

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

Product Name: Sound bar

Trade Mark: SineAudio

Test Model: DS6502

FCC ID: 2AP93-DS6X

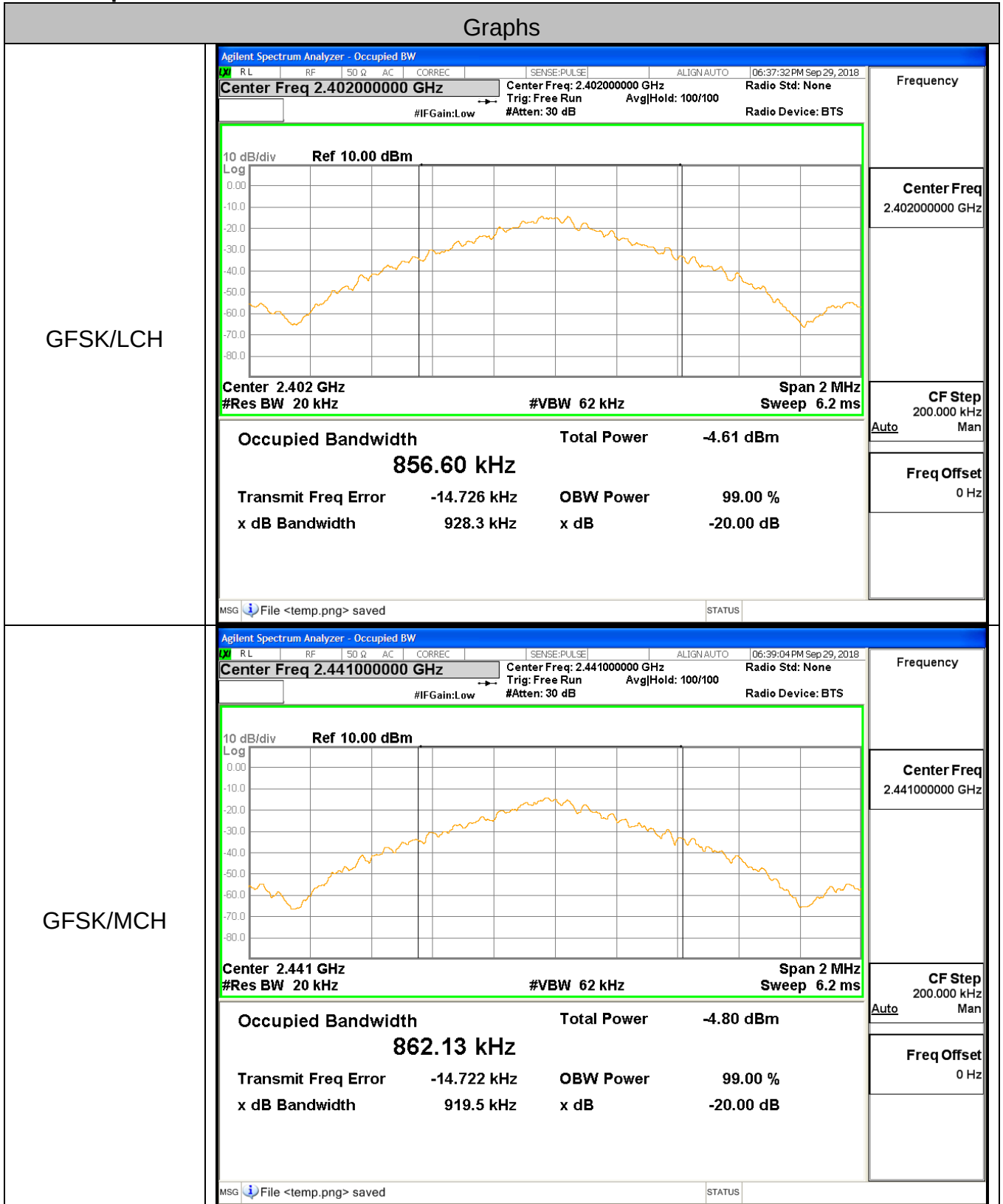
Environmental Conditions

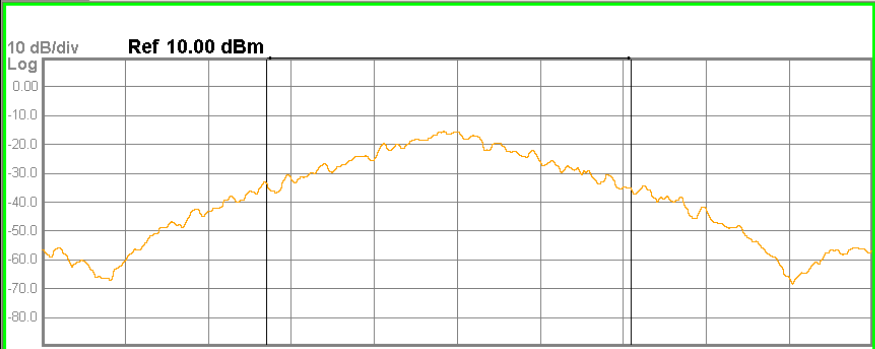
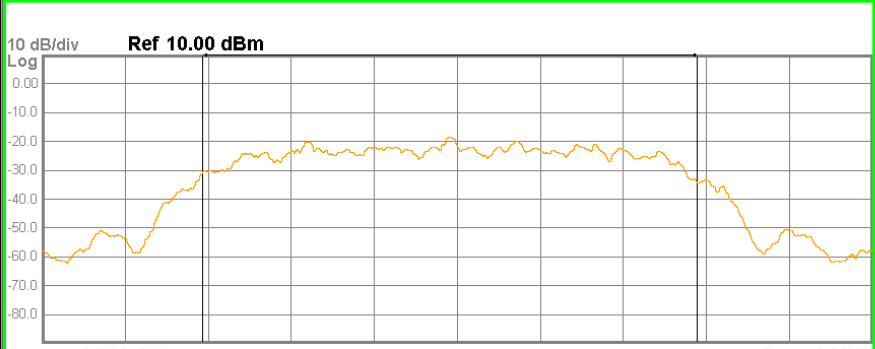
Temperature:	22.5 ° C
Relative Humidity:	55.6%
ATM Pressure:	100.0 kPa
Test Engineer:	Gary Qian
Supervised by:	Eden Hu

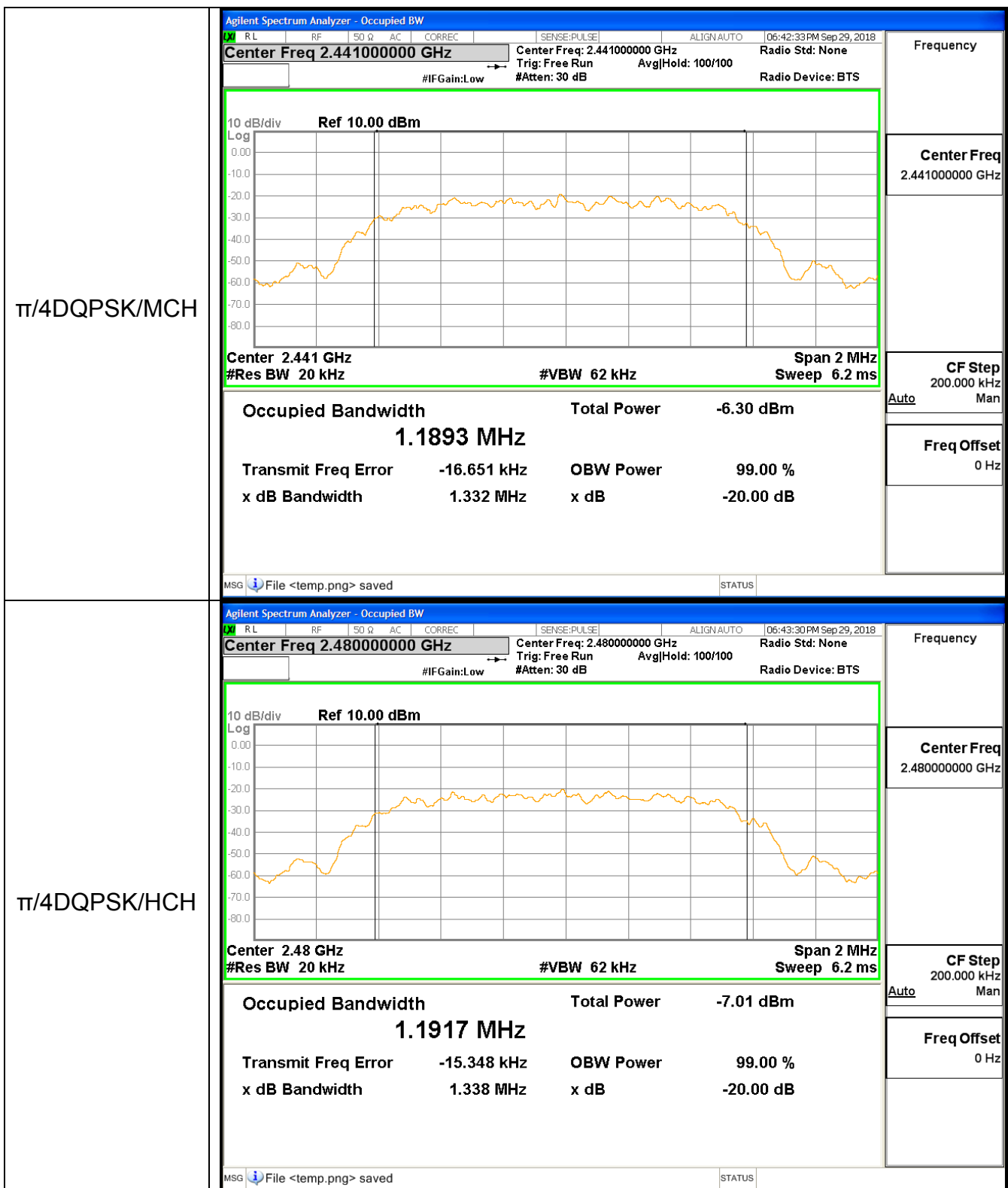
A.1 20 dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit(MHz)	Verdict
GFSK	LCH	0.928	Not Specified	PASS
GFSK	MCH	0.919	Not Specified	PASS
GFSK	HCH	0.934	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.332	Not Specified	PASS
$\pi/4$ DQPSK	MCH	1.332	Not Specified	PASS
$\pi/4$ DQPSK	HCH	1.338	Not Specified	PASS

Test Graph



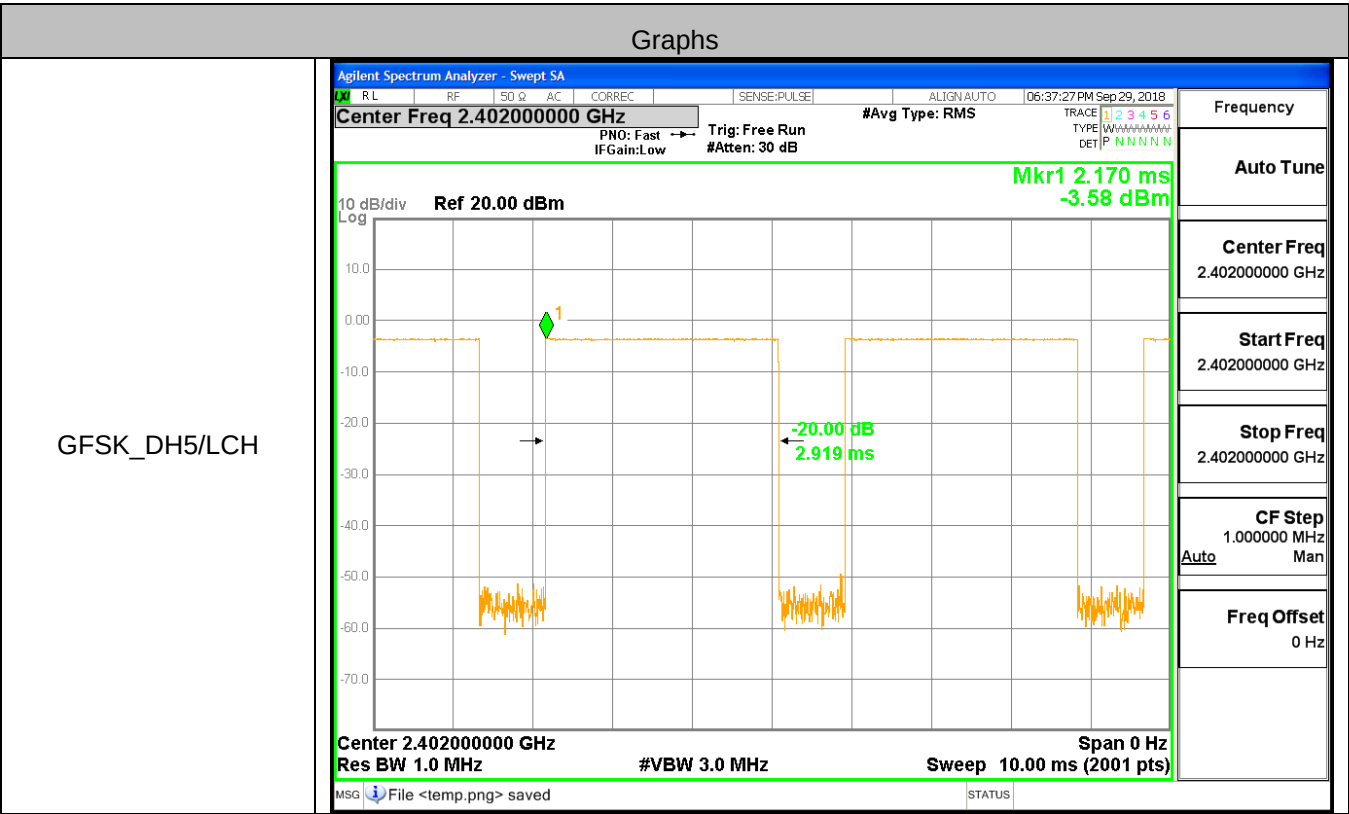
GFSK/HCH	Agilent Spectrum Analyzer - Occupied BW Center Freq 2.480000000 GHz #IFGain:Low Center Freq: 2.480000000 GHz Trig: Free Run #Atten: 30 dB Align: AUTO Radio Std: None Radio Device: BTS 06:40:02 PM Sep 29, 2018				Frequency
					Center Freq 2.480000000 GHz
	Center 2.48 GHz #Res BW 20 kHz #VBW 62 kHz Span 2 MHz Sweep 6.2 ms				CF Step 200.000 kHz Man
	Occupied Bandwidth 873.77 kHz Total Power -5.74 dBm Transmit Freq Error -19.461 kHz OBW Power 99.00 % x dB Bandwidth 933.7 kHz x dB -20.00 dB				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 Radio Std: None Radio Device: BTS 06:41:20 PM Sep 29, 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 1.1878 MHz Total Power -6.07 dBm Transmit Freq Error -15.951 kHz OBW Power 99.00 % x dB Bandwidth 1.332 MHz x dB -20.00 dB				Freq Offset 0 Hz

