

Appendix A

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

Product Name: WIRELESS EARPHONES

Trade Mark: ONN

Test Model: 18LY09

FCC ID: 2AKI8-ONDBTINEAR

Environmental Conditions

Temperature:	22.9 ° C
Relative Humidity:	52%
ATM Pressure:	100.0 kPa
Test Engineer:	Gary Qian
Supervised by:	Eden Hu

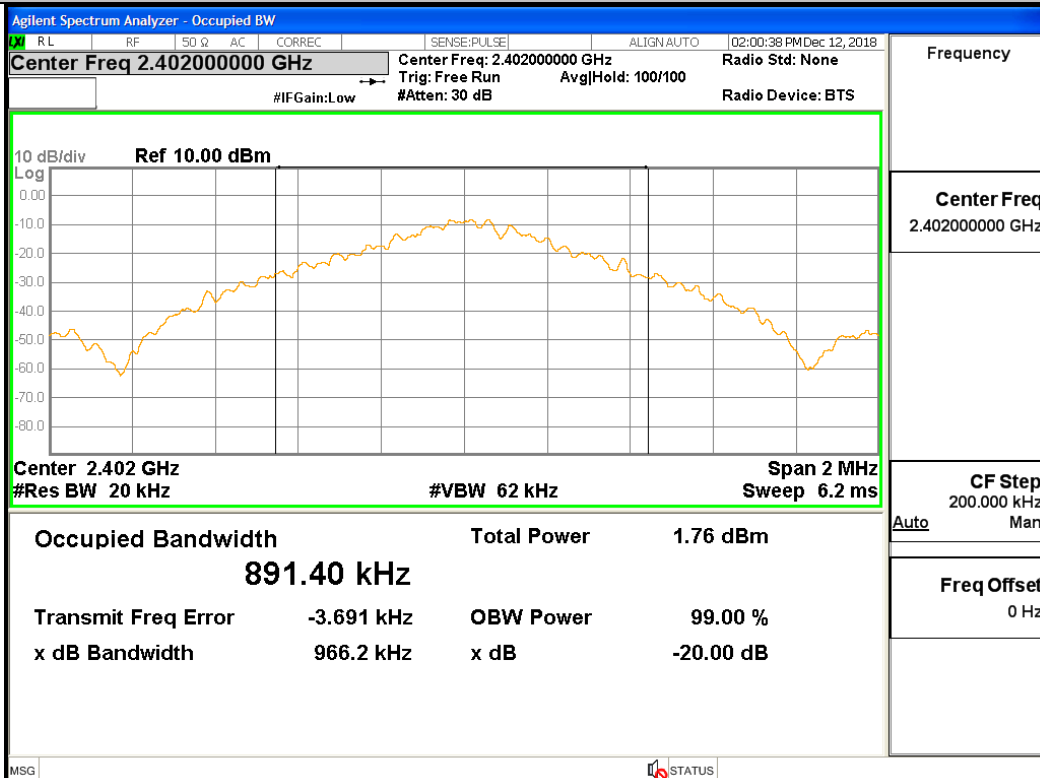
A.1 20 dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit(MHz)	Verdict
GFSK	LCH	0.966	Not Specified	PASS
GFSK	MCH	0.938	Not Specified	PASS
GFSK	HCH	0.965	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.334	Not Specified	PASS
$\pi/4$ DQPSK	MCH	1.348	Not Specified	PASS
$\pi/4$ DQPSK	HCH	1.348	Not Specified	PASS
8DPSK	LCH	1.328	Not Specified	PASS
8DPSK	MCH	1.344	Not Specified	PASS
8DPSK	HCH	1.341	Not Specified	PASS

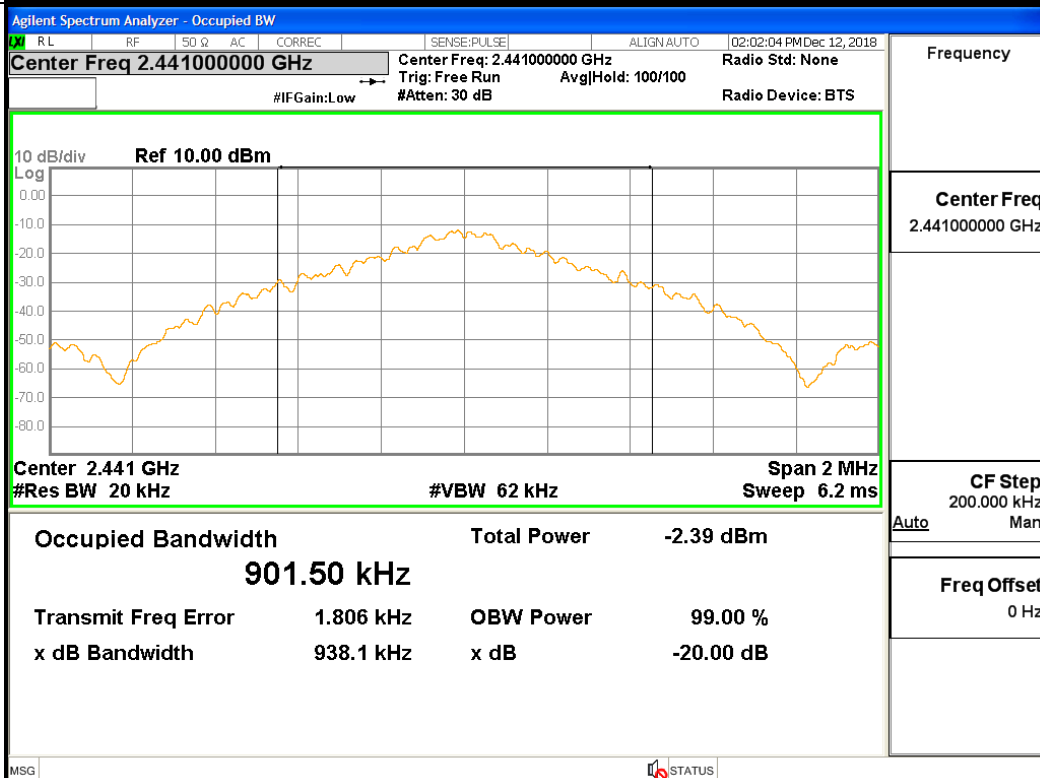
Test Graph

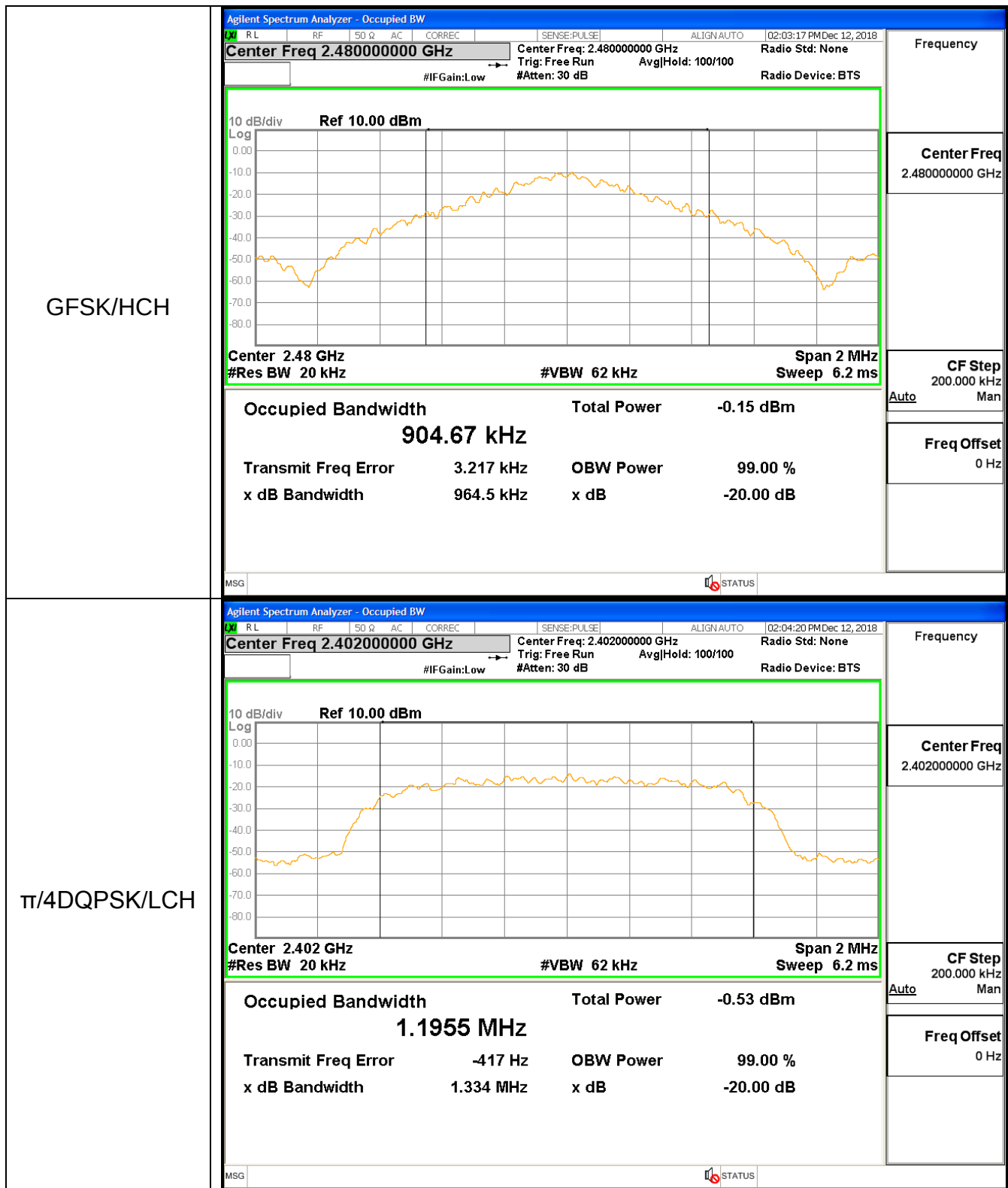
Graphs

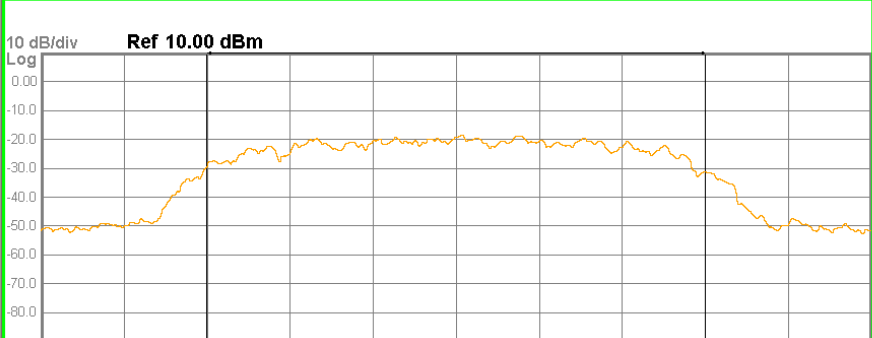
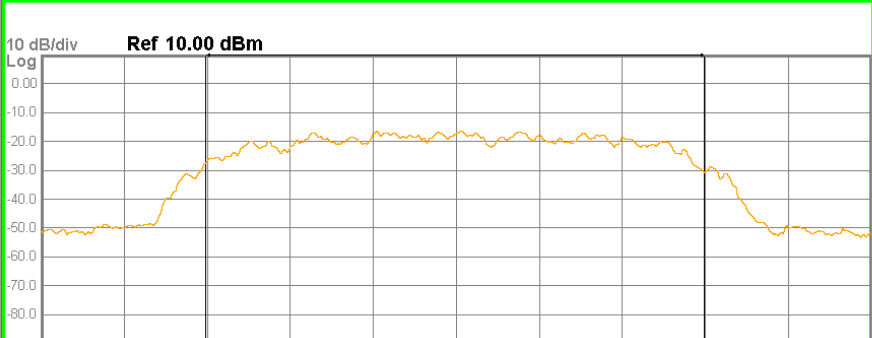
GFSK/LCH

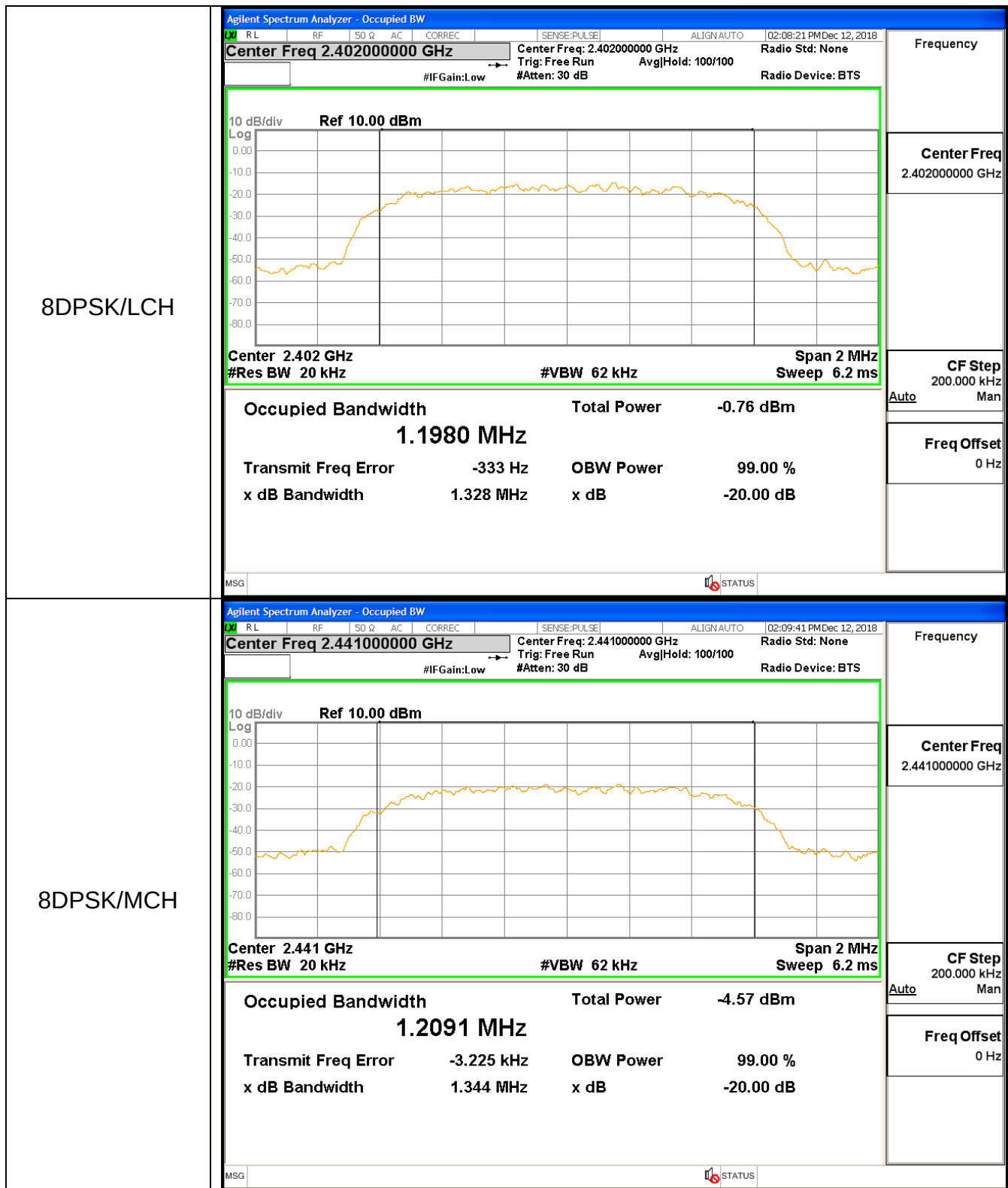


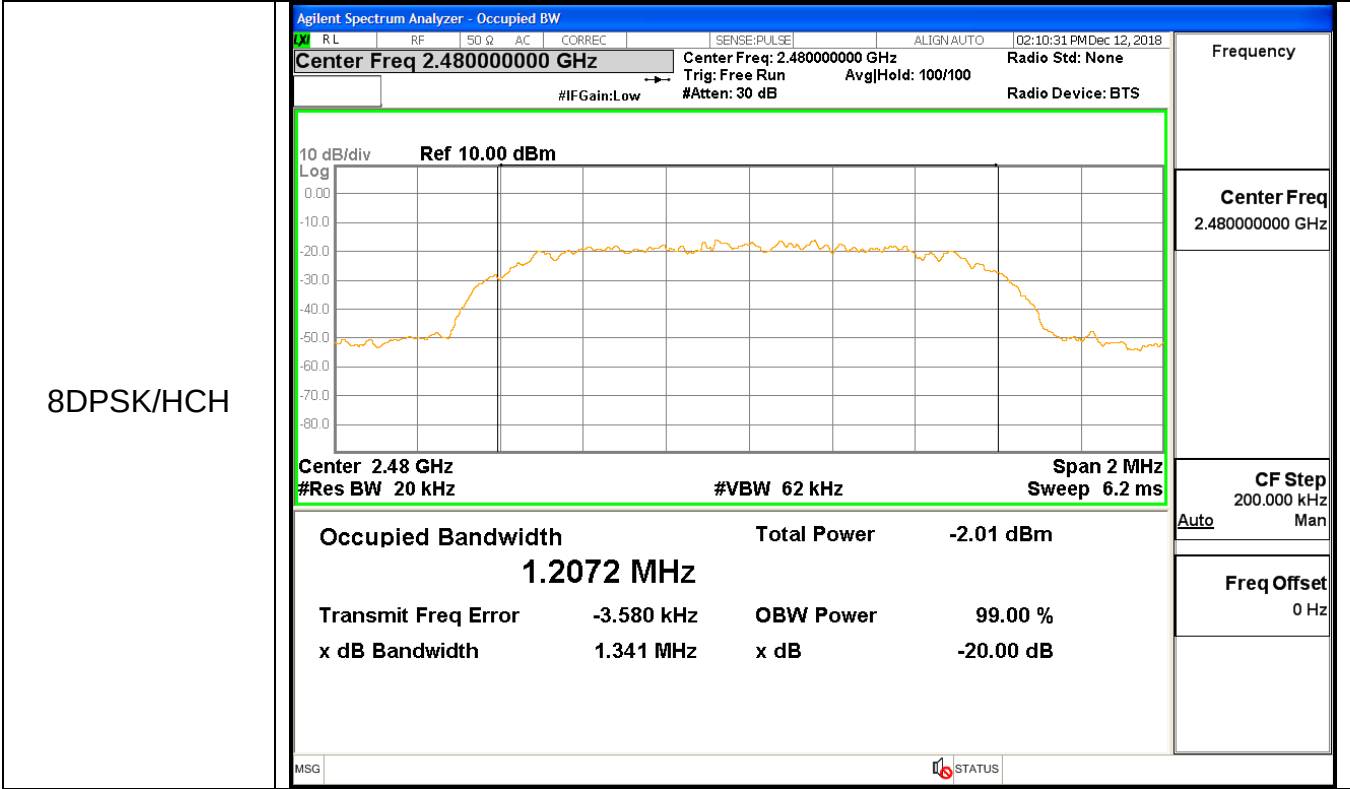
GFSK/MCH





π/4DQPSK/MCH	Agilent Spectrum Analyzer - Occupied BW RL RF 50 Ω AC CORREC SENSE:PULSE ALIGN: AUTO 02:05:47 PM Dec 12, 2018 Center Freq 2.441000000 GHz Center Freq: 2.441000000 GHz Radio Std: None #IFGain: Low #Atten: 30 dB AvgHold: 100/100 Radio Device: BTS  10 dB/div Ref 10.00 dBm Center 2.441 GHz Span 2 MHz #Res BW 20 kHz #VBW 62 kHz Sweep 6.2 ms Occupied Bandwidth 1.2004 MHz Total Power -4.41 dBm Transmit Freq Error -563 Hz OBW Power 99.00 % x dB Bandwidth 1.348 MHz x dB -20.00 dB MSG STATUS	Frequency Center Freq 2.441000000 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 02:06:52 PM Dec 12, 2018 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 6.2 ms Occupied Bandwidth 1.1954 MHz Total Power -2.05 dBm Transmit Freq Error -1.512 kHz OBW Power 99.00 % x dB Bandwidth 1.348 MHz x dB -20.00 dB MSG STATUS	Frequency Center Freq 2.480000000 GHz CF Step 200.000 kHz Auto Man Freq Offset 0 Hz

