



# KP1100-POWER THYRISTOR

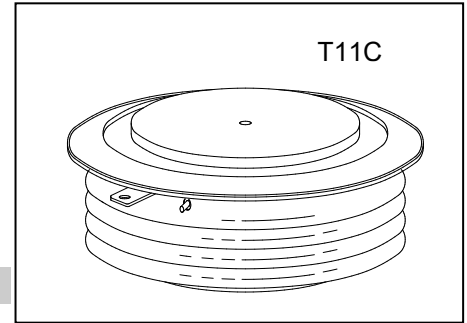
6000-6500  $V_{DRM}$

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## FREE FLOATING TYPE THYRISTOR FOR PHASE CONTROL APPLICATIONS

### Features:

- . Free-floating silicon technology
- . Low on-state and switching losses
- . Optimum power handling capability
- . Blocking capability up to 6500 volts
- . Distributed amplifying gate



## ELECTRICAL CHARACTERISTICS AND RATINGS

### Blocking - Off State

Device Type	$V_{RRM}$ (1)	$V_{DRM}$ (1)	$V_{RSM}$ (1)
KP1100/60	5100	5100	6000
KP1100/62	5300	5300	6200
KP1100/65	5600	5600	6500

$V_{RRM}$  = 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 200 mA (3)
Critical rate of voltage rise	dv/dt (4)	2000 V/ $\mu$ s

### Notes:

- (1) All voltage ratings are specified for an applied 50Hz sinusoidal waveform over the temperature range -40 °C to +125 °C.
- (2) 10 msec. max. pulse width
- (3) Maximum value for  $T_j = 125$  °C.
- (4) Minimum value for linear and exponential waveshape to 67% rated  $V_{DRM}$ . Gate open.  $T_j = 125$  °C.
- (5) The value of di/dt is established in accordance with EIA/NIMA Standard JB/T 8950.2-2013

### Conducting - On State

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Average value of on-state current	$I_{T(AV)}$		1100		A	Sinewave, 180° conduction, $T_c=70$ °C
RMS value of on-state current	$I_{TRMS}$		1727		A	Nominal value
Peak one cycle surge (non repetitive) current	$I_{TSM}$		21500		A	10.0 msec (50Hz), sinusoidal waveshape, 180° conduction, $T_j = 125$ °C
I square t	$I^2t$		$2.31 \times 10^6$		A <sup>2</sup> s	10 msec
Latching current	$I_L$		1000		mA	$V_D = 12$ V; $R_L = 12$ ohms
Holding current	$I_H$		200		mA	$V_D = 12$ V; $I = 2.5$ A
Peak on-state voltage	$V_{TM}$		2.3		V	$I_{TM}=1500$ A; $T_j = 25$ °C
Threshold voltage, low-level	$V_{TO}$		1.1		V	$T_j=125$ °C
Slope resistance, low-level	$r_T$		0.8		m $\Omega$	1000A to 5000A
Critical rate of rise of on-state current(5)	di/dt		150		A/ $\mu$ s	$T_j=125$ °C; $V_D = 0.67 V_{DRM}$ ; $f=50$ Hz; $I_{TM}=1000$ A

**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		mA	$V_D = 12\text{ V}; R_L = 3\text{ ohms}; T_j = +25\text{ }^\circ\text{C}$
Gate- trigger voltage	$V_{GT}$	0.7	2.6		V	$V_D = 12\text{ V}; R_L = 3\text{ ohms}; T_j = +25\text{ }^\circ\text{C}$
Peak negative voltage	$V_{GRM}$		10		V	

**Dynamic**

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	$t_d$			3.0	$\mu\text{s}$	$I_{TM}=100\text{A}; V_D=67\%V_{DRM}$ 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 $V_R = -5\text{ V}$ )	$t_q$			700	$\mu\text{s}$	$I_{TM} = 2000\text{A}; di/dt = -10\text{A}/\mu\text{s};$ $V_R = 100\text{V}; dv/dt = 30\text{V}/\mu\text{s};$ $V_D = 67\%V_{DRM}; T_j = 125^\circ\text{C}$
Reverse recovery charge	$Q_{rr}$		3600		$\mu\text{C}$	$I_{TM}=2000\text{A}; di/dt=-10\text{A}/\mu\text{s};$ $V_R=100\text{V}; T_j=125^\circ\text{C}$

**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	$R_{\Theta(j-c)}$		0.015		$^\circ\text{C}/\text{W}$	Double sided cooled
Thermal resistance - case to heatsink	$R_{\Theta(c-s)}$		0.004		$^\circ\text{C}/\text{W}$	Double sided cooled
Mounting force	F	32	36	34	kN	
Weight	m			1.0	kg	

\* Mounting surfaces smooth, flat and greased

