

INTERNATIONAL RECTIFIER



CRYDOM

# SERIES PVR

## BOSFET

### PhotoVoltaic Relay

Two Pole, 180 mA  
0-300V AC/DC

#### GENERAL DESCRIPTION:

The Crydom Photovoltaic Relay (PVR) is a two pole, normally open solid state replacement for electromechanical Reed Relays. It utilizes as an output switch a unique bidirectional (AC or DC) mosfet power IC termed a BOSFET. The BOSFET is controlled by a photovoltaic generator of novel construction, which is energized by radiation from a dielectrically isolated Light Emitting Diode.

#### PVR FEATURES

The PVR overcomes the limitations of Reed Relays by offering the solid state advantages of long life, high operating speed, low pick-up power, bounce free operation, low thermal voltages and miniaturization. These advantages allow product improvement and design innovations in many applications such as process control, multiplexing, telecommunications, automatic test equipment, and data acquisition.

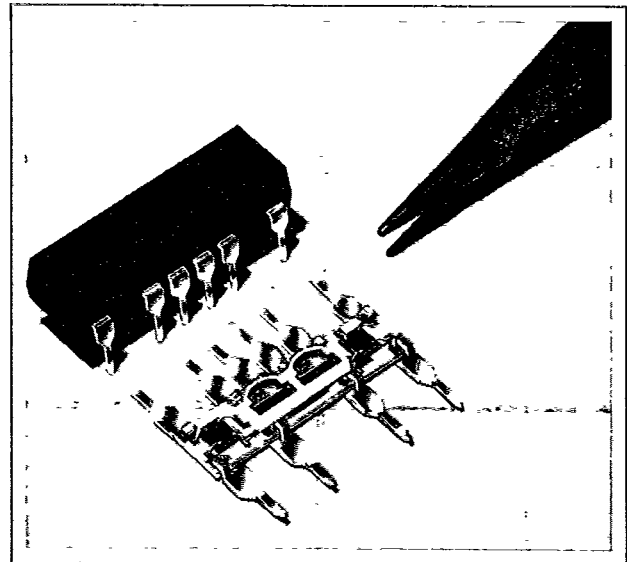
The PVR switches analog signals from thermocouple level to 300 volts peak AC or DC polarity. Signal frequencies into the RF range are easily controlled and switching rates up to 5 kHz are achievable. The extremely small thermally generated offset voltages allow increased measurement accuracies.

Unique silicon technology developed by International Rectifier forms the heart of the Crydom PVR. The monolithic BOSFET contains a bidirectional N channel power mosfet output structure. In addition, this power IC chip also has input circuitry for fast turn-off and gate protection functions. This section of the BOSFET chip utilizes both bipolar and MOS technology to form NPN transistors, P channel mosfets, resistors, diodes and capacitors.

The photovoltaic generator similarly utilizes a unique International Rectifier alloyed multi-junction structure. The excellent current conversion efficiency of this technique results in the very fast response of the Crydom PVR.

This advanced semiconductor technology has created a radically new control device. Designers can now develop analog switching systems to new standards of electrical performance and mechanical compactness.

- BOSFET Power IC
- 10<sup>10</sup> Operations
- 250  $\mu$ Sec Operating Time
- 0.2  $\mu$ Volt Thermal Offset
- 5 milliwatts Pick-Up Power
- 1000V/ $\mu$ sec dv/dt
- Bounce Free
- TO-116 Pinout
- -40°C to 80°C



#### Part Identification

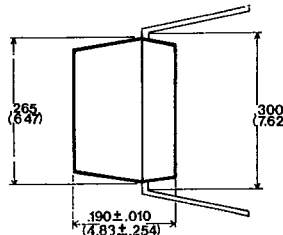
Part No.	Operating Voltage	Off-state Resistance
PVR2300	0-200V AC/DC	10 <sup>8</sup> ohms
PVR3300	0-300V AC/DC	
PVR3301		10 <sup>10</sup> ohms

