

Appendix A

RF Test Data for BT V4.0(BDR/EDR) (Conducted Measurement)

Product Name: HyTabPlus

Trade Mark: HYUNDAI

Test Model: HT10LB3MBKLTM

Environmental Conditions

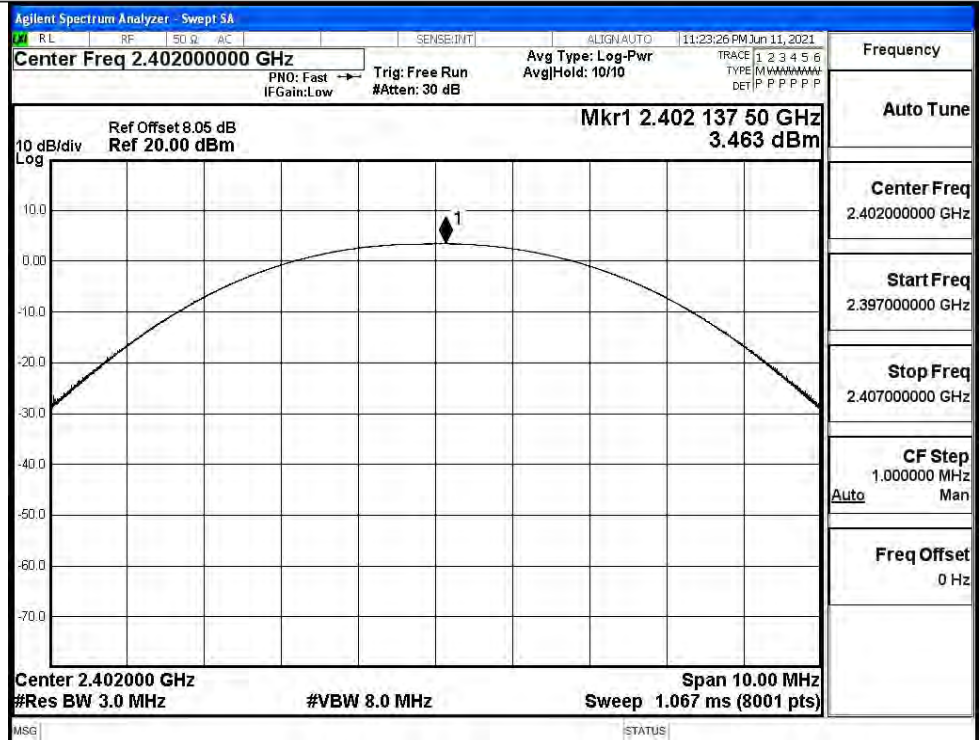
Temperature:	21.6° C
Relative Humidity:	52.7%
ATM Pressure:	100.0 kPa
Test Engineer:	Ken He
Supervised by:	Li Huan

A.1 Maximum Conducted Peak Output Power

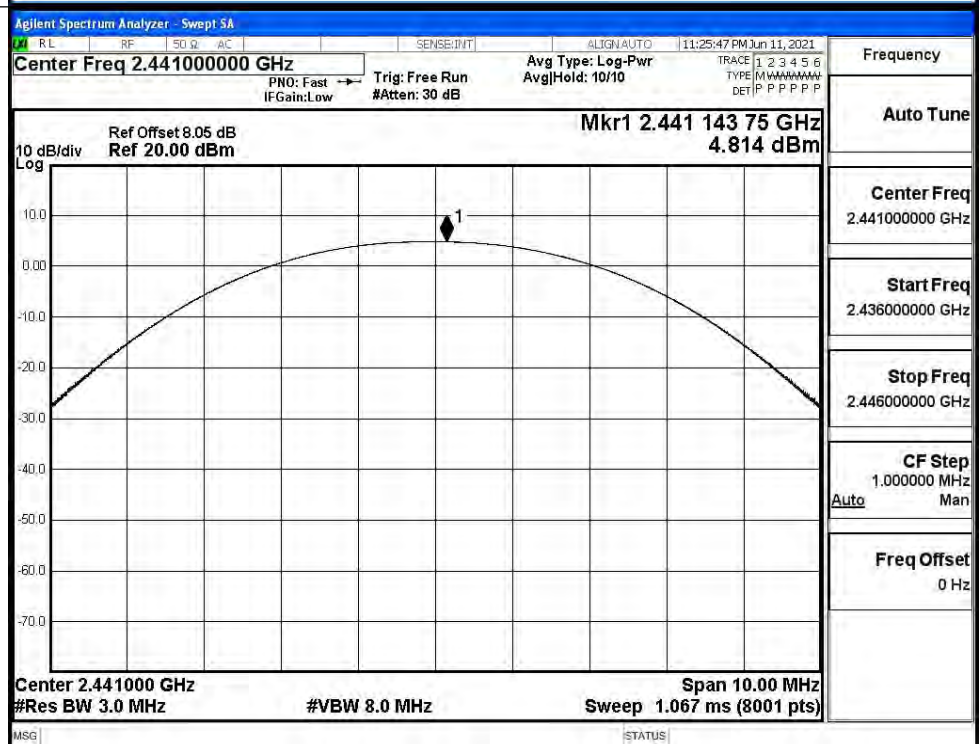
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.463	21	PASS
	MCH	4.814	21	PASS
	HCH	3.213	21	PASS
$\pi/4$ DQPSK	LCH	2.707	21	PASS
	MCH	4.040	21	PASS
	HCH	2.464	21	PASS
8DPSK	LCH	2.777	21	PASS
	MCH	4.160	21	PASS
	HCH	2.628	21	PASS

Test Graphs

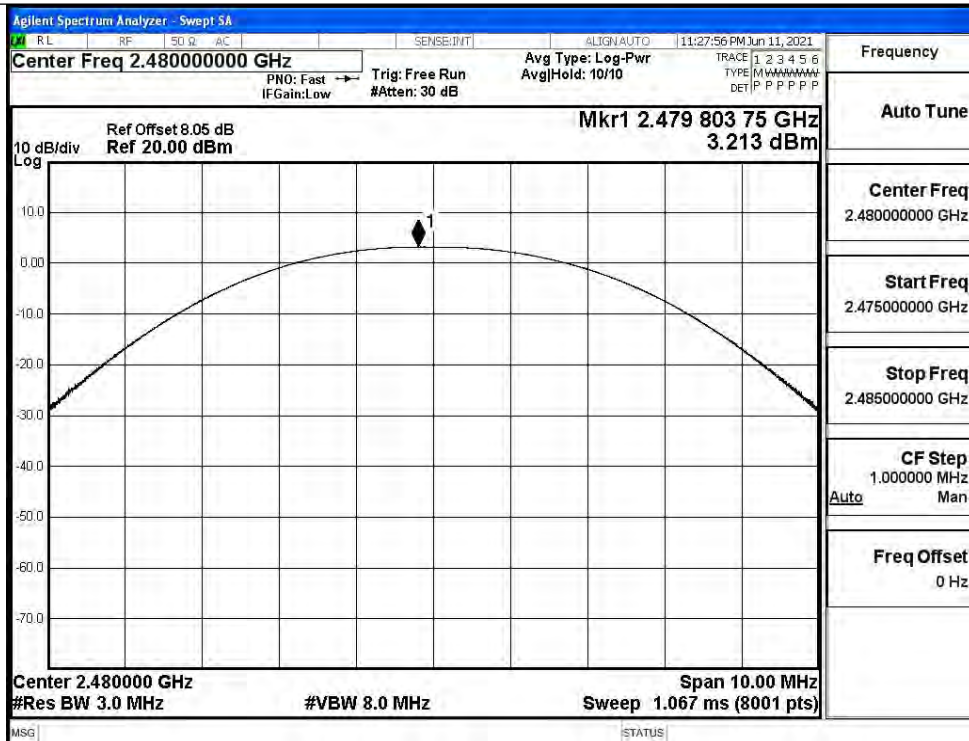
GFSK/LCH



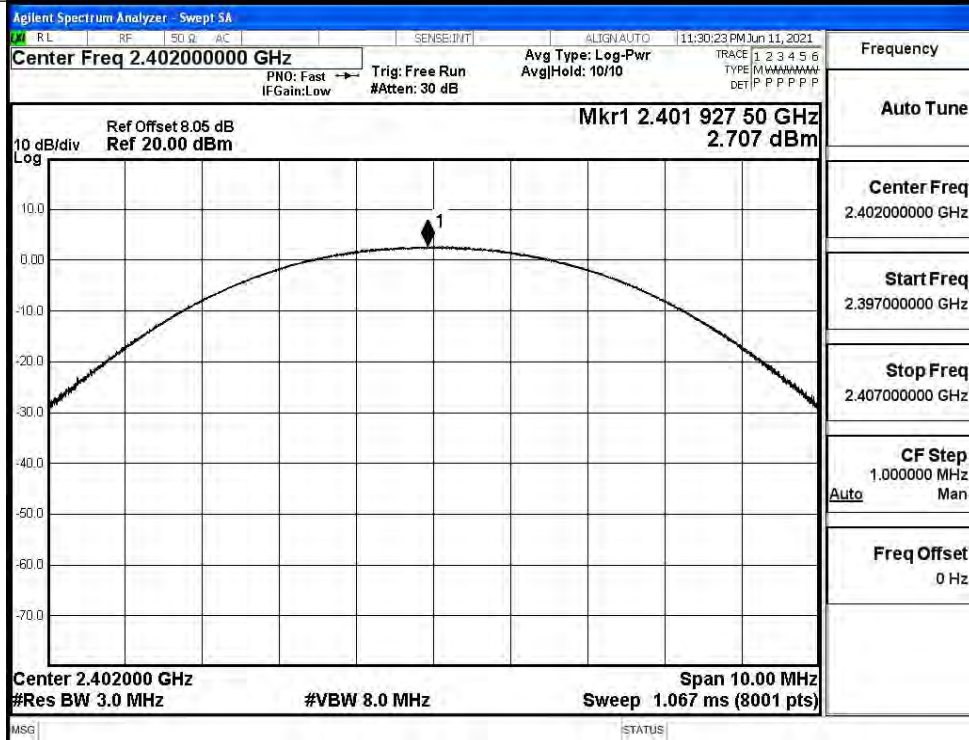
GFSK/MCH

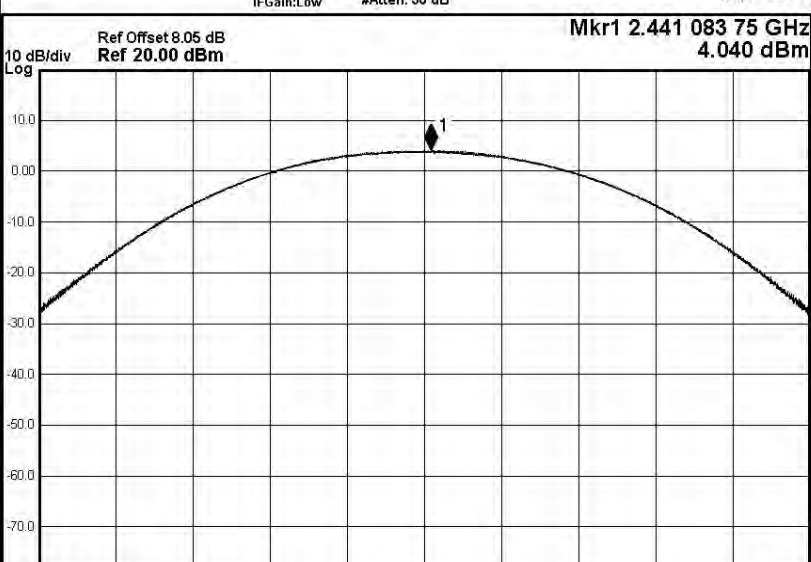
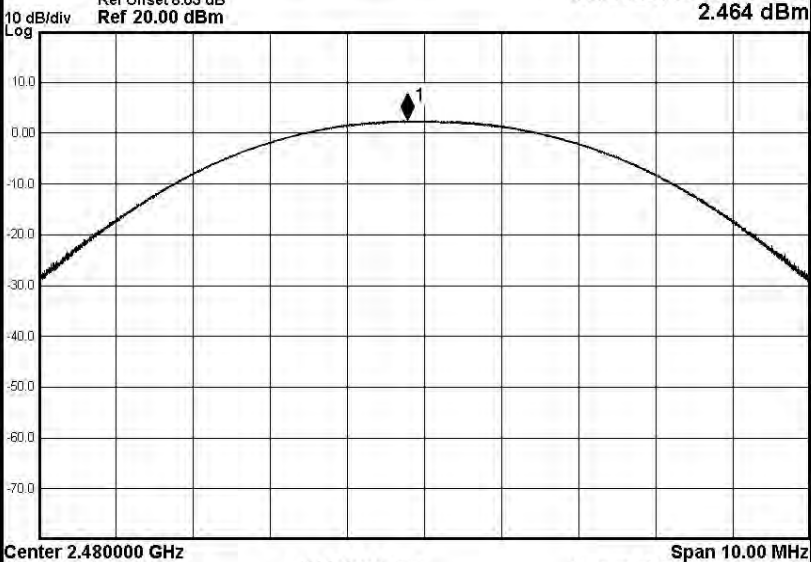


GFSK/HCH

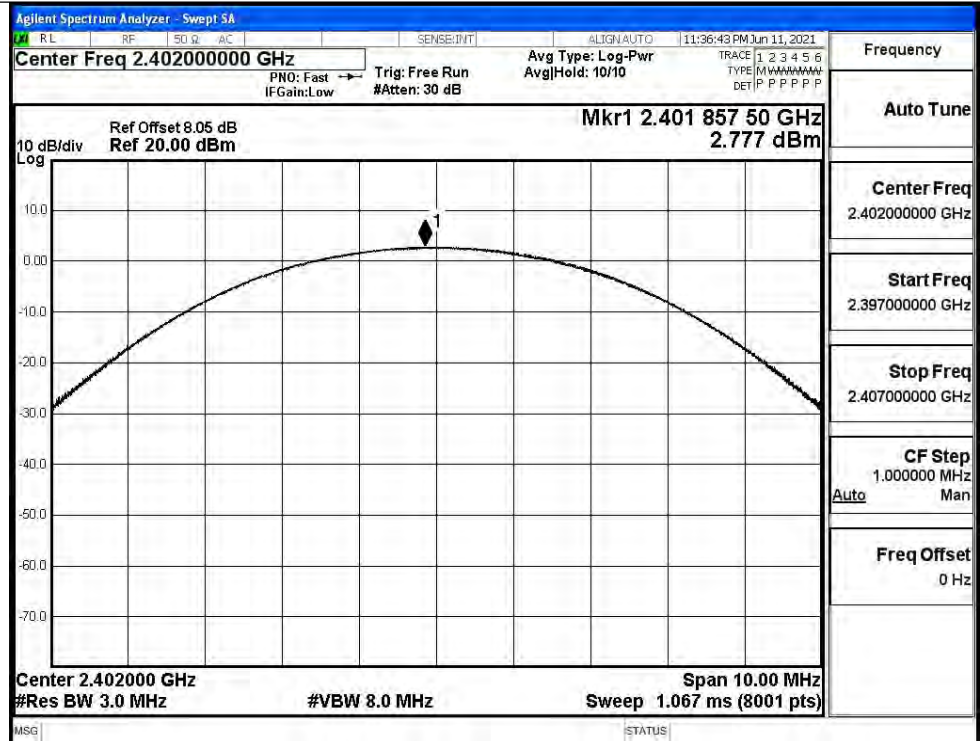


$\pi/4$ DQPSK/LCH

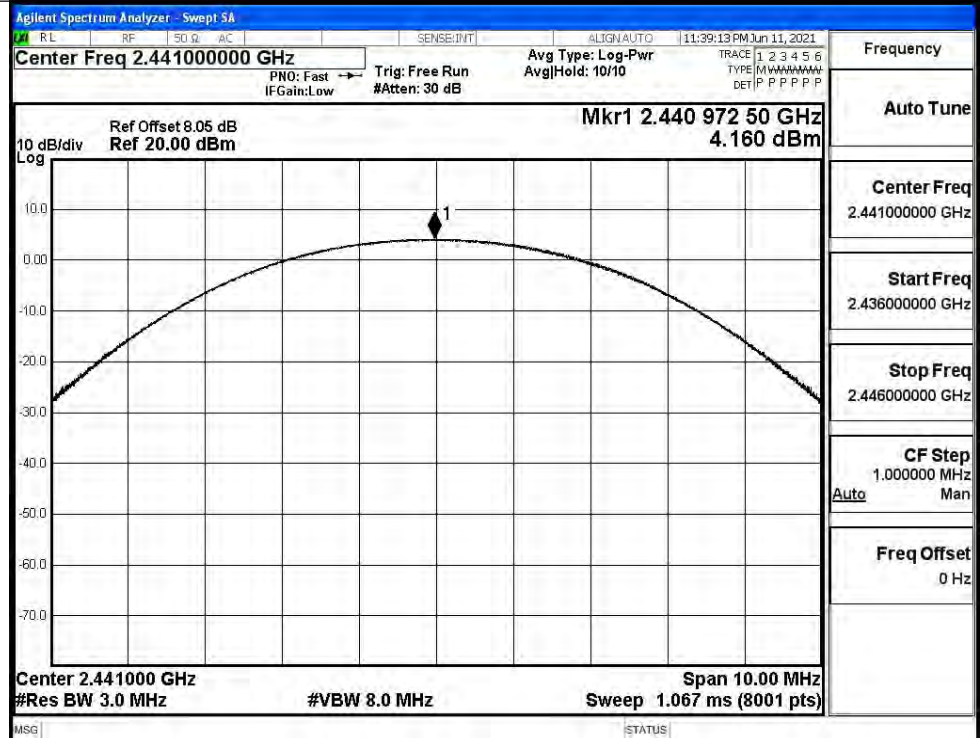


$\pi/4$DQPSK/MCH	Agilent Spectrum Analyzer - Swept SA RL RF 50 Q AC SENSE:INT ALIGN:Auto 11:32:42 PM Jun 11, 2021 Center Freq 2.441000000 GHz PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 10/10 Mkr1 2.441 083 75 GHz 10 dB/div Ref Offset 8.05 dB Ref 20.00 dBm Log  Center 2.441000 GHz #Res BW 3.0 MHz #VBW 8.0 MHz Span 10.00 MHz Sweep 1.067 ms (8001 pts) MSG STATUS Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.436000000 GHz Stop Freq 2.446000000 GHz CF Step 1.000000 MHz Auto Man Freq Offset 0 Hz
$\pi/4$DQPSK/HCH	Agilent Spectrum Analyzer - Swept SA RL RF 50 Q AC SENSE:INT ALIGN:Auto 11:34:20 PM Jun 11, 2021 Center Freq 2.480000000 GHz PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB Avg Type: Log-Pwr Avg/Hold: 10/10 Mkr1 2.479 778 75 GHz 10 dB/div Ref Offset 8.05 dB Ref 20.00 dBm Log  Center 2.480000 GHz #Res BW 3.0 MHz #VBW 8.0 MHz Span 10.00 MHz Sweep 1.067 ms (8001 pts) MSG STATUS Frequency Auto Tune Center Freq 2.480000000 GHz Start Freq 2.475000000 GHz Stop Freq 2.485000000 GHz CF Step 1.000000 MHz Auto Man Freq Offset 0 Hz

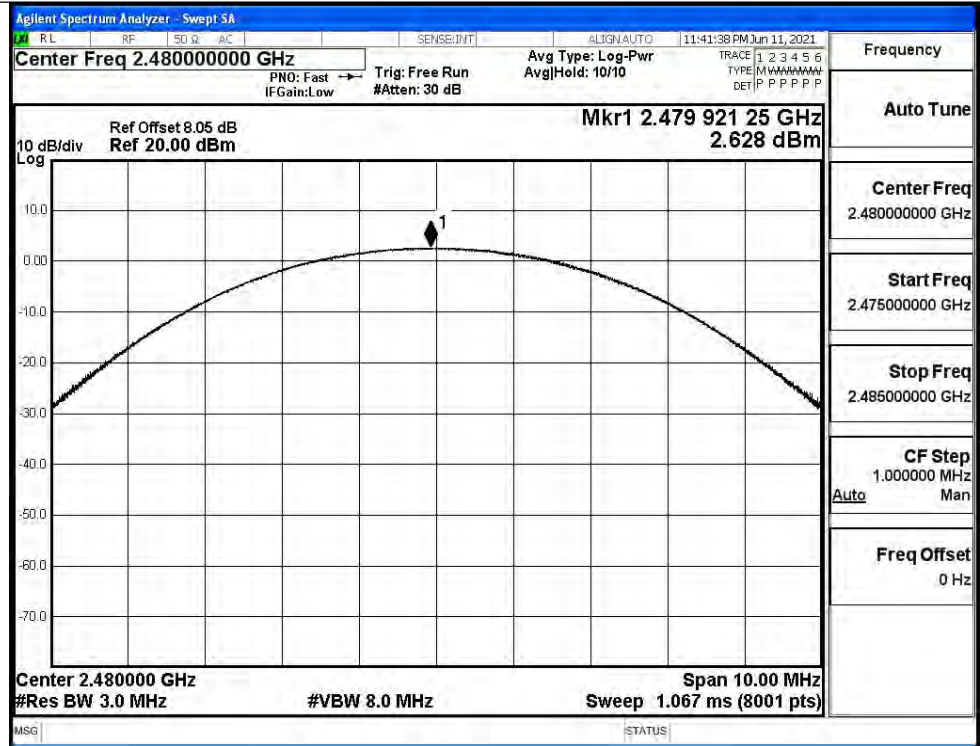
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

