

# International IOR Rectifier

PHOTOVOLTAIC ISOLATOR

## Series PVI5013R

Solid-State  
Opto-Isolated MOSFET Gate Driver  
Dual-Channel  
5V, 1.0μA

### General Description

The PVI5013R Photovoltaic Isolator is a dual-channel, opto-isolated driver capable of directly driving gates of power MOSFETs or IGBTs. It utilizes a monolithic integrated circuit photovoltaic generator of novel construction as its output. The output is controlled by radiation from a GaAlAs light emitting diode (LED) which is optically isolated from the photovoltaic generator.

The PVI5013R is ideally suited for applications requiring high-current and/or high voltage switching with optical isolation between the low-level driving circuitry and high-energy or high-voltage load circuits. It can be used for directly driving gates of power MOSFETs. The dual-channel configuration allows its outputs to drive independent discrete power MOSFETs, or be connected in parallel or in series to provide higher-current drive for power MOSFETs or higher-voltage drive for IGBTs. PVI5013R employs a fast turn-off circuitry.

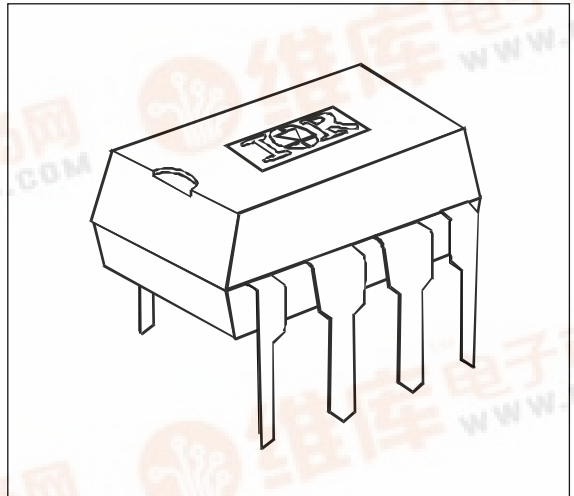
PVI5013R Photovoltaic Isolators are packaged in an 8-pin, molded DIP package with either thru-hole or "gull-wing" terminals. It is available in standard plastic shipping tubes or on tape-and-reel. Refer to Part Identification information.

### Applications

- Telecommunications ■
- Load Distribution ■
- Industrial Controls ■
- Instrumentation and Measurement ■

### PVI5013R Features

- Monolithic construction ■
- 3,750 V<sub>RMS</sub> I/O isolation ■
- 1,200 V<sub>DC</sub> output-to-output isolation ■
- Dual-Channel application flexibility ■
- Solid-State reliability ■
- UL and CSA certifications pending ■



### Part Identification

PVI5013R	thru-hole
PVI5013RS	SMT
PVI5013RS-T	SMT, T&R



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

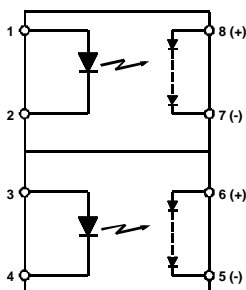
INPUT CHARACTERISTICS	Limits	Units
Min. Input Current (See Fig.1)	5.0	mA
Input Current Range (See Fig. 1)	3.0 to 25	mA
Max. Continuous Input Current @ T <sub>A</sub> =+25°C	40	mA
LED Forward Voltage Drop @ 5mA, T <sub>A</sub> =+25°C (See Fig. 3)	1.4	V
Max. Reverse Voltage	7.0	V
Max. Reverse Current @ -7V <sub>DC</sub> , T <sub>A</sub> =+25°C	10	μA

OUTPUT CHARACTERISTICS	Limits	Units
Min. Forward Voltage	8.0	V <sub>DC</sub>
Max. Reverse Current	10	μA <sub>DC</sub>

COUPLED CHARACTERISTICS	Limits	Units
Min. Output Voltage @ I <sub>LED</sub> = 5mA, R <sub>L</sub> = 10MΩ @ T <sub>A</sub> =0°C to +70°C (See Fig. 1 & 2)	3	V
Max. Output Voltage @ I <sub>LED</sub> = 5mA, R <sub>L</sub> = 10MΩ @ T <sub>A</sub> =0°C to +70°C (See Fig. 1 & 2)	8	V
Max. Voltage Differential Between Outputs @ I <sub>LED</sub> = 5mA, R <sub>L</sub> = 10MΩ	1.0	V
Typical Output Short-Circuit Current @ I <sub>LED</sub> = 5mA, @ T <sub>A</sub> =+25°C (See Fig. 1 & 2)	1.0	μA
Max. Turn-On Time @ I <sub>LED</sub> = 5mA, C <sub>LOAD</sub> = 200pF (See Fig. 4)	5	ms
Max. Turn-Off Time @ I <sub>LED</sub> = 5mA, C <sub>LOAD</sub> = 200pF (See Fig. 4)	0.25	ms
Off-State Clamping Resistance: minimum	100	Ω
maximum	3300	Ω

GENERAL CHARACTERISTICS	Limits	Units
Min. Dielectric Strength, Input-Output	3750	V <sub>RMS</sub>
Min. Dielectric Strength, Output-to-Output	1200	V <sub>DC</sub>
Min. Insulation Resistance, Input-to-Output @ T <sub>A</sub> =+25°C, 50%RH, 100V <sub>DC</sub>	10 <sup>12</sup>	Ω
Max. Capacitance, Input-Output	5.0	pF
Max. Pin Soldering Temperature (10 seconds max.)	+260	°C
Ambient Temperature Range: Operating	-40 to +85	°C
Storage	-40 to +125	°C

