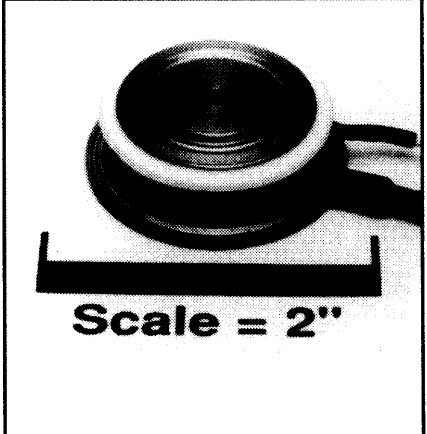
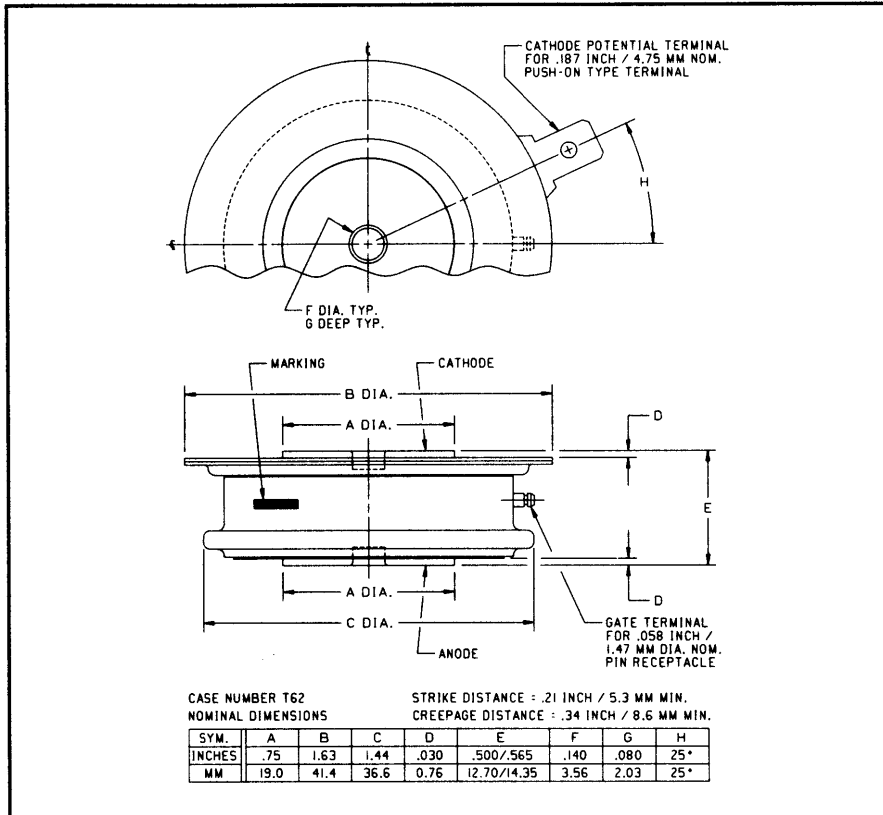


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**Phase Control SCR**  
 250 Amperes Average  
 1600 Volts



**C380 Phase Control SCR**  
 250 Amperes Average, 1600 Volts

C380 (Outline Drawing)

**Description:**

Powerex Silicon Controlled Rectifiers (SCR) are designed for phase control applications. These are all-diffused, Press-Pak (Pow-R-Disc) 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  $I^2t$  Ratings

**Applications:**

- Power Supplies
- Battery Chargers
- Motor Control

**Ordering Information:**

Select the complete five or six digit part number you desire from the table, i.e. C380PM is a 1600 Volt, 250 Ampere Phase Control SCR.

