

Appendix A

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

Product Name: TRUE WIRELESS EARBUDS

Trade Mark: N/A

Test Model: RT33

FCC ID: 2ATOY-RT33

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	0.799	Not Specified	PASS
GFSK	MCH	0.846	Not Specified	PASS
GFSK	HCH	0.797	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.197	Not Specified	PASS
$\pi/4$ DQPSK	MCH	1.194	Not Specified	PASS
$\pi/4$ DQPSK	HCH	1.193	Not Specified	PASS

Test Graph

Graphs

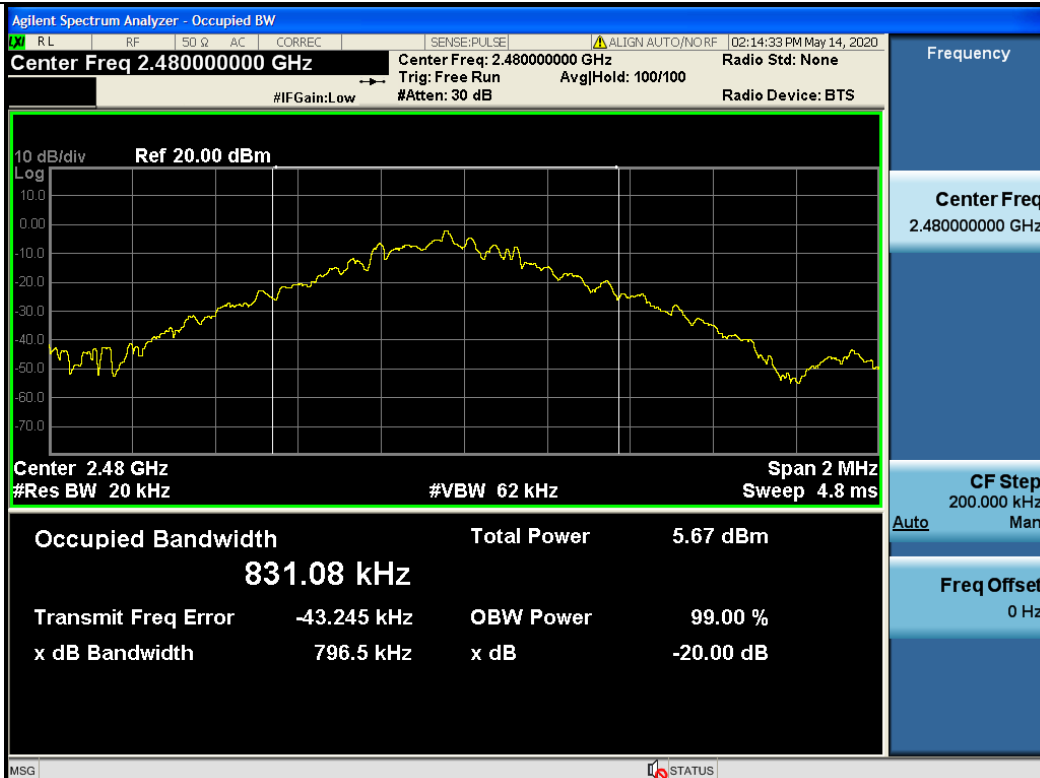
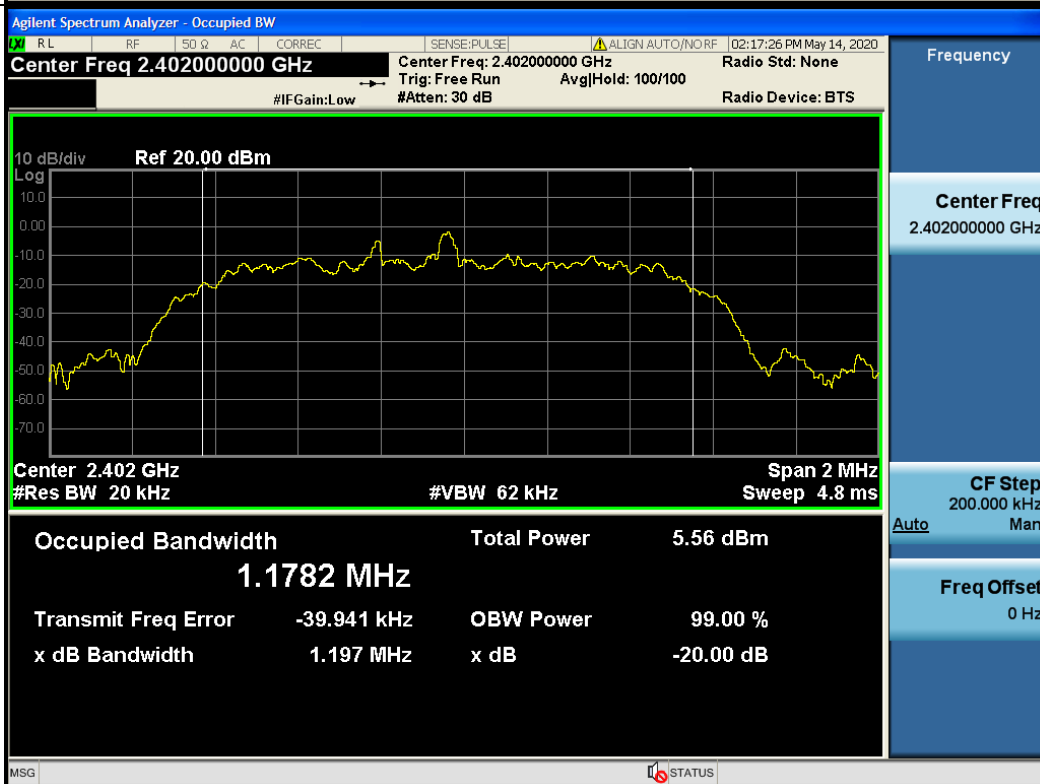
GFSK/LCH

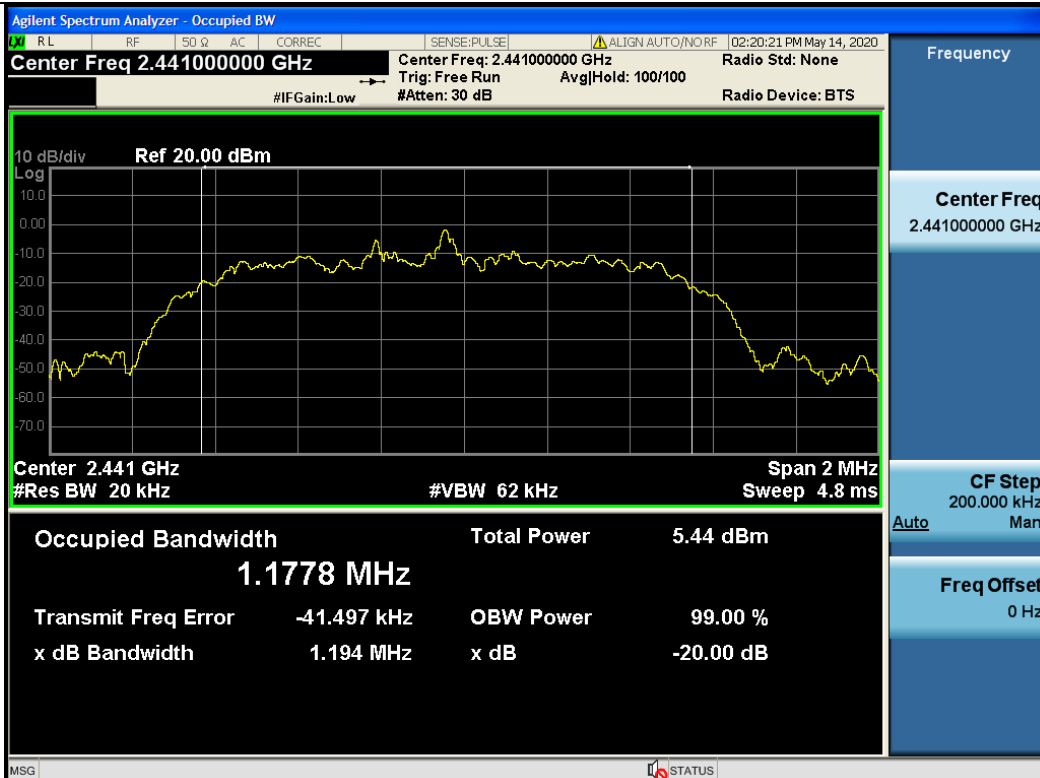
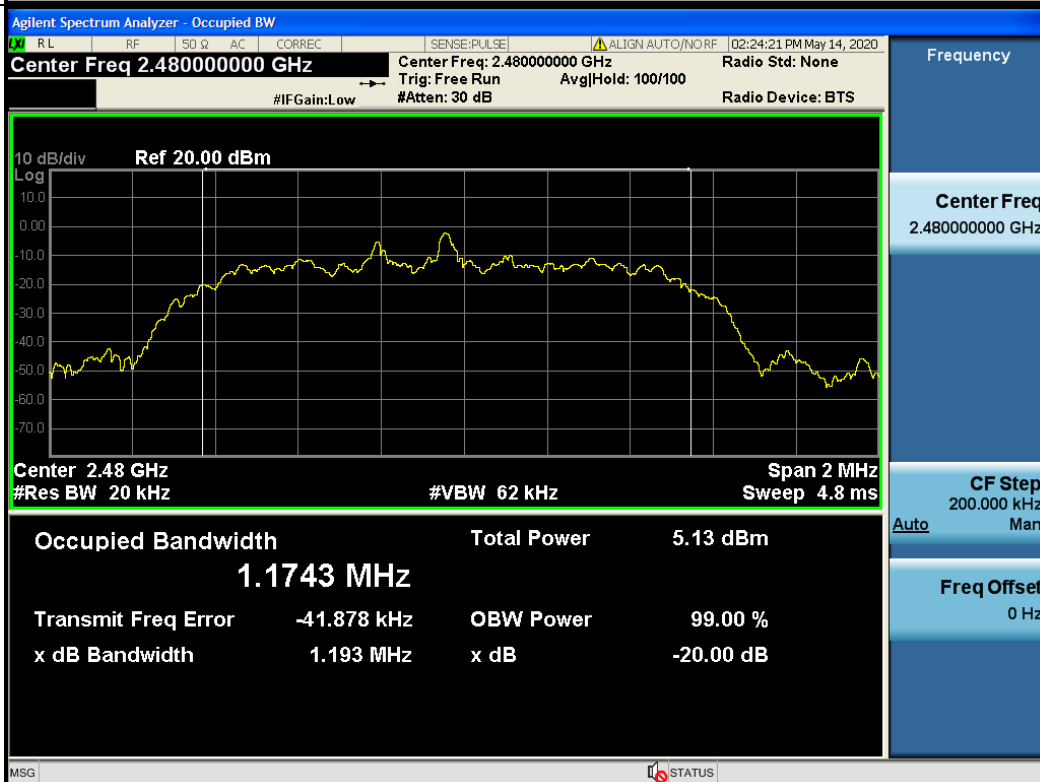


GFSK/MCH



GFSK/HCH

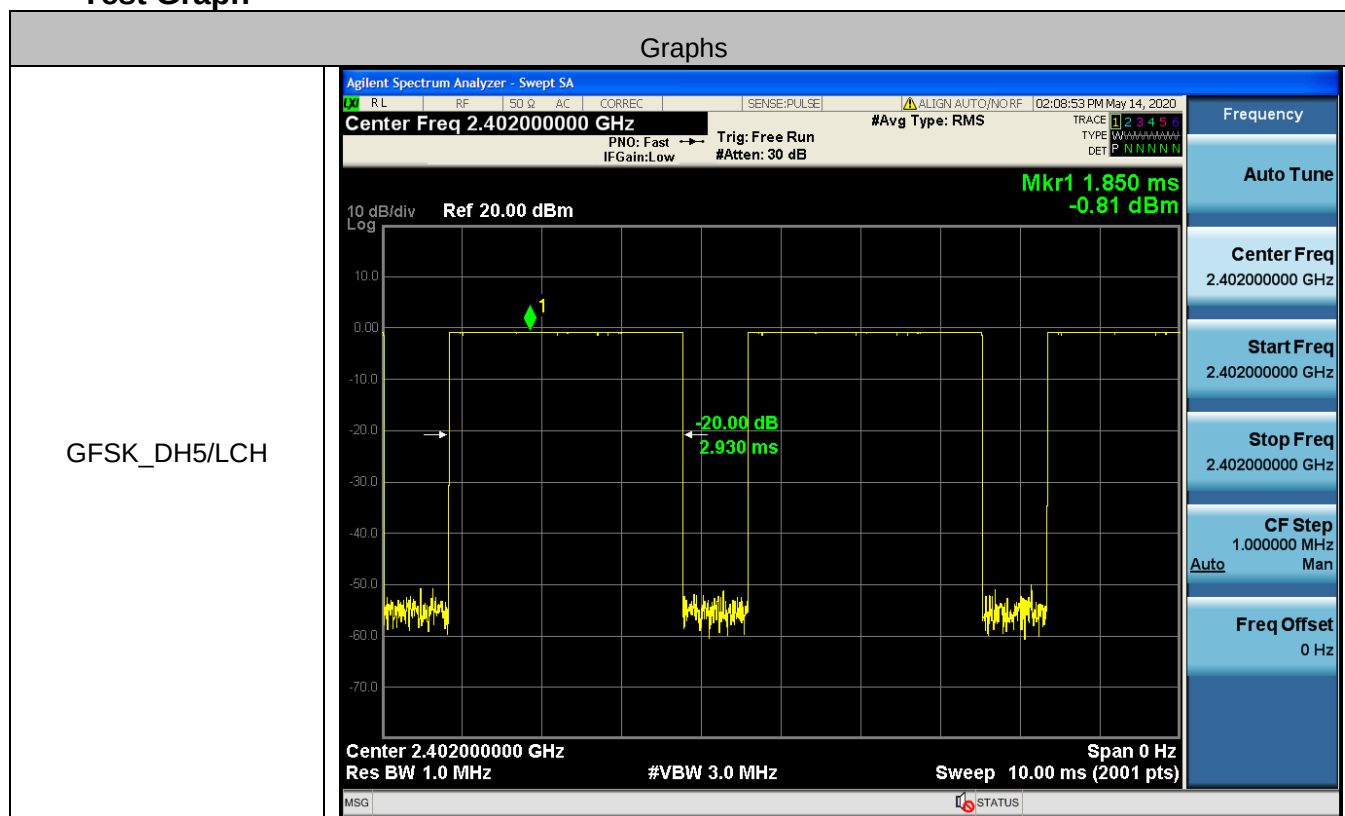
 π /4DQPSK/LCH

π /4DQPSK/MCH π /4DQPSK/HCH

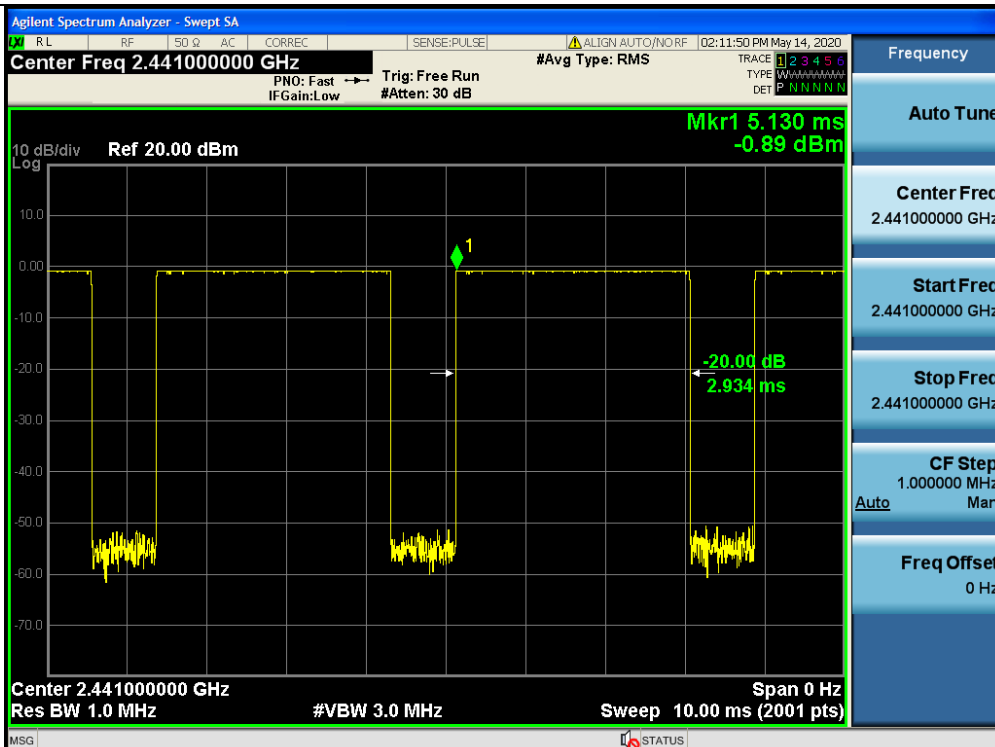
A.2 Dwell Time

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.930	106.7	0.313	0.4	PASS
GFSK	DH5	MCH	2.934	106.7	0.313	0.4	PASS
GFSK	DH5	HCH	2.934	106.7	0.313	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.938	106.7	0.313	0.4	PASS
$\pi/4$ DQPSK	2DH5	MCH	2.938	106.7	0.313	0.4	PASS
$\pi/4$ DQPSK	2DH5	HCH	2.938	106.7	0.313	0.4	PASS

