

Appendix A

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

Product Name: Bluetooth Headphones

Trade Mark: Billboard

Test Model: BB1999

FCC ID: 2AL9B-BB1999

Environmental Conditions

Temperature:	22.7° C
Relative Humidity:	45%
ATM Pressure:	100.0 kPa
Test Engineer:	Gary Qian
Supervised by:	Eden Hu

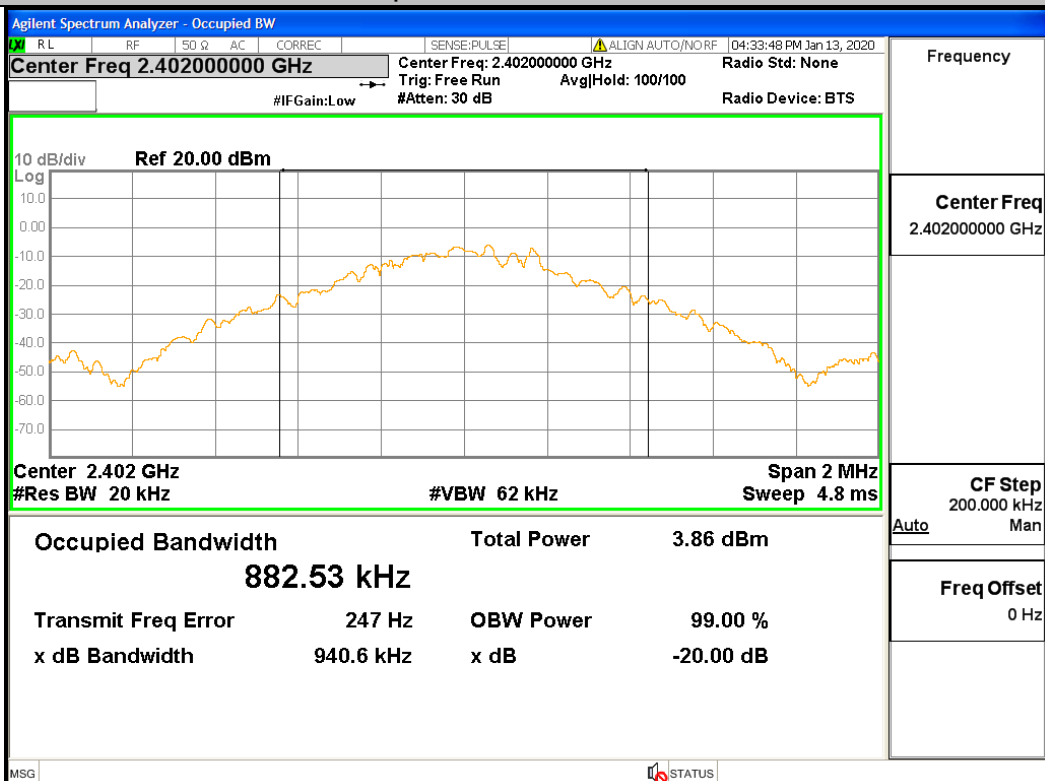
A.1 20 dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit(MHz)	Verdict
GFSK	LCH	0.941	Not Specified	PASS
GFSK	MCH	0.941	Not Specified	PASS
GFSK	HCH	0.944	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.246	Not Specified	PASS
$\pi/4$ DQPSK	MCH	1.250	Not Specified	PASS
$\pi/4$ DQPSK	HCH	1.314	Not Specified	PASS
8DPSK	LCH	1.308	Not Specified	PASS
8DPSK	MCH	1.265	Not Specified	PASS
8DPSK	HCH	1.309	Not Specified	PASS