Type	Voltage		Current
	$V_{DRM}$ $V_{RRM}$	Code	$I_T(av)$
C380	400	D	250
	600	M	
	800	N	
	1000	P	
	1200	PB	
	1400	PD	
	1600	PM	



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C380  
Phase Control SCR  
250 Amperes Average, 1600 Volts

### Absolute Maximum Ratings

	Symbol	C380	Units
RMS On-State Current @ $T_C = 74^\circ\text{C}$	$I_{T(\text{RMS})}$	400	Amperes
Average On-State Current @ $T_C = 74^\circ\text{C}$	$I_{T(\text{av})}$	250	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	500	Amperes/ $\mu\text{s}$
$I^2t$ (for Fusing), 8.3 milliseconds	$I^2t$	50,000	$\text{A}^2\text{sec}$
Peak Gate Power Dissipation	$P_{GM}$	10	Watts
Average Gate Power Dissipation	$P_{G(\text{av})}$	2	Watts
Storage Temperature	$T_{STG}$	-40 to 150	$^\circ\text{C}$
Operating Temperature	$T_J$	-40 to 125	$^\circ\text{C}$
Mounting Force		720 to 880	lb.
Mounting Force		3.2 to 3.92	kN

**C380**  
**Phase Control SCR**  
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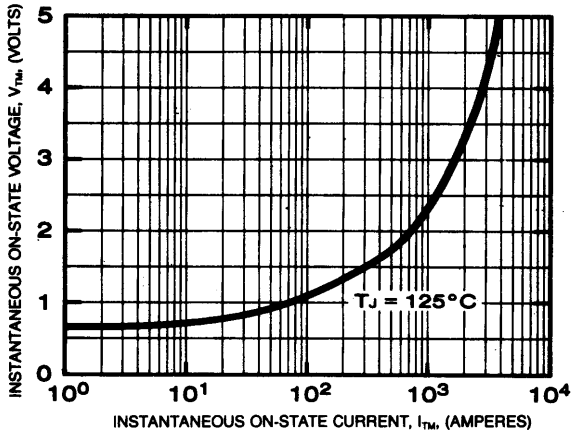
## Electrical and Thermal Characteristics

Characteristics	Symbol	Test Conditions	C380	Units
<b>Voltage—Blocking State Maximums</b>				
Forward Leakage, Peak	$I_{DRM}$	$T_J = 125^\circ\text{C}, V = V_{DRM}$	20	mA
Reverse Leakage, Peak	$I_{RRM}$	$T_J = 125^\circ\text{C}, V = V_{RRM}$	20	mA
<b>Current—Conducting State Maximums</b>				
Peak On-State Voltage	$V_{TM}$	$I_{TM} = 1500\text{A Peak}, T_C = 25^\circ\text{C}, \text{Duty Cycle} \leq 0.01\%$	2.85	Volts
<b>Switching</b>				
Typical Turn-Off Time	$t_q$	$T_J = 120^\circ\text{C}, I_{TM} = 250 \text{ amps};$ $V_R = 50 \text{ Volts Min.}; V_{DRM} \text{ (Reapplied);}$ Rate-of-Rise of Reapplied Off-State; Voltage = 20 Volts/ $\mu\text{sec}$ (Linear); Gate Bias During Turn-Off Interval = 0 Volts, 100 Ohms Duty Cycle $\leq 0.01\%$	200	$\mu\text{sec}$
Typical Delay Time	$t_d$	$T_J = 25^\circ\text{C}, I_T = 100 \text{ Adc}, V_{DRM} = \text{Rated};$ Gate Supply: 10 Volt Open Circuit, 25 Ohm, 0.1 $\mu\text{sec}$ max. rise time	1	$\mu\text{sec}$
Min. Critical dv/dt exponential to $V_{DRM}$	dv/dt	$T_J = 125^\circ\text{C}, \text{Gate Open}$	200	V/ $\mu\text{sec}$
<b>Thermal</b>				
Maximum Thermal Resistance, double sided cooling				
Junction to Case	$R_{\theta JC}$		0.095	$^\circ\text{C/Watt}$
Case to Sink, Lubricated	$R_{\theta CS}$		0.02	$^\circ\text{C/Watt}$
<b>Gate—Maximum Parameters</b>				
Gate Current to Trigger	$I_{GT}$	$V_D = 6\text{V}, T_C = 25^\circ\text{C}, R_L = 3\Omega$	150	mA
Gate Voltage to Trigger	$V_{GT}$	$V_D = 6\text{V}, T_C = -40 \text{ to } 125^\circ\text{C}, R_L = 3\Omega$	3	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

