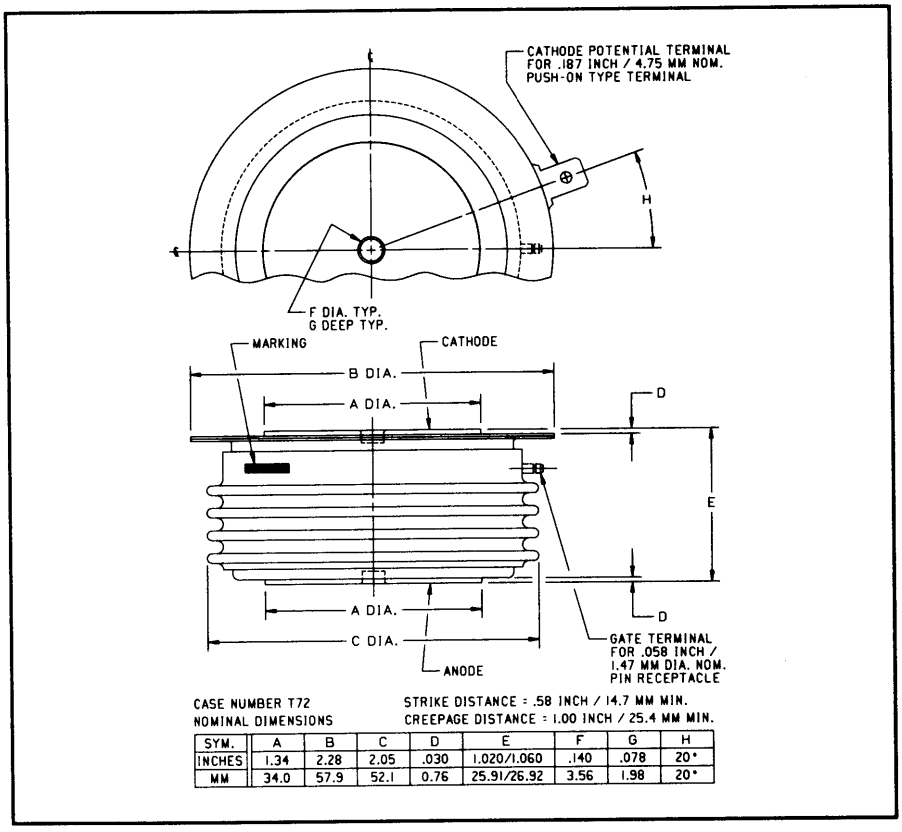
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272
Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

Phase Control SCR
620 Amperes Average
600 Volts

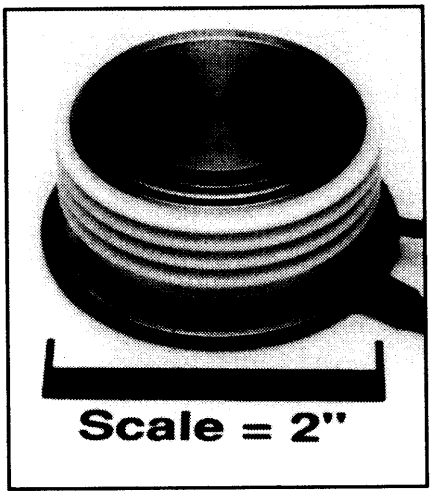


CASE NUMBER T72
NOMINAL DIMENSIONS

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_ _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	$I_{T(av)}$
C390_ _X500	200	B	620
	400	D	
	600	M	

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C390_ _X500
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Absolute Maximum Ratings