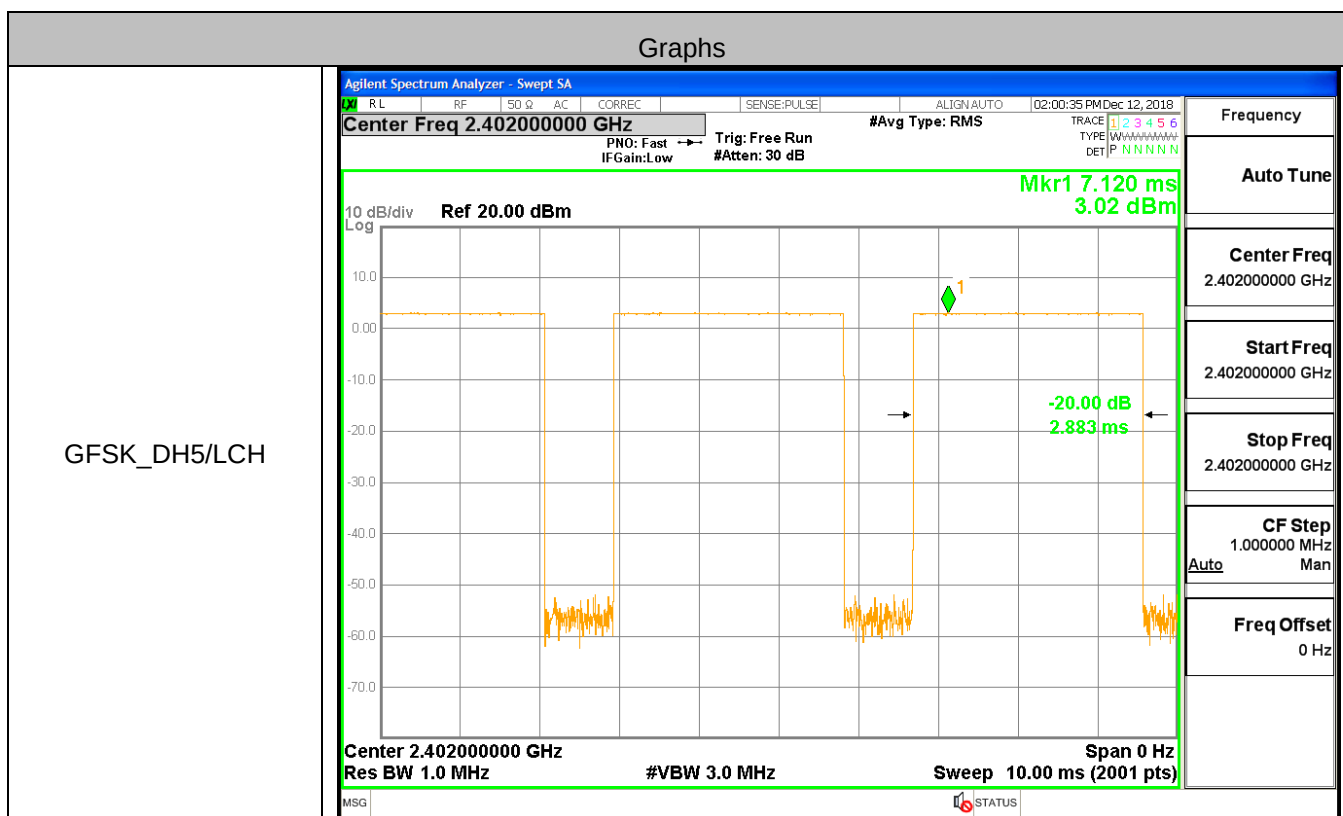


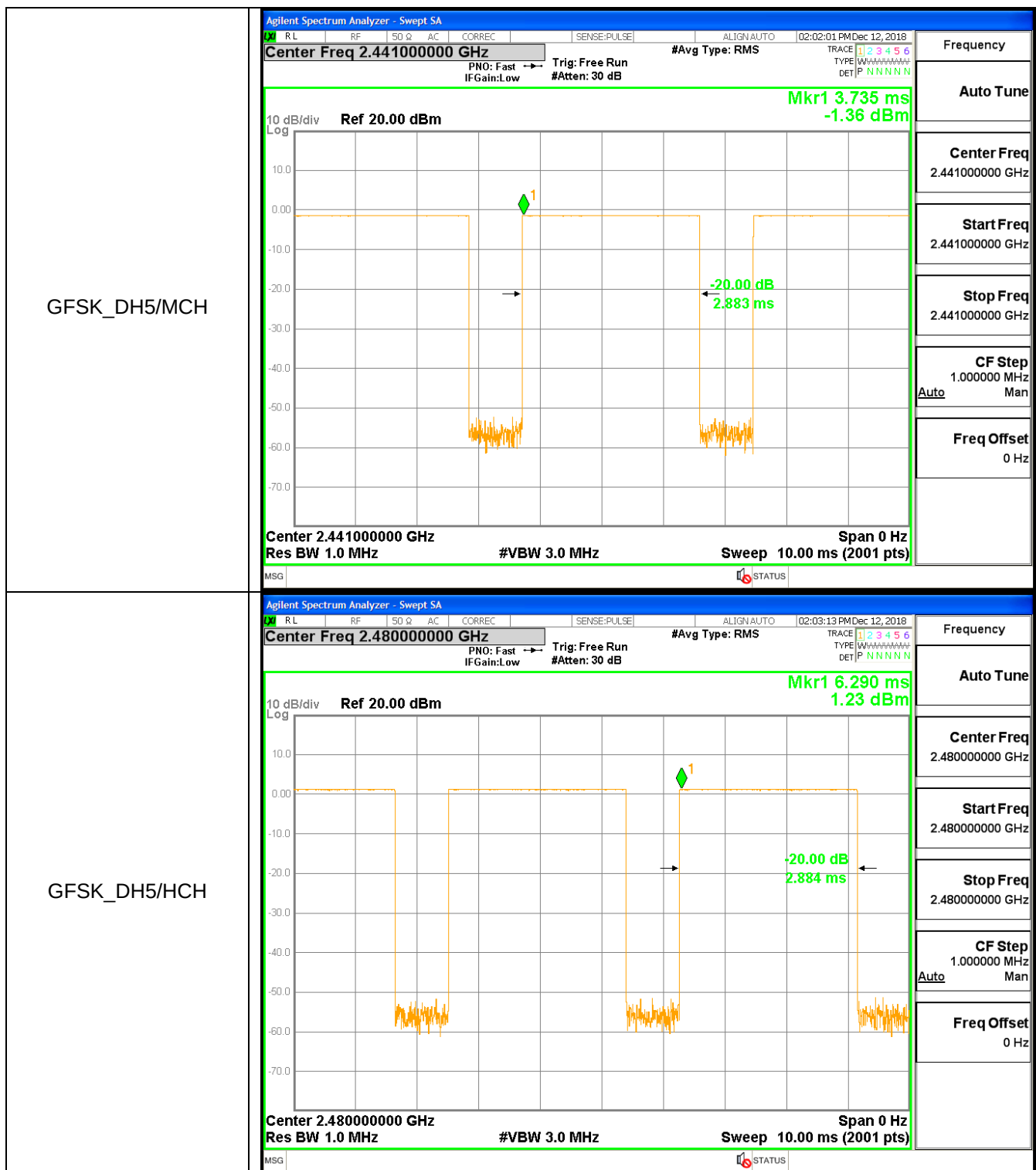


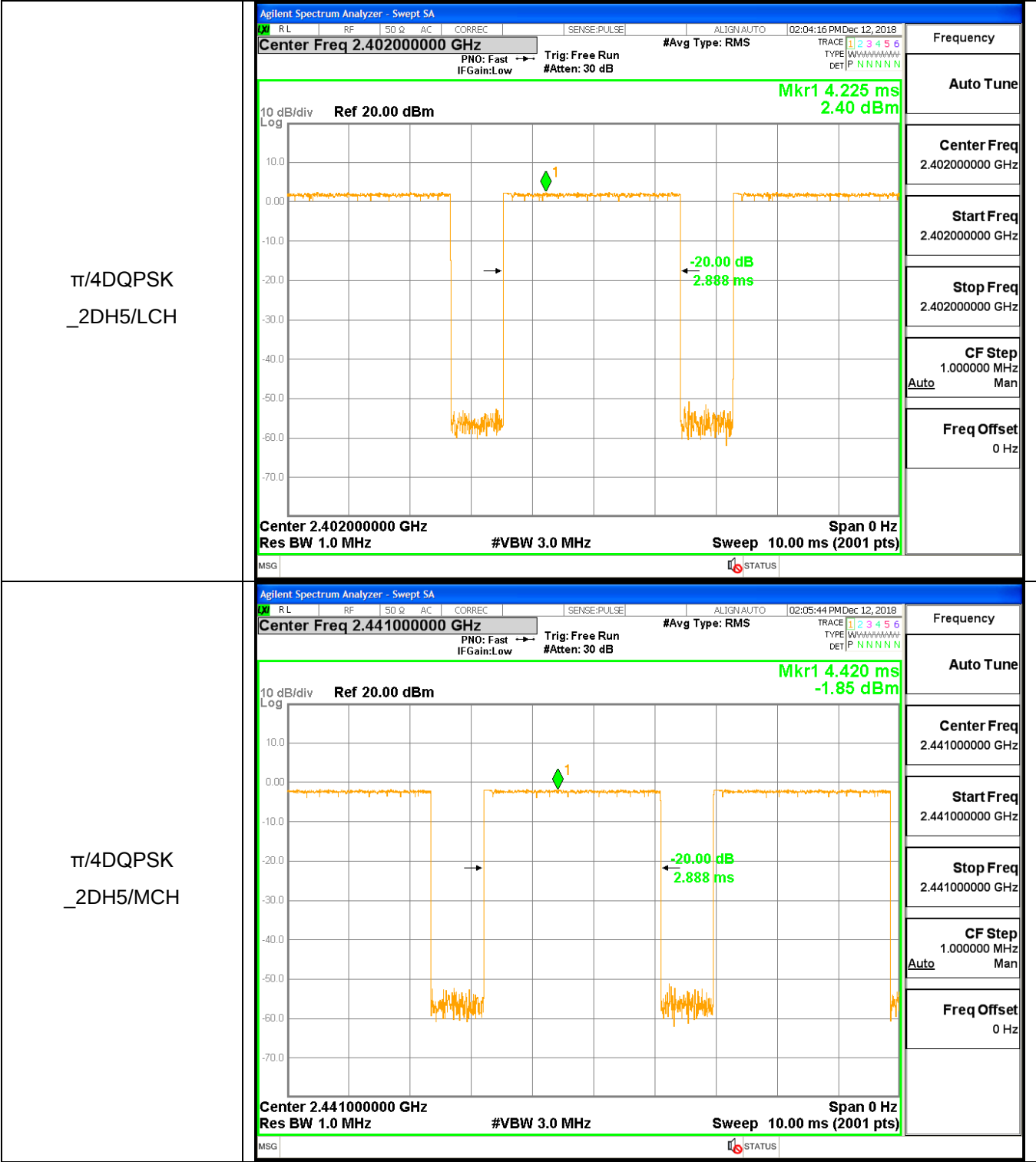
A.2 Dwell Time

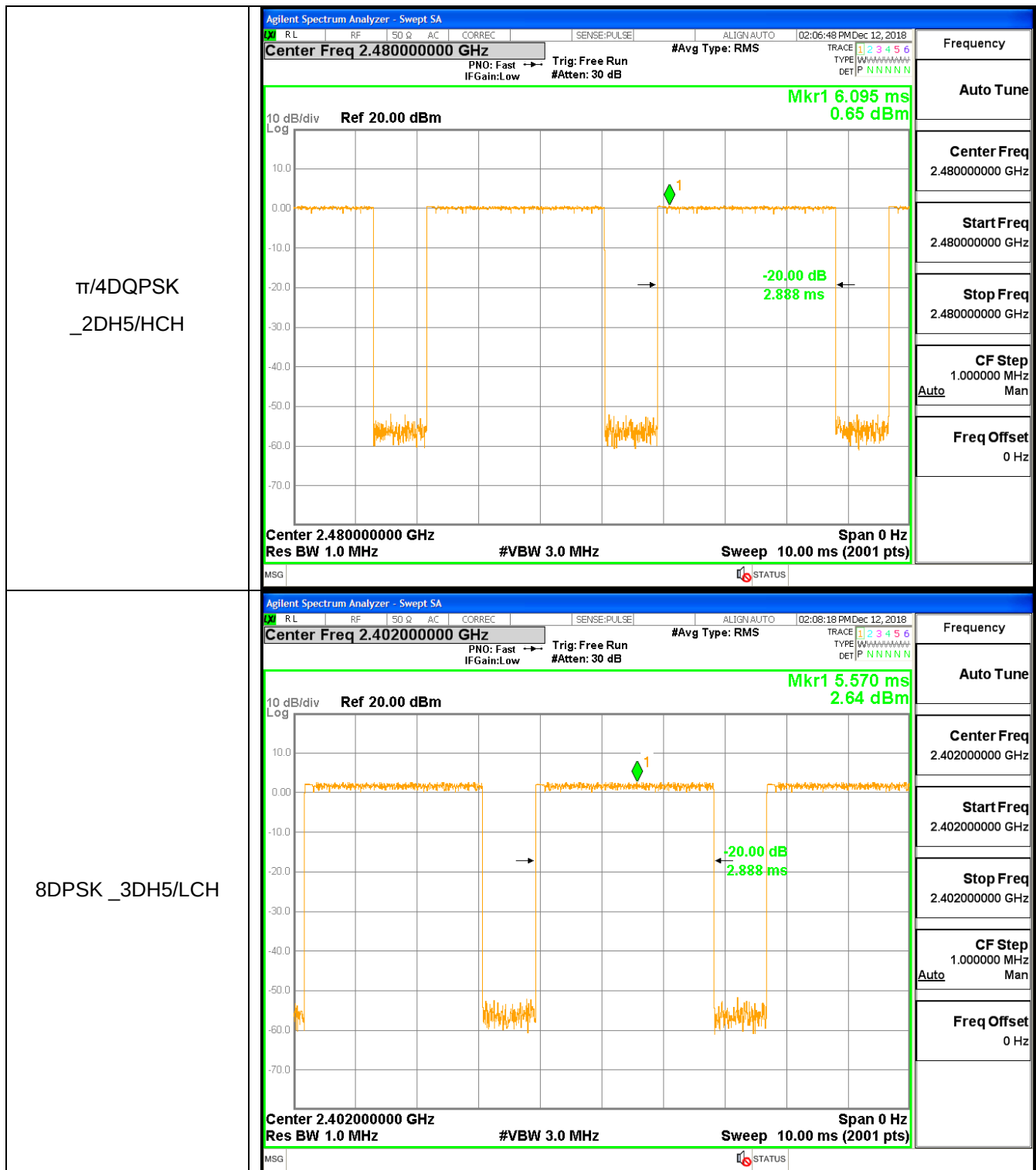
Mode	Packet	Channel	Burst Width [s/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	0.002883002	106.7	0.307616322	0.4	PASS
GFSK	DH5	MCH	0.002883383	106.7	0.307656915	0.4	PASS
GFSK	DH5	HCH	0.002883542	106.7	0.307673883	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	0.002887506	106.7	0.308096932	0.4	PASS
$\pi/4$ DQPSK	2DH5	MCH	0.002888409	106.7	0.308193196	0.4	PASS
$\pi/4$ DQPSK	2DH5	HCH	0.002887713	106.7	0.308119004	0.4	PASS
8DPSK	3DH5	LCH	0.00288814	106.7	0.308164519	0.4	PASS
8DPSK	3DH5	MCH	0.002888504	106.7	0.308203414	0.4	PASS
8DPSK	3DH5	HCH	0.002888471	106.7	0.308199856	0.4	PASS

