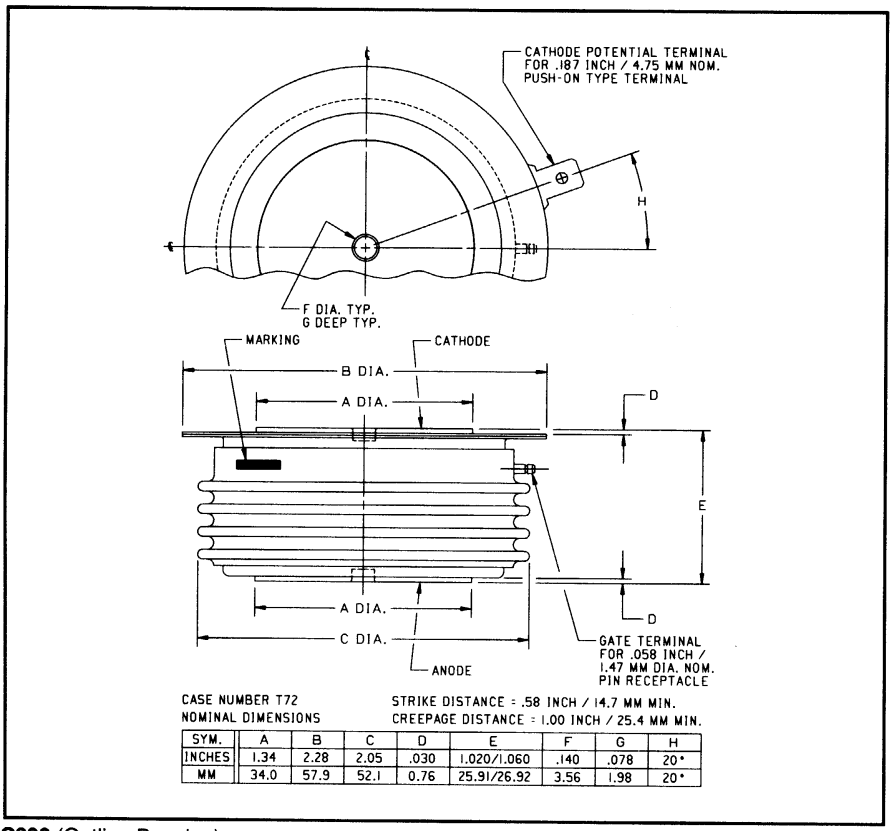
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272
Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

C390

Phase Control SCR
450 Amperes Average
2400 Volts



CASE NUMBER T72
NOMINAL DIMENSIONS

STRIKE DISTANCE = .58 INCH / 14.7 MM MIN.
CREEPAGE DISTANCE = 1.00 INCH / 25.4 MM MIN.

SYM.	A	B	C	D	E	F	G	H
INCHES	1.34	2.28	2.05	.030	1.020/1.060	.140	.078	20°
MM	34.0	57.9	52.1	0.76	25.91/26.92	3.56	1.98	20°

C390 (Outline Drawing)

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

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	$I_{T(av)}$
C390	600	M	450
	800	N	
	1000	P	
	1200	PB	
	1400	PD	
	1600	PM	
	1800	PN	
	2000	L	
	2200	LB	
	2400	LD	

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Absolute Maximum Ratings

	Symbol	C390	Units
RMS On-State Current @ T_C = 73°C	$I_{T(RMS)}$	700	Amperes
Average On-State Current @ T_C = 73°C	$I_{T(av)}$	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, 40μsec Pulse	P_{GM}	200	Watts
Average Gate Power Dissipation	$P_{G(av)}$	5	Watts
Storage Temperature	T_{STG}	−40 to 150	°C
Operating Temperature	T_J	−40 to 125	°C
Mounting Force		2000 to 2500	lb.
Mounting Force		8.9 to 11.1	kN

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Electrical and Thermal Characteristics

