



AC solid state relay for loads up to 10A @ 250Vrms

Product Facts

- Approved to DSCC drawing 86031.
- Optically coupled all solid state relay.
- **■** TTL compatible input.
- Zero voltage turn-on for low FMI
- Custom power package with screw terminals.



The PS12 series solid state relay is designed for AC power switching up to 10 amps at 250Vrms. The circuit employs back-to-back SCRs with zero voltage turn-on for reliable switch-

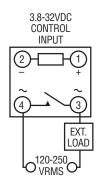
ing of resistive or reactive loads. TTL compatible input circuitry is optically isolated to 1,500Vrms from the AC load circuit. The relay is offered in two versions: the PS12-1Y with "Y" level

screening per Mil-R-28750C, and the PS12-1W screened per Tyco Electronics specifications for CII relays, equivalent to former "W" level of Mil-R-28750.

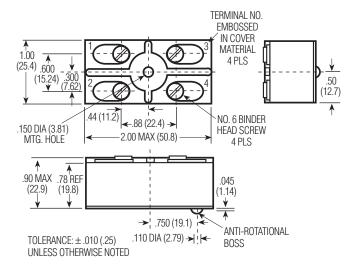
CII Part Number	DSCC Part Number	Screening Level
PS12-1Y	86031-001	Υ
PS12-1W	N/A	W

Circuit Diagram

Terminal View



Outline Drawing



© 2009 by Tyco Electronics Corporation. All Rights Reserved.

CII , TE (logo) and Tyco Electronics are trademarks of the Tyco Electronics group of companies and its licensors.

www.tycoelectronics.com



AC solid state relay for loads up to 10A @ 250Vrms (Continued)

Environmental Characteristics

Ambient Temperature Range:

Operating: -55°C to +95°C. Storage: -55°C to +110°C.

Vibration Resistance: 30 G's, 78-2,000 Hz.

Shock Resistance:

100 G's, 6 ms pulse.

Constant Acceleration Resistance:

100 G's.

Mechanical Characteristics

Weight (max.):

3 oz. (85 grams)

Materials:

Case: Plastic, self-extinguishing,

epoxy filled

Terminals: Brass, nickel-plated.

Base Plate: Aluminum

NOTE: Do not exceed 128 in-oz when

tightening screws.

Electrical Specifications (-55°C to +95°C unless otherwise specified)

