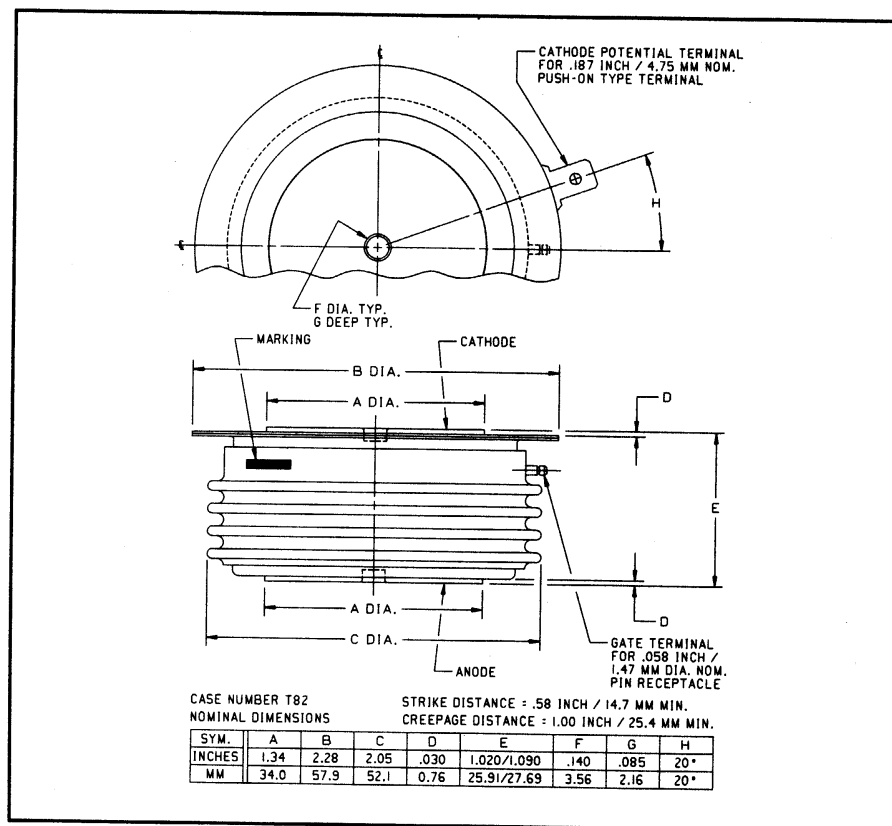
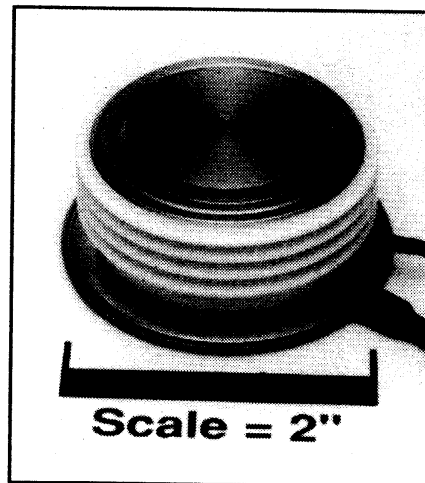


Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272
Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

Phase Control SCR 750 Amperes Average 2400 Volts



C441 (Outline Drawing)



C441 Phase Control SCR
750 Amperes Average, 2400 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
- ☐ Motor Control

Ordering Information:

Select the complete five or six digit part number you desire from the table, i.e. C441LD is a 2400 Volt, 750 Ampere Phase Control SCR.

