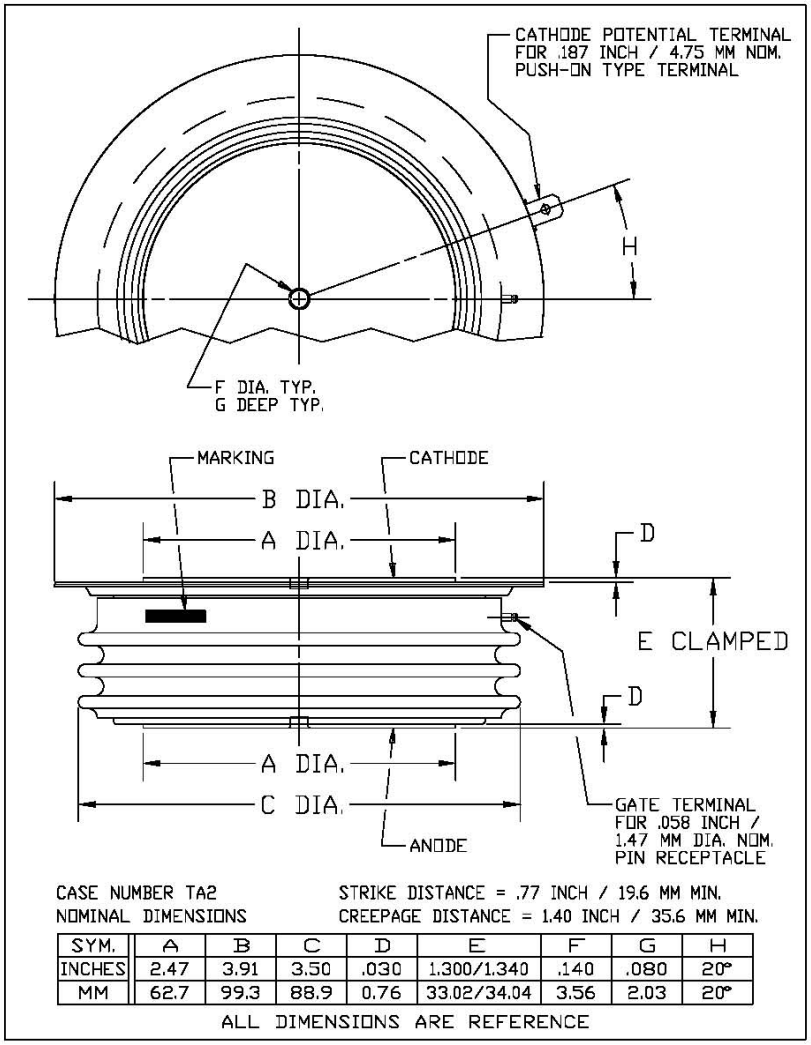
TAK7
1200A

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

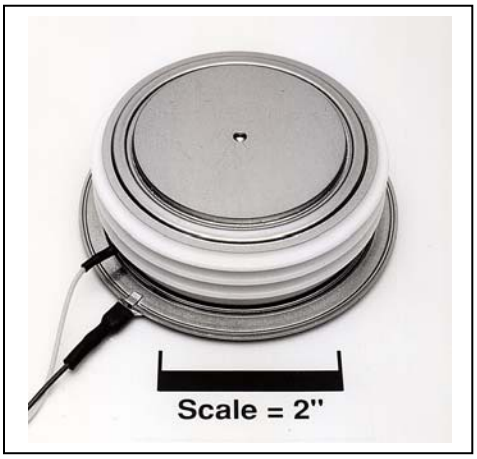
Phase Control SCR
1200 Amperes Average
4400 Volts



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

TAK7 120A (Outline Drawing)



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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
- ☐ Battery Chargers
- ☐ Static VAR

Ordering Information:
Select the complete 12 digit module part number from the table below.
Example: TAK7441202DH is a 4400V 1200A 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
TAK7	36 40 44	12	0	2	DH
	3600V 4000V 4400V	1200A	500 µsec (Typical)	300 mA	12”

