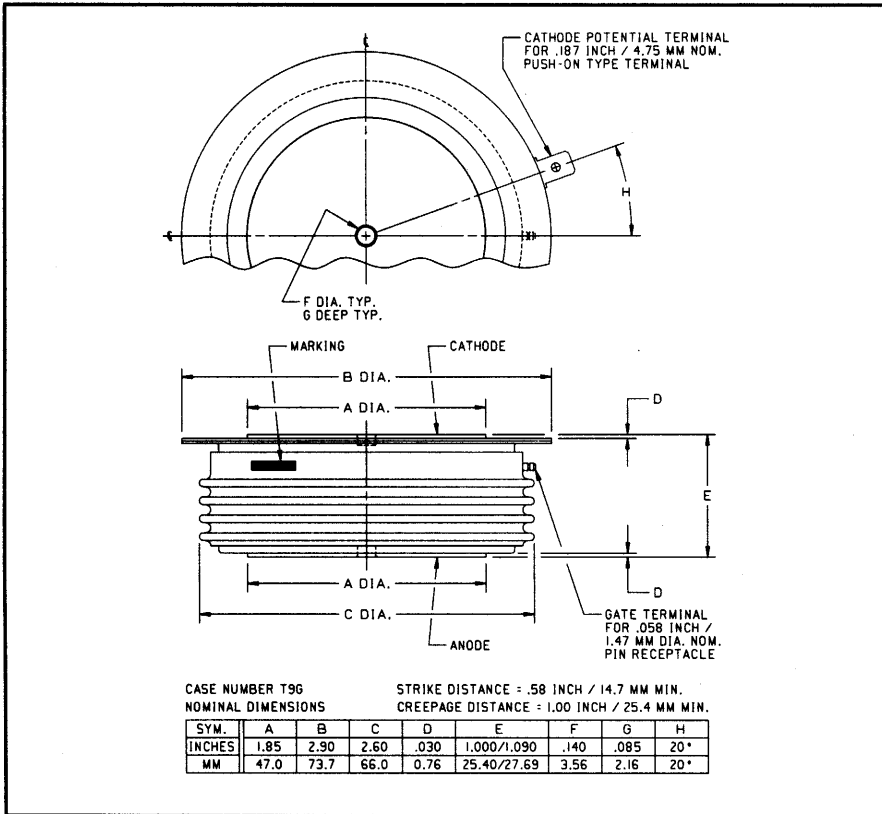
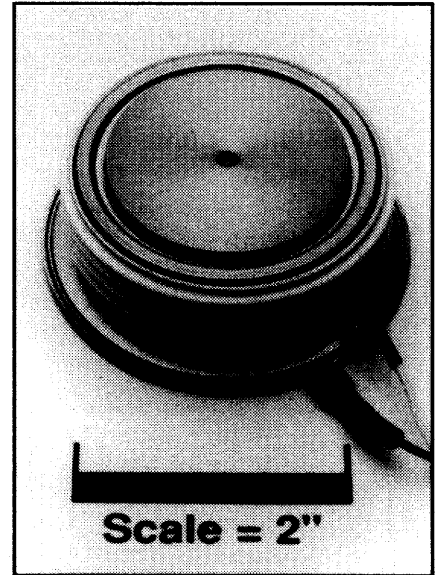


Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272  
 Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

**Phase Control SCR**  
 1000 Amperes Average  
 3200 Volts



C702 (Outline Drawing)



C702 Phase Control SCR  
 1000 Amperes Average, 3200 Volts

### Ordering Information:

Select the complete six digit part number you desire from the table, i.e. C702CB is a 3200 Volt, 1000 Ampere Phase Control SCR.

Type	Voltage		Current
	V <sub>DRM</sub>	V <sub>RRM</sub> Code	I <sub>T(av)</sub>
C702	2400	LD	1000
	2600	LM	
	2800	LN	
	3000	CP	
	3200	CB	