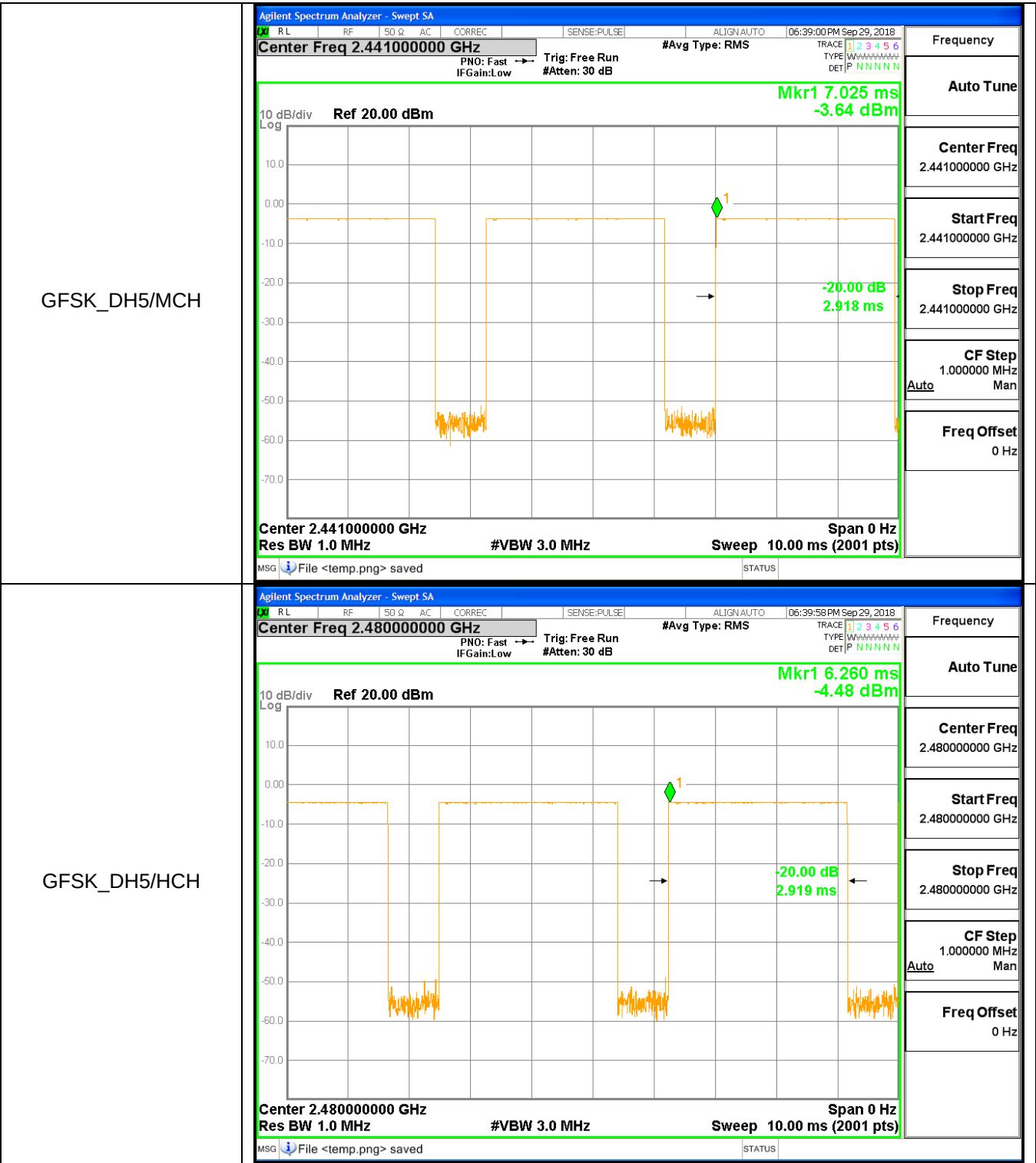


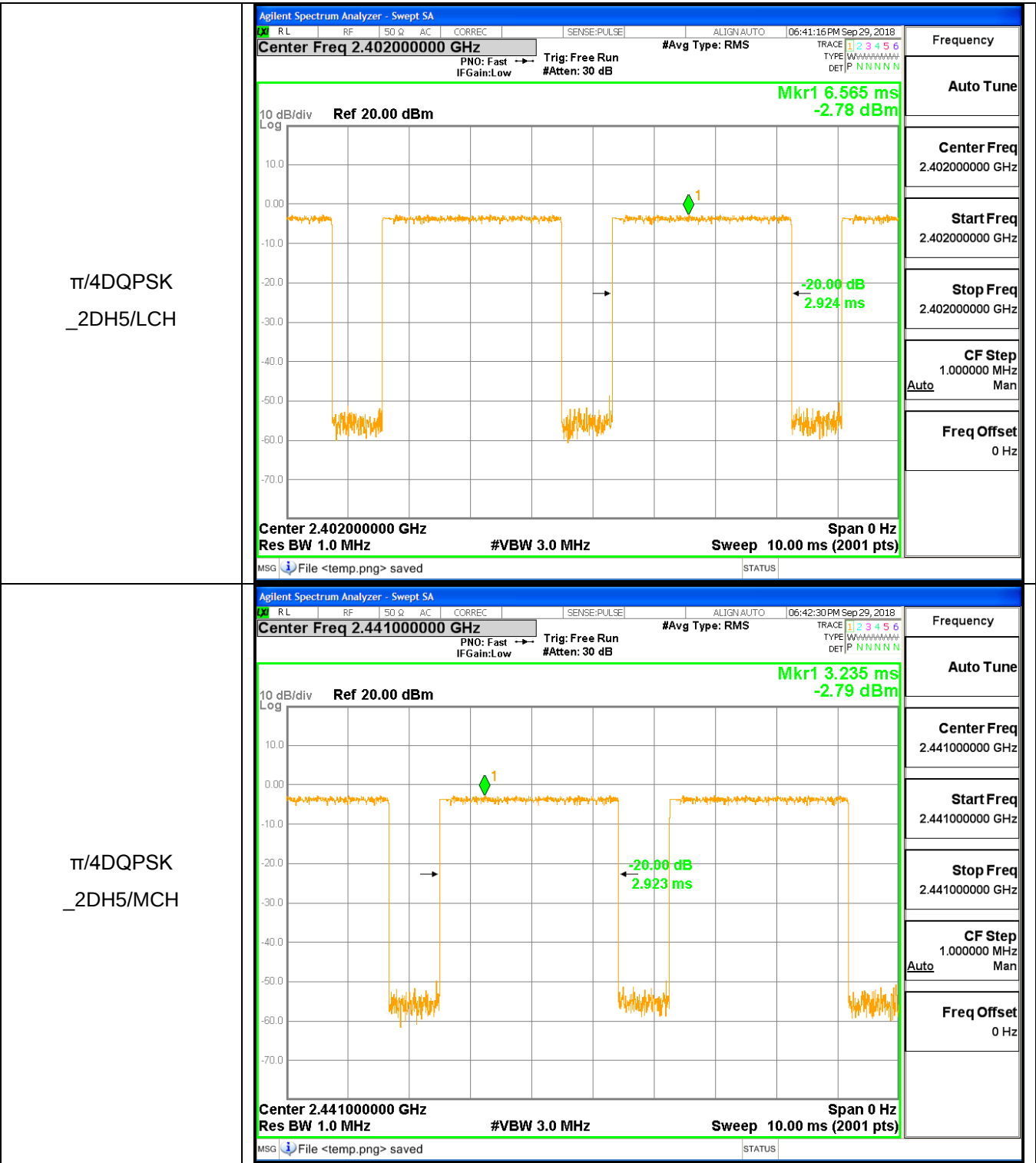
A.2 Dwell Time

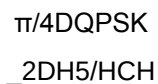
Mode	Packet	Chann el	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	0.002919	106.7	0.311421	0.4	PASS
GFSK	DH5	MCH	0.002918	106.7	0.311389	0.4	PASS
GFSK	DH5	HCH	0.002919	106.7	0.31141	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	0.002924	106.7	0.311948	0.4	PASS
$\pi/4$ DQPSK	2DH5	MCH	0.002923	106.7	0.311922	0.4	PASS
$\pi/4$ DQPSK	2DH5	HCH	0.002924	106.7	0.31198	0.4	PASS

