

Appendix A

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

Product Name: Bluetooth Earphones

Trade Mark: Altec Lansing

Test Model: MZX890

FCC ID: 2AL9B-MZX890

Environmental Conditions

Temperature:	23.3 ° C
Relative Humidity:	50%
ATM Pressure:	100.0 kPa
Test Engineer:	Gary Qian
Supervised by:	Eden Hu

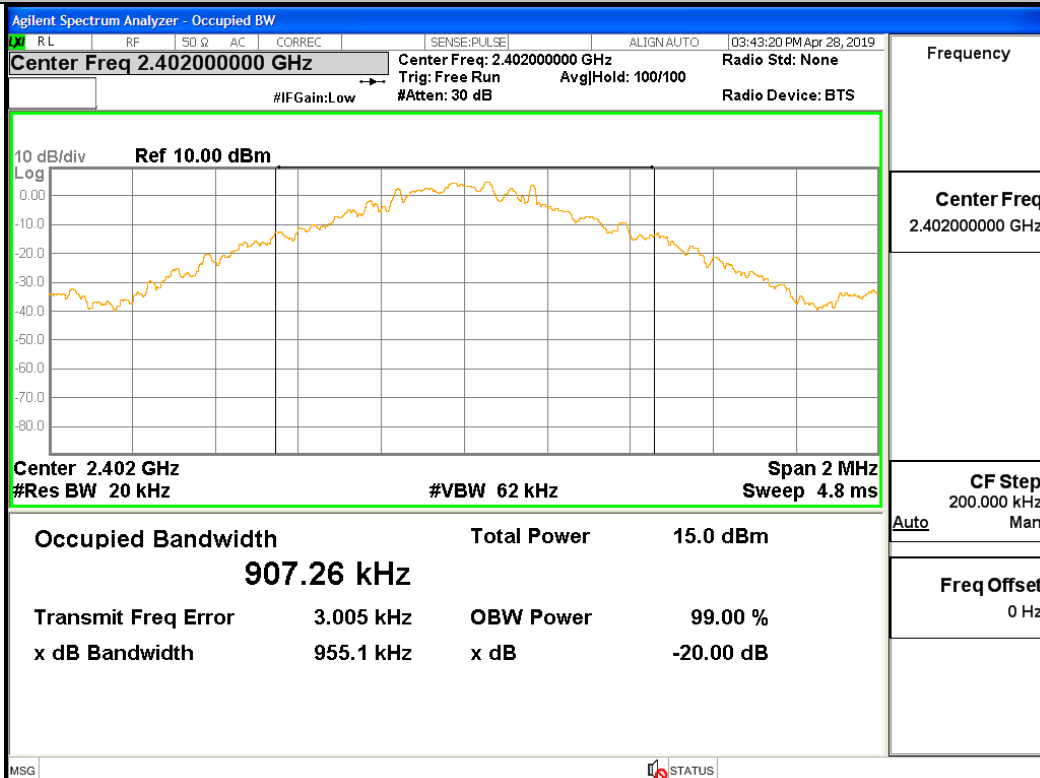
A.1 20 dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit(MHz)	Verdict
GFSK	LCH	0.955	Not Specified	PASS
GFSK	MCH	0.999	Not Specified	PASS
GFSK	HCH	0.959	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.250	Not Specified	PASS
$\pi/4$ DQPSK	MCH	1.306	Not Specified	PASS
$\pi/4$ DQPSK	HCH	1.324	Not Specified	PASS
8DPSK	LCH	1.267	Not Specified	PASS
8DPSK	MCH	1.261	Not Specified	PASS
8DPSK	HCH	1.262	Not Specified	PASS

