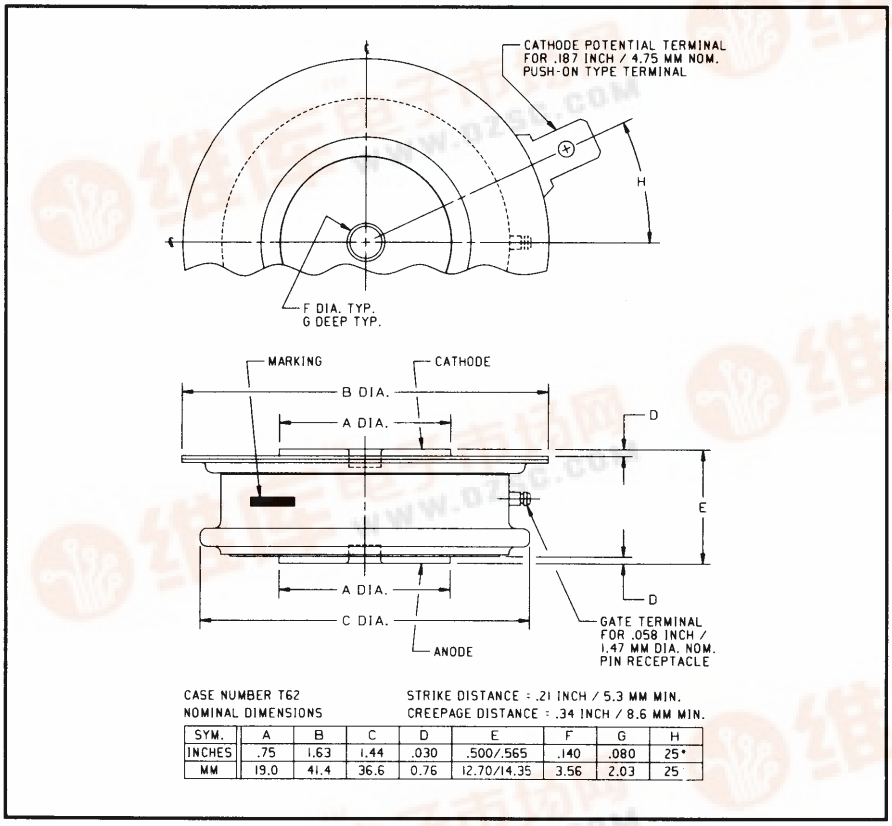
C380_ _X500

Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272
Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

Phase Control SCR
310 Amperes Average
1600 Volts

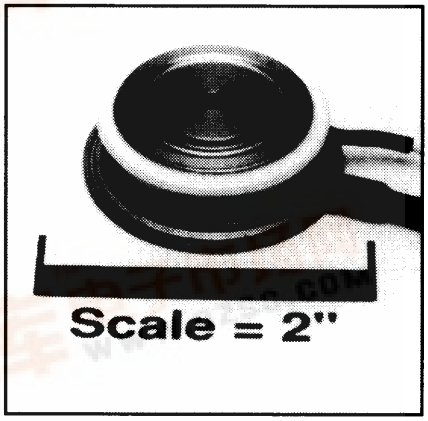


CASE NUMBER T62
NOMINAL DIMENSIONS

STRIKE DISTANCE = .21 INCH / 5.3 MM MIN.
CREEPAGE DISTANCE = .34 INCH / 8.6 MM MIN.

SYM.	A	B	C	D	E	F	G	H
INCHES	.75	1.63	1.44	.030	.500/.565	.140	.080	25°
MM	19.0	41.4	36.6	0.76	12.70/14.35	3.56	2.03	25

C380_ _X500 (Outline Drawing)



C380_ _X500 Phase Control SCR
310 Amperes Average, 1600 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

Applications:
- ☐ Power Supplies
- ☐ Battery Chargers

Ordering Information:
Select the complete nine digit part number you desire from the table, i.e. C380PMX500 is a 1600 Volt, 310 Ampere Phase Control SCR.

Type	Voltage V_{DRM} V_{RRM}	Code	Current $I_{T(av)}$
C380_ _X500	200	B	310
	400	D	
	600	M	
	800	N	
	1000	P	
	1200	PB	
	1400	PD	
	1600	PM	

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Absolute Maximum Ratings

	Symbol	C380__X500	Units
RMS On-State Current @ T_C = 83°C	$I_{T(RMS)}$	500	Amperes
Average On-State Current @ T_C = 83°C	$I_{T(av)}$	310	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (60Hz)	I_{TSM}	5500	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz)	I_{TSM}	5000	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), One Cycle at 60Hz	I^2t	125,000	A^2sec
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		720 to 880	lb.
Mounting Force		3.2 to 3.92	kN

