

Appendix A

RF Test Data for BT V5.1(BDR/EDR) (Conducted Measurement)

Product Name: Bluetooth Speaker

Trade Mark: N/A

Test Model: XY-AU008-1

Environmental Conditions

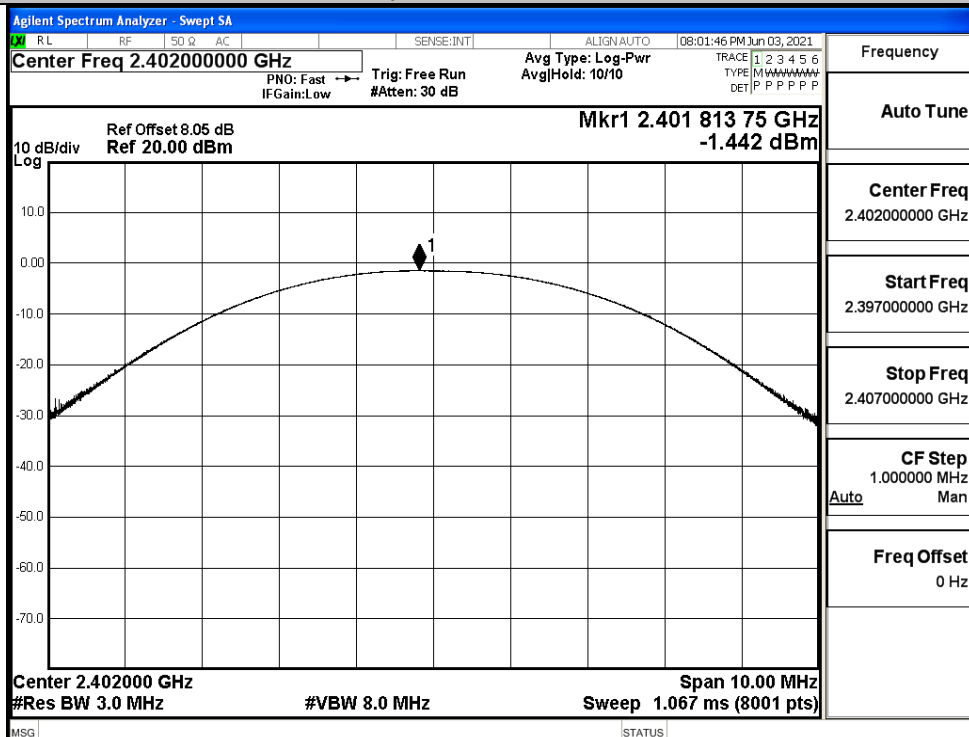
Temperature:	24.5 ° C
Relative Humidity:	54.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Jay Li
Supervised by:	Li Huan

A.1 Maximum Conducted Peak Output Power

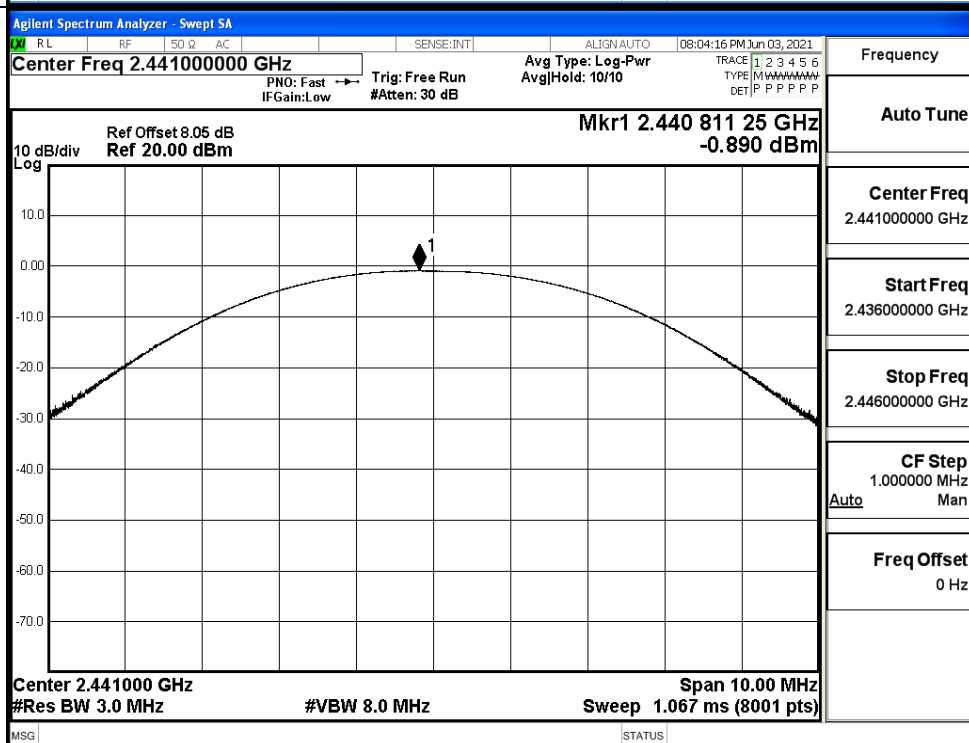
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-1.442	21	PASS
	MCH	-0.890	21	PASS
	HCH	-0.874	21	PASS
$\pi/4$ DQPSK	LCH	-0.546	21	PASS
	MCH	0.008	21	PASS
	HCH	0.042	21	PASS

Test Graphs

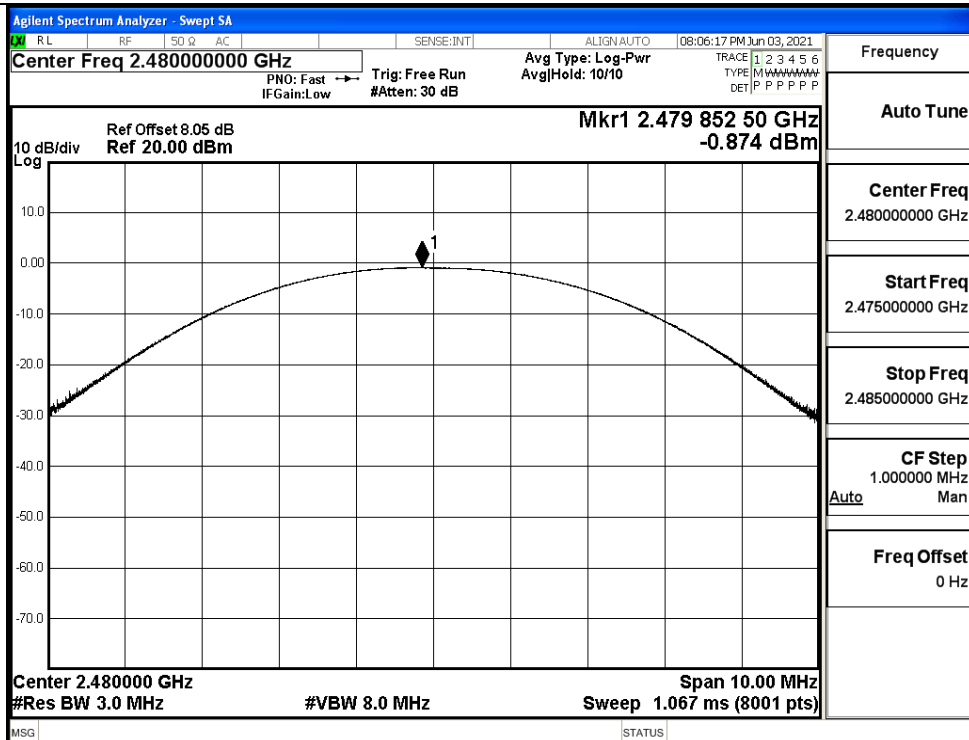
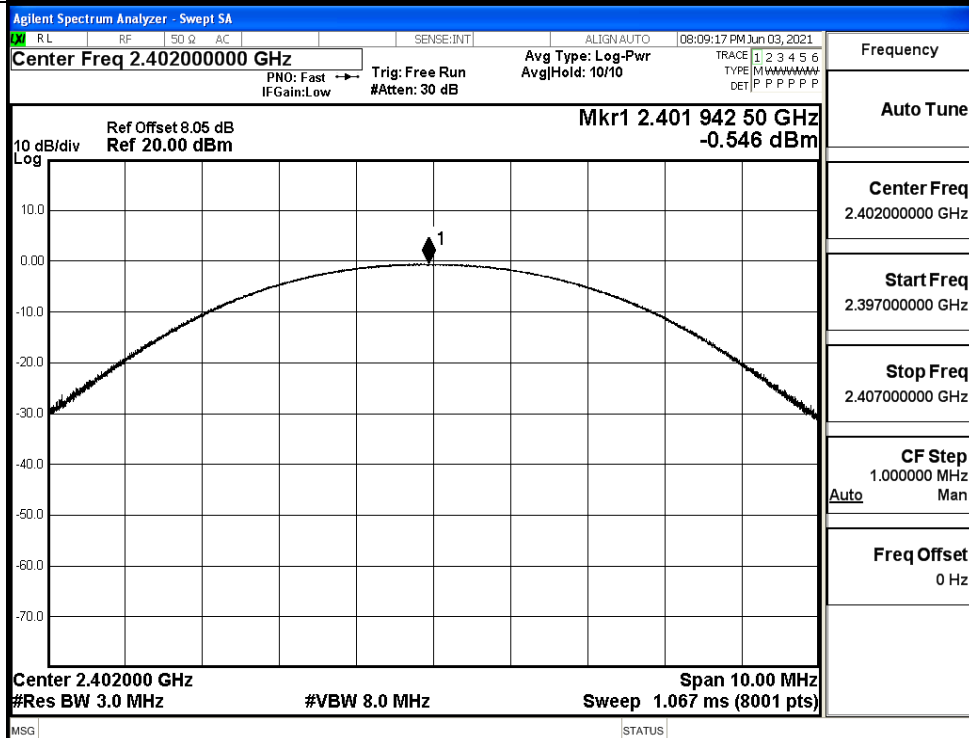
GFSK/LCH

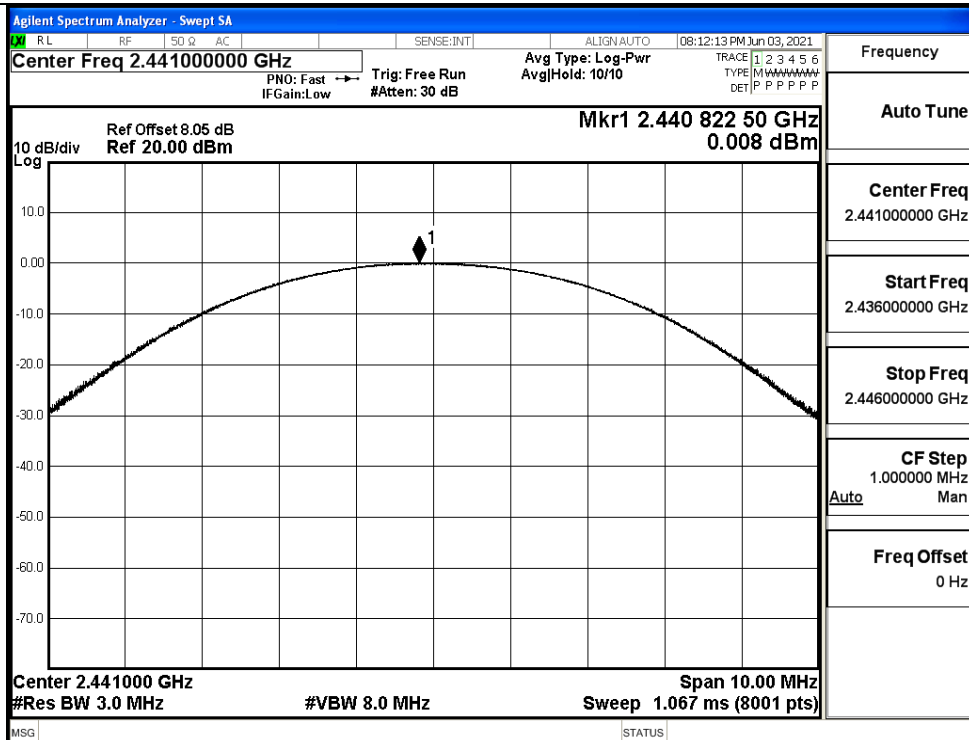
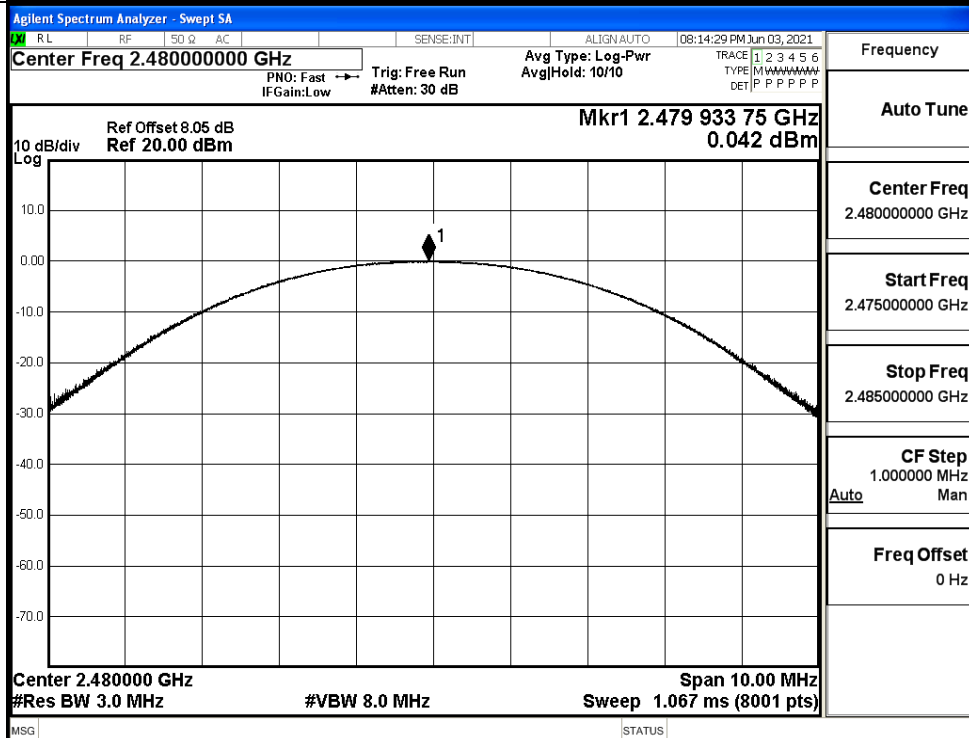


