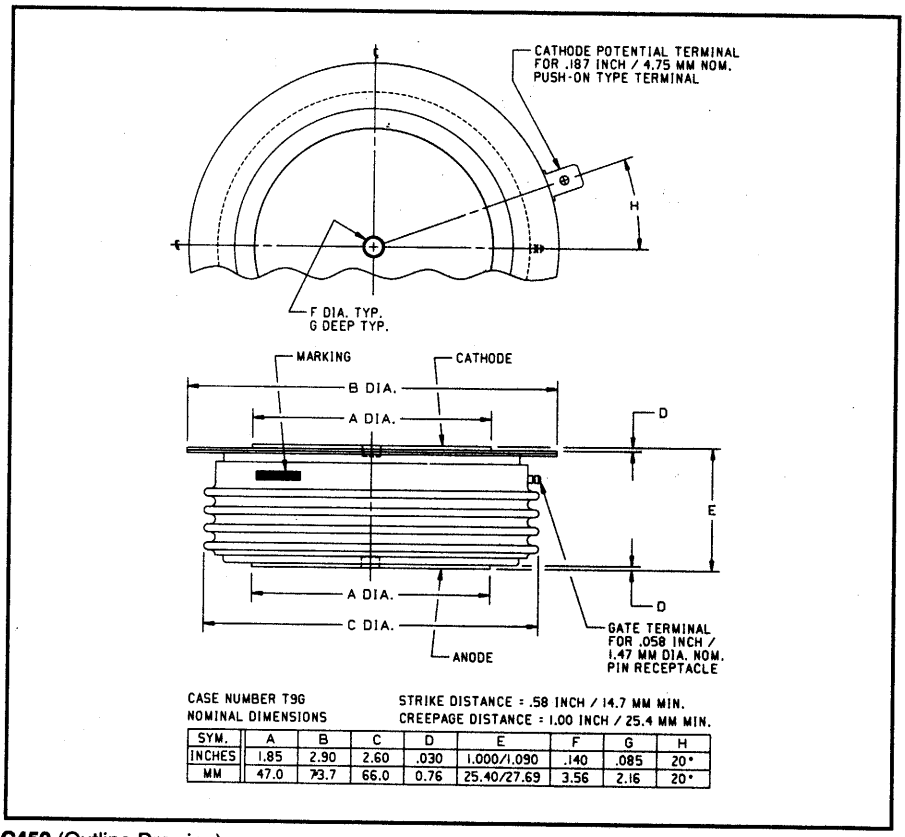
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272
Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

Phase Control SCR
1640 Amperes Average
1600 Volts



CASE NUMBER T9G
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	1.85	2.90	2.60	.030	1.000/1.090	.140	.085	20°
MM	47.0	73.7	66.0	0.76	25.40/27.69	3.56	2.16	20°

C450 (Outline Drawing)

C450 Phase Control SCR
1640 Amperes Average, 1600 Volts

Description:
Powerex Silicon Controlled Rectifiers (SCR) are designed for phase control applications. These are all-diffused, Press-Pak, hermetic Pow-R-Disc devices employing the field proven amplifying gate.

Ordering Information:
Select the complete five or six digit part number you desire from the table, i.e. C450PM is a 1600 Volt, 1640 Ampere Phase Control SCR.

Type	Voltage		Current
	V_{DRM} V_{RRM}	Code	$I_{T(av)}$
C450	600	M	1640
	800	N	
	1000	P	
	1200	PB	
	1400	PD	
	1600	PM	

Features:
- ☐ Low On-State Voltage
- ☐ High di/dt Capability
- ☐ High dv/dt Capability
- ☐ Hermetic Packaging
- ☐ Excellent Surge and I^2t Ratings

