

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

Product Name: X-boy

Trade Mark: /

Test Model: XS03

FCC ID: 2AIZN-XS03

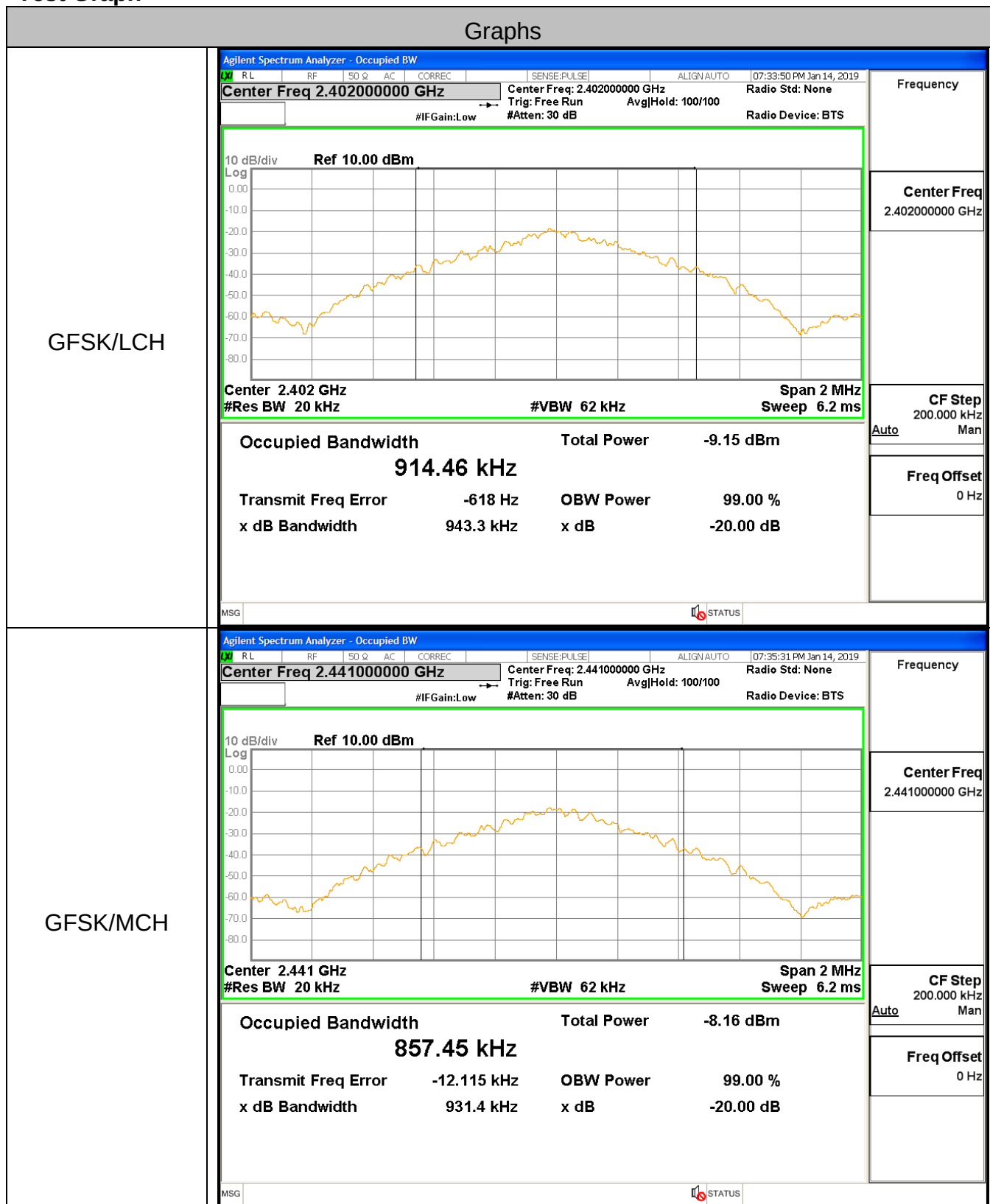
Environmental Conditions

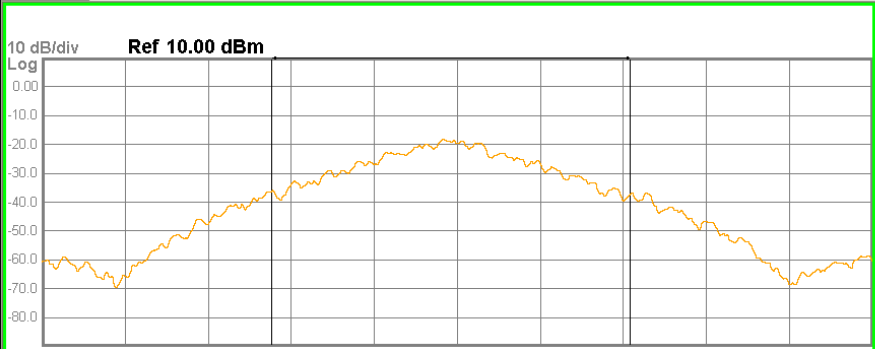
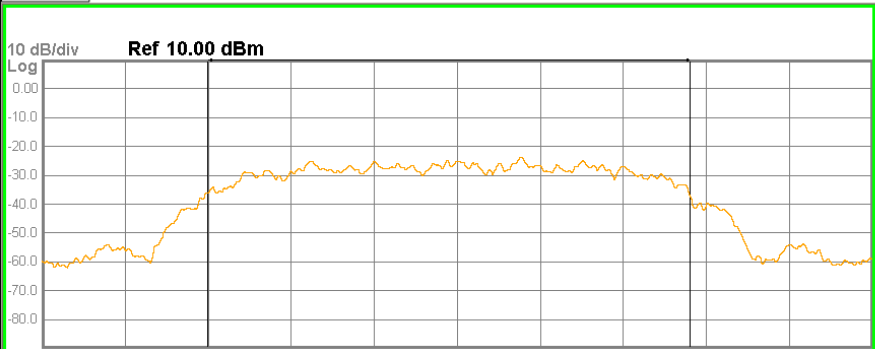
Temperature:	22.5 ° C
Relative Humidity:	55.6%
ATM Pressure:	100.0 kPa
Test Engineer:	Gary Qian
Supervised by:	Eden Hu

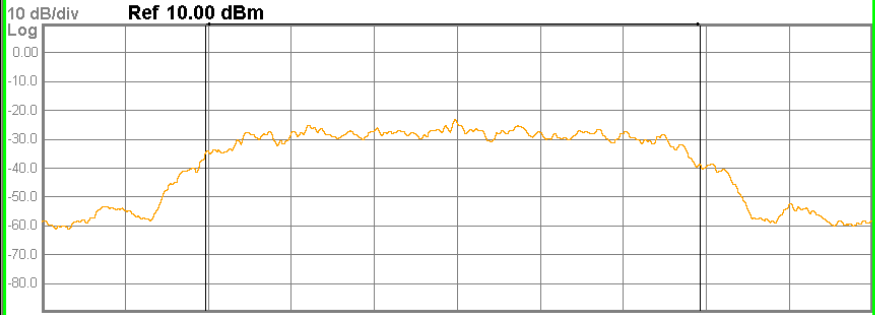
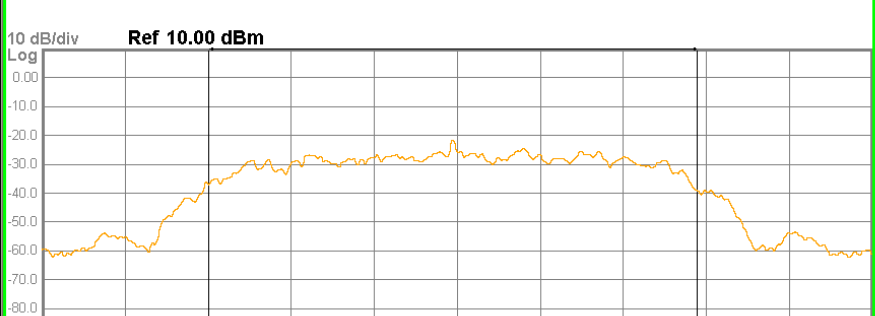
A.1 20 dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit(MHz)	Verdict
GFSK	LCH	0.943	Not Specified	PASS
GFSK	MCH	0.931	Not Specified	PASS
GFSK	HCH	0.936	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.329	Not Specified	PASS
$\pi/4$ DQPSK	MCH	1.328	Not Specified	PASS
$\pi/4$ DQPSK	HCH	1.265	Not Specified	PASS

Test Graph



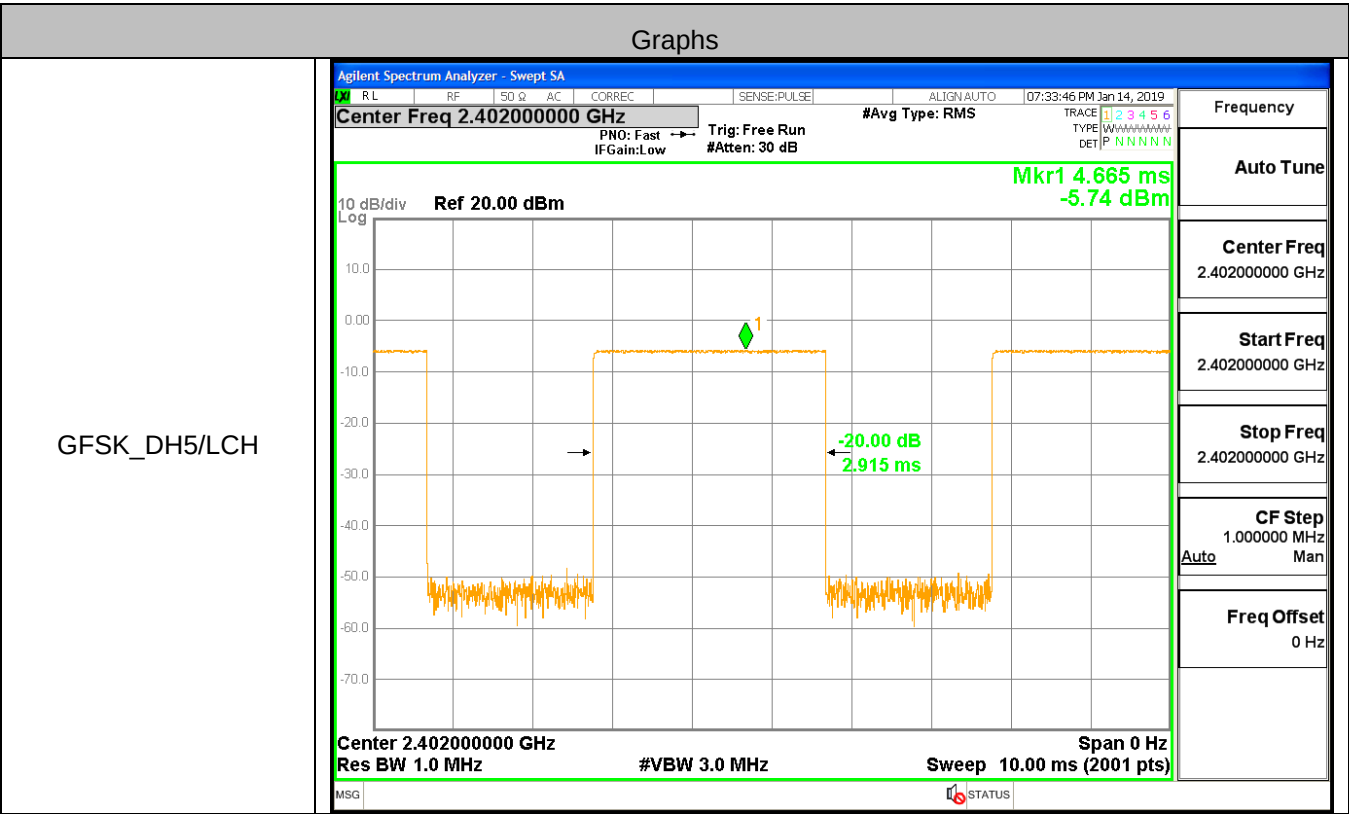
GFSK/HCH	Agilent Spectrum Analyzer - Occupied BW Center Freq 2.480000000 GHz #IFGain:Low Center Freq: 2.480000000 GHz Trig: Free Run #Atten: 30 dB ALIGN AUTO 07:36:52 PM Jan 14, 2019 Radio Std: None Radio Device: BTS 10 dB/div Ref 10.00 dBm  Center 2.48 GHz #Res BW 20 kHz #VBW 62 kHz Span 2 MHz Sweep 6.2 ms Occupied Bandwidth 861.02 kHz Total Power -8.44 dBm Transmit Freq Error -15.219 kHz OBW Power 99.00 % x dB Bandwidth 935.5 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
π /4DQPSK/LCH	Agilent Spectrum Analyzer - Occupied BW Center Freq 2.402000000 GHz #IFGain:Low Center Freq: 2.402000000 GHz Trig: Free Run #Atten: 30 dB ALIGN AUTO 07:38:38 PM Jan 14, 2019 Radio Std: None Radio Device: BTS 10 dB/div Ref 10.00 dBm  Center 2.402 GHz #Res BW 20 kHz #VBW 62 kHz Span 2 MHz Sweep 6.2 ms Occupied Bandwidth 1.1586 MHz Total Power -10.6 dBm Transmit Freq Error -18.875 kHz OBW Power 99.00 % x dB Bandwidth 1.329 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

