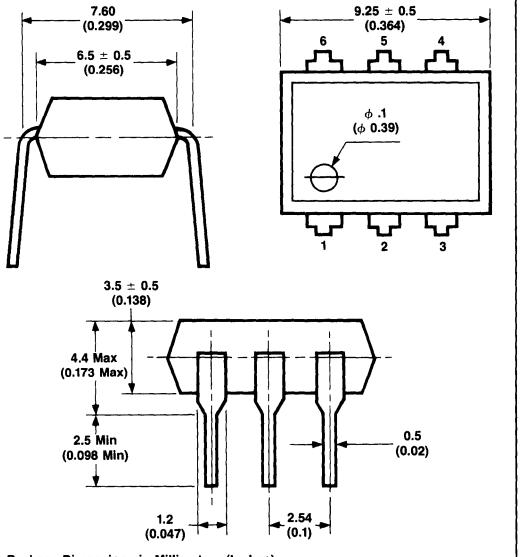
# PS3001/2
# SCR PHOTO COUPLERS
*NEPOC SERIES*

## Description

The PS3001 and PS3002 are optically coupled isolators containing a GaAs infrared emitting diode and a PNPN silicon photo SCR.

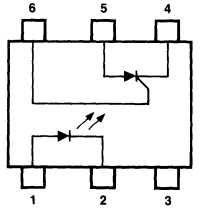
## Package Dimensions




Package Dimensions in Millimeters (Inches)

83-000421A

## Pin Connection




(Top View)

1. Anode
2. Cathode
3. NC
4. Cathode
5. Anode
6. Gate

83-000556A

## Features

- ☐ High voltage isolation: $2000V_{AC}$ min
- ☐ Low turn-on current: 12mA max
- ☐ Plastic dual-in-line package
- ☐ High-speed switching
- ☐ Economical, compact

## Applications

- ☐ Interface circuit for various instruments and control equipment
- ☐ Replacement for reed relays

## Absolute Maximum Ratings

$T_A$ = +25°C

| | |
|---|---|
| **Diode** | |
| Reverse Voltage, $V_R$ | 6V |
| Forward Current (DC), $I_F$ | 80mA |
| Peak Forward Current, $I_{FP}$ | 3A |
| Power Dissipation, $P_D$ | 100mW |
| **SCR** | |
| Peak Off and Reverse Voltage, $V_{DRM}$, $V_{RRM}$ | PS3001 200V |
| Peak Off and Reverse Voltage, $V_{DRM}$, $V_{RRM}$ | PS3002 400V |
| Direct On-Site Current, $I_T$ | 300mA |
| Peak Pulse Current[1], $I_{TP}$ | 3A |
| Peak Surge on Current, $I_{TSM}$ | 3A |
| Power Dissipation, $P_D$ | 350mW |
| Isolation Voltage[2], BV | $2500V_{DC}$ |
| Storage Temperature, $T_{STG}$ | −55°C to +125°C |
| Operating Temperature, $T_{OPT}$ | −55°C to +100°C |
| Lead Soldering Time (at 260°C) | 10s |

5

## Electrical Characteristics
$T_A$ = +25°C

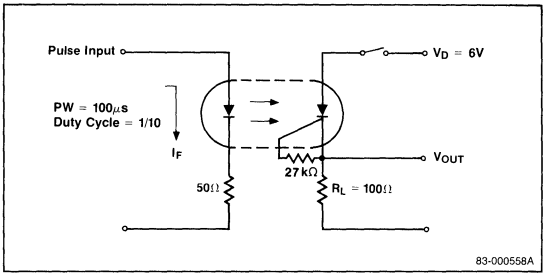
| Parameter | Symbol | Limits Min | Typ | Max | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| **Diode** | | | | | | |
| Forward Voltage | $V_F$ | | 1.1 | 1.4 | V | $I_F$ = 20mA |
| Reverse Current | $I_R$ | | | 10 | μA | $V_R$ = 6V |
| Junction Capacitance | $C_T$ | | 50 | | pf | V = 0, f = 1.0MHz |
| **Photo SCR** | | | | | | |
| Peak Off-State Current | $I_{DRM}$ | | | 10 | μA | $V_{DRM}$ = Rated, $R_{GK}$ = 27KΩ, $T_A$ = +100°C |
| Reverse Current | $I_{RRM}$ | | | 10 | μA | |
| On State Voltage | $V_{TM}$ | | | 1.3 | V | $I_T$ = 300mA |
| Holding Current | $I_H$ | | 0.2 | 1 | mA | $R_{GK}$ = 27kΩ, $V_D$ = 24V |
| Rate of Rise of Forward Blocking Voltage | dV/dt | 0.5 | 1.0 | | V/μs | $V_{DRM}$ = Rated, $R_{GK}$ = 27kΩ, $T_A$ = +100°C |
| **Coupled** | | | | | | |
| Turn on Current | $I_{FT}$ | | 5 | 12 | mA | $V_D$ = 6V, $R_{GK}$ = 27kΩ |
| Isolation Breakdown Voltage | $V_{1-2}$ | 2500 | | | $V_{DC}$ | DC/1 min |
| Isolation Resistance | $R_{1-2}$ | $10^{11}$ | | | Ω | $V_{IN-OUT}$ = 1.0kV |
| Isolation Capacitance | $C_{1-2}$ | | 0.8 | | pF | V = 0, f = 1.0MHz |
| Turn-on Time[3] | $t_{ON}$ | | 10 | | μs | $I_{FT}$ = 50mA, $V_D$ = 6V, $R_{GK}$ = 27kΩ, $R_L$ = 100Ω |

