

Single Phase Full Controlled Bridges with freewheeling diode

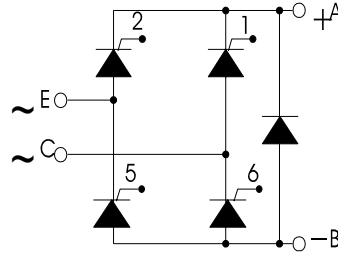
PSCT 50

$I_{dAV} = 53 \text{ A}$
 $V_{RRM} = 400-1600 \text{ V}$

Preliminary Data Sheet

| V_{RSM} V_{DSM} | V_{RRM} V_{DRM} | Type |
|------------------------|------------------------|------------|
| 500 | 400 | PSCT 50/04 |
| 900 | 800 | PSCT 50/08 |
| 1300 | 1200 | PSCT 50/12 |
| 1500 | 1400 | PSCT 50/14 |
| *1700 | *1600 | PSCT 50/16 |

* Delivery on request



| Symbol | Test Conditions | Maximum Ratings |
|----------------|---|-----------------------|
| I_{dAV} | $T_C = 85^\circ\text{C}$ 180° sine, per module | 53 A |
| I_{TSM} | $T_{VJ} = 45^\circ\text{C}$ $V_R = 0$ $t = 10 \text{ ms}$ (50 Hz), sine | 550 A |
| | $t = 8.3 \text{ ms}$ (60 Hz), sine | 600 A |
| | $T_{VJ} = T_{VJM}$ $V_R = 0$ $t = 10 \text{ ms}$ (50 Hz), sine | 500 A |
| | $t = 8.3 \text{ ms}$ (60 Hz), sine | 550 A |
| $\int i^2 dt$ | $T_{VJ} = 45^\circ\text{C}$ $V_R = 0$ $t = 10 \text{ ms}$ (50 Hz), sine | 1520 A ² s |
| | $t = 8.3 \text{ ms}$ (60 Hz), sine | 1520 A ² s |
| | $T_{VJ} = T_{VJM}$ $V_R = 0$ $t = 10 \text{ ms}$ (50 Hz), sine | 1250 A ² s |
| | $t = 8.3 \text{ ms}$ (60 Hz), sine | 1250 A ² s |
| $(di/dt)_{cr}$ | $T_{VJ} = T_{VJM}$ repetitive, $I_T = 50 \text{ A}$ $f = 50\text{Hz}$, $t_p = 200\mu\text{s}$ $V_D = 2/3 V_{DRM}$ | 150 A/ μs |
| | $I_G = 0.3 \text{ A}$ $di_G/dt = 0.3 \text{ A}/\mu\text{s}$ | 500 A/ μs |
| | non repetitive, $I_T = 1/2 \cdot I_{dAV}$ | 500 A/ μs |
| $(dv/dt)_{cr}$ | $T_{VJ} = T_{VJM}$ $V_{DR} = 2/3 V_{DRM}$ $R_{GK} = \infty$, method 1 (linear voltage rise) | 1000 V/ μs |
| P_{GM} | $T_{VJ} = T_{VJM}$ $t_p = 30\mu\text{s}$ | $\leq 10 \text{ W}$ |
| | $I_T = I_{TAVM}$ $t_p = 500\mu\text{s}$ | $\leq 5 \text{ W}$ |
| P_{GAVM} | | 0.5 W |
| V_{RGM} | | 10 V |
| T_{VJ} | | -40 ... + 125 °C |
| T_{VJM} | | 125 °C |
| T_{stg} | | -40 ... + 125 °C |
| V_{ISOL} | 50/60 HZ, RMS $t = 1 \text{ min}$ | 2500 V ~ |
| | $I_{ISOL} \leq 1 \text{ mA}$ $t = 1 \text{ s}$ | 3000 V ~ |
| M_d | Mounting torque (M5) | 2 - 2.5 Nm |
| Weight | typ. | 100 g |

Features

- Package with fast-on terminals
- Isolation voltage 3000 V~
- Planar glasspassivated chips
- Low forward voltage drop
- UL registered E 148688

