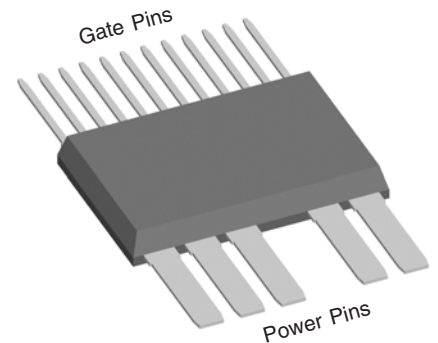
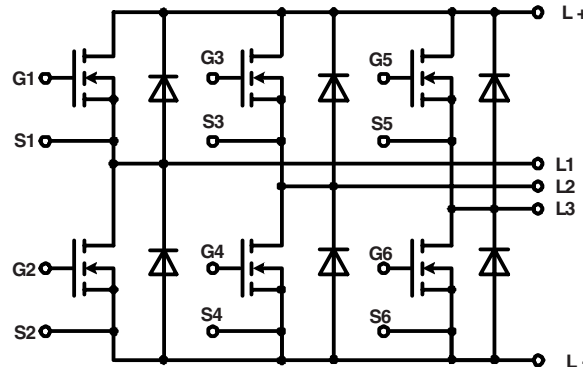


## Three phase full bridge with Trench MOSFETs in DCB isolated high current package

$$\begin{aligned} V_{DSS} &= 100 \text{ V} \\ I_{D25} &= 70 \text{ A} \\ R_{DSon \text{ typ.}} &= 11 \text{ m}\Omega \end{aligned}$$



### MOSFETs

| Symbol    | Conditions  | Maximum Ratings |   |
|-----------|---|-----------------|---|
| $V_{DSS}$ | $T_{VJ} = 25^{\circ}\text{C to } 150^{\circ}\text{C}$ | 100             | V |
| $V_{GS}$  |   | $\pm 20$        | V |
| $I_{D25}$ | $T_C = 25^{\circ}\text{C}$                            | 70              | A |
| $I_{D90}$ | $T_C = 90^{\circ}\text{C}$                            | 50              | A |
| $I_{F25}$ | $T_C = 25^{\circ}\text{C}$ (diode)                    | 130             | A |
| $I_{F90}$ | $T_C = 90^{\circ}\text{C}$ (diode)                    | 85              | A |

### Applications

- AC drives
- in automobiles
    - electric power steering
    - starter generator
  - in industrial vehicles
    - propulsion drives
    - fork lift drives
  - in battery supplied equipment

### Features

- MOSFETs in trench technology:
  - low  $R_{DSon}$
  - optimized intrinsic reverse diode
- package:
  - high level of integration
  - high current capability
  - auxiliary terminals for MOSFET control
  - terminals for soldering or welding connections
  - isolated DCB ceramic base plate with optimized heat transfer

| Symbol  | Conditions  | Characteristic Values<br>( $T_{VJ} = 25^{\circ}\text{C}$ , unless otherwise specified) |      |                     |
|---|---|--|------|---------------------|
|   |   | min.   | typ. | max.                |
| $R_{DSon}$                                    | on chip level at $\left. \begin{array}{l} T_{VJ} = 25^{\circ}\text{C} \\ V_{GS} = 10 \text{ V}; I_D = 35 \text{ A} \end{array} \right\} T_{VJ} = 125^{\circ}\text{C}$ |  | 11   | 14                  |
|   |   |  | 24   | m $\Omega$          |
| $V_{GSth}$                                    | $V_{DS} = 20 \text{ V}; I_D = 1 \text{ mA}$   | 2  |      | 4                   |
|   |   |  |      | V                   |
| $I_{DSS}$                                     | $V_{DS} = V_{DSS}; V_{GS} = 0 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$<br>$T_{VJ} = 125^{\circ}\text{C}$   |  | 0.1  | 1                   |
|   |   |  |      | $\mu\text{A}$<br>mA |
| $I_{GSS}$                                     | $V_{GS} = \pm 20 \text{ V}; V_{DS} = 0 \text{ V}$   |  |      | 0.2                 |
|   |   |  |      | $\mu\text{A}$       |
| $Q_g$<br>$Q_{gs}$<br>$Q_{gd}$                 | $V_{GS} = 10 \text{ V}; V_{DS} = 80 \text{ V}; I_D = 25 \text{ A}$  |  | 110  |                     |
|   |   |  | 18   | nC                  |
|   |   |  | 44   | nC                  |
| $t_{d(on)}$<br>$t_r$<br>$t_{d(off)}$<br>$t_f$ | $V_{GS} = 10 \text{ V}; V_{DS} = 30 \text{ V};$<br>$I_D = 25 \text{ A}; R_G = 10 \Omega$  |  | 35   |                     |
|   |   |  | 85   | ns                  |
|   |   |  | 150  | ns                  |
|   |   |  | 70   | ns                  |
| $V_F$   | (diode) $I_F = 35 \text{ A}; V_{GS} = 0 \text{ V}$  |  | 0.8  | 1.25                |
|   |   |  |      | V                   |
| $t_{rr}$                                      | (diode) $I_F = 75 \text{ A}; -di/dt = 100 \text{ A}/\mu\text{s}; V_{DS} = 30 \text{ V}$   |  | 80   |                     |
|   |   |  |      | ns                  |
| $R_{thJC}$<br>$R_{thJH}$                      | with heat transfer paste  |  | 1.7  | 0.85                |
|   |   |  |      | K/W<br>K/W          |

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

## Component

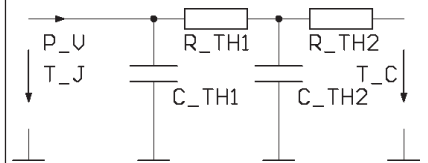
| Symbol     | Conditions   | Maximum Ratings |    |
|------------|--|-----------------|----|
| $I_{RMS}$  | per pin in main current paths (L+, L-, L <sub>1</sub> , L <sub>2</sub> , L <sub>3</sub> )<br>may be additionally limited by external connections | 300             | A  |
| $T_{VJ}$   |  | -40...+175      | °C |
| $T_{stg}$  |  | -55...+125      | °C |
| $V_{ISOL}$ | $I_{ISOL} \leq 1$ mA; 50/60 Hz; t = 1 min  | 1000            | V~ |
| $F_c$      | Mounting force with clip   | 50 - 250        | N  |

| Symbol              | Conditions  | Characteristic Values                                |      |      |
|---------------------|---|--|------|------|
|                     |   | (T <sub>VJ</sub> = 25°C, unless otherwise specified) |      |      |
|                     |   | min.   | typ. | max. |
| $R_{pin\ to\ chip}$ |   |  | 0.6  | mΩ   |
| $C_p$               | coupling capacity between shorted pins and mounting tab in the case |  | 160  | pF   |
| Weight              | typ.  |  | 25   | g    |

## Equivalent Circuits for Simulation

## Thermal Response



junction - case (typ.)

$$C_{th1} = 0.039 \text{ J/K}; R_{th1} = 0.28 \text{ K/W}$$

$$C_{th2} = 0.069 \text{ J/K}; R_{th2} = 0.57 \text{ K/W}$$

Dimensions in mm (1 mm = 0.0394")

