

Appendix A

RF Test Data for BT V4.2(BDR/EDR) (Conducted Measurement)

Product Name: Rechargeable Blue tooth speaker light

Trade Mark: Good Earth

Test Model: RE1203-WHG-07LF1-G

Environmental Conditions

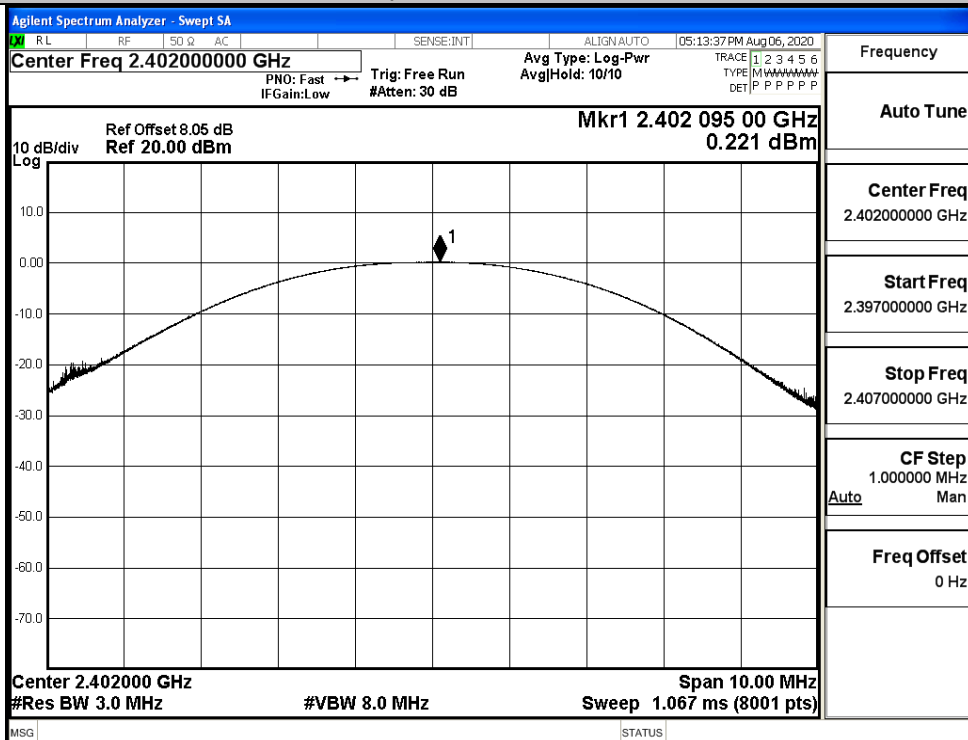
Temperature:	24.3°C
Relative Humidity:	54.3%
ATM Pressure:	100.0 kPa
Test Engineer:	JAM ZHENG
Supervised by:	Li Huan

A.1 Maximum Conducted Peak Output Power

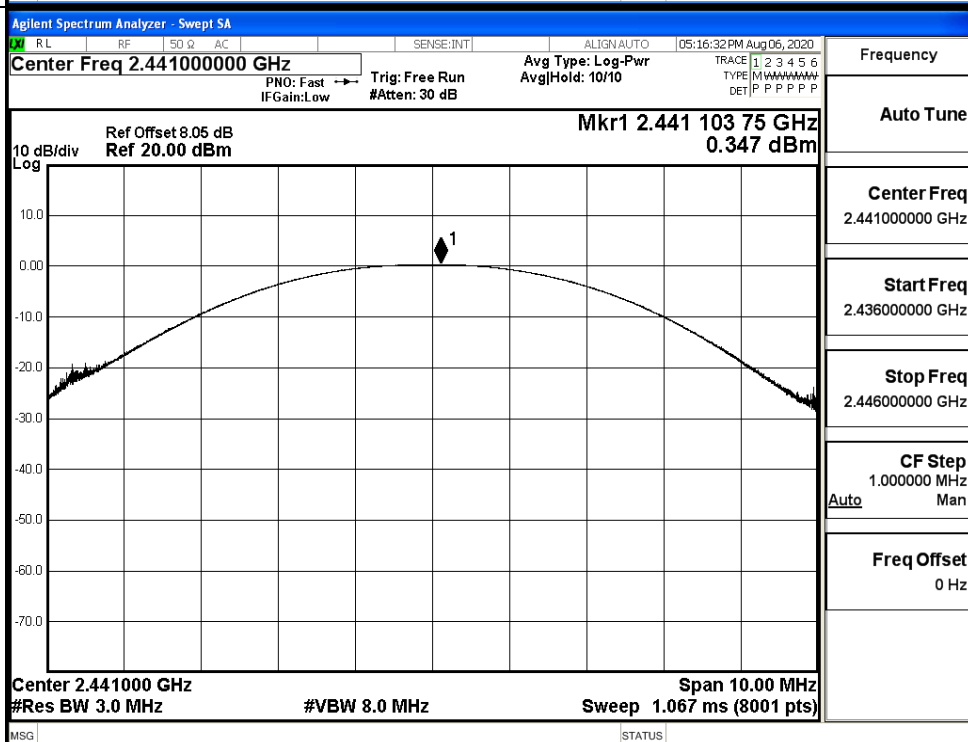
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.221	21	PASS
	MCH	0.347	21	PASS
	HCH	0.135	21	PASS
$\pi/4$ DQPSK	LCH	1.389	21	PASS
	MCH	1.522	21	PASS
	HCH	1.374	21	PASS

