

Appendix A

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

Product Name: Bluetooth Speaker

Trade Mark: Aitkenson

Test Model: B122

Environmental Conditions

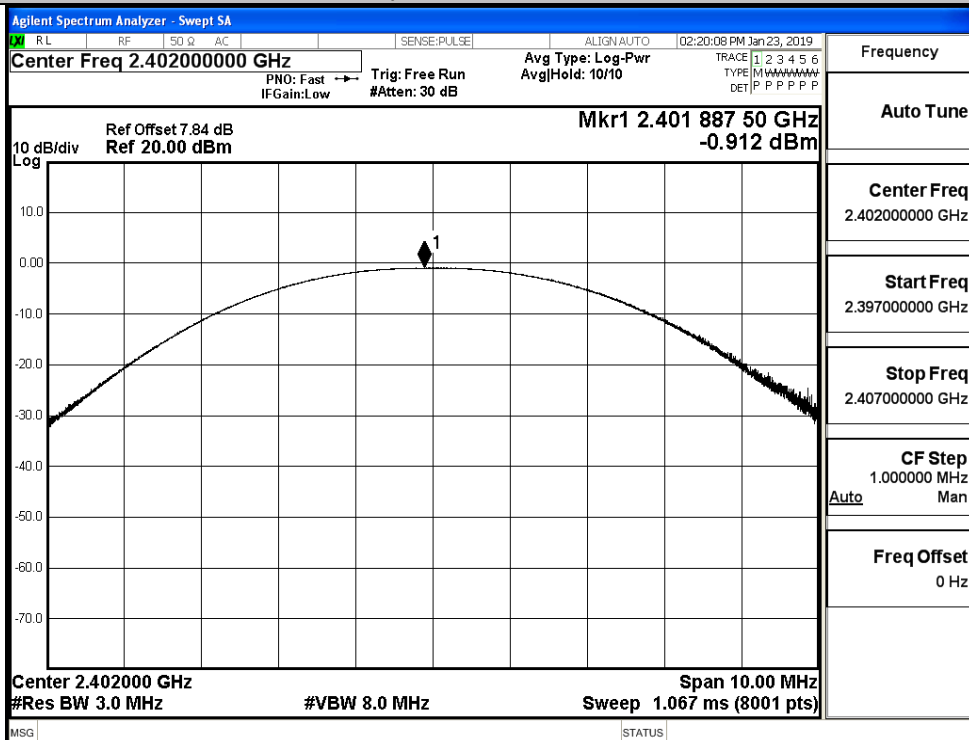
Temperature:	23.1 ° C
Relative Humidity:	53.6%
ATM Pressure:	100.0 kPa
Test Engineer:	WANGCHUANG
Supervised by:	Jayden.Zhuo

A.1 Maximum Conducted Peak Output Power

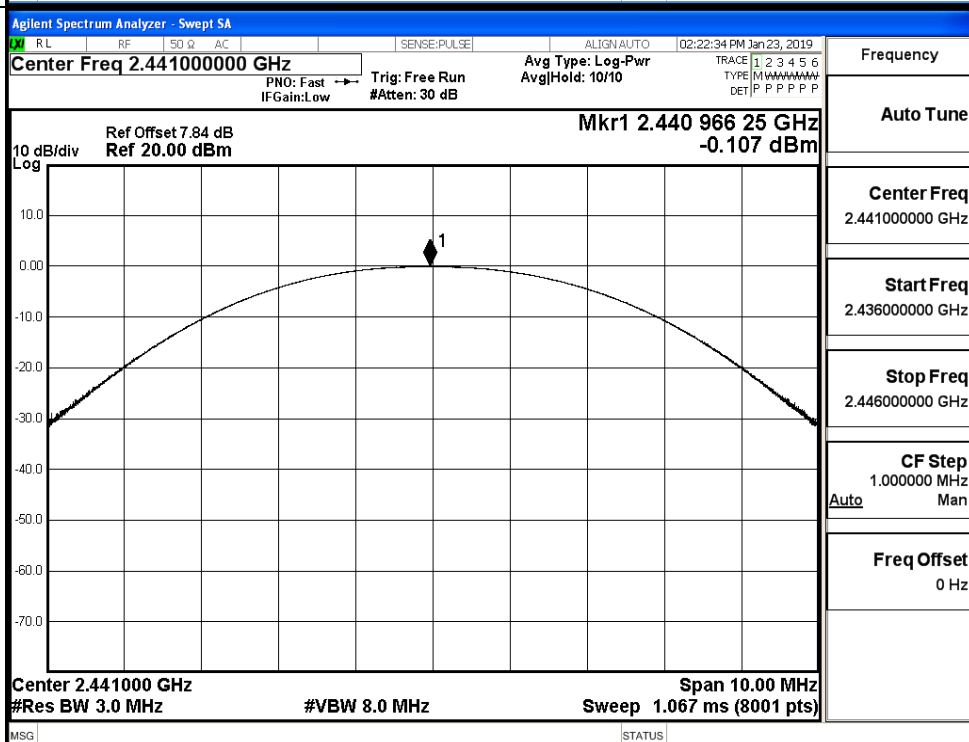
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.912	21	PASS
	MCH	-0.107	21	PASS
	HCH	-1.303	21	PASS
$\pi/4$ DQPSK	LCH	-1.471	21	PASS
	MCH	-0.698	21	PASS
	HCH	-1.945	21	PASS

Test Graphs

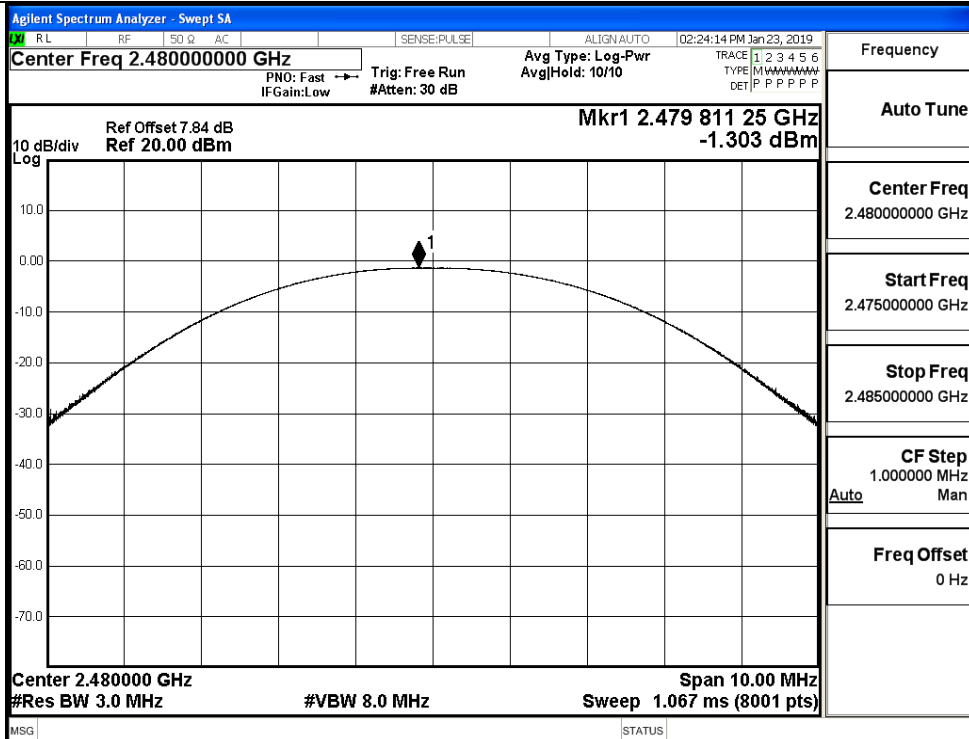
GFSK/LCH



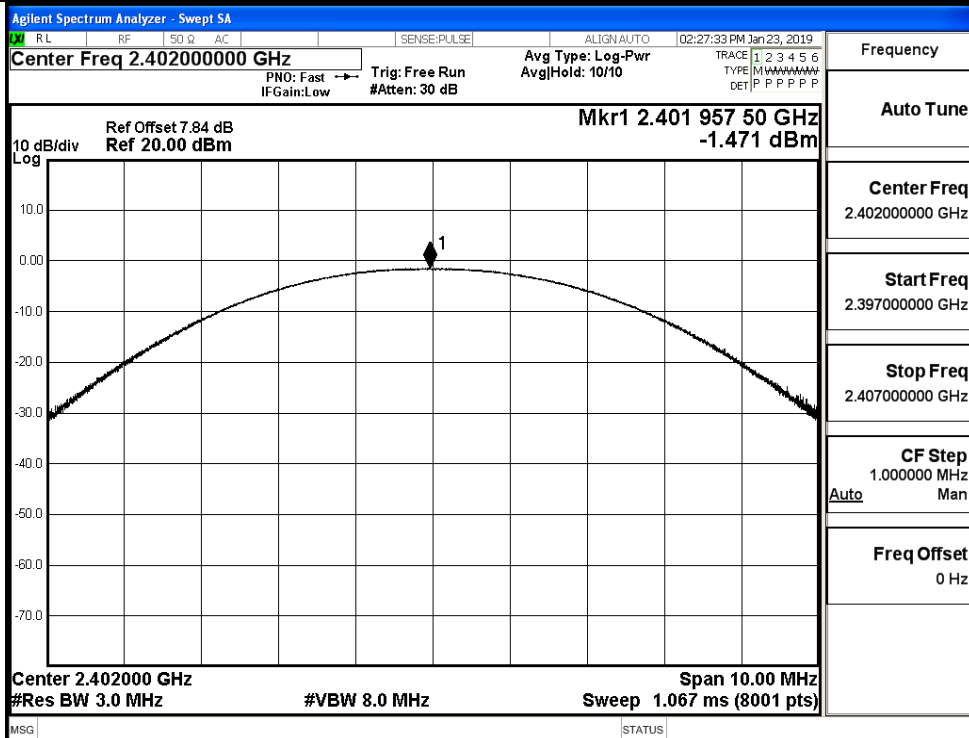
GFSK/MCH



GFSK/HCH



$\pi/4$ DQPSK/LCH

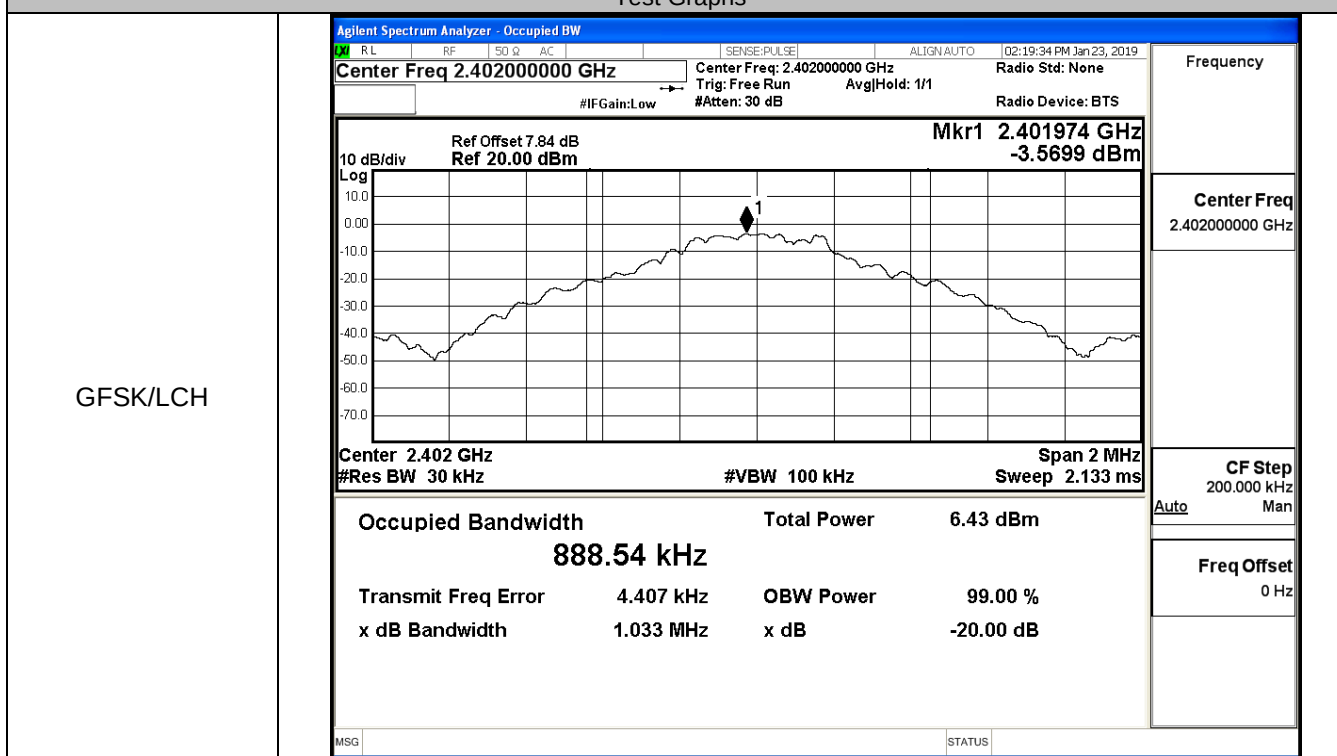


$\pi/4$DQPSK/MCH	Agilent Spectrum Analyzer - Swept SA ☒ R L ☐ RF ☐ 50 Ω ☐ AC ☐ SENSE:PULSE ☐ ALIGN:AUTO 02:29:57 PM Jan 23, 2019 Center Freq 2.441000000 GHz PNO: Fast ☐ Trig: Free Run Avg Type: Log-Pwr IF Gain: Low #Atten: 30 dB AvgHld: 10/10 TRACE 1 2 3 4 5 6 TYPE M W W W W W W W DET P P P P P P P Ref Offset 7.84 dB Ref 20.00 dBm Mkr1 2.441 006 25 GHz -0.698 dBm 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 ☒ R L ☐ RF ☐ 50 Ω ☐ AC ☐ SENSE:PULSE ☐ ALIGN:AUTO 02:31:34 PM Jan 23, 2019 Center Freq 2.480000000 GHz PNO: Fast ☐ Trig: Free Run Avg Type: Log-Pwr IF Gain: Low #Atten: 30 dB AvgHld: 10/10 TRACE 1 2 3 4 5 6 TYPE M W W W W W W W DET P P P P P P P Ref Offset 7.84 dB Ref 20.00 dBm Mkr1 2.480 002 50 GHz -1.945 dBm 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

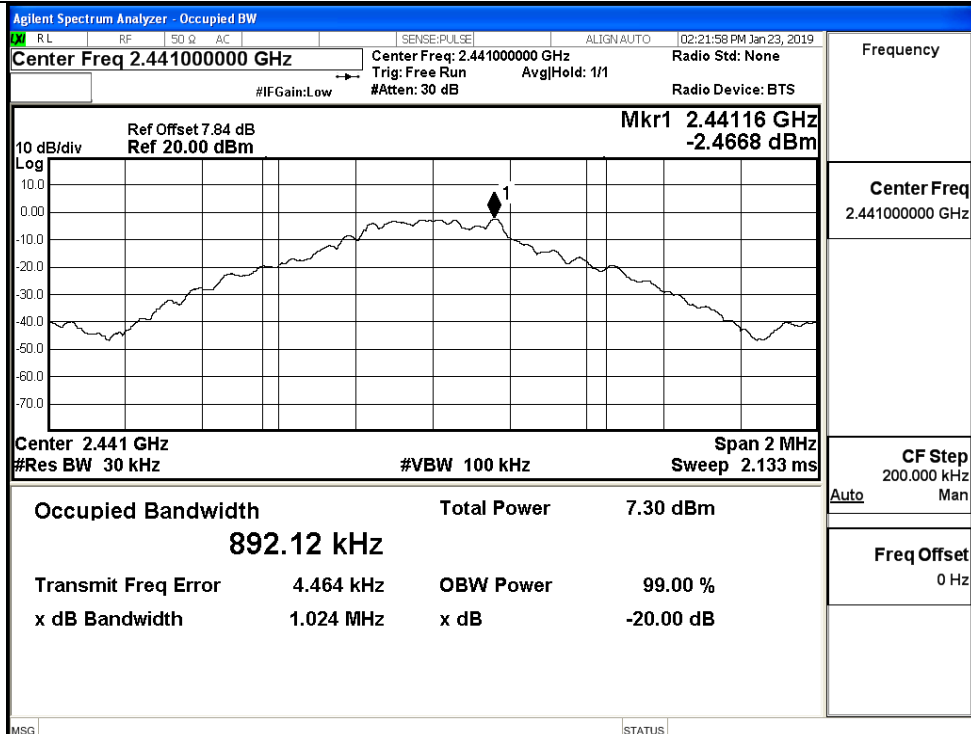
A.2 99% and 20dB Bandwidth

Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.88854	1.033	Not Specified	PASS
	MCH	0.89212	1.024	Not Specified	PASS
	HCH	0.89435	0.9709	Not Specified	PASS
π /4DQPSK	LCH	1.1794	1.295	Not Specified	PASS
	MCH	1.1774	1.315	Not Specified	PASS
	HCH	1.1735	1.311	Not Specified	PASS

