International
IOR Rectifier

Data Sheet No. PD10051 revl

Series PVA33NPbF

Microelectronic Power IC
HEXFET® Power MOSFET Photovoltaic Relay
Single-Pole, Normally-Open
0-300V AC/DC, 150mA

General Description

The PVA33 Series AC Relay (PVA) is a single-pole, normally open, solid-state replacement for electromechanical relays used for general purpose switching of analog signals. 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.

The PVA33 Series overcomes the limitations of both conventional electromechanical and reed relays by offering the solid state advantages of long life, fast operating speed, low pick up power, bounce-free operation, low thermal offset voltages and miniature package. These advantages allow product improvement and design innovations in many applications such as process control, multiplexing, automatic test equipment and data acquisition.

The PVA33 can switch analog signals from thermocouple level to 300 Volts peak AC or DC polarity. Signal frequencies into the RF range are easily controlled and switching rates up to 500Hz are achievable. The extremely small thermally generated offset voltages allow increased measurement accuracies.

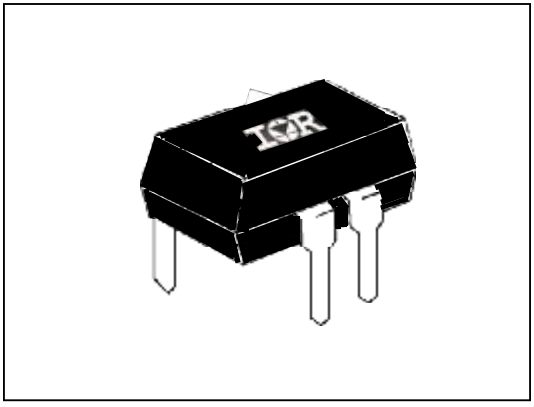
These relays are packaged in 8-pin, molded DIP packages and available with either thru-hole or surface-mount ("gull-wing") leads, in plastic shipping tubes.

Applications

- Process Control
- Data Acquisition
- Test Equipment
- Multiplexing and Scanning

Features

- Bounce-Free Operation
- 10^{10} Off-State Resistance
- 1,000 V/μsec dv/dt
- 0.2 μV Thermal Offset
- 5 mA Input Sensitivity
- 4,000 V_{RMS} I/O Isolation
- Solid-State Reliability
- UL Recognized
- ESD Tolerance:
  4000V Human Body Model
  500V Machine Model



Part Identification

PVA2352NPbF PVA3324NPbF PVA3354NPbF	thru-hole
PVA2352NSPbF PVA3324NSPbF PVA3354NSPbF	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	PVA2352N	PVA3324N	PVA3354N	Units
Minimum Control Current (see figures 1 and 2)				DC
For 60mA Continuous Load Current	--	1	--	mA@25°C
For 170mA Continuous Load Current	2	2	2	mA@25°C
For 100mA Continuous Load Current	5	2	5	mA@85°C
Maximum Control Current for Off-State Resistance at 25°C	10			µA(DC)
Control Current Range (Caution: current limit input LED. See figure 6)	2.0 to 25			mA(DC)
Maximum Reverse Voltage	6.0			V(DC)

OUTPUT CHARACTERISTICS	PVA2352N	PVA3324N	PVA3354N	Units
Operating Voltage Range	0 to ± 200	0 to ± 300		$V_{(PEAK)}$
Maxiumum Load Current 40°C I LED 5mA	150			$mA_{(DC)}$
Max. On-state Resistance 25°C (Pulsed) (fig. 4) 50 mA Load, 5mA Control	24			Ω
Min. Off-state Resistance @ 25°C (see figure 5)	10^8@160VDC	10^{10} @ 240VDC		Ω
Response Time @25°C (see figures 7 and 8)				
Max. T(on) @ 12mA Control, 50 mA Load, 100 VDC	100			µs
Max. T(off) @ 12mA Control, 50 mA Load, 100 VDC	110			µs
Max. Thermal Offset Voltage @ 5.0mA Control	0.2			µvolts
Min. Off-State dv/dt	1000			V/µs
Typical Output Capacitance (see figure 10)	6			pF @ 50V

GENERAL CHARACTERISTICS		(PVA2352N, PVA3324N and PVA3354N)	Units
Dielectric Strength: Input-Output		4000	V_{RMS}
Insulation Resistance: Input-Output @ 90V_{DC}		10^{12} @ 25°C - 50% RH	Ω
Maximum Capacitance: Input-Output		1.0	pF
Max. Pin Soldering Temperature (1.6mm below seating plane, 10 seconds max.)		+260	°C
Ambient Temperature Range:	Operating	-40 to +85	
	Storage	-40 to +100	

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.

