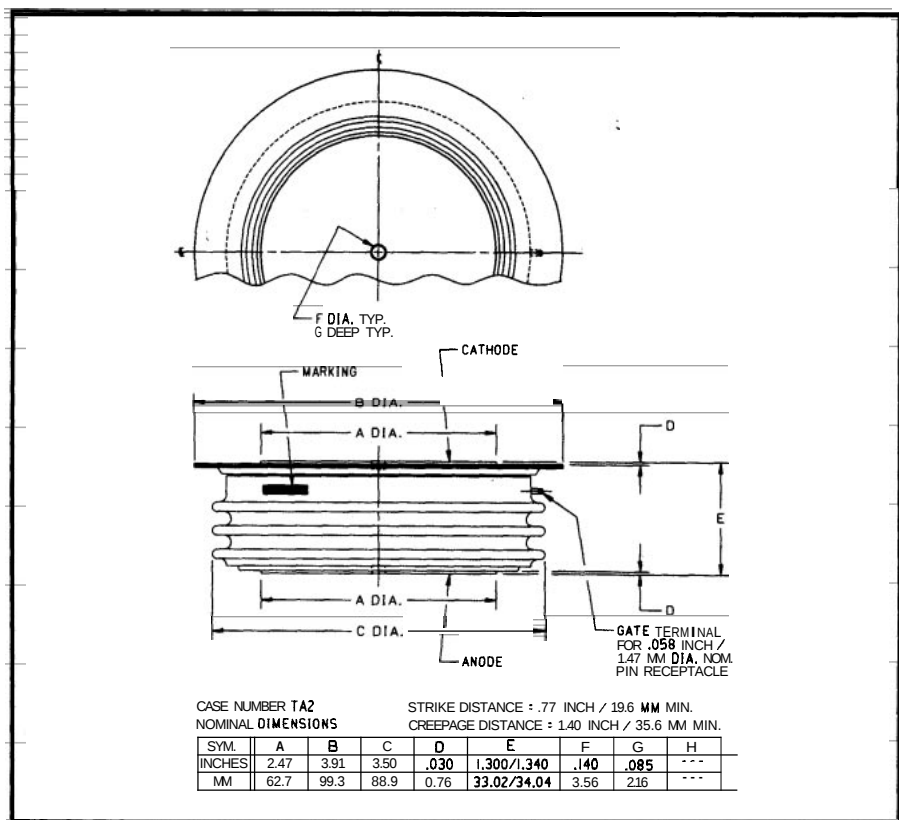


Phase Control SCR 1600 Amperes Average 2200 Volts



TA20 1600A (Outline Drawing)



TA20 1600A Phase Control SCR
1600 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 and 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_{ORM}/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 200V through 2200V	16 1600A	0 250 μ sec (Typical)	3 200mA	DH 12"



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

TA20 1600A

Phase Control SCR

1600 Amperes Average, 2200 Volts

Absolute Maximum Ratings

Characteristics	Symbol	TA20 1600A	Units
Non-repetitive Transient Peak Reverse Voltage	V_{RSM}	$V_{RRM} + 100V$	Volts
RMS On-state Current, $T_C = 80^{\circ}C$	$I_{T(rms)}$	2500	Amperes
Average Current 180° Sine Wave, $T_C = 80^{\circ}C$	$I_{T(av)}$	1600	Amperes
RMS On-state Current, $T_C = 55^{\circ}C$	$I_{T(rms)}$	3390	Amperes
Average Current 180° Sine Wave, $T_C = 55^{\circ}C$	$I_{T(av)}$	2160	Amperes
Peak One Cycle Surge On-state Current (Non-repetitive) 60Hz	I_{tsm}	29500	Amperes
Peak One Cycle Surge On-state Current (Non-repetitive) 50Hz	I_{tsm}	26900	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	3.63×10^6	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 1600A
Phase Control SCR
 1600 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%			1.75	Volts
Threshold Voltage, Low-level	$V_{(TO)1}$	$T_j = 125^\circ\text{C}, I = 15\%, I_{T(av)} \text{ to } \pi I_{T(av)}$			0.89109	Volts
Slope Resistance, Low-level	r_{T1}				0.2148	m Ω
Threshold Voltage, High-level	$V_{(TO)2}$	$T_j = 125^\circ\text{C}, I = \pi I_{T(av)} \text{ to } I_{TSM}$			1.7405	Volts
Slope Resistance, High-level	r_{T2}				0.1024	m Ω
V_{TM} Coefficients, Low-level		$T_j = 125^\circ\text{C}, I = 15\% I_{T(av)} \text{ to } \pi I_{T(av)}$			$A_1 = 1.1219$ $B_1 = -0.10195$ $C_1 = 4.764\text{E-}05$ $D_1 = 0.02077$	
V_{TM} Coefficients, High-level		$T_j = 125^\circ\text{C}, I = \pi I_{T(av)} \text{ to } I_{TSM}$			$A_2 = -3.7832$ $B_2 = 0.56271$ $C_2 = 3.607\text{E-}05$ $D_2 = 0.010389$	
Typical Turn-on Time	t_{on}	$I_{TM} = 1000\text{A}, V_D = 1500\text{V}$		4		μsec
Typical Turn-off Time	t_q	$T_j = 125^\circ\text{C}, I_T = 250\text{A},$ $di_R/dt = 50\text{A}/\mu\text{sec}$ 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			V/ μsec
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

