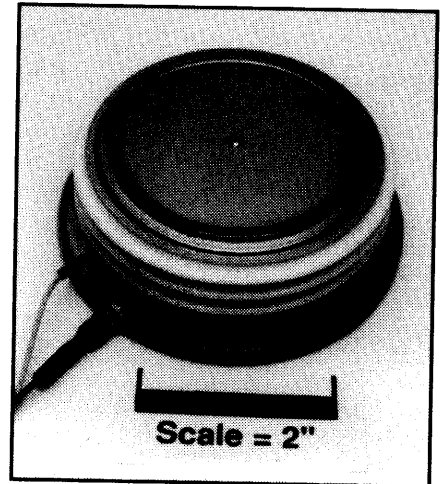


TA20 1800A (Outline Drawing)



TA20 1800A Phase Control SCR
1800 Amperes Average, 2200 Volts

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 I^2t Ratings

Applications:

- Power Supplies
- Motor Control

Ordering Information:

Select the complete 12 digit part number you desire from the table below.

| Type | Voltage | Current | Turn-off | Gate Current | Lead Code |
|------|------------------------------|------------------|----------------------------|------------------|-----------|
| | V_{DRM}/V_{RRM} (Volts) | $I_T(av)$ (A) | t_q (μ sec) | I_{GT} (mA) | |
| TA20 | 02 through 22 | 18 | 0 | 3 | DH |
| | 200V through 2200V | 1800A | 250 μ sec (Typical) | 200mA | 12" |



POWEREX, Inc. 173 Pavilion Ln Youngwood, PA USA 724-925-7272

www.pwrx.com

TA20 1800A

Phase Control SCR

1800 Amperes Average, 2200 Volts

Absolute Maximum Ratings

| Characteristics | Symbol | TA20 1800A | Units |
|---|--------------|--------------------|--------------------|
| Non-repetitive Transient Peak Reverse Voltage | V_{RSM} | $V_{RRM} + 100V$ | Volts |
| RMS On-state Current, $T_C = 85^\circ C$ | $I_{T(rms)}$ | 2820 | Amperes |
| Average Current 180° Sine Wave, $T_C = 85^\circ C$ | $I_{T(av)}$ | 1800 | Amperes |
| RMS On-state Current, $T_C = 55^\circ C$ | $I_{T(rms)}$ | 4200 | Amperes |
| Average Current 180° Sine Wave, $T_C = 55^\circ C$ | $I_{T(av)}$ | 2675 | Amperes |
| Peak One Cycle Surge On-state Current (Non-repetitive) 60Hz | I_{tsm} | 40000 | Amperes |
| Peak One Cycle Surge On-state Current (Non-repetitive) 50Hz | I_{tsm} | 36500 | Amperes |
| Critical Rate-of-rise of On-state Current (Non-repetitive) | di/dt | 400 | A/ μ sec |
| Critical Rate-of-rise of On-state Current (Repetitive) | di/dt | 150 | A/ μ sec |
| I^2t (for Fusing) for One Cycle, 60Hz | I^2t | 6.67×10^6 | A ² sec |
| Peak Gate Power Dissipation | P_{GM} | 16 | Watts |
| Average Gate Power Dissipation | $P_{G(av)}$ | 3 | Watts |
| Operating Temperature | T_j | -40 to +125°C | °C |
| Storage Temperature | T_{stg} | -40 to +150°C | °C |
| Approximate Weight | | 2.1 | lb. |
| | | 950 | g |
| Mounting Force | | 9000 to 11000 | lb. |
| | | 4100 to 5000 | kg. |

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Electrical Characteristics, T_j = 25°C Unless Otherwise Specified

| Characteristics | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|--|--------------------|--|------|------|----------------------------|--------|
| Repetitive Peak Reverse Leakage Current | I _{RRM} | T _j = 125°C, V _R = V _{RRM} | | | 100 | mA |
| Repetitive Peak Forward Leakage Current | I _{DRM} | T _j = 125°C, V _D = V _{DRM} | | | 100 | mA |
| Peak On-state Voltage | V _{TM} | I _{TM} = 3000A Peak Duty Cycle < 0.1% | | | 1.45 | Volts |
| Threshold Voltage, Low-level | V _{(TO)1} | T _j = 125°C, I = 15%, I _{T(av)} to πI _{T(av)} | | | 0.71870 | Volts |
| Slope Resistance, Low-level | r _{T1} | | | | 0.1669 | mΩ |
| Threshold Voltage, High-level | V _{(TO)2} | T _j = 125°C, I = πI _{T(av)} to I _{TSM} | | | 0.97647 | Volts |
| Slope Resistance, High-level | r _{T2} | | | | 0.1215 | mΩ |
| V _{TM} Coefficients, Low-level | | T _j = 125°C, I = 15% I _{T(av)} to πI _{T(av)} | | | | |
| | | | | | A ₁ = 1.0791 | |
| | | | | | B ₁ = -0.12551 | |
| | | | | | C ₁ = 3.874E-06 | |
| | | | | | D ₁ = 0.02151 | |
| V _{TM} Coefficients, High-level | | T _j = 125°C, I = πI _{T(av)} to I _{TSM} | | | | |
| | | | | | A ₂ = -6.7846 | |
| | | | | | B ₂ = 1.1619 | |
| | | | | | C ₂ = 1.858E-04 | |
| | | | | | D ₂ = -0.03560 | |
| Typical Turn-on Time | t _{on} | I _T = 1000A, V _D = 1500V | | 4 | | μsec |
| Typical Turn-off Time | t _q | T _j = 125°C, I _T = 250A, di _R /dt = 50A/μsec Reapplied dv/dt = 20V/μsec Linear to 80% V _{DRM} | | 250 | | μsec |
| Minimum Critical dv/dt - Exponential to V _{DRM} | dv/dt | T _j = 125°C | 300 | | | V/μsec |
| Gate Trigger Current | I _{GT} | T _j = 25°C, V _D = 12V | | | 200 | mA |
| Gate Trigger Voltage | V _{GT} | T _j = 25°C, V _D = 12V | | | 4.5 | Volts |
| Non-Triggering Gate Voltage | V _{GDM} | T _j = 125°C, V _D = V _{DRM} | | | 0.15 | Volts |
| Peak Forward Gate Current | I _{GTM} | | | | 4 | A |
| Peak Reverse Gate Voltage | V _{GDM} | | | | 5 | Volts |

