

| Part Number*   | Description                                   |
|----------------|---|
| PC27001-47XX   | 1 Amp, 270 Vdc Solid-State Power Controller   |
| PC27002-47XX   | 2 Amp, 270 Vdc Solid-State Power Controller   |
| PC27005-47XX   | 5 Amp, 270 Vdc Solid-State Power Controller   |
| PC27007.5-47XX | 7.5 Amp, 270 Vdc Solid-State Power Controller |
| PC27010-47XX   | 10 Amp, 270 Vdc Solid-State Power Controller  |

\* The last two digits in the part number denote the screen level in conformance test.  
XX = 00 is a W level screened  
XX = 01 is a Y level screened  
(EXAMPLE: PC27005-4701 is "Y" level screened) (For Y, W level screen chart, see page xyz)

### ELECTRICAL SPECIFICATION

(-55°C TO +105°C Case Temperature, Unless Otherwise Specified)

#### INPUT (CONTROL) SPECIFICATION

|   | Min | Typ | Max | Units |
|---|-----|-----|-----|-------|
| Bias Voltage  | 4.5 | 5.0 | 5.5 | Vdc   |
| Bias Current (On)<br>$V_{bias} = 5$ Vdc, $V_{ctrl} = 2.4$ Vdc |     |     | 45  | mA    |
| Control Voltage (High)  |     |     | 2.0 | V     |
| Control Voltage (Low)   | 0.8 |     |     | V     |
| Control Current (High)<br>$V_{ctrl} = 2.4$ Vdc                |     |     | 50  | mA    |
| Control Current (Low)<br>$V_{ctrl} = 0.8$ Vdc                 |     |     | 10  | mA    |

#### OUTPUT (LOAD) SPECIFICATION

|                        | MIN | TYP | MAX  | UNITS |
|------------------------|-----|-----|------|-------|
| Rated Line Voltage     | 210 | 270 | 330  | Vdc   |
| Rated Load Current     |     |     |      |       |
| PC27001-47XX           |     |     | 1.0  | A     |
| PC27002-47XX           |     |     | 2.0  | A     |
| PC27005-47XX           |     |     | 5.0  | A     |
| PC27007.5-47XX         |     |     | 7.5  | A     |
| PC27010-47XX           |     |     | 10.0 | A     |
| Output Leakage Current |     |     | 500  | mA    |
| Output On-Resistance   |     |     |      |       |
| PC27001-47XX           |     |     | 0.64 | Ohm   |
| PC27002-47XX           |     |     | 0.32 | Ohm   |
| PC27005-47XX           |     |     | 0.16 | Ohm   |
| PC27007.5-47XX         |     |     | 0.10 | Ohm   |
| PC27010-47XX           |     |     | 0.10 | Ohm   |



### FEATURES/BENEFITS

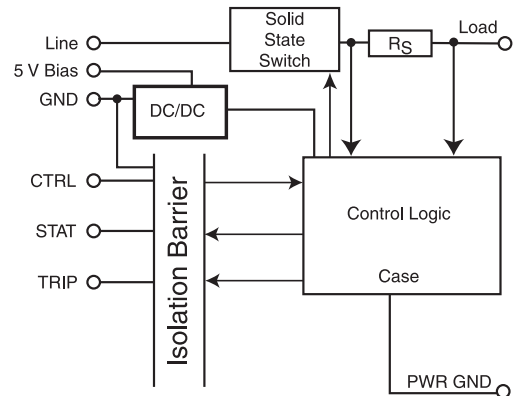
- Temperature-independent current rating and overload protection
- Surge tolerant short-circuit protection
- Optical isolation
- Extremely low On-Resistance
- Load Voltage status
- TTL and CMOS compatible control
- Meets surge and spike requirements of MIL-STD-704E

