

## **PVAZ172NPbF** Microelectronic Power IC HEXFET® Power MOSFET Photovoltaic Relay Single Pole, Normally Open 0-60V AC, 1.0A

### General Description

The PVAZ172N Photovoltaic Relay is a single-pole, normally open solid state relay that can replace electromechanical relays used for general purpose switching of DC and AC loads. It utilizes International Rectifier's HEXFET power MOSFETs as the output switches, driven by an integrated circuit photovoltaic generator of novel construction. The output switch is controlled by radiation from a GaAlAs light emitting diode (LED) which is optically isolated from the photovoltaic generator.

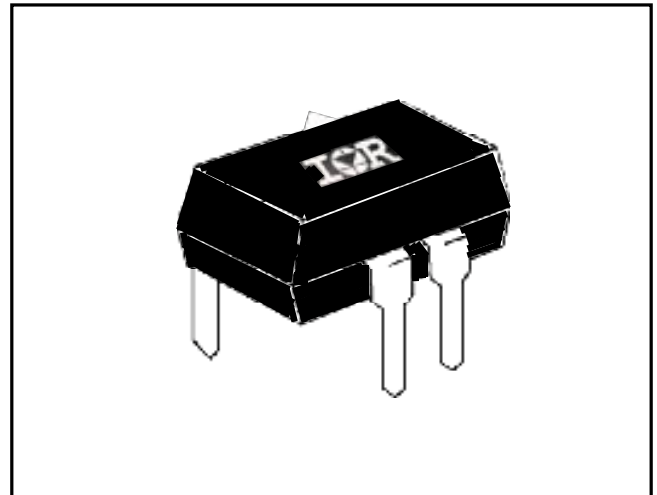
These units overcome the limitations of both electro-mechanical and reed relays by offering the solid-state advantages of high sensitivity, miniaturization, no contact bounce, long operational life, insensitivity to external magnetic fields, shock and vibration, and high reliability inherent with solid state technology. They are ideally suited for switching high currents or low level signals without distortion or injection of electrical noise. These relays are packaged in 8-pin, molded DIP packages and available with either thru-hole or surface-mount ("gull-wing") leads, in plastic shipping tubes.

### Applications

- Portable Electronics
- Programmable Logic Controllers
- Computers and Peripheral Devices
- Audio Equipment
- Power Supplies and Power Distribution
- Instrumentation

### Features

- 500mΩ On-Resistance
- Bounce-Free Operation
- 1.0 Amp capacity
- 4,000 V<sub>RMS</sub> I/O Isolation
- Solid-State Reliability
- UL recognized
- ESD Tolerance:
  - 4000V Human Body Model
  - 500V Machine Model



### Part Identification

PVAZ172NPbF	thru-hole
PVAZ172NSPbF	surface-mount (gull-wing)
PVAZ172NS-TPbF	surface-mount, tape and reel

*(HEXFET is the registered trademark for International Rectifier Power MOSFETs)*

**Electrical Specifications** ( $-40^{\circ}\text{C} \leq T_A \leq +85^{\circ}\text{C}$  unless otherwise specified)

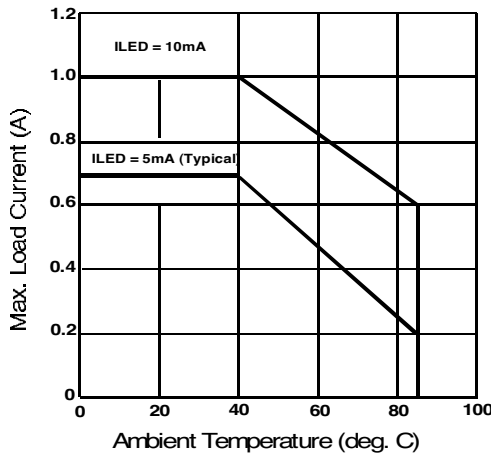
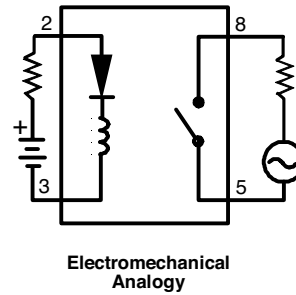
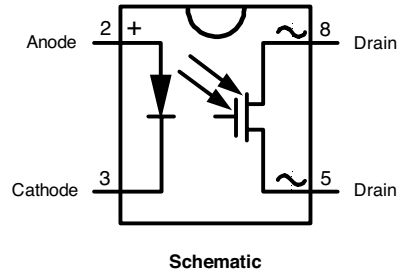
<b>INPUT CHARACTERISTICS</b>	<b>Limits</b>	<b>Units</b>
Min. Control Current (see figures 1 and 2)	10	mA
Max. Control Current for Off-State Resistance @ $T_A=+25^{\circ}\text{C}$	0.4	mA
Control Current Range (Caution: Current limit input LED, see figure 6)	5.0 to 25	mA
Maximum Reverse Voltage	6.0	V

