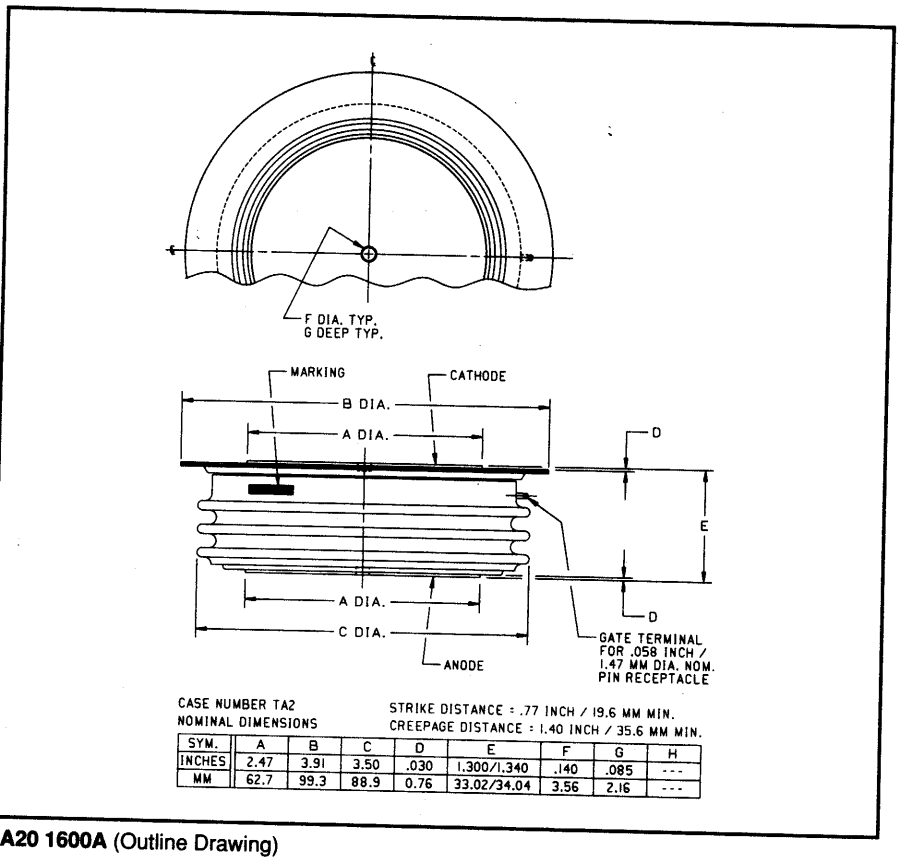
TA20
1600A

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

Phase Control SCR
1600 Amperes Average
2200 Volts

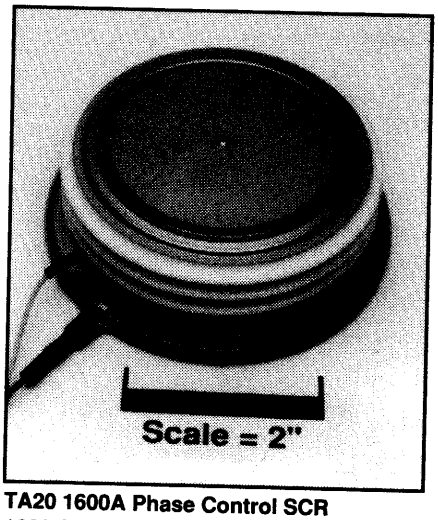


CASE NUMBER TA2
NOMINAL DIMENSIONS

STRIKE DISTANCE = .77 INCH / 19.6 MM MIN.
CREEPAGE DISTANCE = 1.40 INCH / 35.6 MM MIN.

SYM.	A	B	C	D	E	F	G	H
INCHES	2.47	3.91	3.50	.030	1.300/1.340	.140	.085	---
MM	62.7	99.3	88.9	0.76	33.02/34.04	3.56	2.16	---

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_{DRM}/V_{RRM} (Volts)	Current $I_{T(av)}$ (A)	Turn-off t_q (µsec)	Gate Current I_{GT} (mA)	Lead Code
TA20	02 through 22	16	0	3	DH
	200V through 2200V	1600A	250µsec (Typical)	200mA	12"

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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°C	$I_{T(rms)}$	2500	Amperes
Average Current 180° Sine Wave, T_C = 80°C	$I_{T(av)}$	1600	Amperes
RMS On-state Current, T_C = 55°C	$I_{T(rms)}$	3390	Amperes
Average Current 180° Sine Wave, T_C = 55°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/µsec
Critical Rate-of-rise of On-state Current (Repetitive)	di/dt	150	A/µsec
I^2t (for Fusing) for One Cycle, 60Hz	I^2t	3.63×10^6	A^2sec
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%			1.75	Volts
Threshold Voltage, Low-level	$V_{(TO)1}$	T_j = 125°C, I = 15%, $I_{T(av)}$ to $\pi I_{T(av)}$			0.89109	Volts
Slope Resistance, Low-level	r_{T1}				0.2148	mΩ
Threshold Voltage, High-level	$V_{(TO)2}$	T_j = 125°C, I = $\pi I_{T(av)}$ to I_{TSM}			1.7405	Volts
Slope Resistance, High-level	r_{T2}				0.1024	mΩ
V_{TM} Coefficients, Low-level		T_j = 125°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°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} = 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			3.0	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_{GRM}				5	Volts

