

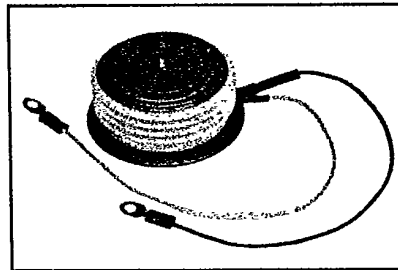
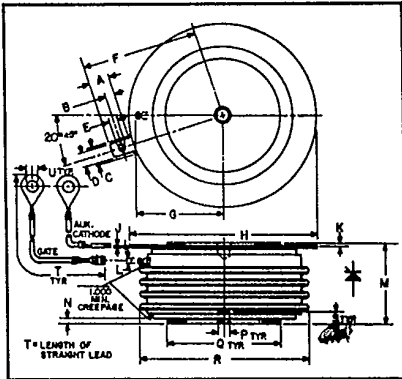
T-25-20



**C390\_X555**

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**  
**590 Amperes Avg**  
**500-1200 Volts**



**C390\_X555**  
**Phase Control SCR**  
 590 Amperes/500-1200 Volts

**C390\_X555**  
**Outline Drawing**

Dimensions	Inches		Millimeters	
	Min.	Max.	Min.	Max.
A	.240	.260	6.096	6.604
B	.110	.130	2.794	3.302
C	.245	—	6.223	—
D	.186	.191	4.724	4.851
E	.060	.075	1.524	1.905
F	—	1.430	—	36.32
G	—	1.065	—	27.051
H	2.200	2.500	55.88	63.50
J	.011	.019	2.794	3.483
K	.030	.130	.762	3.302
L	.056	.060	1.422	1.524
M	1.000	1.065	25.40	27.05
N	.030	.096	.762	2.438
P	.130	.150	3.302	3.810
Q	1.300	1.345	33.02	34.16
R	—	2.150	—	54.61
S	.067	.803	1.702	2.110
T	12.200	12.360	309.9	313.9
U	.137	.153	3.480	3.886

**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. C390NX555 is a 800 Volt, 590 Ampere Phase Control SCR.

Type	Voltage		Current
	V <sub>DRM</sub> V <sub>RRM</sub>	Code	
C390_X555	500	E	590
	600	M	
	700	S	
	800	N	
	900	T	
	1000	P	
	1100	PA	
1200	PB		



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### Absolute Maximum Ratings

	Symbol	C390_X555	Units
RMS On-State Current	$I_{T(RMS)}$	925	Amperes
Average On-State Current	$I_{T(av)}$	590	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (60Hz)	$I_{TSM}$	8000	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz)	$I_{TSM}$	7600	Amperes
Critical Rate-of-Rise of On-State Current (Non-Repetitive)	$di/dt$	800	Amperes/ $\mu$ s
Critical Rate-of-Rise of On-State Current (Repetitive)	$di/dt$	500	Amperes/ $\mu$ s
$I^2t$ (for Fusing), One Cycle at 60Hz	$I^2t$	266,500	$A^2sec$
Peak Gate Power Dissipation	$P_{GM}$	200	Watts
Average Gate Power Dissipation	$P_{G(av)}$	5	Watts
Storage Temperature	$T_{STG}$	-40 to 150	$^{\circ}C$
Operating Temperature	$T_J$	-40 to 150	$^{\circ}C$
Mounting Force <sup>ⓐ</sup>		1800 to 2200	lb.
Mounting Force <sup>ⓐ</sup>		8 to 9.8	kN

### Electrical and Thermal Characteristics

Characteristics	Symbol	Test Conditions	C390_X555	Units
<b>Voltage—Blocking State Maximums</b>				
Forward Leakage, Peak	$I_{DRM}$	$T_J = 150^{\circ}C$ , rated $V_{DRM}$	65	mA
Reverse Leakage, Peak	$I_{RRM}$	$T_J = 150^{\circ}C$ , rated $V_{RRM}$	65	mA
<b>Current—Conducting State Maximums</b>				
Peak On-State Voltage	$V_{TM}$	$I_{TM} = 3000A$ , $T_J = 25^{\circ}C$	2.6	Volts
<b>Switching</b>				
Typical Turn-Off Time	$t_q$	$T_J = 150^{\circ}C$ ; $I_{TM} = 50$ Amps; $V_R = 50$ Volts Min.; $V_{DRM}$ (Reapplied); Rate-of-Rise of Reapplied Off-State Voltage = $20V/\mu$ sec (linear); Commutation $di/dt = 25$ Amps/ $\mu$ sec; Repetition Rate = 1 pps; Gate Bias During Turn-Off Interval = 0 Volts, $100\Omega$	200	$\mu$ sec
Min. Critical $dv/dt$ exponential to $V_{DRM}$	$dv/dt$	$T_J = 150^{\circ}C$ , Gate Open	200	$V/\mu$ sec
<b>Thermal</b>				
Maximum Thermal Resistance, <sup>ⓐ</sup> double sided cooling				
Junction to Case	$R_{\theta JC}$		.06	$^{\circ}C/Watt$
Case to Sink, Lubricated	$R_{\theta CS}$		.02	$^{\circ}C/Watt$
<b>Gate—Maximum Parameters</b>				
Gate Current to Trigger	$I_{GT}$	$T_J = 25^{\circ}C$ , $V_D = 6Vdc$ , $R_L = 3\Omega$	150	mA
Gate Voltage to Trigger	$V_{GT}$	$T_J = -40^{\circ}C$ to $150^{\circ}C$ , $V_D = 6Vdc$ , $R_L = 3\Omega$	5	Volts
Non-Triggerring Gate Voltage	$V_{GDM}$	$T_J = 150^{\circ}C$ , $V_D = \text{Rated } V_{DRM}$ , $R_L = 1000\Omega$	.15	Volts
Peak Forward Gate Current	$I_{GTM}$		10	Amperes
Peak Reverse Gate Voltage	$V_{GRM}$		5	Volts