Type	Voltage		Current
	V_{DRM} V_{RRM}	Code	
C441	1400	PD	750
	1600	PM	
	1800	PN	
	2000	L	
	2200	LB	
	2400	LD	



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C441
Phase Control SCR
750 Amperes Average, 2400 Volts

Absolute Maximum Ratings

Characteristics	Symbol	C451	Units
Non-repetitive Transient Peak Reverse Voltage	V_{RSM}	$V_{RRM} + 100V$	Volts
RMS On-state Current, $T_C = 65^\circ C$	$I_{T(rms)}$	1175	Amperes
Average Current 180° Sine Wave, $T_C = 65^\circ C$	$I_{T(av)}$	750	Amperes
RMS On-state Current, $T_C = 55^\circ C$	$I_{T(rms)}$	1295	Amperes
Average Current 180° Sine Wave, $T_C = 55^\circ C$	$I_{T(av)}$	825	Amperes
Peak One Cycle Surge On-state Current (Non-repetitive) 60Hz	I_{tsm}	11000	Amperes
Peak One Cycle Surge On-state Current (Non-repetitive) 50Hz	I_{tsm}	10000	Amperes
Critical Rate-of-rise of On-state Current (Non-repetitive)	di/dt	150	A/ μ sec
Critical Rate-of-rise of On-state Current (Repetitive)	di/dt	75	A/ μ sec
I^2t (for Fusing) for One Cycle, 60Hz	I^2t	500000	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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C441

Phase Control SCR

750 Amperes Average, 2400 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%			2.0	Volts
Threshold Voltage, Low-level	$V_{(TO)1}$	$T_j = 125^\circ\text{C}$, $I = 15\%$, $I_{T(av)}$ to $\pi I_{T(av)}$			0.870402	Volts
Slope Resistance, Low-level	r_{T1}				0.53766	m Ω
Threshold Voltage, High-level	$V_{(TO)2}$	$T_j = 125^\circ\text{C}$, $I = \pi I_{T(av)}$ to I_{TSM}			1.285229	Volts
Slope Resistance, High-level	r_{T2}				0.37519	m Ω
V_{TM} Coefficients, Low-level		$T_j = 125^\circ\text{C}$, $I = 15\%$ $I_{T(av)}$ to $\pi I_{T(av)}$			$A_1 = 0.368671$ $B_1 = 0.108542$ $C_1 = 4.872\text{E-}04$ $D_1 = -5.119\text{E-}03$	
V_{TM} Coefficients, High-level		$T_j = 125^\circ\text{C}$, $I = \pi I_{T(av)}$ to I_{TSM}			$A_2 = -5.48202$ $B_2 = 1.134485$ $C_2 = 5.015\text{E-}04$ $D_2 = 0.04941$	
Typical Delay Time	t_d	$I_T = 50\text{A}$, Gate = 20V, 20 Ω , 1 μsec Rise		0.7		μsec
Typical Turn-off Time	t_q	$T_j = 125^\circ\text{C}$, $I_T = 500\text{A}$, $di_R/dt = 25\text{A}/\mu\text{sec}$ 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}	$T_C = 125^\circ\text{C}$, $V_D = 6\text{V}$, $R_L = 3\Omega$			125	mA
Gate Trigger Voltage	V_{GT}	$T_j = -40^\circ\text{C}$ to $+125^\circ\text{C}$, $V_D = 6\text{V}_{DC}$, $R_L = 3\Omega$			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

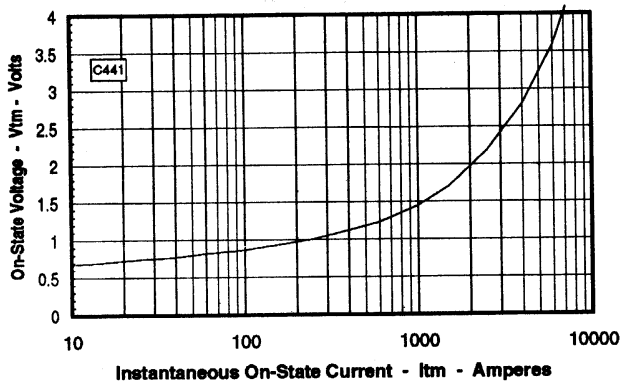
Maximum Thermal Resistance, Double Sided Cooling

