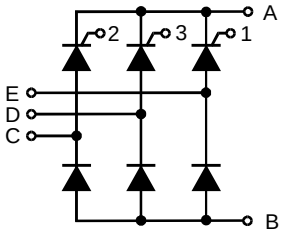
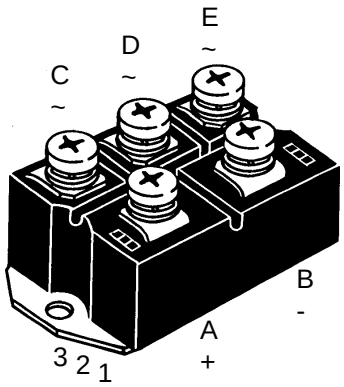
# Three Phase Half Controlled Rectifier Bridge, B6HK

$I_{dAVM}$ = 110/167 A
$V_{RRM}$ = 1200-1600 V

| $V_{RSM}$ $V_{DSM}$ V | $V_{RRM}$ $V_{DRM}$ V | Type | |
|---|---|---|---|
| 1300 | 1200 | VVZ 110-12io7 | VVZ 175-12io7 |
| 1500 | 1400 | VVZ 110-14io7 | VVZ 175-14io7 |
| 1700 | 1600 | | VVZ 175-16io7 |




| Symbol | Test Conditions | | Maximum Ratings VVZ 110 | VVZ 175 | |
|---|---|---|---|---|---|
| $I_{dAV}$ | $T_C$ = 85°C; module | | 110 | 167 | A |
| $I_{FRMS}$, $I_{TRMS}$ | per leg | | 58 | 89 | A |
| $I_{FSM}$, $I_{TSM}$ | $T_{VJ}$ = 45°C; | t = 10 ms (50 Hz), sine | 1150 | 1500 | A |
| | $V_R$ = 0 | t = 8.3 ms (60 Hz), sine | 1230 | 1600 | A |
| | $T_{VJ}$ = $T_{VJM}$ | t = 10 ms (50 Hz), sine | 1000 | 1350 | A |
| | $V_R$ = 0 | t = 8.3 ms (60 Hz), sine | 1070 | 1450 | A |
| $I^2t$ | $T_{VJ}$ = 45°C | t = 10 ms (50 Hz), sine | 6600 | 11200 | $A^2s$ |
| | $V_R$ = 0 | t = 8.3 ms (60 Hz), sine | 6280 | 10750 | $A^2s$ |
| | $T_{VJ}$ = $T_{VJM}$ | t = 10 ms (50 Hz), sine | 5000 | 9100 | $A^2s$ |
| | $V_R$ = 0 | t = 8.3 ms (60 Hz), sine | 4750 | 8830 | $A^2s$ |
| $(di/dt)_{cr}$ | $T_{VJ}$ = $T_{VJM}$ repetitive, $I_T$ = 50 A<br>f =400 Hz, $t_P$ =200 µs<br>$V_D$ = 2/3 $V_{DRM}$ | | 150 | | A/µs |
| | $I_G$ = 0.3 A, non repetitive,<br>$di_G/dt$ = 0.3 A/µs, $I_T$ = 1/3 • $I_{dAV}$ | | 500 | | A/µs |
| $(dv/dt)_{cr}$ | $T_{VJ}$ = $T_{VJM}$; $V_{DR}$ = 2/3 $V_{DRM}$<br>$R_{GK}$ = ∞; 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 | 2500 | | V~ |
| | $I_{ISOL}$ ≤ 1 mA | t = 1 s | 3000 | | V~ |
| $M_d$ | Mounting torque (M6) | | 5±15 % | | Nm |
| | Terminal connection torque (M6) | | 5±15 % | | Nm |
| Weight | typ. | | 300 | | g |

### Features

- Package with screw terminals
- Isolation voltage 3000 V~
- Planar passivated chips
- UL registered E72873

### Applications

- Input rectifier for PWM converter
- Input rectifier for switch mode power supplies (SMPS)
- Softstart capacitor charging

### Advantages

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

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.

| Symbol | Test Conditions | | | Characteristic Values VVZ 110 | VVZ 175 | |
|---|---|---|---|---|---|---|
| $I_R$, $I_D$ | $V_R = V_{RRM}$; $V_D = V_{DRM}$ | $T_{VJ} = T_{VJM}$ | ≤ | 5 | | mA |
| | | $T_{VJ} = 25°C$ | ≤ | 0.3 | | mA |
| $V_F$, $V_T$ | $I_F$, $I_T$ = 200 A, $T_{VJ} = 25°C$ | | ≤ | 1.75 | 1.57 | V |
| $V_{T0}$ | For power-loss calculations only | | | 0.85 | 0.85 | V |
| $r_T$ | ($T_{VJ} = 125°C$) | | | 6 | 3.5 | mΩ |
| $V_{GT}$ | $V_D$ = 6 V; | $T_{VJ} = 25°C$ | ≤ | 1.5 | | V |
| | | $T_{VJ} = -40°C$ | ≤ | 1.6 | | V |
| $I_{GT}$ | $V_D$ = 6 V; | $T_{VJ} = 25°C$ | ≤ | 100 | | mA |
| | | $T_{VJ} = -40°C$ | ≤ | 200 | | 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<br>$di_G/dt$ = 0.3 A/µs | $T_{VJ} = 25°C$ | ≤ | 450 | | mA |
| $I_H$ | $T_{VJ} = 25°C$; $V_D$ = 6 V; $R_{GK} = \infty$ | | ≤ | 200 | | mA |
| $t_{gd}$ | $T_{VJ} = 25°C$; $V_D = 1/2\ V_{DRM}$<br>$I_G$ = 0.3 A; $di_G/dt$ = 0.3 A/µs | | ≤ | 2 | | µs |
| $R_{thJC}$ | per thyristor (diode); DC current | | | 0.65 | 0.46 | K/W |
| | per module | | | 0.108 | 0.077 | K/W |
| $R_{thJH}$ | per thyristor (diode); DC current | | | 0.8 | 0.55 | K/W |
| | per module | | | 0.133 | 0.092 | K/W |
| $d_S$ | Creeping distance on surface | | | | 10 | mm |
| $d_A$ | Creepage distance in air | | | | 9.4 | mm |
| a | Max. allowable acceleration | | | | 50 | $m/s^2$ |

