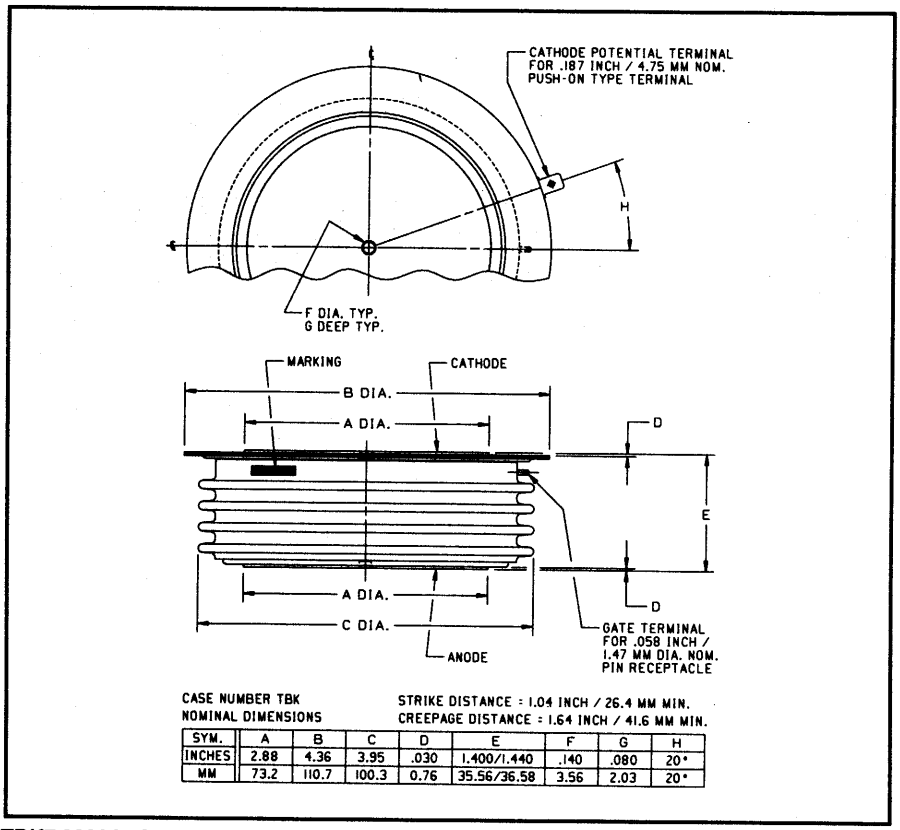
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272
Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

Phase Control SCR
3000 Amperes Average
600 Volts

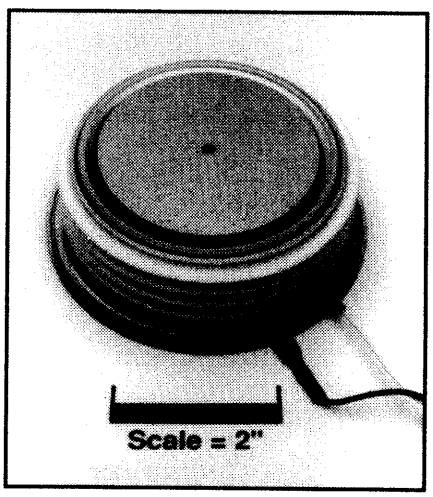


CASE NUMBER TBK
NOMINAL DIMENSIONS

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°

TBK7 3000A (Outline Drawing)



TBK7 3000A Phase Control SCR
3000 Amperes Average, 600 Volts

Description:
The TBK7 is a low voltage, high current version of the Powerex C781. 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
- ☐ Also Available in Thin Package (26mm) as TBS7 for Higher Current Capability.

Applications:
- ☐ Power Supplies
- ☐ Motor Control
- ☐ Battery Chargers

Ordering Information:
Select the complete 12 digit part number you desire from the table below.

