



PST KP4000-26

HIGH POWER PHASE CONTROL THYRISTOR FOR PHASE CONTROL APPLICATIONS

Features :

- Blocking Capability up to 2600 V
- High dV/dt Capability
- All Diffused Structure
- Amplifying Gate Configuration
- Rugged Ceramic Hermetic Package

ELECTRICAL CHARACTERISTICS AND RATINGS

Blocking

| Parameter | Symbol | Min | Max | Typ | Unit | Conditions |
|-------------------------------------|-----------|-----|------|-----|------|--|
| Repetitive peak reverse voltage | V_{RRM} | | 2600 | | V | $T_j = -40\text{ }^{\circ}\text{C}$ to $125\text{ }^{\circ}\text{C}$ |
| Repetitive peak off-state voltage | V_{DRM} | | 2600 | | V | $T_j = -40\text{ }^{\circ}\text{C}$ to $125\text{ }^{\circ}\text{C}$ |
| Non repetitive peak reverse voltage | V_{RSM} | | 2700 | | V | $T_j = -40\text{ }^{\circ}\text{C}$ to $125\text{ }^{\circ}\text{C}$ |
| Repetitive peak reverse current | I_{RRM} | | 300 | | mA | $T_j = T_{jmax}$, $V = V_{RRM}$ |
| Repetitive peak off-state current | I_{DRM} | | 300 | | mA | $T_j = T_{jmax}$, $V = V_{DRM}$ |

Conducting

| Parameter | Symbol | Min | Max | Typ | Unit | Conditions |
|-----------------------------------|--------------|-----|-------|------|-----------------------|---|
| Average value of on-state current | $I_{T(AV)}$ | | 4750 | | A | 50 Hz sine wave, 180° conduction, $T_c = 85\text{ }^{\circ}\text{C}$ |
| RMS value of on-state current | $I_{T(RMS)}$ | | 7458 | | A | 50 Hz sine wave, 180° conduction, $T_c = 85\text{ }^{\circ}\text{C}$ |
| Surge non repetitive current | I_{TSM} | | 75 | | kA | 50 Hz sine wave Half cycle |
| I square t | $I^2 t$ | | 28125 | | kA^2s | $V_R = 0$ $T_j = 125\text{ }^{\circ}\text{C}$ |
| Peak on-state voltage | V_{TM} | | 1.2 | | V | On-state current 4500 A, $T_j = T_{jmax}$ |
| Threshold voltage | $V_{T(TO)}$ | | 0.88 | | V | $T_j = T_{jmax}$ |
| On-state slope resistance | r_T | | 0.068 | | $\text{m}\Omega$ | $T_j = T_{jmax}$ |
| Holding current | I_H | | | 300 | mA | $V_D = 24\text{ V}$; $I_T = 2.5\text{ A}$ |
| Latching current | I_L | | | 1500 | mA | $V_D = 24\text{ V}$; $R_L = 12\ \Omega$ |

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Triggering

| Parameter | Symbol | Min | Max | Typ | Unit | Conditions |
|--------------------------------|-------------|-----|-----|-----|------|---|
| Gate current | I_{GT} | | 500 | | mA | $V_D = 6\text{ V}; R_L = 3\ \Omega; T_j = -40\text{ }^\circ\text{C}$ |
| | | | 300 | | mA | $V_D = 6\text{ V}; R_L = 3\ \Omega; T_j = 25\text{ }^\circ\text{C}$ |
| | | | 200 | | mA | $V_D = 6\text{ V}; R_L = 3\ \Omega; T_j = 125\text{ }^\circ\text{C}$ |
| Gate voltage | V_{GT} | | 5 | | V | $V_D = 6\text{ V}; R_L = 3\ \Omega; T_j = -40\text{ }^\circ\text{C}$ |
| | | | 3 | | V | $V_D = 6\text{ V}; R_L = 3\ \Omega; T_j = 0 \div 125\text{ }^\circ\text{C}$ |
| | | 0.4 | | | V | $V_D = V_{DRM}; R_L = 10\text{ k}\Omega; T_j = 125\text{ }^\circ\text{C}$ |
| Peak gate current | I_{GM} | | 12 | | A | |
| Peak reverse gate voltage | V_{RGM} | | 5 | | V | |
| Peak gate power dissipation | P_{GM} | | 200 | | W | |
| Average gate power dissipation | $P_{G(AV)}$ | | 5 | | W | |