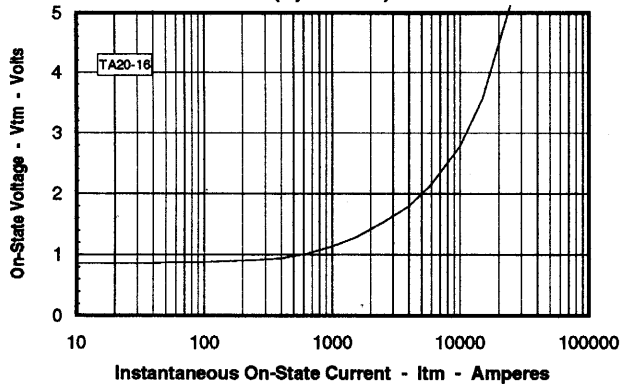
Thermal Characteristics

Maximum Thermal Resistance, Double Sided Cooling

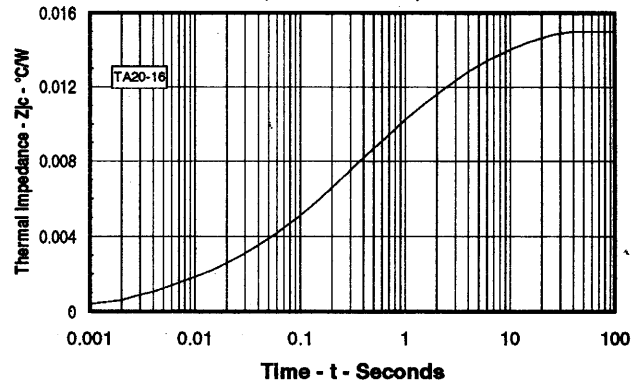
Junction-to-Case	$R_{\theta(j-c)}$	0.015	$^\circ\text{C/W}$
Case-to-Sink	$R_{\theta(c-s)}$	0.007	$^\circ\text{C/W}$

TA20 1600A
Phase Control SCR
 1600 Amperes Average, 2200 Volts

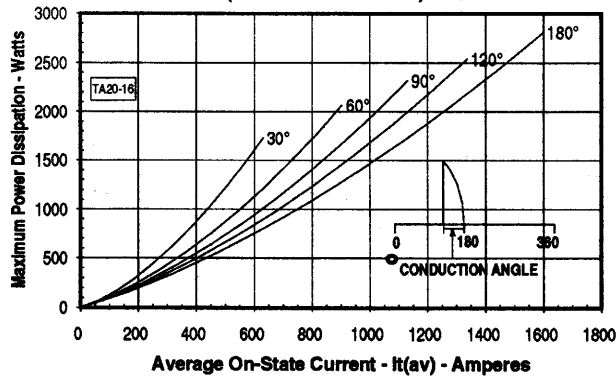
Maximum On-State Forward Voltage Drop
 ($T_J = 125^\circ\text{C}$)



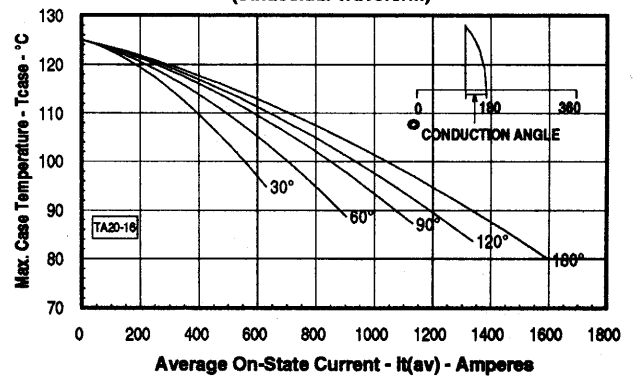
Maximum Transient Thermal Impedance
 (Junction to Case)



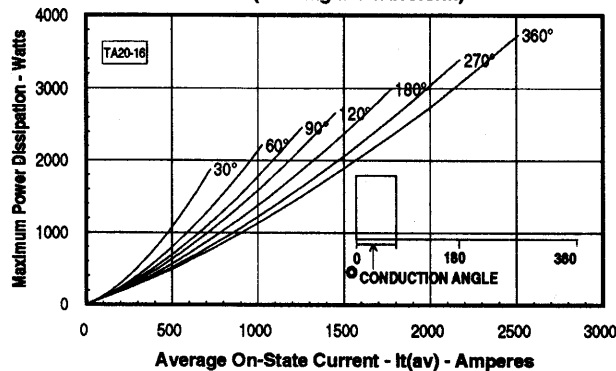
Maximum On-State Power Dissipation
 (Sinusoidal Waveform)



Maximum Allowable Case Temperature
 (Sinusoidal Waveform)



Maximum On-State Power Dissipation
 (Rectangular Waveform)



Maximum Allowable Case Temperature
 (Rectangular Waveform)

