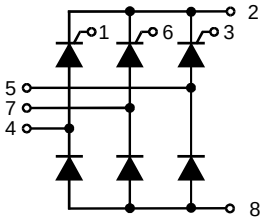
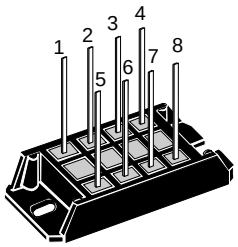
# Three Phase Half Controlled Rectifier Bridge

$I_{dAVM}$ = 20 A
$V_{RRM}$ = 1200-1600 V

| $V_{RSM}$ $V_{DSM}$ V | $V_{RRM}$ $V_{DRM}$ V | Type |
|---|---|---|
| 1300 | 1200 | VVZ 12-12io1 |
| 1500 | 1400 | VVZ 12-14io1 |
| 1700 | 1600 | VVZ 12-16io1 |




| Symbol | Test Conditions | | Maximum Ratings | |
|---|---|---|---|---|
| $I_{dAV}$ | $T_K$ = 100°C; module | | 15 | A |
| $I_{dAVM}$ | module | | 20 | A |
| $I_{FRMS}$, $I_{TRMS}$ | per leg | | 12 | A |
| $I_{FSM}$, $I_{TSM}$ | $T_{VJ}$ = 45°C; | t = 10 ms (50 Hz), sine | 110 | A |
| | $V_R$ = 0 | t = 8.3 ms (60 Hz), sine | 115 | A |
| | $T_{VJ}$ = $T_{VJM}$ | t = 10 ms (50 Hz), sine | 100 | A |
| | $V_R$ = 0 | t = 8.3 ms (60 Hz), sine | 105 | A |
| $I^2t$ | $T_{VJ}$ = 45°C | t = 10 ms (50 Hz), sine | 60 | $A^2s$ |
| | $V_R$ = 0 | t = 8.3 ms (60 Hz), sine | 55 | $A^2s$ |
| | $T_{VJ}$ = $T_{VJM}$ | t = 10 ms (50 Hz), sine | 50 | $A^2s$ |
| | $V_R$ = 0 | t = 8.3 ms (60 Hz), sine | 45 | $A^2s$ |
| $(di/dt)_{cr}$ | $T_{VJ}$ = $T_{VJM}$; f =400 Hz, $t_P$ =200 µs; $V_D$ = 2/3 $V_{DRM}$; $I_G$ = 0.3 A, $di_G/dt$ = 0.3 A/µs | repetitive, $I_T$ = 50 A | 150 | A/µs |
| | | non repetitive, $I_T$ = 1/3 ~ $I_{dAV}$ | 500 | A/µs |
| $(dv/dt)_{cr}$ | $T_{VJ}$ = $T_{VJM}$; $V_{DR}$ = 2/3 $V_{DRM}$; $R_{GK}$ = ∞; method 1 (linear voltage rise) | | 1000 | V/µs |
| $V_{RGM}$ | | | 10 | V |
| $P_{GM}$ | $T_{VJ}$ = $T_{VJM}$ | $t_p$ = 30 µs | ≤ 10 | W |
| | $I_T$ = $I_{TAVM}$ | $t_p$ = 500 µs | ≤ 5 | W |
| | | $t_p$ = 10 ms | ≤ 1 | W |
| $P_{GAVM}$ | | | 0.5 | W |
| $T_{VJ}$ | | | -40...+125 | °C |
| $T_{VJM}$ | | | 125 | °C |
| $T_{stg}$ | | | -40...+125 | °C |
| $V_{ISOL}$ | 50/60 Hz, RMS | t = 1 min | 3000 | V~ |
| | $I_{ISOL}$ ≤ 1 mA | t = 1 s | 3600 | V~ |
| $M_d$ | Mounting torque | (M5) | 2-2.5 | Nm |
| | | (10-32 UNF) | 18-22 | lb.in. |
| Weight | typ. | | 28 | g |

Data according to IEC 60747 and refer to a single thyristor/diode unless otherwise stated.
IXYS reserves the right to change limits, test conditions and dimensions.

