



High-end Power Semiconductor Manufacturer

KP3200A 3000V-3600V 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}		3200 A	
Repetitive peak off-state voltage		V _{DRM}		3000 – 3600 V	
Repetitive peak reverse voltage		V _{RRM}			
Turn-off time		t _q		630 μs	
V _{DRM} , V _{RRM} , V	3000	3200	3400	3600	
Voltage code	30	32	34	36	
T _j , °C	– 60 – 125				

MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions	
ON-STATE					
I_{TAV}	Mean on-state current	A	3200	$T_c=85\text{ }^{\circ}\text{C}$, Double side cooled 180° half-sine wave; 50 Hz	
I_{TRMS}	RMS on-state current	A	5024	$T_c=85\text{ }^{\circ}\text{C}$, Double side cooled 180° half-sine wave; 50 Hz	
I_{TSM}	Surge on-state current	kA	72.0 83.0	$T_j=T_{j\max}$ $T_j=25\text{ }^{\circ}\text{C}$	180° half-sine wave; 50 Hz ($t_p=10\text{ ms}$); single pulse; $V_D=V_R=0\text{ V}$; Gate pulse: $I_G=2\text{ A}$; $t_{GP}=50\text{ }\mu\text{s}$; $di_G/dt\geq 1\text{ A}/\mu\text{s}$
			76.0 87.0	$T_j=T_{j\max}$ $T_j=25\text{ }^{\circ}\text{C}$	180° half-sine wave; 60 Hz ($t_p=8.3\text{ ms}$); single pulse; $V_D=V_R=0\text{ V}$; Gate pulse: $I_G=2\text{ A}$; $t_{GP}=50\text{ }\mu\text{s}$; $di_G/dt\geq 1\text{ A}/\mu\text{s}$
I^2t	Safety factor	$\text{A}^2\text{s}\cdot 10^3$	25920 34445	$T_j=T_{j\max}$ $T_j=25\text{ }^{\circ}\text{C}$	180° half-sine wave; 50 Hz ($t_p=10\text{ ms}$); single pulse; $V_D=V_R=0\text{ V}$; Gate pulse: $I_G=2\text{ A}$; $t_{GP}=50\text{ }\mu\text{s}$; $di_G/dt\geq 1\text{ A}/\mu\text{s}$
			23970 31410	$T_j=T_{j\max}$ $T_j=25\text{ }^{\circ}\text{C}$	180° half-sine wave; 60 Hz ($t_p=8.3\text{ ms}$); single pulse; $V_D=V_R=0\text{ V}$; Gate pulse: $I_G=2\text{ A}$; $t_{GP}=50\text{ }\mu\text{s}$; $di_G/dt\geq 1\text{ A}/\mu\text{s}$
BLOCKING					
V_{DRM}, V_{RRM}	Repetitive peak off-state and Repetitive peak reverse voltages	V	3000–3600	$T_{j\min}<T_j<T_{j\max}$; 180° half-sine wave; 50 Hz; Gate open	
V_{DSM}, V_{RSM}	Non-repetitive peak off-state and Non-repetitive peak reverse voltages	V	3100–3700	$T_{j\min}<T_j<T_{j\max}$; 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	