Test Graphs

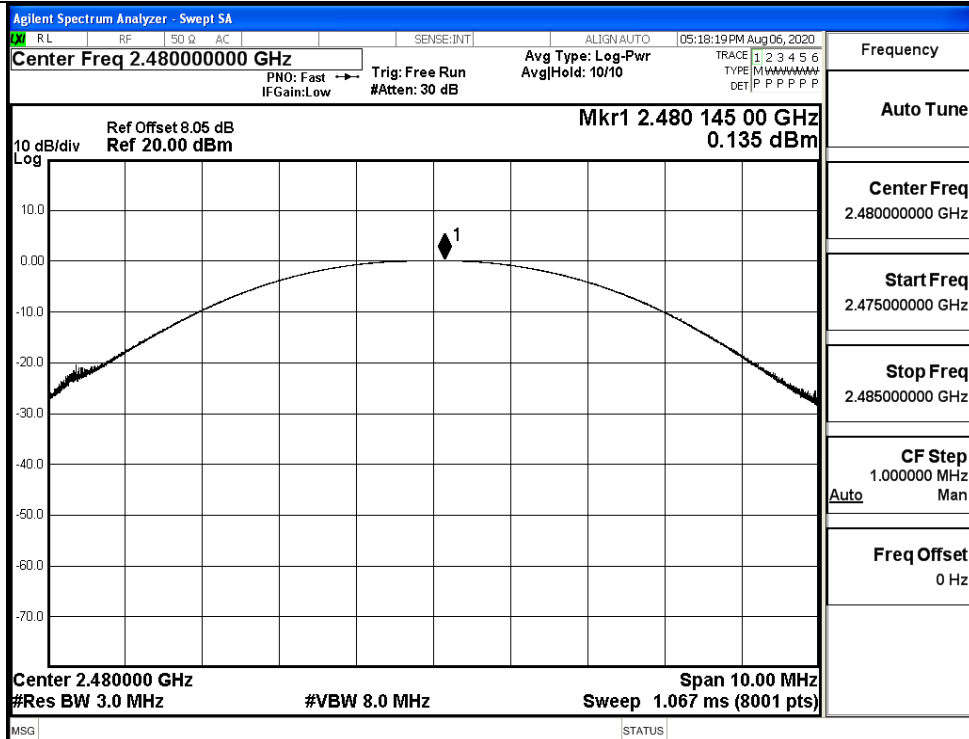
GFSK/LCH



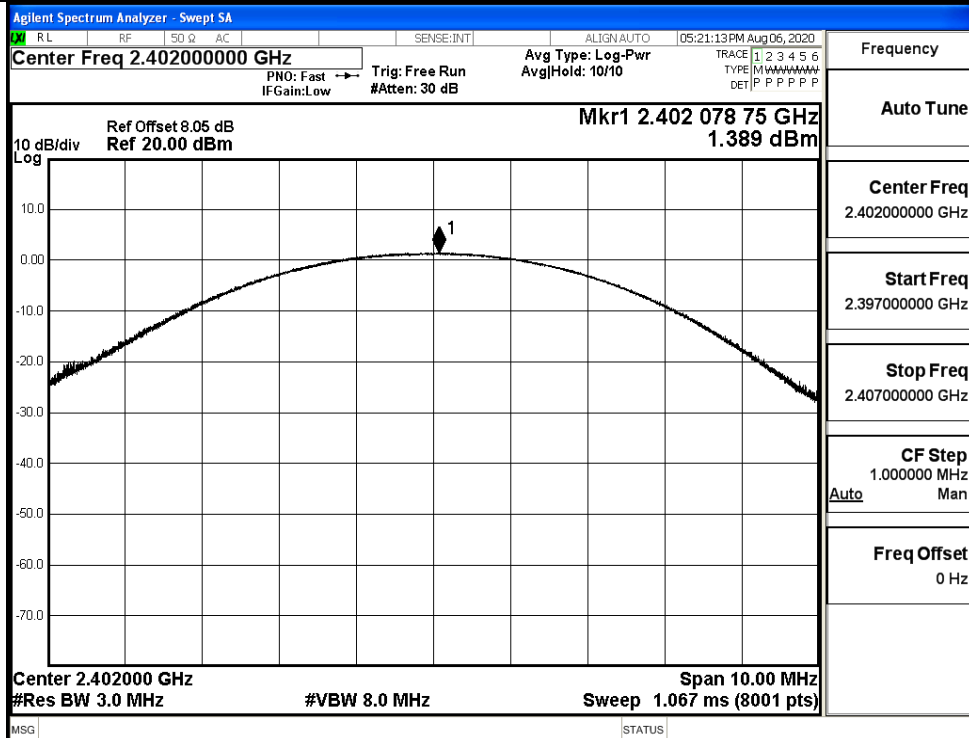
GFSK/MCH

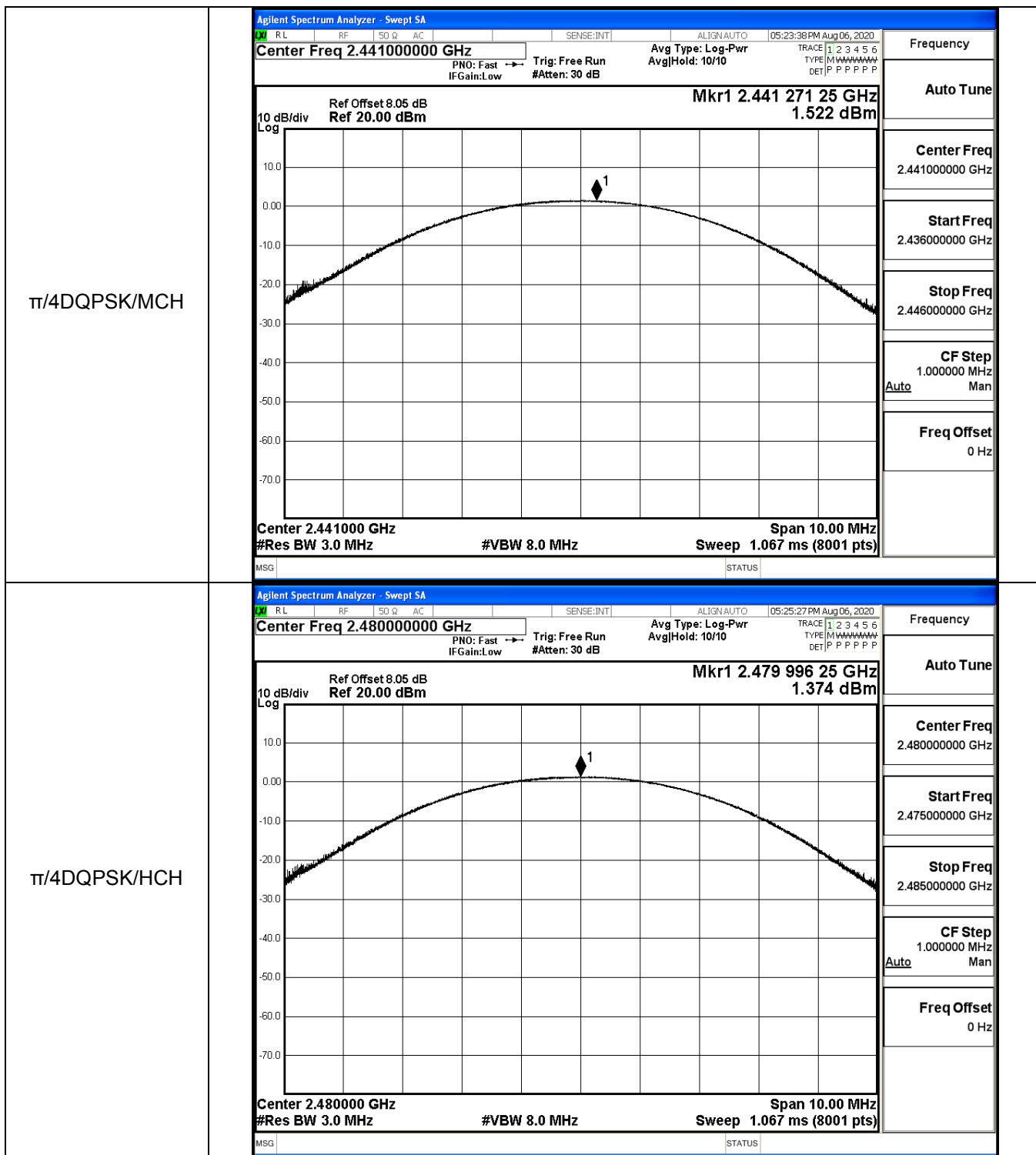


GFSK/HCH



$\pi/4$ DQPSK/LCH

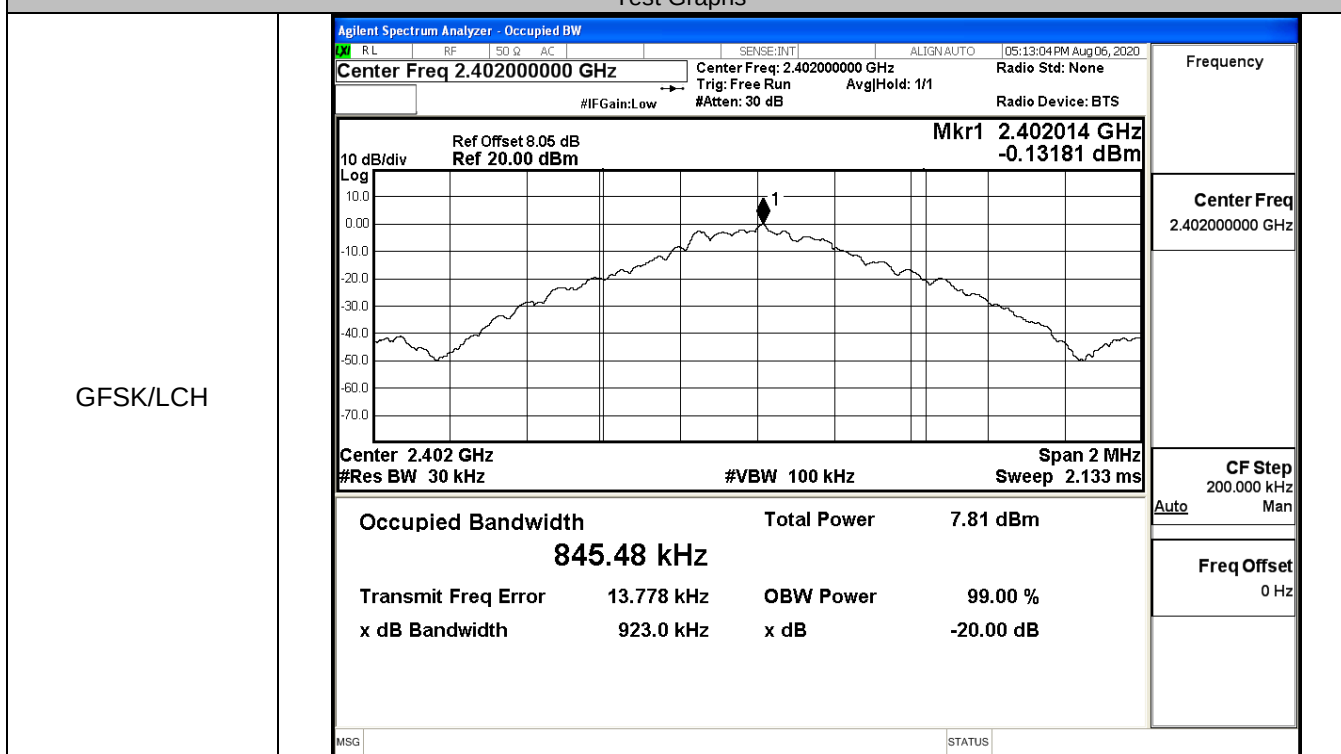




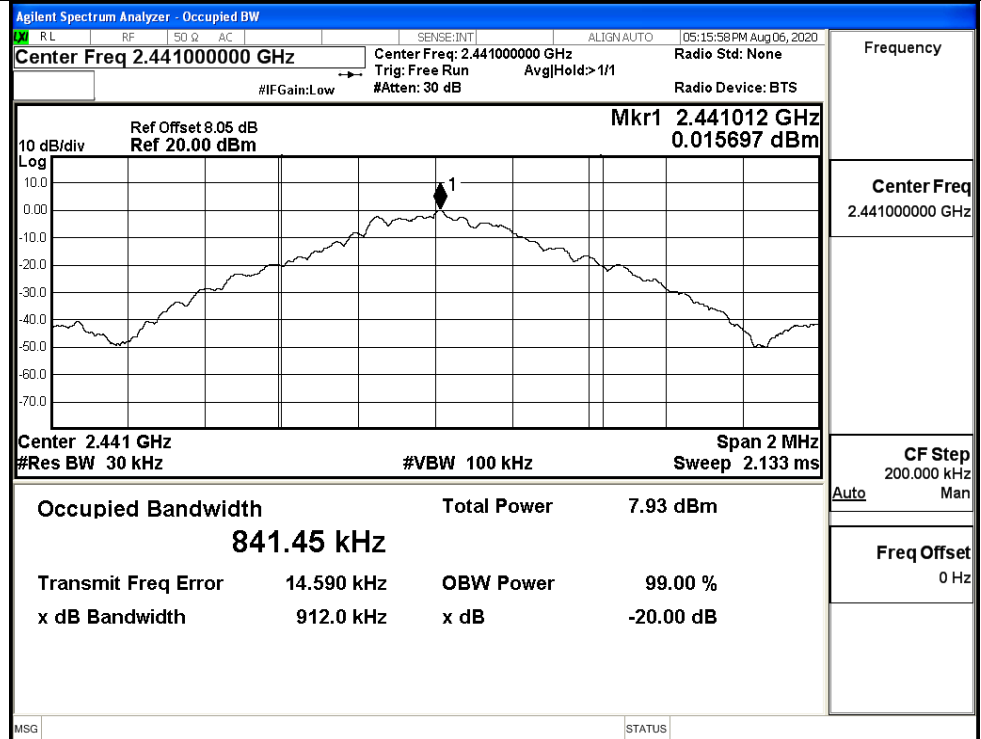
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9230	Not Specified	PASS
	MCH	0.9120	Not Specified	PASS
	HCH	0.9221	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.225	Not Specified	PASS
	MCH	1.255	Not Specified	PASS
	HCH	1.228	Not Specified	PASS

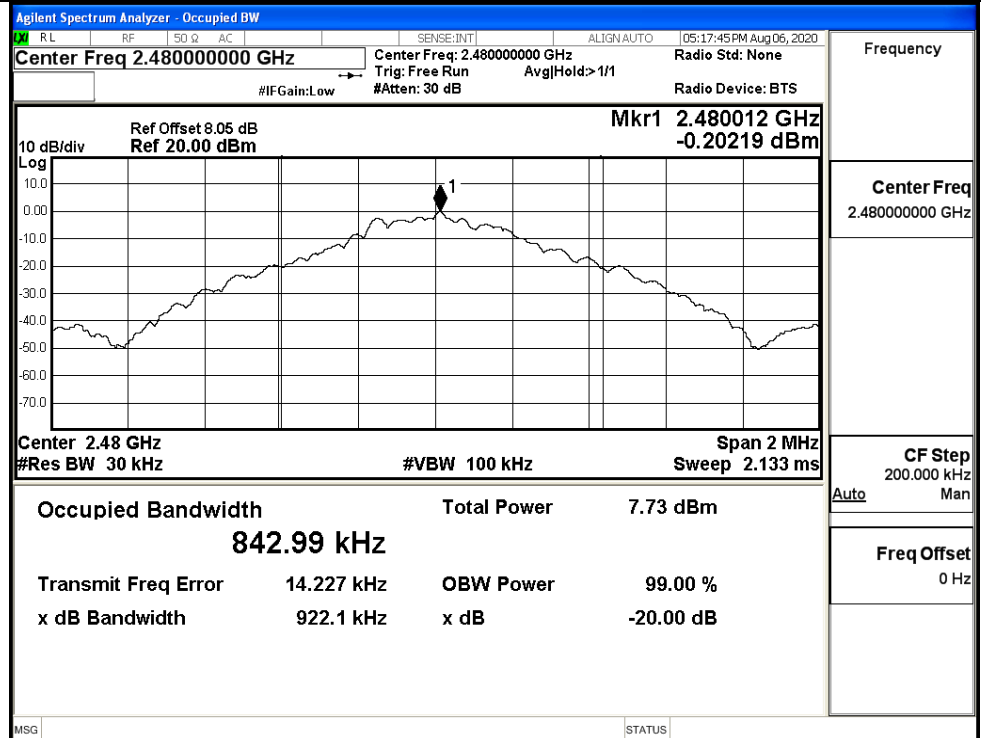
Test Graphs

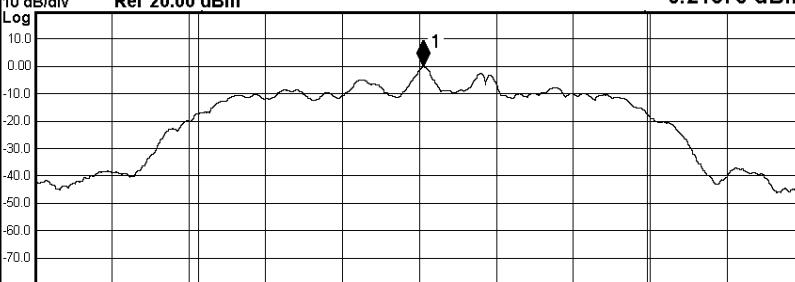
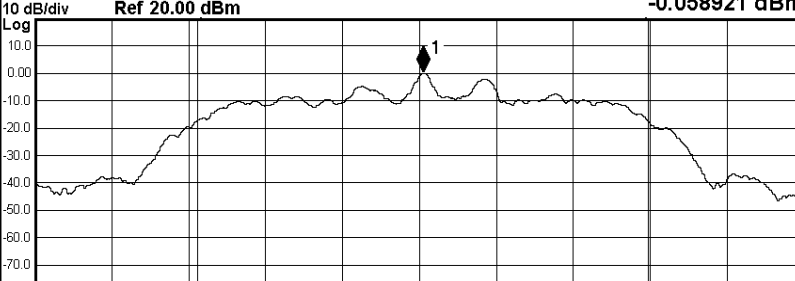


GFSK/MCH

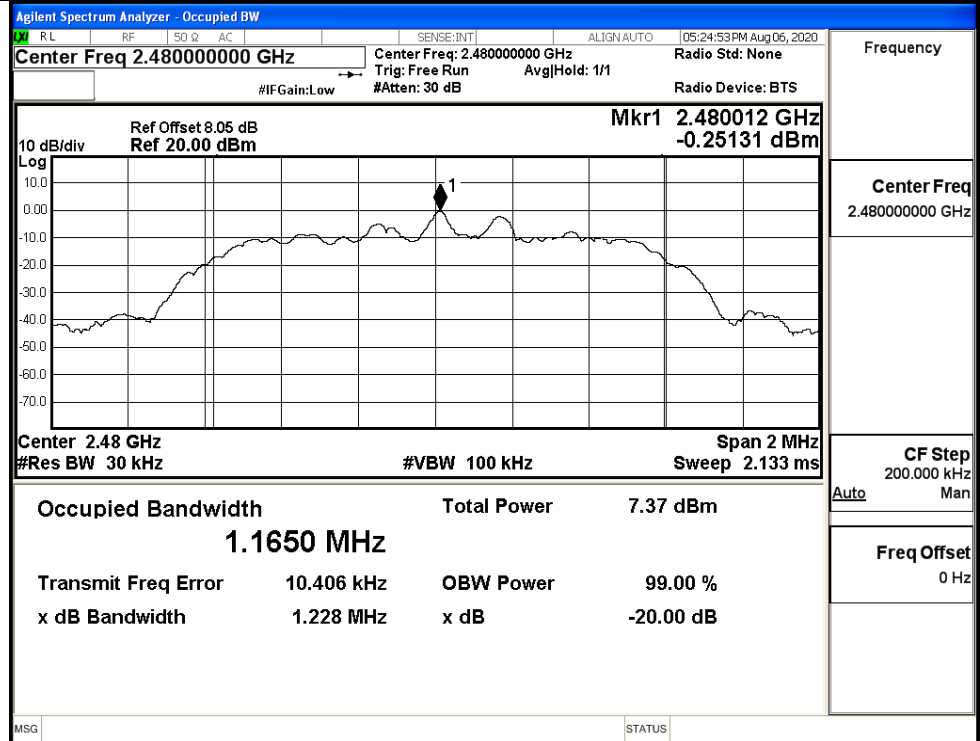


GFSK/HCH



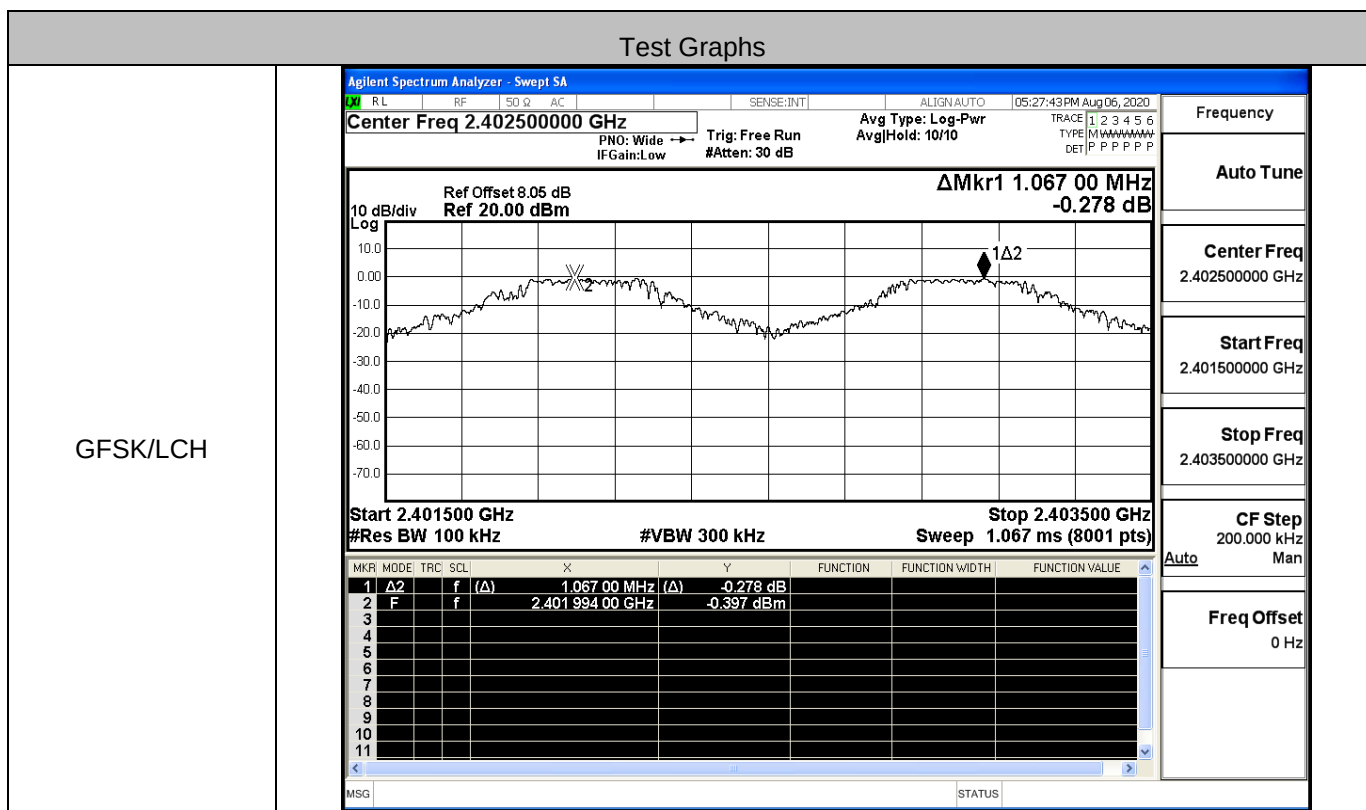
$\pi/4$DQPSK/LCH	Agilent Spectrum Analyzer - Occupied BW RL RF 50 Q AC SENSE:INT ALIGN: AUTO 05:20:39 PM Aug 06, 2020 Center Freq 2.40200000 GHz Center Freq: 2.40200000 GHz Trig: Free Run Avg/Hold: 1/1 Radio Std: None #IFGain: Low #Atten: 30 dB Radio Device: BTS Ref Offset 8.05 dB Ref 20.00 dBm Mkr1 2.40201 GHz -0.21375 dBm  Center 2.402 GHz #Res BW 30 kHz #VBW 100 kHz Span 2 MHz Sweep 2.133 ms Occupied Bandwidth 1.1650 MHz Total Power 7.36 dBm Transmit Freq Error 10.386 kHz OBW Power 99.00 % x dB Bandwidth 1.225 MHz x dB -20.00 dB MSG STATUS	Frequency Center Freq 2.40200000 GHz CF Step 200.000 kHz Auto Man Freq Offset 0 Hz
$\pi/4$DQPSK/MCH	Agilent Spectrum Analyzer - Occupied BW RL RF 50 Q AC SENSE:INT ALIGN: AUTO 05:23:04 PM Aug 06, 2020 Center Freq 2.44100000 GHz Center Freq: 2.44100000 GHz Trig: Free Run Avg/Hold: 1/1 Radio Std: None #IFGain: Low #Atten: 30 dB Radio Device: BTS Ref Offset 8.05 dB Ref 20.00 dBm Mkr1 2.44101 GHz -0.058921 dBm  Center 2.441 GHz #Res BW 30 kHz #VBW 100 kHz Span 2 MHz Sweep 2.133 ms Occupied Bandwidth 1.1647 MHz Total Power 7.59 dBm Transmit Freq Error 10.646 kHz OBW Power 99.00 % x dB Bandwidth 1.255 MHz x dB -20.00 dB MSG STATUS	Frequency Center Freq 2.44100000 GHz CF Step 200.000 kHz Auto Man Freq Offset 0 Hz