Test Graph





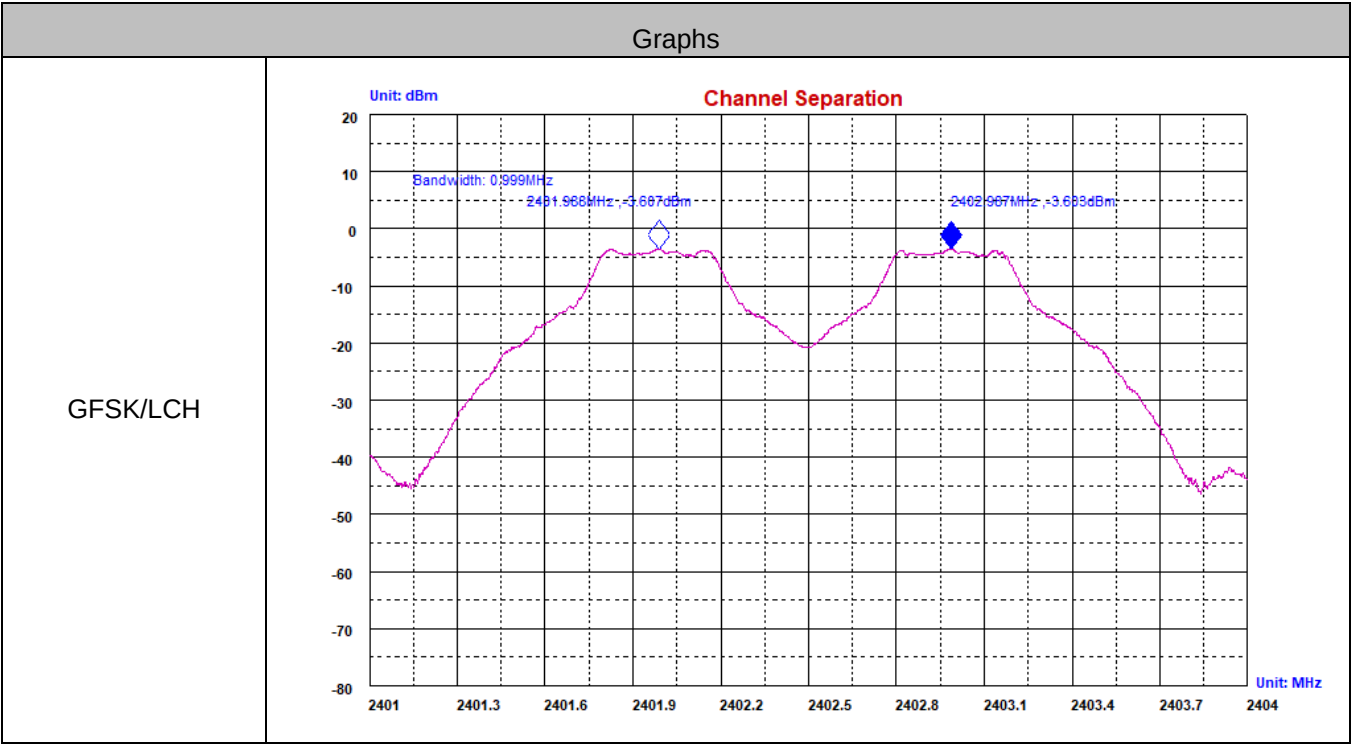


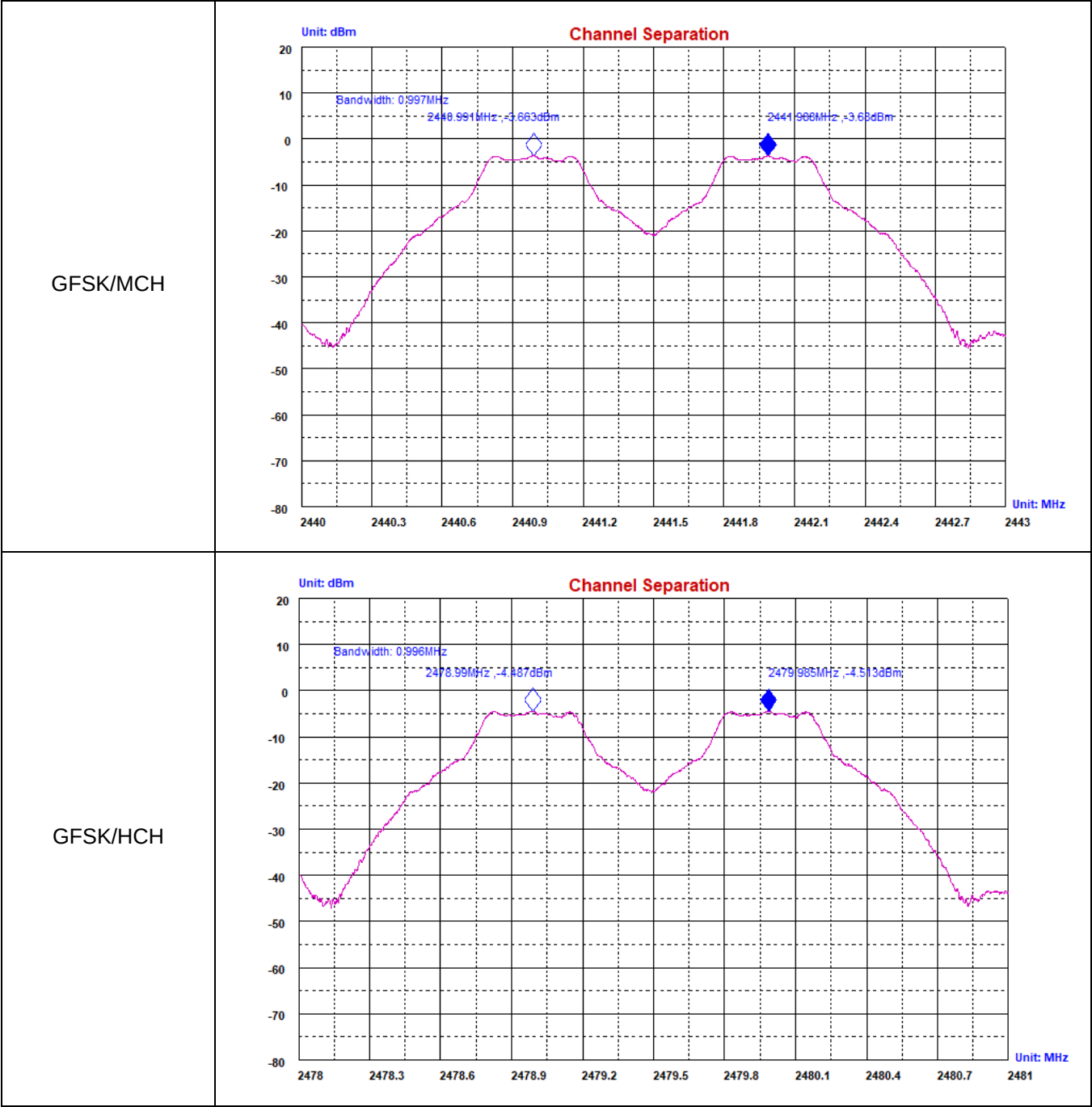


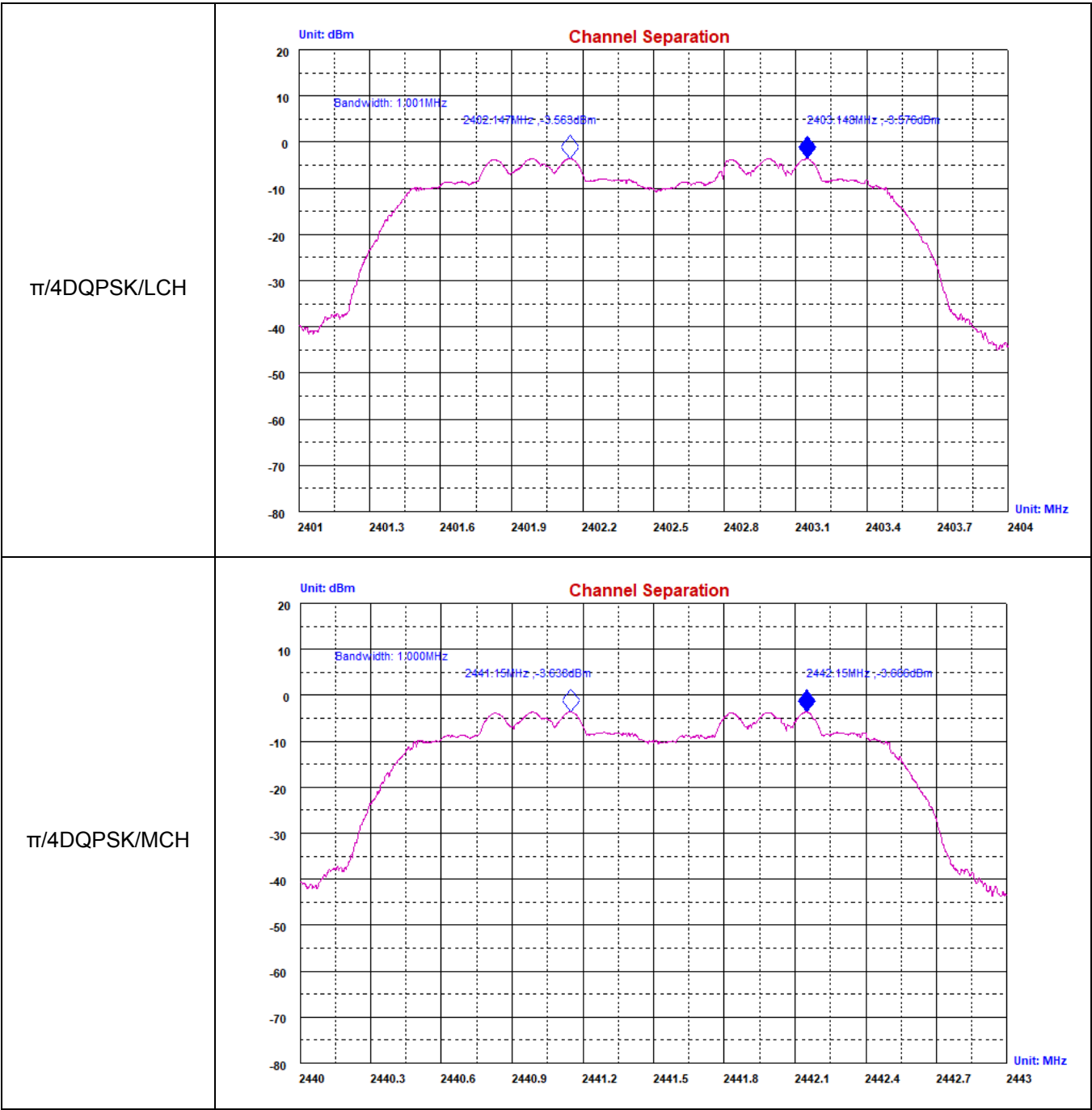
A.3 Carrier Frequency Separation

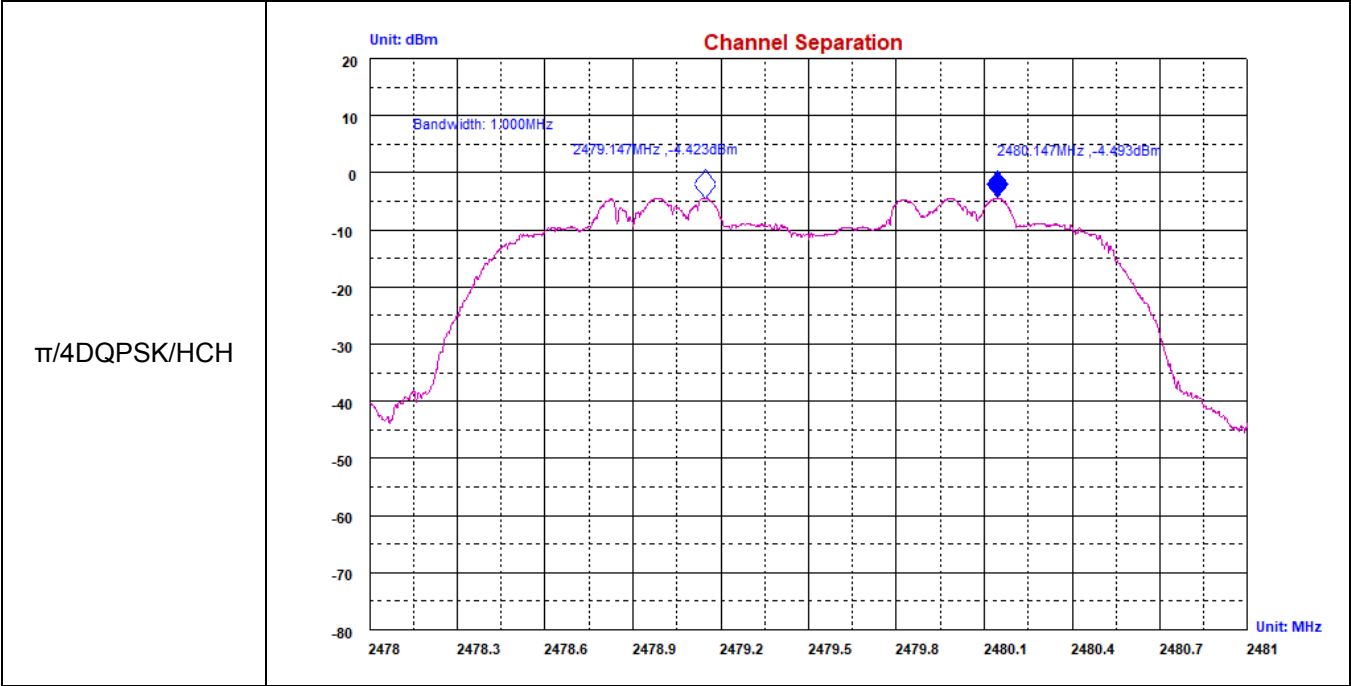
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.999	0.619	PASS
GFSK	MCH	0.997	0.613	PASS
GFSK	HCH	0.996	0.623	PASS
$\pi/4$ DQPSK	LCH	1.001	0.888	PASS
$\pi/4$ DQPSK	MCH	1.000	0.888	PASS
$\pi/4$ DQPSK	HCH	1.000	0.892	PASS

