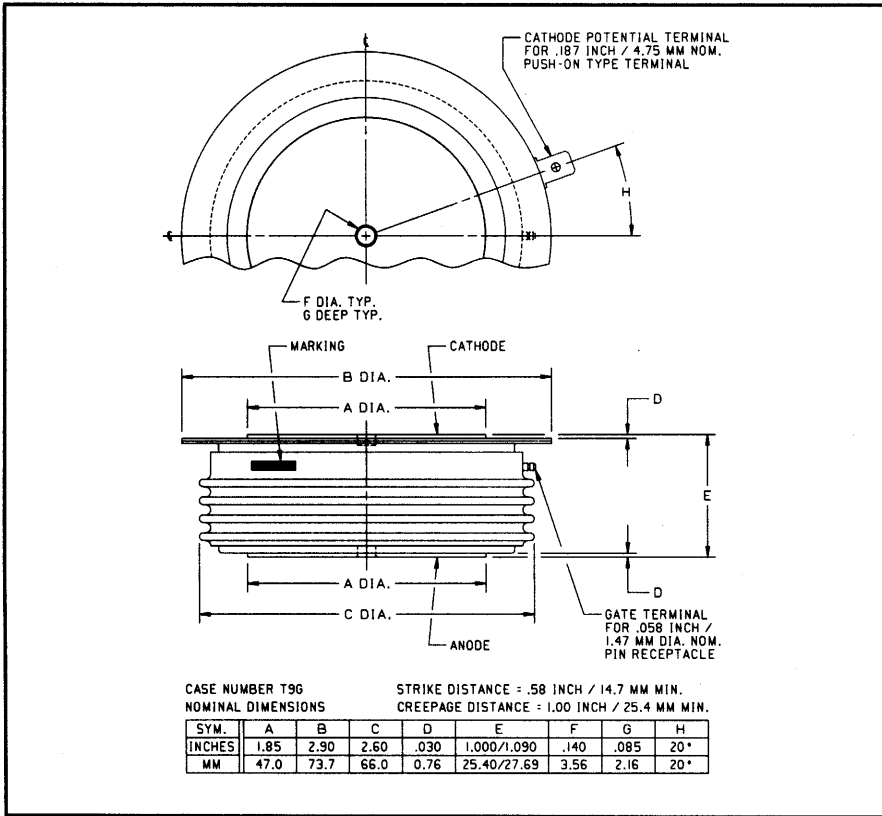
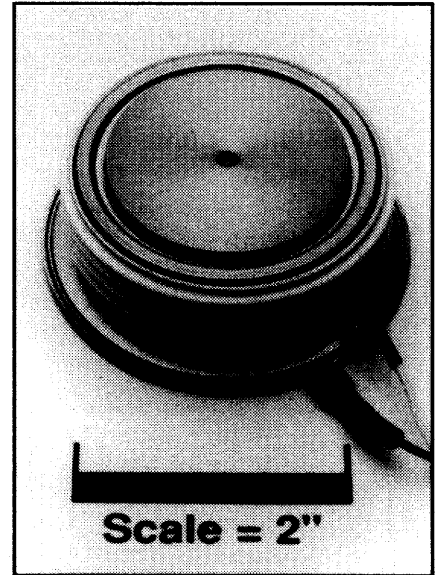


Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272
 Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

Phase Control SCR
 1000 Amperes Average
 3200 Volts



C702 (Outline Drawing)



C702 Phase Control SCR
 1000 Amperes Average, 3200 Volts

Ordering Information:

Select the complete six digit part number you desire from the table, i.e. C702CB is a 3200 Volt, 1000 Ampere Phase Control SCR.

| Type | Voltage | | Current |
|------|------------------|-----------------------|--------------------|
| | V _{DRM} | V _{RRM} Code | I _{T(av)} |
| C702 | 2400 | LD | 1000 |
| | 2600 | LM | |
| | 2800 | LN | |
| | 3000 | CP | |
| | 3200 | CB | |

Description:

Powerex Silicon Controlled Rectifiers (SCR) are designed for phase control applications. These are all-diffused, Press-Pak, hermetic Pow-R-Disc devices employing the field proven amplifying gate.

Features:

- Low On-State Voltage
- High di/dt Capability
- High dv/dt Capability
- Hermetic Packaging
- Excellent Surge and I²t Ratings

Applications:

- Power Supplies
- Motor Control



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C702

Phase Control SCR

1000 Amperes Average, 3200 Volts

Absolute Maximum Ratings

| Characteristics | Symbol | C702 | Units |
|---|-------------|------------------|--------------------|
| Non-repetitive Transient Peak Reverse Voltage | V_{RSM} | $V_{RRM} + 100V$ | Volts |
| RMS On-state Current, $T_C = 74^\circ C$ | $I_T(rms)$ | 1570 | Amperes |
| Average Current 180° Sine Wave, $T_C = 74^\circ C$ | $I_T(av)$ | 1050 | Amperes |
| RMS On-state Current, $T_C = 55^\circ C$ | $I_T(rms)$ | 1880 | Amperes |
| Average Current 180° Sine Wave, $T_C = 55^\circ C$ | $I_T(av)$ | 1200 | Amperes |
| Peak One Cycle Surge On-state Current (Non-repetitive) 60Hz | I_{tsm} | 15000 | Amperes |
| Peak One Cycle Surge On-state Current (Non-repetitive) 50Hz | I_{tsm} | 14000 | Amperes |
| Critical Rate-of-rise of On-state Current (Non-repetitive) | di/dt | 100 | A/ μ sec |
| Critical Rate-of-rise of On-state Current (Repetitive) | di/dt | 25 | A/ μ sec |
| I^2t (for Fusing) for One Cycle, 60Hz | I^2t | 933,000 | A ² sec |
| Peak Gate Power Dissipation | P_{GM} | 200 | Watts |
| Average Gate Power Dissipation | $P_{G(av)}$ | 5 | Watts |
| Operating Temperature | T_j | -40 to +125°C | °C |
| Storage Temperature | T_{stg} | -40 to +125°C | °C |
| Approximate Weight | | 1 | lb. |
| | | 454 | g |
| Mounting Force | | 5000 to 6000 | lb. |
| | | 2220 to 2660 | kg. |



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C702

Phase Control SCR

1000 Amperes Average, 3200 Volts

Electrical Characteristics, $T_j = 25^\circ\text{C}$ Unless Otherwise Specified

| Characteristics | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|---|-------------|---|------|------|---------------------------|--------------------|
| Repetitive Peak Reverse Leakage Current | I_{RRM} | $T_j = 125^\circ\text{C}, V_R = V_{RRM}$ | | | 65 | mA |
| | | $T_j = 25^\circ\text{C}, V_R = V_{RRM}$ | | | 15 | mA |
| Repetitive Peak Forward Leakage Current | I_{DRM} | $T_j = 125^\circ\text{C}, V_D = V_{DRM}$ | | | 65 | mA |
| | | $T_j = 25^\circ\text{C}, V_R = V_{RRM}$ | | | 15 | mA |
| Peak On-state Voltage | V_{TM} | $T_j = 125^\circ\text{C}, I_T = 3000\text{A Peak}$ Duty Cycle < 0.1% | | | 2.26 | Volts |
| Threshold Voltage, Low-level | $V_{(TO)1}$ | $T_j = 125^\circ\text{C}, I = 15\%, I_{T(av)}$ to $\pi I_{T(av)}$ | | | 0.94963 | Volts |
| Slope Resistance, Low-level | r_{T1} | | | | 0.1234 | m Ω |
| Threshold Voltage, High-level | $V_{(TO)2}$ | $T_j = 125^\circ\text{C}, I = \pi I_{T(av)}$ to I_{TSM} | | | 1.1007 | Volts |
| Slope Resistance, High-level | r_{T2} | | | | 0.1149 | m Ω |
| V_{TM} Coefficients, Low-level | | $T_j = 125^\circ\text{C}, I = 15\% I_{T(av)}$ to $\pi I_{T(av)}$ | | | | |
| | | | | | $A_1 = -0.007132$ | |
| | | | | | $B_1 = 0.18721$ | |
| | | | | | $C_1 = 1.589\text{E-}04$ | |
| | | | | | $D_1 = -0.011393$ | |
| V_{TM} Coefficients, High-level | | $T_j = 125^\circ\text{C}, I = \pi I_{T(av)}$ to I_{TSM} | | | | |
| | | | | | $A_2 = 30.510$ | |
| | | | | | $B_2 = -4.6029$ | |
| | | | | | $C_2 = -2.083\text{E-}04$ | |
| | | | | | $D_2 = 0.1610$ | |
| Typical Delay Time | t_d | Switching from 300V, Gate = 20V, 10 Ω , 0.5 μsec Rise Time | | 1.8 | | μsec |
| Minimum Critical dv/dt - Exponential to V_{DRM} | dv/dt | $T_j = 125^\circ\text{C}, V_{DRM} = 0.5$ Rated, Gate Open | 200 | | | V/ μsec |
| Gate Trigger Current | I_{GT} | $T_C = 125^\circ\text{C},$ $V_D = 10\text{V}, R_L = 3\Omega$ | | | 200 | mA |
| Gate Trigger Voltage | V_{GT} | $T_j = 0^\circ$ to $125^\circ\text{C},$ $V_D = 10\text{V}, R_L = 3\Omega$ | | | 4.5 | Volts |
| Non-Trigging Gate Voltage | V_{GDM} | $T_j = 125^\circ\text{C},$ $V_D = 0.5V_{DRM}, R_L = 1000\Omega$ | | | 0.3 | Volts |
| Peak Forward Gate Current | I_{GTM} | | | | 4 | A |
| Peak Reverse Gate Voltage | V_{GRM} | | | | 5 | Volts |