$\pi/4$ DQPSK/HCH

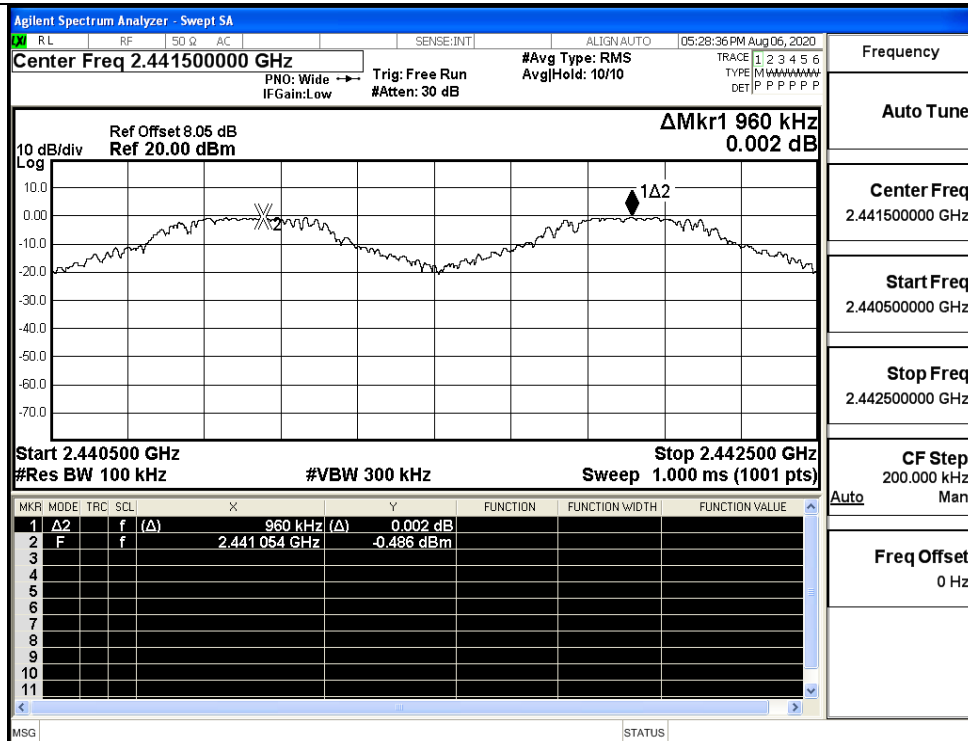


A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.067	0.615	PASS
	MCH	0.960	0.615	PASS
	HCH	0.924	0.615	PASS
$\pi/4$ DQPSK	LCH	0.882	0.837	PASS
	MCH	1.156	0.837	PASS
	HCH	1.296	0.837	PASS



GFSK/MCH



Frequency

Auto Tune

Center Freq
2.441500000 GHz

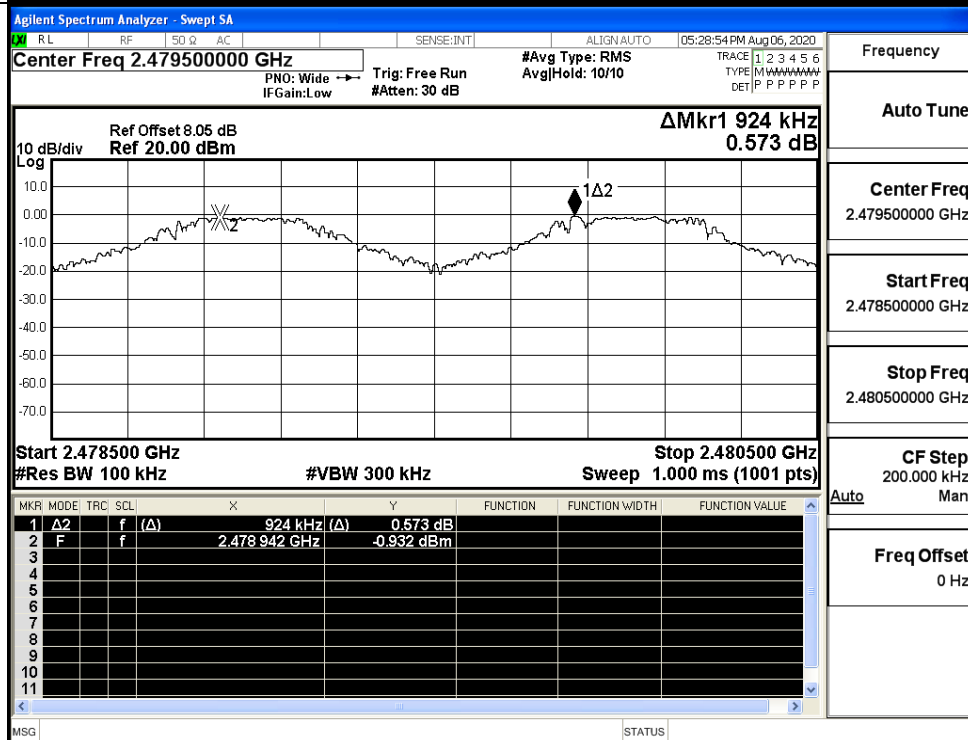
Start Freq
2.440500000 GHz

Stop Freq
2.442500000 GHz

CF Step
200.000 kHz
Man

Freq Offset
0 Hz

GFSK/HCH



Frequency

Auto Tune

Center Freq
2.479500000 GHz

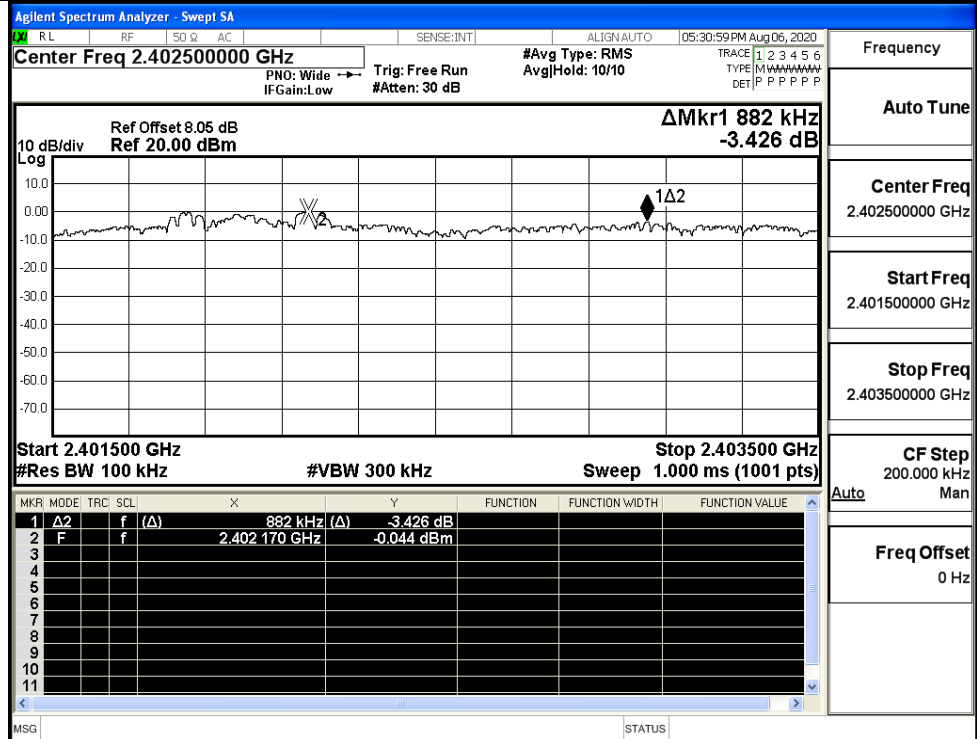
Start Freq
2.478500000 GHz

Stop Freq
2.480500000 GHz

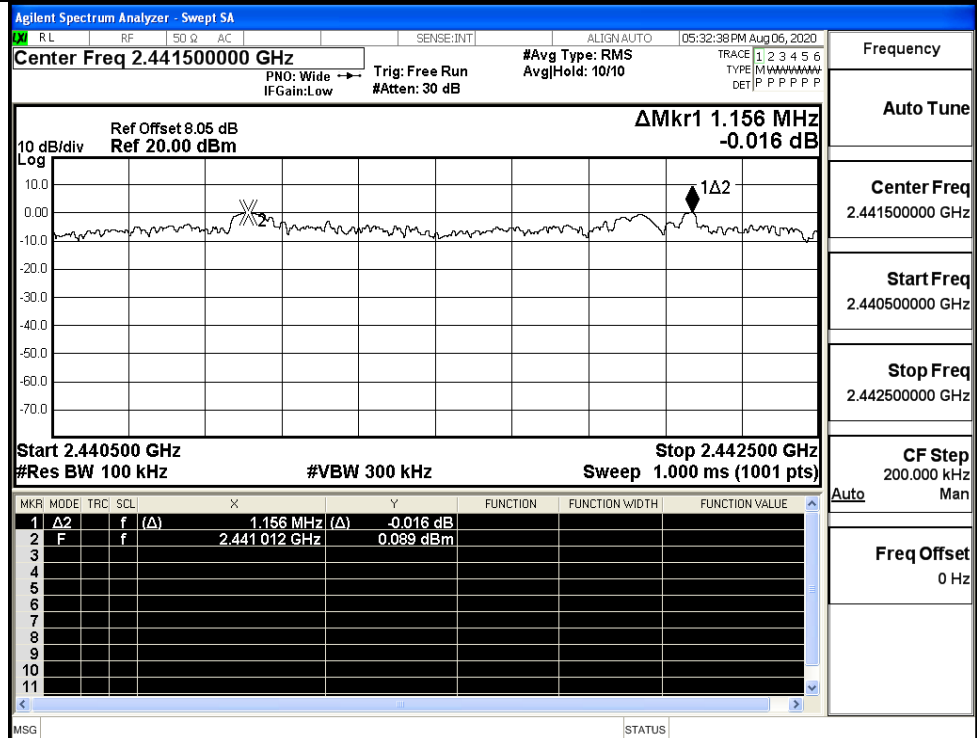
CF Step
200.000 kHz
Man

Freq Offset
0 Hz

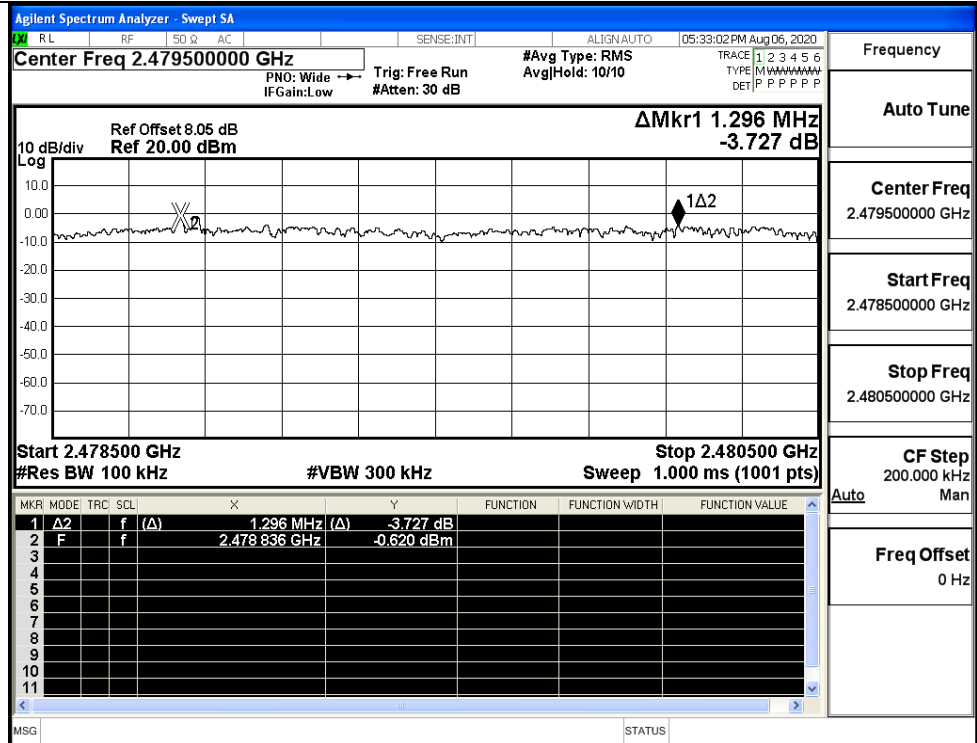
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH



$\pi/4$ DQPSK/HCH

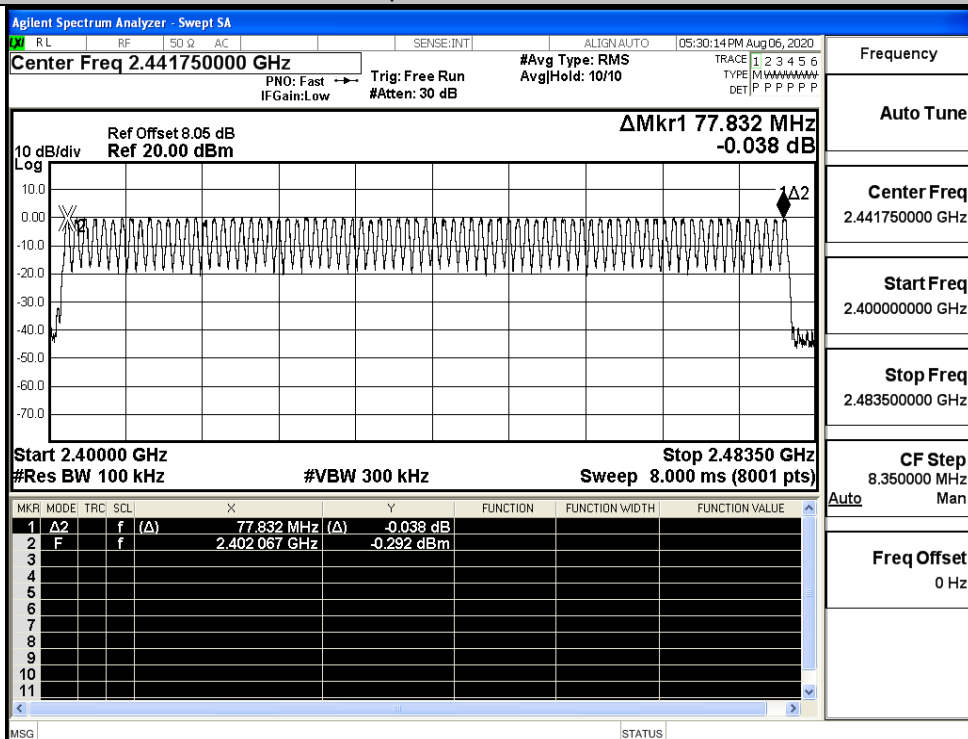


A.4 Hopping Channel Number

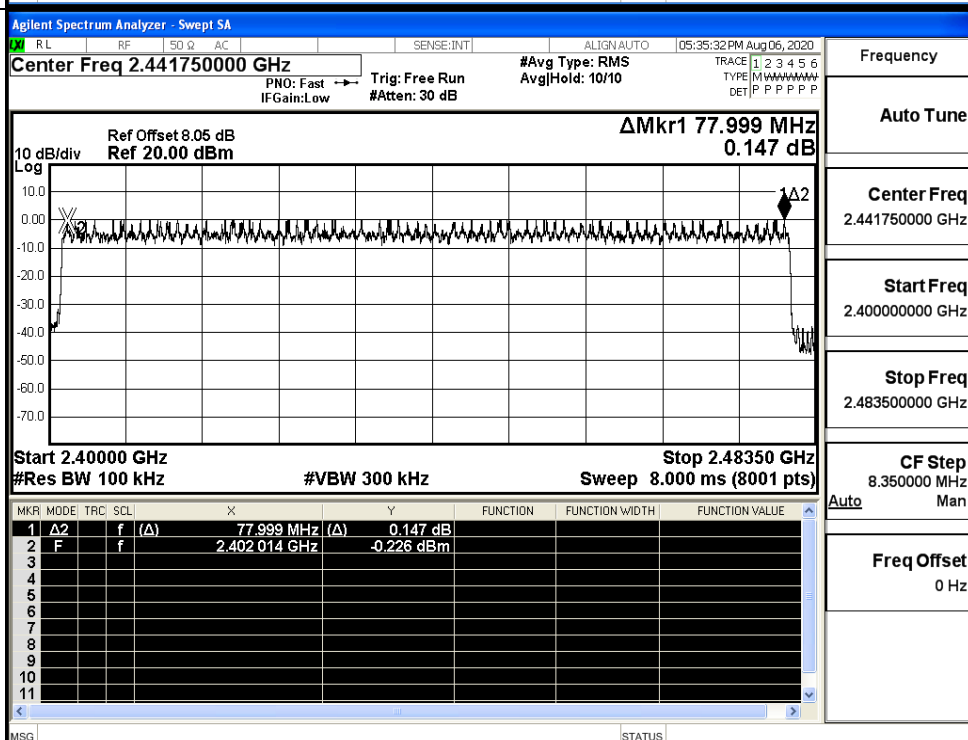
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	≥ 15	PASS
$\pi/4$ DQPSK	Hop	79	≥ 15	PASS
8DPSK	Hop	79	≥ 15	PASS

