**LM-80 Integrated Solutions**  
Reliable, Energy Efficient, High Capacity  
Applications: LM-79, LM-80-08, LM-80-15

<table>
<thead>
<tr>
<th>LM-80 Complete Turnkey Solution</th>
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</tr>
</thead>
<tbody>
<tr>
<td>High Capacity Complete LM-80 Solution including:</td>
<td>• LM-80 Drive Electronics</td>
</tr>
<tr>
<td>• LM-80 Chambers (Integrated Thermal Control Systems)</td>
<td>• LM-80 Automated Light Measurement System</td>
</tr>
<tr>
<td>• LM-80 Software</td>
<td>• LM-80 Temperature Monitoring</td>
</tr>
<tr>
<td>• LM-80 Load Boards (n+1)</td>
<td>• Accessories and Services</td>
</tr>
<tr>
<td>• Accessories and Services</td>
<td>• See details below</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LM-80 Drive Electronics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>High capacity complete driver system</td>
<td>• Approved for LM-80 usage (auditable)</td>
</tr>
<tr>
<td>• Modular and scalable architecture; configure to your needs</td>
<td>• Energy efficient</td>
</tr>
<tr>
<td>• Energy efficient</td>
<td>• SpikeSafe™ Current Sources = accurate, reliable drive current</td>
</tr>
<tr>
<td>• Max current to 60A</td>
<td>• Max compliance voltage to 400V</td>
</tr>
<tr>
<td>• DC and Continuous Pulse test modes</td>
<td>• LM-80 software (SpikeSafe Test and Reliability System - STARS)</td>
</tr>
<tr>
<td>• Use with your own chamber or bundle with the ITCS</td>
<td></td>
</tr>
</tbody>
</table>
## LM-80 Integrated Solutions
Reliable, Energy Efficient, High Capacity
Applications: LM-79, LM-80-08, LM-80-15

### LM-80 Integrated Thermal Control System - ITCS (chamber)
- High capacity integrated chamber
- Use for low/mid/high power devices, COB, arrays, modules, UV and VIS devices, laser diodes, VCSEL
- Instrumented for LM-80 temperature monitoring
- Active liquid cooling – chill and heat; uses plant water
- Energy efficient – low heat output to the environment
- Models to 5kW, 7.5kW and 10kW total device heat dissipation,
- Temperatures 55°C to 150°C
- Approved for LM-80 usage (auditable)
- Coordination with LM-80 Drive Electronics protect devices

### LM-80 Temperature Monitoring
- Monitor Tsink to ensure temperature uniformity
- Monitor Tair: user positional probes
- Monitor Tcase: high accuracy thermocouples
- Monitor Tcase: RTD
- Monitor Tcase: NTC

### ITCS Fixturing
- Vektrex ITCS Fixturing
- 40 test locations (75 x 150mm)
- n+1 load board architecture; unique ID for each device
- Reconfigure to support larger devices (150x150mm)
- Reconfigure to support modules (300x150mm)
- Slide out drawers: easy load and unload
- Includes LM-80 Temperature Monitoring
- Optional LM-80 IDC Tuning System

### LM-80 ITCS IDC Tuning System
- Optional upgrade for LM-80 system
- Individual drawer tuning – adjust temperature up and down
- Ideal for chambers with a product mix (high/mid/low power)
- Includes hardware upgrade
<table>
<thead>
<tr>
<th>LM-80 Integrated Solutions</th>
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</thead>
<tbody>
<tr>
<td>Reliable, Energy Efficient, High Capacity</td>
</tr>
<tr>
<td>Applications: LM-79, LM-80-08, LM-80-15</td>
</tr>
</tbody>
</table>

**LM-80 Automated Light Measurement System – ALMS**

- Automated light measurement supporting LM-80/LM-79
- Accurately test 80 devices in 10 minutes
- Repeatable, accurate light measurements enable rapid detection of trends
- Luminous flux repeatability: 0.05%
- High voltage and high current capability
- LM-85 pulsed mode light measurements
- Integrates CAS-140 and SpecWinPro
- ISD audit trail included

**LM-80 Software (LEDBench)**

- LEDBench is delivered with the LM-79/LM-80 ALMS
- LM-85/Single Pulse Mode to reduce junction temperature and improve light measurements
- Measure 1 to 80 devices on n+1 load board
LM-80 Software Applications