Test Graph

Graphs

GFSK/LCH



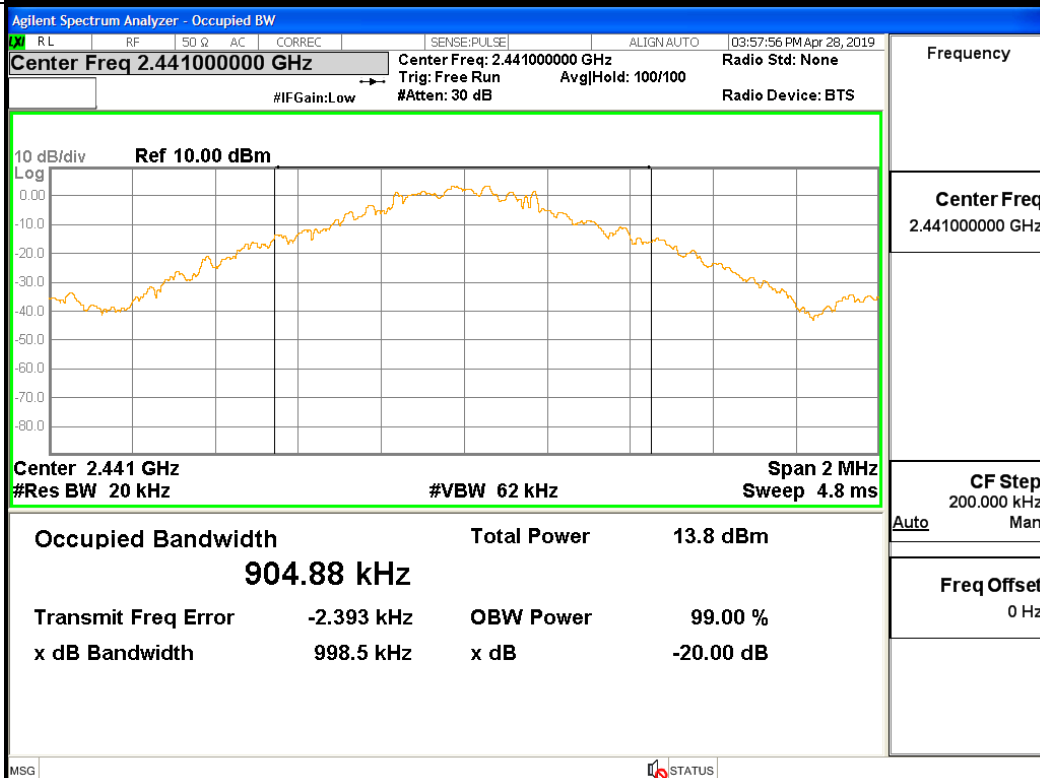
Frequency

Center Freq
2.40200000 GHz

CF Step
200.000 kHz
Auto Man

Freq Offset
0 Hz

GFSK/MCH

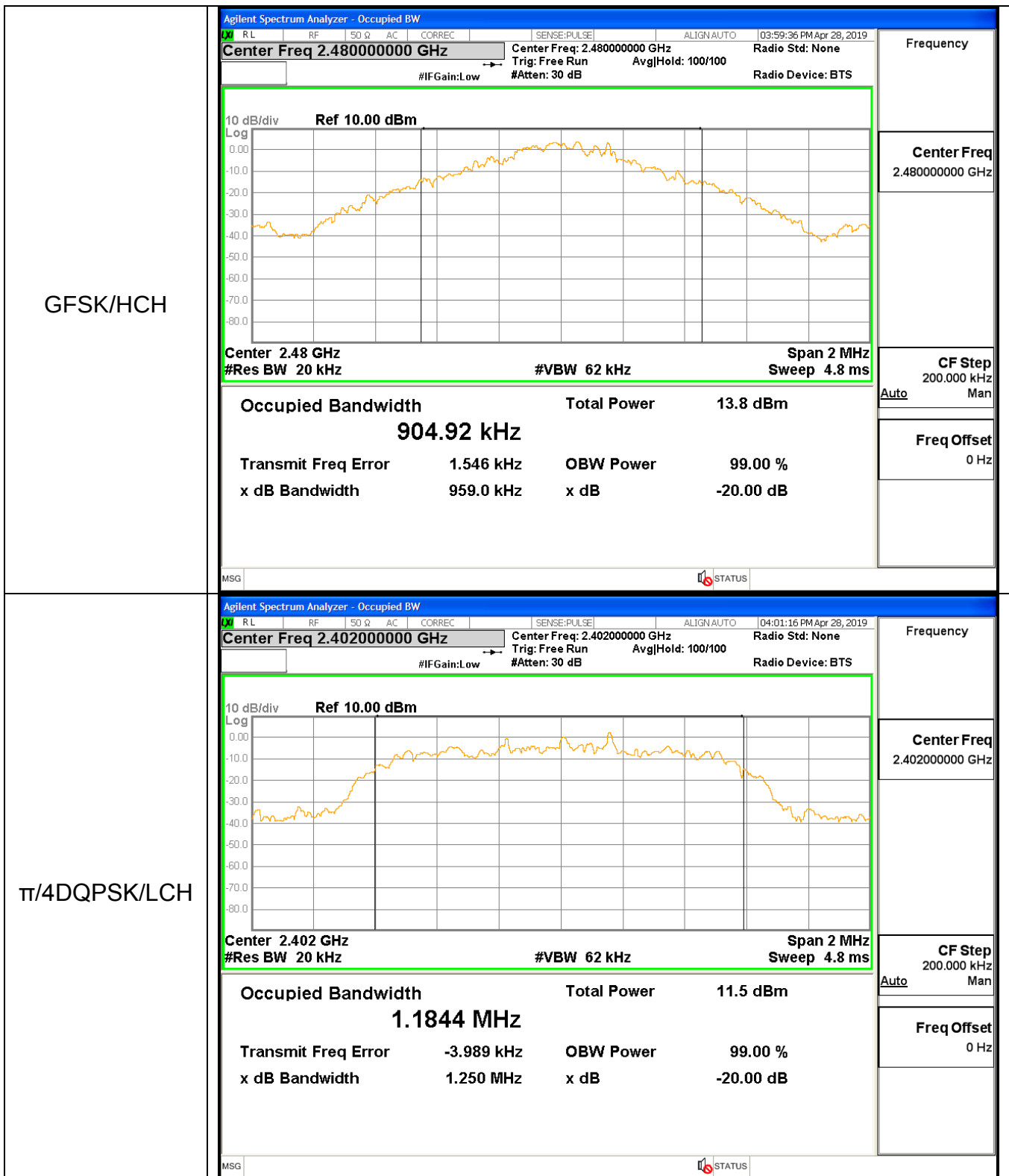


Frequency

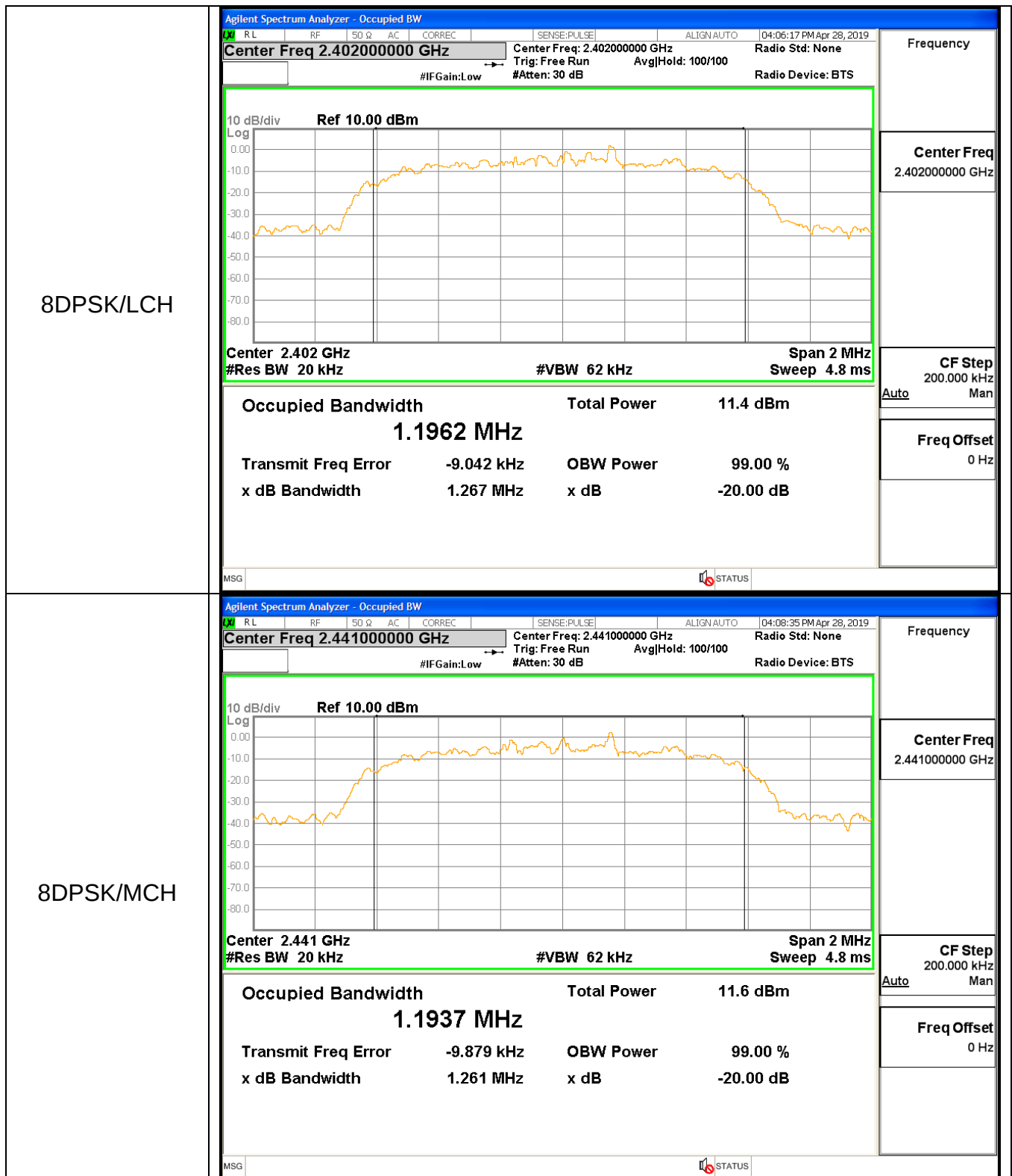
Center Freq
2.44100000 GHz

CF Step
200.000 kHz
Auto Man

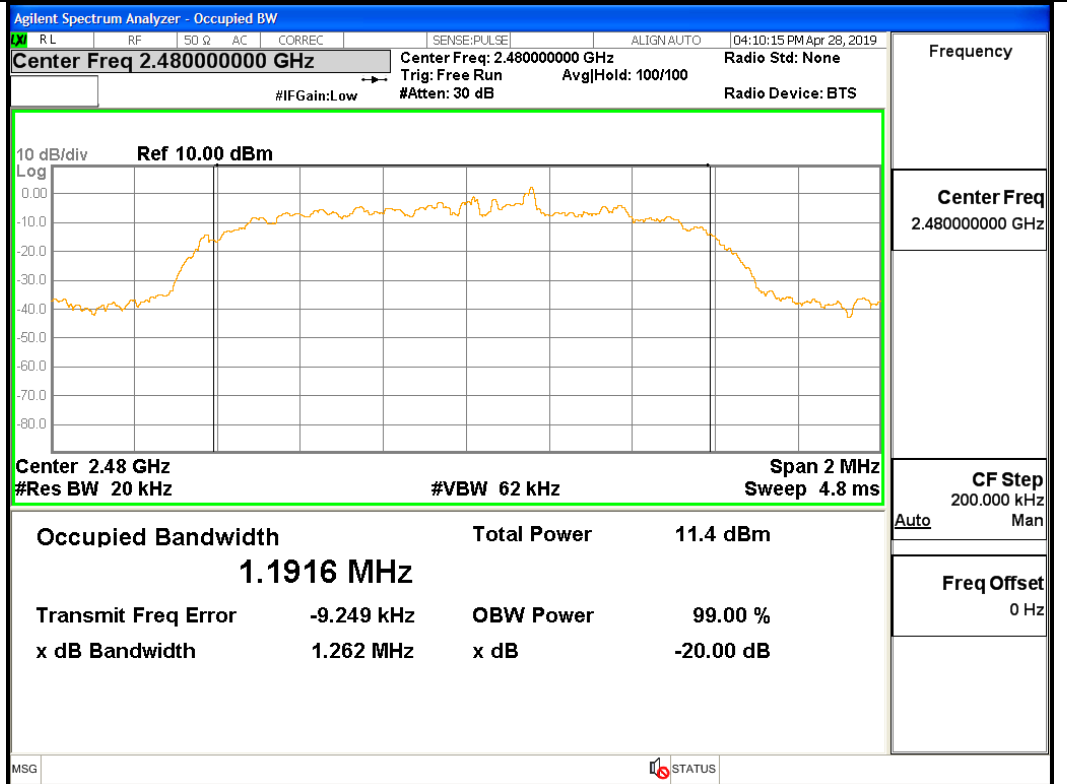
Freq Offset
0 Hz







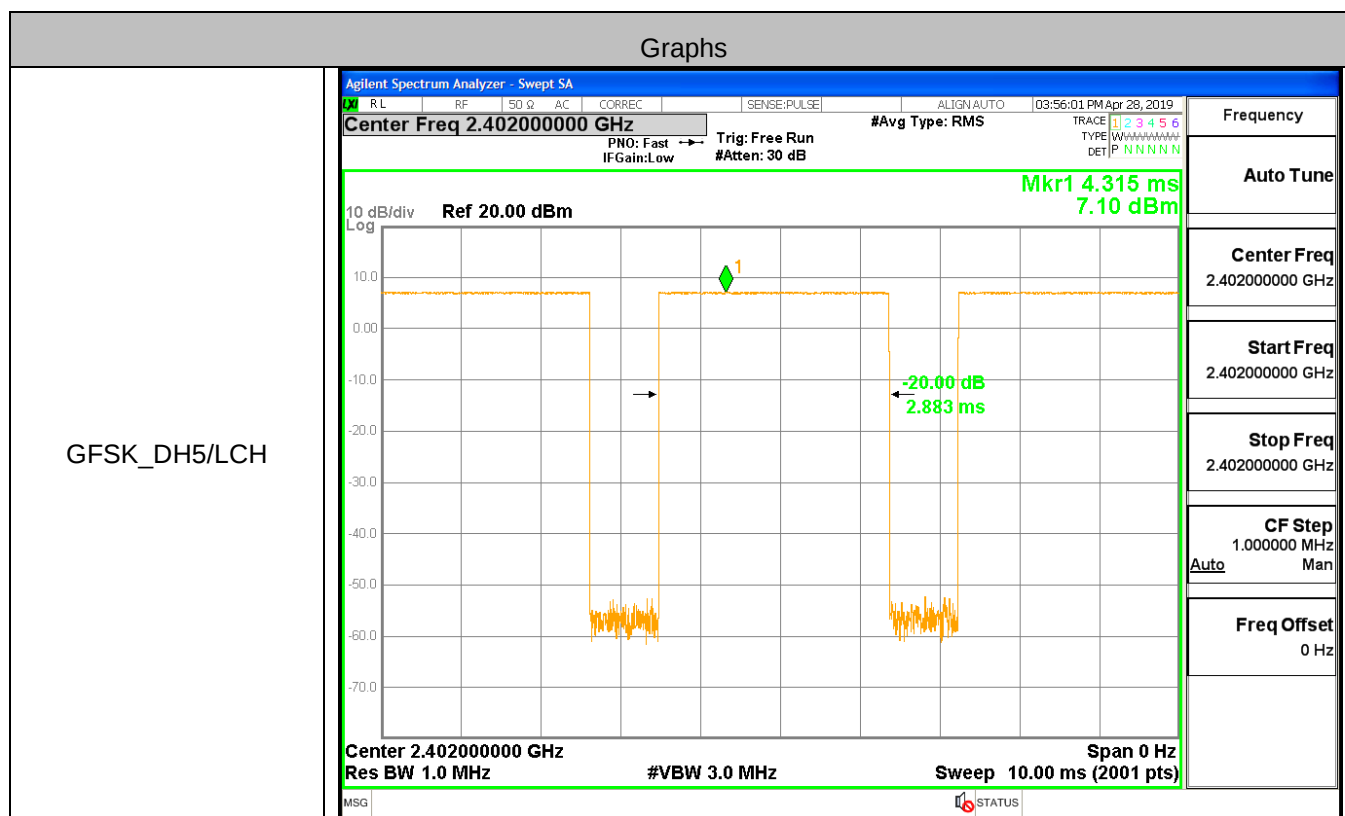
8DPSK/HCH

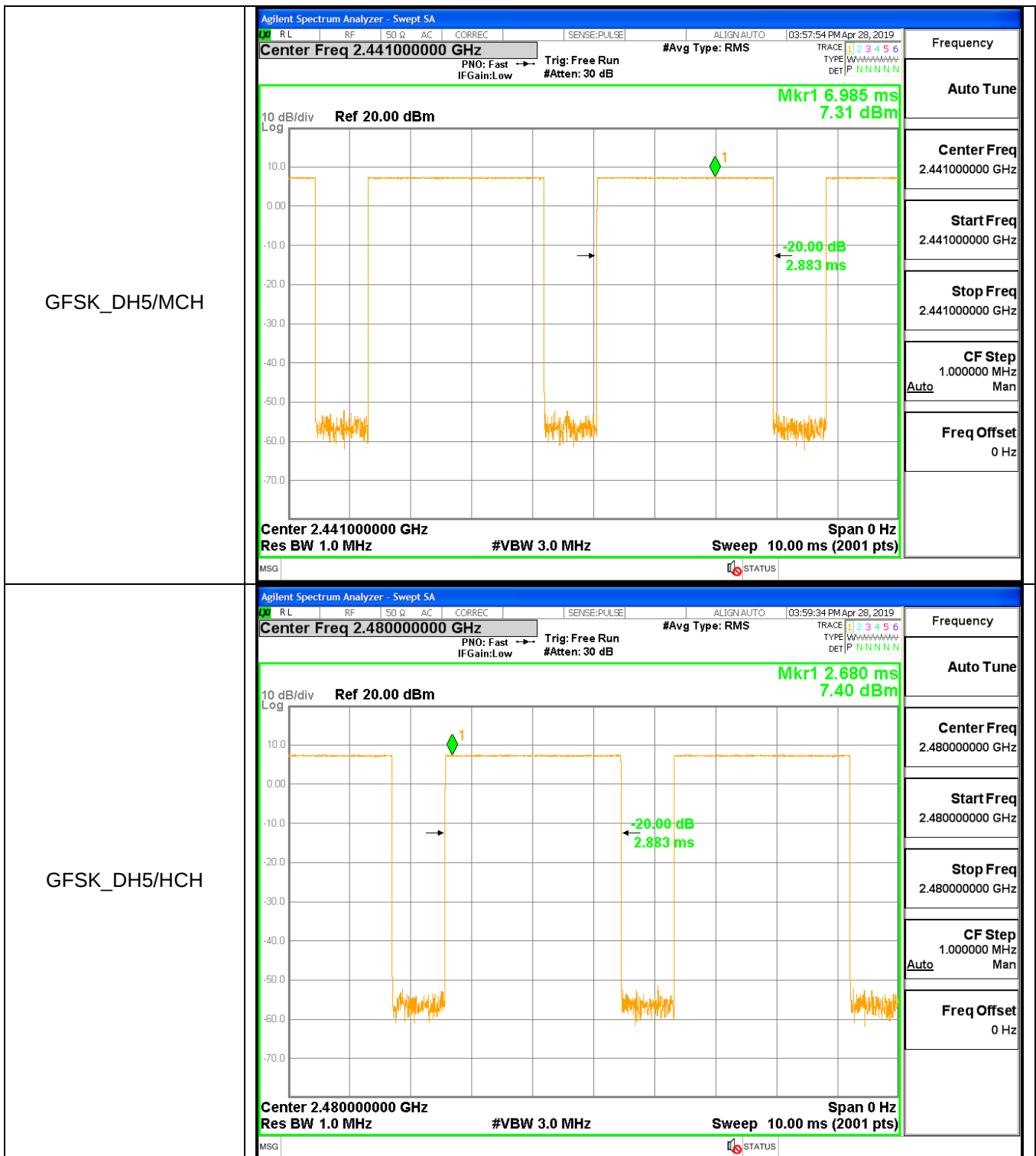


A.2 Dwell Time

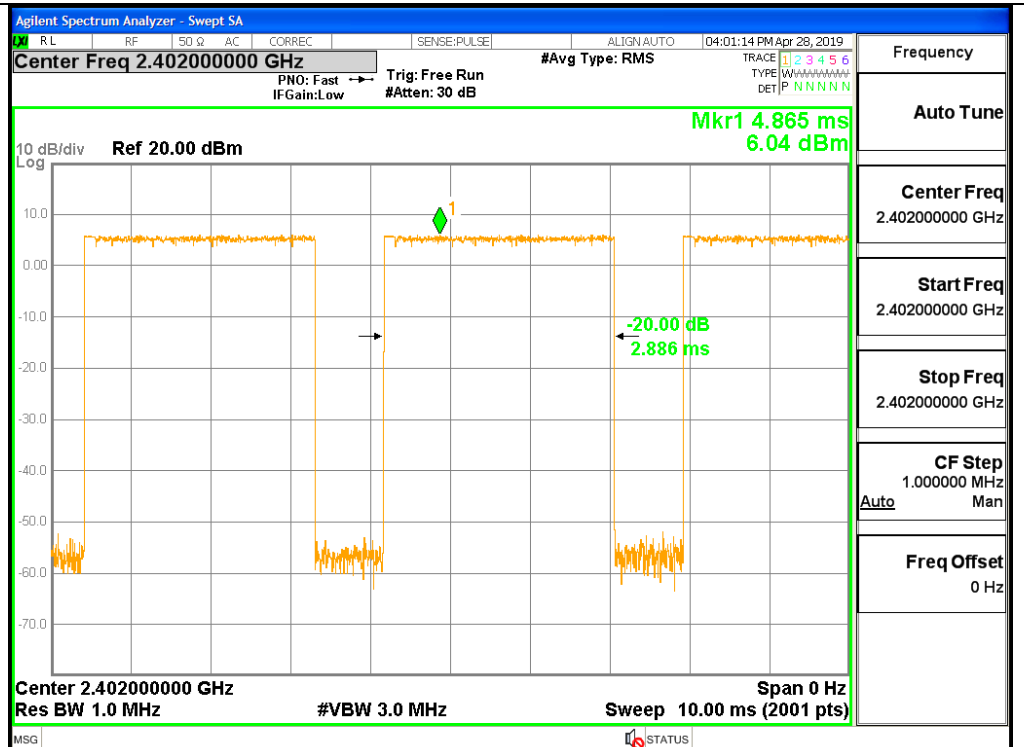
Mode	Packet	Channel	Burst Width [s/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	0.002883	106.7	0.307664	0.4	PASS
GFSK	DH5	MCH	0.002883	106.7	0.307597	0.4	PASS
GFSK	DH5	HCH	0.002883	106.7	0.307584	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	0.002886	106.7	0.30792	0.4	PASS
$\pi/4$ DQPSK	2DH5	MCH	0.002888	106.7	0.308109	0.4	PASS
$\pi/4$ DQPSK	2DH5	HCH	0.002888	106.7	0.308147	0.4	PASS
8DPSK	3DH5	LCH	0.002888	106.7	0.308129	0.4	PASS
8DPSK	3DH5	MCH	0.002888	106.7	0.308131	0.4	PASS
8DPSK	3DH5	HCH	0.002890	106.7	0.308316	0.4	PASS

Test Graph

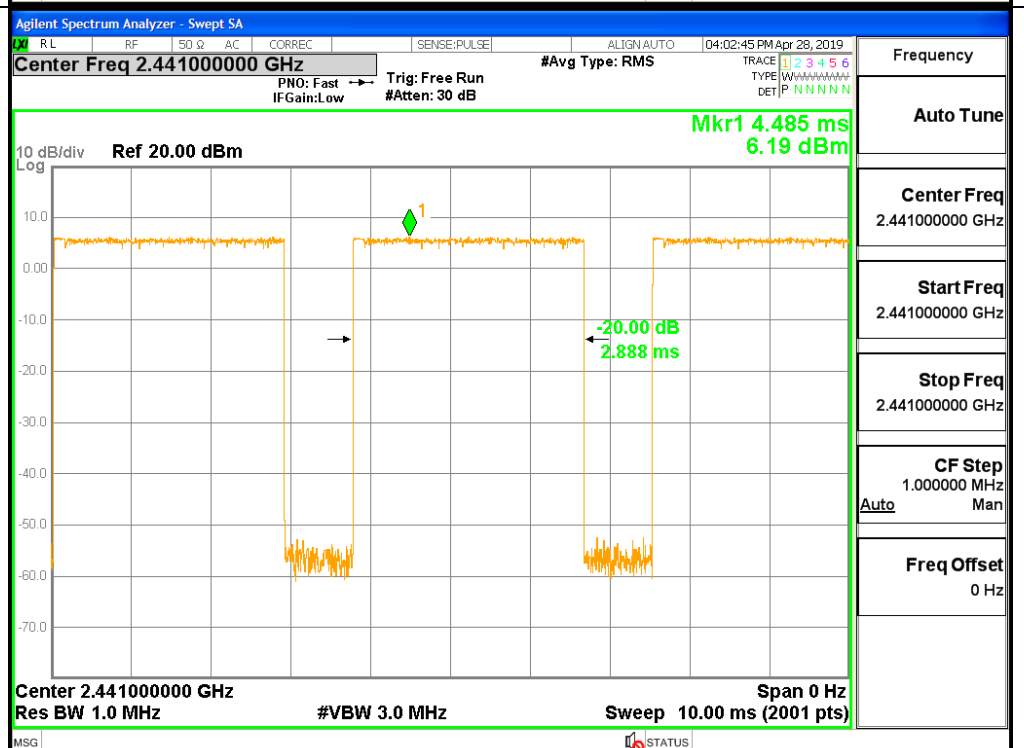




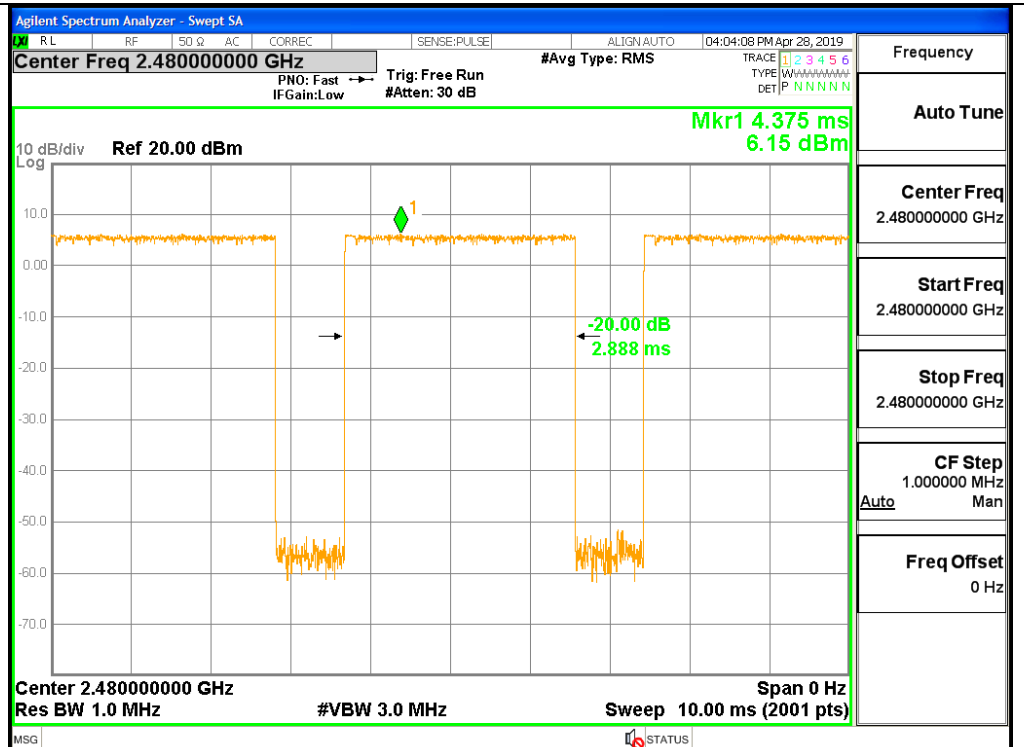
$\pi/4$ DQPSK
_2DH5/LCH



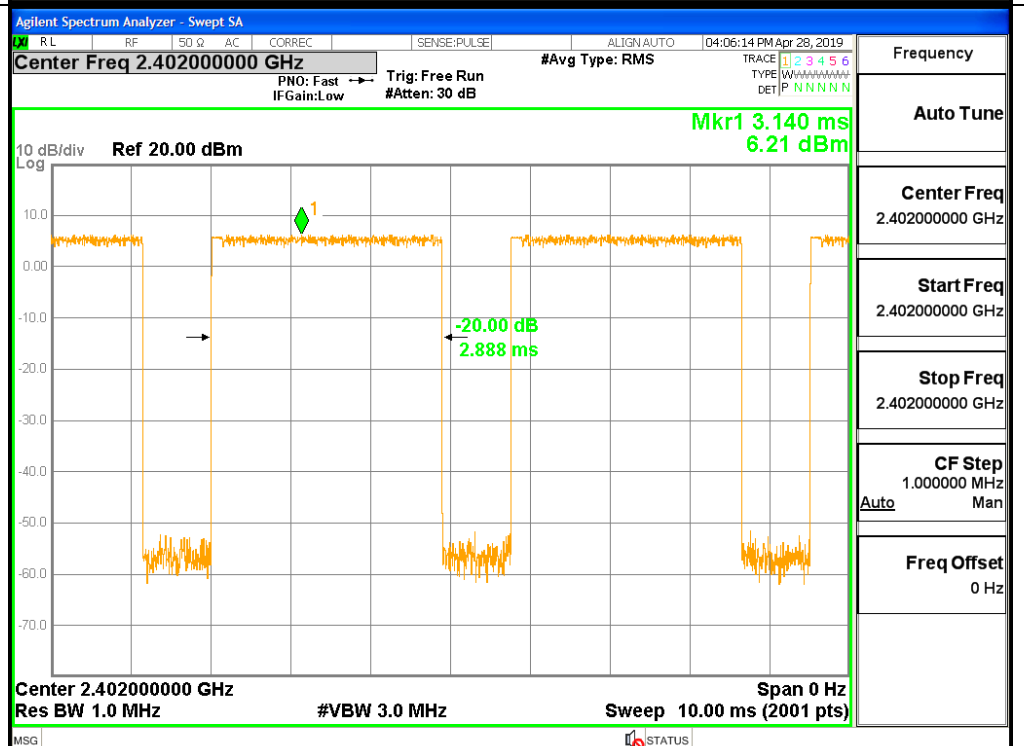
$\pi/4$ DQPSK
_2DH5/MCH

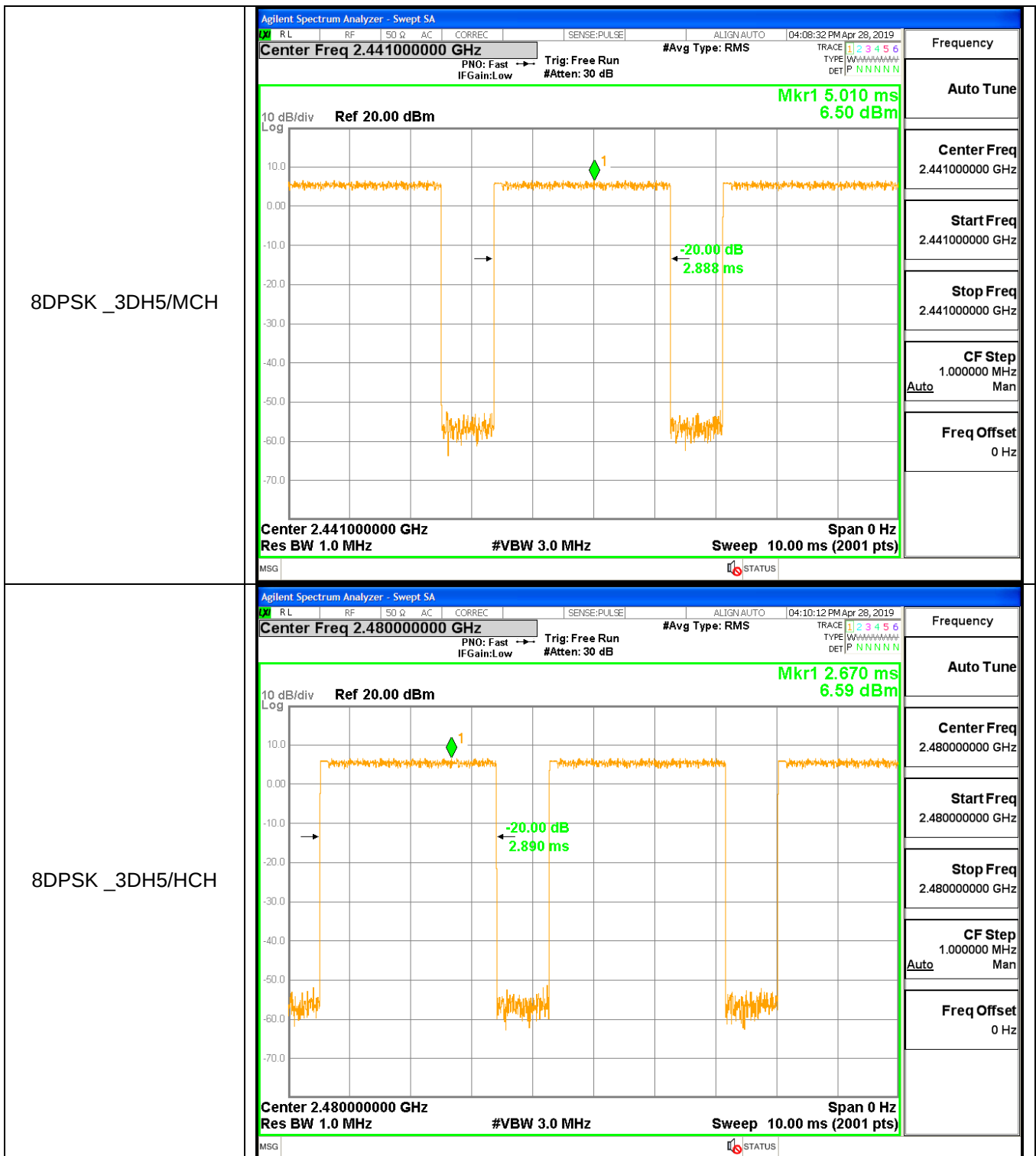


$\pi/4$ DQPSK
_2DH5/HCH



8DPSK_3DH5/LCH





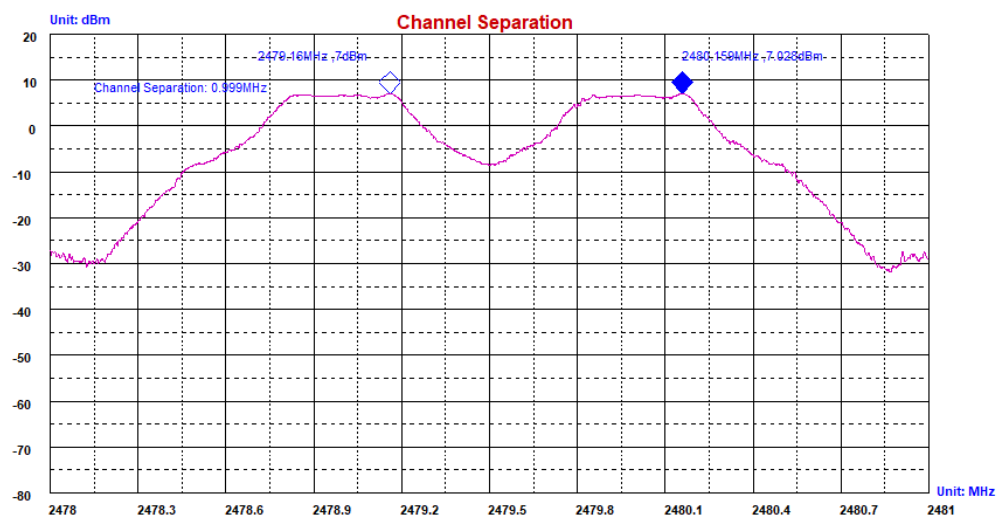
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.009	0.637	PASS
GFSK	MCH	1.003	0.666	PASS
GFSK	HCH	0.999	0.639	PASS
$\pi/4$ DQPSK	LCH	1.004	0.833	PASS
$\pi/4$ DQPSK	MCH	1.003	0.871	PASS
$\pi/4$ DQPSK	HCH	1.009	0.883	PASS
8DPSK	LCH	0.994	0.845	PASS
8DPSK	MCH	0.991	0.841	PASS
8DPSK	HCH	1.007	0.841	PASS

