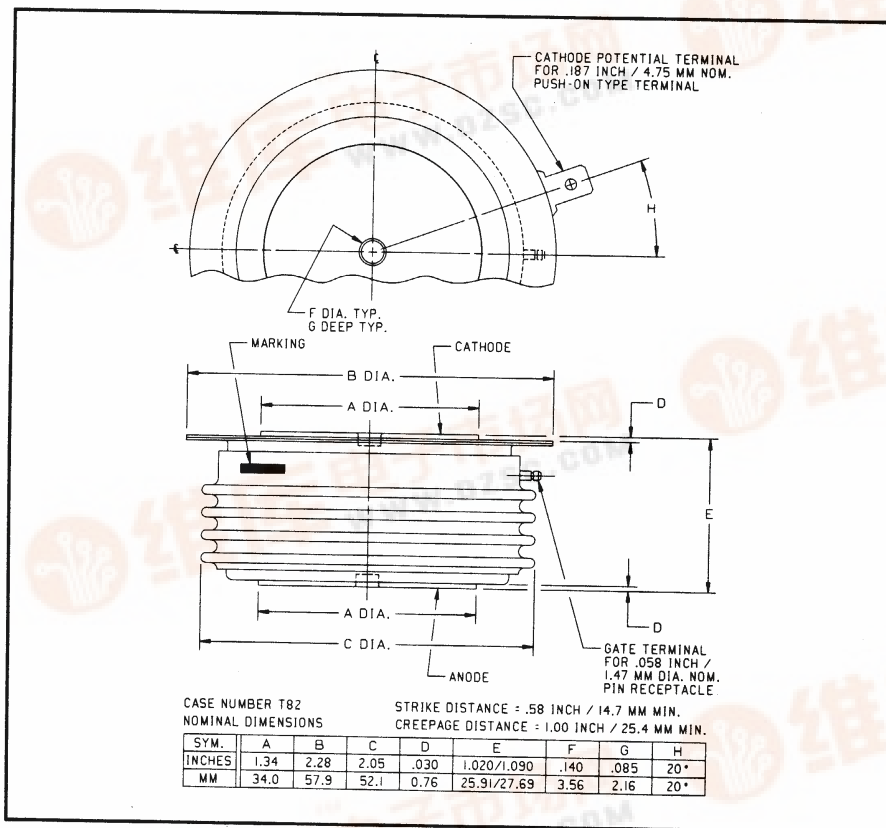


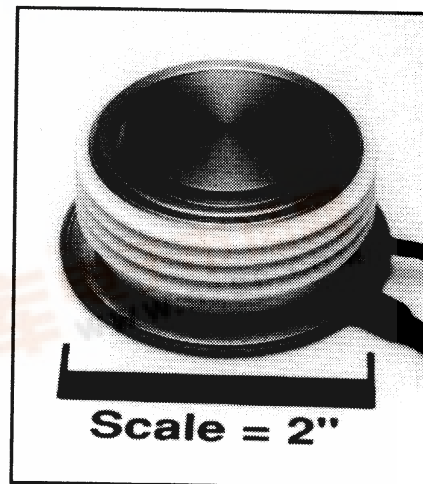
C440

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
900 Amperes Average
1600 Volts



C440 (Outline Drawing)



C440 Phase Control SCR
900 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.

Features:

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

Applications:

- ☐ Power Supplies

Ordering Information:

Select the complete five or six digit part number you desire from the table, i.e. C440PM is a 1600 Volt, 900 Ampere Phase Control SCR.

Type	Voltage		Current
	V _{DRM} V _{RPM}	Code	
C440	600	M	900
	800	N	
	1000	P	
	1200	PB	
	1400	PD	
	1600	PM	