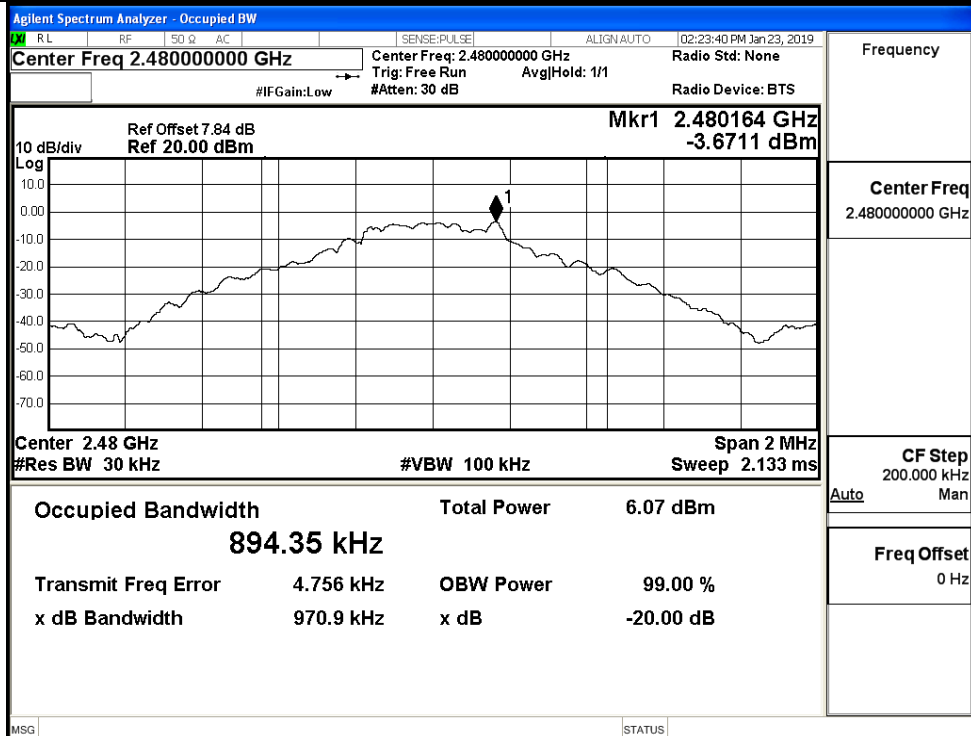
Test Graphs

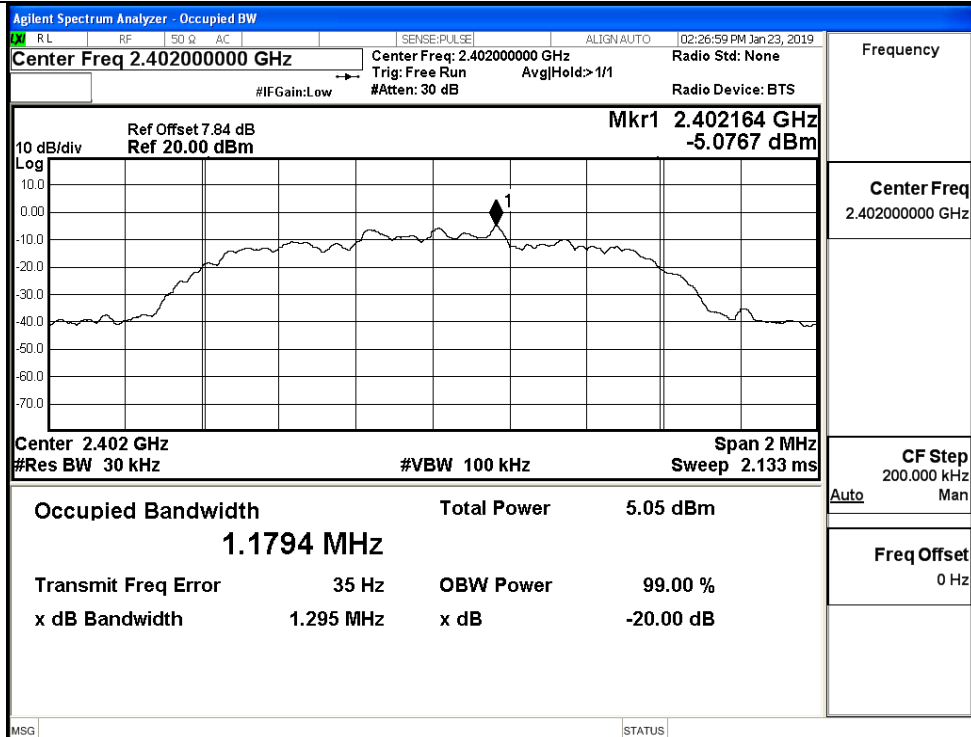
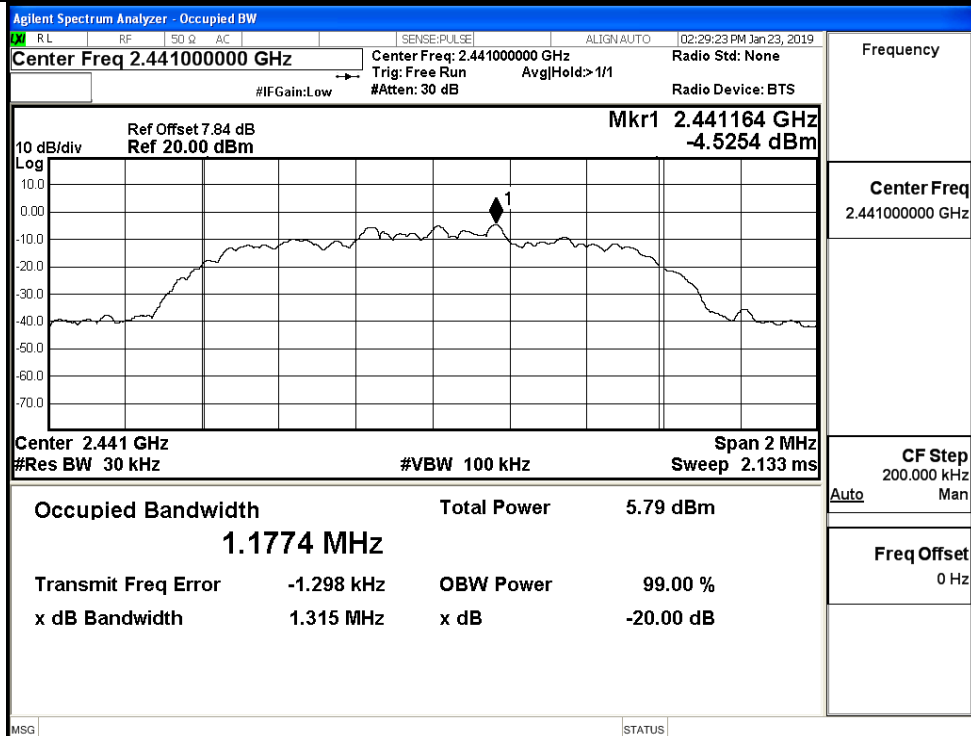


GFSK/MCH

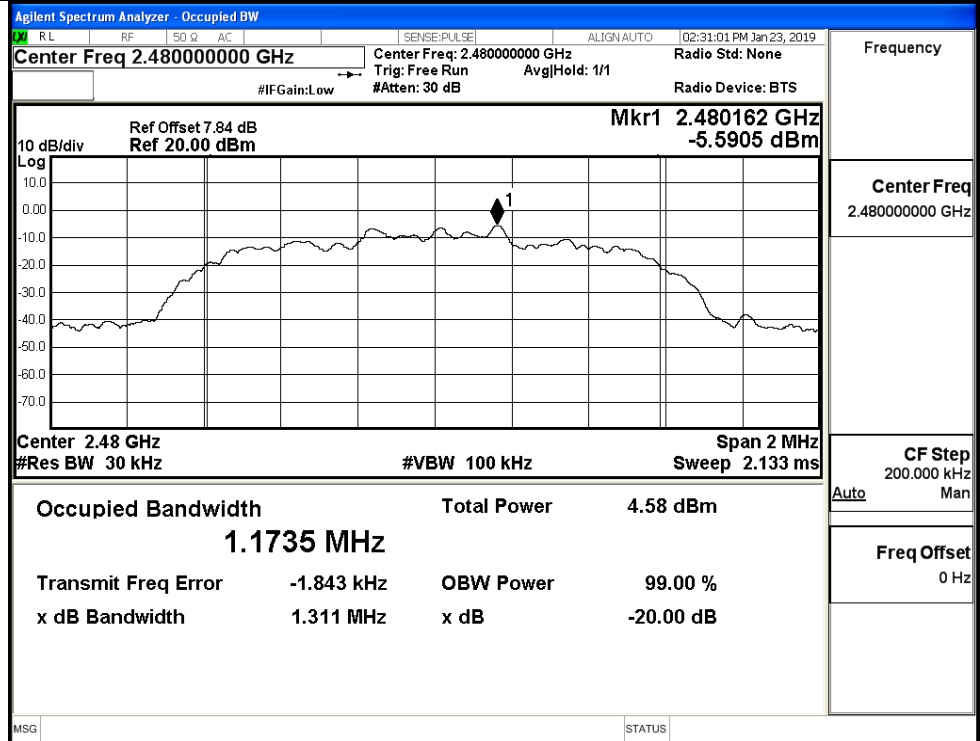


GFSK/HCH



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

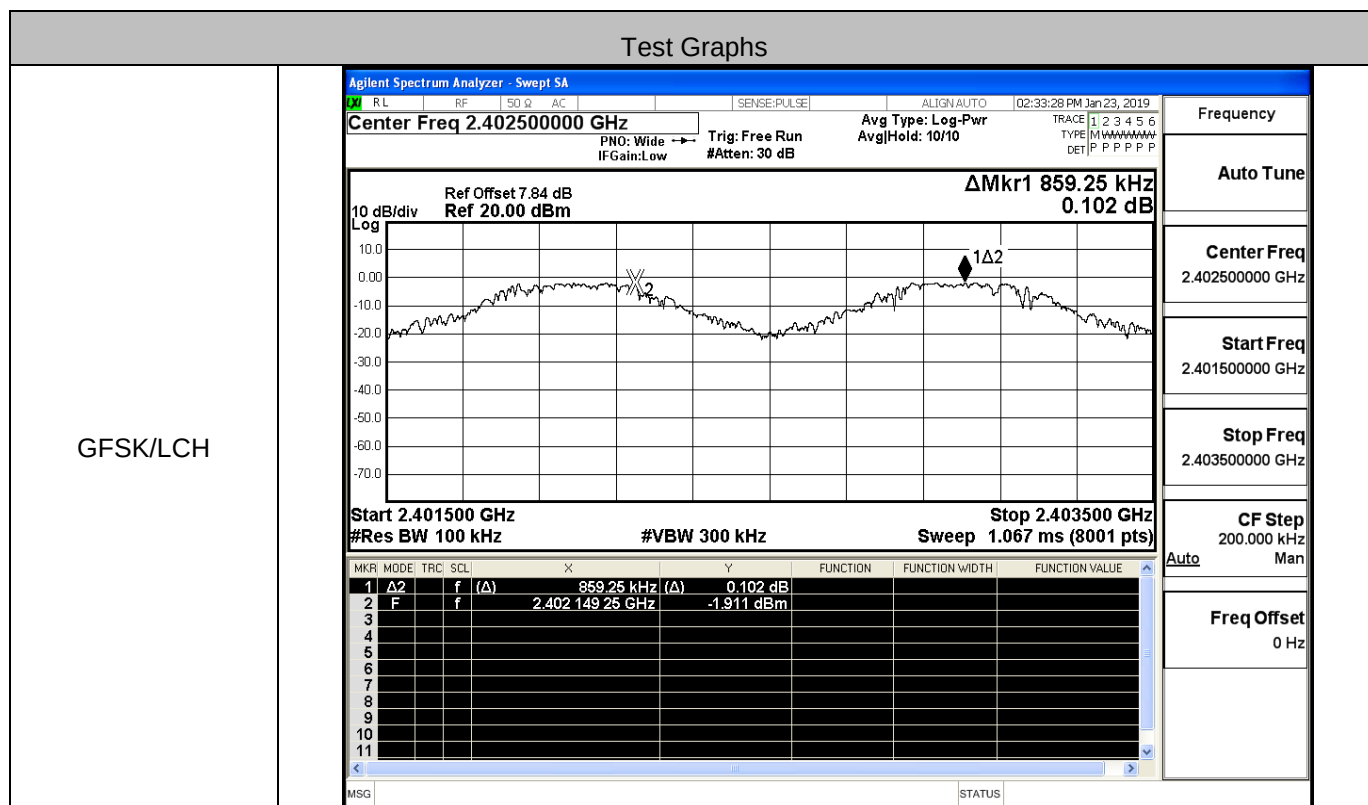
$\pi/4$ DQPSK/HCH



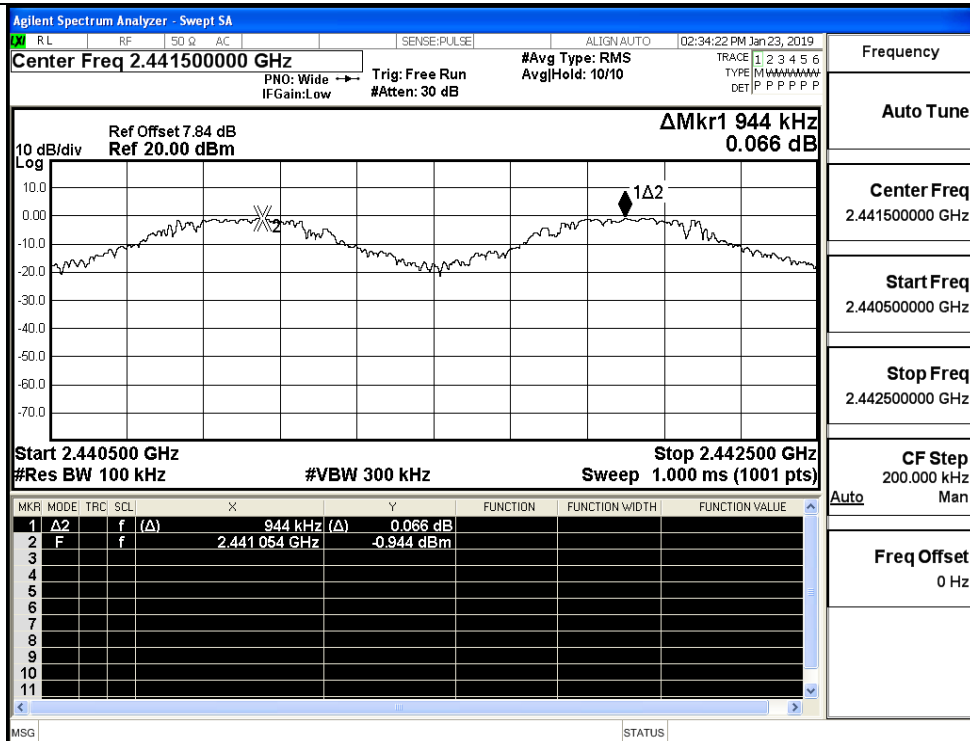
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.859	0.689	PASS
	MCH	0.944	0.689	PASS
	HCH	1.086	0.689	PASS
π /4DQPSK	LCH	0.972	0.877	PASS
	MCH	0.950	0.877	PASS
	HCH	1.146	0.877	PASS