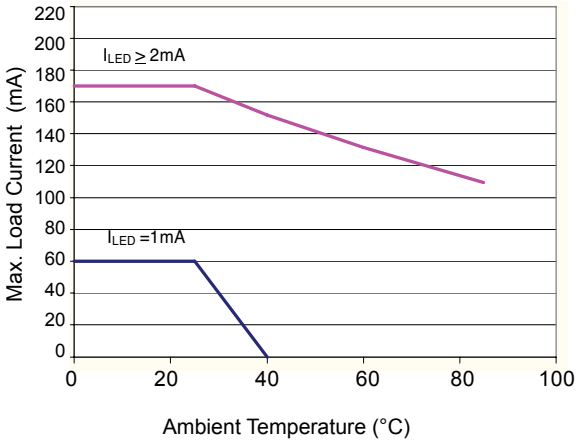


Figure 1. Current Derating Curves (PVA3324N)

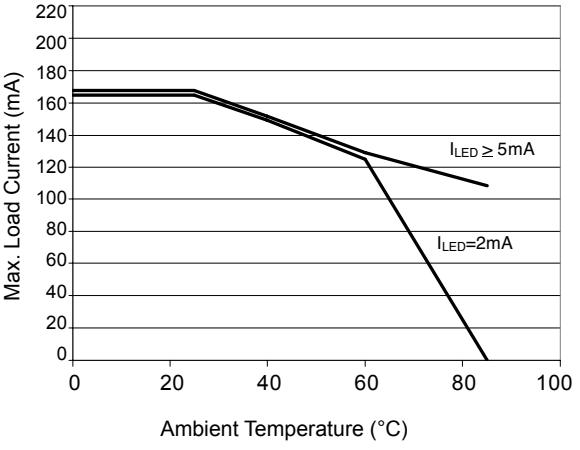


Figure 2. Current Derating Curves (PVA3354N, PVA2352N)