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C440

Phase Control SCR

900 Amperes Average, 1600 Volts

Absolute Maximum Ratings

Characteristics	Symbol	C440	Units
Non-repetitive Transient Peak Reverse Voltage	V_{RSM}	$V_{RRM} + 100V$	Volts
RMS On-state Current, $T_C = 67^\circ C$	$I_{T(rms)}$	1400	Amperes
Average Current 180° Sine Wave, $T_C = 67^\circ C$	$I_{T(av)}$	900	Amperes
RMS On-state Current, $T_C = 55^\circ C$	$I_{T(rms)}$	1600	Amperes
Average Current 180° Sine Wave, $T_C = 55^\circ C$	$I_{T(av)}$	1020	Amperes
Peak One Cycle Surge On-state Current (Non-repetitive) 60Hz	I_{tsm}	13000	Amperes
Peak One Cycle Surge On-state Current (Non-repetitive) 50Hz	I_{tsm}	12000	Amperes
Critical Rate-of-rise of On-state Current (Non-repetitive)	di/dt	400	A/ μ sec
Critical Rate-of-rise of On-state Current (Repetitive)	di/dt	150	A/ μ sec
I^2t (for Fusing) for One Cycle, 60Hz	I^2t	700,000	A ² sec
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		8	oz.
		227	g
Mounting Force		3000 to 3500	lb.
		1330 to 1550	kg.



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C440

Phase Control SCR

900 Amperes Average, 1600 Volts

Electrical Characteristics, $T_j = 25^\circ\text{C}$ Unless Otherwise Specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Repetitive Peak Reverse Leakage Current	I_{RRM}	$T_j = 125^\circ\text{C}$, $V_R = V_{RRM}$			35	mA
Repetitive Peak Forward Leakage Current	I_{DRM}	$T_j = 125^\circ\text{C}$, $V_D = V_{DRM}$			35	mA
Peak On-state Voltage	V_{TM}	$I_{TM} = 3000\text{A}$ Peak Duty Cycle $< 0.1\%$			1.65	Volts
Threshold Voltage, Low-level	$V_{(TO)1}$	$T_j = 125^\circ\text{C}$, $I = 15\%$, $I_{T(av)}$ to $\pi I_{T(av)}$			0.72273	Volts
Slope Resistance, Low-level	r_{T1}				0.3798	m Ω
Threshold Voltage, High-level	$V_{(TO)2}$	$T_j = 125^\circ\text{C}$, $I = \pi I_{T(av)}$ to I_{TSM}			0.89585	Volts
Slope Resistance, High-level	r_{T2}				0.2776	m Ω
V_{TM} Coefficients, Low-level		$T_j = 125^\circ\text{C}$, $I = 15\%$ $I_{T(av)}$ to $\pi I_{T(av)}$			$A_1 = 0.78305$ $B_1 = -0.093783$ $C_1 = -9.599\text{E-}05$ $D_1 = 0.035453$	
V_{TM} Coefficients, High-level		$T_j = 125^\circ\text{C}$, $I = \pi I_{T(av)}$ to I_{TSM}			$A_2 = 15.757$ $B_2 = -2.6710$ $C_2 = -1.727\text{E-}04$ $D_2 = 0.14317$	
Typical Delay Time	t_d	$I_T = 50\text{A}$, Gate = 20V, 20 Ω , 0.1 μsec Rise		0.7		μsec
Typical Turn-off Time	t_q	$T_j = 125^\circ\text{C}$, $I_{TM} = 500\text{A}$, $di_R/dt = 25\text{A}/\mu\text{sec}$ Reapplied $dv/dt = 20\text{V}/\mu\text{sec}$ Linear to 80% V_{DRM} , $V_R \geq 50\text{V}$, Gate = 0V, $R_{GK} = 100\Omega$		125		μsec
Minimum Critical dv/dt - Exponential to V_{DRM}	dv/dt	$T_j = 125^\circ\text{C}$	200			V/ μsec
Gate Trigger Current	I_{GT}	$T_j = 25^\circ\text{C}$, $V_D = 6V_{DC}$, $R_L = 3\Omega$			150	mA
Gate Trigger Voltage	V_{GT}	$T_j = -40^\circ\text{C}$ to $+125^\circ\text{C}$, $V_D = 6V_{DC}$, $R_L = 3\Omega$			5.0	Volts
Non-Triggering Gate Voltage	V_{GDM}	$T_j = 125^\circ\text{C}$, $V_D = V_{DRM}$, $R_L = 1000\Omega$			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	$R_{\theta(j-c)}$	0.040	$^\circ\text{C}/\text{W}$
Case-to-Sink	$R_{\theta(c-s)}$	0.020	$^\circ\text{C}/\text{W}$



