

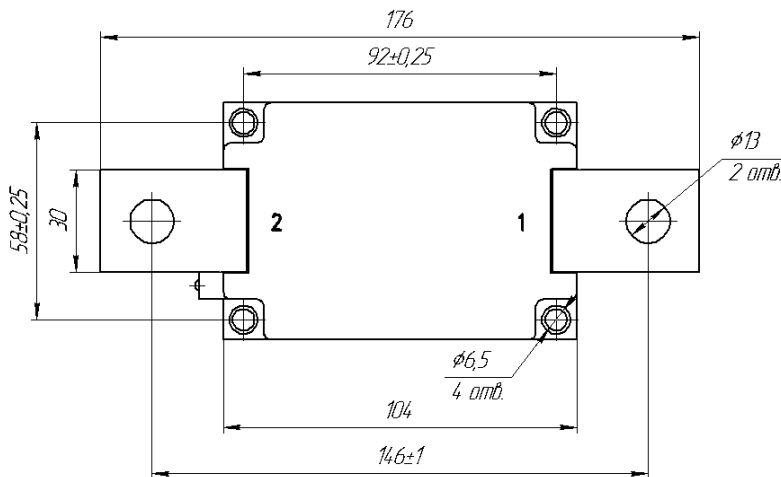
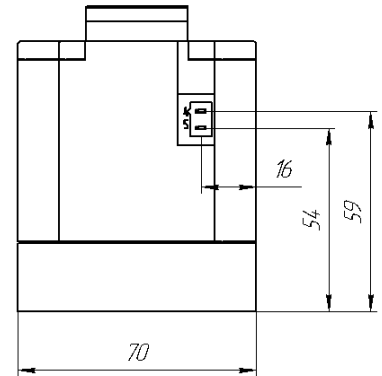
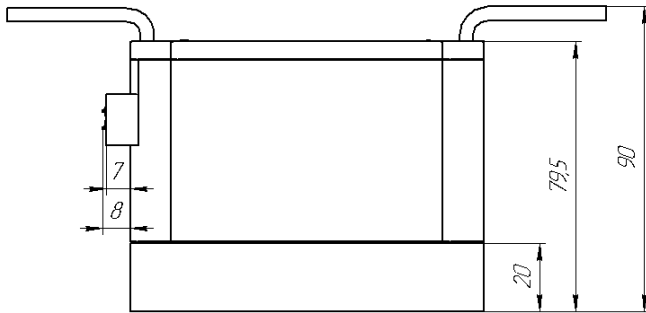
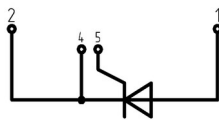


Electrically isolated base plate
Industrial standard package
Simplified mechanical design, rapid assembly
Pressure contact

**Single Thyristor Module
For Phase Control
MT1-635-28-E**

| | | | | | |
|-----------------------------------|-----------|------|-----------|---------------|------|
| Mean on-state current | | | I_{TAV} | 635 A | |
| Repetitive peak off-state voltage | | | V_{DRM} | 2000 ÷ 2800 V | |
| Repetitive peak reverse voltage | | | V_{RRM} | | |
| Turn-off time | | | t_q | 320 μ s | |
| V_{DRM}, V_{RRM}, V | 2000 | 2200 | 2400 | 2600 | 2800 |
| Voltage code | 20 | 22 | 24 | 26 | 28 |
| $T_j, ^\circ C$ | -40 ÷ 125 | | | | |