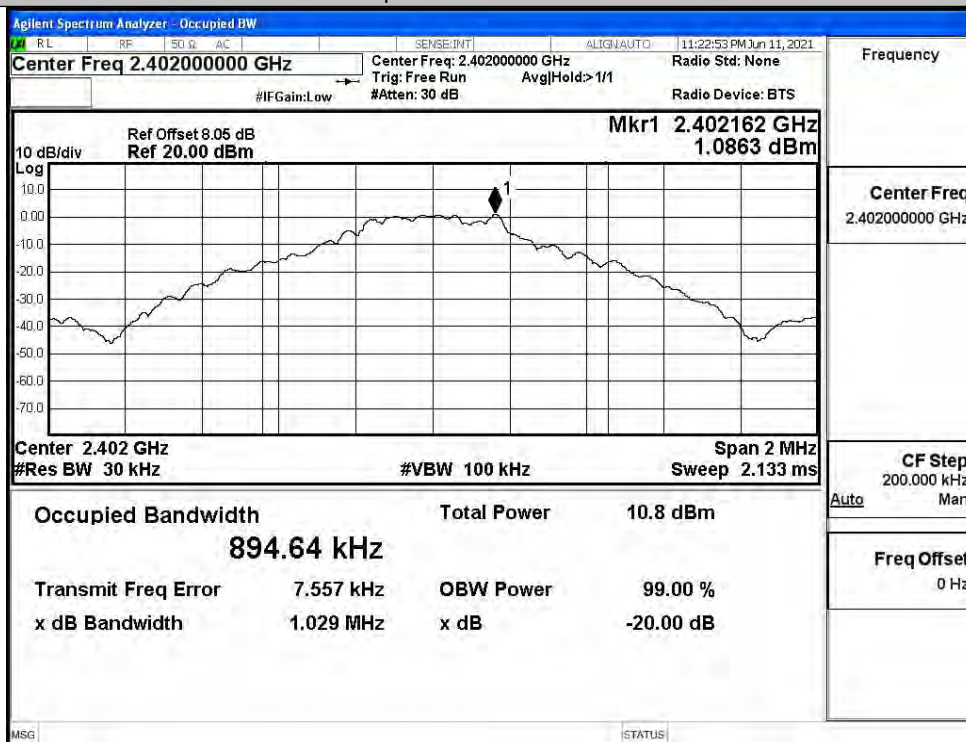


A.2 20dB Bandwidth

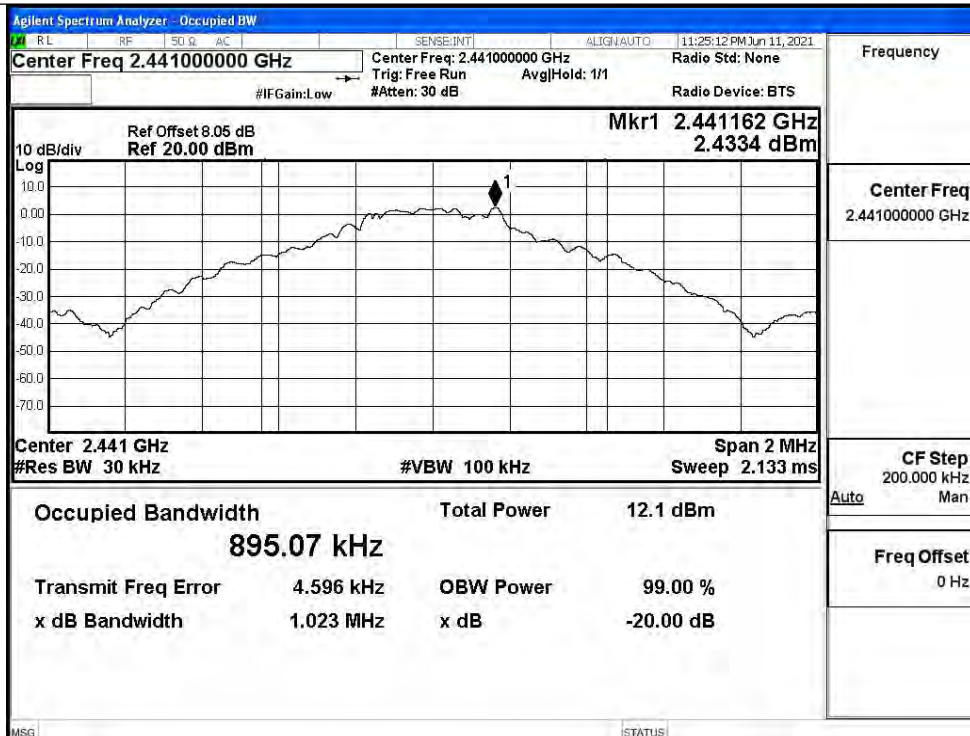
Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.029	Not Specified	PASS
	MCH	1.023	Not Specified	PASS
	HCH	1.038	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.287	Not Specified	PASS
	MCH	1.289	Not Specified	PASS
	HCH	1.288	Not Specified	PASS
8DPSK	LCH	1.292	Not Specified	PASS
	MCH	1.297	Not Specified	PASS
	HCH	1.293	Not Specified	PASS

Test Graphs

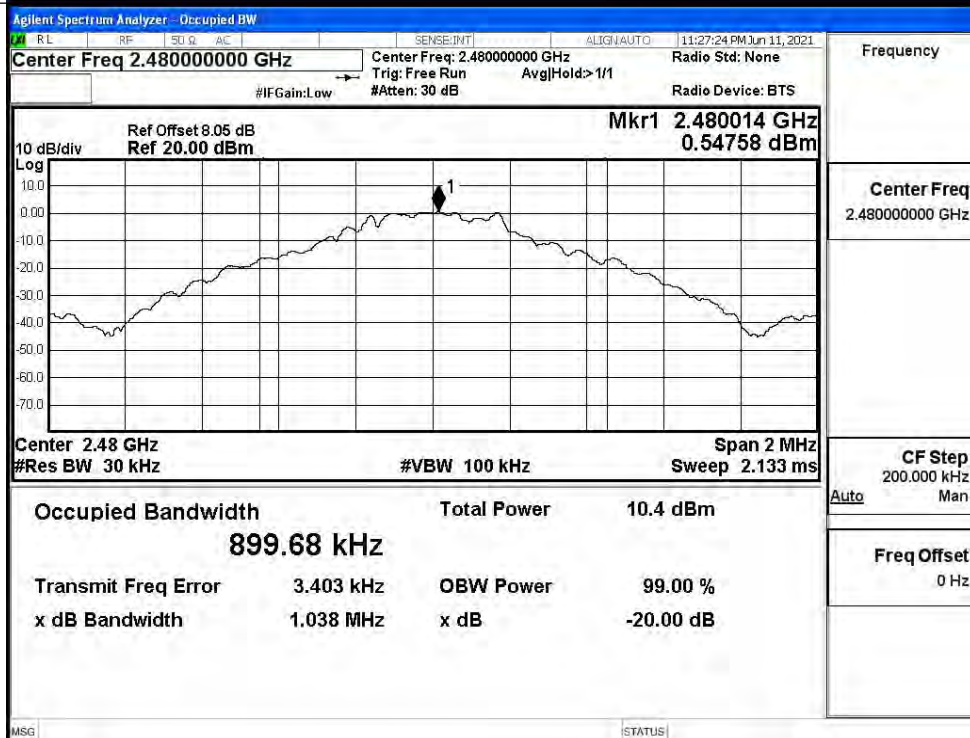
GFSK/LCH



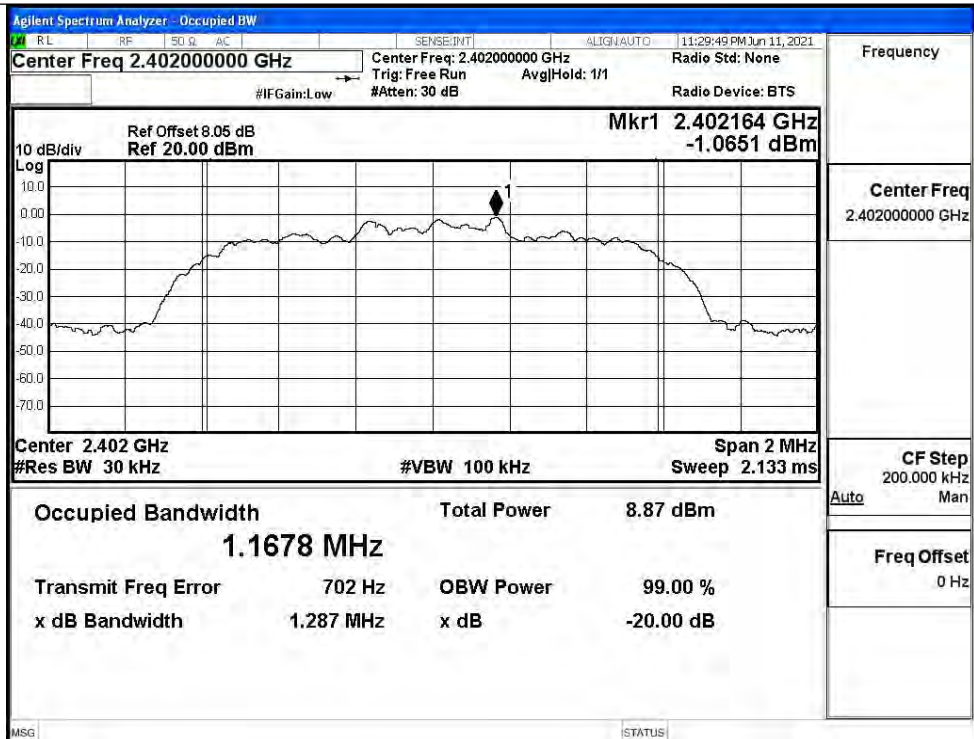
GFSK/MCH



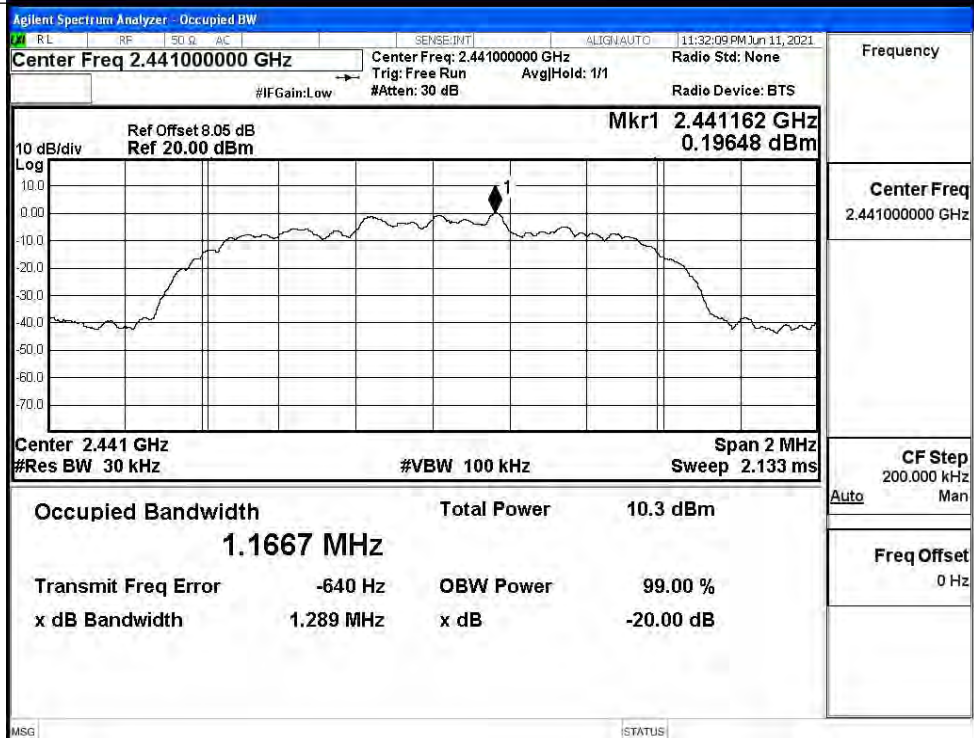
GFSK/HCH

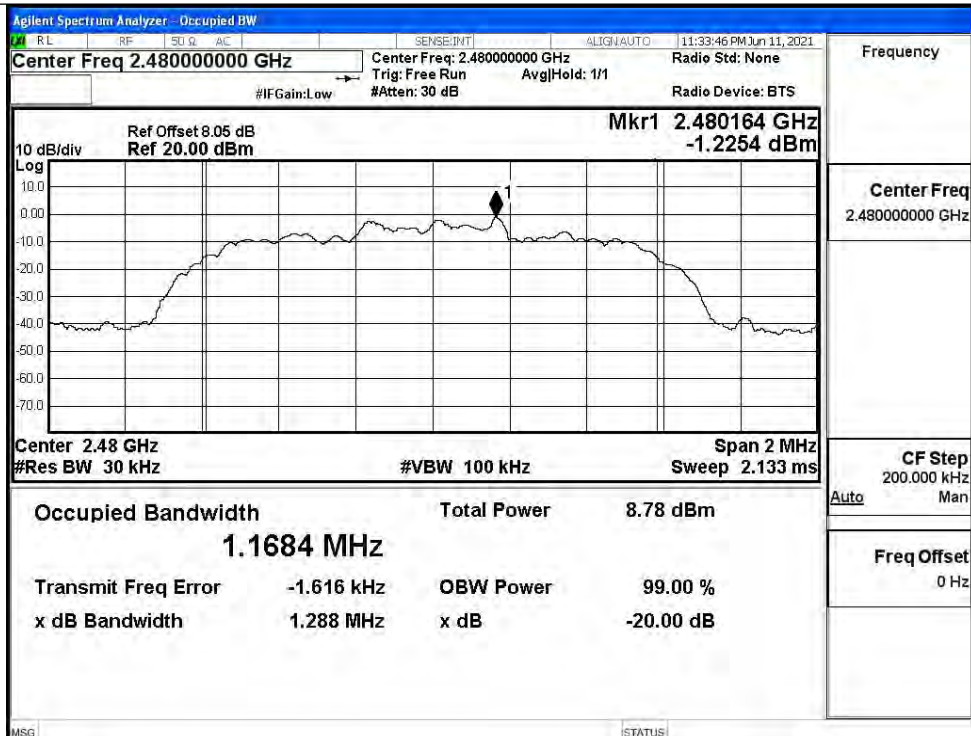


$\pi/4$ DQPSK/LCH

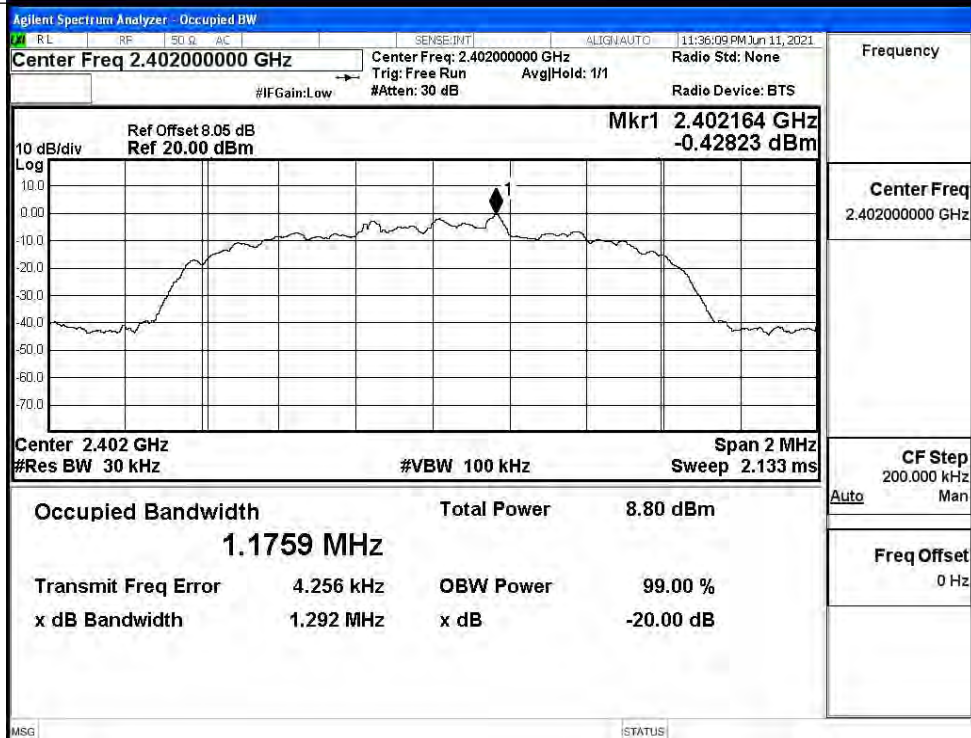


$\pi/4$ DQPSK/MCH

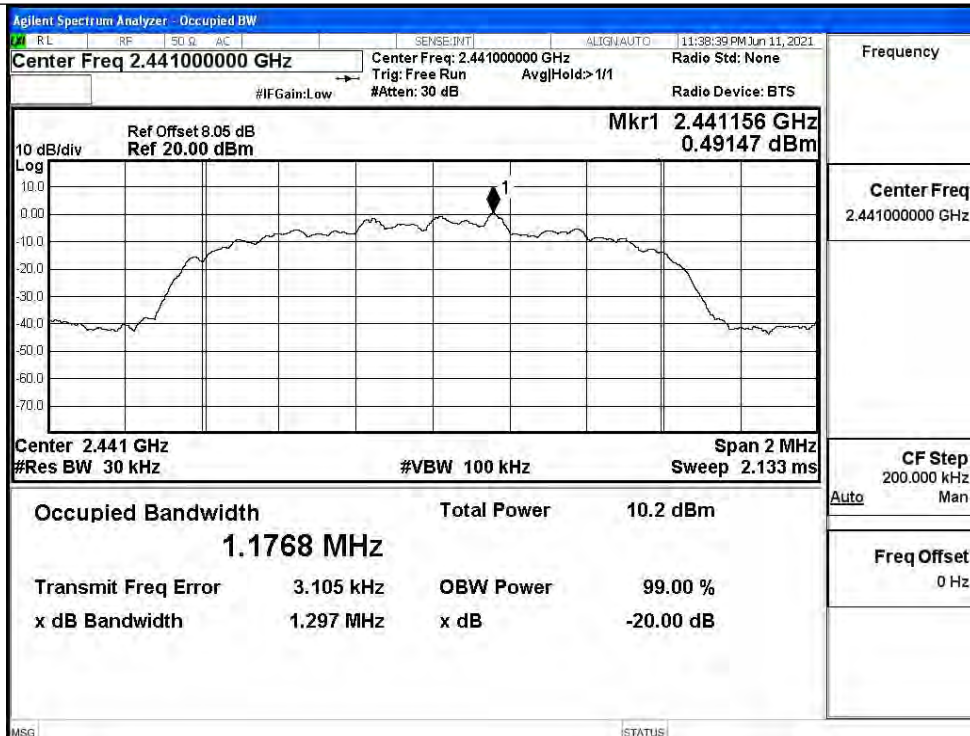


$\pi/4$ DQPSK/HCH

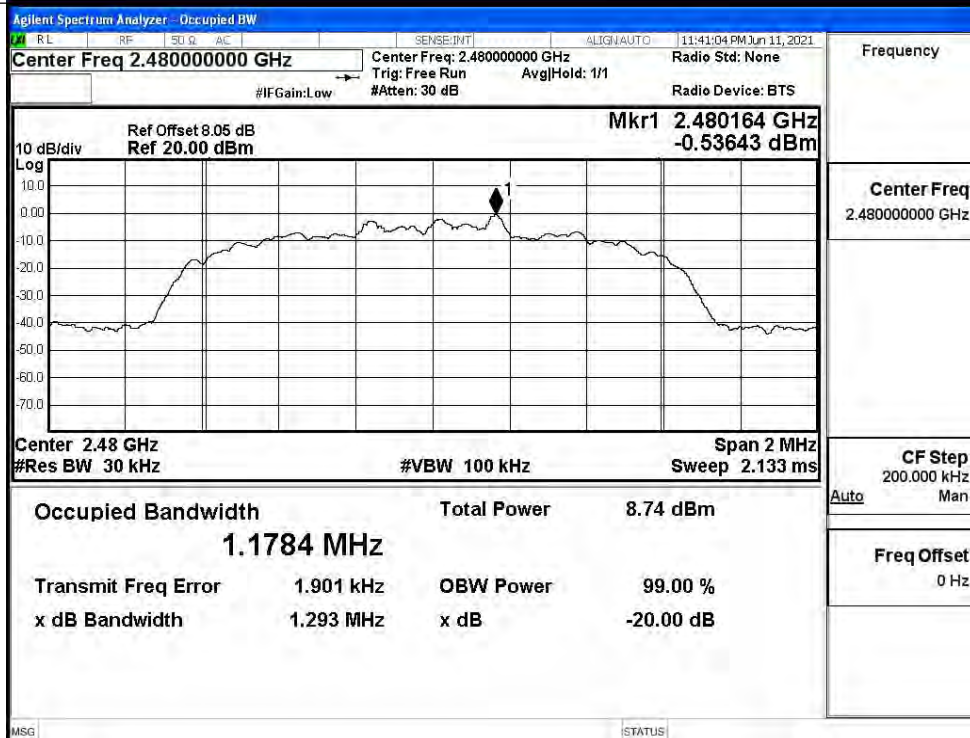
8DPSK/LCH



8DPSK/MCH



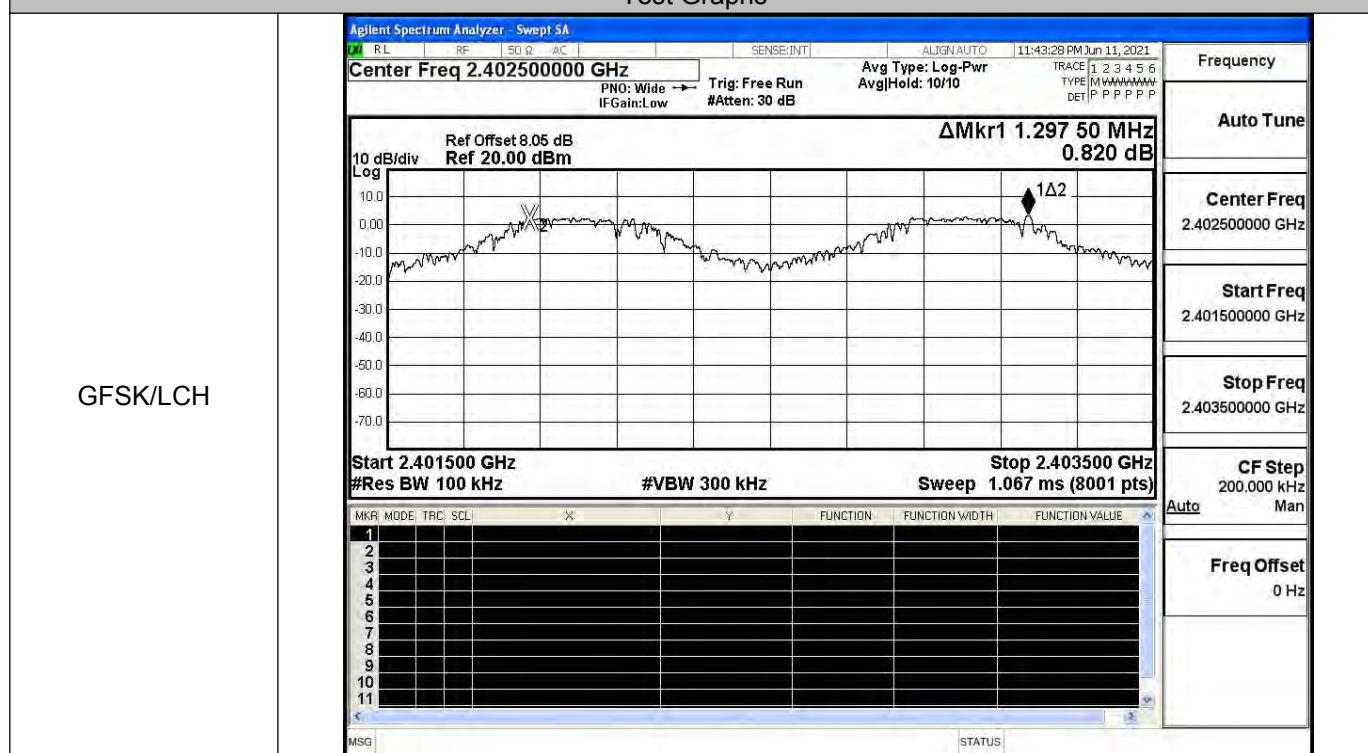
8DPSK/HCH



A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.298	0.686	PASS
	MCH	0.962	0.682	PASS
	HCH	1.020	0.692	PASS
$\pi/4$ DQPSK	LCH	1.028	0.858	PASS
	MCH	0.870	0.859	PASS
	HCH	0.886	0.859	PASS
8DPSK	LCH	0.874	0.861	PASS
	MCH	0.912	0.865	PASS
	HCH	1.130	0.862	PASS