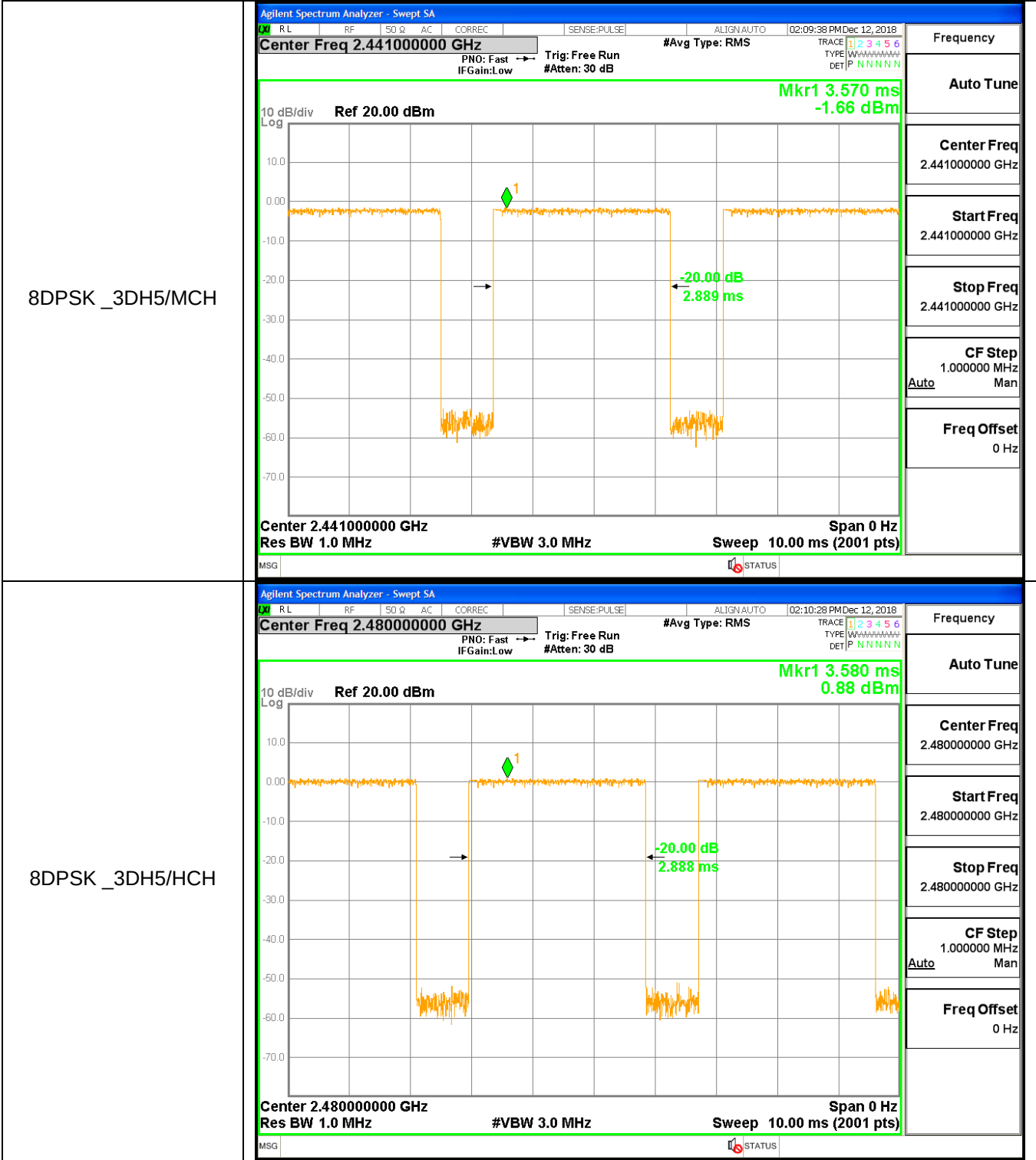
Test Graph







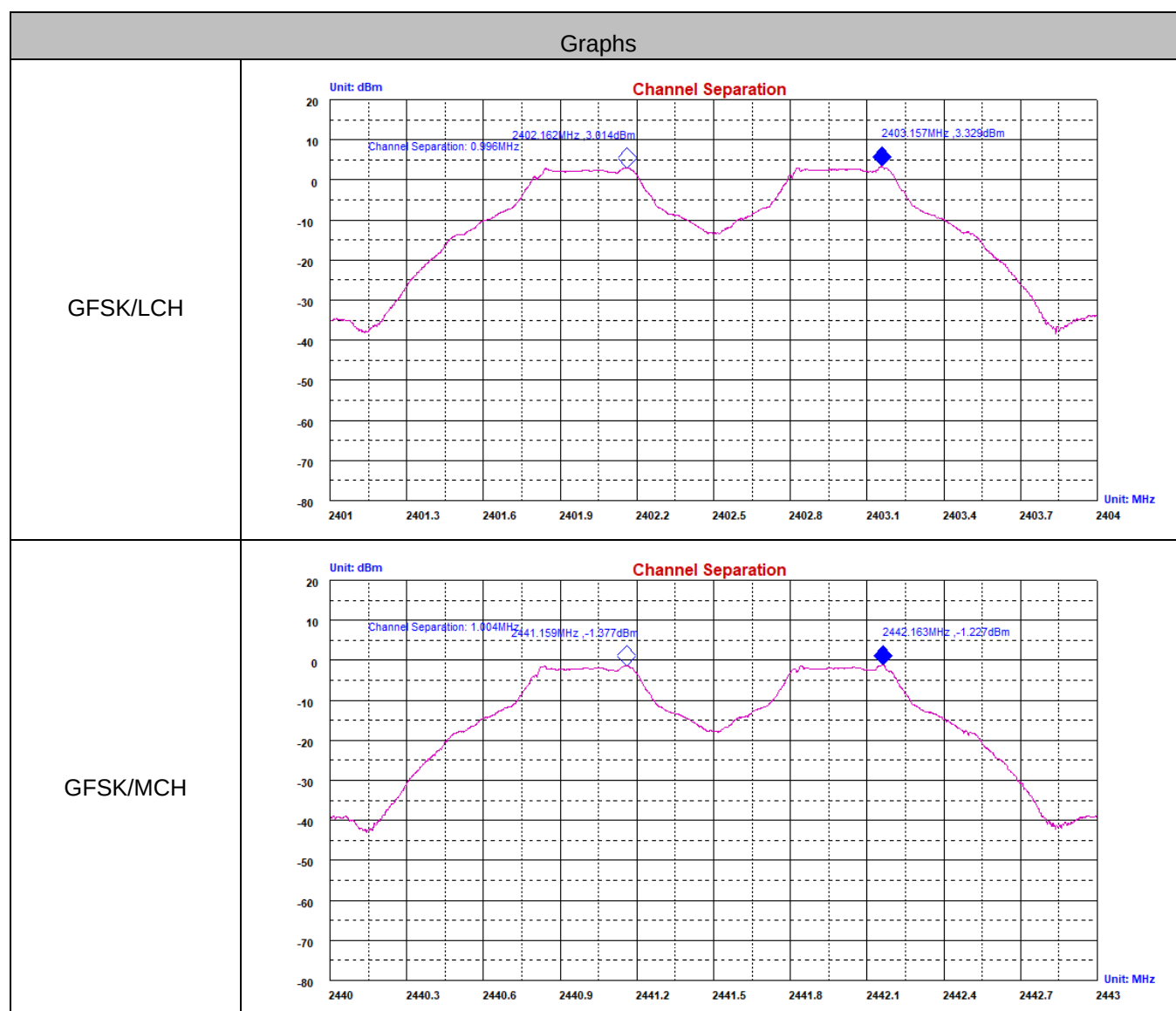


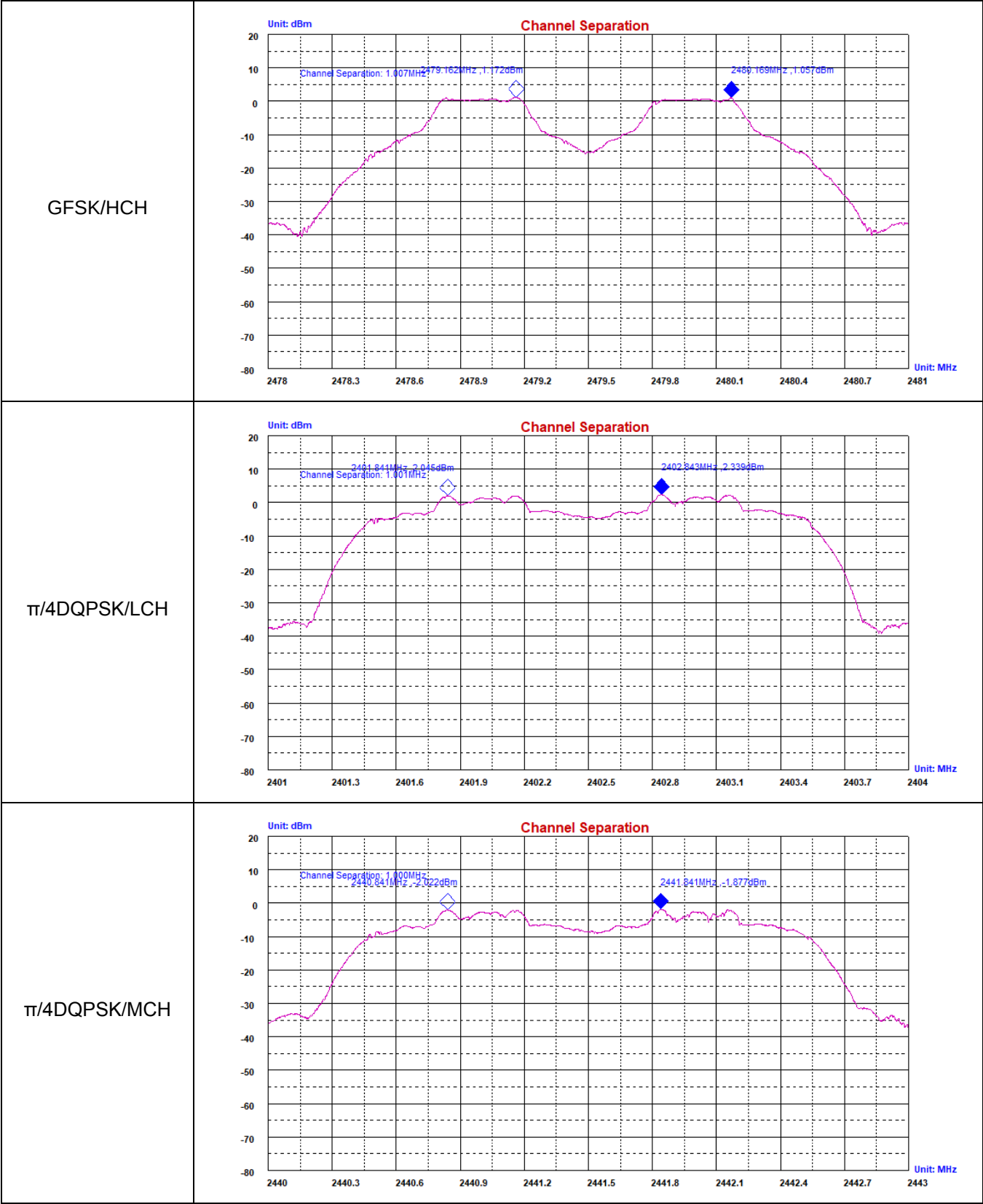


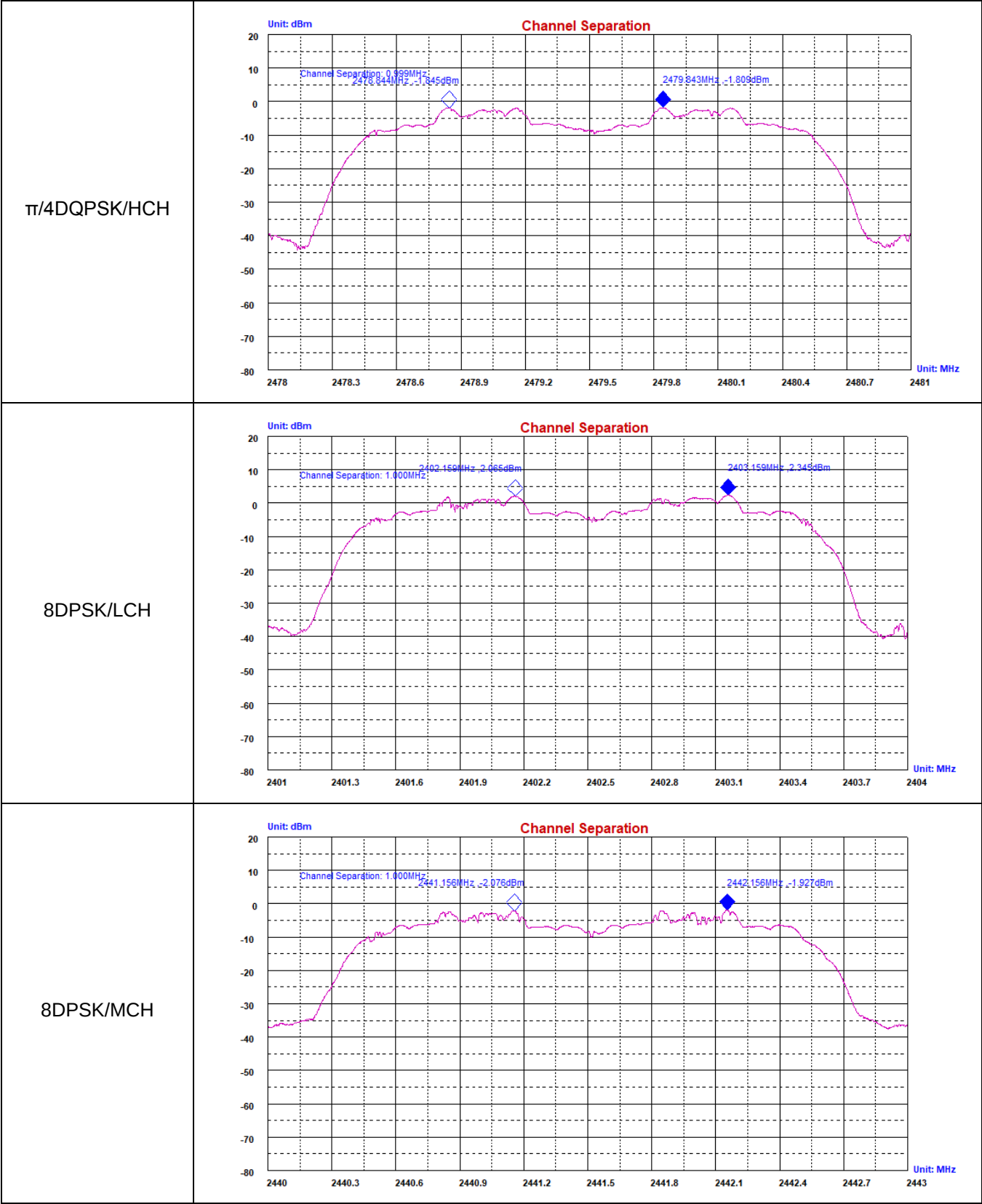
A.3 Carrier Frequency Separation

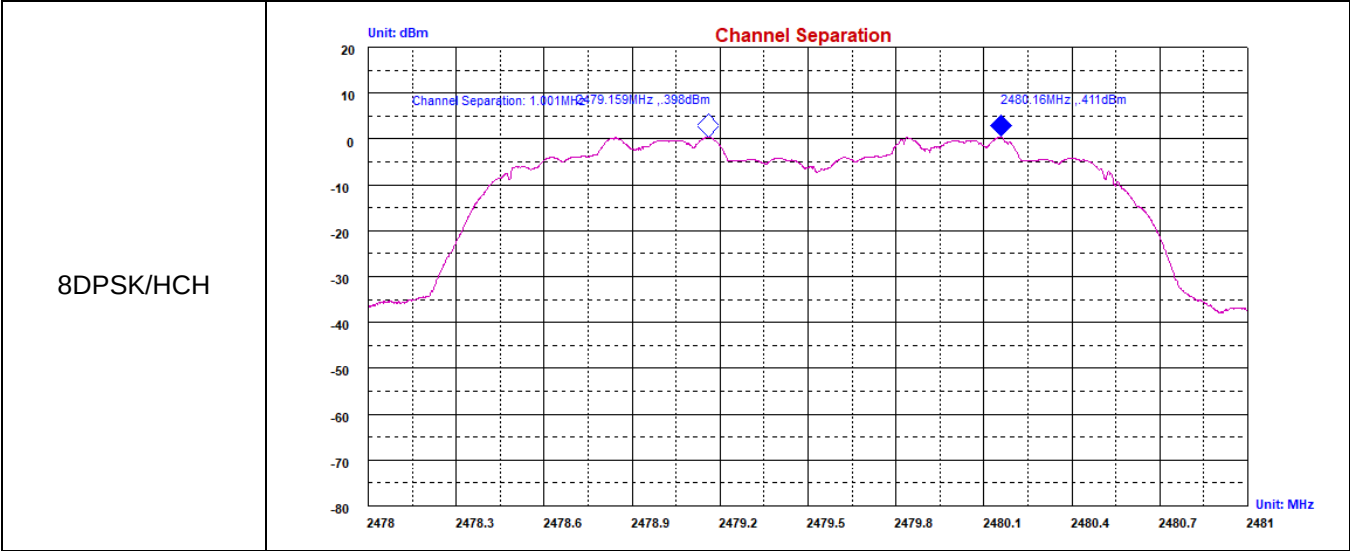
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.996	0.642	PASS
GFSK	MCH	1.004	0.625	PASS
GFSK	HCH	1.007	0.643	PASS
$\pi/4$ DQPSK	LCH	1.001	0.889	PASS
$\pi/4$ DQPSK	MCH	1.000	0.899	PASS
$\pi/4$ DQPSK	HCH	0.999	0.899	PASS
8DPSK	LCH	1.000	0.885	PASS
8DPSK	MCH	1.000	0.896	PASS
8DPSK	HCH	1.001	0.895	PASS

