



High power cycling capability
Low on-state and switching losses
Designed for traction and industrial applications

Phase Control Thyristor Type T343-630-28

| | | | | | | |
|-----------------------------------|-----------|---------------|------|------|------|--|
| Mean on-state current | I_{TAV} | 630 A | | | | |
| Repetitive peak off-state voltage | V_{DRM} | 2000 ÷ 2800 V | | | | |
| Repetitive peak reverse voltage | V_{RRM} | | | | | |
| Turn-off time | t_q | 250 μ s | | | | |
| V_{DRM}, V_{RRM}, V | 2000 | 2200 | 2400 | 2600 | 2800 | |
| Voltage code | 20 | 22 | 24 | 26 | 28 | |
| $T_j, ^\circ C$ | -60 ÷ 125 | | | | | |

MAXIMUM ALLOWABLE RATINGS

| Symbols and parameters | | Units | Values | Test conditions | |
|------------------------|--|-------------------|--|--|--|
| ON-STATE | | | | | |
| I_{TAV} | Mean on-state current | A | 630 715 | $T_c=91^\circ C$, Double side cooled $T_c=85^\circ C$, Double side cooled 180° half-sine wave; 50 Hz | |
| I_{TRMS} | RMS on-state current | A | 989 | $T_c=91^\circ C$, Double side cooled 180° half-sine wave; 50 Hz | |
| I_{TSM} | Surge on-state current | kA | 11.0 12.7 | $T_j=T_{j\ max}$ $T_j=25^\circ C$ | 180° half-sine wave; 50 Hz ($t_p=10\ ms$); single pulse; $V_D=V_R=0\ V$; Gate pulse: $I_G=2\ A$; $t_{GP}=50\ \mu s$; $di_G/dt \geq 1\ A/\mu s$ |
| | | | 12.0 13.8 | $T_j=T_{j\ max}$ $T_j=25^\circ C$ | 180° half-sine wave; 60 Hz ($t_p=8.3\ ms$); single pulse; $V_D=V_R=0\ V$; Gate pulse: $I_G=2\ A$; $t_{GP}=50\ \mu s$; $di_G/dt \geq 1\ A/\mu s$ |
| I^2t | Safety factor | $A^2s \cdot 10^3$ | 605 805 | $T_j=T_{j\ max}$ $T_j=25^\circ C$ | 180° half-sine wave; 50 Hz ($t_p=10\ ms$); single pulse; $V_D=V_R=0\ V$; Gate pulse: $I_G=2\ A$; $t_{GP}=50\ \mu s$; $di_G/dt \geq 1\ A/\mu s$ |
| | | | 595 790 | $T_j=T_{j\ max}$ $T_j=25^\circ C$ | 180° half-sine wave; 60 Hz ($t_p=8.3\ ms$); single pulse; $V_D=V_R=0\ V$; Gate pulse: $I_G=2\ A$; $t_{GP}=50\ \mu s$; $di_G/dt \geq 1\ A/\mu s$ |
| BLOCKING | | | | | |
| V_{DRM}, V_{RRM} | Repetitive peak off-state and Repetitive peak reverse voltages | V | 2000 ÷ 2800 | $T_{j\ min} < T_j < T_{j\ max}$; 180° half-sine wave; 50 Hz; Gate open | |
| V_{DSM}, V_{RSM} | Non-repetitive peak off-state and Non-repetitive peak reverse voltages | V | 2100 ÷ 2900 | $T_{j\ min} < T_j < T_{j\ max}$; 180° half-sine wave; 50 Hz; single pulse; Gate open | |
| V_D, V_R | Direct off-state and Direct reverse voltages | V | $0.75 \cdot V_{DRM}$ $0.75 \cdot V_{RRM}$ | $T_j=T_{j\ max}$; Gate open | |

| TRIGGERING | | | | |
|--------------------|---|-------------|-------------|---|
| I_{FGM} | Peak forward gate current | A | 8 | $T_j = T_{j\ max}$ |
| V_{RGM} | Peak reverse gate voltage | V | 5 | |
| P_G | Gate power dissipation | W | 4 | $T_j = T_{j\ max}$ 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 | 400 | $T_j = T_{j\ max}; V_D = 0.67 \cdot V_{DRM}; I_{TM} = 2 I_{TAV};$ Gate pulse: $I_G = 2\ A;$ $t_{GP} = 50\ \mu s; di_G/dt \geq 1\ A/\mu s$ |
| THERMAL | | | | |
| T_{stg} | Storage temperature | $^{\circ}C$ | -60 ÷ 125 | |
| T_j | Operating junction temperature | $^{\circ}C$ | -60 ÷ 125 | |
| MECHANICAL | | | | |
| F | Mounting force | kN | 14.0 ÷ 16.0 | |
| a | Acceleration | m/s^2 | 50 100 | Device unclamped Device clamped |

