



High-end Power Semiconductor Manufacturer

# KP2000A 2000V-2800V

## Phase Control Thyristor

- High power cycling capability
- Low on-state and switching losses
- Designed for traction and industrial applications



Mean on-state current	$I_{TAV}$	2000 A			
Repetitive peak off-state voltage	$V_{DRM}$	2000 – 2800 V			
Repetitive peak reverse voltage	$V_{RRM}$				
Turn-off time	$t_q$	500 $\mu$ s			
$V_{DRM}, V_{RRM}, V$	2000	2200	2400	2600	2800
Voltage code	20	22	24	26	28
$T_j, ^\circ C$	-60 – 125				

### MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions
<b>ON-STATE</b>				
$I_{TAV}$	Mean on-state current	A	2000	$T_c=85^\circ C$ , Double side cooled 180° half-sine wave; 50 Hz
$I_{TRMS}$	RMS on-state current	A	3140	$T_c=85^\circ C$ , Double side cooled 180° half-sine wave; 50 Hz
$I_{TSM}$	Surge on-state current	kA	46.0 53.0	$T_j=T_{j\ max}$ $T_j=25^\circ C$ 180° half-sine wave; 50 Hz ( $t_p=10\ ms$ ); single pulse; $V_D=V_R=0\ V$ ; Gate pulse: $I_G=2\ A$ ; $t_{GP}=50\ \mu s$ ; $di_G/dt \geq 1\ A/\mu s$
			49.0 56.0	$T_j=T_{j\ max}$ $T_j=25^\circ C$ 180° half-sine wave; 60 Hz ( $t_p=8.3\ ms$ ); single pulse; $V_D=V_R=0\ V$ ; Gate pulse: $I_G=2\ A$ ; $t_{GP}=50\ \mu s$ ; $di_G/dt \geq 1\ A/\mu s$
$I^2t$	Safety factor	$A^2s \cdot 10^3$	10580 14045	$T_j=T_{j\ max}$ $T_j=25^\circ C$ 180° half-sine wave; 50 Hz ( $t_p=10\ ms$ ); single pulse; $V_D=V_R=0\ V$ ; Gate pulse: $I_G=2\ A$ ; $t_{GP}=50\ \mu s$ ; $di_G/dt \geq 1\ A/\mu s$
			9960 13010	$T_j=T_{j\ max}$ $T_j=25^\circ C$ 180° half-sine wave; 60 Hz ( $t_p=8.3\ ms$ ); single pulse; $V_D=V_R=0\ V$ ; Gate pulse: $I_G=2\ A$ ; $t_{GP}=50\ \mu s$ ; $di_G/dt \geq 1\ A/\mu s$
<b>BLOCKING</b>				
$V_{DRM}, V_{RRM}$	Repetitive peak off-state and Repetitive peak reverse voltages	V	2000–2800	$T_{j\ min} < T_j < T_{j\ max}$ ; 180° half-sine wave; 50 Hz; Gate open
$V_{DSM}, V_{RSM}$	Non-repetitive peak off-state and Non-repetitive peak reverse voltages	V	2100–2900	$T_{j\ min} < T_j < T_{j\ max}$ ; 180° half-sine wave; 50 Hz; single pulse; Gate open
$V_D, V_R$	Direct off-state and Direct reverse voltages	V	$0.75 \cdot V_{DRM}$ $0.75 \cdot V_{RRM}$	$T_j=T_{j\ max}$ ; Gate open