Test Graph





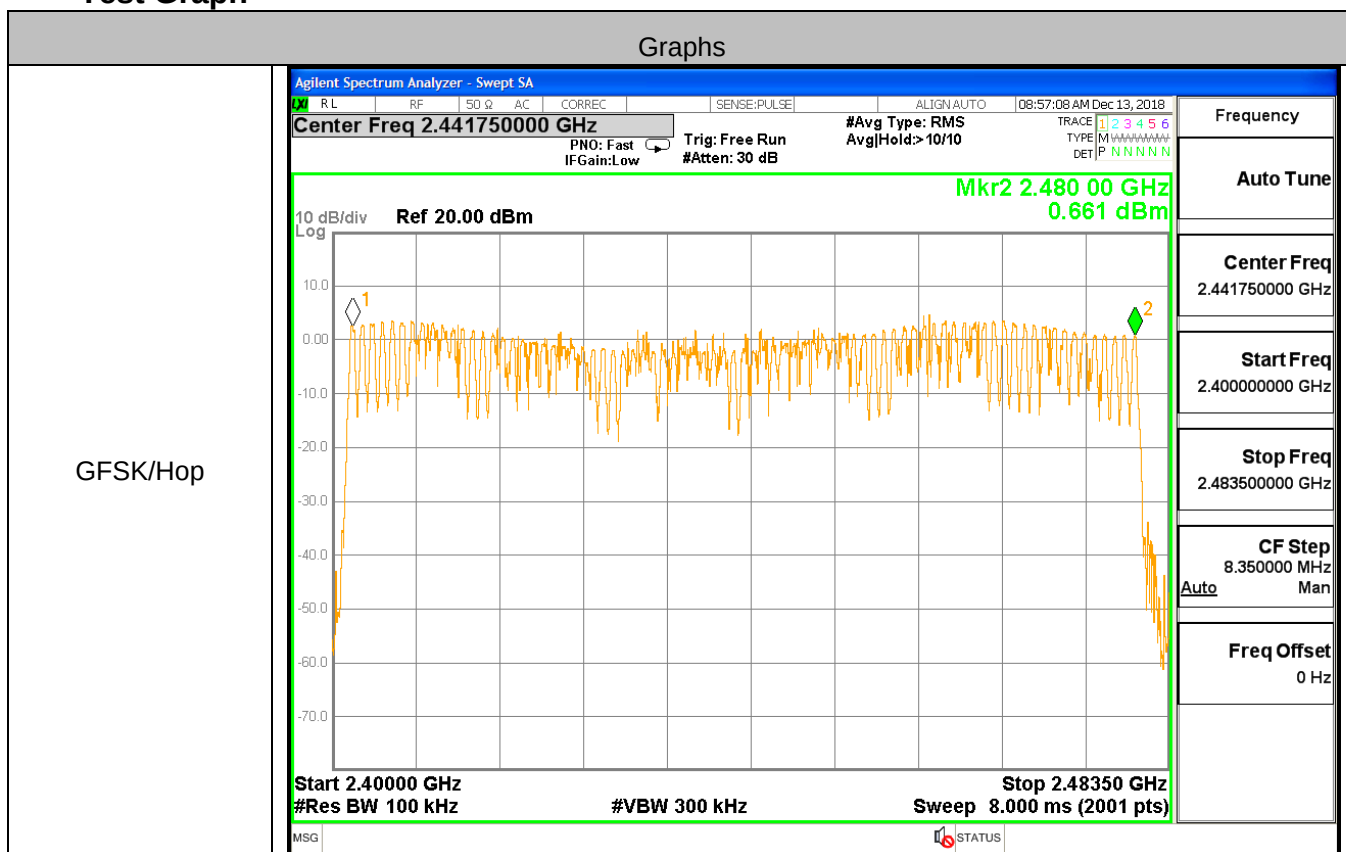


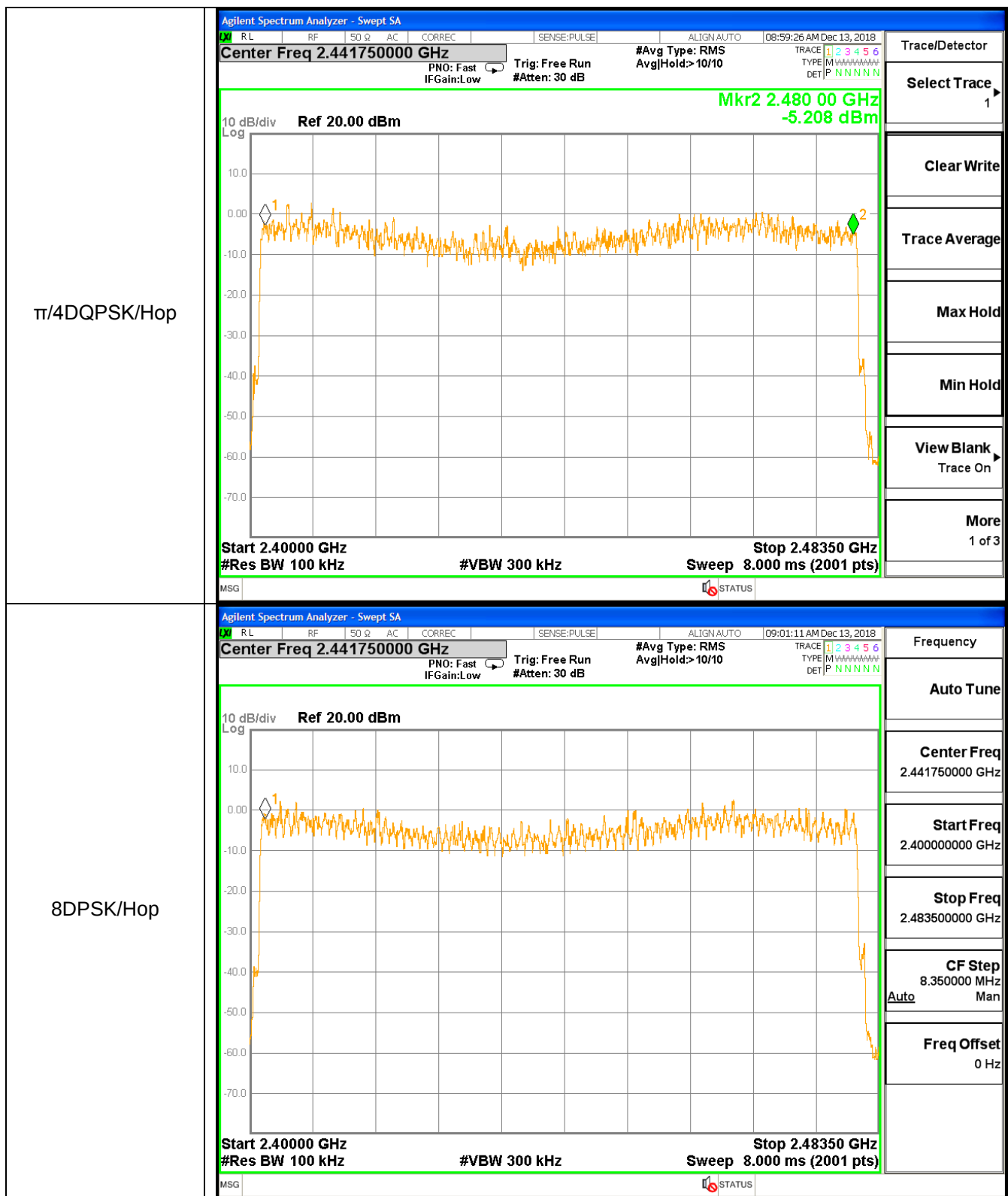


A.4 Hopping Channel Number

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

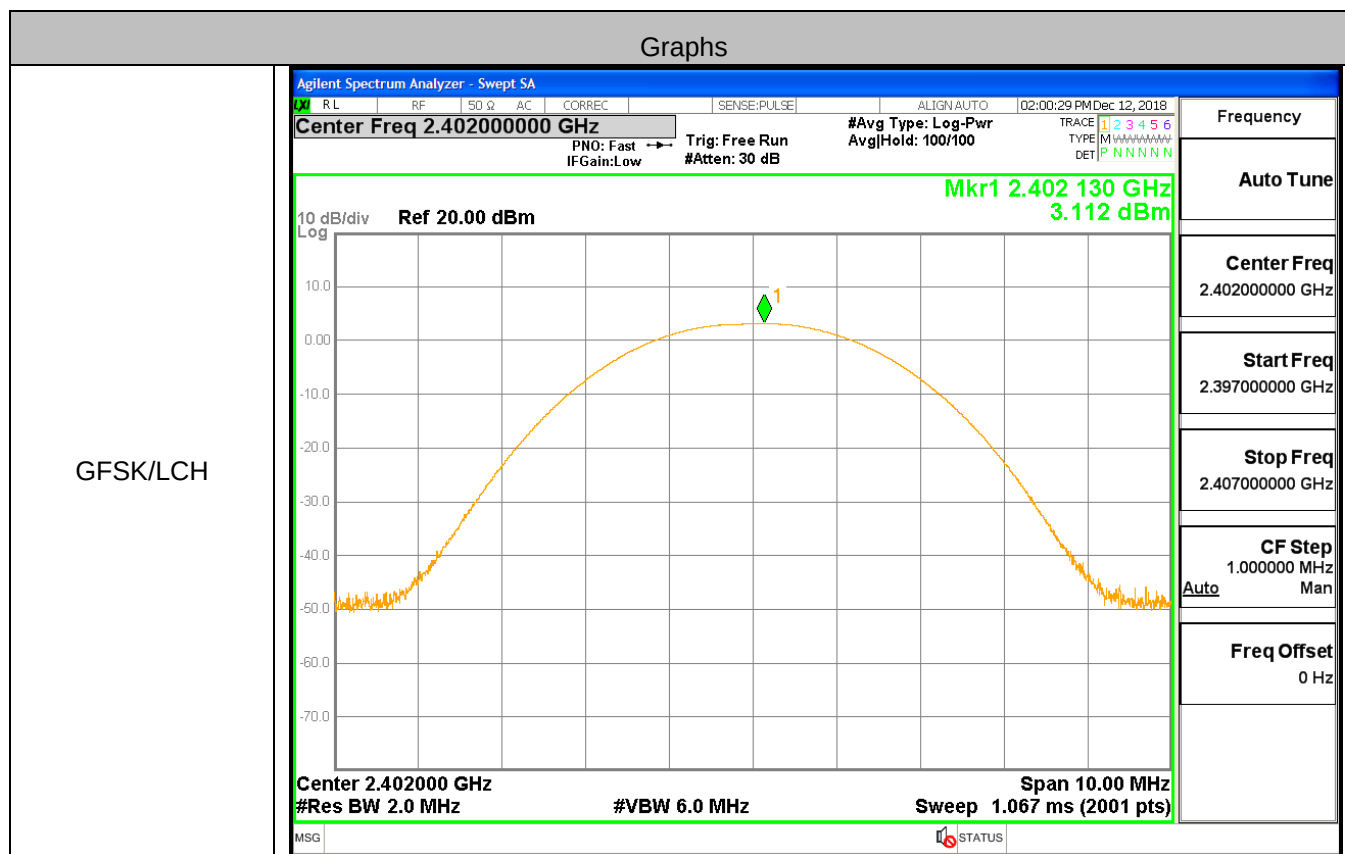


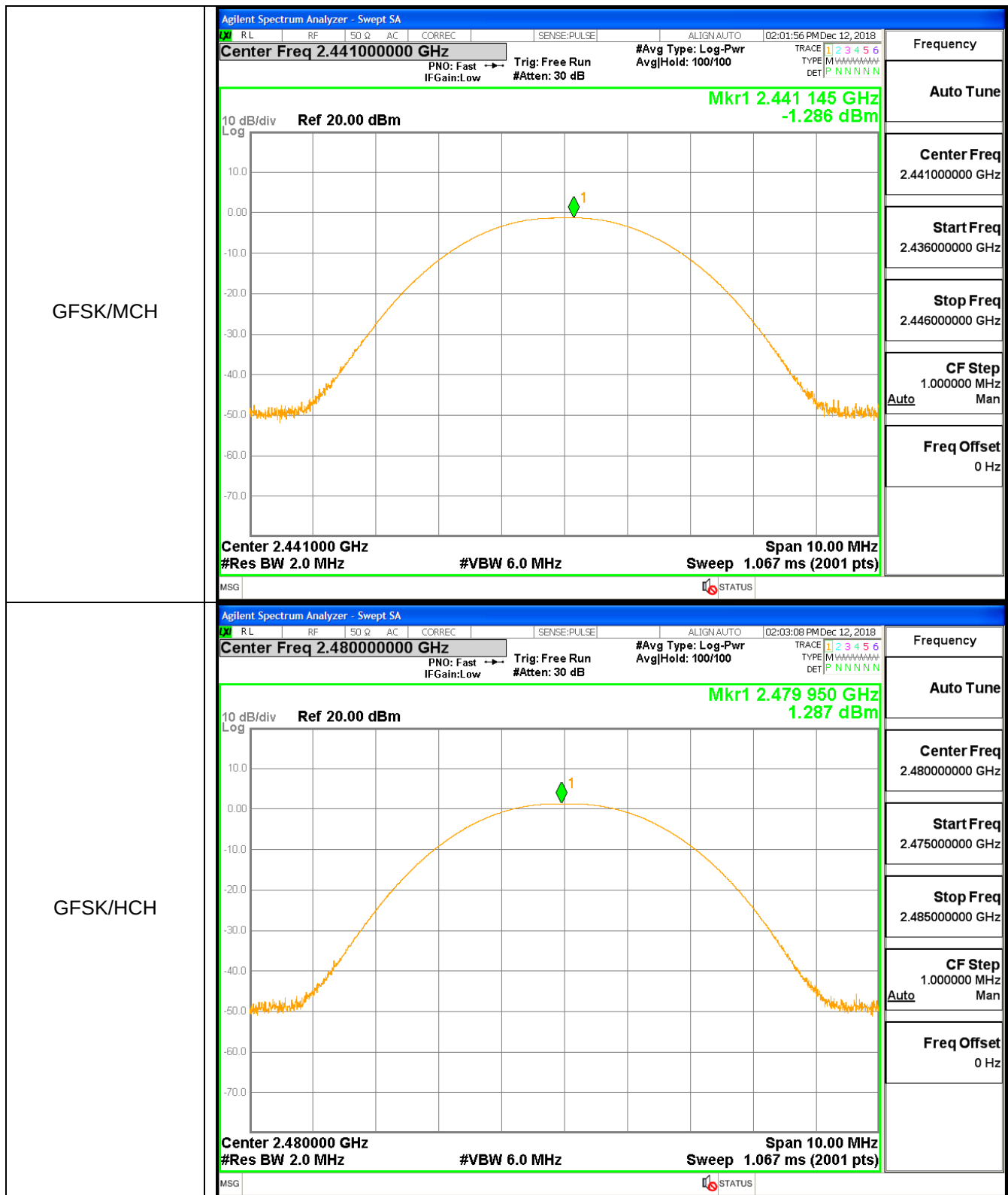


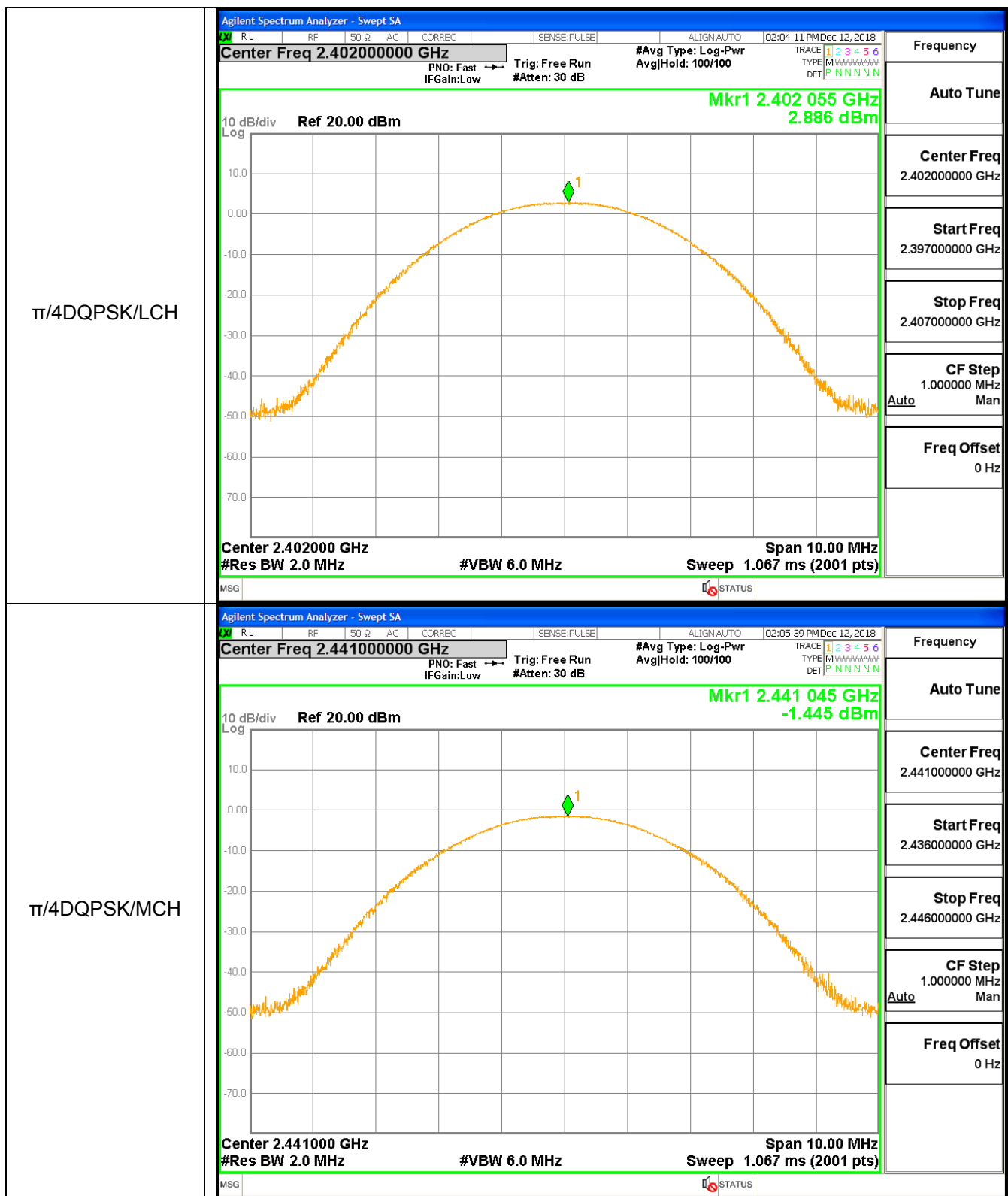
A.5 Conducted Peak Output Power

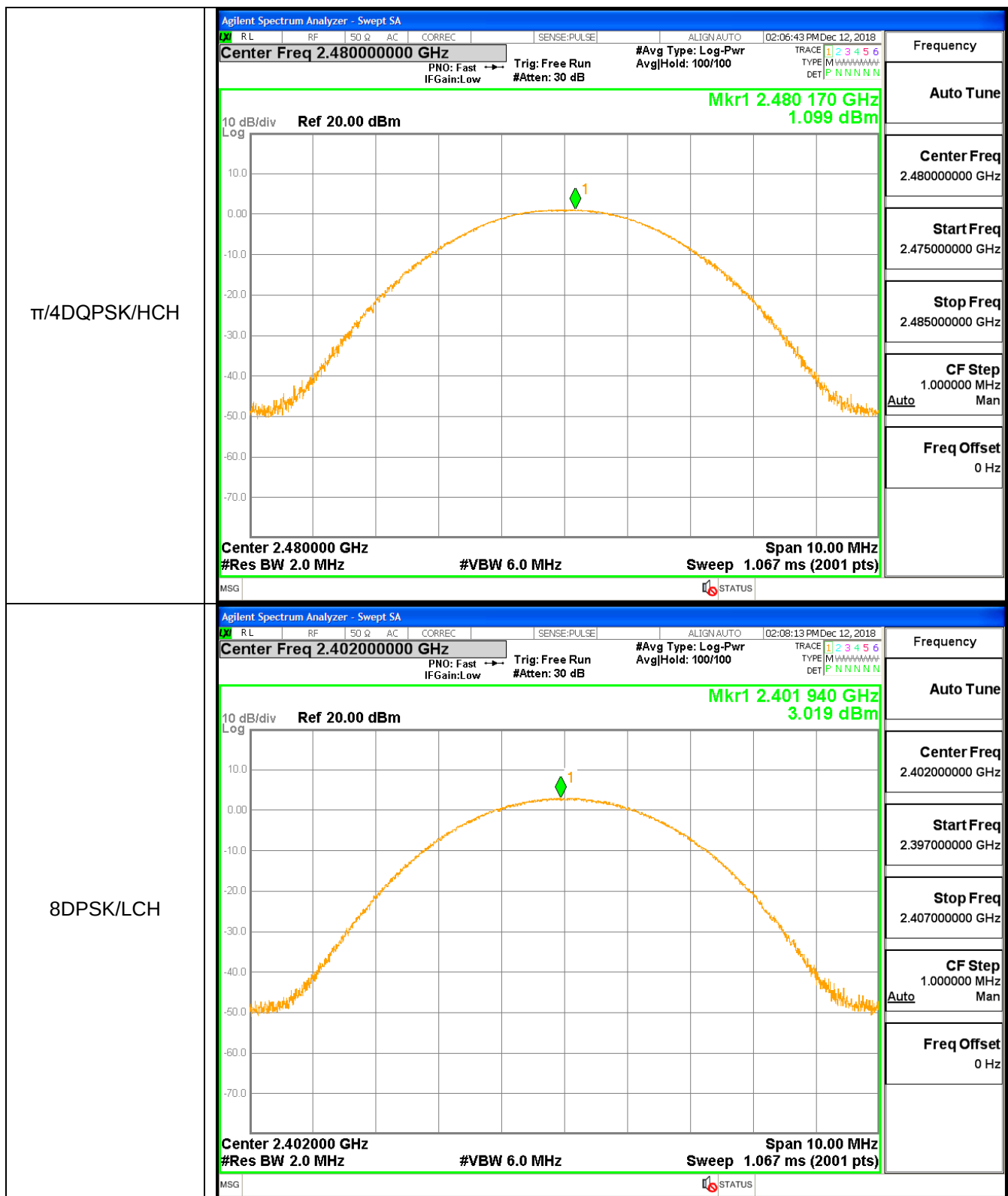
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	3.112	21	PASS
GFSK	MCH	-1.286	21	PASS
GFSK	HCH	1.287	21	PASS
$\pi/4$ DQPSK	LCH	2.886	21	PASS
$\pi/4$ DQPSK	MCH	-1.445	21	PASS
$\pi/4$ DQPSK	HCH	1.099	21	PASS
8DPSK	LCH	3.019	21	PASS
8DPSK	MCH	-1.354	21	PASS
8DPSK	HCH	1.223	21	PASS

