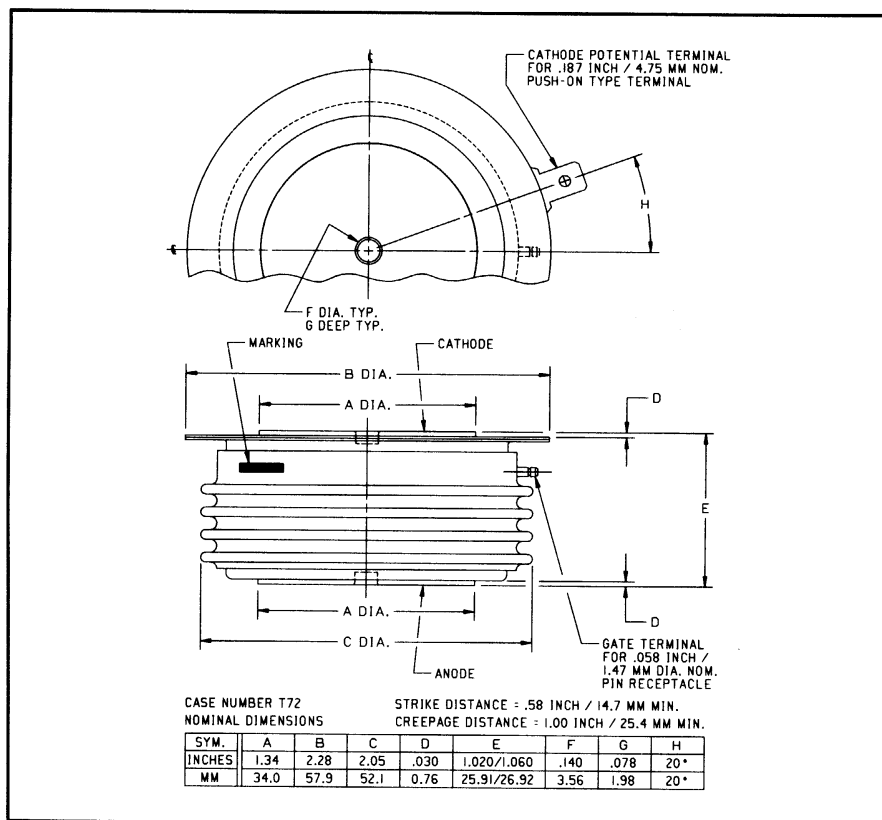


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Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

Phase Control SCR 450 Amperes Average 2400 Volts

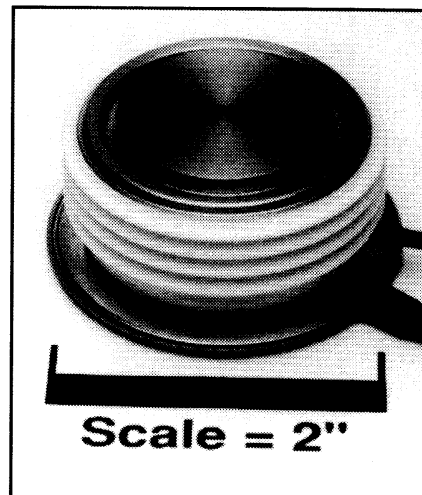


C390 (Outline Drawing)

Ordering Information:

Select the complete five or six digit part number you desire from the table, i.e. C390LD is a 2400 Volt, 450 Ampere Phase Control SCR.

Type	Voltage		Current
	V_{DRM} V_{RRM}	Code	
C390	600	M	450
	800	N	
	1000	P	
	1200	PB	
	1400	PD	
	1600	PM	
	1800	PN	
	2000	L	
	2200	LB	
	2400	LD	



C390 Phase Control SCR
450 Amperes Average, 2400 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



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C390

Phase Control SCR

450 Amperes Average, 2400 Volts

Absolute Maximum Ratings

	Symbol	C390	Units
RMS On-State Current @ $T_C = 73^\circ\text{C}$	$I_{T(\text{RMS})}$	700	Amperes
Average On-State Current @ $T_C = 73^\circ\text{C}$	$I_{T(\text{av})}$	450	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/ μs
Critical Rate-of-Rise of On-State Current (Repetitive)	di/dt	500	Amperes/ μs
I^2t (for Fusing), 8.3 milliseconds	I^2t	265,000	A^2sec
Peak Gate Power Dissipation, 40 μsec Pulse	P_{GM}	200	Watts
Average Gate Power Dissipation	$P_{\text{G(av)}}$	5	Watts
Storage Temperature	T_{STG}	-40 to 150	$^\circ\text{C}$
Operating Temperature	T_J	-40 to 125	$^\circ\text{C}$
Mounting Force		2000 to 2500	lb.
Mounting Force		8.9 to 11.1	kN

