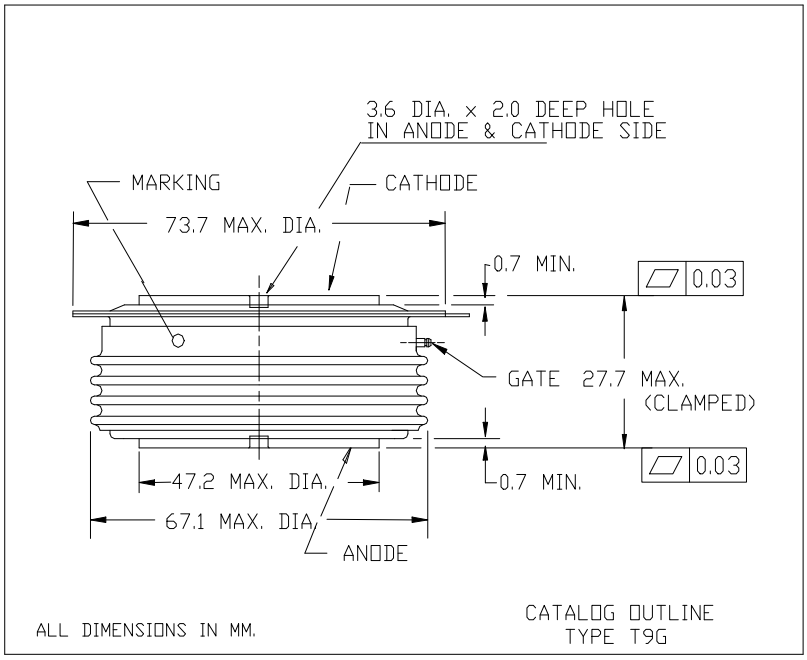
T9KC__0603

Phase Control Thyristor

Powerex, Inc., 173 Pavilion Ln, Youngwood, PA 15697-1800 (724)925-7272 WWW.PWRX.COM

600 Amperes 6500 Volts



The T9KC 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: T9KC650603DH is a 6500V-600A SCR with 200ma IGT and 12 inch gate and cathode potential leads.

PART	Voltage Rating	Voltage Code	Current Rating	Current Code	Turn-Off	Gate	Leads
	V_{DRM}-V_{RRM}		I_{tavg}		tq	I_{GT}	
T9KC	6500	**65**	600	**06**	**0**	**3**	**DH**
	6200	**62**					
	6000	**60**			600us	200ma	12"
					(typ.)	(max)	

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Absolute Maximum Ratings

Characteristic	Symbol		Rating	Units
Repetitive Peak Voltage	V_{DRM}-V_{RRM}		6500	Volts
Average On-State Current, T_C= 73 °C	$I_{T(Avg.)}$		600	A
RMS On-State Current, T_C= 73 °C	$I_{T(RMS)}$		942	A
Average On-State Current, T_C= 56 °C	$I_{T(Avg.)}$		700	A
RMS On-State Current, T_C= 56 °C	$I_{T(RMS)}$		1100	A
Peak One Cycle Surge Current, 60Hz, V_R=0V	I_{TSM}		7,750	A
Peak One Cycle Surge Current, 50Hz, V_R=0V	I_{TSM}		7,307	A
Fuse Coordination I^2t, 60Hz	I^2t		2.50E+05	A^2s
Fuse Coordination I^2t, 50Hz	I^2t		2.67E+05	A^2s
Critical Rate-of-Rise of On-State Current	di/dt	-- Rep.	150	A/us
.67•V_{DRM} I_{TM} = 600A	di/dt	-- Non-Rep.	300	A/us
Gate Drive: 20V 10Ω Tr=0.5us				
Peak Gate Power, 100us	P_{GM}		16	Watts
Average Gate Power	$P_{G(avg)}$		5	Watts
Operating Temperature	Tj		-40 to+125	°C
Storage Temperature	$T_{Stg.}$		-50 to+150	°C
Approximate Weight			1	lb
			0.45	Kg
Mounting Force			5500-6000	lbs
			24.5 - 26.7	Knewtons