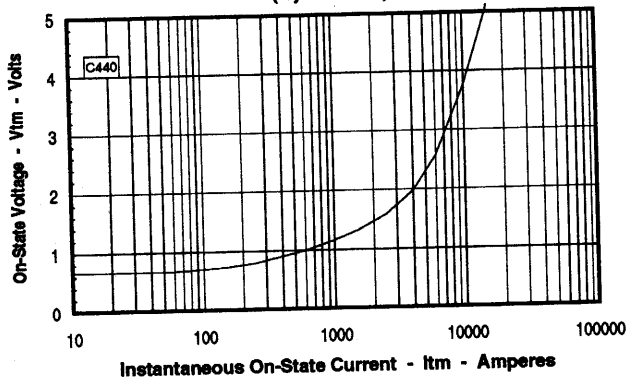
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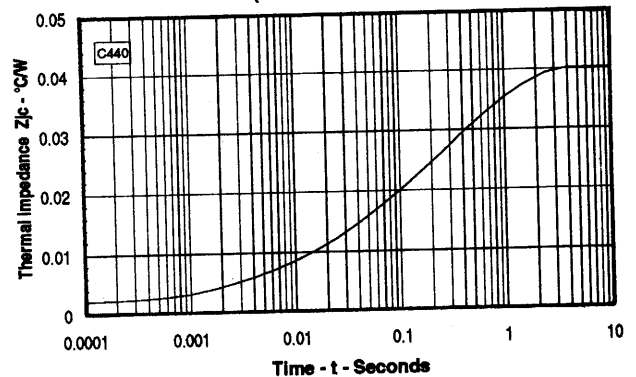
Phase Control SCR

900 Amperes Average, 1600 Volts

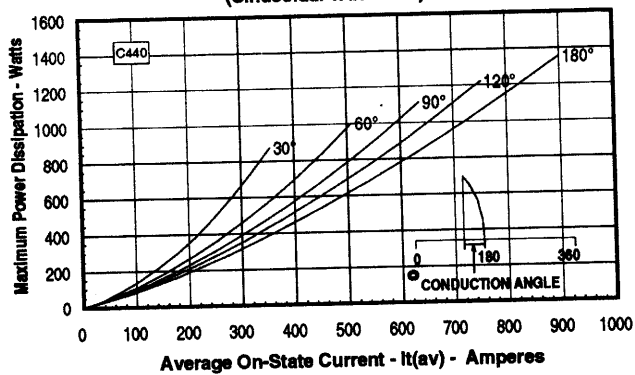
Maximum On-State Forward Voltage Drop
($T_J = 125^\circ\text{C}$)



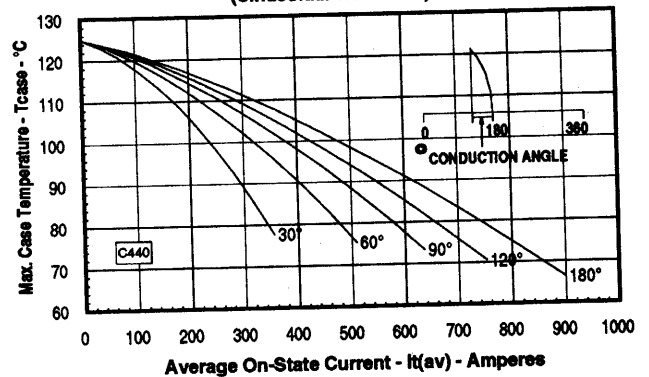
Maximum Transient Thermal Impedance
(Junction to Case)



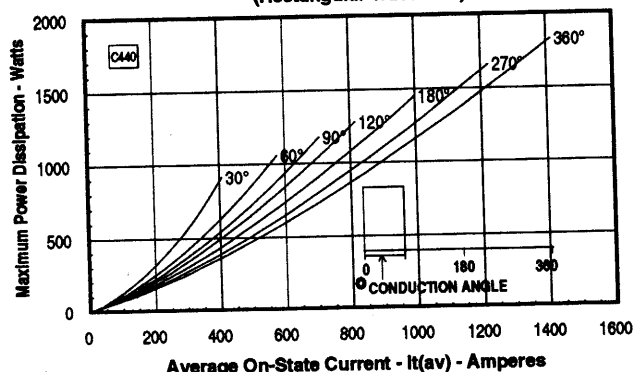
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)

