International
IOR Rectifier

Data Sheet No. PD 10034 revK

Series PVN012PbF

Microelectronic Power IC

HEXFET® Power MOSFET Photovoltaic Relay

Single Pole, Normally Open, 0-20V, 2.5A AC/ 4.5A DC

General Description

The PVN012 Series Photovoltaic Relay at 100 milliohms features the lowest possible on-state resistance in a miniature package — lower than a comparable reed relay.

The PVN012 is a single-pole, normally open solid-state relay. It utilizes a GenerationV HEXFET 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 exceed the performance capabilities of electromechanical relays in life, sensitivity, stable on-resistance, miniaturization, magnetic insensitivity and ruggedness. They are ideally suited for switching high currents or low level signals without distortion or injection of electrical noise.

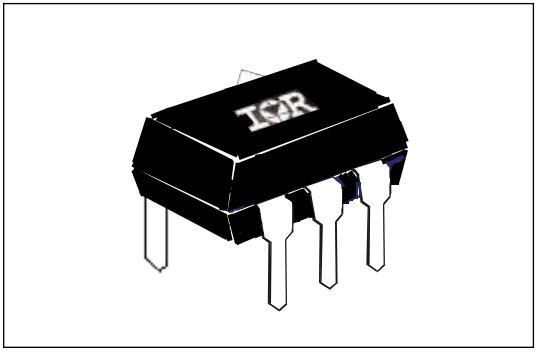
Series PVN012 Relays are packaged in a 6-lead molded DIP package with either thru-hole or surface mount (gull-wing) terminals. They are available in standard plastic shipping tubes or on tape-and-reel. Please refer to part identification information opposite.

Applications

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

Features

- 100mΩ On-Resistance
- GenV HEXFET output
- Bounce-free operation
- 2.5 - 4.5 Amp capacity
- Linear AC/DC operation
- 4,000 V_{RMS} I/O isolation
- Solid-State reliability
- UL recognized
- ESD Tolerance:
  - 4000V Human Body Model
  - 500V Machine Model



Part Identification

PVN012PbF	thru-hole
PVN012SPbF	surface-mount
PVN012S-TPbF	surface-mount, tape and reel

(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
Minimum Control Current (see figure 1)	3.0	mA
Maximum Control Current for Off-State Resistance @ T_A = +25°C	0.4	mA
Control Current Range (Caution: current limit input LED, see figure 6)	3.0 to 25	mA
Maximum Reverse Voltage	6.0	V

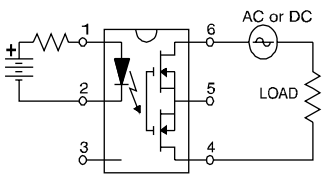
OUTPUT CHARACTERISTICS		Limits	Units
Operating Voltage Range		0 to ±20	$V_{(DC\ or\ AC\ peak)}$
Maximum Continuous Load Current @ T_A=+40°C, 5mA Control (see figure 1)			
	A Connection	2.5	A (DC or AC)
	B Connection	3.0	A (DC)
	C Connection	4.5	A (DC)
Maximum Pulsed Load Current @T_A=+25°C, (100 ms @ 10% duty cycle)			
	A Connection	6.0	A (DC or AC)
Maximum On-State Resistance @T_A=+25°C, for 1A pulsed load, 5mA Control (see figure 4)			
	A Connection	100	mΩ
	B Connection	65	
	C Connection	40	
Minimum Off-State Resistance @ T_A=+25°C, ±16V_{DC}		0.16 x 10^8	Ω
Maximum Turn-On Time @T_A=+25°C (see figure 7), for 1A, 20 V_{DC} load, 5mA Control		5.0	ms
Maximum Turn-Off Time @T_A=+25°C (see figure 7), for 1A, 20 V_{DC} load, 5mA Control		0.5	ms
Maximum Output Capacitance @ 20V_{DC} (see figure 2)		300	pF

GENERAL CHARACTERISTICS		Limits	Units
Minimum Dielectric Strength, Input-Output		4000	V_{RMS}
Minimum Insulation Resistance, Input-Output, @T_A=+25°C, 50%RH, 100V_{DC}		10^{12}	Ω
Maximum Capacitance, Input-Output		1.0	pF
Maximum Pin Soldering Temperature (10 seconds maximum)		+260	°C
Ambient Temperature Range:	Operating	-40 to +85	
	Storage	-40 to +100	