# CRYDOM BOSFET<sup>®</sup> PhotoVoltaic Relay

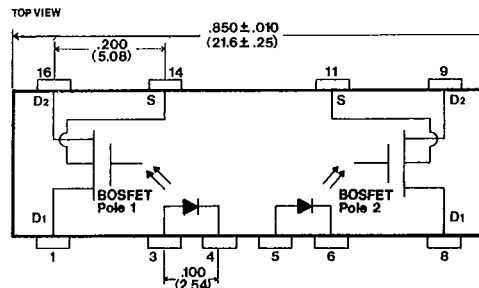
SPECIFICATIONS: (-40°C ≤ T <sub>A</sub> ≤ 80°C unless otherwise specified)	PART NO.			Units
	PVR2300	PVR3300	PVR3301	
<b>Input Characteristics</b> (See Fig. 4) Min. Allowable Control Current: For 20mA Continuous Load Current. For 100mA Continuous Load Current. For 20mA Continuous Load Current.		2.0 @ 25°C 5.0 @ 25°C 5.0 @ 80°C		mA (DC) mA (DC) mA (DC)
Min. Turn-Off Current		10		μA (DC)
Min. Turn-Off Voltage		0.6		V (DC)
Control Current Range (Caution: Current limit input LED. See Fig. 6)		2.0 to 25		mA (DC)
Max. Reverse Voltage		-7.0		V (DC)
<b>Response Time</b> (See Fig. 7) Max. T <sub>(on)</sub> @ 8 mA Control, 100 mA load, 100 VDC, 25°C., 0 to 90% Max. T <sub>(off)</sub> @ 8 mA Control, 100 mA load, 100 VDC, 25°C., 100% to 10%		250		microsec
		50		microsec
<b>Output Characteristics</b> Operating Voltage Range	0 ±200	0 ± 300		V (peak)
Max. Load Current 40°C (See Fig. 1) AC (See Wiring Diagram "A") DC (See Wiring Diagram "B") DC (See Wiring Diagram "C")		180 200 260		mA (peak) mA (DC) mA (DC)
Max. On-State Resistance 25°C (See Fig. 2) (50 mA load, 8 mA Control) AC Connection (See Wiring Diagram "A") DC Connection (See Wiring Diagram "B") DC Connection (See Wiring Diagram "C")		24 12 6		Ohms Ohms Ohms
Min. Off-State Resistance at 10 VDC, 25°C (see Fig. 5)		1x10 <sup>8</sup>	1x10 <sup>10</sup>	Ohms
Min. Off-State Resistance at 240 VDC, 25°C (see Fig. 5)		0.2x10 <sup>8</sup>	1x10 <sup>9</sup>	Ohms
Max. Thermal Offset Voltage, 5.0 mA Control		0.2		μ volts
Min Off-State dv/dt		1000		v/μs
Output Capacitance (See Fig. 3)		12		pf @ 50 VDC
<b>General Characteristics</b> Dielectric Strength-Input/Output Insulation Resistance @ 500 VDC-Input/Output		1500 10 <sup>9</sup>		V (RMS) Ohms
Max. Capacitance-Input/Output		1.0		pf
Ambient Temperature Range: Operating		-40 to 80		°C
Ambient Temperature Range: Storage		-40 to 100		°C

### Mechanical Specifications

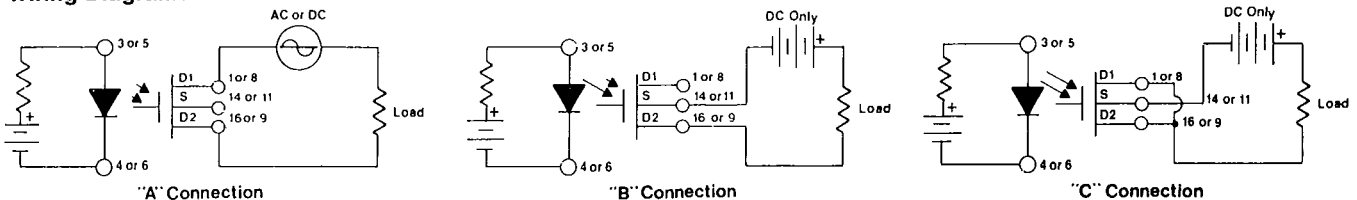
TO-116 Pinout



Dimensions in Inches (Millimeters)



