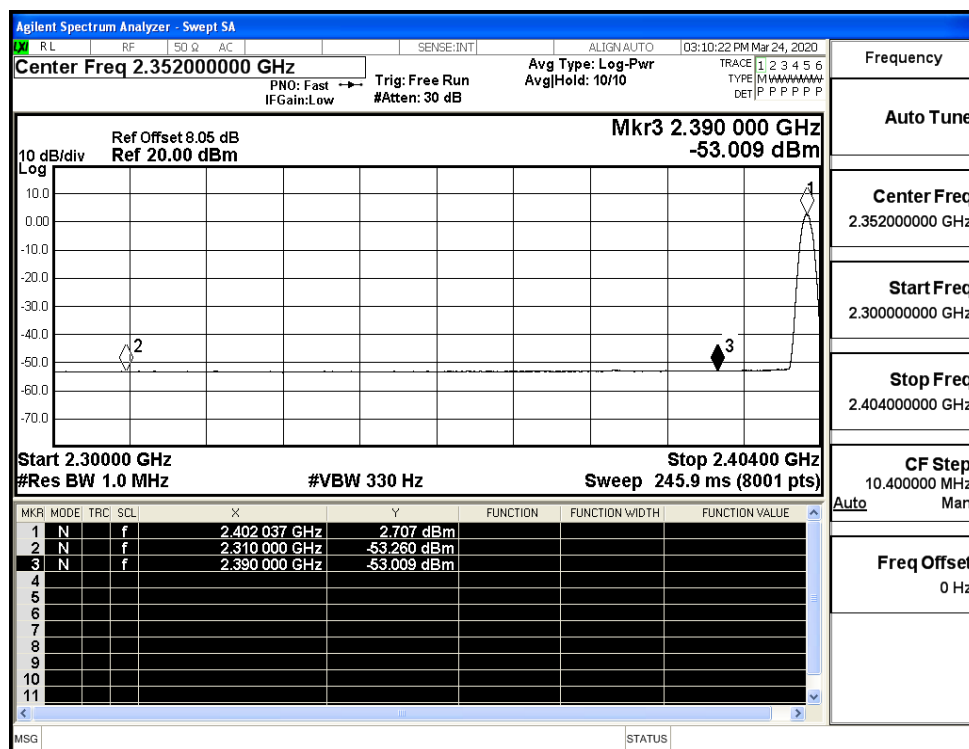
A.9 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.14	2.0	0	54.12	PEAK	74	PASS
	Off	2310.0	-53.26	2.0	0	44.00	AV	54	PASS
	Off	2390.0	-42.06	2.0	0	55.2	PEAK	74	PASS
	Off	2390.0	-53.01	2.0	0	44.25	AV	54	PASS
	Off	2483.5	-42.55	2.0	0	54.71	PEAK	74	PASS
	Off	2483.5	-52.42	2.0	0	44.84	AV	54	PASS
	Off	2500.0	-41.99	2.0	0	55.27	PEAK	74	PASS
	Off	2500.0	-52.26	2.0	0	45.00	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.13	2.0	0	54.13	PEAK	74	PASS
	Off	2310.0	-53.31	2.0	0	43.95	AV	54	PASS
	Off	2390.0	-42.79	2.0	0	54.47	PEAK	74	PASS
	Off	2390.0	-52.91	2.0	0	44.35	AV	54	PASS
	Off	2483.5	-41.72	2.0	0	55.54	PEAK	74	PASS
	Off	2483.5	-52.35	2.0	0	44.91	AV	54	PASS
	Off	2500.0	-42.13	2.0	0	55.13	PEAK	74	PASS
	Off	2500.0	-52.34	2.0	0	44.92	AV	54	PASS