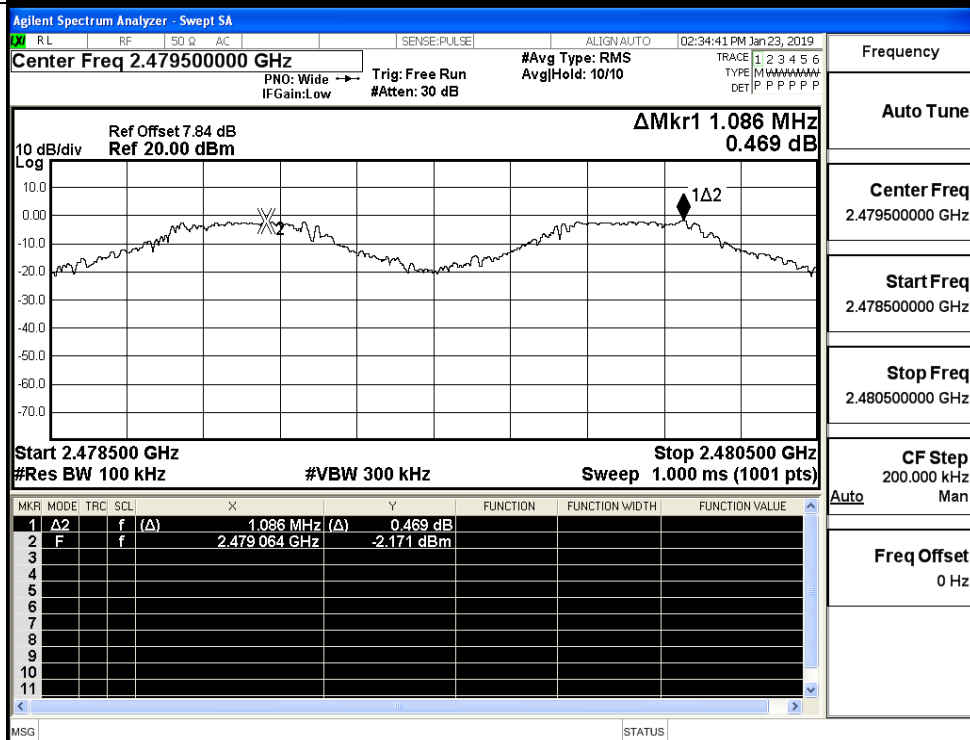
Test Graphs



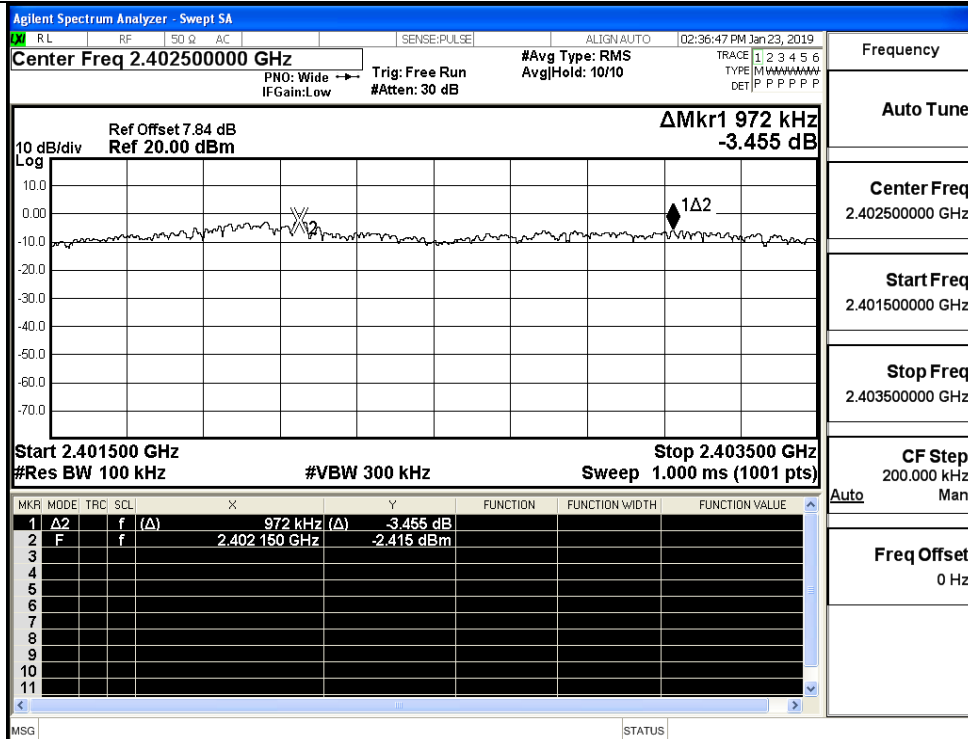
GFSK/MCH



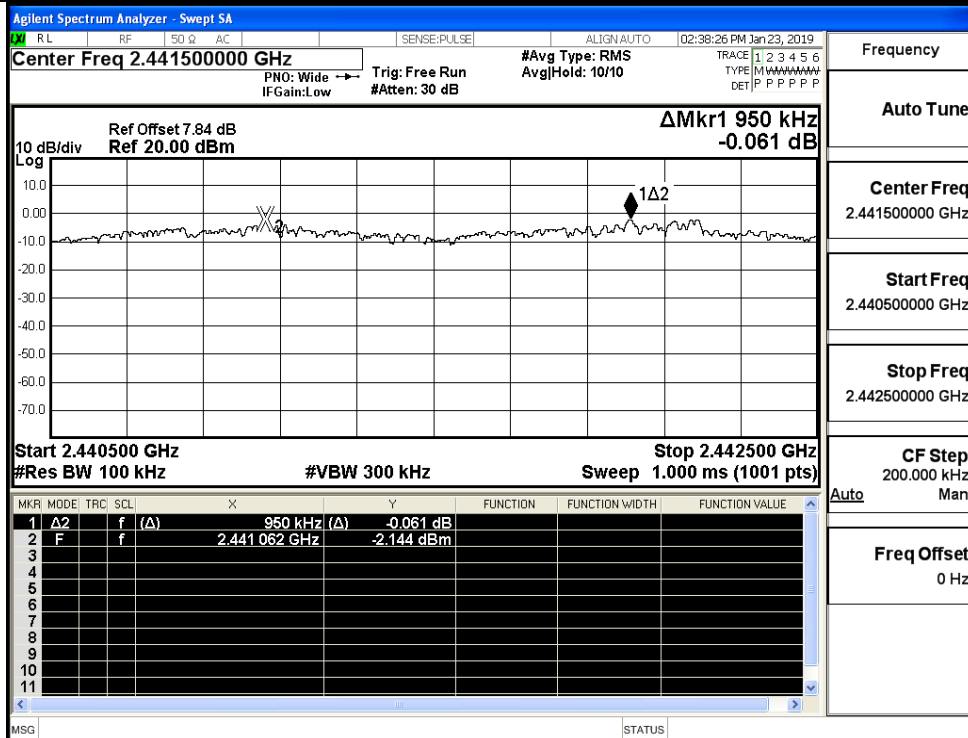
GFSK/HCH



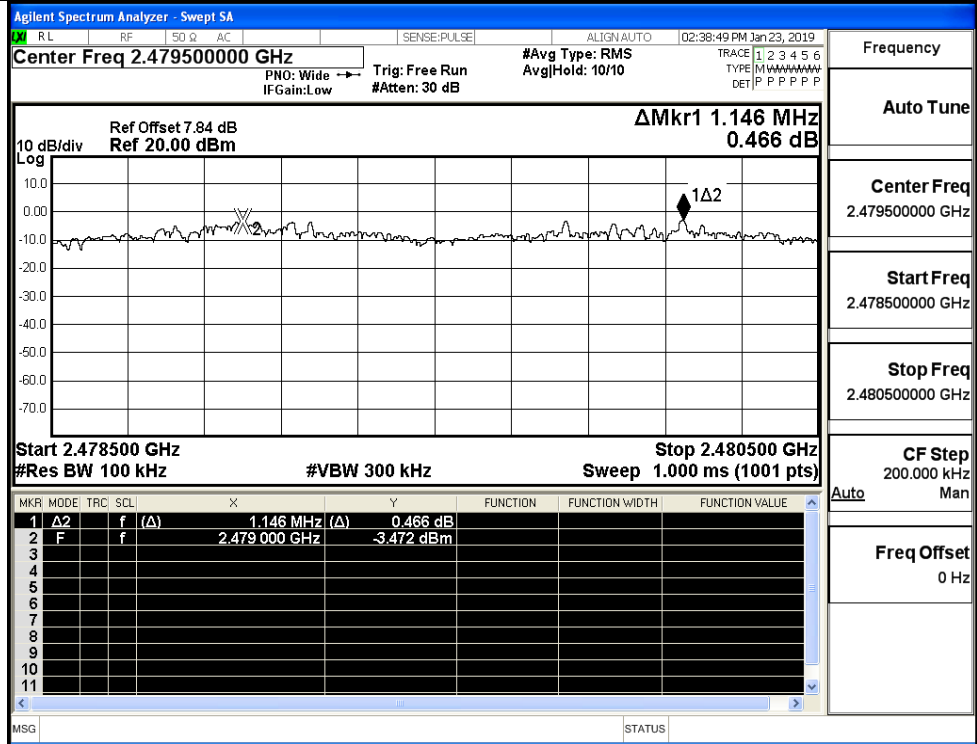
$\pi/4$ DQPSK/LCH



$\pi/4$ DQPSK/MCH



$\pi/4$ DQPSK/HCH

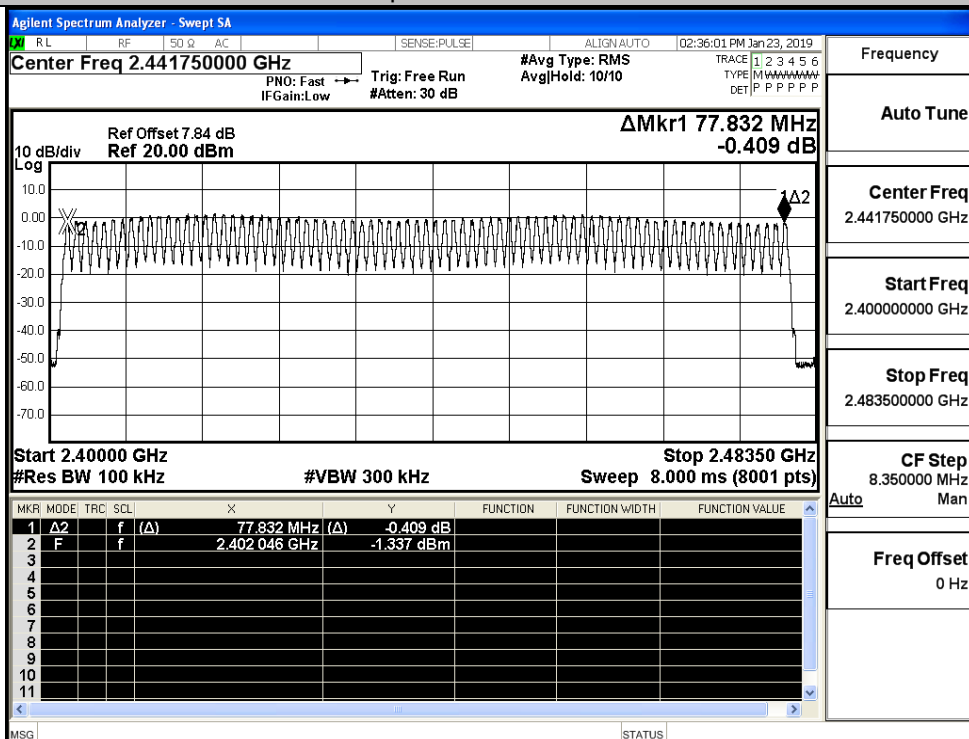
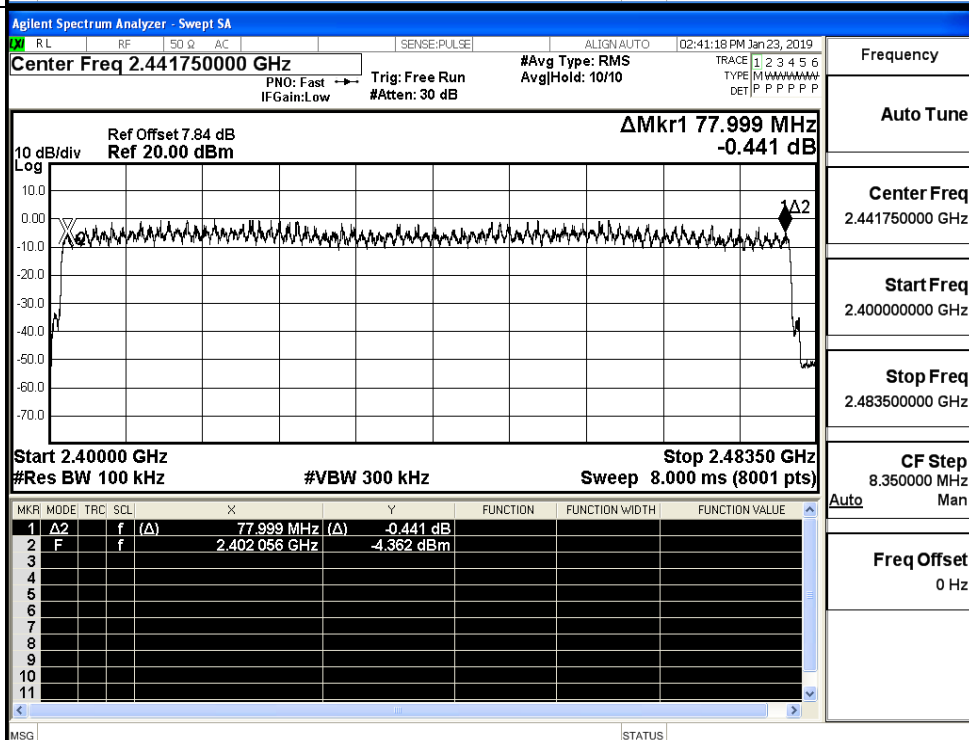


