International
IOR Rectifier

Data Sheet No. PD10052 revI

Series PVD13NPbF

Microelectronic Power IC
HEXFET® Power MOSFET Photovoltaic Relay
Single-Pole, Normally-Open
0-100V DC, 550mA

General Description

The PVD13 Series DC Relay (PVD) 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 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.

The PVD13 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 PVD13 can switch analog signals from thermocouple level to 100 Volts peak DC. Signal frequencies into the RF range are easily controlled and switching rates up to 450Hz are achievable. The extremely small thermally generated offset voltages allow increased measurement accuracies.

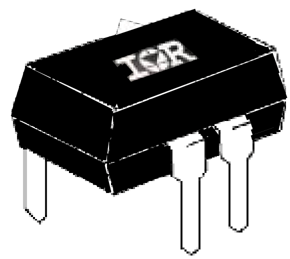
These relays are packaged in 8-pin, molded DIP packages and available with either thru-hole or surface-mount ("gull-wing") leads, in plastic shipping tubes.

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
- 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

PVD1352NPbF PVD1354NPbF	thru-hole
PVD1352NSPbF PVD1354NSPbF	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	PVD1352N	PVD1354N	Units
Minimum Control Current (see figures 1 and 2)			DC
For 500mA Continuous Load Current	2		mA@25°C
For 550mA Continuous Load Current	5		mA@40°C
For 350mA Continuous Load Current	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	PVD1352N	PVD1354N	Units
Operating Voltage Range	0 to + 100		V(PEAK)
Maxiumum Load Current 40°C I LED 5mA	550		mA(DC)
Response Time @25°C (see figures 7 and 8)			
Max. T(on) @ 12mA Control, 50 mA Load, 100 VDC	150		µs
Max. T(off) @ 12mA Control, 50 mA Load, 100 VDC	125		µs
Max. On-state Resistance 25°C (Pulsed) (fig. 4) 200 mA Load, 5mA Control	1.5		Ω
Min. Off-state Resistance 25°C @ 80 VDC (see figure 5)	10^8	10^{10}	Ω
Max. Thermal Offset Voltage @ 5.0mA Control	0.2		µvolts
Min. Off-State dv/dt	1000		V/µs
Typical Output Capacitance	20		pF @ 50VDC

GENERAL CHARACTERISTICS		(PVD1352N and PVD1354N)	Units
Dielectric Strength: Input-Output		4000	VRMS
Insulation Resistance: Input-Output @ 90VDC		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	°C
	Storage	-40 to +100	°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.