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

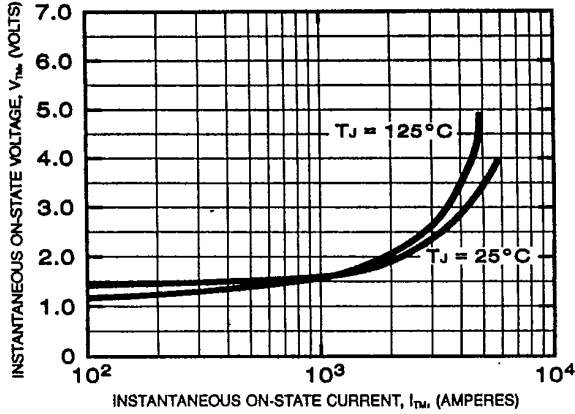


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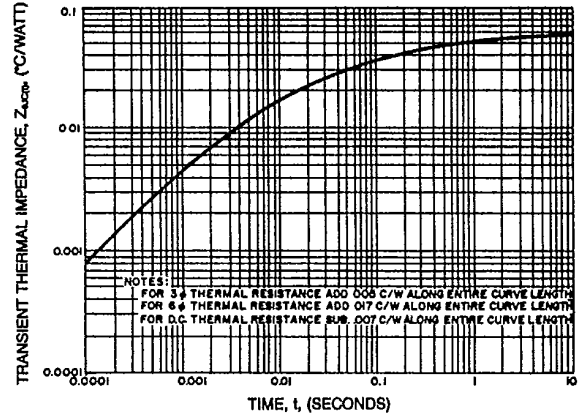
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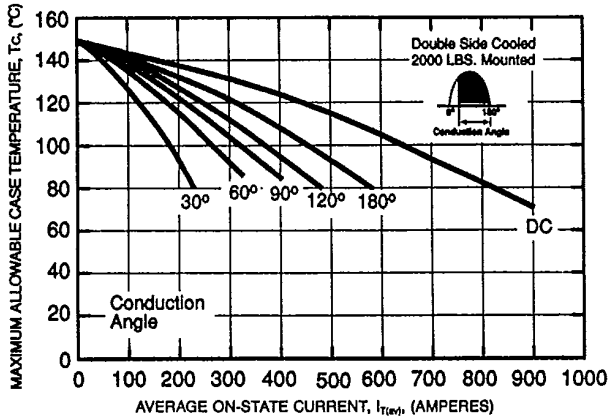
MAXIMUM ON-STATE CHARACTERISTICS



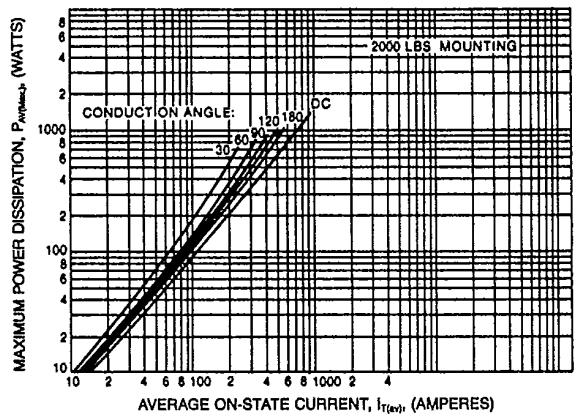
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



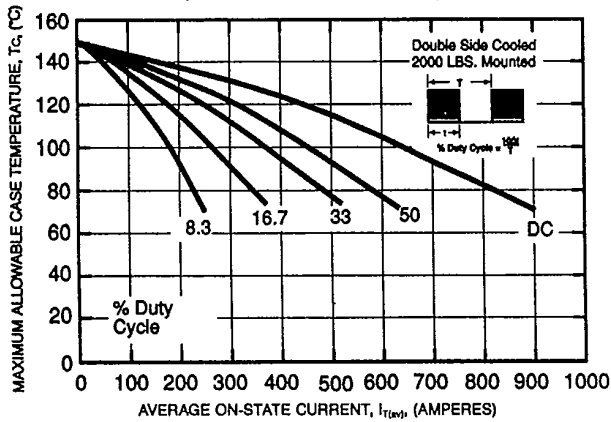
MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



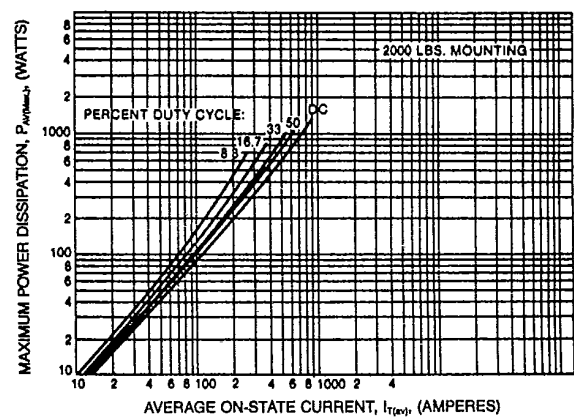
MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)





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