International
IOR Rectifier

Data Sheet No. PD 10031B

Series PVU414

HEXFET® Power MOSFET Photovoltaic Relay
Single Pole, Normally Open
0-400V, 140mA AC/DC

General Description

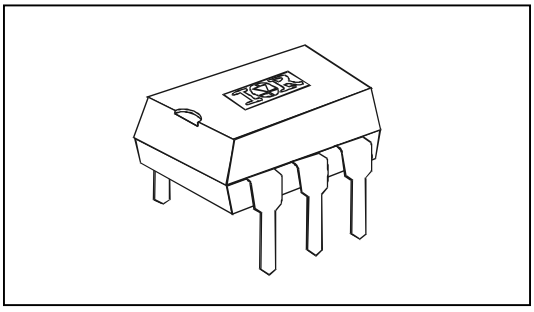
The PVU414 Series Photovoltaic Relay is a single-pole, normally open solid-state relay that can replace electromechanical relays in many applications. It utilizes International Rectifier's proprietary HEXFET® power MOSFET as the output switch, driven by an integrated circuit photovoltaic generator of novel construction. The output switch is controlled by radiation from a GaAlAs light emitting diode (LED) which is optically isolated from the photovoltaic generator.

The PVU414 is ideally suited for instrumentation, multiplexing, scanning and data acquisition applications. It offers high operating speed, low thermal offset (EMF) voltage, low and stable on-state resistance and high off-state resistance.

The PVU414 relay is packaged in a 6-pin, molded DIP package with either through-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.)

Features

- HEXFET® MOSFET output ■
- Bounce-free operation ■
- High operating speed ■
- High off-state resistance ■
- 0.2 µV thermal offset voltage ■
- Linear AC/DC operation ■
- 4,000 V_{RMS} I/O isolation ■
- Solid-state reliability ■
- UL recognized and CSA certified ■



Applications

- Multiplexing
- Scanning
- Multichannel Sampling
- Data Acquisition
- Signal Level Switching
- Instrumentation and Measurement

Part Identification

PVU414	through-hole
PVU414S	surface-mount
PVU414S-T	surface-mount, tape-and-reel

(HEXFET is the registered trademark for International Rectifier's power MOSFETs)

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

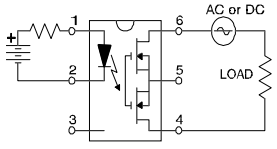
INPUT CHARACTERISTICS	Limits	Units
Minimum Control Current (see figure 1)	3.0	mA
Maximum Control Current for Off-State Resistance @T_A=+25°C	0.4	mA
Control Current Range (Caution: current limit input LED, see figure 6)	3.0 to 25	mA
Maximum Reverse Voltage	7.0	V

OUTPUT CHARACTERISTICS	Limits	Units
Operating Voltage Range	0 to ±400	V(DC or AC peak)
Maximum Load Current @T_A=+40°C, 5mA Control (See figure 1)		
A Connection	140	mA (AC or DC)
B Connection	150	mA (DC)
C Connection	210	mA (DC)
Maximum On-State Resistance @T_A=+25°C For 50mA pulsed load, 5mA Control (see figure 4)		
A Connection	27	Ω
B Connection	14	Ω
C Connection	7	Ω
Minimum Off-State Resistance @T_A=+25°C, ±320V (see figure 5)	10^{10}	Ω
Maximum Turn-On Time @T_A=+25°C (see figure 7) For 50mA, 100 V_{DC} Load, 5mA Control	500	µs
Maximum Turn-Off Time @T_A=+25°C (see figure 7) For 50mA, 100 V_{DC} Load, 5m_A Control	200	µs
Maximum Thermal Offset Voltage @ 5mA Control	0.2	µV
Maximum Output Capacitance @ 50V_{DC} (see figure 2)	12	pF

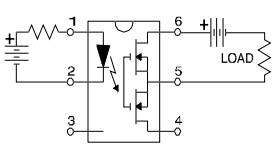
GENERAL CHARACTERISTICS		Limits	Units
Minimum Dielectric Strength, Input-Output		4000	V_{RMS}
Minimum Insulation Resistance, Input-Output @T_A=+25°C, 50%RH, 100V_{DC}		10^{12}	Ω
Maximum Capacitance, Input-Output		1.0	pF
Maximum Pin Soldering Temperature (10 seconds maximum)		+260	°C
Ambient Temperature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

