

Appendix A

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

Product Name: Bluetooth Headphones

Trade Mark: N/A

Test Model: AKS1

FCC ID: 2AQ4I-AKS1

Environmental Conditions

Temperature:	22.8° C
Relative Humidity:	56%
ATM Pressure:	100.0 kPa
Test Engineer:	Nancy Li
Supervised by:	Hugo Chen

A.1 20 dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit(MHz)	Verdict
GFSK	LCH	0.794	Not Specified	PASS
GFSK	MCH	0.798	Not Specified	PASS
GFSK	HCH	0.803	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.276	Not Specified	PASS
$\pi/4$ DQPSK	MCH	1.199	Not Specified	PASS
$\pi/4$ DQPSK	HCH	1.197	Not Specified	PASS

Test Graph

Graphs

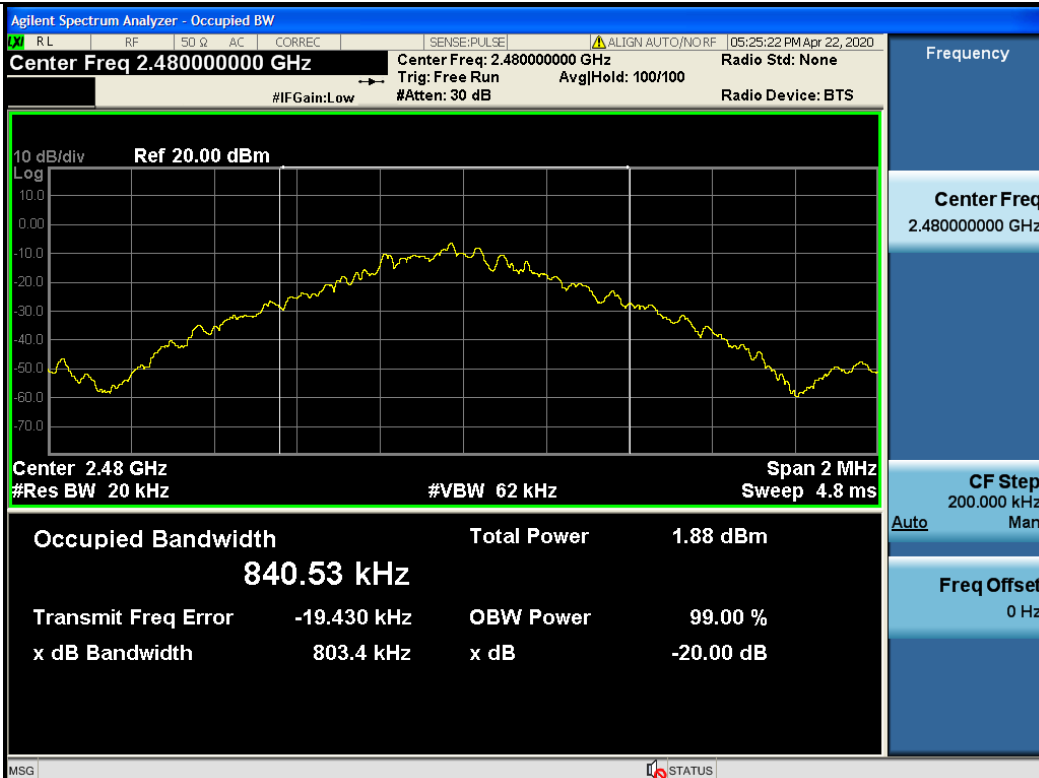
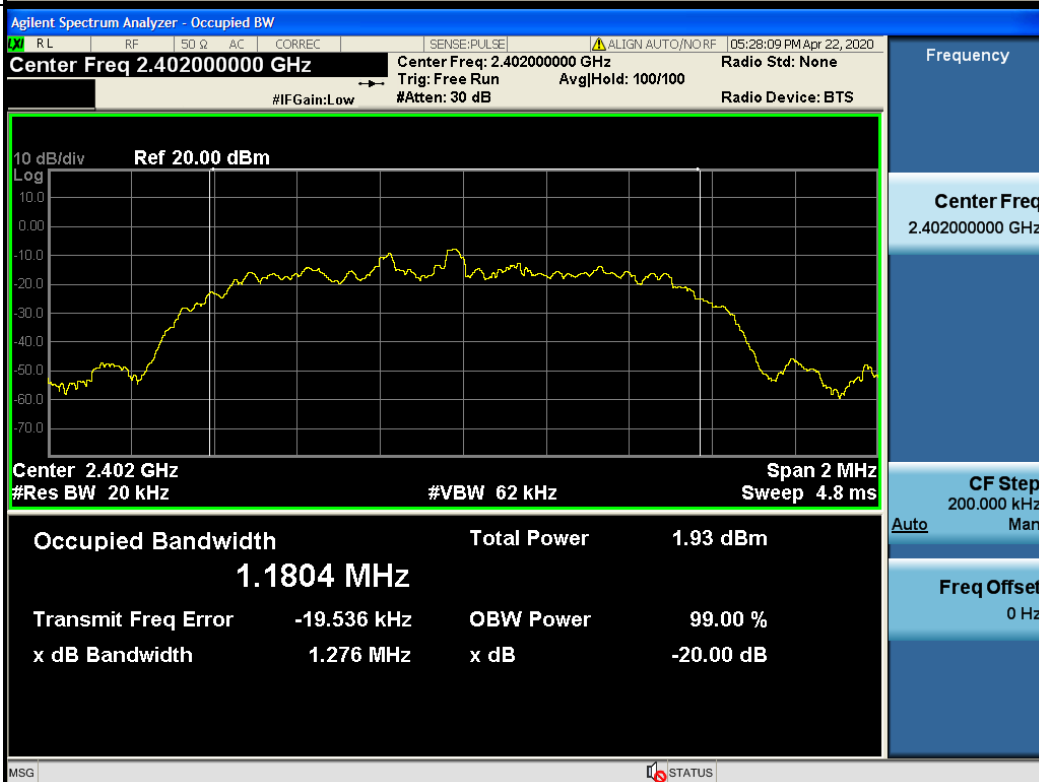
GFSK/LCH

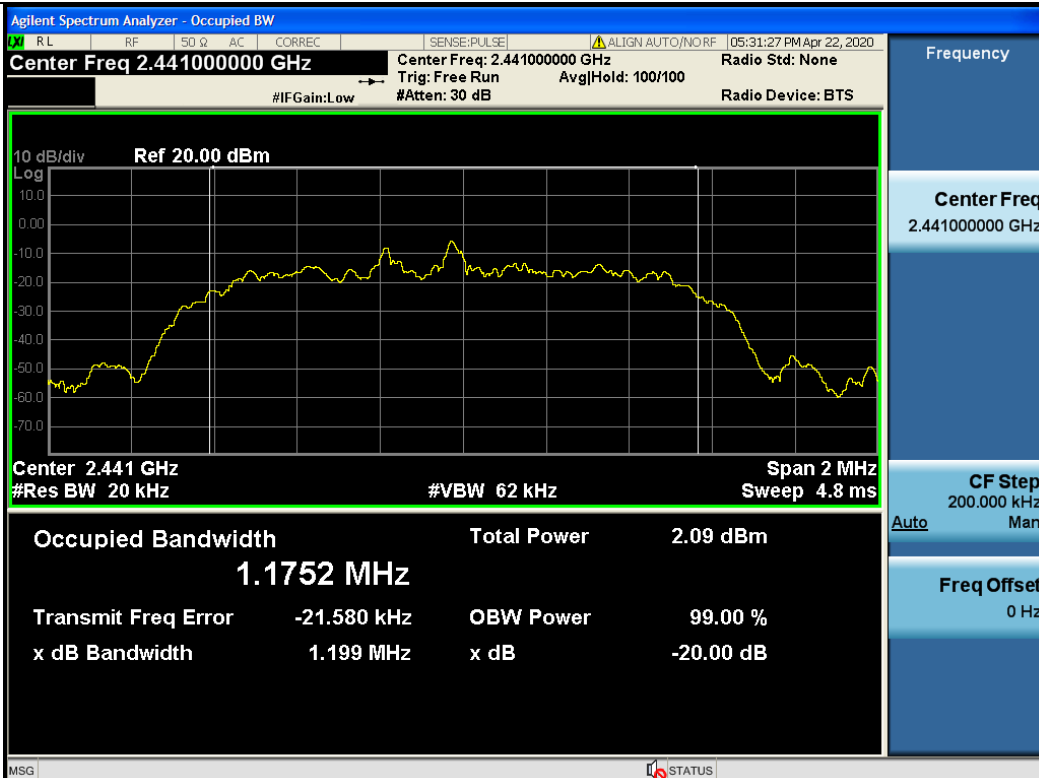


GFSK/MCH



GFSK/HCH

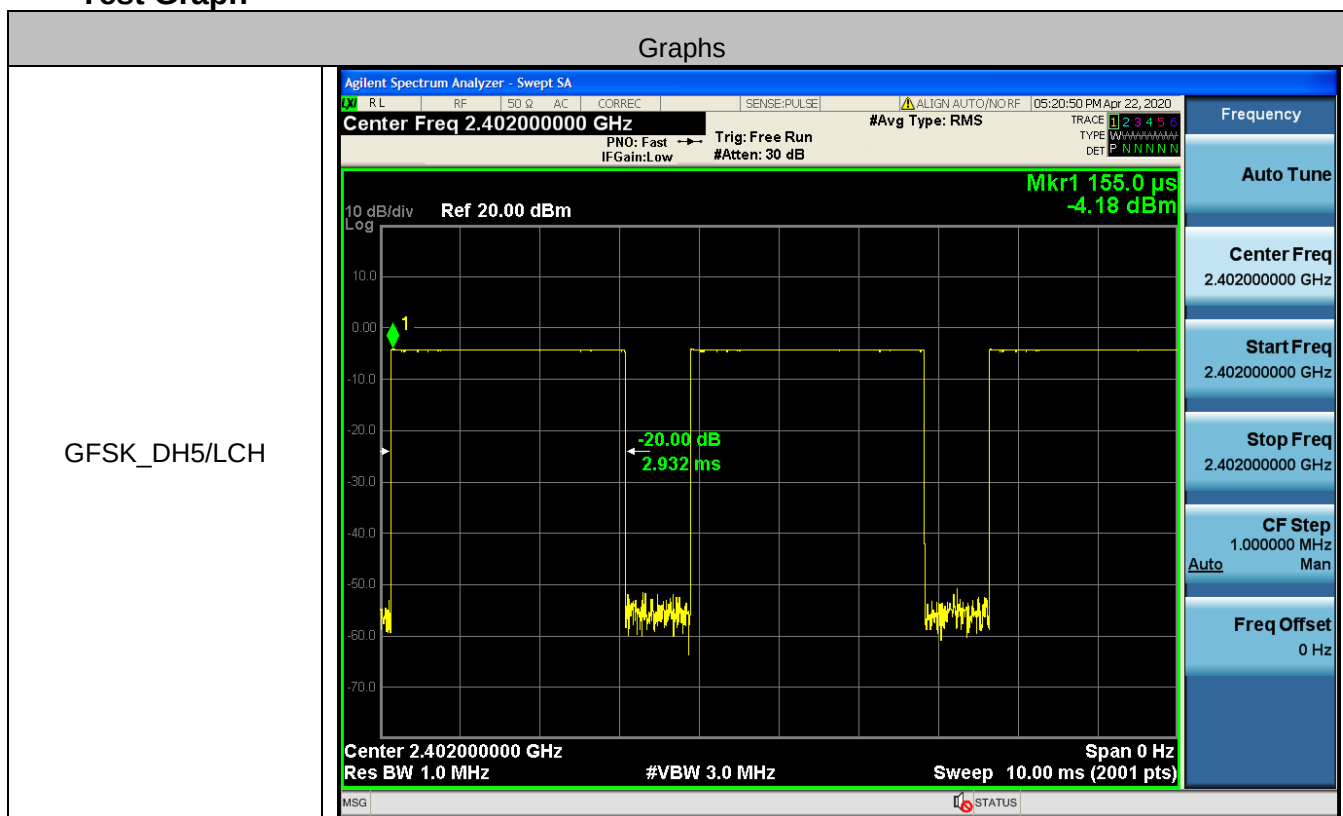
 π /4DQPSK/LCH

π /4DQPSK/MCH π /4DQPSK/HCH

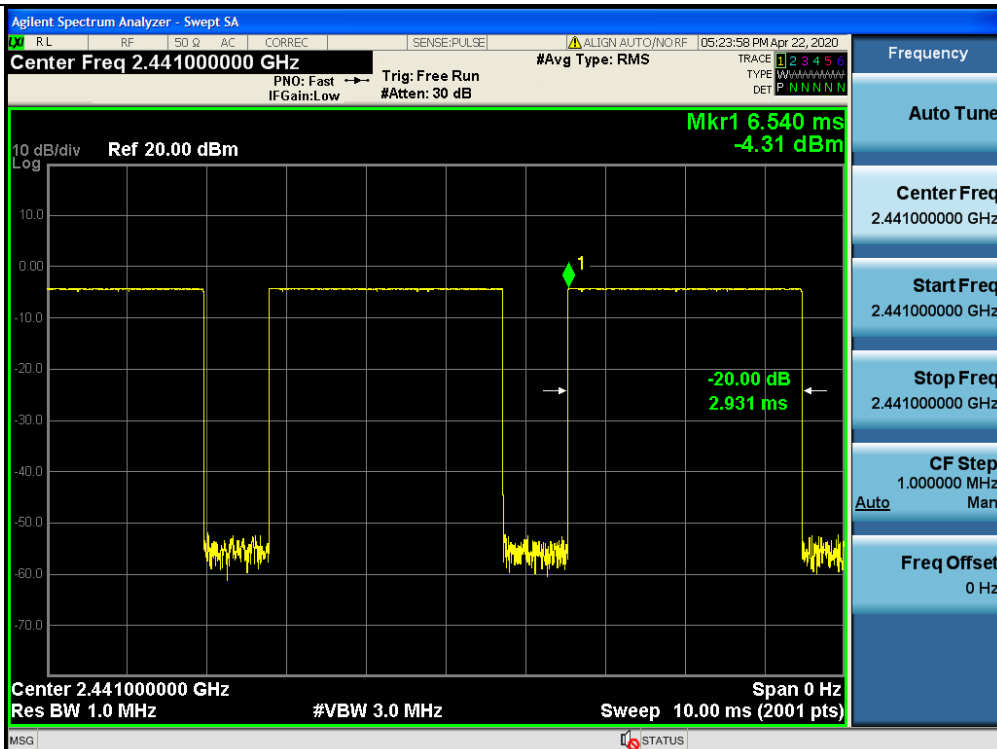
A.2 Dwell Time

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.932	106.7	0.313	0.4	PASS
GFSK	DH5	MCH	2.931	106.7	0.313	0.4	PASS
GFSK	DH5	HCH	2.932	106.7	0.313	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.939	106.7	0.314	0.4	PASS
$\pi/4$ DQPSK	2DH5	MCH	2.936	106.7	0.313	0.4	PASS
$\pi/4$ DQPSK	2DH5	HCH	2.939	106.7	0.314	0.4	PASS

