

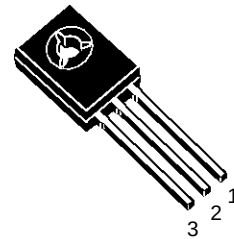
## PNP SILICON TRANSISTORS

- SGS-THOMSON PREFERRED SALESTYPES
- PNP TRANSISTOR

### DESCRIPTION

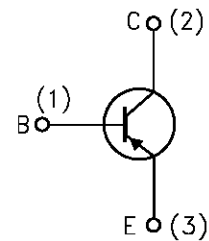
The BD136, BD138 and BD140 are silicon epitaxial planar PNP transistors in Jedec SOT-32 plastic package, designed for audio amplifiers and drivers utilizing complementary or quasi complementary circuits.

The complementary NPN types are the BD135, BD137 and BD139.



**SOT-32**

### INTERNAL SCHEMATIC DIAGRAM



### ABSOLUTE MAXIMUM RATINGS

| Symbol    | Parameter                                            | Value      |       |       | Unit             |
|-----------|------------------------------------------------------|------------|-------|-------|------------------|
|           |                                                      | BD136      | BD138 | BD140 |                  |
| $V_{CBO}$ | Collector-Base Voltage ( $I_E = 0$ )                 | -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                |
| $I_C$     | Collector Current                                    | -1.5       |       |       | A                |
| $I_{CM}$  | Collector Peak Current                               | -3         |       |       | A                |
| $I_B$     | Base Current                                         | -0.5       |       |       | A                |
| $P_{tot}$ | Total Dissipation at $T_c \leq 25^\circ\text{C}$     | 12.5       |       |       | W                |
| $P_{tot}$ | Total Dissipation at $T_{amb} \leq 25^\circ\text{C}$ | 1.25       |       |       | W                |
| $T_{stg}$ | Storage Temperature                                  | -65 to 150 |       |       | $^\circ\text{C}$ |
| $T_j$     | Max. Operating Junction Temperature                  | 150        |       |       | $^\circ\text{C}$ |

# BD136/BD138/BD140

## THERMAL DATA

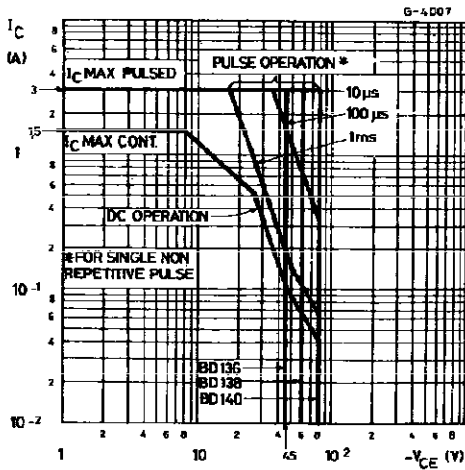
|                       |                                  |     |    |      |
|-----------------------|----------------------------------|-----|----|------|
| R <sub>thj-case</sub> | Thermal Resistance Junction-case | Max | 10 | °C/W |
|-----------------------|----------------------------------|-----|----|------|

## 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) | V <sub>CB</sub> = -30 V<br>V <sub>CB</sub> = -30 V T <sub>C</sub> = 125 °C                                                                         |                   |      | -0.1<br>-10 | μA<br>μA    |
| I <sub>EBO</sub>       | Emitter Cut-off Current (I <sub>C</sub> = 0)   | V <sub>EB</sub> = -5 V                                                                                                                             |                   |      | -10         | μA          |
| V <sub>CEO(sus)*</sub> | Collector-Emitter Sustaining Voltage           | I <sub>C</sub> = -30 mA<br>for <b>BD136</b><br>for <b>BD138</b><br>for <b>BD140</b>                                                                | -45<br>-60<br>-80 |      |             | V<br>V<br>V |
| V <sub>CE(sat)*</sub>  | Collector-Emitter Saturation Voltage           | I <sub>C</sub> = -0.5 A I <sub>B</sub> = -0.05 A                                                                                                   |                   |      | -0.5        | V           |
| V <sub>BE*</sub>       | Base-Emitter Voltage                           | I <sub>C</sub> = -0.5 A V <sub>CE</sub> = -2 V                                                                                                     |                   |      | -1          | V           |
| h <sub>FE*</sub>       | DC Current Gain                                | I <sub>C</sub> = -5 mA V <sub>CE</sub> = -2 V<br>I <sub>C</sub> = -0.5 A V <sub>CE</sub> = -2 V<br>I <sub>C</sub> = -150 mA V <sub>CE</sub> = -2 V | 25<br>25<br>40    |      | 250         |             |
| h <sub>FE</sub>        | h <sub>FE</sub> Groups                         | I <sub>C</sub> = -150 mA V <sub>CE</sub> = -2 V<br>for BD140 group 10                                                                              | 63                |      | 160         |             |

