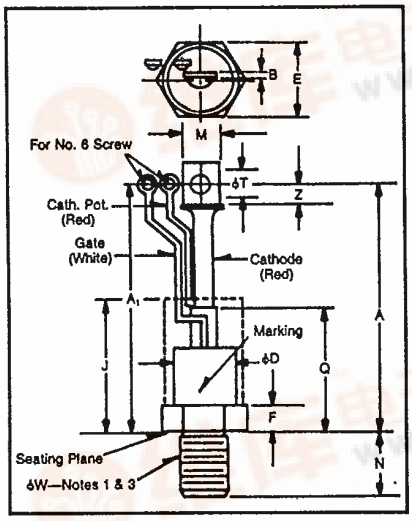
# POWEREX

# T700

## Phase Control SCR

### 250-350 Amperes Avg
### 200-2200 Volts

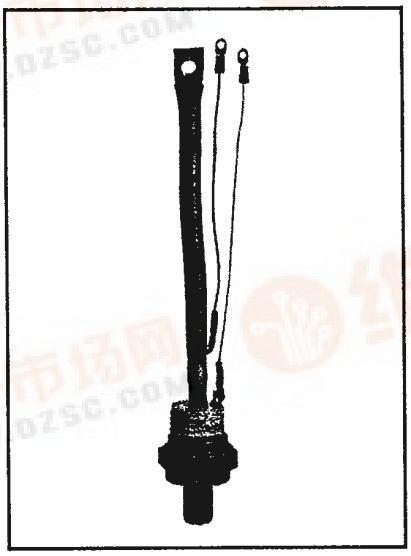
*Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272*
*Powerex Europe, S.A., 428 Ave. G. Durand, BP107, 72003 LeMans, France (43) 72.75.15*




**T70**
**Outline Drawing**

| Dimensions | Inches | | Millimeters | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 9.23 | 10.00 | 234.44 | 254.00 |
| $A_1$ | 9.65 | 10.42 | 245.11 | 264.67 |
| B | .063 | .172 | 1.60 | 4.37 |
| ϕD | — | 1.490 | — | 37.85 |
| E | 1.620 | 1.750 | 41.15 | 44.45 |
| F | .430 | .810 | 10.92 | 20.57 |
| J | 4.000 | — | 101.60 | — |
| M | .530 | .755 | 13.46 | 19.18 |
| N | 1.04 | 1.08 | 26.42 | 27.43 |
| Q | — | 3.100 | — | 78.74 |
| ϕT | .330 | .350 | 8.38 | 8.89 |
| Z | .440 | — | 11.18 | — |
| ϕW | ¾-16 UNF-2A | | | |

T700
Creep Distance—1.76 in. min. (44.70 mm)
Strike Distance—.81 in. min. (20.70 mm).
(In accordance with NEMA standards.)
Finish—Nickel Plate.
Approx. Weight—18 oz. (510 g).
1. Complete threads to extend to within 2½ threads of seating plane.
2. Angular orientation of terminals is undefined.
3. Pitch diameter of ¾-16 UNF-2A (coated) threads (ASA B1.1—1960).
4. Dimension "J" denotes seated height with leads bent at right angles.



**T700**
**Phase Control SCR**
250-350 Amperes/200-2200 Volts

**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 $I^2t$ Ratings

**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. T7001435 is a 1400 Volt, 350 Ampere Phase Control SCR.

| Type | Voltage | | Current | |
|---|---|---|---|---|
| | $V_{DRM}$ $V_{RRM}$ | Code | $I_T$ (avg) | Code |
| T700 | 200 | 02 | 350 | 35 |
| | 400 | 04 | 300 | 30 |
| | 600 | 06 | 250 | 25 |
| | 800 | 08 | | |
| | 1000 | 10 | | |
| | 1200 | 12 | | |
| | 1300 | 13 | | |
| | 1400 | 14 | | |
| | 1600 | 16 | | |
| | 1800 | 18 | | |
| | 2000 | 20 | | |
| | 2200 | 22 | | |

