#### Data Sheet No. PD 10029-G

#### **Series PVI**

Photovoltaic Isolator 5-10 Volt Output

### **General Description**

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**ICR** Rectifier

The PVI Photovoltaic Isolator generates an electrically isolated DC voltage upon receipt of a DC input signal. The input of the PVI is a light-emitting diode (LED) which is optically coupled to, but electrically isolated from, the output. A GaAIAs LED is used for high output and maximum stability. The infrared emission from the LED energizes, by photovoltaic action, a series connection of silicon PN junctions. A unique alloyed junction stack which is edge-illuminated is used to form the output photovoltaic generators. This novel structure produces extremely high operating efficiency. Units are available with a single 5-volt output or dual 5-volt outputs which can be series connected to produce 10 volts.

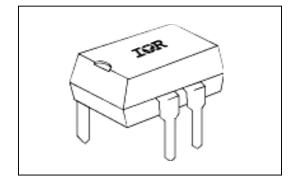
A PVI can serve as an isolator, a coupler and as an isolated voltage source. As an isolator, the PVI can serve as the key component in a solid state relay circuits. The PVI is ideally suited for driving power MOS-FETs and IGBTs or sensitive gate SCRs to form solid state relays.

As a coupler, the PVI can sense a low-level DC signal and transmit a voltage signal to an electrically remote circuit. As a voltage source, the PVI can function as a 'DC transformer' by providing an isolated, low-current DC source for biasing or supplying power to low quiescent current electronic devices.

Conventional optocouplers merely modulate the resistance of an output device such as a transistor, diode or resistor. Such optocouplers require a separate voltage source to detect the presence of an input signal. In contrast, a PVI actually transmits (and transforms) energy across the isolation barrier and directly generates an output voltage. This DC voltage, available at a 2500VAC isolation level, gives circuit designers a new and uniquely useful electronic component.

#### Features

- Isolated Voltage Source
  - MOSFET Driver
  - Up to 10µA Output
    - Fast Response
      - GaAIAs LED
- 2500V (RMS) Isolation
  - 8-pin DIP Package
  - Single or Dual Output



### Part Identification

Part Number	Outputs	Output Voltage	Output Current	
PVI5050	1	5.0V	5µA	
PVI5080	1	5.0V	8µA	
PVI1050	2	5.0/10.0V	10/5µA	

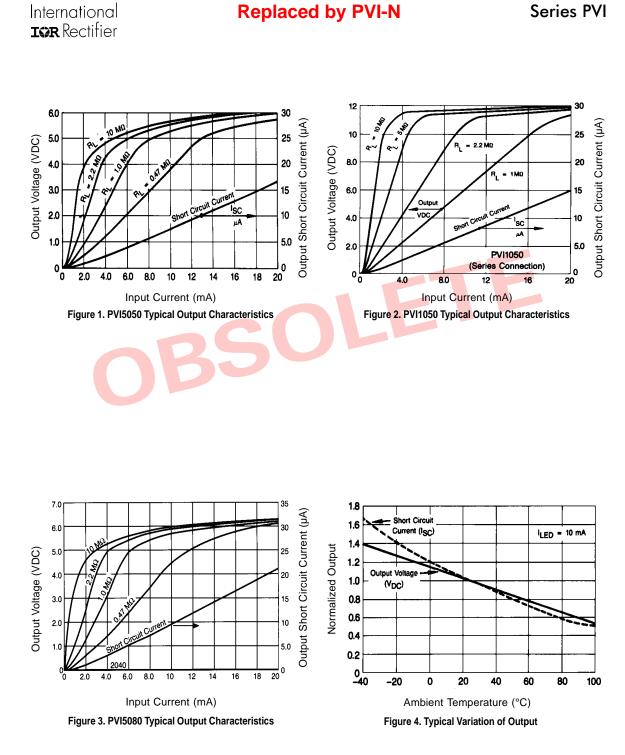
## **Electrical Specifications (**-40°C $\leq$ T<sub>A</sub> $\leq$ +85°C unless otherwise specified)

INPUT CHARACTERISTICS	PVI Series	Units
Input Current Range (see figure 6)	2.0 to 50	mA (DC)
Maximum Forward Voltage Drop @ 10mA, 25°C (see figure 7)	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 8)	1.0	A(peak)

