

KH1000A/5000V

HIGH POWER THYRISTOR FOR PHASE CONTROL APPLICATIONS

Features:

- . All Diffused Structure
- . Spoke Amplifying Gate Configuration
- . Blocking capability up to 5000 volts
- . Guaranteed Maximum Turn-Off Time
- . High dV/dt Capability
- . Pressure Assembled Device

ELECTRICAL CHARACTERISTICS AND RATINGS

Blocking - Off State

Device Type	V_{RRM} (1)	V_{DRM} (1)	V_{RSM} (1)
KH1000	5000	5000	5200

V_{RRM} = Repetitive peak reverse voltage

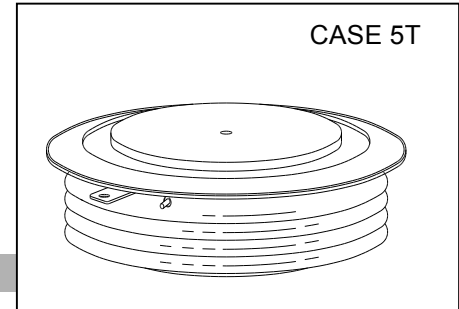
V_{DRM} = Repetitive peak off state voltage

V_{RSM} = Non repetitive peak reverse voltage (2)

Repetitive peak reverse leakage and off state leakage	I_{RRM}/I_{DRM}	80 mA 350mA (3)
Critical rate of voltage rise	dV/dt (4)	1500V/ μ sec

Conducting - on state

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Average value of on-state current	$I_{T(AV)}$		1000		A	Sinewave, 180° conduction, $T_c=85^\circ\text{C}$
RMS value of on-state current	I_{TRMS}		1550		A	Nominal value
Peak one cycle surge (non repetitive) current	I_{TSM}		15000		A	10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, $T_j = 125^\circ\text{C}$
I square t	I^2t		2.0×10^6		A^2s	10.0 msec
Latching current	I_L		3		A	$V_D = 24\text{ V}$; $R_L = 12\text{ ohms}$
Holding current	I_H		80		mA	$V_D = 24\text{ V}$; $I = 2.5\text{ A}$
Peak on-state voltage	V_{TM}		3.00		V	$I_{TM} = 3000\text{ A}$; Duty cycle $\leq 0.01\%$
Critical rate of rise of on-state current (5, 6)	di/dt		200		A/ μ s	Switching from $V_{DRM} \leq 3000\text{ V}$, non-repetitive
Critical rate of rise of on-state current (6)	di/dt		100		A/ μ s	Switching from $V_{DRM} \leq 3000\text{ V}$



Notes:

All ratings are specified for $T_j=25^\circ\text{C}$ unless otherwise stated.

(1) All voltage ratings are specified for an applied 50Hz/60Hz sinusoidal waveform over the temperature range -40 to $+125^\circ\text{C}$.

(2) 10 msec. max. pulse width

(3) Maximum value for $T_j = 125^\circ\text{C}$.

(4) Minimum value for linear and exponential waveshape to 70% rated V_{DRM} . Gate open. $T_j = 125^\circ\text{C}$.

(5) Non-repetitive value.

(6) The value of di/dt is established in accordance with EIA/NIMA Standard RS-397, Section 5-2-2-6. The value defined would be in addition to that obtained from a snubber circuit, comprising a $0.2\text{ }\mu\text{F}$ capacitor and 20 ohms resistance in parallel with the thyristor under test.

ELECTRICAL CHARACTERISTICS AND RATINGS (cont'd) Power Thyristor KH1000A**Gating**

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Peak gate power dissipation	P_{GM}		200		W	$t_p = 40 \mu s$
Average gate power dissipation	$P_{G(AV)}$		5		W	
Peak gate current	I_{GM}		20		A	
Gate current required to trigger all units	I_{GT}		300		mA	$V_D = 6 V; R_L = 3 \text{ ohms}; T_j = +25^\circ C$
Gate voltage required to trigger all units	V_{GT}		3		V	$V_D = 6 V; R_L = 3 \text{ ohms}; T_j = 25^\circ C$
Peak negative voltage	V_{GRM}		20		V	

Dynamic

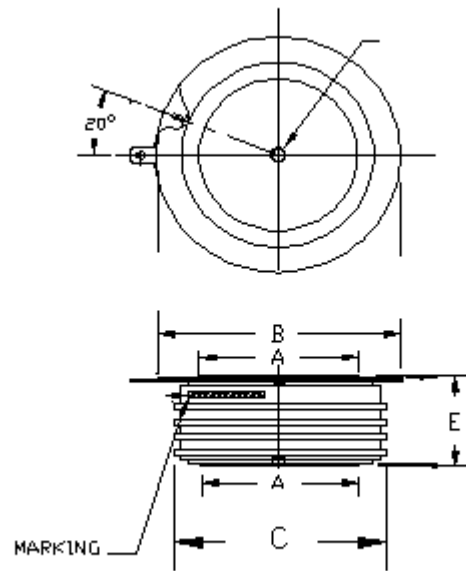
Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	t_d		3.0		μs	$I_{TM} = 50 A; V_D = 2000 V$ Gate pulse: $V_G = 20 V; R_G = 20 \text{ ohms};$ $t_r = 0.1 \mu s; t_p = 20 \mu s$
Turn-off time (with $V_R = -50 V$)	t_q		700	250	μs	$I_{TM} > 2000 A; di/dt = 10 A/\mu s;$ $V_R \geq -50 V; R_e\text{-applied } dV/dt = 500$ $V/\mu s \text{ linear to } 2000 V; V_G = 0;$ $T_j = 125^\circ C; \text{Duty cycle} \geq 0.01\%$
Reverse recovery current	I_{rr}		300		A	$I_{TM} > 2000 A; di/dt = 10 A/\mu s;$ $V_R \geq -50 V$

THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Operating temperature	T_j	-40	+125		$^\circ C$	
Storage temperature	T_{stg}	-40	+150		$^\circ C$	
Thermal resistance - junction to case	$R_{\theta(j-c)}$		0.006		$^\circ C/W$	Double sided cooled
Thermal resistance - case to sink	$R_{\theta(c-s)}$		0.002		$^\circ C/W$	Double sided cooled * *
Mounting force	F		60		kN	

* Mounting surfaces smooth, flat and greased

Note : for case outline and dimensions, see case outline drawing in page 3 of this Technical Data



A: 63 mm

B: 100 mm

C: 89 mm

E: 26 mm