Test Graphs



GFSK/MCH

GFSK/HCH

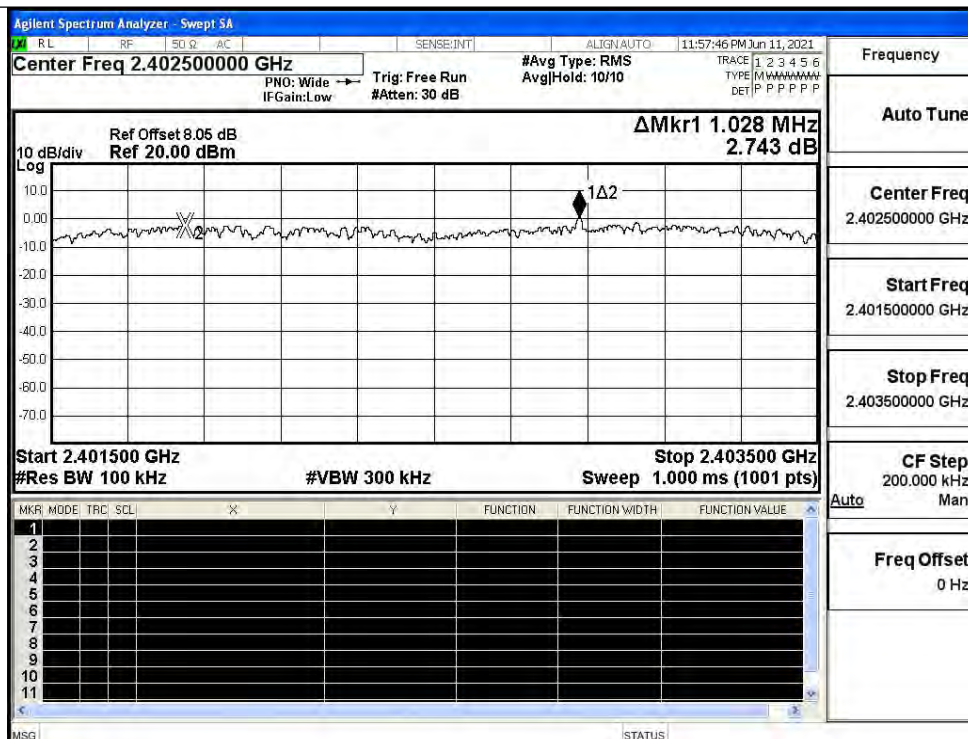
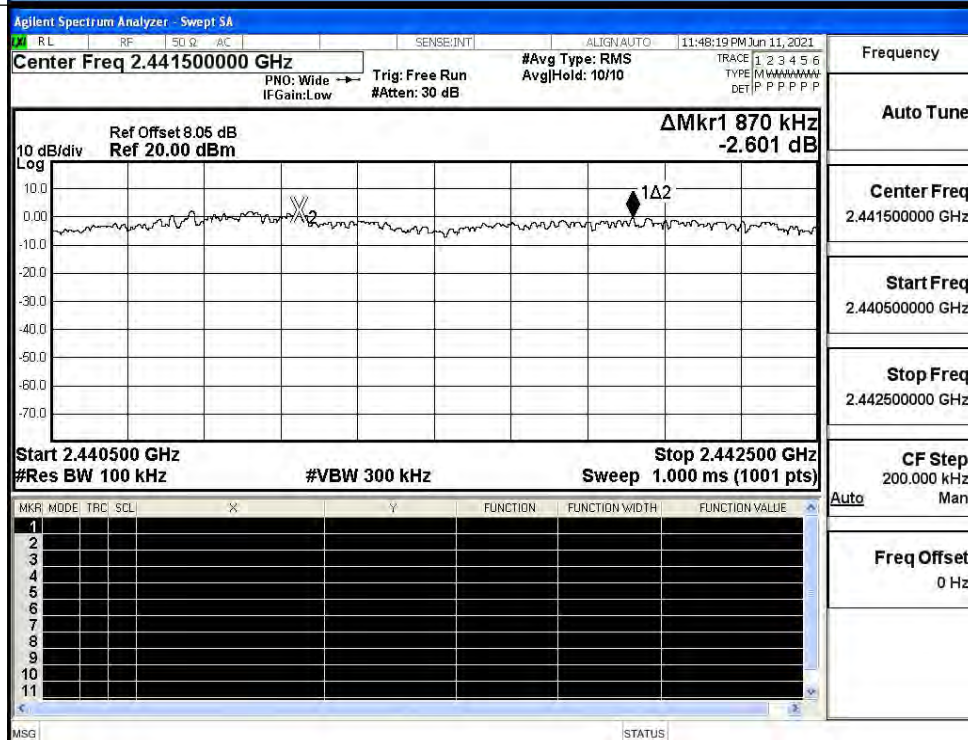
The figure displays two screenshots of an Agilent Spectrum Analyzer, showing the results of a GFSK signal analysis. Both screenshots are taken from the 'Swept SA' (Spectrum Analyzer) mode.

Top Screenshot (GFSK/MCH):

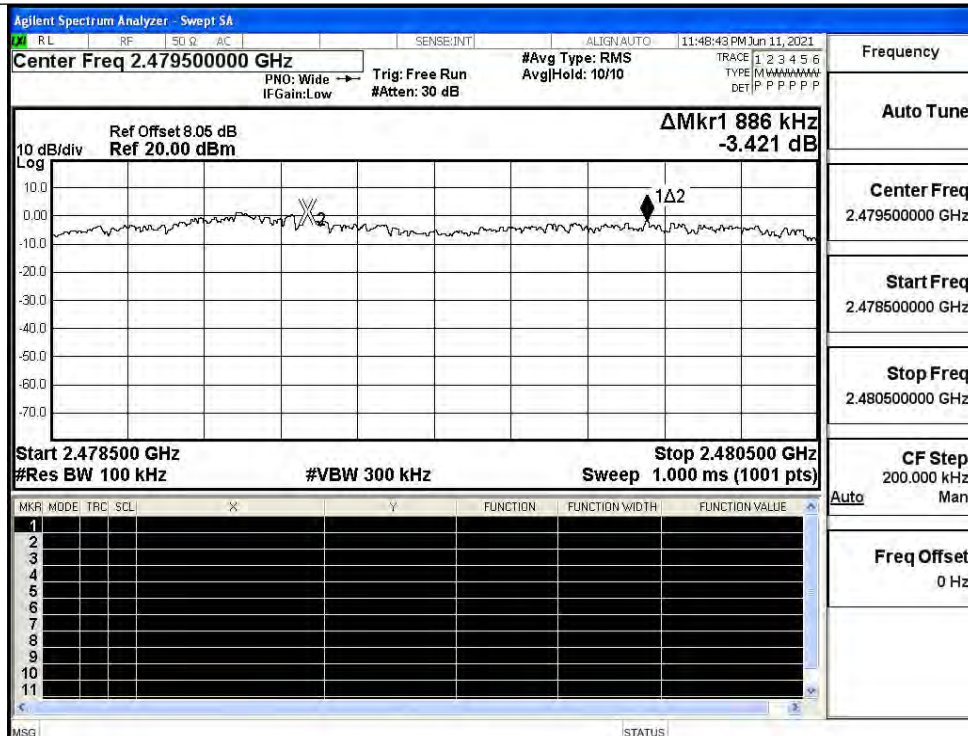
- Center Freq:** 2.441500000 GHz
- Ref Offset:** 8.05 dB
- Ref:** 20.00 dBm
- ΔMkr1:** 962 kHz
- Peak Level:** -0.152 dB
- Start:** 2.440500 GHz
- Stop:** 2.442500 GHz
- #Res BW:** 100 kHz
- #VBW:** 300 kHz
- Sweep:** 1.000 ms (1001 pts)

Bottom Screenshot (GFSK/HCH):

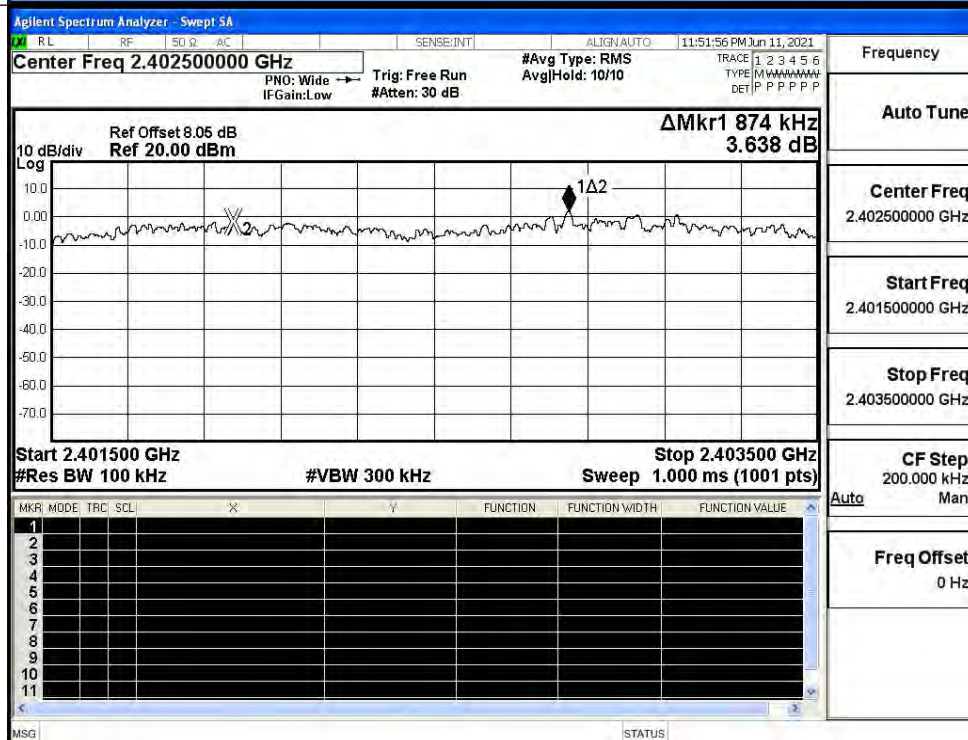
- Center Freq:** 2.479500000 GHz
- Ref Offset:** 8.05 dB
- Ref:** 20.00 dBm
- ΔMkr1:** 1.020 MHz
- Peak Level:** -0.146 dB
- Start:** 2.478500 GHz
- Stop:** 2.480500 GHz
- #Res BW:** 100 kHz
- #VBW:** 300 kHz
- Sweep:** 1.000 ms (1001 pts)

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

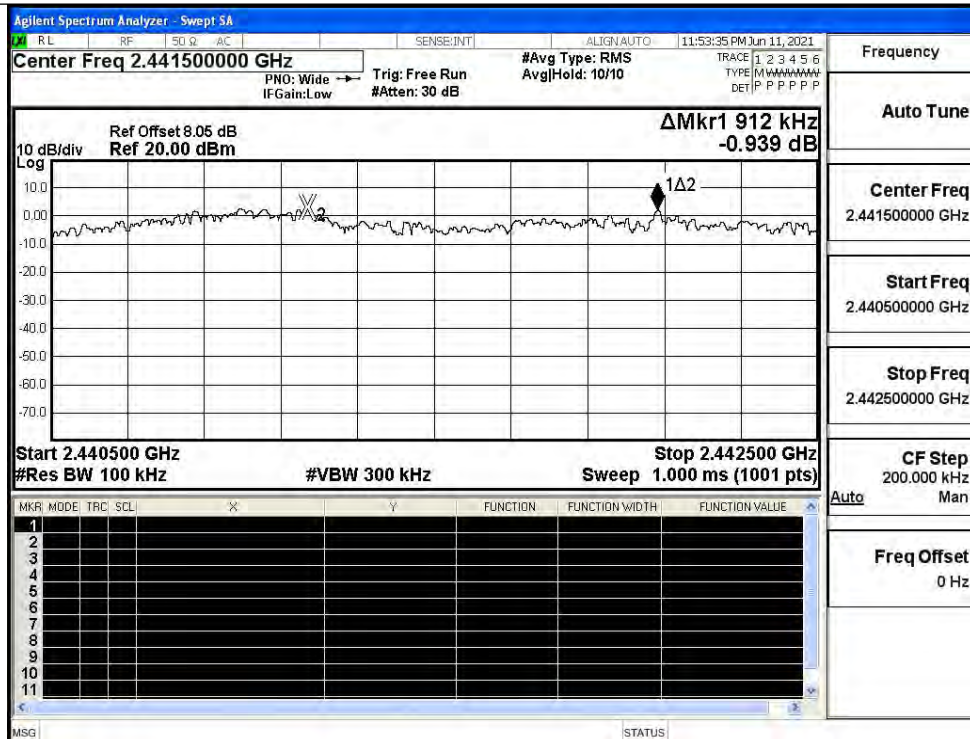
$\pi/4$ DQPSK/HCH



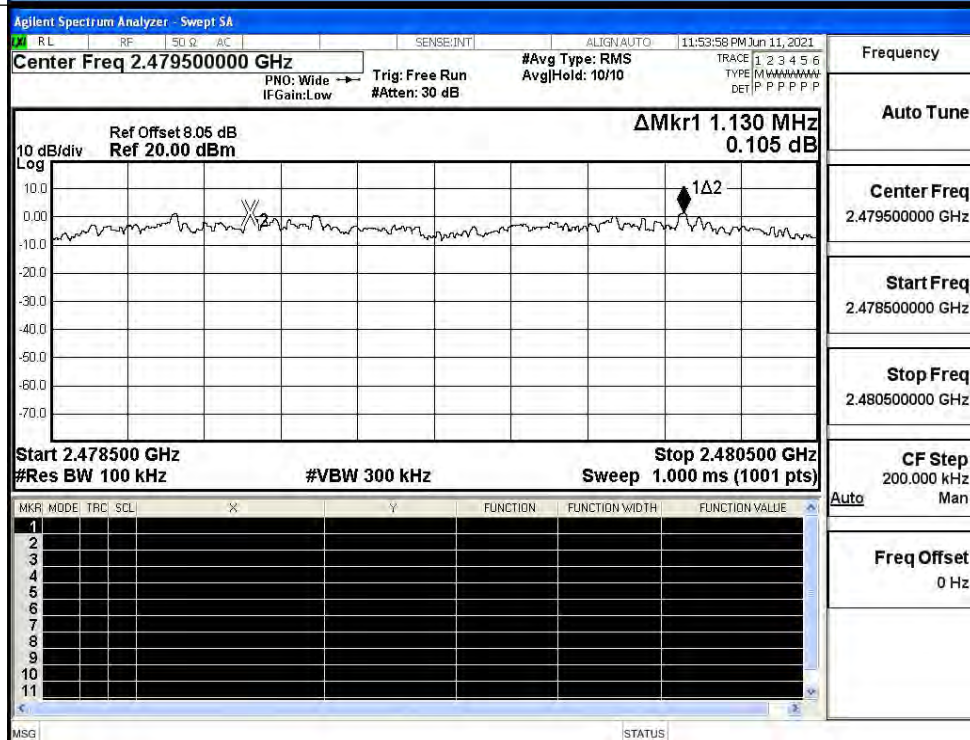
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

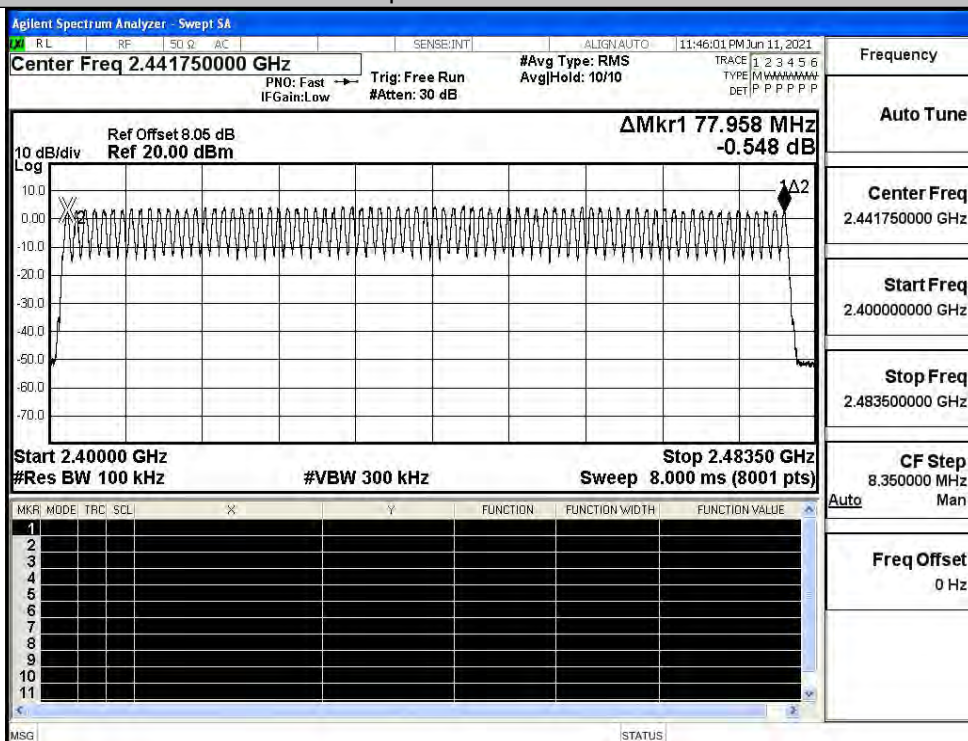
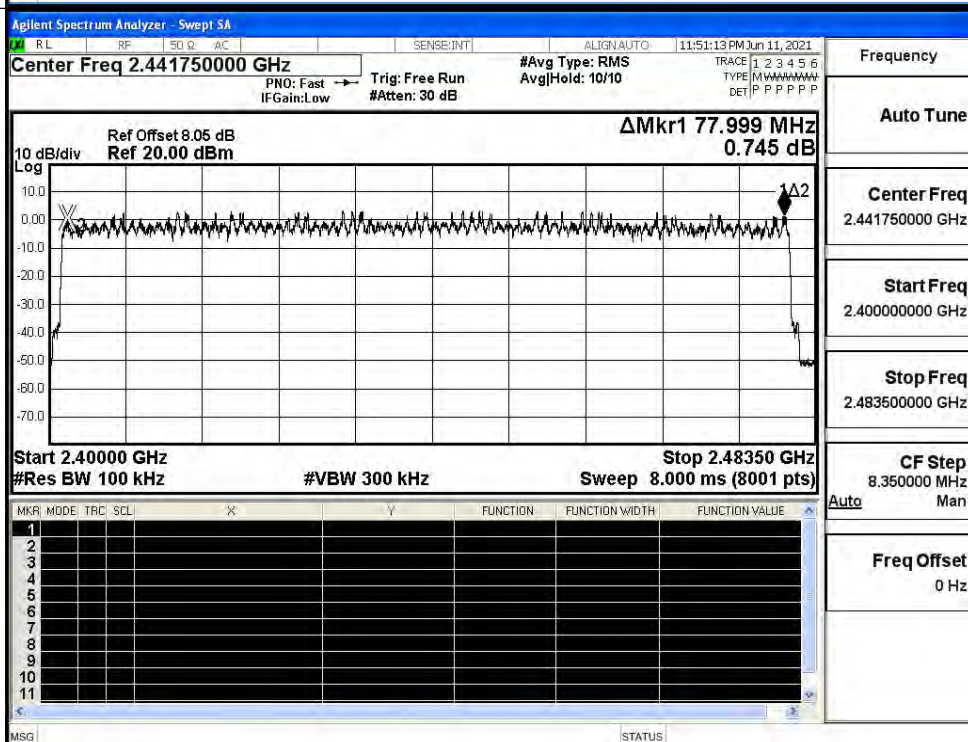


