

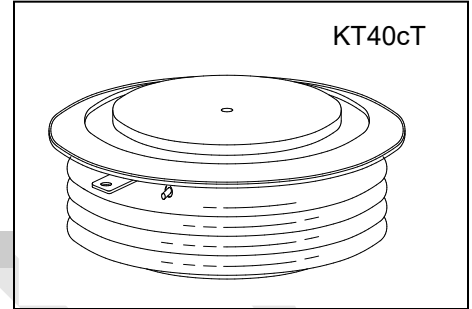


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### LOW LOSSES FAST SWITCHING THYRISTOR FOR INVERTER

#### Features:

- . All Diffused Structure
- . Amplifying Gate Configuration
- . Blocking capability up to 1600 volts
- . High dv/dt Capability
- . Pressure Assembled Device



### ELECTRICAL CHARACTERISTICS AND RATINGS

#### Blocking - Off State

Device Type	V <sub>RRM</sub> (1)	V <sub>DRM</sub> (1)	V <sub>RSM</sub> (1)
C448PB	1200	1200	1300
C448PD	1400	1400	1500
C448PM	1600	1600	1700

V<sub>RRM</sub> = Repetitive peak reverse voltage

V<sub>DRM</sub> = Repetitive peak off state voltage

V<sub>RSM</sub> = Non repetitive peak reverse voltage (2)

Repetitive peak reverse leakage and off state leakage	I <sub>RRM</sub> /I <sub>DRM</sub>	5 mA 45 mA (3)
Critical rate of voltage rise	dv/dt (4)	500 V/sec (min)

#### Notes:

All ratings are specified for T<sub>j</sub>=25 °C unless otherwise stated.

(1) All voltage ratings are specified for an applied 50Hz/60Hz sinusoidal waveform over the temperature range -40 to +125 °C.

(2) 10 msec. max. pulse width

(3) Maximum value for T<sub>j</sub> = 125 °C.

(4) Minimum value for linear and exponential waveshape to 80% rated V<sub>DRM</sub>. Gate open. T<sub>j</sub> = 125 °C.

(5) The value of di/dt is established in accordance with EIA/NIMA Standard RS-397, Section 5-2-2-6.

#### Conducting - On State

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Average value of on-state current	I <sub>T(AV)</sub>		700		A	Sinewave, 180° conduction, T <sub>c</sub> =55°C
RMS value of on-state current	I <sub>T(RMS)</sub>		1099		A	Nominal value
Peak one cycle surge (non repetitive) current	I <sub>TSM</sub>		8400		A	10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, T <sub>j</sub> = 125 °C
I square t	I <sup>2</sup> t		3.5x10 <sup>5</sup>		A <sup>2</sup> s	10 msec
Latching current	I <sub>L</sub>		1000		mA	V <sub>D</sub> = 12 V; R <sub>L</sub> = 12 ohms
Holding current	I <sub>H</sub>		200		mA	V <sub>D</sub> = 12 V; I = 2.5 A
Peak on-state voltage	V <sub>TM</sub>		2.9		V	I <sub>TM</sub> = 2000 A; T <sub>j</sub> = 25 °C
Threshold voltage, low level	V <sub>TO</sub>		1.50		V	T <sub>j</sub> =125°C
Slope resistance, low-level	r <sub>T</sub>		0.6		mΩ	1500A to 2500A
Critical rate of rise of on-state current (5)	di/dt		200		A/μs	Repetition

**Gating**

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Peak gate power dissipation	$P_{GM}$		20		W	
Average gate power dissipation	$P_{G(AV)}$		4		W	
Gate current required to trigger all units	$I_{GT}$		300 150 5		mA mA mA	$V_D = 6\text{ V}; R_L = 3\text{ ohms}; T_j = -40\text{ }^\circ\text{C}$ $V_D = 6\text{ V}; R_L = 3\text{ ohms}; T_j = +25\text{ }^\circ\text{C}$ $V_D = 6\text{ V}; R_L = 3\text{ ohms}; T_j = +125\text{ }^\circ\text{C}$
Gate voltage required to trigger all units	$V_{GT}$	0.30	5 3		V V V	$V_D = 6\text{ V}; R_L = 3\text{ ohms}; T_j = -40\text{ }^\circ\text{C}$ $V_D = 6\text{ V}; R_L = 3\text{ ohms}; T_j = 0\text{--}125\text{ }^\circ\text{C}$ $V_D = \text{Rated } V_{DRM}; R_L = 1000\text{ ohms}; T_j = +125\text{ }^\circ\text{C}$
Peak negative voltage	$V_{GRM}$		5		V	

**Dynamic**

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	$t_d$		3.0	1.5	$\mu\text{s}$	$I_{TM} = 50\text{ A}; V_D = 67\% V_{DRM}$ Gate pulse: $V_G = 30\text{ V}; R_G = 10\text{ ohms}; t_r = 0.1\mu\text{s}; t_p = 20\mu\text{s}$
Turn-off time (with $V_R = -5\text{ V}$ )	$t_q$		35		$\mu\text{s}$	$I_{TM} = 500\text{ A}; di/dt = -25\text{ A}/\mu\text{s}; V_R = 50\text{ V};$ Re-applied $dV/dt = 200\text{ V}/\mu\text{s}$ linear to $80\% V_{DRM}$ ; $T_j = 125\text{ }^\circ\text{C};$ Duty cycle $\geq 0.01\%$
Reverse recovery current	$I_{rr}$				A	$I_{TM} = 500\text{ A}; di/dt = -25\text{ A}/\mu\text{s}; V_R = -50\text{ V}; T_j = 125\text{ }^\circ\text{C}$

**THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS**

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Operating temperature	$T_j$	-40	+125		$^\circ\text{C}$	
Storage temperature	$T_{stg}$	-40	+140		$^\circ\text{C}$	
Thermal resistance-junction to case	$R_{\Theta(j-c)}$		0.04 0.08		$^\circ\text{C}/\text{W}$	Double sided cooled Single sided cooled
Thermal resistance - case to heatsink	$R_{\Theta(c-s)}$		0.008 0.016		$^\circ\text{C}/\text{W}$	Double sided cooled * Single sided cooled
Mounting force	P	13	17	15	kN	
Weight	W			0.26	kg.	

\* Mounting surfaces smooth, flat and greased

