SpikeSafe™ Performance Precision Pulsed Current Source Specifications

Performance Precision Pulsed Current Sources

VEKTREX™

Mode Descriptions			Models			
Mode	Description	Typical Application	PRF	PRF + BIAS	PRF + MODI	PRF + BIAS + MODI
DC	Constant Current.	Any constant current application. LM-85, light measurement, characterization, R&D, production.	✓	✓	✓	✓
Single Pulse	Single pulse output (one transition on and off) according to configured pulse parameters.	Any single pulse application. LM-85, light measurement, characterization, R&D, production.	✓	✓	✓	✓
Continuous Pulse	Continuous current pulse train that transitions on and off according to configured pulse parameters.	Continuous Pulse light measurements to reduce junction heating. Any other continuous pulse application.	✓	✓	✓	✓
Modulated Current (MODI)	A programmable sequence of DC current steps that define a waveform. Sequences may be finite or run indefinitely.	Cell phone flash emulation, rectifier ripple emulation. Requires purchase of optional Modulated Current function.			✓	✓
Bias	Constant DC bias current - generally used for K-factor determination.	Thermal Resistance and Tj measurements.		✓		✓
Multiple Pulse	Similar to Single Pulse mode, but allows a programmable number of pulses to be output.	Simulated Lightning Strikes Test. Other fixed pulse count device testing.	✓	✓	✓	✓
DC Dynamic	Constant current - current changes may occur while the source channel is enabled.	L-I-V sweeps, programmed ramps, low speed >10s pulsing	✓	✓	✓	✓
Continuous Dynamic	Continuous current pulse train - current changes may occur while the source channel is enabled.	PWM modulation, production binning, closed-loop power control.	✓	✓	✓	✓
Continuous Pulse with Bias Current	A continuous current pulse train that drops to bias level during off times.	Thermal Resistance and Tj measurements using Continuous Pulse mode.		✓		✓
Continuous Dynamic with Bias Current	A continuous current pulse train (identical to Continuous Dynamic mode) but the bias current source is always enabled and drawing the bias current through the load.	Thermal Resistance and Tj measurements using Continuous Dynamic mode.		✓		✓
Single Pulse with Bias Current	Identical to Single Pulse mode, but the bias current source is always enabled and drawing the bias current through the load.	Thermal Resistance and Tj measurements using Single Pulse mode.		✓		✓

