

# Single Thyristor Module

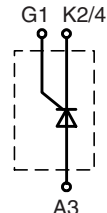
$$I_{TRMS} = 85 \text{ A}$$

$$V_{RRM} = 1200-1600 \text{ V}$$

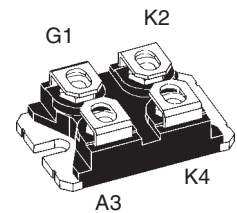
$$I_{TAV} = 54 \text{ A}$$

Preliminary data

| $V_{RSM}$<br>$V_{DSM}$<br>$V$ | $V_{RRM}$<br>$V_{DRM}$<br>$V$ | Type         |
|-------------------------------|-------------------------------|--------------|
| 1200                          | 1200                          | MCO 50-12io6 |
| 1600                          | 1600                          | MCO 50-16io6 |



miniBLOC, SOT-227 B



| Symbol         | Conditions                                                                                                                                                        | Maximum Ratings                                                                                                     |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| $I_{TRMS}$     | $T_{VJ} = T_{VJM}$                                                                                                                                                | 85 A                                                                                                                |
| $I_{TAV}$      | $T_C = 80^\circ\text{C}; (180^\circ \text{ sine})$                                                                                                                | 54 A                                                                                                                |
| $I_{TSM}$      | $T_{VJ} = 45^\circ\text{C};$<br>$V_R = 0$                                                                                                                         | $t = 10 \text{ ms (50 Hz), sine}$ 740 A<br>$t = 8.3 \text{ ms (60 Hz), sine}$ 800 A                                 |
|                | $T_{VJ} = T_{VJM}$<br>$V_R = 0$                                                                                                                                   | $t = 10 \text{ ms (50 Hz), sine}$ 650 A<br>$t = 8.3 \text{ ms (60 Hz), sine}$ 700 A                                 |
| $I^2t$         | $T_{VJ} = 45^\circ\text{C}$<br>$V_R = 0$                                                                                                                          | $t = 10 \text{ ms (50 Hz), sine}$ 2740 A <sup>2</sup> s<br>$t = 8.3 \text{ ms (60 Hz), sine}$ 2700 A <sup>2</sup> s |
|                | $T_{VJ} = T_{VJM}$<br>$V_R = 0$                                                                                                                                   | $t = 10 \text{ ms (50 Hz), sine}$ 2100 A <sup>2</sup> s<br>$t = 8.3 \text{ ms (60 Hz), sine}$ 2100 A <sup>2</sup> s |
| $(di/dt)_{cr}$ | $T_{VJ} = T_{VJM}$<br>$f = 50 \text{ Hz}, t_p = 200 \mu\text{s}$<br>$V_D = \frac{2}{3} V_{DRM}$<br>$I_G = 0.3 \text{ A}$<br>$di_G/dt = 0.3 \text{ A}/\mu\text{s}$ | repetitive, $I_T = 150 \text{ A}$ 100 A/ $\mu\text{s}$                                                              |
|                |                                                                                                                                                                   | non repetitive, $I_T = I_{TAVM}$ 500 A/ $\mu\text{s}$                                                               |
| $(dv/dt)_{cr}$ | $T_{VJ} = T_{VJM};$<br>$R_{GK} = \infty; \text{method 1 (linear voltage rise)}$                                                                                   | $V_{DR} = \frac{2}{3} V_{DRM}$ 1000 V/ $\mu\text{s}$                                                                |
| $P_{GM}$       | $T_{VJ} = T_{VJM}$<br>$I_T = I_{TAVM}$                                                                                                                            | $t_p = 30 \mu\text{s}$ 10 W<br>$t_p = 300 \mu\text{s}$ 5 W                                                          |
| $P_{GAVM}$     |                                                                                                                                                                   | 0.5 W                                                                                                               |
| $V_{RGM}$      |                                                                                                                                                                   | 10 V                                                                                                                |
| $T_{VJ}$       |                                                                                                                                                                   | -40...+150 °C                                                                                                       |
| $T_{VJM}$      |                                                                                                                                                                   | 150 °C                                                                                                              |
| $T_{stg}$      |                                                                                                                                                                   | -40...+150 °C                                                                                                       |
| $V_{ISOL}$     | 50/60 Hz, RMS; $I_{ISOL} \leq 1 \text{ mA}$                                                                                                                       | 2500 V~                                                                                                             |
| $M_d$          | Mounting torque (M4)                                                                                                                                              | 1.1 - 1.5 / 9 - 13 Nm/lb.in.                                                                                        |
|                | Terminal connection torque (M4)                                                                                                                                   | 1.1 - 1.5 / 9 - 13 Nm/lb.in.                                                                                        |
| Weight         | typ.                                                                                                                                                              | 30 g                                                                                                                |

Data according to IEC 60747 and to a single thyristor/diode unless otherwise stated.