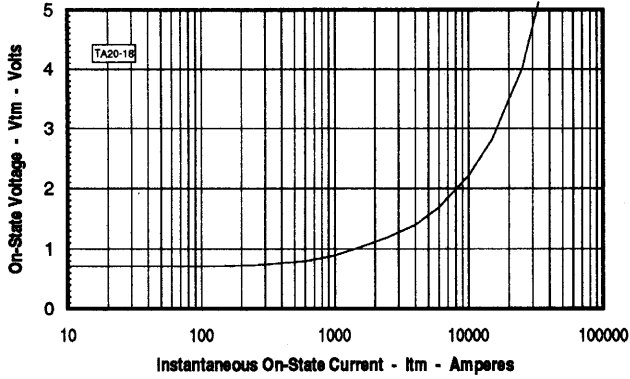
Thermal Characteristics

Maximum Thermal Resistance, Double Sided Cooling

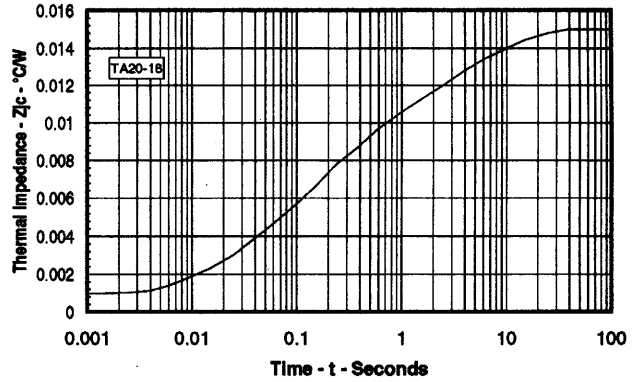
| | | | | |
|------------------|---------------------|--|-------|------|
| Junction-to-Case | R _{θ(j-c)} | | 0.015 | °C/W |
| Case-to-Sink | R _{θ(c-s)} | | 0.007 | °C/W |

Phase Control SCR
1800 Amperes Average, 2200 Volts

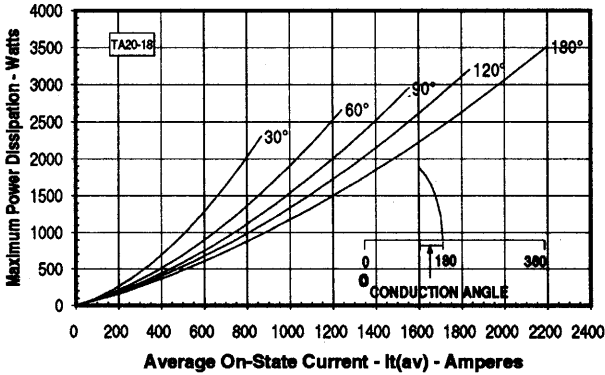
Maximum On-State Forward Voltage Drop
($T_J = 125^\circ\text{C}$)



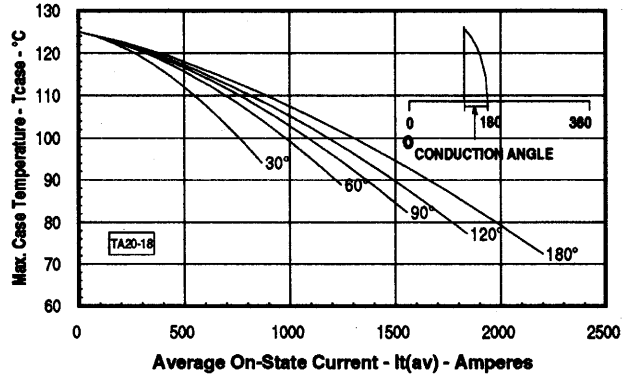
Maximum Transient Thermal Impedance
(Junction to Case)



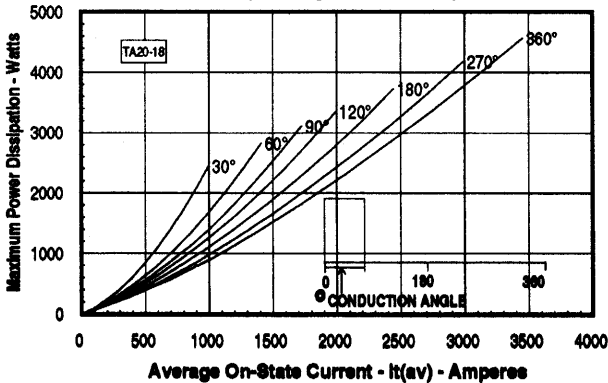
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)

