

## HIGH CURRENT NPN SILICON TRANSISTOR

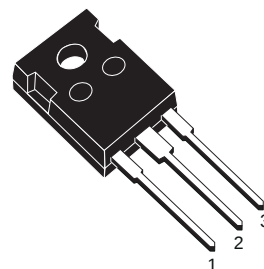
- STMicroelectronics PREFERRED SALESTYPE
- NPN TRANSISTOR

### APPLICATIONS:

- MOTOR CONTROL
- HIGH FREQUENCY AND EFFICIENCY CONVERTERS

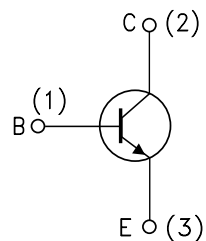
### DESCRIPTION

High current, high speed transistor suited for power conversion applications, high efficiency converters and motor controls.



TO-247

### INTERNAL SCHEMATIC DIAGRAM



SC06960

### ABSOLUTE MAXIMUM RATINGS

| Symbol    | Parameter                                  | Value      | Unit       |
|-----------|--------------------------------------------|------------|------------|
| $V_{CES}$ | Collector-Emitter Voltage ( $V_{BE} = 0$ ) | 500        | V          |
| $V_{CEO}$ | Collector-Emitter Voltage ( $I_B = 0$ )    | 250        | V          |
| $V_{EBO}$ | Emitter-Base Voltage ( $I_C = 0$ )         | 7          | V          |
| $I_E$     | Emitter-Current                            | 60         | A          |
| $I_{EM}$  | Emitter Peak Current ( $t_p < 5ms$ )       | 70         | A          |
| $I_B$     | Base Current                               | 15         | A          |
| $I_{BM}$  | Base Peak Current ( $t_p < 5ms$ )          | 18         | A          |
| $P_{tot}$ | Total Dissipation at $T_c \leq 25^\circ C$ | 180        | W          |
| $T_{stg}$ | Storage Temperature                        | -65 to 150 | $^\circ C$ |
| $T_j$     | Max. Operating Junction Temperature        | 150        | $^\circ C$ |

**THERMAL DATA**

|                       |                                  |     |     |      |
|-----------------------|----------------------------------|-----|-----|------|
| R <sub>thj-case</sub> | Thermal Resistance Junction-case | MAX | 0.7 | °C/W |
|-----------------------|----------------------------------|-----|-----|------|

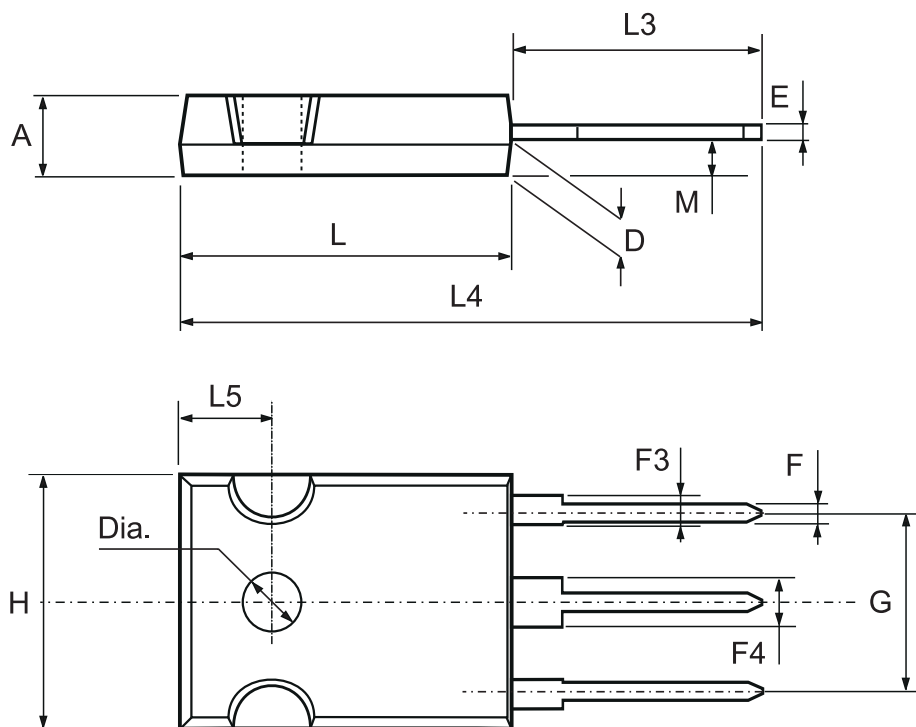
**ELECTRICAL CHARACTERISTICS** (T<sub>case</sub> = 25 °C unless otherwise specified)

