

# SpikeSafe SS200 Precision Pulsed Current Source

## High Performance DC and Pulsed

- Precise Current Regulation - 0.1%
- 1 – 8 channel configurations
- Per channel
  - Constant Current to 10A
  - Pulsed Current to 10A/10uS – 1S
  - 200V compliance voltage
- Series drive reduces energy cost/DUT
  - up to 62%
- SpikeSafe™ protects DUTs



SpikeSafe 200 8 channel  
for up to 320 5V DUTS

Copyright 2009, Vektrex, Version 2.2 7/7/2009

### Overview – Industry Standard Current Source

For applications that benefit from precisely regulated current and voltage, the industry standard SpikeSafe 200 provides single or multiple drive channels at voltages to 200V and currents from 0 to 10A. Flexible operating modes support reliability protocols including: DC, pulsed drive, thermal synchronization, long duration flash tests, and user programmable waveforms. Precise current regulation meets LM-80 electronic requirements.

### SpikeSafe Protects Devices and Data

Load protection algorithms continuously monitor drive voltage and current for anomalies. If an anomaly is detected, drive is terminated. This shutdown preserves the individual device for failure analysis, and it ensures other devices in the circuit are not damaged, ultimately improving overall reliability.

### Modular to Fit Small or Large Applications

The modular SS200 packaging may be configured to support your application. Packaging options include

- 2U bench top / rack chassis; 1-8 channels
- 9U air-cooled rack crate; 1 – 64 channels
- 19" air-cooled rack; 1 – 256 channels
- OEM to your needs

Each channel can power up to 40 series-connected 5V Devices Under Test (DUTs) for a total capacity of 10,240 DUTs per system.

### Efficient Design Cuts Electricity Use 62%

In a typical high power burn-in application, the lifetime cost of electricity used often exceeds the cost of the equipment itself. The SS200's efficient digital power conversion technology wastes little power, reducing costs by 62% compared with traditional sources.

### User configurable load tuning capability

Programmable load tuning capability adjusts internal drive circuitry to maintain pulse fidelity and fast transition times to accommodate a variety of load conditions. Compensation settings include tuning for cable length, load impedance, and rise time. User configurable load protection algorithms protect devices.

### Applications:

- ❑ LEDs, Laser Diodes, Solar Cells, Arrays
- ❑ Reliability test
- ❑ Stress Screening
- ❑ Burn-in and Production Test
- ❑ LM-80 Energy Star compliance
- ❑ Characterization
- ❑ T<sub>j</sub>, Thermal Resistance Measurement

 **VEKTREX**

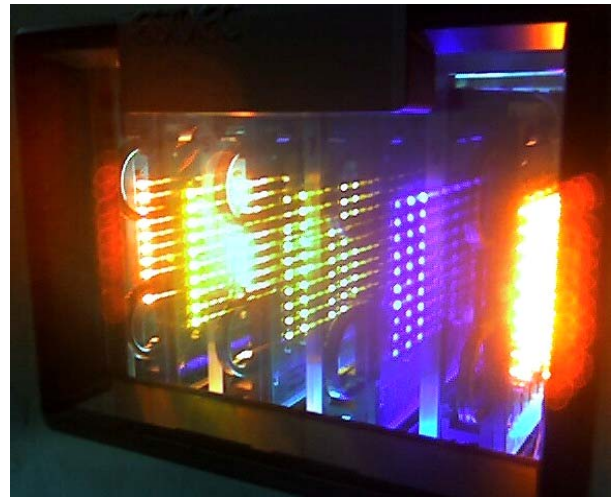
# SS200 Precision Pulsed Current Source

## Series Drive Capability Reduces Cost/DUT

With 200V compliance, each SpikeSafe 200 channel can easily drive series circuits with dozens of devices under test (DUTs). SpikeSafe load protection assures remaining devices are protected even if one fails. Optional shunting hardware can automatically bypass the failed DUTs allowing the remainder to continue operating without user intervention.

## Flexible Power Choices

In the 2U configuration, the SS200 can be powered from the AC mains. For larger applications such as volume LED burn-in, the SS200 uses bulk DC power provided by an external AC-DC supply. This flexibility simplifies facility wiring and reduces overall system cost.