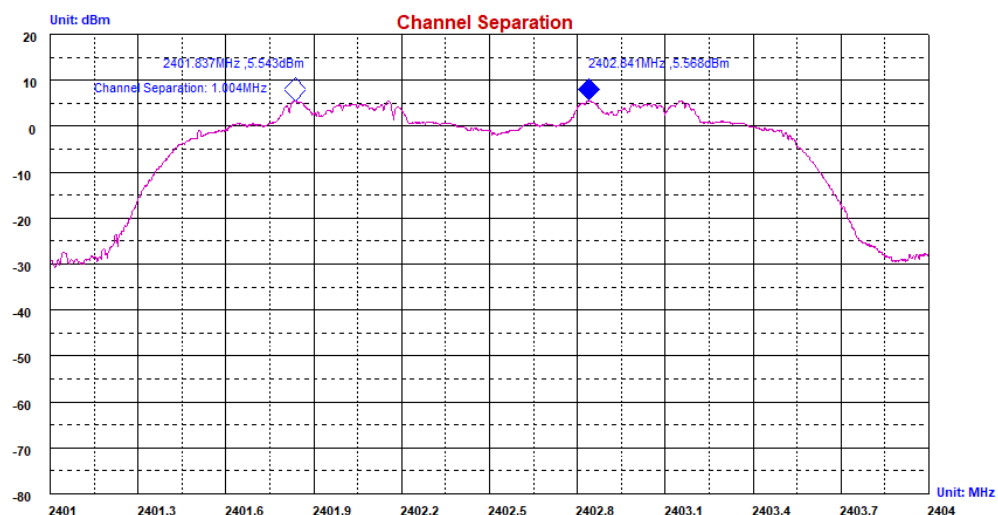
Test Graph



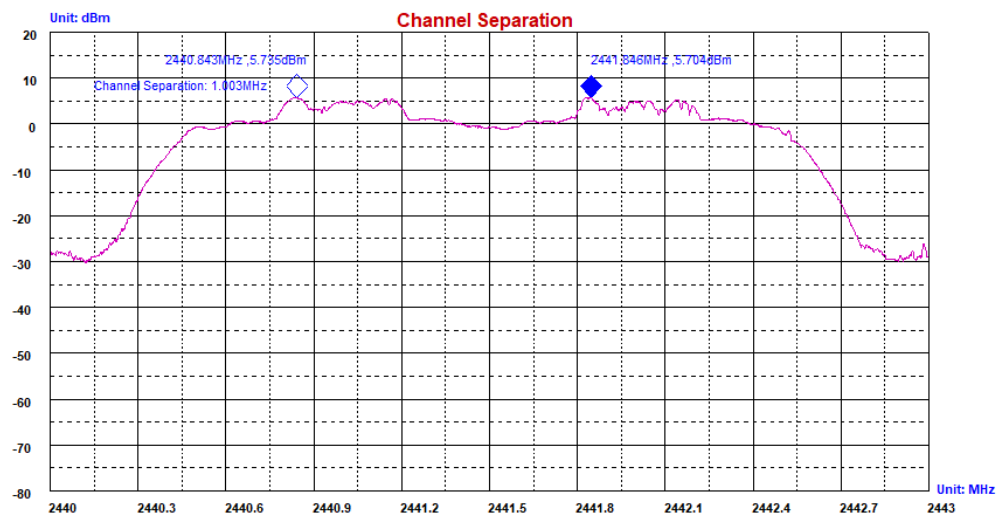
GFSK/HCH

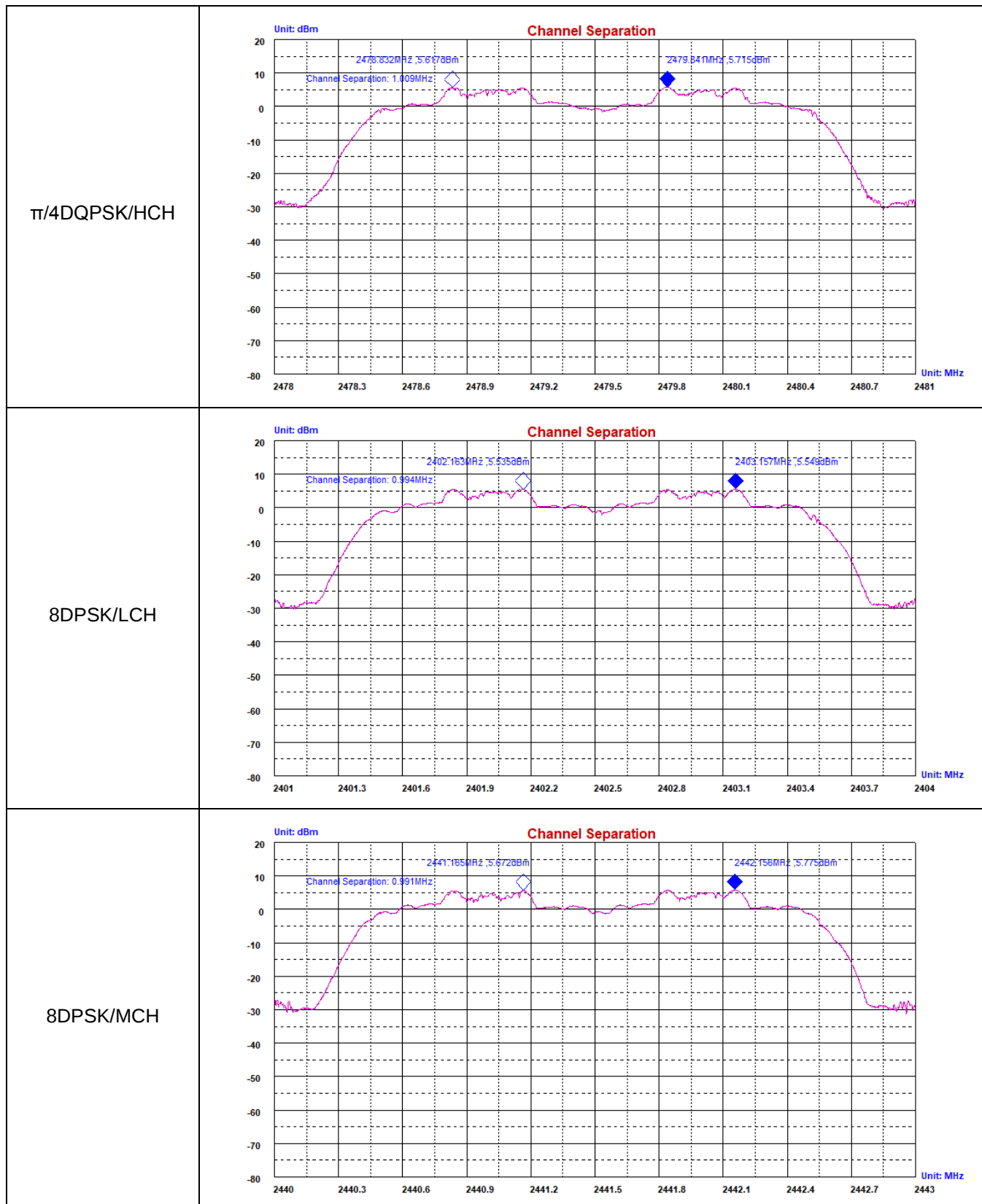


π /4DQPSK/LCH

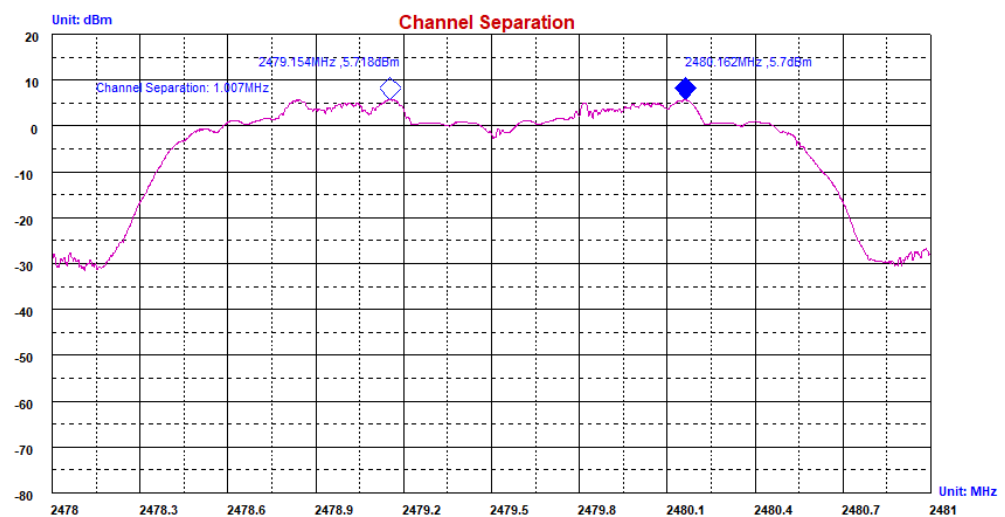


π /4DQPSK/MCH





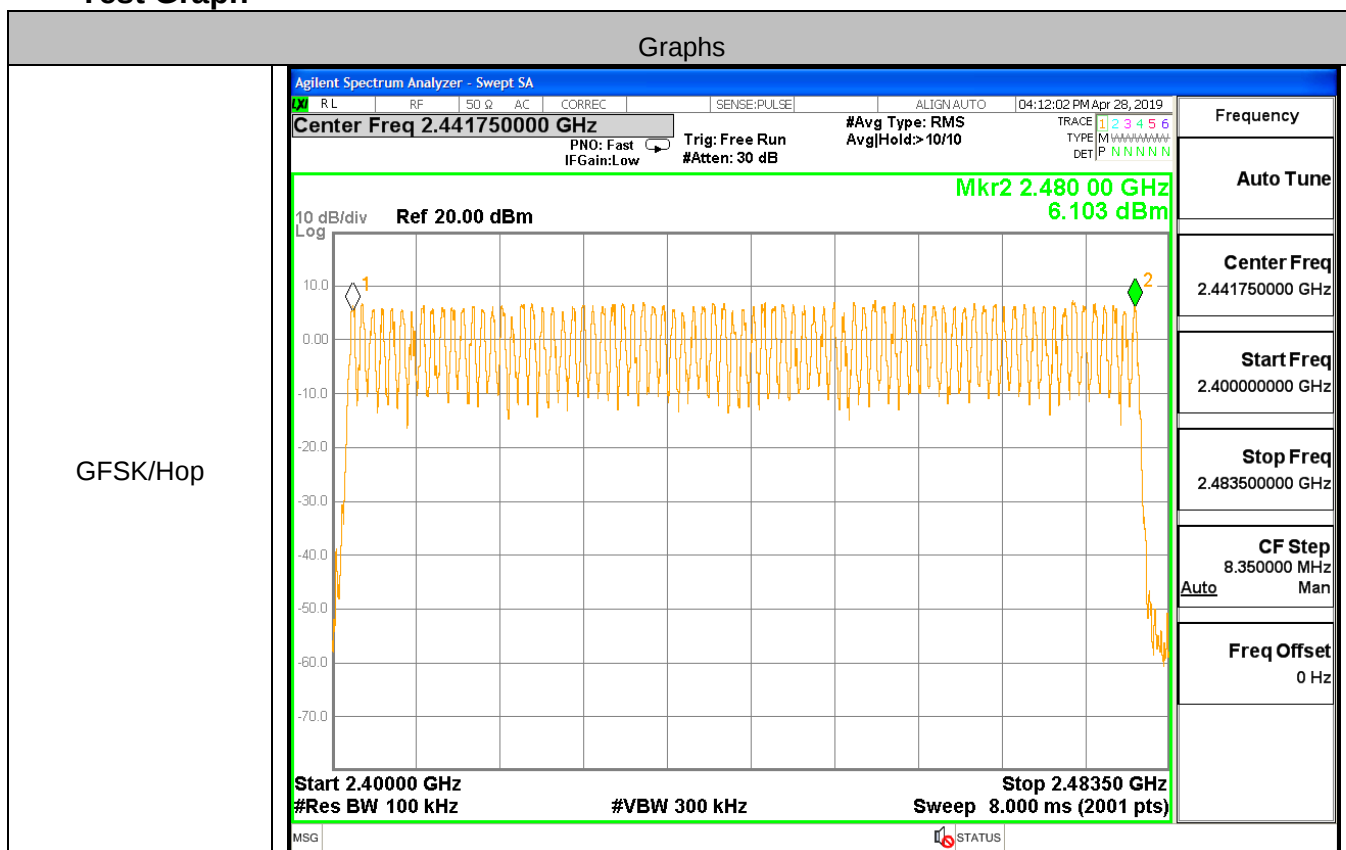
8DPSK/HCH

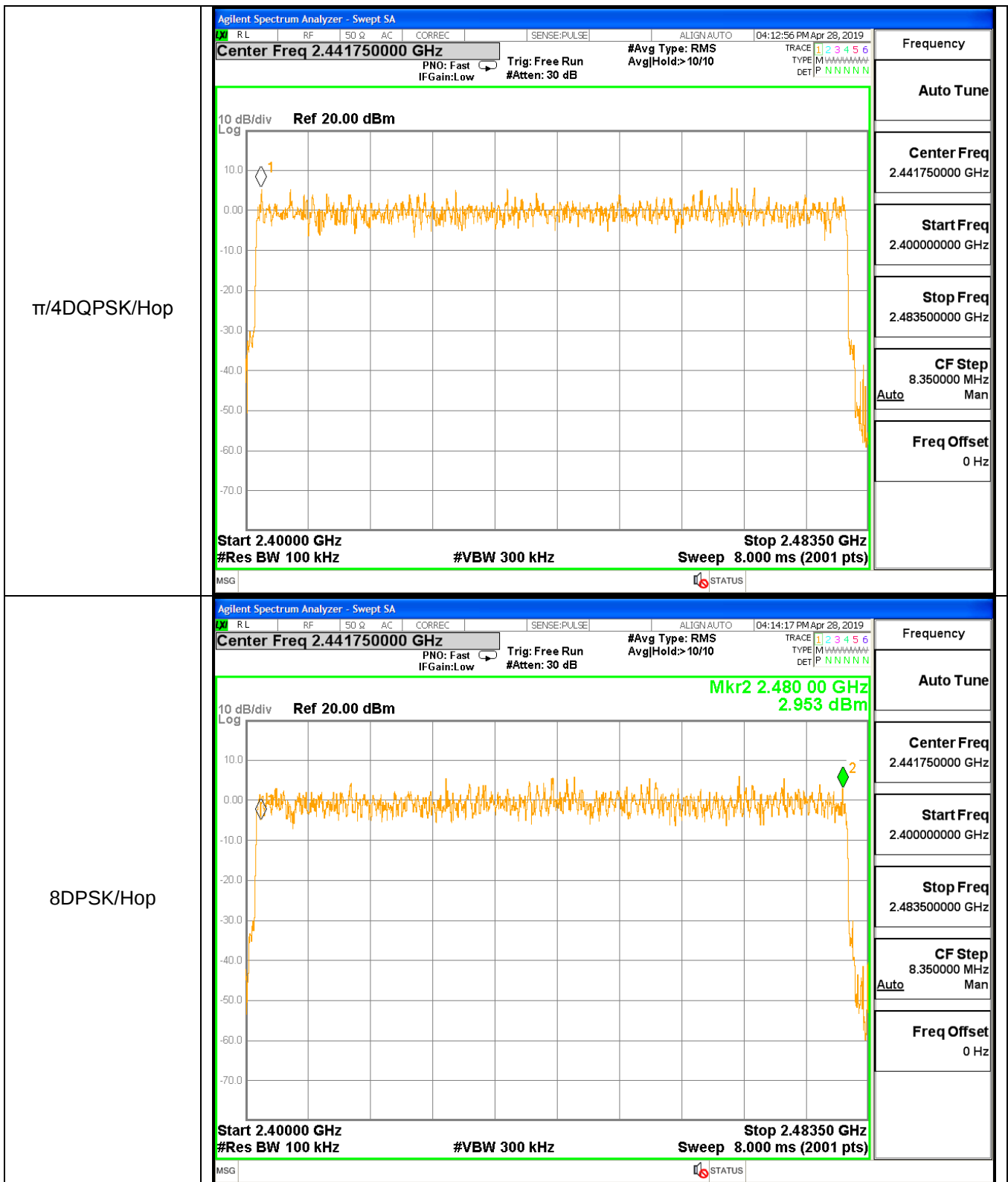


A.4 Hopping Channel Number

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

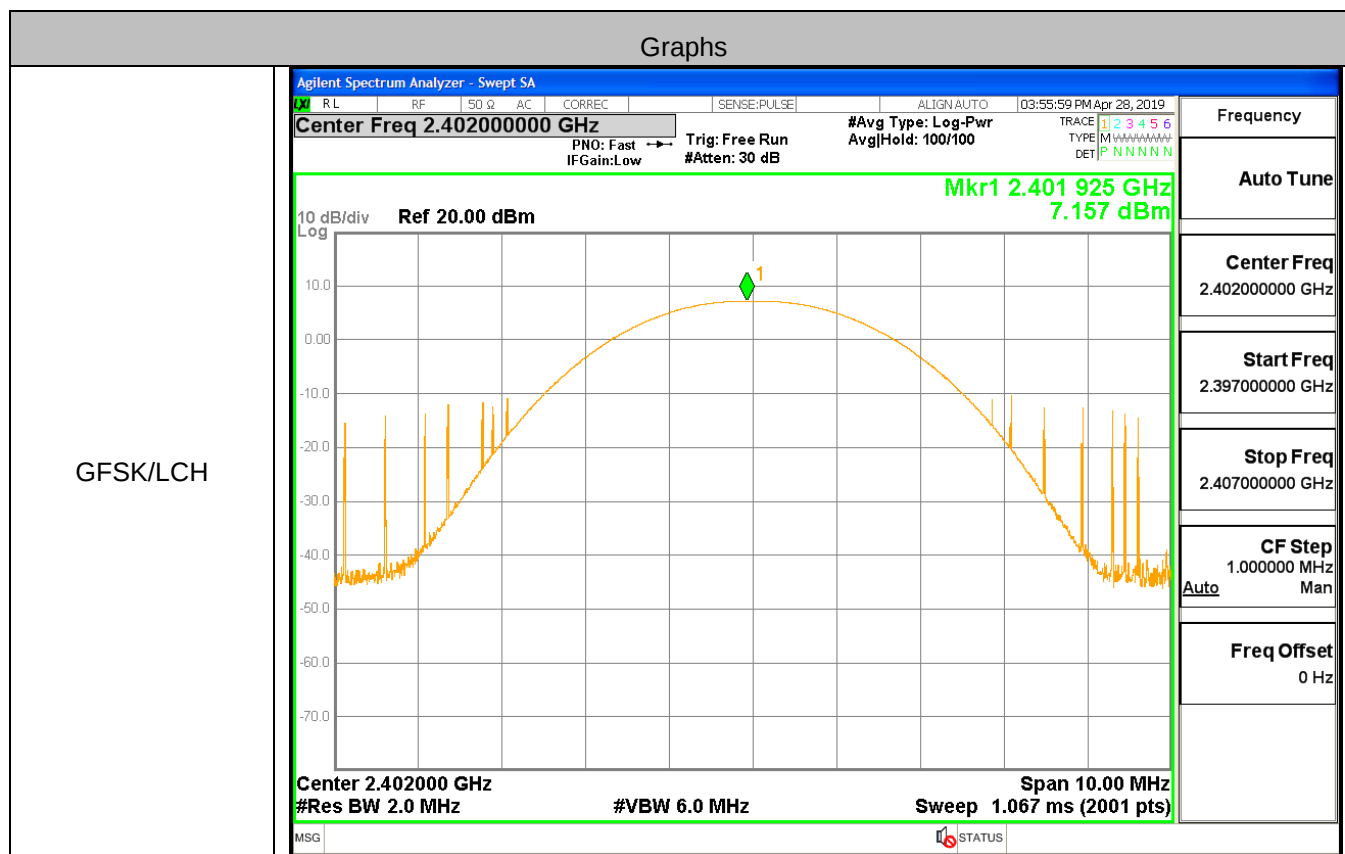




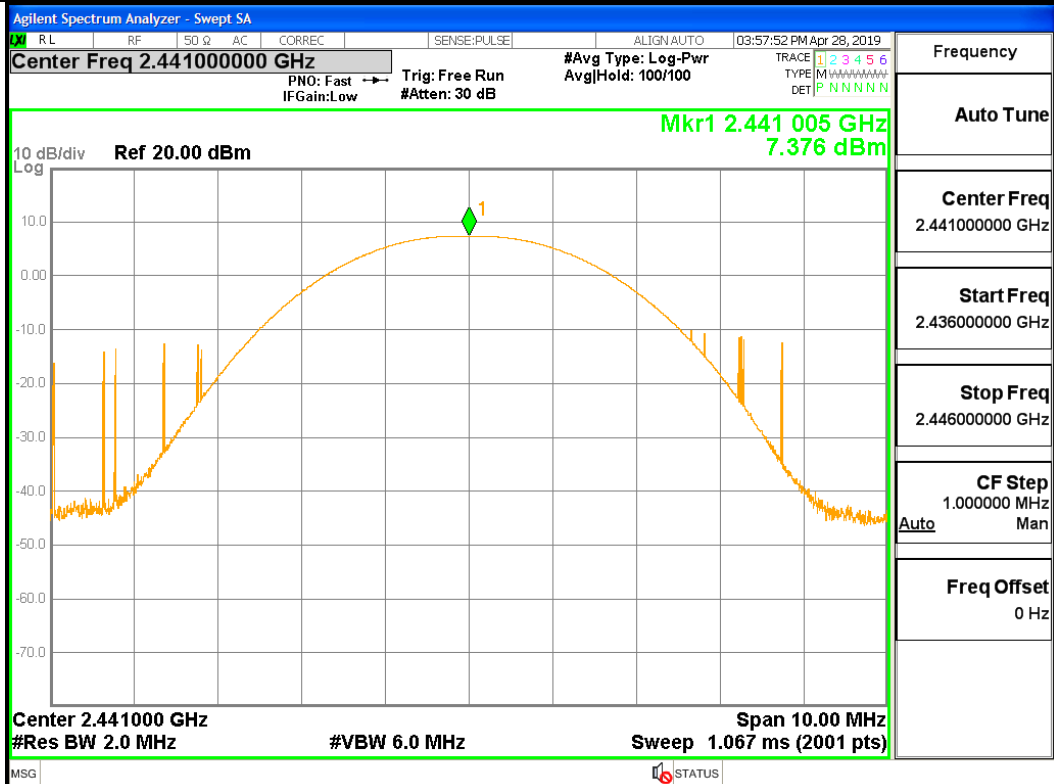
A.5 Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	7.157	21	PASS
GFSK	MCH	7.376	21	PASS
GFSK	HCH	7.459	21	PASS
$\pi/4$ DQPSK	LCH	6.449	21	PASS
$\pi/4$ DQPSK	MCH	6.656	21	PASS
$\pi/4$ DQPSK	HCH	6.642	21	PASS
8DPSK	LCH	6.577	21	PASS
8DPSK	MCH	6.876	21	PASS
8DPSK	HCH	6.940	21	PASS