| Symbol                           | Parameter                                                 | Test Conditions                                                                                                                                                 | Min.   | Typ.       | Max.       | Unit     |
|----------------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------|------------|----------|
| I <sub>CES</sub>                 | Collector Cut-off Current (V <sub>BE</sub> = -1.5V)       | V <sub>CE</sub> = 450 V<br>V <sub>CE</sub> = 450 V T <sub>C</sub> = 100°C                                                                                       |        |            | 50<br>1    | μA<br>mA |
| I <sub>EBO</sub>                 | Emitter Cut-off Current (I <sub>C</sub> = 0)              | V <sub>EB</sub> = 5 V                                                                                                                                           |        |            | 50         | μA       |
| V <sub>CES</sub>                 | Collector-Emitter Voltage (V <sub>EB</sub> = 0)           | I <sub>C</sub> = 5 mA                                                                                                                                           | 500    |            |            | V        |
| V <sub>EBO</sub>                 | Emitter-Base Voltage (I <sub>C</sub> = 0)                 | I <sub>E</sub> = 50 mA                                                                                                                                          | 7      |            |            | V        |
| V <sub>CEO(sus)</sub> *          | Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0) | I <sub>C</sub> = 200 mA                                                                                                                                         | 250    |            |            | V        |
| V <sub>CE(sat)</sub> *           | Collector-Emitter Saturation Voltage                      | I <sub>C</sub> = 60 A I <sub>B</sub> = 15 A<br>I <sub>C</sub> = 60 A I <sub>B</sub> = 15 A T <sub>C</sub> = 100°C                                               |        | 0.8<br>1.1 | 1<br>1.5   | V<br>V   |
| V <sub>BE(sat)</sub> *           | Base-Emitter Saturation Voltage                           | I <sub>C</sub> = 60 A I <sub>B</sub> = 15 A<br>I <sub>C</sub> = 60 A I <sub>B</sub> = 15 A T <sub>C</sub> = 100°C                                               |        |            | 1.9<br>2   | V<br>V   |
| h <sub>FE</sub> *                | DC Current Gain                                           | I <sub>C</sub> = 60 A V <sub>CE</sub> = 3 V<br>I <sub>C</sub> = 60 A V <sub>CE</sub> = 3 V T <sub>C</sub> = 100°C<br>I <sub>C</sub> = 5 A V <sub>CE</sub> = 3 V | 9<br>6 |            | 65         |          |
| t <sub>s</sub><br>t <sub>f</sub> | RESISTIVE LOAD<br>Storage Time<br>Fall Time               | I <sub>C</sub> = 50 A V <sub>CC</sub> = 250 V<br>I <sub>B1</sub> = -I <sub>B2</sub> = 10 A                                                                      |        | 1.2<br>250 | 1.4<br>300 | μs<br>ns |

\* Pulsed: Pulse duration = 300 ms, duty cycle 1.5 %

## TO-247 MECHANICAL DATA

| DIM. | mm   |      |      | inch  |       |       |
|------|------|------|------|-------|-------|-------|
|      | MIN. | TYP. | MAX. | MIN.  | TYP.  | MAX.  |
| A    | 4.7  |      | 5.3  | 0.185 |       | 0.209 |
| D    | 2.2  |      | 2.6  | 0.087 |       | 0.102 |
| E    | 0.4  |      | 0.8  | 0.016 |       | 0.031 |
| F    | 1    |      | 1.4  | 0.039 |       | 0.055 |
| F3   | 2    |      | 2.4  | 0.079 |       | 0.094 |
| F4   | 3    |      | 3.4  | 0.118 |       | 0.134 |
| G    |      | 10.9 |      |       | 0.429 |       |
| H    | 15.3 |      | 15.9 | 0.602 |       | 0.626 |
| L    | 19.7 |      | 20.3 | 0.776 |       | 0.779 |
| L3   | 14.2 |      | 14.8 | 0.559 |       | 0.582 |
| L4   |      | 34.6 |      |       | 1.362 |       |
| L5   |      | 5.5  |      |       | 0.217 |       |
| M    | 2    |      | 3    | 0.079 |       | 0.118 |



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