

Appendix A

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

Product Name: TRUE WIRELESS EARBUDS WITH CHARGING CASE

Trade Mark: N/A

Test Model: CP-TW03

FCC ID: 2AUDSCP-TW03

Environmental Conditions

Temperature:	22.7° C
Relative Humidity:	50%
ATM Pressure:	100.0 kPa
Test Engineer:	Gary Qian
Supervised by:	Eden Hu

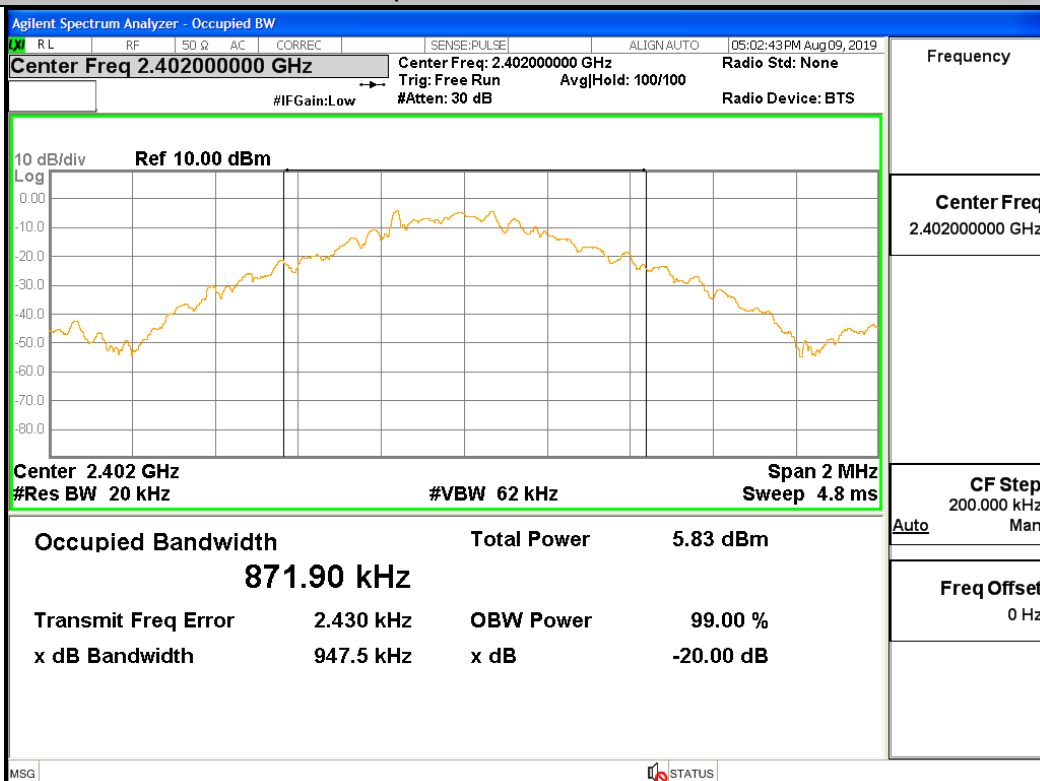
A.1 20 dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit(MHz)	Verdict
GFSK	LCH	0.948	Not Specified	PASS
GFSK	MCH	0.938	Not Specified	PASS
GFSK	HCH	0.943	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.320	Not Specified	PASS
$\pi/4$ DQPSK	MCH	1.309	Not Specified	PASS
$\pi/4$ DQPSK	HCH	1.303	Not Specified	PASS
8DPSK	LCH	1.301	Not Specified	PASS
8DPSK	MCH	1.297	Not Specified	PASS
8DPSK	HCH	1.261	Not Specified	PASS