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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 = 82°C	$I_{T(RMS)}$	1700	Amperes
Average Current 180° Sine Wave, T_C = 82°C	$I_{T(AV)}$	1200	Amperes
RMS On-State Current, T_C = 55°C	$I_{T(RMS)}$		Amperes
Average Current 180° Sine Wave, T_C = 55°C	$I_{T(AV)}$	960	Amperes
Peak One Cycle Surge On-State Current (Non-Repetitive) 60 Hz	I_{TSM}	40,000	Amperes
Peak One Cycle Surge On-State Current (Non-Repetitive) 50 Hz	I_{TSM}	36,500	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	6.67 X 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		2.2	lb
		1000	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, $V_R = V_{RRM}$			250	mA
Repetitive Peak Forward Leakage Current	I_{DRM}	T_J=125°C, $V_D = V_{DRM}$			250	mA
Peak On-State Voltage	V_{TM}	T_J=25°C, I_{TM}=1500A peak, Duty Cycle < 0.1 %			1.90	V
Threshold Voltage, Low-level Slope Resistance, Low-level	$V_{(TO)1}$ r_{T1}	T_J = 125°C, ITM = 250A to 4000A			1.262 0.397	V mΩ
Threshold Voltage, High-level Slope Resistance, High-level	$V_{(TO)2}$ r_{T2}	T_J = 125°C, I_{TM} ≥ 4000A			1.412 0.368	V mΩ
V_{TM} Coefficients		T_J = 125°C V_{TM} = A+ B Ln(I) +C(I) + D Sqrt(I)		A = B = C = D =	2.53 -0.294 2.47 E-04 0.0284	
Typical Delay Time	t_d	I_{TM} = 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}		500		µs
Minimum Critical dv/dt – Exponential to V_{DRM}	dv/dt	T_J = 125°C	1000			V/µs
Gate Trigger Current	I_{GT}	T_J = 25°C, V_D = 12 V			300	mA
Gate Trigger Voltage	V_{GT}	T_J = 25°C, V_D = 12 V			5.0	V
Non-Triggering Gate Voltage	V_{GDM}	T_J = 125°C, $V_D = V_{DRM}$			0.45	V
Peak Forward Gate Current	I_{GTM}				4	A
Peak Reverse Gate Voltage	V_{GRM}				5	V

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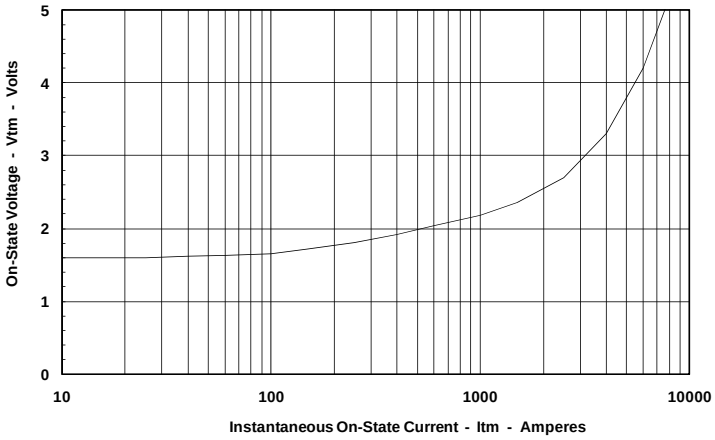
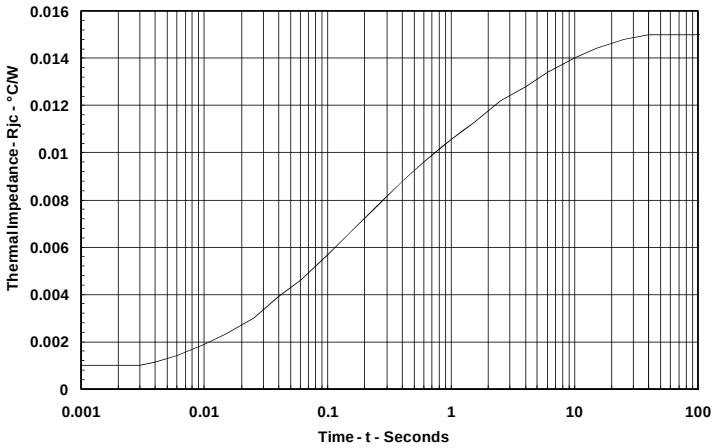
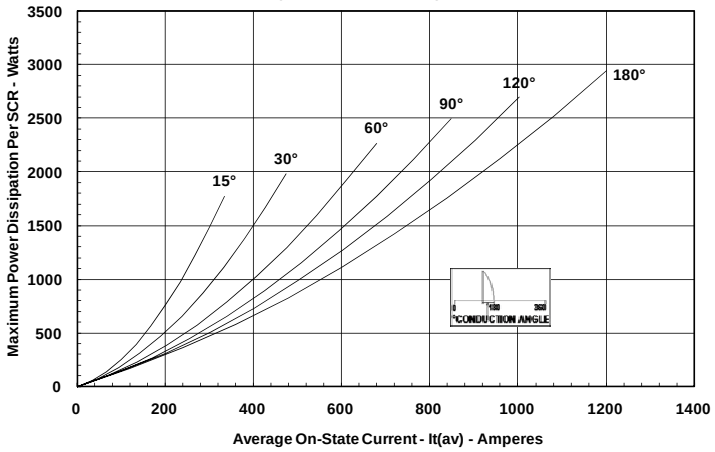
Maximum On-State Forward Voltage Drop
(Tj = 125 °C)



