

## Series PVI5033R

Photovoltaic Isolator  
Solid-State  
Opto-Isolated MOSFET Gate Driver  
Dual-Channel, 5V, 5 $\mu$ A

### General Description

The PVI5033R 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 PVI5033R 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. PVI5033R employs a fast turn-off circuitry.

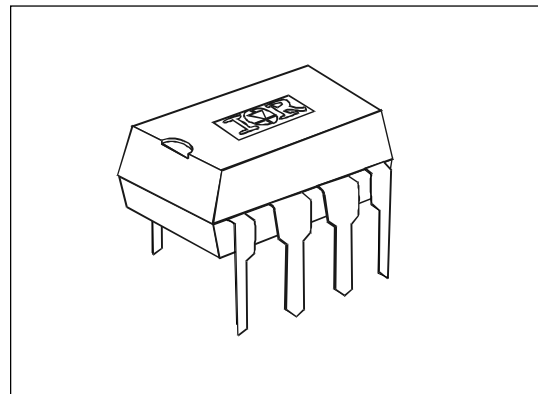
PVI5033R Photovoltaic Isolators are packaged in an 8-pin, molded DIP package with either thru-hole or "gull-wing" terminals. It is available in standard plastic shipping tubes or on tape-and-reel. Refer to Part Identification information.

### Applications

- Telecommunications
- Load Distribution
- Industrial Controls
- Instrumentation and Measurement
- Electronic Ballast

### 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 recognition pending



### Part Identification

PVI5033R	thru-hole
PVI5033RS	SMT
PVI5033RS-T	SMT, Tape and Reel

**Electrical Specifications** ( $-40^{\circ}\text{C} \leq T_A \leq +85^{\circ}\text{C}$  unless otherwise specified)

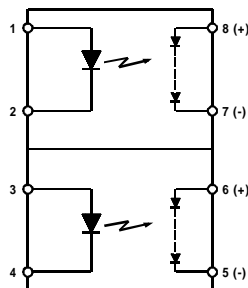
INPUT CHARACTERISTICS	Limits	Units
Min. Input Current (See Fig.1)	5.0	mA
Input Current Range (See Fig. 1)	3.0 to 25	mA
Max. Continuous Input Current @ $T_A=+25^{\circ}\text{C}$	40	mA
LED Forward Voltage Drop @ 5mA, $T_A=+25^{\circ}\text{C}$ (See Fig. 3)	1.4	V
Max. Reverse Voltage	7.0	V
Max. Reverse Current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

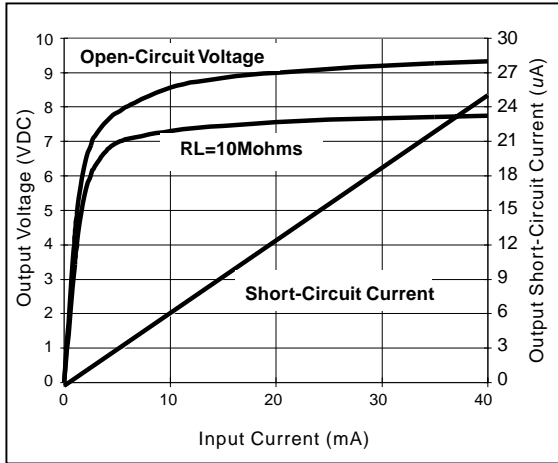
OUTPUT CHARACTERISTICS	Limits	Units
Min. Forward Voltage	8.0	$V_{DC}$
Max. Reverse Current	10	$\mu\text{A}_{DC}$

