International
IOR Rectifier

Data Sheet No. PD10041-D

Series PVI5013R

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

General Description

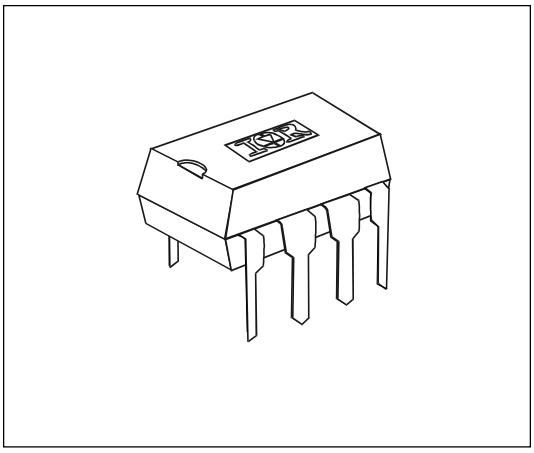
The PVI5013R Photovoltaic Isolator is a dual-channel, opto-isolated driver capable of directly driving gates of power MOSFETs or IGBTs. It utilizes a monolithic integrated circuit photovoltaic generator of novel construction as its output. The output is controlled by radiation from a GaAlAs light emitting 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 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	thru-hole
PVI5013RS	surface-mount
PVI5013RS-T	surface-mount, Tape and Reel

Electrical Specifications (-40°C ≤ T_A ≤ +85°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°C	40	mA
LED Forward Voltage Drop @ 5mA, T_A=+25°C (see figure 3)	1.4	V
Maximum Reverse Voltage	7.0	V
Maximum Reverse Current @ -7V_{DC}, T_A=+25°C	10	µA

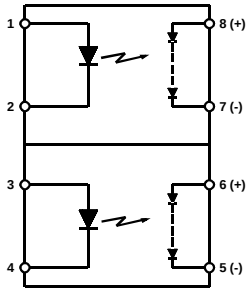
OUTPUT CHARACTERISTICS	Limits	Units
Minimum Forward Voltage	8.0	V_{DC}
Maximum Reverse Current	10	µA_{DC}

COUPLED CHARACTERISTICS	Limits	Units
Minimum Output Voltage @ I_{LED} = 5mA, R_L = 10MΩ @ T_A=0°C to +70°C (see figures 1 and 2)	3	V
Maximum Output Voltage @ I_{LED} = 5mA, R_L = 10MΩ @ T_A=0°C to +70°C (see figures 1 and 2)	8	V
Maximum Voltage Differential Between Outputs @ I_{LED} = 5mA, R_L = 10MΩ	1.0	V
Typical Output Short-Circuit Current @ I_{LED} = 5mA, @ T_A=+25°C (see figures 1 and 2)	1.0	µA
Maximum Turn-On Time @ I_{LED} = 5mA, C_{LOAD} = 200pF (see figure 4)	5	ms
Max. Turn-Off Time @ I_{LED} = 5mA, C_{LOAD} = 200pF (see figure 4)	0.25	ms
Off-State Clamping Resistance: minimum	100	Ω
maximum	3300	Ω

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°C, 50%RH, 100V_{DC}		10^{12}	Ω
Maximum Capacitance, Input-Output		5.0	pF
Maximum Pin Soldering Temperature (10 seconds maximum)		+260	°C
Ambient Temperature Range:	Operating	-40 to +85	°C
	Storage	-40 to +125	°C

International Rectifier does not recommend the use of this product in aerospace, avionics, military or life support applications. Users of this International Rectifier product in such applications assume all risks of such use and indemnify International Rectifier against all damages resulting from such use.

Connection Diagram



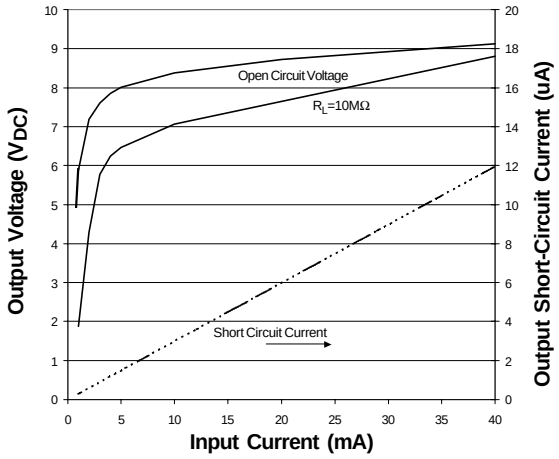


Figure 1. Typical Output Characteristics

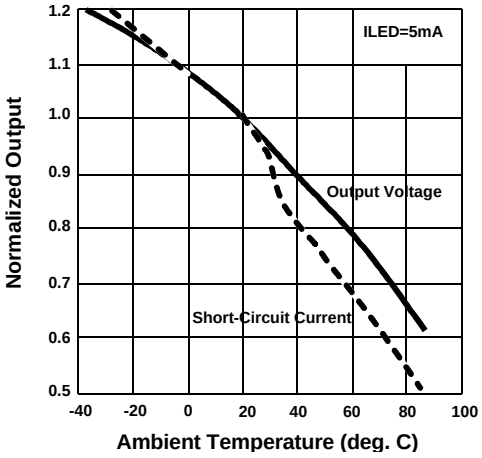


Figure 2. Typical Variation of Output

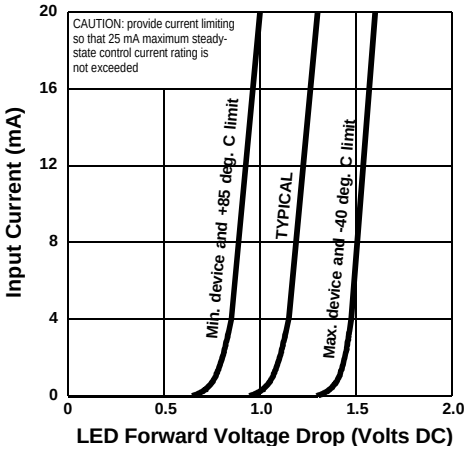


Figure 3. Input Characteristics (Current Controlled)