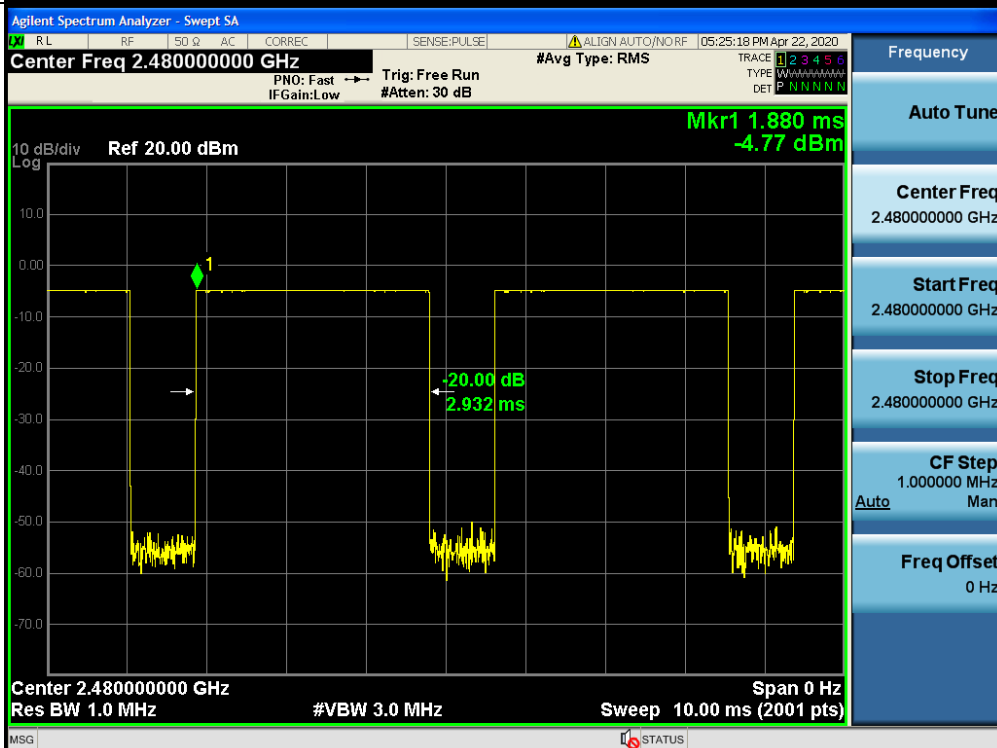
Test Graph

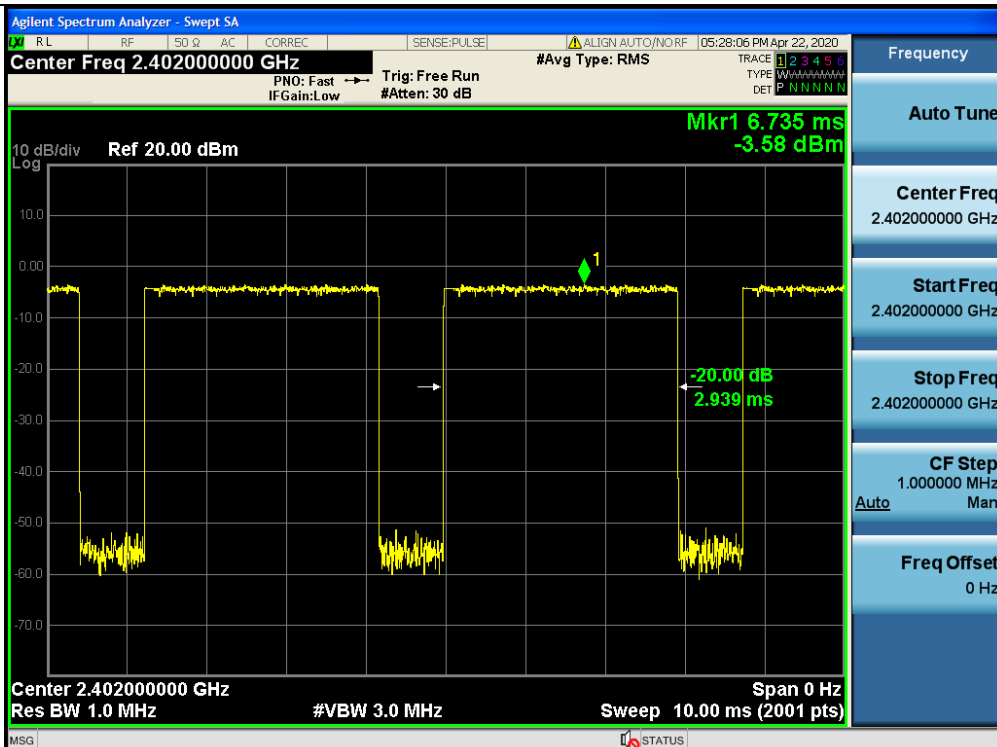
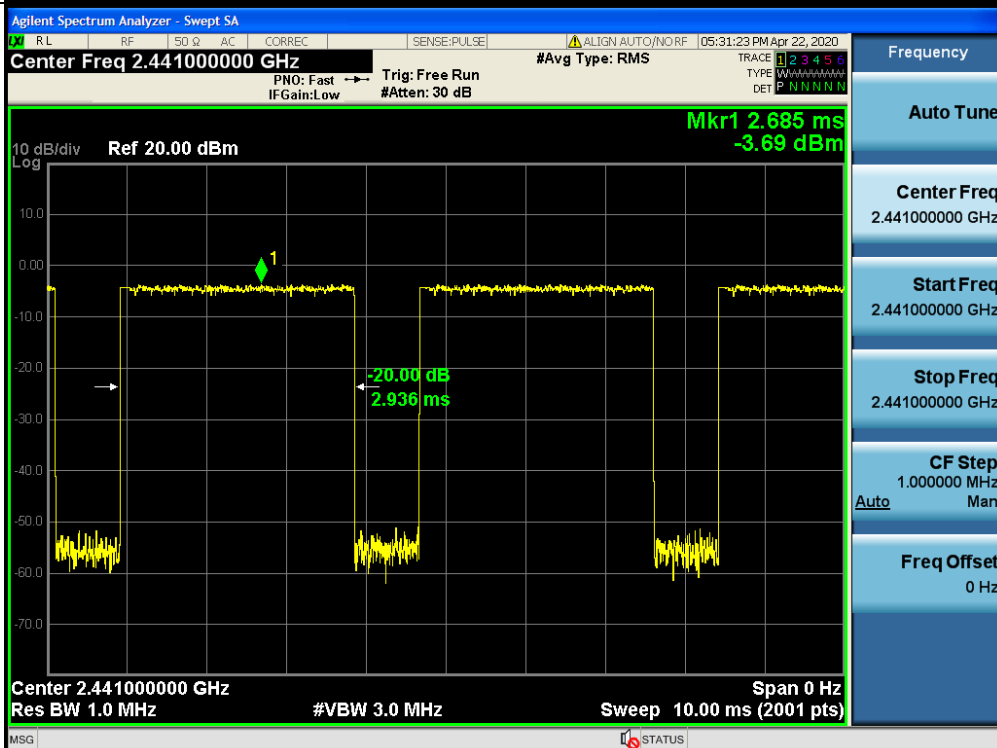


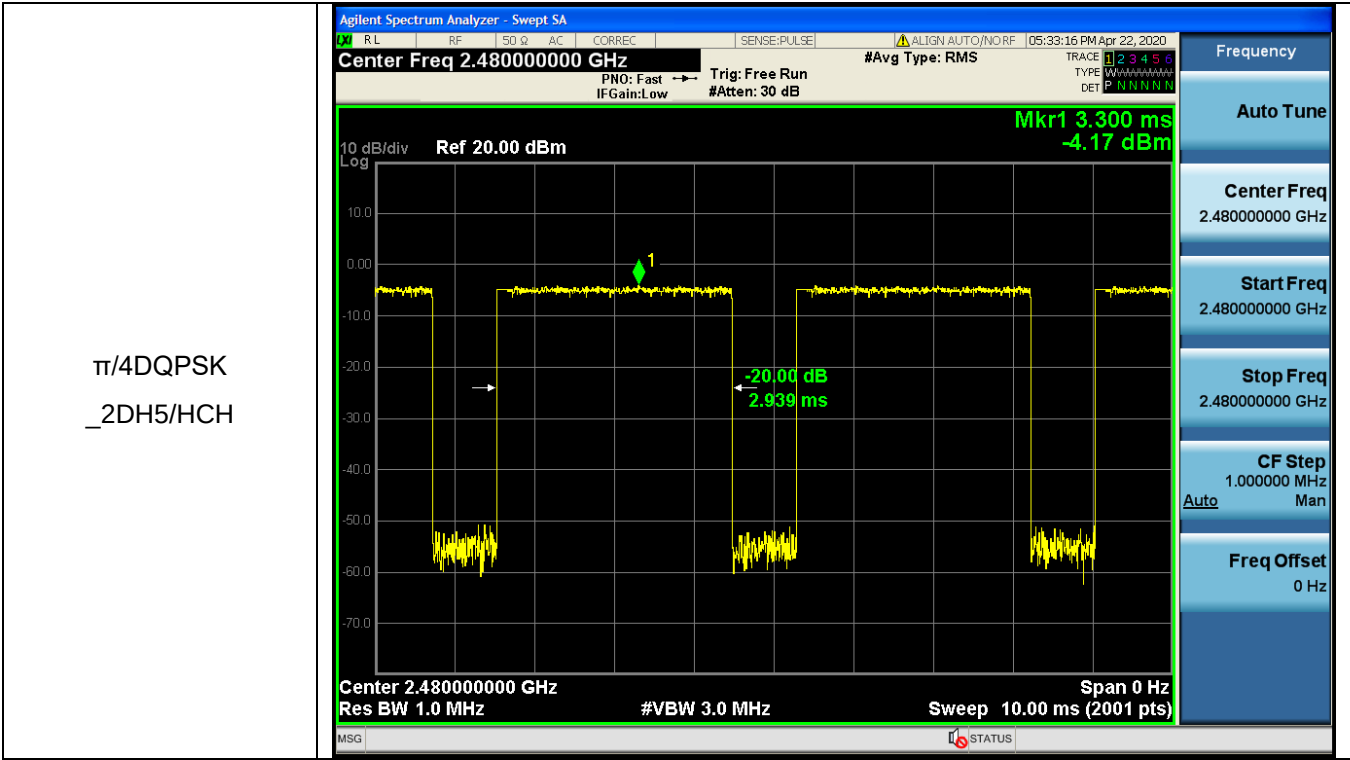
GFSK_DH5/MCH



GFSK_DH5/HCH



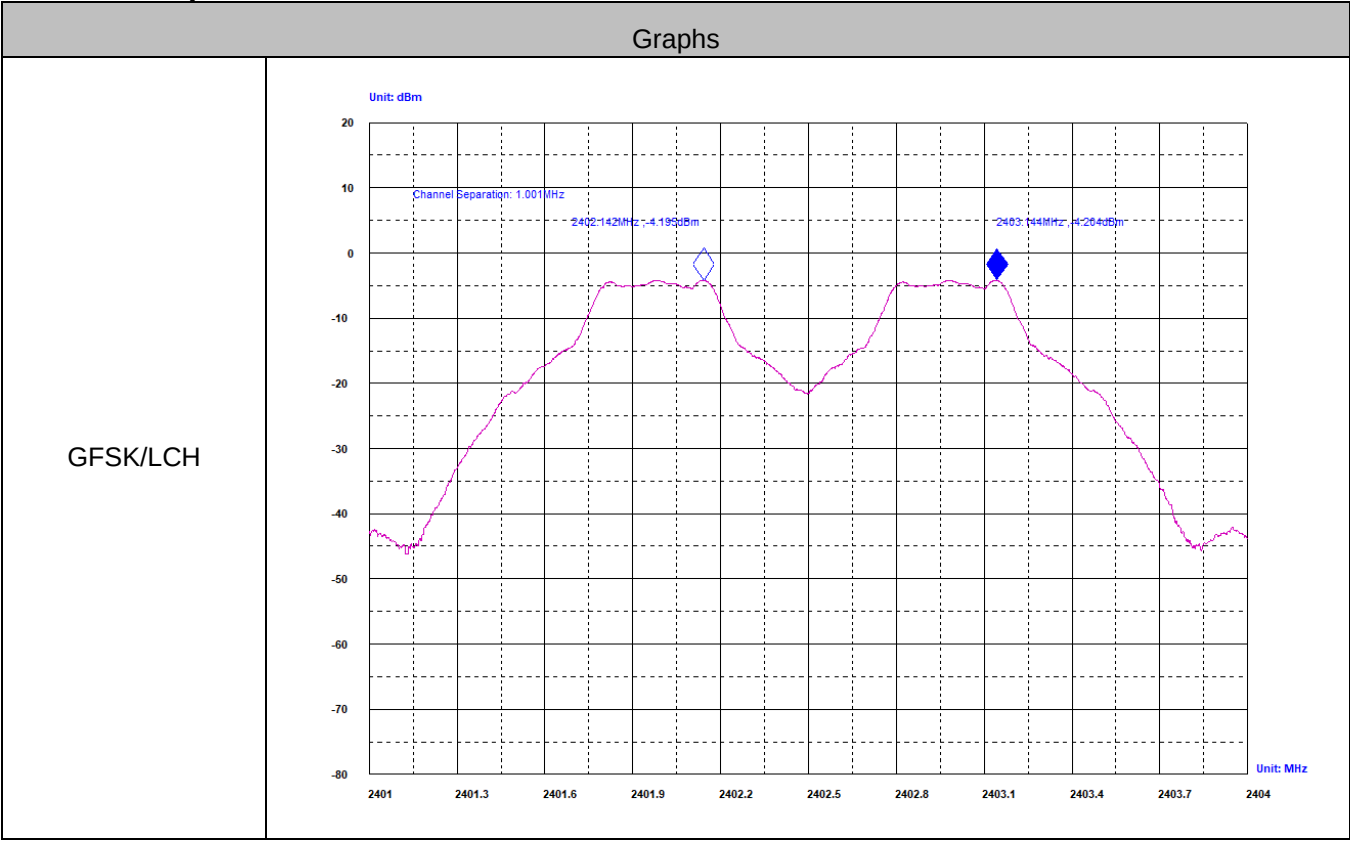
$\pi/4$ DQPSK
_2DH5/LCH $\pi/4$ DQPSK
_2DH5/MCH

