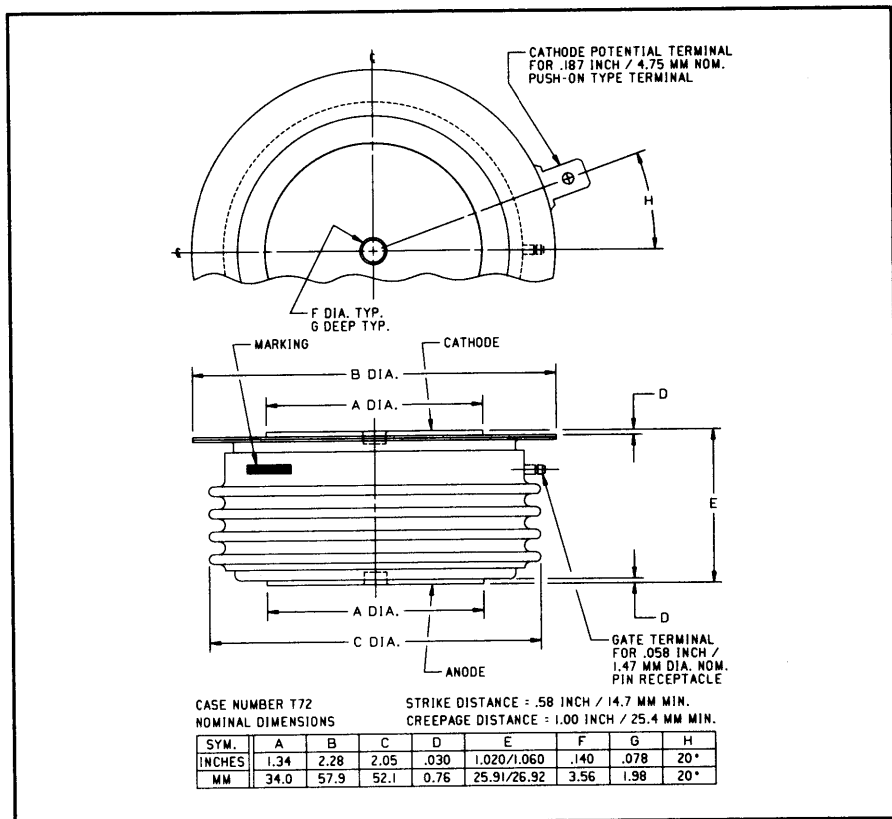
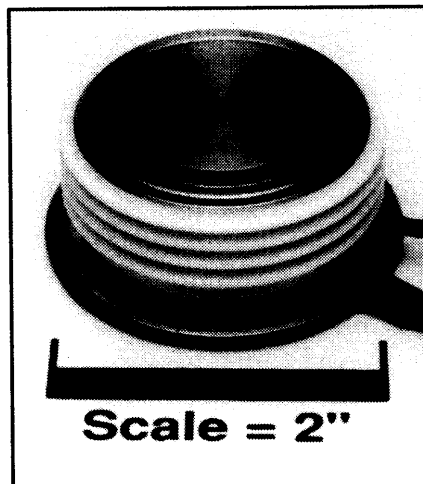


Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272
Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

Phase Control SCR
620 Amperes Average
600 Volts



C390__X500 (Outline Drawing)



C390__X500 Phase Control SCR
620 Amperes Average, 600 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
- ☐ Motor Control

Ordering Information:

Select the complete nine digit part number you desire from the table, i.e. C390MX500 is a 600 Volt, 620 Ampere Phase Control SCR.

Type	Voltage		Current
	V_{DRM} V_{RRM}	Code	
C390__X500	200	B	620
	400	D	
	600	M	

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C390_X500
Phase Control SCR
620 Amperes Average, 600 Volts

Absolute Maximum Ratings

	Symbol	C390_X500	Units
RMS On-State Current @ $T_C = 65^\circ\text{C}$	$I_{T(RMS)}$	975	Amperes
Average On-State Current @ $T_C = 65^\circ\text{C}$	$I_{T(av)}$	620	Amperes
Peak One-Cycle Surge (Non Repetitive) On-State Current (60Hz)	I_{TSM}	10,000	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz)	I_{TSM}	9500	Amperes
Critical Rate-of-Rise of On-State Current (Non-Repetitive)	di/dt	400	Amperes/ μs
Critical Rate-of-Rise of On-State Current (Repetitive)	di/dt	150	Amperes/ μs
I^2t (for Fusing), One Cycle at 60Hz	I^2t	416,500	A^2sec
Peak Gate Power Dissipation, 40 μsec Pulse	P_{GM}	200	Watts
Average Gate Power Dissipation	$P_{G(av)}$	5	Watts
Storage Temperature	T_{STG}	-40 to 150	$^\circ\text{C}$
Operating Temperature	T_J	-40 to 125	$^\circ\text{C}$
Mounting Force		1800 to 2200	lb.
Mounting Force		8 to 9.8	kN