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

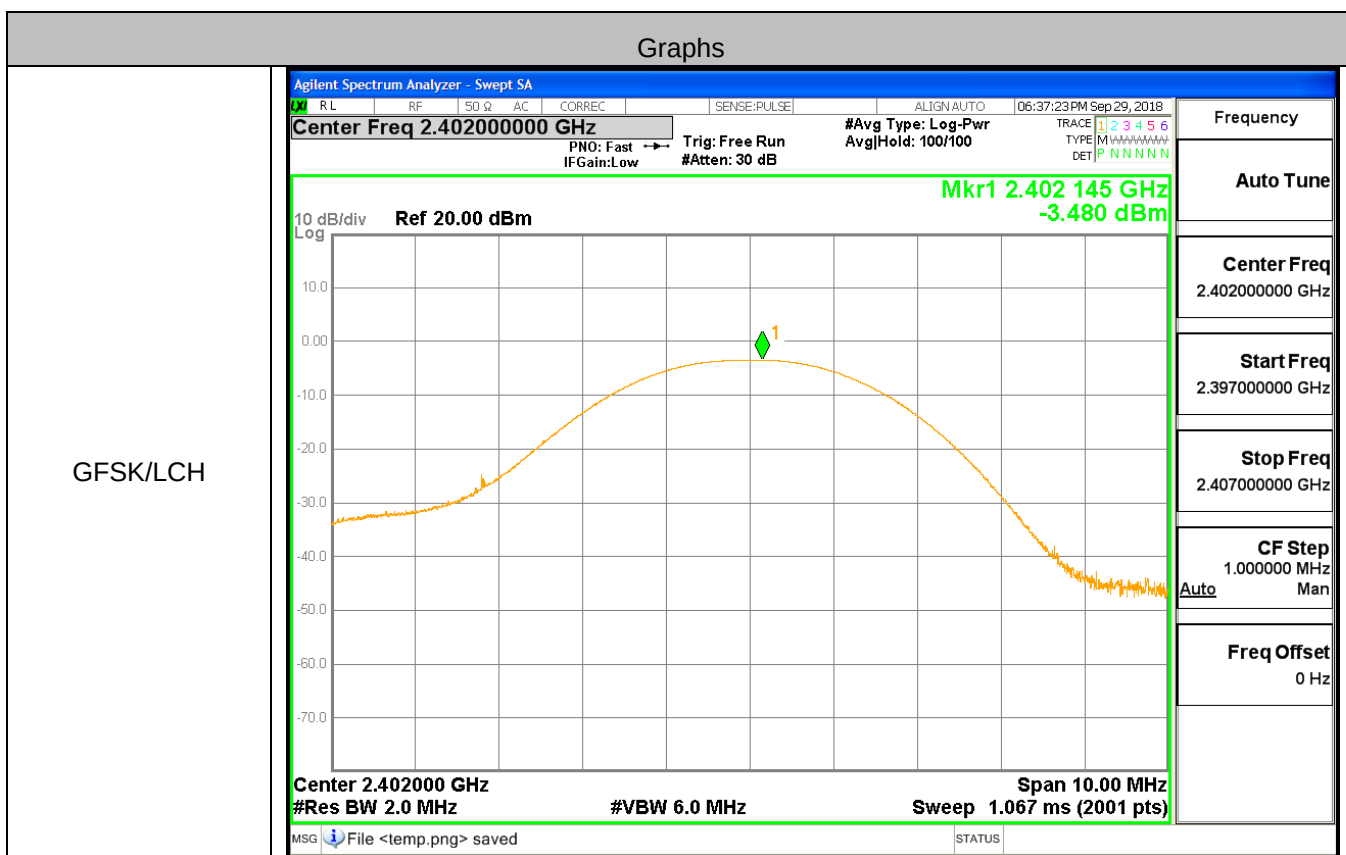


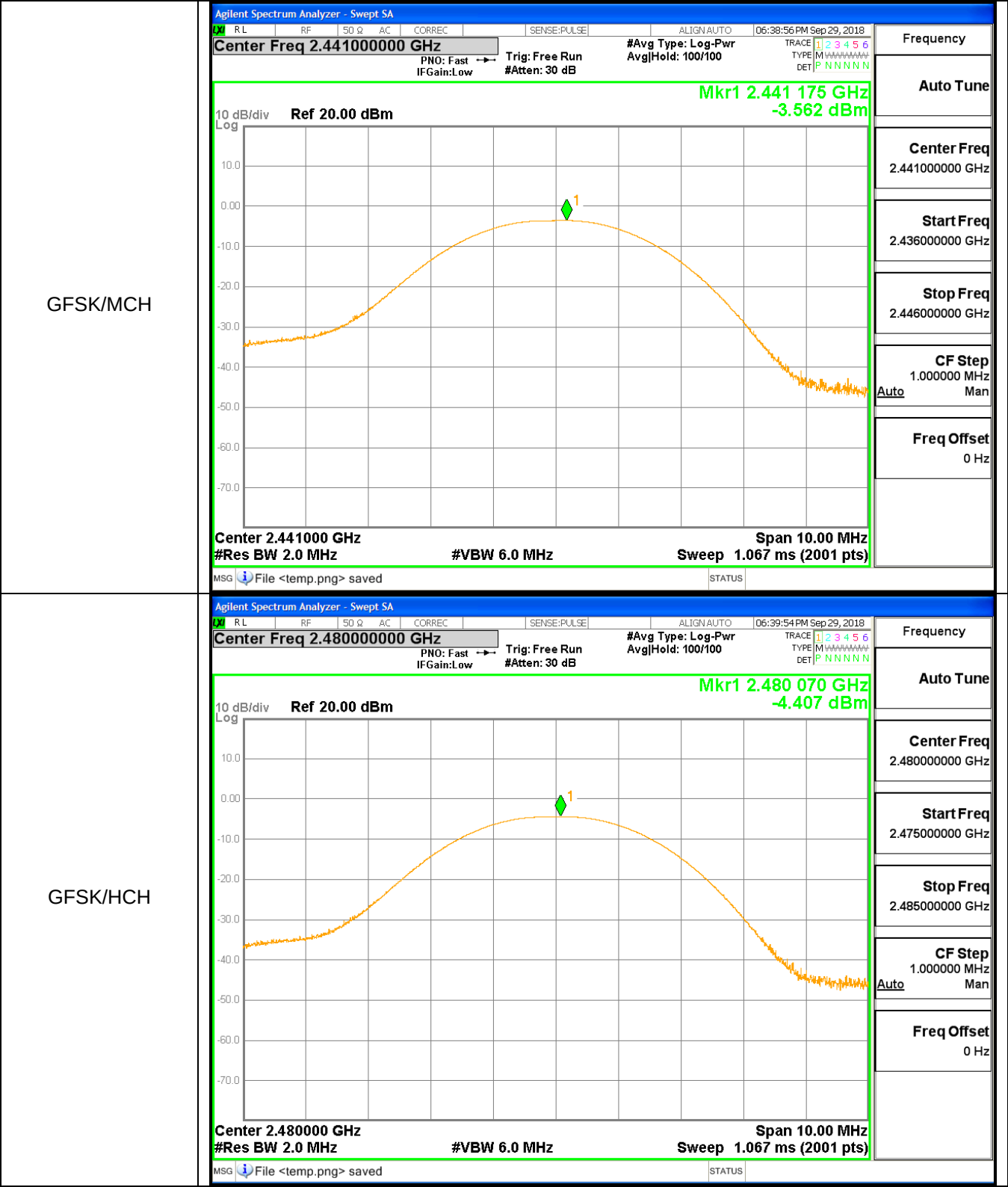


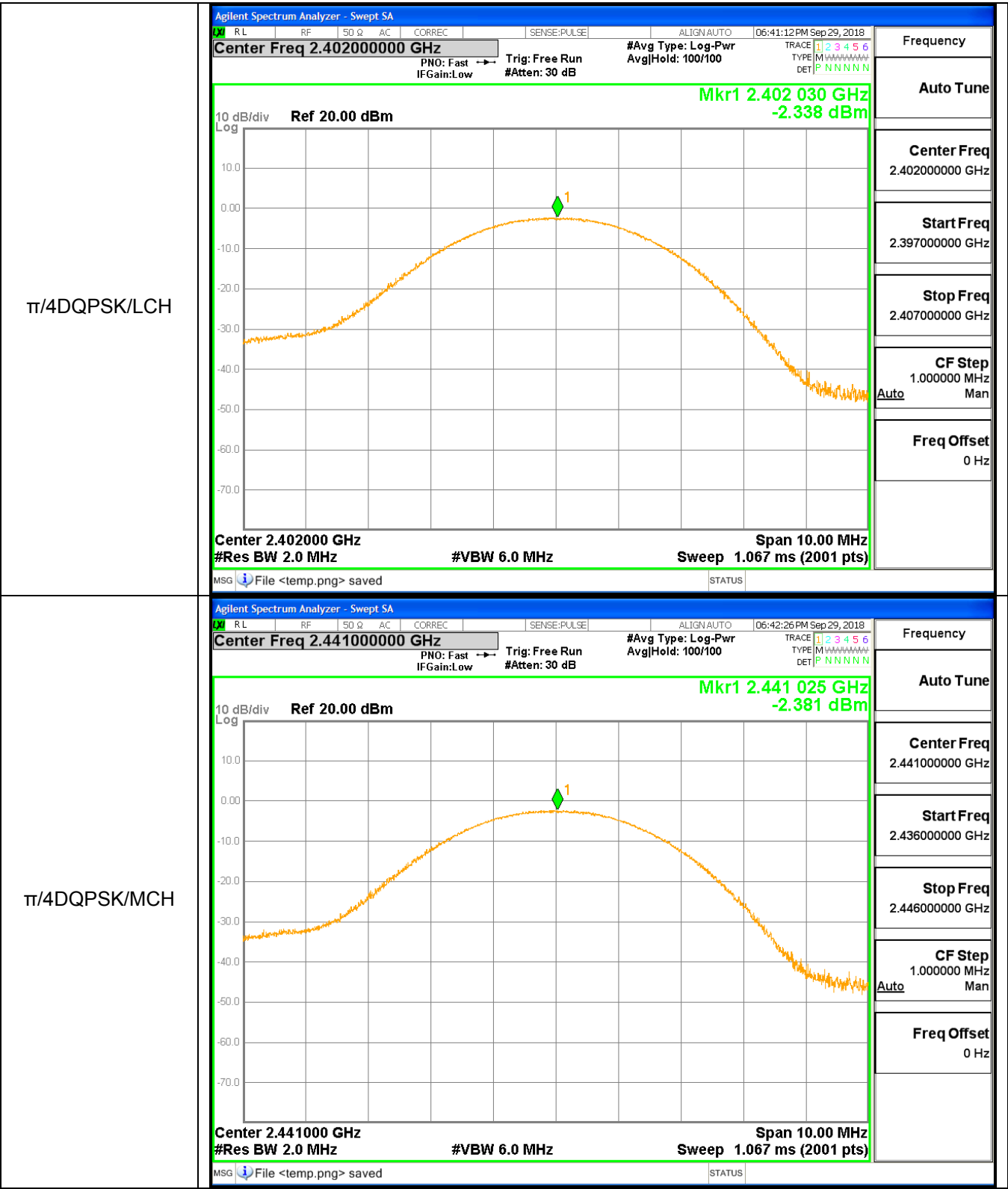
A.5 Conducted Peak Output Power

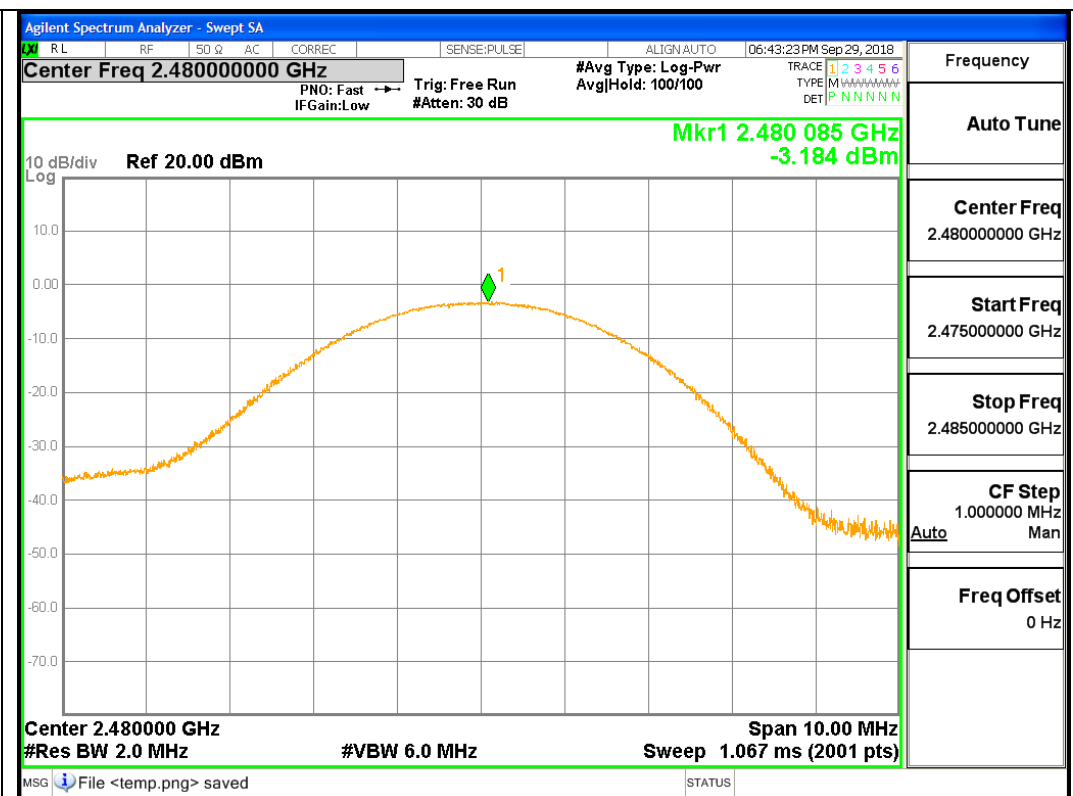
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-3.48	21	PASS
GFSK	MCH	-3.56	21	PASS
GFSK	HCH	-4.41	21	PASS
$\pi/4$ DQPSK	LCH	-2.34	21	PASS
$\pi/4$ DQPSK	MCH	-2.38	21	PASS
$\pi/4$ DQPSK	HCH	-3.18	21	PASS

