

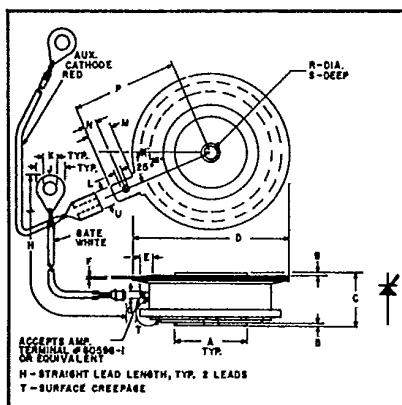
**C380**

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

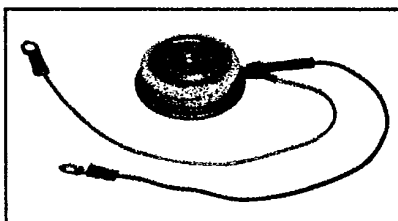
Phase Control SCR

250 Amperes Avg
100-1300 Volts



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



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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 I²t Ratings

Applications:

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

Ordering Information

Example: Select the complete five or six digit part number you desire from the table – i.e. C380M is a 600 Volt, 250 Ampere Phase Control SCR.

Type	Voltage		Current
	V _{ORM} V _{RRM}	Code	
C380	100	A	250
	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	Units
RMS On-State Current	$I_{T(RMS)}$	400	Amperes
Average On-State Current	$I_{T(av)}$	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/ μs
Critical Rate-of-Rise of On-State Current (Repetitive)	di/dt	500	Amperes/ μs
I^2t (for Fusing), 8.3 milliseconds	I^2t	50,000	A ² 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 125	°C
Mounting Force ^①		720 to 880	lb.
Mounting Force ^①		3.2 to 3.92	kN

① Consult recommended mounting procedures.



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Electrical and Thermal Characteristics

Characteristics	Symbol	Test Conditions	C380	Units
Voltage—Blocking State Maximums				
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
Current—Conducting State Maximums				
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
Switching				
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/ μsec (Linear); Gate Bias During Turn-Off Interval = 0 Volts, 100 Ohms Duty Cycle $\leq 0.01\%$	200	μsec
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 μsec max. rise time	1	μsec
Min. Critical dv/dt exponential to V_{DRM}	dv/dt	$T_J = 125^\circ\text{C}, \text{Gate Open}$	200	V/ μsec
Thermal				
Maximum Thermal Resistance ^① , double sided cooling				
Junction to Case	$R_{\theta JC}$		.095	$^\circ\text{C/Watt}$
Case to Sink, Lubricated	$R_{\theta CS}$		.02	$^\circ\text{C/Watt}$
Gate—Maximum Parameters				
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}	$T_J = 125^\circ\text{C}, \text{rated } V_{DRM}, R_L = 1000\Omega$	.15	Volts
Peak Forward Gate Current	I_{GTM}		10	Amperes
Peak Reverse Gate Voltage	V_{GRM}		5	Volts

① Consult recommended mounting procedures.