A.4 Hopping Channel Number

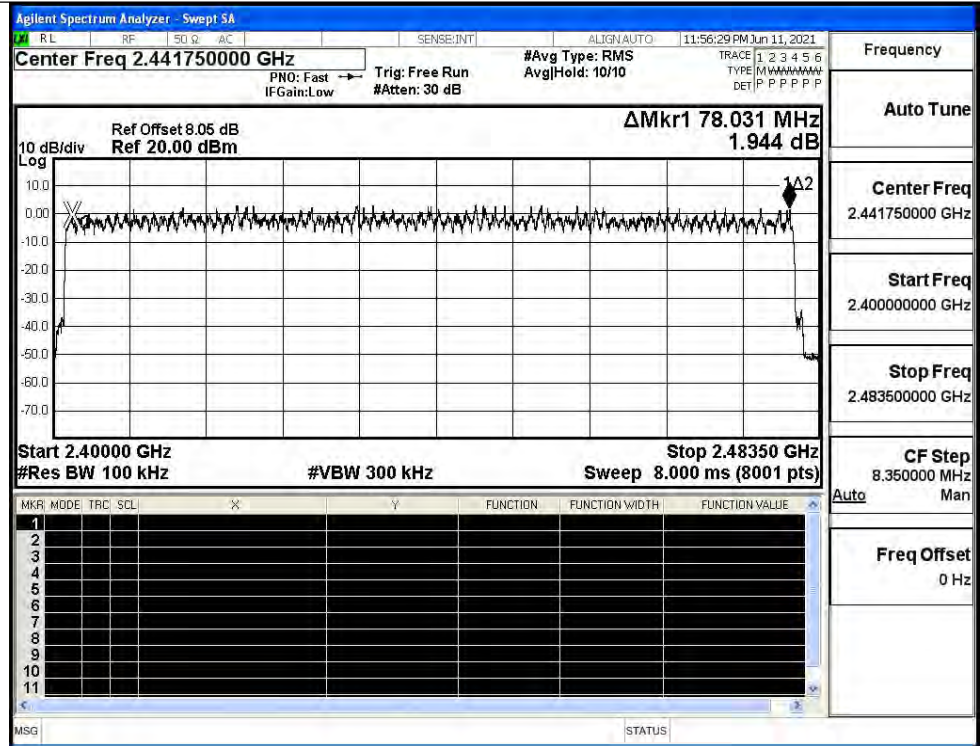
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	≥ 15	PASS
$\pi/4$ DQPSK	Hop	79	≥ 15	PASS
8DPSK	Hop	79	≥ 15	PASS

Test Graphs

GFSK/Hop

 $\pi/4$ DQPSK/Hop

8DPSK/Hop

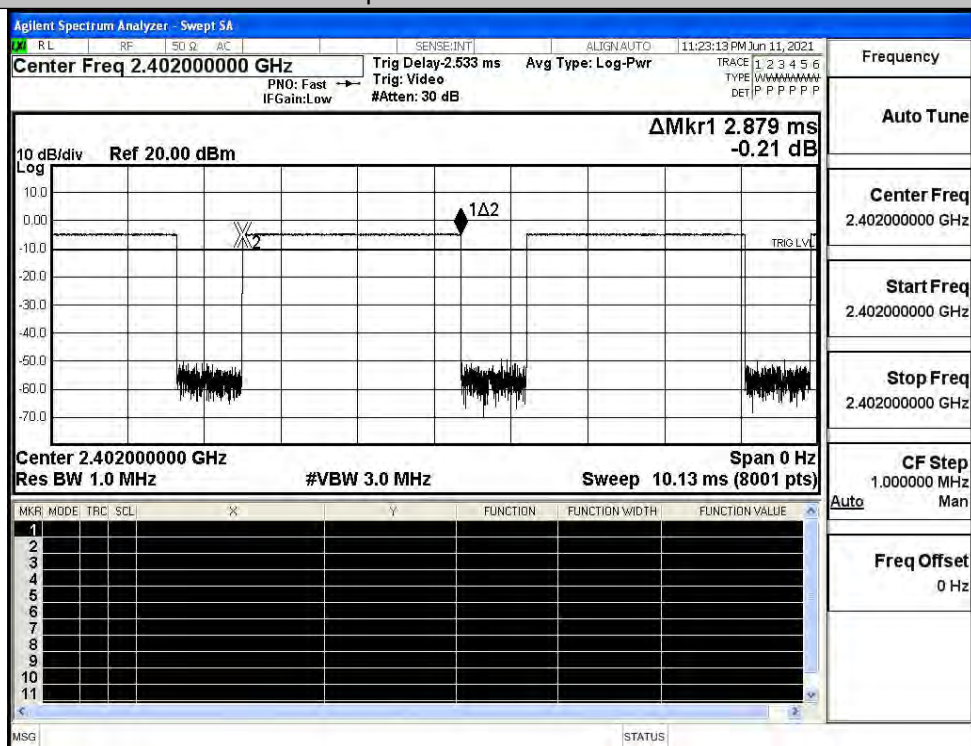


A.5 Dwell Time

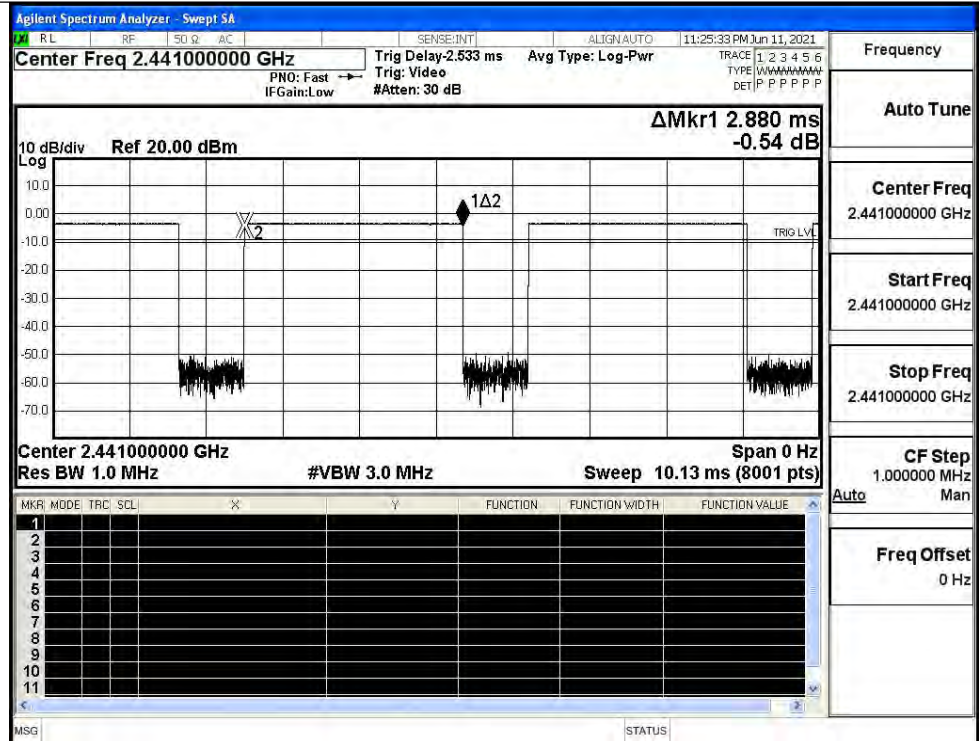
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88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

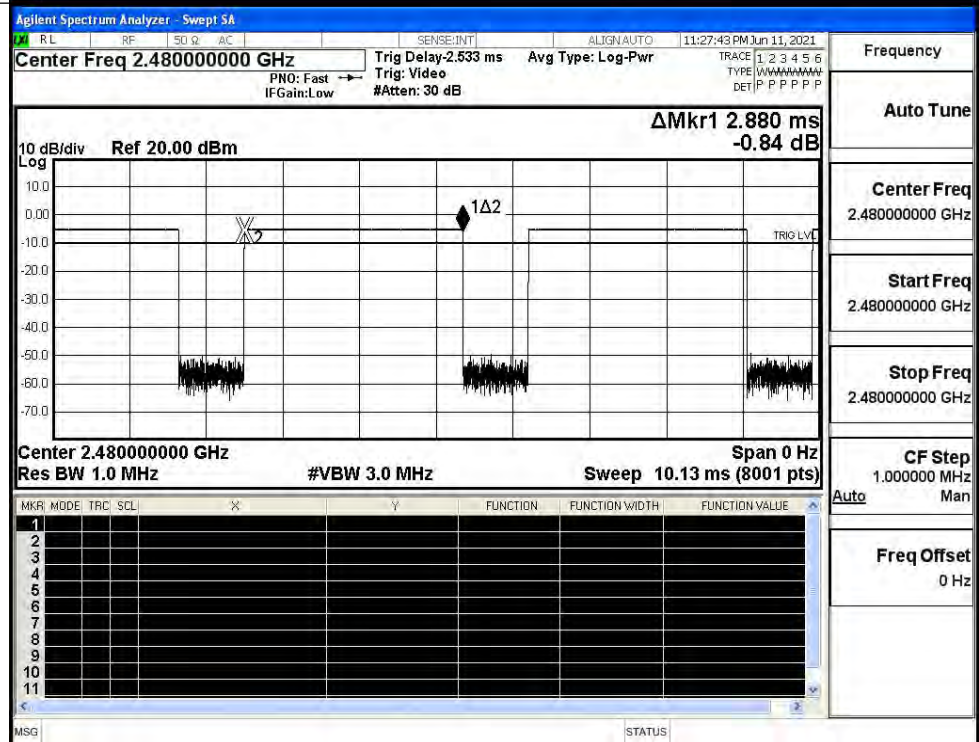
GFSK_DH5/LCH



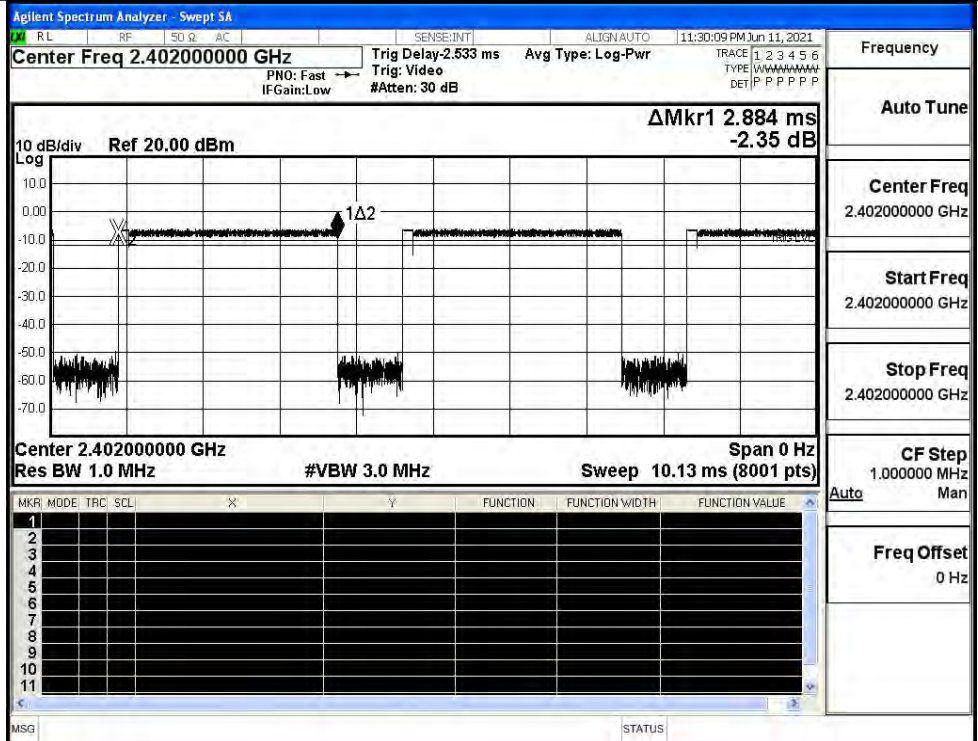
GFSK_DH5/MCH



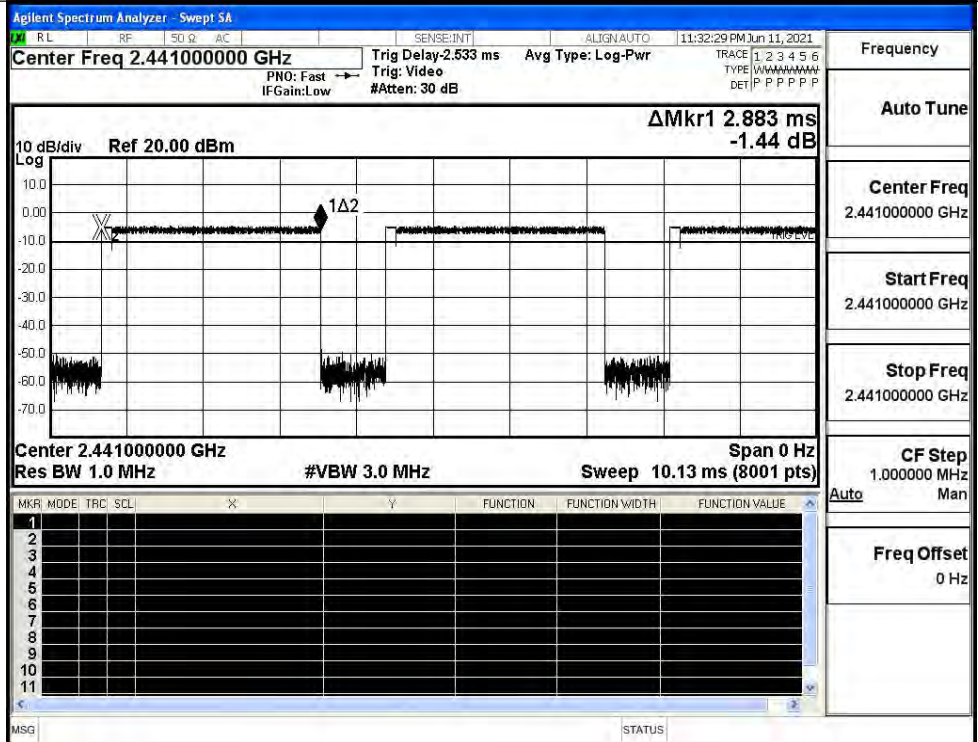
GFSK_DH5/HCH



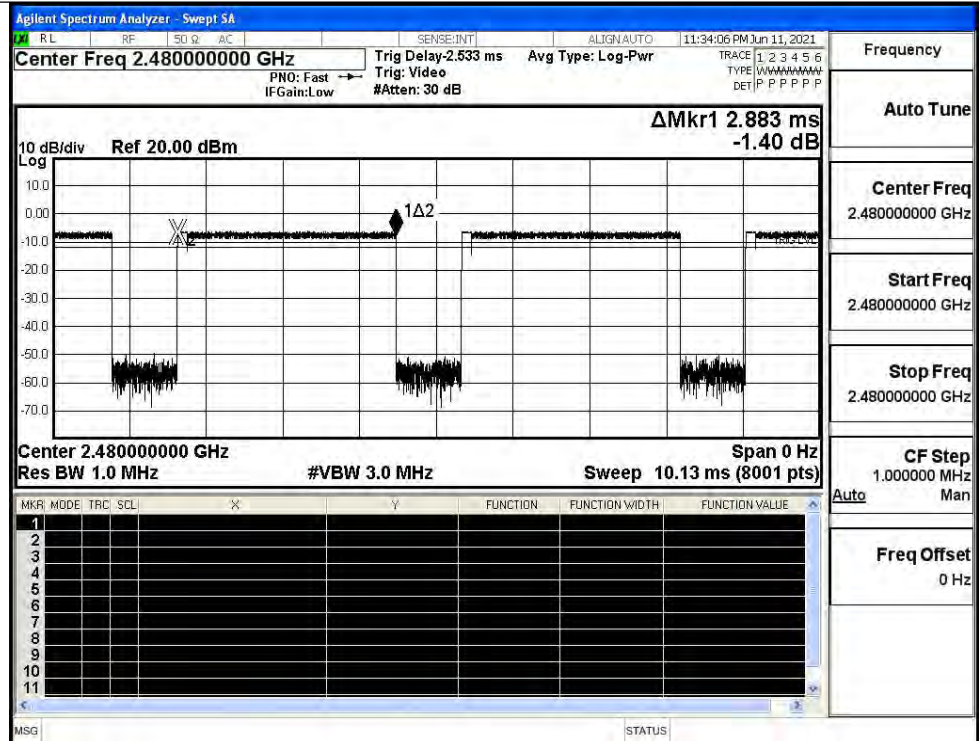
$\pi/4$ DQPSK
_2DH5/LCH



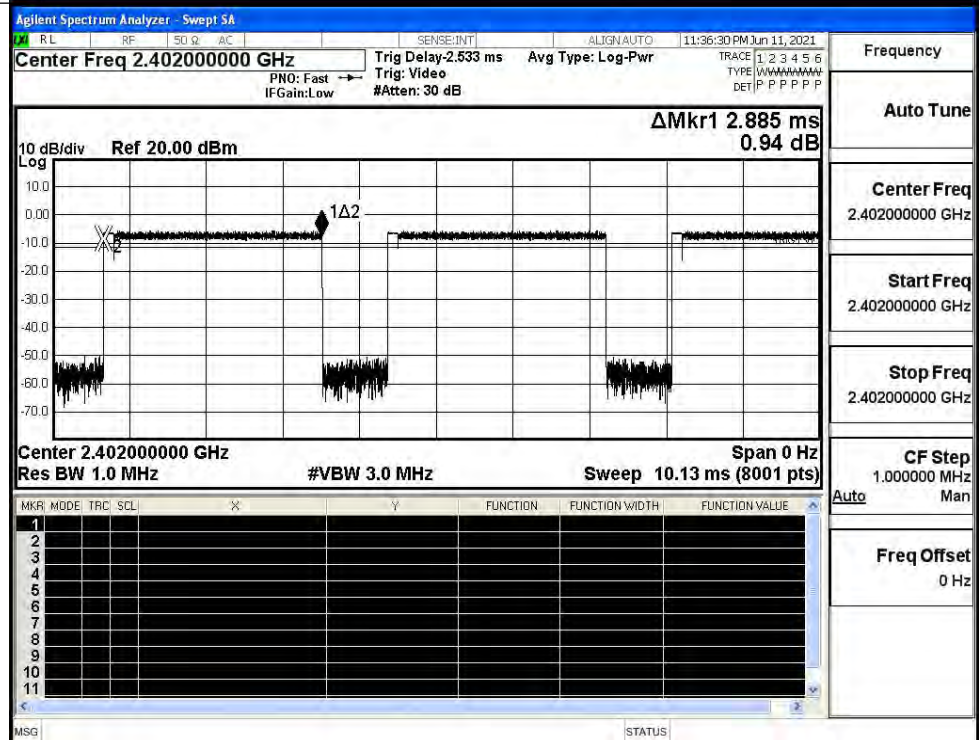
$\pi/4$ DQPSK
_2DH5/MCH



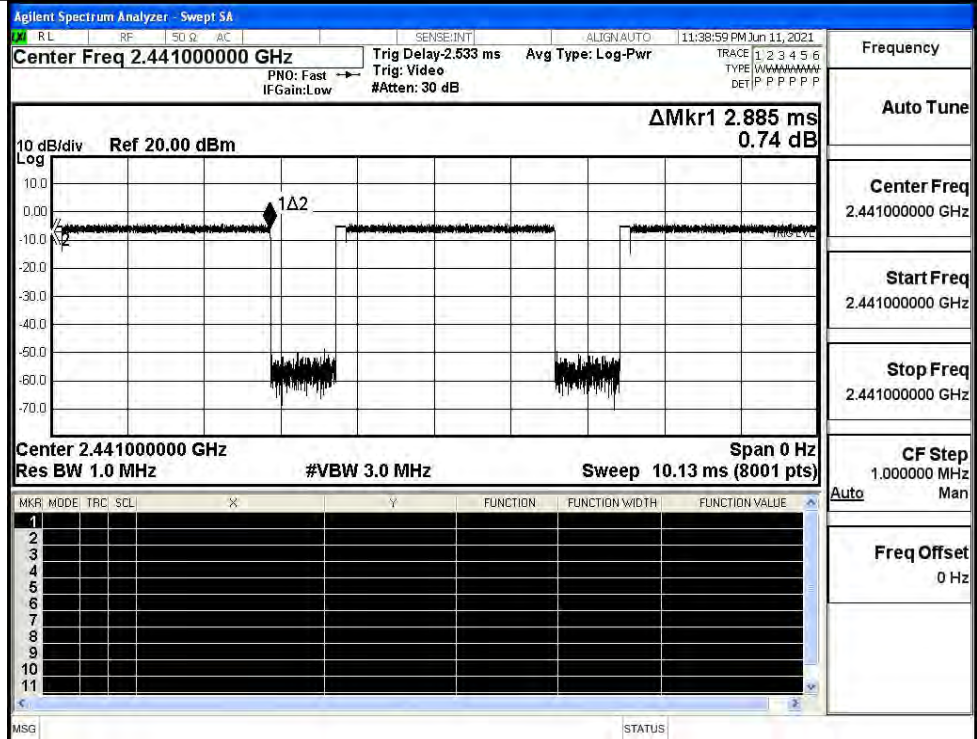
$\pi/4$ DQPSK
_2DH5/HCH



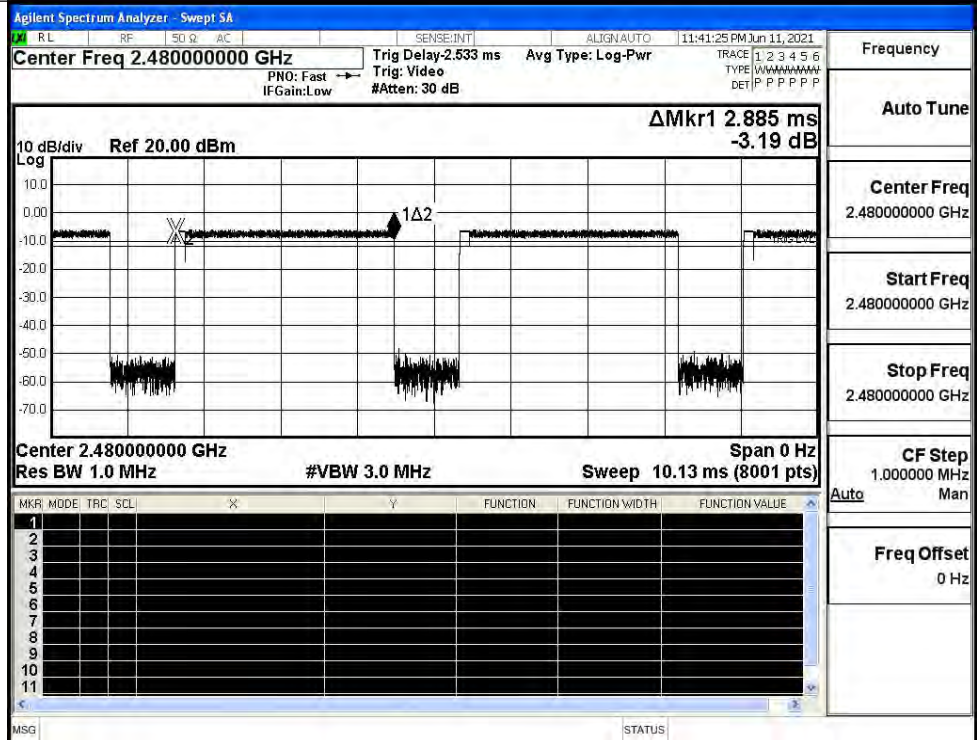
8DPSK_3DH5/LCH



8DPSK_3DH5/MCH



8DPSK_3DH5/HCH

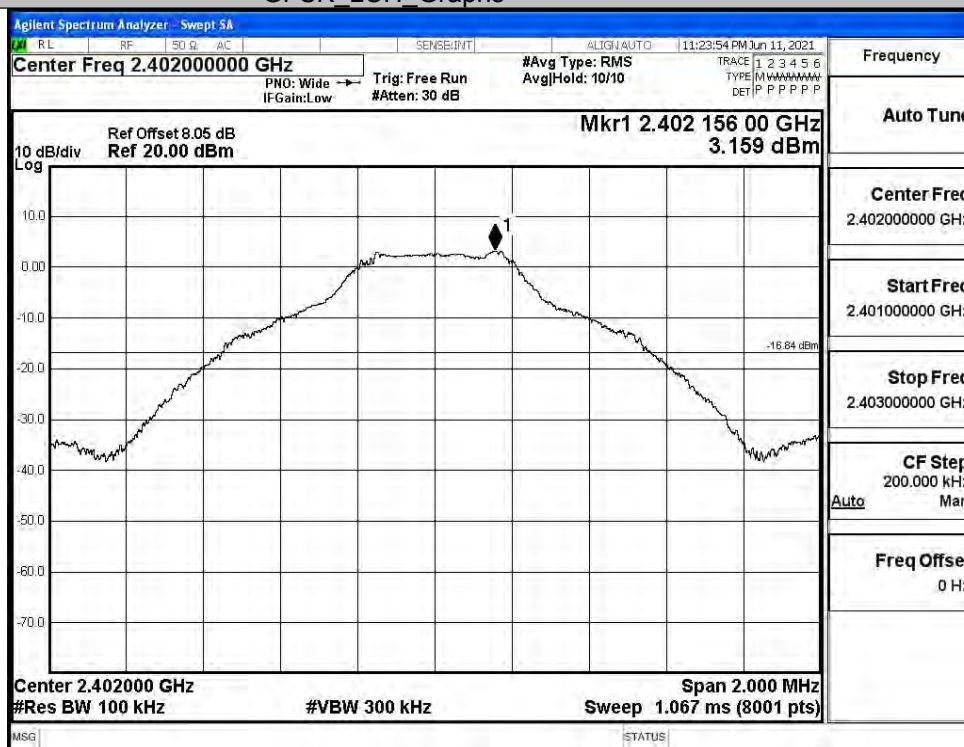


A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.159	-38.209	-16.841	PASS
	MCH	4.504	-37.712	-15.496	PASS
	HCH	2.88	-37.698	-17.120	PASS
$\pi/4$ DQPSK	LCH	1.413	-38.487	-18.587	PASS
	MCH	2.972	-38.169	-17.028	PASS
	HCH	1.579	-38.096	-18.421	PASS
8DPSK	LCH	1.71	-37.090	-18.290	PASS
	MCH	3.002	-38.557	-16.998	PASS
	HCH	1.485	-37.668	-18.515	PASS