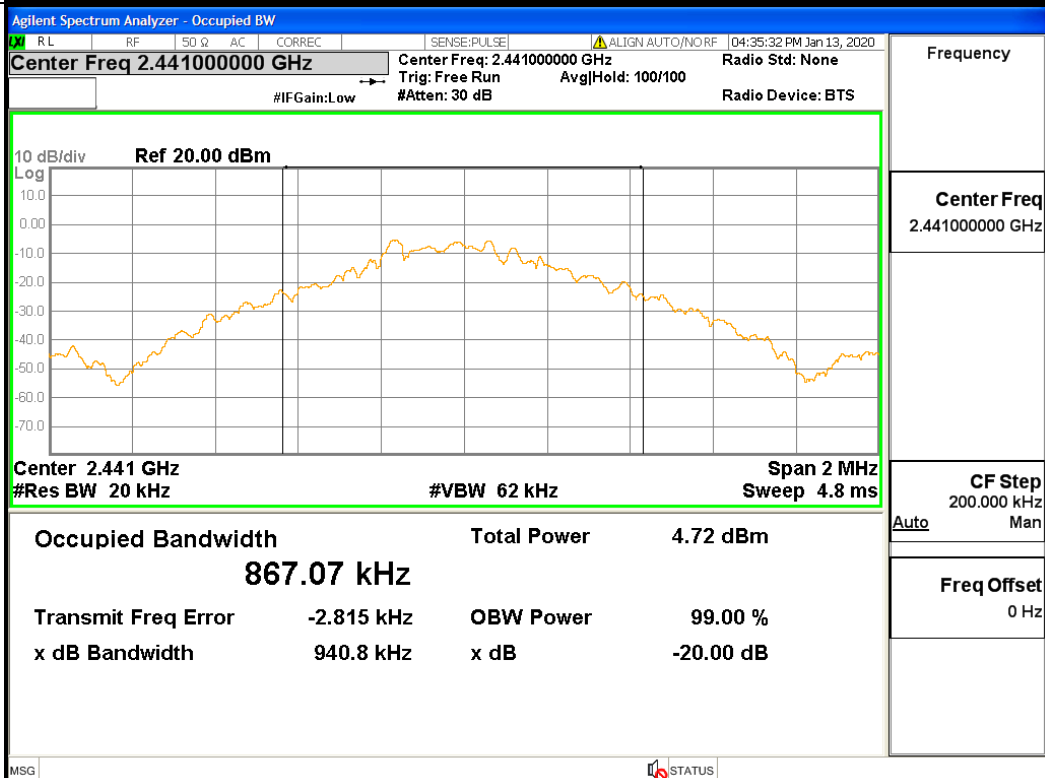
Test Graph

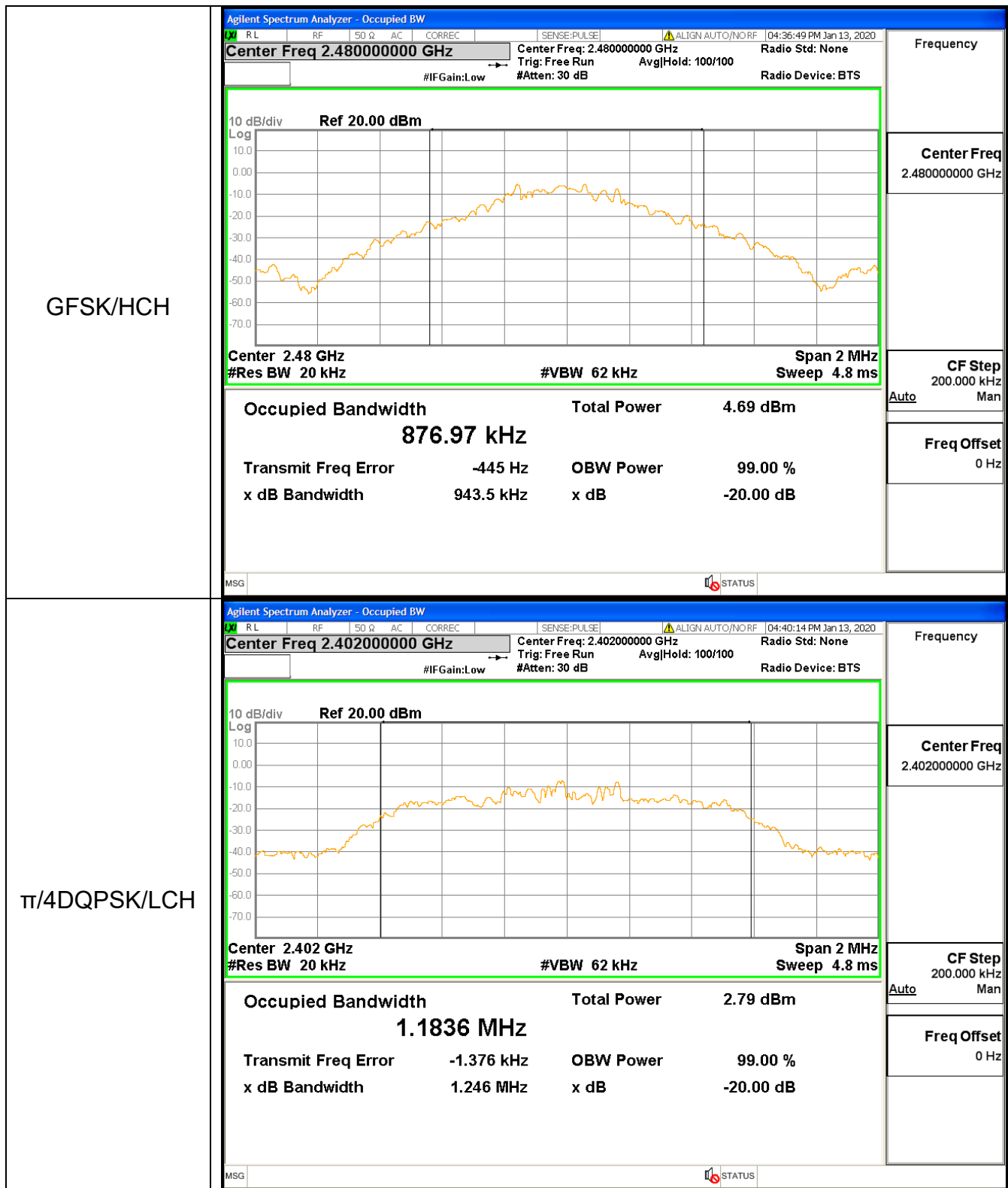
Graphs

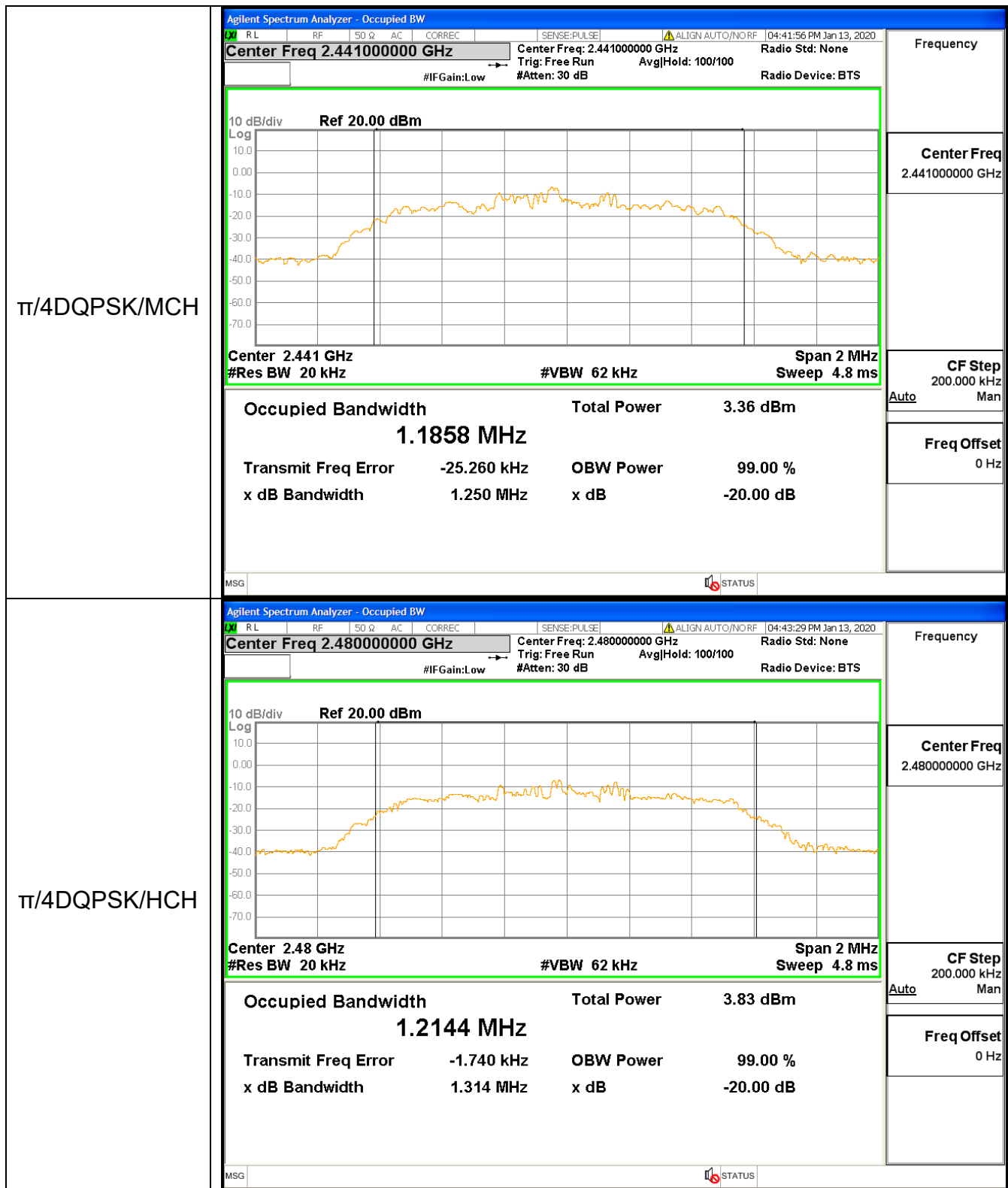
GFSK/LCH

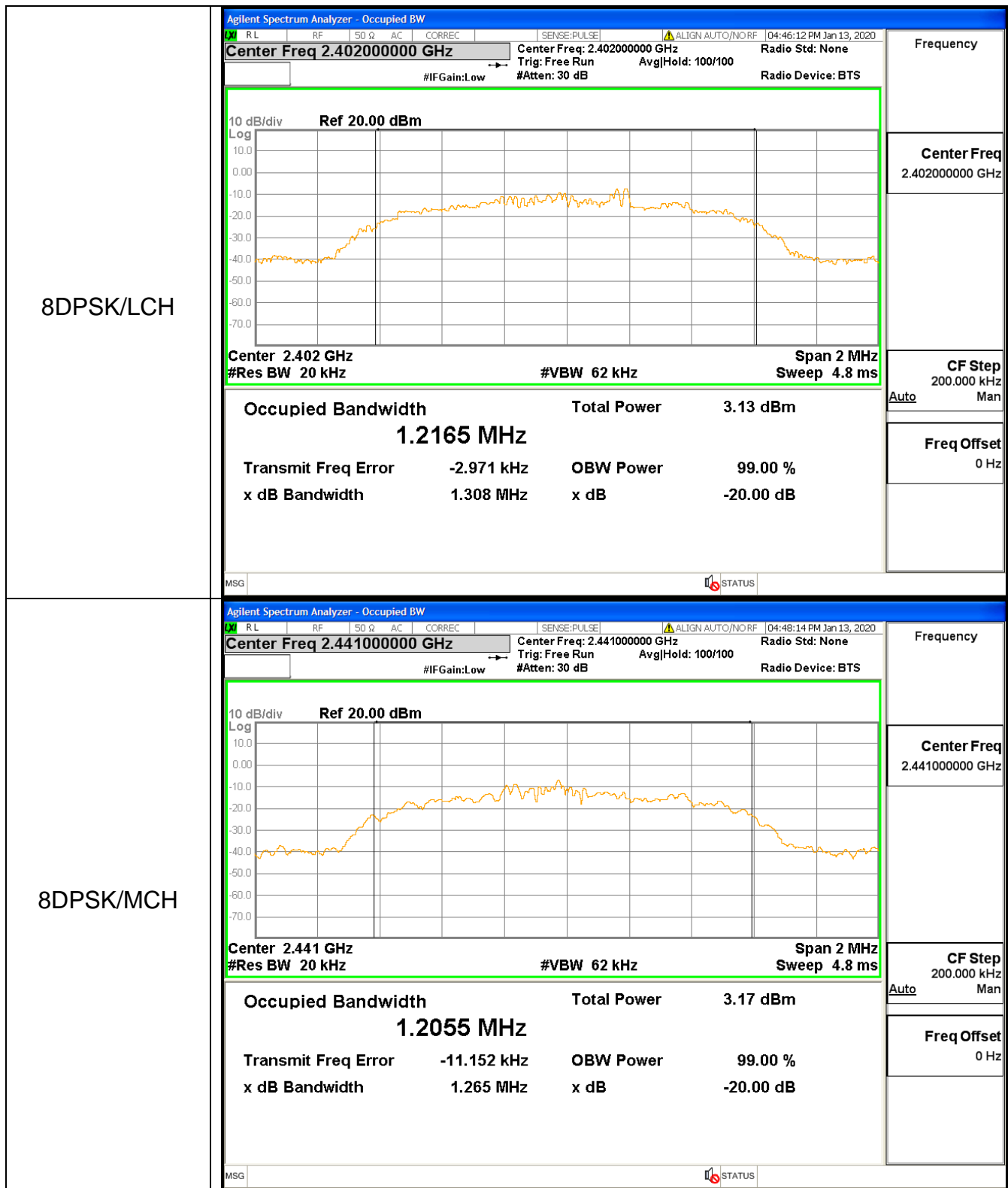


GFSK/MCH

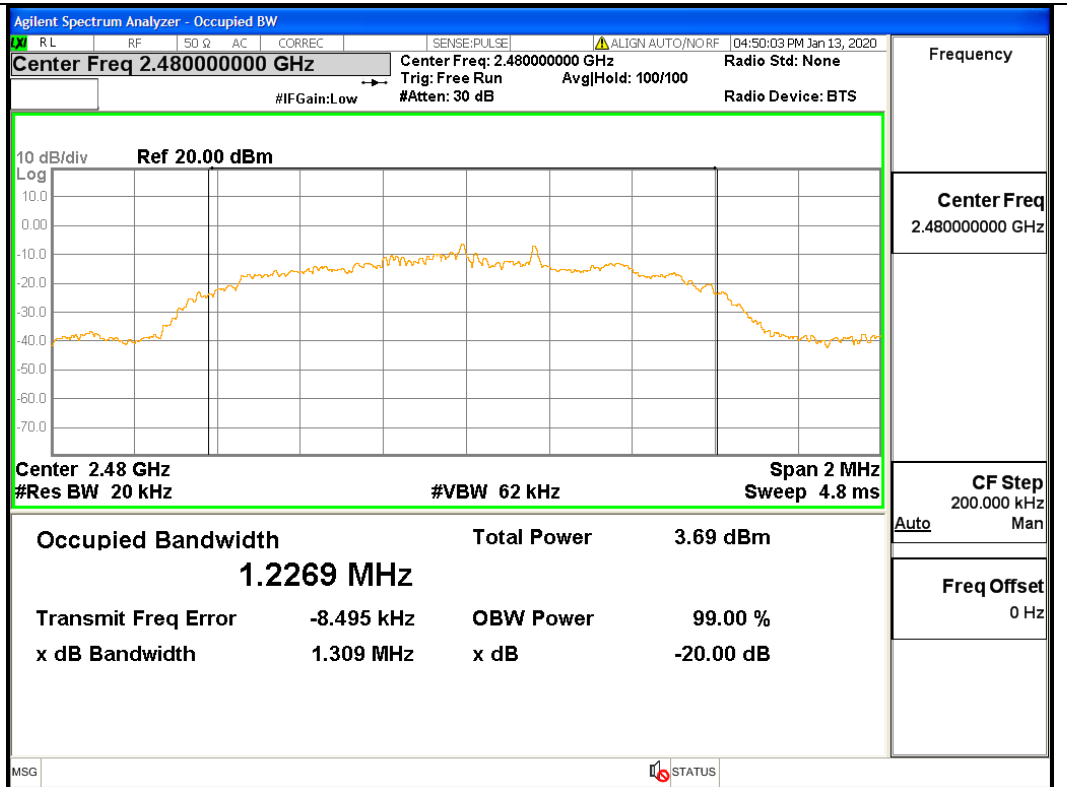








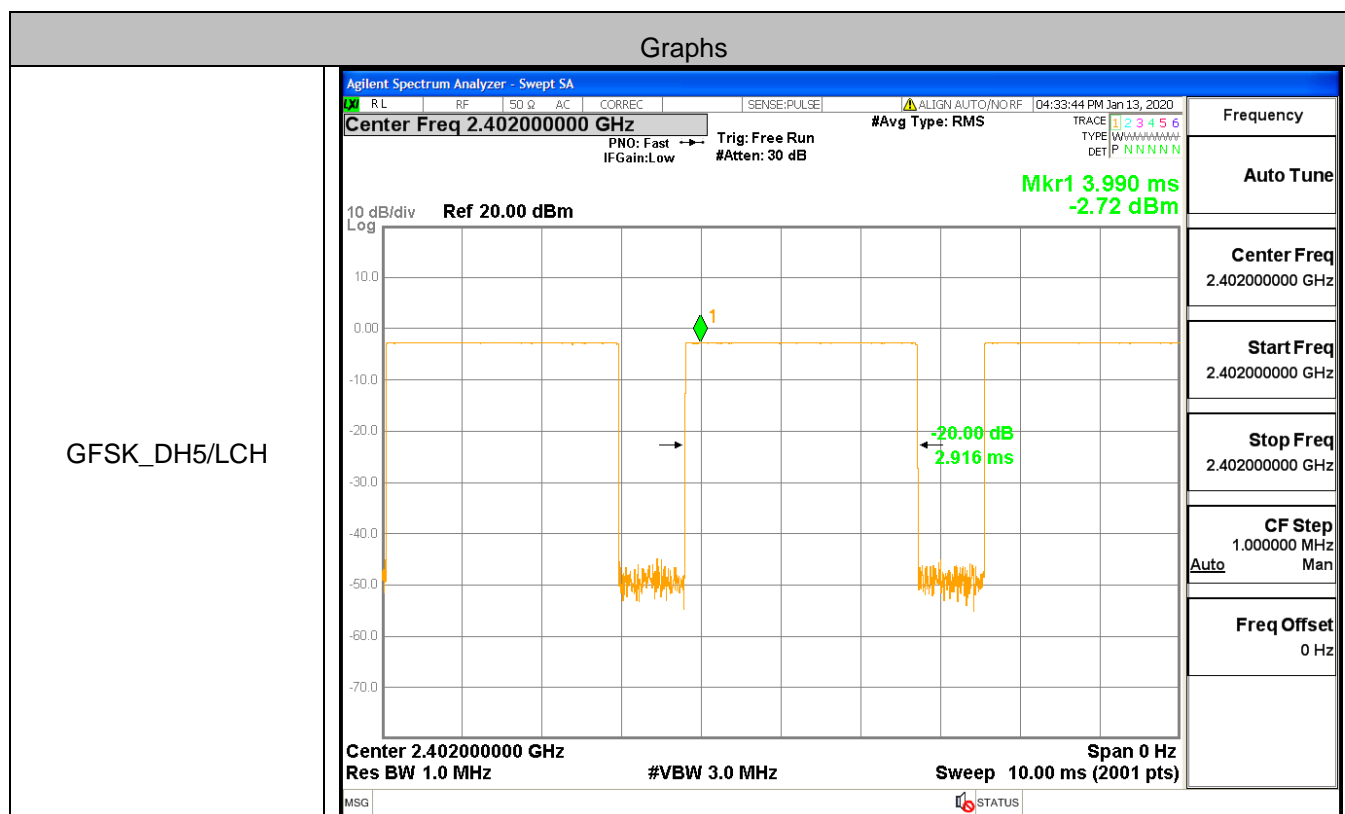
8DPSK/HCH

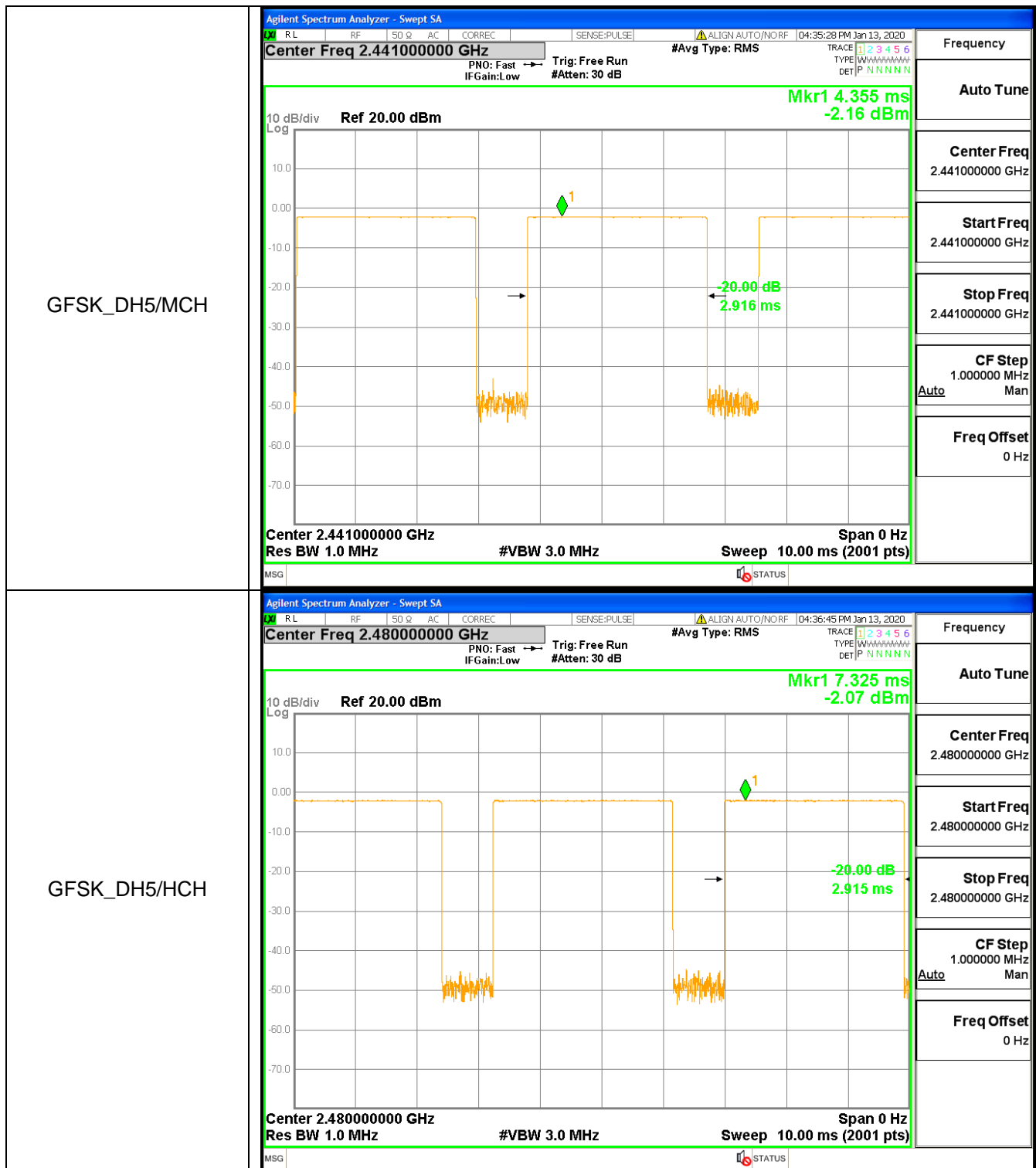


A.2 Dwell Time

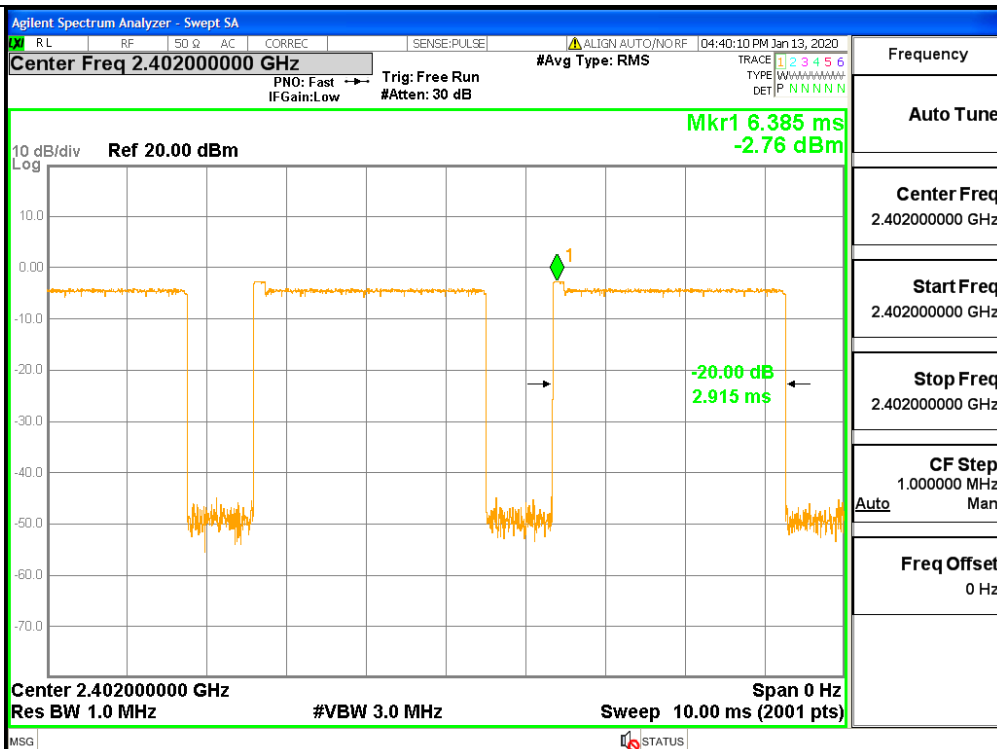
Mode	Packet	Channel	Burst Width [s/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	0.002916	106.7	0.311091	0.4	PASS
GFSK	DH5	MCH	0.002916	106.7	0.311102	0.4	PASS
GFSK	DH5	HCH	0.002915	106.7	0.311036	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	0.002915	106.7	0.311069	0.4	PASS
$\pi/4$ DQPSK	2DH5	MCH	0.002915	106.7	0.311029	0.4	PASS
$\pi/4$ DQPSK	2DH5	HCH	0.002914	106.7	0.310909	0.4	PASS
8DPSK	3DH5	LCH	0.002915	106.7	0.311068	0.4	PASS
8DPSK	3DH5	MCH	0.002914	106.7	0.31097	0.4	PASS
8DPSK	3DH5	HCH	0.002916	106.7	0.311127	0.4	PASS

