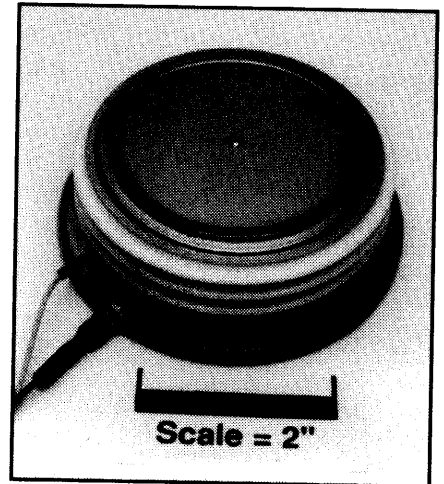


TA20 1800A (Outline Drawing)



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.pwr.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

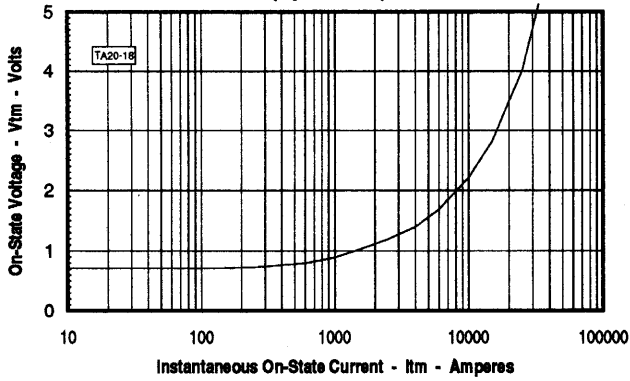
Thermal Characteristics

Maximum Thermal Resistance, Double Sided Cooling

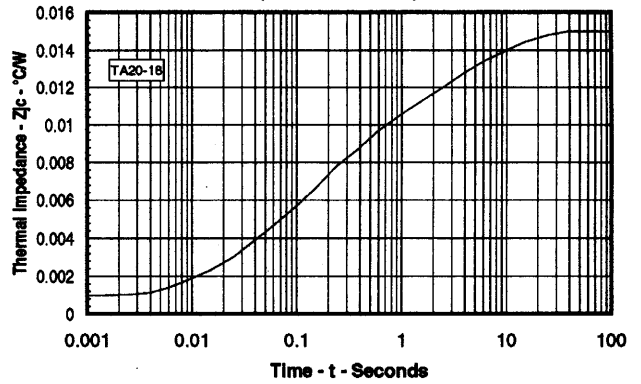
Junction-to-Case	R _{θ(j-c)}		0.015	°C/W
Case-to-Sink	R _{θ(c-s)}		0.007	°C/W

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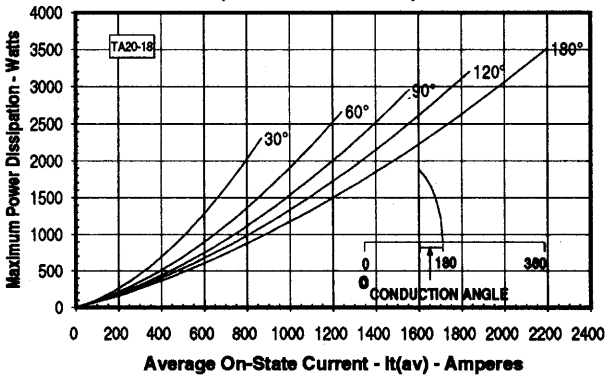
Maximum On-State Forward Voltage Drop
($T_J = 125^\circ\text{C}$)



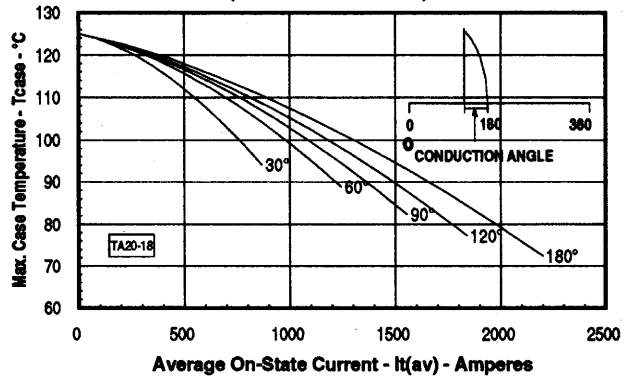
Maximum Transient Thermal Impedance
(Junction to Case)



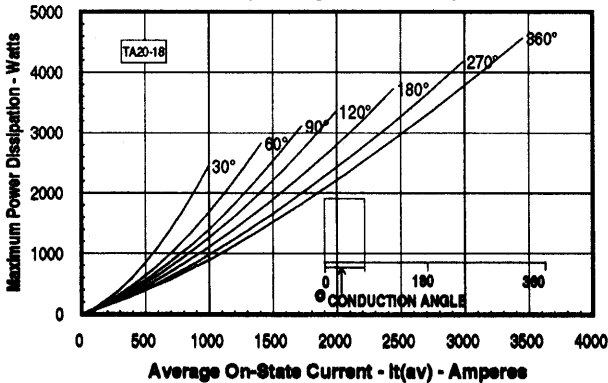
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)