LM-80 Integrated Software Solution

- Integrated and coordinated software applications to simplify LM-80 test
- Data logging
- Monitoring
- Safety mechanisms
- Current source control
- Chamber control
# LM-80 Software Applications

<table>
<thead>
<tr>
<th>LM-80 Software (STARS)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STARS</strong> - SpikeSafe Test and Reliability System Software Application</td>
</tr>
<tr>
<td>Manage up to 256 independent source channels</td>
</tr>
<tr>
<td>Approved for LM-80 test (auditable)</td>
</tr>
<tr>
<td>Monitoring/data logging: current, voltage, Tsink, Tair, Tcase</td>
</tr>
<tr>
<td>Duration timers automatically stop tests at the correct time</td>
</tr>
<tr>
<td>Software timing uncertainty report consistent with LM-80 standard</td>
</tr>
<tr>
<td>Use with any SpikeSafe Series current source</td>
</tr>
<tr>
<td>Failsafe shutdown preserves devices from catastrophic failure</td>
</tr>
<tr>
<td>Automatic restarts when failure detected</td>
</tr>
<tr>
<td>Management overview functions simplify test processes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LM-80 Software (STARPLOT)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STARPLOT</strong> Software Application</td>
</tr>
<tr>
<td>Graphically view STARS data log files to easily spot trends</td>
</tr>
<tr>
<td>Overlay multiple tests</td>
</tr>
<tr>
<td>Zoom on anomalies</td>
</tr>
<tr>
<td>Graph by temperature, current, or voltage</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LM-80 Software Application (TCP)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LM-80 Software Temperature Control Panel (TCP)</strong></td>
</tr>
<tr>
<td>Thermal Control integrates with STARS, providing integrated safety system: shut down power and cooling/chamber at failure</td>
</tr>
<tr>
<td>Remote control and monitoring for ITCS liquid-cooled chambers</td>
</tr>
<tr>
<td>Remote control and monitoring of temperature control unit</td>
</tr>
<tr>
<td>Temperature monitoring: Tsink, Tair, Tcase</td>
</tr>
<tr>
<td>Failsafe temperature shutdown preserves devices</td>
</tr>
</tbody>
</table>
## LM-80 Accessories

### Thermocouple (Tcase G2)
- High accuracy thermocouples meet LM-80 specifications
- User positional: use ITCS fixturing to attach probe to Tcase point
- No soldering required
- Ceramic – long time use with no outgassing

### Thermocouple (Tcase Thin Wire)
- Useful for COB
- Thinwire thermocouple: high accuracy
- Attach to Tcase position using Kaptan tape or solder

### Thermocouple (Tair G1)
- User positional Tair probe
- Shielded to avoid stray LED light
- Use ITCS fixturing to attach probe at the correct place for Tair
- Use one for entire chamber
- Use multiple Tair probes to monitor Tair at several locations

### Thermocouple Isolator Pod
- 500V electrical isolation
- Passive design: no circuitry
- Attach with solder or epoxy
- Excellent thermal conductivity
- LED-safe materials
- Improves thermocouple measurement accuracy
<table>
<thead>
<tr>
<th>Accessories</th>
<th>Description</th>
</tr>
</thead>
</table>
| **RTD Ring Lug**       | • Provides isolation from load plate/load board  
                          • Eliminate heating effects during mounting  
                          • Simply attach wires to the connector or load board  
                          • Reusable  
                          • Includes RTD                                                                                                                                  |
| **Cable Extension**    | • SpikeSafe current sources drive current accurately to 15m  
                          • Extension cables available in 3m, 6m, and 12m lengths  
                          • PVC  
                          • Connect between SpikeSafe current source and ITCS junction or your device                                                                      |
| **N+1 Load Board**     | • N+1 load board architecture  
                          • Drive devices in series  
                          • Drive devices individually for light measurement  
                          • Design guidelines available  
                          • Use only best materials to reduce thermal resistance  
                          • Design service available |
Vektrex System Configurations

- Scalable, modular design enables easy system expansion for increased capacity
- Solutions available for any size lab
- Sample lab layouts include:
  - Starter System – one source module connected to your fixturing
  - One to one layout – system next to your chamber or test setup
  - Line layout – one system connected to several chambers or test setups in a row
  - Star layout – one central command system connected to many chambers in the lab