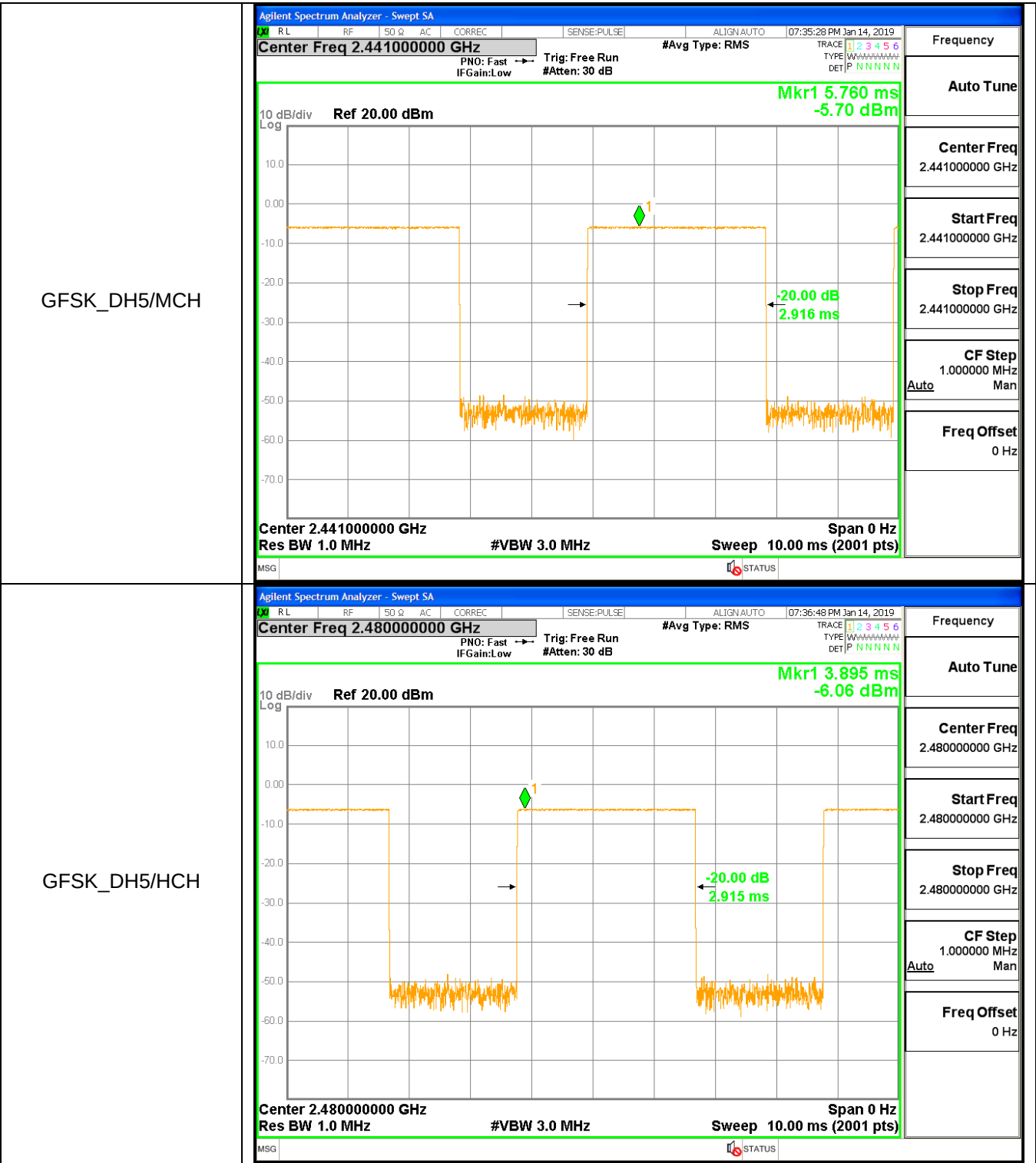
π/4DQPSK/MCH	Agilent Spectrum Analyzer - Occupied BW Center Freq 2.441000000 GHz Center Freq: 2.441000000 GHz Trig: Free Run Avg/Hold: 100/100 Radio Std: None Radio Device: BTS 10 dB/div Ref 10.00 dBm  Center 2.441 GHz #Res BW 20 kHz #VBW 62 kHz Span 2 MHz Sweep 6.2 ms Occupied Bandwidth 1.1910 MHz Total Power -10.9 dBm Transmit Freq Error -10.985 kHz OBW Power 99.00 % x dB Bandwidth 1.328 MHz x dB -20.00 dB MSG STATUS
π/4DQPSK/HCH	Agilent Spectrum Analyzer - Occupied BW Center Freq 2.480000000 GHz Center Freq: 2.480000000 GHz Trig: Free Run Avg/Hold: 100/100 Radio Std: None Radio Device: BTS 10 dB/div Ref 10.00 dBm  Center 2.48 GHz #Res BW 20 kHz #VBW 62 kHz Span 2 MHz Sweep 6.2 ms Occupied Bandwidth 1.1698 MHz Total Power -10.9 dBm Transmit Freq Error -8.824 kHz OBW Power 99.00 % x dB Bandwidth 1.265 MHz x dB -20.00 dB MSG STATUS

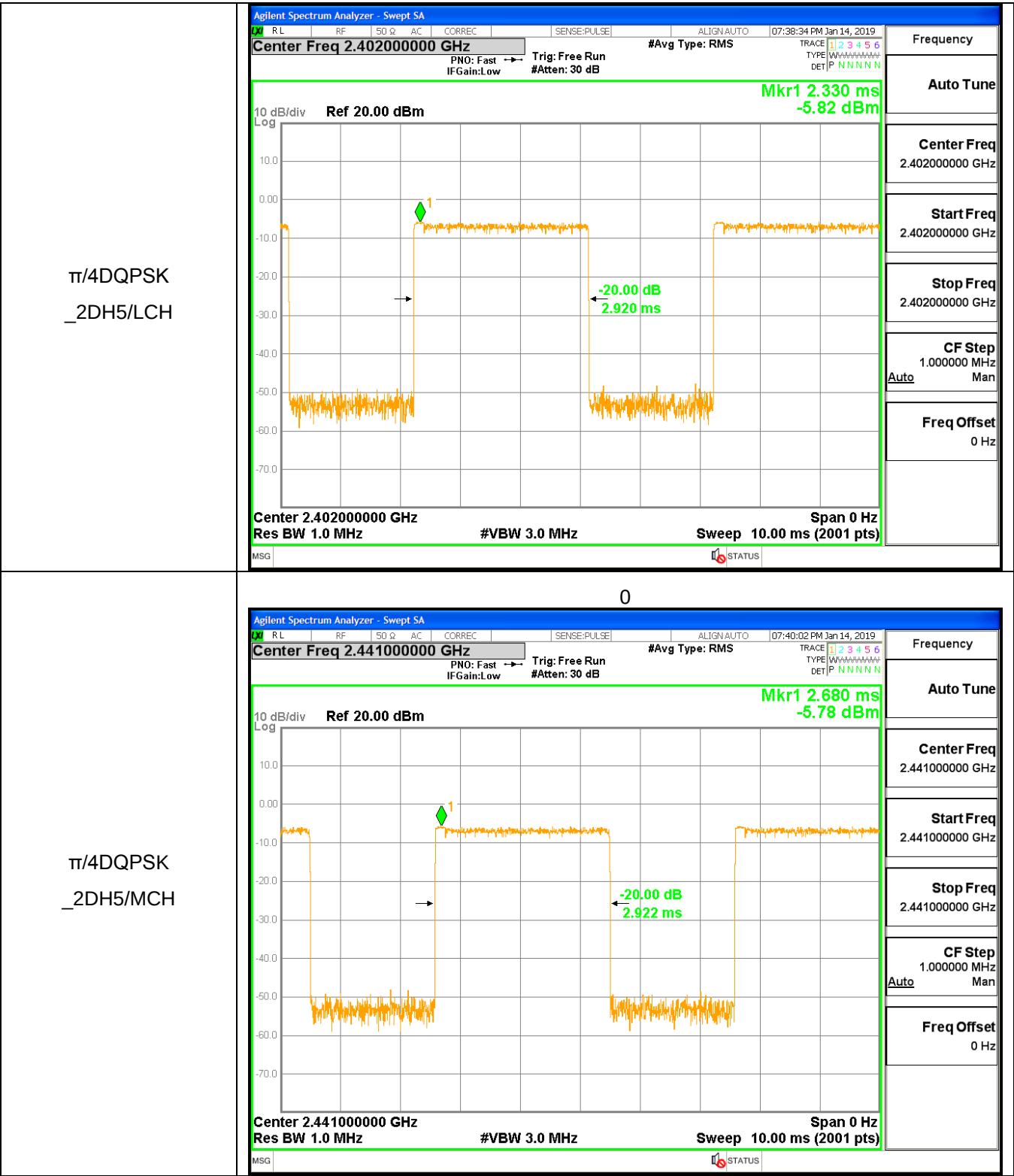
A.2 Dwell Time

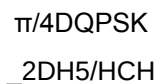
Mode	Packet	Chann el	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	0.002915316	106.7	0.311064187	0.4	PASS
GFSK	DH5	MCH	0.002916229	106.7	0.311161587	0.4	PASS
GFSK	DH5	HCH	0.002915232	106.7	0.311055206	0.4	PASS
π /4DQPSK	2DH5	LCH	0.002920208	106.7	0.311586176	0.4	PASS
π /4DQPSK	2DH5	MCH	0.002922225	106.7	0.311801373	0.4	PASS
π /4DQPSK	2DH5	HCH	0.002919949	106.7	0.311558594	0.4	PASS