GFSK/MCH



GFSK/HCH

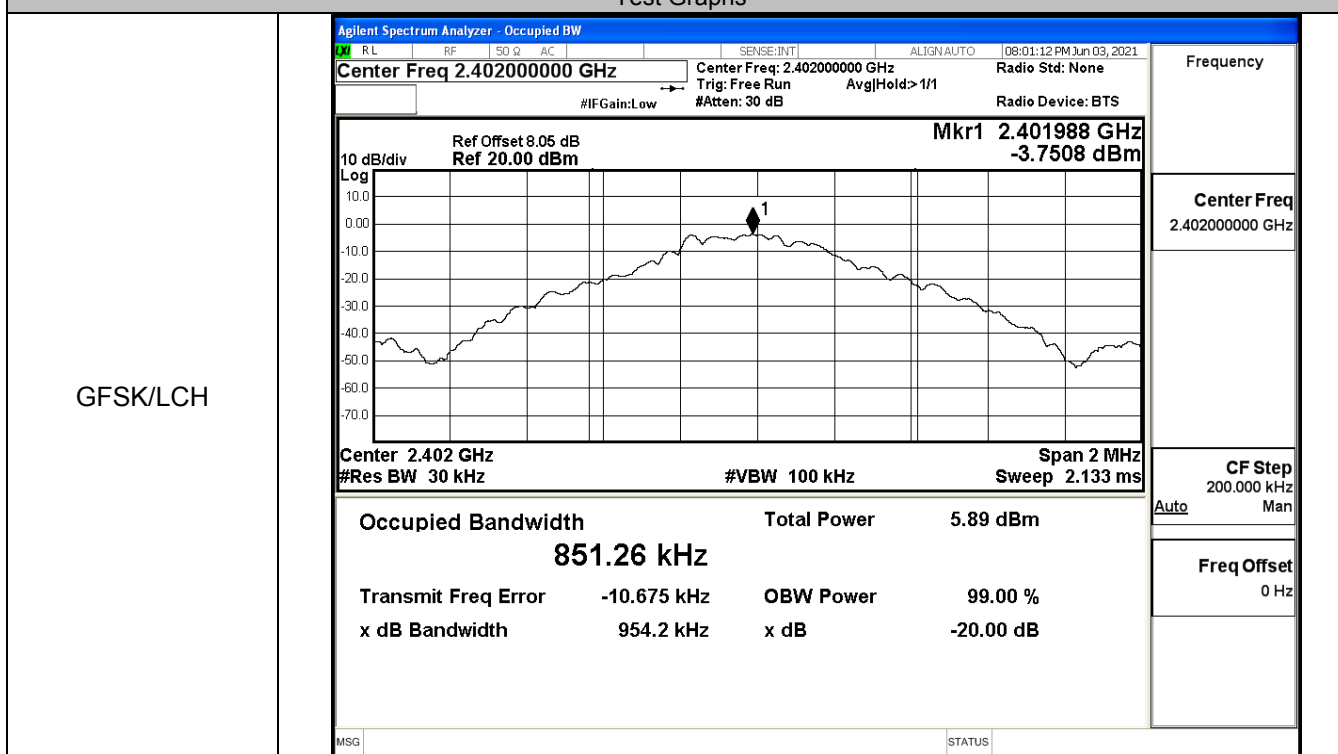
 $\pi/4$ DQPSK/LCH

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

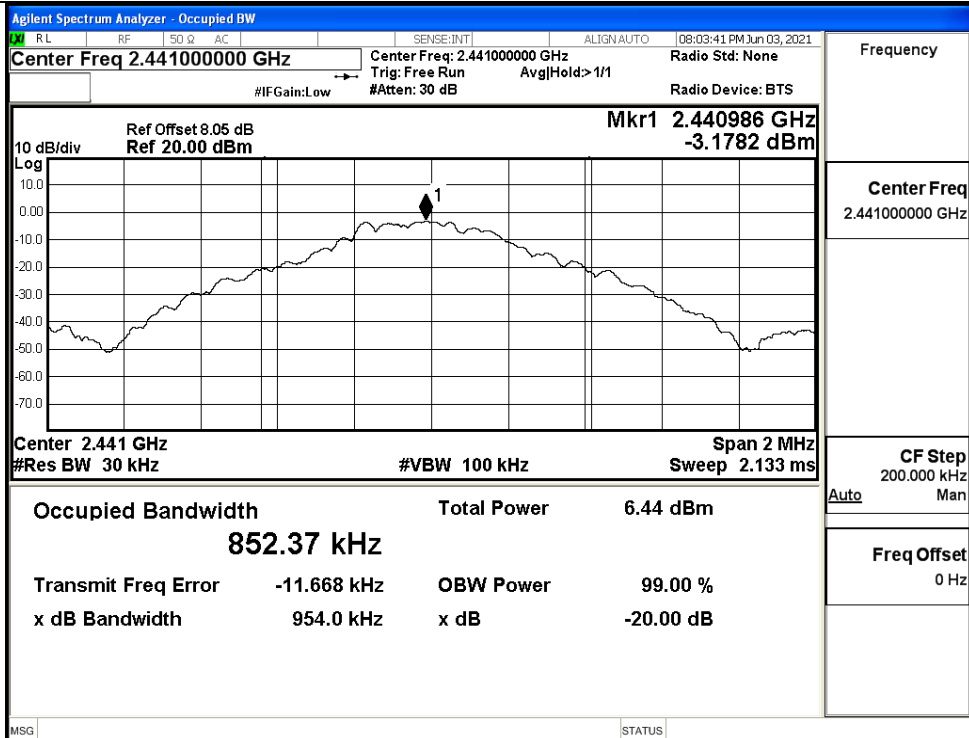
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9542	Not Specified	PASS
	MCH	0.9540	Not Specified	PASS
	HCH	0.9549	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.282	Not Specified	PASS
	MCH	1.284	Not Specified	PASS
	HCH	1.283	Not Specified	PASS

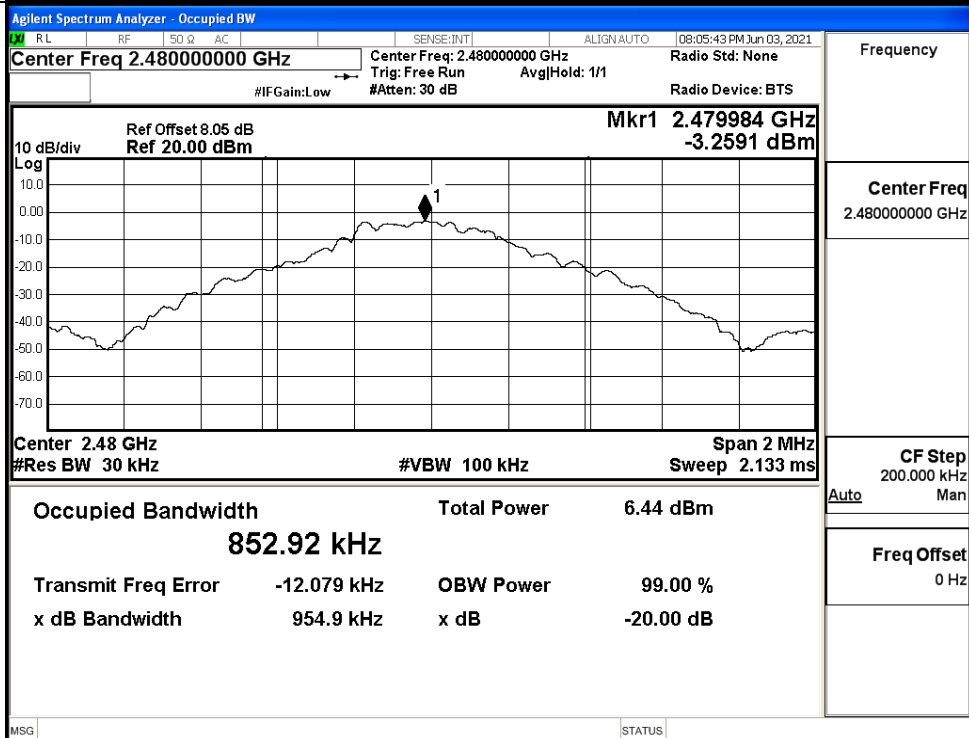
Test Graphs

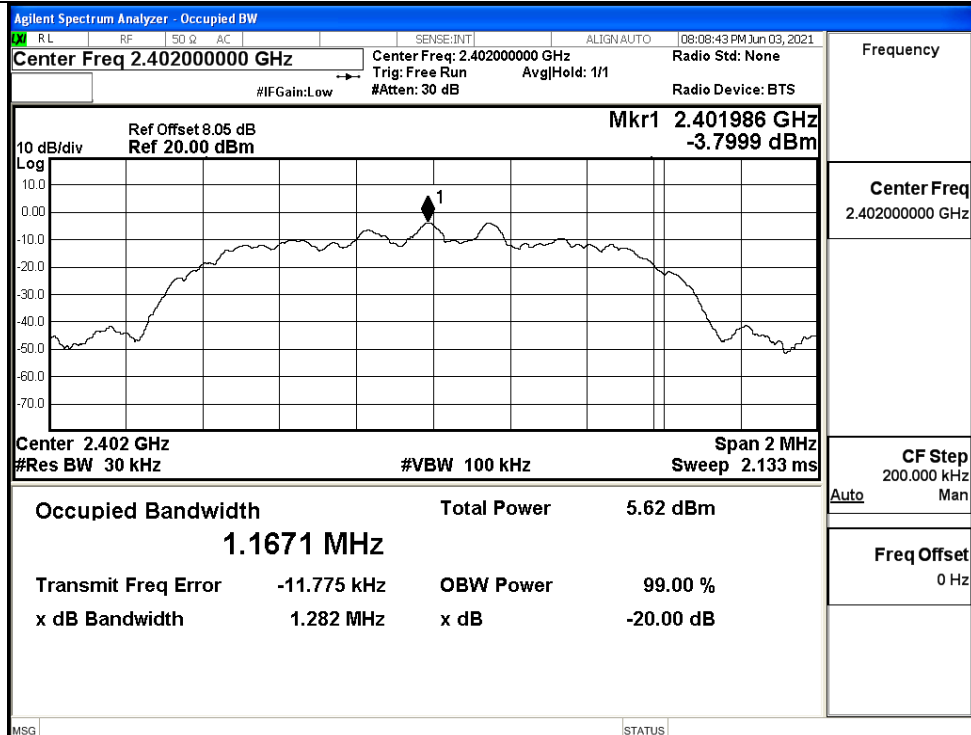
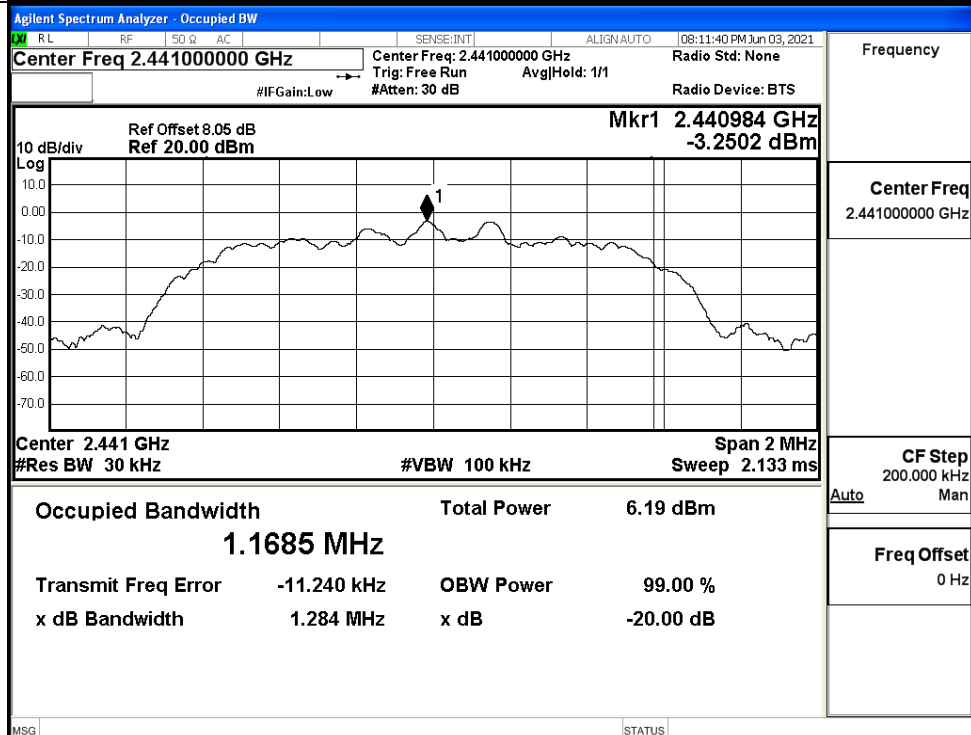


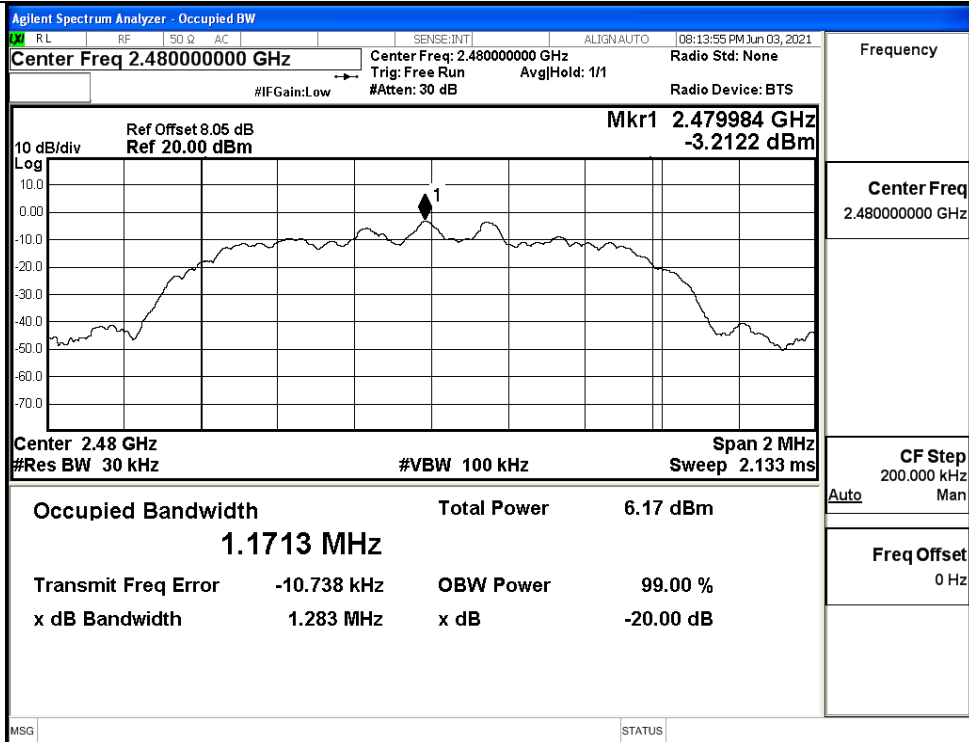
GFSK/MCH



GFSK/HCH



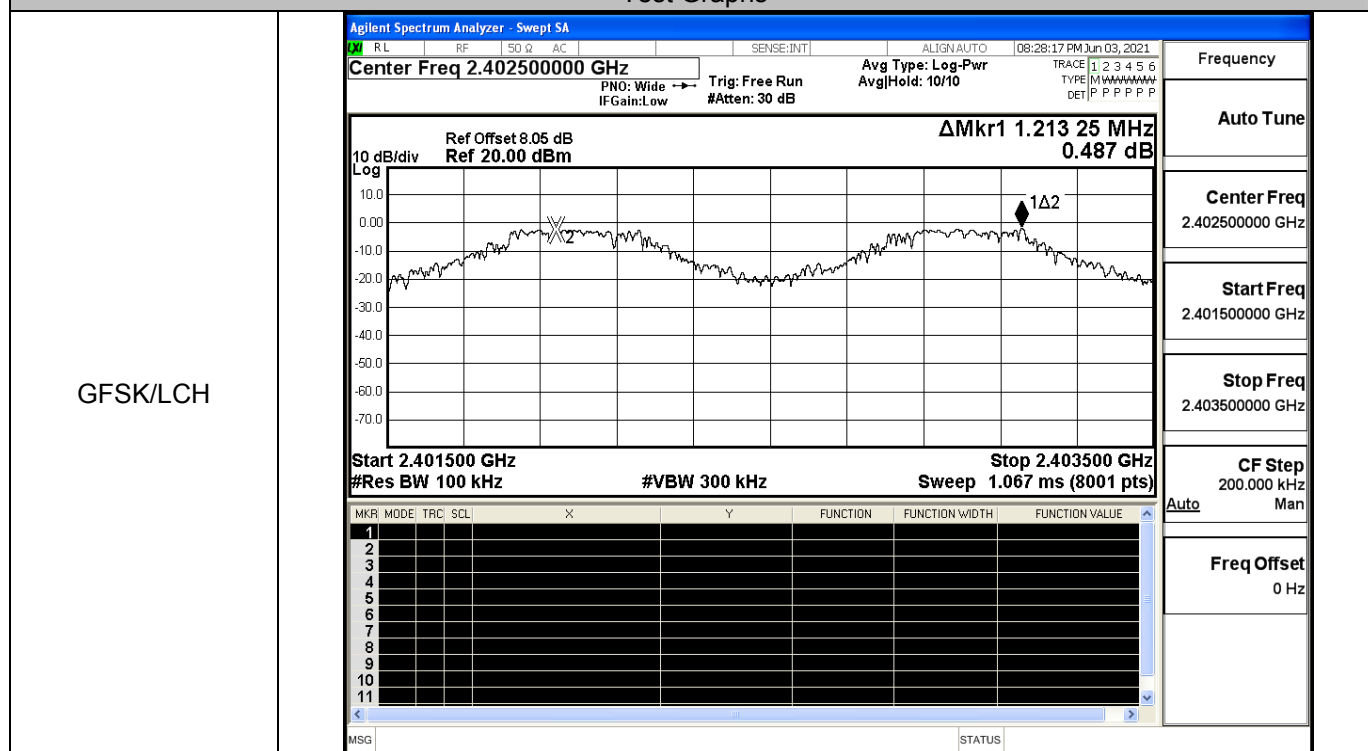
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

