



High-end Power Semiconductor Manufacturer

KP3170A 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}	3170 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	3170	$T_c=70$ °C, half-sine wave	
I_{TRMS}	RMS on-state current	A	4980	$T_c=70$ °C, half-sine wave	
I_{TSM}	Surge on-state current	kA	52.0	$t_p = 10$ ms	$T_{vj} = 125$ °C, $V_D = V_R = 0$ V
			56.0	$t_p = 8.3$ ms	$T_{vj} = 125$ °C, $V_D = V_R = 0$ V
I^2t	Safety factor	$A^2s \cdot 10^3$	13520	$t_p = 10$ ms	$T_{vj} = 125$ °C, $V_D = V_R = 0$ V
			13014	$t_p = 8.3$ ms	$T_{vj} = 125$ °C, $V_D = V_R = 0$ V
BLOCKING					
V_{DRM}, V_{RRM}	Repetitive peak off-state and Repetitive peak reverse voltages	V	4200	$f = 50$ Hz, $t_p = 10$ ms	
V_D, V_R	Direct off-state and Direct reverse voltages	V	$0.6 \cdot V_{DRM}$ $0.6 \cdot V_{RRM}$	$T_j = T_{jmax}$; Gate open	

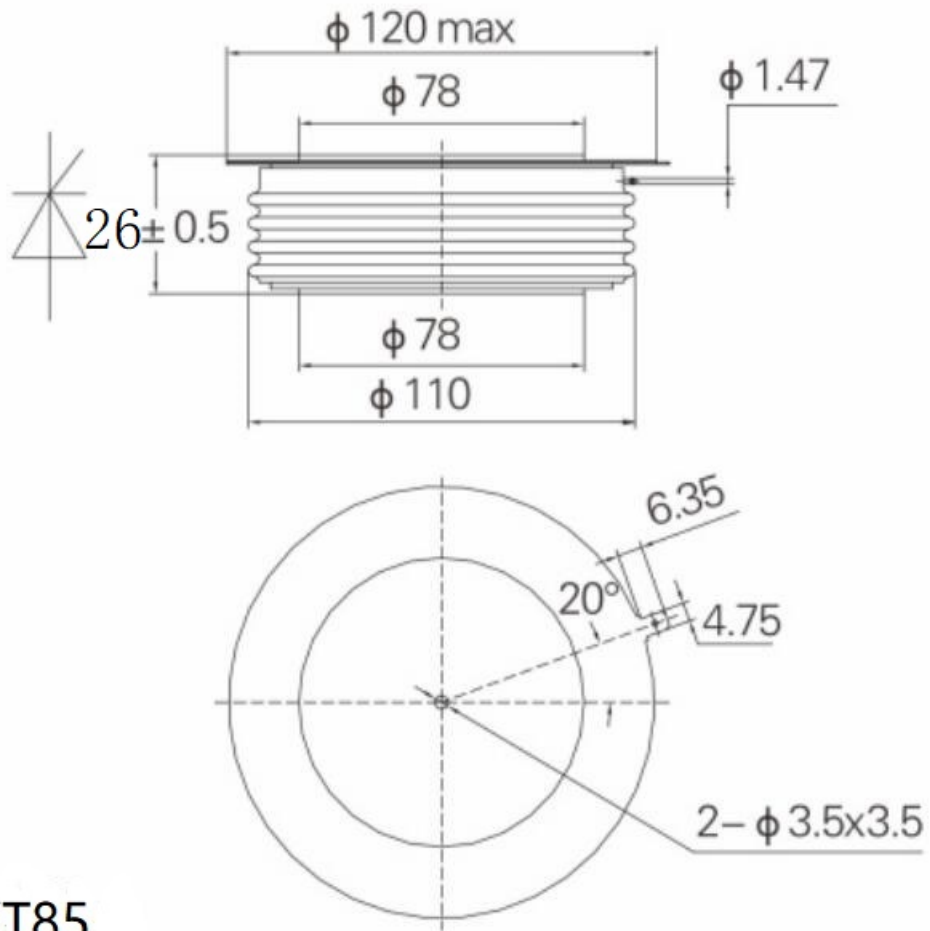
TRIGGERING				
I_{FGM}	Peak forward gate current	A	10	$T_j = T_{j\max}$
V_{RGM}	Peak reverse gate voltage	V	10	
P_G	Gate power dissipation	W	3	
SWITCHING				
$(di_T/dt)_{crit}$	Critical rate of rise of on-state current non-repetitive (f=1 Hz)	A/ μ s	1000	$T_{vj} = 125\text{ }^\circ\text{C}$, $I_{TRM} = 4000\text{ A}$, $V_D \leq 0.67 \cdot V_{DRM}$, $I_{FG} = 2\text{ A}$, $t_r = 0.5\text{ }\mu\text{s}$
THERMAL				
T_{stg}	Storage temperature	$^\circ\text{C}$	-40-140	
T_{vj}	Operating junction temperature	$^\circ\text{C}$	125	
MECHANICAL				
F	Mounting force	kN	63-84	
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	1.45	$I_T = 3000\text{ A}$, $T_{vj} = 125\text{ }^\circ\text{C}$	
$V_{T(TO)}$	On-state threshold voltage, max	V	0.97	$I_T = 2000\text{ A} - 6000\text{ A}$, $T_{vj} = 125\text{ }^\circ\text{C}$	
