

T7H8 750A (Outline Drawing)



**T7H8 750A Phase Control SCR**  
750 Amperes Average, 1600 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: T7H8167504DN is a 1600V 750A Phase Control SCR.

Type	Voltage $V_{RRM}$ (Volts)	Current $I_{T(av)}$ (A)	Turn-off Time $t_q$ ( $\mu$ sec)	Gate Current $I_{GT}$ (mA)	Lead Code
T7H8	02 through 16	75	0	4	DN
	200V through 1600V	750A	150 $\mu$ sec typical	150 mA	8"

**Absolute Maximum Ratings**

Characteristics	Symbol		Units
Non-Repetitive Transient Peak Reverse Blocking Voltage	$V_{RSM}$	$V_{RRM} + 100V$	Volts
RMS On-State Current, $T_C = 62^\circ C$	$I_{T(RMS)}$	1180	Amperes
Average Current 180° Sine Wave, $T_C = 62^\circ C$	$I_{T(AV)}$	750	Amperes
RMS On-State Current, $T_C = 55^\circ C$	$I_{T(RMS)}$	1260	Amperes
Average Current 180° Sine Wave, $T_C = 55^\circ C$	$I_{T(AV)}$	800	Amperes
Peak One Cycle Surge On-State Current (Non-Repetitive) 60 Hz	$I_{TSM}$	10500	Amperes
Peak One Cycle Surge On-State Current (Non-Repetitive) 50 Hz	$I_{TSM}$	9600	Amperes
Critical Rate-of-rise of On-State Current (Non-Repetitive)	di/dt	600	A/ $\mu$ sec
Critical Rate-of-rise of On-State Current (Repetitive)	di/dt	150	A/ $\mu$ sec
$I^2t$ (for Fusing) for One Cycle, 60 Hz	$I^2t$	460,000	A <sup>2</sup> 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	$^\circ C$
Storage Temperature	$T_{stg}$	-40 to +150	$^\circ C$
Approximate Weight		4	oz.
		113	g
Mounting Force		2000 to 2400	lb.
		900 to 1090	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.

**Electrical Characteristics,  $T_J=25^\circ\text{C}$  unless otherwise specified**

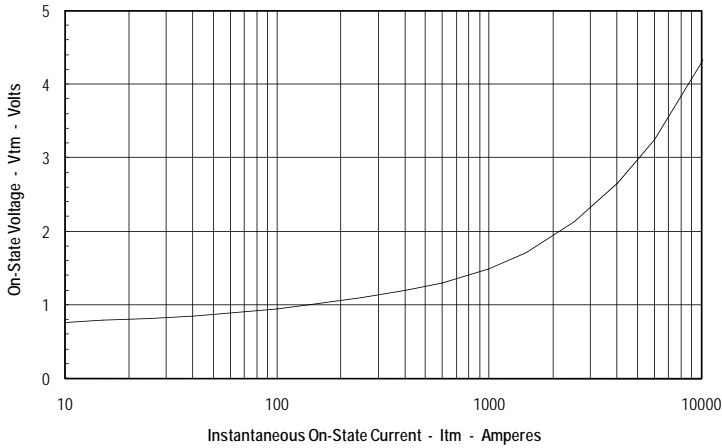
Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Repetitive Peak Reverse Leakage Current	$I_{RRM}$	$T_J=125^\circ\text{C}, V_R = V_{RRM}$			30	mA
Repetitive Peak Forward Leakage Current	$I_{DRM}$	$T_J=125^\circ\text{C}, V_D = V_{DRM}$			30	mA
Peak On-State Voltage	$V_{TM}$	$I_{FM}=625\text{A peak},$ Duty Cycle < 0.1 %			1.40	V
Threshold Voltage, Low-level	$V_{(TO)1}$	$T_J = 125^\circ\text{C}, I = 15\%I_{T(AV)} \text{ to } \pi I_{T(AV)}$			0.97192	V
Slope Resistance, Low-level	$r_{T1}$				0.4818	m $\Omega$
Threshold Voltage, High-level	$V_{(TO)2}$	$T_J = 125^\circ\text{C}, I = \pi I_{T(AV)} \text{ to } I_{TSM}$			1.4824	V
Slope Resistance, High-level	$r_{T2}$				0.2845	m $\Omega$
$V_{TM}$ Coefficients, Low-level		$T_J = 125^\circ\text{C}, I = 15\%I_{T(AV)} \text{ to } \pi I_{T(AV)}$  $V_{TM} = A + B \ln(I) + C(I) + D \text{ Sqrt}(I)$		A = B = C = D =	1.221 -0.1259 8.857 E-04 0.03348	
Typical Turn-On Time	$t_{on}$	$I_T = 100\text{A}, V_D = 100\text{V}$		7		$\mu\text{s}$
Typical Turn-Off Time	$t_q$	$T_J = 125^\circ\text{C}, I_T = 250\text{A},$ $di_r/dt = 25\text{A}/\mu\text{s}$ Reapplied $dv/dt = 20\text{V}/\mu\text{s}$ Linear to 80% $V_{DRM}$		150		$\mu\text{s}$
Minimum Critical $dv/dt$ – Exponential to $V_{DRM}$	$dv/dt$	$T_J = 125^\circ\text{C}$	300			V/ $\mu\text{s}$
Gate Trigger Current	$I_{GT}$	$T_J = 25^\circ\text{C}, V_D = 12\text{V}$			150	mA
Gate Trigger Voltage	$V_{GT}$	$T_J = 25^\circ\text{C}, V_D = 12\text{V}$			3.0	V
Non-Triggering Gate Voltage	$V_{GDM}$	$T_J = 125^\circ\text{C}, V_D = V_{DRM}$			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	$R_{\Theta(J-C)}$	0.04	$^\circ\text{C}/\text{W}$
Case-to-Sink	$R_{\Theta(C-S)}$	0.02	$^\circ\text{C}/\text{W}$

