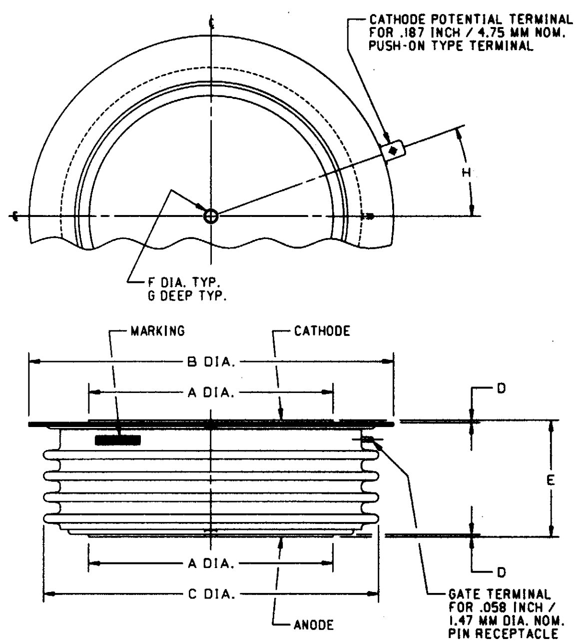
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272
Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

Phase Control SCR

1800 Amperes Average
3700 Volts

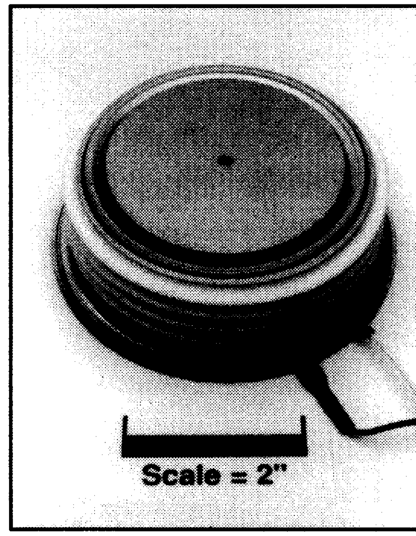


CASE NUMBER TBK
NOMINAL DIMENSIONS

STRIKE DISTANCE = 1.04 INCH / 26.4 MM MIN.
CREEPAGE DISTANCE = 1.64 INCH / 41.6 MM MIN.

SYM.	A	B	C	D	E	F	G	H
INCHES	2.88	4.36	3.95	.030	1.400/1.440	.140	.080	20°
MM	73.2	110.7	100.3	0.76	35.56/36.58	3.56	2.03	20°

C783 (Outline Drawing)



C783 Phase Control SCR
1800 Amperes Average, 3700 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
- ☐ VAR Generators

Ordering Information:

Select the complete six digit part number you desire from the table, i.e. C783CS is a 3700 Volt, 1800 Ampere Phase Control SCR.

Type	Voltage V_{DRM} V_{RRM}	Code	Current $I_{T(av)}$
C783	3000	CP	1800
	3200	CB	
	3400	CD	
	3600	CM	
	3700	CS	

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Absolute Maximum Ratings

Characteristics	Symbol	C783	Units
Non-repetitive Transient Peak Reverse Voltage	V_{RSM}	V_{RRM} + 100V	Volts
RMS On-state Current, T_C = 70°C	$I_{T(rms)}$	2826	Amperes
Average Current 180° Sine Wave, T_C = 70°C	$I_{T(av)}$	1800	Amperes
RMS On-state Current, T_C = 55°C	$I_{T(rms)}$	3300	Amperes
Average Current 180° Sine Wave, T_C = 55°C	$I_{T(av)}$	2100	Amperes
Peak One Cycle Surge On-state Current (Non-repetitive) 60Hz	I_{tsm}	29000	Amperes
Peak One Cycle Surge On-state Current (Non-repetitive) 50Hz	I_{tsm}	27000	Amperes
Critical Rate-of-rise of On-state Current (Non-repetitive)	di/dt	600	A/μsec
Critical Rate-of-rise of On-state Current (Repetitive)	di/dt	100	A/μsec
I^2t (for Fusing) for One Cycle, 60Hz	I^2t	3.5×10^6	A^2sec
Peak Gate Power Dissipation	P_{GM}	250	Watts
Average Gate Power Dissipation	$P_{G(av)}$	35	Watts
Operating Temperature	T_j	-40 to +125°C	°C
Storage Temperature	T_{stg}	-40 to +150°C	°C
Approximate Weight		3.5	lb.
		1.60	kg
Mounting Force		9000 to 10000	lb.
		40 to 44.5	kN

