

Series PVN012APbF

Microelectronic Power IC

HEXFET® Power MOSFET Photovoltaic Relay Single-Pole, Normally-Open, 0-20V, 4.0A AC / 6.0A DC

General Description

The PVN012A Series Photovoltaic Relay at 50 milliohms features the lowest possible on-state resistance in a miniature package - lower than a comparable reed relay.

The PVN012A is a single-pole, normally open solidstate relay. It utilizes a HEXFET® MOSFET 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 onresistance, 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 PVN012A 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.

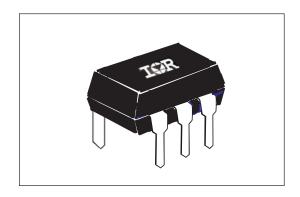
Applications

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

Features

- 50mΩ On-Resistance
- Bounce-free Operation
- 4.0 6.0 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

PVN012APbF PVN012ASPbF PVN012AS-TPbF thru-hole surface-mount surface-mount, tape and reel

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



Electrical Specifications (-40°C \leq T_A \leq +85°C unless otherwise specified)

INPUT CHARACTERISTICS	Limits	Units
Minimum Control Current (see figure 1)	5.0	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) 5.0 to 25.0 mA		mA
Maximum Reverse Voltage	6.0	V

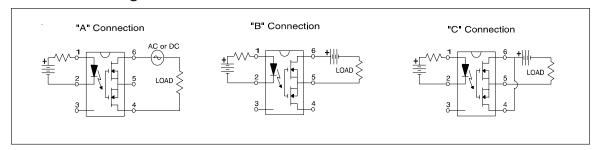
OUTPUT CHARACTERISTICS		Units
Operating Voltage Range	0 to ±20	V(DC or AC peak)
Maximum Continuous Load Current @ 40°C, 10mA Control (see figure 1)		
A Connection	4.0	A (DC or AC)
B Connection	4.5	A (DC)
C Connection	6.0	A (DC)
Maximum Pulsed Load Current @ 25°C,10mA Control (100 mS @ 10% duty cycle)		
A Connection	8.0	A (DC or AC)
B Connection	9.0	A (DC)
C Connection	15.0	A (DC)
Typical Thermal Resistance (Tthja, Junction-to-Ambient)		
A Connection	85.1	(°C/W)
B Connection	122.9	(°C/W)
C Connection	89.7	(°C/W)
Maximum On-State Resistance @25°C, 10mA Control 100mA pulsed load, (see figs. 3 & 4)		
A Connection	50	mΩ
B Connection	25	mΩ
C Connection	15	mΩ
Maximum Off-State Leakage @ T _A =+25°C, ±20V _{DC}		μΑ
Maximum Turn-On Time @T _A =+25°C (see figure 7), for 1A, 20 V _{DC} load, 10mA Control	3.0	ms
Maximum Turn-Off Time @T _A =+25°C (see figure 7), for 1A, 20 V _{DC} load, 10mA Control	0.5	ms
Typical Output Capacitance @ 20V _{DC} (see figure 2)		pF

GENERAL CHARACTERISTICS		Limits	Units
Minimum Dielectric Strength, Input-Output		4000	VRMS
Minimum Insulation Resistance, Input-Output		1012	Ω
Maximum Capacitance, Input-Output, Vd =0V, f = 1MHz		1.0	pF
Maximum Pin Soldering Temperature		+260	
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



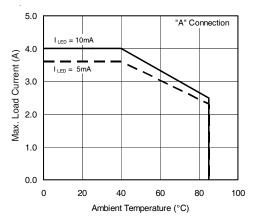


Figure 1. Current Derating Curves*

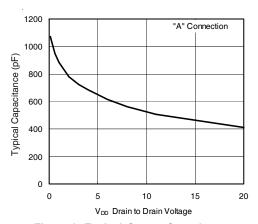


Figure 2. Typical Output Capacitance

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

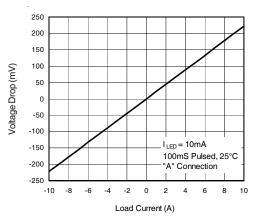


Figure 3. Linearity Characteristics

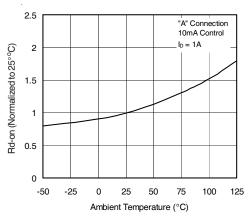


Figure 4. Typical Normalized On-Resistance



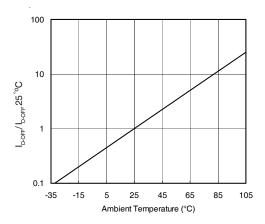


Figure 5. Typical Normalized Off-State Leakage

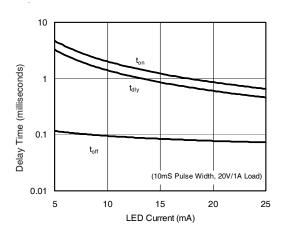


Figure 7. Typical Delay Times

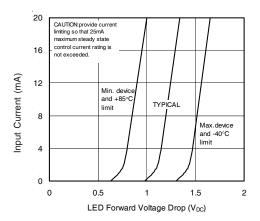


Figure 6. Input Characteristics (Current Controlled)

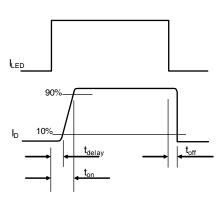
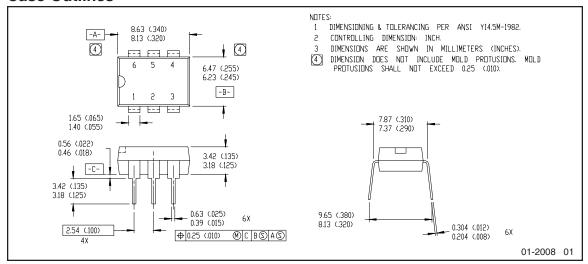
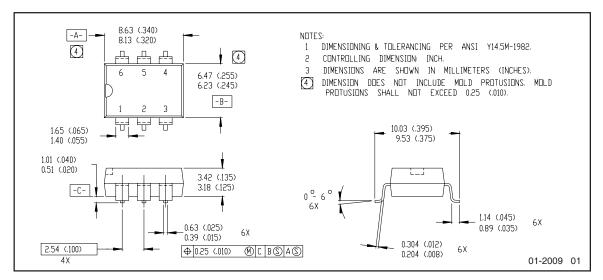


Figure 8. Delay Time Definitions



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	PVN012APbF	N/A	
	PVN012ASPbF	MSL4	
	PVN012AS-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

Revision History

Date	Comments
5/11/2015	Added Qualification Information Table on page 6
3/11/2013	Updated data sheet with new IR corporate template



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Data and specifications subject to change without notice

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

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