POWERSEM

# Three Phase Full Controlled Bridges

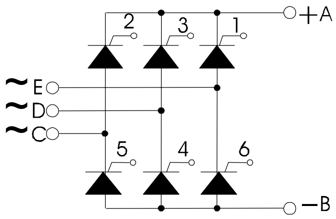
## PSDT 110

$I_{dAV}$ = 110A
$V_{RRM}$ = 400-1600 V

Preliminary Data Sheet

| $V_{RSM}$ $V_{DSM}$ | $V_{RRM}$ $V_{DRM}$ | Type |
|---|---|---|
| 500 | 400 | PSDT 110/04 |
| 900 | 800 | PSDT 110/08 |
| 1300 | 1200 | PSDT 110/12 |
| 1500 | 1400 | PSDT 110/14 |
| *1700 | *1600 | PSDT 110/16 |

* Delivery on request




| Symbol | Test Conditions | | | Maximum Ratings | |
|---|---|---|---|---|---|
| $I_{dAV}$ | $T_C$ = 85 °C | per module | | 110 | A |
| $I_{TSM}$ | $T_{VJ}$ = 45°C | t = 10 ms | (50 Hz), sine | 1150 | A |
| | $V_R$ = 0 | t = 8.3 ms | (60 Hz), sine | 1230 | A |
| | $T_{VJ}$ = $T_{VJM}$ | t = 10 ms | (50 Hz), sine | 1000 | A |
| | $V_R$ = 0 | t = 8.3 ms | (60 Hz), sine | 1070 | A |
| $\int i^2 dt$ | $T_{VJ}$ = 45°C | t = 10 ms | (50 Hz), sine | 6600 | $A^2$ s |
| | $V_R$ = 0 | t = 8.3 ms | (60 Hz), sine | 6280 | $A^2$ s |
| | $T_{VJ}$ = $T_{VJM}$ | t = 10 ms | (50 Hz), sine | 5000 | $A^2$ s |
| | $V_R$ = 0 | t = 8.3 ms | (60 Hz), sine | 4750 | $A^2$ s |
| $(di/dt)_{cr}$ | $T_{VJ}$ = $T_{JVM}$ | repetitive, $I_T$ = 50 A | | 150 | A/µs |
| | f = 400Hz, $t_P$ = 200µs | | | | |
| | $V_D$ = 2/3 $V_{DRM}$ | | | | |
| | $I_G$ = 0.3 A | non repetitive, $I_T$ = 1/3 · $I_{dAV}$ | | 500 | A/µs |
| | $di_G/dt$ = 0.3 A/µs | | | | |
| $(dv/dt)_{cr}$ | $T_{VJ}$ = $T_{VJM}$ | $V_{DR}$ = 2/3 $V_{DRM}$ | | 1000 | V/µs |
| | $R_{GK}$ = ∞, method 1 (linear voltage rise) | | | | |
| $P_{GM}$ | $T_{VJ}$ = $T_{VJM}$ | $t_P$ = 30µs | | ≤ 10 | W |
| | $I_T$ = $I_{TAVM}$ | $t_P$ = 500µs | | ≤ 5 | 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 min | | 2500 | V ~ |
| | $I_{ISOL}$ ≤ 1 mA | t = 1 s | | 3000 | V ~ |
| $M_d$ | Mounting torque | | (M6) | 5 | Nm |
| | Terminal connection torque | | (M6) | 5 | Nm |
| Weight | typ. | | | 270 | g |

### Features

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

### Applications

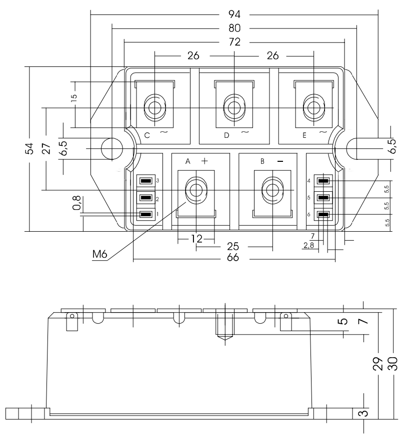
- Heat and temperature control for industrial furnaces and chemical processes
- Lighting control
- Motor control
- Power converter