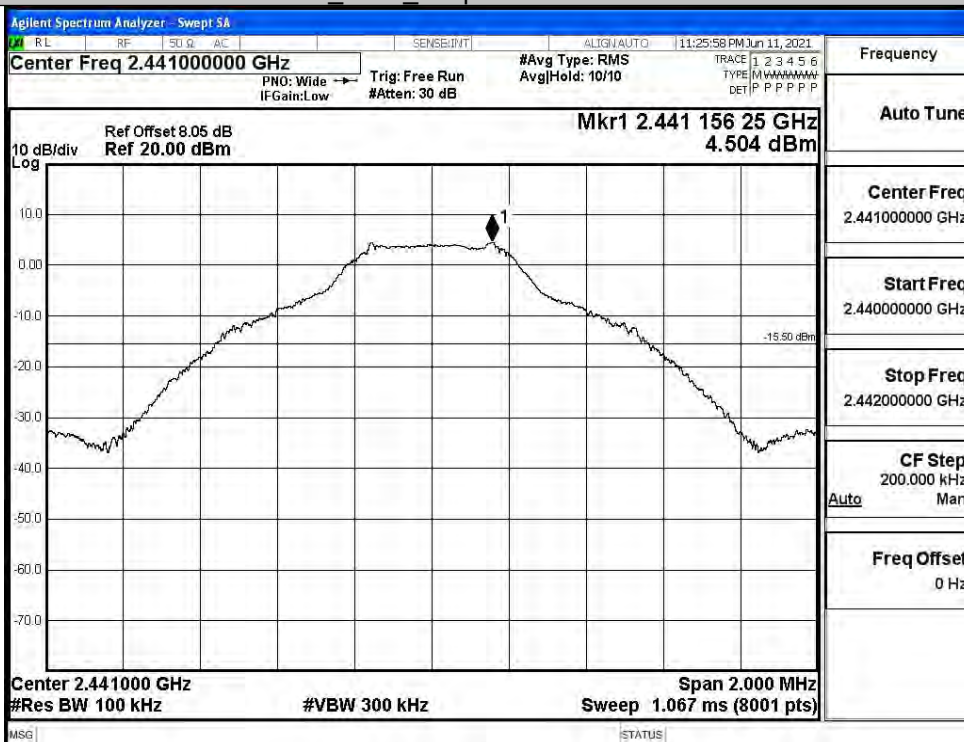
GFSK LCH Graphs

Pref



GFSK_MCH_Graphs

Pref

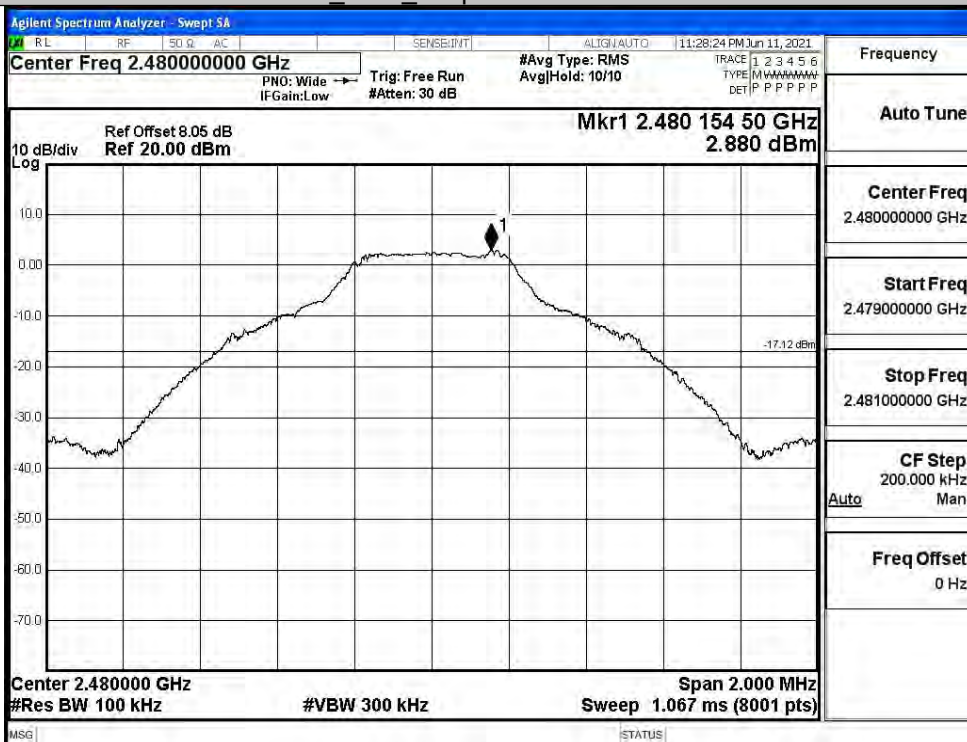


Puw

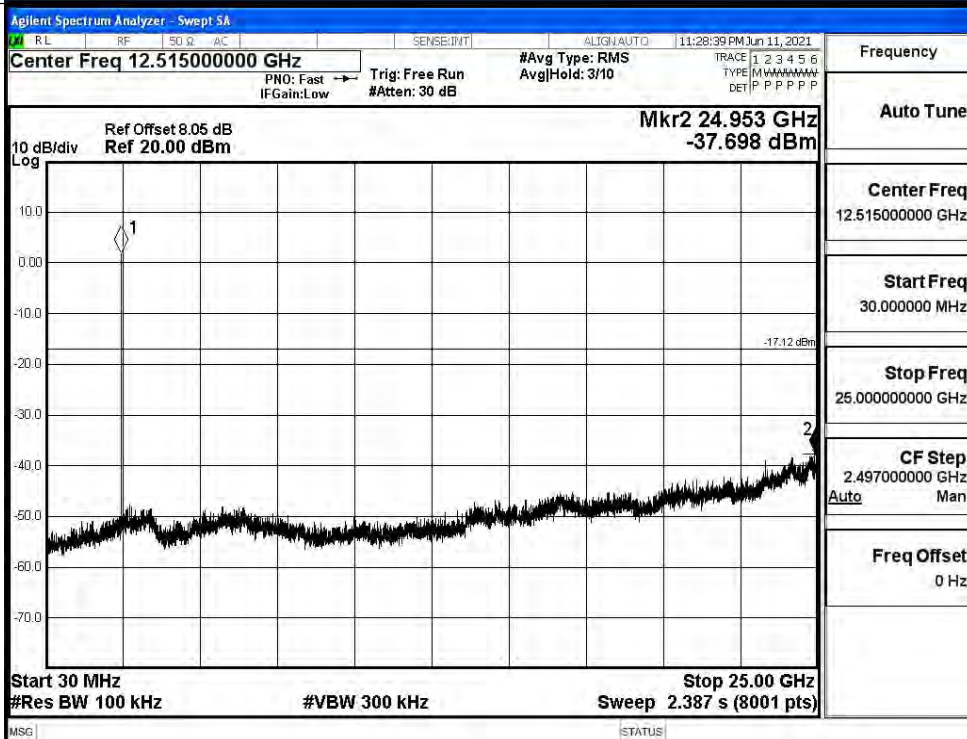


GFSK_HCH_Graphs

Pref

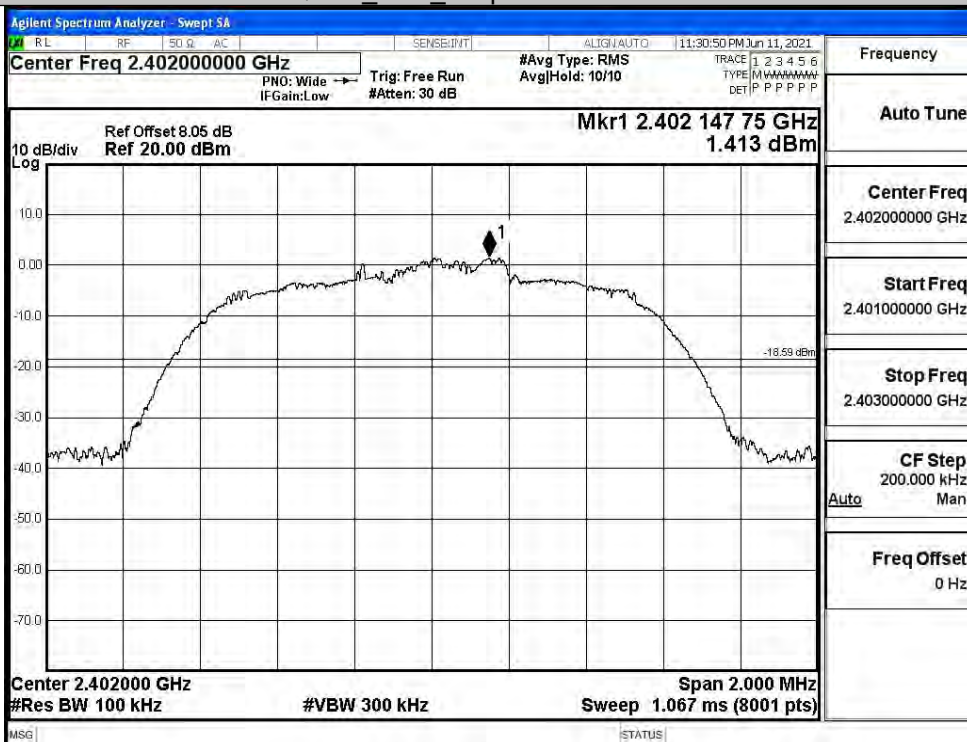


Puw

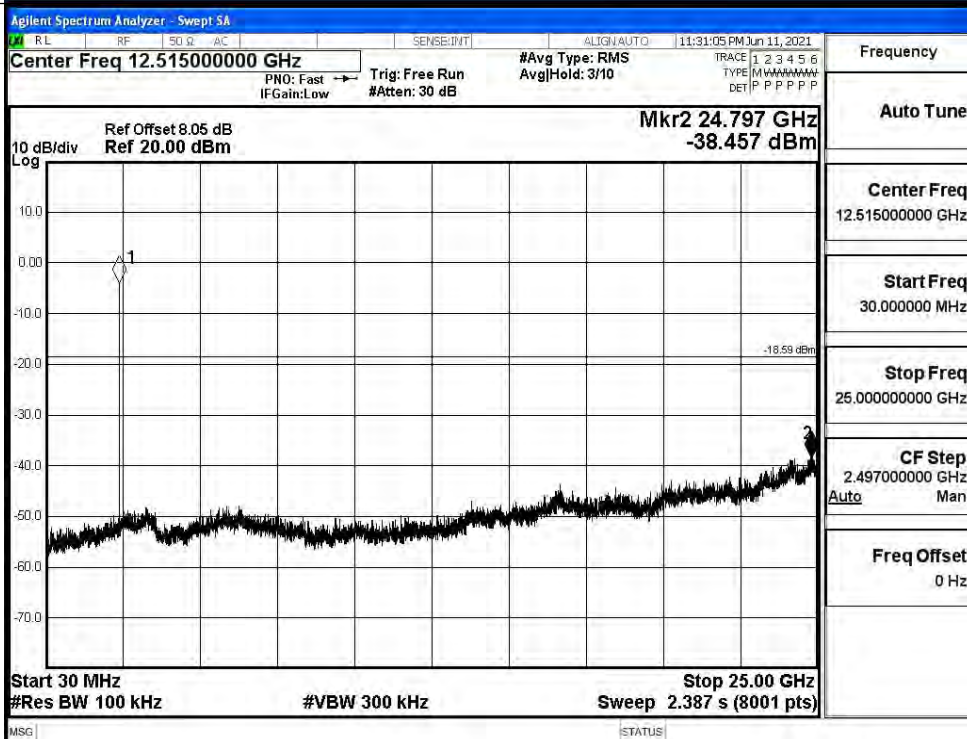


$\pi/4$ DQPSK_LCH_Graphs

Pref

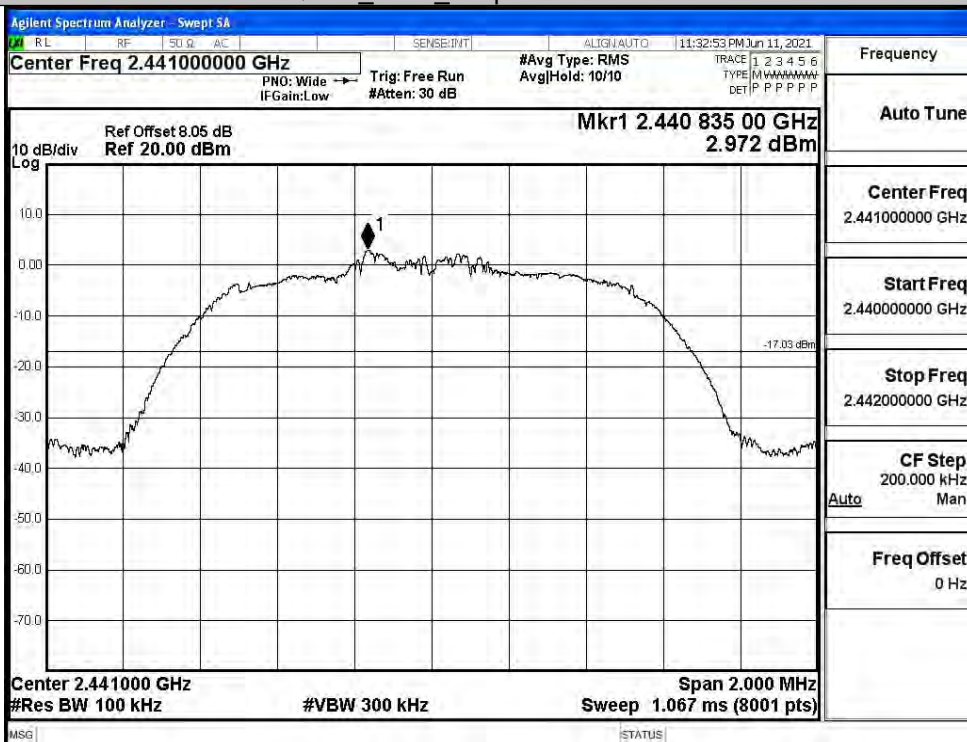


Puw



$\pi/4$ DQPSK_MCH_Graphs

Pref

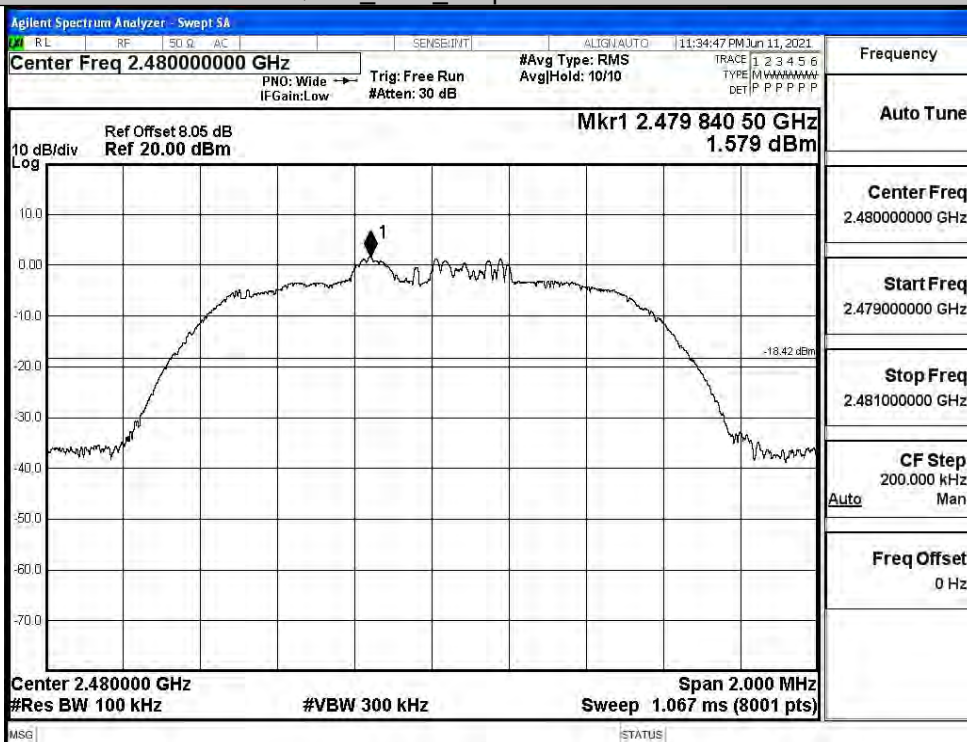


Puw



$\pi/4$ DQPSK_HCH_Graphs

Pref

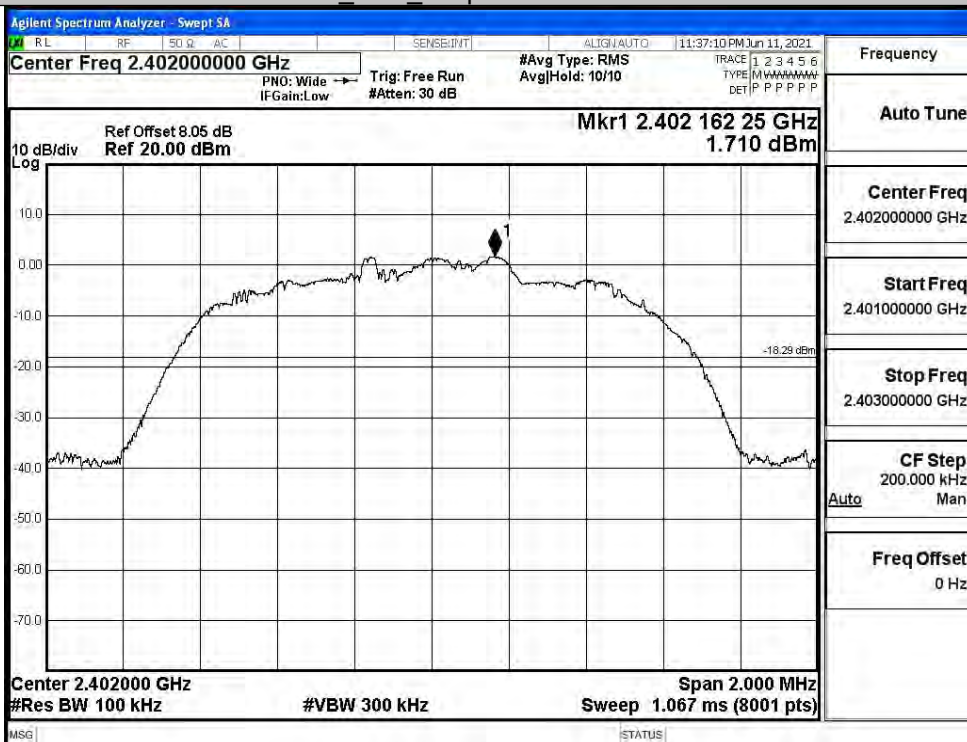


Puw

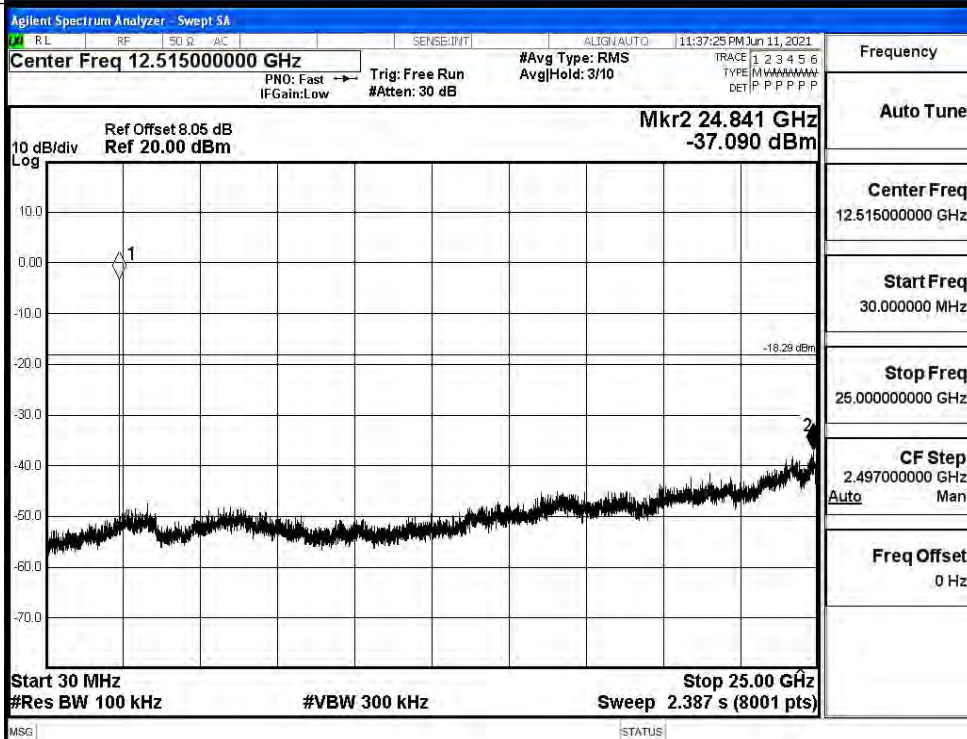


8DPSK_LCH_Graphs

Pref

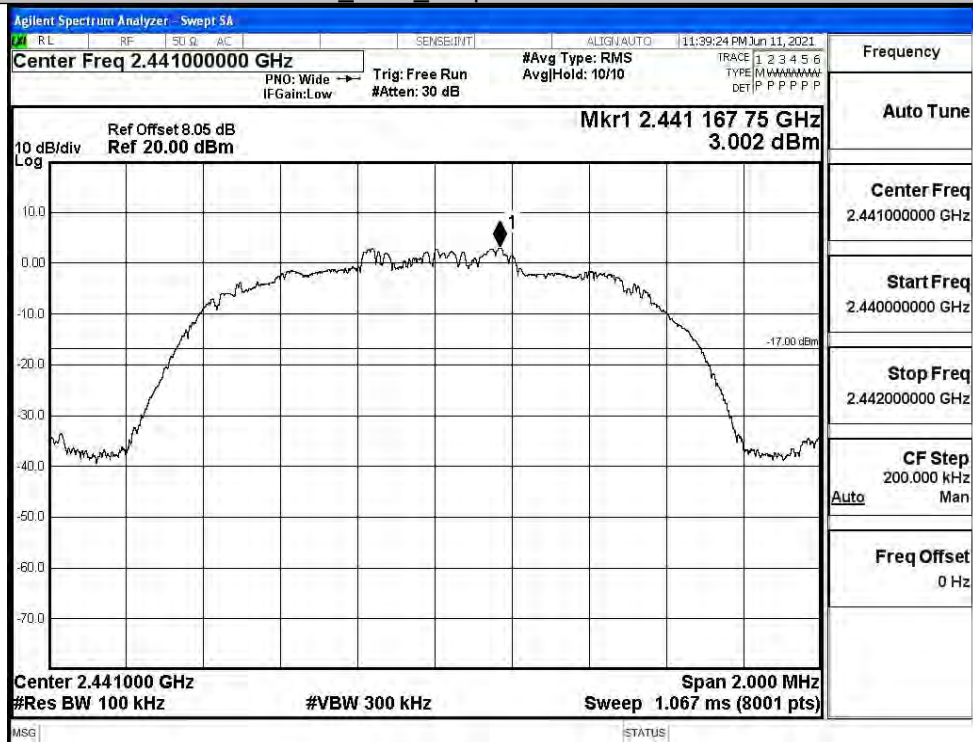


Puw

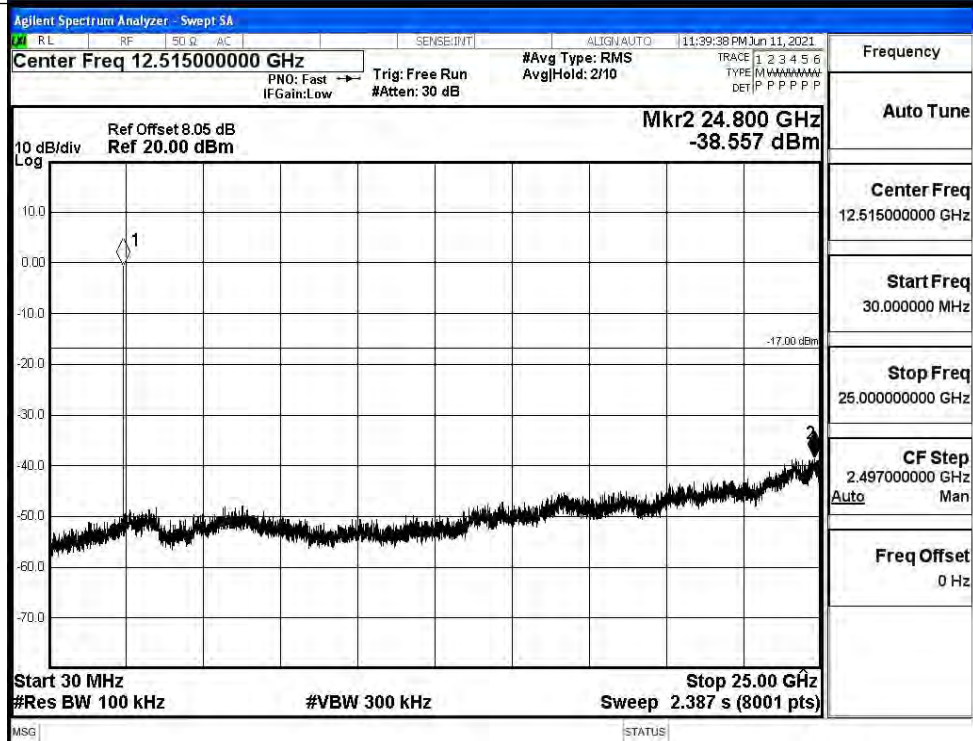


8DPSK_MCH_Graphs

Pref

