



High-end Power Semiconductor Manufacturer

KP5000A 1000V-1800V 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}	5000 A			
Repetitive peak off-state voltage	V_{DRM}	1000 – 1800 V			
Repetitive peak reverse voltage	V_{RRM}				
Turn-off time	t_q	400 μ s			
V_{DRM}, V_{RRM}, V	1000	1200	1400	1600	1800
Voltage code	10	12	14	16	18
$T_j, ^\circ\text{C}$	– 60 – 125				

MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions
ON-STATE				
I_{TAV}	Mean on-state current	A	5000	$T_c=85^\circ\text{C}$, Double side cooled 180° half-sine wave; 50 Hz
I_{TRMS}	RMS on-state current	A	7850	$T_c=85^\circ\text{C}$, Double side cooled 180° half-sine wave; 50 Hz
I_{TSM}	Surge on-state current	kA	94.0 108.0	$T_j=T_{j\max}$ $T_j=25^\circ\text{C}$ 180° half-sine wave; 50 Hz ($t_p=10$ ms); single pulse; $V_D=V_R=0$ V; Gate pulse: $I_G=2$ A; $t_{GP}=50$ μ s; $di_G/dt \geq 1$ A/ μ s
			99.0 114.0	$T_j=T_{j\max}$ $T_j=25^\circ\text{C}$ 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; $t_{GP}=50$ μ s; $di_G/dt \geq 1$ A/ μ s
I^2t	Safety factor	$\text{A}^2\text{s}\cdot 10^3$	44180 58320	$T_j=T_{j\max}$ $T_j=25^\circ\text{C}$ 180° half-sine wave; 50 Hz ($t_p=10$ ms); single pulse; $V_D=V_R=0$ V; Gate pulse: $I_G=2$ A; $t_{GP}=50$ μ s; $di_G/dt \geq 1$ A/ μ s
			40670 53930	$T_j=T_{j\max}$ $T_j=25^\circ\text{C}$ 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; $t_{GP}=50$ μ s; $di_G/dt \geq 1$ A/ μ s
BLOCKING				
V_{DRM}, V_{RRM}	Repetitive peak off-state and Repetitive peak reverse voltages	V	1000–1800	$T_{j\min} < T_j < T_{j\max}$; 180° half-sine wave; 50 Hz; Gate open
V_{DSM}, V_{RSM}	Non-repetitive peak off-state and Non-repetitive peak reverse voltages	V	1100–1900	$T_{j\min} < T_j < T_{j\max}$; 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

TRIGGERING				
I_{FGM}	Peak forward gate current	A	12	$T_j = T_{j\max}$
V_{RGM}	Peak reverse gate voltage	V	5	
P_G	Gate power dissipation	W	5	$T_j = T_{j\max}$ for DC gate current
SWITCHING				
$(di_T/dt)_{crit}$	Critical rate of rise of on-state current non-repetitive (f=1 Hz)	A/ μ s	1000	$T_j = T_{j\max}$; $V_D = 0.67 \cdot V_{DRM}$; $I_{TM} = 2 I_{TAV}$; Gate pulse: $I_G = 2$ A; $t_{GP} = 50 \mu$ s; $di_G/dt \geq 1$ A/ μ s
THERMAL				
T_{stg}	Storage temperature	$^{\circ}$ C	-60–125	
T_j	Operating junction temperature	$^{\circ}$ C	-60–125	
MECHANICAL				
F	Mounting force	kN	70.0–90.0	
a	Acceleration	m/s ²	50 100	Device unclamped Device clamped