Switching

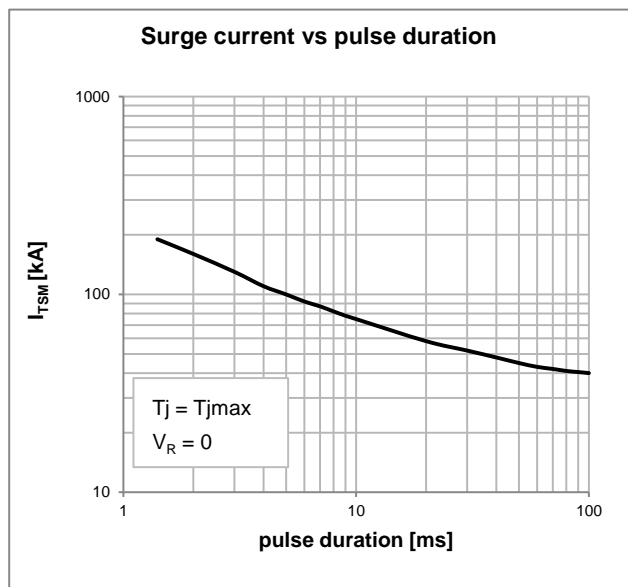
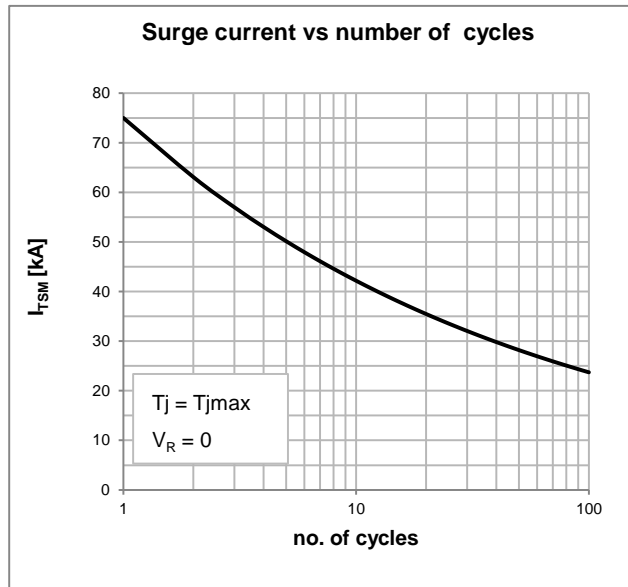
| Parameter | Symbol | Min | Max | Typ | Unit | Conditions |
|---|----------|-----|------|------|------------|---|
| Critical rate of rise of on-state current | di/dt | | 320 | | A/ μ s | Switching from $V_{DRM} \leq 1000\text{ V}$ - repetitive |
| Critical rate of rise of on-state voltage | dv/dt | | 1000 | | V/ μ s | Linear ramp up to 80% of V_{DRM} |
| Gate controlled delay time | t_d | | 2.5 | | μ s | $I_{TM} = 50\text{ A}; V_D = 1500\text{ V}; V_G = 20\text{ V}$ $R_G = 20\ \Omega; t_r = 0.1\ \mu\text{s}; t_p = 20\ \mu\text{s}$ |
| Turn-off time | t_q | | 500 | | μ s | $I_{TM} = 2500\text{ A}; di/dt = 25\text{ A}/\mu\text{s}; V_R \geq 50\text{ V}$ $dV/dt = 50\text{ V}/\mu\text{s}$ linear to 80% V_{DRM} $V_G = 0\text{ V}; T_j = 125\text{ }^\circ\text{C}$ |
| Reverse recovery charge | Q_{rr} | | | 7200 | μ C | $I_T = 2000\text{ A}$ $di/dt = 20\text{ A}/\mu\text{s}$ |
| Reverse recovery current | I_{rr} | | | 230 | A/ μ s | $V_R \geq 50\text{ V}$ $T_j = T_{jmax}$ |

Thermal and mechanical

| Parameter | Symbol | Min | Max | Typ | Unit | Conditions |
|-------------------------------------|---------------|-----|--------|------|---------------------------|--|
| Operating temperature | T_j | -40 | 125 | | $^\circ\text{C}$ | |
| Storage temperature | T_{stg} | -40 | 125 | | $^\circ\text{C}$ | |
| Thermal resistance junction to case | $R_{th(j-c)}$ | | 0.0050 | | $^\circ\text{C}/\text{W}$ | Double side cooled , DC |
| Thermal resistance case to sink | $R_{th(c-s)}$ | | 0.0010 | | $^\circ\text{C}/\text{W}$ | Double side cooled, mounting surfaces smooth, flat and greased |
| Mounting force | F | 70 | 90 | | kN | |
| Weight | W | | | 2200 | g | |