	Symbol	C390__X500	Units
RMS On-State Current @ T_C = 65°C	$I_{T(RMS)}$	975	Amperes
Average On-State Current @ T_C = 65°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	°C
Operating Temperature	T_J	−40 to 125	°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°C, V = V_{DRM}	50	mA
Reverse Leakage, Peak	I_{RRM}	T_J = 125°C, V = V_{RRM}	50	mA
Current—Conducting State Maximums				
Peak On-State Voltage	V_{TM}	I_{TM} = 3000A; T_J = 25°C	1.9	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 = 25A/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	0.7	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	$R_{\theta CS}$		0.02	°C/Watt
Gate—Maximum Parameters				
Gate Current to Trigger	I_{GT}	V_D = 6Vdc, T_J = 25°C, R_L = 3Ω	200	mA
Gate Voltage to Trigger	V_{GT}	T_J = −40°C to 125°C, V_D = Vdc, R_L = 3Ω	5	Volts
Non-Triggering Gate Voltage	V_{GDM}	T_J = 125°C, rated V_{DRM}, 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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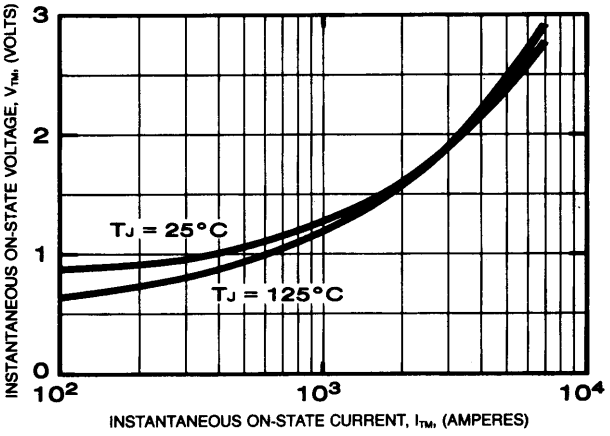
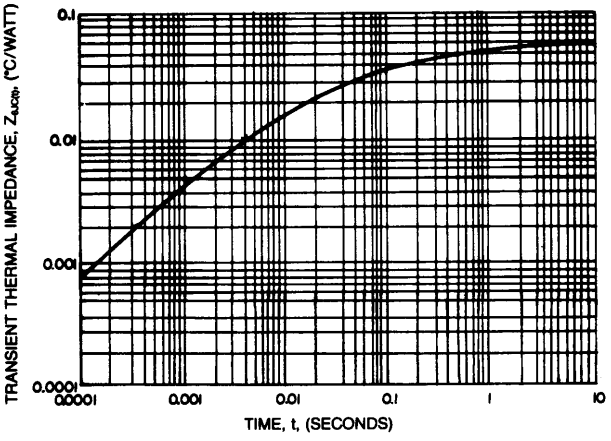
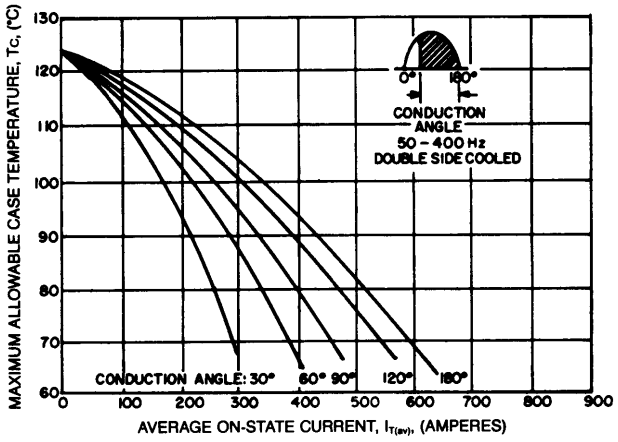
MAXIMUM ON-STATE CHARACTERISTICS



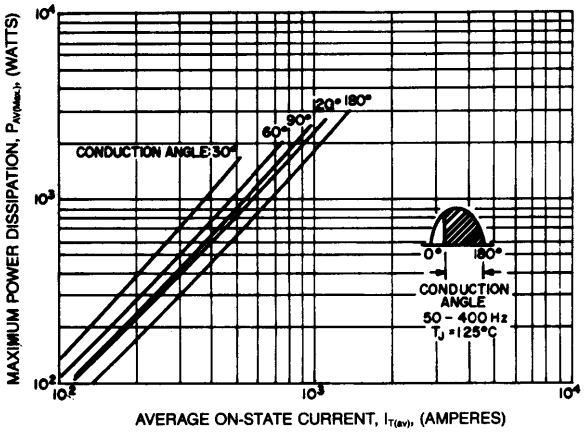
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



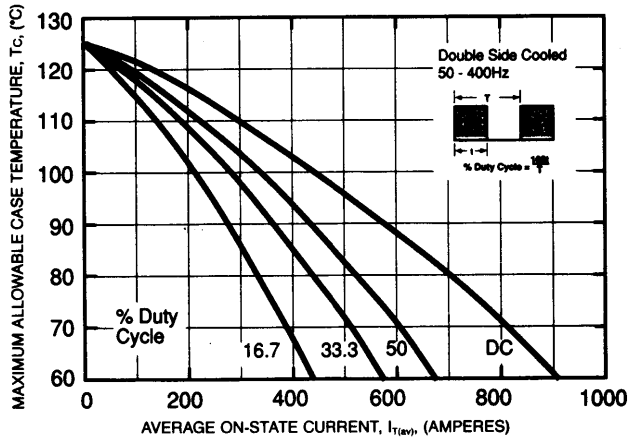
MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