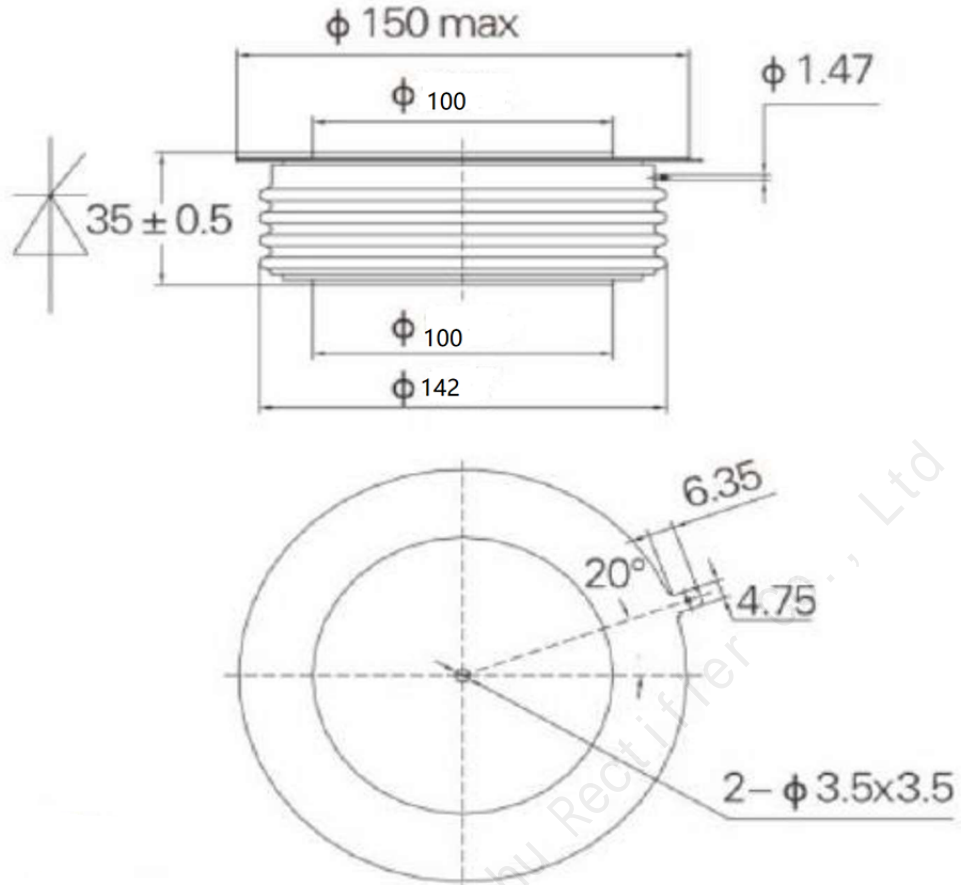
CHARACTERISTICS

Symbols and parameters		Units	Values	Conditions
ON-STATE				
V_{TM}	Peak on-state voltage, max	V	1.50	$T_j = 25 \text{ }^{\circ}\text{C}$; $I_{TM} = 6300$ A
$V_{T(TO)}$	On-state threshold voltage, max	V	0.95	$T_j = T_{j\max}$;
r_T	On-state slope resistance, max	m Ω	0.080	$0.5 \pi I_{TAV} < I_T < 1.5 \pi I_{TAV}$
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/ μ s
I_H	Holding current, max	mA	300	$T_j = 25 \text{ }^{\circ}\text{C}$; $V_D = 12$ V; Gate open
BLOCKING				
I_{DRM} , I_{RRM}	Repetitive peak off-state and Repetitive peak reverse currents, max	mA	300	$T_j = T_{j\max}$; $V_D = V_{DRM}$; $V_R = V_{RRM}$
$(dv_D/dt)_{crit}$	Critical rate of rise of off-state voltage ¹⁾ , min	V/ μ s	1000	$T_j = T_{j\max}$; $V_D = 0.67 \cdot V_{DRM}$; Gate open
TRIGGERING				
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	
V_{GD}	Gate non-trigger direct voltage, min	V	0.35	$T_j = T_{j\max}$; $V_D = 0.67 \cdot V_{DRM}$; Direct gate current
I_{GD}	Gate non-trigger direct current, min	mA	15.00	
SWITCHING				
t_{gd}	Delay time	μ s	2.00	$T_j = 25 \text{ }^{\circ}\text{C}$; $V_D = 0.4 \cdot V_{DRM}$; $I_{TM} = 2000$ A; Gate pulse: $I_G = 2$ A; $t_{GP} = 50 \mu$ s; $di_G/dt \geq 1$ A/ μ s
t_q	Turn-off time ²⁾ , max	μ s	400	$dv_D/dt = 50$ V/ μ s; $T_j = T_{j\max}$; $I_{TM} = 2000$ A; $di_R/dt = -10$ A/ μ s; $V_R = 100$ V; $V_D = 0.67 \cdot V_{DRM}$

THERMAL					
R _{thjc}	Thermal resistance, junction to case, max	°C/W	0.0057	Direct current	Double side cooled
R _{thjc-A}			0.0125		Anode side cooled
R _{thjc-K}			0.0103		Cathode side cooled
R _{thck}	Thermal resistance, case to heatsink, max	°C/W	0.0010	Direct current	
MECHANICAL					
w	Weight, typ	g	2700		
D _s	Surface creepage distance	mm (inch)	62.09 (2.444)		
D _a	Air strike distance	mm (inch)	23.40 (0.921)		

Beijing Xinchuang Chunshu Rectifier Co., Ltd

OVERALL DIMENSIONS



KT110DT

All dimensions in millimeters