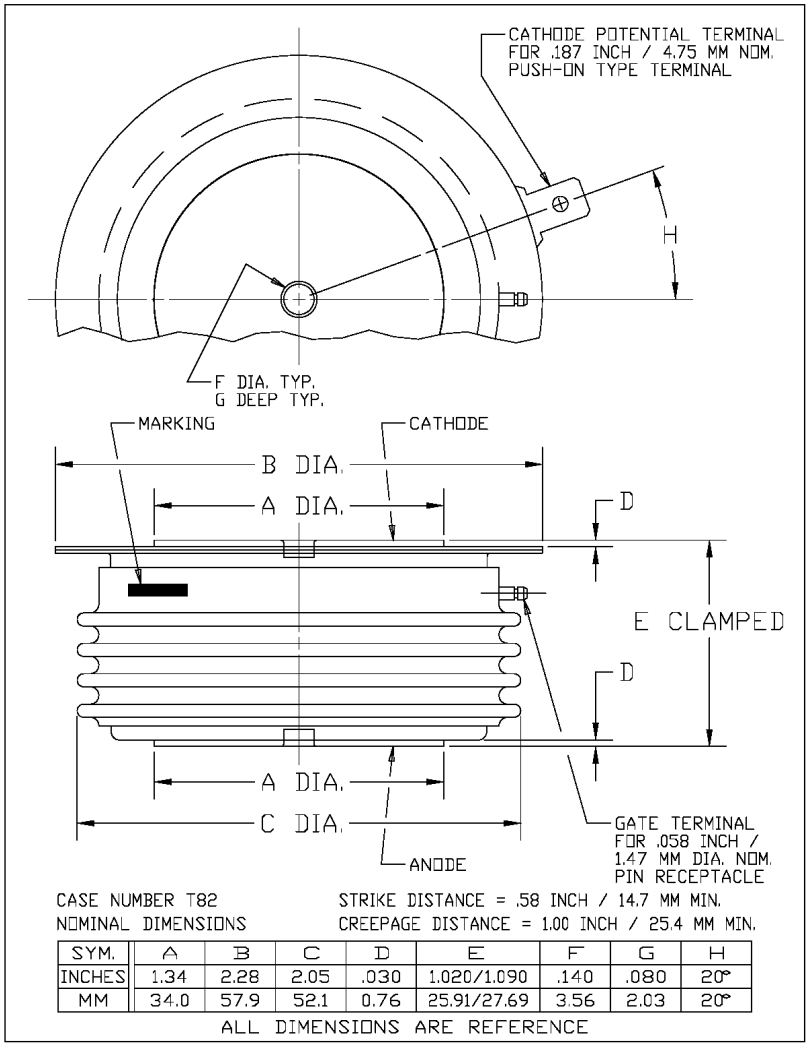
T820
750A

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

Phase Control SCR
750 Amperes Average
2400 Volts



SYM.	A	B	C	D	E	F	G	H
INCHES	1.34	2.28	2.05	.030	1.020/1.090	.140	.080	20°
MM	34.0	57.9	52.1	0.76	25.91/27.69	3.56	2.03	20°

ALL DIMENSIONS ARE REFERENCE

T820 750A (Outline Drawing)



T820 750A Phase Control SCR
750 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: T820167504DH is a 1600V 750A 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
T820	02 through 24 200V through 2400V	75 750A	0 200 µsec (Typical)	4 150 mA	DH 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 = 70°C	$I_{T(RMS)}$	1175	Amperes
Average Current 180° Sine Wave, T_C = 70°C	$I_{T(AV)}$	750	Amperes
RMS On-State Current, T_C = 55°C	$I_{T(RMS)}$	1500	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}	12,000	Amperes
Peak One Cycle Surge On-State Current (Non-Repetitive) 50 Hz	I_{TSM}	10,950	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	600,000	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		8	oz.
		227	g
Mounting Force		3000 to 3500	lb.
		1360 to 1590	kg.

Information presented is based upon manufacturers testing and projected capabilities.
This information is subject to change without notice.
The manufacturer makes no claim as to the suitability of use, reliability, capability,
or future availability of this product.