r_T	On-state slope resistance, max	$\text{m}\Omega$	0.158		
I_L	Latching current, max	mA	500	$T_{vj} = 25\text{ }^\circ\text{C}$	
I_H	Holding current, max	mA	100	$T_{vj} = 25\text{ }^\circ\text{C}$	
BLOCKING					
I_{DRM} , I_{RRM}	Repetitive peak off-state and Repetitive peak reverse currents, max	mA	400	V_{DRM} , $T_{vj} = 125\text{ }^\circ\text{C}$	
$(dv_D/dt)_{crit}$	Critical rate of rise of off-state voltage ¹⁾	V/ μ s	2000	Exp. to $0.67 \times V_{DRM}$, $T_{vj} = 125\text{ }^\circ\text{C}$	
TRIGGERING					
V_{GT}	Gate trigger direct voltage, max	V	2.60	$T_{vj} = 25\text{ }^\circ\text{C}$	
I_{GT}	Gate trigger direct current, max	mA	400	$T_{vj} = 25\text{ }^\circ\text{C}$	
SWITCHING					
t_{gd}	Delay time	μ s	3.00	$V_D = 0.4 \cdot V_{DRM}$, $I_{FG} = 2\text{ A}$, $t_r = 0.5\text{ }\mu\text{s}$	
t_q	Turn-off time ²⁾	μ s	800	$T_{vj} = 125\text{ }^\circ\text{C}$, $I_{TRM} = 4000\text{ A}$, $V_R = 200\text{ V}$, $di_T/dt = -5\text{ A}/\mu\text{s}$, $V_D \leq 0.67 \cdot V_{DRM}$, $dv_D/dt = 20\text{ V}/\mu\text{s}$	
Q_{rr}	Total recovered charge, max	μAs	7500	$T_{vj} = 125\text{ }^\circ\text{C}$, $I_{TRM} = 4000\text{ A}$, $V_R = 200\text{ V}$, $di_T/dt = -5\text{ A}/\mu\text{s}$	

THERMAL					
R_{thjc}	Thermal resistance, junction to case, max	K/kW	7.0	Direct current	Double side cooled
R_{thjc-A}			14.0		Anode side cooled
R_{thjc-K}			14.0		Cathode side cooled
R_{thck}	Thermal resistance, case to heatsink, max	K/kW	1.5	Double-side cooled	
MECHANICAL					
w	Weight, typ	g	1450		
D_s	Surface creepage distance	mm	36		
D_a	Air strike distance	mm	15		

OVERALL DIMENSIONS



KT85

All dimensions in millimeters