

Appendix A

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

Product Name: Bamboo Bluetooth Speaker

Trade Mark: N/A

Test Model: XO-9700

Environmental Conditions

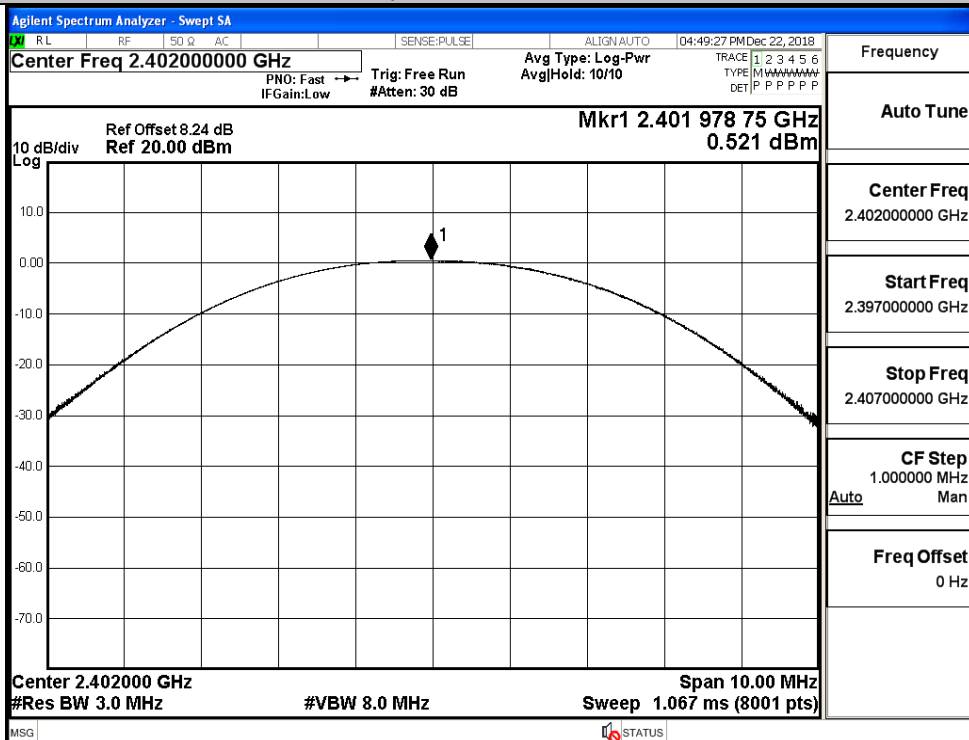
Temperature:	24.6 ° C
Relative Humidity:	54.6%
ATM Pressure:	100.0 kPa
Test Engineer:	Francis Zhang&Mina Xu
Supervised by:	Jayden.Zhuo

A.1 Maximum Conducted Peak Output Power

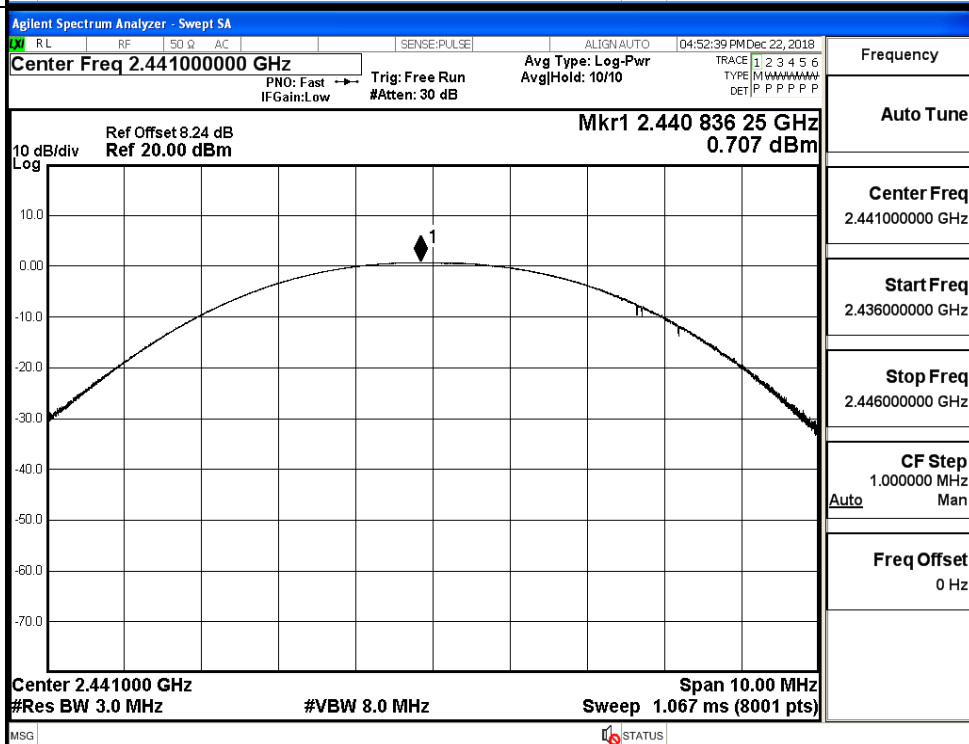
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.521	21	PASS
	MCH	0.707	21	PASS
	HCH	0.661	21	PASS
$\pi/4$ DQPSK	LCH	-0.423	21	PASS
	MCH	-0.255	21	PASS
	HCH	-0.543	21	PASS

Test Graphs

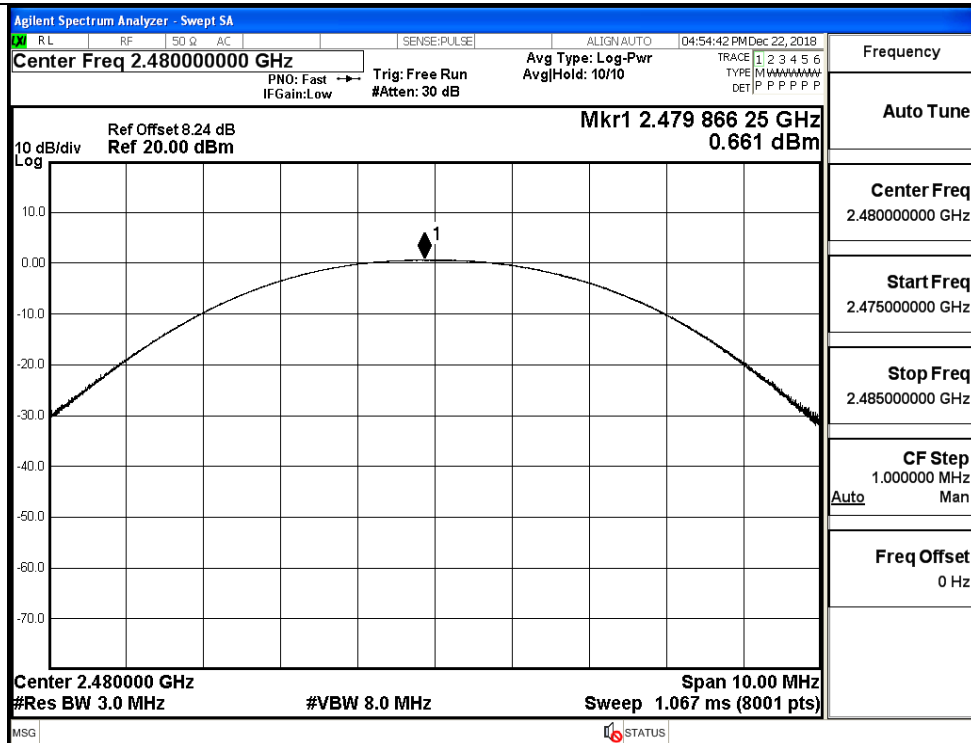
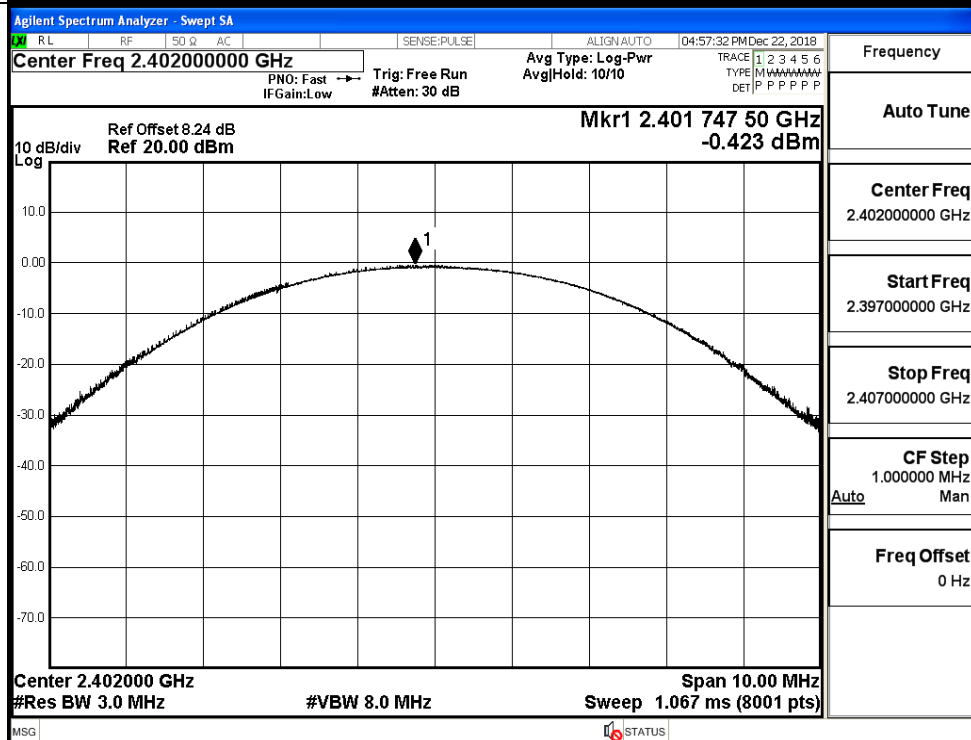
GFSK/LCH

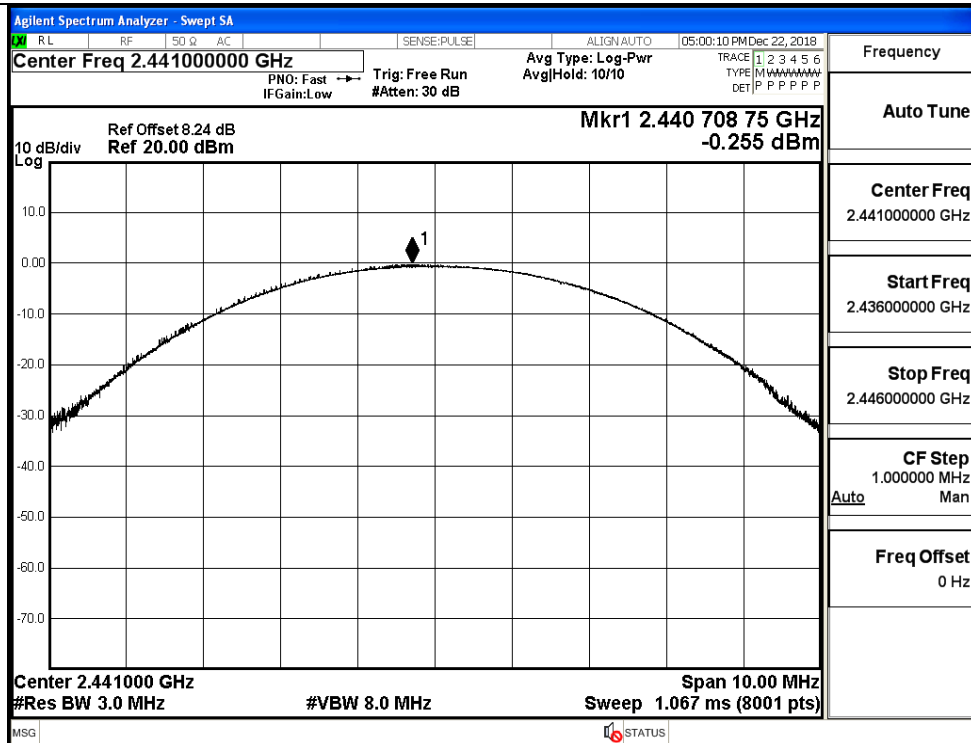
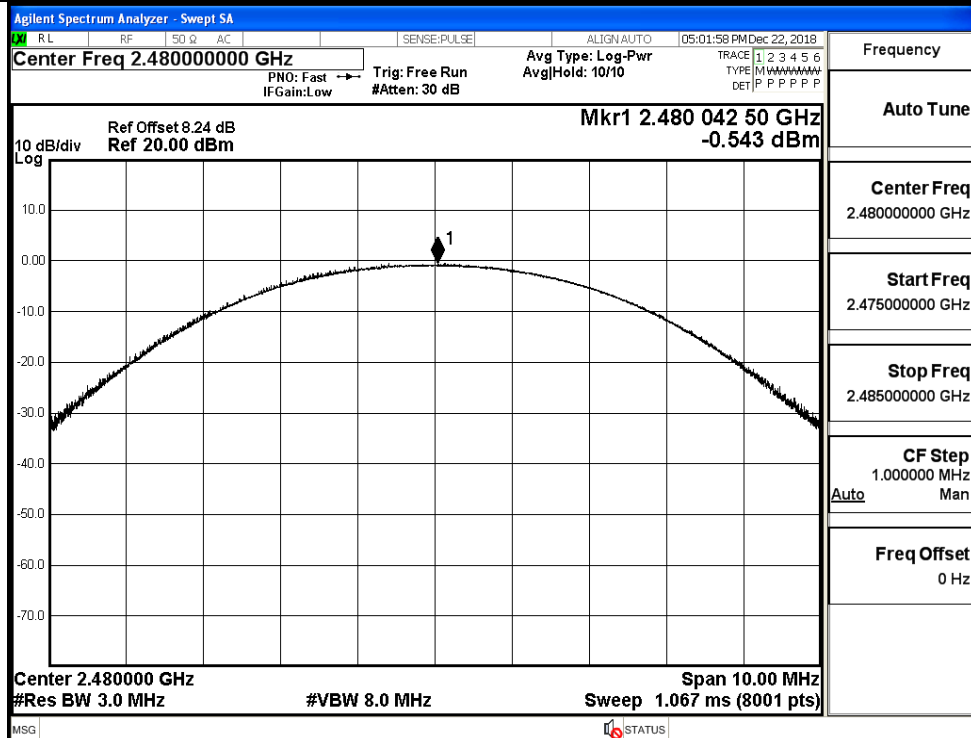