COUPLED CHARACTERISTICS	Limits	Units
Min. Output Voltage @ $I_{LED} = 10\text{mA}$ , $R_L = 10\text{M}\Omega$ @ $T_A=0^{\circ}\text{C}$ to $+70^{\circ}\text{C}$ (See Fig. 1 & 2)	5	V
Max. Output Voltage @ $I_{LED} = 10\text{mA}$ , $R_L = 10\text{M}\Omega$ @ $T_A=0^{\circ}\text{C}$ to $+70^{\circ}\text{C}$ (See Fig. 1 & 2)	10	V
Max. Voltage Differential Between Outputs @ $I_{LED} = 5\text{mA}$ , $R_L = 10\text{M}\Omega$	1.0	V
Min. Output Short-Circuit Current @ $I_{LED} = 10\text{mA}$ , @ $T_A=+25^{\circ}\text{C}$ (See Fig. 1 & 2)	5	$\mu\text{A}$
Max. Turn-On Time @ $I_{LED} = 5\text{mA}$ , $C_{LOAD} = 200\text{pF}$ (See Fig. 4)	2.5	ms
Max. Turn-Off Time @ $I_{LED} = 5\text{mA}$ , $C_{LOAD} = 200\text{pF}$ (See Fig. 4)	.5	ms
Off-State Clamping Resistance: minimum	350	$\Omega$
maximum	1500	$\Omega$

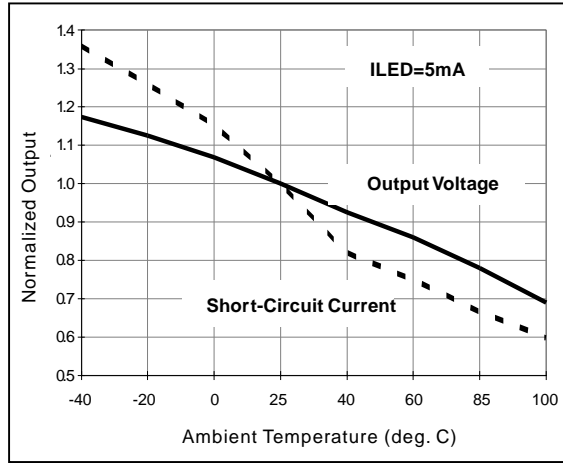
GENERAL CHARACTERISTICS	Limits	Units
Min. Dielectric Strength, Input-Output	3750	$V_{RMS}$
Min. Dielectric Strength, Output-to-Output	1200	$V_{DC}$
Min. Insulation Resistance, Input-to-Output @ $T_A=+25^{\circ}\text{C}$ , 50%RH, 100VDC	$10^{12}$	$\Omega$
Max. Capacitance, Input-Output	5.0	pF
Max. Pin 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**

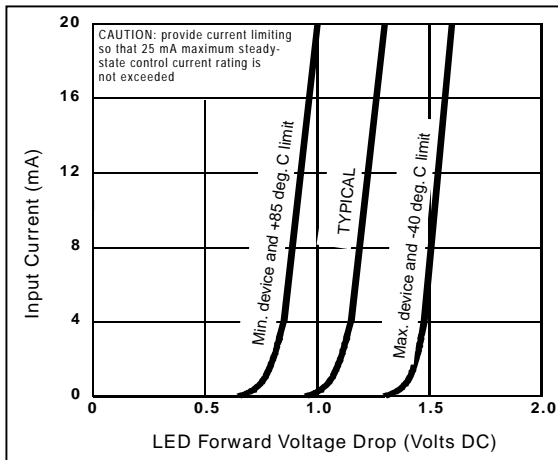




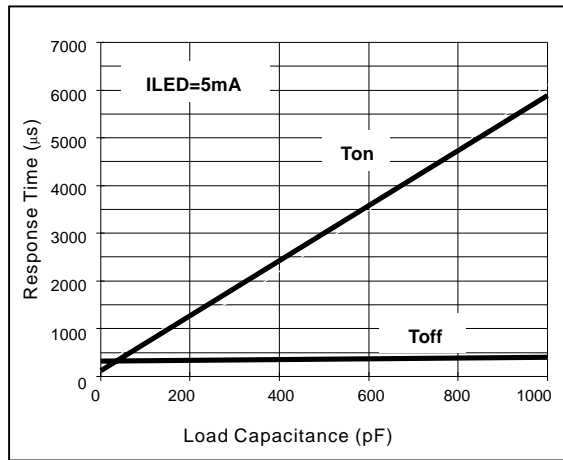
**Figure 1. Typical Output Characteristics**



**Figure 2. Typical Variation of Output**



**Figure 3. Input Characteristics (Current Controlled)**



**Figure 4. Typical Response Time**