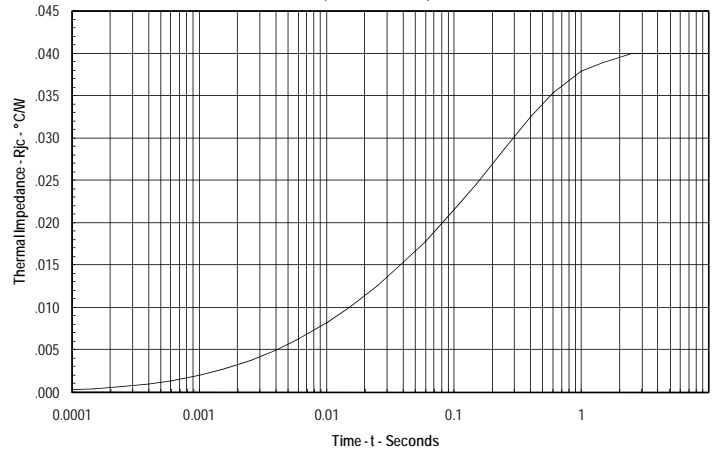
**Maximum On-State Forward Voltage Drop**

(T<sub>j</sub> = 125 °C)



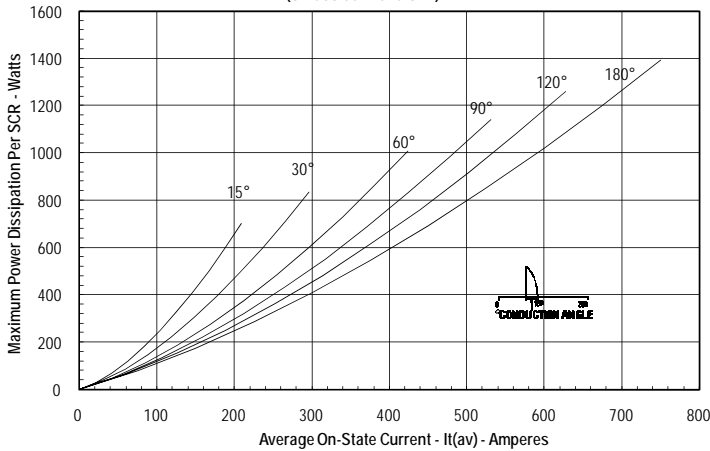
**Maximum Transient Thermal Impedance**

(Junction to Case)



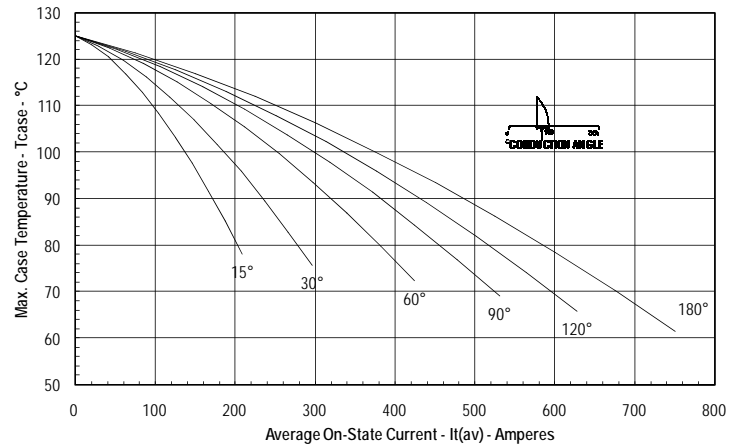
**Maximum On-State Power Dissipation**

(Sinusoidal Waveform)



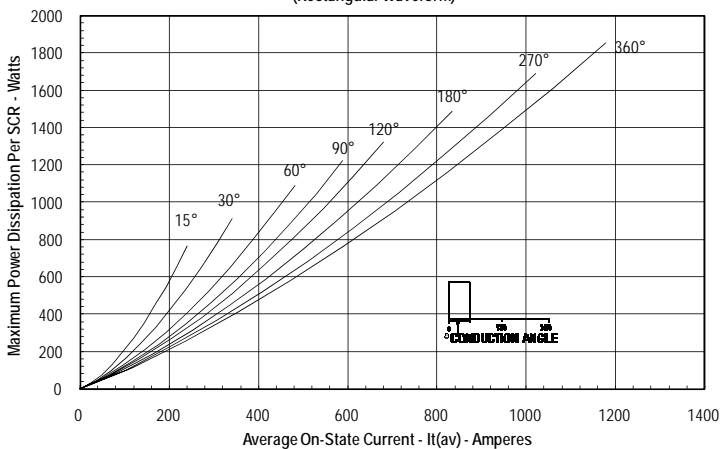
**Maximum Allowable Case Temperature**

(Sinusoidal Waveform)



**Maximum On-State Power Dissipation**

(Rectangular Waveform)



**Maximum Allowable Case Temperature**

(Rectangular Waveform)