Type	Voltage V_{DRM}/V_{RRM} (Volts)	Current $I_{T(av)}$ (A)	Turn-off t_q (µsec)	Gate Current I_{GT} (mA)	Lead Code
TBK7	02 04 06 200V 400V 600V	30 3000A	0 400µsec (Typical)	H 250mA	HE 20"

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TBK7 3000A
Phase Control SCR
3000 Amperes Average, 600 Volts

Absolute Maximum Ratings

Characteristics	Symbol	TBK7 3000A	Units
Non-repetitive Transient Peak Reverse Voltage	V_{RSM}	V_{RRM} + 100V	Volts
RMS On-state Current, T_C = 70°C	$I_{T(rms)}$	4710	Amperes
Average Current 180° Sine Wave, T_C = 70°C	$I_{T(av)}$	3000	Amperes
RMS On-state Current, T_C = 55°C	$I_{T(rms)}$	5888	Amperes
Average Current 180° Sine Wave, T_C = 55°C	$I_{T(av)}$	3750	Amperes
Peak One Cycle Surge On-state Current (Non-repetitive) 60Hz	I_{tsm}	48000	Amperes
Peak One Cycle Surge On-state Current (Non-repetitive) 50Hz	I_{tsm}	44200	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	9.6×10^6	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		6000 to 10000	lb.
		26.6 to 44.4	kN

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TBK7 3000A
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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}	I_{TM} = 3000A Peak Duty Cycle < 0.01%			1.05	Volts
Threshold Voltage, Low-level	$V_{(TO)1}$	T_j = 125°C, I = 15%, $I_{T(av)}$ to $\pi I_{T(av)}$			0.6917	Volts
Slope Resistance, Low-level	r_{T1}				0.08747	mΩ
Threshold Voltage, High-level	$V_{(TO)2}$	T_j = 125°C, I = $\pi I_{T(av)}$ to I_{TSM}			0.97621	Volts
Slope Resistance, High-level	r_{T2}				0.06881	mΩ
V_{TM} Coefficients, Low-level		T_j = 125°C, I = 15% $I_{T(av)}$ to $\pi I_{T(av)}$				
					A_1 = -0.063144	
					B_1 = 0.14784	
					C_1 = 1.161E-04	
					D_1 = -0.009048	
V_{TM} Coefficients, High-level		T_j = 125°C, I = $\pi I_{T(av)}$ to I_{TSM}				
					A_2 = 9.5164	
					B_2 = -1.3858	
					C_2 = -2.9E-05	
					D_2 = 0.05091	
Typical Delay Time	t_d	Switching from 140V, 20V, 10Ω Gate, 0.5µsec Rise Time		8		µsec
Typical Turn-off Time	t_q	T_j = 125°C, I_T = 1000A, V_R > 50V, Reapplied dv/dt = 20V/µsec Linear to 80% V_{DRM}		400		µsec
Minimum Critical dv/dt - Linear to V_{DRM}	dv/dt	T_j = 125°C, V_{DRM} = 80% Rated Gate Open	300			V/µsec
Gate Trigger Current	I_{GT}	T_j = 25°C, V_D = 12V	30		250	mA
Gate Trigger Voltage	V_{GT}	T_j = 25°C, V_D = 12V	0.5		4.0	Volts
Peak Reverse Gate Voltage	V_{GRM}				10	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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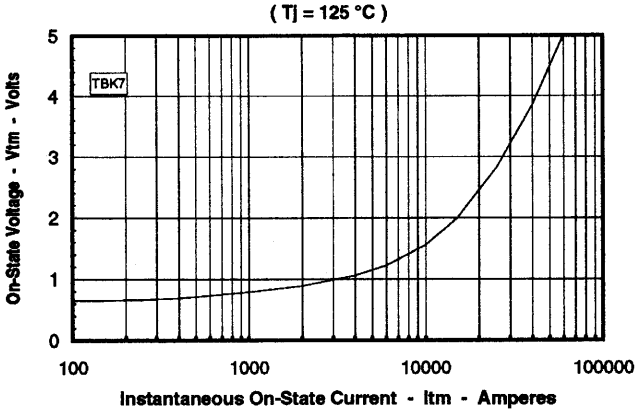
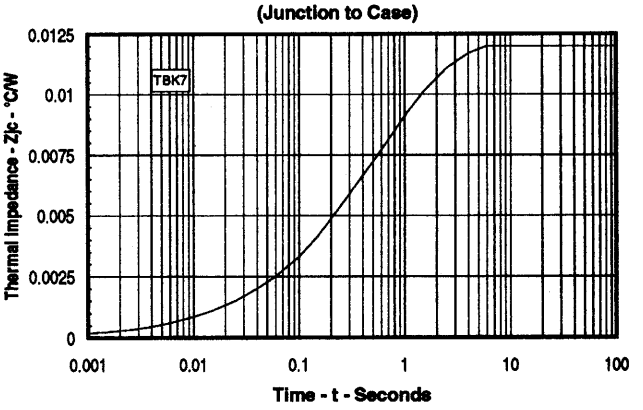
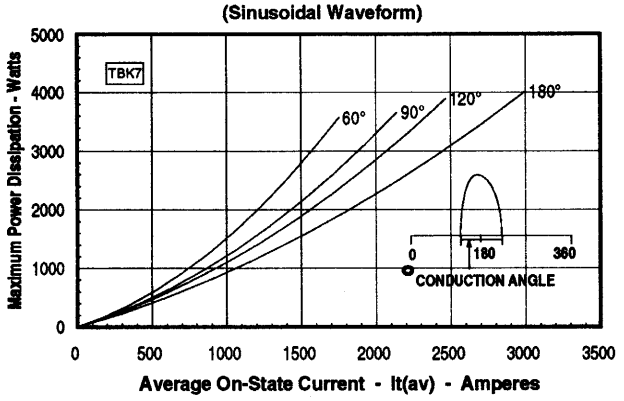
Maximum On-State Forward Voltage Drop
(Tj = 125 °C)



