

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

Product Name: Bluetooth headset

Trade Mark: sentry

Test Model: BT989

FCC ID: 2ACP4-BT989

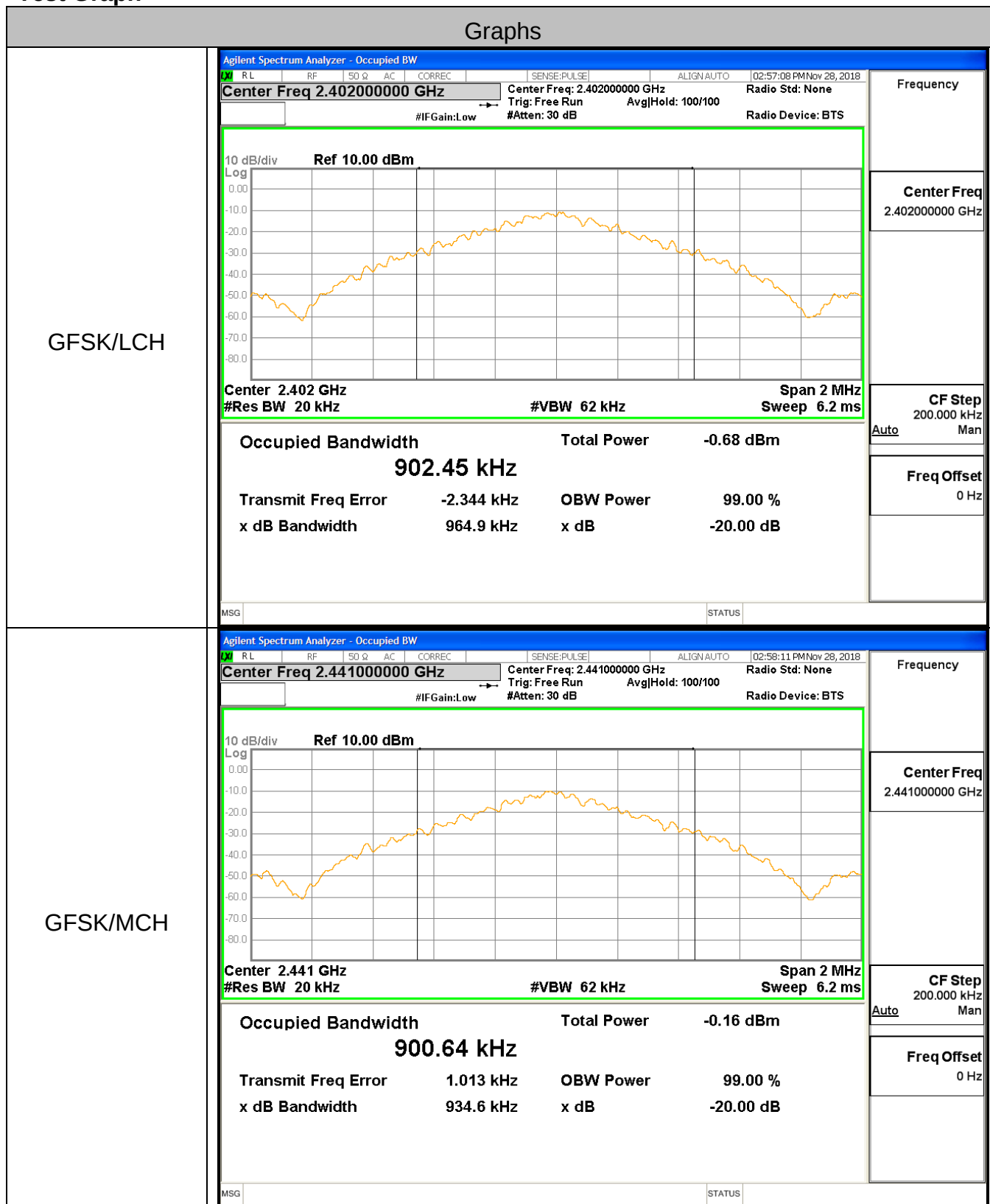
Environmental Conditions

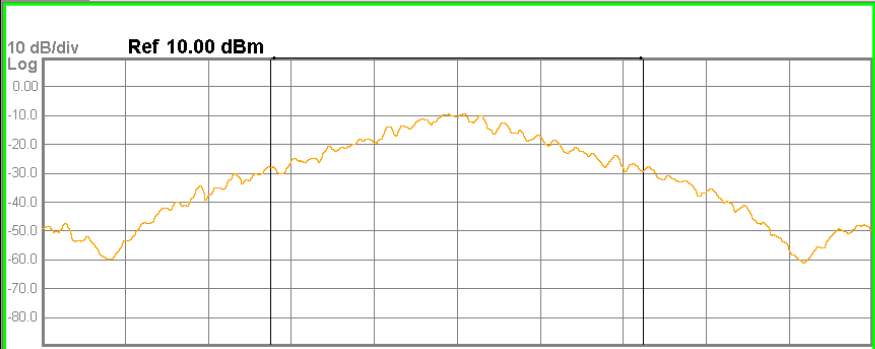
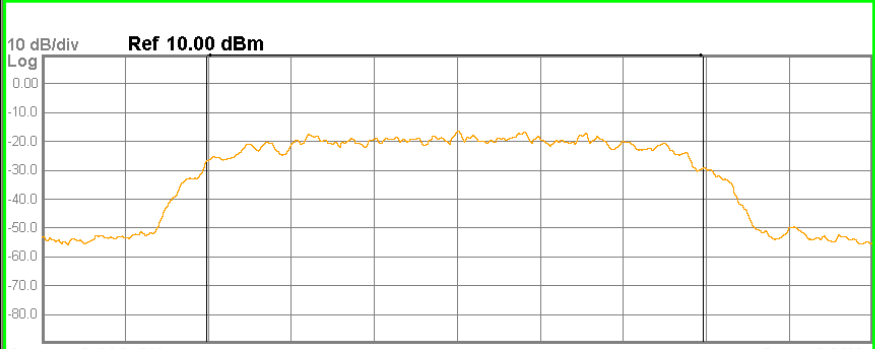
Temperature:	22.5 ° C
Relative Humidity:	55.6%
ATM Pressure:	100.0 kPa
Test Engineer:	Gary Qian
Supervised by:	Eden Hu

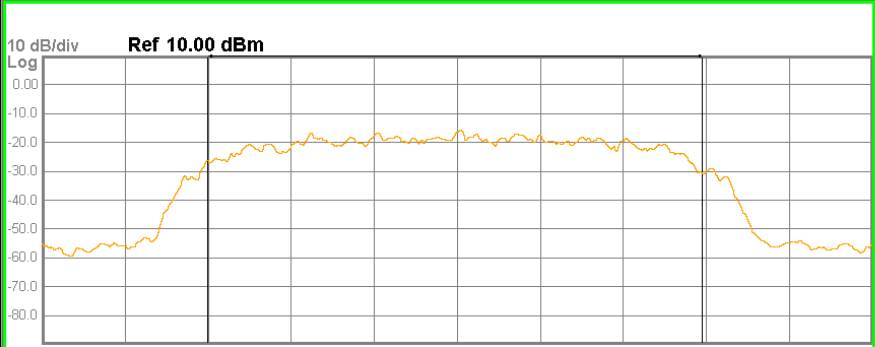
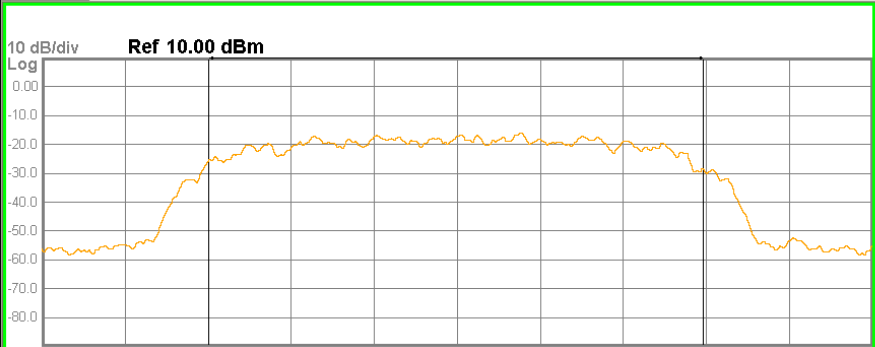
A.1 20 dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit(MHz)	Verdict
GFSK	LCH	0.963	Not Specified	PASS
GFSK	MCH	0.935	Not Specified	PASS
GFSK	HCH	0.940	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.335	Not Specified	PASS
$\pi/4$ DQPSK	MCH	1.332	Not Specified	PASS
$\pi/4$ DQPSK	HCH	1.336	Not Specified	PASS

Test Graph



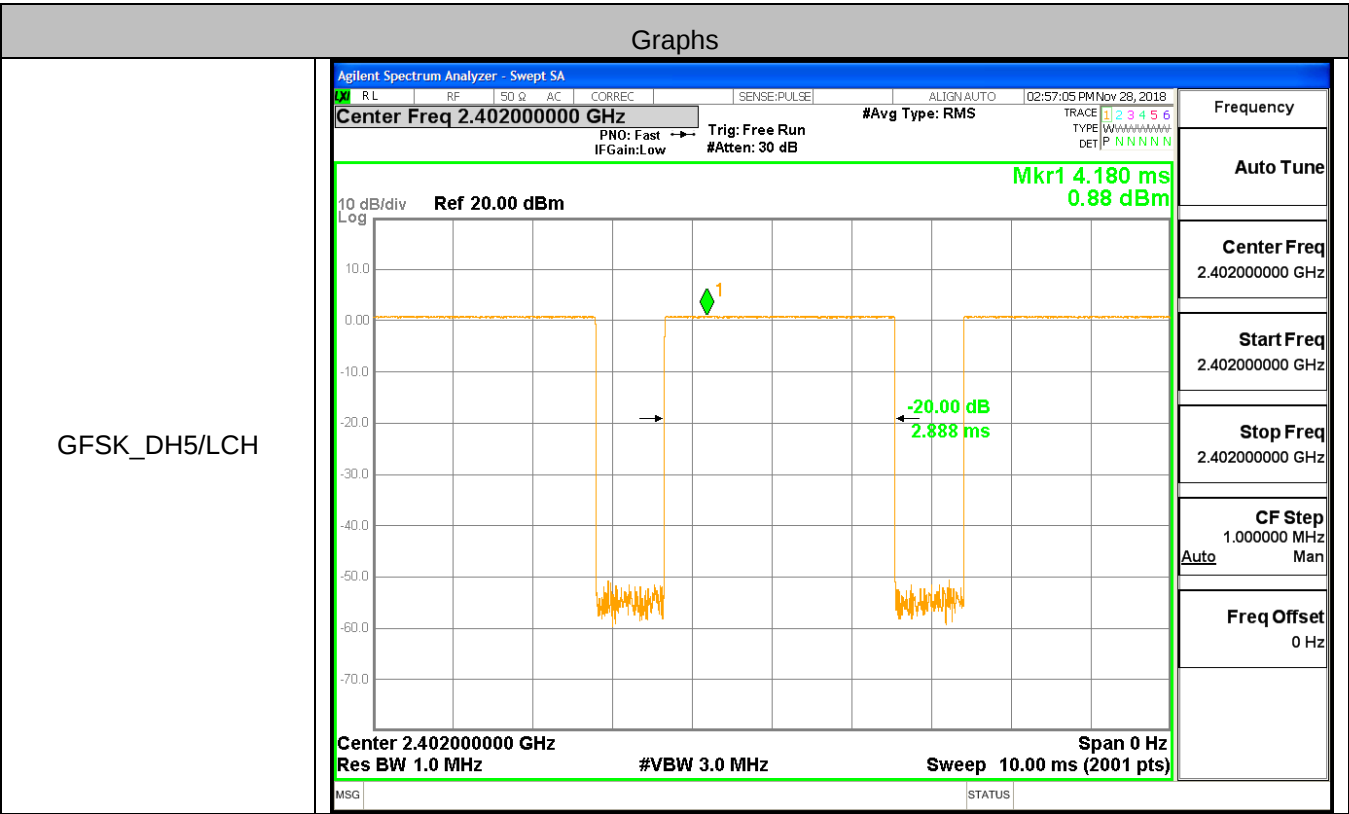
GFSK/HCH	Agilent Spectrum Analyzer - Occupied BW Center Freq 2.480000000 GHz Center Freq: 2.480000000 GHz Trig: Free Run #IFGain: Low #Atten: 30 dB Radio Std: None Avg/Hold: 100/100 Radio Device: BTS 03:00:23 PM Nov 28, 2018				Frequency
					Center Freq 2.480000000 GHz
	Center 2.48 GHz #Res BW 20 kHz #VBW 62 kHz Span 2 MHz Sweep 6.2 ms				CF Step 200.000 kHz Man
	Occupied Bandwidth 897.06 kHz Total Power 0.51 dBm Transmit Freq Error -814 Hz OBW Power 99.00 % x dB Bandwidth 939.5 kHz x dB -20.00 dB				Freq Offset 0 Hz
π /4DQPSK/LCH	Agilent Spectrum Analyzer - Occupied BW Center Freq 2.402000000 GHz Center Freq: 2.402000000 GHz Trig: Free Run #IFGain: Low #Atten: 30 dB Radio Std: None Avg/Hold: 100/100 Radio Device: BTS 03:01:29 PM Nov 28, 2018				Frequency
					Center Freq 2.402000000 GHz
	Center 2.402 GHz #Res BW 20 kHz #VBW 62 kHz Span 2 MHz Sweep 6.2 ms				CF Step 200.000 kHz Man
	Occupied Bandwidth 1.1915 MHz Total Power -2.81 dBm Transmit Freq Error -4.014 kHz OBW Power 99.00 % x dB Bandwidth 1.335 MHz x dB -20.00 dB				Freq Offset 0 Hz