Applications

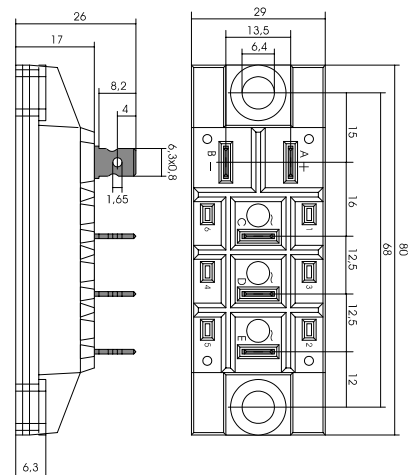
- Heat and temperature control for industrial furnaces and chemical processes
- Lighting control
- Motor control
- Power converter

Advantages

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

Package, style and outline

Dimensions in mm (1mm = 0.0394")



| Symbol | Test Conditions | Characteristic Value | |
|------------|--|------------------------|---------------|
| I_D, I_R | $T_{VJ} = T_{VJM}, V_R = V_{RRM}, V_D = V_{DRM}$ | ≤ 5 mA | |
| V_T, V_F | $I_T, I_F = 80A, T_{VJ} = 25^\circ C$ | ≤ 1.64 V | |
| V_{TO} | For power-loss calculations only ($T_{VJ} = T_{VJM}$) | 0.85 V | |
| r_T | | 11 mΩ | |
| V_{GT} | $V_D = 6V$ | $T_{VJ} = 25^\circ C$ | ≤ 1.5 V |
| | | $T_{VJ} = -40^\circ C$ | ≤ 1.6 V |
| I_{GT} | $V_D = 6V$ | $T_{VJ} = 25^\circ C$ | ≤ 100 mA |
| | | $T_{VJ} = -40^\circ C$ | ≤ 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 | $T_{VJ} = 25^\circ C, t_p = 10\mu s$ | ≤ 450 mA | |
| | $I_G = 0.45A, di_G/dt = 0.45A/\mu s$ | | |
| I_H | $T_{VJ} = 25^\circ C, V_D = 6V, R_{GK} = \infty$ | ≤ 200 mA | |
| t_{gd} | $T_{VJ} = 25^\circ C, V_D = 1/2 V_{DRM}$ | ≤ 2 μs | |
| | $I_G = 0.45A, di_G/dt = 0.45A/\mu s$ | | |
| t_q | $T_{VJ} = T_{VJM}, I_T = 20A, t_p = 200\mu s, V_R = 100V$ | 250 μs | |
| | $di/dt = -10A/\mu s, dv/dt = 15V/\mu s, V_D = 2/3 V_{DRM}$ | | |
| R_{thJC} | per thyristor; sine 180°el | 0.9 K/W | |
| | per module | 0.18 K/W | |
| R_{thJK} | per thyristor; sine 180° el | 1.1 K/W | |
| | per module | 0.22 K/W | |
| d_s | Creeping distance on surface | 16.0 mm | |
| d_A | Creeping distance in air | 7.6 mm | |
| a | Max. allowable acceleration | 50 m/s ² | |