Test Graph





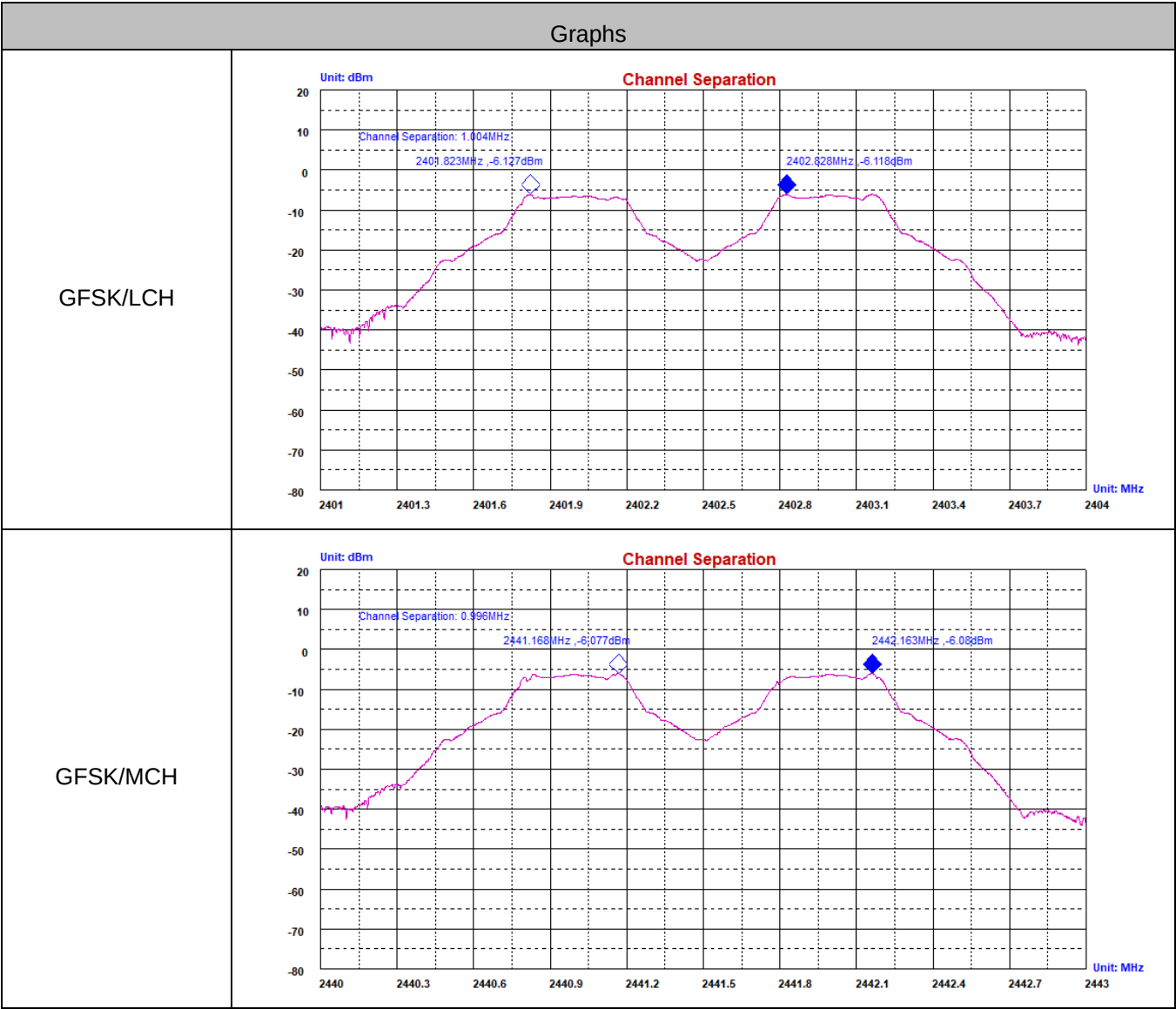


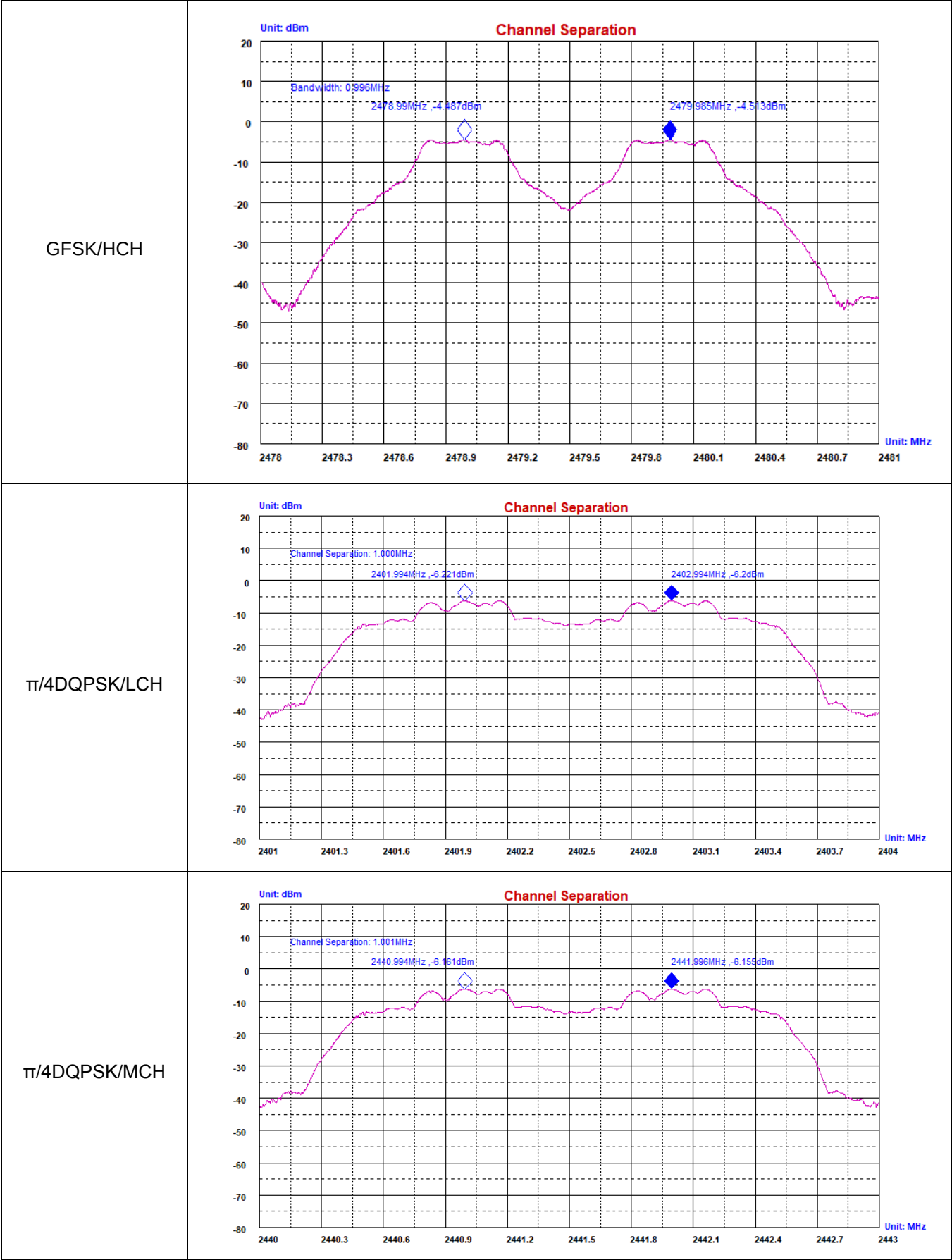


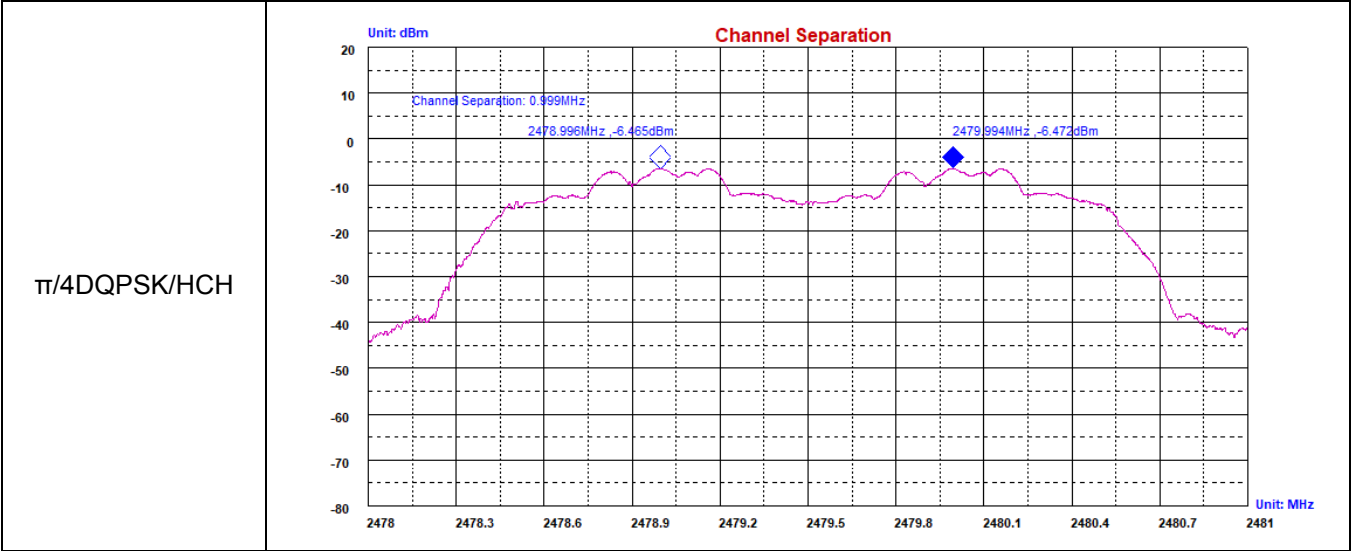
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.004	0.619	PASS
GFSK	MCH	0.996	0.613	PASS
GFSK	HCH	0.996	0.623	PASS
$\pi/4$ DQPSK	LCH	1.000	0.888	PASS
$\pi/4$ DQPSK	MCH	1.001	0.888	PASS
$\pi/4$ DQPSK	HCH	0.999	0.892	PASS