Test Graph





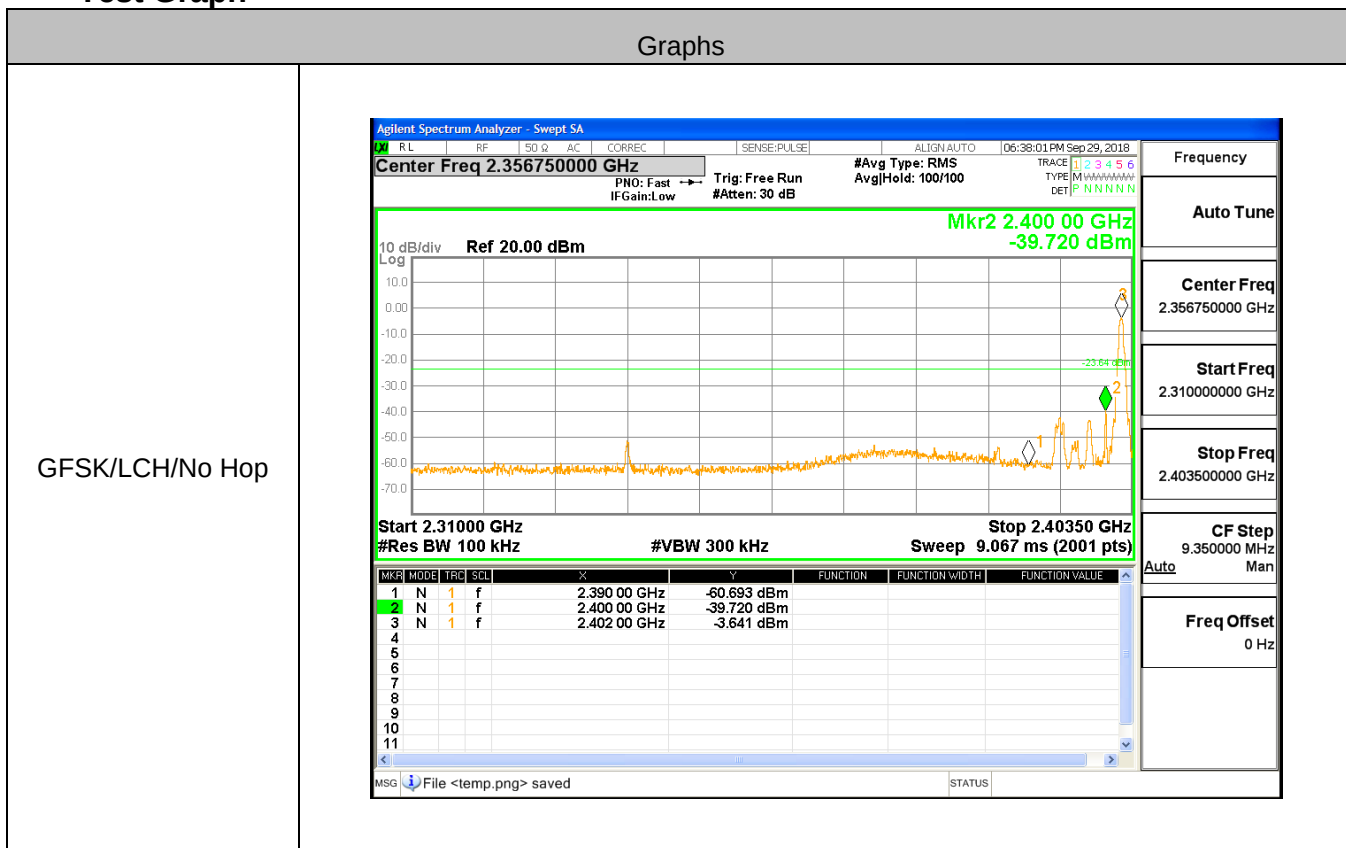


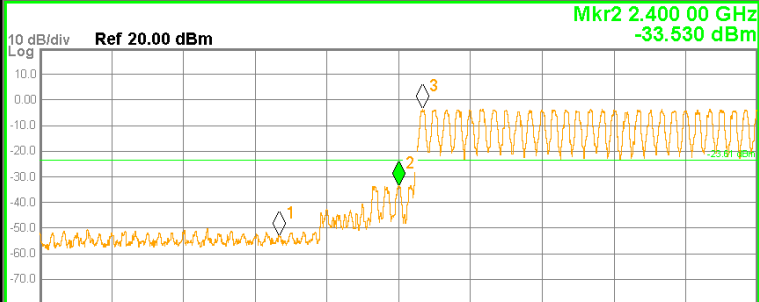
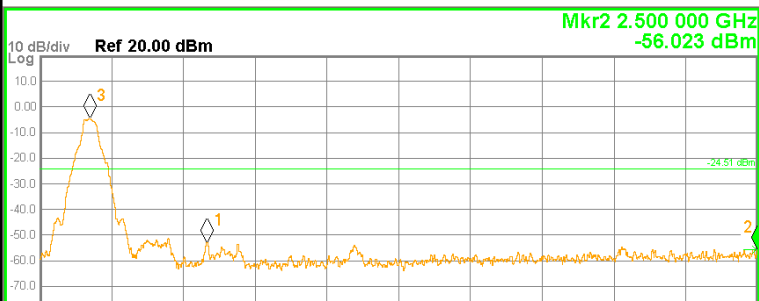


A.6 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Frequency [MHz]	Frequency Hopping	Carrier Frequency Power [dBm]	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	Off	-3.64	-39.72	-23.64	PASS
			On	-3.61	-33.53	-23.61	PASS
GFSK	HCH	2480	Off	-4.51	-33.53	-24.51	PASS
			On	-4.19	-54.81	-24.19	PASS
$\pi/4$ DQPSK	LCH	2402	Off	-3.68	-39.66	-23.68	PASS
			On	-3.54	-38.45	-23.54	PASS
$\pi/4$ DQPSK	HCH	2480	Off	-4.58	-57.06	-24.58	PASS
			On	-4.00	-55.80	-24.00	PASS

Test Graph



GFSK/LCH/Hop	Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC CORREC SENSE: PULSE ALIGN: AUTO 04:28:34 PM Sep 30, 2018 Center Freq 2.400000000 GHz PN0: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB #Avg Type: RMS Avg/Hold: >100/100 TRACE 1 2 3 4 5 6 TYPE M W W W W W W W DET P N N N N N N 10 dB/div Ref 20.00 dBm Log Mkr2 2.400 00 GHz -33.530 dBm  Start 2.37000 GHz Stop 2.43000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 5.867 ms (2001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRG</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2.390 00 GHz</td><td>-52.983 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.400 00 GHz</td><td>-33.530 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td>N</td><td>1</td><td>f</td><td>2.402 01 GHz</td><td>-3.606 dBm</td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> MSG File <temp.png> saved STATUS	MKR	MODE	TRG	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	2.390 00 GHz	-52.983 dBm				2	N	1	f	2.400 00 GHz	-33.530 dBm				3	N	1	f	2.402 01 GHz	-3.606 dBm				4									5									6									7									8									9									10									11									Frequency Auto Tune Center Freq 2.400000000 GHz Start Freq 2.370000000 GHz Stop Freq 2.430000000 GHz CF Step 6.000000 MHz Man Auto Freq Offset 0 Hz
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GFSK/HCH/No Hop	Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC CORREC SENSE: PULSE ALIGN: AUTO 06:40:12 PM Sep 29, 2018 Center Freq 2.489250000 GHz PN0: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB #Avg Type: RMS Avg/Hold: 100/100 TRACE 1 2 3 4 5 6 TYPE M W W W W W W W DET P N N N N N N 10 dB/div Ref 20.00 dBm Log Mkr2 2.500 000 GHz -56.023 dBm  Start 2.47850 GHz Stop 2.50000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.133 ms (2001 pts) <table><tr><th>MKR</th><th>MODE</th><th>TRG</th><th>SCL</th><th>X</th><th>Y</th><th>FUNCTION</th><th>FUNCTION WIDTH</th><th>FUNCTION VALUE</th></tr><tr><td>1</td><td>N</td><td>1</td><td>f</td><td>2.483 500 GHz</td><td>-53.012 dBm</td><td></td><td></td><td></td></tr><tr><td>2</td><td>N</td><td>1</td><td>f</td><td>2.500 000 GHz</td><td>-56.023 dBm</td><td></td><td></td><td></td></tr><tr><td>3</td><td>N</td><td>1</td><td>f</td><td>2.479 994 GHz</td><td>-4.507 dBm</td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> MSG File <temp.png> saved STATUS	MKR	MODE	TRG	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	1	f	2.483 500 GHz	-53.012 dBm				2	N	1	f	2.500 000 GHz	-56.023 dBm				3	N	1	f	2.479 994 GHz	-4.507 dBm				4									5									6									7									8									9									10									11									Frequency Auto Tune Center Freq 2.489250000 GHz Start Freq 2.478500000 GHz Stop Freq 2.500000000 GHz CF Step 2.150000 MHz Man Auto Freq Offset 0 Hz
	MKR	MODE	TRG	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE																																																																																																					
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GFSK/HCH/Hop

Center Freq 2.48350000 GHz

Start 2.45350 GHz #Res BW 100 kHz

Stop 2.51350 GHz #VBW 300 kHz Sweep 5.867 ms (2001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.483 50 GHz	-55.248 dBm			
2	N	1	f	2.500 00 GHz	-54.812 dBm			
3	N	1	f	2.458 18 GHz	-4.189 dBm			

Frequency

Auto Tune

Center Freq
2.483500000 GHz

Start Freq
2.453500000 GHz

Stop Freq
2.513500000 GHz

CF Step
6.000000 MHz
Man

Freq Offset
0 Hz

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

Center Freq 2.356750000 GHz

Start 2.31000 GHz #Res BW 100 kHz

Stop 2.40350 GHz #VBW 300 kHz Sweep 9.067 ms (2001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.390 00 GHz	-56.937 dBm			
2	N	1	f	2.400 00 GHz	-39.656 dBm			
3	N	1	f	2.402 00 GHz	-3.683 dBm			

Frequency

Auto Tune

Center Freq
2.356750000 GHz

Start Freq
2.310000000 GHz

Stop Freq
2.403500000 GHz

CF Step
9.350000 MHz
Man

Freq Offset
0 Hz

$\pi/4$ DQPSK/LCH/Hop

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.40000000 GHz

Mkr2 2.400 00 GHz -38.445 dBm

Start 2.37000 GHz Stop 2.43000 GHz

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

Mkri	Mode	Trig	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.390 00 GHz	-54.383 dBm			
2	N	1	f	2.400 00 GHz	-38.445 dBm			
3	N	1	f	2.422 17 GHz	-3.541 dBm			

Frequency: 2.40000000 GHz

Auto Tune

Center Freq: 2.40000000 GHz

Start Freq: 2.37000000 GHz

Stop Freq: 2.43000000 GHz

CF Step: 6.000000 MHz

Freq Offset: 0 Hz

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

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.48925000 GHz

Mkr2 2.500 000 GHz -57.467 dBm

Start 2.47850 GHz Stop 2.50000 GHz

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

Mkri	Mode	Trig	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.483 500 GHz	-57.065 dBm			
2	N	1	f	2.500 000 GHz	-57.467 dBm			
3	N	1	f	2.479 994 GHz	-4.583 dBm			