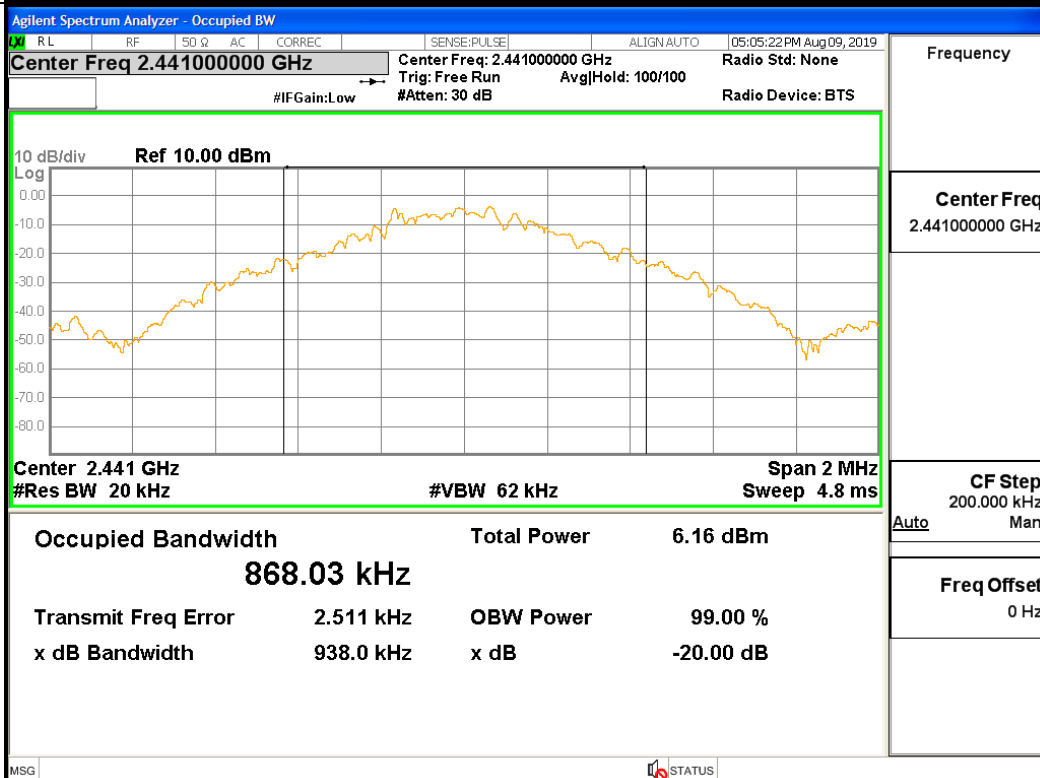
Test Graph

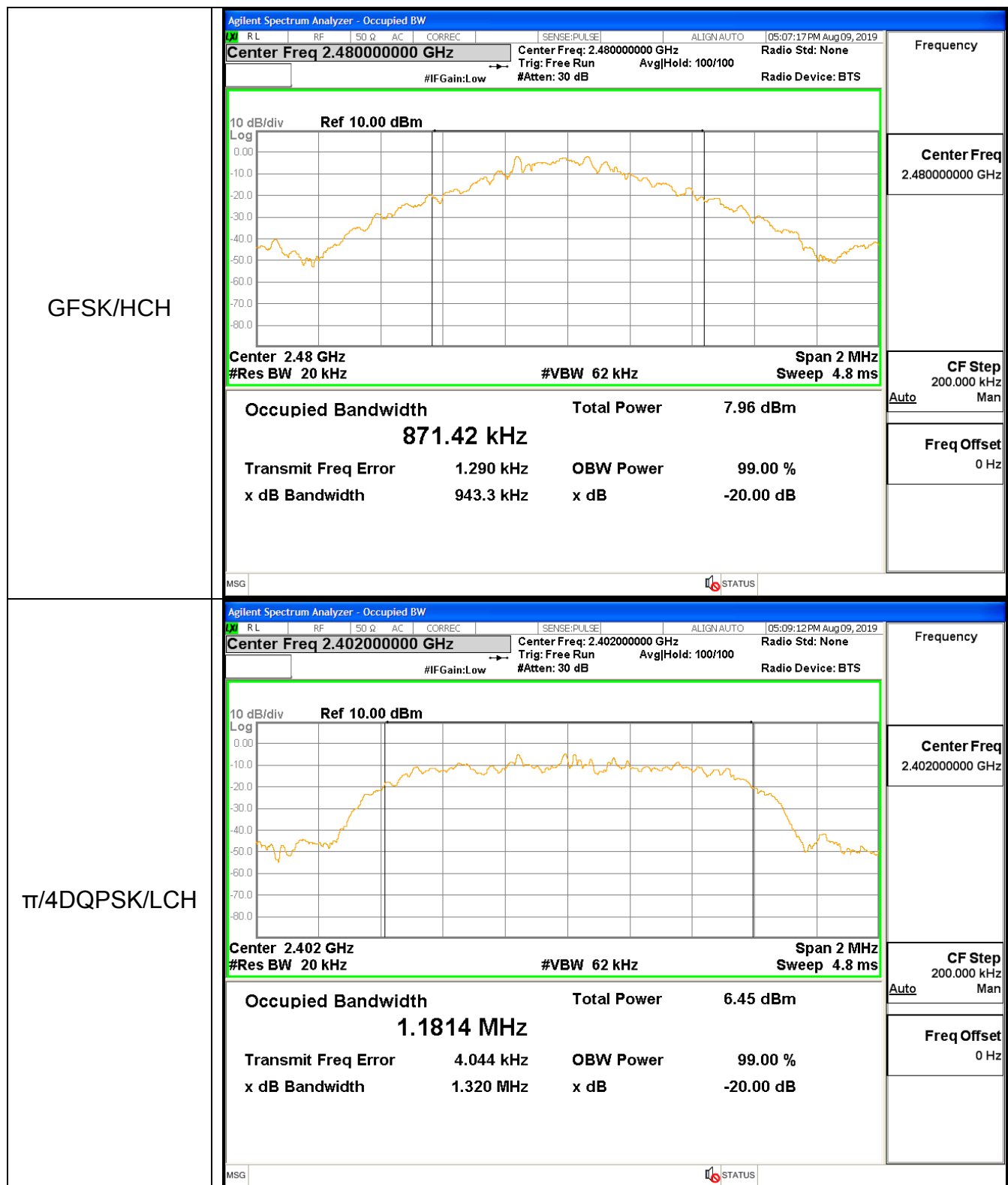
Graphs

GFSK/LCH



GFSK/MCH

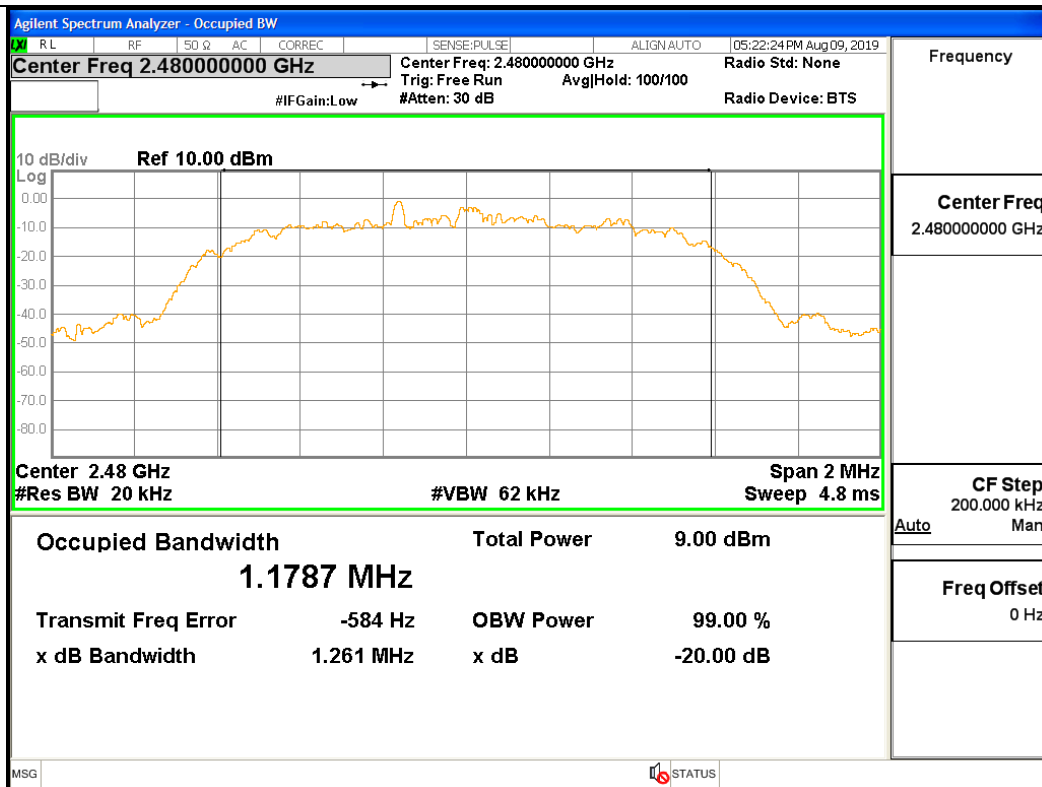








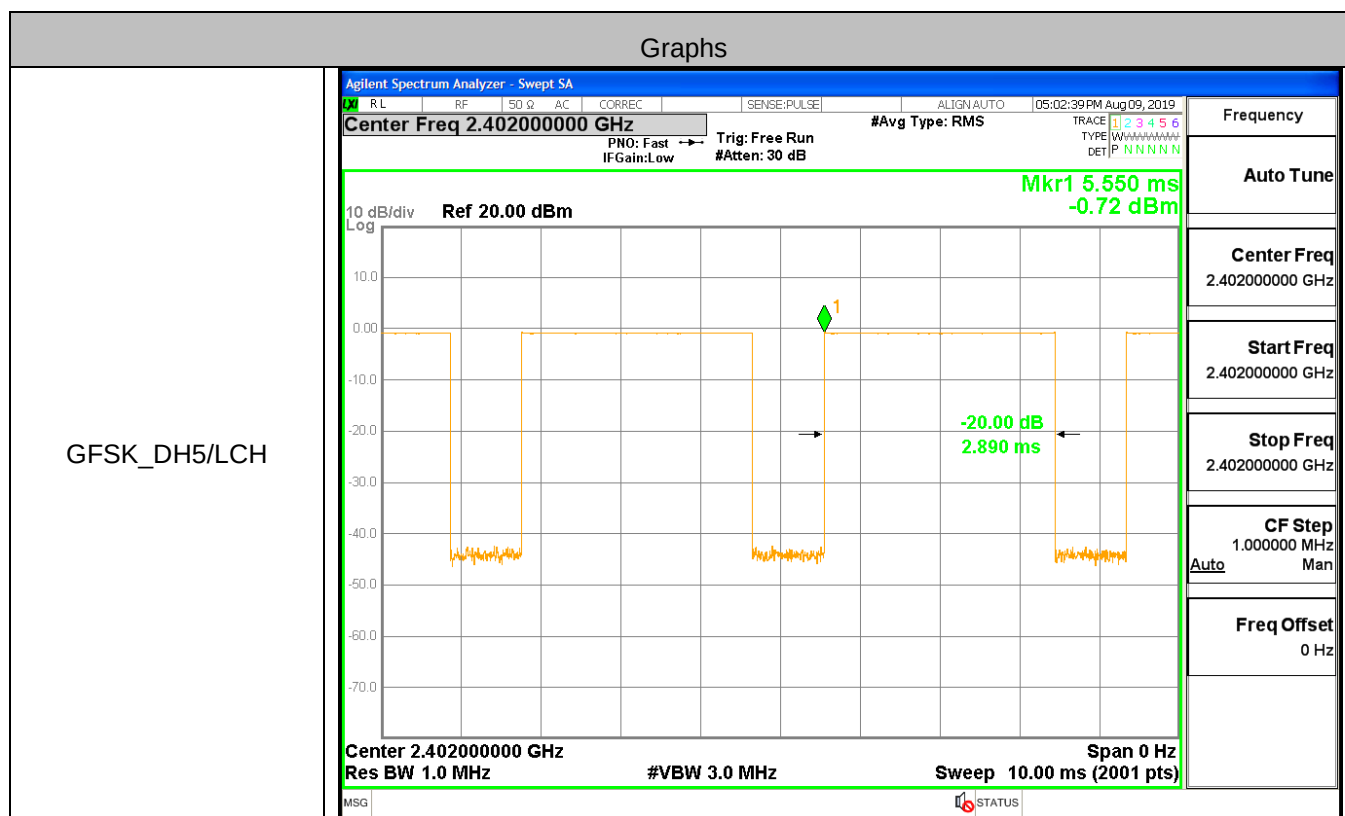
8DPSK/HCH

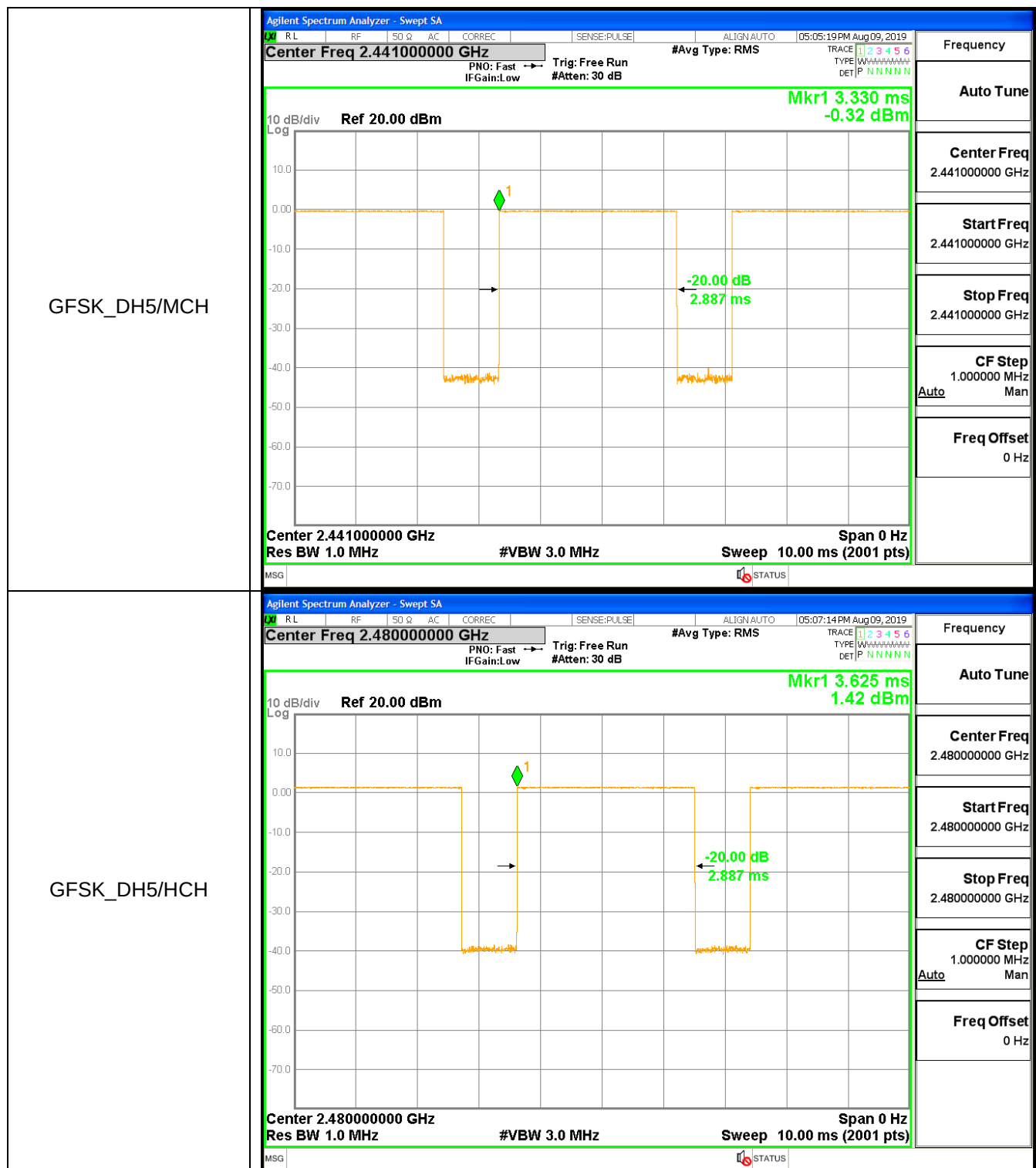


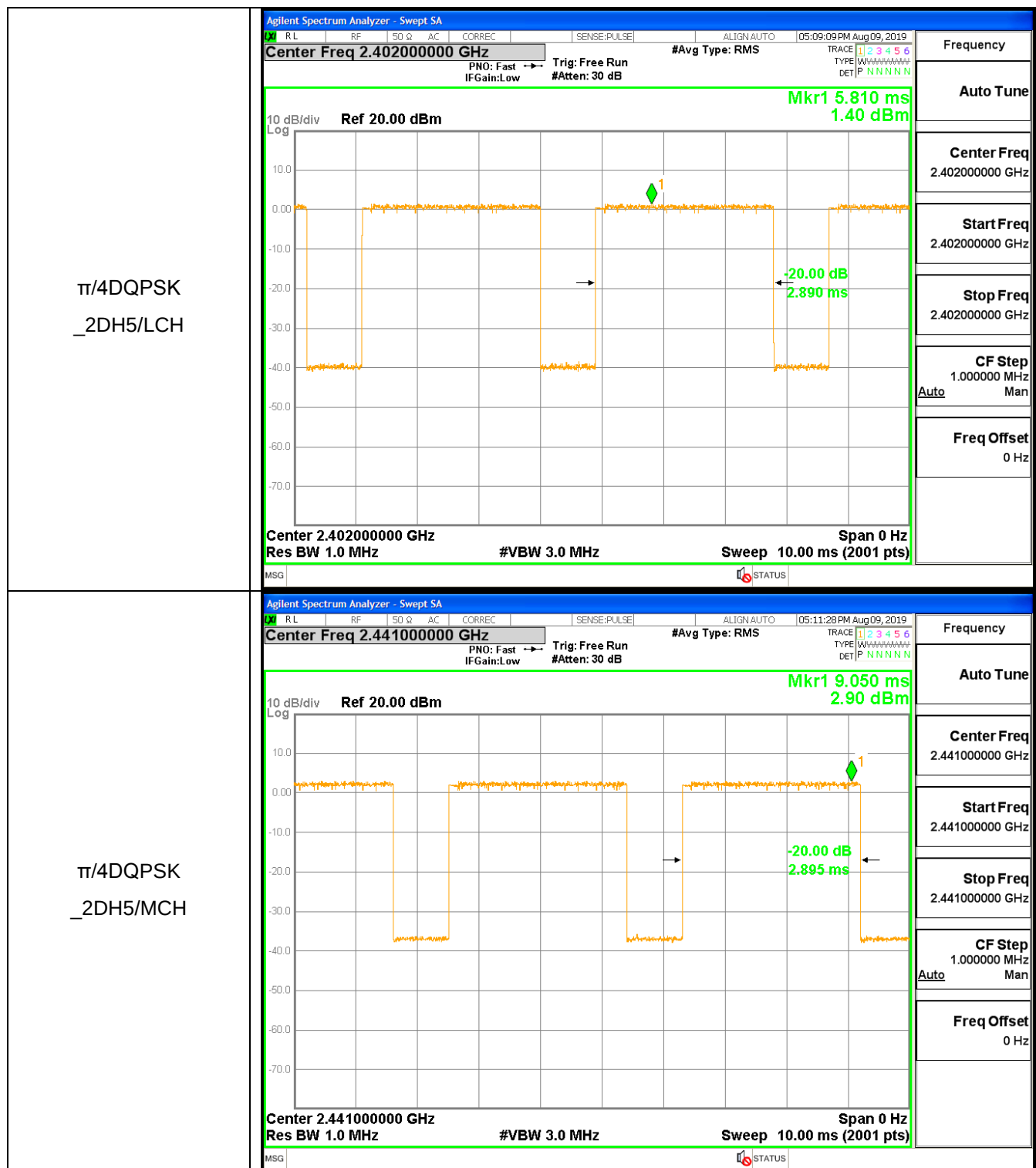
A.2 Dwell Time

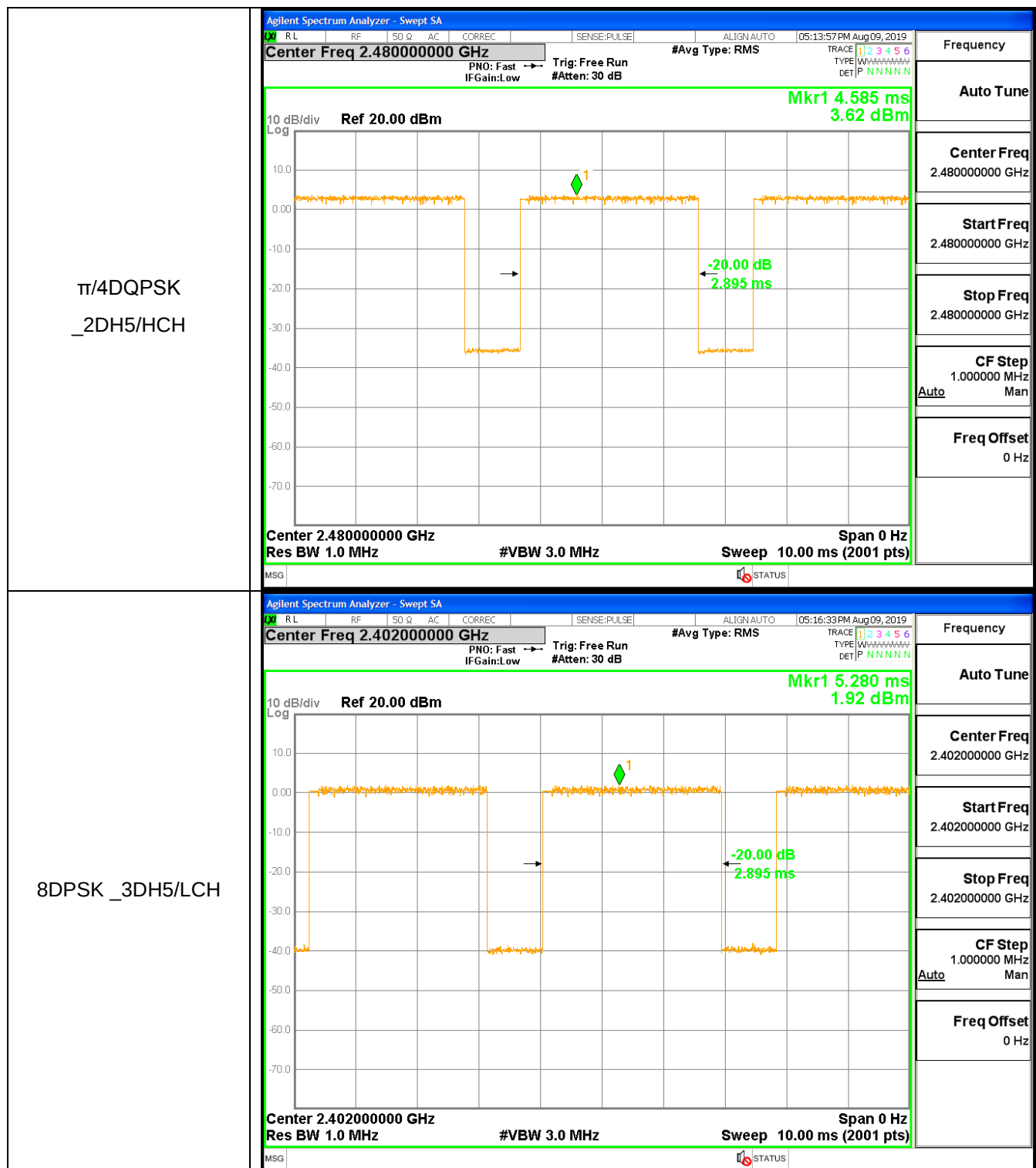
Mode	Packet	Channel	Burst Width [s/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	0.002890	106.7	0.308316	0.4	PASS
GFSK	DH5	MCH	0.002887	106.7	0.308014	0.4	PASS
GFSK	DH5	HCH	0.002887	106.7	0.308030	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	0.002890	106.7	0.308377	0.4	PASS
$\pi/4$ DQPSK	2DH5	MCH	0.002895	106.7	0.308869	0.4	PASS
$\pi/4$ DQPSK	2DH5	HCH	0.002895	106.7	0.308884	0.4	PASS
8DPSK	3DH5	LCH	0.002895	106.7	0.308849	0.4	PASS
8DPSK	3DH5	MCH	0.002895	106.7	0.308901	0.4	PASS
8DPSK	3DH5	HCH	0.002894	106.7	0.308835	0.4	PASS

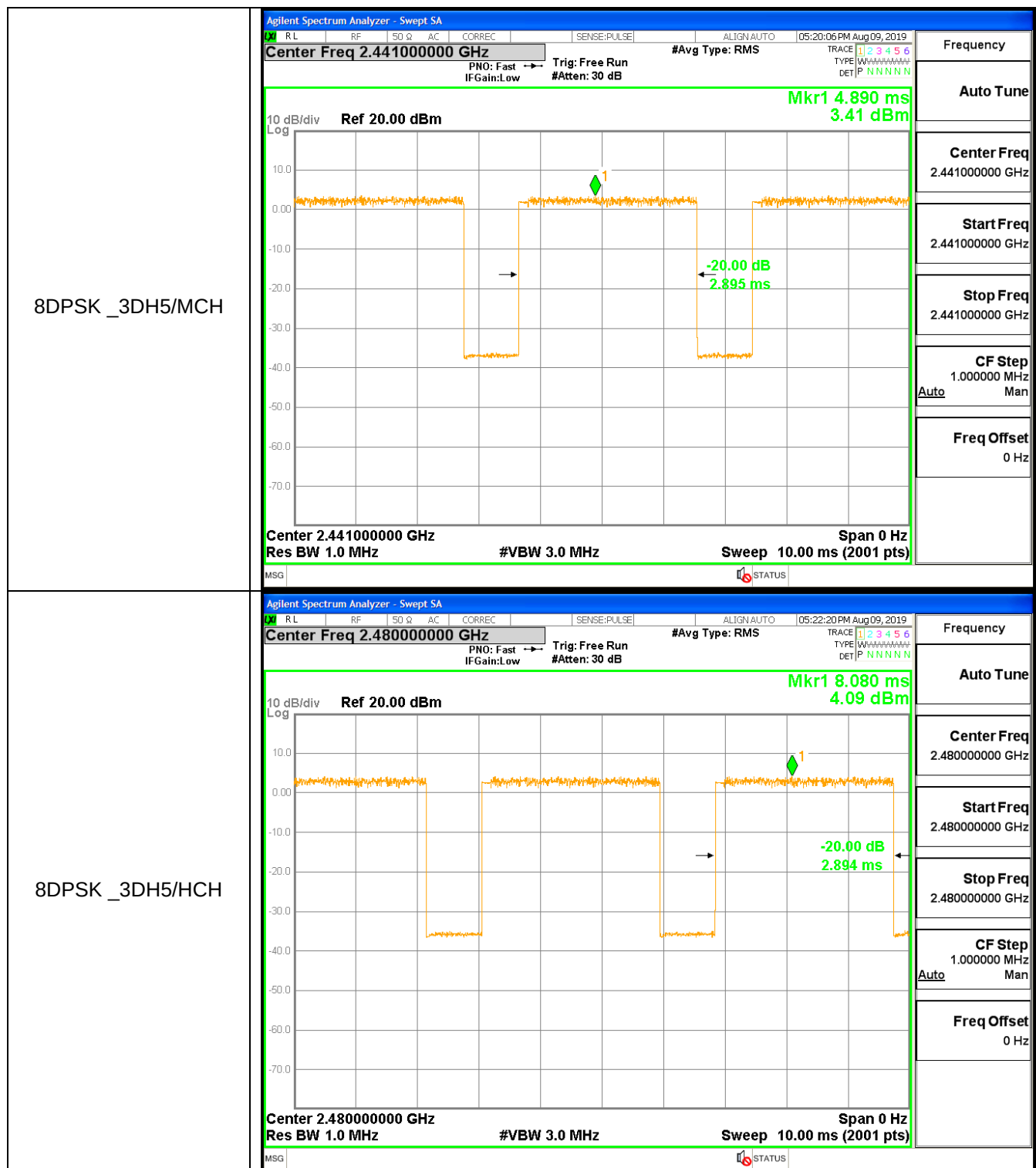
Test Graph







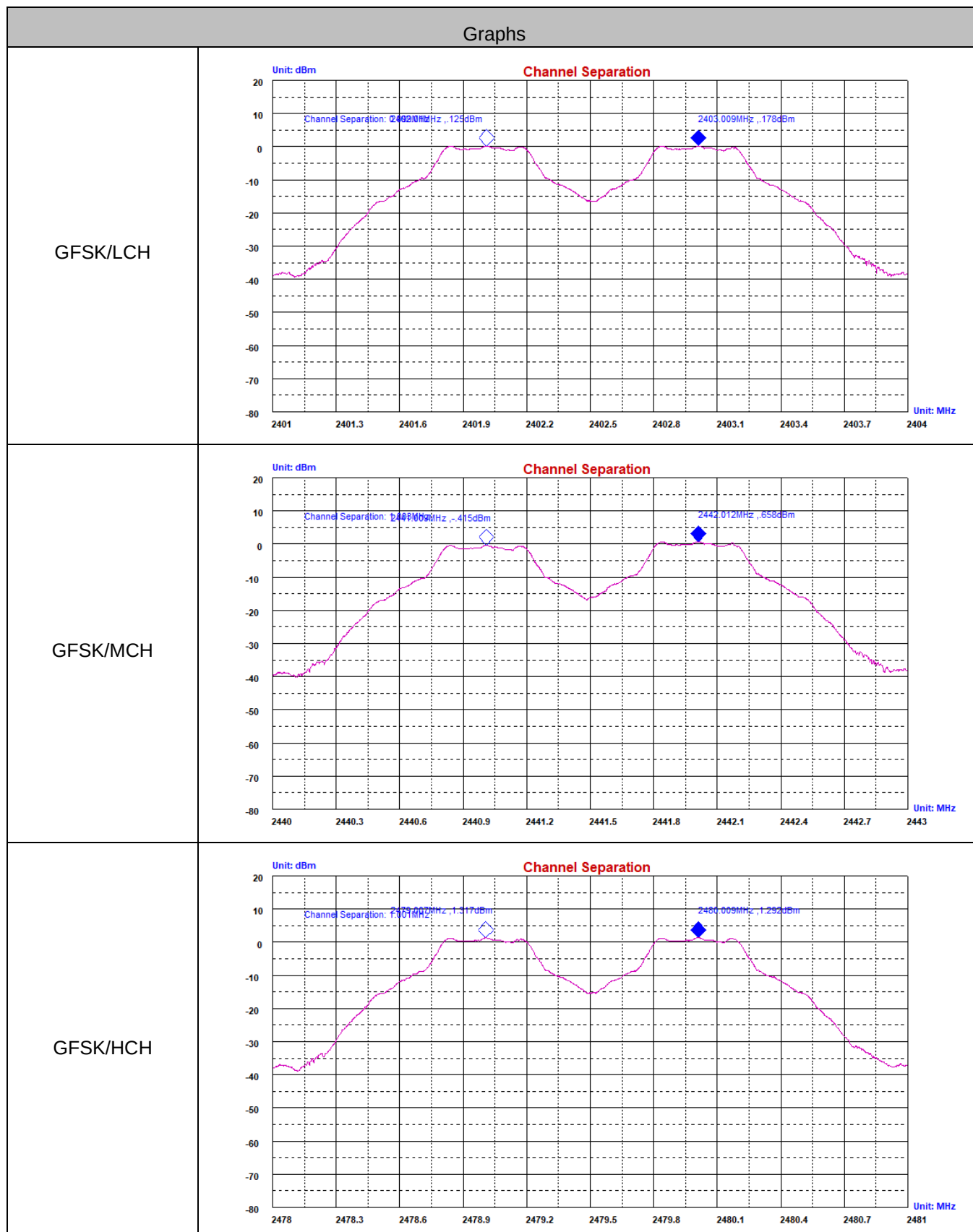


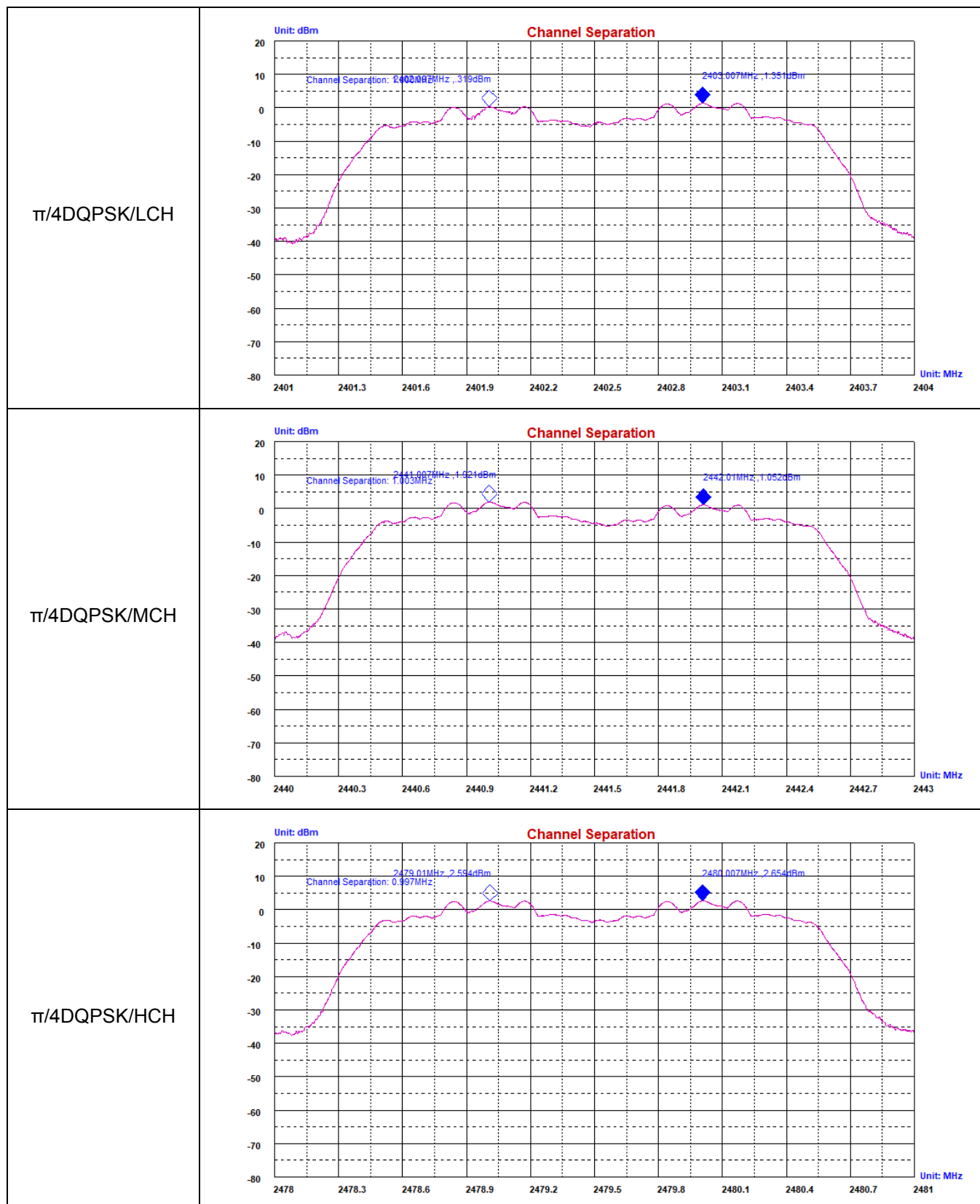


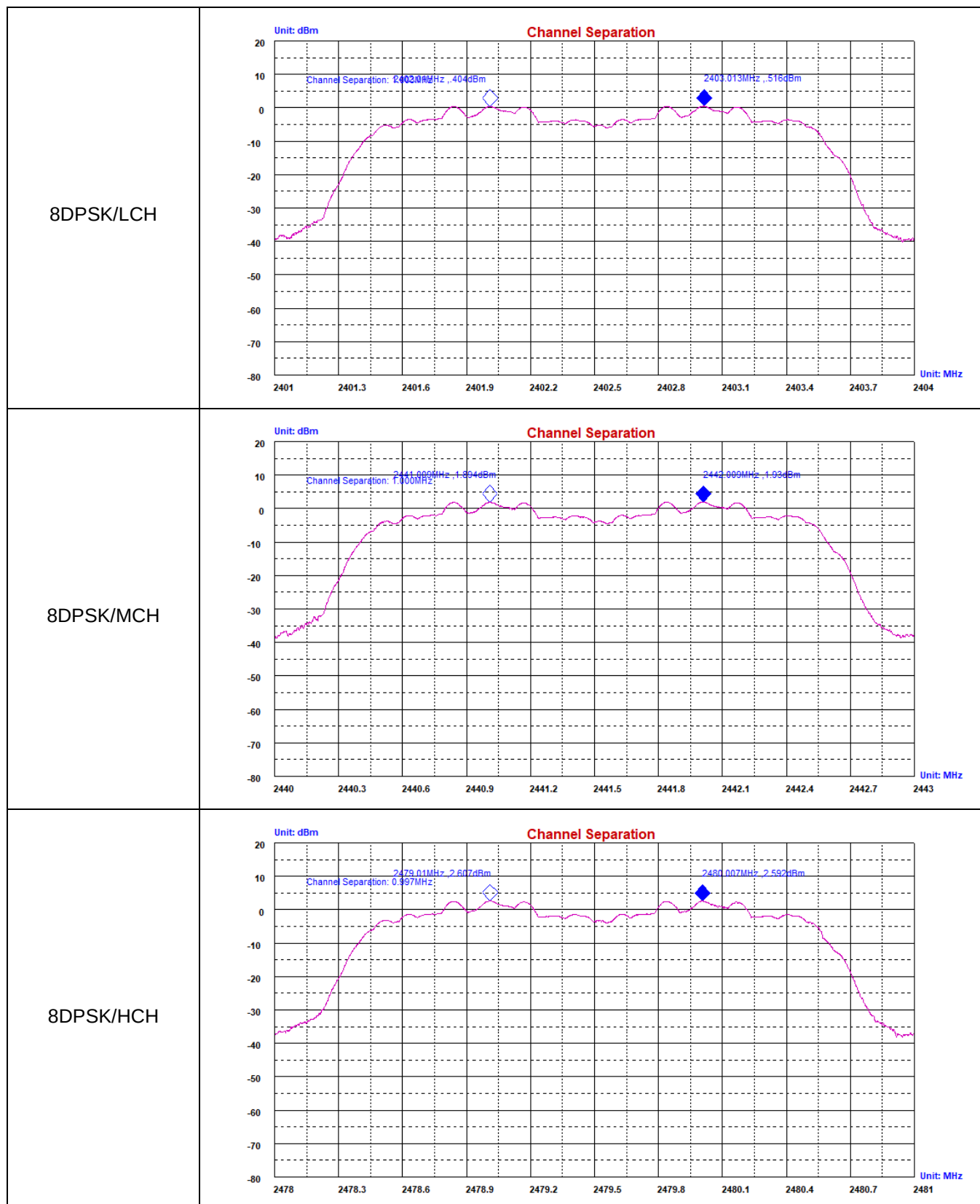
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.999	0.631	PASS
GFSK	MCH	1.003	0.625	PASS
GFSK	HCH	1.001	0.841	PASS
$\pi/4$ DQPSK	LCH	1.000	0.880	PASS
$\pi/4$ DQPSK	MCH	1.003	0.873	PASS
$\pi/4$ DQPSK	HCH	0.997	0.869	PASS
8DPSK	LCH	1.003	0.867	PASS
8DPSK	MCH	1.000	0.865	PASS
8DPSK	HCH	0.997	0.841	PASS