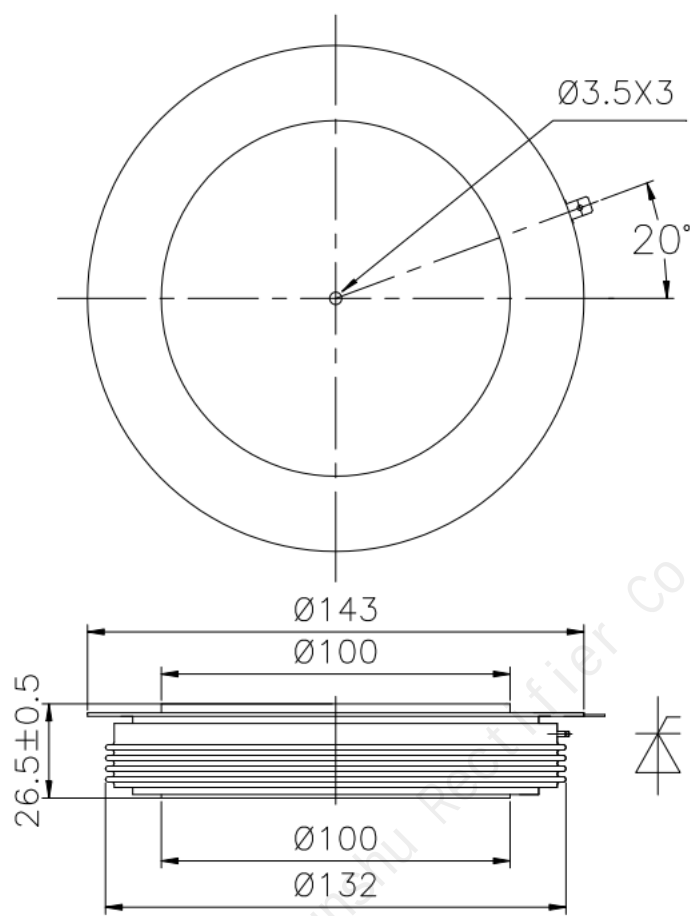
TRIGGERING				
I_{FGM}	Peak forward gate current	A	12	$T_j = T_{j\max}$
V_{RGM}	Peak reverse gate voltage	V	5	
P_G	Gate power dissipation	W	5	$T_j = T_{j\max}$ for DC gate current
SWITCHING				
$(di_T/dt)_{crit}$	Critical rate of rise of on-state current non-repetitive (f=1 Hz)	A/ μ s	1000	$T_j = T_{j\max}$; $V_D = 0.67 V_{DRM}$; $I_{TM} = 2 I_{TAV}$; 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	$T_j=125\text{ }^{\circ}\text{C}$; $I_{TM}=4000\text{ A}$	
$V_{T(TO)}$	On-state threshold voltage, max	V	0.95	$T_j=T_{j\text{ max}}$;	
r_T	On-state slope resistance, max	m Ω	0.140	$0.5\pi I_{TAV} < I_T < 1.5\pi I_{TAV}$	
I_L	Latching current, max	mA	1500	$T_j=25\text{ }^{\circ}\text{C}$; $V_D=12\text{ V}$; Gate pulse: $I_G=2\text{ A}$; $t_{GP}=50\text{ }\mu\text{s}$; $di_G/dt\geq 1\text{ A}/\mu\text{s}$	
I_H	Holding current, max	mA	300	$T_j=25\text{ }^{\circ}\text{C}$; $V_D=12\text{ V}$; Gate open	
BLOCKING					
I_{DRM} , I_{RRM}	Repetitive peak off-state and Repetitive peak reverse currents, max	mA	300	$T_j=T_{j\text{ max}}$; $V_D=V_{DRM}$; $V_R=V_{RRM}$	
$(dv_D/dt)_{crit}$	Critical rate of rise of off-state voltage ¹⁾ , min	V/ μs	1000	$T_j=T_{j\text{ max}}$; $V_D=0.67\cdot V_{DRM}$; Gate open	
TRIGGERING					
V_{GT}	Gate trigger direct voltage, max	V	3.00 2.00	$T_j=25\text{ }^{\circ}\text{C}$ $T_j= T_{j\text{ max}}$	$V_D=12\text{ V}$; $I_D=3\text{ A}$; Direct gate current
I_{GT}	Gate trigger direct current, max	mA	300 200	$T_j= 25\text{ }^{\circ}\text{C}$ $T_j= T_{j\text{ max}}$	
V_{GD}	Gate non-trigger direct voltage, min	V	0.35	$T_j=T_{j\text{ max}}$; $V_D=0.67\cdot V_{DRM}$;	
I_{GD}	Gate non-trigger direct current, min	mA	15.00	Direct gate current	
SWITCHING					
t_{gd}	Delay time	μs	3.00	$T_j=25\text{ }^{\circ}\text{C}$; $V_D=0.4\cdot V_{DRM}$; $I_{TM}=2000\text{ A}$; Gate pulse: $I_G=2\text{ A}$; $t_{GP}=50\text{ }\mu\text{s}$; $di_G/dt\geq 1\text{ A}/\mu\text{s}$	
t_q	Turn-off time ²⁾ , max	μs	630	$dv_D/dt=50\text{ V}/\mu\text{s}$; $T_j=T_{j\text{ max}}$; $I_{TM}=2000\text{ A}$; $di_R/dt=-10\text{ A}/\mu\text{s}$; $V_R=100\text{ V}$; $V_D=0.67\text{ }V_{DRM}$;	

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)	62.16 (2.447)		
D _a	Air strike distance	mm (inch)	26.00 (1.024)		

OVERALL DIMENSIONS



KT110

All dimensions in millimeters