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Electrical Characteristics, Tj=25°C unless otherwise specified

Characteristic	Symbol	Test Conditions	Rating min	Rating typ	Rating max	Units
Repetitive Peak Forward Leakage Current	I_{DRM}	Tj=125°C, V_{DRM}=Rated		110	180	ma
Repetitive Peak Reverse Leakage Current	I_{RRM}	Tj=125°C, V_{RRM}=Rated		70	180	ma
Repetitive Peak Leakage Current Distribution	I_{DRM}-I_{RRM}	Tj=125°C, Voltage=Rated	5% 70	50% 95	95% 165	ma
Peak On-State Voltage	V_{TM}	Tj=125°C, I_{TM}=1500A			3.70	V
V_{TM} Model, Low Level	V_0	Tj=125°C			1.32	V
VTM = V_O + r•I_{TM}	r	15% I_{TM} - π•I_{TM}			1.58E-03	Ω
V_{TM} Model, High Level	V_0	Tj=125°C			1.73	V
VTM = V_O + r•I_{TM}	r	π•I_{TM} - I_{TSM}			1.32E-03	Ω
V_{TM} Model, 4-Term	A	Tj=125°C			0.140	
V_{TM}= A + B•Ln(I_{TM}) +	B	15%I_{TM} - I_{TSM}			0.185	
C•(I_{TM}) + D•(I_{TM})^{½}	C				0.00121	
	D				0.0100	
Turn-On Delay Time	t_d	V_D = 0.5•V_{DRM} Gate Drive: 40V - 20Ω		2.0		us
Turn-Off Time	tq	Tj=125°C dv/dt = 20V/us to 67% V_{DRM}		600		us
Reverse Recovery Current	$I_{R(Rec)}$	Tj=125°C 1000A -10A/us VR= 50V		160		A
Reverse Recovery Charge	Q_{RR}			2200		uCoul
Reverse Recovery Current Distribution	$I_{R(Rec)}$	Tj=125°C 1000A -10A/us VR = 50V	5% 100	50% 112	95% 125	A
$dv/dt_{(Crit)}$	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

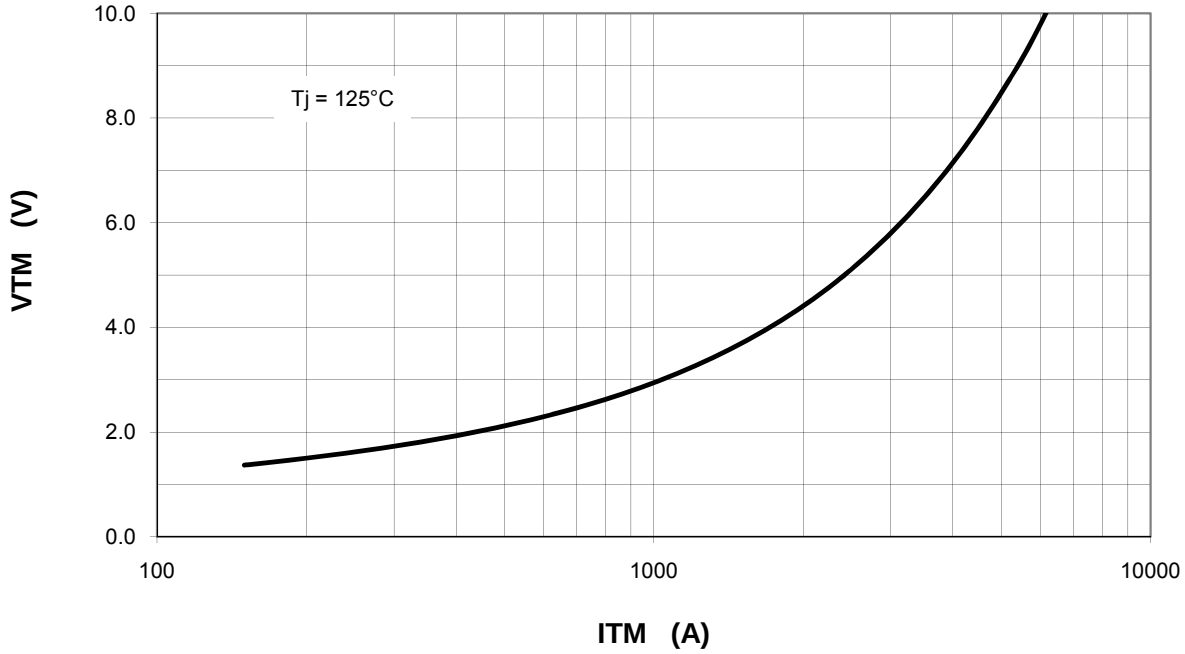
Characteristic	Symbol	Test Conditions	Rating max	Units
Thermal Resistance				
Junction to Case	$R\Theta_{jc}$	Double side cooled	0.023	°C/Watt
Case to Sink	$R\Theta_{cs}$	Double side cooled	0.006	°C/Watt
Thermal Impedance Model	$Z\Theta_{jc}$	Double side cooled		