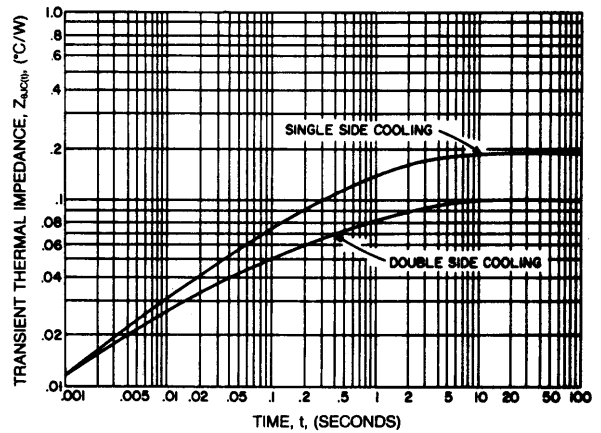
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**C380**  
**Phase Control SCR**  
 250 Amperes Average, 1600 Volts

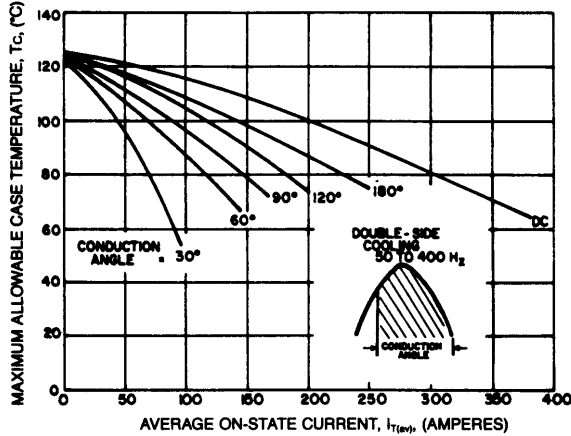
**MAXIMUM ON-STATE CHARACTERISTICS**



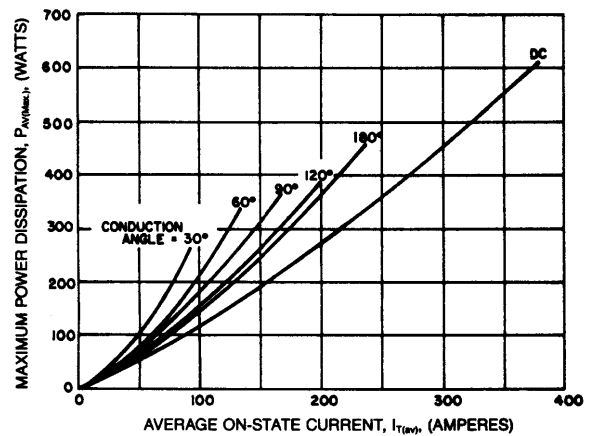
**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)**



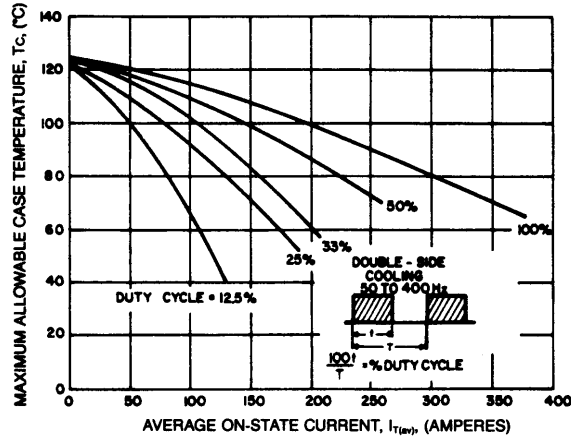
**MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)**



