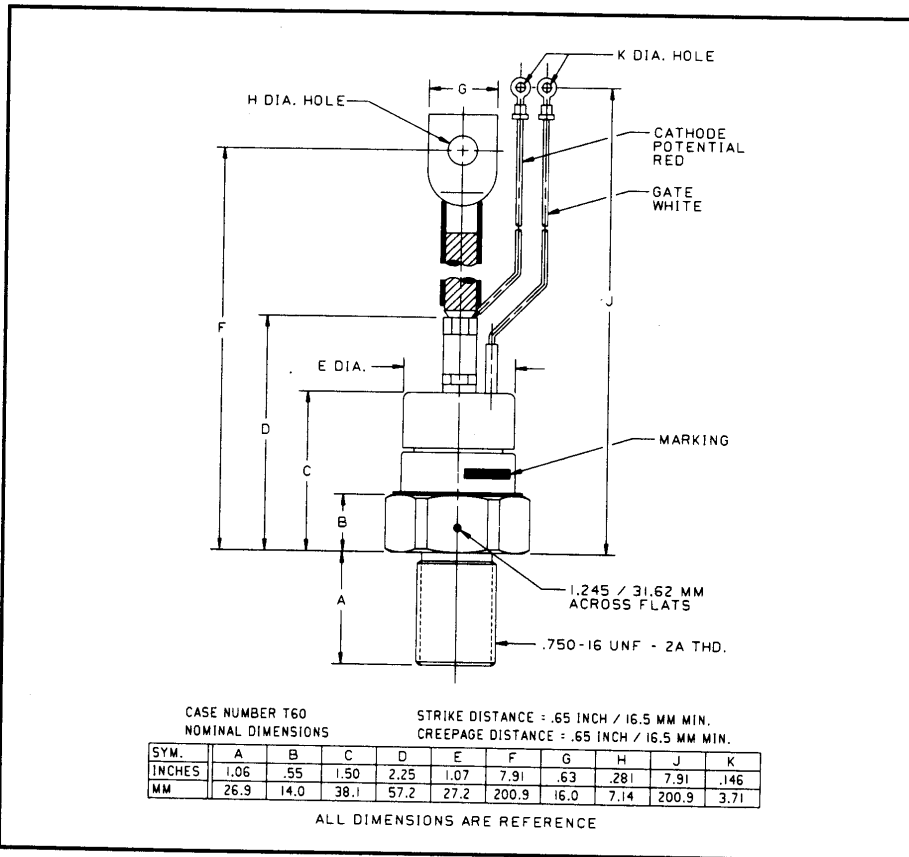
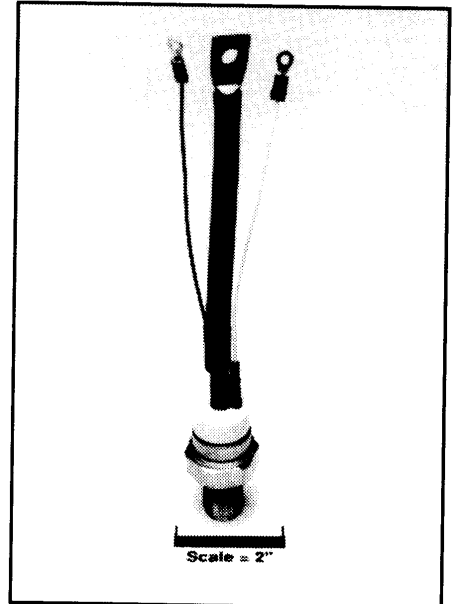


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 Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

**Phase Control SCR**  
 150 Amperes Average  
 1600 Volts



C180 (Outline Drawing)



**C180 Phase Control SCR**  
 150 Amperes Average, 1600 Volts

### Ordering Information:

Select the complete five or six digit part number you desire from the table, i.e. C180PM is a 1600 Volt, 150 Ampere Phase Control SCR.

