

Appendix A

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

Product Name: Bluetooth Headset

Trade Mark: KuLark

Test Model: GT101

FCC ID: 2ASKNGT101

Environmental Conditions

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

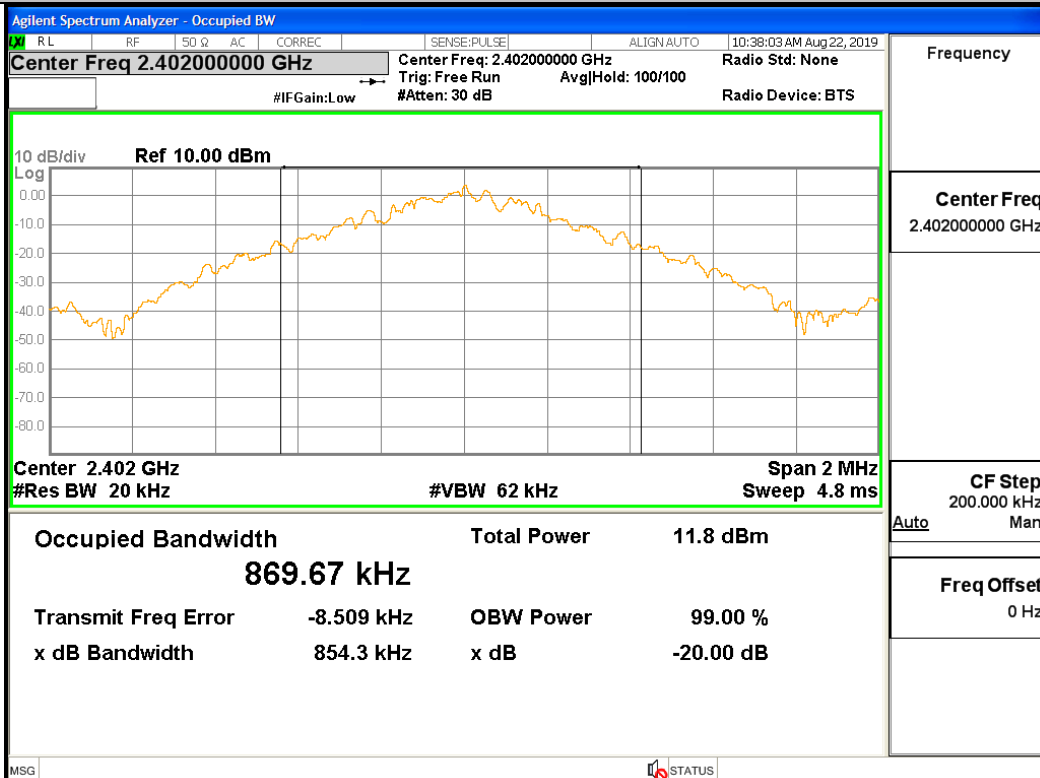
A.1 20 dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit(MHz)	Verdict
GFSK	LCH	0.854	Not Specified	PASS
GFSK	MCH	0.858	Not Specified	PASS
GFSK	HCH	0.946	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.362	Not Specified	PASS
$\pi/4$ DQPSK	MCH	1.250	Not Specified	PASS
$\pi/4$ DQPSK	HCH	1.294	Not Specified	PASS
8DPSK	LCH	1.309	Not Specified	PASS
8DPSK	MCH	1.278	Not Specified	PASS
8DPSK	HCH	1.252	Not Specified	PASS

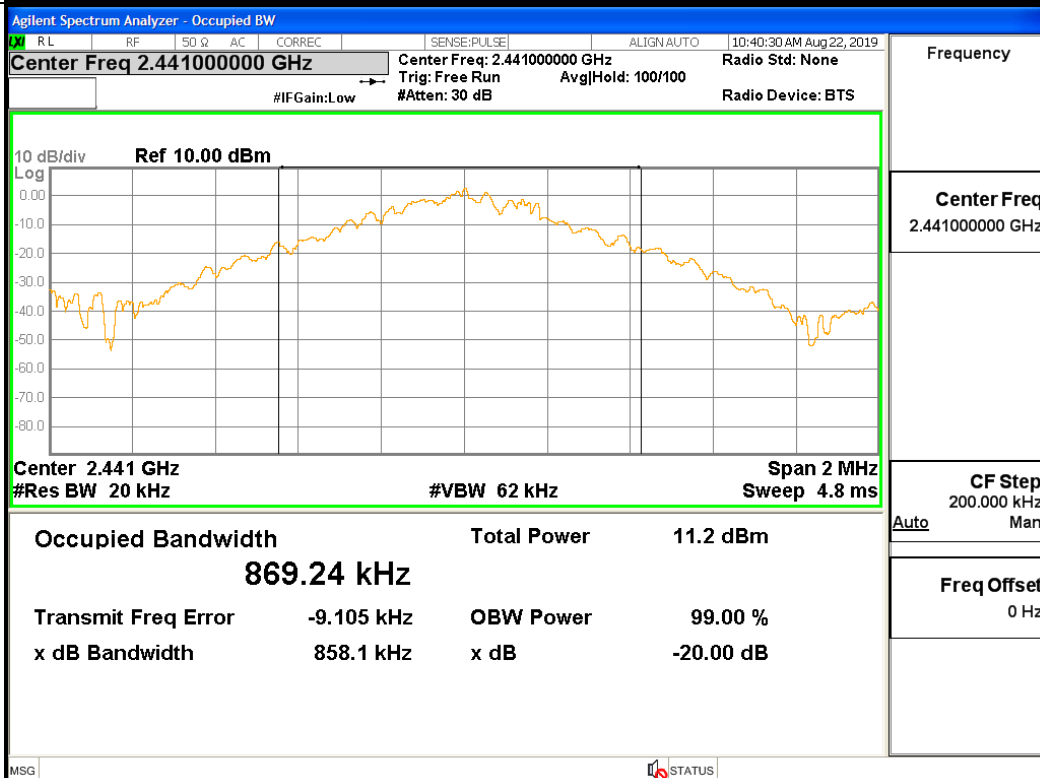
Test Graph

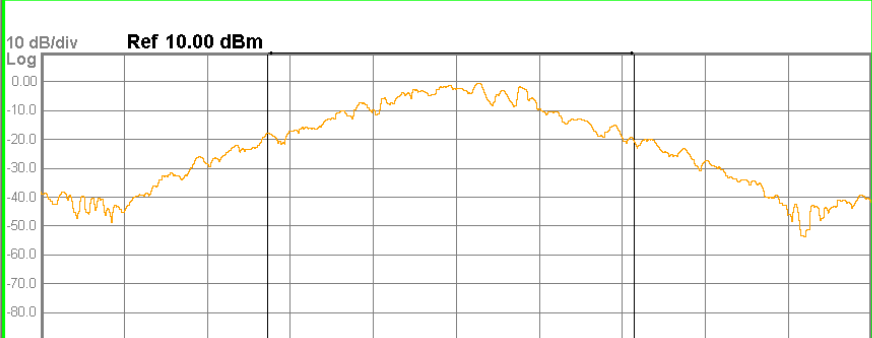
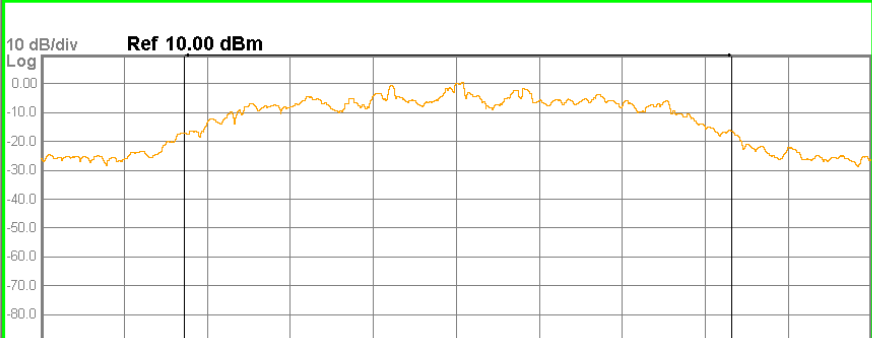
Graphs

GFSK/LCH

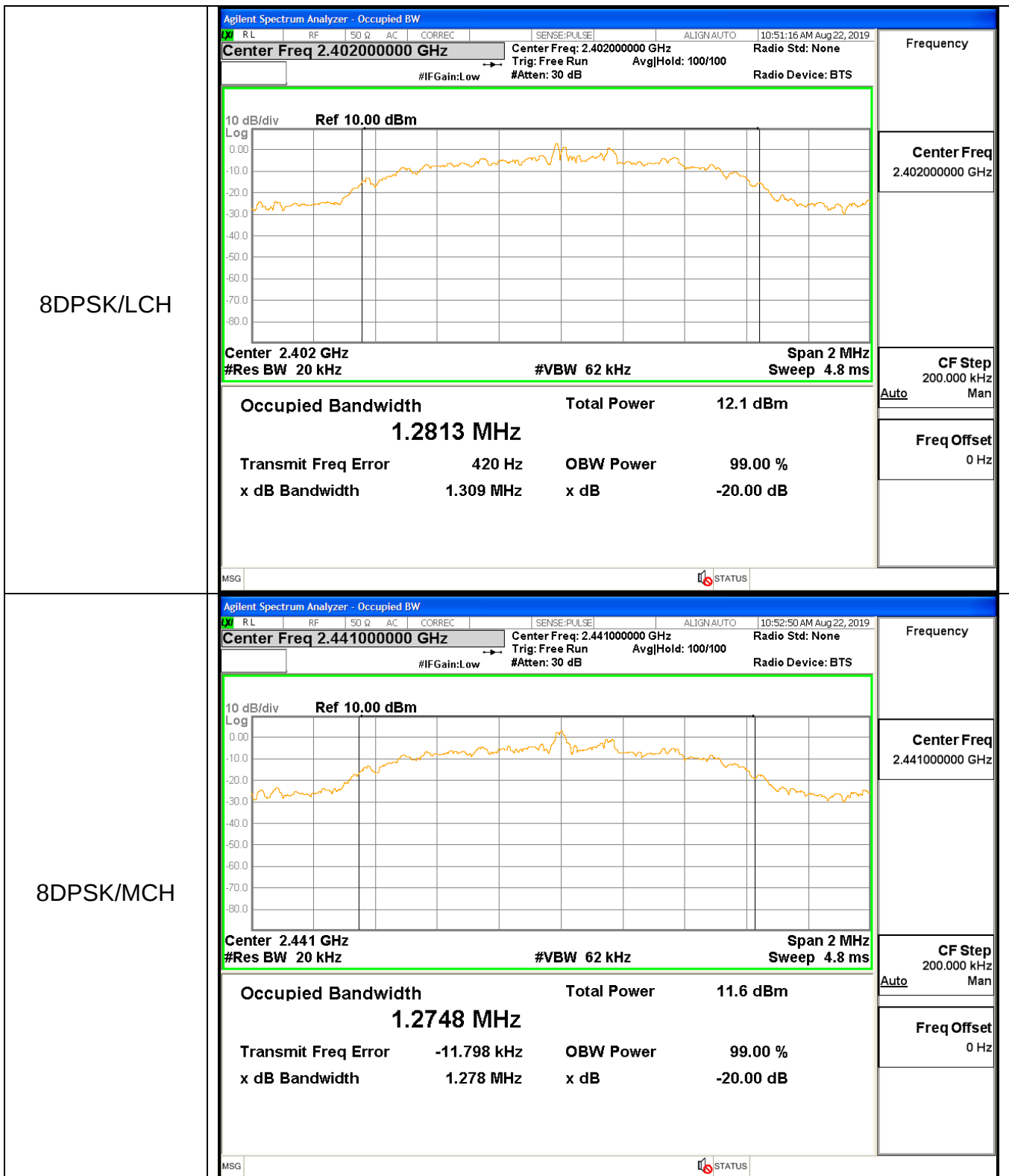


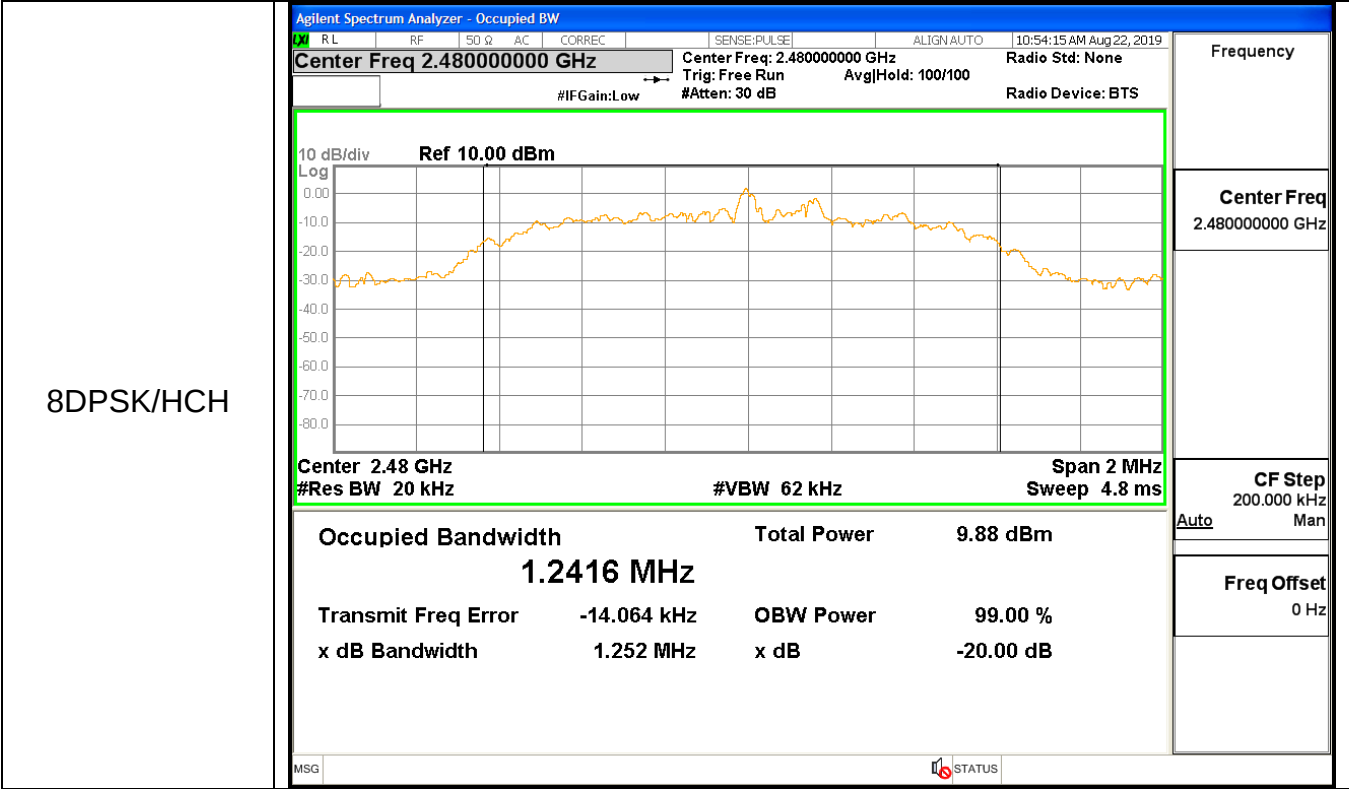
GFSK/MCH



GFSK/HCH	Agilent Spectrum Analyzer - Occupied BW RL RF 50 Ω AC CORREC SENSE:PULSE ALIGN AUTO 10:42:08 AM Aug 22, 2019 Center Freq 2.480000000 GHz Center Freq: 2.480000000 GHz Radio Std: None #IFGain:Low #Atten: 30 dB AvgHold: 100/100 Radio Device: BTS  10 dB/div Ref 10.00 dBm Center 2.48 GHz Span 2 MHz #Res BW 20 kHz #VBW 62 kHz Sweep 4.8 ms Occupied Bandwidth 875.63 kHz Total Power 9.45 dBm Transmit Freq Error -11.152 kHz OBW Power 99.00 % x dB Bandwidth 945.6 kHz x dB -20.00 dB MSG STATUS	Frequency Center Freq 2.480000000 GHz CF Step 200.000 kHz Auto Man Freq Offset 0 Hz
	Agilent Spectrum Analyzer - Occupied BW RL RF 50 Ω AC CORREC SENSE:PULSE ALIGN AUTO 10:44:37 AM Aug 22, 2019 Center Freq 2.402000000 GHz Center Freq: 2.402000000 GHz Radio Std: None #IFGain:Low #Atten: 30 dB AvgHold: 100/100 Radio Device: BTS  10 dB/div Ref 10.00 dBm Center 2.402 GHz Span 2 MHz #Res BW 20 kHz #VBW 62 kHz Sweep 4.8 ms Occupied Bandwidth 1.3162 MHz Total Power 11.6 dBm Transmit Freq Error 4.477 kHz OBW Power 99.00 % x dB Bandwidth 1.362 MHz x dB -20.00 dB MSG STATUS	Frequency Center Freq 2.402000000 GHz CF Step 200.000 kHz Auto Man Freq Offset 0 Hz



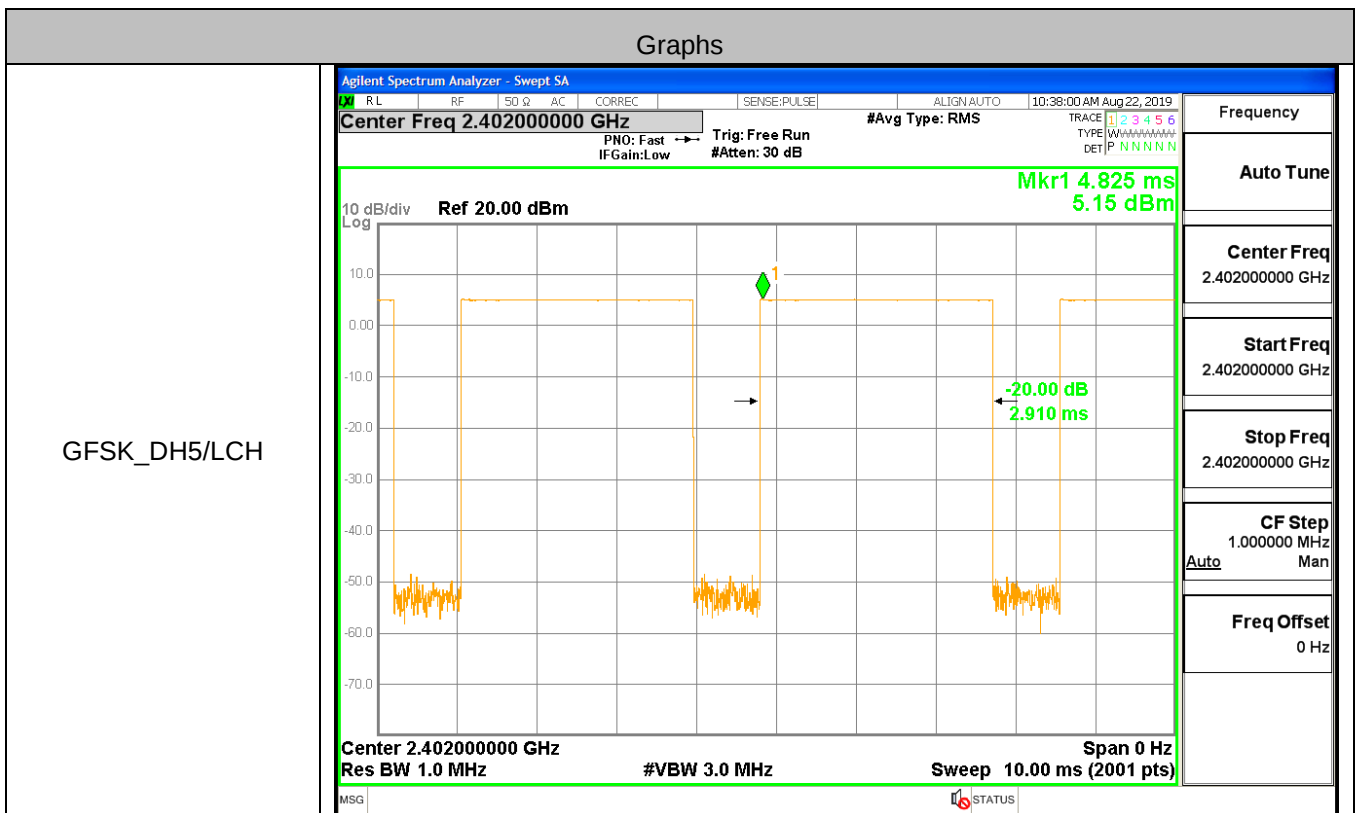




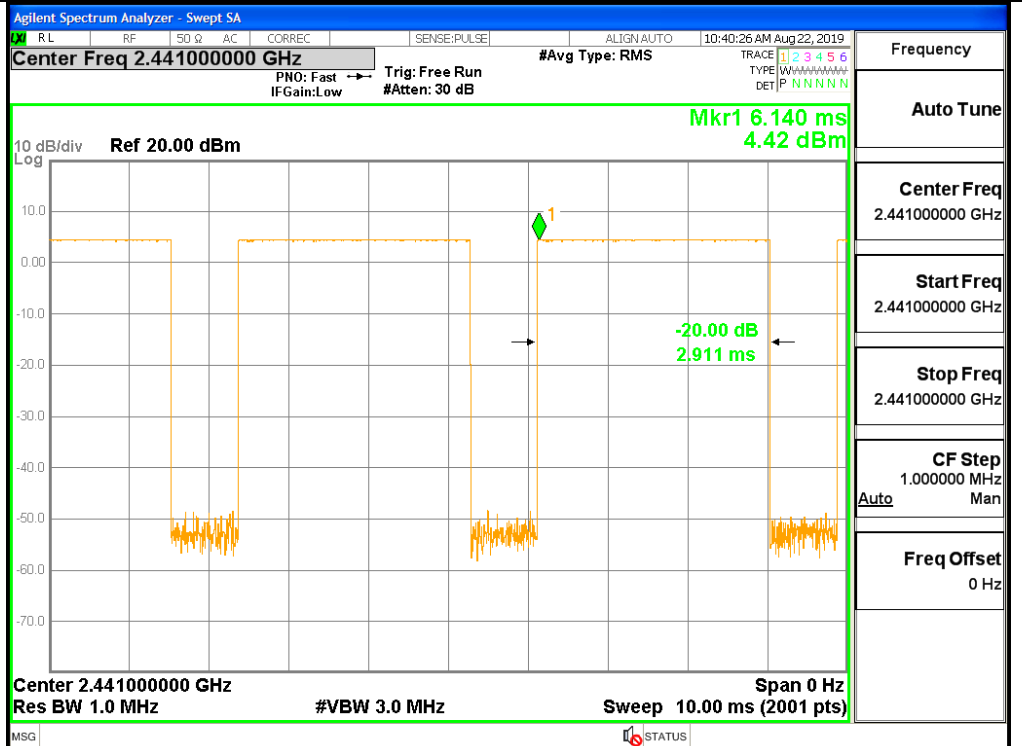
A.2 Dwell Time

Mode	Packet	Channel	Burst Width [s/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	0.002910	106.7	0.310497	0.4	PASS
GFSK	DH5	MCH	0.002911	106.7	0.310604	0.4	PASS
GFSK	DH5	HCH	0.002911	106.7	0.310604	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	0.002915	106.7	0.311031	0.4	PASS
$\pi/4$ DQPSK	2DH5	MCH	0.002916	106.7	0.311137	0.4	PASS
$\pi/4$ DQPSK	2DH5	HCH	0.002915	106.7	0.311031	0.4	PASS
8DPSK	3DH5	LCH	0.002918	106.7	0.311351	0.4	PASS
8DPSK	3DH5	MCH	0.002918	106.7	0.311351	0.4	PASS
8DPSK	3DH5	HCH	0.002919	106.7	0.311457	0.4	PASS