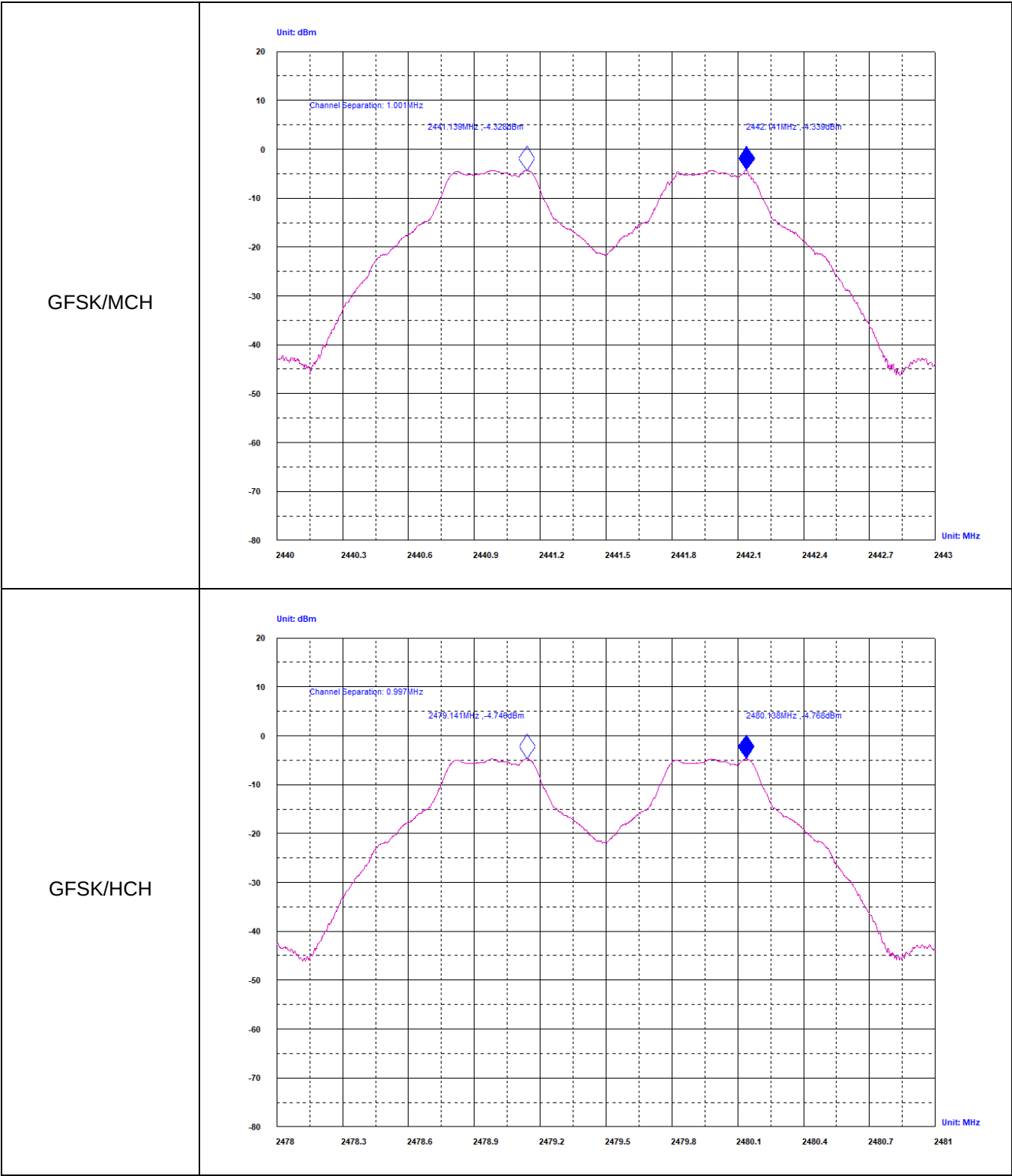


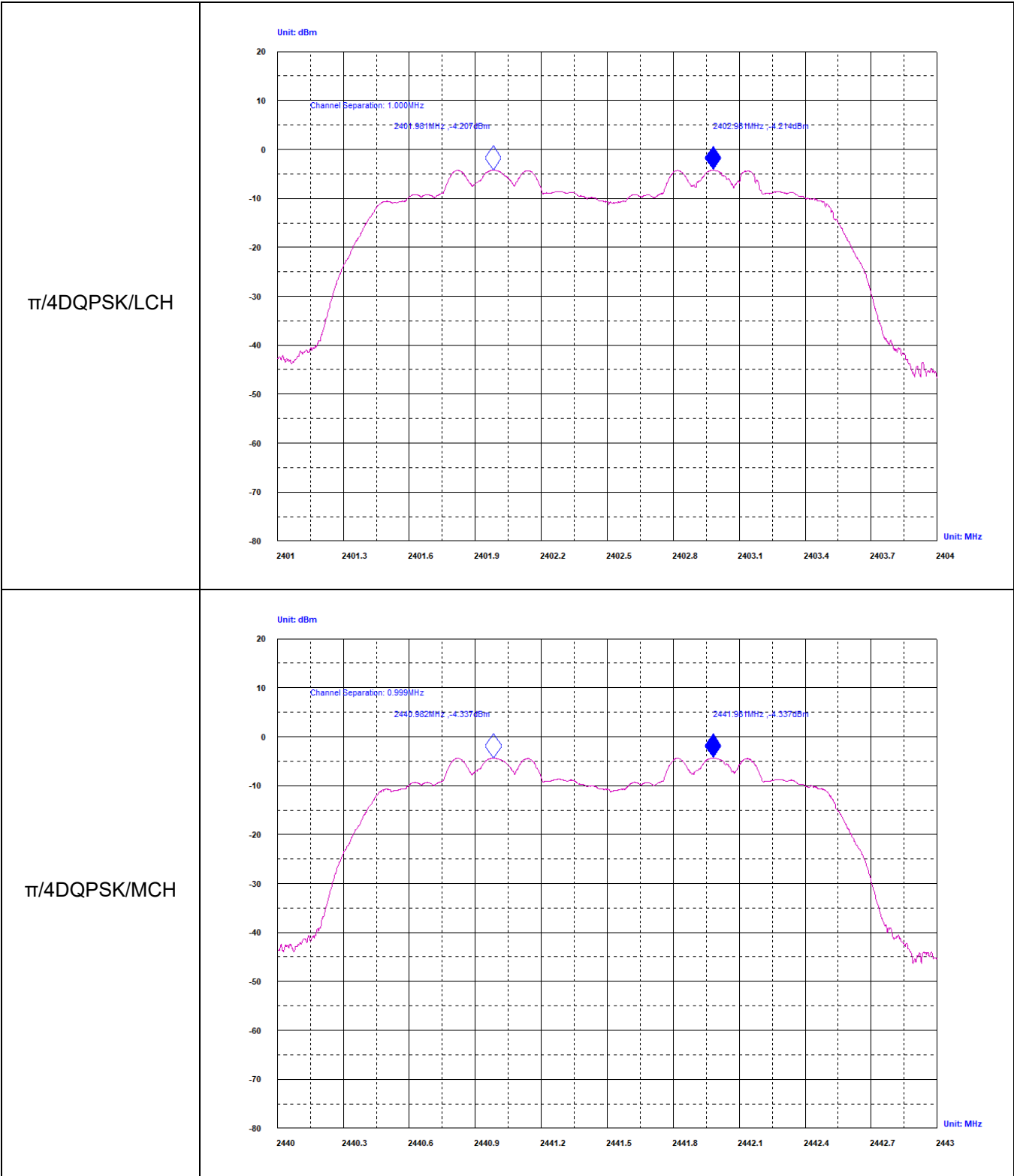
A.3 Carrier Frequency Separation

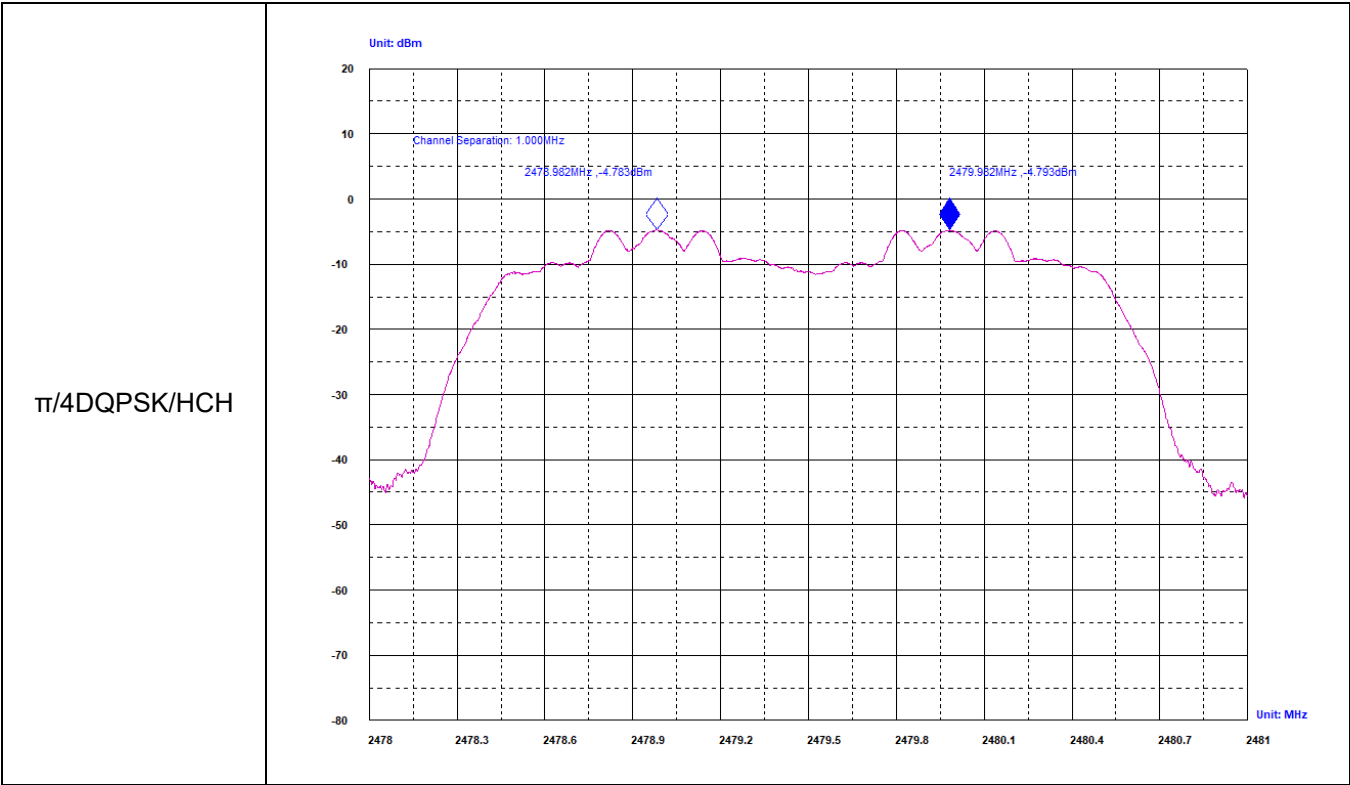
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.001	0.529	PASS
GFSK	MCH	1.001	0.532	PASS
GFSK	HCH	0.997	0.535	PASS
$\pi/4$ DQPSK	LCH	1.000	0.851	PASS
$\pi/4$ DQPSK	MCH	0.999	0.799	PASS
$\pi/4$ DQPSK	HCH	1.000	0.824	PASS

Test Graph





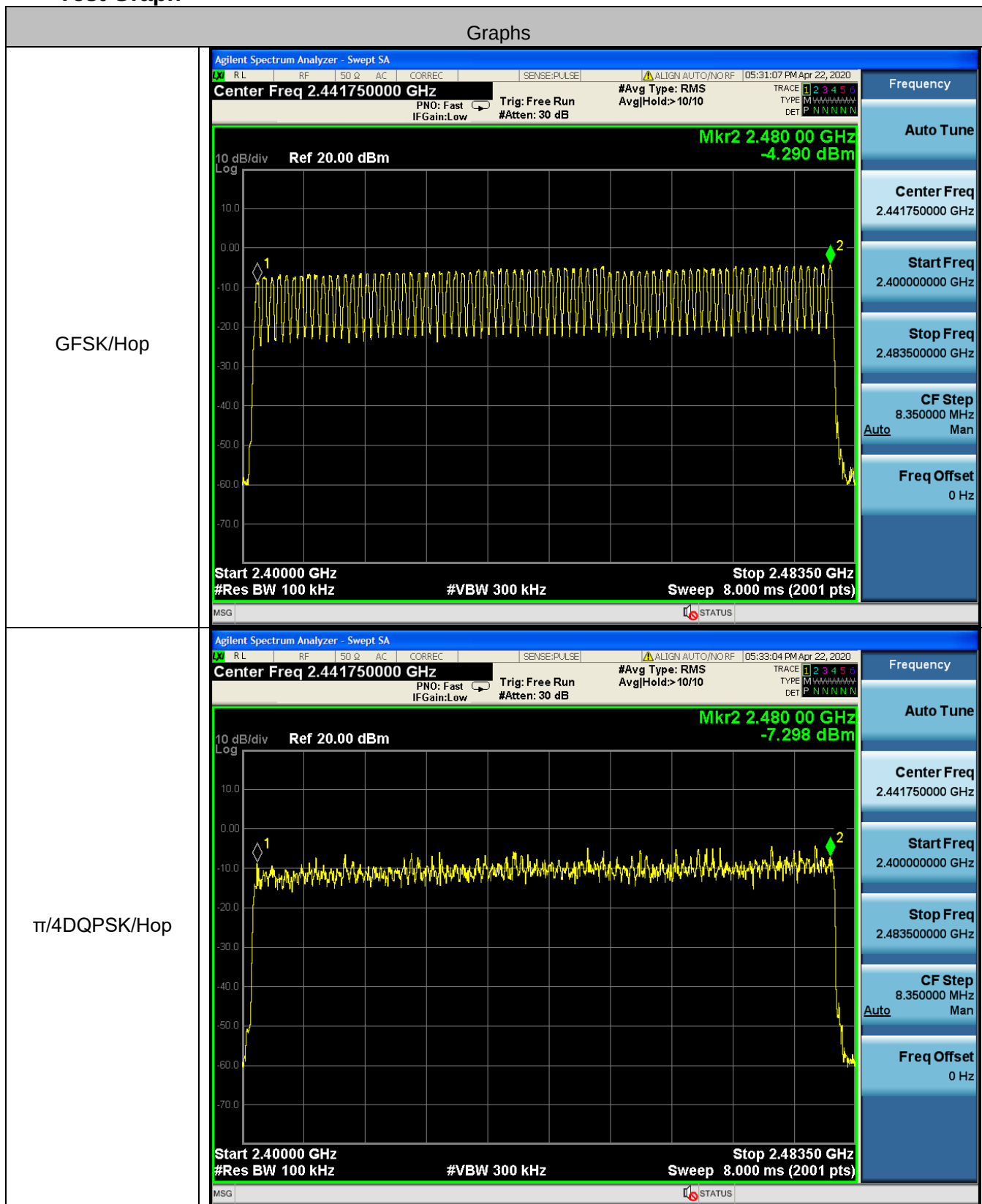




A.4 Hopping Channel Number

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

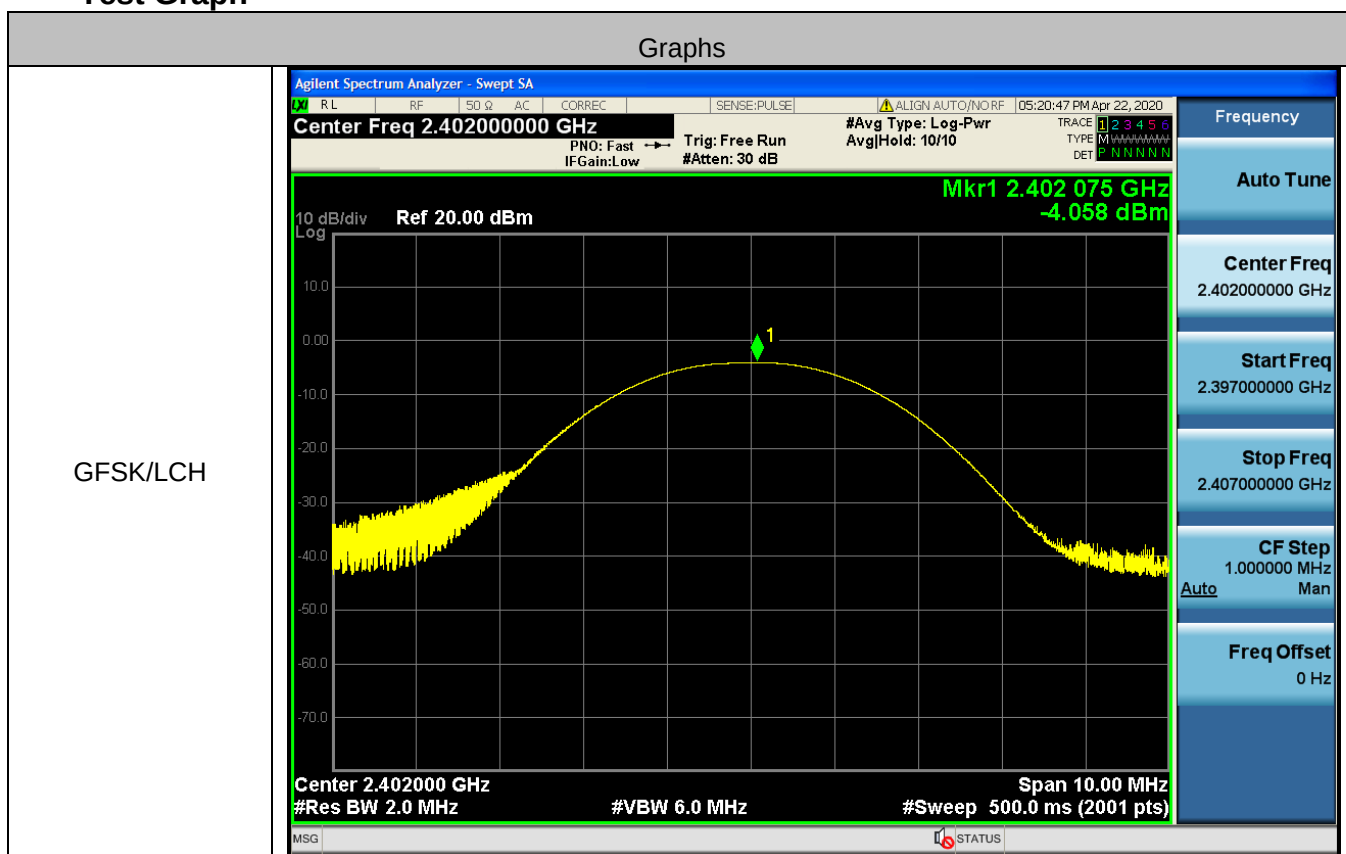
Test Graph



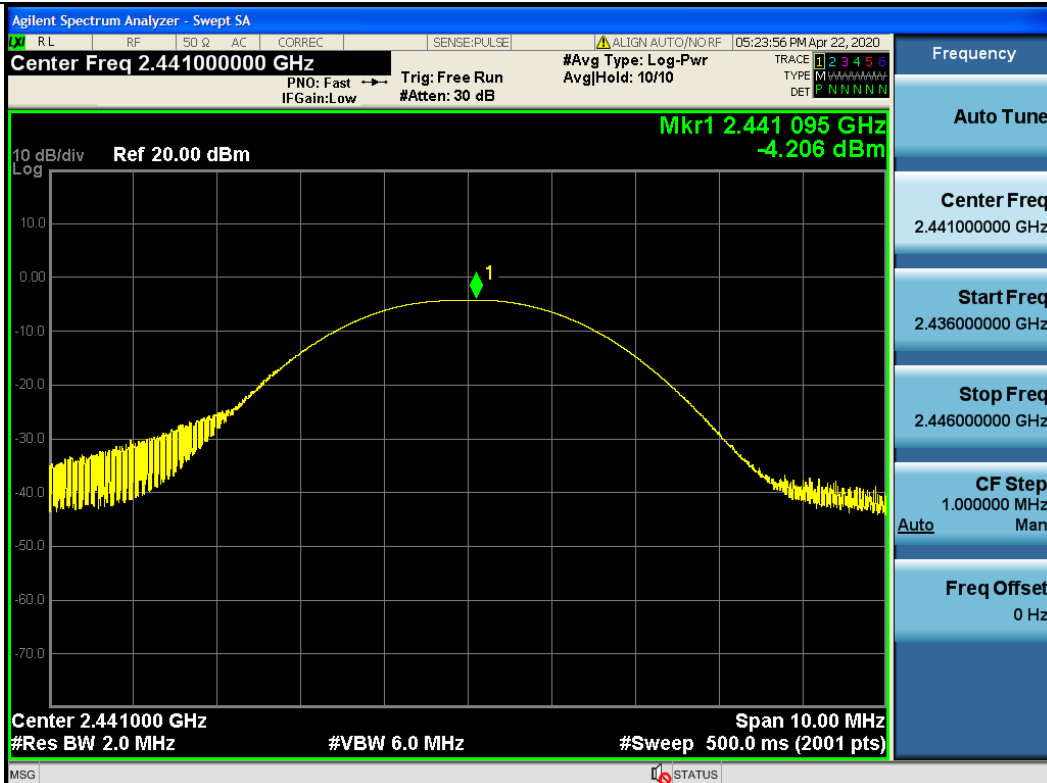
A.5 Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-4.058	21	PASS
GFSK	MCH	-4.206	21	PASS
GFSK	HCH	-4.660	21	PASS
$\pi/4$ DQPSK	LCH	-3.152	21	PASS
$\pi/4$ DQPSK	MCH	-3.264	21	PASS
$\pi/4$ DQPSK	HCH	-3.742	21	PASS