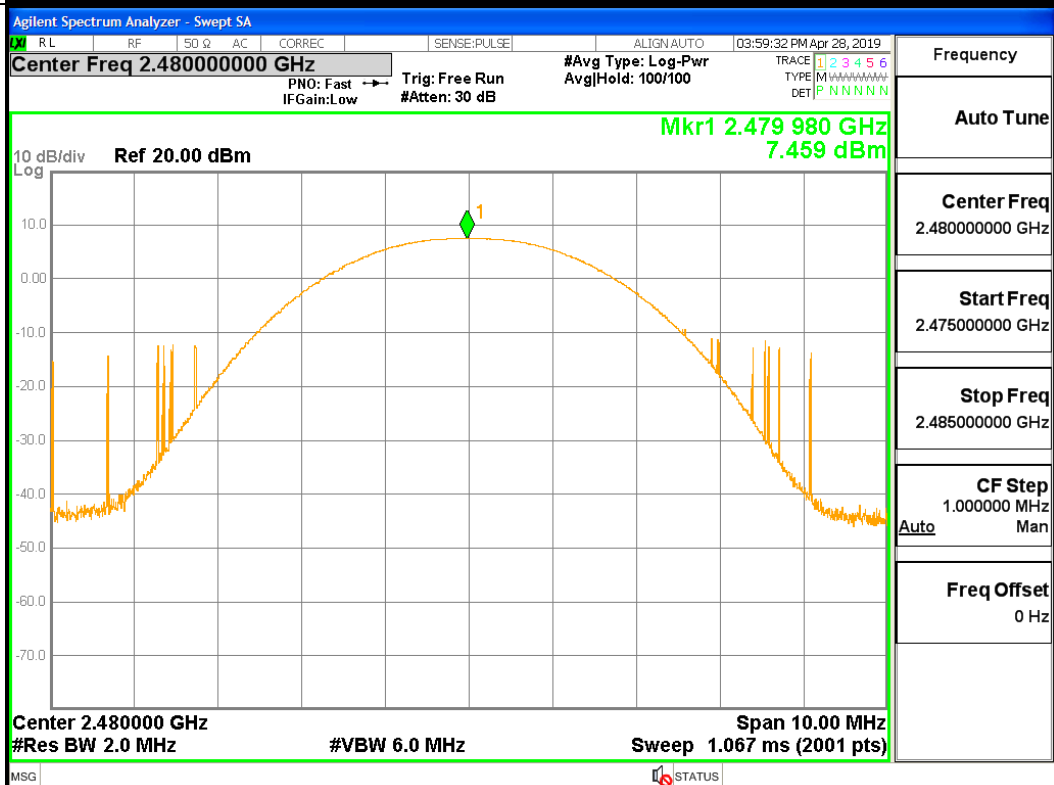
Test Graph

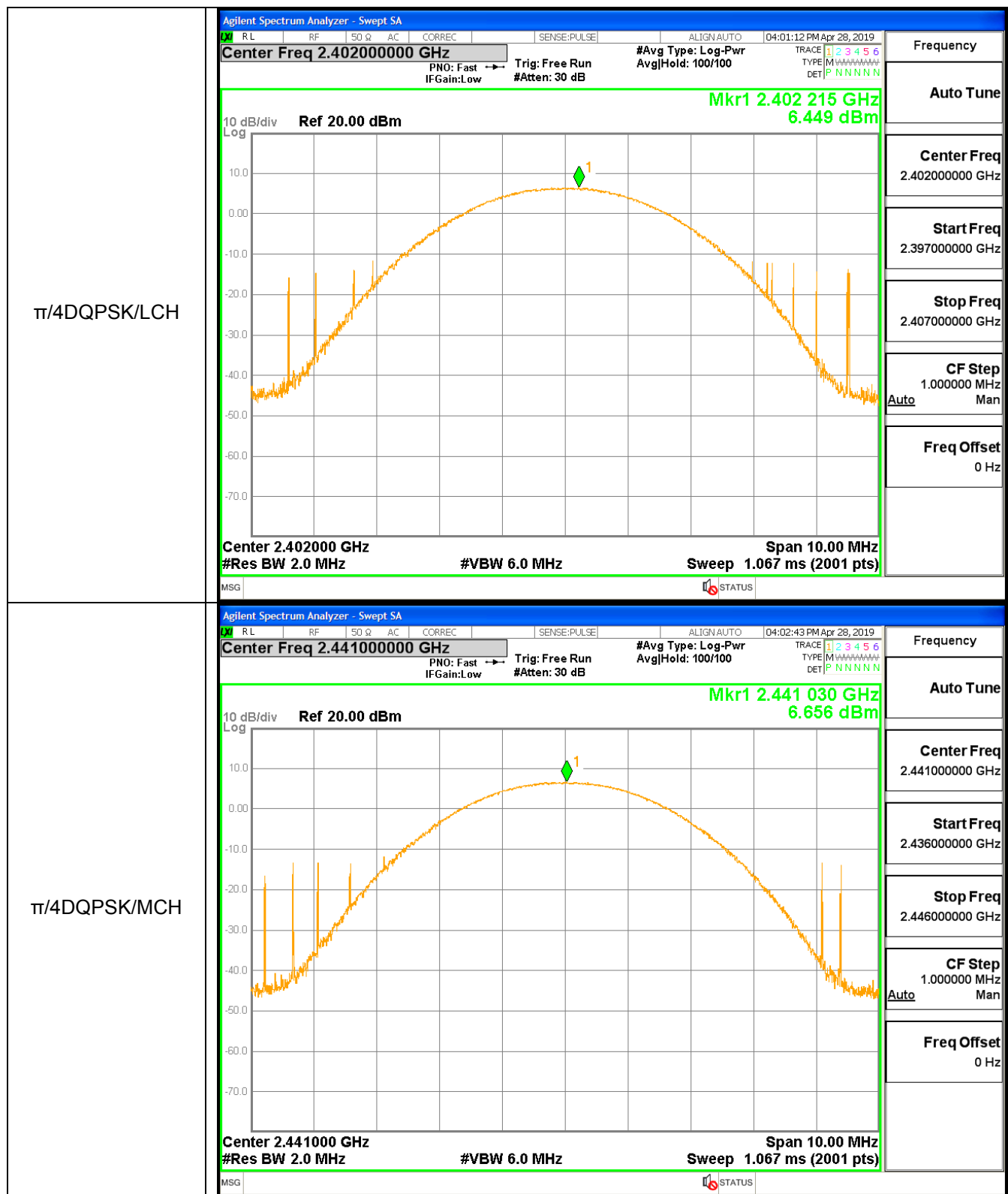


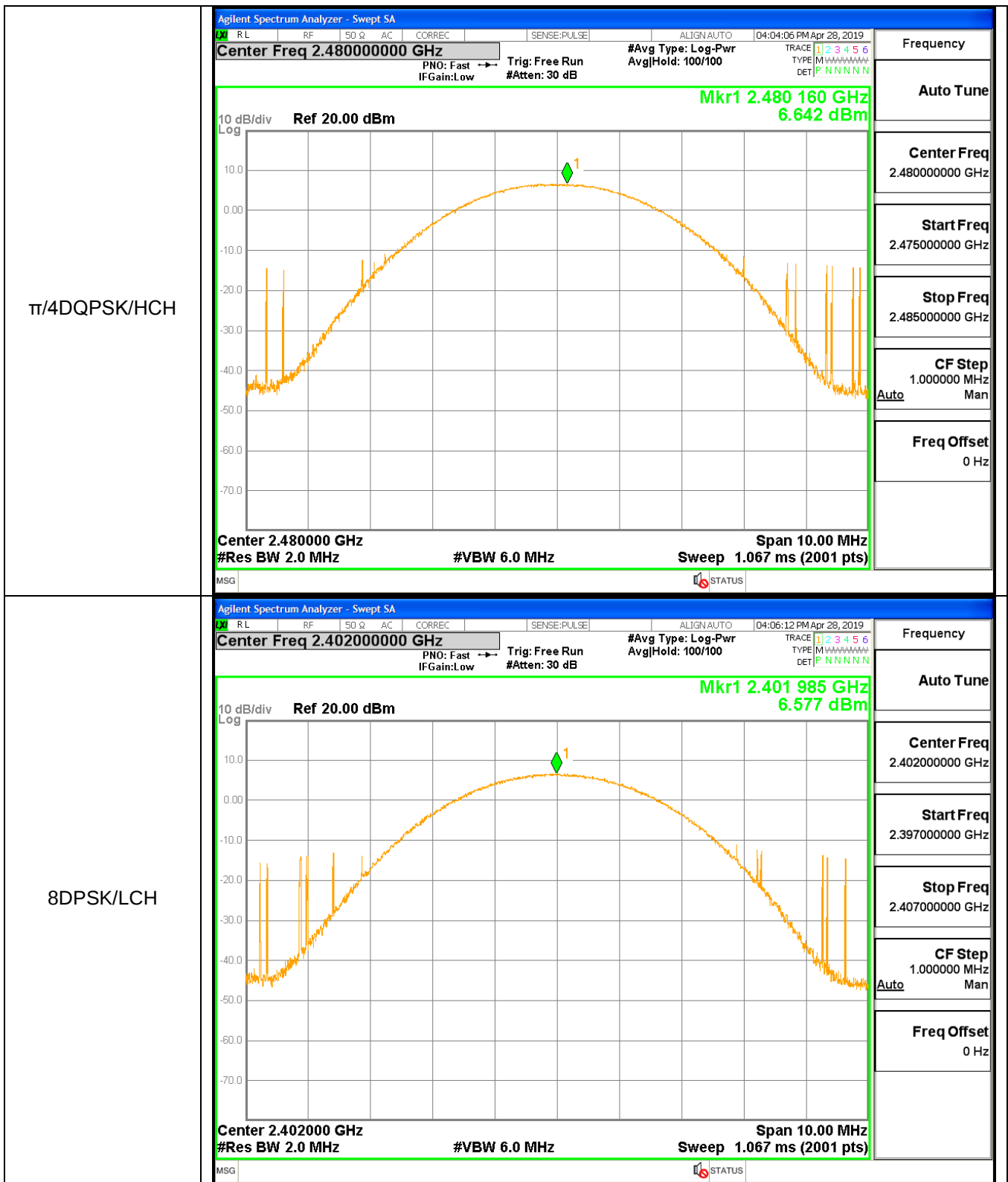
GFSK/MCH

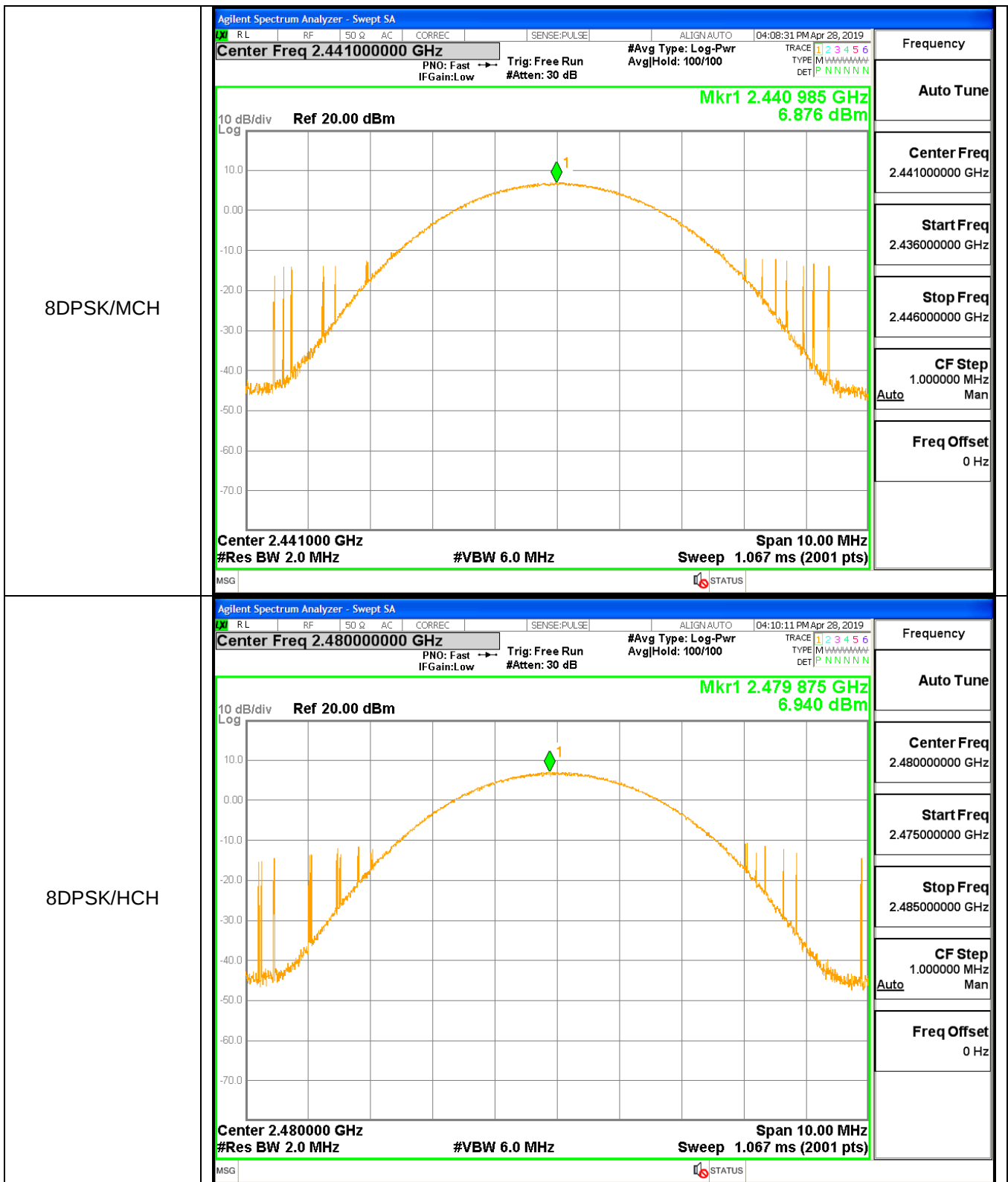


GFSK/HCH







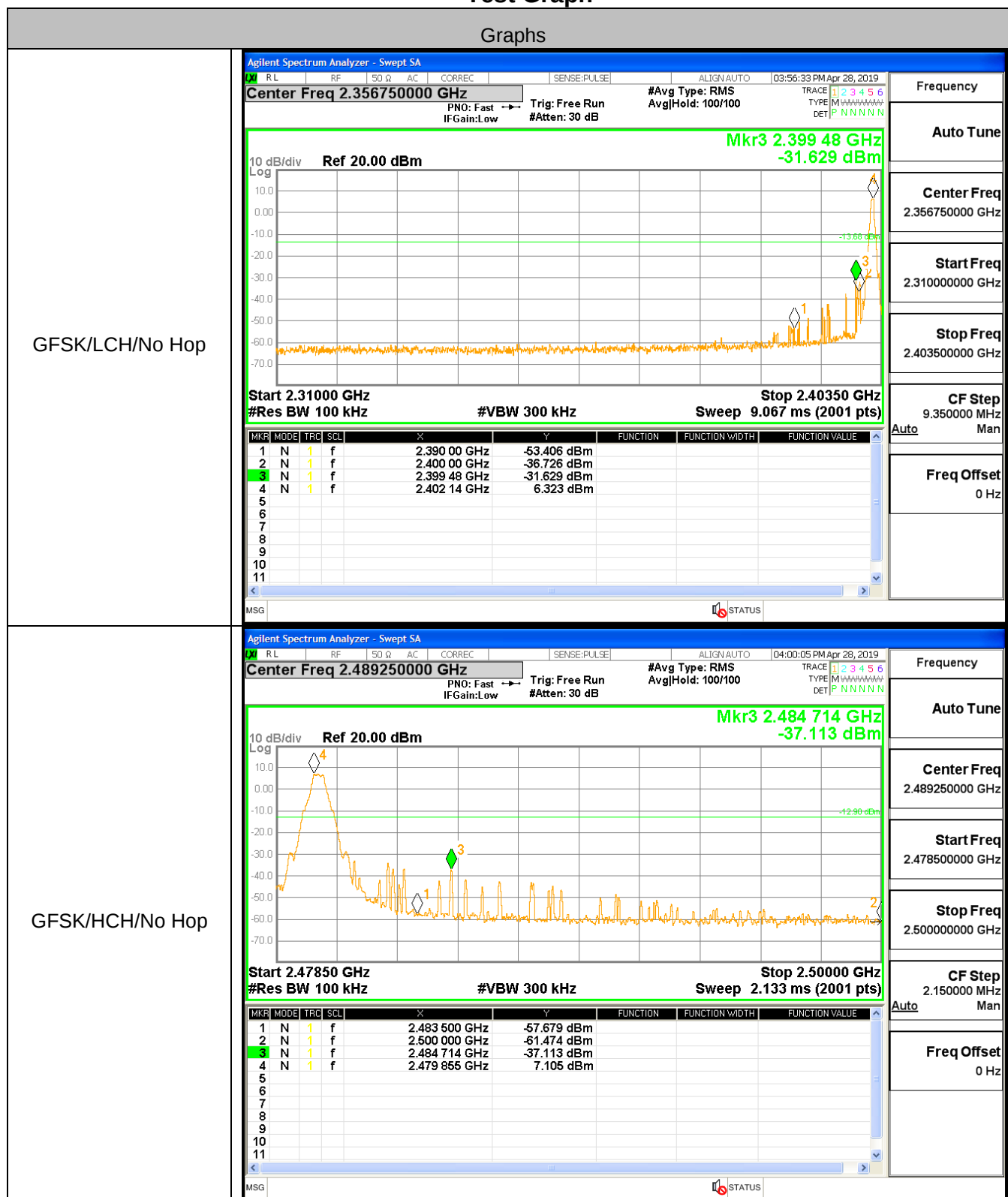


A.6 Band-edge for RF Conducted Emissions

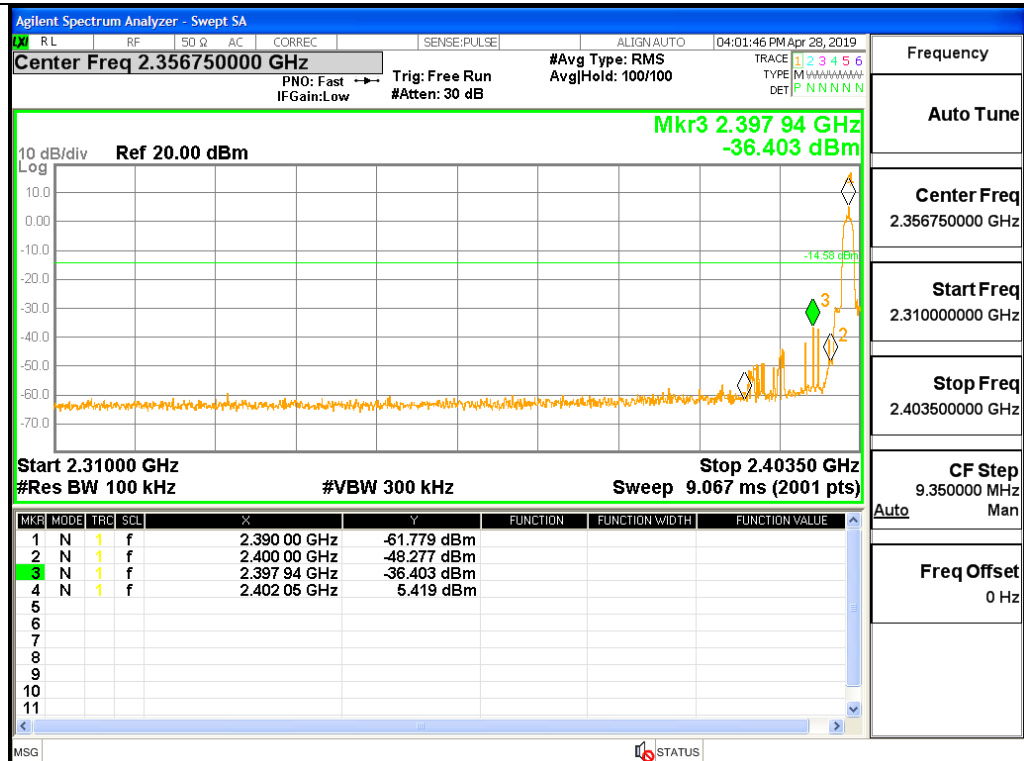
Type	Carrier Frequency(MHz)	Frequency(MHz)	Carrier Frequency Power [dBm]	Bandedge Peak(dBm)	Upper limit(dBm)	Conclusion
1DH5	2402	2399.48	6.323	-31.629	-13.677	Pass
1DH5	2480	2484.714	7.105	-37.113	-12.895	Pass
2DH5	2402	2397.937	5.419	-36.403	-14.581	Pass
2DH5	2480	2483.929	2.733	-36.285	-17.267	Pass
3DH5	2402	2398.685	5.223	-34.329	-14.777	Pass
3DH5	2480	2483.95	5.405	-36.18	-14.595	Pass
1DH5-Hopping	2402	2399.7	6.921	-34.737	-13.079	Pass
1DH5-Hopping	2480	2485.15	6.937	-46.656	-13.063	Pass
2DH5-Hopping	2402	2399.37	5.493	-38.049	-14.507	Pass
2DH5-Hopping	2480	2483.68	5.613	-38.416	-14.387	Pass
3DH5-Hopping	2402	2399.55	5.524	-38.444	-14.476	Pass
3DH5-Hopping	2480	2487.82	4.947	-44.196	-15.053	Pass

