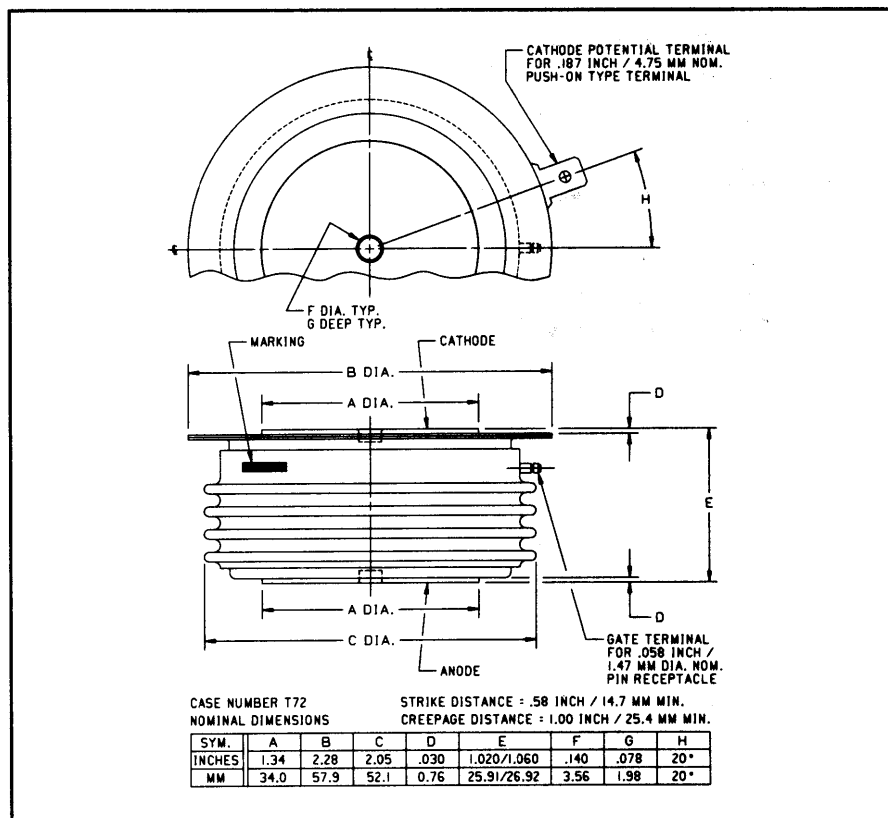
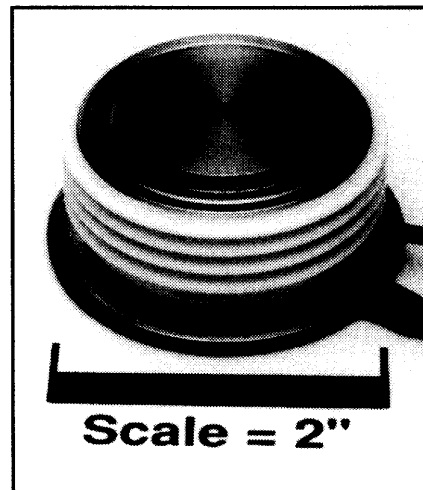


Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272
Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

Phase Control SCR 620 Amperes Average 600 Volts



C390__X550 (Outline Drawing)



C390__X550 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
- ☐ High Temperature Operation

Applications:

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

Ordering Information:

Select the complete nine digit part number you desire from the table, i.e. C390MX550 is a 600 Volt, 620 Ampere Phase Control SCR.

Type	Voltage		Current $I_{T(av)}$
	V_{DRM} V_{RRM}	Code	
C390__X550	200	B	620
	400	D	
	600	M	



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C390_X550

Phase Control SCR

620 Amperes Average, 600 Volts

Absolute Maximum Ratings

	Symbol	C390_X550	Units
RMS On-State Current @ $T_C = 90^\circ\text{C}$	$I_{T(RMS)}$	975	Amperes
Average On-State Current @ $T_C = 90^\circ\text{C}$	$I_{T(av)}$	620	Amperes
Peak One-Cycle Surge (Non Repetitive) On-State Current (60Hz)	I_{TSM}	9000	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz)	I_{TSM}	8200	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	335,000	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 150	$^\circ\text{C}$
Mounting Force		1800 to 2200	lb.
Mounting Force		8 to 9.8	kN

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C390_X550

Phase Control SCR

620 Amperes Average, 600 Volts

Electrical and Thermal Characteristics

Characteristics	Symbol	Test Conditions	C390_X550	Units
Voltage—Blocking State Maximums				
Forward Leakage, Peak	I_{DRM}	$T_J = 150^{\circ}\text{C}$, $V = \text{rated } V_{DRM}$	50	mA
Reverse Leakage, Peak	I_{RRM}	$T_J = 150^{\circ}\text{C}$, $V = \text{rated } V_{RRM}$	50	mA
Current—Conducting State Maximums				
Peak On-State Voltage	V_{TM}	$T_J = 25^{\circ}\text{C}$, $I_T = 3000\text{A}$, Duty Cycle $\leq 0.01\%$	1.9	Volts
Switching				
Typical Turn-Off Time	t_q	$T_J = 150^{\circ}\text{C}$; $I_{TM} = 500\text{A}$; $V_R = 50\text{V Min.}$; 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	$T_J = 25^{\circ}\text{C}$; $I_{TM} = 50\text{A}$; V_{DRM} Rated. Gate Supply: 20 Volts, 20Ω , $0.1\mu\text{sec}$ Max. Rise Time	1	μsec
Min. Critical dv/dt exponential to V_{DRM}	dv/dt		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}	$T_J = 25^{\circ}\text{C}$, $V_D = 6\text{Vdc}$, $R_L = 3\Omega$	200	mA
Gate Voltage to Trigger	V_{GT}	$T_J = -40^{\circ}\text{C}$ to 150°C , $V_D = 6\text{Vdc}$, $R_L = 3\Omega$	5	Volts
Non-Triggering Gate Voltage	V_{GDM}	$T_J = 150^{\circ}\text{C}$, 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