Type	Voltage		Current
	V <sub>DRM</sub>	V <sub>RRM</sub> Code	I <sub>T(av)</sub>
C180	200	B	150
	400	D	
	600	M	
	800	N	
	1000	P	
	1200	PB	
	1400	PD	
1600	PM		

### 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



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**C180**  
**Phase Control SCR**  
 150 Amperes Average, 1600 Volts

### Absolute Maximum Ratings

	Symbol	C180	Units
RMS On-State Current @ $T_C = 90^\circ\text{C}$	$I_{T(RMS)}$	235	Amperes
Average On-State Current @ $T_C = 90^\circ\text{C}$	$I_{T(av)}$	150	Amperes
Peak One-Cycle Surge (Non Repetitive) On-State Current (60Hz)	$I_{TSM}$	3500	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz)	$I_{TSM}$	3200	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	$I^2t$	50,800	$\text{A}^2\text{sec}$
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

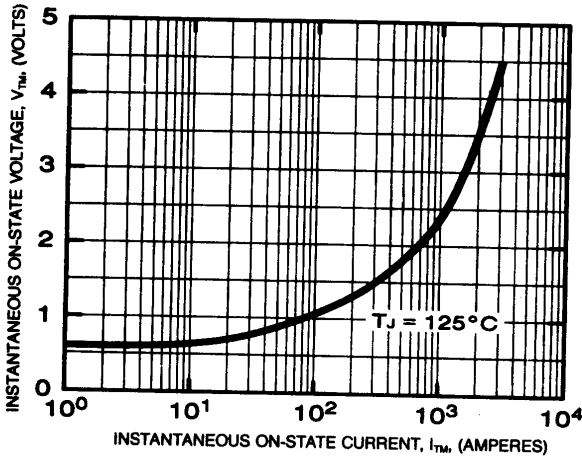
### Electrical and Thermal Characteristics

Characteristics	Symbol	Test Conditions	C180	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	$V_{TM}$	$T_J = 25^\circ\text{C}, I_{TM} = 1500\text{A}$	2.85	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 $0.8V_{DRM}, V_R = 50\text{V}$	100	$\mu\text{sec}$
Typical Delay Time	$t_d$	$I_T = 100\text{A}, V_{DRM} = \text{Rated}$ Gate Supply = 10V Open Ckt, 25 $\Omega$ , 0.1 $\mu\text{sec}$ Rise Time	1.0	$\mu\text{sec}$
Min. Critical $dv/dt$ exponential to $V_{DRM}$	$dv/dt$	$T_J = 125^\circ\text{C}$ , 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	$V_{GDM}$	$T_J = 125^\circ\text{C}$ , 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

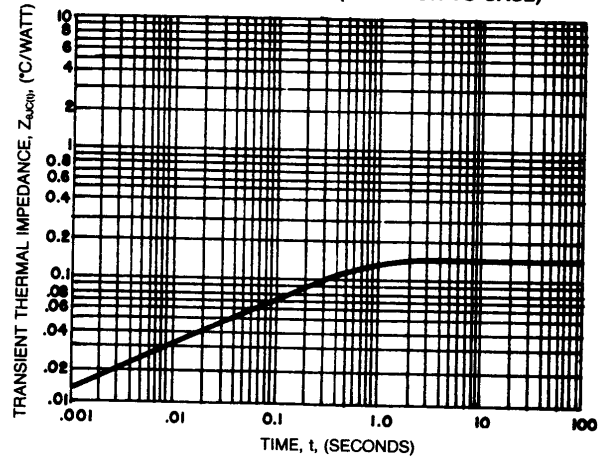
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**C180**  
**Phase Control SCR**  
 150 Amperes Average, 1600 Volts