Test Graph

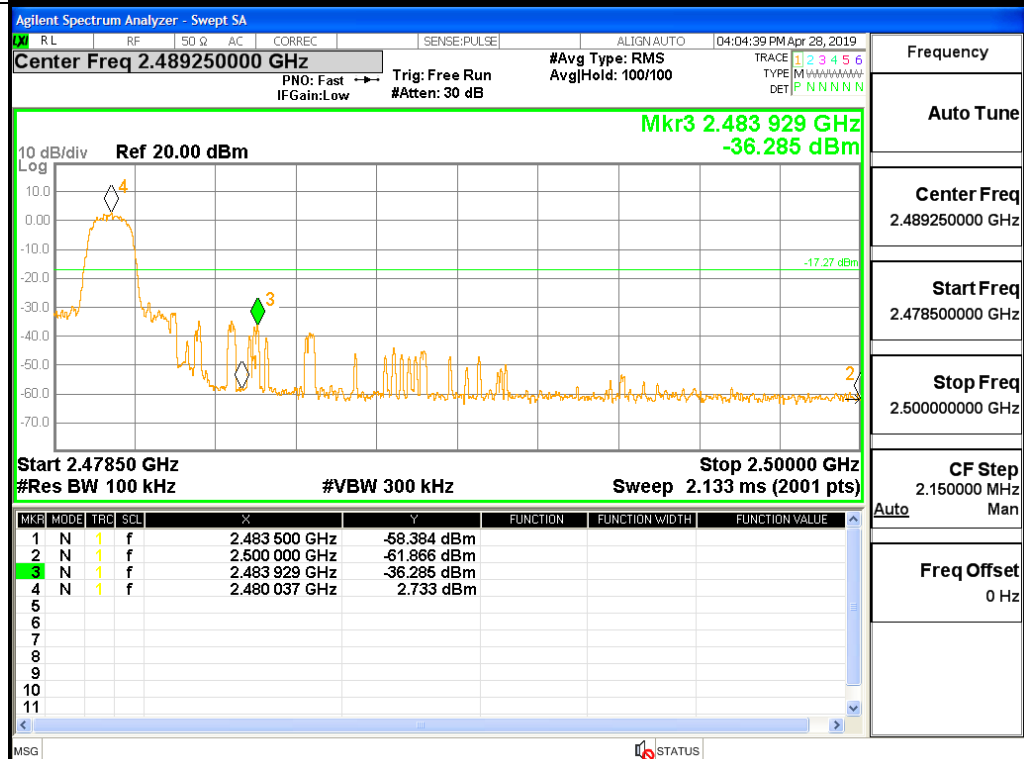
Graphs



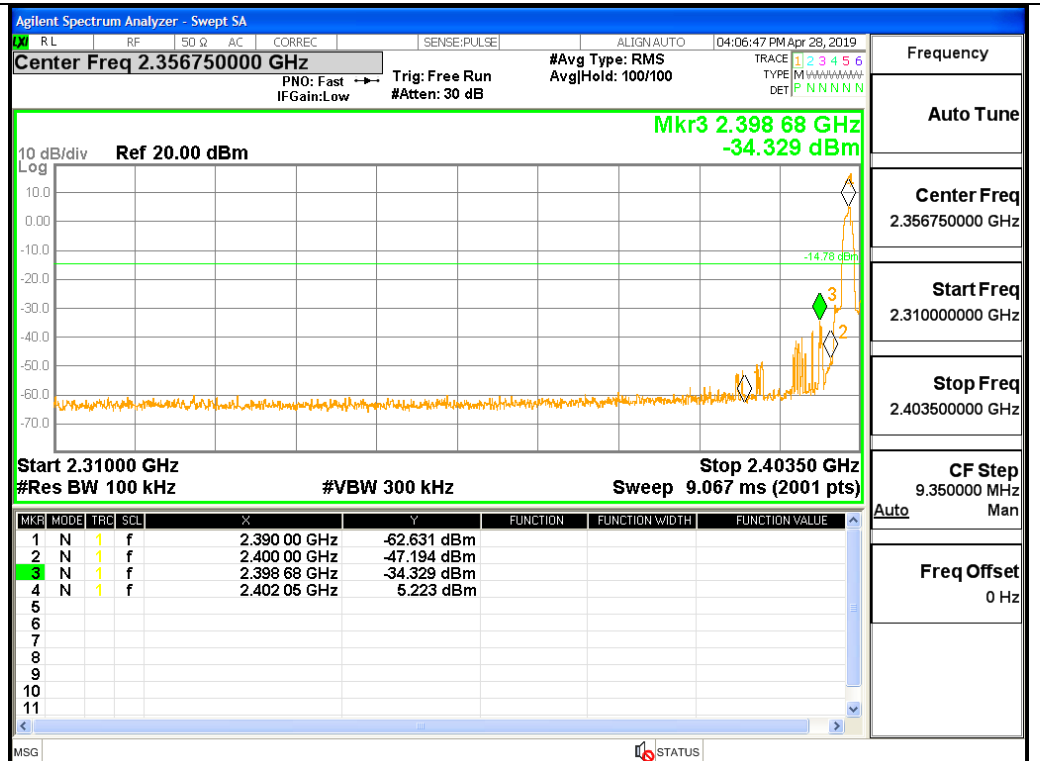
π /4DQPSK/LCH/No
Hop



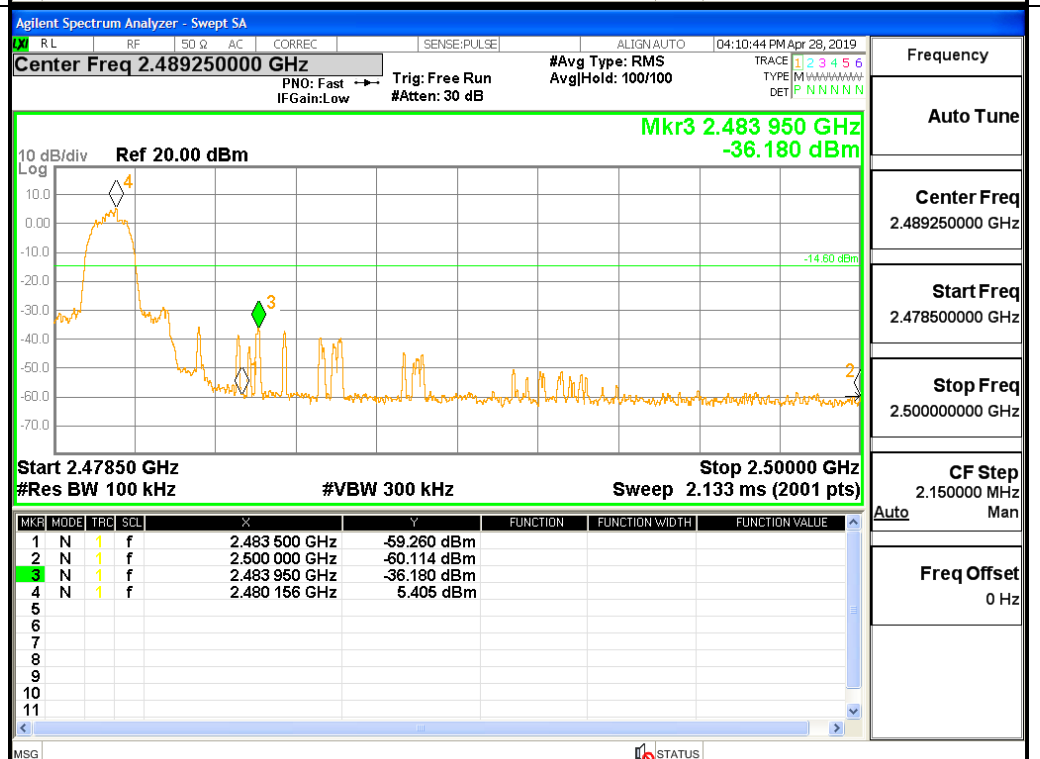
π /4DQPSK/HCH/No
Hop



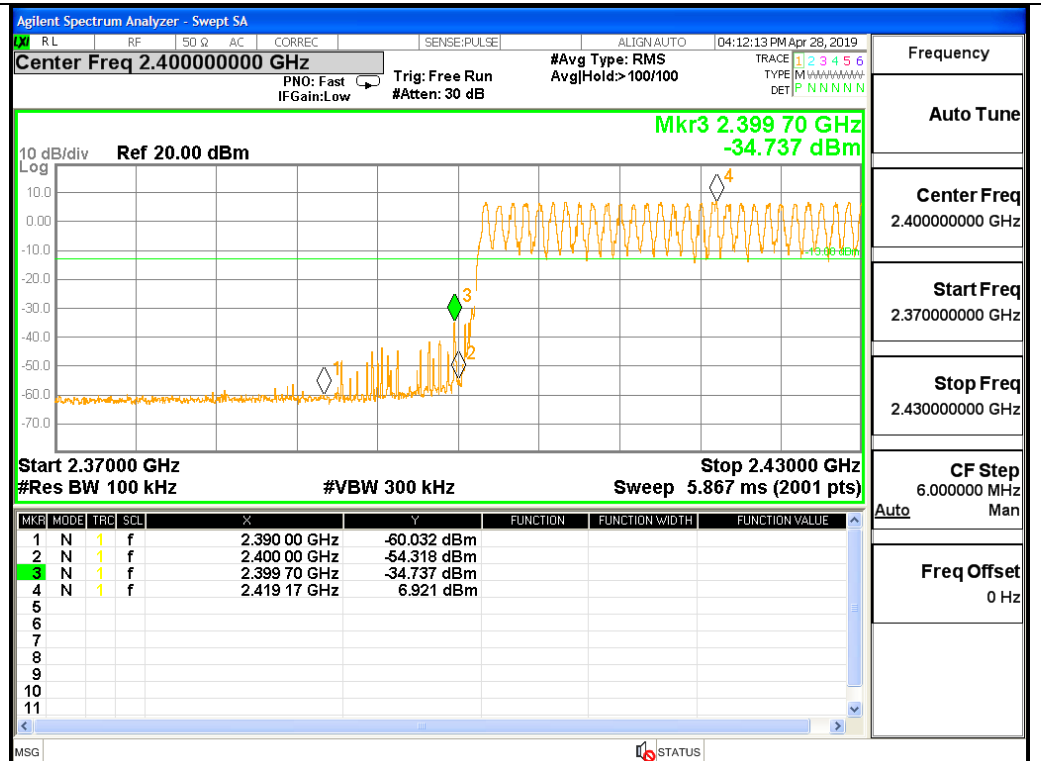
8DPSK/LCH/No Hop



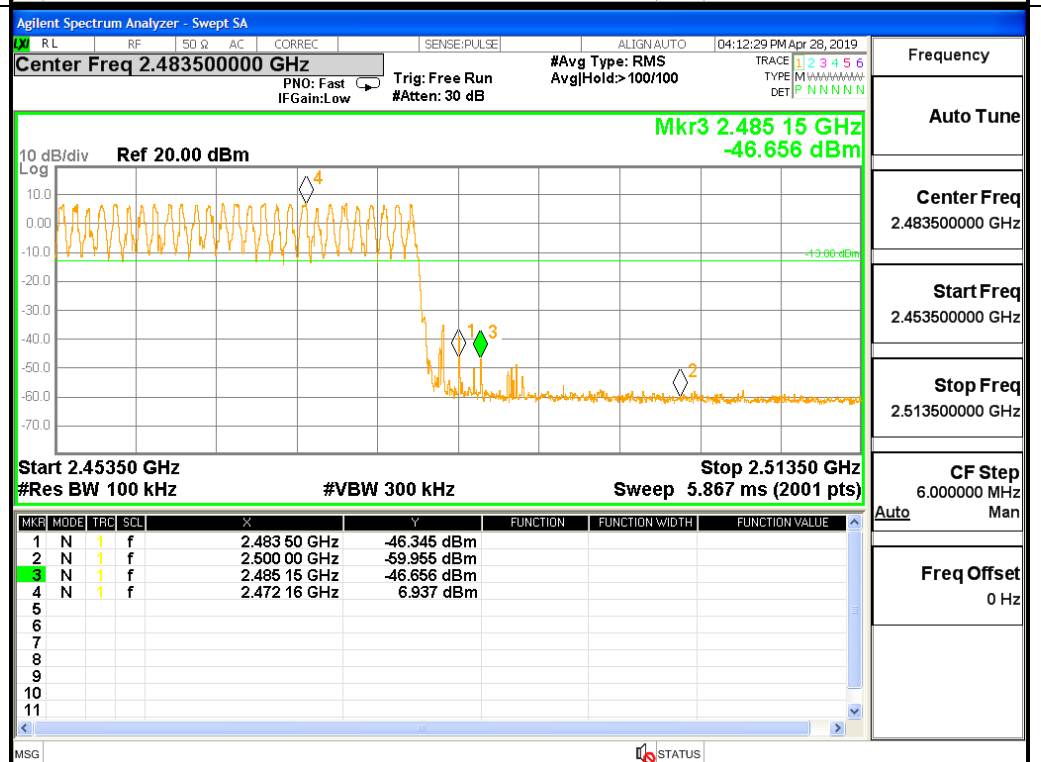
8DPSK/HCH/No Hop



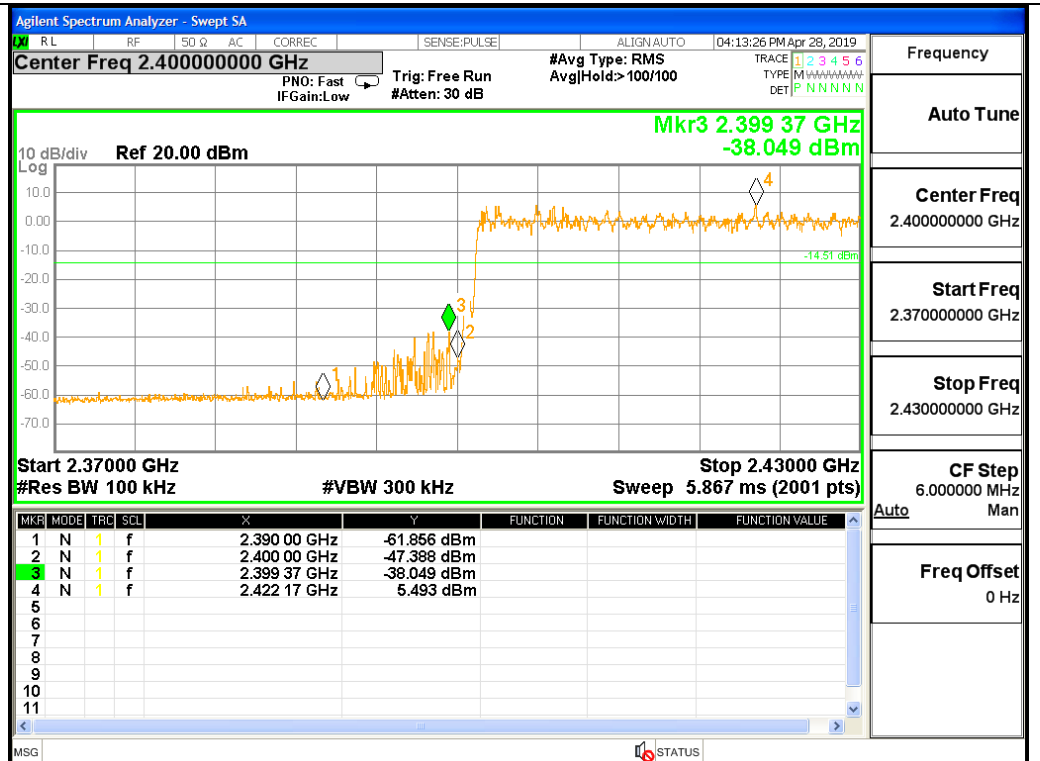
GFSK/LCH/Hop



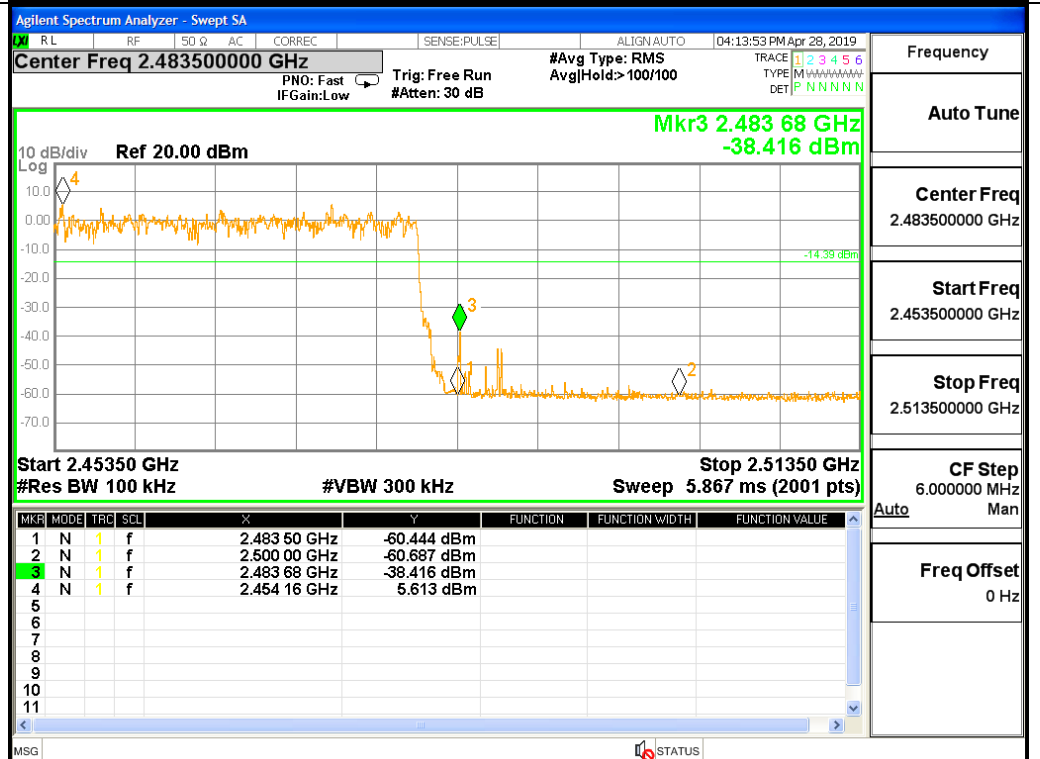
GFSK/HCH/Hop



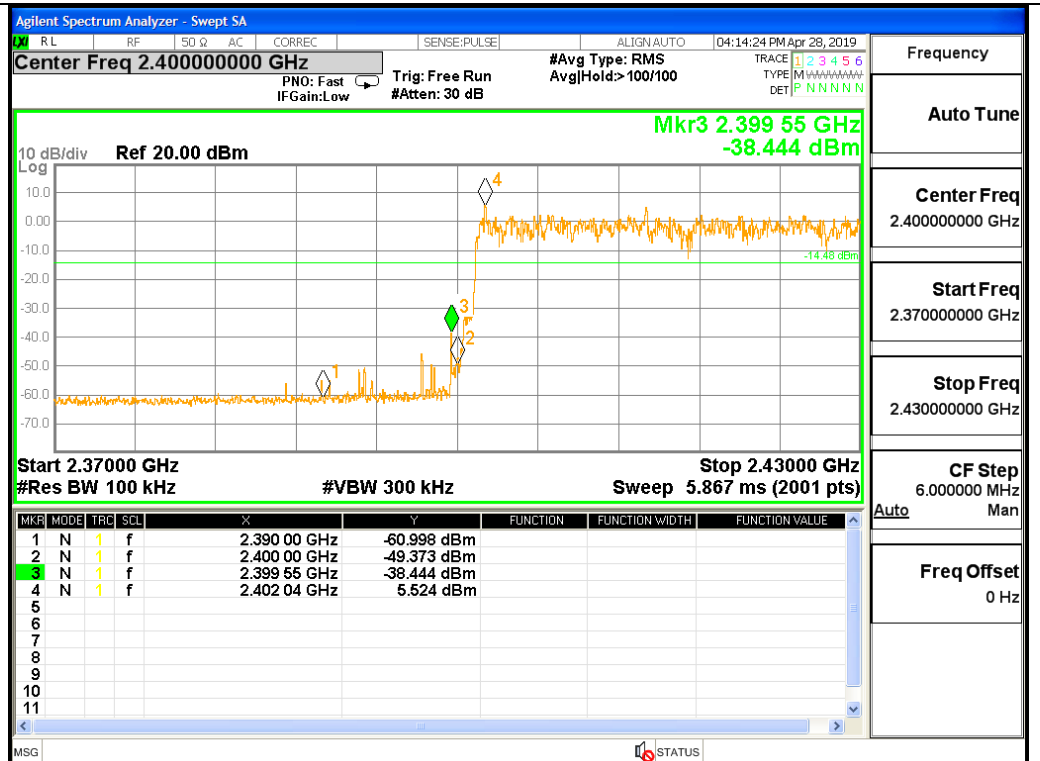