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C390

Phase Control SCR

450 Amperes Average, 2400 Volts

Electrical and Thermal Characteristics

Characteristics	Symbol	Test Conditions	C390	Units
Voltage—Blocking State Maximums				
Forward Leakage, Peak	I_{DRM}	$T_J = 125^{\circ}\text{C}$, $V = V_{DRM}$	45	mA
Reverse Leakage, Peak	I_{RRM}	$T_J = 125^{\circ}\text{C}$, $V = V_{RRM}$	45	mA
Current—Conducting State Maximums				
Peak On-State Voltage	V_{TM}	$T_C = 25^{\circ}\text{C}$, $I_{TM} = 3000$ A Peak, Duty Cycle $\leq 0.01\%$	2.4	Volts
Switching				
Typical Turn-Off Time	t_q	$T_J = 125^{\circ}\text{C}$; $I_{TM} = 500$ Amps; $V_R = 50$ Volts Min.; V_{DRM} (Reapplied); Rate-of-Rise of Reapplied Off-State Voltage = $20\text{V}/\mu\text{sec}$ (linear); Commutation $di/dt = 25$ Amps/ μsec ; Repetition Rate = 1 pps; Gate Bias During Turn-Off Interval = 0 Volts, 100Ω	125	μsec
Typical Delay Time	t_d	$T_J = 25^{\circ}\text{C}$, $I_{TM} = 50$ Adc, V_{DRM} Rated. Gate Supply: 20 Volts, 20Ω , $0.1 \mu\text{sec}$ Max. Rise Time	0.4	μsec
Min. Critical dv/dt exponential to V_{DRM}	dv/dt	$T_J = 125^{\circ}\text{C}$, 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	$R_{\theta CS}$		0.020	$^{\circ}\text{C}/\text{Watt}$
Gate—Maximum Parameters				
Gate Current to Trigger	I_{GT}	$T_J = 25^{\circ}\text{C}$, $V_D = 6\text{Vdc}$, $R_L = 3\Omega$	150	mA
Gate Voltage to Trigger	V_{GT}	$T_J = -40^{\circ}\text{C}$ to 125°C , $V_D = 6\text{Vdc}$, $R_L = 3\Omega$	5	Volts
Non-Triggering Gate Voltage	V_{GDM}	$T_C = 125^{\circ}\text{C}$, $V_D = \text{Rated}$, $R_L = 1000\Omega$	0.15	Volts
Peak Forward Gate Current	I_{GTM}		10	Amperes
Peak Reverse Gate Voltage	V_{GRM}		5	Volts

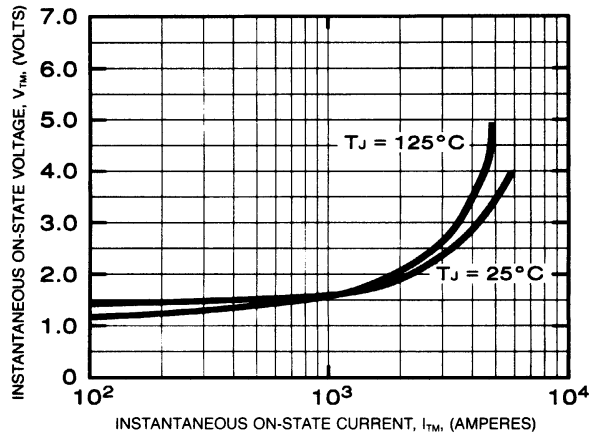
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C390

