

The TBKC is a high voltage, high current disc pack SCR employing a high di/dt gate structure. This gate design allows the SCR to be reliably operated at high di/dt and dv/dt conditions in various phase control applications.

#### FEATURES:

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

#### APPLICATIONS:

- DC Power Supplies
- Motor Controls
- AC Soft-Starters

#### ORDERING INFORMATION

Select the complete 12 digit Part Number using the table below.  
EXAMPLE: TBKC651202DH is a 6500V-1200A SCR with 300ma IGT and 12 inch gate and cathode potential leads.

PART	Voltage Rating $V_{DRM}-V_{RRM}$	Voltage Code	Current Rating $I_{tavg}$	Current Code	Turn-Off $t_q$	Gate $I_{GT}$	Leads
<b>TBKC</b>	6500	<b>65</b>	1250	<b>12</b>	<b>0</b>	<b>2</b>	
	6200	<b>62</b>					
	6000	<b>60</b>			800us (typ.)	300ma (max)	12"

Revised: 12/1/2006

### Absolute Maximum Ratings

Characteristic	Symbol	Rating	Units
Repetitive Peak Voltage	$V_{DRM}-V_{RRM}$	6500	Volts
Average On-State Current, $T_C=70^{\circ}C$	$I_{T(Avg.)}$	1250	A
RMS On-State Current, $T_C=70^{\circ}C$	$I_{T(RMS)}$	1963	A
Average On-State Current, $T_C=50^{\circ}C$	$I_{T(Avg.)}$	1500	A
RMS On-State Current, $T_C=50^{\circ}C$	$I_{T(RMS)}$	2356	A
Peak One Cycle Surge Current, 60Hz, $V_R=0V$	$I_{TSM}$	22,000	A
Peak One Cycle Surge Current, 50Hz, $V_R=0V$	$I_{TSM}$	20,742	A
Fuse Coordination $I^2t$ , 60Hz	$I^2t$	2.02E+06	A <sup>2</sup> s
Fuse Coordination $I^2t$ , 50Hz	$I^2t$	2.15E+06	A <sup>2</sup> s
Critical Rate-of-Rise of On-State Current Repetitive $.67 \cdot V_{DRM}$	di/dt	100	A/us
Critical Rate-of-Rise of On-State Current Non-Repetitive $.67 \cdot V_{DRM}$	di/dt	200	A/us
Peak Gate Power, 100us	$P_{GM}$	16	Watts
Average Gate Power	$P_{G(avg)}$	5	Watts
Operating Temperature	$T_j$	-40 to+125	$^{\circ}C$
Storage Temperature	$T_{Stg.}$	-50 to+150	$^{\circ}C$
Approximate Weight		3.5	lb
		1.59	Kg
Mounting Force		9000-10000	lbs
		40 - 44.5	KNewtons

Information presented is based upon manufacturers preliminary testing and projected capabilities. This information is subject to change without notice. The manufacturer makes no claim as to suitability for use, reliability, capability or future availability of this product.

**Electrical Characteristics, T<sub>j</sub>=25°C unless otherwise specified**

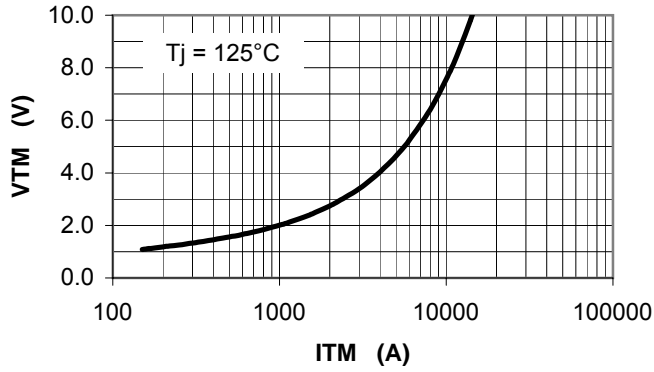
Characteristic	Symbol	Test Conditions	Rating			Units
			min	typ	max	
Repetitive Peak Forward Leakage Current	I <sub>DRM</sub>	T <sub>j</sub> =125°C, V <sub>DRM</sub> =Rated			400	ma
Repetitive Peak Reverse Leakage Current	I <sub>RPM</sub>	T <sub>j</sub> =125°C, V <sub>RPM</sub> =Rated			400	ma
Peak On-State Voltage	V <sub>TM</sub>	T <sub>j</sub> =125°C, I <sub>TM</sub> =2000A			2.75	V
V <sub>TM</sub> Model, Low Level	V <sub>0</sub>	T <sub>j</sub> =125°C			1.153	V
V <sub>TM</sub> = V <sub>0</sub> + r•I <sub>TM</sub>	r	15% I <sub>TM</sub> - π•I <sub>TM</sub>			7.44E-04	Ω
V <sub>TM</sub> Model, High Level	V <sub>0</sub>	T <sub>j</sub> =125°C			1.79	V
V <sub>TM</sub> = V <sub>0</sub> + r•I <sub>TM</sub>	r	π•I <sub>TM</sub> - I <sub>TSM</sub>			5.60E-04	Ω
V <sub>TM</sub> Model, 4-Term	A	T <sub>j</sub> =125°C			0.000150	
V <sub>TM</sub> = A + B•Ln(I <sub>TM</sub> ) +	B	15% I <sub>TM</sub> - I <sub>TSM</sub>			0.184	
C•(I <sub>TM</sub> ) + D•(I <sub>TM</sub> ) <sup>1/2</sup>	C				0.000509	
	D				0.00634	
Turn-On Delay Time	t <sub>d</sub>	V <sub>D</sub> = 0.5•V <sub>DRM</sub> Gate Drive: 40V - 20Ω			2.5	us
Turn-Off Time	t <sub>q</sub>	T <sub>j</sub> =125°C dv/dt = 20V/us to 80% V <sub>DRM</sub>			800	us
Reverse Recovery Current	I <sub>R(Rec)</sub>	T <sub>j</sub> =125°C 2000A -10A/us			200	A
Reverse Recovery Charge	Q <sub>RR</sub>				2800	uCoul
dv/dt <sub>(Crit)</sub>	dv/dt	T <sub>j</sub> =125°C Exp. Waveform V <sub>D</sub> =80% Rated			1000	V/us
Gate Trigger Current	I <sub>GT</sub>	T <sub>j</sub> =25°C V <sub>D</sub> = 12V	40	175	300	ma
Gate Trigger Voltage	V <sub>GT</sub>		0.8	2.0	5.0	V
Peak Reverse Gate Voltage	V <sub>GPM</sub>				5	V