Electrical and Thermal Characteristics

Characteristics	Symbol	Test Conditions	C380__X500	Units
Voltage—Blocking State Maximums				
Forward Leakage, Peak	I_{DRM}	T_J = 125°C, V = V_{DRM}	20	mA
Reverse Leakage, Peak	I_{RRM}	T_J = 125°C, V = V_{RRM}	20	mA
Current—Conducting State Maximums				
Peak On-State Voltage	V_{TM}	T_C = 125°C, I_{TM} = 1500A, Duty Cycle = 0.01%	1.75	Volts
Switching				
Typical Turn-On Delay	t_d	T_C = 25°C, I_T = 100A, V_{DRM} = rated. Gate Supply 10V Open Circuit, 25Ω, 0.1 μsec max. rise time	1	μsec
Min. Critical dv/dt exponential to V_{DRM}	dv/dt	T_J = 125°C, Gate open circuited.	200	V/μsec
Thermal				
Maximum Thermal Resistance, double sided cooling				
Junction to Case	$R_{\theta JC}$		0.095	°C/Watt
Case to Sink, Lubricated	$R_{\theta CS}$		0.02	°C/Watt
Gate—Maximum Parameters				
Gate Current to Trigger	I_{GT}	T_C = 25°C, V_D = 6V, R_L = 3 Ω	150	mA
Gate Voltage to Trigger	V_{GT}	T_C = −40°C to 125°C, V_D = 6V, R_L = 3 Ω	3.0	Volts
Non-Triggering Gate Voltage	V_{GDM}	T_J = 125°C, Rated V_{DRM}, R_L = 1000 Ω	0.15	Volts
Peak Forward Gate Current	I_{GTM}		10	Amperes
Peak Reverse Gate Voltage	V_{GRM}		5	Volts

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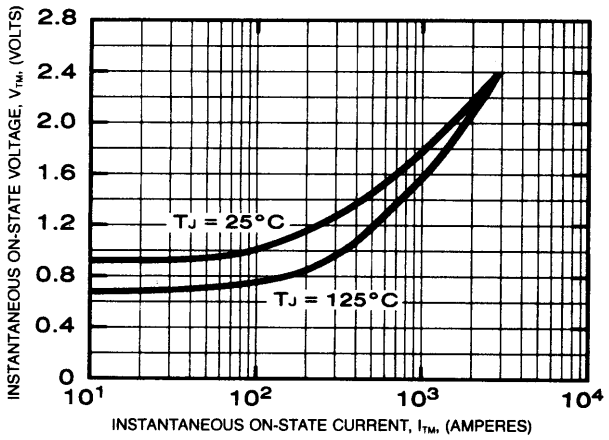
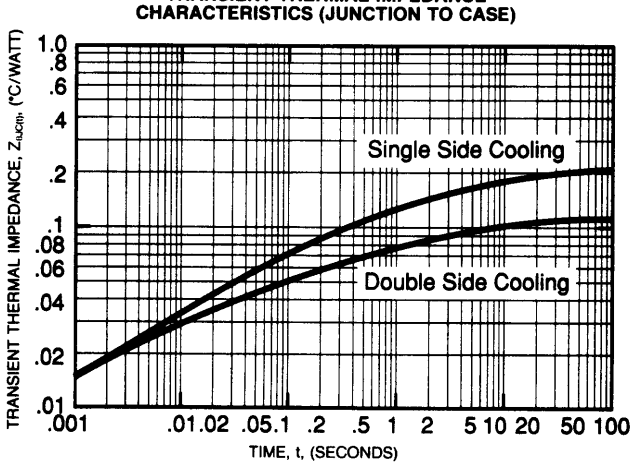
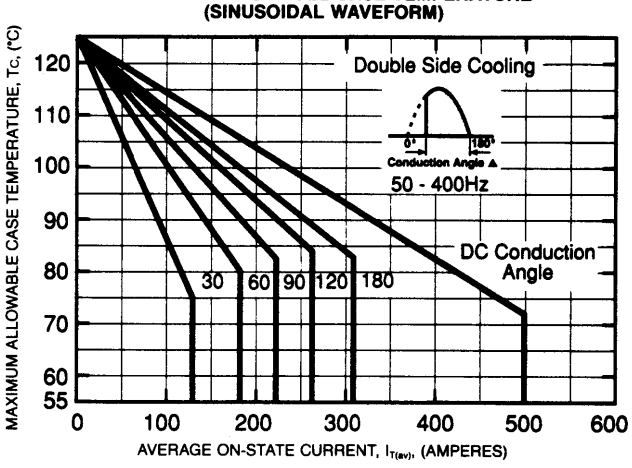
MAXIMUM ON-STATE CHARACTERISTICS