Test Graphs

GFSK/Hop

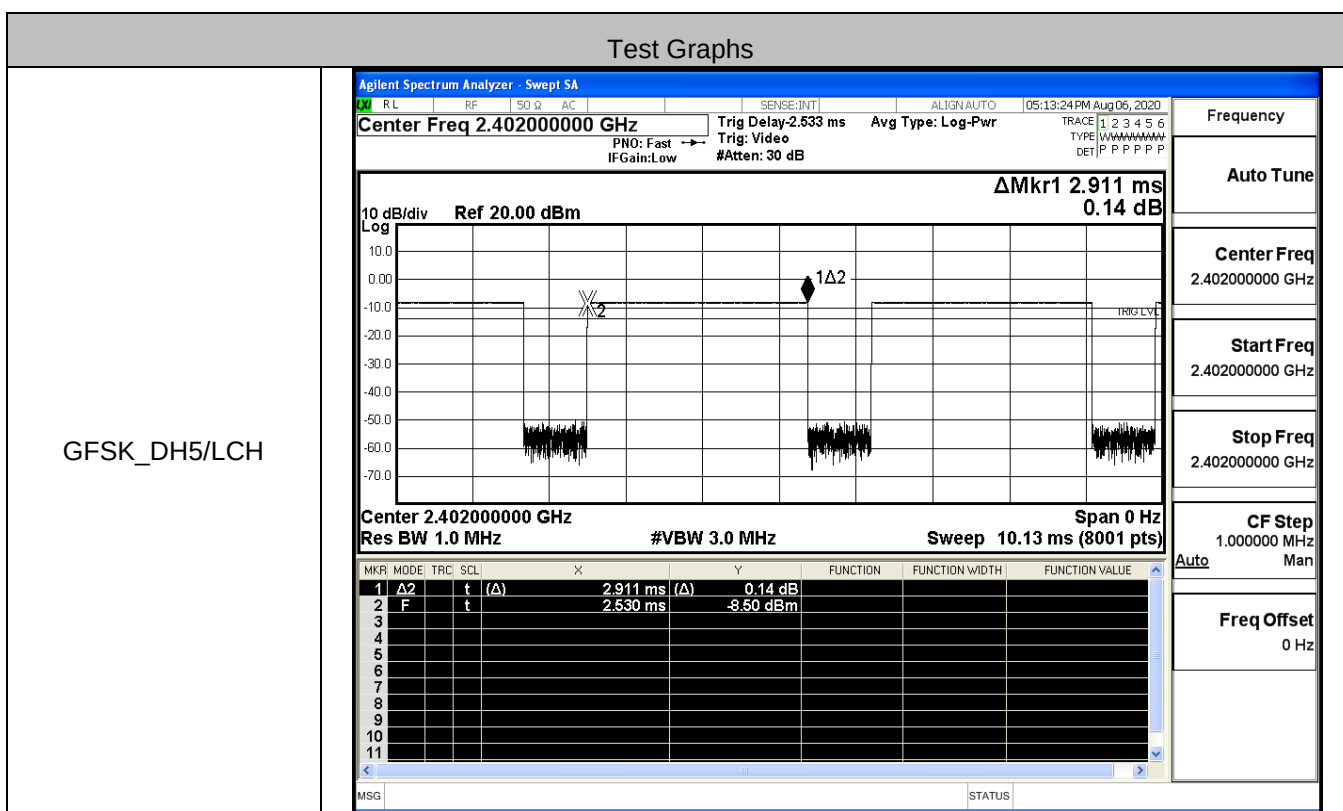


$\pi/4$ DQPSK/Hop

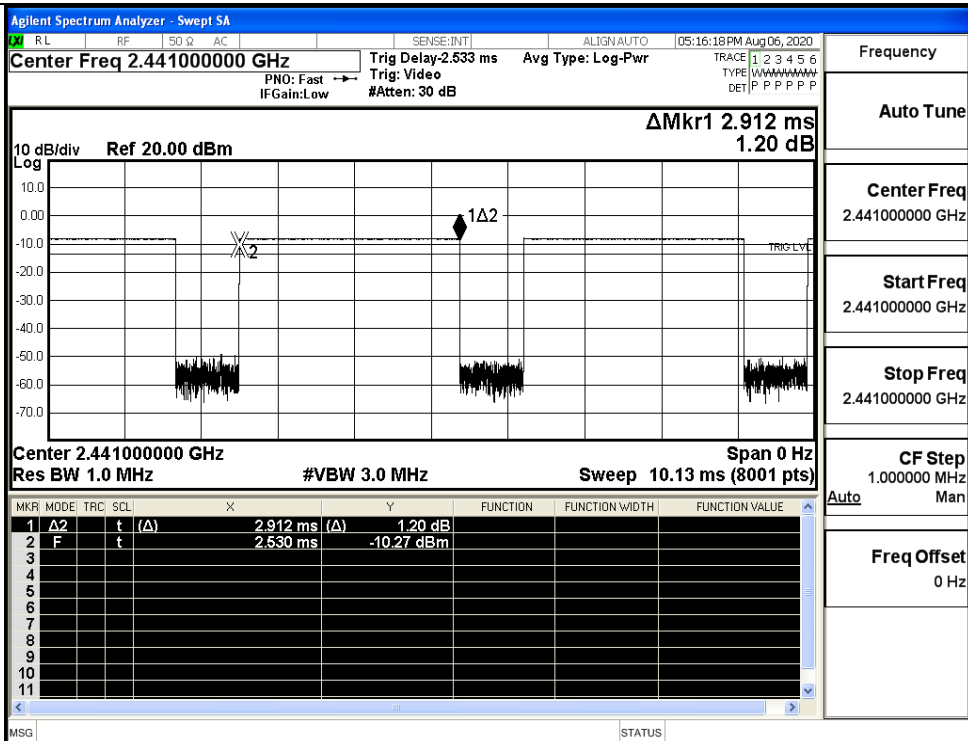


A.5 Dwell Time

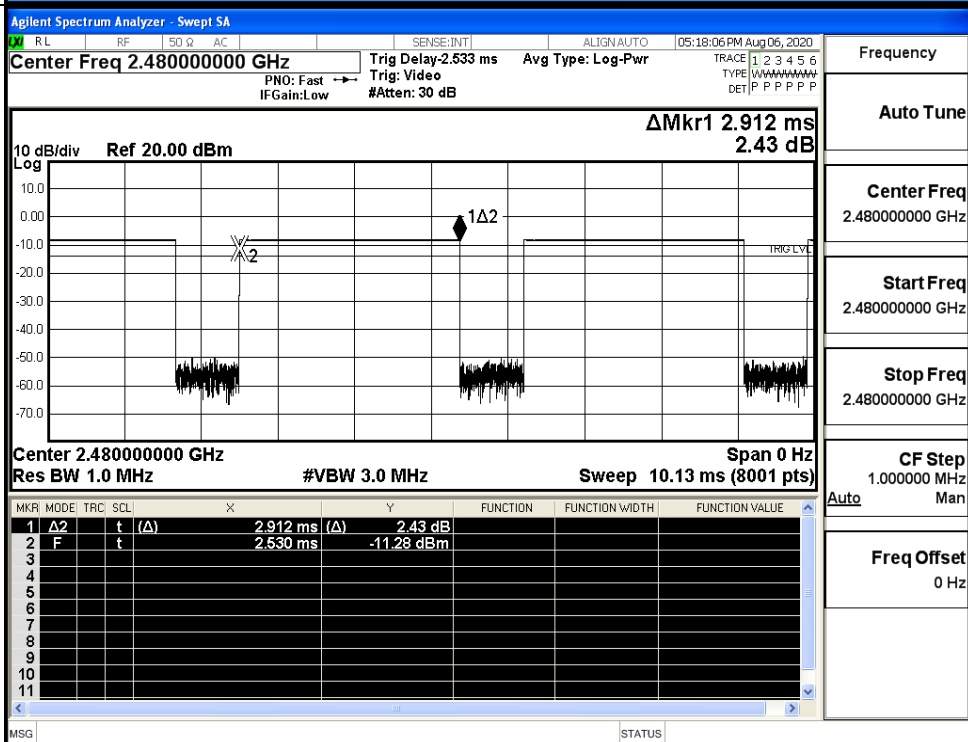
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.91	106.7	0.31	0.4	PASS
	DH5	MCH	2.91	106.7	0.31	0.4	PASS
	DH5	HCH	2.91	106.7	0.31	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.91	106.7	0.312	0.4	PASS
	2DH5	MCH	2.91	106.7	0.312	0.4	PASS
	2DH5	HCH	2.91	106.7	0.312	0.4	PASS