## Features

- International standard package miniBLOC (ISOTOP compatible)
- Isolation voltage 2500 V~
- Planar passivated chips

## Applications

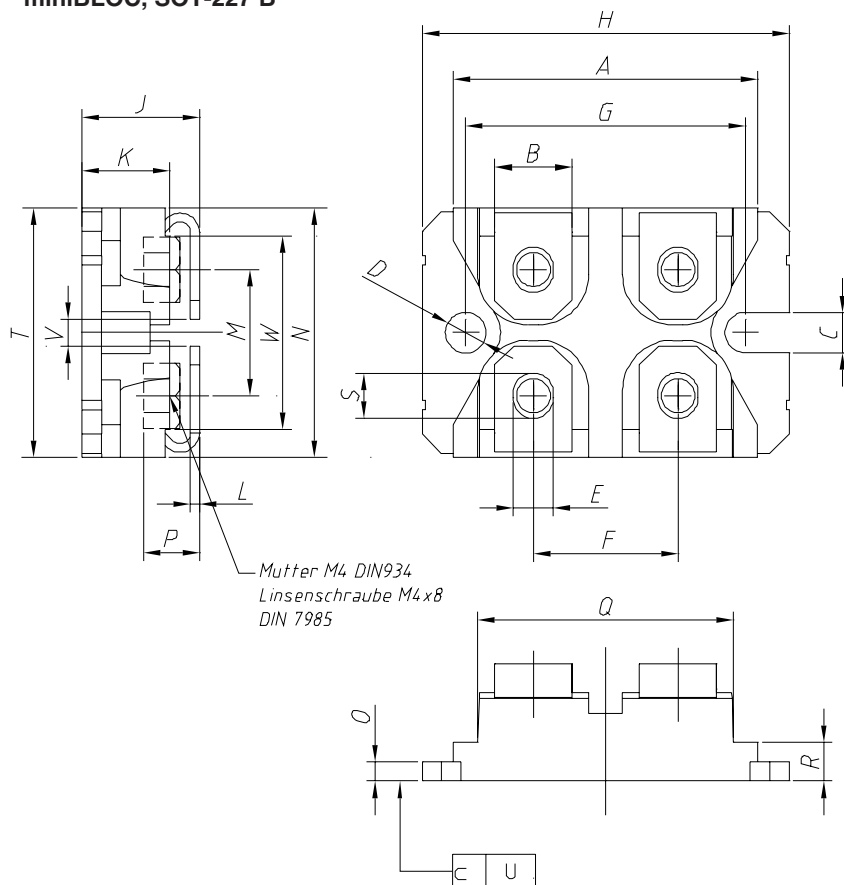
- Solid state switches
- motor control
- soft starter
- light and temperature control

## Advantages

- Easy to mount with two screws
- Space and weight savings
- Improved temperature and power cycling
- High power density

