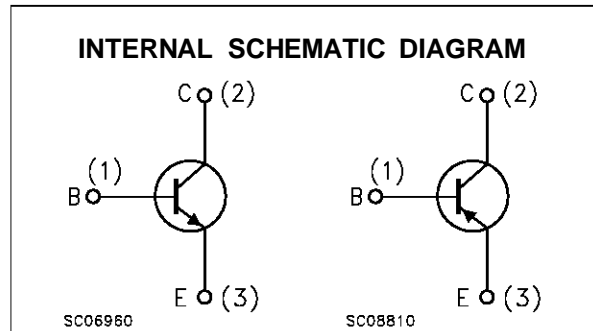
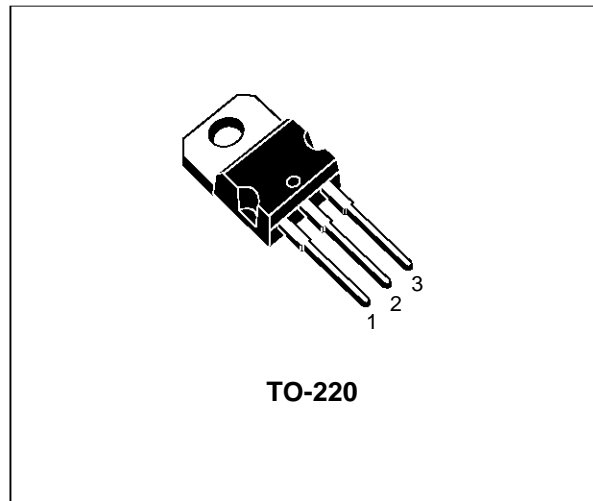


## COMPLEMENTARY SILICON POWER TRANSISTORS

- BD534, BD535, BD536, BD537 AND BD538 ARE SGS-THOMSON PREFERRED SALESTYPES

### DESCRIPTION

The BD533, BD535, and BD537 are silicon epitaxial-base NPN power transistors in Jedec TO-220 plastic package, intended for use in medium power linear and switching applications. The complementary PNP types are BD534, BD536, and BD538 respectively.



### ABSOLUTE MAXIMUM RATINGS

| Symbol     | Parameter                                  | Value |            |       | Unit |            |
|------------|--------------------------------------------|-------|------------|-------|------|------------|
|            |                                            | NPN   | BD533      | BD535 |      | BD537      |
|            |                                            | PNP   | BD534      | BD536 |      | BD538      |
| $V_{CBO}$  | Collector-Base Voltage ( $I_E = 0$ )       |       | 45         | 60    | 80   | V          |
| $V_{CES}$  | Collector-Emitter Voltage ( $V_{BE} = 0$ ) |       | 45         | 60    | 80   | V          |
| $V_{CEO}$  | Collector-Emitter Voltage ( $I_B = 0$ )    |       | 45         | 60    | 80   | V          |
| $V_{EBO}$  | Emitter-Base Voltage ( $I_C = 0$ )         |       | 5          |       |      | V          |
| $I_C, I_E$ | Collector and Emitter Current              |       | 8          |       |      | A          |
| $I_B$      | Base Current                               |       | 1          |       |      | A          |
| $P_{tot}$  | Total Dissipation at $T_c \leq 25^\circ C$ |       | 50         |       |      | W          |
| $T_{stg}$  | Storage Temperature                        |       | -65 to 150 |       |      | $^\circ C$ |
| $T_j$      | Max. Operating Junction Temperature        |       | 150        |       |      | $^\circ C$ |

For PNP types voltage and current values are negative.

# BD533/BD534/BD535/BD536/BD537/BD538

## THERMAL DATA

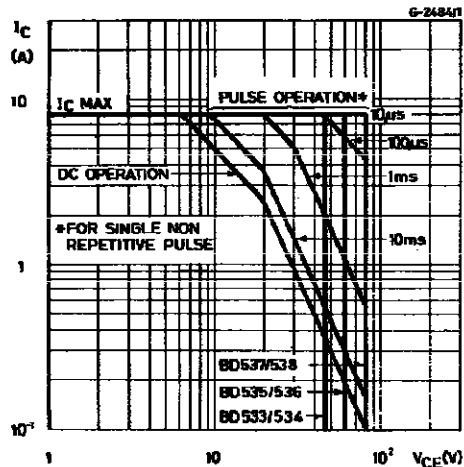
|                       |                                     |     |     |      |
|-----------------------|-------------------------------------|-----|-----|------|
| R <sub>thj-case</sub> | Thermal Resistance Junction-case    | Max | 2.5 | °C/W |
| R <sub>thj-amb</sub>  | Thermal Resistance Junction-ambient | Max | 70  | °C/W |