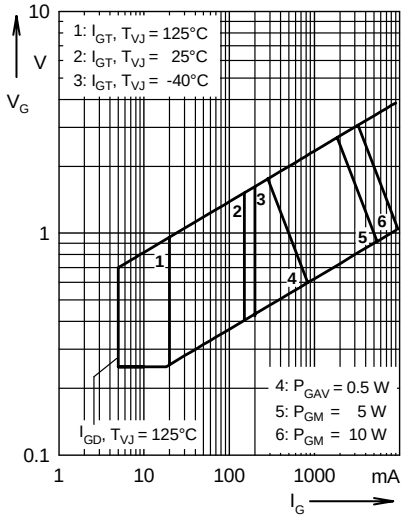



Fig. 1 Gate trigger characteristics

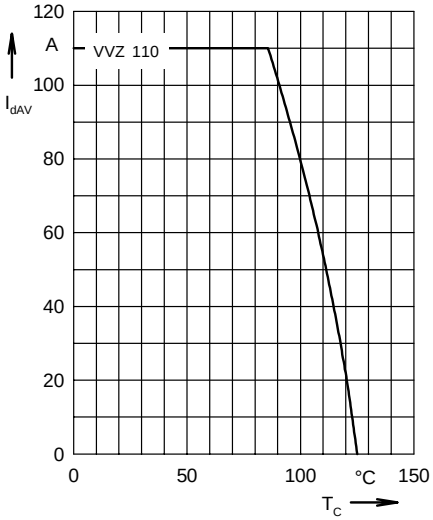
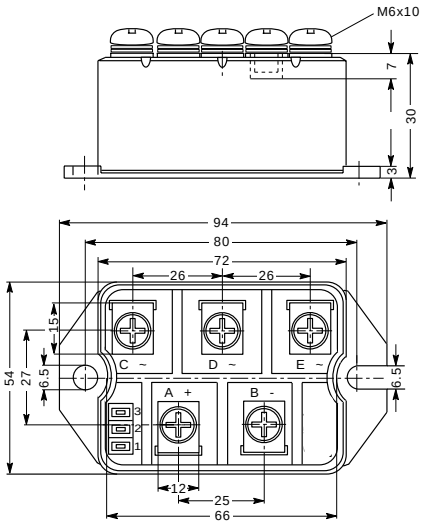



Fig. 2 DC output current at case temperature

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



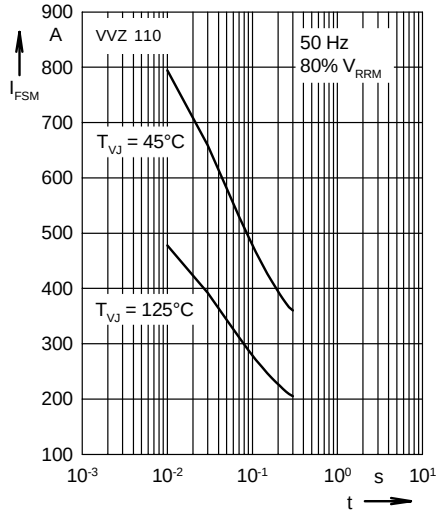




Fig. 3 Surge overload current
$I_{FSM}$: Crest value, t: duration

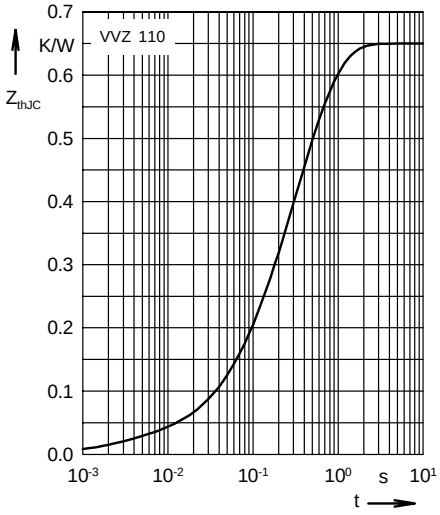



Fig. 4 Transient thermal impedance junction to case (per leg)