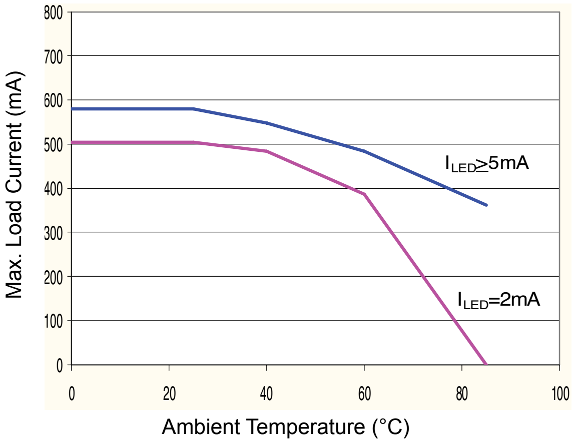


Figure 1. Current Derating Curves

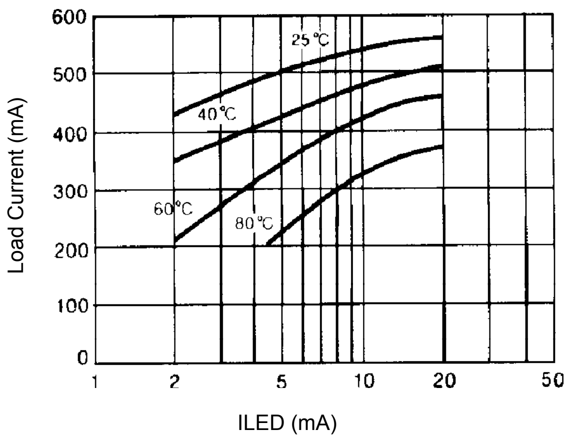


Figure 2. Typical Control Current Requirements

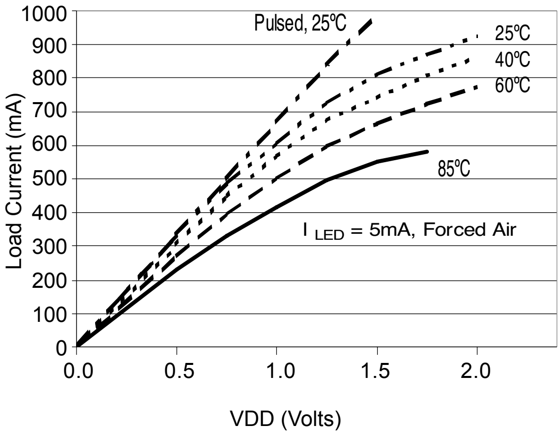


Figure 3.Typical On Characteristics

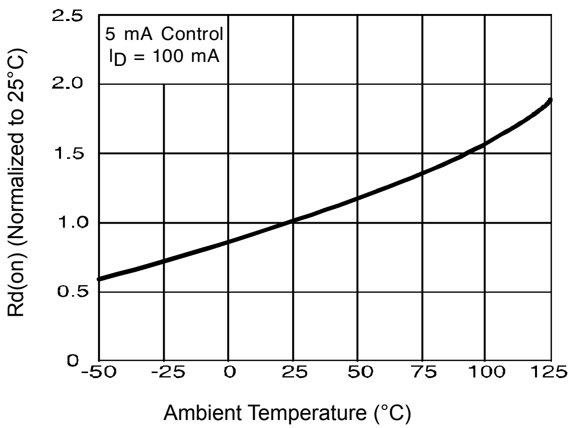


Figure 4. Typical Normalized On-Resistance

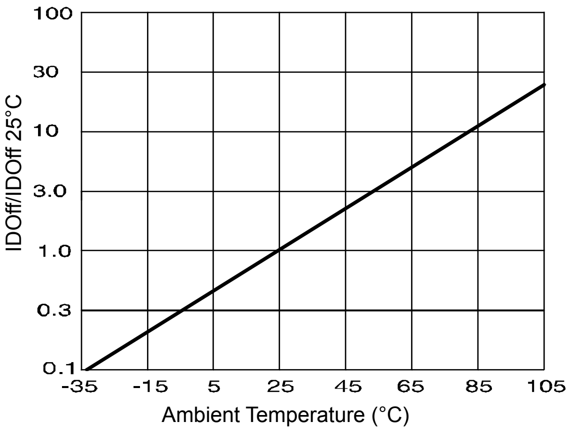


Figure 5. Typical Normalized Off-State Leakage

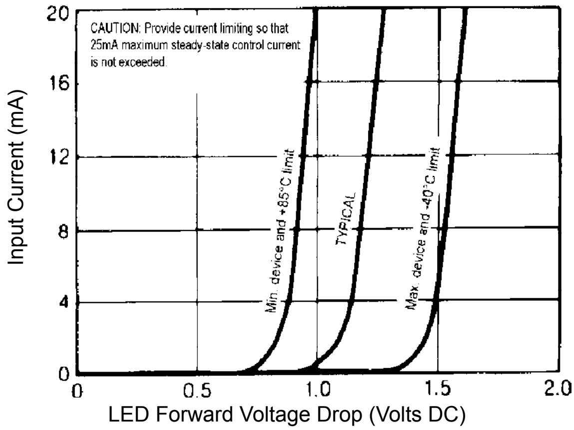


Figure 6. Input Characteristics (Current Controlled)