OUTPUT CHARACTERISTICS	PVI Series	Units
Maximum Forward Voltage @ 10µA	8.0 per channel	V <sub>(DC)</sub>
Maxiumum Reverse Current @ -10VDC	10	µA(DC)
	10	µ∧(⊔

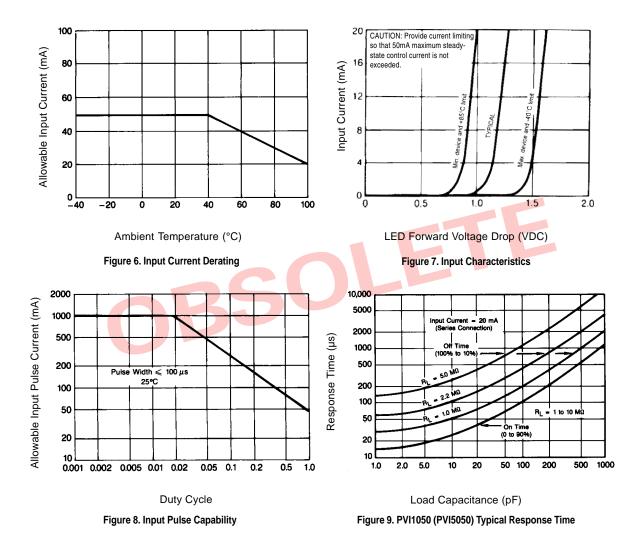
COUPLED CHARACTERISTICS		PVI5050	PVI5080	PVI1050	Units
Minimum Open Circuit Voltage @ 10mA, 25°C (see	figures 1 to 4)	5.	0V	5.0V/channel 10V series	V (DC)
Minimum Short Circuit Current @ 10mA, 25°C (see	figures 1 to 3)	5μΑ	8µA	5.0µA/channel 10µA parallel	µA (DC)
Maximum Capacitance (Input/Output)		1	.0	2.0	pF
Maximum Turn-On Time @ 20mA Input, 25°C	RL=5.0MΩ	30	30	30	μs
(see figure 9)	$R_L=1.0M\Omega$	40	40	40	μs
Maximum Turn-Off Time @ 20mA Input, 25°C	RL=5.0MΩ	400	400	400	μs
(see figure 9)	RL=1.0MΩ	100	100	100	μs
Insulation Resistance @ 90VDC (Input/Output)		1	0 <sup>12</sup>		Ω
Dielectric Strength	Input/Output	2500		V(RMS)	
	Between Outputs	N	/A	1200	V(DC)

GENERAL CHARACTERISTICS		PVI Series	Units
Ambient Temperature Range	Operating	-40 to +100	
	Storage	-40 to +100	°C
Maximum Lead Temperature (1.6mm below seatin	g plane for 10 seconds)	280	

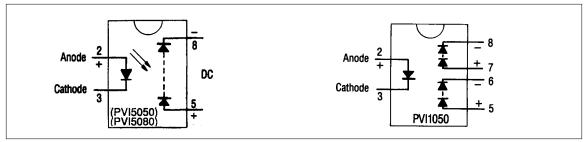


**Series PVI** 

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## **Wiring Diagram**



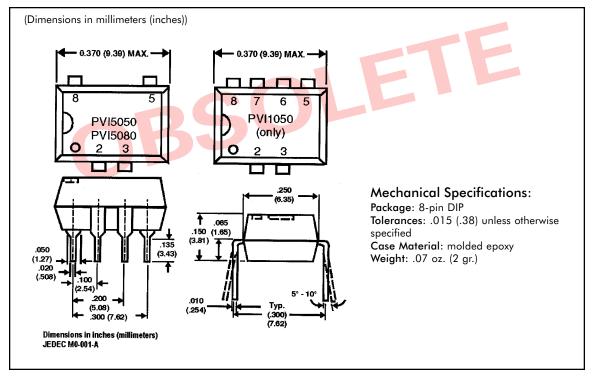
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## **Application Note:**

The outputs of the PVI1050 (pins 5-6 and 7-8) may be placed in series connection to produce a 10-volt output with a  $5\mu$ A 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  $10\mu$ A minimum short circuit current.

The two outputs of the PVI1050 may be applied separately with a maximum 1200VDC between the outputs. Input-to-output isolation to either output is 2500V (RMS).

## **Case Outline**



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Data and specifications subject to change without notice. 12/6/2000