

## PVT442

Microelectronic Power IC  
HEXFET® Power MOSFET Relay  
Single Pole, Normally Closed  
0-400V, 170mA AC/DC

### General Description

PVT442 Photovoltaic Relay is a single-pole, normally closed solid-state relay that can replace electromechanical relays in many applications. It utilizes a 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.

PVT442 is ideally suited for worldwide telecom applications: On/Off Hook switch, Parallel telecom equipment setup, and general switching.

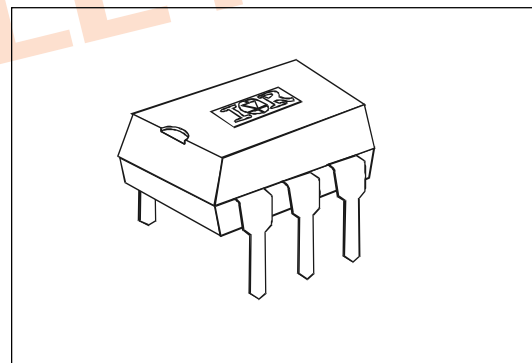
PVT442 Relays are packaged in a 6-pin, molded DIP package with either thru-hole or "gull-wing" surface mount terminals. It is available in standard plastic shipping tubes or on Tape-and-Reel. Refer to Part Identification information.

### Applications

- On/Off Hook switch
- Parallel telecom equipment setup
- General switching

### Features

- HEXFET Power MOSFET output
- Bounce-free operation
- 4,000 V<sub>RMS</sub> I/O isolation
- Linear AC/DC operation
- Solid-State Reliability
- BABT certified
- ESD Tolerance:
  - 4000V Human Body Model
  - 500V Machine Model



### Part Identification

|           |                    |
|-----------|--------------------|
| PVT442    | thru-hole          |
| PVT442S   | SMT                |
| PVT442S-T | SMT, tape and reel |

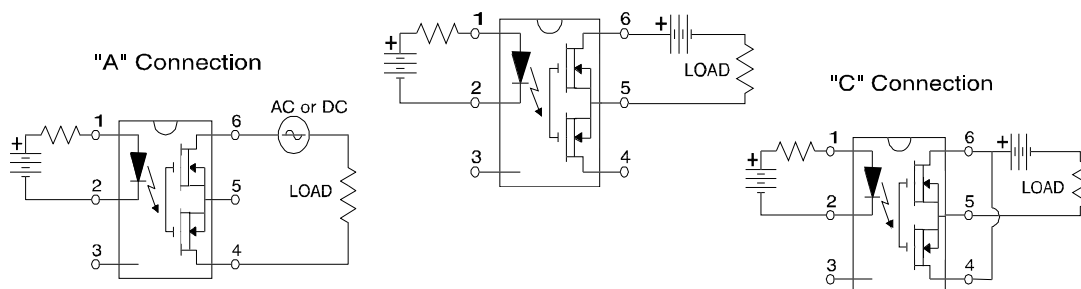
(HEXFET® is a trademark of International Rectifier)

**Electrical Specifications** ( $-40^{\circ}\text{C} \leq T_A \leq +85^{\circ}\text{C}$  unless otherwise specified)

| INPUT CHARACTERISTICS                                               | Limits    | Units |
|---------------------------------------------------------------------|-----------|-------|
| Min. Control Current (See Fig.1)                                    | 3.0       | mA    |
| Control Current Range (Caution: current limit input LED, see Fig.6) | 3.0 to 25 | mA    |
| Max. Reverse Voltage                                                | 7.0       | V     |

| OUTPUT CHARACTERISTICS                                                                                    | Limits                                                         | Units                               |
|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-------------------------------------|
| Operating Voltage Range                                                                                   | 0 to $\pm 400$                                                 | $V_{(DC \text{ or AC peak})}$       |
| Max. Load Current @ $T_A = +40^{\circ}\text{C}$<br>(See Fig.1)                                            | "A" Connection 170<br>"B" Connection 185<br>"C" Connection 300 | mA (AC or DC)<br>mA (DC)<br>mA (DC) |
| Max. On-State Resistance @ $T_A = +25^{\circ}\text{C}$<br>For 50mA Pulsed Load, 5mA Control (See Fig.4)   | "A" Connection 16<br>"B" Connection 14<br>"C" Connection 7     | $\Omega$<br>$\Omega$<br>$\Omega$    |
| Max. Off-State Leakage @ $T_A = +25^{\circ}\text{C}$ , $\pm 400\text{V}$ (See Fig.5) @ 5mA Control        | 1.0                                                            | $\mu\text{A}$                       |
| Max. Turn-On Time @ $T_A = +25^{\circ}\text{C}$ (See Fig. 7)<br>For 50mA, 100 $V_{DC}$ Load, 5mA Control  | 2.0                                                            | ms                                  |
| Max. Turn-Off Time @ $T_A = +25^{\circ}\text{C}$ (See Fig. 7)<br>For 50mA, 100 $V_{DC}$ Load, 5mA Control | 3.0                                                            | ms                                  |
| Max. Output Capacitance @ 50 $V_{DC}$ (See Fig. 2)                                                        | 50                                                             | pF                                  |