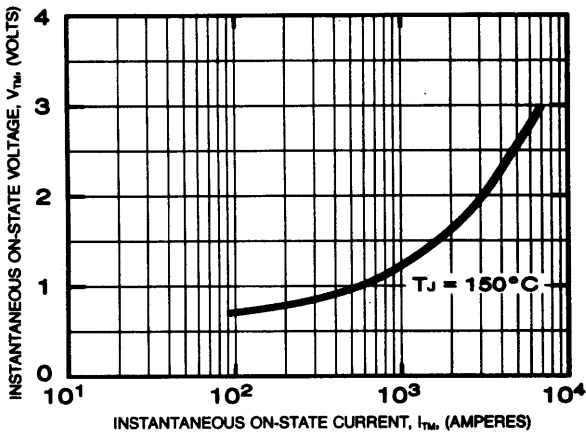
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C390_X550

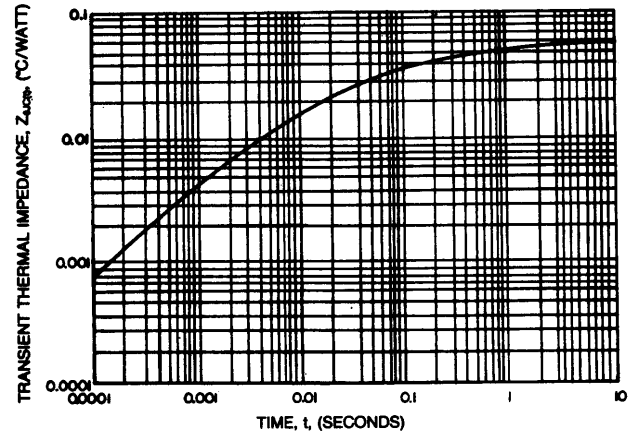
Phase Control SCR

620 Amperes Average, 600 Volts

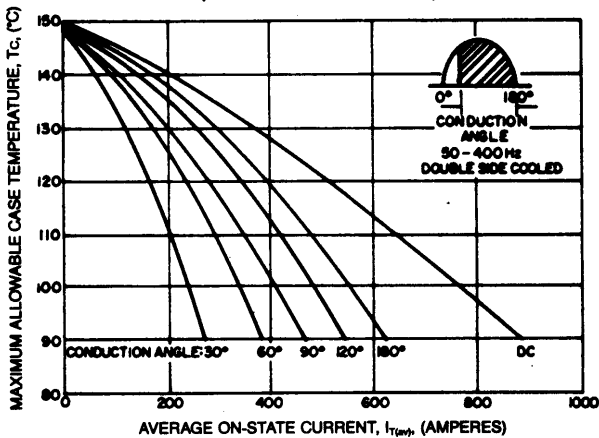
MAXIMUM ON-STATE CHARACTERISTICS



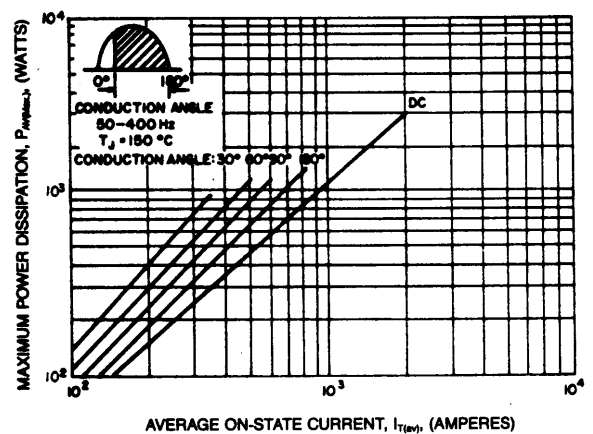
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



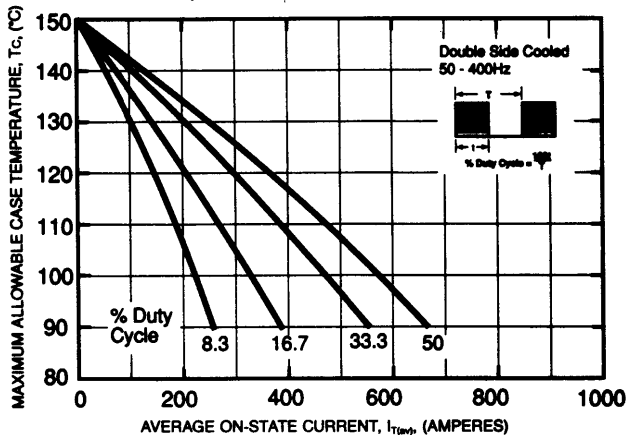
MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)

