



# R U N A U

Jiangsu Runau Electronics Manufacturing Co.,Ltd

## KP2000- POWER THYRISTOR

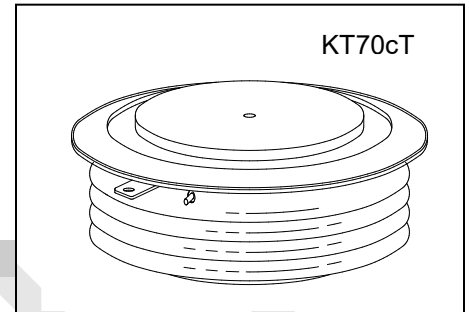
2600-3200V<sub>DRM</sub>

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### HIGH POWER THYRISTOR FOR PHASE CONTROL APPLICATIONS

#### Features:

- . All Diffused Structure
- . Amplifying Gate Configuration
- . Blocking capability up to 3200 volts
- . 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) |
|-------------|---------------|---------------|---------------|
| KP2000/26   | 2600          | 2600          | 2800          |
| KP2000/28   | 2800          | 2800          | 3000          |
| KP2000/30   | 3000          | 3000          | 3200          |
| KP2000/32   | 3200          | 3200          | 3400          |

$V_{RRM}$  = 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 | $I_{RRM}/I_{DRM}$ | 5 mA<br>150 mA (3) |
| Critical rate of voltage rise                         | $dv/dt$ (4)       | 1000 V/ $\mu$ sec  |

Notes:

(1) All voltage ratings are specified for an applied 50Hz/60Hz sinusoidal waveform over the temperature range 0 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 67% rated  $V_{DRM}$ . Gate open.  $T_j = 125$  °C.

(5) The value of  $di/dt$  is established in accordance with EIA/NIMA Standard JB/T 8950.2-2013

#### Conducting - On State

| Parameter                                     | Symbol      | Min. | Max.              | Typ. | Units            | Conditions                                                               |
|-----------------------------------------------|-------------|------|-------------------|------|------------------|--------------------------------------------------------------------------|
| Average value of on-state current             | $I_{T(AV)}$ |      | 2100              |      | A                | Sinewave, 180° conduction, $T_c = 70$ °C                                 |
| RMS value of on-state current                 | $I_{TRMS}$  |      | 3297              |      | A                | Nominal value                                                            |
| Peak one cycle surge (non repetitive) current | $I_{TSM}$   |      | 24000             |      | A                | 10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, $T_j = 125$ °C |
| I square t                                    | $I^2t$      |      | $2.9 \times 10^6$ |      | A <sup>2</sup> s | 10 msec                                                                  |
| Latching current                              | $I_L$       |      | 1000              |      | mA               | $V_D = 12$ V; $R_L = 12$ ohms                                            |
| Holding current                               | $I_H$       |      | 200               |      | mA               | $V_D = 12$ V; $I = 2.5$ A                                                |
| Peak on-state voltage                         | $V_{TM}$    |      | 1.85              |      | V                | $I_{TM} = 3000$ A; $T_j = 25$ °C                                         |
| Threshold voltage, low-level                  | $V_{TO}$    |      | 1.02              |      | V                | $T_j = 125$ °C                                                           |
| Slope resistance, low-level                   | $r_T$       |      | 0.23              |      | m $\Omega$       | 3000A to 5000A                                                           |
| Critical rate of rise of on-state current     | $di/dt$     |      | 200               |      | A/ $\mu$ s       | Repetition                                                               |

**Gating**

| Parameter                      | Symbol      | Min. | Max. | Typ. | Units | Conditions                                                                |
|--------------------------------|-------------|------|------|------|-------|---------------------------------------------------------------------------|
| Peak gate power dissipation    | $P_{GM}$    |      | 20   |      | W     |                                                                           |
| Average gate power dissipation | $P_{G(AV)}$ |      | 4    |      | W     |                                                                           |
| Gate-trigger current           | $I_{GT}$    |      | 200  |      | mA    | $V_D = 12\text{ V}; R_L = 3\text{ ohms}; T_j = +25\text{ }^\circ\text{C}$ |
| Gate- trigger voltage          | $V_{GT}$    | 0.70 | 2.5  |      | V     | $V_D = 12\text{ V}; R_L = 3\text{ ohms}; T_j = +25\text{ }^\circ\text{C}$ |
| Peak negative voltage          | $V_{GRM}$   |      | 5    |      | V     |                                                                           |

**Dynamic**

| Parameter                                 | Symbol   | Min. | Max. | Typ. | Units         | Conditions                                                                                                                                                            |
|-------------------------------------------|----------|------|------|------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delay time                                | $t_d$    |      | 3.0  | 2.5  | $\mu\text{s}$ | $I_{TM} = 100\text{ A}; V_D = 67\% V_{DRM}$<br>Gate pulse: $V_G = 30\text{ V}; R_G = 10\text{ ohms};$<br>$t_r = 0.1\mu\text{s}; t_p = 20\mu\text{s}$                  |
| Turn-off time (with $V_R = -5\text{ V}$ ) | $t_q$    |      |      | 600  | $\mu\text{s}$ | $I_{TM} = 1000\text{ A}; di/dt = -10\text{ A}/\mu\text{s};$<br>$V_R = 50\text{ V}; dV/dt = 30\text{ V}/\mu\text{s};$<br>$V_D = 67\% V_{DRM}; T_j = 125^\circ\text{C}$ |
| Reverse recovery charge                   | $Q_{rr}$ |      |      | 5500 | $\mu\text{C}$ | $I_{TM} = 1000\text{ A}; di/dt = -10\text{ A}/\text{s};$<br>$V_R = 50\text{ V}; T_j = 125^\circ\text{C}$                                                              |

**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  | +140   |      | $^\circ\text{C}$          |                     |
| Thermal resistance - junction to case | $R_{\Theta(j-c)}$ |      | 0.0125 |      | $^\circ\text{C}/\text{W}$ | Double sided cooled |
| Thermal resistance - case to heatsink | $R_{\Theta(c-s)}$ |      | 0.004  |      | $^\circ\text{C}/\text{W}$ | Double sided cooled |
| Mounting force                        | P                 | 32   | 39     | 33   | kN                        |                     |
| Weight                                | W                 |      |        | 0.85 | kg                        |                     |

\* Mounting surfaces smooth, flat and greased