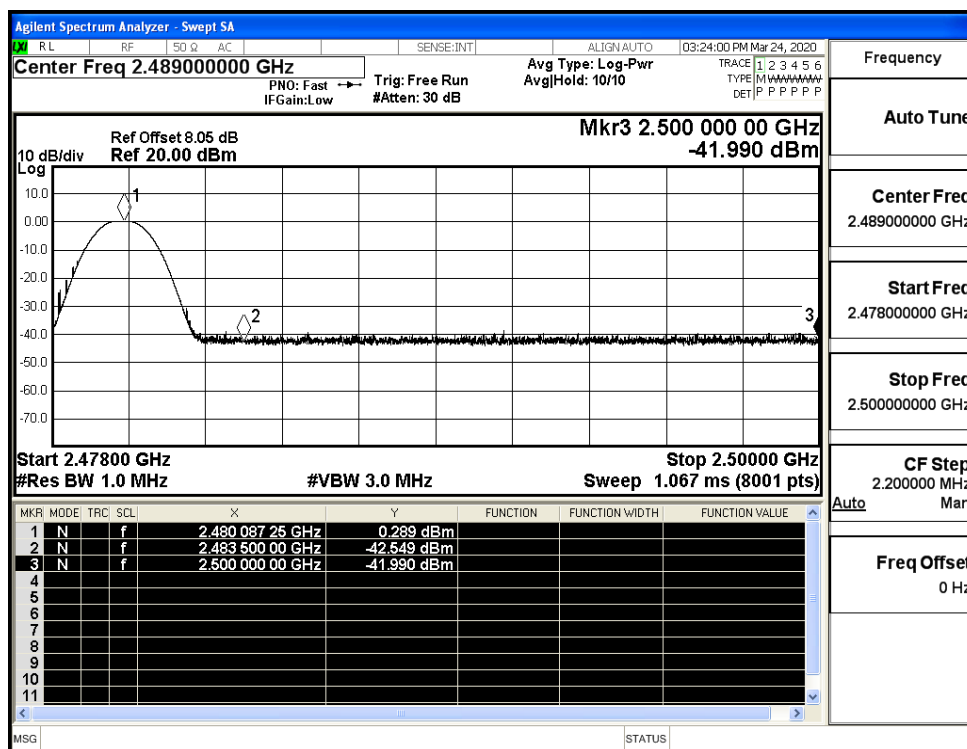
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



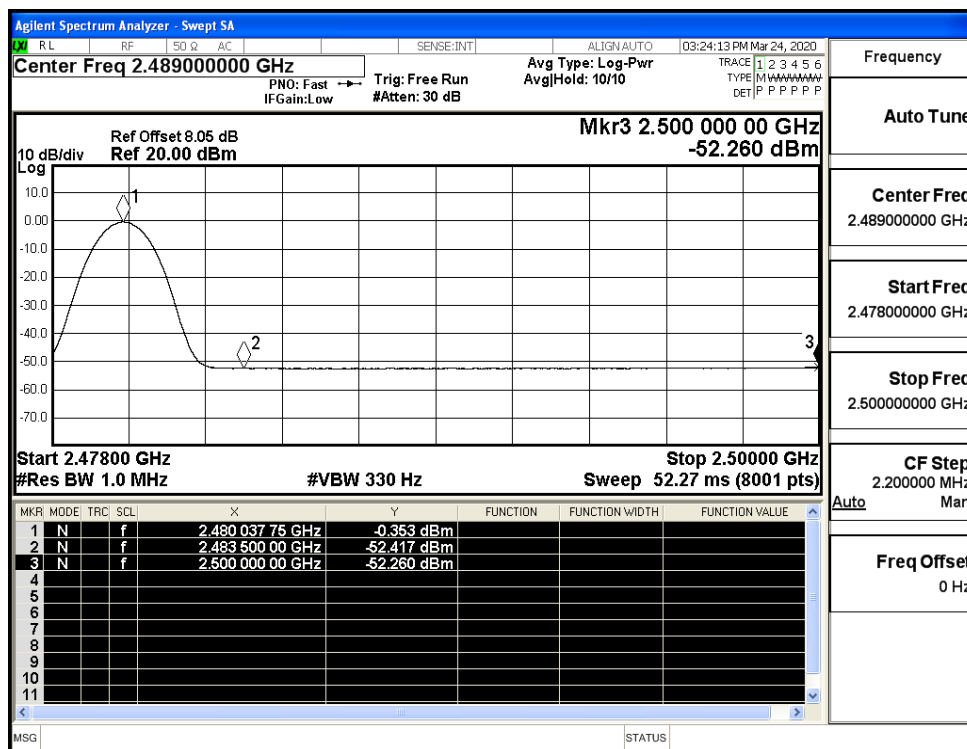
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