Test Graph



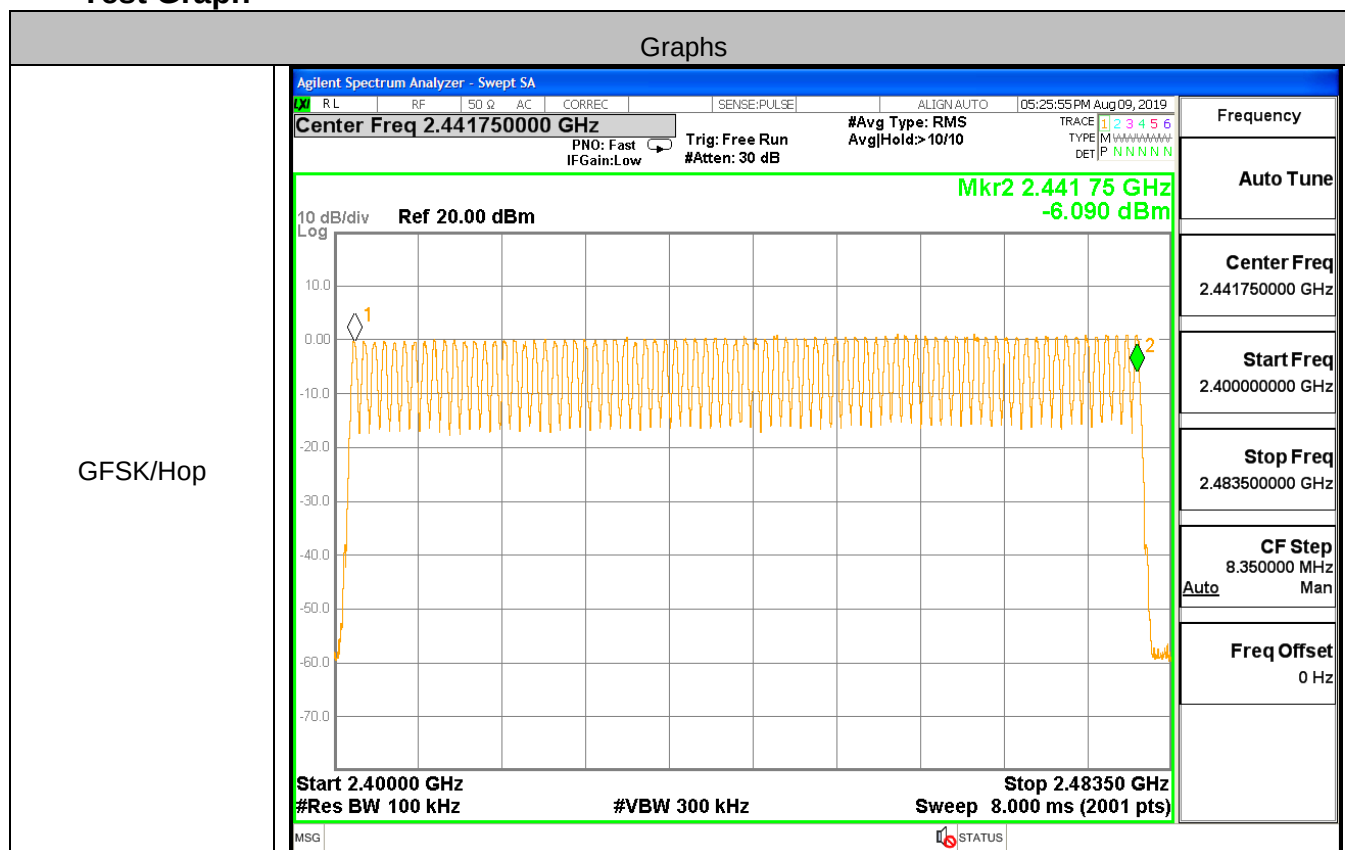


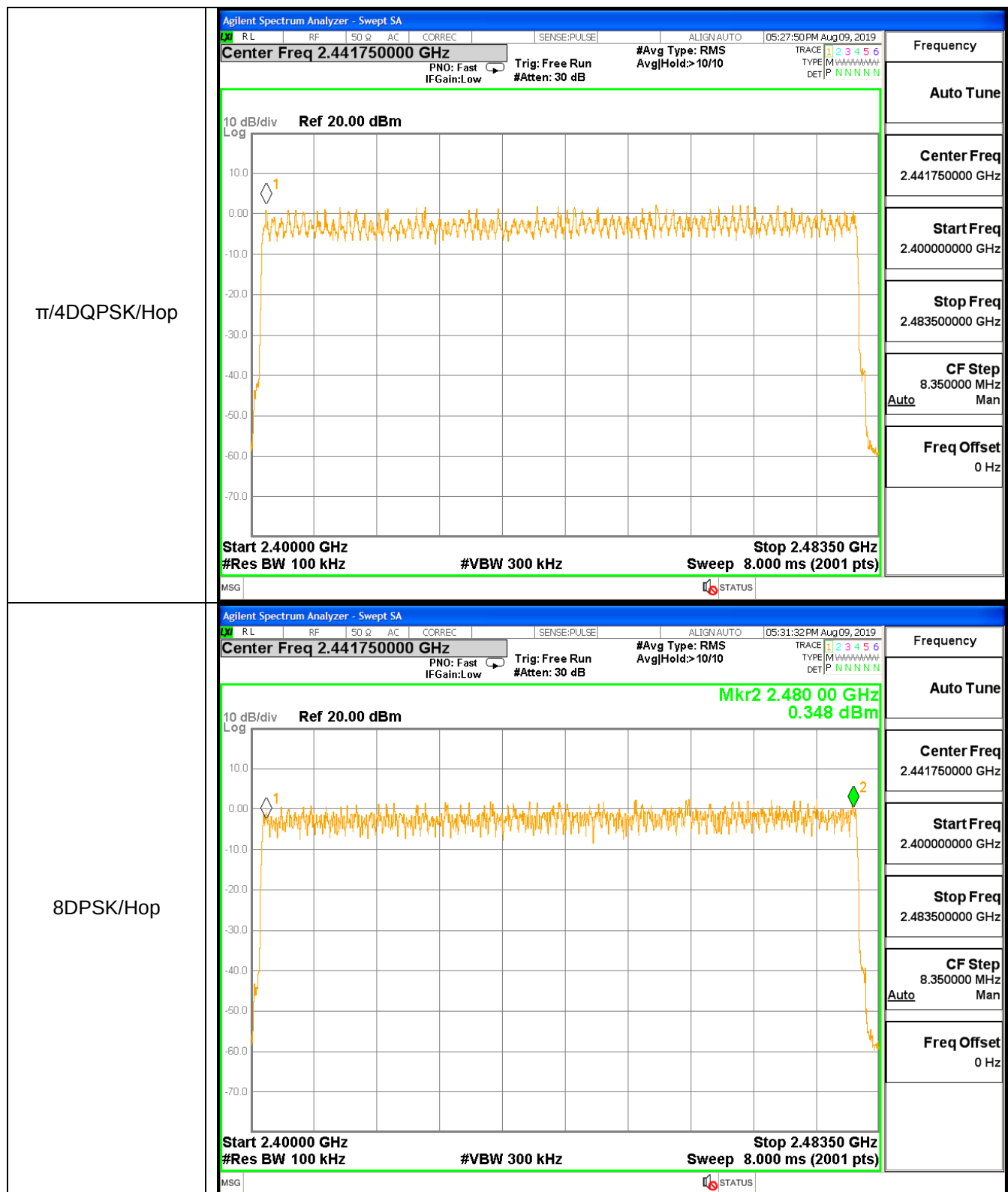


A.4 Hopping Channel Number

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



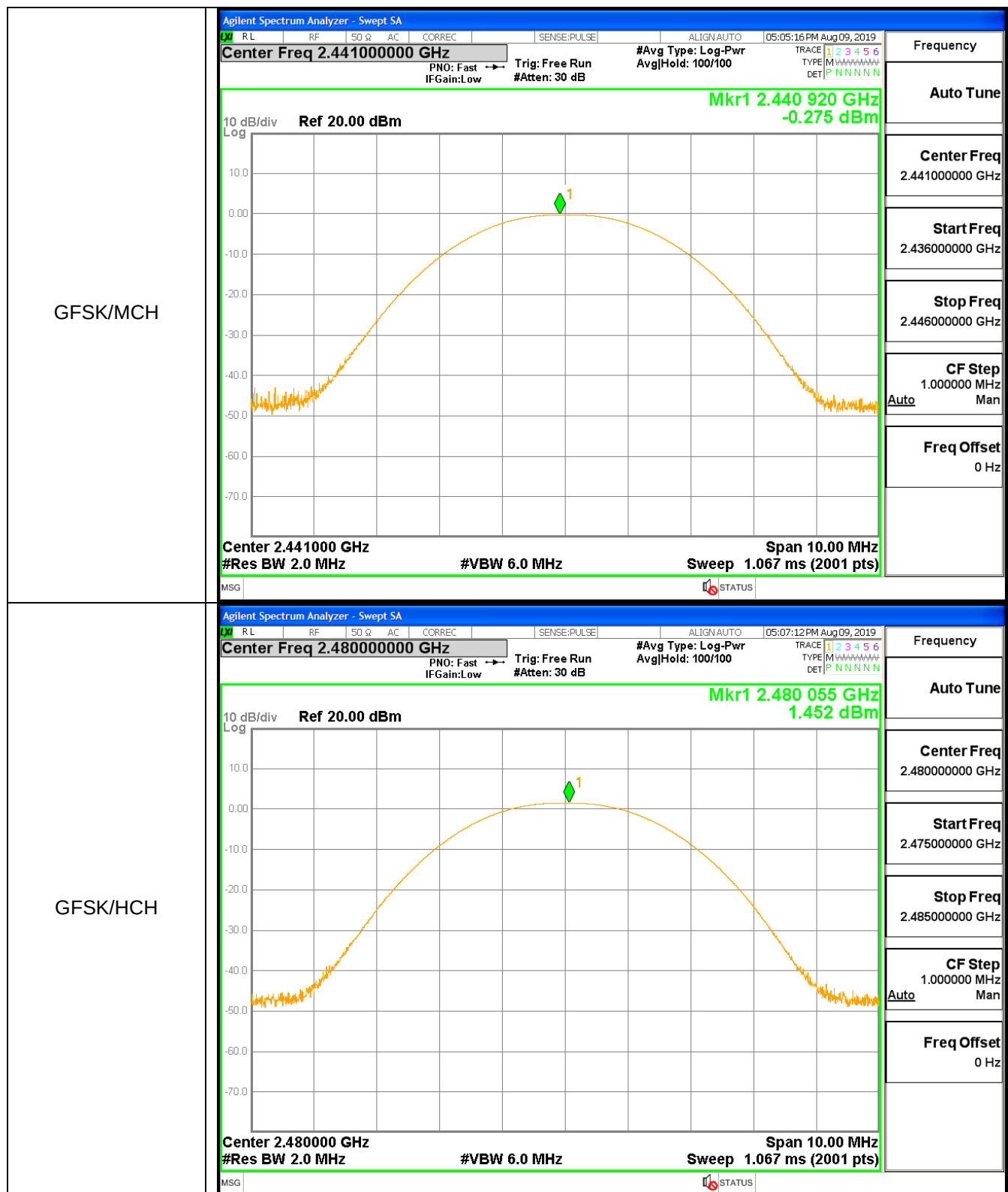


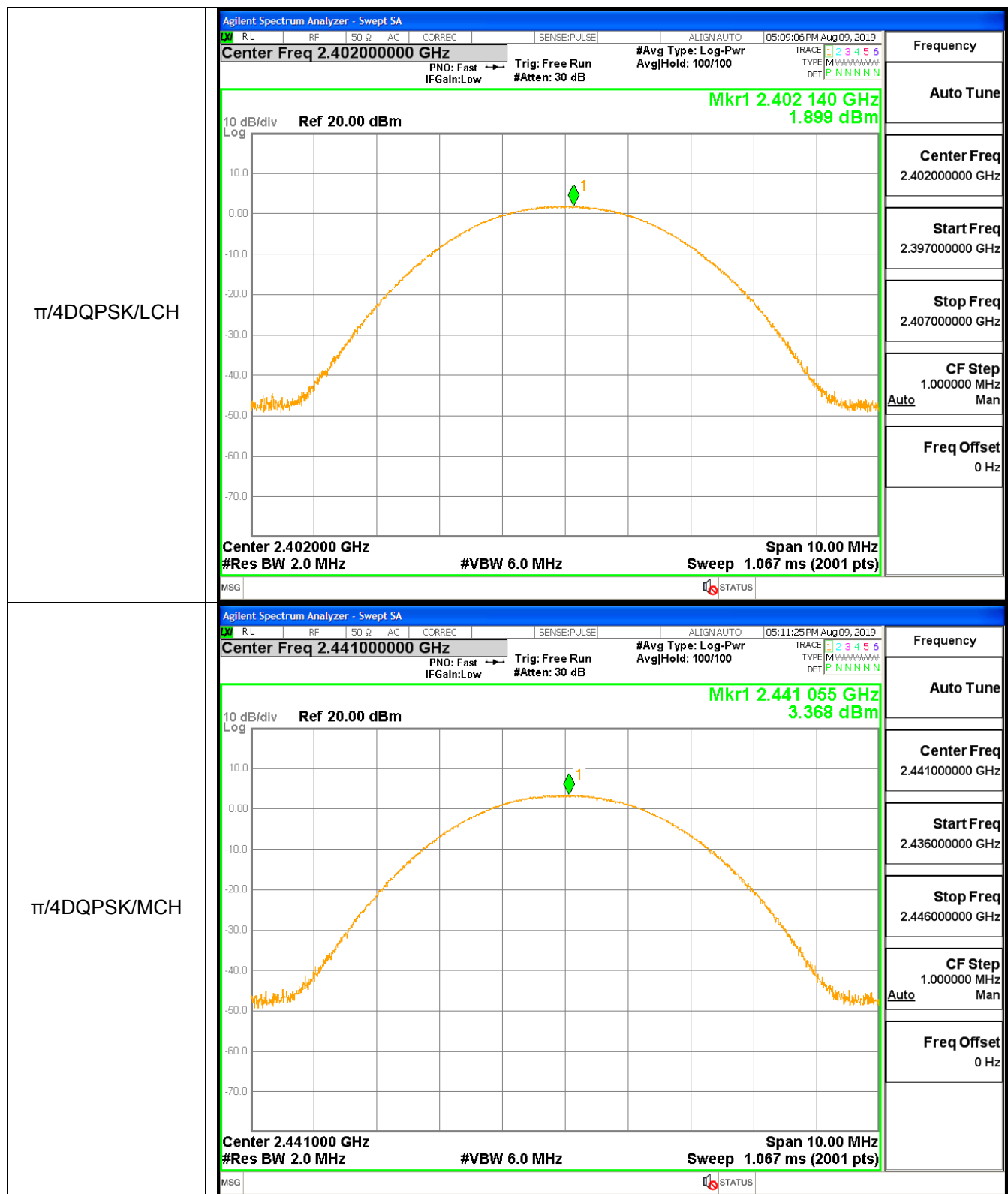
A.5 Conducted Peak Output Power

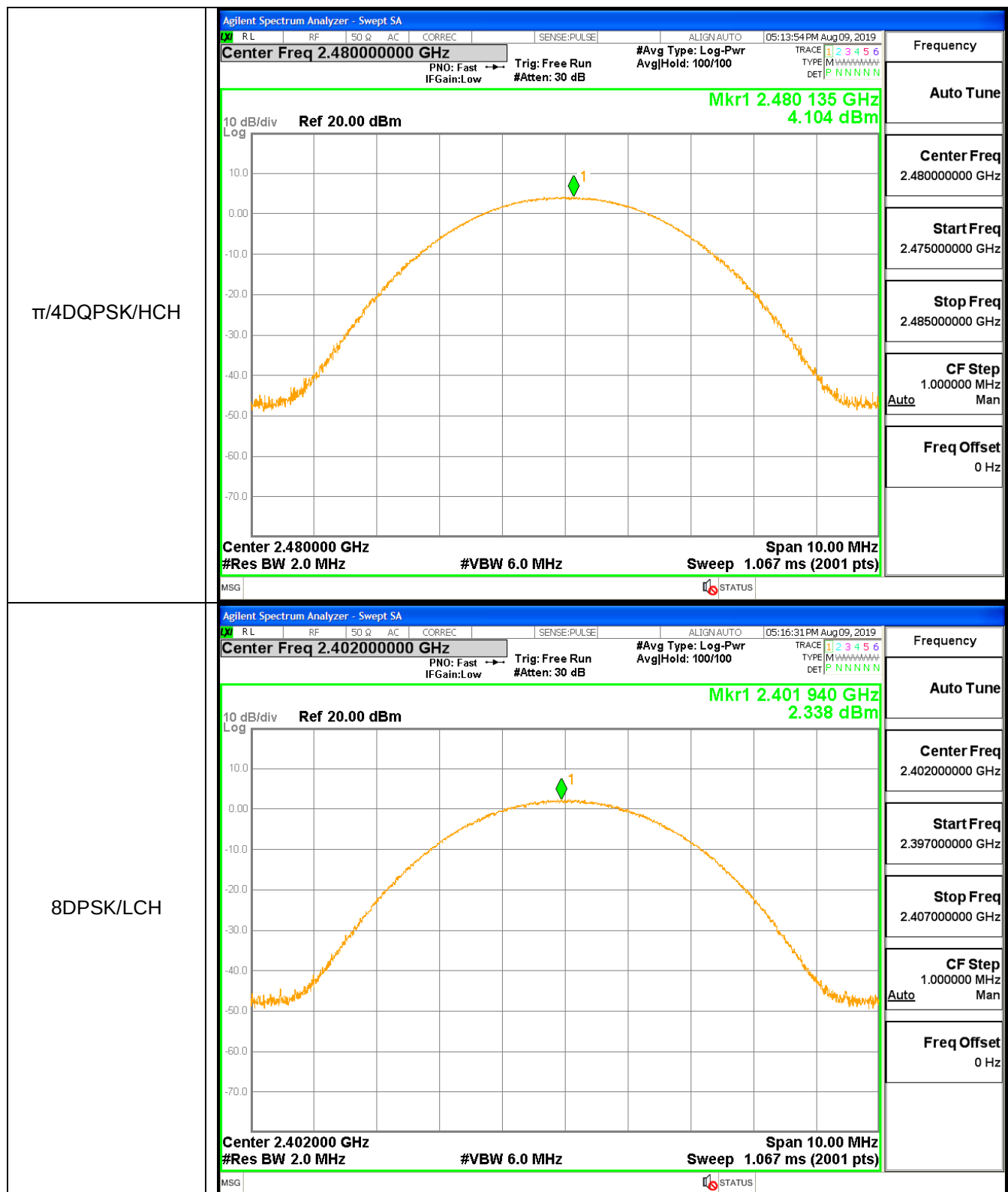
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.693	21	PASS
GFSK	MCH	-0.275	21	PASS
GFSK	HCH	1.452	21	PASS
$\pi/4$ DQPSK	LCH	1.899	21	PASS
$\pi/4$ DQPSK	MCH	3.368	21	PASS
$\pi/4$ DQPSK	HCH	4.104	21	PASS
8DPSK	LCH	2.338	21	PASS
8DPSK	MCH	3.787	21	PASS
8DPSK	HCH	4.468	21	PASS

