International
IOR Rectifier

Series PVG612PbF

Microelectronic Power IC

HEXFET® Power MOSFET Photovoltaic Relay
Single-Pole, Normally-Open, 0-60V, 1.0A AC / 2.0A DC

General Description

The PVG612 Series Photovoltaic Relay is a single-pole, normally open solid-state relay that can replace electromechanical relays in many applications. It utilizes International Rectifier's proprietary 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 exceed the performance capabilities of electromechanical relays in operating life, sensitivity, stability of on-resistance, miniaturization, insensitivity to magnetic fields and ruggedess. The compact PVG612 is particularly suited for isolated switching of high currents from 12 to 48 Volt AC or DC power sources.

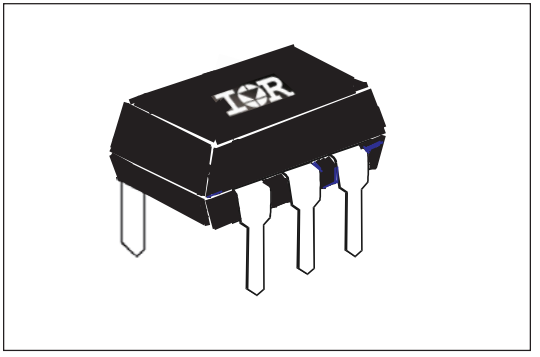
Series PVG612 Relays are packaged in a 6-pin, molded DIP package with either thru-hole or surface mount (gull-wing) terminals. It is available in standard plastic shipping tubes or on tape-and-reel. Please refer to Part Identification information opposite.

Applications

- Programmable Logic Controllers
- Computers and Peripheral Devices
- Audio Equipment
- Power Supplies and Power Distribution
- Control of Displays and Indicators
- Industrial Automation

Features

- Bounce-free operation
- High load current capacity
- High off-state resistance
- 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

PVG612PbF	thru-hole
PVG612SPbF	surface-mount
PVG612S-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)	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	mA
Maximum Reverse Voltage	6.0	V

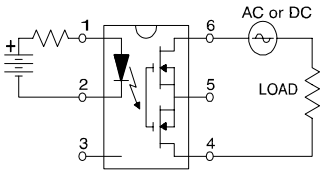
OUTPUT CHARACTERISTICS		Limits	Units
Operating Voltage Range		0 to ±60	$V_{(DC\ or\ AC\ peak)}$
Maximum Load Current @ T_A = +40°C, 10mA Control (see figure 1)			
	A Connection	1.0	A (AC or DC)
	B Connection	1.5	A (DC)
	C Connection	2.0	A (DC)
Maximum Pulsed Load Current @ T_A =+25°C (100 ms @ 10% Duty Cycle)			
	A Connection	2.4	A (AC or DC)
Maximum On-State Resistance @T_A =+25°C			
For 1A pulsed load, 10mA Control (see figure 4)	A Connection	500	mΩ
	B Connection	250	mΩ
	C Connection	150	mΩ
Minimum Off-State Resistance @T_A =+25°C, ±48V (see figure 5)		10^8	Ω
Maximum Turn-On Time @T_A =+25°C (see figure 7)			
For 500mA, 50 V_{DC} load, 10mA Control		2.0	ms
Maximum Turn-Off Time @T_A =+25°C (see figure 7)			
For 500mA, 50 V_{DC} load, 10mA Control		0.5	ms
Maximum Output Capacitance @ 50V_{DC} (see figure 2)		130	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	

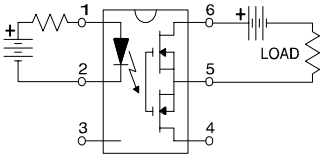
International Rectifier does not recommend the use of this product in aerospace, avionics, military or life support applications. Users of this International Rectifier product in such applications assume all risks of such use and indemnify International Rectifier against all damages resulting from such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