Input supply voltage range (Vcc) 3.8 - 32 Vdc Input current (max.) @ 5Vdc 16mAdc Must turn-on voltage 3.8Vdc Must turn-off voltage 1Vdc Reverse voltage protection -32Vdc VO Dielectric strength (min.) Insulation resistance (min.) @ 500Vdc 108 ohms Capacitance (max.) Output Output current rating (max.) Surge current (max.) Output current rating (max.) Surge current (max.) 100A pk (Fig. 2, Note 1) Surge current (max.) 100A pk (Fig. 1, Note 2) Continuous load voltage (max.) 250V rms Transient blocking voltage (max.) 46 V k (Fig. 1, Note 2) Continuous load voltage (max.) 45 - 440 k [E. Output voltage (max.) 45 - 440 k [E. Output voltage (max.) 250 v ms Transient (max.) 1 cycle	Input		
Must turn-on voltage 3.8Vdc Must turn-off voltage 1Vdc Reverse voltage protection -32Vdc //0 -32Vdc Job 1,500V rms/60 Hz. Insulation resistance (min.) @ 500Vdc 10 ⁸ ohms Capacitance (max.) 15pF Output -32Vdc Output current rating (max.) 10A rms (Fig. 2, Note 1) Surge current (max.) 100A pk (Fig. 1, Note 2) Continuous load voltage (max.) 250V rms Transient blocking voltage (max.) 460V pk Frequency range 45 - 440 Hz. Output voltage drop (max.) @ 25A load current 1.5V rms Off-state leakage current (max.) @ 220V rms/400 Hz. 9mA rms Turn-on time (max.) 1/2 cycle Turn-off time (max.) 1 cycle Off-state dv/dt (min.), with snubber 200V /μs (Note 3) Zero voltage turn-on window (max.) ±15V pk Output chip junction temperature (max.) 125°C (Note 1) Thermal resistance (max.), junction to ambient 11.5°C/W Thermal resistance (max.), junction to case 2.0°C/W F	Input supply voltage range (Vcc)	3.8 - 32 Vdc	
Must turn-off voltage Reverse voltage protection -32Vdc //O Dielectric strength (min.) 1,500V rms/60 Hz. Insulation resistance (min.) @ 500Vdc 108 ohms Capacitance (max.) 15pF Output Output current rating (max.) 100A pk (Fig. 1, Note 2) Continuous load voltage (max.) 250V rms Transient blocking voltage (max.) 460V pk Frequency range 45 - 440 Hz. Output voltage drop (max.) @ 25A load current 1.5V rms Off-state leakage current (max.) @ 220V rms/400 Hz. Turn-on time (max.) 1 cycle Off-state dv/dt (min.), with snubber 200V /µs (Note 3) Zero voltage turn-on window (max.) 125°C (Note 1) Thermal resistance (max.), junction to case Fusing 1 ² T, 1 ms (max.) 1.50 Ava 1.5	Input current (max.) @ 5Vdc	16mAdc	
Reverse voltage protection Journal Journa	Must turn-on voltage	3.8Vdc	
Dielectric strength (min.) Di	Must turn-off voltage	1Vdc	
Dielectric strength (min.) Insulation resistance (min.) @ 500Vdc 108 ohms Capacitance (max.) 15pF Output Output current rating (max.) 10A rms (Fig. 2, Note 1) Surge current (max.) 100A pk (Fig. 1, Note 2) Continuous load voltage (max.) Transient blocking voltage (max.) Frequency range 45 - 440 Hz. Output voltage drop (max.) @ 25A load current 1.5V rms Off-state leakage current (max.) @ 220V rms/400 Hz. 9mA rms Turn-on time (max.) 1 cycle Off-state dv/dt (min.), with snubber 200V /µs (Note 3) Zero voltage turn-on window (max.) 125°C (Note 1) Thermal resistance (max.), junction to ambient 1.50A value 1.50A value 1.50B value 1.50C (Note 1) Thermal resistance (max.), junction to case 2.0°C/W Fusing I²T, 1 ms (max.) 1.50A²s Load power factor (min.)	Reverse voltage protection	-32Vdc	
Insulation resistance (min.) @ 500Vdc 108 ohms Capacitance (max.) 15pF Output Output current rating (max.) 10A rms (Fig. 2, Note 1) Surge current (max.) 100A pk (Fig. 1, Note 2) Continuous load voltage (max.) 250V rms Transient blocking voltage (max.) 460V pk Frequency range 45 - 440 Hz. Output voltage drop (max.) @ 25A load current 1.5V rms Off-state leakage current (max.) @ 220V rms/400 Hz. 9mA rms Turn-on time (max.) 1/2 cycle Turn-off time (max.) 1 cycle Off-state dv/dt (min.), with snubber 200V /µs (Note 3) Zero voltage turn-on window (max.) 125°C (Note 1) Thermal resistance (max.), junction to ambient 11.5°C/W Thermal resistance (max.), junction to case 2.0°C/W Fusing 1 ² T, 1 ms (max.) 150A ² s Load power factor (min.) 0.2	1/0		
