



High-end Power Semiconductor Manufacturer

KK250A 3000-3600V

Fast Switching Thyristor

- Low switching losses
- Low reverse recovery charge
- Distributed amplified gate for high di_T/dt



Mean on-state current			I _{TAV}		250 A	
Repetitive peak off-state voltage			V _{DRM}		3000 – 3600 V	
Repetitive peak reverse voltage			V _{RRM}			
Turn-off time			t _q		50.0; 63.0; 80.0; 100; 125 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	250 375	$T_c=85^{\circ}\text{C}$; Double side cooled; $T_c=55^{\circ}\text{C}$; 180° half-sine wave; 50 Hz	
I_{TRMS}	RMS on-state current	A	393	$T_c=85^{\circ}\text{C}$; Double side cooled; 180° half-sine wave; 50 Hz	
I_{TSM}	Surge on-state current	kA	5.4 6.2	$T_j=T_{j\max}$ $T_j=25^{\circ}\text{C}$	180° half-sine wave; 50 Hz ($t_p=10\text{ ms}$); single pulse; $V_D=V_R=0\text{ V}$; Gate pulse: $I_G=I_{FGM}$; $V_G=20\text{ V}$; $t_{GP}=50\text{ }\mu\text{s}$; $di_G/dt=1\text{ A}/\mu\text{s}$
			6.0 6.9	$T_j=T_{j\max}$ $T_j=25^{\circ}\text{C}$	180° half-sine wave; 60 Hz ($t_p=8.3\text{ ms}$); single pulse; $V_D=V_R=0\text{ V}$; Gate pulse: $I_G=I_{FGM}$; $V_G=20\text{ V}$; $t_{GP}=50\text{ }\mu\text{s}$; $di_G/dt=1\text{ A}/\mu\text{s}$
I^2t	Safety factor	$\text{A}^2\text{s}\cdot 10^3$	145 190	$T_j=T_{j\max}$ $T_j=25^{\circ}\text{C}$	180° half-sine wave; 50 Hz ($t_p=10\text{ ms}$); single pulse; $V_D=V_R=0\text{ V}$; Gate pulse: $I_G=I_{FGM}$; $V_G=20\text{ V}$; $t_{GP}=50\text{ }\mu\text{s}$; $di_G/dt=1\text{ A}/\mu\text{s}$
			145 195	$T_j=T_{j\max}$ $T_j=25^{\circ}\text{C}$	180° half-sine wave; 60 Hz ($t_p=8.3\text{ ms}$); single pulse; $V_D=V_R=0\text{ V}$; Gate pulse: $I_G=I_{FGM}$; $V_G=20\text{ V}$; $t_{GP}=50\text{ }\mu\text{s}$; $di_G/dt=1\text{ A}/\mu\text{s}$
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	