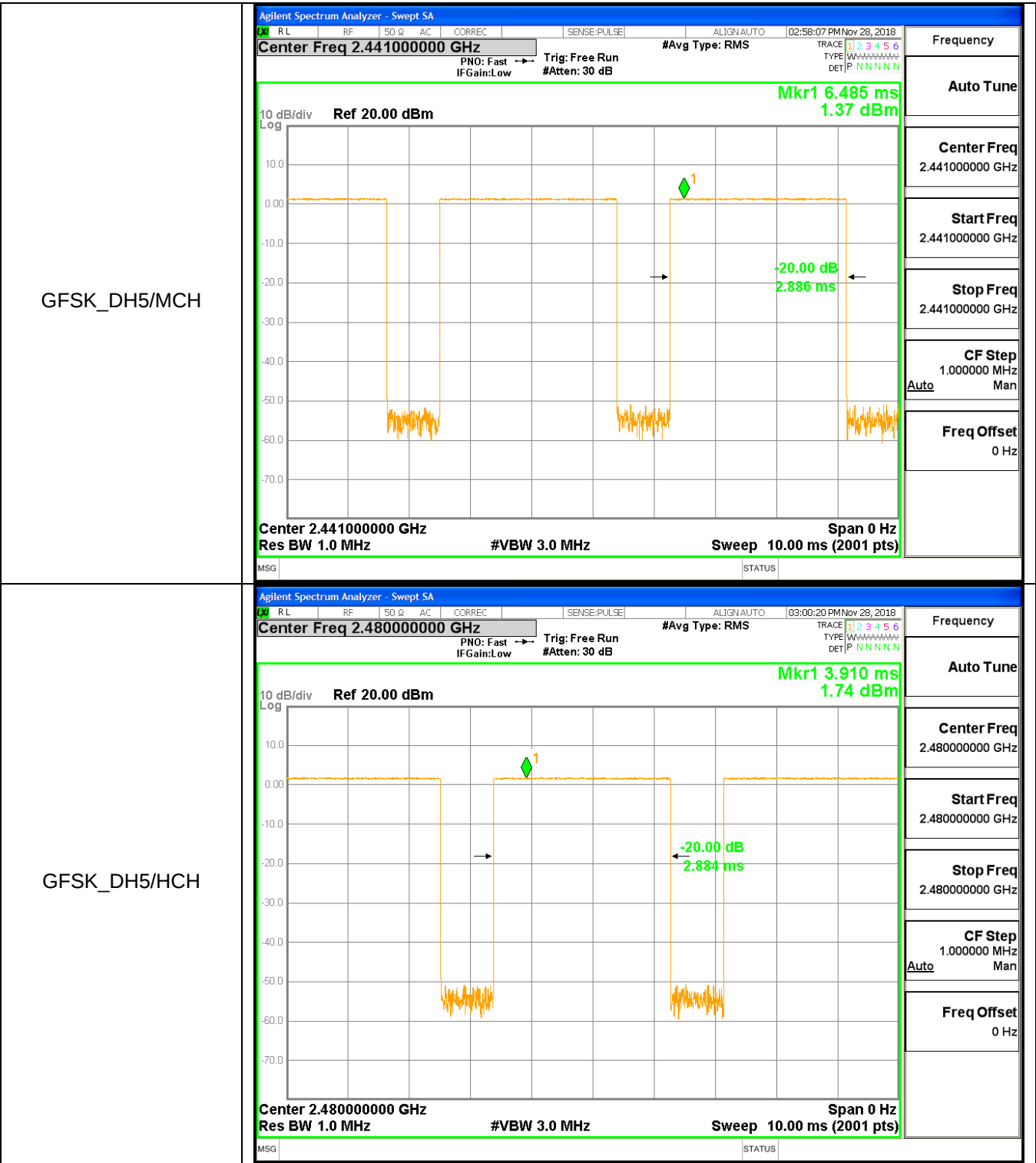
π/4DQPSK/MCH	Agilent Spectrum Analyzer - Occupied BW Center Freq 2.441000000 GHz #IFGain:Low Center Freq: 2.441000000 GHz Trig: Free Run #Atten: 30 dB ALIGN AUTO 03:02:55 PM Nov 28, 2018 Frequency			
	10 dB/div Ref 10.00 dBm  Center Freq 2.441 GHz #Res BW 20 kHz #VBW 62 kHz Span 2 MHz Sweep 6.2 ms			
	Occupied Bandwidth 1.1906 MHz Total Power -2.43 dBm Transmit Freq Error -5.479 kHz OBW Power 99.00 % x dB Bandwidth 1.331 MHz x dB -20.00 dB			
	MSG STATUS			
π/4DQPSK/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 03:04:03 PM Nov 28, 2018 Frequency			
	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 1.1912 MHz Total Power -2.11 dBm Transmit Freq Error -3.455 kHz OBW Power 99.00 % x dB Bandwidth 1.335 MHz x dB -20.00 dB			
	MSG STATUS			

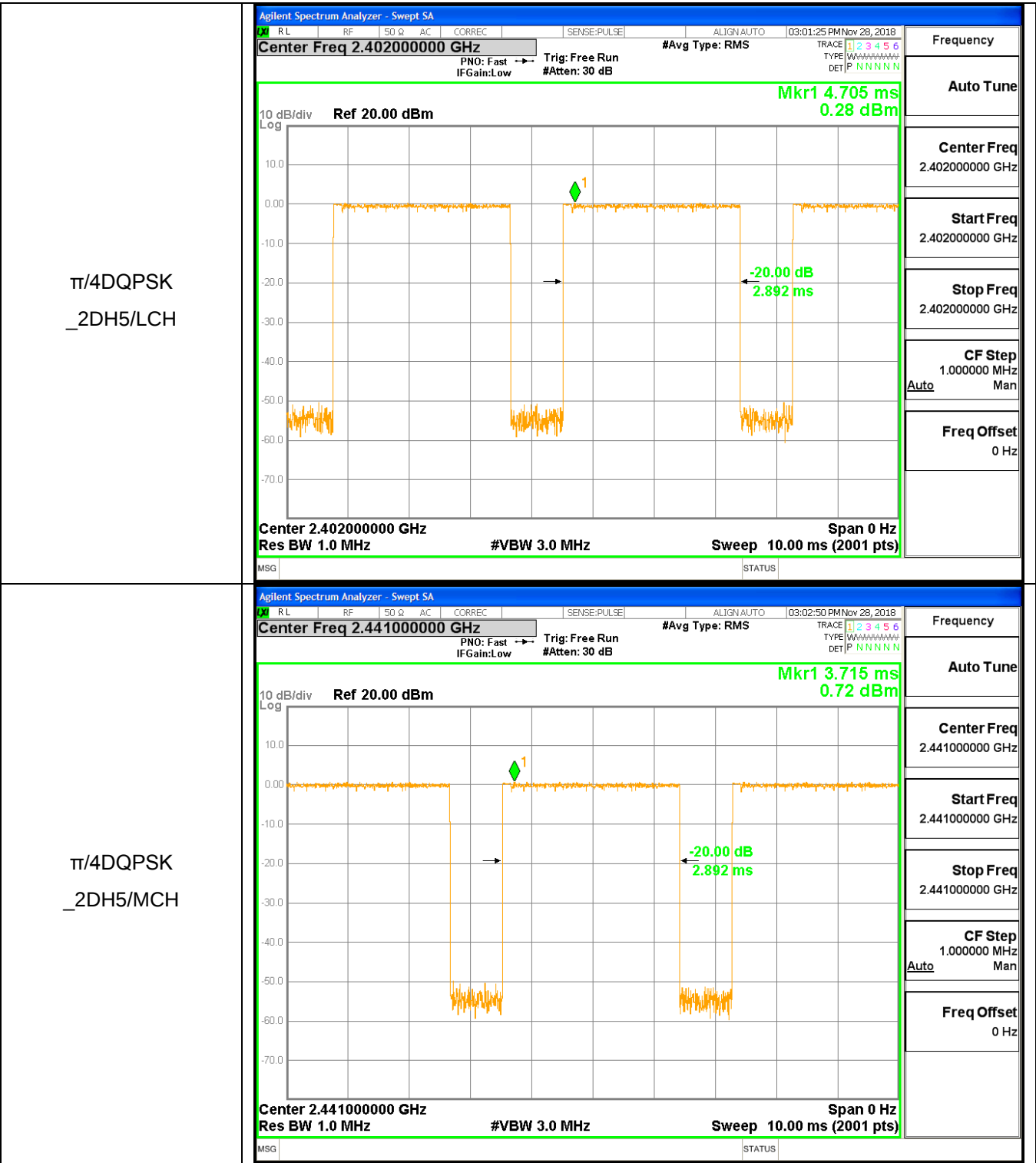
A.2 Dwell Time

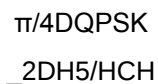
Mode	Packet	Chann el	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	0.00321295	106.7	0.34282177	0.4	PASS
GFSK	DH5	MCH	0.003098497	106.7	0.330609681	0.4	PASS
GFSK	DH5	HCH	0.002888395	106.7	0.308191787	0.4	PASS
π /4DQPSK	2DH5	LCH	0.002886448	106.7	0.307984036	0.4	PASS
π /4DQPSK	2DH5	MCH	0.0028837	106.7	0.307690737	0.4	PASS
π /4DQPSK	2DH5	HCH	0.002892336	106.7	0.308612239	0.4	PASS

