International
IOR Rectifier

Data Sheet No. PD10054

Series PVI-N

Photovoltaic Isolator
Single and Dual Channel
5-10 Volt Output

General Description

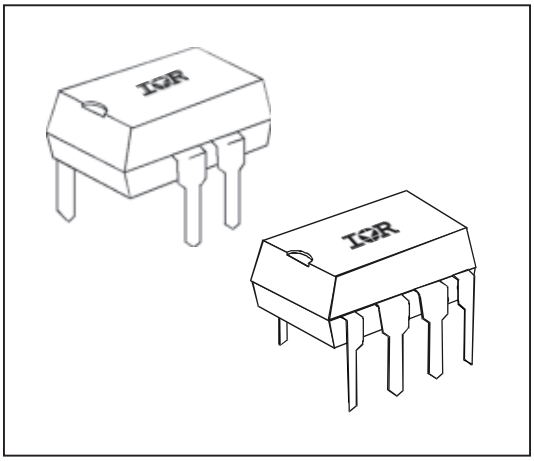
The PVI Series Photovoltaic Isolator generates an electrically isolated DC voltage upon receipt of a DC input signal. It is capable of directly driving gates of power MOSFETs or IGBTs. It utilizes a monolithic integrated circuit photovoltaic generator of novel construction as its output. The output is controlled by radiation from a GaAlAs light emitting diode (LED), which is optically isolated from the photovoltaic generator.

The PVI Series 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 device 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. The PVI Series Photovoltaic isolators employ fast turn-off circuitry.

These PVI Series Photovoltaic Isolators are packaged in 8-pin, molded DIP packages and available with either through-hole or surface-mount (“gull-wing”) leads, in plastic shipping tubes.

Features

- Isolated Voltage Source
- Monolithic Construction
- Up to 8μA Output
- Single or Dual Output
- Solid-State Reliability



Applications

- Load Distribution
- Industrial Controls
- Current-to-Voltage Conversion
- Custom Solid-State Relay

Part Identification

PVI1050N PVI5050N PVI5080N	through-hole
PVI1050NS PVI5050NS PVI5080NS	surface-mount (gull-wing)

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

INPUT CHARACTERISTICS	PVI Series	Units
Input Current Range (see figure 4)	2.0 to 50	mA (DC)
Maximum Forward Voltage Drop @ 10mA, 25°C (see figure 5)	1.4	V (DC)
Maximum Reverse Voltage	7.0	V(DC)
Maximum Reverse Current @ -7.0V (DC), 25°C	100	µA(DC)
Maximum Pulsed Input Current @ 25°C (see figure 6)	1.0	A(peak)

OUTPUT CHARACTERISTICS	PVI Series	Units
Maximum Forward Voltage @ 10µA	8.0 per channel	$V_{(DC)}$
Maxiumum Reverse Current @ -10VDC	10	µA(DC)

COUPLED CHARACTERISTICS	PVI5050N	PVI5080N	PVI1050N	Units
Minimum Open Circuit Voltage @ ILED = 10mA, 25°C, RL = >10MΩ (see figures 1 to 2)	5.0		5.0/channel 10 series	V (DC)
Minimum Short Circuit Current @ ILED = 10mA, 25°C (see figures 1 to 2)	5.0	8.0	5.0 /channel 10 parallel	µA (DC)
Maximum Capacitance (Input/Output)	1.0		2.0	pF
Maximum Ton Time @ ILED=10mA, CLOAD=10pF (See Figure7)				
RL>20MΩ	300			µS
RL=10MΩ	160			µS
RL=4.7MΩ	90			µS
Maximum Toff Time @ ILED=10mA, CLOAD=10pF (See Figure7)	220			µS

GENERAL CHARACTERISTICS	PVI5050N/5080N	PVI1050N	Units
Min. Dielectric Strength, Input-Output	4000	2500	V_{RMS}
Min. Dielectric Strength, Output-to-Output	1200		V_{DC}
Min. Insulation Resistance, Input-to-Output @T_A=+25°C, 50%RH, 100V_{DC}	10^{12}		Ω
Max. Pin Soldering Temperature (10 seconds max.)	+260		°C
Ambient Temperature Range: Operating	-40 to +85		°C
Storage	-40 to +125		°C