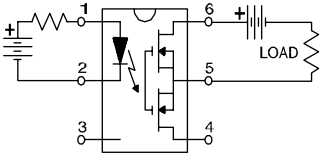
International Rectifier does not recommend the use of this product in aerospace, avionics, military or life support applications. Users of this International Rectifier product in such applications assume all risks of such use and indemnify International Rectifier against all damages resulting from such use.

Connection Diagrams

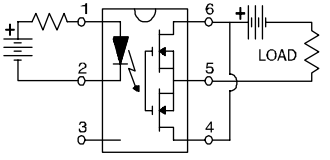
"A" Connection



"B" Connection



"C" Connection



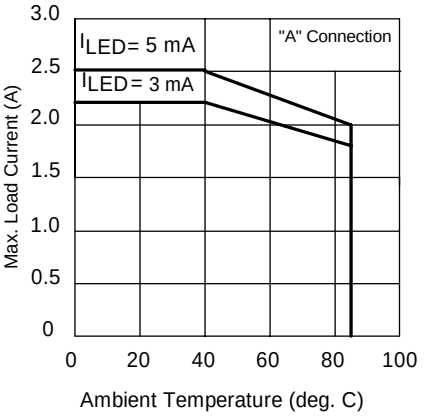


Figure 1. Current Derating Curves*

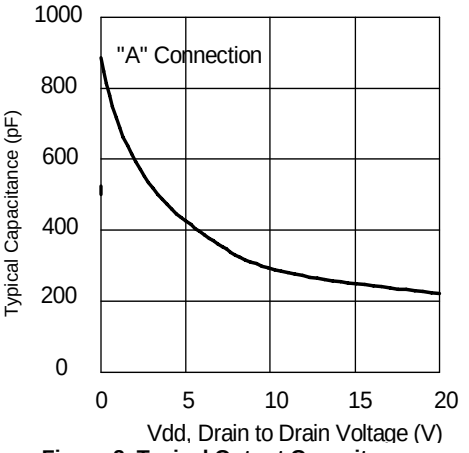


Figure 2. Typical Output Capacitance

* Derating of 'B' and 'C' connection at +85°C will be 70% of that specified at +40°C and is linear from +40°C to +85°C.