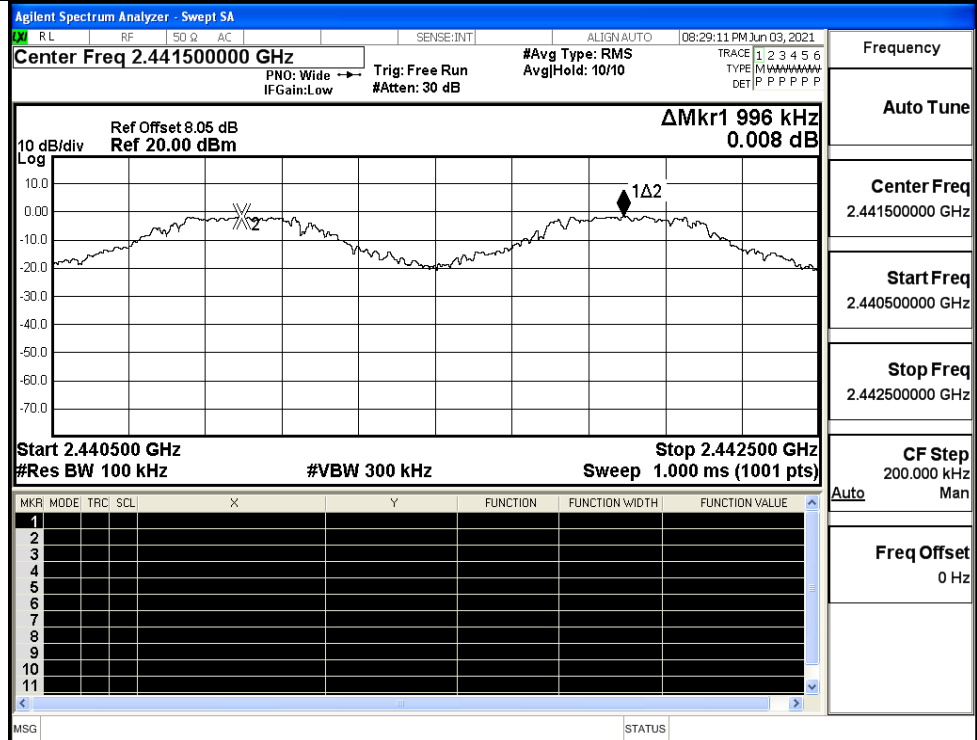
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.213	0.637	PASS
	MCH	0.996	0.637	PASS
	HCH	0.858	0.637	PASS
$\pi/4$ DQPSK	LCH	0.950	0.856	PASS
	MCH	0.986	0.856	PASS
	HCH	1.086	0.856	PASS

Test Graphs



GFSK/MCH

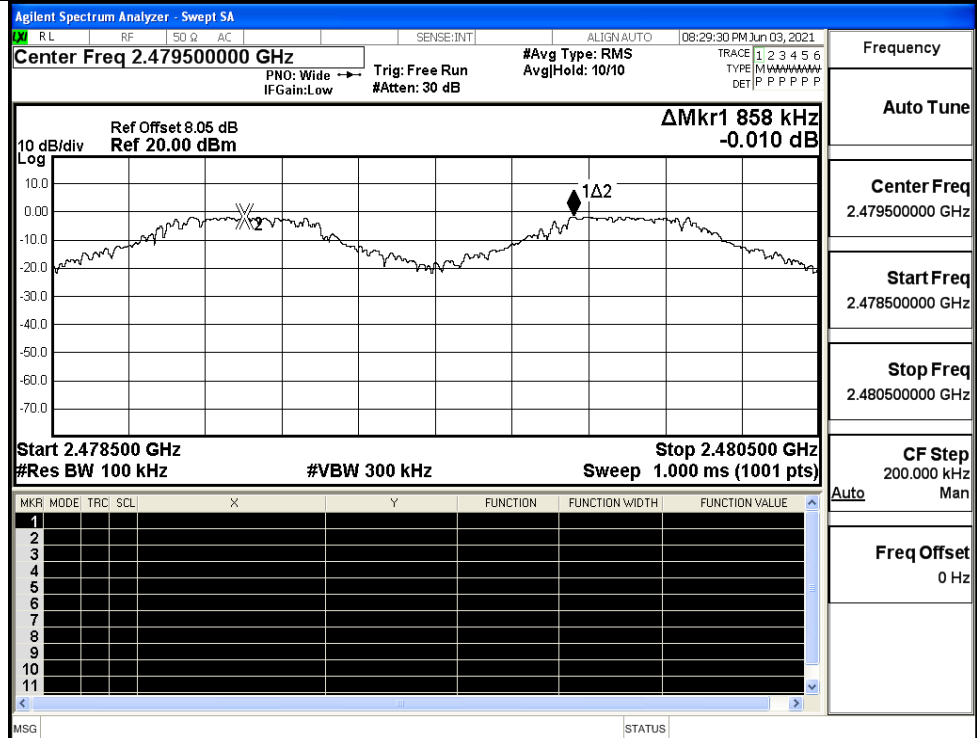


Frequency

Auto Tune

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

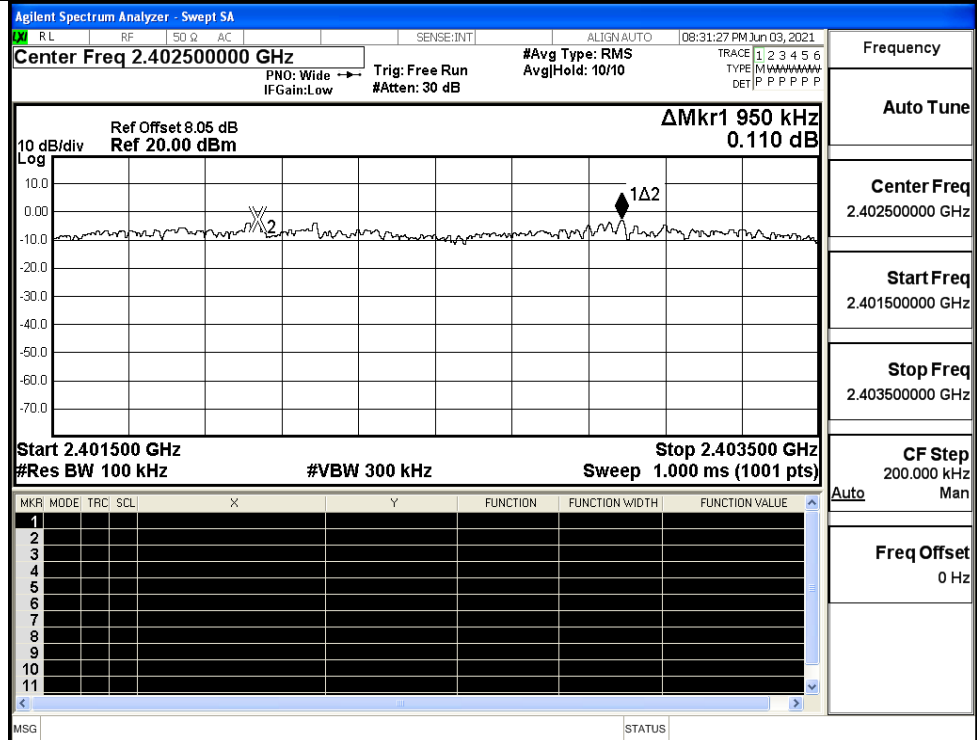
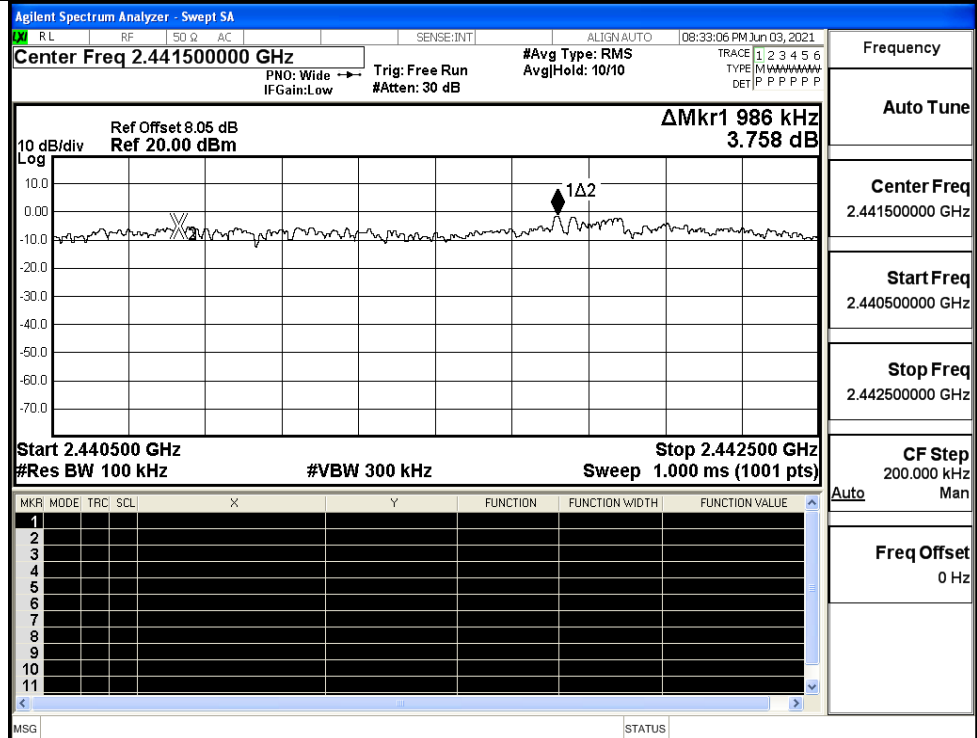
GFSK/HCH

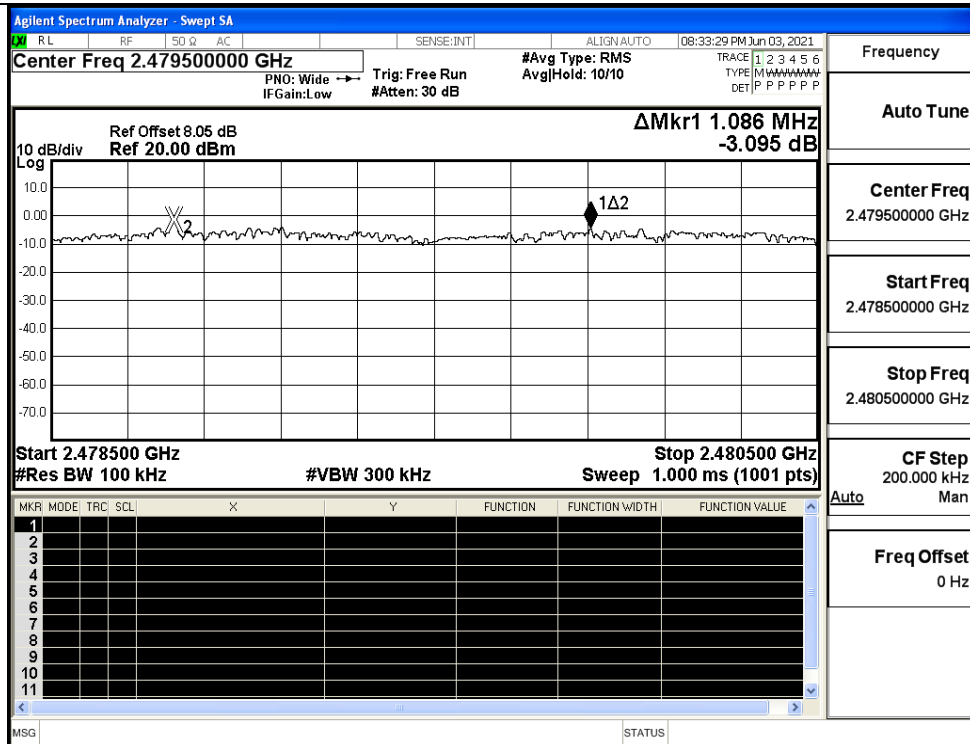


Frequency

Auto Tune

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

π /4DQPSK/LCH π /4DQPSK/MCH

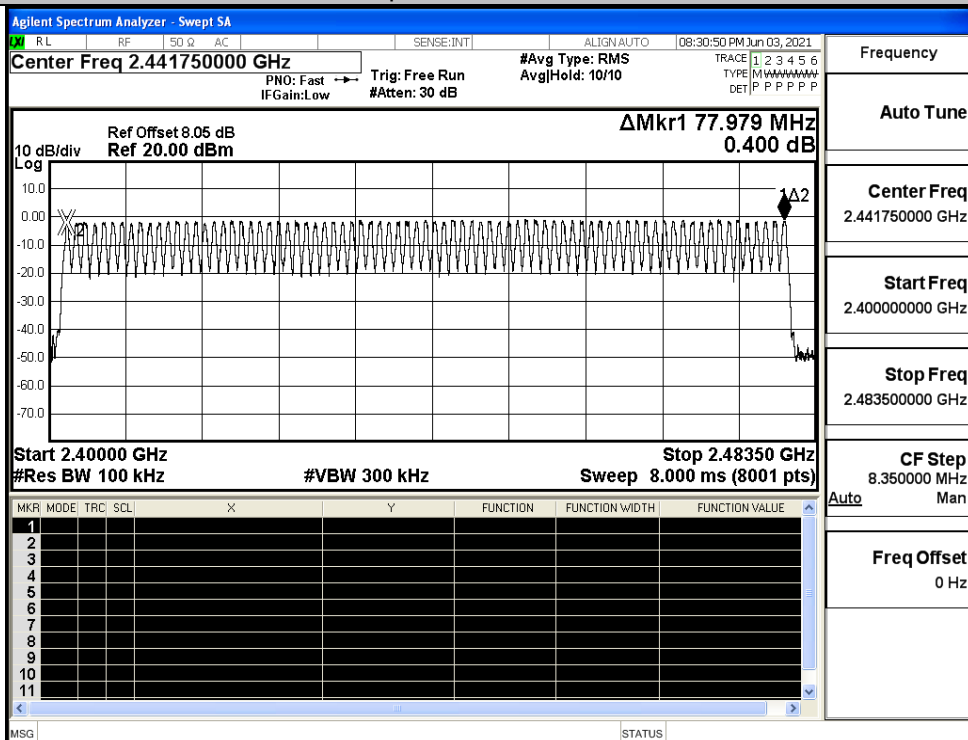
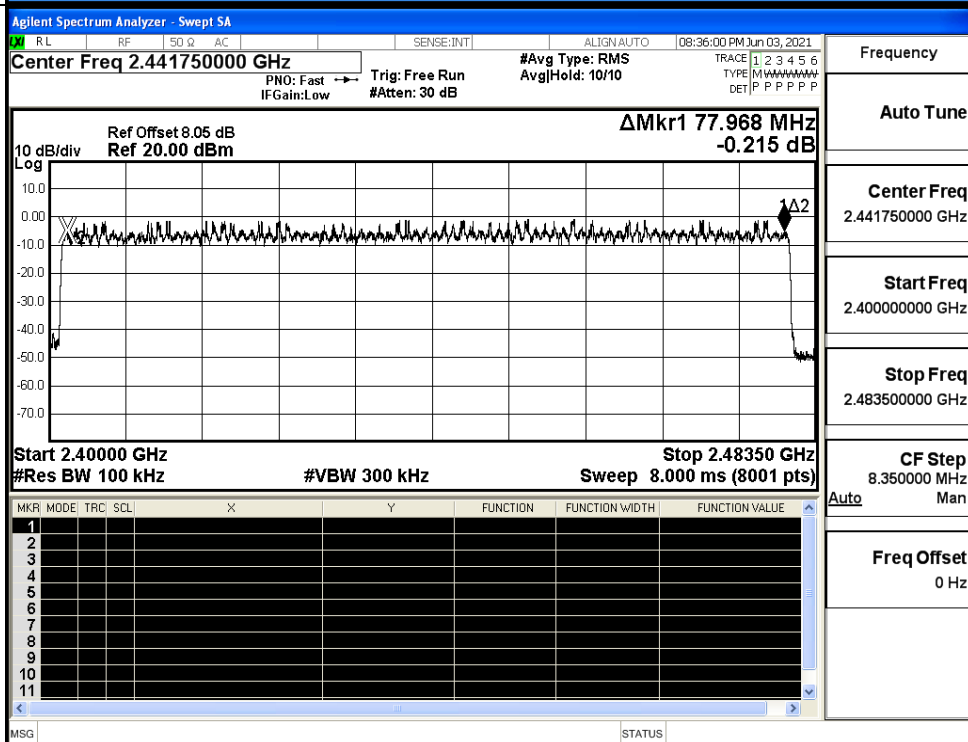
$\pi/4$ DQPSK/HCH

