

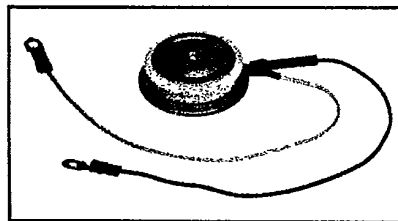
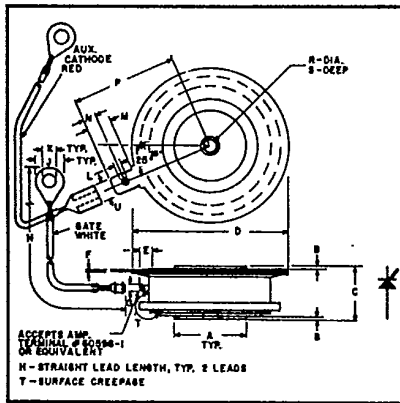


C380__X555

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
100-1300 Volts



C380__X555
Phase Control SCR
 300 Amperes/100-1300 Volts

TO-200
Outline Drawing

| Dimensions | Inches | | Millimeters | |
|------------|--------|-------|-------------|--------|
| | Min. | Max. | Min. | Max. |
| A | .744 | .752 | 18.897 | 19.101 |
| B | .030 | .060 | .762 | 1.524 |
| C | .515 | .565 | 13.081 | 14.351 |
| D | 1.600 | 1.656 | 40.64 | 42.06 |
| E | .110 | — | 2.794 | — |
| F | .013 | .017 | .330 | .432 |
| G | .057 | .059 | 1.447 | 1.449 |
| H | 7.980 | 8.115 | 202.70 | 206.11 |
| J | — | .300 | — | 7.620 |
| K | .137 | .153 | 3.479 | 3.886 |
| L | .065 | .070 | 1.651 | 1.778 |
| M | .245 | .260 | 6.223 | 6.604 |
| N | .120 | .140 | 3.048 | 3.556 |
| P | 1.090 | 1.125 | 27.69 | 28.55 |
| R | .135 | .145 | 3.429 | 3.683 |
| S | .067 | .083 | 1.701 | 2.108 |
| T | .340 | — | 8.636 | — |
| U | .186 | .189 | 4.724 | 4.801 |

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 I²t Ratings
- High Temperature Operation

Applications:

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

Ordering Information

Example: Select the complete nine or ten digit part number you desire from the table - i.e. C380NX555 is an 800 Volt, 300 Ampere Phase Control SCR.

| Type | Voltage | | Current |
|------------|--------------------------------------|------|---------|
| | V _{ORM} V _{RRM} | Code | |
| C380__X555 | 100 | A | 300 |
| | 200 | B | |
| | 300 | C | |
| | 400 | D | |
| | 500 | E | |
| | 600 | M | |
| | 700 | S | |
| | 800 | N | |
| | 900 | T | |
| | 1000 | P | |
| 1100 | PA | | |
| 1200 | PB | | |
| 1300 | PC | | |



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Absolute Maximum Ratings

| | Symbol | C380_X555 | Units |
|---|--------------|-------------|--------------------|
| RMS On-State Current | $I_{T(RMS)}$ | 450 | Amperes |
| Average On-State Current | $I_{T(av)}$ | 300 | Amperes |
| Peak One-Cycle Surge (Non-Repetitive) On-State Current (60Hz) | I_{TSM} | 3200 | Amperes |
| Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz) | I_{TSM} | 2900 | Amperes |
| Critical Rate-of-Rise of On-State Current (Non-Repetitive) | di/dt | 600 | Amperes/ μ s |
| Critical Rate-of-Rise of On-State Current (Repetitive) | di/dt | 300 | Amperes/ μ s |
| I^2t (for Fusing), 8.3 milliseconds | I^2t | 42,000 | A ² sec |
| Peak Gate Power Dissipation | P_{GM} | 10 | Watts |
| Average Gate Power Dissipation | $P_{G(av)}$ | 2 | Watts |
| Storage Temperature | T_{STG} | -40 to 150 | °C |
| Operating Temperature | T_J | -40 to 150 | °C |
| Mounting Force [Ⓞ] | | 720 to 880 | lb. |
| Mounting Force [Ⓞ] | | 3.2 to 3.92 | kN |