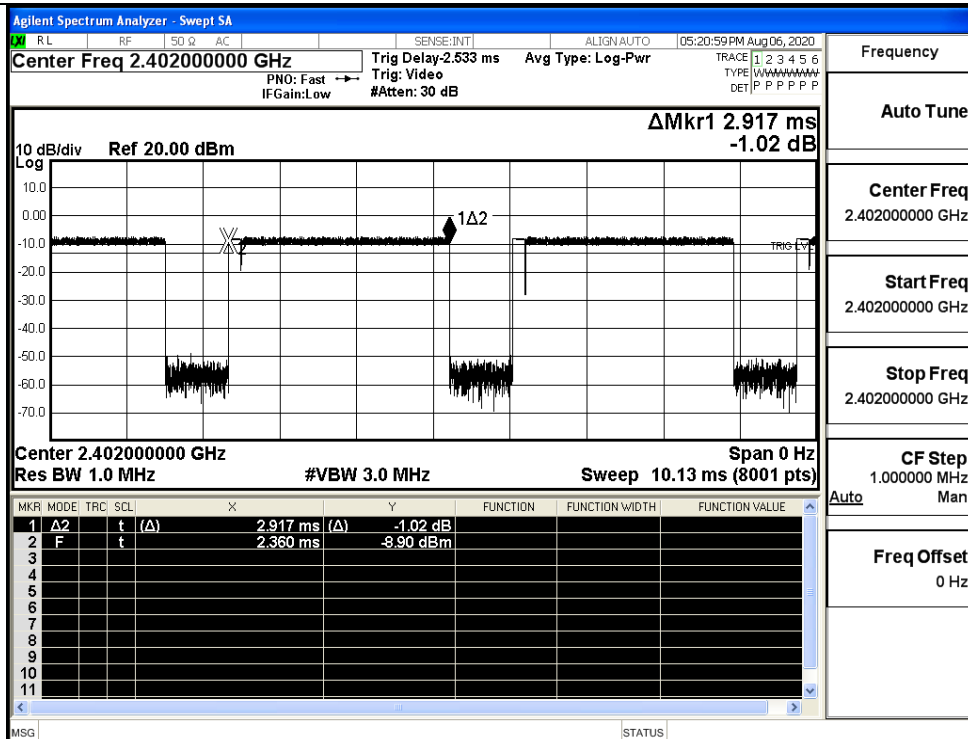
GFSK_DH5/MCH



GFSK_DH5/HCH



$\pi/4$ DQPSK
_2DH5/LCH



Frequency

Auto Tune

Center Freq
2.402000000 GHz

Start Freq
2.402000000 GHz

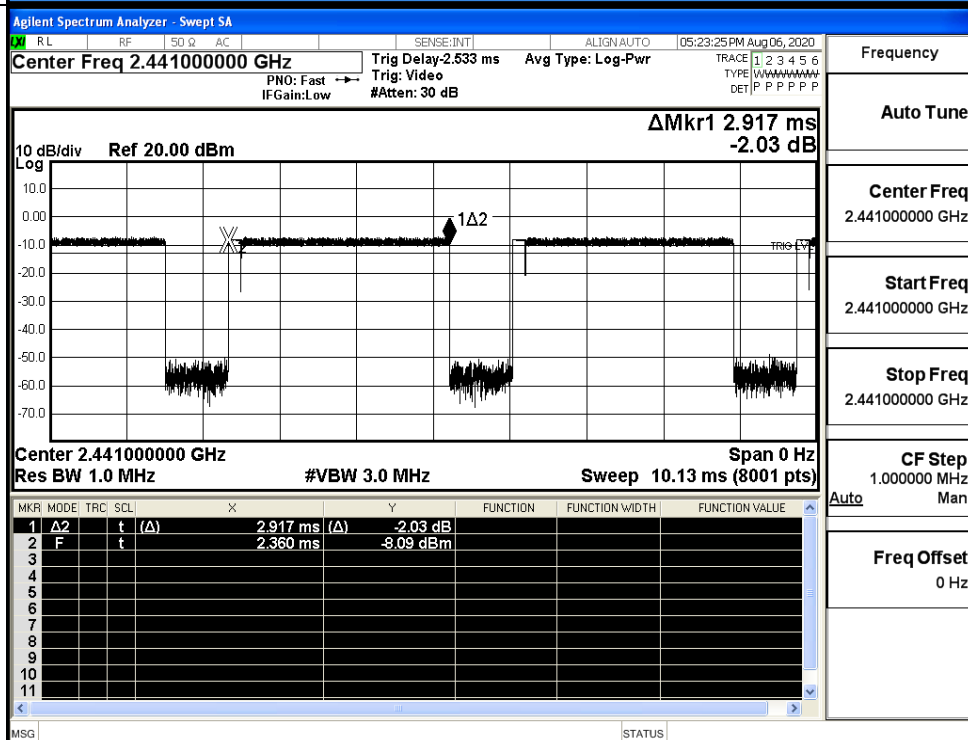
Stop Freq
2.402000000 GHz

CF Step
1.000000 MHz

Auto

Freq Offset
0 Hz

$\pi/4$ DQPSK
_2DH5/MCH



Frequency

Auto Tune

Center Freq
2.441000000 GHz

Start Freq
2.441000000 GHz

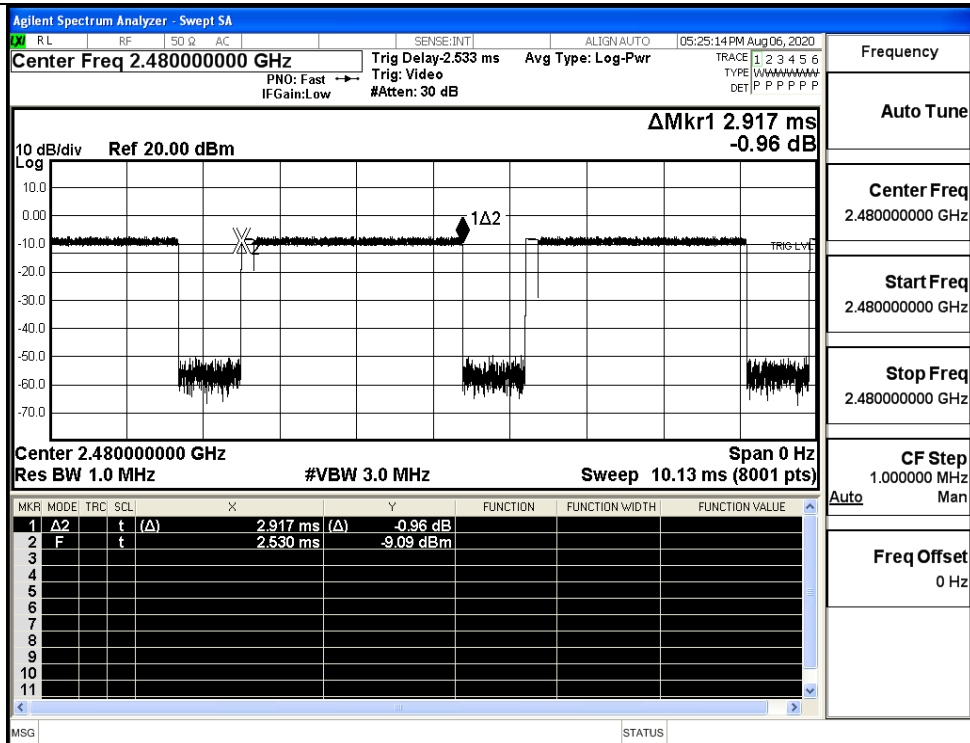
Stop Freq
2.441000000 GHz

CF Step
1.000000 MHz

Auto

Freq Offset
0 Hz

π/4DQPSK
2DH5/HCH

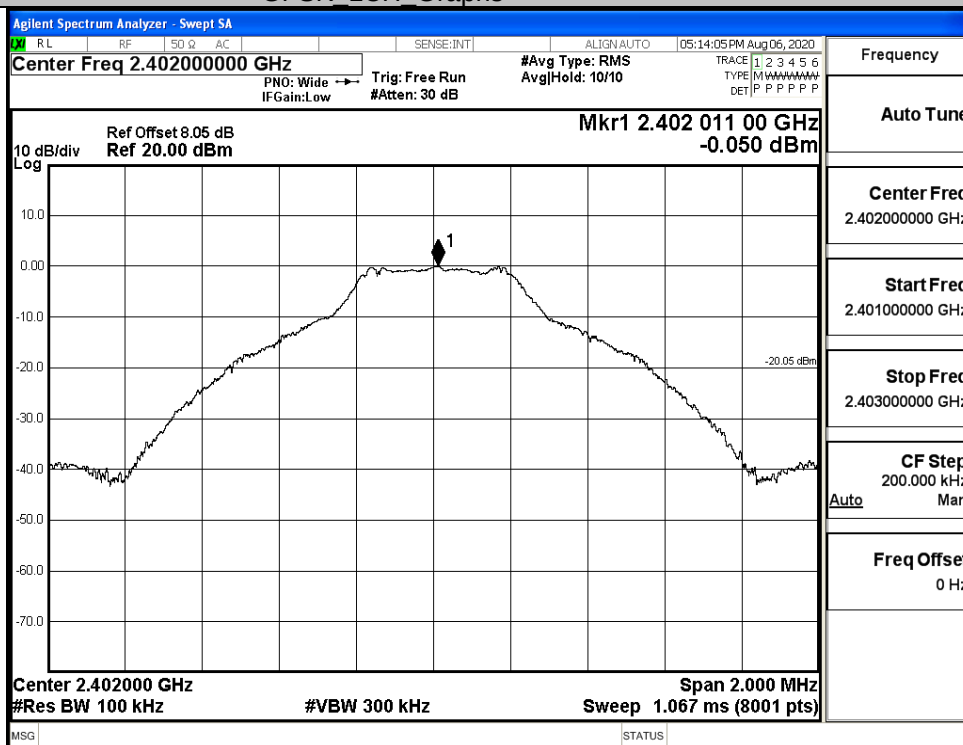


A.6 RF Conducted Spurious Emissions

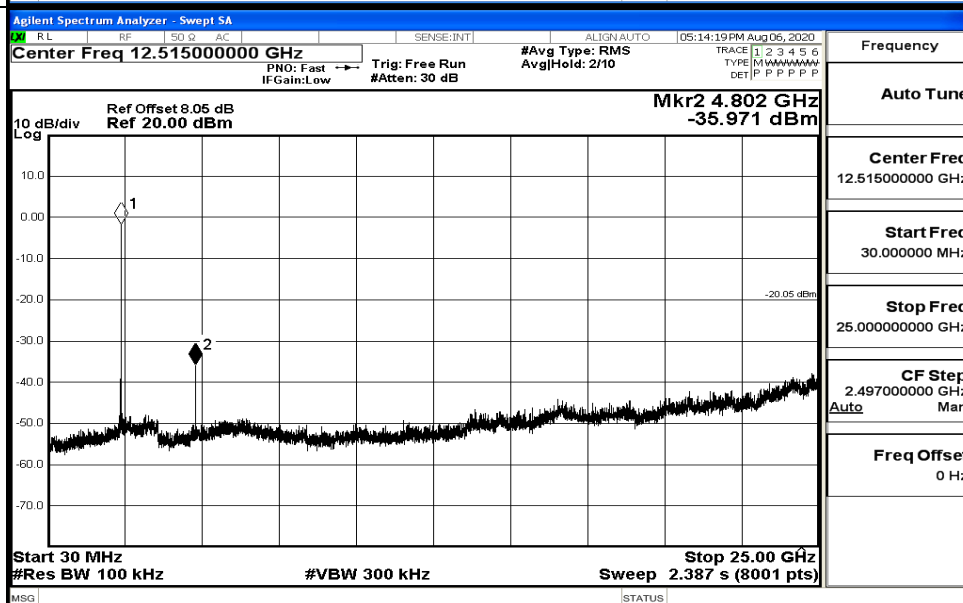
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.05	-35.971	-20.050	PASS
	MCH	0.098	-32.135	-19.902	PASS
	HCH	-0.125	-35.999	-20.125	PASS
$\pi/4$ DQPSK	LCH	-0.025	-33.367	-20.025	PASS
	MCH	0.081	-38.005	-19.919	PASS
	HCH	-0.116	-37.610	-20.116	PASS