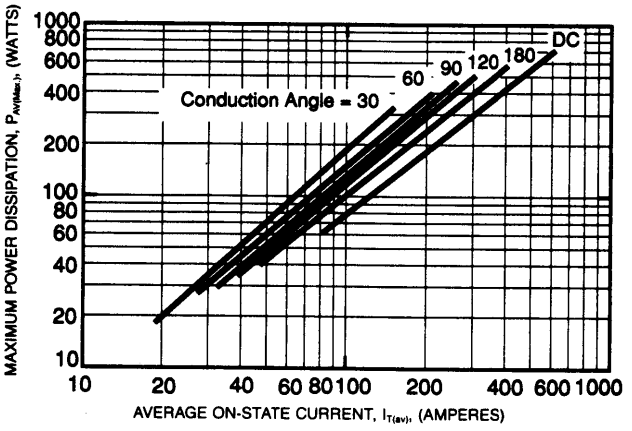
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



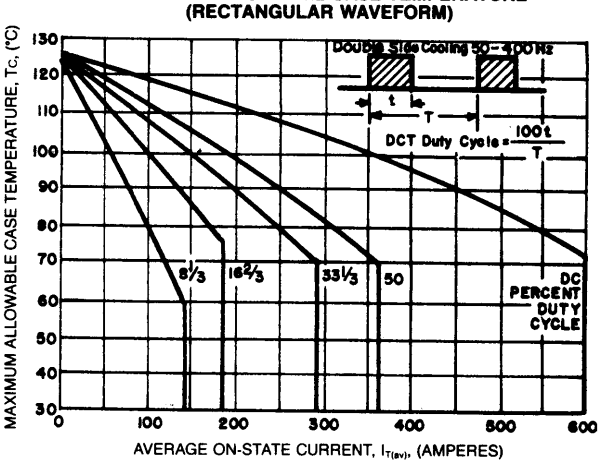
MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



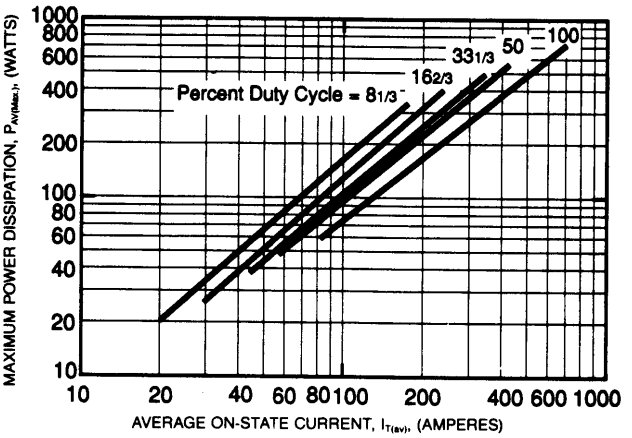
MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)



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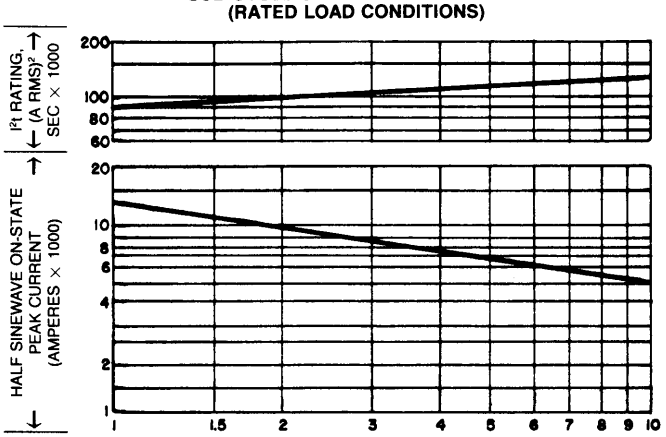
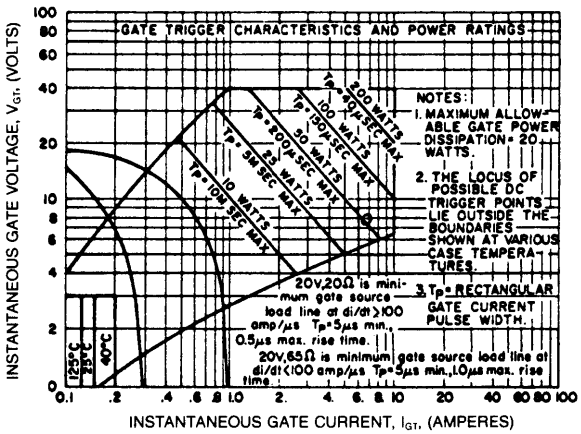
SUB-CYCLE SURGE AND I^2t RATINGS (RATED LOAD CONDITIONS)



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. Tp = Rectangular Gate Current Pulse Width.