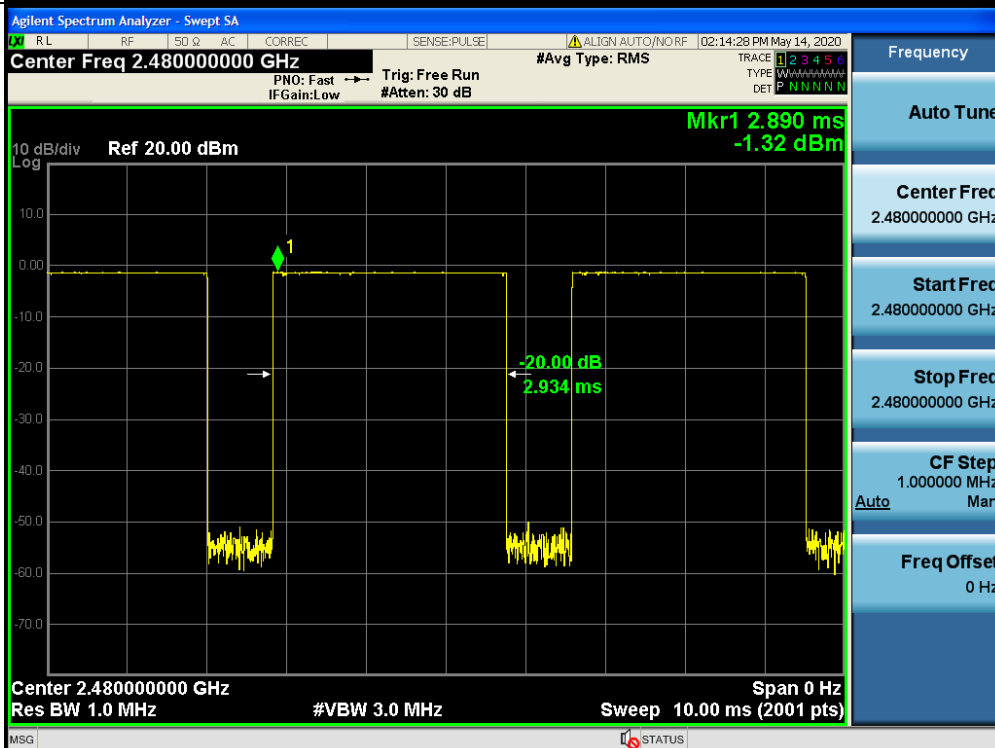
Test Graph

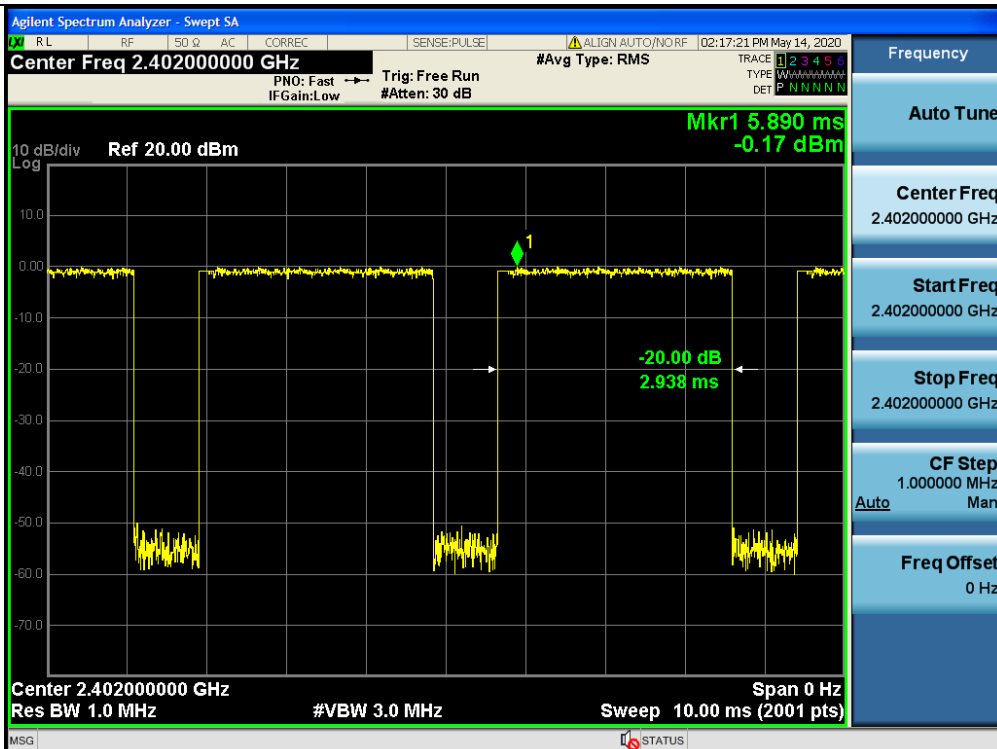
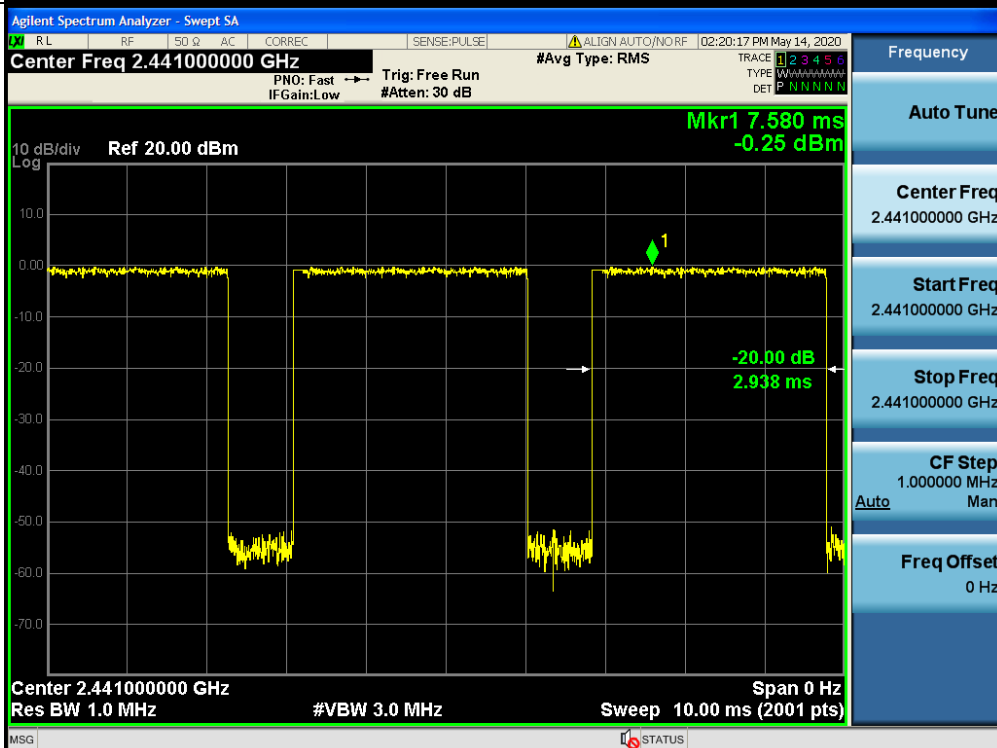


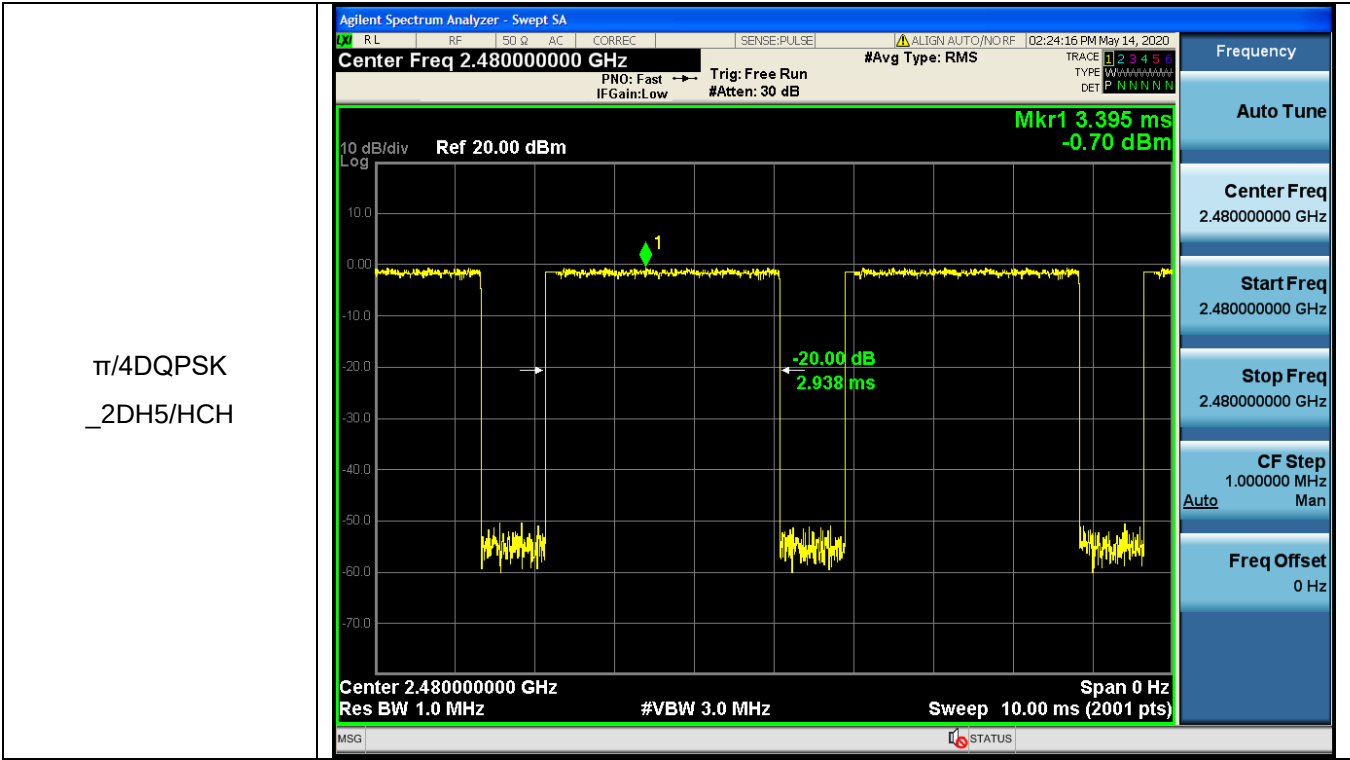
GFSK_DH5/MCH



GFSK_DH5/HCH



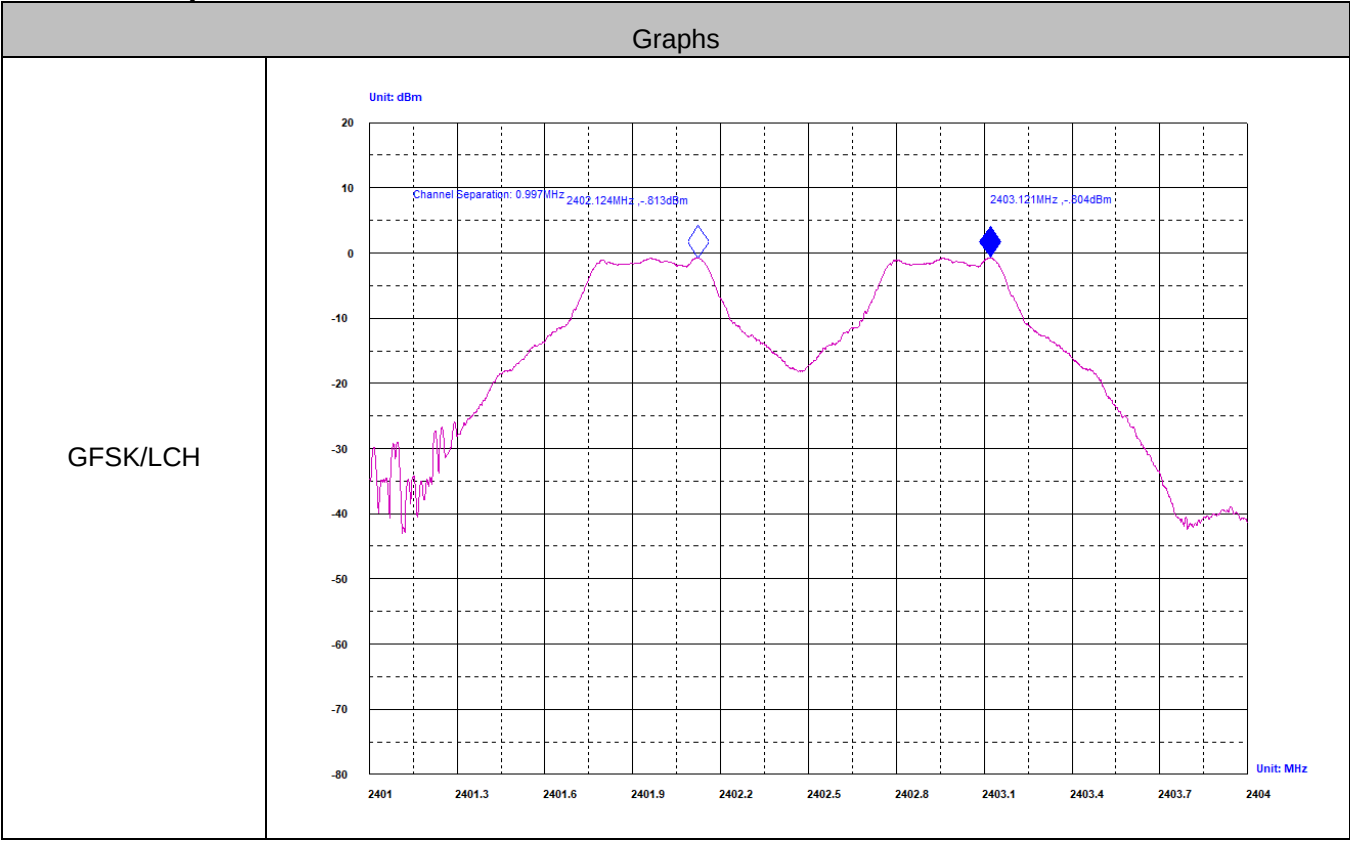
$\pi/4$ DQPSK
_2DH5/LCH $\pi/4$ DQPSK
_2DH5/MCH

