

Microelectronic Power IC

HEXFET® Power MOSFET Photovoltaic Relay
Single-Pole, Normally-Open, 0-60V AC, 1.5A

General Description

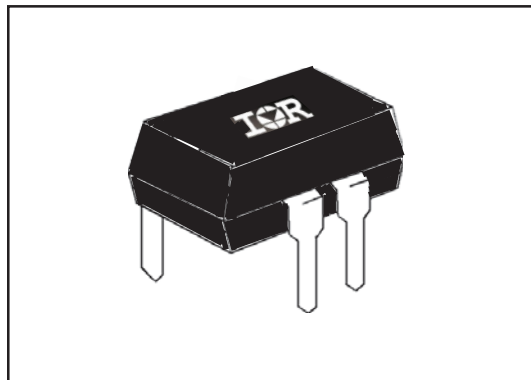
The PVDZ172N Photovoltaic Relay is a single-pole, normally open solid state relay that can replace electromechanical relays used for general purpose switching of DC loads. It utilizes International Rectifier's HEXFET power MOSFET as the output switch, driven by an integrated circuit photovoltaic generator 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 surface-mount (gull-wing) leads, in plastic shipping tubes.

Features

- 250mΩ On-Resistance
- Bounce-Free Operation
- 1.5 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

PVDZ172NPbF	thru-hole
PVDZ172NSPbF	surface-mount (gull-wing)
PVDZ172NS-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)

INPUT CHARACTERISTICS	Limits	Units
Minimum Control Current (see figures 1 and 2)	10	mA
Maximum 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

OUTPUT CHARACTERISTICS		Units
Operating Voltage Range	0 to 60	V(DC)
Maximum Load Current 40°C (see figures 1 and 2)	1.5	A(DC)
Maximum Pulsed Load Current @ $T_A=+25^{\circ}\text{C}$ (100 ms @ 10% duty cycle)	4.0	A(DC)
Maximum Turn-On Time @ $T_A=+25^{\circ}\text{C}$ (see figure 7) For 500mA, 50V _{DC} Load, 10mA Control	2.0	ms
Maximum Turn-Off Time @ $T_A=+25^{\circ}\text{C}$ (see figure 7) For 500mA, 50V _{DC} Load, 10mA Control	0.5	ms
Maximum On State Resistance @ $T_A=+25^{\circ}\text{C}$ (pulsed) (see figure 4) 1.0A load, 10mA Control	250	m Ω
Minimum Off State Resistance @ $T_A=+25^{\circ}\text{C}$ @ 48 V _{DC} (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} @ $T_A=+25^{\circ}\text{C}$ - 50% RH	Ω
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

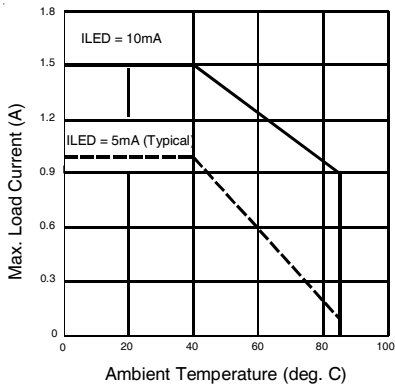
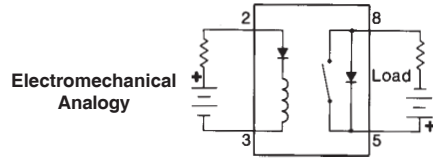
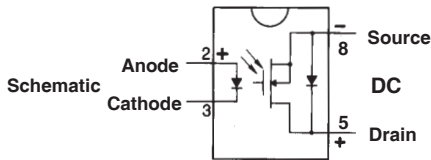


