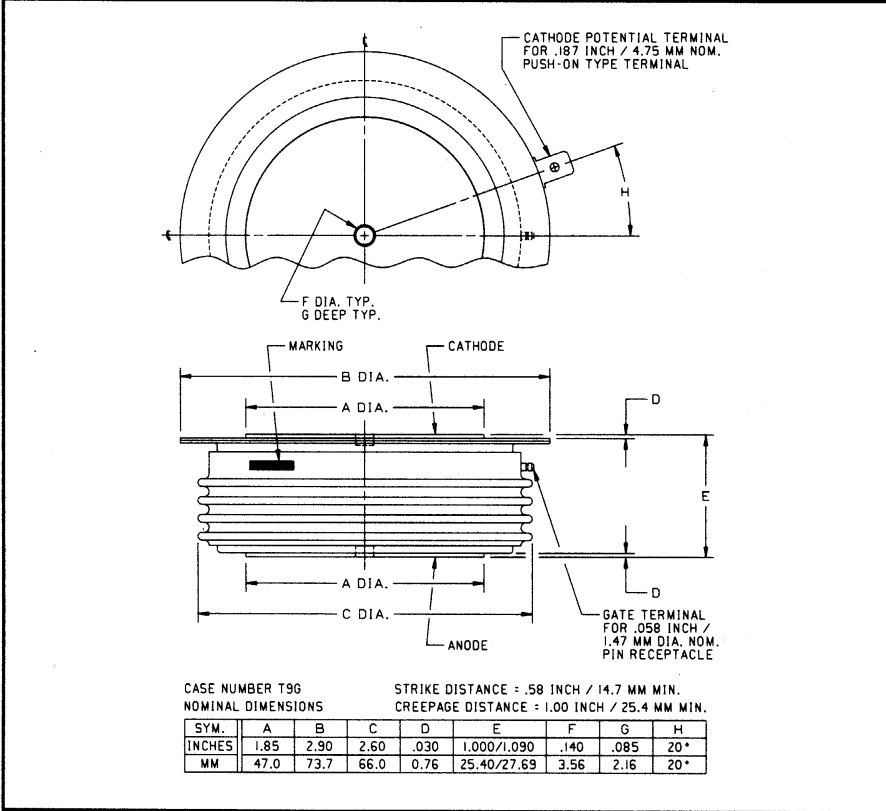


Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272  
 Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

**Phase Control SCR**  
 800 Amperes Average  
 4500 Volts



T9K7 800A (Outline Drawing)



T9K7 800A Phase Control SCR  
 800 Amperes Average, 4500 Volts

**Description:**

The T9K7 is a high voltage version of the Powerex C702. Powerex Silicon Controlled Rectifiers (SCR) are designed for phase control applications. These are all-dif-fused, Press-Pak, hermetic Pow-R-Disc devices employing the field proven amplifying gate.

**Features:**

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

**Applications:**

- Power Supplies
- Motor Starters
- Motor Control
- VAR Generators

**Ordering Information:**

Select the complete 12 digit part number you desire from the table below.

Type	Voltage	Current	Turn-off	Gate Current	Lead Code
	$V_{DRM}/V_{RRM}$ (Volts)	$I_T(av)$ (A)	$t_q$ ( $\mu$ sec)	$I_{GT}$ (mA)	
T9K7	36 40 42 45	08	0	2	DH
	3600V 4000V 4200V 4500V	800A	500 $\mu$ sec (Typical)	300mA	12"



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**T9K7 800A**  
**Phase Control SCR**  
 800 Amperes Average, 4500 Volts