MT1



MAXIMUM ALLOWABLE RATINGS

| Symbols and parameters | | Units | Values | Test conditions |
|------------------------|--|-----------------------|--|--|
| ON-STATE | | | | |
| I_{TAV} | Mean on-state current | A | 635 | $T_c=85\text{ }^\circ\text{C}$; 180° half-sine wave; 50 Hz |
| I_{TRMS} | RMS on-state current | A | 997 | |
| I_{TSM} | Surge on-state current | kA | 23.0 26.0 | $T_j=T_{j\text{ max}}$ $T_j=25\text{ }^\circ\text{C}$ 180° half-sine wave; $t_p=10\text{ ms}$; single pulse; $V_D=V_R=0\text{ V}$; Gate pulse: $I_G=I_{FGM}$; $V_G=20\text{ V}$; $t_{GP}=500\text{ }\mu\text{s}$; $di_G/dt=1\text{ A}/\mu\text{s}$ |
| | | | 24.0 28.0 | $T_j=T_{j\text{ max}}$ $T_j=25\text{ }^\circ\text{C}$ 180° half-sine wave; $t_p=8.3\text{ ms}$; single pulse; $V_D=V_R=0\text{ V}$; Gate pulse: $I_G=I_{FGM}$; $V_G=20\text{ V}$; $t_{GP}=500\text{ }\mu\text{s}$; $di_G/dt=1\text{ A}/\mu\text{s}$ |
| I^2t | Safety factor | $A^2s\cdot 10^3$ | 2600 3300 | $T_j=T_{j\text{ max}}$ $T_j=25\text{ }^\circ\text{C}$ 180° half-sine wave; $t_p=10\text{ ms}$; single pulse; $V_D=V_R=0\text{ V}$; Gate pulse: $I_G=I_{FGM}$; $V_G=20\text{ V}$; $t_{GP}=500\text{ }\mu\text{s}$; $di_G/dt=1\text{ A}/\mu\text{s}$ |
| | | | 2300 3200 | $T_j=T_{j\text{ max}}$ $T_j=25\text{ }^\circ\text{C}$ 180° half-sine wave; $t_p=8.3\text{ ms}$; single pulse; $V_D=V_R=0\text{ V}$; Gate pulse: $I_G=I_{FGM}$; $V_G=20\text{ V}$; $t_{GP}=500\text{ }\mu\text{s}$; $di_G/dt=1\text{ A}/\mu\text{s}$ |
| BLOCKING | | | | |
| V_{DRM}, V_{RRM} | Repetitive peak off-state and Repetitive peak reverse voltages | V | 2000÷2800 | $T_{j\text{ min}} < T_j < T_{j\text{ max}}$; 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 | $T_{j\text{ min}} < T_j < T_{j\text{ max}}$; 180° half-sine wave; single pulse; Gate open |
| V_{Dr}, V_R | Direct off-state and Direct reverse voltages | V | $0.6\cdot V_{DRM}$ $0.6\cdot V_{RRM}$ | $T_j=T_{j\text{ max}}$; Gate open |
| TRIGGERING | | | | |
| I_{FGM} | Peak forward gate current | A | 8 | $T_j=T_{j\text{ max}}$ |
| V_{RGM} | Peak reverse gate voltage | V | 5 | |
| P_G | Gate power dissipation | W | 4 | $T_j=T_{j\text{ max}}$ for DC gate current |
| SWITCHING | | | | |
| $(di_T/dt)_{crit}$ | Critical rate of rise of on-state current non-repetitive (f=1 Hz) | $A/\mu\text{s}$ | 400 | $T_j=T_{j\text{ max}}$; $V_D=0.67\cdot V_{DRM}$; $I_{TM}=2\text{ }I_{TAV}$; Gate pulse: $I_G=I_{FGM}$; $V_G=20\text{ V}$; $t_{GP}=500\text{ }\mu\text{s}$; $di_G/dt=2\text{ A}/\mu\text{s}$ |
| THERMAL | | | | |
| T_{stg} | Storage temperature | $^\circ\text{C}$ | -40 ÷ 50 | |
| T_j | Operating junction temperature | $^\circ\text{C}$ | -40 ÷ 125 | |
| $T_{c\text{ op}}$ | Operating temperature | $^\circ\text{C}$ | -40 ÷ 125 | |
| MECHANICAL | | | | |
| a | Acceleration under vibration | m/s^2 | 50 | |

