KP4000A/800V

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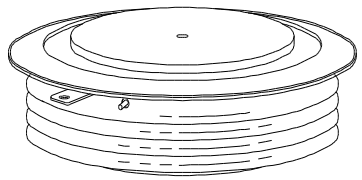
HIGH POWER THYRISTOR FOR PHASE CONTROL APPLICATIONS

Features:

- **All Diffused Structure**
- **Spoke Amplifying Gate Configuration**
- **Guaranteed Maximum Turn-Off Time**
- **High dV/dt Capability**
- **Pressure Assembled Device**

CASE 5T



ELECTRICAL CHARACTERISTICS AND RATINGS

Blocking - Off State

Device Type	V_{RRM} (1)	V_{DRM} (1)	V_{RSM} (1)
KP4000	800	800	900

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 150mA (3)
Critical rate of voltage rise	dV/dt (4)	1000V/µsec

Notes:
All ratings are specified for Tj=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 Tj = 125 °C.
(4) Minimum value for linear and exponential waveshape to 70% rated V_{DRM}. Gate open. Tj = 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 addi-tion to that obtained from a snubber circuit, comprising a 0.2 µF capacitor and 20 ohmsresistance in parallel with the thristor under test.

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^2t		16.x10^6		A^2s	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}		1.30		V	I_{TM} =3000 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

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 us
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 ohms;T_j = +25 ^oC
Gate voltage required to trigger all units	V_{GT}		3		V	V_D = 6 V;R_L = 3 ohms;T_j = 25^oC
Peak negative voltage	V_{GRM}		20		V	

Dynamic

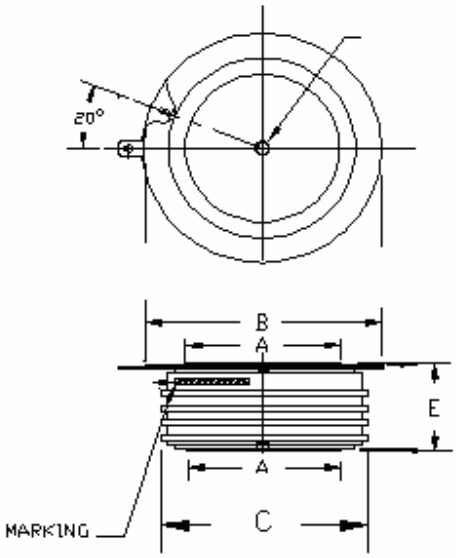
Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	t_d		3.0		µs	I_{TM} = 50 A; V_D = 2000 V Gate pulse: V_G = 20 V; R_G = 20 ohms; t_r = 0.1 µs; t_p = 20 µs
Turn-off time (with V_R = -50 V)	t_q		600	250	µs	I_{TM} > 2000 A; di/dt = 10 A/µs; V_R ≥ -50 V; Re-applied dV/dt = 500 V/µs linear to 2000 V; V_G = 0; T_j = 125 ^oC; Duty cycle ≥ 0.01%
Reverse recovery current	I_{rr}		300		A	I_{TM} > 2000 A; di/dt = 10 A/µs; V_R ≥ -50 V

THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Operating temperature	T_j	-40	+125		^oC	
Storage temperature	T_{stg}	-40	+150		^oC	
Thermal resistance - junction to case	$R_{\Theta (j-c)}$		0.006		^oC/W	Double sided cooled
Thermal resistamce - case to sink	$R_{\Theta (c-s)}$		0.002		^oC/W	Double sided cooled * *
Mounting force	F		90		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： 84 mm
B： 118 mm
C： 107 mm
E： 26 mm