GFSK/MCH



GFSK/HCH

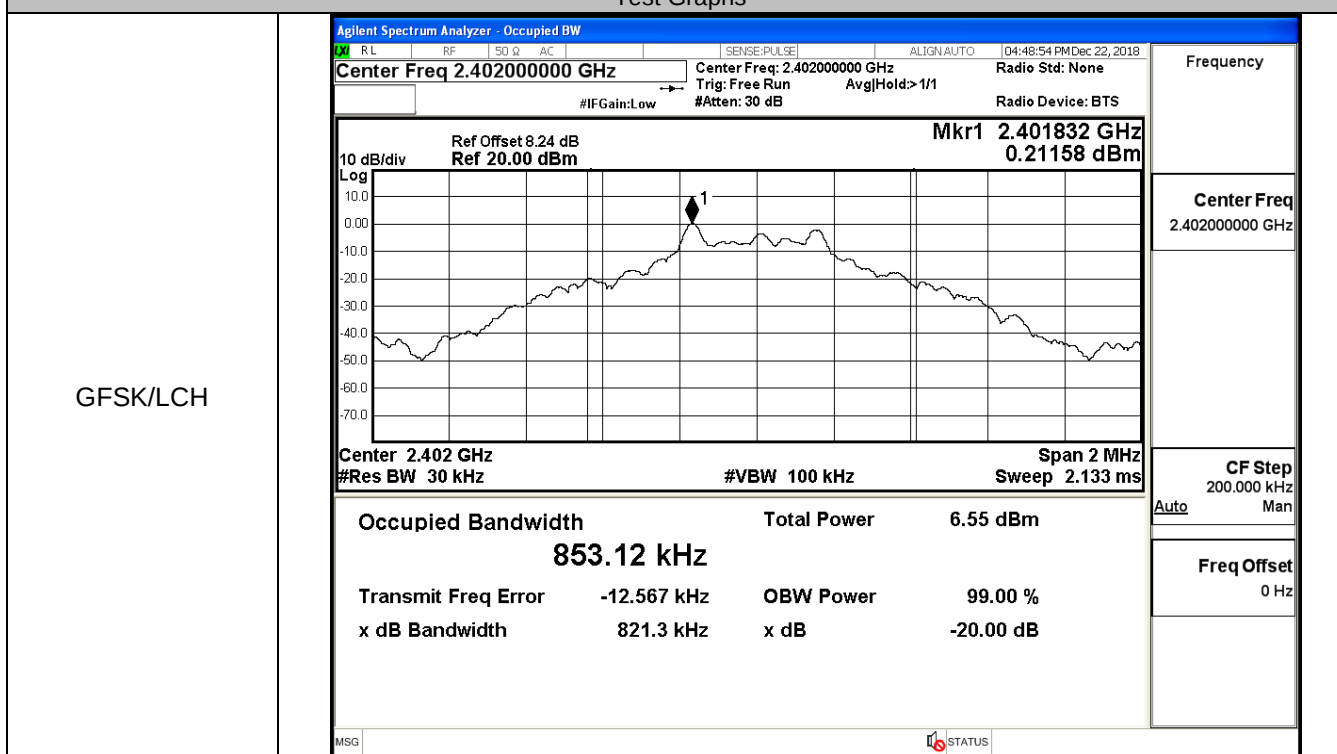
 π /4DQPSK/LCH

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

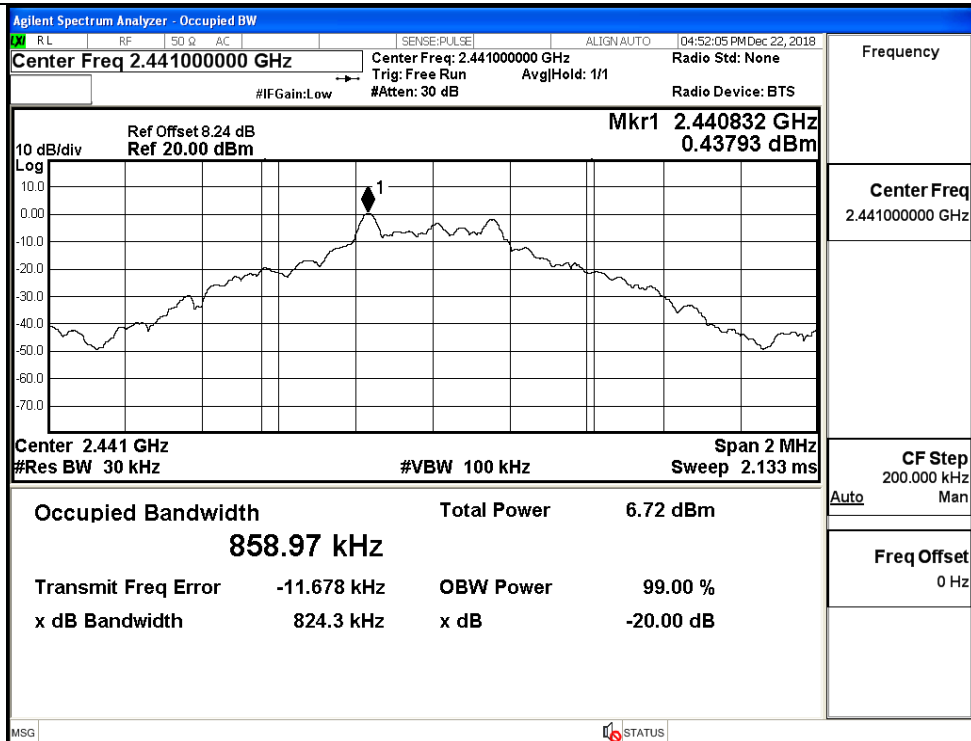
A.2 99% and 20dB Bandwidth

Mode	Channel.	99% Bandwidth [MHz]	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.85312	0.8213	Not Specified	PASS
	MCH	0.85897	0.8243	Not Specified	PASS
	HCH	0.85908	0.8261	Not Specified	PASS
π /4DQPSK	LCH	1.0638	1.102	Not Specified	PASS
	MCH	1.0630	1.113	Not Specified	PASS
	HCH	1.0632	1.106	Not Specified	PASS

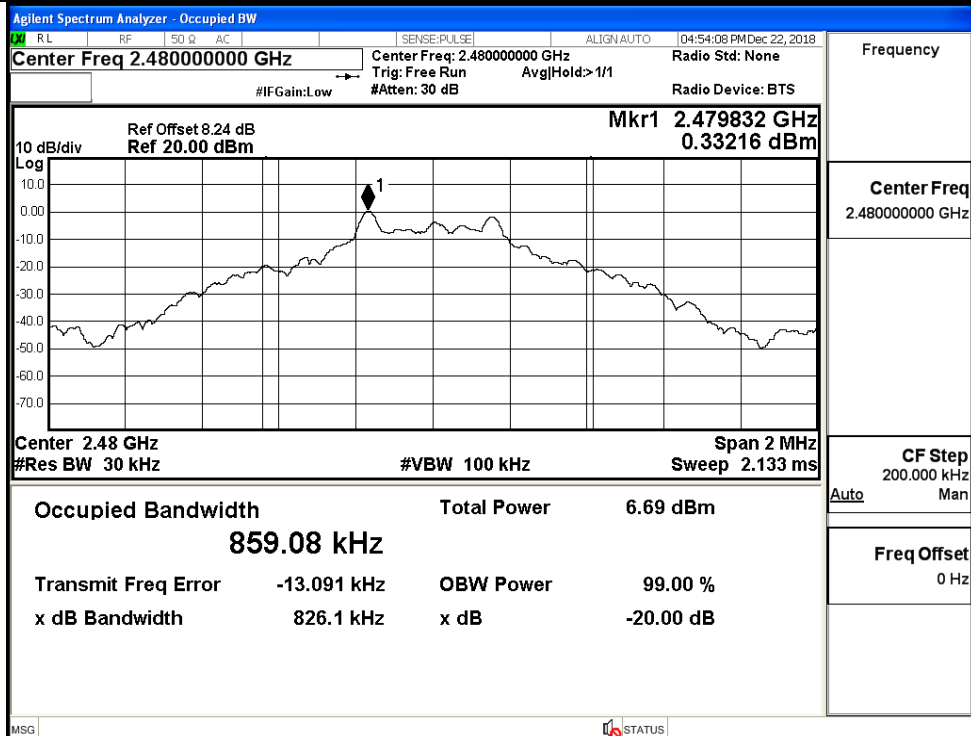
Test Graphs

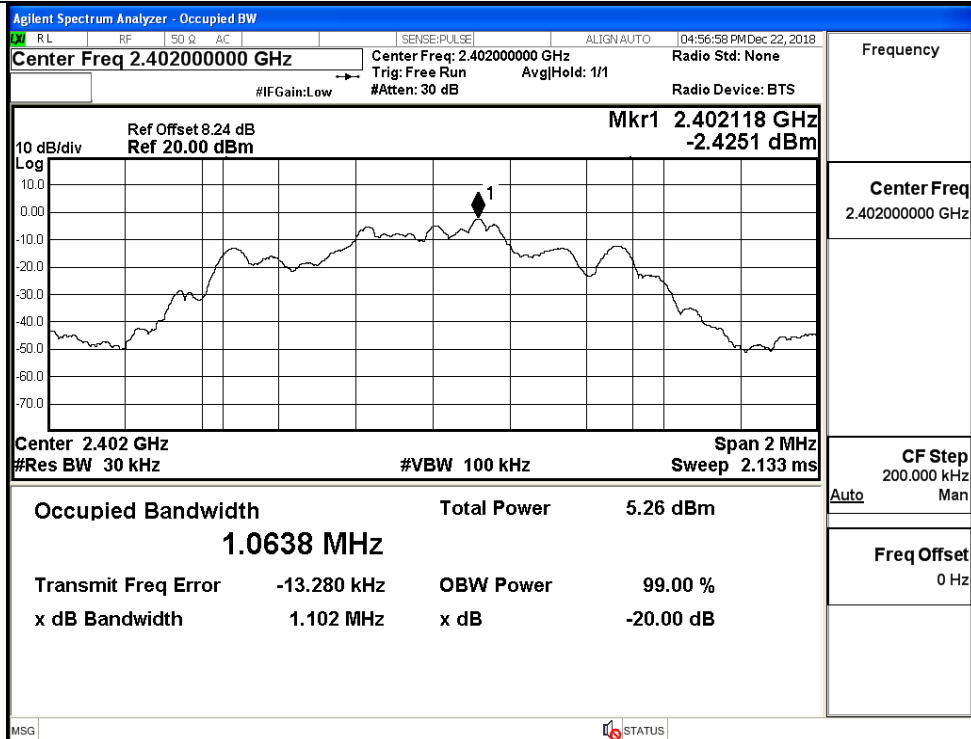
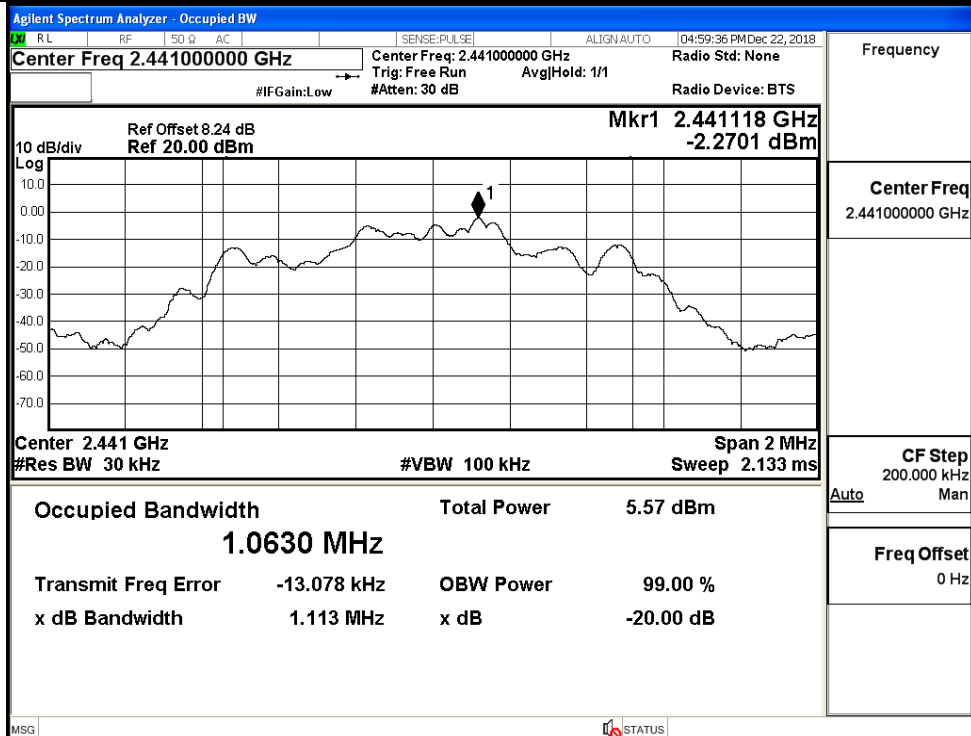


