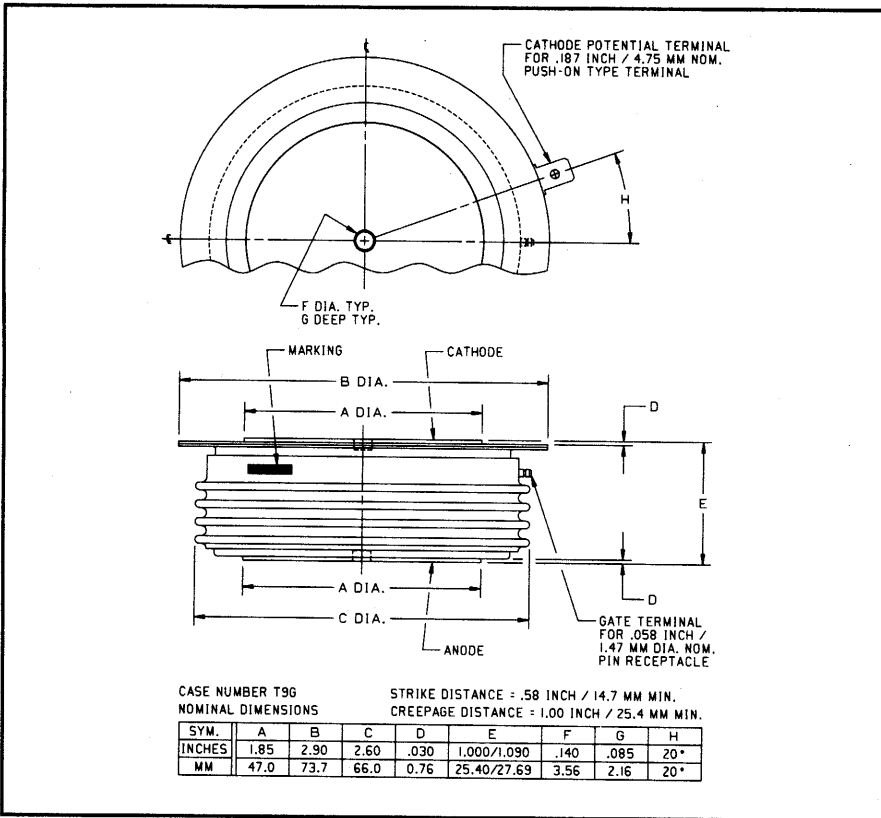


Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272  
 Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

**Phase Control SCR**  
 1000 Amperes Average  
 2400 Volts



T9G0 1000A (Outline Drawing)



T9G0 1000A Phase Control SCR  
 1000 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<sup>2</sup>t Ratings

**Applications:**

- Power Supplies
- Motor Control
- Battery Chargers

**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 <sub>DRM</sub> /V <sub>RRM</sub> (Volts)	I <sub>T(av)</sub> (A)	t <sub>q</sub> (μsec)	I <sub>GT</sub> (mA)	
T9G0	02 through 24  200V through 2400V	10  1000A	0  250μsec (Typical)	3  200mA	DH  12"

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**T9G0 1000A**  
**Phase Control SCR**  
 1000 Amperes Average, 2400 Volts

## Absolute Maximum Ratings

Characteristics	Symbol	T9G0 1000A	Units
Non-repetitive Transient Peak Reverse Voltage	$V_{RSM}$	$V_{RRM} + 100V$	Volts
RMS On-state Current, $T_C = 82^\circ C$	$I_{T(rms)}$	1590	Amperes
Average Current 180° Sine Wave, $T_C = 82^\circ C$	$I_{T(av)}$	1000	Amperes
RMS On-state Current, $T_C = 55^\circ C$	$I_{T(rms)}$	2100	Amperes
Average Current 180° Sine Wave, $T_C = 55^\circ C$	$I_{T(av)}$	1340	Amperes
Peak One Cycle Surge On-state Current (Non-repetitive) 60Hz	$I_{tsm}$	17000	Amperes
Peak One Cycle Surge On-state Current (Non-repetitive) 50Hz	$I_{tsm}$	15500	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, 60Hz	$I^2t$	1,203,000	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°C	°C
Storage Temperature	$T_{stg}$	-40 to +150°C	°C
Approximate Weight		1	lb.
		454	g
Mounting Force		5000 to 5500	lb.
		2270 to 2500	kg