Characteristics	Symbol	Test Conditions	C390	Units
Voltage—Blocking State Maximums				
Forward Leakage, Peak	I_{DRM}	T_J = 125°C, V = V_{DRM}	45	mA
Reverse Leakage, Peak	I_{RRM}	T_J = 125°C, V = V_{RRM}	45	mA
Current—Conducting State Maximums				
Peak On-State Voltage	V_{TM}	T_C = 25°C, I_{TM} = 3000 A Peak, Duty Cycle ≤0.01%	2.4	Volts
Switching				
Typical Turn-Off Time	t_q	T_J = 125°C; I_{TM} = 500 Amps; V_R = 50 Volts Min.; V_{DRM} (Reapplied); Rate-of-Rise of Reapplied Off-State Voltage = 20V/µsec (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°C, I_{TM} = 50 Adc, V_{DRM} Rated. Gate Supply: 20 Volts, 20Ω, 0.1 µsec Max. Rise Time	0.4	µsec
Min. Critical dv/dt exponential to V_{DRM}	dv/dt	T_J = 125°C, Gate Open	200	V/µsec
Thermal				
Maximum Thermal Resistance, double sided cooling				
Junction to Case	$R_{\theta JC}$		0.06	°C/Watt
Case to Sink, Lubricated	$R_{\theta CS}$		0.020	°C/Watt
Gate—Maximum Parameters				
Gate Current to Trigger	I_{GT}	T_J = 25°C, V_D = 6Vdc, R_L = 3Ω	150	mA
Gate Voltage to Trigger	V_{GT}	T_J = −40°C to 125°C, V_D = 6Vdc, R_L = 3Ω	5	Volts
Non-Triggering Gate Voltage	V_{GDM}	T_C = 125°C, V_D = Rated, R_L = 1000Ω	0.15	Volts
Peak Forward Gate Current	I_{GTM}		10	Amperes
Peak Reverse Gate Voltage	V_{GRM}		5	Volts

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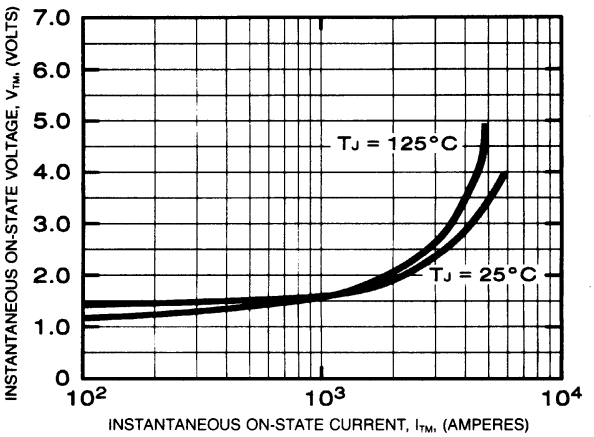
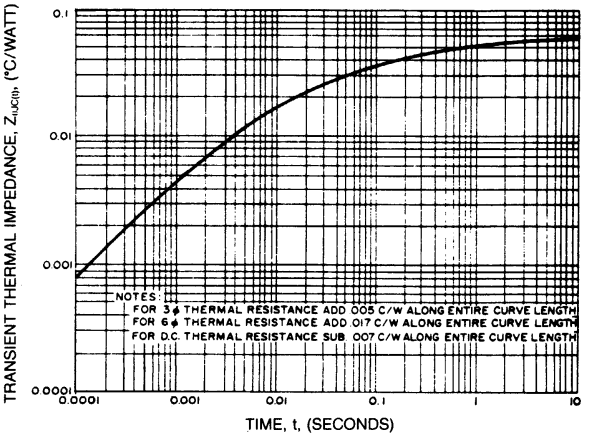
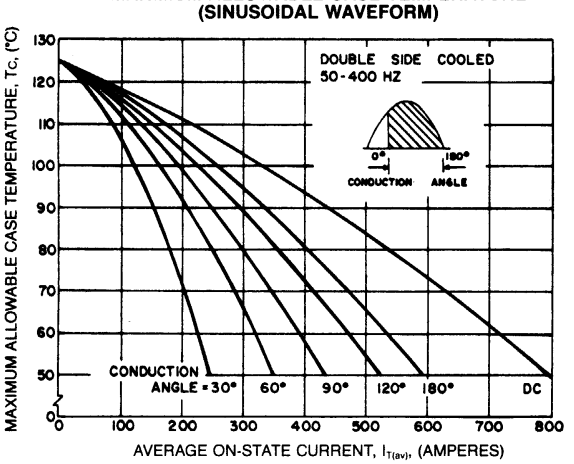
MAXIMUM ON-STATE CHARACTERISTICS