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Specifications

Model (Maximum Current)	0.5	2	3	4	5	8	10	16	20	32	40	60
Overall												
Recommended Min Current[7]	339µA	5.9mA	5.9mA	5.9mA	5.9mA	5.9mA	11.8mA	23.6mA	23.6mA	47.3mA	47.3mA	285mA
Min Voltage	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V
Max Voltage	50V, 100V, 200V, 300V, 400V	50V, 100V, 200V, 300V, 400V	50V, 100V, 200V, 300V, 400V	50V, 100V, 200V, 300V, 400V	50V, 100V, 200V, 300V, 400V	50V, 100V, 200V	50V, 100V, 200V	50V, 100V, 200V	50V, 100V, 200V	50V, 100V, 200V	50V, 100V, 200V	50V
Independent Channels/Module	1, 2, 4, 8	1, 2, 4, 8	1, 2, 4, 8	1, 2, 4, 8	1, 2, 4, 8	1, 2, 4, 8	1, 2, 4	1, 2	1, 2	1	1	1
Max Power, per Channel[4]	200W	800W	1kW	1kW	1kW	1.6kW	1.6kW	3.2kW	3.2kW	6.4kW	6.4kW	3kW
Max Power, all Channels[4]	1.6kW	6.4kW	8kW	8kW	8kW	8kW	6.4kW	6.4kW	6.4kW	6.4kW	6.4kW	3kW
Output Conductor Pairs/Channel	1	1	1	1	1	1	2	4	4	8	8	8
Conversion Mode	Buck/Boost	Buck/Boost	Buck/Boost	Buck/Boost	Buck	Buck/Boost	Buck/Boost	Buck	Buck	Buck	Buck	Buck
Pulsing												
Pulse Width Range	10µs-15000s	10µs-15000s	10µs-15000s	10µs-15000s	10µs-15000s	10µs-15000s	10µs-15000s	10µs-15000s	10µs-15000s	10µs-15000s	10µs-15000s	10µs-15000s
Pulse Width Resolution	1µs	1µs	1µs	1µs	1µs	1µs	1µs	1µs	1µs	1µs	1µs	1µs
Pulse Width Accuracy[2]	1µs	1.5µs	1µs	1µs	1µs	1µs	1µs	1µs	1.3µs	1.3µs	1.3µs	1.3µs
Pulse Rise/Fall Time[3]	200ns-3µs	200ns-2µs	200ns-3µs	200ns-3µs	200ns-3µs	200ns-3µs	200ns-3µs	200ns-3µs	350ns-4.5µs	350ns-4.5µs	350ns-4.5µs	3µs-5µs
Typical Pulse Width Jitter	30ns	30ns	30ns	30ns	30ns	30ns	30ns	30ns	30ns	30ns	30ns	30ns
Timebase Accuracy	50ppm	50ppm	50ppm	50ppm	50ppm	50ppm	50ppm	50ppm	50ppm	50ppm	50ppm	50ppm
Pulse Period Range	30µs-30000s, depending on settings											
Duty Cycle Range	0-100%	0-100%	0-100%	0-100%	0-100%	0-100%	0-100%	0-100%	0-100%	0-100%	0-100%	0-100%
Multi Channel Pulse Synchronization	Settable, synchronized (+/- 1µs), or staggered (1/N*Period)										+/-2µs	+/-2µs
Low Range Current												
Max Current	40mA	200mA	200mA	200mA	200mA	200mA	400mA	800mA	800mA	1.6A	1.6A	3.2A
Setpoint Resolution	1µA	5µA	5µA	5µA	5µA	5µA	10µA	20µA	20µA	40µA	40µA	80µA
Output Current Accuracy	0.05%+10µA	0.04%+175µA	0.04%+175µA	0.04%+175µA	0.04%+175µA	0.04%+175µA	0.04%+350µA	0.04%+700µA	0.04%+700µA	0.04%+1.4mA	0.04%+1.4mA	0.2%+8mA
Current Measure Accuracy[11]	0.7%+200µA	0.4%+5mA	0.1%+1mA	0.1%+1mA	0.1%+1mA	0.1%+1mA	0.1%+2mA	0.1%+4mA	0.1%+4mA	0.1%+8mA	0.1%+8mA	0.5%+4mA
High Range Current												
Max Current	500mA	2A	3A	4A	5A	8A	10A	16A	20A	32A	40A	60A
Setpoint Resolution	10µA	50µA	100µA	100µA	100µA	200µA	200µA	400µA	400µA	800µA	800µA	1.6mA
Output Current Accuracy	0.05%+75µA	0.08%+500µA	0.08%+1mA	0.08%+1mA	0.08%+1mA	0.08%+2mA	0.08%+2mA	0.08%+4mA	0.08%+4mA	0.08%+8mA	0.08%+8mA	0.3%+24mA
Current Measure Accuracy[11]	0.2%+1mA	0.4%+5mA	0.4%+5mA	0.4%+5mA	0.4%+5mA	0.4%+5mA	0.4%+10mA	0.4%+20mA	0.4%+20mA	0.4%+40mA	0.4%+40mA	0.5%+40mA