Connection Diagrams

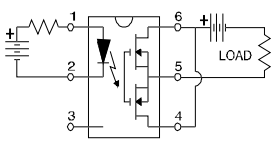
"A" Connection



"B" Connection



"C" Connection



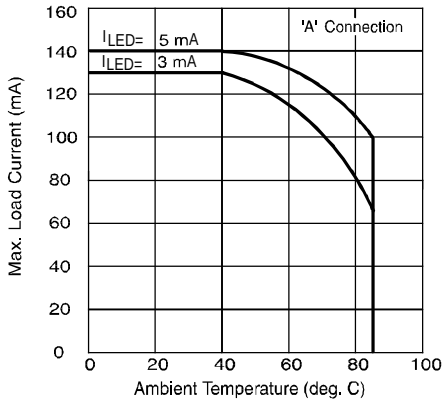


Figure 1. Current Derating Curves

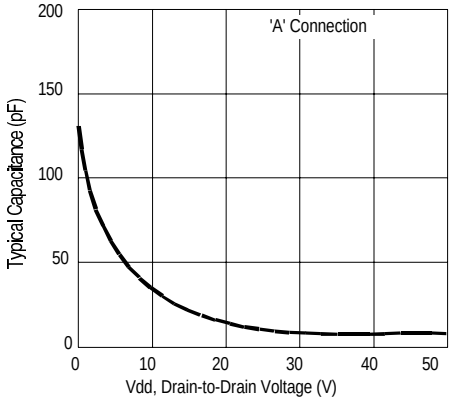


Figure 2. Typical Output Capacitance

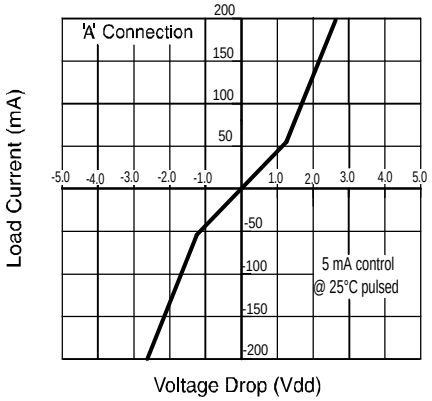


Figure 3. Linearity Characteristics

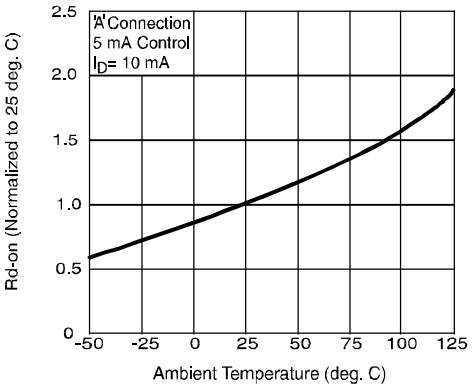


Figure 4. Typical Normalized On-Resistance

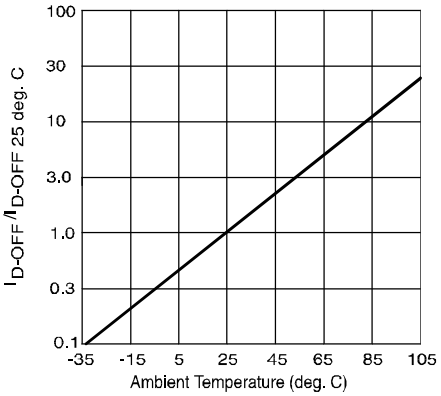


Figure 5. Typical Normalized Off-State Leakage

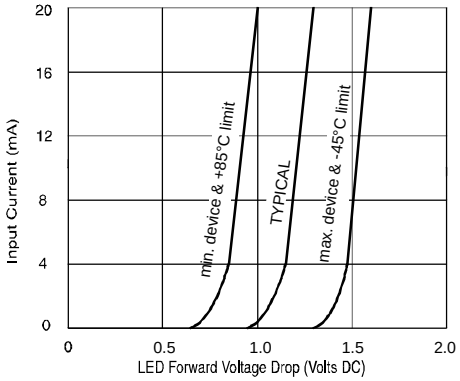


Figure 6. Input Characteristics (Current Controlled)