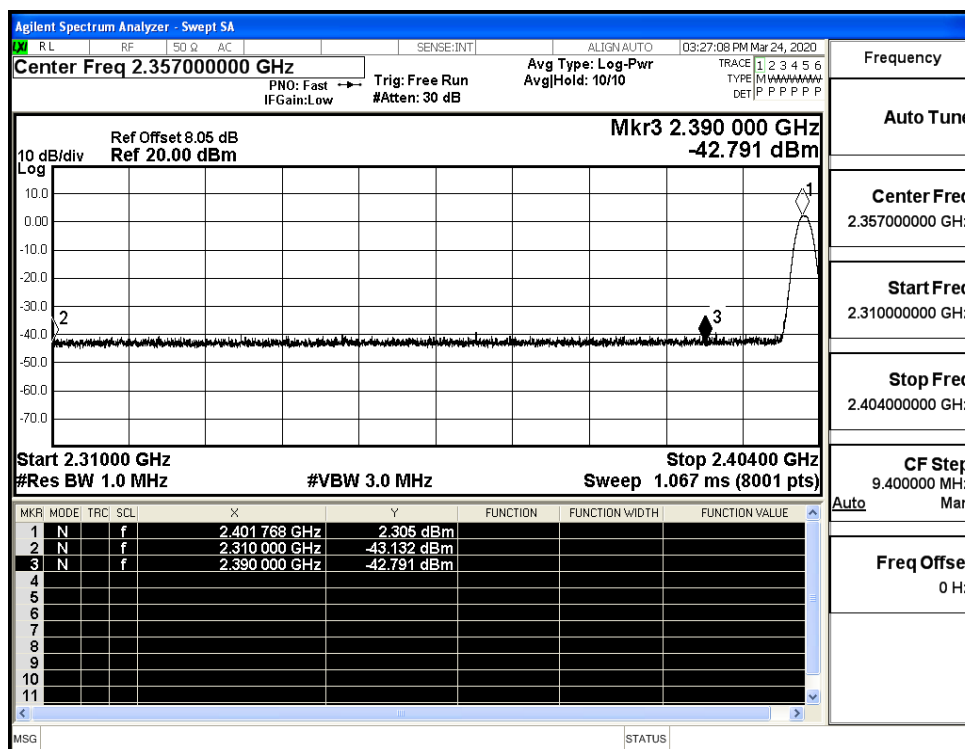
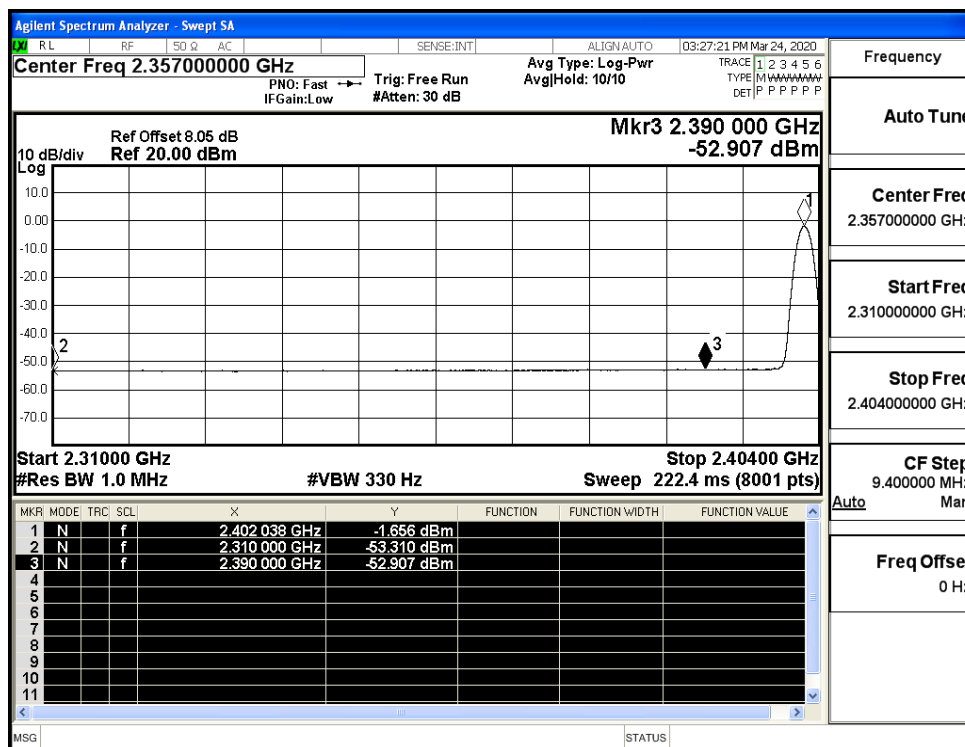


Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)

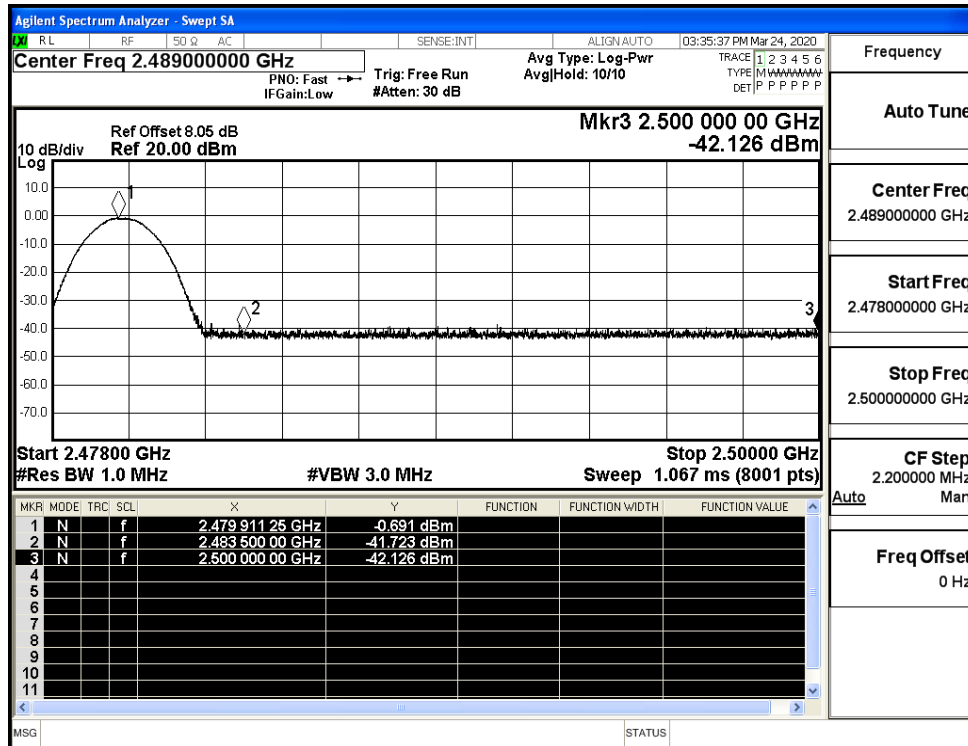


Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



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_π/4-DQPSK_PEAK (High Channel)



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