Connection Diagrams

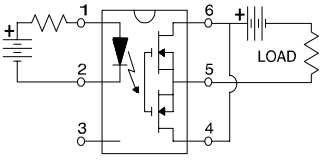
"A" Connection



"B" Connection



"C" Connection



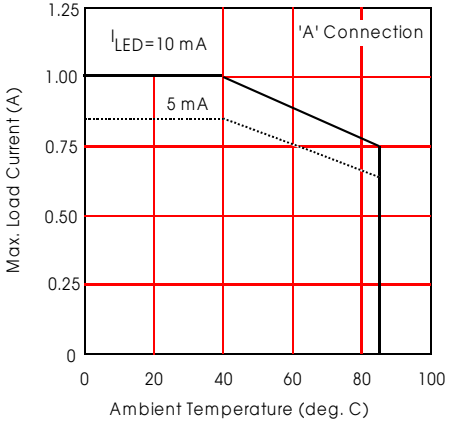


Figure 1. Current Derating Curves*

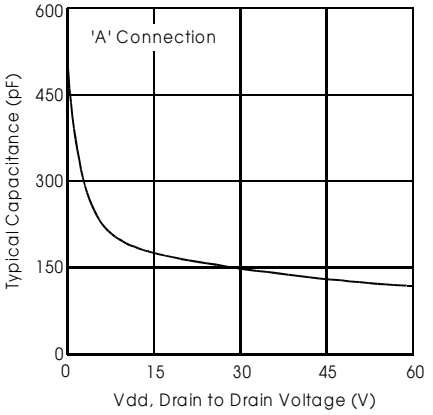


Figure 2. Typical Output Capacitance

* 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.

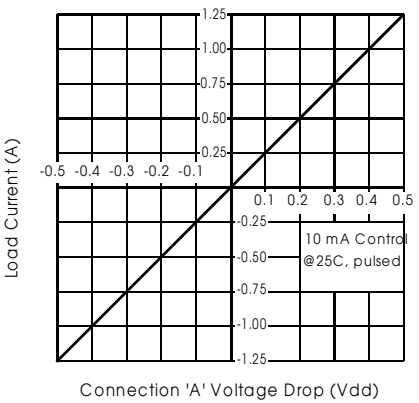


Figure 3. Linearity Characteristics

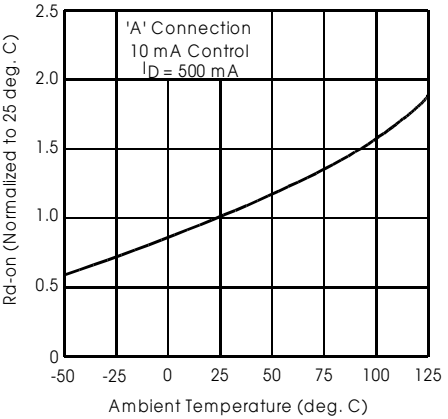


Figure 4. Typical Normalized On-Resistance

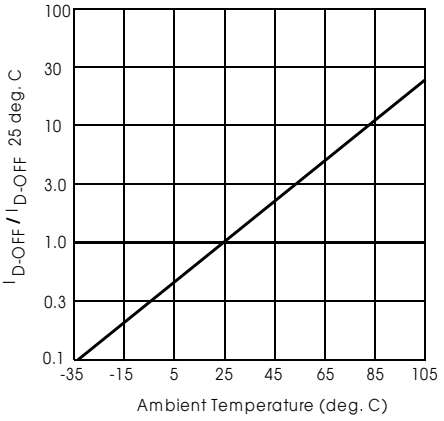


Figure 5. Typical Normalized Off-State Leakage

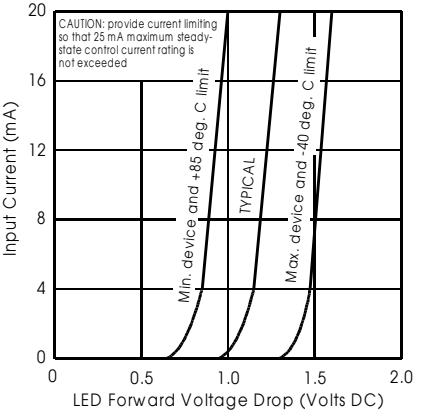


Figure 6. Input Characteristics (Current Controlled)

