

The T8KC 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 I²t Ratings

APPLICATIONS:

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

ORDERING INFORMATION

Select the complete 12 digit Part Number using the table below.
 EXAMPLE: T8K7653203DH is a 6500V-325A SCR with 200ma I_{GT} 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
T8KC	6500	65	325	32	0	3	DH
	6200	62					
	6000	60			500us (typ.)	200ma (max)	12"

Revised: 7/20/2004

Absolute Maximum Ratings

Characteristic	Symbol	Rating	Units
Repetitive Peak Voltage	$V_{DRM}-V_{RRM}$	6500	Volts
Average On-State Current, $T_C=70^\circ\text{C}$	$I_{T(Avg.)}$	325	A
RMS On-State Current, $T_C=70^\circ\text{C}$	$I_{T(RMS)}$	511	A
Average On-State Current, $T_C=55^\circ\text{C}$	$I_{T(Avg.)}$	375	A
RMS On-State Current, $T_C=55^\circ\text{C}$	$I_{T(RMS)}$	589	A
Peak One Cycle Surge Current, 60Hz, $V_R=0V$	I_{TSM}	4,500	A
Peak One Cycle Surge Current, 50Hz, $V_R=0V$	I_{TSM}	4,243	A
Fuse Coordination I^2t , 60Hz	I^2t	8.44E+04	A ² s
Fuse Coordination I^2t , 50Hz	I^2t	9.00E+04	A ² 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	°C
Storage Temperature	$T_{Stg.}$	-50 to+150	°C
Approximate Weight		0.6	lb
		0.27	Kg
Mounting Force		3000-3500	lbs
		13.3 - 15.5	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, Tj=25°C unless otherwise specified

Characteristic	Symbol	Test Conditions	Rating			Units
			min	typ	max	
Repetitive Peak Forward Leakage Current	I_{DRM}	Tj=125°C, V_{DRM} =Rated		70	100	ma
Repetitive Peak Reverse Leakage Current	I_{RRM}	Tj=125°C, V_{RRM} =Rated		70	100	ma
Repetitive Peak Leakage Current Distribution	I_{DRM}	Tj=125°C, Voltage=Rated	5%	50%	95%	ma
	I_{RRM}		30	45	65	
Peak On-State Voltage	V_{TM}	Tj=125°C, I_{TM} =1000A			4.40	V
V_{TM} Model, Low Level	V_0	Tj=125°C			1.1698667	V
	r	$15\% I_{TM} - \pi \cdot I_{TM}$			3.26E-03	Ω
V_{TM} Model, High Level	V_0	Tj=125°C			1.8617225	V
	r	$\pi \cdot I_{TM} - I_{TSM}$			2.68E-03	Ω
V_{TM} Model, 4-Term	A	Tj=125°C			0.246	
	B	$15\% I_{TM} - I_{TSM}$			0.170	
	C				2.56E-03	
	D				1.27E-02	
Turn-On Delay Time	t_d	$V_D = 0.5 \cdot V_{DRM}$		2.0	2.5	us
		Gate Drive: 40V - 20 Ω				
Turn-Off Time	t_q	Tj=125°C $dv/dt = 20V/us$ to 67% V_{DRM}		450	600	us
Reverse Recovery Current	$I_{R(Rec)}$	Tj=125°C 600A -10A/us		90		A
Reverse Recovery Charge	Q_{RR}			1230		uCoul
Reverse Recovery Current Distribution	$I_{R(Rec)}$	Tj=125°C 600A -10A/us	5%	50%	95%	A
			75	85	95	
$dv/dt_{(Crit)}$	dv/dt	Tj=125°C Exp. Waveform $V_D = 67\%$ Rated	1000	>2000		V/us
Gate Trigger Current	I_{GT}	Tj=25°C $V_D = 12V$	30	100	200	ma
Gate Trigger Voltage	V_{GT}		0.8	1.5	3.0	V
Peak Reverse Gate Voltage	V_{GRM}			5		V

Thermal Characteristics

Characteristic	Symbol	Test Conditions	Rating			Units
			min	typ	max	
Thermal Resistance						
Junction to Case	$R\theta_{jc}$	Double side cooled		0.038	0.042	°C/Watt
Case to Sink	$R\theta_{cs}$	Double side cooled		0.007	0.0085	°C/Watt