A.4 Hopping Channel Number

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

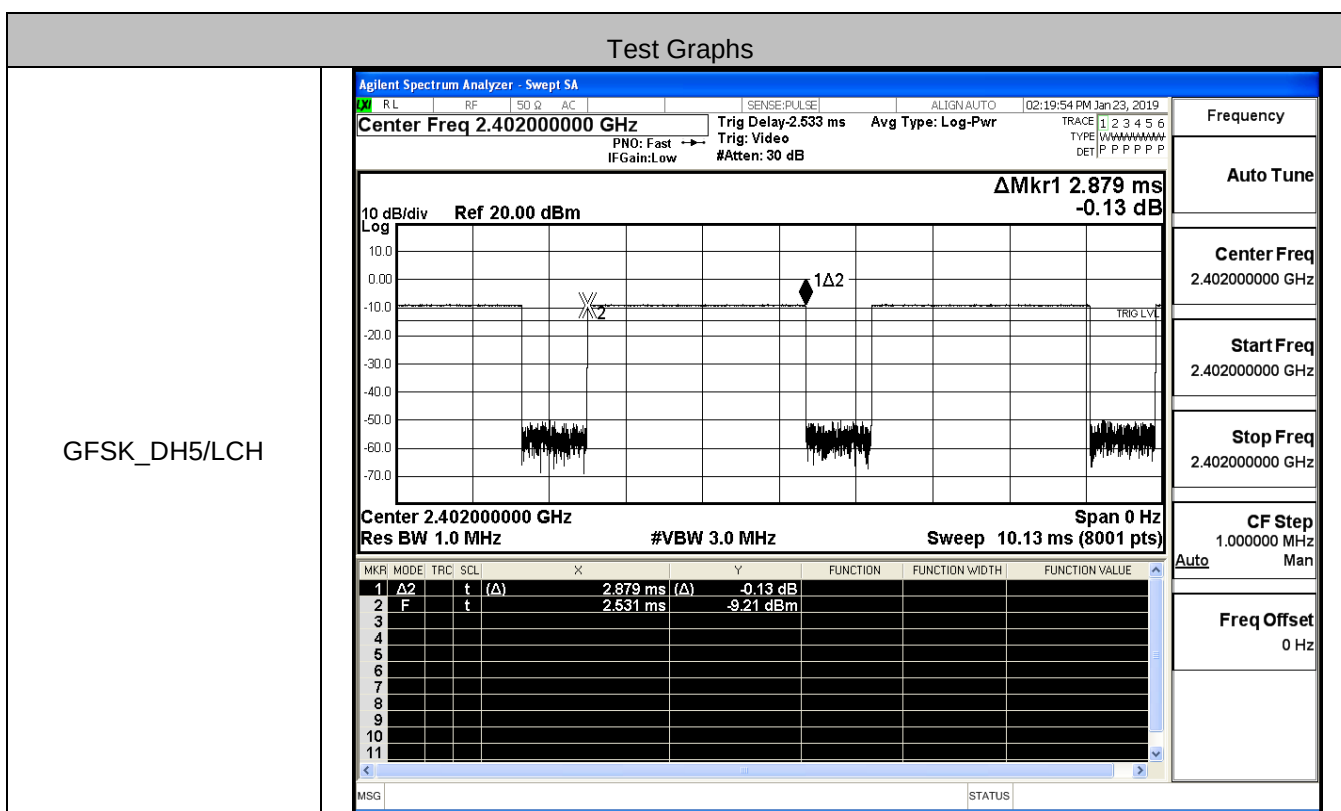
Test Graphs

GFSK/Hop

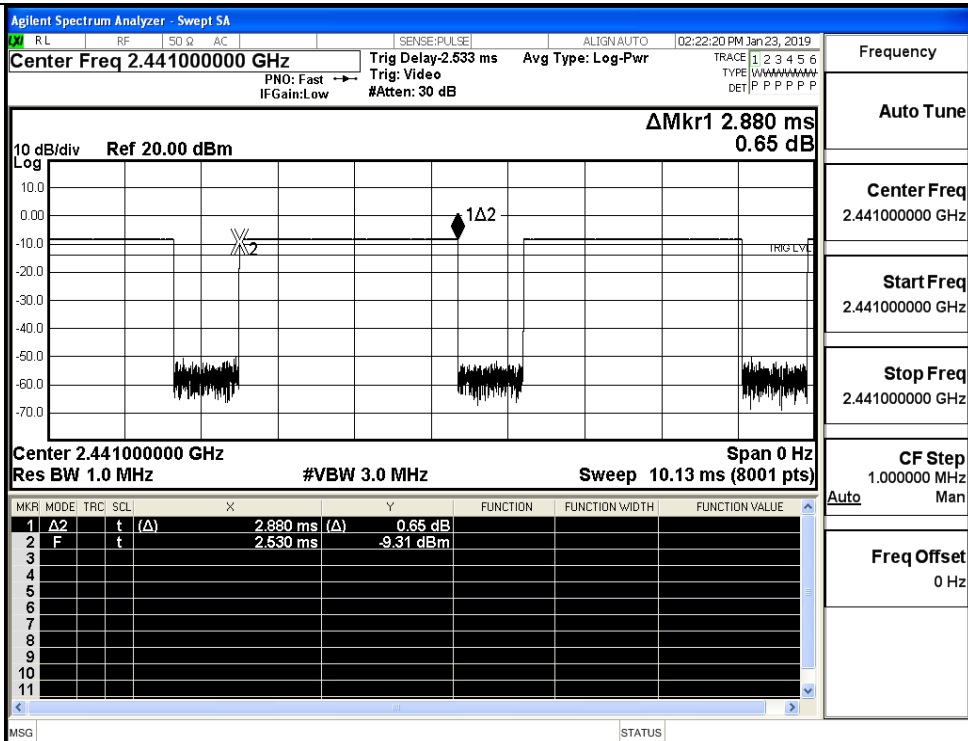
 $\pi/4$ DQPSK/Hop

A.5 Dwell Time

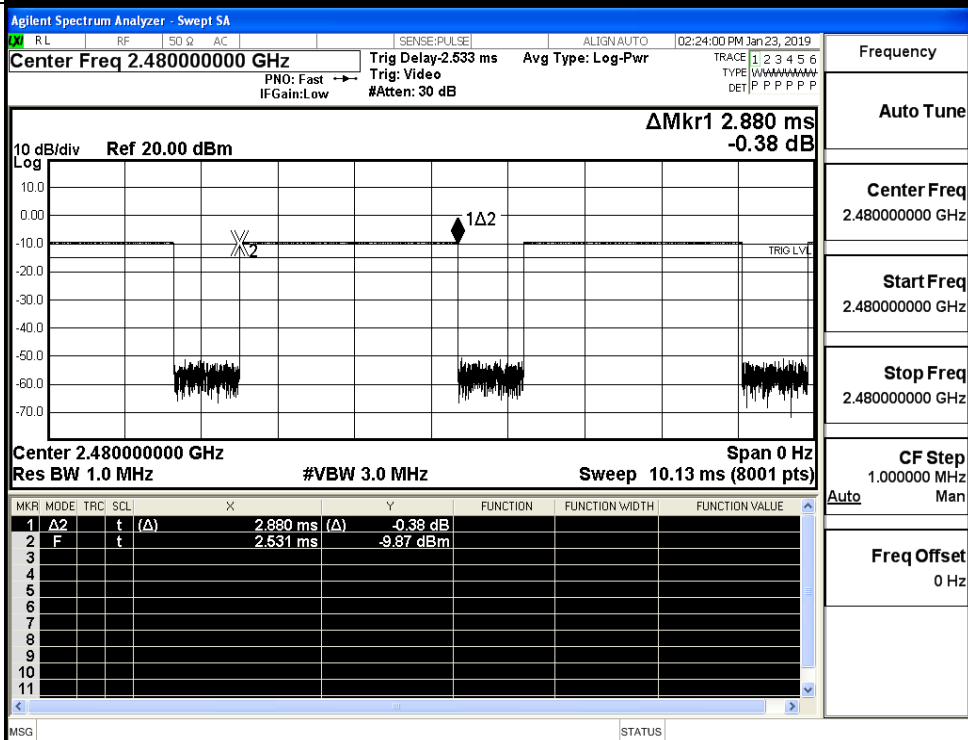
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88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



