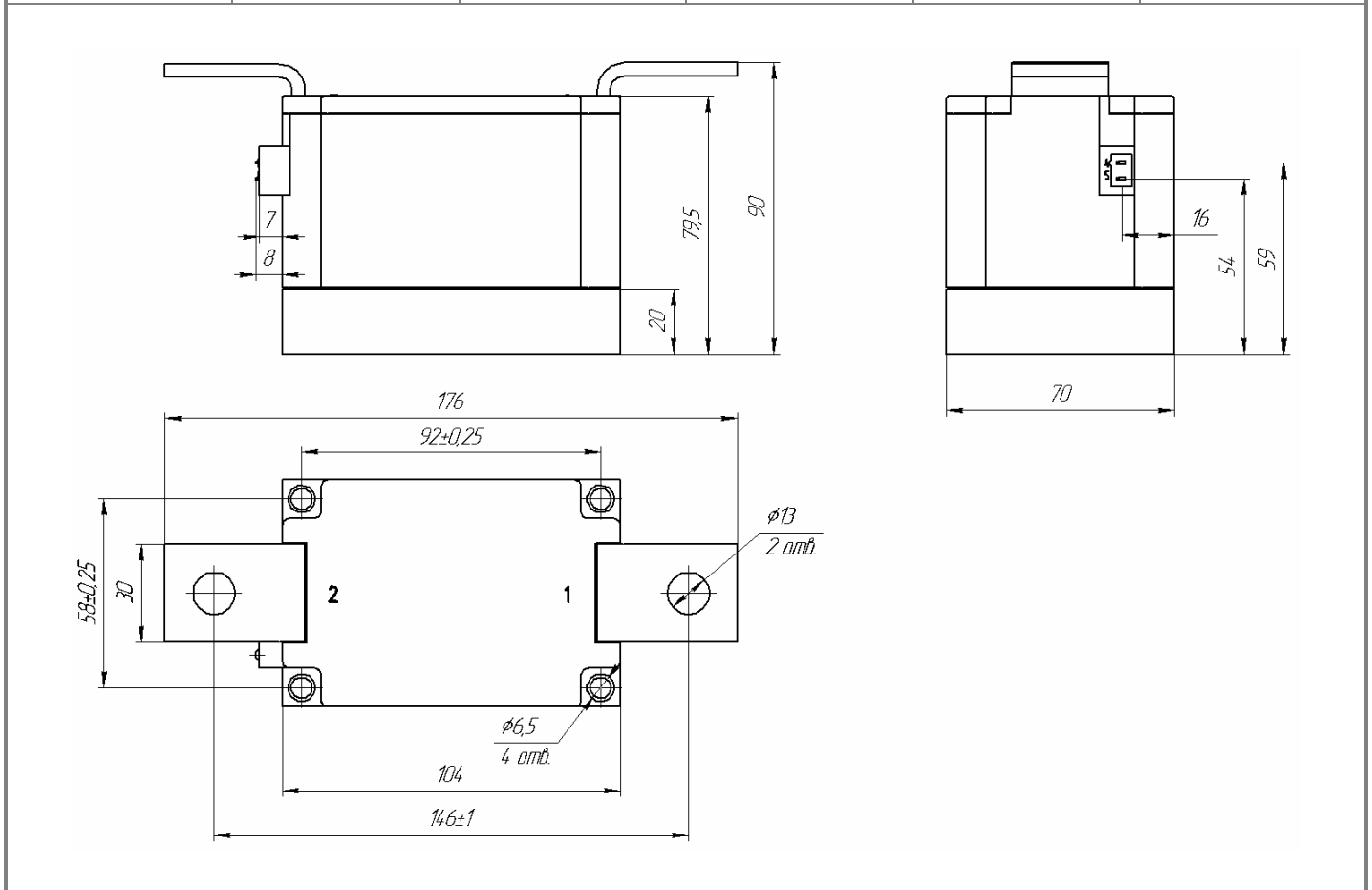
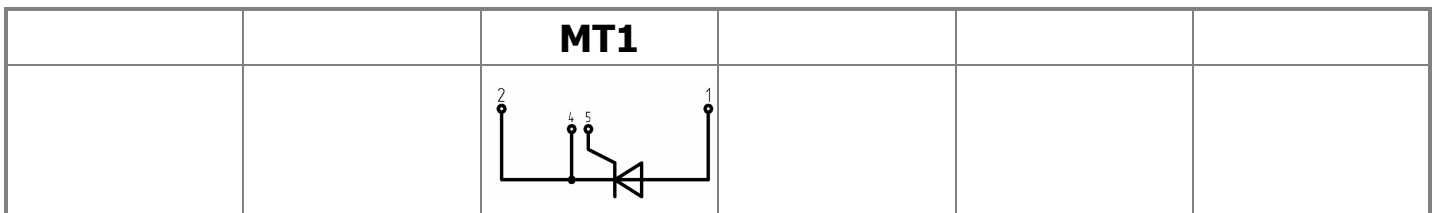