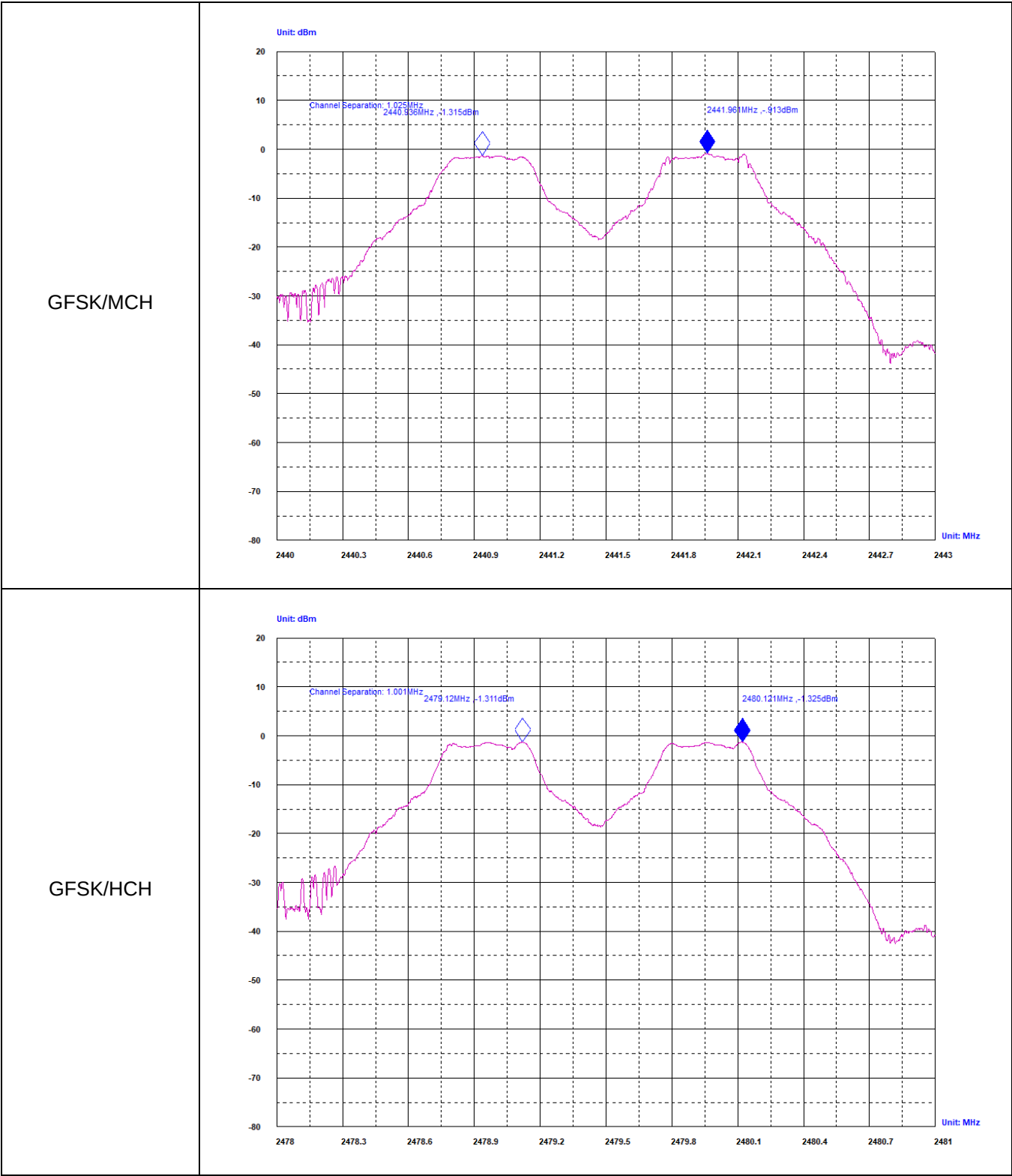


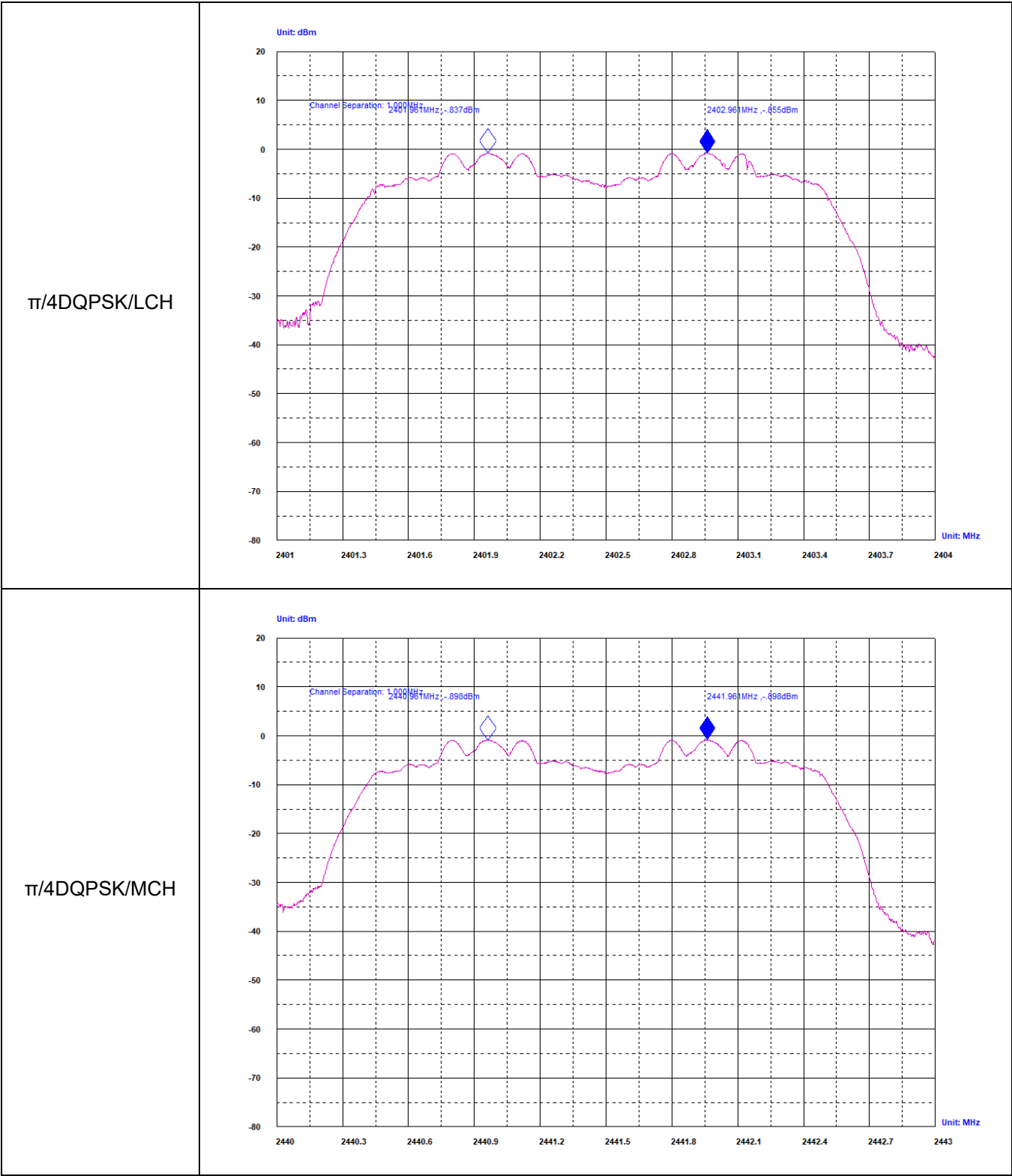
A.3 Carrier Frequency Separation

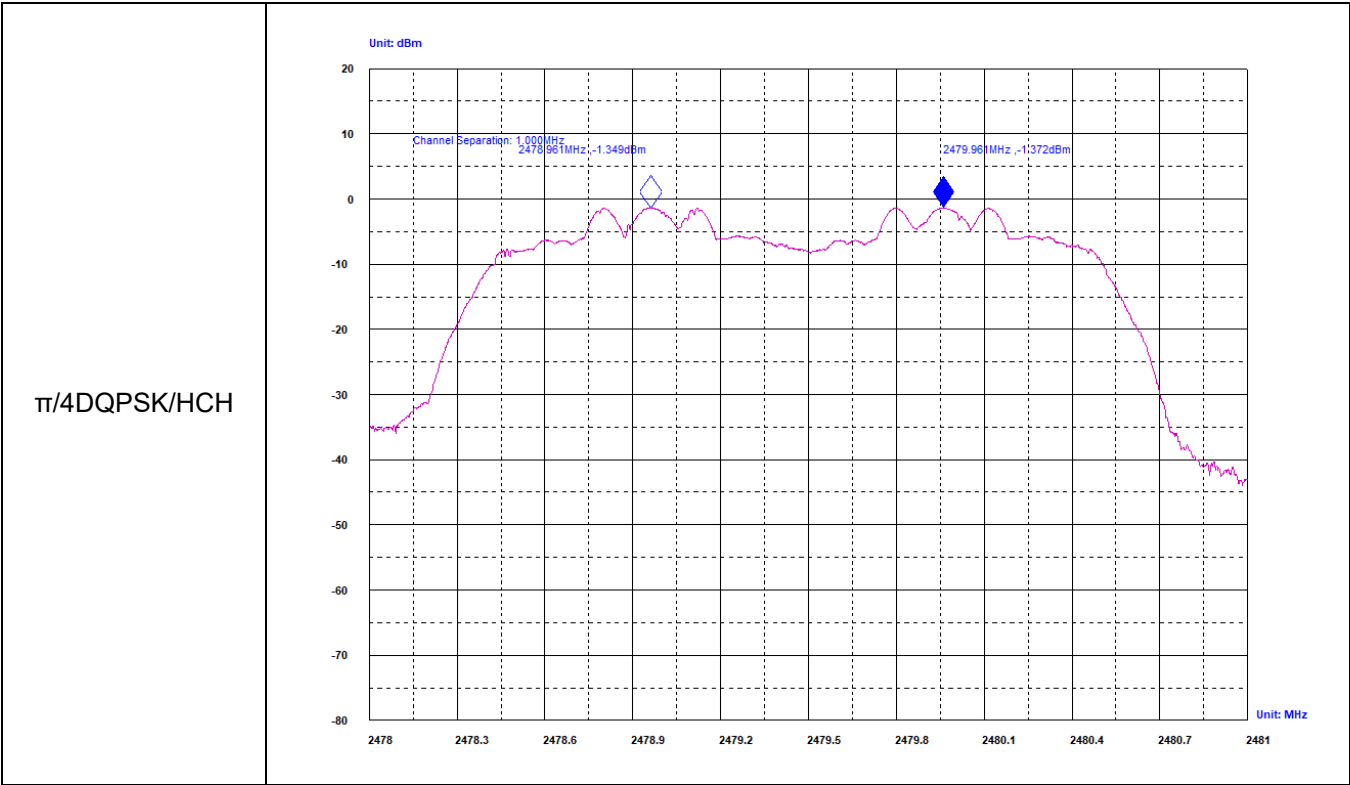
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.997	0.795	PASS
GFSK	MCH	1.025	0.795	PASS
GFSK	HCH	1.001	0.531	PASS
$\pi/4$ DQPSK	LCH	1.000	0.798	PASS
$\pi/4$ DQPSK	MCH	1.000	0.796	PASS
$\pi/4$ DQPSK	HCH	1.000	0.795	PASS