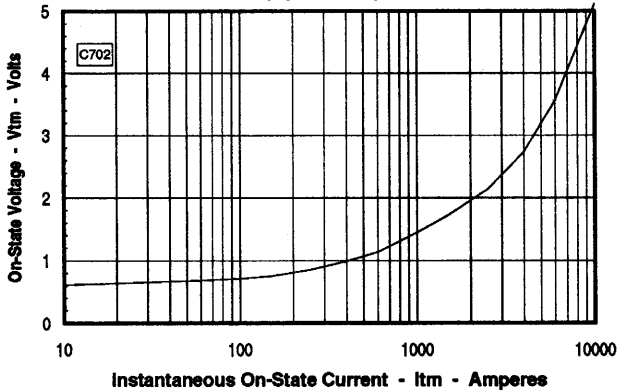
Thermal Characteristics

Maximum Thermal Resistance, Double Sided Cooling

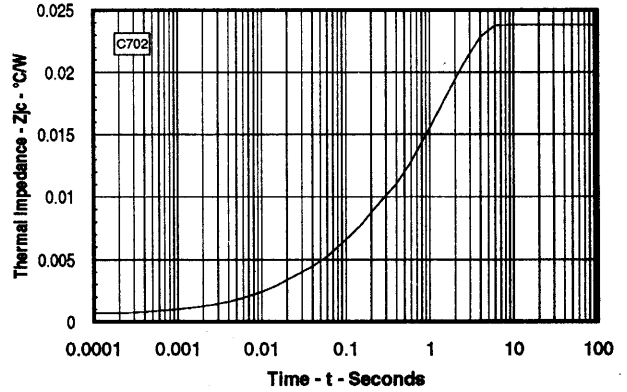
| | | | |
|------------------|-------------------|-------|--------------------|
| Junction-to-Case | $R_{\theta(j-c)}$ | 0.023 | $^\circ\text{C/W}$ |
| Case-to-Sink | $R_{\theta(c-s)}$ | 0.075 | $^\circ\text{C/W}$ |

C702
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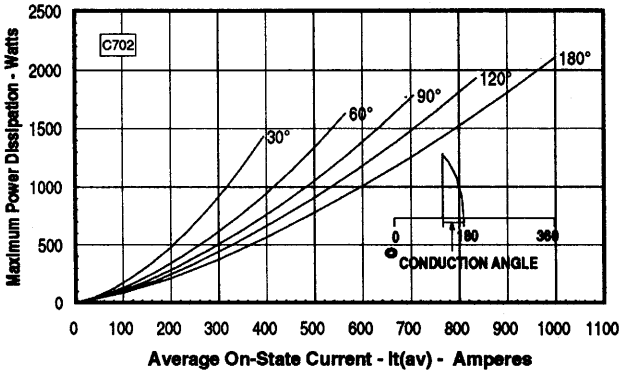
Maximum On-State Forward Voltage Drop
 ($T_J = 125^\circ\text{C}$)



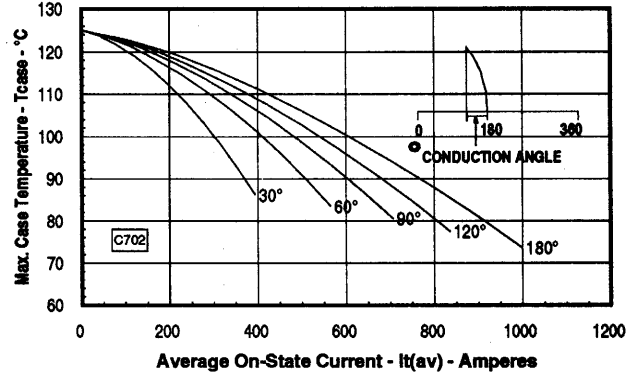
Maximum Transient Thermal Impedance
 (Junction to Case)



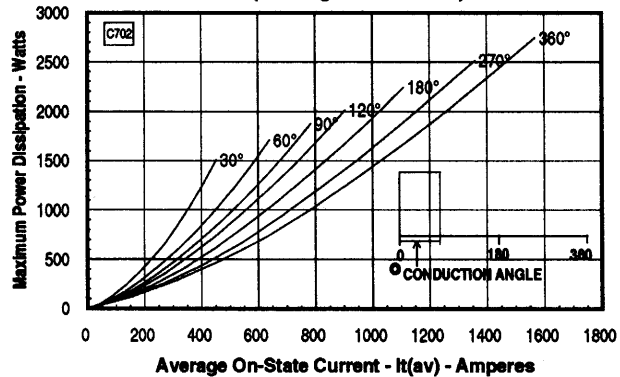
Maximum On-State Power Dissipation
 (Sinusoidal Waveform)



Maximum Allowable Case Temperature
 (Sinusoidal Waveform)



Maximum On-State Power Dissipation
 (Rectangular Waveform)



Maximum Allowable Case Temperature
 (Rectangular Waveform)