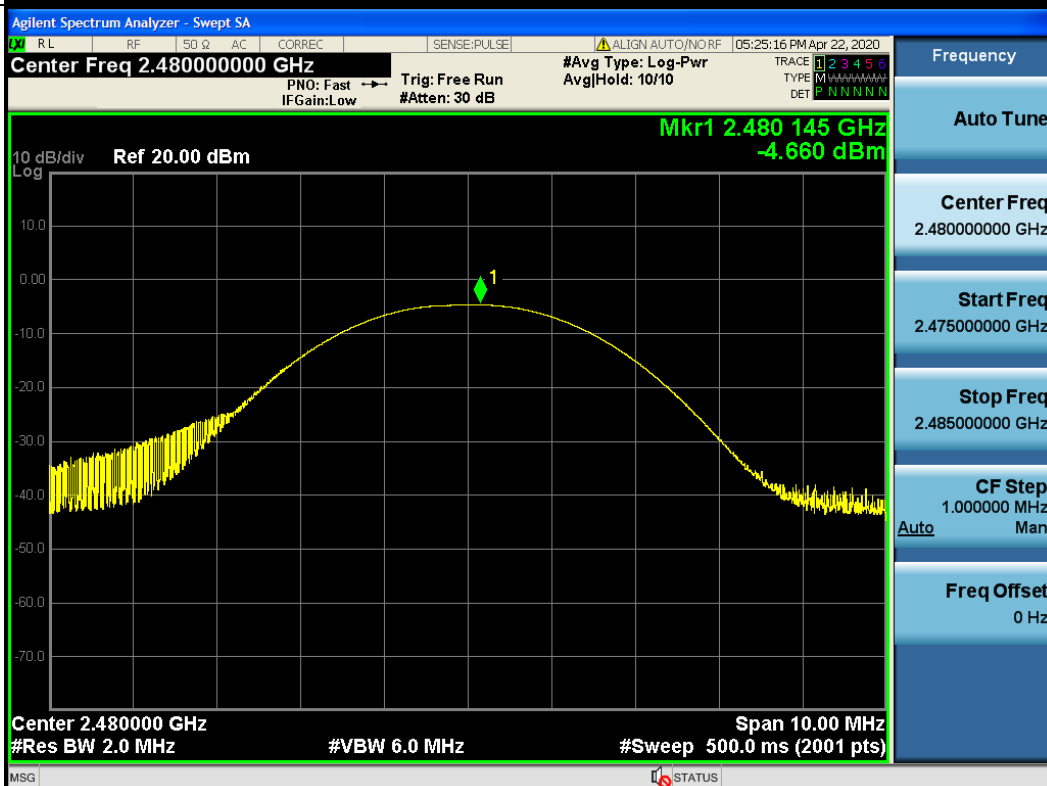
Test Graph

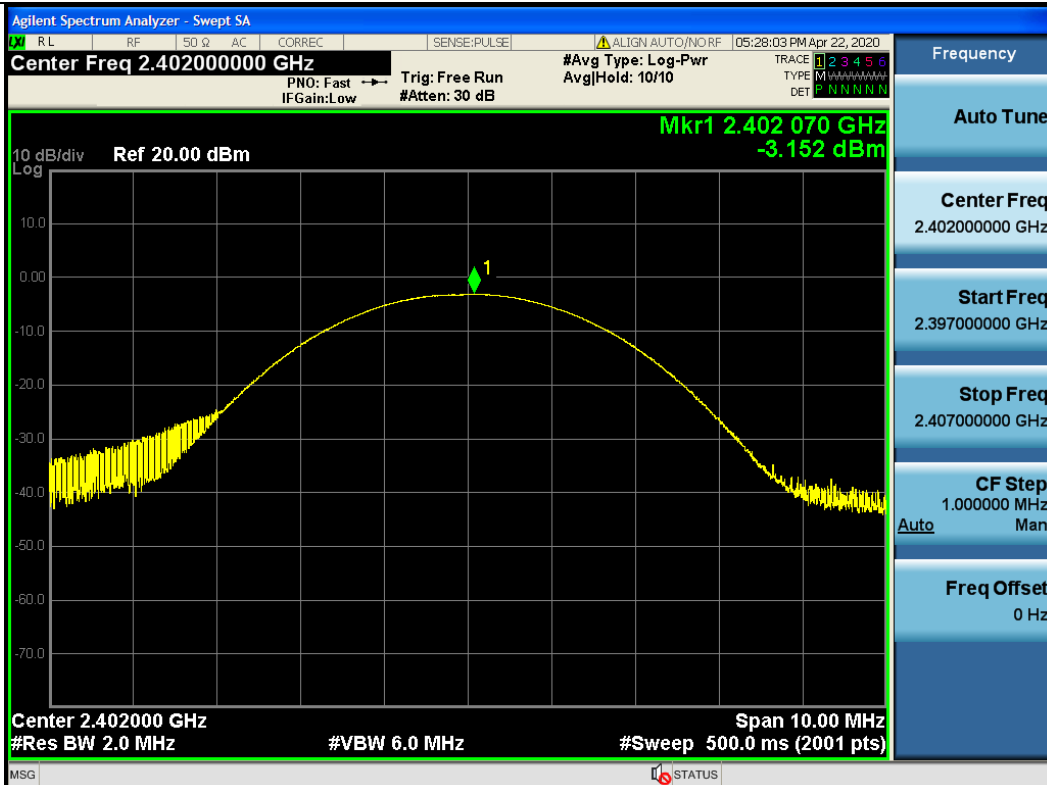
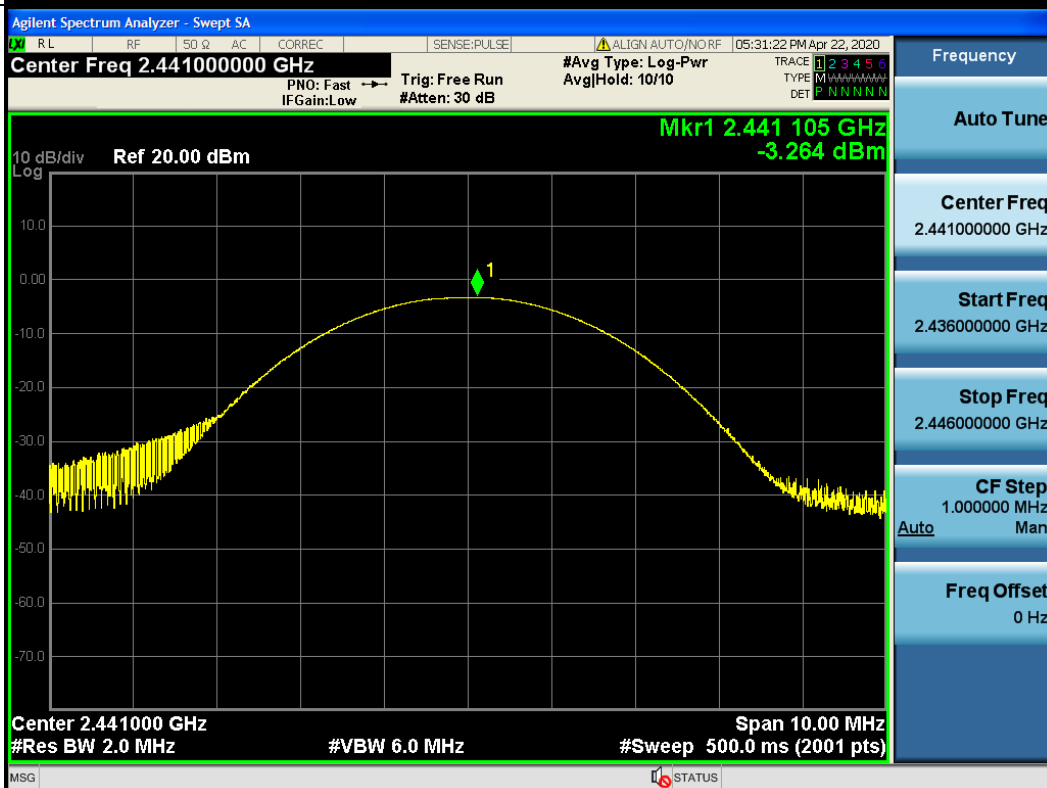


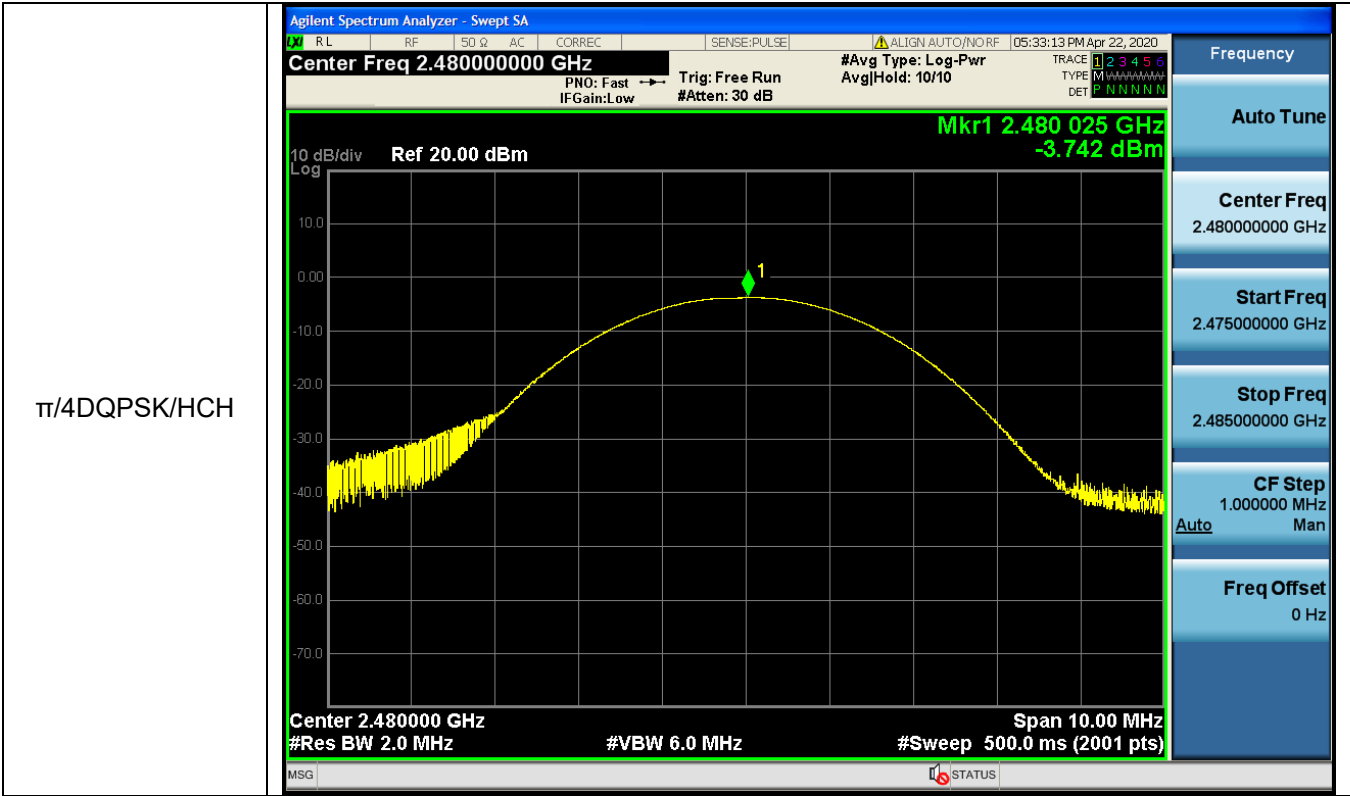
GFSK/MCH



GFSK/HCH



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



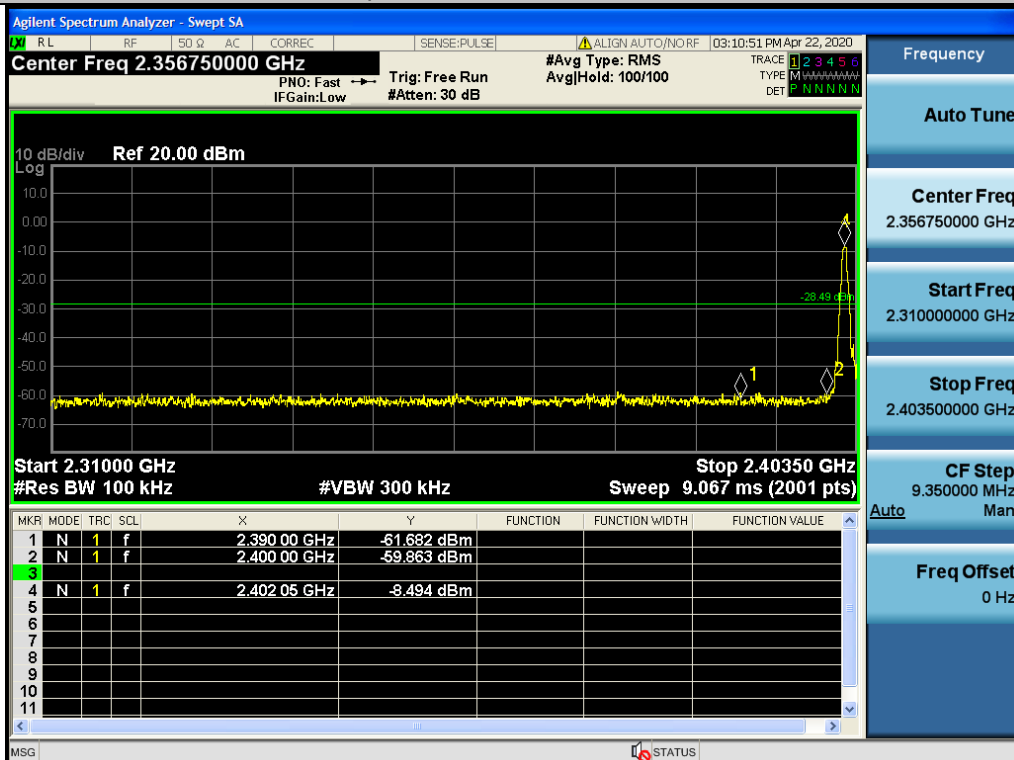
A.6 Band-edge for RF Conducted Emissions

Type	Carrier Frequency(MHz)	Frequency(MHz)	Carrier Frequency Power [dBm]	Bandedge Peak(dBm)	Upper limit(dBm)	Conclusion
1DH5	2402	2400	-8.494	-59.86	-28.494	Pass
1DH5	2480	2498.151	-0.717	-58.472	-20.717	Pass
2DH5	2402	2400	-8.52	-59	-28.52	Pass
2DH5	2480	2483.5	-7.089	-60.21	-27.089	Pass
1DH5-Hopping	2402	2390	-5.619	-59.82	-25.619	Pass
1DH5-Hopping	2480	2500	-4.114	-56.2	-24.114	Pass
2DH5-Hopping	2402	2400	-5.827	-60.03	-25.827	Pass
2DH5-Hopping	2480	2500	-4.255	-57.06	-24.255	Pass