$$Z\Theta_{jc}(t) = \Sigma(A(N)\bullet(1-\exp(-t/Tau(N))))$$

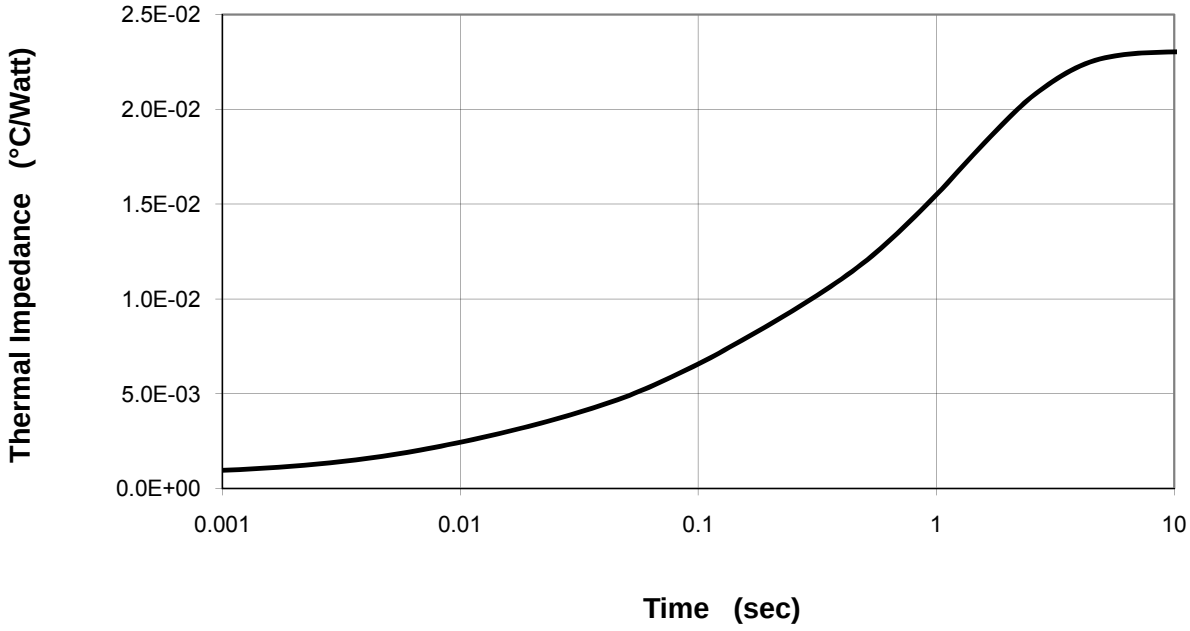
where:

N =	1	2	3	4
A(N) =	7.26E-04	1.58E-03	4.55E-03	1.62E-02
Tau(N) =	4.49E-05	8.21E-03	8.84E-02	1.31E+00

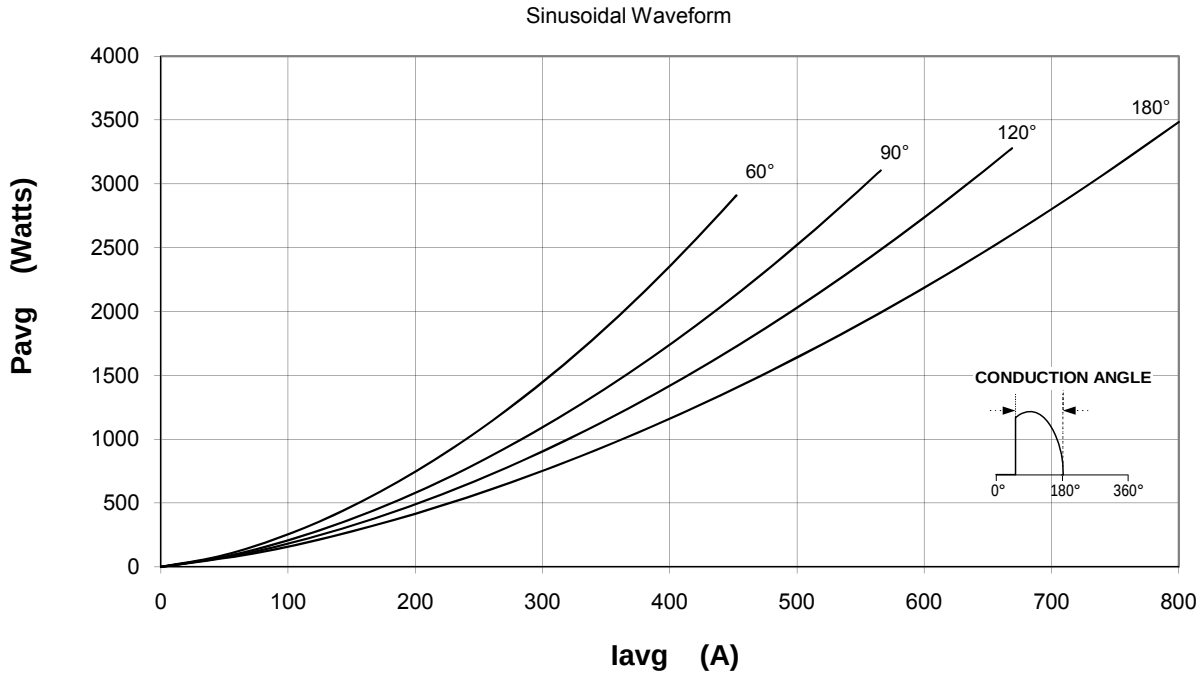
Maximum On-State Voltage Drop



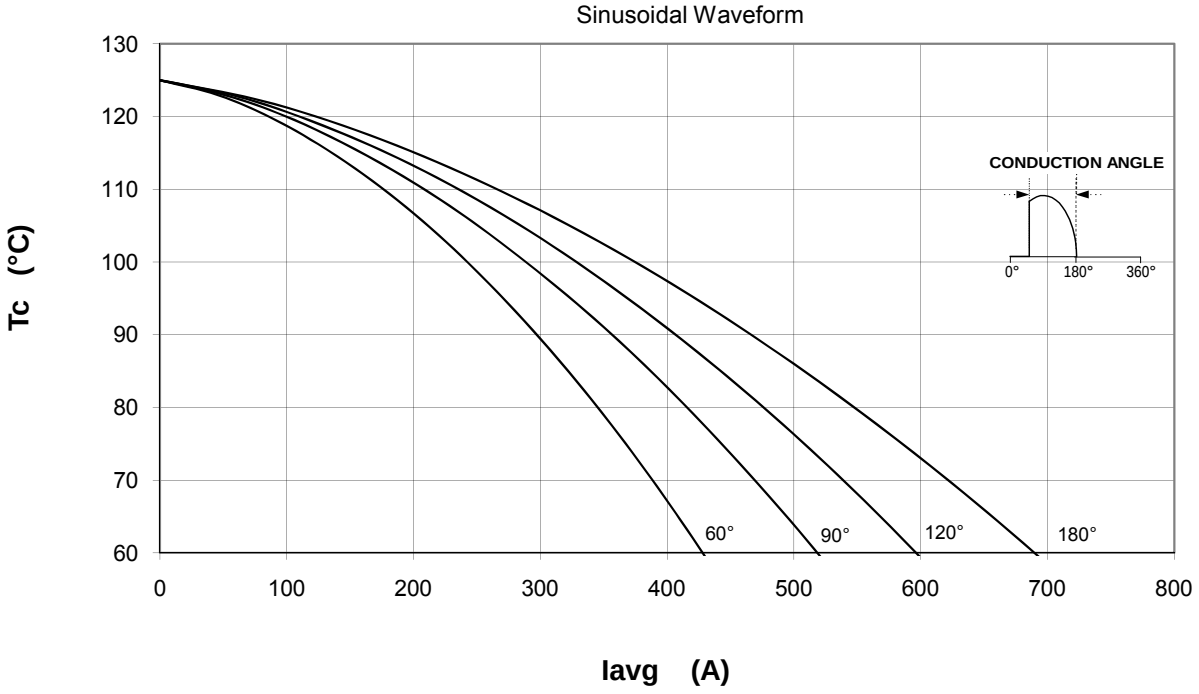
