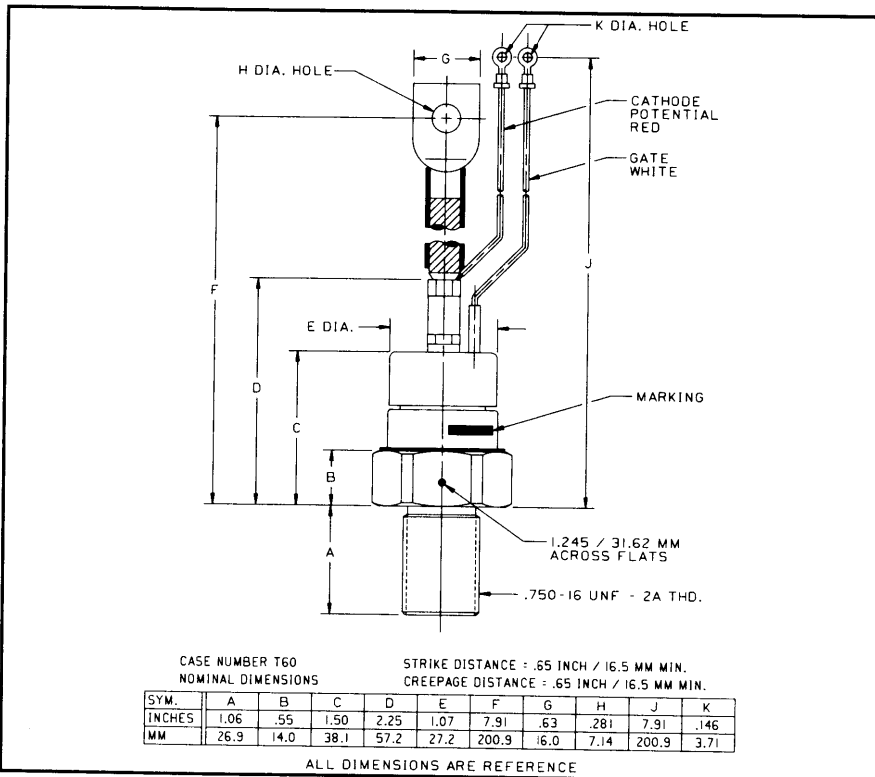
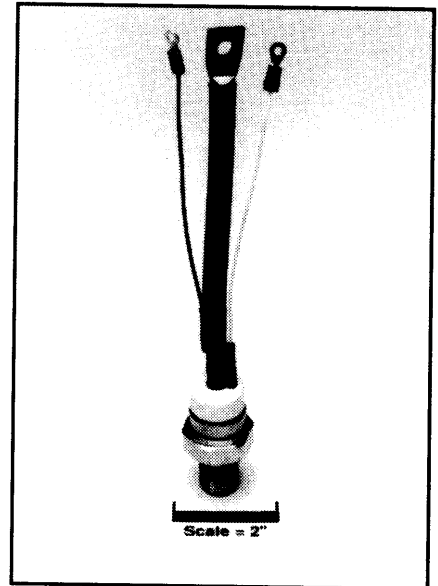


Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272  
 Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

**Phase Control SCR**  
 190 Amperes Average  
 600 Volts



C180\_\_X500 (Outline Drawing)



C180\_\_X500 Phase Control SCR  
 190 Amperes Average, 600 Volts

### Ordering Information:

Select the complete nine digit part number you desire from the table, i.e. C180MX500 is a 600 Volt, 190 Ampere Phase Control SCR.