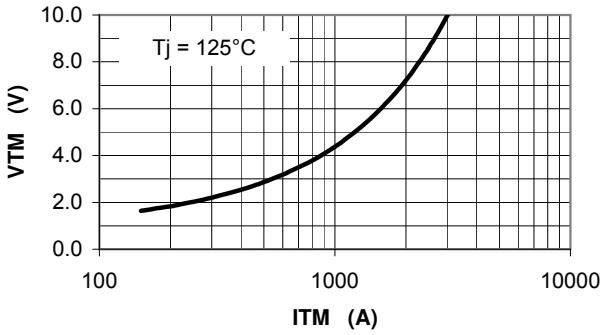
 Thermal Impedance Model $Z\theta_{jc}$ Double side cooled

$$Z\theta_{jc}(t) = \sum(A(N) \cdot (1 - \exp(-t/\tau(N))))$$

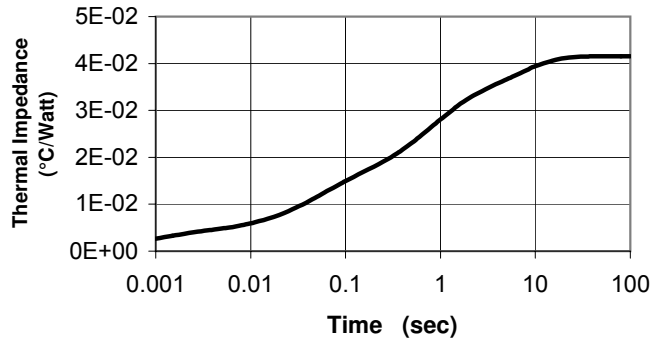
where: N = 1 2 3 4

A(N) =	3.68E-03	9.85E-03	1.68E-02	1.12E-02
Tau(N) =	9.55E-04	4.49E-02	6.87E-01	6.00E+00

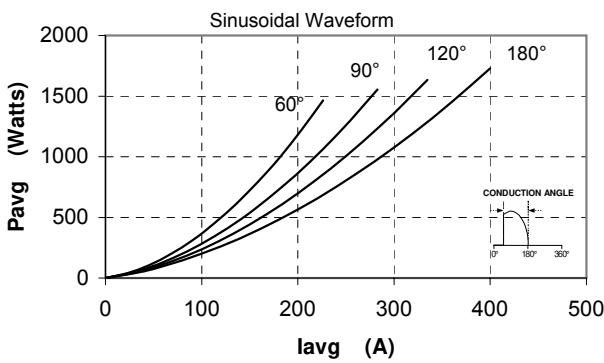
Maximum On-State Voltage Drop



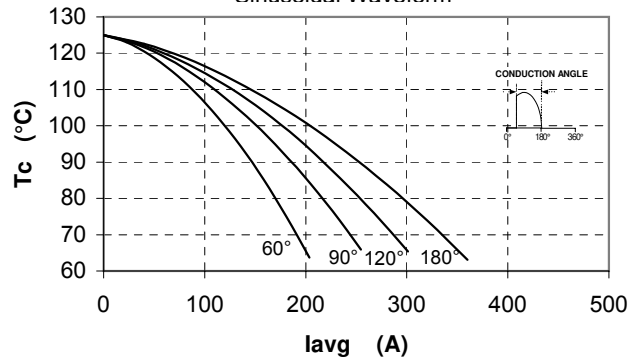
MAXIMUM TRANSIENT THERMAL IMPEDANCE



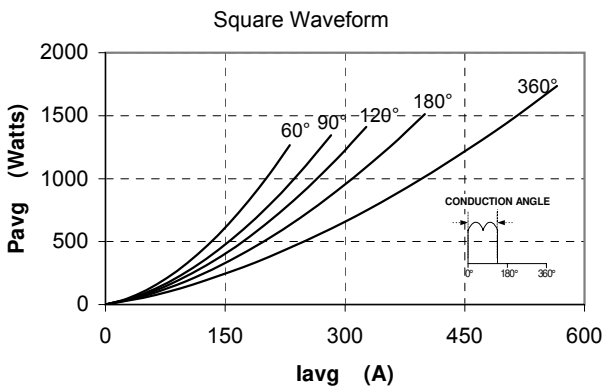
Maximum On-State Power Dissipation



Maximum Allowable Case Temperature
Sinusoidal Waveform



Maximum On-State Power Dissipation



Maximum Allowable Case Temperature
Square Waveform