Figure 1. Current Derating Curves

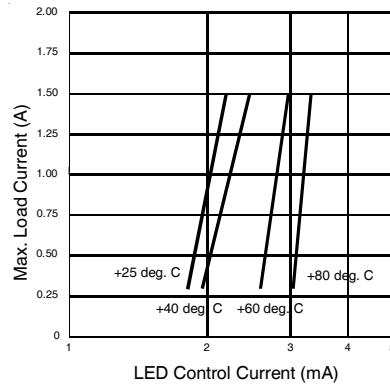


Figure 2. Typical Control Current Requirements

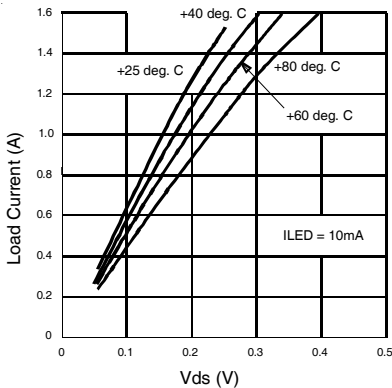


Figure 3. Typical On-Characteristics

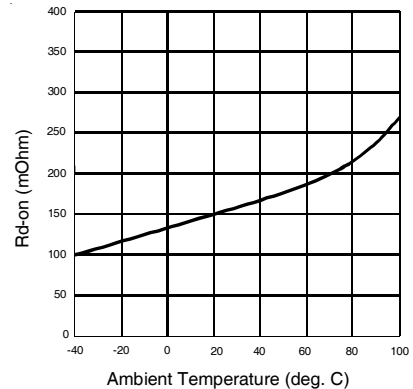


Figure 4. Typical On-Resistance

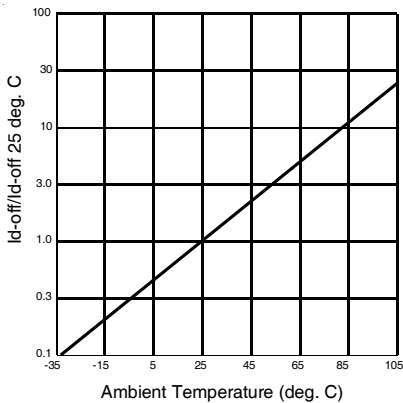


Figure 5. Typical Normalized Off-State Leakage

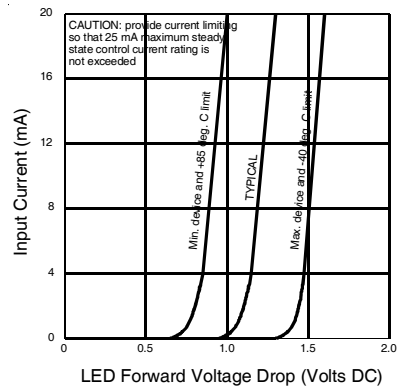


Figure 6. Input Characteristics (Current Controlled)