Frequency: 2.48925000 GHz

Auto Tune

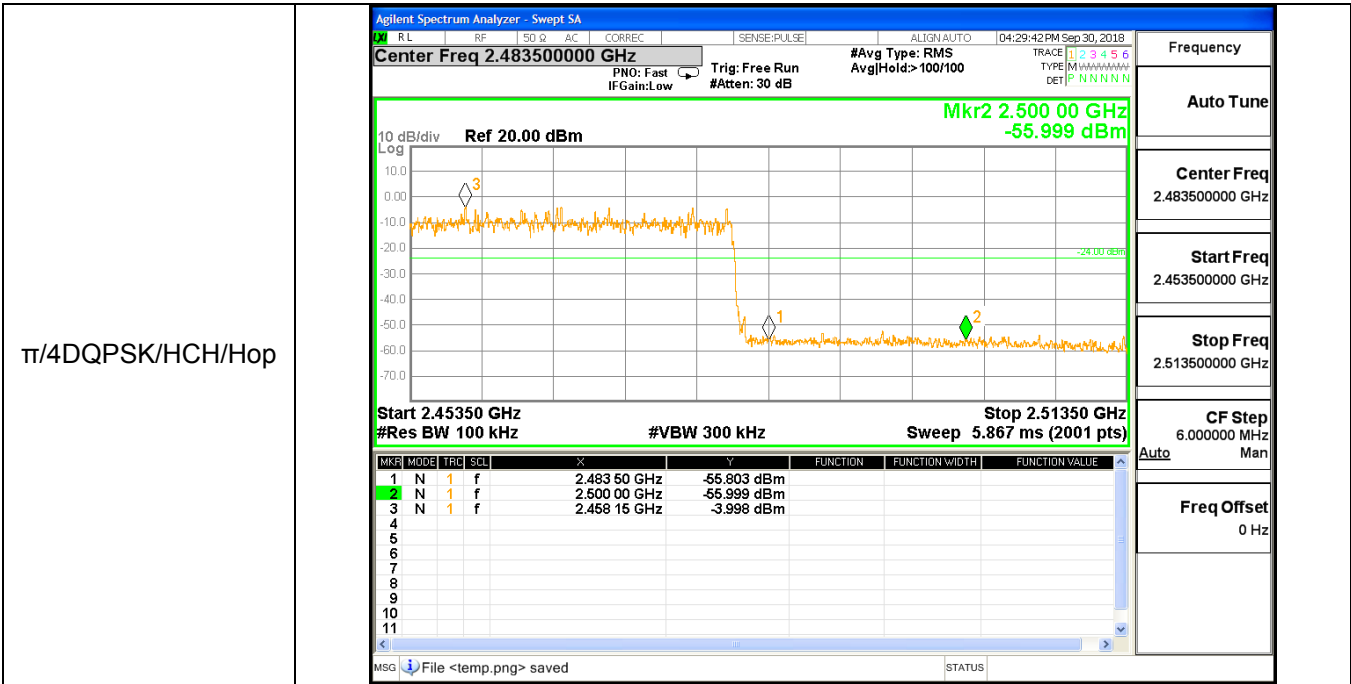
Center Freq: 2.48925000 GHz

Start Freq: 2.47850000 GHz

Stop Freq: 2.50000000 GHz

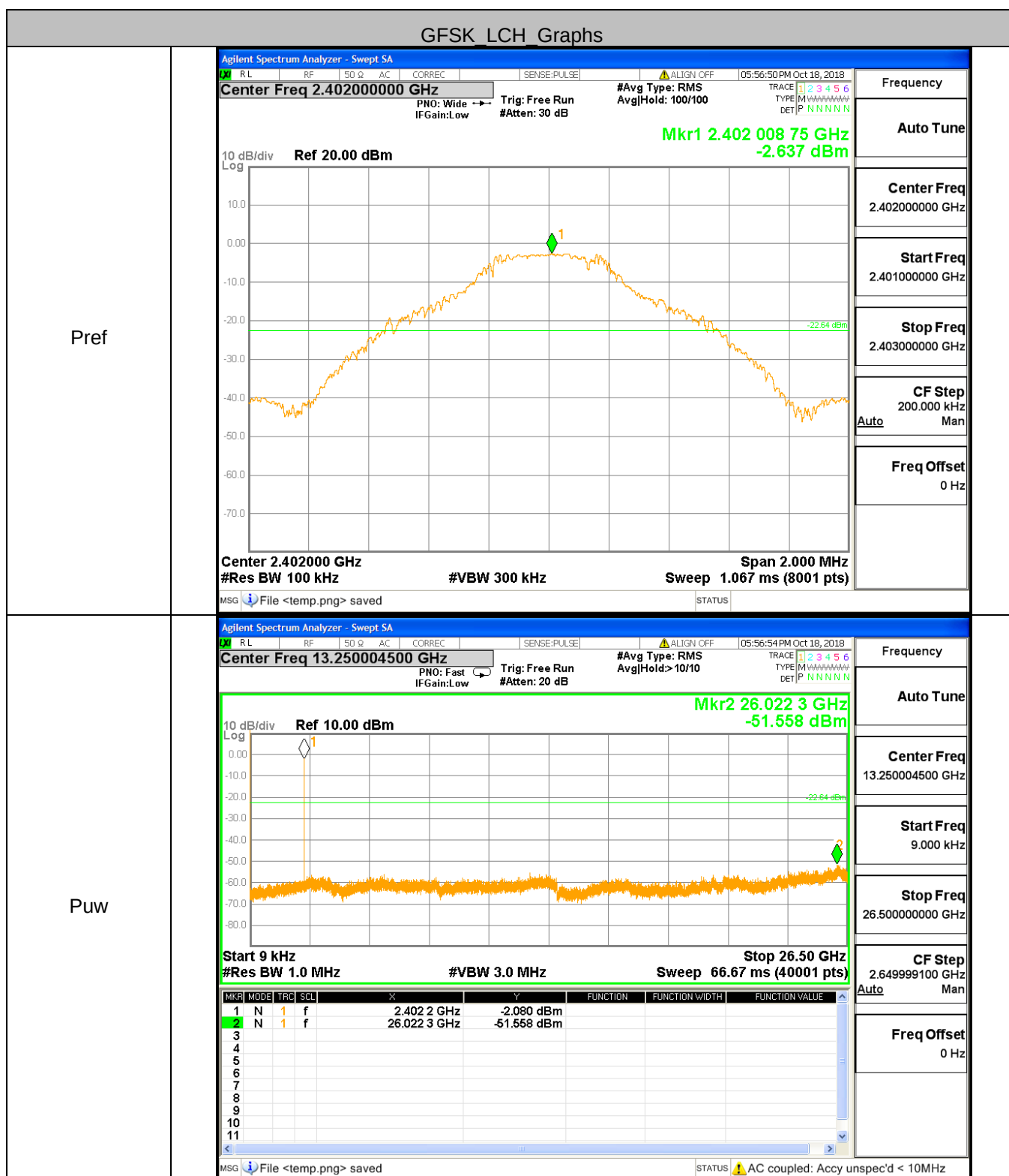
CF Step: 2.150000 MHz

Freq Offset: 0 Hz

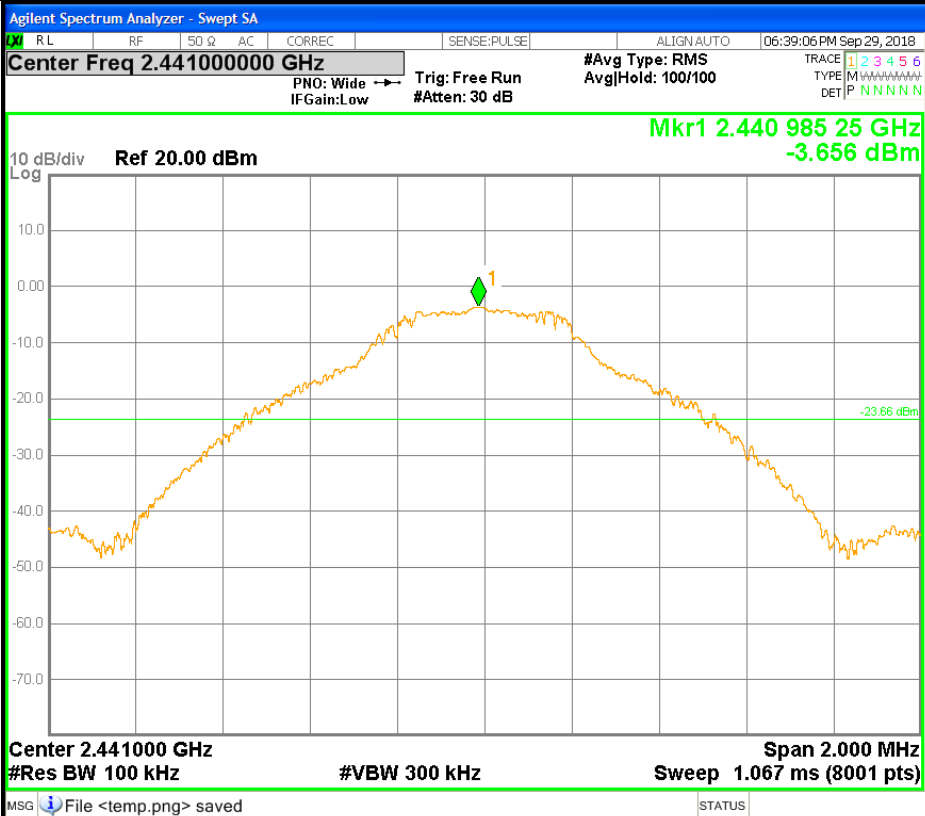


A.7 RF Conducted Spurious Emissions

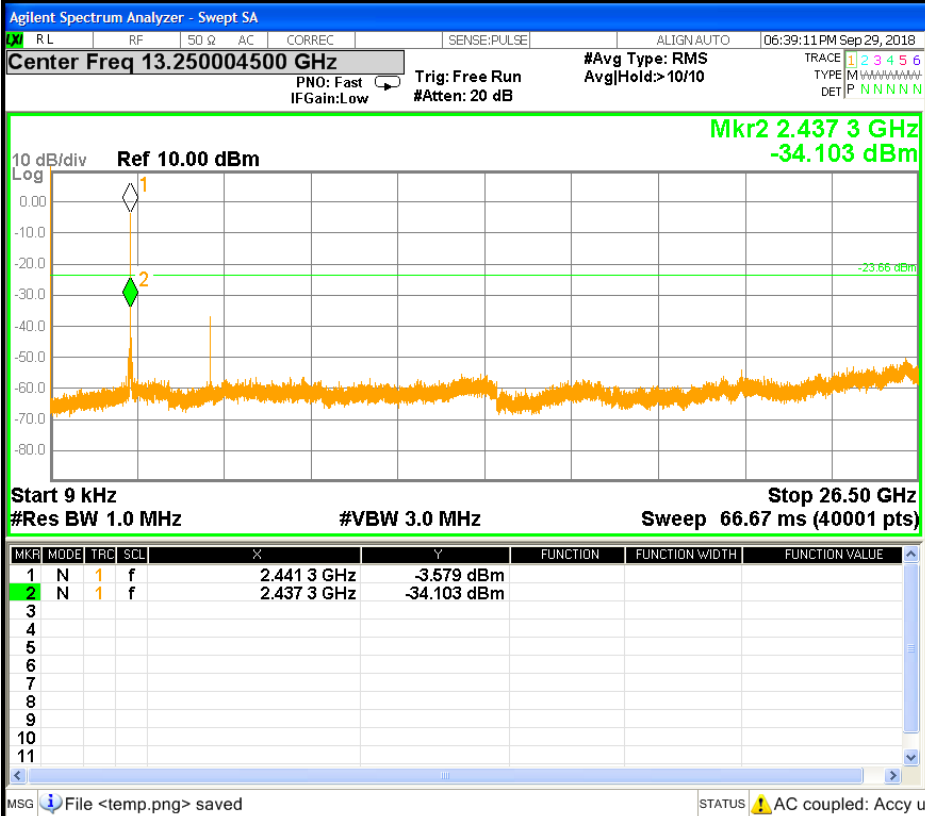
Test Graph



GFSK MCH Graphs

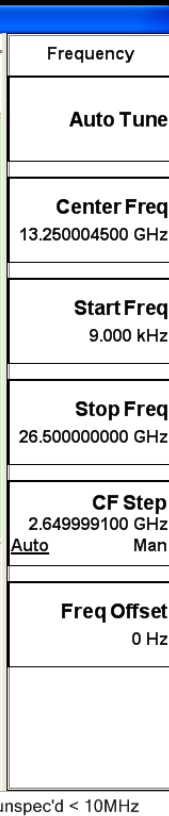
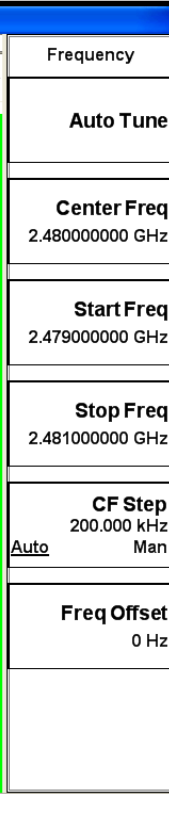


Frequency	
Auto Tune	
Center Freq 2.441000000 GHz	
Start Freq 2.440000000 GHz	
Stop Freq 2.442000000 GHz	
CF Step 200.000 kHz	Man
Freq Offset 0 Hz	

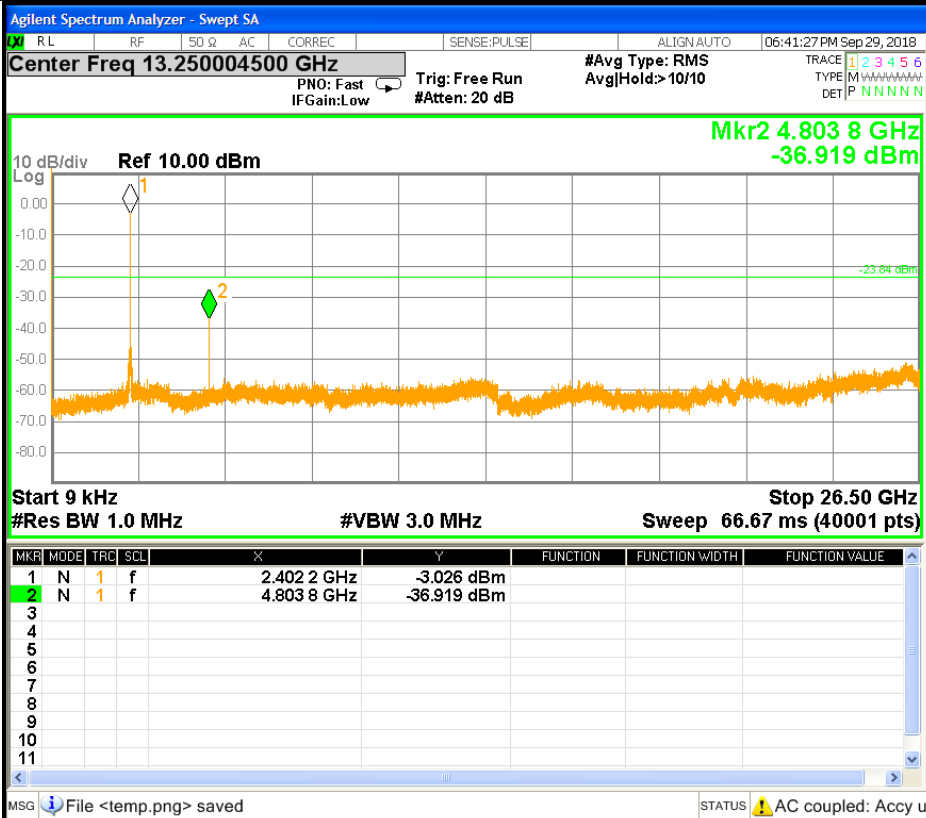
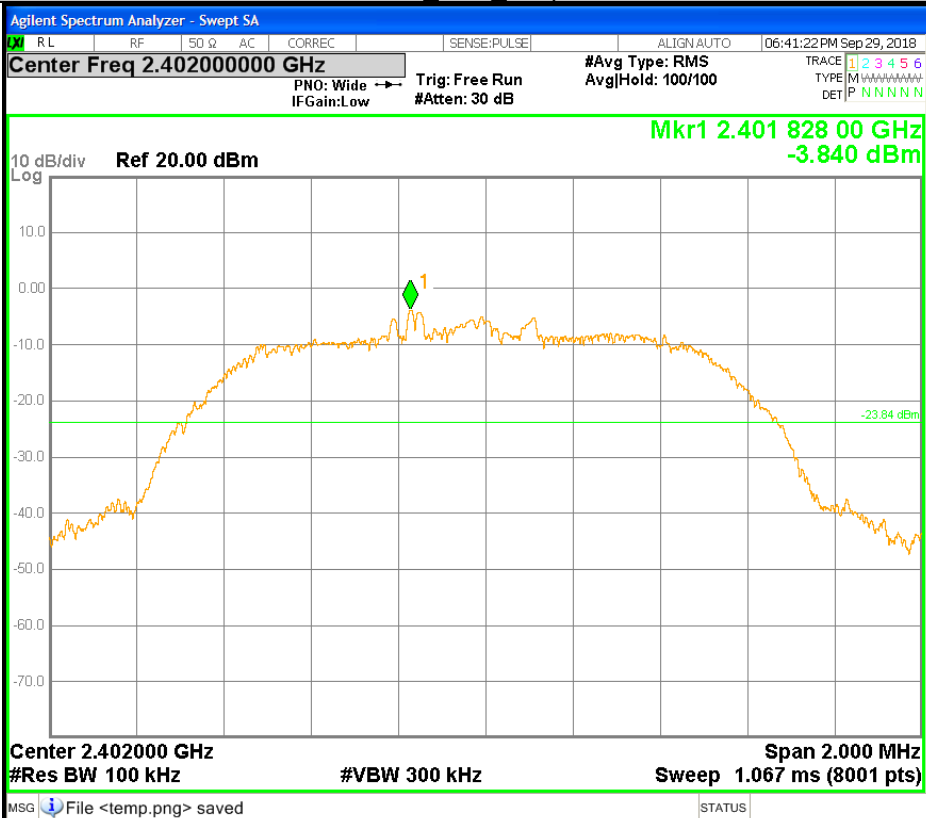