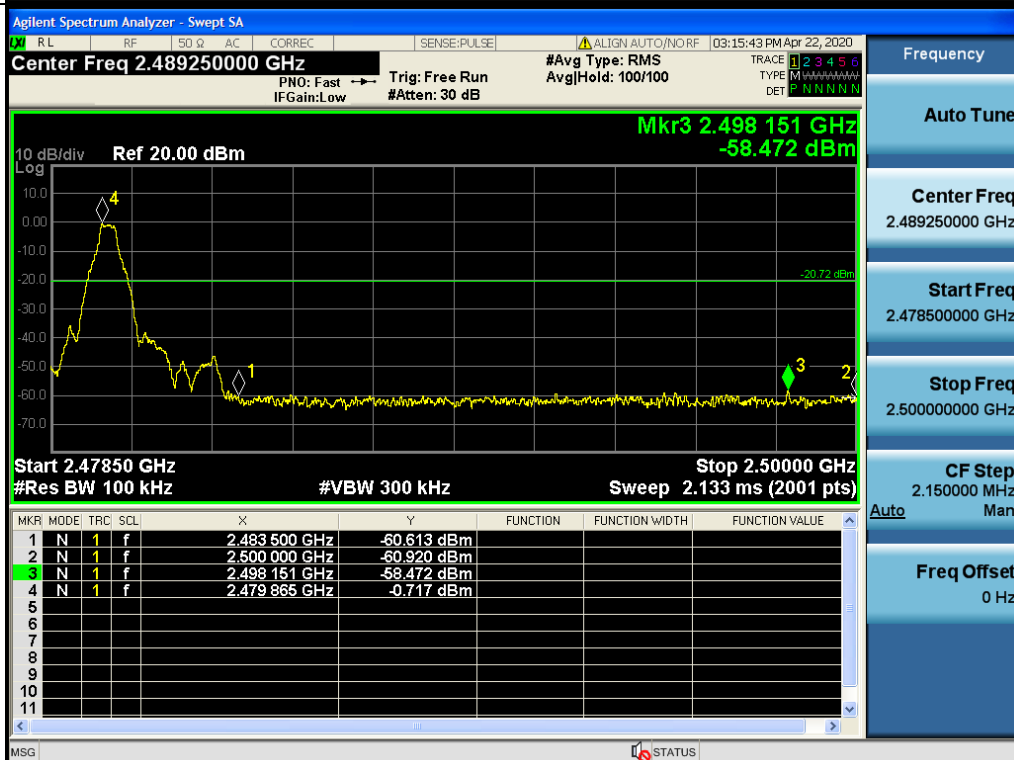
Test Graph

Graphs

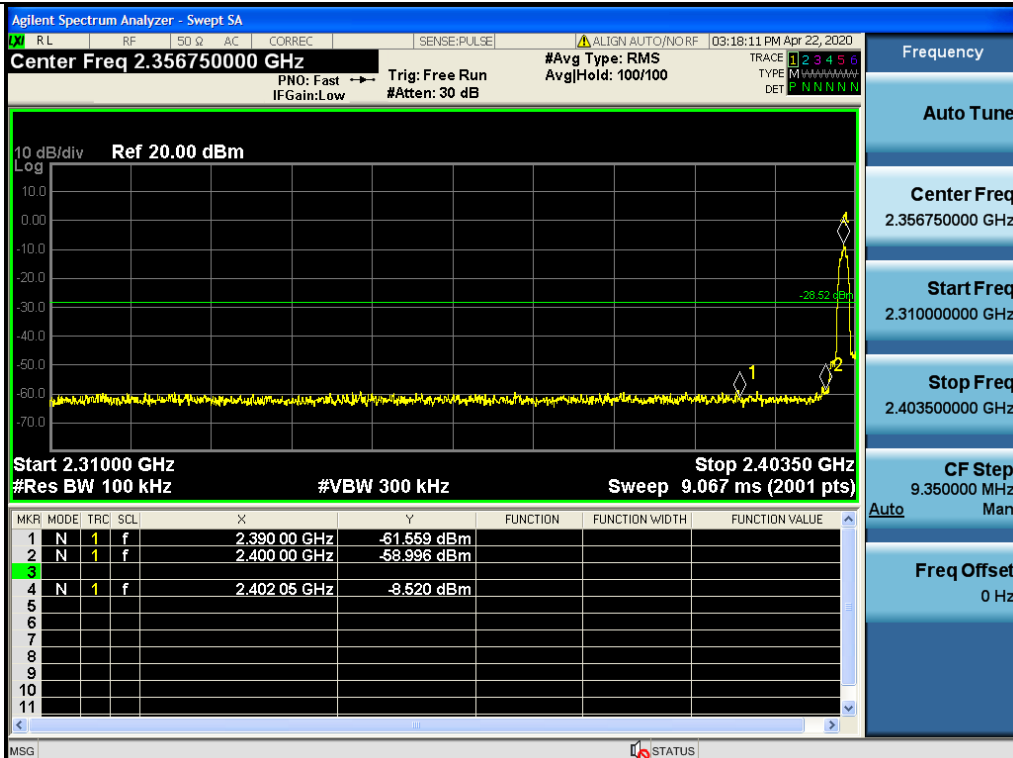
GFSK/LCH/No Hop



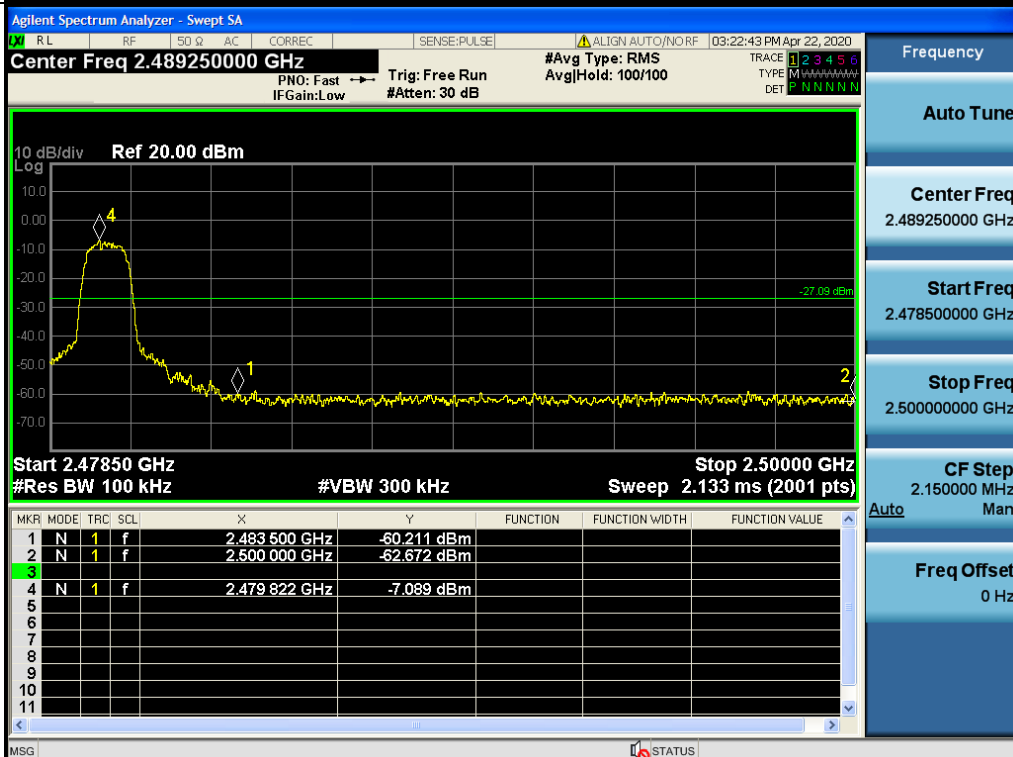
GFSK/HCH/No Hop



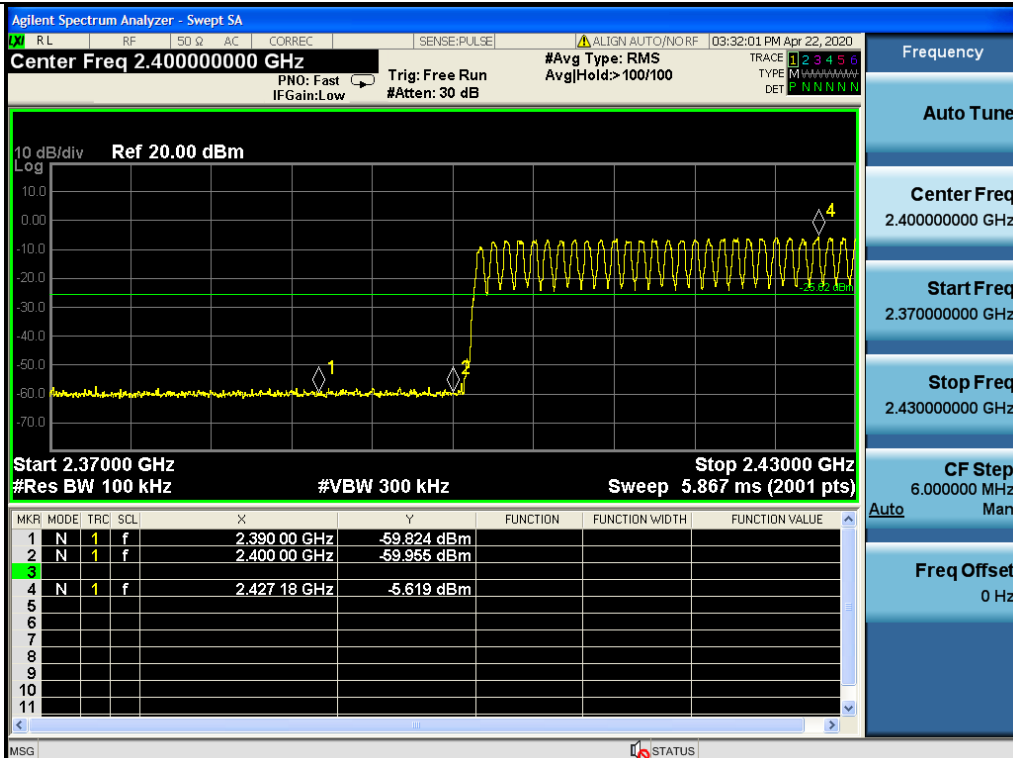
$\pi/4$ DQPSK/LCH/No
Hop



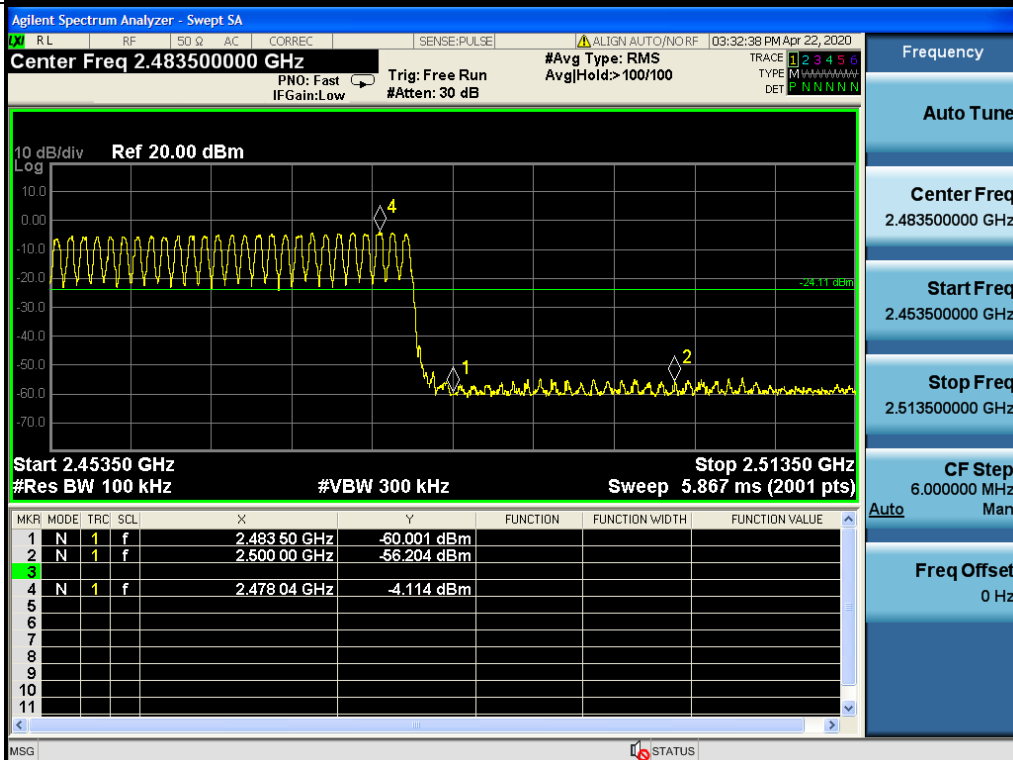
$\pi/4$ DQPSK/HCH/No
Hop

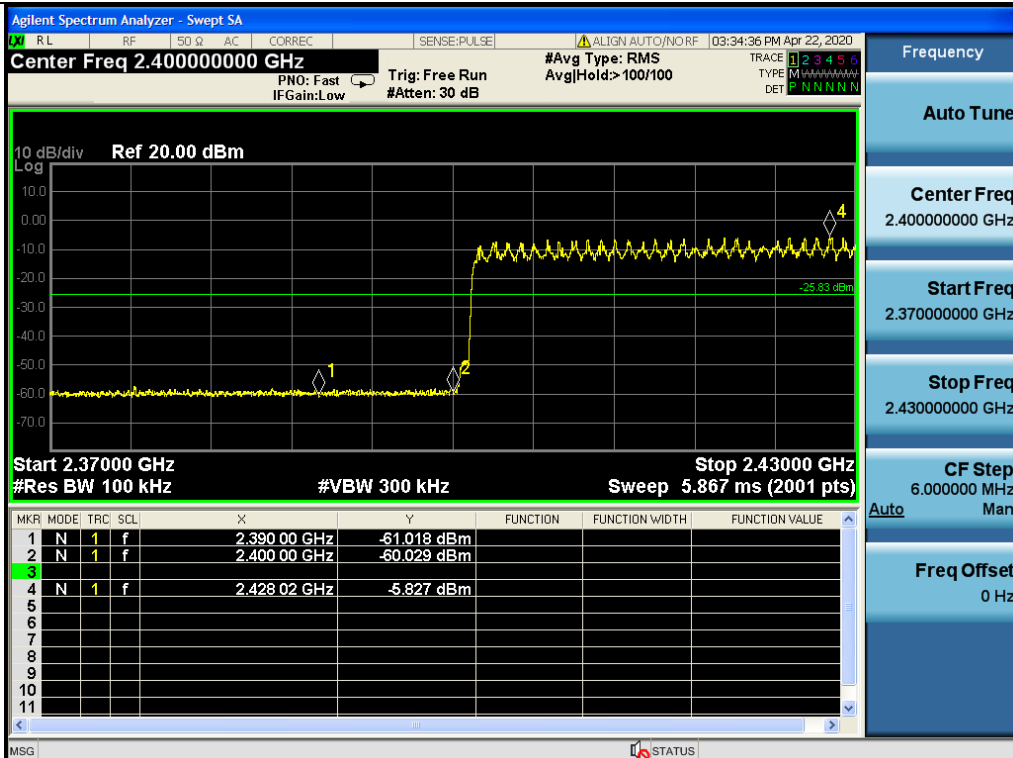
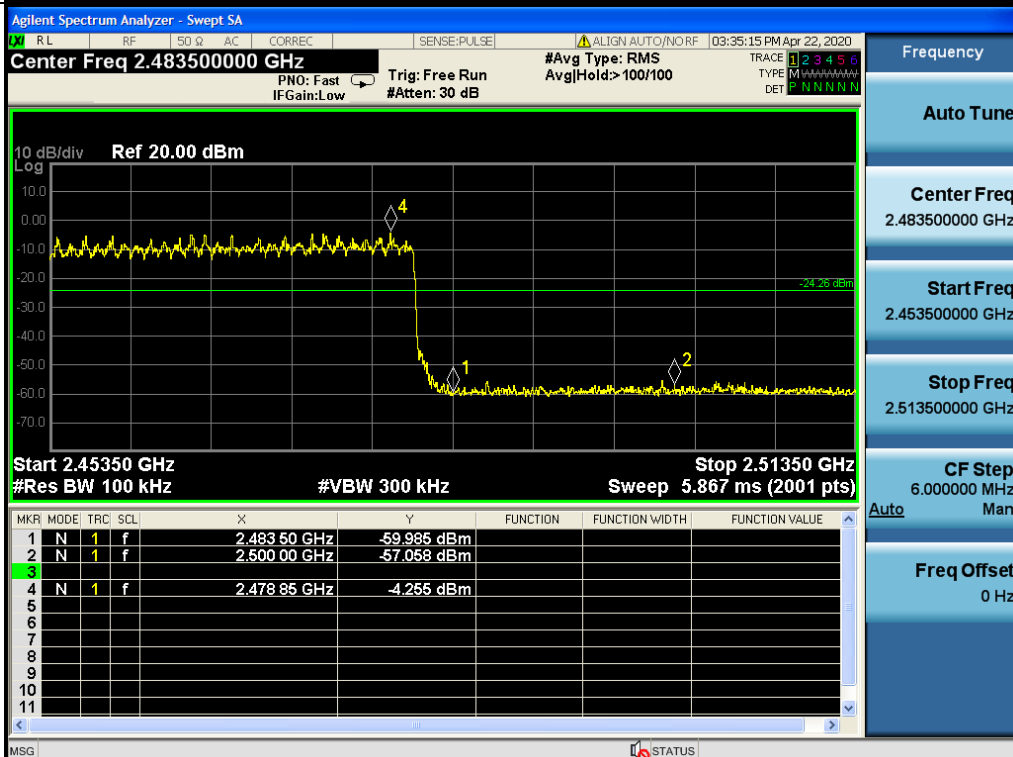