π /4DQPSK/LCH/Hop



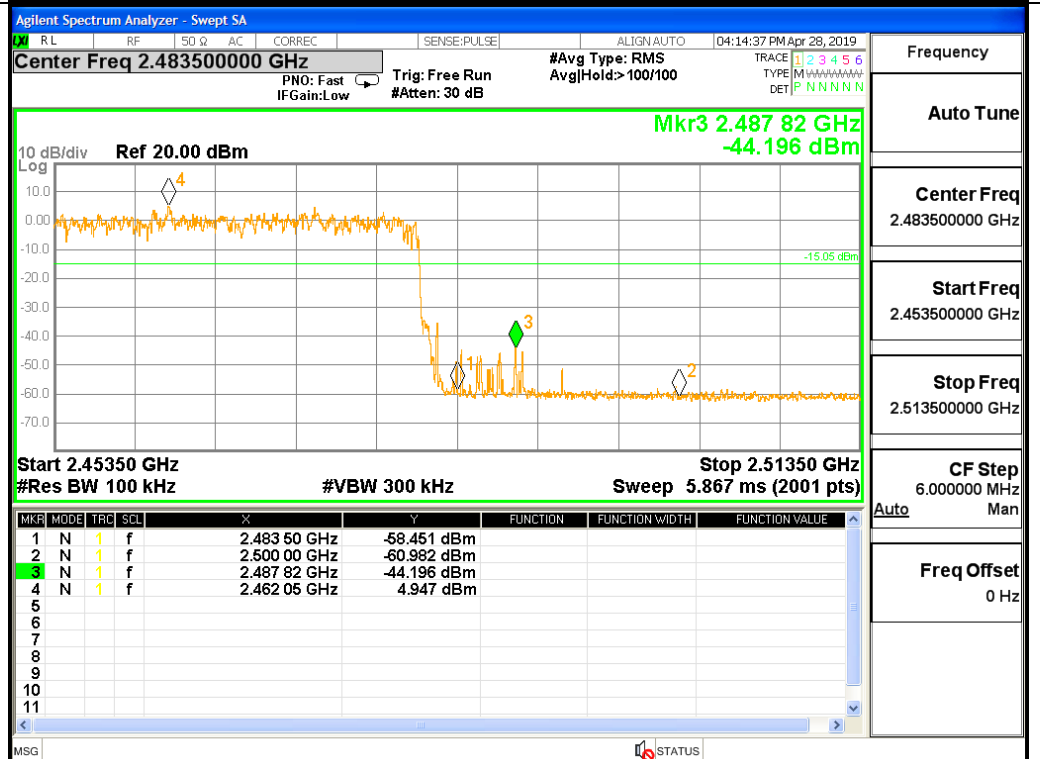
π /4DQPSK/HCH/Hop



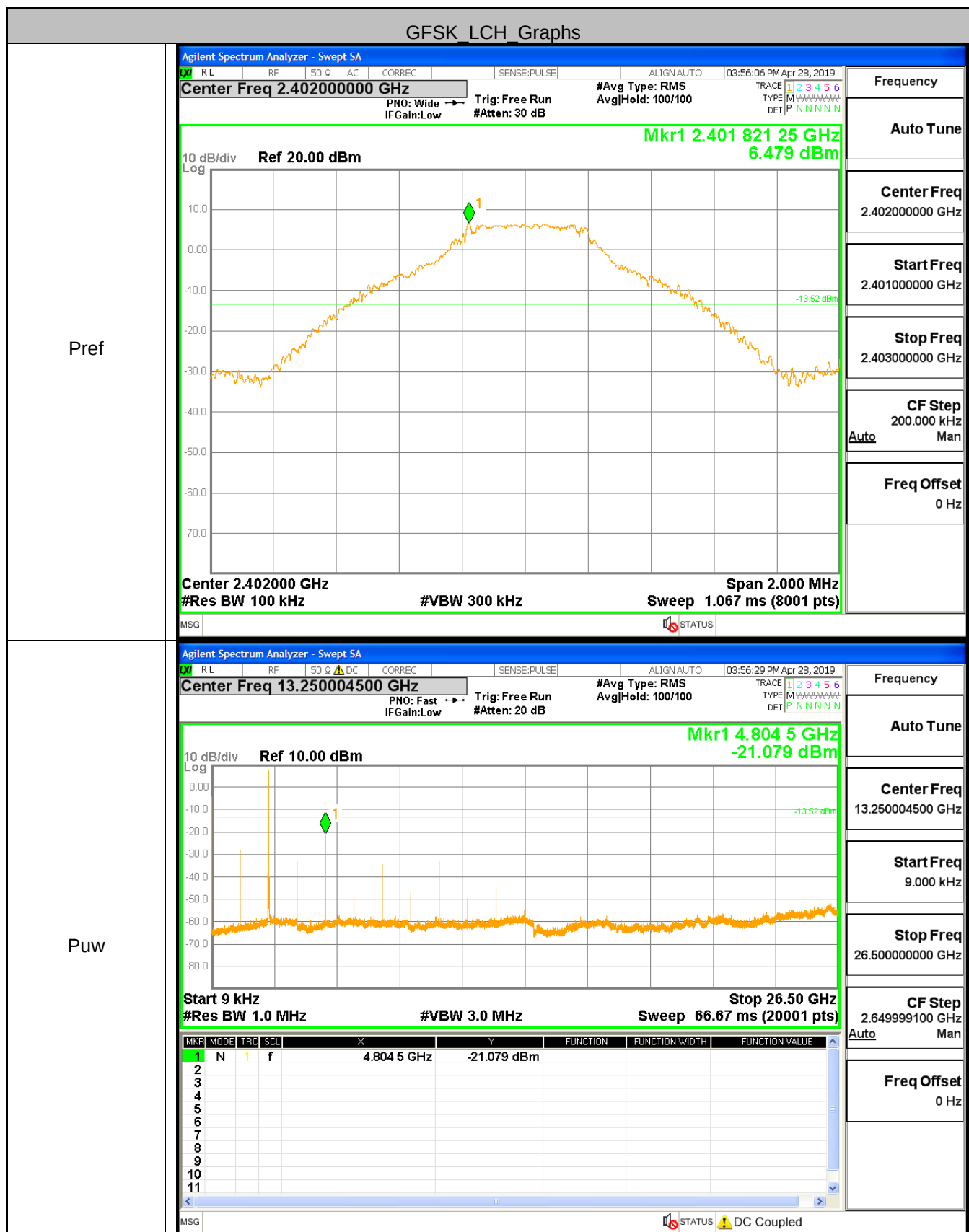
8DPSK/LCH/Hop



8DPSK/HCH/Hop

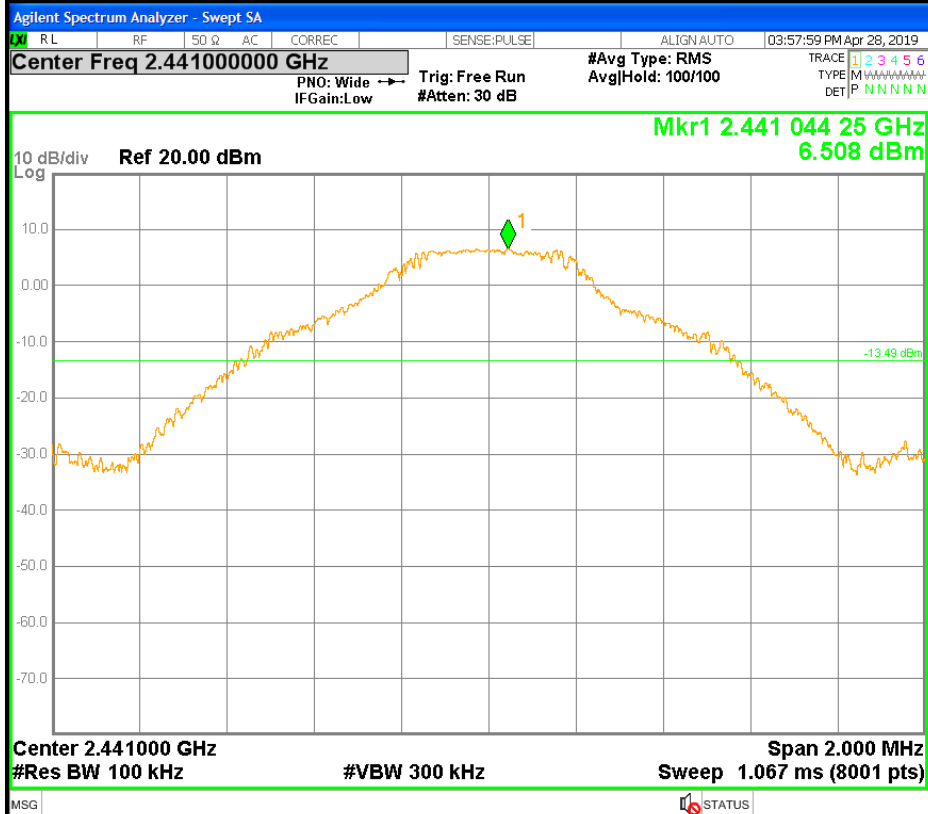


A.7 RF Conducted Spurious Emissions Test Graph

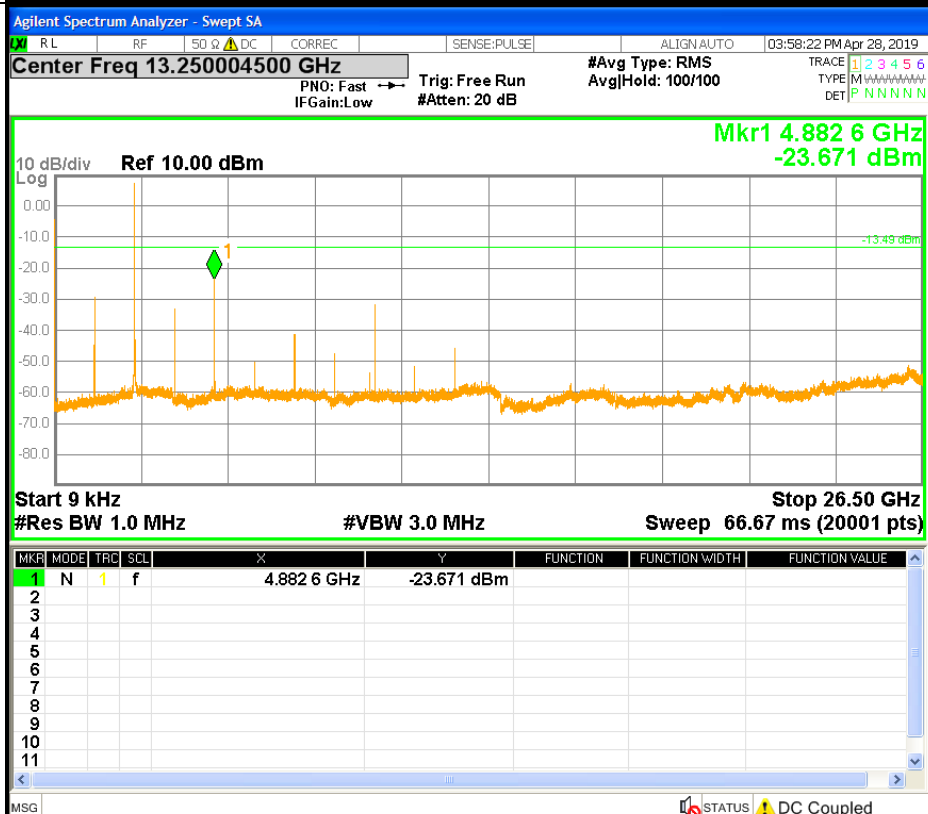


GFSK MCH Graphs

Pref

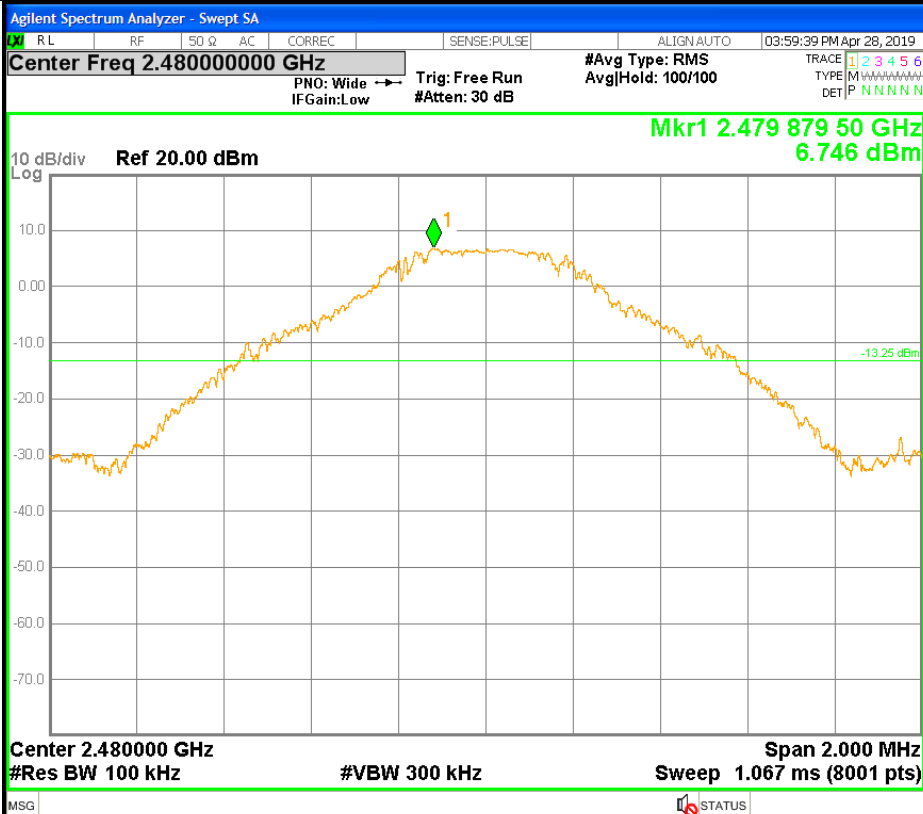


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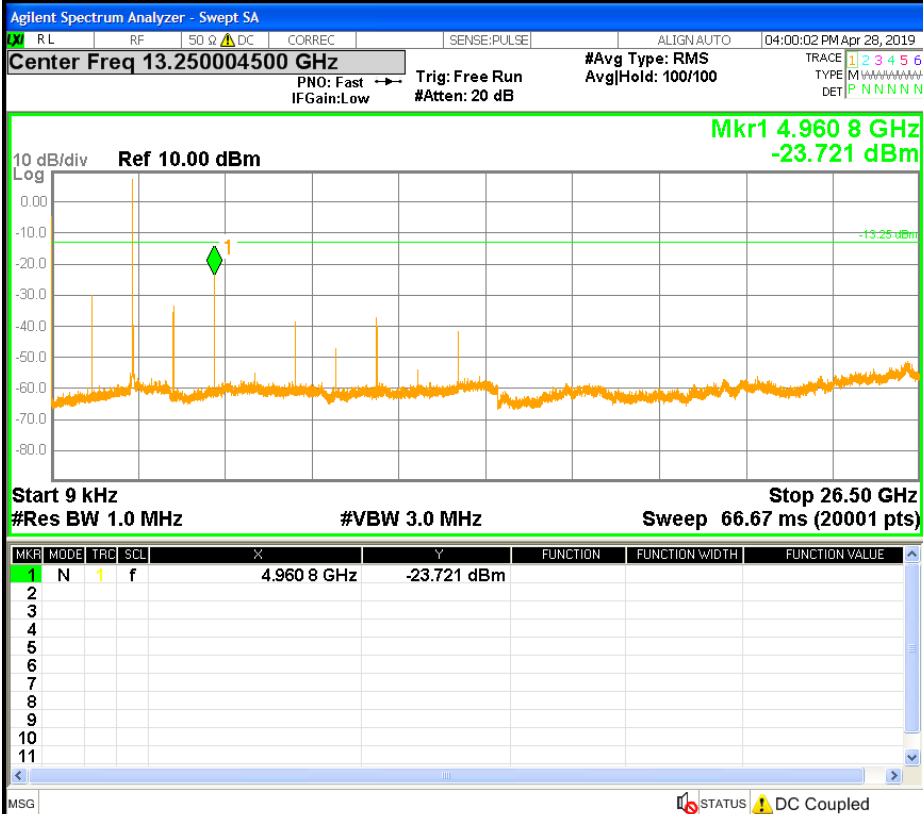


