



# KK1000-FAST SWITCHING THYRISTOR

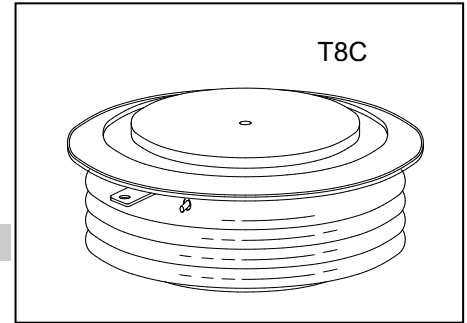
1600 V<sub>DRM</sub>

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## HIGH POWER THYRISTOR FOR INVERTER APPLICATION

### 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)
KK1000/16	1600	1600	1800

- 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)

### 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 0 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 67% rated V<sub>DRM</sub>. Gate open, T<sub>j</sub>=125 °C

(5) The value of di/dt is established in accordance with JB/T4193-2013.

Repetitive peak reverse leakage and off state leakage	I <sub>RRM</sub> /I <sub>DRM</sub>	5 mA 80 mA (3)
Critical rate of voltage rise	dv/dt (4)	1000 V/μs

### Conducting - On State

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Average value of on-state current	I <sub>T(AV)</sub>		1000		A	Sinewave, 180° conduction, T <sub>c</sub> =55°C
RMS value of on-state current	I <sub>TRMS</sub>		1570		A	Nominal value
Peak one cycle surge (non repetitive) current	I <sub>TSM</sub>		14000		A	10 msec (50Hz), sinusoidal wave-shape, 180° conduction, T <sub>j</sub> = 125 °C
I square t	I <sup>2</sup> t		9.8x10 <sup>5</sup>		A <sup>2</sup> s	10 msec
Latching current	I <sub>L</sub>		1000		mA	V <sub>D</sub> =12V; R <sub>L</sub> =12ohms
Holding current	I <sub>H</sub>		200		mA	V <sub>D</sub> =12V; I=2.5A
Peak on-state voltage	V <sub>TM</sub>		2.40		V	I <sub>TM</sub> = 3000A; T <sub>j</sub> =25°C
Threshold voltage, low-level	V <sub>TO</sub>		1.32		V	T <sub>j</sub> =125°C
Slope resistance, low-level	r <sub>T</sub>		0.36		mΩ	1500A to 2500A
Critical rate of rise of on-state current(5)	di/dt		200		A/μs	T <sub>j</sub> =125°C; V <sub>D</sub> = 0.67 V <sub>DRM</sub> ; f=50Hz; I <sub>TM</sub> =1500A

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### 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-trigger current	$I_{GT}$		150		mA	$V_D=12V; R_L=3ohms; T_j=+25^{\circ}C$
Gate- trigger voltage	$V_{GT}$	0.70	2.5		V	$V_D=12V; R_L=3ohms; T_j=+25^{\circ}C$
Peak negative voltage	$V_{GRM}$		5		V	