Test Graph

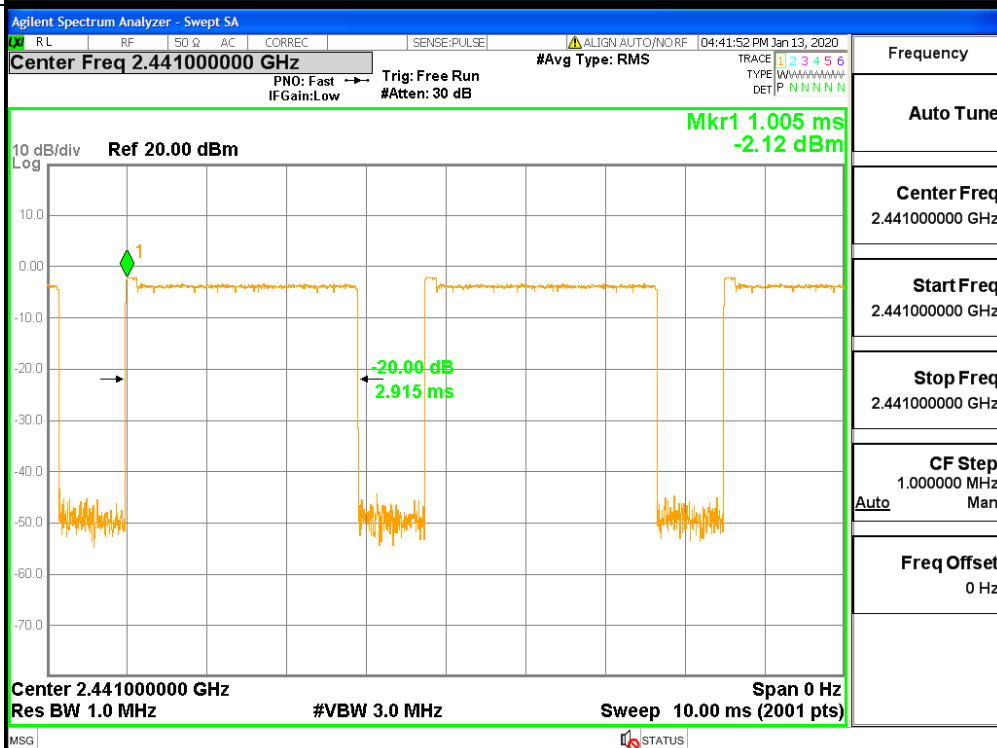




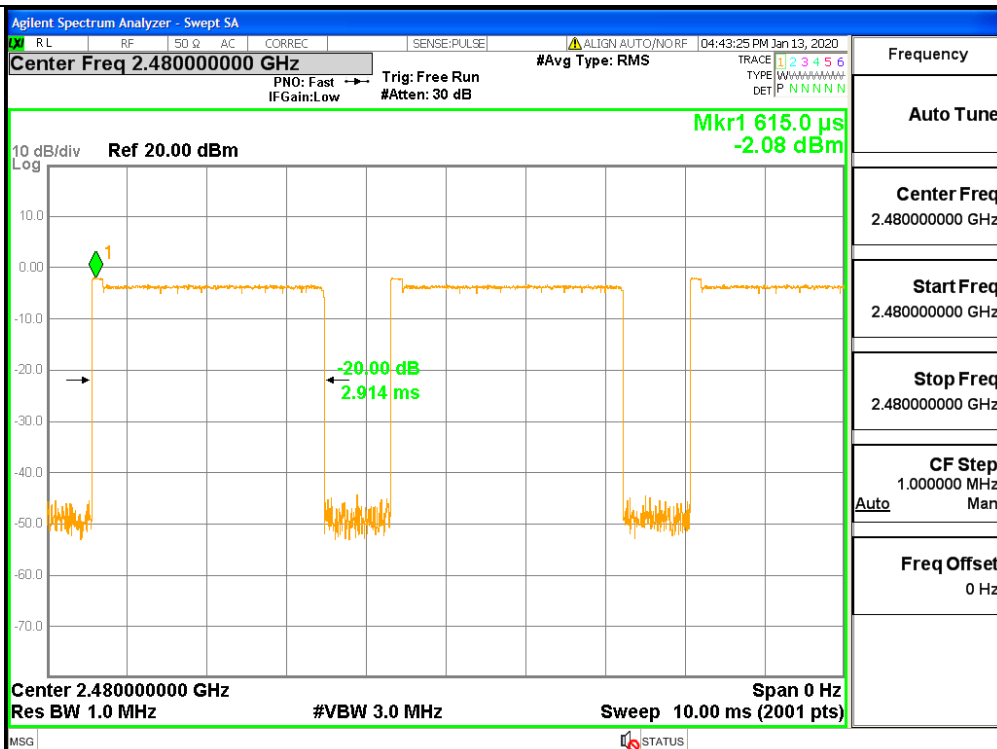
$\pi/4$ DQPSK
_2DH5/LCH



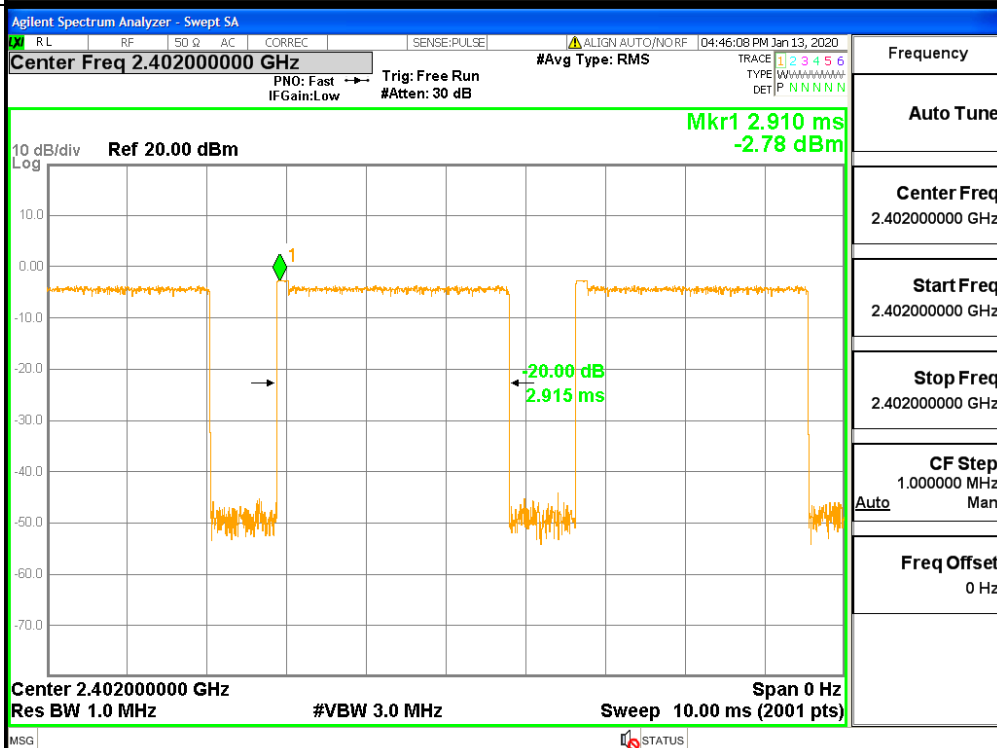
$\pi/4$ DQPSK
_2DH5/MCH

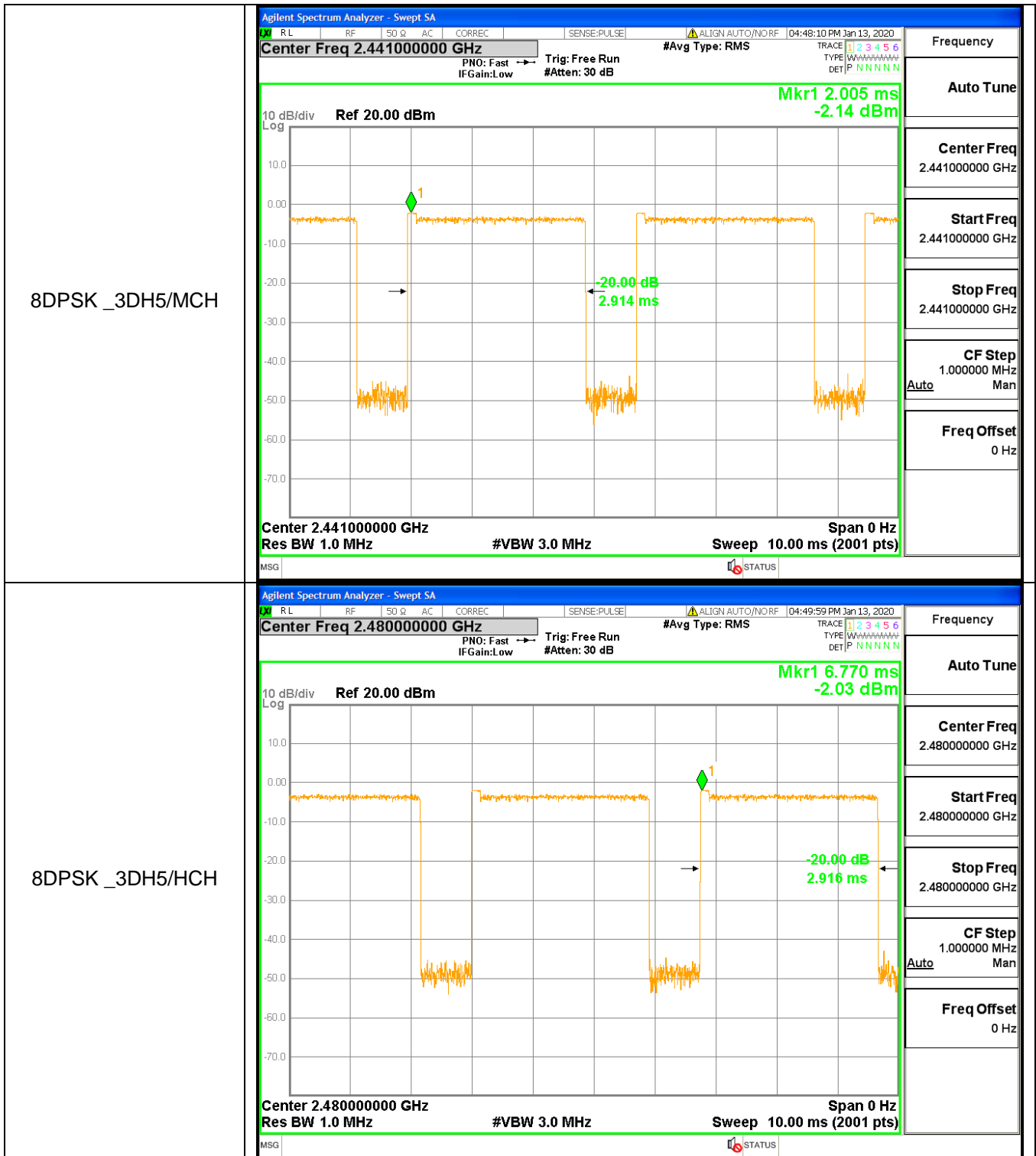


$\pi/4$ DQPSK
_2DH5/HCH



8DPSK _3DH5/LCH

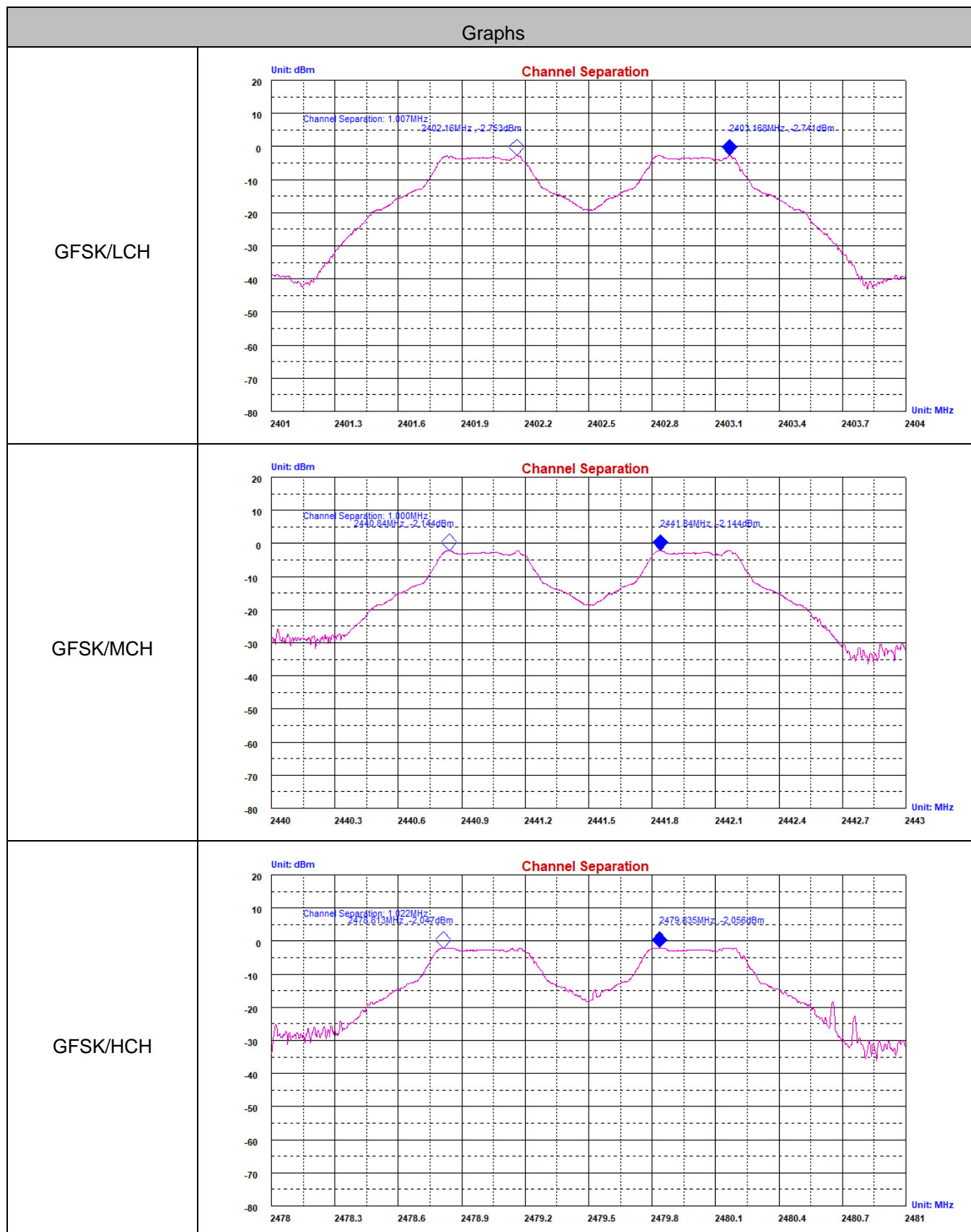


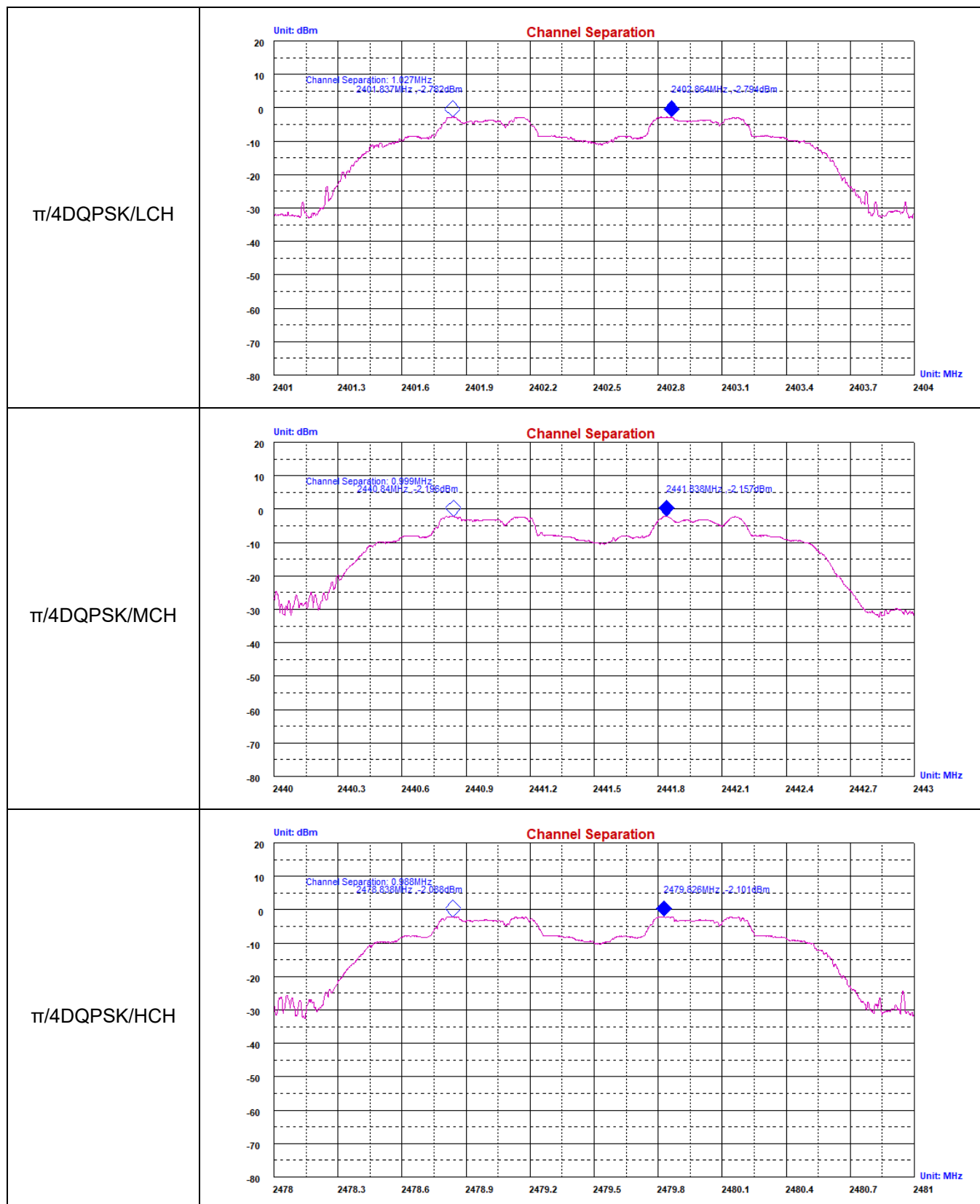


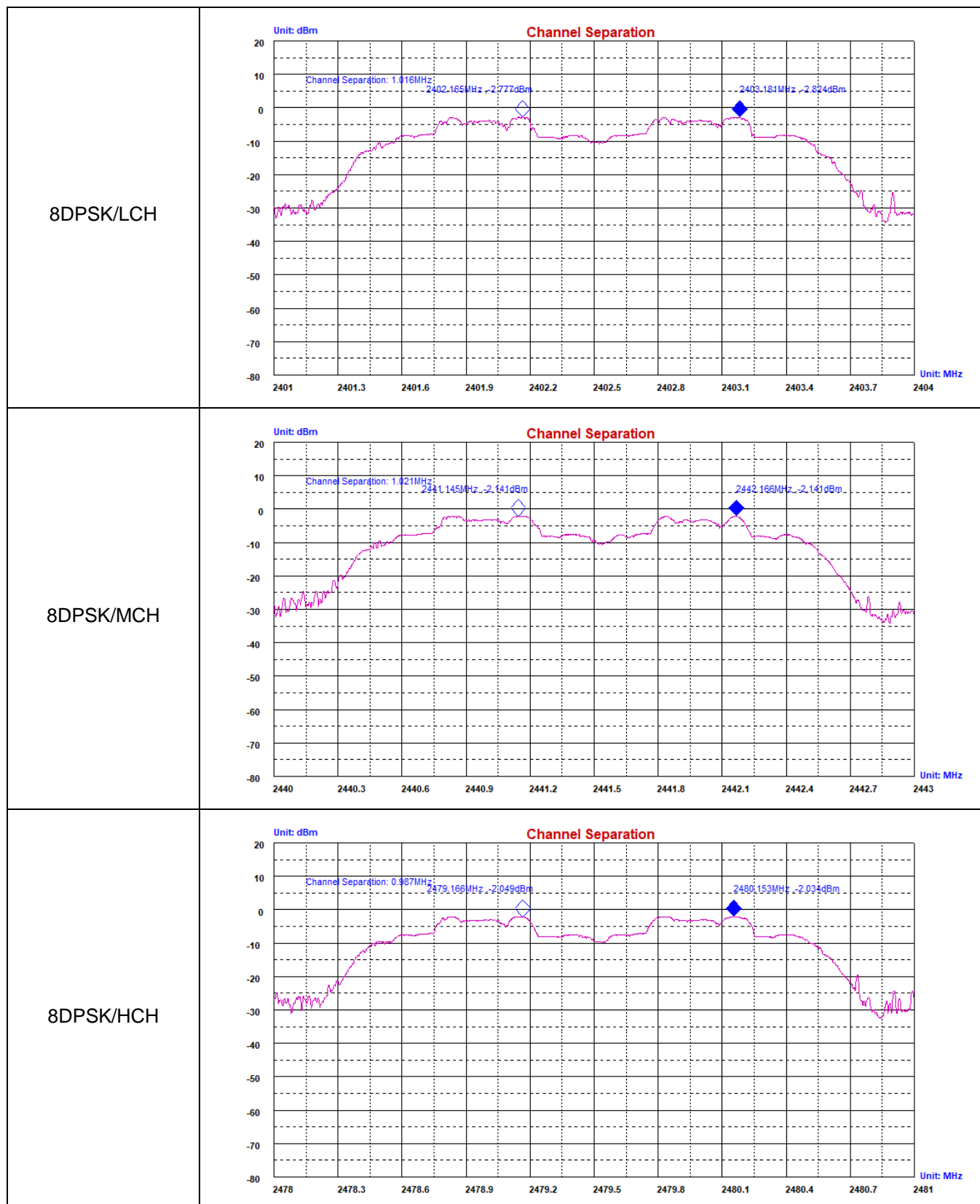
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.007	0.873	PASS
GFSK	MCH	1.000	0.627	PASS
GFSK	HCH	1.022	0.629	PASS
$\pi/4$ DQPSK	LCH	1.027	0.831	PASS
$\pi/4$ DQPSK	MCH	0.999	0.833	PASS
$\pi/4$ DQPSK	HCH	0.988	0.876	PASS
8DPSK	LCH	1.016	0.872	PASS
8DPSK	MCH	1.021	0.843	PASS
8DPSK	HCH	0.987	0.873	PASS