| GENERAL CHARACTERISTICS                                                                         | Limits      | Units              |
|-------------------------------------------------------------------------------------------------|-------------|--------------------|
| Min. Dielectric Strength, Input-Output                                                          | 4000        | $V_{RMS}$          |
| Min. Insulation Resistance, Input-Output<br>@ $T_A = +25^{\circ}\text{C}$ , 50%RH, 100 $V_{DC}$ | $10^{12}$   | $\Omega$           |
| Max. Capacitance, Input-Output                                                                  | 1.0         | pF                 |
| Max. Pin Soldering Temperature (10 seconds max.)                                                | +260        | $^{\circ}\text{C}$ |
| Ambient Temperature Range: Operating                                                            | -40 to +85  | $^{\circ}\text{C}$ |
| Storage                                                                                         | -40 to +100 | $^{\circ}\text{C}$ |

**Connection Diagrams****"B" Connection**

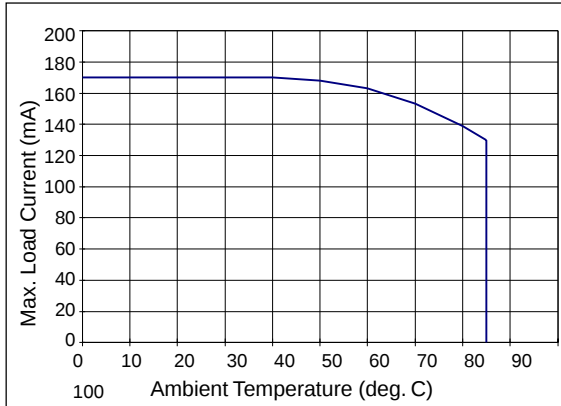


Figure 1. Current Derating Curve, "A" connection

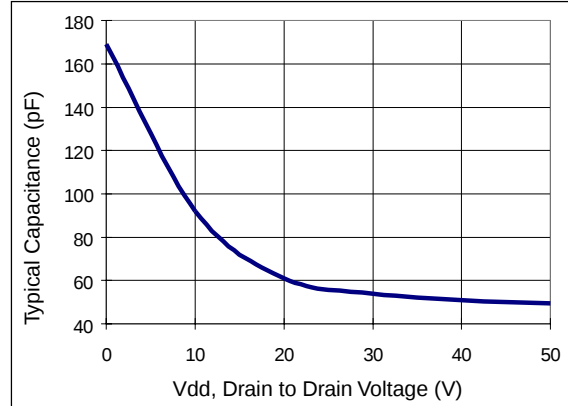


Figure 2. Typical Output Capacitance

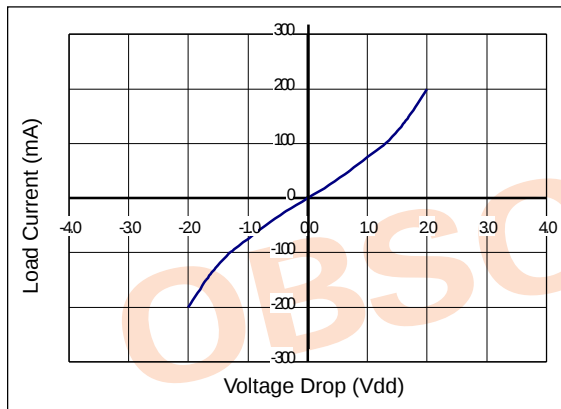


Figure 3. Linearity Characteristics, "A" connection

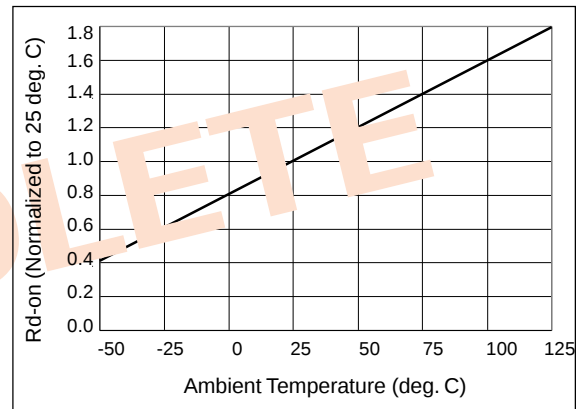


Figure 4. Typical Normalized On-Resistance; "A" conn

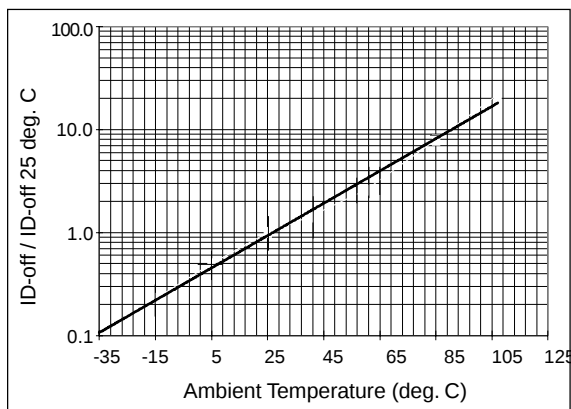


Figure 5. Typical Normalized Off-State Leakage

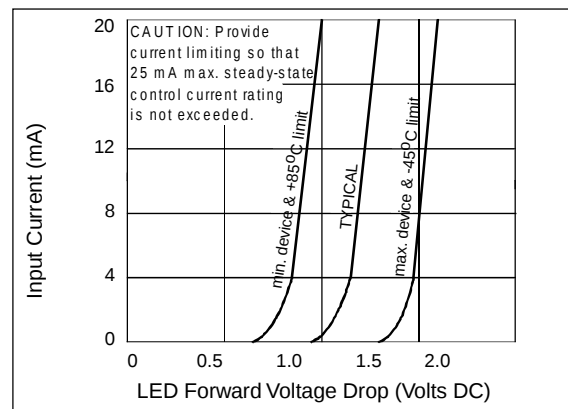


Figure 6. Input Characteristics (Current Controlled)