### 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“)



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| Symbol | Test Conditions | | | Characteristic Value | |
|---|---|---|---|---|---|
| $I_D$, $I_R$ | $T_{VJ} = T_{VJM}$, $V_R = V_{RRM}$, $V_D = V_{DRM}$ | | ≤ | 5 | mA |
| $V_T$ | $I_T$ = 200A, $T_{VJ}$ = 25°C | | ≤ | 1.75 | V |
| $V_{TO}$ | For power-loss calculations only ($T_{VJ} = T_{VJM}$) | | | 0.85 | V |
| $r_T$ | | | | 6 | mΩ |
| $V_{GT}$ | $V_D$ = 6V | $T_{VJ}$ = 25°C | ≤ | 1.5 | V |
| | | $T_{VJ}$ = -40°C | ≤ | 1.6 | V |
| $I_{GT}$ | $V_D$ = 6V | $T_{VJ}$ = 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 |
| $I_L$ | $T_{VJ}$ = 25°C, $t_P$ = 30µs<br>$I_G$ = 0.3A, $di_G/dt$ = 0.3A/µs | | ≤ | 450 | mA |
| $I_H$ | $T_{VJ}$ = 25°C, $V_D$ = 6V, $R_{GK}$ = ∞ | | ≤ | 200 | mA |
| $t_{gd}$ | $T_{VJ}$ = 25°C, $V_D$ = ½ $V_{DRM}$<br>$I_G$ = 0.3A, $di_G/dt$ = 0.3A/µs | | ≤ | 2 | µs |
| $t_q$ | $T_{VJ} = T_{VJM}$, $I_T$ = 20A, $t_P$ = 200µs, $V_R$ = 100V<br>-di/dt = 10A/µs, dv/dt = 15V/µs, $V_D$ = 2/3 $V_{DRM}$ | | | 150 | µs |
| $R_{thJC}$ | per thyristor; sine 180°el | | | 0.65 | K/W |
| | per module | | | 0.108 | K/W |
| $R_{thJK}$ | per thyristor; sine 180° el | | | 0.8 | K/W |
| | per module | | | 0.133 | K/W |
| $d_S$ | Creeping distance on surface | | | 10.0 | mm |
| $d_A$ | Creeping distance in air | | | 9.4 | mm |
| a | Max. allowable acceleration | | | 50 | $m/s^2$ |

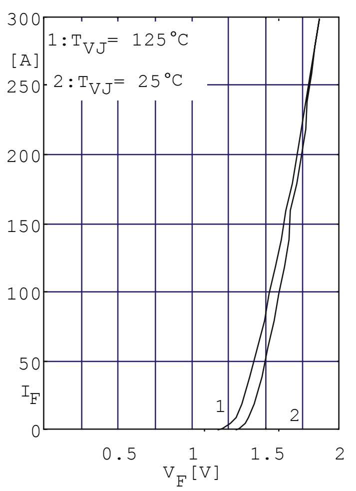


Fig. 1 Forward current vs. voltage drop per diode or thyristor

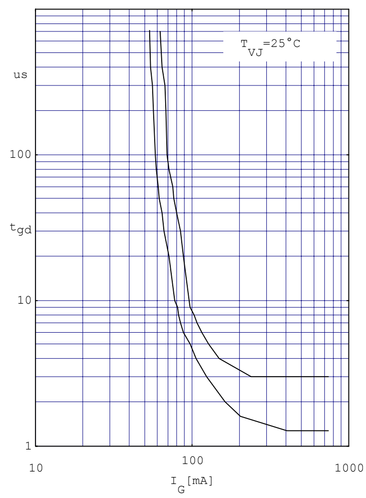


Fig. 2 Gate trigger delay time

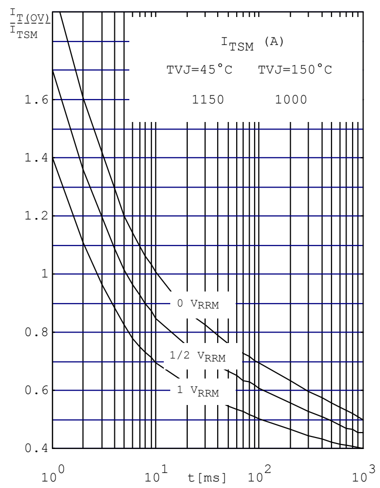


Fig. 3 Surge overload current per diode (or thyristor) $I_{FSM}$, $I_{TSM}$: Crest value t: duration