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## Absolute Maximum Ratings

| | Symbol | T700_ _25 | T700_ _30 | T700_ _35 | Units |
|---|---|---|---|---|---|
| RMS On-State Current | $I_{T(RMS)}$ | 400 | 470 | 550 | Amperes |
| Average On-State Current | $I_{T(av)}$ | 250 | 300 | 350 | Amperes |
| Peak One-Cycle Surge (Non Repetitive) On-State Current (60Hz)③ | $I_{TSM}$ | 7000 | 8400 | 10,000 | Amperes |
| Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz)③ | $I_{TSM}$ | 6400 | 7700 | 9100 | Amperes |
| Critical Rate-of-Rise of On-State Current (Non-Repetitive)①④⑥ | di/dt | 800 | 800 | 800 | Amperes/μs |
| Critical Rate-of-Rise of On-State Current (Repetitive) | di/dt | 150 | 150 | 150 | Amperes/μs |
| $I^2t$ (for Fusing), 8.3 milliseconds | $I^2t$ | 205,000 | 295,000 | 416,000 | $A^2sec$ |
| Peak Gate Power Dissipation | $P_{GM}$ | 16 | 16 | 16 | Watts |
| Average Gate Power Dissipation | $P_{G(av)}$ | 3 | 3 | 3 | Watts |
| Storage Temperature | $T_{STG}$ | −40 to 150 | −40 to 150 | −40 to 150 | °C |
| Operating Temperature | $T_J$ | −40 to 125 | −40 to 125 | −40 to 125 | °C |
| Mounting Torque① | | 360 | 360 | 360 | in.-lb. |
| Mounting Torque① | | 400 | 400 | 400 | kg-cm |

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

| | Symbol | Test Conditions | T700_ _25 | T700_ _30 | T700_ _35 | Units |
|---|---|---|---|---|---|---|
| **Current—Conducting State Maximums** | | | | | | |
| Peak On-State Voltage | $V_{TM}$ | $T_J$ = 25°C, $I_{TM}$ = 625A | 1.80 | 1.60 | 1.40 | Volts |
| | | | | T700 | | |
| **Voltage—Blocking State Maximums** | | | | | | |
| Forward Leakage, Peak | $I_{DRM}$ | $T_J$ = 125°C, $V_{DRM}$ = rated | | 30 | | mA |
| Reverse Leakage, Peak | $I_{RRM}$ | $T_J$ = 125°C, $V_{RRM}$ = rated | | 30 | | mA |
| **Switching** | | | | | | |
| Typical Turn-Off Time | $t_q$ | $I_T$ = 250 A, $di_R/dt$ = 25 A/μsec, reapplied dv/dt = 20V/μsec linear to 0.8 $V_{DRM}$, $T_J$ = 125°C | | 150 | | μsec |
| Typical Turn-On Time④ | $t_{on}$ | $I_T$ = 100A, $V_D$ = 100V | | 7 | | μsec |
| Min. Critical dv/dt exponential to $V_{DRM}$⑤⑥ | dv/dt | $T_J$ = 125°C | | 300 | | V/μsec |
| **Thermal** | | | | | | |
| Maximum Thermal Resistance① | | | | | | |
| Junction to Case | $R_{\theta JC}$ | | | .10 | | °C/Watt |
| Case to Sink, Lubricated | $R_{\theta CS}$ | | | .05 | | °C/Watt |
| **Gate—Maximum Parameters** | | | | | | |
| Gate Current to Trigger | $I_{GT}$ | $T_J$ = 25°C, $V_D$ = 12V | | 150 | | mA |
| Gate Voltage to Trigger | $V_{GT}$ | $T_J$ = 25°C, $V_D$ = 12V | | 3 | | Volts |
| Non-Triggering Gate Voltage | $V_{GDM}$ | $T_J$ = 125°C, $V_{DRM}$ = rated | | .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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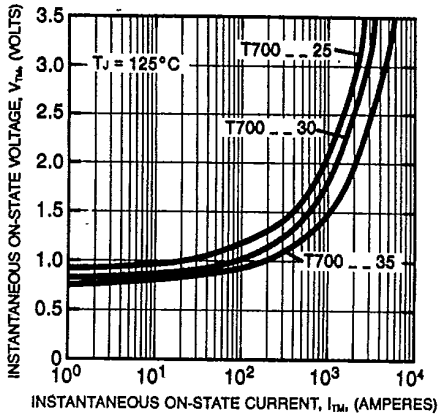
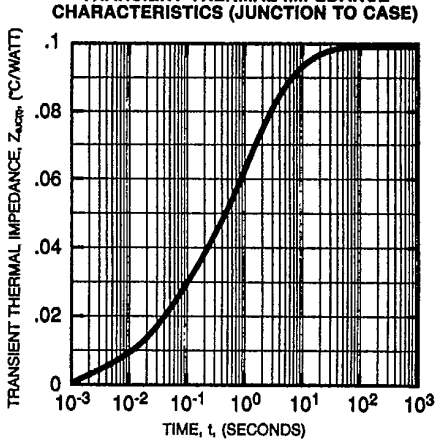
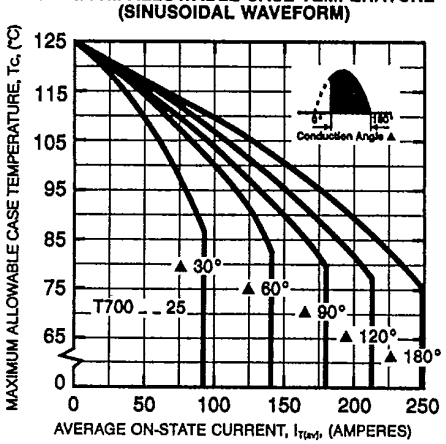
**MAXIMUM ON-STATE CHARACTERISTICS**