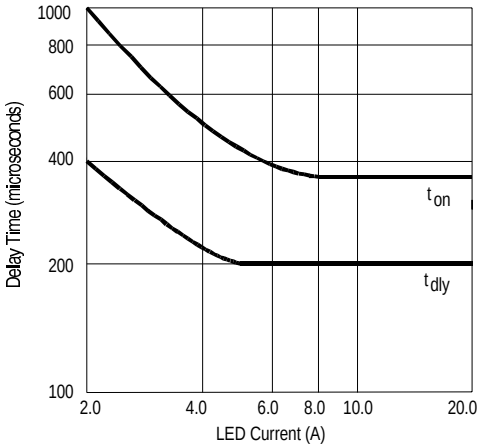


Figure 7. Typical Delay Times

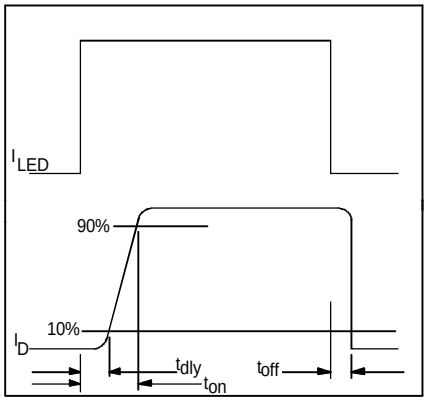
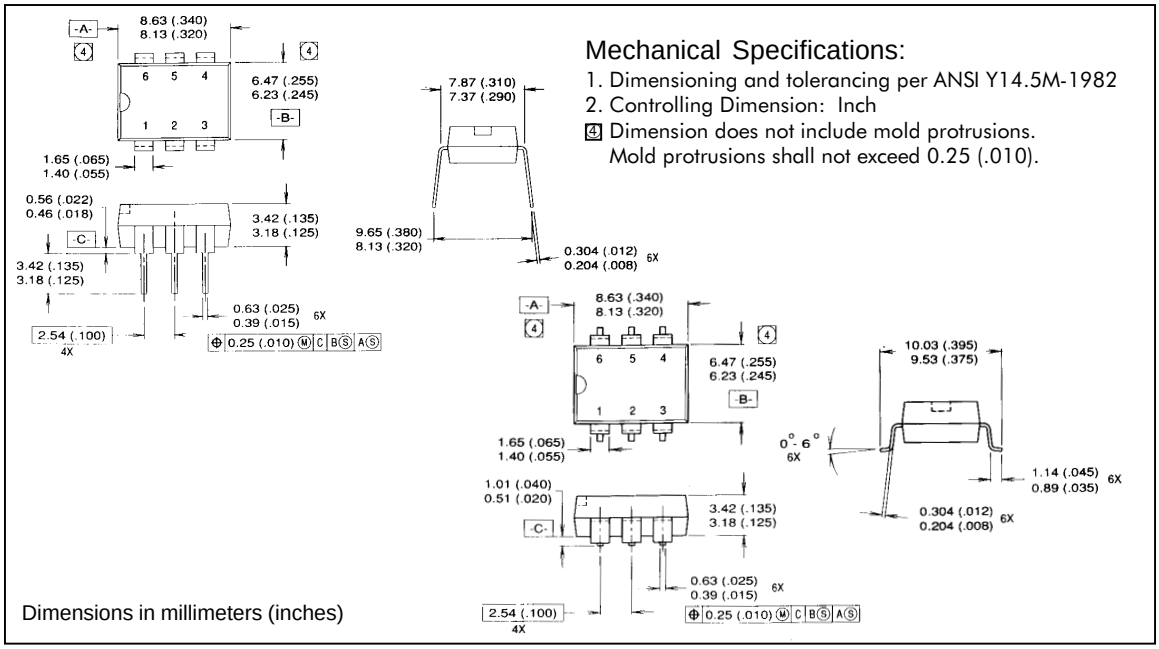


Figure 8. Delay Time Definitions

Case Outline



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