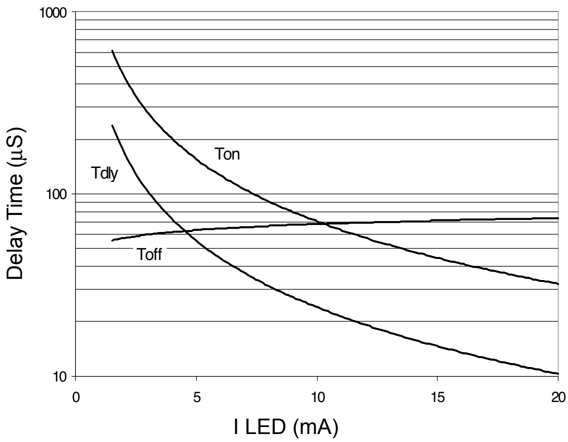


Figure 7.Typical Delay Times

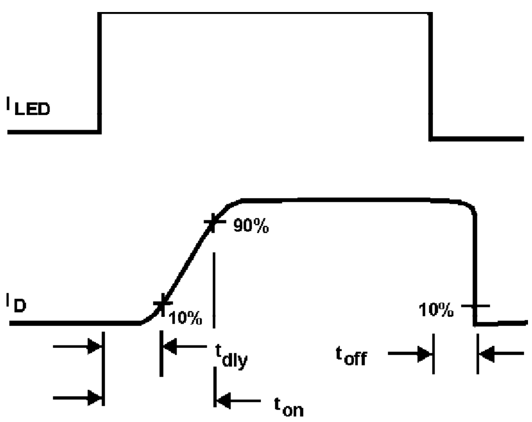


Figure 8. Delay Time Definitions

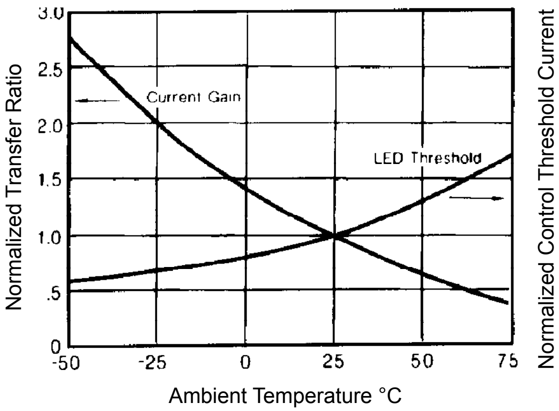


Figure 9. Typical Control Threshold and Transfer Ratio

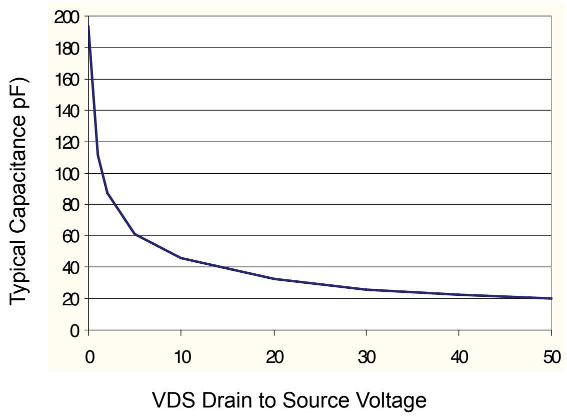
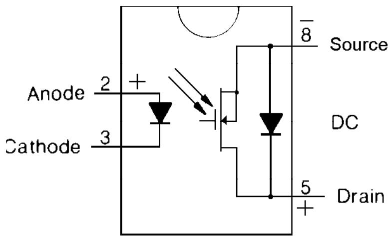
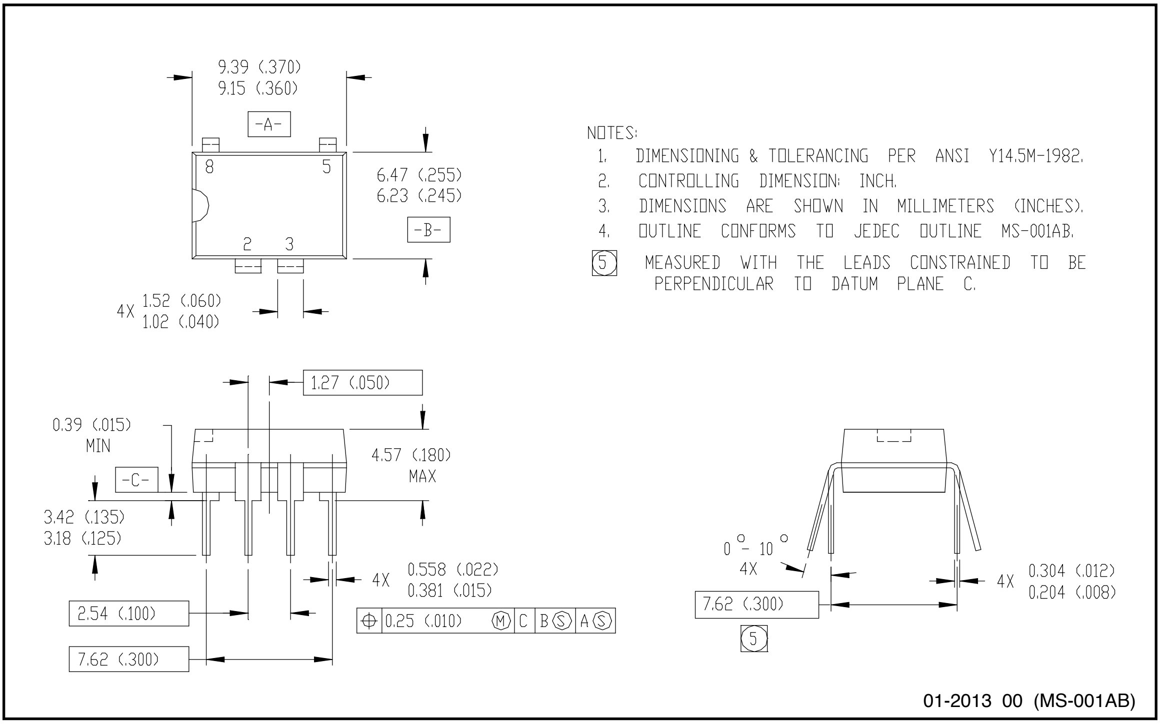


