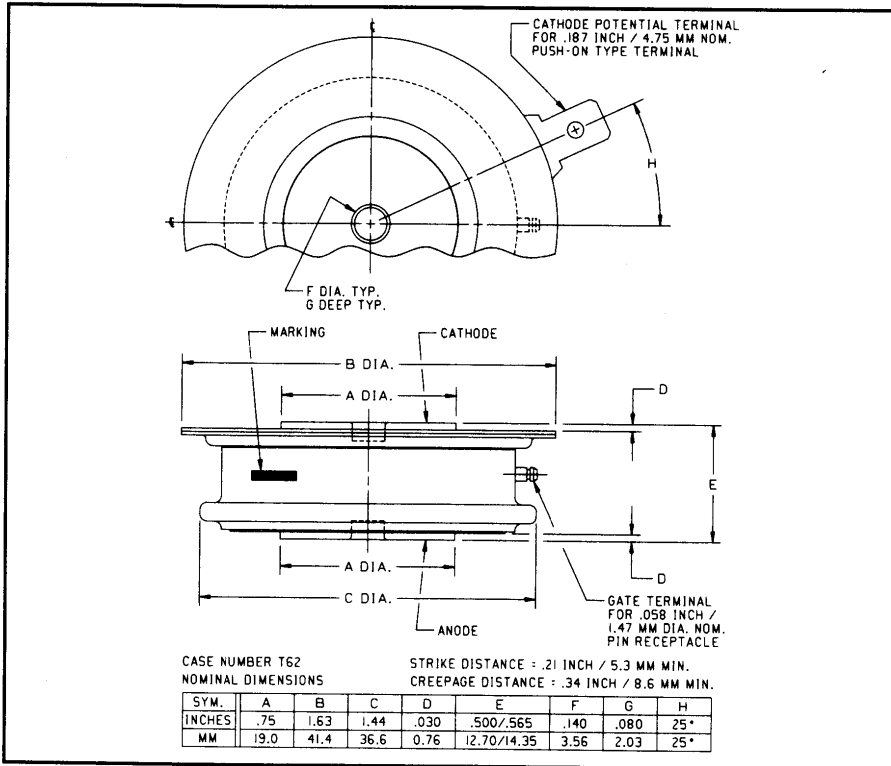
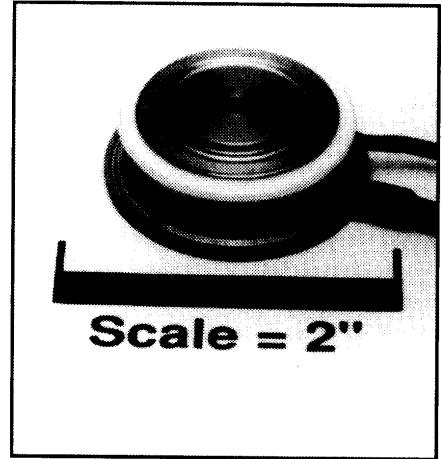


Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272  
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**Phase Control SCR**  
 300 Amperes Average  
 1300 Volts



C380\_X555 (Outline Drawing)



C380\_X555 Phase Control SCR  
 300 Amperes Average, 1300 Volts

### 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
- High Temperature Operation

### Applications:

- Power Supplies
- Battery Chargers
- Motor Control

### Ordering Information:

Select the complete nine or ten digit part number you desire from the table, i.e. C380PCX555 is a 1300 Volt, 300 Ampere Phase Control SCR.

Type	Voltage		Current
	$V_{DRM}$	Code	$I_T(av)$
C380_X555	400	D	300
	600	M	
	800	N	
	1000	P	
	1200	PB	
	1300	PC	

C380\_X555  
 Phase Control SCR  
 300 Amperes Average, 1300 Volts

## Absolute Maximum Ratings

	Symbol	C380_X555	Units
RMS On-State Current @ $T_C = 85^\circ\text{C}$	$I_{T(RMS)}$	450	Amperes
Average On-State Current @ $T_C = 85^\circ\text{C}$	$I_{T(av)}$	300	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (60Hz)	$I_{TSM}$	3200	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz)	$I_{TSM}$	2900	Amperes
Critical Rate-of-Rise of On-State Current (Non-Repetitive)	$di/dt$	600	Amperes/ $\mu\text{s}$
Critical Rate-of-Rise of On-State Current (Repetitive)	$di/dt$	300	Amperes/ $\mu\text{s}$
$I^2t$ (for Fusing), 8.3 milliseconds	$I^2t$	42,000	$\text{A}^2\text{sec}$
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 150	$^\circ\text{C}$
Mounting Force		720 to 880	lb.
Mounting Force		3.2 to 3.92	kN