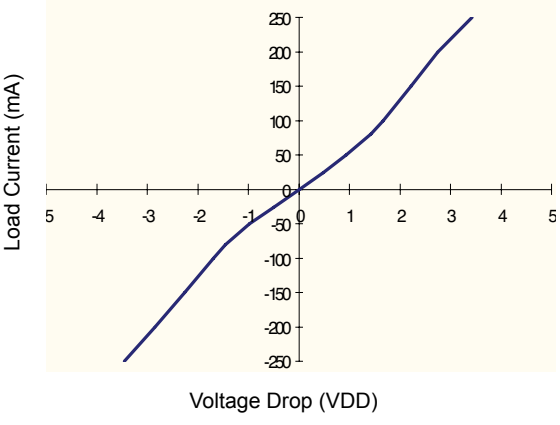


Figure 3.Typical On Characteristics

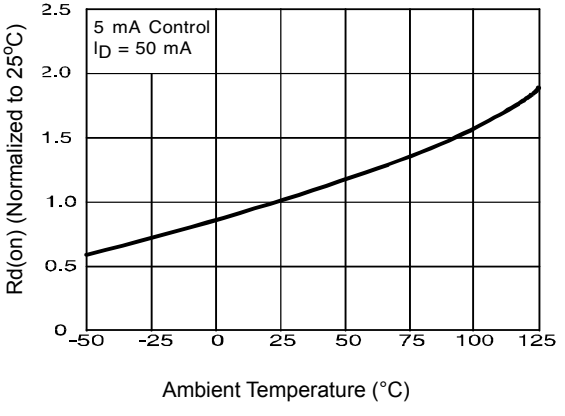


Figure 4. Typical On-Resistance

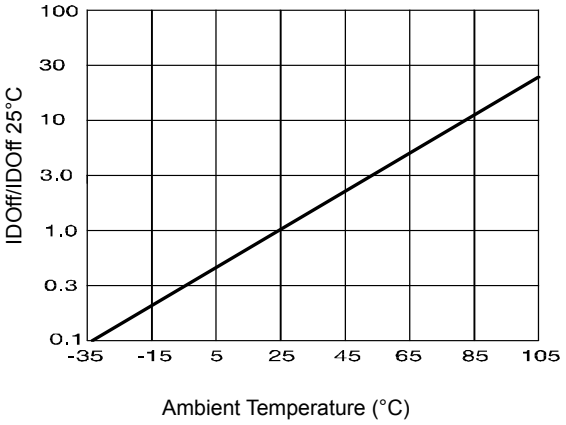


Figure 5. Typical Normalized Off-State Leakage

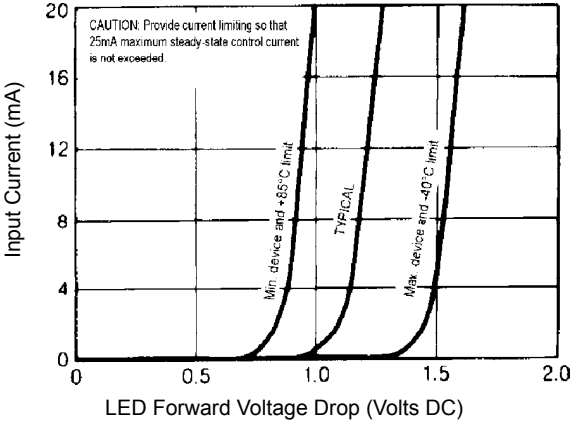


Figure 6. Input Characteristics (Current Controlled)