Test Graph



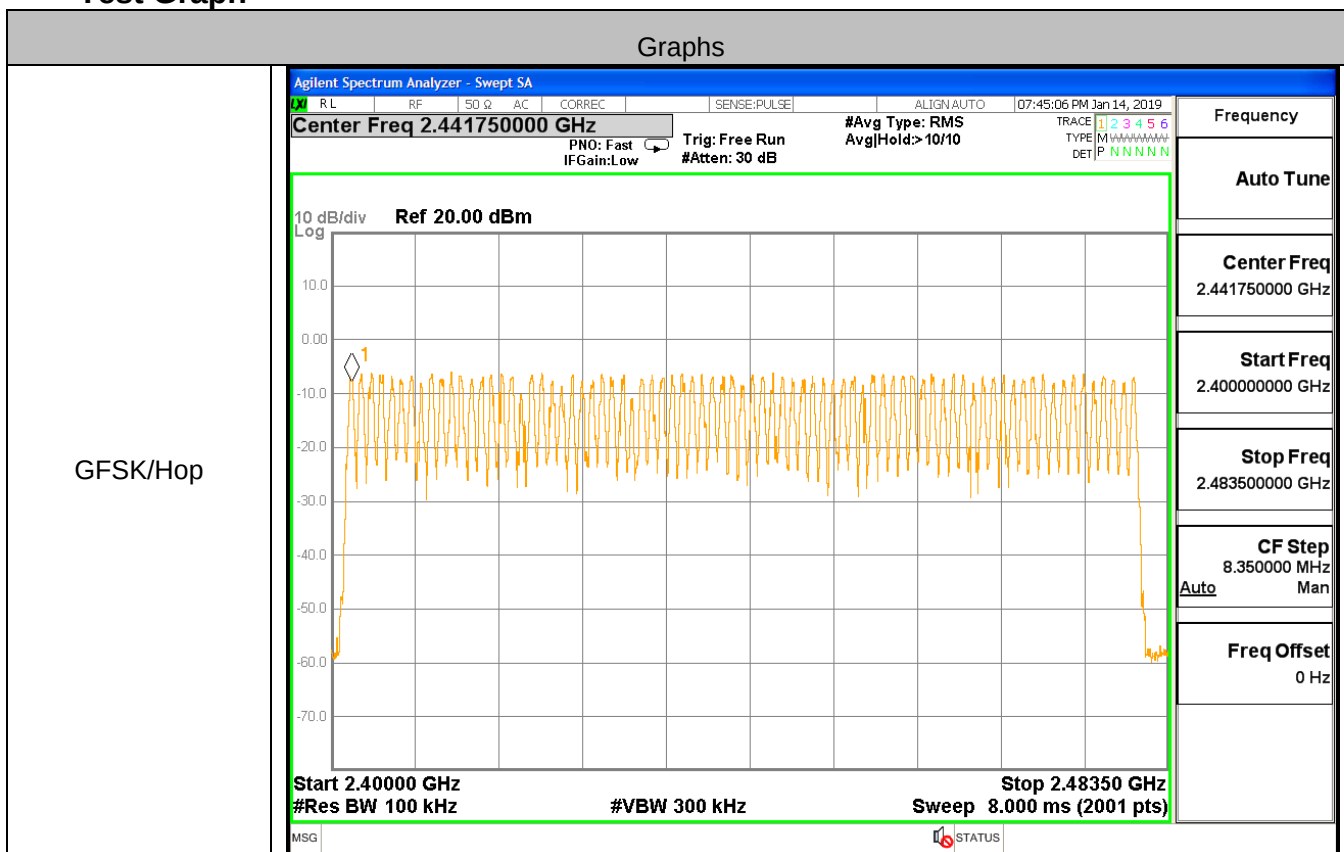


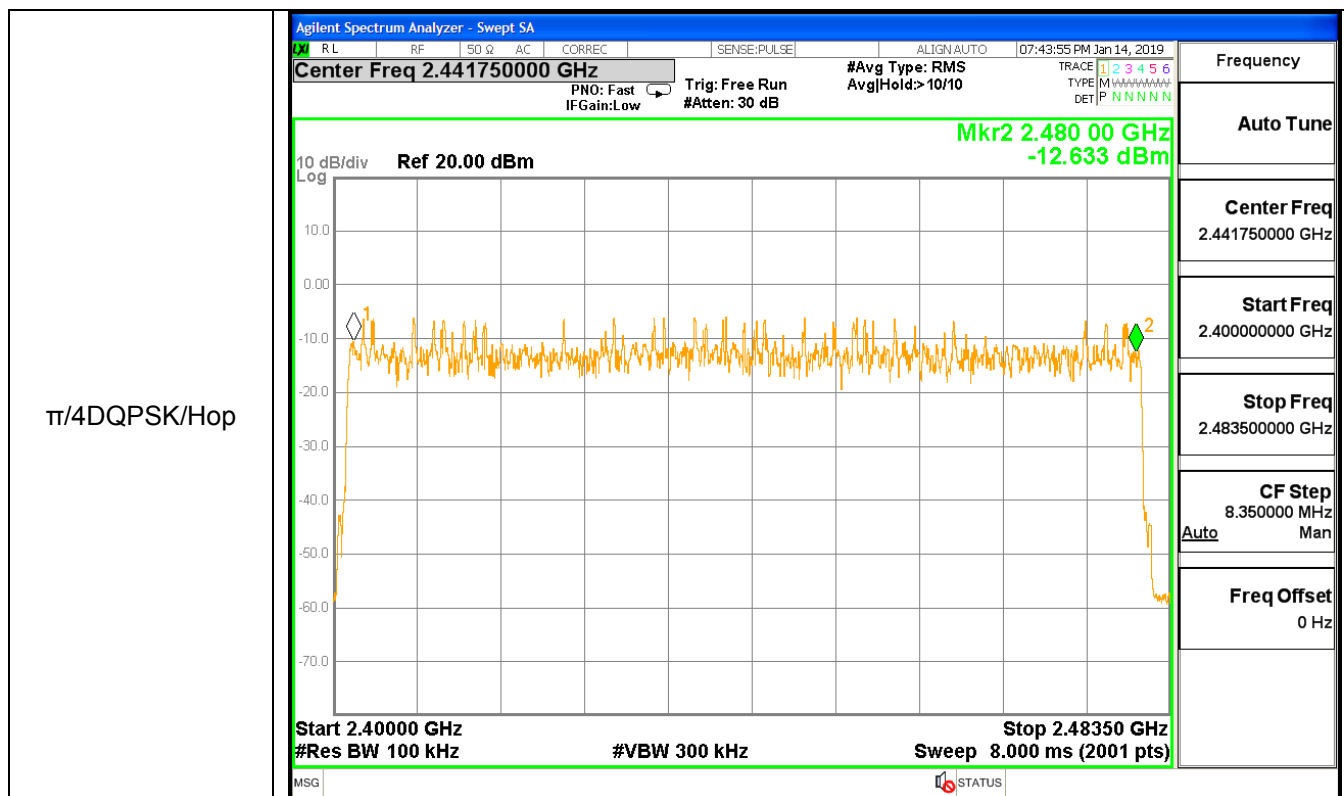


A.4 Hopping Channel Number

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

Test Graph

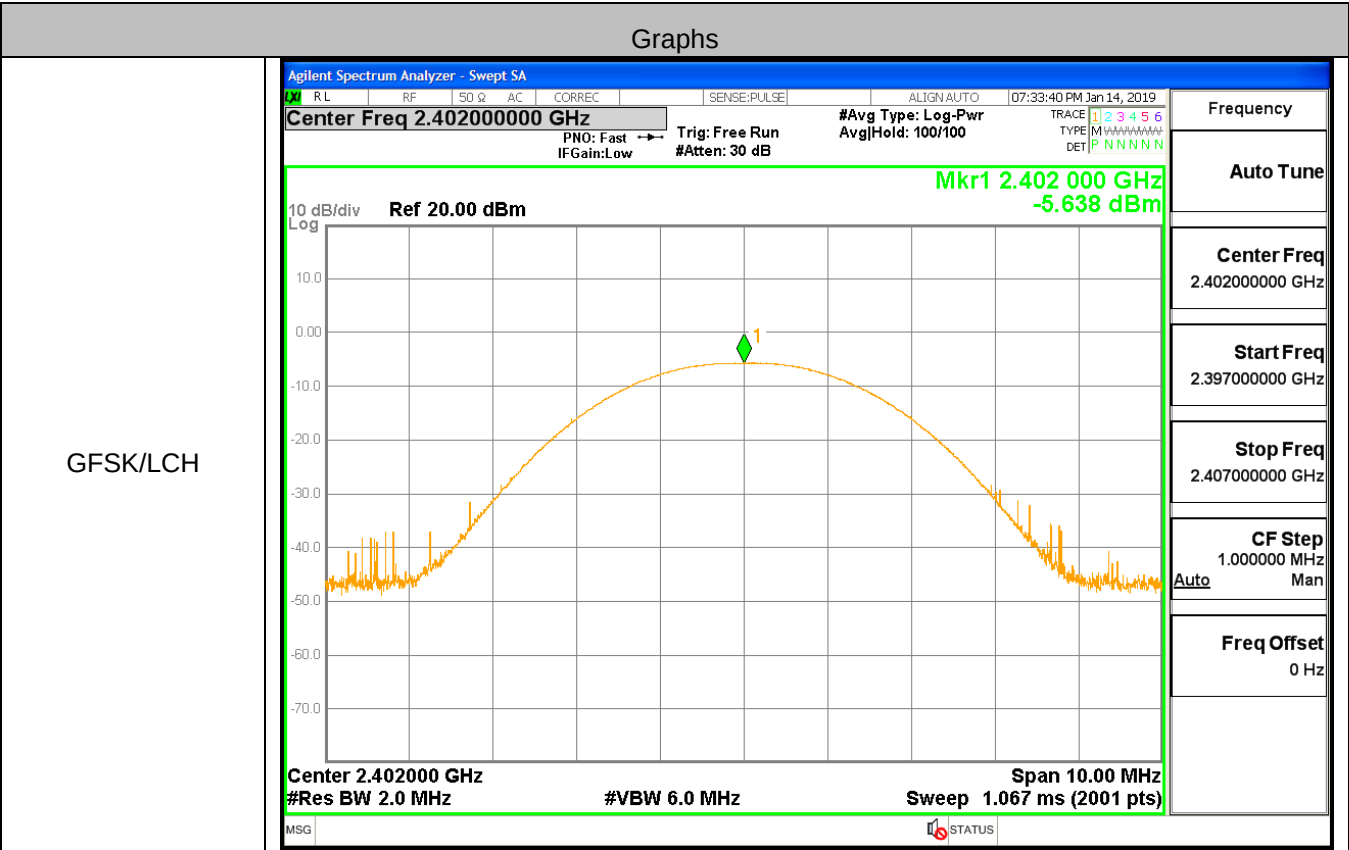


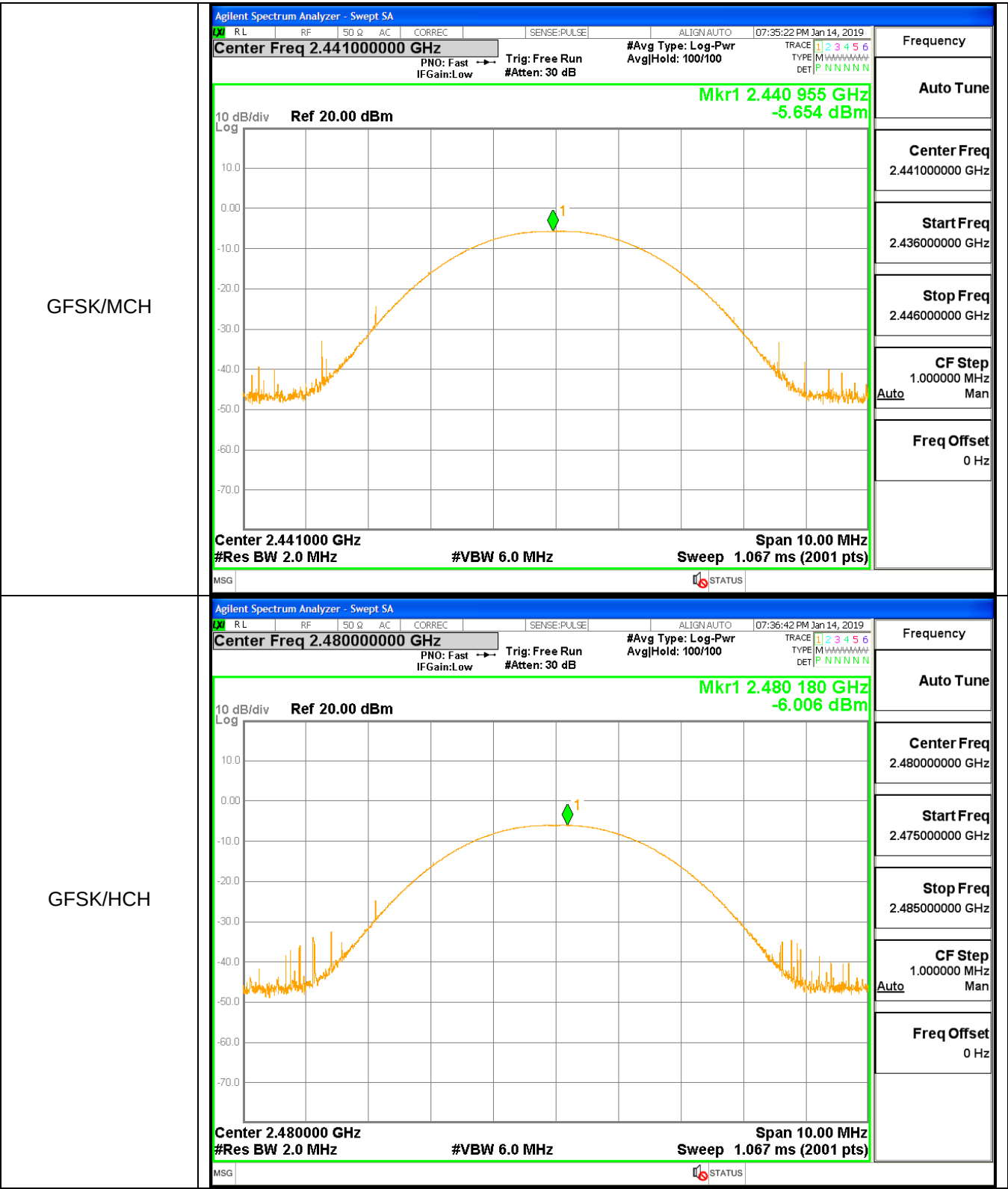


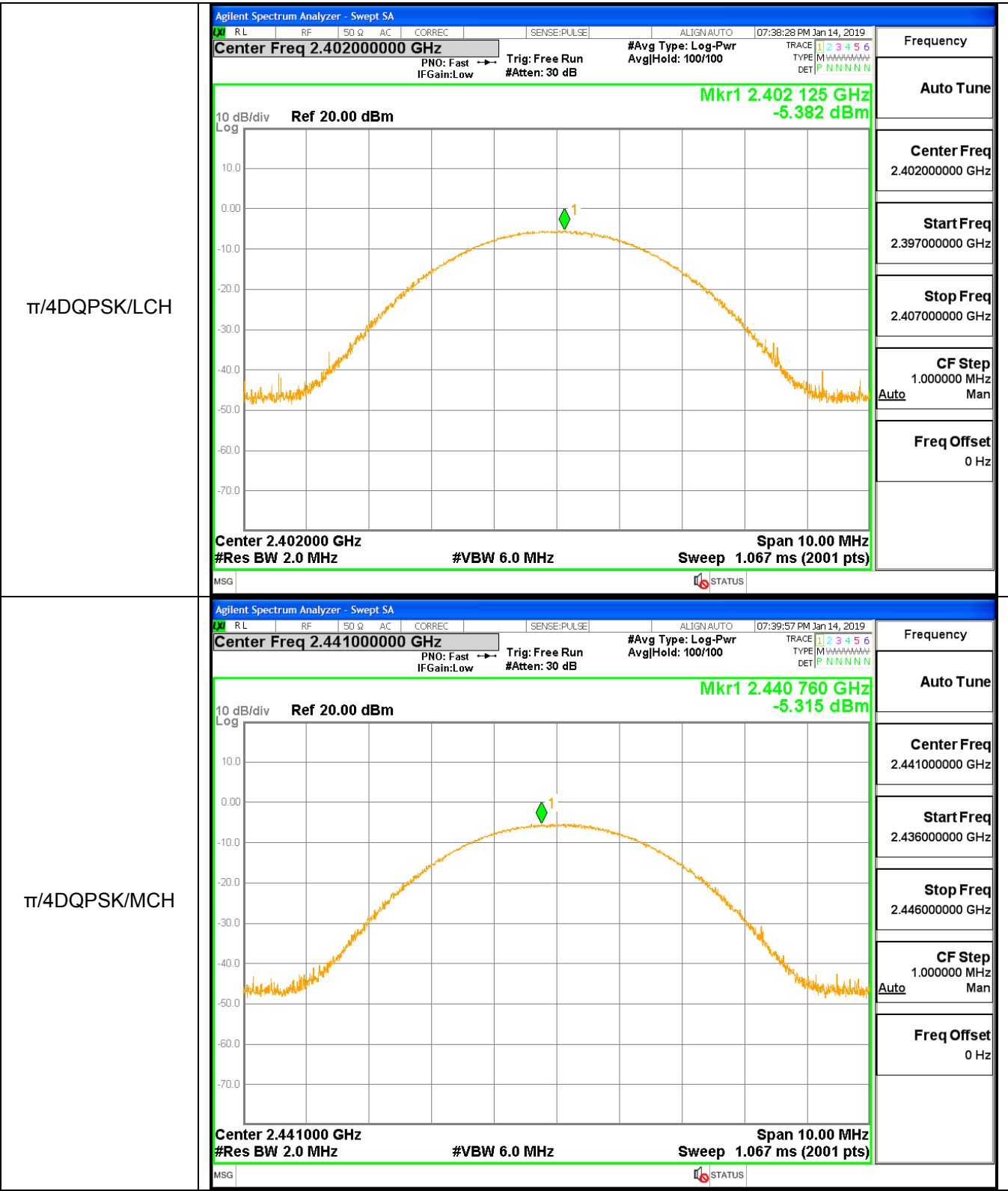
A.5 Conducted Peak Output Power

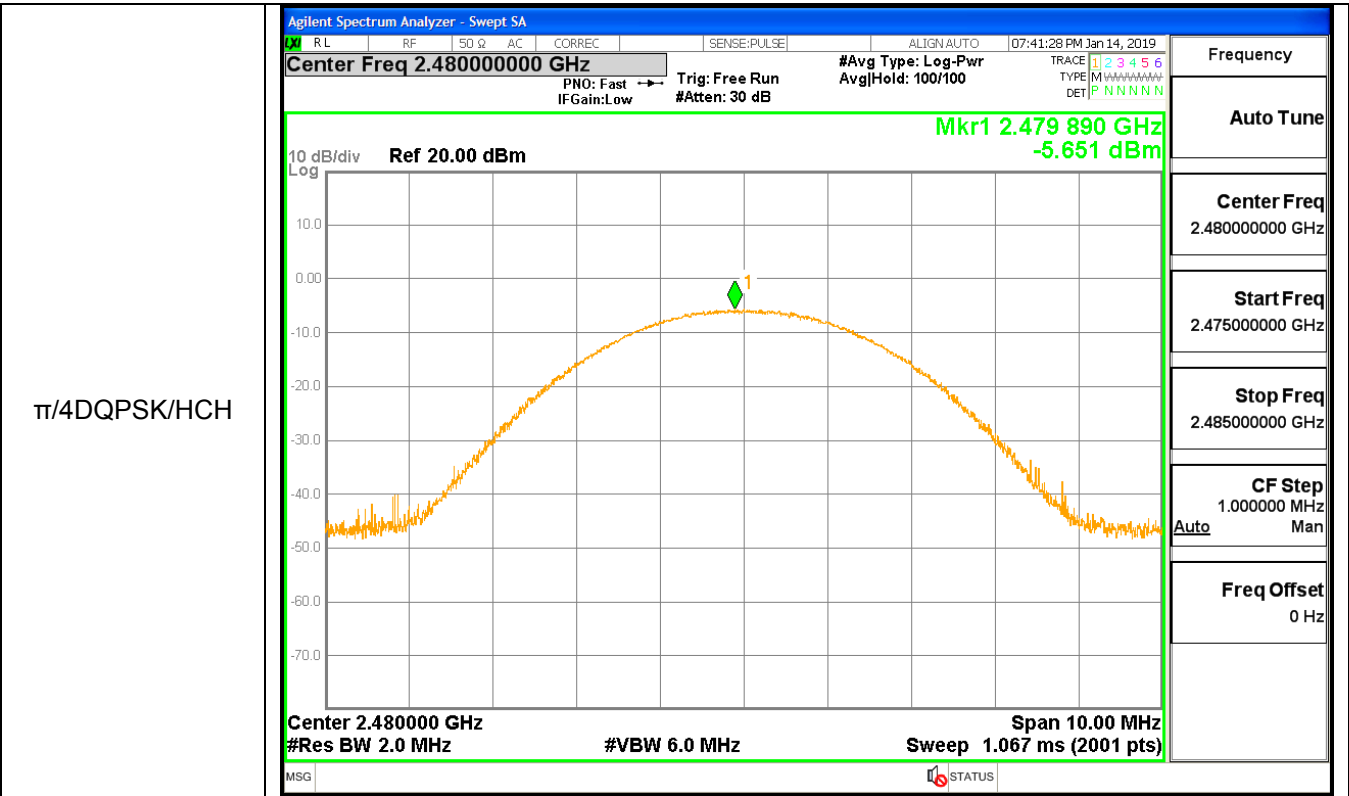
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-5.638	21	PASS
GFSK	MCH	-5.654	21	PASS
GFSK	HCH	-6.006	21	PASS
$\pi/4$ DQPSK	LCH	-5.382	21	PASS
$\pi/4$ DQPSK	MCH	-5.315	21	PASS
$\pi/4$ DQPSK	HCH	-5.651	21	PASS

Test Graph





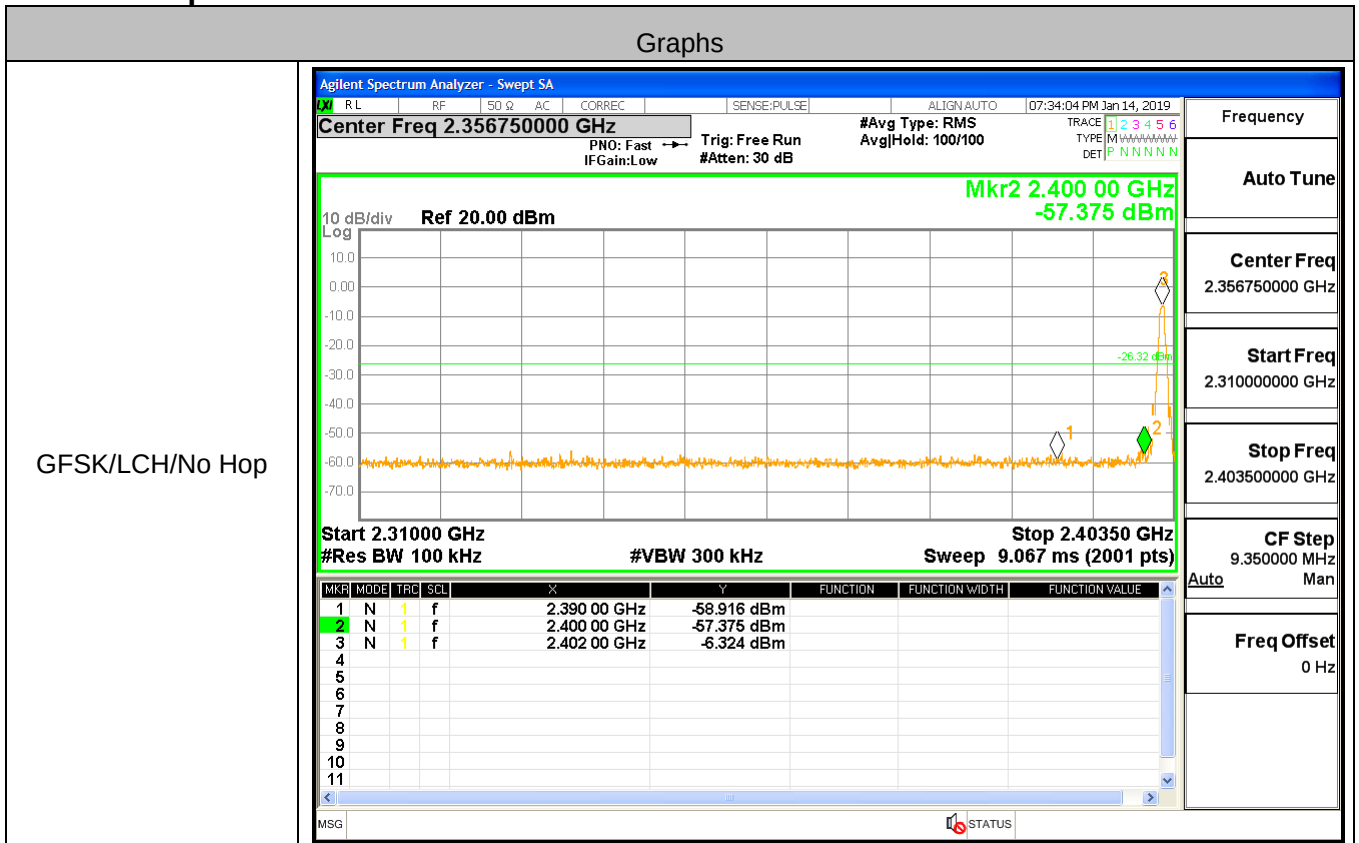


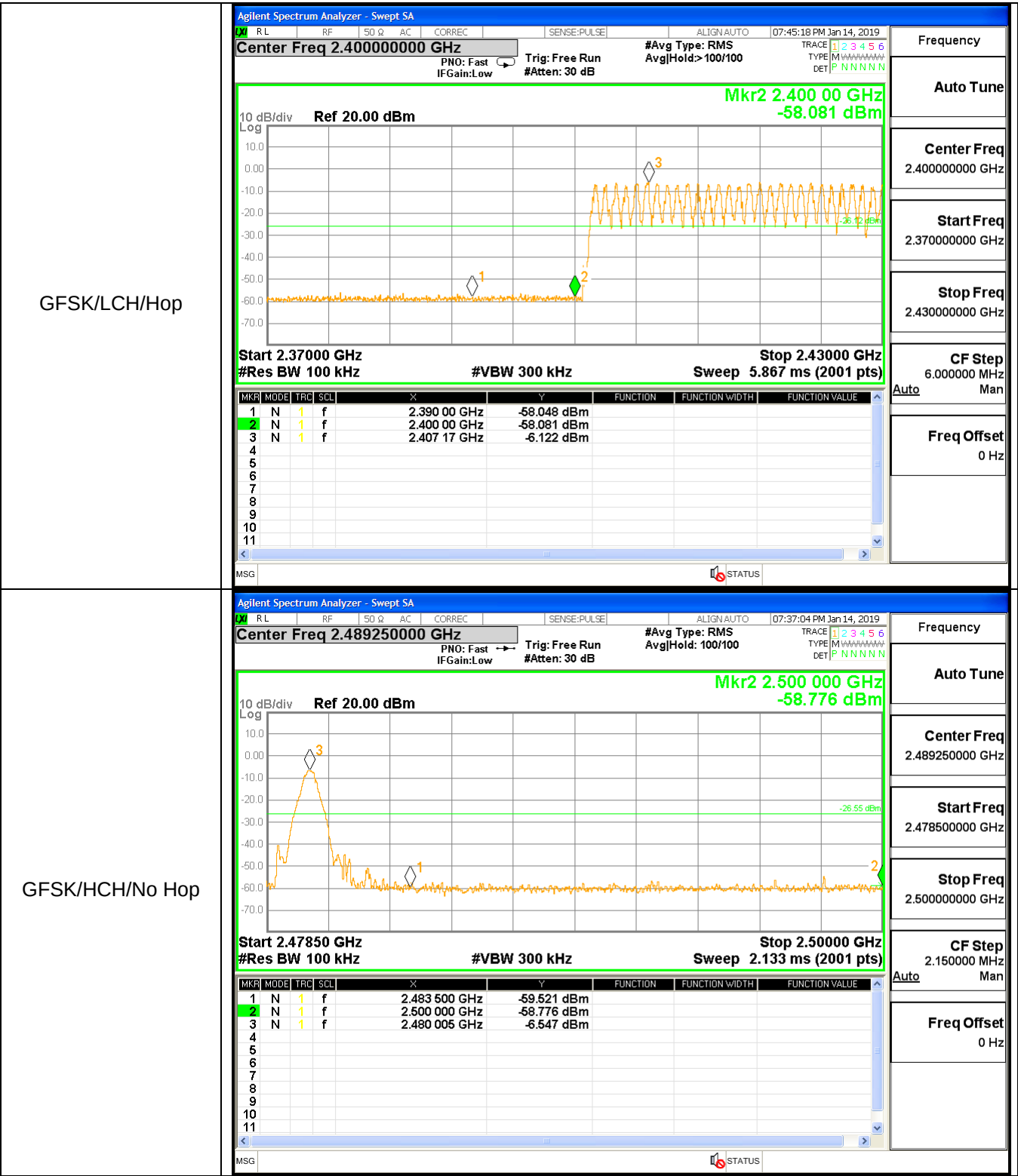


A.6 Band-edge for RF Conducted Emissions

Type	Carrier Frequency(MHz)	Frequency(MHz)	Carrier Frequency Power [dBm]	Bandedge Peak(dBm)	Upper limit(dBm)	Conclusion
1DH5	2402	2390	-6.324	-58.92	-26.324	Pass
1DH5	2402	2400	-6.324	-57.38	-26.324	Pass
1DH5-Hopping	2402	2390	-6.122	-58.05	-26.122	Pass