Electrically isolated base plate  
Industrial standard package  
Simplified mechanical design, rapid assembly  
Pressure contact

**Single Thyristor Module**  
**For Phase Control**  
**MT1-830-18-E**

|                                   |           |      |           |               |      |
|-----------------------------------|-----------|------|-----------|---------------|------|
| Mean on-state current             |           |      | $I_{TAV}$ | 830 A         |      |
| Repetitive peak off-state voltage |           |      | $V_{DRM}$ | 1000 ÷ 1800 V |      |
| Repetitive peak reverse voltage   |           |      | $V_{RRM}$ |               |      |
| Turn-off time                     |           |      | $t_q$     | 250 $\mu$ s   |      |
| $V_{DRM}, V_{RRM}, V$             | 1000      | 1200 | 1400      | 1600          | 1800 |
| Voltage code                      | 10        | 12   | 14        | 16            | 18   |
| $T_{jv}, ^\circ C$                | -40 ÷ 130 |      |           |               |      |



All dimensions in millimeters (inches)

## MAXIMUM ALLOWABLE RATINGS

| Symbols and parameters |  | Units            | Values                                     | Test conditions  |
|------------------------|--|------------------|--|--|
| <b>ON-STATE</b>        |  |                  |  |  |
| $I_{TAV}$              | Mean on-state current  | A                | 830  | $T_c=85\text{ }^\circ\text{C}$ ;<br>180° half-sine wave; 50 Hz   |
| $I_{TRMS}$             | RMS on-state current   | A                | 1303                                       |  |
| $I_{TSM}$              | Surge on-state current   | kA               | 33.0<br>38.0                               | $T_j=T_{j\max}$<br>$T_j=25\text{ }^\circ\text{C}$<br>180° half-sine wave; 50 Hz<br>( $t_p=10\text{ ms}$ ); single pulse;<br>$V_D=V_R=0\text{ V}$ ;<br>Gate pulse: $I_G=2\text{ A}$ ;<br>$t_{GP}=50\text{ }\mu\text{s}$ ; $di_G/dt\geq 1\text{ A}/\mu\text{s}$  |
|                        |  |                  | 35.0<br>40.0                               | $T_j=T_{j\max}$<br>$T_j=25\text{ }^\circ\text{C}$<br>180° half-sine wave; 60 Hz<br>( $t_p=8.3\text{ ms}$ ); single pulse;<br>$V_D=V_R=0\text{ V}$ ;<br>Gate pulse: $I_G=2\text{ A}$ ;<br>$t_{GP}=50\text{ }\mu\text{s}$ ; $di_G/dt\geq 1\text{ A}/\mu\text{s}$ |