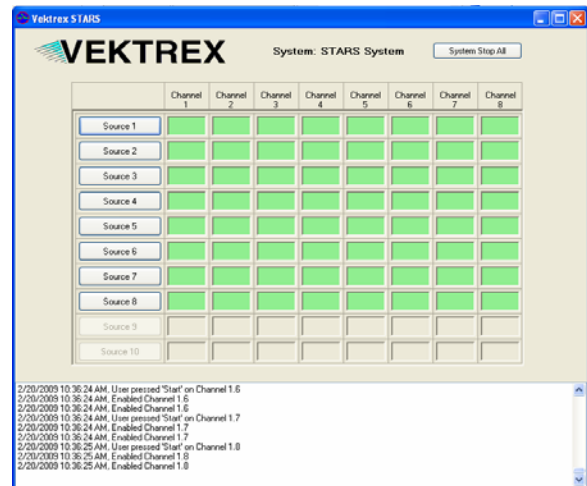
LEDs In Series-Driven Reliability Test

## Simplified Output Cabling

The SS200 was developed specifically to support DC and pulsed operation in demanding burn-in and life test situations in which the device under test is mounted in an external chamber or temperature platform. To keep cost/DUT low, the SS200's programmable load tuning capability adjusts internal drive circuitry to maintain pulse fidelity and fast transition times with simple twisted pair cables up to 10 meters in length.

## Easy To Use Control Software

The Ethernet-controlled SpikeSafe 200 includes an interactive Control Panel application that may be used to control and operate from one to eight source channels. The Control Panel supports all source modes and it displays voltage and current readings read back from each source channel. For larger systems, optional SpikeSafe Test and Reliability Software – STARS – is available to control up to 256 source channels. Custom applications, such as part characterization and production test, can also be developed using available .Net and LabVIEW drivers.



SpikeSafe Test And Reliability Software

## FailSafe Temperature Monitoring

In-situ temperature monitoring combined with STARS failsafe rapidly shuts down power to devices when device temperature exceeds user set thresholds.

## Available Stand-Alone or as Turn-Key System

The SS200 can be provided as a stand-alone unit or as part of an integrated system. Integrated systems may include software and signal distribution hardware that can provide signal expansion to many DUTs and automatic failed DUT bypass. In-situ  $V_f$ ,  $I_f$ ,  $T_j$ , and  $R_\theta$  monitoring is also supported with available scanning and logging modules.

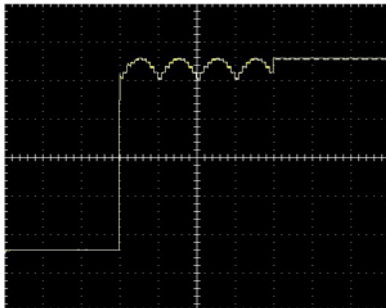
# SS200 Precision Pulsed Current Source

## Targeted SpikeSafe Models Available For Many Applications

The versatile SS200 is used for many applications ranging from quantum cascade laser burn-in to high power laser bar characterization. SS200 models are available to support many common uses. For applications outside of these, a custom model can be tailored to match a specific requirement. Contact Vektrex or a Vektrex representative to determine which source is best for a particular application.

Models	Features	Typical Application
SS200	Standard unit, supports 10uS pulsing, 5A/channel	Laser diodes, LED test and burn-in, characterization
SS200 - 10A	Standard unit, 10A maximum pulsed current, channel	High current devices
SS200 - 500mA DC	500mA maximum, improved low current performance, DC only	Low current DC LED life test, low current devices
SS200 - Common Anode	1-6 channels 10A/channel Rapid current startup, floating output	Production test of multi-chip modules with common anode connection
SS200FP – Fast Pulse (See separate datasheet)	Standard unit with extended minimum pulse width to 1uS, adds low inductance output section	Laser diodes, LED test and characterization, quantum cascade lasers
SS200HC – High Current (See separate datasheet)	High current model. Channels combined to supports up to 533A, 100V	Laser diode burn-in, rapid characterization, high voltage laser stacks

Options	Description	Typical Application
Tj Measurement	Adds low current 0-25mA measurement current source	Tj, Rθ measurements
Modulated Current	Adds modulated current capability	Rectifier ripple simulation, camera flash sequences, power cycling test protocols



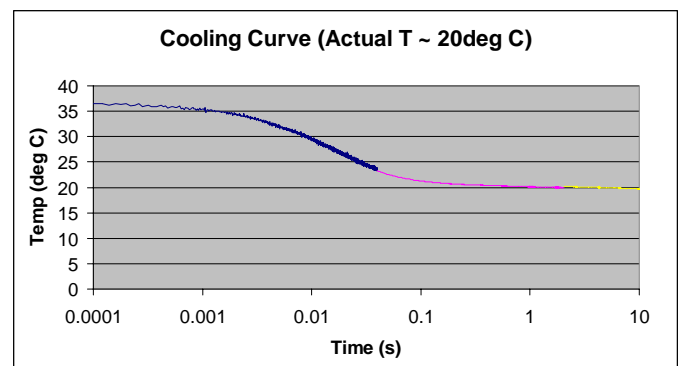
**Rectifier Ripple Waveform**

## Modulated Current Option

The SS200 can provide arbitrary current waveforms with the Modulated Current Option. This option allows sequences of current steps to be defined and downloaded. Each step defines the current amplitude as a percentage of the set point and the step duration. Sequences can be nested and repeated to support applications such as rectifier ripple or a camera “red-eye” flash.

