



Product Facts

- Combines isolated load switching and circuit protection capabilities.
- Fast acting bounce-free switching
- Carries full rated load (2.5A) without heat sinking to 90°C.
- Low output on-resistance and voltage drop.
- Meets surge requirement of MIL-STD-1275 and MIL-STD-740A.
- Nuclear tolerance tested.

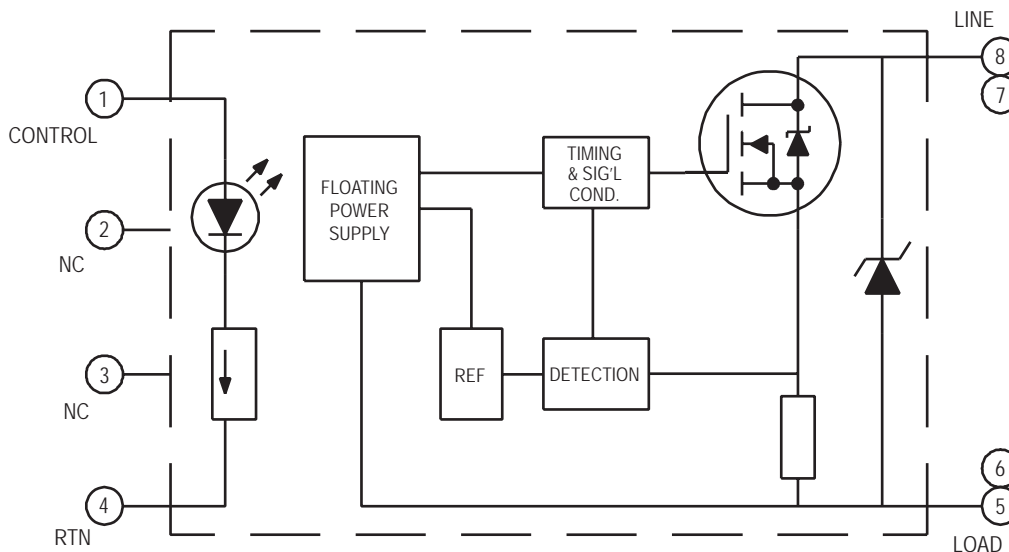


This controller features state of the art photo-voltaic optical input/output isolation and power MOSFET output switching technology for reliable control of DC loads up to 2.5 amps up to 90°C ambient. Temperature compensated output current monitoring and trip circuitry

provide overload/short circuit protection while providing inrush current handling capability for lamp, motor, and inductive loads. The output MOSFET chip is rated at 100V to withstand the abnormal power surge requirements of MIL-STD-1275 and MIL-STD-740A for

28Vdc systems. Thick film hybrid construction is employed in a low profile, hermetically sealed package that is designed and screened to applicable requirements of MIL-PRF-28750D, Y level.

Functional Block Diagram



(see notes 4 and 5)

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KSR-201 DC Solid State Relay / Power Controller (Continued)

Environmental Characteristics

Ambient Temperature Range:

Operating: -55°C to +105°C.
Storage: -55°C to +125°C.

Vibration Resistance:

20 G's, 10-2,000 Hz.

Shock Resistance:

1,500 G's, 0.5 ms pulse.

Constant Acceleration Resistance

(Y1 axis):

5,000 G's.

Mechanical Characteristics

Weight (max.):

.35 oz. (10 grams)

Materials:

Case: 1010 CRS, nickel plated
Pins: Copper cored Alloy 52, gold plated

Electrical Specifications (-55°C to +105°C unless otherwise specified)

Input

Control voltage range (Vcc)	3.8 - 32 Vdc (Notes 1 & 2, Figures 1 & 2)
Control current (max.) @ 5Vdc	15mA (Notes 1 & 2, Figures 1 & 2)
Must turn-on voltage	2.4Vdc
Must turn-off voltage	1.5Vdc
Reverse voltage protection	-7Vdc

I/O

Dielectric Strength (min.)	500V rms
Insulation Resistance (min.) @ 500Vdc	10 ⁸ ohms

Output

Continuous load current (max.)	2.5Adc (Figure 4)
Continuous load voltage (max.)	60Vdc
Transient blocking voltage (max.)	80Vdc (Note 2)
On resistance (max.) @ I _L = 100mA, 25°C	0.14 ohm
Output voltage drop (max.)	0.42Vdc
Leakage current (max.) @ V = 32Vdc	40µAdc
Turn-on time (max.)	1.8 ms (Note 3, Figure 5)
Turn-off time (max.)	1.1 ms (Figure 5)
Electrical system spike	600Vdc (Note 8)
Junction temperature (max.)	125°C
Thermal resistance (max.), junction to ambient	35°C/W
Thermal resistance (max.), junction to case	15°C/W
Inrush current, 75ms, no trip	10Adc (Figure 3)
Inrush current, 100ms, must trip	22Adc (Figure 3)
Inrush current, 200ms, no trip	4.5Adc (Figure 3)
Inrush current, 200ms, must trip	10Adc (Figure 3)



