

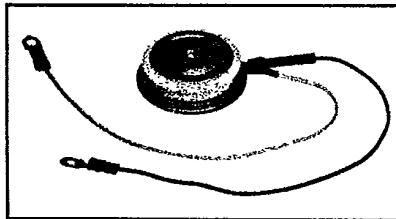
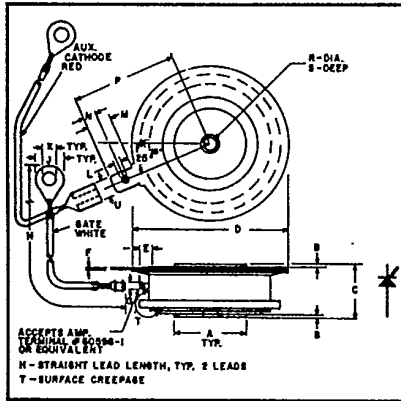


**C380\_\_X555**

T-25-19

Powerex, Inc. Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272  
 Powerex Europe, S.A., 428 Ave. G. Durand, BP107, 72003 LeMans, France (43) 72.75.15

**Phase Control SCR**  
**300 Amperes Avg**  
**100-1300 Volts**



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**TO-200**  
**Outline Drawing**

Dimensions	Inches		Millimeters	
	Min.	Max.	Min.	Max.
A	.744	.752	18.897	19.101
B	.030	.060	.762	1.524
C	.515	.565	13.081	14.351
D	1.600	1.656	40.64	42.06
E	.110	—	2.794	—
F	.013	.017	.330	.432
G	.057	.059	1.447	1.449
H	7.980	8.115	202.70	206.11
J	—	.300	—	7.620
K	.137	.153	3.479	3.886
L	.065	.070	1.651	1.778
M	.245	.260	6.223	6.604
N	.120	.140	3.048	3.556
P	1.090	1.125	27.69	28.55
R	.135	.145	3.429	3.683
S	.067	.083	1.701	2.108
T	.340	—	8.636	—
U	.186	.189	4.724	4.801

**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<sup>2</sup>t Ratings
- High Temperature Operation

**Applications:**

- Power Supplies
- Battery Chargers
- Motor Control
- Light Dimmers
- VAR Generators

**Ordering Information**

Example: Select the complete nine or ten digit part number you desire from the table - i.e. C380NX555 is an 800 Volt, 300 Ampere Phase Control SCR.

Type	Voltage		Current
	V <sub>ORM</sub> V <sub>RRM</sub>	Code	
C380__X555	100	A	300
	200	B	
	300	C	
	400	D	
	500	E	
	600	M	
	700	S	
	800	N	
	900	T	
	1000	P	
1100	PA		
1200	PB		
1300	PC		



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### Absolute Maximum Ratings

	Symbol	C380_X555	Units
RMS On-State Current	$I_{T(RMS)}$	450	Amperes
Average On-State Current	$I_{T(av)}$	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/ $\mu$ s
Critical Rate-of-Rise of On-State Current (Repetitive)	$di/dt$	300	Amperes/ $\mu$ s
$I^2t$ (for Fusing), 8.3 milliseconds	$I^2t$	42,000	A <sup>2</sup> 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	°C
Operating Temperature	$T_J$	-40 to 150	°C
Mounting Force <sup>Ⓞ</sup>		720 to 880	lb.
Mounting Force <sup>Ⓞ</sup>		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/ $\mu$ sec (Linear) Gate Bias During Turn-off Interval = 0 Volts, 100 $\Omega$ . Duty Cycle $\leq 0.01\%$	75	$\mu$ 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 $\mu$ sec maximum rise time	1.0	$\mu$ sec
Min. Critical $dv/dt$ exponential to $V_{DRM}$	$dv/dt$	$T_J = 150^\circ\text{C}, \text{Gate Open}$	200	V/ $\mu$ sec
<b>Thermal</b>				
Maximum Thermal Resistance, <sup>Ⓞ</sup> double sided cooling				
Junction to Case	$R_{\theta JC}$		.095	°C/Watt
Case to Sink, Lubricated	$R_{\theta CS}$		.02	°C/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	$V_{GT}$	$T_C = -40^\circ\text{C to } 150^\circ\text{C}, V_D = 6\text{Vdc}, R_L = 3\Omega$	3	Volts
Non-Triggering Gate Voltage	$V_{GDM}$	$T_J = 150^\circ\text{C}, R_L = 1000\Omega, \text{Rated } V_{DRM}$	.15	Volts
Peak Forward Gate Current	$I_{GTM}$		10	Amperes
Peak Reverse Gate Voltage	$V_{GRM}$		5	Volts

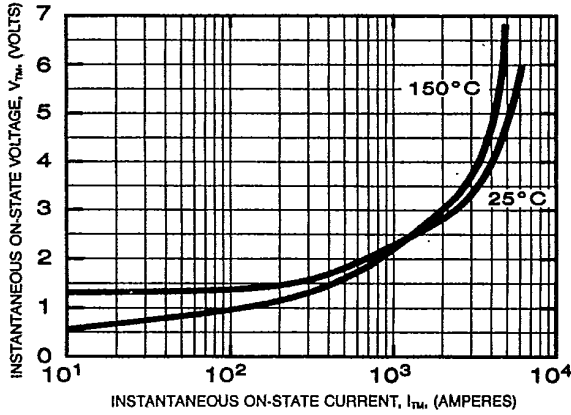
<sup>Ⓞ</sup> Consult recommended mounting procedures.