### 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



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**C702**

**Phase Control SCR**

1000 Amperes Average, 3200 Volts

**Absolute Maximum Ratings**

Characteristics	Symbol	C702	Units
Non-repetitive Transient Peak Reverse Voltage	$V_{RSM}$	$V_{RRM} + 100V$	Volts
RMS On-state Current, $T_C = 74^\circ C$	$I_T(rms)$	1570	Amperes
Average Current 180° Sine Wave, $T_C = 74^\circ C$	$I_T(av)$	1050	Amperes
RMS On-state Current, $T_C = 55^\circ C$	$I_T(rms)$	1880	Amperes
Average Current 180° Sine Wave, $T_C = 55^\circ C$	$I_T(av)$	1200	Amperes
Peak One Cycle Surge On-state Current (Non-repetitive) 60Hz	$I_{tsm}$	15000	Amperes
Peak One Cycle Surge On-state Current (Non-repetitive) 50Hz	$I_{tsm}$	14000	Amperes
Critical Rate-of-rise of On-state Current (Non-repetitive)	$di/dt$	100	A/ $\mu$ sec
Critical Rate-of-rise of On-state Current (Repetitive)	$di/dt$	25	A/ $\mu$ sec
$I^2t$ (for Fusing) for One Cycle, 60Hz	$I^2t$	933,000	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 +125°C	°C
Approximate Weight		1	lb.
		454	g
Mounting Force		5000 to 6000	lb.
		2220 to 2660	kg.



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C702

Phase Control SCR

1000 Amperes Average, 3200 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	$I_{RRM}$	$T_j = 125^\circ\text{C}, V_R = V_{RRM}$			65	mA
		$T_j = 25^\circ\text{C}, V_R = V_{RRM}$			15	mA
Repetitive Peak Forward Leakage Current	$I_{DRM}$	$T_j = 125^\circ\text{C}, V_D = V_{DRM}$			65	mA
		$T_j = 25^\circ\text{C}, V_R = V_{RRM}$			15	mA
Peak On-state Voltage	$V_{TM}$	$T_j = 125^\circ\text{C}, I_T = 3000\text{A Peak}$ Duty Cycle < 0.1%			2.26	Volts
Threshold Voltage, Low-level	$V_{(TO)1}$	$T_j = 125^\circ\text{C}, I = 15\%, I_{T(av)}$ to $\pi I_{T(av)}$			0.94963	Volts
Slope Resistance, Low-level	$r_{T1}$				0.1234	m $\Omega$
Threshold Voltage, High-level	$V_{(TO)2}$	$T_j = 125^\circ\text{C}, I = \pi I_{T(av)}$ to $I_{TSM}$			1.1007	Volts
Slope Resistance, High-level	$r_{T2}$				0.1149	m $\Omega$
$V_{TM}$ Coefficients, Low-level		$T_j = 125^\circ\text{C}, I = 15\% I_{T(av)}$ to $\pi I_{T(av)}$				
					$A_1 = -0.007132$	
					$B_1 = 0.18721$	
					$C_1 = 1.589\text{E-}04$	
					$D_1 = -0.011393$	
$V_{TM}$ Coefficients, High-level		$T_j = 125^\circ\text{C}, I = \pi I_{T(av)}$ to $I_{TSM}$				
					$A_2 = 30.510$	
					$B_2 = -4.6029$	
					$C_2 = -2.083\text{E-}04$	
					$D_2 = 0.1610$	
Typical Delay Time	$t_d$	Switching from 300V, Gate = 20V, 10 $\Omega$ , 0.5 $\mu\text{sec}$ Rise Time		1.8		$\mu\text{sec}$
Minimum Critical dv/dt - Exponential to $V_{DRM}$	dv/dt	$T_j = 125^\circ\text{C}, V_{DRM} = 0.5$ Rated, Gate Open	200			V/ $\mu\text{sec}$
Gate Trigger Current	$I_{GT}$	$T_C = 125^\circ\text{C},$ $V_D = 10\text{V}, R_L = 3\Omega$			200	mA
Gate Trigger Voltage	$V_{GT}$	$T_j = 0^\circ$ to $125^\circ\text{C},$ $V_D = 10\text{V}, R_L = 3\Omega$			4.5	Volts
Non-Trigging Gate Voltage	$V_{GDM}$	$T_j = 125^\circ\text{C},$ $V_D = 0.5V_{DRM}, R_L = 1000\Omega$			0.3	Volts
Peak Forward Gate Current	$I_{GTM}$				4	A
Peak Reverse Gate Voltage	$V_{GRM}$				5	Volts

