International
IOR Rectifier

Data Sheet No. PD10041C

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.

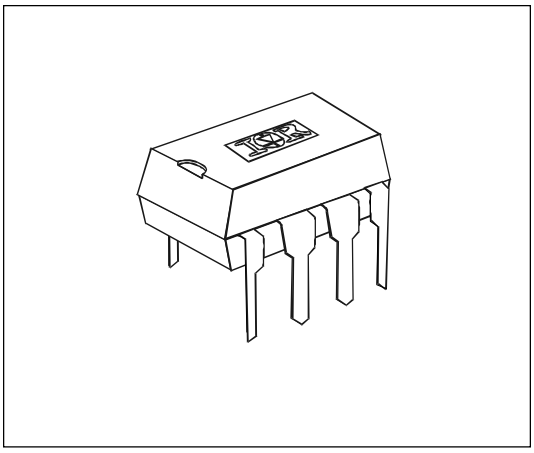
The PVI5013R is ideally suited for applications requiring high-current and/or high voltage switching with optical isolation between the low-level driving circuitry and high-energy or high- voltage load circuits. It can be used for directly driving gates of power MOSFETs. The dual-channel configuration 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 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

Electrical Specifications (-40°C ≤ T_A ≤ +85°C unless otherwise specified)

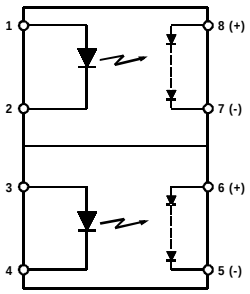
INPUT CHARACTERISTICS	Limits	Units
Minimum Input Current (see figure 1)	5.0	mA
Input Current Range (see figure 1)	3.0 to 25	mA
Maximum Continuous Input Current @ T_A=+25°C	40	mA
LED Forward Voltage Drop @ 5mA, T_A=+25°C (see figure 3)	1.4	V
Maximum Reverse Voltage	7.0	V
Maximum Reverse Current @ -7V_{DC},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

Connection Diagram



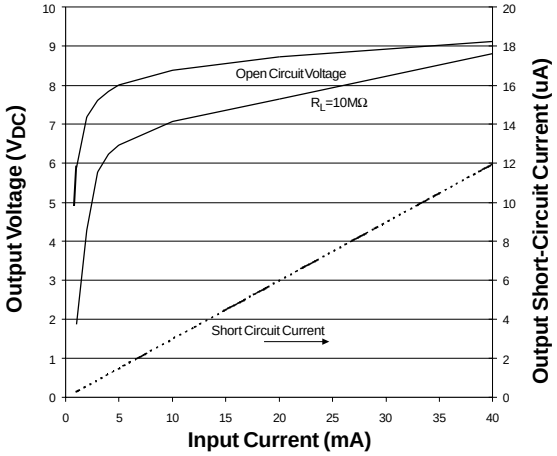


Figure 1. Typical Output Characteristics

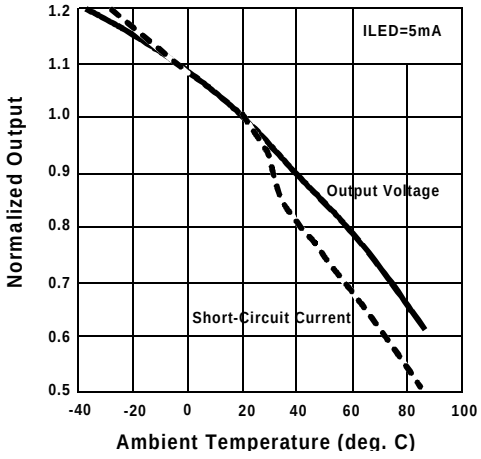


Figure 2. Typical Variation of Output

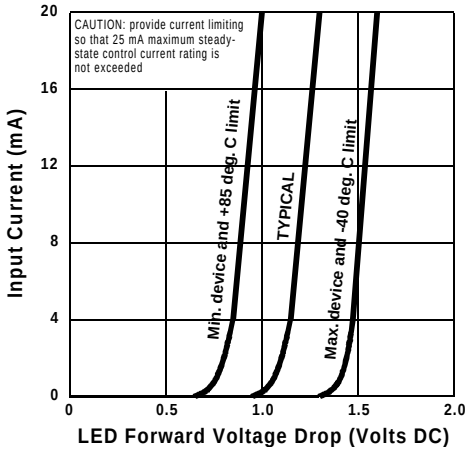


Figure 3. Input Characteristics (Current Controlled)