Test Graph



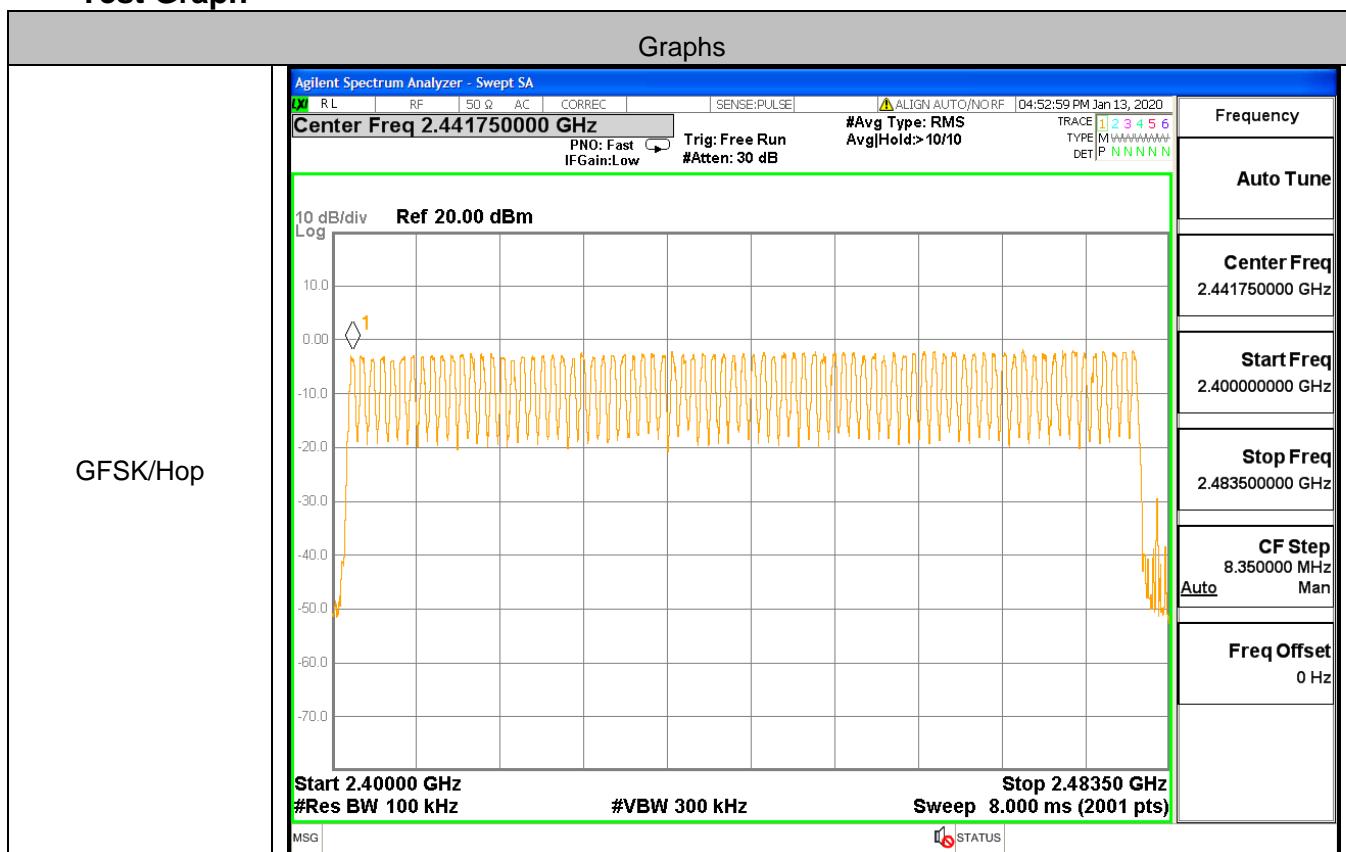


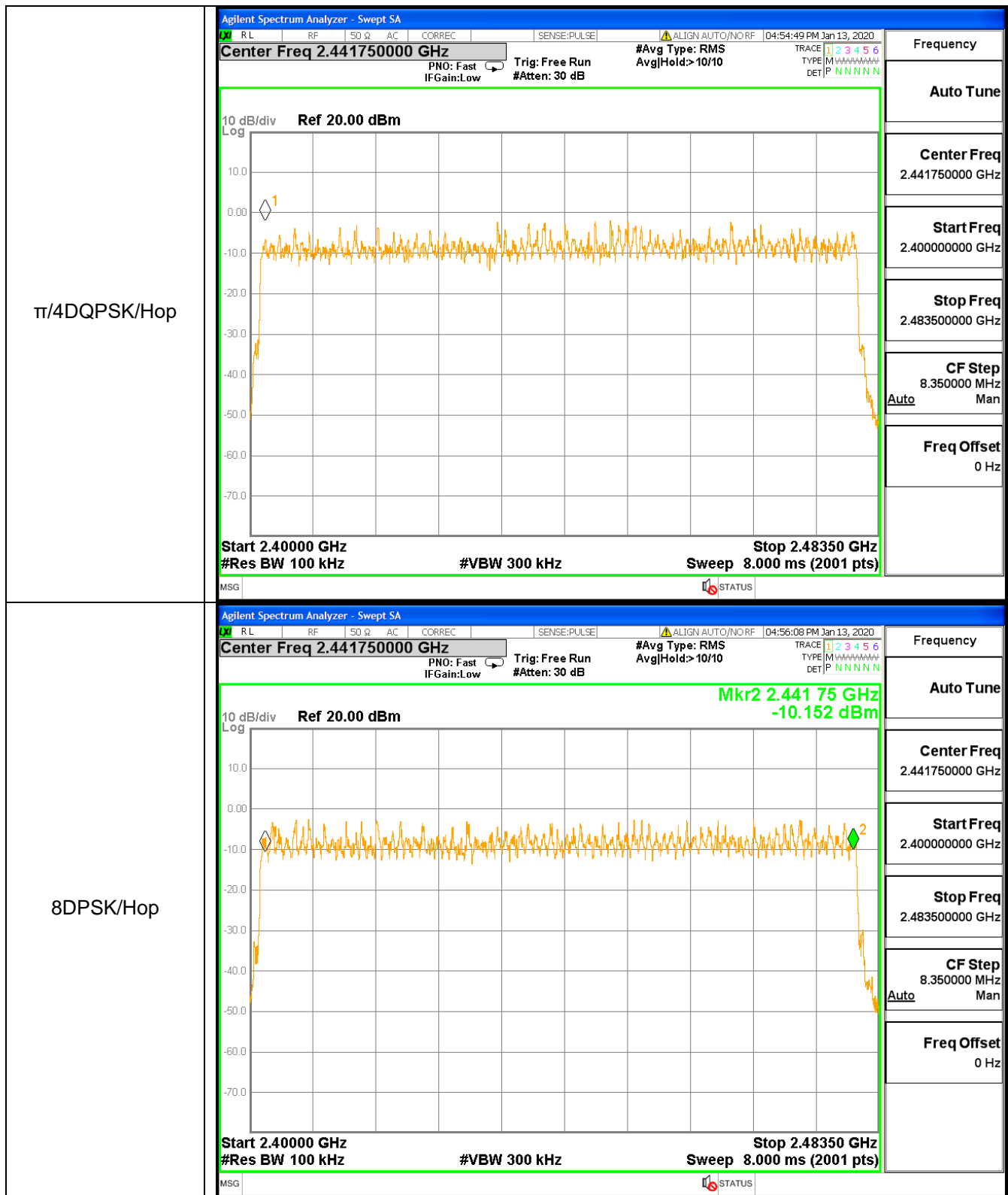


A.4 Hopping Channel Number

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

Test Graph

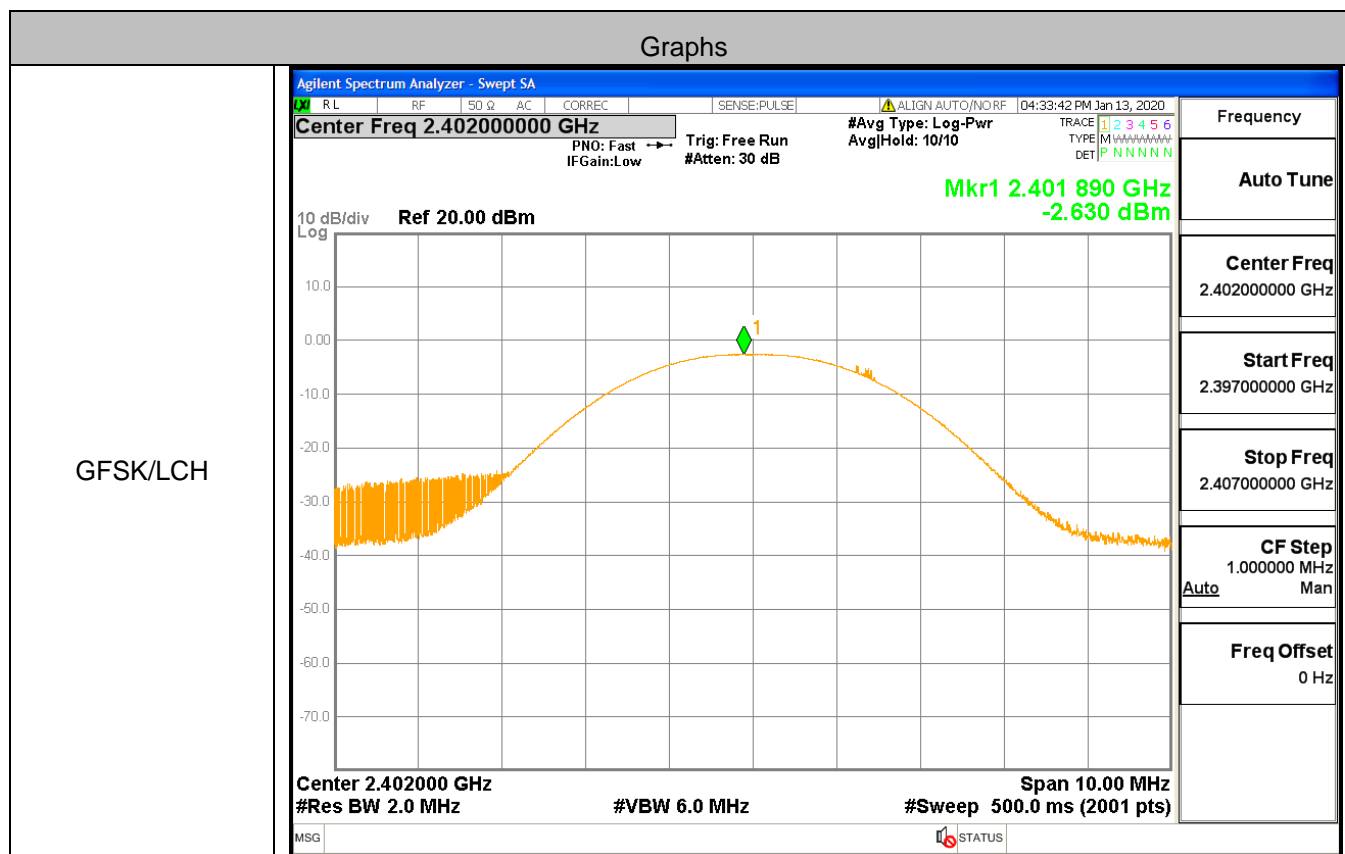


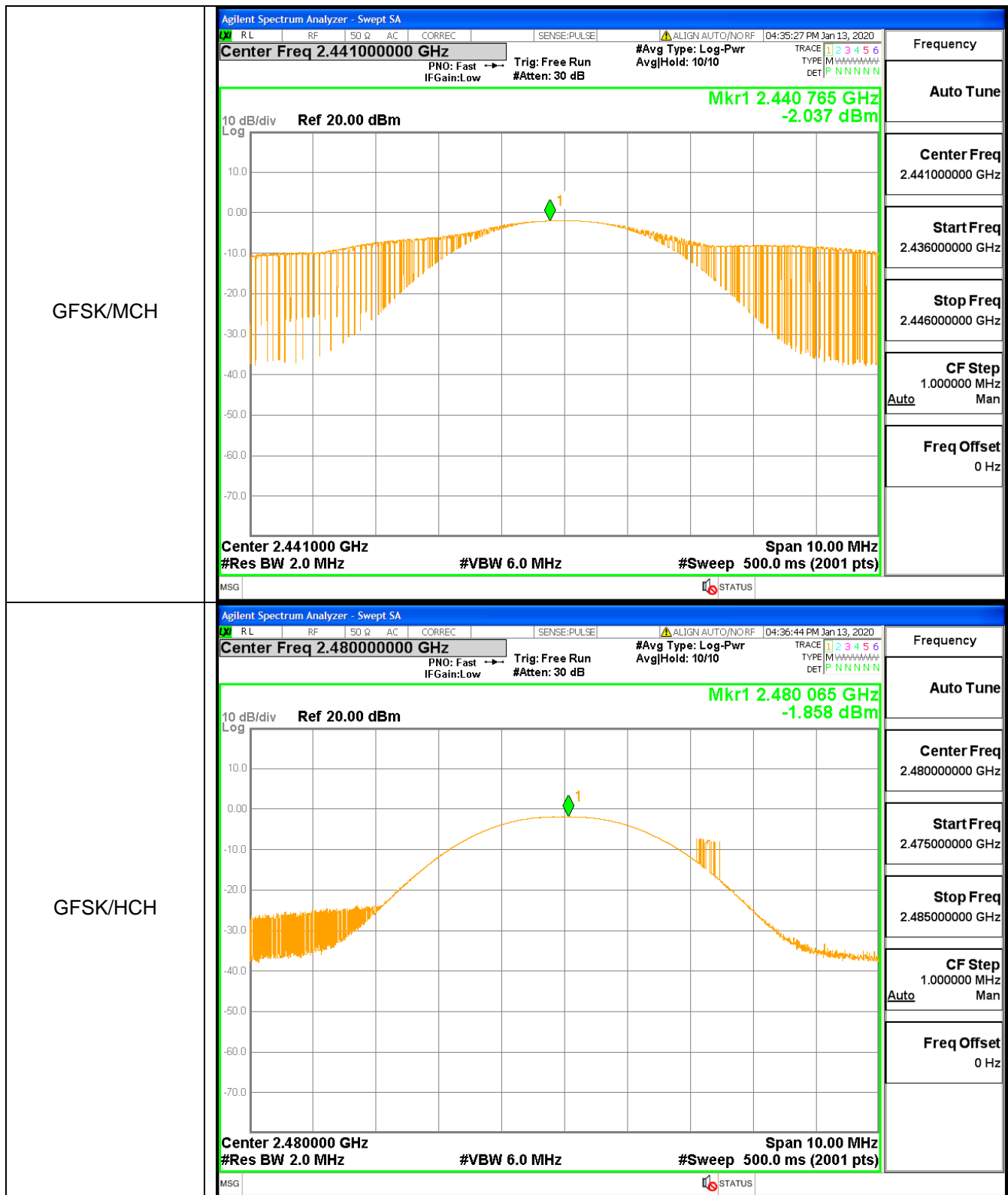


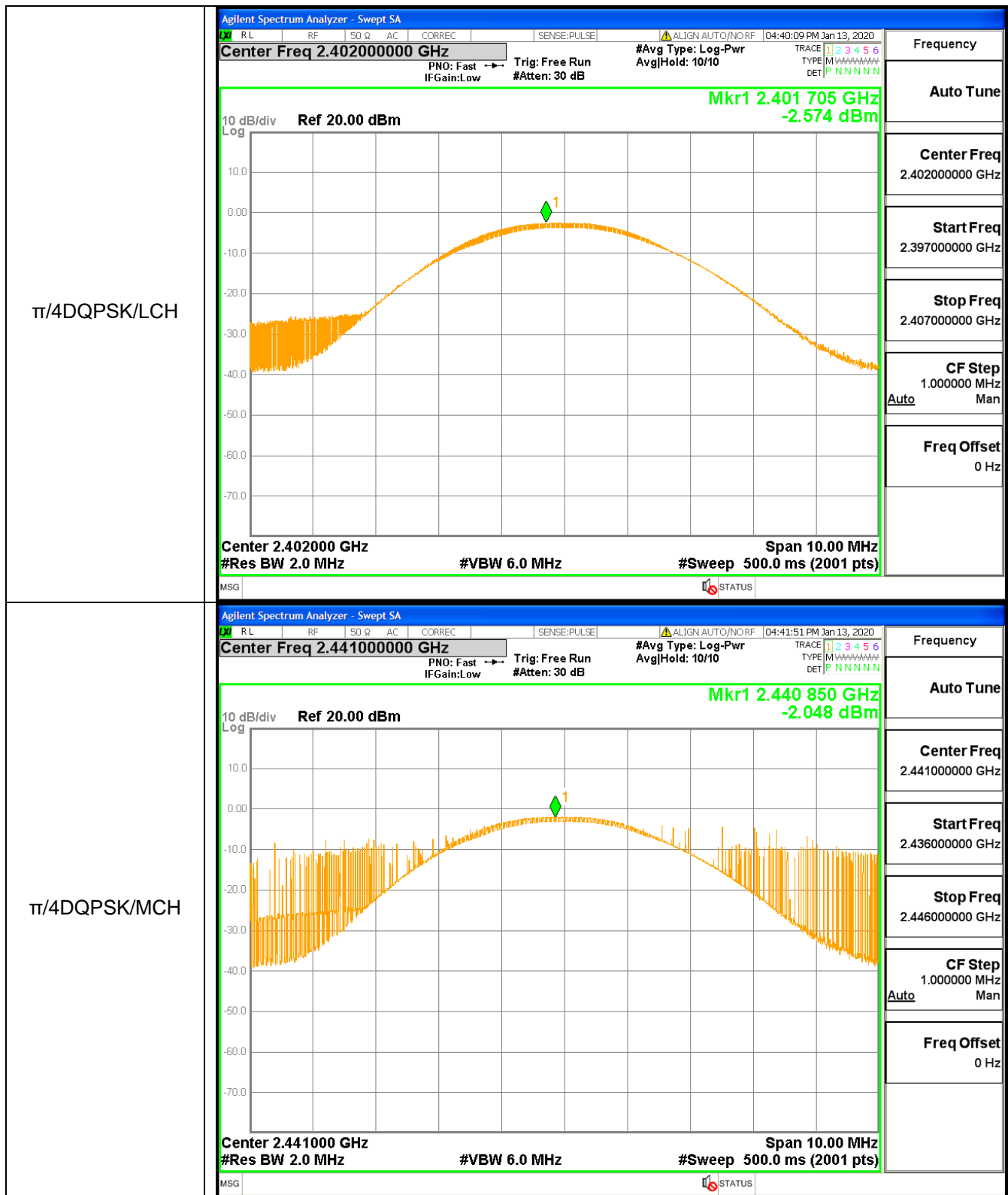
A.5 Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-2.630	21	PASS
GFSK	MCH	-2.037	21	PASS
GFSK	HCH	-1.858	21	PASS
$\pi/4$ DQPSK	LCH	-2.574	21	PASS
$\pi/4$ DQPSK	MCH	-2.048	21	PASS
$\pi/4$ DQPSK	HCH	-1.951	21	PASS
8DPSK	LCH	-2.635	21	PASS
8DPSK	MCH	-2.036	21	PASS
8DPSK	HCH	-1.916	21	PASS

Test Graph







Frequency

Auto Tune

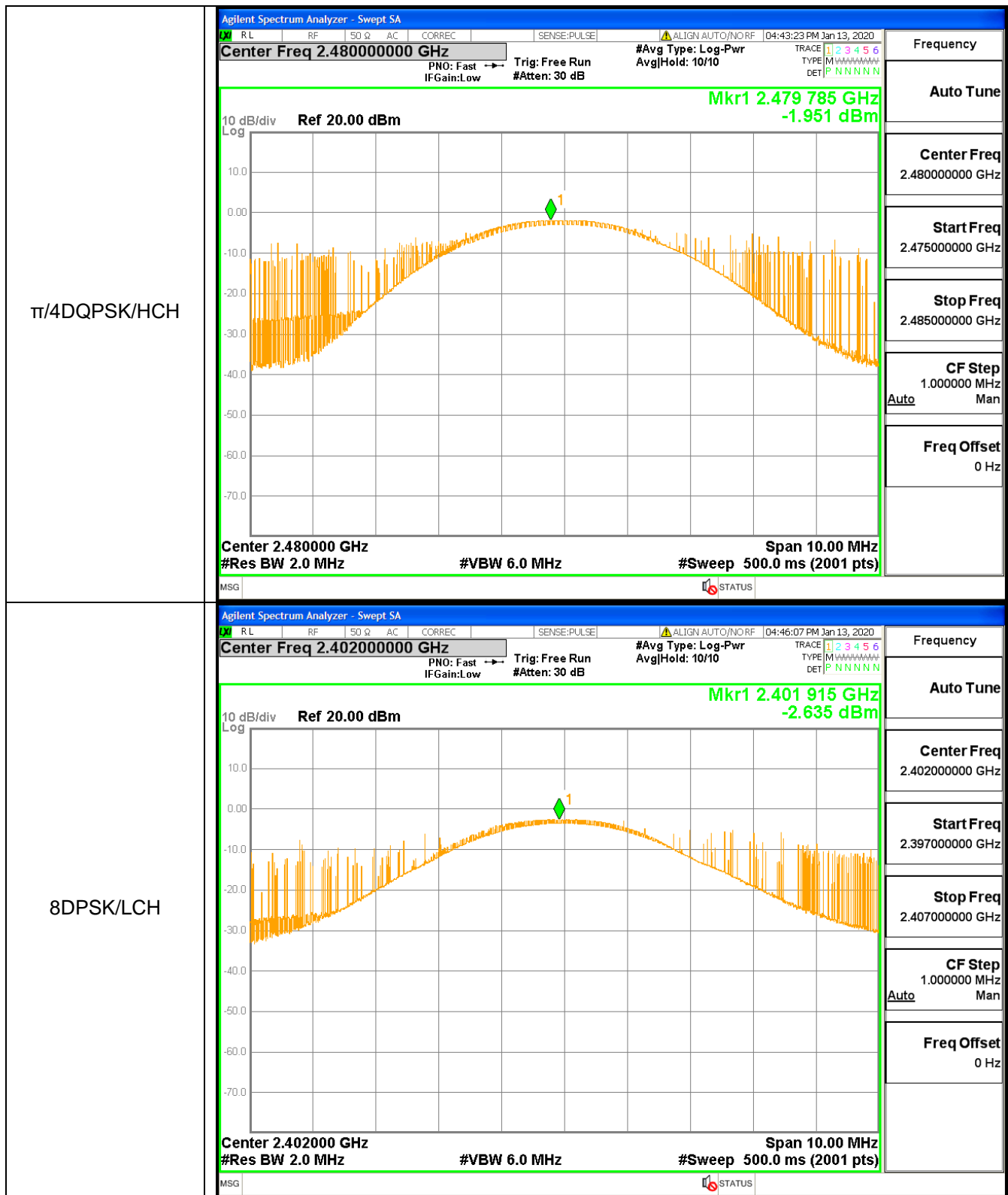
Center Freq 2.402000000 GHz

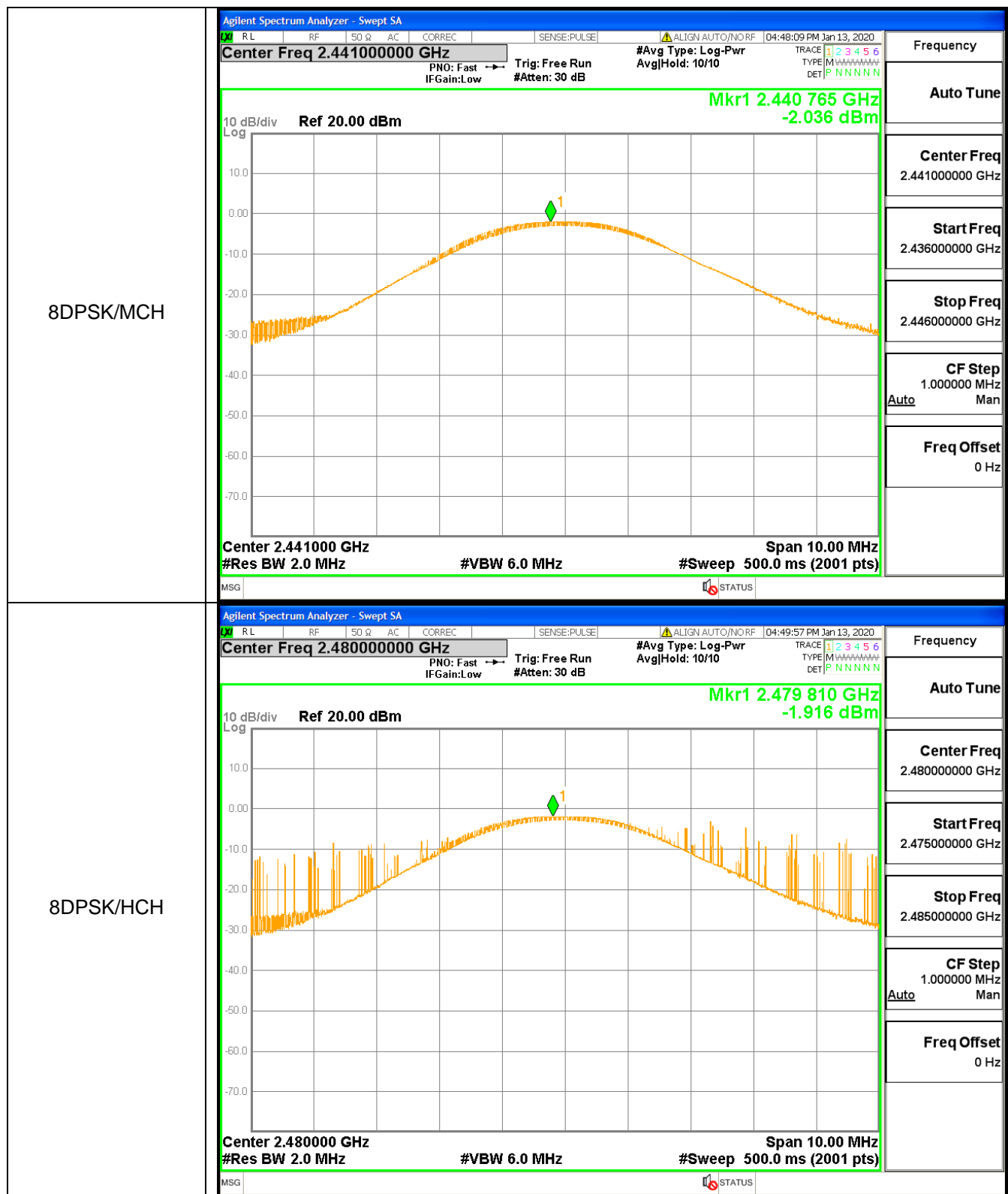
Start Freq 2.397000000 GHz

Stop Freq 2.407000000 GHz

CF Step 1.000000 MHz Auto Man

Freq Offset 0 Hz



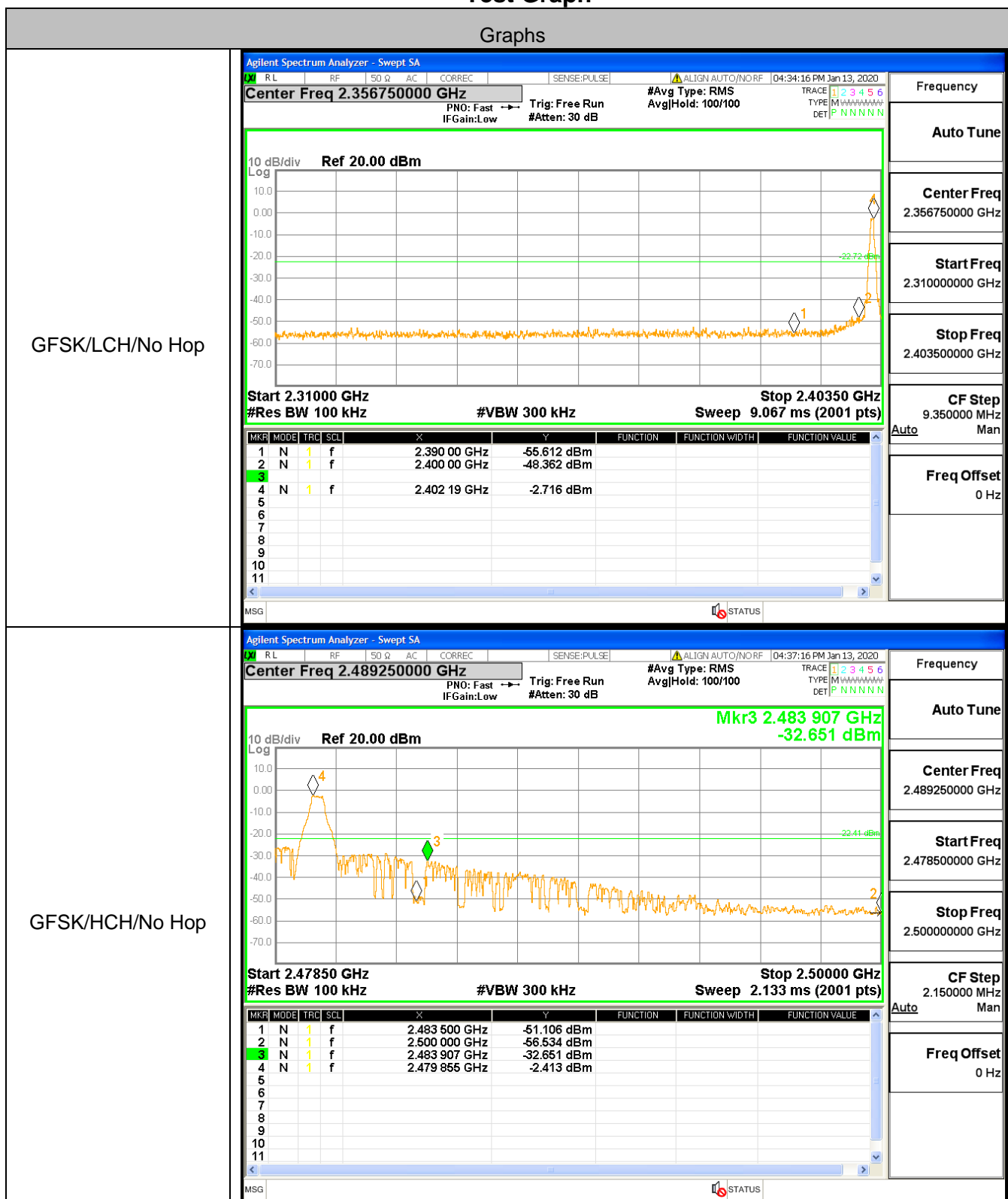


A.6 Band-edge for RF Conducted Emissions

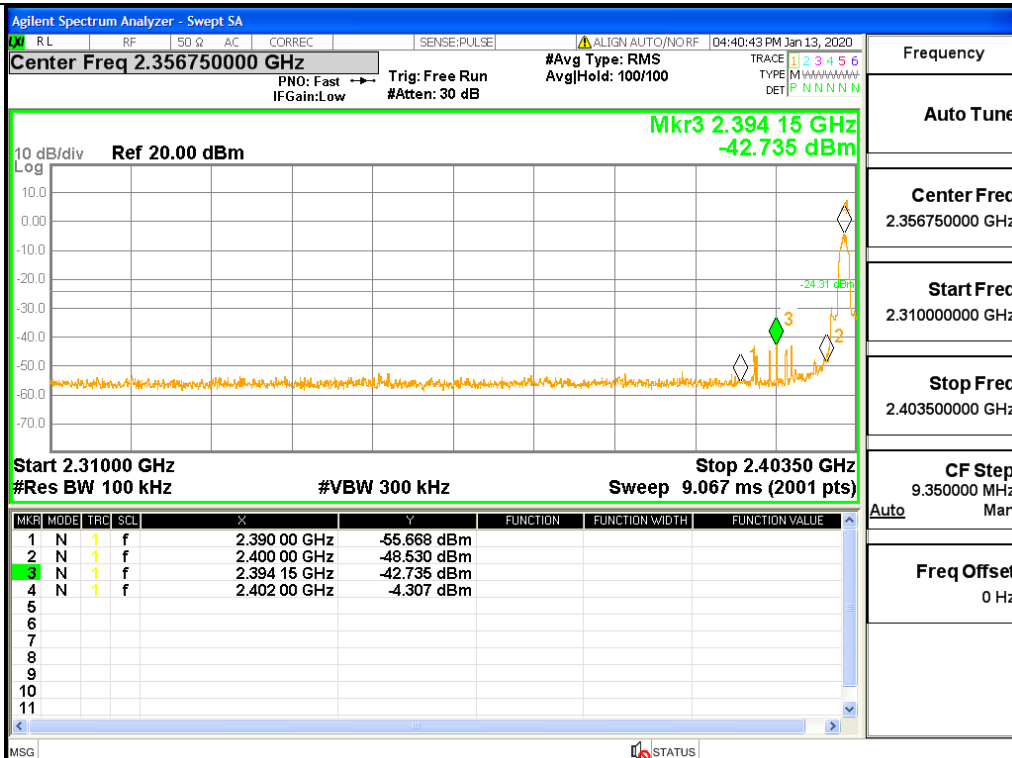
Type	Carrier Frequency(MHz)	Frequency(MHz)	Carrier Frequency Power [dBm]	Bandedge Peak(dBm)	Upper limit(dBm)	Conclusion
1DH5	2402	2400	-2.716	-48.36	-22.716	Pass
1DH5	2480	2483.907	-2.413	-32.651	-22.413	Pass
2DH5	2402	2394.15	-4.307	-42.735	-24.307	Pass
2DH5	2480	2483.5	-3.375	-50.17	-23.375	Pass
3DH5	2402	2400	-6.656	-42.7	-26.656	Pass
3DH5	2480	2483.5	-2.226	-45.85	-22.226	Pass
1DH5-Hopping	2402	2400	-2.49	-51.62	-22.49	Pass
1DH5-Hopping	2480	2484.37	-2.024	-34.947	-22.024	Pass
2DH5-Hopping	2402	2398.05	-2.507	-36.532	-22.507	Pass
2DH5-Hopping	2480	2489.26	-2.018	-43.555	-22.018	Pass
3DH5-Hopping	2402	2397.36	-2.509	-36.793	-22.509	Pass
3DH5-Hopping	2480	2483.5	-1.966	-36.628	-21.966	Pass