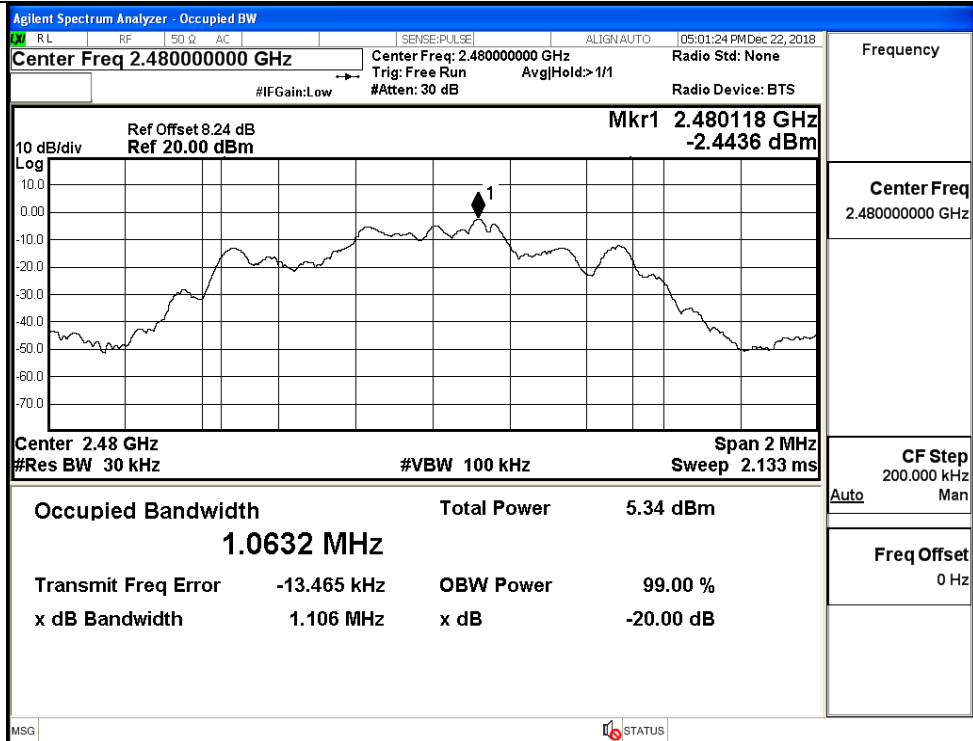
GFSK/MCH



GFSK/HCH



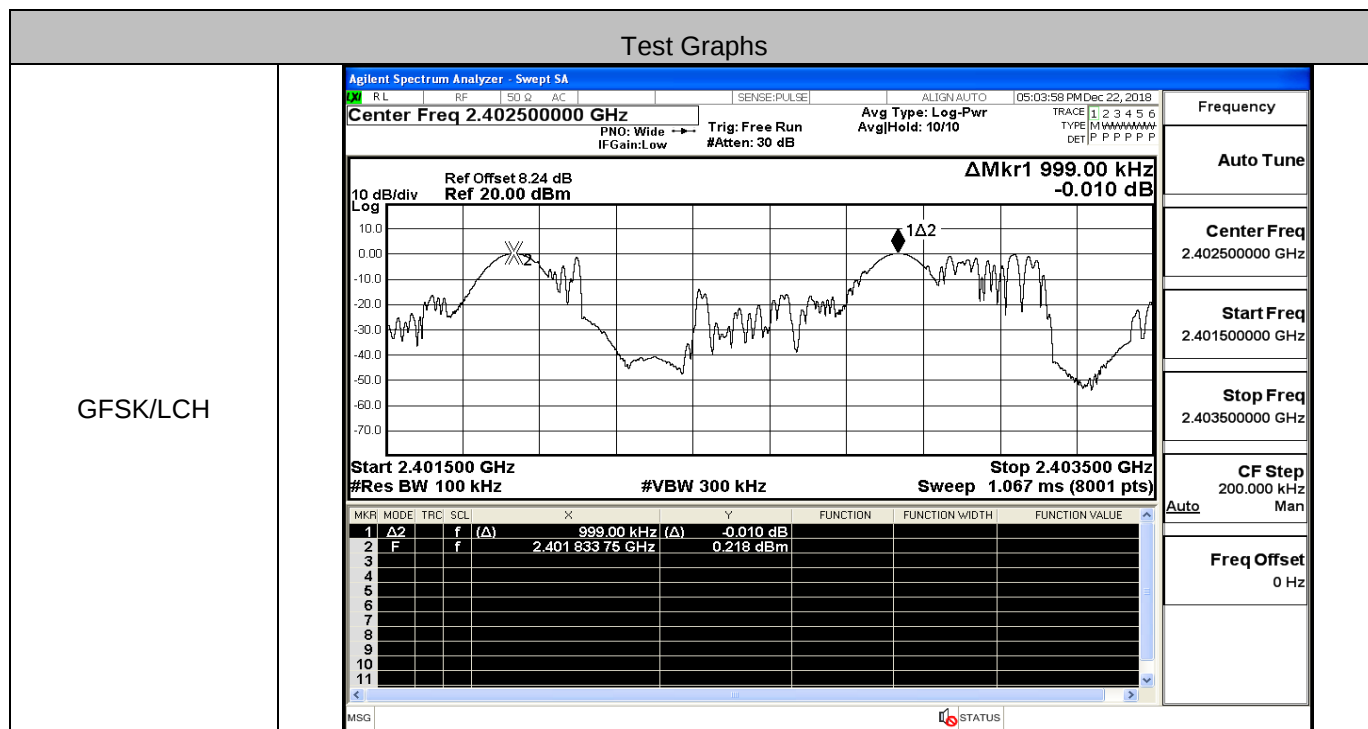
$\pi/4$ DQPSK/LCH $\pi/4$ DQPSK/MCH

$\pi/4$ DQPSK/HCH

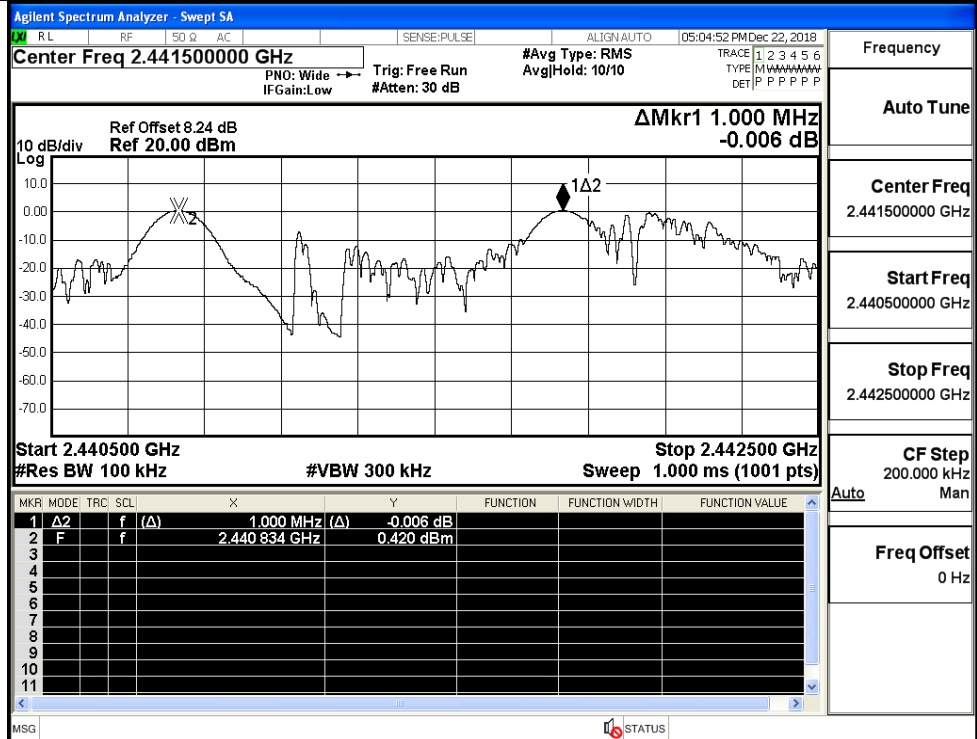
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.999	0.551	PASS
	MCH	1.000	0.551	PASS
	HCH	1.000	0.551	PASS
$\pi/4$ DQPSK	LCH	1.000	0.742	PASS
	MCH	0.898	0.742	PASS
	HCH	1.106	0.742	PASS