Test Graph





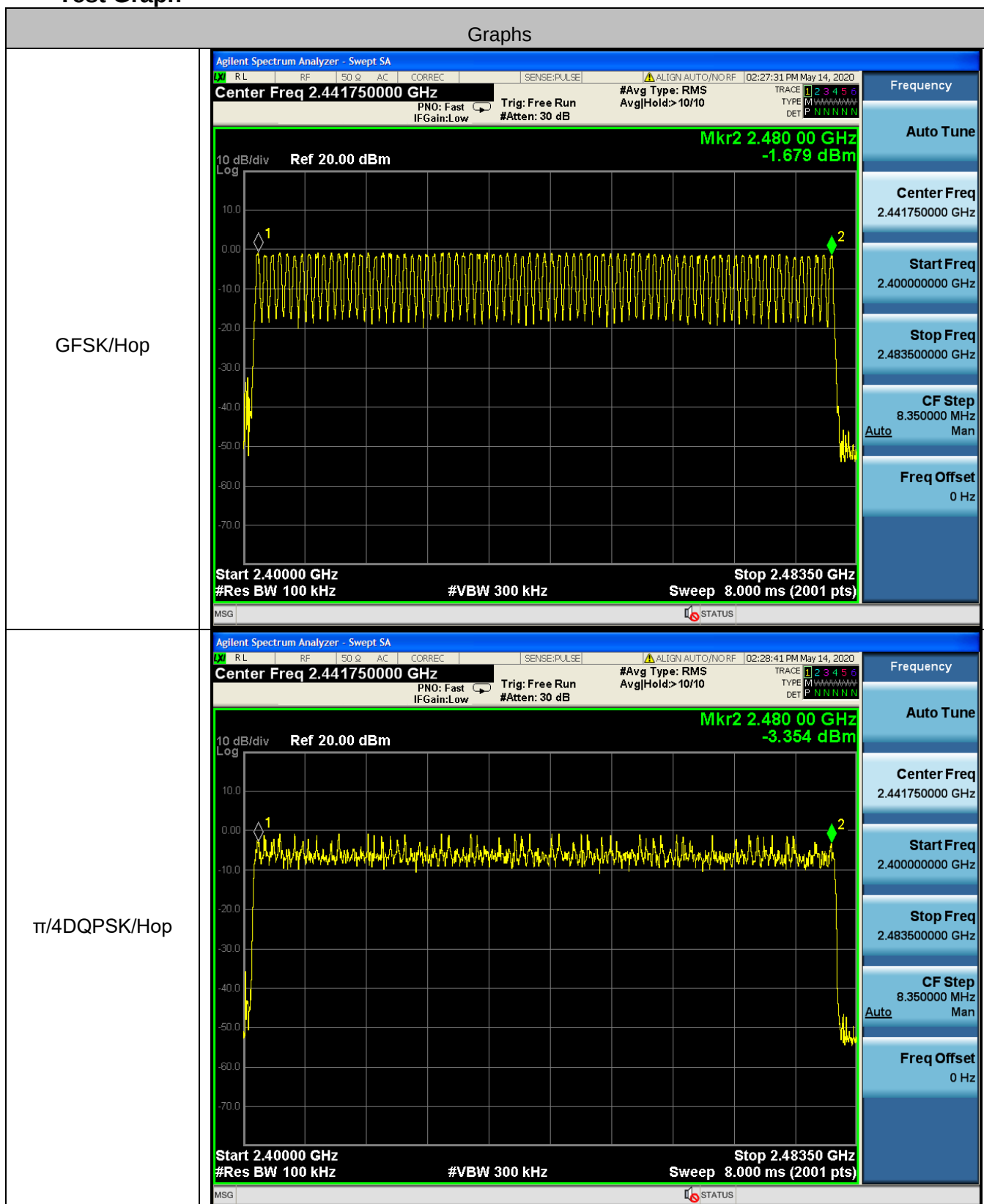




A.4 Hopping Channel Number

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

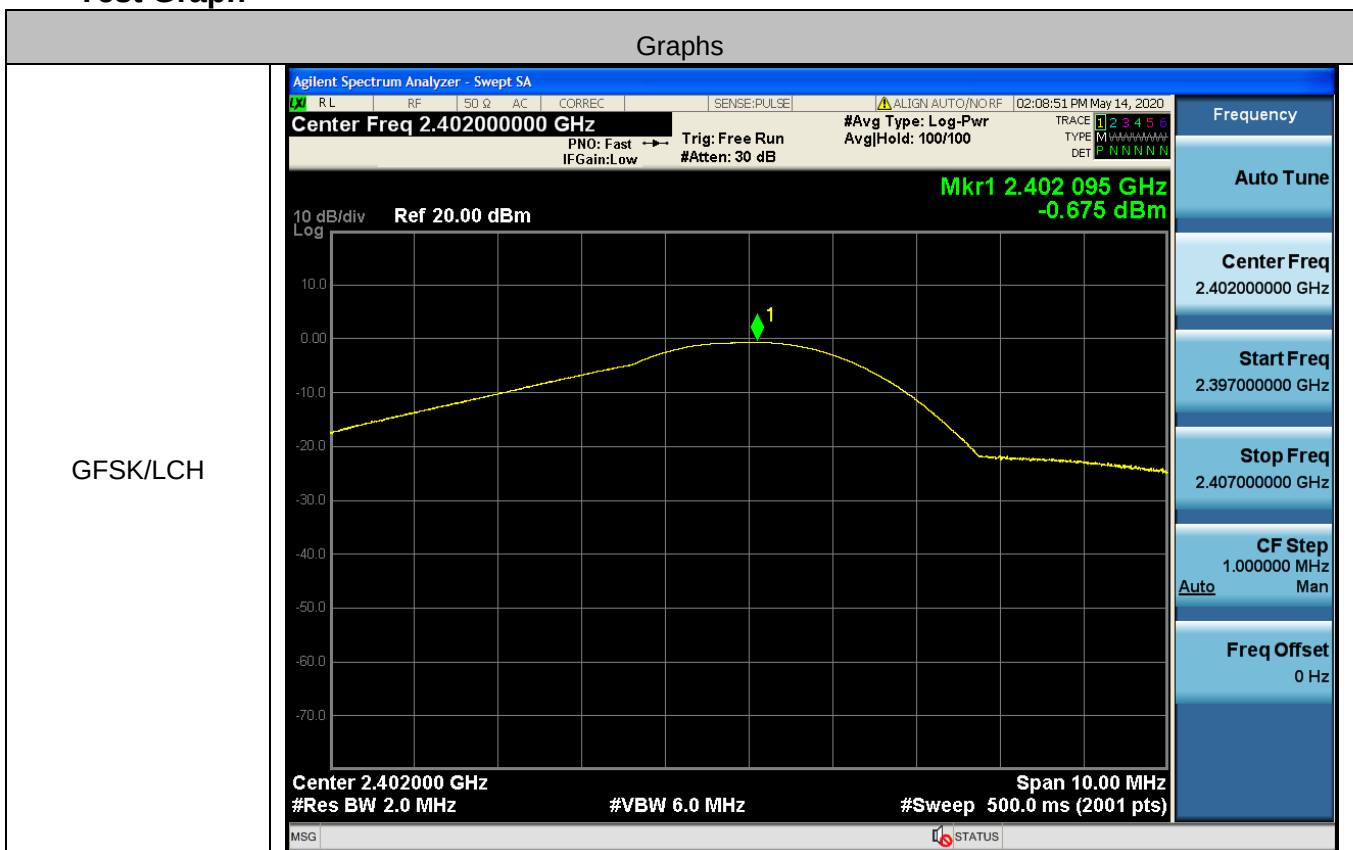
Test Graph



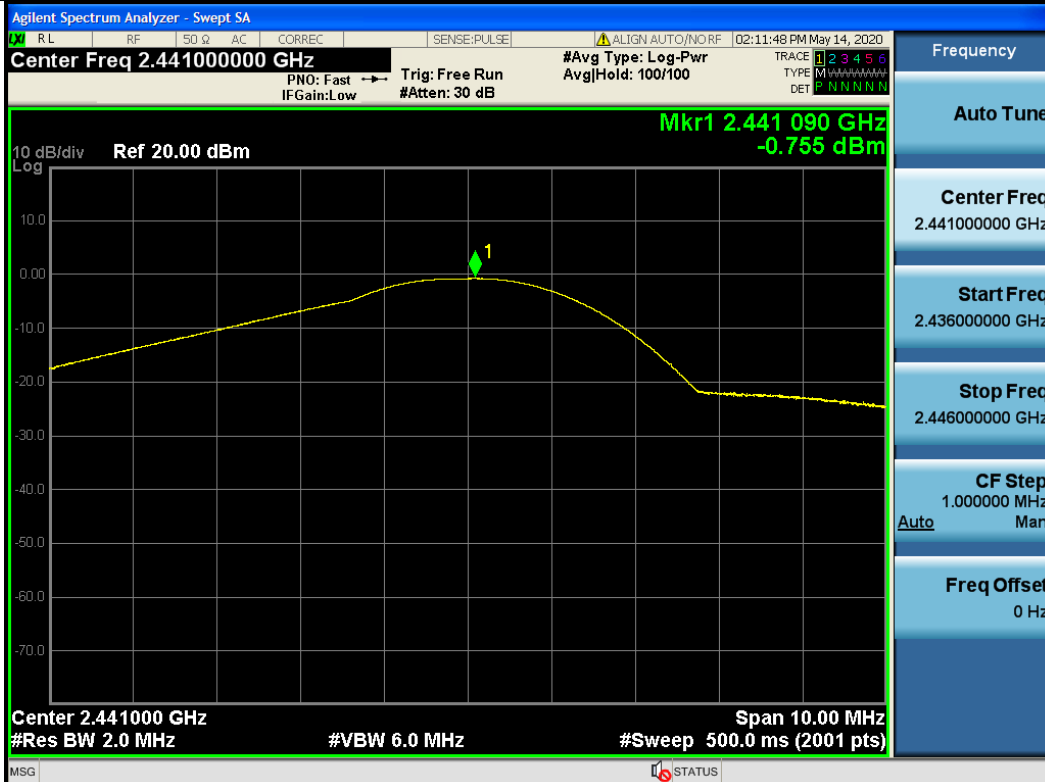
A.5 Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.675	21	PASS
GFSK	MCH	-0.755	21	PASS
GFSK	HCH	-1.201	21	PASS
$\pi/4$ DQPSK	LCH	0.222	21	PASS
$\pi/4$ DQPSK	MCH	0.154	21	PASS
$\pi/4$ DQPSK	HCH	-0.304	21	PASS

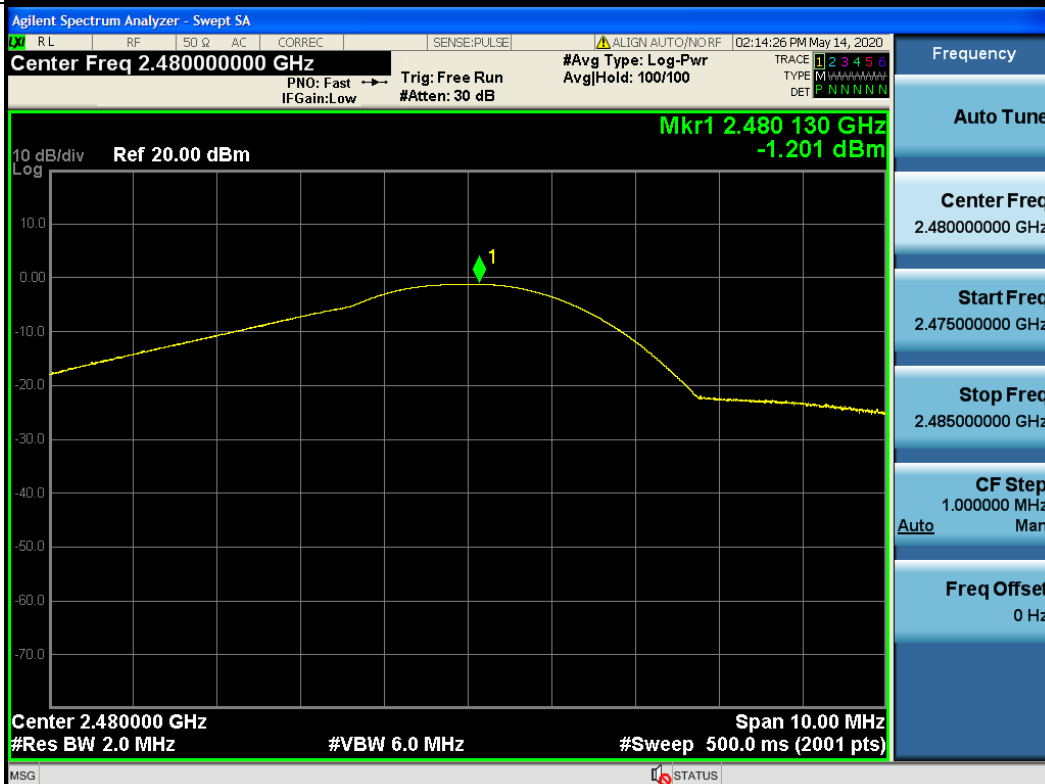
Test Graph

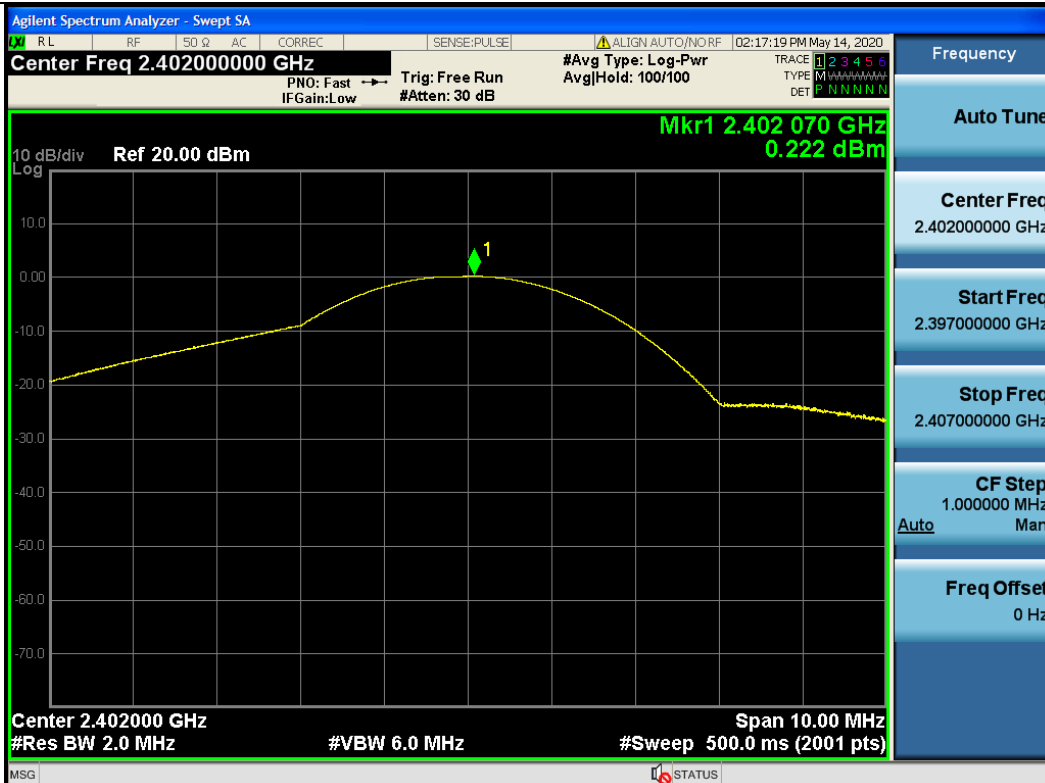


GFSK/MCH



GFSK/HCH



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



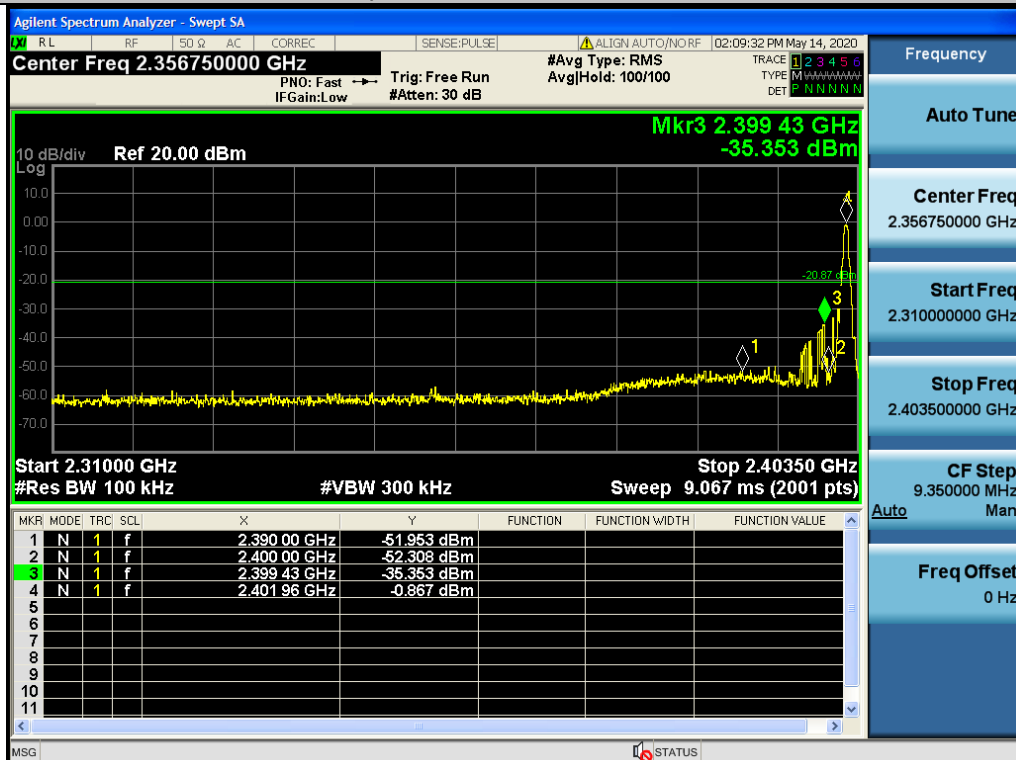
A.6 Band-edge for RF Conducted Emissions

Type	Carrier Frequency(MHz)	Frequency(MHz)	Carrier Frequency Power [dBm]	Bandedge Peak(dBm)	Upper limit(dBm)	Conclusion
1DH5	2402	2399.433	-0.867	-35.353	-20.867	Pass
1DH5	2480	2484.155	-1.707	-48.680	-21.707	Pass
2DH5	2402	2399.526	-1.764	-37.054	-21.764	Pass
2DH5	2480	2483.5	-4.624	-53.412	-24.624	Pass
1DH5-Hopping	2402	2398.47	-0.932	-41.426	-20.932	Pass
1DH5-Hopping	2480	2483.5	-1.114	-52.58	-21.114	Pass
2DH5-Hopping	2402	2399.37	-0.881	-37.687	-20.881	Pass
2DH5-Hopping	2480	2483.5	-1.088	-53.72	-21.088	Pass