CHARACTERISTICS

| Symbols and parameters | | Units | Values | Conditions | |
|------------------------|---|---------------------------|----------------------|---|---|
| ON-STATE | | | | | |
| V_{TM} | Peak on-state voltage, max | V | 1.55 | $T_j=25\text{ }^\circ\text{C}; I_{TM}=2500\text{ A}$ | |
| $V_{T(TO)}$ | On-state threshold voltage, max | V | 0.95 | $T_j=T_{j\text{ max}};$ | |
| r_T | On-state slope resistance, max | m Ω | 0.350 | $0.5\pi I_{TAV} < I_T < 1.5\pi I_{TAV}$ | |
| I_L | Latching current, max | mA | 1500 | $T_j=25\text{ }^\circ\text{C}; V_D=12\text{ V};$ Gate pulse: $I_G=I_{FGM}; V_G=20\text{ V};$ $t_{GP}=500\text{ }\mu\text{s}; di_G/dt=1\text{ A}/\mu\text{s}$ | |
| I_H | Holding current, max | mA | 300 | $T_j=25\text{ }^\circ\text{C};$ $V_D=12\text{ V};$ Gate open | |
| BLOCKING | | | | | |
| I_{DRM}, I_{RRM} | Repetitive peak off-state and Repetitive peak reverse currents, max | mA | 200 | $T_j=T_{j\text{ max}};$ $V_D=V_{DRM}; V_R=V_{RRM}$ | |
| $(dv_D/dt)_{crit}$ | Critical rate of rise of off-state voltage ¹⁾ , min | V/ μs | 1000 | $T_j=T_{j\text{ max}};$ $V_D=0.67\cdot V_{DRM};$ Gate open | |
| TRIGGERING | | | | | |
| V_{GT} | Gate trigger direct voltage, max | V | 4.00 2.50 2.00 | $T_j= T_{j\text{ min}}$ $T_j=25\text{ }^\circ\text{C}$ $T_j= T_{j\text{ max}}$ | $V_D=12\text{ V}; I_D=3\text{ A};$ Direct gate current |
| I_{GT} | Gate trigger direct current, max | mA | 400 250 200 | $T_j= T_{j\text{ min}}$ $T_j= 25\text{ }^\circ\text{C}$ $T_j= T_{j\text{ max}}$ | |
| V_{GD} | Gate non-trigger direct voltage, min | V | 0.25 | $T_j=T_{j\text{ max}};$ $V_D=0.67\cdot V_{DRM};$ | |
| I_{GD} | Gate non-trigger direct current, min | mA | 10.00 | Direct gate current | |
| SWITCHING | | | | | |
| t_{gd} | Delay time | μs | 2.50 | $T_j=25\text{ }^\circ\text{C}; V_D=1500\text{ V}; I_{TM}=I_{TAV};$ $di/dt=200\text{ A}/\mu\text{s};$ Gate pulse: $I_G=2\text{ A}; V_G=20\text{ V};$ $t_{GP}=50\text{ }\mu\text{s}; di_G/dt=2\text{ A}/\mu\text{s}$ | |
| t_q | Turn-off time ²⁾ , max | μs | 320 | $dv_D/dt=50\text{ V}/\mu\text{s}; T_j=T_{j\text{ max}}; I_{TM}= I_{TAV};$ $di_R/dt=-10\text{ A}/\mu\text{s}; V_R=100\text{ V};$ $V_D=0.67\cdot V_{DRM}$ | |
| THERMAL | | | | | |
| R_{thjc} | Thermal resistance, junction to case | | | 180° half-sine wave, 50 Hz | |
| | per module | $^\circ\text{C}/\text{W}$ | 0.0420 | | |
| R_{thch} | Thermal resistance, case to heatsink | | | | |
| | per module | $^\circ\text{C}/\text{W}$ | 0.0100 | | |
| INSULATION | | | | | |
| V_{ISOL} | Insulation test voltage | kV | 3.00 | Sine wave, 50 Hz; | t=60 sec |
| | | | 3.60 | RMS | t=1 sec |
| MECHANICAL | | | | | |
| M_1 | Mounting torque (M6) ³⁾ | Nm | 6.00 | Tolerance $\pm 15\%$ | |
| M_2 | Terminal connection torque (M12) ³⁾ | Nm | 18.00 | Tolerance $\pm 15\%$ | |
| w | Weight, max | g | 2250 | | |

PART NUMBERING GUIDE

| | | | | | | | | | | | | |
|----|---|---|-----|---|----|---|----|----|---|---|---|---|
| MT | 1 | - | 635 | - | 28 | - | A2 | K2 | - | E | - | N |
| 1 | 2 | | 3 | | 4 | | 5 | 6 | | 7 | | 8 |

1. MT - Thyristor module
2. Circuit Schematic
3. Average On-state Current, A
4. Voltage Code
5. Critical rate of rise of off-state voltage
6. Group of turn-off time ($dv_D/dt=50 \text{ V}/\mu\text{s}$)
7. Package Type (M.E)
8. Ambient Conditions:
N – Normal

NOTES

¹⁾ Critical rate of rise of off-state voltage

| | |
|---|------|
| Symbol of group | A2 |
| $(dv_D/dt)_{crit}, \text{ V}/\mu\text{s}$ | 1000 |

²⁾ Turn-off time ($dv_D/dt=50 \text{ V}/\mu\text{s}$)

| | |
|----------------------|-----|
| Symbol of group | K2 |
| $t_{q}, \mu\text{s}$ | 320 |

³⁾ The screws must be lubricated



UL certified file-No. E255404