



# KP2600-POWER THYRISTOR

1200-1800  $V_{DRM}$

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## HIGH POWER THYRISTOR FOR PHASE CONTROL APPLICATIONS

### Features:

- . All Diffused Structure
- . Amplifying Gate Configuration
- . Blocking capability up to 1800 volts
- . High  $dv/dt$  Capability
- . Pressure Assembled Device

## ELECTRICAL CHARACTERISTICS AND RATINGS

### Blocking - Off State

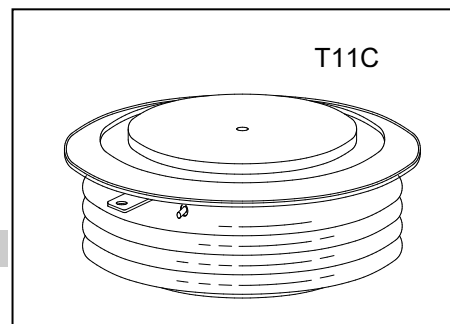
| Device Type | $V_{RRM}$ (1) | $V_{DRM}$ (1) | $V_{RSM}$ (1) |
|-------------|---------------|---------------|---------------|
| KP2600/12   | 1200          | 1200          | 1400          |
| KP2600/14   | 1400          | 1400          | 1600          |
| KP2600/16   | 1600          | 1600          | 1760          |
| KP2600/18   | 1800          | 1800          | 1900          |

$V_{RRM}$  = 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/ $\mu$ s    |



Notes:

- (1) All voltage ratings are specified for an applied 50Hz sinusoidal waveform over the temperature range  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ .
- (2) 10 msec. max. pulse width
- (3) Maximum value for  $T_j = 125^{\circ}\text{C}$ .
- (4) Minimum value for linear and exponential waveshape to 67% rated  $V_{DRM}$ . Gate open.  $T_j = 125^{\circ}\text{C}$ .
- (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             | $I_{T(AV)}$ |      | 2600              |      | A                    | Sinewave, $180^{\circ}$ conduction, $T_c = 70^{\circ}\text{C}$                                     |
| RMS value of on-state current                 | $I_{TRMS}$  |      | 4082              |      | A                    | Nominal value                                                                                      |
| Peak one cycle surge (non repetitive) current | $I_{TSM}$   |      | 47000             |      | A                    | 10.0 msec (50Hz), sinusoidal wave-shape, $180^{\circ}$ conduction, $T_j = 125^{\circ}\text{C}$     |
| I square t                                    | $I^2t$      |      | $1.1 \times 10^7$ |      | $\text{A}^2\text{s}$ | 10 msec                                                                                            |
| Latching current                              | $I_L$       |      | 1000              |      | mA                   | $V_D = 12\text{ V}$ ; $R_L = 12\text{ ohms}$                                                       |
| Holding current                               | $I_H$       |      | 200               |      | mA                   | $V_D = 12\text{ V}$ ; $I = 2.5\text{ A}$                                                           |
| Peak on-state voltage                         | $V_{TM}$    |      | 1.45              |      | V                    | $I_{TM} = 3000\text{ A}$ ; $T_j = 25^{\circ}\text{C}$                                              |
| Threshold voltage, low-level                  | $V_{TO}$    |      | 0.91              |      | V                    | $T_j = 125^{\circ}\text{C}$                                                                        |
| Slope resistance, low-level                   | $r_T$       |      | 0.12              |      | $\text{m}\Omega$     | 1000A to 5000A                                                                                     |
| Critical rate of rise of on-state current(5)  | $di/dt$     |      | 200               |      | A/ $\mu$ s           | $T_j = 125^{\circ}\text{C}$ ; $V_D = 0.67 V_{DRM}$ ; $f = 50\text{ Hz}$ ; $I_{TM} = 3000\text{ A}$ |

**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          | $V_{GT}$    | 0.7  | 3.0  |      | 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     |                                                                             |

