

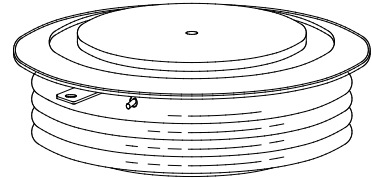
KK4000A - 2500V

HIGH POWER THYRISTOR FOR PHASE CONTROL APPLICATIONS

Features:

- . All Diffused Structure
- . Interdigitated 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)
KK4000A	2500	2500	2600

- 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	I _{RRM} / I _{DRM}	20 mA 150 mA (3)
Critical rate of voltage rise	dV/dt (4)	1000 V/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 =70°C
RMS value of on-state current	I _{TRMS}		4900		A	Nominal value
Peak one cPSTCle surge (non repetitive) current	I _{TSM}		5500 0		A	8.3 msec (60Hz), sinusoidal wave-shape, 180° conduction, T _j = 125 °C
			5200 0		A	10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, T _j = 125 °C
I square t	I ² t		5.5x10 ⁶		A ² s	8.3 msec

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 80% 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, Section 5-2-2-6. The value defined would be in addition to that obtained from a snubber circuit, comprising a 0.2 μF capacitor and 20 ohms resistance in parallel with the thristor under test.



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Latching current	I_L		1000		mA	$V_D = 24\text{ V}; R_L = 12\text{ ohms}$
Holding current	I_H		500		mA	$V_D = 24\text{ V}; I = 2.5\text{ A}$
Peak on-state voltage	V_{TM}		2.30		V	$I_{TM} = 3000\text{ A};$
Critical rate of rise of on-state current (5, 6)	di/dt		800		A/ μs	Switching from $V_{DRM} \leq 1000\text{ V}$, non-repetitive
Critical rate of rise of on-state current (6)	di/dt		300		A/ μs	Switching from $V_{DRM} \leq 1000\text{ V}$

Gating

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Peak gate power dissipation	P_{GM}		200		W	$t_p = 40\text{ us}$
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	$V_D = 6\text{ V}; R_L = 3\text{ ohms}; T_j = -40\text{ }^\circ\text{C}$
			200		mA	$V_D = 6\text{ V}; R_L = 3\text{ ohms}; T_j = +25\text{ }^\circ\text{C}$
			125		mA	$V_D = 6\text{ V}; R_L = 3\text{ ohms}; T_j = +125\text{ }^\circ\text{C}$
Gate voltage required to trigger all units	V_{GT}	0.30	5		V	$V_D = 6\text{ V}; R_L = 3\text{ ohms}; T_j = -40\text{ }^\circ\text{C}$
			4		V	$V_D = 6\text{ V}; R_L = 3\text{ ohms}; T_j = 0\text{-}125\text{ }^\circ\text{C}$
					V	$V_D = \text{Rated } V_{DRM}; R_L = 1000\text{ ohms}; T_j = +125\text{ }^\circ\text{C}$
Peak negative voltage	V_{GRM}		20		V	

Dynamic

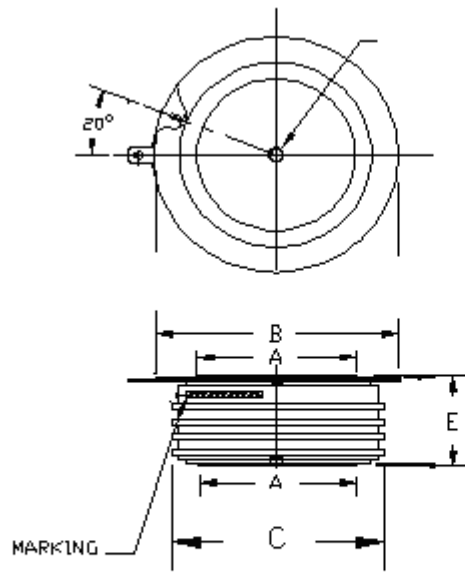
Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	t_d		2.0		μs	$I_{TM} = 50\text{ A}; V_D = 67\% V_{DRM}$ Gate pulse: $V_G = 30\text{ V}; R_G = 10\text{ ohms}; t_r = 0.1\text{ } \mu\text{s}; t_p = 20\text{ } \mu\text{s}$
Turn-off time (with $V_R = -5\text{ V}$)	t_q		80		μs	$I_{TM} > 2000\text{ A}; di/dt = 25\text{ A}/\mu\text{s};$ $V_R \geq -5\text{ V};$ Re-applied $dV/dt = 400\text{ V}/\mu\text{s}$ linear to $67\% V_{DRM}$; $T_j = 125\text{ }^\circ\text{C};$ Duty cPSTCle $\geq 0.01\%$
Reverse recovery current	I_{rr}		200		A	$I_{TM} > 2000\text{ A}; di/dt = 25\text{ A}/\mu\text{s};$ $V_R \geq -50\text{ V}; T_j = 125\text{ }^\circ\text{C}$

THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Operating temperature	T _j	-40	+125		°C	
Storage temperature	T _{stg}	-40	+150		°C	
Thermal resistance - junction to case	R _{Θ(j-c)}		0.012		°C/W	Double sided cooled Single sided cooled
Thermal resistance - case to sink	R _{Θ(c-s)}		0.002		°C/W	Double sided cooled * Single sided cooled *
Mounting force	P	1000 0	12000		lb. kN	
Weight	W			3.5 1.60	Lb. Kg.	

* 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



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