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

Test Graphs

GFSK/Hop

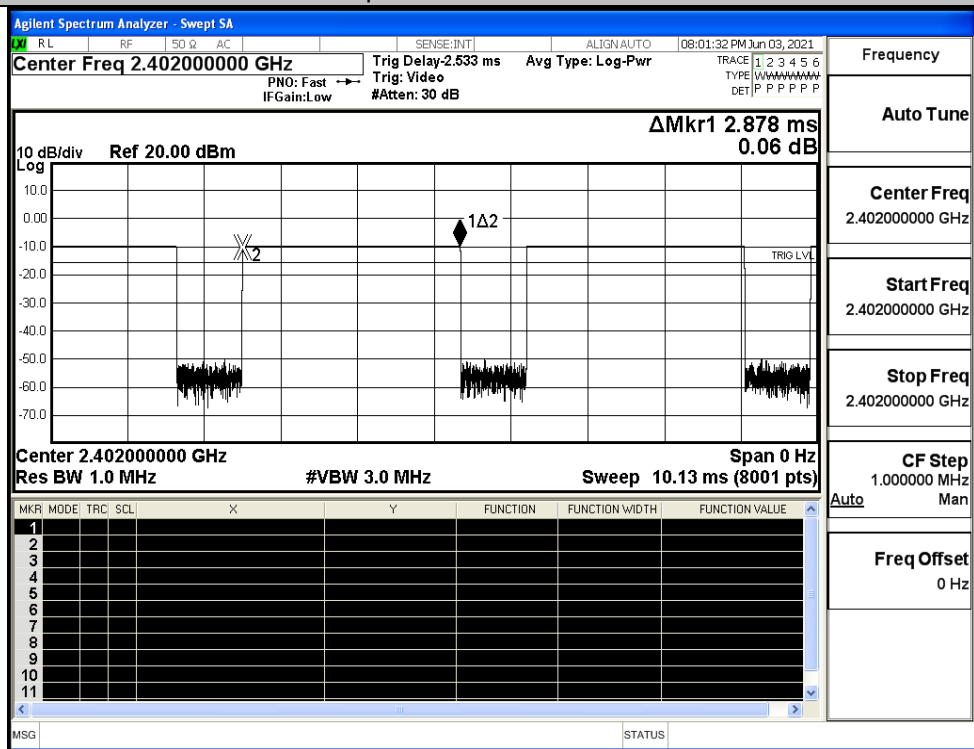
 $\pi/4$ DQPSK/Hop

A.5 Dwell Time

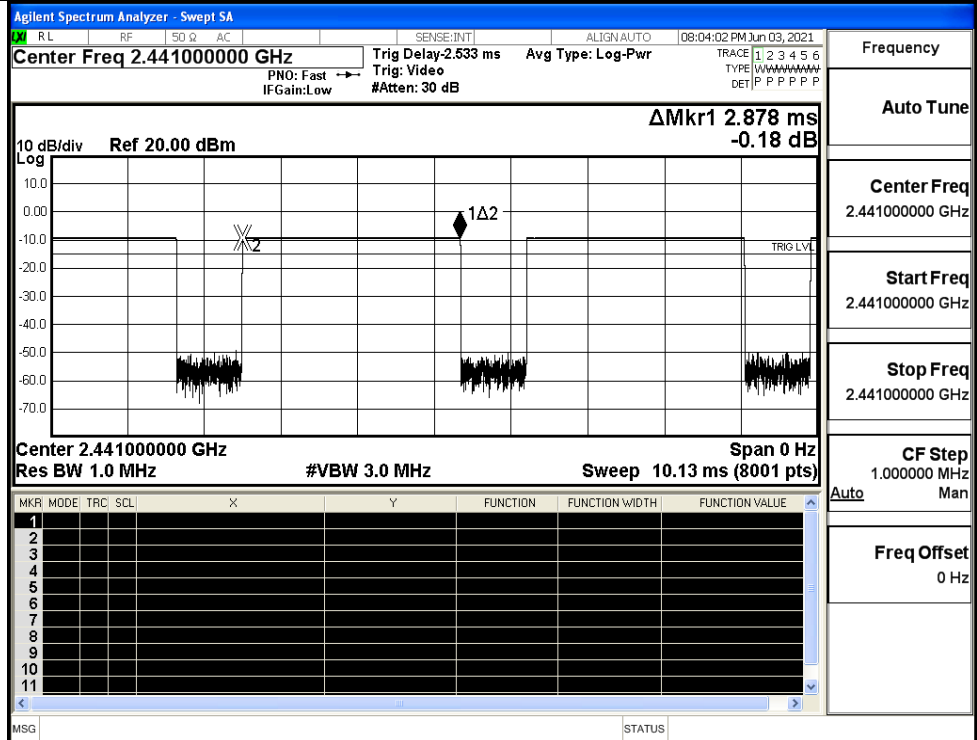
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88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

Test Graphs

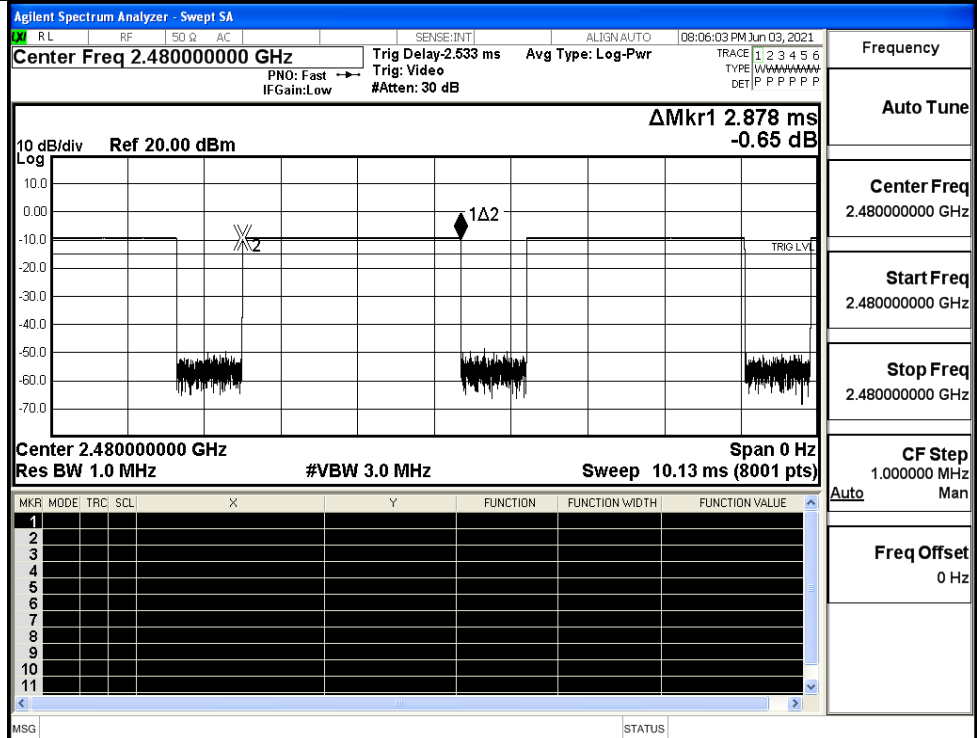
GFSK_DH5/LCH



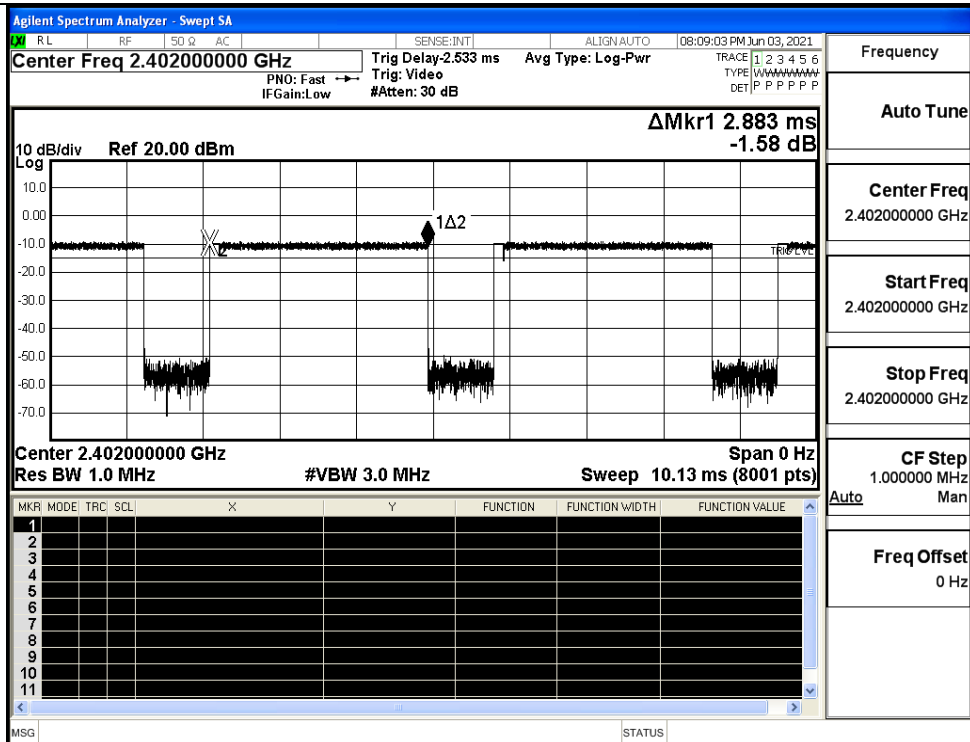
GFSK_DH5/MCH



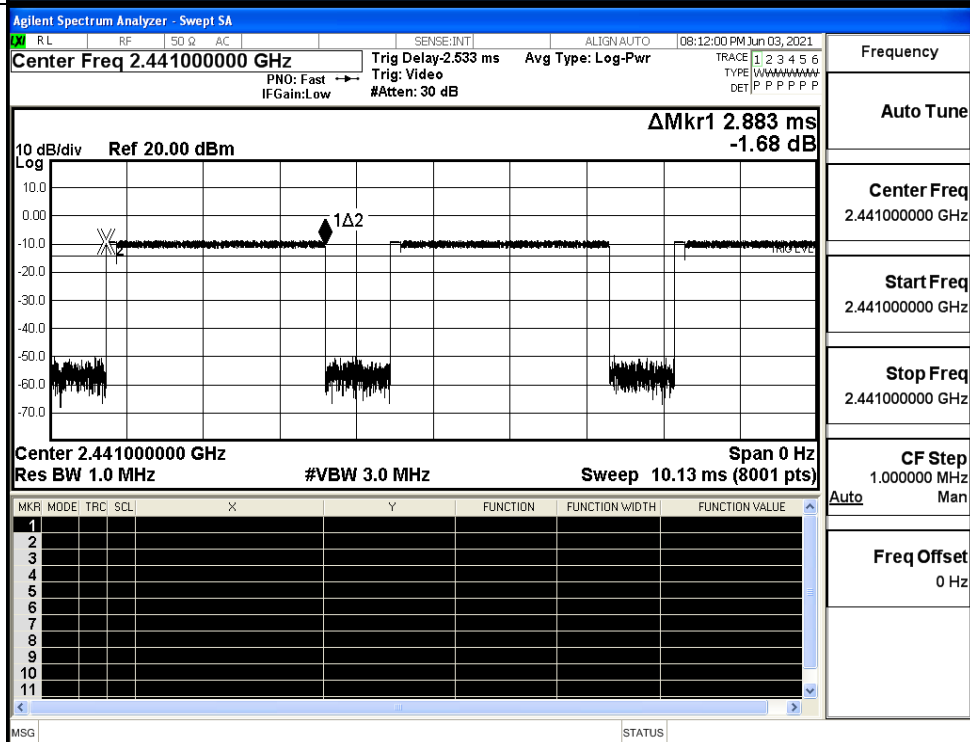
GFSK_DH5/HCH



$\pi/4$ DQPSK
_2DH5/LCH



$\pi/4$ DQPSK
_2DH5/MCH



Agilent Spectrum Analyzer - Swept SA

R/L	RF	SQ	Z	AC	SENSE INT	ALIGN AUTO	OB:14:15 PM Jun 03, 2021
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Center Freq 2.480000000 GHz Trig Delay: 2.533 ms Avg Type: Log-Pwr TRACE 1 2 3 4 5 6
PNO: Fast → Trig: Video TYPE WXXXXXXXXXX
IF Gain: Low #Atten: 30 dB DET P P P P P P

ΔMkr1 2.883 ms
-1.61 dB

Center 2.480000000 GHz Span 0 Hz
Res BW 1.0 MHz #VBW 3.0 MHz Sweep 10.13 ms (8001 pts)