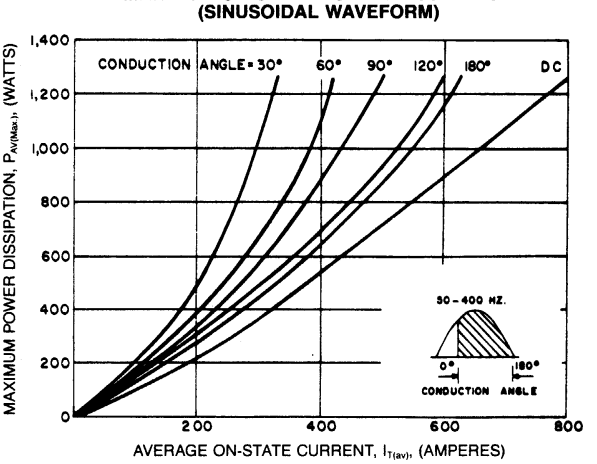
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



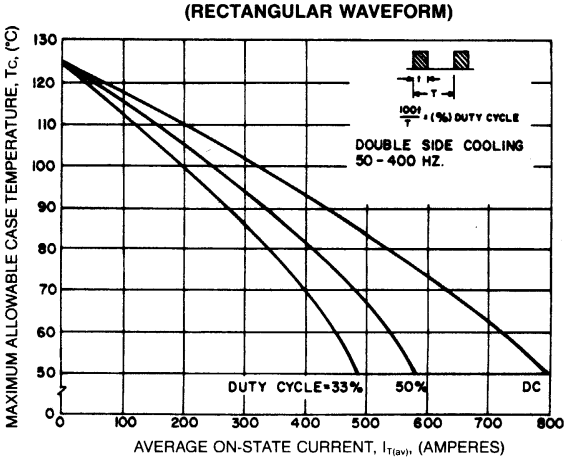
MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



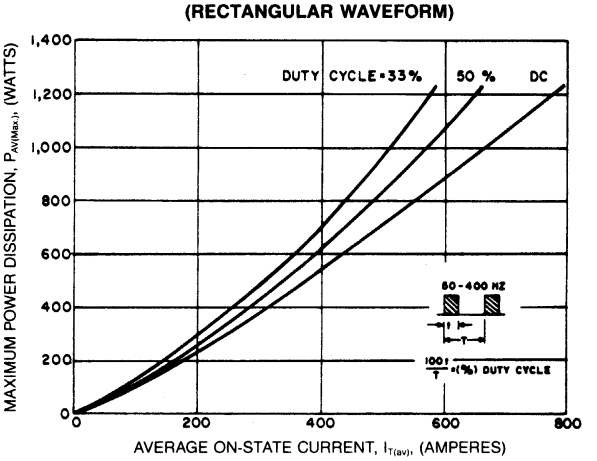
MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)



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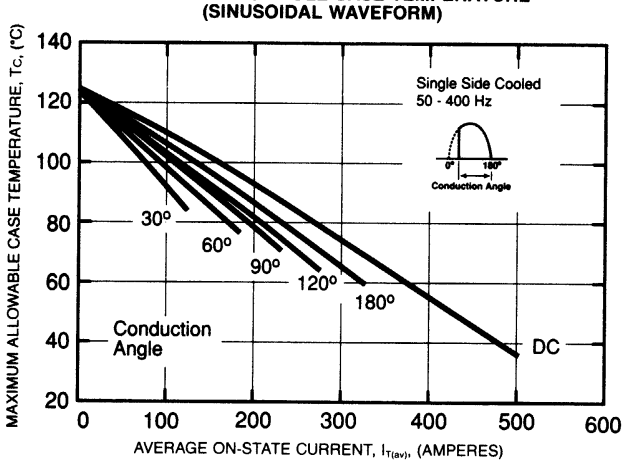
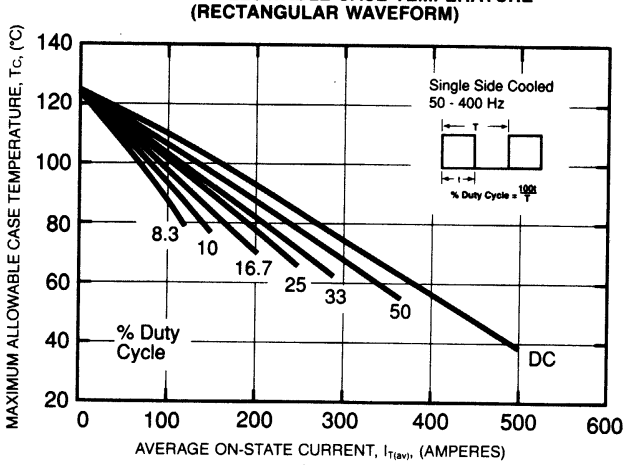
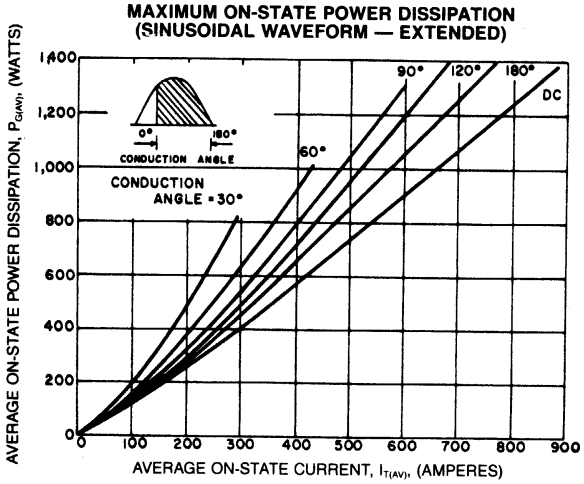