Test Graph





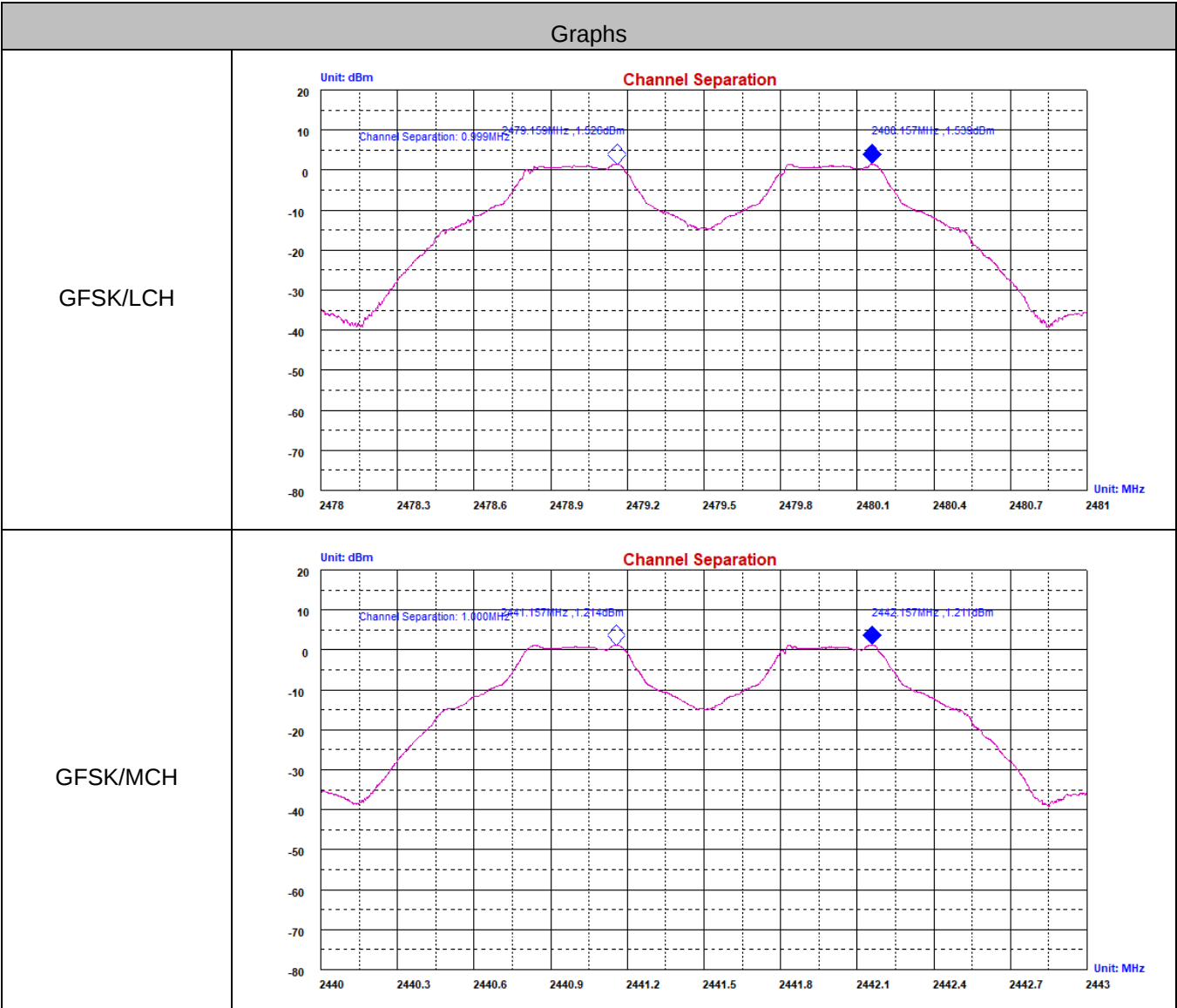


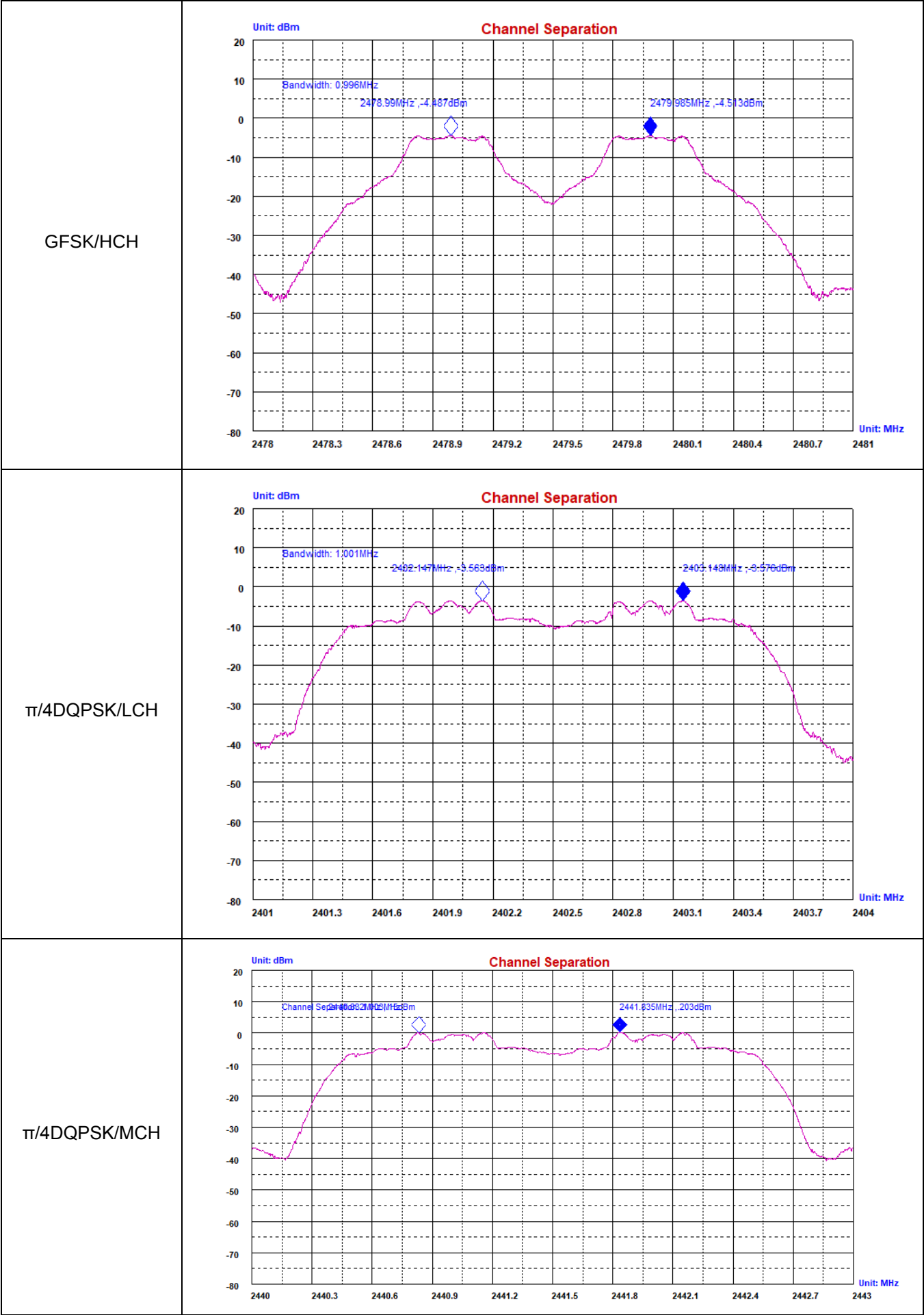


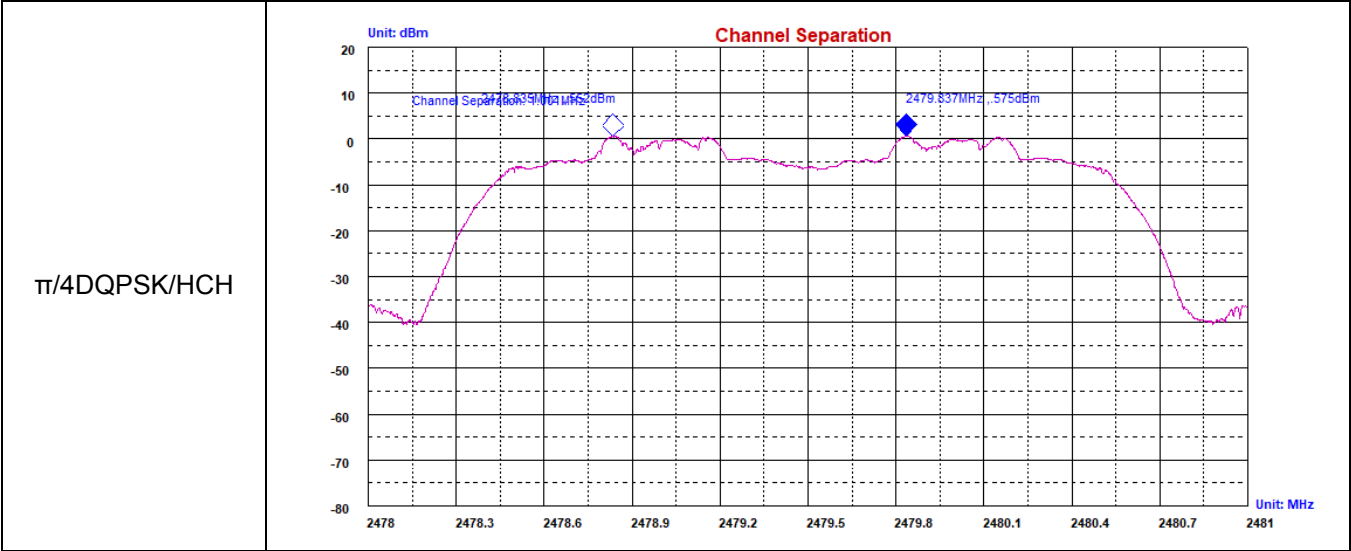
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.999	0.642	PASS
GFSK	MCH	1.000	0.623	PASS
GFSK	HCH	0.996	0.627	PASS
π /4DQPSK	LCH	1.001	0.890	PASS
π /4DQPSK	MCH	1.003	0.888	PASS
π /4DQPSK	HCH	1.001	0.891	PASS