GFSK/LCH/Hop



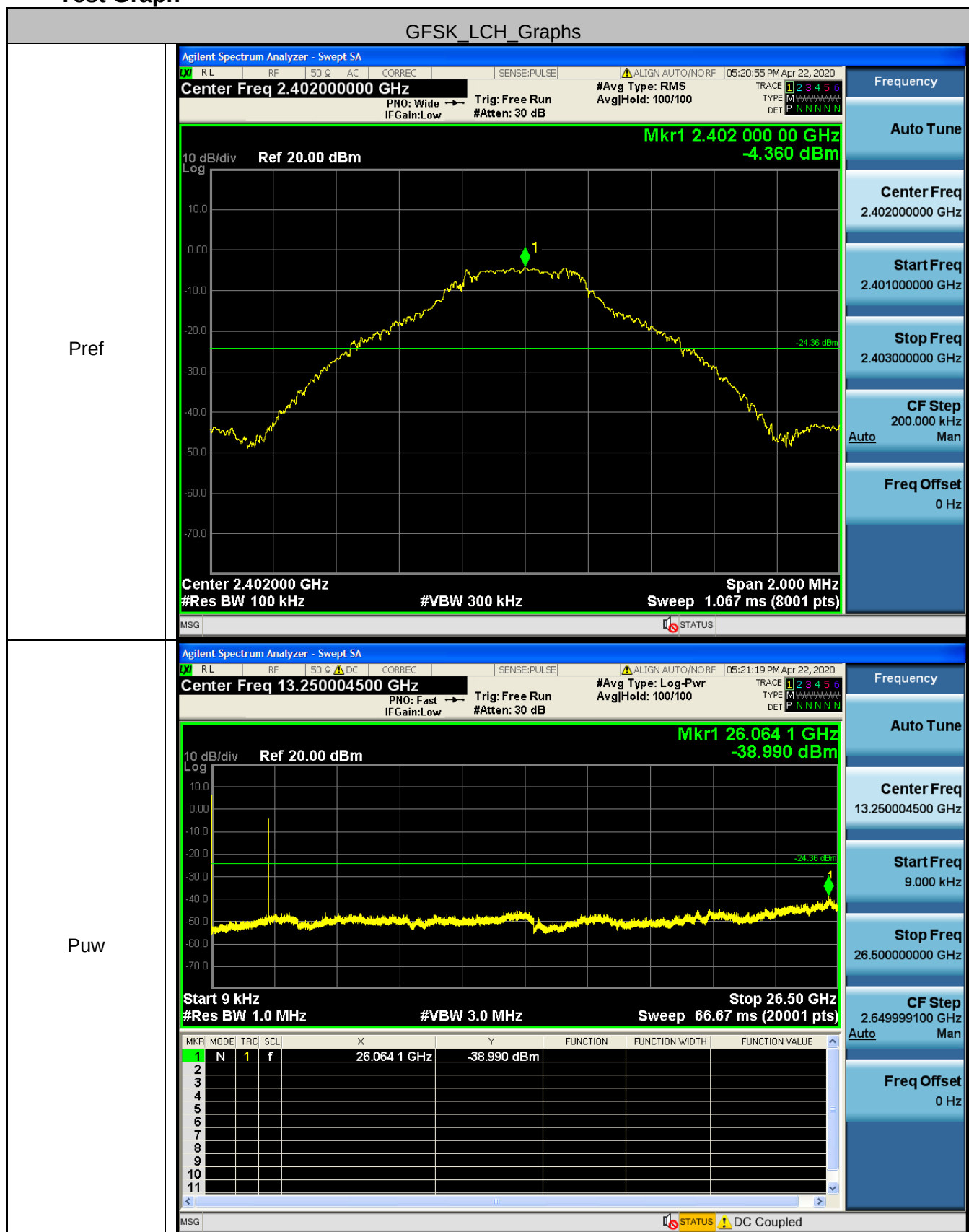
GFSK/HCH/Hop



$\pi/4$ DQPSK/LCH/Hop $\pi/4$ DQPSK/HCH/Hop

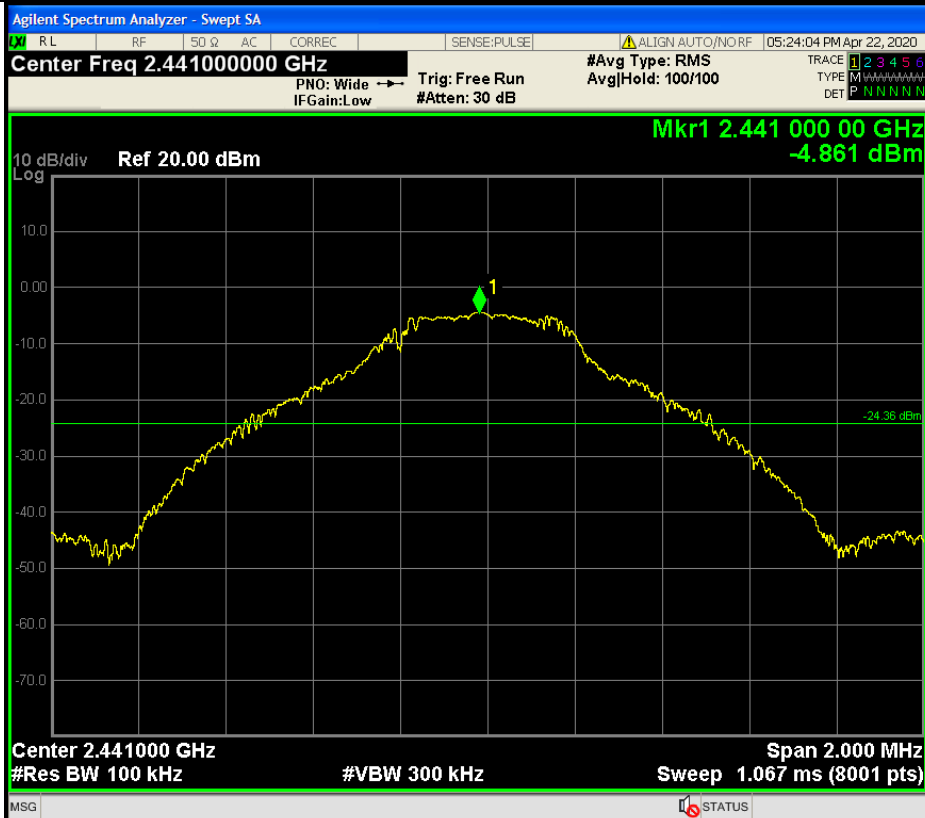
A.7 RF Conducted Spurious Emissions

Test Graph

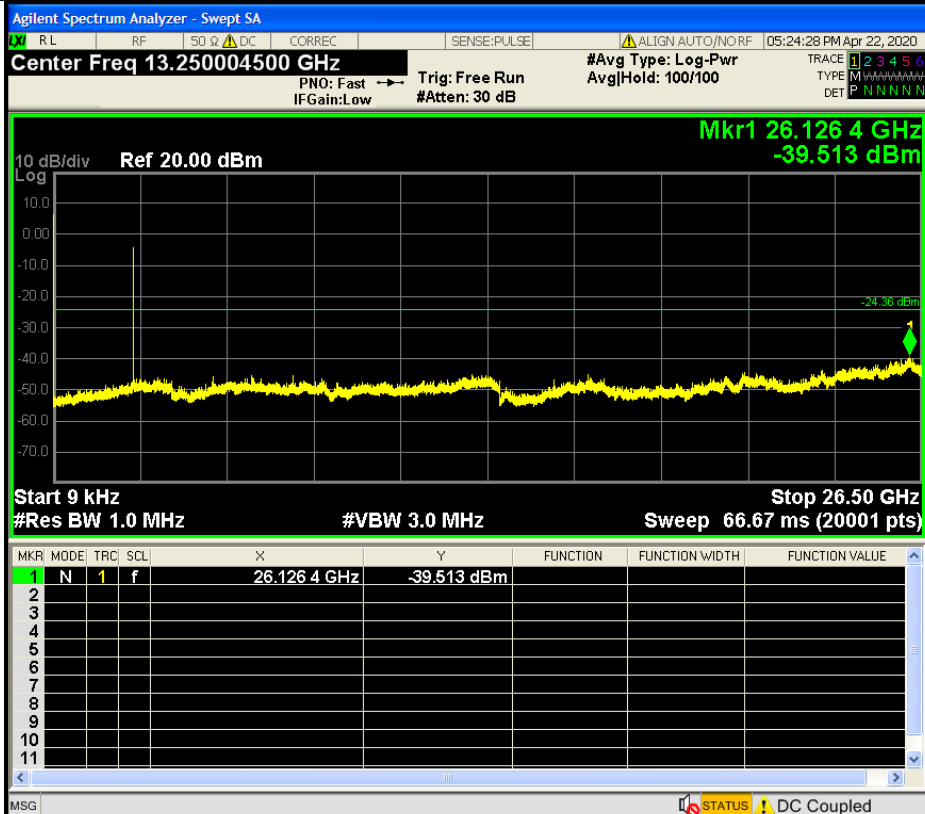


GFSK MCH Graphs

Pref

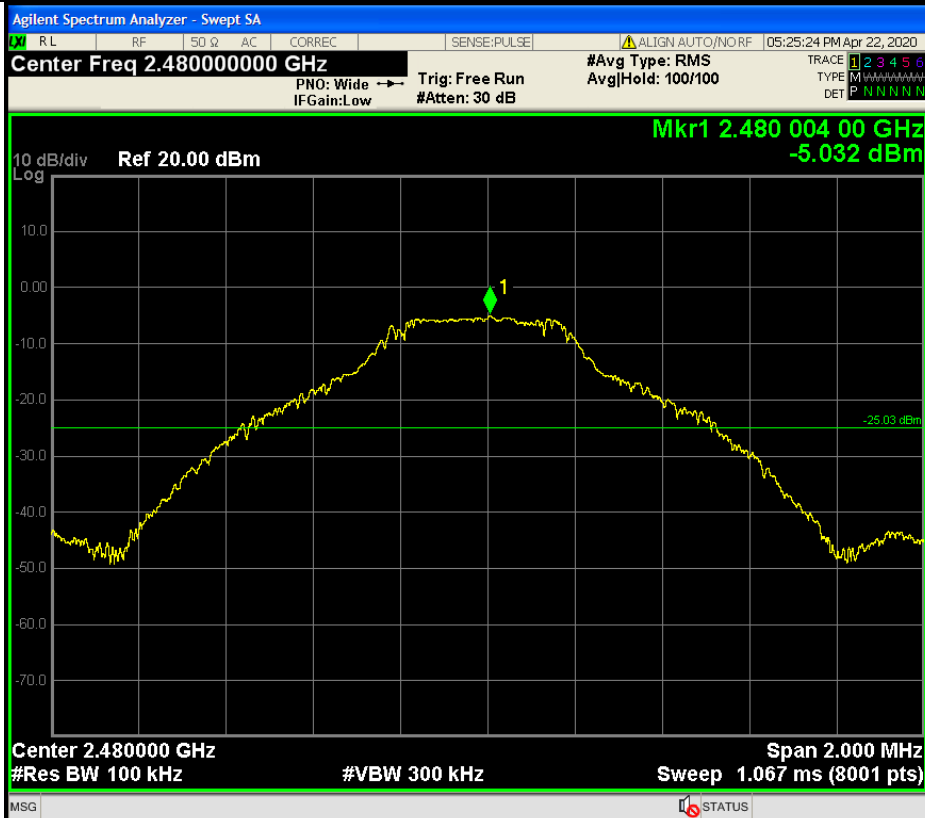


Puw

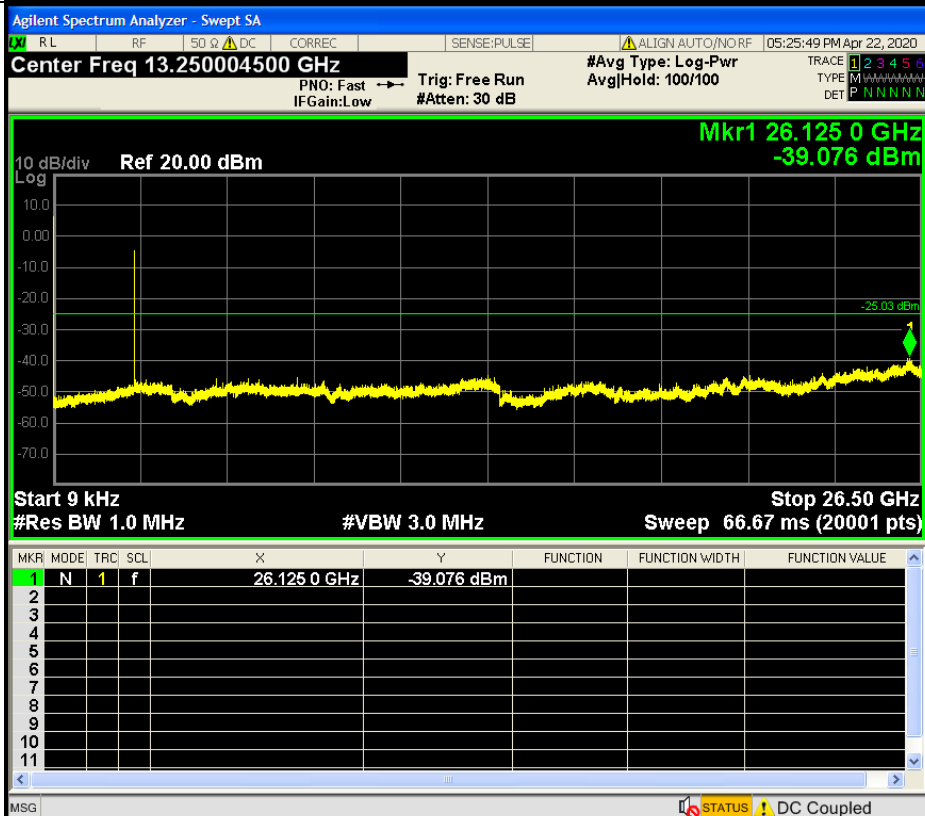


GFSK_HCH_Graphs

Pref

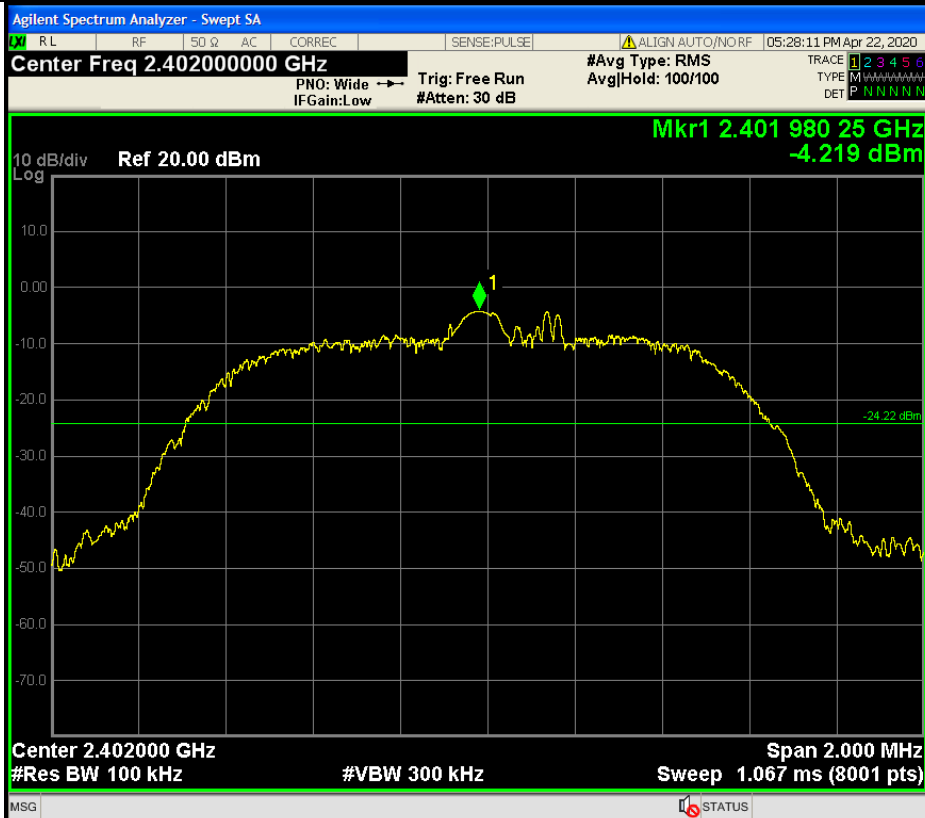


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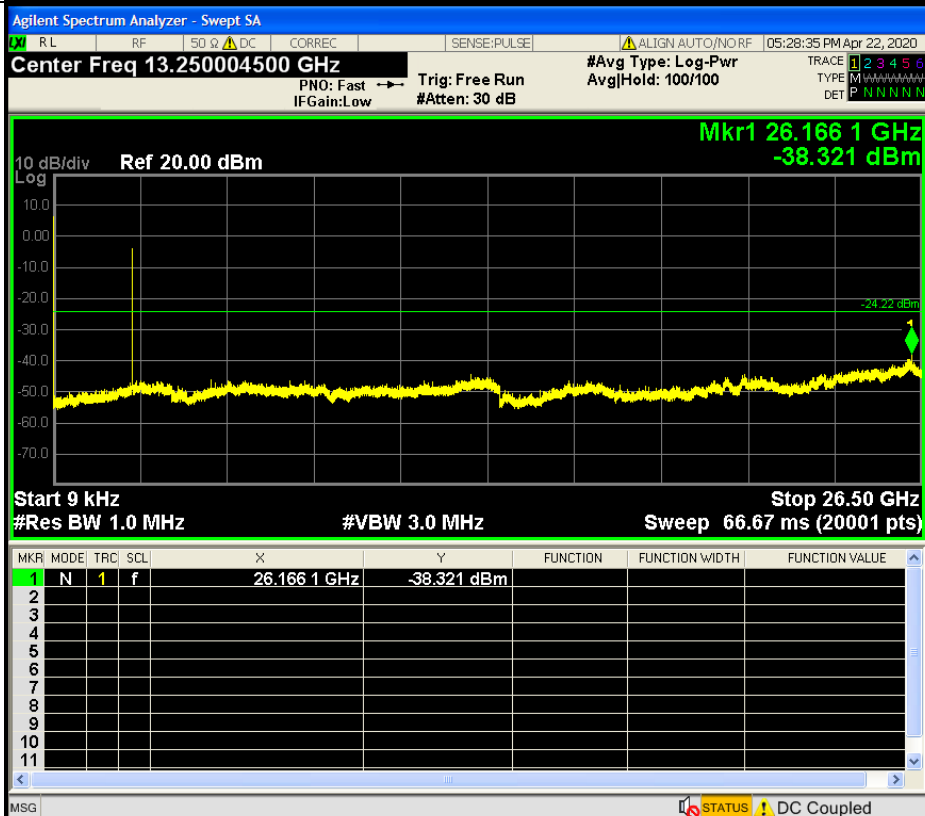


