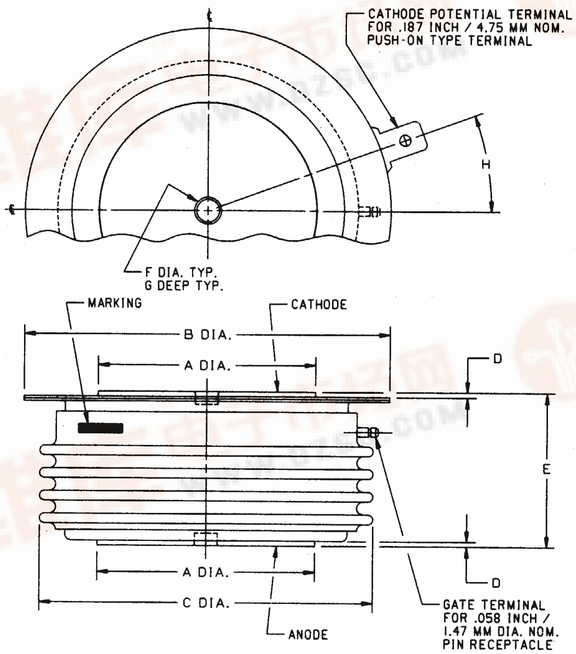
POWEREX

T820
750A

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

750 Amperes Average
2400 Volts

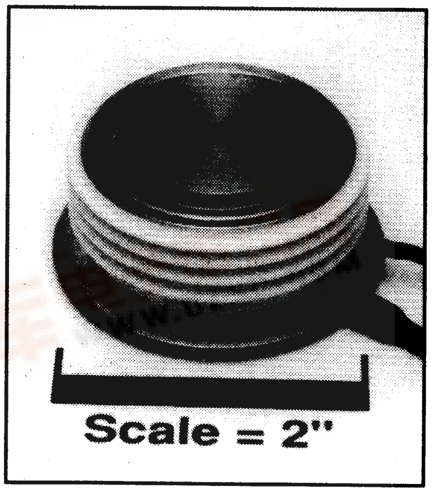


CASE NUMBER T82
NOMINAL DIMENSIONS

STRIKE DISTANCE = .58 INCH / 14.7 MM MIN.
CREEPAGE DISTANCE = 1.00 INCH / 25.4 MM MIN.

SYM.	A	B	C	D	E	F	G	H
INCHES	1.34	2.28	2.05	.030	1.020/1.090	.140	.085	20°
MM	34.0	57.9	52.1	0.76	25.91/27.69	3.56	2.16	20°

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 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
T820	02 through 24	75	0	4	DH
	200V through 2400V	750A	200μsec (Typical)	150mA	12"

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Absolute Maximum Ratings

Characteristics	Symbol	T820 750A	Units
Non-repetitive Transient Peak Reverse 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) 60Hz	I_{tsm}	12000	Amperes
Peak One Cycle Surge On-state Current (Non-repetitive) 50Hz	I_{tsm}	10950	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	600,000	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		8	oz.
		227	g
Mounting Force		3000 to 3500	lb.
		1360 to 1590	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, $V_R = V_{RRM}$			35	mA
Repetitive Peak Forward Leakage Current	I_{DRM}	T_j = 125°C, $V_D = V_{DRM}$			35	mA
Peak On-state Voltage	V_{TM}	I_{TM} = 1500A Peak Duty Cycle < 0.01%			1.65	Volts
Threshold Voltage, Low-level	$V_{(TO)1}$	T_j = 125°C, I = 15%, $I_{T(av)}$ to $\pi I_{T(av)}$			0.97268	Volts
Slope Resistance, Low-level	r_{T1}				0.4950	mΩ
Threshold Voltage, High-level	$V_{(TO)2}$	T_j = 125°C, I = $\pi I_{T(av)}$ to I_{TSM}			1.2785	Volts
Slope Resistance, High-level	r_{T2}				0.3365	mΩ
V_{TM} Coefficients, Low-level		T_j = 125°C, I = 15% $I_{T(av)}$ to $\pi I_{T(av)}$			A_1 = 0.50605 B_1 = 0.073285 C_1 = 2.864E-04 D_1 = 0.007176	
V_{TM} Coefficients, High-level		T_j = 125°C, I = $\pi I_{T(av)}$ to I_{TSM}			A_2 = -10.717 B_2 = 2.2006 C_2 = 7.43E-04 D_2 = -0.12418	
Typical Turn-on Time	t_{on}	I_T = 1000A, V_D = 600V		5		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}		200		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			150	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	$R_{\theta(j-c)}$	0.037	°C/W
Case-to-Sink	$R_{\theta(c-s)}$	0.020	°C/W