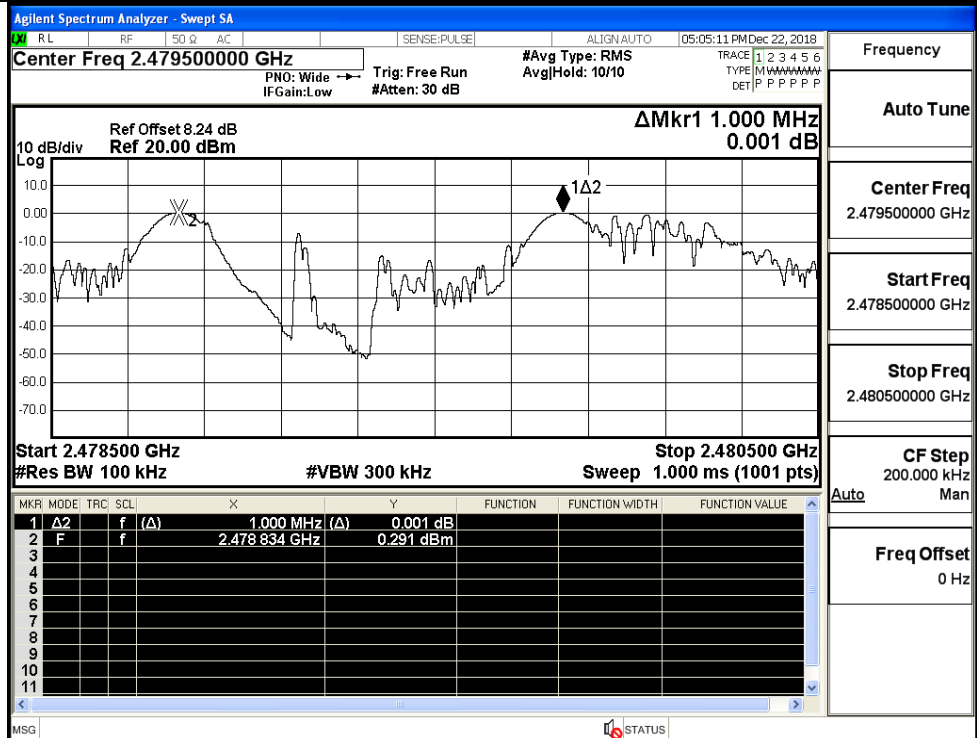
Test Graphs

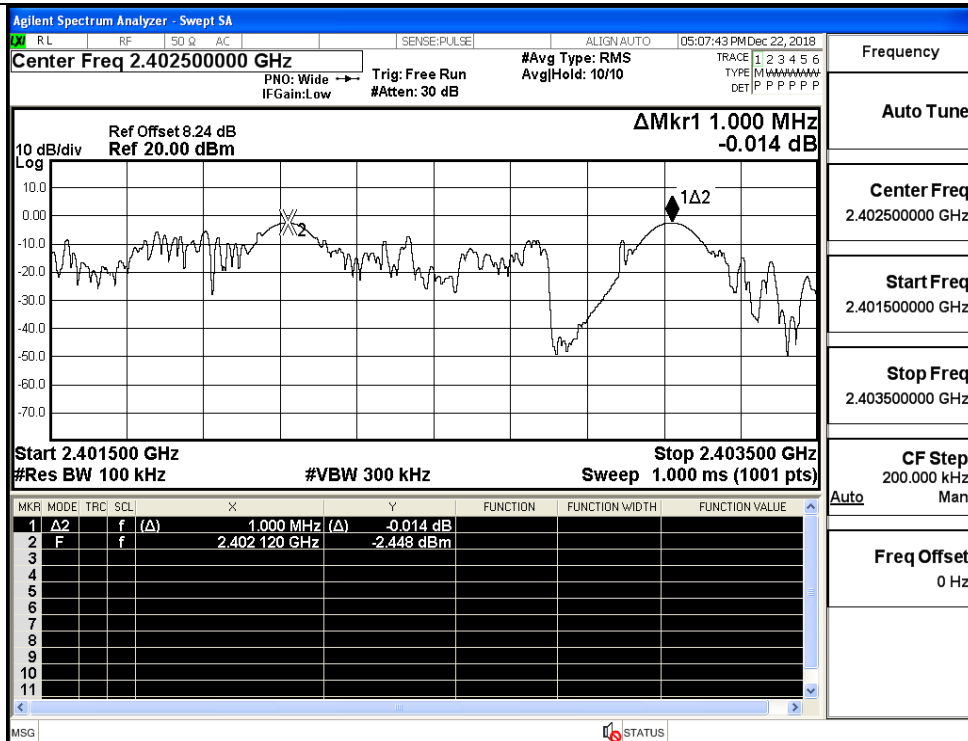


GFSK/MCH



GFSK/HCH



$\pi/4$ DQPSK/LCH

Frequency

Auto Tune

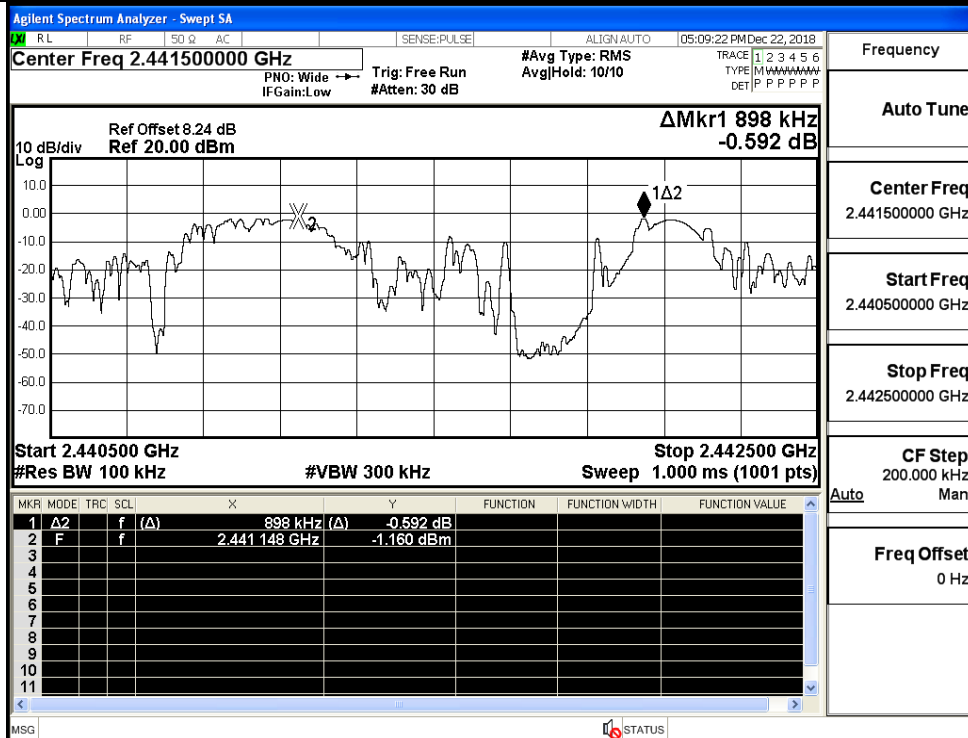
Center Freq
2.402500000 GHz

Start Freq
2.401500000 GHz

Stop Freq
2.403500000 GHz

CF Step
200.000 kHz
Man

Freq Offset
0 Hz

 $\pi/4$ DQPSK/MCH

Frequency

Auto Tune

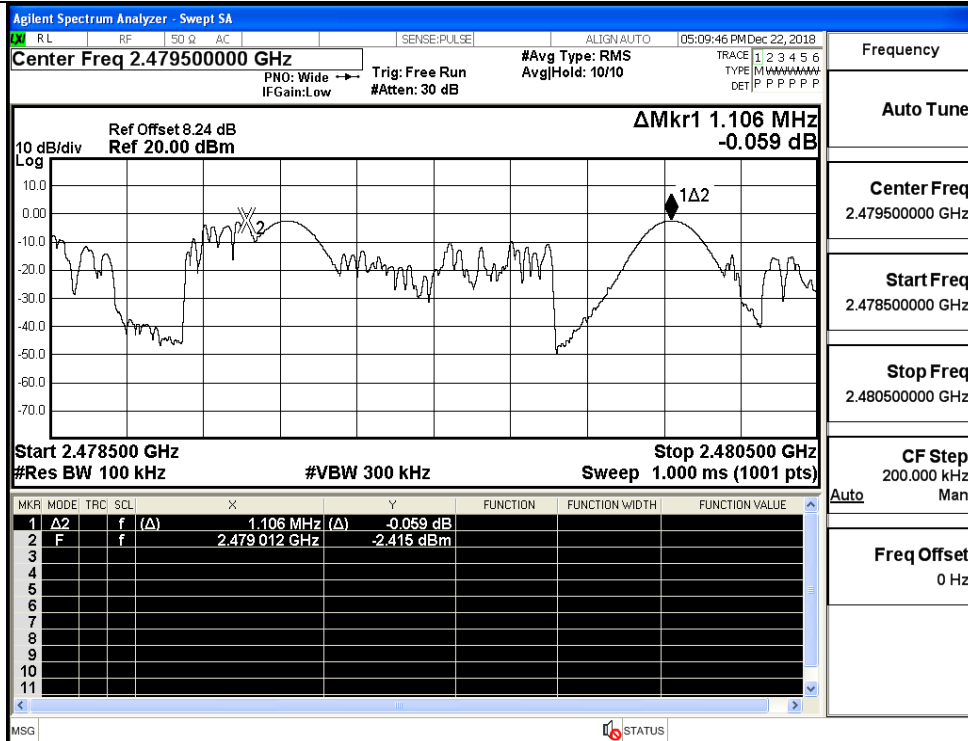
Center Freq
2.441500000 GHz

Start Freq
2.440500000 GHz

Stop Freq
2.442500000 GHz

CF Step
200.000 kHz
Man

Freq Offset
0 Hz

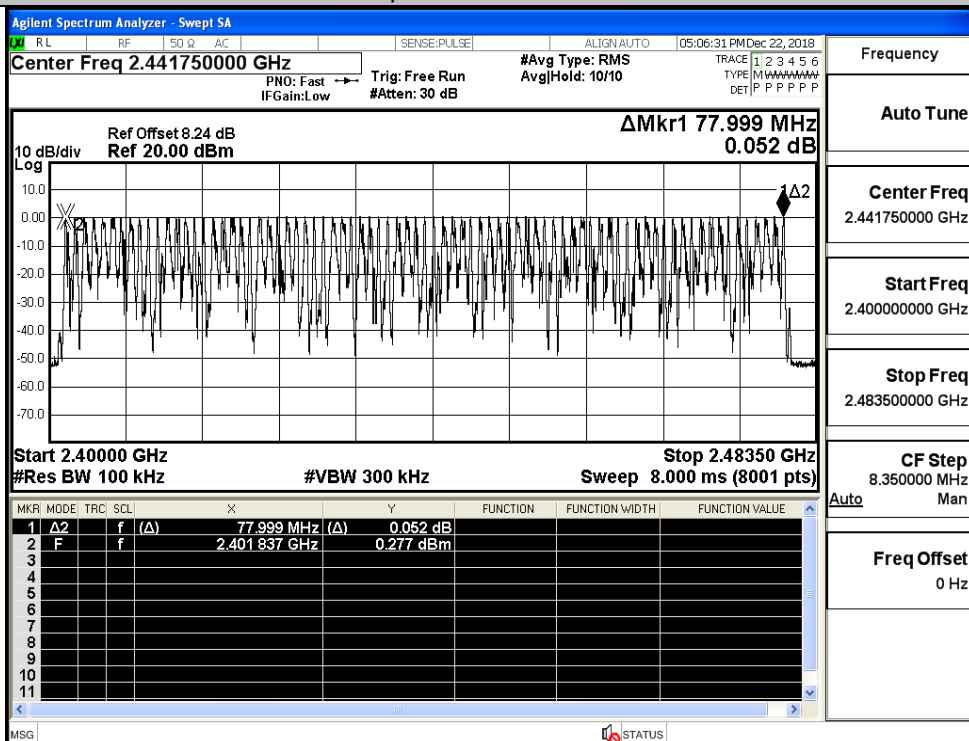
$\pi/4$ DQPSK/HCH

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

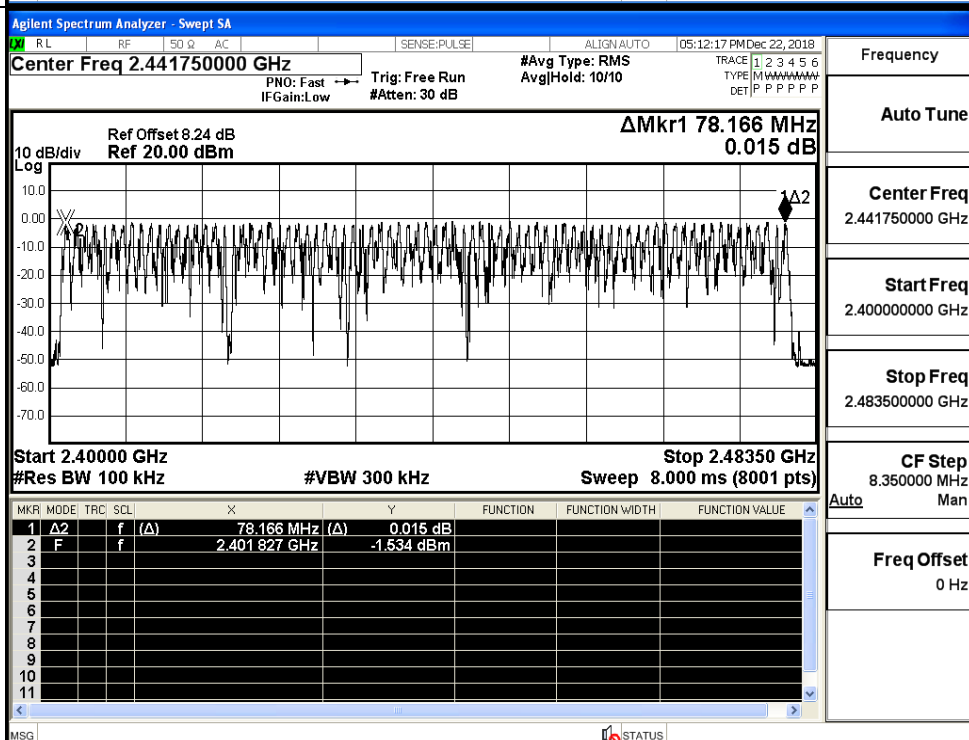
Test Graphs

GFSK/Hop



Frequency

Auto Tune

Center Freq
2.441750000 GHzStart Freq
2.400000000 GHzStop Freq
2.483500000 GHzCF Step
8.350000 MHz
Auto ManFreq Offset
0 Hz $\pi/4$ DQPSK/Hop

Frequency

Auto Tune

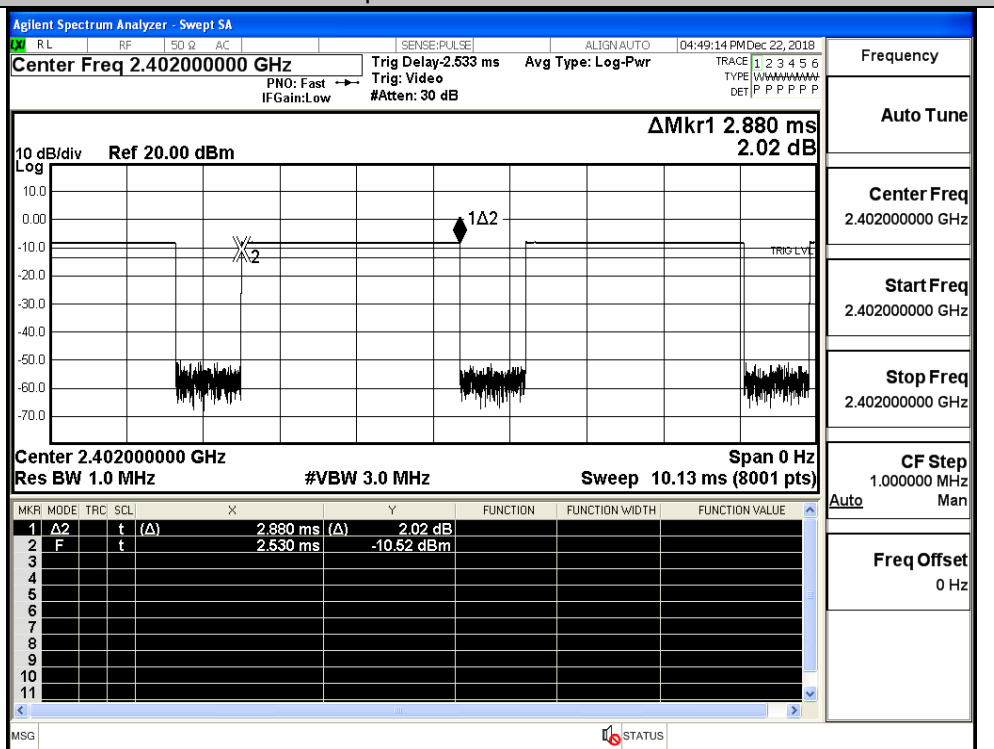
Center Freq
2.441750000 GHzStart Freq
2.400000000 GHzStop Freq
2.483500000 GHzCF Step
8.350000 MHz
Auto ManFreq Offset
0 Hz

A.5 Dwell Time

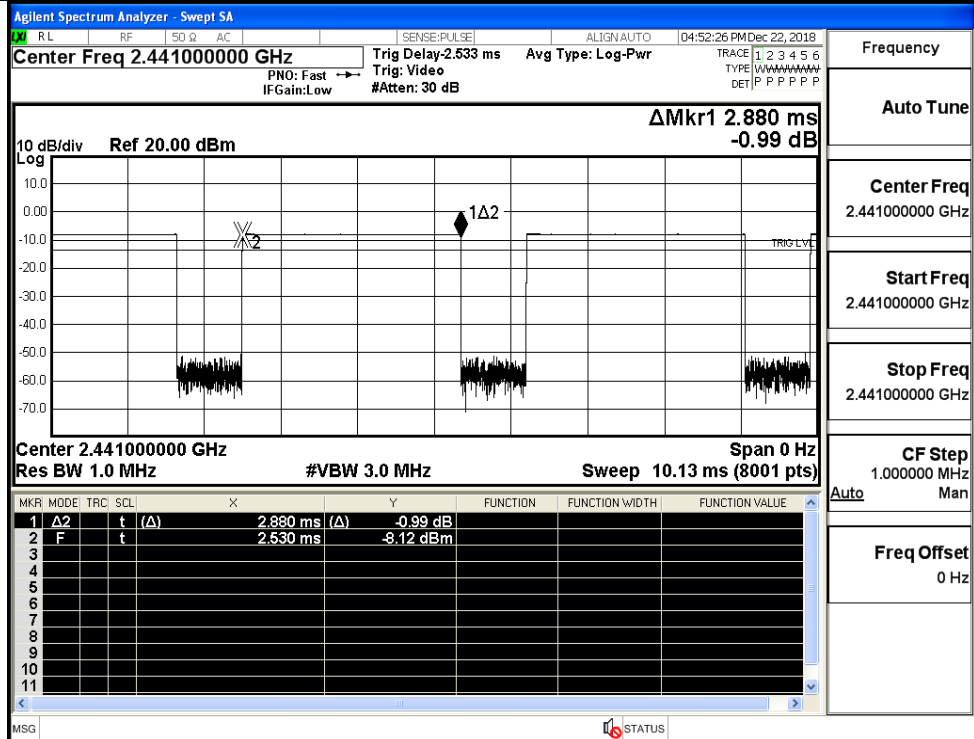
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88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