$\pi/4$ DQPSK LCH_Graphs

Pref

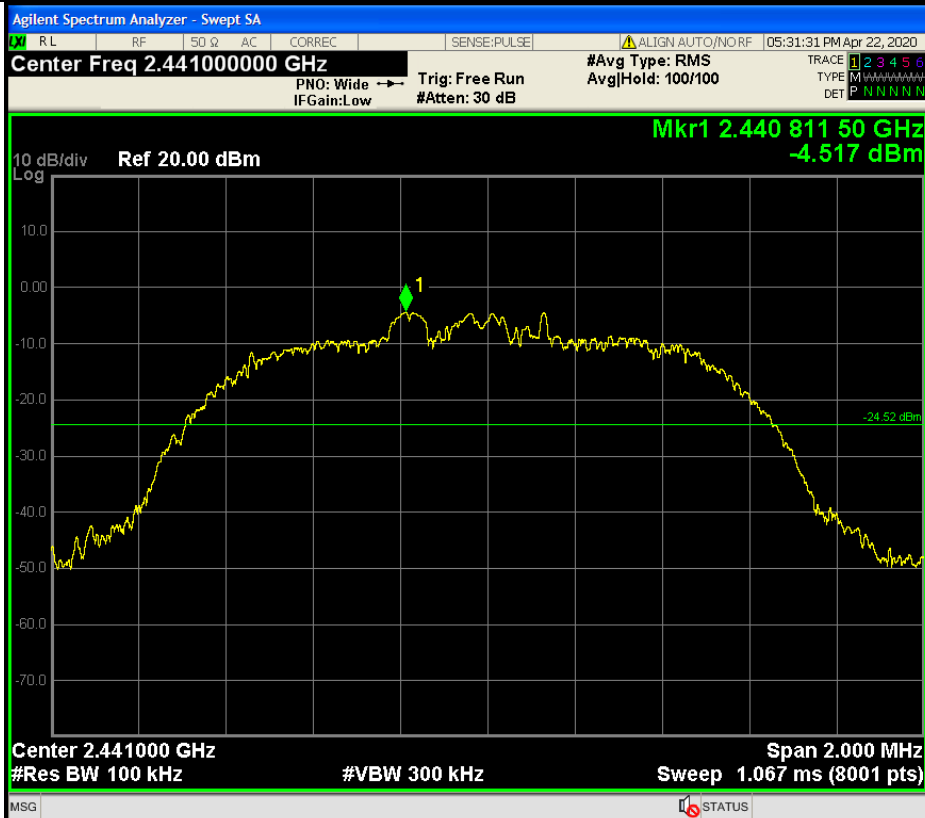


Puw

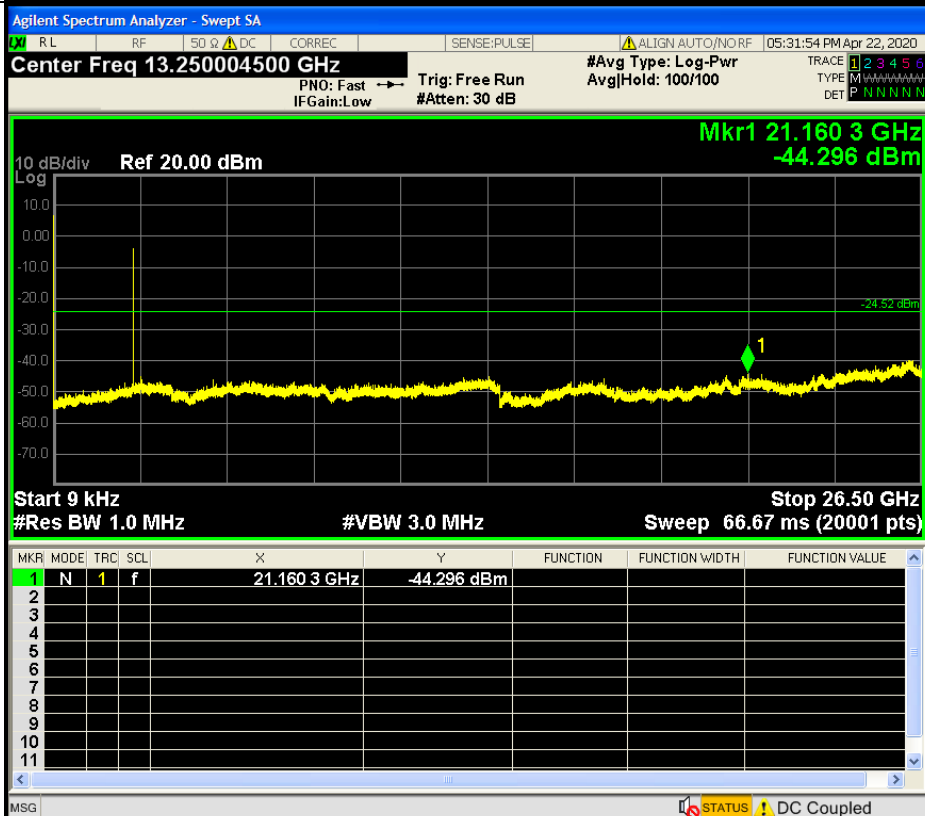


$\pi/4$ DQPSK MCH Graphs

Pref

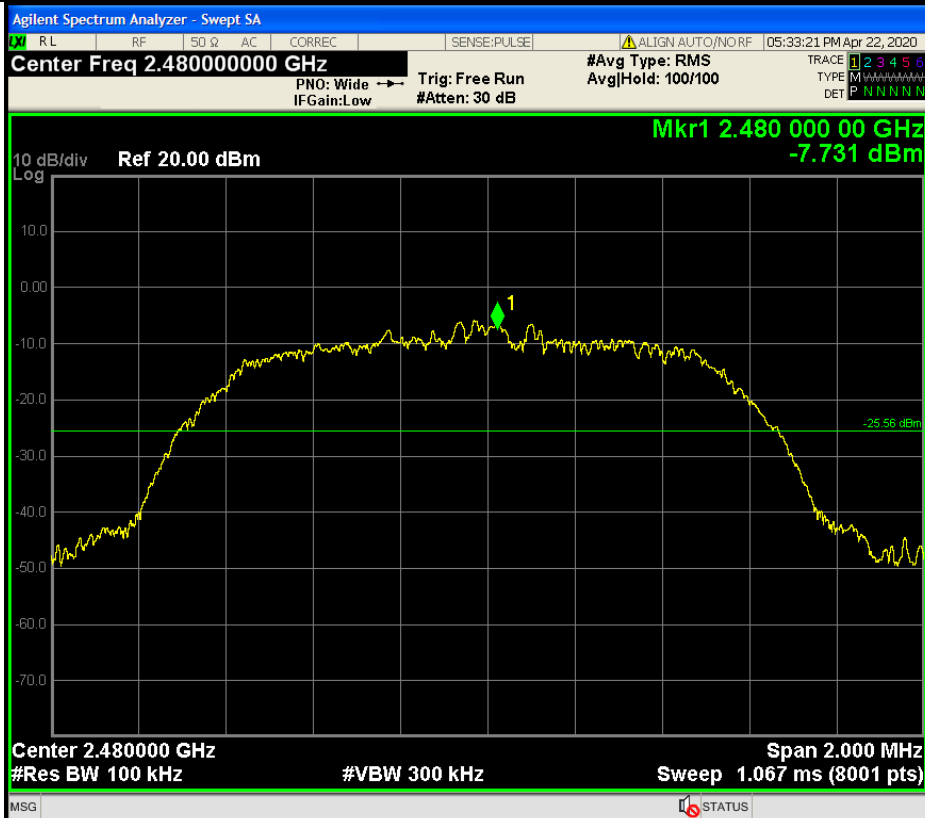


Puw

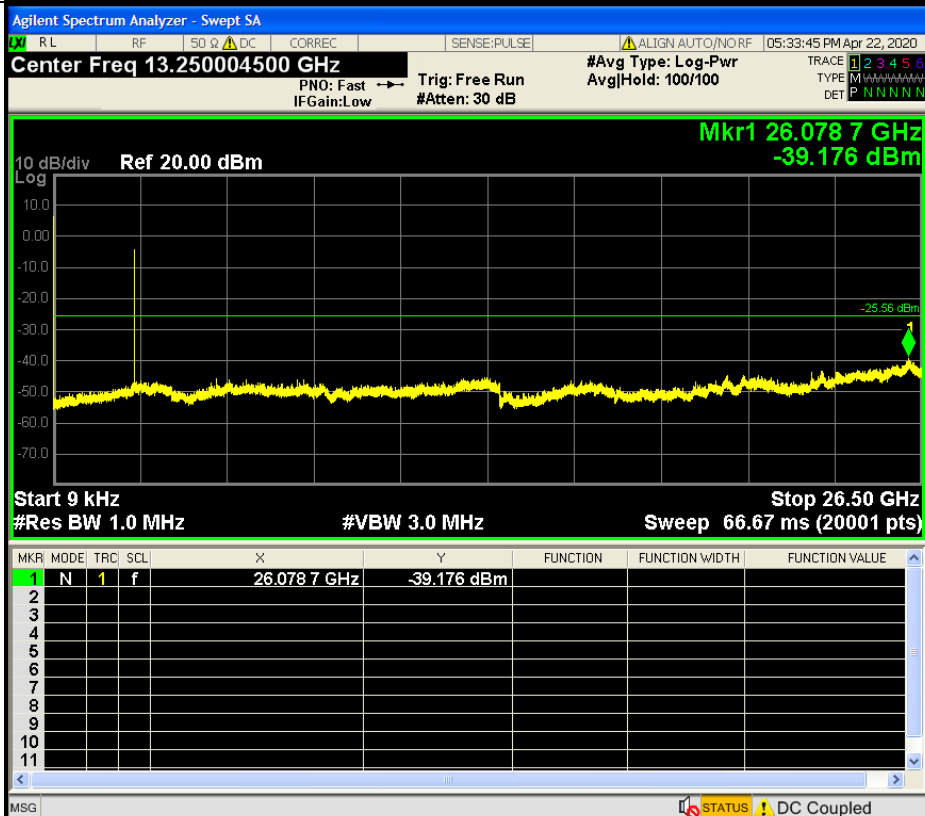


$\pi/4$ DQPSK HCH Graphs

Pref



Puw

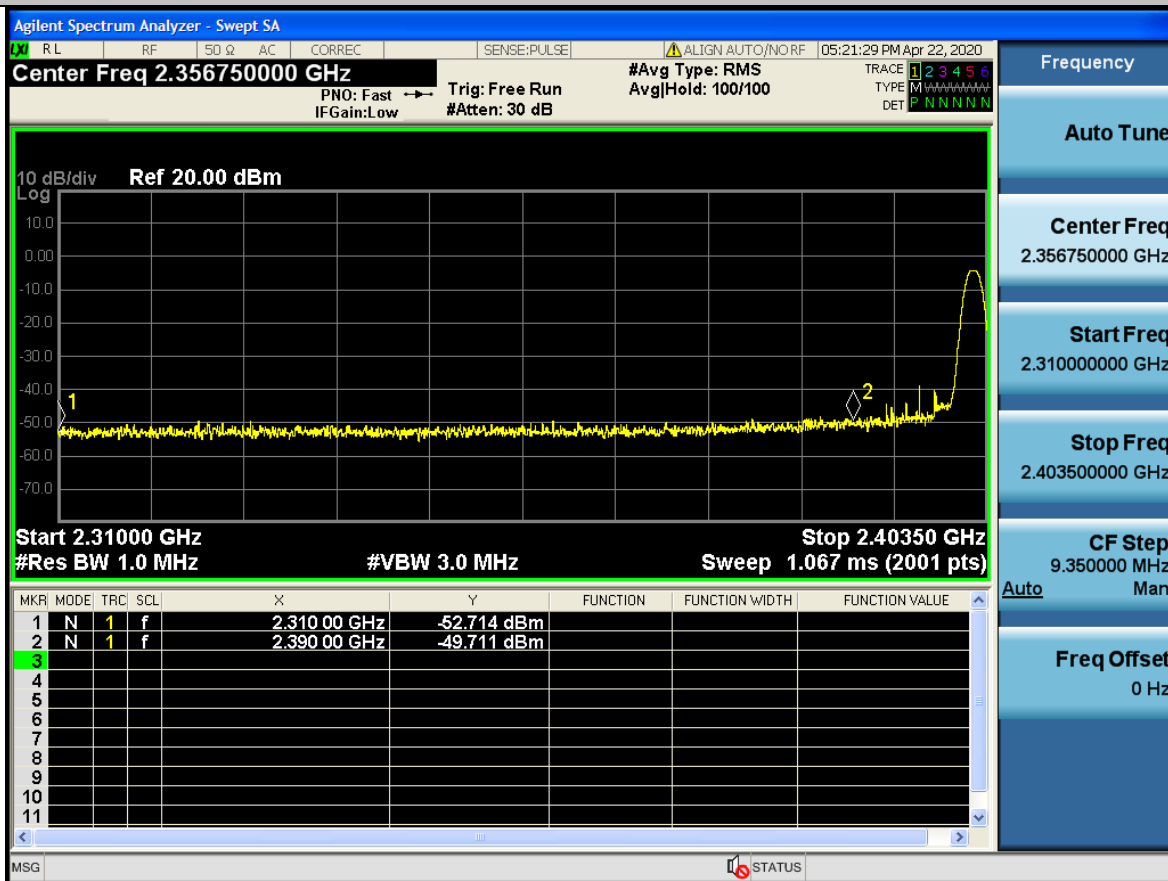


A.8 Restrict-band band-edge measurements

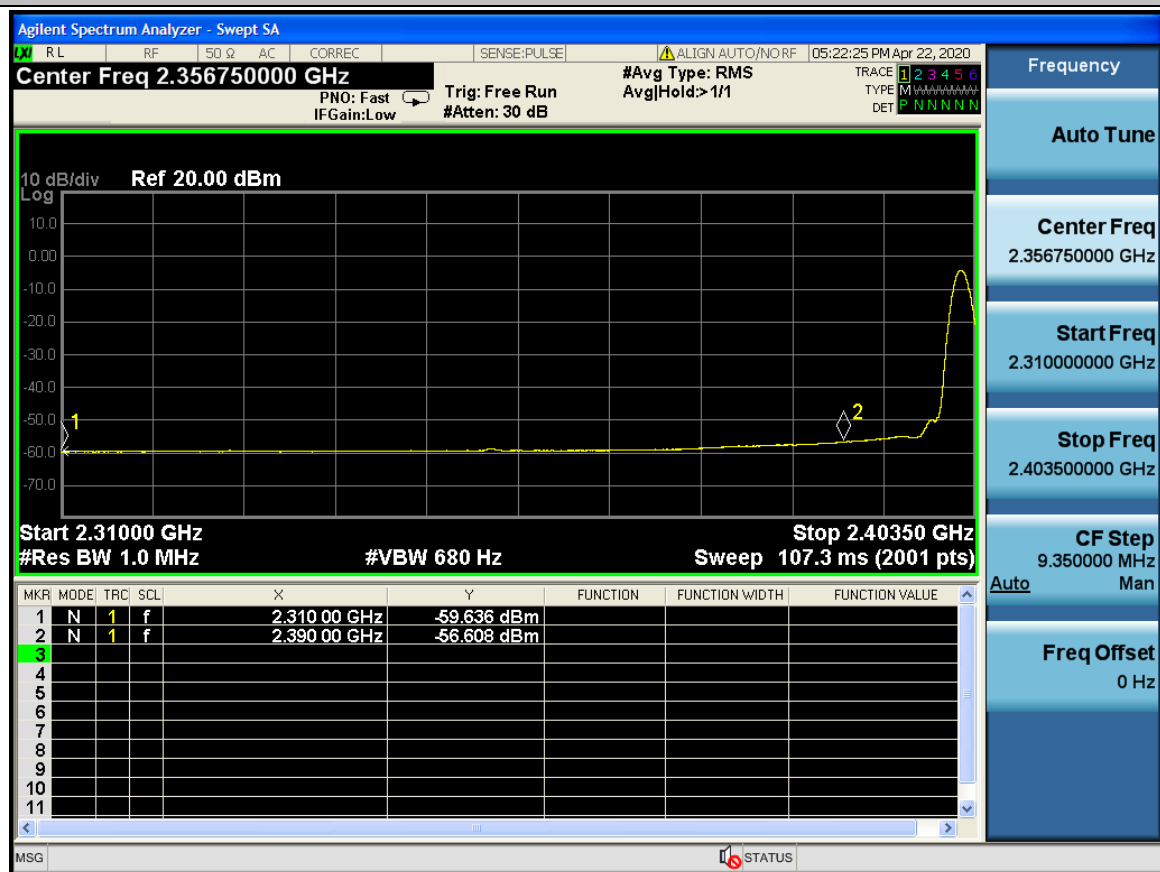
Type	Carrier Frequency (MHz)	Frequency(M Hz)	Gain	Ground Factor	Peak Value(dBm)	E [dBuV/m]	Limit [dBuV/m]	Conclusion
1DH5	2402	2390	2.00	0.00	-49.711	47.489	74	Pass
1DH5	2480	2485.67	2.00	0.00	-45.034	52.166	74	Pass
2DH5	2402	2390	2.00	0.00	-48.645	48.555	74	Pass
2DH5	2480	2485.853	2.00	0.00	-44.796	52.404	74	Pass

Type	Carrier Frequency (MHz)	Frequency(M Hz)	Gain	Ground Factor	Average Value(dBm)	E [dBuV/m]	Limit [dBuV/m]	Conclusion
1DH5	2402	2390	2.00	0.00	-56.608	40.592	54	Pass
1DH5	2480	2485.67	2.00	0.00	-52.153	45.047	54	Pass
2DH5	2402	2390	2.00	0.00	-56.665	40.535	54	Pass
2DH5	2480	2485.853	2.00	0.00	-53.184	44.016	54	Pass

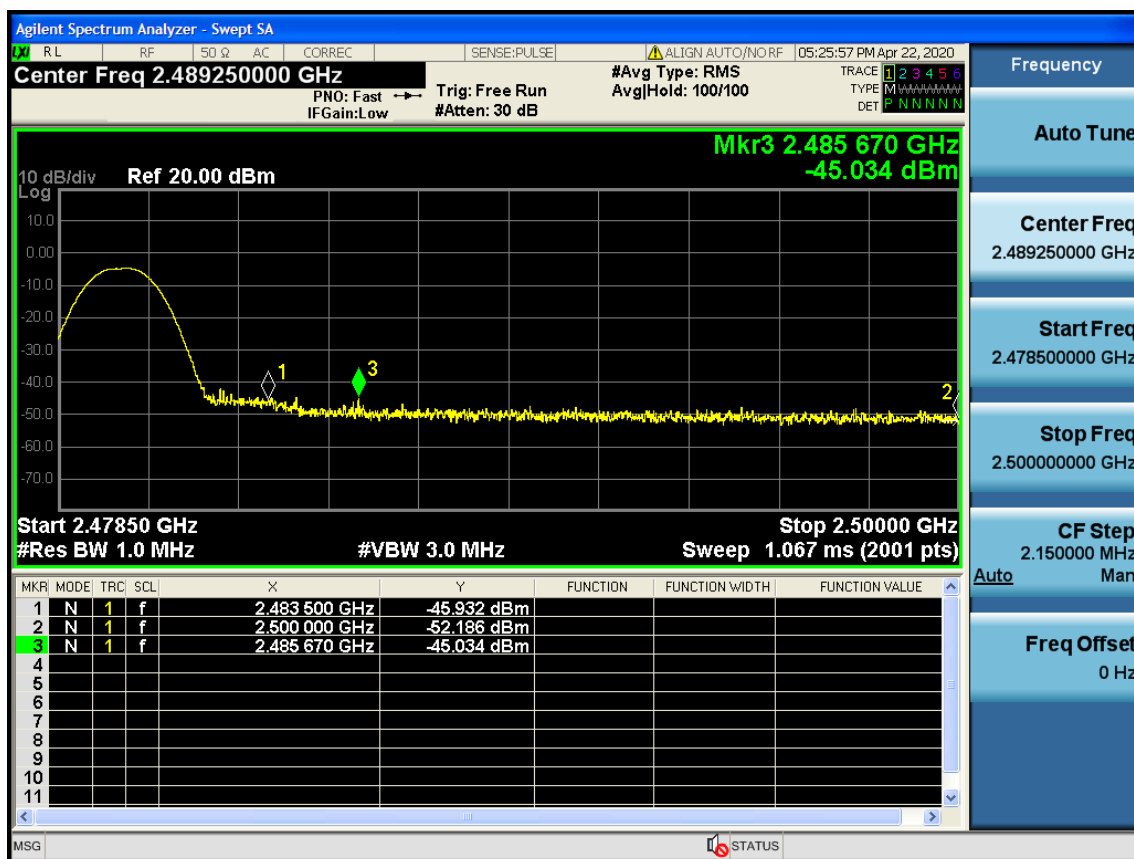
Restrict-band band-edge measurements_2402_PEAK_DH5



Restrict-band band-edge measurements_2402_AV_DH5



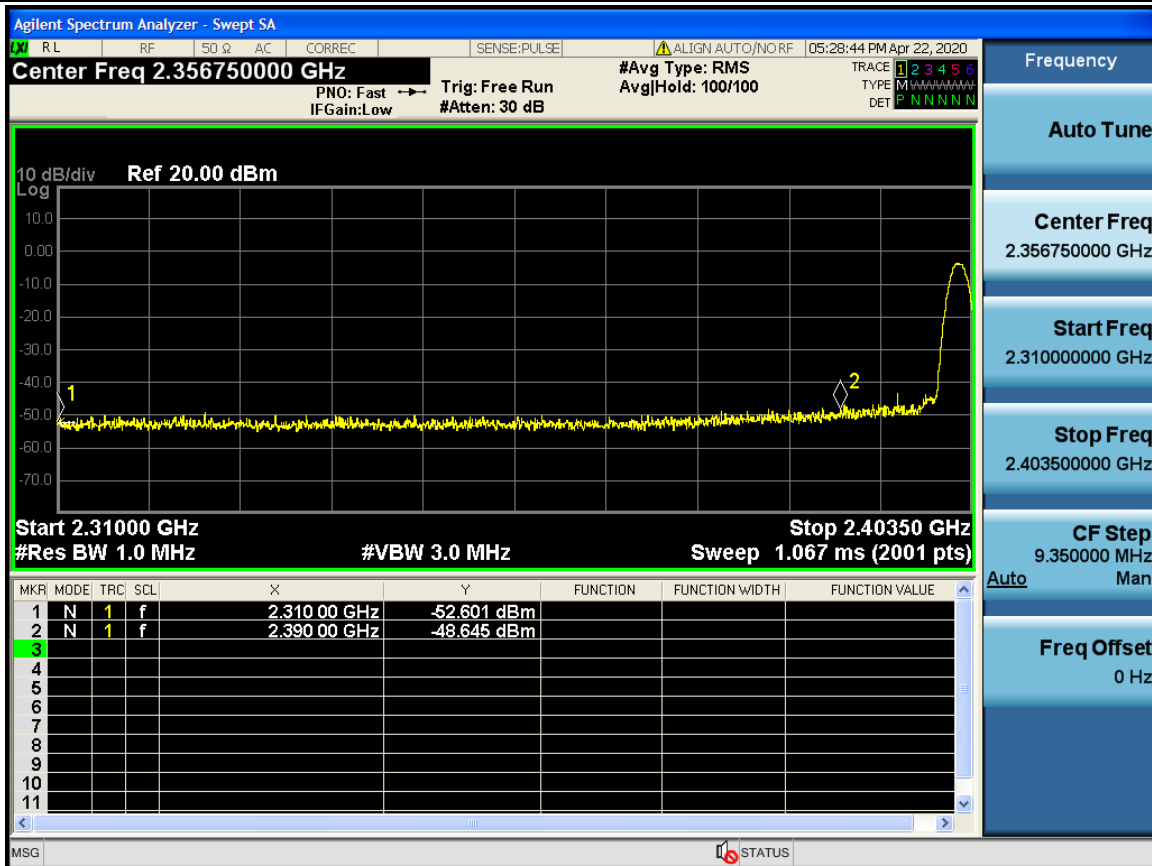
Restrict-band band-edge measurements_2480_PEAK_DH5



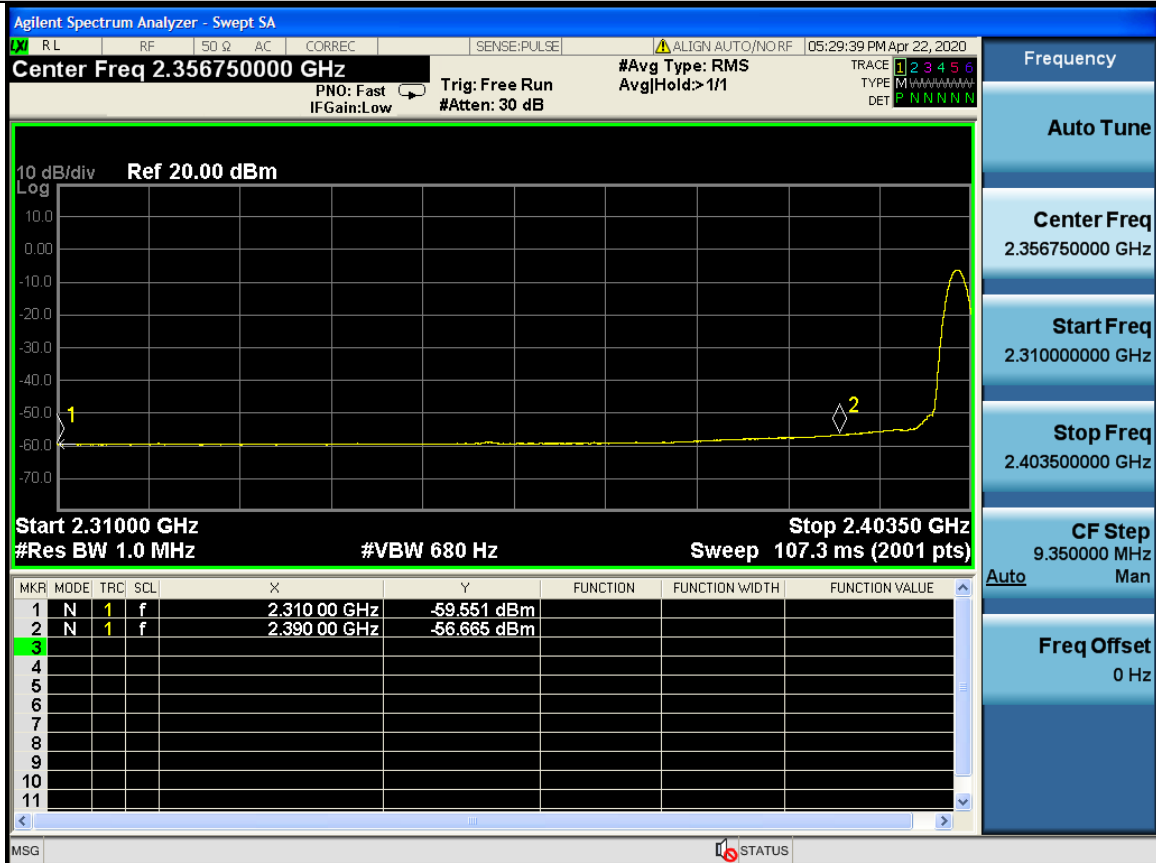
Restrict-band band-edge measurements_2480_AV_DH5



Restrict-band band-edge measurements_2402_PEAK_2DH5



Restrict-band band-edge measurements_2402_AV_2DH5