<b>TRIGGERING</b>				
$I_{FGM}$	Peak forward gate current	A	10	$T_j = T_{j\ max}$
$V_{RGM}$	Peak reverse gate voltage	V	5	
$P_G$	Gate power dissipation	W	5	$T_j = T_{j\ max}$ for DC gate current
<b>SWITCHING</b>				
$(di_T/dt)_{crit}$	Critical rate of rise of on-state current non-repetitive (f=1 Hz)	A/ $\mu$ s	630	$T_j = T_{j\ max}; V_D = 0.67 \cdot V_{DRM}; I_{TM} = 2 I_{TAV};$ Gate pulse: $I_G = 2$ A; $t_{GP} = 50 \mu$ s; $di_G/dt \geq 1$ A/ $\mu$ s
<b>THERMAL</b>				
$T_{stg}$	Storage temperature	$^{\circ}$ C	-60 – 125	
$T_j$	Operating junction temperature	$^{\circ}$ C	-60 – 125	
<b>MECHANICAL</b>				
F	Mounting force	kN	40.0 – 50.0	
a	Acceleration	$m/s^2$	50 100	Device unclamped Device clamped

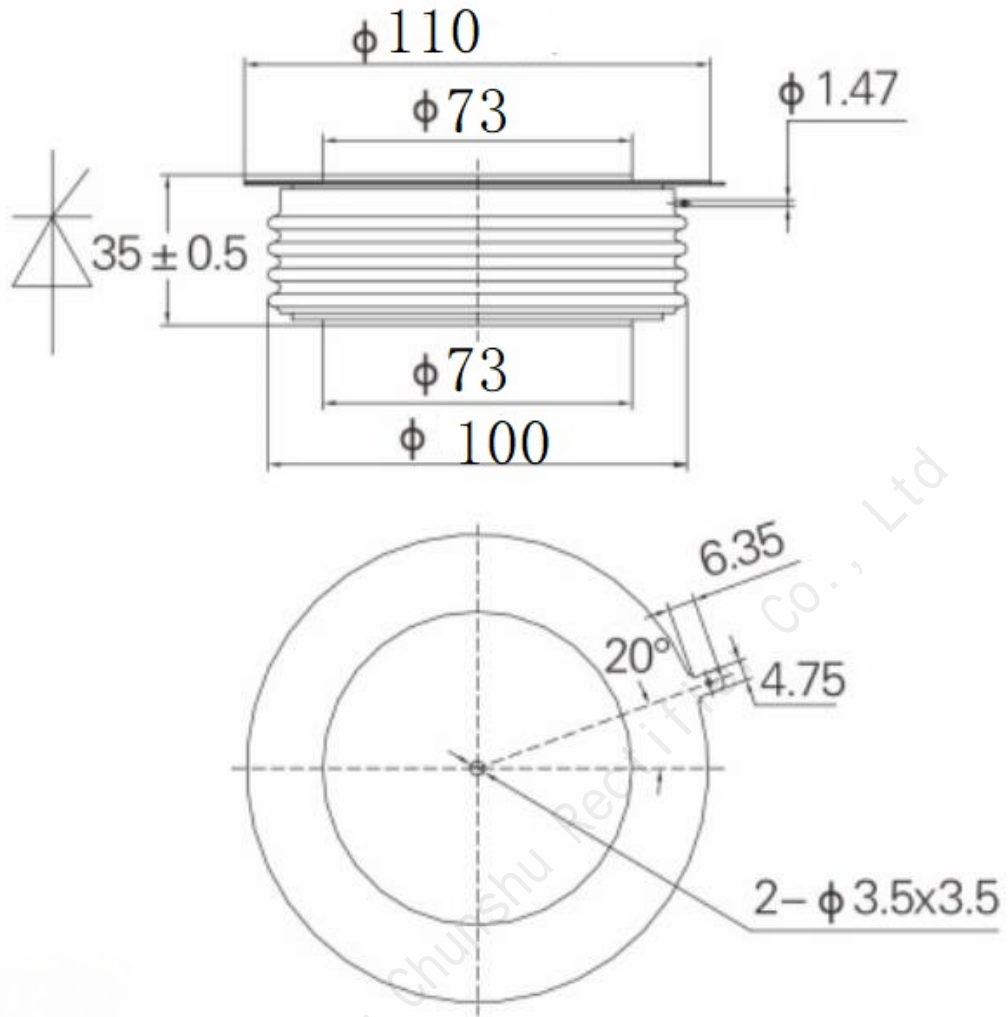
## CHARACTERISTICS

Symbols and parameters		Units	Values	Conditions	
<b>ON-STATE</b>					
$V_{TM}$	Peak on-state voltage, max	V	1.70	$T_j = 25 \text{ }^{\circ}\text{C}; I_{TM} = 6280$ A	
$V_{T(TO)}$	On-state threshold voltage, max	V	1.00	$T_j = T_{j\ max};$	
$r_T$	On-state slope resistance, max	m $\Omega$	0.140	$0.5 \pi I_{TAV} < I_T < 1.5 \pi I_{TAV}$	
$I_L$	Latching current, max	mA	1500	$T_j = 25 \text{ }^{\circ}\text{C}; V_D = 12$ V; Gate pulse: $I_G = 2$ A; $t_{GP} = 50 \mu$ s; $di_G/dt \geq 1$ A/ $\mu$ s	
$I_H$	Holding current, max	mA	300	$T_j = 25 \text{ }^{\circ}\text{C};$ $V_D = 12$ V; Gate open	
<b>BLOCKING</b>					
$I_{DRM}, I_{RRM}$	Repetitive peak off-state and Repetitive peak reverse currents, max	mA	200	$T_j = T_{j\ max};$ $V_D = V_{DRM}; V_R = V_{RRM}$	