Frequency	
Auto Tune	
Center Freq	13.250004500 GHz
Start Freq	9.000 kHz
Stop Freq	26.500000000 GHz
CF Step	2.649999100 GHz
<u>Auto</u>	Man
Freq Offset	0 Hz

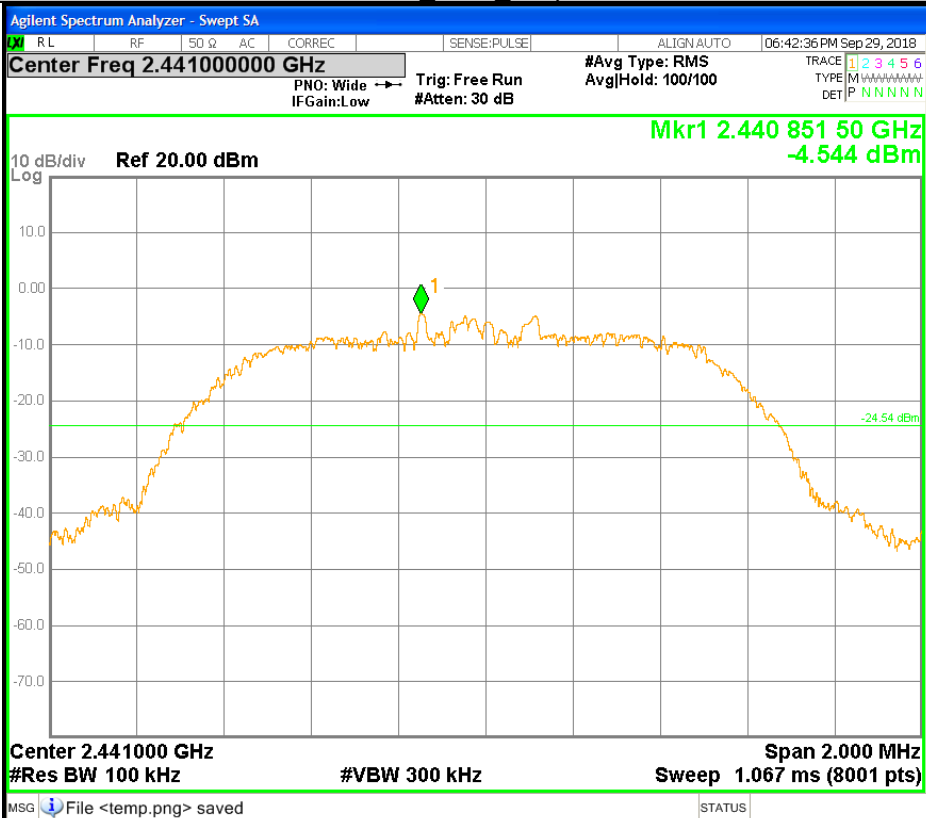
GFSK HCH Graphs



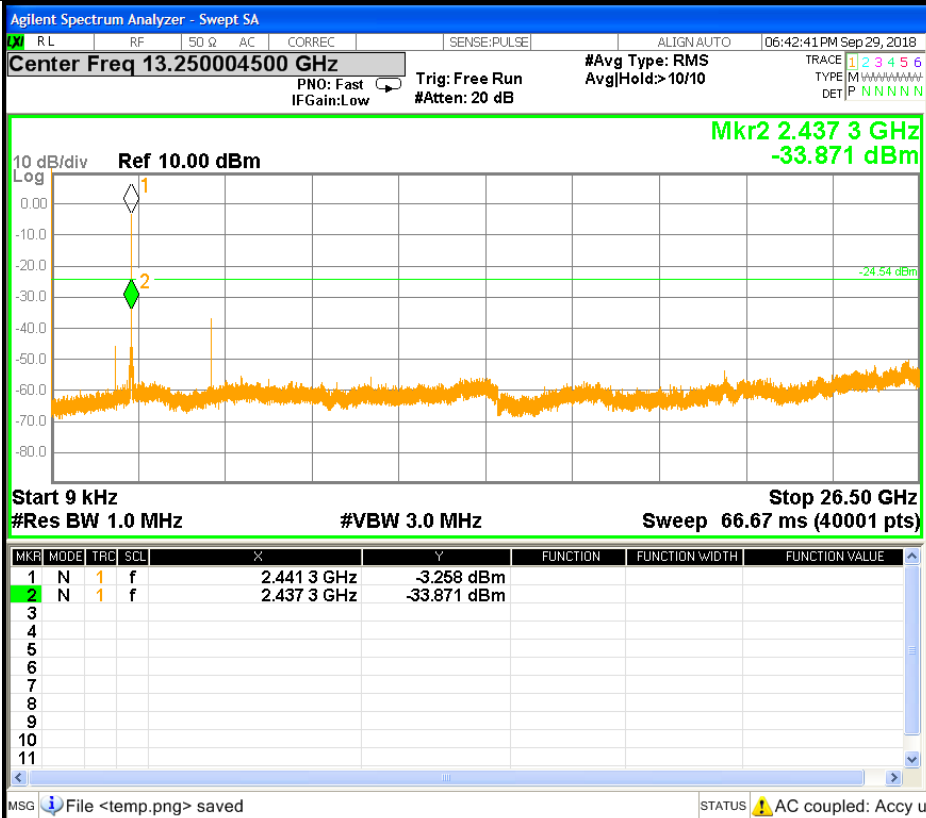
$\pi/4$ DQPSK LCH Graphs



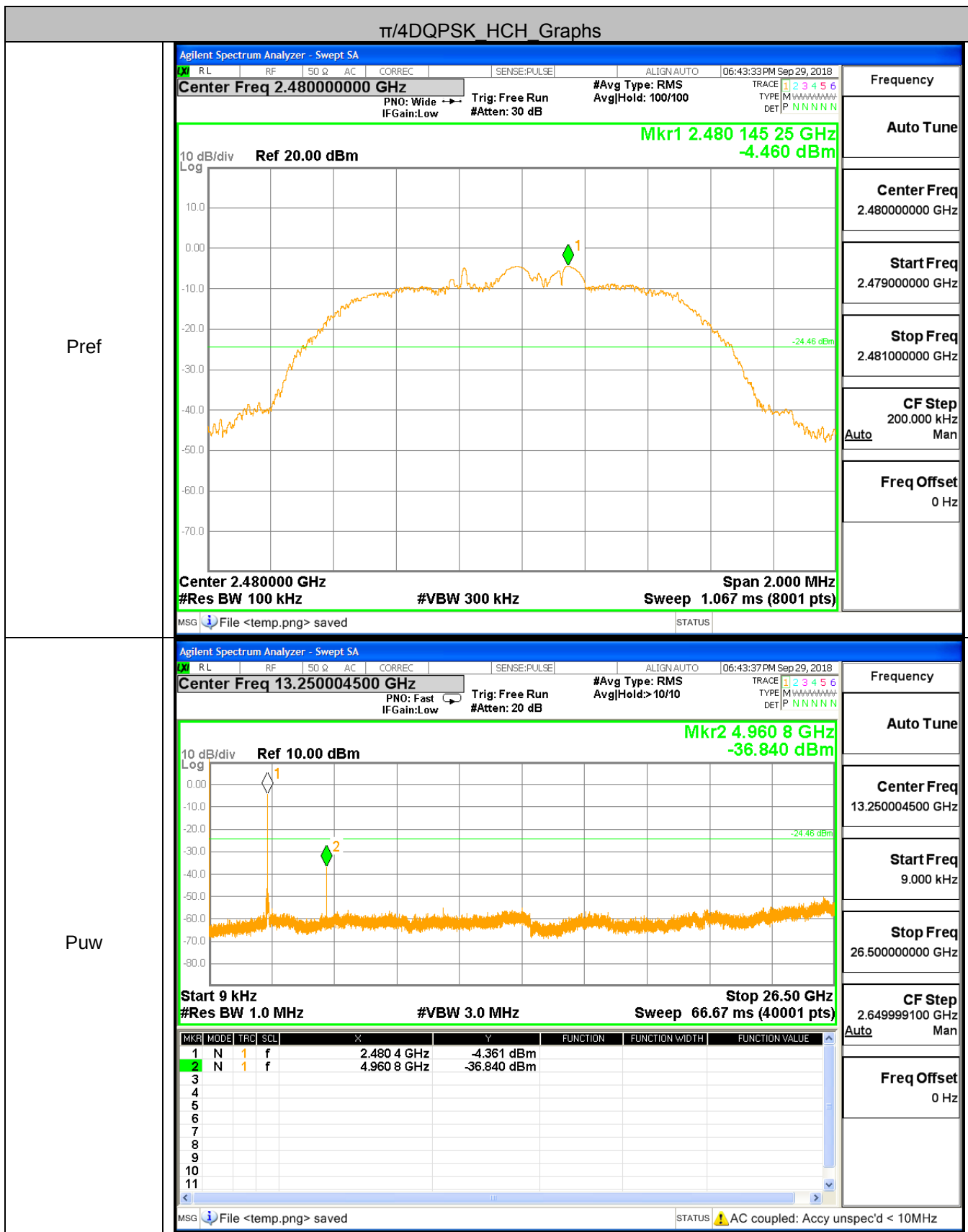
$\pi/4$ DQPSK MCH Graphs



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



Frequency	
Auto Tune	
Center Freq	3.250004500 GHz
Start Freq	9.000 kHz
Stop Freq	5.500000000 GHz
CF Step	2.649999100 GHz
to Man	
Freq Offset	0 Hz