### DESCRIPTION

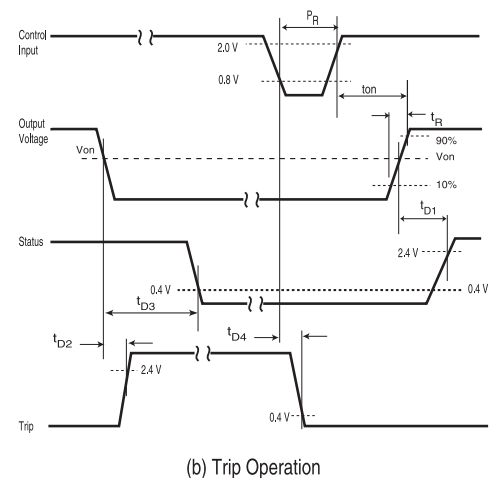
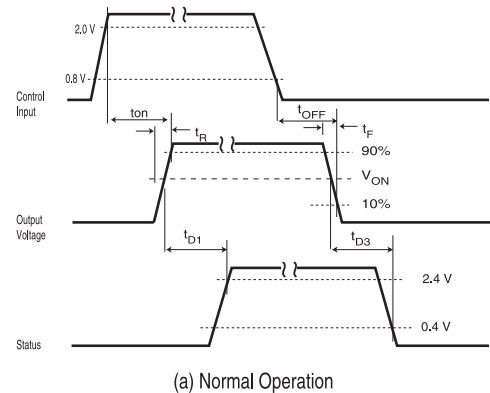
These state-of-the-art solid-state power controllers (SSPCs) are designed for use in power controller applications. These SSPCs utilize the latest technology to provide low On-resistance output with complete short circuit and overload current protection. In addition, status output lines for trip, and load voltage are provided to monitor the load and provide BIT (built-in-test) feature. SSPCs are electronic replacements for the conventional electromechanical circuit breakers. The remote features allow the SSPC to replace these circuit breakers as well as a load switching relay. They reduce component count, system weight and cost and increase system reliability.

**OUTPUT (LOAD) SPECIFICATION**

|   | Min | Typ | Max   | Units |
|---|-----|-----|-------|-------|
| <b>Voltage Drop</b>   |     |     |       |       |
| PC27001-47XX  |     |     | 0.64  | Vdc   |
| PC27002-47XX  |     |     | 0.64  | Vdc   |
| PC27005-47XX  |     |     | 0.80  | Vdc   |
| PC27007.5-47XX  |     |     | 0.75  | Vdc   |
| PC27010-47XX  |     |     | 1.00  | Vdc   |
| <b>Transient Voltage</b>  |     |     |       |       |
|   |     |     | 470   | Vdc   |
| <b>Electrical System Spike</b>  |     |     |       |       |
|   |     |     | ± 600 | Vpk   |
| MIL-PRF-28750 Z = 80 Ohms, pw = 10 msec   |     |     |       |       |
| <b>Capacitive Load @ Rated Load</b>   |     |     |       |       |
| PC27001-47XX  |     |     | 8     | mF    |
| PC27002-47XX  |     |     | 16    | mF    |
| PC27005-47XX  |     |     | 40    | mF    |
| PC27007.5-47XX  |     |     | 60    | mF    |
| PC27010-47XX  |     |     | 80    | mF    |
| <b>Turn-On Time</b>   |     |     |       |       |
|   |     |     | 1     | msec  |
| <b>Turn-Off Time</b>  |     |     |       |       |
|   |     |     | 1     | msec  |
| <b>Trip Point @ 150% of Rated Load Current</b>  |     |     |       |       |
| PC27001-47XX  | 2.8 |     |       | sec   |
| PC27002-47XX  | 2.8 |     |       | sec   |
| PC27005-47XX  | 2.8 |     |       | sec   |
| PC27007.5-47XX  | 2.8 |     |       | sec   |
| PC27010-47XX  | 4.5 |     |       | sec   |
| <b>Trip Point @ 250% of Rated Load Current</b>  |     |     |       |       |
| PC27001-47XX  | 1.5 | 6.5 |       | sec   |
| PC27002-47XX  | 1.5 | 6.5 |       | sec   |
| PC27005-47XX  | 1.5 | 6.5 |       | sec   |
| PC27007.5-47XX  | 1.5 | 6.5 |       | sec   |
| <b>Trip Point @ Upper Limit Must Not Trip</b>   |     |     |       |       |
| PC27001-47XX (600%)   | 0.5 | 1.9 |       | sec   |
| PC27002-47XX (600%)   | 0.5 | 1.9 |       | sec   |
| PC27005-47XX (600%)   | 0.5 | 1.9 |       | sec   |
| PC27007.5-47XX (600%)   | 0.5 | 1.9 |       | sec   |
| PC27010-47XX (300%)   | 2.0 | 16  |       | sec   |
| <b>Trip Time at Short Circuit</b>   |     |     |       |       |
|   |     |     | 1     | msec  |
| <b>Overload Trip time</b> See Figure 4  |     |     |       |       |
| <b>Trip Reset Time</b> 50 msec  |     |     |       |       |
| $V_{cc}$ Initialization: $V_{line} = \text{rated}$ , $V_{ctrl} = 0Vdc$ ,<br>$V_{bias} = 0$ to 5Vdc, 100 V/μsec      Output Shall remain Off |     |     |       |       |
| <b>Line Voltage dv/dt Per MIL-PRF-28750</b> 100 V/μsec  |     |     |       |       |
| <b>Input to Output &amp; Case Isolation</b> 100 pF  |     |     |       |       |
| <b>Dielectric Withstanding Voltage</b>  |     |     |       |       |
| <b>Input to Output &amp; Case</b> 800 Vac   |     |     |       |       |