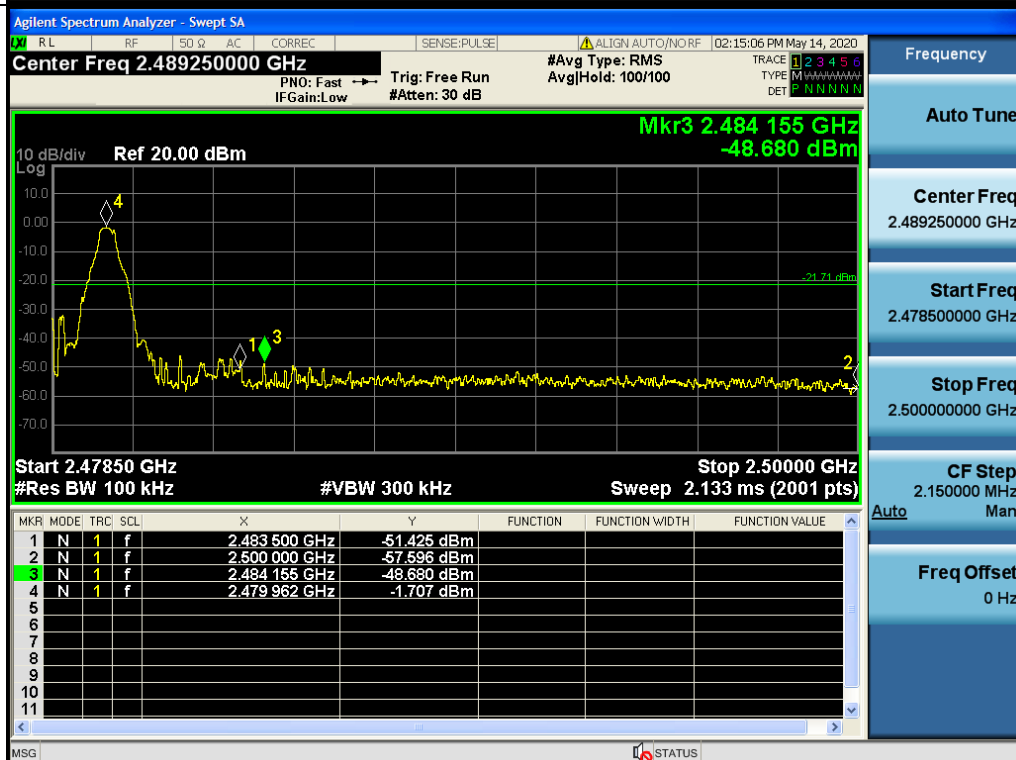
Test Graph

Graphs

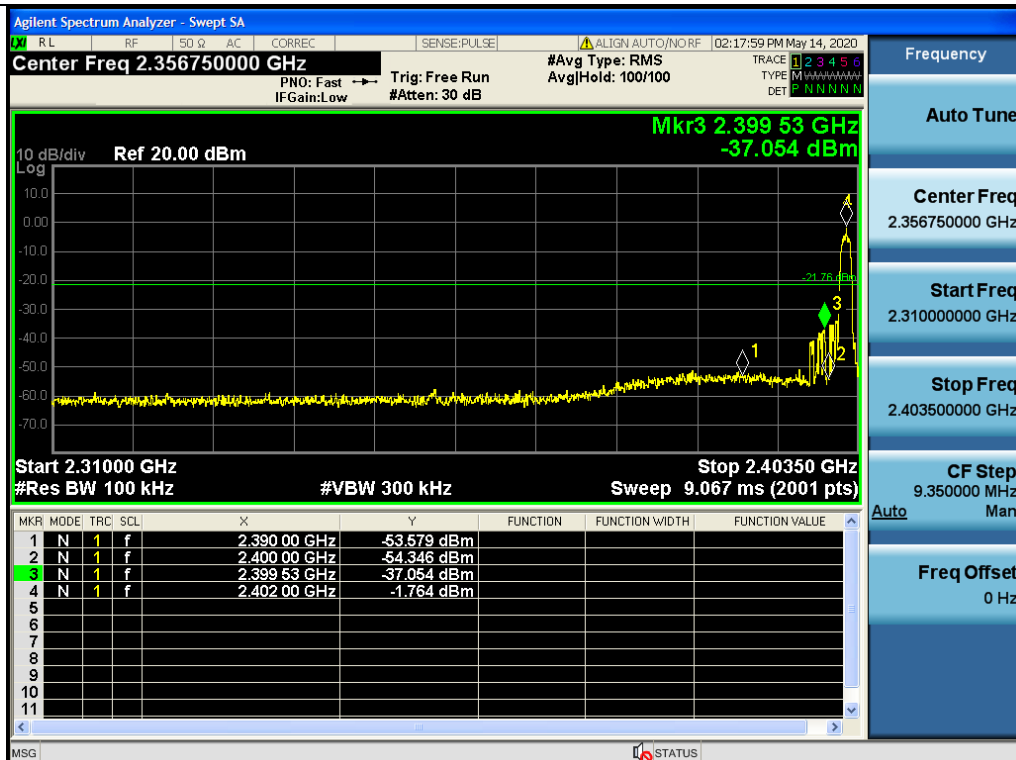
GFSK/LCH/No Hop



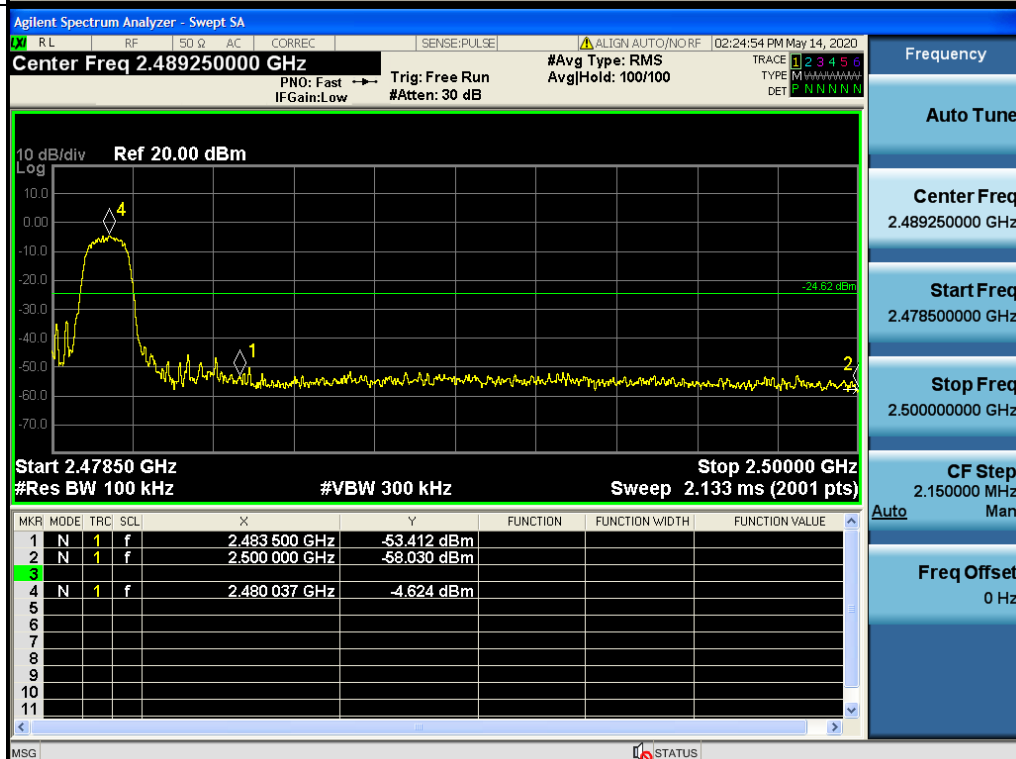
GFSK/HCH/No Hop

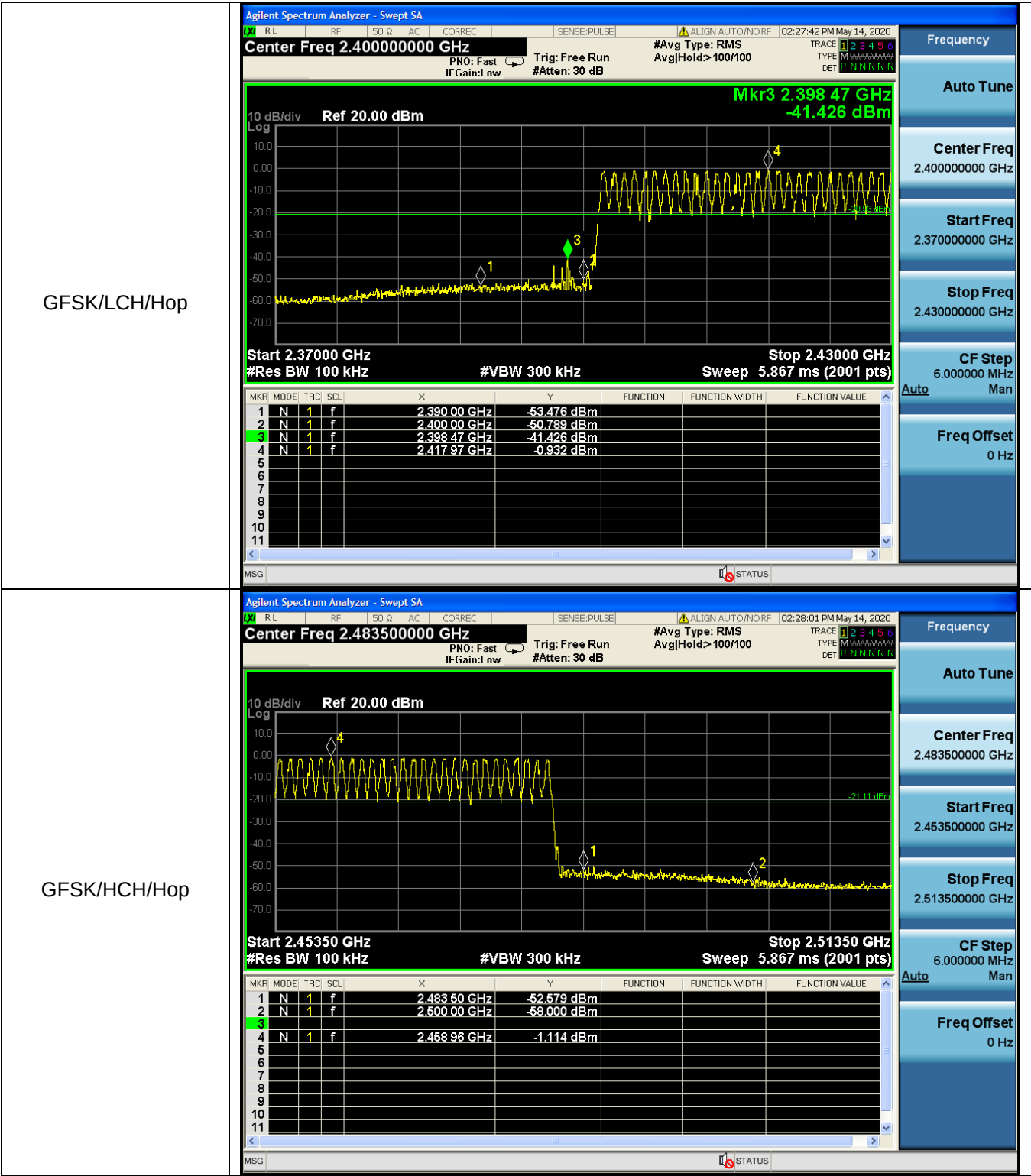


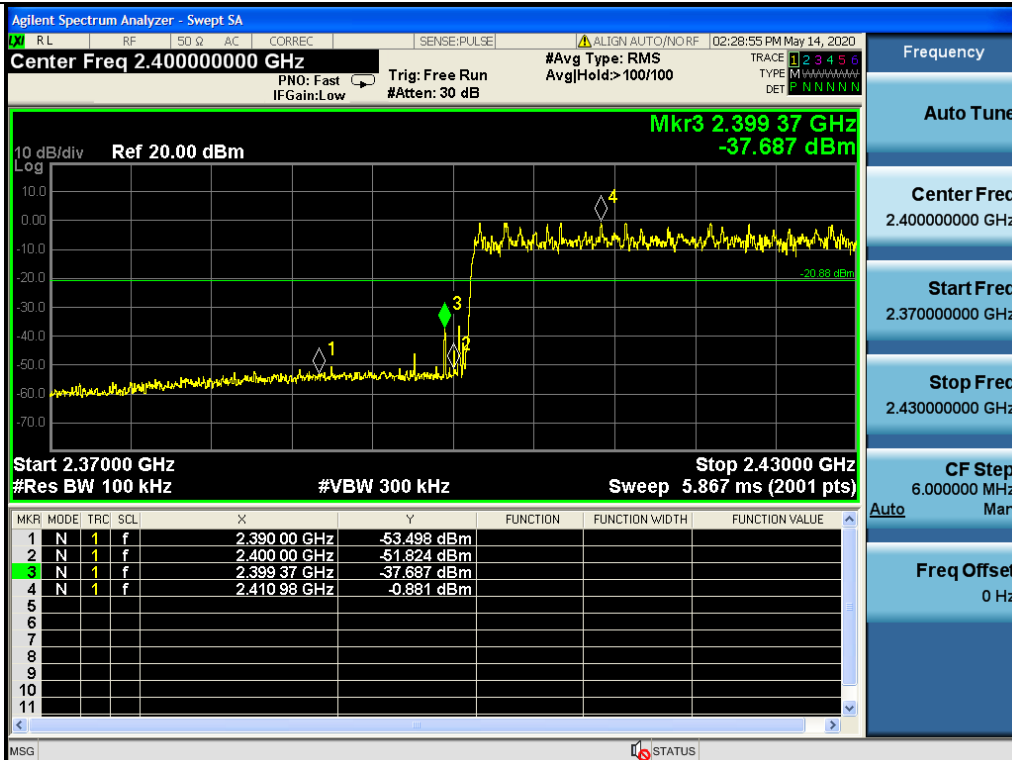
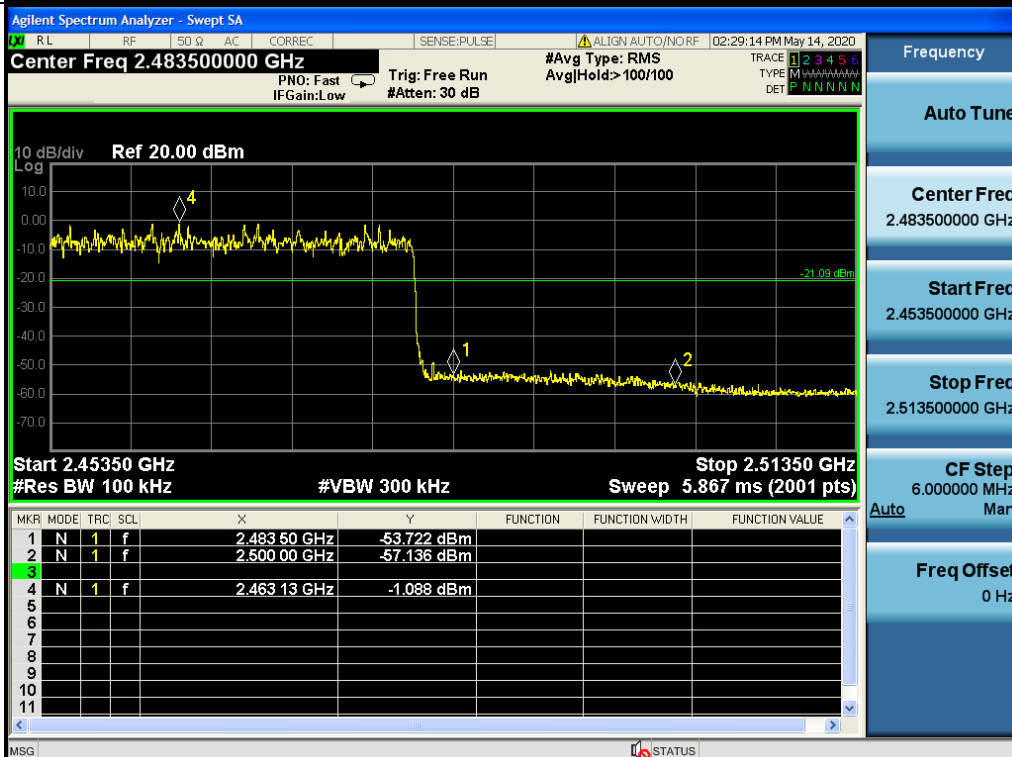
$\pi/4$ DQPSK/LCH/No
Hop



