

The TAKC 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: TAKC651103DH is a 6500V-1100A SCR with 200ma 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>TAKC</b>	6500	<b>65</b>	1100	<b>11</b>	<b>0</b>	<b>3</b>	<b>DH</b>
	6200	<b>62</b>					
	6000	<b>60</b>			600us (typ.)	200ma (max)	12"

Revised: 4/4/2006

**Absolute Maximum Ratings**

Characteristic	Symbol	Rating	Units
Repetitive Peak Voltage	$V_{DRM}-V_{RRM}$	6500	Volts
Average On-State Current, $T_C= 70\text{ }^\circ\text{C}$	$I_{T(Avg.)}$	1100	A
RMS On-State Current, $T_C= 70\text{ }^\circ\text{C}$	$I_{T(RMS)}$	1728	A
Average On-State Current, $T_C= 55\text{ }^\circ\text{C}$	$I_{T(Avg.)}$	1275	A
RMS On-State Current, $T_C= 55\text{ }^\circ\text{C}$	$I_{T(RMS)}$	2003	A
Peak One Cycle Surge Current, 60Hz, $V_R=0V$	$I_{TSM}$	12,000	A
Peak One Cycle Surge Current, 50Hz, $V_R=0V$	$I_{TSM}$	11,314	A
Fuse Coordination $I^2t$ , 60Hz	$I^2t$	6.00E+05	$A^2s$
Fuse Coordination $I^2t$ , 50Hz	$I^2t$	6.40E+05	$A^2s$
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	$^\circ\text{C}$
Storage Temperature	$T_{Stg.}$	-50 to+150	$^\circ\text{C}$
Approximate Weight		2.2	lb
		1.00	Kg
Mounting Force		8000-10000	lbs
		35.6 - 44.5	Knewtons

The information on this datasheet is based upon Powerex testing and projected ratings and is subject to change without notice. Powerex makes no implicit or explicit claim to reliability, capability, performance or suitability of this product for a users application. Powerex makes no guarantee of future availability of this product.

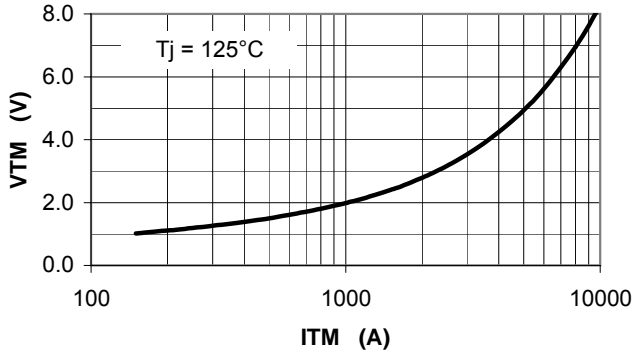
**Electrical Characteristics, T<sub>j</sub>=25°C unless otherwise specified**

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		170	200	ma
Repetitive Peak Reverse Leakage Current	I <sub>R<sub>RM</sub></sub>	T <sub>j</sub> =125°C, V <sub>R<sub>RM</sub></sub> =Rated		100	150	ma
Peak On-State Voltage	V <sub>TM</sub>	T <sub>j</sub> =125°C, I <sub>TM</sub> =2000A			2.80	V
V <sub>TM</sub> Model, Low Level	V <sub>0</sub>	T <sub>j</sub> =125°C			1.06	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>			8.37E-04	Ω
V <sub>TM</sub> Model, 4-Term	A	T <sub>j</sub> =125°C			0.00194	
V <sub>TM</sub> = A + B•Ln(I <sub>TM</sub> ) +	B	15% I <sub>TM</sub> - I <sub>TSM</sub>			0.170	
C•(I <sub>TM</sub> ) + D•(I <sub>TM</sub> ) <sup>1/2</sup>	C				0.000609	
	D				0.00619	
Turn-On Delay Time	t <sub>d</sub>	V <sub>D</sub> = 0.5•V <sub>DRM</sub> Gate Drive: 40V - 20Ω		3.0		us
Turn-Off Time	t <sub>q</sub>	T <sub>j</sub> =125°C dv/dt = 20V/us to 67% V <sub>DRM</sub>		650		us
Reverse Recovery Current	I <sub>R(Rec)</sub>	T <sub>j</sub> =125°C 1000A -10A/us VR = 50V		220		A
Reverse Recovery Charge	Q <sub>RR</sub>			2200		uCoul
Reverse Recovery Current Distribution	I <sub>R(Rec)</sub>	T <sub>j</sub> =125°C 600A -10A/us VR =50V	5% 140	50% 180	95% 210	A
dv/dt <sub>(Crit)</sub>	dv/dt	T <sub>j</sub> =125°C Exp. Waveform V <sub>D</sub> =67% Rated	1000	>2000		V/us
Gate Trigger Current	I <sub>GT</sub>	T <sub>j</sub> =25°C V <sub>D</sub> = 12V	30	100	200	ma
Gate Trigger Voltage	V <sub>GT</sub>		0.8	1.5	3.0	V
Peak Reverse Gate Voltage	V <sub>G<sub>RM</sub></sub>				5	V