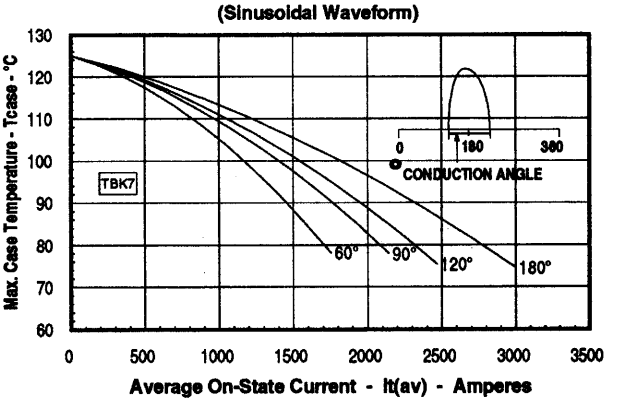
Maximum Transient Thermal Impedance
(Junction to Case)



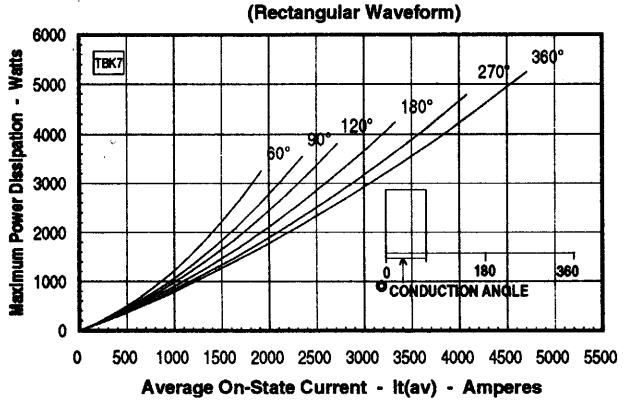
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



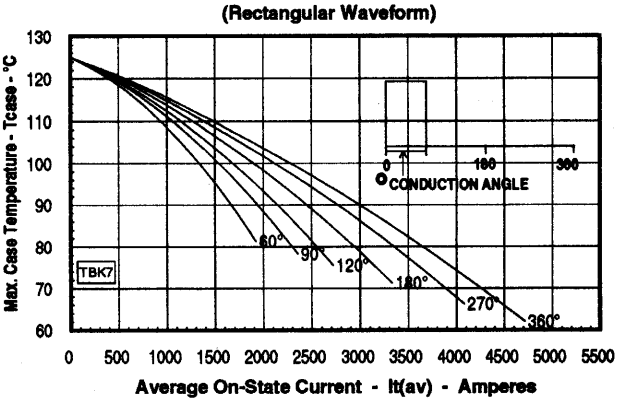
Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)



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