Electrical and Thermal Characteristics

Characteristics	Symbol	Test Conditions	C390_X500	Units
Voltage—Blocking State Maximums				
Forward Leakage, Peak	I_{DRM}	$T_J = 125^\circ\text{C}, V = V_{DRM}$	50	mA
Reverse Leakage, Peak	I_{RRM}	$T_J = 125^\circ\text{C}, V = V_{RRM}$	50	mA
Current—Conducting State Maximums				
Peak On-State Voltage	V_{TM}	$I_{TM} = 3000\text{A}; T_J = 25^\circ\text{C}$	1.9	Volts
Switching				
Typical Turn-Off Time	t_t	$T_J = 125^\circ\text{C}, I_{TM} = 500\text{Amps}; V_R = 50\text{Volts Min.}; V_{DRM}$ (Reapplied); Rate-of-Rise of Reapplied Off-State Voltage = $20\text{V}/\mu\text{sec}$ (linear); Commutation $di/dt = 25\text{A}/\mu\text{sec}$; Repetition Rate = 1 pps; Gate Bias During Turn-Off Interval = 0 Volts, 100Ω	125	μsec
Typical Delay Time	t_d	$T_J = 25^\circ\text{C}, I_{TM} = 50\text{Adc}, V_{DRM}$ Rated. Gate Supply: 20 Volts, 20Ω , $0.1\mu\text{sec}$ Max. Rise Time	0.7	μsec
Min. Critical dv/dt exponential to V_{DRM}	dv/dt	$T_J = 125^\circ\text{C}, \text{Gate Open}$	200	$\text{V}/\mu\text{sec}$
Thermal				
Maximum Thermal Resistance, double sided cooling				
Junction to Case	$R_{\theta JC}$		0.06	$^\circ\text{C}/\text{Watt}$
Case to Sink, Lubricated	$R_{\theta CS}$		0.02	$^\circ\text{C}/\text{Watt}$
Gate—Maximum Parameters				
Gate Current to Trigger	I_{GT}	$V_D = 6\text{Vdc}, T_J = 25^\circ\text{C}, R_L = 3\Omega$	200	mA
Gate Voltage to Trigger	V_{GT}	$T_J = -40^\circ\text{C}$ to $125^\circ\text{C}, V_D = \text{Vdc}, R_L = 3\Omega$	5	Volts
Non-Triggering Gate Voltage	V_{GDM}	$T_J = 125^\circ\text{C}, \text{rated } V_{DRM}, R_L = 1000\Omega$	0.15	Volts
Peak Forward Gate Current	I_{GTM}		10	Amperes
Peak Reverse Gate Voltage	V_{GRM}		5	Volts

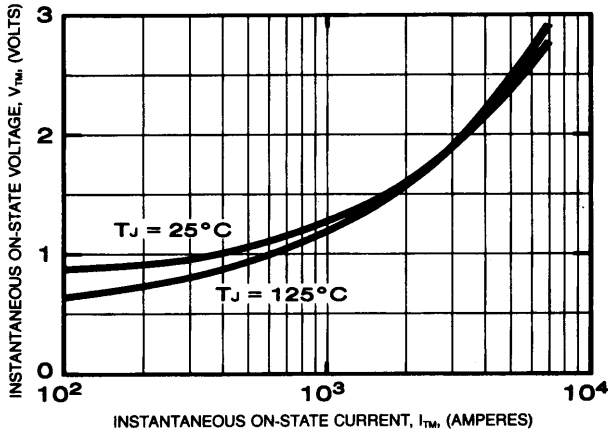
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C390_X500