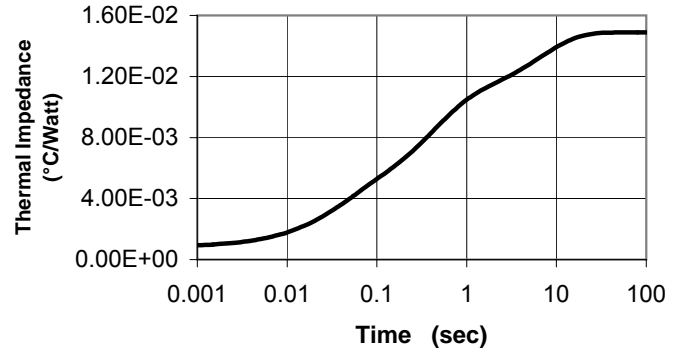
**Thermal Characteristics**

Characteristic	Symbol	Test Conditions	Rating			Units
			min	typ	max	
Thermal Resistance						
Junction to Case	Rθ <sub>jc</sub>	Double side cooled		0.013	0.015	°C/Watt
Case to Sink	Rθ <sub>cs</sub>	Double side cooled		0.0035	0.004	°C/Watt
Thermal Impedance Model						
Zθ <sub>jc</sub>	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) =	8.33E-04	3.16E-03	6.35E-03	4.54E-03
		Tau(N) =	2.53E-06	3.53E-02	4.00E-01	6.43E+00

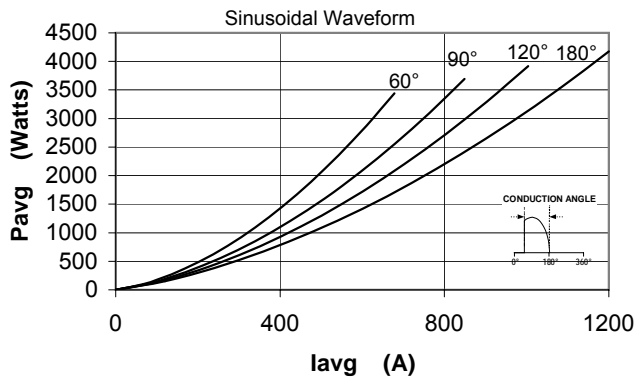
**Maximum On-State Voltage Drop**



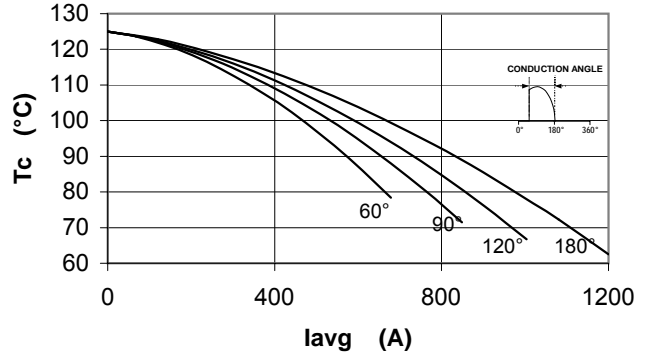
**MAXIMUM TRANSIENT THERMAL IMPEDANCE**



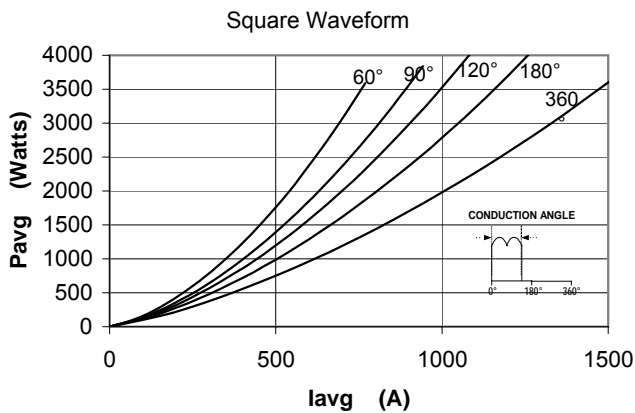
**Maximum On-State Power Dissipation**



**Maximum Allowable Case Temperature**  
 Sinusoidal Waveform



**Maximum On-State Power Dissipation**



**Maximum Allowable Case Temperature**  
 Square Waveform