Capacitance (max.) Output Output current rating (max.) Surge current (max.) Continuous load voltage (max.) Transient blocking voltage (max.) Frequency range 45 - 440 Hz. Output voltage drop (max.) @ 25A load current Off-state leakage current (max.) @ 220V rms/400 Hz. Furn-on time (max.) Turn-off time (max.) Turn-off time (max.) Tero voltage turn-on window (max.) Zero voltage turn-on window (max.) Dutput chip junction temperature (max.) Thermal resistance (max.), junction to case 2.0°C/W Fusing 1 ² T, 1 ms (max.) 10A rms (Fig. 2, Note 1) 100A pk (Fig. 1, Note 2) 250V rms 460V pk 460V pk 150V rms 150V rms 150A ² s Load power factor (min.)	Dielectric strength (min.)	1,500V rms/60 Hz.	
Output current rating (max.) Output current rating (max.) Surge current (max.) Continuous load voltage (max.) Transient blocking voltage (max.) Frequency range 45 - 440 Hz. Output voltage drop (max.) @ 25A load current Off-state leakage current (max.) @ 220V rms/400 Hz. Turn-on time (max.) Turn-on time (max.) 1/2 cycle Turn-off time (max.) 1 cycle Off-state dv/dt (min.), with snubber 200V /µs (Note 3) Zero voltage turn-on window (max.) 125°C (Note 1) Thermal resistance (max.), junction to ambient 1.5°C/W Thermal resistance (max.), junction to case 2.0°C/W Fusing 1²T, 1 ms (max.) 150A²s Load power factor (min.)	Insulation resistance (min.) @ 500Vdc	10 ⁸ ohms	
Output current rating (max.) Surge current (max.) Continuous load voltage (max.) Transient blocking voltage (max.) Frequency range Output voltage drop (max.) @ 25A load current Output voltage drop (max.) @ 220V rms/400 Hz. Turn-on time (max.) Turn-on time (max.) 1/2 cycle Turn-off time (max.) Off-state dv/dt (min.), with snubber Zero voltage turn-on window (max.) Thermal resistance (max.), junction to ambient Thermal resistance (max.), junction to case 2.0°C/W Fusing I ² T, 1 ms (max.) 100A pk (Fig. 2, Note 1) 100A pk (Fig. 1, Note 2) 250V rms 460V pk 45 - 440 Hz. 9mA rms 1/2 cycle 1/2 cycle 200V /µs (Note 3) 2ero voltage turn-on window (max.) 1 25°C (Note 1) Thermal resistance (max.), junction to ambient 11.5°C/W Thermal resistance (max.), junction to case 2.0°C/W Fusing I ² T, 1 ms (max.) 150A ² s Load power factor (min.)	Capacitance (max.)	15pF	
Surge current (max.) Continuous load voltage (max.) Transient blocking voltage (max.) Frequency range 45 - 440 Hz. Output voltage drop (max.) @ 25A load current 1.5V rms Off-state leakage current (max.) @ 220V rms/400 Hz. Furn-on time (max.) Turn-on time (max.) 1/2 cycle Turn-off time (max.) 1 cycle Off-state dv/dt (min.), with snubber 200V /µs (Note 3) Zero voltage turn-on window (max.) 125°C (Note 1) Thermal resistance (max.), junction to ambient 11.5°C/W Thermal resistance (max.), junction to case 2.0°C/W Fusing I ² T, 1 ms (max.) 150A ² s Load power factor (min.)	Output		
Continuous load voltage (max.) Transient blocking voltage (max.) Frequency range 45 - 440 Hz. Output voltage drop (max.) @ 25A load current 1.5V rms Off-state leakage current (max.) @ 220V rms/400 Hz. 9mA rms Turn-on time (max.) 1/2 cycle Turn-off time (max.) 1 cycle Off-state dv/dt (min.), with snubber 200V /µs (Note 3) Zero voltage turn-on window (max.) 125°C (Note 1) Thermal resistance (max.), junction to ambient 11.5°C/W Thermal resistance (max.), junction to case 2.0°C/W Fusing I ² T, 1 ms (max.) 150A ² s Load power factor (min.)	Output current rating (max.)	10A rms (Fig. 2, Note 1)	
Transient blocking voltage (max.) Frequency range Output voltage drop (max.) @ 25A load current 1.5V rms Off-state leakage current (max.) @ 220V rms/400 Hz. Furn-on time (max.) 1/2 cycle Turn-off time (max.) 1 cycle Off-state dv/dt (min.), with snubber 200V /µs (Note 3) Zero voltage turn-on window (max.) 125°C (Note 1) Thermal resistance (max.), junction to ambient 11.5°C/W Thermal resistance (max.), junction to case 2.0°C/W Fusing I ² T, 1 ms (max.) 150A ² s Load power factor (min.)	Surge current (max.)	100A pk (Fig. 1, Note 2)	
Frequency range Output voltage drop (max.) @ 25A load current 1.5V rms Off-state leakage current (max.) @ 220V rms/400 Hz. 9mA rms Turn-on time (max.) 1/2 cycle Turn-off time (max.) 1 cycle Off-state dv/dt (min.), with snubber 200V /µs (Note 3) Zero voltage turn-on window (max.) 125°C (Note 1) Thermal resistance (max.), junction to ambient 11.5°C/W Thermal resistance (max.), junction to case 2.0°C/W Fusing I ² T, 1 ms (max.) 150A ² s Load power factor (min.)	Continuous load voltage (max.)	250V rms	