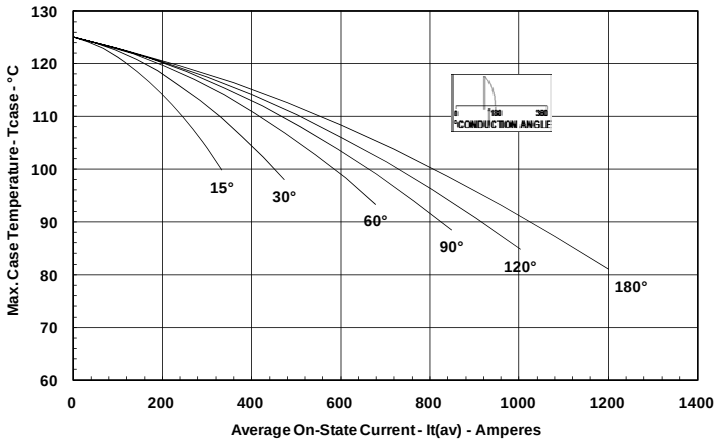
Maximum Transient Thermal Impedance
(Junction to Case)



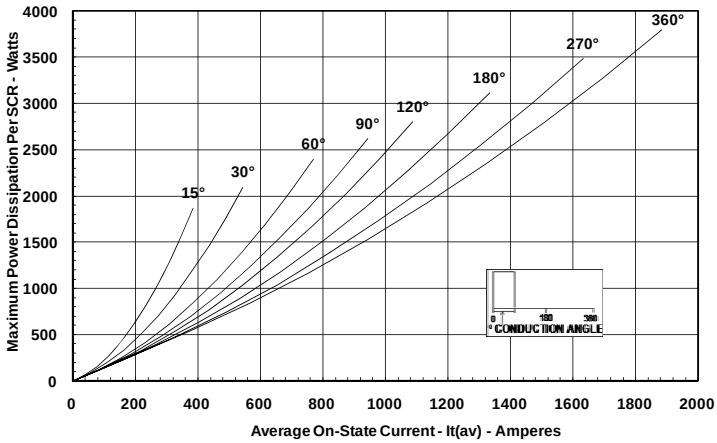
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



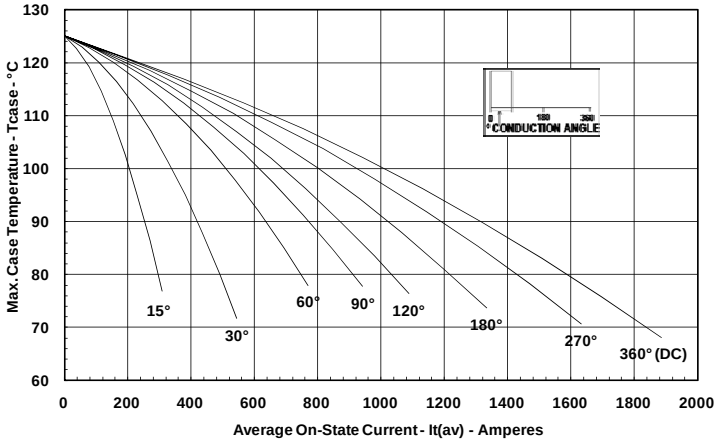
Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)



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