Applications:
- ☐ Power Supplies
- ☐ Motor Control
- ☐ VAR Generators

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

C450
Phase Control SCR
1640 Amperes Average, 1600 Volts

Absolute Maximum Ratings

Characteristics	Symbol	C450	Units
Non-repetitive Transient Peak Reverse Voltage	V_{RSM}	V_{RRM} + 100V	Volts
RMS On-state Current, T_C = 65°C	$I_{T(rms)}$	2575	Amperes
Average Current 180° Sine Wave, T_C = 65°C	$I_{T(av)}$	1640	Amperes
RMS On-state Current, T_C = 55°C	$I_{T(rms)}$	2790	Amperes
Average Current 180° Sine Wave, T_C = 55°C	$I_{T(av)}$	1780	Amperes
Peak One Cycle Surge On-state Current (Non-repetitive) 60Hz	I_{tsm}	28500	Amperes
Peak One Cycle Surge On-state Current (Non-repetitive) 50Hz	I_{tsm}	26000	Amperes
Critical Rate-of-rise of On-state Current (Non-repetitive)	di/dt	800	A/µsec
Critical Rate-of-rise of On-state Current (Repetitive)	di/dt	400	A/µsec
I^2t (for Fusing) for One Cycle, 60Hz	I^2t	3.4×10^6	A^2sec
Peak Gate Power Dissipation	P_{GM}	200	Watts
Average Gate Power Dissipation	$P_{G(av)}$	5	Watts
Operating Temperature	T_j	-40 to +125°C	°C
Storage Temperature	T_{stg}	-40 to +150°C	°C
Approximate Weight		1	lb.
		454	g
Mounting Force		5500 to 6000	lb.
		2450 to 2670	kg.

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

C450
Phase Control SCR
1640 Amperes Average, 1600 Volts

Electrical Characteristics, T_j = 25°C Unless Otherwise Specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Repetitive Peak Reverse Leakage Current	I_{RRM}	T_j = 125°C, $V_R = V_{RRM}$			45	mA
Repetitive Peak Forward Leakage Current	I_{DRM}	T_j = 125°C, $V_D = V_{DRM}$			45	mA
Peak On-state Voltage	V_{TM}	I_{TM} = 3000A Peak Duty Cycle < 0.1%			1.4	Volts
Threshold Voltage, Low-level	$V_{(TO)1}$	T_j = 125°C, I = 15%, $I_{T(av)}$ to $\pi I_{T(av)}$			0.6768	Volts
Slope Resistance, Low-level	r_{T1}				0.1925	mΩ
Threshold Voltage, High-level	$V_{(TO)2}$	T_j = 125°C, I = $\pi I_{T(av)}$ to I_{TSM}			1.1978	Volts
Slope Resistance, High-level	r_{T2}				0.0937	mΩ
V_{TM} Coefficients, Low-level		T_j = 125°C, I = 15% $I_{T(av)}$ to $\pi I_{T(av)}$				
					A_1 = 0.10625	
					B_1 = 0.047301	
					C_1 = 9.845E-06	
					D_1 = 0.015056	
V_{TM} Coefficients, High-level		T_j = 125°C, I = $\pi I_{T(av)}$ to I_{TSM}				
					A_2 = -2.5719	
					B_2 = 0.54707	
					C_2 = 1.157E-04	
					D_2 = -0.014735	
Typical Delay Time	t_d	I_T = 50A, Gate = 20V, 20Ω, 0.1µsec Rise		0.7		µsec
Typical Turn-off Time	t_q	T_j = 125°C, I_T = 2000A, di_R/dt = 25A/µsec Reapplied dv/dt = 200V/µsec Linear to V_{DRM}, V_R = 50V, Gate = 0V, R_{GK} = 100Ω		150		µsec
Minimum Critical dv/dt - Exponential to V_{DRM}	dv/dt	T_j = 125°C	400			V/µsec
Gate Trigger Current	I_{GT}	T_j = 25°C, V_D = 20V_{DC}, R_L = 3Ω			200	mA
Gate Trigger Voltage	V_{GT}	T_j = -40°C to +125°C, V_D = 20V, R_L = 3Ω			5.0	Volts
Non-Triggering Gate Voltage	V_{GDM}	T_j = 125°C, $V_D = V_{DRM}$, R_L = 1000Ω			0.15	Volts
Peak Forward Gate Current	I_{GTM}				10	A
Peak Reverse Gate Voltage	V_{GRM}				5	Volts

