

## Series PVU414

Microelectronic  
Power IC Relay  
Single Pole, Normally Open  
0-400V, 140mA AC/DC

### HEXFET® POWER MOSFET PHOTOVOLTAIC RELAY

#### 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.

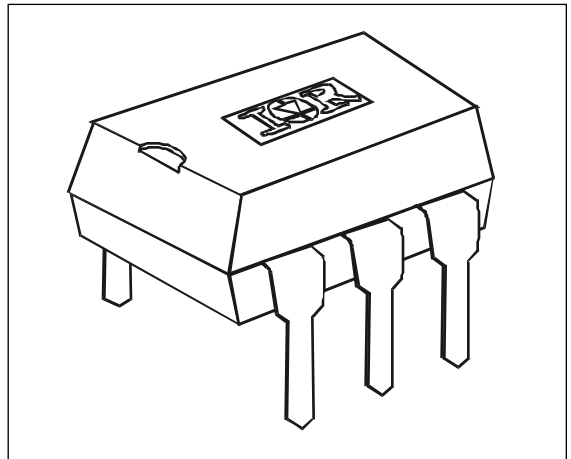
The PVU414 relay is packaged in a 6-pin, molded DIP package with either thru-hole or "gull-wing" surface mount terminals. It is available in standard plastic shipping tubes or on tape-and-reel. Refer to Part Identification information.

#### Applications

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

#### PVU414 Features

- HEXFET output ■
- Bounce-free operation ■
- High operating speed ■
- High off-state resistance ■
- 0.2  $\mu$ V thermal offset voltage ■
- Linear AC/DC operation ■
- 4,000  $V_{RMS}$  I/O isolation ■
- Solid-state reliability ■
- UL and CSA certifications pending ■



#### Part Identification

PVU414	thru-hole
PVU414S	SMT
PVU414S-T	SMT, T&R

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

# Series PVU414

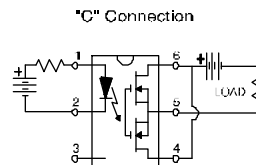
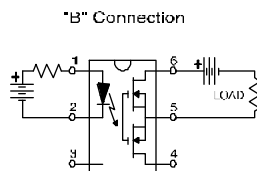
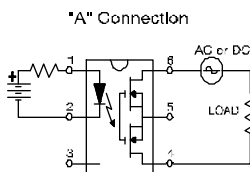
## Electrical Specifications (-40°C ≤ T<sub>A</sub> ≤ +85°C unless otherwise specified)

INPUT CHARACTERISTICS	Limits	Units
Min. Control Current (See Fig. 1)	3.0	mA
Max. Control Current for Off-State Resistance @T <sub>A</sub> =+25°C	0.4	mA
Control Current Range (Caution: current limit input LED, See Fig.6)	3.0 to 25	mA
Max. Reverse Voltage	7.0	V

OUTPUT CHARACTERISTICS	Limits	Units
Operating Voltage Range	0 to ±400	V(DC or AC peak)
Max. Load Current @T <sub>A</sub> =+40°C 5mA Control (See Fig. 1)	'A' Connection 140 'B' Connection 150 'C' Connection 210	mA (AC or DC) mA (DC) mA (DC)
Max. On-State Resistance @T <sub>A</sub> =+25°C For 50mA Pulsed Load, 5mA Control (See Fig.5)	'A' Connection 27 'B' Connection 14 'C' Connection 7	Ω Ω Ω
Min. Off-State Resistance @T <sub>A</sub> =+25°C, ±320V (See Fig. 5)	10 <sup>10</sup>	Ω
Max. Turn-On Time @T <sub>A</sub> =+25°C (See Fig. 7) For 50mA, 100 V <sub>DC</sub> Load, 5mA Control	500	μs
Max. Turn-Off Time @T <sub>A</sub> =+25°C (See Fig. 7) For 50mA, 100 V <sub>DC</sub> Load, 5mA Control	200	μs
Max. Thermal Offset Voltage @ 5mA Control	0.2	μV
Max. Output Capacitance @ 50V <sub>DC</sub> (See Fig. 2)	12	pF