**T9G0 1000A**  
**Phase Control SCR**  
 1000 Amperes Average, 2400 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	$I_{RRM}$	$T_j = 125^\circ\text{C}, V_R = V_{RRM}$			75	mA
Repetitive Peak Forward Leakage Current	$I_{DRM}$	$T_j = 125^\circ\text{C}, V_D = V_{DRM}$			75	mA
Peak On-state Voltage	$V_{TM}$	$I_{TM} = 1500\text{A Peak}$ Duty Cycle < 0.1%			1.75	Volts
Threshold Voltage, Low-level	$V_{(TO)1}$	$T_j = 125^\circ\text{C}, I = 15\%, I_{T(av)}$ to $\pi I_{T(av)}$			0.90398	Volts
Slope Resistance, Low-level	$r_{T1}$				0.49075	m $\Omega$
Threshold Voltage, High-level	$V_{(TO)2}$	$T_j = 125^\circ\text{C}, I = \pi I_{T(av)}$ to $I_{TSM}$			0.96507	Volts
Slope Resistance, High-level	$r_{T2}$				0.42052	m $\Omega$
$V_{TM}$ Coefficients, Low-level		$T_j = 125^\circ\text{C}, I = 15\% I_{T(av)}$ to $\pi I_{T(av)}$				
					$A_1 = 0.11284$	
					$B_1 = 0.08444$	
					$C_1 = 1.569\text{E-}04$	
					$D_1 = 0.020707$	
$V_{TM}$ Coefficients, High-level		$T_j = 125^\circ\text{C}, I = \pi I_{T(av)}$ to $I_{TSM}$				
					$A_2 = 26.048$	
					$B_2 = -3.9592$	
					$C_2 = 1.118\text{E-}04$	
					$D_2 = 0.14391$	
Typical Turn-on Time	$t_{on}$	$I_{TM} = 1000\text{A}, V_D = 450\text{V}$		3		$\mu\text{sec}$
Typical Turn-off Time	$t_q$	$T_j = 125^\circ\text{C}, I_T = 250\text{A}, di_T/dt = 50\text{A}/\mu\text{sec}$ Reapplied $dv/dt = 20\text{V}/\mu\text{sec}$ Linear to 80% $V_{DRM}$		250		$\mu\text{sec}$
Minimum Critical $dv/dt$ - Exponential to $V_{DRM}$	$dv/dt$	$T_j = 125^\circ\text{C}$	300	1000		V/ $\mu\text{sec}$
Gate Trigger Current	$I_{GT}$	$T_j = 25^\circ\text{C}, V_D = 12\text{V}$	30	100	200	mA
Gate Trigger Voltage	$V_{GT}$	$T_j = 25^\circ\text{C}, V_D = 12\text{V}$		1.5	3.0	Volts
Non-triggering Gate Voltage	$V_{GDM}$	$T_j = 125^\circ\text{C}, V_D = V_{DRM}$			0.15	Volts
Peak Forward Gate Current	$I_{GTM}$				4	A
Peak Reverse Gate Voltage	$V_{GRM}$				5	Volts

## Thermal Characteristics

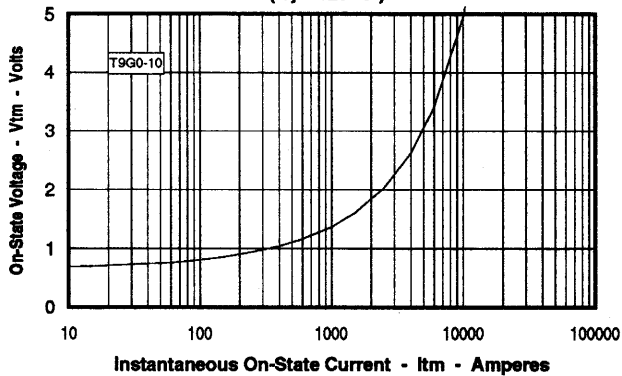
Maximum Thermal Resistance, Double Sided Cooling