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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, $V_R = V_{RRM}$			60	mA
Repetitive Peak Forward Leakage Current	I_{DRM}	T_J=125°C, $V_D = V_{DRM}$			60	mA
Peak On-State Voltage	V_{TM}	I_{FM}=1500A peak, Duty Cycle < 0.1 %			1.65	V
Threshold Voltage, Low-level Slope Resistance, Low-level	$V_{(TO)1}$ r_{T1}	T_J = 125°C, I = 15%$I_{T(AV)}$ to π$I_{T(AV)}$			0.97268 0.4950	V mΩ
Threshold Voltage, High-level Slope Resistance, High-level	$V_{(TO)2}$ r_{T2}	T_J = 125°C, I = π$I_{T(AV)}$ to I_{TSM}			1.2785 0.3365	V mΩ
V_{TM} Coefficients, Low-level		T_J = 125°C, I = 15%$I_{T(AV)}$ to π$I_{T(AV)}$ V_{TM} = A+ B Ln(I) +C(I) + D Sqrt(I)		A = B = C = D =	0.50605 0.073285 2.864 E-04 0.007176	
V_{TM} Coefficients, High-level		T_J = 125°C, I = π$I_{T(AV)}$ to I_{TSM} V_{TM} = A+ B Ln(I) +C(I) + D Sqrt(I)		A = B = C = D =	-10.717 2.2006 7.43 E-04 -0.12418	
Typical Turn-On Time	t_{on}	I_T = 1000A, V_D = 600 V		5		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}		200		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			150	mA
Gate Trigger Voltage	V_{GT}	T_J = 25°C, V_D = 12 V			3.0	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

Thermal Characteristics

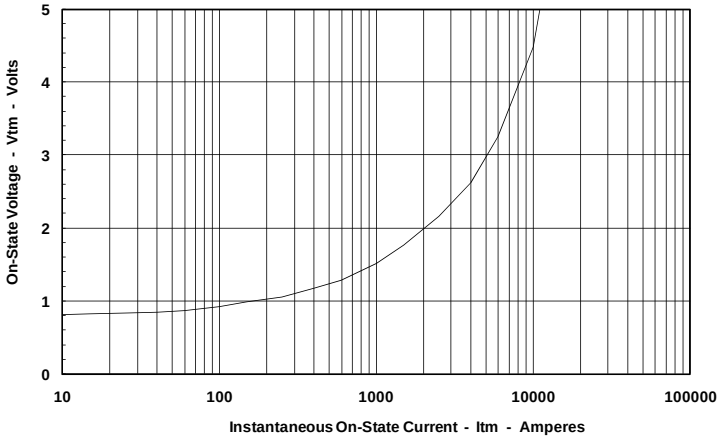
Maximum Thermal Resistance, Double Sided Cooling		Max.	Units
Junction-to-Case	$R_{Θ(J-C)}$	0.037	°C/W
Case-to-Sink	$R_{Θ(C-S)}$	0.020	°C/W

T820
750A

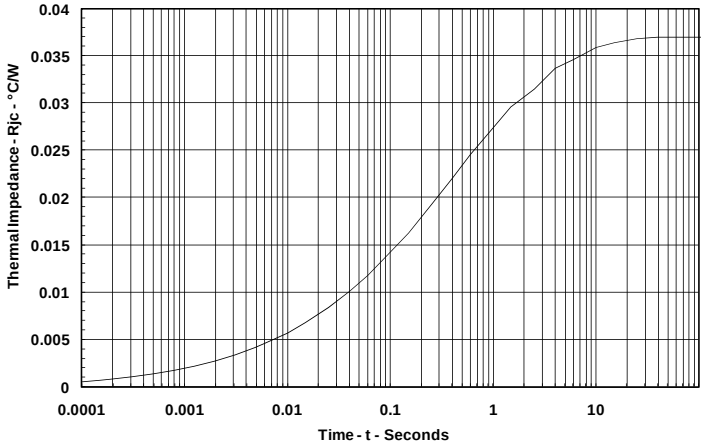
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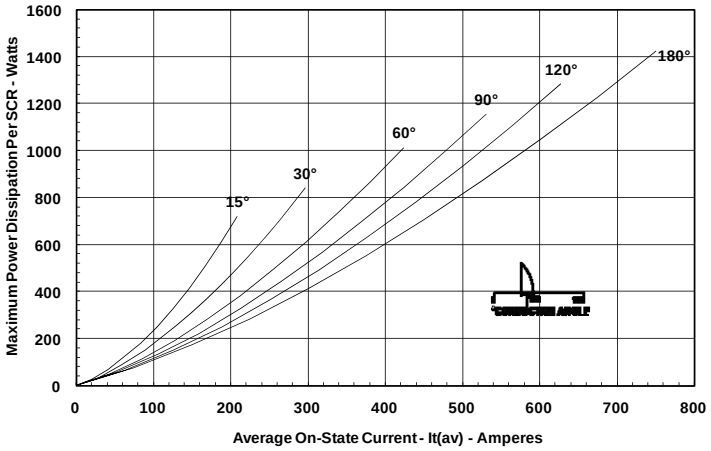
Maximum On-State Forward Voltage Drop
(Tj = 125 °C)