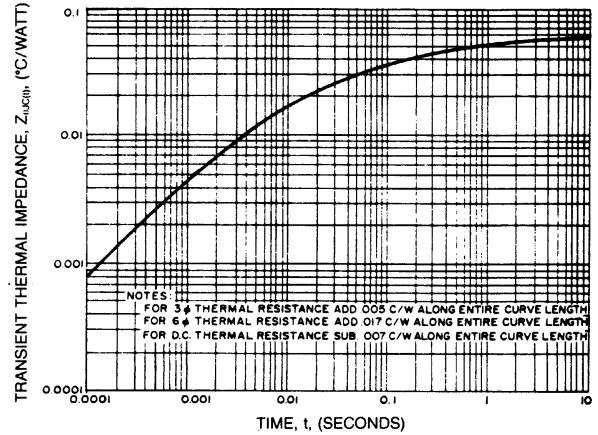
Phase Control SCR

450 Amperes Average, 2400 Volts

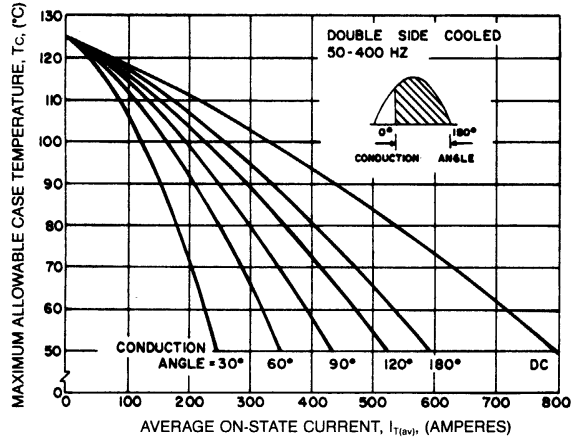
MAXIMUM ON-STATE CHARACTERISTICS



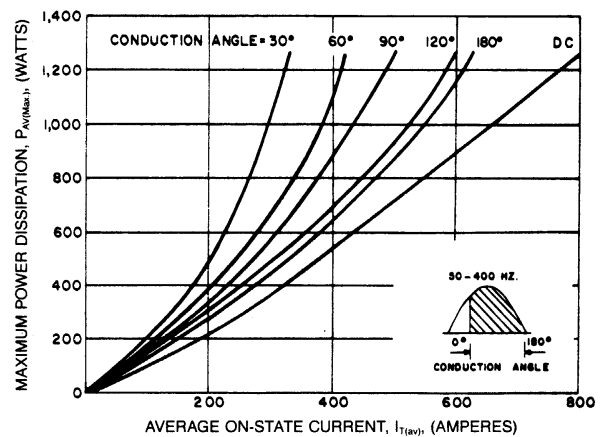
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



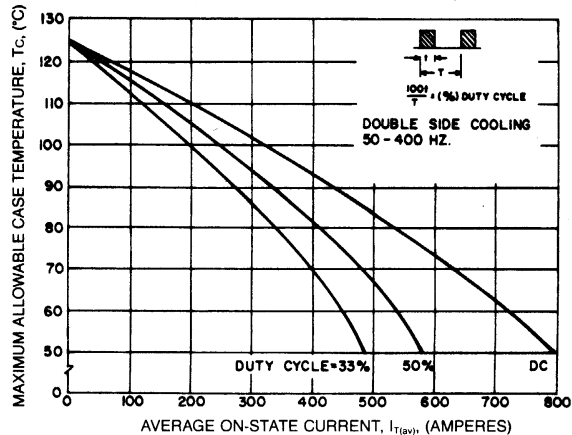
MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



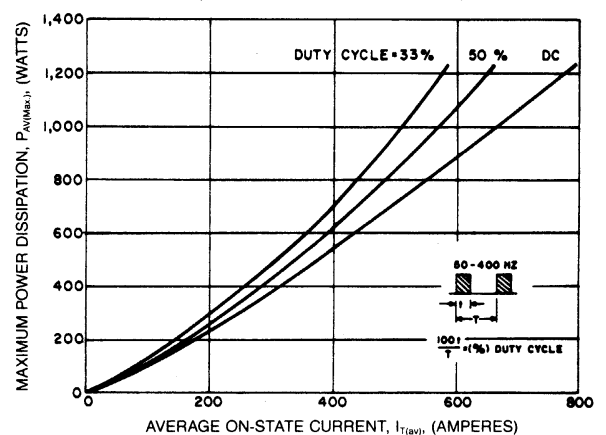
MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)



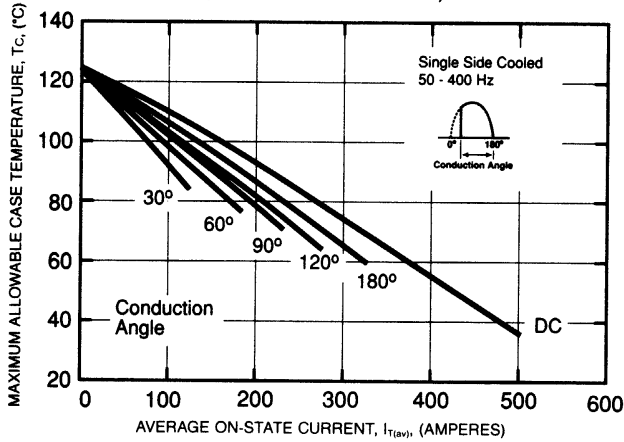
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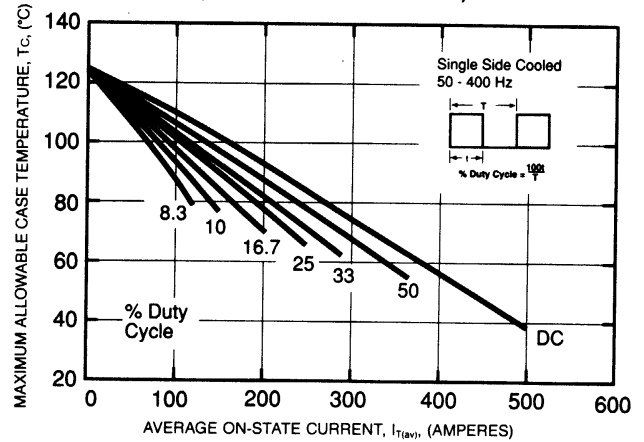
Phase Control SCR