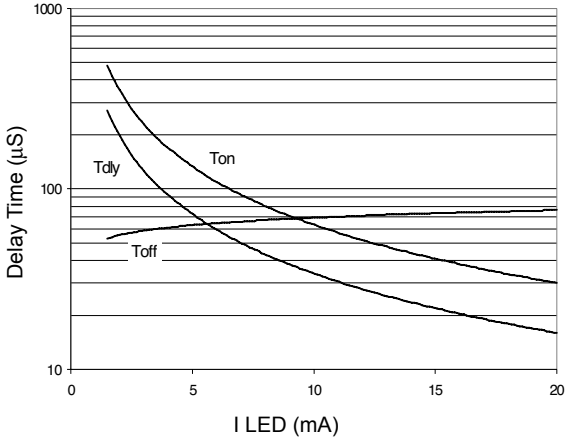


Figure 7.Typical Delay Times

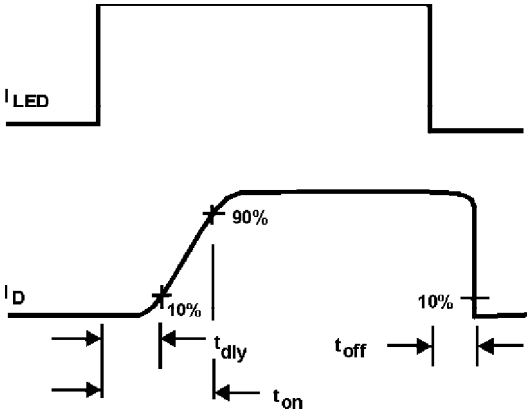


Figure 8. Delay Time Definitions

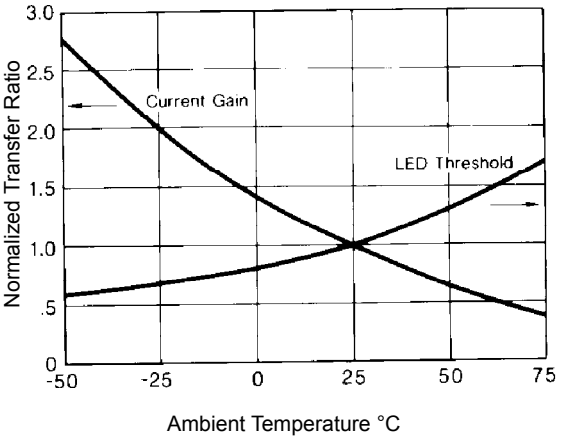


Figure 9. Typical Control Threshold and Transfer Ratio

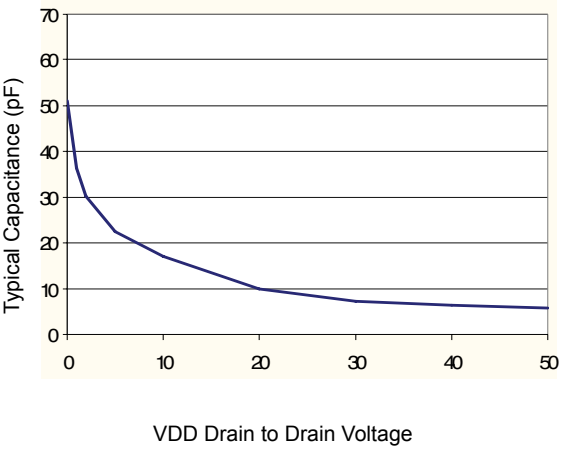
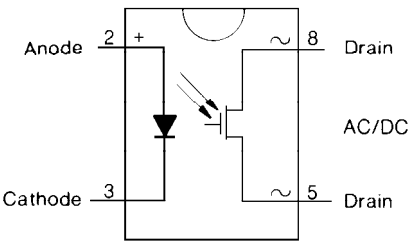
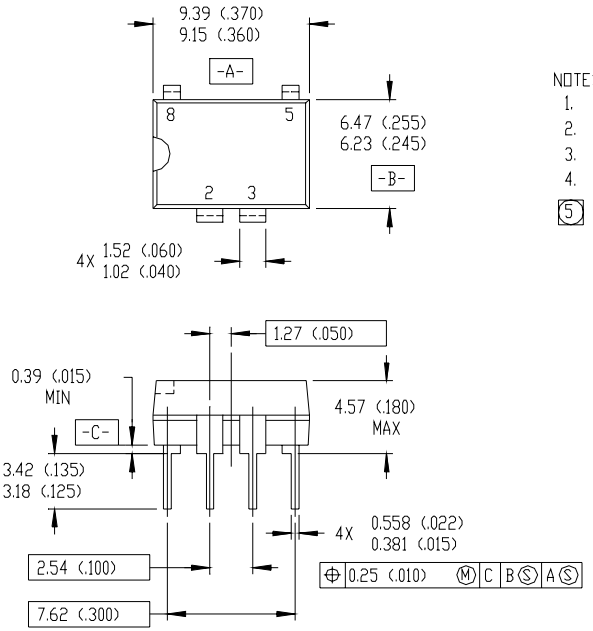


Figure 10. Typical Output Capacitance

Wiring Diagram

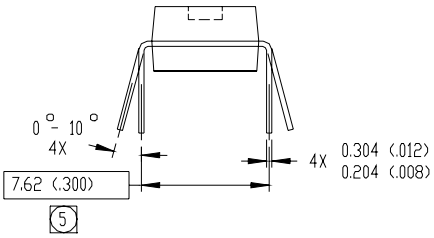


Case Outlines

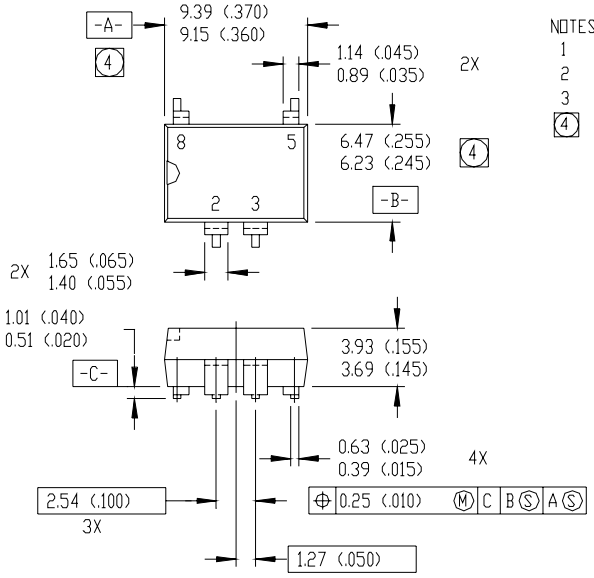


NOTES:

1. DIMENSIONING & TOLERANCING PER ANSI Y14.5M-1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-001AB.
5. MEASURED WITH THE LEADS CONSTRAINED TO BE PERPENDICULAR TO DATUM PLANE C.

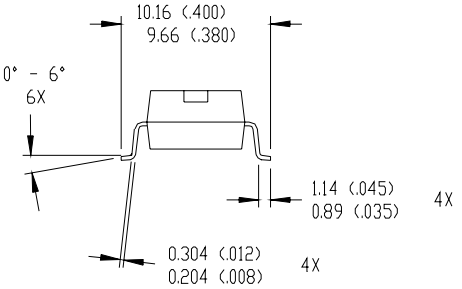


01-2013 00 (MS-001AB)



NOTES:

1 DIMENSIONING & TOLERANCING PER ANSI Y14.5M-1982.
2 CONTROLLING DIMENSION: INCH.
3 DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
4 DIMENSION DOES NOT INCLUDE MOLD PROTUSIONS. MOLD PROTUSIONS SHALL NOT EXCEED 0.25 (.010).



01-2019 00

2/2008