



## T820

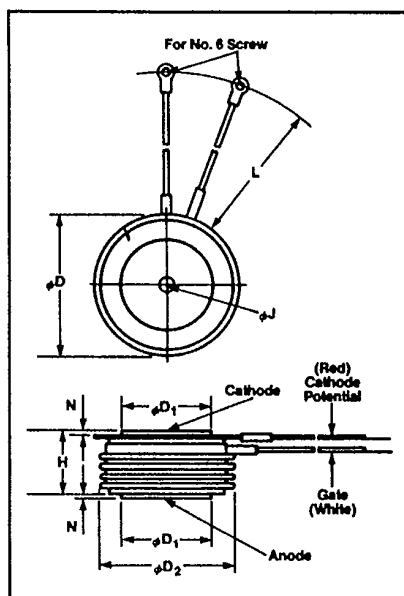
Powerex, Inc. Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272

Powerex Europe, S.A., 428 Ave. G. Durand, BP107, 72003 LeMans, France (43) 72.75.15

## Phase Control SCR

500-600 Amperes Avg

2200-4200 Volts



## T82

## Outline Drawing

Dimensions	Inches		Millimeters	
	Min.	Max.	Min.	Max.
$\phi D$	2.250	2.290	57.15	58.17
$\phi D_1$	1.333	1.343	33.86	34.11
$\phi D_2$	2.030	2.090	51.56	53.09
H	1.020	1.060	25.91	26.92
$\phi J$	.135	.145	3.43	3.68
L	11.50	12.50	292.10	317.50
N	.040	—	1.02	—

Creep Distance—1.00 in. min. (25.40 mm)

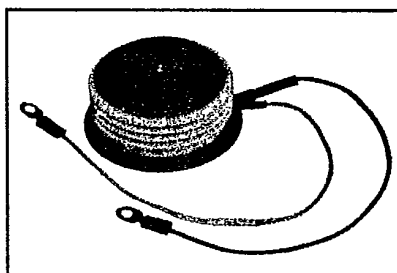
Strike Distance—.89 in. min. (17.53 mm).

(In accordance with NEMA standards.)

Finish—Nickel Plate.

Approx. Weight—8 oz. (227 g).

1. Dimension "H" is clamped dimension.



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## Description

Powerex Silicon Controlled Rectifiers (SCR) are designed for phase control applications. These are all-diffused, Press-Pak (Pow-R-Disc) devices employing the field-proven amplifying (di/namic) gate.

## Features:

- ☐ Low On-State Voltage
- ☐ High di/dt
- ☐ High dv/dt
- ☐ Hermetic Packaging
- ☐ Excellent Surge and  $I^2t$  Ratings

## Applications:

- ☐ Power Supplies
- ☐ Battery Chargers
- ☐ Motor Control
- ☐ Light Dimmers
- ☐ VAR Generators

## Ordering Information

Example: Select the complete eight digit part number you desire from the table – i.e. T8203050 is a 3000 Volt, 500 Ampere Phase Control SCR.

Type	Voltage*		Current	
	V <sub>ORM</sub> V <sub>RRM</sub>	Code	I <sub>T</sub> (avg)	Code
T820	2200	22	500	50
	2400	24	600	60
	2600	26		
	2800	28		
	3000	30		
	3200	32		
	3400	34		
	3600	36		
	3800	38		
	4000	40		
	4200	42		

\* All voltages not available in all current ratings.



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## Absolute Maximum Ratings

	Symbol	T820 - 50	T820 - 60	Units
Maximum Blocking Voltage	$V_{DRM}, V_{RRM}$	4200	3800	Volts
RMS On-State Current	$I_{T(RMS)}$	785	940	Amperes
Average On-State Current	$I_{T(av)}$	500	600	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (60Hz) <sup>①</sup>	$I_{TSM}$	6,000	10,500	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz) <sup>①</sup>	$I_{TSM}$	5,475	9,580	Amperes
Critical Rate-of-Rise of On-State Current (Non-Repetitive) <sup>② ③</sup>	$di/dt$	100	400	Amperes/ $\mu$ s
Critical Rate-of-Rise of On-State Current (Repetitive)	$di/dt$	30	150	Amperes/ $\mu$ s
$I^2t$ (for Fusing), One Cycle at 60Hz	$I^2t$	150,000	459,000	A <sup>2</sup> sec
Peak Gate Power Dissipation	$P_{GM}$	16	16	Watts
Average Gate Power Dissipation	$P_{G(av)}$	3	3	Watts
Storage Temperature	$T_{STG}$	-40 to 150	-40 to 150	°C
Operating Temperature	$T_J$	-40 to 125	-40 to 125	°C
Mounting Force <sup>④</sup>		3000 to 3500	3000 to 3500	lb.
Mounting Force <sup>④</sup>		1360 to 1590	1360 to 1590	kg