Junction-to-Case	$R_{\theta(j-c)}$	0.040	$^\circ\text{C/W}$
Case-to-Sink	$R_{\theta(c-s)}$	0.020	$^\circ\text{C/W}$

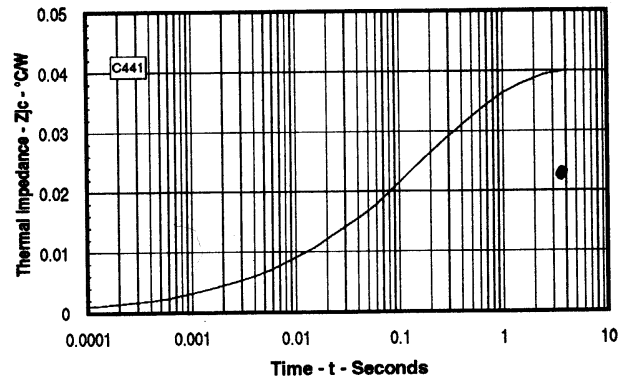
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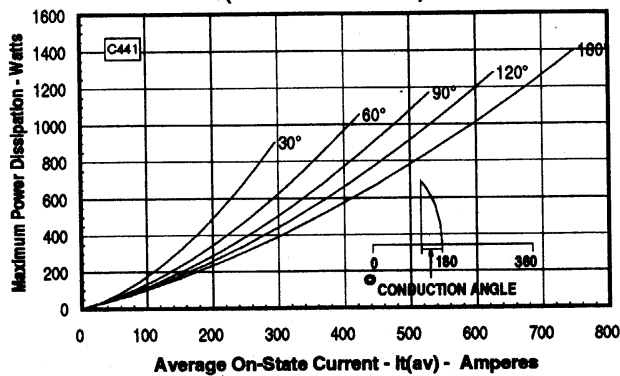
Maximum On-State Forward Voltage Drop
 ($T_J = 125^\circ\text{C}$)



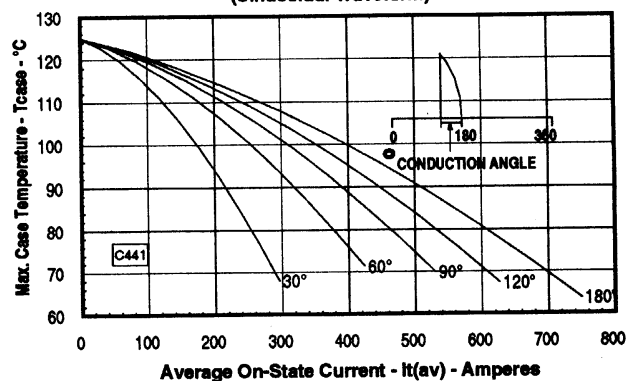
Maximum Transient Thermal Impedance
 (Junction to Case)



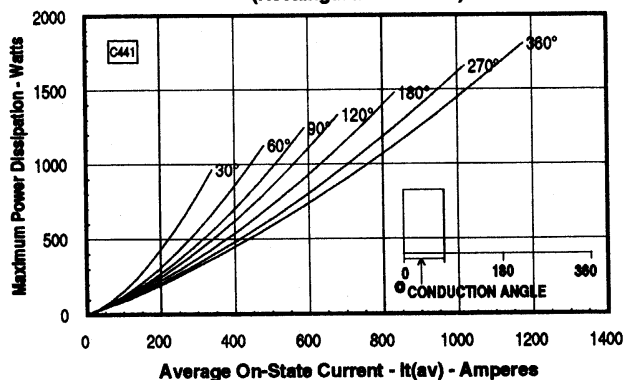
Maximum On-State Power Dissipation
 (Sinusoidal Waveform)



Maximum Allowable Case Temperature
 (Sinusoidal Waveform)



Maximum On-State Power Dissipation
 (Rectangular Waveform)



Maximum Allowable Case Temperature
 (Rectangular Waveform)