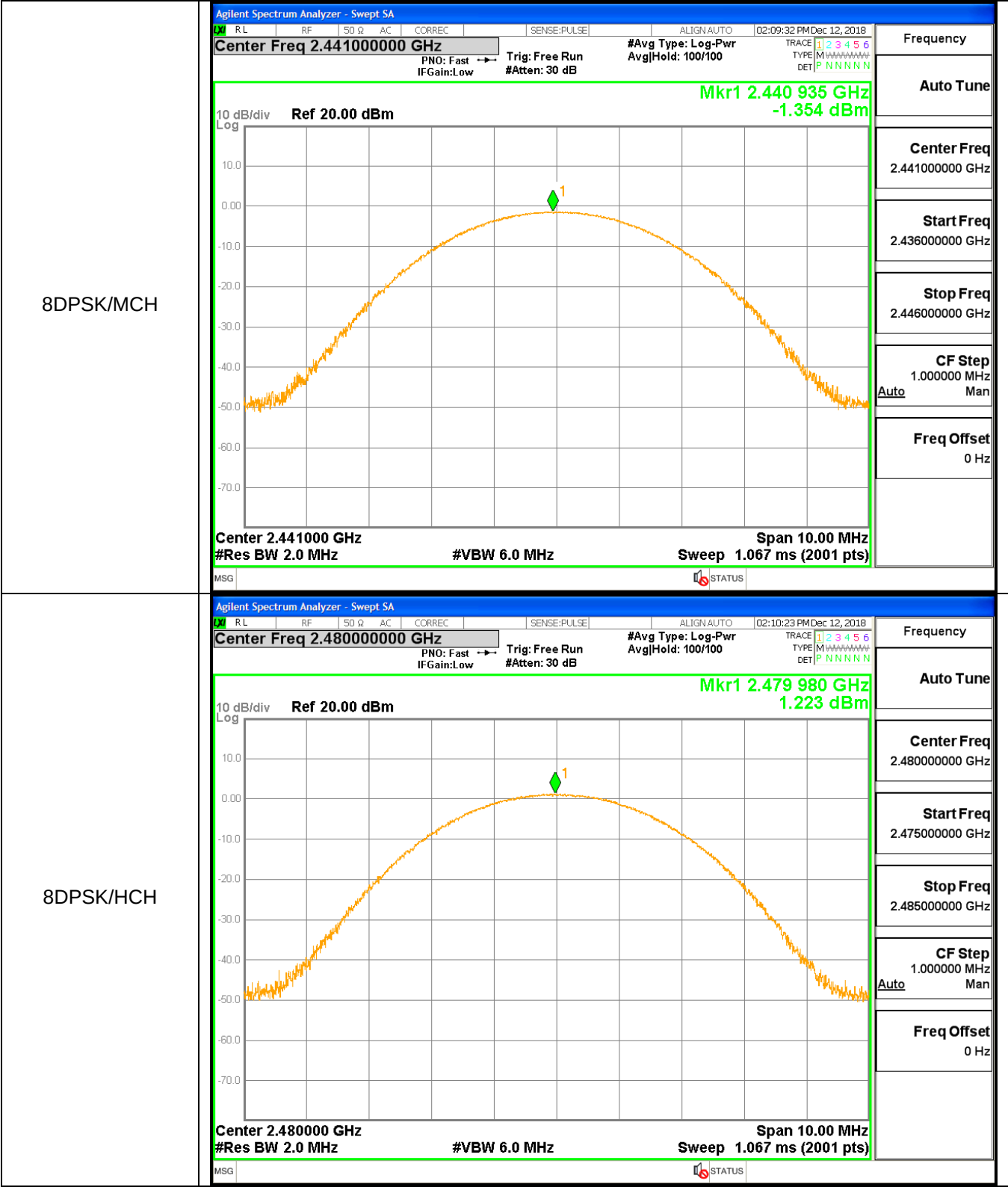
Test Graph







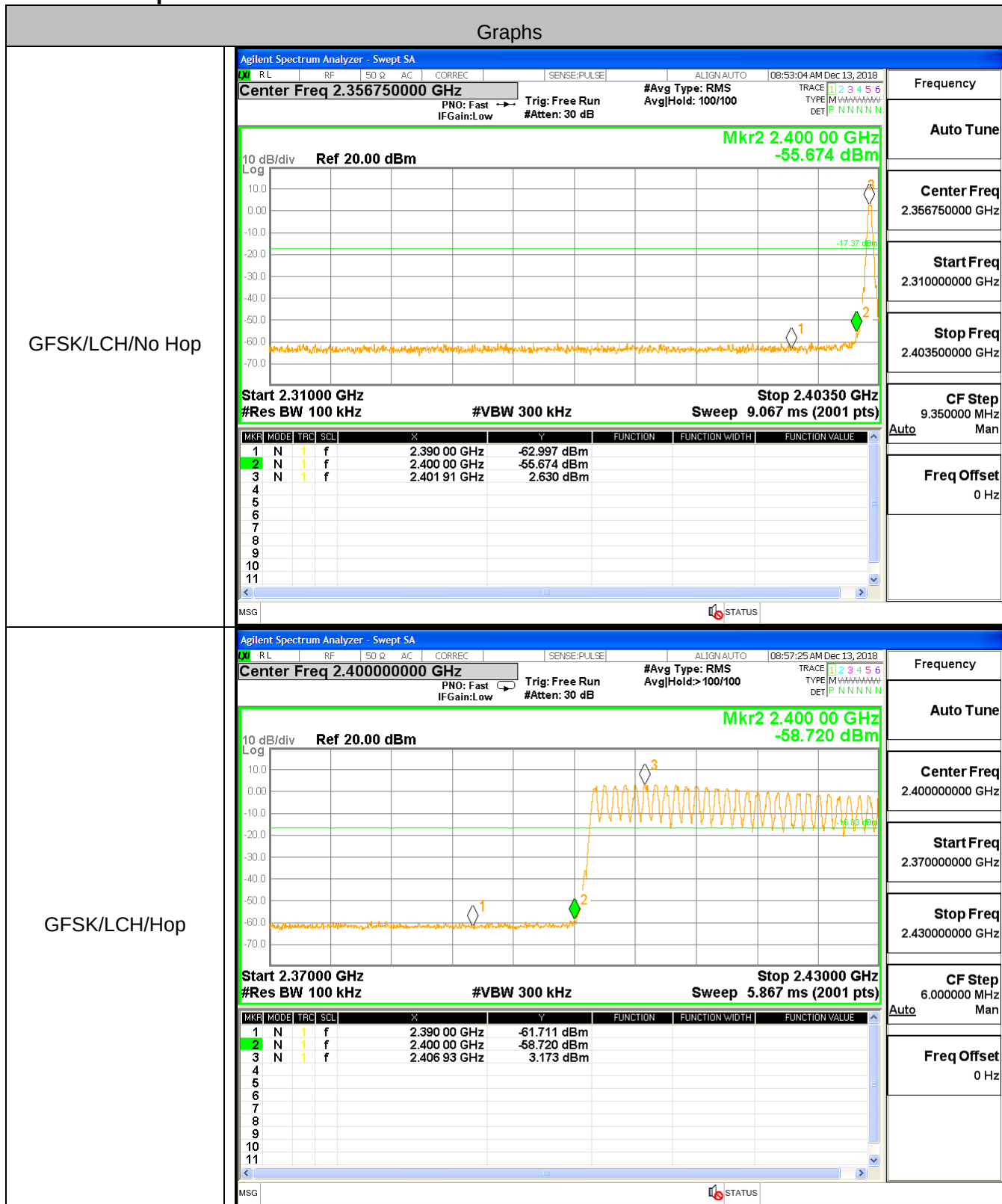


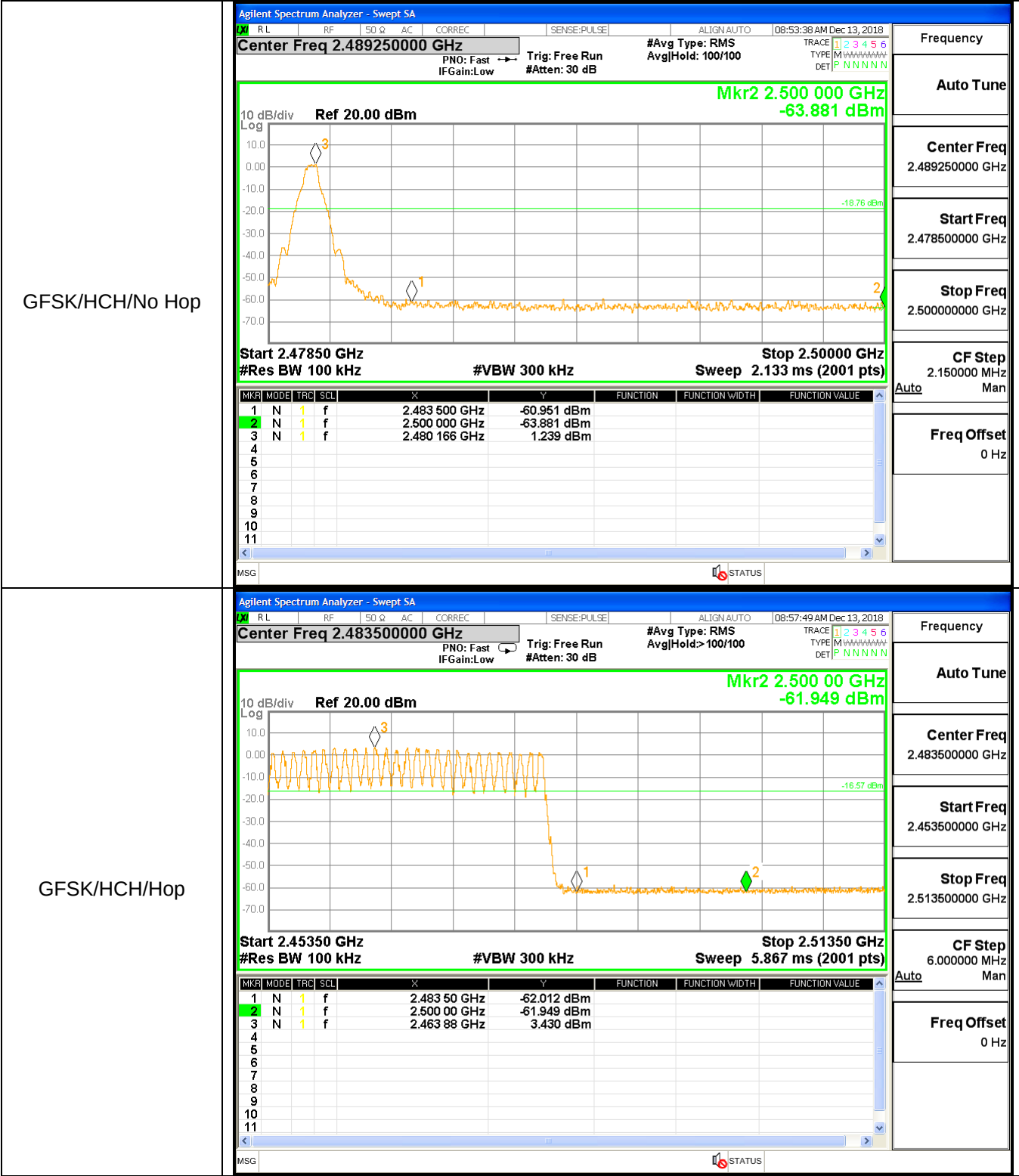


A.6 Band-edge for RF Conducted Emissions

Type	Carrier Frequency(MHz)	Frequency(MHz)	Carrier Frequency Power [dBm]	Bandedge Peak(dBm)	Upper limit(dBm)	Conclusion
1DH5	2402	2390	2.63	-63.00	-17.37	Pass
1DH5	2402	2400	2.63	-55.67	-17.37	Pass
1DH5-Hopping	2402	2390	3.173	-61.71	-16.827	Pass
1DH5-Hopping	2402	2400	3.173	-58.72	-16.827	Pass
1DH5	2480	2483.5	1.239	-60.95	-18.761	Pass
1DH5	2480	2500	1.239	-63.88	-18.761	Pass
1DH5-Hopping	2480	2483.5	3.43	-62.01	-16.57	Pass
1DH5-Hopping	2480	2500	3.43	-61.95	-16.57	Pass
2DH5	2402	2390	-0.032	-63.03	-20.032	Pass
2DH5	2402	2400	-0.032	-55.49	-20.032	Pass
2DH5-Hopping	2480	2483.5	2.077	-61.43	-17.923	Pass
2DH5-Hopping	2480	2500	2.077	-61.48	-17.923	Pass
2DH5	2480	2483.5	-2.011	-62.36	-22.011	Pass
2DH5	2480	2500	-2.011	-62.83	-22.011	Pass
2DH5-Hopping	2402	2390	1.788	-61.96	-18.212	Pass
2DH5-Hopping	2402	2400	1.788	-58.64	-18.212	Pass
3DH5	2402	2390	1.009	-64.42	-18.991	Pass
3DH5	2402	2400	1.009	-56.28	-18.991	Pass
3DH5-Hopping	2402	2390	0.44	-62.27	-19.56	Pass
3DH5-Hopping	2402	2400	0.44	-56.72	-19.56	Pass
3DH5	2480	2483.5	-1.804	-58.14	-21.804	Pass
3DH5	2480	2500	-1.804	-62.36	-21.804	Pass
3DH5-Hopping	2480	2483.5	0.745	-61.55	-19.255	Pass
3DH5-Hopping	2480	2500	0.745	-61.34	-19.255	Pass

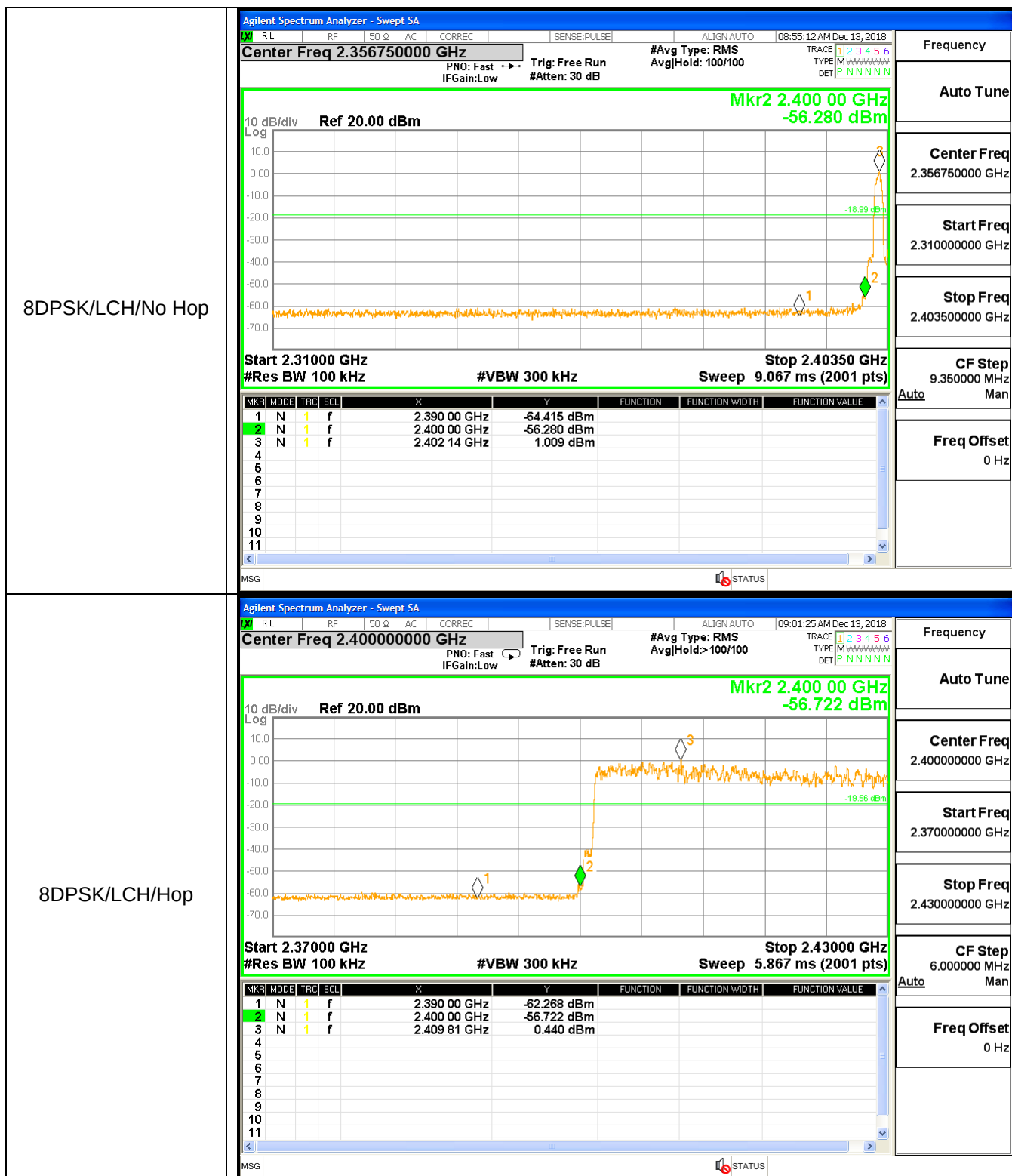
Test Graph



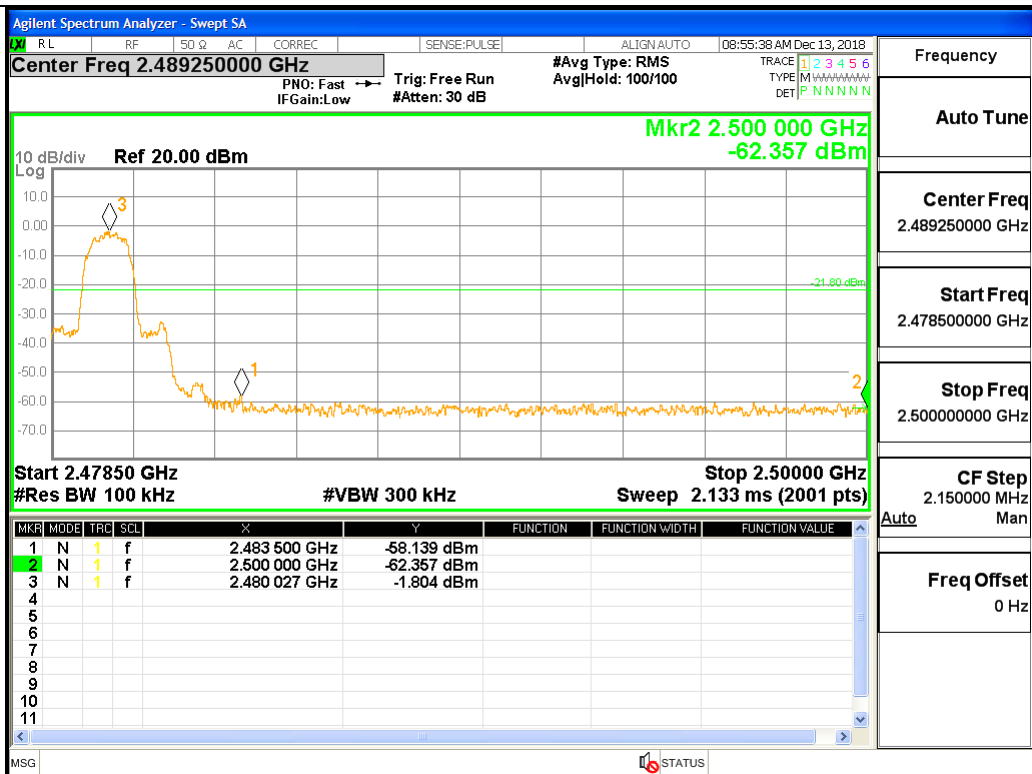




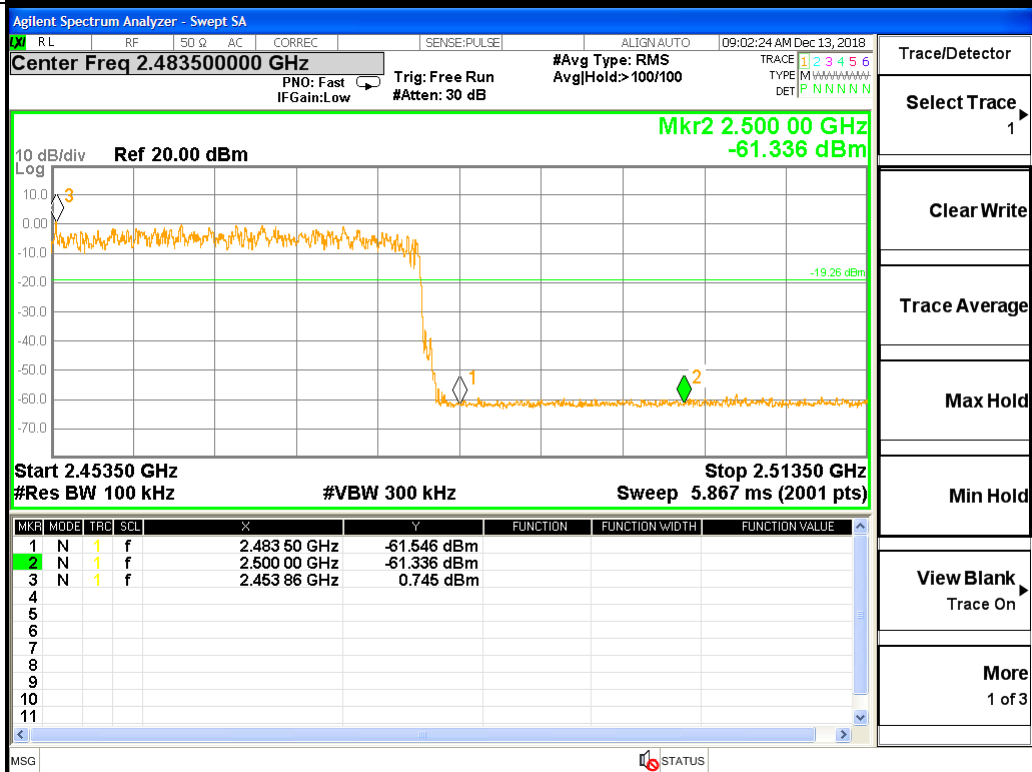




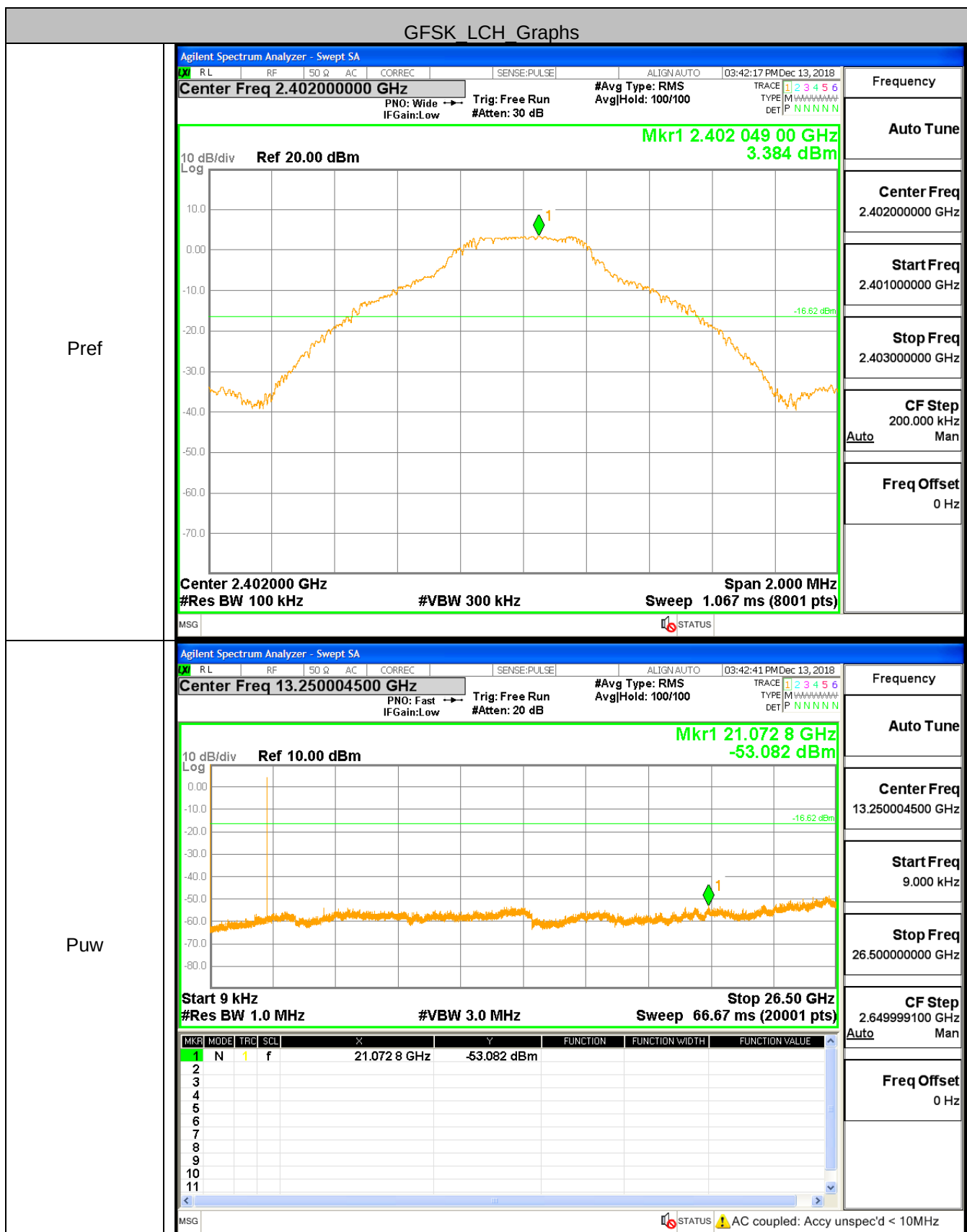
8DPSK/HCH/No Hop

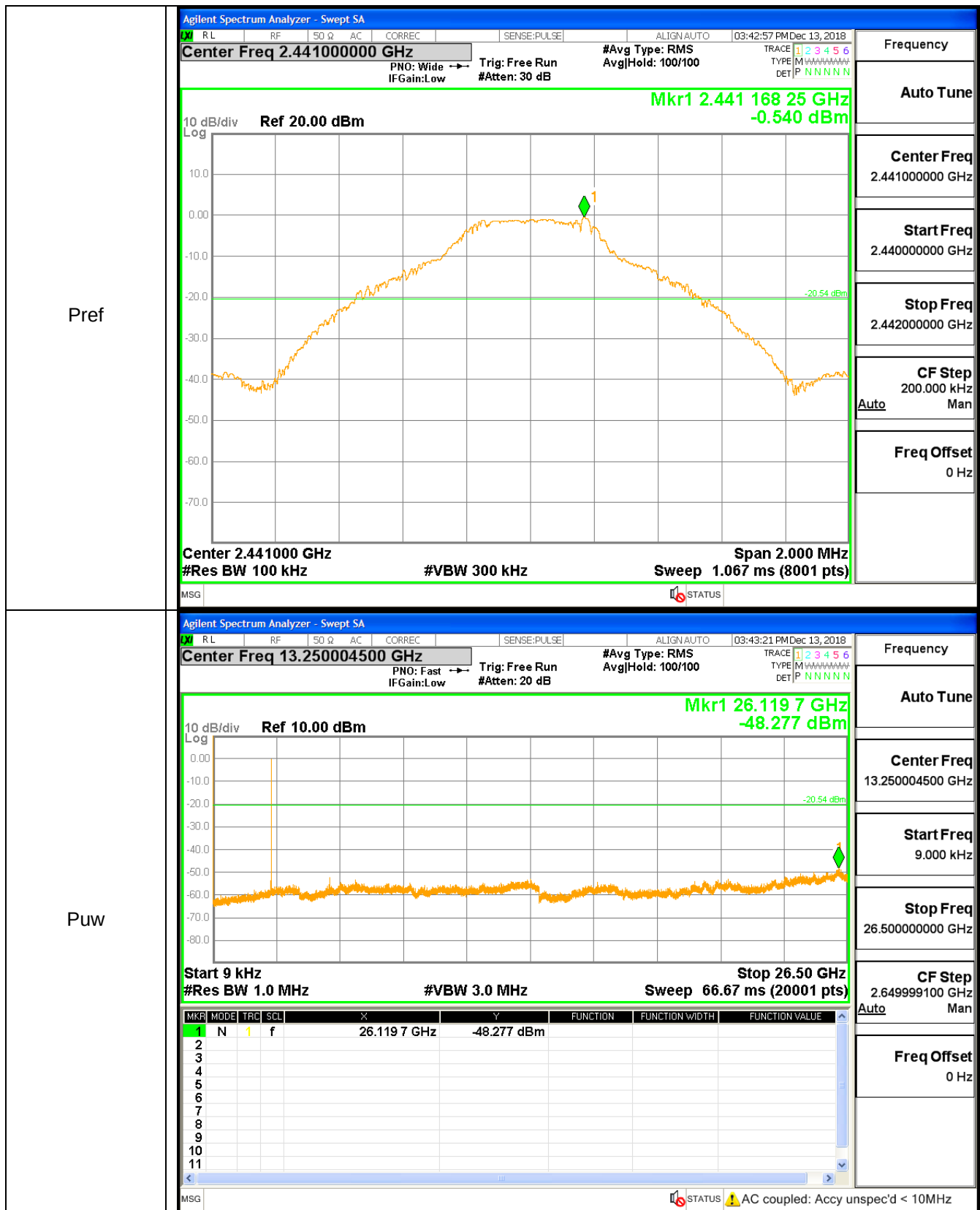


8DPSK/HCH/Hop



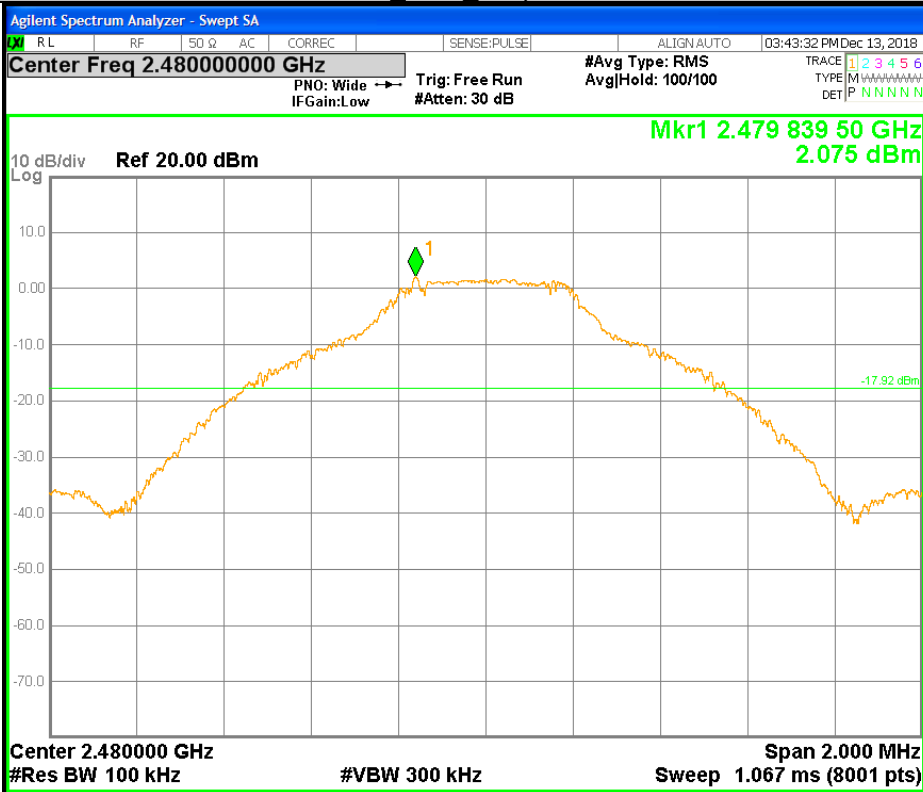
A.7 RF Conducted Spurious Emissions Test Graph



