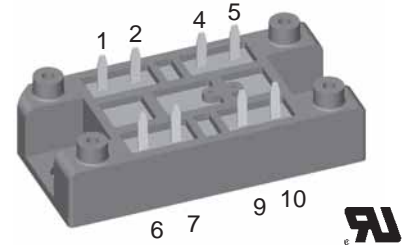
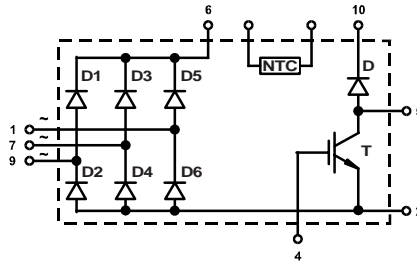


Three Phase Rectifier Bridge with Brake Chopper

$V_{RRM} = 1200/1600 \text{ V}$
 $I_{dAVM} = 110 \text{ A}$



Input Rectifier D1 - D6

| Symbol | Conditions | Maximum Ratings | |
|------------|--|-----------------|---|
| V_{RRM} | VUB 72 -12 NO1 | 1200 | V |
| | VUB 72 -16 NO1 | 1600 | V |
| I_{FAV} | $T_C = 80^\circ\text{C}$; sine 180° | 40 | A |
| I_{dAVM} | $T_C = 80^\circ\text{C}$; rectangular; $d = 1/3$; bridge | 110 | A |
| I_{FSM} | $T_{VJ} = 25^\circ\text{C}$; $t = 10 \text{ ms}$; sine 50 Hz | 530 | A |
| P_{tot} | $T_C = 25^\circ\text{C}$ | 100 | W |

Features

- three phase mains rectifier
- brake chopper:
 - IGBT with low saturation voltage
 - HiPerFRED™ free wheeling diode
- module package:
 - high level of integration
 - solder terminals for PCB mounting
 - UL registered E72873
 - isolated DCB ceramic base plate
 - large creepage and strike distances
 - high reliability

| Symbol | Conditions | Characteristic Values ($T_{VJ} = 25^\circ\text{C}$, unless otherwise specified) | | |
|------------|---|--|------|------|
| | | min. | typ. | max. |
| V_F | $I_F = 25 \text{ A}$; $T_{VJ} = 25^\circ\text{C}$ | 1.0 | 1.1 | V |
| | | 0.9 | | V |
| I_R | $V_R = V_{RRM}$; $T_{VJ} = 25^\circ\text{C}$ $V_R = 0.8 \cdot V_{RRM}$; $T_{VJ} = 125^\circ\text{C}$ | 0.4 | 0.02 | mA |
| | | | | mA |
| R_{thJC} | per diode | | 1.2 | K/W |
| R_{thJH} | with heat transfer paste | | 1.42 | K/W |

Applications

- drives with
- mains input
 - DC link
 - inverter or chopper feeding the machine
 - motor and generator/brake operation

Chopper Diode D

| Symbol | Conditions | Maximum Ratings | |
|-----------|--|-----------------|---|
| V_{RRM} | $T_{VJ} = 25^\circ\text{C}$ to 150°C | 1200 | V |
| I_{F25} | DC; $T_C = 25^\circ\text{C}$ | 25 | A |
| I_{F80} | DC; $T_C = 80^\circ\text{C}$ | 15 | A |

| Symbol | Conditions | Characteristic Values | | |
|------------|---|-----------------------|------|------|
| | | min. | typ. | max. |
| V_F | $I_F = 25 \text{ A}$; $T_{VJ} = 25^\circ\text{C}$ | 2.7 | 3.1 | V |
| | | 2.0 | | V |
| I_R | $V_R = V_{RRM}$; $T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$ | 0.1 | 0.1 | mA |
| | | | | mA |
| I_{RM} | $I_F = 15 \text{ A}$; $di_F/dt = -400 \text{ A}/\mu\text{s}$; $T_{VJ} = 125^\circ\text{C}$ $V_R = 600 \text{ V}$ | 16 | | A |
| t_{rr} | | 130 | | ns |
| R_{thJC} | with heat transfer paste | | 2.3 | K/W |
| R_{thJH} | | | 3.12 | K/W |

IXYS reserves the right to change limits, test conditions and dimensions.