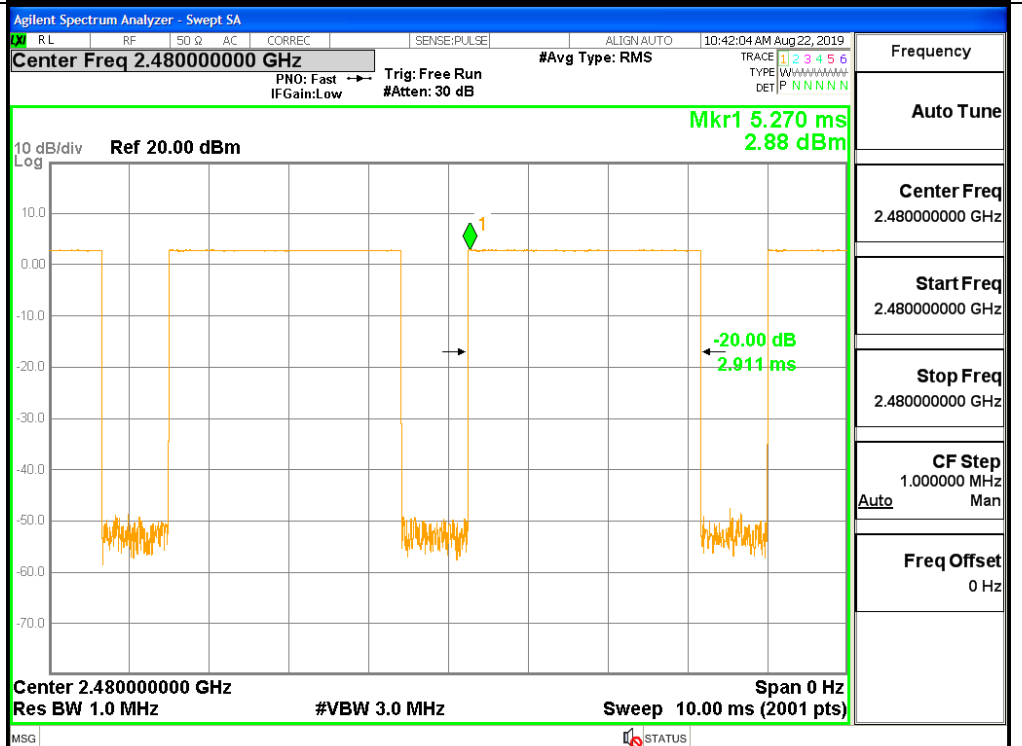
Test Graph



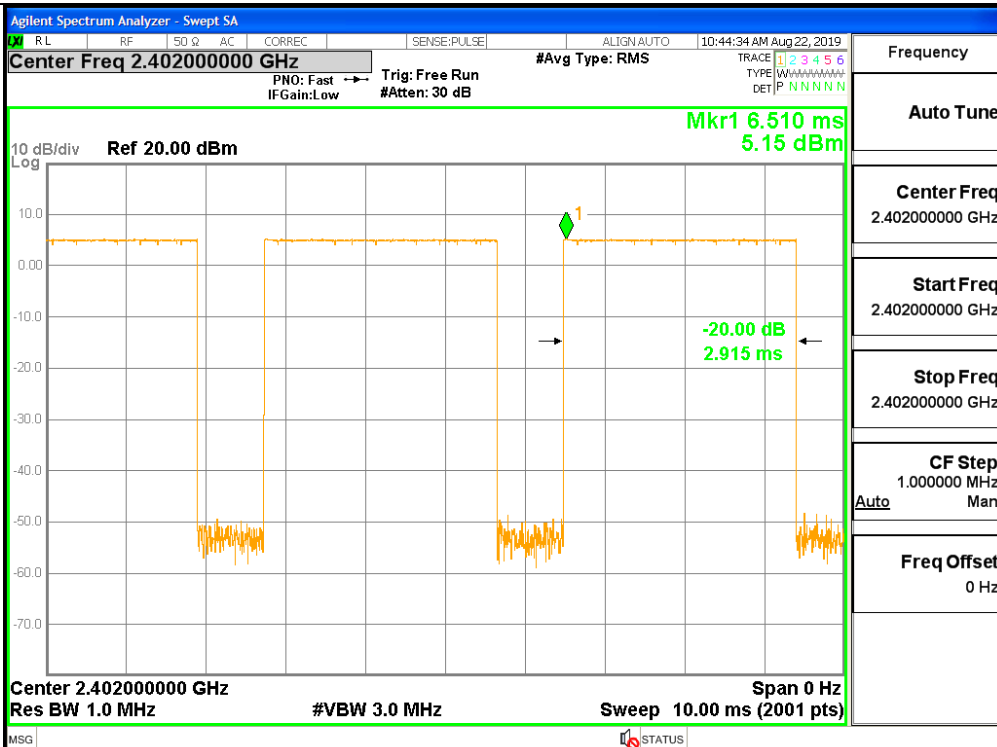
GFSK_DH5/MCH



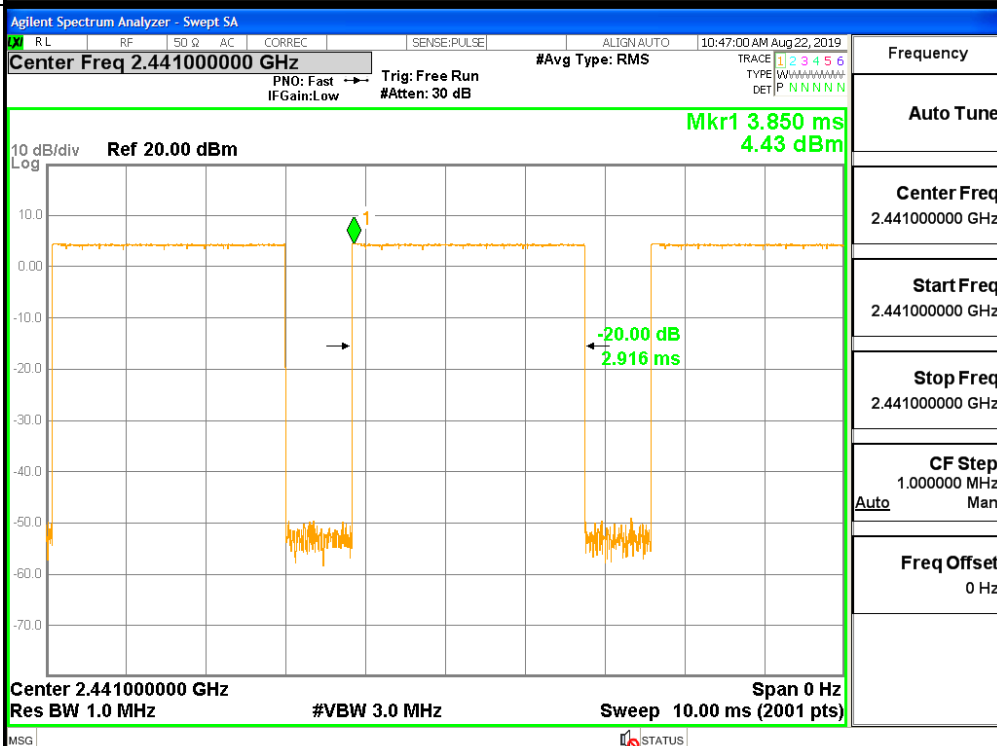
GFSK_DH5/HCH



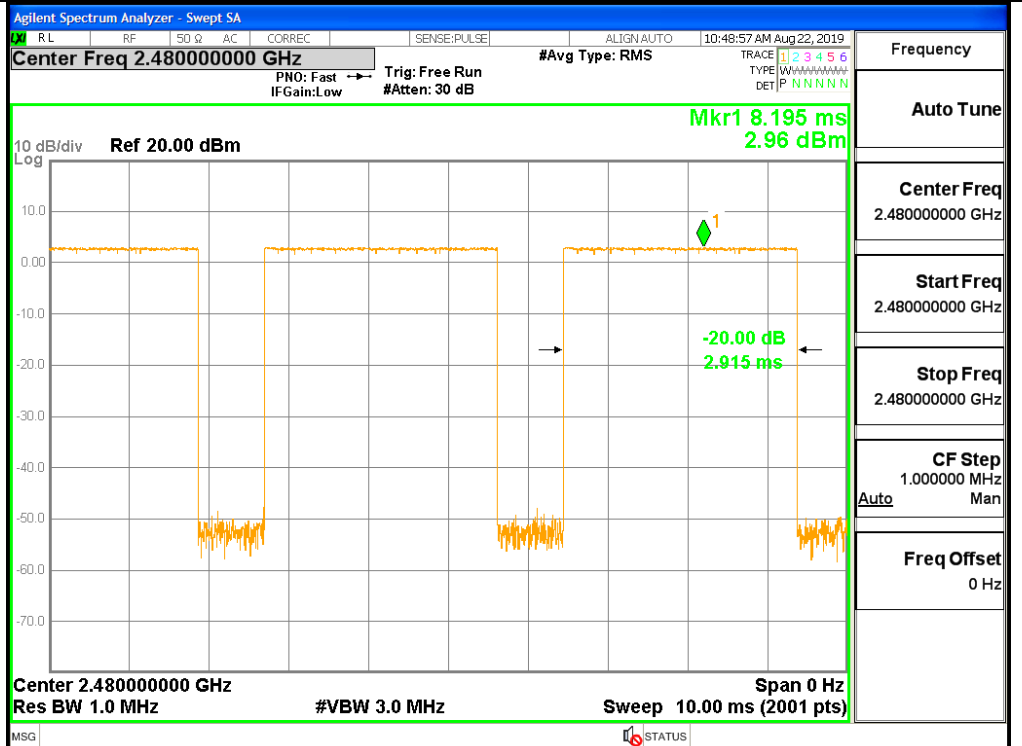
$\pi/4$ DQPSK
_2DH5/LCH



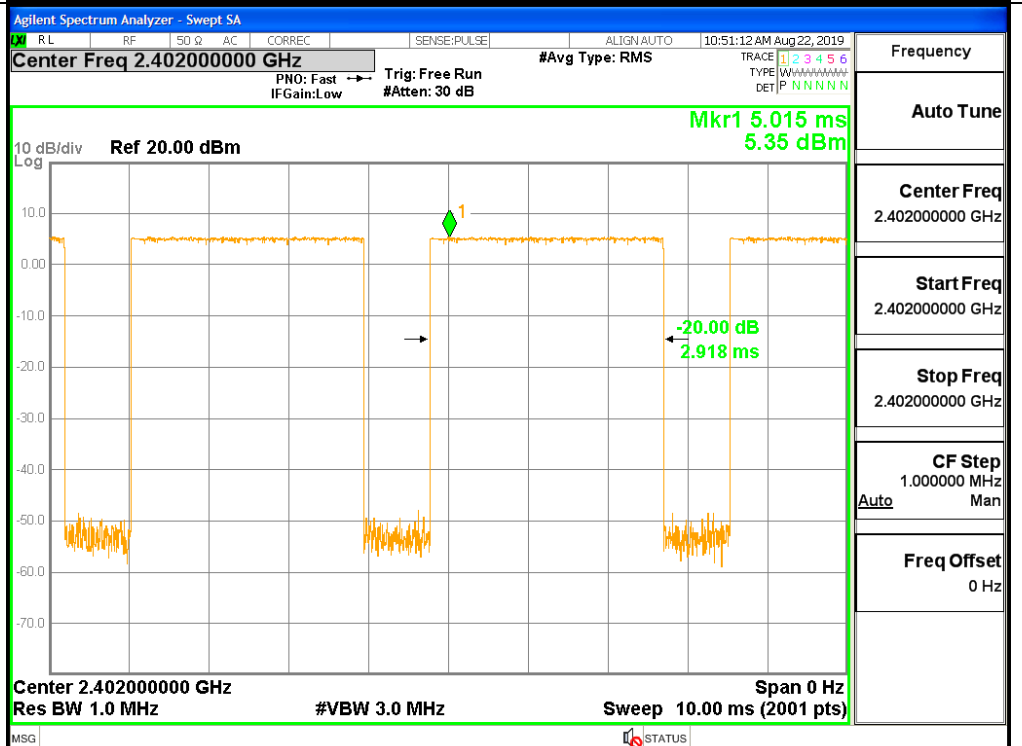
$\pi/4$ DQPSK
_2DH5/MCH

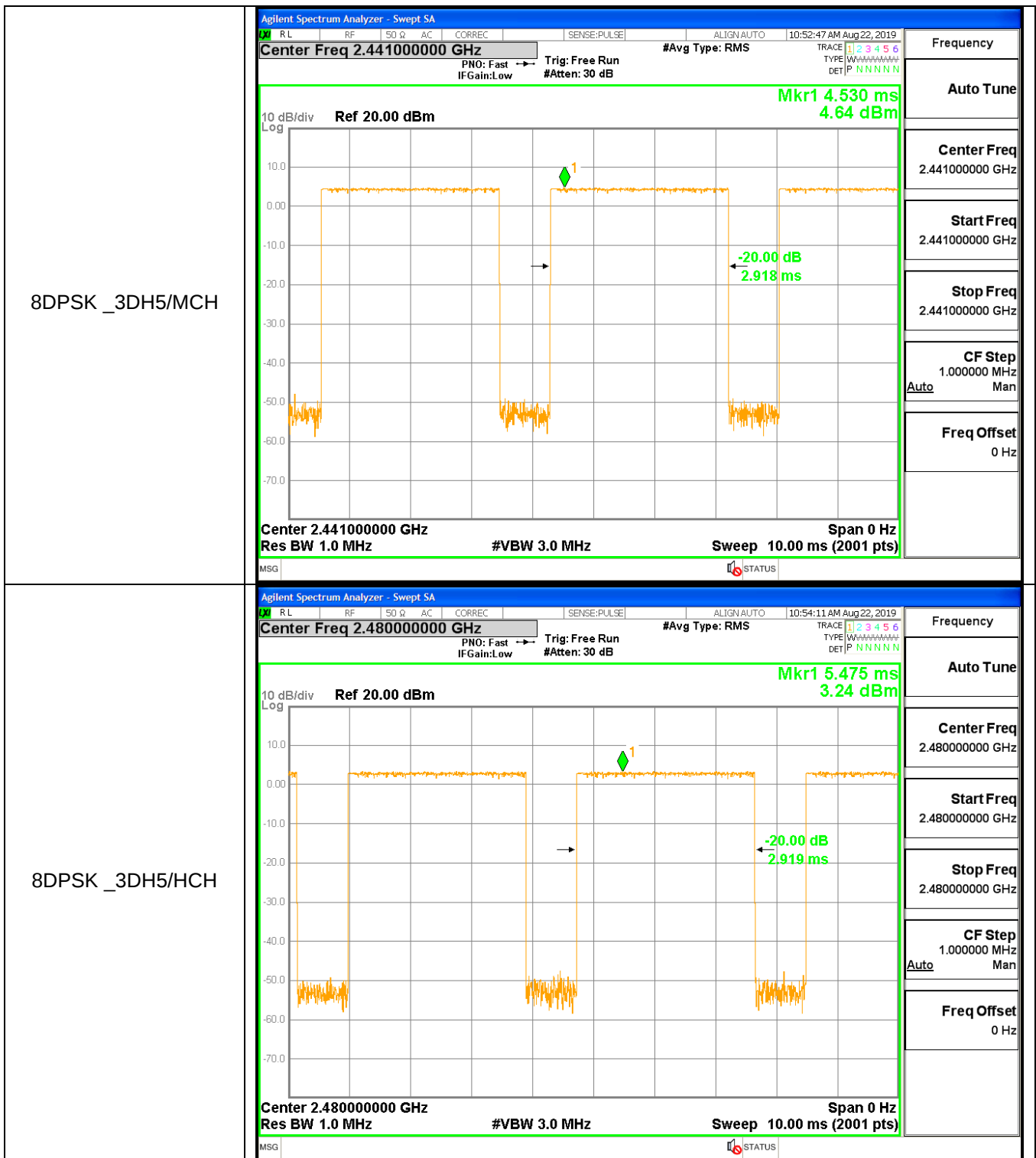


$\pi/4$ DQPSK
_2DH5/HCH



8DPSK_3DH5/LCH

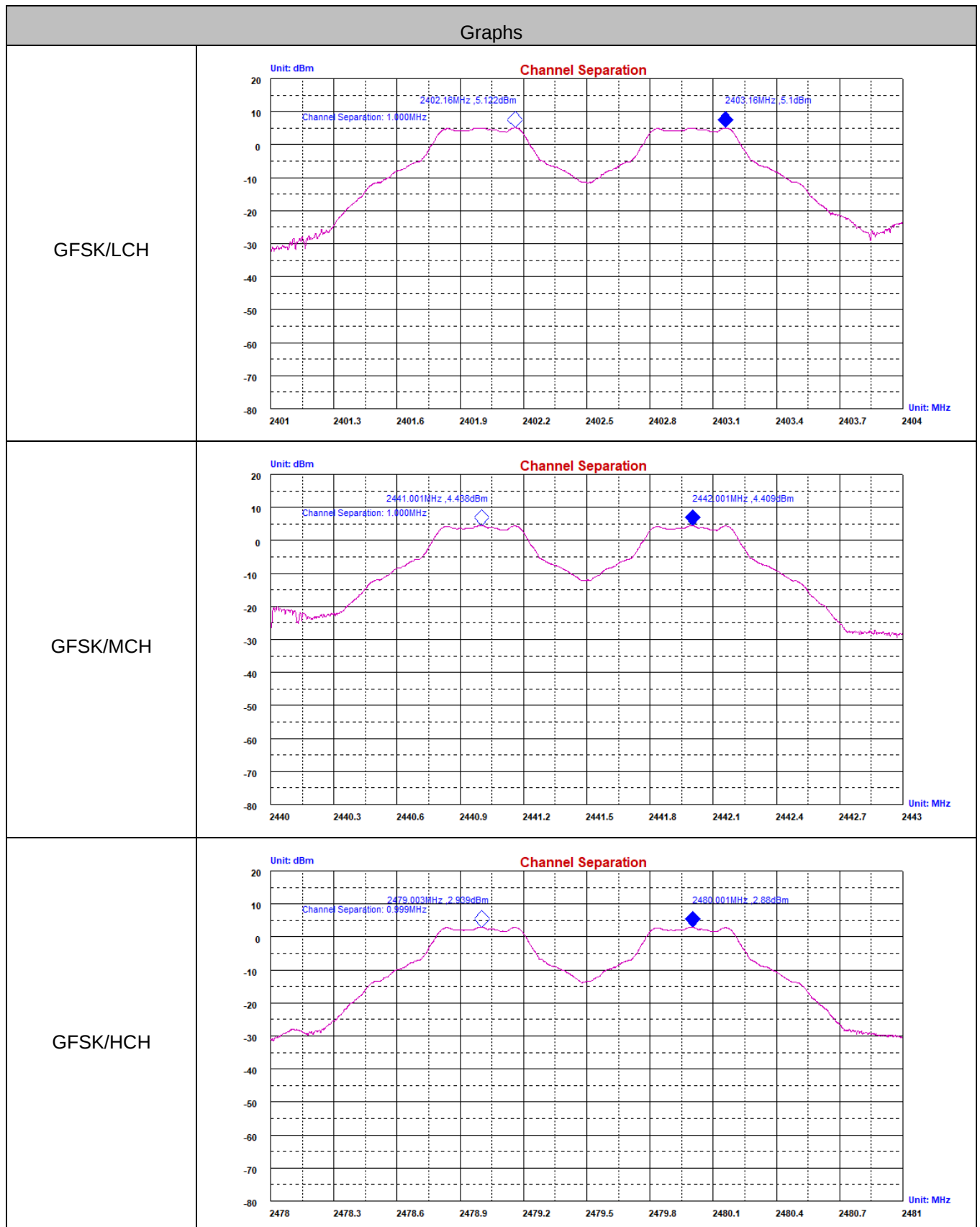


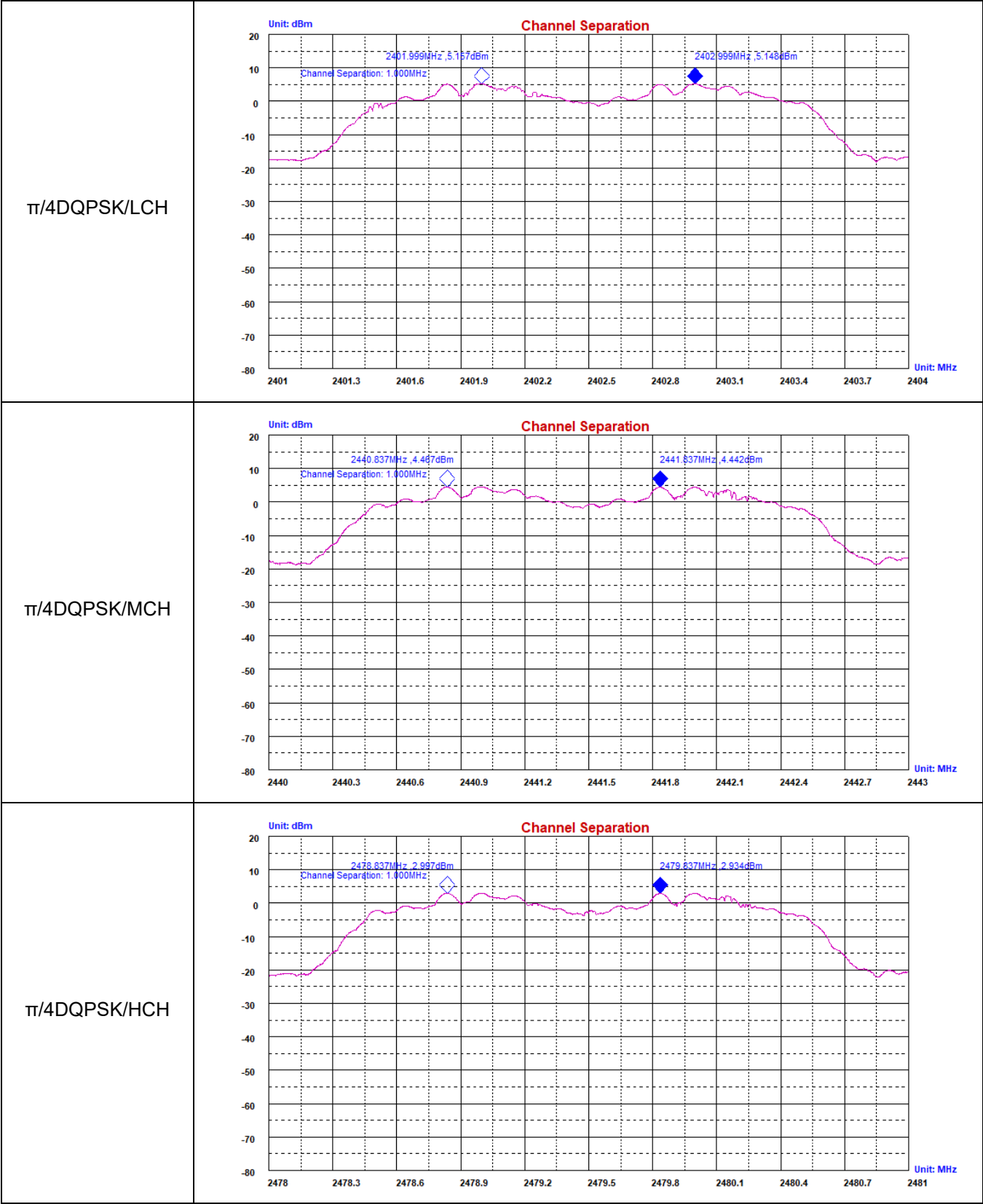


A.3 Carrier Frequency Separation

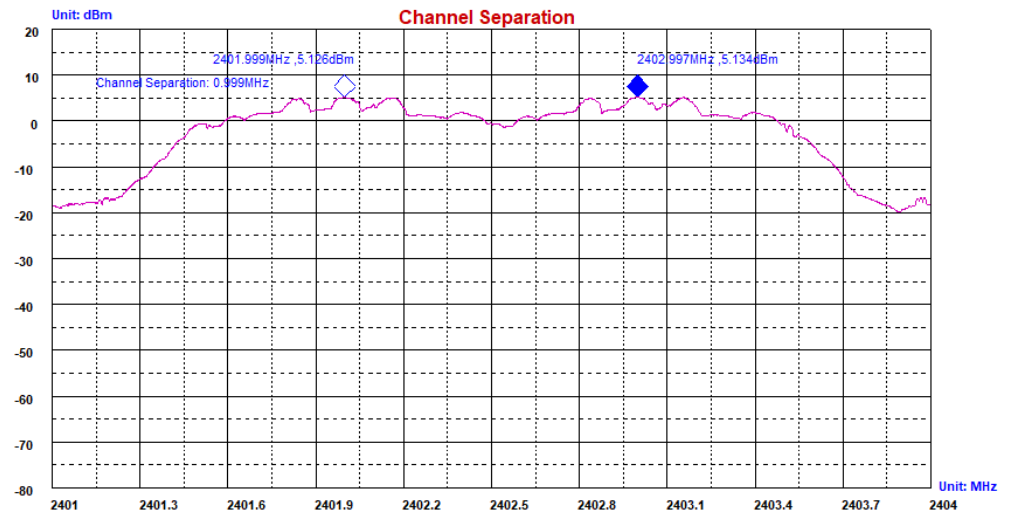
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.000	0.569	PASS
GFSK	MCH	1.000	0.572	PASS
GFSK	HCH	0.999	0.631	PASS
$\pi/4$ DQPSK	LCH	1.000	0.908	PASS
$\pi/4$ DQPSK	MCH	1.000	0.833	PASS
