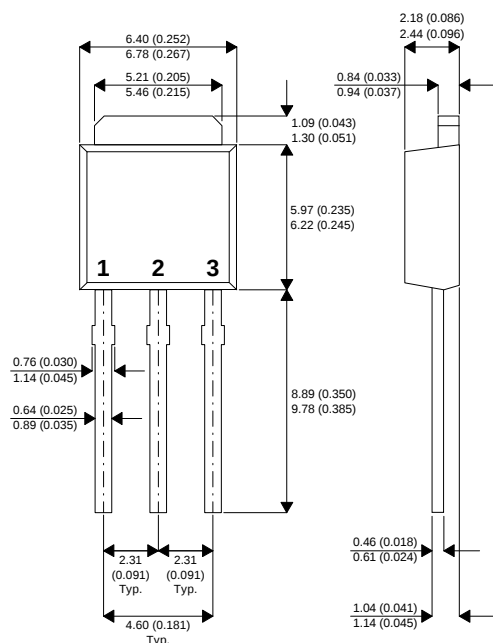


## MECHANICAL DATA

Dimensions in mm



### I-PAK(TO251)

Pin 1 – Base

Pin 2 – Collector

Pin 3 – Emitter

## ADVANCED DISTRIBUTED BASE DESIGN HIGH VOLTAGE HIGH SPEED NPN SILICON POWER TRANSISTOR

Designed for use in  
electronic ballast applications

- SEMEFAB DESIGNED AND DIFFUSED DIE
- HIGH VOLTAGE
- FAST SWITCHING
- HIGH ENERGY RATING

## FEATURES

- Multi-base for efficient energy distribution across the chip resulting in significantly improved switching and energy ratings across full temperature range.
- Ion implant and high accuracy masking for tight control of characteristics from batch to batch.
- Triple Guard Rings for improved control of high voltages.

## ABSOLUTE MAXIMUM RATINGS ( $T_{case} = 25^{\circ}C$ unless otherwise stated)

|             |                                               |                          |
|-------------|-----------------------------------------------|--------------------------|
| $V_{CBO}$   | Collector – Base Voltage( $I_E=0$ )           | 600V                     |
| $V_{CEO}$   | Collector – Emitter Voltage ( $I_B = 0$ )     | 300V                     |
| $V_{EBO}$   | Emitter – Base Voltage ( $I_C = 0$ )          | 10V                      |
| $I_C$       | Continuous Collector Current                  | 10A                      |
| $I_{C(PK)}$ | Peak Collector Current                        | 18A                      |
| $I_B$       | Base Current                                  | 6A                       |
| $P_{tot}$   | Total Dissipation at $T_{case} = 25^{\circ}C$ | 25W                      |
| $T_{stg}$   | Operating and Storage Temperature Range       | $-55$ to $+150^{\circ}C$ |

**ELECTRICAL CHARACTERISTICS** ( $T_{\text{case}} = 25^{\circ}\text{C}$  unless otherwise stated)

| Parameter                  |                                        | Test Conditions        |                        | Min.                   | Typ. | Max. | Unit |
|----------------------------|----------------------------------------|------------------------|------------------------|------------------------|------|------|------|
| ELECTRICAL CHARACTERISTICS |                                        |                        |                        |                        |      |      |      |
| V <sub>CEO(sus)</sub>      | Collector – Emitter Sustaining Voltage | I <sub>C</sub> = 10mA  |                        | 300                    |      |      | V    |
| V <sub>(BR)CBO</sub>       | Collector – Base Breakdown Voltage     | I <sub>C</sub> = 1mA   |                        | 600                    |      |      |      |
| V <sub>(BR)EBO</sub>       | Emitter – Base Breakdown Voltage       | I <sub>E</sub> = 1mA   |                        | 10                     |      |      |      |
| I <sub>CBO</sub>           | Collector – Base Cut–Off Current       | V <sub>CB</sub> = 600V |                        |                        |      | 10   | μA   |
|                            |                                        | T <sub>C</sub> = 125°C |                        |                        |      | 100  |      |
| I <sub>CEO</sub>           | Collector – Emitter Cut–Off Current    | I <sub>B</sub> = 0     | V <sub>CE</sub> = 290V |                        |      | 100  | μA   |
| I <sub>EBO</sub>           | Emitter Cut–Off Current                | V <sub>EB</sub> = 9V   |                        |                        |      | 10   | μA   |
|                            |                                        | I <sub>C</sub> = 0     |                        | T <sub>C</sub> = 125°C |      | 100  |      |
| h <sub>FE</sub> *          | DC Current Gain                        | I <sub>C</sub> = 0.1A  | V <sub>CE</sub> = 5V   | 20                     | 30   |      | —    |
|                            |                                        | I <sub>C</sub> = 1A    | V <sub>CE</sub> = 5V   | 25                     | 50   |      |      |
|                            |                                        | I <sub>C</sub> = 5A    | V <sub>CE</sub> = 1V   | 5                      | 9    |      |      |
|                            |                                        |                        | T <sub>C</sub> = 125°C | 4                      | 8    |      |      |
| V <sub>CE(sat)</sub> *     | Collector – Emitter Saturation Voltage | I <sub>C</sub> = 1A    | I <sub>B</sub> = 0.2A  |                        | .07  | 0.1  | V    |
|                            |                                        | I <sub>C</sub> = 3A    | I <sub>B</sub> = 0.6A  |                        | 0.2  | 0.5  |      |
|                            |                                        | I <sub>C</sub> = 6A    | I <sub>B</sub> = 1.2A  |                        | 0.4  | 0.8  |      |
| V <sub>BE(sat)</sub> *     | Base – Emitter Saturation Voltage      | I <sub>C</sub> = 3A    | I <sub>B</sub> = 0.6A  |                        |      | 1.1  | V    |
|                            |                                        | I <sub>C</sub> = 6A    | I <sub>B</sub> = 1.2A  |                        |      | 1.4  |      |
| DYNAMIC CHARACTERISTICS    |                                        |                        |                        |                        |      |      |      |
| f <sub>t</sub>             | Transition Frequency                   | I <sub>C</sub> = 0.2A  | V <sub>CE</sub> = 4V   |                        | 20   |      | MHz  |
| C <sub>ob</sub>            | Output Capacitance                     | V <sub>CB</sub> = 10V  | f = 1MHz               |                        | 62   |      | pF   |

\* Pulse test  $t_{\text{p}} = 300\mu\text{s}$ ,  $\delta < 2\%$