

# KK800-Fast Switching Thyristor

Jiangsu Yangjie Runau Semiconductor Co.,Ltd

1600-2000 V<sub>DRM</sub>

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## HIGH POWER THYRISTOR FOR INVERTER APPLICATION

### Features:

KT50cT

- . 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 <sub>R</sub> RM (1)	V <sub>D</sub> RM (1)	V <sub>R</sub> SM (1)
KK800/16	1600	1600	1800
KK800/18	1800	1800	2000
KK800/20	2000	2000	2100

V<sub>R</sub>RM = Repetitive peak reverse voltage  
V<sub>D</sub>RM = Repetitive peak off state voltage  
V<sub>R</sub>SM = Non Repetitive peak reverse voltage(2)

Repetitive peak reverse leakage and off state leakage	I <sub>RRM</sub> /I <sub>DRM</sub>	5 mA 50 mA (3)
Critical rate of voltage rise	dv/dt (4)	1000 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 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.

### Conducting-On State

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Average value of on-state current	I <sub>T(AV)</sub>		800		A	Sinewave, 180° conduction, T <sub>c</sub> =55°C
RMS value of on-state current	I <sub>TRMS</sub>		1256		A	Nominal value
Peak one cycle surge (non repetitive) current	I <sub>TSM</sub>		11200		A	10 msec (50Hz), sinusoidal wave-shape, 180° conduction, T <sub>j</sub> = 125 °C
I square t	I <sup>2</sup> t		6.3x10 <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>                      2.60                      V                      I<sub>TM</sub>= 2400A; T<sub>j</sub> =25°C

**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	$V_D=12V; R_L=30\Omega; T_j=+25^\circ C$
Gate trigger voltage	$V_{GT}$	0.70	3.0	2.5	V	$V_D=12V; R_L=30\Omega; T_j=+25^\circ C$
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: $V_G=30V; R_G=10\Omega$ ; $t_r=0.1\mu s; t_p=20\mu s$
Turn-off time ( $V_R=-5V$ )	$t_q$		30		$\mu s$	$I_{TM}=800A; di/dt=-10A/\mu s$ ; $V_R=50V; dV/dt=30V/\mu s$ ; $V_D=67\%V_{DRM}; T_j=125^\circ C$
Reverse recovery current	$Q_{rr}$				$\mu C$	$I_{TM}=800A; di/dt=-10A/\mu s$ ; $V_R=50V; T_j=125^\circ C$

**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	$R_{\theta(j-c)}$		0.03		$^\circ C/W$	Double sided cooled
Thermal resistance - case to heatsink	$R_{\theta(c-s)}$		0.006		$^\circ C/W$	Double sided cooled
Mounting force	P	18	22	20	kN	