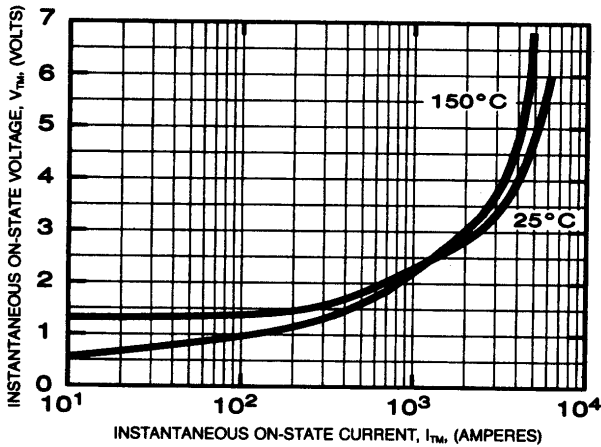
## Electrical and Thermal Characteristics

Characteristics	Symbol	Test Conditions	C380_X555	Units
<b>Voltage—Blocking State Maximums</b>				
Forward Leakage, Peak	$I_{DRM}$	$T_J = 150^\circ\text{C}, V = V_{DRM}$	45	mA
Reverse Leakage, Peak	$I_{RRM}$	$T_J = 150^\circ\text{C}, V = V_{RRM}$	45	mA
<b>Current—Conducting State Maximums</b>				
Peak On-State Voltage	$V_{TM}$	$I_{TM} = 1500\text{A Peak}, T_C = 25^\circ\text{C}$	2.85	Volts
<b>Switching</b>				
Typical Turn-Off Time	$t_q$	$T_J = +150^\circ\text{C}, I_{TM} = 250$ Amperes, $V_R = 50$ Volts Minimum, $V_{DRM}$ (Reapplied), Rate-of-Rise of Reapplied Off-State voltage = 20 Volts/ $\mu\text{sec}$ (Linear) Gate Bias During Turn-off Interval = 0 Volts, 100 $\Omega$ . Duty Cycle $\leq 0.01\%$	75	$\mu\text{sec}$
Typical Delay Time	$t_d$	$T_C = +25^\circ\text{C}, I_T = 100$ Adc, $V_{DRM} = \text{Rated}$ Gate Supply: 10 Volt Open Circuit, 25 ohm, 0.1 $\mu\text{sec}$ maximum rise time	1.0	$\mu\text{sec}$
Min. Critical $dv/dt$ exponential to $V_{DRM}$	$dv/dt$	$T_J = 150^\circ\text{C}, \text{Gate Open}$	200	$\text{V}/\mu\text{sec}$
<b>Thermal</b>				
Maximum Thermal Resistance, double sided cooling Junction to Case	$R_{\theta JC}$		0.095	$^\circ\text{C}/\text{Watt}$
Case to Sink, Lubricated	$R_{\theta CS}$		0.02	$^\circ\text{C}/\text{Watt}$
<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 $150^\circ\text{C}, V_D = 6$ Vdc, $R_L = 3\Omega$	3	Volts
Non-Trigging Gate Voltage	$V_{GDM}$	$T_J = 150^\circ\text{C}, R_L = 1000\Omega, \text{Rated } V_{DRM}$	0.15	Volts
Peak Forward Gate Current	$I_{GTM}$		10	Amperes
Peak Reverse Gate Voltage	$V_{GRM}$		5	Volts

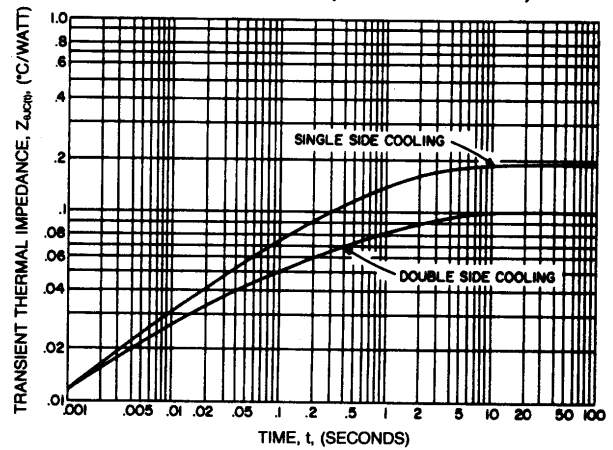
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**C380\_X555**  
**Phase Control SCR**  
 300 Amperes Average, 1300 Volts