Agilent Spectrum Analyzer - Swept SA

Center Freq 2.489250000 GHz

PNO: Fast → Trig: Free Run #Avg Type: RMS Avg|Hold: 100/100

IF Gain: Low #Atten: 30 dB

TRACE 1 2 3 4 5 6 TYPE M W W W W W W W DET P N N N N N

10 dB/div Ref 20.00 dBm

Log

Mkr3 2.485 853 GHz -44.796 dBm

Start 2.47850 GHz #Res BW 1.0 MHz #VBW 3.0 MHz Stop 2.50000 GHz Sweep 1.067 ms (2001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.483 500 GHz	-47.346 dBm			
2	N	1	f	2.500 000 GHz	-50.607 dBm			
3	N	1	f	2.485 853 GHz	-44.796 dBm			
4								
5								
6								
7								
8								
9								
10								
11								

Frequency

Auto Tune

Center Freq 2.489250000 GHz

Start Freq 2.478500000 GHz

Stop Freq 2.500000000 GHz

CF Step 2.150000 MHz

Auto

Freq Offset 0 Hz

MSG STATUS

Agilent Spectrum Analyzer - Swept SA

RL RF 50 Ω AC CORREC SENSE:PULSE ALIGN AUTO/NO RF 05:34:28 PM Apr 22, 2020

Center Freq 2.489250000 GHz **Trig: Free Run** **#Avg Type: RMS** **Avg|Hold> 1/1** **TRACE 1 2 3 4 5 6**
PNO: Fast **IFGain: Low** **#Atten: 30 dB** **TYPE M** **DET P**

10 dB/div Ref 20.00 dBm

Start 2.47850 GHz Stop 2.50000 GHz
#Res BW 1.0 MHz #VBW 680 Hz Sweep 24.67 ms (2001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.483 500 GHz	-53.184 dBm			
2	N	1	f	2.500 000 GHz	-57.840 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								

MSG STATUS

Frequency

Auto Tune

Center Freq 2.489250000 GHz

Start Freq 2.478500000 GHz

Stop Freq 2.500000000 GHz

CF Step 2.150000 MHz

Auto

Freq Offset 0 Hz