

# POWEREX

T760

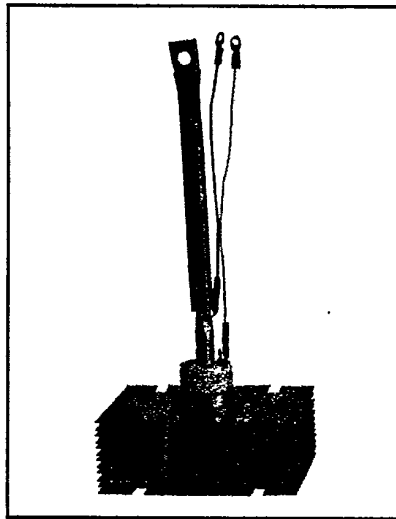
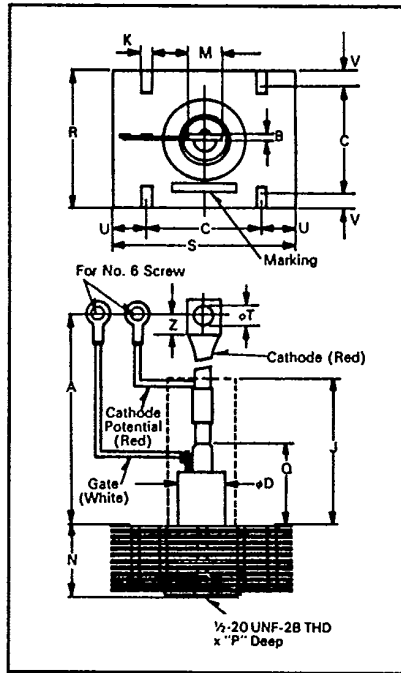
T-25-19

Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272

Powerex Europe, S.A., 428 Ave. G. Durand, BP107, 72003 LeMans, France (43) 72.75.15

## Phase Control SCR

300 Amperes Avg  
100-2000 Volts



**T760**  
**Phase Control SCR**  
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### Description

Powerex Silicon Controlled Rectifiers (SCR) are designed for phase control applications. These are all-diffused, compression bonded encapsulated (CBE) devices employing the field-proven amplifying (di/namic) gate.

### Features:

- ☐ Low On-State Voltage
- ☐ High di/dt
- ☐ High dv/dt
- ☐ Hermetic Packaging
- ☐ Excellent Surge and I<sup>2</sup>t Ratings
- ☐ Integral Heat Sink

### Applications:

- ☐ Power Supplies
- ☐ Battery Chargers
- ☐ Motor Control
- ☐ Light Dimmers
- ☐ VAR Generators

### Ordering Information

Example: Select the complete eight digit part number you desire from the table – i.e. T7601030 is a 1000 Volt, 300 Ampere Phase Control SCR.

### T76

#### Outline Drawing

| Dimensions | Inches |       | Millimeters |        |
|------------|--------|-------|-------------|--------|
|            | Min.   | Max.  | Min.        | Max.   |
| A          | 9.00   | 10.00 | 228.60      | 254.00 |
| B          | .063   | .172  | 1.60        | 4.37   |
| C          | 2.980  | 3.020 | 75.69       | 76.71  |
| φD         | —      | 1.490 | —           | 37.85  |
| J          | 3.750  | —     | 95.25       | —      |
| K          | .272   | .292  | 6.91        | 7.42   |
| M          | .530   | .755  | 13.46       | 19.18  |
| N          | 2.030  | 2.150 | 51.56       | 54.61  |
| P          | .500   | —     | 12.70       | —      |
| Q          | —      | 2.670 | —           | 67.81  |
| R          | 3.937  | 4.063 | 100.00      | 103.20 |
| S          | 4.937  | 5.063 | 125.40      | 128.60 |
| φT         | .330   | .350  | 8.38        | 8.89   |
| U          | .970   | 1.030 | 24.64       | 26.16  |
| V          | .470   | .530  | 11.94       | 13.46  |
| Z          | .440   | —     | 11.18       | —      |

Creep Distance—1.76 in. min. (44.91 mm)

Strike Distance—.81 in. min. (20.70 mm).

(In accordance with NEMA standards.)

Finish—Nickel Plate.

Approx. Weight—5 lb. (2.3 kg.).