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

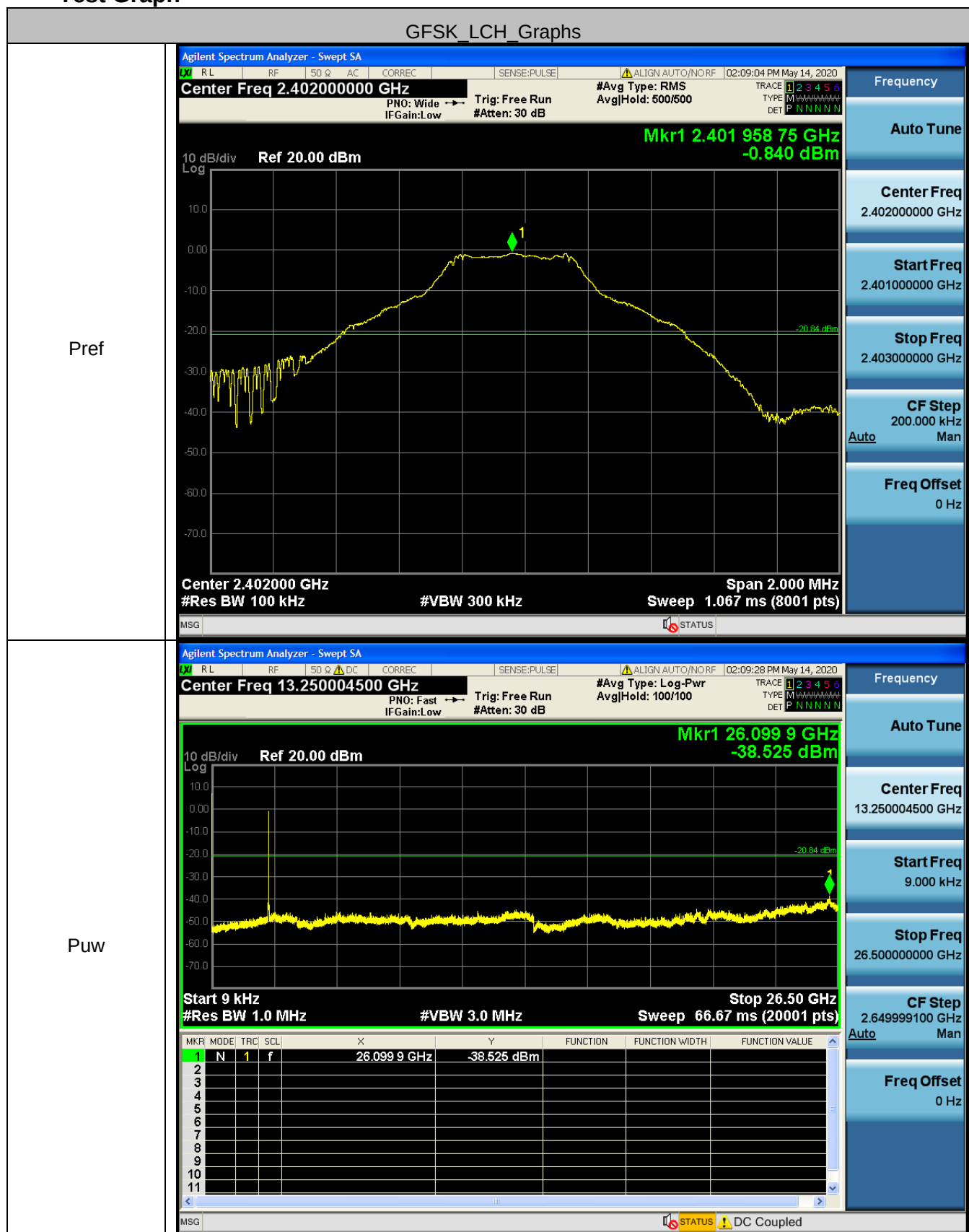




$\pi/4$ DQPSK/LCH/Hop $\pi/4$ DQPSK/HCH/Hop

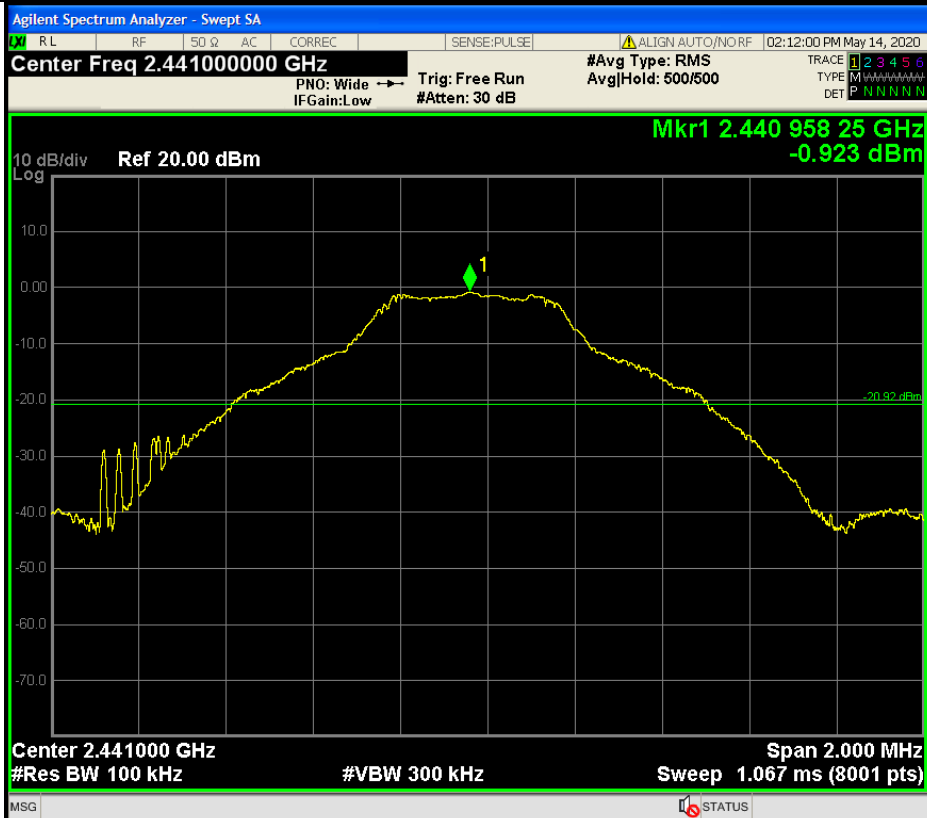
A.7 RF Conducted Spurious Emissions

Test Graph

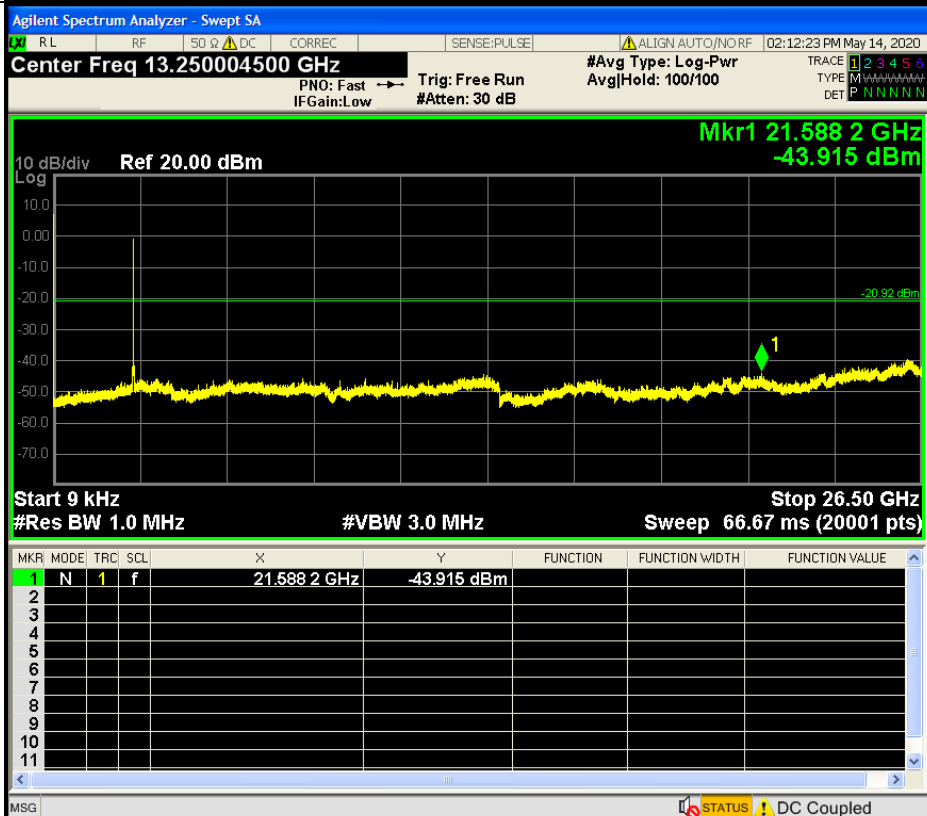


GFSK MCH Graphs

Pref



Puw

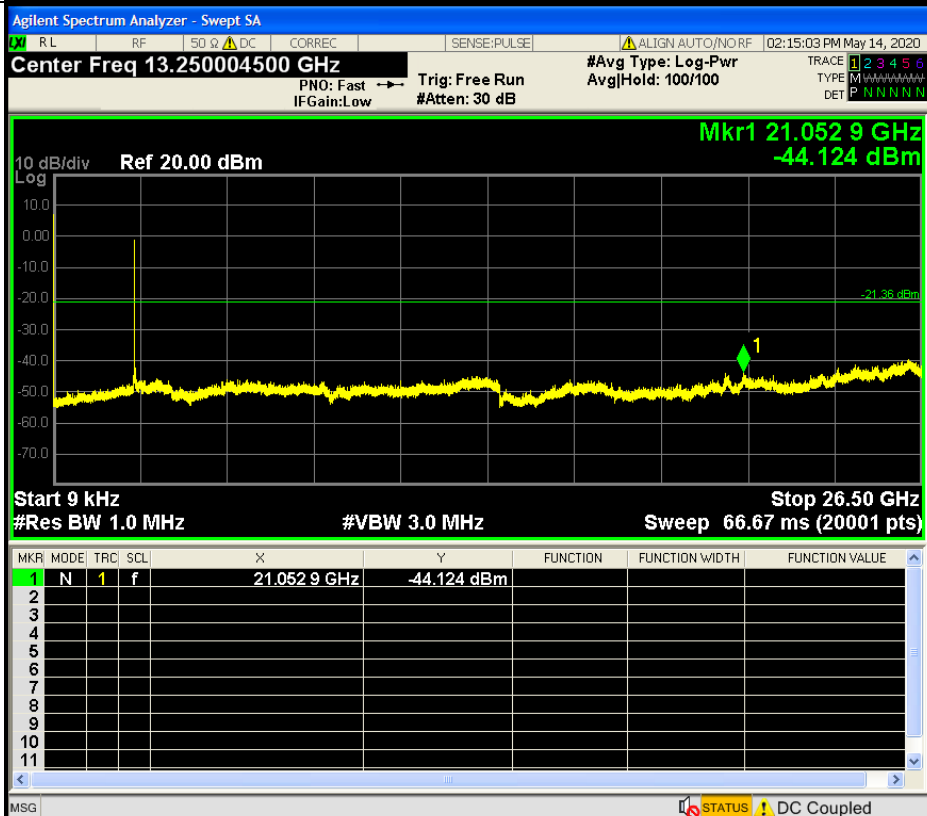


GFSK_HCH_Graphs

Pref

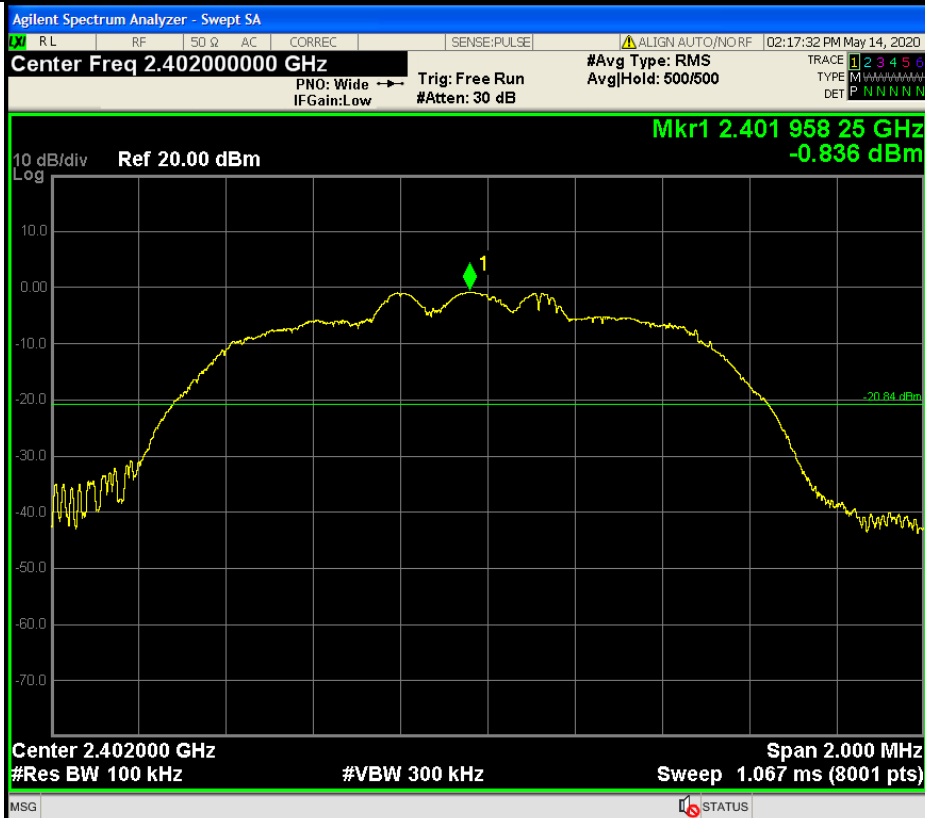


Puw

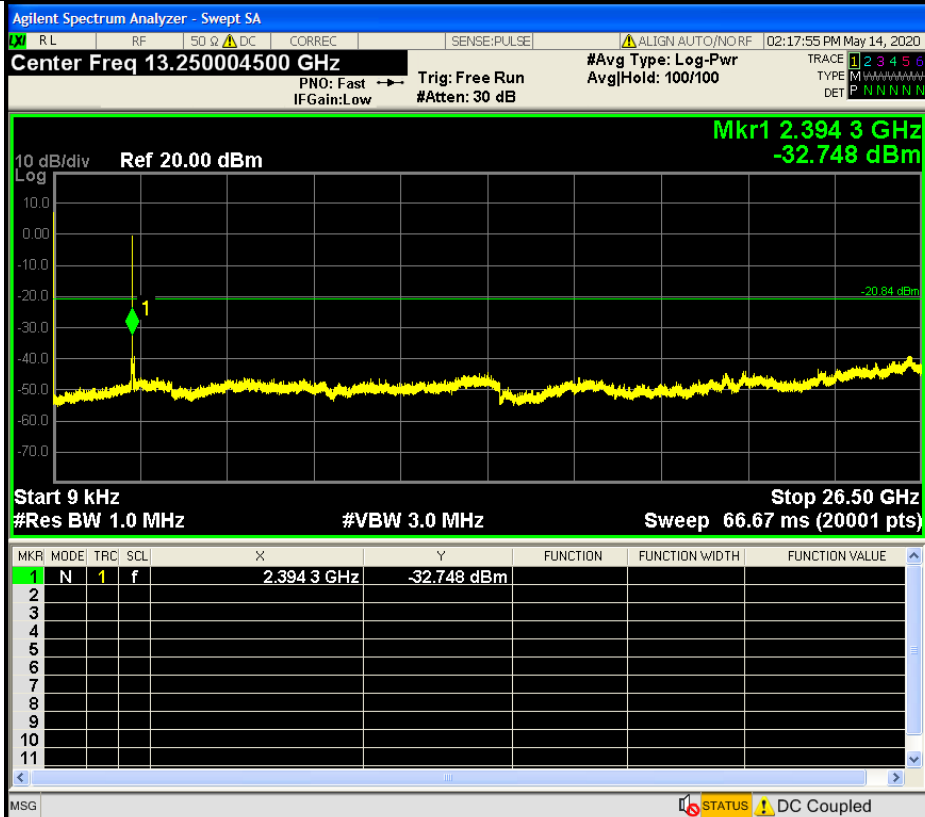


$\pi/4$ DQPSK LCH_Graphs

Pref

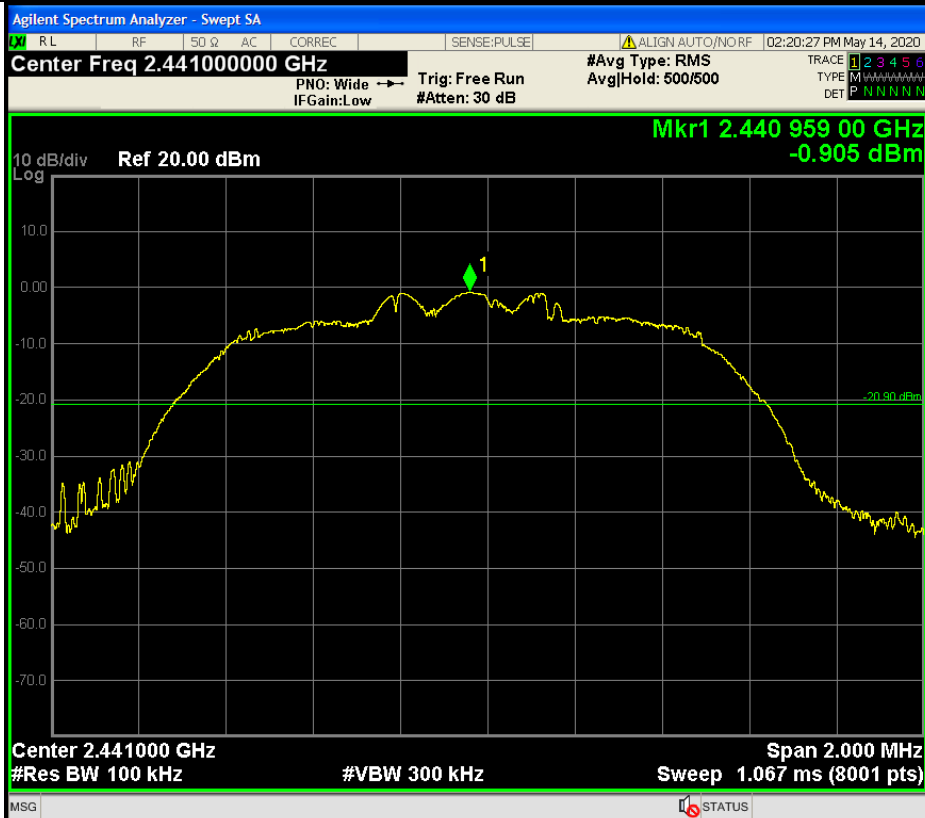


Puw



$\pi/4$ DQPSK MCH Graphs

Pref



Frequency

Auto Tune

Center Freq

2.441000000 GHz

Start Freq

2.440000000 GHz