CHARACTERISTICS

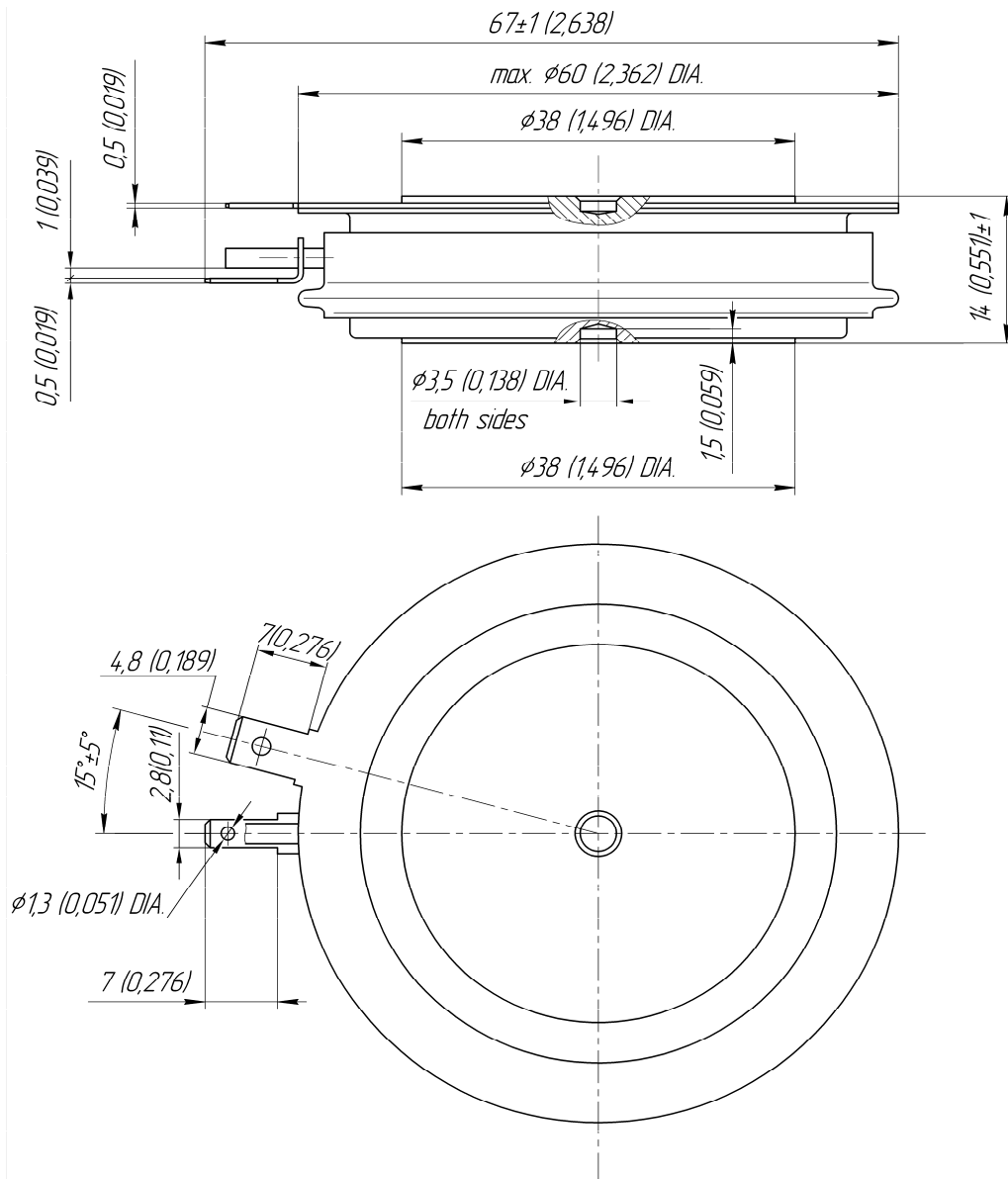
| Symbols and parameters | | Units | Values | Conditions | |
|------------------------|---|------------|--------|---|---|
| ON-STATE | | | | | |
| V_{TM} | Peak on-state voltage, max | V | 1.90 | $T_j = 25\ ^{\circ}C; I_{TM} = 1978\ A$ | |
| $V_{T(TO)}$ | On-state threshold voltage, max | V | 1.15 | $T_j = T_{j\ max};$ | |
| r_T | On-state slope resistance, max | m Ω | 0.400 | $0.5\ \pi\ I_{TAV} < I_T < 1.5\ \pi\ I_{TAV}$ | |
| I_L | Latching current, max | mA | 1000 | $T_j = 25\ ^{\circ}C; V_D = 12\ V;$ Gate pulse: $I_G = 2\ A;$ $t_{GP} = 50\ \mu s; di_G/dt \geq 1\ A/\mu s$ | |
| I_H | Holding current, max | mA | 300 | $T_j = 25\ ^{\circ}C;$ $V_D = 12\ V;$ Gate open | |
| BLOCKING | | | | | |
| I_{DRM}, I_{RRM} | Repetitive peak off-state and Repetitive peak reverse currents, max | mA | 100 | $T_j = T_{j\ max};$ $V_D = V_{DRM}; V_R = V_{RRM}$ | |
| $(dv_D/dt)_{crit}$ | Critical rate of rise of off-state voltage ¹⁾ , min | V/ μ s | 1000 | $T_j = T_{j\ max};$ $V_D = 0.67 \cdot V_{DRM};$ Gate open | |
| TRIGGERING | | | | | |
| V_{GT} | Gate trigger direct voltage, max | V | 4.00 | $T_j = T_{j\ min}$ $T_j = 25\ ^{\circ}C$ | $V_D = 12\ V; I_D = 3\ A;$ Direct gate current |
| | | | 2.50 | | |
| I_{GT} | Gate trigger direct current, max | mA | 400 | $T_j = T_{j\ min}$ $T_j = 25\ ^{\circ}C$ | |
| | | | 250 | | |
| | | | 200 | $T_j = T_{j\ max}$ | |