MAXIMUM TRANSIENT THERMAL IMPEDANCE



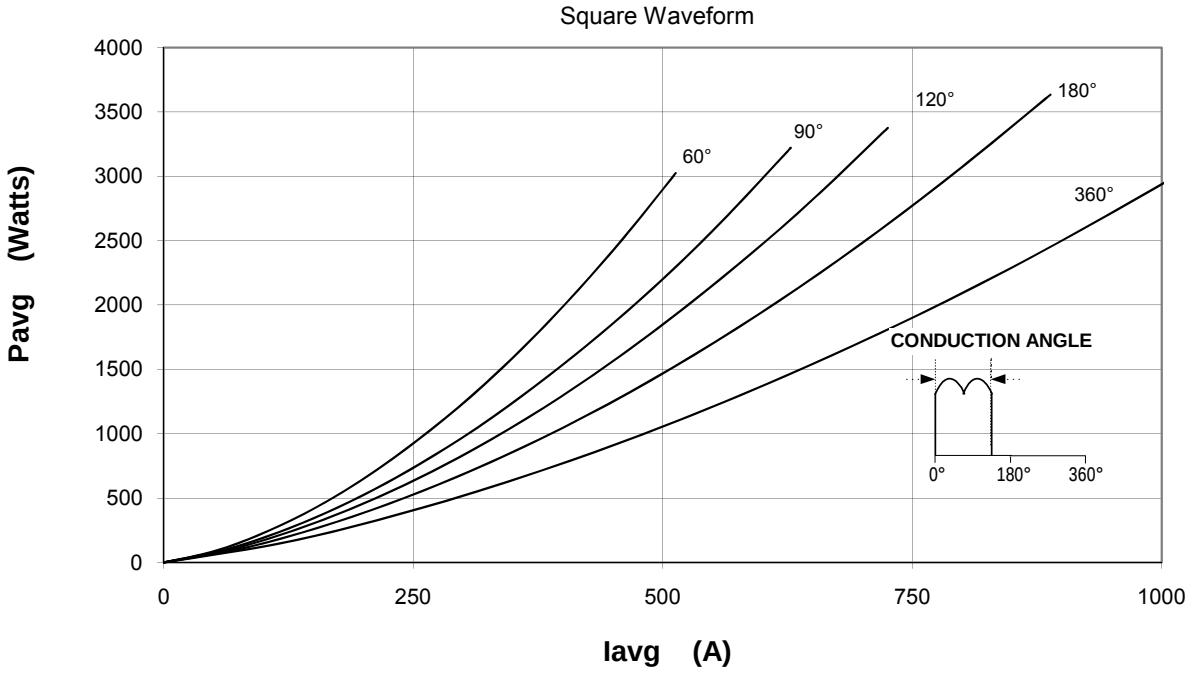
Maximum On-State Power Dissipation



Maximum Allowable Case Temperature



Maximum On-State Power Dissipation



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