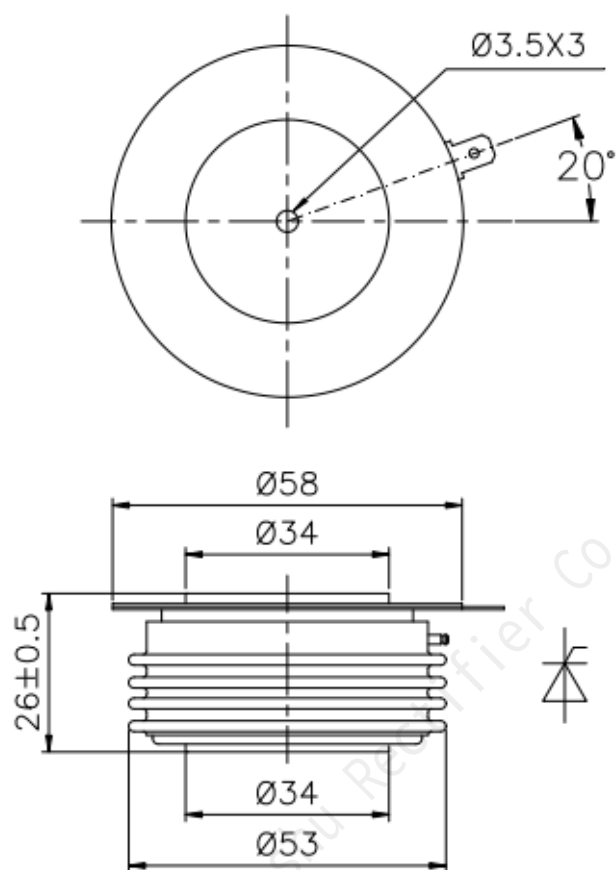
TRIGGERING				
I_{FGM}	Peak forward gate current	A	6	$T_j = T_{j\max}$
V_{RGM}	Peak reverse gate voltage	V	5	
P_G	Gate power dissipation	W	3	$T_j = T_{j\max}$ for DC gate current
SWITCHING				
$(di_T/dt)_{crit}$	Critical rate of rise of on-state current non-repetitive ($f=1$ Hz)	A/ μ s	1000	$T_j = T_{j\max}$; $V_D = 0.67V_{DRM}$; $I_{TM} = 2 I_{TAV}$; Gate pulse: $I_G = I_{FGM}$; $V_G = 20$ V; $t_{GP} = 50 \mu$ s; $di_G/dt = 1$ 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	9.0 – 11.0	
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	3.00	T _j =25 °C; I _{TM} =785 A	
V _{T(TO)}	On-state threshold voltage, max	V	2.00	T _j =T _{j max} ;	
r _T	On-state slope resistance, max	mΩ	1.200	0.5 π I _{TAV} < I _T < 1.5 π I _{TAV}	
I _H	Holding current, max	mA	500	T _j =25 °C; V _D =12 V; Gate open	
BLOCKING					
I _{DRM} , I _{RRM}	Repetitive peak off-state and Repetitive peak reverse currents, max	mA	70	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/μs	1000	T _j =T _{j max} ; V _D =0.67·V _{DRM} ; Gate open	
TRIGGERING					
V _{GT}	Gate trigger direct voltage, max	V	4.00 2.50 2.00	T _j = T _{j min} T _j =25 °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	500 300 200	T _j = T _{j min} T _j = 25 °C T _j = T _{j max}	
V _{GD}	Gate non-trigger direct voltage, min	V	0.25	T _j =T _{j max} ; V _D =0.67·V _{DRM} ;	
I _{GD}	Gate non-trigger direct current, min	mA	10.00	Direct gate current	
SWITCHING					
t _{gd}	Delay time	μs	3.0	T _j =25 °C; V _D =0.4·V _{DRM} ; I _{TM} =I _{TAV} ; Gate pulse: I _G =I _{FGM} ; V _G =20 V; t _{GP} =50 μs; di _G /dt=1 A/μs	
t _q	Turn-off time ²⁾ , max	μs	50.0; 63.0; 80.0; 100; 125	dv _D /dt=50 V/μs;	T _j =T _{j max} ; I _{TM} = I _{TAV} ; di _R /dt=-10 A/μs; V _R =100V; V _D =0.67·V _{DRM}
			63.0; 80.0; 100; 125; 160	dv _D /dt=200 V/μs;	
Q _{rr}	Total recovered charge, max	μC	500	T _j =T _{j max} ; I _{TM} = I _{TAV} ;	
t _{rr}	Reverse recovery time, typ	μs	5.0	di _R /dt=-50 A/μs;	
I _{rrM}	Peak reverse recovery current, max	A	200	V _R =100 V	

THERMAL					
R _{thjc}	Thermal resistance, junction to case, max	°C/W	0.0400	Direct current	Double side cooled
R _{thjc-A}			0.0880		Anode side cooled
R _{thjc-K}			0.0720		Cathode side cooled
R _{thck}	Thermal resistance, case to heatsink, max	°C/W	0.0060	Direct current	
MECHANICAL					
w	Weight, typ	g	180		
D _s	Surface creepage distance	mm (inch)	19.44 (0.765)		
D _a	Air strike distance	mm (inch)	12.10 (0.476)		

OVERALL DIMENSIONS



KT40

All dimensions in millimeters