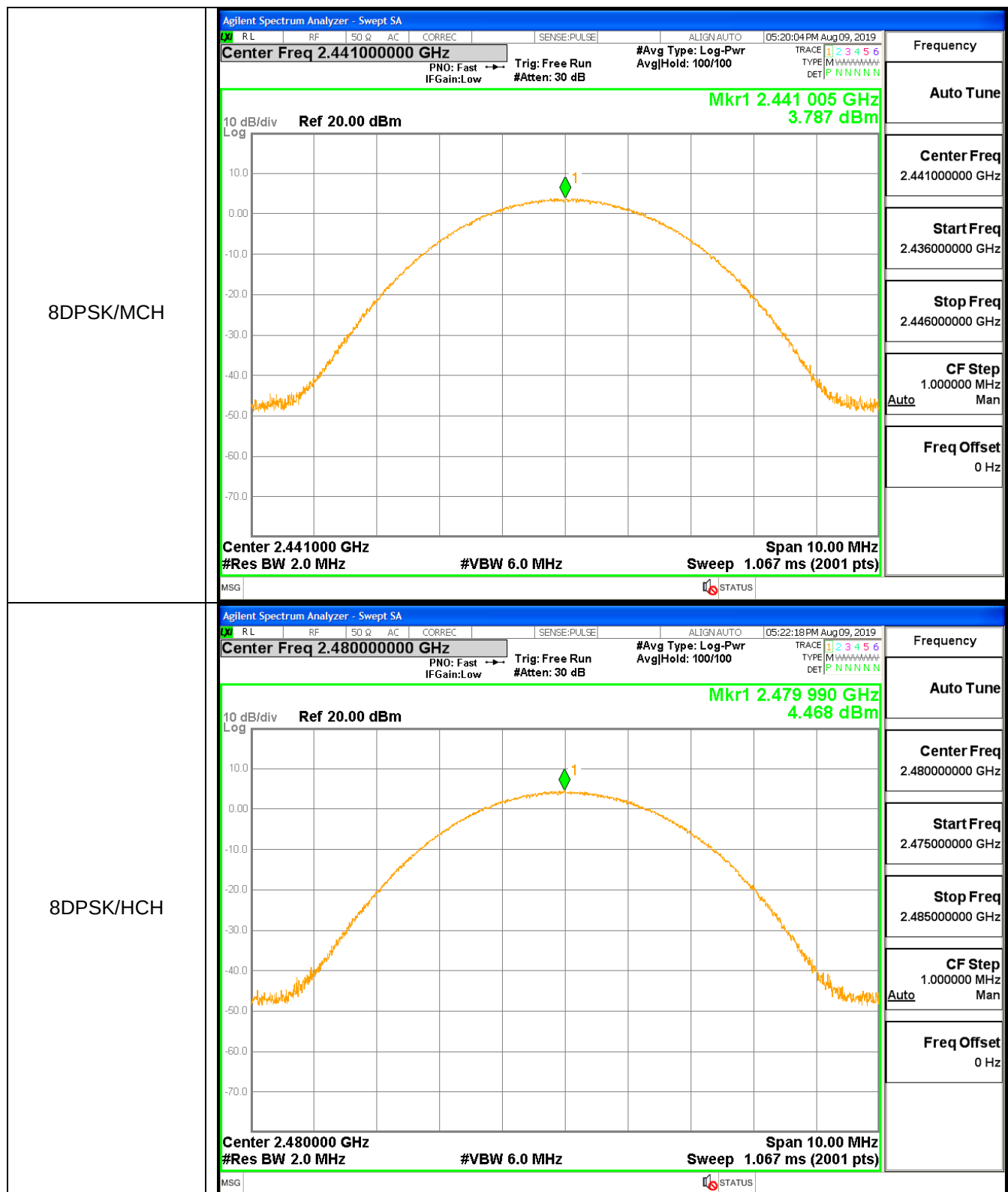
Test Graph











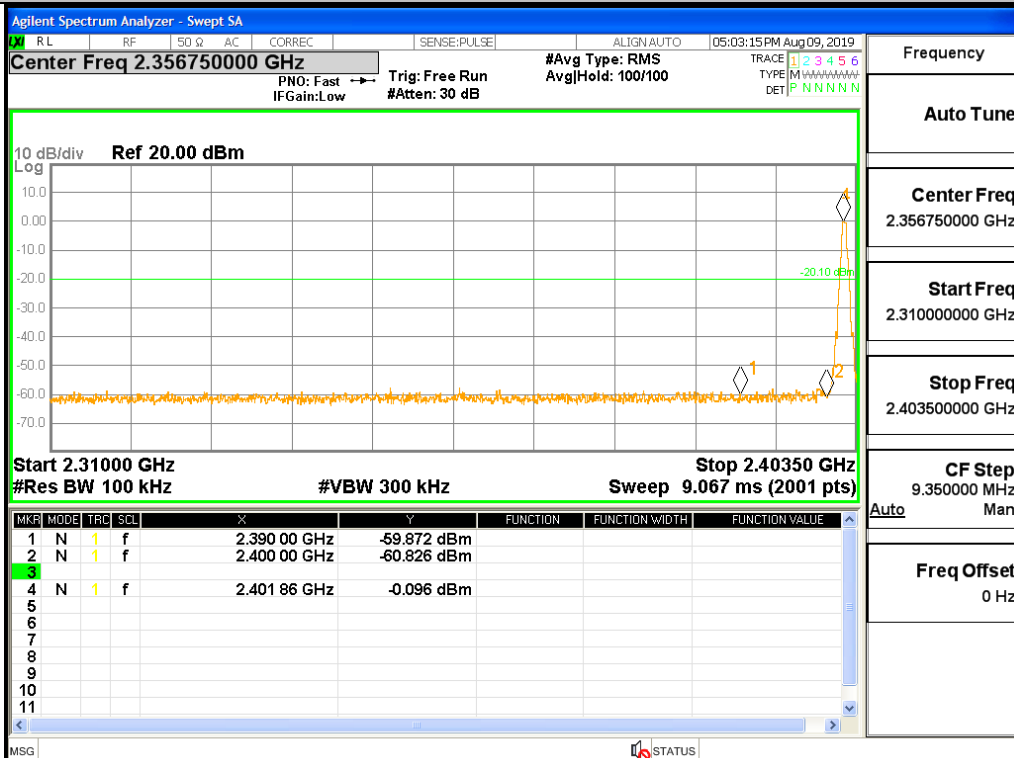
A.6 Band-edge for RF Conducted Emissions

Type	Carrier Frequency(MHz)	Frequency(MHz)	Carrier Frequency Power [dBm]	Bandedge Peak(dBm)	Upper limit(dBm)	Conclusion
1DH5	2402	2390	-0.096	-59.87	-20.096	Pass
1DH5	2480	2499.764	1.011	-57.134	-18.989	Pass
2DH5	2402	2400	-1.296	-57.45	-21.296	Pass
2DH5	2480	2483.5	2.547	-61.7	-17.453	Pass
3DH5	2402	2400	-1.129	-57.32	-21.129	Pass
3DH5	2480	2500	2.423	-60.44	-17.577	Pass
1DH5-Hopping	2402	2400	0.094	-58.44	-19.906	Pass
1DH5-Hopping	2480	2483.5	1.042	-58.94	-18.958	Pass
2DH5-Hopping	2402	2400	1.427	-58.07	-18.573	Pass
2DH5-Hopping	2480	2500	2.415	-57.93	-17.585	Pass
3DH5-Hopping	2402	2400	1.612	-57.02	-18.388	Pass
3DH5-Hopping	2480	2500	2.363	-58.34	-17.637	Pass