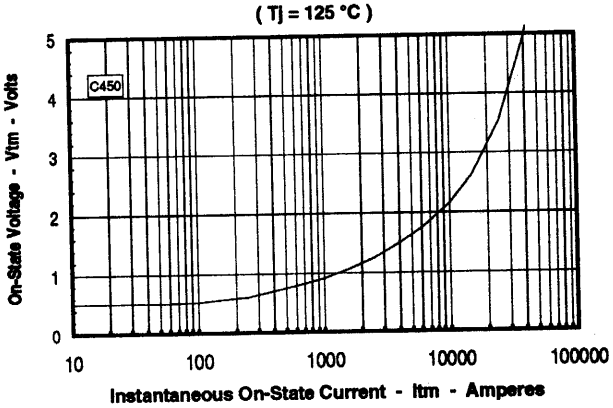
Thermal Characteristics

Maximum Thermal Resistance, Double Sided Cooling						
Junction-to-Case	$R_{\theta(j-c)}$				0.025	°C/W
Case-to-Sink	$R_{\theta(c-s)}$				0.0075	°C/W

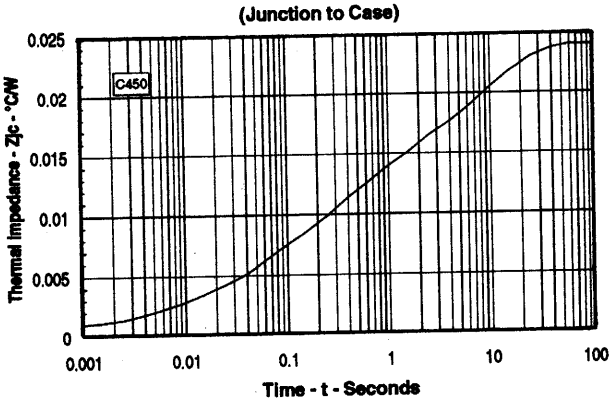
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272
Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

C450
Phase Control SCR
1640 Amperes Average, 1600 Volts

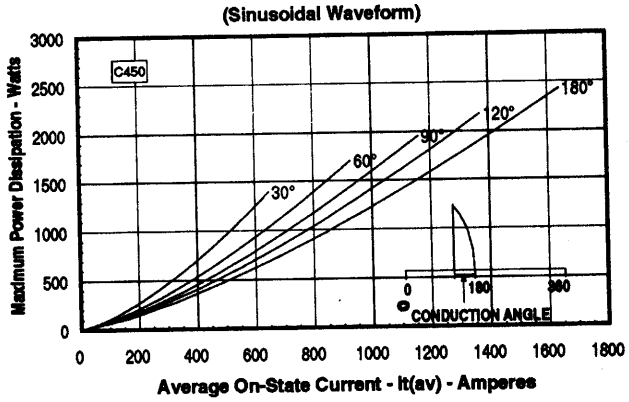
Maximum On-State Forward Voltage Drop
(TJ = 125 °C)



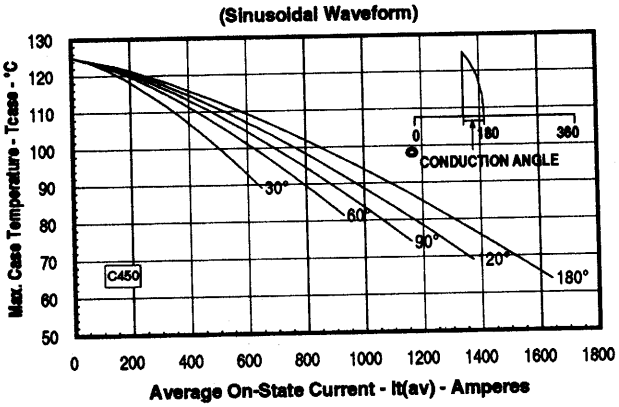
Maximum Transient Thermal Impedance
(Junction to Case)



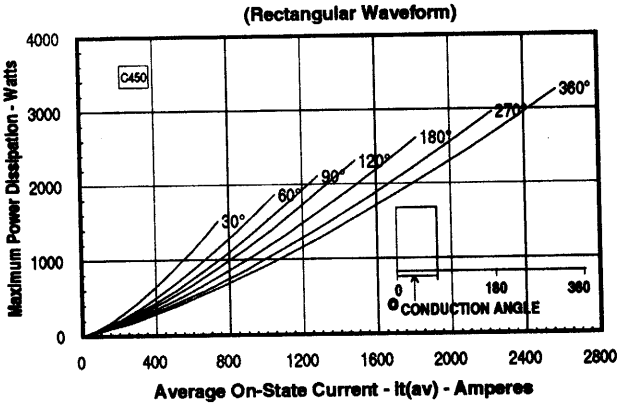
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)