### Wiring Diagrams



2

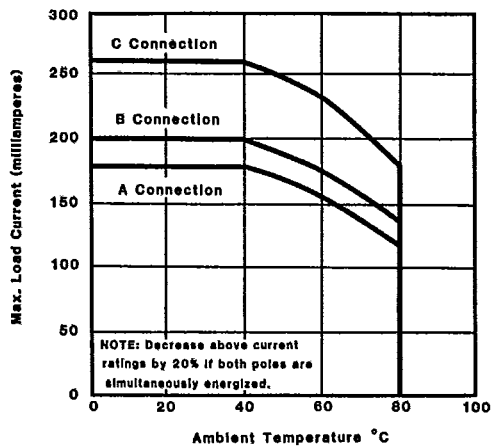


FIGURE 1. Current Derating Curve

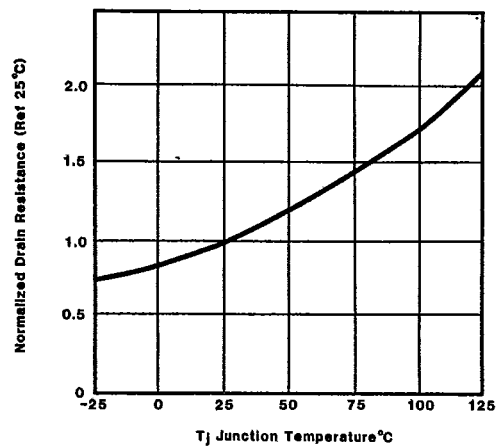


FIGURE 2. Normalized On-Resistance

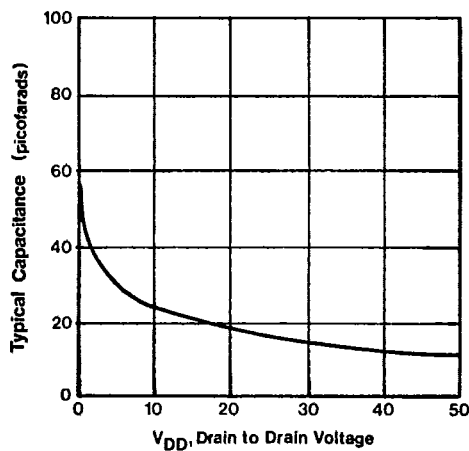


FIGURE 3. Typical Output Capacitance

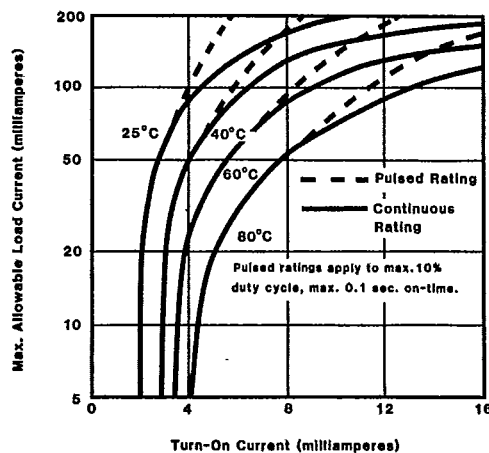


FIGURE 4. Minimum Control Current For Full Turn-on

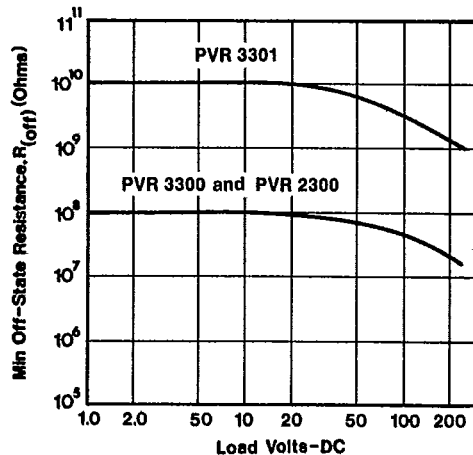


FIGURE 5. Off-State Resistance

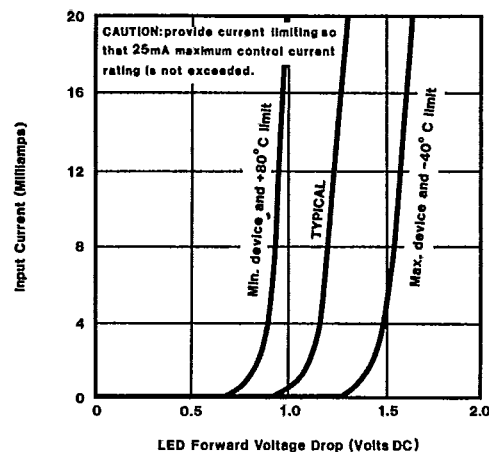


FIGURE 6. LED Input Characteristics

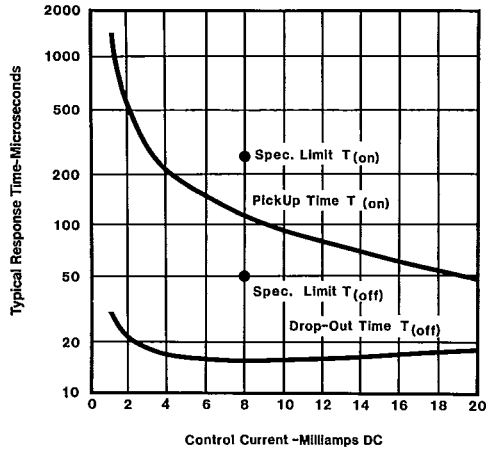


FIGURE 7. Typical Response Time

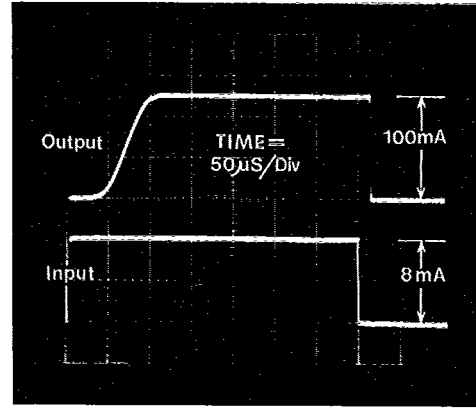


FIGURE 8. Switching Waveforms

Data and specifications subject to change without notice



**CRYDOM**

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