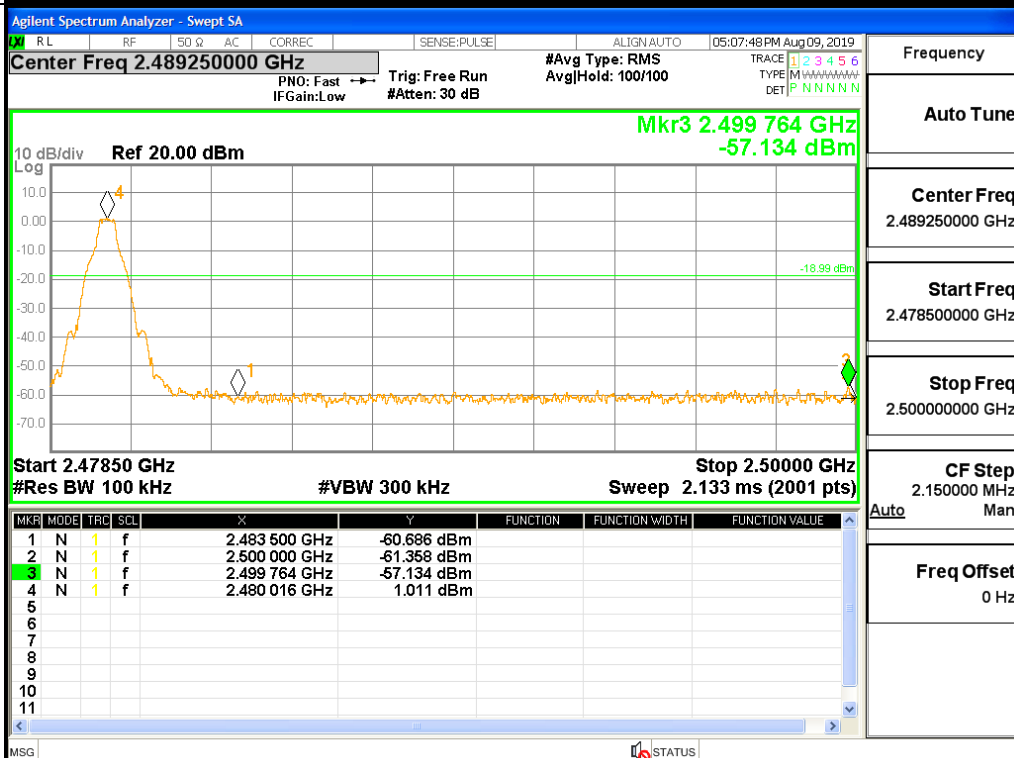
Test Graph

Graphs

GFSK/LCH/No Hop

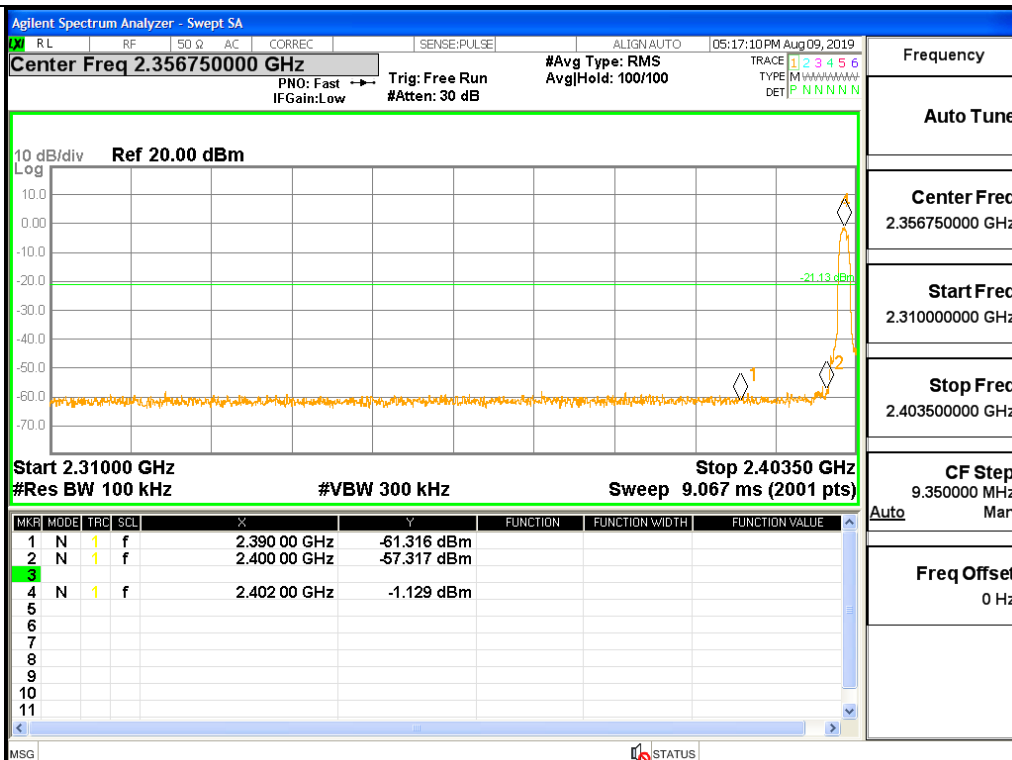


GFSK/HCH/No Hop

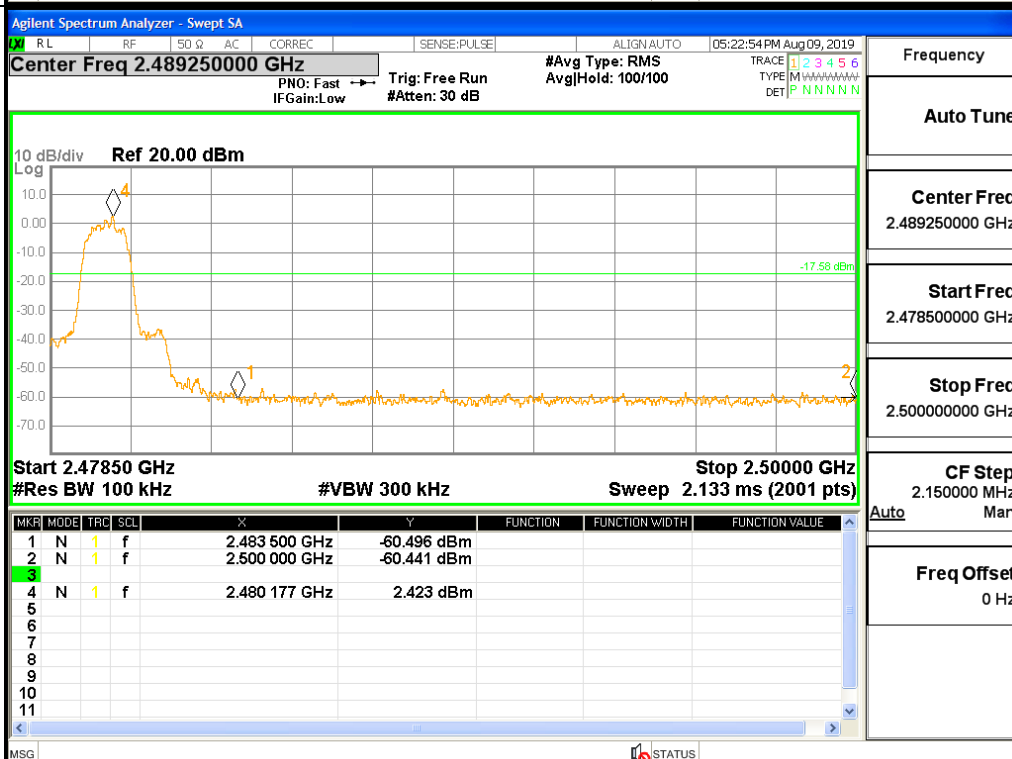




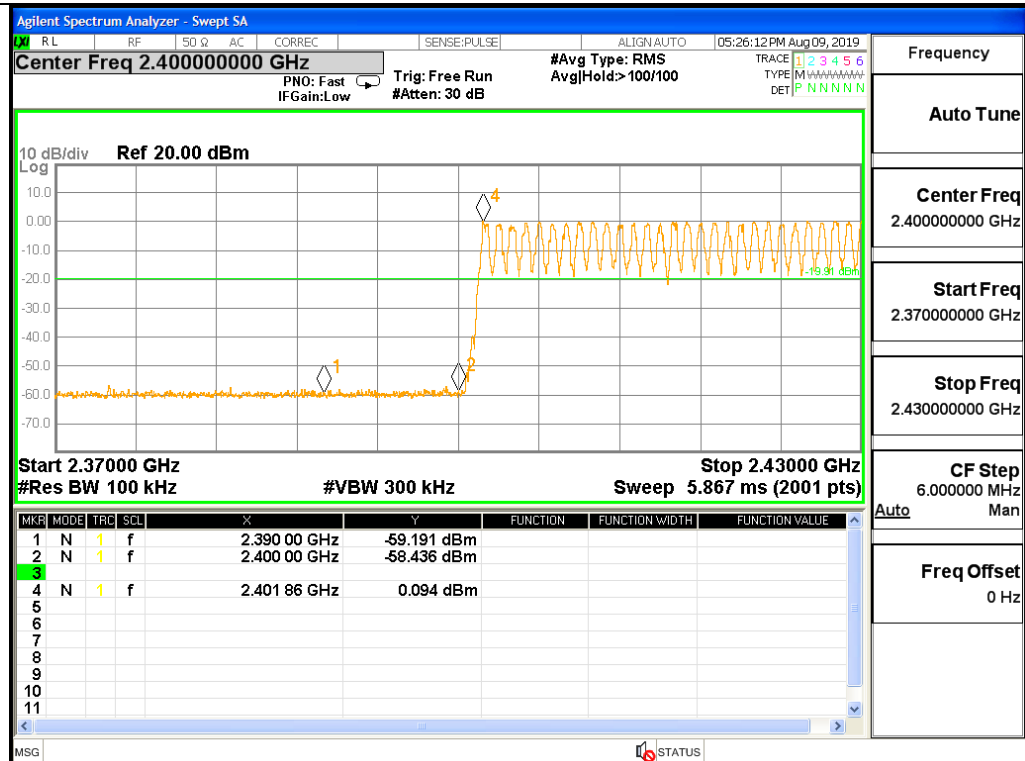
8DPSK/LCH/No Hop



8DPSK/HCH/No Hop



GFSK/LCH/Hop

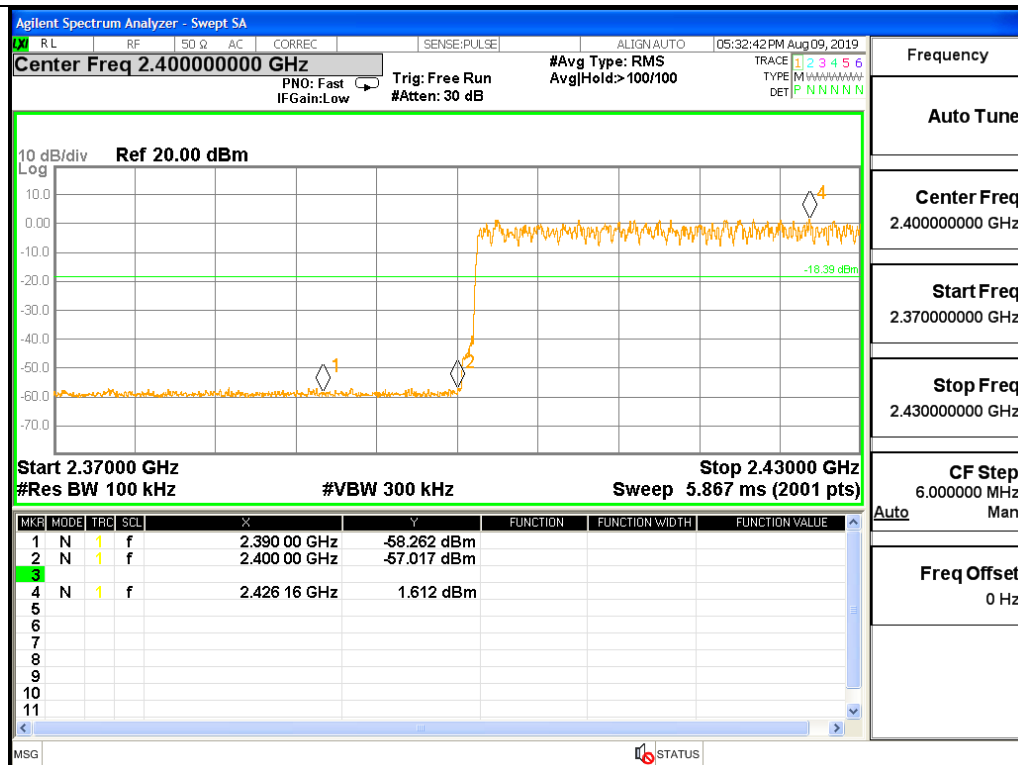


GFSK/HCH/Hop



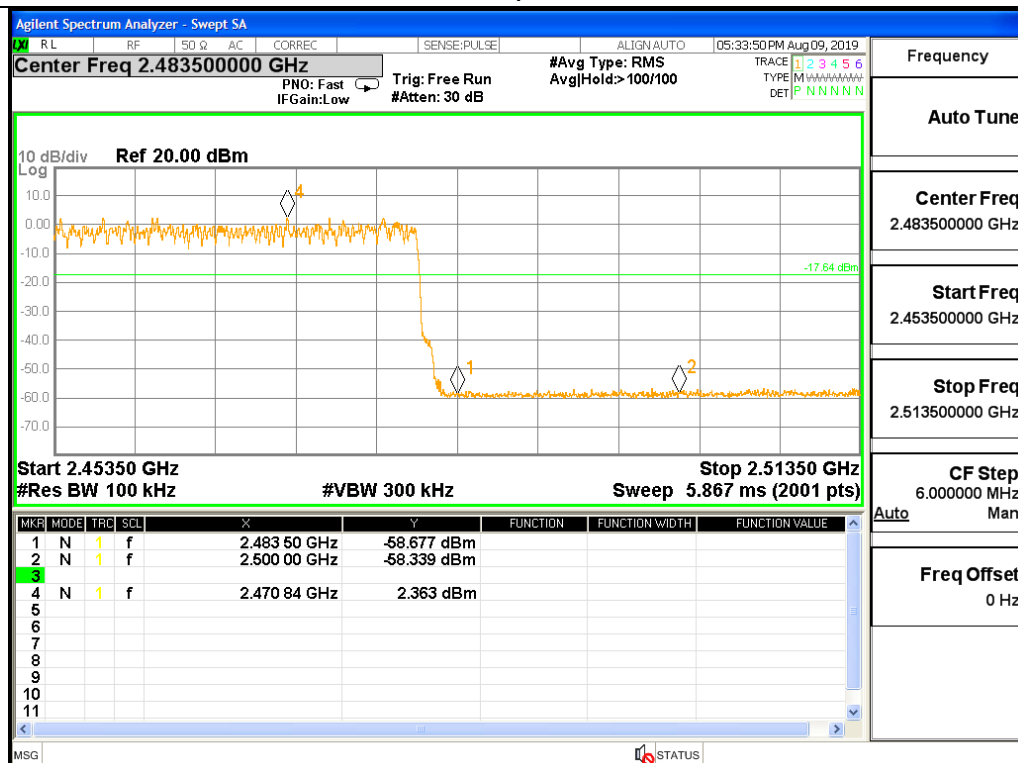


8DPSK/LCH/Hop

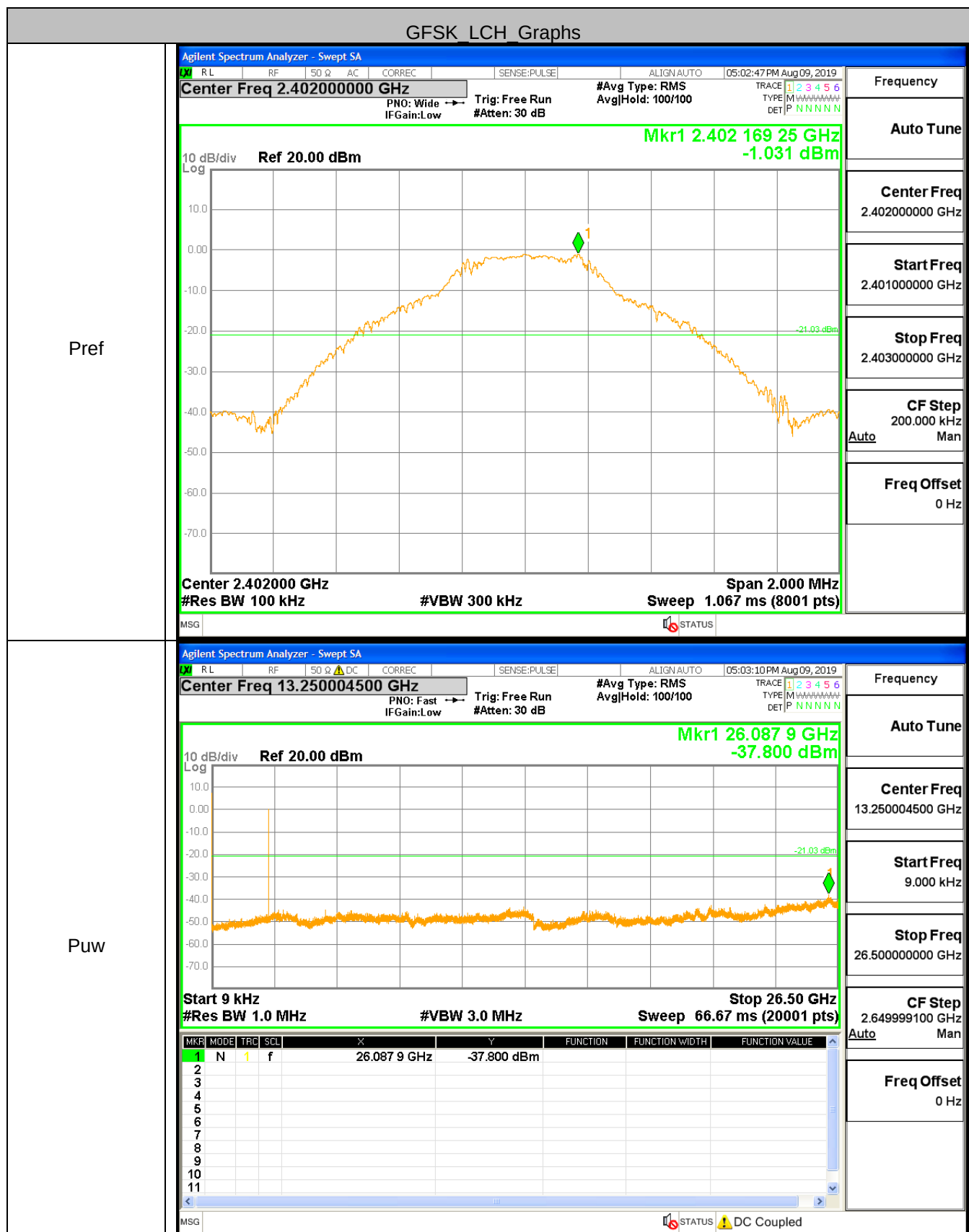


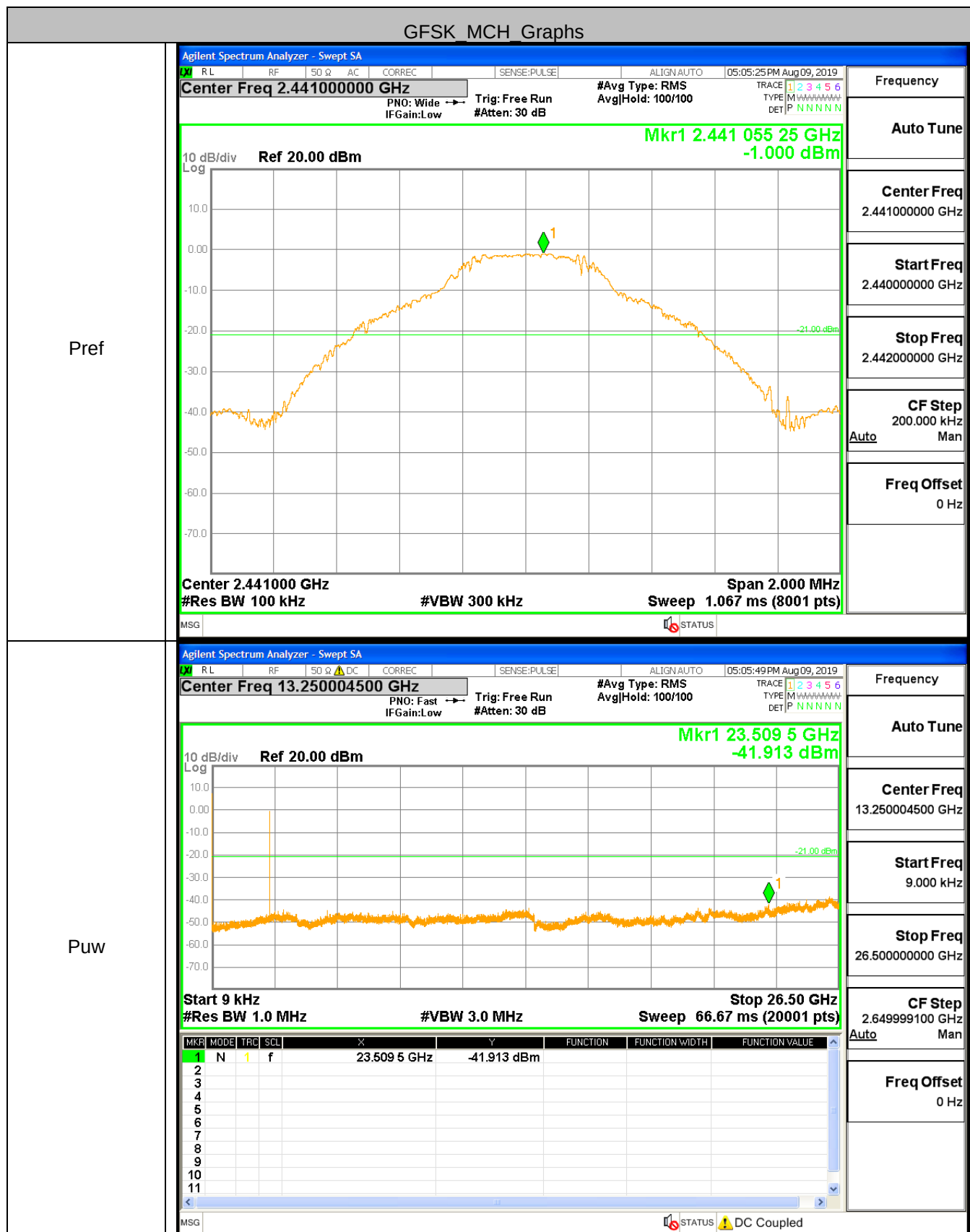
V

8DPSK/HCH/Hop



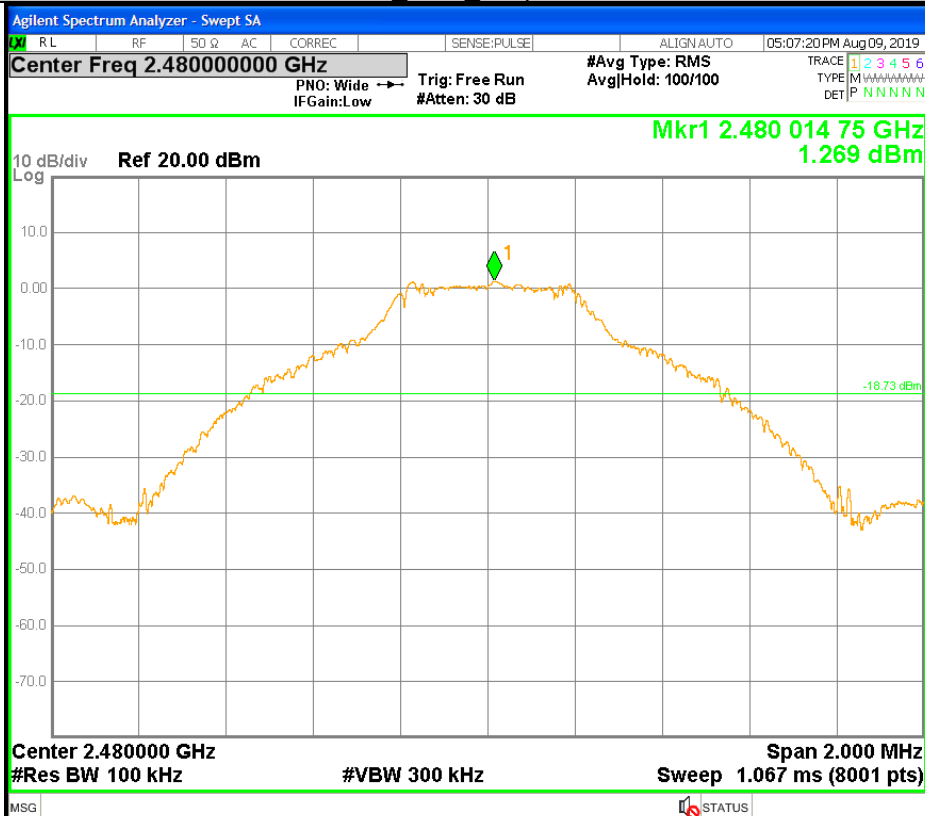
A.7 RF Conducted Spurious Emissions Test Graph





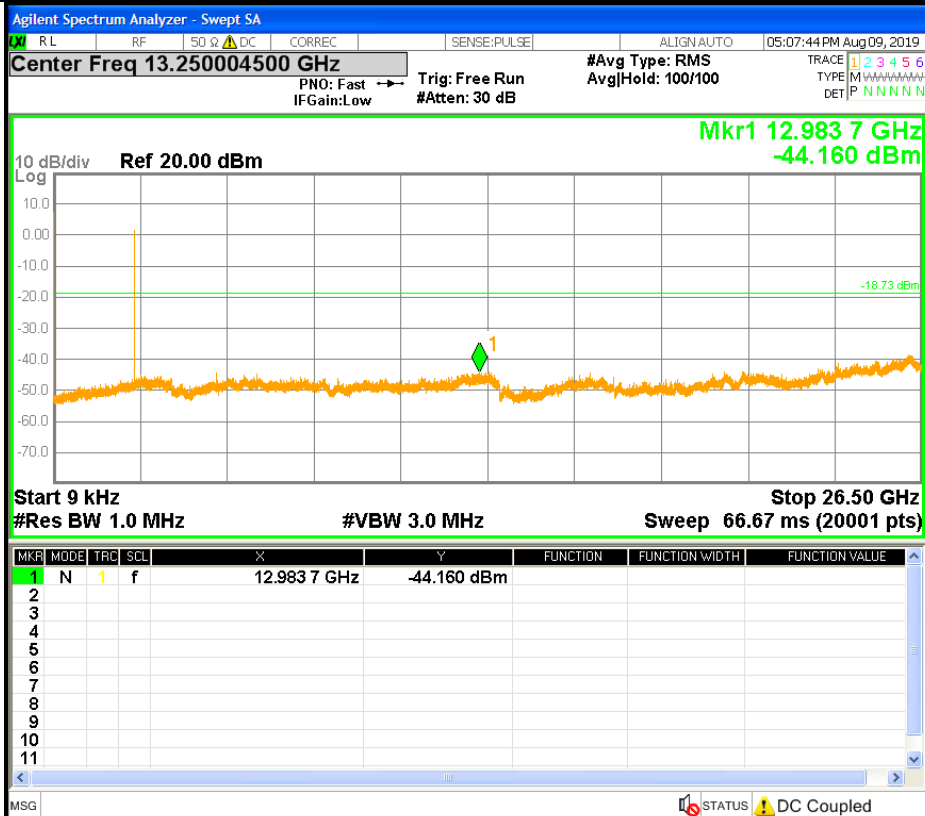
GFSK HCH Graphs

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

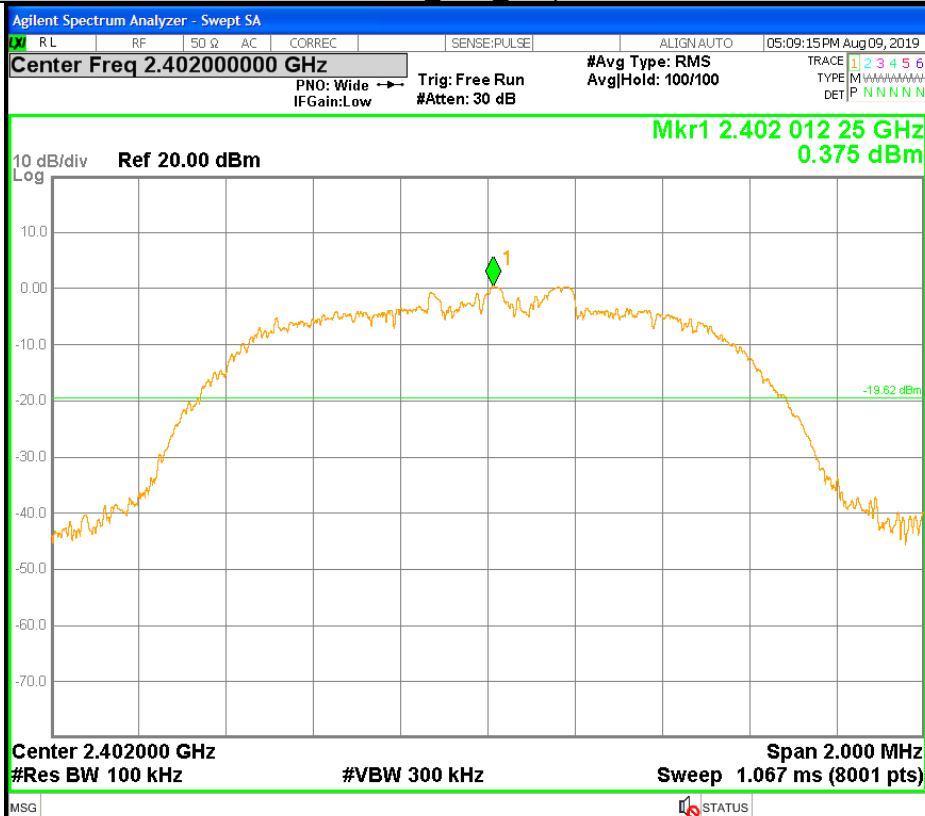
Puw



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

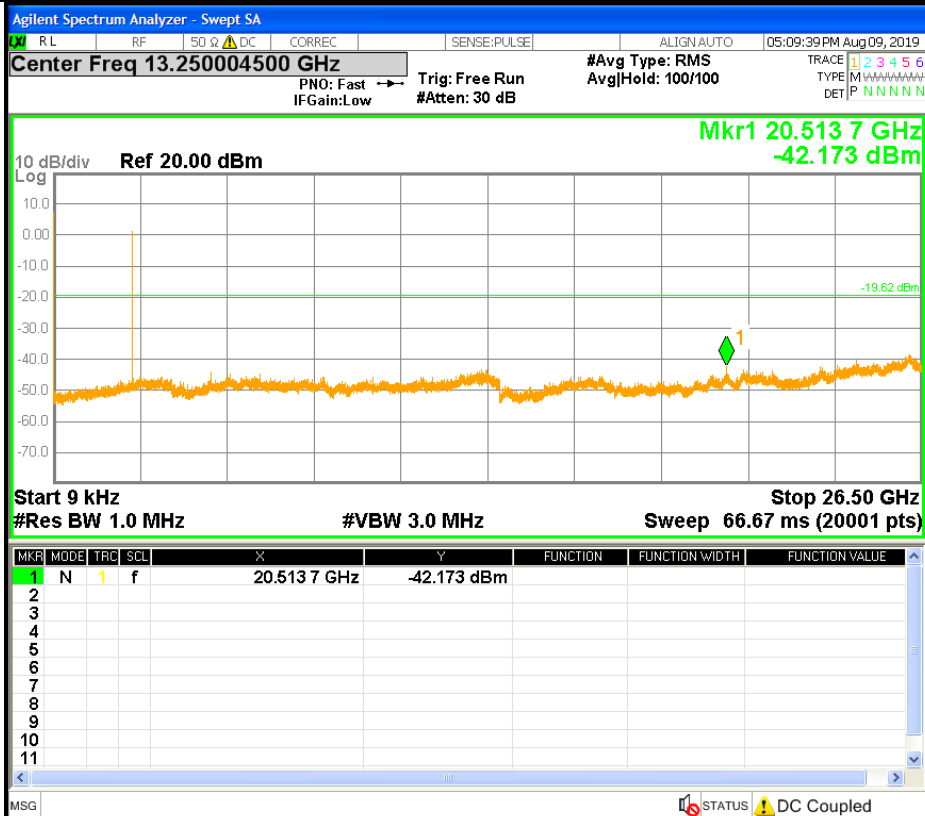
$\pi/4$ DQPSK LCH Graphs

Pref



Frequency
Auto Tune
Center Freq 2.402000000 GHz
Start Freq 2.401000000 GHz
Stop Freq 2.403000000 GHz
CF Step 200.000 kHz Auto Man
Freq Offset 0 Hz

