KK3000-FAST SWITCHING THYRISTOR

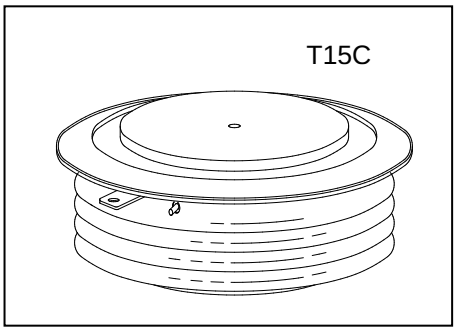
2500-2800 V_{DRM}

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HIGH POWER THYRISTOR FOR INVERTER APPLICATION

Features:

. All Diffused Structure
. Amplifying Gate Configuration
. Blocking capability up to 2800 volts
. High dv/dt Capability
. Pressure Assembled Device



ELECTRICAL CHARACTERISTICS AND RATINGS

Blocking - Off State

Device Type	V_{RRM} (1)	V_{DRM} (1)	V_{RSM} (1)
KK3000/25	2500	2500	2500
KK3000/28	2800	2800	2800

V_{RRM} = Repetitive peak reverse voltage
V_{DRM} = Repetitive peak off state voltage
V_{RSM} = Non repetitive peak reverse voltage (2)

Repetitive peak reverse leakage and off state leakage	I_{RRM}/I_{DRM}	5 mA 150 mA (3)
Critical rate of voltage rise	dv/dt (4)	1000 V/µs

Notes
All ratings are specified for Tj=25 °C unless otherwise stated.
(1) All voltage ratings are specified for an applied 50Hz/60zHz sinusoidal waveform over the temperature range 0 to +125 °C
(2) 10 msec. Max. Pulse width
(3) Maximum value for Tj=125 °C.
(4) Minimum value for linear and exponential waveshape to 67% rated $V_{DRM.}$ Gate open, Tj=125 °C
(5) The value of di/dt is established in accordance with JB/T4193-2013.

Conducting - On State

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Average value of on-state current	$I_{T(AV)}$		3000		A	Sinewave,180° conduction,Tc=55°C
RMS value of on-state current	I_{TRMS}		4710		A	Nominal value
Peak one cycle surge (non repetitive) current	I_{TSM}		36000		A	10 msec (50Hz), sinusoidal wave-shape, 180° conduction, T_j = 125 °C
I square t	I^2t		$6.5x10^6$		A^2s	10 msec
Latching current	I_L		1000		mA	V_D=12V; R_L=12ohms
Holding current	I_H		200		mA	V_D=12V; I=2.5A
Peak on-state voltage	V_{TM}		1.90		V	I_{TM}= 3000A;Tj =25°C
Threshold voltage, low-level	V_{TO}		1.36		V	Tj=125°C
Slope resistance, low-level	r_T		0.18		mΩ	3000A to 5000A
Critical rate of rise of on-state current(5)	di/dt		200		A/µs	T_j=125°C; V_D = 0.67 V_{DRM}; f=50Hz; I_{TM}=4000A

ELECTRICAL CHARACTERISTICS AND RATINGS KK3000-FAST SWITCHING THYRISTOR

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=+25ºC
Gate- trigger voltage	V_{GT}	0.70	2.5		V	V_D=12V;R_L=3ohms;T_j=+25ºC
Peak negative voltage	V_{GRM}		5		V	

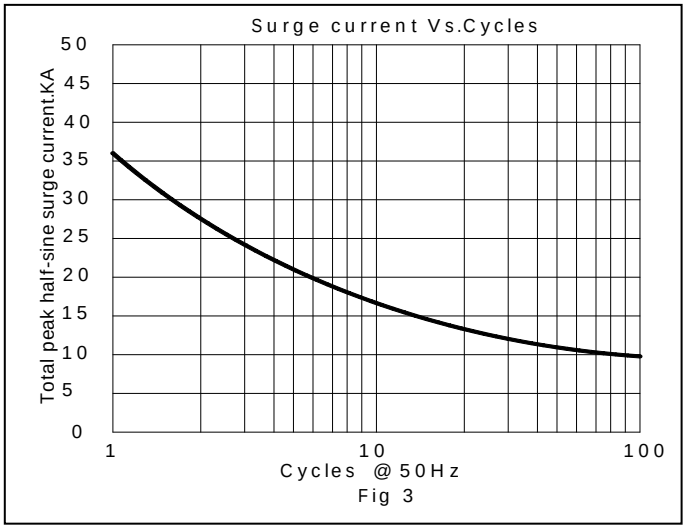
Dynamic

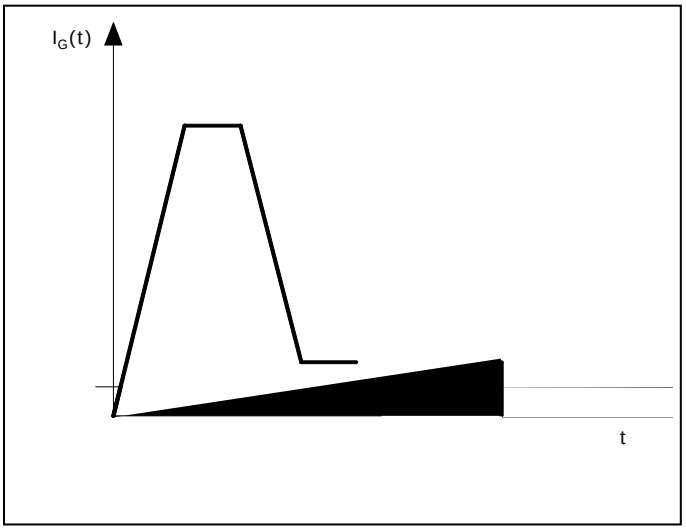
Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	t_d		3.0	2.5	μs	I_{TM}=1000A; V_D=67%V_{DRM} Gate pulse: V_G=30V; R_G=10ohms; t_r=0.1μs; t_p=20μs
Turn-off time (with V_R = -5 V)	t_q		70		μs	I_{TM} =3000 A; di/dt =- 25 A/μs; V_R =50 V; dv/dt=30V/μs ; V_D= 67%V_{DRM};T_j=125ºC
Reverse recovery charge	Q_{rr}				μC	I_{TM}=3000 A;di/dt=-10A/μs; V_R=50 V; T_j=125ºC

THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Operating temperature	T_j	-40	+125		ºC	
Storage temperature	T_{stg}	-40	+140		ºC	
Thermal resistance - junction to case	$R_{\Theta(j\text{-}c)}$		0.008		ºC/W	Double sided cooled
Thermal resistance - case to heatsink	$R_{\Theta(c\text{-}s)}$		0.002		ºC/W	Double sided cooled
Mounting force	F	55	65	60	kN	
Weight	m			1.40	kg	

*** Mounting surfaces smooth, flat and greased**


Surge current Vs.Cycles
Total peak half-sine surge current:KA
50
45
40
35
30
25
20
15
10
5
0
1
10
100
Cycles @50Hz
Fig 3


$I_G(t)$
t

