



Pressure contact
 Low switching losses
 Low reverse recovery charge
 High power cycling capability
 Distributed amplified gate for high di_T/dt

Fast Stud Thyristor Type TFI175-200-14

| | | | |
|-----------------------------------|------------|--------------------|------|
| Mean on-state current | I_{TAV} | 200 A | |
| Repetitive peak off-state voltage | V_{DRM} | 1000 ÷ 1400 V | |
| Repetitive peak reverse voltage | V_{RRM} | | |
| Turn-off time | t_q | 20.0; 25.0 μ s | |
| V_{DRM}, V_{RRM}, V | 1000 | 1200 | 1400 |
| Voltage code | 10 | 12 | 14 |
| $T_j, ^\circ C$ | - 60 ÷ 125 | | |

MAXIMUM ALLOWABLE RATINGS

| Symbols and parameters | | Units | Values | Test conditions |
|------------------------|--|-------------------|------------------------------------|--|
| ON-STATE | | | | |
| I_{TAV} | Mean on-state current | A | 200 410 | $T_c=99^\circ C$; $T_c=55^\circ C$; 180° half-sine wave; 50 Hz |
| I_{TRMS} | RMS on-state current | A | 314 | $T_c=99^\circ C$; 180° half-sine wave; 50 Hz |
| I_{TSM} | Surge on-state current | kA | 6.5 7.5 | 180° half-sine wave; 50 Hz ($t_p=10$ ms); single pulse; $V_D=V_R=0$ V; Gate pulse: $I_G=I_{FGM}$; $V_G=20$ V; $t_{GP}=50$ μ s; $di_G/dt=1$ A/ μ s |
| | | | 7.0 8.1 | 180° half-sine wave; 60 Hz ($t_p=8.3$ ms); single pulse; $V_D=V_R=0$ V; Gate pulse: $I_G=I_{FGM}$; $V_G=20$ V; $t_{GP}=50$ μ s; $di_G/dt=1$ A/ μ s |
| I^2t | Safety factor | $A^2s \cdot 10^3$ | 210 280 | 180° half-sine wave; 50 Hz ($t_p=10$ ms); single pulse; $V_D=V_R=0$ V; Gate pulse: $I_G=I_{FGM}$; $V_G=20$ V; $t_{GP}=50$ μ s; $di_G/dt=1$ A/ μ s |
| | | | 200 270 | 180° half-sine wave; 60 Hz ($t_p=8.3$ ms); single pulse; $V_D=V_R=0$ V; Gate pulse: $I_G=I_{FGM}$; $V_G=20$ V; $t_{GP}=50$ μ s; $di_G/dt=1$ A/ μ s |
| BLOCKING | | | | |
| V_{DRM}, V_{RRM} | Repetitive peak off-state and Repetitive peak reverse voltages | V | 1000÷1400 | $T_{j\ min} < T_j < T_{j\ max}$; 180° half-sine wave; 50 Hz; Gate open |
| V_{DSM}, V_{RSM} | Non-repetitive peak off-state and Non-repetitive peak reverse voltages | V | 1100÷1500 | $T_{j\ min} < T_j < T_{j\ max}$; 180° half-sine wave; 50 Hz; single pulse; Gate open |
| V_D, V_R | Direct off-state and Direct reverse voltages | V | 0.75· V_{DRM} 0.75· V_{RRM} | $T_j=T_{j\ max}$; Gate open |

| TRIGGERING | | | | |
|--------------------|---|------------------|-----------|--|
| I_{FGM} | Peak forward gate current | A | 6 | $T_j = T_{j\max}$ |
| V_{RGM} | Peak reverse gate voltage | V | 5 | |
| P_G | Gate power dissipation | W | 3 | $T_j = T_{j\max}$ for DC gate current |
| SWITCHING | | | | |
| $(di_T/dt)_{crit}$ | Critical rate of rise of on-state current non-repetitive (f=1 Hz) | A/ μ s | 1600 | $T_j = T_{j\max}$; $V_D = 0.67 V_{DRM}$; $I_{TM} = 2 I_{TAV}$; Gate pulse: $I_G = I_{FGM}$; $V_G = 20$ V; $t_{GP} = 50 \mu$ s; $di_G/dt = 1$ A/ μ s |
| THERMAL | | | | |
| T_{stg} | Storage temperature | $^{\circ}$ C | -60 ÷ 125 | |
| T_j | Operating junction temperature | $^{\circ}$ C | -60 ÷ 125 | |
| MECHANICAL | | | | |
| F | Mounting force | kN | 1.5 ÷ 2.5 | |
| a | Acceleration | m/s ² | 100 | |