| $I^2t$                 | Safety factor  | $A^2s\cdot 10^3$ | 5445<br>7220                               | $T_j=T_{j\max}$<br>$T_j=25\text{ }^\circ\text{C}$<br>180° half-sine wave; 50 Hz<br>( $t_p=10\text{ ms}$ ); single pulse;<br>$V_D=V_R=0\text{ V}$ ;<br>Gate pulse: $I_G=2\text{ A}$ ;<br>$t_{GP}=50\text{ }\mu\text{s}$ ; $di_G/dt\geq 1\text{ A}/\mu\text{s}$  |
|                        |  |                  | 5080<br>6640                               | $T_j=T_{j\max}$<br>$T_j=25\text{ }^\circ\text{C}$<br>180° half-sine wave; 60 Hz<br>( $t_p=8.3\text{ ms}$ ); single pulse;<br>$V_D=V_R=0\text{ V}$ ;<br>Gate pulse: $I_G=2\text{ A}$ ;<br>$t_{GP}=50\text{ }\mu\text{s}$ ; $di_G/dt\geq 1\text{ A}/\mu\text{s}$ |
| <b>BLOCKING</b>        |  |                  |  |  |
| $V_{DRM}, V_{RRM}$     | Repetitive peak off-state and<br>Repetitive peak reverse voltages                  | V                | 1000÷1800                                  | $T_{j\min} < T_j < T_{j\max}$ ;<br>180° half-sine wave; 50 Hz;<br>Gate open  |
| $V_{DSM}, V_{RSM}$     | Non-repetitive peak off-state and<br>Non-repetitive peak reverse voltages          | V                | 1100÷1900                                  | $T_{j\min} < T_j < T_{j\max}$ ;<br>180° half-sine wave; 50 Hz; single pulse;<br>Gate open  |
| $V_D, V_R$             | Direct off-state and<br>Direct reverse voltages                                    | V                | $0.75\cdot V_{DRM}$<br>$0.75\cdot V_{RRM}$ | $T_j=T_{j\max}$ ;<br>Gate open   |
| <b>TRIGGERING</b>      |  |                  |  |  |
| $I_{FGM}$              | 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  |
| <b>SWITCHING</b>       |  |                  |  |  |
| $(di_T/dt)_{crit}$     | Critical rate of rise of<br>on-state current<br>non-repetitive ( $f=1\text{ Hz}$ ) | $A/\mu\text{s}$  | 400  | $T_j=T_{j\max}$ ; $V_D=0.67\cdot V_{DRM}$ ;<br>$I_{TM}=2\text{ }I_{TAV}$ ;<br>Gate pulse: $I_G=2\text{ A}$ ;<br>$t_{GP}=50\text{ }\mu\text{s}$ ; $di_G/dt\geq 1\text{ A}/\mu\text{s}$  |
| <b>THERMAL</b>         |  |                  |  |  |
| $T_{stg}$              | Storage temperature  | $^\circ\text{C}$ | -40 ÷ 125                                  |  |
| $T_j$                  | Operating junction temperature   | $^\circ\text{C}$ | -40 ÷ 130                                  |  |
| <b>MECHANICAL</b>      |  |                  |  |  |
| a                      | Acceleration under vibration   | $\text{m/s}^2$   | 50   |  |

