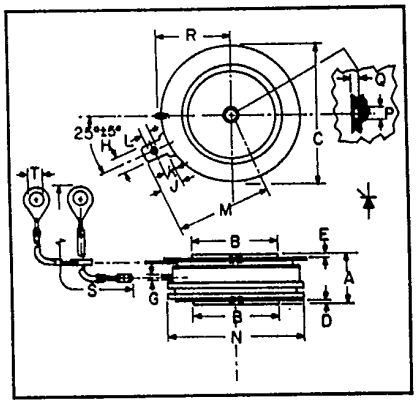
# POWEREX

# C430__X550

## Phase Control SCR

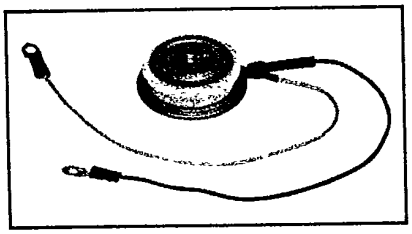
### 800 Amperes Avg
### 100-400 Volts

*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*




**C430__X550**
**Outline Drawing**

| Dimensions | Inches | | Millimeters | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | .560 | .605 | 14.22 | 15.37 |
| B | .985 | .995 | 25.01 | 25.27 |
| C | 1.600 | 1.650 | 40.64 | 41.91 |
| D | .030 | — | .76 | — |
| E | .040 | — | 1.01 | — |
| G | .057 | .059 | 1.44 | 1.50 |
| H | .186 | .191 | 4.72 | 4.85 |
| J | .245 | .255 | 6.22 | 6.48 |
| K | .115 | .130 | 2.92 | 3.30 |
| L | .064 | .070 | 1.62 | 1.78 |
| M | — | 1.120 | — | 28.45 |
| N | — | 1.585 | — | 40.26 |
| P | .135 | .145 | 3.42 | 3.68 |
| Q | .070 | .084 | 1.77 | 2.13 |
| R | — | .875 | — | 22.23 |
| S | 12.219 | 12.343 | 310.36 | 313.51 |
| T | .137 | .153 | 3.47 | 3.89 |



**C430__X550**
**Phase Control SCR**
800 Amperes/100-400 Volts

**Description**
Powerex Silicon Controlled Rectifiers (SCR) are designed for phase control applications. These are all-diffused, Press-Pak (Pow-R-Disc) 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
- ☐ High Temperature Operation

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

**Ordering Information**
Example: Select the complete nine digit part number you desire from the table – i.e. C430DX550 is a 400 Volt, 800 Ampere Phase Control SCR.

| Type | Voltage | | Current |
|---|---|---|---|
| | $V_{DRM}$ $V_{RRM}$ | Code | $I_T$ (avg) |
| C430__X550 | 100 | A | 800 |
| | 200 | B | |
| | 300 | C | |
| | 400 | D | |

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***C430__X550***
***Phase Control SCR***
*800 Amperes Avg/100-400 Volts*

## Absolute Maximum Ratings

| | Symbol | C430__X550 | Units |
|---|---|---|---|
| RMS On-State Current | $I_{T(RMS)}$ | 1250 | Amperes |
| Average On-State Current | $I_{T(av)}$ | 800 | Amperes |
| Peak One-Cycle Surge (Non-Repetitive) On-State Current (60Hz) | $I_{TSM}$ | 9000 | Amperes |
| Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz) | $I_{TSM}$ | 8200 | Amperes |
| Critical Rate-of-Rise of On-State Current (Non-Repetitive) | di/dt | 400 | Amperes/μs |
| Critical Rate-of-Rise of On-State Current (Repetitive) | di/dt | 150 | Amperes/μs |
| $I^2t$ (for Fusing), One Cycle at 60Hz | $I^2t$ | 335,000 | $A^2$sec |
| Peak Gate Power Dissipation | $P_{GM}$ | 200 | Watts |
| Average Gate Power Dissipation | $P_{G(av)}$ | 5 | Watts |
| Storage Temperature | $T_{STG}$ | −40 to 150 | °C |
| Operating Temperature | $T_J$ | −40 to 150 | °C |
| Mounting Force① | | 800 to 2200 | lb. |
| Mounting Force① | | 3.6 to 11.1 | kN |

① Consult recommended mounting procedures.