$\pi/4$ DQPSK	HCH	1.000	0.863	PASS
8DPSK	LCH	0.999	0.873	PASS
8DPSK	MCH	0.993	0.852	PASS
8DPSK	HCH	1.000	0.835	PASS

Test Graph

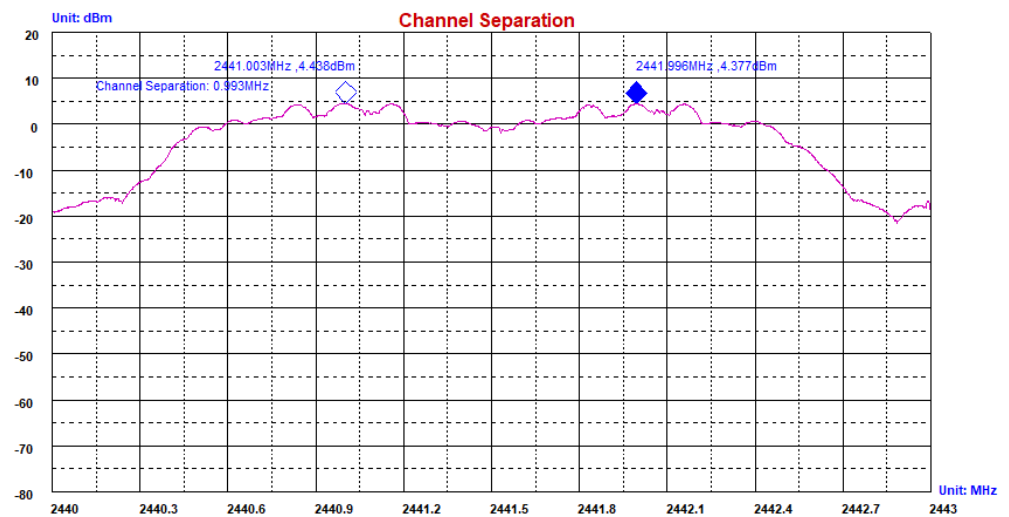




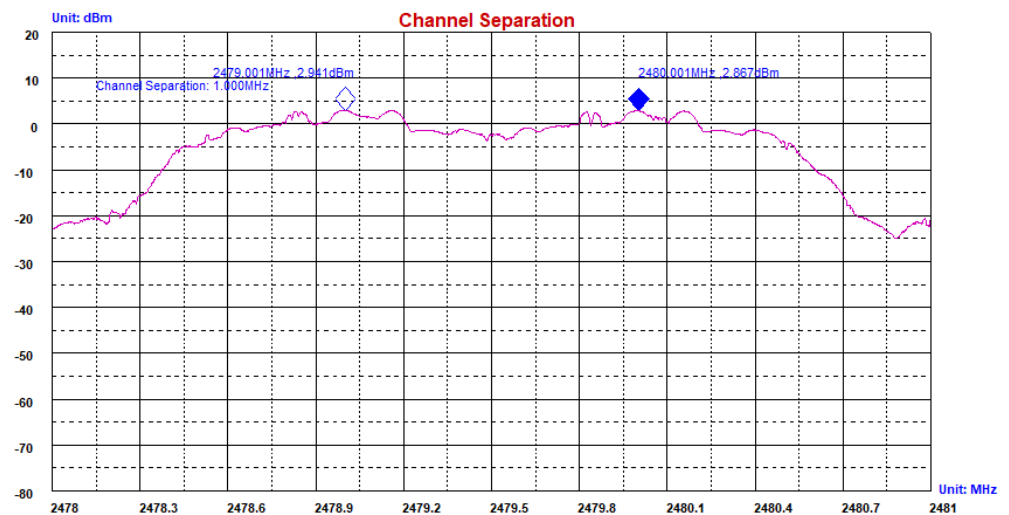
8DPSK/LCH



8DPSK/MCH



8DPSK/HCH

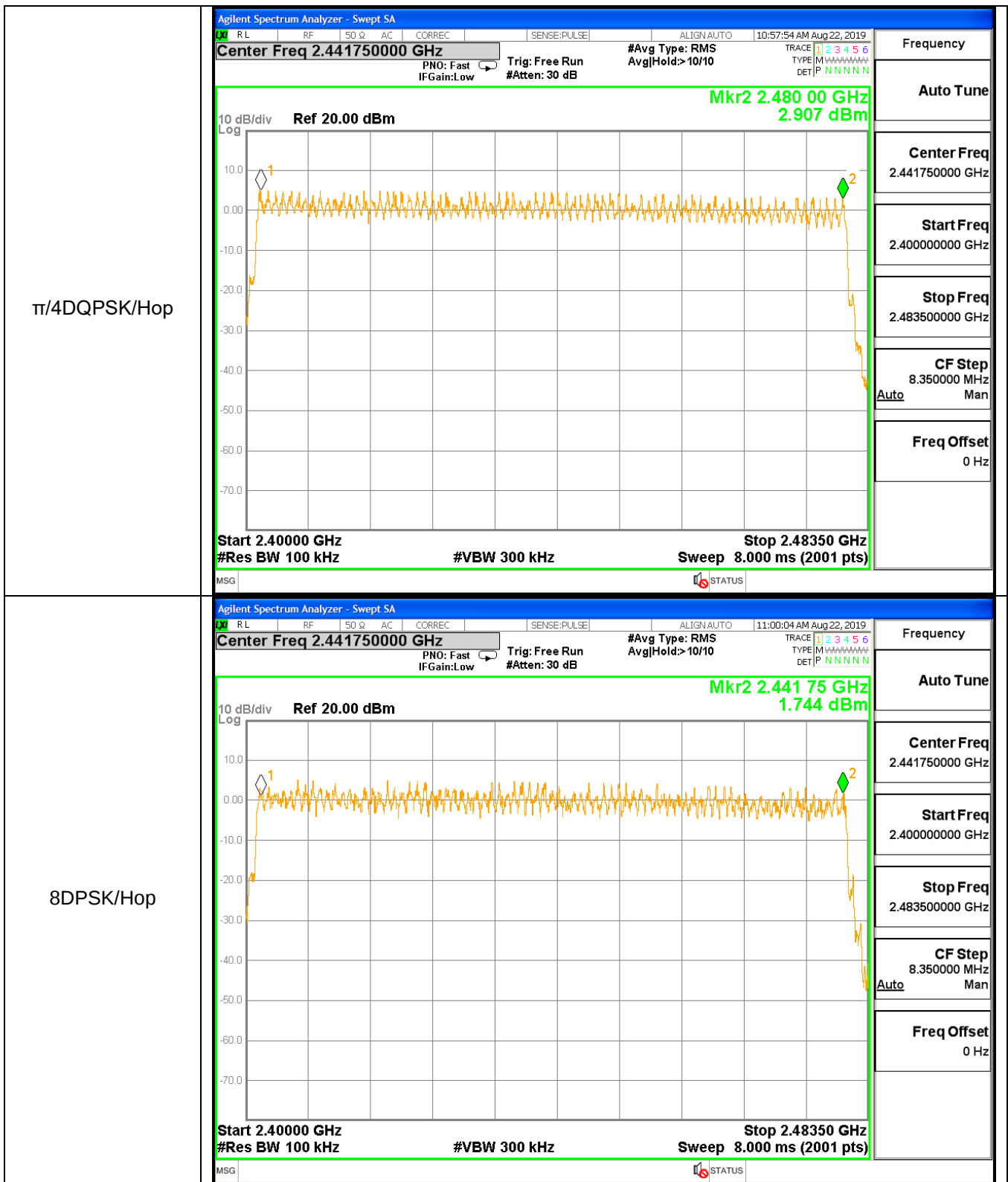


A.4 Hopping Channel Number

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

Test Graph

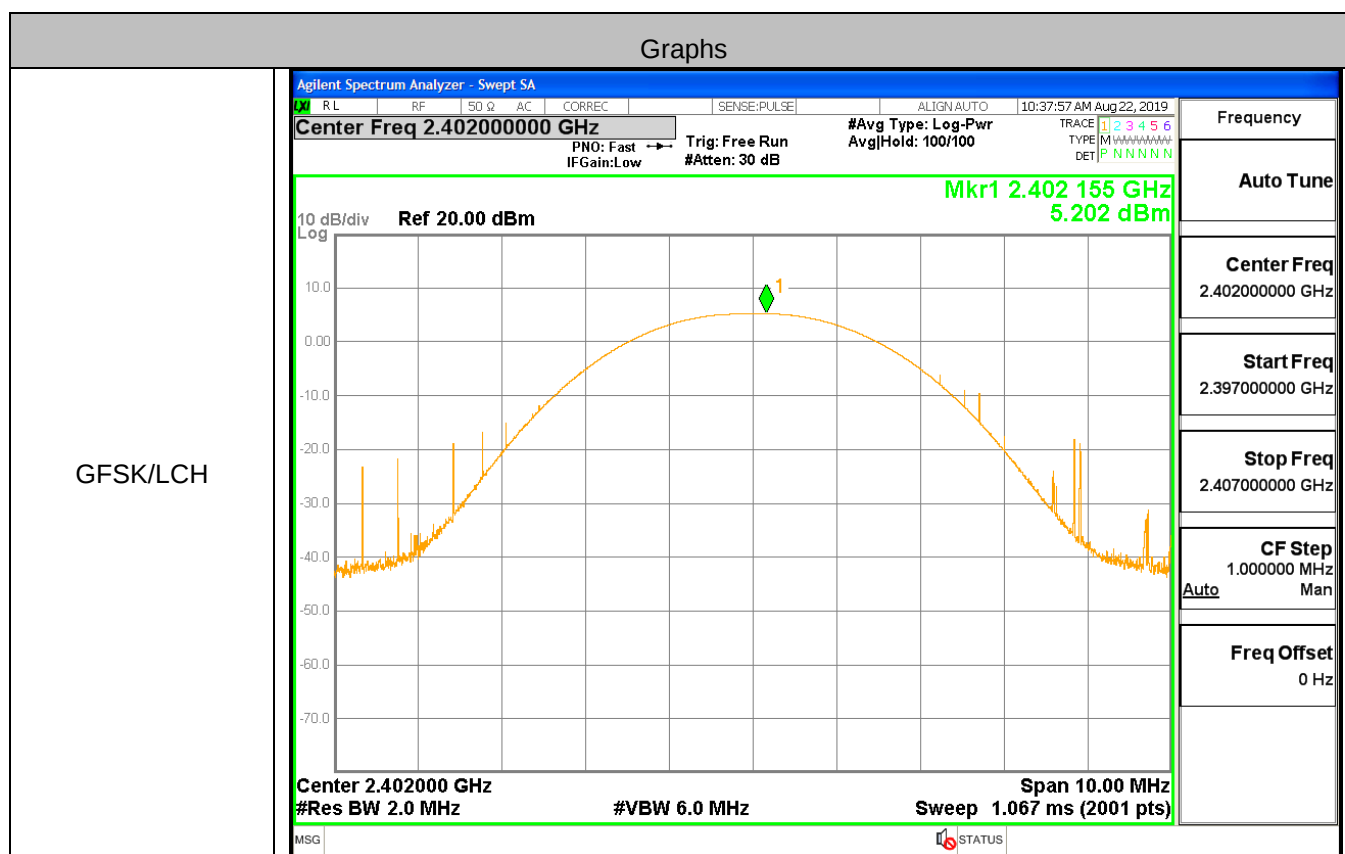




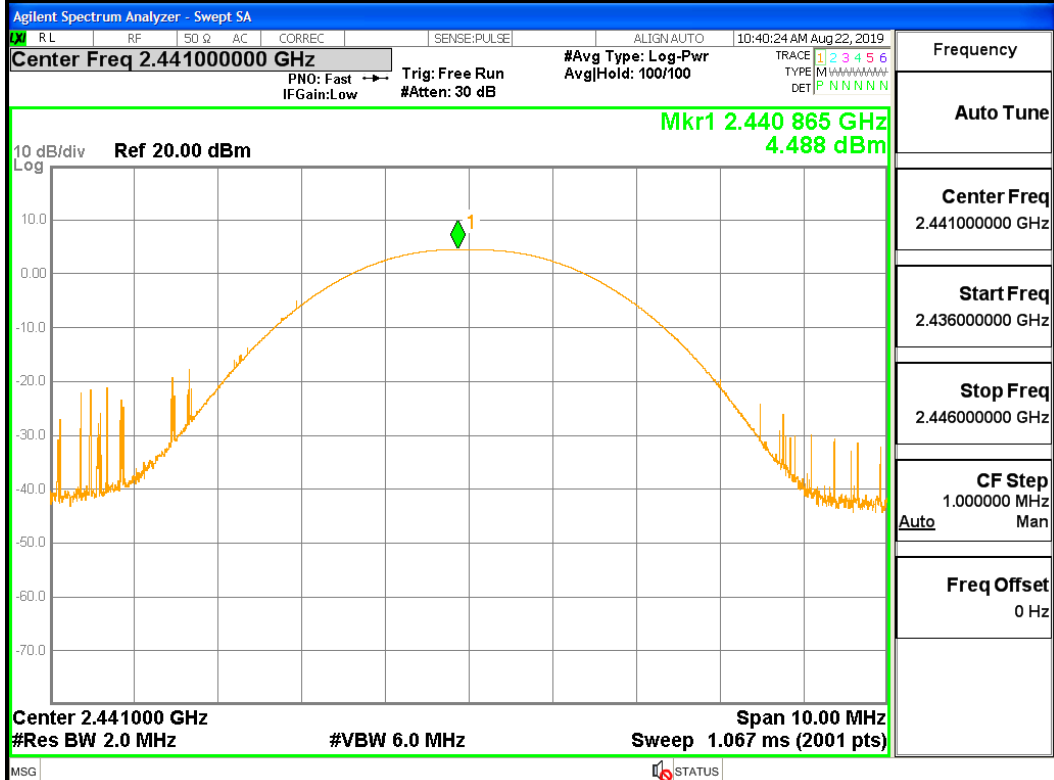
A.5 Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	5.202	21	PASS
GFSK	MCH	4.488	21	PASS
GFSK	HCH	2.951	21	PASS
$\pi/4$ DQPSK	LCH	5.396	21	PASS
$\pi/4$ DQPSK	MCH	4.673	21	PASS
$\pi/4$ DQPSK	HCH	3.291	21	PASS
8DPSK	LCH	5.456	21	PASS
8DPSK	MCH	4.756	21	PASS
8DPSK	HCH	3.421	21	PASS