GFSK LCH Graphs

Pref

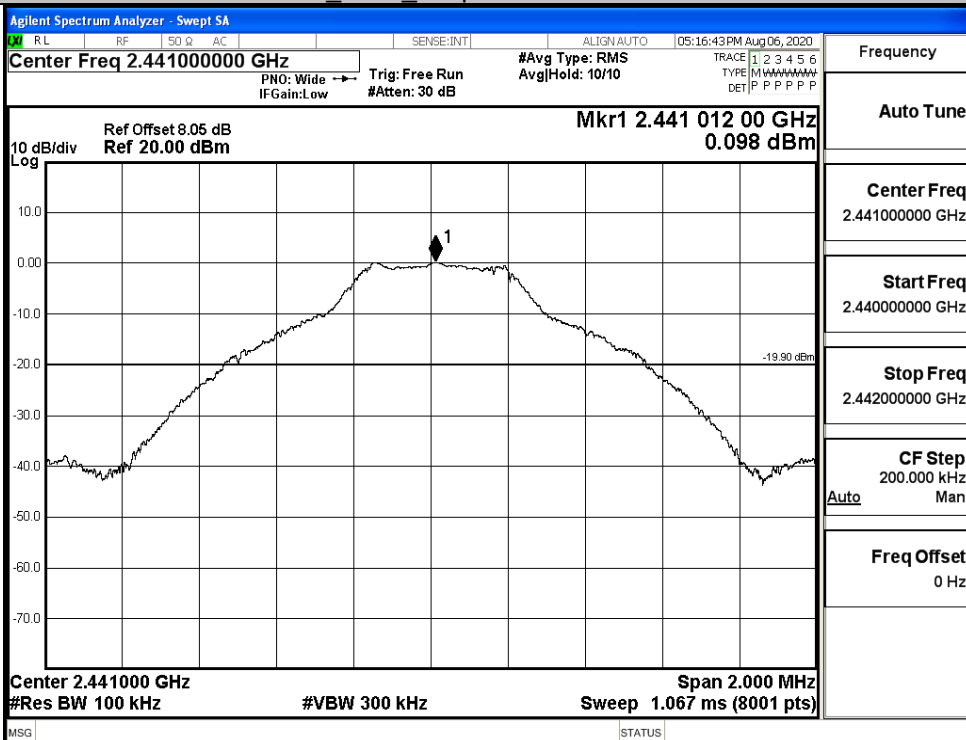


Puw

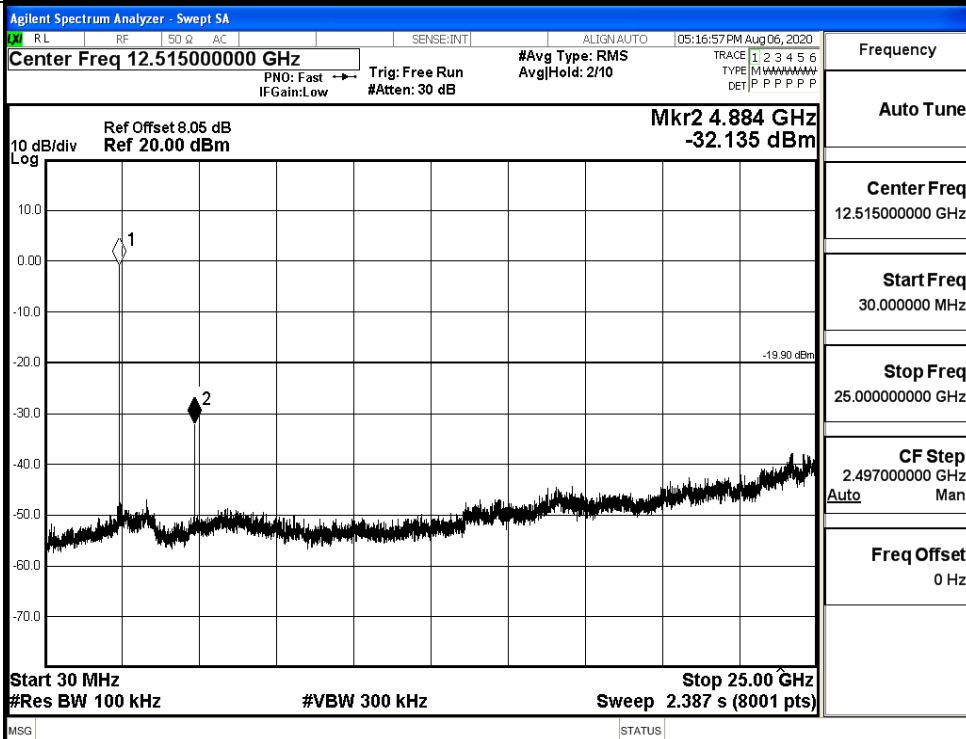


GFSK_MCH_Graphs

Pref

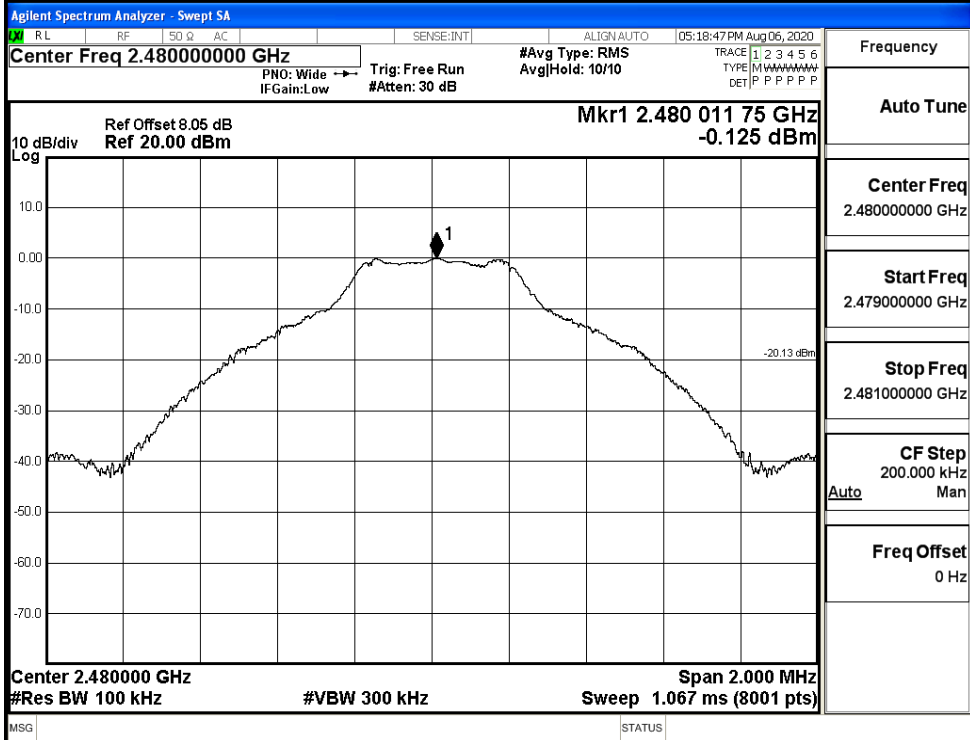


Puw

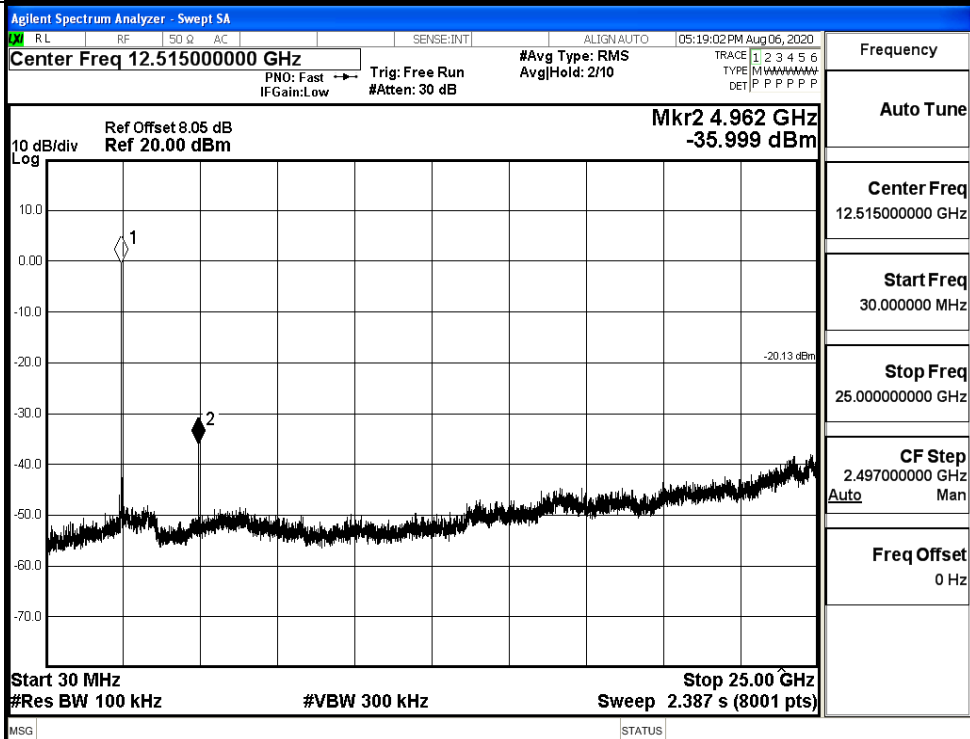


GFSK HCH_Graphs

Pref

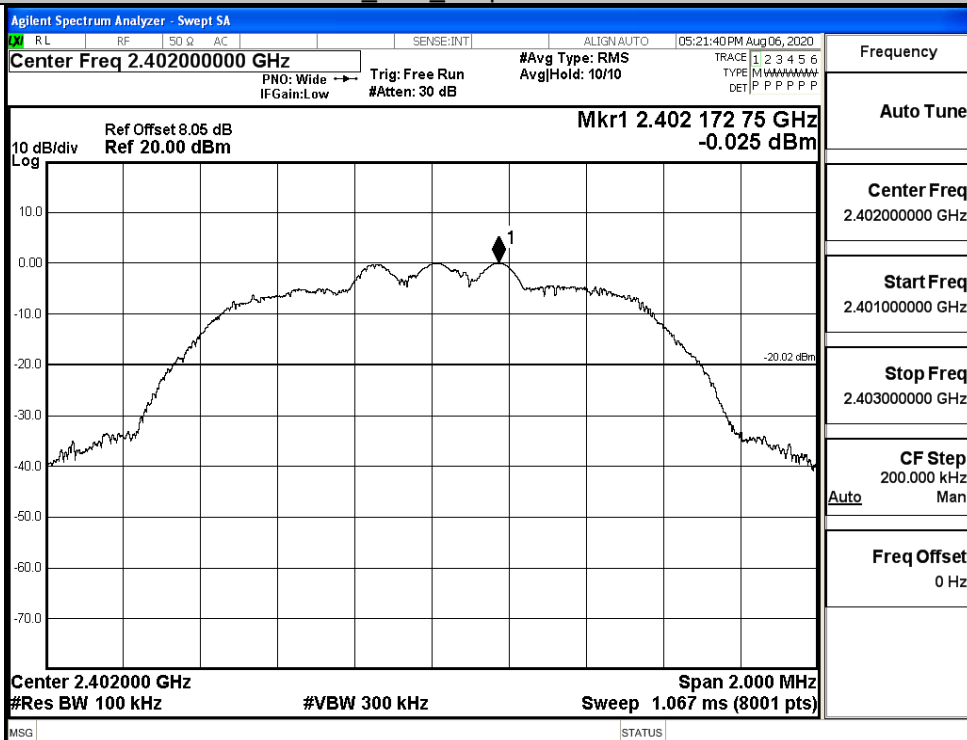


Puw

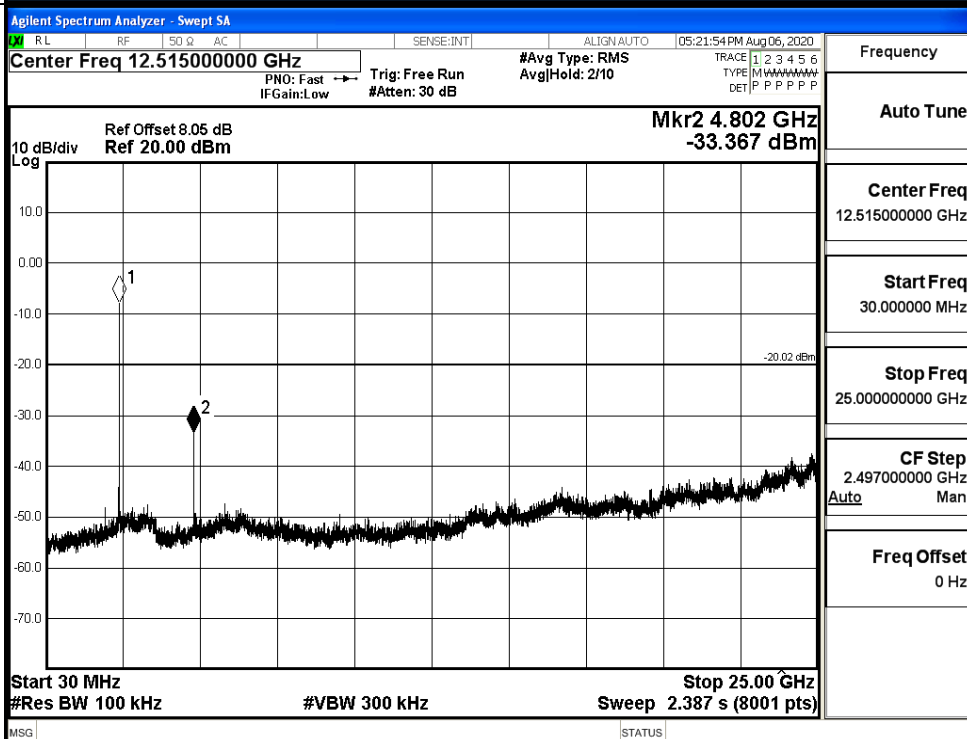


$\pi/4$ DQPSK_LCH_Graphs

Pref

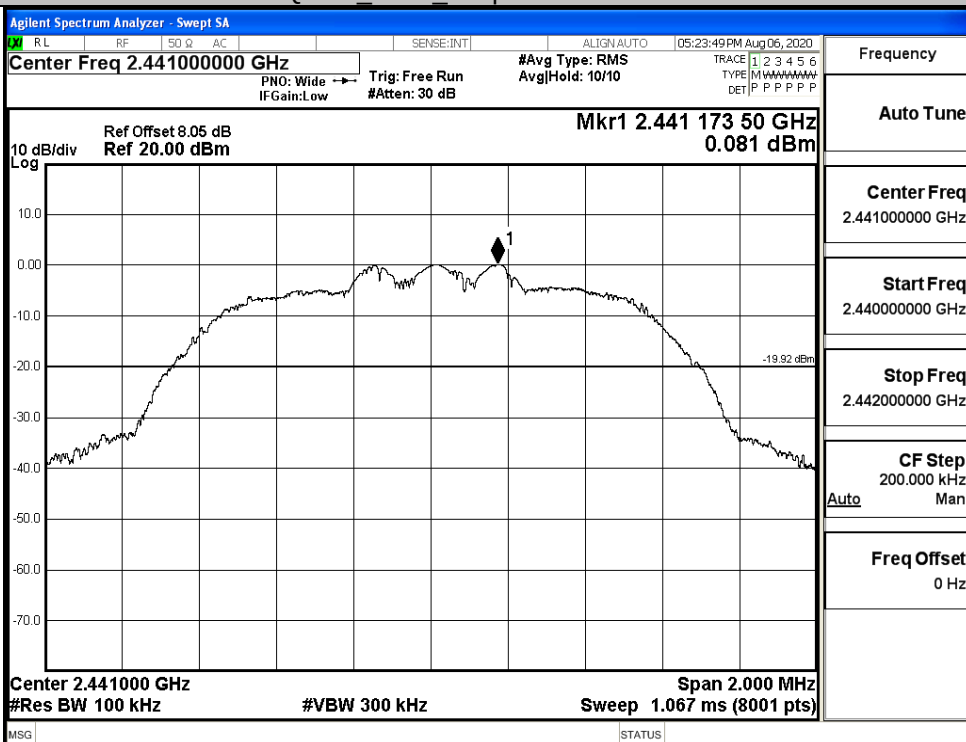


Puw

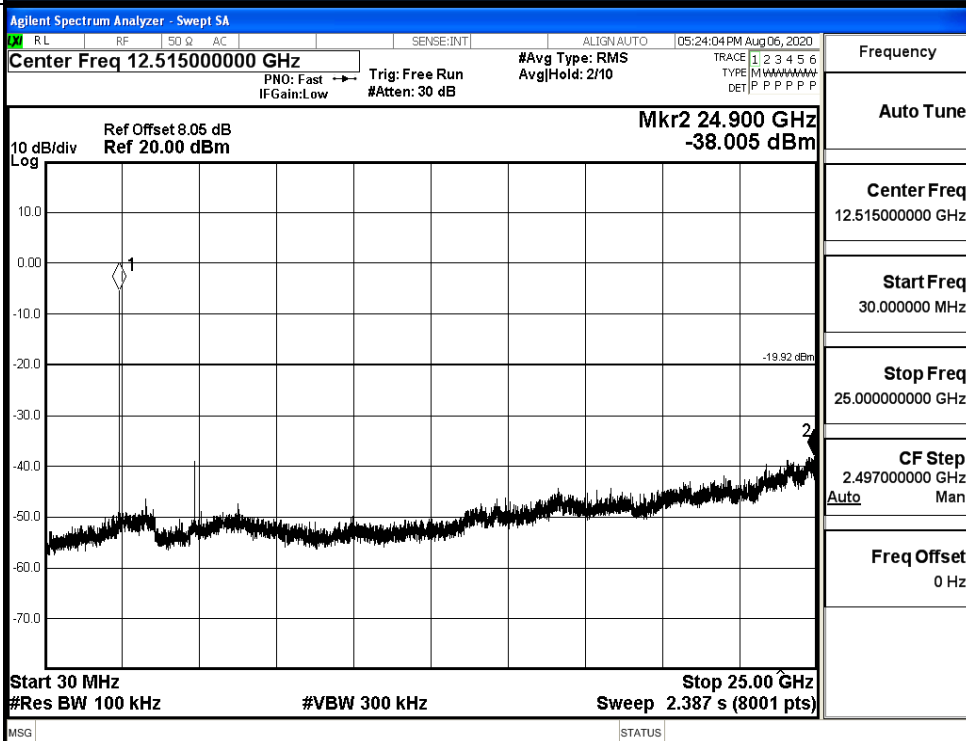


$\pi/4$ DQPSK_MCH_Graphs

Pref

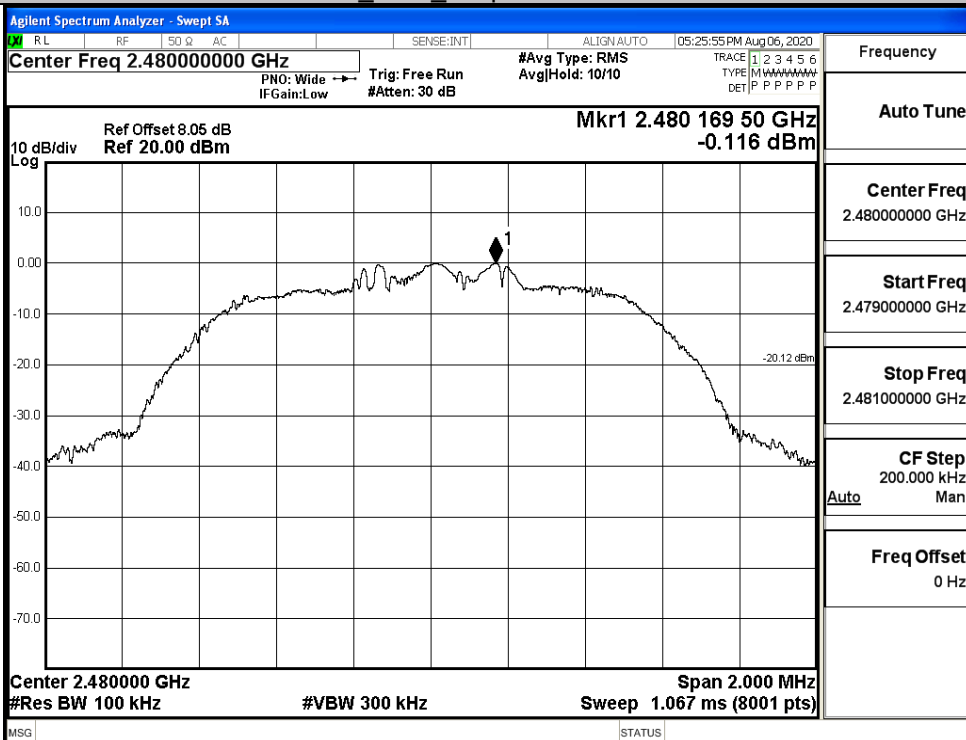


Puw

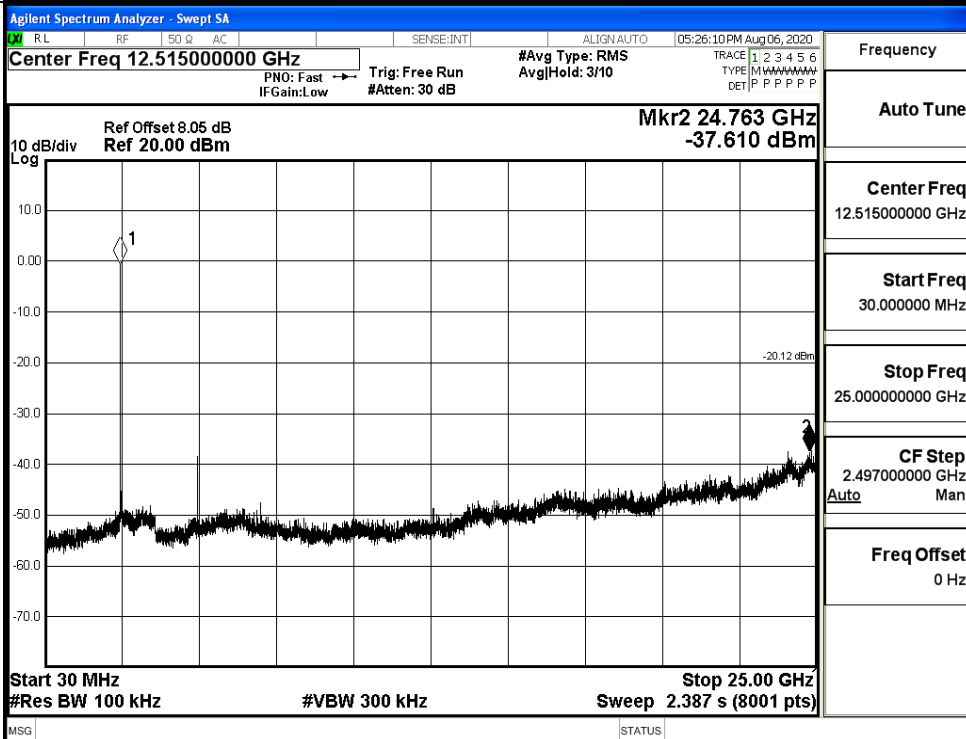


π /4DQPSK_HCH_Graphs

Pref



Puw

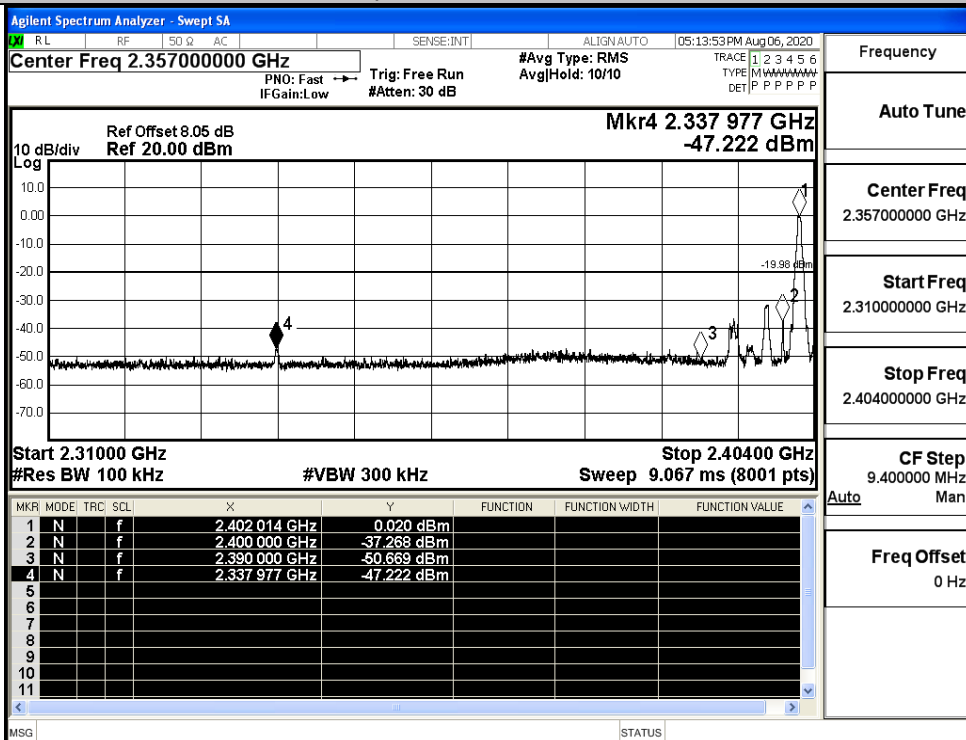


A.7 Band-edge for RF Conducted Emissions

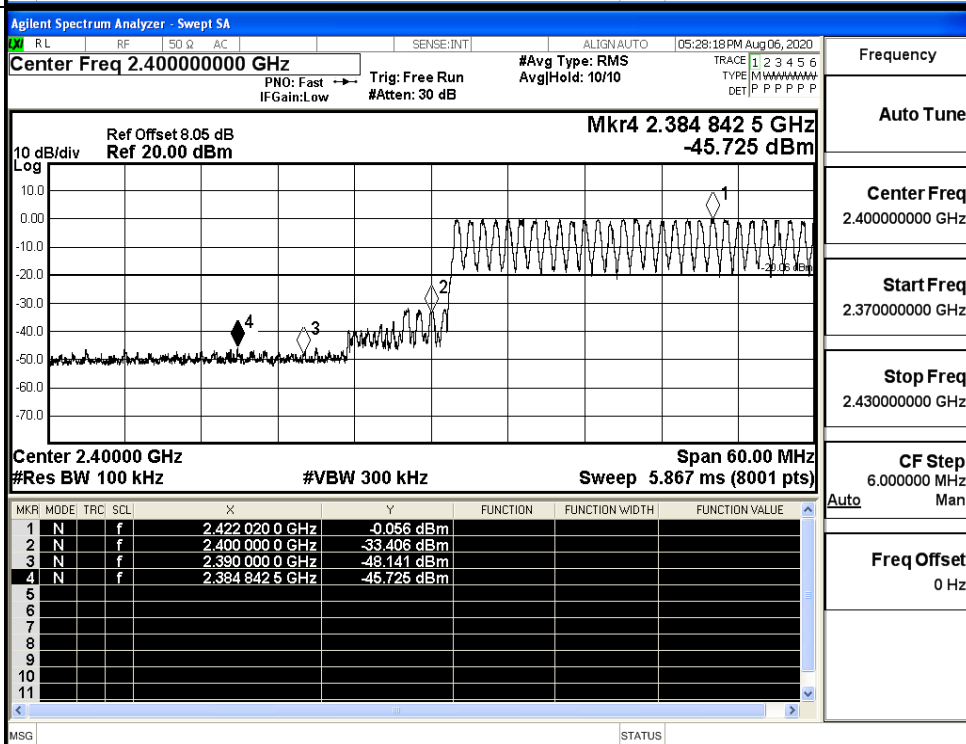
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	0.020	Off	-47.222	-19.98	PASS
			-0.056	On	-45.725	-20.06	PASS
	HCH	2480	-0.027	Off	-38.295	-20.03	PASS
			0.044	On	-37.962	-19.96	PASS
$\pi/4$ DQPSK	LCH	2402	-0.032	Off	-47.686	-20.03	PASS
			0.115	On	-46.841	-19.89	PASS
	HCH	2480	-0.141	Off	-38.027	-20.14	PASS
			0.103	On	-38.606	-19.9	PASS

