

## Microelectronic Power IC

HEXFET® Power MOSFET Photovoltaic Relay  
 Single-Pole, Normally-Open, 0-150V, 550mA AC / 825mA DC

### General Description

The PVT212 Series Photovoltaic Relay is a single-pole, normally open solid-state relay that can replace electromechanical relays in many applications. It utilizes International Rectifier's proprietary HEXFET power MOSFET as the output switch, driven by an integrated circuit photovoltaic generator of novel construction. The output switch is controlled by radiation from a GaAlAs light emitting diode (LED) which is optically isolated from the photovoltaic generator.

These SSRs are specifically designed for industrial control and peripheral telecom applications. Series PVT212 Relays are packaged in a 6-lead 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.

### Applications

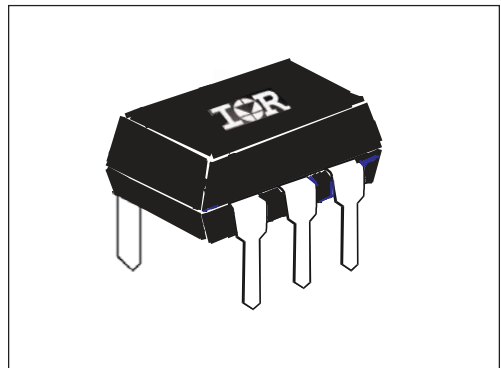
- Control of AC (up to 90 VAC) industrial loads
- Control of DC industrial loads up to +/-120 VDC
- Telecom line switching

### Part Identification

PVT212PbF	thru-hole
PVT212SPbF	surface-mount
PVT212S-TPbF	surface-mount, Tape and Reel

### Features

- HEXFET Power MOSFET output
- Bounce-free operation
- 4,000 V<sub>RMS</sub> I/O isolation
- Very low on-resistance (R<sub>DD-ON</sub>)
- Linear AC/DC operation
- Solid-State Reliability
- UL recognized
- ESD Tolerance:
  - 4000V Human Body Model
  - 500V Machine Model



*(HEXFET is the registered trademark for International Rectifier Power MOSFETs)*

**Electrical Specifications** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

INPUT CHARACTERISTICS	Limits	Units
Minimum Control Current (see figure 1)	5.0	mA
Maximum Control Current for Off-State Resistance	0.4	mA
Control Current Range (Caution: current limit input LED, see figure 5)	5.0 to 25	mA
Maximum Reverse Voltage	6.0	V

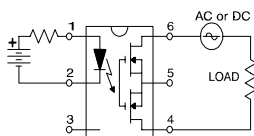
OUTPUT CHARACTERISTICS	Limits	Units
Operating Voltage Range	0 to $\pm 150$	V peak
Maximum Load Current @ $T_A = +40^\circ\text{C}$ 5mA Control (see figure 1)		
A Connection	550	mA
B Connection	600	mA
C Connection	825	mA
Maximum On-State Resistance @ $T_A = +25^\circ\text{C}$ 100mA Pulsed Load, 5mA Control (see figures 2 & 3)		
A Connection	0.75	$\Omega$
B Connection	0.40	$\Omega$
C Connection	0.25	$\Omega$
Max. pulsed Load Current @ $T_A = +25^\circ\text{C}$ , 10mA Control (10mS @ 10% duty cycle)	1200	mA
Maximum Off-State Leakage @ $T_A = +25^\circ\text{C}$ , $\pm 150\text{V}$	1.0	$\mu\text{A}$
Maximum Turn-On Time @ $T_A = +25^\circ\text{C}$ (see figures 6 & 7) For 50mA, 100 $V_{\text{DC}}$ load, 10mA Control (5mS pulse width @ 50% duty cycle)	3.0	ms
Maximum Turn-Off Time @ $T_A = +25^\circ\text{C}$ (see figures 6 & 7) For 50mA, 100 $V_{\text{DC}}$ load, 10mA Control (5mS pulse width @ 50% duty cycle)	0.5	ms
Maximum Output Capacitance @ 50V <sub>DC</sub> , f=1MHz (C <sub>out</sub> , see figure 8)	100	pF

GENERAL CHARACTERISTICS	Limits	Units
Minimum Dielectric Strength, Input-Output	4000	$V_{\text{RMS}}$
Minimum Insulation Resistance, Input-Output	$10^{12}$	$\Omega$
Maximum Capacitance, Input-Output $V_d = 0\text{V}$ , f=1MHz	1.0	pF
Maximum Pin Soldering Temperature (10 seconds maximum)	+260	
Ambient Temperature Range:	Operating	$^\circ\text{C}$
	Storage	