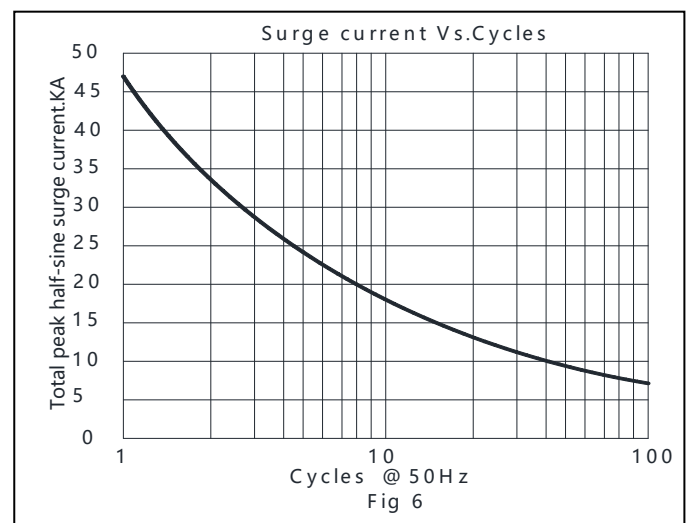
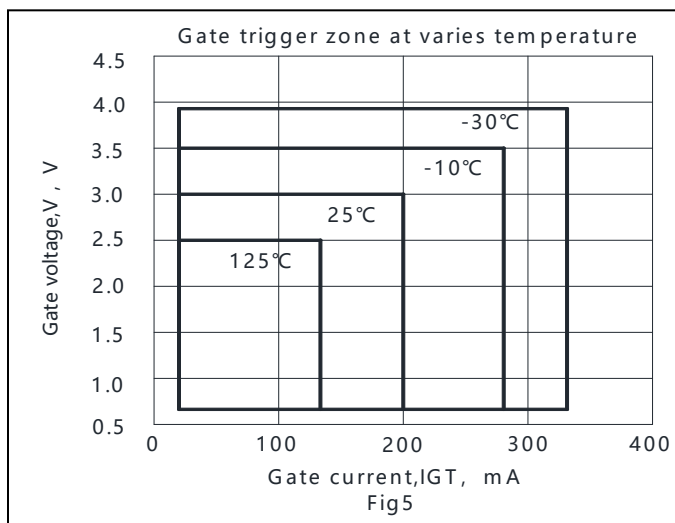
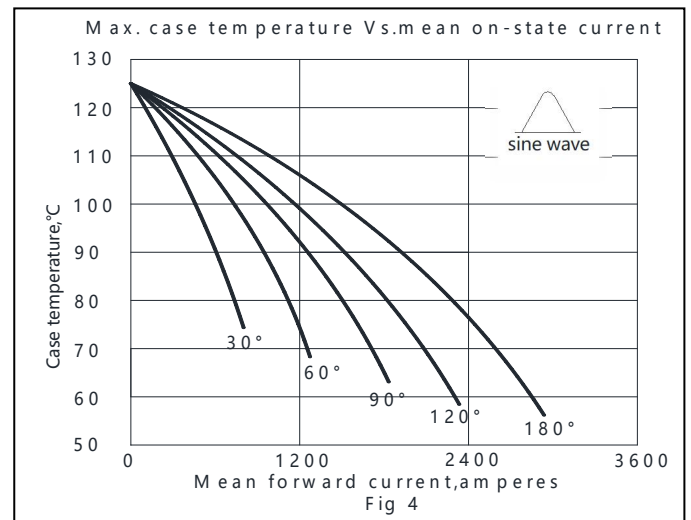