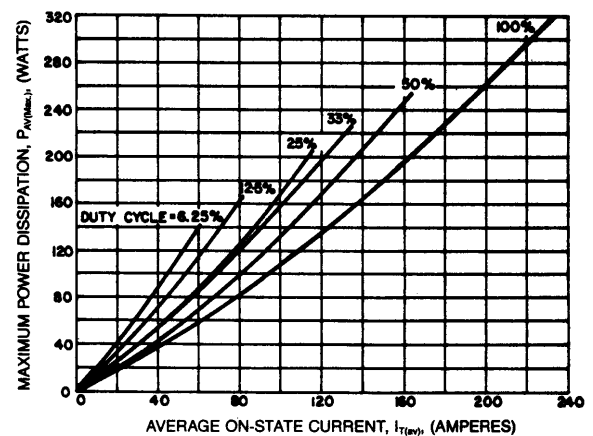
**MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)**



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



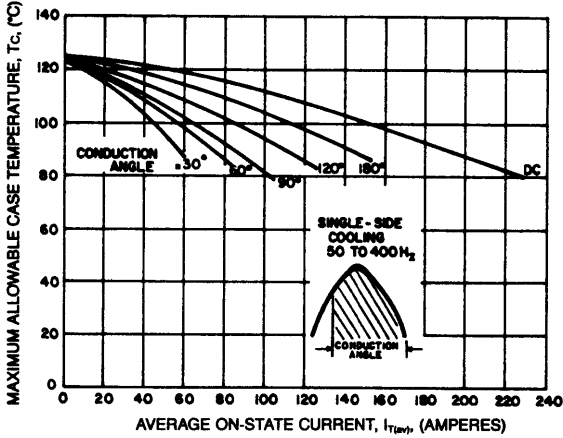
**MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)**



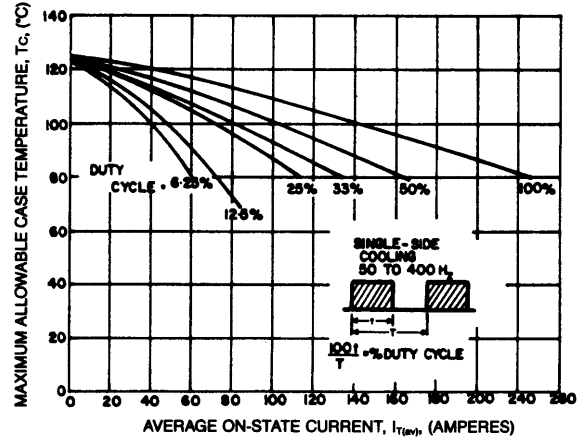
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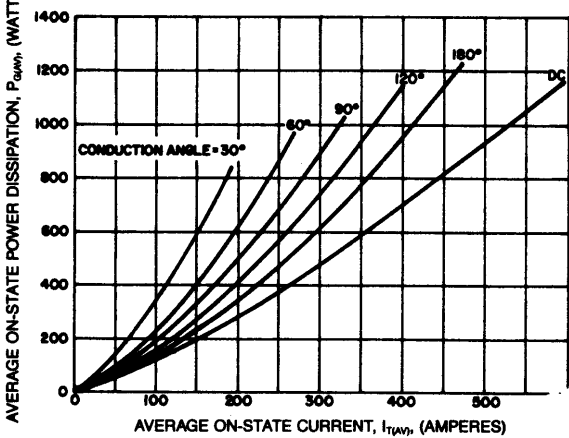
**MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)**