Electrical and Thermal Characteristics

| Characteristics | Symbol | Test Conditions | C380_X555 | Units |
|--|-----------|--|-----------|--------------|
| Voltage—Blocking State Maximums | | | | |
| Forward Leakage, Peak | I_{DRM} | $T_J = 150^\circ\text{C}, V = V_{DRM}$ | 45 | mA |
| Reverse Leakage, Peak | I_{RRM} | $T_J = 150^\circ\text{C}, V = V_{RRM}$ | 45 | mA |
| Current—Conducting State Maximums | | | | |
| Peak On-State Voltage | V_{TM} | $I_{TM} = 1500\text{A Peak}, T_C = 25^\circ\text{C}$ | 2.85 | Volts |
| Switching | | | | |
| Typical Turn-Off Time | t_q | $T_J = +150^\circ\text{C}, I_{TM} = 250$ Amperes, $V_R = 50$ Volts Minimum, V_{DRM} (Reapplied), Rate-of-Rise of Reapplied Off-State voltage = 20 Volts/ μ sec (Linear) Gate Bias During Turn-off Interval = 0 Volts, 100 Ω . Duty Cycle $\leq 0.01\%$ | 75 | μ sec |
| Typical Delay Time | t_d | $T_C = +25^\circ\text{C}, I_T = 100$ Adc, $V_{DRM} =$ Rated Gate Supply: 10 Volt Open Circuit, 25 ohm, 0.1 μ sec maximum rise time | 1.0 | μ sec |
| Min. Critical dv/dt exponential to V_{DRM} | dv/dt | $T_J = 150^\circ\text{C},$ Gate Open | 200 | V/ μ sec |
| Thermal | | | | |
| Maximum Thermal Resistance, [Ⓞ] double sided cooling | | | | |
| Junction to Case | R_{BJC} | | .095 | °C/Watt |
| Case to Sink, Lubricated | R_{BCS} | | .02 | °C/Watt |
| Gate—Maximum Parameters | | | | |
| Gate Current to Trigger | I_{GT} | $T_C = 25^\circ\text{C}, V_D = 6\text{Vdc}; R_L = 3\Omega$ | 150 | mA |
| Gate Voltage to Trigger | V_{GT} | $T_C = -40^\circ\text{C to } 150^\circ\text{C}, V_D = 6\text{Vdc}, R_L = 3\Omega$ | 3 | Volts |
| Non-Triggering Gate Voltage | V_{GDM} | $T_J = 150^\circ\text{C}, R_L = 1000\Omega,$ Rated V_{DRM} | .15 | Volts |
| Peak Forward Gate Current | I_{GTM} | | 10 | Amperes |
| Peak Reverse Gate Voltage | V_{GRM} | | 5 | Volts |

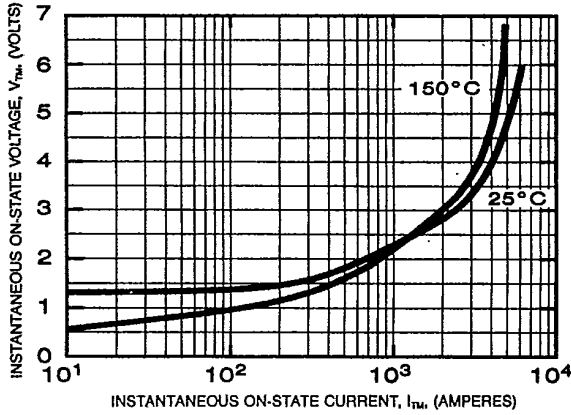
[Ⓞ] Consult recommended mounting procedures.