Junction-to-Case	$R_{\theta(j-c)}$			0.023	$^\circ\text{C}/\text{W}$
Case-to-Sink	$R_{\theta(c-s)}$		0.006	0.0075	$^\circ\text{C}/\text{W}$

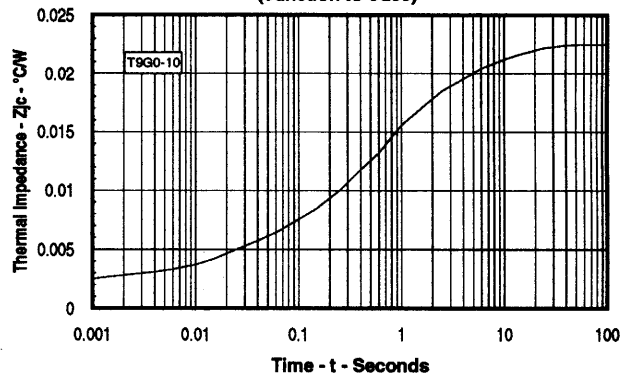
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**T9G0 1000A**  
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 1000 Amperes Average, 2400 Volts

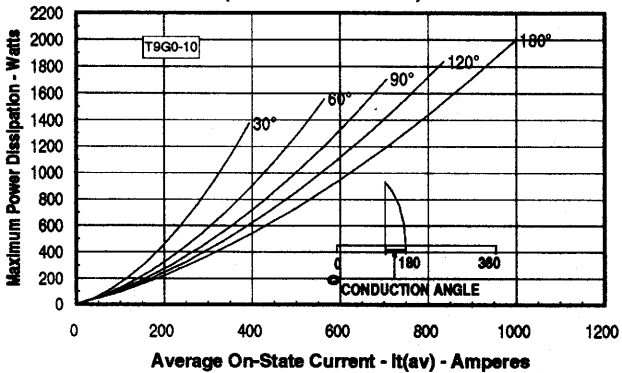
**Maximum On-State Forward Voltage Drop**  
 ( $T_J = 125^\circ\text{C}$ )



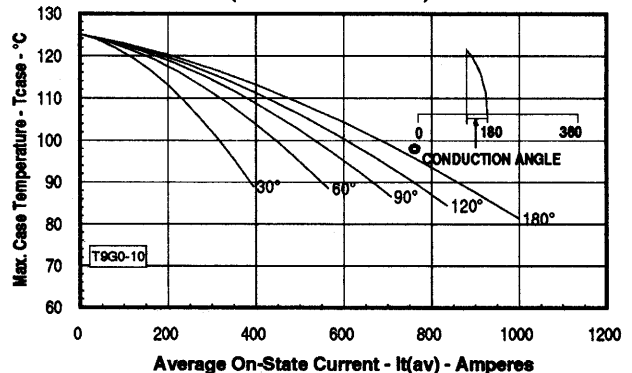
**Maximum Transient Thermal Impedance**  
 (Junction to Case)



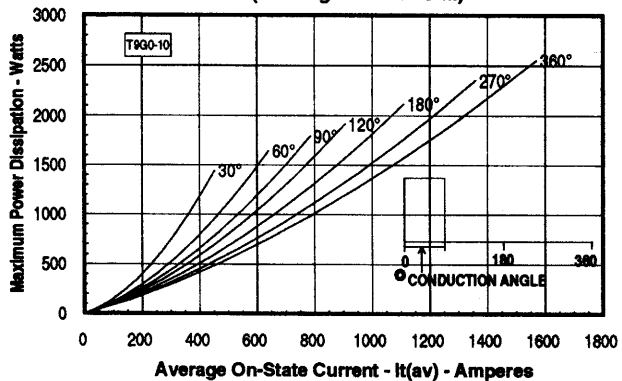
**Maximum On-State Power Dissipation**  
 (Sinusoidal Waveform)



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



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



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