| Symbol             | Conditions                                                                                                                                                                             | Characteristic Values |                     |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------------|
| $I_{RRM} / D_{RM}$ | $T_{VJ} = 125^{\circ}\text{C}; V_R = V_{RRM}; V_D = V_{DRM}$                                                                                                                           | $\leq$                | 3 mA                |
| $V_T$              | $I_T = 50; T_{VJ} = 25^{\circ}\text{C}$                                                                                                                                                | $\leq$                | 1.3 V               |
| $V_{T0}$           | For power-loss calculations only                                                                                                                                                       |                       | 0.9 V               |
| $r_T$              |                                                                                                                                                                                        |                       | 5.8 m $\Omega$      |
| $V_{GT}$           | $V_D = 6 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$                                                                                                                                       | $\leq$                | 1.4 V               |
|                    | $T_{VJ} = -40^{\circ}\text{C}$                                                                                                                                                         | $\leq$                | 1.6 V               |
| $I_{GT}$           | $V_D = 6 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$                                                                                                                                       | $\leq$                | 80 mA               |
|                    | $T_{VJ} = -40^{\circ}\text{C}$                                                                                                                                                         | $\leq$                | 120 mA              |
| $V_{GD}$           | $T_{VJ} = T_{VJM}; V_D = \frac{2}{3} V_{DRM}$                                                                                                                                          | $\leq$                | 0.2 V               |
| $I_{GD}$           |                                                                                                                                                                                        | $\leq$                | 5 mA                |
| $I_L$              | $T_{VJ} = 25^{\circ}\text{C}; t_P = 10 \mu\text{s}$<br>$I_G = 0.3 \text{ A}; di_G/dt = 0.3 \text{ A}/\mu\text{s}$                                                                      | $\leq$                | 450 mA              |
| $I_H$              | $T_{VJ} = 25^{\circ}\text{C}; V_D = 6 \text{ V}; R_{GK} = \infty$                                                                                                                      | $\leq$                | 100 mA              |
| $t_{gd}$           | $T_{VJ} = 25^{\circ}\text{C}; V_D = \frac{1}{2} V_{DRM}$<br>$I_G = 0.3 \text{ A}; di_G/dt = 0.3 \text{ A}/\mu\text{s}$                                                                 | $\leq$                | 2 $\mu\text{s}$     |
| $t_q$              | $T_{VJ} = T_{VJM}; I_T = 11 \text{ A}, t_P = 200 \mu\text{s}; di/dt = -10 \text{ A}/\mu\text{s}$<br>$V_R = 100 \text{ V}; dv/dt = 15 \text{ V}/\mu\text{s}; V_D = \frac{2}{3} V_{DRM}$ | typ.                  | 150 $\mu\text{s}$   |
| $R_{thJC}$         | DC current                                                                                                                                                                             |                       | 0.72 K/W            |
| $R_{thCH}$         | DC current                                                                                                                                                                             | typ.                  | 0.4 K/W             |
| $d_s$              | Creeping distance on surface                                                                                                                                                           |                       | 8 mm                |
| $d_A$              | Creepage distance in air                                                                                                                                                               |                       | 4 mm                |
| $a$                | Max. allowable acceleration                                                                                                                                                            |                       | 50 m/s <sup>2</sup> |

## miniBLOC, SOT-227 B



M4 screws (4x) supplied

| Dim. | Millimeter |       | Inches |       |
|------|------------|-------|--------|-------|
|      | Min.       | Max.  | Min.   | Max.  |
| A    | 31.50      | 31.88 | 1.240  | 1.255 |
| B    | 7.80       | 8.20  | 0.307  | 0.323 |
| C    | 4.09       | 4.29  | 0.161  | 0.169 |
| D    | 4.09       | 4.29  | 0.161  | 0.169 |
| E    | 4.09       | 4.29  | 0.161  | 0.169 |
| F    | 14.91      | 15.11 | 0.587  | 0.595 |
| G    | 30.12      | 30.30 | 1.186  | 1.193 |
| H    | 37.80      | 38.23 | 1.489  | 1.505 |
| J    | 11.68      | 12.22 | 0.460  | 0.481 |
| K    | 8.92       | 9.60  | 0.351  | 0.378 |
| L    | 0.76       | 0.84  | 0.030  | 0.033 |
| M    | 12.60      | 12.85 | 0.496  | 0.506 |
| N    | 25.15      | 25.42 | 0.990  | 1.001 |
| O    | 1.98       | 2.13  | 0.078  | 0.084 |
| P    | 4.95       | 5.97  | 0.195  | 0.235 |
| Q    | 26.54      | 26.90 | 1.045  | 1.059 |
| R    | 3.94       | 4.42  | 0.155  | 0.174 |
| S    | 4.72       | 4.85  | 0.186  | 0.191 |
| T    | 24.59      | 25.07 | 0.968  | 0.987 |
| U    | -0.05      | 0.1   | -0.002 | 0.004 |
| V    | 3.30       | 4.57  | 0.130  | 0.180 |
| W    | 0.780      | 0.830 | 0.031  | 0.033 |

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