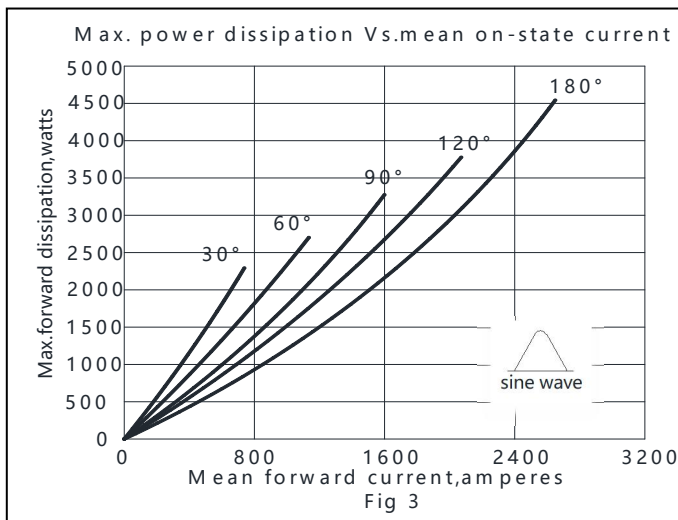
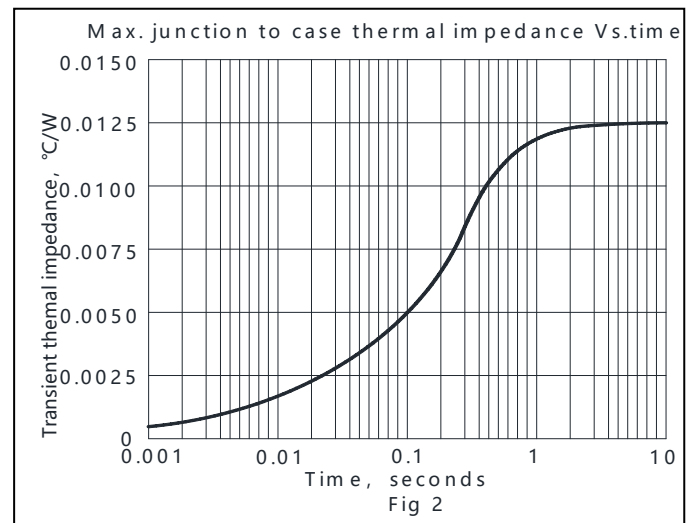
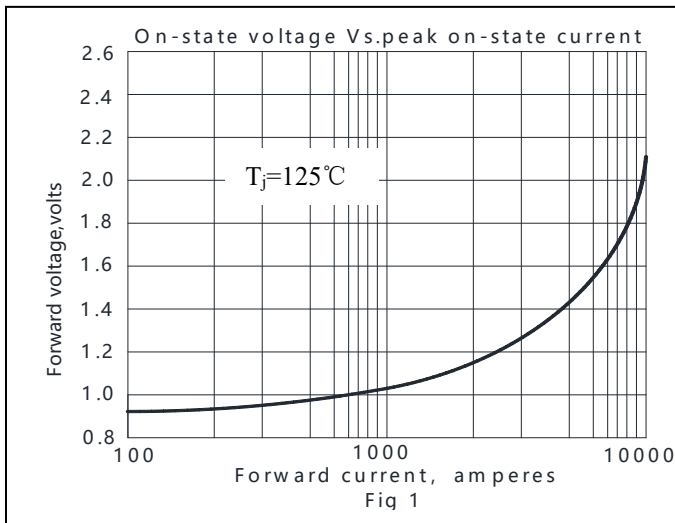
**Dynamic**