Test Graph



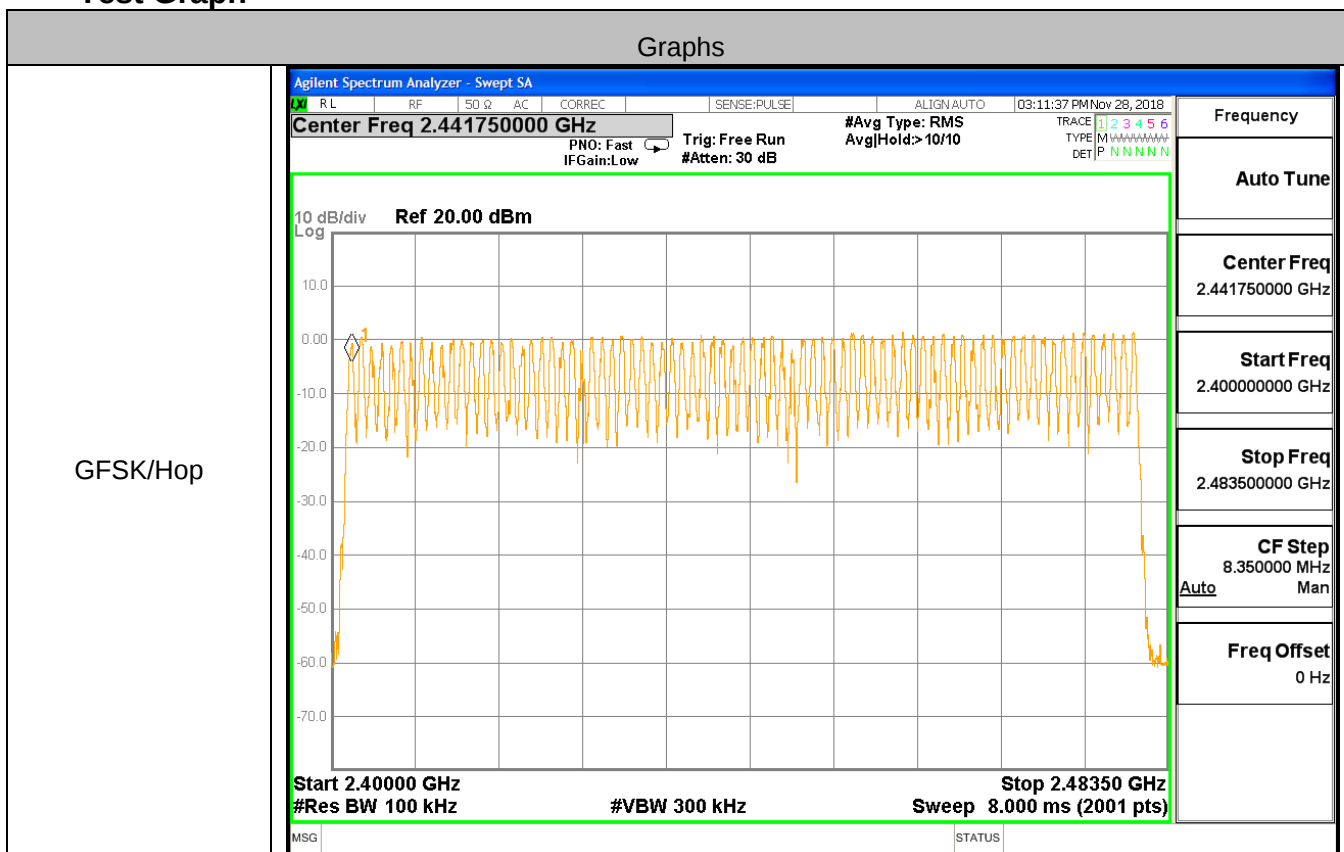


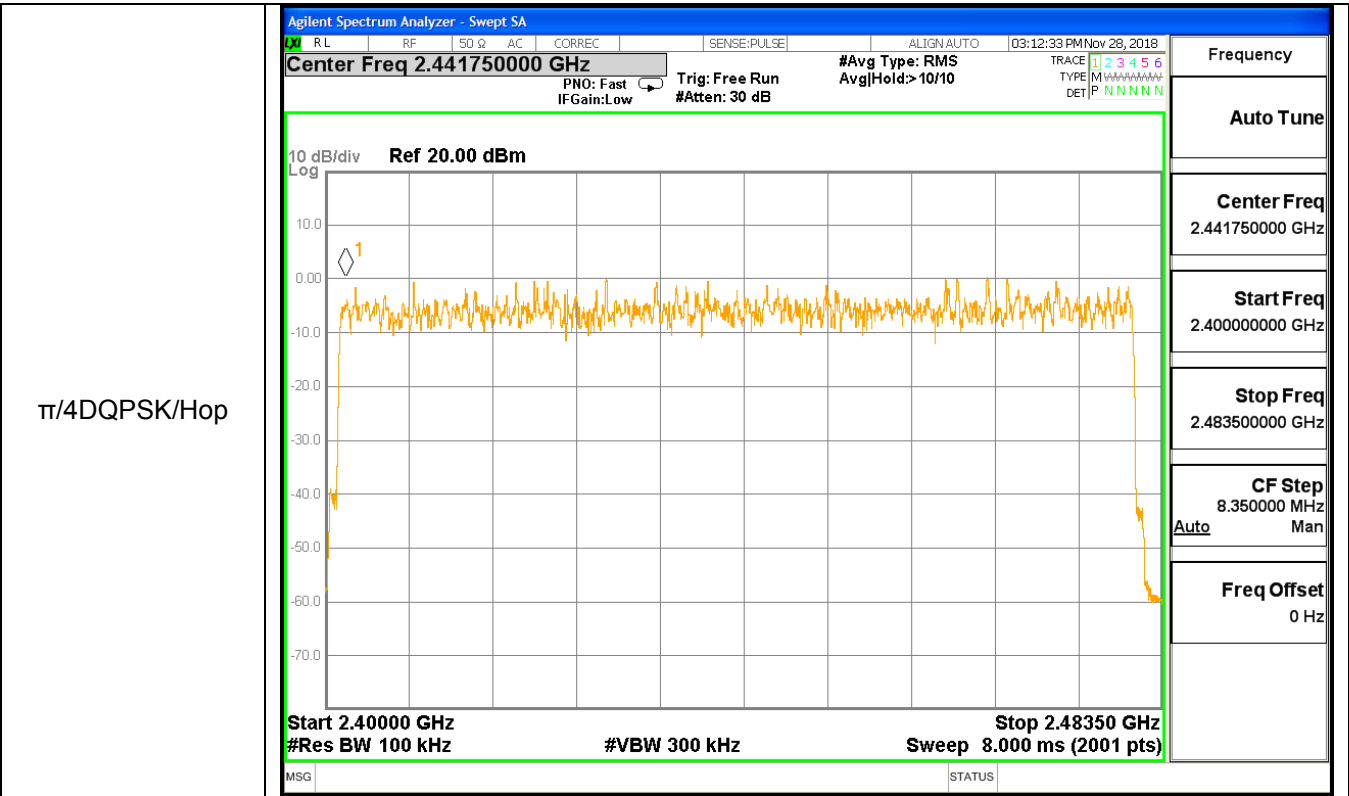


A.4 Hopping Channel Number

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

Test Graph

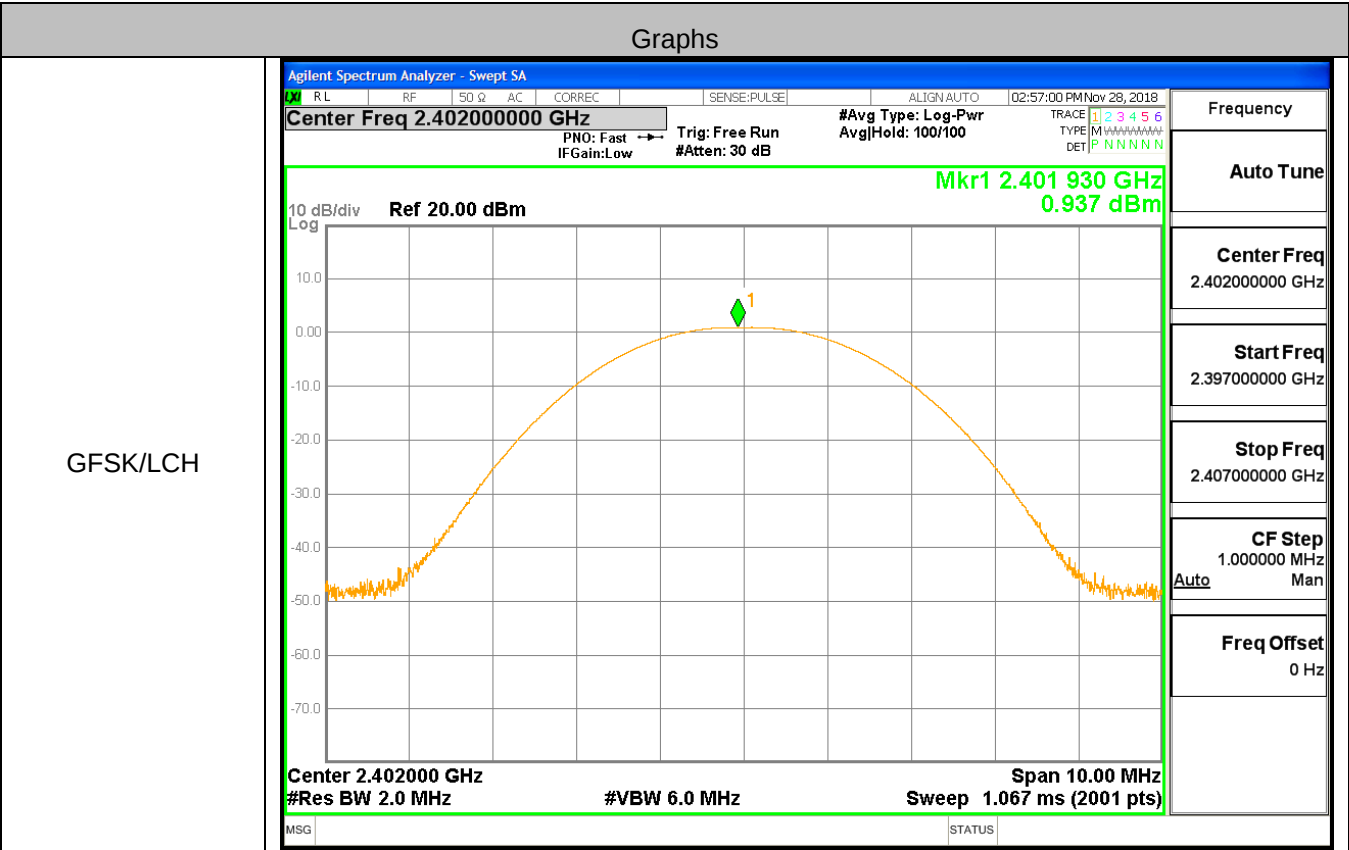


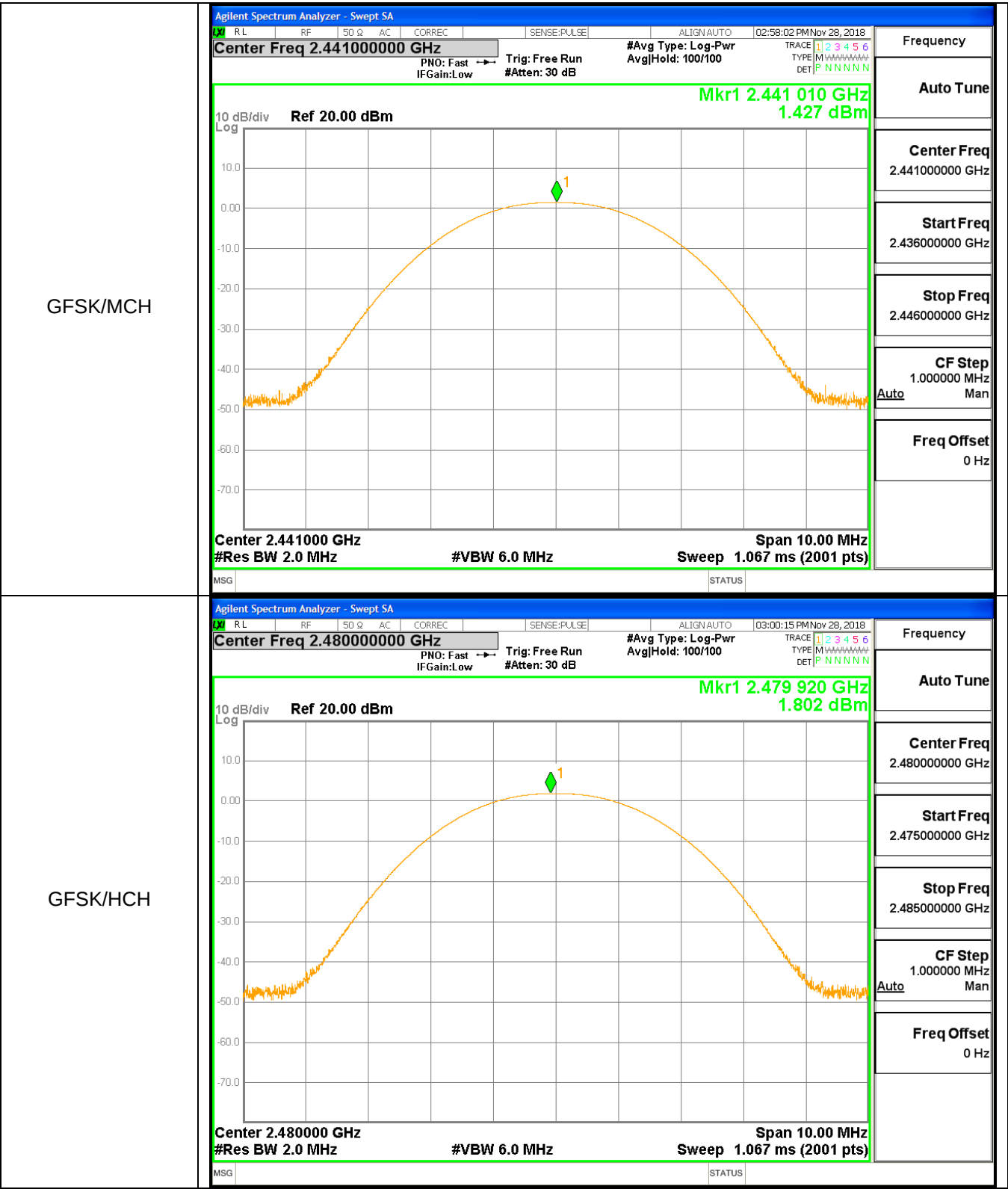


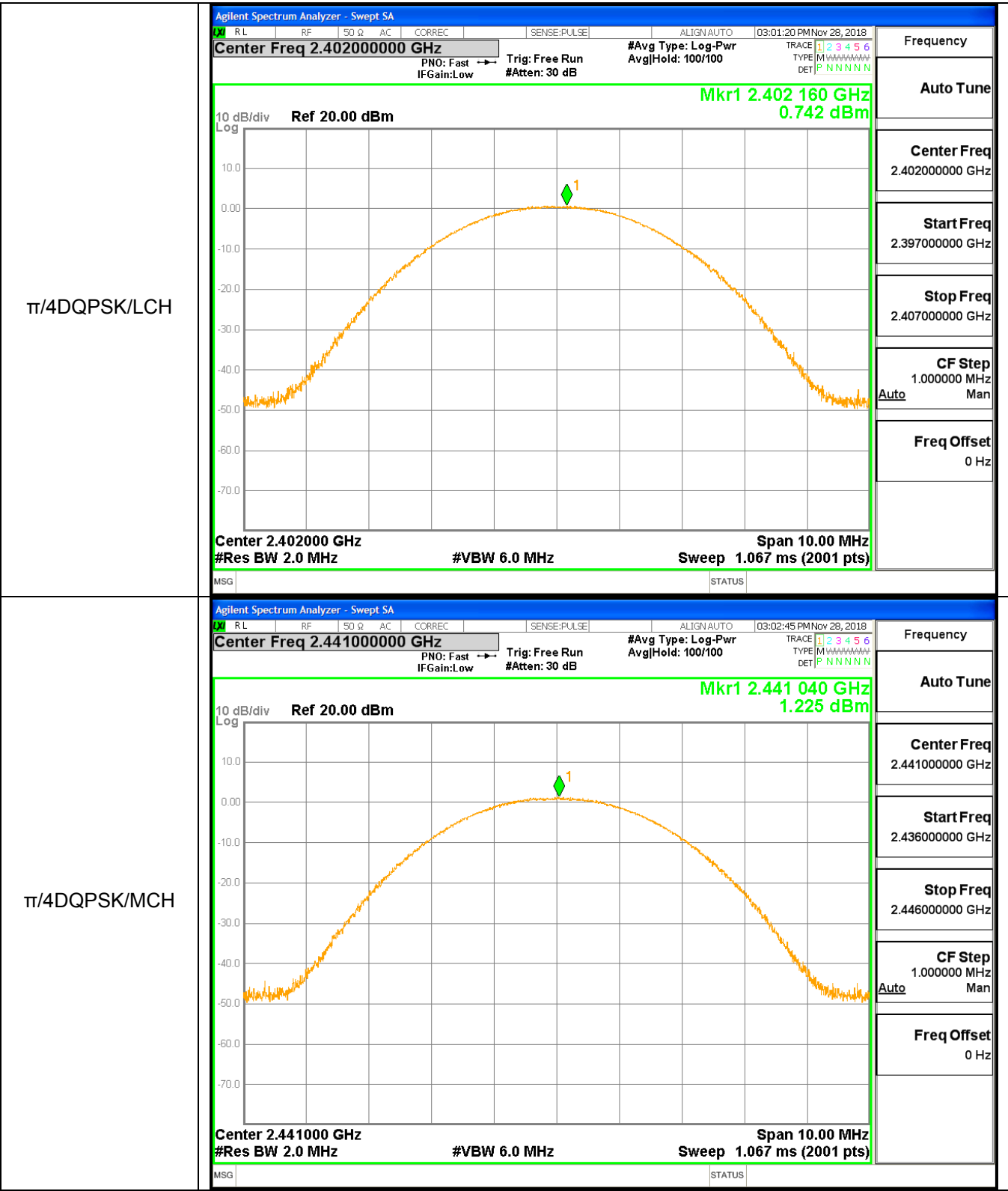
A.5 Conducted Peak Output Power

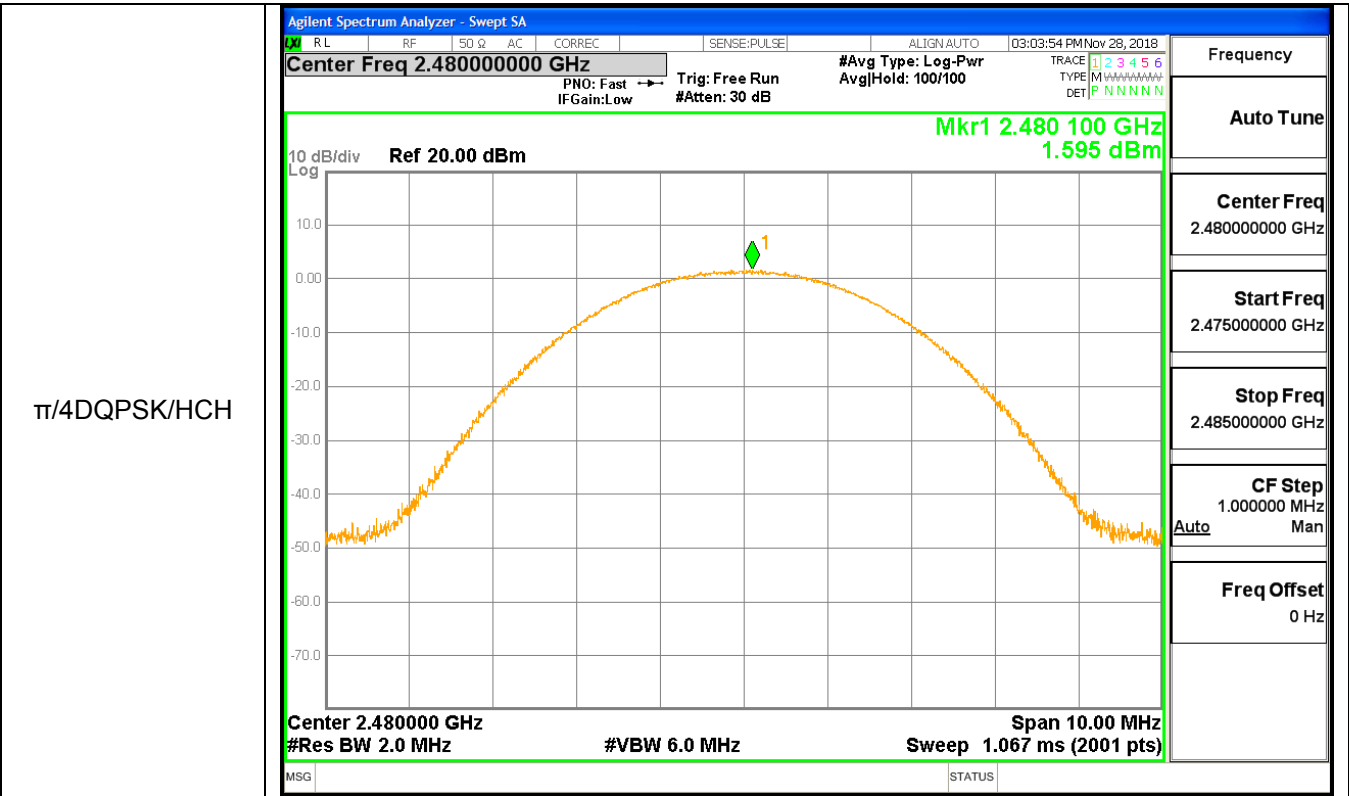
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.937	21	PASS
GFSK	MCH	1.427	21	PASS
GFSK	HCH	1.802	21	PASS
$\pi/4$ DQPSK	LCH	0.742	21	PASS
$\pi/4$ DQPSK	MCH	1.225	21	PASS
$\pi/4$ DQPSK	HCH	1.595	21	PASS