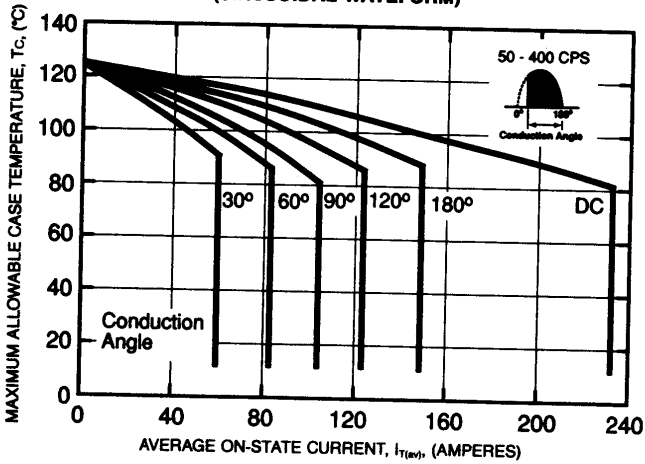
**MAXIMUM ON-STATE CHARACTERISTICS**



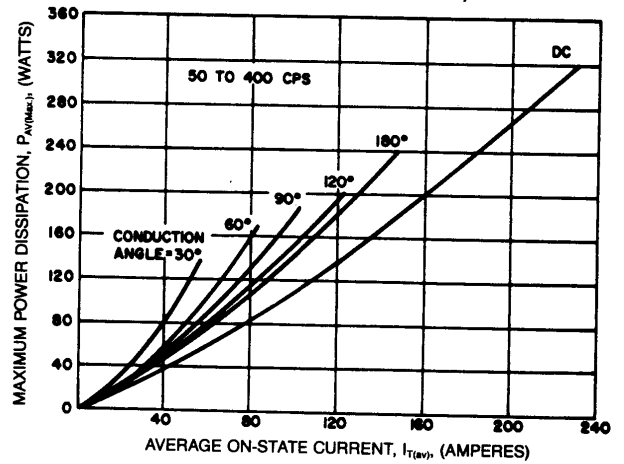
**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)**



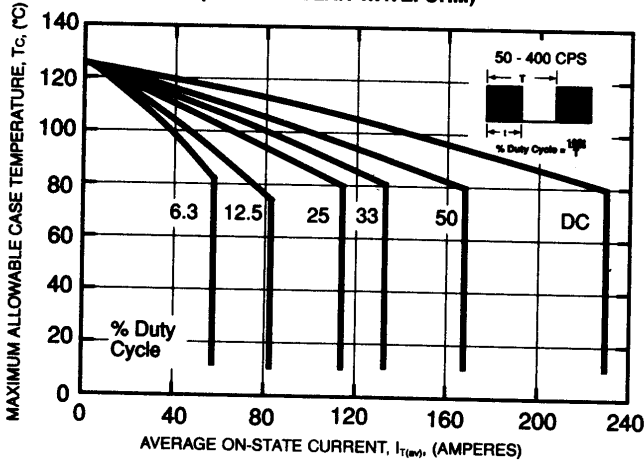
**MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)**



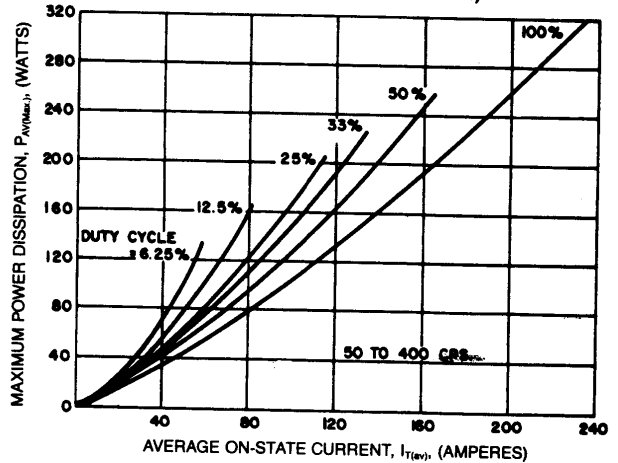
**MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)**