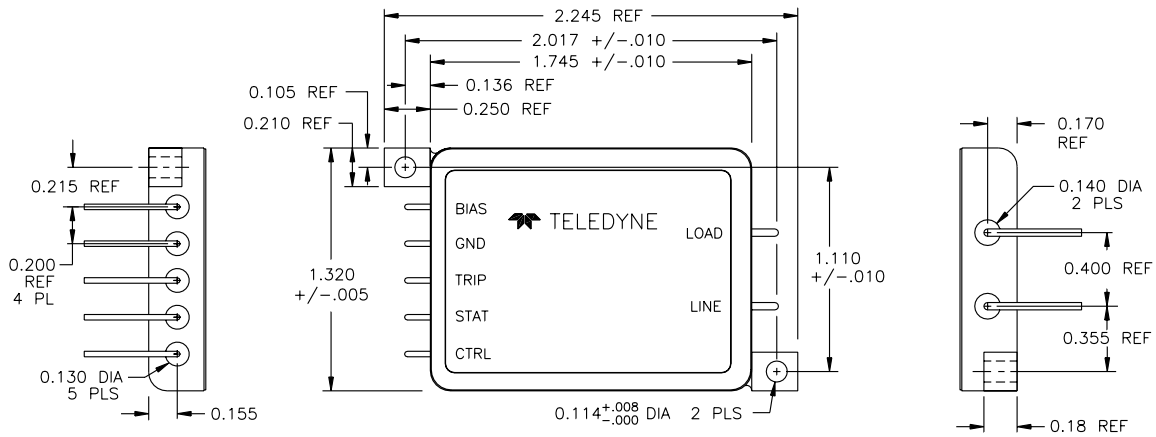


**FUNCTIONAL BLOCK DIAGRAM**  
**FIGURE 2**

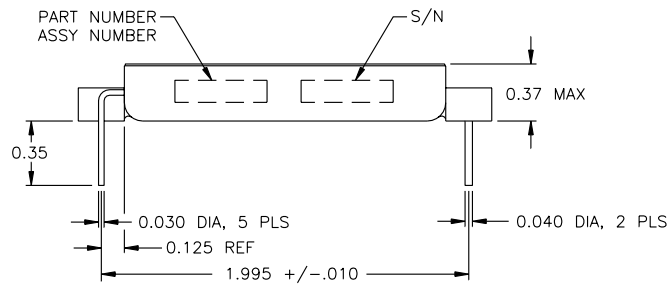


**TIMING WAVE FORMS**  
**FIGURE 3**

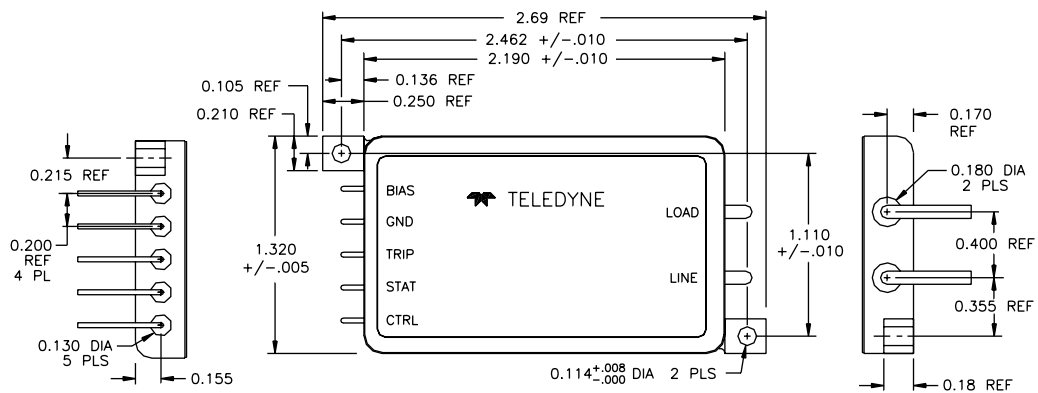
**MECHANICAL DIAGRAM**



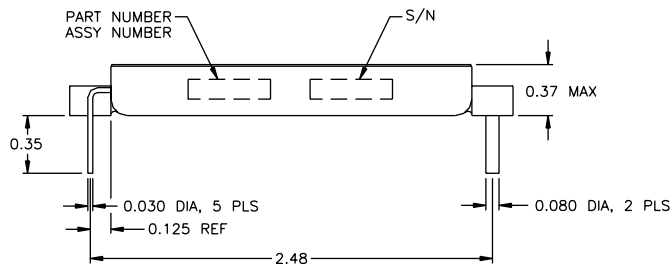
TOLERANCES:  
.XX = +/- .01  
.XXX = +/- .003



**FIGURE 1A**  
**1, 2 AMP, 270 VDC PACKAGE**



TOLERANCES:  
.XX = +/- .01  
.XXX = +/- .003



**FIGURE 1B**  
**5, 7.5, 10 AMP, 270 VDC PACKAGE**

**OUTPUT (LOAD) SPECIFICATION**

|   | Min             | Typ | Max  | Units |
|---|-----------------|-----|------|-------|
| Insulation Resistance                   |                 |     |      |       |
| Input to Output & Case                  | 10 <sup>8</sup> |     |      | Ohm   |
| Thermal Resistance, Junction to Case    |                 |     |      |       |
| PC27001-47XX                            |                 |     | 1.0  | °C/W  |
| PC27002-47XX                            |                 |     | 0.5  | °C/W  |
| PC27005-47XX                            |                 |     | 0.25 | °C/W  |
| PC27007.5-47XX                          |                 |     | 0.17 | °C/W  |
| PC27010-47XX                            |                 |     | 0.14 | °C/W  |
| Thermal Resistance, Junction to Ambient |                 |     |      |       |
| PC27001-47XX                            |                 |     | 21   | °C/W  |
| PC27002-47XX                            |                 |     | 21   | °C/W  |
| PC27005-47XX                            |                 |     | 19   | °C/W  |
| PC27007.5-47XX                          |                 |     | 19   | °C/W  |
| PC27010-47XX                            |                 |     | 19   | °C/W  |

**STATUS SPECIFICATION**

|                                       | Min | Typ | Max  | Units |
|---------------------------------------|-----|-----|------|-------|
| Status Output High $I_{source} = 4mA$ | 3.7 |     |      | Vdc   |
| Status Output Low $I_{sink} = 4mA$    |     |     | 0.4  | Vdc   |
| Load Status Turn-On Time              |     |     | 2    | msec  |
| Trip Status Turn-On Time              |     |     | 0.15 | msec  |
| Load Status Turn-Off Time             |     |     | 2    | msec  |
| Trip Status Turn-Off Time             |     |     | 0.15 | msec  |