1. Angular orientation of terminals are undefined.

2. Pitch diameter of 1/2-20 UNF-2A (coated) threads (ASA B1.1-1960).

3. Dimension "J" denotes seated height with leads bent at right angles.

| Type | Voltage                              |      | Current              |      |
|------|--------------------------------------|------|----------------------|------|
|      | V <sub>ORM</sub><br>V <sub>RRM</sub> | Code | I <sub>T</sub> (avg) | Code |
| T760 | 100                                  | 01   | 300                  | 30   |
|      | 200                                  | 02   |                      |      |
|      | 400                                  | 04   |                      |      |
|      | 600                                  | 06   |                      |      |
|      | 800                                  | 08   |                      |      |
|      | 1000                                 | 10   |                      |      |
|      | 1200                                 | 12   |                      |      |
|      | 1300                                 | 13   |                      |      |
|      | 1400                                 | 14   |                      |      |
|      | 1500                                 | 15   |                      |      |
|      | 1600                                 | 16   |                      |      |
|      | 1700                                 | 17   |                      |      |
|      | 1800                                 | 18   |                      |      |
|      | 2000                                 | 20   |                      |      |



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### Absolute Maximum Ratings

|   | Symbol       | T760       | Units              |
|---|--------------|------------|--------------------|
| RMS On-State Current  | $I_{T(RMS)}$ | 470        | Amperes            |
| Average On-State Current  | $I_{T(av)}$  | 300        | Amperes            |
| Peak One-Cycle Surge (Non-Repetitive) On-State Current (60Hz) <sup>①</sup>  | $I_{TSM}$    | 8400       | Amperes            |
| Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz) <sup>①</sup>  | $I_{TSM}$    | 7650       | Amperes            |
| Critical Rate-of-Rise of On-State Current (Non-Repetitive) <sup>② ③ ④</sup> | $di/dt$      | 600        | Amperes/ $\mu$ s   |
| Critical Rate-of-Rise of On-State Current (Repetitive)                      | $di/dt$      | 150        | Amperes/ $\mu$ s   |
| $I^2t$ (for Fusing), 8.3 milliseconds                                       | $I^2t$       | 295,000    | A <sup>2</sup> sec |
| Peak Gate Power Dissipation   | $P_{GM}$     | 16         | Watts              |
| Average Gate Power Dissipation  | $P_{G(av)}$  | 3          | Watts              |
| Storage Temperature   | $T_{STG}$    | -40 to 150 | °C                 |
| Operating Temperature   | $T_J$        | -40 to 125 | °C                 |

① Consult recommended mounting procedures.

② Applies for zero or negative gate bias.

③ Per JEDEC RS-397, 5.2.2.1.

④ With recommended gate drive.

⑤ Higher  $dv/dt$  ratings available, consult factory.

⑥ Per JEDEC standard RS-397, 5.2.2.6.



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**Electrical and Thermal Characteristics**

| Characteristics   | Symbol          | Test Conditions  | T760 | Units                        |
|---|-----------------|--|------|------------------------------|
| <b>Voltage—Blocking State Maximums<sup>①</sup></b>              |                 |  |      |                              |
| Forward Leakage, Peak   | $I_{DRM}$       | $T_J = 125^\circ\text{C}$ , $V_{DRM} = \text{rated}$   | 30   | mA                           |
| Reverse Leakage, Peak   | $I_{RRM}$       | $T_J = 125^\circ\text{C}$ , $V_{RRM} = \text{rated}$   | 30   | mA                           |
| <b>Current—Conducting State Maximums</b>                        |                 |  |      |                              |
| Peak On-State Voltage   | $V_{TM}$        | $I_{TM} = 3000\text{A}$ , $T_J = 25^\circ\text{C}$   | 3.30 | Volts                        |
| <b>Switching</b>  |                 |  |      |                              |
| Typical Turn-Off Time   | $t_q$           | $I_T = 250\text{A}$ , $T_J = 125^\circ\text{C}$ ,<br>$di_r/dt = 25\text{A}/\mu\text{sec}$ , reapplied<br>$dv/dt = 20\text{V}/\mu\text{sec}$<br>linear to $0.8 V_{DRM}$ | 150  | $\mu\text{sec}$              |
| Typical Turn-On Time <sup>②</sup>                               | $t_{on}$        | $I_T = 100\text{A}$ , $V_D = 100\text{V}$  | 7    | $\mu\text{sec}$              |
| Min. Critical $dv/dt$ exponential to $V_{DRM}$ <sup>③</sup>     | $dv/dt$         | $T_J = 125^\circ\text{C}$  | 300  | $\text{V}/\mu\text{sec}$     |
| <b>Thermal</b>  |                 |  |      |                              |
| Maximum Thermal Resistance, <sup>④</sup><br>Junction to Ambient | $R_{\theta JA}$ | 1500 LFM Airflow   | 0.18 | $^\circ\text{C}/\text{Watt}$ |
| <b>Gate—Maximum Parameters</b>                                  |                 |  |      |                              |
| Gate Current to Trigger   | $I_{GT}$        | $T_J = 25^\circ\text{C}$ , $V_D = 12\text{V}$  | 150  | mA                           |
| Gate Voltage to Trigger   | $V_{GT}$        | $T_J = 25^\circ\text{C}$ , $V_D = 12\text{V}$  | 3    | Volts                        |
| Non-Triggering Gate Voltage                                     | $V_{GDM}$       | $T_J = 125^\circ\text{C}$ , rated $V_{DRM}$  | 0.15 | Volts                        |
| Peak Forward Gate Current                                       | $I_{GTM}$       |  | 4    | Amperes                      |
| Peak Reverse Gate Voltage                                       | $V_{GRM}$       |  | 5    | Volts                        |