Test Graph

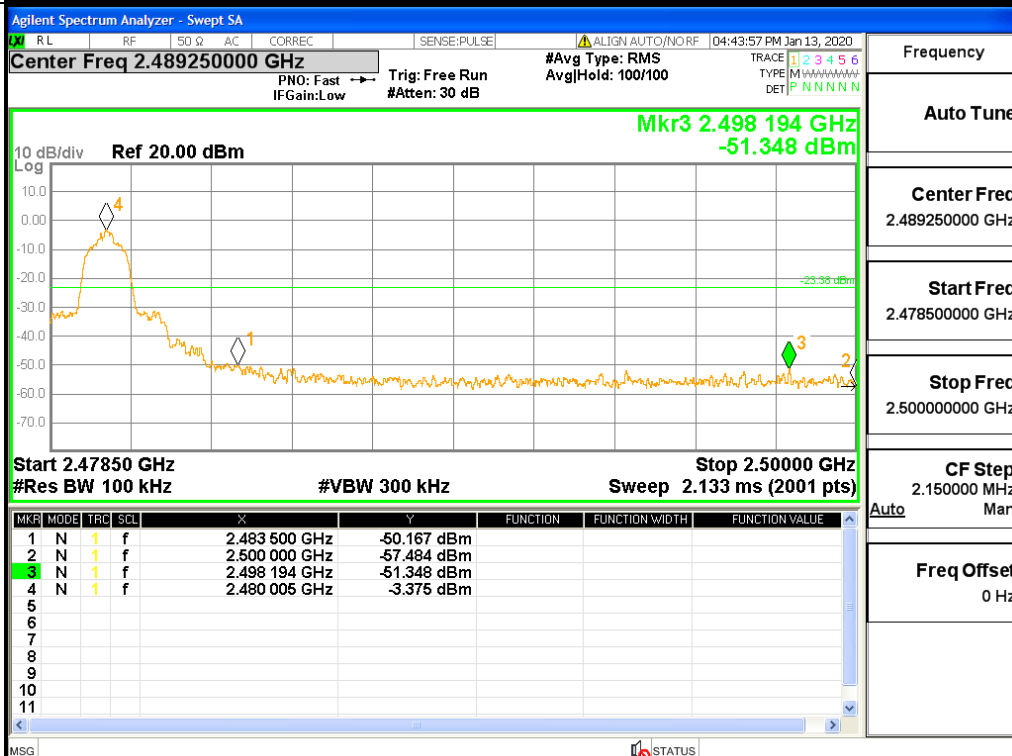
Graphs



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

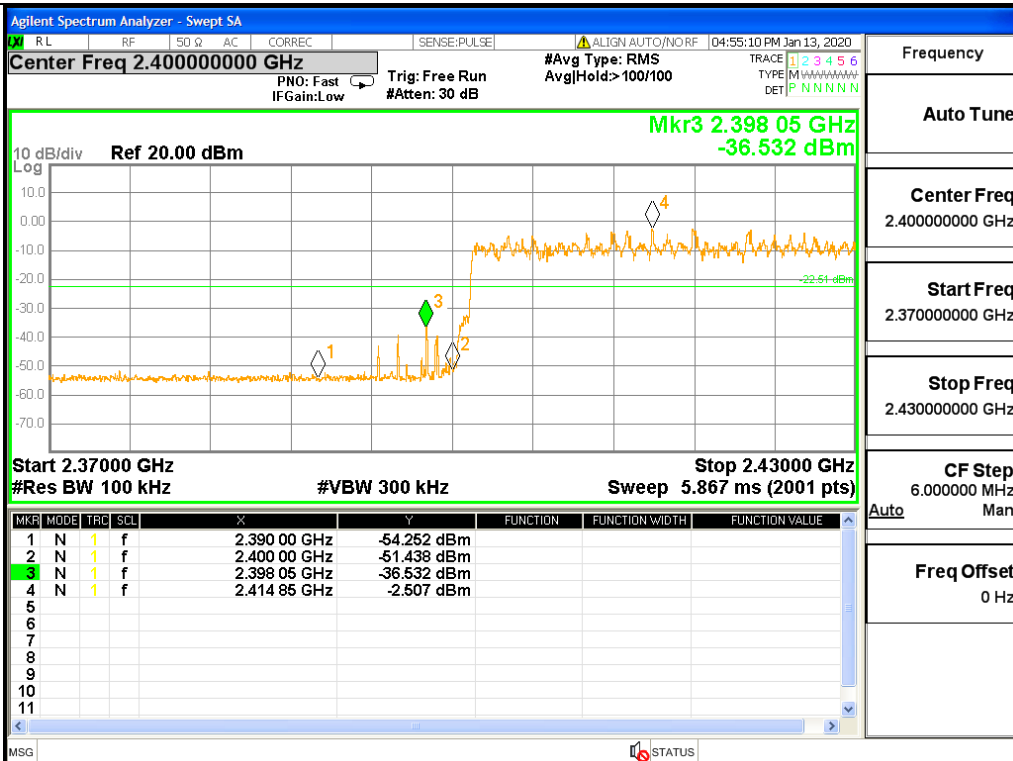


$\pi/4$ DQPSK/HCH/No
Hop

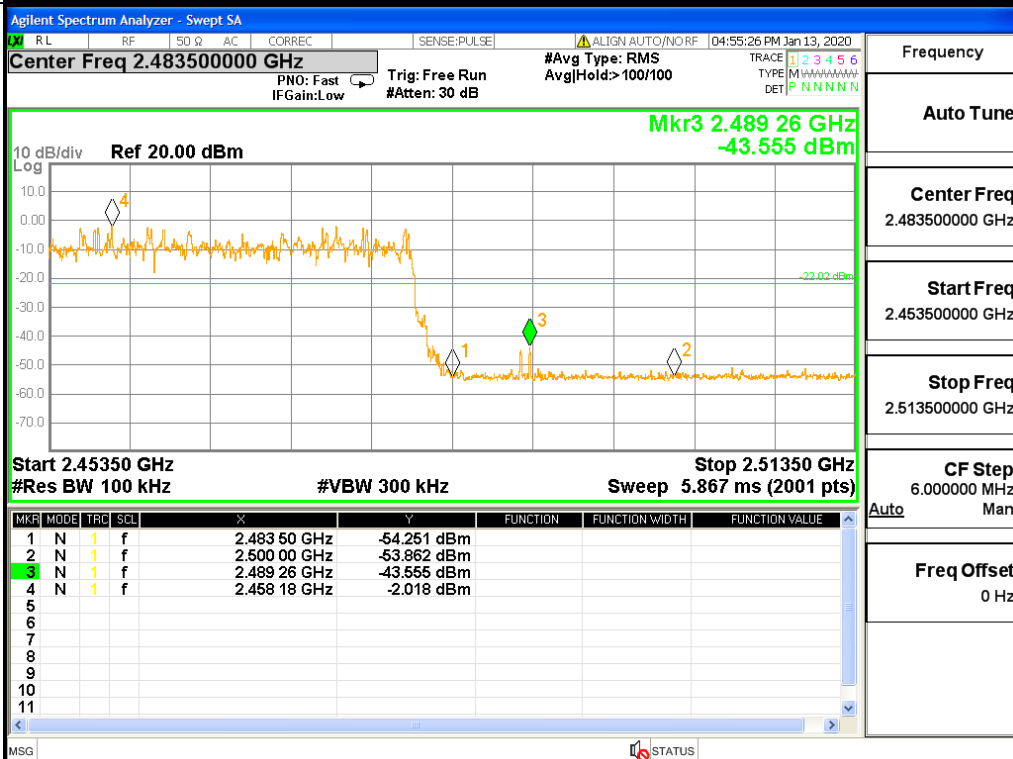




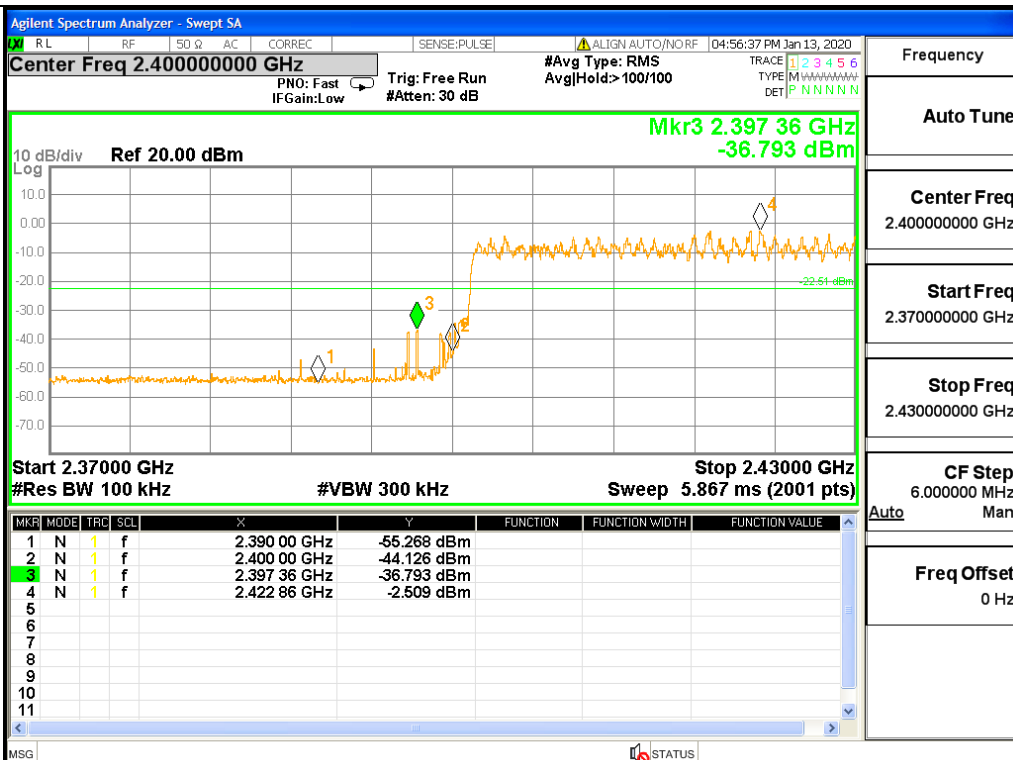
$\pi/4$ DQPSK/LCH/Hop



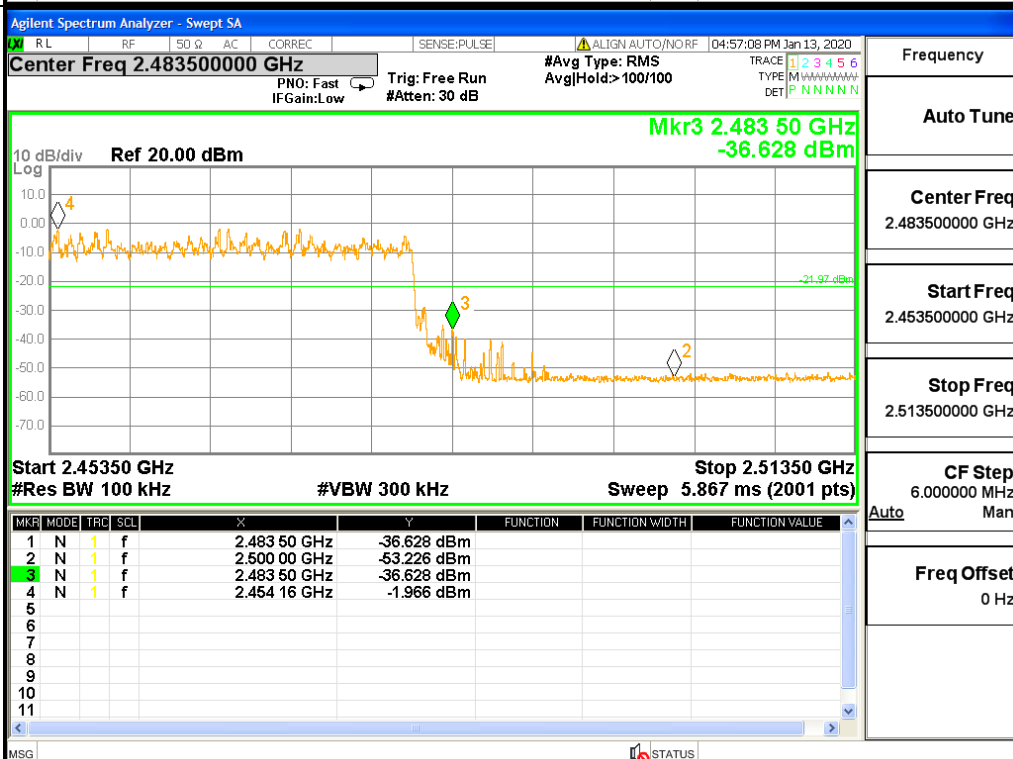
$\pi/4$ DQPSK/HCH/Hop



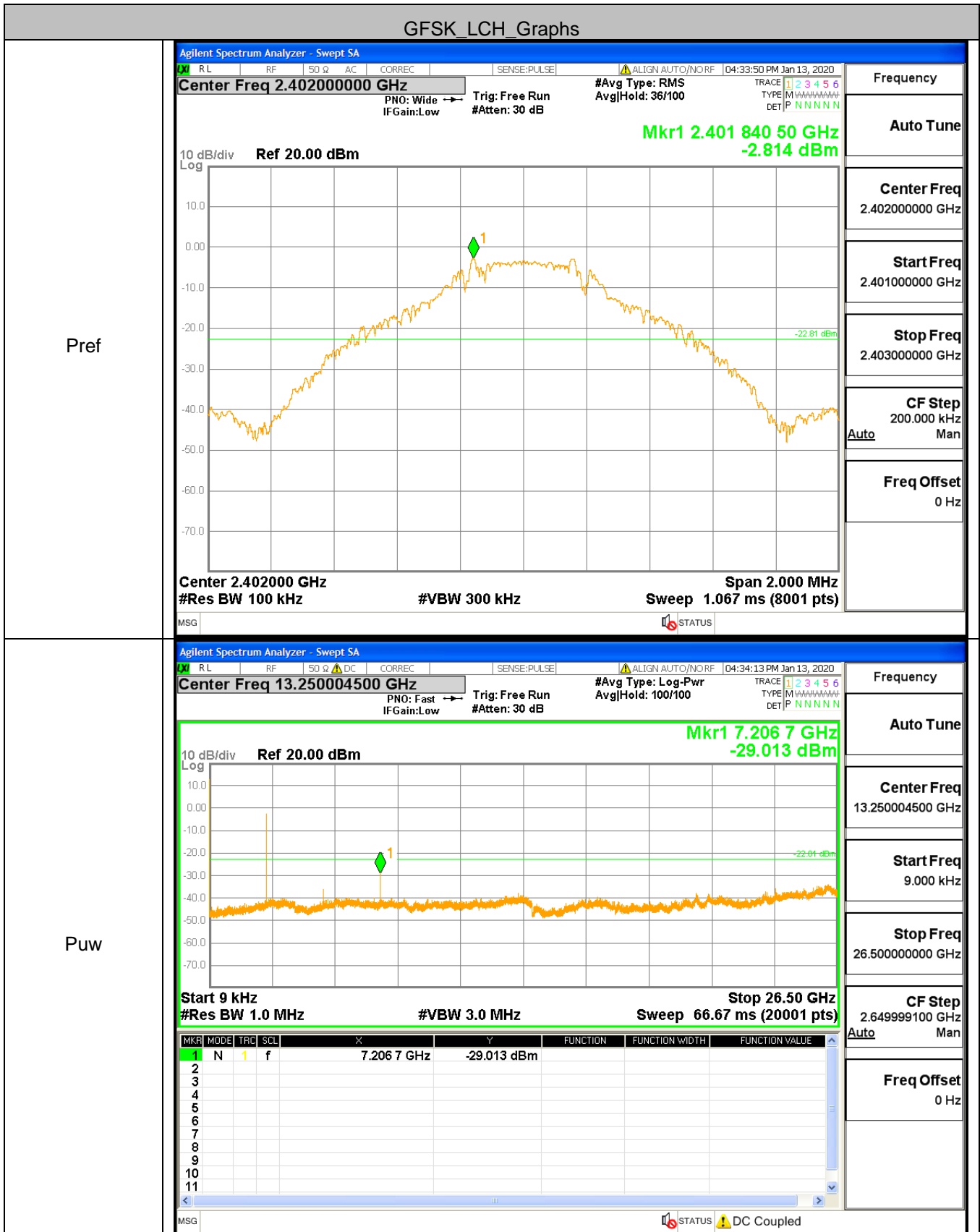
8DPSK/LCH/Hop



8DPSK/HCH/Hop

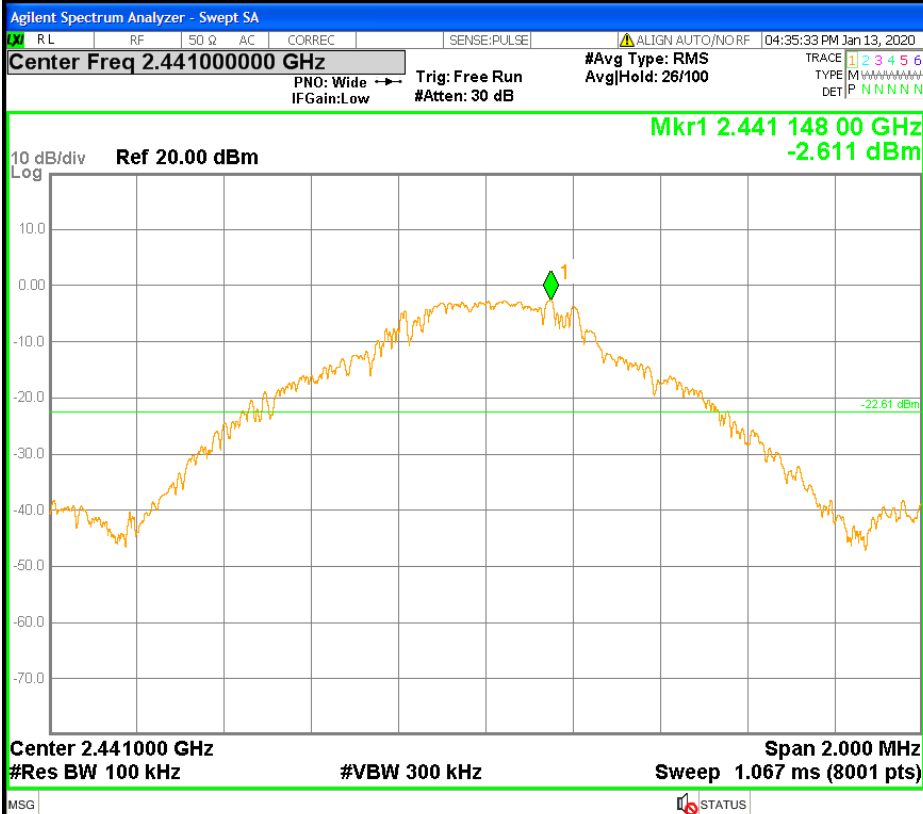


A.7 RF Conducted Spurious Emissions Test Graph



GFSK_MCH_Graphs

Pref



Frequency

Auto Tune

Center Freq

2.441000000 GHz

Start Freq

2.440000000 GHz

Stop Freq

2.442000000 GHz

CF Step

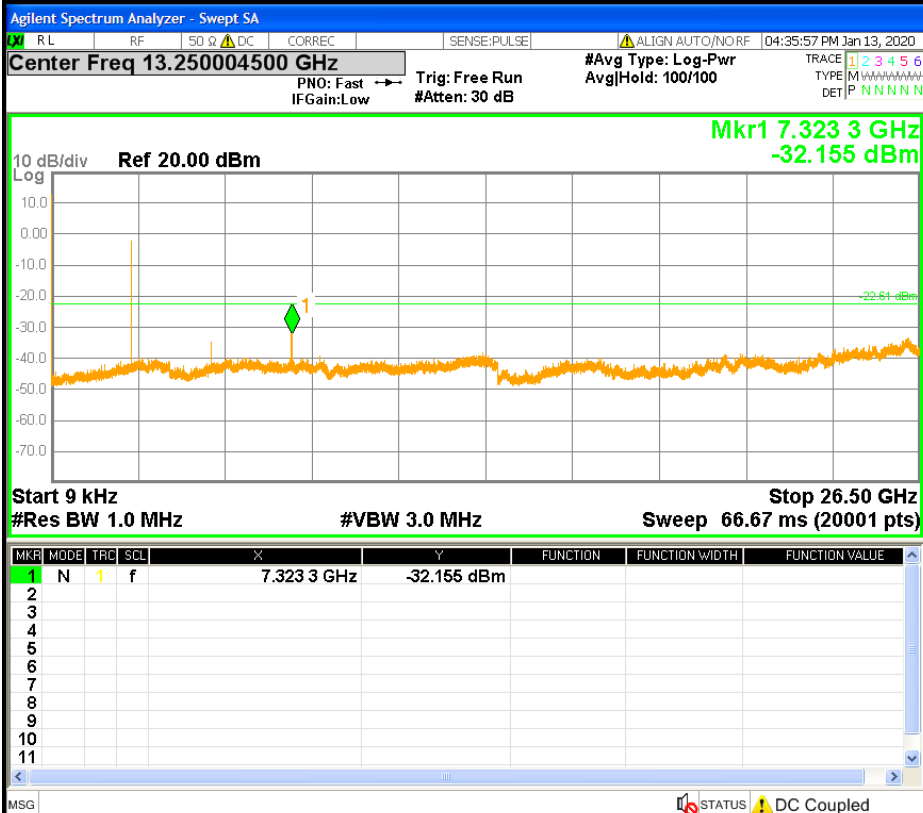
200.000 kHz

Auto

Freq Offset

0 Hz

Puw



Frequency

Auto Tune

Center Freq

13.250004500 GHz

Start Freq

9.000 kHz

Stop Freq

26.500000000 GHz

CF Step

2.649999100 GHz

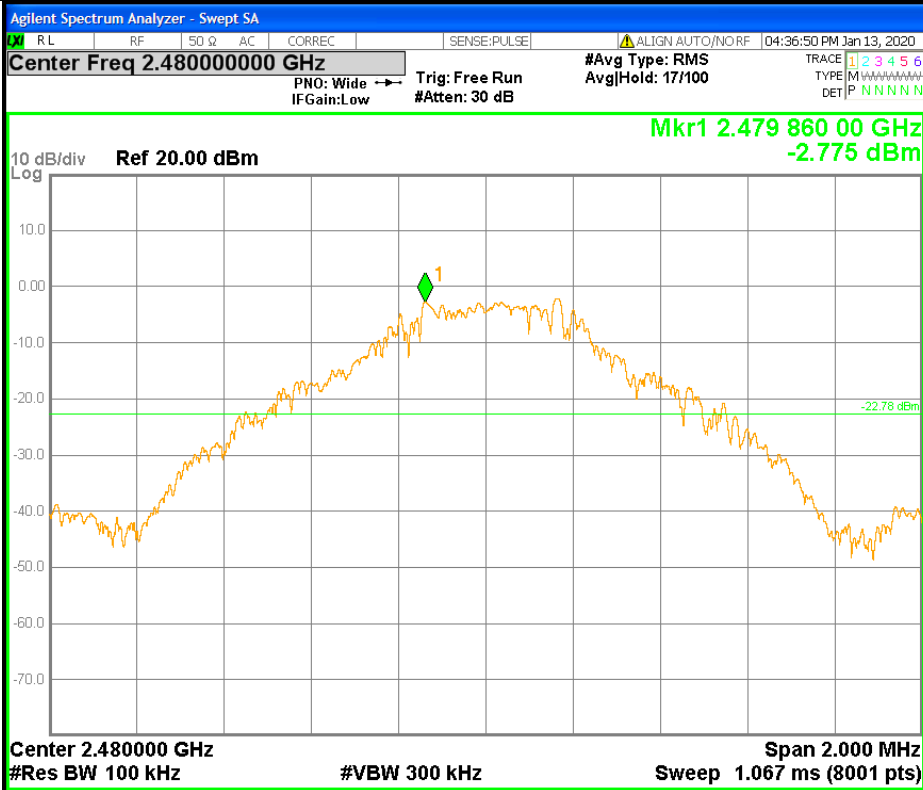
Auto

Freq Offset

0 Hz

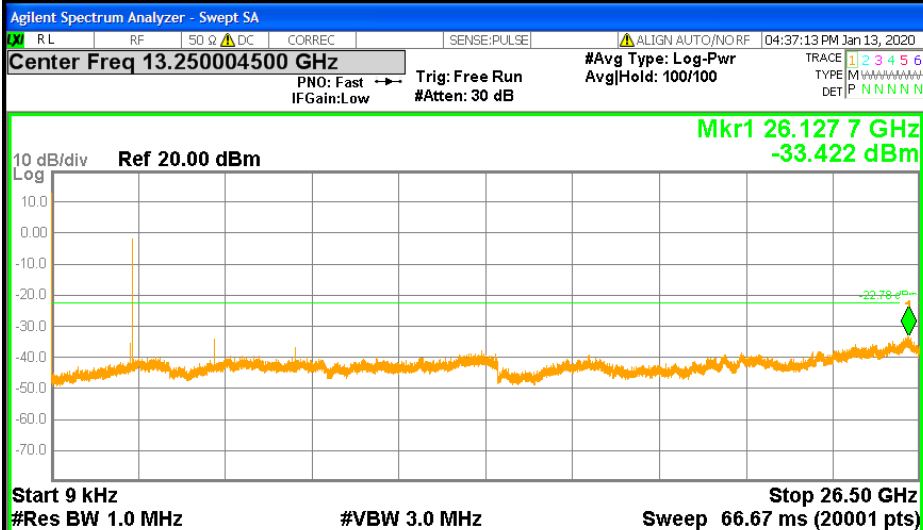
GFSK_HCH_Graphs

Pref



Frequency
Auto Tune
Center Freq 2.480000000 GHz
Start Freq 2.479000000 GHz
Stop Freq 2.481000000 GHz
CF Step 200.000 kHz Auto Man
Freq Offset 0 Hz

Puw



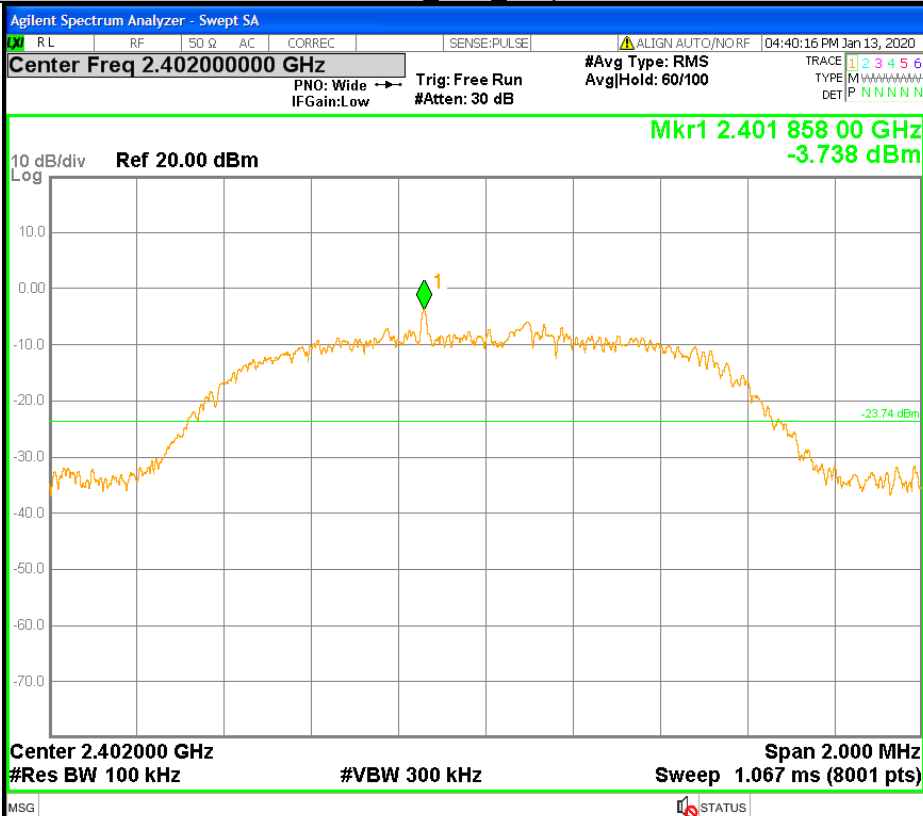
Frequency
Auto Tune