### Absolute Maximum Ratings

Characteristics	Symbol	T9K7 800A	Units
Non-repetitive Transient Peak Reverse Voltage	$V_{RSM}$	$V_{RRM} + 100V$	Volts
RMS On-state Current, $T_C = 79^\circ C$	$I_{T(rms)}$	1250	Amperes
Average Current 180° Sine Wave, $T_C = 79^\circ C$	$I_{T(av)}$	800	Amperes
RMS On-state Current, $T_C = 55^\circ C$	$I_{T(rms)}$	1665	Amperes
Average Current 180° Sine Wave, $T_C = 55^\circ C$	$I_{T(av)}$	1060	Amperes
Peak One Cycle Surge On-state Current (Non-repetitive) 60Hz	$I_{tsm}$	9000	Amperes
Peak One Cycle Surge On-state Current (Non-repetitive) 50Hz	$I_{tsm}$	8000	Amperes
Critical Rate-of-rise of On-state Current (Non-repetitive)	$di/dt$	200	A/ $\mu$ sec
Critical Rate-of-rise of On-state Current (Repetitive)	$di/dt$	75	A/ $\mu$ sec
$I^2t$ (for Fusing) for One Cycle, 60Hz	$I^2t$	337,500	A <sup>2</sup> sec
Peak Gate Power Dissipation	$P_{GM}$	200	Watts
Average Gate Power Dissipation	$P_{G(av)}$	5	Watts
Operating Temperature	$T_j$	-40 to +125°C	°C
Storage Temperature	$T_{stg}$	-40 to +150°C	°C
Approximate Weight		1	lb.
		454	g
Mounting Force		5000 to 6000	lb.
		22.2 to 26.6	kg.



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**T9K7 800A**  
**Phase Control SCR**  
 800 Amperes Average, 4500 Volts

**Electrical Characteristics,  $T_j = 25^\circ\text{C}$  Unless Otherwise Specified**

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Repetitive Peak Reverse Leakage Current	$I_{RRM}$	$T_j = 125^\circ\text{C}, V_R = V_{RRM}$			150	mA
Repetitive Peak Forward Leakage Current	$I_{DRM}$	$T_j = 125^\circ\text{C}, V_D = V_{DRM}$			150	mA
Peak On-state Voltage	$V_{TM}$	$I_{TM} = 1500\text{A Peak}$ Duty Cycle < 0.1%			2.0	Volts
Threshold Voltage, Low-level	$V_{(TO)1}$	$T_j = 125^\circ\text{C}, I = 15\%, I_{T(av)}$ to $\pi I_{T(av)}$			1.2127	Volts
Slope Resistance, Low-level	$r_{T1}$				0.6021	m $\Omega$
Threshold Voltage, High-level	$V_{(TO)2}$	$T_j = 125^\circ\text{C}, I = \pi I_{T(av)}$ to $I_{TSM}$			1.3048	Volts
Slope Resistance, High-level	$r_{T2}$				0.5897	m $\Omega$
$V_{TM}$ Coefficients, Low-level		$T_j = 125^\circ\text{C}, I = 15\% I_{T(av)}$ to $\pi I_{T(av)}$				$A_1 = 1.9623$ $B_1 = -0.19517$ $C_1 = 4.845\text{E-}04$ $D_1 = 0.021894$
$V_{TM}$ Coefficients, High-level		$T_j = 125^\circ\text{C}, I = \pi I_{T(av)}$ to $I_{TSM}$				$A_2 = -19.918$ $B_2 = 3.7822$ $C_2 = 0.001228$ $D_2 = -0.20013$
Typical Delay Time	$t_d$	$V_D = 0.5V_{DRM}$		3.0		$\mu\text{sec}$
Typical Turn-off Time	$t_q$	$V_R = 100\text{V},$ $di_R/dt = 5\text{A}/\mu\text{sec}$ Reapplied $dv/dt = 20\text{V}/\mu\text{sec}$ . Linear to 50% $V_{DRM}$		500		$\mu\text{sec}$
Minimum Critical $dv/dt$ - Exponential to $V_D$	$dv/dt$	$T_j = 125^\circ\text{C}, V_D = 0.8V_{DRM}$	800			V/ $\mu\text{sec}$
Gate Trigger Current	$I_{GT}$	$T_j = 25^\circ\text{C}, V_D = 12\text{V}$	30		300	mA
Gate Trigger Voltage	$V_{GT}$	$T_j = 25^\circ\text{C}, V_D = 12\text{V}$	0.5		4.5	Volts
Peak Reverse Gate Voltage	$V_{GRM}$				5	Volts