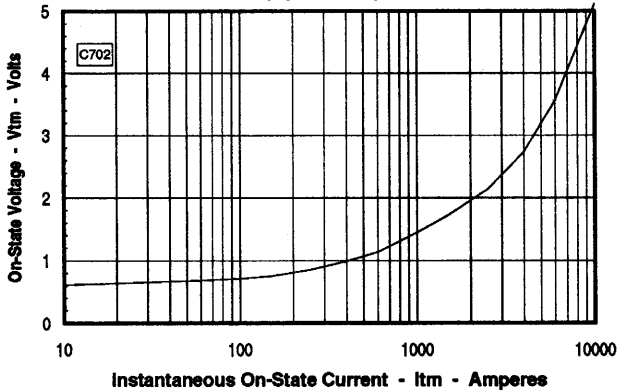
### Thermal Characteristics

Maximum Thermal Resistance, Double Sided Cooling

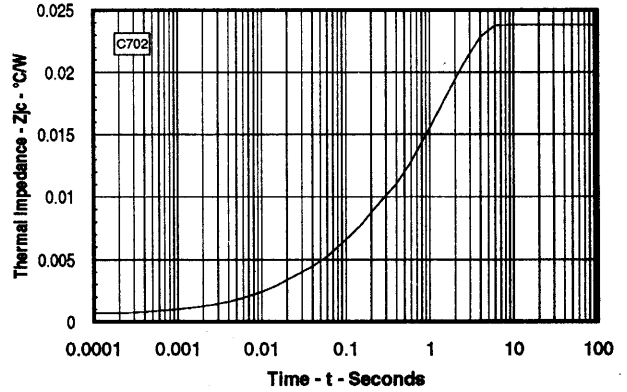
Junction-to-Case	$R_{\theta(j-c)}$	0.023	$^\circ\text{C/W}$
Case-to-Sink	$R_{\theta(c-s)}$	0.075	$^\circ\text{C/W}$

**C702**  
**Phase Control SCR**  
 1000 Amperes Average, 3200 Volts

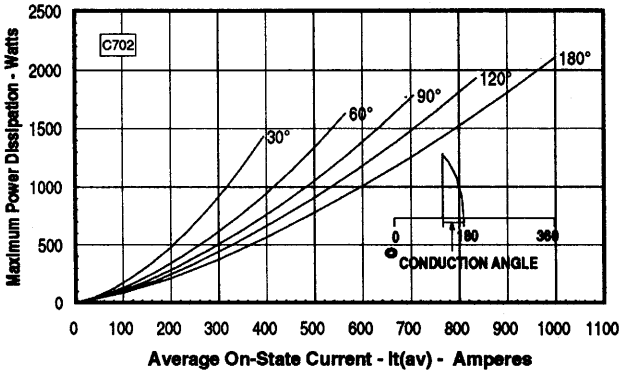
**Maximum On-State Forward Voltage Drop**  
 ( $T_J = 125^\circ\text{C}$ )



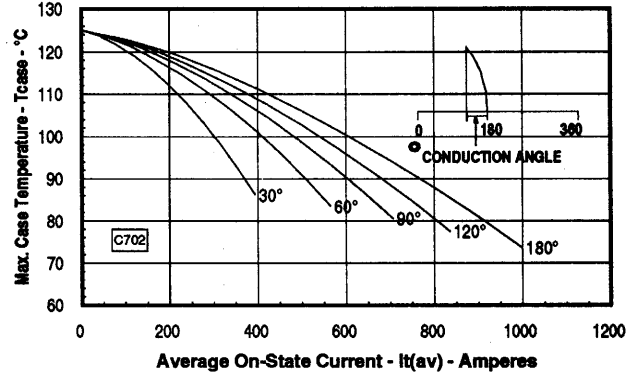
**Maximum Transient Thermal Impedance**  
 (Junction to Case)



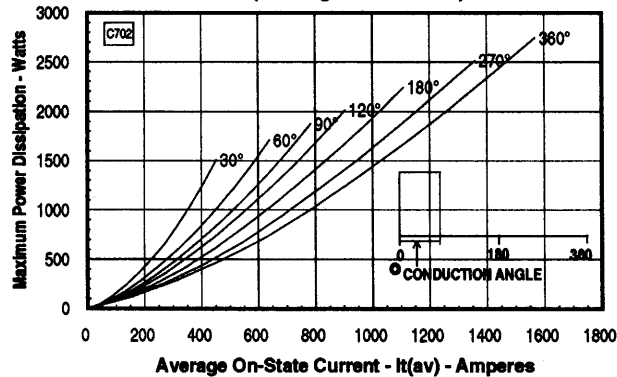
**Maximum On-State Power Dissipation**  
 (Sinusoidal Waveform)



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



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



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