## CHARACTERISTICS

| Symbols and parameters |  | Units                     | Values               | Conditions  |   |
|------------------------|--|---------------------------|----------------------|---|---|
| <b>ON-STATE</b>        |  |                           |                      |   |   |
| $V_{TM}$               | Peak on-state voltage, max   | V                         | 1.45<br>1.50         | $T_j=25\text{ }^\circ\text{C}; I_{TM}=2512\text{ A}$<br>$T_j=T_{j\text{ max}}; I_{TM}=3000\text{ A}$  |   |
| $V_{T(TO)}$            | On-state threshold voltage, max  | V                         | 0.80                 | $T_j=T_{j\text{ max}}$  |   |
| $r_T$                  | On-state slope resistance, max   | m $\Omega$                | 0.170                | $0.5\pi I_{TAV} < I_T < 1.5\pi I_{TAV}$   |   |
| $I_L$                  | Latching current, max  | mA                        | 1500                 | $T_j=25\text{ }^\circ\text{C}; V_D=12\text{ V};$<br>Gate pulse: $I_G=2\text{ A};$<br>$t_{GP}=50\text{ }\mu\text{s}; di_G/dt \geq 1\text{ A}/\mu\text{s}$                      |   |
| $I_H$                  | Holding current, max   | mA                        | 300                  | $T_j=25\text{ }^\circ\text{C};$<br>$V_D=12\text{ V};$ Gate open   |   |
| <b>BLOCKING</b>        |  |                           |                      |   |   |
| $I_{DRM}, I_{RRM}$     | Repetitive peak off-state and<br>Repetitive peak reverse currents, max | mA                        | 150                  | $T_j=T_{j\text{ max}};$<br>$V_D=V_{DRM}; V_R=V_{RRM}$   |   |
| $(dv_D/dt)_{crit}$     | Critical rate of rise of<br>off-state voltage, min                     | V/ $\mu\text{s}$          | 1000                 | $T_j=T_{j\text{ max}};$<br>$V_D=0.67\cdot V_{DRM};$ Gate open   |   |
| <b>TRIGGERING</b>      |  |                           |                      |   |   |
| $V_{GT}$               | Gate trigger direct voltage, max                                       | V                         | 4.00<br>2.50<br>2.00 | $T_j=T_{j\text{ min}}$<br>$T_j=25\text{ }^\circ\text{C}$<br>$T_j=T_{j\text{ max}}$  | $V_D=12\text{ V}; I_D=3\text{ A};$<br>Direct gate current |
| $I_{GT}$               | Gate trigger direct current, max                                       | mA                        | 500<br>300<br>200    | $T_j=T_{j\text{ min}}$<br>$T_j=25\text{ }^\circ\text{C}$<br>$T_j=T_{j\text{ max}}$  |   |
| $V_{GD}$               | Gate non-trigger direct voltage, min                                   | V                         | 0.25                 | $T_j=T_{j\text{ max}};$<br>$V_D=0.67\cdot V_{DRM};$   |   |
| $I_{GD}$               | Gate non-trigger direct current, min                                   | mA                        | 10.00                | Direct gate current   |   |
| <b>SWITCHING</b>       |  |                           |                      |   |   |
| $t_{gd}$               | Delay time   | $\mu\text{s}$             | 2.00                 | $T_j=25\text{ }^\circ\text{C}; V_D=0.4\cdot V_{DRM}; I_{TM}=I_{TAV};$<br>Gate pulse: $I_G=2\text{ A};$<br>$t_{GP}=50\text{ }\mu\text{s}; di_G/dt \geq 1\text{ A}/\mu\text{s}$ |   |
| $t_q$                  | Turn-off time, max   | $\mu\text{s}$             | 250                  | $dv_D/dt=50\text{ V}/\mu\text{s}; T_j=T_{j\text{ max}}; I_{TM}=I_{TAV};$<br>$di_R/dt=-10\text{ A}/\mu\text{s}; V_R=100\text{ V};$<br>$V_D=0.67\cdot V_{DRM}$                  |   |
| <b>THERMAL</b>         |  |                           |                      |   |   |
| $R_{thjc}$             | 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               |   |   |
| <b>INSULATION</b>      |  |                           |                      |   |   |
| $V_{ISOL}$             | Insulation test voltage  | kV                        | 3.00                 | Sine wave, 50 Hz;<br>RMS  | t=1 min   |
|                        |  |                           | 3.60                 |   | t=1 sec   |
| <b>MECHANICAL</b>      |  |                           |                      |   |   |
| $M_1$                  | Mounting torque (M6) <sup>1)</sup>                                     | Nm                        | 6.00                 | Tolerance $\pm 15\%$  |   |
| $M_2$                  | Terminal connection torque (M12) <sup>1)</sup>                         | Nm                        | 18.00                | Tolerance $\pm 10\%$  |   |
| w                      | Weight   | g                         | 2800                 |   |   |

| PART NUMBERING GUIDE  |   |   |     |   |    |   |   |   |   | NOTES |                                  |
|---|---|---|-----|---|----|---|---|---|---|-------|----------------------------------|
| MT  | 1 | - | 830 | - | 18 | - | E | - | N |       | 1) The screws must be lubricated |
| 1   | 2 |   | 3   |   | 4  |   | 5 |   | 6 |       |                                  |
| 1. Single Thyristor module (MT)<br>Single Diode module (MD)<br>2. Circuit Schematic<br>3. Average On-state Current, A<br>4. Voltage Code<br>5. Package Type (M.E)<br>6. Ambient Conditions:<br>N – Normal |   |   |     |   |    |   |   |   |   |       |                                  |

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