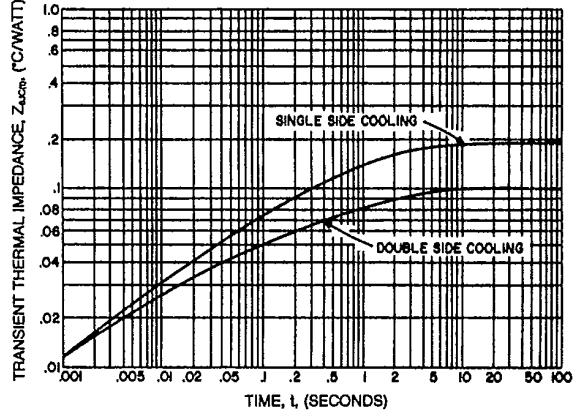
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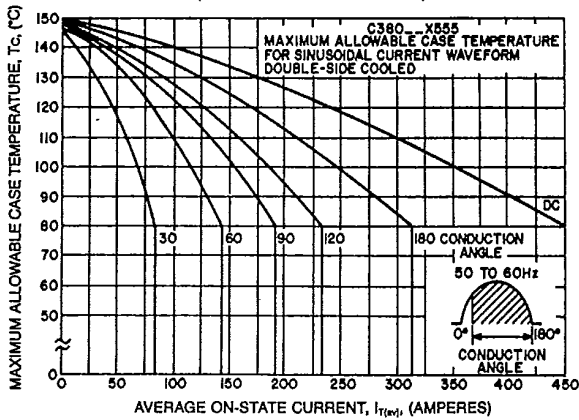
MAXIMUM ON-STATE CHARACTERISTICS



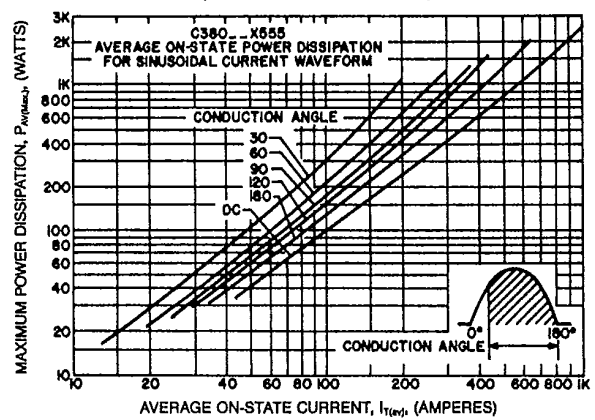
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



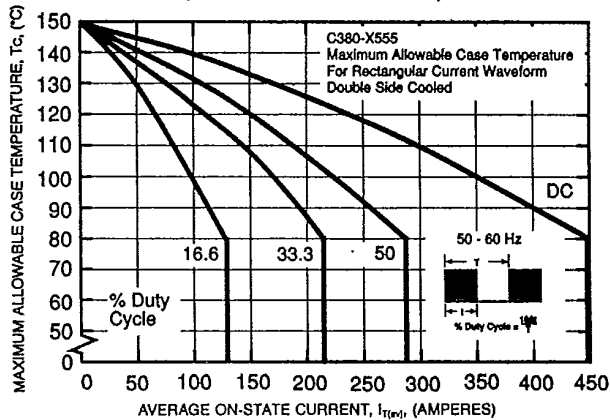
MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



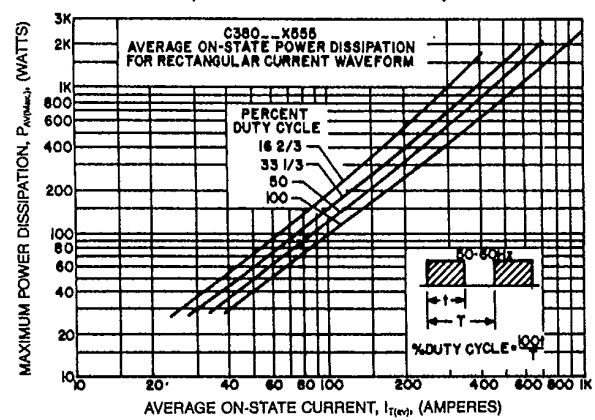
MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