Stop Freq

2.442000000 GHz

CF Step

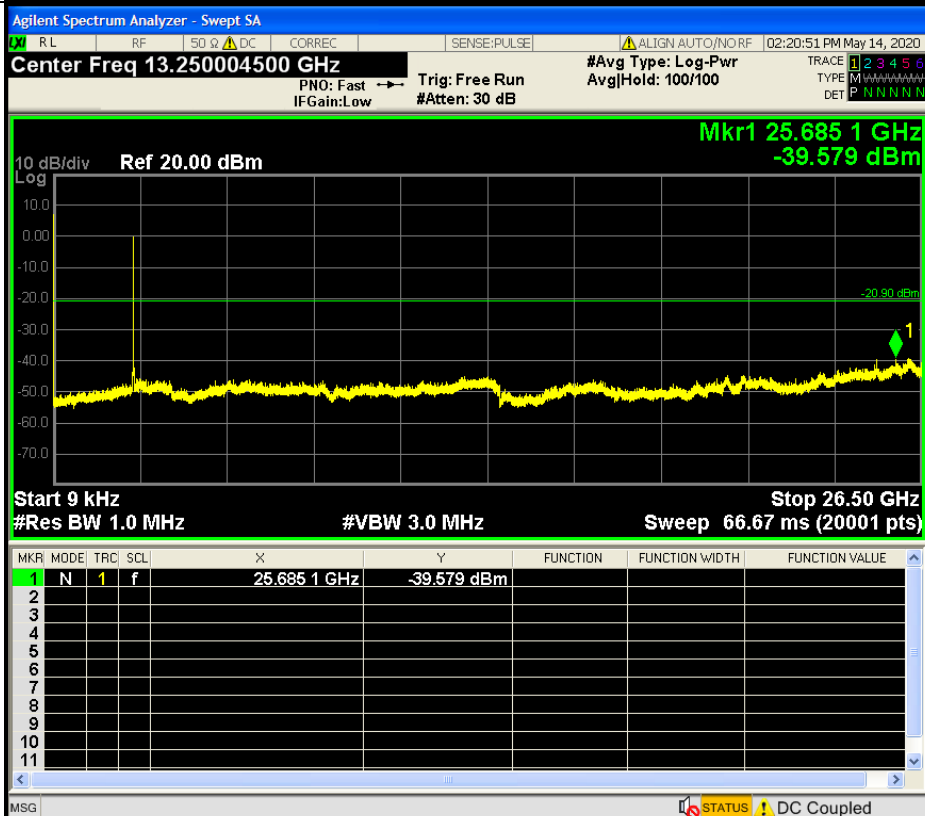
200.000 kHz

Auto

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

Auto

2.649999100 GHz

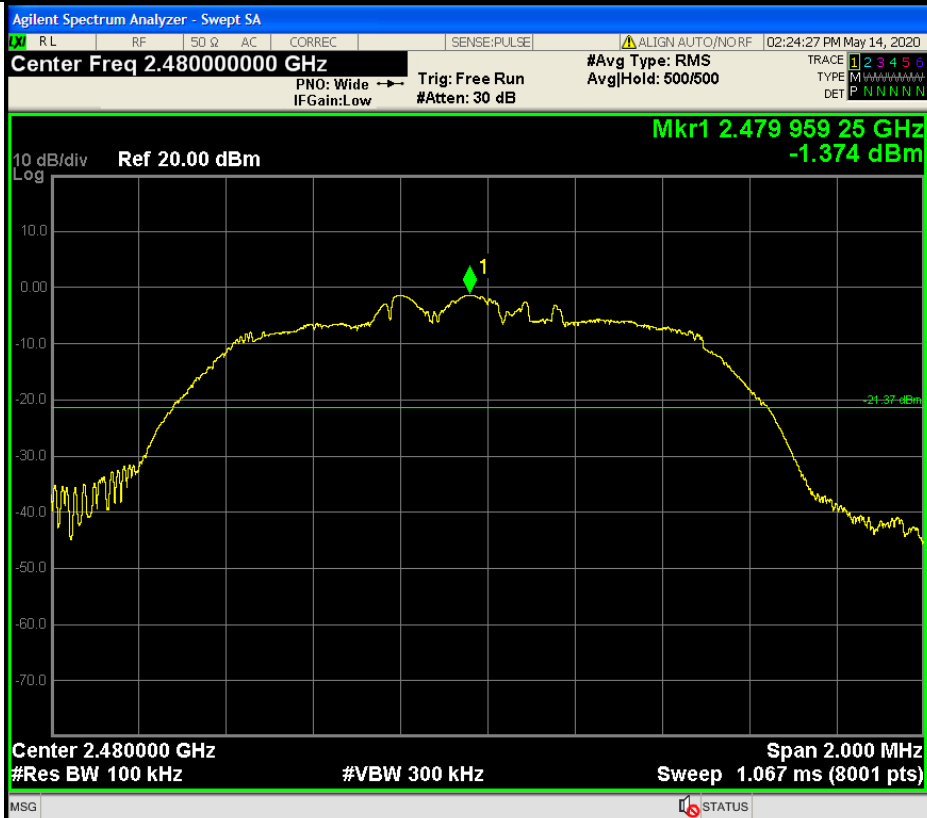
Man

Freq Offset

0 Hz

$\pi/4$ DQPSK HCH Graphs

Pref

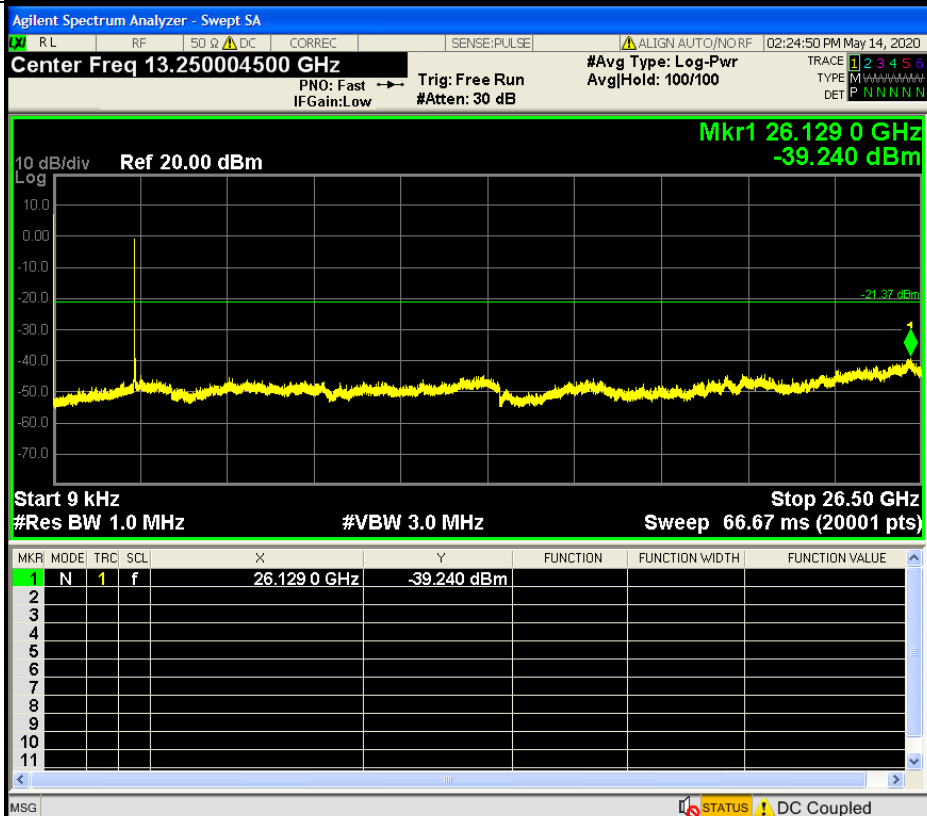


Frequency

Auto Tune

Center Freq
2.480000000 GHzStart Freq
2.479000000 GHzStop Freq
2.481000000 GHzCF Step
200.000 kHz
Auto ManFreq Offset
0 Hz

Puw



Frequency

Auto Tune

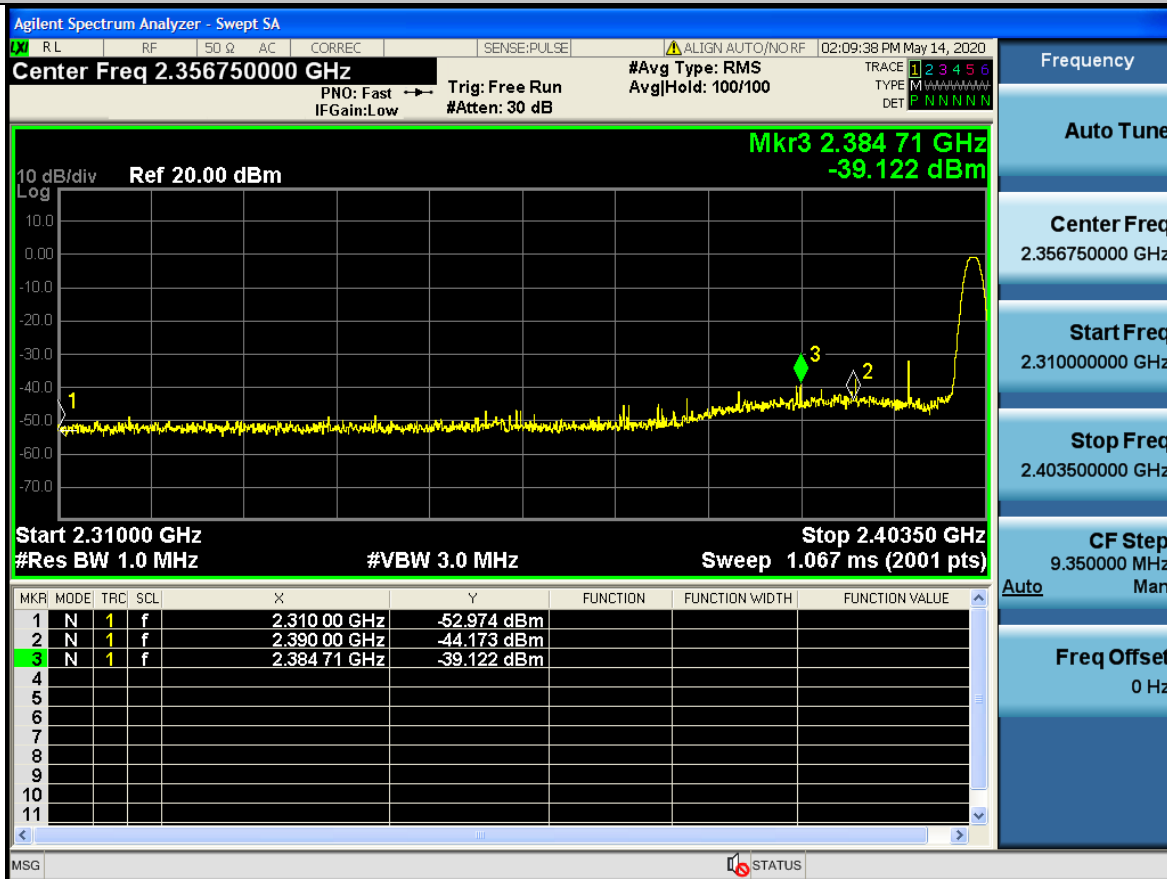
Center Freq
13.250004500 GHzStart Freq
9.000 kHzStop Freq
26.500000000 GHzCF Step
2.649999100 GHz
Auto ManFreq Offset
0 Hz