MKR	MODE	TFC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								

Frequency: Auto Tune

Center Freq: 2.480000000 GHz

Start Freq: 2.480000000 GHz

Stop Freq: 2.480000000 GHz

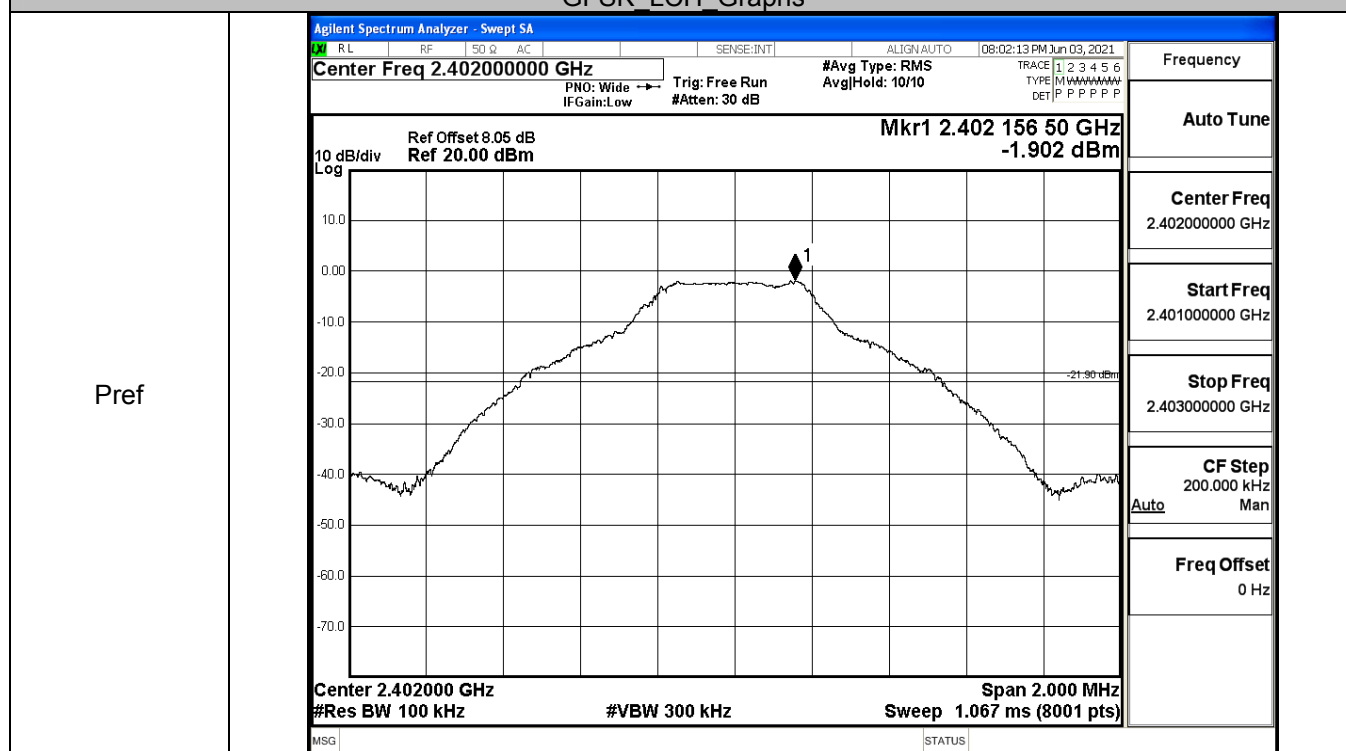
CF Step: 1.000000 MHZ Man

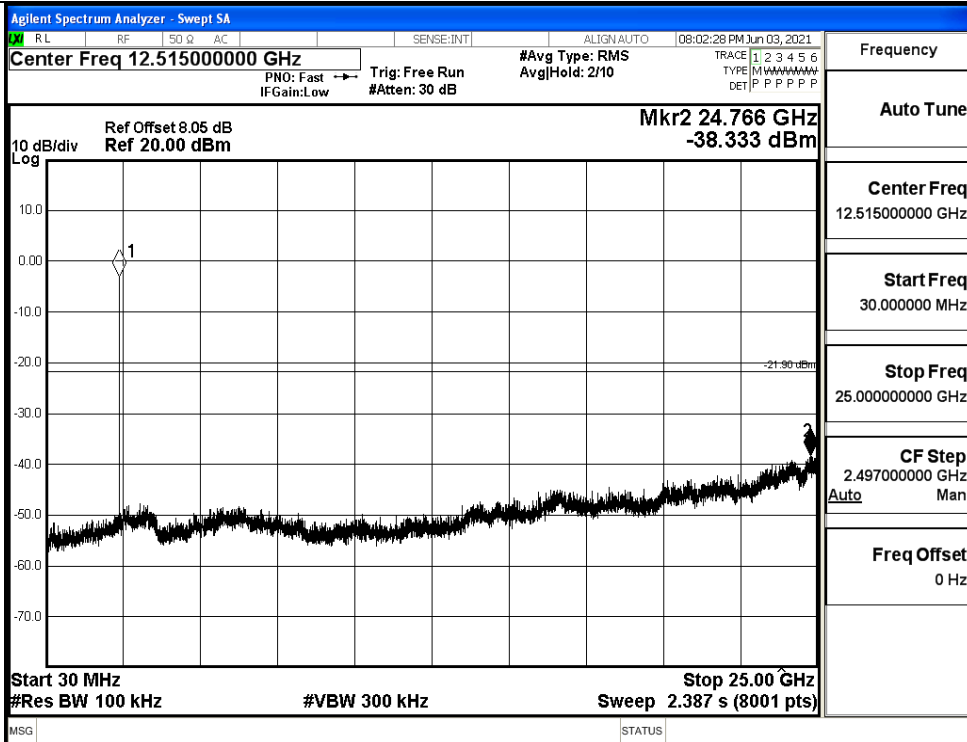
Freq Offset: 0 Hz

A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-1.902	-38.333	-21.902	PASS
	MCH	-1.098	-37.166	-21.098	PASS
	HCH	-1.284	-37.505	-21.284	PASS
$\pi/4$ DQPSK	LCH	-1.719	-38.552	-21.719	PASS
	MCH	-1.161	-37.255	-21.161	PASS
	HCH	-1.143	-37.888	-21.143	PASS