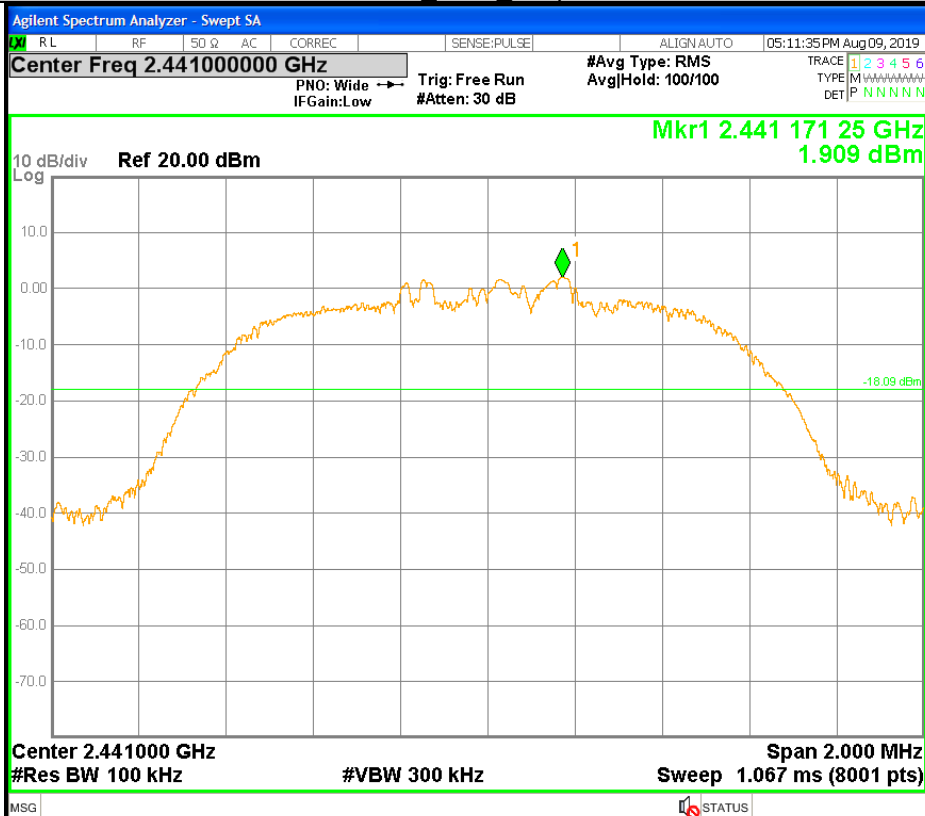
Puw



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

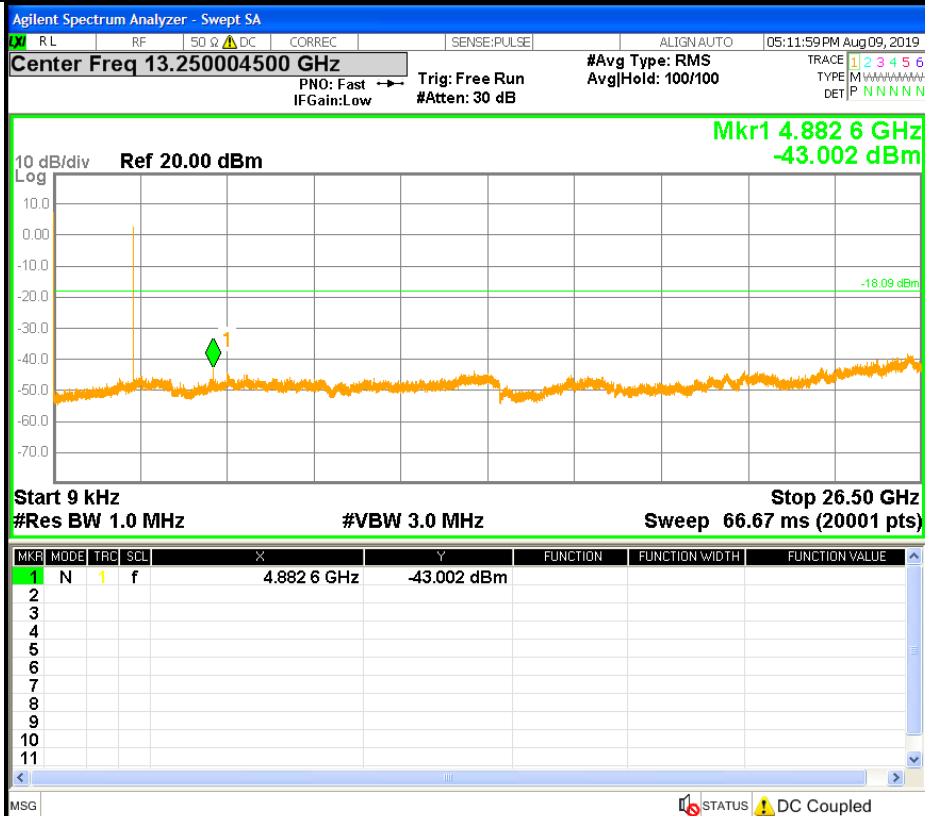
$\pi/4$ DQPSK MCH Graphs

Pref



Frequency
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Center Freq 2.441000000 GHz
Start Freq 2.440000000 GHz
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CF Step 200.000 kHz Auto Man
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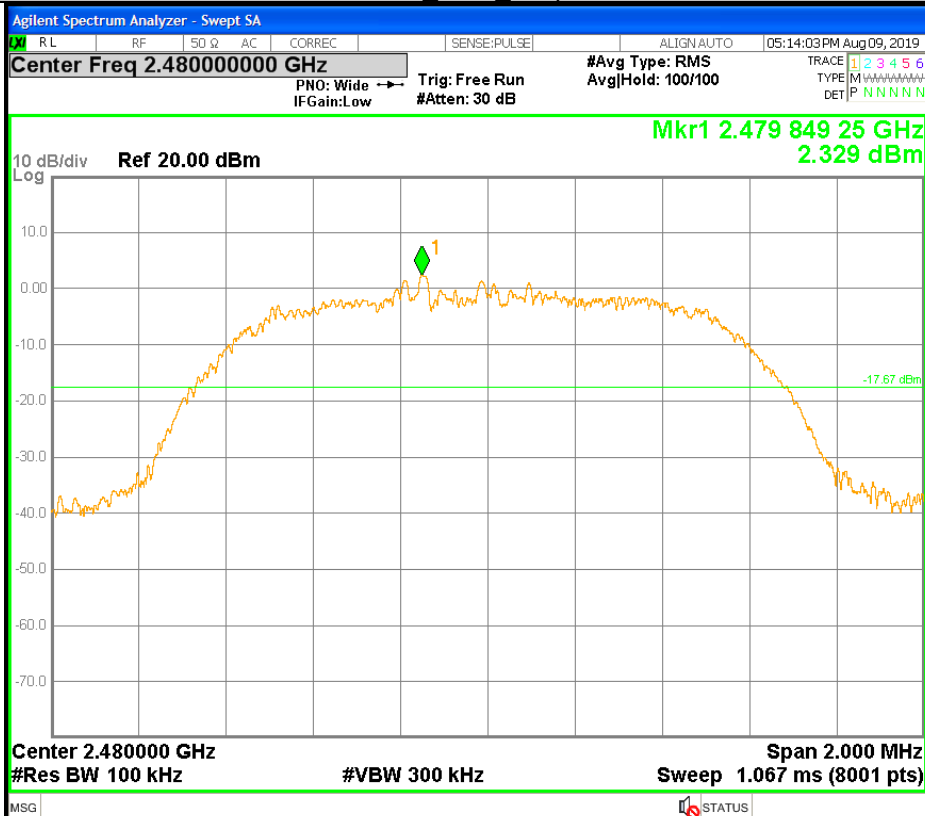
Puw



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
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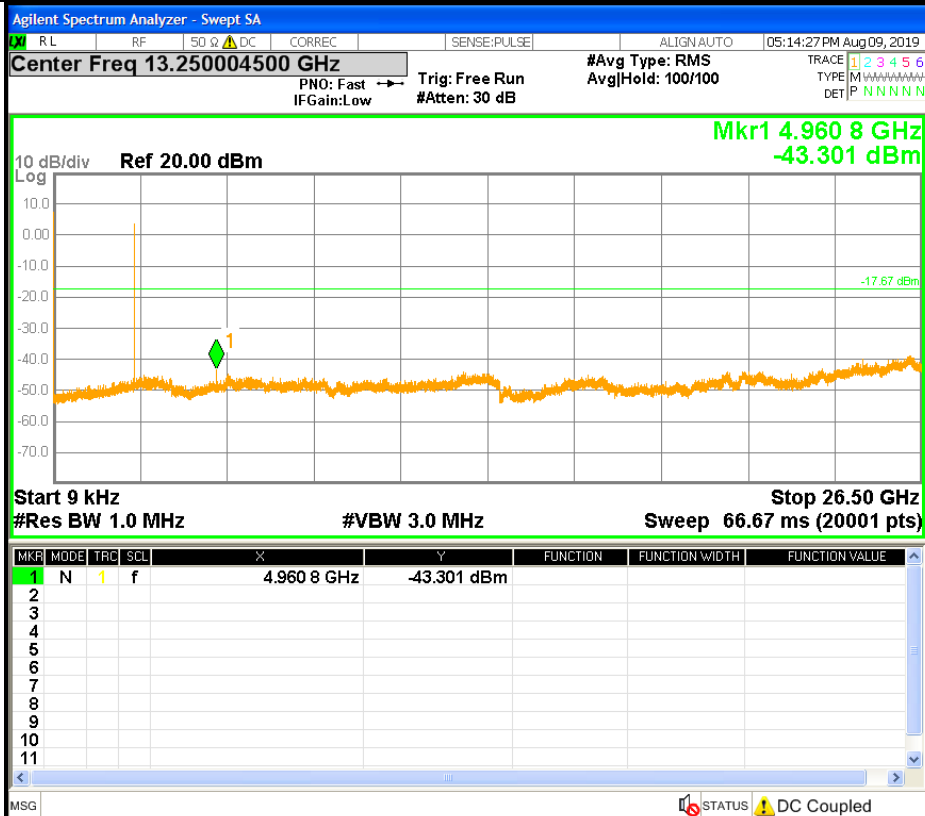
$\pi/4$ DQPSK HCH Graphs

Pref



Frequency
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Start Freq 2.479000000 GHz
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CF Step 200.000 kHz Auto Man
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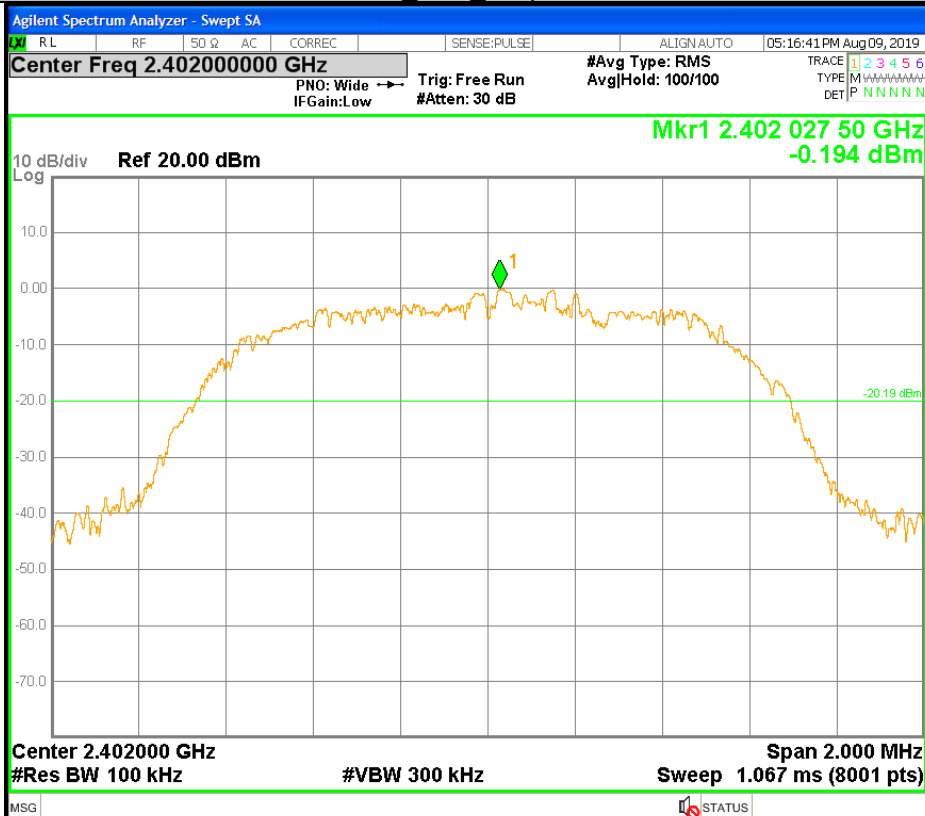
Puw



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
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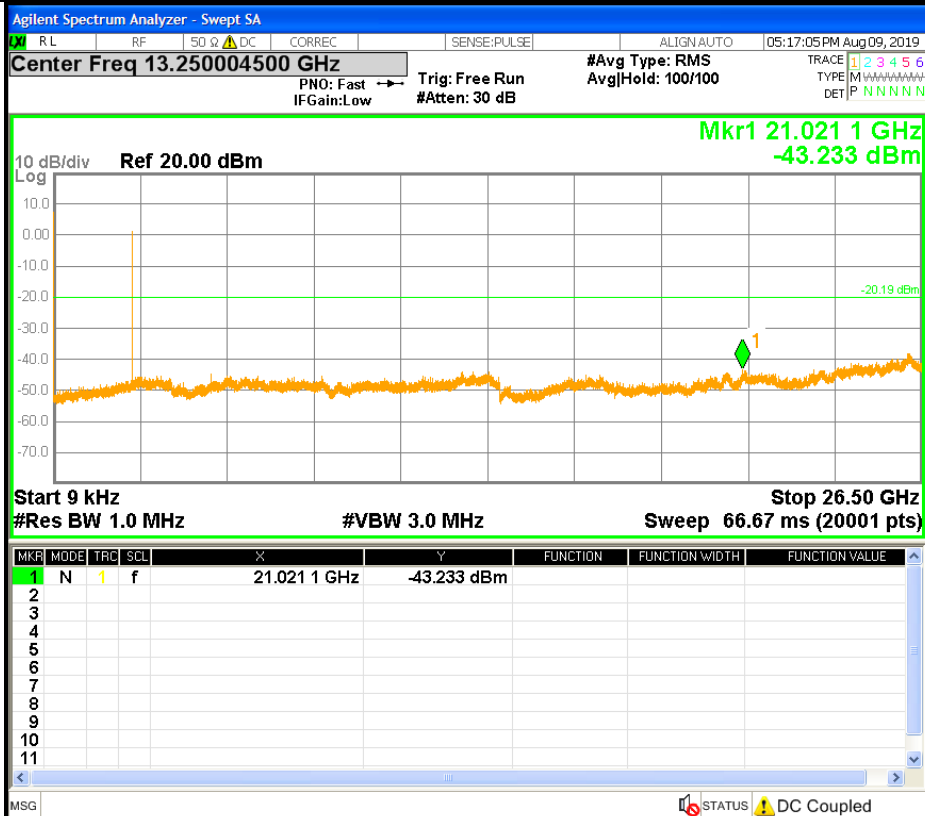
8DPSK LCH Graphs

Pref



Frequency
Auto Tune
Center Freq 2.402000000 GHz
Start Freq 2.401000000 GHz
Stop Freq 2.403000000 GHz
CF Step 200.000 kHz Auto
Freq Offset 0 Hz

