Powerex, Inc., 173 Pavilion Lane, Youngwood, Pennsylvania 15697 (724) 925-7272

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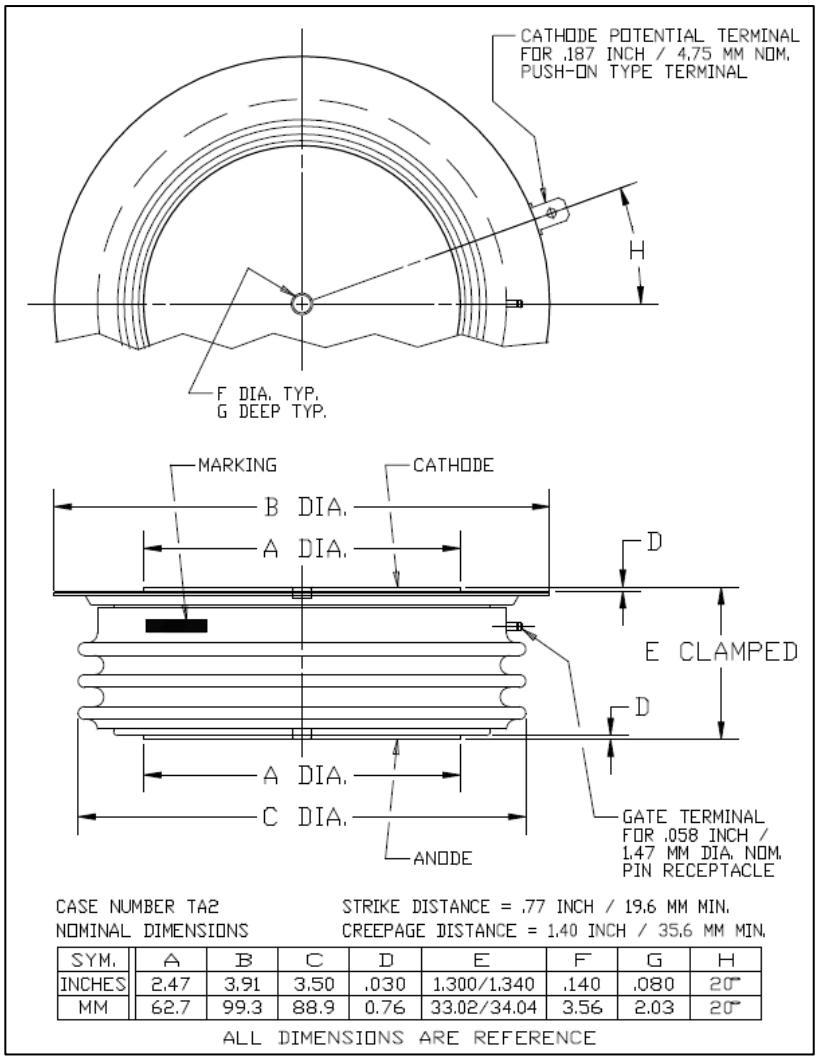
TA20
1600A

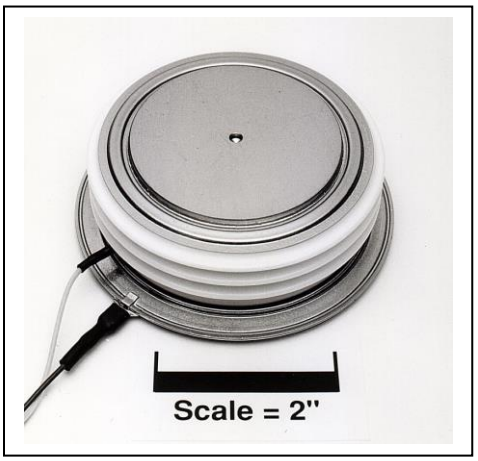
Phase Control SCR
1600 Amperes Average
2400 Volts



SYM.	A	B	C	D	E	F	G	H
INCHES	2.47	3.91	3.50	.030	1.300/1.340	.140	.080	20°
MM	62.7	99.3	88.9	0.76	33.02/34.04	3.56	2.03	20°

ALL DIMENSIONS ARE REFERENCE

TA20 1600A (Outline Drawing)



TA20 1600A Phase Control SCR
1600 Amperes Average, 2400 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 module part number from the table below.
Example: TA20121603DH is a 1200V 1600A Phase Control SCR.