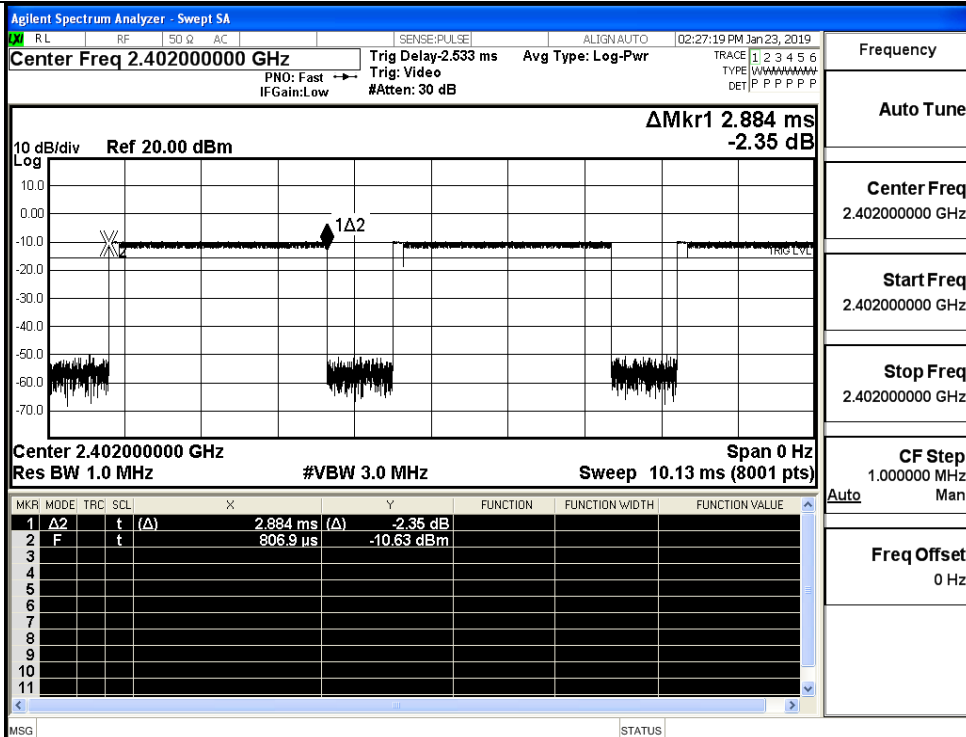
GFSK_DH5/MCH



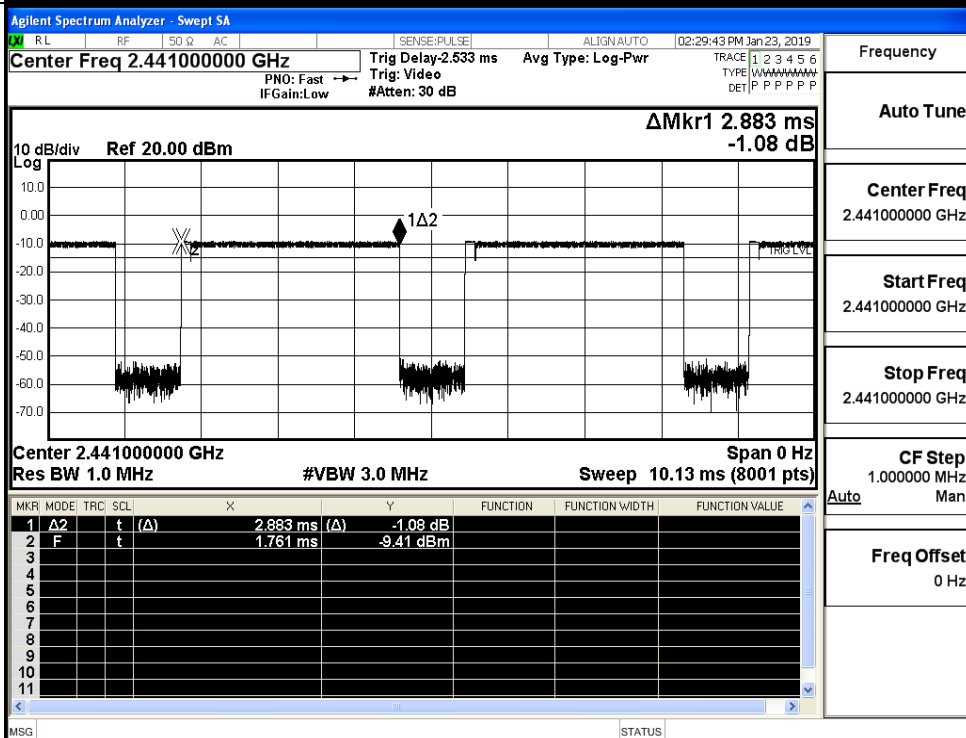
GFSK_DH5/HCH



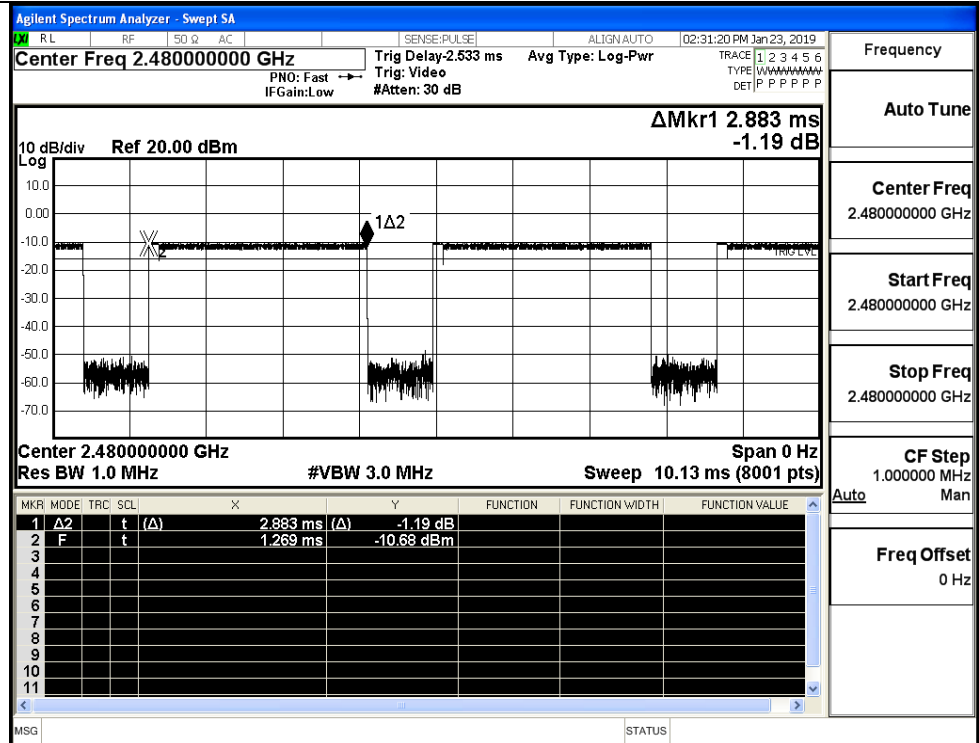
$\pi/4$ DQPSK
_2DH5/LCH



$\pi/4$ DQPSK
_2DH5/MCH



$\pi/4$ DQPSK
_2DH5/HCH

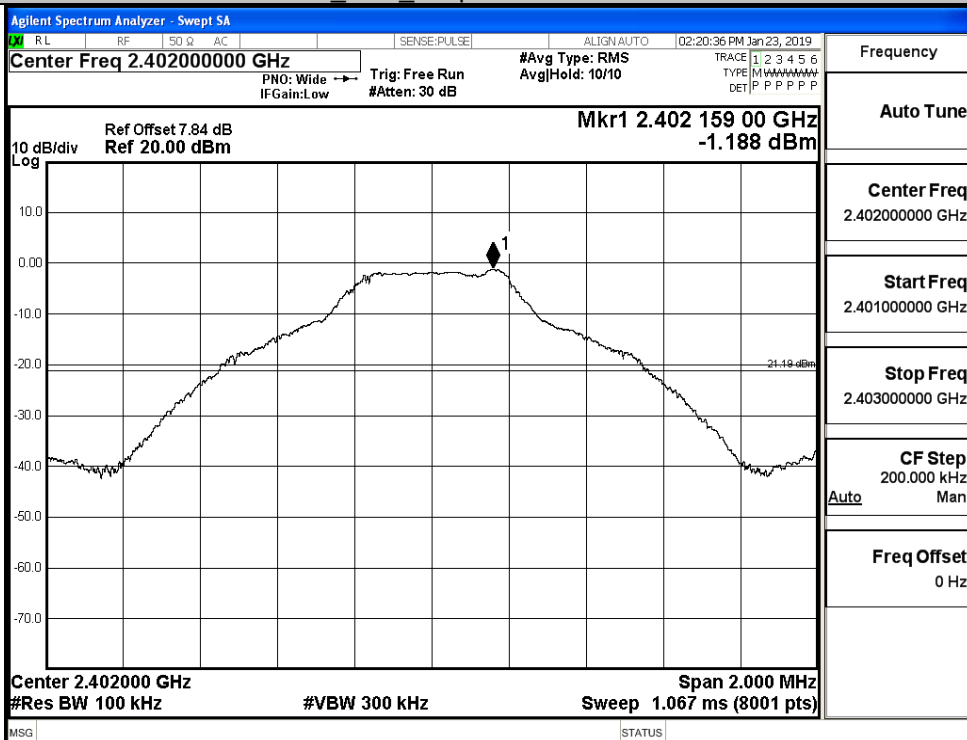


A.6 RF Conducted Spurious Emissions

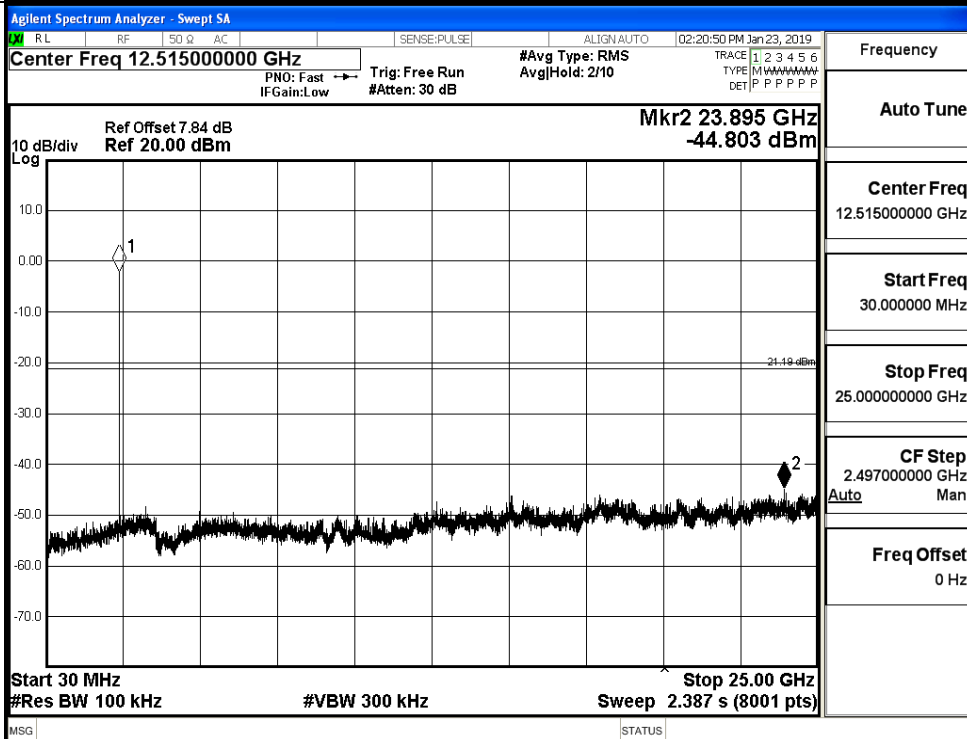
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-1.188	-44.803	-21.188	PASS
	MCH	-0.415	-45.607	-20.415	PASS
	HCH	-1.567	-45.630	-21.567	PASS
$\pi/4$ DQPSK	LCH	-2.241	-45.656	-22.241	PASS
	MCH	-1.486	-43.106	-21.486	PASS
	HCH	-2.667	-45.373	-22.667	PASS

