International **IOR** Rectifier

Data Sheet No. PD10062 revE

Series PVG612A & PbF

Microelectronic Power IC

HEXFET® Power MOSFET Photovoltaic Relay Single Pole, Normally Open, 0-60V, 2.0A AC/ 4.0 A DC

General Description

The PVG612A Series Photovoltaic Relay is a singlepole, 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 GaAIAs 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 PVG612A is particularly suited for isolated switching of high currents from 12 to 48 Volt AC or DC power sources.

Series PVG612A 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; pending for lead-free part number (PbF)
- ESD Tolerance: 4000V Human Body Model 500V Machine Model



Part Identification

PVG612A & PbF PVG612AS & PbF PVG612AS-T & PbF thru-hole surface-mount surface-mount, tape and reel

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

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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 - 25	mA
Maximum Reverse Voltage (1mA max.)	6.0	V

OUTPUT CHARACTERISTICS		Limits	Units
Operating Voltage Range		0 to ±60	V(DC or AC peak)
Maximum Continuous Load Current @ TA = +4	0°C, 10mA Control		
(see figure 1)	A Connection	2.0	A (AC or DC)
	B Connection	2.5	A (DC)
	C Connection	4.0	A (DC)
Maximum Pulsed Load Current @ T _{A =+25°C} (
	A Connection	7.5	A (AC or DC)
	B Connection	8.5	A (DC)
	C Connection	15.5	A (DC)
Typical Thermal Resistance (Rthja, Junction-to-Ambient)			
	A Connection	79.1	(°C/W)
	B Connection	112.2	(°C/W)
	C Connection	81.0	(°C/W)
Maximum On-State Resistance @TA =+25°C			
For 1A pulsed load, 10mA Control (see figure 4)	A Connection	100	mΩ
	B Connection	50	mΩ
	C Connection	35	mΩ
Maximum Off-State Leakage @ 60V, TA =+25°C		1.0	μA
Maximum Turn-On Time @TA =+25°C (see figures	s 7 & 8)		
For 500mA, 50V _{DC} load, 10mA Control, 10mS pulse width		3.5	ms
Maximum Turn-Off Time @TA =+25°C (see figur			
For 500mA, 50V _{DC} load, 10mA Control, 10mS pulse width		0.5	ms
Typical Output Capacitance @ Vdd=50V, f=1MHz	z (see figure 2)	105	pF

GENERAL CHARACTERISTICS		Limits	Units
Minimum Dielectric Strength, Input-Output		4000	V _{RMS}
Minimum Insulation Resistance, Input-Output, @TA=+25°C, 50%RH, 100VDC		10 ¹²	Ω
Maximum Capacitance, Input-Output		1.0	pF
Maximum Pin Soldering Temperature (10 seconds maximum)		+260	
Ambient Temperature Range:	Operating	-40 to +85	C
	Storage	-40 to +100	1

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.

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Connection Diagrams

"A" Connection "B" Connection "C" Connection AC or DC + 6 + LOAD > LOAD LOAD 3 3 5,0 900 850 800 750 650 650 550 400 350 350 350 250 250 150 150 100 50 0 "C" Connection I_{LED} = 10mA "A" Connection 4.0 Typical Capacitance (pF) Max. Load Current (A) 3.0 ection 2.0 "A" Connection 1.0 0.0 80 100 20 40 60 0 0 10 20 30 40 50 60 Ambient Temperature (C) V_{DD} Drain to Drain Voltage

100

90

80

70

60

50

40

30

20

10

0

0

RDDS0n (mohm)

"A" Connection

25

Figure 1. Current Derating Curves

Figure 2. Typical Output Capacitance

"B" Connection

"C" Connection

75



Figure 3. Typical Linearity Characteristics

Figure 4. Typical Normalized On-Resistance

Temperature (C)

50

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100

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Figure 5. Typical Normalized Off-State Leakage



Figure 6. Input Characteristics (Current Controlled)



Figure 7. Typical Delay Times



Figure 8. Delay Time Definitions

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Case Outlines



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IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245 Tel: (310) 252-7105 This product has been designed and qualified for the Industrial market. Data and specifications subject to change without notice. 8/25/2006