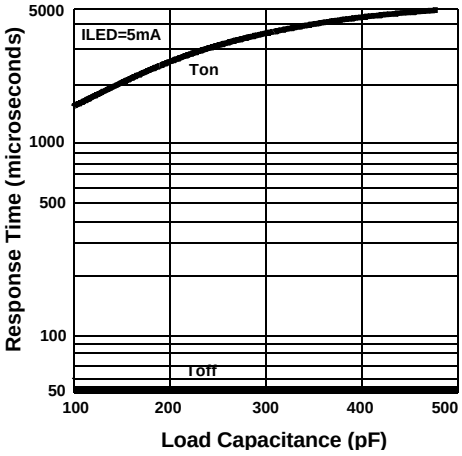
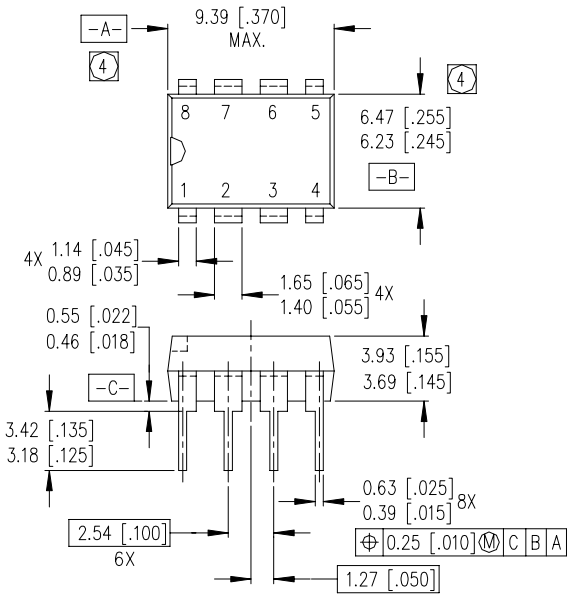
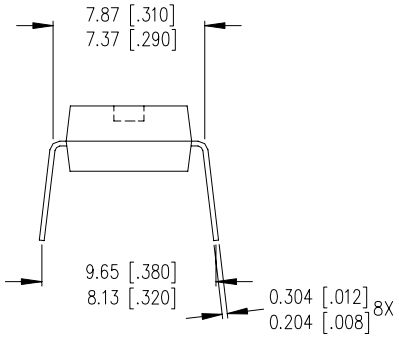


Figure 4. Typical Response Time

Case Outlines



NOTES:
1. DIMENSIONING & TOLERANCING PER ANSI Y14.5M–1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
4. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS SHALL NOT EXCEED 0.25 [.010].
5. PRODUCTS AFFECTED: PVI1050N, PVT322, PVT322A, PVT422, PVI5013R AND PVI5033R.



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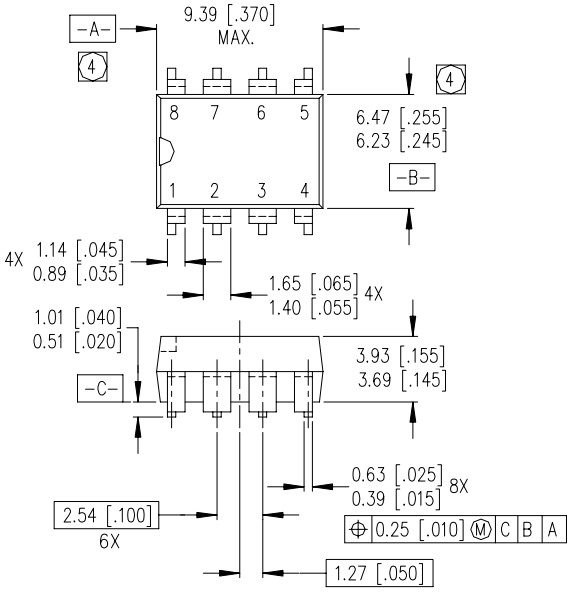

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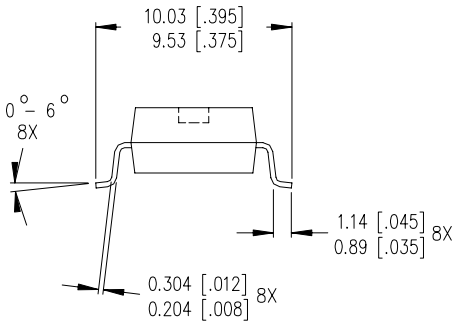
5. PRODUCTS AFFECTED: PVI1050NS, PVT322S, PVT322AS, PVT422S, PVI5013RS AND PVI5033RS.



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