Type	Voltage		Current
	V <sub>DRM</sub> V <sub>RRM</sub>	Code	I <sub>T(av)</sub>
C180__X500	100	A	190
	200	B	
	300	C	
	400	D	
	500	E	
	600	M	

### Description:

Powerex Silicon Controlled Rectifiers (SCR) are designed for phase control applications. These are all-diffused, compression bonded encapsulated (CBE) 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<sup>2</sup>t Ratings

### Applications:

- Power Supplies
- Battery Chargers
- Motor Control



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

C180\_X500  
 Phase Control SCR  
 190 Amperes Average, 600 Volts

### Absolute Maximum Ratings

	Symbol	C180_X500	Units
RMS On-State Current @ $T_C = 92^\circ\text{C}$	$I_{T(RMS)}$	300	Amperes
Average On-State Current @ $T_C = 92^\circ\text{C}$	$I_{T(av)}$	190	Amperes
Peak One-Cycle Surge (Non Repetitive) On-State Current (60Hz)	$I_{TSM}$	5500	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz)	$I_{TSM}$	5000	Amperes
Critical Rate-of-Rise of On-State Current (Non-Repetitive)	di/dt	800	Amperes/ $\mu\text{s}$
Critical Rate-of-Rise of On-State Current (Repetitive)	di/dt	150	Amperes/ $\mu\text{s}$
$I^2t$ (for Fusing), 8.3 milliseconds	$I^2t$	125,000	$\text{A}^2\text{sec}$
Peak Gate Power Dissipation	$P_{GM}$	10	Watts
Average Gate Power Dissipation	$P_{G(av)}$	2	Watts
Storage Temperature	$T_{STG}$	-40 to 150	$^\circ\text{C}$
Operating Temperature	$T_J$	-40 to 125	$^\circ\text{C}$
Mounting Torque		250 to 300	in.-lb.
Mounting Torque		28 to 34	N-M

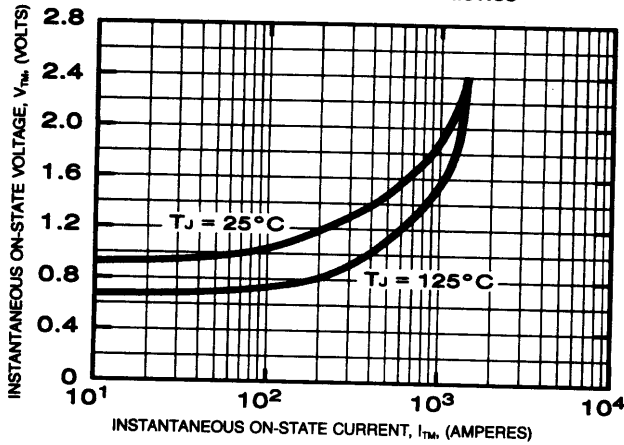
### Electrical and Thermal Characteristics

Characteristics	Symbol	Test Conditions	C180_X500	Units
<b>Voltage—Blocking State Maximums</b>				
Forward Leakage, Peak	$I_{DRM}$	$T_J = 125^\circ\text{C}, V_{DRM} = \text{Rated}$	20	mA
Reverse Leakage, Peak	$I_{RRM}$	$T_J = 125^\circ\text{C}, V_{RRM} = \text{Rated}$	20	mA
<b>Current—Conducting State Maximums</b>				
Peak On-State Voltage	$V_{TM}$	$T_J = 25^\circ\text{C}, I_{TM} = 900\text{A Peak}$	1.75	Volts
<b>Switching</b>				
Typical Turn-Off Time	$t_q$	$I_T = 150\text{A}, T_J = 125^\circ\text{C}, di_R/dt = 12.5\text{A}/\mu\text{sec}$ Reapplied $dv/dt = 20\text{V}/\mu\text{sec}$ , Linear to $0.8 V_{DRM}, V_R = 50\text{V}$	100	$\mu\text{sec}$
Typical Delay Time	$t_d$	$I_T = 100\text{A}, V_{DRM} = \text{rated};$ Gate supply: 10V, open circuit; $R_L = 25\Omega, 0.1\mu\text{sec}$ rise time	1.0	$\mu\text{sec}$
Min. Critical $dv/dt$ exponential to $V_{DRM}$	$dv/dt$	$T_J = 125^\circ\text{C}, \text{Gate Open}$	200	$\text{V}/\mu\text{sec}$
<b>Thermal</b>				
Maximum Thermal Resistance Junction to Case	$R_{\theta JC}$		0.14	$^\circ\text{C}/\text{Watt}$
Case to Sink, Lubricated	$R_{\theta CS}$		0.075	$^\circ\text{C}/\text{Watt}$
<b>Gate—Maximum Parameters</b>				
Gate Current to Trigger	$I_{GT}$	$T_C = 25^\circ\text{C}; V_D = 6\text{Vdc}, R_L = 3\Omega$	150	mA
Gate Voltage to Trigger	$V_{GT}$	$T_C = -40^\circ\text{C}$ to $125^\circ\text{C}, V_D = 6\text{Vdc}, R_L = 3\Omega$	3.0	Volts
Non-Triggering Gate Voltage	$V_{GDM}$	$T_J = 125^\circ\text{C}, \text{Rated } V_{DRM}, R_L = 1000\Omega$	0.15	Volts
Peak Forward Gate Current	$I_{GTM}$		10	Amperes
Peak Reverse Gate Voltage	$V_{GRM}$		5	Volts