1DH5-Hopping	2402	2400	-6.122	-58.08	-26.122	Pass
1DH5	2480	2483.5	-6.547	-59.52	-26.547	Pass
1DH5	2480	2500	-6.547	-58.78	-26.547	Pass
1DH5-Hopping	2480	2483.5	-6.197	-58.6	-26.197	Pass
1DH5-Hopping	2480	2500	-6.197	-58.46	-26.197	Pass
2DH5	2402	2390	-6.295	-60.44	-26.295	Pass
2DH5	2402	2400	-6.295	-50.4	-26.295	Pass
2DH5-Hopping	2480	2483.5	-6.528	-57.91	-26.528	Pass
2DH5-Hopping	2480	2500	-6.528	-57.33	-26.528	Pass
2DH5	2480	2483.5	-9.83	-59.1	-29.83	Pass
2DH5	2480	2500	-9.83	-60.6	-29.83	Pass
2DH5-Hopping	2402	2390	-6.146	-58.62	-26.146	Pass
2DH5-Hopping	2402	2400	-6.146	-54.67	-26.146	Pass

est Graph







$\pi/4$ DQPSK/LCH/Hop

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.40000000 GHz

Ref 20.00 dBm

Mkr2 2.400 00 GHz -54.669 dBm

Start 2.37000 GHz Stop 2.43000 GHz

#Res BW 100 kHz #VBW 300 kHz Sweep 5.867 ms (2001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.390 00 GHz	-58.623 dBm			
2	N	1	f	2.400 00 GHz	-54.669 dBm			
3	N	1	f	2.429 01 GHz	-6.146 dBm			