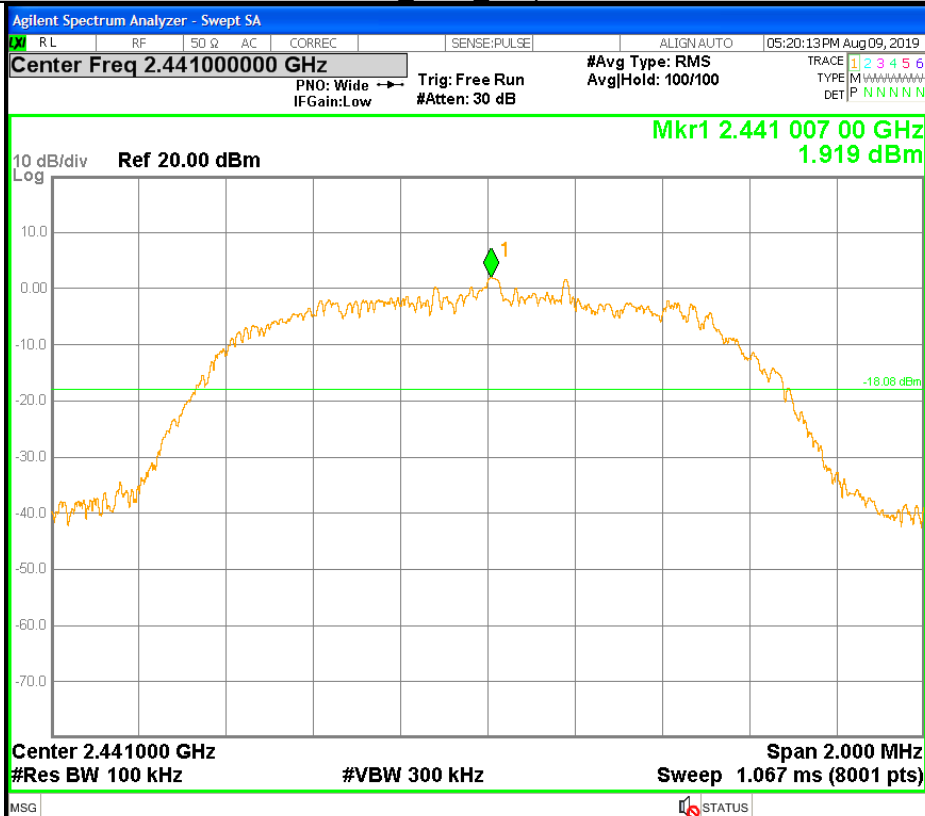
Puw



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

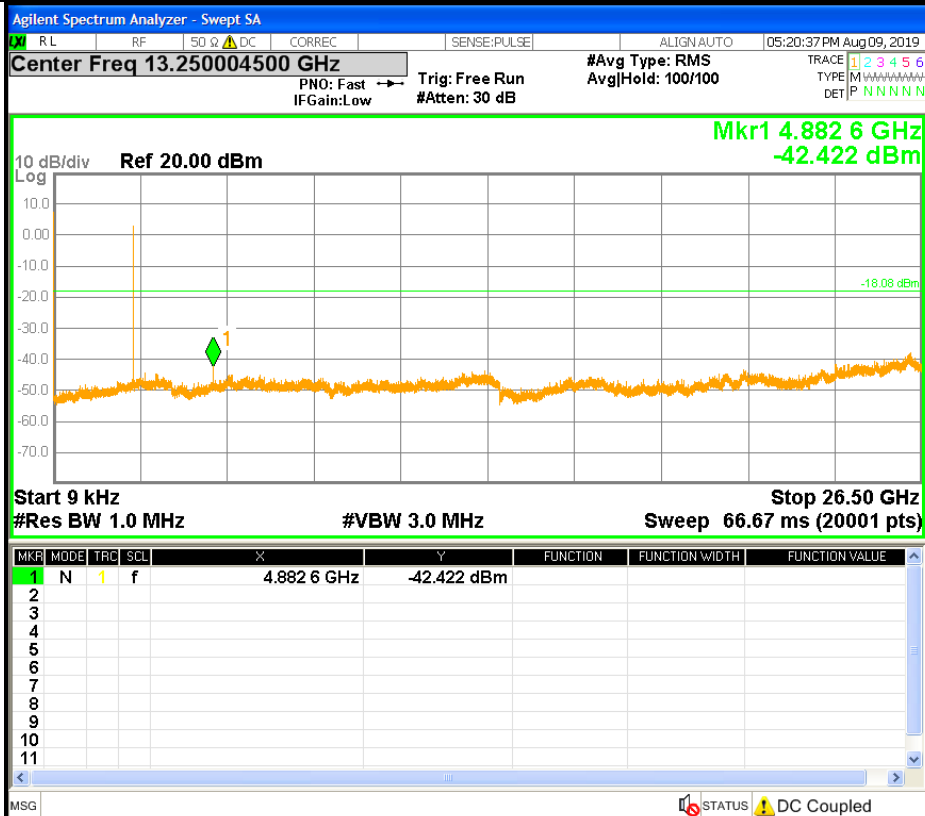
8DPSK MCH Graphs

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

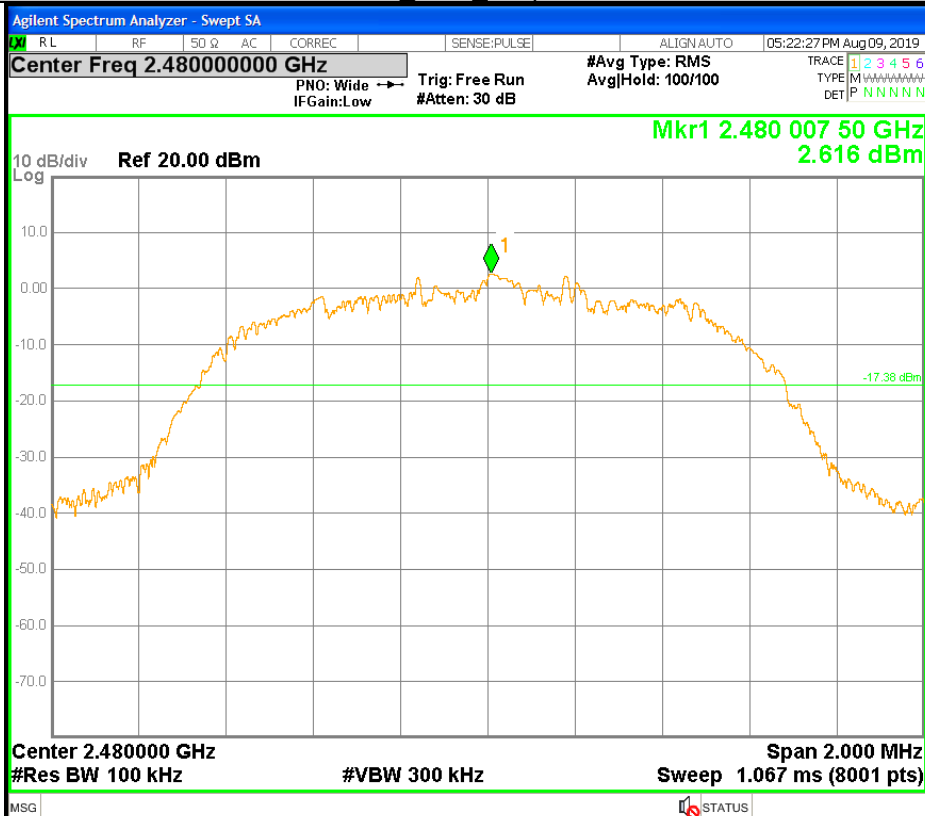
Puw



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

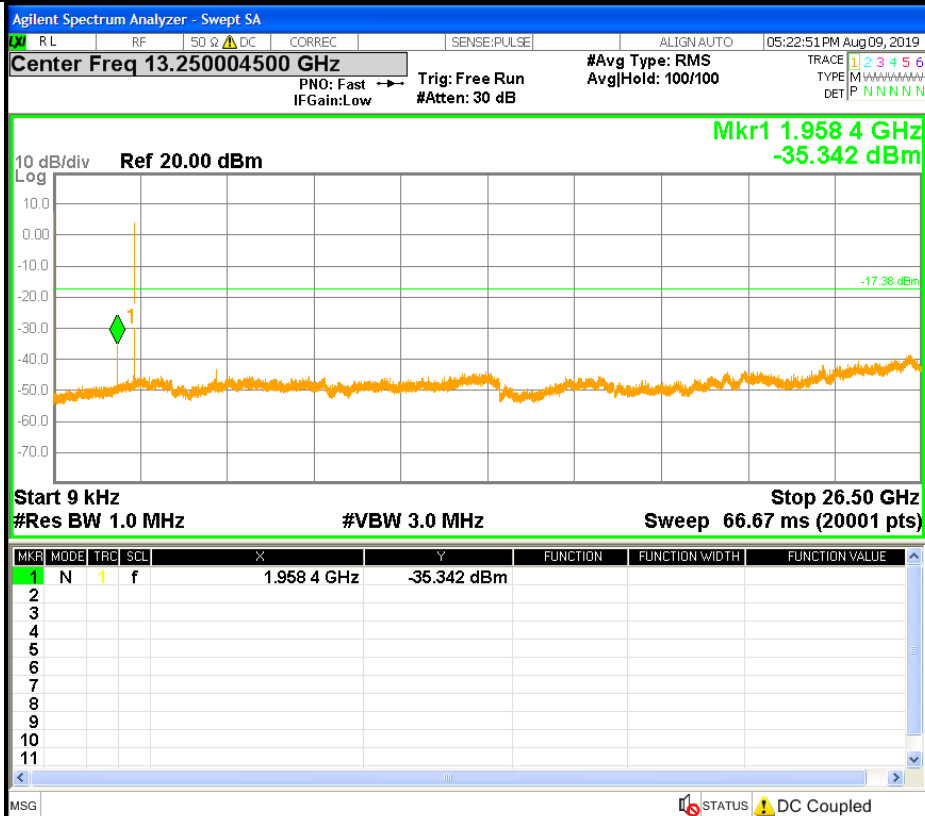
8DPSK HCH Graphs

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



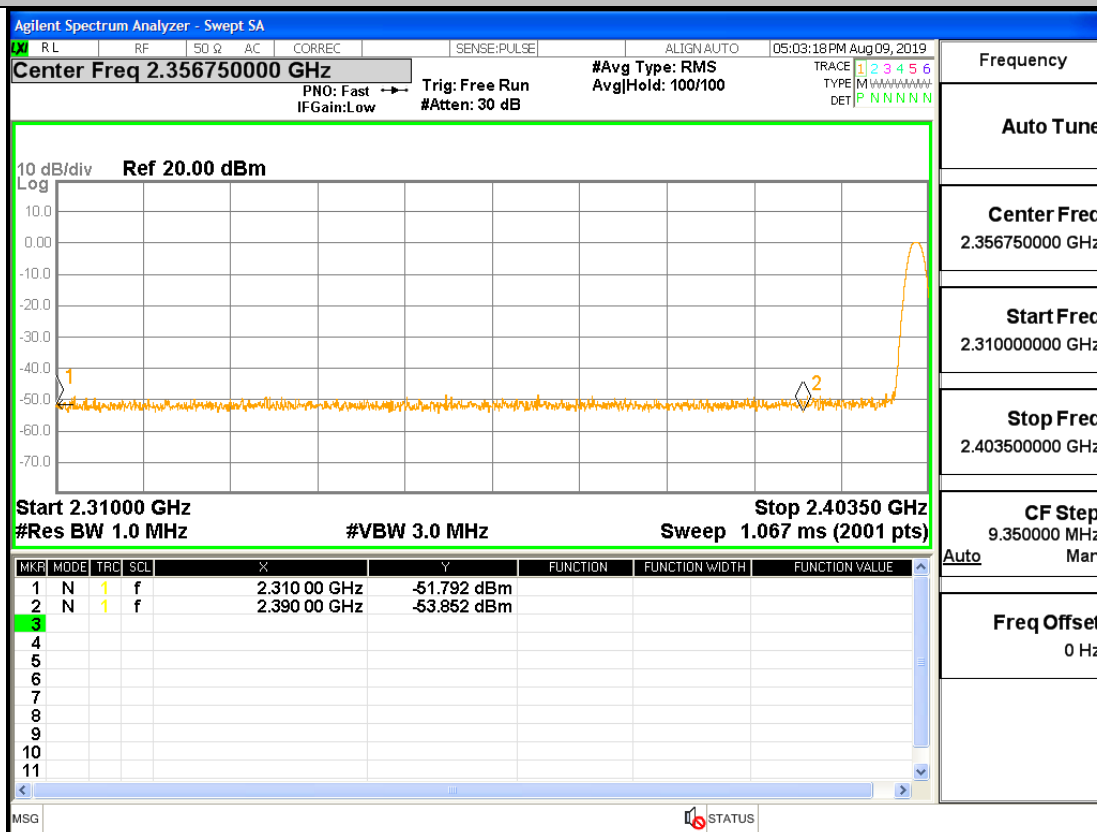
Frequency
Auto Tune
Center Freq 13.250004500 GHz
Start Freq 9.000 kHz
Stop Freq 26.500000000 GHz
CF Step 2.649999100 GHz Auto
Freq Offset 0 Hz

A.8 Restrict-band band-edge measurements

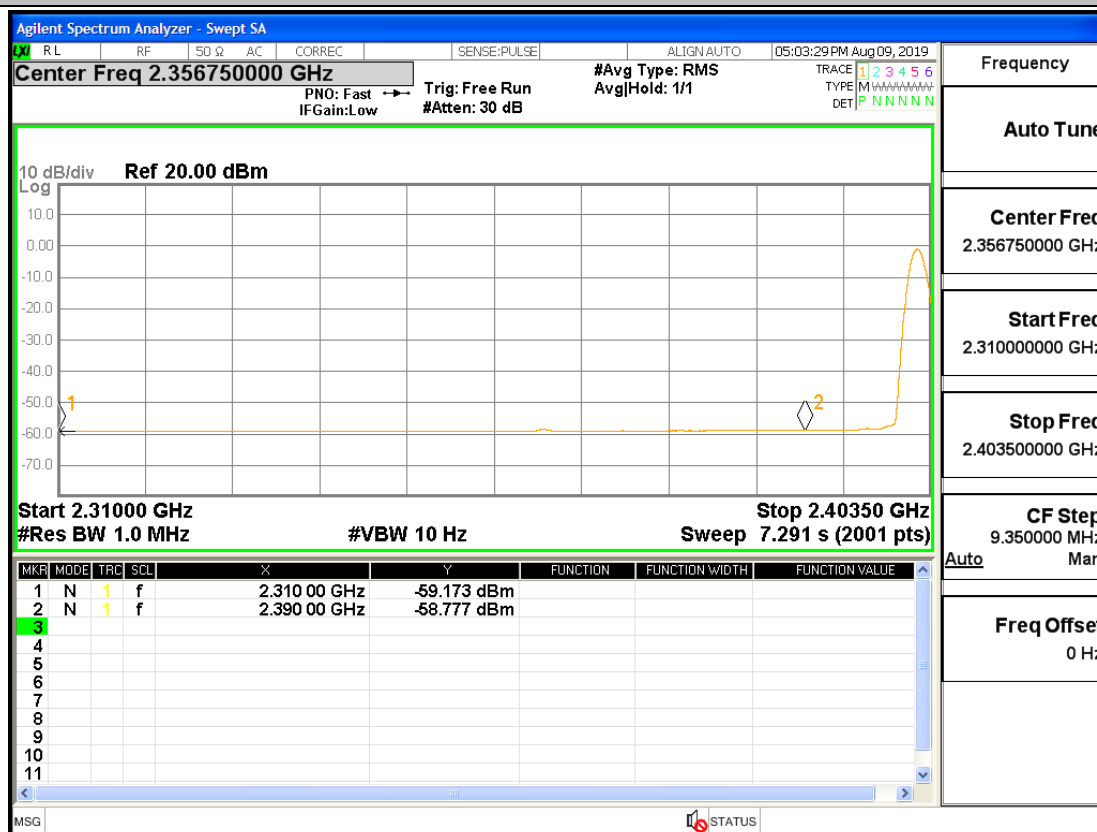
Type	Carrier Frequency (MHz)	Frequency(M Hz)	Gain	Ground Factor	Peak Value(dBm)	E [dBuV/m]	Limit [dBuV/m]	Conclusion
1DH5	2402	2310.00	2.00	0.00	-51.79	45.41	74	Pass
1DH5	2480	2483.50	2.00	0.00	-50.08	46.62	74	Pass
2DH5	2402	2390.00	2.00	0.00	-52.14	45.06	74	Pass
2DH5	2480	2483.68	2.00	0.00	-45.66	51.54	74	Pass
3DH5	2402	2374.09	2.00	0.00	-47.45	49.76	74	Pass
3DH5	2480	2495.31	2.00	0.00	-47.21	49.99	74	Pass

Type	Carrier Frequency (MHz)	Frequency(M Hz)	Gain	Ground Factor	Average Value(dBm)	E [dBuV/m]	Limit [dBuV/m]	Conclusion
1DH5	2402	2310.00	2.00	0.00	-58.78	38.42	54	Fail
1DH5	2480	2483.50	2.00	0.00	-56.13	41.07	54	Fail
2DH5	2402	2390.00	2.00	0.00	-58.80	38.40	54	Fail
2DH5	2480	2483.68	2.00	0.00	-54.57	42.63	54	Fail
3DH5	2402	2374.09	2.00	0.00	-58.80	38.40	54	Fail
3DH5	2480	2495.31	2.00	0.00	-54.62	42.58	54	Fail

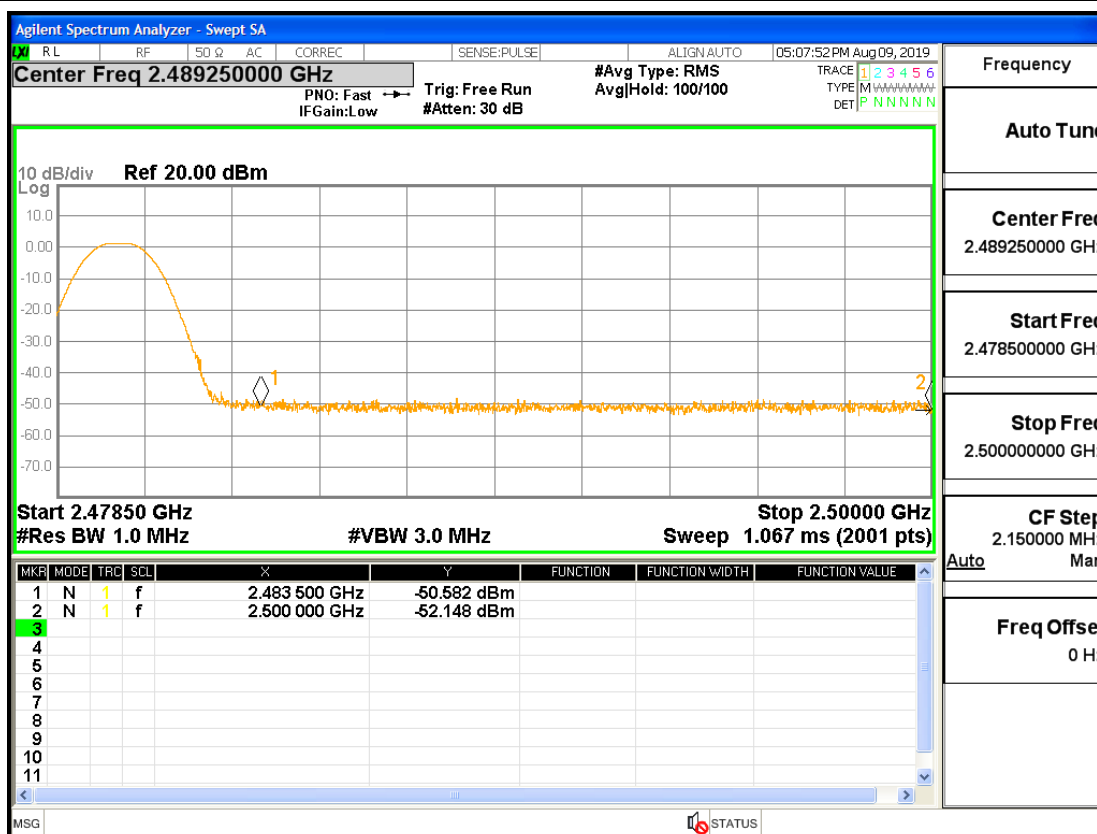
Restrict-band band-edge measurements_2402_PEAK_DH5



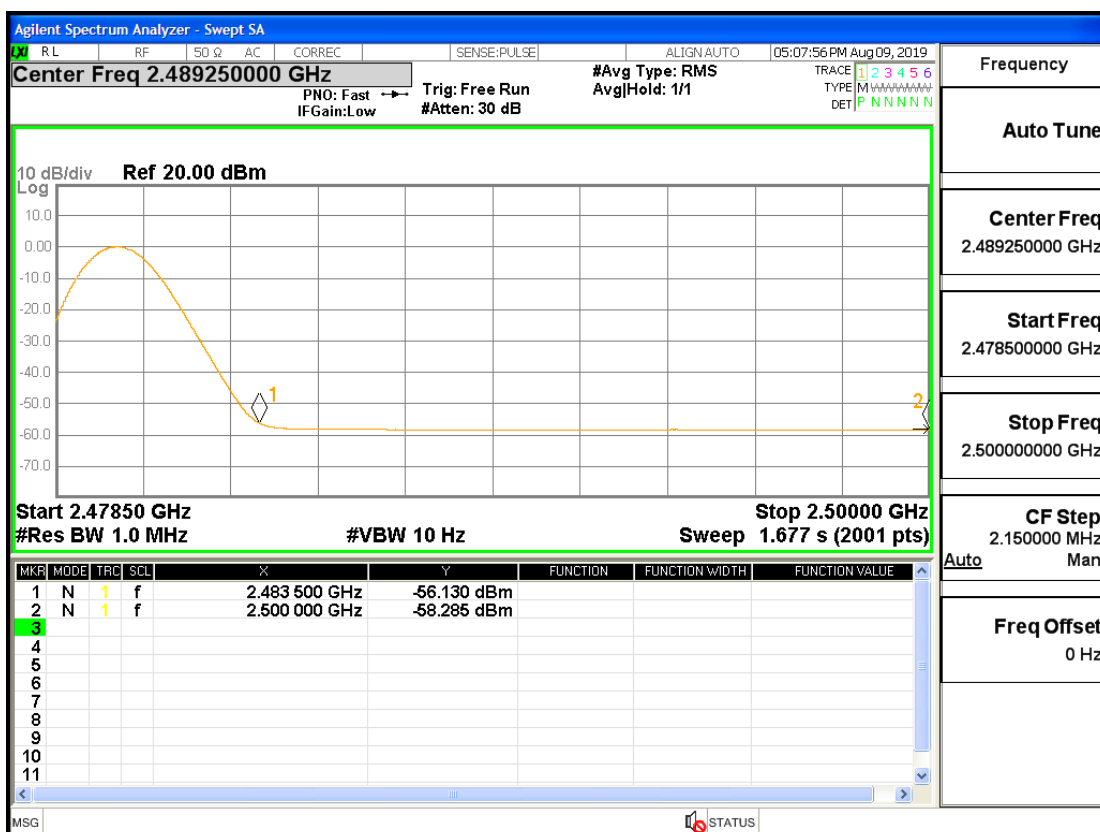
Restrict-band band-edge measurements_2402_AV_DH5



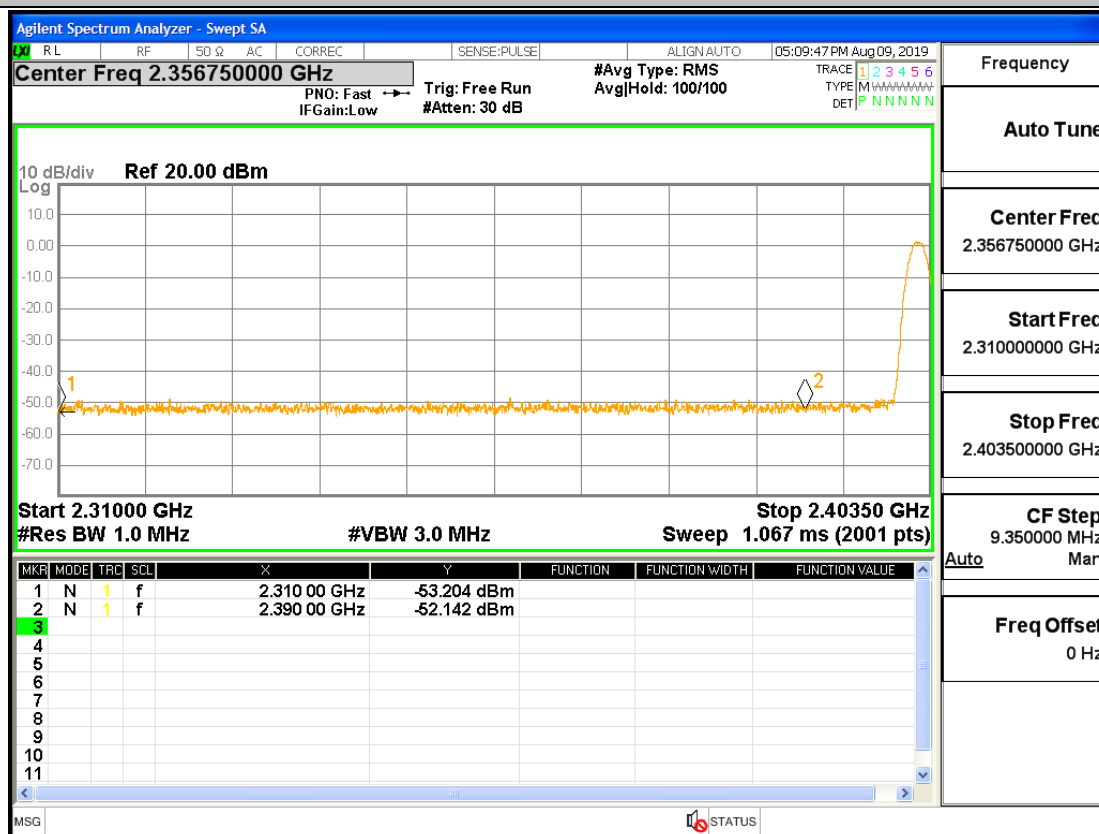
Restrict-band band-edge measurements_2480_PEAK_DH5