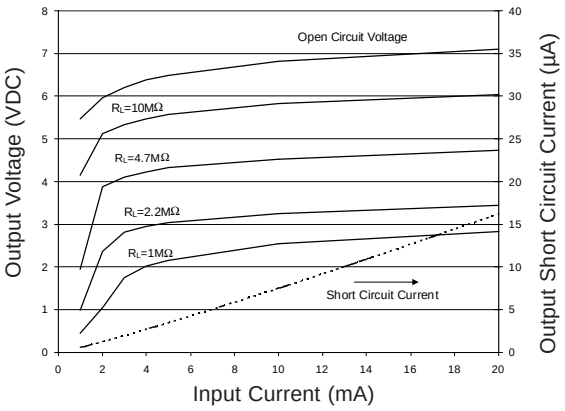


Figure 1. PVI5050N, PVI1050N Typical Output Characteristics

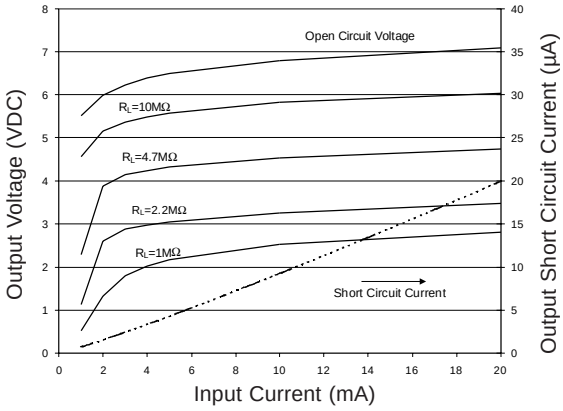


Figure 2. PVI15080N Typical Output Characteristics

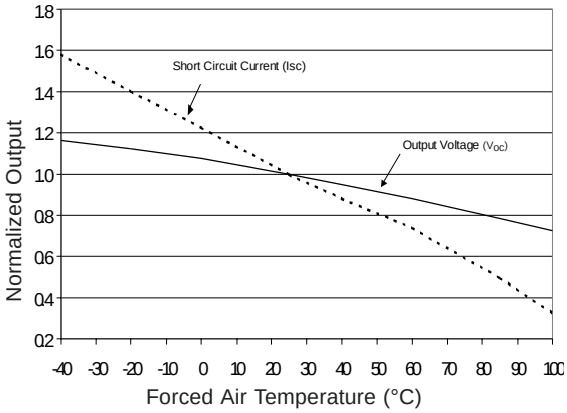


Figure 3. Typical Variation of Output

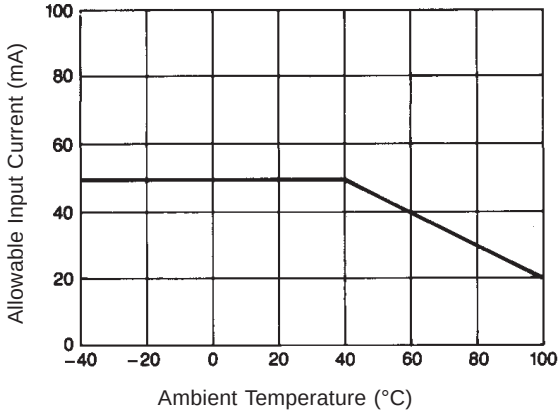


Figure 4. Input Current Derating

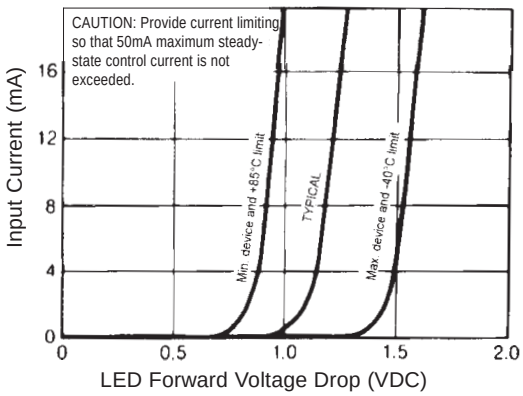


Figure 5. Input Characteristics

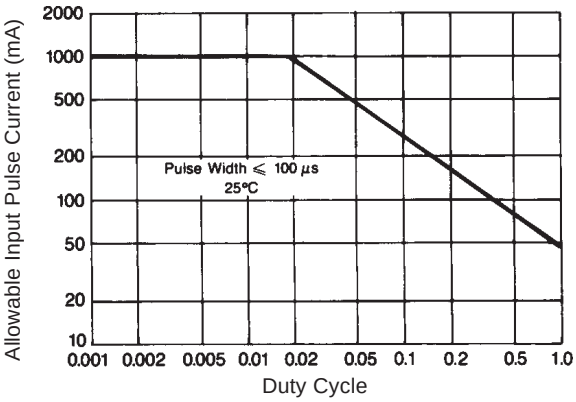


Figure 6. Input Pulse Capability

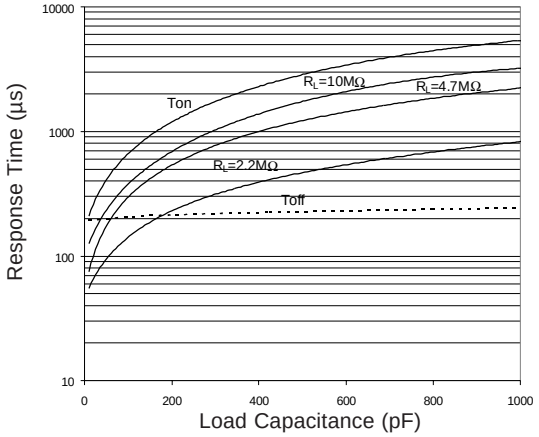
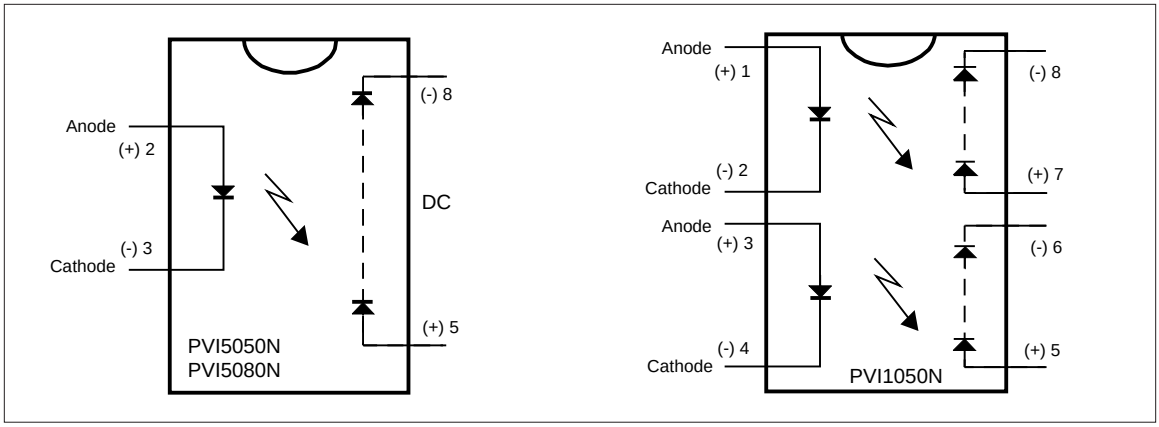