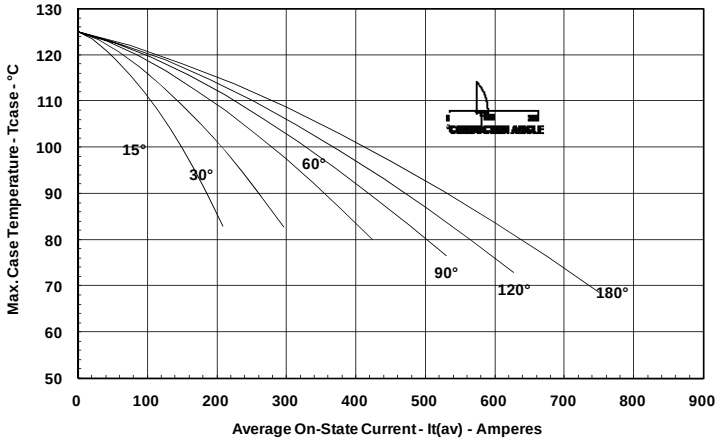
Maximum Transient Thermal Impedance
(Junction to Case)



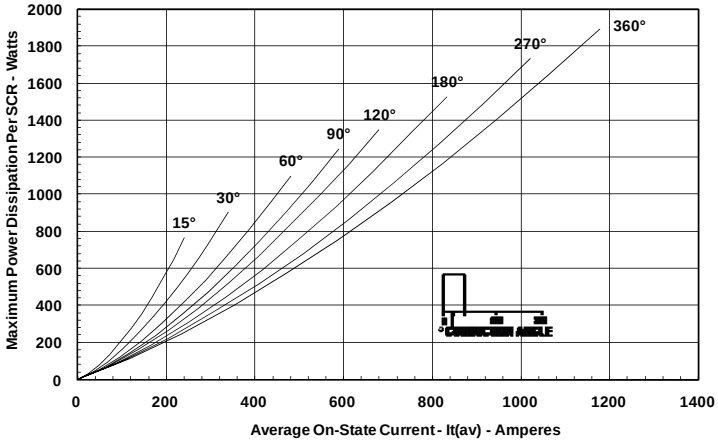
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



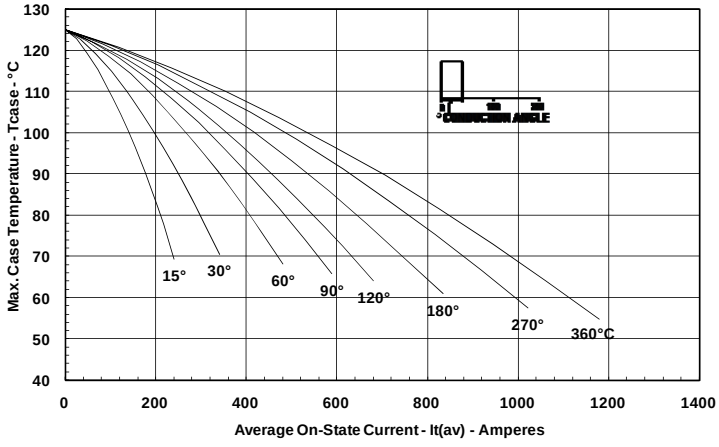
Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)



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