International
IOR Rectifier

Data Sheet No. PD 10040 revH

PVAZ172N & PbF

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

General Description

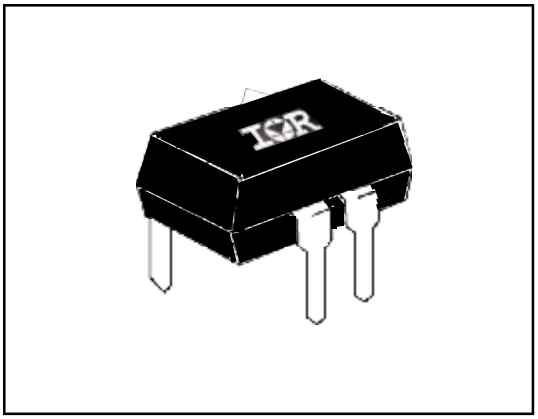
The PVAZ172N Photovoltaic Relay is a single-pole, normally open solid state relay that can replace electromechanical relays used for general purpose switching of DC and AC loads. It utilizes International Rectifier' s HEXFET power MOSFETs as the output switches, driven by an integrated circuit photovoltaic 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 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 either thru-hole or surface-mount ("gull-wing") leads, in plastic shipping tubes.

Features

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



Applications

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

Part Identification

PVAZ172N & PbF	thru-hole
PVAZ172NS & PbF	surface-mount (gull-wing)

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

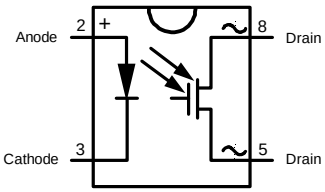
Electrical Specifications (-40°C ≤ T_A ≤ =+85°C unless otherwise specified)

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 figure 6)	5.0 to 25	mA
Maximum Reverse Voltage	6.0	V

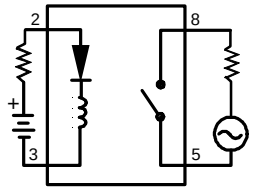
OUTPUT CHARACTERISTICS		
Operating Voltage Range	0 to 60	V(AC peak)
Maximum Load Current 40° C (see figures 1 and 2)	1.0	A (DC)
Maximum Pulsed Load Current @T_A=+25°C (100 ms @ 10% duty cycle)	2.4	A (AC peak)
Maximum Turn-On Time @T_A=+25°C (see figure 7) For 500mA, 50VDC Load, 10mA Control	2.0	ms
Maximum Turn-Off Time @TA=+25°C (see figure 7) For 500mA, 50VDC Load, 10mA Control	0.5	ms
Maximum On State Resistance @TA=+25°C(pulsed) (See figure 4) 1.0A Load, 10mA Control	500	mΩ
Minimum Off State Resistance @T_A=+25°C @ 48 VDC (see figure 5)	10^8	Ohms
Minimum Off-State dv/dt	1000	V/µs
Output Capacitance (see figure 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 seconds		+260	°C
Ambient Temperature Range:	Operating	-40 to +85	°C
	Storage	-40 to +100	°C

Wiring Diagrams:



Schematic



Electromechanical Analogy

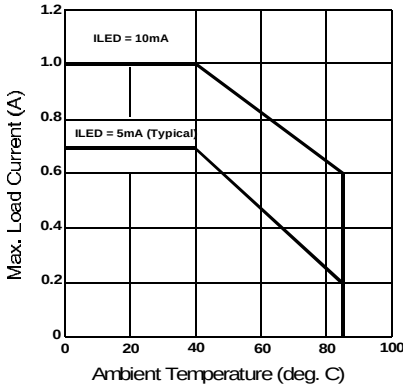


Figure 1. Current Derating Curves

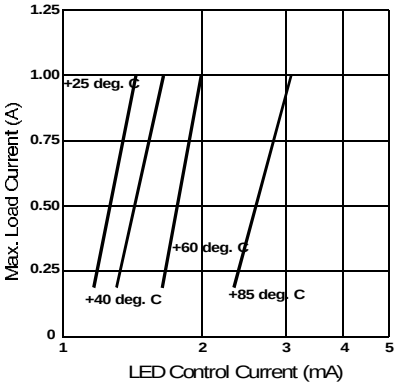


Figure 2. Typical Control Current Requirements

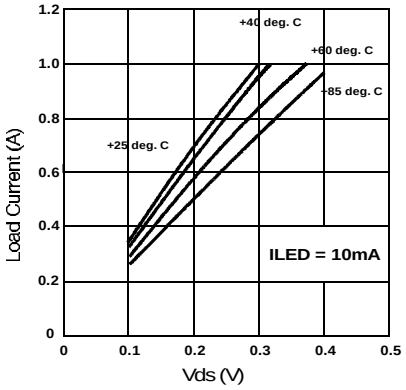


Figure 3. Typical On-Characteristics

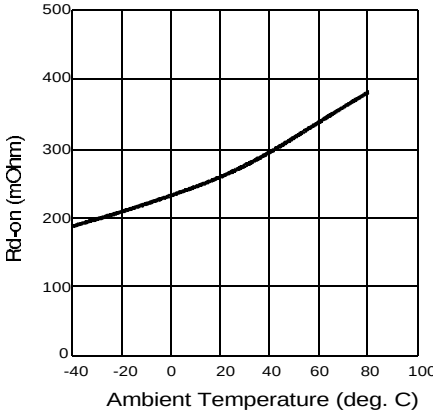


Figure 4. Typical On-Resistance

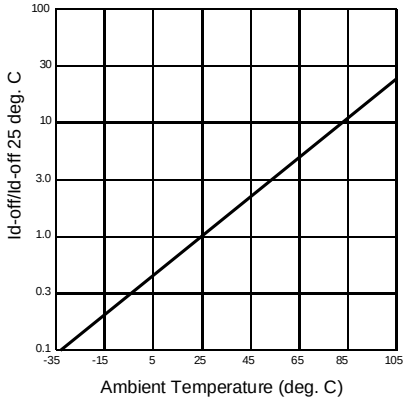


Figure 5. Typical Normalized Off-State Leakage

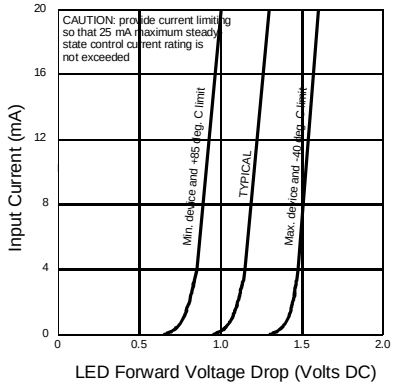


Figure 6. Input Characteristics (Current Controlled)

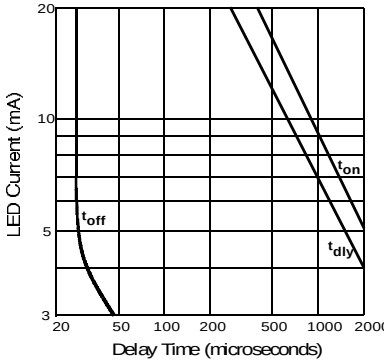


Figure 7. Typical Delay Times

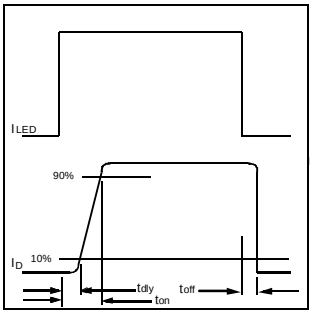


Figure 8. Delay Time Definitions

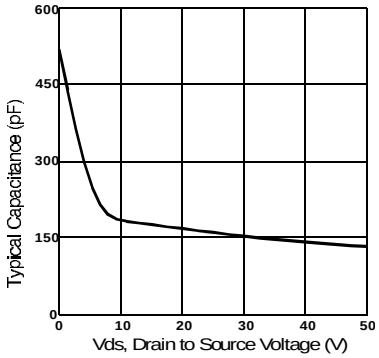


Figure 9. Typical Output Capacitance

Case Outline