| V_{GD} | Gate non-trigger direct voltage, min | V | 0.25 | $T_j = T_{j\ max};$ $V_D = 0.67 \cdot V_{DRM};$ | |
| I_{GD} | Gate non-trigger direct current, min | mA | 10.00 | Direct gate current | |
| SWITCHING | | | | | |
| t_{gd} | Delay time | μ s | 2.50 | $T_j = 25\ ^{\circ}C; V_D = 0.4 \cdot V_{DRM}; I_{TM} = I_{TAV};$ Gate pulse: $I_G = 2\ A;$ $t_{GP} = 50\ \mu s; di_G/dt \geq 1\ A/\mu s$ | |
| t_q | Turn-off time ²⁾ , max | μ s | 250 | $dv_D/dt = 50\ V/\mu s; T_j = T_{j\ max}; I_{TM} = I_{TAV};$ $di_R/dt = -10\ A/\mu s; V_R = 100V;$ $V_D = 0.67 \cdot V_{DRM}$ | |

| THERMAL | | | | | |
|-------------------|---|--------------|-----------------|----------------|---------------------|
| R_{thjc} | Thermal resistance, junction to case, max | °C/W | 0.030 | Direct current | Double side cooled |
| R_{thjc-A} | | | 0.066 | | Anode side cooled |
| R_{thjc-K} | | | 0.054 | | Cathode side cooled |
| R_{thck} | Thermal resistance, case to heatsink, max | °C/W | 0.006 | Direct current | |
| MECHANICAL | | | | | |
| w | Weight, typ | g | 210 | | |
| D_s | Surface creepage distance | mm (inch) | 7.86 (0.309) | | |
| D_a | Air strike distance | mm (inch) | 6.10 (0.240) | | |

PART NUMBERING GUIDE

| | | | | |
|---|-----|-----|----|---|
| T | 343 | 630 | 28 | N |
| 1 | 2 | 3 | 4 | 5 |

1. Phase Control Thyristor
2. Design version
3. Mean on-state current, A
4. Voltage code
5. Ambient conditions: N – normal; T – tropical



All dimensions in millimeters (inches)