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

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.48925000 GHz

Ref 20.00 dBm

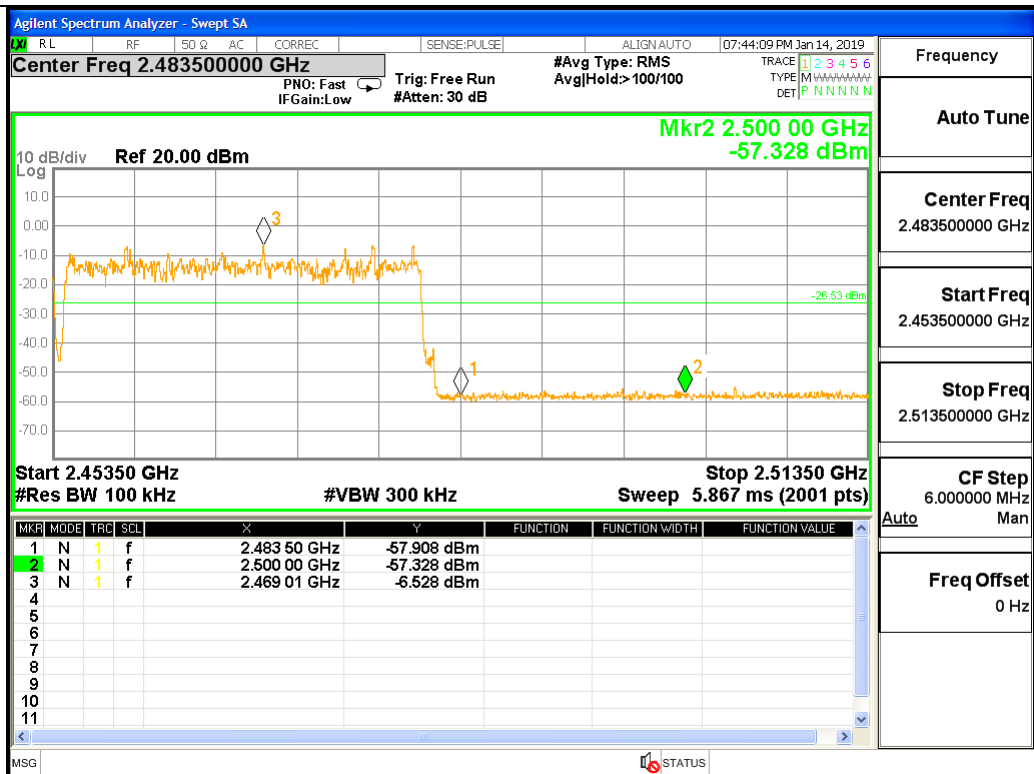
Mkr2 2.500 000 GHz -60.599 dBm

Start 2.47850 GHz Stop 2.50000 GHz

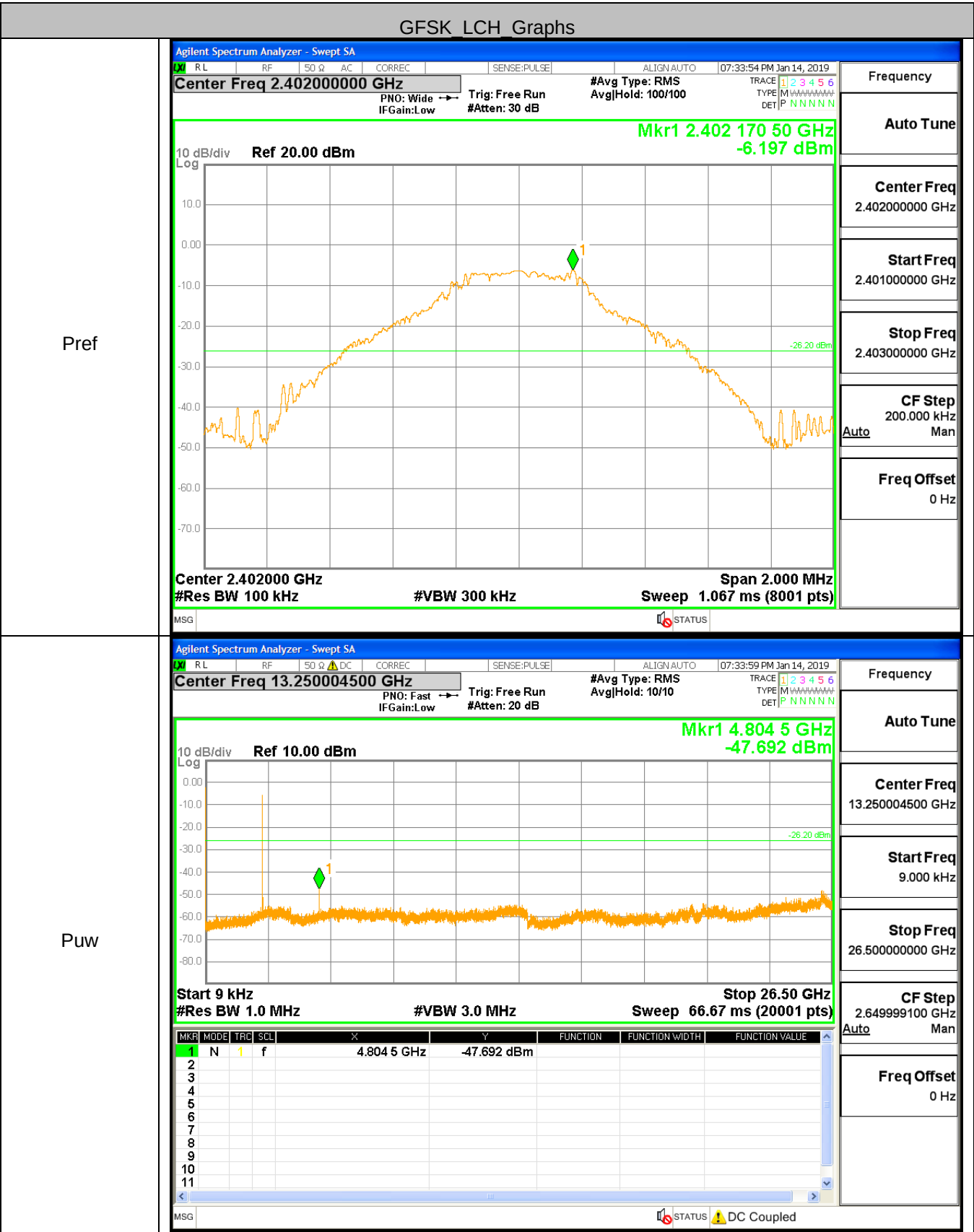
#Res BW 100 kHz #VBW 300 kHz Sweep 2.133 ms (2001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.483 500 GHz	-59.096 dBm			
2	N	1	f	2.500 000 GHz	-60.599 dBm			
3	N	1	f	2.479 887 GHz	-9.830 dBm			

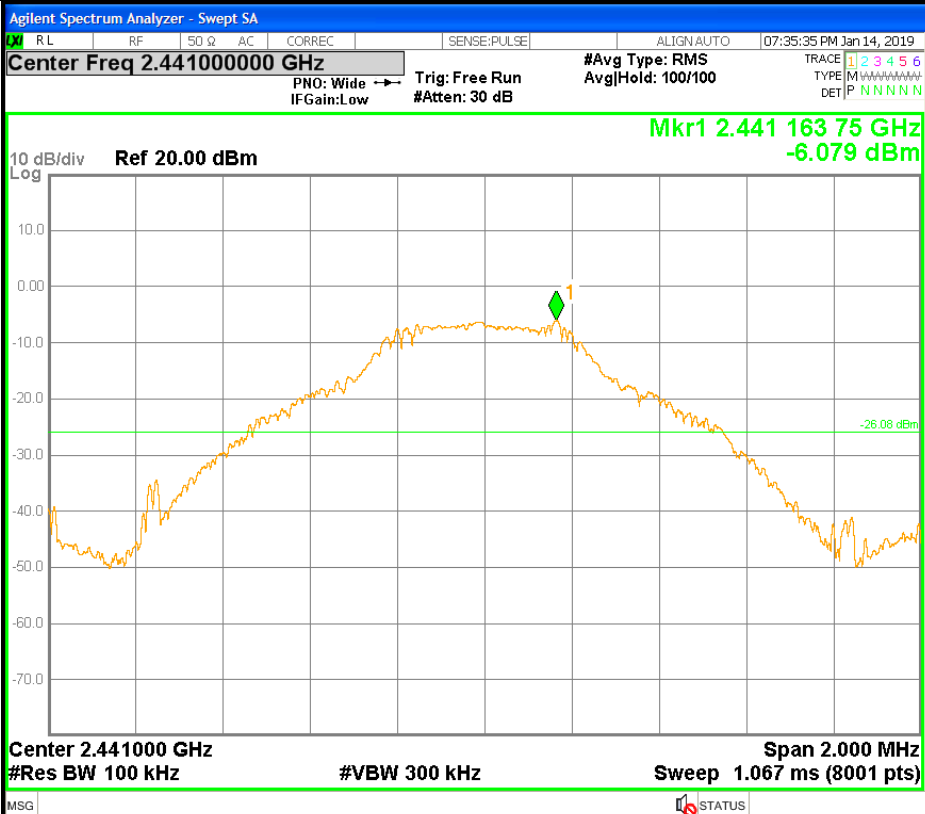
$\pi/4$ DQPSK/HCH/Hop



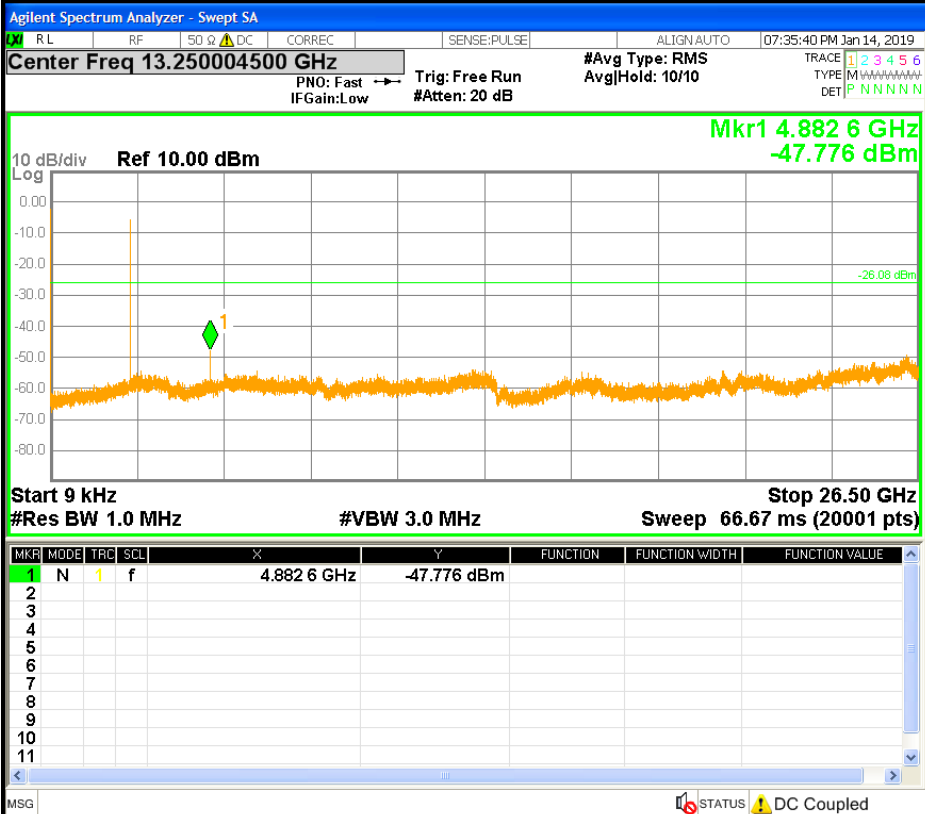
A.7 RF Conducted Spurious Emissions
Test Graph