Test Graphs

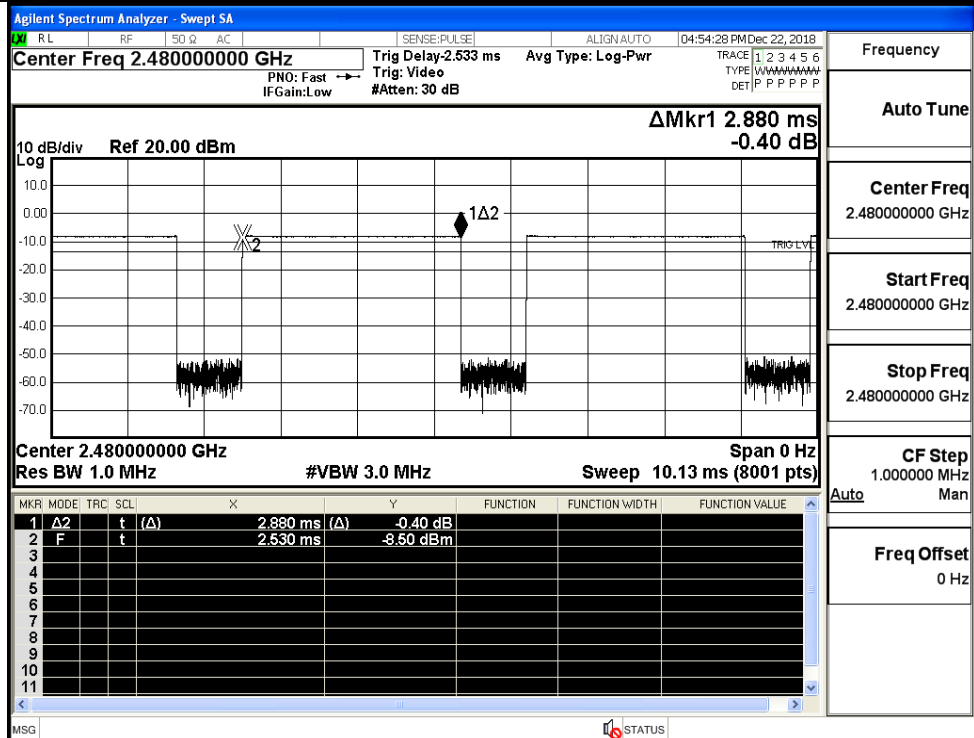
GFSK_DH5/LCH



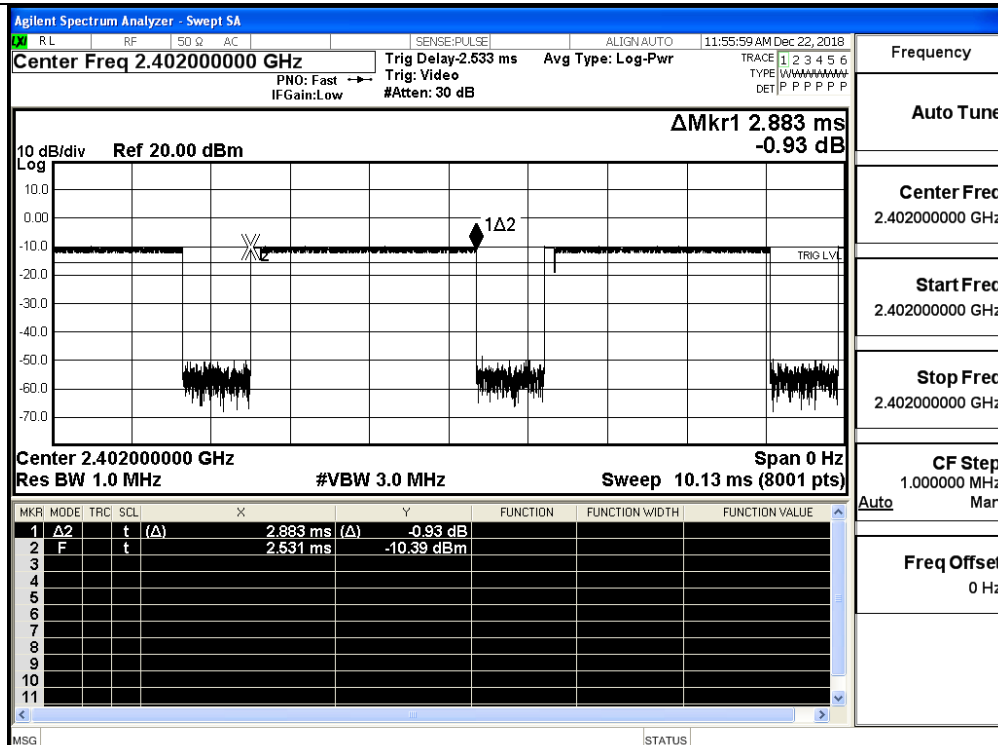
GFSK_DH5/MCH



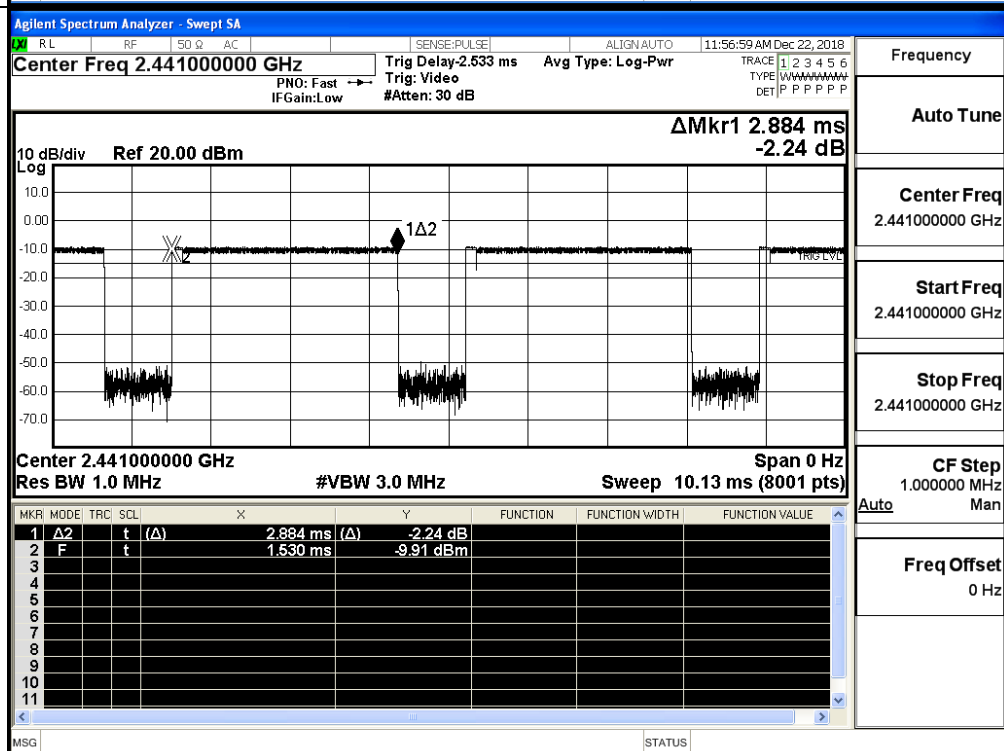
GFSK_DH5/HCH



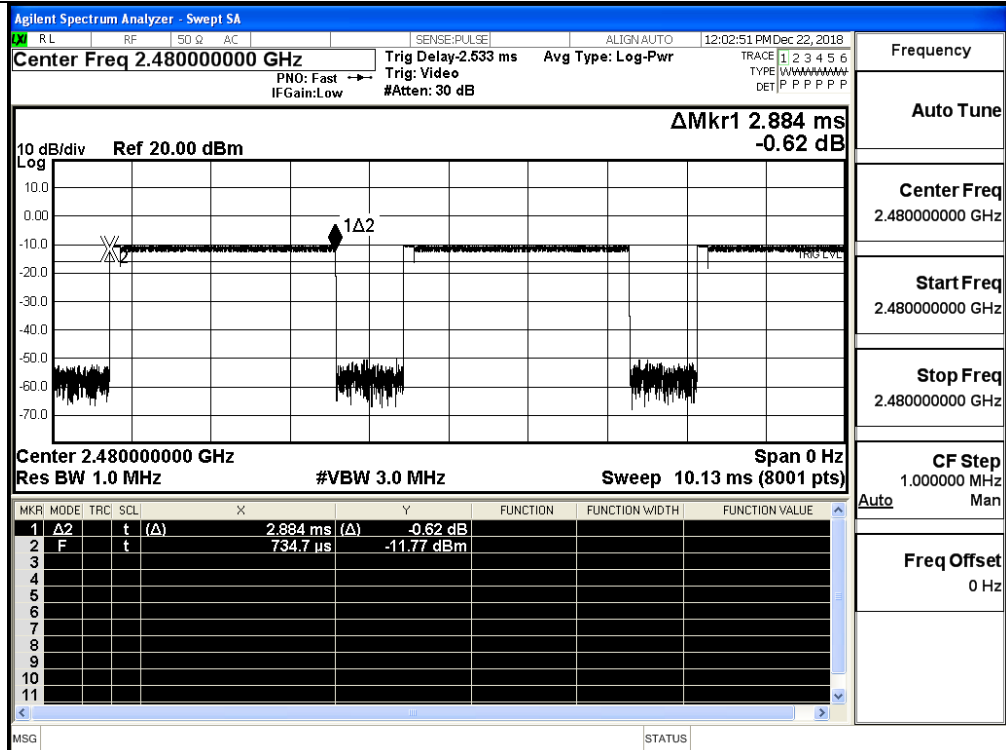
$\pi/4$ DQPSK
_2DH5/LCH



$\pi/4$ DQPSK
_2DH5/MCH



$\pi/4$ DQPSK
_2DH5/HCH

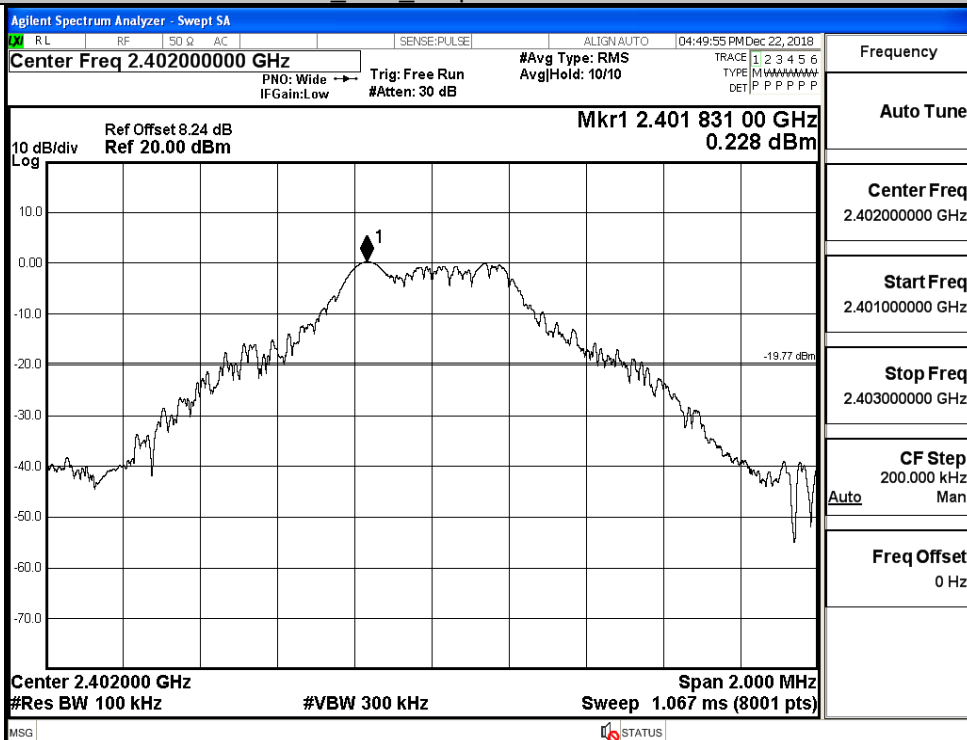


A.6 RF Conducted Spurious Emissions

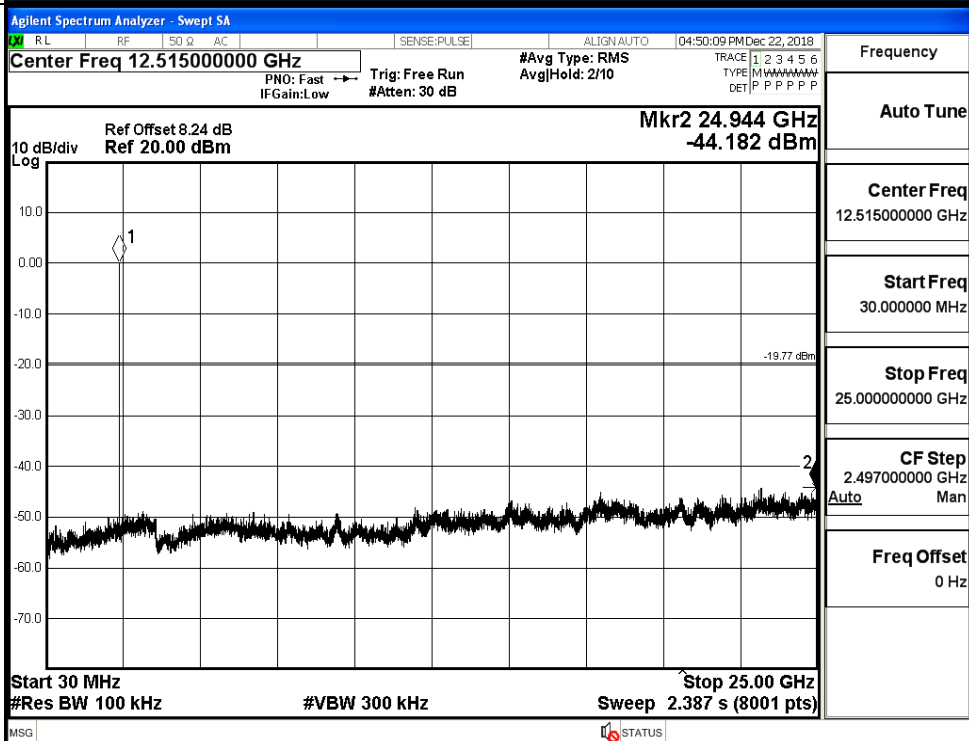
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.228	-44.182	-19.772	PASS
	MCH	-0.053	-44.441	-20.053	PASS
	HCH	0.336	-44.664	-19.664	PASS
$\pi/4$ DQPSK	LCH	-1.348	-44.099	-21.348	PASS
	MCH	-1.283	-44.839	-21.283	PASS
	HCH	-2.184	-43.562	-22.184	PASS