GFSK LCH Graphs

Pref

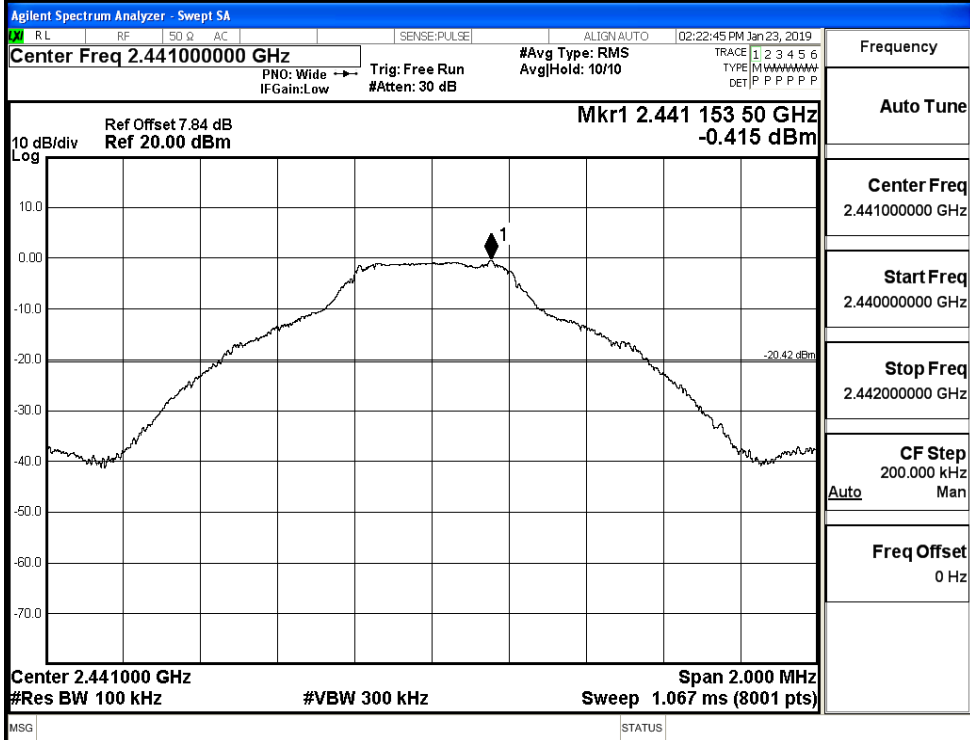


Puw

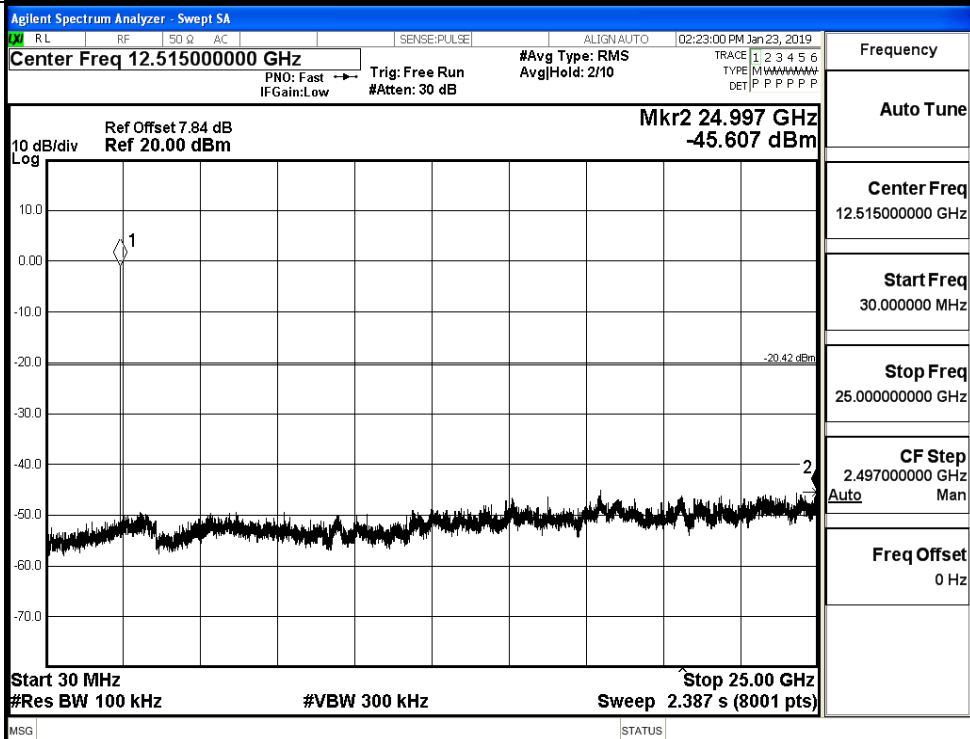


GFSK_MCH_Graphs

Pref

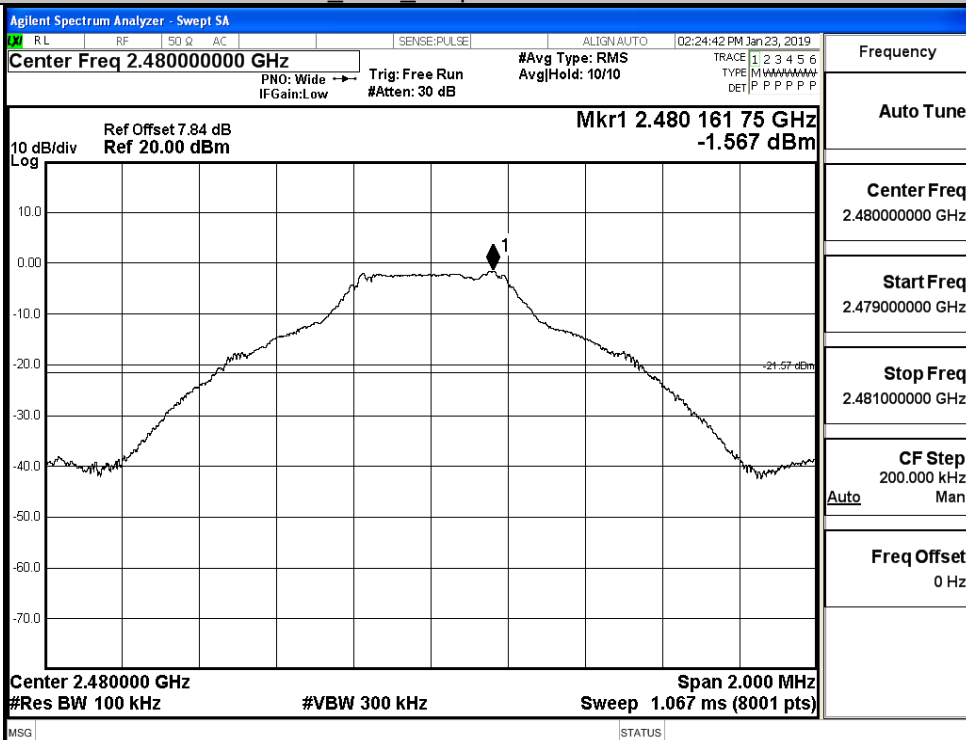


Puw

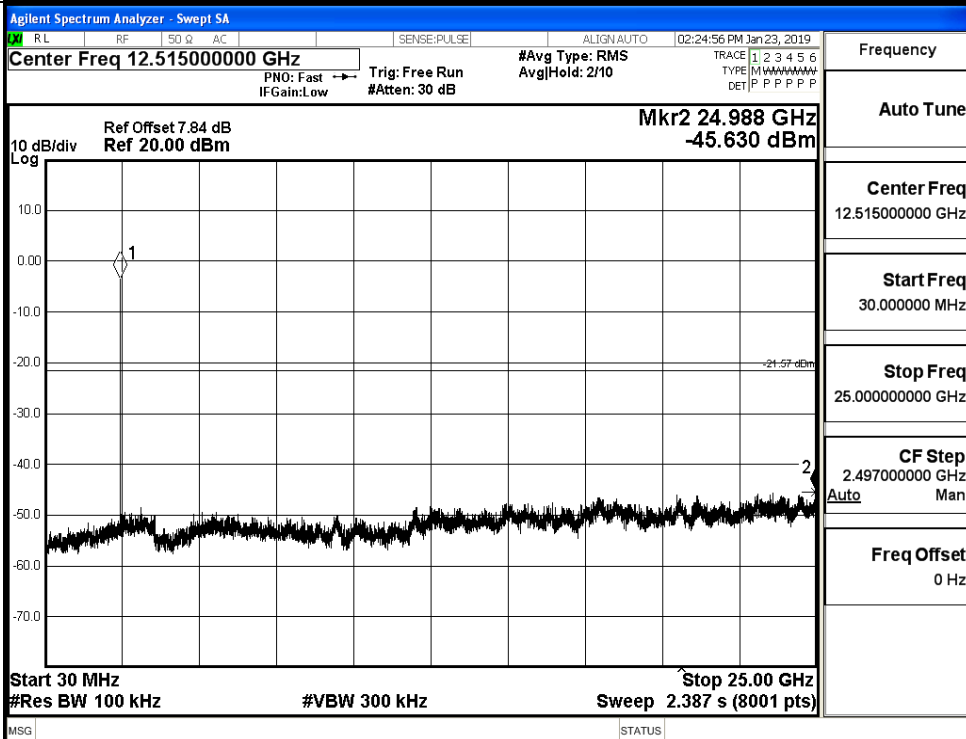


GFSK HCH Graphs

Pref

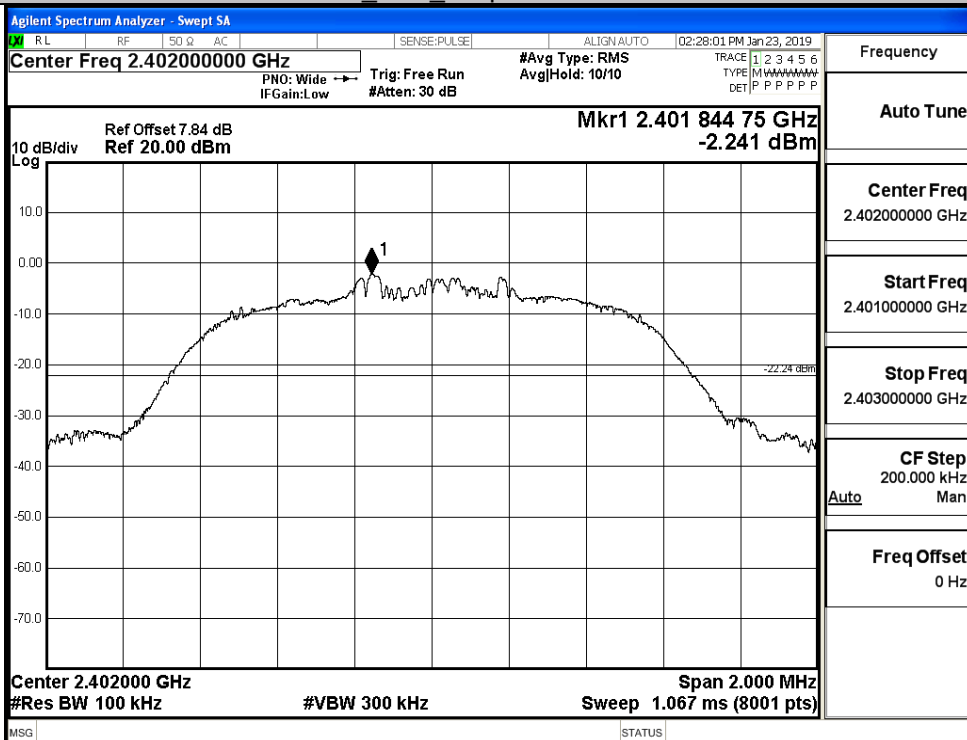


Puw

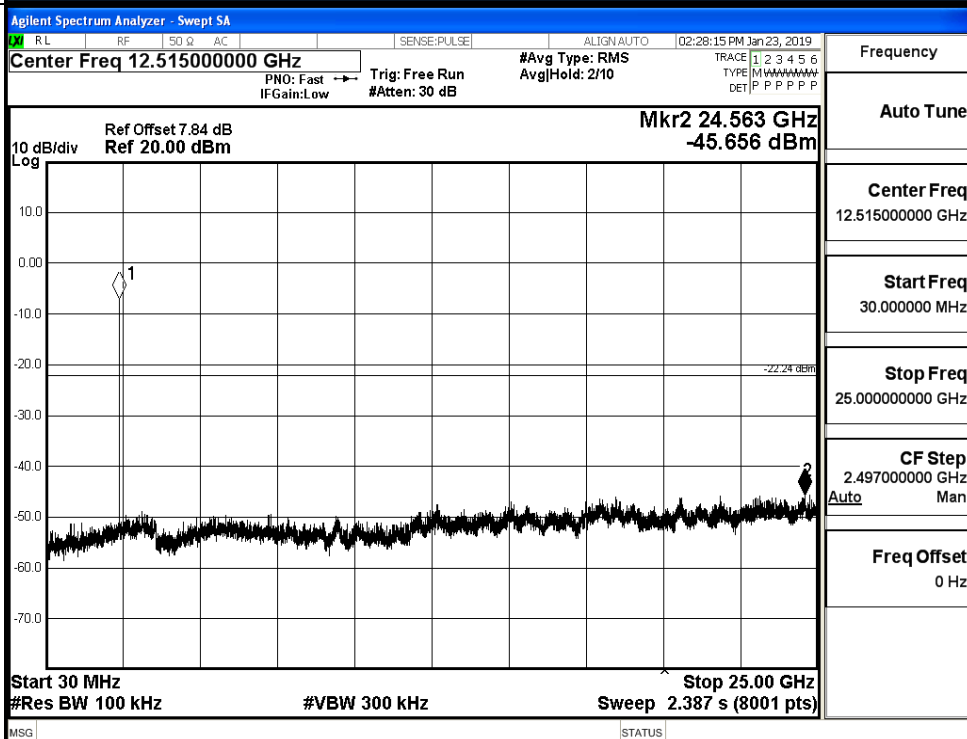


$\pi/4$ DQPSK LCH_Graphs

Pref

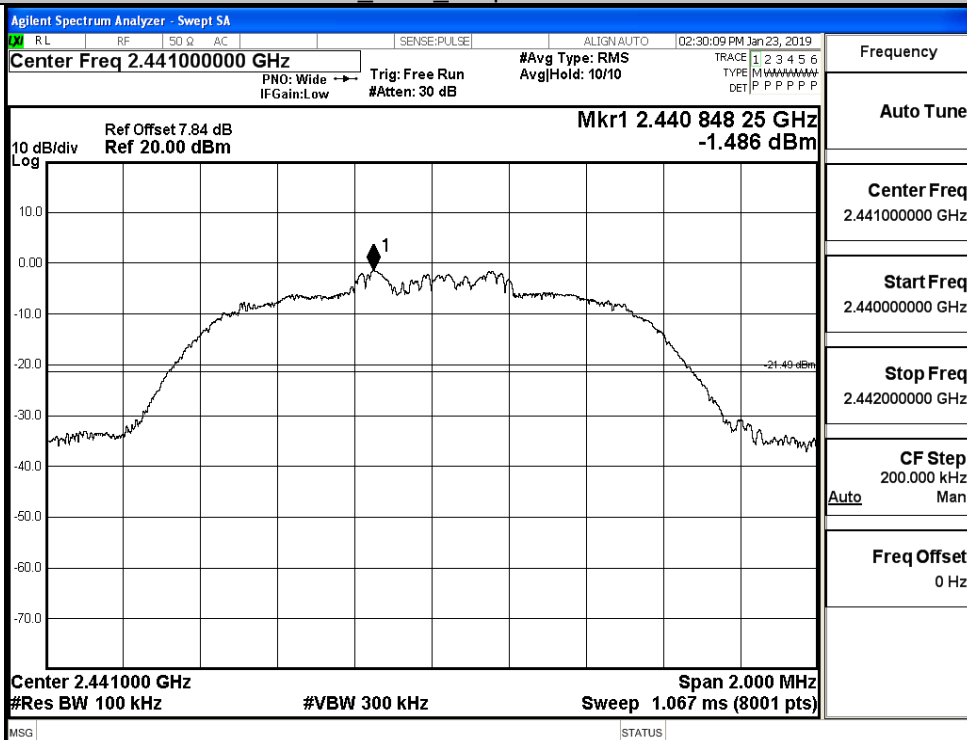


Puw

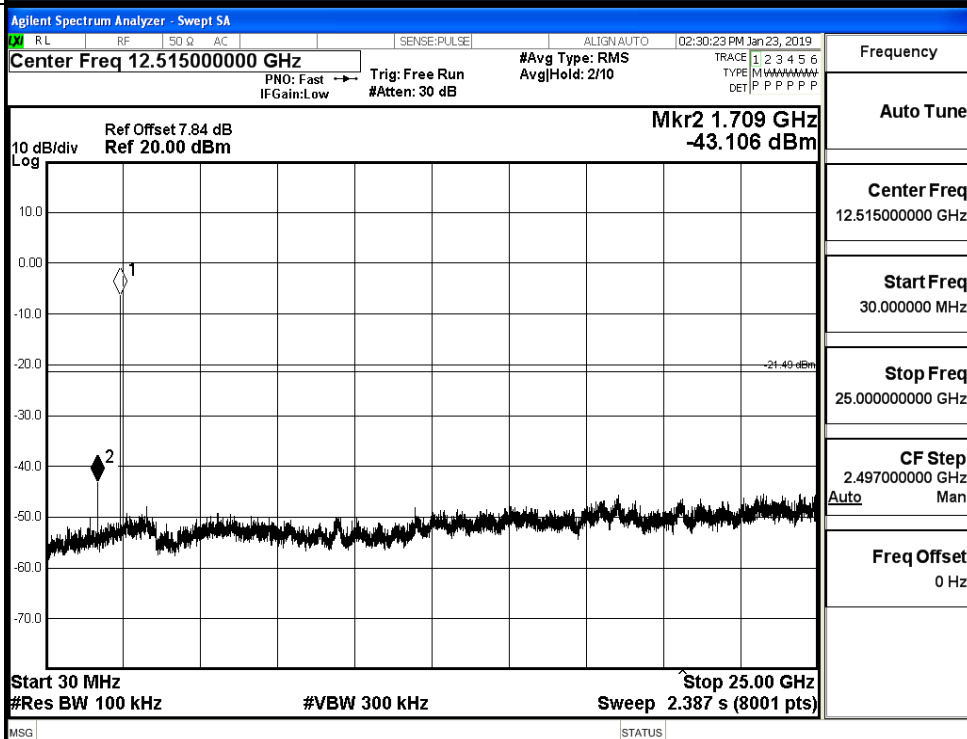


$\pi/4$ DQPSK_MCH_Graphs

Pref

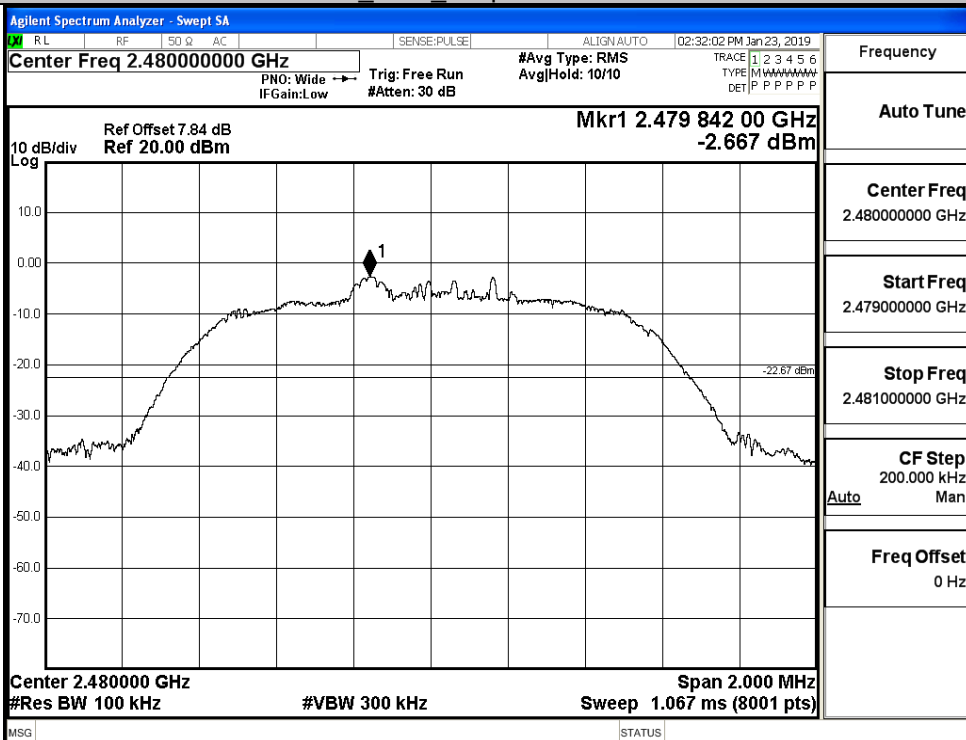


Puw

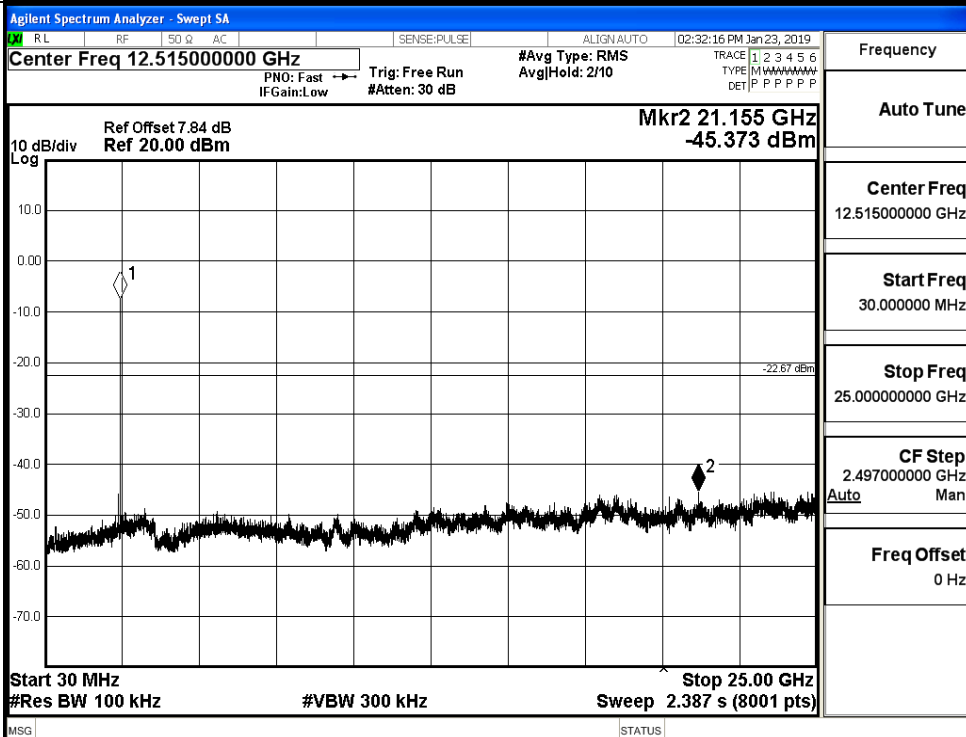


$\pi/4$ DQPSK_HCH_Graphs

Pref



Puw

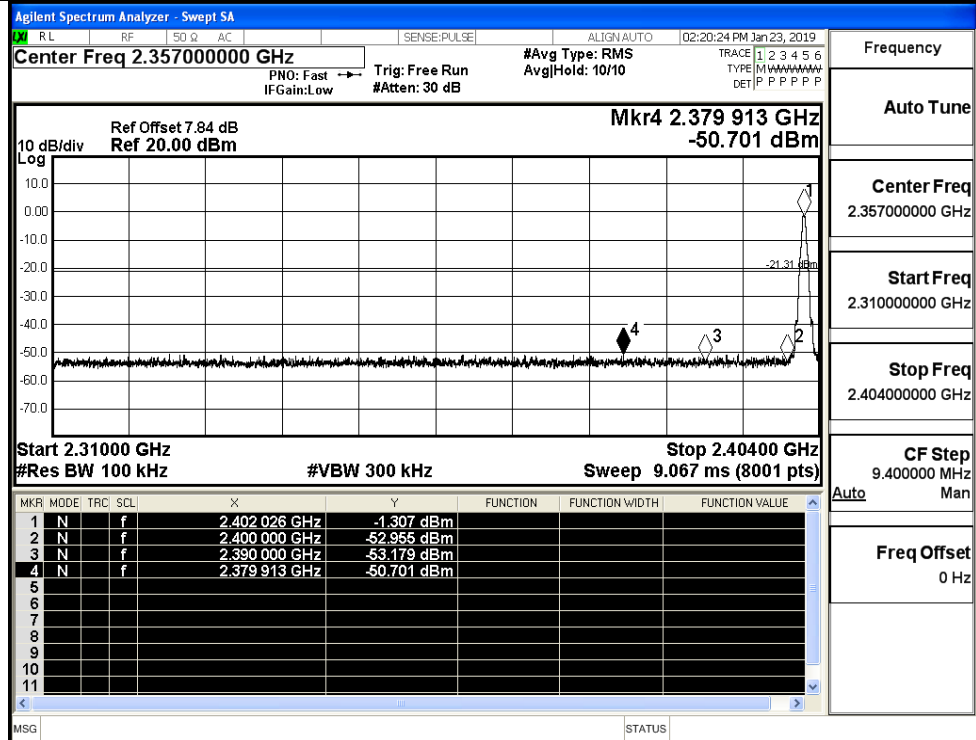


A.7 Band-edge for RF Conducted Emissions

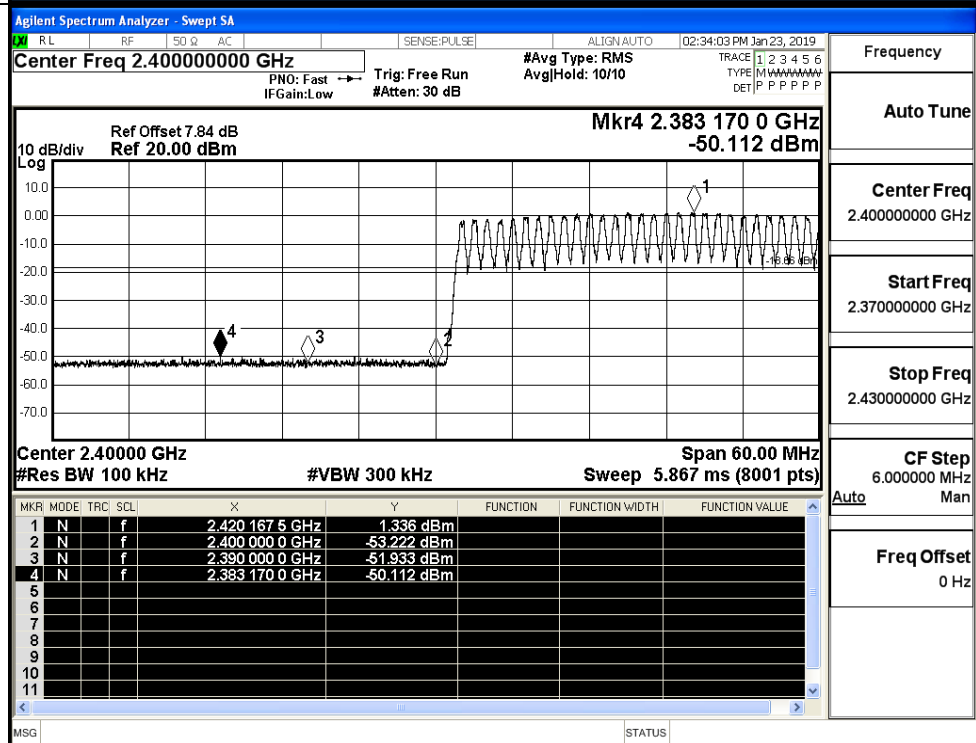
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-1.307	Off	-50.701	-21.31	PASS
			1.336	On	-50.112	-18.66	PASS
	HCH	2480	-1.604	Off	-50.440	-21.6	PASS
			1.009	On	-49.313	-18.99	PASS
$\pi/4$ DQPSK	LCH	2402	-2.181	Off	-50.701	-22.18	PASS
			-0.045	On	-50.221	-20.05	PASS
	HCH	2480	-2.871	Off	-50.056	-22.87	PASS
			-0.407	On	-49.347	-20.41	PASS