**ENVIRONMENTAL SPECIFICATION**

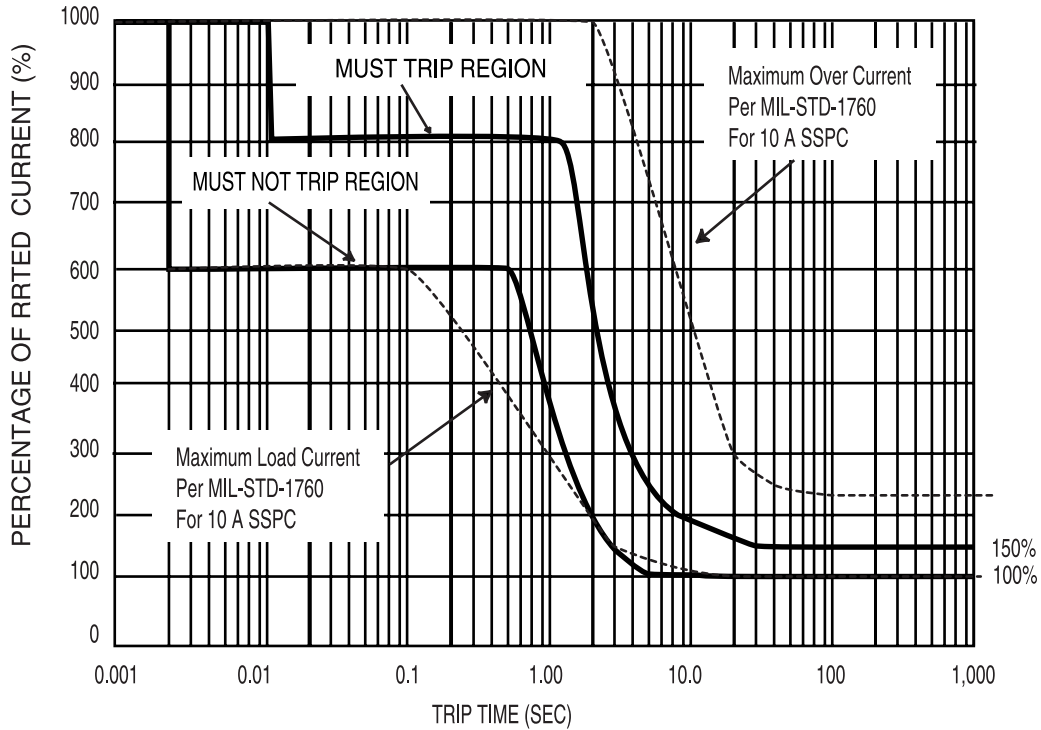
|                       | Min           | Typ | Max | Units |
|-----------------------|---------------|-----|-----|-------|
| Operating Temperature | -55           |     | 105 | °C    |
| Storage Temperature   | -55           |     | 125 | °C    |
| Constant Acceleration | MIL-PRF-28750 |     |     |       |
| Seal                  | MIL-PRF-28750 |     |     |       |