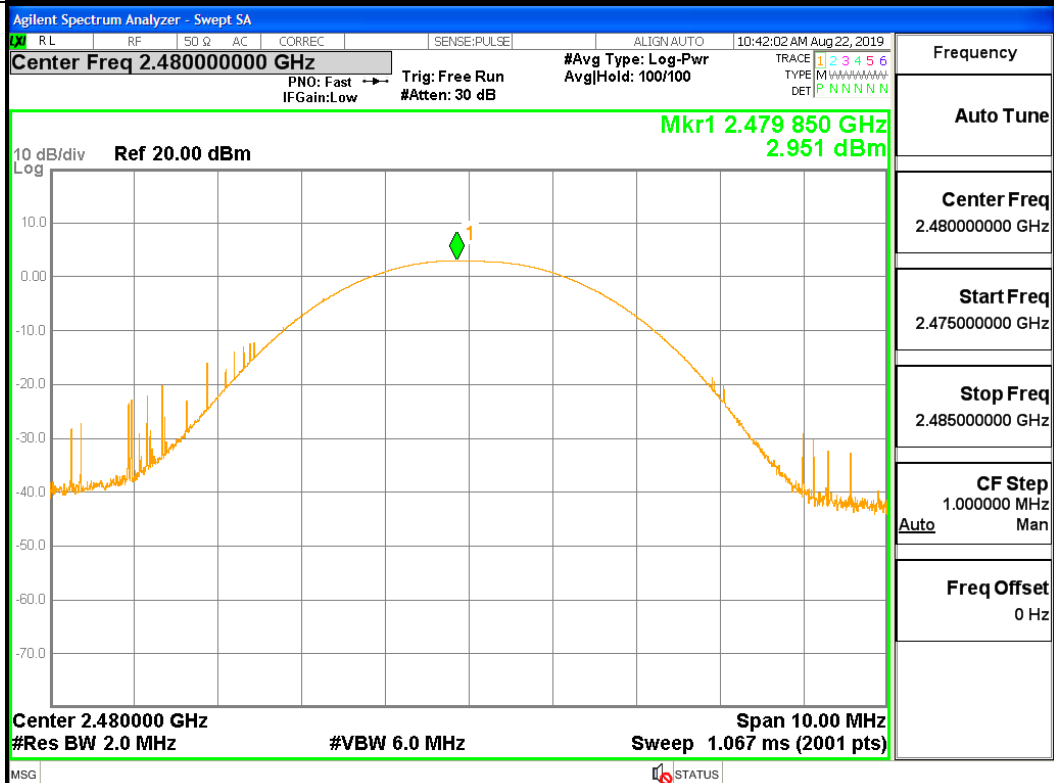
Test Graph

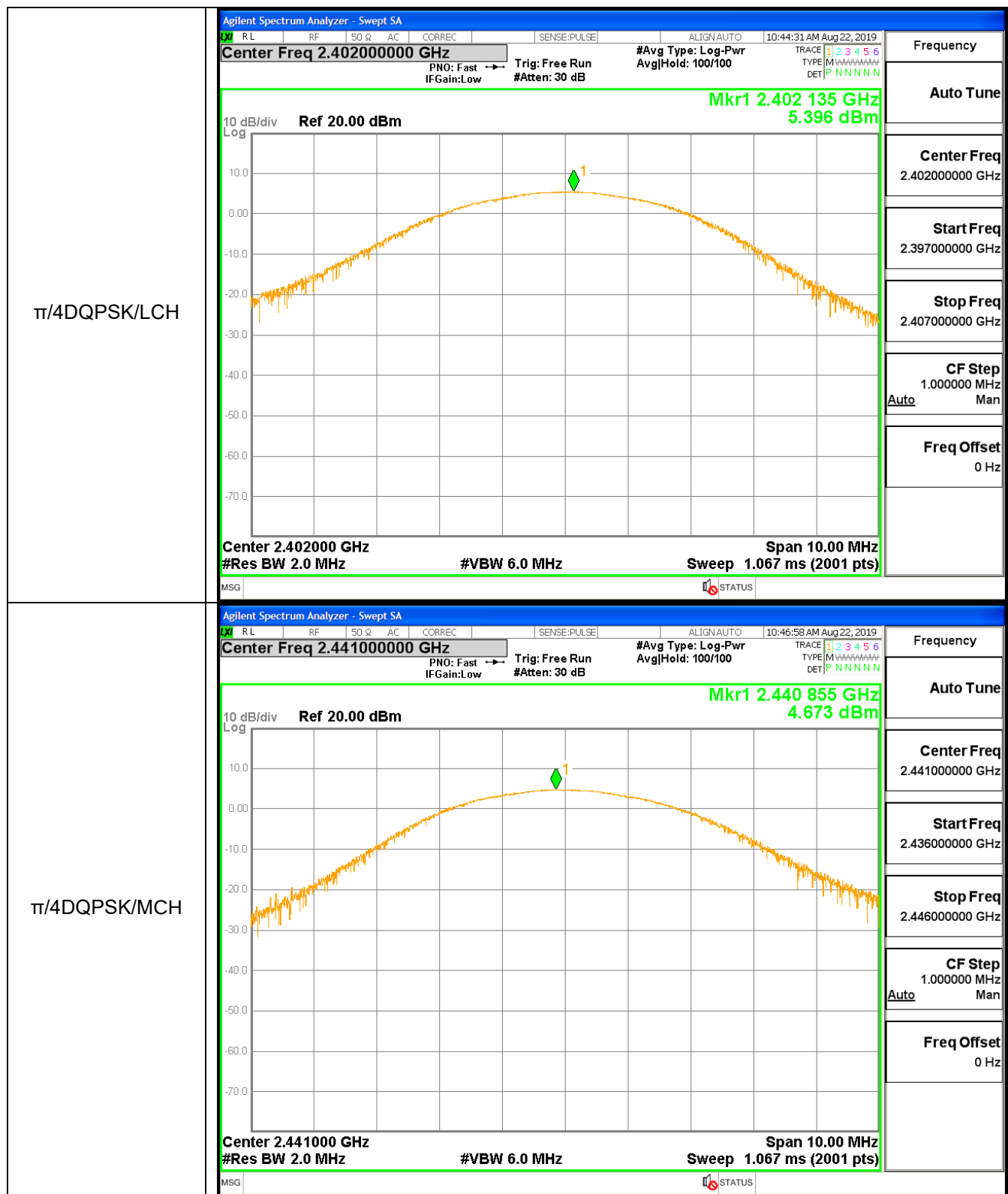


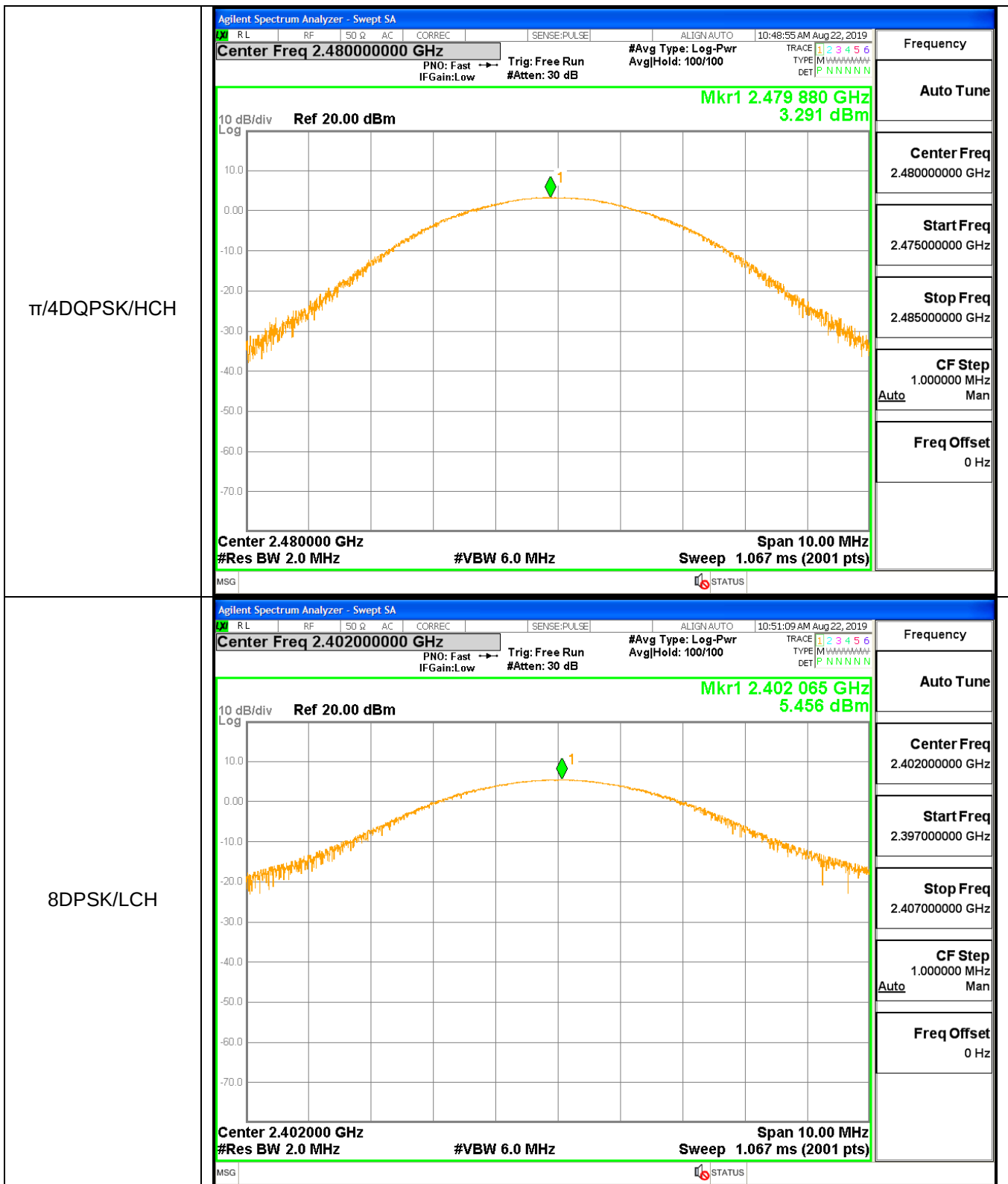
GFSK/MCH



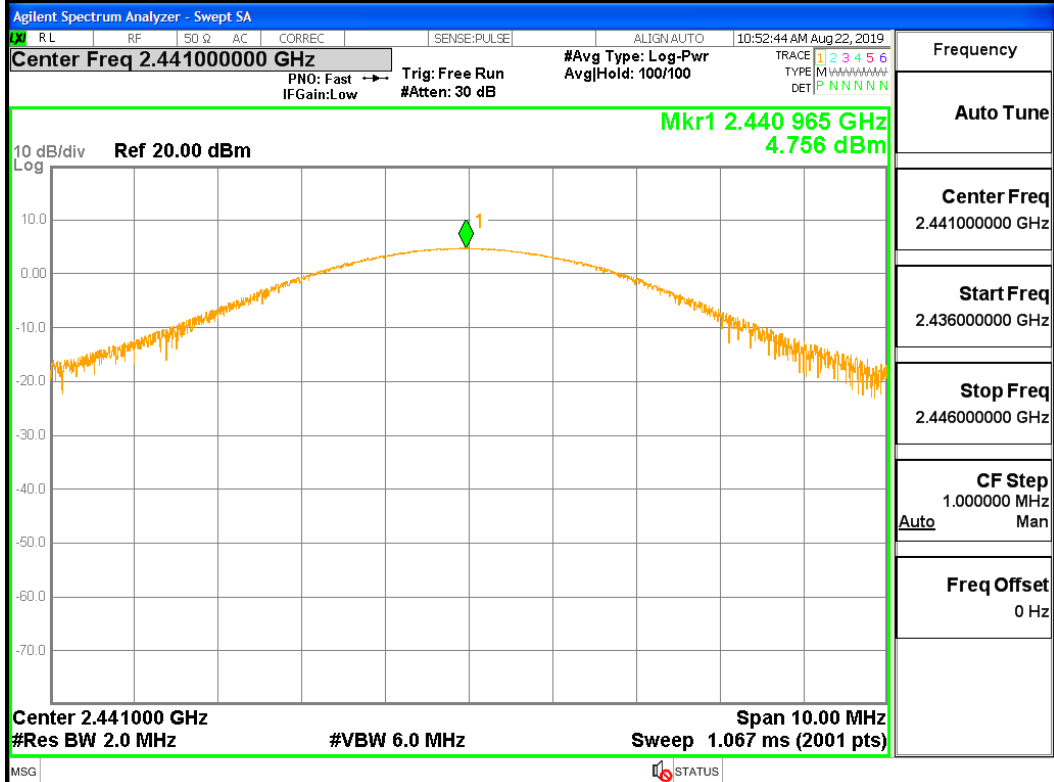
GFSK/HCH



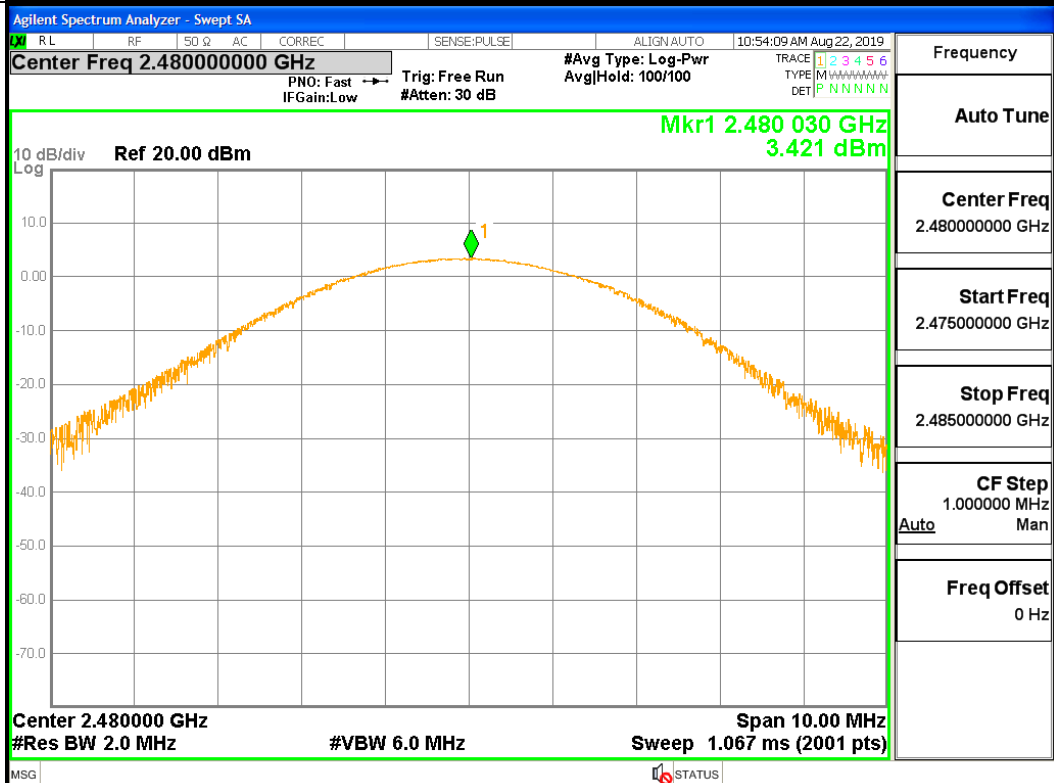




8DPSK/MCH



8DPSK/HCH



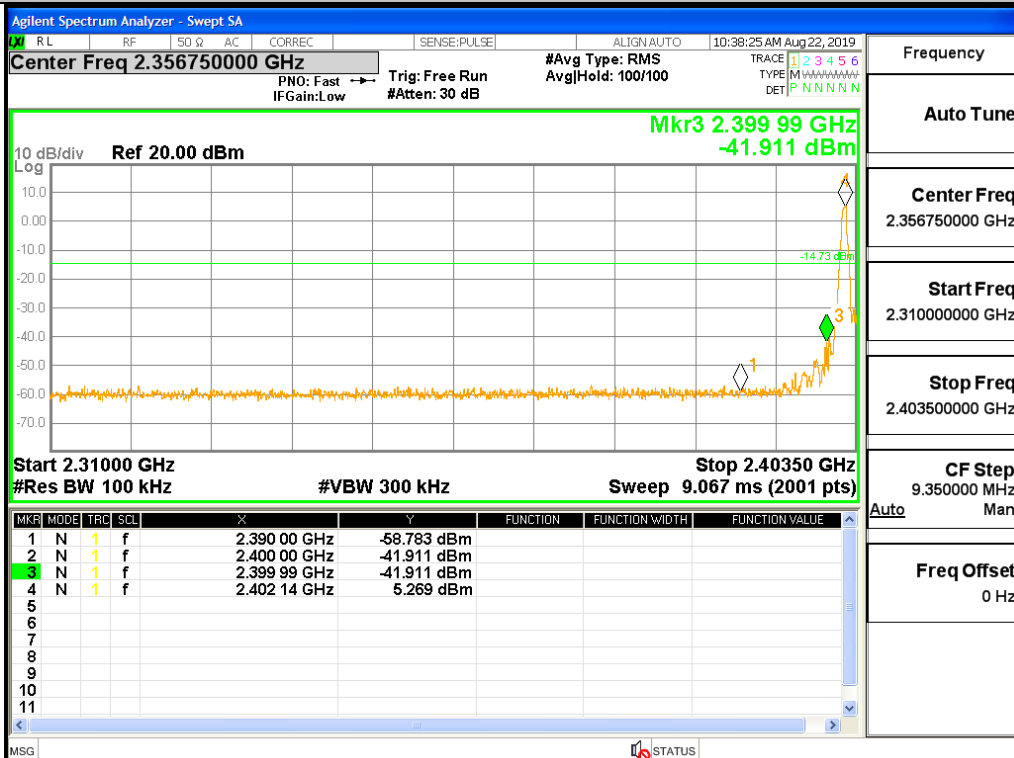
A.6 Band-edge for RF Conducted Emissions

Type	Carrier Frequency(MHz)	Frequency(MHz)	Carrier Frequency Power [dBm]	Bandedge Peak(dBm)	Upper limit(dBm)	Conclusion
1DH5	2402	2400	5.269	-41.91	-14.731	Pass
1DH5	2480	2484.757	2.889	-50.362	-17.111	Pass
2DH5	2402	2400	4.915	-28.02	-15.085	Pass
2DH5	2480	2483.5	1.899	-45.52	-18.101	Pass
3DH5	2402	2400	5.13	-26.85	-14.870	Pass
3DH5	2480	2483.5	2.997	-42.64	-17.003	Pass
1DH5-Hopping	2402	2400	5.181	-43.22	-14.819	Pass
1DH5-Hopping	2480	2484.01	4.099	-48.198	-15.901	Pass
2DH5-Hopping	2402	2400	5.059	-30.6	-14.941	Pass
2DH5-Hopping	2480	2483.5	4.084	-46.2	-15.916	Pass
3DH5-Hopping	2402	2399.73	4.967	-26.268	-15.033	Pass
3DH5-Hopping	2480	2483.5	4.13	-41.65	-15.870	Pass