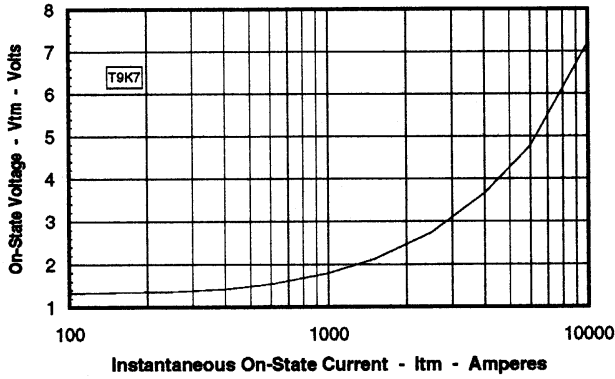
**Thermal Characteristics**

Maximum Thermal Resistance, Double Sided Cooling						
Junction-to-Case	$R_{\theta(j-c)}$				0.023	$^\circ\text{C}/\text{W}$
Case-to-Sink	$R_{\theta(c-s)}$				0.0075	$^\circ\text{C}/\text{W}$

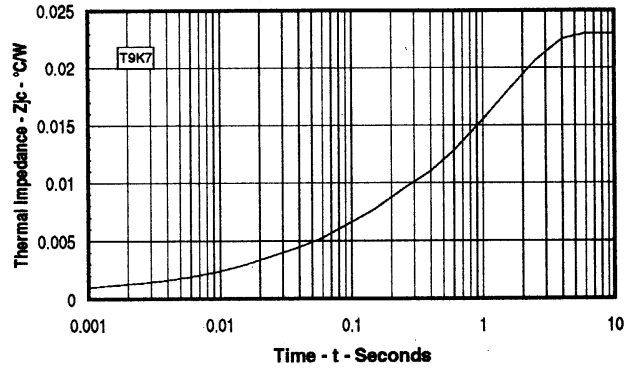
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**T9K7 800A**  
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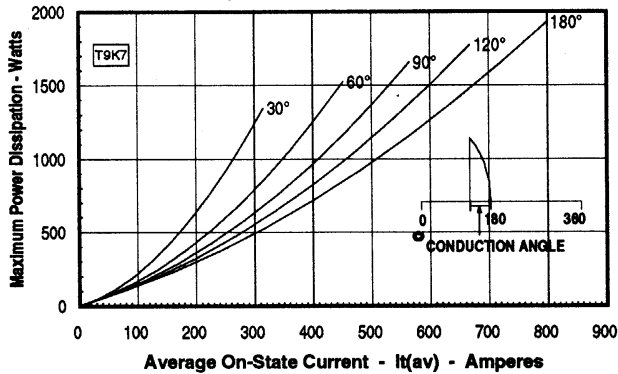
**Maximum On-State Forward Voltage Drop**  
 ( $T_J = 125^\circ\text{C}$ )



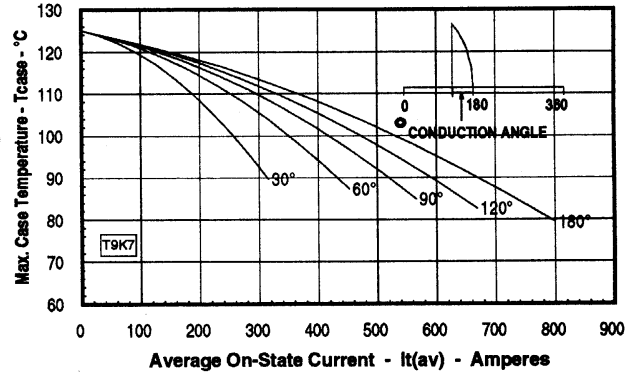
**Maximum Transient Thermal Impedance**  
 (Junction to Case)



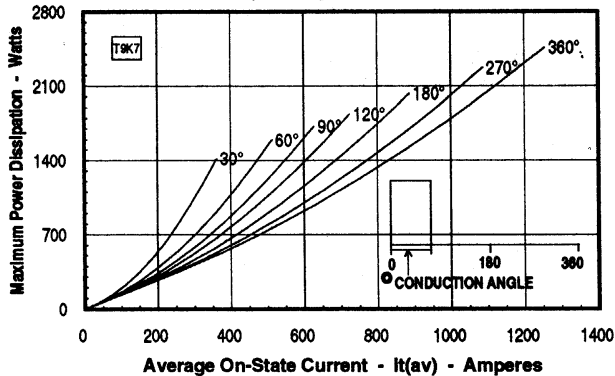
**Maximum On-State Power Dissipation**  
 (Sinusoidal Waveform)



**Maximum Allowable Case Temperature**  
 (Sinusoidal Waveform)



**Maximum On-State Power Dissipation**  
 (Rectangular Waveform)



**Maximum Allowable Case Temperature**  
 (Rectangular Waveform)

