

Series PVI5013R

Photovoltaic Isolator

Solid-State

Opto-Isolated MOSFET Gate Driver

Dual-Channel, 5V, 1.0 μ A

General Description

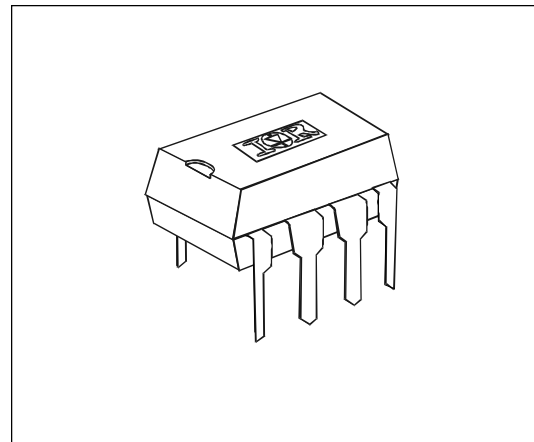
The PVI5013R Photovoltaic Isolator is a dual-channel, opto-isolated driver capable of directly driving gates of power MOSFETs or IGBTs. It utilizes a monolithic integrated circuit photovoltaic generator of novel construction as its output. The output is controlled by radiation from a GaAlAs light emitting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

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 recognized and BABT Certified



Applications

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

Part Identification

PVI5013R	through-hole
PVI5013RS	surface-mount
PVI5013RS-T	surface-mount, Tape and Reel

Series PVI5013R

International
IR Rectifier

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

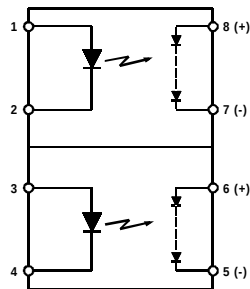
INPUT CHARACTERISTICS	Limits	Units
Minimum Input Current (see figure 1)	5.0	mA
Input Current Range (see figure 1)	3.0 to 25	mA
Maximum Continuous Input Current @ $T_A = +25^{\circ}\text{C}$	40	mA
LED Forward Voltage Drop @ 5mA, $T_A = +25^{\circ}\text{C}$ (see figure 3)	1.4	V
Maximum Reverse Voltage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

OUTPUT CHARACTERISTICS	Limits	Units
Minimum Forward Voltage	8.0	V_{DC}
Maximum Reverse Current	10	μA_{DC}

COUPLED CHARACTERISTICS	Limits	Units
Minimum 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 figures 1 and 2)	3	V
Maximum 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 figures 1 and 2)	8	V
Maximum 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 figures 1 and 2)	1.0	μA
Maximum Turn-On Time @ $I_{LED} = 5\text{mA}$, $C_{LOAD} = 200\text{pF}$ (see figure 4)	5	ms
Max. Turn-Off Time @ $I_{LED} = 5\text{mA}$, $C_{LOAD} = 200\text{pF}$ (see figure 4)	0.25	ms
Off-State Clamping Resistance:	minimum maximum	Ω Ω
	100 3300	

GENERAL CHARACTERISTICS	Limits	Units
Minimum Dielectric Strength, Input-Output	3750	V_{RMS}
Minimum Dielectric Strength, Output-to-Output	1200	V_{DC}
Minimum Insulation Resistance, Input-to-Output @ $T_A = +25^{\circ}\text{C}$, 50%RH, $100V_{DC}$	10^{12}	Ω
Maximum Capacitance, Input-Output	5.0	pF
Maximum Pin Soldering Temperature (10 seconds maximum)	+260	$^{\circ}\text{C}$
Ambient Temperature Range:	Operating Storage	$^{\circ}\text{C}$ $^{\circ}\text{C}$
	-40 to +85 -40 to +125	

Connection Diagram



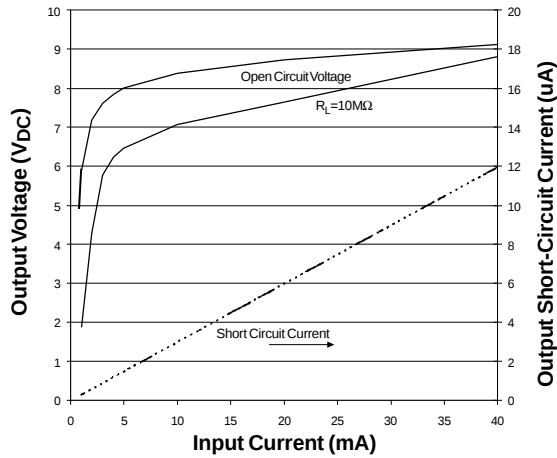


Figure 1. Typical Output Characteristics

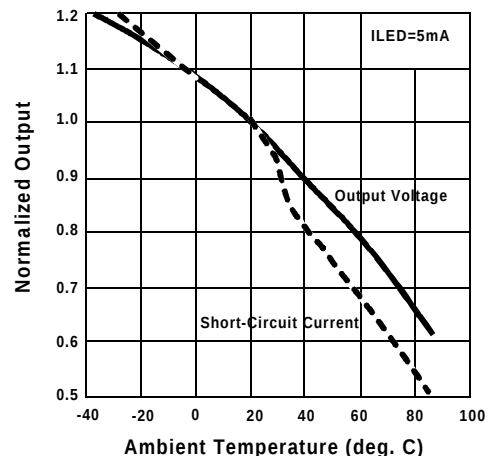


Figure 2. Typical Variation of Output

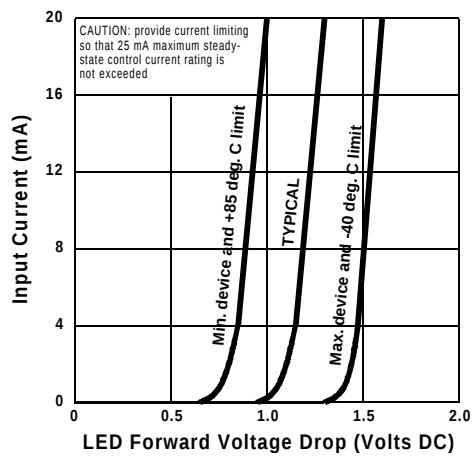


Figure 3. Input Characteristics (Current Controlled)

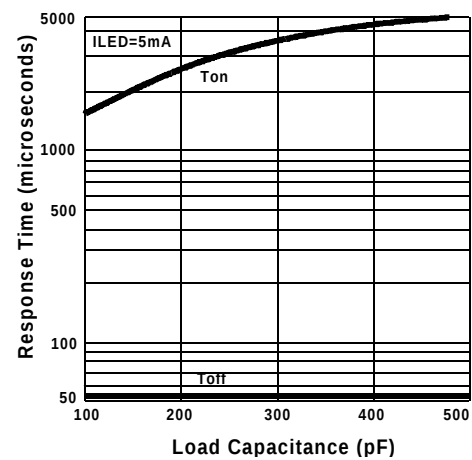


Figure 4. Typical Response Time

Case Outlines