Figure 7. Typical Response Time

Wiring Diagram

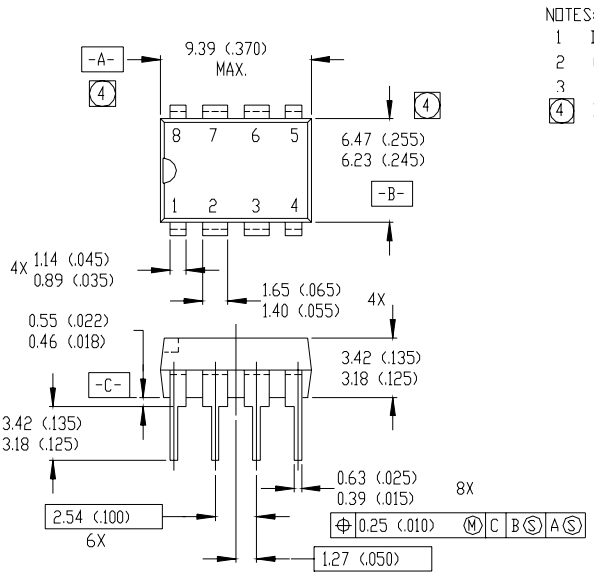


Application Note:

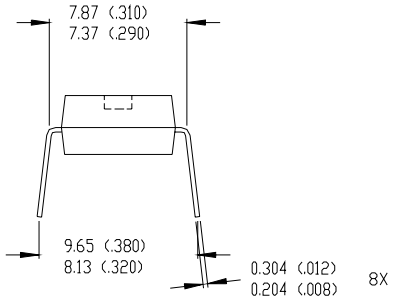
The outputs of the PVI1050N (pins 5-6 and 7-8) may be placed in series connection to produce a 10-volt output with a 5µA minimum short circuit current. Alternatively, the two ouptut of the PVI1050 may be connected in parallel to produce a 5.0-volt ouput with a 10µA minimum short circuit current.

The two outputs of the PVI1050N may be applied separately with a maximum 1200VDC between the outputs. Input-to-output isolation to either output is 2500V (RMS).