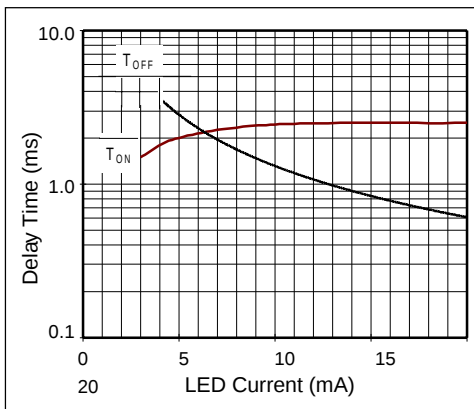


Figure 7. Typical Delay Times

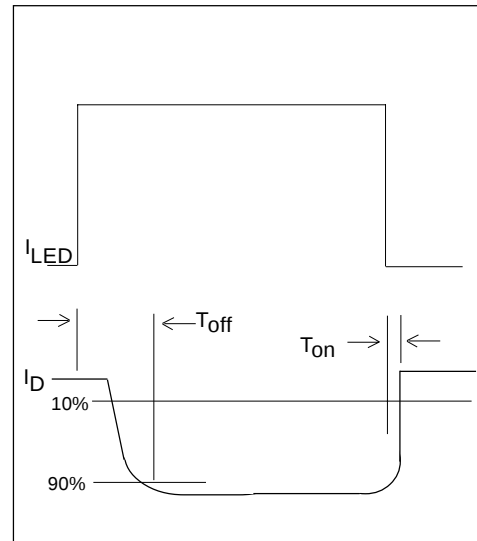
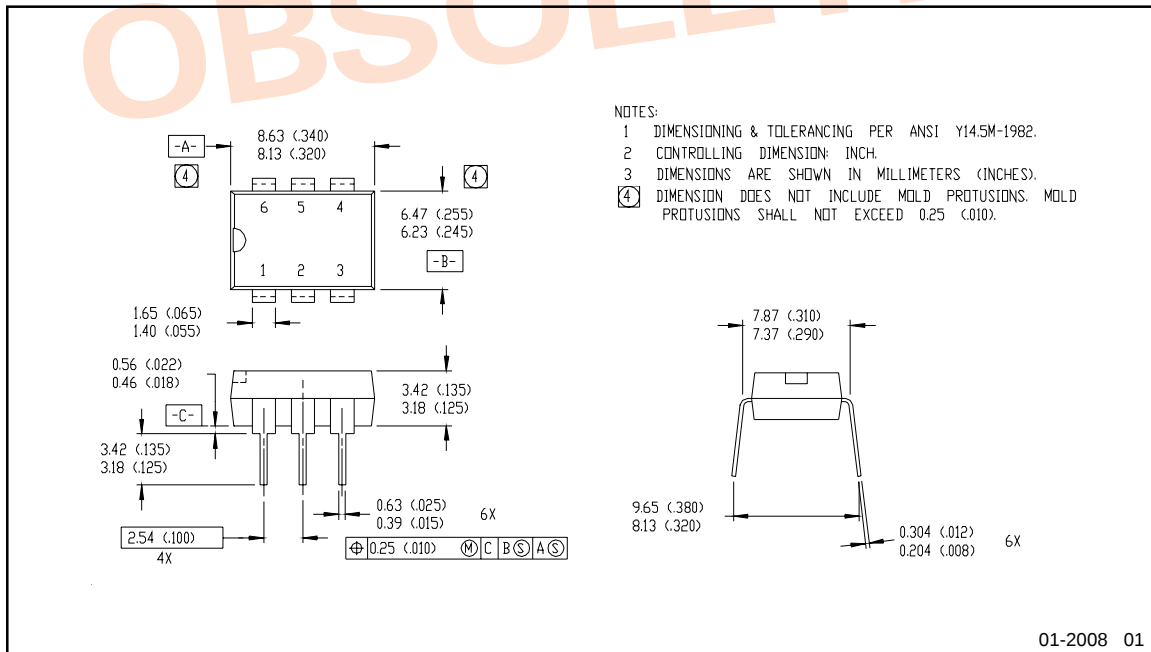