**Thermal Characteristics**

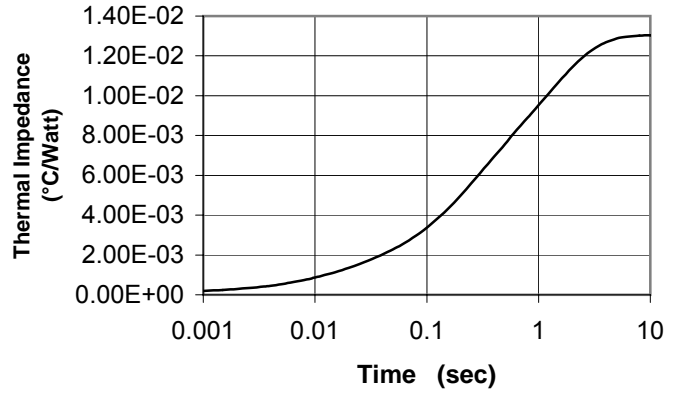
Characteristic	Symbol	Test Conditions	Rating			Units
			min	typ	max	
Thermal Resistance						
Junction to Case	Rθ <sub>jc</sub>	Double side cooled		0.0115	0.013	°C/Watt
Case to Sink	Rθ <sub>cs</sub>	Double side cooled		0.0015	0.002	°C/Watt

Characteristic	Symbol	Test Conditions	min	typ	max	Units	
Thermal Impedance Model	Zθ <sub>jc</sub>	Double side cooled					
Zθ <sub>jc</sub> (t) = Σ(A(N)•(1-exp(-t/Tau(N))))		where:	N =	1	2	3	4
			A(N) =	1.10E-04	8.86E-04	4.54E-03	7.50E-03
			Tau(N) =	5.05E-04	1.33E-02	1.95E-01	1.30E+00

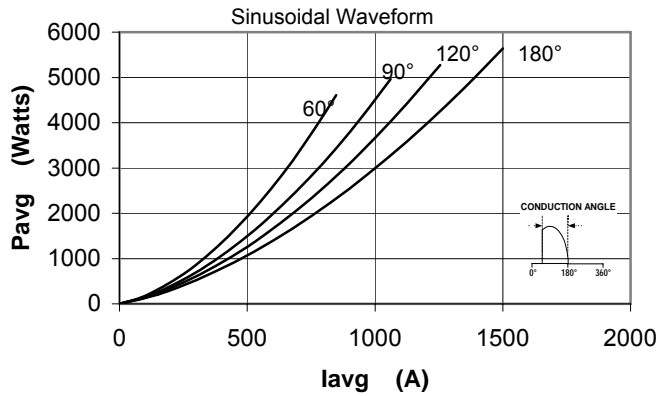
**Maximum On-State Voltage Drop**



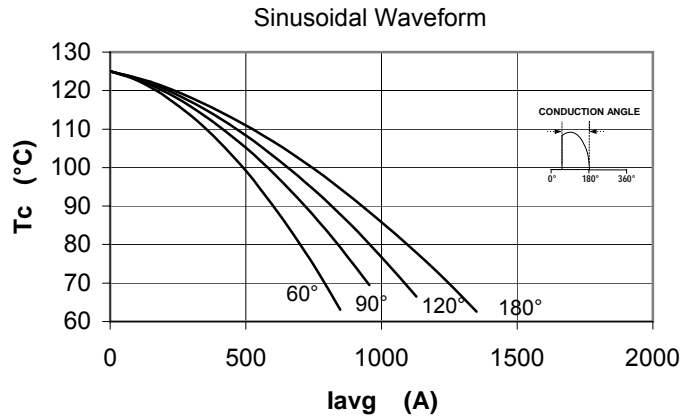
**MAXIMUM TRANSIENT THERMAL IMPEDANCE**



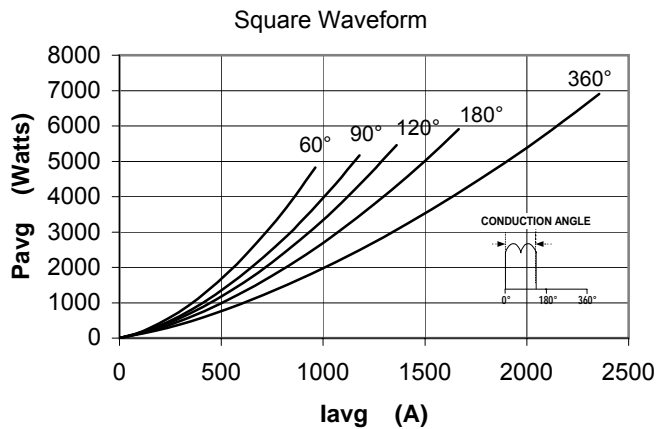
**Maximum On-State Power Dissipation**



**Maximum Allowable Case Temperature**



**Maximum On-State Power Dissipation**



**Maximum Allowable Case Temperature**

