

AC/DC Solid State Power Controller Module

Description:

The Solid State Power Controller (SSPC) Module is a microcontroller based Solid State Relay designed to be used in Aircraft or Navy in 115VAC/150VDC applications. This module has integrated current sensing and over current / over temp protection. The module is equivalent to a DPST relay with a common single side isolated control.

Compliant Documents & Standards:

| | | |
|-------------------|--|----------------------|
| MIL-STD-167-1 (1) | Mechanical Vibrations of Shipboard Equipment | 19 June 1987 |
| MIL-STD-217F | Reliability Prediction of Electronic Equipment | Notice 2 28 Feb 1995 |
| P4855-1A | Navy Power Supply Design and Reliability Guidelines (NAVMAT) | January 1989 |



Module Features:

- Epoxy shell construction
- Solid state reliability; Low weight (60 gms)
- High power density
- Similar footprint as a mechanical relay: 2.8"x1.15"x1.15"
- Single-in-line pins to ease pcb assembly

Electrical Features:

- 115VAC Input: Current rating of 8A with very low drop; 180mV typ
- Current rating upto 12A with drop @ 280mV
- Advanced TRUE I²t algorithm to compensate for different current waveforms
- 2-Pole operation: 500V DC isolation between poles
- High control circuit isolation: 1500V DC to either pole
- Cross-trip feature: Fault on one pole trips the other within 50 μsec
- Very low control current: 14 mA typ @ 24V
- True I²t Protection from 12A to 90A
- Instant Trip Protection (3 μsec typ) for loads over 100A
- High Overload Capability up to 250A; Repetitive Fault handling capability
- Built-in Transient Voltage Suppressor to handle Short Circuit Turn-Off Spikes
- Over-temperature Protection: 75 °C Amb typ
- Internally generated isolated supply to drive the switch
- Opto Isolated Control Signal input and Status output
- Soft Turn-on to reduce EMC issues
- Module Reset with a Low Level Signal; Trip Reset Circuit is Trip-Free
- Built-in Hysteresis and Noise Filtering to avoid nuisance Turn-ON/OFF

Datasheet 4119, Rev. C.1

Electrical Characteristics

| Control & Status | |
|---------------------------------|--|
| Vcc | 24V DC Nominal 20V to 36V DC |
| Control Vcc Current (from +24V) | 14 mA typ 20 mA max |
| Alarm Out Signal | ON: High (internal pull-up to +24V); Output can source upto 5 mA OFF: Logic Low Output shall remain below 2V sink upto 5 mA |
| Control signal | ON: Logic Low (internal pull-up to +24V) Turns ON when input is pulled below 4V Input current @ Control pin < 0.5 mA OFF: Open Turns OFF when input is float or pulled above 12V |
| Reset | Thro cycling of Control signal Thro cycling of Vcc |

| Power | |
|--|---|
| Input Voltage | 0 to 170V DC 0 to 120V AC 10 Hz to 440 Hz |
| Power Dissipation | < 2.5W @ 8A @ 70°C Amb per pole |
| Current (Pole #1 and Pole #2) | 8A Continuous 250A for 3 μsec |
| Max Voltage Drop (Each Pole) | 180 mV typ @ 8A, T _A = 25 °C 260 mV max T _A = -40 °C ~ 70 °C |
| Turn ON time (measured from Input Signal) | 3 msec max Both Poles turn-on together |
| Turn OFF time (measured from Input Signal) | 50 μsec max Both Poles turn-off together |
| Time Difference at Turn-on between Poles | 20 μsec max |
| Time Difference at Turn-off between Poles | 20 μsec max |
| Min Trip current (Each Pole) | 8.8A DC 8.8A AC RMS |
| Trip time | |
| 12A | 320 msec ~ 846 msec |
| 20A | 130 msec ~ 270msec |
| 50A | 22 msec ~ 42 msec |
| 90A | 7 msec ~ 13 msec |
| 100A and above | Less than 3 μsec |
| Repetitive Fault current Rating | 250A |
| Output Rise Time (turn ON) | 5 μsec typ |
| Output Fall Time under normal turn-off | 300 nsec typ |
| Output Fall Time under Fault | 300 nsec typ |
| Min Load Requirement | Nil |

| Protection | |
|--------------------------|-----------|
| Short Circuit Protection | Upto 250A |