**Notes:** 1. Pulse width = 100μs, repetition frequency = 100Hz.

2. Measuring Conditions: DC voltage for 1 minute at $T_A$ = +25°C; RH = 60% between input (pins 1, 2, and 3 common) and output (pins 4, 5, and 6 common).

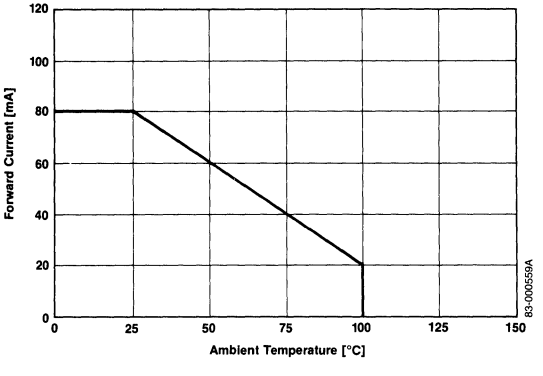
3. Turn-on time test circuit.

*Turn-on test circuit*

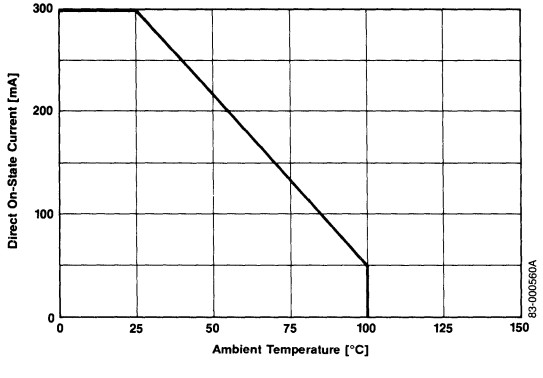



## Typical Characteristics
$T_A$ = +25°C

Forward Current vs Ambient Temperature



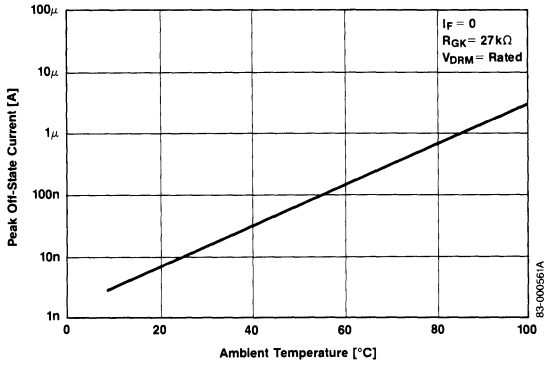

Direct On-State Current vs Ambient Temperature



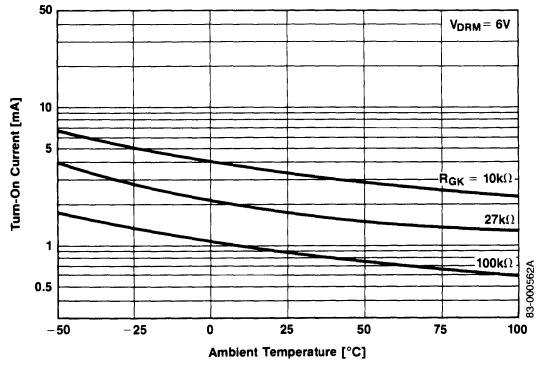
## Typical Characteristics (cont)

$T_A$ = +25°C

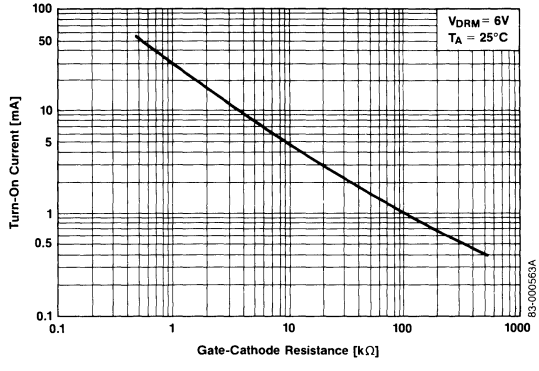
Peak Off-State Current vs Ambient Temperature




Turn-On Current vs Ambient Temperature




Turn-On Current vs Gate-Cathode Resistance




5