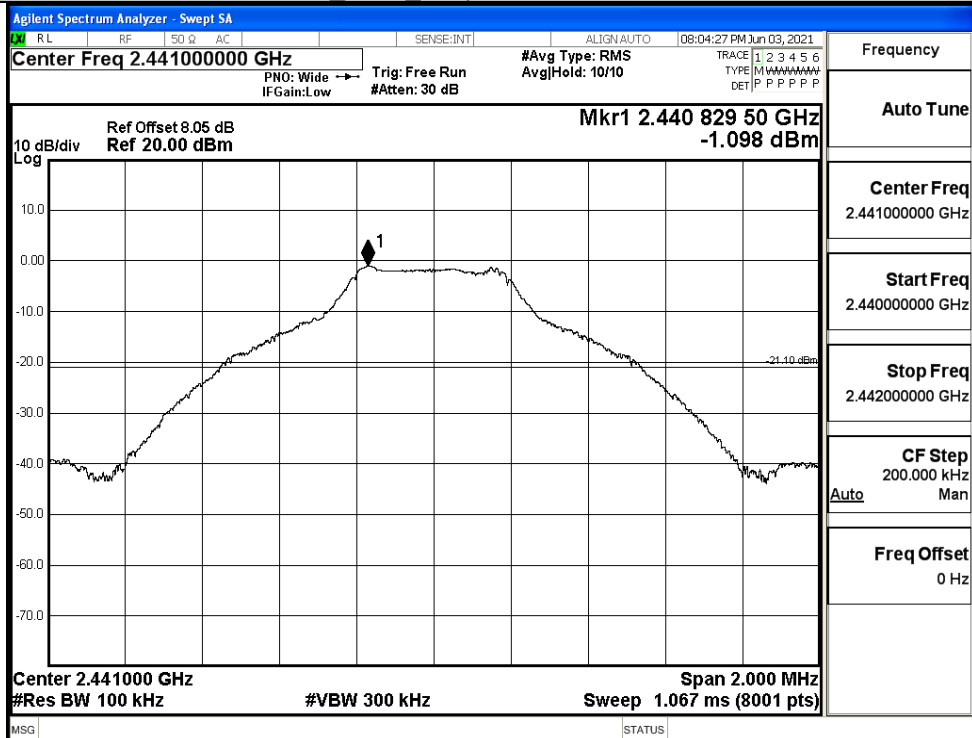
GFSK LCH Graphs



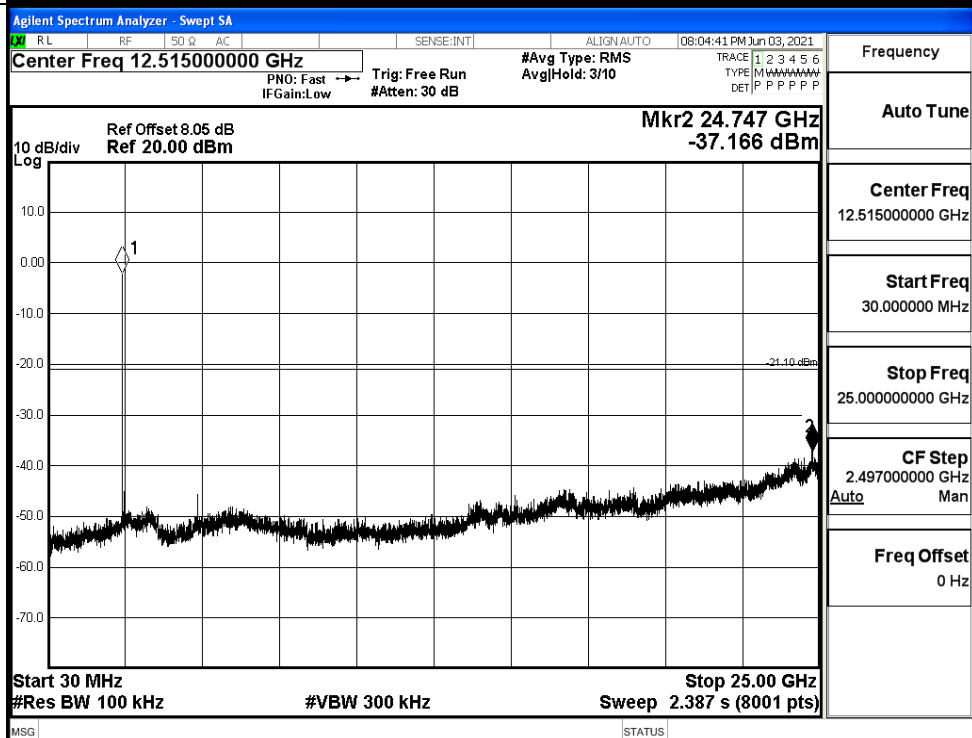
P_{uw}

GFSK_MCH_Graphs

Pref

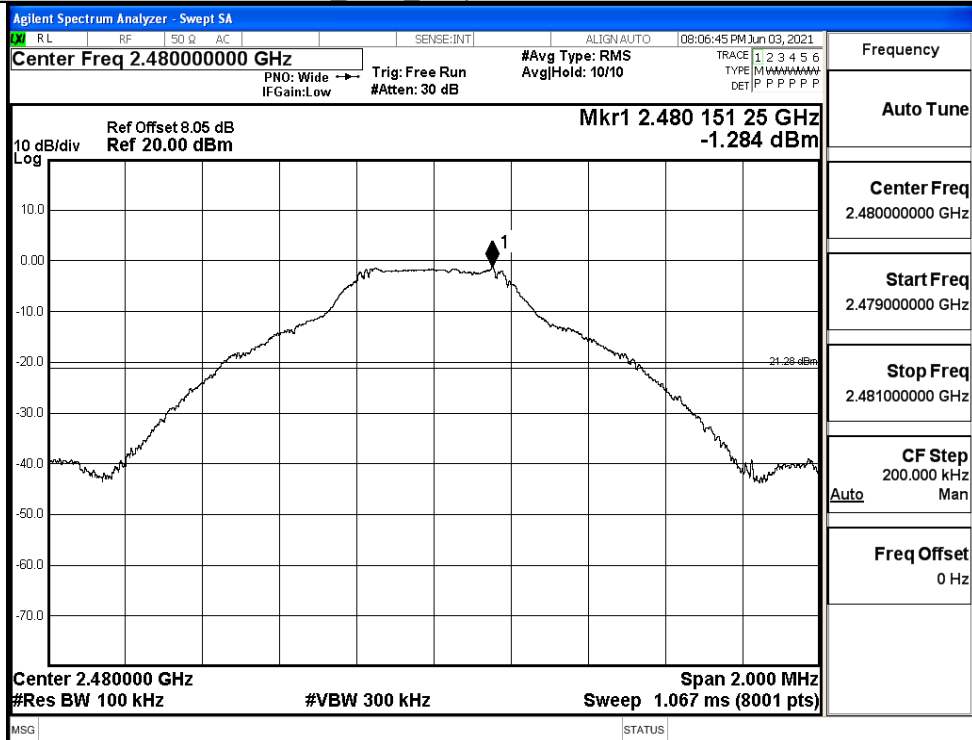


Puw

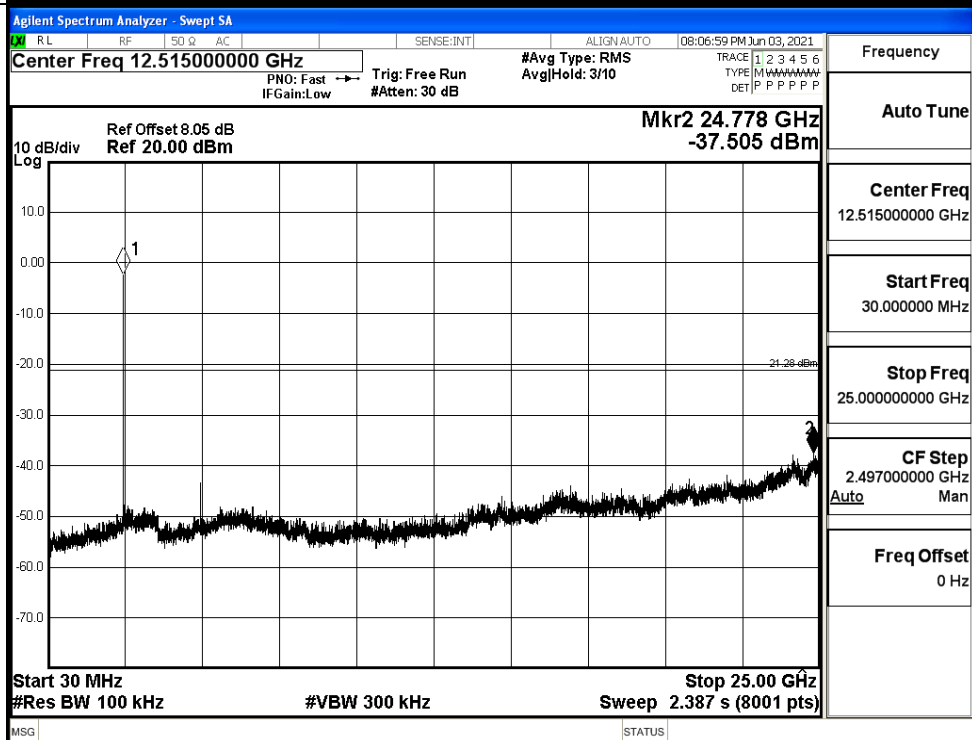


GFSK_HCH_Graphs

Pref

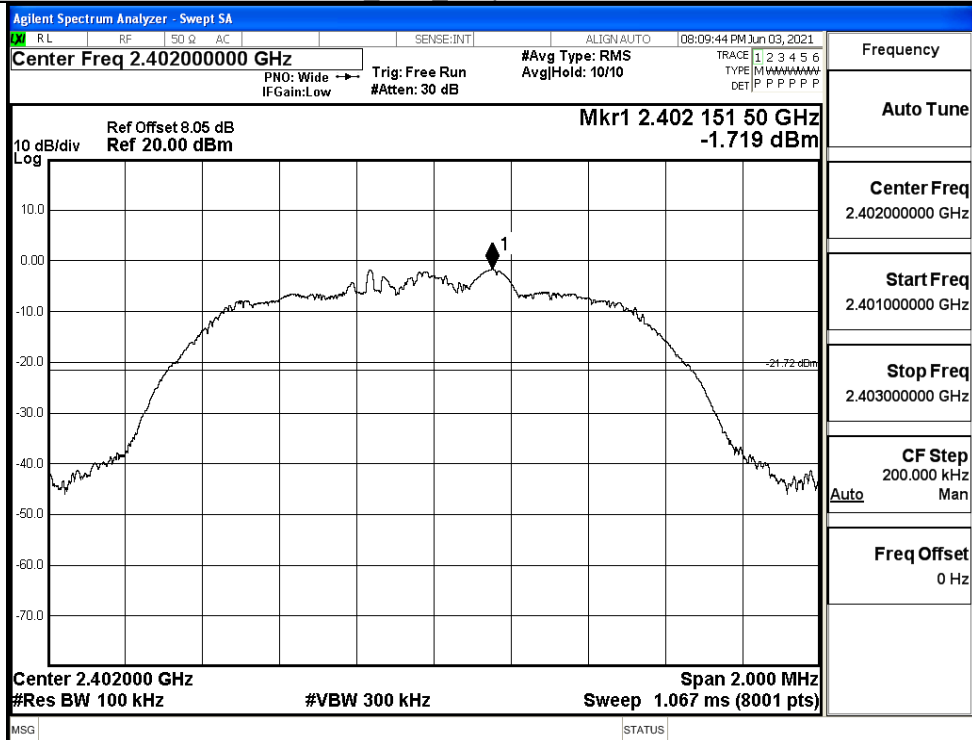


Puw

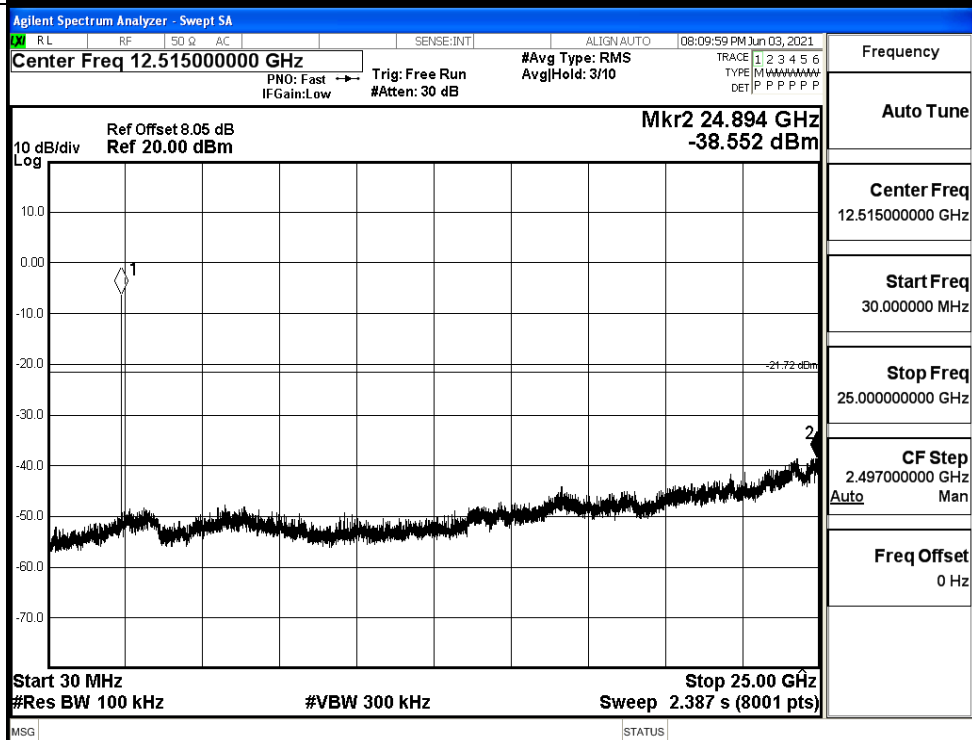


π /4DQPSK_LCH_Graphs

Pref

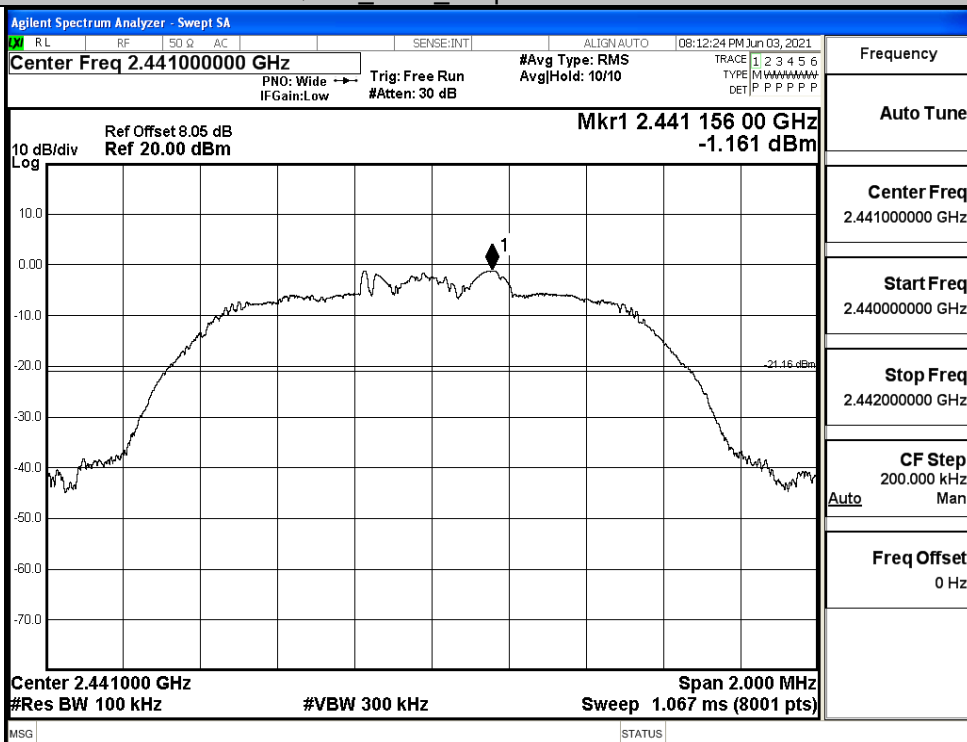


Puw

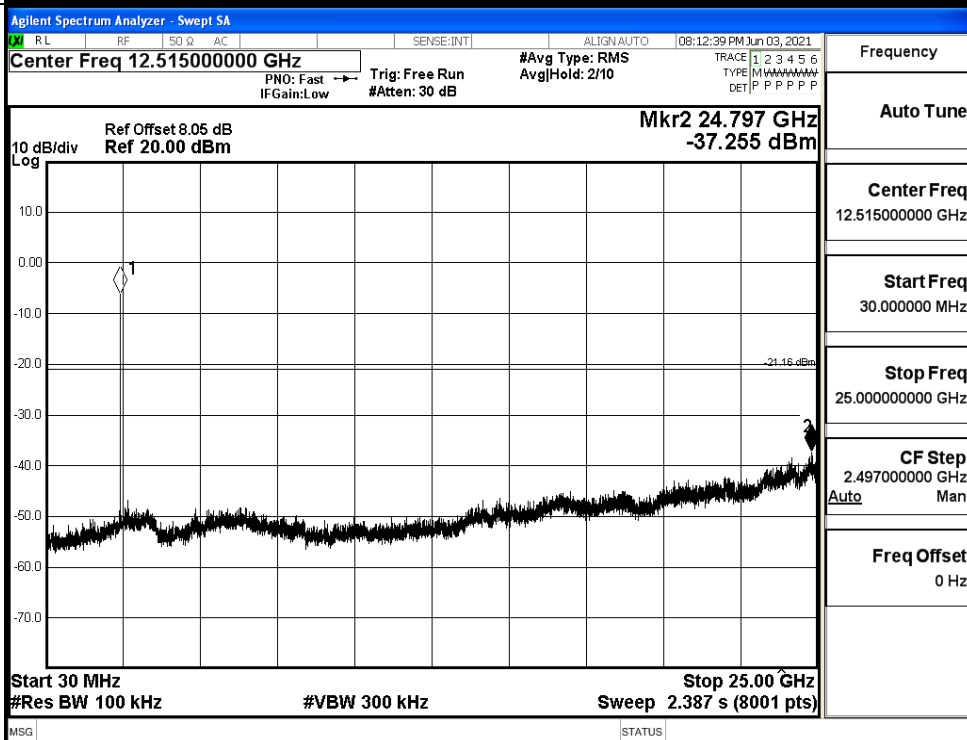


$\pi/4$ DQPSK_MCH_Graphs

Pref

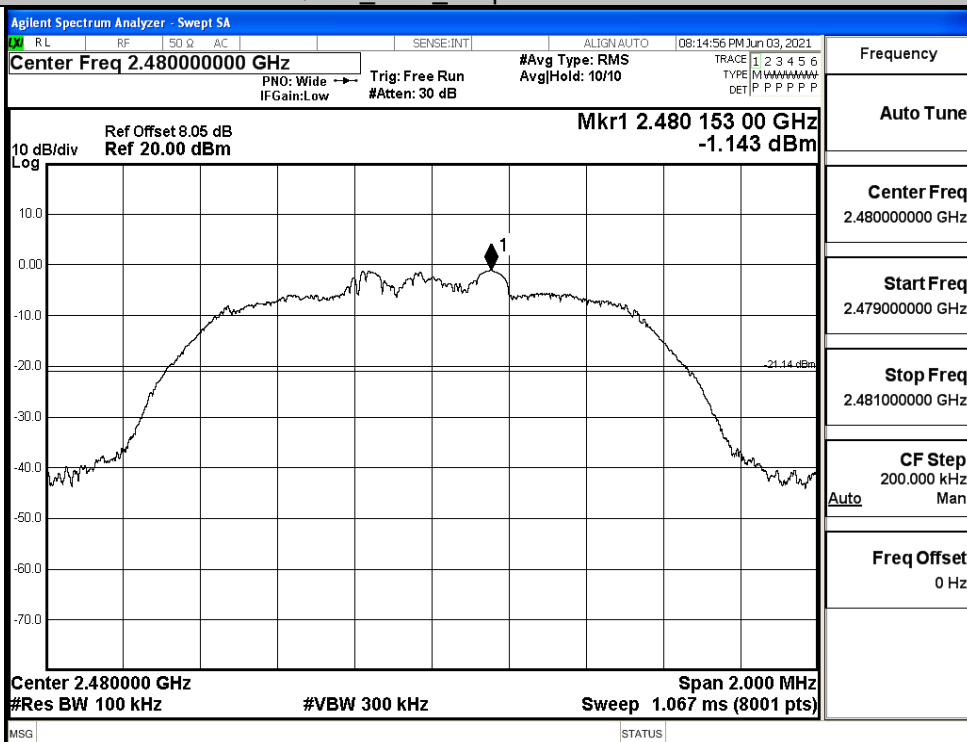


Puw

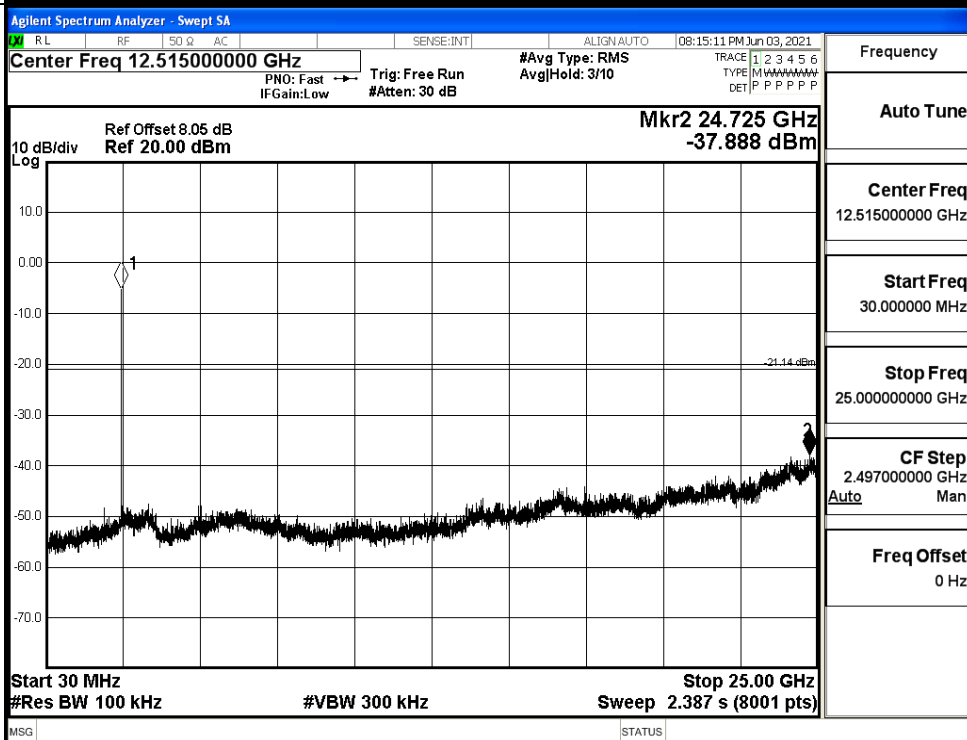


$\pi/4$ DQPSK_HCH_Graphs

Pref



Puw

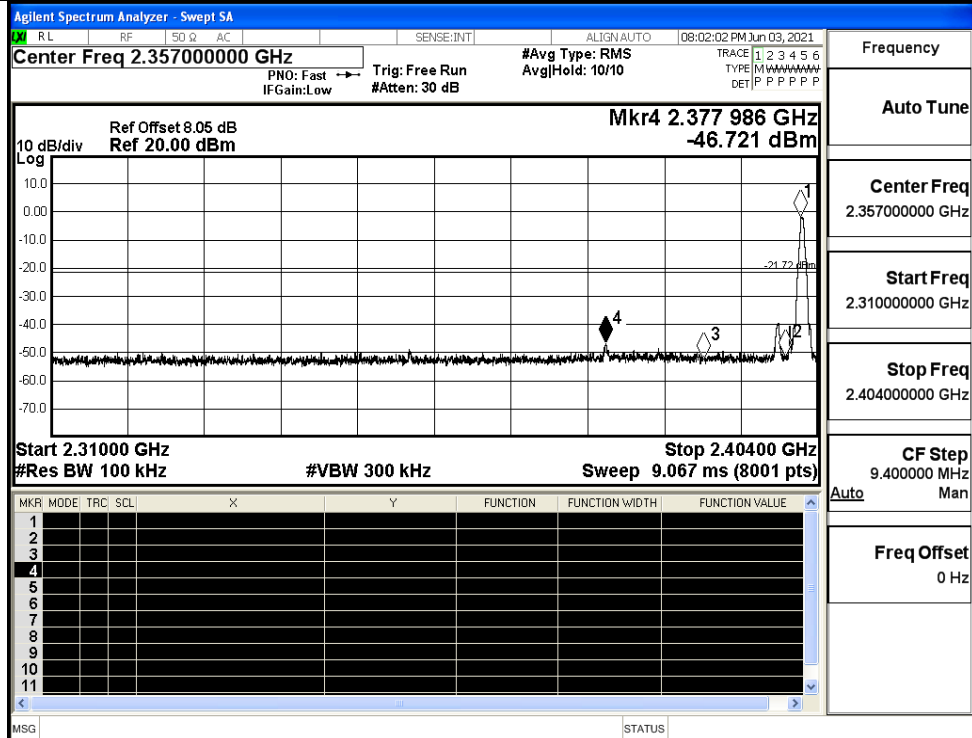


A.7 Band-edge for RF Conducted Emissions

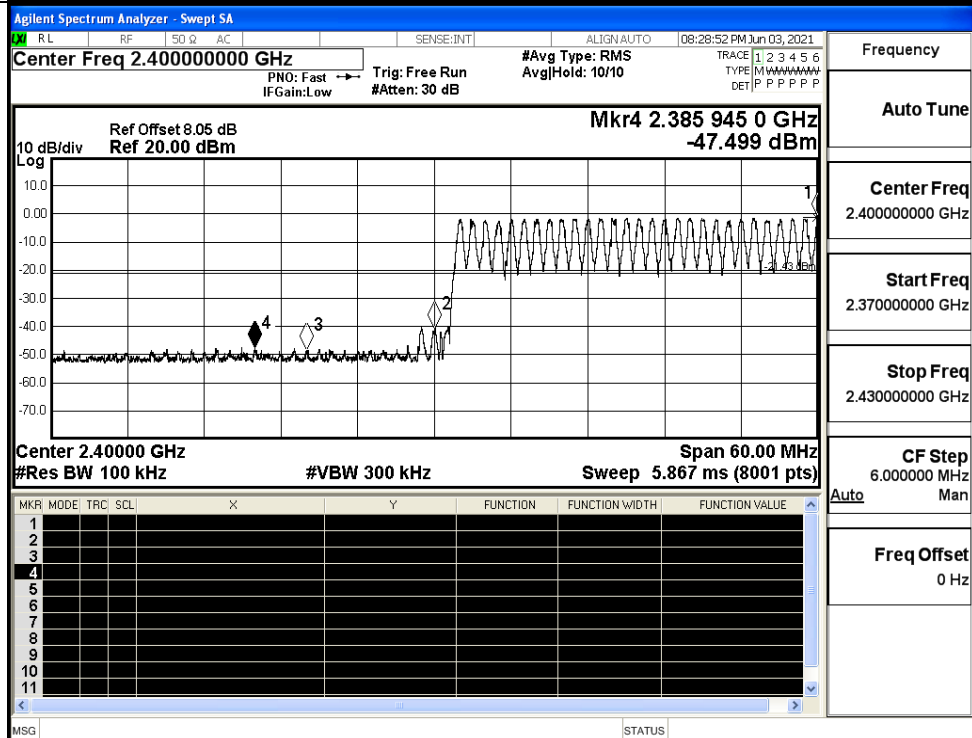
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-1.722	Off	-46.721	-21.72	PASS
			-1.428	On	-47.499	-21.43	PASS
	HCH	2480	-1.052	Off	-45.525	-21.05	PASS
			-0.899	On	-45.601	-20.9	PASS
$\pi/4$ DQPSK	LCH	2402	-2.516	Off	-48.085	-22.52	PASS
			-1.294	On	-47.369	-21.29	PASS
	HCH	2480	-1.061	Off	-46.592	-21.06	PASS
			-0.960	On	-45.669	-20.96	PASS