Test Graph





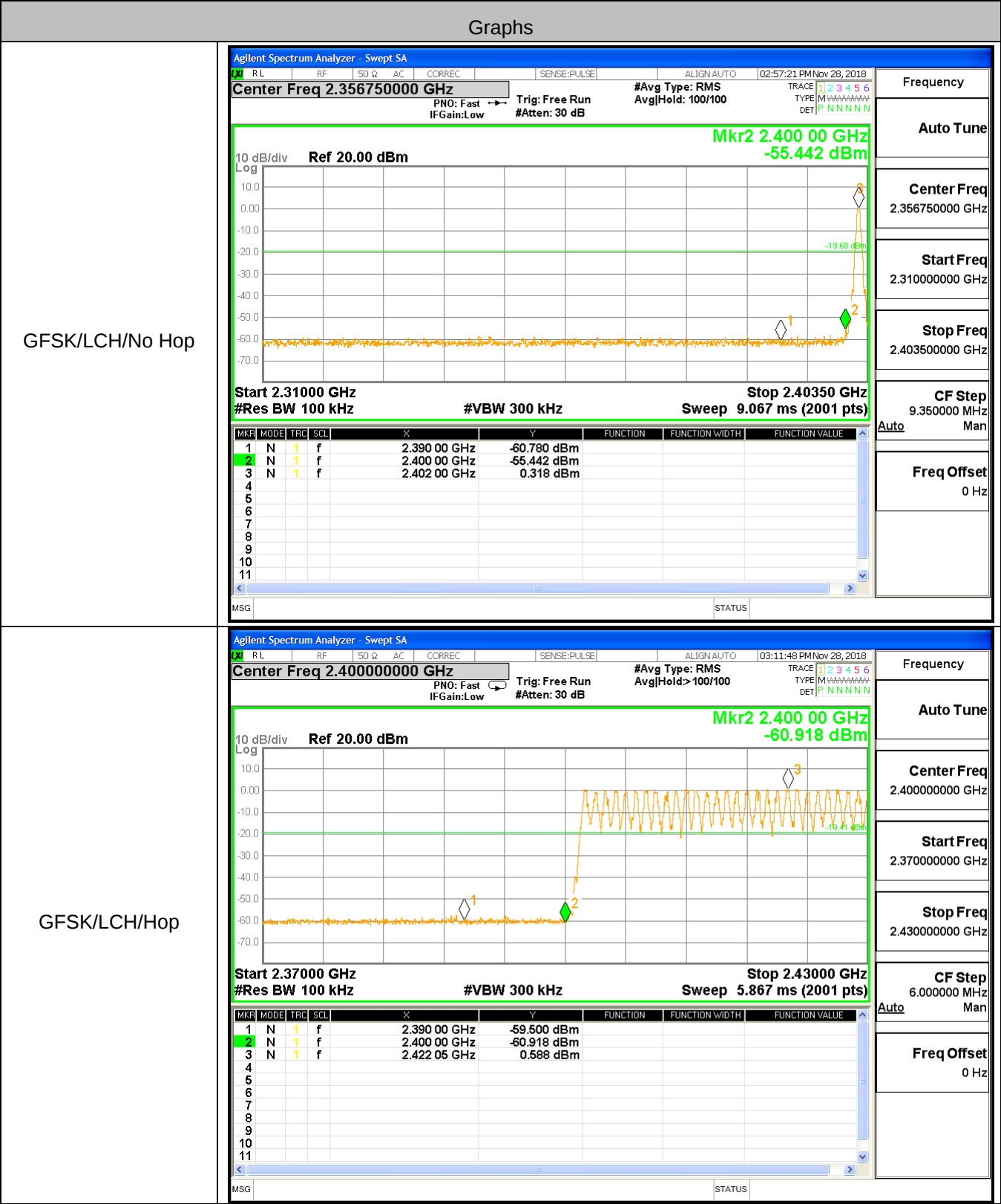


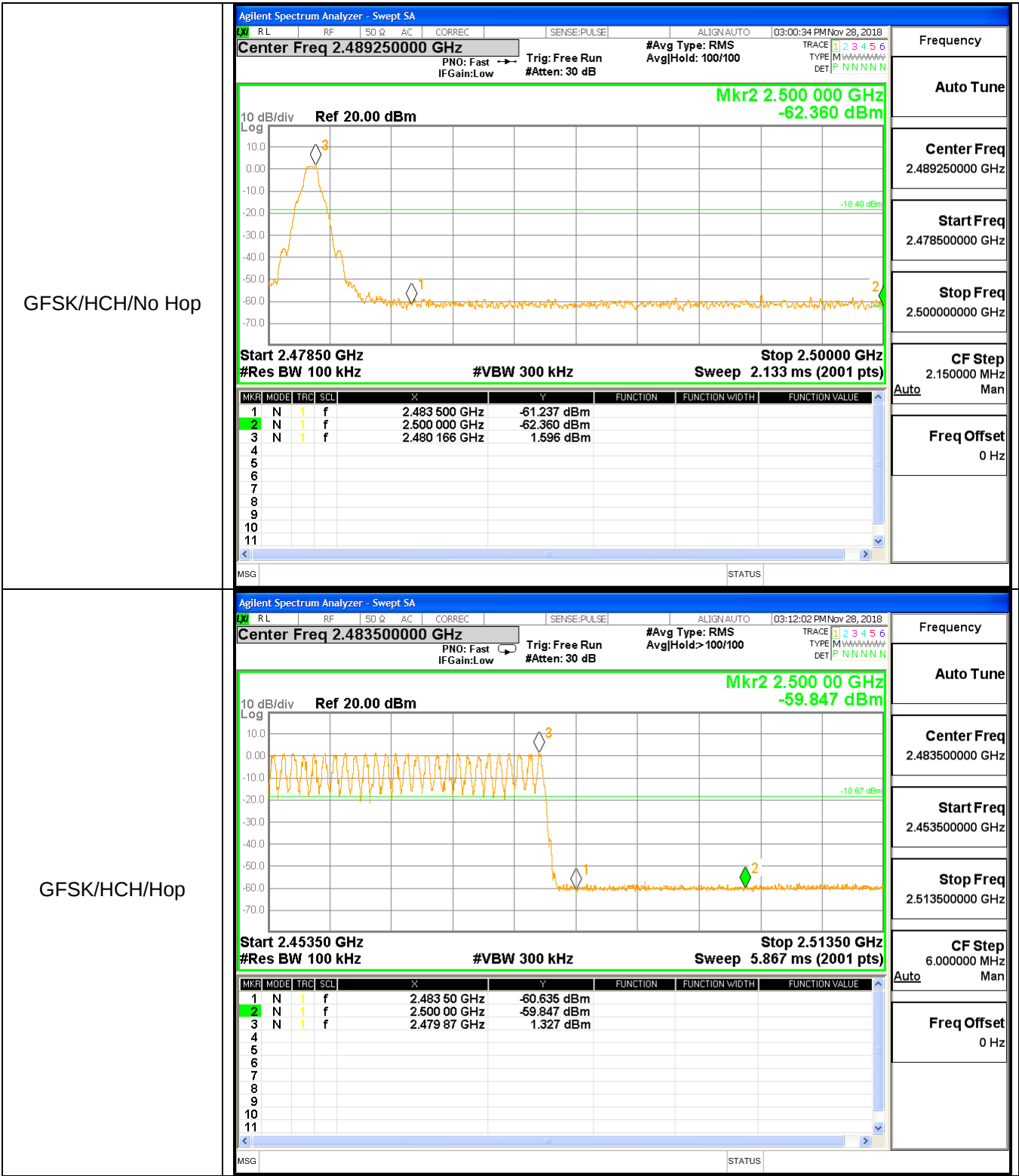


A.6 Band-edge for RF Conducted Emissions

Type	Carrier Frequency(MHz)	Frequency(MHz)	Carrier Frequency Power [dBm]	Bandedge Peak(dBm)	Upper limit(dBm)	Conclusion
1DH5	2402	2390	0.318	-60.78	-19.682	Pass
1DH5	2402	2400	0.318	-55.44	-19.682	Pass
1DH5-Hopping	2402	2390	0.588	-59.5	-19.412	Pass
1DH5-Hopping	2402	2400	0.588	-60.92	-19.412	Pass
1DH5	2480	2483.5	1.596	-61.24	-18.404	Pass
1DH5	2480	2500	1.596	-62.36	-18.404	Pass
1DH5-Hopping	2480	2483.5	1.327	-60.64	-18.673	Pass
1DH5-Hopping	2480	2500	1.327	-59.85	-18.673	Pass
2DH5	2402	2390	-3.638	-60.92	-23.638	Pass
2DH5	2402	2400	-3.638	-55.14	-23.638	Pass
2DH5-Hopping	2480	2483.5	-0.047	-60.16	-20.047	Pass
2DH5-Hopping	2480	2500	-0.047	-59.71	-20.047	Pass
2DH5	2480	2483.5	-0.803	-62.32	-20.803	Pass
2DH5	2480	2500	-0.803	-61.38	-20.803	Pass
2DH5-Hopping	2402	2390	-2.746	-0.236	-60.52	Pass
2DH5-Hopping	2402	2400	-2.746	-0.236	-58.11	Pass

Test Graph





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

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.356750000 GHz

Ref 20.00 dBm

Mkr2 2.400 00 GHz -55.142 dBm

Start 2.31000 GHz Stop 2.40350 GHz

#Res BW 100 kHz #VBW 300 kHz Sweep 9.067 ms (2001 pts)

MkP	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.390 00 GHz	-60.920 dBm			
2	N	1	f	2.400 00 GHz	-55.142 dBm			
3	N	1	f	2.401 82 GHz	-3.638 dBm			

$\pi/4$ DQPSK/LCH/Hop

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.400000000 GHz

Ref 20.00 dBm

Mkr2 2.400 00 GHz -58.114 dBm

Start 2.37000 GHz Stop 2.43000 GHz

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

MkP	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.390 00 GHz	-60.521 dBm			
2	N	1	f	2.400 00 GHz	-58.114 dBm			
3	N	1	f	2.424 06 GHz	-0.236 dBm			

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

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.483 500 GHz	-62.323 dBm			
2	N	1	f	2.500 000 GHz	-61.378 dBm			
3	N	1	f	2.479 984 GHz	-0.803 dBm			

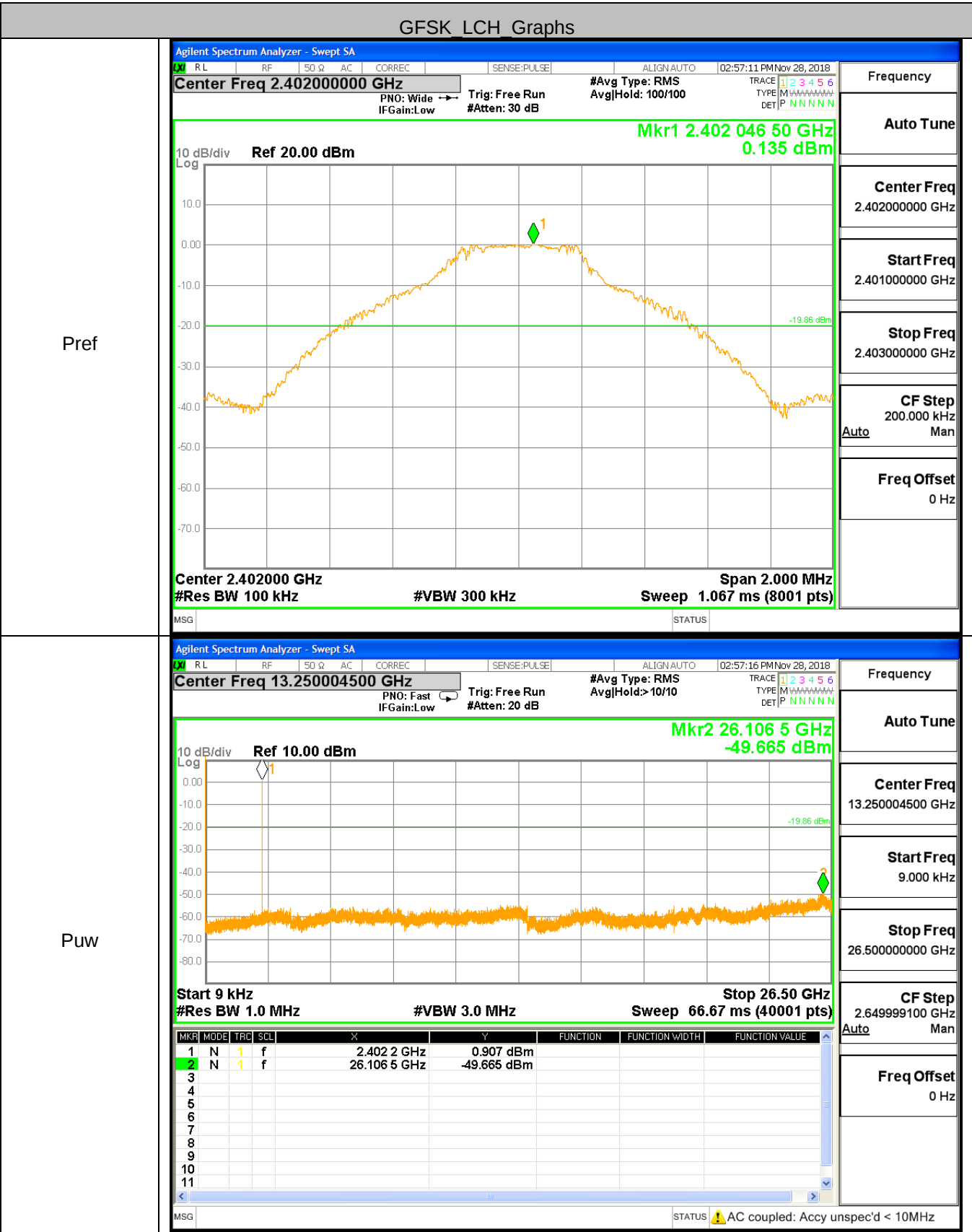
Frequency
Auto Tune
Center Freq
2.489250000 GHz
Start Freq
2.478500000 GHz
Stop Freq
2.500000000 GHz
CF Step
2.150000 MHz
Auto
Freq Offset
0 Hz