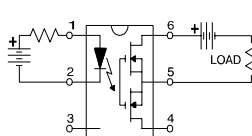
International Rectifier does not recommend the use of this product in aerospace, avionics, military or life support applications. Users of this International Rectifier product in such applications assume all risks of such use and indemnify International Rectifier against all damages resulting from such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

**Connection Diagrams**

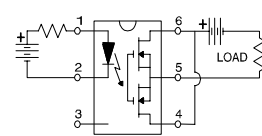
"A" Connection



"B" Connection



"C" Connection



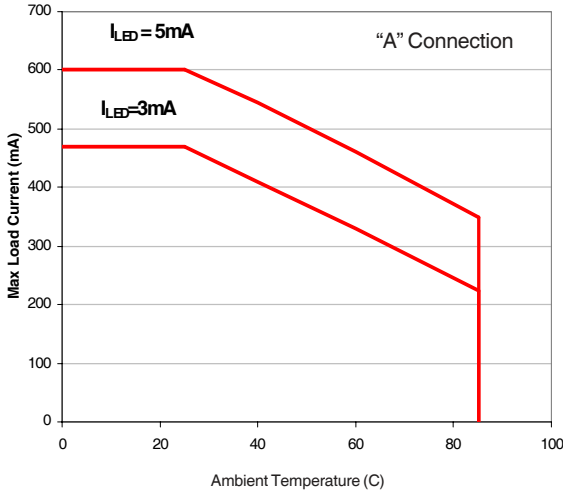


Figure 1. Typical Current Derating Curves

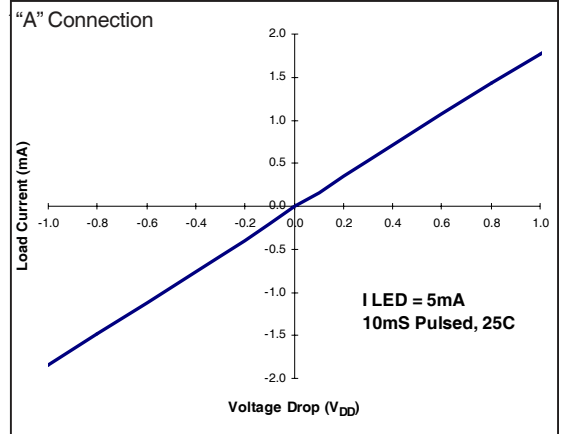


Figure 2. Typical On Characteristics

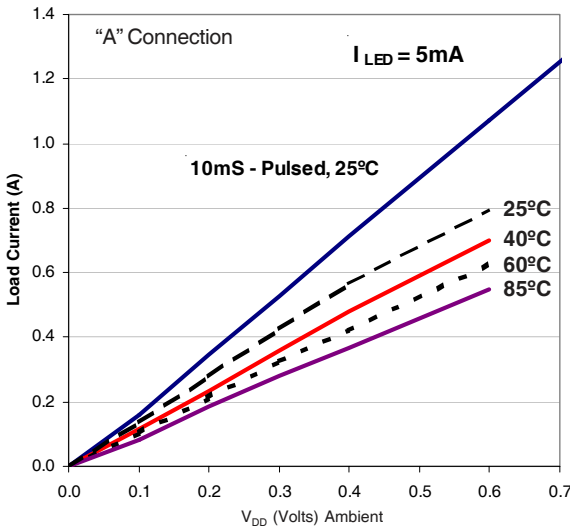


Figure 3. Typical On-Characteristics

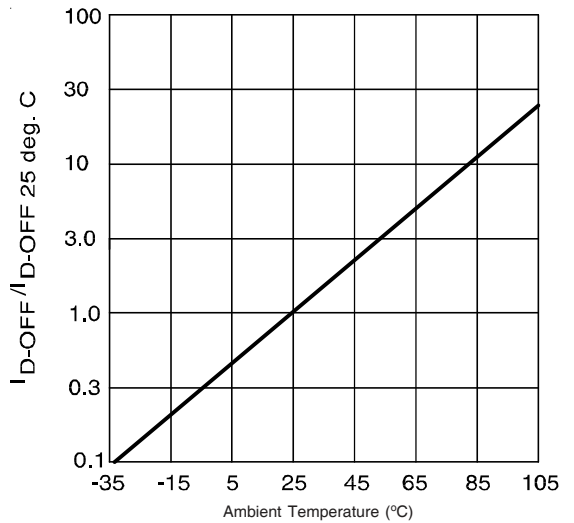


Figure 4. Typical Normalized Off-State Leakage

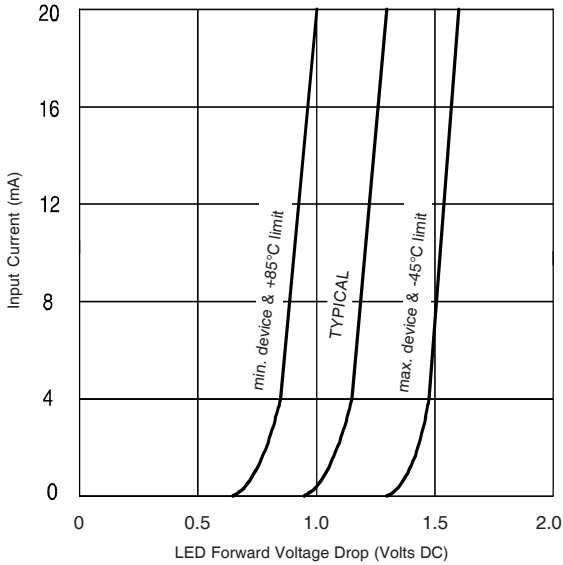


Figure 5. Input Characteristics (Current Controlled)

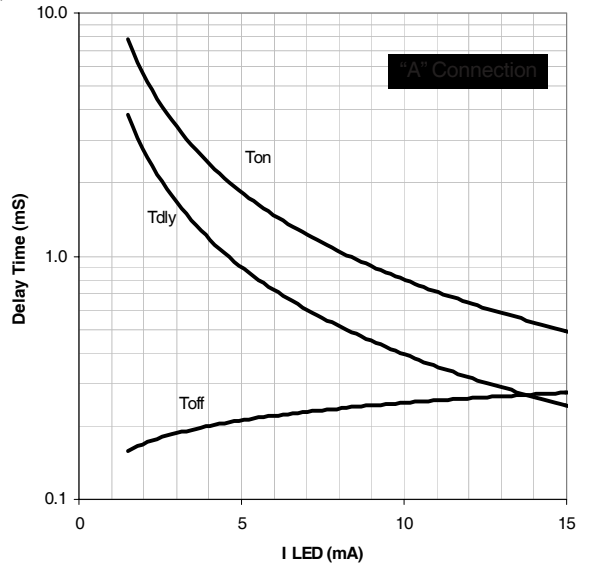


Figure 6. Typical Delay Times  
(5mS Pulse Width, 100V/50mA Load)