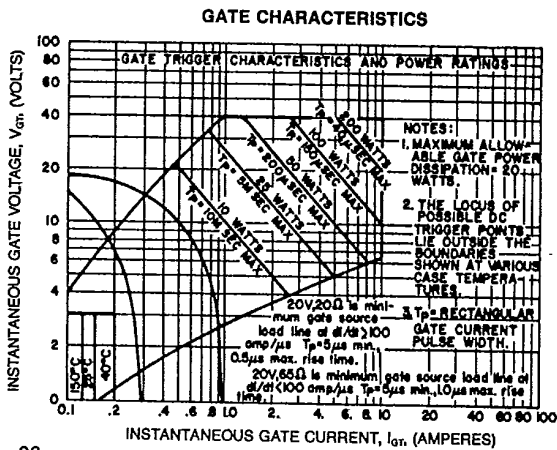
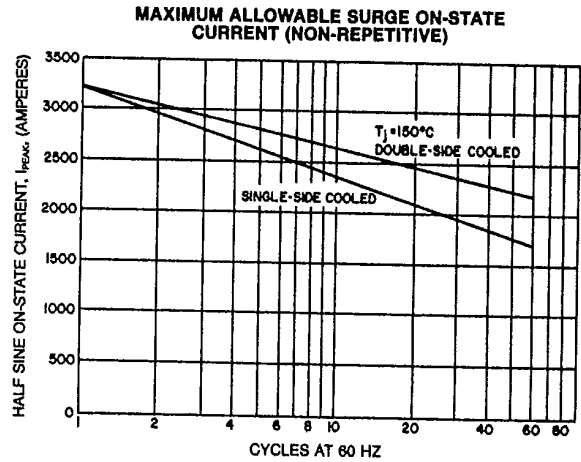
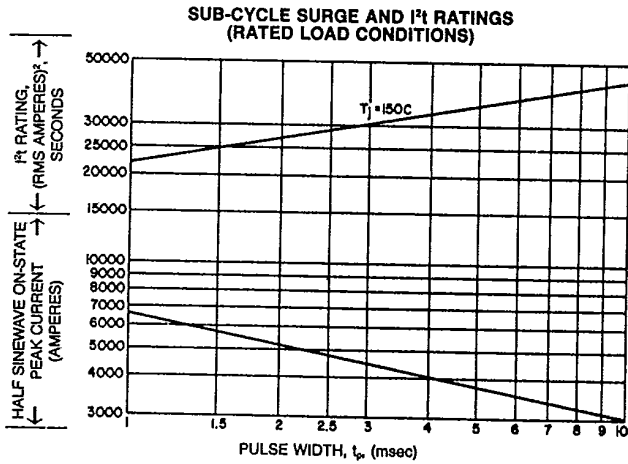
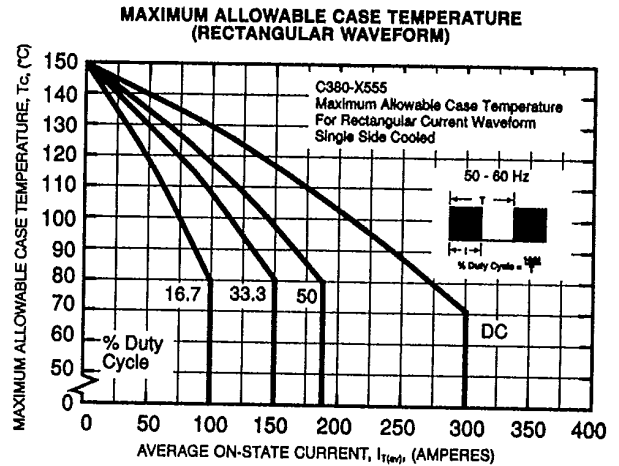
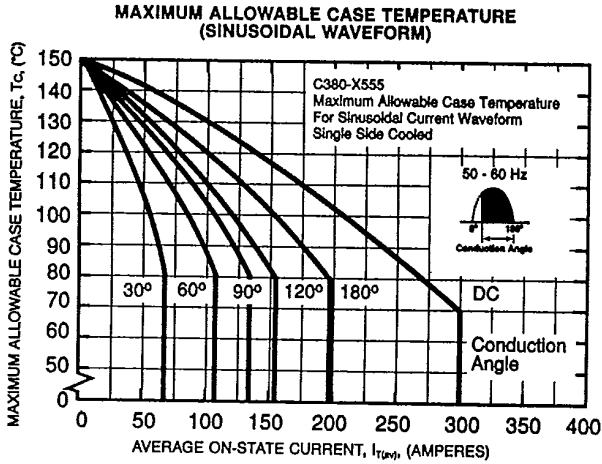
MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)





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- 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.



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