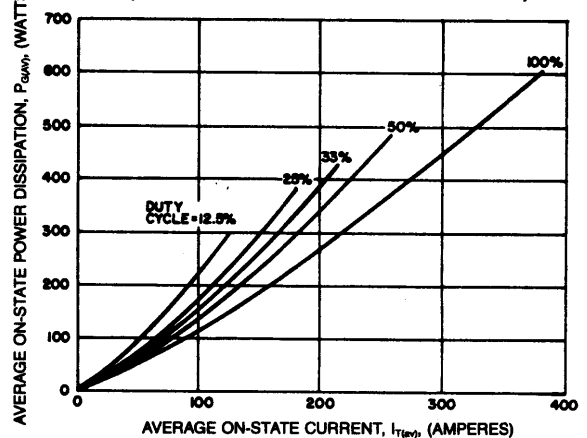
**MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)**



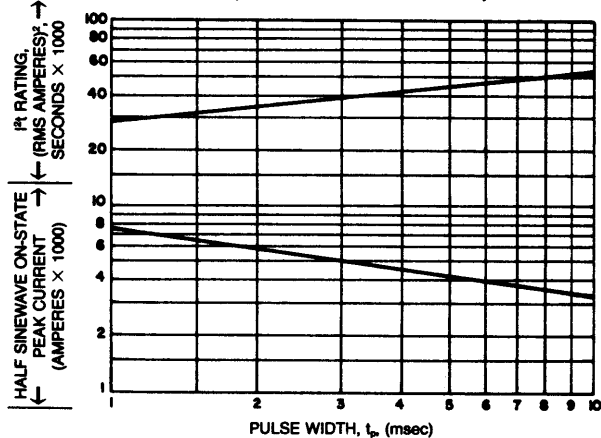
**MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM — EXTENDED)**



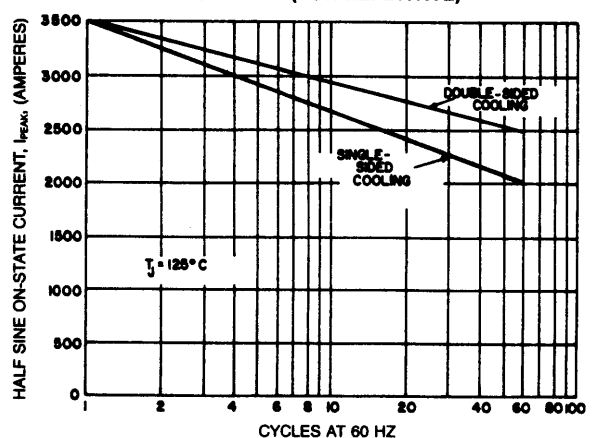
**MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM — EXTENDED)**



**SUB-CYCLE SURGE AND  $I^2t$  RATINGS (RATED LOAD CONDITIONS)**



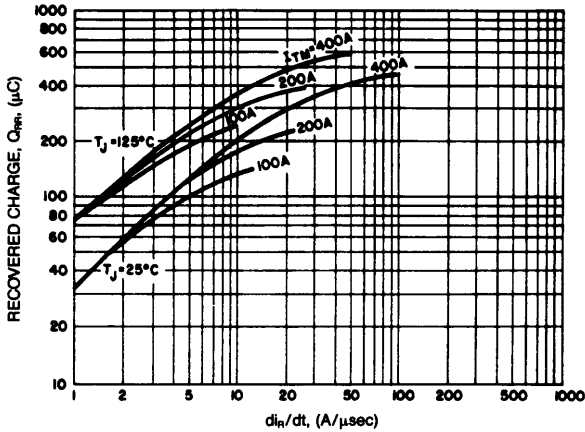
**MAXIMUM ALLOWABLE SURGE ON-STATE CURRENT (NON-REPETITIVE)**



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**C380**  
**Phase Control SCR**  
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**MAXIMUM RECOVERED CHARGE**



**GATE CHARACTERISTICS**