KSR-201 DC Solid State Relay / Power Controller (Continued)

Figure 1 - Input Current vs. Input Voltage

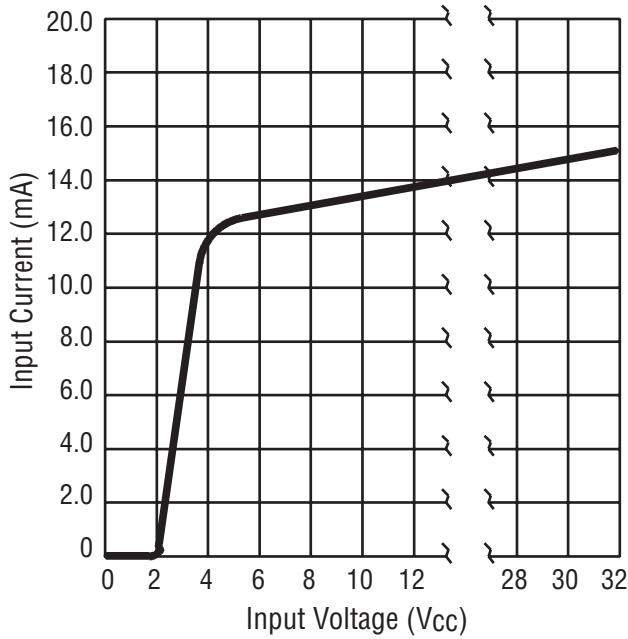


Figure 2 - Series Resistance vs. Vcc Input Voltage (Note 1)

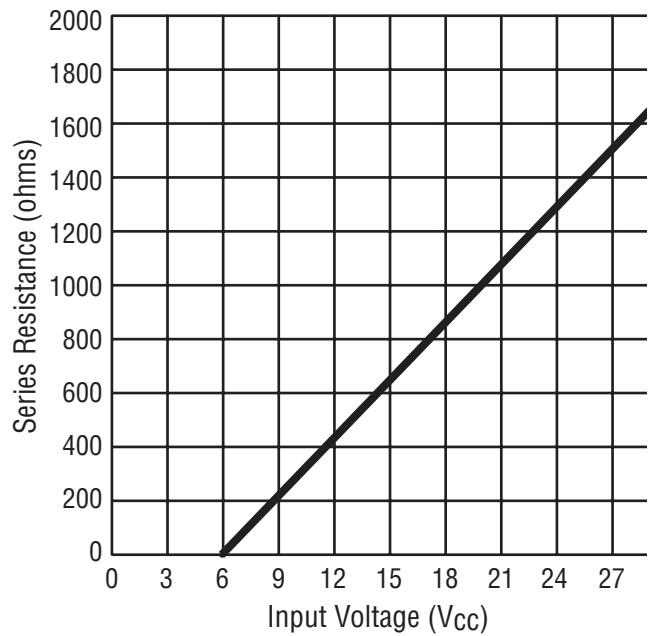


Figure 3 - Overload Trip Curve

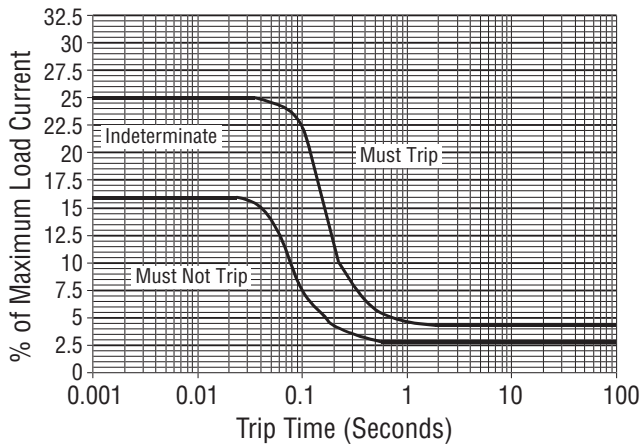
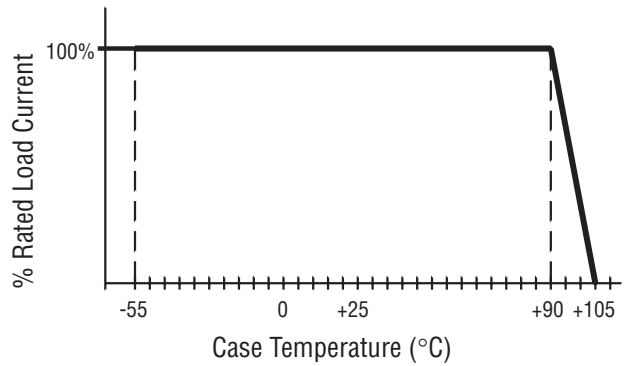