Test Graphs

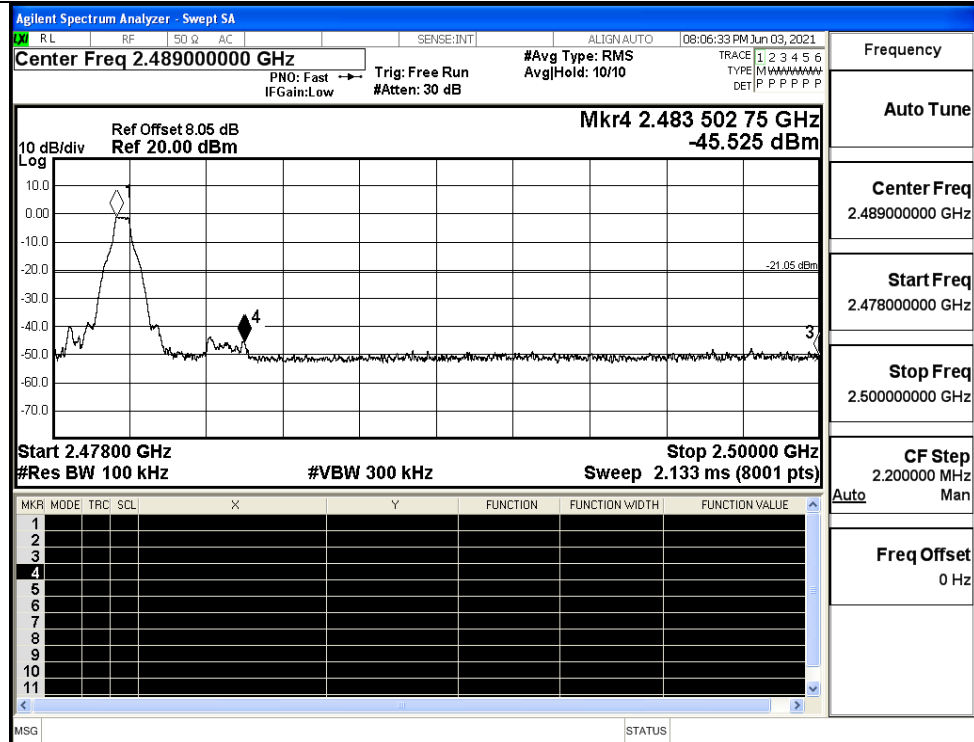
GFSK/LCH/No Hop



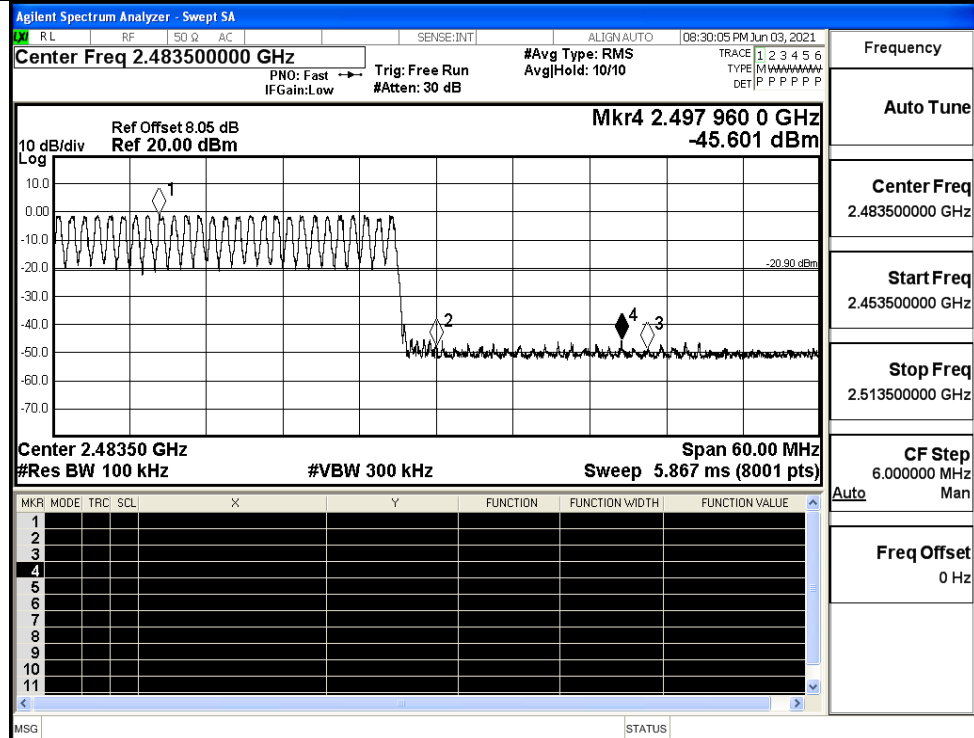
GFSK/LCH/Hop



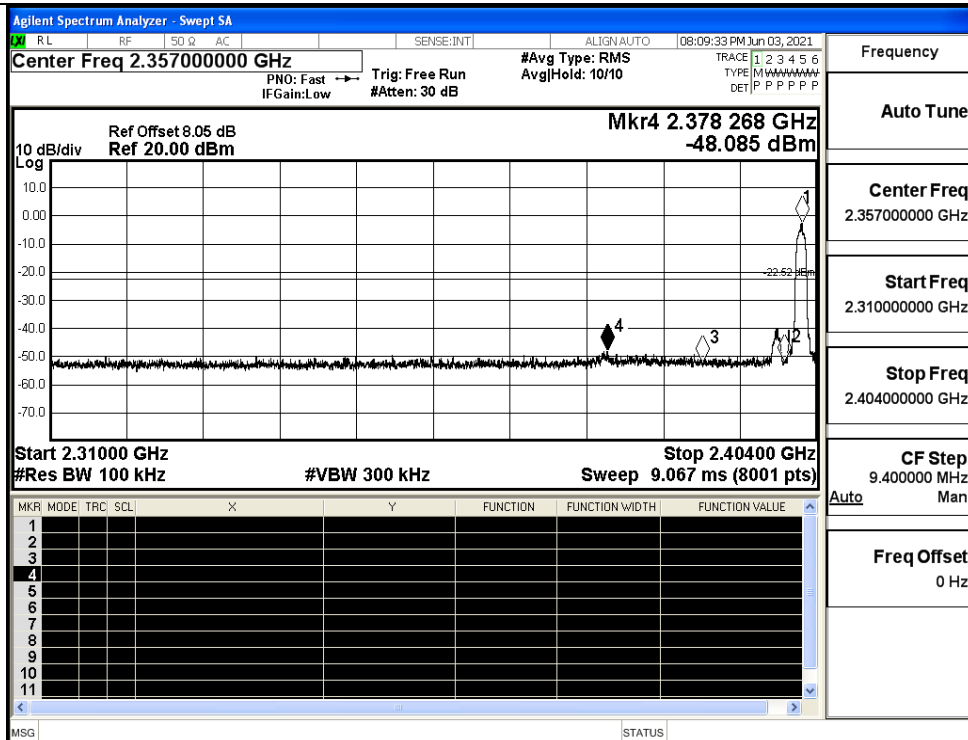
GFSK/HCH/No Hop



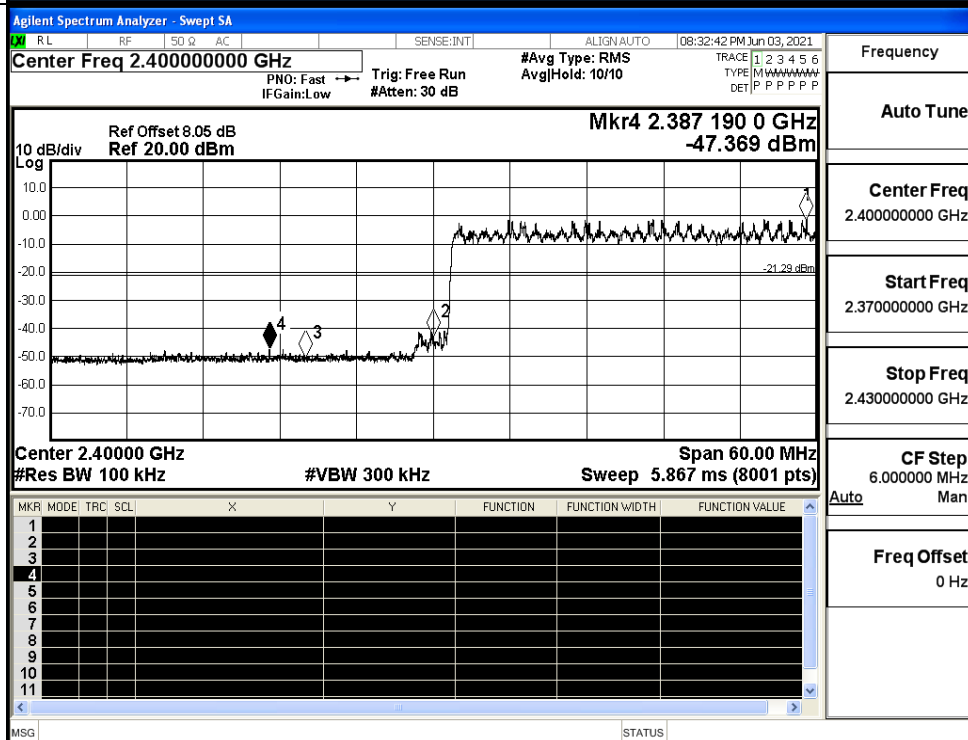
GFSK/HCH/Hop



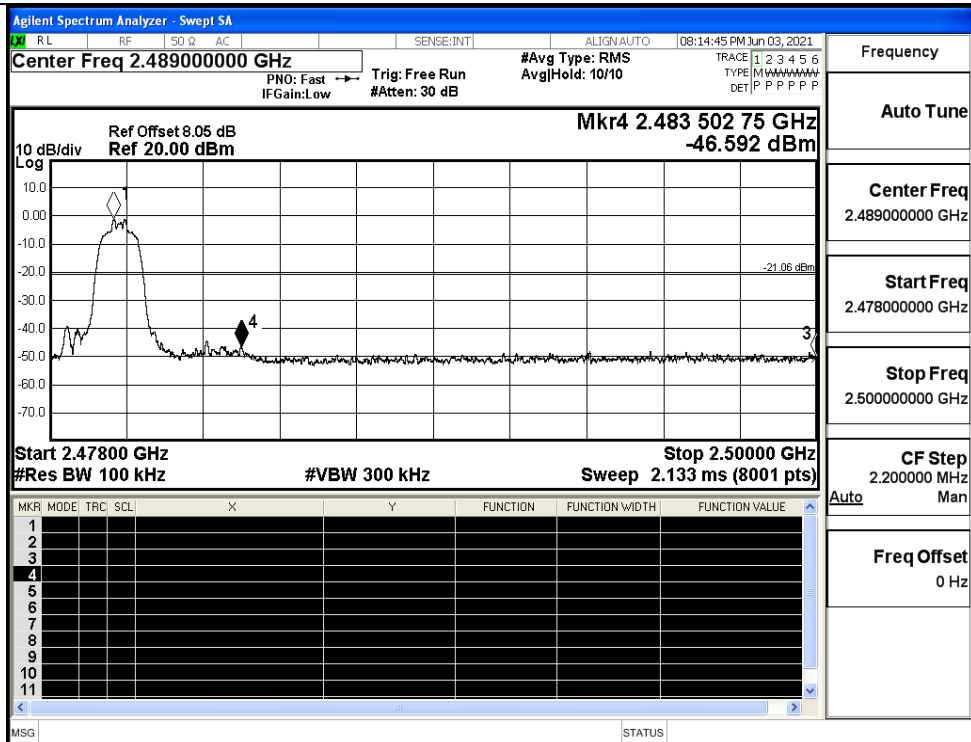
$\pi/4$ DQPSK/LCH/No
Hop



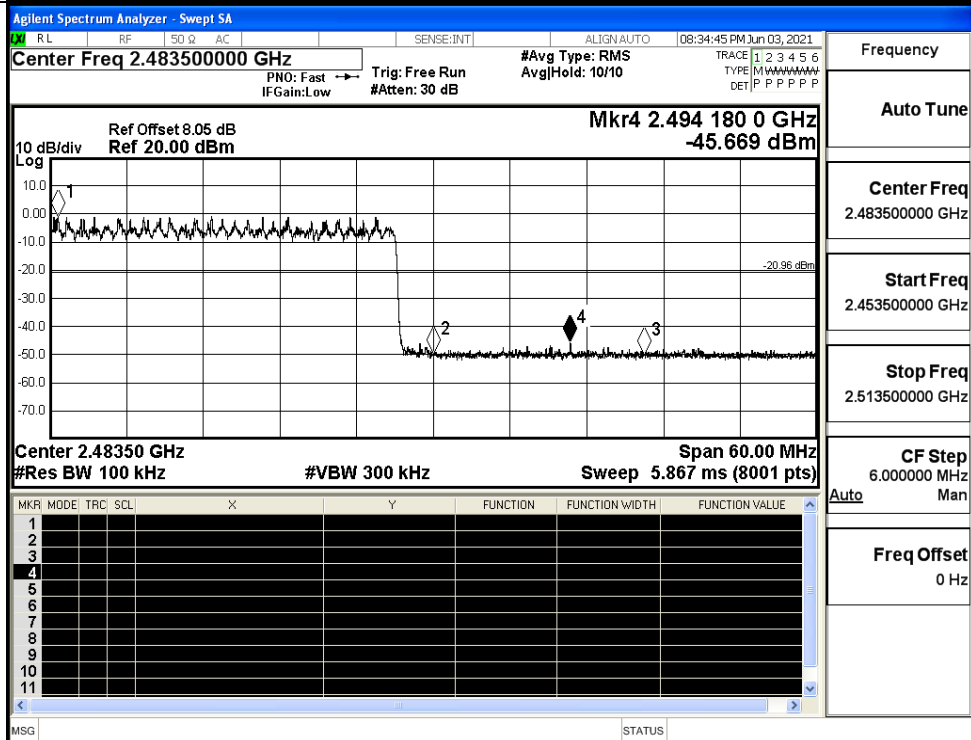
$\pi/4$ DQPSK/LCH/Hop



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



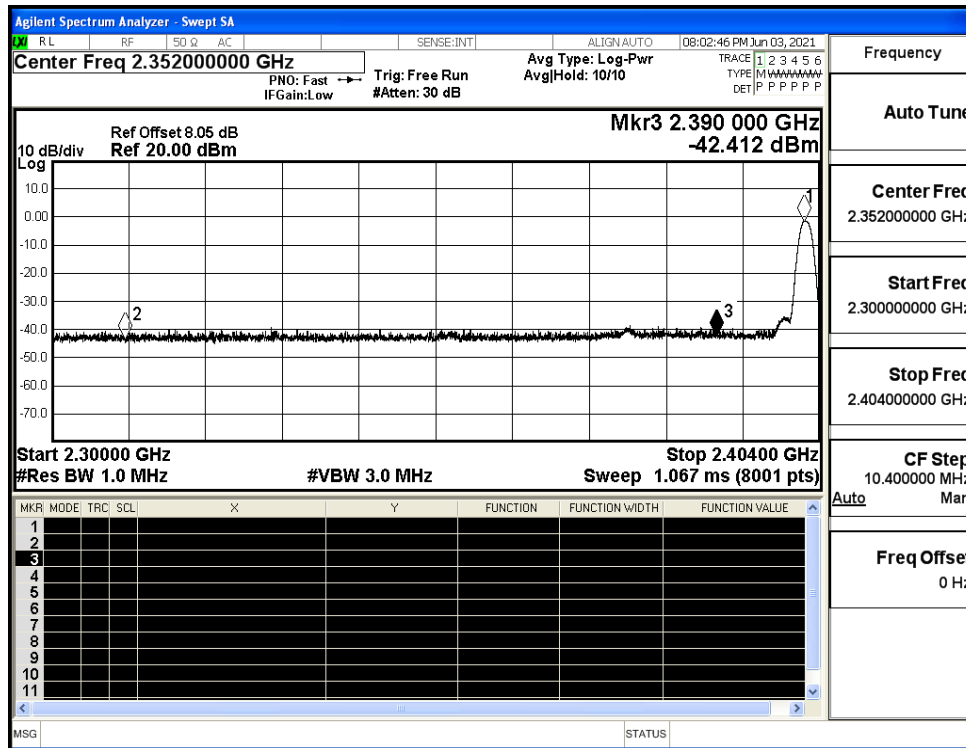
$\pi/4$ DQPSK/HCH/Hop



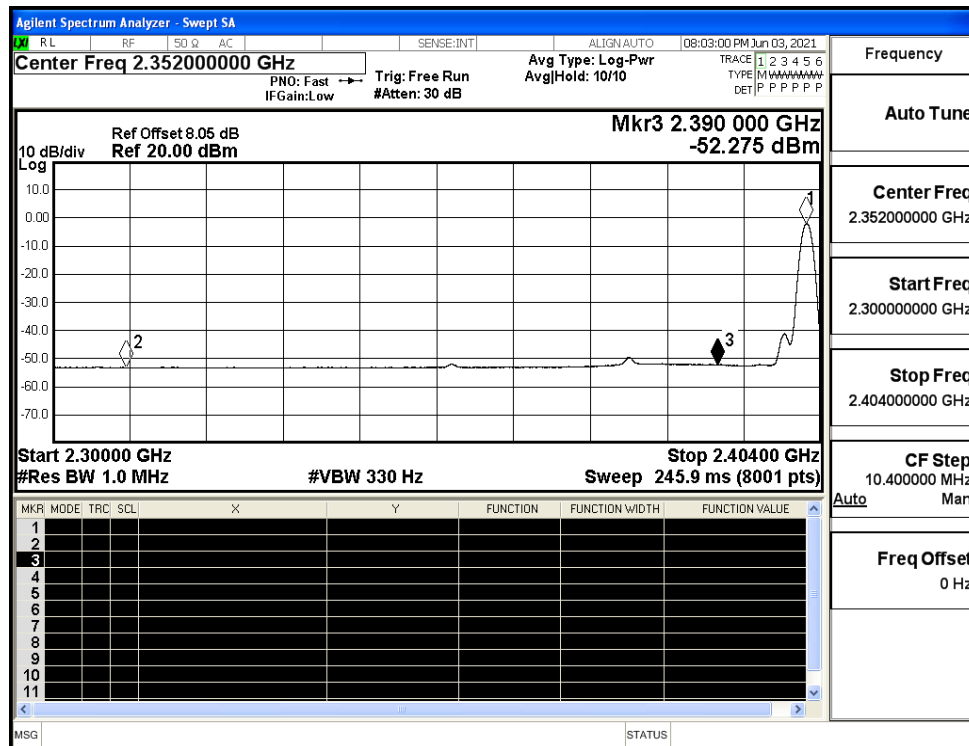
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.51	2.0	0	53.72	PEAK	74	PASS
	Off	2310.0	-53.27	2.0	0	43.96	AV	54	PASS
	Off	2390.0	-42.41	2.0	0	54.82	PEAK	74	PASS
	Off	2390.0	-52.28	2.0	0	44.95	AV	54	PASS
	Off	2483.5	-38.79	2.0	0	58.44	PEAK	74	PASS
	Off	2483.5	-48.09	2.0	0	49.14	AV	54	PASS
	Off	2500.0	-40.77	2.0	0	56.46	PEAK	74	PASS
