

# Trench Power MOSFET

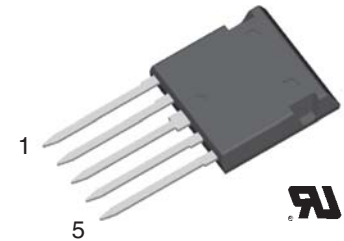
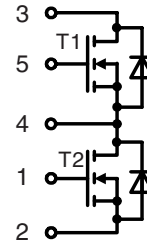
Phaseleg Topology  
in ISOPLUS i4-PAC™

$$I_{D25} = 300 \text{ A}$$

$$V_{DSS} = 55 \text{ V}$$

$$R_{DSon typ.} = 2.7 \text{ m}\Omega$$

Preliminary data



## MOSFET T1/T2

| Symbol    | Conditions                                   | Maximum Ratings |   |
|-----------|----------------------------------------------|-----------------|---|
| $V_{DSS}$ | $T_{VJ} = 25^{\circ}\text{C}$ to $T_{VJmax}$ | 55              | V |
| $V_{GS}$  |                                              | $\pm 20$        | V |
| $I_{D25}$ | $T_C = 25^{\circ}\text{C}$                   | 300             | A |
| $I_{D90}$ | $T_C = 90^{\circ}\text{C}$                   | 220             | A |
| $I_{F25}$ | (body diode) $T_C = 25^{\circ}\text{C}$      | 240             | A |
| $I_{F90}$ | (body diode) $T_C = 90^{\circ}\text{C}$      | 150             | A |

| Symbol                                        | Conditions                                                                                                   | Characteristic Values<br>( $T_{VJ} = 25^{\circ}\text{C}$ , unless otherwise specified) |                      |                       |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------|-----------------------|
|                                               |                                                                                                              | min.                                                                                   | typ.                 | max.                  |
| $R_{DSon}$                                    | $V_{GS} = 10 \text{ V}; I_D = 150 \text{ A}$                                                                 |                                                                                        | 2.7                  | 3.6 m $\Omega$        |
| $V_{GSth}$                                    | $V_{DS} = 20 \text{ V}; I_D = 2 \text{ mA}$                                                                  | 2                                                                                      |                      | 4 V                   |
| $I_{DSS}$                                     | $V_{DS} = 55 \text{ V}; V_{GS} = 0 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$<br>$T_{VJ} = 125^{\circ}\text{C}$ |                                                                                        | 0.2                  | 2 $\mu\text{A}$<br>mA |
| $I_{GSS}$                                     | $V_{GS} = \pm 20 \text{ V}; V_{DS} = 0 \text{ V}$                                                            |                                                                                        |                      | 200 nA                |
| $Q_g$<br>$Q_{gs}$<br>$Q_{gd}$                 | $V_{GS} = 10 \text{ V}; V_{DS} = 44 \text{ V}; I_D = 50 \text{ A}$                                           |                                                                                        | 172<br>36<br>50      | nC<br>nC<br>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>$I_D = 50 \text{ A}; R_G = 4.7 \Omega$                     |                                                                                        | 25<br>50<br>70<br>40 | ns<br>ns<br>ns<br>ns  |
| $V_F$                                         | (body diode) $I_F = 150 \text{ A}; V_{GS} = 0 \text{ V}$                                                     |                                                                                        | 1.1                  | 1.5 V                 |
| $t_{rr}$                                      | (body diode) $I_F = 40 \text{ A}; -di/dt = 200 \text{ A}/\mu\text{s}; V_{DS} = 30 \text{ V}$                 |                                                                                        | 100                  | ns                    |
| $R_{thJC}$<br>$R_{thJH}$                      | with heat transfer paste                                                                                     |                                                                                        | 1                    | 0.5 K/W<br>K/W        |

## Features

- trench MOSFET
  - very low on state resistance  $R_{DSon}$
  - fast switching
- ISOPLUS i4-PAC™ package
  - isolated back surface
  - low coupling capacity between pins and heatsink
  - enlarged creepage towards heatsink
  - application friendly pinout
  - low inductive current path
  - high reliability
  - industry standard outline
  - UL registered, E 72873

## Applications

- automotive
  - AC drives - starter generator for 12/14 V etc.
  - choppers - replacing series resistors for DC drives, heating etc.
  - DC-DC converters - between 12V and 42V system etc.
  - electronic switches -replacing relays and fuses
- power supplies
  - DC-DC converters
  - solar inverters
  - converters for fuel cells
- battery supplied systems
  - choppers or inverters for drives in hand held tools
  - battery chargers

**Component**

| Symbol     | Conditions                                     | Maximum Ratings |    |
|------------|------------------------------------------------|-----------------|----|
| $I_{RMS}$  | per pin                                        | 75              | A  |
| $T_{VJ}$   |                                                | -55...+175      | °C |
| $T_{stg}$  |                                                | -55...+125      | °C |
| $V_{ISOL}$ | $I_{ISOL} \leq 1 \text{ mA}; 50/60 \text{ Hz}$ | 2500            | V~ |
| $F_c$      | mounting force with clip                       | 20...120        | N  |

| Symbol           | Conditions                                                          | Characteristic Values |      |      |
|------------------|---------------------------------------------------------------------|-----------------------|------|------|
|                  |                                                                     | min.                  | typ. | max. |
| $R_{pin - chip}$ |                                                                     |                       | 0.5  | mΩ   |
| $C_p$            | coupling capacity between shorted pins and mounting tab in the case |                       | 40   | pF   |
| $d_s, d_A$       | pin - pin                                                           | 1.7                   |      | mm   |
| $d_s, d_A$       | pin - backside metal                                                | 5.5                   |      | mm   |
| Weight           |                                                                     |                       | 9    | g    |

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