## Connection Diagram



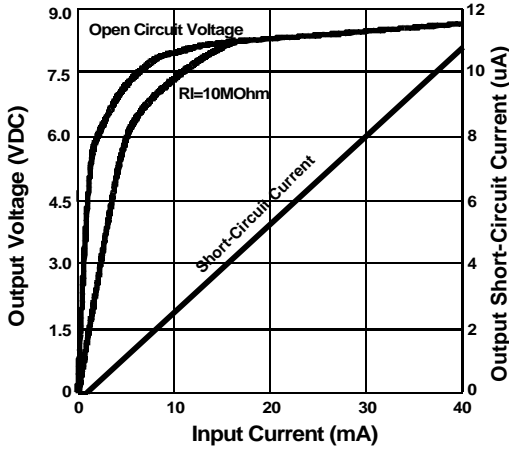


Figure 1. Typical Output Characteristics

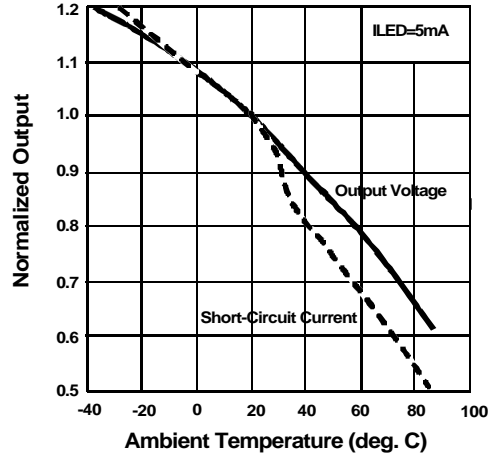


Figure 2. Typical Variation of Output

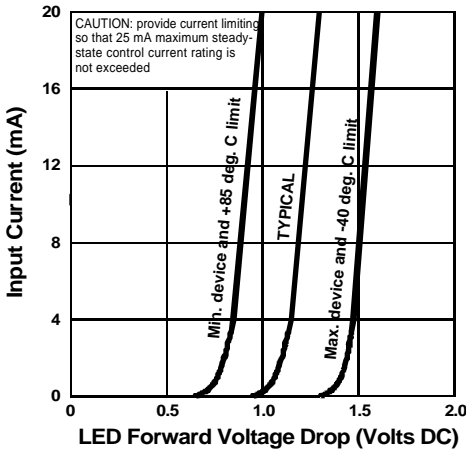


Figure 3. Input Characteristics (Current Controlled)

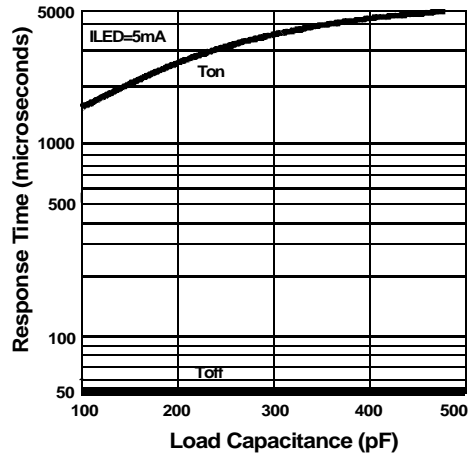
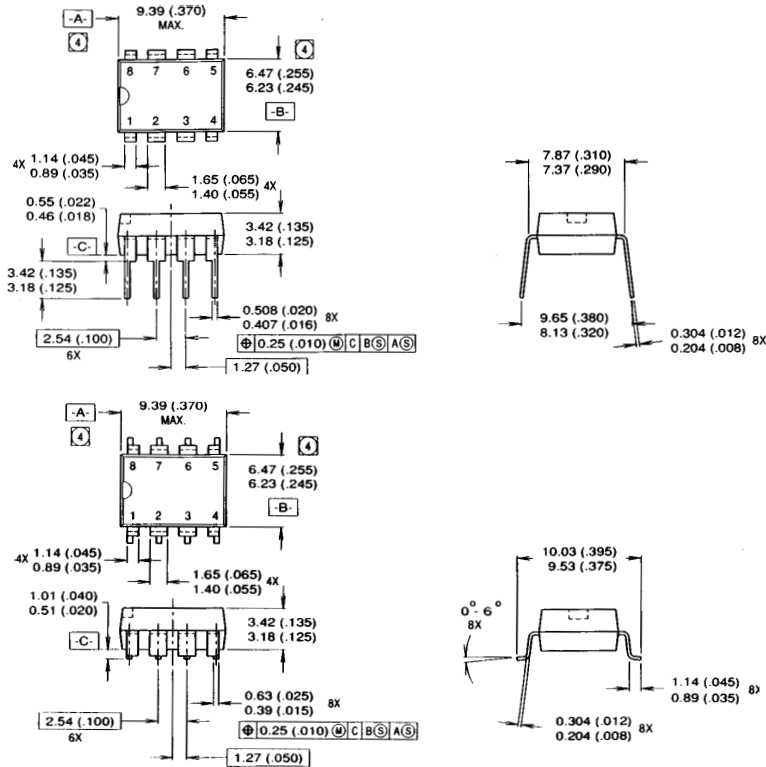


Figure 4. Typical Response Time

# PVI5013R

## Mechanical Specifications

(Dimensions in millimeters (inches))



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

International  
**IR** Rectifier

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Data and specifications subject to change without notice. 6/96