



Applied Pulsed Power, Inc.™

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Model S25 Solid State Switch Module

Using two silicon n-type thyristors in series, combining the aspects of SCR thyristors and high di/dt capability, Applied Pulsed Power, Inc. (APP) now provides a module for 8kV voltage stand-off operation. This module features:

- 8kV Peak Off-State Voltage
- 14kA Peak Non-Repetitive Current
- 30kA/ μ S Maximum di/dt
- 60nS turn-on delay time
- Low Inductance



Optional self-powered gate drive circuit, shown on bottom of page 2, connects directly to the module and requires only a 1A, 15V, trigger signal.

This solid state switch module consists of two silicon thyristors in series, designed specifically for high di/dt, high voltage, pulsed power applications. The module can be provided with a self powered gate drive circuit, an air-cooled electrically-isolated heat sink, and a clamp for connecting to the low inductance high current strip-line. The self powered gate drive circuit connects directly to the module and requires only a 1A, 15V, trigger signal. The electrically-isolated air-cooled heat sink can be floated with the module for high voltage, high power switching applications. These together provide a compact high-power high-voltage solid state switch. The modules can be connected in series to obtain switches capable of up to 60kV.

Operational Ratings for Module (T_j=80°C, unless otherwise specified)

| | | |
|--|-------|---------------|
| Peak Non-Repetitive Off-State Voltage | 8000 | Volts |
| Peak Repetitive Off-State Voltage | 7000 | Volts |
| Peak Non-Repetitive Current | 14000 | Amps |
| Peak Repetitive Current (10 μ sec pulse, 60pps) | 7000 | Amps |
| Peak di/dt | 30 | kA/ μ Sec |
| Maximum RMS On-State Current (T _j =120°C) | 100 | Amps |



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Data Sheet

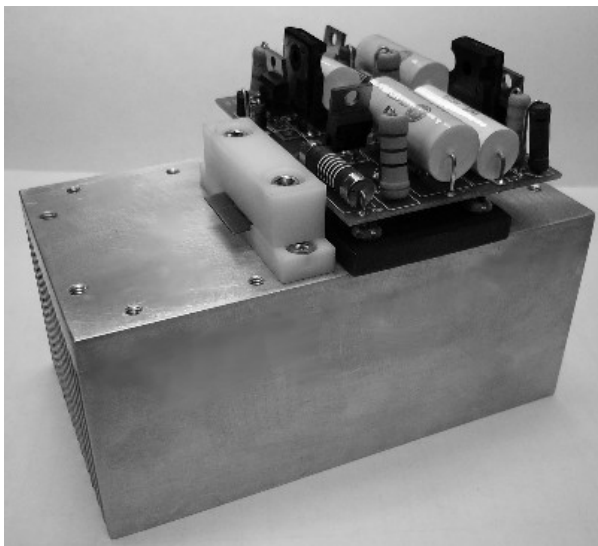
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Operational Ratings for Module (continued)

| | | |
|---|-------------|--------|
| Operating Temperature Range | -40 to +120 | °C |
| Peak Rate of Reapplication of Off-State Voltage | 1000 | V/μSec |
| Peak Reverse Voltage | -10 | V |

Operational Characteristics for Module

| | | |
|--|----------|---------|
| Trigger Voltage | 15 | Volts |
| Trigger Isolation Voltage | 60 | kV |
| Module Thermal Impedance | 0.03 | °C/watt |
| Gate Drive Circuit Shunt Capacitance | 6.8 | nF |
| Gate Drive Parallel Balancing Resistance | 44 | MΩ |
| Typical Leakage Current (4kV) (T _j =25°C) | 90 | μAmp |
| (T _j =80°C) | 130 | μAmp |
| (T _j =120°C) | 890 | μAmp |
| Turn-On Delay | 60 | nSec |
| Turn-On Delay Jitter | <2 | nSec |
| Turn-Off Time (T _j =25°C) | 0.5 | mSec |
| (T _j =60°C) | 0.75 | mSec |
| (T _j =120°C) | 1.5 | mSec |
| Module Dimensions | 80x45x13 | mm |



Note: All tests performed with APP gate drive circuit and APP heat sink using a 3μSec pulse provided by a 1.5μF PFN into a 0.7Ω load.

Thermal impedance of the heat sink shown is 0.22 °C/watt when used with forced air cooling. Contact Howard D. Sanders, hds@appliedpulsedpower.com, for more information.

APP also provides complete pulsed power systems. Contact Steven C. Glidden, scg@appliedpulsedpower.com, for more information.

