

PHOTOVOLTAIC ISOLATOR

Series PVI5013R

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

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.

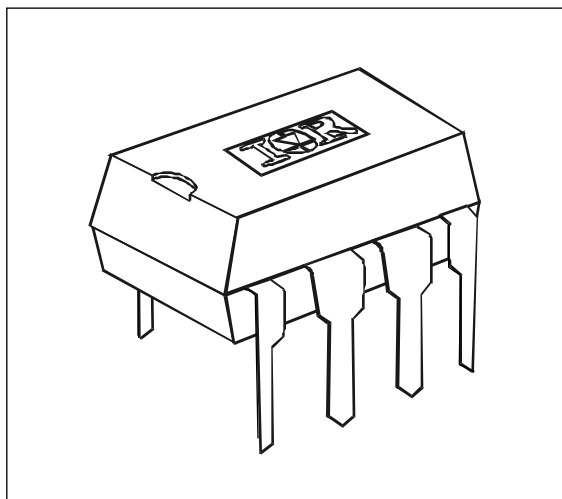
PVI5013R Photovoltaic Isolators are packaged in an 8-pin, molded DIP package with either thru-hole or "gull-wing" terminals. It is available in standard plastic shipping tubes or on tape-and-reel. Refer to Part Identification information.

Applications

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

PVI5013R Features

- Monolithic construction ■
- 3,750 V_{RMS} I/O isolation ■
- 1,200 V_{DC} 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 ($-40^{\circ}\text{C} \leq T_A \leq +85^{\circ}\text{C}$ unless otherwise specified)

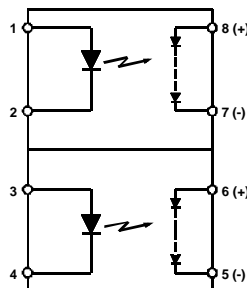
INPUT CHARACTERISTICS	Limits	Units
Min. Input Current (See Fig.1)	5.0	mA
Input Current Range (See Fig. 1)	3.0 to 25	mA
Max. Continuous Input Current @ $T_A=+25^{\circ}\text{C}$	40	mA
LED Forward Voltage Drop @ 5mA, $T_A=+25^{\circ}\text{C}$ (See Fig. 3)	1.4	V
Max. Reverse Voltage	7.0	V
Max. Reverse Current @ $-7V_{DC}$, $T_A=+25^{\circ}\text{C}$	10	μA

OUTPUT CHARACTERISTICS	Limits	Units
Min. Forward Voltage	8.0	V_{DC}
Max. Reverse Current	10	μA_{DC}

COUPLED CHARACTERISTICS	Limits	Units
Min. Output Voltage @ $I_{LED} = 5\text{mA}$, $R_L = 10\text{M}\Omega$ @ $T_A=0^{\circ}\text{C}$ to $+70^{\circ}\text{C}$ (See Fig. 1 & 2)	3	V
Max. Output Voltage @ $I_{LED} = 5\text{mA}$, $R_L = 10\text{M}\Omega$ @ $T_A=0^{\circ}\text{C}$ to $+70^{\circ}\text{C}$ (See Fig. 1 & 2)	8	V
Max. Voltage Differential Between Outputs @ $I_{LED} = 5\text{mA}$, $R_L = 10\text{M}\Omega$	1.0	V
Typical Output Short-Circuit Current @ $I_{LED} = 5\text{mA}$, @ $T_A=+25^{\circ}\text{C}$ (See Fig. 1 & 2)	1.0	μA
Max. Turn-On Time @ $I_{LED} = 5\text{mA}$, $C_{LOAD} = 200\text{pF}$ (See Fig. 4)	5	ms
Max. Turn-Off Time @ $I_{LED} = 5\text{mA}$, $C_{LOAD} = 200\text{pF}$ (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_{RMS}
Min. Dielectric Strength, Output-to-Output	1200	V_{DC}
Min. Insulation Resistance, Input-to-Output @ $T_A=+25^{\circ}\text{C}$, 50%RH, $100V_{DC}$	10^{12}	Ω
Max. Capacitance, Input-Output	5.0	pF
Max. Pin Soldering Temperature (10 seconds max.)	+260	$^{\circ}\text{C}$
Ambient Temperature Range: Operating	-40 to +85	$^{\circ}\text{C}$
Storage	-40 to +125	$^{\circ}\text{C}$