Figure 4 - Thermal Derating





KSR-201 DC Solid State Relay / Power Controller (Continued)

Figure 5 - Turn-On and Turn-Off Timing

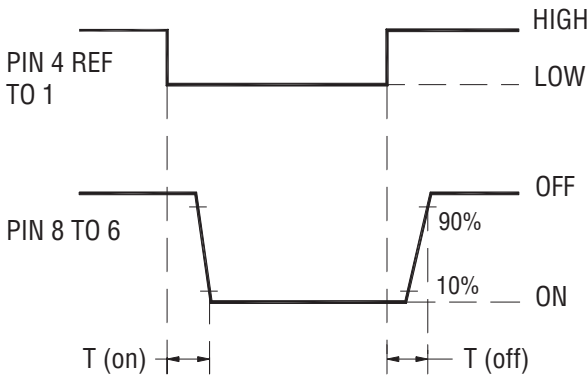
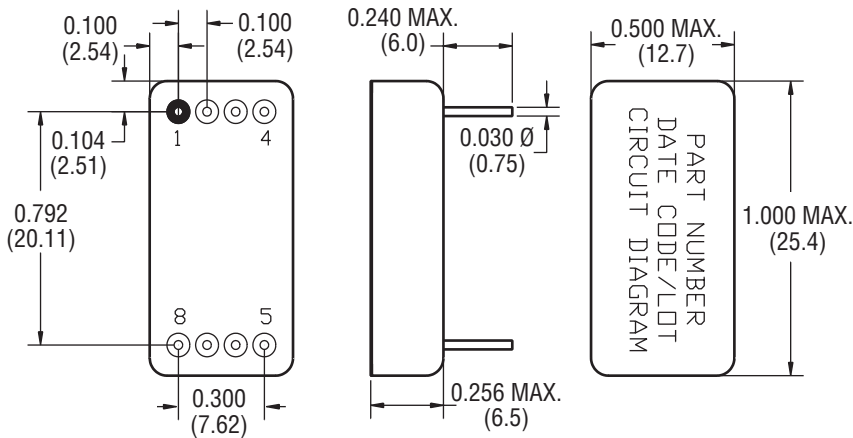


Figure 6 - Outline Dimensions



TOLERANCES:
± 0.010 (0.25mm) FOR 2 PLACE DECIMALS;
± 0.005 (0.13mm) FOR 3 PLACE DECIMALS;
UNLESS OTHERWISE NOTED.

Notes

- For control voltages >6.0 Vdc, a series resistor is recommended. See Fig. 2 for value. The control voltage is the voltage across the input terminals (pin 1 referenced to pin 4). Transition of the control voltage should be <1.0 msec and should be of a "bounce free" nature.
- Tested to the requirements of MIL-STD-1275. For transients >80 Vdc, the power controller will be protected and will pass the current resulting from the transient on to the load. The magnitude of the current is a function of the clamping voltage of the power controller and the source impedance of the transient. The clamping voltage of the power controller is 100 Vdc ±5% with a temperature coefficient of 0.1%/°C.
- Timing measurements taken with a resistive load, at $V_{BIAS} = 5.5$ Vdc and measured between the 10% and 90% points.
- The output of the Solid State Power Controller is floating, thereby allowing the load to be connected to the high or low side of the switch. The switch is capable of sinking or sourcing the load current. Reversing the polarity of the line voltage may cause permanent damage.
- Inductive loads must be diode suppressed. When switching into a shorted condition, series inductance must be <50 millihenries. Input repetition rate not to exceed 10 Hz when switching into a shorted condition.
- To reset power controller after a shorted or overload condition has occurred, remove the short circuit or overload condition; then remove and reapply the control voltage after a minimum 50 ms reset time.
- The rated input voltage for functional tests shall be 5.0 Vdc. This includes tests for on-resistance, output voltage drop, timing, short circuit and overload protection.
- Electrical system spike per MIL-PRF-28750, 10 ms

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