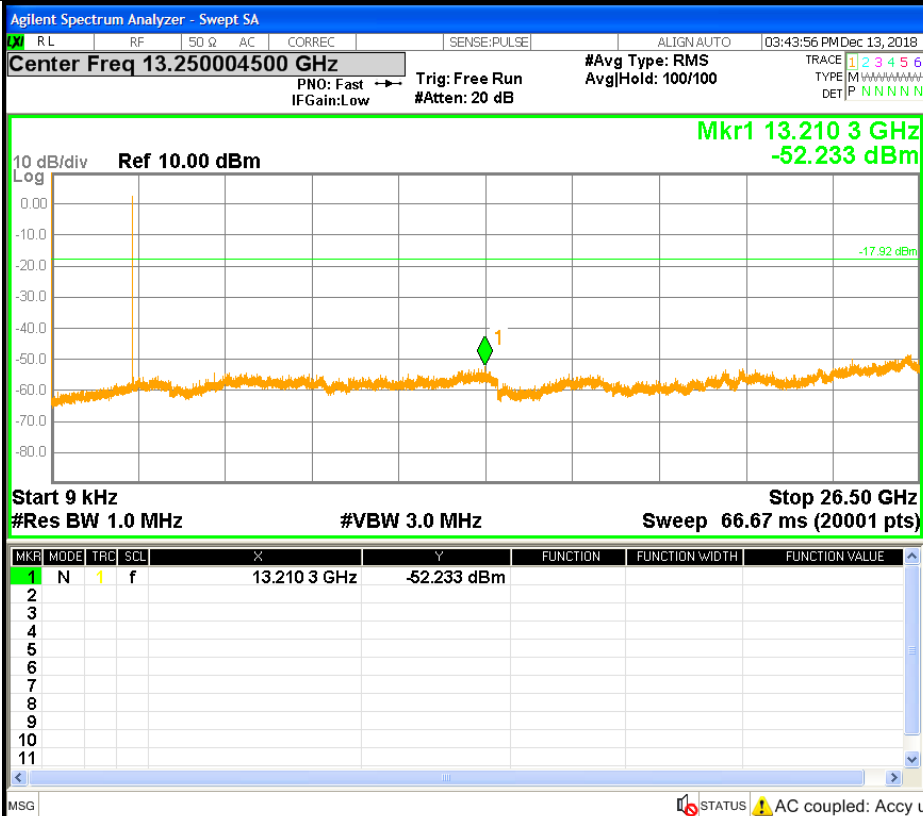


GFSK HCH Graphs

Pref

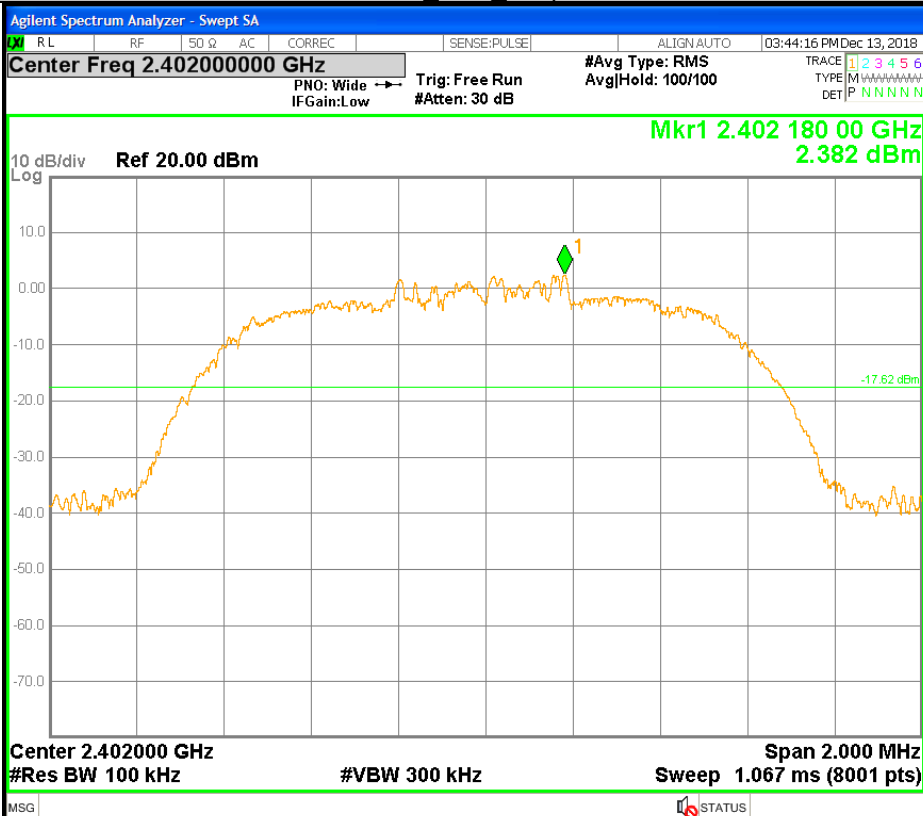


Puw



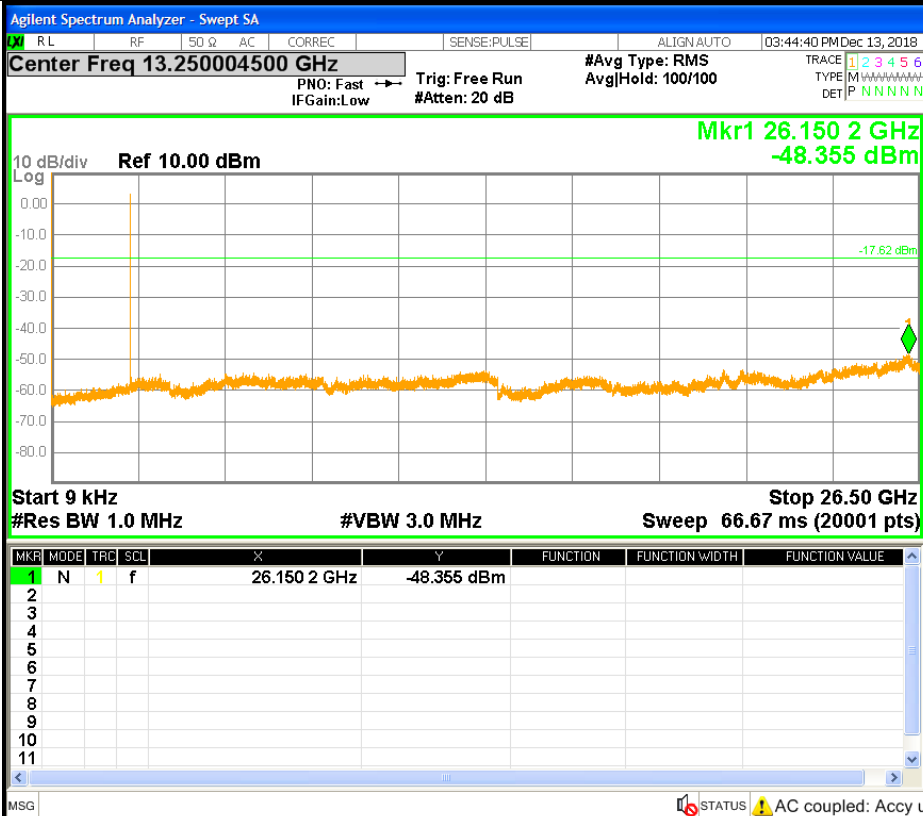
$\pi/4$ DQPSK LCH Graphs

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

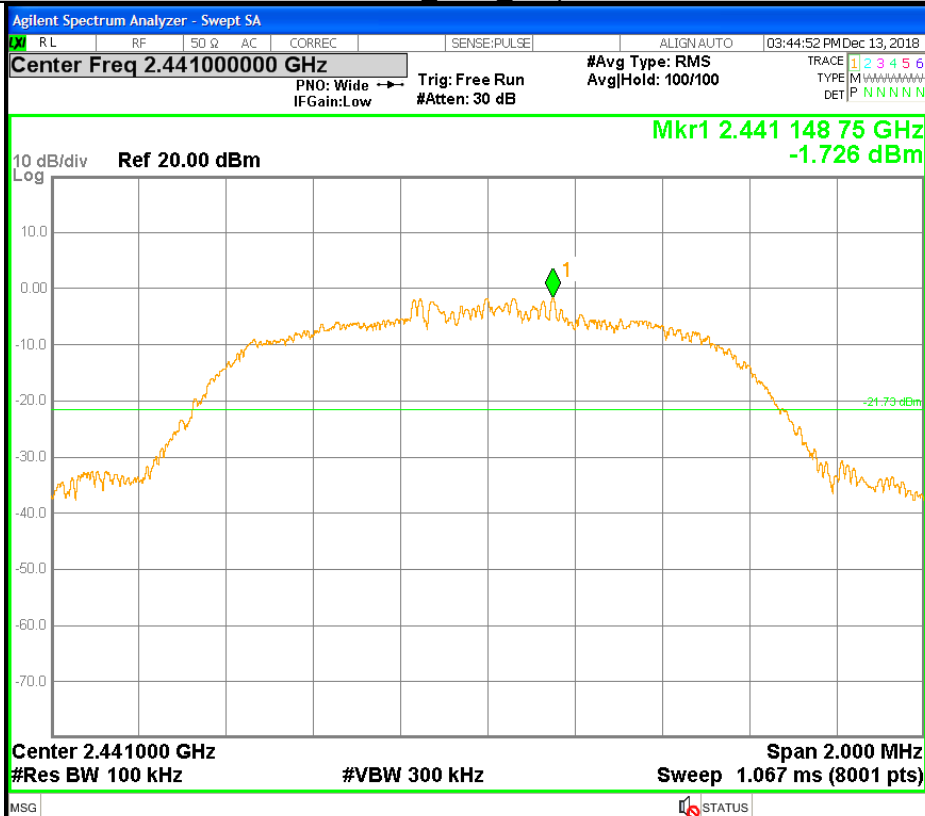
Puw



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

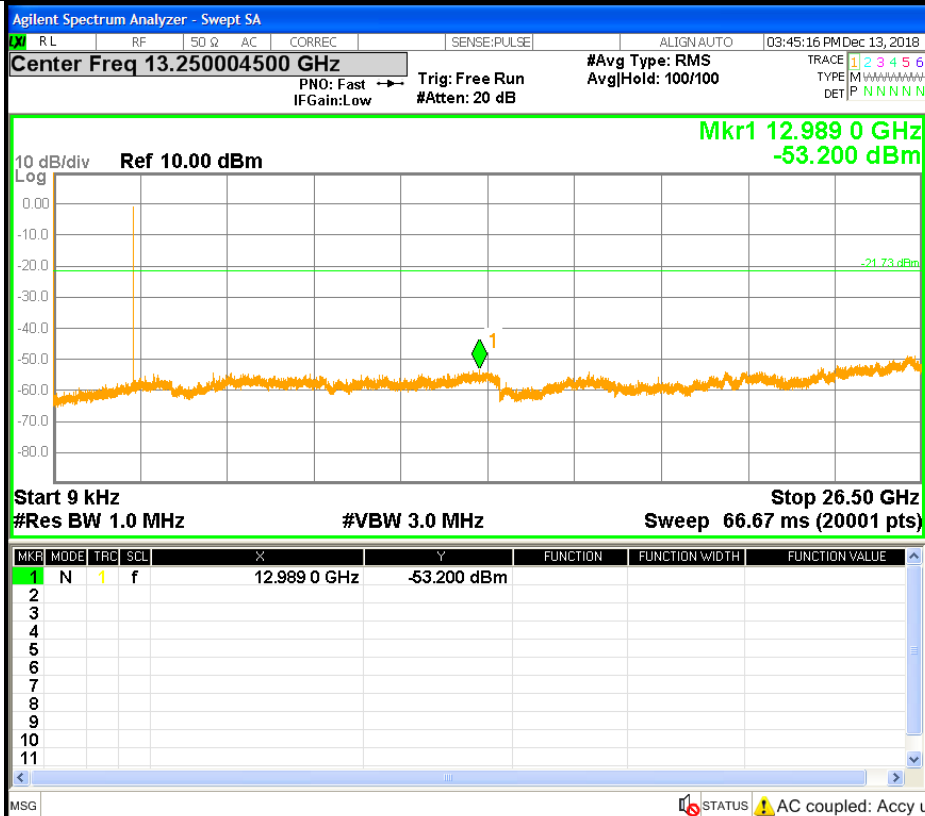
$\pi/4$ DQPSK MCH Graphs

Pref



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

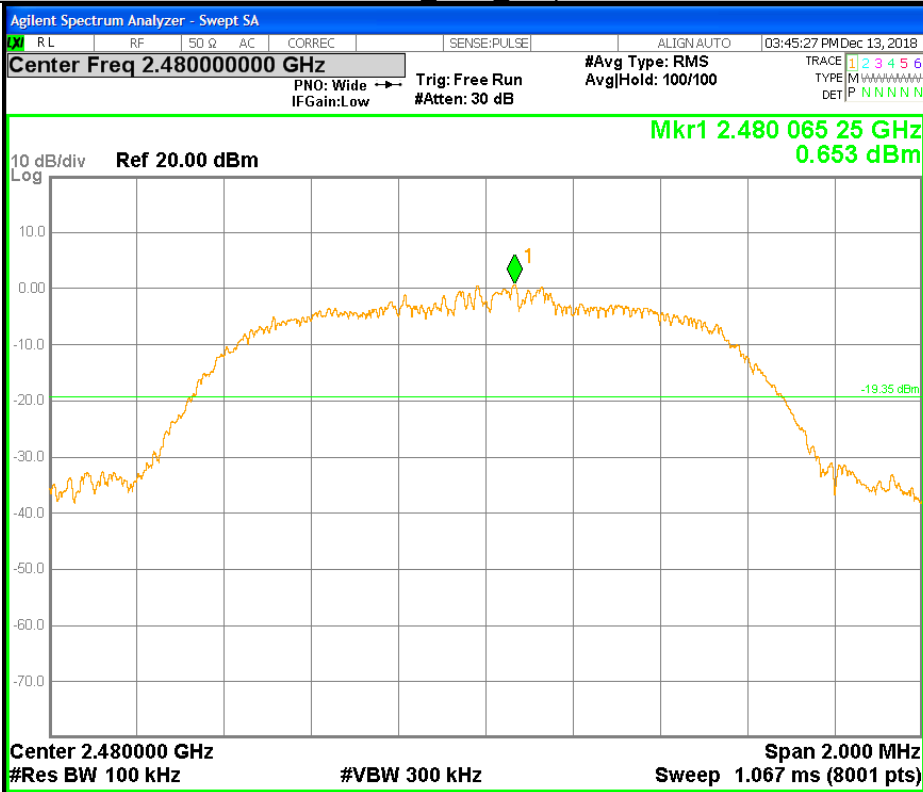
Puw



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

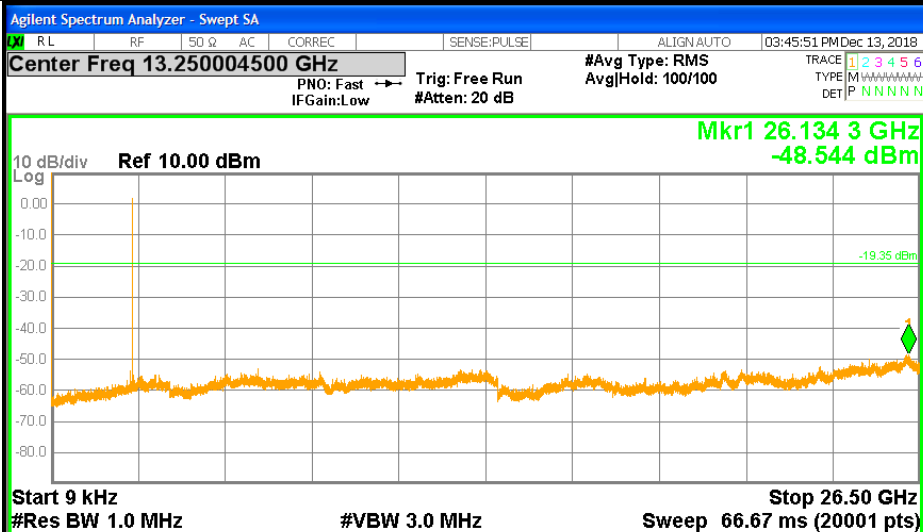
$\pi/4$ DQPSK HCH Graphs

Pref



Frequency
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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



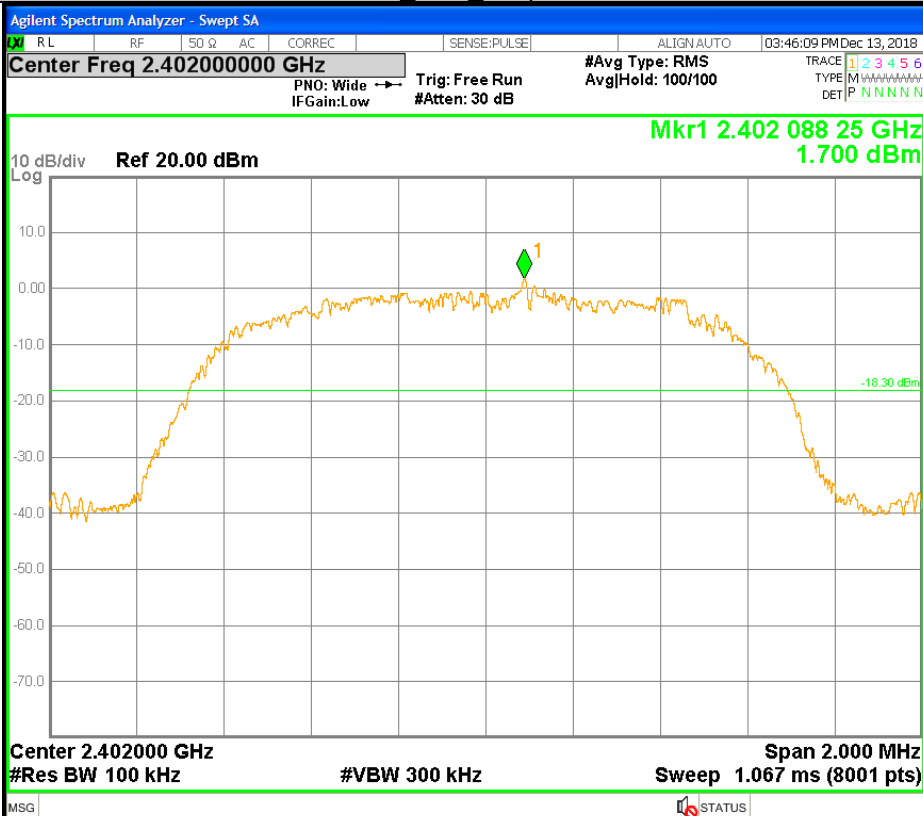
Frequency
Auto Tune
Center Freq 13.250004500 GHz
Start Freq 9.000 kHz
Stop Freq 26.500000000 GHz
CF Step 2.649999100 GHz Auto Man
Freq Offset 0 Hz