Test Graphs

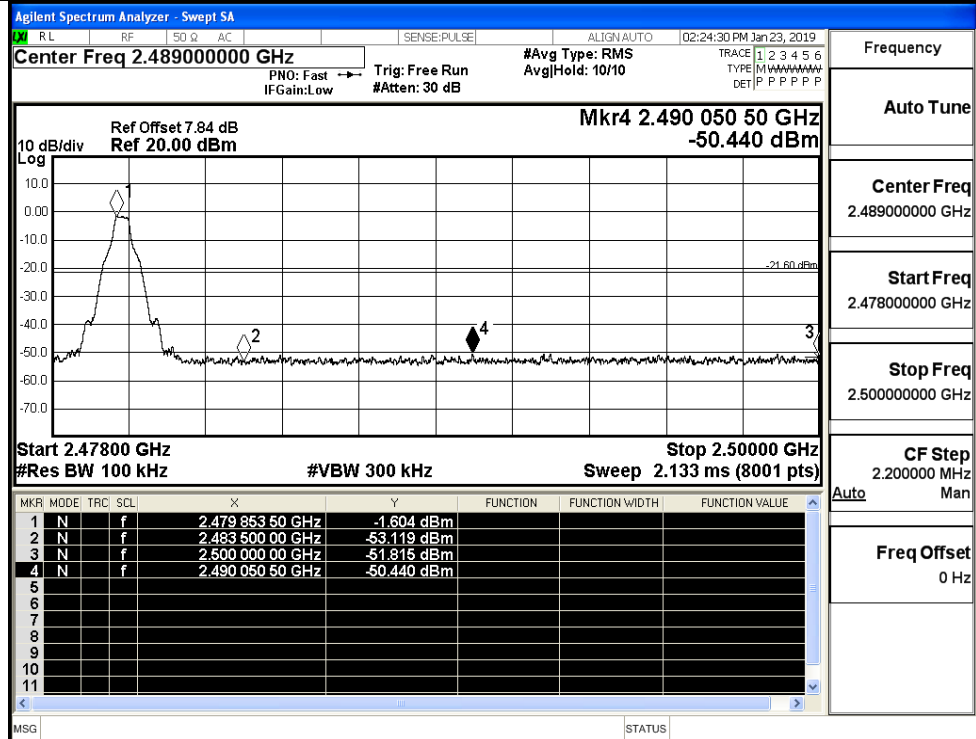
GFSK/LCH/No Hop



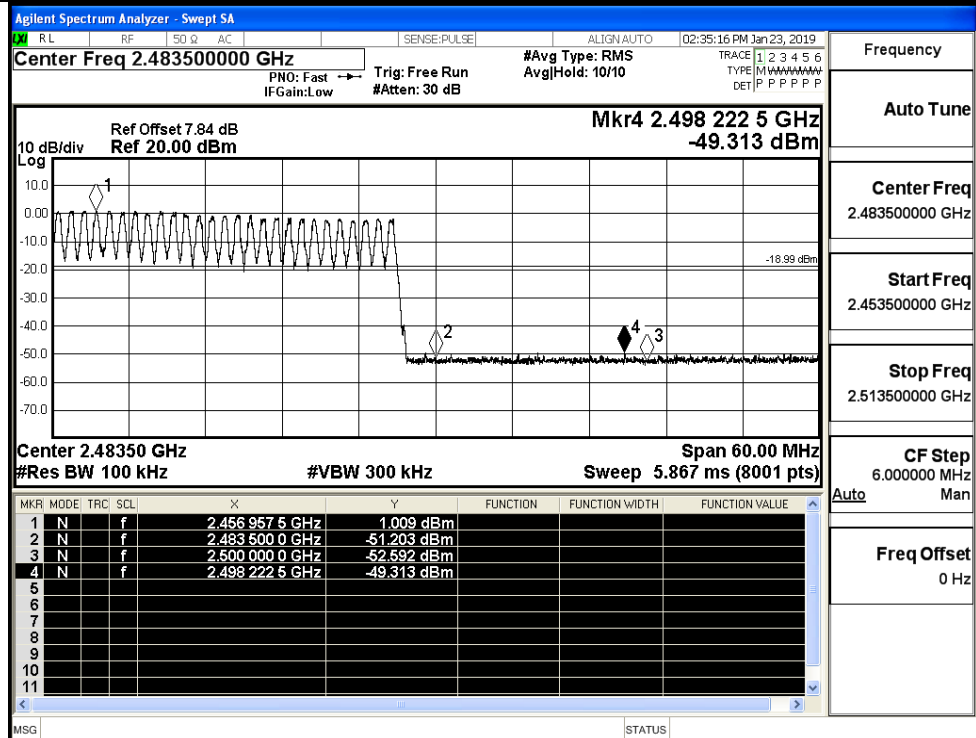
GFSK/LCH/Hop



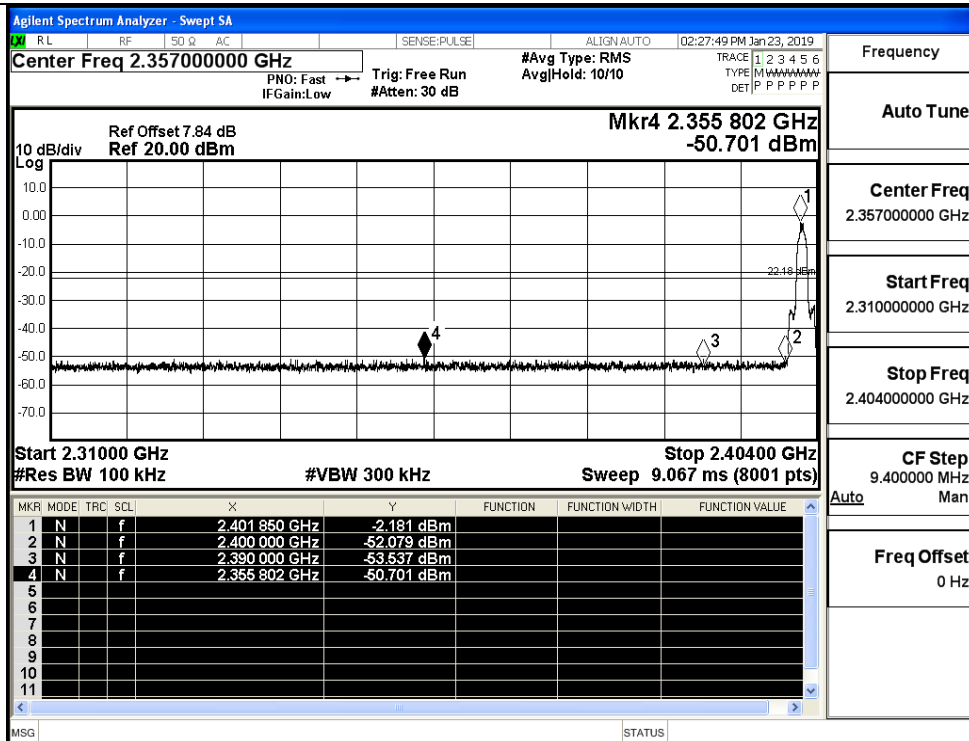
GFSK/HCH/No Hop



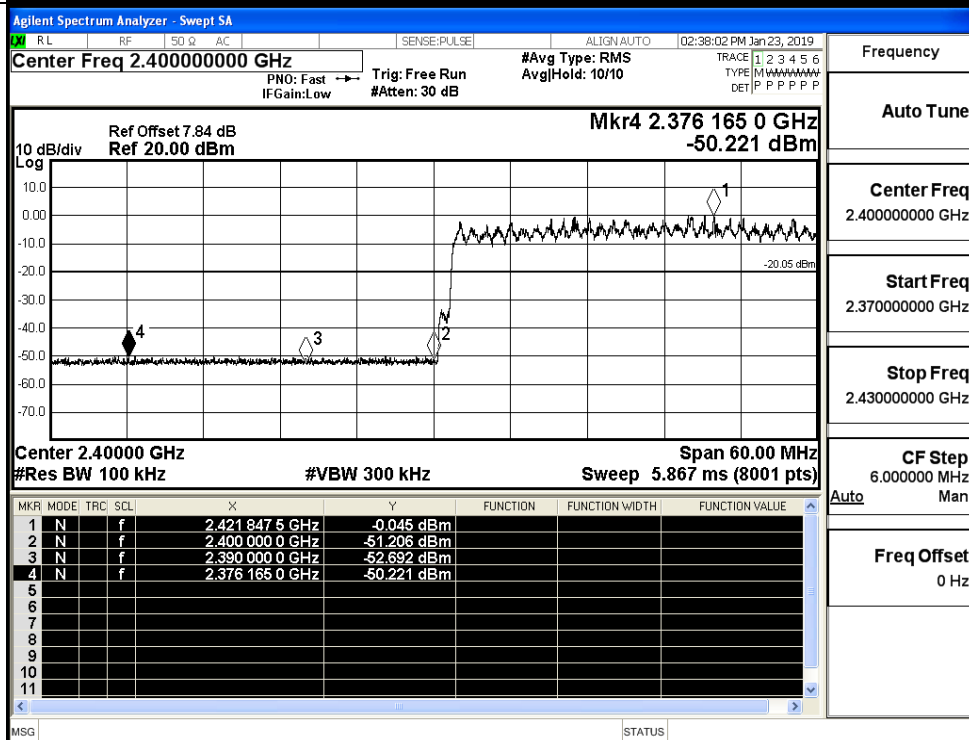
GFSK/HCH/Hop



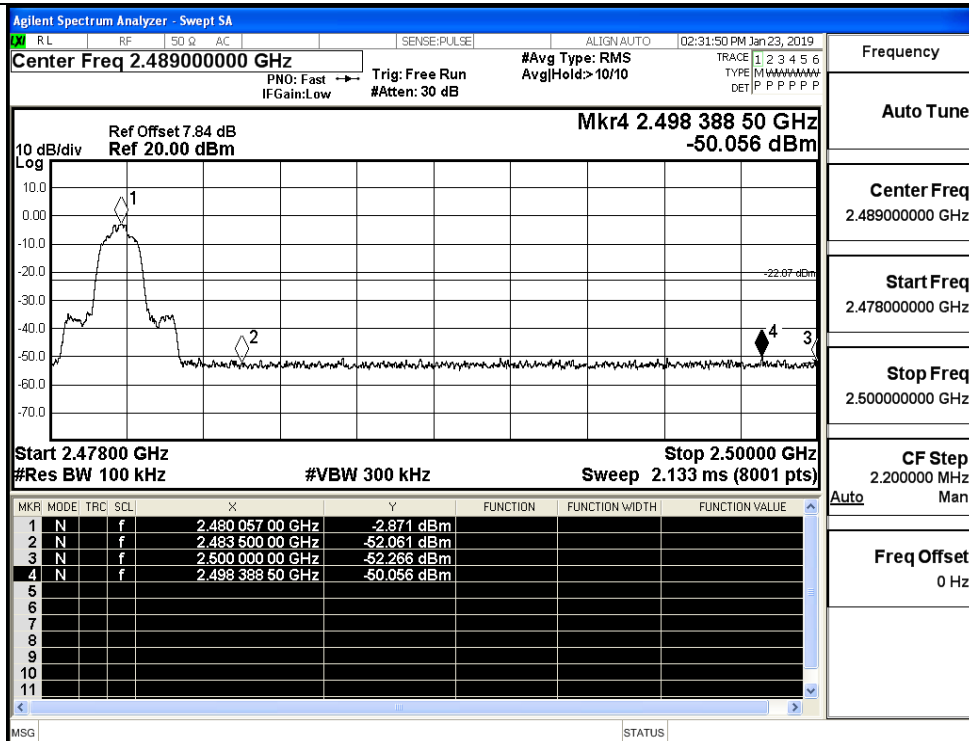
$\pi/4$ DQPSK/LCH/No
Hop



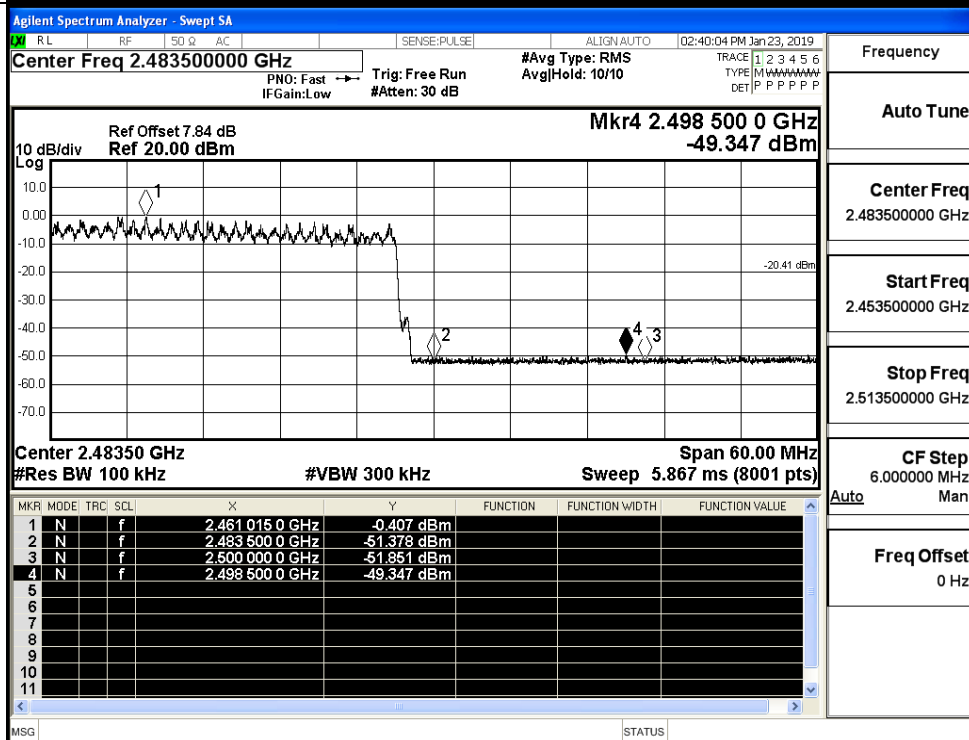
$\pi/4$ DQPSK/LCH/Hop



π /4DQPSK/HCH/No
Hop



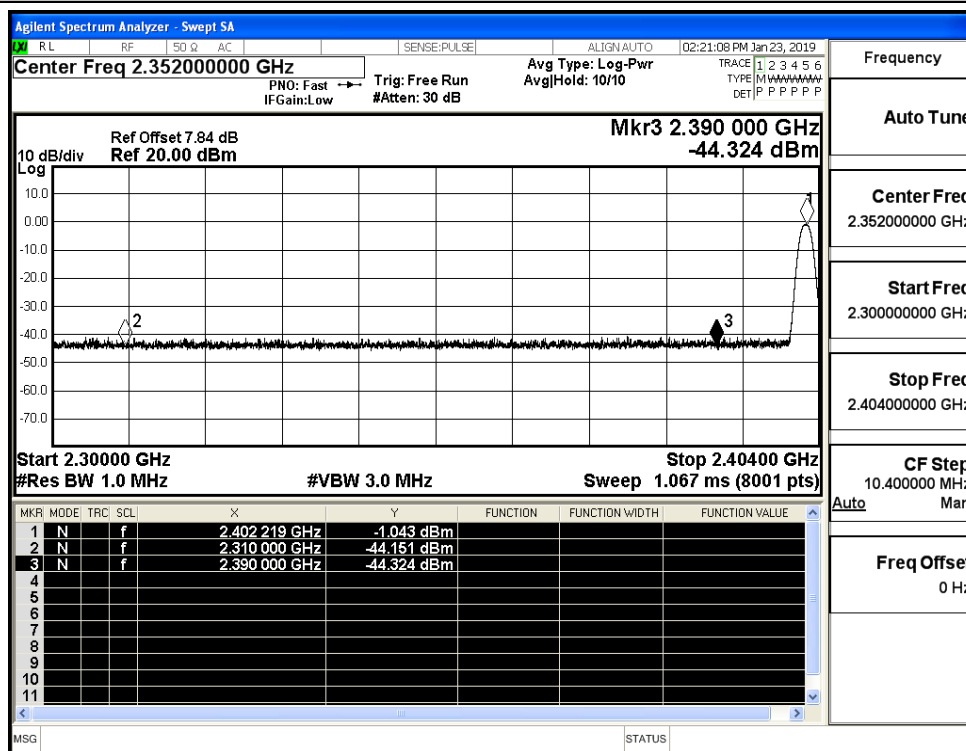
π /4DQPSK/HCH/Hop



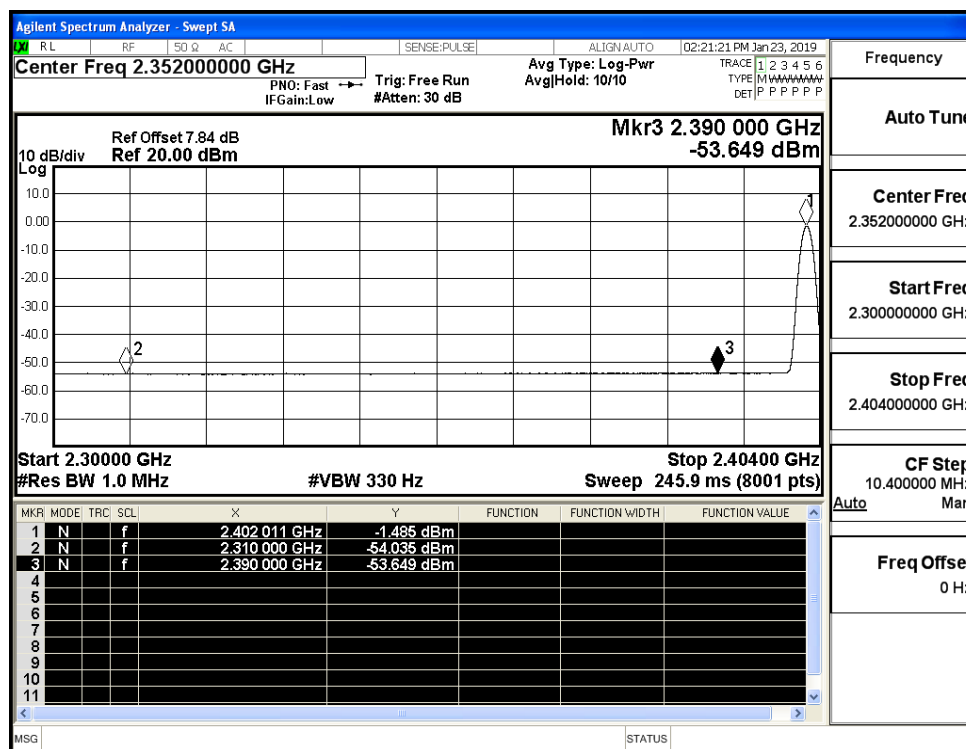
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-44.15	2.0	0	53.11	PEAK	74	PASS
	Off	2310.0	-54.04	2.0	0	43.22	AV	54	PASS
	Off	2390.0	-44.32	2.0	0	52.93	PEAK	74	PASS
	Off	2390.0	-53.65	2.0	0	43.61	AV	54	PASS
	Off	2483.5	-44.24	2.0	0	53.02	PEAK	74	PASS
	Off	2483.5	-53.45	2.0	0	43.81	AV	54	PASS
	Off	2500.0	-43.08	2.0	0	54.18	PEAK	74	PASS