From leftmost image, moving clockwise: L-Shape Layout, In-Line Layout, Star Layout
# Reliability Solutions

Reliable, Energy Efficient, High Capacity

Applications: LM-80; LM-79; Reliability Test, Burn-In

LED, Laser Diode, VCSEL, Module

## Reliability Drive Electronics

- Accurate, reliable drive current for 7/24 operation
- Use with any SpikeSafe Series current source
- DC and DC / Continuous Pulse modes available
- SpikeSafe load protection preserves devices and improves reliability statistics
- Individual control of source channels (current, voltage, duty cycle)

## Reliability Drive Electronics

- Portable, roll-around small driver rack
- Use with any SpikeSafe current source
- Maximum 8 modules (64 source channels)
- Control all current sources from one centralized location
- Multiple system sizes to meet the needs of any lab
- Small size driver rack shown: 1m tall
- Integrated bulk power to 5kW possible

## Reliability Drive Electronics

- Drive electronics for low to high capacity / R&D
- Configure with any SpikeSafe current source
- May be used for pre-LM-80 validation
- Modular and scalable architecture
- Maximum 16 modules, 128 source channels
- Energy efficient
- Integrated bulk power to 10kW possible
- Medium size driver rack shown: 1.88m tall
## Reliability Solutions

Reliable, Energy Efficient, High Capacity
Applications:  LM-80; LM-79; Reliability Test, Burn-In
LED, Laser Diode, VCSEL, Module

### Reliability Drive Electronics

- High-capacity, large drive electronics cabinet shown: 2.39m tall
- Maximum capacity 32 modules (256 source channels)
- Use to control your lab from one centralized location, reducing labor costs
- Highest power density available – 256kW
- Any SpikeSafe current source module may be used
- Energy efficiency reduces ROI
- Use with STARS software or develop your own

### Integrated Thermal Control System (ITCS)

- Integrated Thermal Control System (ITCS)
- High capacity integrated chamber
- Active liquid cooling: uses plant water
- 10kW total heat dissipation
- Temperatures: to 150°C
- Applications: burn-in, RTOL Test
- Coordination with SpikeSafe Drive Electronics protect devices
- See Software section for Vektrex software applications
- Temperature monitoring optional
# Reliability Software and Applications

## SpikeSafe Test and Reliability System

- STARS software application manages up to 256 source channels
- Each source channel individually programmable / controllable
- Data output in .csv format for easy import and analysis
- Duration timers automatically stop tests at the correct time
- Use with any SpikeSafe Series current source

## STARPLOT

- STARPLOT Software Application
- Graphically presents STARS output data
- Easily spot trends using STARPLOT graphical test data viewer

## SpikeSafe Modulated Current

- SpikeSafe modulated current function
- Adds arbitrary waveform capability to any SpikeSafe DCP current source
- Allows user to download customized waveforms for execution (for example red eye flash test)
- User-defined, text-based sequence downloaded for execution once or for infinity
- To 33MHz

## Temperature Control Panel - TCP

- Thermal Control Panel (TCP) Software Application
- TCP combines with STARS providing integrated safety system – shut down power and cooling/chamber at failure
- Remote control and monitoring for liquid cooled integrated systems
- For use with the Integrated Thermal Control System
- For use with LN2-based installations
## Reliability Accessories

### Cable Extension

- SpikeSafe current guaranteed to the ends of long cables (15m)
- Cable extensions may be combined
- Available in lengths 3m, 6m, 12m

### Failsafe Temperature Monitoring

- Hardware and software combine to protect your devices
- Set maximum temperature for thermocouple or RTD
- If temperature exceeded, then SpikeSafe modules are shutdown
- Also available in standalone mode

### Bulk Power Cabinet

- Bulk Power Cabinet
- Centralize bulk power distribution
- Maximum 80kW
- Emergency off
- Three phase AC power; 240VAC, 380VAC, and 440VAC
# Light Measurement Solutions

Applications: R&D, Characterization, Production

## SpikeSafe Precision Pulsed Current Sources Performance Series

### Single Channel

- Precision timing for reduced junction temperature and improved LED light measurements
- Continuous power conversion for sustained output power
- DC, Continuous Pulse, Single Pulse, Dynamic modes
- Max current: 500mA-60A
- Max voltage: 50-400V
- Pulse rise/fall time: <2µs
- Pulse width range: 10µs – 15000s
- Bias and Modulated Current modes available
- Low jitter trigger
- Approved for LM-80 measurements

