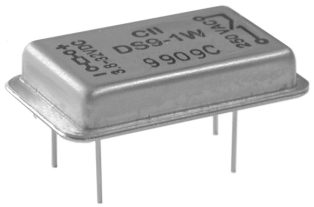
tyco Electronics

DS9 Series High Performance Solid State Relays

AC solid state relay for loads up to 1A @ 250Vrms (2A with heatsink)

Product Facts

- Qualified to Mil-R-28750C (Mil p/n M28750/9-001Y).
- Optically coupled all solid state relay.
- TTL compatible input.
- Zero voltage turn-on for low EMI.
- Hermetically sealed low profile metal DIP package.

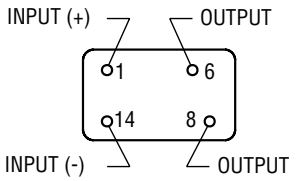


This PC board mountable solid state relay is designed for low power AC load switching up to 1 amp at 250Vrms (2 amps with heatsink). The circuit employs back-to-back photo SCRs with zero voltage turn-on for reliable switching of resistive or reactive loads. TTL compatible input circuitry is optically isolated to 1,500Vrms from the AC load circuit. The relay is offered in two versions: the MIL qualified JDS9-1Y with "Y" level screening per Mil-R-28750C and the DS9-1W tested per Tyco Electronics specifications for CII relays, equivalent to former "W" level screening.

CII Part Number	Military Part Number	Screening Level
JDS9-1Y	M28750/9-001Y	Y
DS9-1W	N/A	W

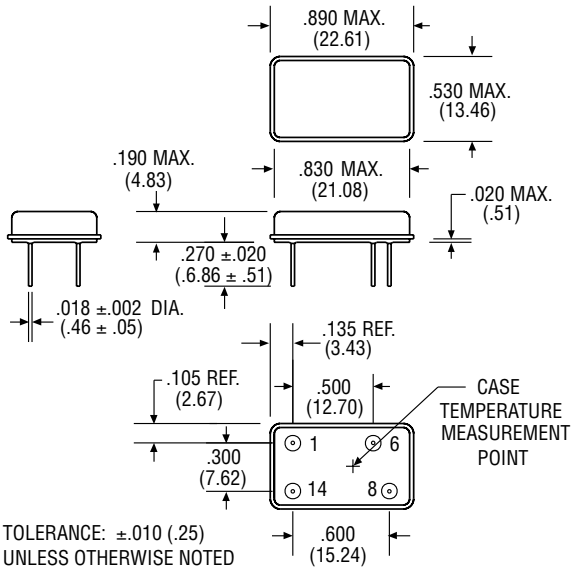
Circuit Diagram

Terminal View



TERMINAL NUMBERS SHOWN ABOVE ARE FOR REFERENCE ONLY

Outline Drawing



Catalog DS9-TBD
Issued 1-04

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-5-729-0425

South America: 55-11-3611-1514
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-141-810-8967

AC solid state relay for loads up to 1A @ 250Vrms (2A with heatsink) (Continued)

Environmental Characteristics

Ambient Temperature Range:
Operating: -55°C to +110°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.

Acceleration Resistance (Y axis):
5,000 G's.

Mechanical Characteristics

Weight (typical):
.176 oz. (5 grams)

Materials:
Header: Kovar
Pins: Kovar, gold plated
Cover: Nickel.

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

Input	
Input supply voltage range (Vcc)	3.8 - 32 Vdc
Input current (max.) @ 5Vdc	15mAdc
Must turn-on voltage	3.8Vdc
Must turn-off voltage	1.5Vdc
Reverse voltage protection	-32Vdc
I/O	
Dielectric strength (min.)	1,500V rms/60 Hz.
Insulation resistance (min.) @ 500VDC	10^9 ohms
Capacitance (max.)	10pF
Output	
Output current rating (max.)	2A rms (Fig. 2, Note 1)
Surge current, 16ms @ 25°C (max.)	8A pk (Fig. 1, Note 3)
Continuous load voltage (max.)	250V rms
Transient blocking voltage (max.)	500V pk
Frequency range	40 - 440 Hz.
Output voltage drop (max.) @ 1A load current	1.5V rms
Off-state leakage current (max.) @ 250V rms/400 Hz.	1mA rms
Turn-on time (max.)	1/2 cycle
Turn-off time (max.)	1 cycle
Off-state dv/dt (min.), with snubber	200V /µs (Note 2)
Zero voltage turn-on window, initial (max.)	10V
Waveform distortion (max.)	4V rms
Output chip junction temperature (max.)	130°C
Thermal resistance (max.), junction to ambient	65°C/W
Thermal resistance (max.), junction to case	15°C/W

Notes

1. Operation at elevated load currents up to 2 amps is dependent on use of suitable heatsink to maintain case temperature per Fig. 2.
2. Recommended output snubber: R = 100 ohms (1/2 W), C = .01µF (600V).
3. Heating of output chip during and after a surge may cause loss of output blocking capability until junction temperature falls below maximum rating.

Figure 1 - Peak Surge Current vs. Surge Current Duration

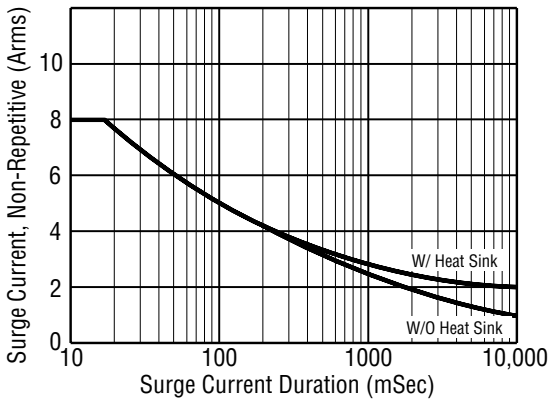


Figure 2 - Load Current vs. Temperature