CHARACTERISTICS

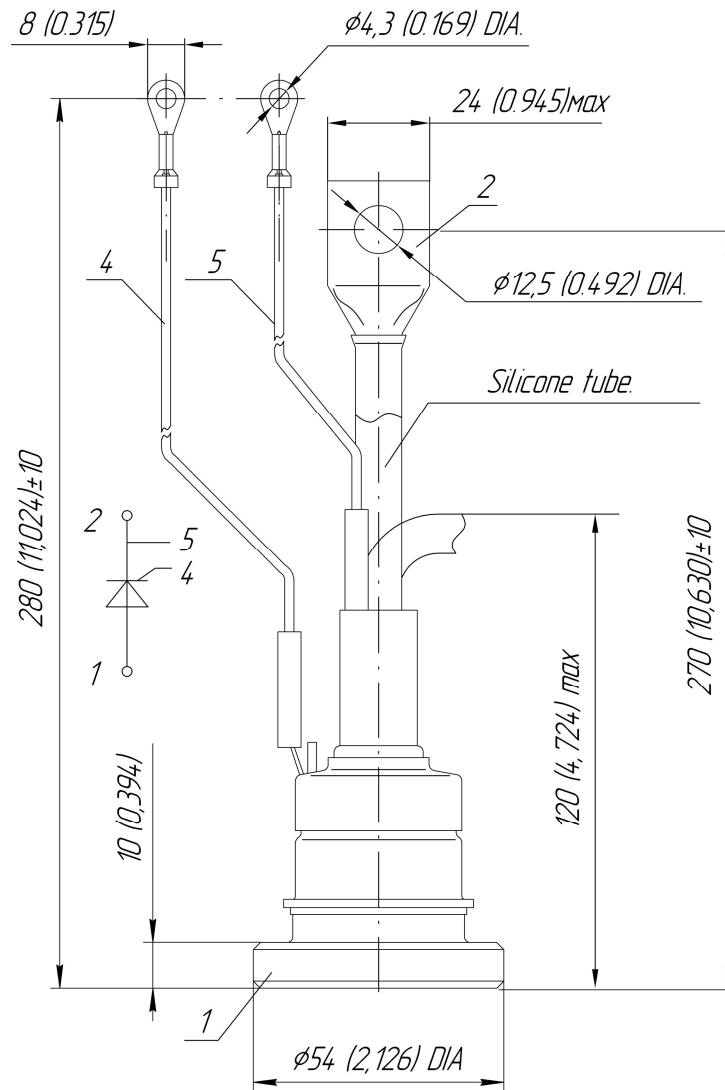
| Symbols and parameters | | Units | Values | Conditions | |
|------------------------|---|------------|----------------------|---|---|
| ON-STATE | | | | | |
| V_{TM} | Peak on-state voltage, max | V | 1.96 | $T_j = 25$ $^{\circ}$ C; $I_{TM} = 628$ A | |
| $V_{T(TO)}$ | On-state threshold voltage, max | V | 1.31 | $T_j = T_{j\max}$; | |
| r_T | On-state slope resistance, max | m Ω | 1.100 | $0.5 \pi I_{TAV} < I_T < 1.5 \pi I_{TAV}$ | |
| I_H | Holding current, max | mA | 500 | $T_j = 25$ $^{\circ}$ C; $V_D = 12$ V; Gate open | |
| BLOCKING | | | | | |
| I_{DRM}, I_{RRM} | Repetitive peak off-state and Repetitive peak reverse currents, max | mA | 70 | $T_j = T_{j\max}$; $V_D = V_{DRM}$; $V_R = V_{RRM}$ | |
| $(dv_D/dt)_{crit}$ | Critical rate of rise of off-state voltage ¹⁾ , min | V/ μ s | 1000 | $T_j = T_{j\max}$; $V_D = 0.67 V_{DRM}$; Gate open | |
| TRIGGERING | | | | | |
| V_{GT} | Gate trigger direct voltage, max | V | 4.00 2.50 2.00 | $T_j = T_{j\min}$ $T_j = 25$ $^{\circ}$ C $T_j = T_{j\max}$ | $V_D = 12$ V; $I_D = 3$ A; Direct gate current |
| I_{GT} | Gate trigger direct current, max | mA | 400 250 200 | $T_j = T_{j\min}$ $T_j = 25$ $^{\circ}$ C $T_j = T_{j\max}$ | |
| V_{GD} | Gate non-trigger direct voltage, min | V | 0.25 | $T_j = T_{j\max}$; | |
| I_{GD} | Gate non-trigger direct current, min | mA | 10.00 | $V_D = 0.67 V_{DRM}$; Direct gate current | |
| SWITCHING | | | | | |
| t_{gd} | Delay time | μ s | 2.00 | $T_j = 25$ $^{\circ}$ C; $V_D = 0.4 V_{DRM}$; $I_{TM} = I_{TAV}$; Gate pulse: $I_G = I_{FGM}$; $V_G = 20$ V; $t_{GP} = 50 \mu$ s; $di_G/dt = 1$ A/ μ s | |
| t_q | Turn-off time ²⁾ , max | μ s | 20.0; 25.0 | $dv_D/dt = 50$ V/ μ s; $T_j = T_{j\max}$; $I_{TM} = I_{TAV}$; $di_R/dt = -10$ A/ μ s; $V_R = 100$ V; $V_D = 0.67 V_{DRM}$ | |
| Q_{rr} | Total recovered charge, max | μ C | 150 | $T_j = T_{j\max}$; $I_{TM} = I_{TAV}$; | |
| t_{rr} | Reverse recovery time, typ | μ s | 3.2 | $di_R/dt = -50$ A/ μ s; | |
| I_{rrM} | Peak reverse recovery current, max | A | 94 | $V_R = 100$ V | |