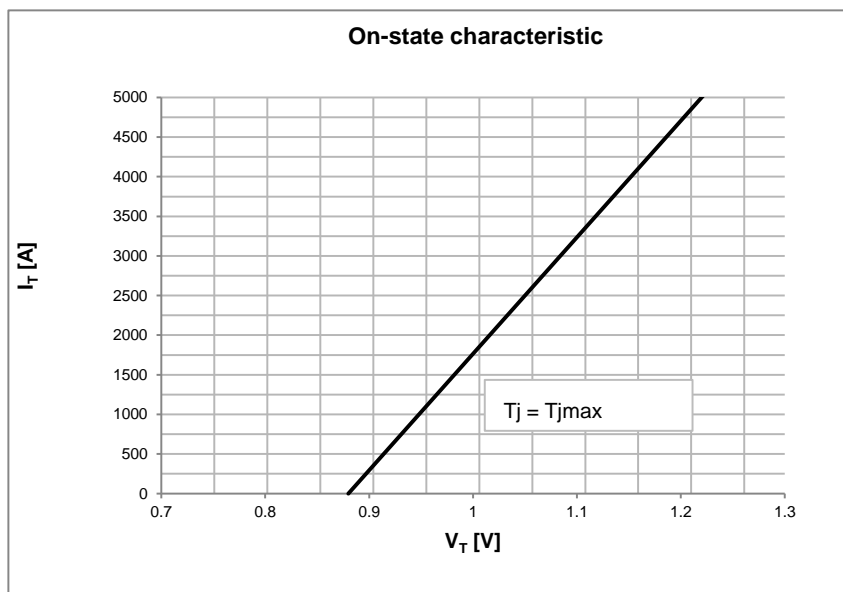
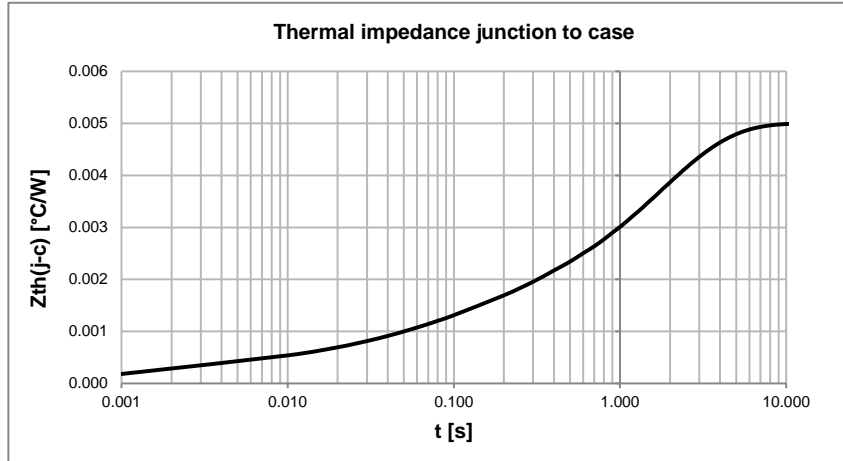
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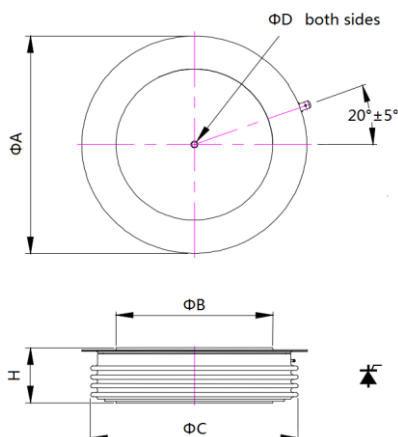


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OUTLINE AND DIMENSIONS



| | A | B | C | D | H |
|----|-----|-----|-----|---------|--------|
| mm | 150 | 100 | 110 | 3.5 x 3 | 26+/-1 |

- All the characteristics given in this data sheet are guaranteed only with uniform clamping force, cleaned and lubricated heatsink surfaces with flatness < 0.03 mm and roughness < 2μm