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***C430__X550***
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## Electrical and Thermal Characteristics

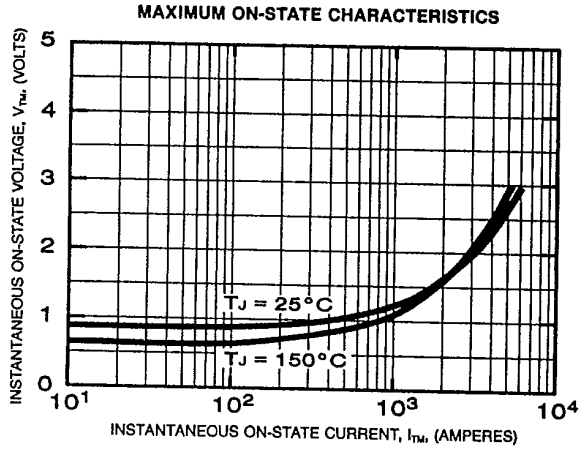
| Characteristics | Symbol | Test Conditions | C430__X550 | Units |
|---|---|---|---|---|
| **Voltage—Blocking State Maximums** | | | | |
| Forward Leakage, Peak | $I_{DRM}$ | $T_J$ = 25°C, V = $V_{DRM}$ | 50 | mA |
| Reverse Leakage, Peak | $I_{RRM}$ | $T_J$ = 25°C, V = $V_{RRM}$ | 50 | mA |
| **Current—Conducting State Maximums** | | | | |
| Peak On-State Voltage | $V_{TM}$ | $I_{TM}$ = 3000A, $T_C$ = 25°C | 1.9 | Volts |
| **Switching** | | | | |
| Typical Turn-Off Time | $t_q$ | $T_J$ = 150°C; $I_{TM}$ = 500A, $V_R$ = 50V Min; $V_{DRM}$ (Reapplied); Reapplied dv/dt = 20V/µsec (linear); Commutation di/dt = 25A/µsec; Repetition Rate = 1pps, Gate Bias during Turn-Off interval = 0V, 100Ω | 125 | µsec |
| Typical Delay Time | $t_d$ | $T_C$ = 25°C, $I_T$ = 50Adc, Gate Supply: 20V, 20Ω, 0.1µsec Rise Time | 0.7 | µsec |
| Min. Critical dv/dt exponential to $V_{DRM}$ | dv/dt | $T_J$ = 150°C, $V_{DRM}$ rated, gate open | 100 | V/µsec |
| **Thermal and Mechanical** | | | | |
| Maximum Thermal Resistance,① double sided cooling | | | | |
| Junction to Case (2000 lb. force) | $R_{\theta JC}$ | | .04 | °C/Watt |
| Case to Sink, Lubricated (2000 lb. force) | $R_{\theta CS}$ | | .02 | °C/Watt |
| **Gate—Maximum Parameters** | | | | |
| Gate Current to Trigger | $I_{GT}$ | $V_D$ = 6V, $T_J$ = 150°C, $R_L$ = 3 ohms | 100 | mA |
| Gate Voltage to Trigger | $V_{GT}$ | $V_D$ = 6V, $T_J$ = 150°C, $R_L$ = 3 ohms | 5 | Volts |
| Non-Triggering Gate Voltage | $V_{GDM}$ | $T_J$ = 150°C, rated $V_{DRM}$ | .15 | Volts |
| Peak Forward Gate Current | $I_{GTM}$ | | 4 | Amperes |
| Peak Reverse Gate Voltage | $V_{GRM}$ | | 5 | Volts |

① Consult recommended mounting procedures.

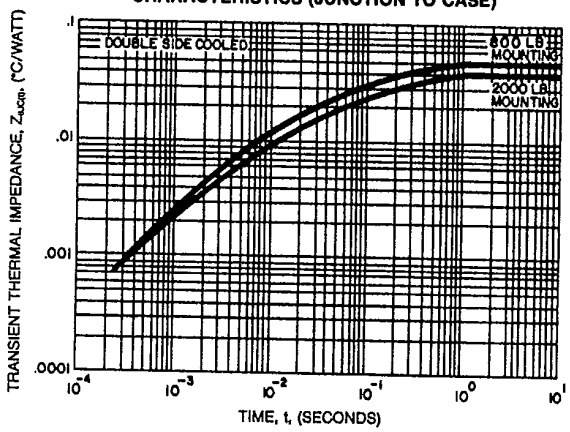
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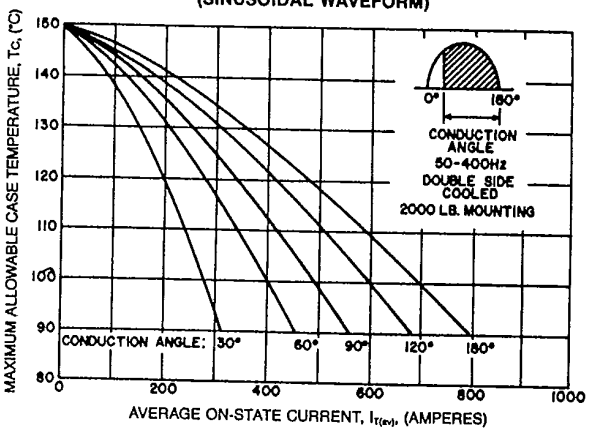
**MAXIMUM ON-STATE CHARACTERISTICS**



