



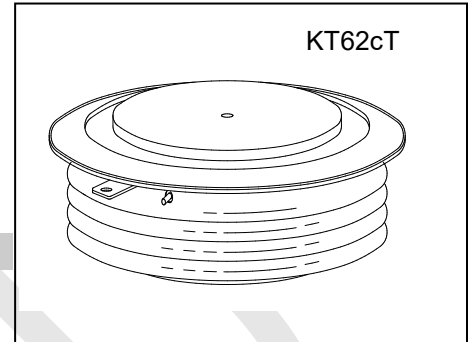
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### HIGH POWER THYRISTOR FOR INVERTER APPLICATION

RA-DSKK-006-2017A

#### Features:

- . All Diffused Structure
- . Amplifying Gate Configuration
- . Blocking capability up to 2000 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)
KK1500/16	1600	1600	1800
KK1500/18	1800	1800	2000
KK1500/20	2000	2000	2100

$V_{RRM}$  = 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 80 mA (3)
Critical rate of voltage rise	$dv/dt$ (4)	1000 V/sec (min)

#### Notes:

All ratings are specified for  $T_j=25^\circ\text{C}$  unless otherwise stated.

(1) All voltage ratings are specified for an applied 50Hz/60Hz sinusoidal waveform over the temperature range 0 to  $+125^\circ\text{C}$

(2) 10 msec. Max. Pulse width

(3) Maximum value for  $T_j=125^\circ\text{C}$ .

(4) Minimum value for linear and exponential waveshape to 67% rated  $V_{DRM}$ . Gate open,  $T_j=125^\circ\text{C}$

(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	$I_{T(AV)}$		1500		A	Sinewave, 180° conduction, $T_c=55^\circ\text{C}$
RMS value of on-state current	$I_{TRMS}$		2355		A	Nominal value
Peak one cycle surge (non repetitive) current	$I_{TSM}$		21000		A	10 msec (50Hz), sinusoidal waveshape, 180° conduction, $T_j = 125^\circ\text{C}$
I square t	$I^2t$		$2.2 \times 10^6$		$\text{A}^2\text{s}$	10 msec
Latching current	$I_L$		1000		mA	$V_D=12\text{V}$ ; $R_L=12\text{ohms}$
Holding current	$I_H$		200		mA	$V_D=12\text{V}$ ; $I=2.5\text{A}$
Peak on-state voltage	$V_{TM}$		2.20		V	$I_{TM}= 3000\text{A}$ ; $T_j = 25^\circ\text{C}$
Threshold voltage, low level	$V_{TO}$		1.39		V	$T_j=125^\circ\text{C}$
Slope resistance, low-level	$r_T$		0.27		$\text{m}\Omega$	1500A to 3000A
Critical rate of rise of on-state current(5)	$di/dt$		200		$\text{A}/\mu\text{s}$	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 trigger current	$I_{GT}$		200	150	mA	$V_D=12V; R_L=3ohms; T_j=+25^{\circ}C$
Gate trigger voltage	$V_{GT}$	0.70	3.0	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	$\mu s$	$I_{TM}=50A; V_D=67\%V_{DRM}$ Gate pulse: $V_G=30V; R_G=10ohms;$ $t_r=0.1\mu s; t_p=20\mu s$
Turn-off time ( $V_R=-5V$ )	$t_q$		30		$\mu s$	$I_{TM}=1500 A; di/dt=-10 A/\mu s;$ $V_R=50 V; dV/dt=30V/\mu s;$ $V_D=67\%V_{DRM}; T_j=125^{\circ}C$
Reverse recovery current	$Q_{rr}$				$\mu C$	$I_{TM}=1500 A; di/dt=-10A/\mu s;$ $V_R=50 V; T_j=125^{\circ}C$

**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	$R_{\theta(j-c)}$		0.016		$^{\circ}C/W$	Double sided cooled
Thermal resistance - case to heatsink	$R_{\theta(c-s)}$		0.005		$^{\circ}C/W$	Double sided cooled
Mounting force	P	25	31	28	kN	
Weight	W			0.65	kg.	

\* Mounting surfaces smooth, flat and greased