$\pi/4$ DQPSK/HCH/Hop

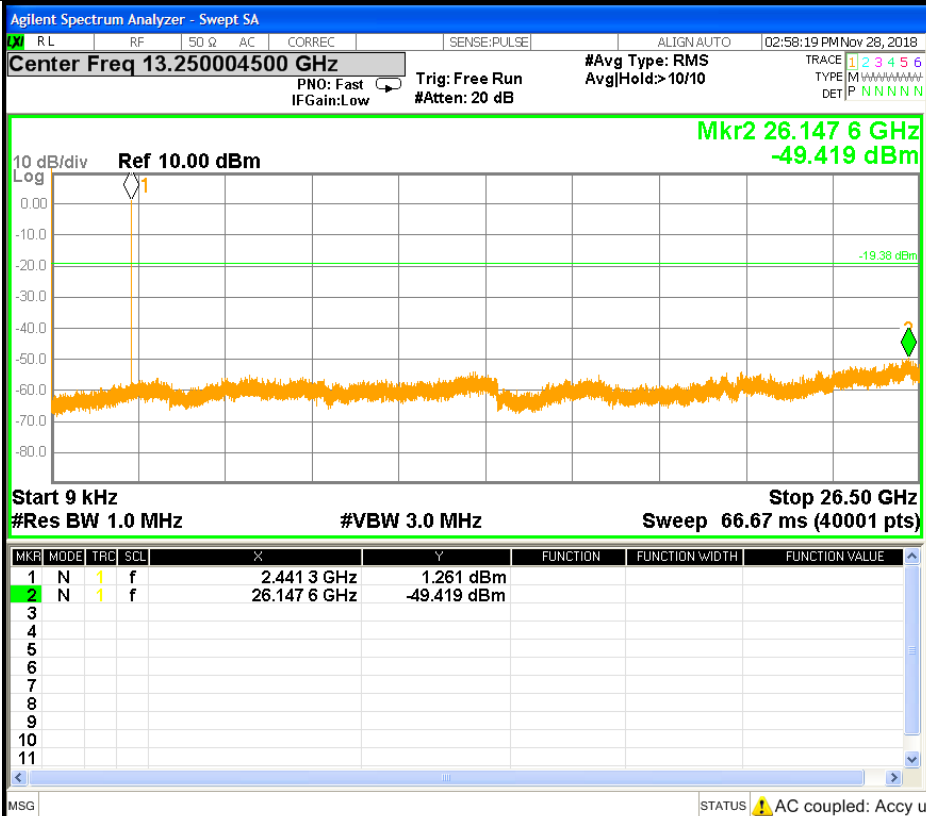
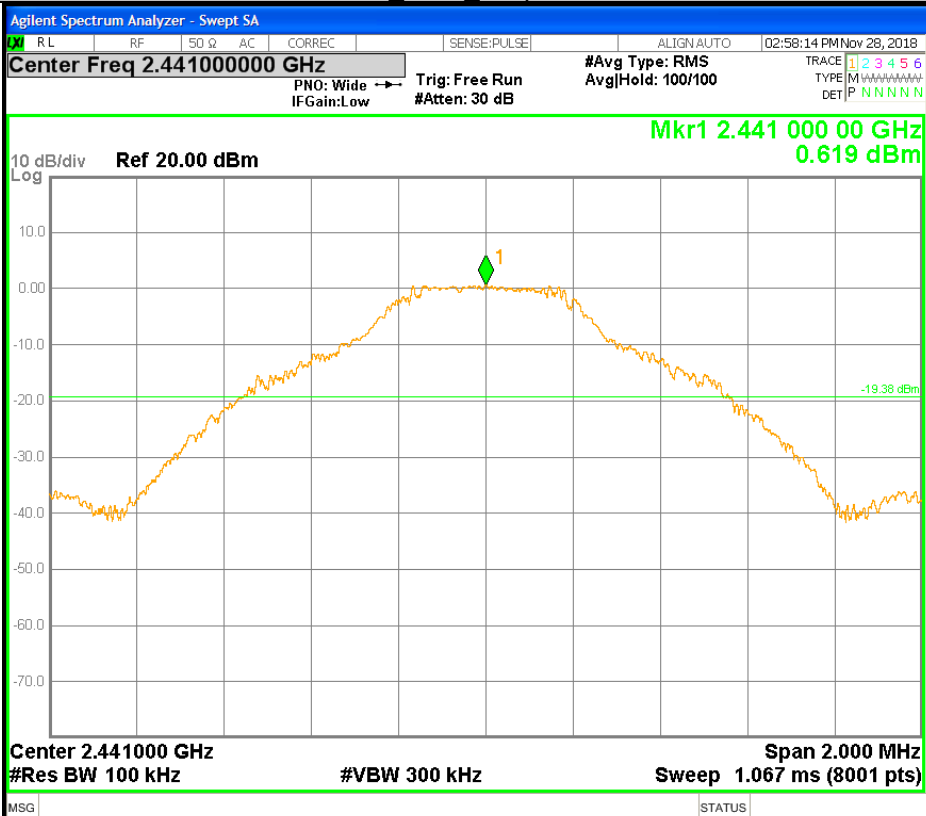
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.483 50 GHz	-60.165 dBm			
2	N	1	f	2.500 00 GHz	-59.709 dBm			
3	N	1	f	2.465 98 GHz	-0.047 dBm			

Frequency
Auto Tune
Center Freq
2.483500000 GHz
Start Freq
2.453500000 GHz
Stop Freq
2.513500000 GHz
CF Step
6.000000 MHz
Auto
Freq Offset
0 Hz

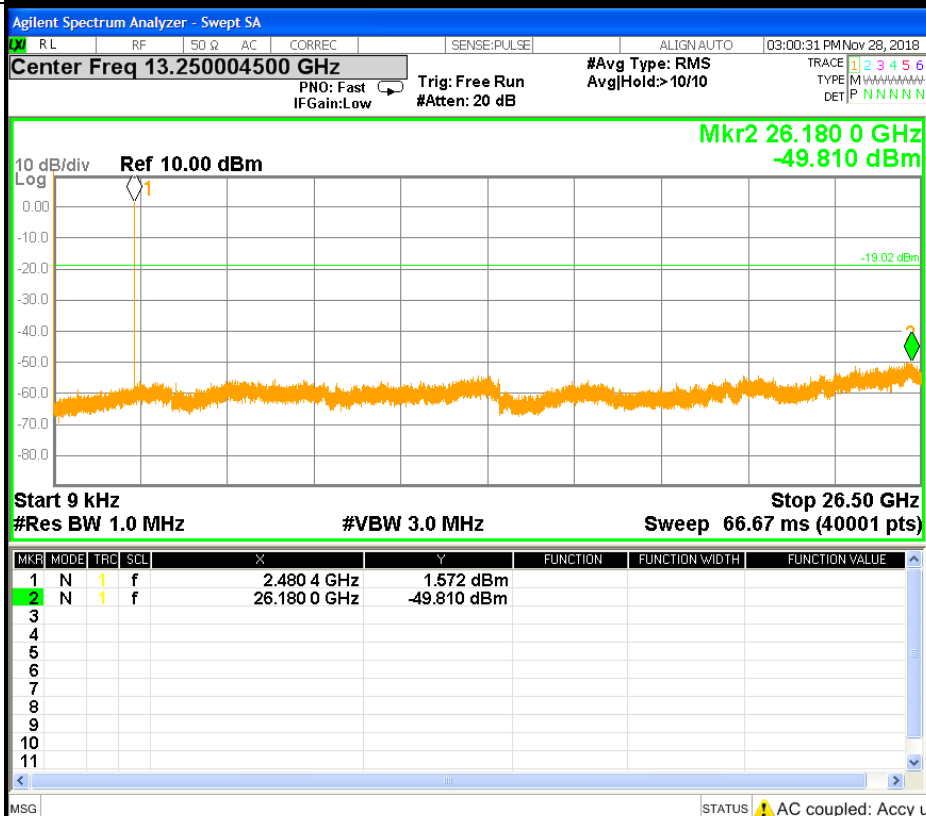
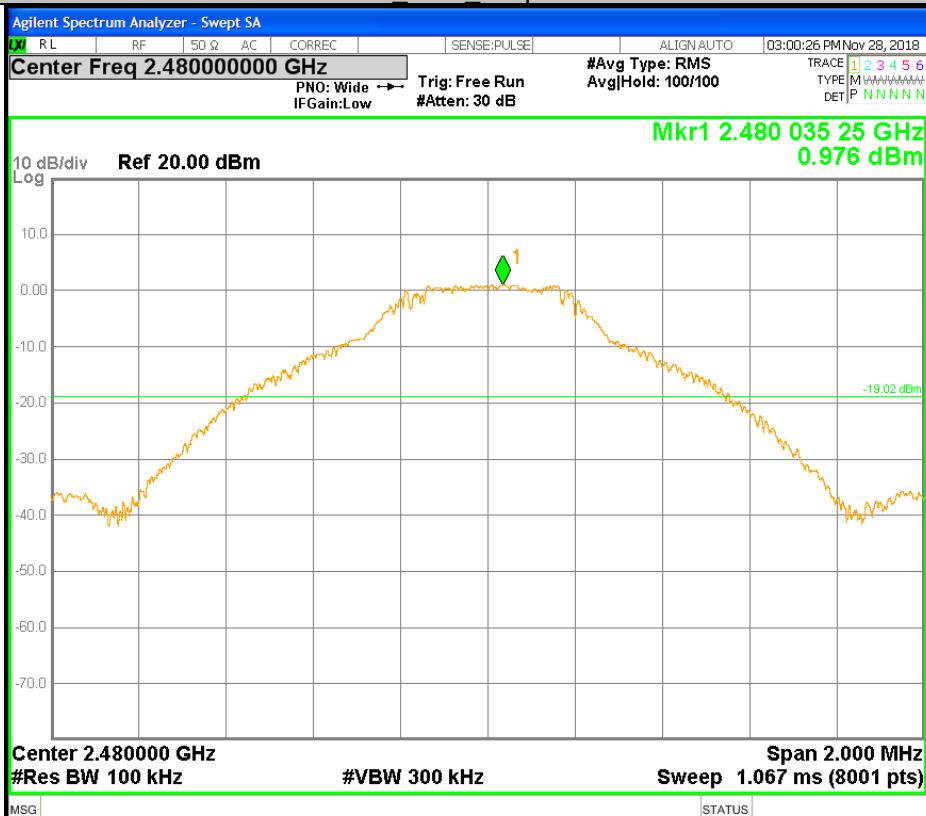
A.7 RF Conducted Spurious Emissions
Test Graph



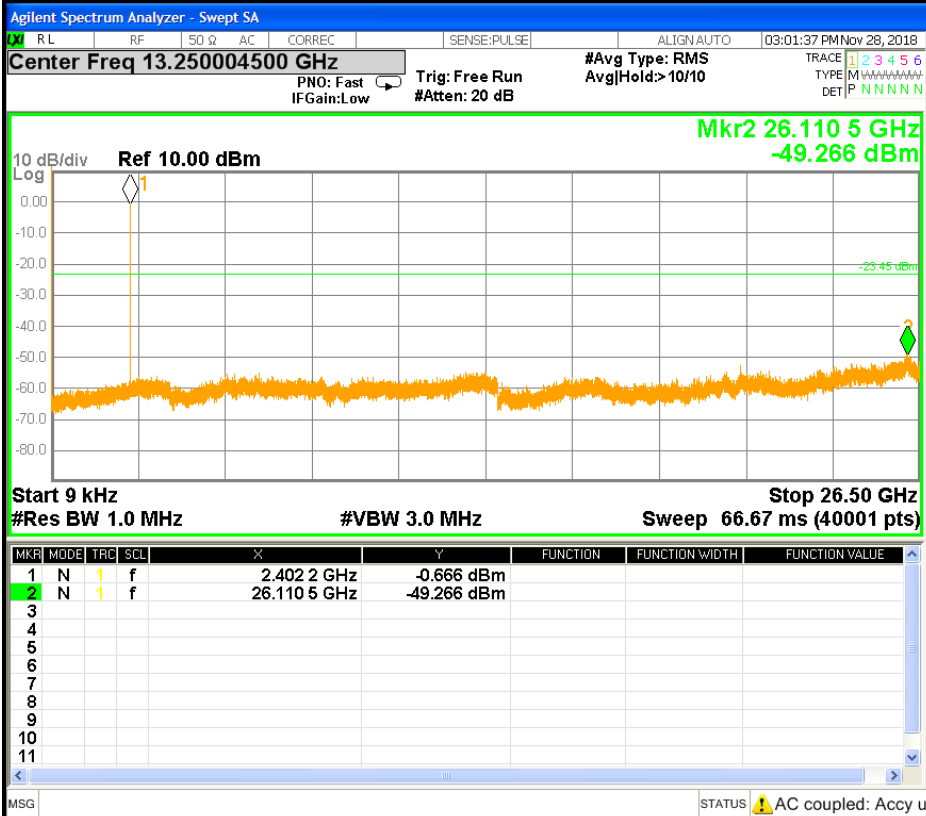
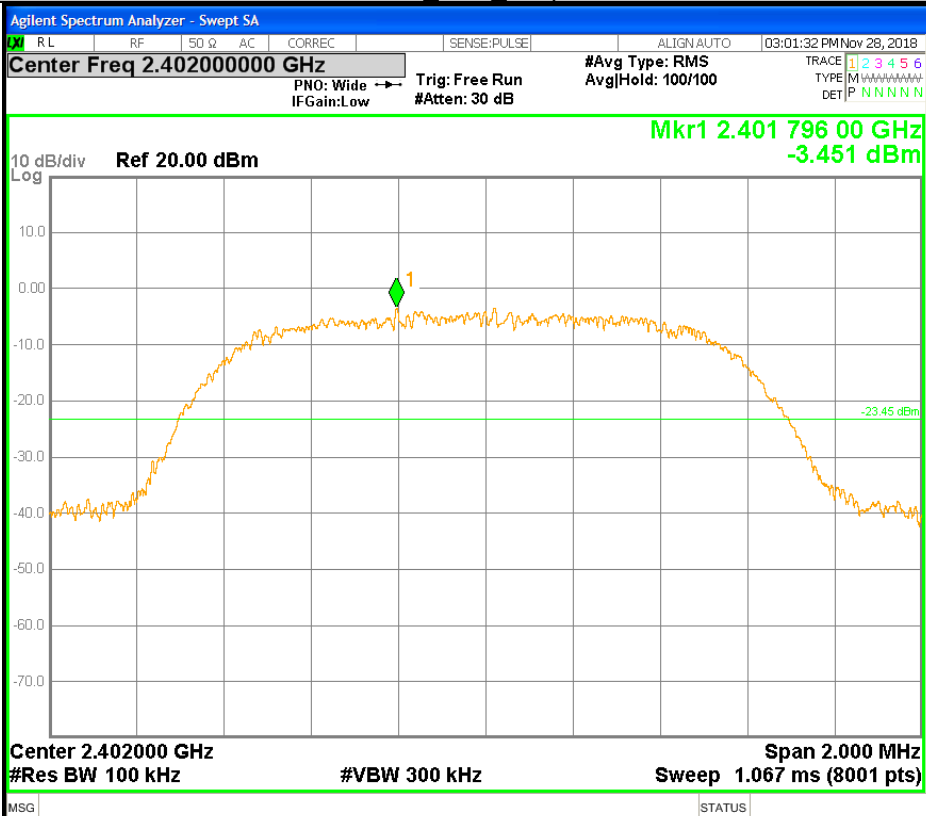
GFSK MCH Graphs