$(dv_D/dt)_{crit}$	Critical rate of rise of off-state voltage <sup>1)</sup> , min	V/ $\mu$ s	1000	$T_j = T_{j\ max};$ $V_D = 0.67 \cdot V_{DRM};$ Gate open	
<b>TRIGGERING</b>					
$V_{GT}$	Gate trigger direct voltage, max	V	3.00 2.00	$T_j = 25 \text{ }^{\circ}\text{C}$ $T_j = T_{j\ max}$	$V_D = 12$ V; $I_D = 3$ A; Direct gate current
$I_{GT}$	Gate trigger direct current, max	mA	300 200	$T_j = 25 \text{ }^{\circ}\text{C}$ $T_j = T_{j\ max}$	
$V_{GD}$	Gate non-trigger direct voltage, min	V	0.35	$T_j = T_{j\ max};$ $V_D = 0.67 \cdot V_{DRM};$	
$I_{GD}$	Gate non-trigger direct current, min	mA	15.00	Direct gate current	
<b>SWITCHING</b>					
$t_{gd}$	Delay time	$\mu$ s	2.50	$T_j = 25 \text{ }^{\circ}\text{C}; V_D = 0.4 \cdot V_{DRM}; I_{TM} = I_{TAV};$ Gate pulse: $I_G = 2$ A; $t_{GP} = 50 \mu$ s; $di_G/dt \geq 1$ A/ $\mu$ s	
$t_q$	Turn-off time <sup>2)</sup> , max	$\mu$ s	500	$dv_D/dt = 50$ V/ $\mu$ s; $T_j = T_{j\ max}; I_{TM} = I_{TAV};$ $di_R/dt = -10$ A/ $\mu$ s; $V_R = 100$ V; $V_D = 0.67 \cdot V_{DRM}$	

<b>THERMAL</b>					
$R_{thjc}$	Thermal resistance, junction to case, max	°C/W	0.010	Direct current	Double side cooled
$R_{thjc-A}$			0.022		Anode side cooled
$R_{thjc-K}$			0.018		Cathode side cooled
$R_{thck}$	Thermal resistance, case to heatsink, max	°C/W	0.002	Direct current	
<b>MECHANICAL</b>					
w	Weight, typ	g	1700		
$D_s$	Surface creepage distance	mm (inch)	47.12 (1.855)		
$D_a$	Air strike distance	mm (inch)	25.40 (1.000)		

Beijing Xinchuang Chunshu Rectifier Co., Ltd

OVERALL DIMENSIONS



KT80DT

All dimensions in millimeters