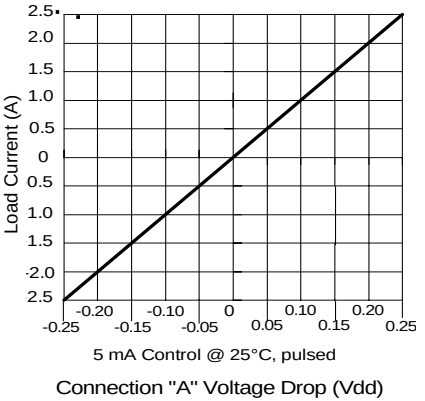


Figure 3. Linearity Characteristics

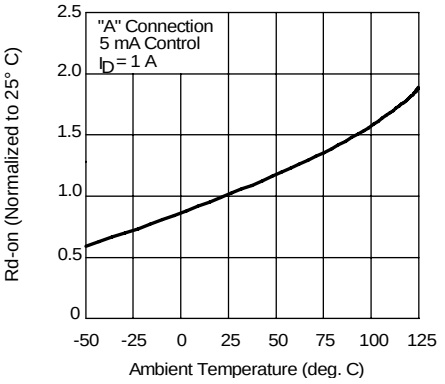


Figure 4. Typical Normalized On-Resistance

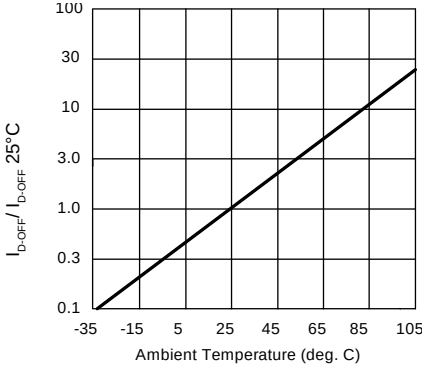


Figure 5. Typical Normalized Off-State Leakage

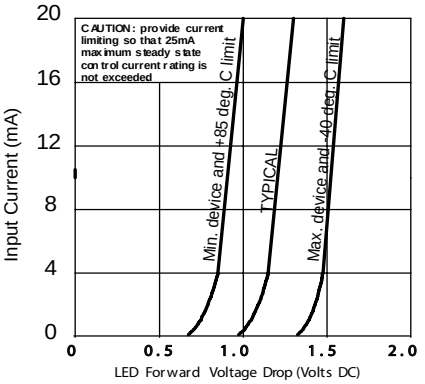


Figure 6. Input Characteristics (Current Controlled)

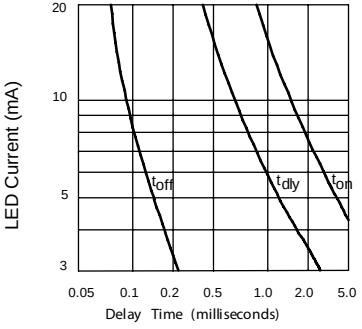


Figure 7. Typical Delay Times

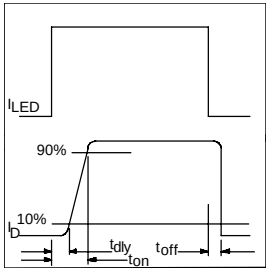
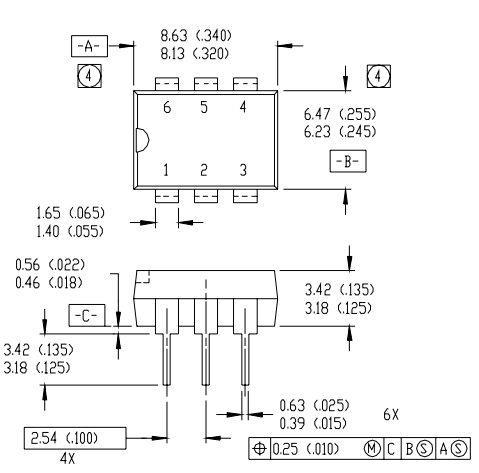
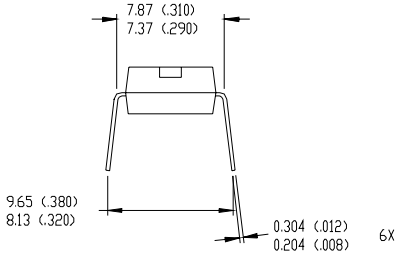


Figure 8. Delay Time Definitions

Case Outlines



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).



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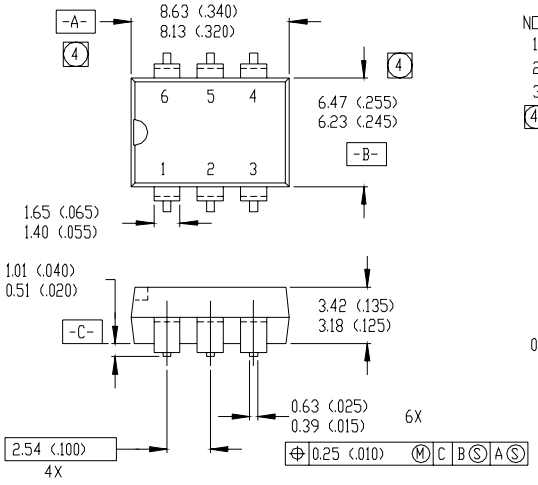

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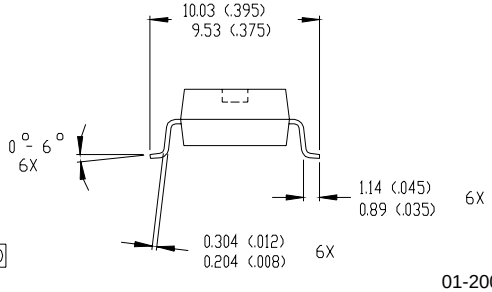

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