GFSK HCH Graphs

Pref

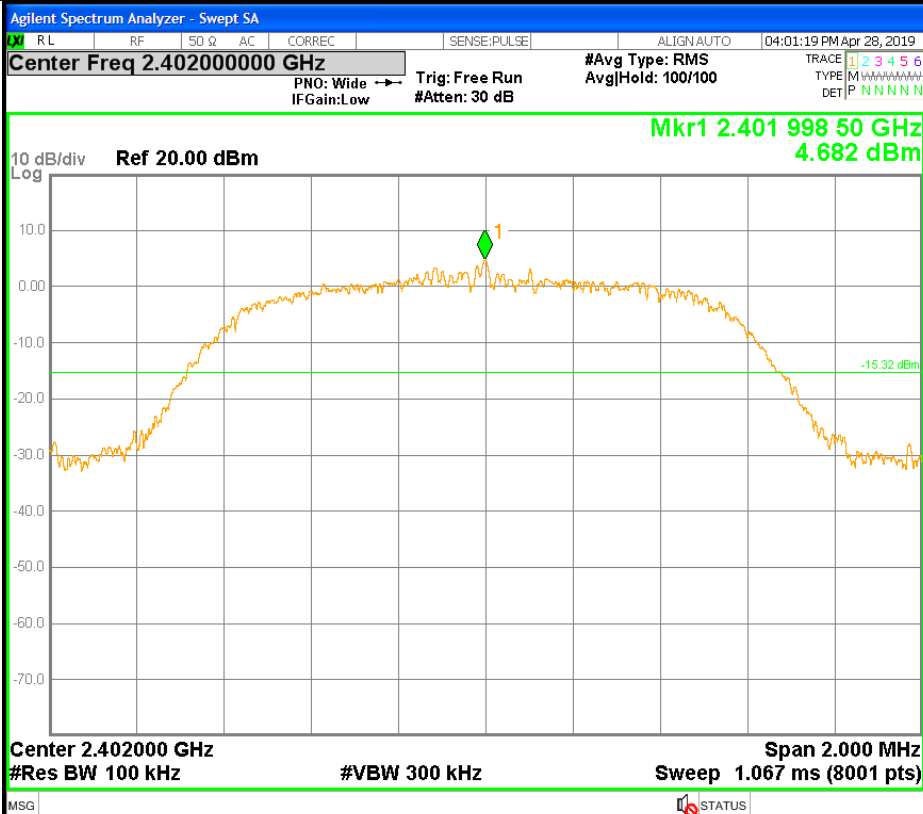


Puw

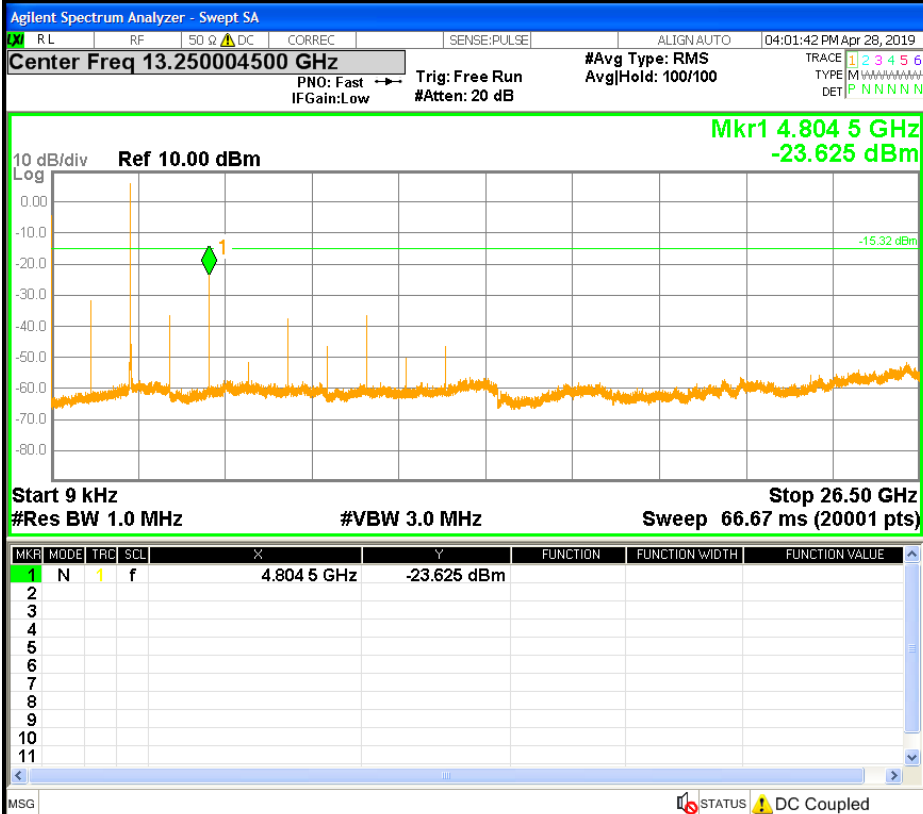


$\pi/4$ DQPSK LCH Graphs

Pref

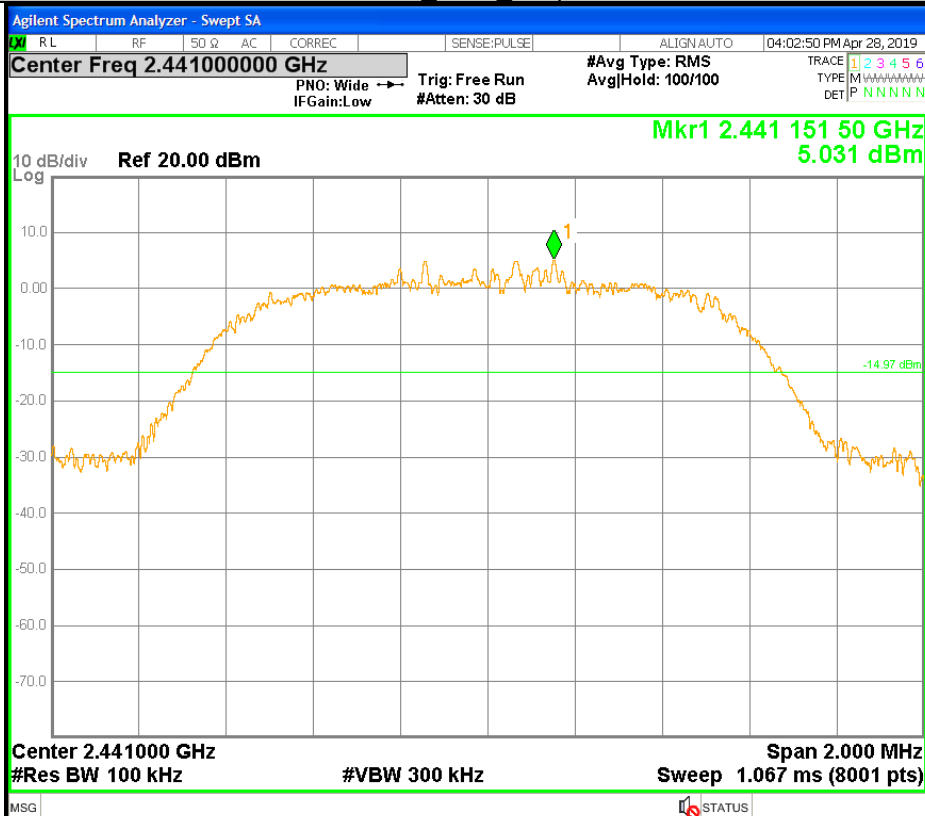


Puw

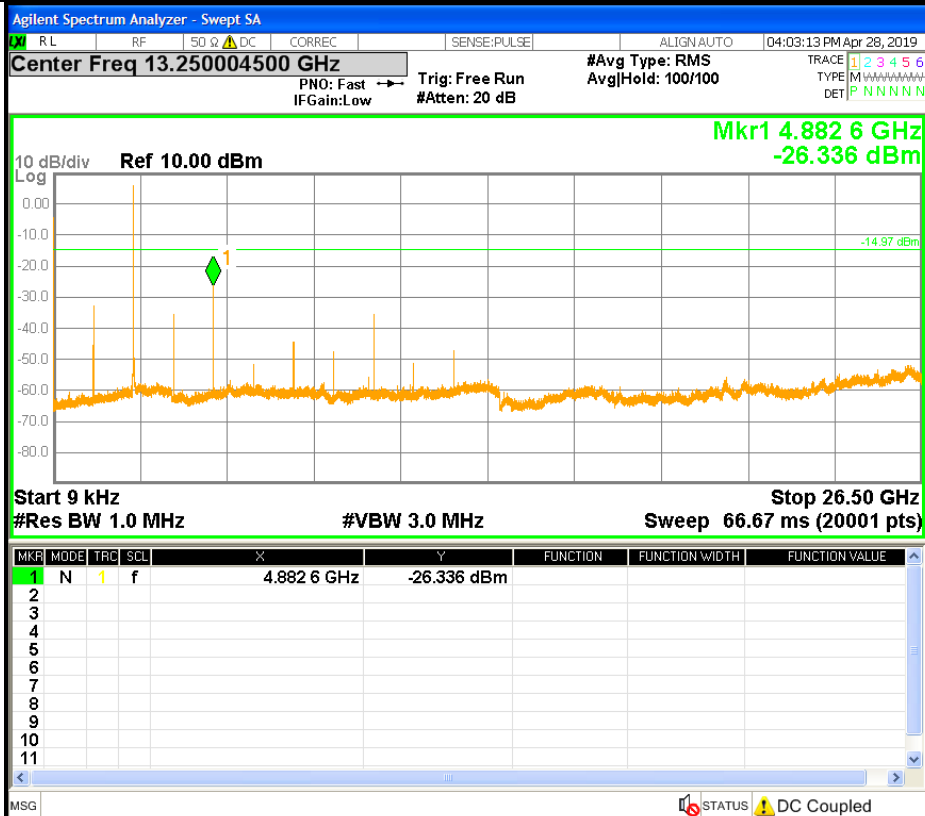


$\pi/4$ DQPSK MCH Graphs

Pref

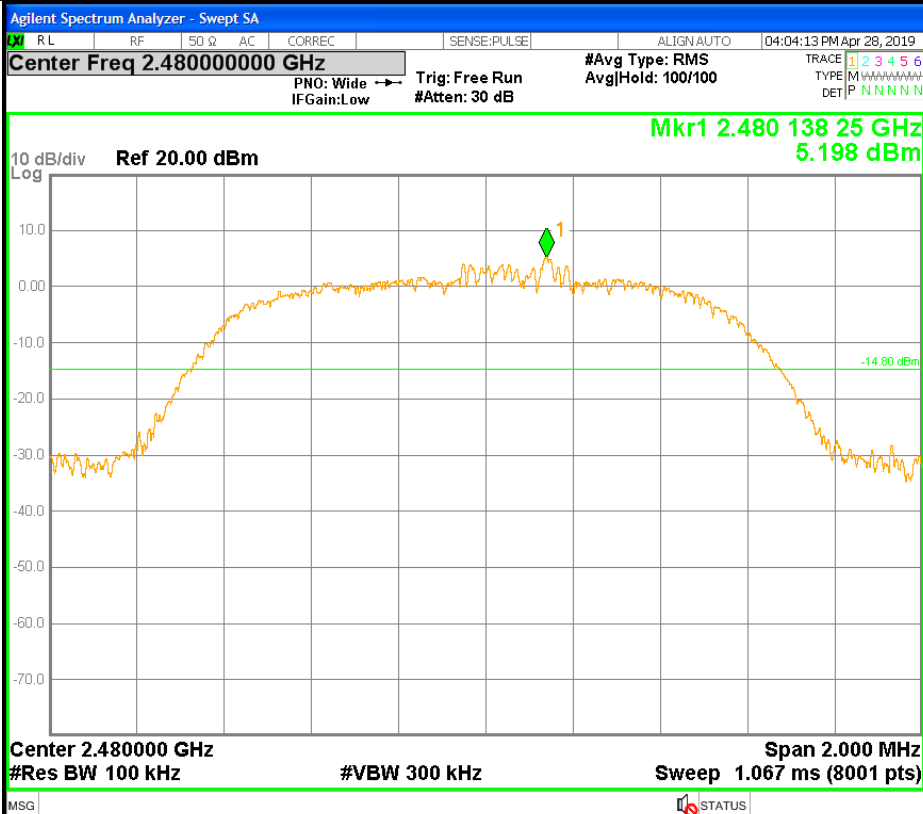


Puw



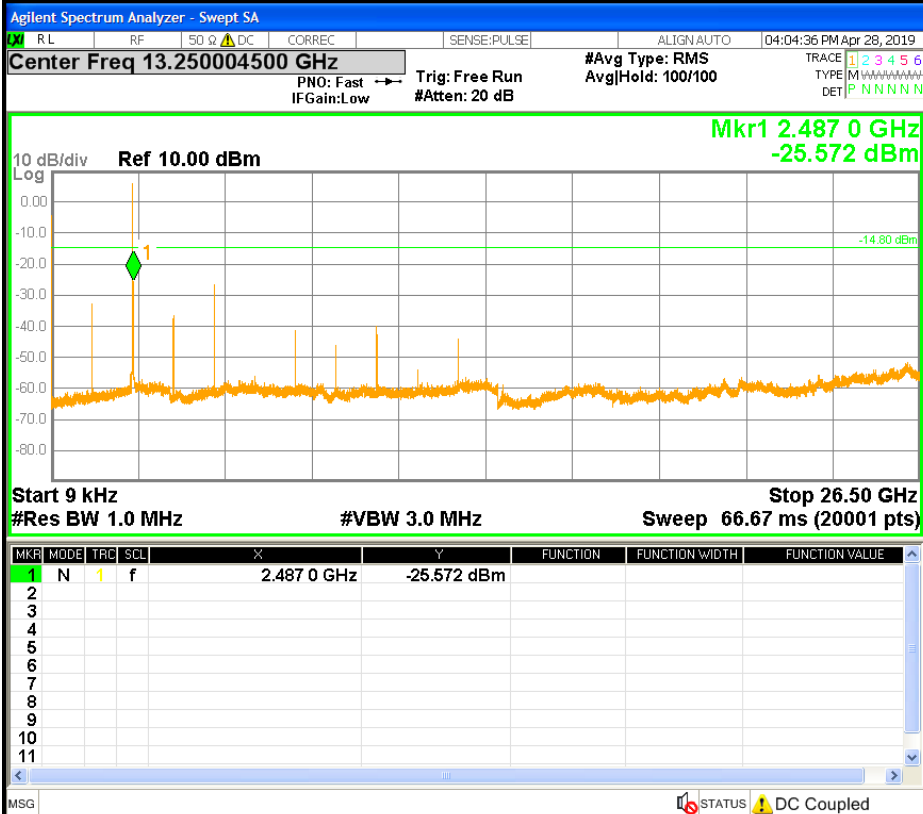
$\pi/4$ DQPSK HCH Graphs

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

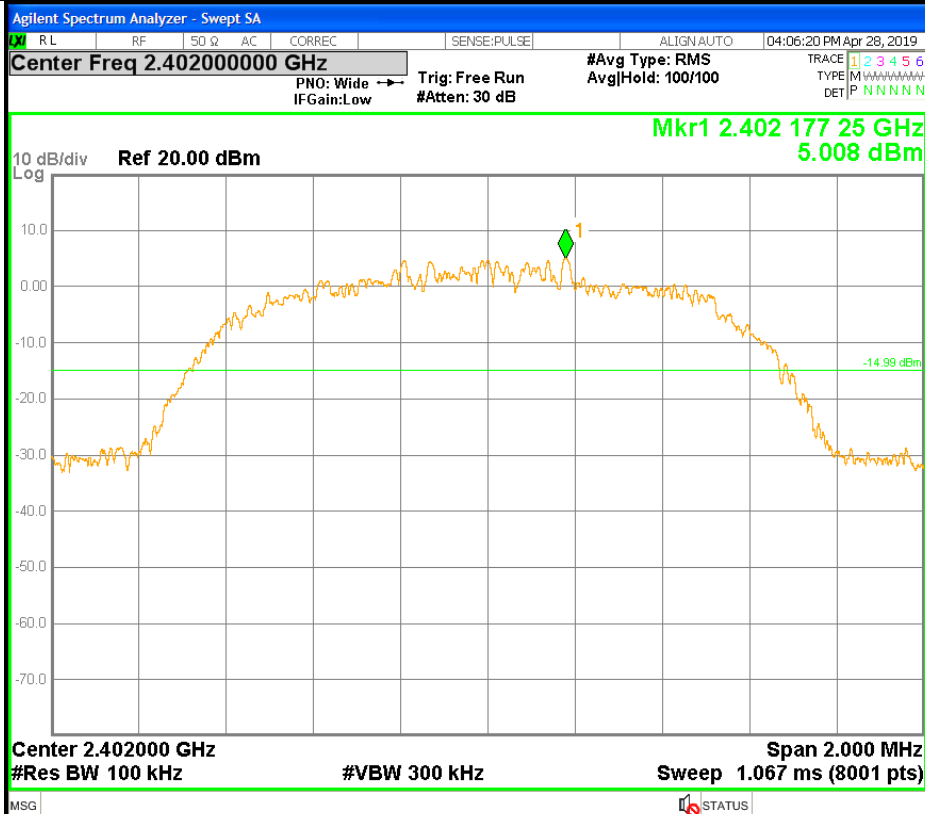
Puw



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

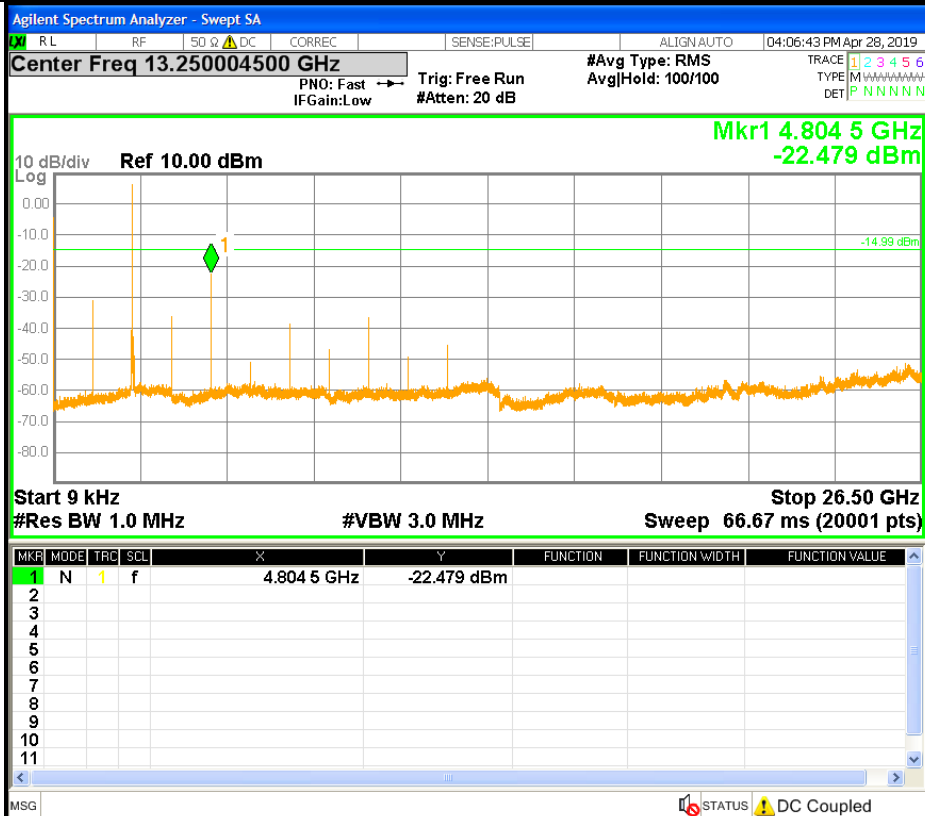
8DPSK LCH Graphs

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 Man
Freq Offset 0 Hz

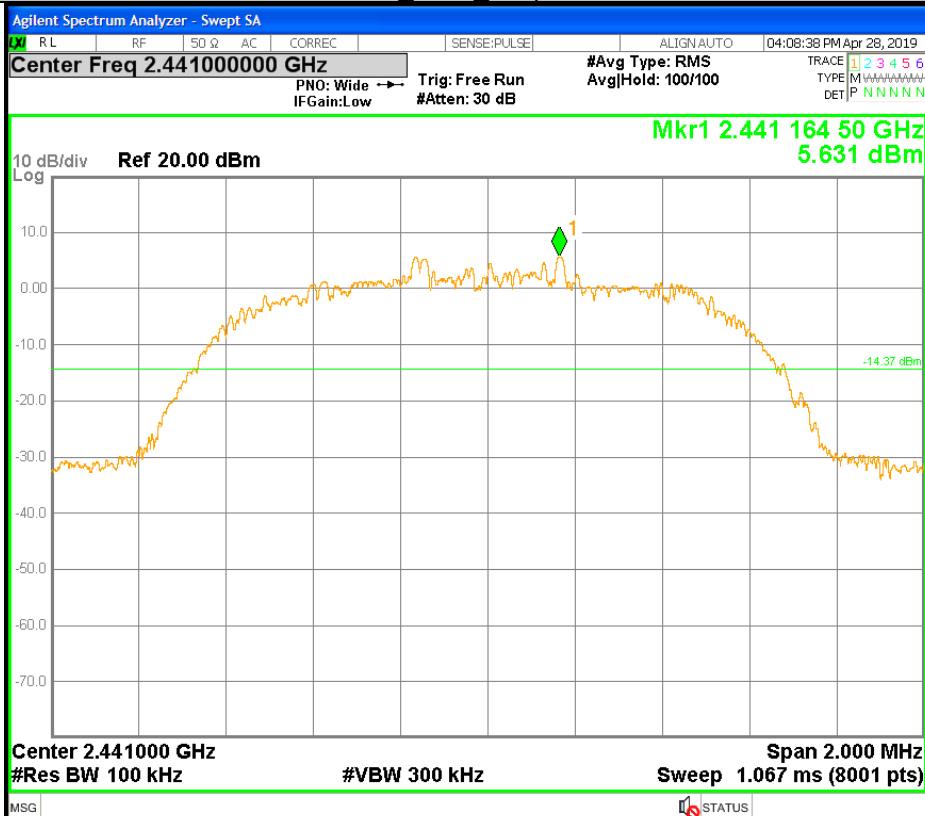
Puw



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

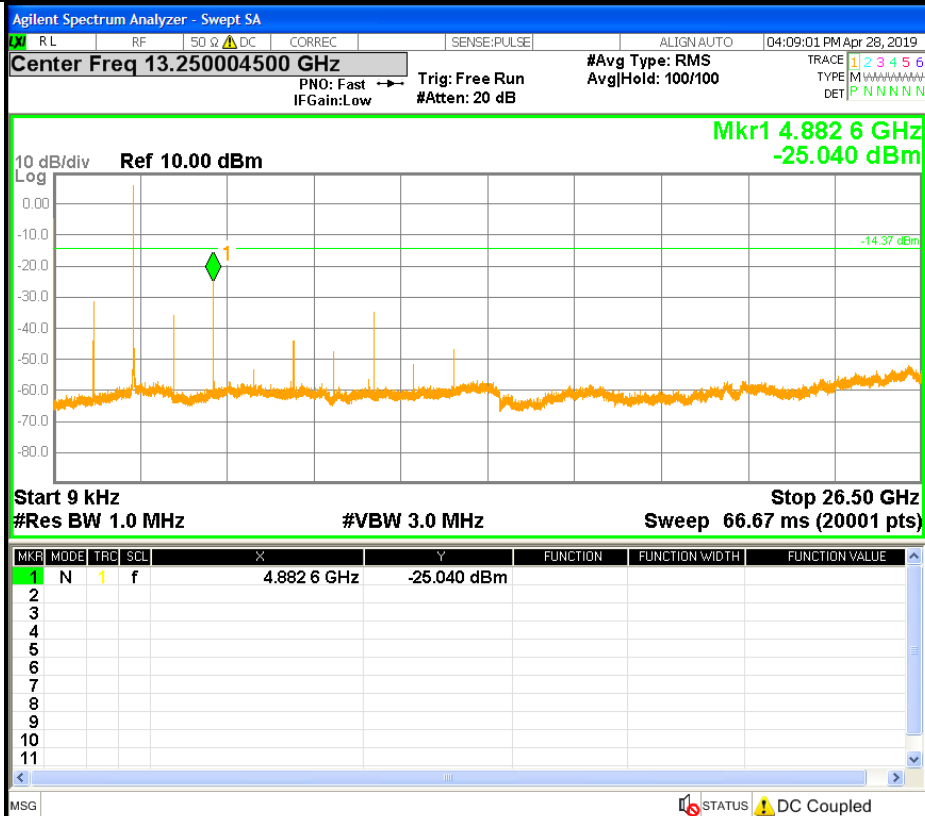
8DPSK MCH Graphs

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 Man
Freq Offset 0 Hz

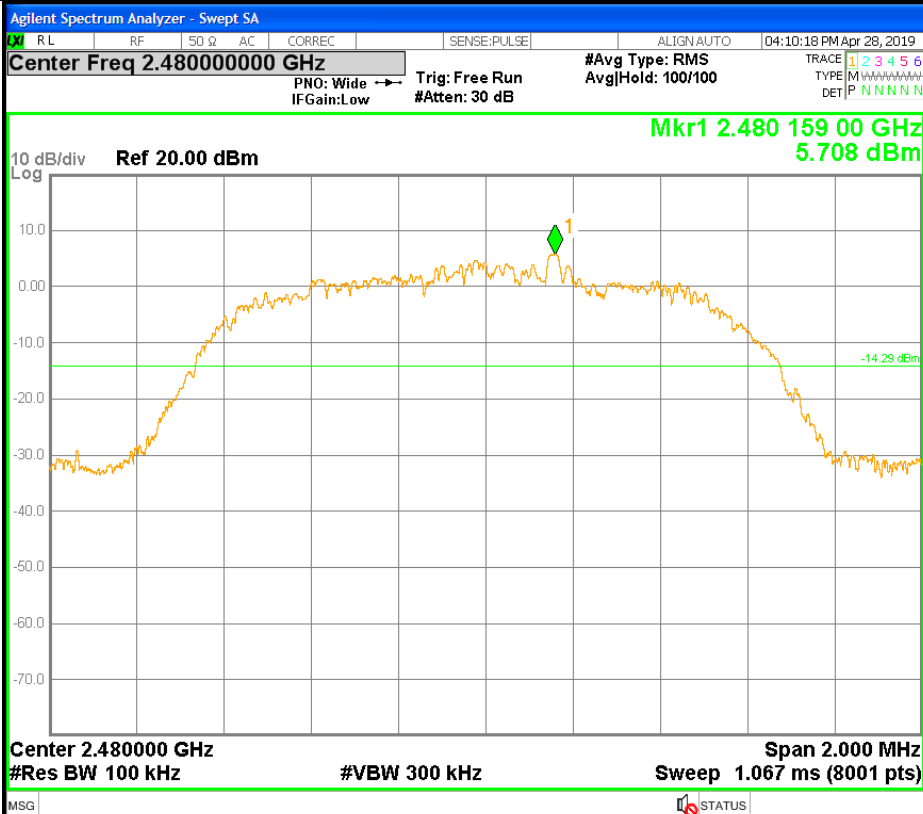
Puw



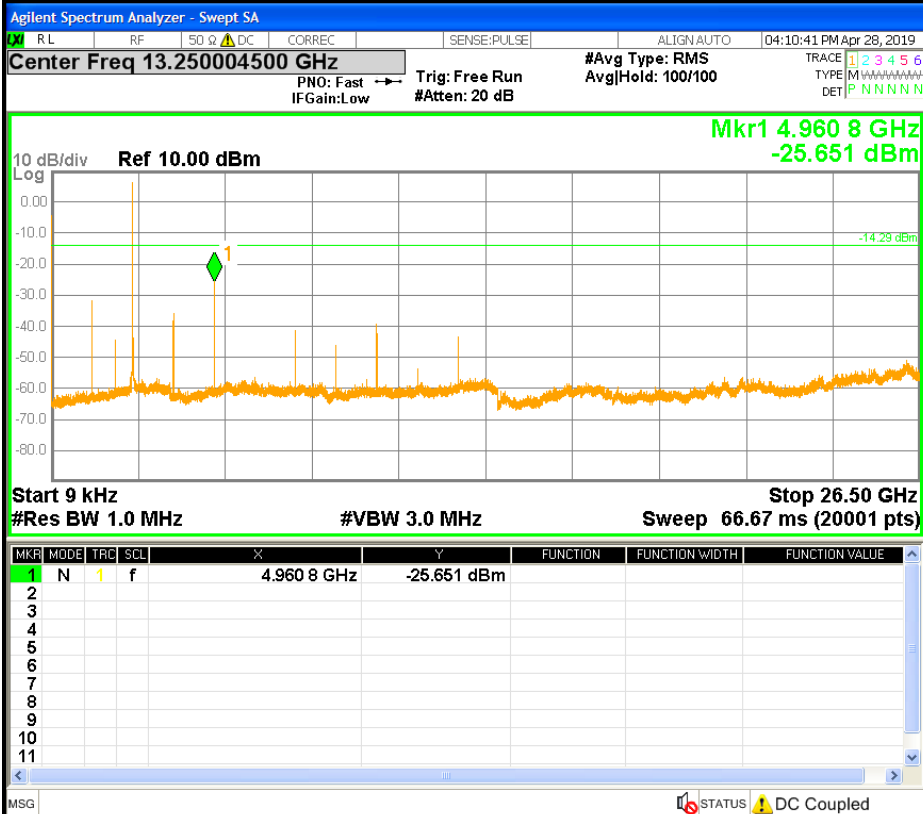
Frequency
Auto Tune
Center Freq 13.250004500 GHz
Start Freq 9.000 kHz
Stop Freq 26.500000000 GHz
CF Step 2.649999100 GHz Auto Man
Freq Offset 0 Hz

8DPSK HCH Graphs

Pref



Puw



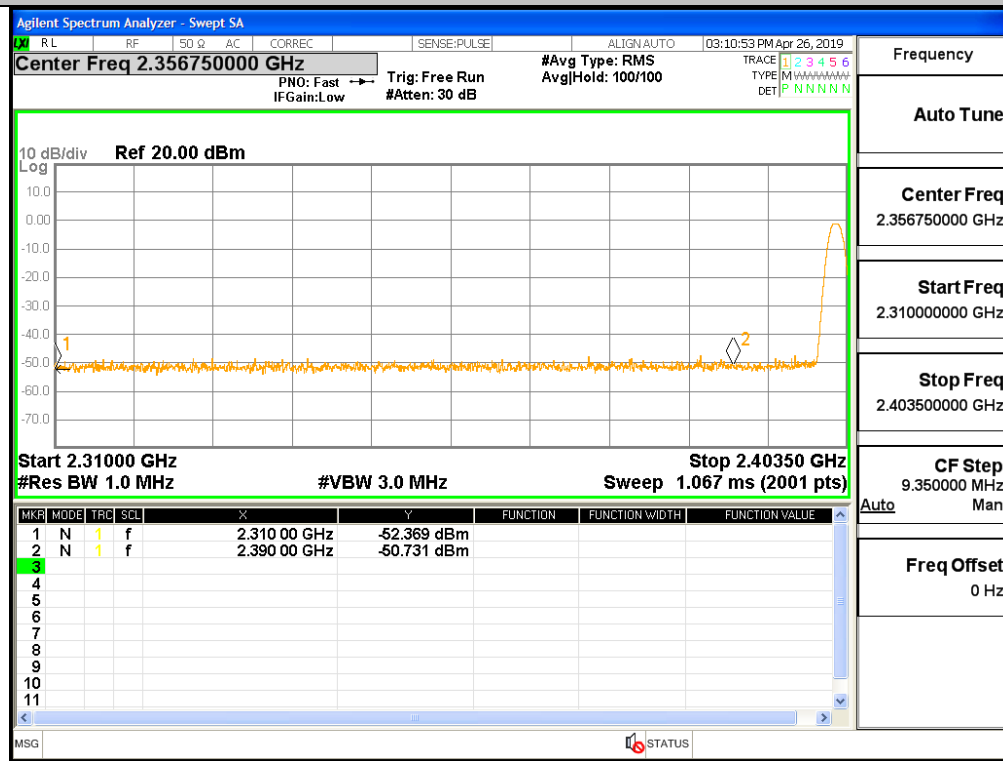
A.8 Restrict-band band-edge measurements

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	-50.73	46.47	74	Pass
1DH5	2480	2493.58	2.00	0.00	-46.87	50.33	74	Pass
2DH5	2402	2353.62	2.00	0.00	-46.54	50.66	74	Pass
2DH5	2480	2483.50	2.00	0.00	-49.66	47.54	74	Pass
3DH5	2402	2390.00	2.00	0.00	-50.80	46.40	74	Pass
3DH5	2480	2500.00	2.00	0.00	-51.20	46.00	74	Pass

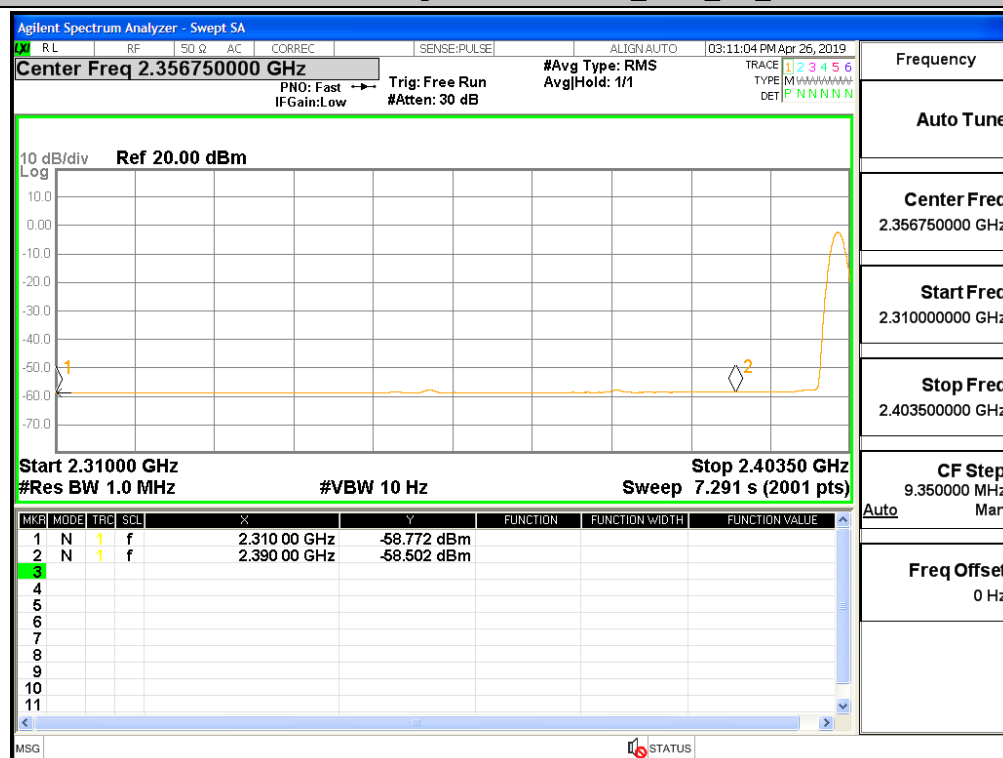
Type	Carrier Frequency (MHz)	Frequency(M Hz)	Gain	Ground Factor	Average Value(dBm)	E [dBuV/m]	Limit [dBuV/m]	Conclusion
1DH5	2402	2390.00	2.00	0.00	-58.51	38.70	54	Pass
1DH5	2480	2483.50	2.00	0.00	-57.16	40.04	54	Pass
2DH5	2402	2390.00	2.00	0.00	-58.79	38.41	54	Pass
2DH5	2480	2483.50	2.00	0.00	-56.76	40.45	54	Pass
3DH5	2402	2390.00	2.00	0.00	-58.50	38.70	54	Pass
3DH5	2480	2483.50	2.00	0.00	-56.76	40.44	54	Pass