## Tj Measurement Option

The Tj Measurement Option adds an adjustable low current measurement current source along with additional firmware that supports junction temperature (Tj) and thermal resistance (Rθ) measurements using the JESD51-1 Electrical Test Method (ETM). For more information see the SpikeSafe Tj Measurement Option datasheet.



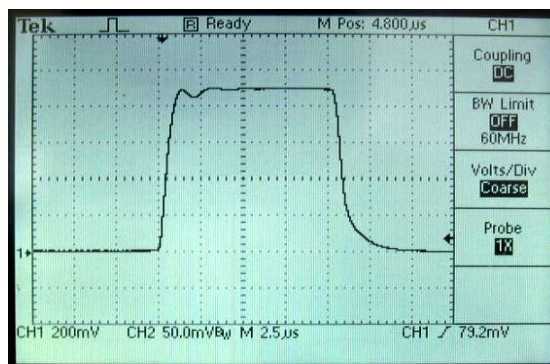
**Cooling Curve Generated with Tj Option**

# SS200 Precision Pulsed Current Source

## Standard SS200 Specifications

Output Configuration	
Current Sources:	1-8 channels/module
Type:	Differential drive, available floating or ground-referenced
Output connector:	16 pin Molex Mini-fit JR
Remote Control	
Physical:	100-base T Ethernet
Protocol:	TCP/IP
Command Set:	SCPI
Drivers:	.NET, LabVIEW
Read back Capability:	Voltage, current for each channel, fault conditions
Power Conversion	
Type:	DSP-controlled two-stage step down regulator
Output Power:	1000W/channel maximum
Losses:	20W/channel losses typical, 2-3x higher during current start-up
Duty Cycle:	Rated for continuous operation
Cooling:	Forced air
Current Source Performance	
Output Current Range:	0 – 5A per channel, see other models for higher or lower currents
Maximum Compliance Voltage:	200V
Setpoint Resolution:	100uA
Absolute Accuracy:	0.1%+2mA 0-5A, +/-1mA typical
Setpoint Stability:	+/- 50 ppm after 8 minute warm-up
Output Current Ripple:	0.2% p-p typical, 200kHz, at 1A
Input Power	
AC (2U Chassis):	90-240V, 400W maximum
Logic:	15VDC, 1.5A
Bulk (If DC Bulk Used):	0-220V, 40A maximum
Bulk connector:	2 pin Molex Mini-fit SR
Physical	
Weight:	27 lbs
Size:	2U rack mount 24.5"vx 19" x 3.5"
Other	
Trigger Output:	Active low, 13uS after pulse start
Isolated Disable:	Halts current output

Pulse Performance	
Modes:	DC, Single Pulse, Continuous Pulse, DC Dynamic, Continuous Dynamic
Time base Accuracy:	+/-50 ppm
Pulse Width Range:	10uS – 1S
Pulse Width Resolution:	10nS
Pulse Repetition Frequency	0.0025 Hz – 33 kHz
Pulse Width Accuracy:	+/- 0.1% +/- 1uS, measured at 1A
Rise/Fall Time:	1-10uS depending upon compensation settings*
SpikeSafe Load Protection	
Startup Shock:	Eliminated with 1S soft ramp-up
Current Anomaly:	Typically limited to less than 400mA peak. Controlled to 5% of setpoint within 3uS
Current Anomaly Shutdown:	Automatic shutdown when anomaly exceeds programmed threshold, shutdown within 3-10uS
Voltage Anomaly:	Detected and logged, optional automatic channel shutdown
Edge Undershoot:	Limited to –100uA
Edge Overshoot:	Limited to 20% for fast edge setting; 0% slow edge setting
Leakage Current:	Shutdown within 20mS of cathode/anode current imbalance



**\*Typical 5A, 10 uS current pulse showing 1uS rise time, flat top, and controlled fall time**



For more information see [www.vektrex.com](http://www.vektrex.com)

Contact: Melissa Ford  
Phone: (858) 558-8282 x6  
melissa@vektrex.com