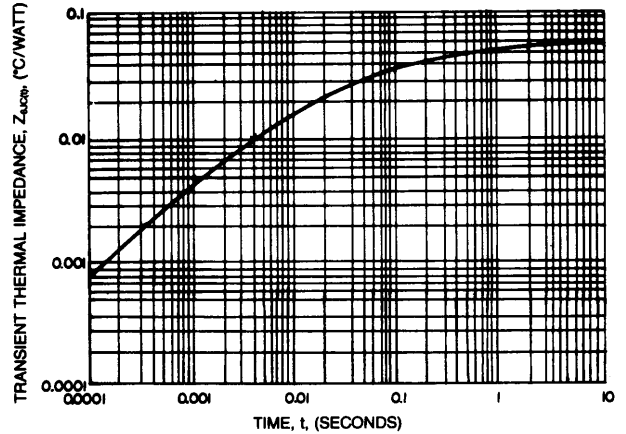
Phase Control SCR

620 Amperes Average, 600 Volts

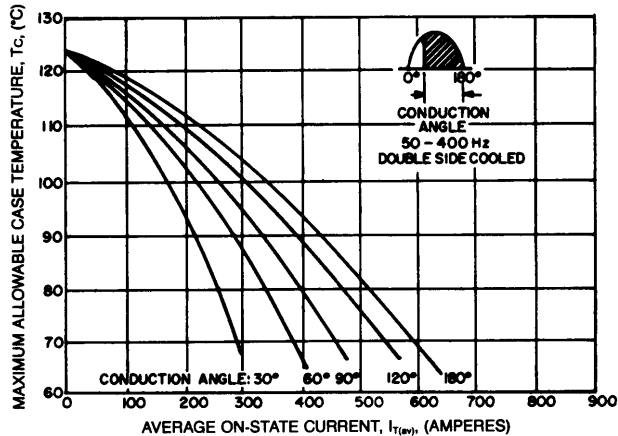
MAXIMUM ON-STATE CHARACTERISTICS



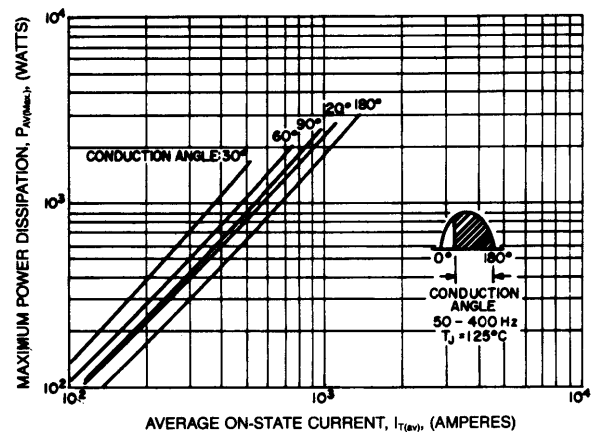
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



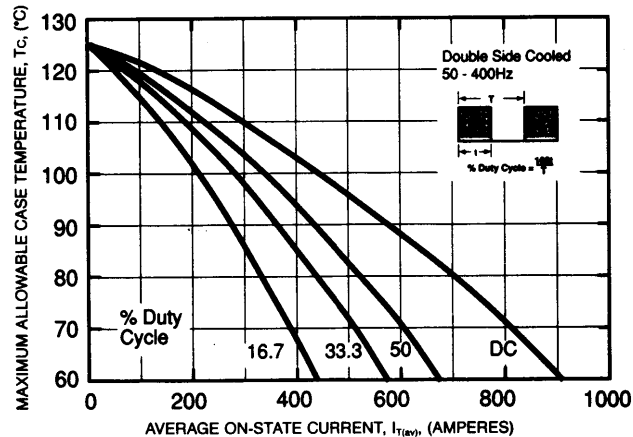
MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



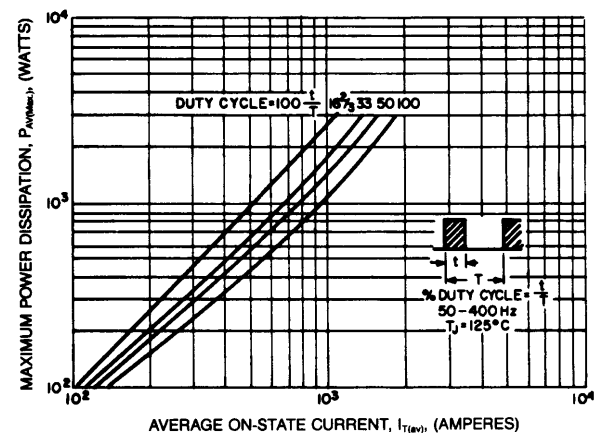
MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)



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