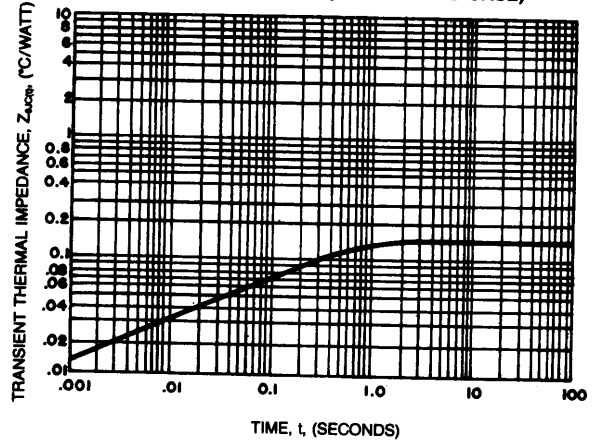
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272  
 Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

C180\_X500  
 Phase Control SCR  
 190 Amperes Average, 600 Volts

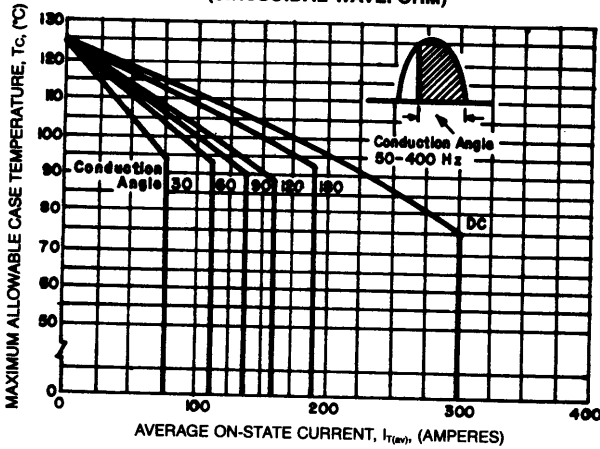
**MAXIMUM ON-STATE CHARACTERISTICS**



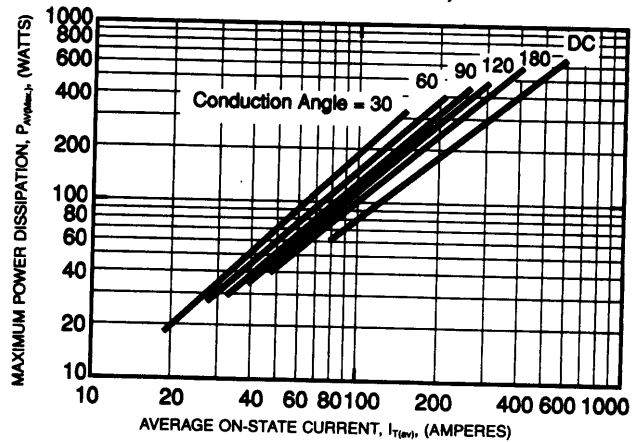
**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)**