<b>OUTPUT CHARACTERISTICS</b>		
Operating Voltage Range	0 to 60	V(AC peak)
Maximum Load Current $40^{\circ}\text{C}$ (see figures 1 and 2)	1.0	A (DC)
Maximum Pulsed Load Current @ $T_A=+25^{\circ}\text{C}$ (100 ms @ 10% duty cycle)	2.4	A (AC peak)
Maximum Turn-On Time @ $T_A=+25^{\circ}\text{C}$ (see figure 7) For 500mA, 50VDC Load, 10mA Control	2.0	ms
Maximum Turn-Off Time @ $T_A=+25^{\circ}\text{C}$ (see figure 7) For 500mA, 50VDC Load, 10mA Control	0.5	ms
Maximum Turn-On State Resistance @ $T_A=+25^{\circ}\text{C}$ (pulsed) (See figure 4) 1.0A Load, 10mA Control	500	m $\Omega$
Minimum Off State Resistance @ $T_A=+25^{\circ}\text{C}$ @ 48 VDC (see figure 5)	$10^8$	Ohms
Minimum Off-State dv/dt	1000	V/ $\mu\text{s}$
Output Capacitance (see figure 9)	150	pF @ 50 VDC

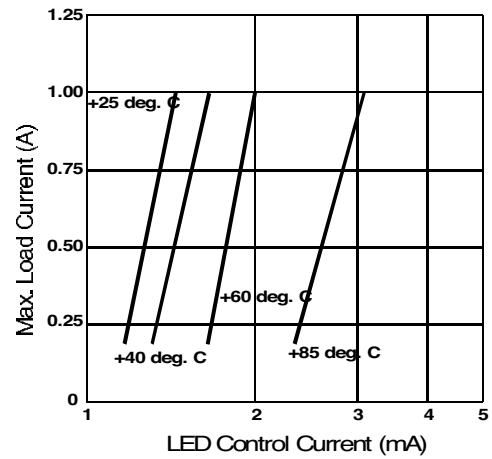
<b>GENERAL CHARACTERISTICS</b>		<b>Limits</b>	<b>Units</b>
Dielectric Strength, Input-Output		4000	V(RMS)
Insulation Resistance, Input-Output , 90 VDC		$10^{12}$ @ $T_A=+25^{\circ}\text{C}$ - 50% RH	$\Omega$
Capacitance, Input-Output		1.0	pF
Lead Temperature (1.6mm below seating plane) for 10 seconds		+260	$^{\circ}\text{C}$
Ambient Temperature Range:	Operating	-40 to +85	$^{\circ}\text{C}$
	Storage	-40 to +100	$^{\circ}\text{C}$

International Rectifier does not recommend the use of this product in aerospace, avionics, military or life support applications. Users of this International Rectifier product in such applications assume all risks of such use and indemnify International Rectifier against all damages resulting from such use.

