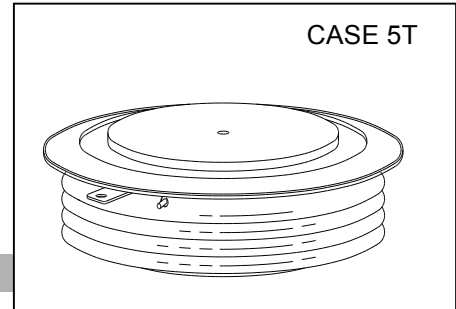


KP4000A/4000V

HIGH POWER THYRISTOR FOR PHASE CONTROL APPLICATIONS

Features:

- . All Diffused Structure
- . Spoke Amplifying Gate Configuration
- . Blocking capability up to 4000volts
- . 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)
KP4000	4000	4000	4200

- 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/μsec

Conducting - on state

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Average value of on-state current	I _{T(AV)}		4000		A	Sinewave, 180° conduction, T _c =85°C
RMS value of on-state current	I _{TRMS}		6200		A	Nominal value
Peak one cycle surge (non repetitive) current	I _{TSM}		60000		A	10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, T _j = 125 °C
I square t	I ² t		16.x10 ⁶		A ² s	10.0 msec
Latching current	I _L		3		A	V _D = 24 V; R _L = 12 ohms
Holding current	I _H		350		mA	V _D = 24 V; I = 2.5 A
Peak on-state voltage	V _{TM}		2.75		V	I _{TM} = 8000 A; Duty cycle ≤ 0.01%
Critical rate of rise of on-state current (5, 6)	di/dt		800		A/μs	Switching from V _{DRM} ≤ 3000 V, non-repetitive
Critical rate of rise of on-state current (6)	di/dt		200		A/μs	Switching from V _{DRM} ≤ 3000 V

Notes:

All ratings are specified for T_j=25 °C unless otherwise stated.

- (1) All voltage ratings are specified for an applied 50Hz/60zHz sinusoidal waveform over the temperature range -40 to +125 °C.
- (2) 10 msec. max. pulse width
- (3) Maximum value for T_j = 125 °C.
- (4) Minimum value for linear and exponential waveshape to 70% rated V_{DRM}. Gate open. T_j = 125 °C.
- (5) Non-repetitive value.
- (6) The value of di/dt is established in accordance with EIA/NIMA Standard RS-397, Section5-2-2-6. The value defined would be in addition to that obtained from a snubber circuit, comprising a 0.2 μF capacitor and 20 ohmsresistance in parallel with the thristor under test.

ELECTRICAL CHARACTERISTICS AND RATINGS (cont'd) Power Thyristor KP4000A

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		600	250	μs	$I_{TM} > 2000 A; di/dt = 10 A/\mu s;$ $V_R \geq -50 V; \text{Re-applied } dV/dt = 500$ $V/\mu s \text{ linear to } 2000 V; V_G = 0;$ $T_j = 125^\circ C; \text{Duty cycle } \geq 0.01\%$
Reverse recovery current	I_{rr}		300		A	$I_{TM} > 2000 A; di/dt = 10 A/\mu s;$ $V_R \geq -50 V$

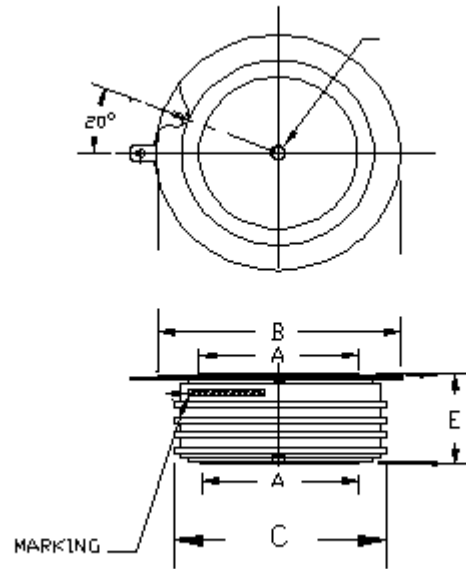
THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

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		108		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: 100 mm

B: 150 mm

C: 127 mm

E: 35 mm