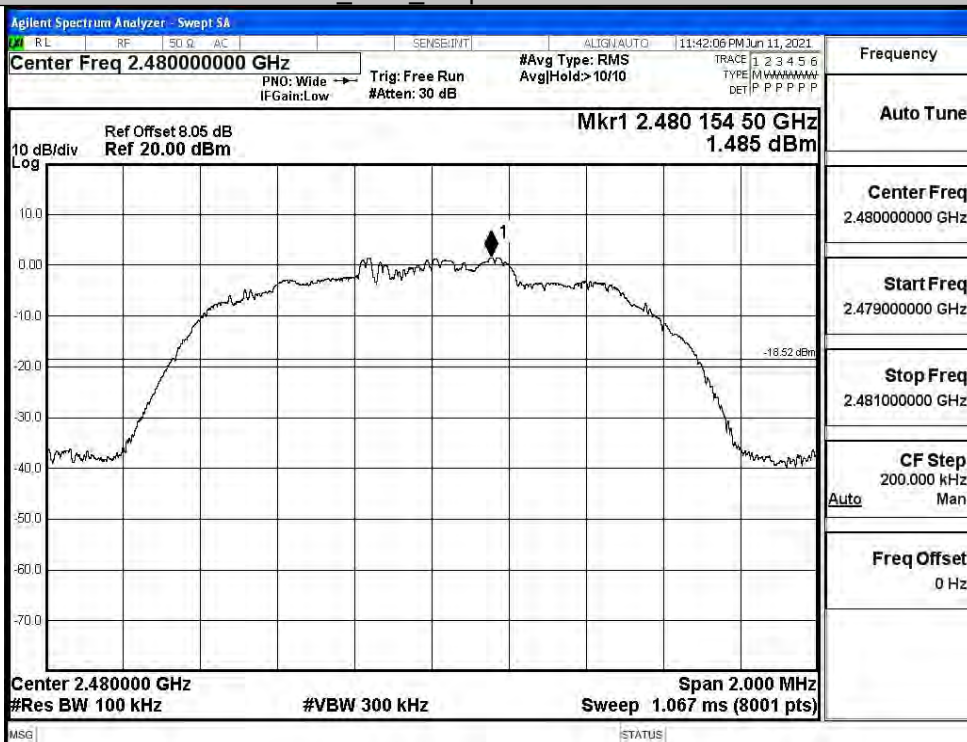


Puw

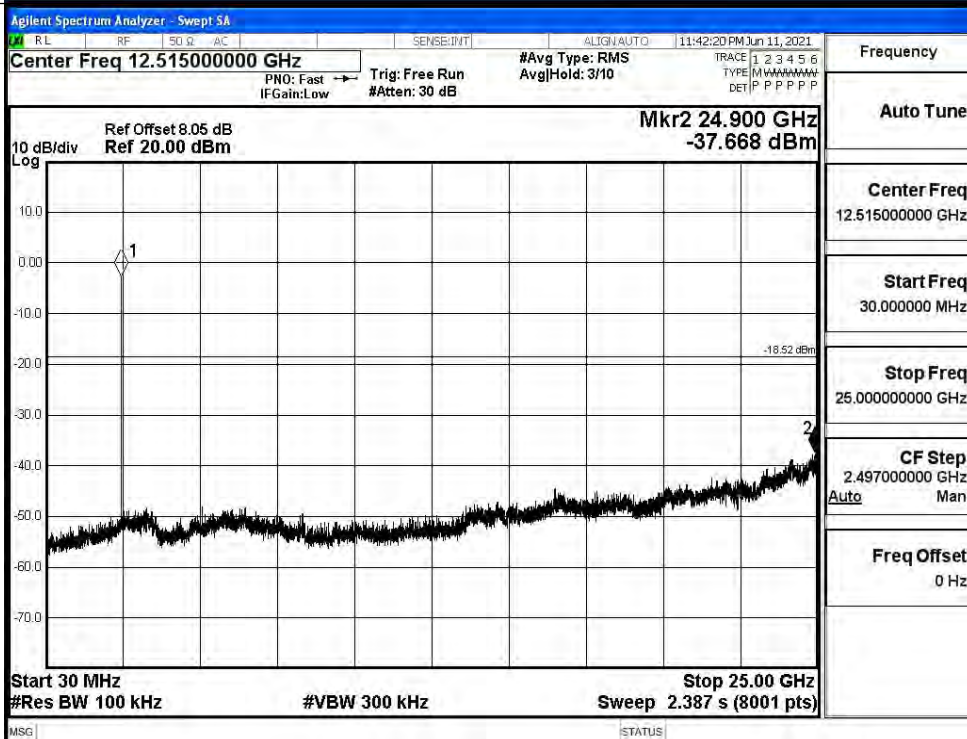


8DPSK_HCH_Graphs

Pref



Puw

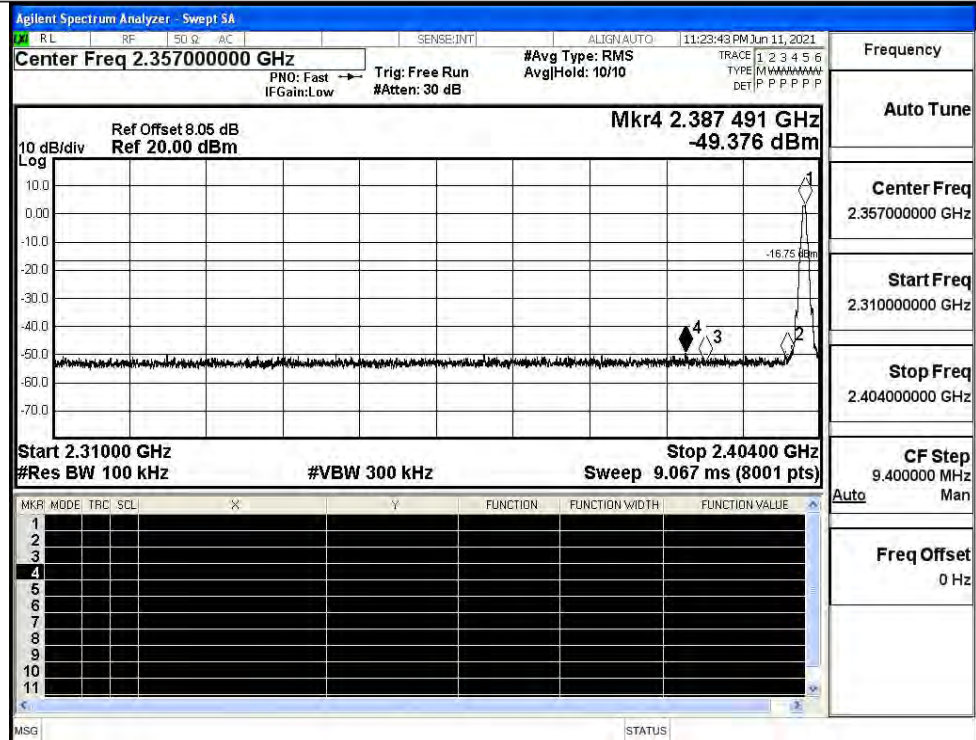


A.7 Band-edge for RF Conducted Emissions

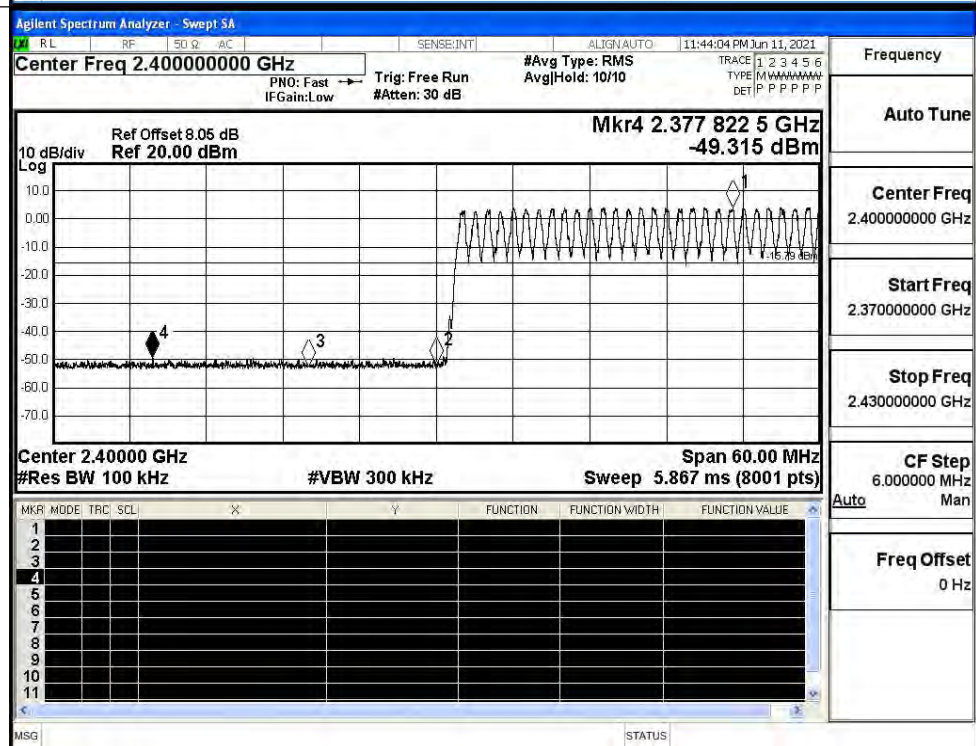
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	3.254	Off	-49.376	-16.75	PASS
			4.212	On	-49.315	-15.79	PASS
	HCH	2480	2.837	Off	-49.461	-17.16	PASS
			4.407	On	-48.485	-15.59	PASS
$\pi/4$ DQPSK	LCH	2402	1.420	Off	-49.151	-18.58	PASS
			2.467	On	-48.757	-17.53	PASS
	HCH	2480	1.683	Off	-49.446	-18.32	PASS
			2.450	On	-48.690	-17.55	PASS
8DPSK	LCH	2402	1.729	Off	-49.558	-18.27	PASS
			2.938	On	-49.110	-17.06	PASS
	HCH	2480	1.705	Off	-49.378	-18.3	PASS
			2.669	On	-48.227	-17.33	PASS