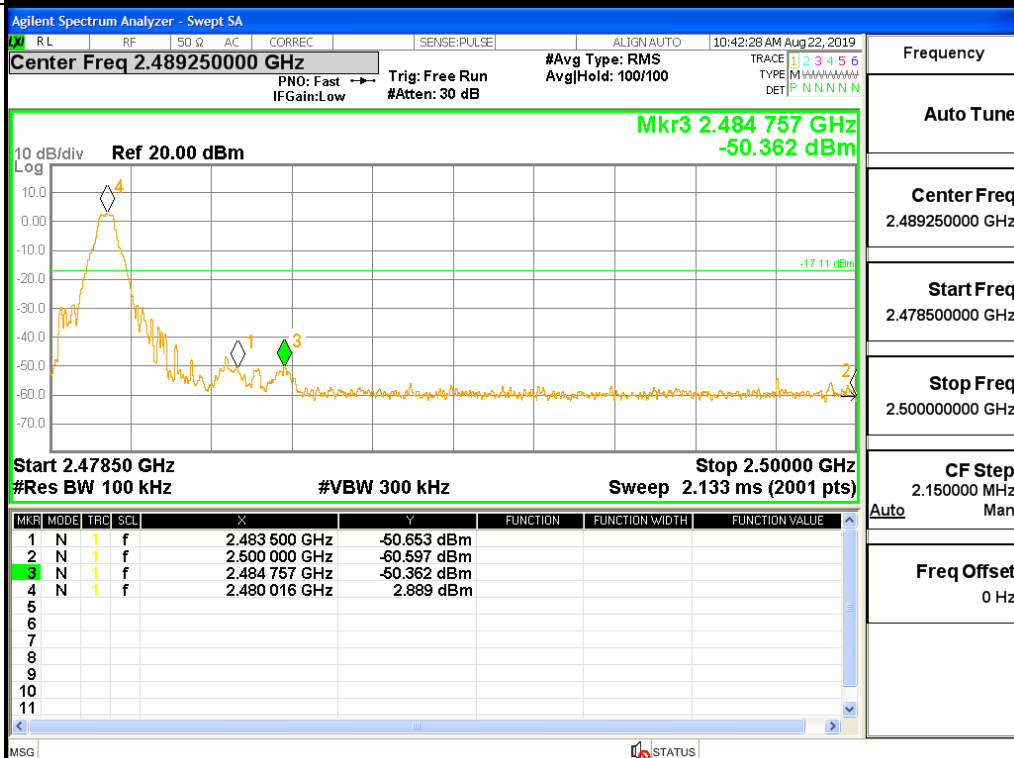
Test Graph

Graphs

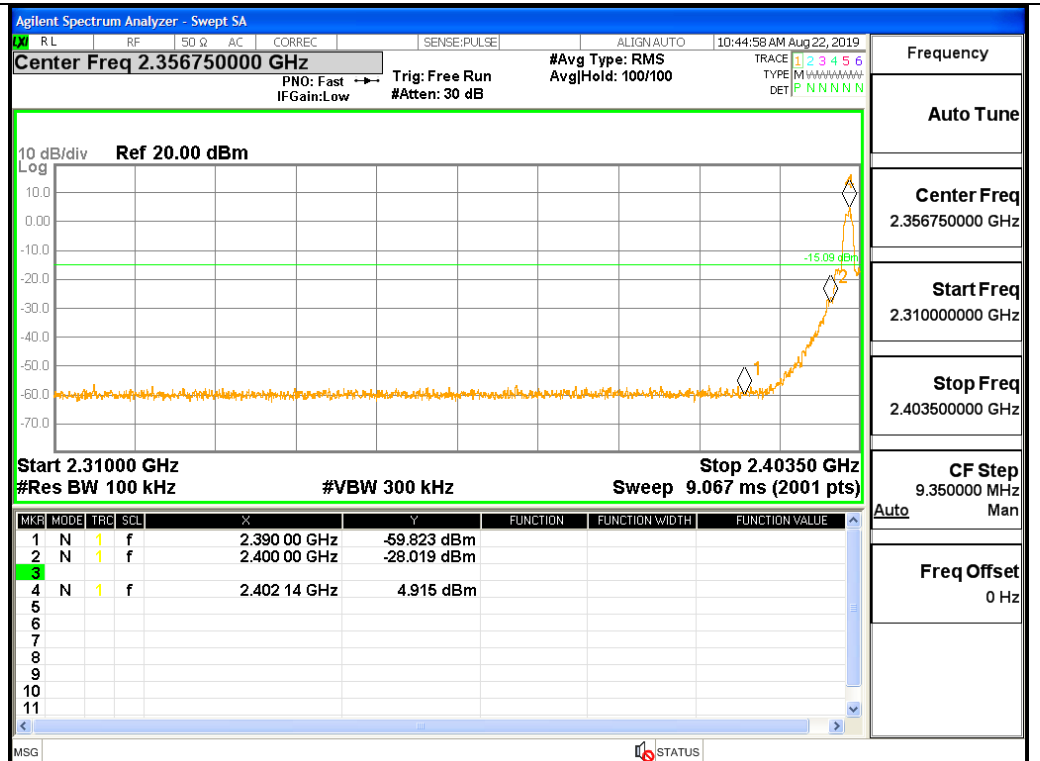
GFSK/LCH/No Hop



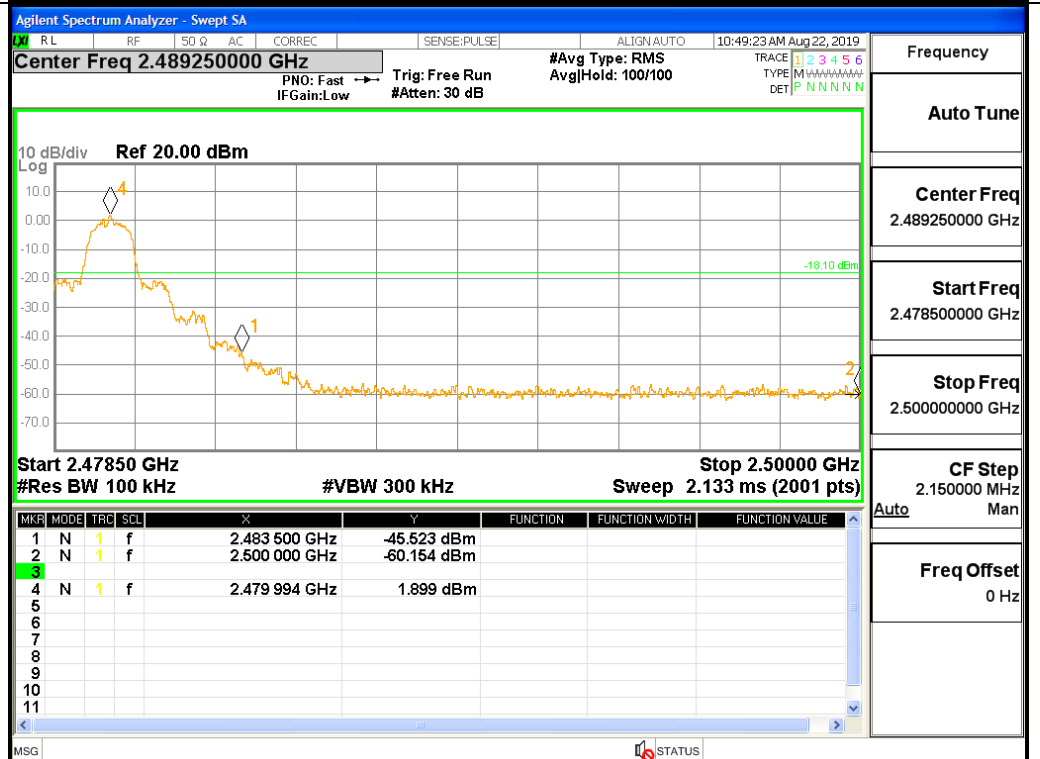
GFSK/HCH/No Hop



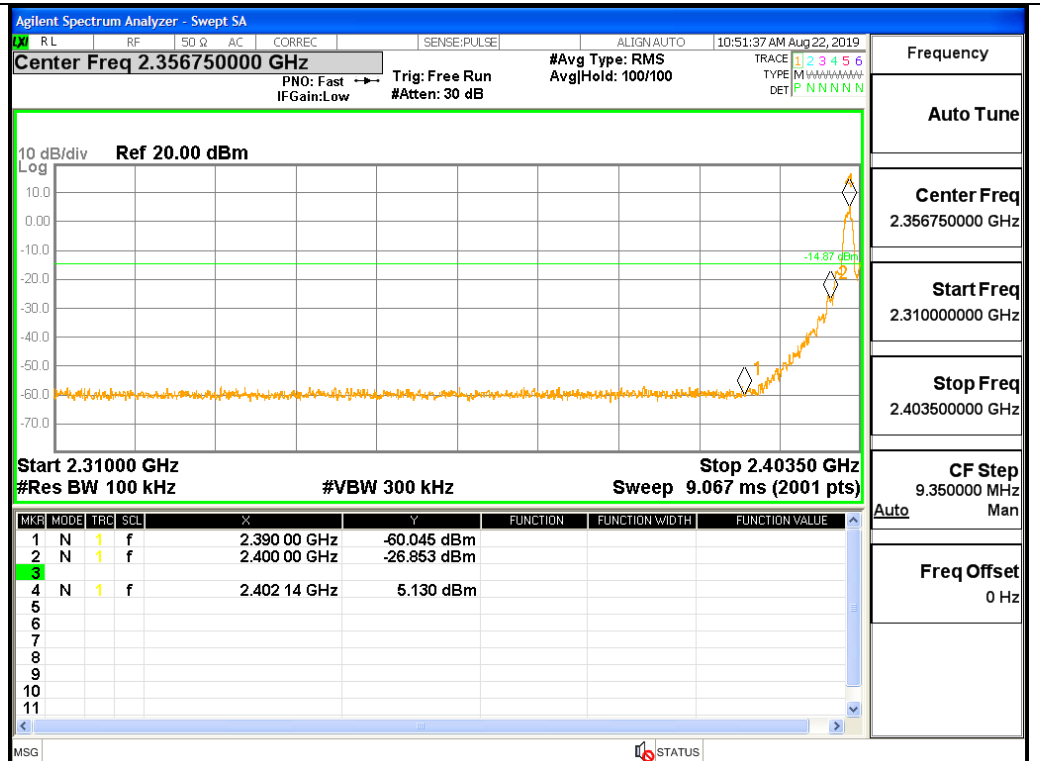
$\pi/4$ DQPSK/LCH/No
Hop



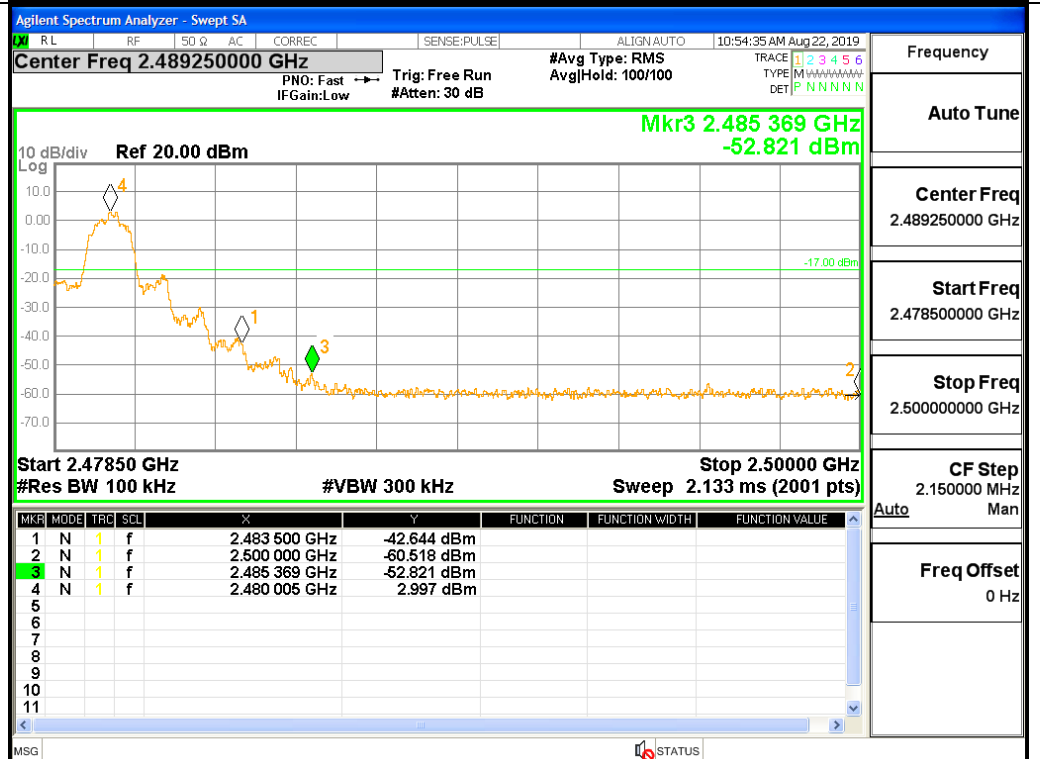
$\pi/4$ DQPSK/HCH/No
Hop



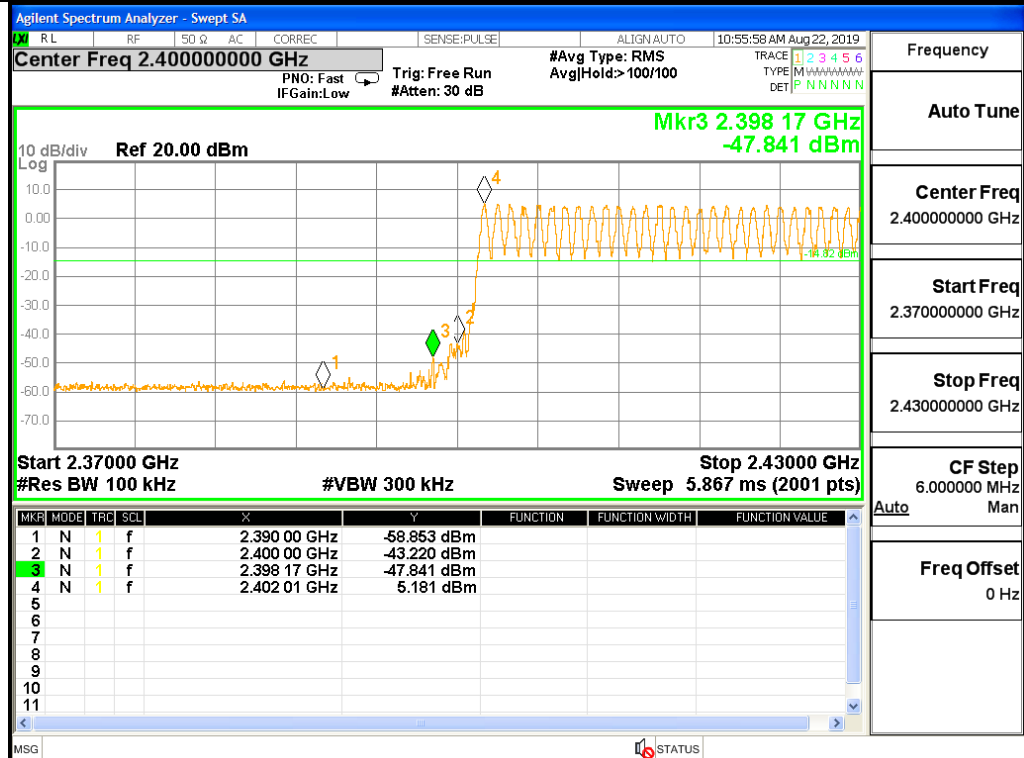
8DPSK/LCH/No Hop



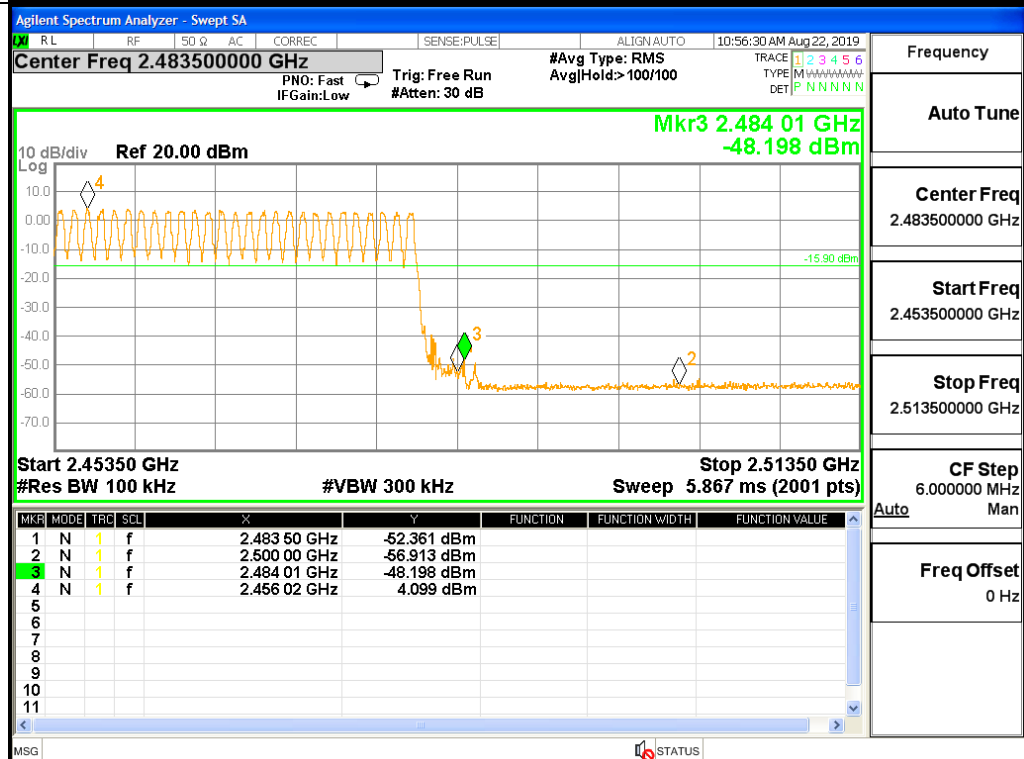
8DPSK/HCH/No Hop



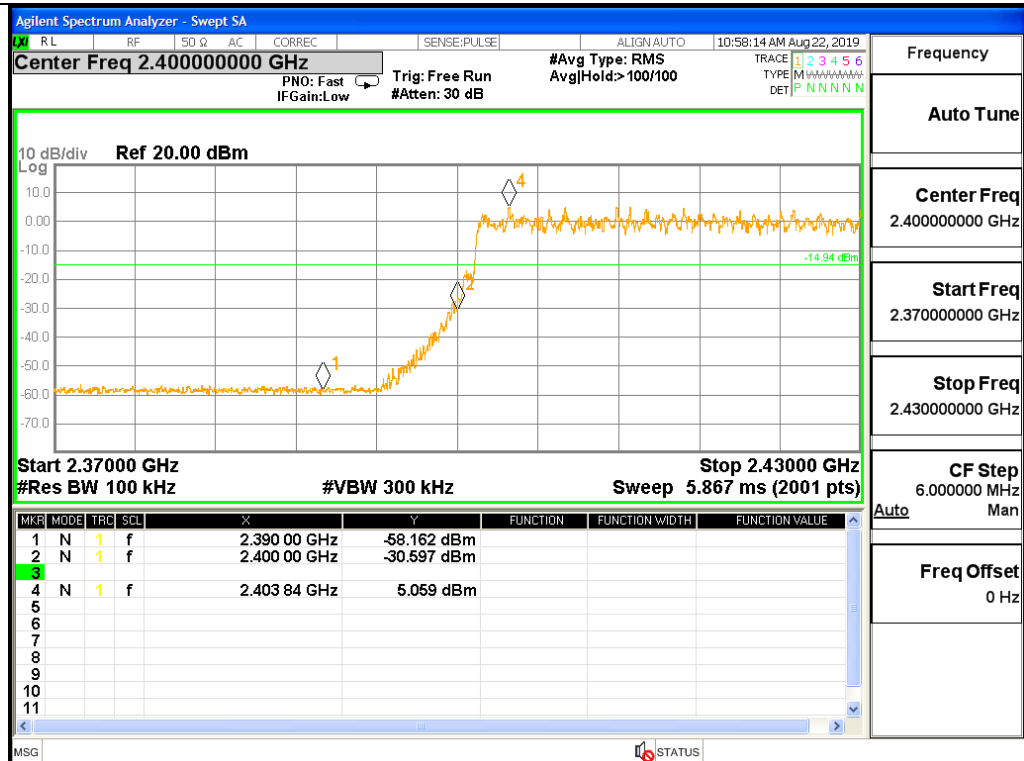
GFSK/LCH/Hop



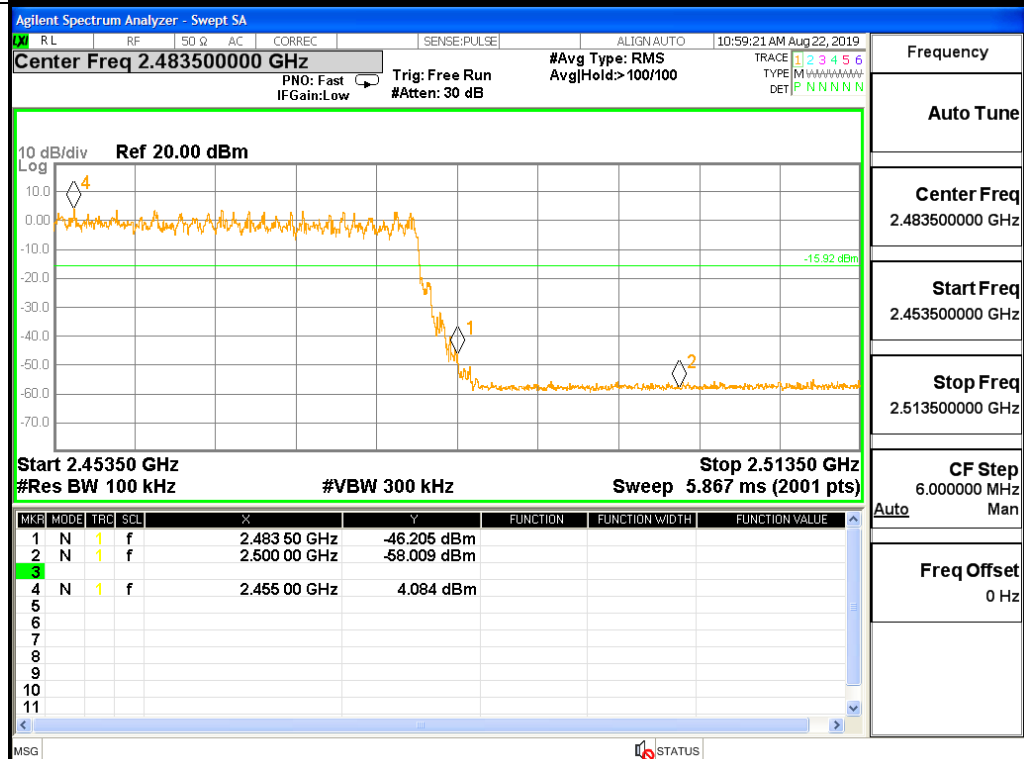
GFSK/HCH/Hop



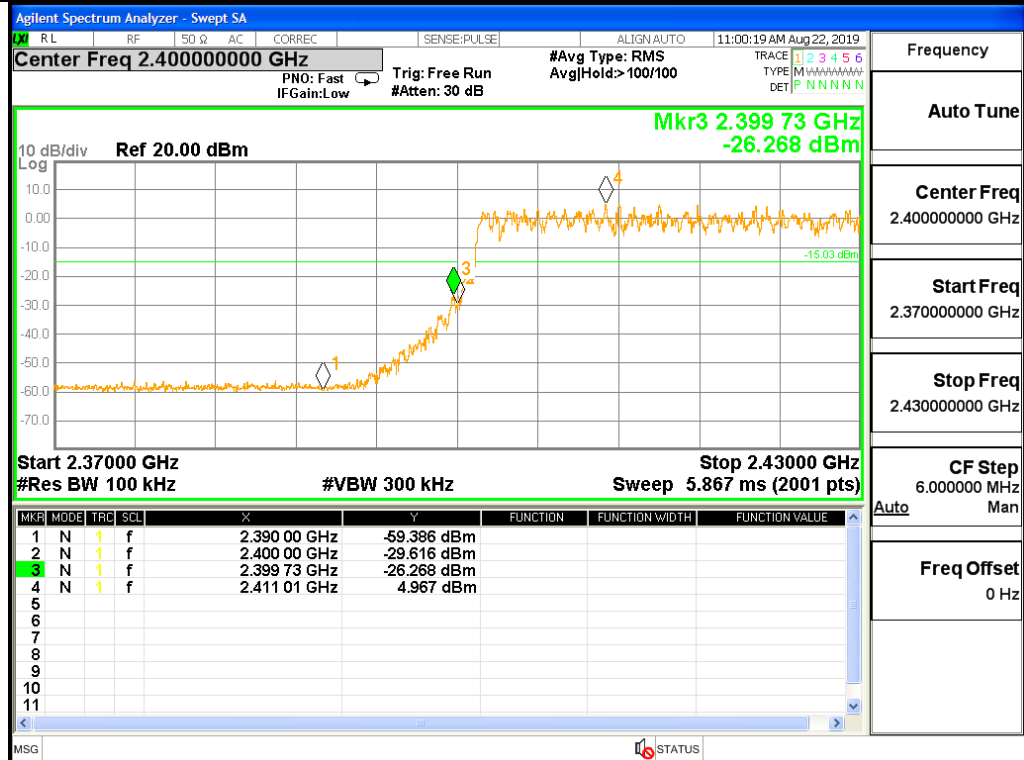
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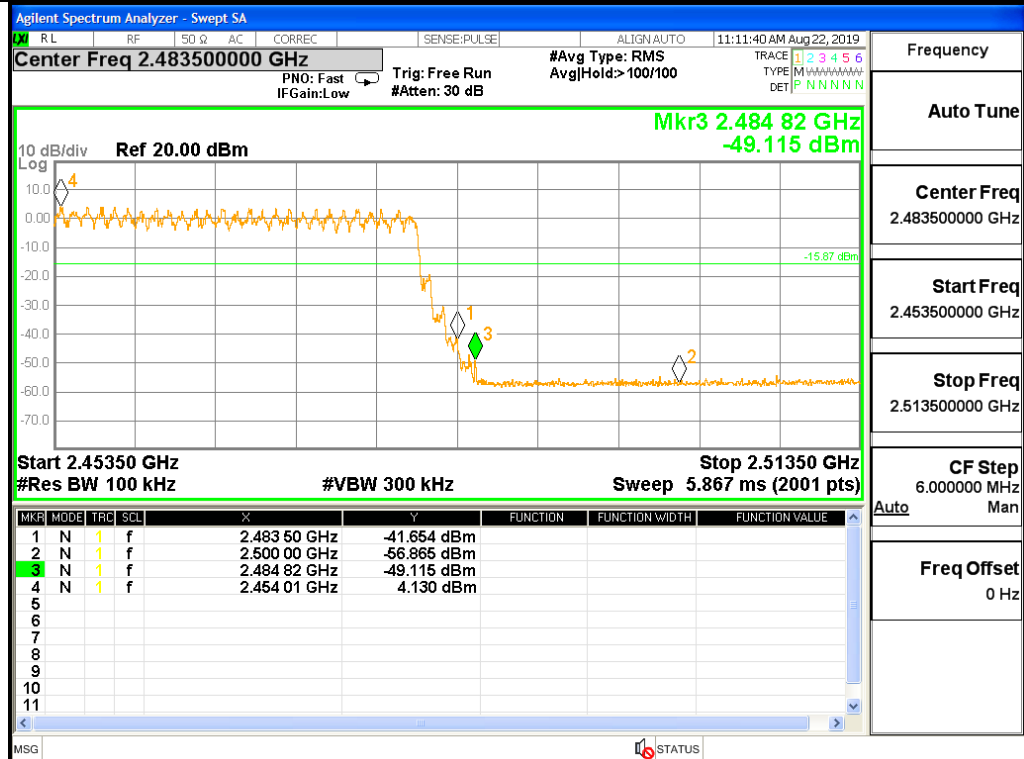
$\pi/4$ DQPSK/HCH/Hop