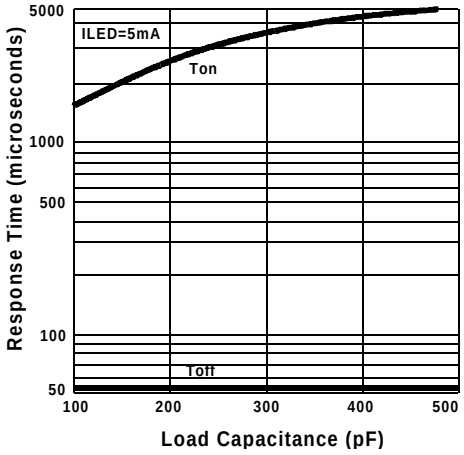
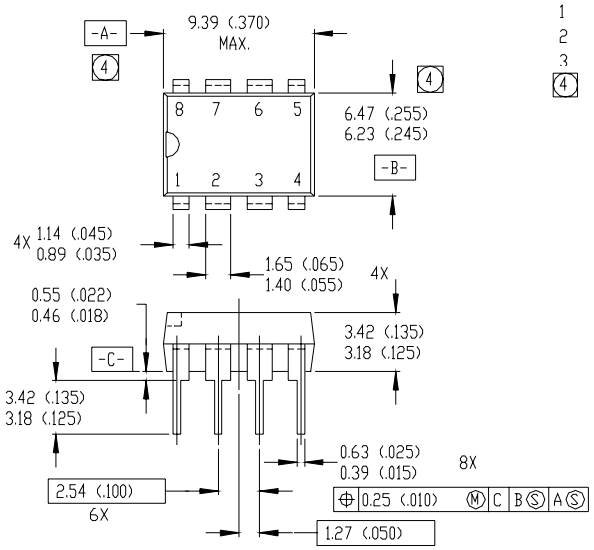
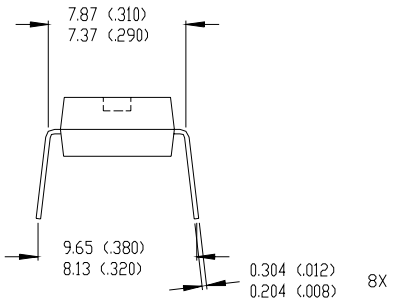


Figure 4. Typical Response Time

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).



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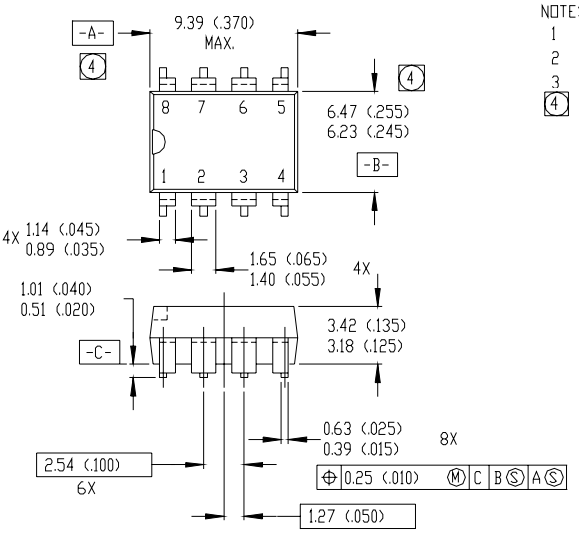

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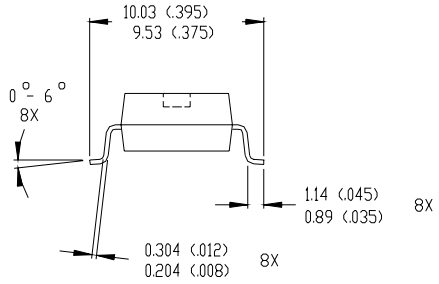

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