① Consult recommended mounting procedures.

② Applies for zero or negative gate bias.

③ Per JEDEC RS-397, 5.2.2.1.

④ With recommended gate drive.

⑤ Higher  $dv/dt$  ratings available, consult factory.

⑥ Per JEDEC standard RS-397, 5.2.2.6.



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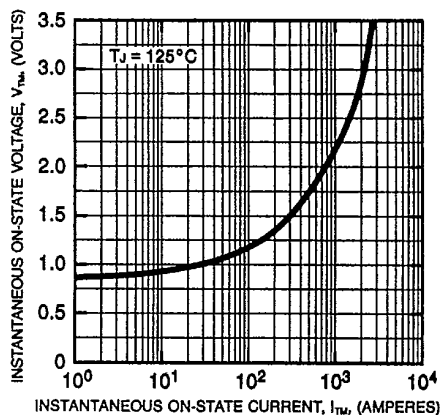
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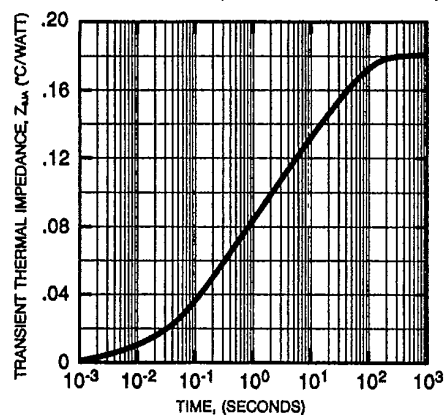
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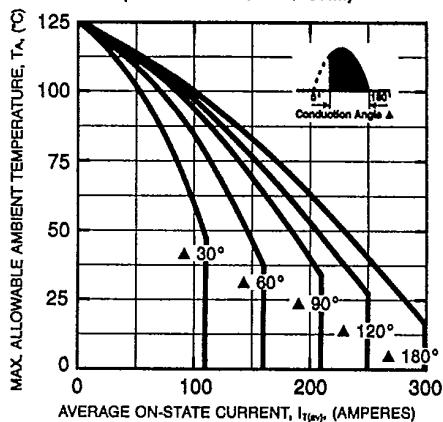
MAXIMUM ON-STATE CHARACTERISTICS



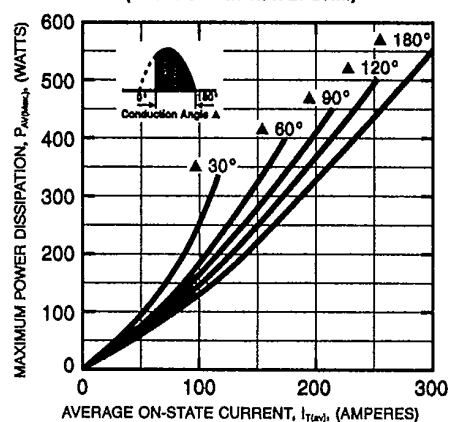
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO AMBIENT)



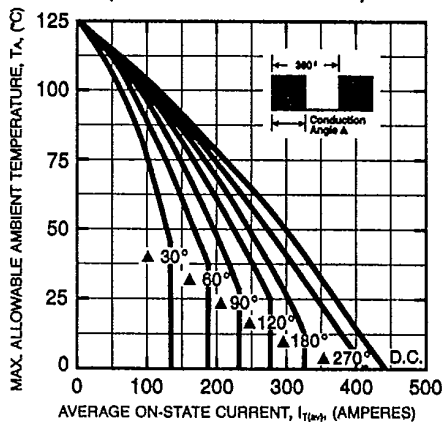
MAXIMUM ALLOWABLE AMBIENT TEMPERATURE (SINUSOIDAL WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE AMBIENT TEMPERATURE (RECTANGULAR WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)

