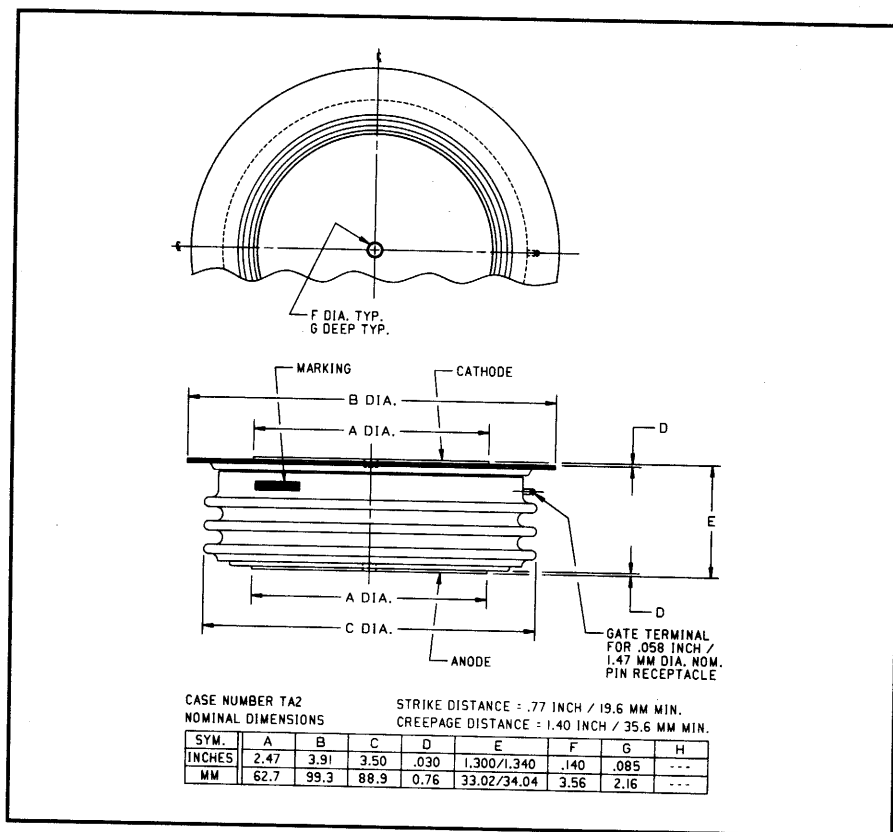
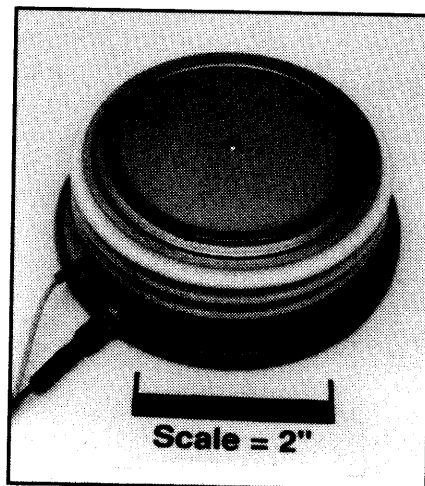




TA20 1800A (Outline Drawing)



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 V_{DRM}/V_{RRM} (Volts)	Current $I_T(av)$ (A)	Turn-off t_q (μ sec)	Gate Current I_{GT} (mA)	Lead Code
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.pwr.x.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.

TA20 1800A

Phase Control SCR

1800 Amperes Average, 2200 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}	$T_j = 125^\circ\text{C}, V_R = V_{RRM}$			100	mA
Repetitive Peak Forward Leakage Current	I_{DRM}	$T_j = 125^\circ\text{C}, V_D = V_{DRM}$			100	mA
Peak On-state Voltage	V_{TM}	$I_{TM} = 3000\text{A Peak}$ Duty Cycle $< 0.1\%$			1.45	Volts
Threshold Voltage, Low-level	$V_{(TO)1}$	$T_j = 125^\circ\text{C}, I = 15\%, I_{T(av)} \text{ to } \pi I_{T(av)}$			0.71870	Volts
Slope Resistance, Low-level	r_{T1}				0.1669	$m\Omega$
Threshold Voltage, High-level	$V_{(TO)2}$	$T_j = 125^\circ\text{C}, I = \pi I_{T(av)} \text{ to } I_{TSM}$			0.97647	Volts
Slope Resistance, High-level	r_{T2}				0.1215	$m\Omega$
V_{TM} Coefficients, Low-level		$T_j = 125^\circ\text{C}, I = 15\% I_{T(av)} \text{ to } \pi I_{T(av)}$			$A_1 = 1.0791$ $B_1 = -0.12551$ $C_1 = 3.874\text{E-}06$ $D_1 = 0.02151$	
V_{TM} Coefficients, High-level		$T_j = 125^\circ\text{C}, I = \pi I_{T(av)} \text{ to } I_{TSM}$			$A_2 = -6.7846$ $B_2 = 1.1619$ $C_2 = 1.858\text{E-}04$ $D_2 = -0.03560$	
Typical Turn-on Time	t_{on}	$I_T = 1000\text{A}, V_D = 1500\text{V}$		4		μsec
Typical Turn-off Time	t_q	$T_j = 125^\circ\text{C}, I_T = 250\text{A},$ $di/dt = 50\text{A}/\mu\text{sec}$ Reapplied $dv/dt = 20\text{V}/\mu\text{sec}$ Linear to 80% V_{DRM}		250		μsec
Minimum Critical dv/dt - Exponential to V_{DRM}	dv/dt	$T_j = 125^\circ\text{C}$	300			$\text{V}/\mu\text{sec}$
Gate Trigger Current	I_{GT}	$T_j = 25^\circ\text{C}, V_D = 12\text{V}$			200	mA
Gate Trigger Voltage	V_{GT}	$T_j = 25^\circ\text{C}, V_D = 12\text{V}$			4.5	Volts
Non-Triggering Gate Voltage	V_{GDM}	$T_j = 125^\circ\text{C}, V_D = V_{DRM}$			0.15	Volts
Peak Forward Gate Current	I_{GTM}				4	A
Peak Reverse Gate Voltage	V_{GRM}				5	Volts