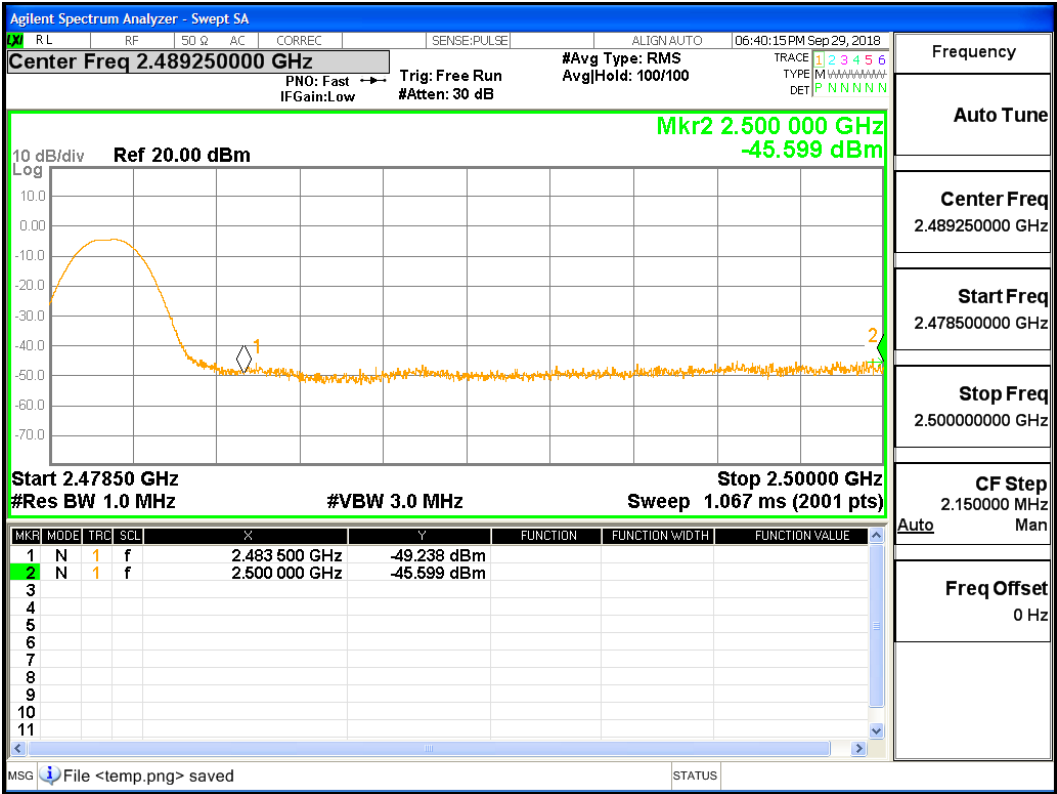
A.8 Restrict-band measurements

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	-53.37	43.83	74	-60.19	37.01	54	Pass
1DH5	2402	2390	2.00	0.00	-50.24	46.96	74	-57.98	39.22	54	Pass
1DH5	2480	2483.5	2.00	0.00	-49.24	47.96	74	-55.11	42.09	54	Pass
1DH5	2480	2500	2.00	0.00	-45.6	51.6	74	-55.36	41.84	54	Pass
2DH5	2402	2310	2.00	0.00	-54.37	42.83	74	-60.21	36.99	54	Pass
2DH5	2402	2390	2.00	0.00	-49.77	47.43	74	-58.09	39.11	54	Pass
2DH5	2480	2483.5	2.00	0.00	-47.87	49.33	74	-55.84	41.36	54	Pass
2DH5	2480	2500	2.00	0.00	-47.18	50.02	74	-55.47	41.73	54	Pass

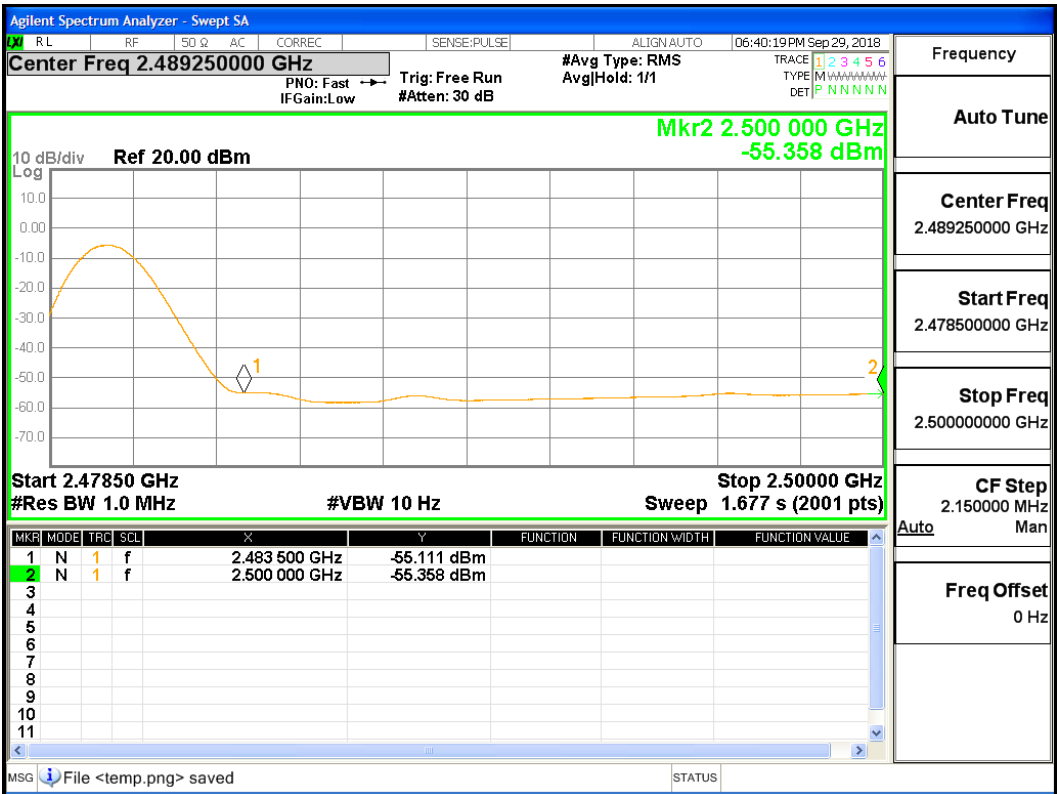
Test Graph



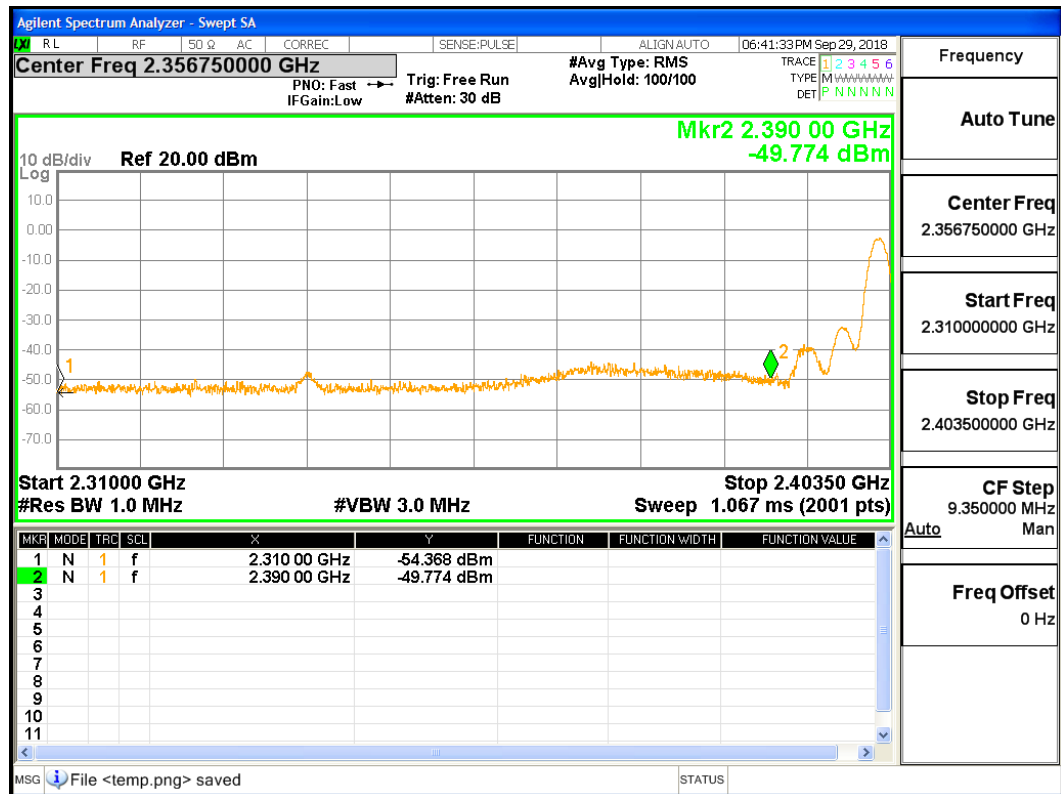
Restrict-band band-edge measurements_2480_PEAK_DH5



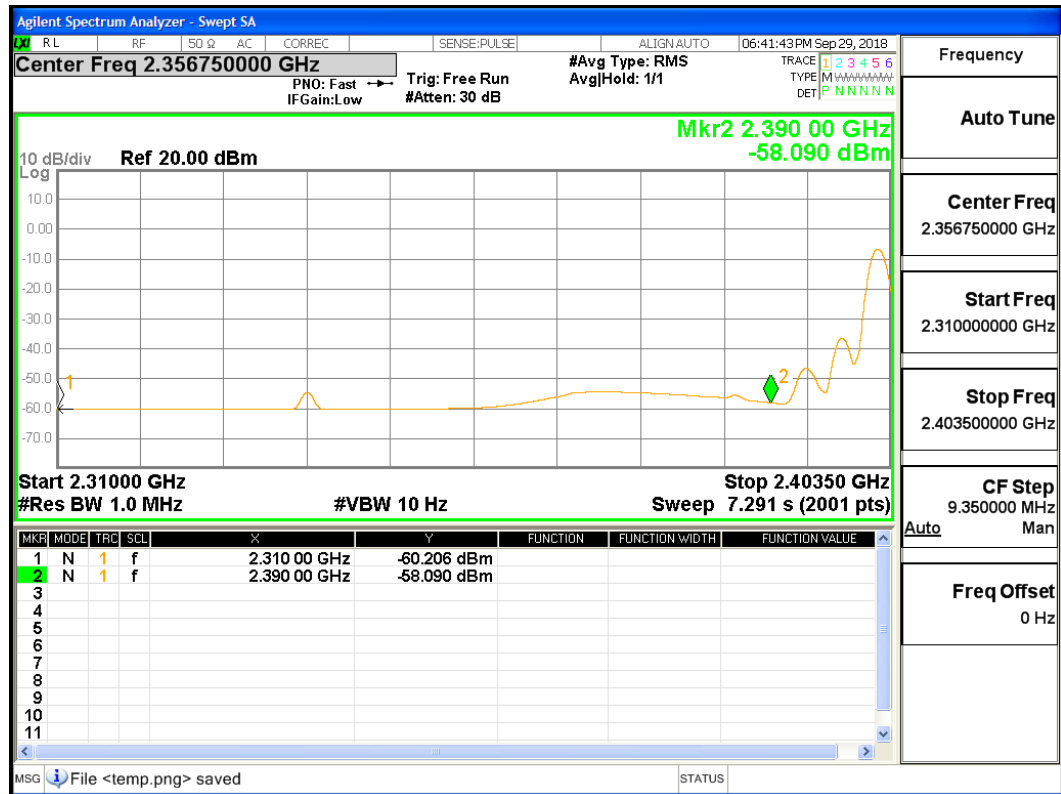
Restrict-band band-edge measurements_2480_AV_DH5



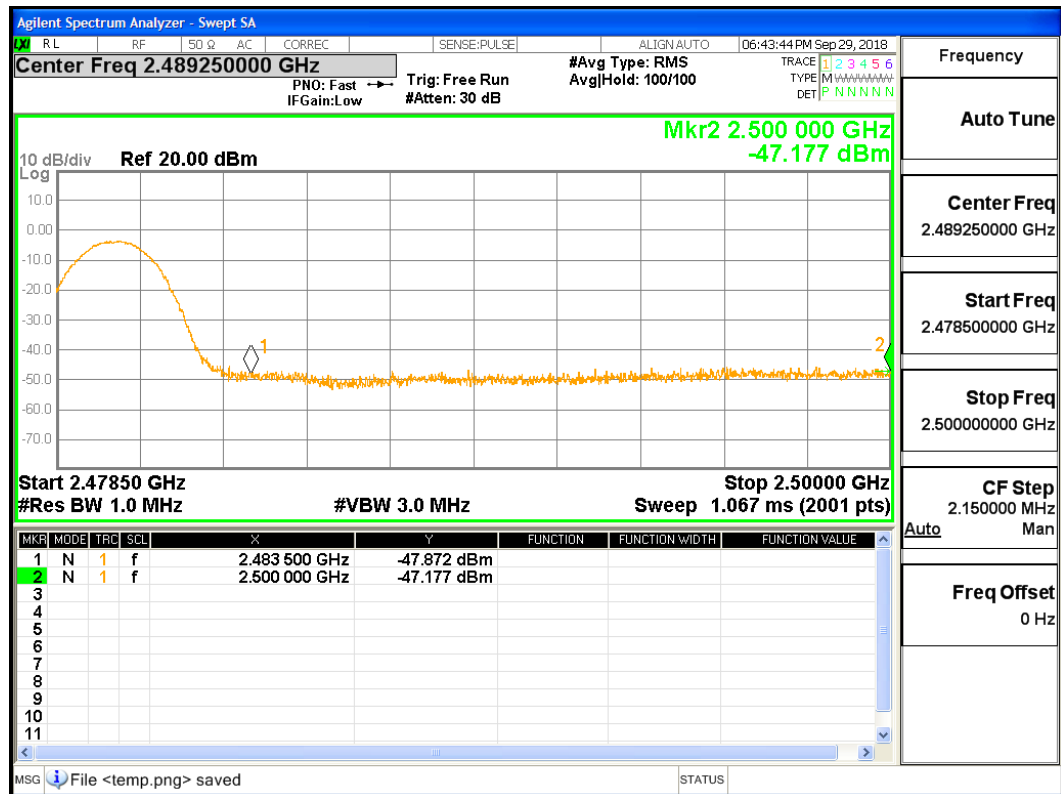
Restrict-band band-edge measurements_2402_PEAK_2DH5



Restrict-band band-edge measurements_2402_AV_2DH5



Restrict-band band-edge measurements_2480_PEAK_2DH5



Restrict-band band-edge measurements_2480_AV_2DH5