MR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	26.134 3 GHz	-48.544 dBm			
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								

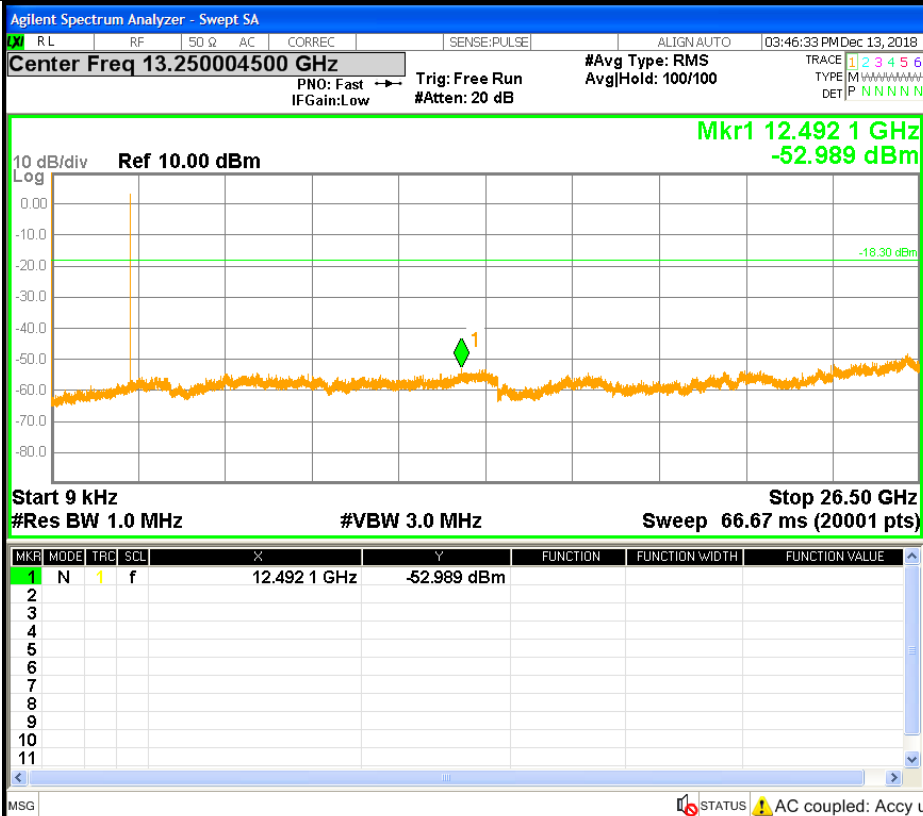
MSG STATUS AC coupled: Accy unspec'd < 10MHz

8DPSK LCH Graphs

Pref

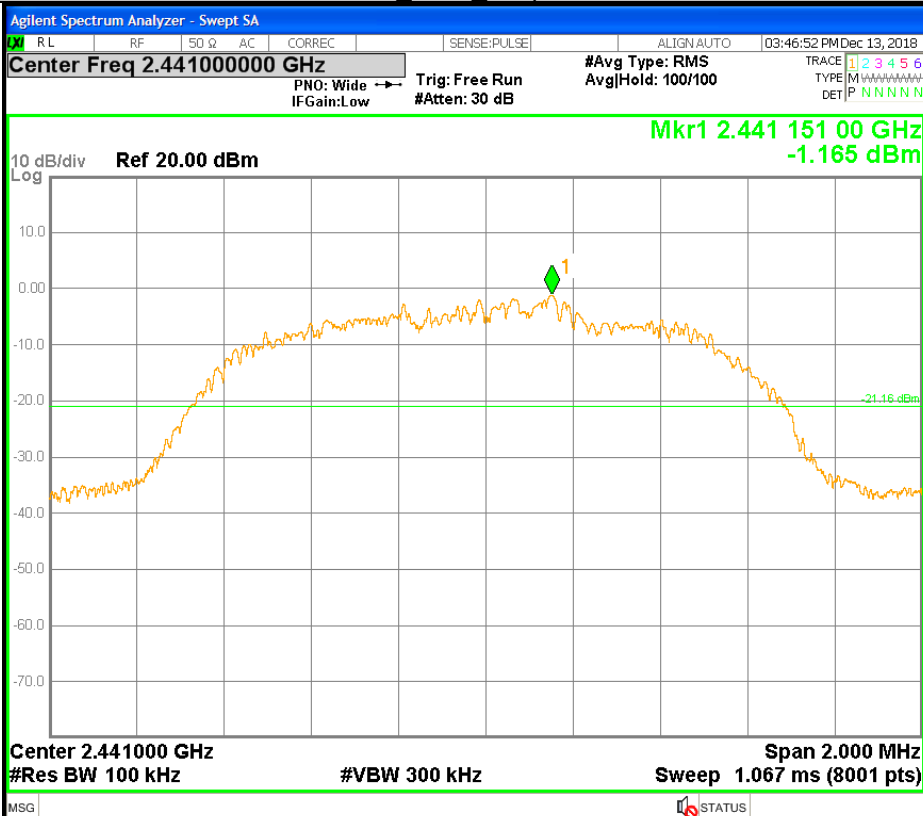


Puw

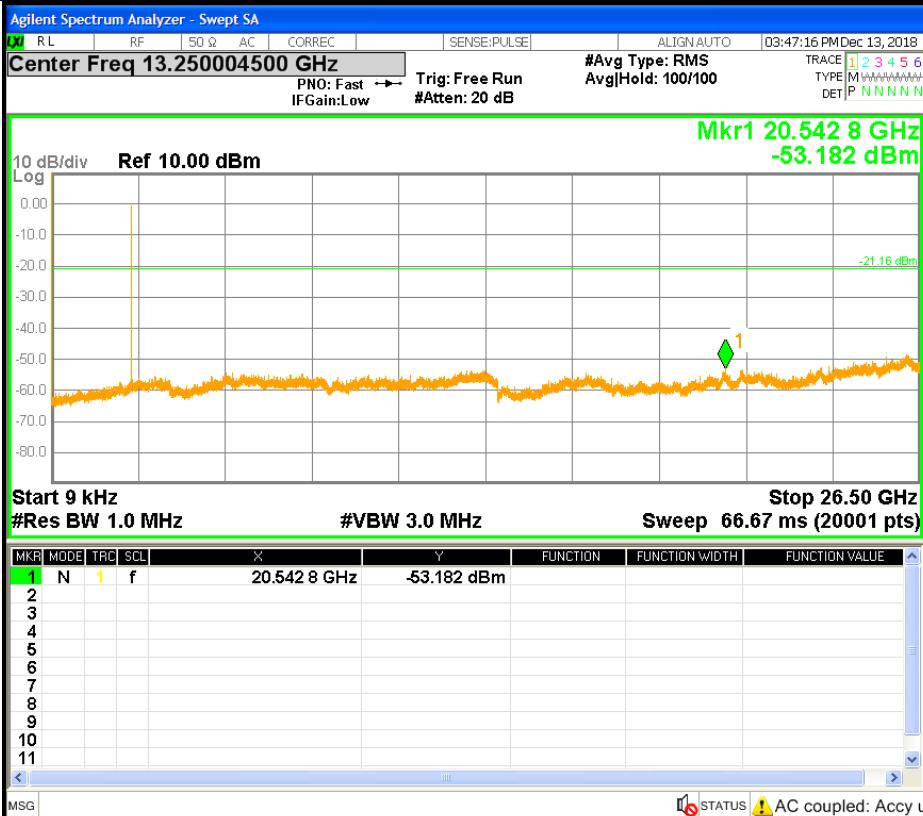


8DPSK MCH Graphs

Pref

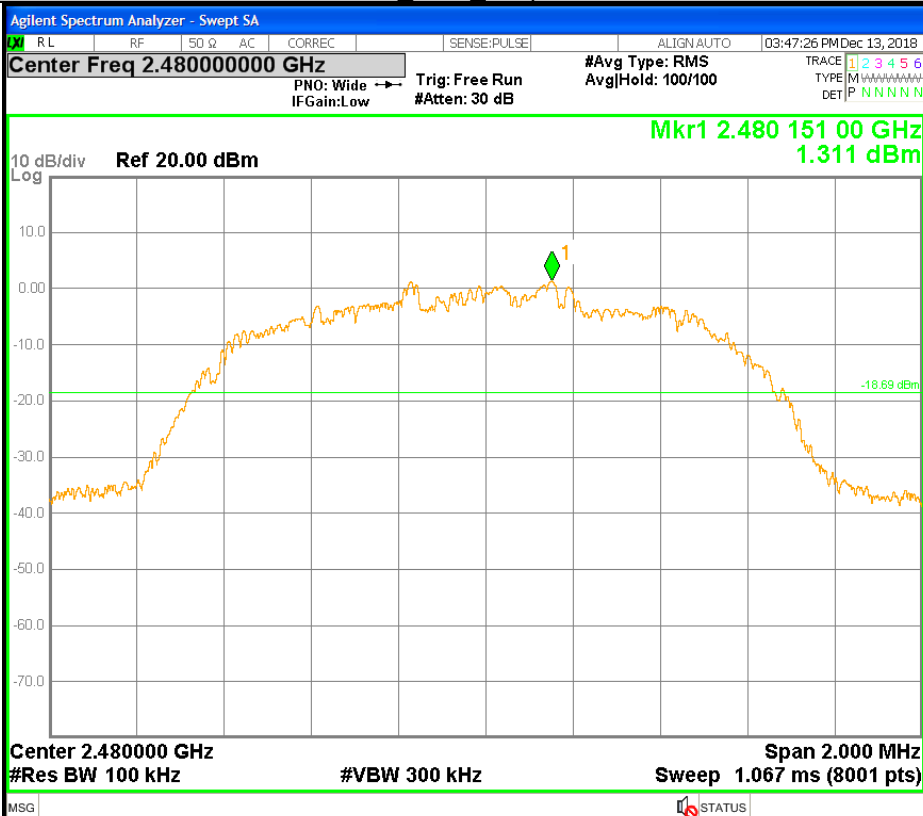


Puw

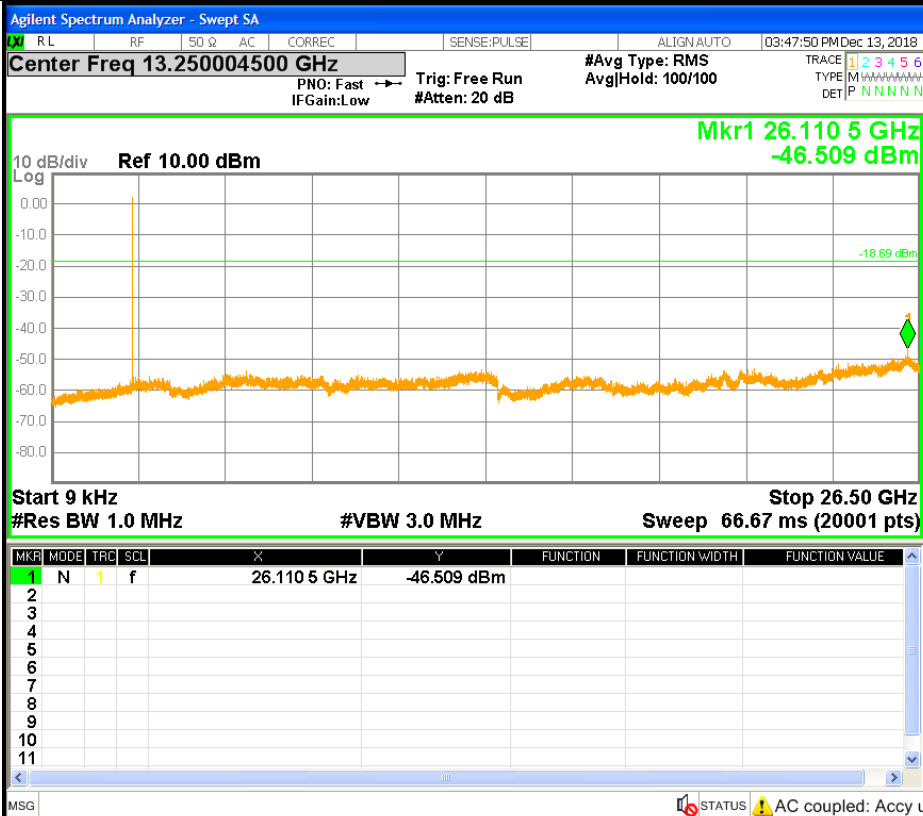


8DPSK HCH Graphs

Pref



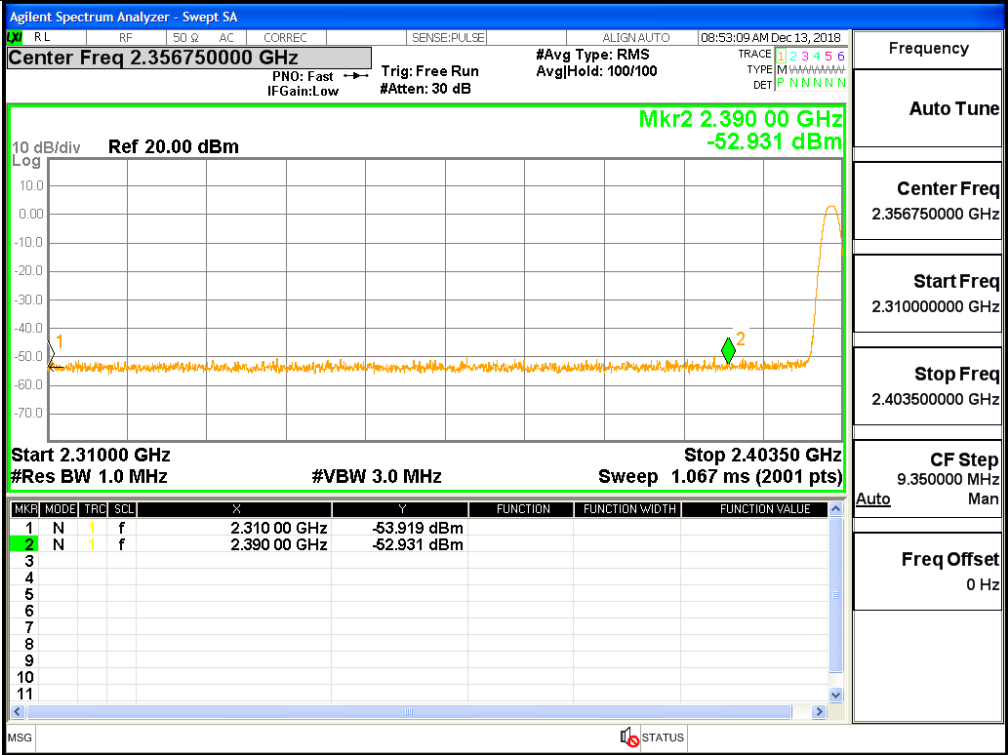
Puw



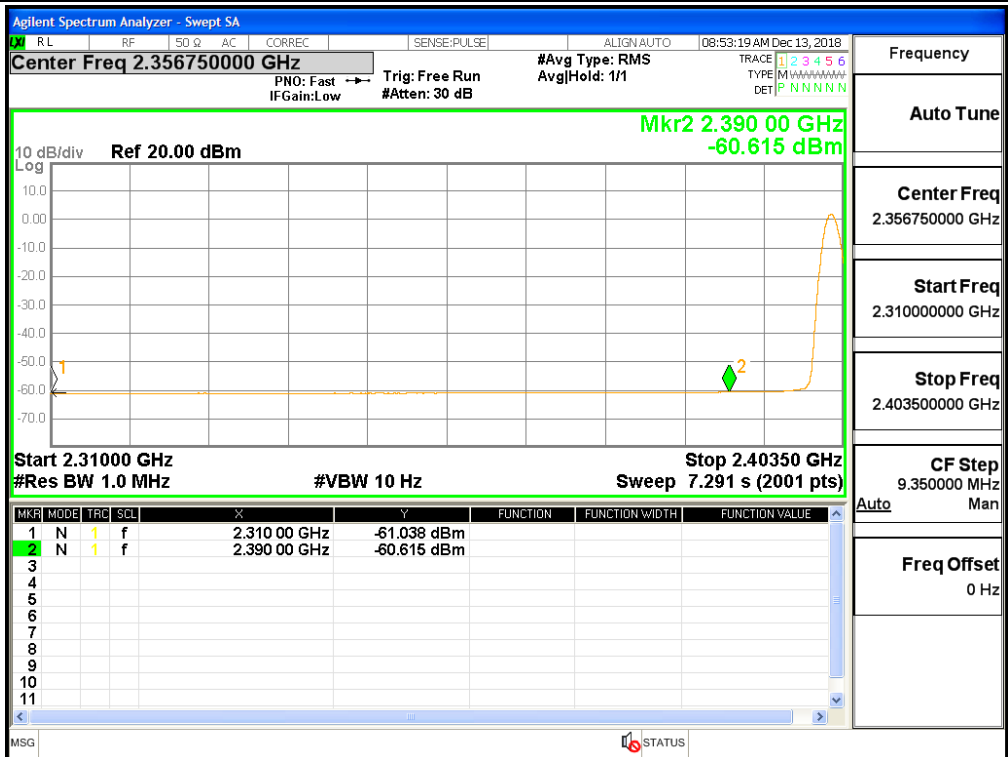
A.8 Restrict-band band-edge measurements

Type	Carrier Frequency (MHz)	Frequency(MHz)	Gain	Ground Factor	Peak Value(dBm)	E [dBuV/m]	Limit [dBuV/m]	Average Value(dBm)	E [dBuV/m]	Limit [dBuV/m]	Conclusion
1DH5	2402	2310	2.00	0.00	-53.92	43.28	74	-61.04	36.16	54	Pass
1DH5	2402	2390	2.00	0.00	-52.93	44.27	74	-60.62	36.58	54	Pass
1DH5	2480	2483.5	2.00	0.00	-50.26	46.94	74	-57.4	39.8	54	Pass
1DH5	2480	2500	2.00	0.00	-53.35	43.85	74	-60.23	36.97	54	Pass
2DH5	2402	2310	2.00	0.00	-53.94	43.26	74	-61.02	36.18	54	Pass
2DH5	2402	2390	2.00	0.00	-54.9	42.3	74	-60.59	36.61	54	Pass
2DH5	2480	2483.5	2.00	0.00	-51.62	45.58	74	-56.47	40.73	54	Pass
2DH5	2480	2500	2.00	0.00	-53.1	44.1	74	-60.22	36.98	54	Pass
3DH5	2402	2310	2.00	0.00	-53.35	43.85	74	-61.03	36.17	54	Pass
3DH5	2402	2390	2.00	0.00	-54.2	43	74	-60.6	36.6	54	Pass
3DH5	2480	2483.5	2.00	0.00	-47.49	49.71	74	-56.57	40.63	54	Pass
3DH5	2480	2500	2.00	0.00	-53.68	43.52	74	-60.22	36.98	54	Pass

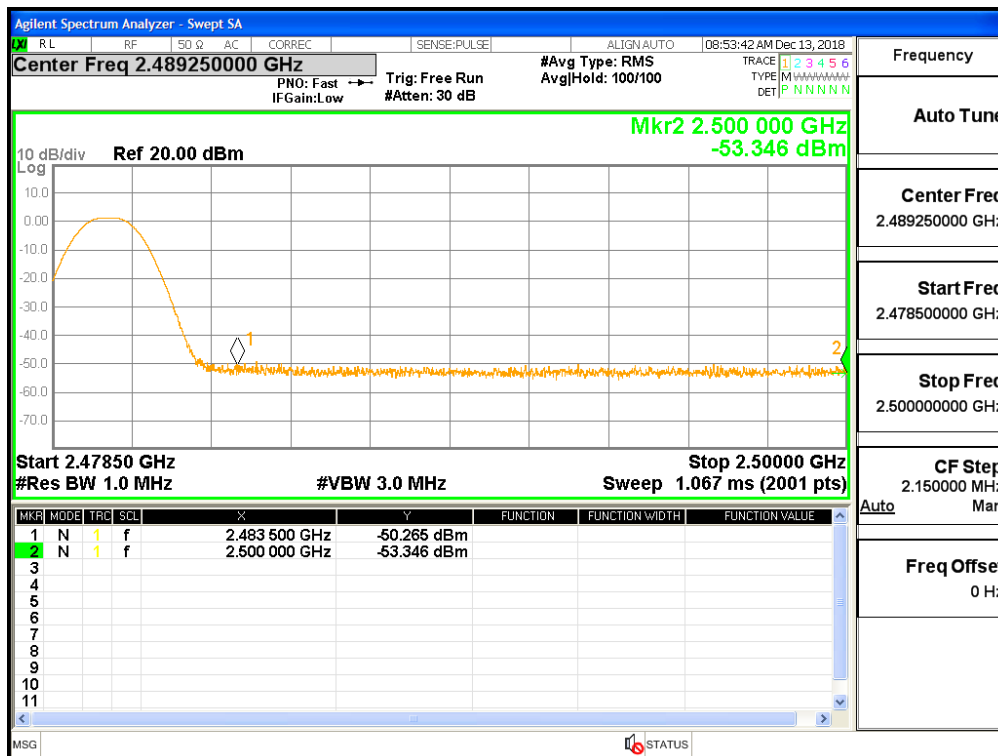
Restrict-band band-edge measurements_2402_PEAK_DH5