8DPSK/LCH/Hop

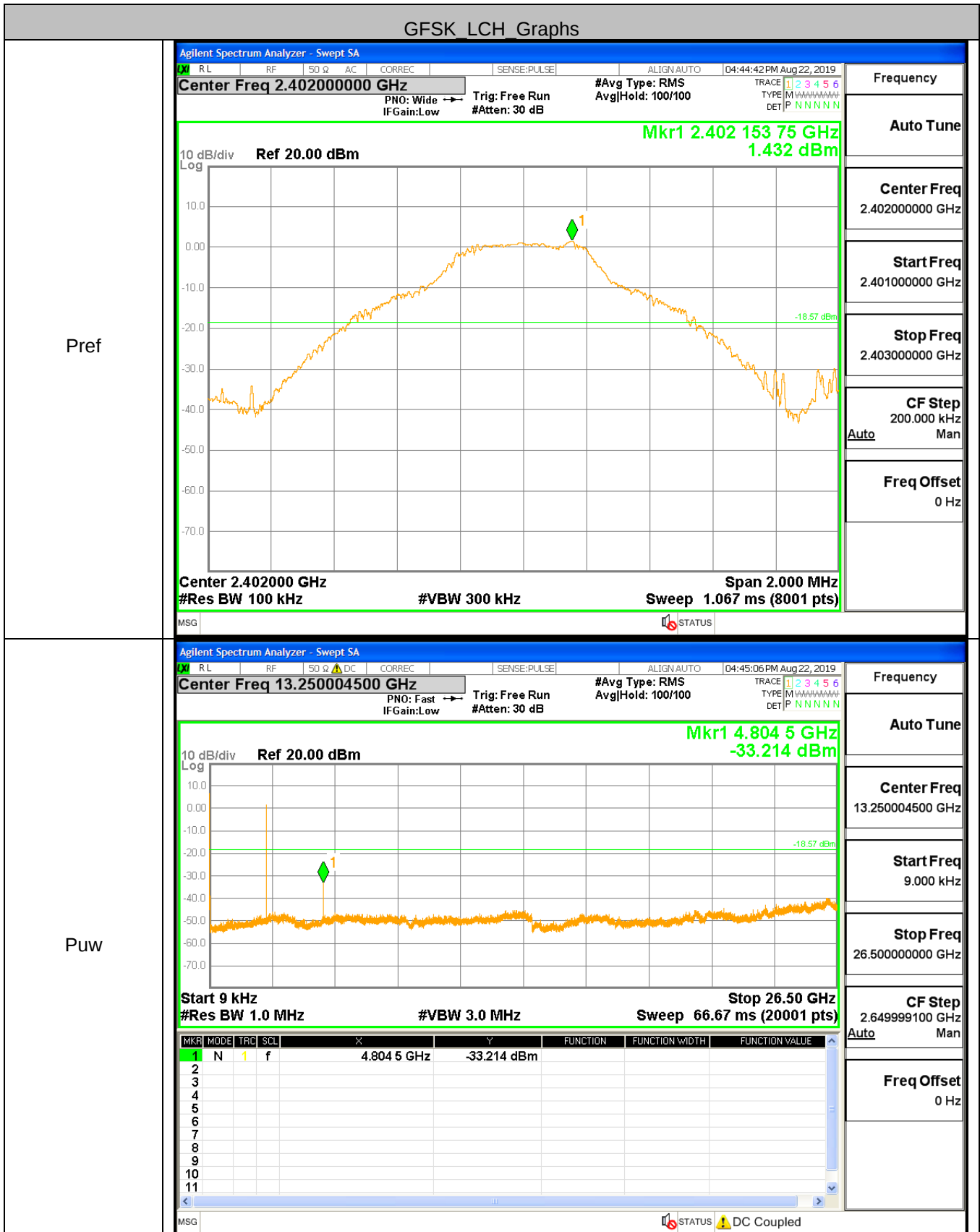


8DPSK/HCH/Hop



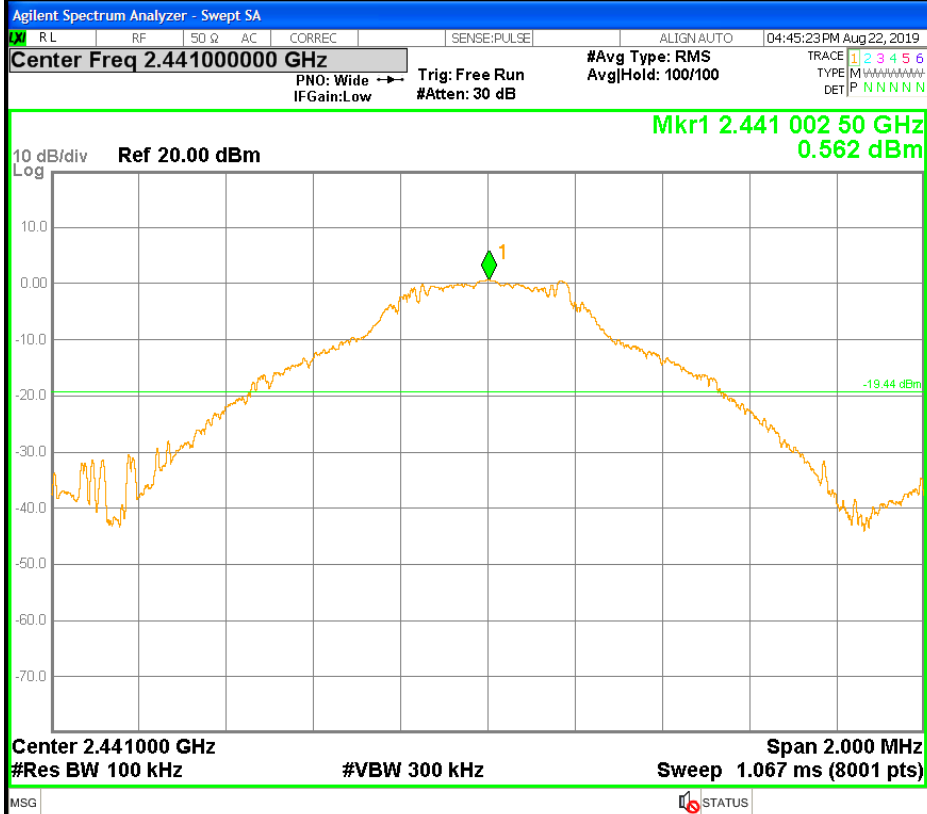
A.7 RF Conducted Spurious Emissions

Test Graph



GFSK MCH Graphs

Pref



Frequency

Auto Tune

Center Freq
2.441000000 GHz

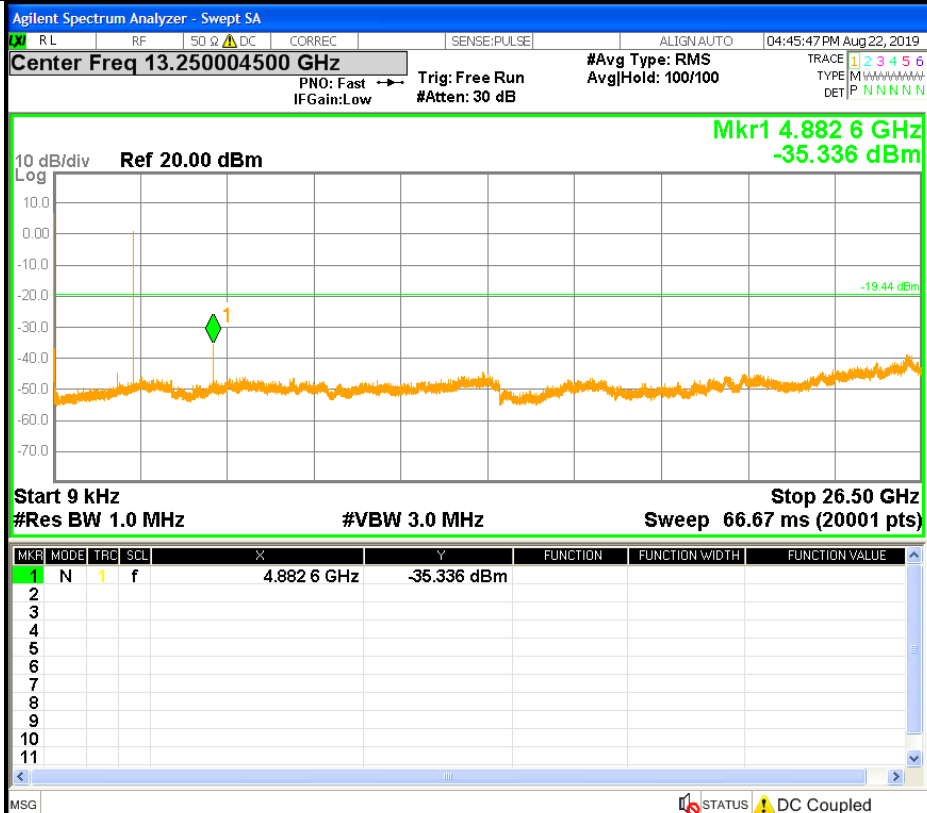
Start Freq
2.440000000 GHz

Stop Freq
2.442000000 GHz

CF Step
200.000 kHz
Auto Man

Freq Offset
0 Hz

Puw



Frequency

Auto Tune

Center Freq
13.250004500 GHz

Start Freq
9.000 kHz

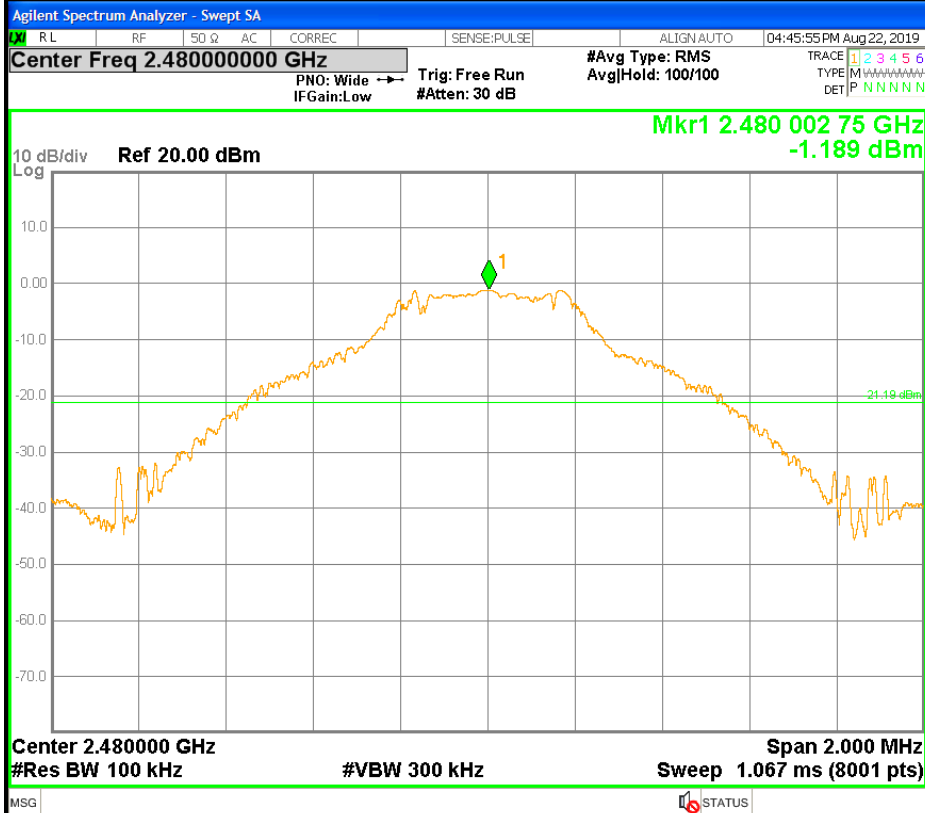
Stop Freq
26.500000000 GHz

CF Step
2.649999100 GHz
Auto Man

Freq Offset
0 Hz

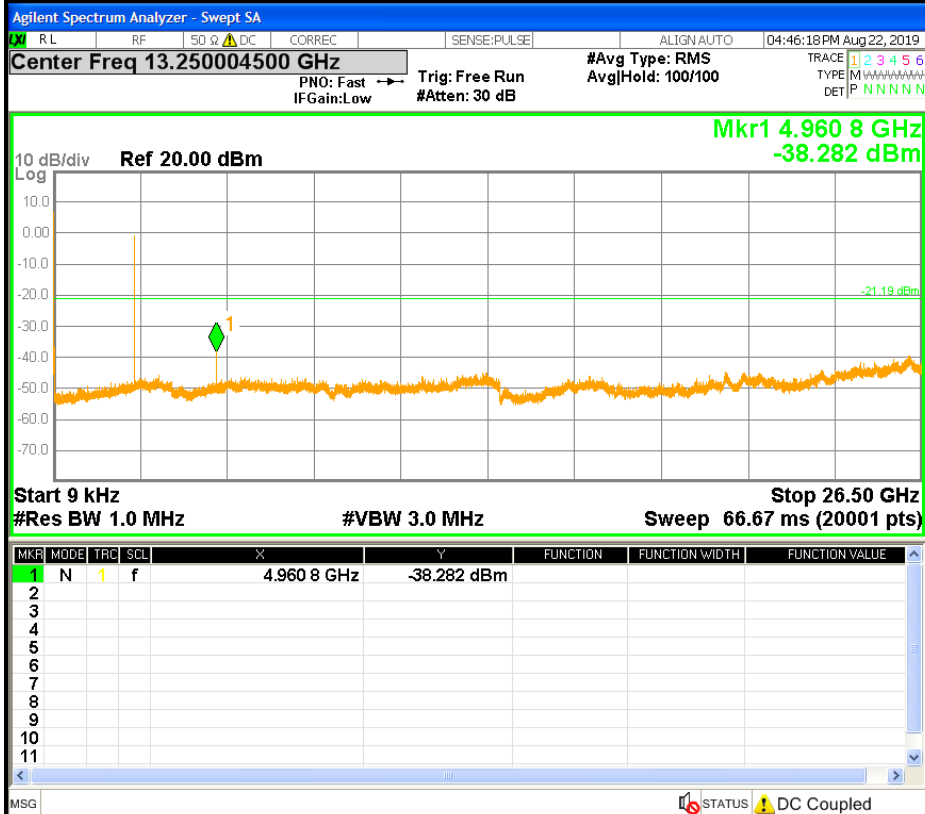
GFSK HCH Graphs

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

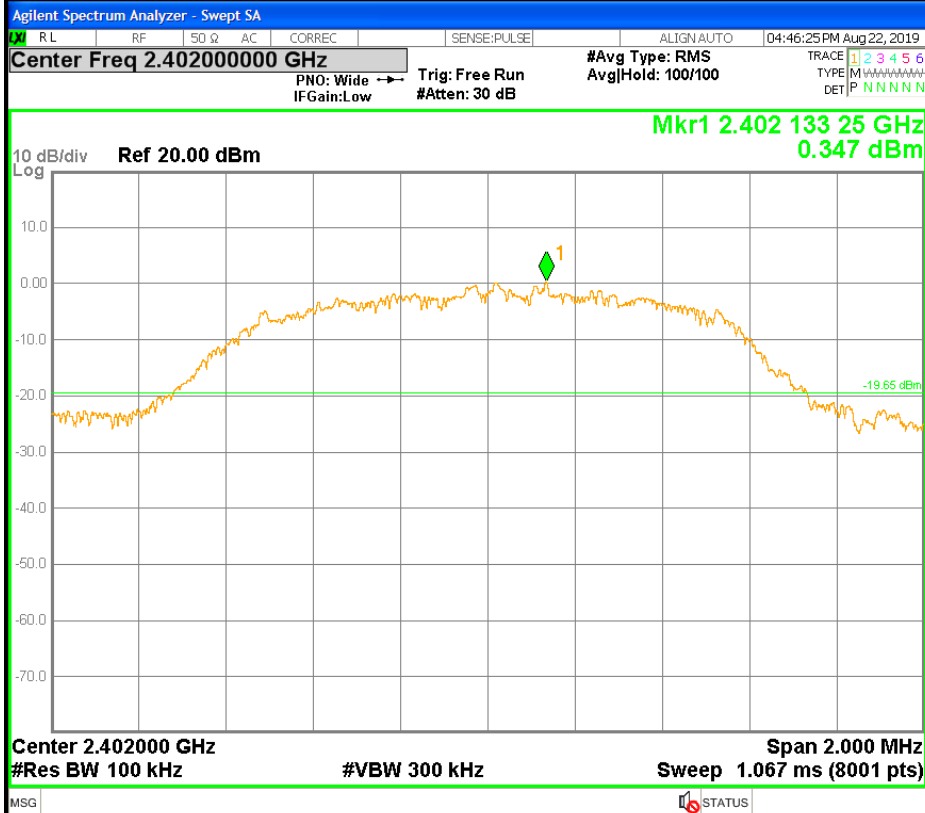
Puw



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

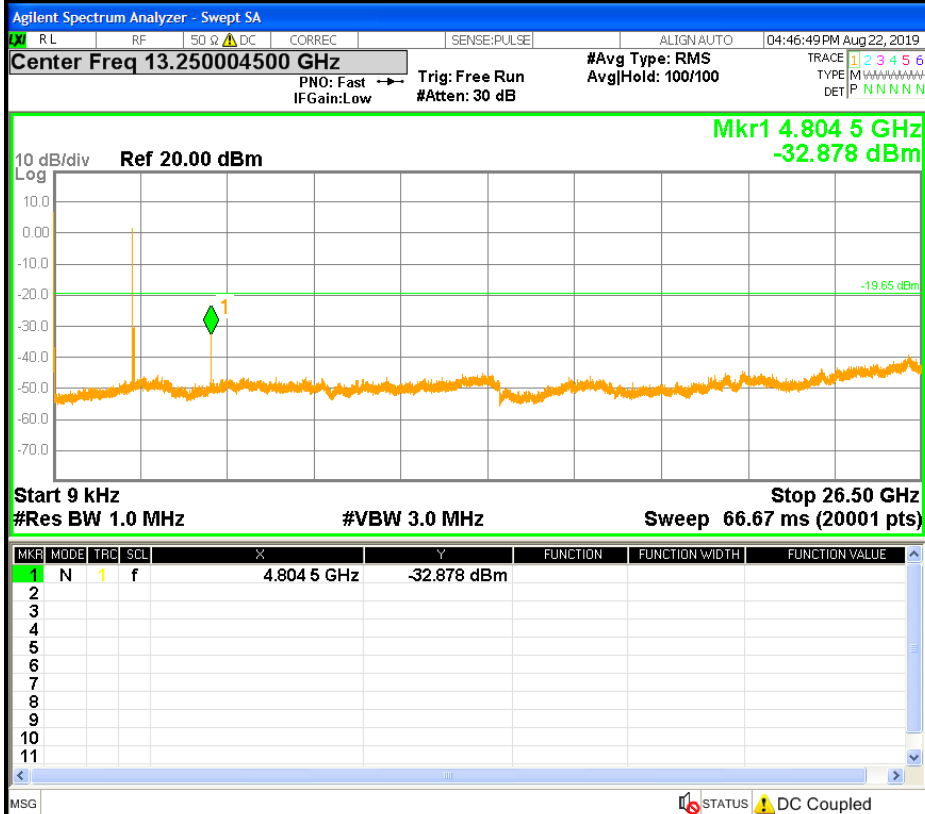
$\pi/4$ DQPSK LCH Graphs

Pref



Frequency
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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

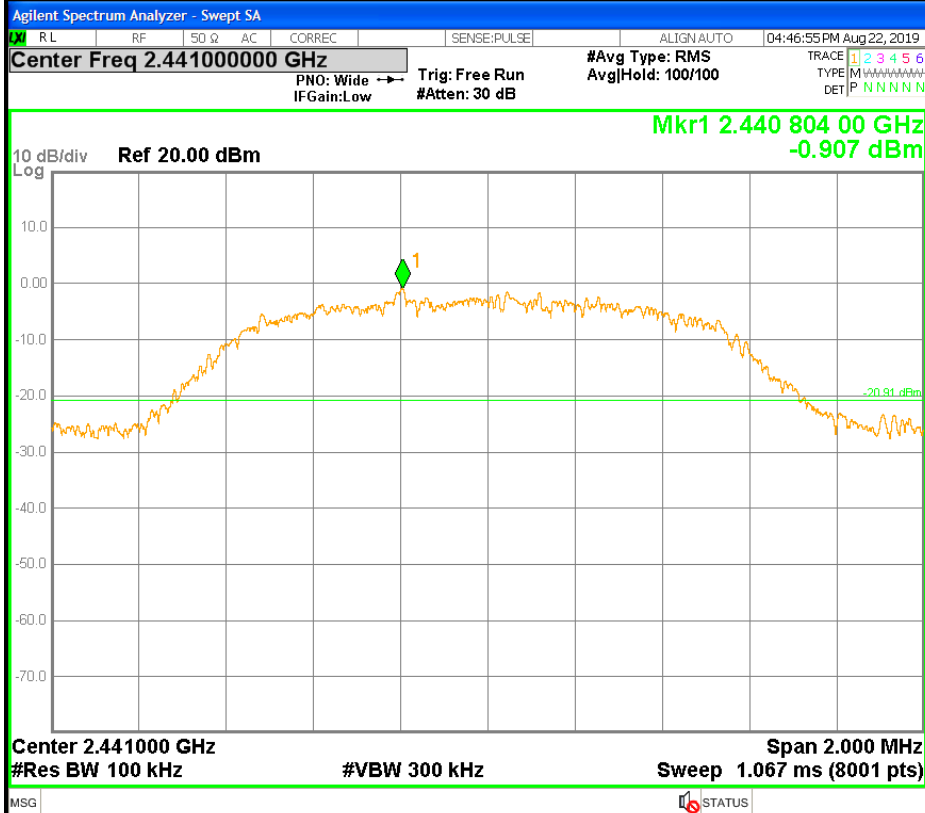
Puw



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

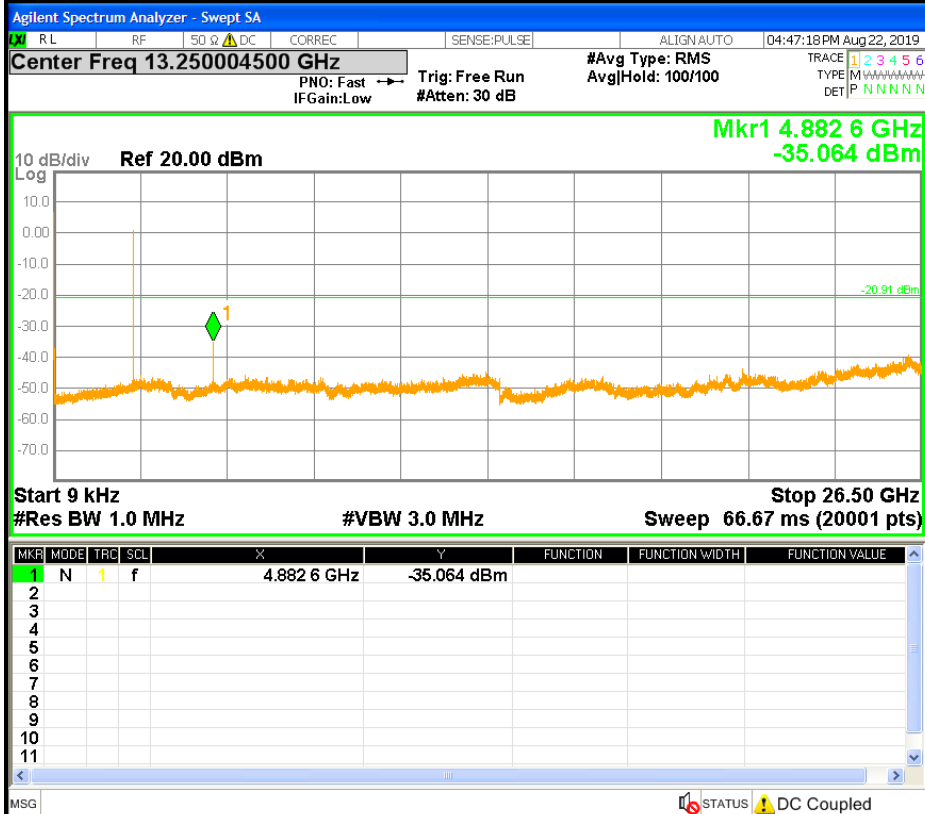
$\pi/4$ DQPSK MCH Graphs

Pref



Frequency
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

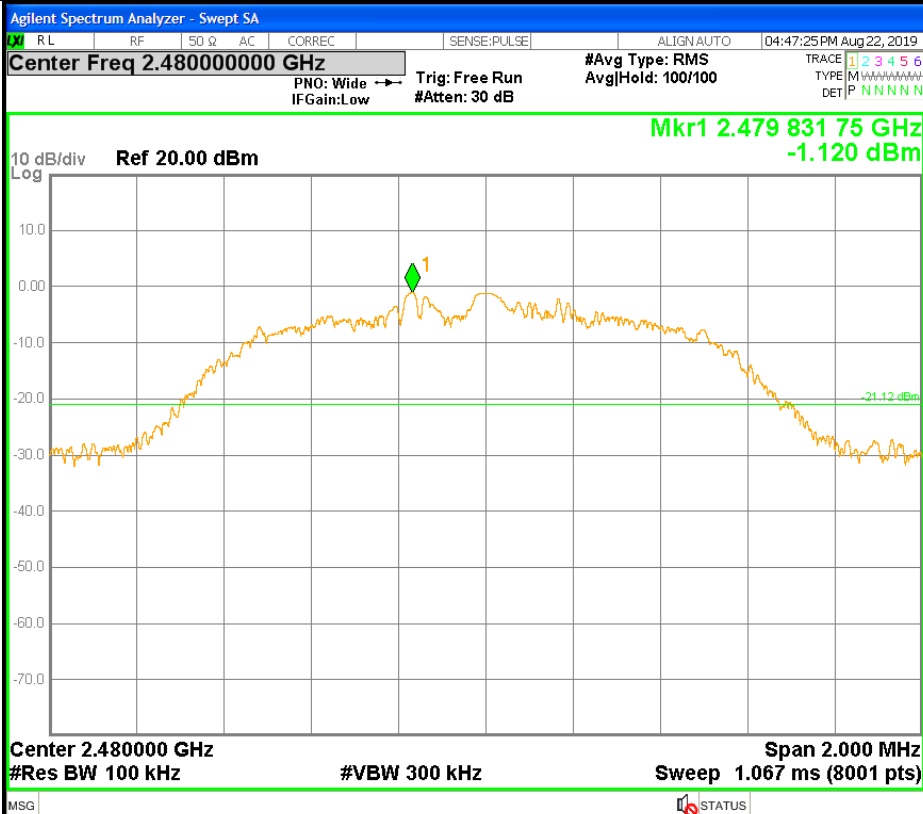
Puw



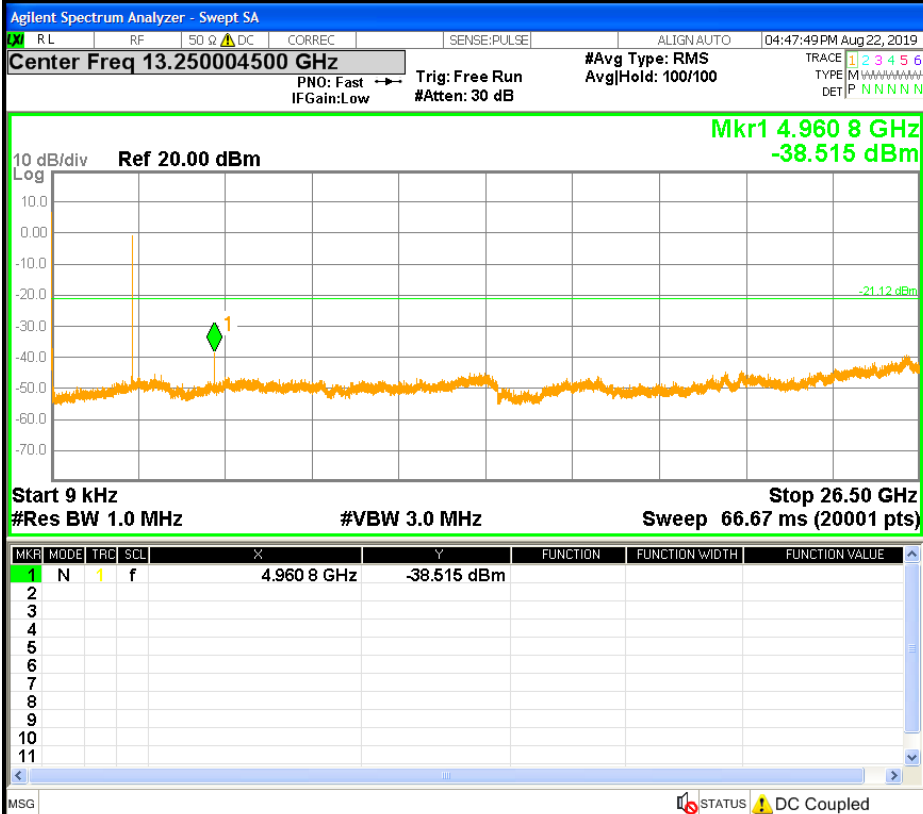
Frequency
Auto Tune
Center Freq 13.250004500 GHz
Start Freq 9.000 kHz
Stop Freq 26.500000000 GHz
CF Step 2.649999100 GHz Auto Man
Freq Offset 0 Hz