GFSK LCH Graphs

Pref

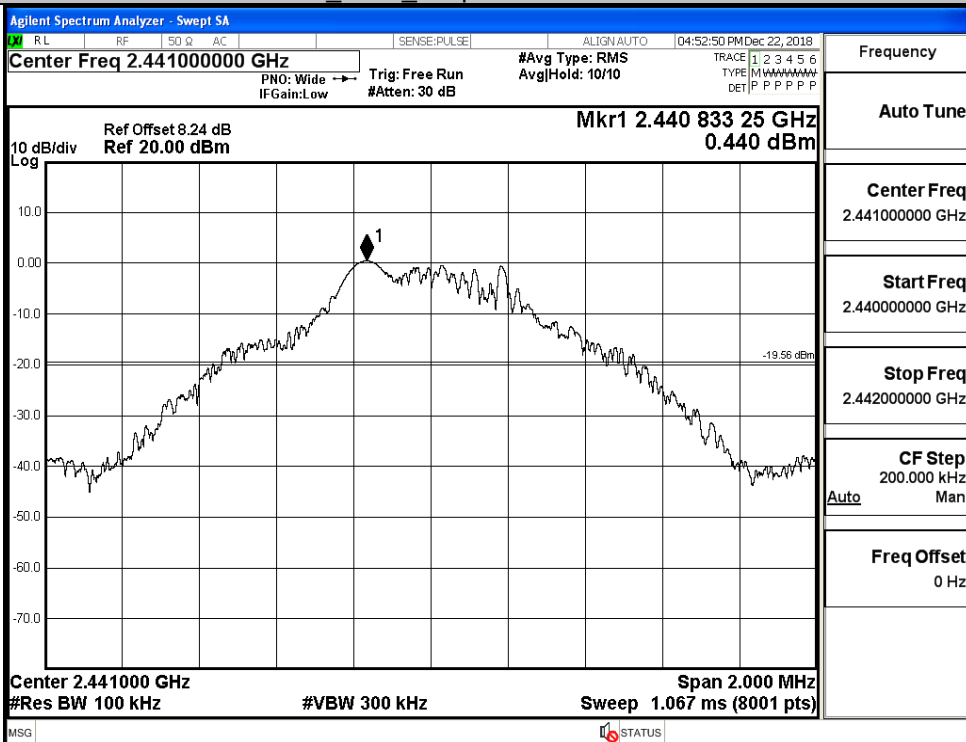


Puw

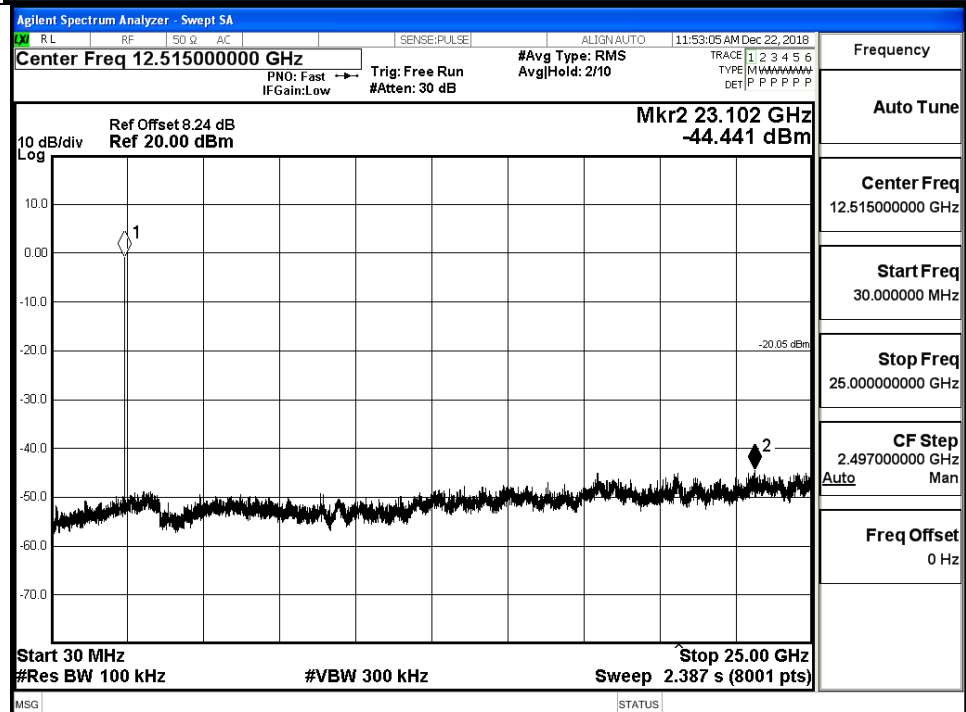


GFSK_MCH_Graphs

Pref

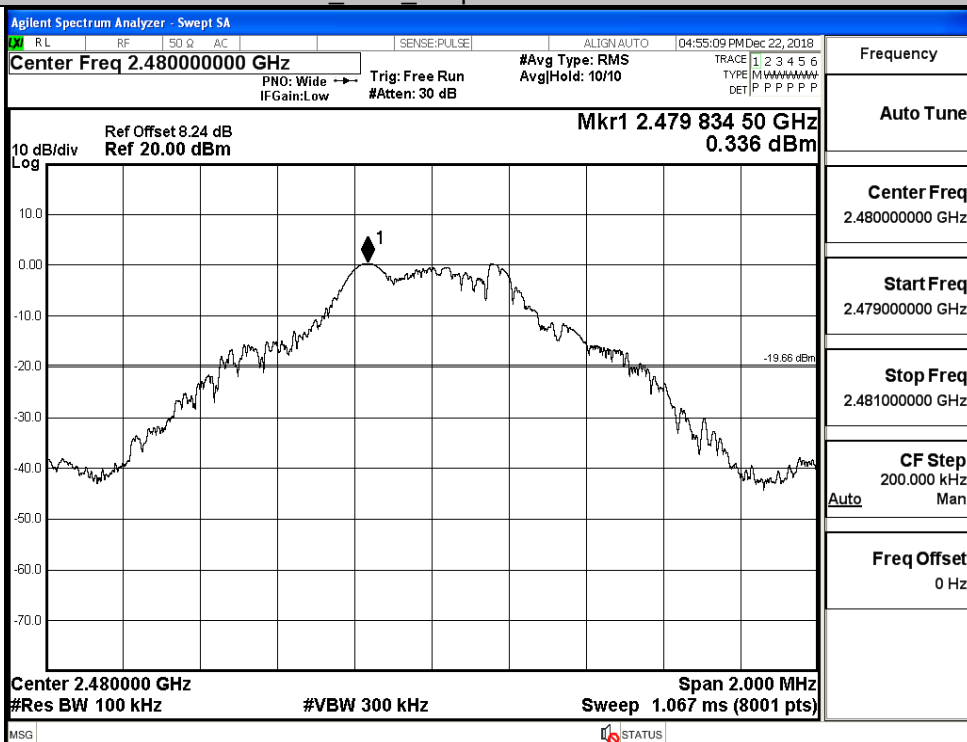


Puw

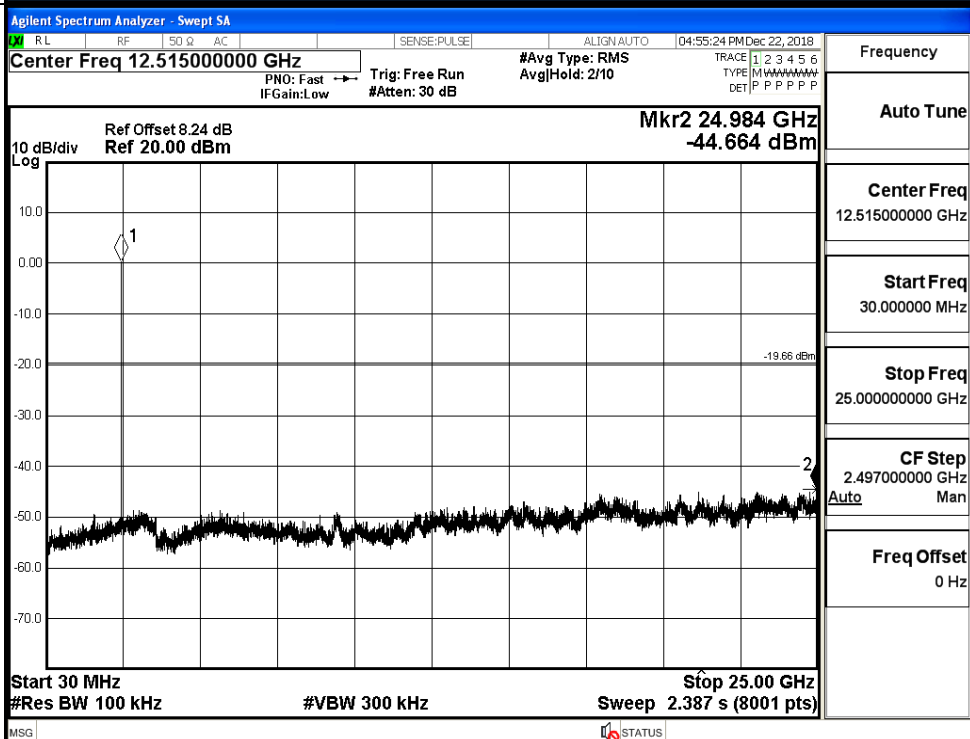


GFSK_HCH_Graphs

Pref

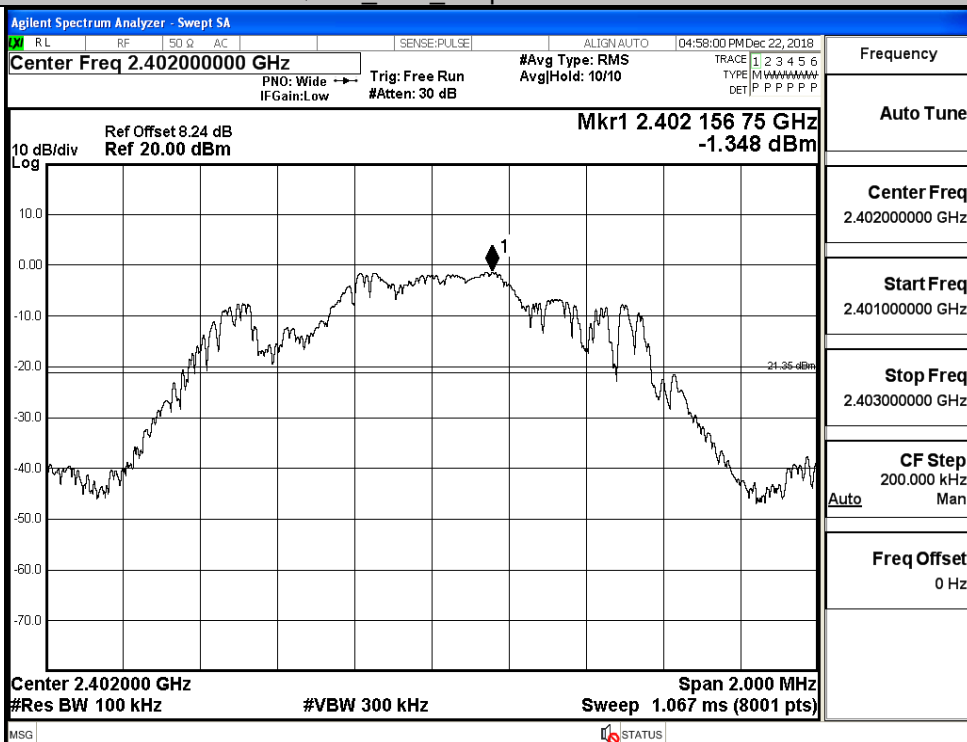


Puw

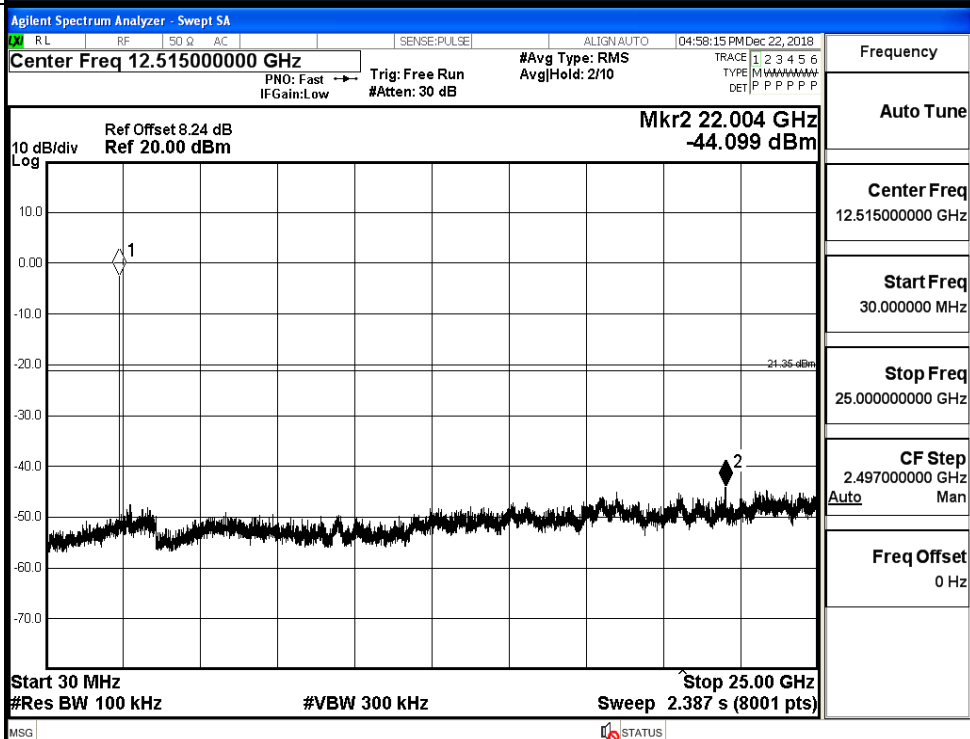


π /4DQPSK_LCH_Graphs

Pref

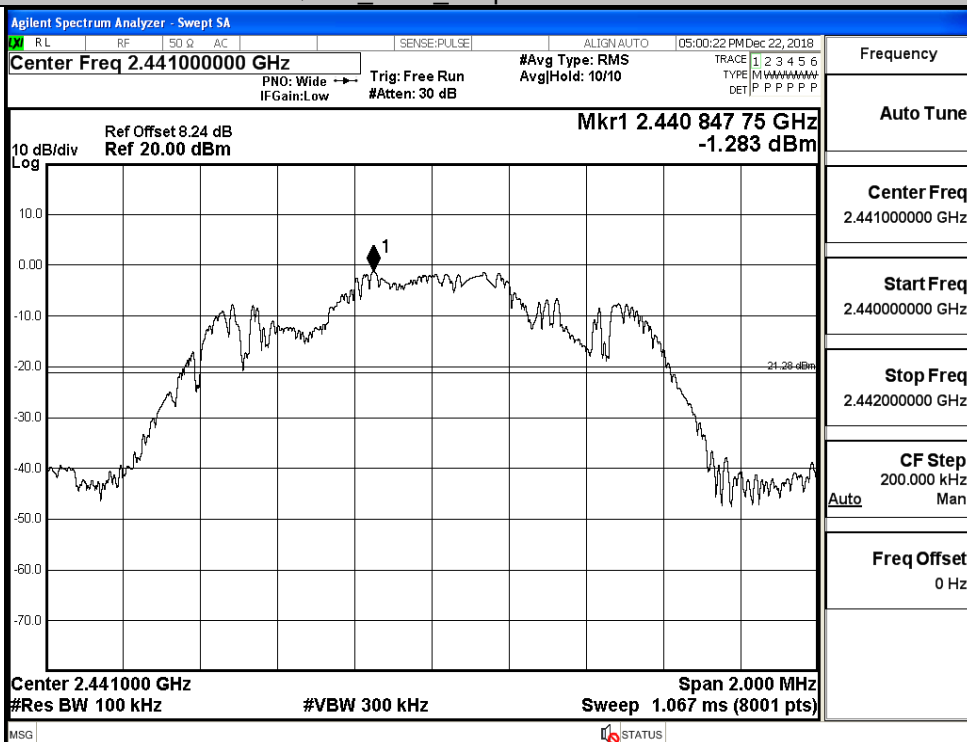


Puw

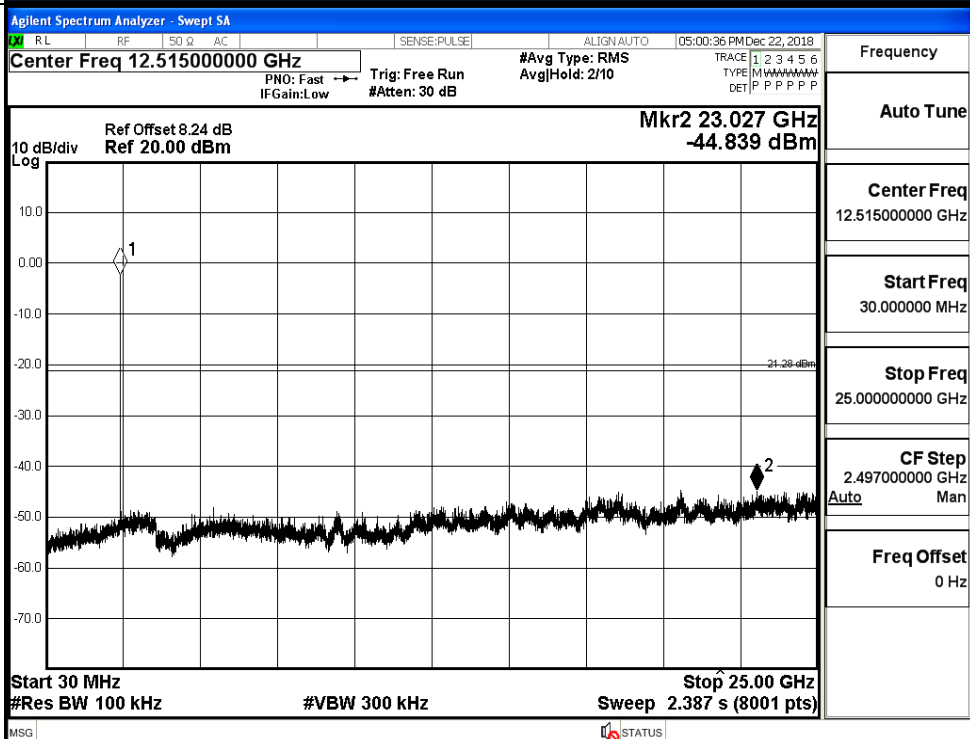


$\pi/4$ DQPSK_MCH_Graphs

Pref

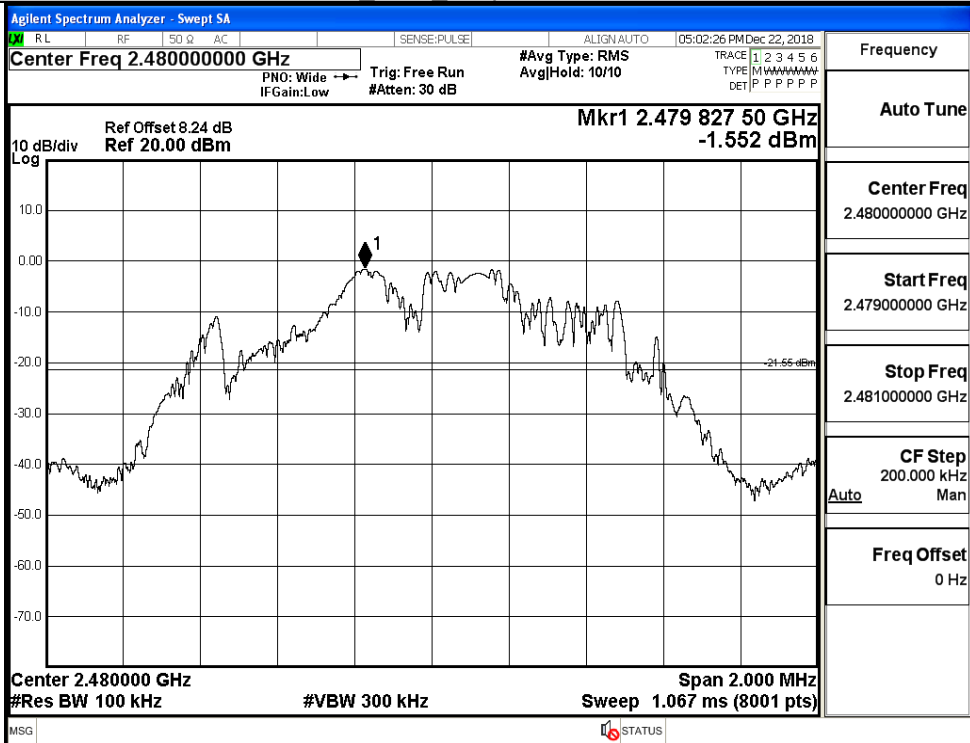


Puw

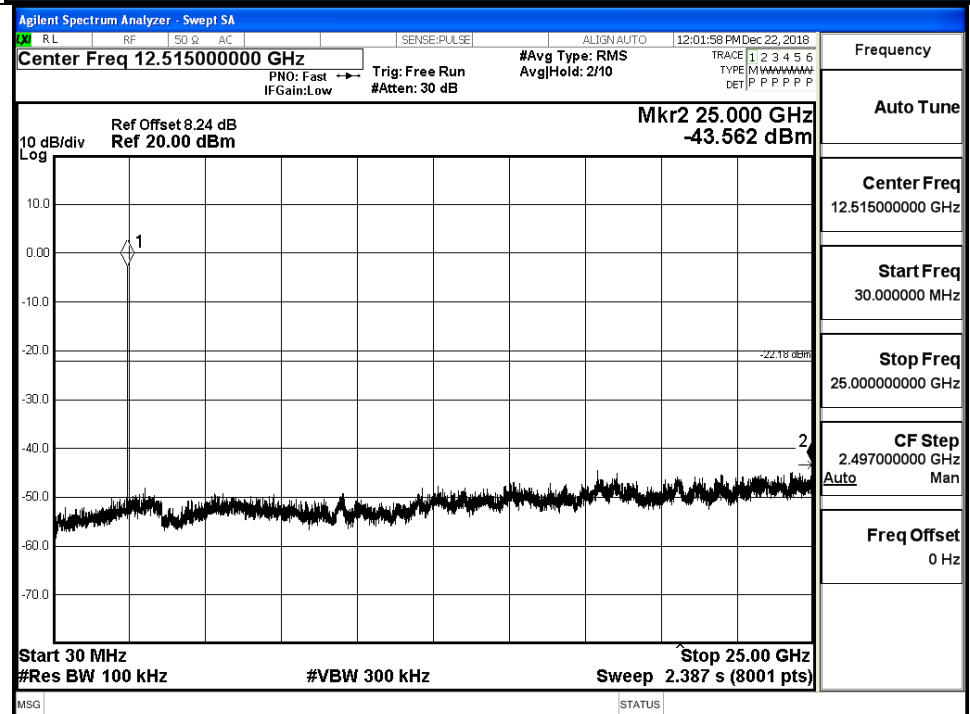


$\pi/4$ DQPSK_HCH_Graphs

Pref



Puw

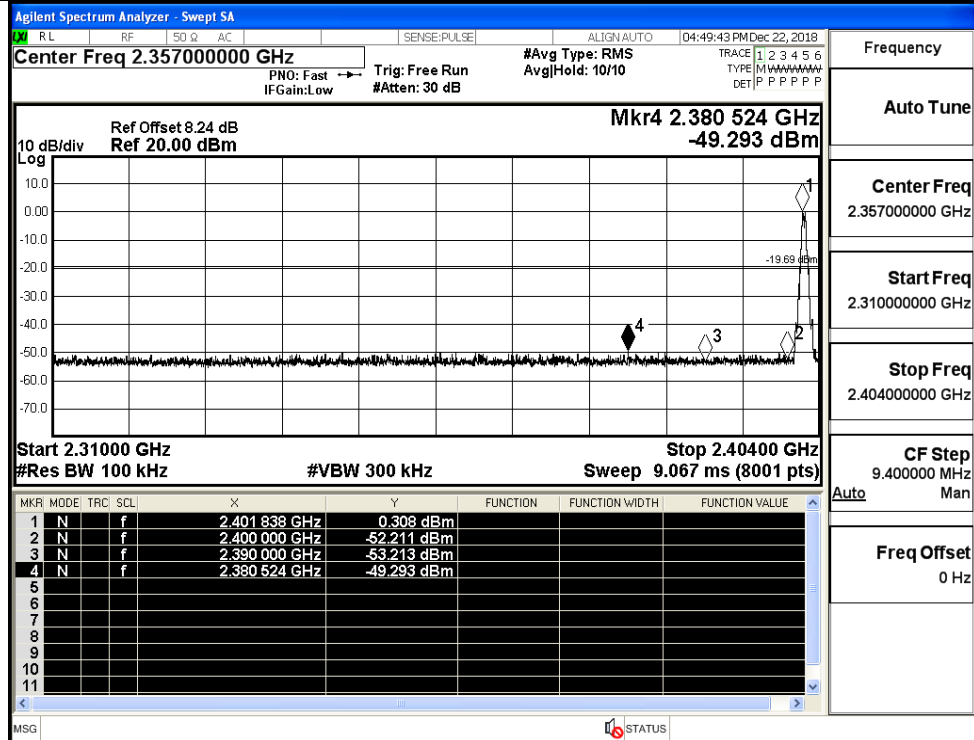


A.7 Band-edge for RF Conducted Emissions

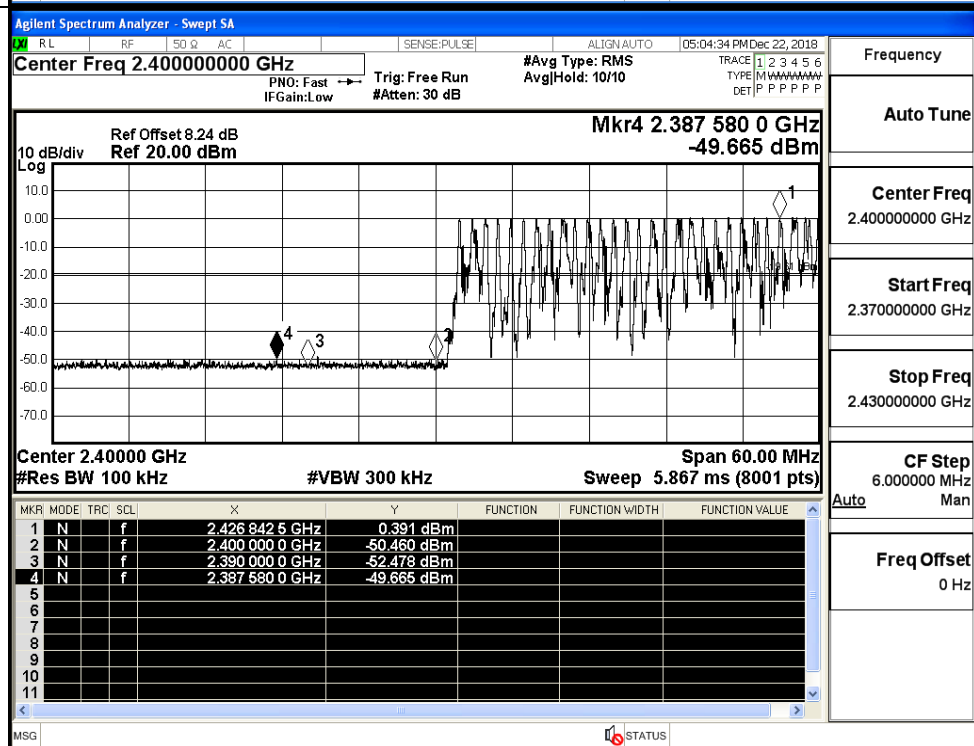
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	0.308	Off	-49.293	-19.69	PASS
			0.391	On	-49.665	-19.61	PASS
	HCH	2480	0.388	Off	-49.912	-19.61	PASS
			0.334	On	-49.691	-19.67	PASS
π /4DQPSK	LCH	2402	-1.106	Off	-49.582	-21.11	PASS
			-1.158	On	-49.162	-21.16	PASS
	HCH	2480	-1.619	Off	-49.158	-21.62	PASS