Chopper Transistor T

| Symbol | Conditions | Maximum Ratings | |
|---------------------|--|-----------------|---------------|
| V_{CES} | $T_{VJ} = 25^{\circ}\text{C}$ to 150°C | 1200 | V |
| V_{GES} | | ± 20 | V |
| I_{C25} | DC; $T_C = 25^{\circ}\text{C}$ | 50 | A |
| I_{C80} | DC; $T_C = 80^{\circ}\text{C}$ | 35 | A |
| I_{CM} | $V_{GE} = \pm 15\text{ V}$; $R_G = 39\ \Omega$; $T_{VJ} = 125^{\circ}\text{C}$ | 50 | A |
| V_{CEK} | RBSOA; $L = 100\ \mu\text{H}$ | V_{CES} | |
| t_{SC} (SCSOA) | $V_{GE} = \pm 15\text{ V}$; $V_{CE} = 900\text{ V}$; $T_{VJ} = 125^{\circ}\text{C}$ $R_G = 39\ \Omega$; non repetitive | 10 | μs |

| Symbol | Conditions ($T_{VJ} = 25^{\circ}\text{C}$, unless otherwise specified) | Characteristic Values | | | |
|--|--|-----------------------|------|----------|----|
| | | min. | typ. | max. | |
| $V_{CE(sat)}$ | $I_C = 25\text{ A}$; $V_{GE} = 15\text{ V}$; $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$ | 1.9 2.1 | 2.4 | V V | |
| $V_{GE(th)}$ | $I_C = 1\text{ mA}$; $V_{GE} = V_{CE}$ | 4.5 | | 6.5 V | |
| I_{CES} | $V_{CE} = V_{CES}$; $V_{GE} = 0\text{ V}$; $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$ | 0.1 | 0.1 | mA mA | |
| I_{GES} | $V_{CE} = 0\text{ V}$; $V_{GE} = \pm 20\text{ V}$ | | 200 | nA | |
| $t_{d(on)}$ t_r $t_{d(off)}$ t_f E_{on} E_{off} | Inductive load, $T_{VJ} = 125^{\circ}\text{C}$ $V_{CE} = 600\text{ V}$; $I_C = 25\text{ A}$ $V_{GE} = \pm 15\text{ V}$; $R_G = 39\ \Omega$ | | 80 | ns | |
| | | | | 50 | ns |
| | | | | 440 | ns |
| | | | | 50 | ns |
| | | | | 3.8 | mJ |
| | | | | 2.0 | mJ |
| C_{ies} | $V_{CE} = 25\text{ V}$; $V_{GE} = 0\text{ V}$; $f = 1\text{ MHz}$ | 2.0 | | nF | |
| Q_{Gon} | $V_{CE} = 600\text{ V}$; $V_{GE} = 15\text{ V}$; $I_C = 35\text{ A}$ | 150 | | nC | |
| R_{thJC} | | | 0.6 | K/W | |
| R_{thJH} | with heat transfer paste, see mounting instructions | | 1.2 | K/W | |

Temperature Sensor NTC

| Symbol | Conditions | Characteristic Values typ. | |
|--------------|---|-------------------------------|------------|
| R_{25} | $T = 25^{\circ}\text{C}$ | 2.2 | k Ω |
| $B_{25/100}$ | $R(T) = R_{25} \cdot e^{B_{25/100} \left(\frac{1}{T} - \frac{1}{298\text{K}} \right)}$ | 100 | K |

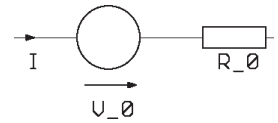
Module

| Symbol | Conditions | Maximum Ratings | |
|------------|--|-----------------|--------------------|
| I_{RMS} | per pin | 100 | A |
| T_{VJ} | | -40...+150 | $^{\circ}\text{C}$ |
| T_{stg} | | -40...+125 | $^{\circ}\text{C}$ |
| V_{ISOL} | $I_{ISOL} \leq 1\text{ mA}$; 50/60 Hz; $t = 1\text{ min}$ | 3600 | V~ |
| M_d | Mounting torque (M5) | 2 - 2.5 | Nm |

| Symbol | Conditions | Characteristic Values | | |
|------------|------------|-----------------------|------|------|
| | | min. | typ. | max. |
| d_A, d_S | | 5 | | mm |
| Weight | | | 35 | g |

Equivalent Circuits for Simulation

Conduction



D1 - D6

Diode (typ. at $T_J = 125^{\circ}\text{C}$)

$$V_0 = 0.85\text{ V}; R_0 = 7\text{ m}\Omega$$

T/D

IGBT (typ. at $V_{GE} = 15\text{ V}$; $T_J = 125^{\circ}\text{C}$)

$$V_0 = 1.0\text{ V}; R_0 = 45\text{ m}\Omega$$

Free Wheeling Diode (typ. at $T_J = 125^{\circ}\text{C}$)

$$V_0 = 1.25\text{ V}; R_0 = 32\text{ m}\Omega$$

Dimensions in mm (1 mm = 0.0394")