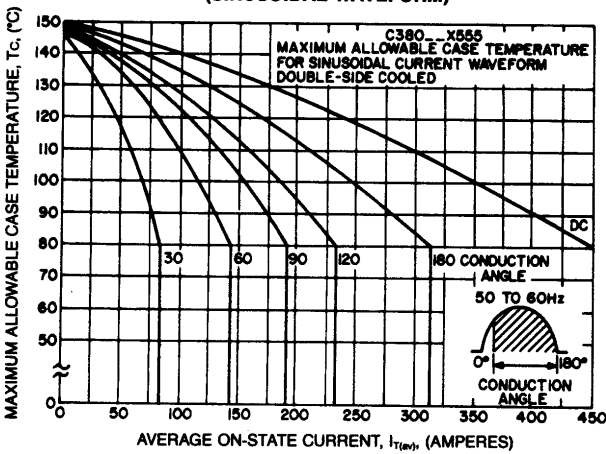
**MAXIMUM ON-STATE CHARACTERISTICS**



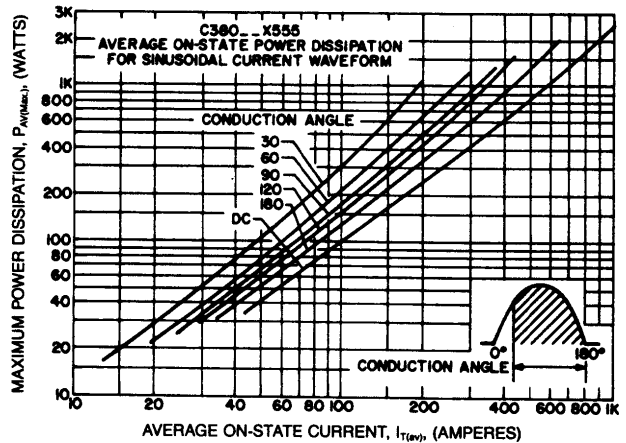
**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)**



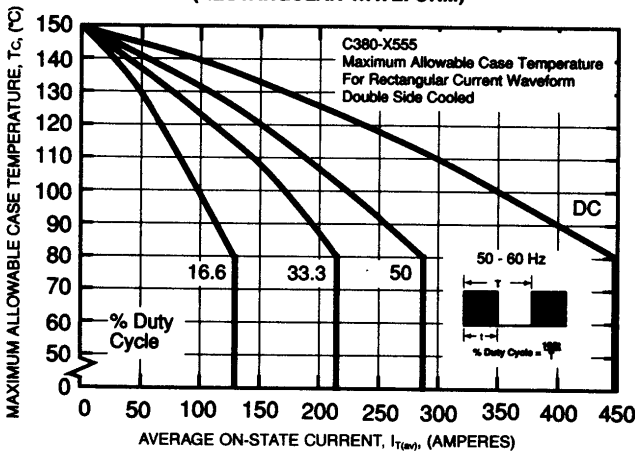
**MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)**



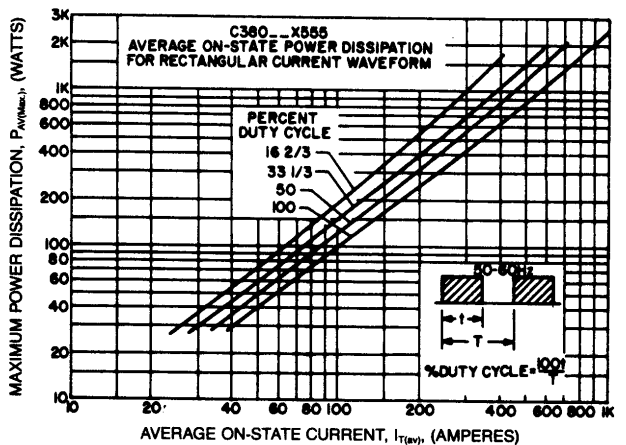
**MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)**



