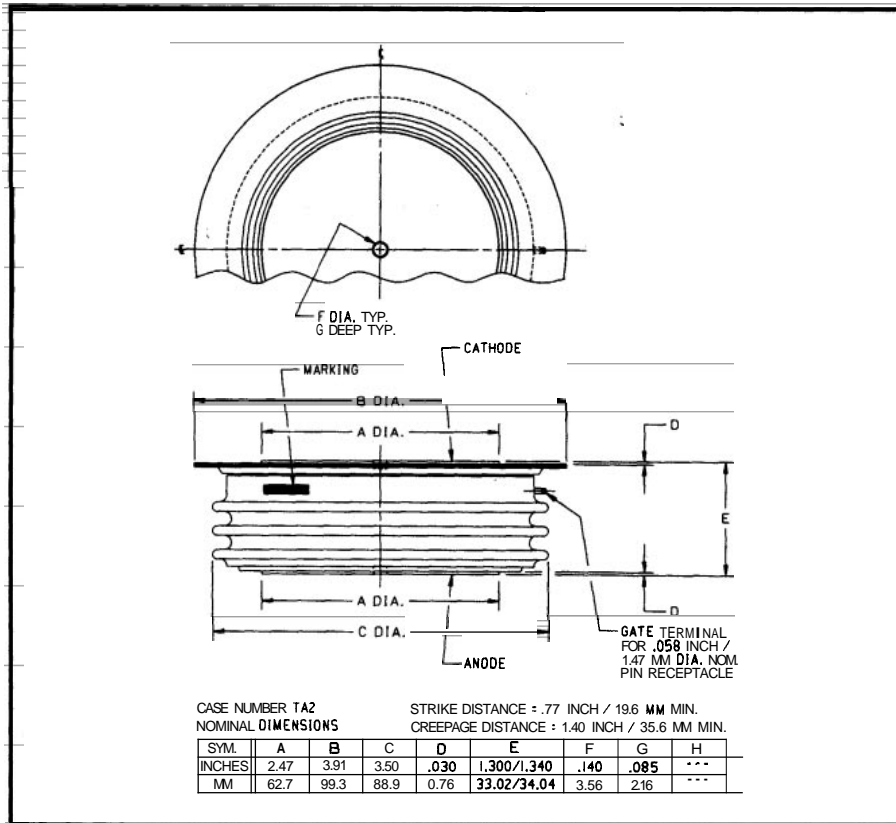


Powerex,
Powerex,
200 Hillis
Durand,

15697-1800
BP107, Le

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	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	16	0	3	DH
	200V through 2200V	1600A	250 μ sec (Typical)	200mA	12"

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

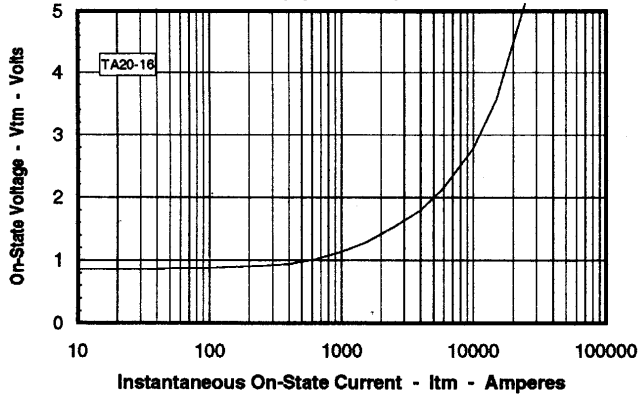
Electrical Characteristics, $T_j = 25^\circ\text{C}$ Unless Otherwise Specified

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	$V_{(TO)1}$	$T_j = 125^\circ\text{C}, I = 15\%, I_{T(av)}$ to $\pi I_{T(av)}$			0.89109	Volts
Slope Resistance, Low-level	r_{T1}				0.2148	m Ω
Threshold Voltage, High-level	$V_{(TO)2}$	$T_j = 125^\circ\text{C}, I = \pi I_{T(av)}$ to I_{TSM}			1.7405	Volts
Slope Resistance, High-level	r_{T2}				0.1024	m Ω
V_{TM} Coefficients, Low-level		$T_j = 125^\circ\text{C}, I = 15\% I_{T(av)}$ to $\pi I_{T(av)}$				$A_1 = 1.1219$ $B_1 = -0.10195$ $C_1 = 4.764E-05$ $D_1 = 0.02077$
V_{TM} Coefficients, High-level		$T_j = 125^\circ\text{C}, I = \pi I_{T(av)}$ to I_{TSM}				$A_2 = -3.7832$ $B_2 = 0.56271$ $C_2 = 3.607E-05$ $D_2 = 0.010389$
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}	$T_j = 25^\circ\text{C}, V_D = 12\text{V}$			3.0	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	$^\circ\text{C/W}$