$\pi/4$ DQPSK HCH Graphs

Pref

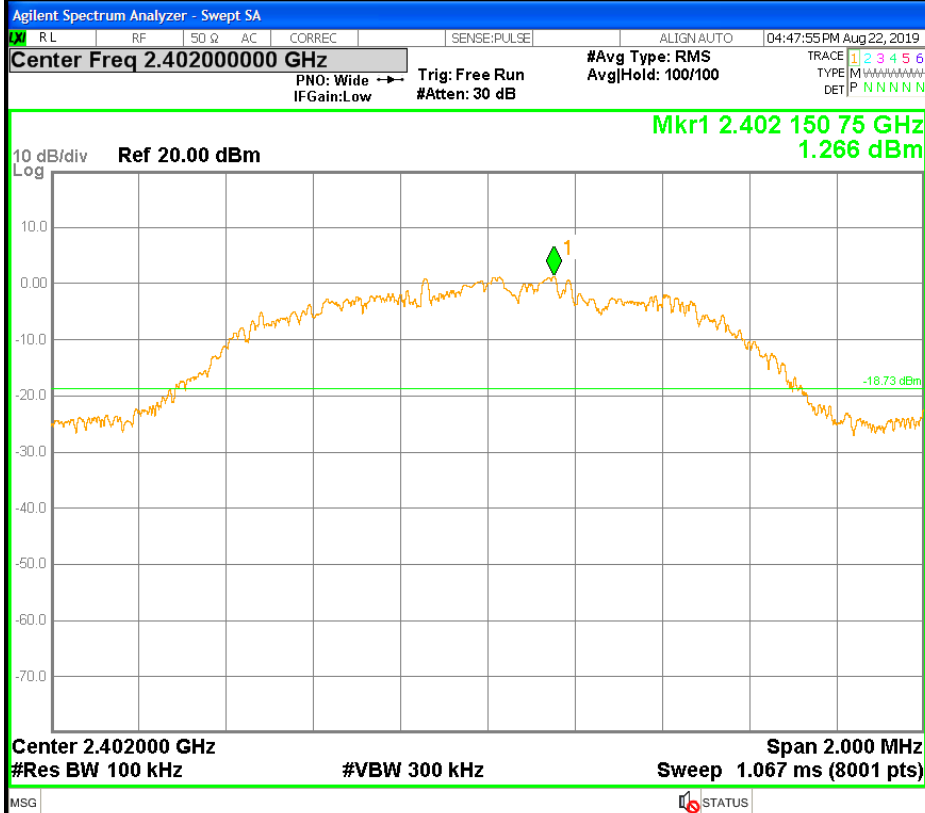


Puw

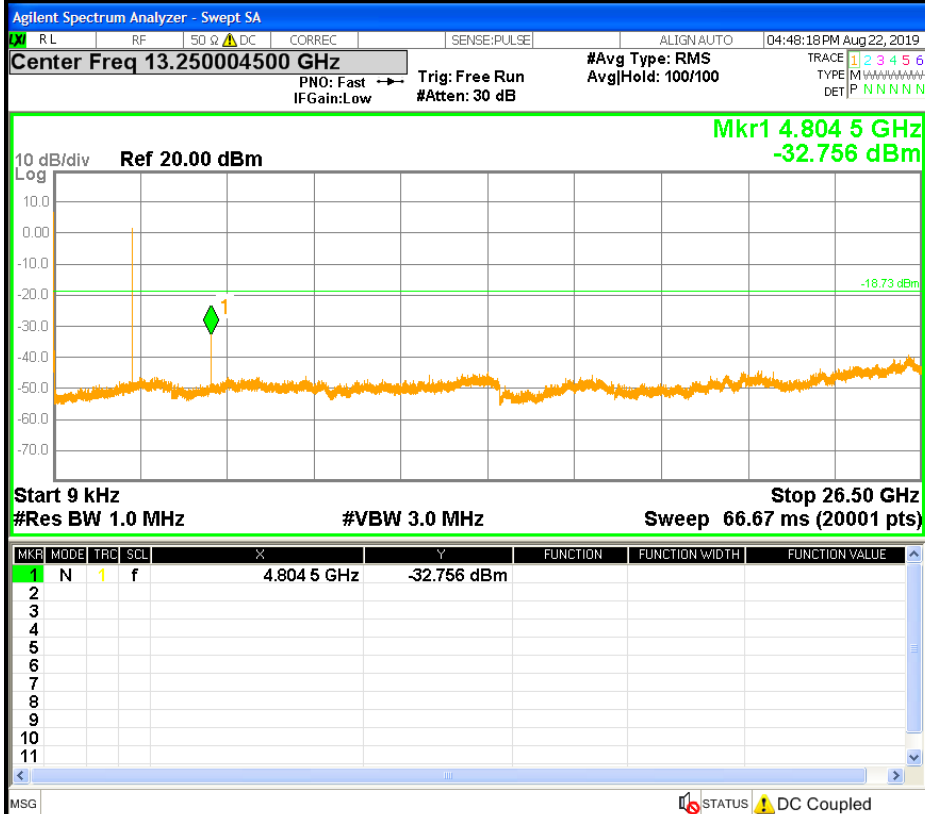


8DPSK LCH Graphs

Pref

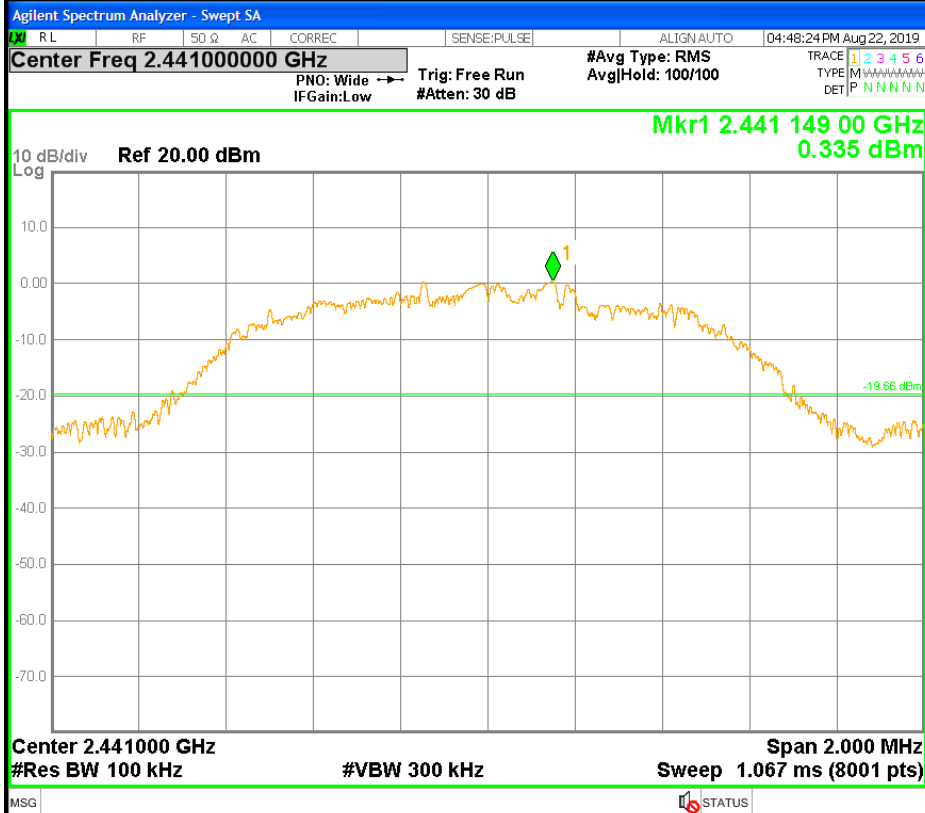


Puw

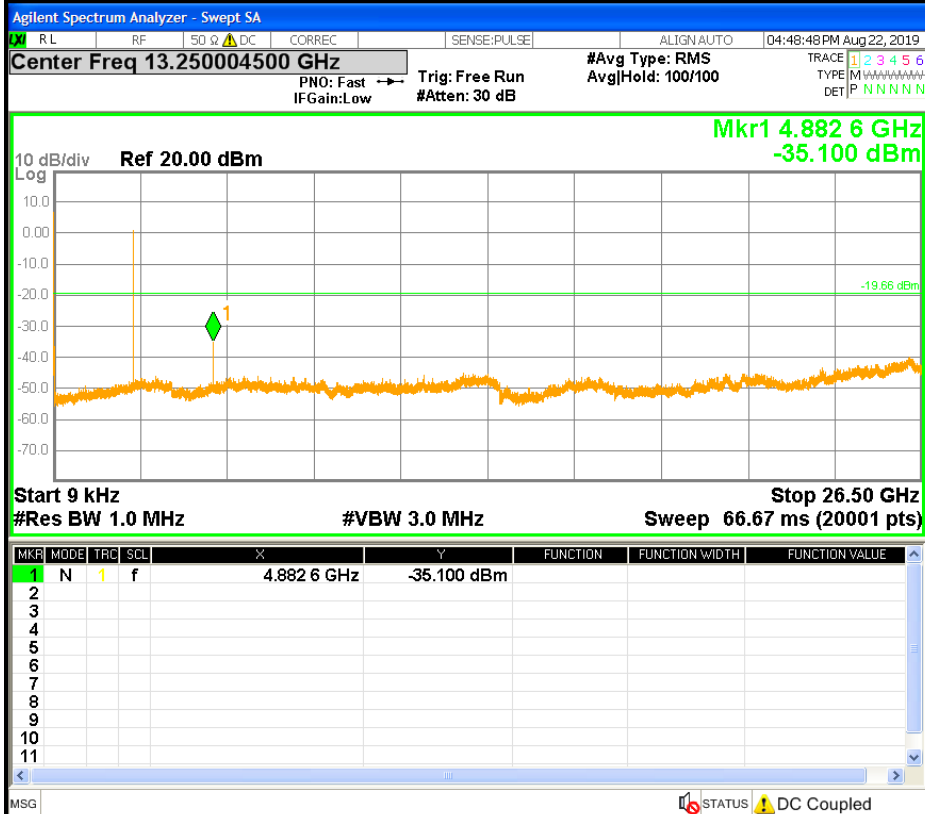


8DPSK MCH Graphs

Pref

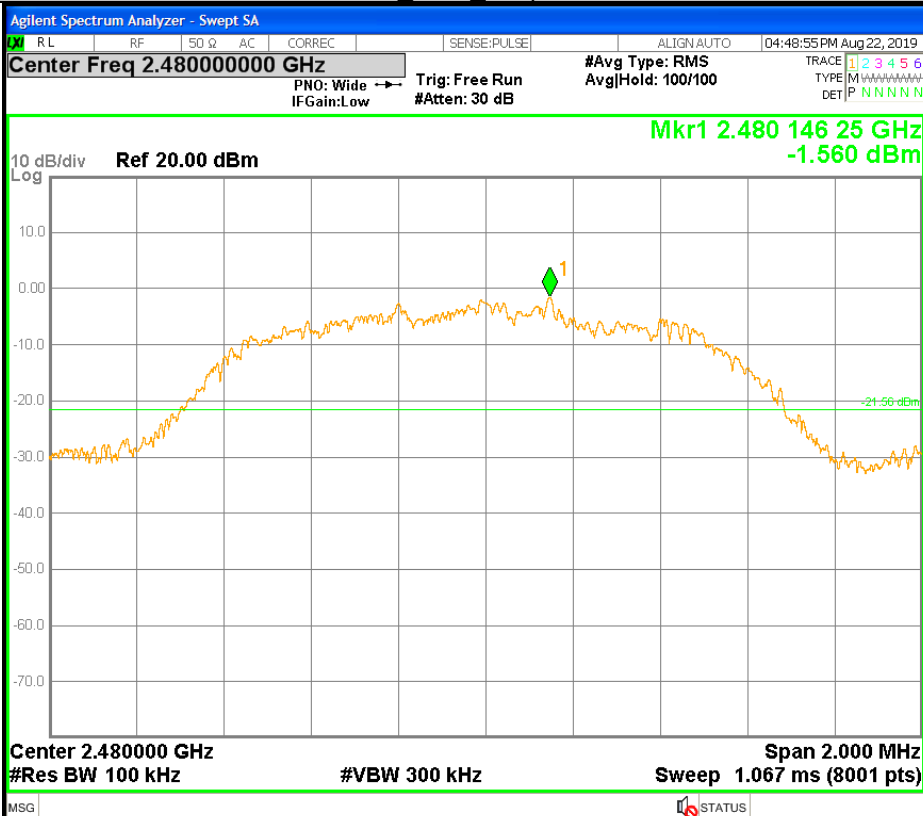


Puw

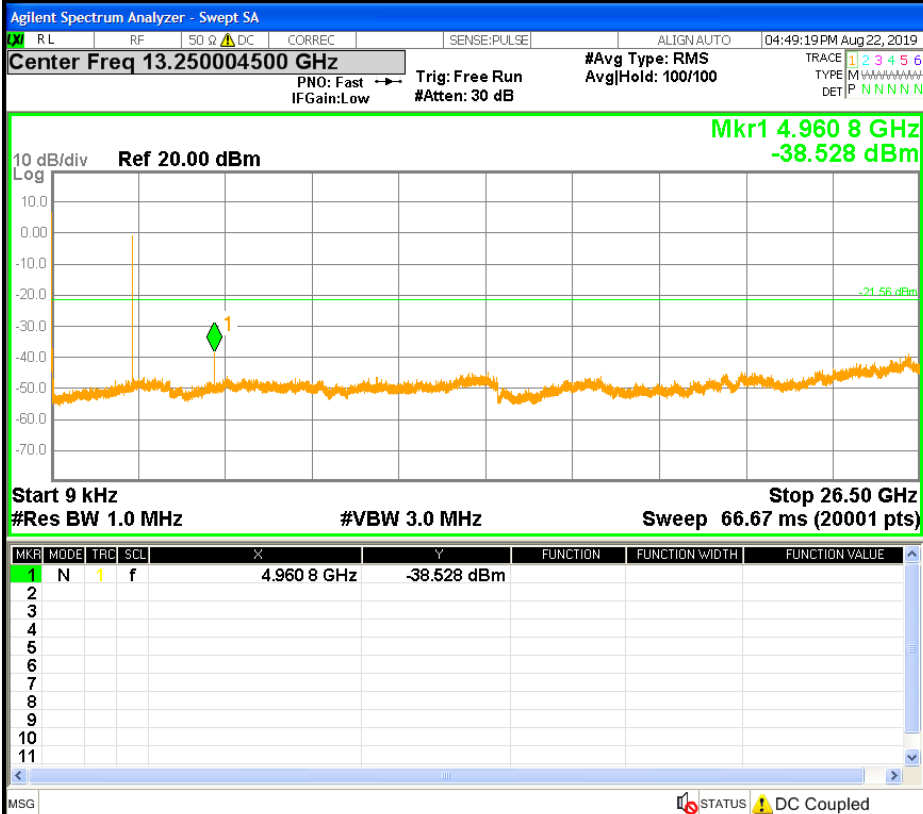


8DPSK HCH Graphs

Pref



Puw

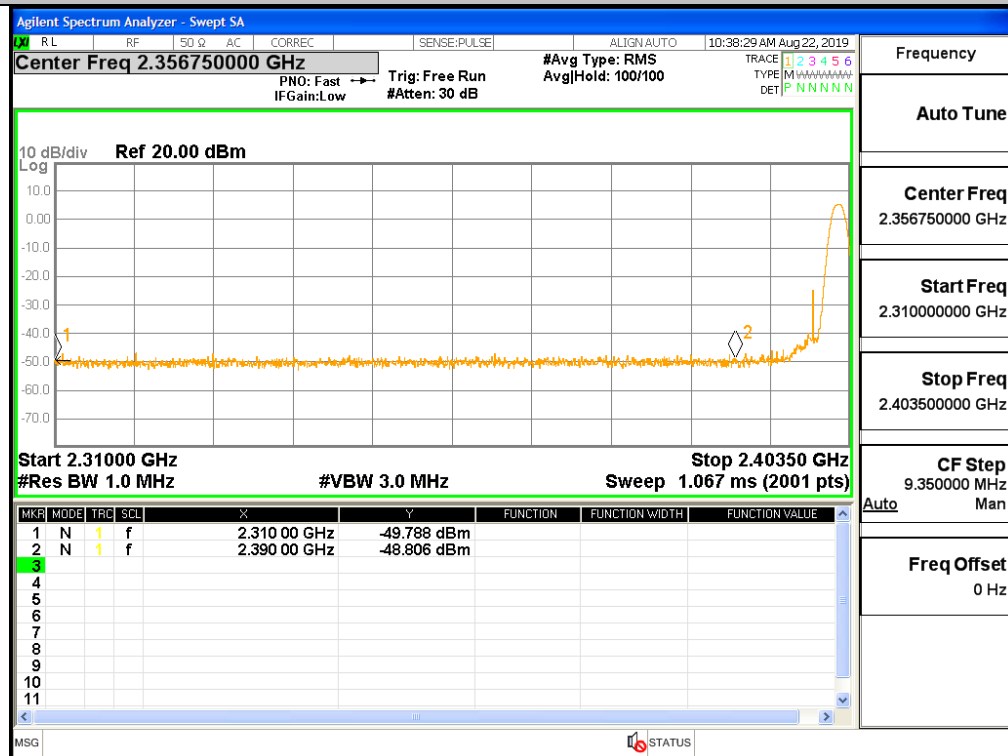


A.8 Restrict-band band-edge measurements

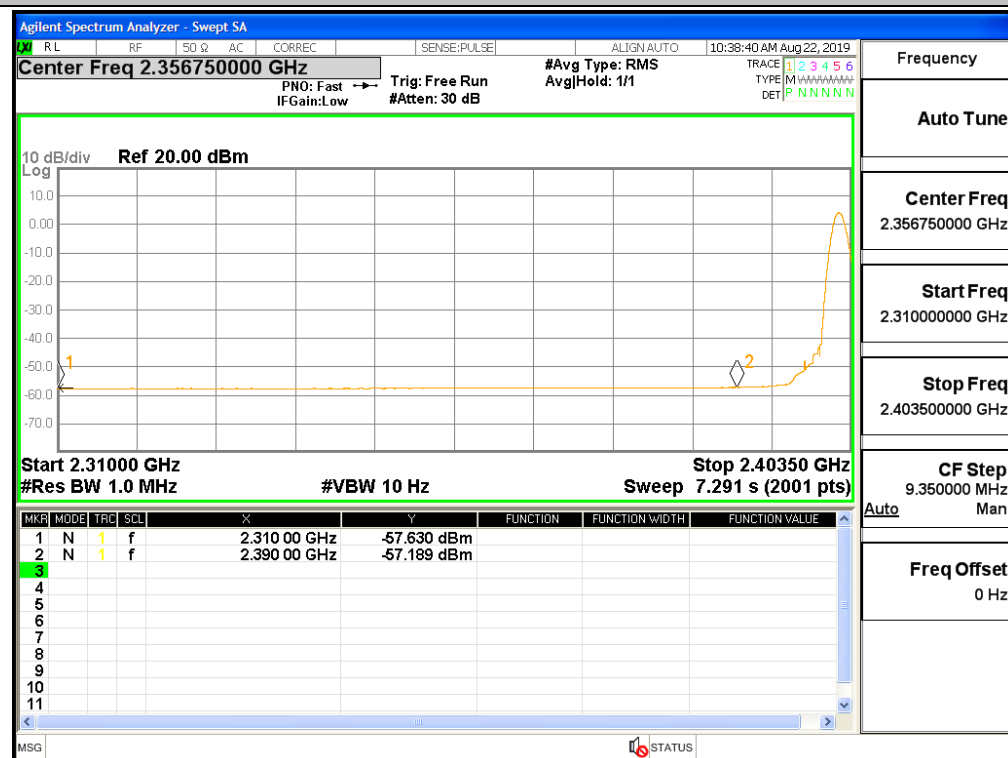
Type	Carrier Frequency (MHz)	Frequency(M Hz)	Gain	Ground Factor	Peak Value(dBm)	E [dBuV/m]	Limit [dBuV/m]	Conclusion
1DH5	2402	2390.00	2.00	0.00	-48.81	48.39	74	Pass
1DH5	2480	2483.53	2.00	0.00	-35.39	61.81	74	Pass
2DH5	2402	2320.80	2.00	0.00	-46.18	51.02	74	Pass
2DH5	2480	2483.58	2.00	0.00	-39.60	57.60	74	Pass
3DH5	2402	2389.94	2.00	0.00	-43.97	53.23	74	Pass
3DH5	2480	2483.50	2.00	0.00	-37.87	59.33	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	-57.19	40.01	54	Pass
1DH5	2480	2483.53	2.00	0.00	-50.28	46.92	54	Pass
2DH5	2402	2320.80	2.00	0.00	-57.15	40.05	54	Pass
2DH5	2480	2483.58	2.00	0.00	-50.03	47.17	54	Pass
3DH5	2402	2389.94	2.00	0.00	-56.78	40.42	54	Pass
3DH5	2480	2483.50	2.00	0.00	-49.73	47.47	54	Pass