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



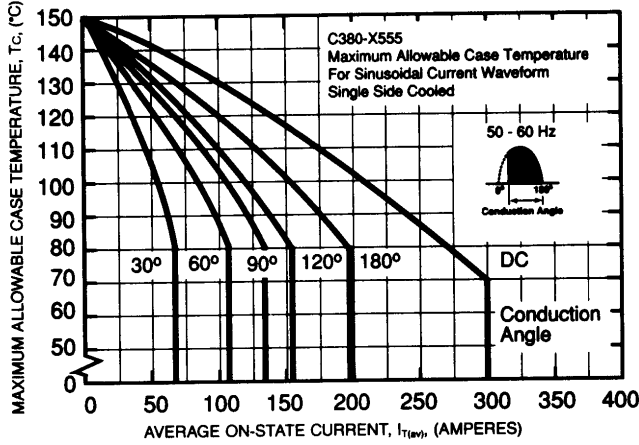
**MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)**



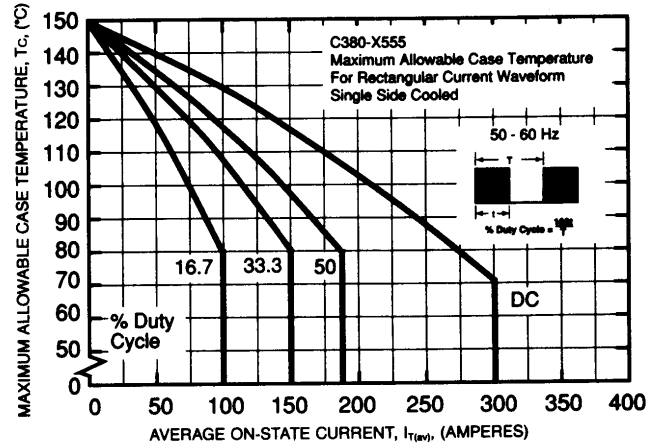
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C380\_X555  
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 300 Amperes Average, 1300 Volts

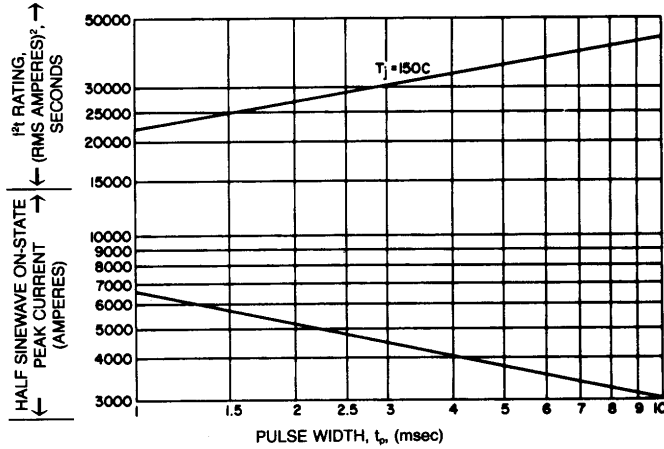
**MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)**



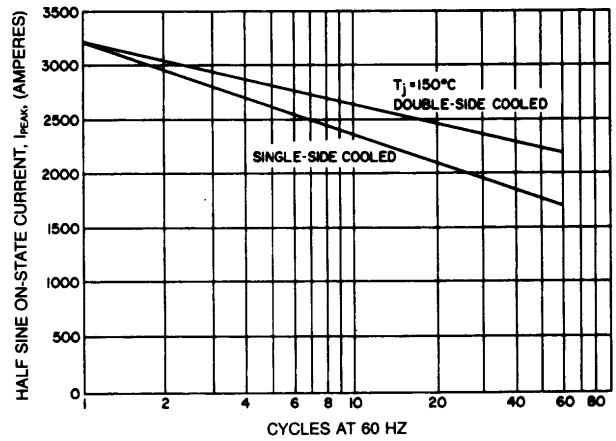
**MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)**



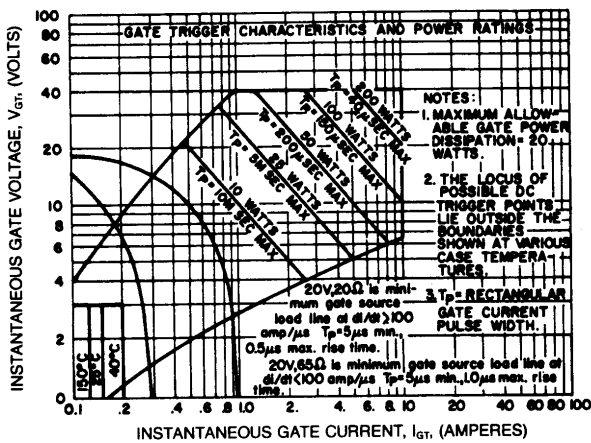
**SUB-CYCLE SURGE AND  $I^2t$  RATINGS (RATED LOAD CONDITIONS)**



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



**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.