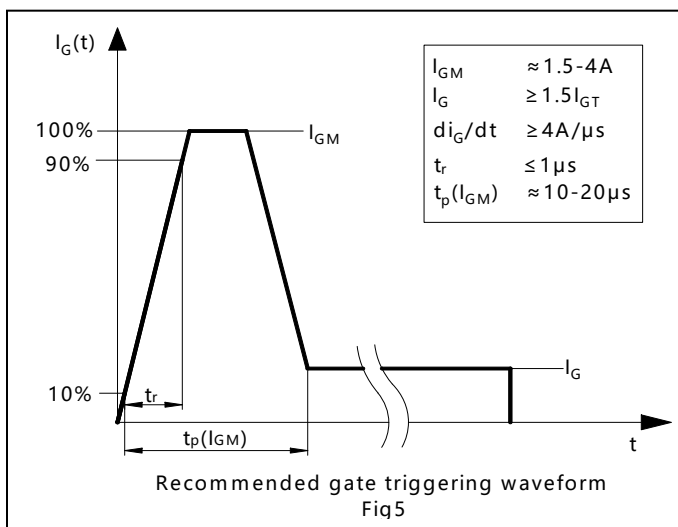
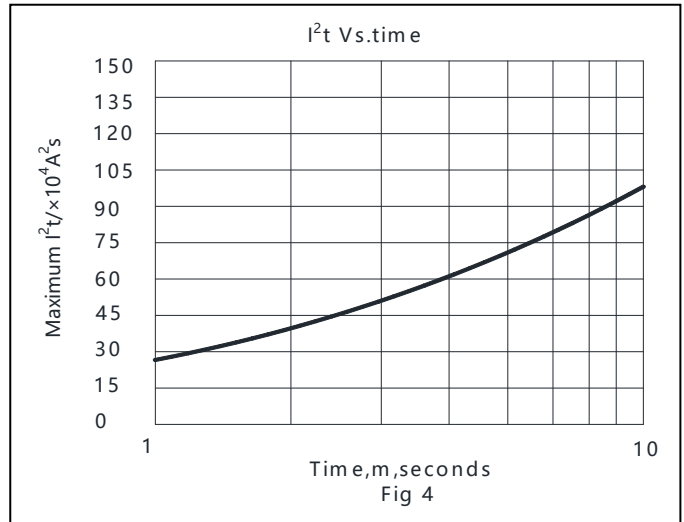
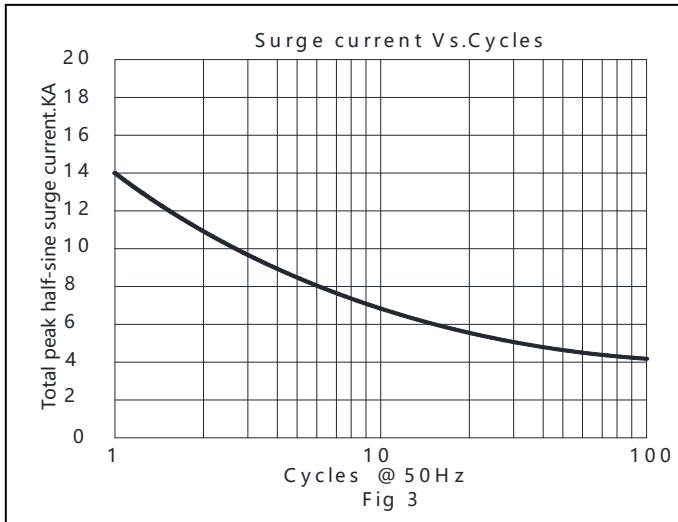
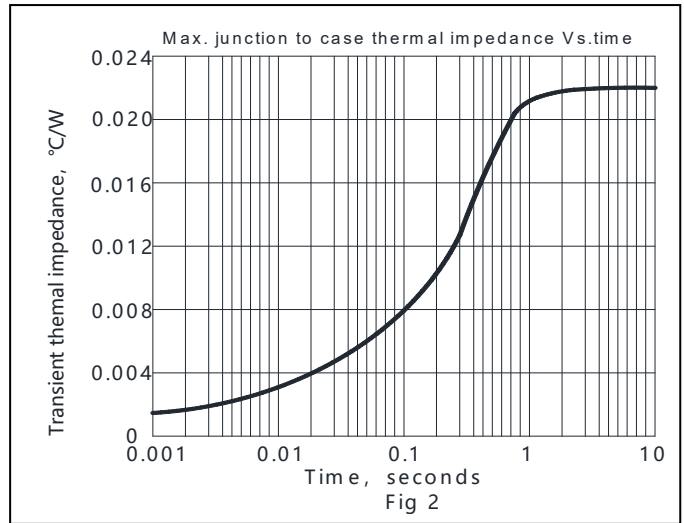
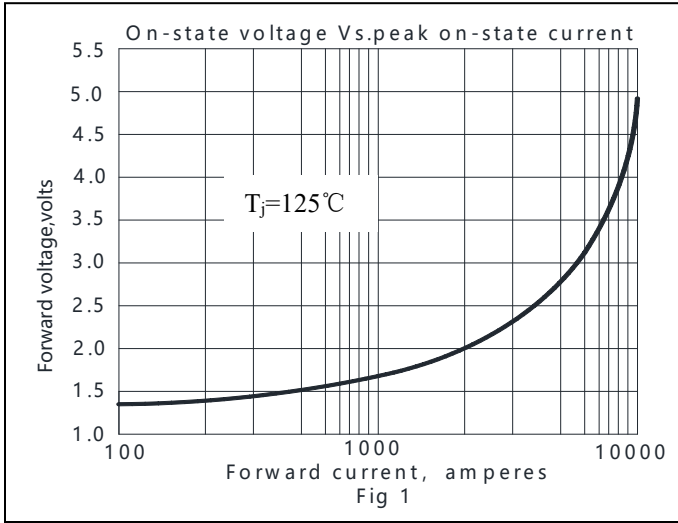
### Dynamic

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	$t_d$		3.0	2.5	$\mu s$	$I_{TM}=1000A; V_D=67\%V_{DRM}$ Gate pulse: $V_G=30V; R_G=10ohms;$ $t_r=0.1\mu s; t_p=20\mu s$
Turn-off time (with $V_R = -5 V$ )	$t_q$		30		$\mu s$	$I_{TM} = 1000 A; di/dt = - 10 A/\mu s;$ $V_R = 50 V; dv/dt=30V/\mu s ;$ $V_D= 67\%V_{DRM}; T_j=125^{\circ}C$
Reverse recovery charge	$Q_{rr}$				$\mu C$	$I_{TM}=1000 A; di/dt=-10A/\mu s;$ $V_R=50 V; T_j=125^{\circ}C$

## THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Operating temperature	$T_j$	-40	+125		$^{\circ}C$	
Storage temperature	$T_{stg}$	-40	+140		$^{\circ}C$	
Thermal resistance - junction to case	$R_{\Theta(j-c)}$		0.022		$^{\circ}C/W$	Double sided cooled
Thermal resistance - case to heatsink	$R_{\Theta(c-s)}$		0.005		$^{\circ}C/W$	Double sided cooled
Mounting force	F	22	27	25	kN	
Weight	m			0.46	kg	

\* Mounting surfaces smooth, flat and greased



ELECTRICAL CHARACTERISTICS AND RATINGS KK1000-FAST SWITCHING THYRISTOR