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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}			150	mA
Repetitive Peak Forward Leakage Current	I_{DRM}	T_j = 125°C, V_D = V_{DRM}			150	mA
Peak On-state Voltage	V_{TM}	T_j = 125°C, I_{TM} = 2000A Peak Duty Cycle < 0.1%			1.71	Volts
Threshold Voltage, Low-level	$V_{(TO)1}$	T_j = 125°C, I = 15%, $I_{T(av)}$ to $\pi I_{T(av)}$			1.1135	Volts
Slope Resistance, Low-level	r_{T1}				0.2778	mΩ
Threshold Voltage, High-level	$V_{(TO)2}$	T_j = 125°C, I = $\pi I_{T(av)}$ to I_{TSM}			1.270	Volts
Slope Resistance, High-level	r_{T2}				0.2463	mΩ
V_{TM} Coefficients, Low-level		T_j = 125°C, I = 15% $I_{T(av)}$ to $\pi I_{T(av)}$			A_1 = 0.53024 B_1 = 0.1030 C_1 = 2.481E-04 D_1 = -0.002243	
V_{TM} Coefficients, High-level		T_j = 125°C, I = $\pi I_{T(av)}$ to I_{TSM}			A_2 = 0.4700 B_2 = 0.11186 C_2 = 2.486E-04 D_2 = -0.002498	
Typical Delay Time	t_d	T_j = 125°C, V_D = 1800V		3		μsec
Typical Turn-off Time	t_q	T_j = 125°C, I_{TM} = 500A, di_R/dt = 25A/μsec Reapplied dv/dt = 20V/μsec Linear to $0.8V_{DRM}$, $V_R \geq$ 50V		200		μsec
Minimum Critical dv/dt - Exponential to V_{DRM}	dv/dt	T_j = 125°C, V_D = 0.8 V_{DRM}	500			V/μsec
Gate Trigger Current	I_{GT}	T_j = 25°C, V_D = $12V_{DC}$			250	mA
Gate Trigger Voltage	V_{GT}	T_j = 25°C, V_D = $12V_{DC}$			4.5	Volts
Non-Triggering Gate Voltage	V_{GDM}	T_j = 125°C, V_D = 1800V			0.8	Volts
Peak Forward Gate Current	I_{GTM}				20	A
Peak Reverse Gate Voltage	V_{GRM}				20	Volts

Thermal Characteristics

Maximum Thermal Resistance, Double Sided Cooling			
Junction-to-Case	$R_{\theta(j-c)}$	0.012	°C/W
Case-to-Sink	$R_{\theta(c-s)}$	0.002	°C/W