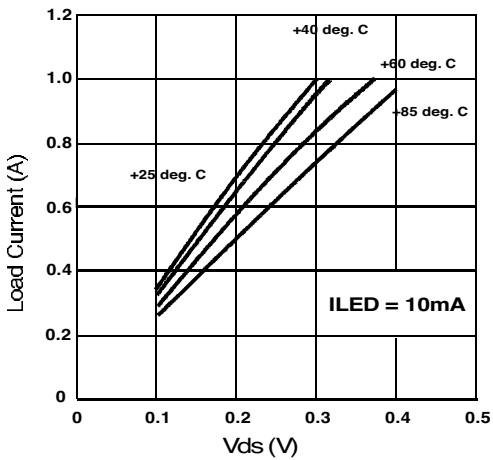
**Wiring Diagrams:**



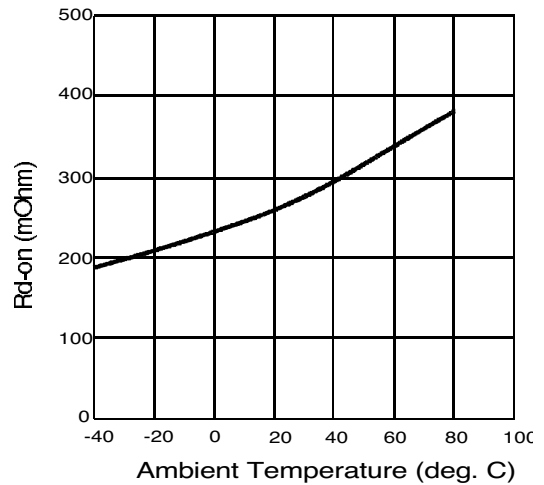
**Figure 1. Current Derating Curves**



**Figure 2. Typical Control Current Requirements**



**Figure 3. Typical On-Characteristics**



**Figure 4. Typical On-Resistance**

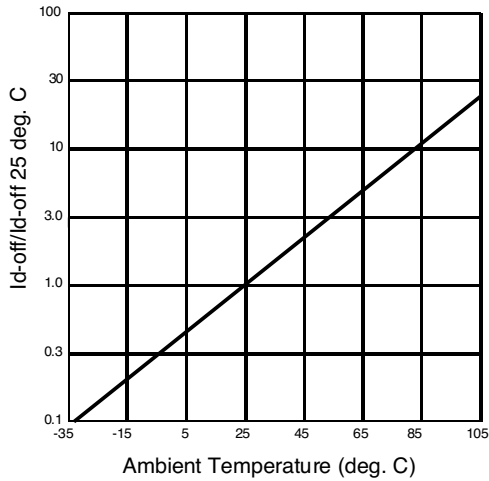


Figure 5. Typical Normalized Off-State Leakage

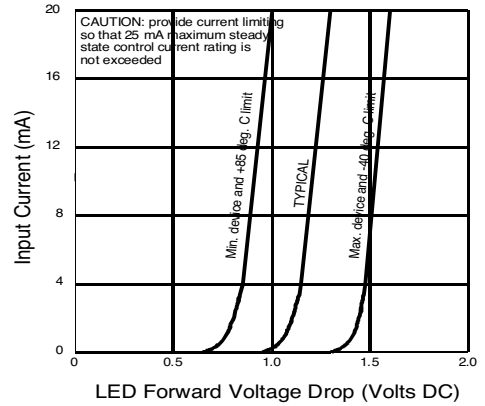


Figure 6. Input Characteristics (Current Controlled)