## Electrical and Thermal Characteristics

	Symbol	Test Conditions	T820 - 50	T820 - 60	Units
<b>Voltage—Blocking State Maximums<sup>①</sup></b>					
Forward Leakage, Peak	$I_{DRM}$	$T_J = 125^\circ\text{C}, V_{DRM} = \text{rated}$	65	35	mA
Reverse Leakage, Peak	$I_{RRM}$	$T_J = 125^\circ\text{C}, V_{RRM} = \text{rated}$	65	35	mA
<b>Current—Conducting State Maximums</b>					
Peak On-State Voltage	$V_{TM}$	$I_{TM} = 1500\text{A}, T_J = 25^\circ\text{C}$	2.3	2.0	Volts
Threshold Voltage	$V_{(TO)}$	$T_J = 125^\circ\text{C}$	.85	.74	Volts
Slope Resistance	$r_T$	$T_J = 125^\circ\text{C}$	1.1	1.06	mOhm
<b>Switching</b>					
T820					
Typical Turn-Off Time	$t_q$	$I_T = 250\text{A}, T_J = 125^\circ\text{C}, di_R/dt = 50\text{A}/\mu\text{sec},$ reapplied $dv/dt = 20\text{V}/\mu\text{sec}$ linear to $0.8V_{DRM}$	200		$\mu\text{sec}$
Typical Turn-On Time <sup>②</sup>	$t_{on}$	$I_{TM} = 1000\text{A}, V_O = 600\text{V}$	5.0		$\mu\text{sec}$
Min. Critical $dv/dt$ exponential to $V_{DRM}$ <sup>③</sup>	$dv/dt$	$T_J = 125^\circ\text{C}$	300		V/ $\mu\text{sec}$
<b>Thermal</b>					
Maximum Thermal Resistance, <sup>④</sup> double sided cooling Junction to Case	$R_{\theta JC}$		.037		°C/Watt
Case to Sink, Lubricated	$R_{\theta CS}$		.020		°C/Watt
<b>Gate—Maximum Parameters</b>					
Gate Current to Trigger	$I_{GT}$	$T_J = 25^\circ\text{C}, V_D = 12\text{V}$	150		mA
Gate Voltage to Trigger	$V_{GT}$	$T_J = 25^\circ\text{C}, V_D = 12\text{V}$	3.0		Volts
Non-Triggering Gate Voltage	$V_{GDM}$	$T_J = 125^\circ\text{C}, \text{rated } V_{DRM}$	.15		Volts
Peak Forward Gate Current	$I_{GTM}$		4		Amperes
Peak Reverse Gate Voltage	$V_{GRM}$		5		Volts

① Consult recommended mounting procedures.

② Applies for zero or negative gate bias.

③ Per JEDEC RS-397, 5.2.2.1.

④ With recommended gate drive.

⑤ Higher  $dv/dt$  ratings available, consult factory.

⑥ Per JEDEC standard RS-397, 5.2.2.6.