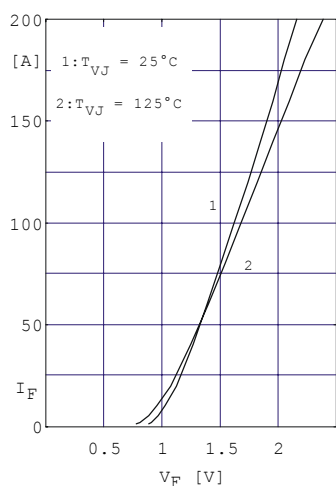


Fig. 1 Forward current vs. voltage drop per diode or thyristor

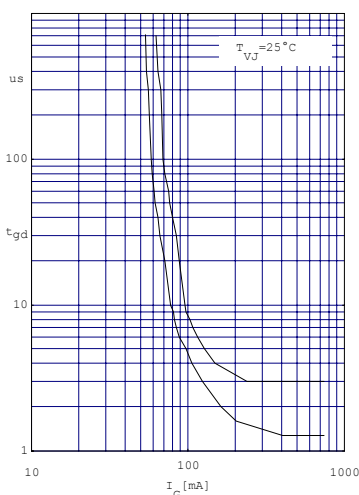


Fig. 2 Gate trigger delay time

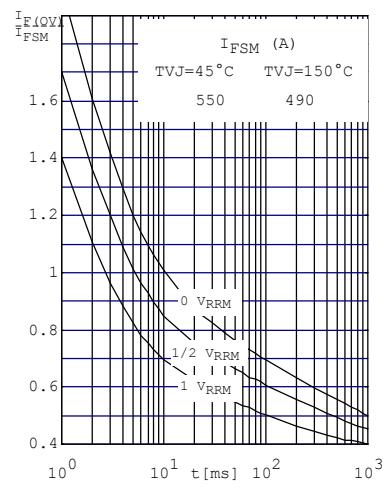


Fig. 3 Surge overload current per diode (or thyristor) I_{FSM} , I_{TSM} : Crest value t: duration



Fig.4 Gate trigger characteristic

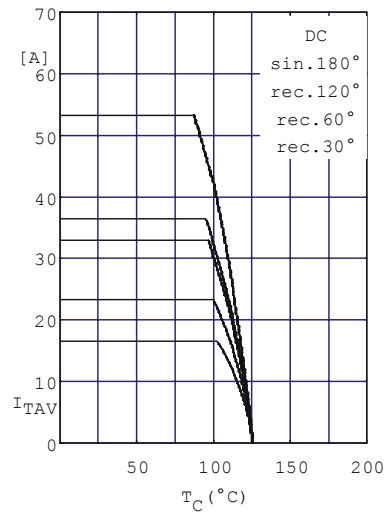


Fig.5 Maximum forward current at case temperature

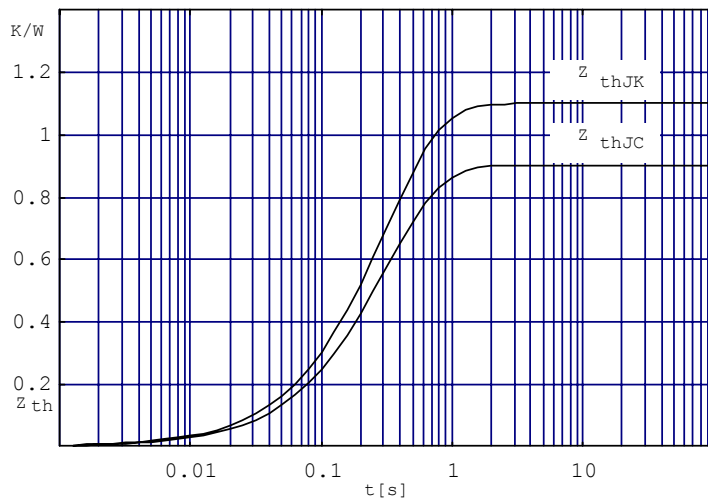


Fig.6 Transient thermal impedance per thyristor or diode (calculated)

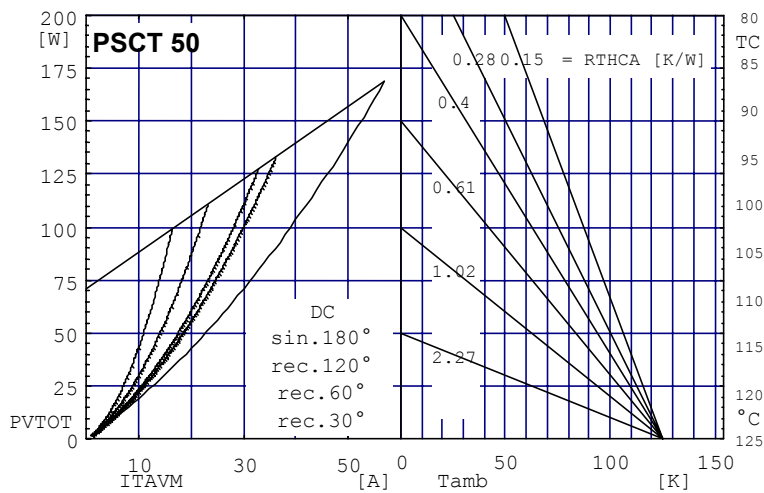


Fig. 7 Power dissipation vs. direct output current and ambient temperature