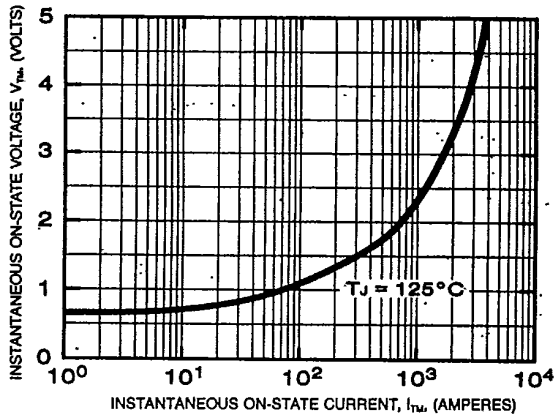
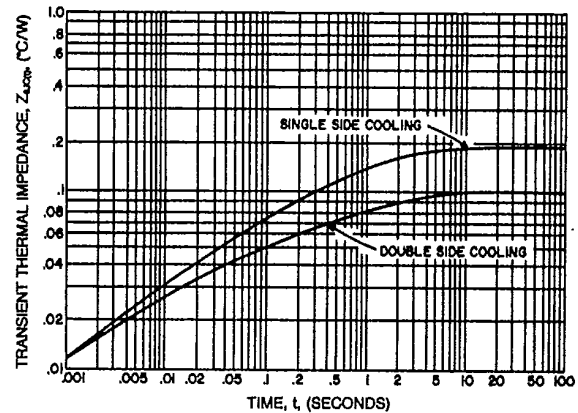
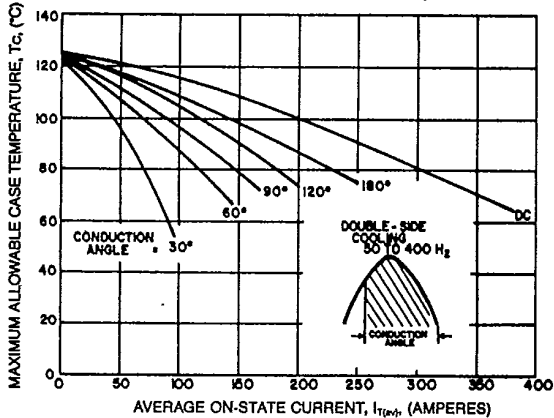
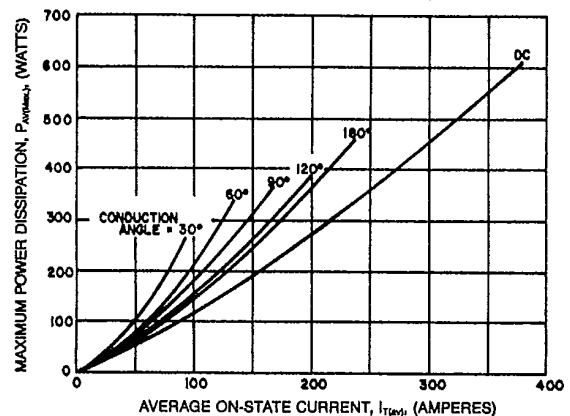
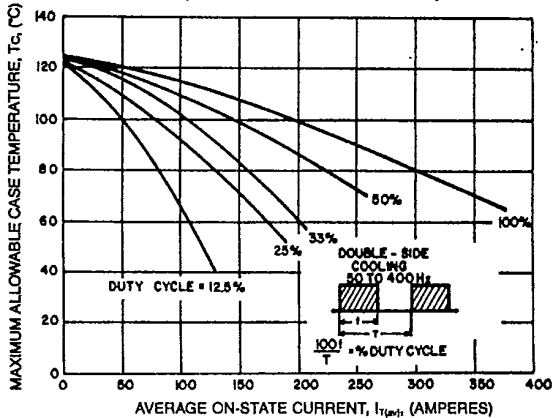
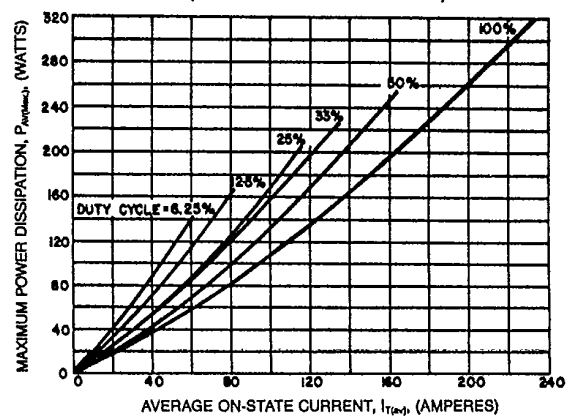
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MAXIMUM ON-STATE CHARACTERISTICS**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)****MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)****MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)****MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)****MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)**