Type	Voltage V_{RRM} (Volts)	Current $I_{T(av)}$ (A)	Turn-off Time t_q (µsec)	Gate Current I_{GT} (mA)	Lead Code
TA20	02 through 24	16	0	3	DH
	200V through 2400V	1600A	250 µsec (Typical)	200 mA	12”

Revision Date: 07/30/2013

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ntrol SCR
mperes Average
Volts

Absolute Maximum Ratings

Characteristics	Symbol		Units
Non-Repetitive Transient Peak Reverse Blocking 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) 60 Hz	I_{TSM}	29,500	Amperes
Peak One Cycle Surge On-State Current (Non-Repetitive) 50 Hz	I_{TSM}	26,900	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, 60 Hz	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
Storage Temperature	T_{stg}	-40 to +150	°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_{FM}=3000A peak, Duty Cycle < 0.1 %			1.75	V
Threshold Voltage, Low-level Slope Resistance, Low-level	$V_{(TO)1}$ r_{T1}	T_J = 125°C, I = 15%$I_{T(AV)}$ to $\pi I_{T(AV)}$			0.89109 0.2148	V mΩ
Threshold Voltage, High-level Slope Resistance, High-level	$V_{(TO)2}$ r_{T2}	T_J = 125°C, I = $\pi I_{T(AV)}$ to I_{TSM}			1.7405 0.1024	V mΩ
V_{TM} Coefficients, Low-level		T_J = 125°C, I = 15%$I_{T(AV)}$ to $\pi I_{T(AV)}$ V_{TM} = A+ B Ln(I) +C(I) + D Sqrt(I)		A = B = C = D =	1.1219 -0.10195 4.764E-05 0.02077	
V_{TM} Coefficients, High-level		T_J = 125°C, I = $\pi I_{T(AV)}$ to I_{TSM} V_{TM} = A+ B Ln(I) +C(I) + D Sqrt(I)		A = B = C = D =	-3.7832 0.56271 3.607E-05 0.010389	
Typical Turn-On Time	t_{on}	I_T = 1000A, V_D = 1500 V		4		µs
Typical Turn-Off Time	t_q	T_j = 125°C, I_T = 250A, di_R/dt = 50A/µs Reapplied dv/dt = 20 V/µs Linear to 80% V_{DRM}		250		µs
Minimum Critical dv/dt – Exponential to V_{DRM}	dv/dt	T_J = 125°C	300			V/µs
Gate Trigger Current	I_{GT}	T_J = 25°C, V_D = 12 V			200	mA
Gate Trigger Voltage	V_{GT}	T_J = 25°C, V_D = 12 V			4.5	V
Non-Triggering Gate Voltage	V_{GDM}	T_J = 125°C, $V_D = V_{DRM}$			0.15	V
Peak Forward Gate Current	I_{GTM}				4	A
Peak Reverse Gate Voltage	V_{GRM}				5	V

4.5

Thermal Characteristics

Maximum Thermal Resistance, Double Sided Cooling		Max.	Units
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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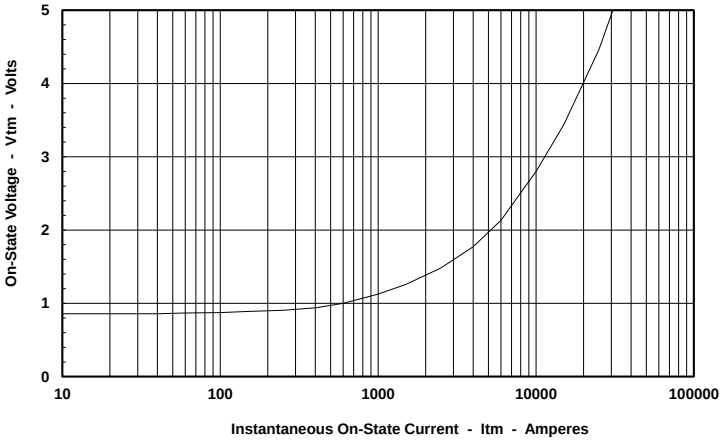
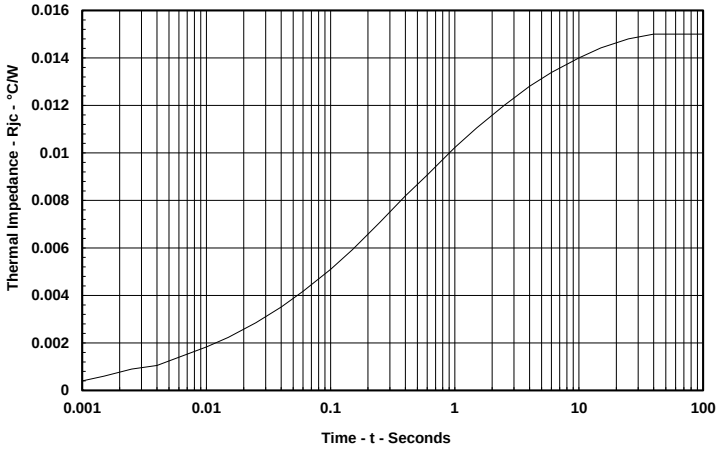
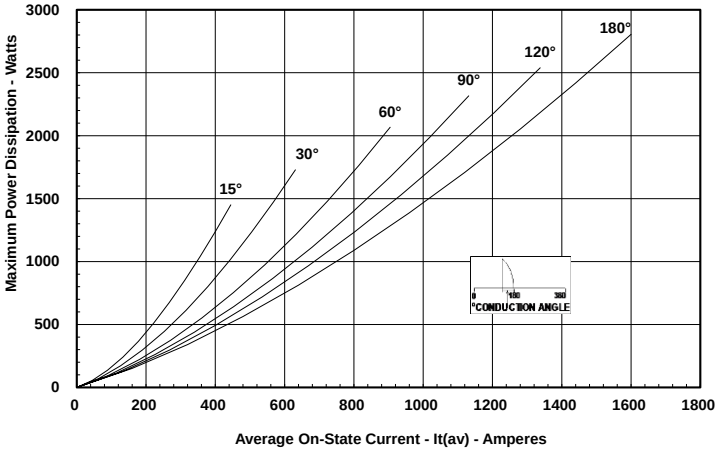
Maximum On-State Forward Voltage Drop
(Tj = 125 °C)