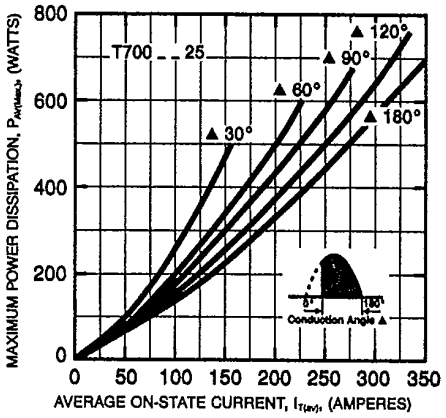

**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)**



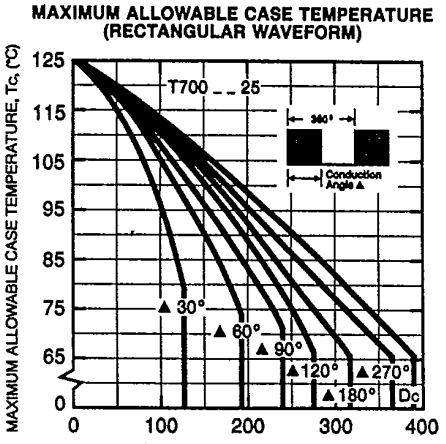

**MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)**




**MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)**




**MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)**

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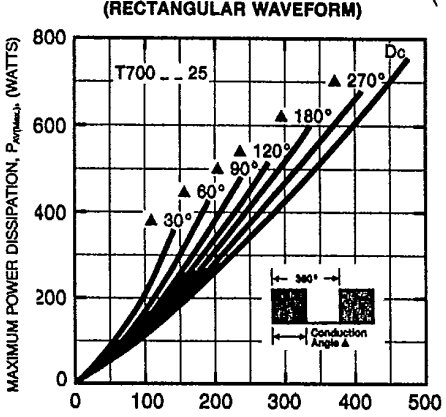

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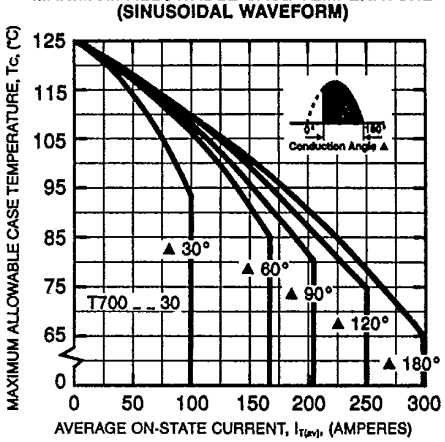