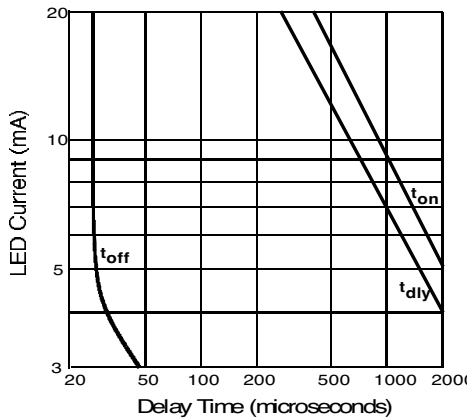


Figure 7. Typical Delay Times

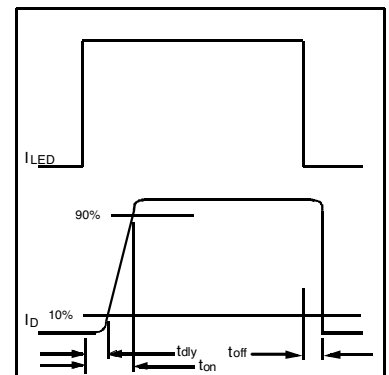


Figure 8. Delay Time Definitions

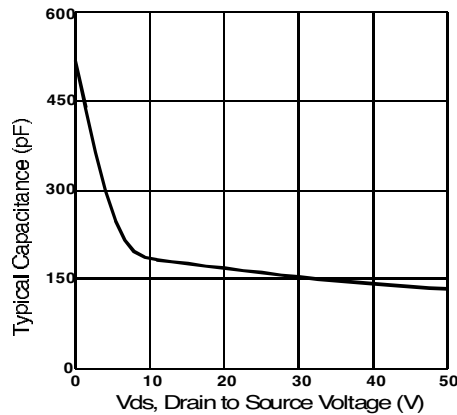
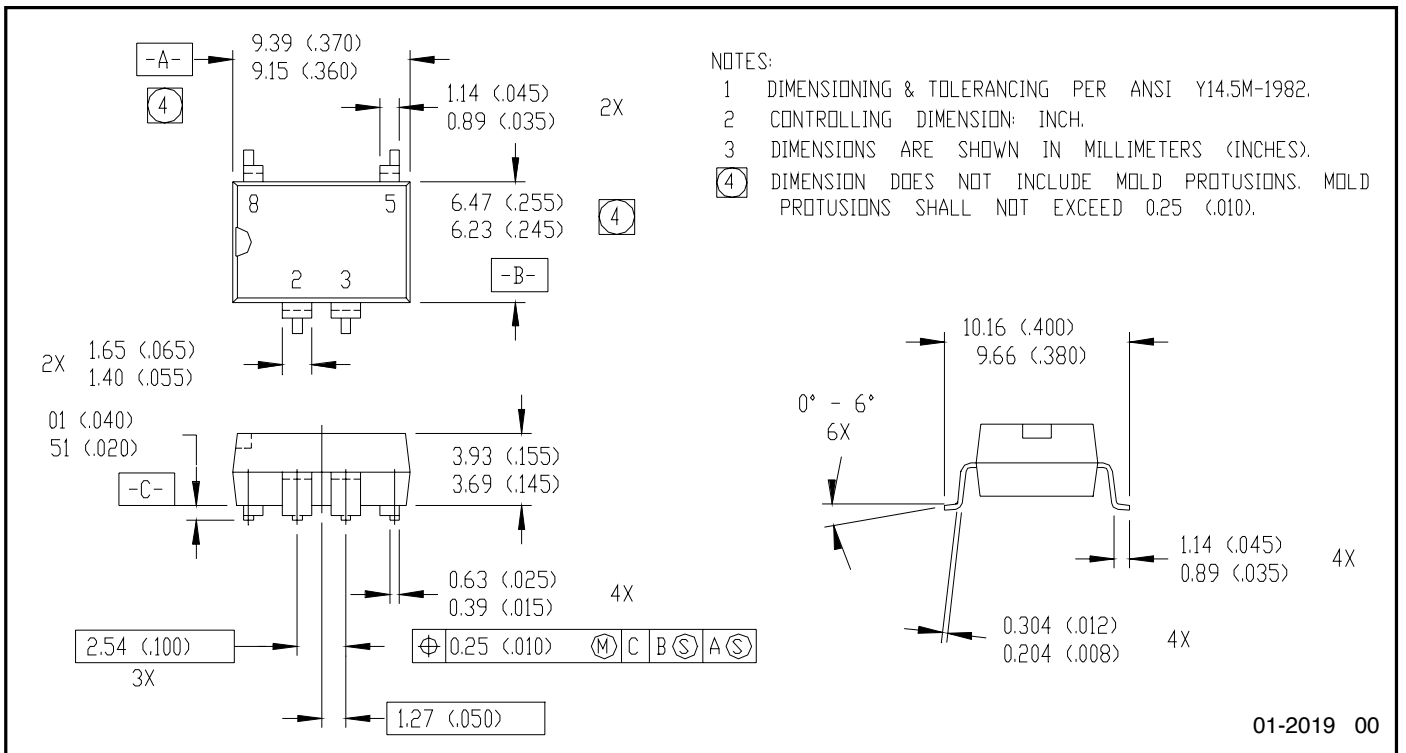