| THERMAL | | | | |
|-------------------|---|-----------------------------|-----------------|----------------|
| R_{thjc} | Thermal resistance, junction to case, max | $^{\circ}\text{C}/\text{W}$ | 0.0700 | Direct current |
| MECHANICAL | | | | |
| w | Weight, typ | g | 500 | |
| D_s | Surface creepage distance | mm (inch) | 12.4 (4.882) | |
| D_a | Air strike distance | mm (inch) | 12.4 (4.882) | |

| NOTES | | PART NUMBERING GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|------|-----------------------------|----|----|---------------------------------------|------|------|--|--|--|--|--|--|--|-----|-----|-----|----|----|----|---|--|---|---|---|---|---|---|---|--|
| ¹⁾ Critical rate of rise of off-state voltage <table border="1"> <tr> <td>Symbol of group</td> <td colspan="2">A2</td> </tr> <tr> <td>$(dv_D/dt)_{crit}$, V/μs</td> <td colspan="2">1000</td> </tr> </table> | | Symbol of group | A2 | | $(dv_D/dt)_{crit}$, V/ μs | 1000 | | <table border="1"> <tr> <td>TFI</td> <td>175</td> <td>200</td> <td>14</td> <td>A2</td> <td>P3</td> <td colspan="2">N</td> </tr> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td colspan="2">7</td> </tr> </table> | | | | | | | TFI | 175 | 200 | 14 | A2 | P3 | N | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| Symbol of group | A2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $(dv_D/dt)_{crit}$, V/ μs | 1000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TFI | 175 | 200 | 14 | A2 | P3 | N | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | | | | | | | | | | | | | | | | | | | | | | |
| ²⁾ Turn-off time ($dv_D/dt=50$ V/ μs) <table border="1"> <tr> <td>Symbol of group</td> <td>P3</td> <td>M3</td> </tr> <tr> <td>t_{qr}, μs</td> <td>20.0</td> <td>25.0</td> </tr> </table> | | Symbol of group | P3 | M3 | t_{qr} , μs | 20.0 | 25.0 | <ol style="list-style-type: none"> High Frequency Inverter Grade Thyristor Design version Mean on-state current, A Voltage code Critical rate of rise of off-state voltage Group of turn-off time ($dv_D/dt=50$ V/μs) Ambient conditions: N – normal; T – tropical | | | | | | | | | | | | | | | | | | | | | | |
| Symbol of group | P3 | M3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| t_{qr} , μs | 20.0 | 25.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

OVERALL DIMENSIONS

Package type: T.SB3



| Polarity | Example of code designation | Reference designation | Colors | | |
|---------------|-----------------------------|-----------------------|--------|----------|-------|
| | | | Anode | Cathode | Gate |
| Anode to stud | TFI175-200-14 | | - | Red tube | White |

All dimensions in millimeters (inches)

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