Thermal Characteristics

Maximum Thermal Resistance, Double Sided Cooling						
Junction-to-Case	$R_{\theta(j-c)}$				0.015	°C/W
Case-to-Sink	$R_{\theta(c-s)}$				0.007	°C/W

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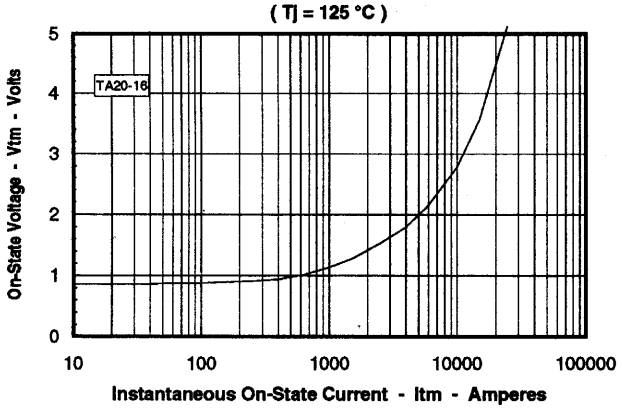
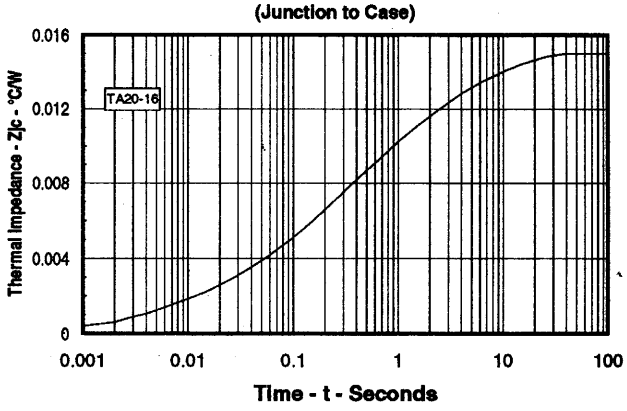
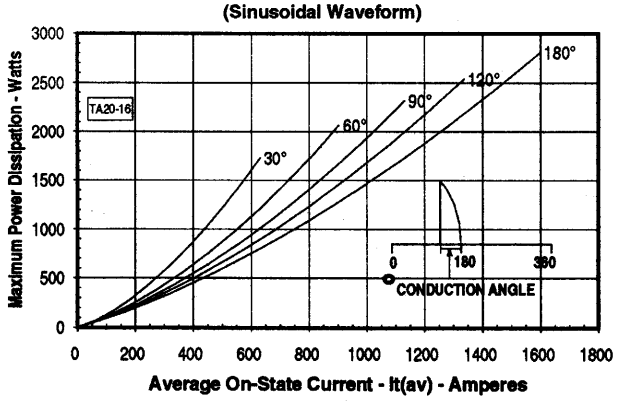
Maximum On-State Forward Voltage Drop
(TJ = 125 °C)



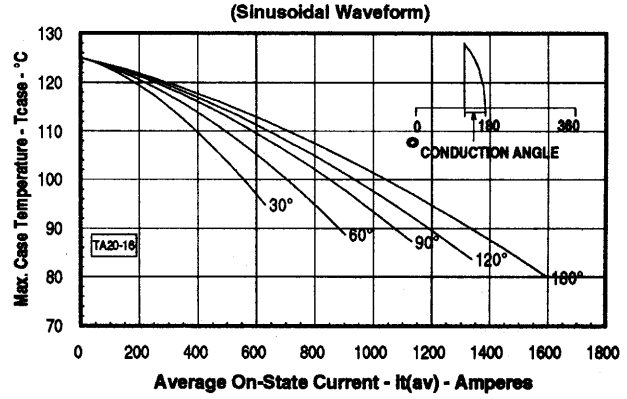
Maximum Transient Thermal Impedance
(Junction to Case)



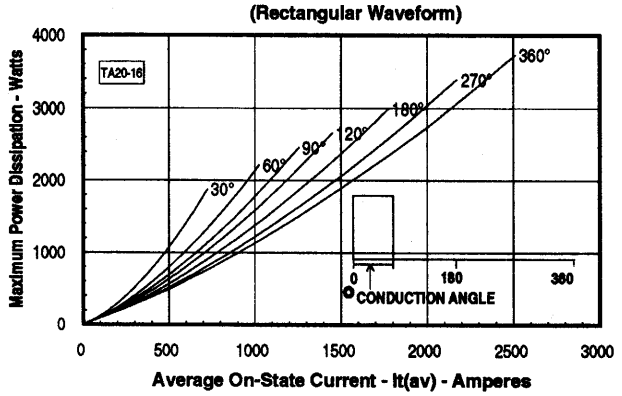
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)