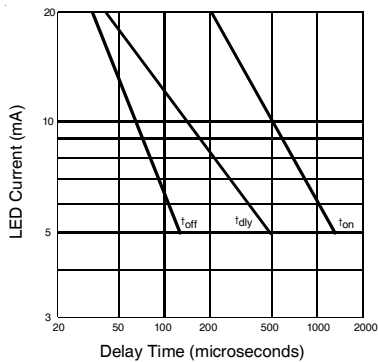


Figure 7. Typical Delay Times

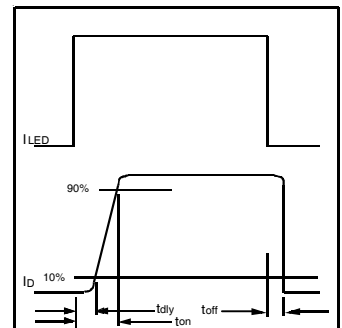


Figure 8. Delay Time Definitions

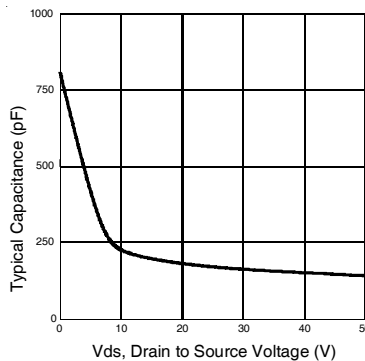
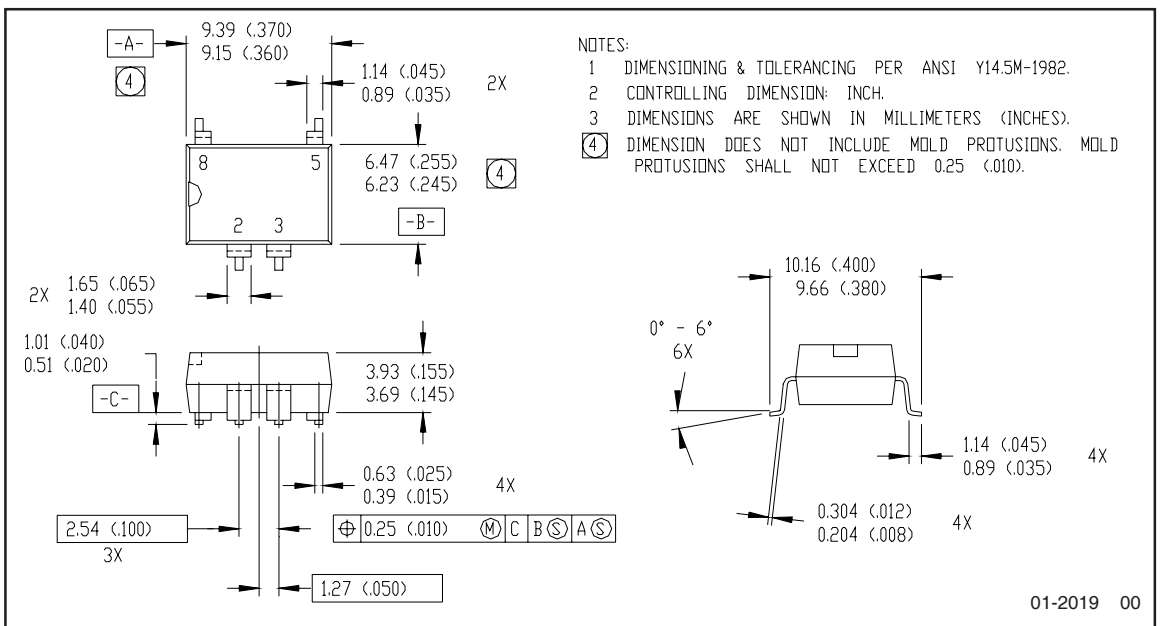
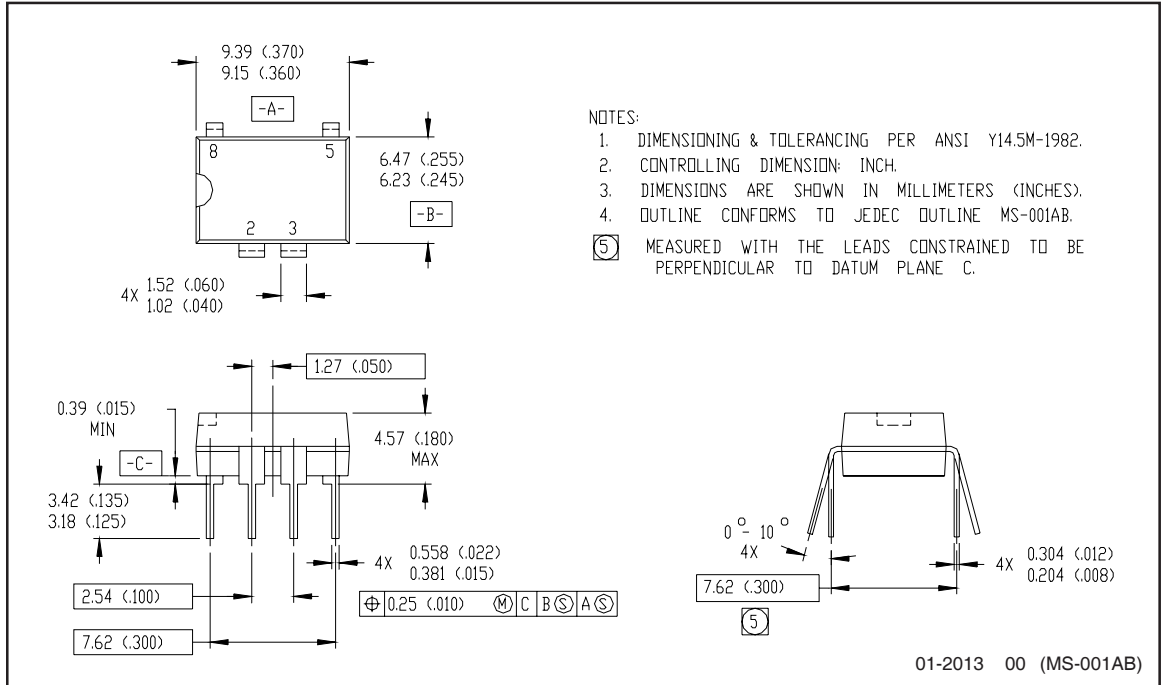


Figure 9. Typical Output Capacitance

Case Outlines



Note: For the most current drawing please refer to IR website at: <http://www.irf.com/package/>

Qualification information[†]

Qualification level	Industrial (per JEDEC JESD47I ^{††} guidelines)	
Moisture Sensitivity Level	PVDZ172NPbF	N/A
	PVDZ172NSPbF	MSL4
	PVDZ172NS-TPbF	(per JEDEC J-STD-020E & JEDEC J-STD-033C ^{††})
RoHS compliant	Yes	

[†] Qualification standards can be found at International Rectifier's web site: <http://www.irf.com/product-info/reliability>

^{††} Applicable version of JEDEC standard at the time of product release

Revision History

Date	Comments
4/29/2015	- Added Qualification Information Table on page 6 - Updated data sheet with new IR corporate template

International
 Rectifier

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Data and specifications subject to change without notice

To contact International Rectifier, please visit <http://www.irf.com/whoto-call/>