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

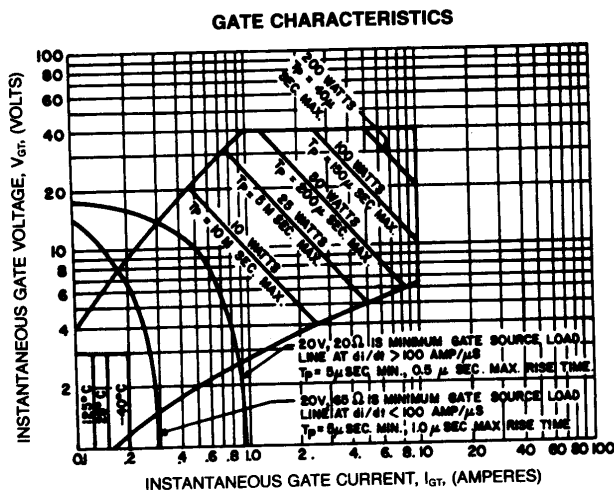
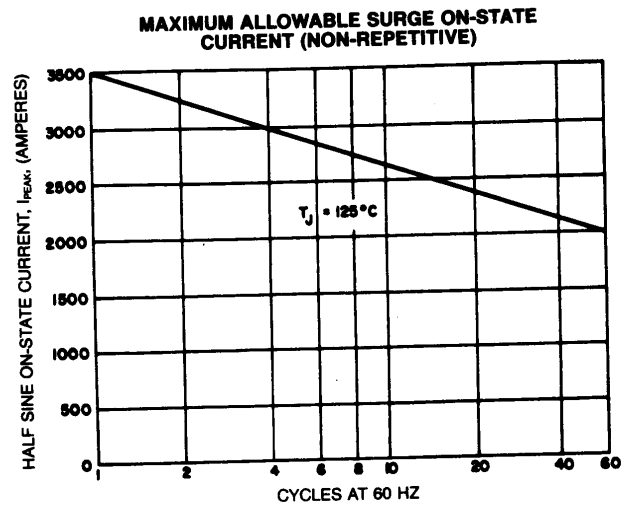
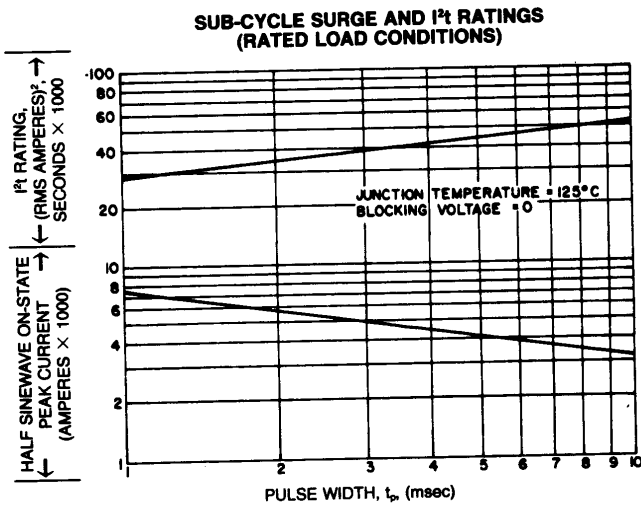
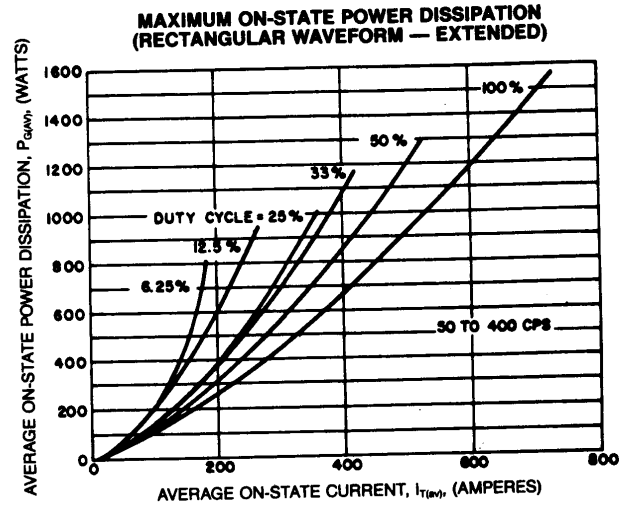
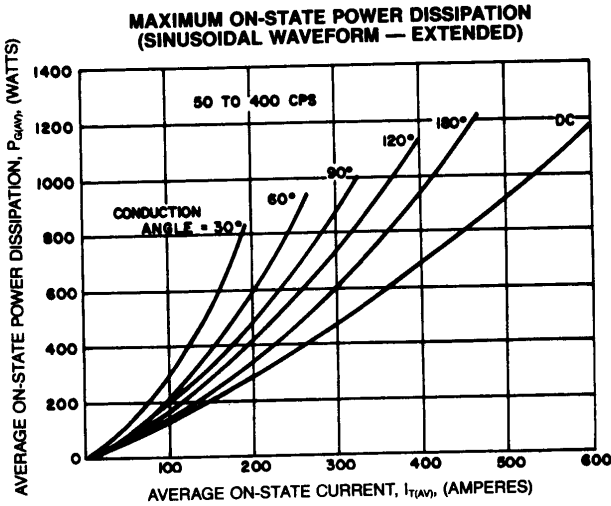


**MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)**



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**C180**  
**Phase Control SCR**  
 150 Amperes Average, 1600 Volts



**NOTES:**

1. Maximum allowable average gate dissipation = 5 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 (5μs min. duration; 1.0μs max. rise time for 20V, 65Ω source).
4. 20V - 20Ω is the minimum gate source load line when rate of circuit current rise > 100 Amp/μs or anode rate of current rise > 200 Amps/μs ( $t_p = 5\mu\text{s min.}, 0.5\mu\text{s max. rise time}$ ).

Maximum long-term repetitive anode  $di/dt = 500 \text{ Amps}/\mu\text{s}$  with 20V - 20Ω gate source.