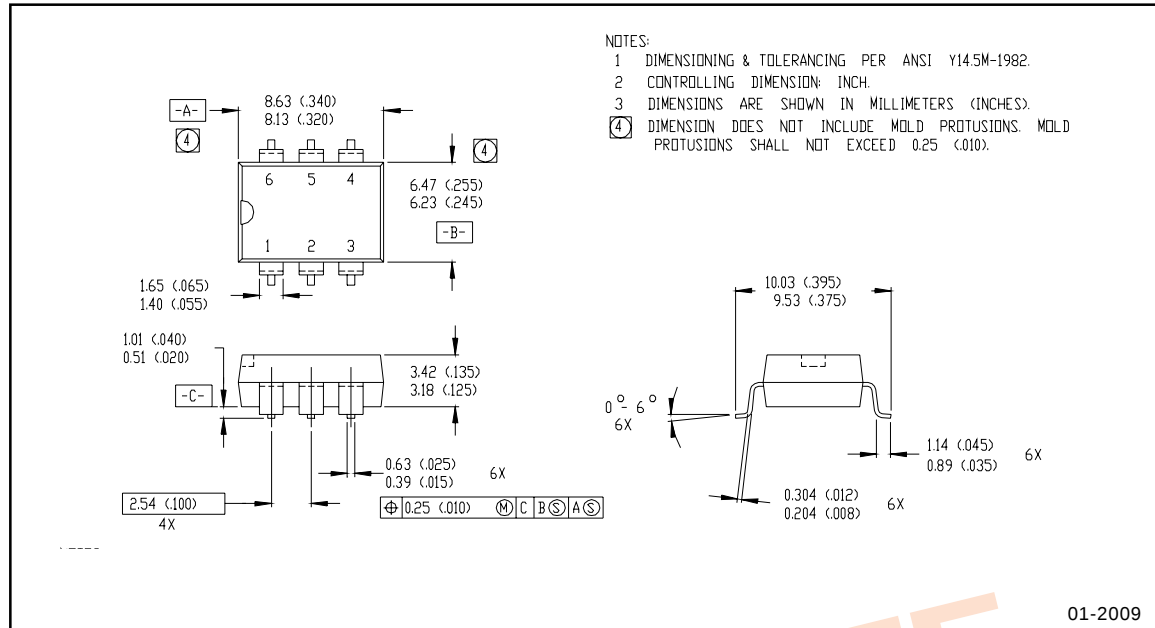
Figure 8. Delay Time Definitions

## Case Outline



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