Test Graph

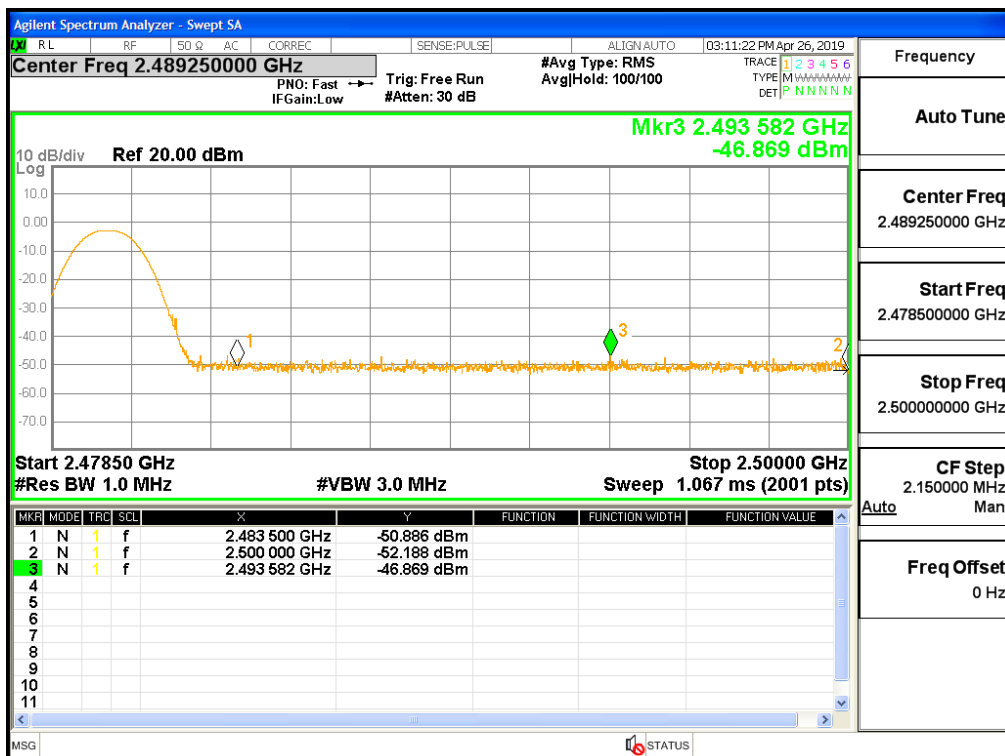
Restrict-band band-edge measurements_2402_PEAK_DH5



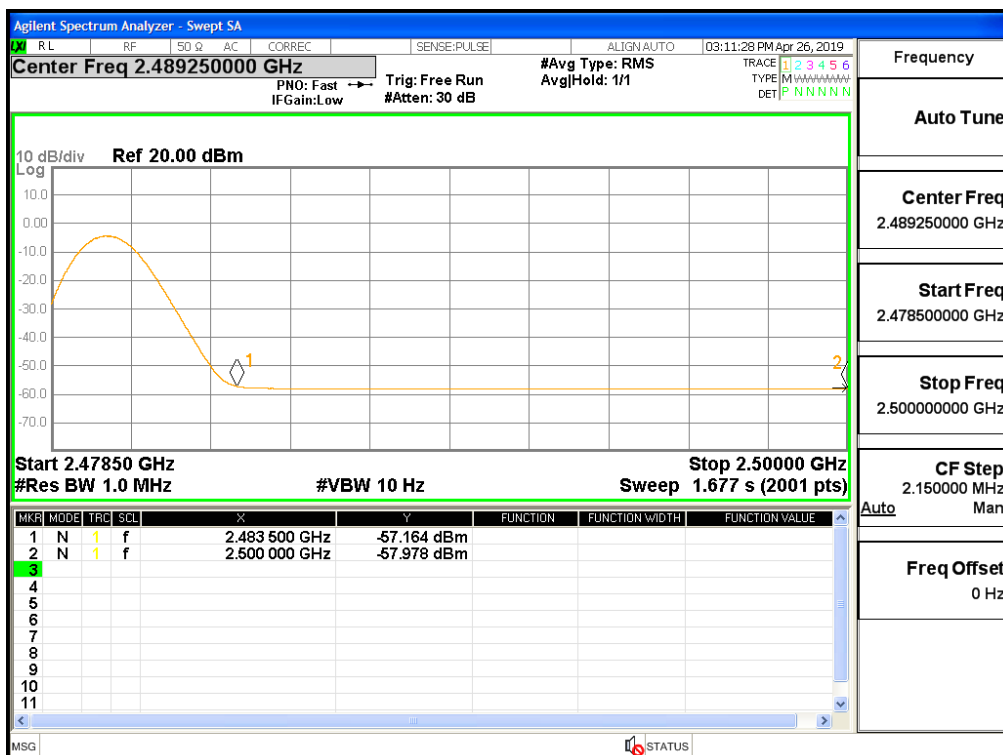
Restrict-band band-edge measurements_2402_AV_DH5



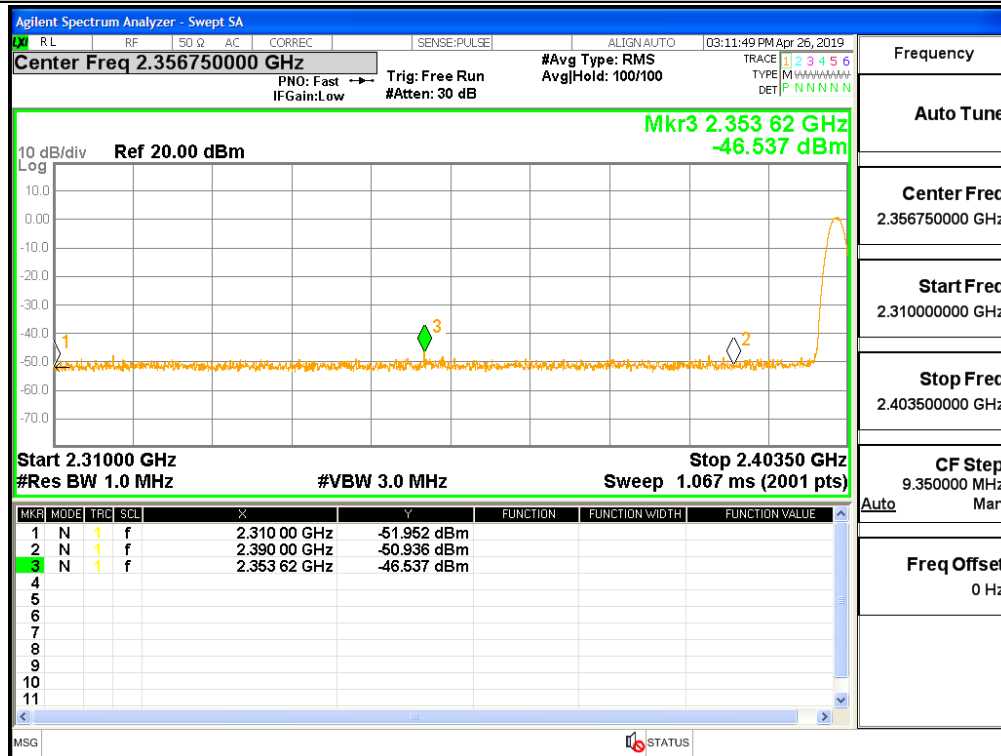
Restrict-band band-edge measurements_2480_PEAK_DH5



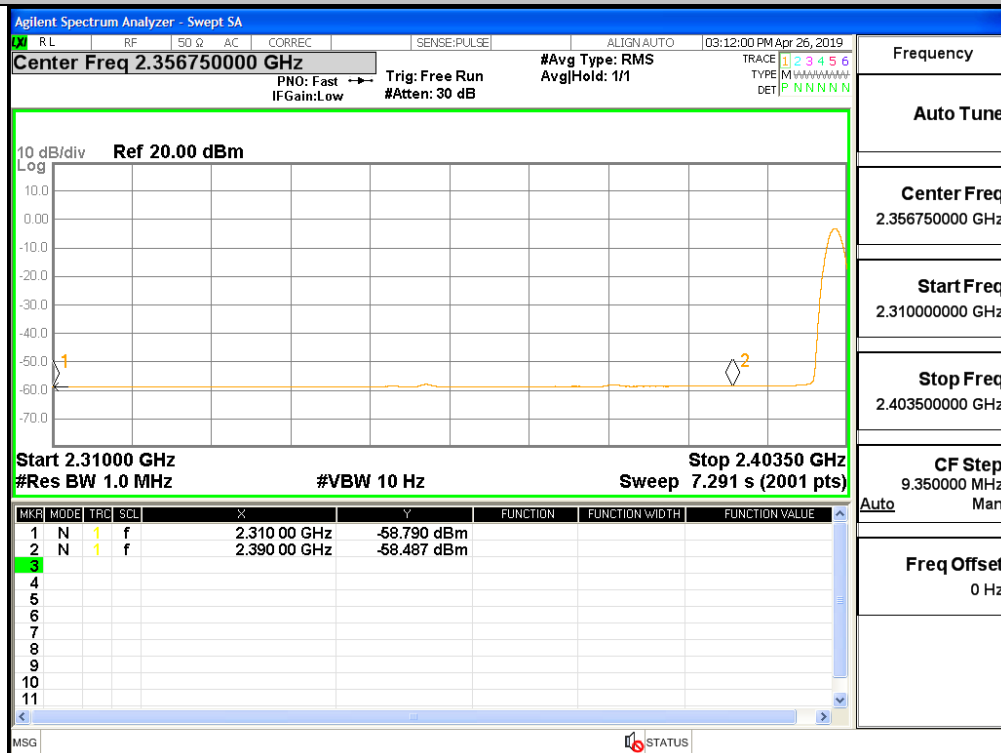
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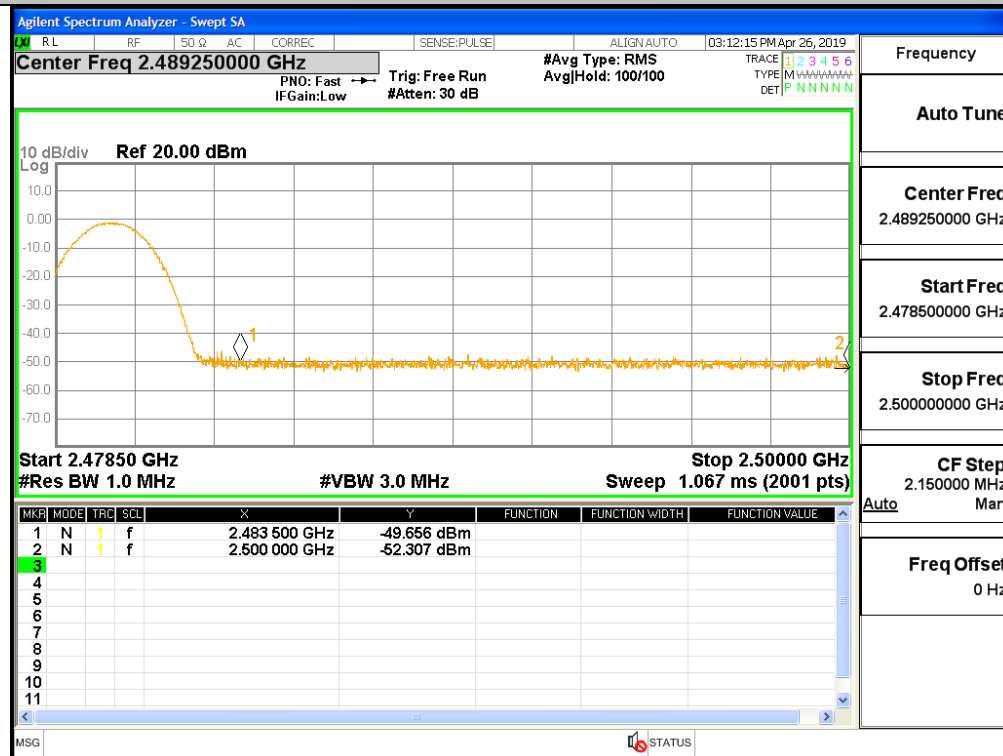
Restrict-band band-edge measurements_2402_PEAK_2DH5



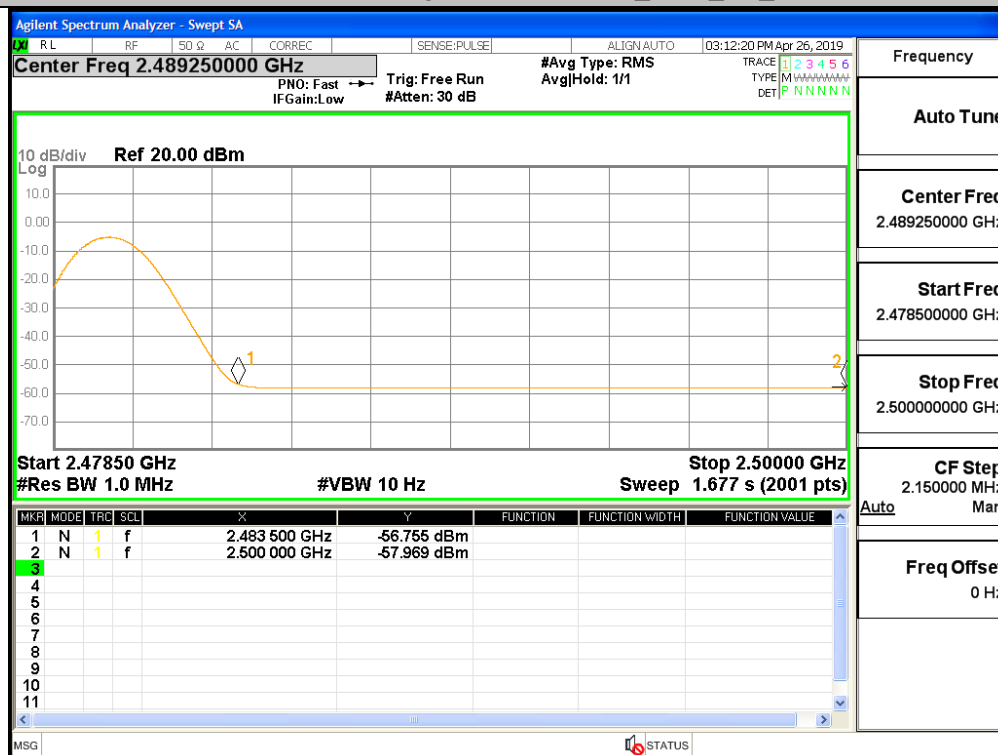
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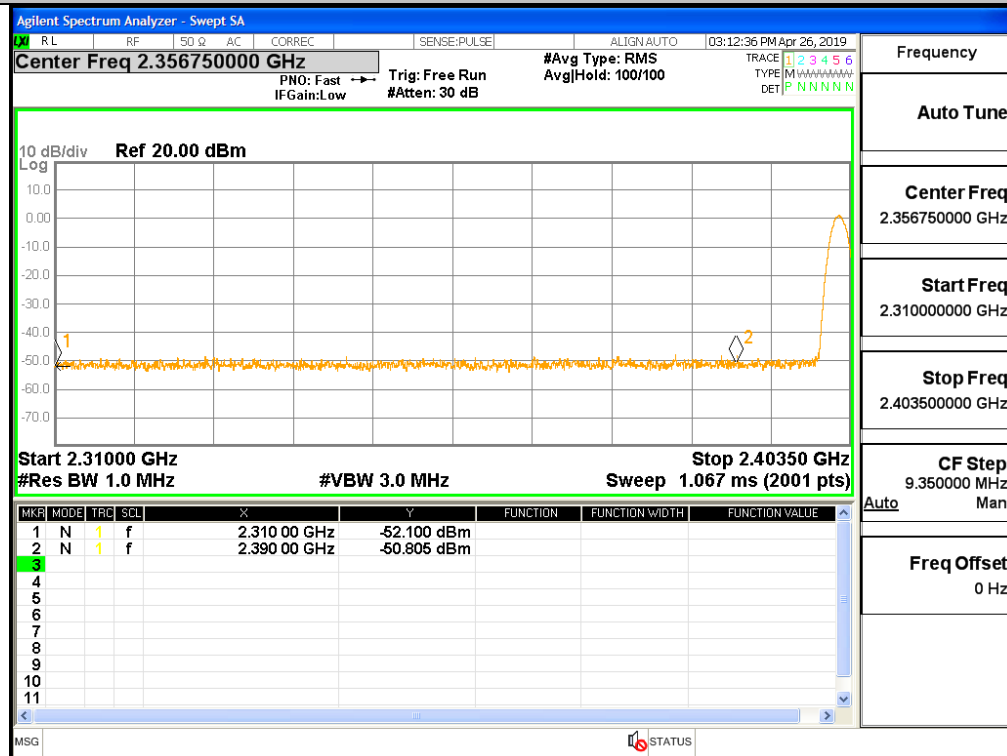
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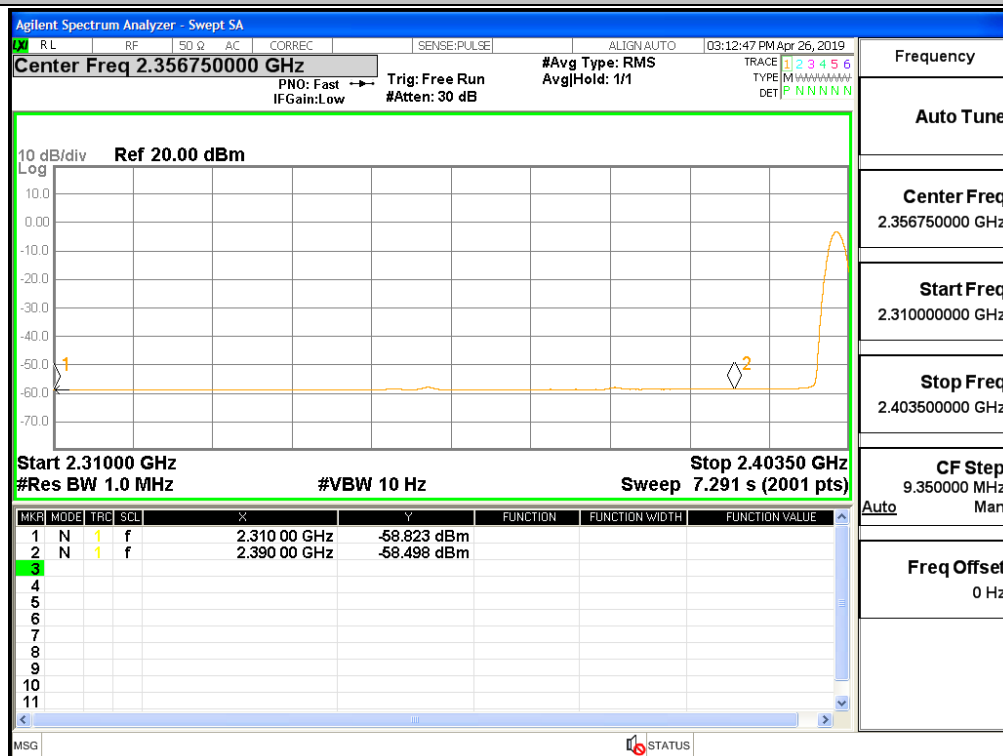
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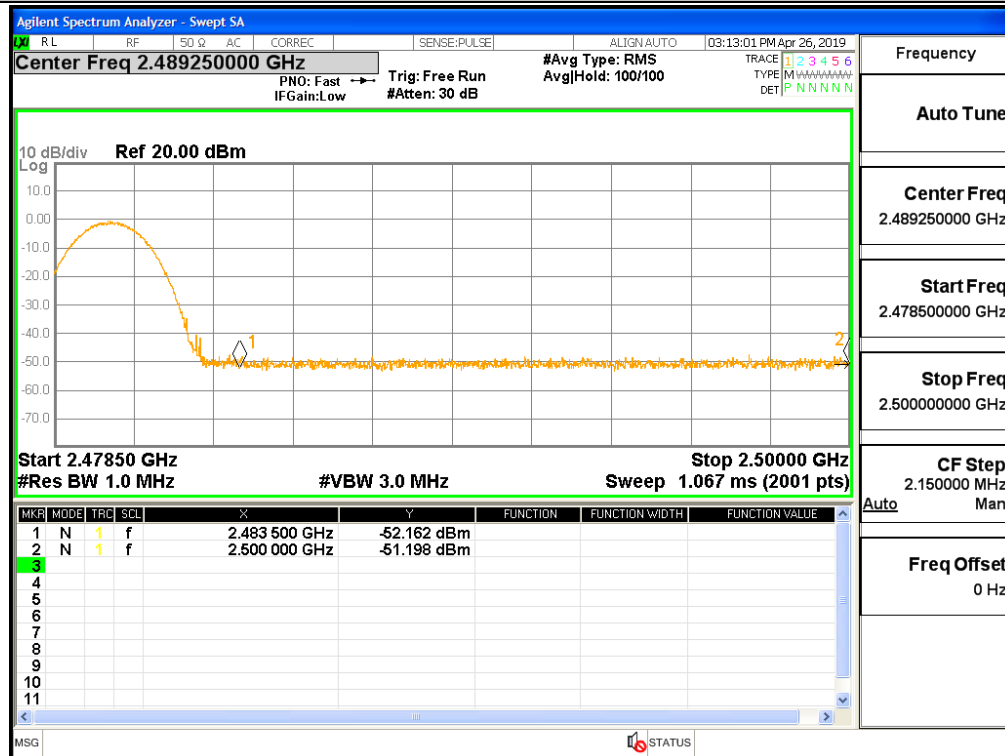
Restrict-band band-edge measurements_2402_PEAK_3DH5



Restrict-band band-edge measurements_2402_AV_3DH5



Restrict-band band-edge measurements_2480_PEAK_3DH5



Restrict-band band-edge measurements_2480_AV_3DH5