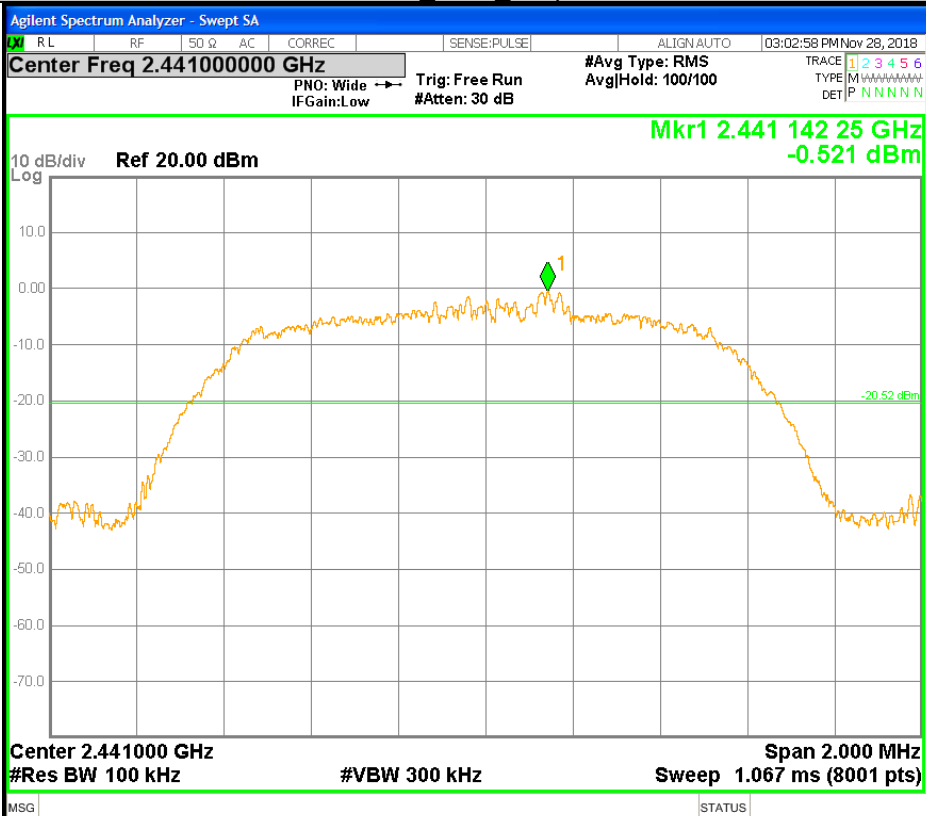
GFSK HCH Graphs



$\pi/4$ DQPSK LCH Graphs

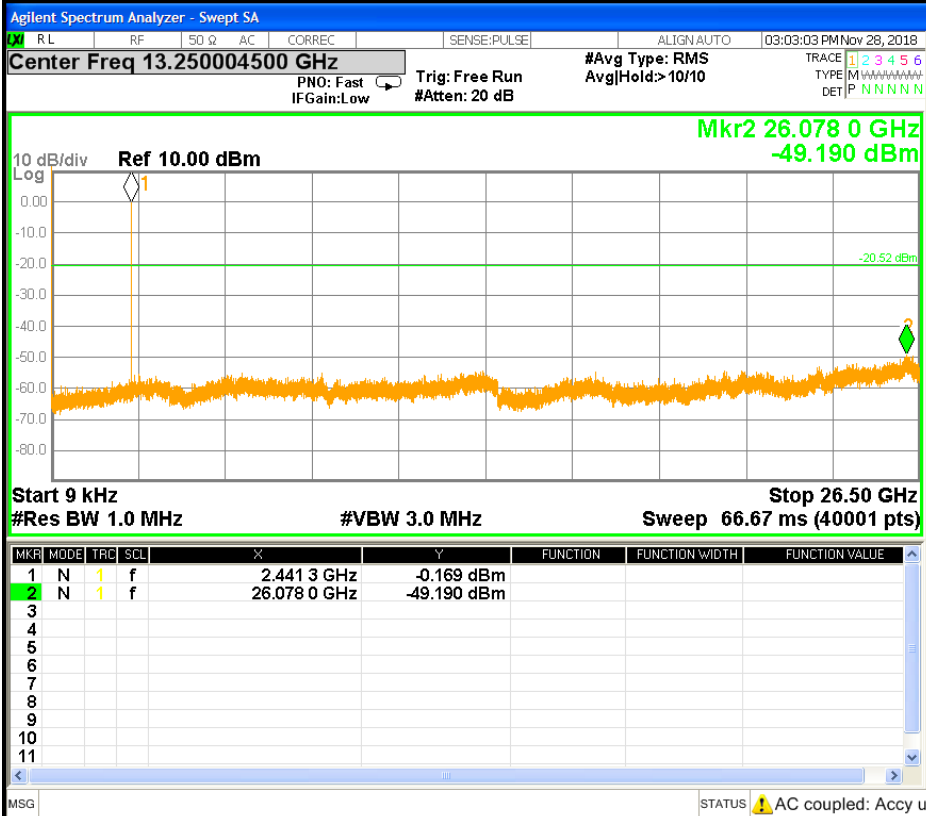


$\pi/4$ DQPSK MCH Graphs



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

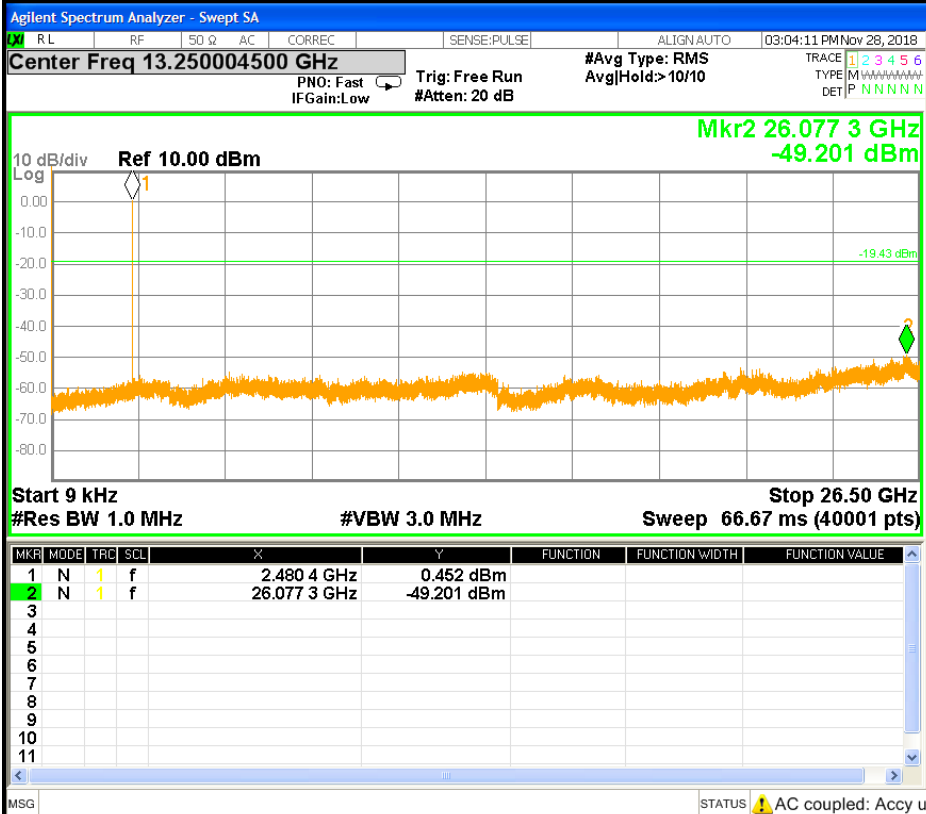
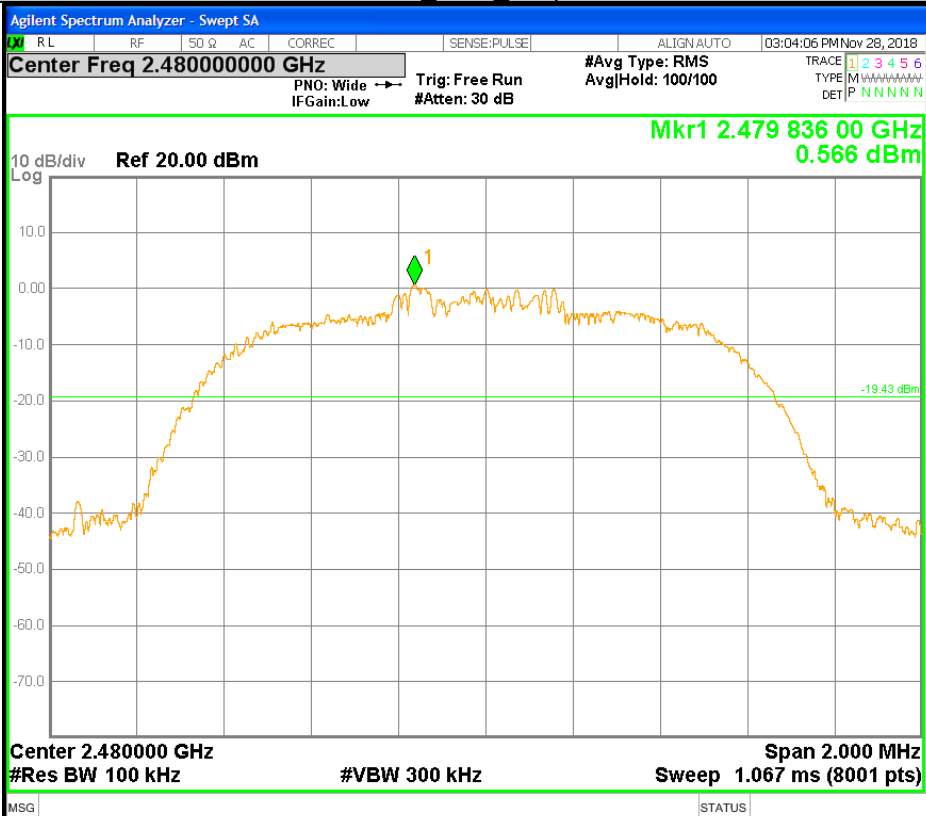
Puw



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

STATUS	⚠ AC coupled: Accy unspec'd < 10MHz
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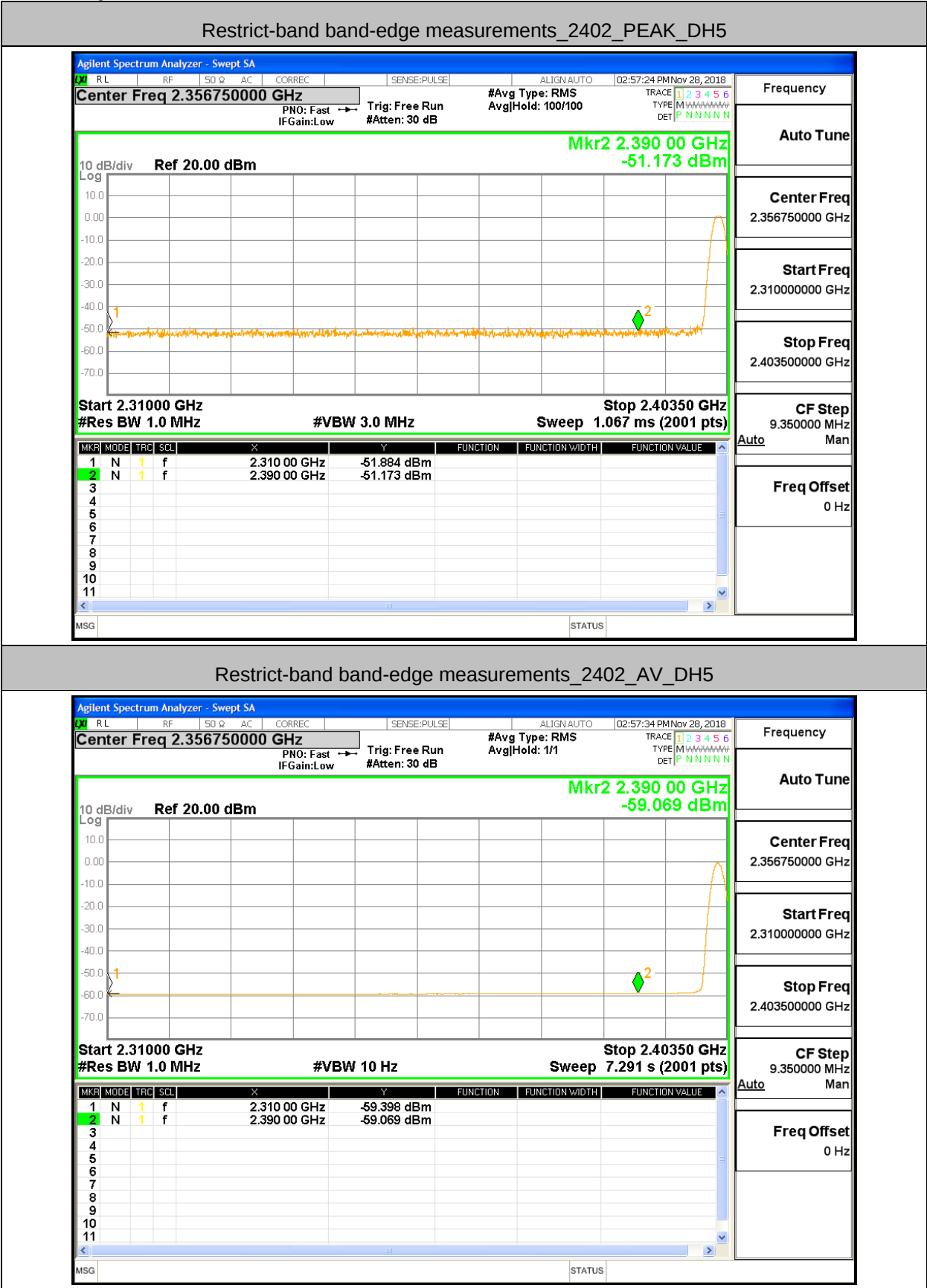
$\pi/4$ DQPSK HCH Graphs