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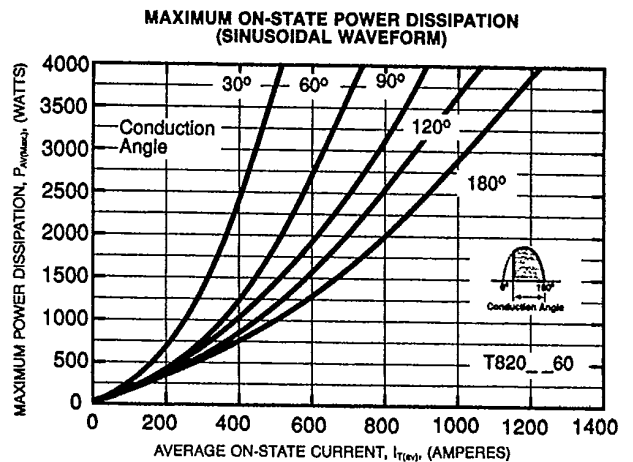
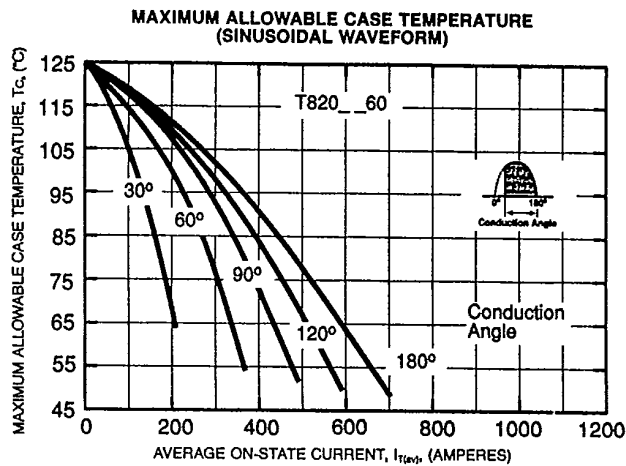
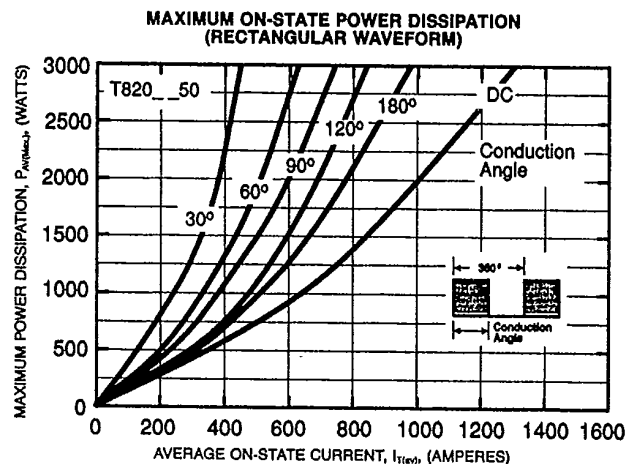
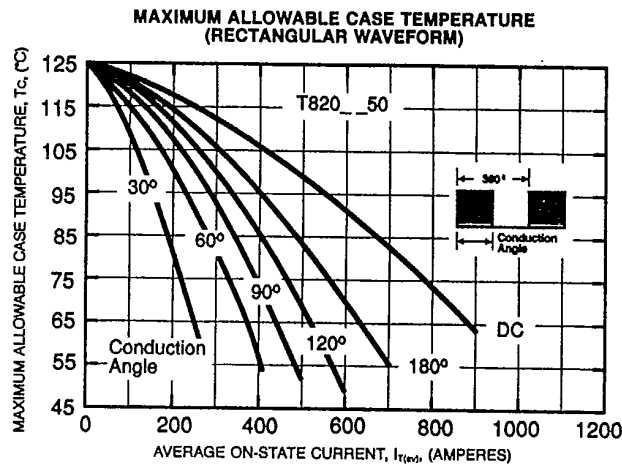
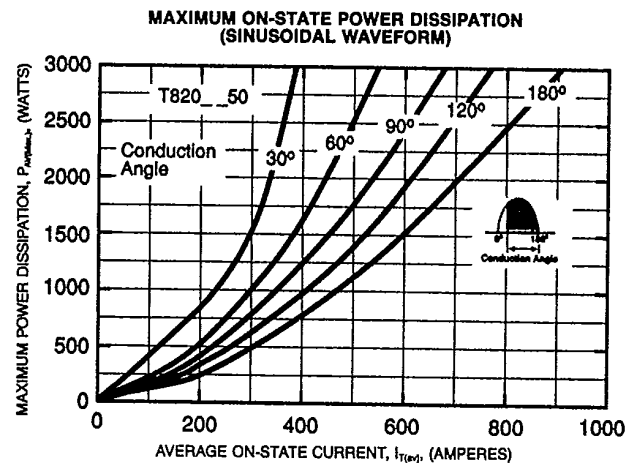
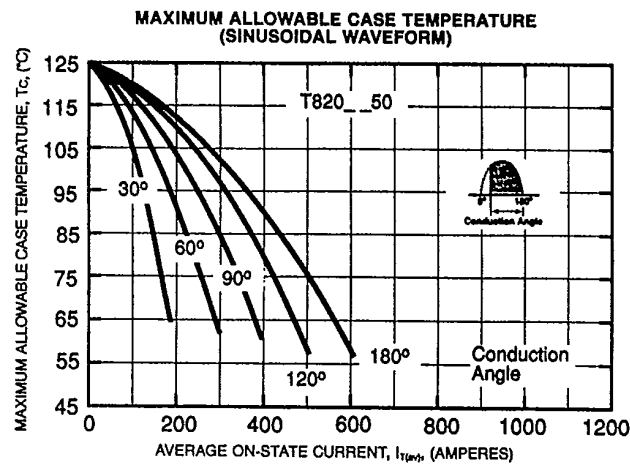
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