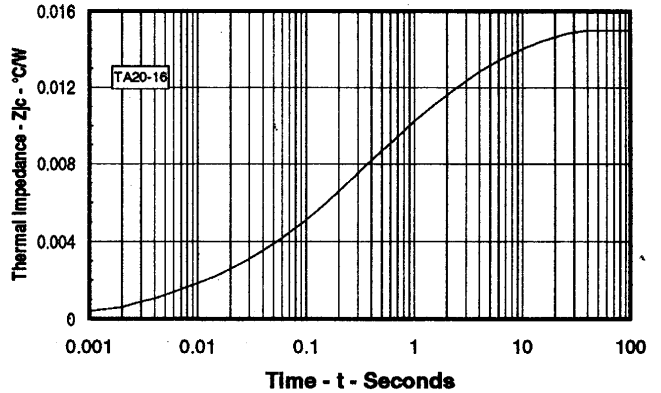
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272
 Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

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

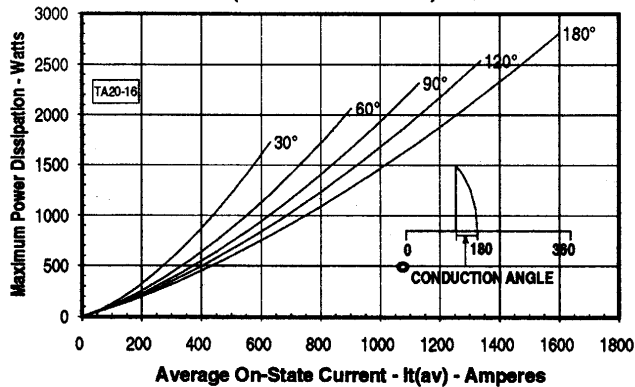
Maximum On-State Forward Voltage Drop
 (T_J = 125 °C)



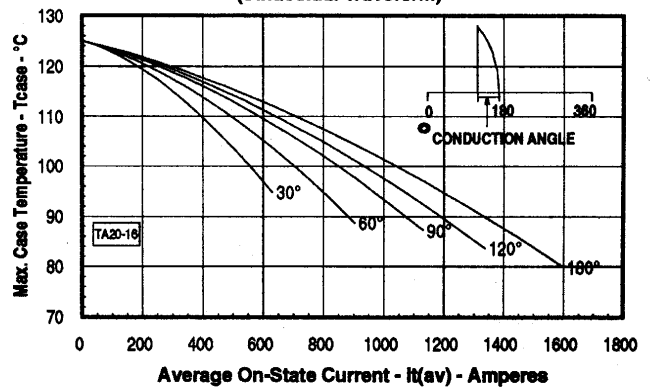
Maximum Transient Thermal Impedance
 (Junction to Case)



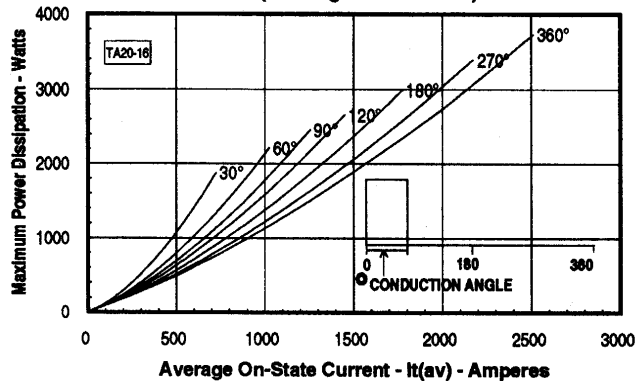
Maximum On-State Power Dissipation
 (Sinusoidal Waveform)



Maximum Allowable Case Temperature
 (Sinusoidal Waveform)



Maximum On-State Power Dissipation
 (Rectangular Waveform)



Maximum Allowable Case Temperature
 (Rectangular Waveform)