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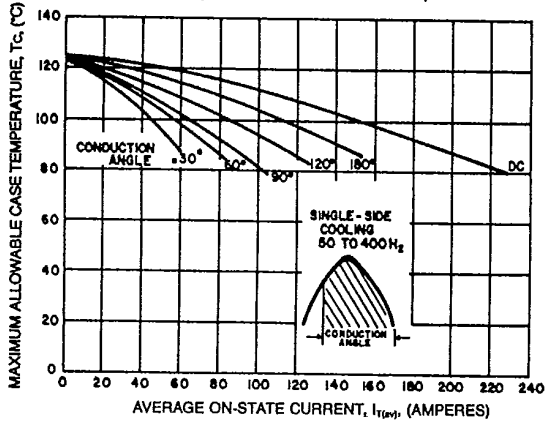
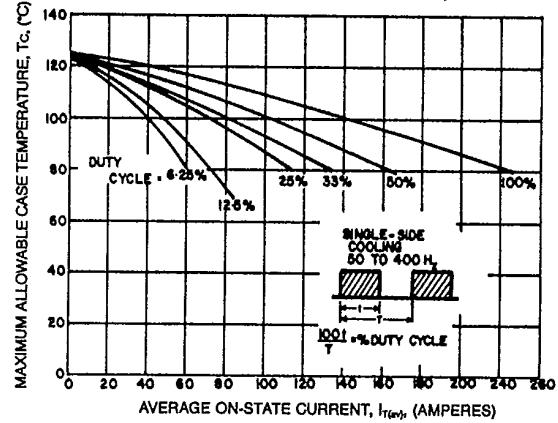
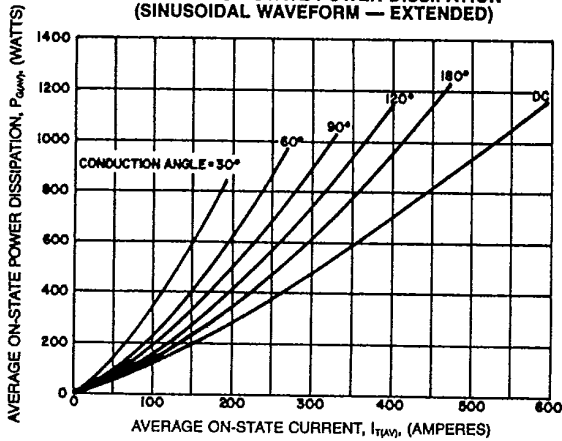
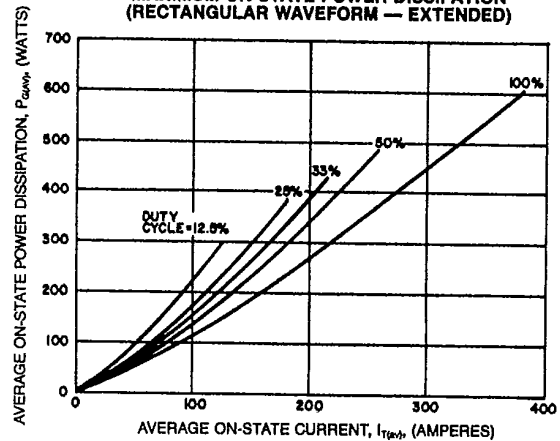
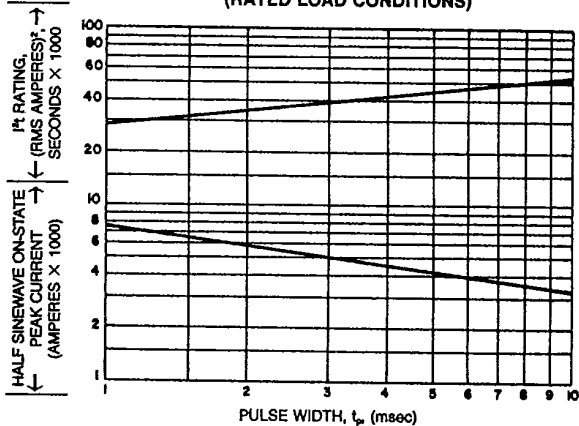
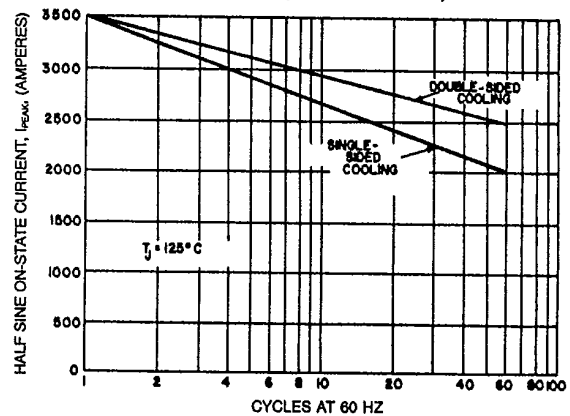
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MAXIMUM ALLOWABLE CASE TEMPERATURE
(SINUSOIDAL WAVEFORM)MAXIMUM ALLOWABLE CASE TEMPERATURE
(RECTANGULAR WAVEFORM)MAXIMUM ON-STATE POWER DISSIPATION
(SINUSOIDAL WAVEFORM — EXTENDED)MAXIMUM ON-STATE POWER DISSIPATION
(RECTANGULAR WAVEFORM — EXTENDED)SUB-CYCLE SURGE AND I^2t RATINGS
(RATED LOAD CONDITIONS)MAXIMUM ALLOWABLE SURGE ON-STATE
CURRENT (NON-REPETITIVE)



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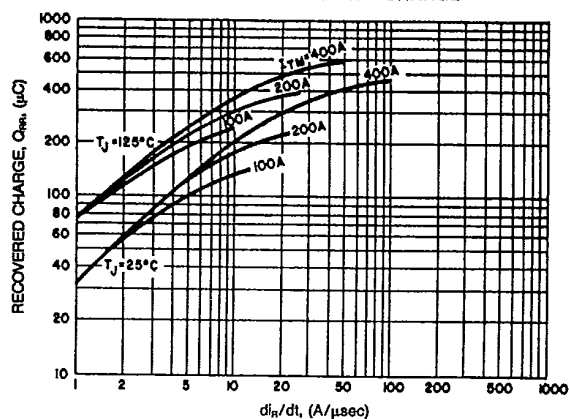
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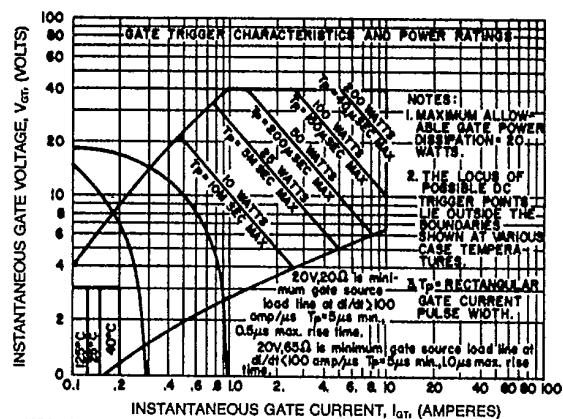
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MAXIMUM RECOVERED CHARGE



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.