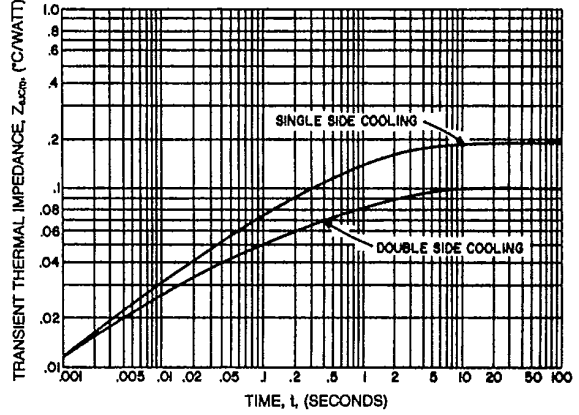
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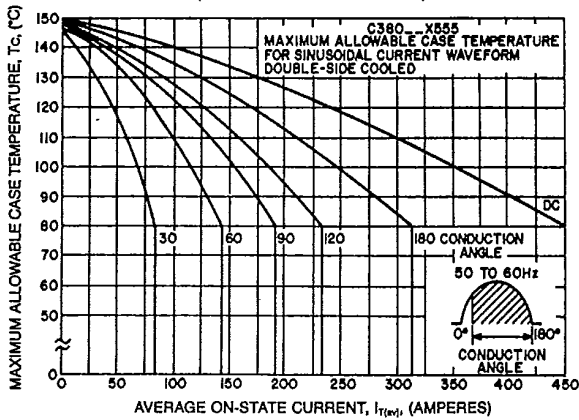
MAXIMUM ON-STATE CHARACTERISTICS



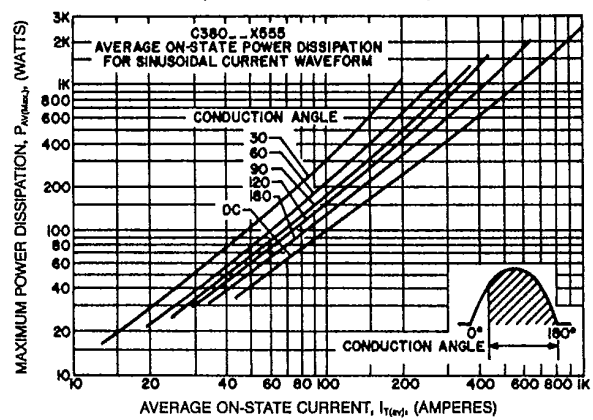
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



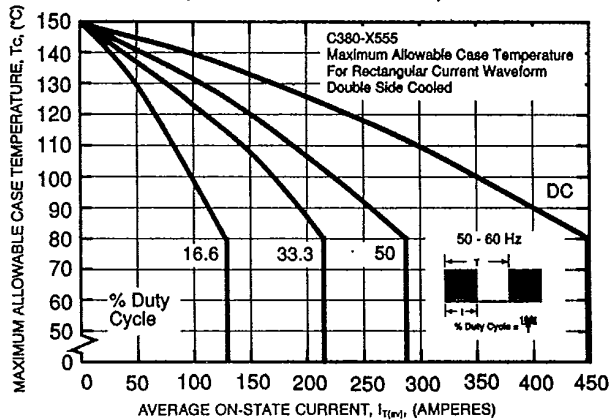
MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



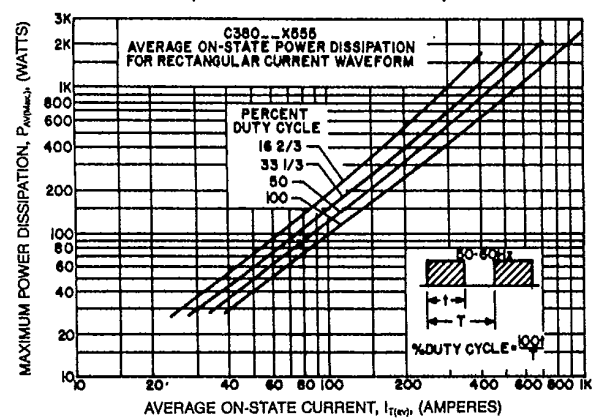
MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