GFSK MCH Graphs

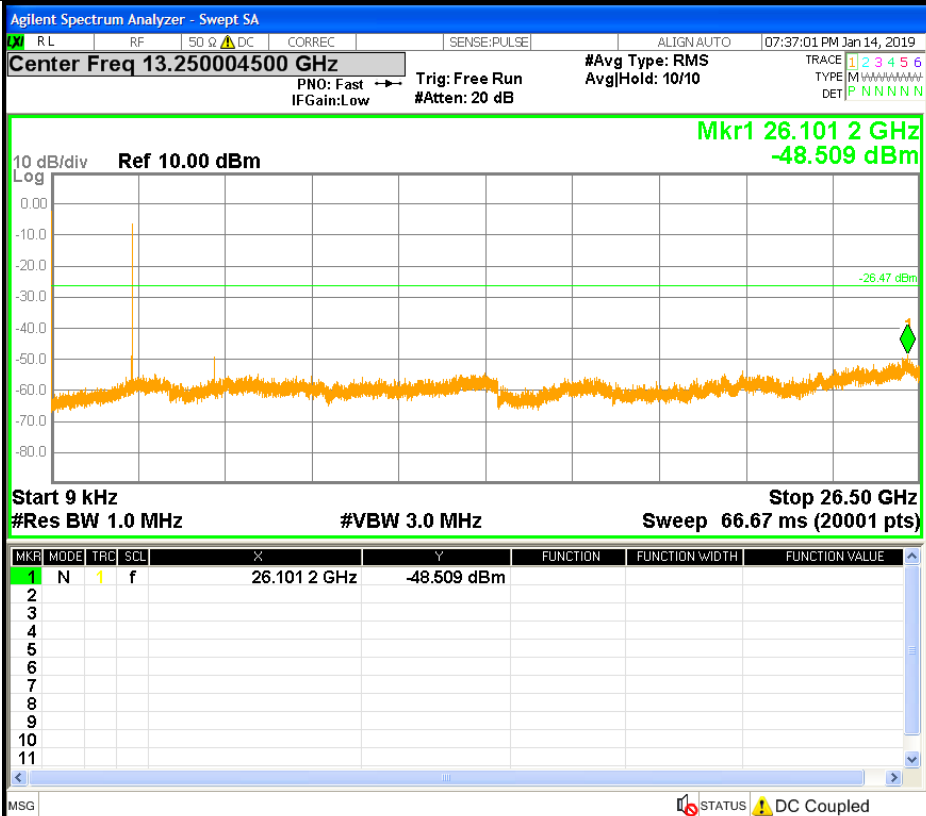
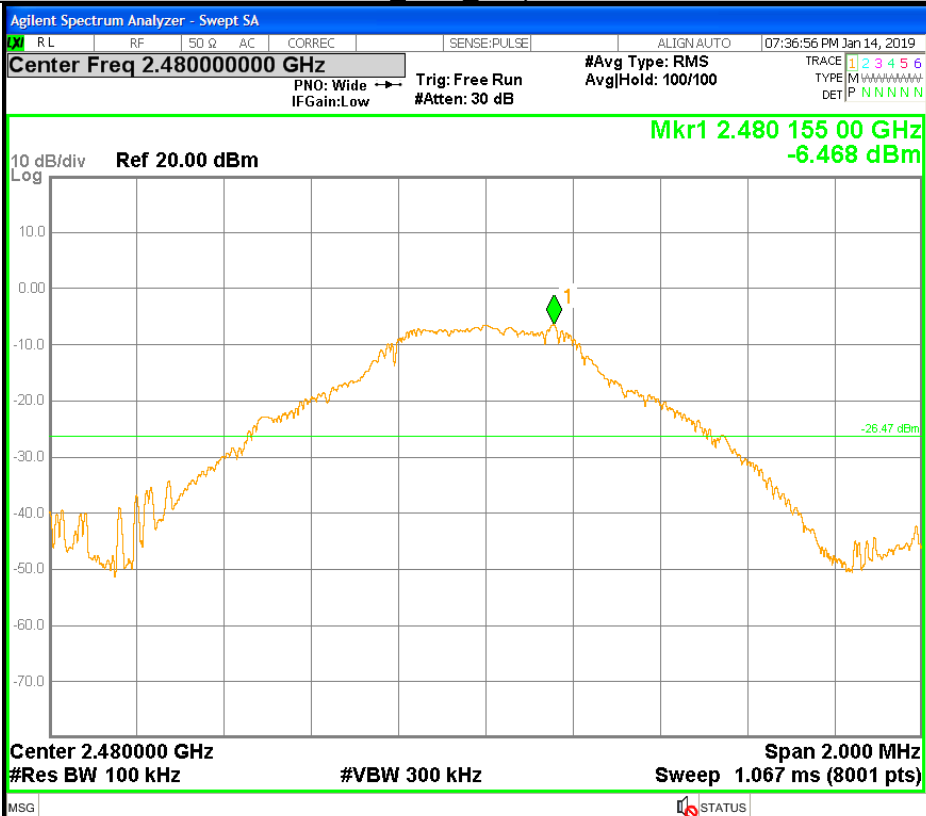


Frequency	
Auto Tune	
Center Freq 2.441000000 GHz	
Start Freq 2.440000000 GHz	
Stop Freq 2.442000000 GHz	
CF Step 200.000 kHz	Auto Man
Freq Offset 0 Hz	

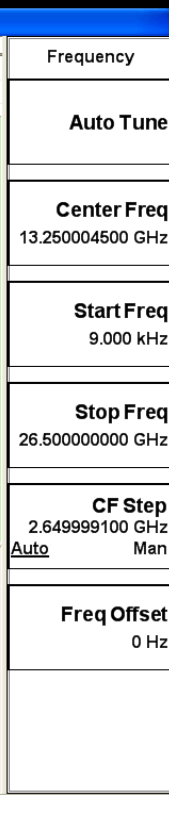
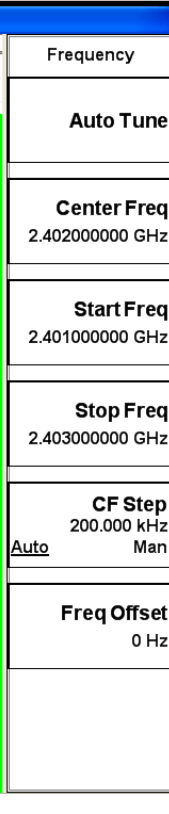


Frequency	
Auto Tune	
Center Freq	13.250004500 GHz
Start Freq	9.000 kHz
Stop Freq	26.500000000 GHz
CF Step	2.649999100 GHz
Auto	Man
Freq Offset	0 Hz

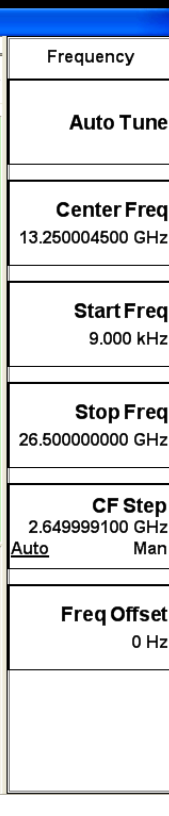
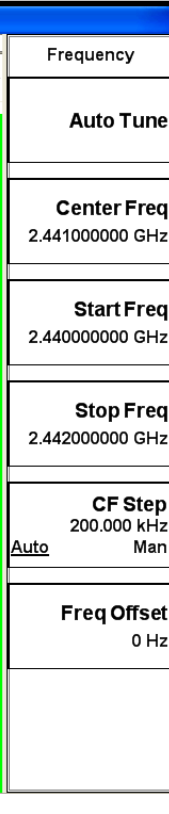
GFSK HCH Graphs



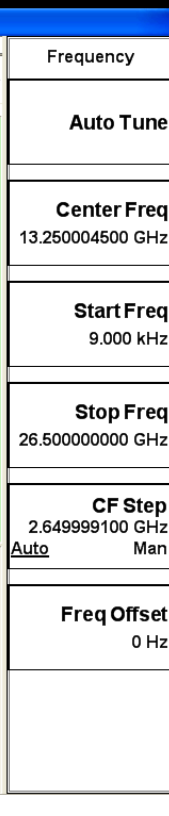
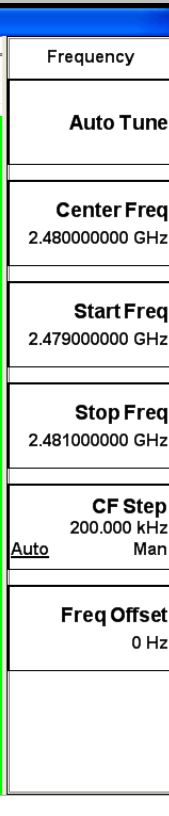
$\pi/4$ DQPSK LCH Graphs