GENERAL CHARACTERISTICS	Limits	Units
Min. Dielectric Strength, Input-Output	4000	V <sub>RMS</sub>
Min. Insulation Resistance, Input-Output @T <sub>A</sub> =+25°C, 50%RH, 100V <sub>DC</sub>	10 <sup>12</sup>	Ω
Max. Capacitance, Input-Output	1.0	pF
Max. Pin Soldering Temperature (10 seconds max.)	+260	°C
Ambient Temperature Range:	Operating Storage	-40 to +85 -40 to +100

## Connection Diagrams



# Series PVU414

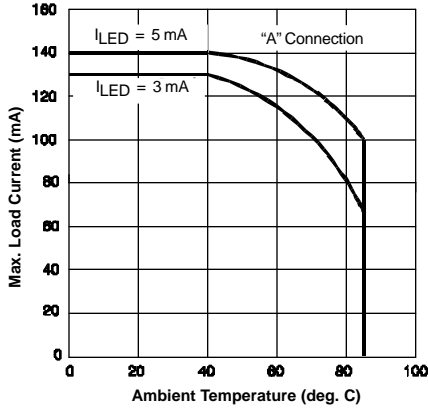


Figure 1. Current Derating Curves

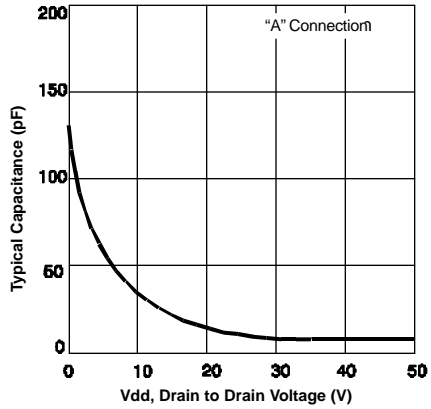


Figure 2. Typical Output Capacitance

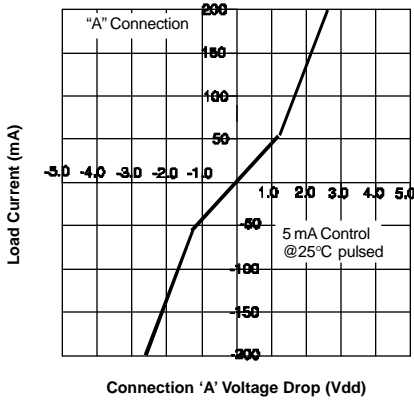


Figure 3. Linearity Characteristics

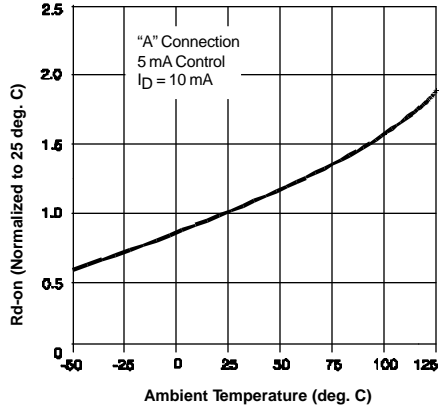


Figure 4. Typical Normalized On-Resistance

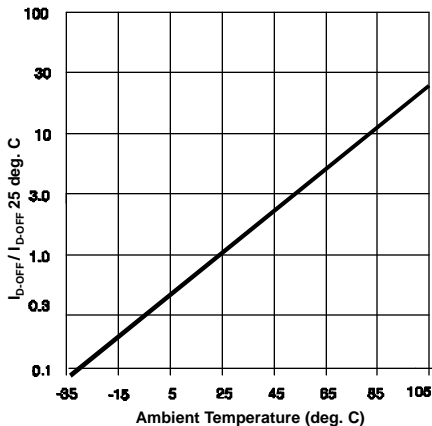


Figure 5. Typical Normalized Off-State Leakage