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Model (Maximum Current)	0.5	2	3	4	5	8	10	16	20	32	40	60
Misc.												
Nominal Current Ripple[1]	0.01%+160μA	<1A: 0.03%+300μA >1A: 0.06%		<1A: 0.03%+300μA >1A: 0.03%+500μA		<1A: 0.03%+300μA >1A: 0.012%+1mA	<1A: 0.03%+300μA >1A: 0.012%+2mA	<5A: 0.05%+250μA >5A: 0.02%+1.8mA		<5A: 0.05%+250μA >5A: 0.02%+4mA		<10A: 0.05%+200μA >10A: 0.02%+3mA
DC Ramp Rate: Low Speed Setting	10V/s, 50mA/s					10V/s, 100mA/s		10V/s, 200mA/s		10V/s, 400mA/s		
DC Ramp Rate: Default Setting	10V/s, 500mA/s					10V/s, 1A/s		10V/s, 2A/s		10V/s, 4A/s		
DC Ramp Rate: High Speed Setting	1000V/s, 50A/s					1000V/s, 100A/s		1000V/s, 200A/s		1000V/s, 400A/s		
Current Stability[10]	70ppm											
Voltage Measure Accuracy[11]												
Bias Current[5]												
Max Current	33mA					66mA		132mA		264mA		
Setpoint Resolution	1μA					2μA		4μA		8μA		
Bias Current Accuracy	0.35%+60μA					0.35%+120μA		0.35%+240μA		0.35%+480μA		
Fall Time to Bias Current	200ns-3μs										500ns-6μs	
5% Settling Time After Falling Edge[8]	10-70μs											
0.1% Settling Time After Falling Edge[9]	70-130μs											
Modulated Current[6]												
Sequence Step Amplitude Range	0-100%											
Min Step Width	1ms											
Max Step Width	10s											
Step Width Accuracy	10μs											
Max Number of Steps	20											
Max Number of Step Sequences (Loops)	3											
Loop Count	1 to 32,767 or infinite											
Current Rise/Fall Time Each Step[3]	5-8μs											

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Specifications	
Available Packages	
2U-Chassis	Rack mount / benchtop chassis 89mmH x 483mmW x 635mmD (including handles)
External Interfaces	
Trigger Out	TTL output equal to pulse on time
Trigger Polarity	Programmable
Trigger To Pulse Rising Edge	2-25μs to rising edge of pulse. Based on current setpoint.
Trigger Jitter	<10ns typical
Remote Pause	Optoisolated input, pauses output, selectable polarity
Remote Disable	Optoisolated input, halts output, selectable polarity
Output Current Drive Type	Differential Drive
Output Cabling	Single or multiconductor twisted pair
Recommended Max Output Cable Length	6m
Input Power	
A/C Power	Selectable; single and three phase available; 50-60Hz
Power Conversion	Two-stage: DC-DC converter + analog current regulator
General	
Remote Control	100-base T Ethernet, TCP/IP with SCPI syntax
Monitoring System	Built-in aquisition system monitors & reports voltage, current and fault conditions
Device Protection	2nd Generation SpikeSafe protection including high speed over current shut down, slow start up, leakage detection and other protection algorithms
Calibration Interval	2 year
Operating Conditions	For indoor use only, 10 to 35C, 70%R.H., <2000m altitude
Cooling	Air cooled
Particulate Level	Clean lab conditions
Other	CE

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Notes
All specifications at 23C+/-5C, pulsing specifications: outside cable <3m
[1]RMS, 20MHz BW primary frequency 100kHz or 200kHz
[2]Typical performance with automatic adjustments enabled compensation settings tuned for best shape, 1>10% Imax
[3]Typical performance with compensation settings tunes for fastest rise and best pulse shape, 1>10% Imax
[4]With suitable auxiliary bulk power supply: Vbulk ≥ Compliance + 20V for Buck models, Compliance Voltage/2 for Buck/Boost models
[5]Requires BIAS option
[6]Requires MODI option
[7]Output current that guarantees 3% accuracy at calibration limit
[8]Typical time to recover to 95% of bias value, typical cable compensation Ibias>50% Max bias
[9]Typical time to recover to 99.9% of bias value, typical cable compensation Ibias>50% Max bias
[10]Typical p-p current variation over 1 hour, after warm up at 23C
[11]2-wire measurement designed for load monitoring. SpikeSafe Performance Current Sources may be paired with available high-speed DMM's for precise voltage and current measurements.
[12]Additional power options must be specified. Please contact your sales representative or email sales@vektrex.com

Model Number Guide: SS400-PRF-BBB-CC-DDE
BBB = Max Voltage
CCC = Max Current, use 05 for 0.5A
DD = Packaging, M = Module, 2U = 2U Chassis
E = Channel Count
Optional features. Specify option in addition to model number
+MODI = Modulated Current
+BIAS = Adds secondary integrated bias current source
Example model number: SS400-PRF-200-8-2U4 +MODI +BIAS[12]   200V 8A 4 Independent Source Channels + Modulated Current and BIAS

Email **sales@vektrex.com** or visit **www.vektrex.com** to get more information and request a quote.

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