Test Graphs

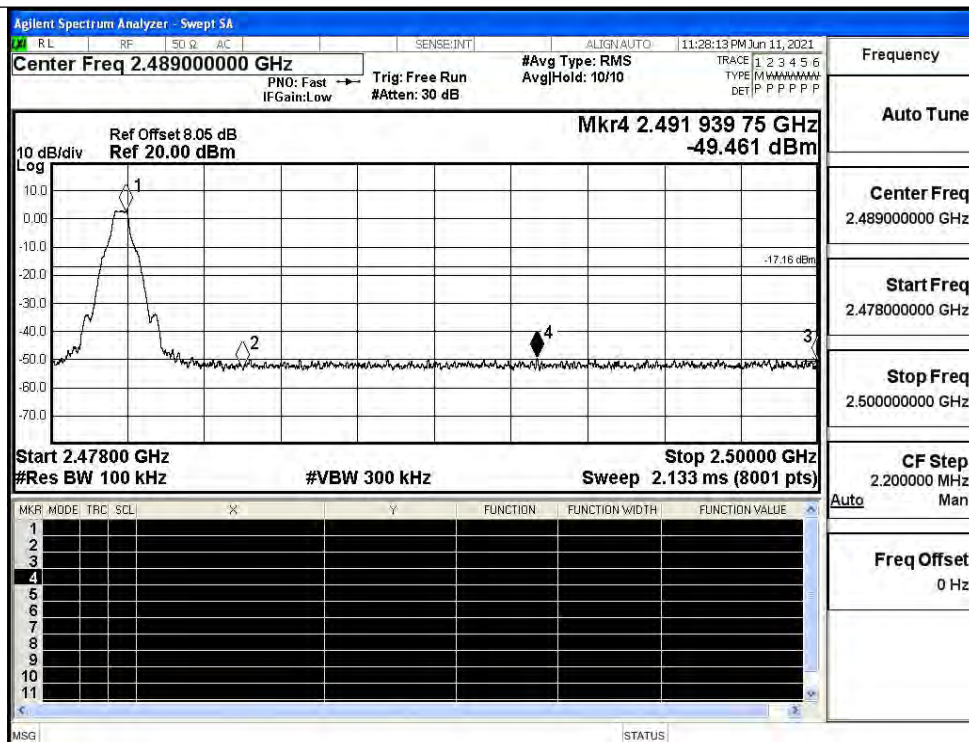
GFSK/LCH/No Hop



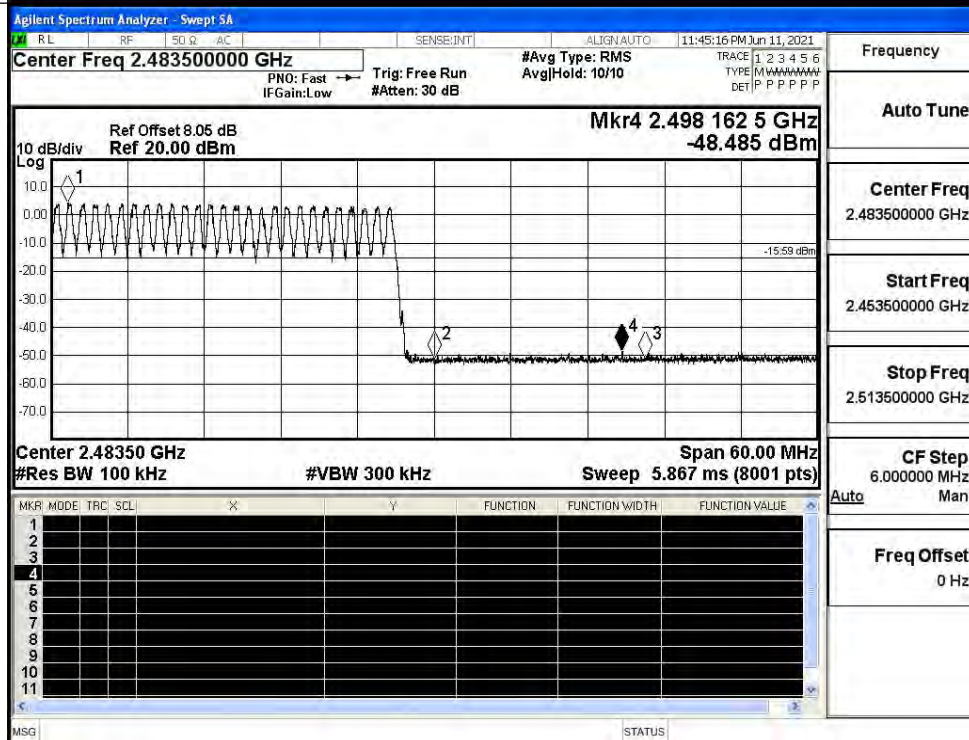
GFSK/LCH/Hop



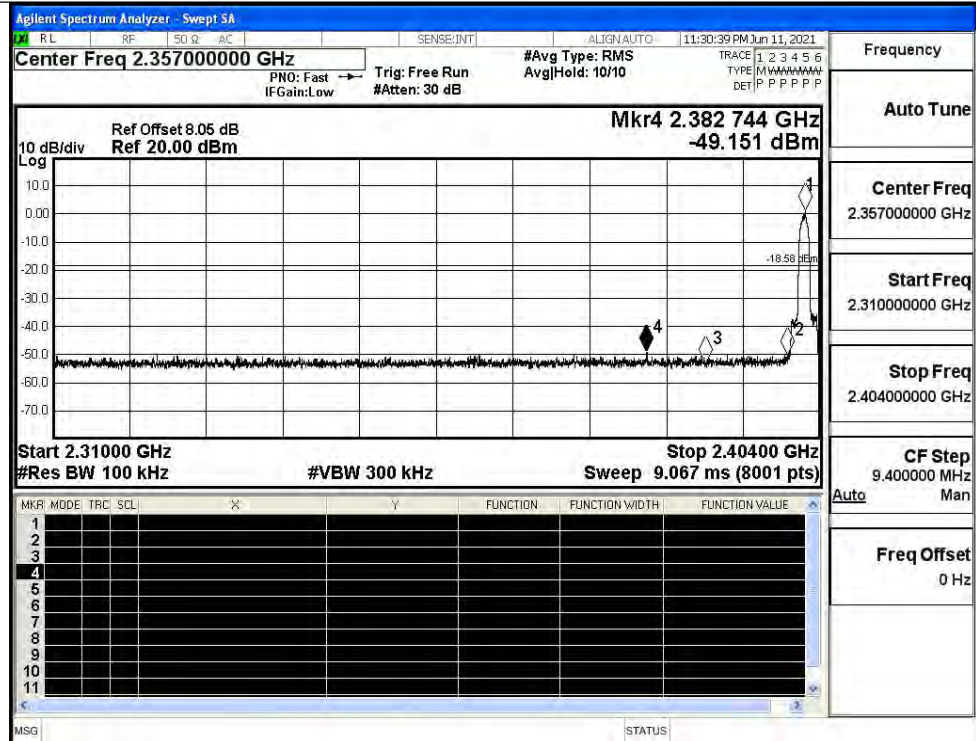
GFSK/HCH/No Hop



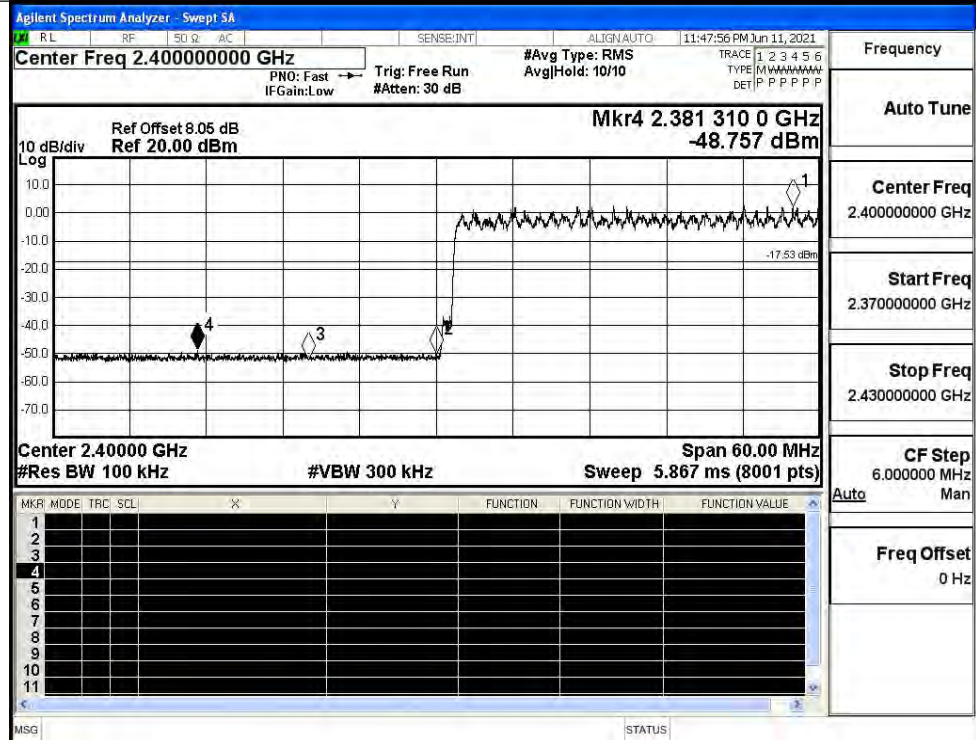
GFSK/HCH/Hop



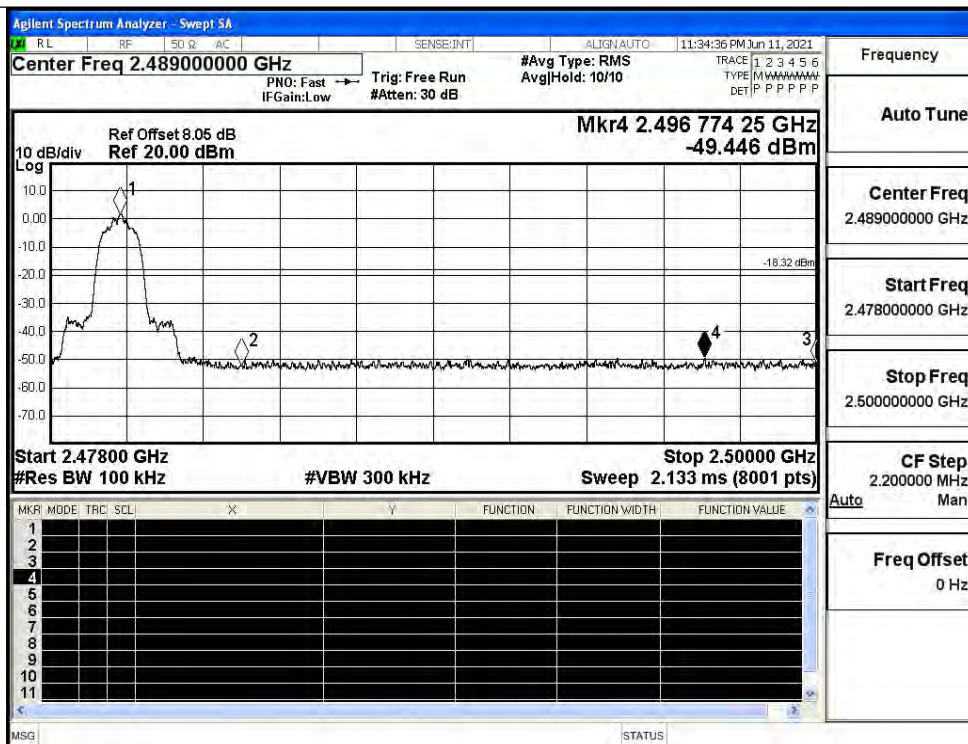
$\pi/4$ DQPSK/LCH/No
Hop



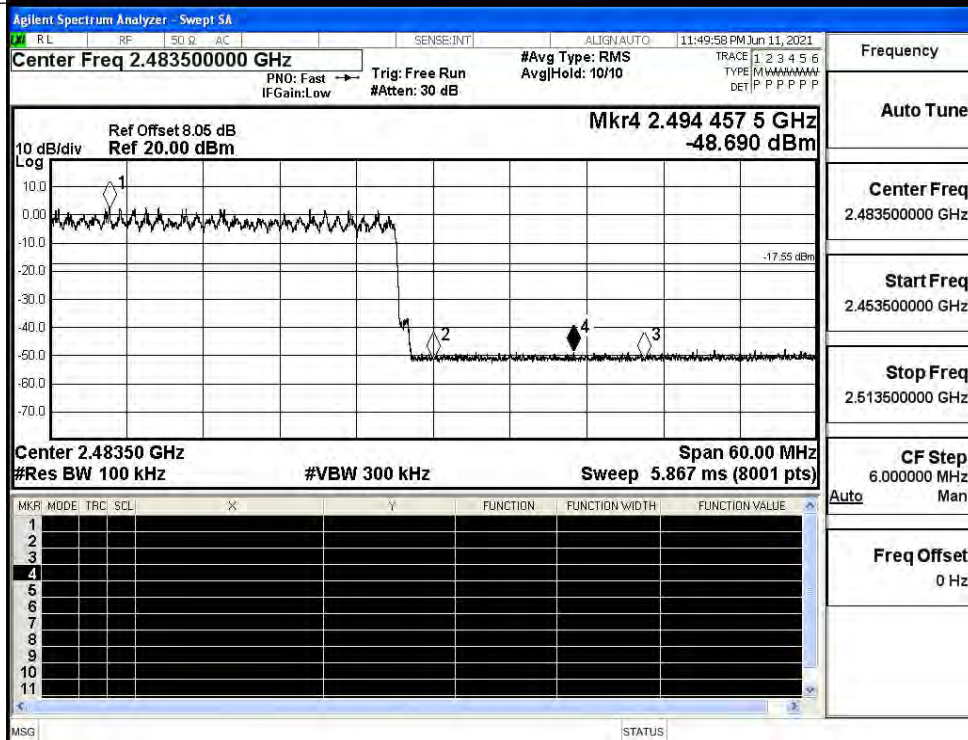
$\pi/4$ DQPSK/LCH/Hop



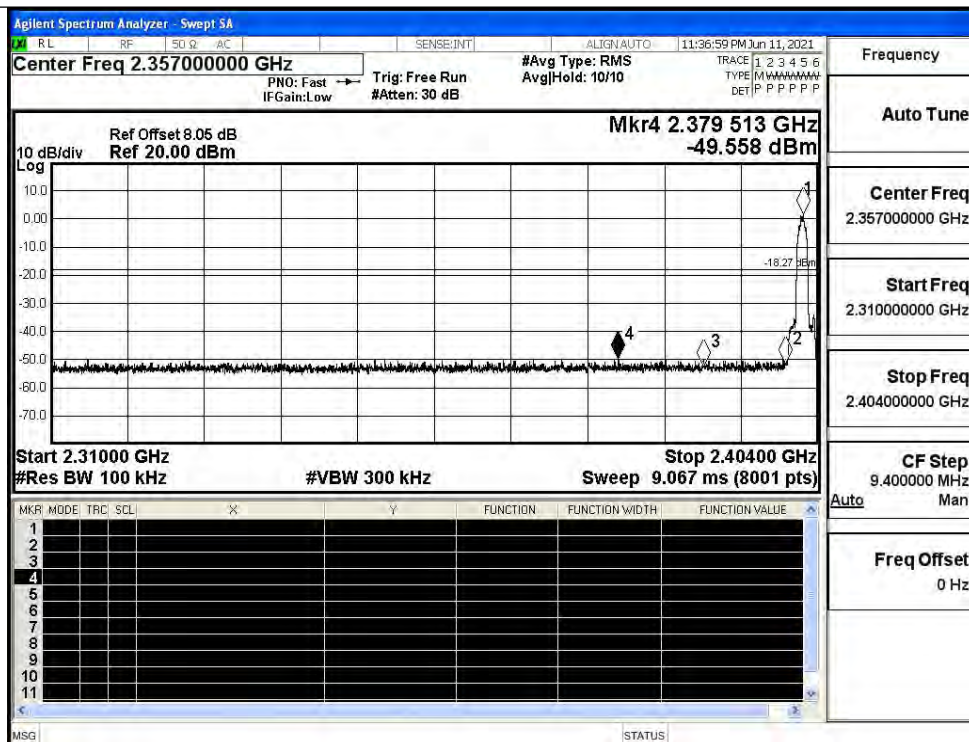
$\pi/4$ DQPSK/HCH/No
Hop



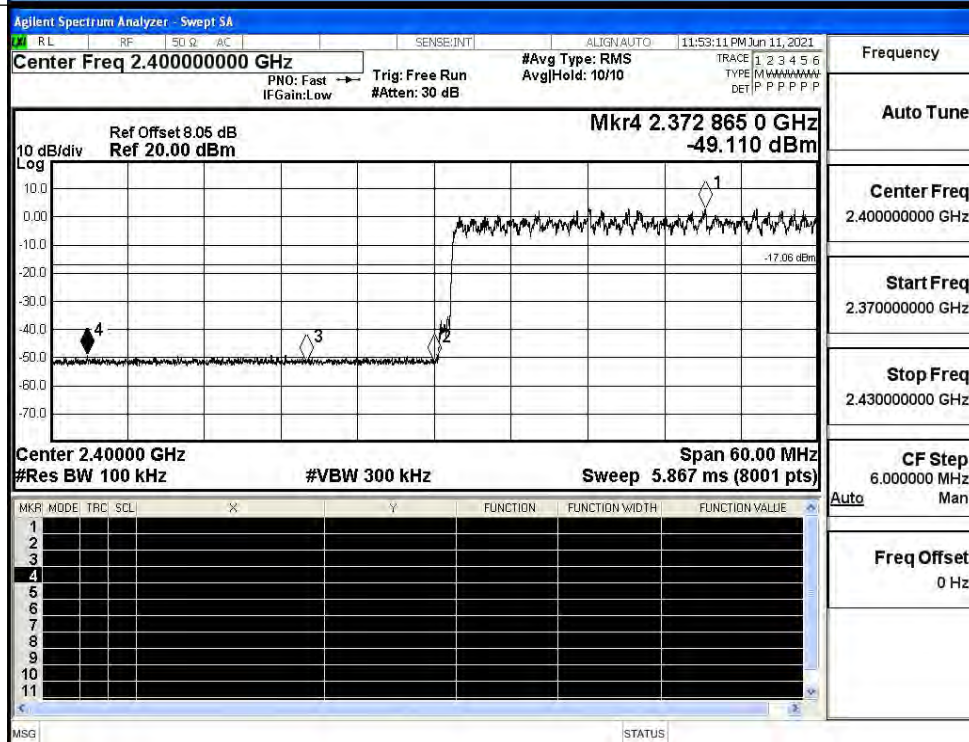
$\pi/4$ DQPSK/HCH/Hop



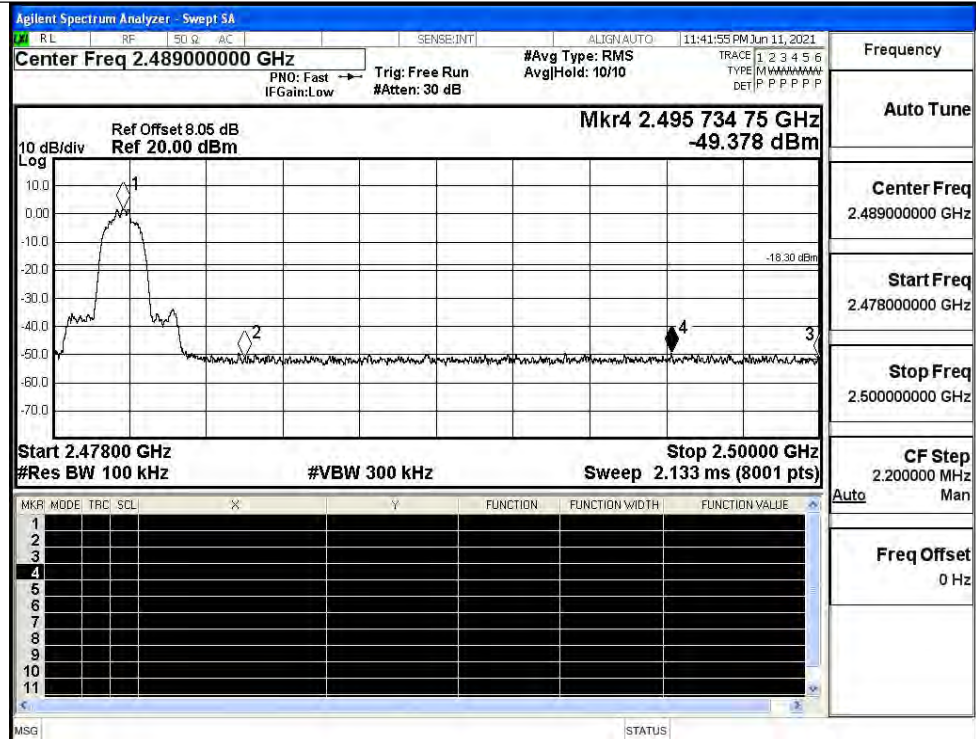
8DPSK/LCH/No Hop



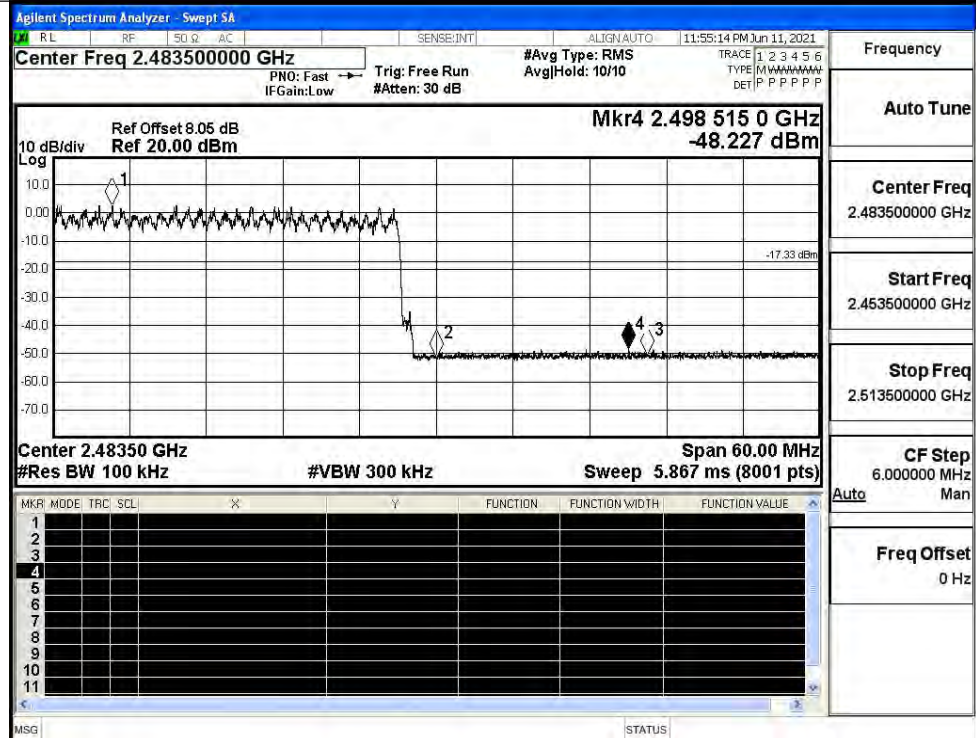
8DPSK/LCH/Hop



8DPSK/HCH/No Hop



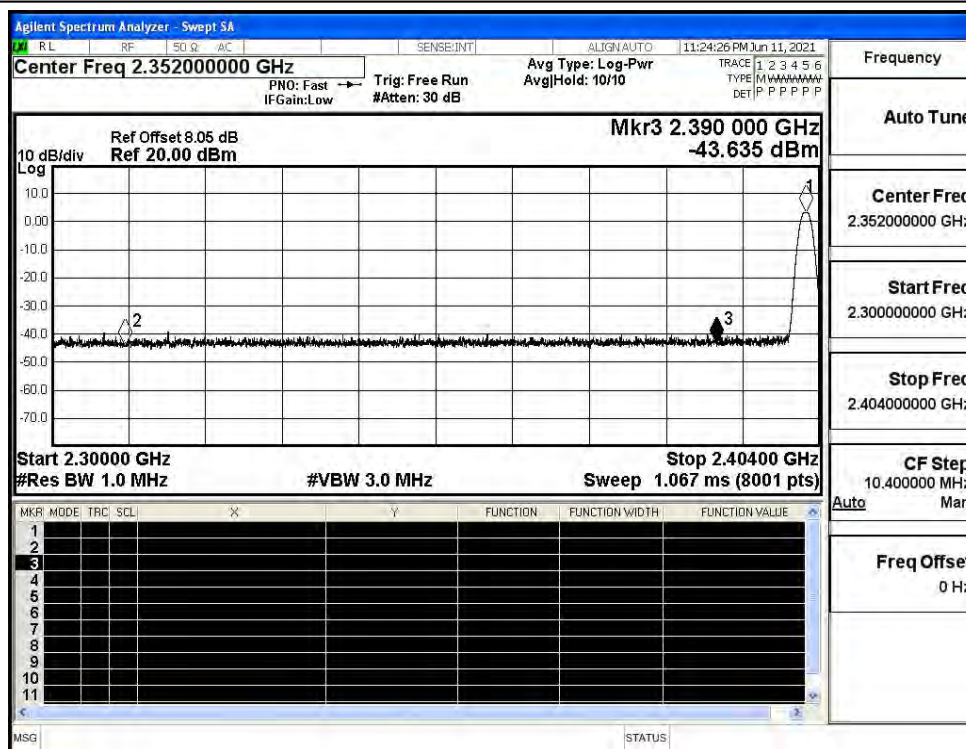
8DPSK/HCH/Hop



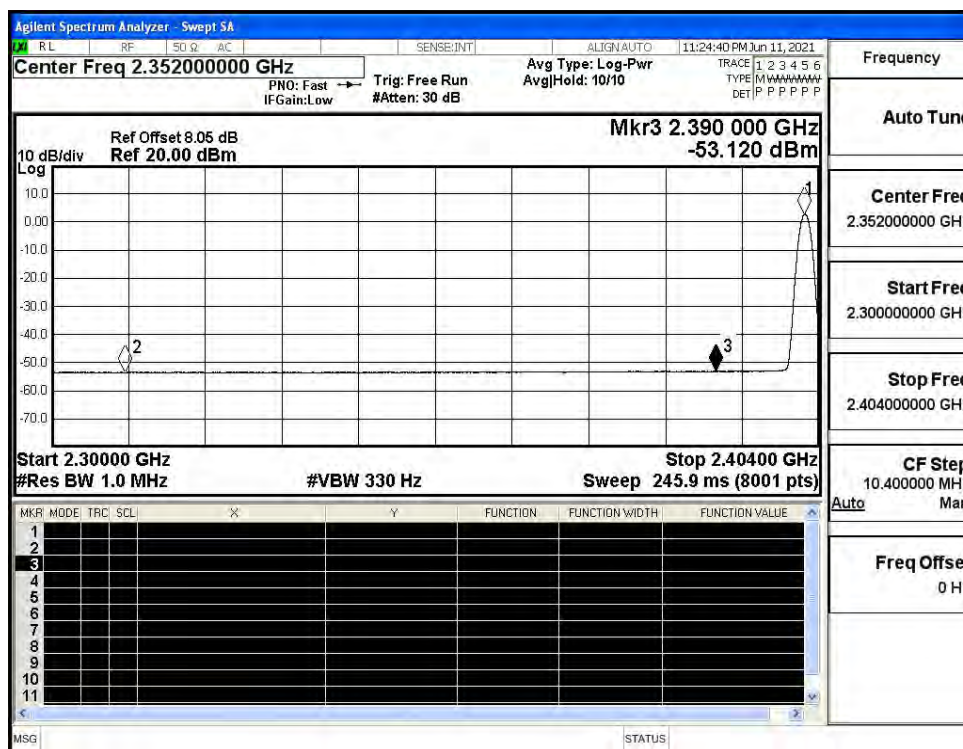
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-44.18	2.0	0	53.05	PEAK	74	PASS
	Off	2310.0	-53.59	2.0	0	43.64	AV	54	PASS
	Off	2390.0	-43.64	2.0	0	53.59	PEAK	74	PASS
	Off	2390.0	-53.12	2.0	0	44.11	AV	54	PASS
	Off	2483.5	-42.49	2.0	0	54.74	PEAK	74	PASS
	Off	2483.5	-52.57	2.0	0	44.66	AV	54	PASS
	Off	2500.0	-41.84	2.0	0	55.39	PEAK	74	PASS
	Off	2500.0	-52.56	2.0	0	44.67	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.65	2.0	0	53.58	PEAK	74	PASS
	Off	2310.0	-53.46	2.0	0	43.77	AV	54	PASS
	Off	2390.0	-43.06	2.0	0	54.17	PEAK	74	PASS
	Off	2390.0	-53.10	2.0	0	44.13	AV	54	PASS
	Off	2483.5	-40.67	2.0	0	56.56	PEAK	74	PASS
	Off	2483.5	-52.42	2.0	0	44.81	AV	54	PASS
	Off	2500.0	-43.06	2.0	0	54.17	PEAK	74	PASS
	Off	2500.0	-52.52	2.0	0	44.71	AV	54	PASS
8DPSK	Off	2310.0	-42.74	2.0	0	54.49	PEAK	74	PASS
	Off	2310.0	-53.57	2.0	0	43.66	AV	54	PASS
	Off	2390.0	-42.31	2.0	0	54.92	PEAK	74	PASS
	Off	2390.0	-53.20	2.0	0	44.03	AV	54	PASS
	Off	2483.5	-43.24	2.0	0	53.99	PEAK	74	PASS
	Off	2483.5	-52.52	2.0	0	44.71	AV	54	PASS
	Off	2500.0	-40.71	2.0	0	56.52	PEAK	74	PASS
	Off	2500.0	-52.54	2.0	0	44.69	AV	54	PASS