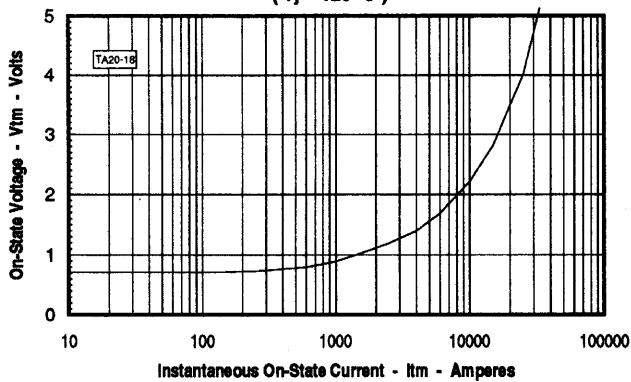
Thermal Characteristics

Maximum Thermal Resistance, Double Sided Cooling

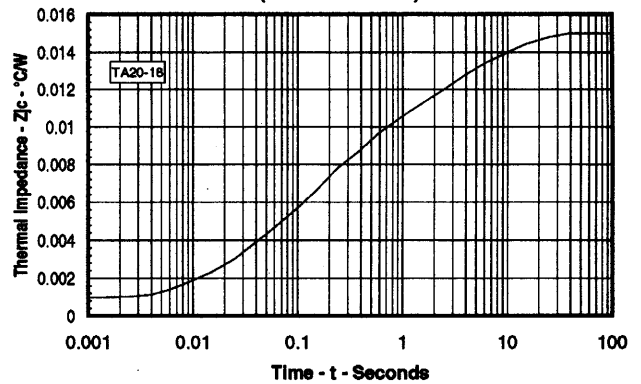
Junction-to-Case	$R_{\theta(j-c)}$	0.015	$^\circ\text{C}/\text{W}$
Case-to-Sink	$R_{\theta(c-s)}$	0.007	$^\circ\text{C}/\text{W}$

Phase Control SCR
1800 Amperes Average, 2200 Volts

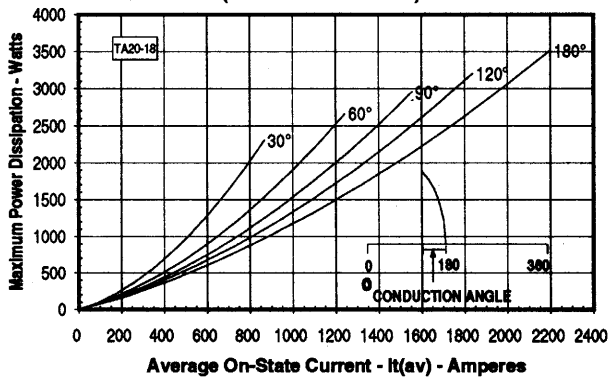
Maximum On-State Forward Voltage Drop
($T_J = 125^\circ\text{C}$)



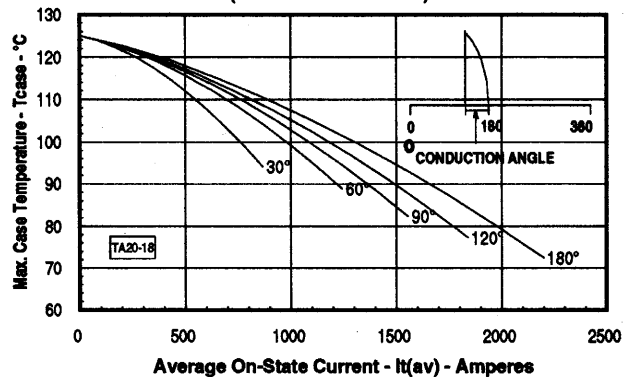
Maximum Transient Thermal Impedance
(Junction to Case)



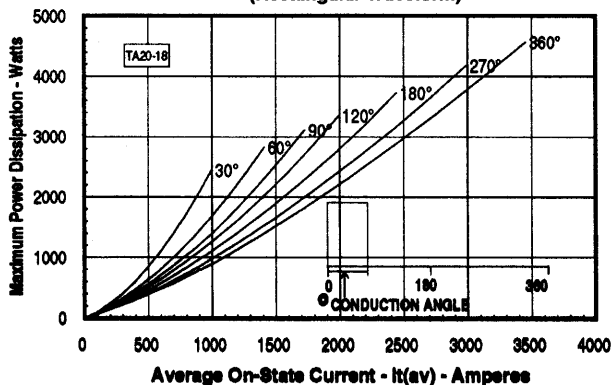
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)

