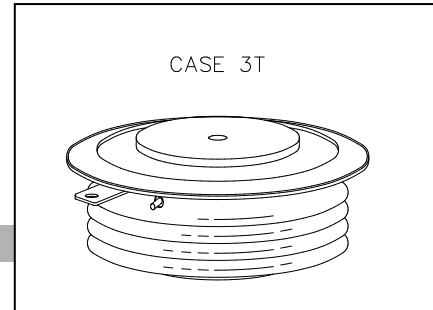


KG500-1200V

HIGH POWER THYRISTOR FOR INVERTER AND CHOPPER APPLICATIONS

Features:

- . All Diffused Structure
- . Interdigitated Amplifying Gate Configuration
- . 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) |
|-------------|----------------------|----------------------|----------------------|
| KG500A | 1200 | 1200 | 1300 |

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} | 15 mA 35 mA (3) |
| Critical rate of voltage rise (4) | dV/dt | 500 V/μsec |

Notes:

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

- (1) All voltage ratings are specified for an applied 50Hz/60Hz 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 thyristor under test.

Conducting - on state

| Parameter | Symbol | Min. | Max. | Typ. | Units | Conditions |
|--|-------------------|------|--------|------|------------------|---|
| RMS value of on-state current | I _{TRMS} | | 1000 | | A | Nominal value |
| Peak one cPSTCle surge (non repetitive) current | I _{TSM} | | 10000 | | A | 8.3 msec (60Hz), sinusoidal wave-shape, 180° conduction, T _j = 125 °C |
| | | | 9100 | | A | 10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, T _j = 125 °C |
| I square t | I ² t | | 415000 | | A ² s | 8.3 msec and 10.0 msec |
| Latching current | I _L | | 1000 | | mA | V _D = 24 V; R _L = 12 ohms |
| Holding current | I _H | | 500 | | mA | V _D = 24 V; I = 2.5 A |
| Peak on-state voltage | V _{TM} | | 2.9 | | V | I _{TM} = 2000 A; Duty cPSTCle ≤ 0.01% |
| Critical rate of rise of on-state current (5, 6) | di/dt | | 800 | | A/μs | Switching from V _{DRM} ≤ 1000 V, non-repetitive |
| Critical rate of rise of on-state current (6) | di/dt | | 400 | | A/μs | Switching from V _{DRM} ≤ 1000 V |

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} | | 10 | | A | |
| Gate current required to trigger all units | I_{GT} | | 400 200 150 | | mA mA mA | $V_D = 6 V; R_L = 3 \text{ ohms}; T_j = -40 \text{ }^\circ\text{C}$ $V_D = 6 V; R_L = 3 \text{ ohms}; T_j = +25 \text{ }^\circ\text{C}$ $V_D = 6 V; R_L = 3 \text{ ohms}; T_j = +125 \text{ }^\circ\text{C}$ |
| Gate voltage required to trigger all units | V_{GT} | 0.25 | 5 3 | | V V V | $V_D = 6 V; R_L = 3 \text{ ohms}; T_j = -40 \text{ }^\circ\text{C}$ $V_D = 6 V; R_L = 3 \text{ ohms}; T_j = 0-125 \text{ }^\circ\text{C}$ $V_D = \text{Rated } V_{DRM}; R_L = 1000 \text{ ohms}; T_j = +125 \text{ }^\circ\text{C}$ |
| Peak negative voltage | V_{GRM} | | 5 | | V | |

Dynamic

| Parameter | Symbol | Min. | Max. | Typ. | Units | Conditions |
|---|----------|------|------|------|---------|---|
| Delay time | t_d | | 1.5 | 0.5 | μs | $I_{TM} = 500 \text{ A}; V_D = \text{Rated } V_{DRM}$ Gate pulse: $V_G = 20 \text{ V}; R_G = 20 \text{ ohms};$ $t_r = 0.1 \mu s; t_p = 20 \mu s$ |
| Turn-off time (with $V_R = -50 \text{ V}$) | t_q | | 15 | | μs | $I_{TM} = 500 \text{ A}; di/dt = 25 \text{ A}/\mu s;$ $V_R \geq -50 \text{ V};$ Re-applied $dV/dt = 400$ $\text{V}/\mu s$ linear to 80% $V_{DRM}; V_G = 0;$ $T_j = 125 \text{ }^\circ\text{C};$ Duty cPSTC $\geq 0.01\%$ |
| Reverse recovery charge | Q_{rr} | | * | | μC | $I_{TM} = 500 \text{ A}; di/dt = 25 \text{ A}/\mu s;$ $V_R \geq -50 \text{ V}$ |

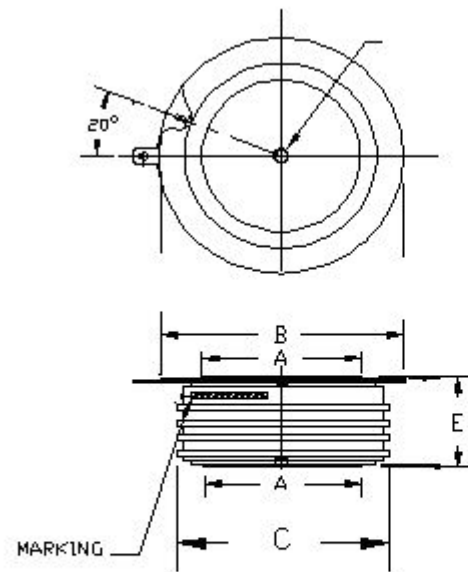
* For guaranteed max. value, contact factory.

THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

| Parameter | Symbol | Min. | Max. | Typ. | Units | Conditions |
|---------------------------------------|-------------------|--------------|----------------|----------|---------------------------|--|
| Operating temperature | T_j | -40 | +125 | | $^\circ\text{C}$ | |
| Storage temperature | T_{stg} | -40 | +150 | | $^\circ\text{C}$ | |
| Thermal resistance - junction to case | $R_{\theta(j-c)}$ | | 0.040 0.080 | | $^\circ\text{C}/\text{W}$ | Double sided cooled Single sided cooled |
| Thermal resistance - case to sink | $R_{\theta(c-s)}$ | | 0.015 0.030 | | $^\circ\text{C}/\text{W}$ | Double sided cooled * Single sided cooled * |
| Mounting force | P | 3000 13.3 | 3500 15.5 | | lb. kN | |
| Weight | W | | | 9 225 | oz. g | |

* Mounting surfaces smooth, flat and greased

Note : for case outline and dimensions, see case outline drawing in page 4 of this Technical Data



- A: 34 mm
- B: 59 mm
- C: 53 mm
- E: 26 mm