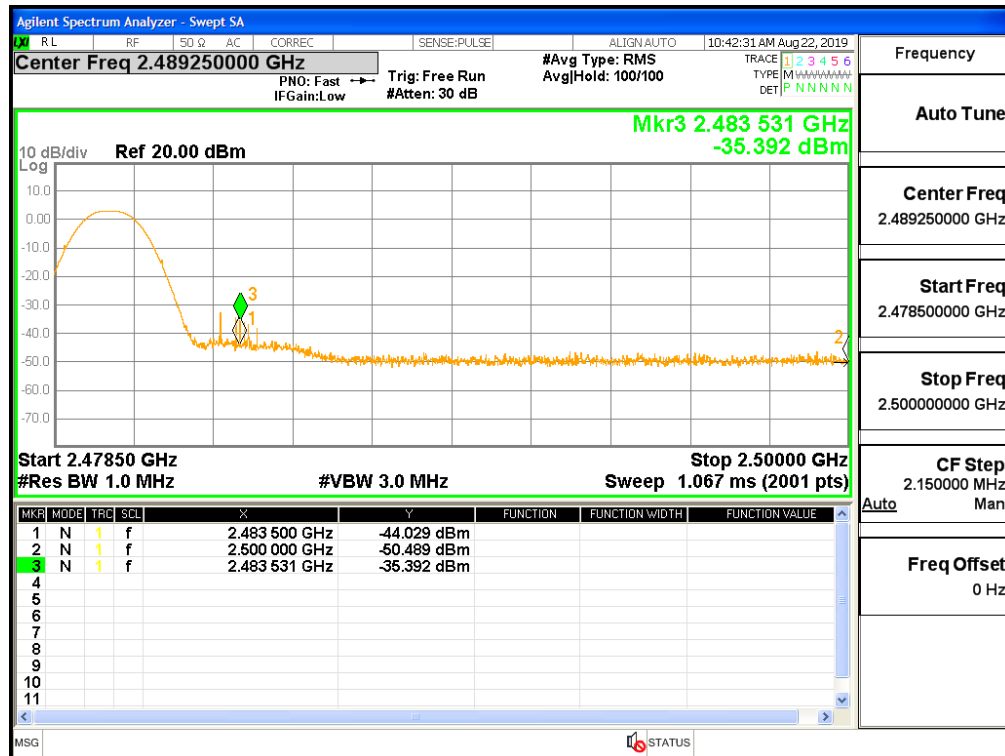
Restrict-band band-edge measurements_2402_PEAK_DH5



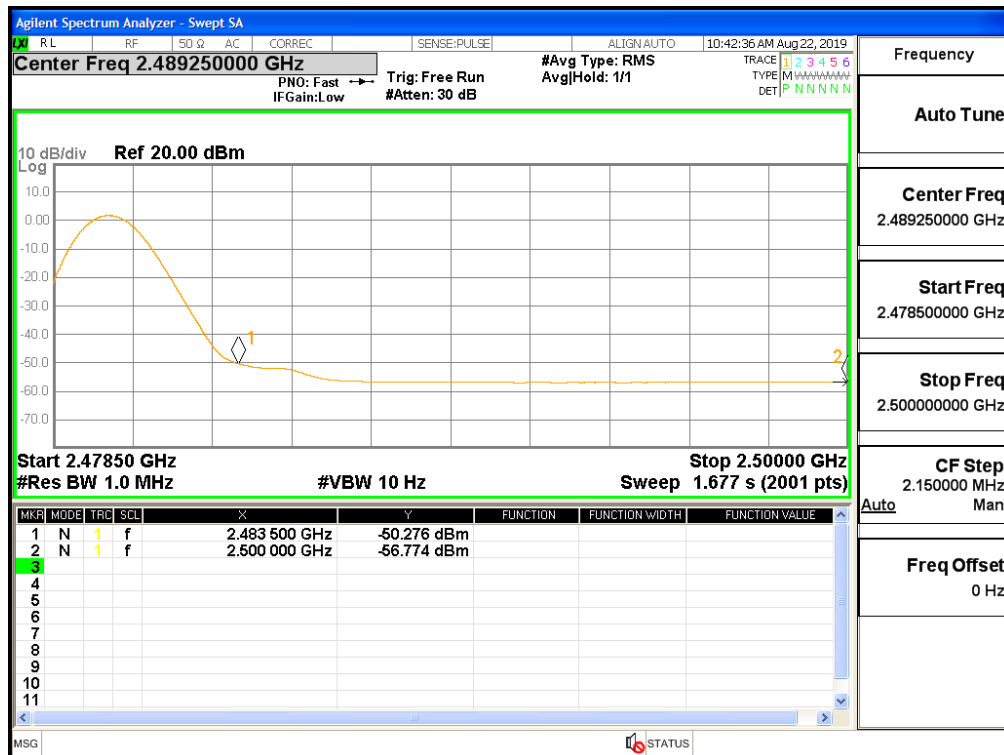
Restrict-band band-edge measurements_2402_AV_DH5



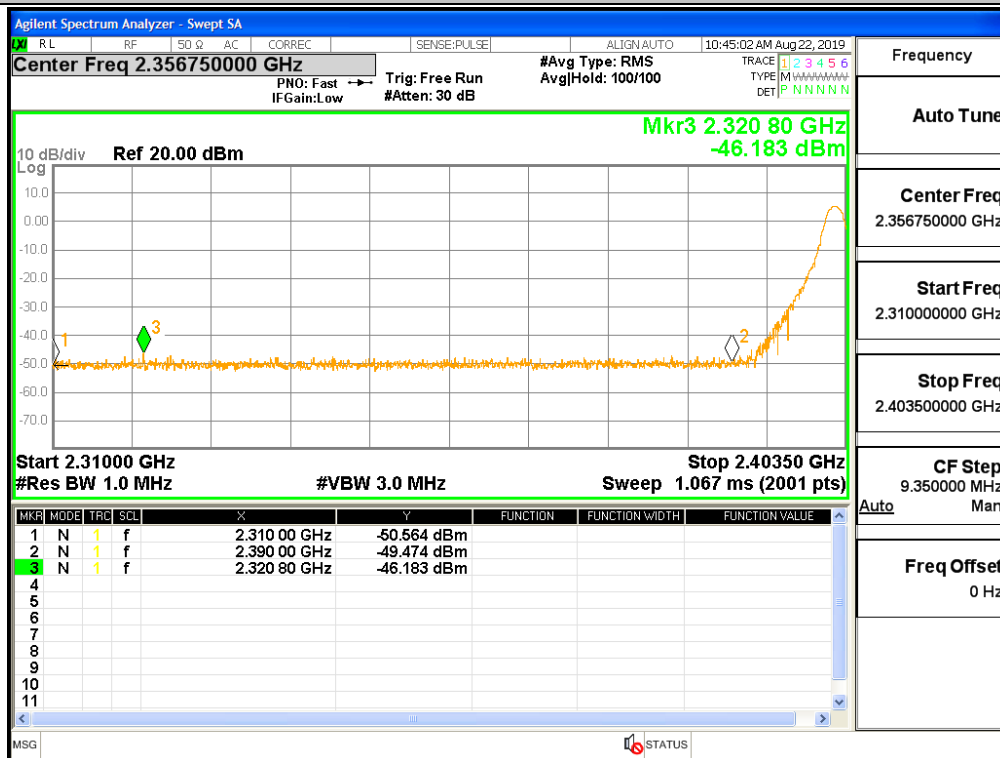
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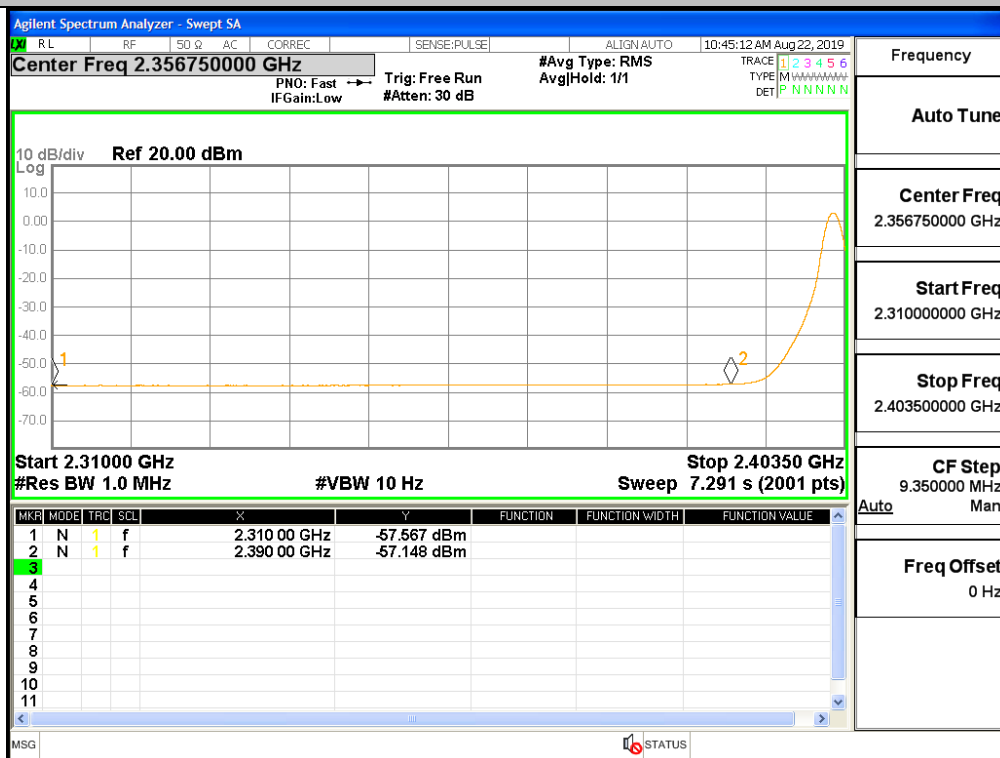
Restrict-band band-edge measurements_2480_AV_DH5



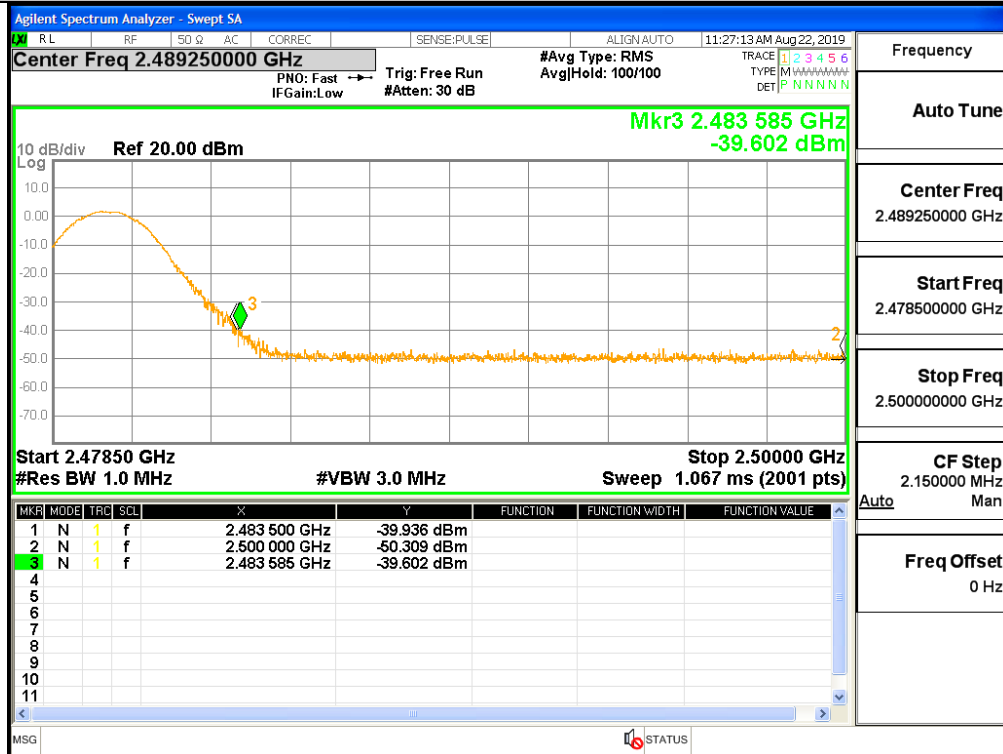
Restrict-band band-edge measurements_2402_PEAK_2DH5



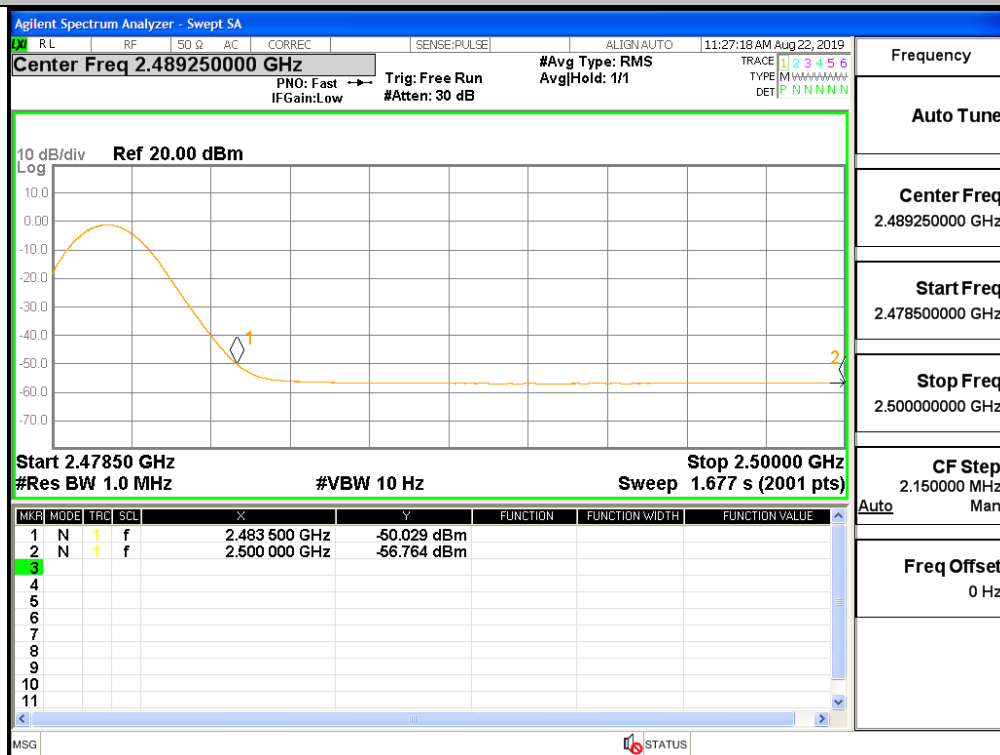
Restrict-band band-edge measurements_2402_AV_2DH5



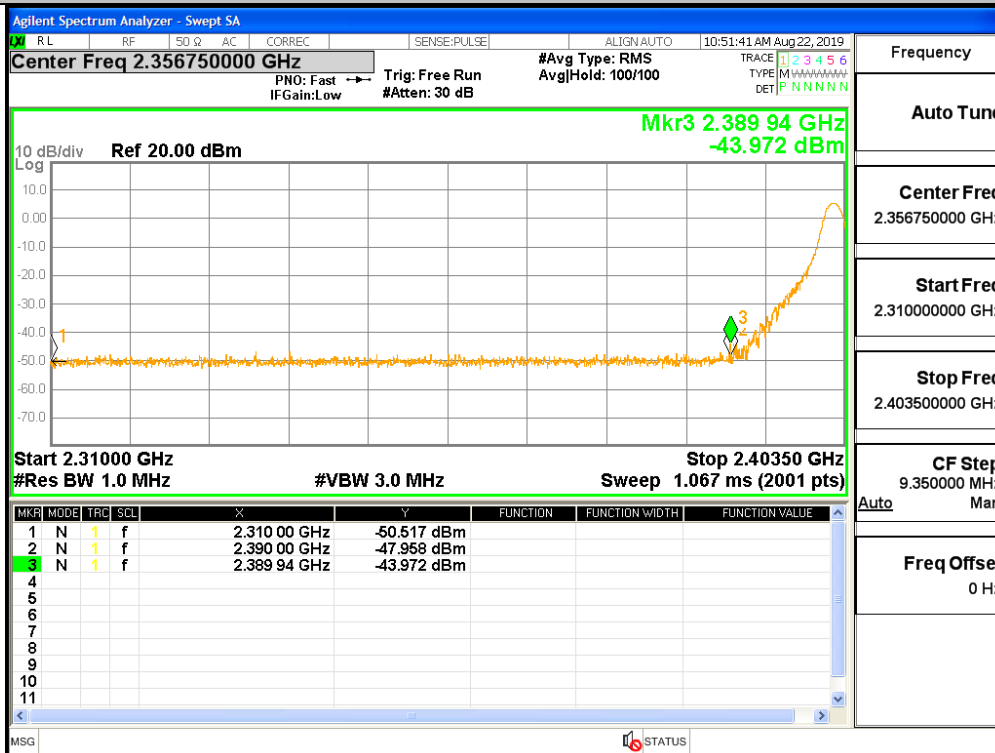
Restrict-band band-edge measurements_2480_PEAK_2DH5



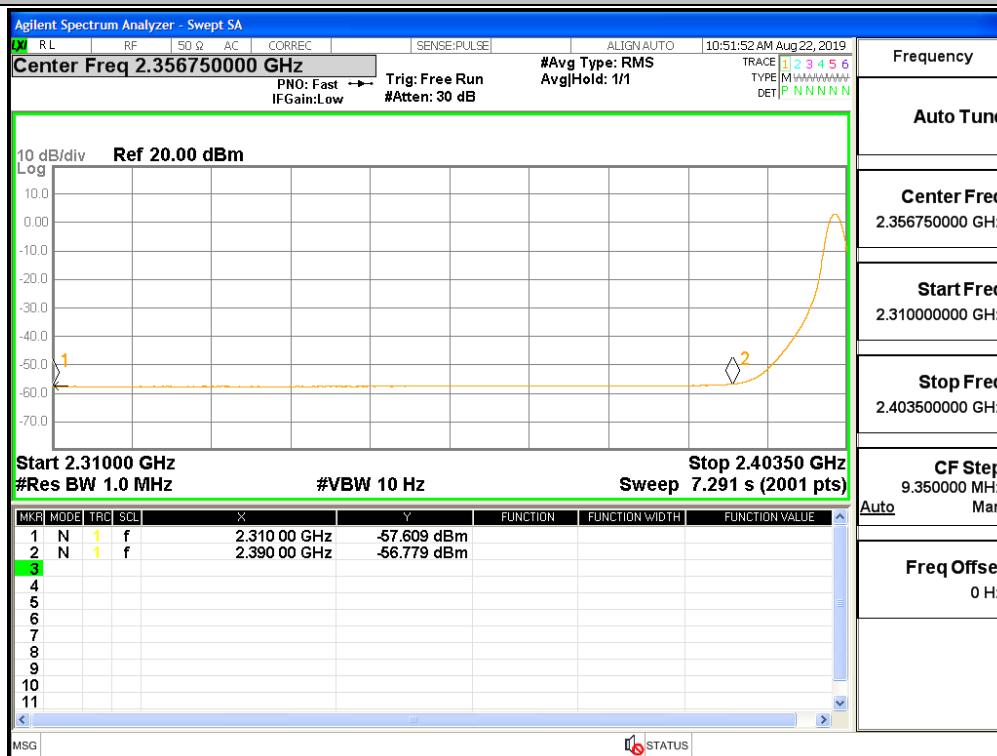
Restrict-band band-edge measurements_2480_AV_2DH5



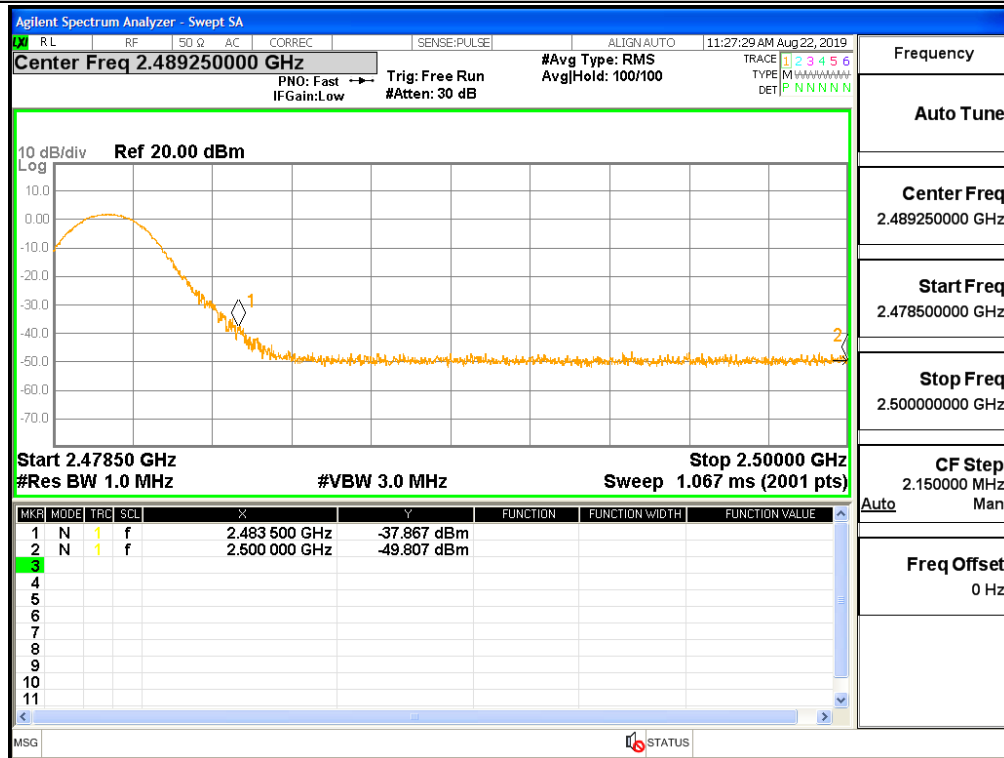
Restrict-band band-edge measurements_2402_PEAK_3DH5



Restrict-band band-edge measurements_2402_AV_3DH5



Restrict-band band-edge measurements_2480_PEAK_3DH5



Restrict-band band-edge measurements_2480_AV_3DH5