**NOTES:**

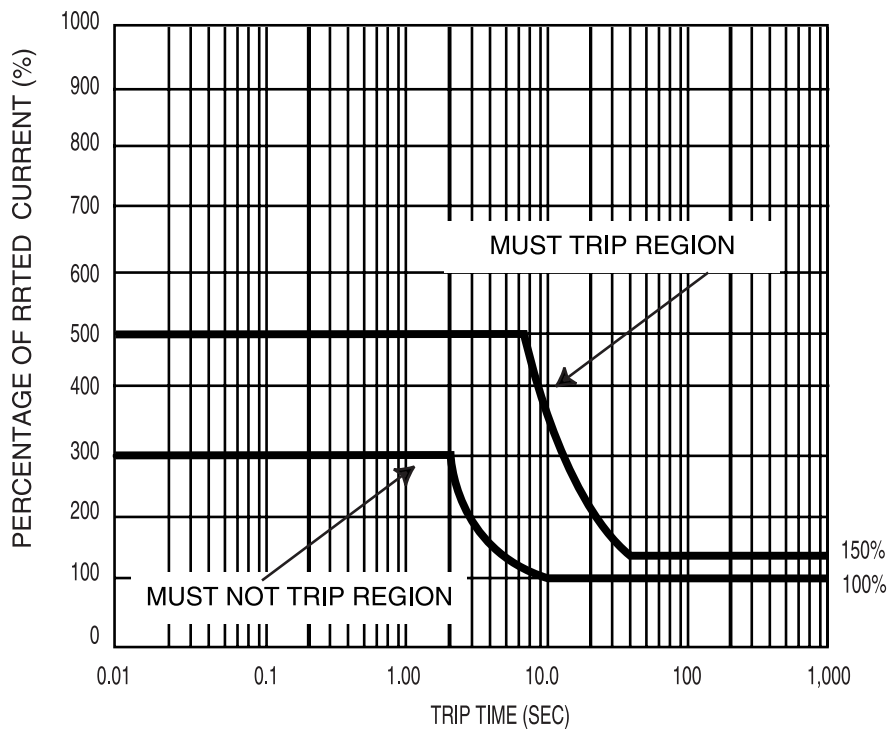
- Unless otherwise noted: All tests shall be performed with  $V_{cc} = 5.0 V$ ,  $V_{line} = \text{Rated Voltage}$ ,  $I_{status} = \pm 4 \text{ ma}$ ,  $I_{load} = \text{Rated current}$ .
- The transition time for the control signal shall be less than 0.1 msec in application.
- Inductive loads must be diode suppressed. System series inductance in the short circuit mode shall be less than 30  $\mu\text{h}$ .
- Temperature coefficient of transient voltage is 0.25 Volt/C @  $T_c = +25^\circ\text{C}$ .
- **Weight**  
PC27001-47XX, 65 gm    PC27002-47XX, 65 gm    PC27005-47XX, 70 gm    PC27007.5-47XX, 70 gm    PC27010-47XX, 70 gm
- **Package Body Finish:**  
Nickel Plate Covered by Electroplate gold
- **Pin Finish:**  
Nickel Plate covered by electroplate gold

**SSPC FUNCTIONAL REQUIREMENTS:**

- **CASE GROUND:** In order for the LOAD STATUS to function properly, the case must be connected to the LINE VOLTAGE RETURN with impedance of 10 ohms maximum.
- The **CONTROL input** is CMOS/TTL Compatible Logic. The device is commanded ON, OFF and RESET by a CMOS/TTL signal at the CONTROL pin. A HIGH signal will turn the device ON. A LOW signal or an OPEN condition will turn the device OFF. If the device trips OFF, the device is reset by cycling the CONTROL to OFF then ON with a pulse width of greater than 50 msec.
- **LOAD STATUS output.** A CMOS/TTL HIGH at the LOAD STATUS output indicates that the device is ON and the output (load) voltage is present. A CMOS/TTL LOW at the LOAD STATUS output indicates that the device is OFF and the output (load) voltage is not present.
- **TRIP STATUS output.** A CMOS/TTL HIGH at the TRIP STATUS output indicates that the device has tripped due to an overcurrent condition. TRIP STATUS output is a CMOS/TTL LOW during normal operation. A TRIP STATUS will change to CMOS/TTL HIGH in response to an overcurrent trip. TRIP STATUS will remain HIGH until the overcurrent condition has cleared and the device is reset.
- **Overcurrent operation.** The device will trip (i.e., turn off) if the load current exceeds the requirement of FIGURE 4. Once the device is tripped, it will remain OFF indefinitely, until the overcurrent condition has cleared and the device is reset.



**FIGURE 4A. CURRENT TRIP CHARACTERISTICS  
(ALL PART NUMBERS EXCEPT PC27010-47XX)**



**FIGURE 4B. CURRENT TRIP CHARACTERISTICS  
(PC27010-47XX ONLY)**