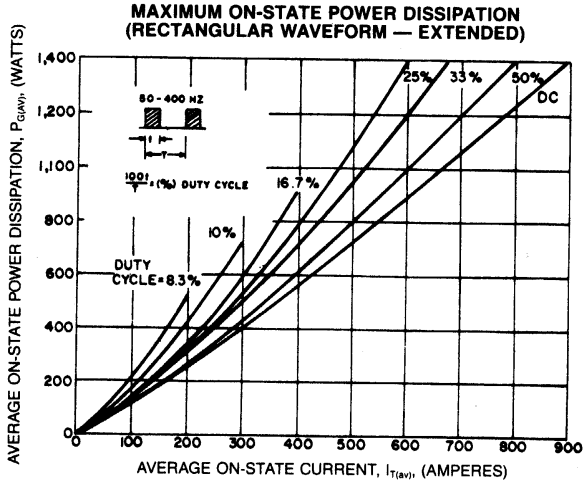
MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



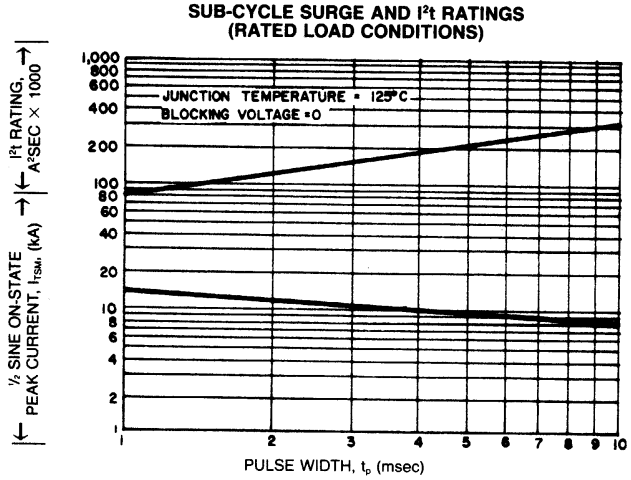
MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM — EXTENDED)



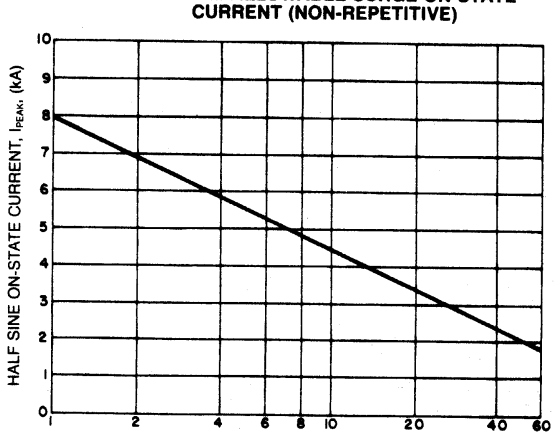
MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM — EXTENDED)



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



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



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GATE CHARACTERISTICS