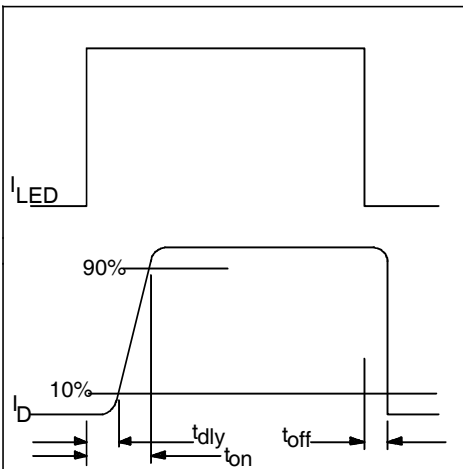


Figure 7. Delay Time Definitions

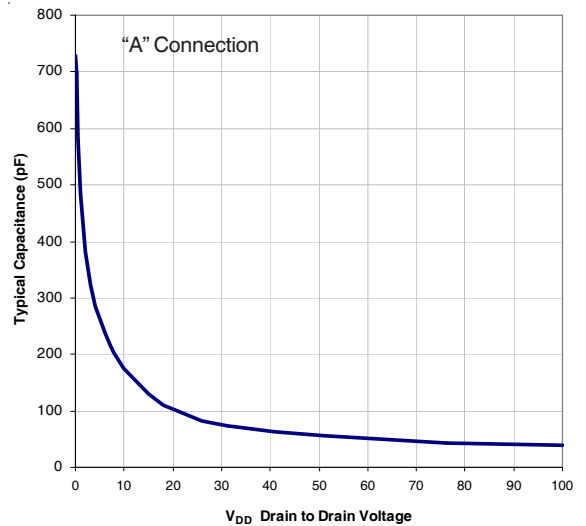
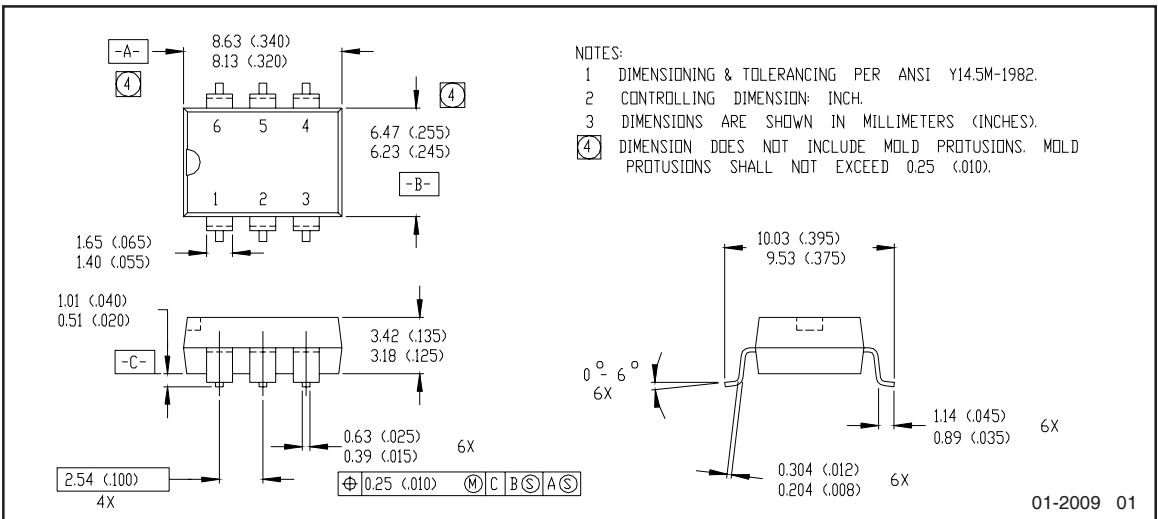
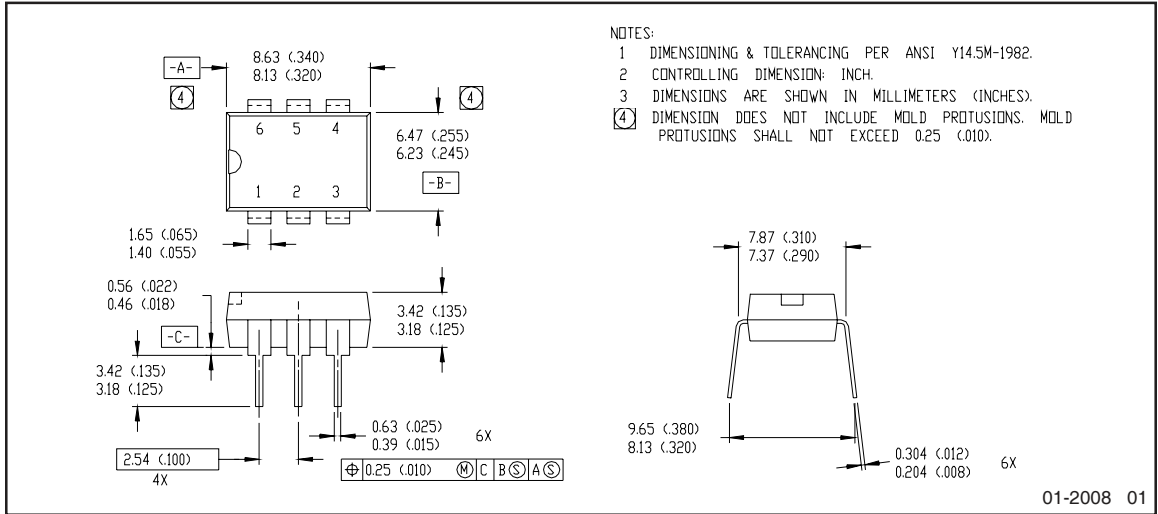


Figure 8. Typical Output Capacitance

### Case Outlines



Note: For the most current drawing please refer to IR website at: <http://www.irf.com/package/>

**Qualification information<sup>†</sup>**

Qualification level	Industrial (per JEDEC JESD471 <sup>††</sup> guidelines)	
Moisture Sensitivity Level	PVT212PbF	N/A
	PVT212SPbF	MSL4 (per JEDEC J-STD-020E & JEDEC J-STD-033C <sup>††</sup> )
	PVT212S-TPbF	
RoHS compliant	Yes	

<sup>†</sup> Qualification standards can be found at International Rectifier’s web site: <http://www.irf.com/product-info/reliability>

<sup>††</sup> Applicable version of JEDEC standard at the time of product release

**Revision History**

Date	Comments
5/18/2015	<ul style="list-style-type: none"> <li>• Added Qualification Information Table on page 6</li> <li>• Updated data sheet with new IR corporate template</li> </ul>