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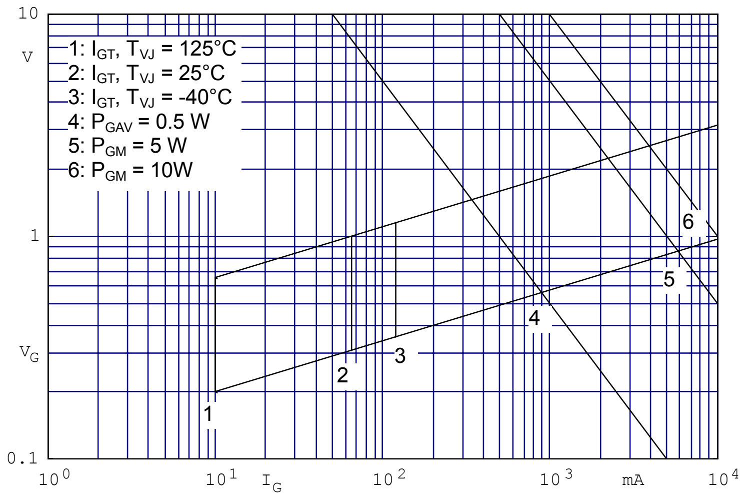


Fig.4 Gate trigger characteristic

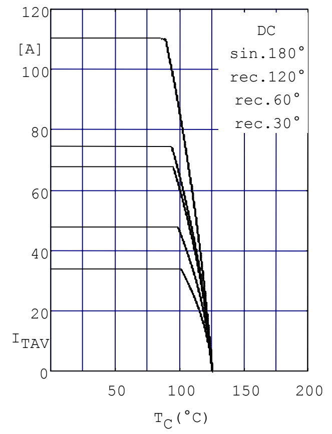


Fig.5 Maximum forward current at case temperature

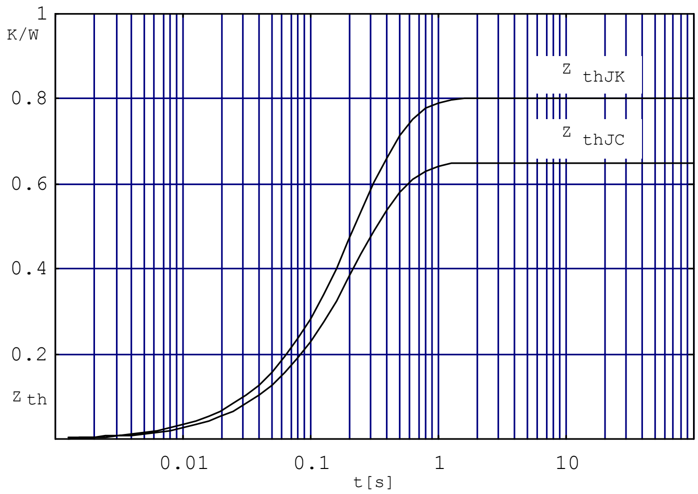


Fig.6 Transient thermal impedance per thyristor or diode (calculated)

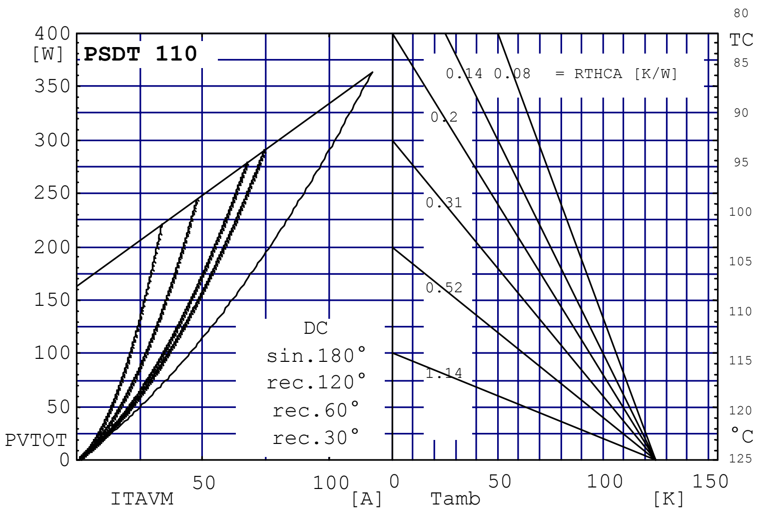


Fig. 7 Power dissipation vs. direct output current and ambient temperature

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