			-1.124	On	-48.434	-21.12	PASS

Test Graphs

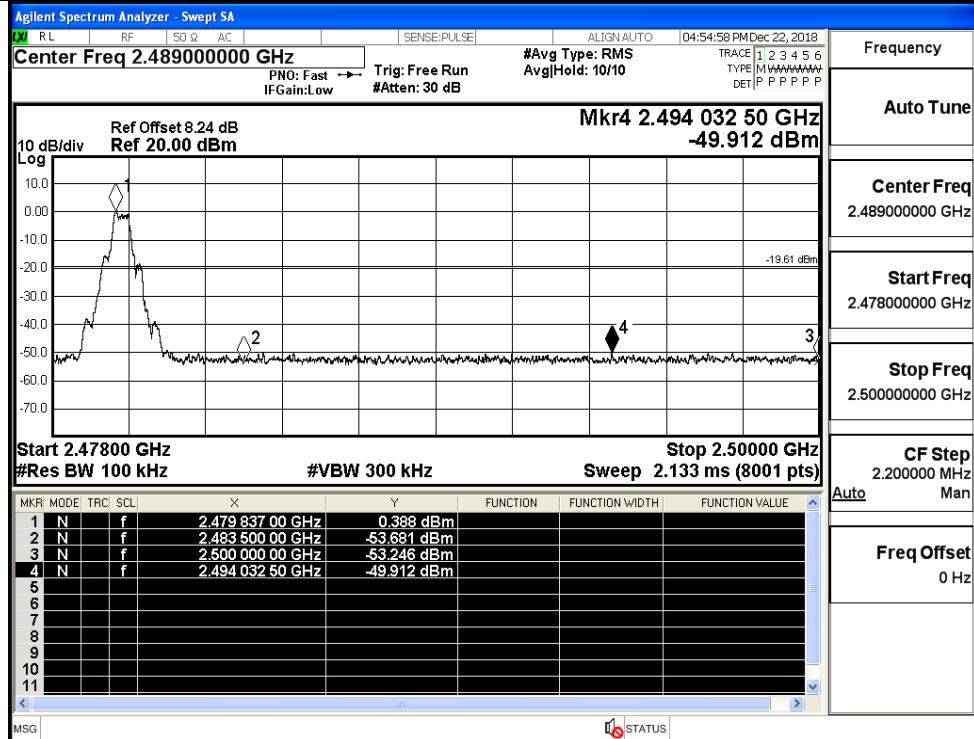
GFSK/LCH/No Hop



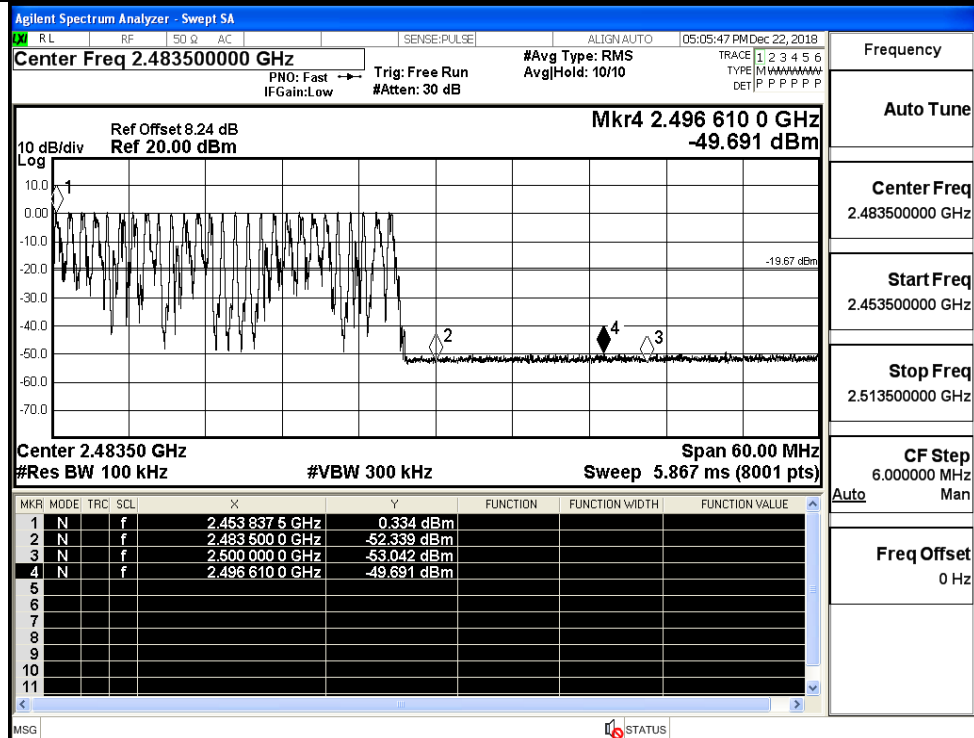
GFSK/LCH/Hop



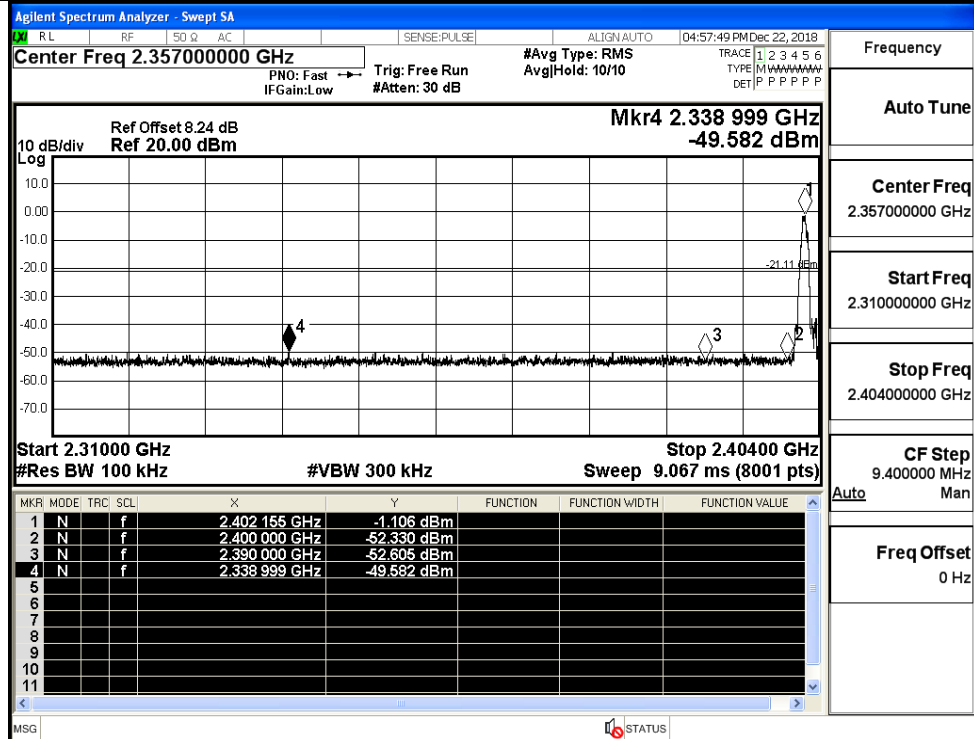
GFSK/HCH/No Hop



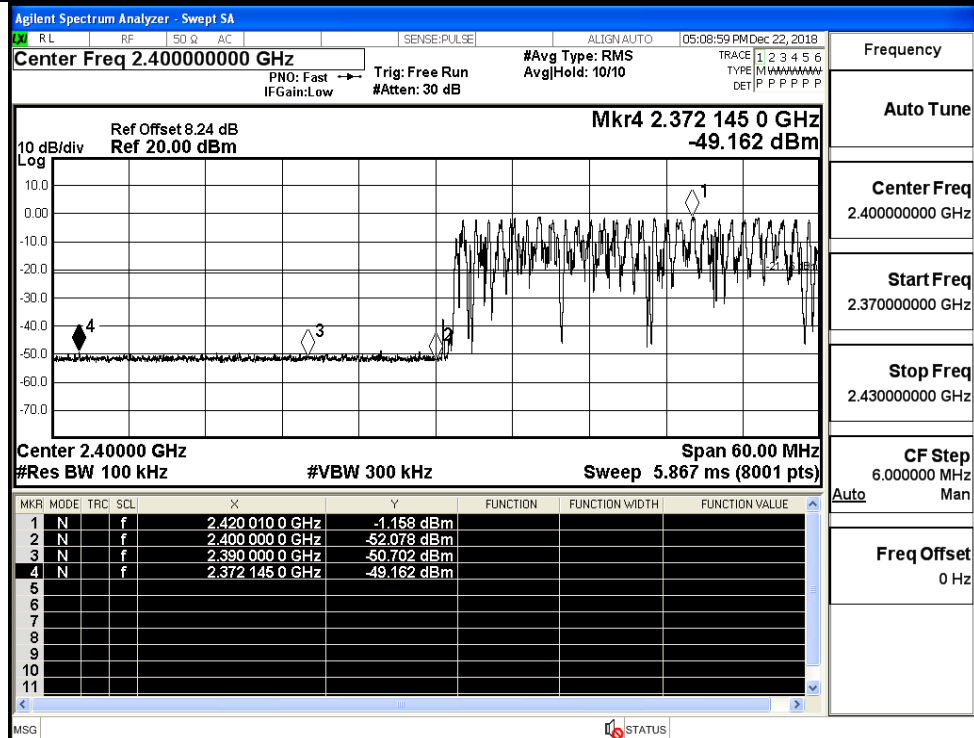
GFSK/HCH/Hop



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



$\pi/4$ DQPSK/LCH/Hop



[illegible]

Agilent Spectrum Analyzer - Swept SA

RL RF 50 Ω AC SENSE:PULSE ALIGN: AUTO 05:11:02 PM Dec 22, 2018

Center Freq 2.483500000 GHz PNO: Fast Trg: Free Run #Avg Type: RMS #Atten: 30 dB AvgHld: 10/10 TRACE 1 2 3 4 5 6 TYPE M W I D E T P P P P P

Ref Offset 8.24 dB Mkr4 2.495 770 0 GHz
Ref 20.00 dB -48.434 dBm

10 dB/div Log

Center 2.48350 GHz Span 60.00 MHz
#Res BW 100 kHz #VBW 300 kHz Sweep 5.867 ms (8001 pts)

MRK	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N		f	2.458 030 0 GHz	-1.124 dBm			
2	N		f	2.483 500 0 GHz	-51.012 dBm			
3	N		f	2.500 000 0 GHz	-51.150 dBm			
4	N		f	2.495 770 0 GHz	-48.434 dBm			
5								
6								
7								
8								
9								
10								
11								