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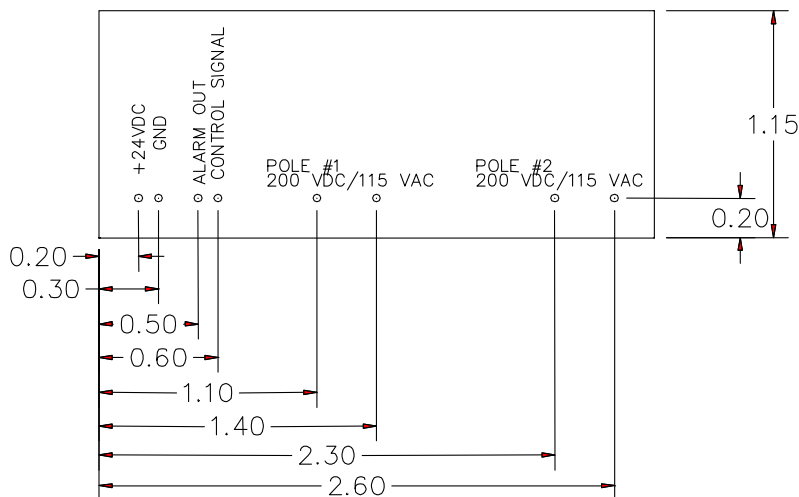
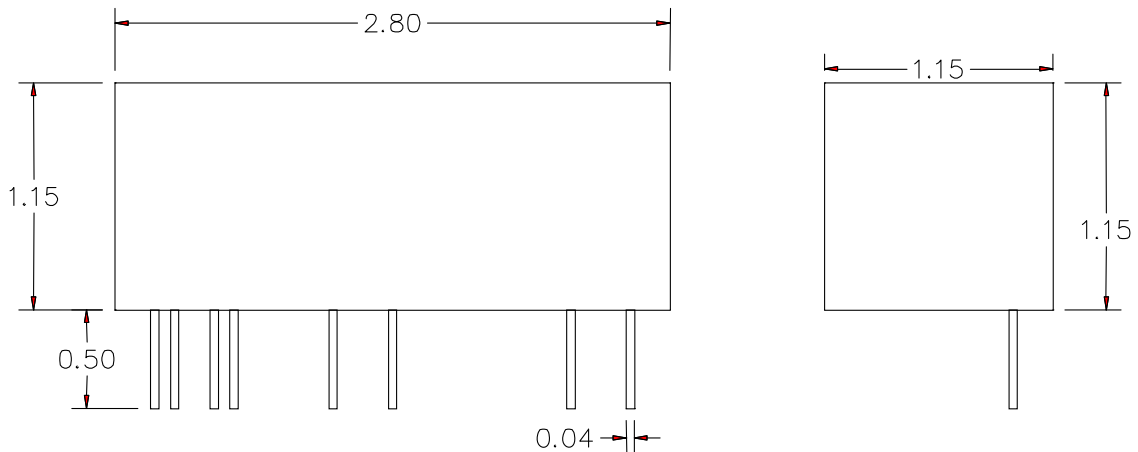
| | |
|---|--|
| Voltage Spikes | External Transient Voltage Suppressor to handle short-circuit turn-off spike |
| OTP (Over Temperature Protection) threshold | typ. 75 °C, min. 70 °C, max 80 °C |
| OTP response time | typ. 5 sec |

Physical Characteristics

| | |
|-----------------------|---------------------------------|
| Temperature | |
| Operating Temperature | T _A = -40°C to +65°C |
| Storage Temperature | T _A = -55°C to +85°C |

| | |
|-------------------------------|---|
| Environmental | |
| Altitude | Upto 30,000 ft Can be installed in an unpressurized area |
| Case Dimensions | 2.8"L x 1.15"W x 1.15"H |
| Operating Orientation | Any |
| Weight | 60 grams typ |
| MTBF (Estimate: MIL STD 217F) | 100,000 hrs at 25°C Full load |

Mechanical Dimensions (in Inches)



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