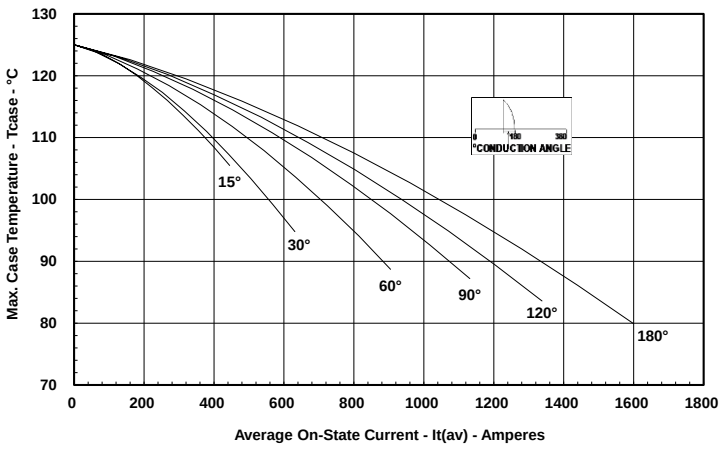
Maximum Transient Thermal Impedance
(Junction to Case)



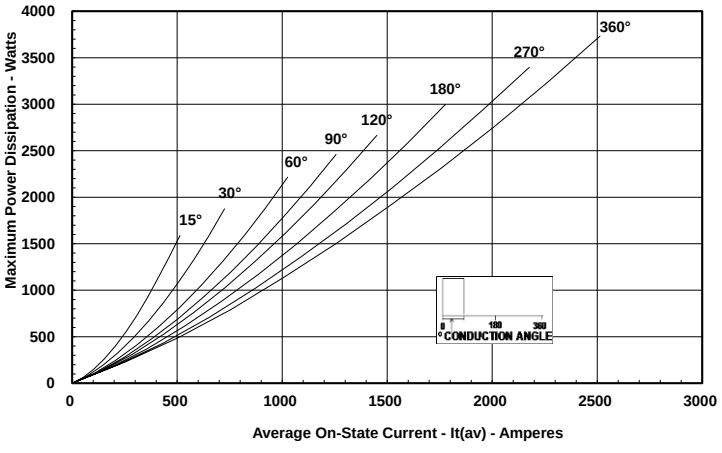
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



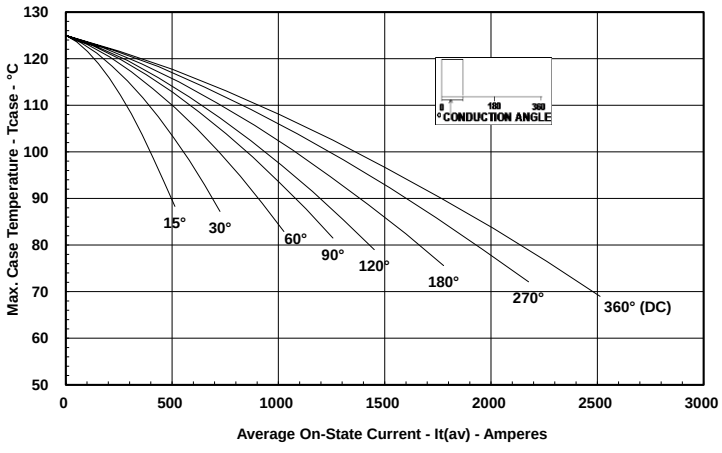
Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)



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