Connection Diagram



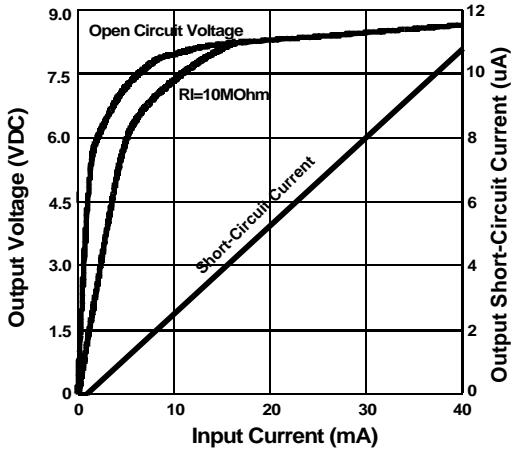


Figure 1. Typical Output Characteristics

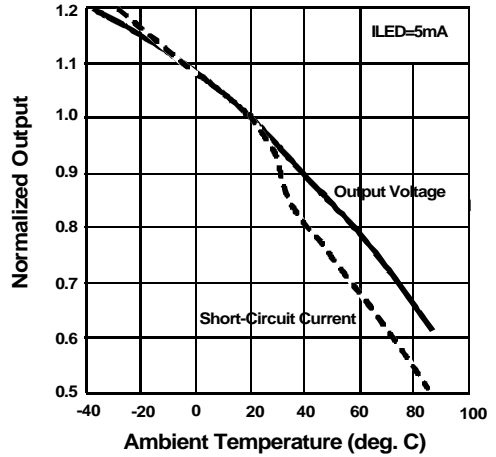


Figure 2. Typical Variation of Output

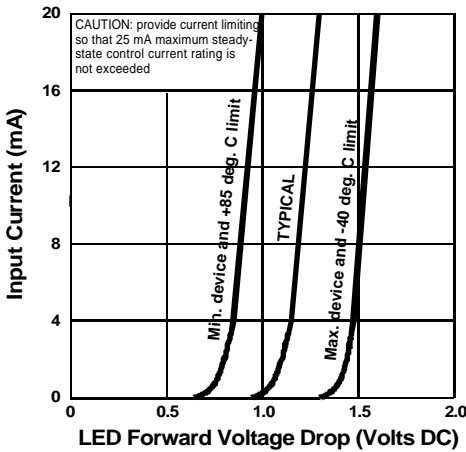


Figure 3. Input Characteristics (Current Controlled)

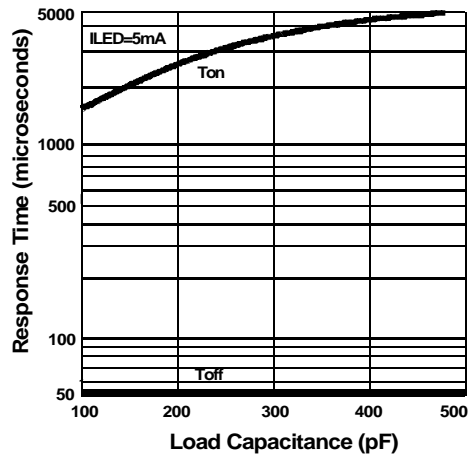
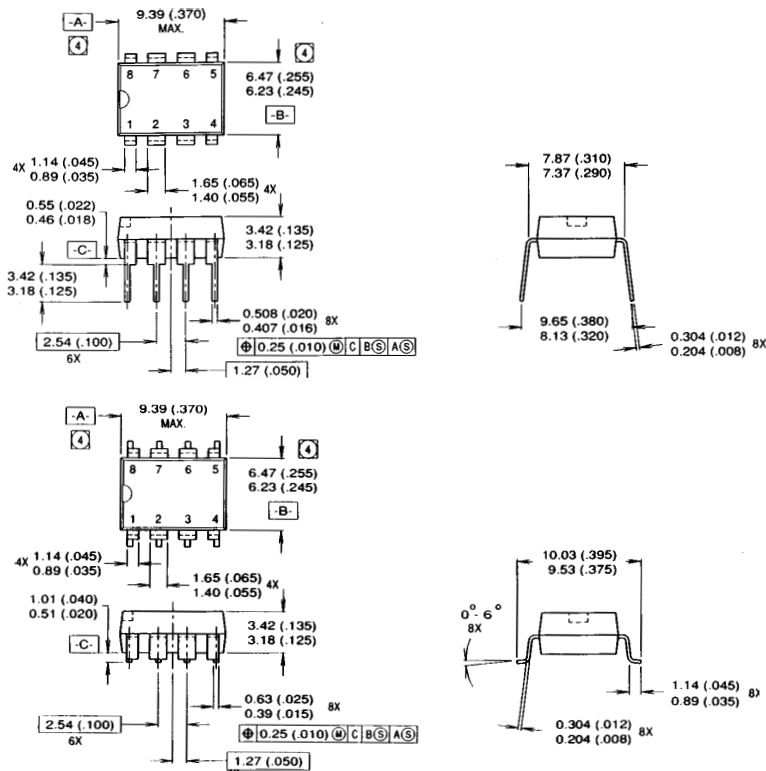


Figure 4. Typical Response Time

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
IOR Rectifier

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