A.8 Restrict-band band-edge measurements

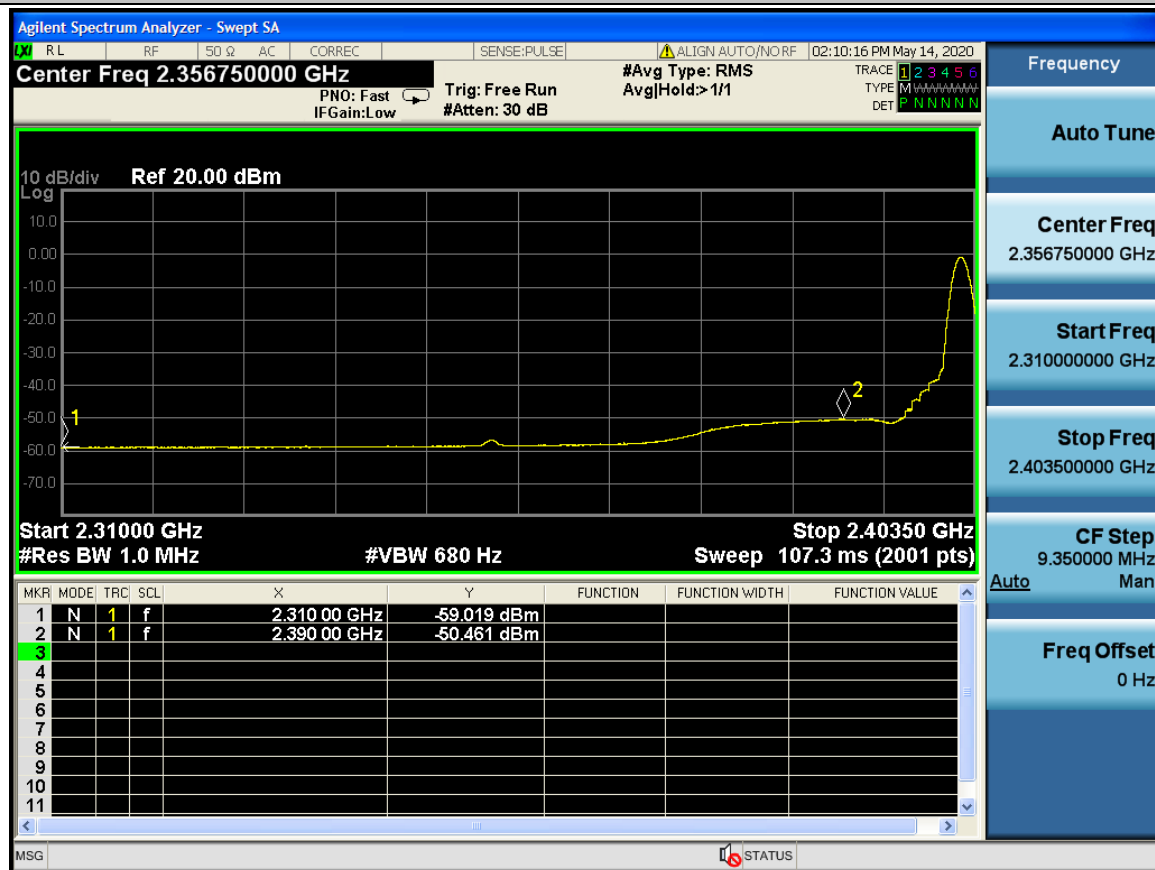
Type	Carrier Frequency (MHz)	Frequency(M Hz)	Gain	Ground Factor	Peak Value(dBm)	E [dBuV/m]	Limit [dBuV/m]	Conclusion
1DH5	2402	2384.707	2.00	0.00	-39.122	58.078	74	Pass
1DH5	2480	2483.854	2.00	0.00	-28.963	68.237	74	Pass
2DH5	2402	2388.026	2.00	0.00	-39.797	57.403	74	Pass
2DH5	2480	2484.574	2.00	0.00	-33.012	64.188	74	Pass

Type	Carrier Frequency (MHz)	Frequency(M Hz)	Gain	Ground Factor	Average Value(dBm)	E [dBuV/m]	Limit [dBuV/m]	Conclusion
1DH5	2402	2384.707	2.00	0.00	-50.461	46.739	54	Pass
1DH5	2480	2483.854	2.00	0.00	-48.860	48.34	54	Pass
2DH5	2402	2388.026	2.00	0.00	-50.529	46.66	54	Pass
2DH5	2480	2484.574	2.00	0.00	-49.702	47.498	54	Pass

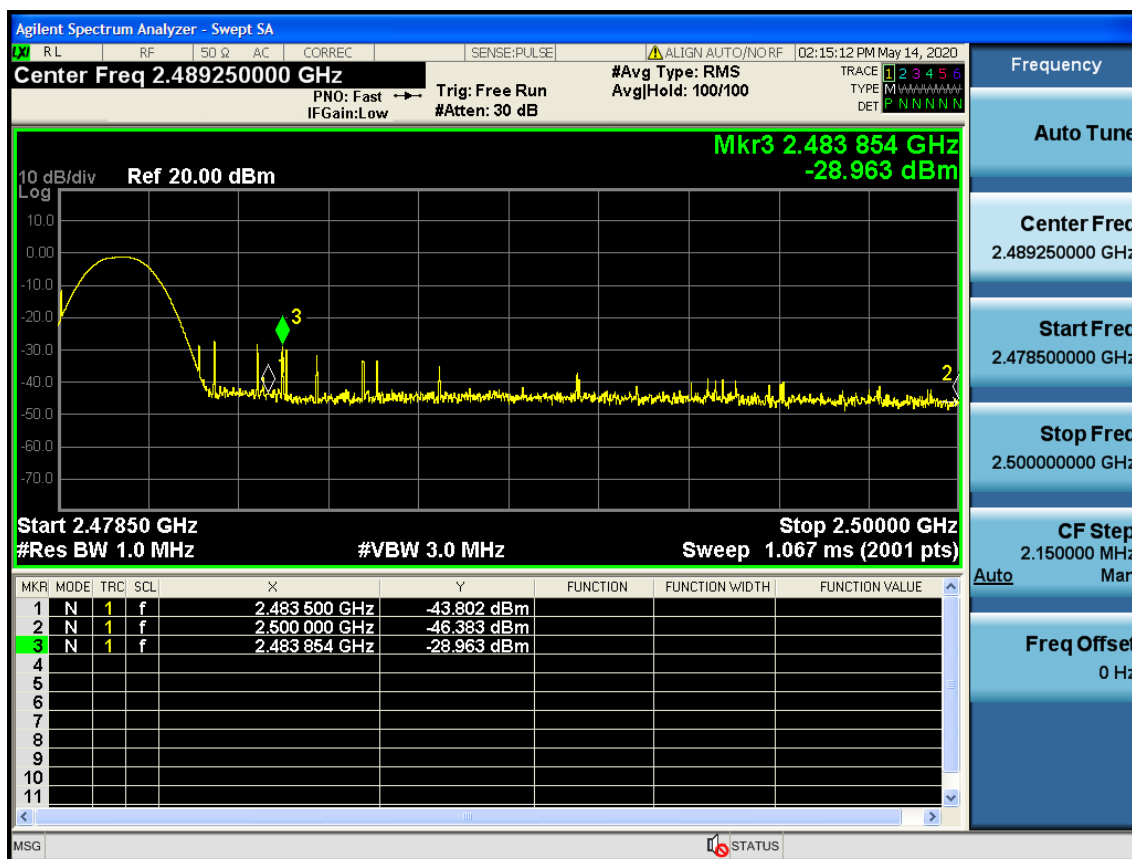
Restrict-band band-edge measurements_2402_PEAK_DH5



Restrict-band band-edge measurements_2402_AV_DH5



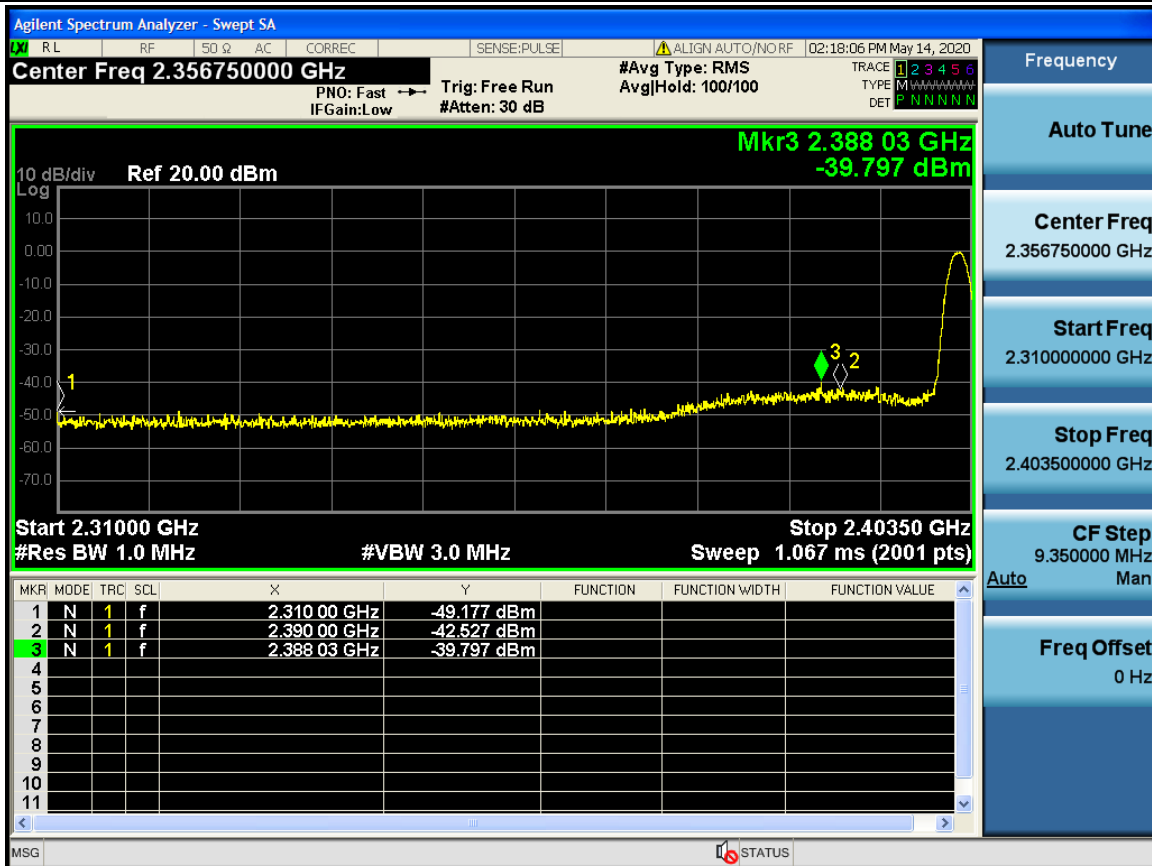
Restrict-band band-edge measurements_2480_PEAK_DH5



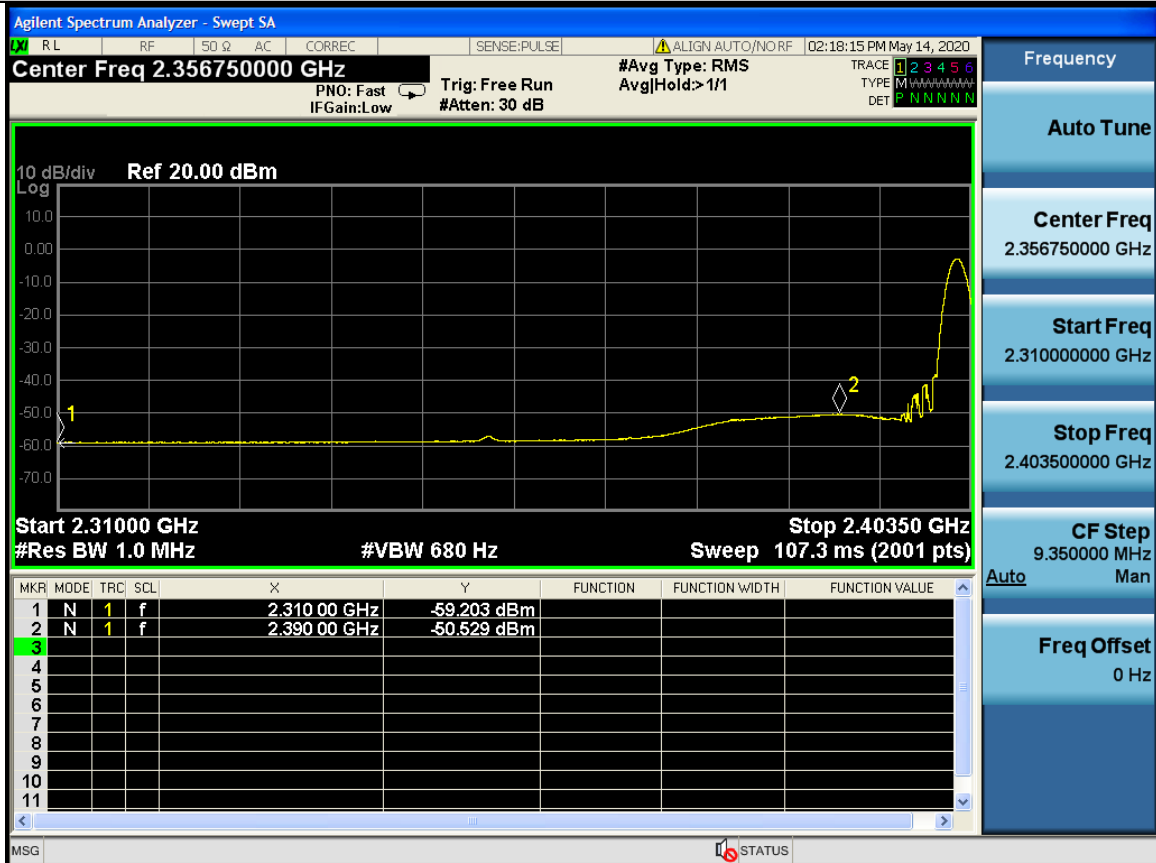
Restrict-band band-edge measurements_2480_AV_DH5



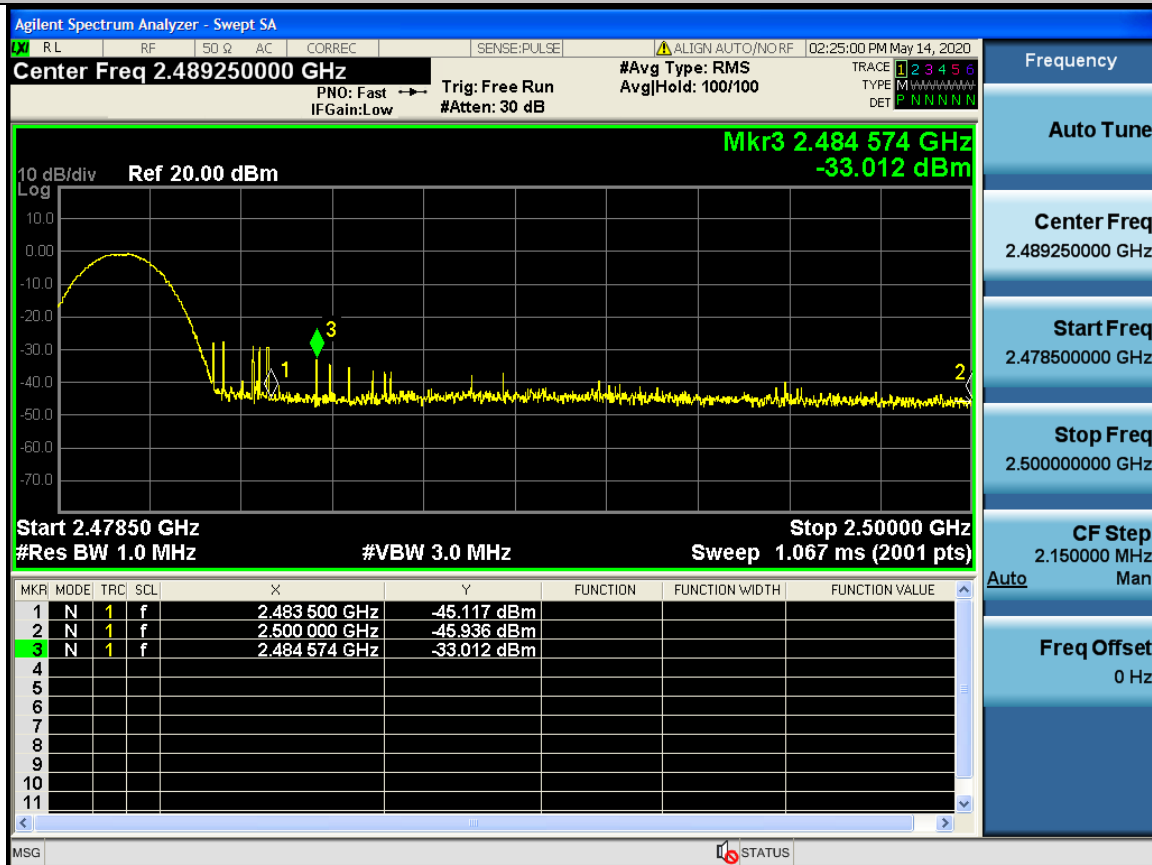
Restrict-band band-edge measurements_2402_PEAK_2DH5



Restrict-band band-edge measurements_2402_AV_2DH5



Restrict-band band-edge measurements_2480_PEAK_2DH5



Restrict-band band-edge measurements_2480_AV_2DH5