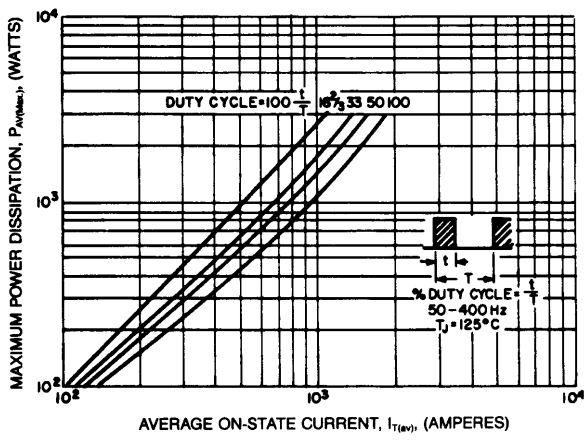
MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)



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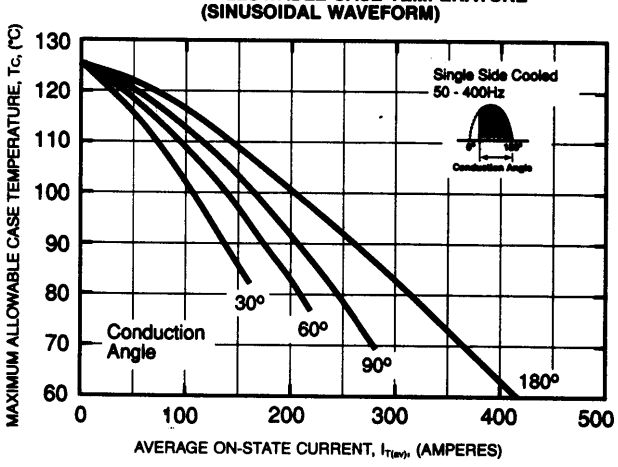
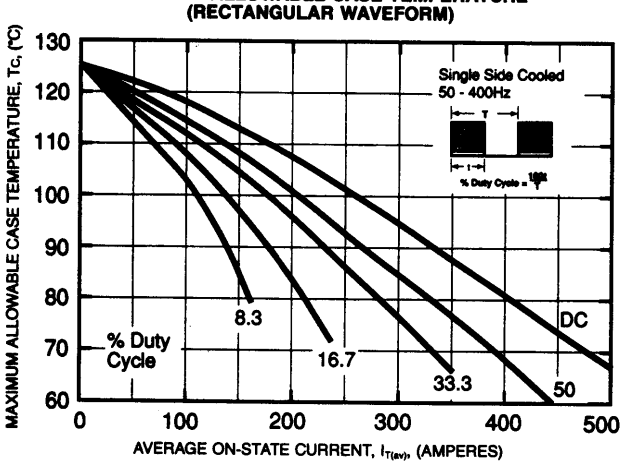
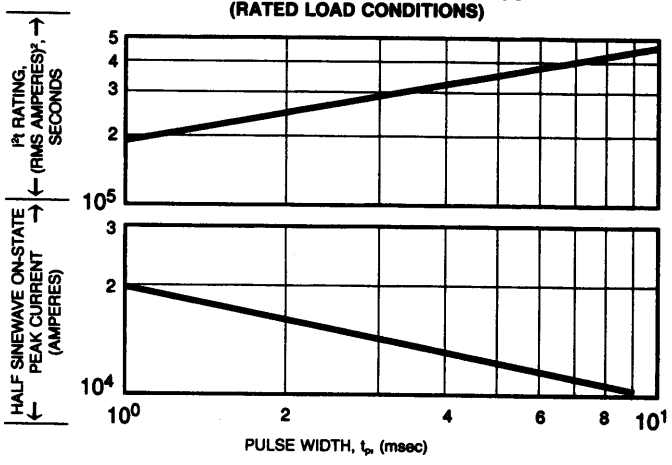
MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



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



GATE CHARACTERISTICS