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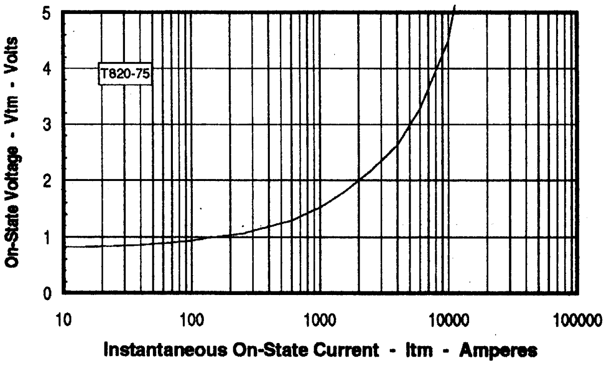
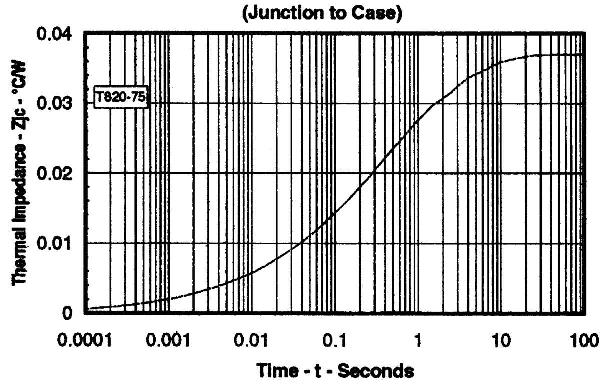
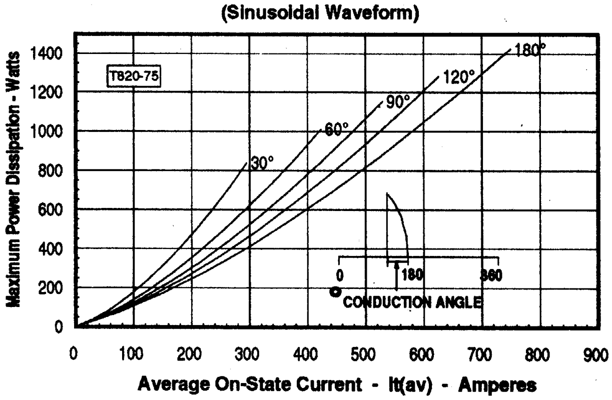
Maximum On-State Forward Voltage Drop
(Tj = 125 °C)



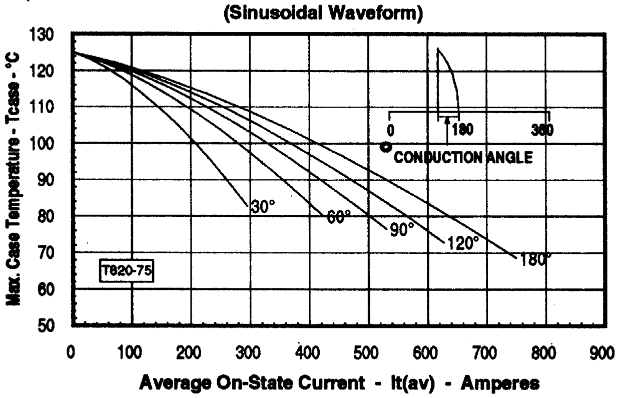
Maximum Transient Thermal Impedance
(Junction to Case)



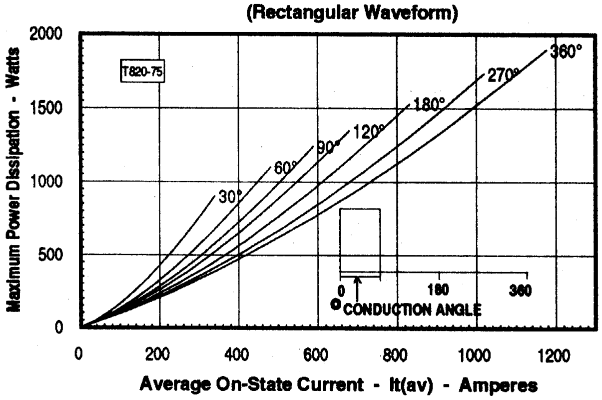
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)