

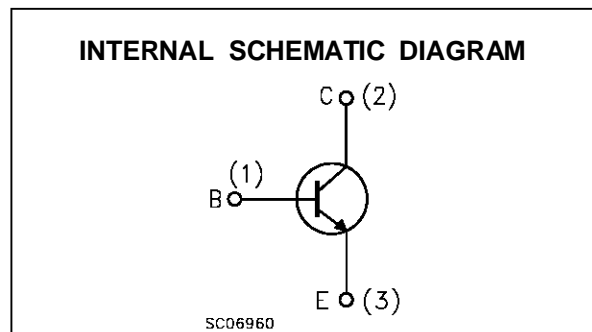
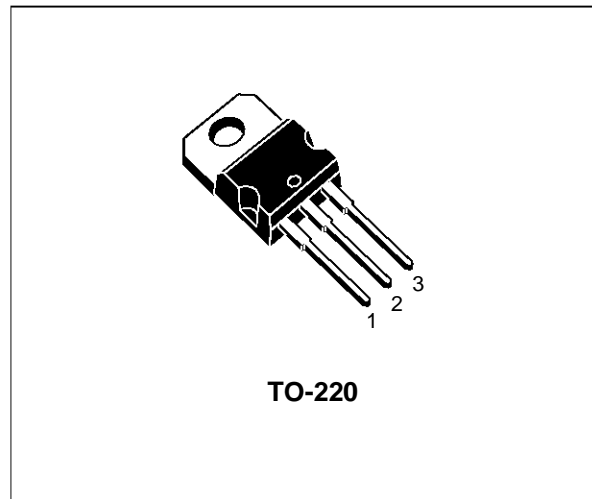
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**SILICON NPN SWITCHING TRANSISTOR**


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**■ SGS-THOMSON PREFERRED SALESTYPE**
**DESCRIPTION**

The MJE13005 is a silicon multiepitaxial mesa NPN transistor in Jedec TO-220 plastic package particularly intended for switch-mode applications.


**ABSOLUTE MAXIMUM RATINGS**

| Symbol    | Parameter   | Value       | Unit             |
|-----------|---|-------------|------------------|
| $V_{CEV}$ | Collector-Emitter Voltage   | 700         | V                |
| $V_{CEO}$ | Collector-Emitter Voltage ( $I_B = 0$ )                             | 400         | V                |
| $V_{EBO}$ | Emitter-Base Voltage ( $I_C = 0$ )                                  | 9           | V                |
| $I_C$     | Collector Current   | 4           | A                |
| $I_{CM}$  | Collector Peak Current  | 8           | A                |
| $I_B$     | Base Current  | 2           | A                |
| $I_{BM}$  | Base Peak Current   | 4           | A                |
| $P_{tot}$ | Total Power Dissipation at $T_{case} \leq 25\text{ }^\circ\text{C}$ | 75          | W                |
| $T_{stg}$ | Storage Temperature   | -65 to +150 | $^\circ\text{C}$ |
| $T_j$     | Max. Operating Junction Temperature                                 | 150         | $^\circ\text{C}$ |

## MJE13005

### THERMAL DATA

|                |                                  |     |      |               |
|----------------|----------------------------------|-----|------|---------------|
| $R_{thj-case}$ | Thermal Resistance Junction-case | Max | 1.67 | $^{\circ}C/W$ |
|----------------|----------------------------------|-----|------|---------------|

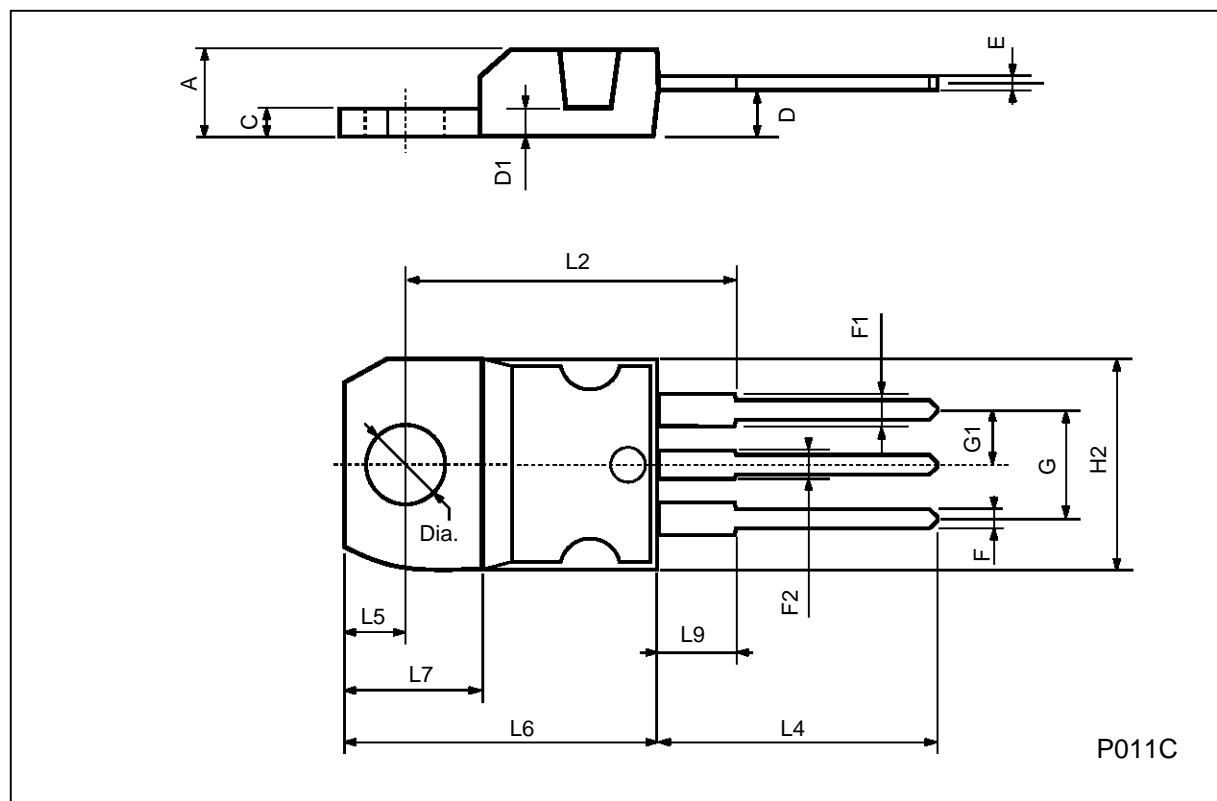
### ELECTRICAL CHARACTERISTICS ( $T_{case} = 25^{\circ}C$ unless otherwise specified)