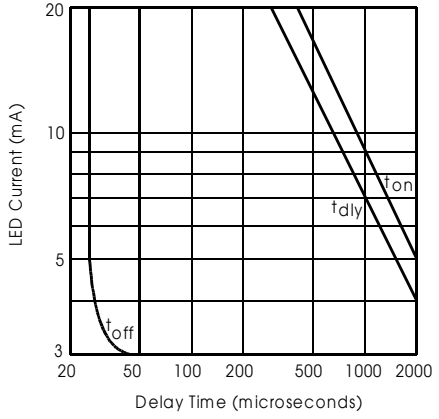


Figure 7. Typical Delay Times

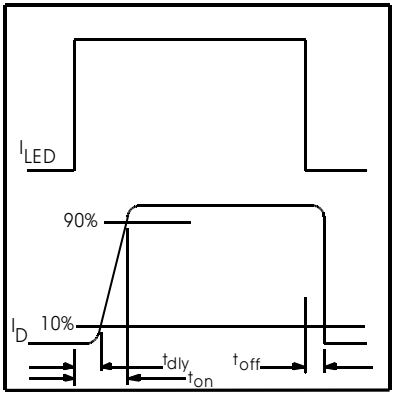
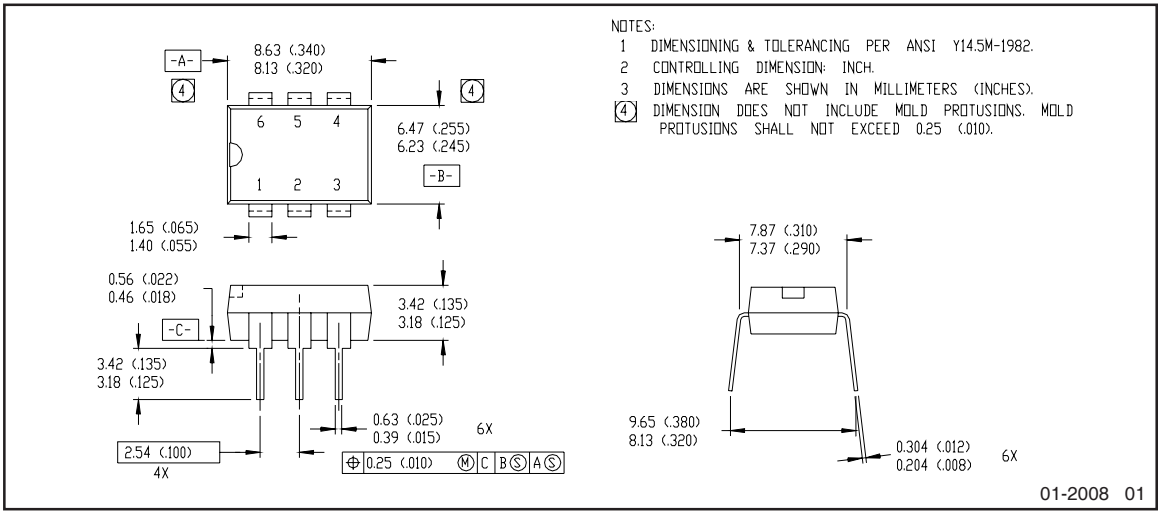
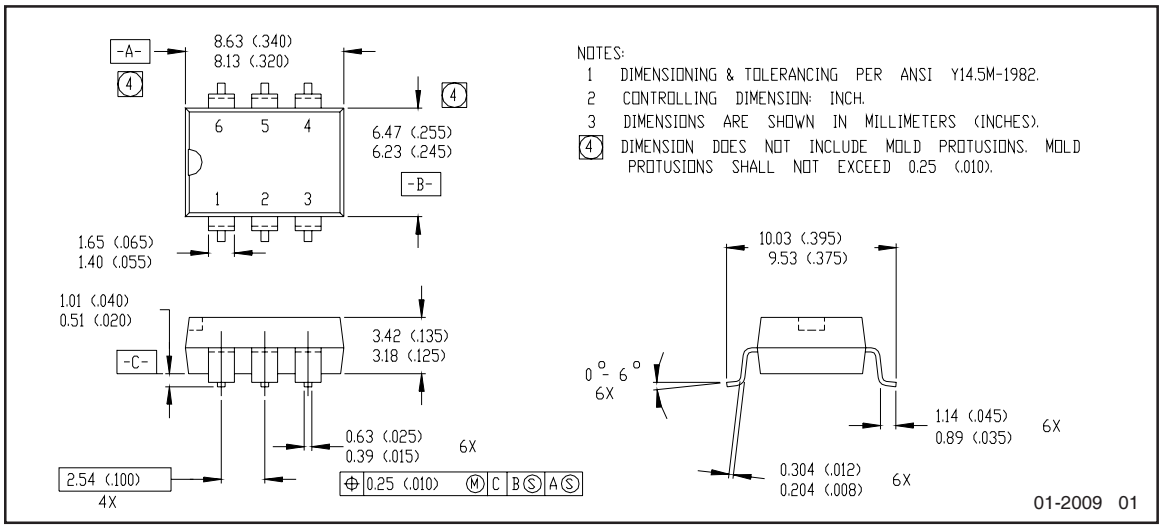


Figure 8. Delay Time Definitions

Case Outlines





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	PVG612PbF	N/A
	PVG612SPbF	MSL4 (per JEDEC J-STD-020E & JEDEC J-STD-033C ††)
	PVG612S-TPbF	
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
5/4/2015	• Added Qualification Information Table on page 6 • Updated data sheet with new IR corporate template

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