Center Freq 13.250004500 GHz
Start Freq 9.000 kHz
Stop Freq 26.500000000 GHz
CF Step 2.649999100 GHz Auto Man
Freq Offset 0 Hz

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	26.127 7 GHz	-33.422 dBm			
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								

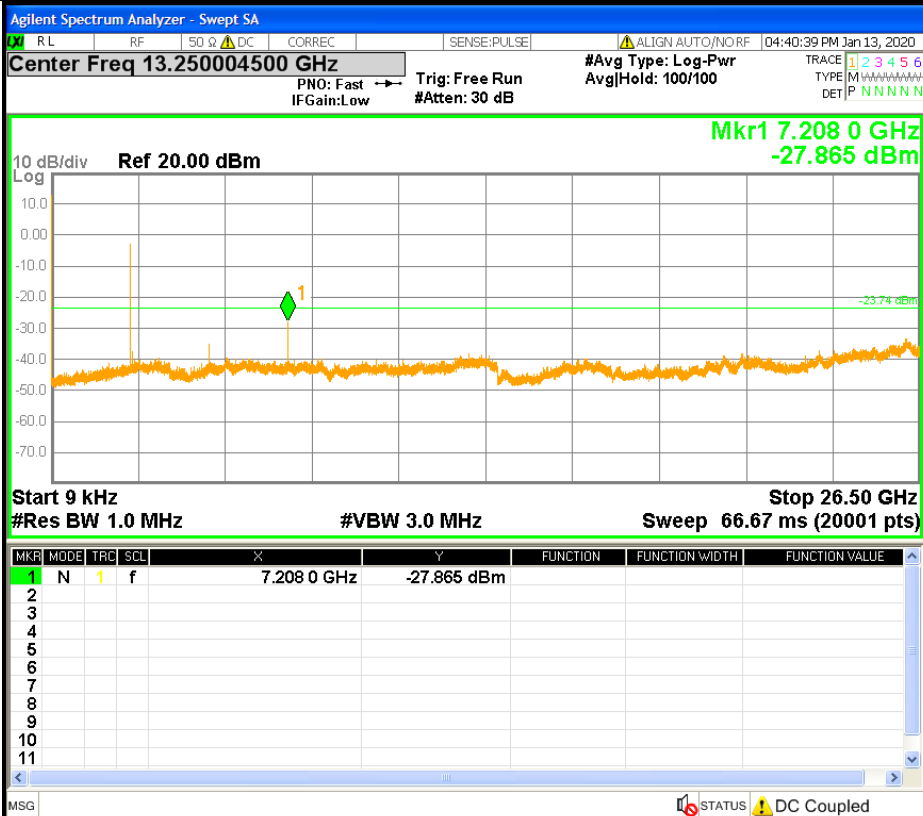
STATUS DC Coupled

$\pi/4$ DQPSK LCH Graphs

Pref

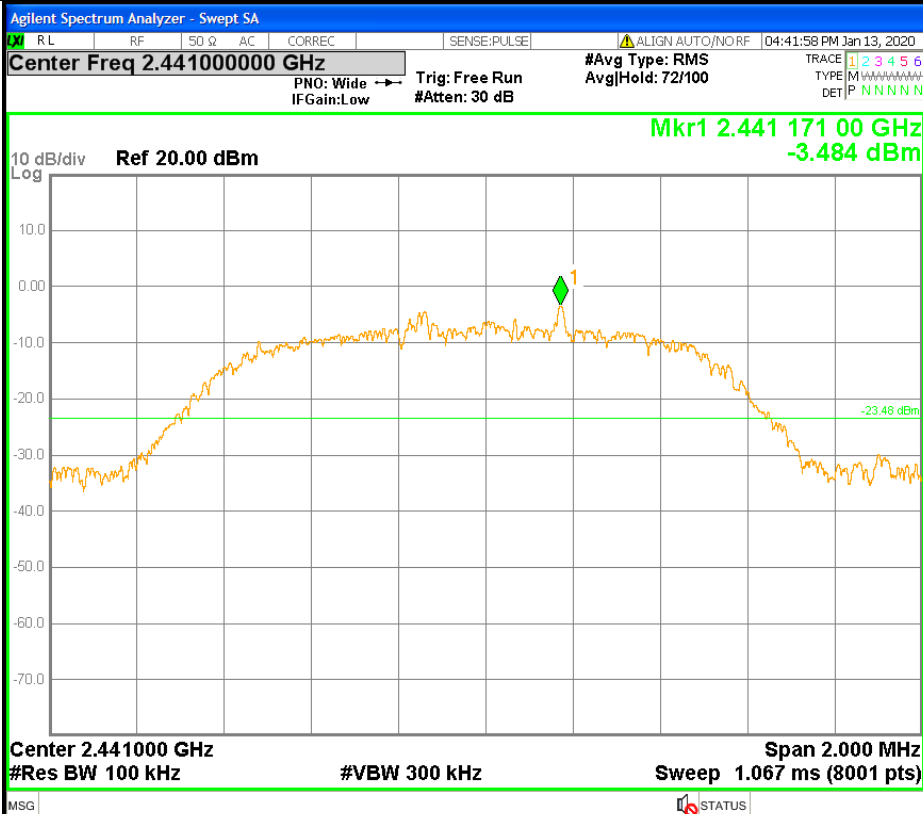


Puw



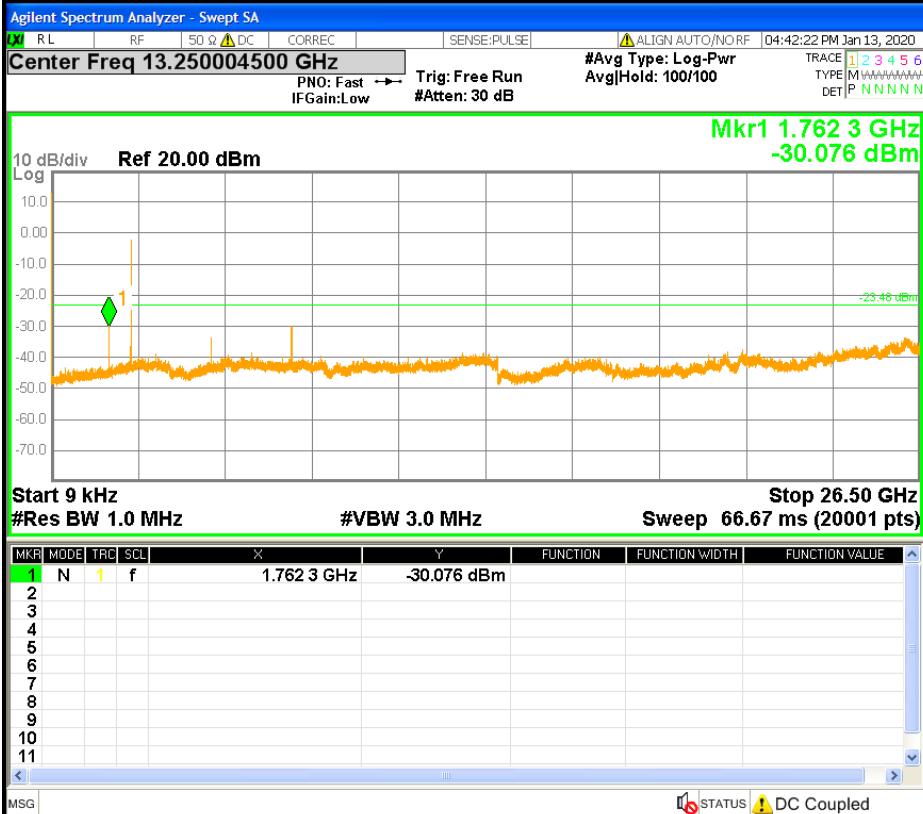
$\pi/4$ DQPSK MCH Graphs

Pref



Frequency
Auto Tune
Center Freq 2.441000000 GHz
Start Freq 2.440000000 GHz
Stop Freq 2.442000000 GHz
CF Step 200.000 kHz Auto Man
Freq Offset 0 Hz

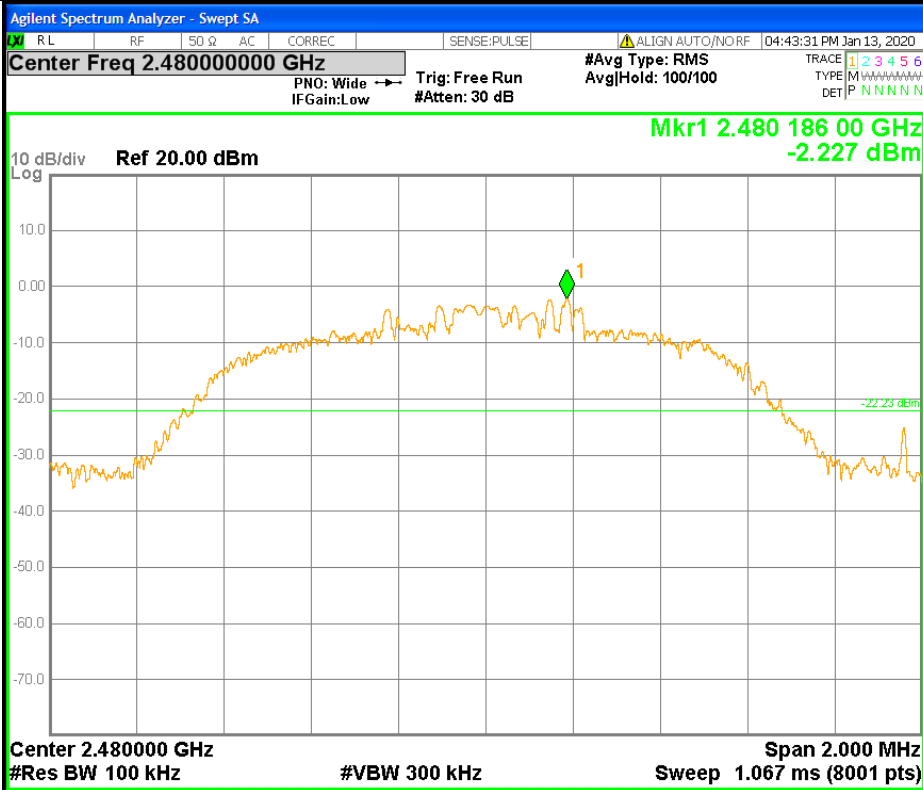
Puw



Frequency
Auto Tune
Center Freq 13.250004500 GHz
Start Freq 9.000 kHz
Stop Freq 26.500000000 GHz
CF Step 2.649999100 GHz Auto Man
Freq Offset 0 Hz

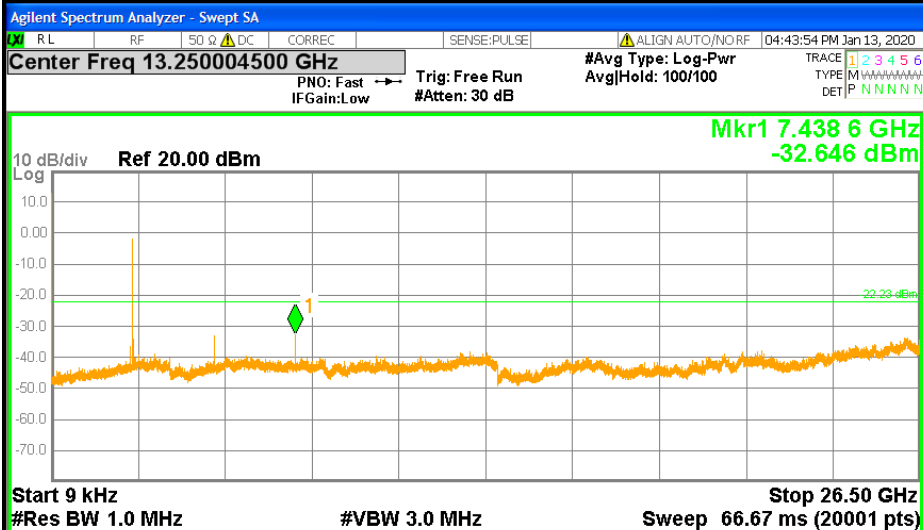
$\pi/4$ DQPSK HCH Graphs

Pref



Frequency
Auto Tune
Center Freq 2.480000000 GHz
Start Freq 2.479000000 GHz
Stop Freq 2.481000000 GHz
CF Step 200.000 kHz Auto Man
Freq Offset 0 Hz

Puw



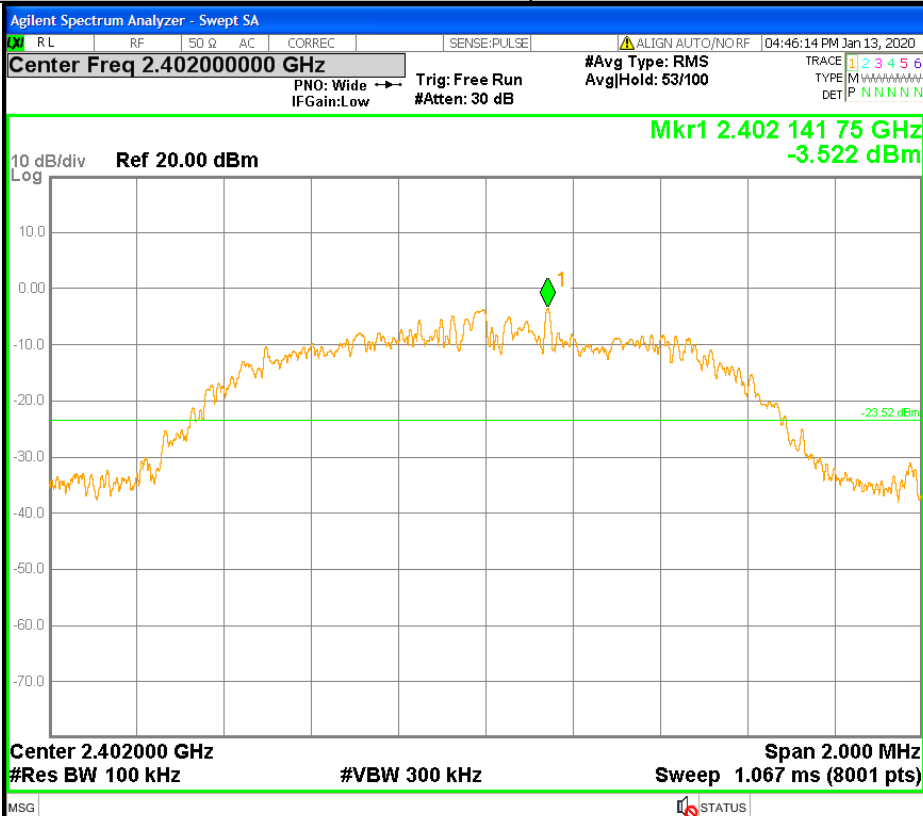
Frequency
Auto Tune
Center Freq 13.250004500 GHz
Start Freq 9.000 kHz
Stop Freq 26.500000000 GHz
CF Step 2.649999100 GHz Auto Man
Freq Offset 0 Hz