## SpikeSafe Precision Pulsed Current Sources Performance Series

### Multi-Channel

- Max current: 500mA-60A
- Max voltage: 50-400V
- Source channels: 2-8; independent control
- Pulse synchronization across channels
- Continuous power conversion for sustained output power
- Precision timing for reduced junction temperature and improved LED light measurements
- Pulse rise/fall time: <2µs
- Pulse width range: 10µs – 10s or longer with MODI upgrade
- DC, Continuous Pulse, Single Pulse, Dynamic modes
- Bias and Modulated Current modes available
- Refer to [vektrex.com](http://vektrex.com) for more information
Combine a Performance Current Source with Sampling Voltmeter for a Complete Source/Measure Capability
## Light Measurement Solutions

Reliable, Repeatable, Reproducible Light Measurements

Software Applications: Control Panel, Vf, Light Measurement,
Software Development Toolkit, Modulated Current
Applications: R&D, Characterization, Production

<table>
<thead>
<tr>
<th>Control Panel</th>
<th>Control Panel Software Application</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Provides access to all SpikeSafe functions “out of the box”</td>
</tr>
<tr>
<td></td>
<td>Controls one (1) SpikeSafe module</td>
</tr>
<tr>
<td></td>
<td>Source channels individually controllable</td>
</tr>
<tr>
<td></td>
<td>For use with all SpikeSafe Series current source products</td>
</tr>
<tr>
<td></td>
<td>SCPI output feature simplifies software development</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control Panel + Vf</th>
<th>Adds Vf monitoring to the Control Panel Software Application</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Includes data logging and editing feature</td>
</tr>
<tr>
<td></td>
<td>Integrates with high speed, accurate sampling voltmeter</td>
</tr>
<tr>
<td></td>
<td>Capture and view Vf across entire pulse or log one value</td>
</tr>
<tr>
<td></td>
<td>Easy to use</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control Panel + Light Measurement</th>
<th>Adds light measurement to Control Panel + Vf and data logging</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coordinate light measurement with SpikeSafe pulses</td>
</tr>
<tr>
<td></td>
<td>Synchronize your light measurement with Vf measurement</td>
</tr>
<tr>
<td></td>
<td>Ideal for R&amp;D, production, and software development use</td>
</tr>
<tr>
<td></td>
<td>Available as a turnkey system or for use in developing your own system</td>
</tr>
</tbody>
</table>
**Light Measurement Solutions**  
Reliable, Repeatable, Reproducible Light Measurements  
Software Applications: Control Panel, Vf, Light Measurement,  
Software Development Toolkit, Modulated Current  
Applications: R&D, Characterization, Production

<table>
<thead>
<tr>
<th>SpikeSafe Software Development Toolkit</th>
<th>SpikeSafe Modulated Current</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Software Development Toolkit" /></td>
<td><img src="image2" alt="Modulated Current" /></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
  - SpikeSafe Software Development Toolkit Software Application  
  - Speeds development of SpikeSafe 400 based applications  
  - Capture SCPI sequences and test/validate prior to insertion into application  
  - For use with all SpikeSafe 400 Series current source products  
  
  - SpikeSafe modulated current function  
  - Adds arbitrary waveform capability to any SpikeSafe PRF current source  
  - Allows user to download customized waveforms for execution (for example red eye flash test)  
  - User-defined, text-based sequence downloaded for execution once or for infinity  
  - To 33MHz  |
Thermal Measurement Solutions
Applications: Junction Temperature, Thermal Resistance, Permissible Pulse Handling Graphs, Thermal Modelling

Performance Series Current Source + Bias Module
- Integrates low current /bias current source
- Hardware integration supports fast transitions required for thermal measurements
- Use for $T_J$ and $R_{th}$ testing as well as thermal modelling
- Develop your own thermal measurement system and generate permissible pulse handling graphs
- Transient thermal measurements
- Available as turnkey system or for use in developing your own system