	Off	2500.0	-51.24	2.0	0	45.99	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.02	2.0	0	54.21	PEAK	74	PASS
	Off	2310.0	-53.20	2.0	0	44.03	AV	54	PASS
	Off	2390.0	-42.13	2.0	0	55.10	PEAK	74	PASS
	Off	2390.0	-52.20	2.0	0	45.03	AV	54	PASS
	Off	2483.5	-39.98	2.0	0	57.25	PEAK	74	PASS
	Off	2483.5	-49.69	2.0	0	47.54	AV	54	PASS
	Off	2500.0	-40.93	2.0	0	56.30	PEAK	74	PASS
	Off	2500.0	-51.18	2.0	0	46.05	AV	54	PASS

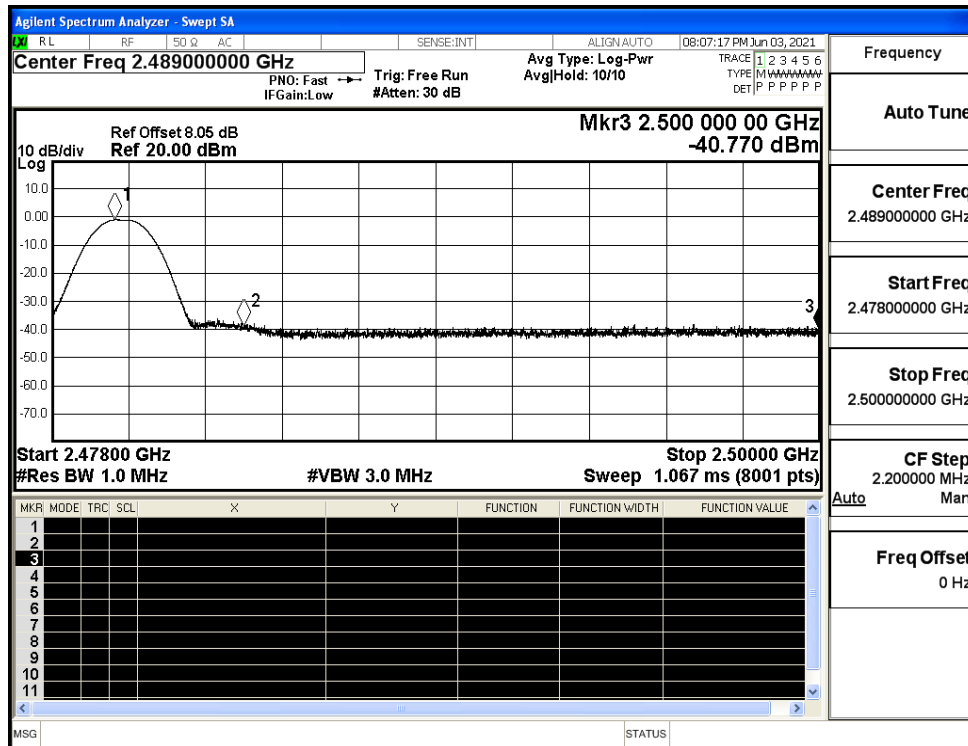
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



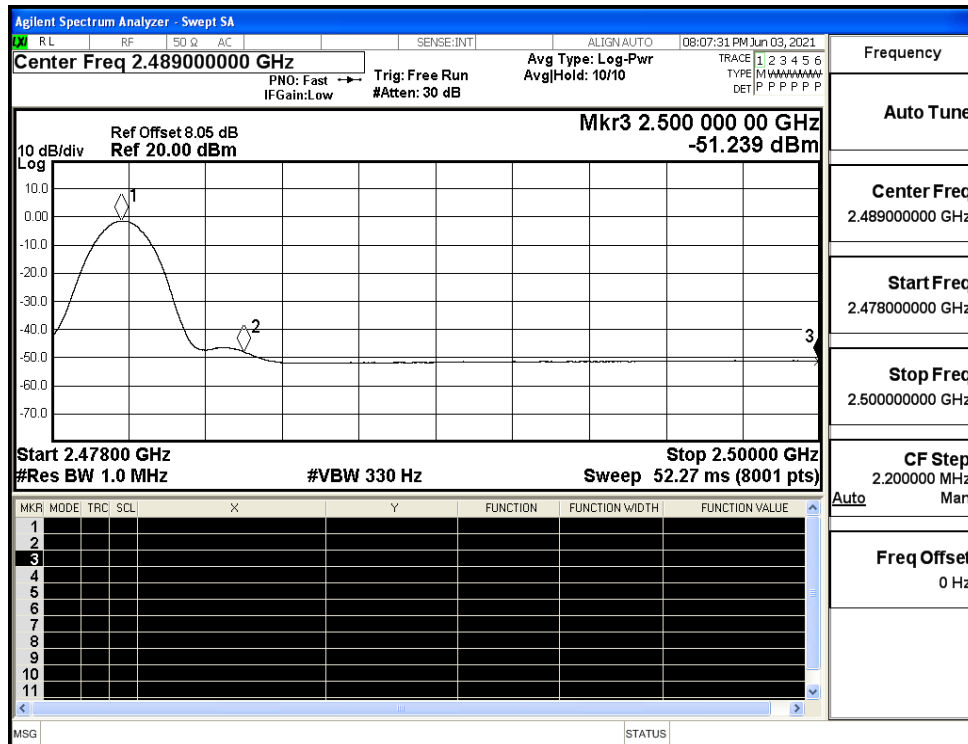
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

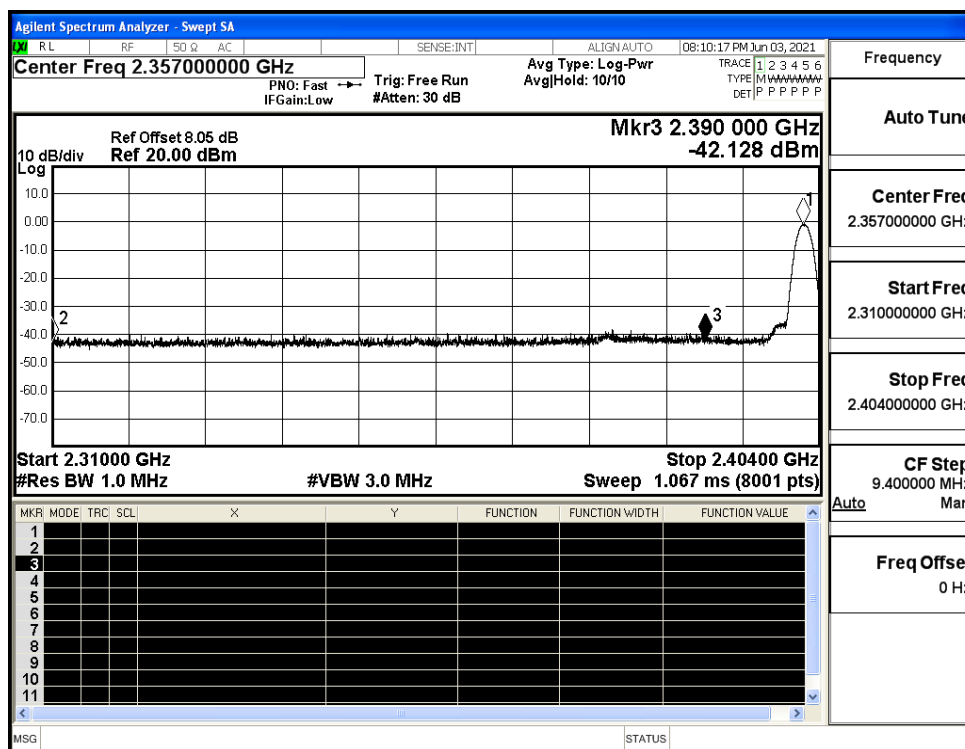
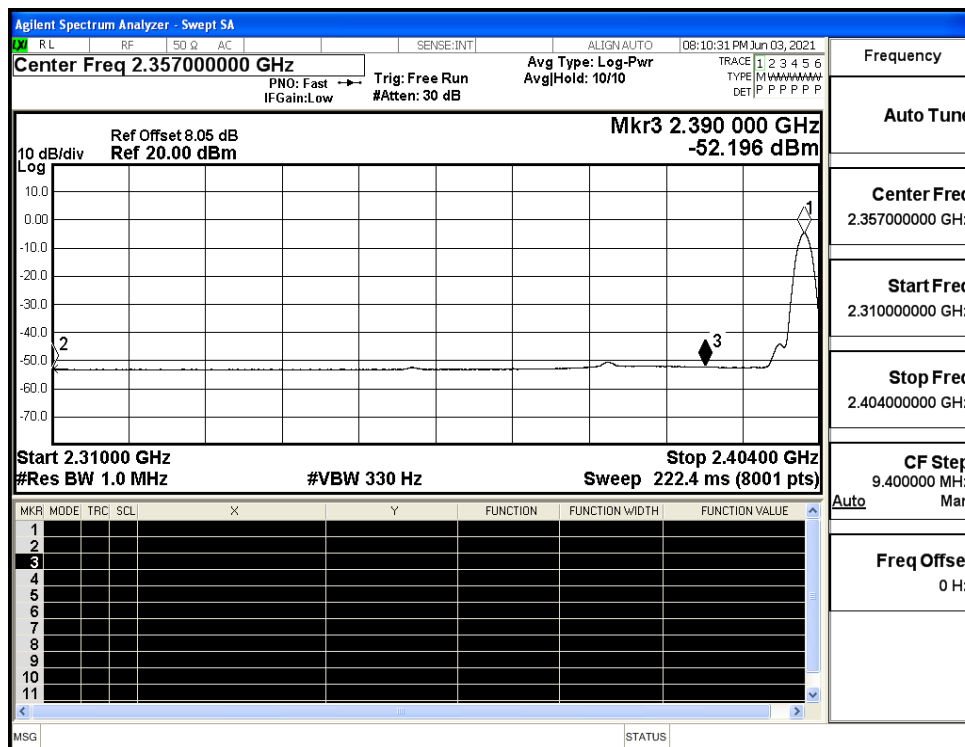


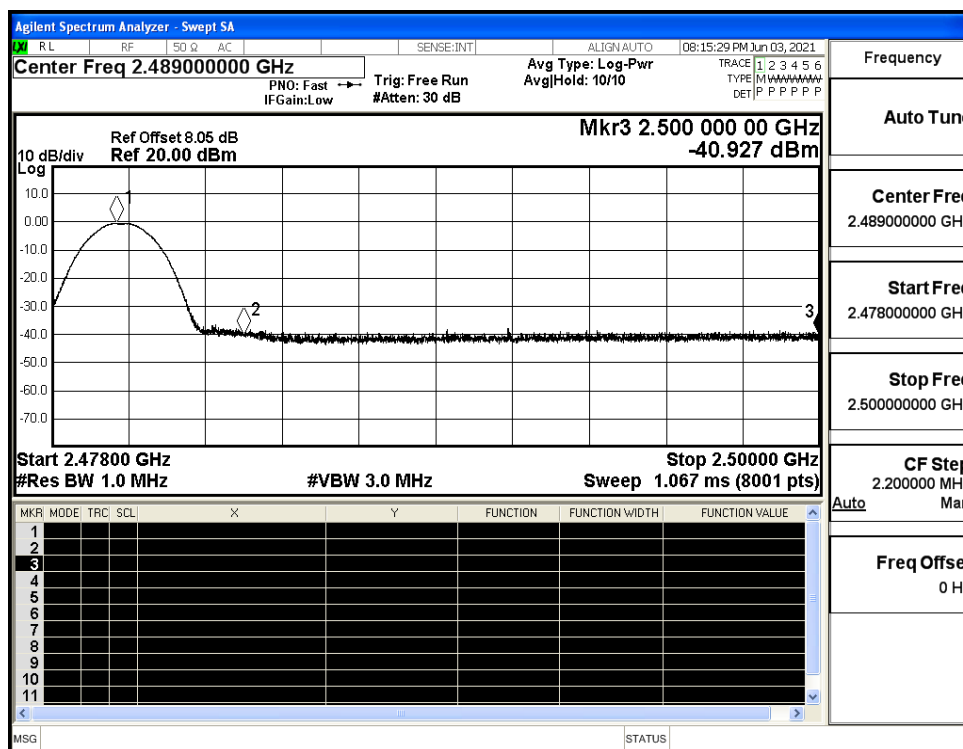
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



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)