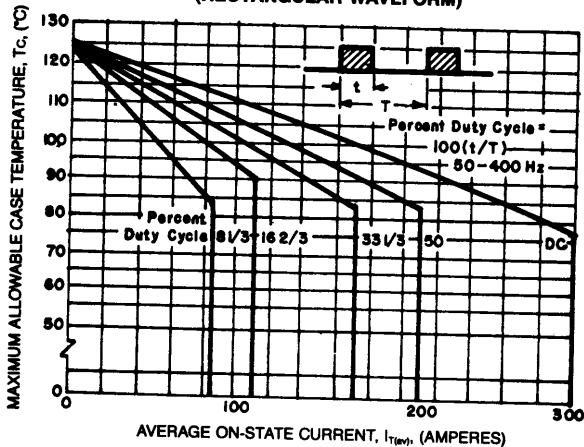
**MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)**



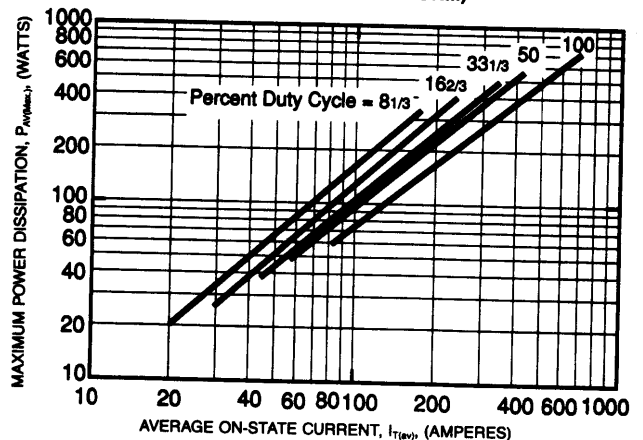
**MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)**



**MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)**



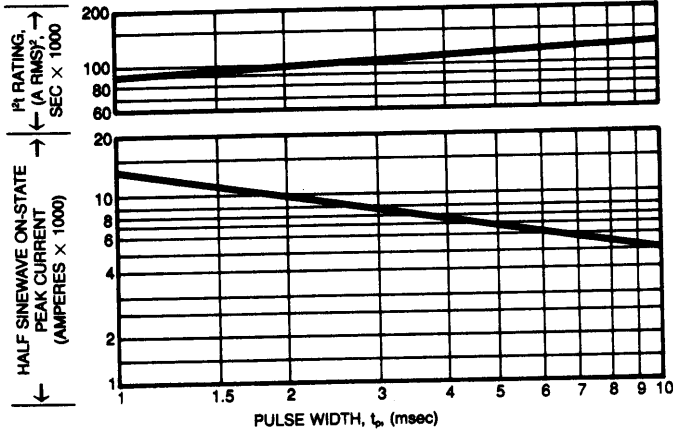
**MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)**



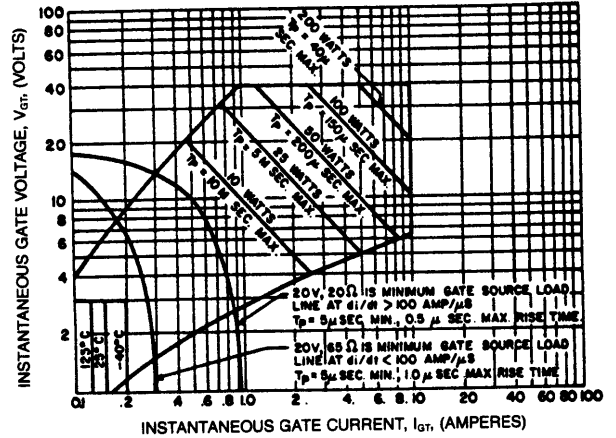
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272  
 Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

**C180\_X500**  
 Phase Control SCR  
 190 Amperes Average, 600 Volts

**SUB-CYCLE SURGE AND  $I_{T1}$  RATINGS**  
 (RATED LOAD CONDITIONS)



**GATE CHARACTERISTICS**



**NOTES:**

1. Maximum allowable gate power dissipation = 2 watts.
2. The locus of possible DC trigger points lie outside the boundaries shown at various case temperatures.
3.  $T_p$  = rectangular gate current pulse width.