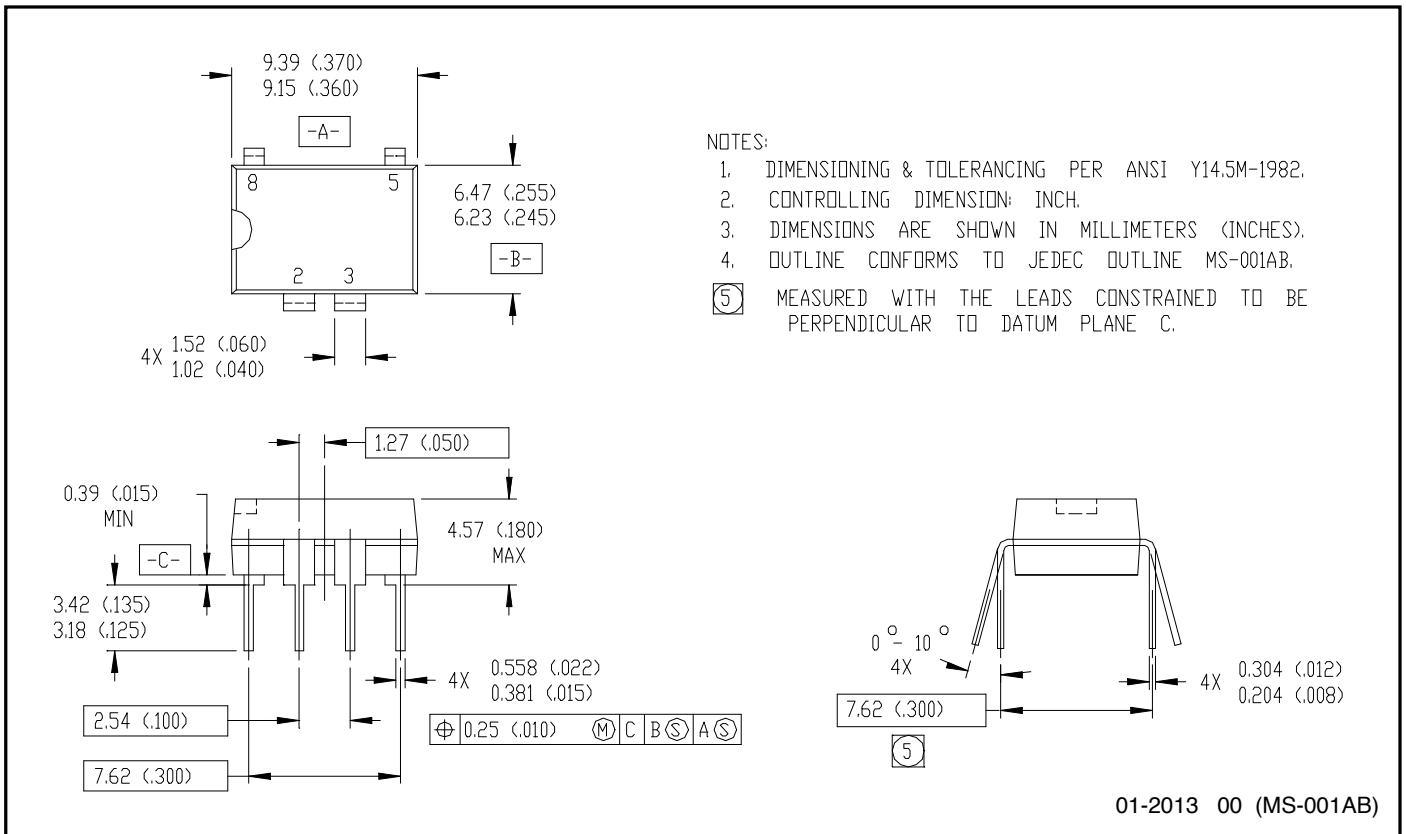


Figure 9. Typical Output Capacitance

Case Outline



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Data and specifications subject to change without notice. 2/2008