MSG STATUS

Frequency

Auto Tune

Center Freq
2.483500000 GHz

Start Freq
2.453500000 GHz

Stop Freq
2.513500000 GHz

CF Step
6.000000 MHz
Man

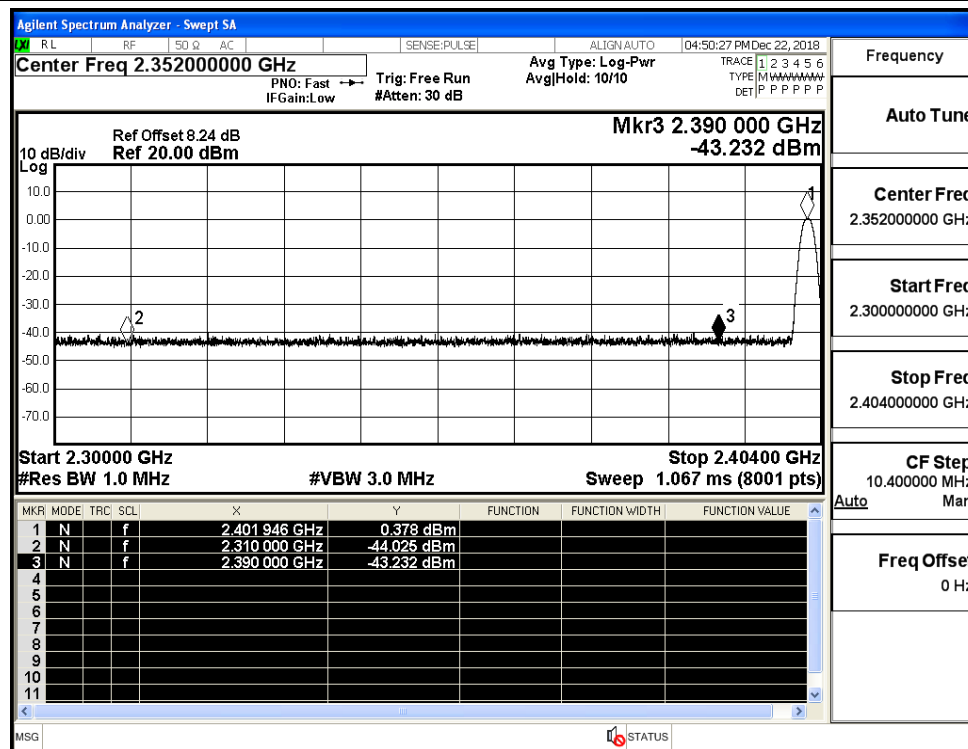
Auto

Freq Offset
0 Hz

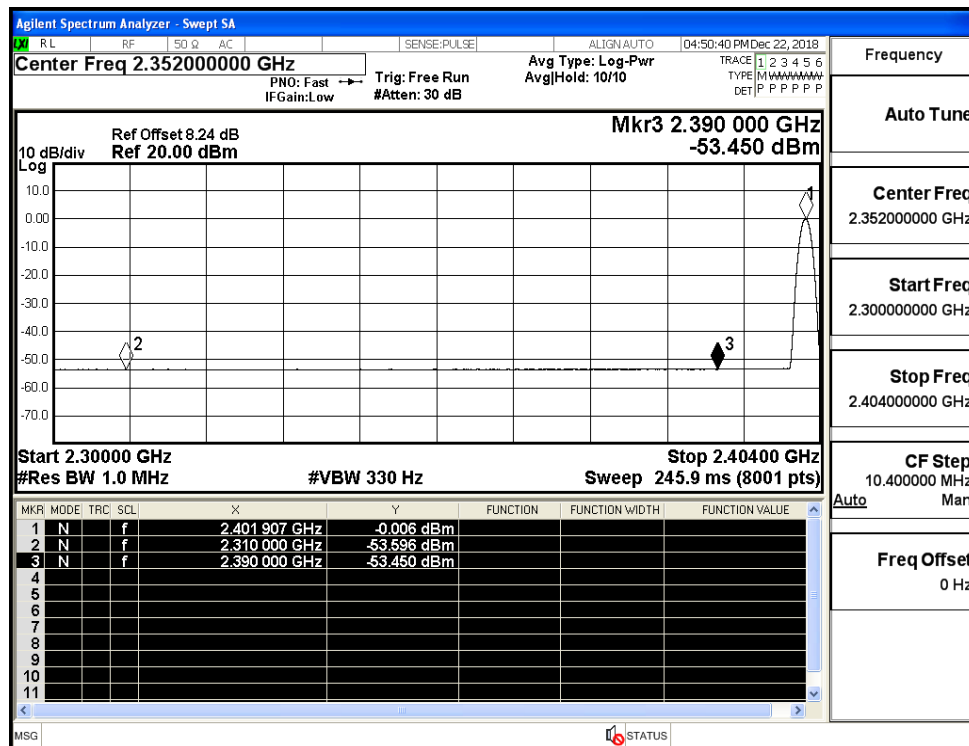
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-44.03	2.0	0	51.23	PEAK	74	PASS
	Off	2310.0	-53.60	2.0	0	41.66	AV	54	PASS
	Off	2390.0	-43.23	2.0	0	52.03	PEAK	74	PASS
	Off	2390.0	-53.45	2.0	0	41.81	AV	54	PASS
	Off	2483.5	-42.50	2.0	0	52.76	PEAK	74	PASS
	Off	2483.5	-53.04	2.0	0	42.22	AV	54	PASS
	Off	2500.0	-42.71	2.0	0	52.55	PEAK	74	PASS
	Off	2500.0	-52.96	2.0	0	42.30	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-43.44	2.0	0	51.82	PEAK	74	PASS
	Off	2310.0	-53.57	2.0	0	41.69	AV	54	PASS
	Off	2390.0	-42.40	2.0	0	52.86	PEAK	74	PASS
	Off	2390.0	-53.34	2.0	0	41.92	AV	54	PASS
	Off	2483.5	-42.93	2.0	0	52.33	PEAK	74	PASS
	Off	2483.5	-52.95	2.0	0	42.31	AV	54	PASS
	Off	2500.0	-42.35	2.0	0	52.91	PEAK	74	PASS
	Off	2500.0	-52.99	2.0	0	42.27	AV	54	PASS

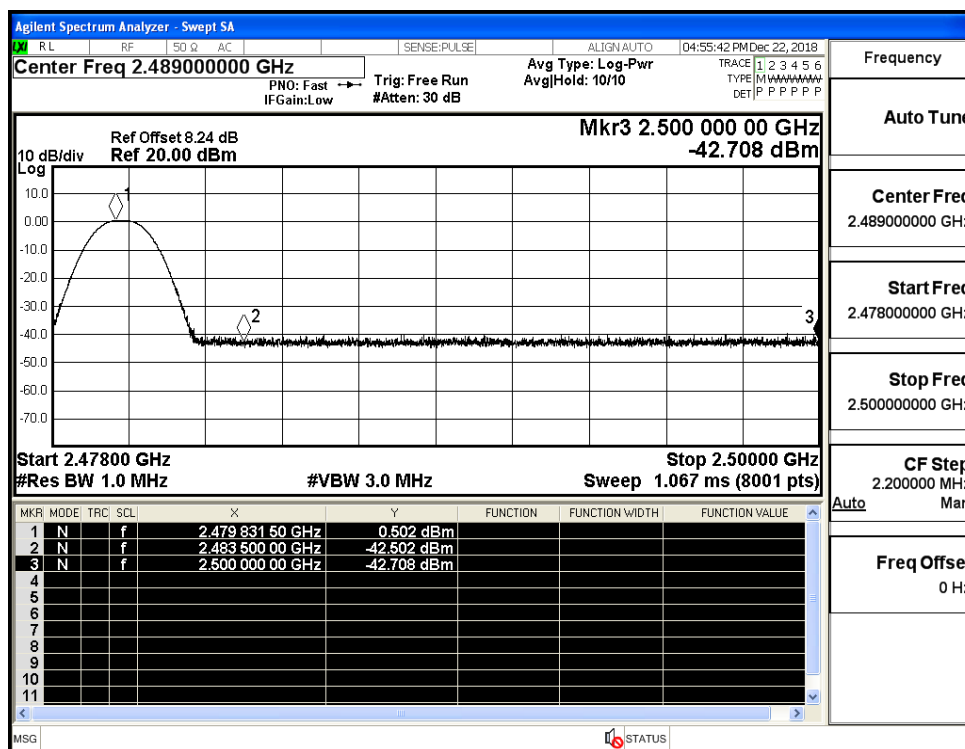
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



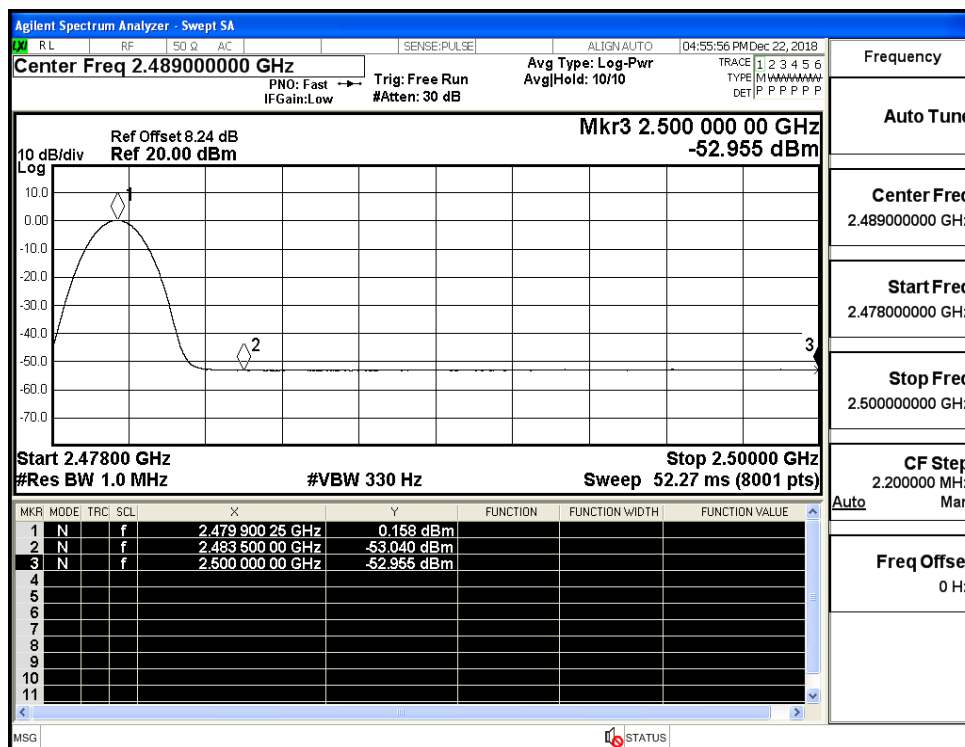
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (Low Channel)

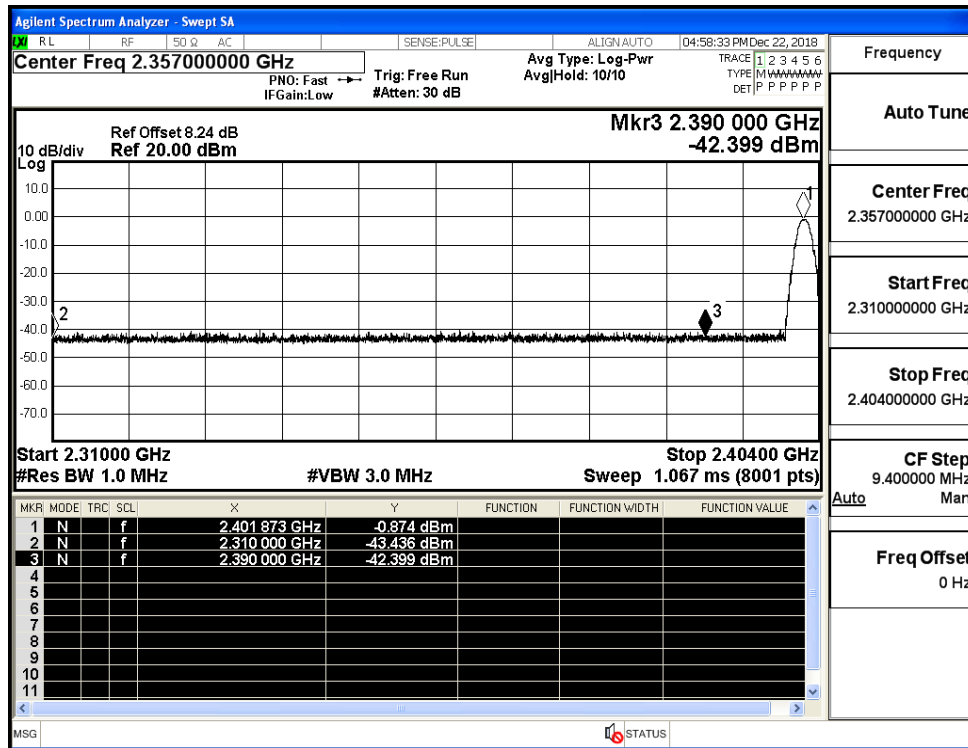
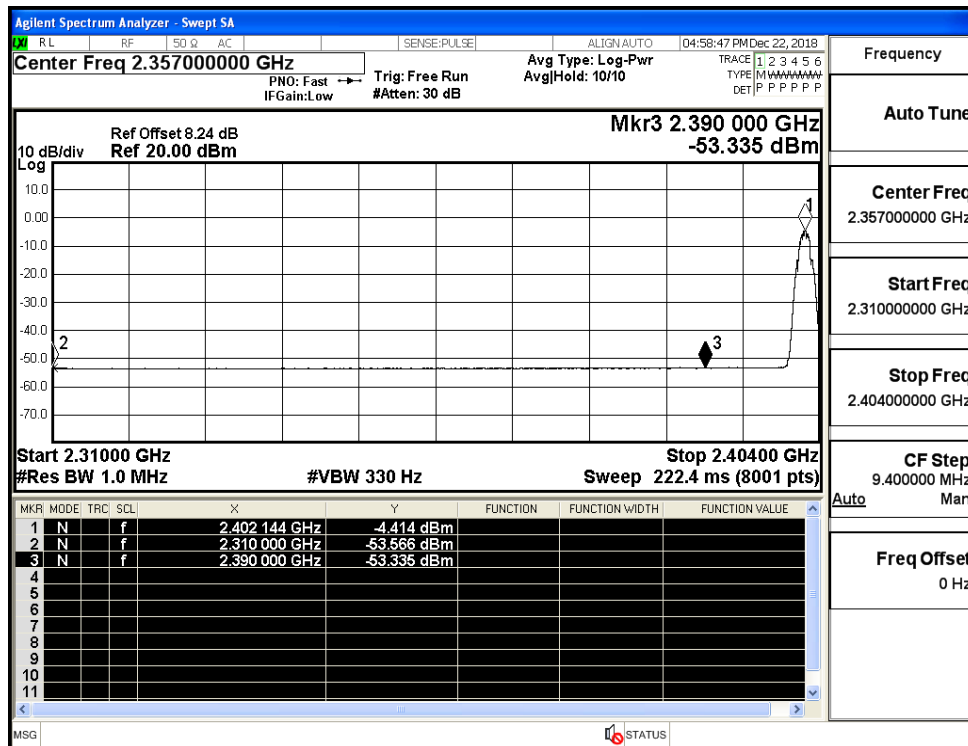


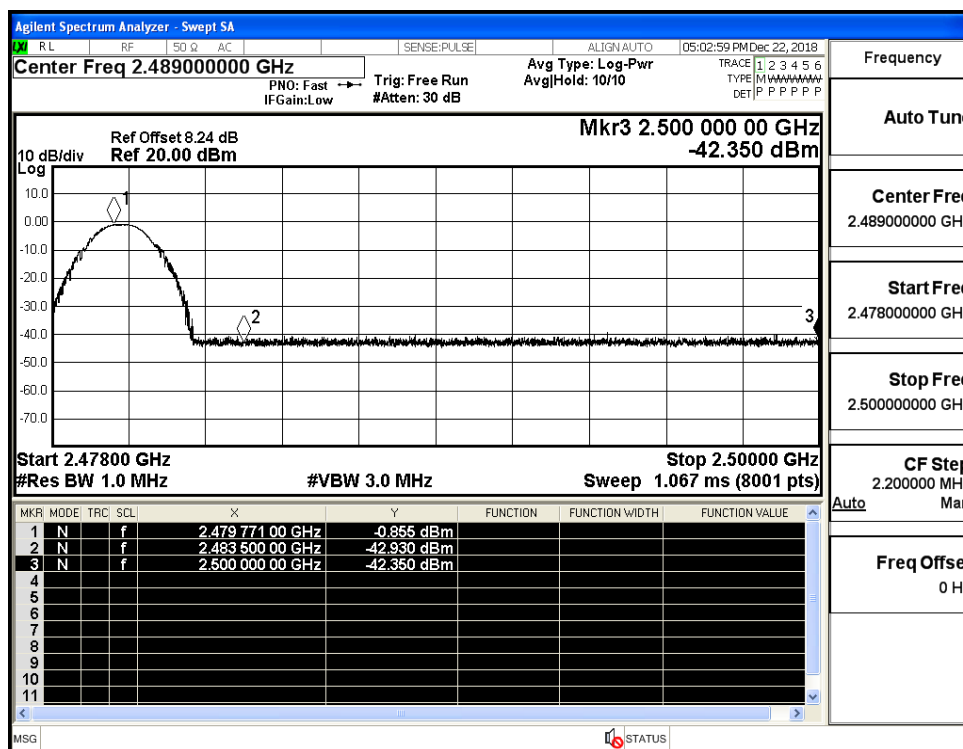
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (High Channel)



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)