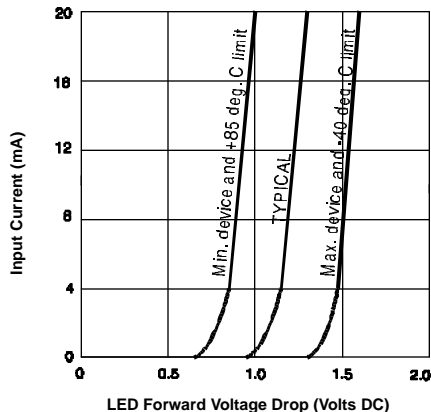


Figure 6. Input Characteristics (Current Controlled)

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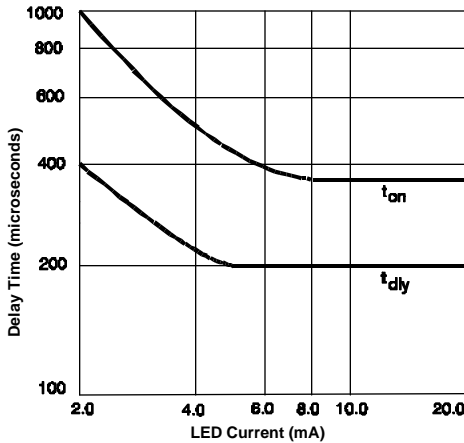


Figure 7. Typical Delay Times

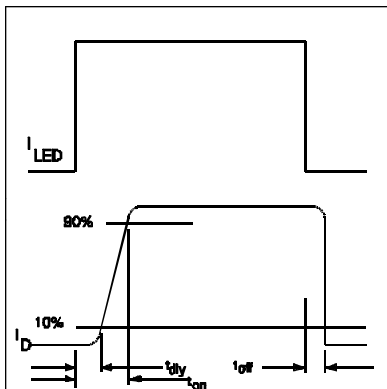
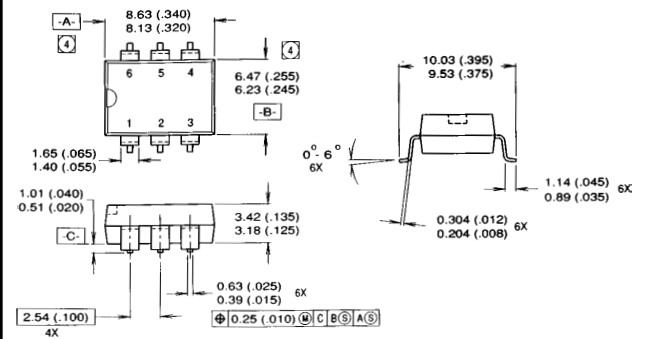
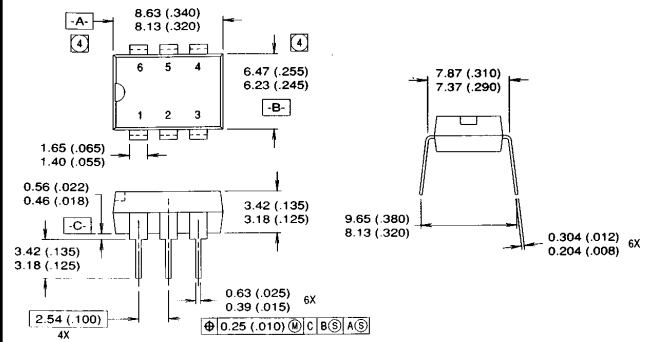


Figure 8. Delay Time Definitions

## Mechanical Specifications

(Dimensions in millimeters (inches))



1. DIMENSIONING AND TOLERANCING PER ANSII Y14.5M-1982
  2. CONTROLLING DIMENSION: INCH
- Ⓜ DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS SHALL NOT EXCEED 0.25 (.010).

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Data and specifications subject to change without notice.

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