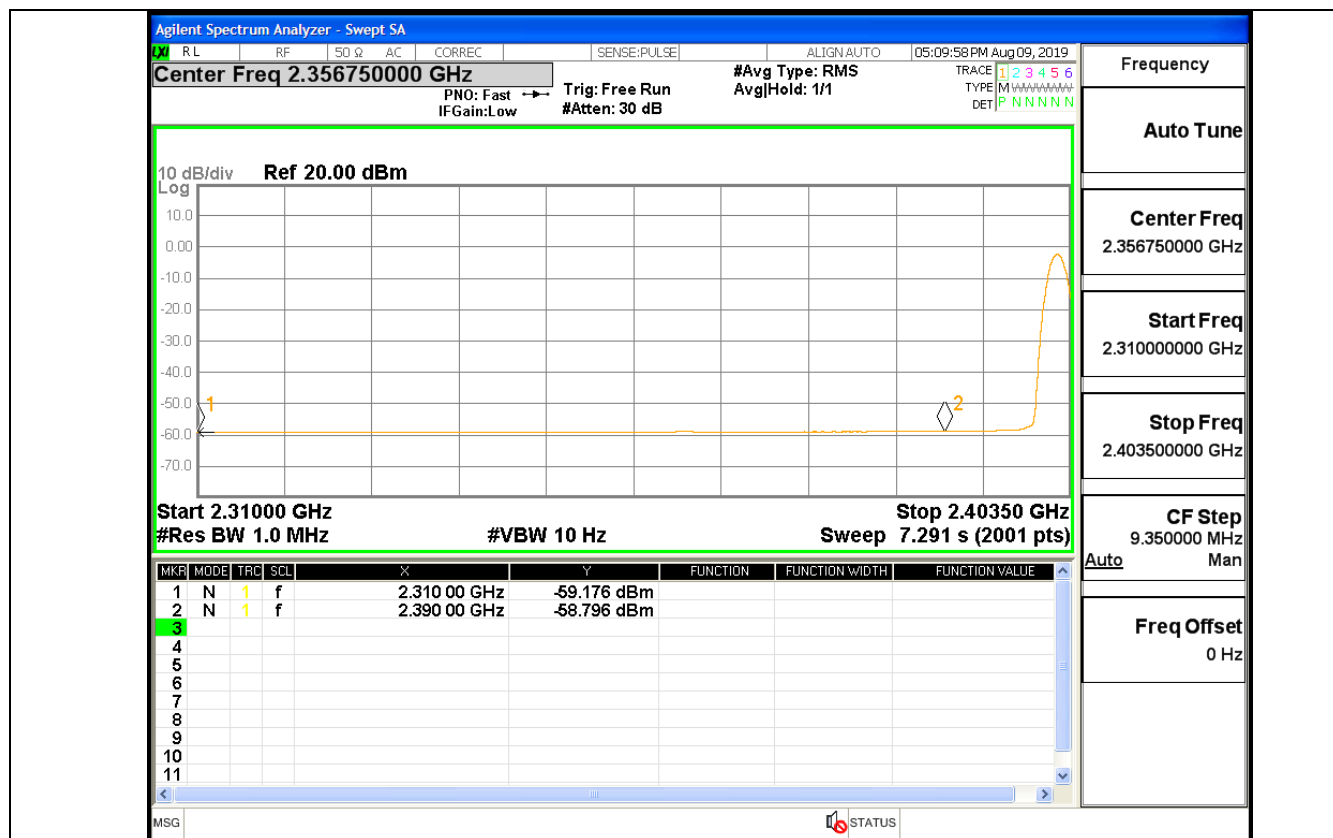
Restrict-band band-edge measurements_2480_AV_DH5



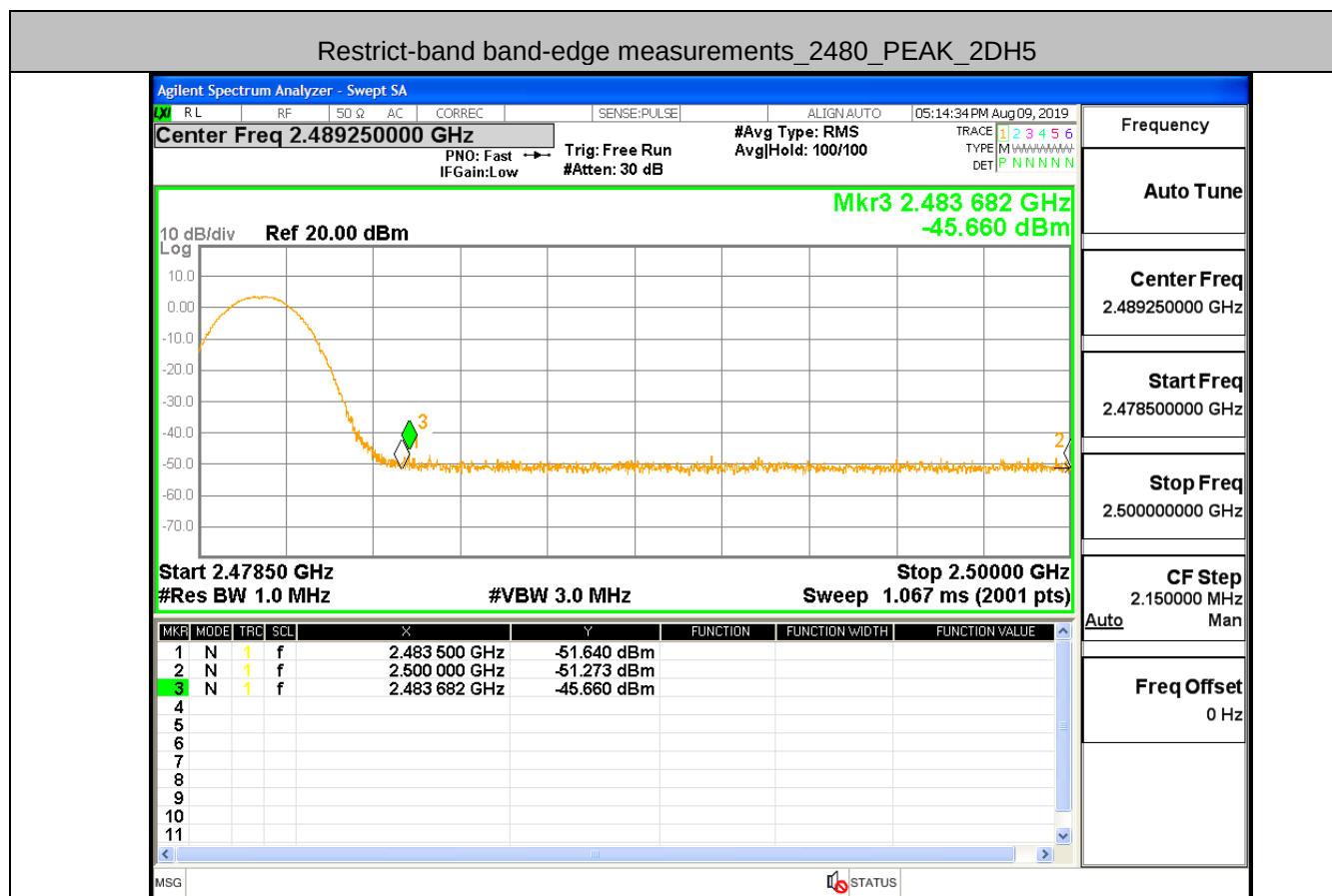
Restrict-band band-edge measurements_2402_PEAK_2DH5



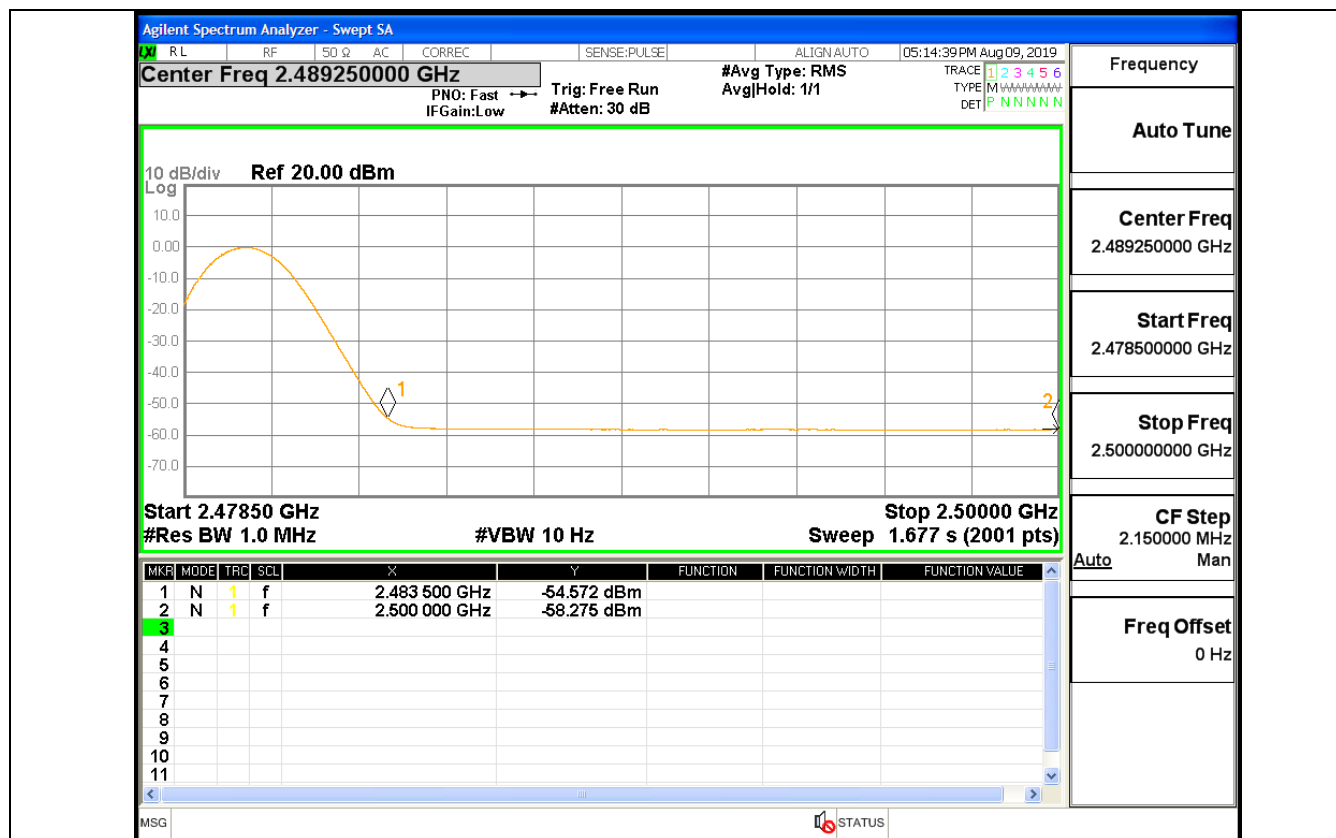
Restrict-band band-edge measurements_2402_AV_2DH5



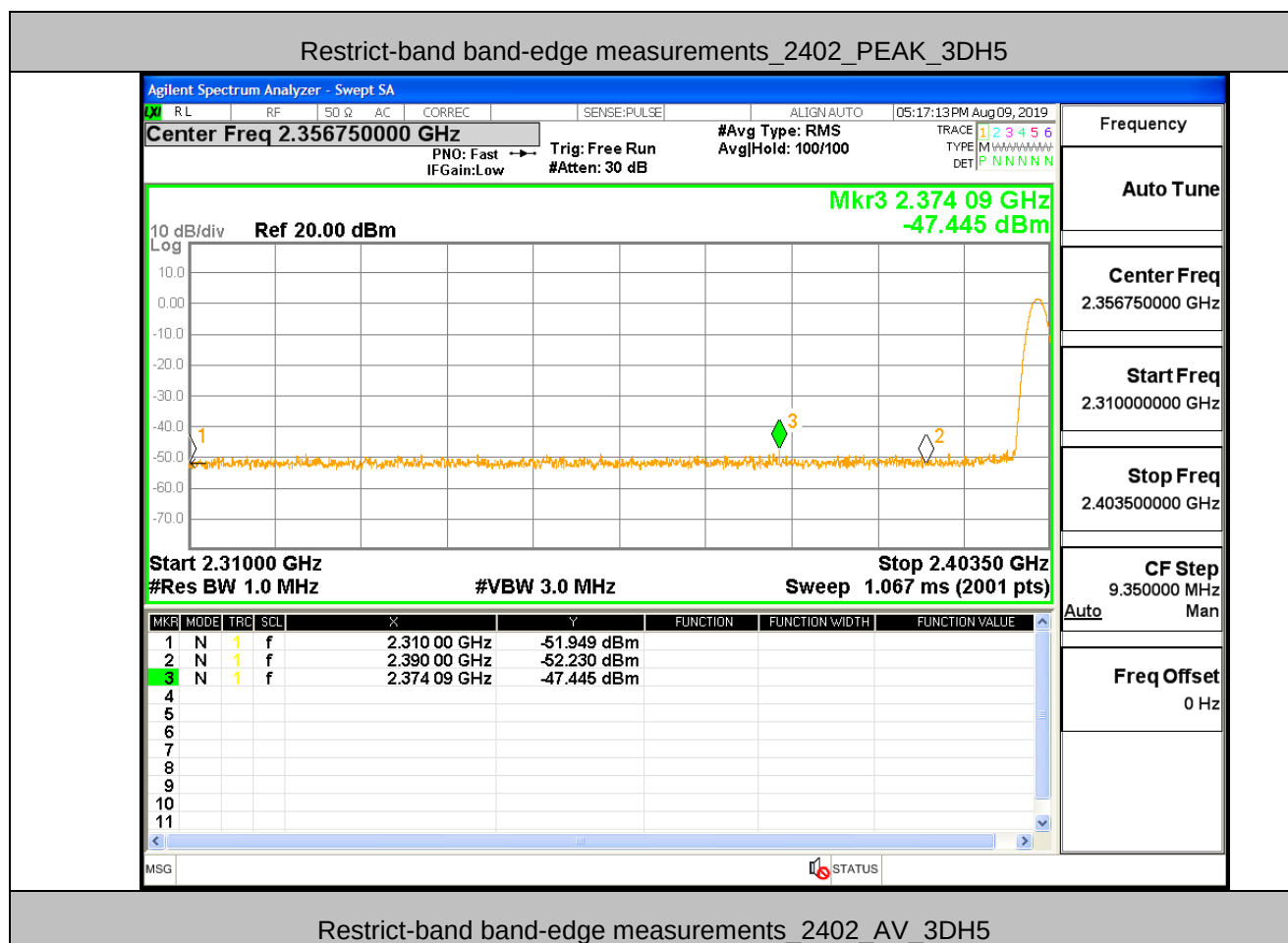
Restrict-band band-edge measurements_2480_PEAK_2DH5



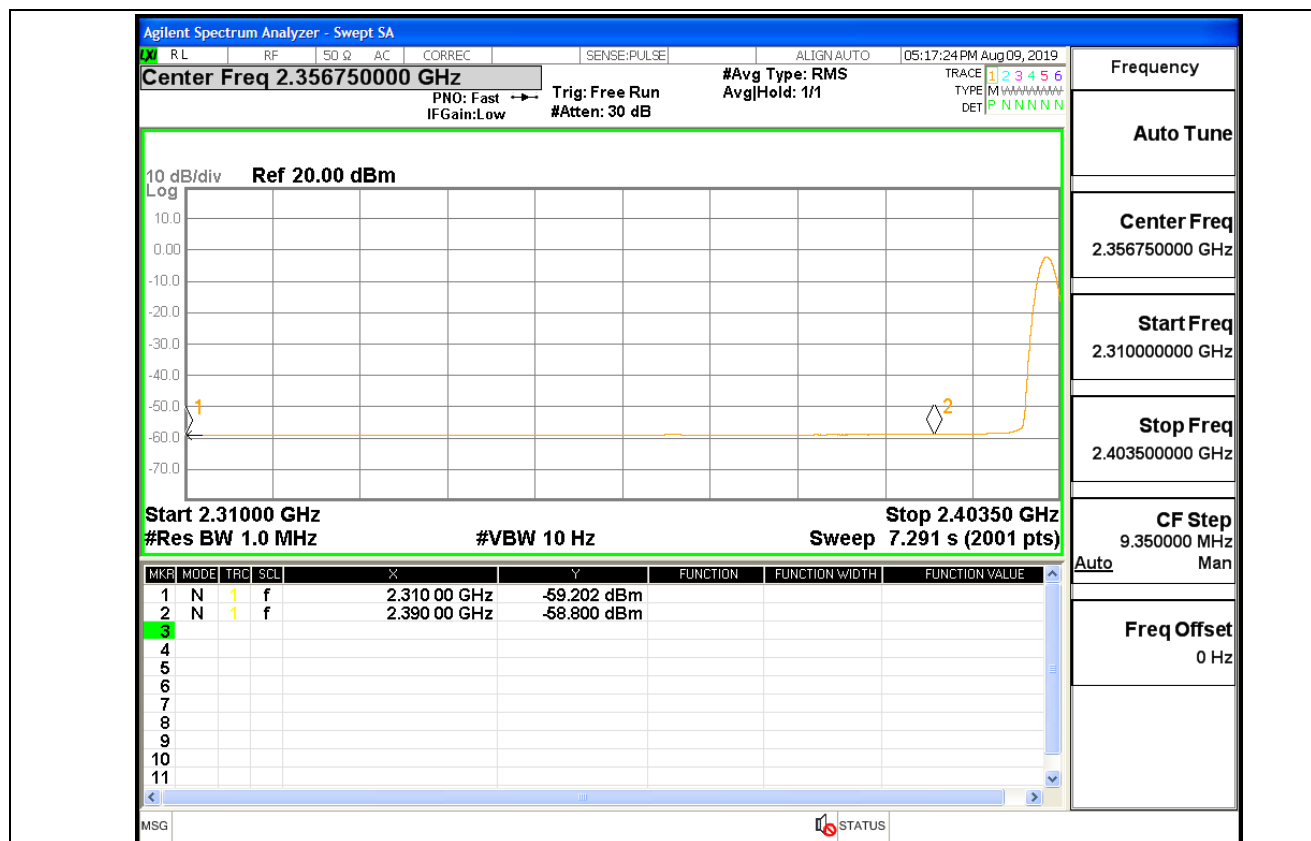
Restrict-band band-edge measurements_2480_AV_2DH5



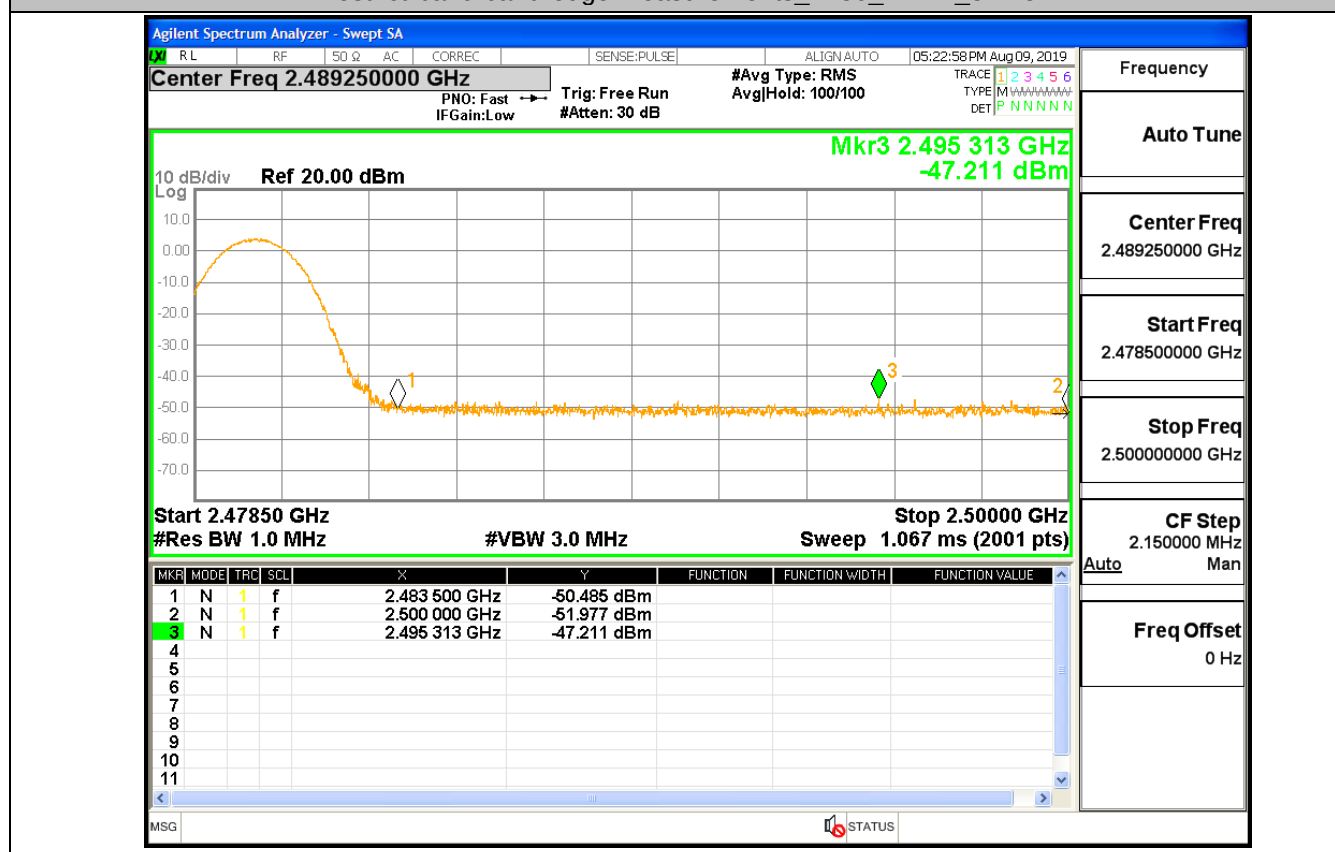
Restrict-band band-edge measurements_2402_PEAK_3DH5



Restrict-band band-edge measurements_2402_AV_3DH5



Restrict-band band-edge measurements_2480_PEAK_3DH5



Restrict-band band-edge measurements_2480_AV_3DH5