Test Graphs

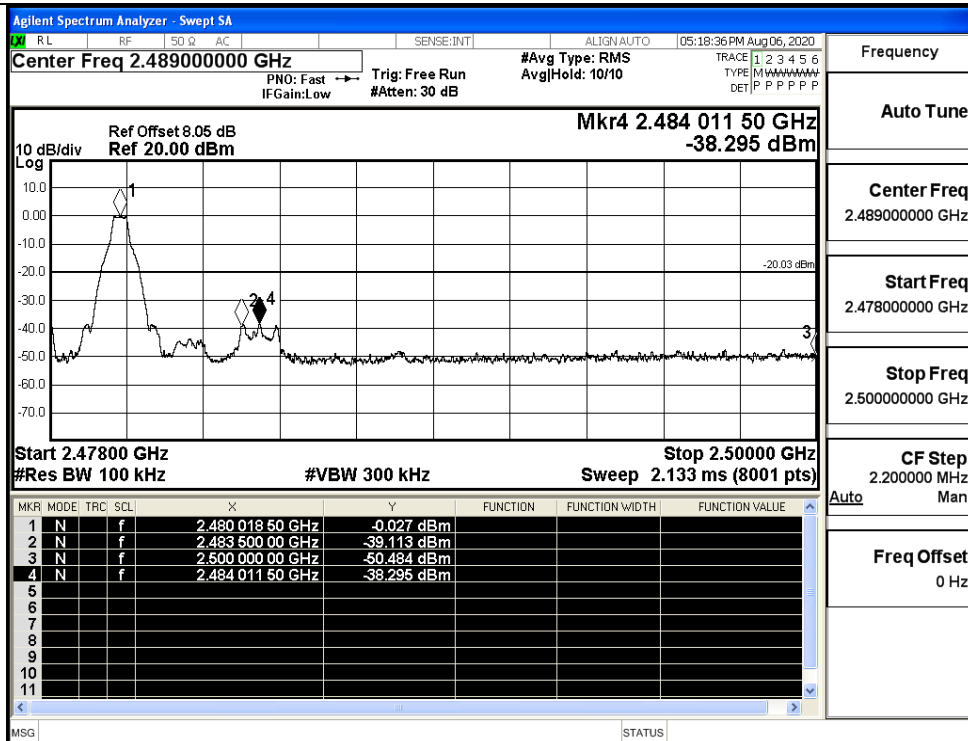
GFSK/LCH/No Hop



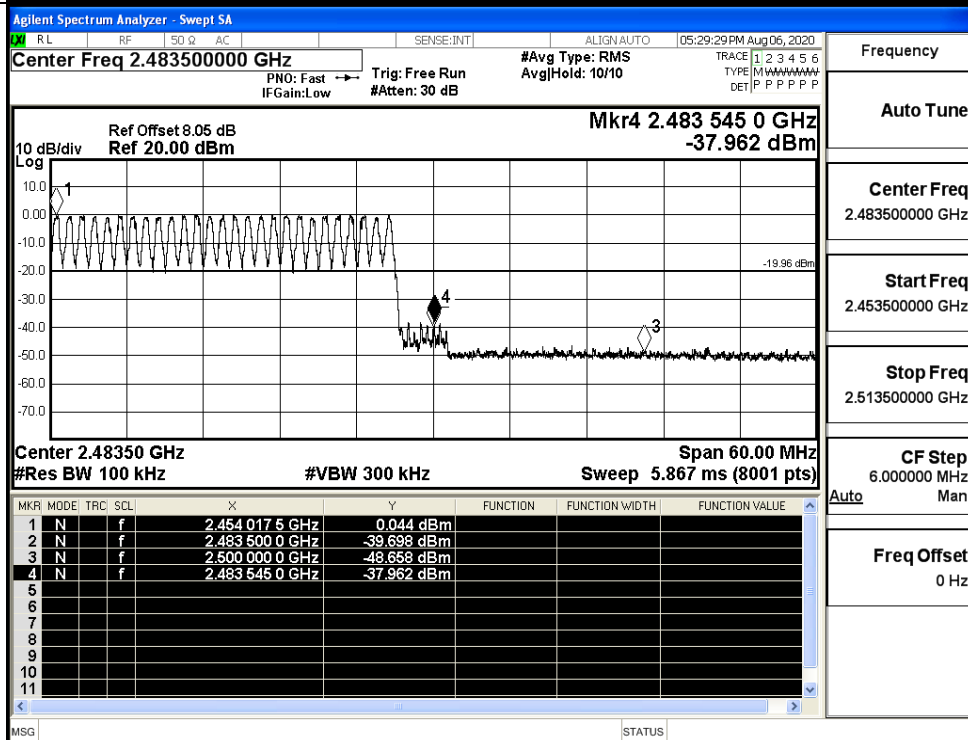
GFSK/LCH/Hop



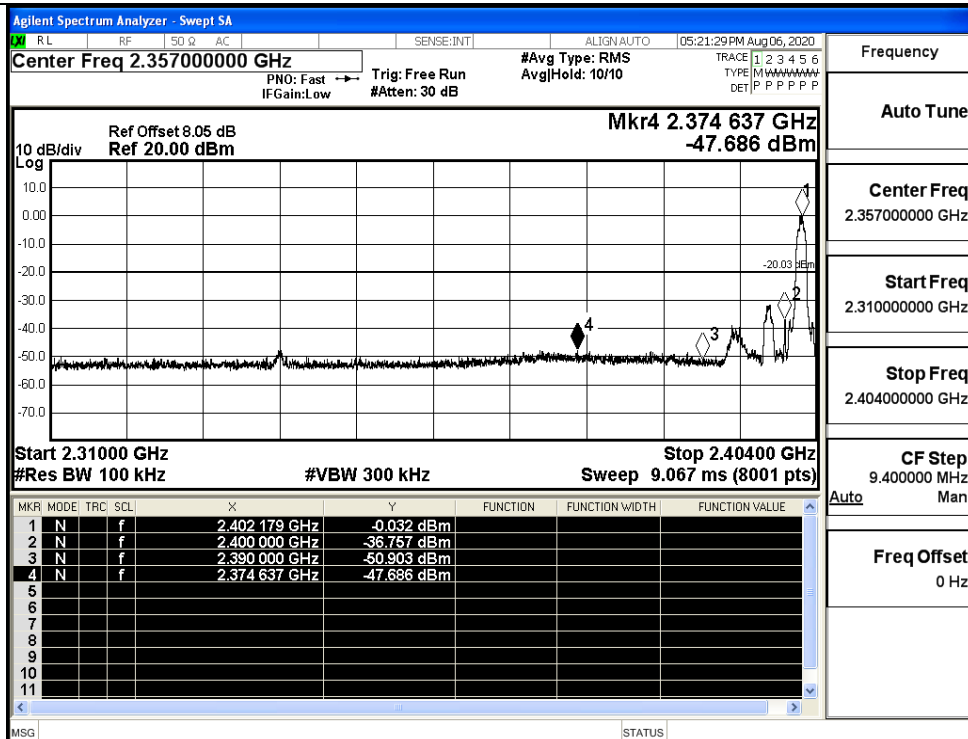
GFSK/HCH/No Hop



GFSK/HCH/Hop



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



Frequency

Auto Tune

Center Freq
2.357000000 GHz

Start Freq
2.310000000 GHz

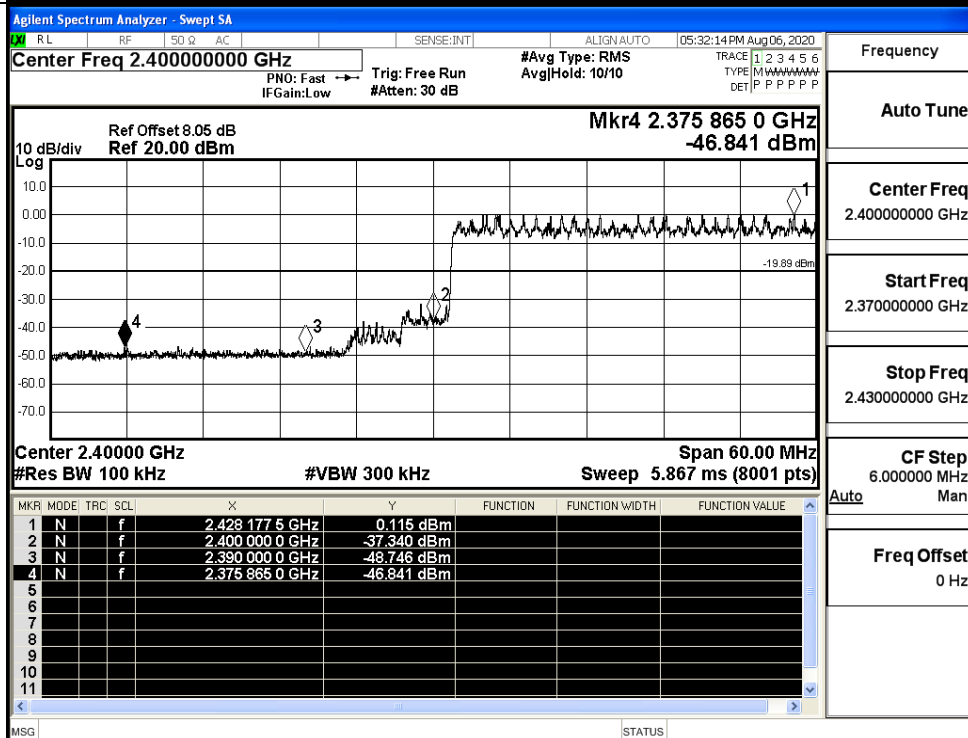
Stop Freq
2.404000000 GHz

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

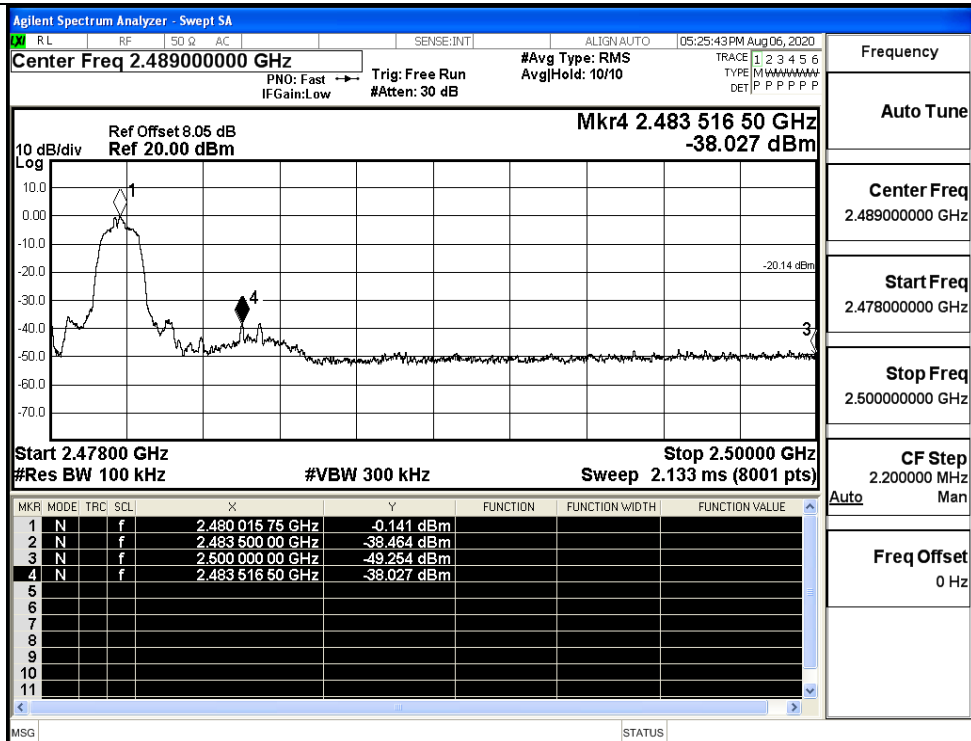
Stop Freq
2.430000000 GHz

CF Step
6.000000 MHz

Auto Man

Freq Offset
0 Hz

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

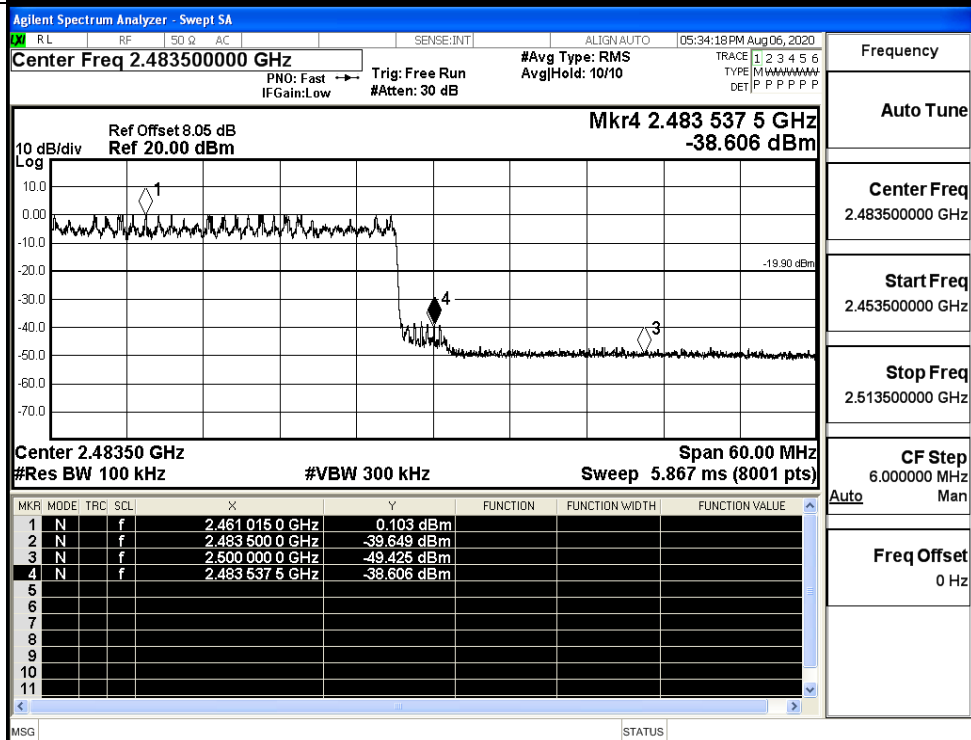


Frequency

Auto Tune

Center Freq
2.489000000 GHzStart Freq
2.478000000 GHzStop Freq
2.500000000 GHzCF Step
2.200000 MHz
Auto ManFreq Offset
0 Hz

$\pi/4$ DQPSK/HCH/Hop



Frequency

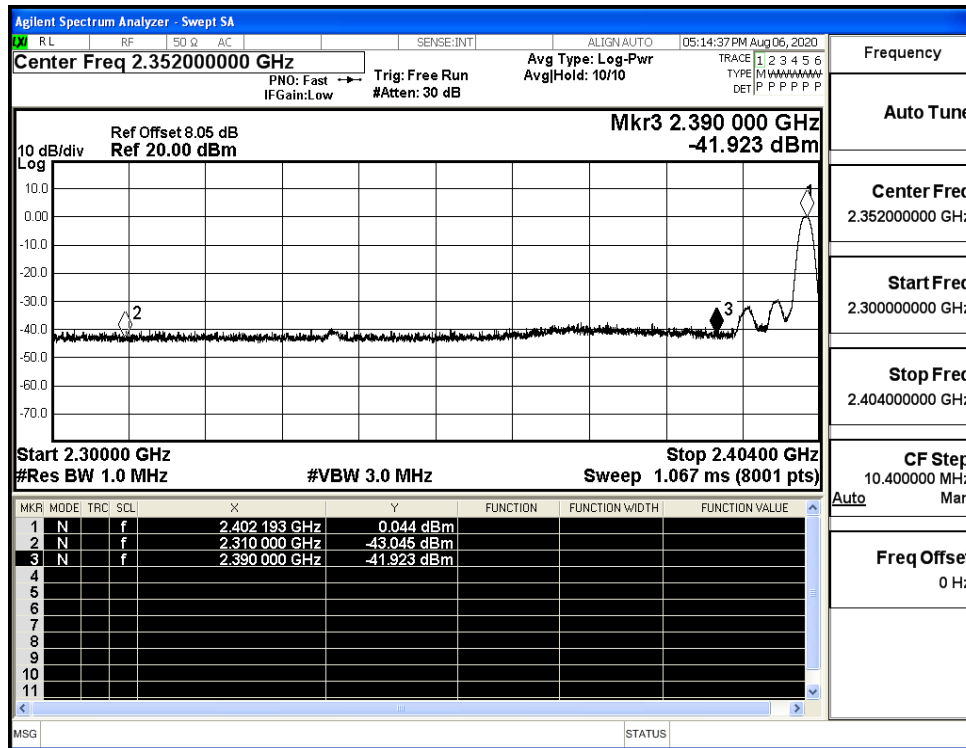
Auto Tune

Center Freq
2.483500000 GHzStart Freq
2.453500000 GHzStop Freq
2.513500000 GHzCF Step
6.000000 MHz
Auto ManFreq Offset
0 Hz