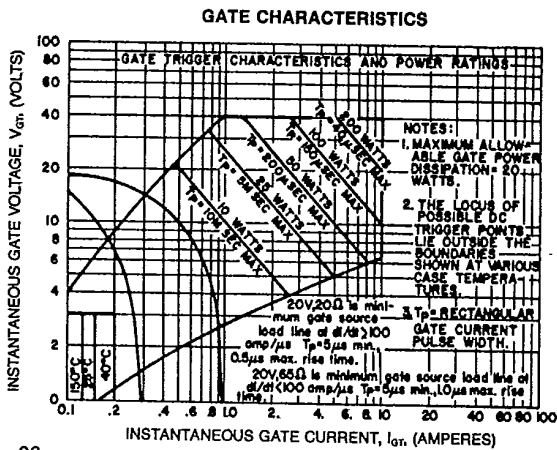
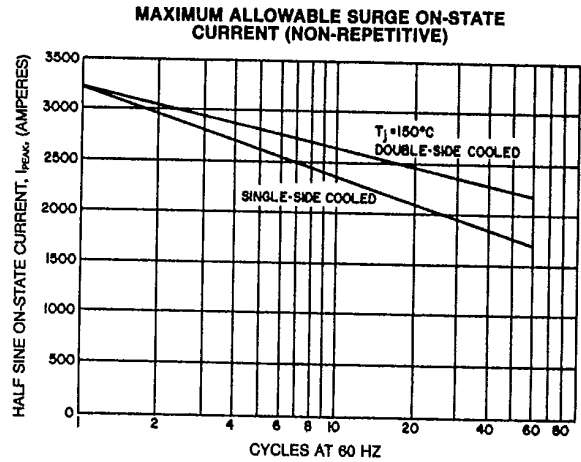
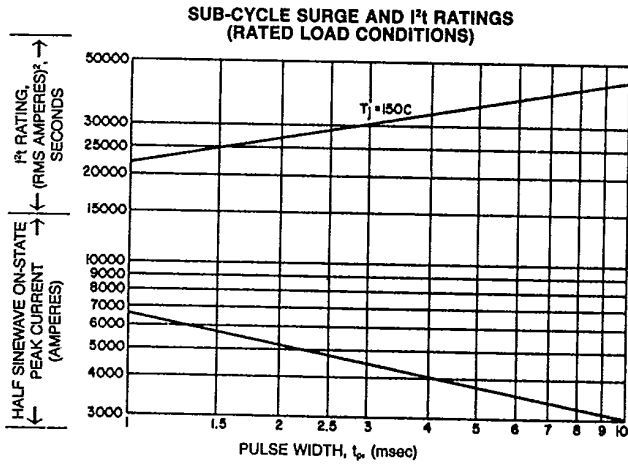
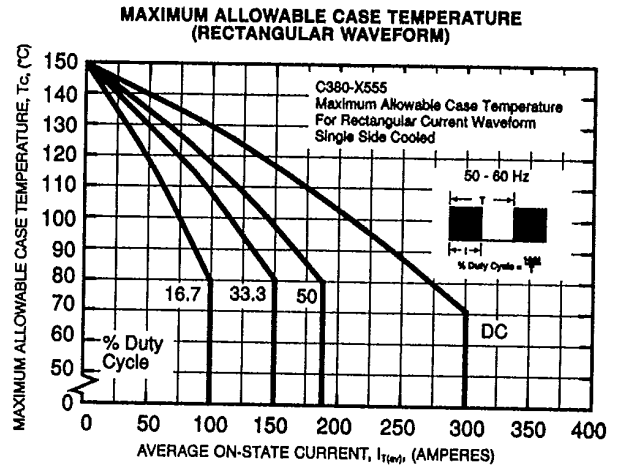
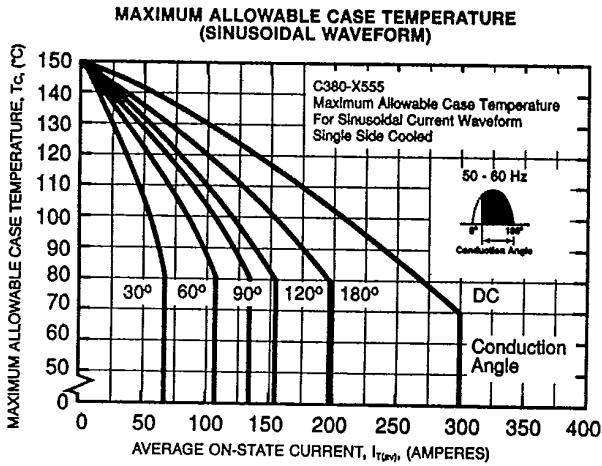
MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)





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- NOTES:
 1. Maximum allowable gate power dissipation = 2 watts.
 2. The locus of possible DC trigger points lie outside the boundaries shown at various case temperatures.
 3. T_p = Rectangular Gate Current Pulse Width.