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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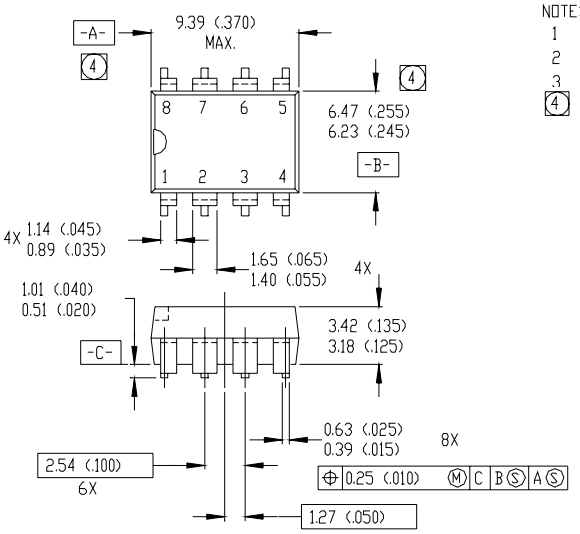

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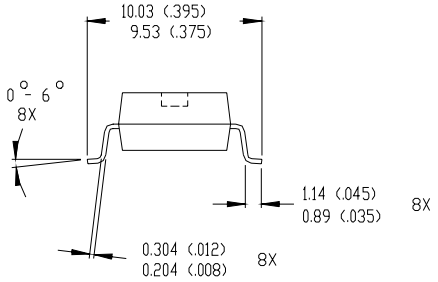

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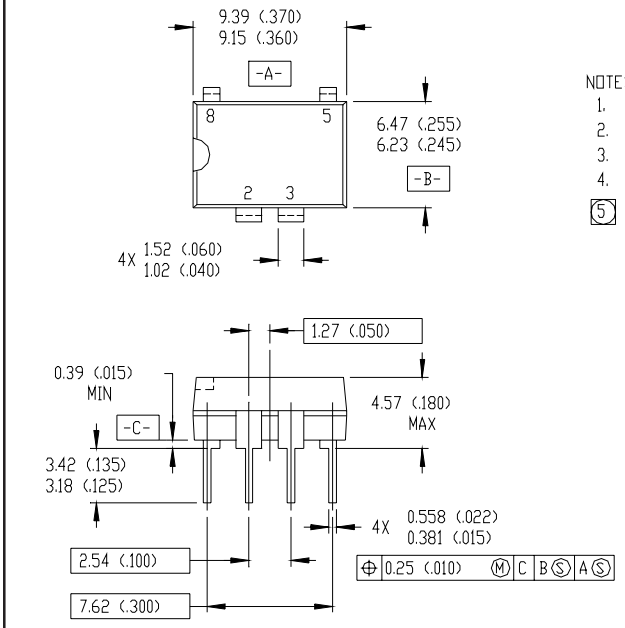
Case Outlines



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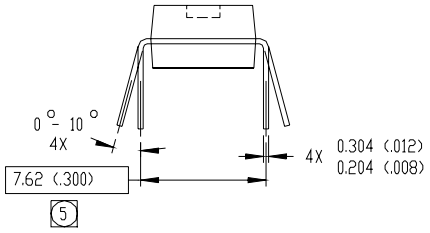
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-001AB.
5. MEASURED WITH THE LEADS CONSTRAINED TO BE PERPENDICULAR TO DATUM PLANE C.



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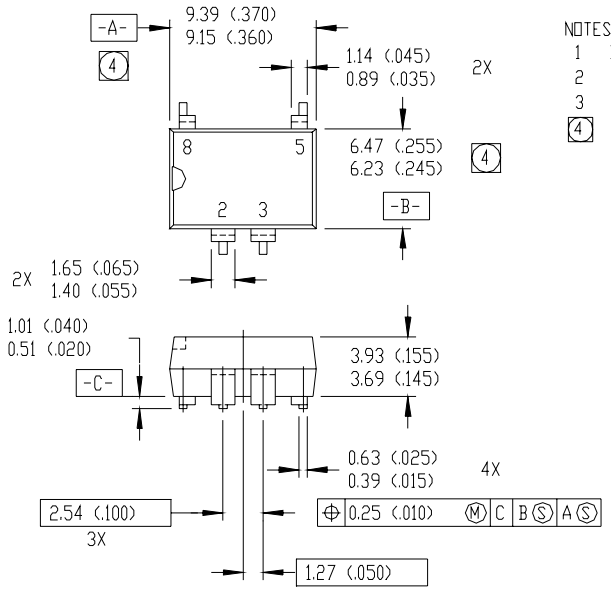

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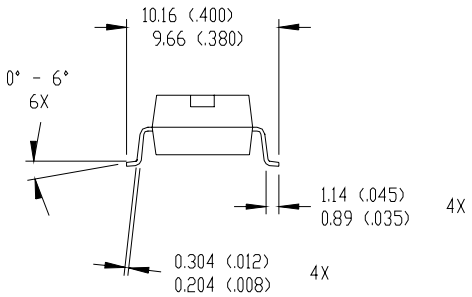

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