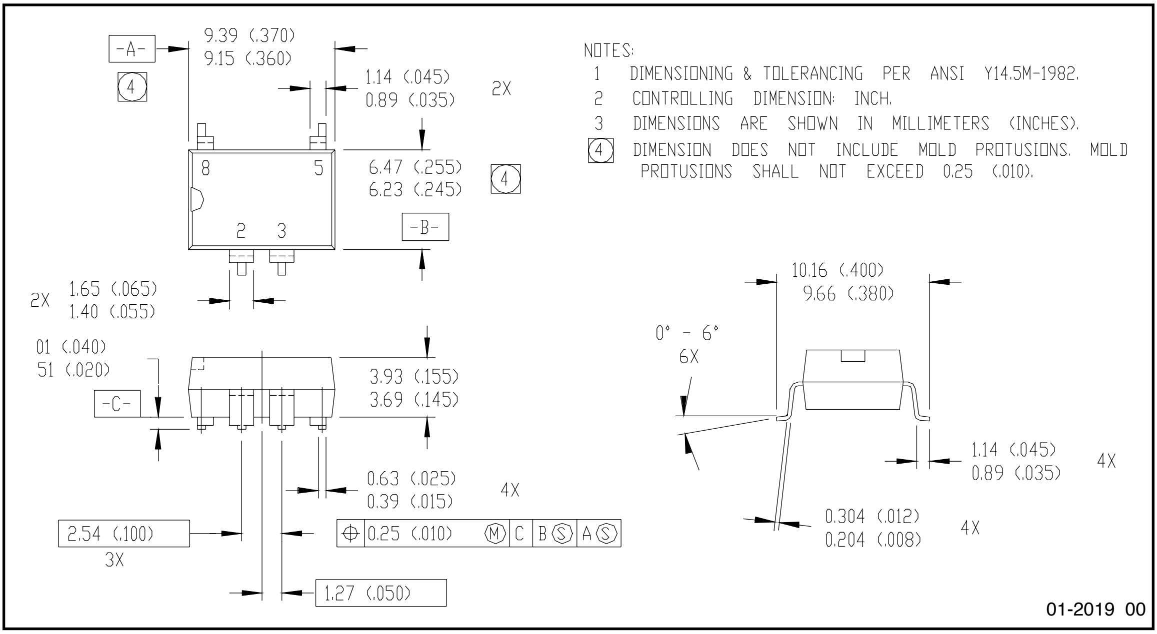
Figure 10. Typical Output Capacitance

Wiring Diagram



Case Outlines





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