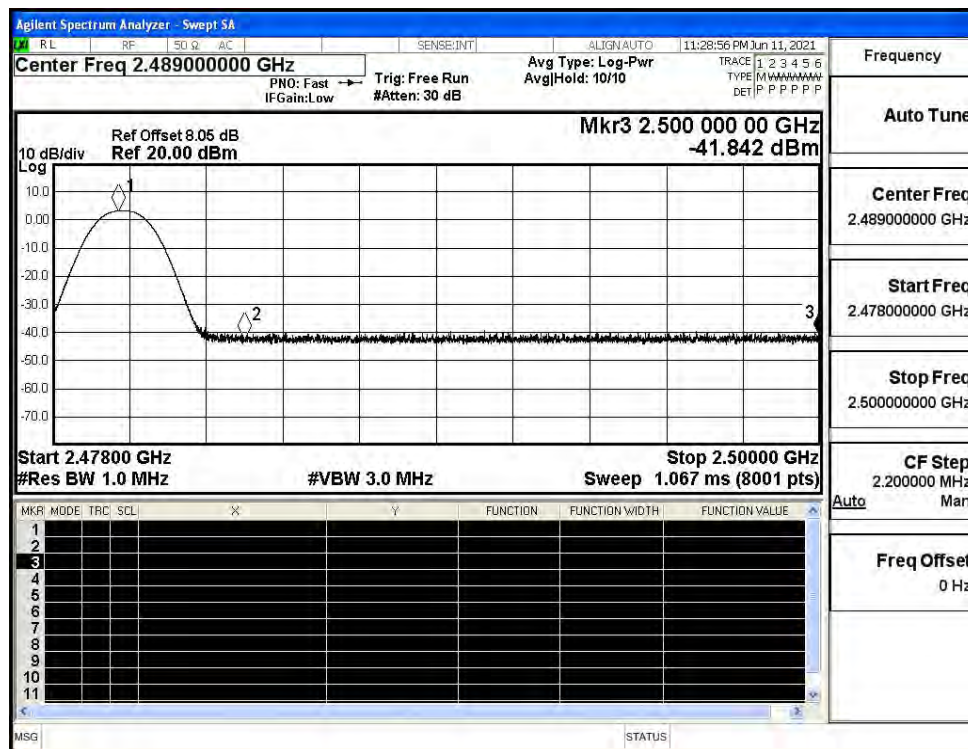
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



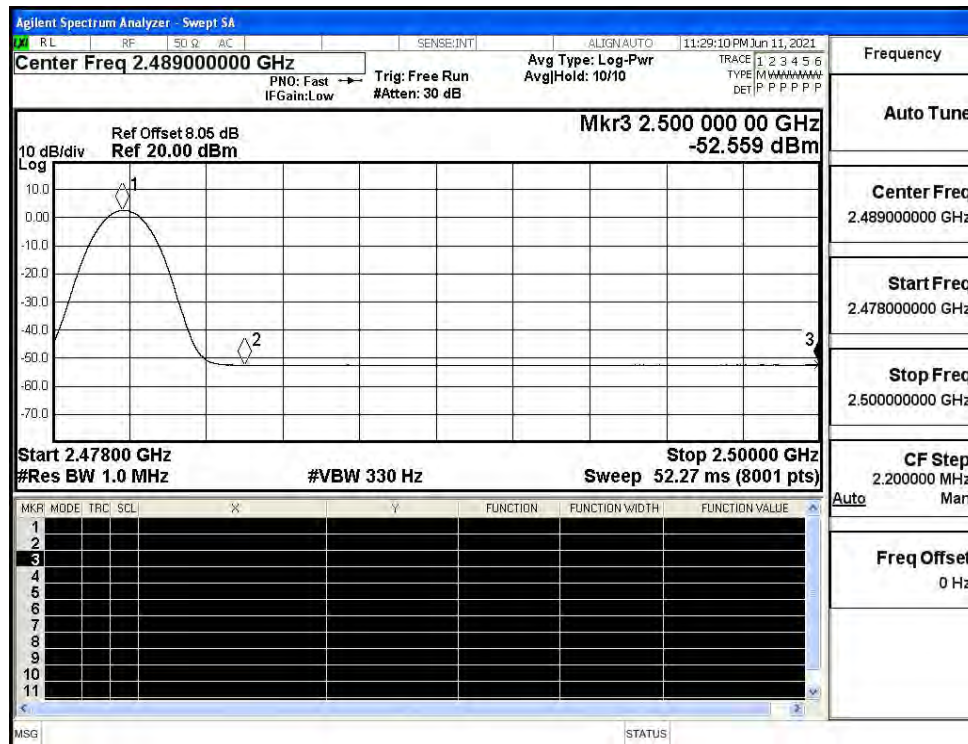
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



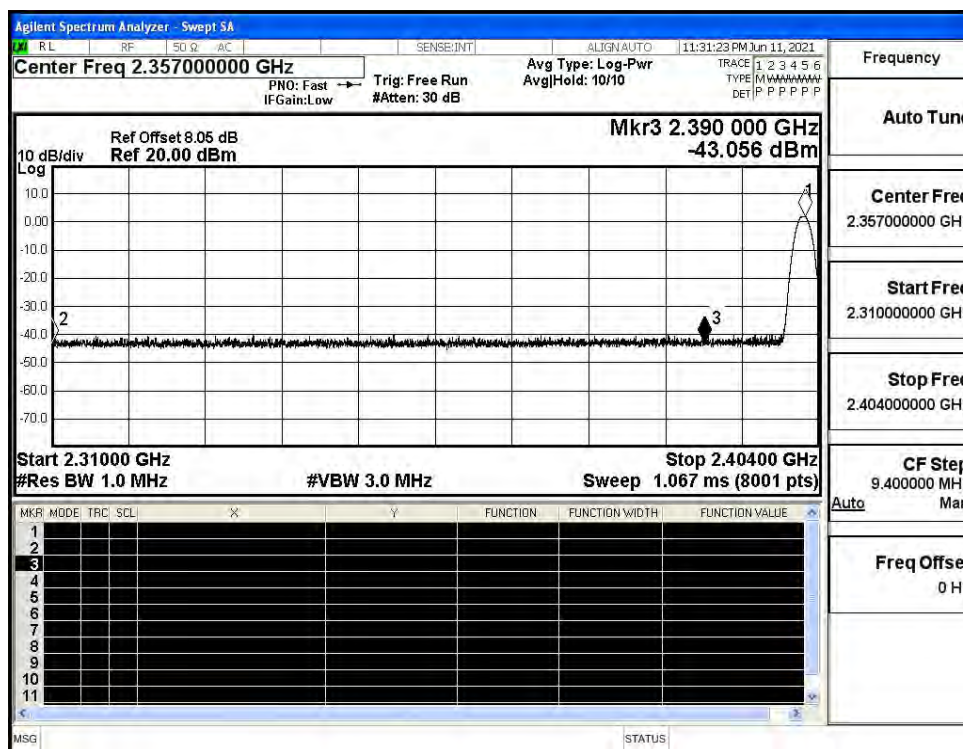
Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



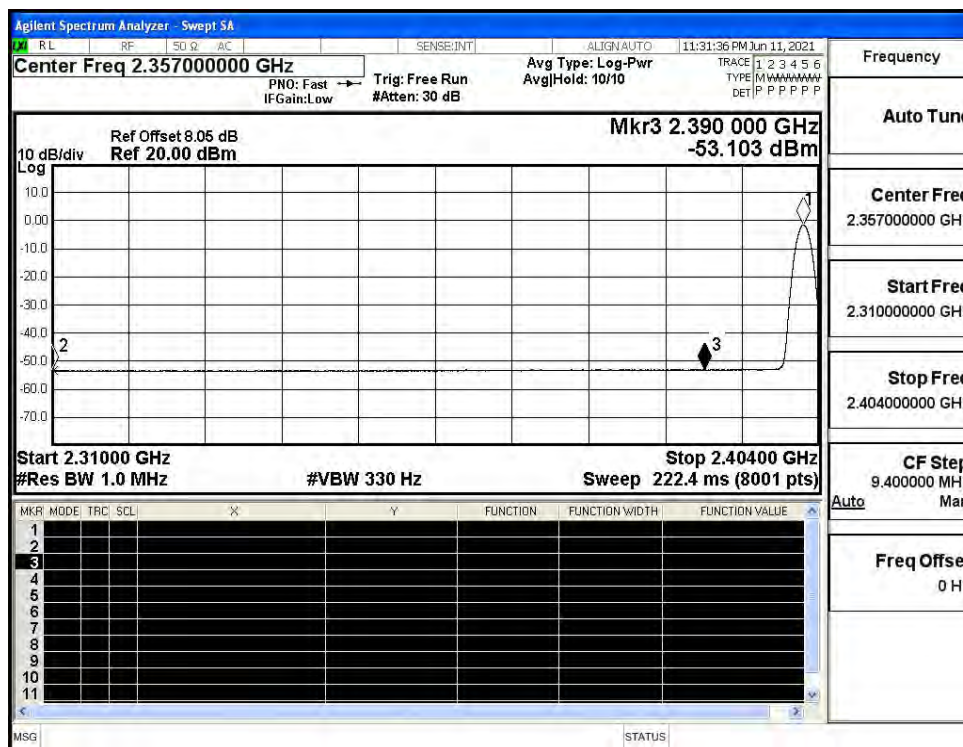
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



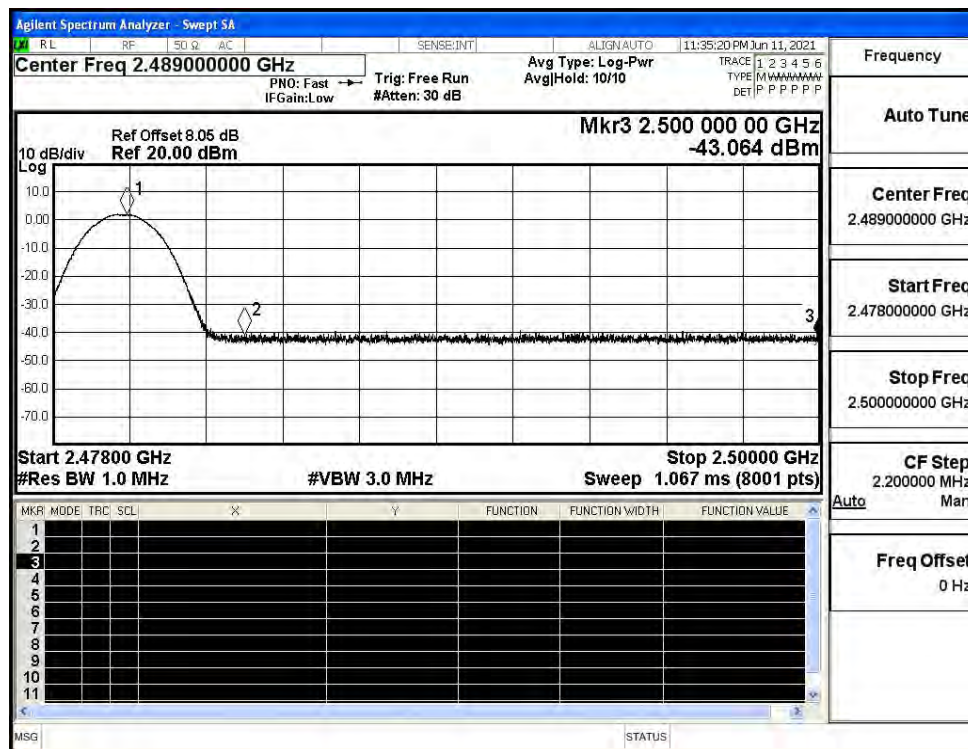
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)



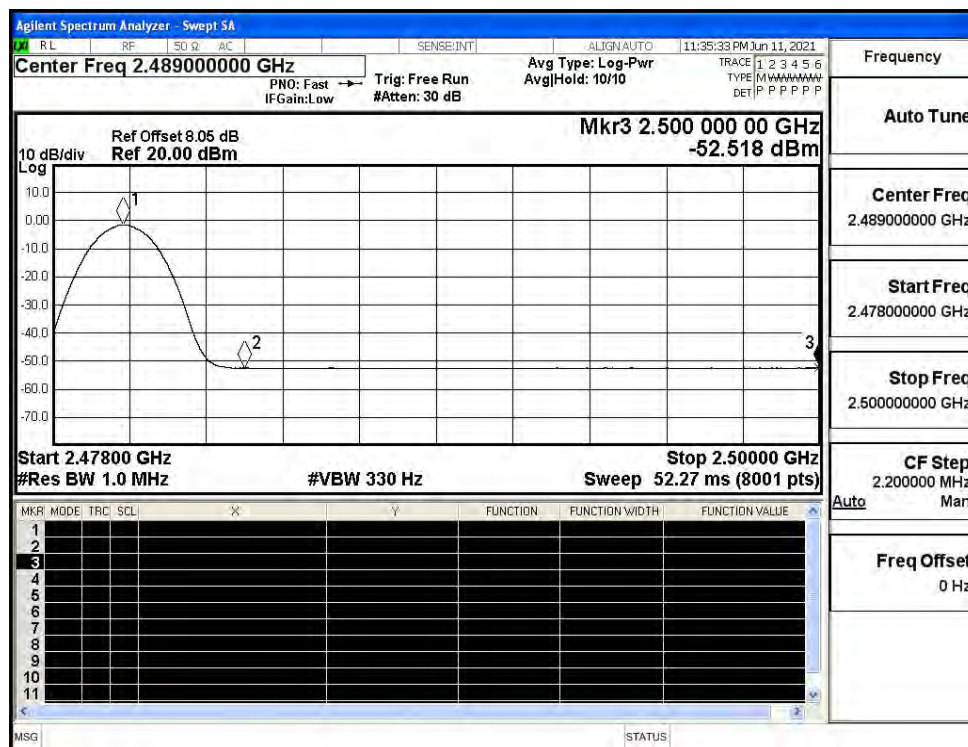
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (Low Channel)



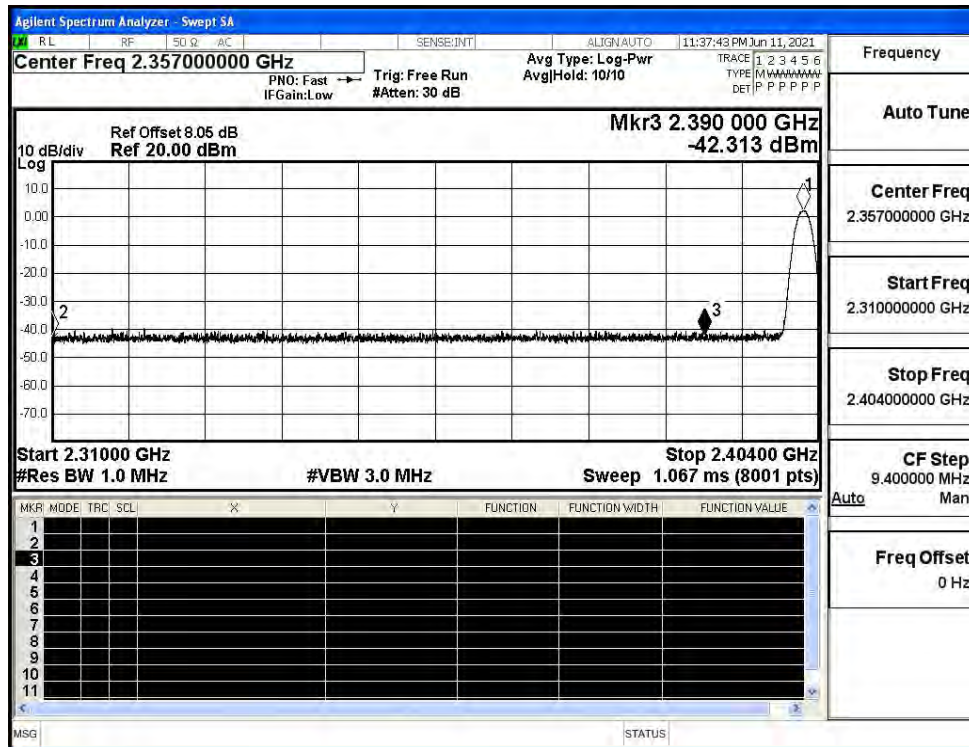
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (High Channel)



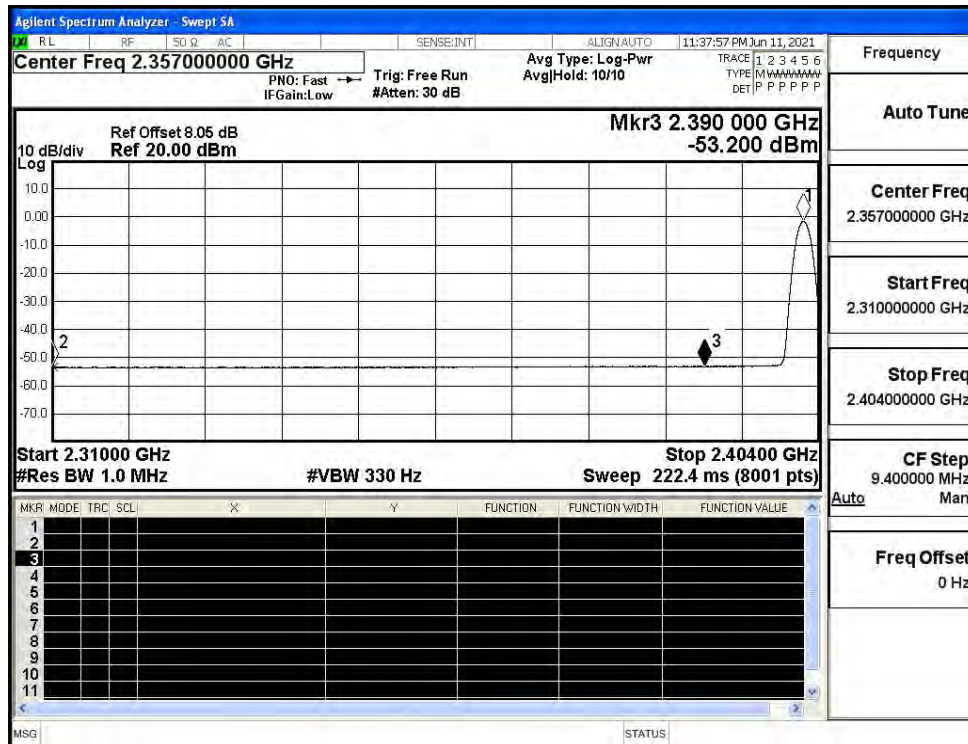
Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



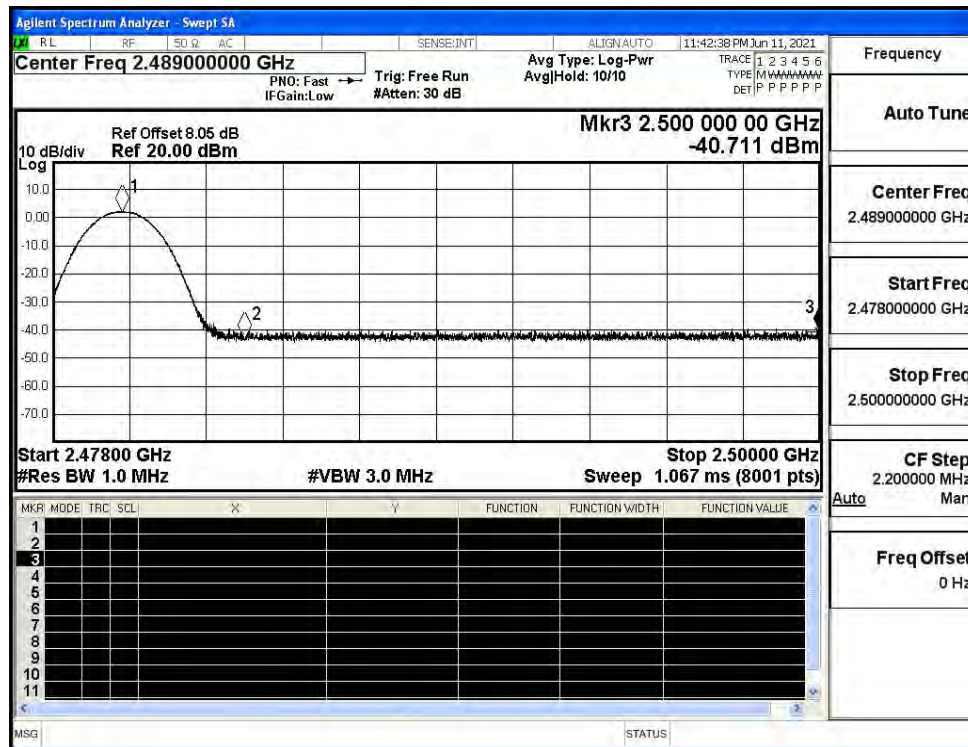
Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (Low Channel)



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)