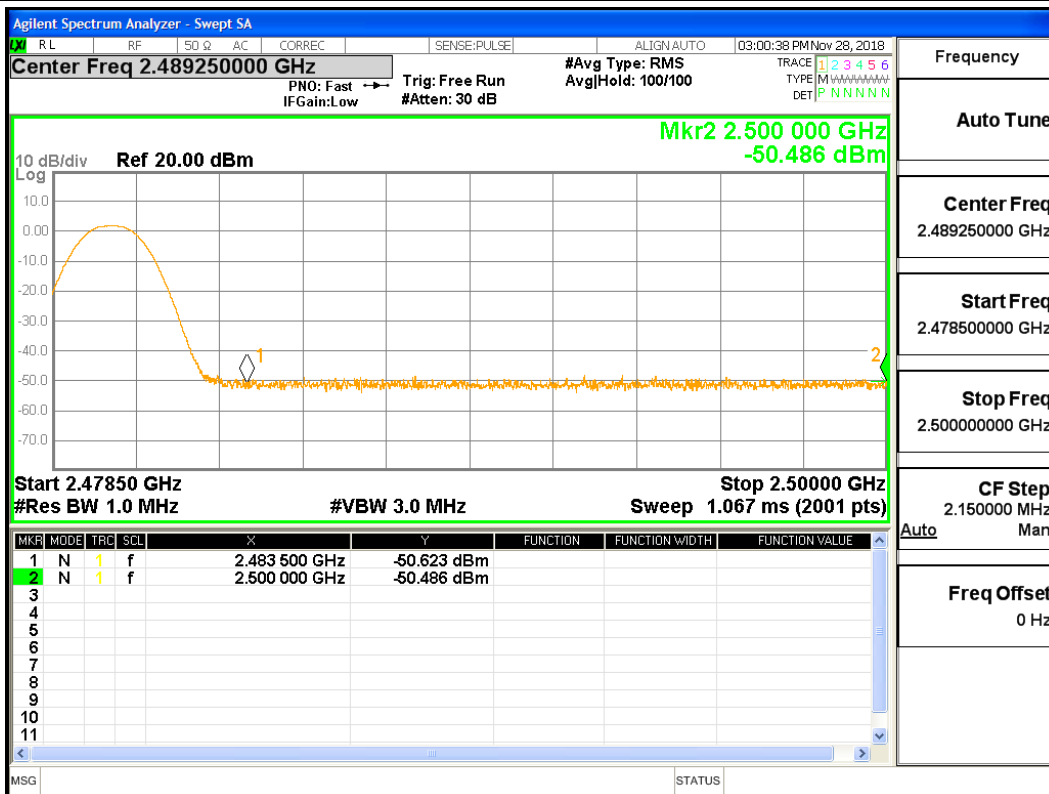
A.8 Restrict-band band-edge measurements

Type	Carrier Frequenc y (MHz)	Frequenc y(MHz)	Gain	Groun d Factor	Peak Value(dBm)	E [dBuV/m]	Limit [dBuV/m]	Average Value(dBm)	E [dBuV/m]	Limit [dBuV/m]	Conclusio n
1DH5	2402	2310	-0.58	0.00	-51.88	42.74	74	-59.4	35.22	54	Pass
1DH5	2402	2390	-0.58	0.00	-51.17	43.45	74	-59.07	35.55	54	Pass
1DH5	2480	2483.5	-0.58	0.00	-50.62	44	74	-56.44	38.18	54	Pass
1DH5	2480	2500	-0.58	0.00	-50.49	44.13	74	-58.51	36.11	54	Pass
2DH5	2402	2310	-0.58	0.00	-52.3	42.32	74	-59.38	35.24	54	Pass
2DH5	2402	2390	-0.58	0.00	-52.92	41.7	74	-59.03	35.59	54	Pass
2DH5	2480	2483.5	-0.58	0.00	-49.04	45.58	74	-56.28	38.34	54	Pass
2DH5	2480	2500	-0.58	0.00	-51.39	43.23	74	-58.5	36.12	54	Pass

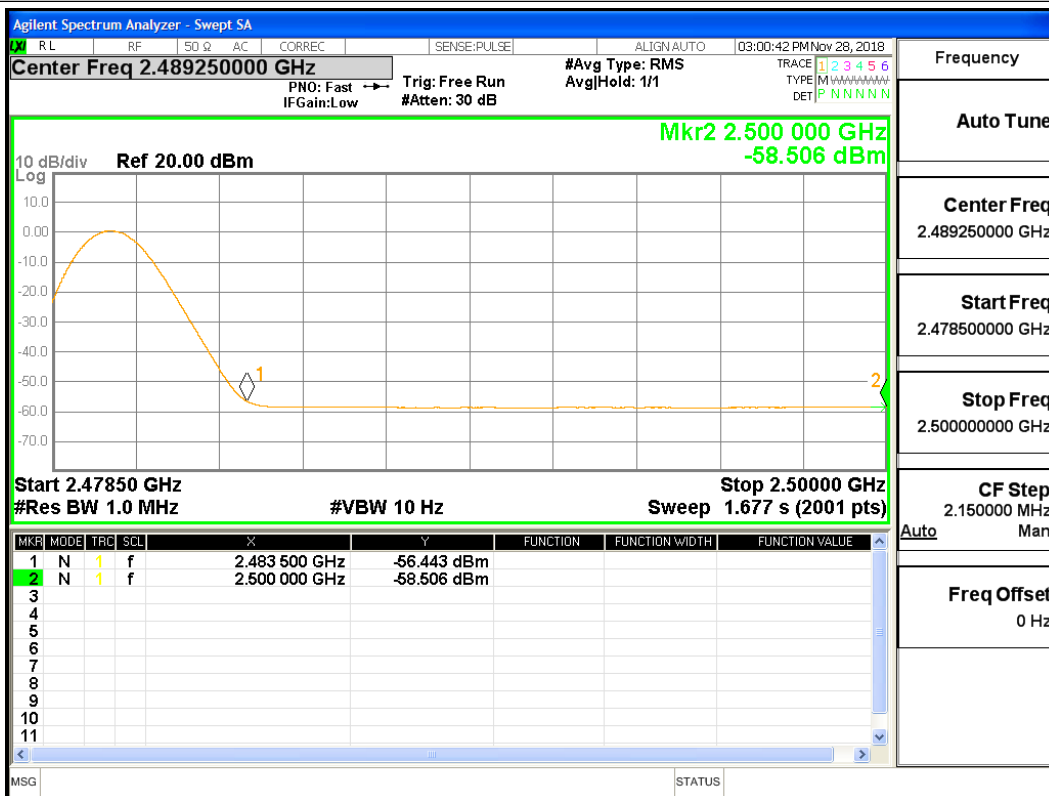
Test Graph



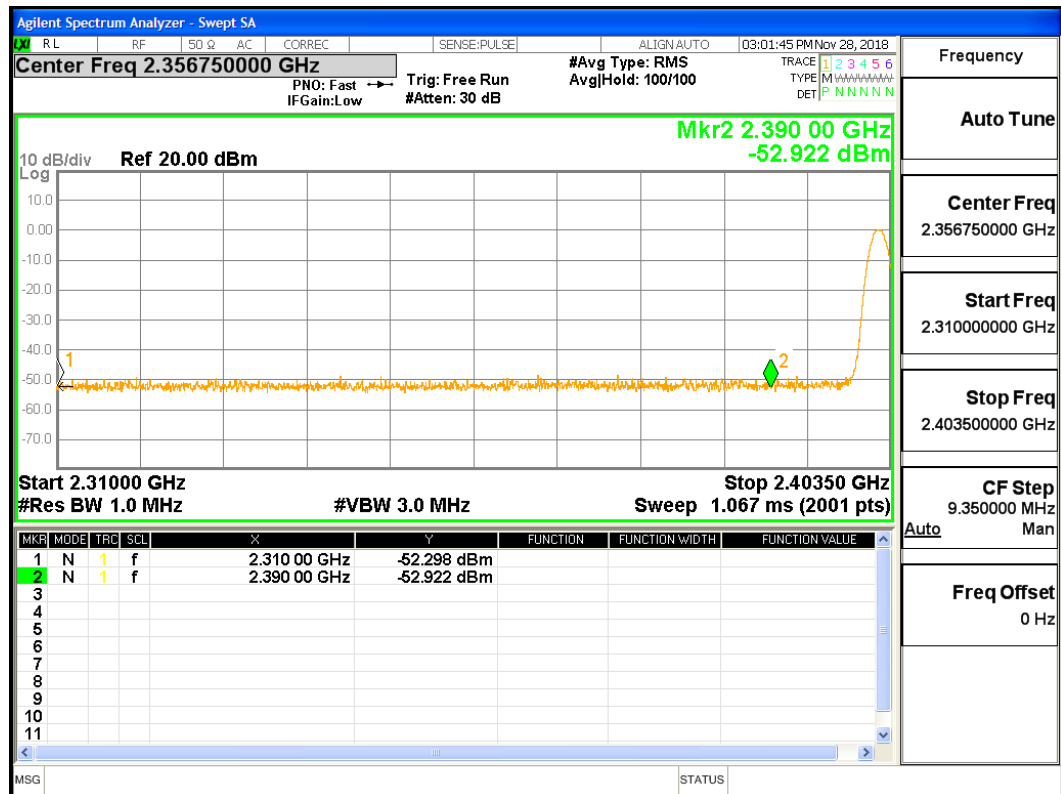
Restrict-band band-edge measurements 2480 PEAK DH5



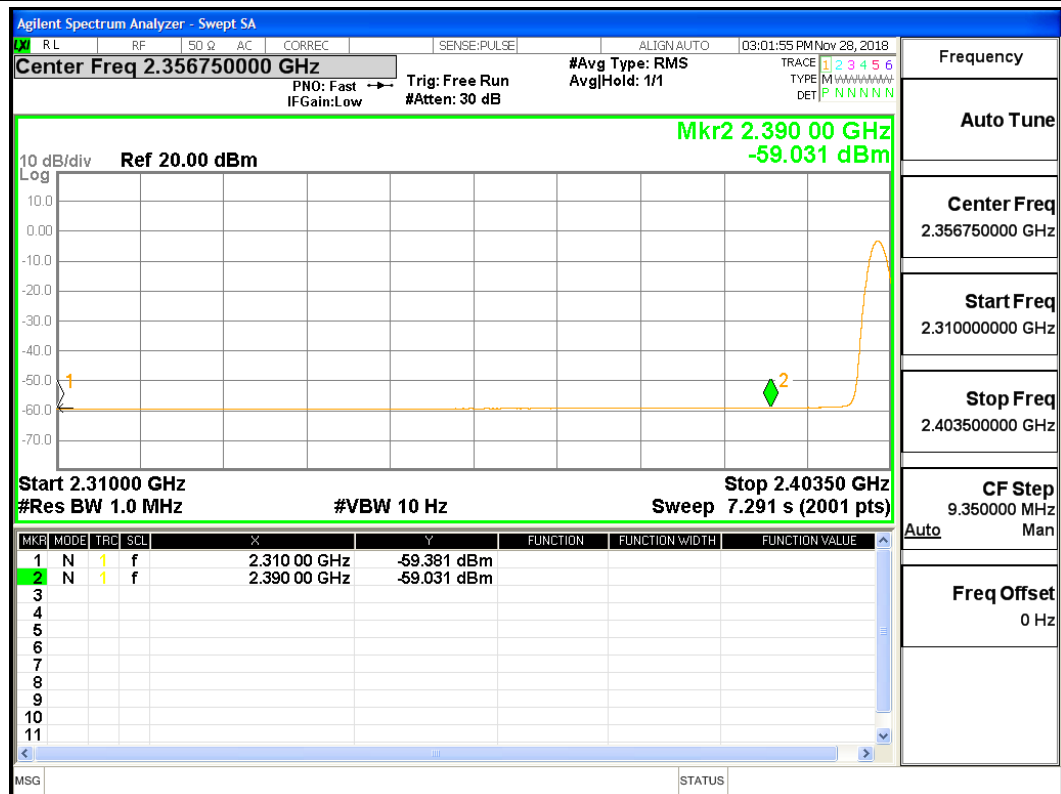
Restrict-band band-edge measurements 2480 AV DH5



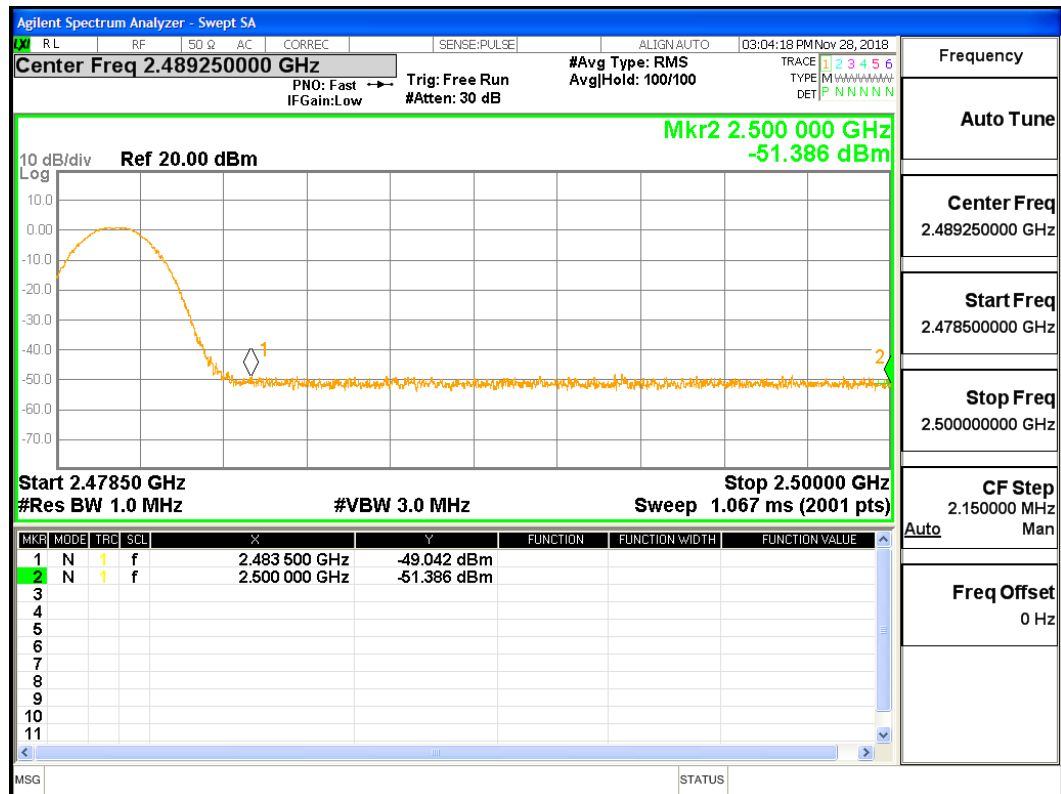
Restrict-band band-edge measurements_2402_PEAK_2DH5



Restrict-band band-edge measurements_2402_AV_2DH5



Restrict-band band-edge measurements_2480_PEAK_2DH5



Restrict-band band-edge measurements_2480_AV_2DH5

