

HEXFET® POWER MOSFET PHOTOVOLTAIC RELAY

PVAZ172N

Microelectronic
Power IC 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 electromechanical 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.

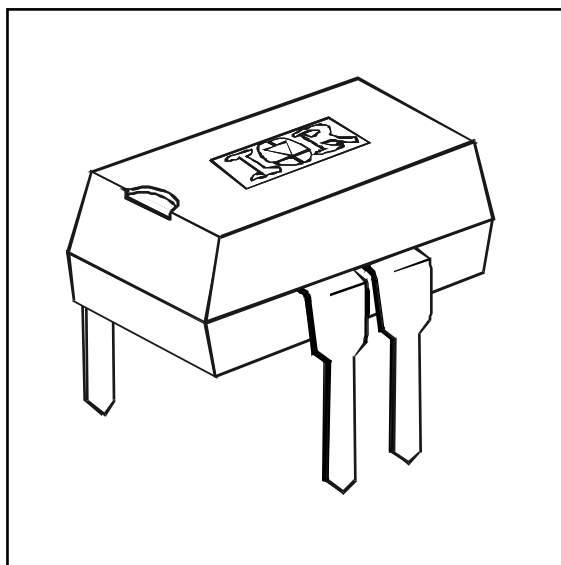
These relays are packaged in 8-pin, molded DIP packages and available with thru-hole and SMT (gull-wing) leads, in plastic shipping tubes.

Applications

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

PVAZ172N Features

- 500mΩ On-Resistance ■
- Bounce-free Operation ■
- 1.0 Amp capacity ■
- 4000 V_{RMS} I/O isolation ■
- Solid-State reliability ■
- UL recognition and CSA certification pending ■



Part Identification

PVAZ172N	thru-hole
PVAZ172NS	SMT (gull-wing)

PVAZ172N Photovoltaic Relay

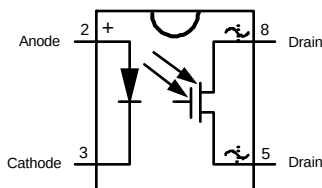
Electrical Specifications (-40°C ≤ T_A ≤ +85°C unless otherwise specified)

INPUT CHARACTERISTICS	Limits	Units
Min. Control Current (see Figures 1 and 2)	10	mA
Max. Control Current for Off-State Resistance @ T _A =+25°C	0.4	mA
Control Current Range (Caution: Current limit input LED, see Fig.6)	5.0 to 25	mA
Max. Reverse Voltage	7.0	V

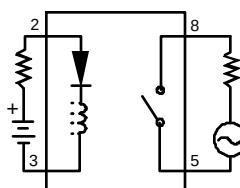
OUTPUT CHARACTERISTICS		
Operating Voltage Range	0 to 60	V(AC peak)
Max. Load Current 40° C (See Fig. 1 and 2)	1.0	A(DC)
Max. Pulsed Load Current @T _A =+25°C (100 ms @ 10% duty Cycle)	2.4	A(AC peak)
Max. Turn-On Time @T _A =+25°C (see Fig. 7) For 500mA, 50VDC Load, 10mA Control	2.0	ms
Max. Turn-Off Time @T _A =+25°C (see Fig. 7) For 500mA, 50VDC Load, 10mA Control	0.5	ms
Max. On State Resistance @T _A =+25°C(pulsed) (See Fig. 4) 1.0A Load, 10mA Control	500	mΩ
Min. Off State Resistance @T _A =+25°C @ 48 VDC (see Fig. 5)	10 ⁸	Ohms
Min. Off-State dv/dt	1000	V/μs
Output Capacitance (See Fig. 9)	150	pF @ 50 VDC

GENERAL CHARACTERISTICS		Limits	Units
Dielectric Strength, Input-Output		4000	V _(RMS)
Insulation Resistance, Input-Output , 90 V _{DC}		10 ¹² @T _A =+25°C - 50% RH	Ω
Capacitance, Input-Output		1.0	pF
Lead Temperature (1.6mm below seating plane) for 10 sec.		+260	°C
Ambient Temperature Range:	Operating	-40 to +85	°C
	Storage	-40 to +100	°C

Wiring Diagrams:



Schematic



Electromechanical
Analogy

PVAZ172N PhotoVoltaic Relay

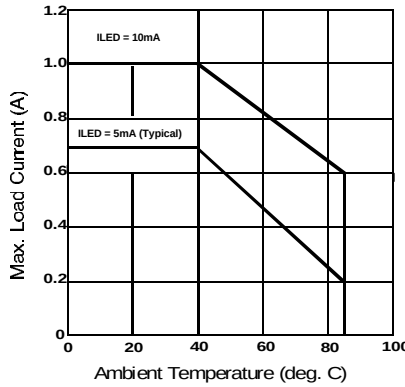


Figure 1. Current Derating Curves

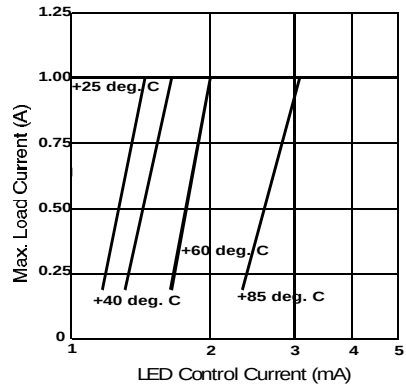


Figure 2. Typical Control Current Requirements

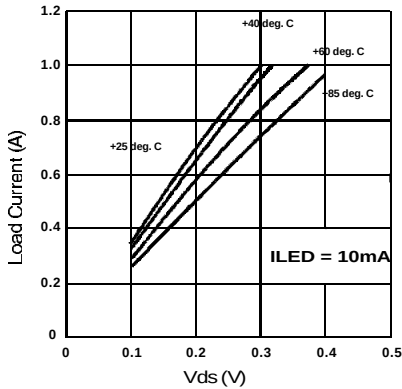


Figure 3. Typical On-Characteristics

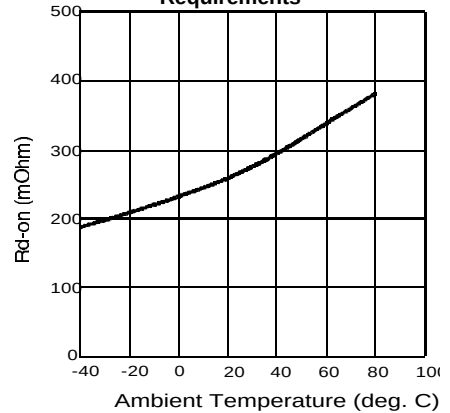


Figure 4. Typical On-Resistance

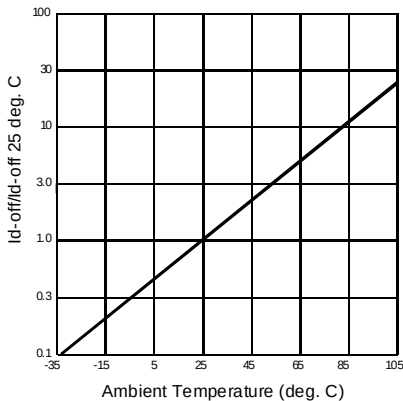


Figure 5. Typical Normalized Off-State Leakage

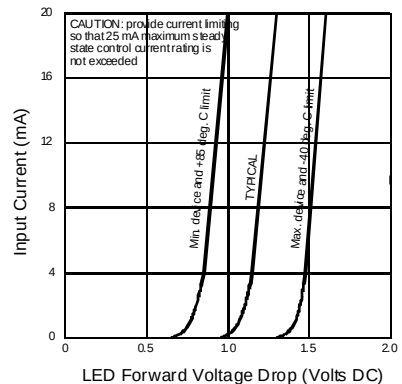


Figure 6. Input Characteristics (Current Controlled)

PVAZ172N PhotoVoltaic Relay

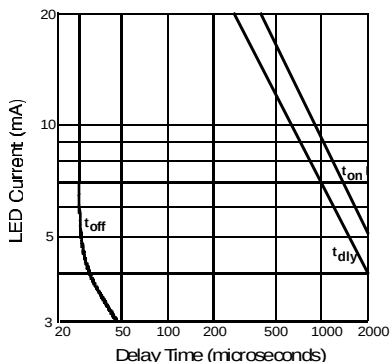


Figure 7. Typical Delay Times

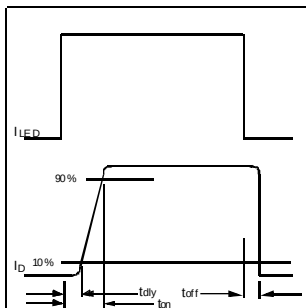


Figure 8. Delay Time Definitions

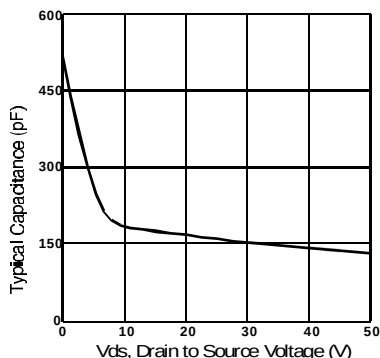
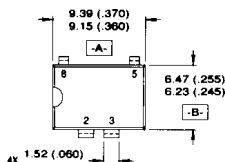


Figure 9. Typical Output Capacitance

Mechanical Specifications

(Dimensions in millimeters (inches))



Dimensions: mm (Inches)

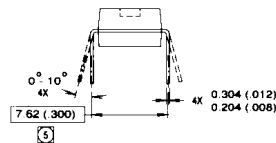
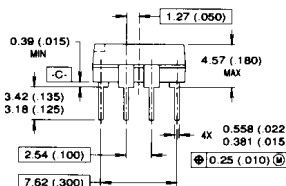
Package Size: 8 Pin DIP

Tolerances: .015 (.38)

unless otherwise specified

Case Material: Molded epoxy

Weight: .07 oz. (2 grams)



International
IR Rectifier

WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, Tel: (310) 322 3331

EUROPEAN HEADQUARTERS: Hurst Green, Oxted, Surrey RH8 9BB, UK Tel: (44) 0883 713215

IR CANADA: 7321 Victoria Park Ave., Suite 201, Markham, Ontario L3R 3L1, Tel: (905) 475 1897

IR GERMANY: Saalburgstrasse 157, 61350 Bad Homburg Tel: 6172 37066

IR ITALY: Via Liguria 49, 10071 Borgaro, Torino Tel: (39) 1145 10111

IR FAR EAST: K&H Bldg., 2F, 3-30-4 Nishi-Ikeburo 3-Chome, Toshima-Ki, Tokyo 171 Tel: (03)3983 0641

IR SOUTHEAST ASIA: 315 Outram Road, #10-02 Tan Boon Liat Building, Singapore 0316 Tel: 65 221 8371

<http://www.irf.com/>

Data and specifications subject to change without notice.4/96