Automated Thermal Resistance Test System
- Automates $R_{th}$ measurements and calculations
- Saves time by detecting failures and stability early in the testing process
- Customizable load board/device test configurations
- Simple user interface
- Logs data for analysis
- Rapidly measures 1-80 devices identifying device failures

Aurotek JD-2020 LED Thermal Resistance Analyzer
- SpikeSafe Performance Series Current Sources with the Bias Module provide the foundation for Aurotek’s Thermal Resistance Analysis System
- Performance Series Current Sources provide highly accurate current
- The Bias Module enables fast transitions from high current to low current

Tj Utility
- Easy to use turnkey solution
- Automates various $T_J$ measurement steps defined in JEDEC JESD51-1 and JESD51-51
- $T_J$ and $R_{th}$ measurements
- Easy-to-use software interface
- For one device at a time and luminaires
Tj Utility Block Diagram

User Computer
- Control Panel Software
- Tj Utility Software
- User Provided Spectrometer Software

Ethernet Switch

SpikeSafe 400
- Performance
- Precision Pulsed
- Current Source

Tj Bias Current

Digital Trigger

Sampling DMM

User Provided Spectrometer

Digital Trigger

Measure Temperature

User Provided: Thermo Electric Cooler (TEC)
SpikeSafe DC / DCP Current Sources:

Form Factor

- Max current: to 60A
- Max compliance voltage: to 400V
- Single and multiple independent source channels
- One module appropriate for low, mid, and high power devices
- Sustained output power to 3kW
- Pulse synchronization across source channels
- See software section for Vektrex software applications
# SpikeSafe DC Current Source Selector Guide

<table>
<thead>
<tr>
<th>Max Current (A)</th>
<th>Max Compliance Voltage</th>
<th>Source Channels</th>
<th>Max Power (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50V</td>
<td>100V</td>
<td>200V</td>
</tr>
<tr>
<td>0.5</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>1</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>4</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>5</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>7.5</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>12.5</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>15</td>
<td>✓</td>
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<td>20</td>
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<td>25</td>
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<td>40</td>
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<tr>
<td>50</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>0.2</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# SpikeSafe DC / Continuous Pulse Current Sources

**DC and Continuous Pulsed Modes**
- High Power Density, 10µs Minimum Pulse Width
- SpikeSafe Load Protection Preserves Devices

**Devices:** LED, Laser Diode, VCSEL, COB, Emitter, Array, Luminaire

**Applications:** LM-80, Reliability, Burn-in, HASS, PTMCL, Stress Test

See more information at [www.vektrex.com](http://www.vektrex.com)

## SpikeSafe Low Power DCP Current Source
- Max current: 1mA to 500mA
- Max compliance voltage: to 400V
- Single and multiple independent source channels
- Sustained output power to 200W per source
- One module appropriate for low power devices
- See software section for Vektrex software applications

## SpikeSafe 200V / 5A Power DCP Current Source
- Max current: 5A
- Max compliance voltage: to 200V
- Sustained output power to 1kW per source
- Single and multiple independent source channels
- See software section for Vektrex software applications

## SpikeSafe Mid Power DCP Current Source
- Max current: to 10A
- Max voltage: to 400V
- Sustained output power to 1600W per source
- Single and multiple independent source channels
- One module appropriate for low and mid power devices
- See software section for Vektrex software applications

## SpikeSafe High Power DCP Current Source
- Max current: to 60A
- Max voltage: to 200V
- Single and multiple independent source channels
- One module appropriate for low, and mid power devices
- See software section for Vektrex software applications

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# SpikeSafe DC / Continuous Pulse Current Source Selector Guide

<table>
<thead>
<tr>
<th>Max Current (A)</th>
<th>Max Compliance Voltage</th>
<th>Source Channels</th>
<th>Max Power (W)</th>
<th>Min Pulse Width</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>✓</td>
<td>✓</td>
<td>1, 2, 4, 8</td>
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<td>100V</td>
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<td></td>
</tr>
<tr>
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<td>✓</td>
<td>✓</td>
<td>1, 2, 4, 8</td>
<td>800</td>
</tr>
<tr>
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<td>✓</td>
<td>1, 2, 4, 8</td>
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<td>1</td>
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<td>40</td>
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<td>1</td>
<td>6400</td>
</tr>
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</tr>
</tbody>
</table>
## DC and DC / Continuous Pulse Software Applications