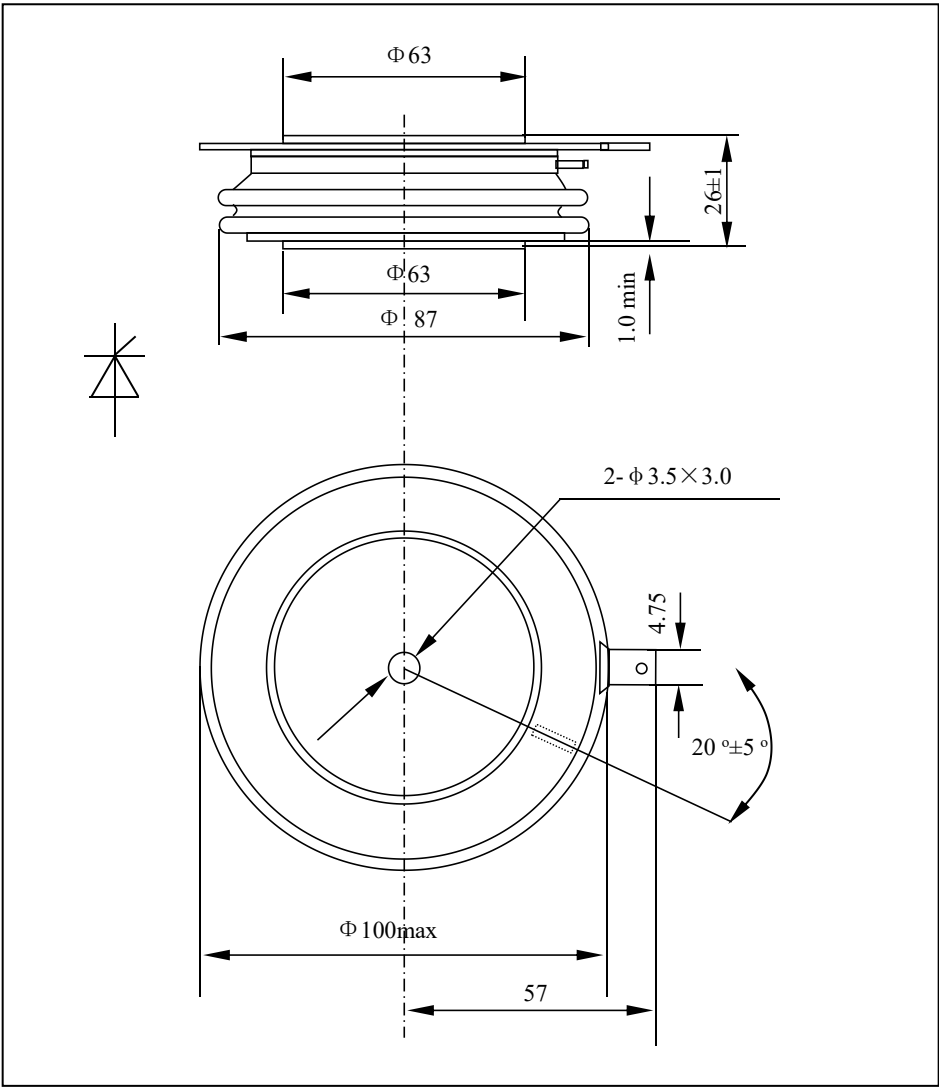
| Parameter                                 | Symbol   | Min. | Max. | Typ. | Units         | Conditions                                                                                                                                                      |
|-------------------------------------------|----------|------|------|------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 $V_R = -5\text{ V}$ ) | $t_q$    |      |      | 300  | $\mu\text{s}$ | $I_{TM} = 2000\text{A}; di/dt = -10\text{A}/\mu\text{s};$<br>$V_R = 100\text{V}; dv/dt = 30\text{V}/\mu\text{s};$<br>$V_D=67\%V_{DRM}; T_j=125^{\circ}\text{C}$ |
| Reverse recovery charge                   | $Q_{rr}$ |      |      |      | $\mu\text{C}$ | $I_{TM}=2000\text{A}; di/dt=-10\text{A}/\mu\text{s};$<br>$V_R=100\text{V}; T_j=125^{\circ}\text{C}$                                                             |

**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                        | F                 | 31   | 35     | 33   | kN                          |                     |
| Weight                                | m                 |      |        | 0.85 | kg                          |                     |

\* Mounting surfaces smooth, flat and greased





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