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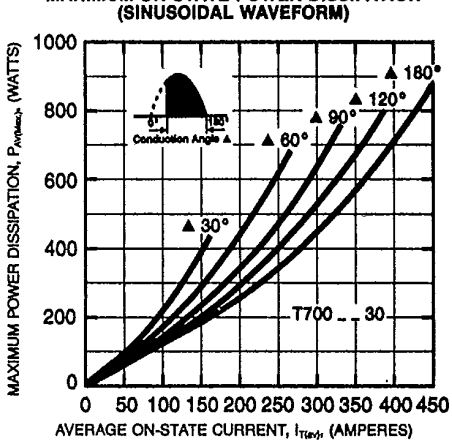


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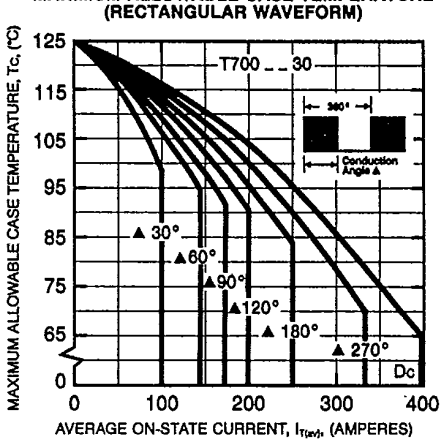


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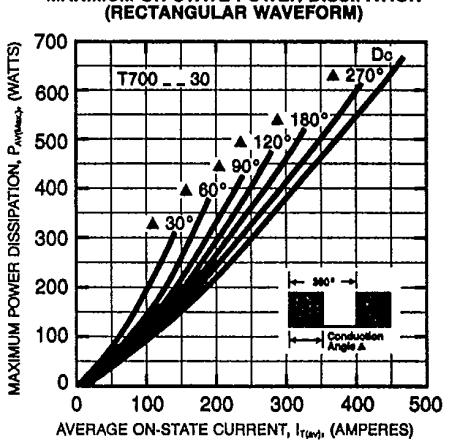


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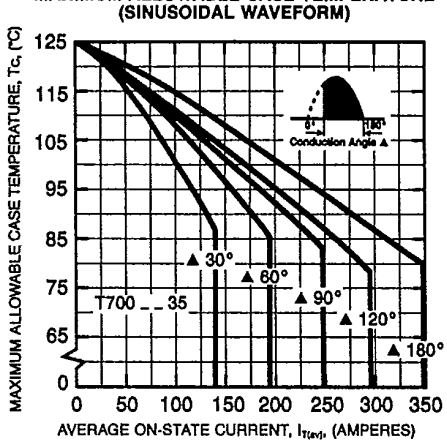


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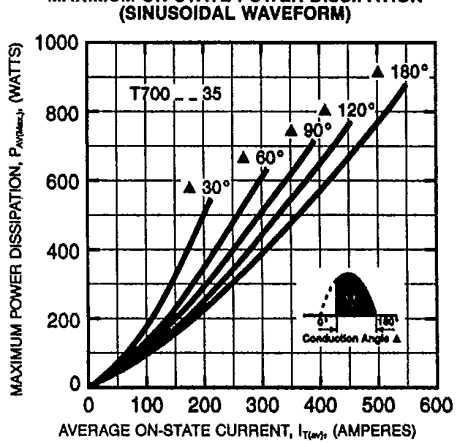

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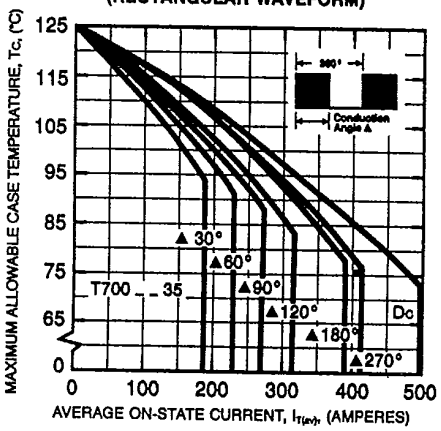


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