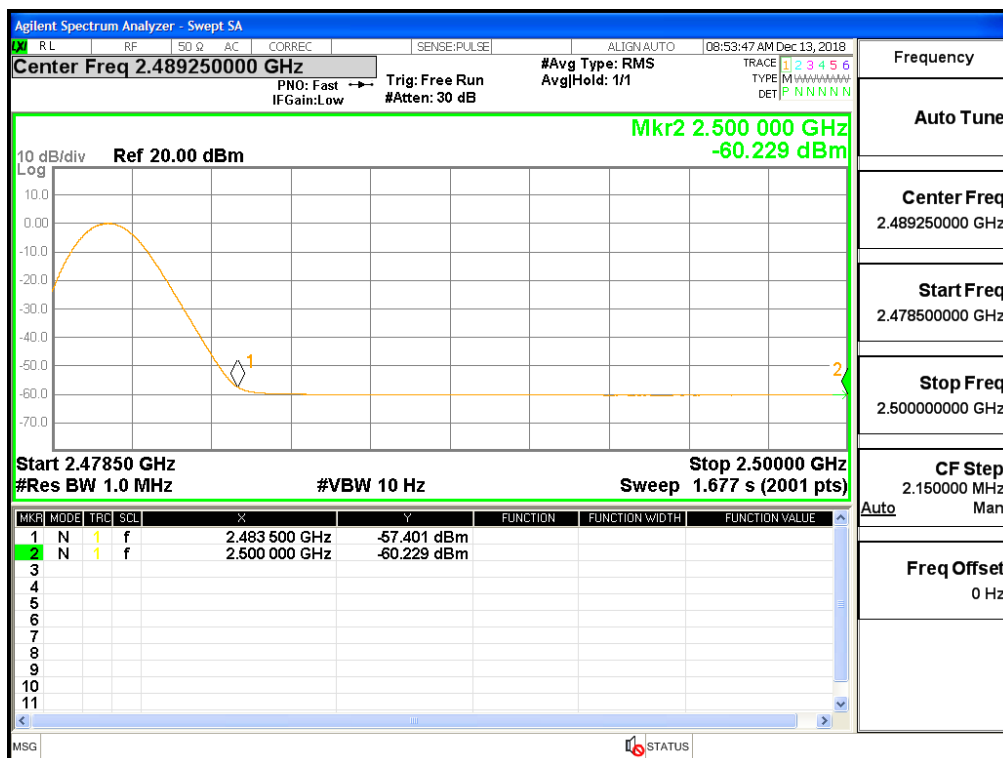
Restrict-band band-edge measurements_2402_AV_DH5



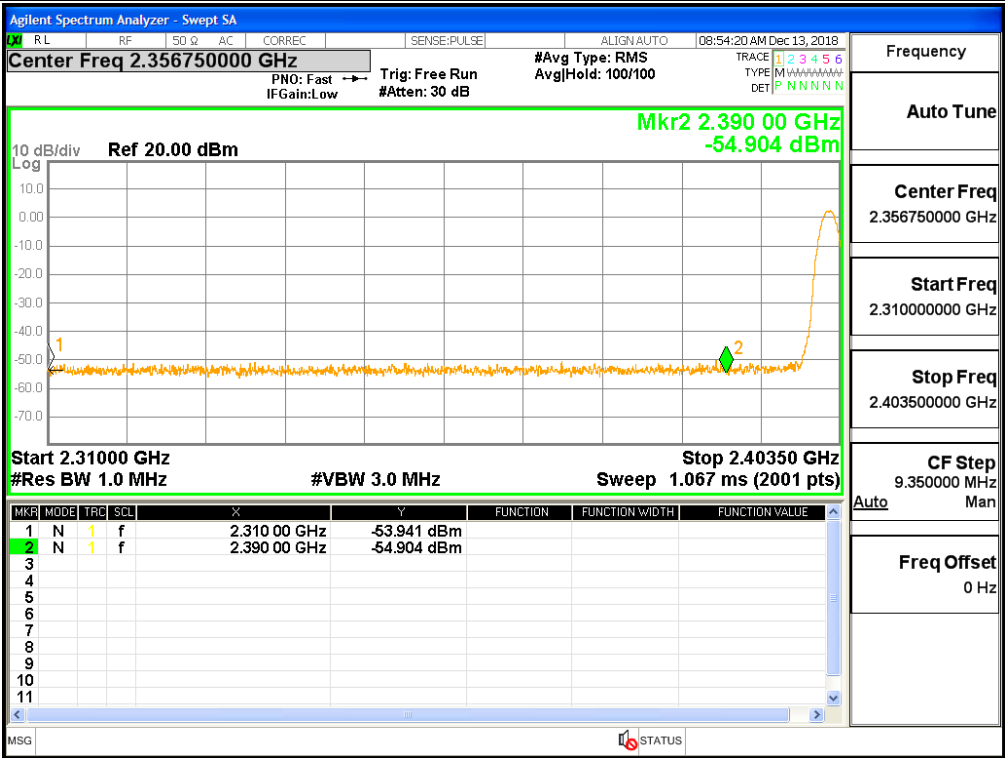
Restrict-band band-edge measurements_2480_PEAK_DH5



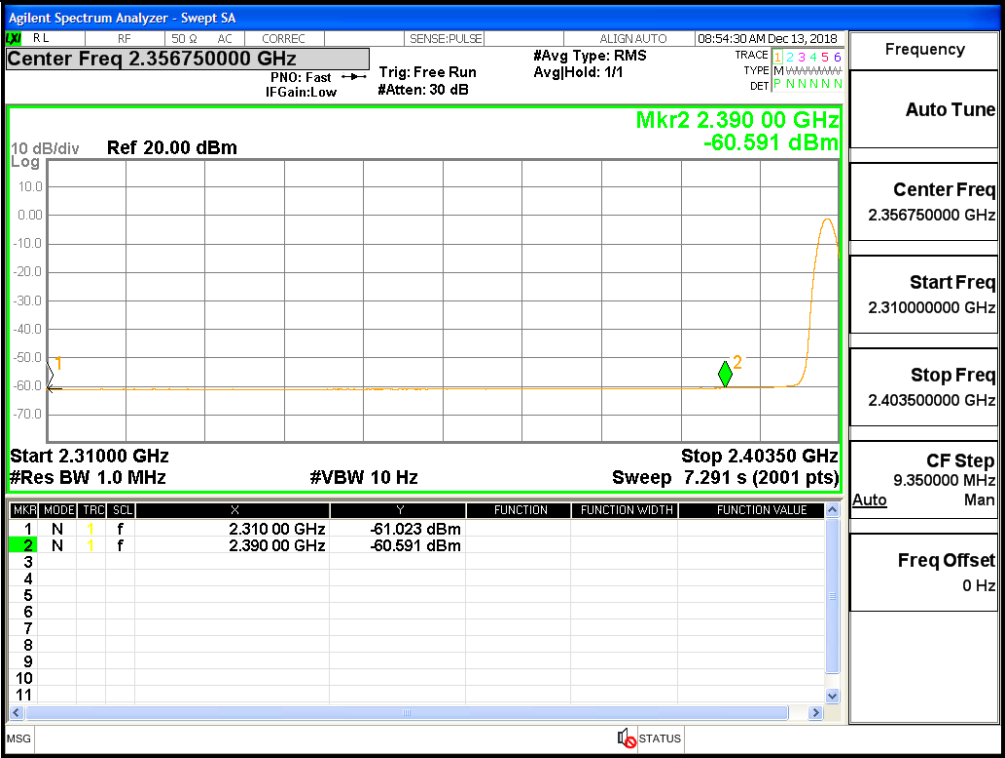
Restrict-band band-edge measurements_2480_AV_DH5



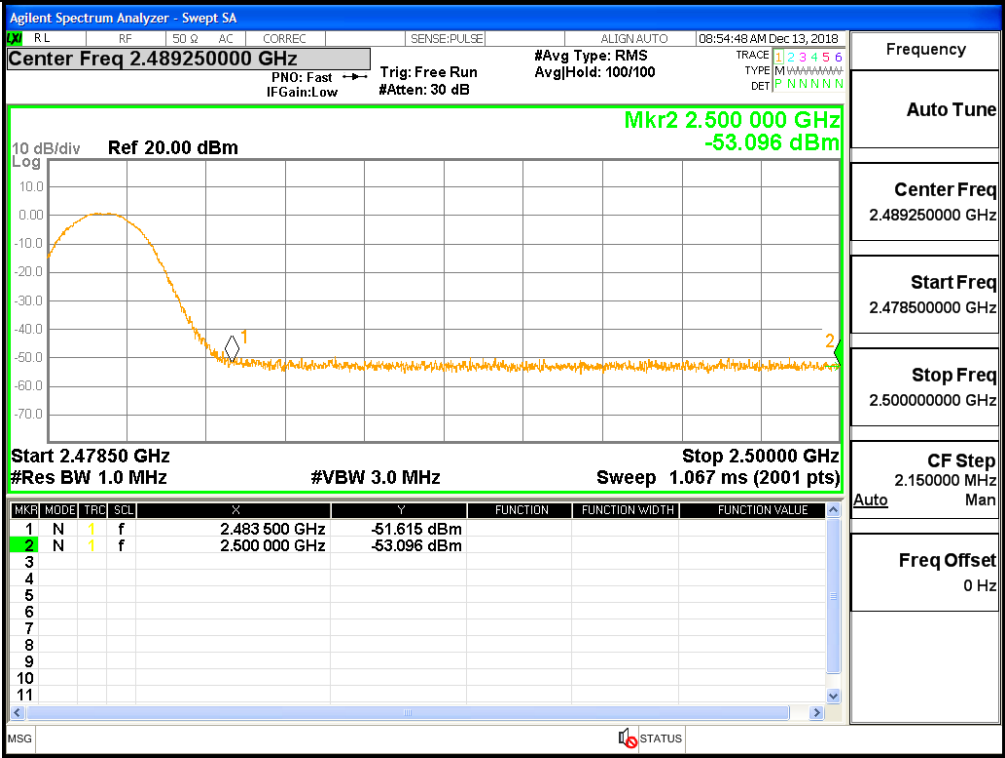
Restrict-band band-edge measurements_2402_PEAK_2DH5



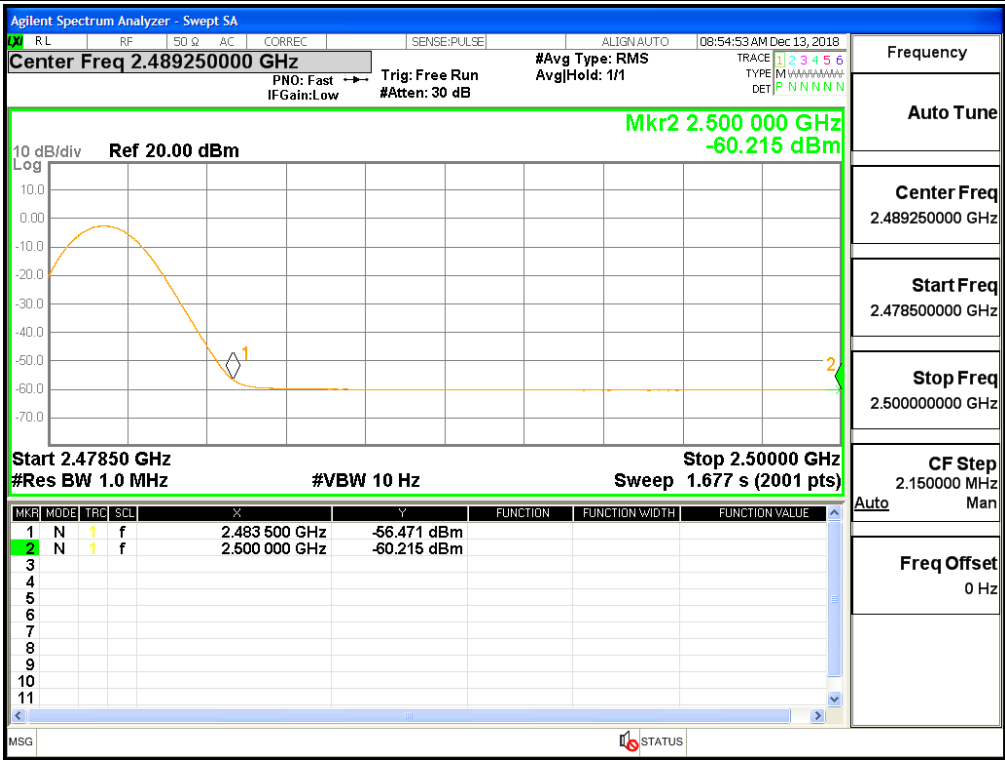
Restrict-band band-edge measurements_2402_AV_2DH5



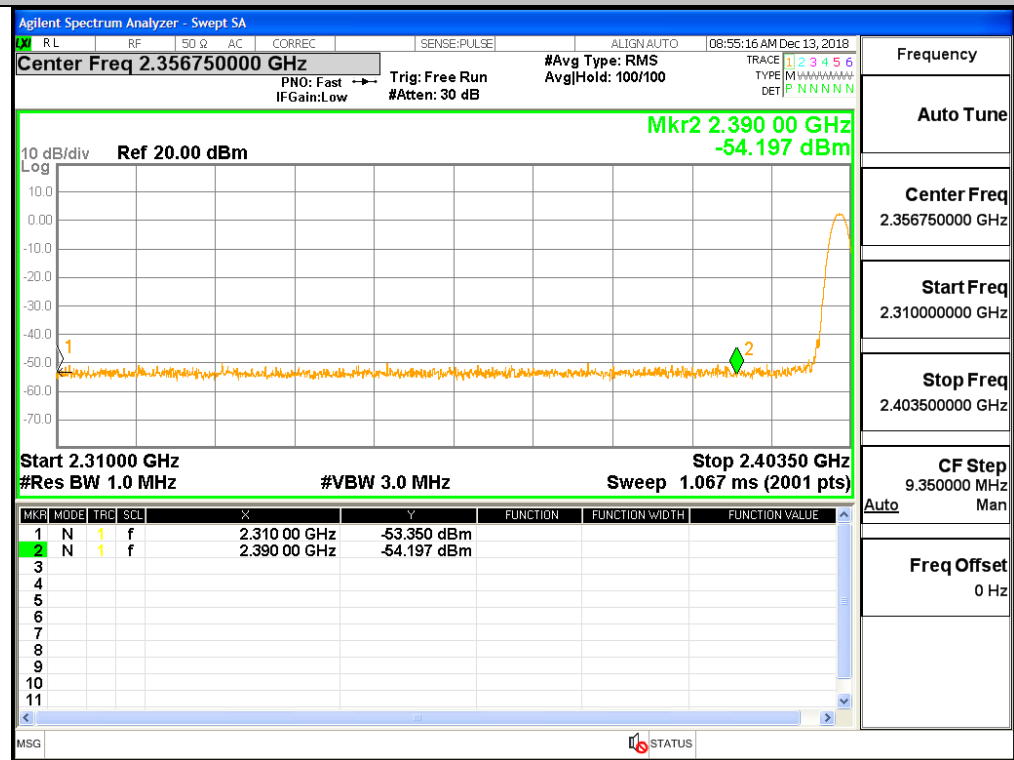
Restrict-band band-edge measurements_2480_PEAK_2DH5



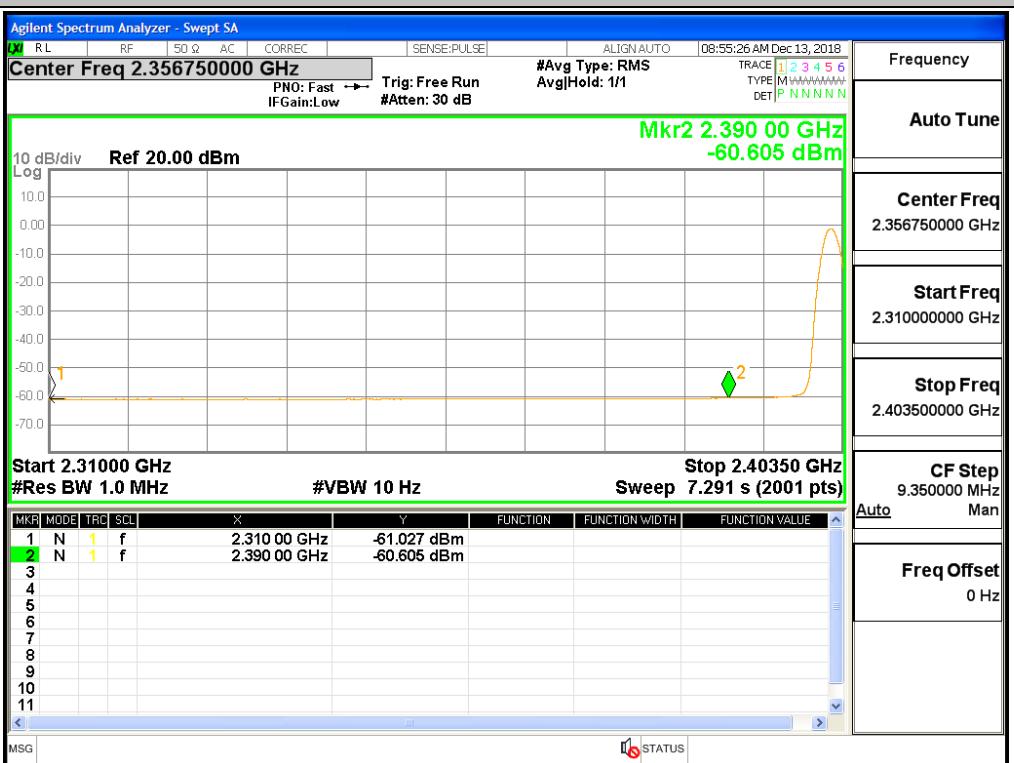
Restrict-band band-edge measurements_2480_AV_2DH5



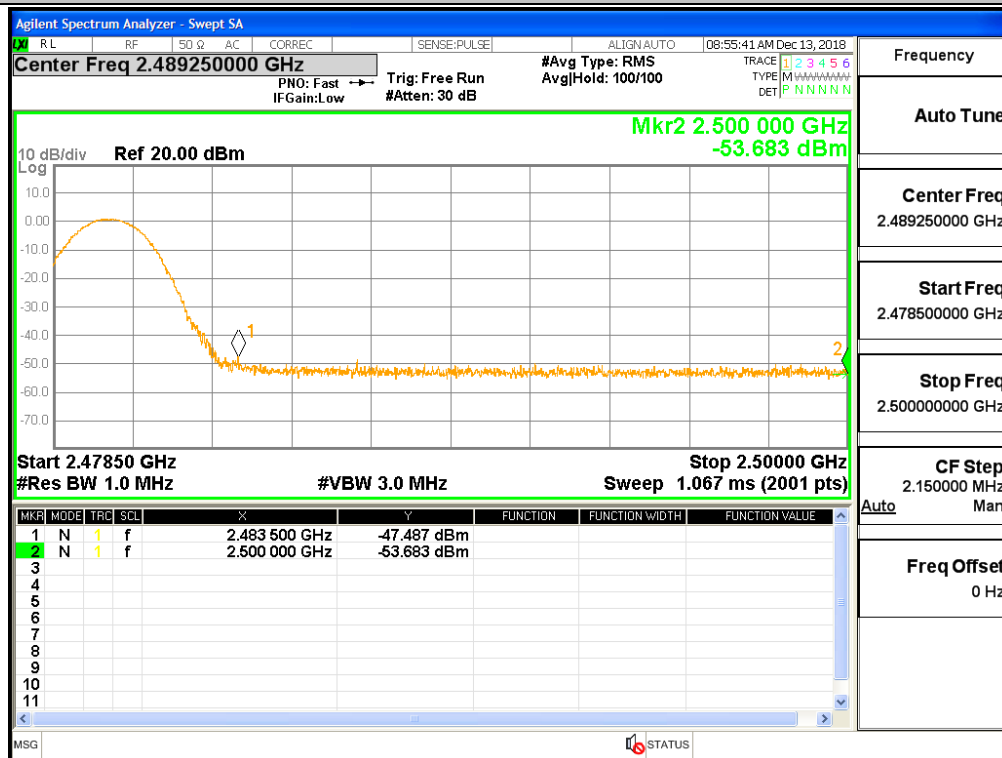
Restrict-band band-edge measurements_2402_PEAK_3DH5



Restrict-band band-edge measurements_2402_AV_3DH5



Restrict-band band-edge measurements_2480_PEAK_3DH5



Restrict-band band-edge measurements_2480_AV_3DH5