450 Amperes Average, 2400 Volts

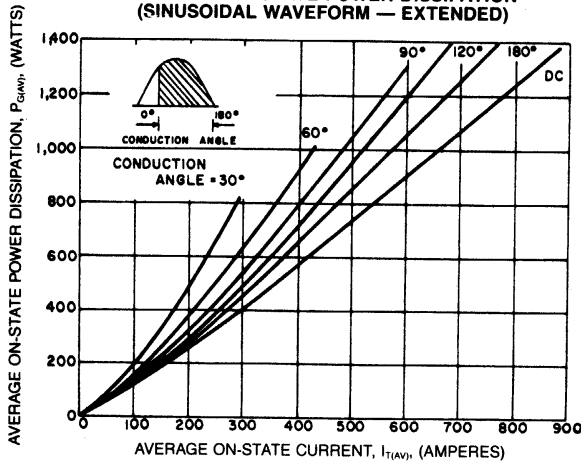
MAXIMUM ALLOWABLE CASE TEMPERATURE
(SINUSOIDAL WAVEFORM)



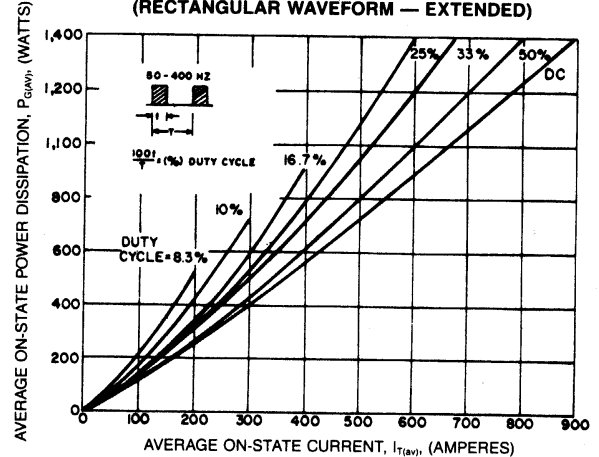
MAXIMUM ALLOWABLE CASE TEMPERATURE
(RECTANGULAR WAVEFORM)



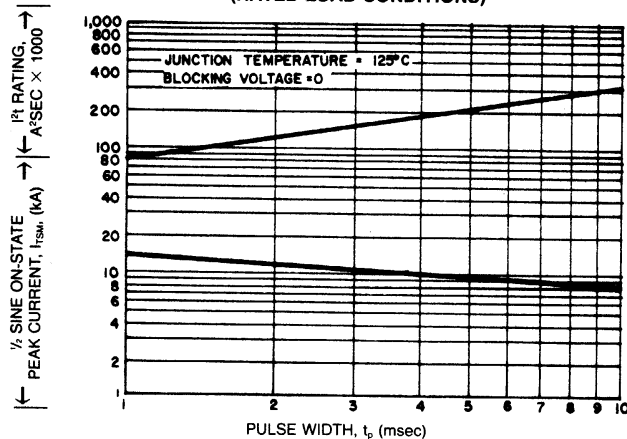
MAXIMUM ON-STATE POWER DISSIPATION
(SINUSOIDAL WAVEFORM — EXTENDED)



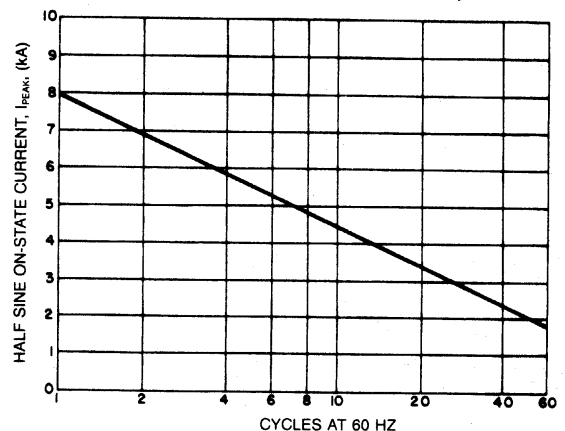
MAXIMUM ON-STATE POWER DISSIPATION
(RECTANGULAR WAVEFORM — EXTENDED)



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



MAXIMUM ALLOWABLE SURGE ON-STATE
CURRENT (NON-REPETITIVE)



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C390
Phase Control SCR
 450 Amperes Average, 2400 Volts

GATE CHARACTERISTICS