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

| Symbol                 | Parameter                                                 | Test Conditions                                                                                                                           | Min.                                                                                                                                                                                                                        | Typ.                                       | Max.              | Unit           |
|------------------------|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------|----------------|
| I <sub>CBO</sub>       | Collector Cut-off Current (I <sub>E</sub> = 0)            | for <b>BD533/534</b> V <sub>CB</sub> = 45 V<br>for <b>BD535/536</b> V <sub>CB</sub> = 60 V<br>for <b>BD537/538</b> V <sub>CB</sub> = 80 V |                                                                                                                                                                                                                             |                                            | 100<br>100<br>100 | μA<br>μA<br>μA |
| I <sub>CES</sub>       | Collector Cut-off Current (V <sub>BE</sub> = 0)           | for <b>BD533/534</b> V <sub>CE</sub> = 45 V<br>for <b>BD535/536</b> V <sub>CE</sub> = 60 V<br>for <b>BD537/538</b> V <sub>CE</sub> = 80 V |                                                                                                                                                                                                                             |                                            | 100<br>100<br>100 | μA<br>μA<br>μA |
| I <sub>EBO</sub>       | Emitter Cut-off Current (I <sub>C</sub> = 0)              | V <sub>EB</sub> = 5 V                                                                                                                     |                                                                                                                                                                                                                             |                                            | 1                 | mA             |
| V <sub>CEO(sus)*</sub> | Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0) | I <sub>C</sub> = 100 mA                                                                                                                   | for <b>BD533/534</b> 45 V<br>for <b>BD535/536</b> 60 V<br>for <b>BD537/538</b> 80 V                                                                                                                                         |                                            |                   | V<br>V<br>V    |
| V <sub>CE(sat)*</sub>  | Collector-Emitter Saturation Voltage                      | I <sub>C</sub> = 2 A<br>I <sub>C</sub> = 6 A                                                                                              | I <sub>B</sub> = 0.2 A<br>I <sub>B</sub> = 0.6 A                                                                                                                                                                            | 0.8                                        | 0.8               | V<br>V         |
| V <sub>BE*</sub>       | Base-Emitter Voltage                                      | I <sub>C</sub> = 2 A                                                                                                                      | V <sub>CE</sub> = 2 V                                                                                                                                                                                                       |                                            | 1.5               | V              |
| h <sub>FE*</sub>       | DC Current Gain                                           | I <sub>C</sub> = 10 mA<br><br>I <sub>C</sub> = 500 mA<br>I <sub>C</sub> = 2 A                                                             | V <sub>CE</sub> = 5 V<br>for <b>BD533/534</b><br>for <b>BD535/536</b><br>for <b>BD537/538</b><br><br>V <sub>CE</sub> = 2 V<br>V <sub>CE</sub> = 2 V<br>for <b>BD533/534</b><br>for <b>BD535/536</b><br>for <b>BD537/538</b> | 20<br>20<br>15<br>40<br><br>25<br>25<br>15 |                   |                |
| f <sub>T</sub>         | Transition frequency                                      | I <sub>C</sub> = 500 mA                                                                                                                   | V <sub>CE</sub> = 1 V                                                                                                                                                                                                       | 3                                          | 12                | MHz            |

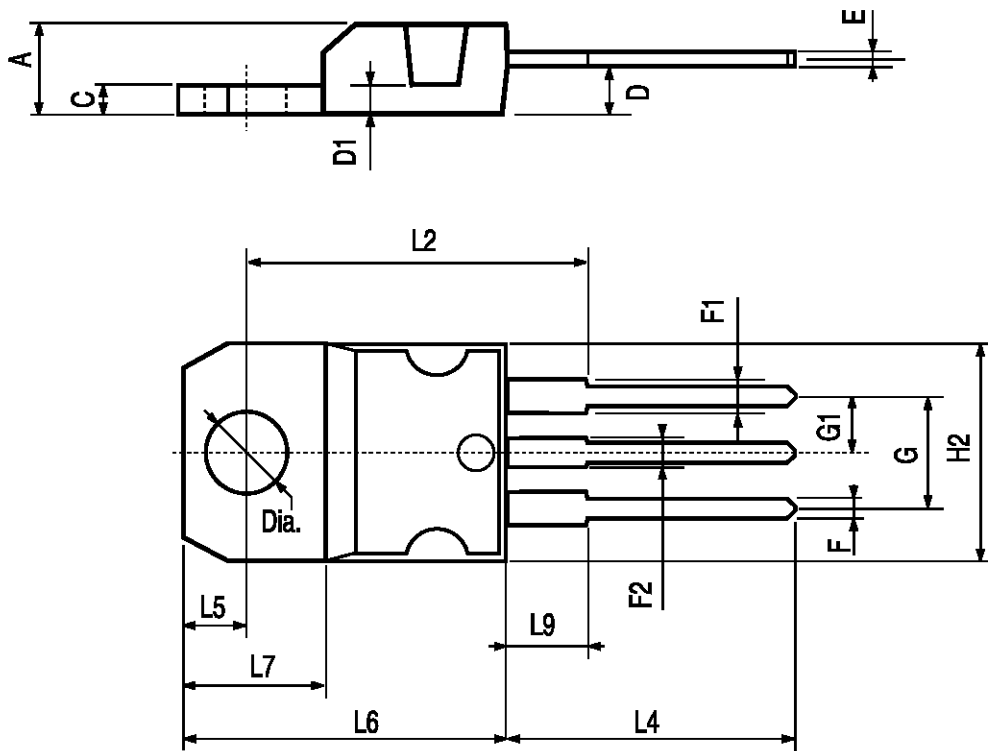
\* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %  
For PNP types voltage and current values are negative.

## Safe Operating Areas



**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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