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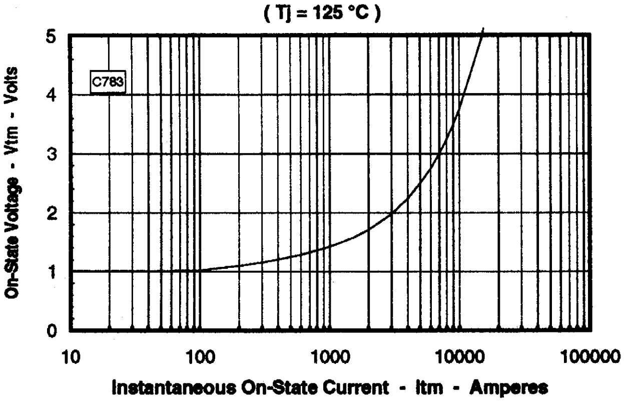
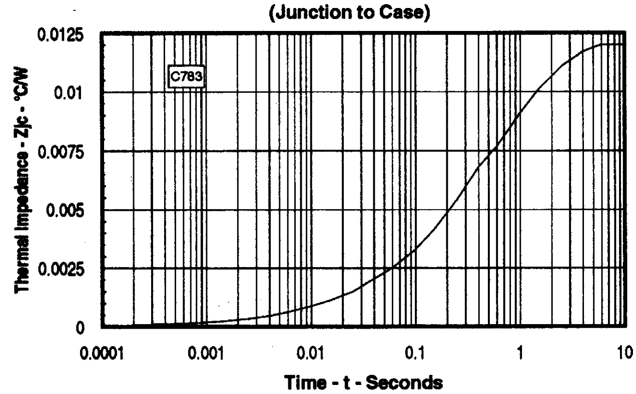
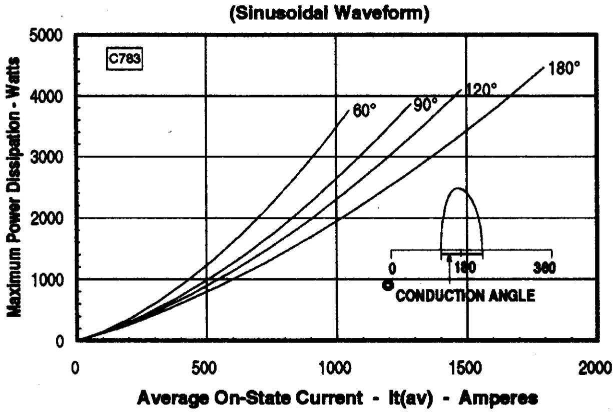
Maximum On-State Forward Voltage Drop
(Tj = 125 °C)



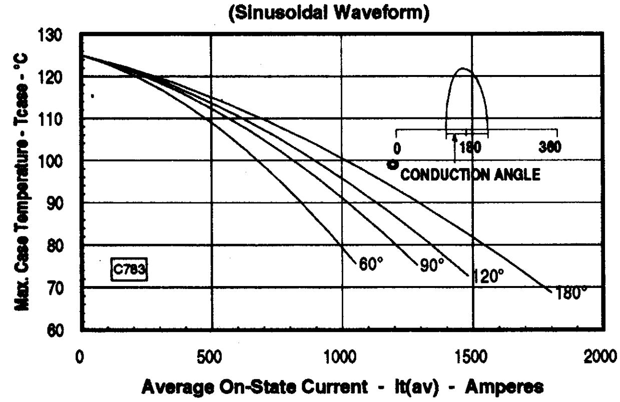
Maximum Transient Thermal Impedance
(Junction to Case)



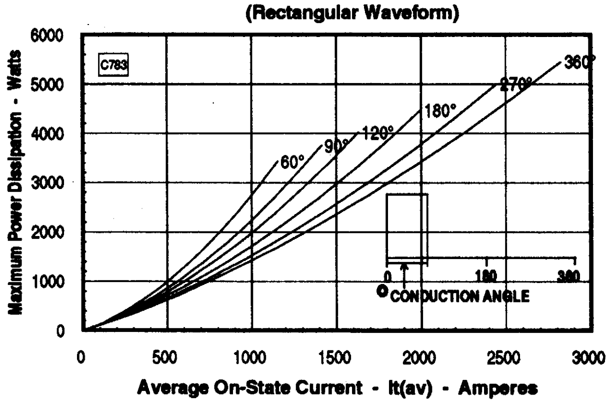
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



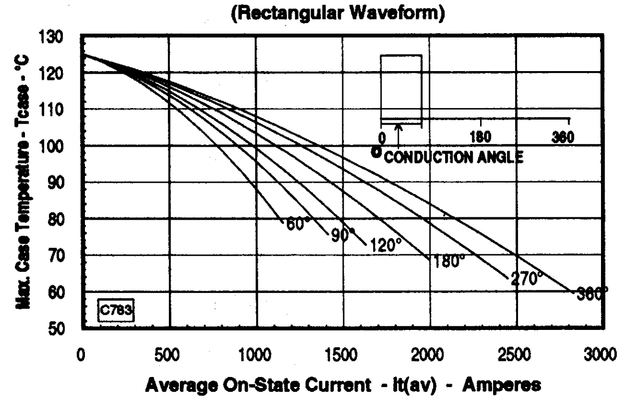
Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)



Note: Spreading losses included. Curves are for an inductive load.