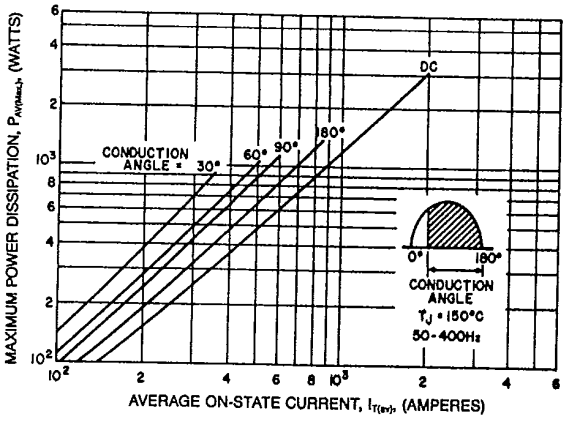

**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)**



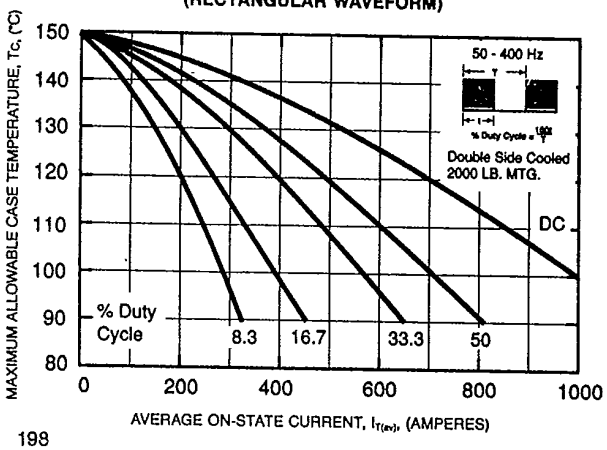

**MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)**



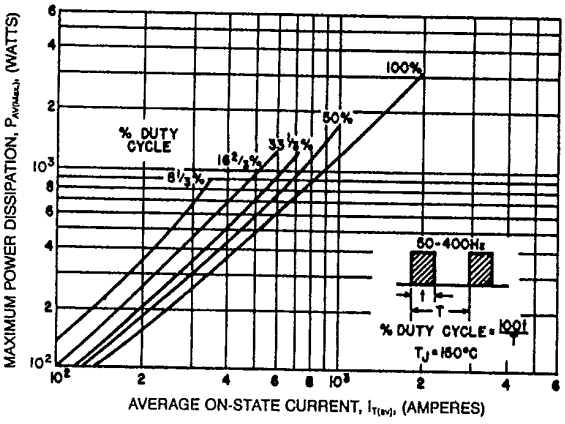

**MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)**




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



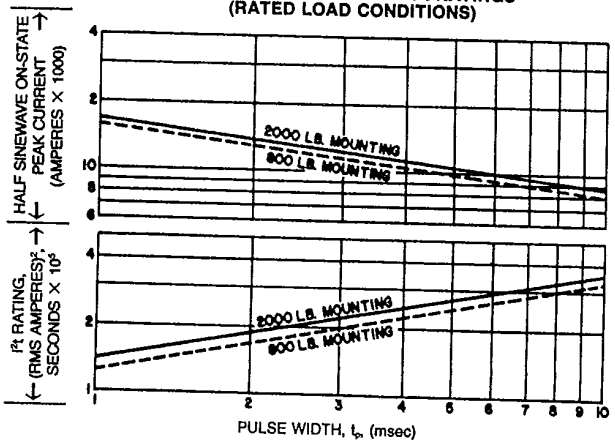

**MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)**



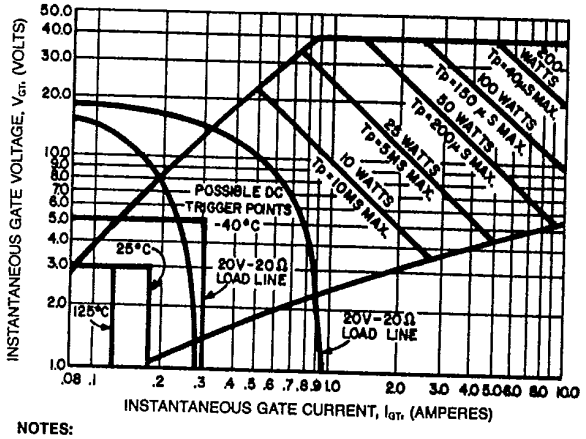
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**SUB-CYCLE SURGE AND $I^2t$ RATINGS (RATED LOAD CONDITIONS)**




**GATE CHARACTERISTICS**




**NOTES:**
1. Maximum allowable average gate dissipation = 5 watts.
2. The locus of possible dc trigger points lie outside the boundaries shown at various case temperatures.
3. Tp = Rectangular gate current pulse width (5µs min. duration; 1.0µs max. rise time for 20V, 65Ω source).
4. 20V – 20Ω is the minimum gate source load line when rate of circuit current rise > 100 Amp/µs or anode rate of current rise > 200 Amps/µs (Tp = 5µs min., 0.5µs max. rise time).

   Maximum long-term repetitive anode di/dt = 500 Amps/µs with 20V – 20Ω gate source.