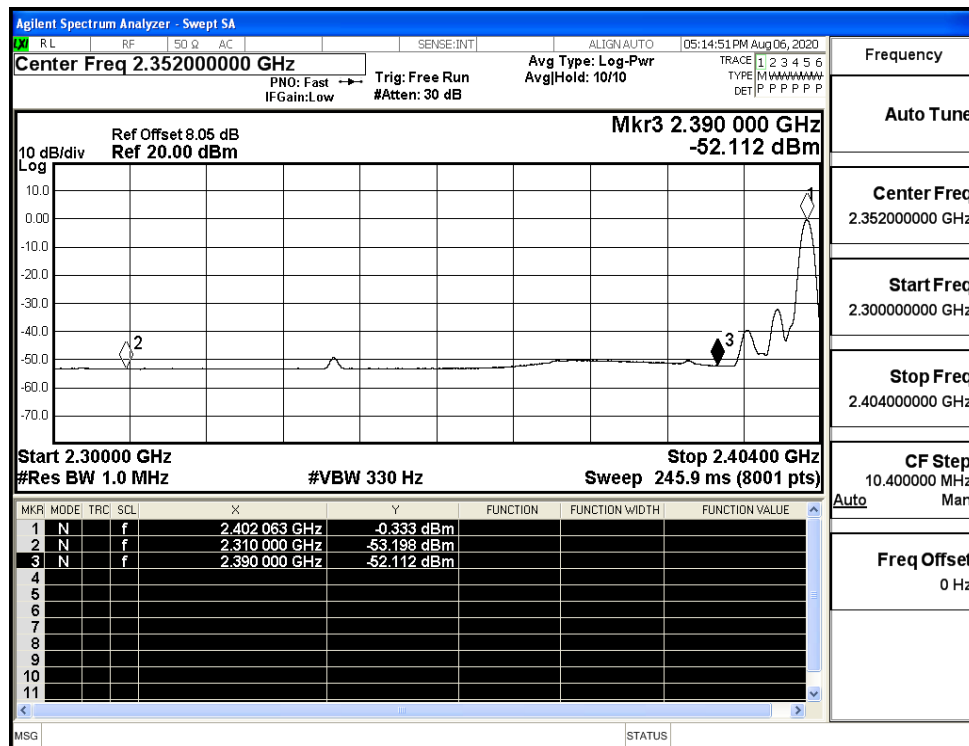
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.05	2.0	0	52.21	PEAK	74	PASS
	Off	2310.0	-53.20	2.0	0	42.06	AV	54	PASS
	Off	2390.0	-41.92	2.0	0	53.33	PEAK	74	PASS
	Off	2390.0	-52.11	2.0	0	43.15	AV	54	PASS
	Off	2483.5	-34.85	2.0	0	60.40	PEAK	74	PASS
	Off	2483.5	-42.96	2.0	0	52.30	AV	54	PASS
	Off	2500.0	-40.31	2.0	0	54.95	PEAK	74	PASS
	Off	2500.0	-50.11	2.0	0	45.15	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-42.17	2.0	0	53.09	PEAK	74	PASS
	Off	2310.0	-53.38	2.0	0	41.88	AV	54	PASS
	Off	2390.0	-42.07	2.0	0	53.19	PEAK	74	PASS
	Off	2390.0	-52.19	2.0	0	43.07	AV	54	PASS
	Off	2483.5	-35.62	2.0	0	59.63	PEAK	74	PASS
	Off	2483.5	-45.12	2.0	0	50.14	AV	54	PASS
	Off	2500.0	-40.16	2.0	0	55.10	PEAK	74	PASS
	Off	2500.0	-50.20	2.0	0	45.05	AV	54	PASS

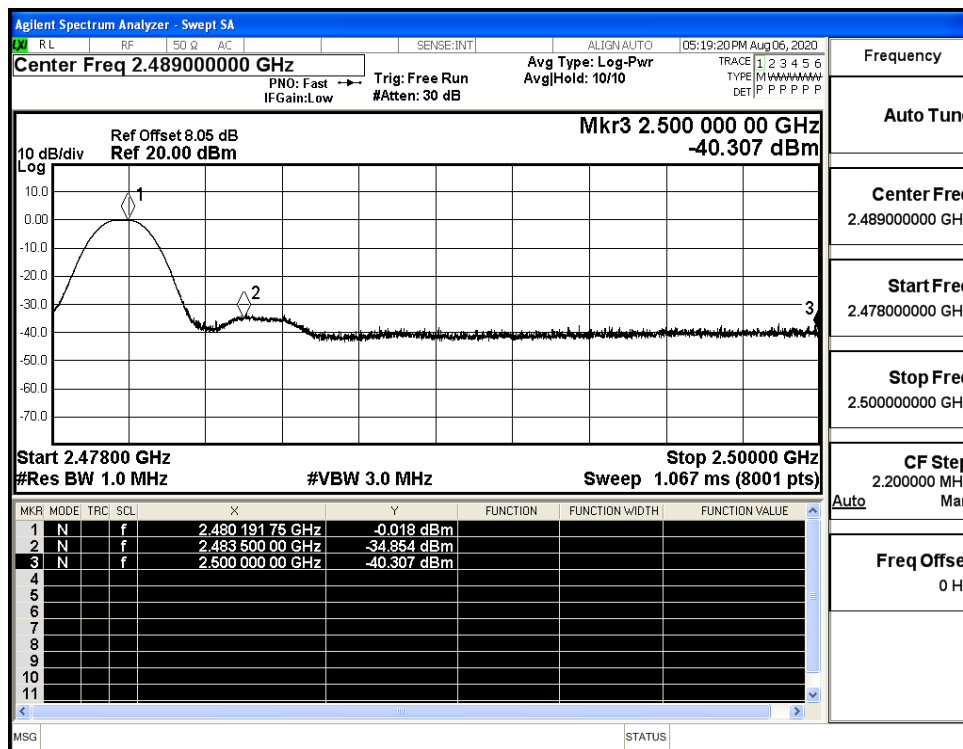
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



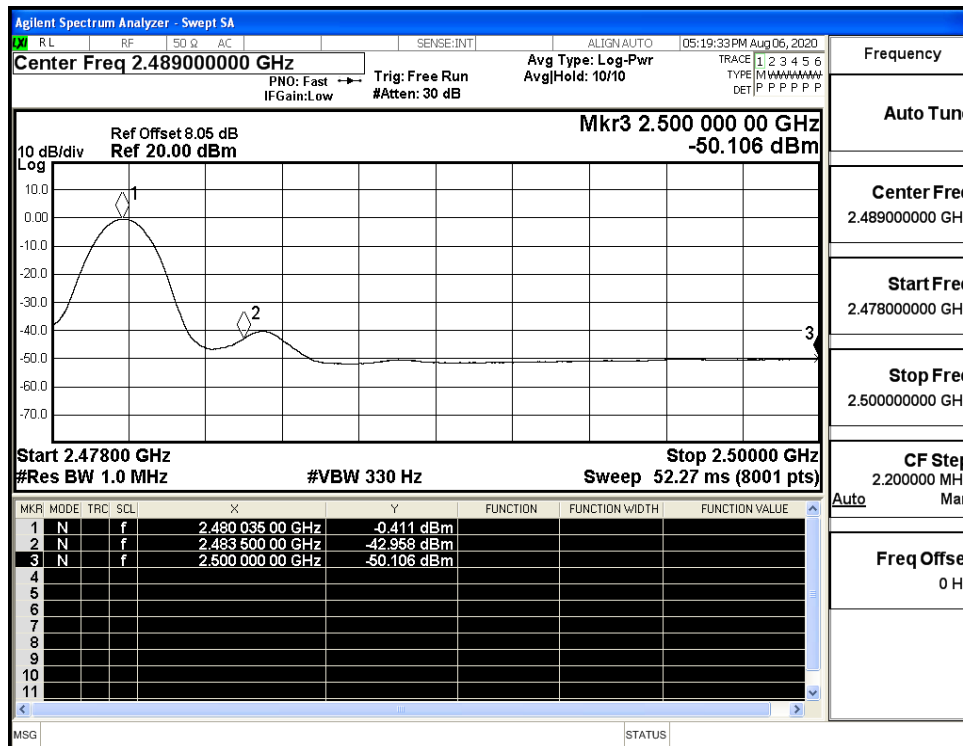
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)



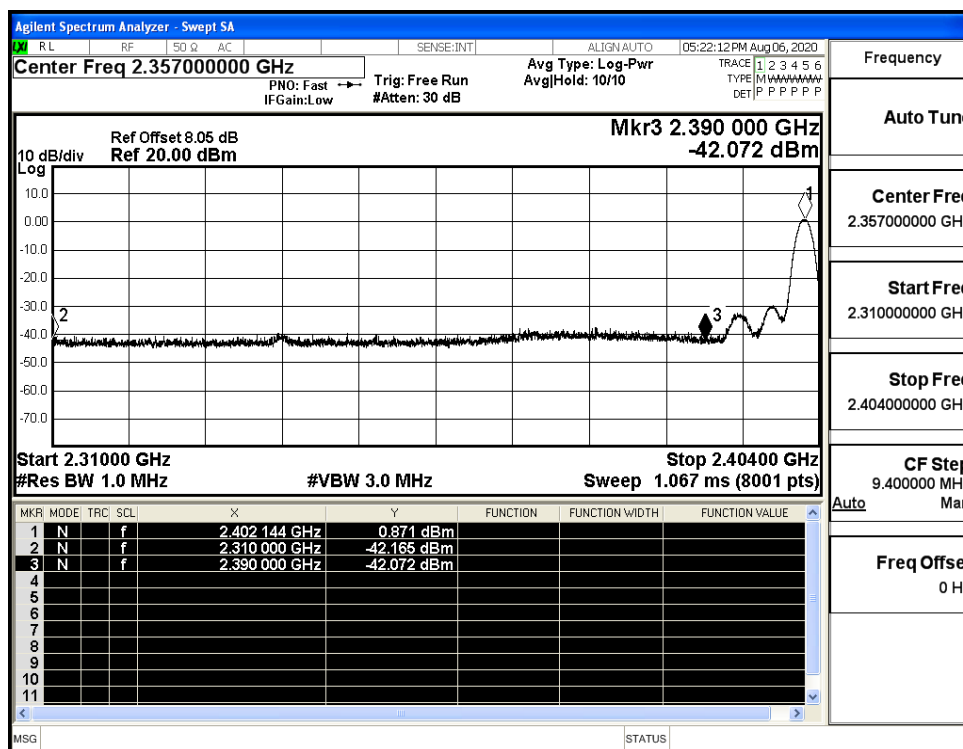
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



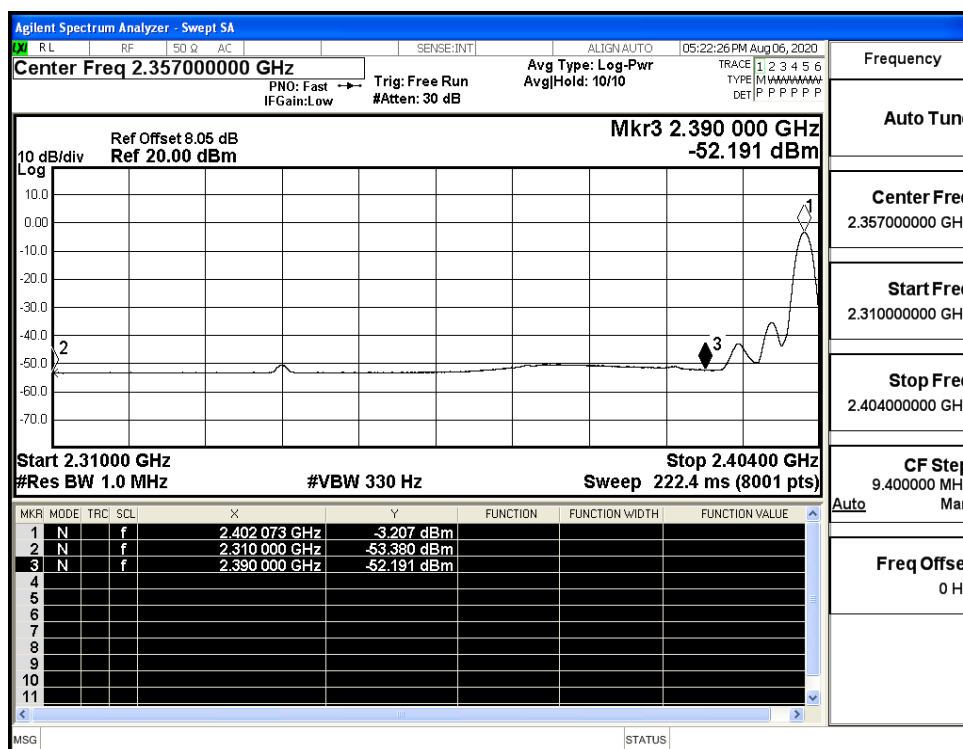
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



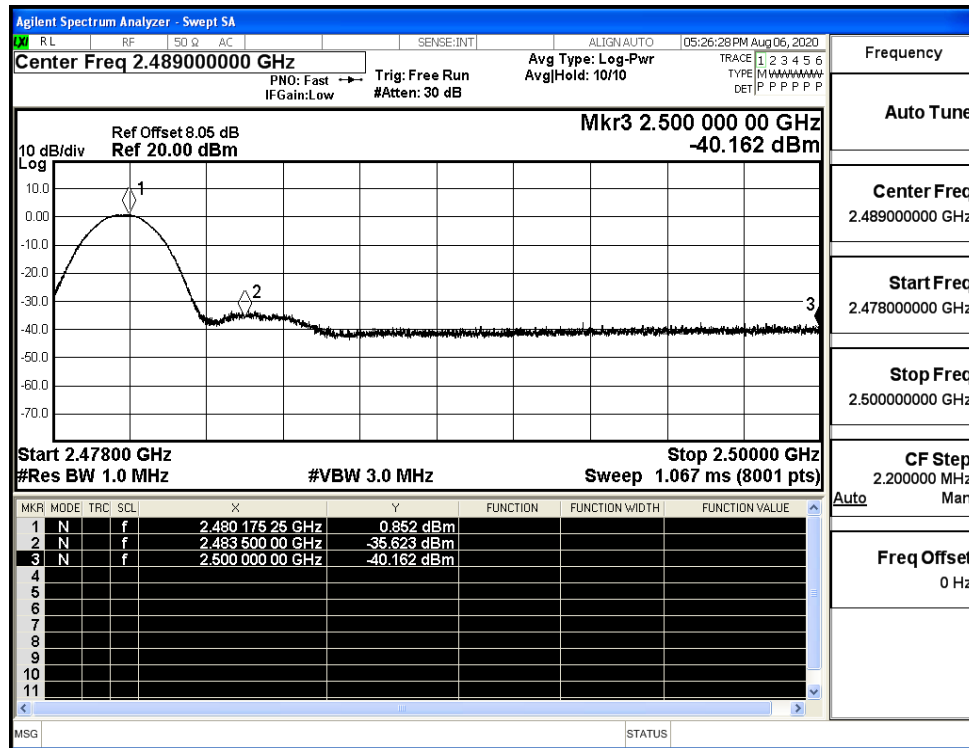
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)



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)