| Symbol                     | Parameter  | Test Conditions   | Min.    | Typ. | Max.            | Unit                          |
|----------------------------|--|---|---------|------|-----------------|-------------------------------|
| $I_{CEV}$                  | Collector Cut-off Current ( $V_{BE} = -1.5V$ )     | $V_{CE} = 700V$<br>$V_{CE} = 700V$ $T_{case} = 100^{\circ}C$                |         |      | 1<br>5          | mA<br>mA                      |
| $I_{EBO}$                  | Emitter Cut-off Current ( $I_C = 0$ )              | $V_{EB} = 9V$   |         |      | 1               | mA                            |
| $V_{CEO(sus)*}$            | Collector-Emitter Sustaining Voltage ( $I_B = 0$ ) | $I_C = 10mA$  | 400     |      |                 | V                             |
| $V_{CE(sat)*}$             | Collector-Emitter Saturation Voltage               | $I_C = 1A$ $I_B = 0.2A$<br>$I_C = 2A$ $I_B = 0.5A$<br>$I_C = 4A$ $I_B = 1A$ |         |      | 0.5<br>0.6<br>1 | V<br>V                        |
| $V_{BE(sat)*}$             | Base-Emitter Saturation Voltage                    | $I_C = 1A$ $I_B = 0.2A$<br>$I_C = 2A$ $I_B = 0.5A$                          |         |      | 1.2<br>1.6      | V                             |
| $h_{FE}$                   | DC Current Gain                                    | $I_C = 1A$ $V_{CE} = 5V$<br>$I_C = 2A$ $V_{CE} = 5V$                        | 10<br>8 | 30   | 60<br>40        | V                             |
| $t_{on}$<br>$t_s$<br>$t_f$ | Turn-on Time<br>Storage Time<br>Fall Time          | $I_C = 2A$<br>$I_{B1} = -I_{B2} = 0.4A$<br>$V_{CC} = 250V$                  |         |      | 0.8<br>4<br>0.9 | $\mu s$<br>$\mu s$<br>$\mu s$ |

\* Pulsed: Pulse duration = 300 $\mu s$ , duty cycle = 1.5%

## TO-220 MECHANICAL DATA

| DIM. | mm    |      |       | inch  |       |       |
|------|-------|------|-------|-------|-------|-------|
|      | MIN.  | TYP. | MAX.  | MIN.  | TYP.  | MAX.  |
| A    | 4.40  |      | 4.60  | 0.173 |       | 0.181 |
| C    | 1.23  |      | 1.32  | 0.048 |       | 0.051 |
| D    | 2.40  |      | 2.72  | 0.094 |       | 0.107 |
| D1   |       | 1.27 |       |       | 0.050 |       |
| E    | 0.49  |      | 0.70  | 0.019 |       | 0.027 |
| F    | 0.61  |      | 0.88  | 0.024 |       | 0.034 |
| F1   | 1.14  |      | 1.70  | 0.044 |       | 0.067 |
| F2   | 1.14  |      | 1.70  | 0.044 |       | 0.067 |
| G    | 4.95  |      | 5.15  | 0.194 |       | 0.203 |
| G1   | 2.4   |      | 2.7   | 0.094 |       | 0.106 |
| H2   | 10.0  |      | 10.40 | 0.393 |       | 0.409 |
| L2   |       | 16.4 |       |       | 0.645 |       |
| L4   | 13.0  |      | 14.0  | 0.511 |       | 0.551 |
| L5   | 2.65  |      | 2.95  | 0.104 |       | 0.116 |
| L6   | 15.25 |      | 15.75 | 0.600 |       | 0.620 |
| L7   | 6.2   |      | 6.6   | 0.244 |       | 0.260 |
| L9   | 3.5   |      | 3.93  | 0.137 |       | 0.154 |
| DIA. | 3.75  |      | 3.85  | 0.147 |       | 0.151 |



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