	Off	2500.0	-53.38	2.0	0	43.88	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-44.45	2.0	0	52.81	PEAK	74	PASS
	Off	2310.0	-54.02	2.0	0	43.24	AV	54	PASS
	Off	2390.0	-43.34	2.0	0	53.92	PEAK	74	PASS
	Off	2390.0	-53.75	2.0	0	43.50	AV	54	PASS
	Off	2483.5	-42.40	2.0	0	54.86	PEAK	74	PASS
	Off	2483.5	-53.44	2.0	0	43.82	AV	54	PASS
	Off	2500.0	-42.84	2.0	0	54.41	PEAK	74	PASS
	Off	2500.0	-53.30	2.0	0	43.95	AV	54	PASS

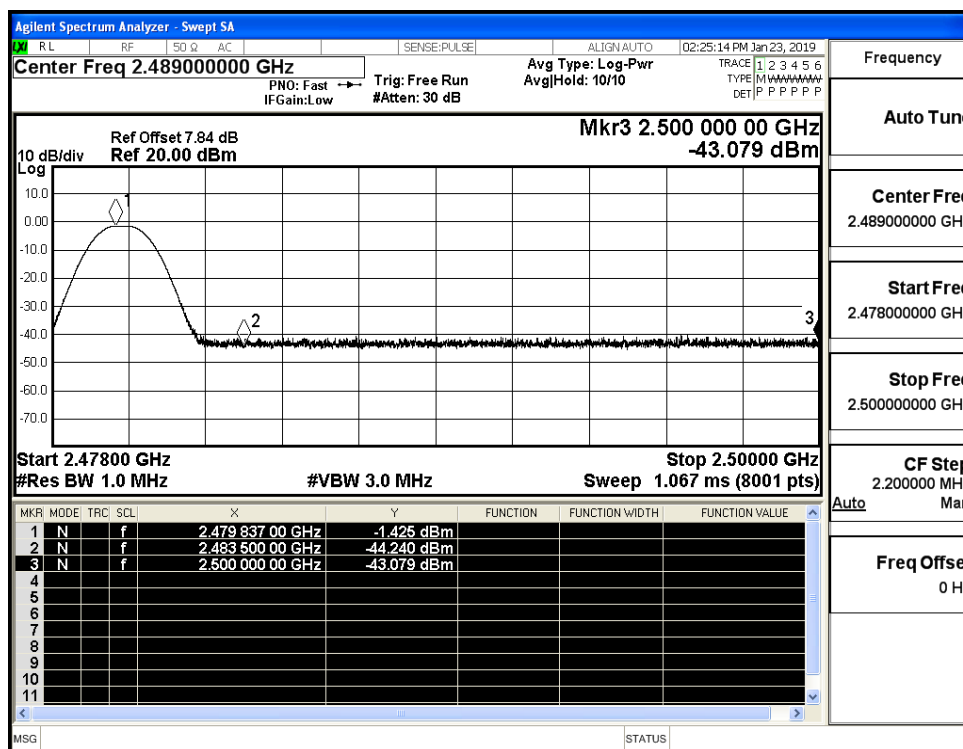
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



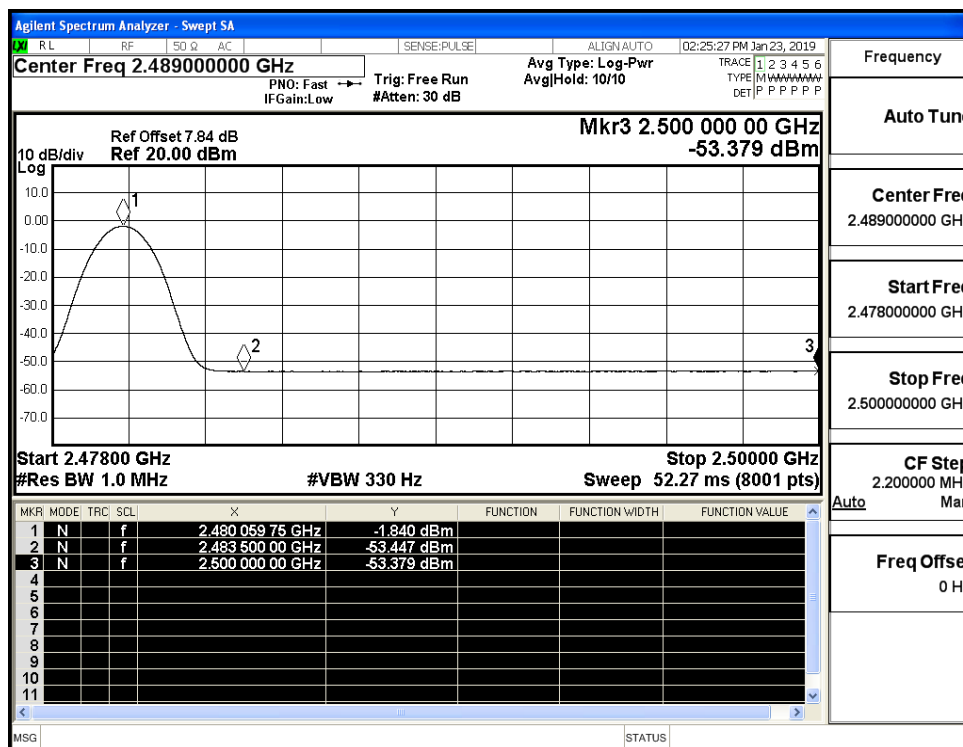
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

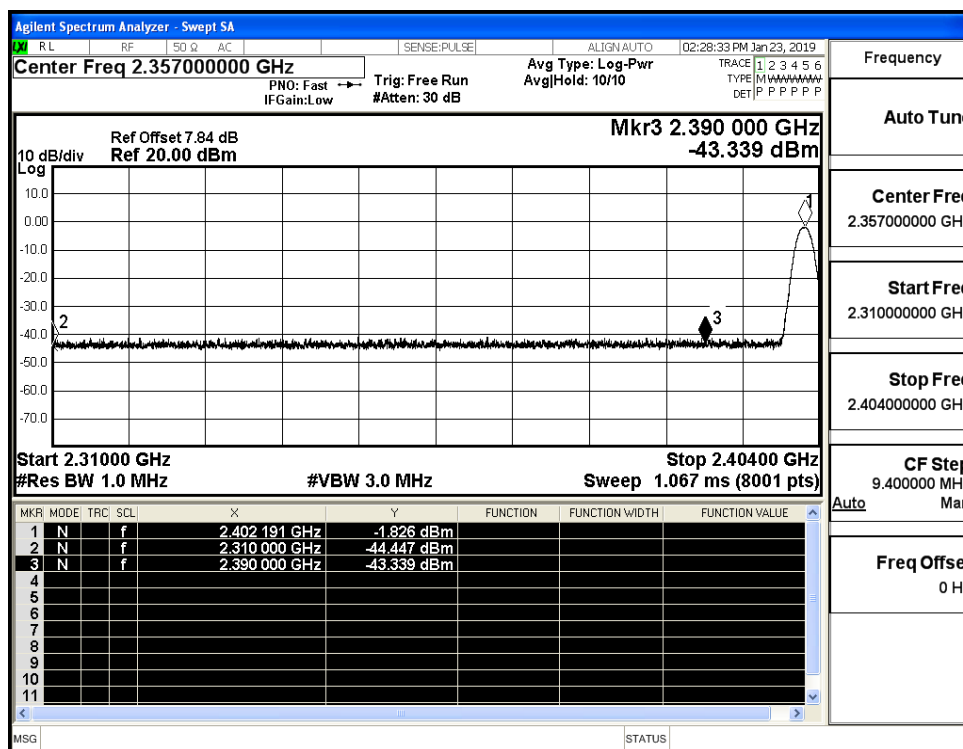
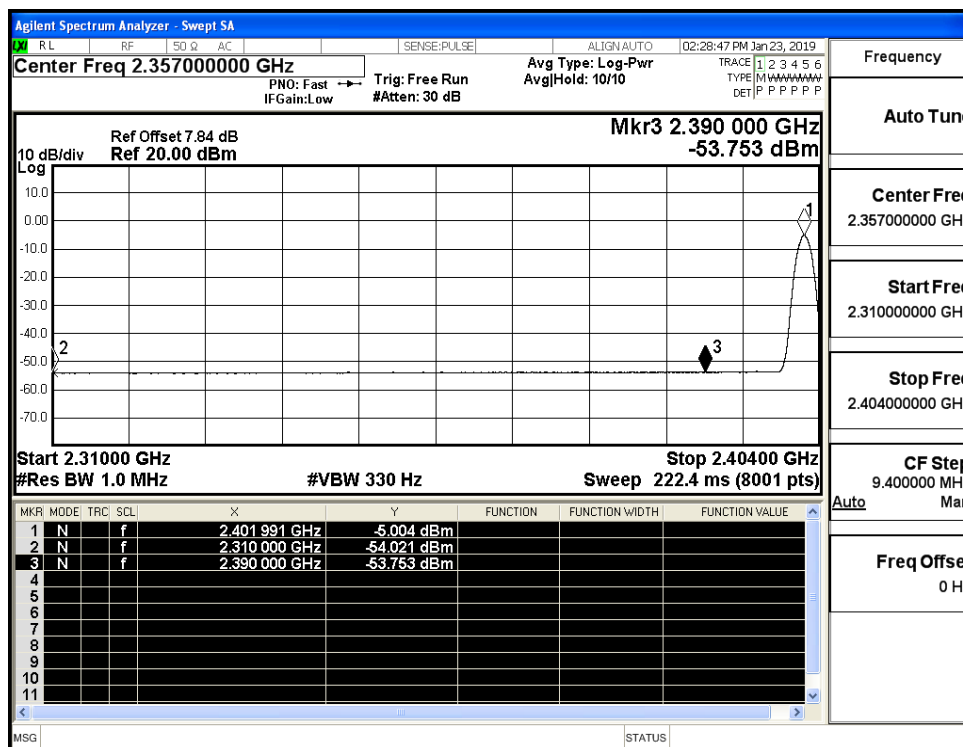


Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)

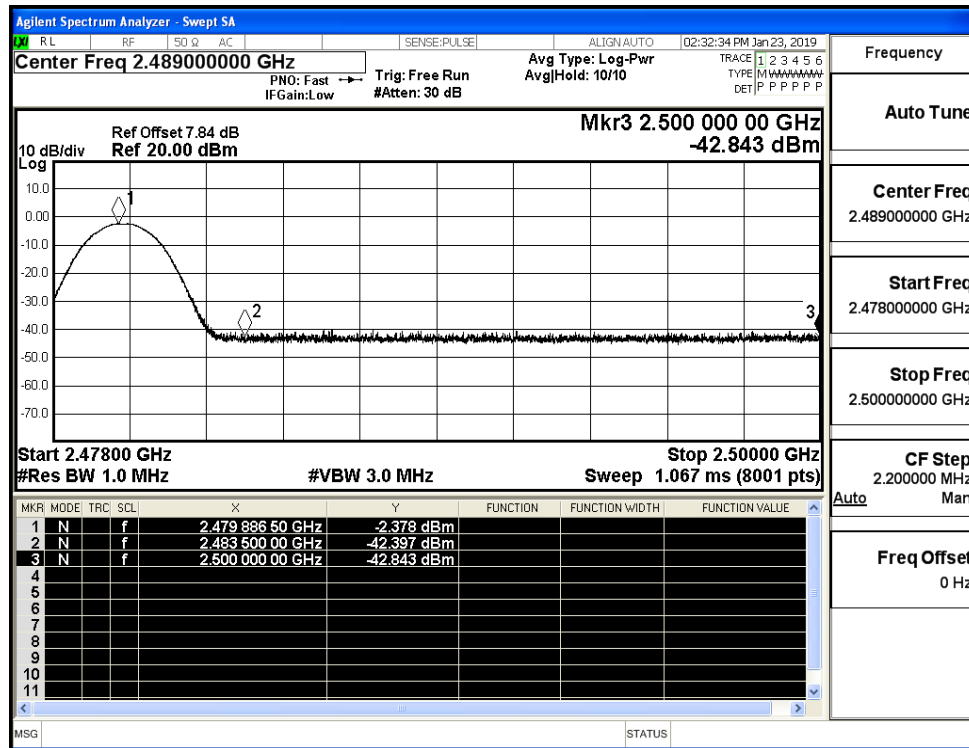


Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



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)

