



High-end Power Semiconductor Manufacturer

KP2075A 4200V

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}	2075 A
Repetitive peak off-state voltage	V_{DRM}	4200 V
Repetitive peak reverse voltage	V_{RRM}	
Turn-off time	t_q	600 μ s
T_{vj} , °C	125	

MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions	
ON-STATE					
I_{TAV}	Mean on-state current	A	2075	$T_c=70\text{ }^{\circ}\text{C}$, half-sine wave	
I_{TRMS}	RMS on-state current	A	3260	$T_c=70\text{ }^{\circ}\text{C}$, half-sine wave	
I_{TSM}	Surge on-state current	kA	32.0	$t_p = 10\text{ ms}$	$T_{vj}= 125\text{ }^{\circ}\text{C}$, $V_D = V_R= 0\text{ V}$
			35.0	$t_p = 8.3\text{ ms}$	$T_{vj}= 125\text{ }^{\circ}\text{C}$, $V_D = V_R= 0\text{ V}$
I^2t	Safety factor	$A^2s\cdot 10^3$	5120	$t_p = 10\text{ ms}$	$T_{vj}= 125\text{ }^{\circ}\text{C}$, $V_D = V_R= 0\text{ V}$
			5000	$t_p = 8.3\text{ ms}$	$T_{vj}= 125\text{ }^{\circ}\text{C}$, $V_D = V_R= 0\text{ V}$
BLOCKING					
V_{DRM}, V_{RRM}	Repetitive peak off-state and Repetitive peak reverse voltages	V	4200	$f = 50\text{ Hz}$, $t_p = 10\text{ ms}$	
V_D, V_R	Direct off-state and Direct reverse voltages	V	$0.6\cdot V_{DRM}$ $0.6\cdot V_{RRM}$	$T_j=T_{j\text{ max}}$; Gate open	

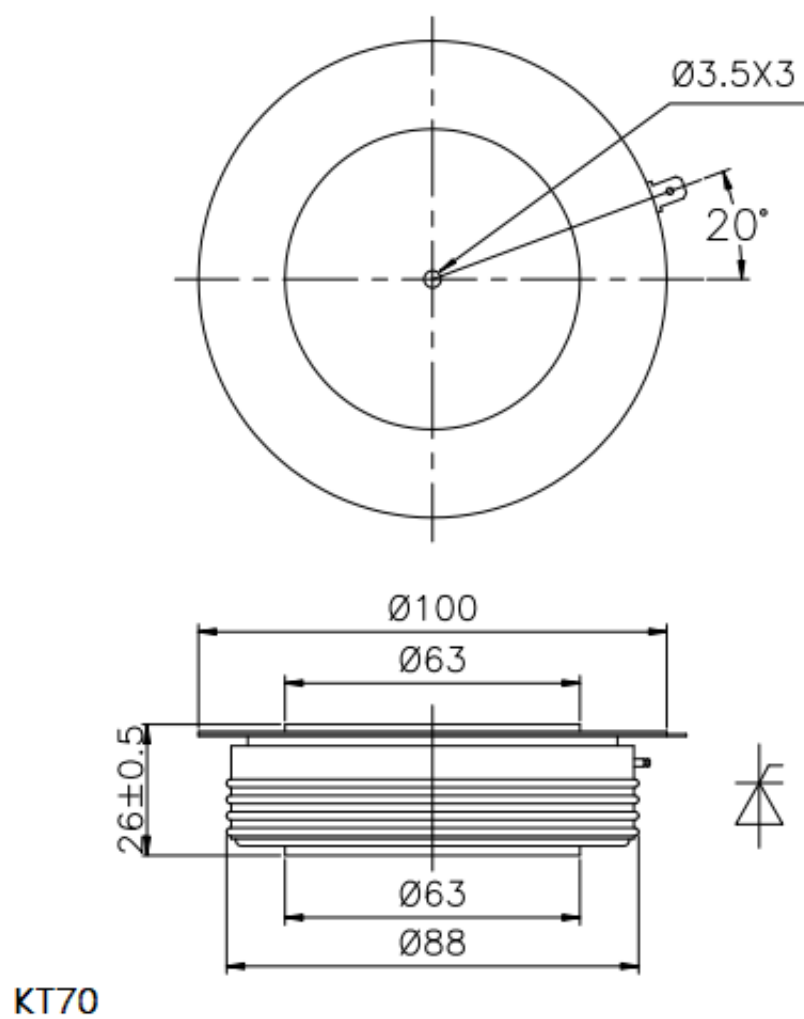
TRIGGERING				
I_{FGM}	Peak forward gate current	A	10	$T_j = T_{j\max}$
V_{RGM}	Peak reverse gate voltage	V	10	
P_G	Gate power dissipation	W	3	
SWITCHING				
$(di_T/dt)_{crit}$	Critical rate of rise of on-state current non-repetitive (f=1 Hz)	A/ μ s	1000	$T_{vj} = 125\text{ }^{\circ}\text{C}$, $I_{TRM} = 3000\text{ A}$, $V_D \leq 0.67 \cdot V_{DRM}$, $I_{FG} = 2\text{ A}$, $t_r = 0.5\text{ }\mu\text{s}$
THERMAL				
T_{stg}	Storage temperature	$^{\circ}\text{C}$	-40-140	
T_{vj}	Operating junction temperature	$^{\circ}\text{C}$	125	
MECHANICAL				
F	Mounting force	kN	45-60	
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	1.53	I _T = 2000 A, T _{vj} = 125 °C	
V _{T(TO)}	On-state threshold voltage, max	V	0.96	I _T = 1000 A - 3000 A, T _{vj} = 125 °C	
r _T	On-state slope resistance, max	mΩ	0.285		
I _L	Latching current, max	mA	600	T _{vj} =25°C	
I _H	Holding current, max	mA	80	T _{vj} =25°C	
BLOCKING					
I _{DRM} , I _{RRM}	Repetitive peak off-state and Repetitive peak reverse currents, max	mA	300	V _{DRM} , T _{vj} = 125 °C	
(dv _D /dt) _{crit}	Critical rate of rise of off-state voltage ¹⁾	V/μs	1000	Exp. to 0.67 x V _{DRM} , T _{vj} = 125 °C	
TRIGGERING					
V _{GT}	Gate trigger direct voltage, max	V	2.60	T _{vj} =25 °C	
I _{GT}	Gate trigger direct current, max	mA	400	T _{vj} = 25 °C	
SWITCHING					
t _{gd}	Delay time	μs	3.00	V _D = 0.4.V _{DRM} , I _{FG} = 2 A, t _r = 0.5 μs	
t _q	Turn-off time ²⁾	μs	600	T _{vj} = 125 °C, I _{TRM} = 3000 A, V _R = 200 V, di _T /dt = -5 A/μs, V _D ≤ 0.67.V _{DRM} , dv _D /dt = 20 V/μs	
Q _{rr}	Total recovered charge, max	μAs	5500	T _{vj} = 125 °C, I _{TRM} = 3000 A, V _R = 200 V, di _T /dt = -.5 A/μs	

THERMAL					
R _{thjc}	Thermal resistance, junction to case, max	K/kW	10	Direct current	Double side cooled
R _{thjc-A}			20		Anode side cooled
R _{thjc-K}			20		Cathode side cooled
R _{thck}	Thermal resistance, case to heatsink, max	K/kW	2	Double-side cooled	
MECHANICAL					
w	Weight, typ	g	900		
D _s	Surface creepage distance	mm	36		
D _a	Air strike distance	mm	15		

OVERALL DIMENSIONS



All dimensions in millimeters