### Features

- Package with DCB ceramic base plate
- Isolation voltage 3600 V~
- Planar passivated chips
- Soldering terminals
- UL registered E 72873

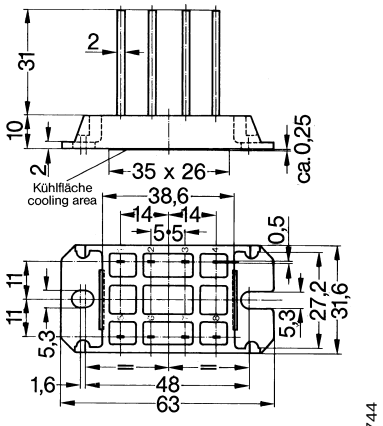
### Applications

- Input rectifier for switch mode power supplies (SMPS)
- Softstart capacitor charging
- Electric drives and auxiliaries

### Advantages

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

### Dimensions in mm (1 mm = 0.0394")



| Symbol | Test Conditions | | Characteristic Values | | |
|---|---|---|---|---|---|
| $I_R$, $I_D$ | $V_R = V_{RRM}$; $V_D = V_{DRM}$ | $T_{VJ} = T_{VJM}$ | ≤ | 5 | mA |
| | | $T_{VJ} = 25°C$ | ≤ | 0.3 | mA |
| $V_F$, $V_T$ | $I_F$, $I_T$ = 30 A, $T_{VJ} = 25°C$ | | ≤ | 2 | V |
| $V_{T0}$ | For power-loss calculations only | | | 1.1 | V |
| $r_T$ | ($T_{VJ} = 125°C$) | | | 30 | mΩ |
| $V_{GT}$ | $V_D$ = 6 V; | $T_{VJ} = 25°C$ | ≤ | 1.0 | V |
| | | $T_{VJ} = -40°C$ | ≤ | 1.2 | V |
| $I_{GT}$ | $V_D$ = 6 V; | $T_{VJ} = 25°C$ | ≤ | 65 | mA |
| | | $T_{VJ} = -40°C$ | ≤ | 80 | mA |
| | | $T_{VJ} = 125°C$ | ≤ | 50 | mA |
| $V_{GD}$ | $T_{VJ} = T_{VJM}$; | $V_D = 2/3\ V_{DRM}$ | ≤ | 0.2 | V |
| $I_{GD}$ | $T_{VJ} = T_{VJM}$; | $V_D = 2/3\ V_{DRM}$ | ≤ | 5 | mA |
| $I_L$ | $I_G$ = 0.3 A; $t_G$ = 30 µs | $T_{VJ} = 25°C$ | ≤ | 150 | mA |
| | $di_G/dt$ = 0.3 A/µs | $T_{VJ} = -40°C$ | ≤ | 200 | mA |
| | | $T_{VJ} = 125°C$ | ≤ | 100 | mA |
| $I_H$ | $T_{VJ} = 25°C$; $V_D$ = 6 V; $R_{GK} = \infty$ | | ≤ | 100 | mA |
| $t_{gd}$ | $T_{VJ} = 25°C$; $V_D = 1/2\ V_{DRM}$ | | ≤ | 2 | µs |
| | $I_G$ = 0.3 A; $di_G/dt$ = 0.3 A/µs | | | | |
| $t_q$ | $T_{VJ} = 125°C$; $I_T$ = 15 A, $t_p$ = 300 µs, -di/dt = 10 A/µs | | typ. | 150 | µs |
| $Q_r$ | $V_R$ = 100 V, dv/dt = 20 V/µs, $V_D = 2/3\ V_{DRM}$ | | | 75 | µC |
| $R_{thJC}$ | per thyristor (diode); DC current | | | 2.5 | K/W |
| | per module | | | 0.42 | K/W |
| $R_{thJH}$ | per thyristor (diode); DC current | | | 3.1 | K/W |
| | per module | | | 0.52 | K/W |
| $d_S$ | Creeping distance on surface | | | 7 | mm |
| $d_A$ | Creepage distance in air | | | 7 | mm |
| a | Max. allowable acceleration | | | 50 | $m/s^2$ |