$\pi/4$ DQPSK MCH Graphs



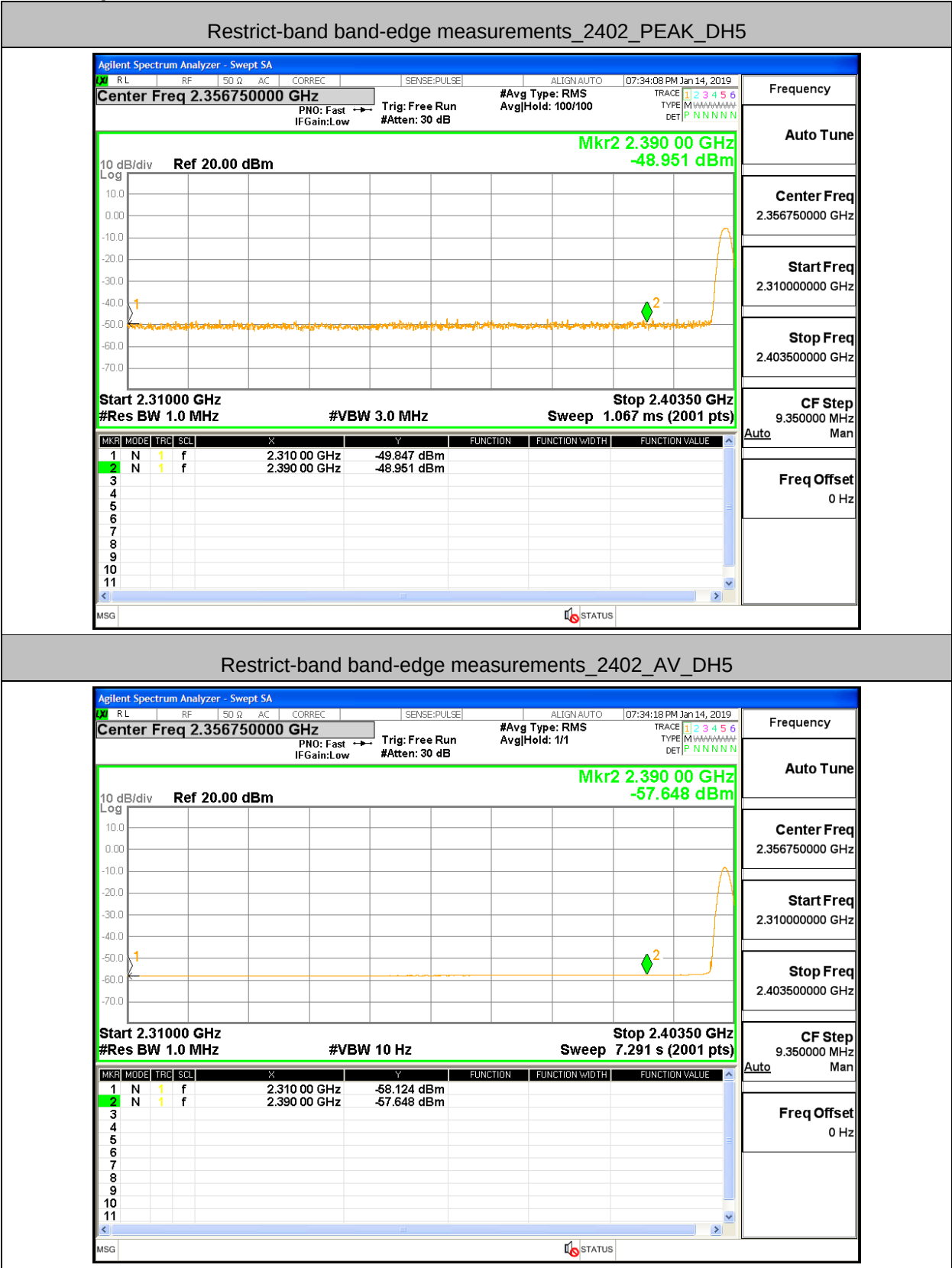
$\pi/4$ DQPSK HCH Graphs



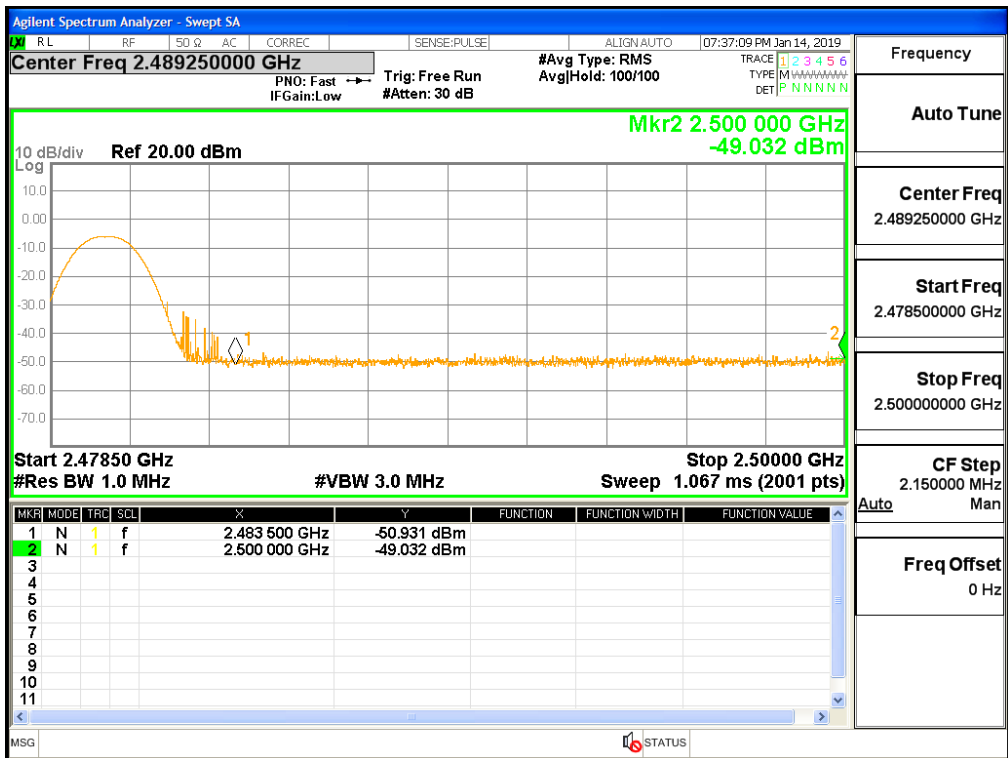
A.8 Restrict-band measurements

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	-49.85	47.35	74	-58.12	39.08	54	Pass
1DH5	2402	2390	2.00	0.00	-48.95	48.25	74	-57.65	39.55	54	Pass
1DH5	2480	2483.5	2.00	0.00	-50.93	46.27	74	-56.88	40.32	54	Pass
1DH5	2480	2500	2.00	0.00	-49.03	48.17	74	-57.05	40.15	54	Pass
2DH5	2402	2310	2.00	0.00	-50.56	46.64	74	-58.08	39.12	54	Pass
2DH5	2402	2390	2.00	0.00	-52.12	45.08	74	-57.6	39.6	54	Pass
2DH5	2480	2483.5	2.00	0.00	-51.01	46.19	74	-56.84	40.36	54	Pass
2DH5	2480	2500	2.00	0.00	-48.92	48.28	74	-57.06	40.14	54	Pass

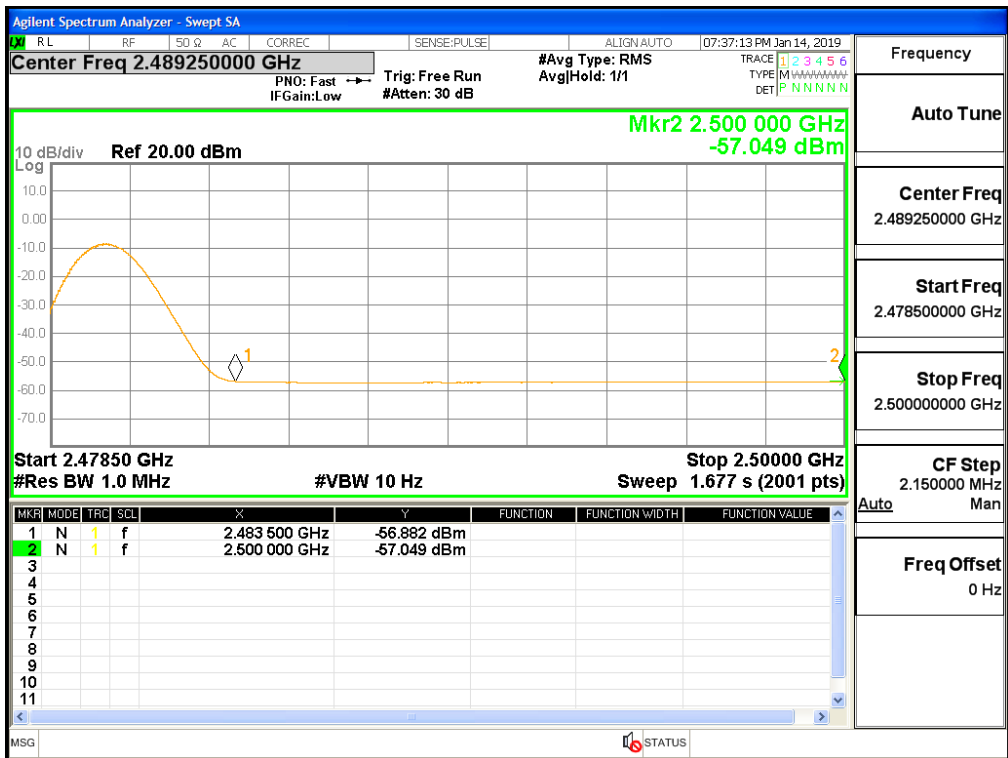
Test Graph



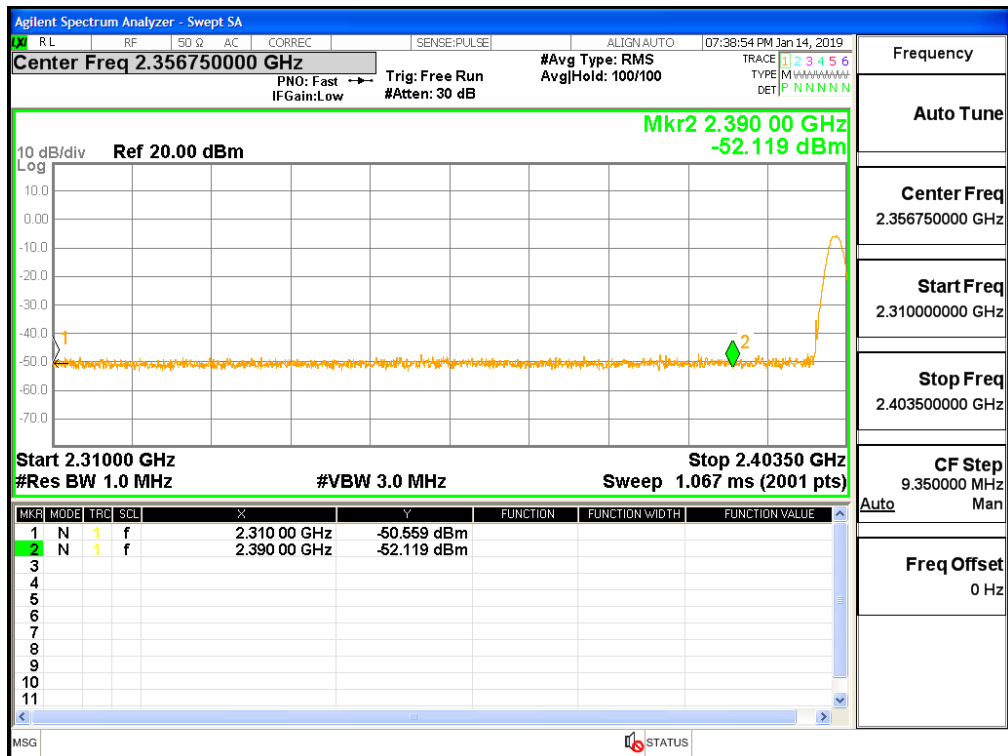
Restrict-band band-edge measurements_2480_PEAK_DH5



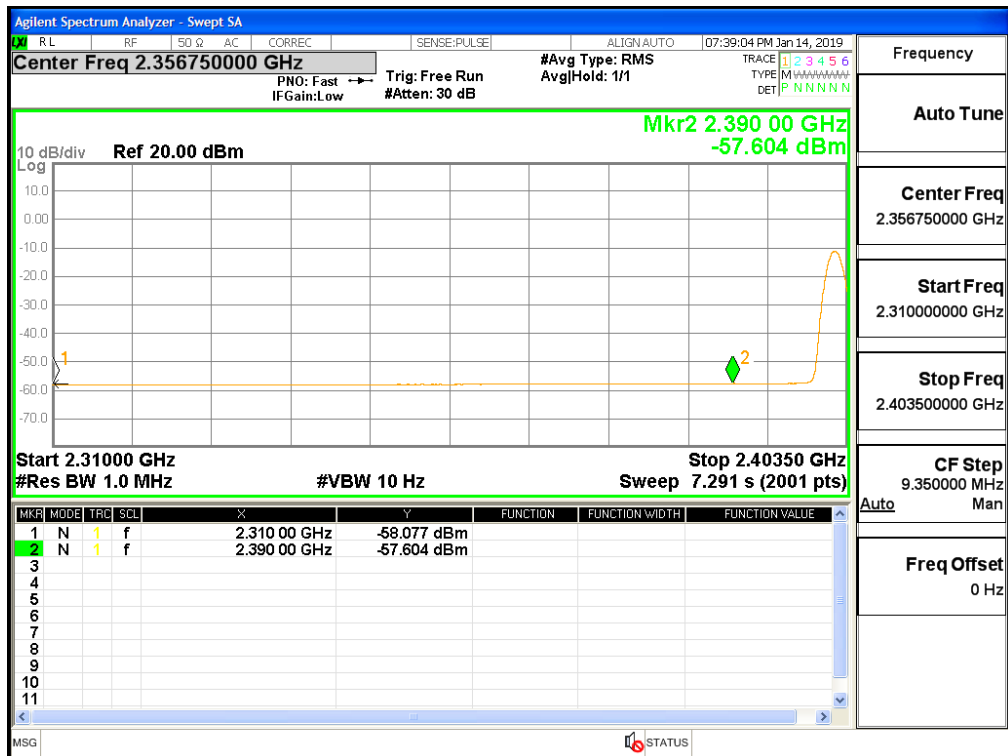
Restrict-band band-edge measurements_2480_AV_DH5



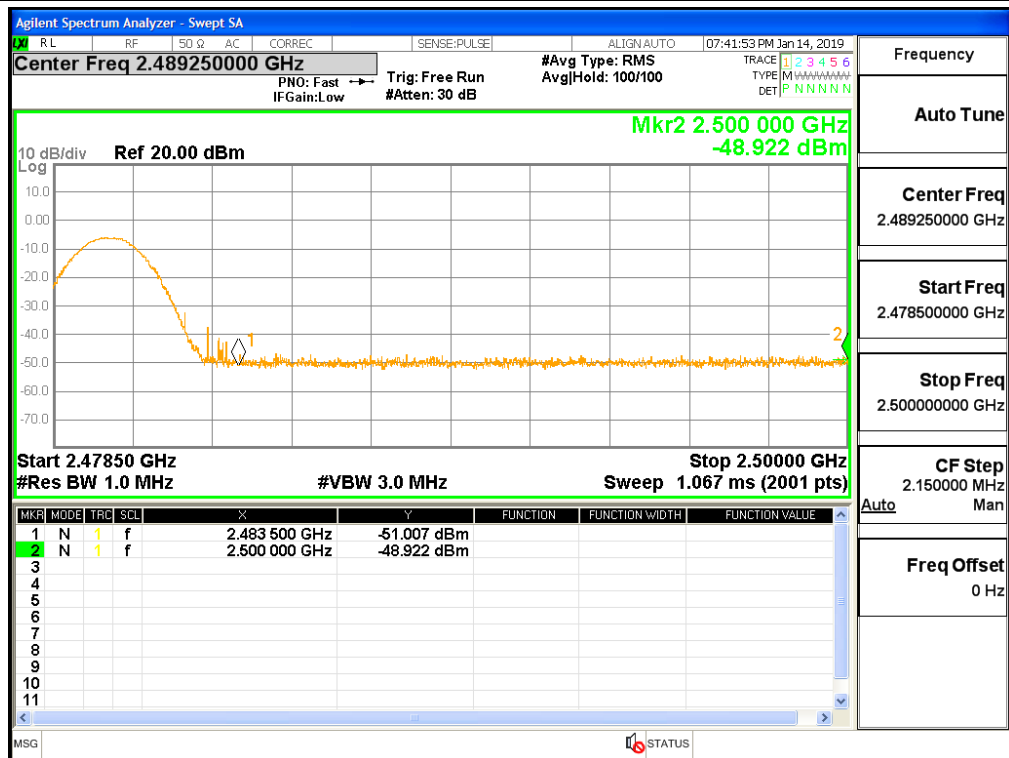
Restrict-band band-edge measurements_2402_PEAK_2DH5



Restrict-band band-edge measurements_2402_AV_2DH5



Restrict-band band-edge measurements_2480_PEAK_2DH5



Restrict-band band-edge measurements_2480_AV_2DH5