### SpikeSafe Test and Reliability System
- STARS Software Application manages up to 256 source channels
- Each source channel individually programmable / controllable
- Approved for LM-80 and reliability test
- Temperature, current, and voltage monitoring and data logging
- Thermocouple, RTD, and NTC temperature monitoring
- Failsafe shutdown preserves device from catastrophic failure
- Data output in .csv format for easy import and analysis
- Duration timers automatically stop tests at the correct time
- Software timing uncertainty consistent with LM-80 standard
- Use with any SpikeSafe Series current source

### STARPLOT
- STARPLOT Software Application
- Graphically presents STARS output data
- Easily spot trends using STARPLOT graphical test data viewer
- May be installed at test station or used from remote location

### Control Panel
- Control Panel Software Application
- Provides access to all SpikeSafe functions “out of the box”
- Controls one (1) SpikeSafe module
- Source channels individually controllable
- For use with all SpikeSafe Series current source products
Performance Series Form Factor

- Award-winning Performance Series Current Sources – 2017 Sapphire Award in the Tools & Tests in SSL Design category
Combine a Performance Current Source with Sampling Voltmeter for a Complete Source/Measure Capability
# SpikeSafe Performance Series Single Channel Current Source Selector Guide

<table>
<thead>
<tr>
<th>Max Current (A)</th>
<th>Max Compliance Voltage</th>
<th>Max Power (W)</th>
<th>Min Pulse Width</th>
</tr>
</thead>
<tbody>
<tr>
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<td>50V</td>
<td>100V</td>
<td>200V</td>
</tr>
<tr>
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</table>
# SpikeSafe Performance Series Multiple Channel Current Source Selector Guide

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<tr>
<th>Max Current (A)</th>
<th>Max Compliance Voltage</th>
<th>Source Channels</th>
<th>Max Power (W)</th>
<th>Min Pulse Width</th>
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</thead>
<tbody>
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<td>200V</td>
<td>300V</td>
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<td>✔</td>
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<td>✔</td>
</tr>
</tbody>
</table>
### Performance Series Current Sources


#### SpikeSafe Precision Pulsed Current Sources

**Performance Series**

**Single Channel**

- Max current: 500mA-60A
- Max voltage: 50-400V
- Continuous power conversion for sustained output power
- Precision timing for reduced junction temperature and improved LED light measurements
- Pulse rise/fall time: <2µs
- Pulse width range: 10µs – 10s or longer with MODI upgrade
- DC, Continuous Pulse, Single Pulse, Dynamic modes
- Bias and Modulated Current modes available
- Refer to [vektrex.com](http://vektrex.com) for more information

#### SpikeSafe Precision Pulsed Current Sources

**Performance Series**

**Multi-Channel**

- Max current: 500mA-60A
- Max voltage: 50-400V
- Source channels: 2-8; independent control
- Pulse synchronization across channels
- Continuous power conversion for sustained output power
- Precision timing for reduced junction temperature and improved LED light measurements
- Pulse rise/fall time: <2µs
- Pulse width range: 10µs – 10s or longer with MODI upgrade
- DC, Continuous Pulse, Single Pulse, Dynamic modes
- Bias and Modulated Current modes available
- Refer to [vektrex.com](http://vektrex.com) for more information
### Performance Series

#### Software Applications

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Control Panel** |  - Control Panel Software Application  
  - Provides access to all SpikeSafe functions “out of the box”  
  - Controls one (1) SpikeSafe module  
  - Source channels individually controllable  
  - For use with all SpikeSafe Series current source products |
| **SpikeSafe Software Development Toolkit** |  - SpikeSafe Software Development Toolkit Software Application  
  - Speeds development of SpikeSafe 400 based applications  
  - Capture SCPI sequences and test/validate prior to insertion into application  
  - For use with all SpikeSafe 400 Series current source products |
| **SpikeSafe Modulated Current (MODI)** |  - Adds the capability to define and execute arbitrary DC waveforms  
  - 1ms current step resolution  
  - Steps defined as a percentage of setpoint current  
  - Useful to simulate rectifier ripple, camera flash, etc. |
| **SpikeSafe with Bias Module** |  - Adds a low current bias module to provide thermal analysis measurement current  
  - Useful for Tj, $\Theta$ testing and thermal modelling |