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	7.438 6 GHz	-32.646 dBm			
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								

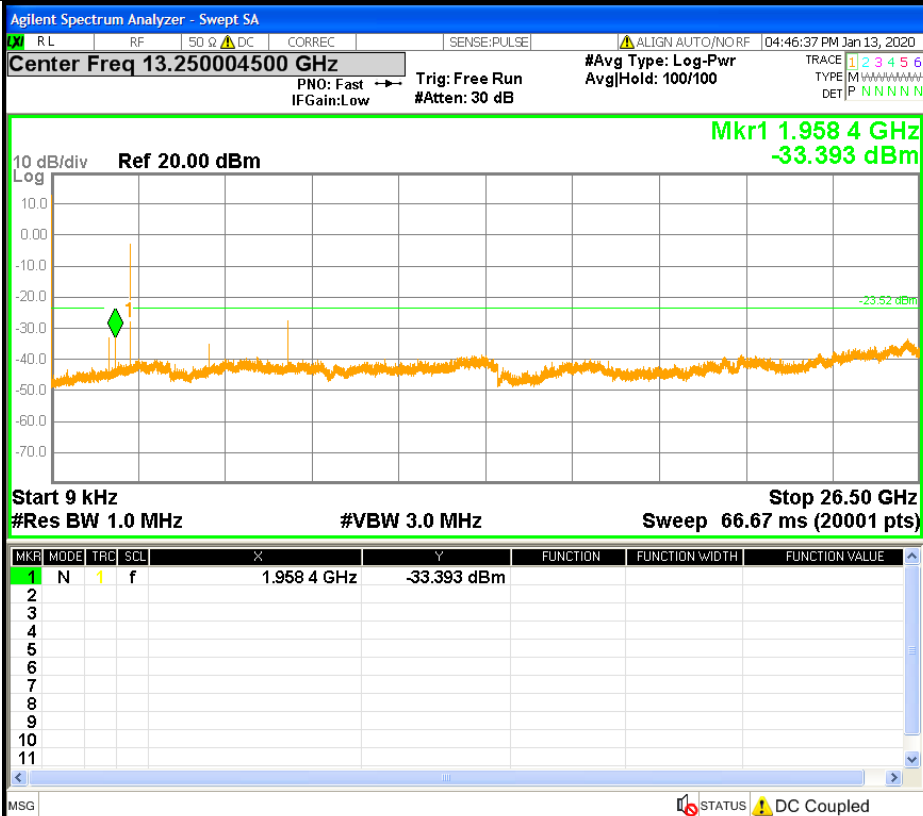
MSG STATUS DC Coupled

8DPSK_LCH_Graphs

Pref

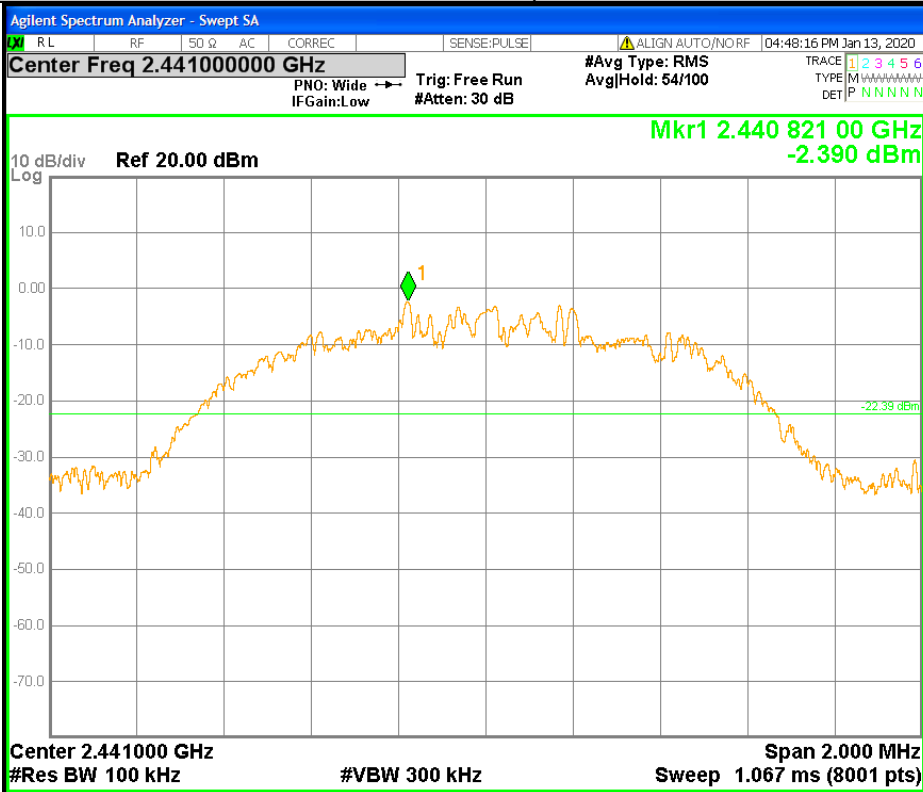


Puw

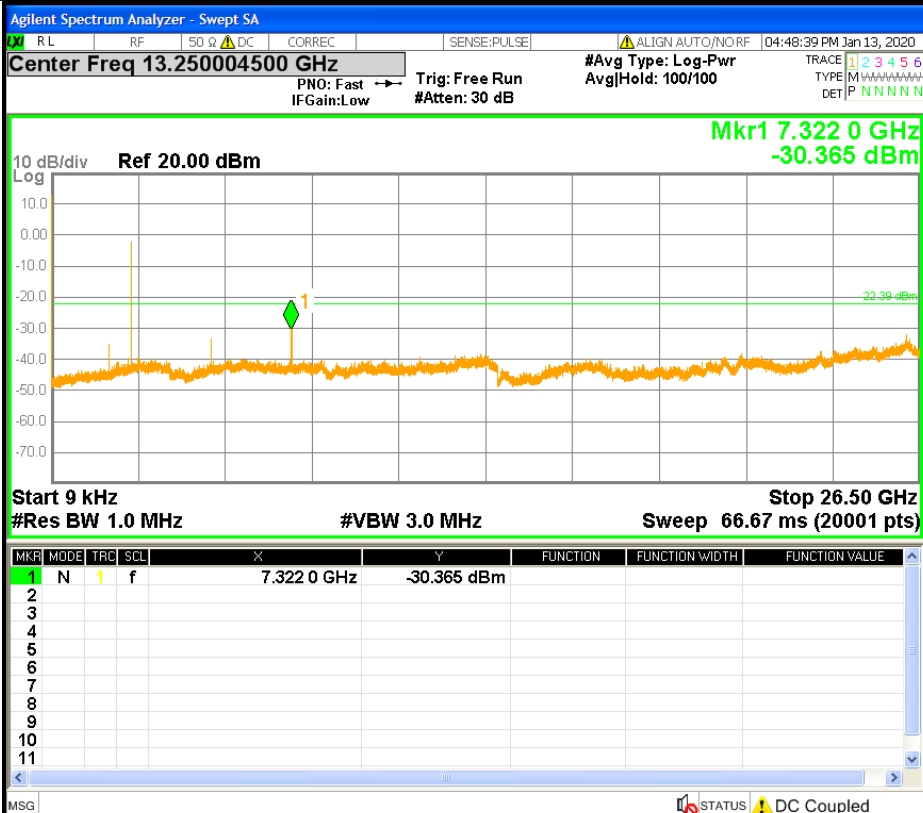


8DPSK_MCH_Graphs

Pref

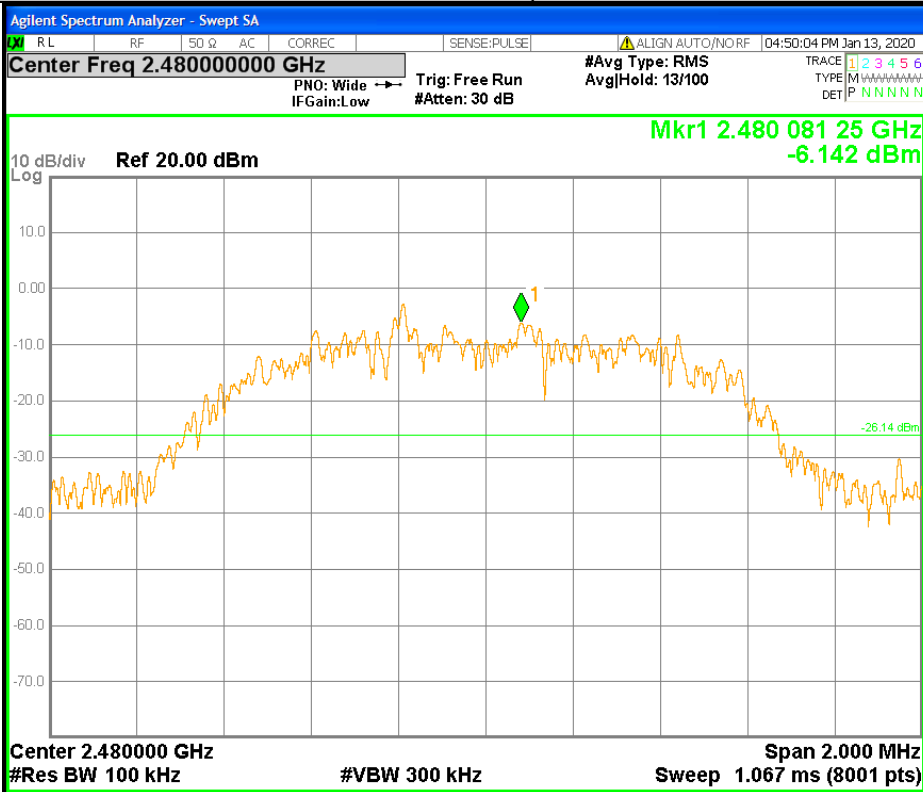


Puw



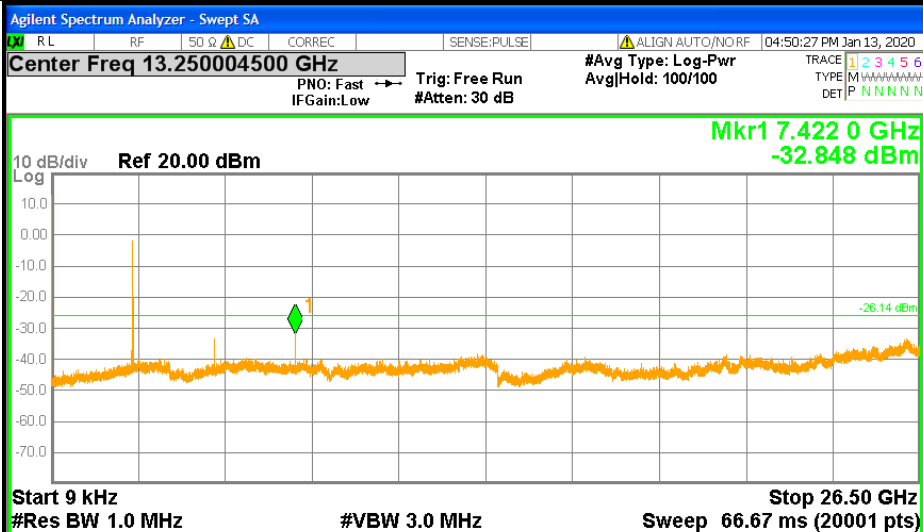
8DPSK_HCH_Graphs

Pref



Frequency
Auto Tune
Center Freq 2.480000000 GHz
Start Freq 2.479000000 GHz
Stop Freq 2.481000000 GHz
CF Step 200.000 kHz Auto
Freq Offset 0 Hz

Puw



Frequency
Auto Tune
Center Freq 13.250004500 GHz
Start Freq 9.000 kHz
Stop Freq 26.500000000 GHz
CF Step 2.649999100 GHz Auto
Freq Offset 0 Hz

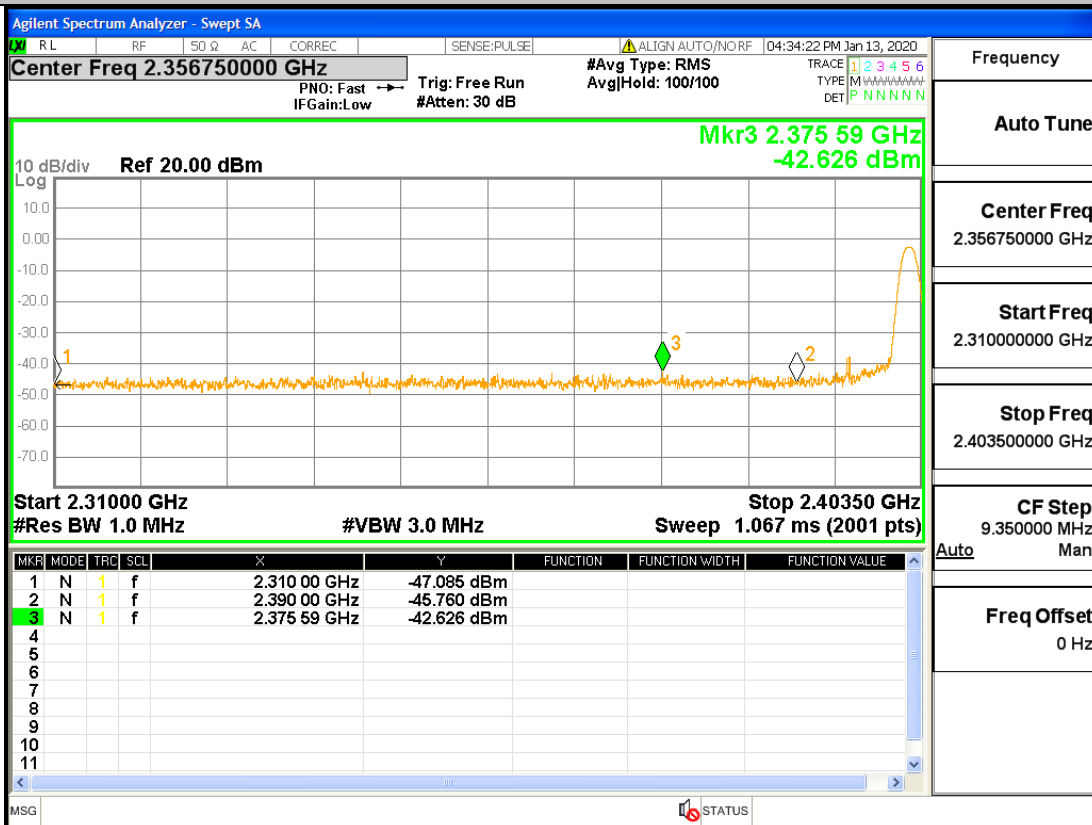
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	7.442 0 GHz	-32.848 dBm			
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								

A.8 Restrict-band band-edge measurements

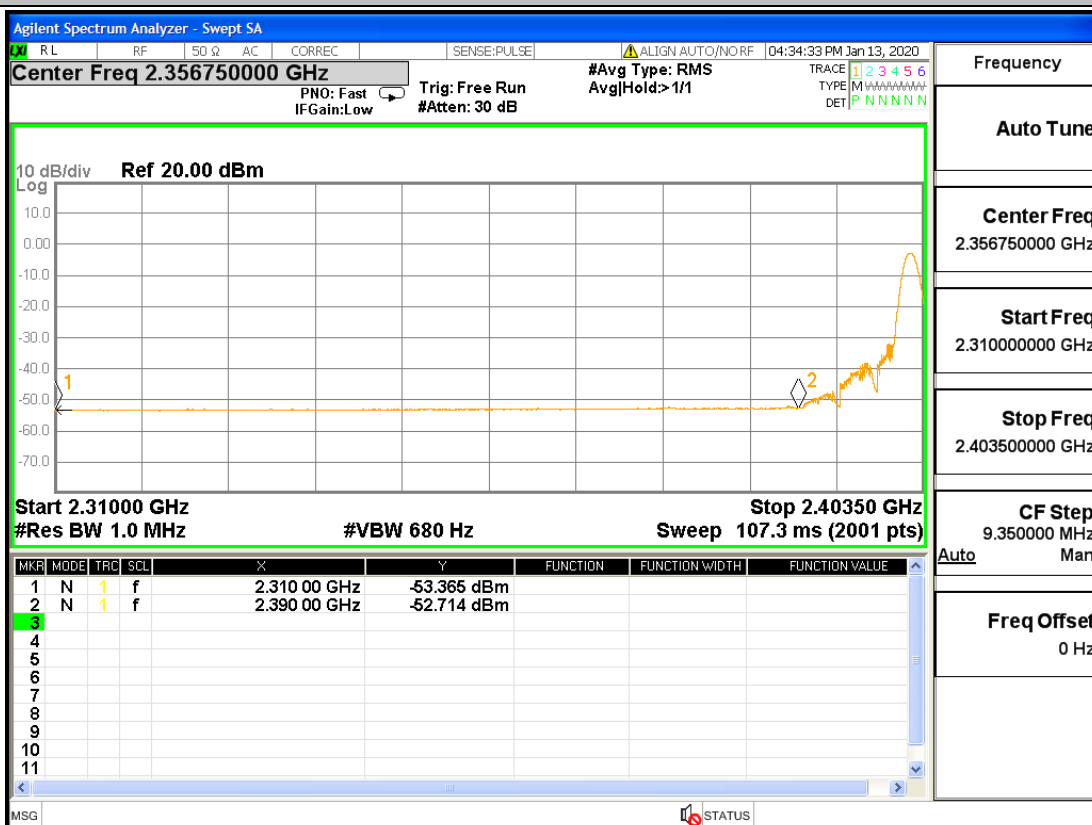
Type	Carrier Frequency (MHz)	Frequency(M Hz)	Gain	Ground Factor	Peak Value(dBm)	E [dBuV/m]	Limit [dBuV/m]	Conclusion
1DH5	2402	2375.59	2.00	0.00	-42.626	54.574	74	Pass
1DH5	2480	2483.5	2.00	0.00	-42.601	54.599	74	Pass
2DH5	2402	2390	2.00	0.00	-44.18	53.020	74	Pass
2DH5	2480	2483.5	2.00	0.00	-41.956	55.244	74	Pass
3DH5	2402	2390	2.00	0.00	-46.496	50.704	74	Pass
3DH5	2480	2483.864	2.00	0.00	-31.326	65.874	74	Pass

Type	Carrier Frequency (MHz)	Frequency(M Hz)	Gain	Ground Factor	Average Value(dBm)	E [dBuV/m]	Limit [dBuV/m]	Conclusion
1DH5	2402	2390.00	2.00	0.00	-52.714	44.486	54	Pass
1DH5	2480	2483.5	2.00	0.00	-46.587	50.613	54	Pass
2DH5	2402	2390	2.00	0.00	-52.077	45.123	54	Pass
2DH5	2480	2483.5	2.00	0.00	-48.362	48.788	54	Pass
3DH5	2402	2390	2.00	0.00	-52.866	44.334	54	Pass
3DH5	2480	2483.5	2.00	0.00	-45.097	52.103	54	Pass

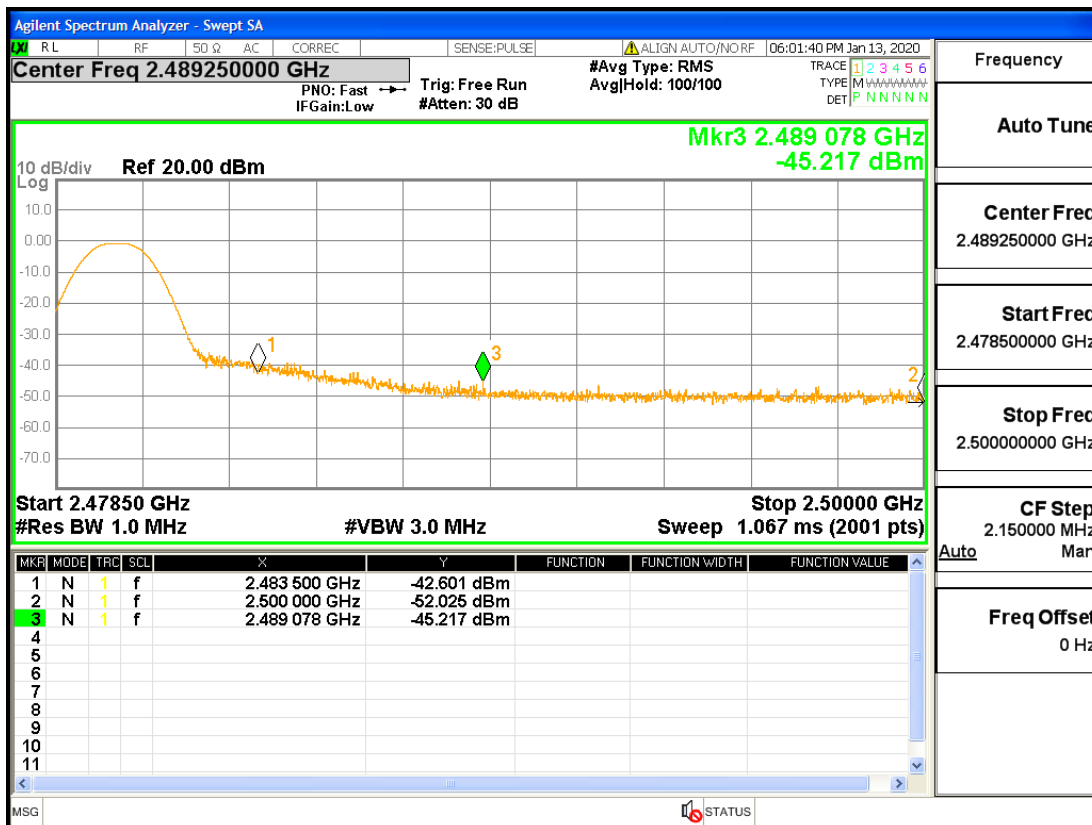
Restrict-band band-edge measurements_2402_PEAK_DH5