Output voltage drop (max.) @ 25A load current Off-state leakage current (max.) @ 220V rms/400 Hz. Furn-on time (max.) 1/2 cycle Turn-off time (max.) 1 cycle Off-state dv/dt (min.), with snubber 200V /µs (Note 3) Zero voltage turn-on window (max.) 125°C (Note 1) Thermal resistance (max.), junction to ambient 11.5°C/W Thermal resistance (max.), junction to case 2.0°C/W Fusing I ² T, 1 ms (max.) 150A ² s Load power factor (min.)	Transient blocking voltage (max.)	460V pk	
Off-state leakage current (max.) @ 220V rms/400 Hz. 9mA rms Turn-on time (max.) 1/2 cycle Turn-off time (max.) 1 cycle Off-state dv/dt (min.), with snubber 200V /µs (Note 3) Zero voltage turn-on window (max.) ±15V pk Output chip junction temperature (max.) 125°C (Note 1) Thermal resistance (max.), junction to ambient 11.5°C/W Thermal resistance (max.), junction to case 2.0°C/W Fusing I ² T, 1 ms (max.) 150A ² s Load power factor (min.) 0.2	Frequency range	45 - 440 Hz.	
Turn-on time (max.) Turn-off time (max.) 1 cycle Off-state dv/dt (min.), with snubber 200V /µs (Note 3) Zero voltage turn-on window (max.) 125°C (Note 1) Thermal resistance (max.), junction to ambient Thermal resistance (max.), junction to case 2.0°C/W Fusing I ² T, 1 ms (max.) 150A ² s Load power factor (min.)	Output voltage drop (max.) @ 25A load current	1.5V rms	
Turn-off time (max.) Off-state dv/dt (min.), with snubber 200V /µs (Note 3) Zero voltage turn-on window (max.) Output chip junction temperature (max.) Thermal resistance (max.), junction to ambient Thermal resistance (max.), junction to case 2.0°C/W Fusing I ² T, 1 ms (max.) Load power factor (min.) 1 cycle 200V /µs (Note 3) 125°C (Note 1) 11.5°C/W 11.5°C/W 11.5°C/W 11.5°C/W 12.0°C/W 13.00°C/W 14.00°C/W 15.00°C/W 15.00°C/W 15.00°C/W 15.00°C/W	Off-state leakage current (max.) @ 220V rms/400 Hz.	9mA rms	
Off-state dv/dt (min.), with snubber 200V /µs (Note 3) Zero voltage turn-on window (max.) ±15V pk Output chip junction temperature (max.) 125°C (Note 1) Thermal resistance (max.), junction to ambient 11.5°C/W Thermal resistance (max.), junction to case 2.0°C/W Fusing I ² T, 1 ms (max.) 150A ² s Load power factor (min.) 0.2	Turn-on time (max.)	1/2 cycle	
Zero voltage turn-on window (max.) ±15V pk Output chip junction temperature (max.) 125°C (Note 1) Thermal resistance (max.), junction to ambient 11.5°C/W Thermal resistance (max.), junction to case 2.0°C/W Fusing I ² T, 1 ms (max.) 150A ² s Load power factor (min.) 0.2	Turn-off time (max.)	1 cycle	
Output chip junction temperature (max.) Thermal resistance (max.), junction to ambient Thermal resistance (max.), junction to case 11.5°C/W Thermal resistance (max.), junction to case 2.0°C/W Fusing I ² T, 1 ms (max.) 150A ² s Load power factor (min.) 0.2	Off-state dv/dt (min.), with snubber	200V /µs (Note 3)	
Thermal resistance (max.), junction to ambient 11.5°C/W Thermal resistance (max.), junction to case 2.0°C/W Fusing I ² T, 1 ms (max.) 150A ² s Load power factor (min.) 0.2	Zero voltage turn-on window (max.)	±15V pk	
Thermal resistance (max.), junction to case 2.0°C/W Fusing I ² T, 1 ms (max.) 150A ² s Load power factor (min.) 0.2	Output chip junction temperature (max.)	125°C (Note 1)	
Fusing I ² T, 1 ms (max.) 150A ² s Load power factor (min.) 0.2	Thermal resistance (max.), junction to ambient	11.5°C/W	
Load power factor (min.) 0.2	Thermal resistance (max.), junction to case	2.0°C/W	
	Fusing I ² T, 1 ms (max.)	150A ² s	
Power dissipation (max.) 1.5W/A	Load power factor (min.)	0.2	
	Power dissipation (max.)	1.5W/A	

Notes

- 1. Operation at elevated load currents up to 10 amps is dependent on the use of suitable heatsink to limit junction temperature.
- 2. Heating of output chips during and after a surge may cause loss of output blocking capability until junction temperature falls below maximum rating.
- 3. Internal snubber network is provided across output chips.

Figure 1 - Peak Surge Current vs. Surge Current Duration

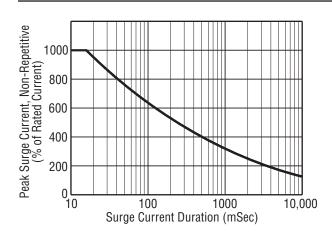
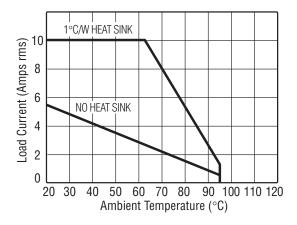


Figure 2 - Load Current vs. Temperature



PS12-TBD-PDF-KRG-10-09