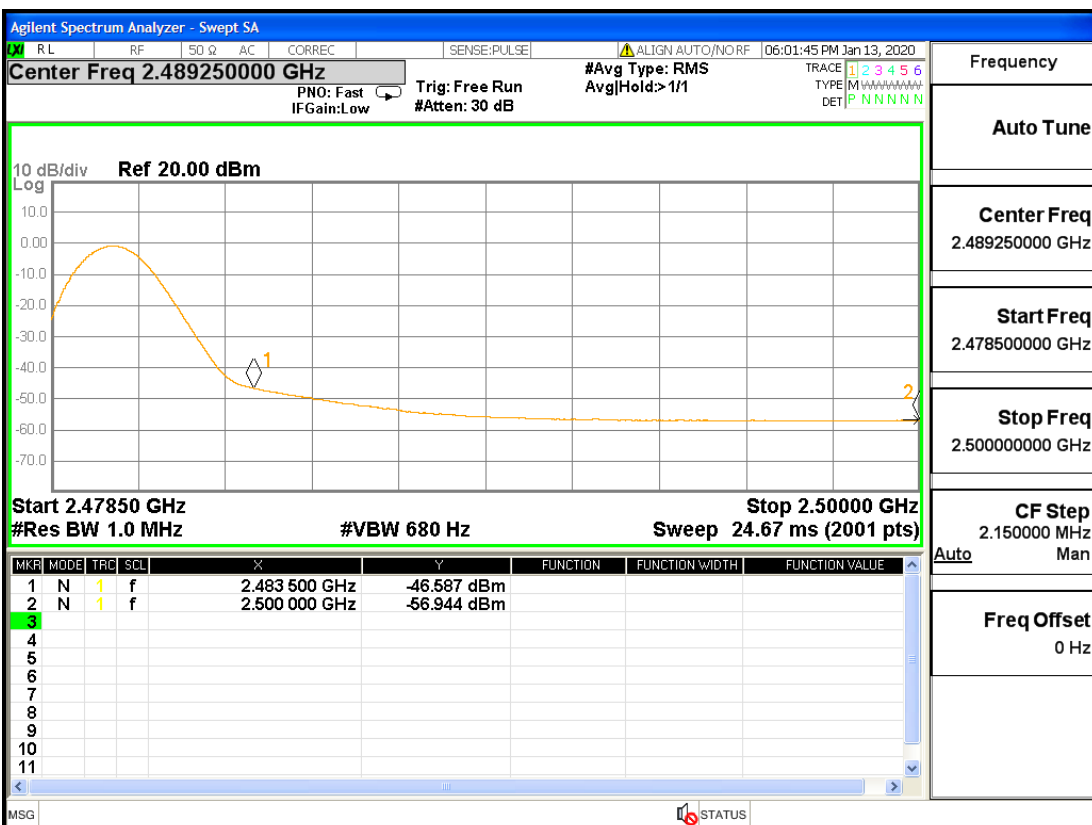
Restrict-band band-edge measurements_2402_AV_DH5



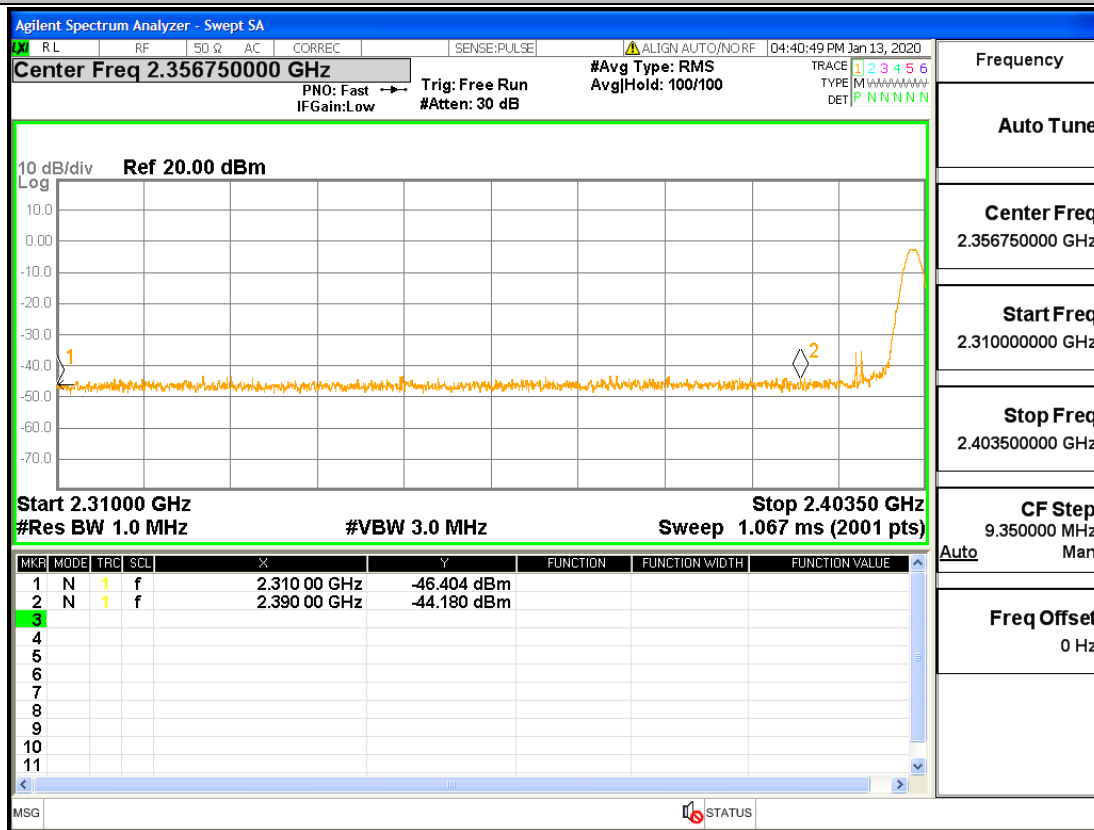
Restrict-band band-edge measurements_2480_PEAK_DH5



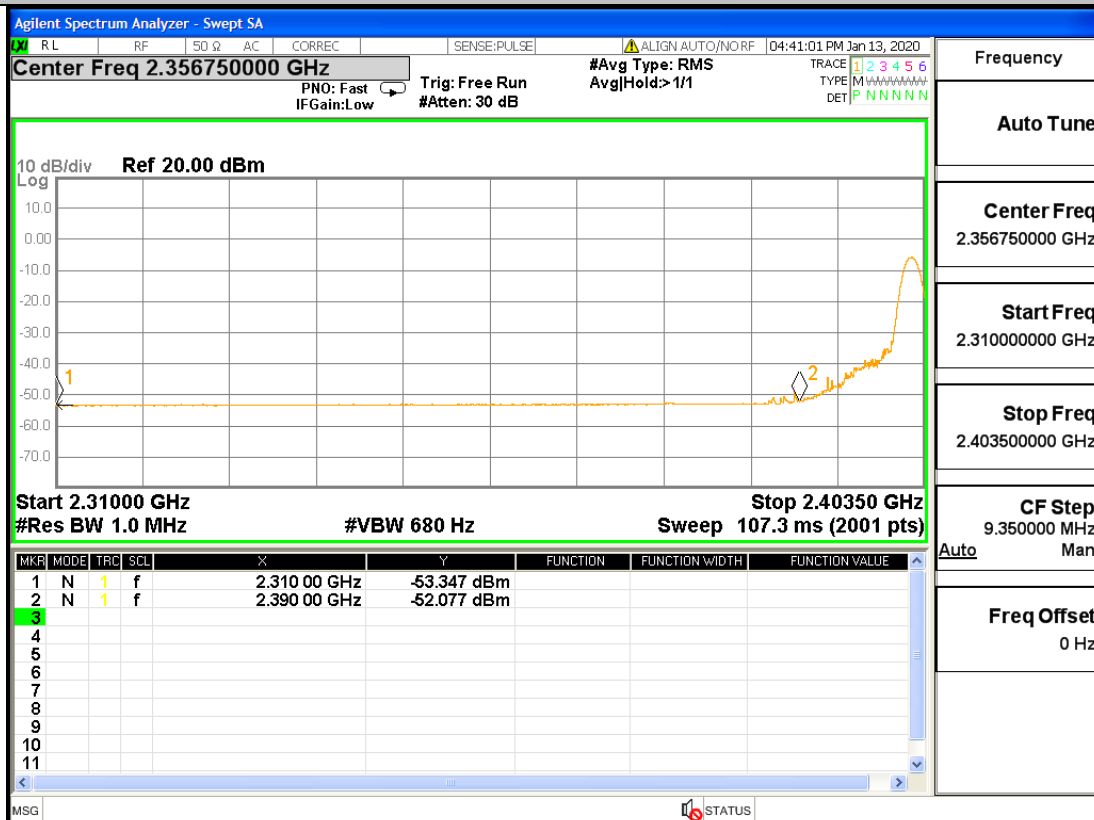
Restrict-band band-edge measurements_2480_AV_DH5



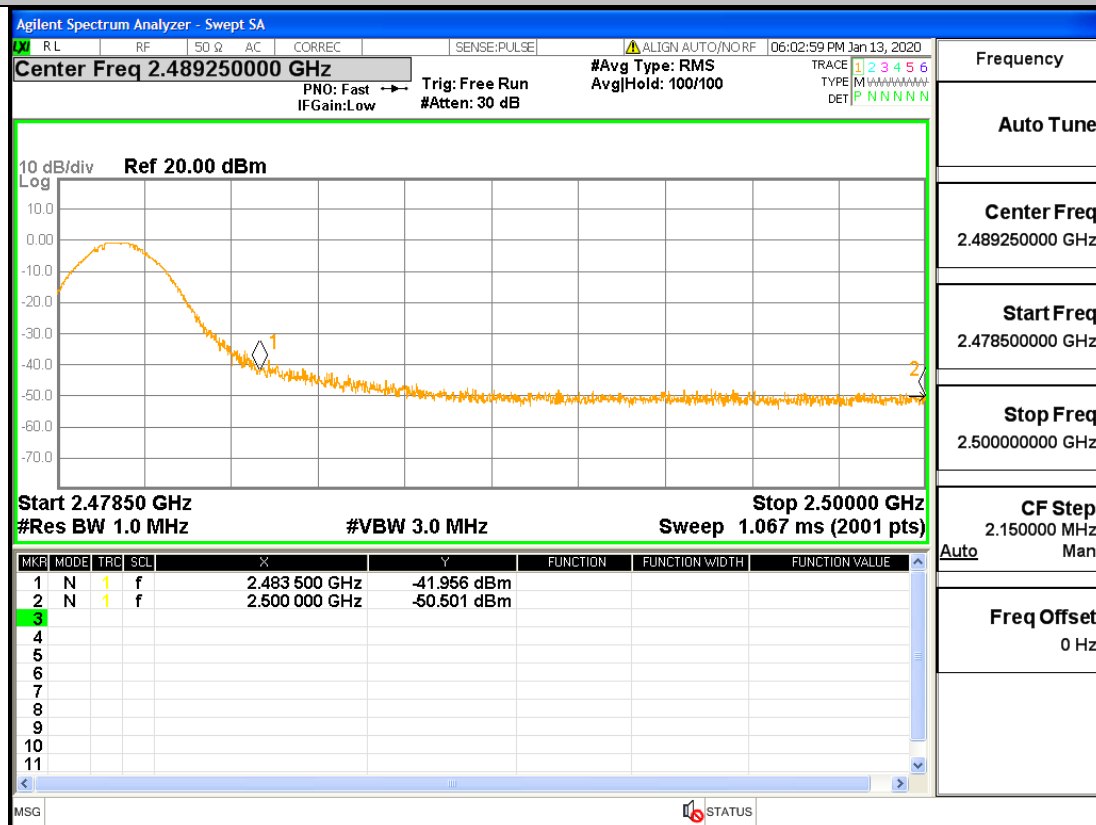
Restrict-band band-edge measurements_2402_PEAK_2DH5



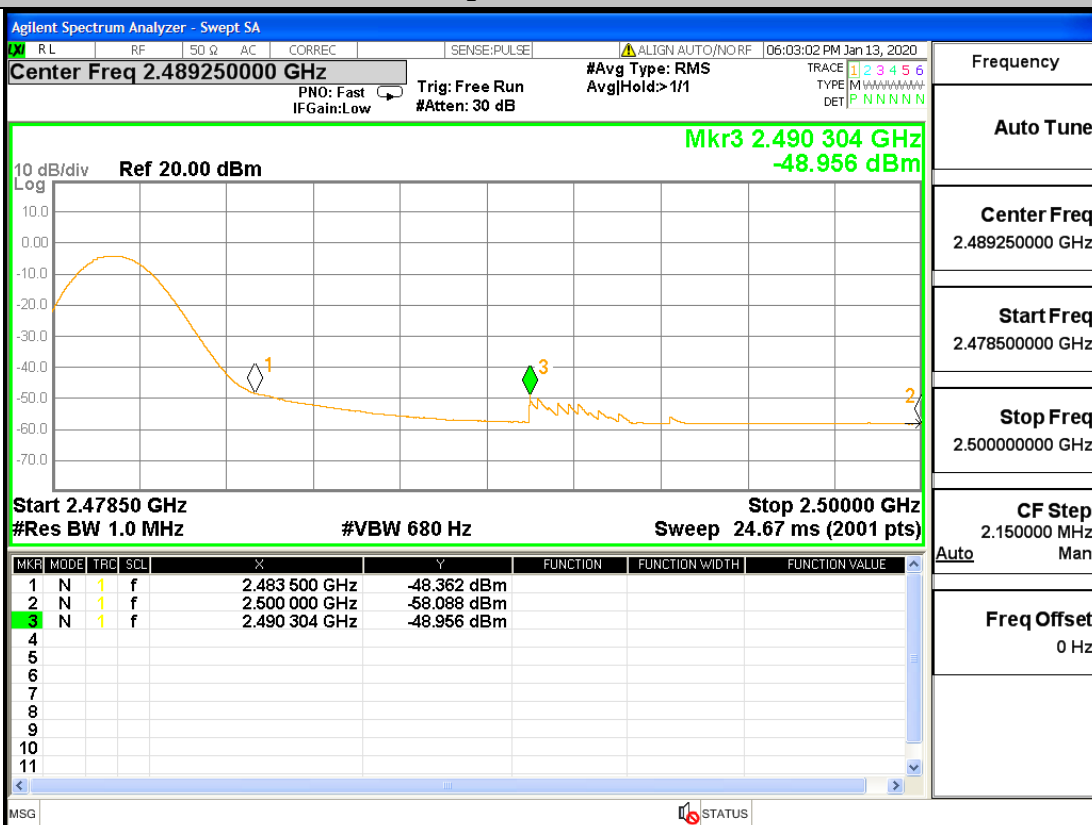
Restrict-band band-edge measurements_2402_AV_2DH5



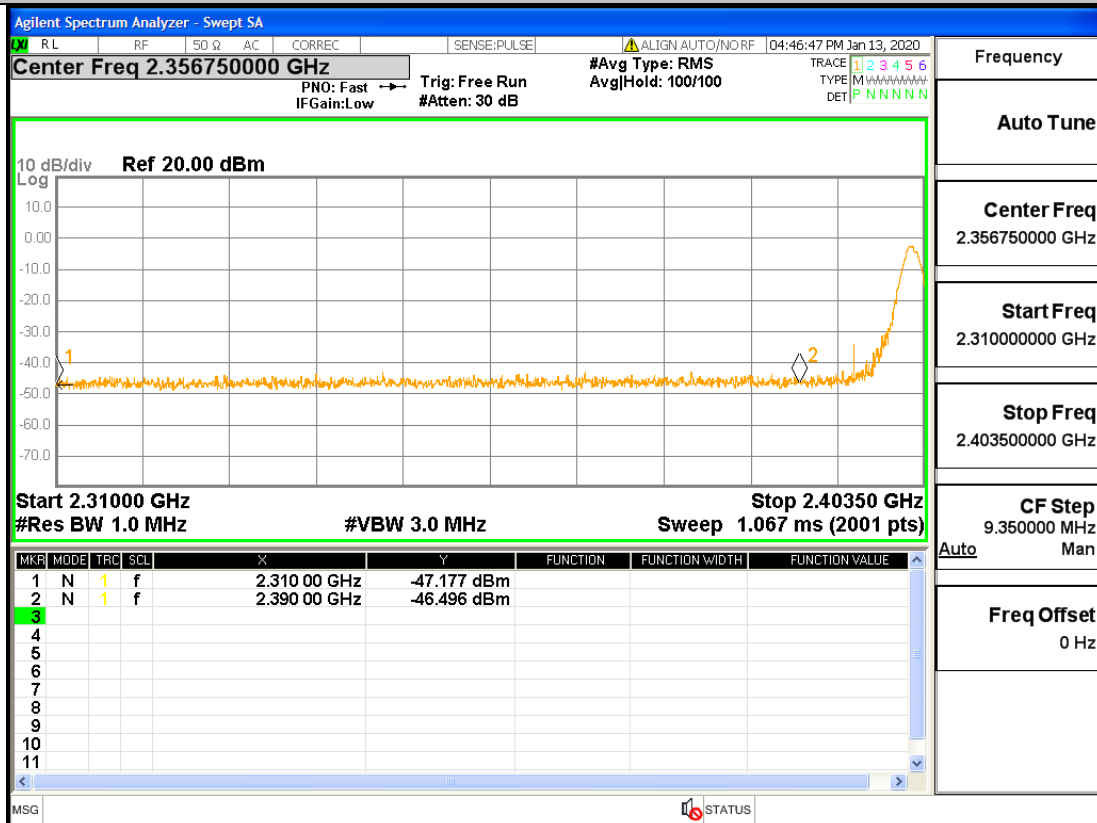
Restrict-band band-edge measurements_2480_PEAK_2DH5



Restrict-band band-edge measurements_2480_AV_2DH5



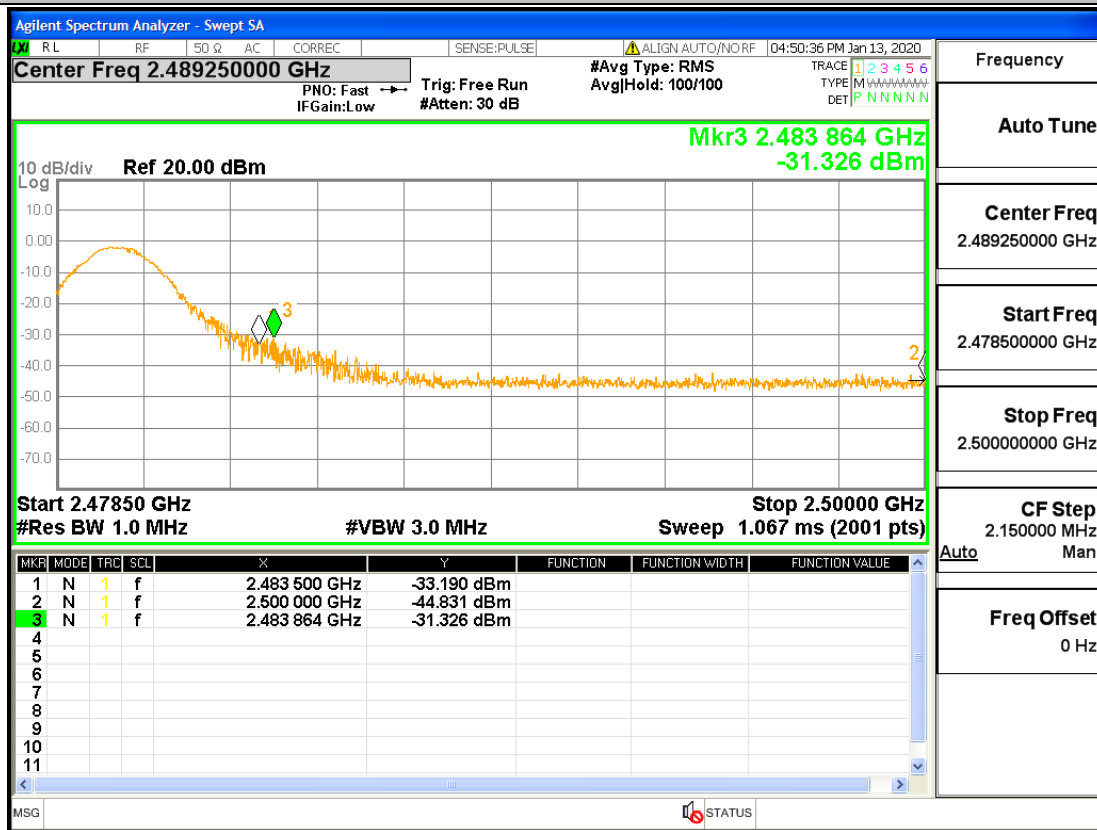
Restrict-band band-edge measurements_2402_PEAK_3DH5



Restrict-band band-edge measurements_2402_AV_3DH5



Restrict-band band-edge measurements_2480_PEAK_3DH5



Restrict-band band-edge measurements_2480_AV_3DH5