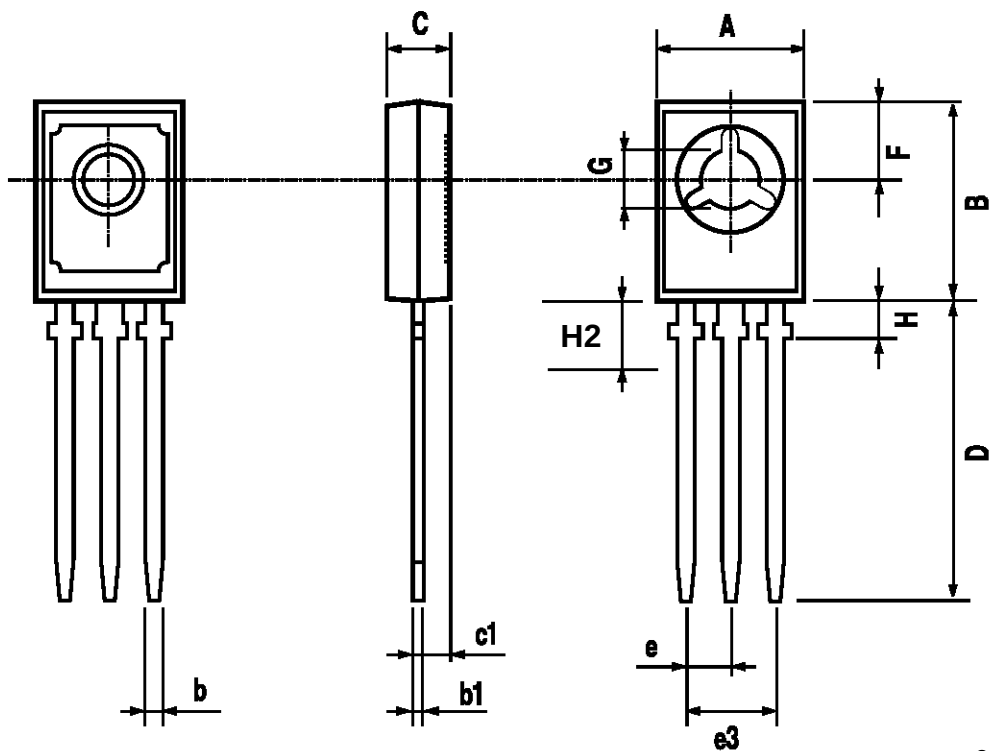
\* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %

## Safe Operating Areas



## SOT-32 (TO-126) MECHANICAL DATA

| DIM. | mm   |      |      | inch  |       |       |
|------|------|------|------|-------|-------|-------|
|      | MIN. | TYP. | MAX. | MIN.  | TYP.  | MAX.  |
| A    | 7.4  |      | 7.8  | 0.291 |       | 0.307 |
| B    | 10.5 |      | 10.8 | 0.413 |       | 0.445 |
| b    | 0.7  |      | 0.9  | 0.028 |       | 0.035 |
| b1   | 0.49 |      | 0.75 | 0.019 |       | 0.030 |
| C    | 2.4  |      | 2.7  | 0.040 |       | 0.106 |
| c1   | 1.0  |      | 1.3  | 0.039 |       | 0.050 |
| D    | 15.4 |      | 16.0 | 0.606 |       | 0.629 |
| e    |      | 2.2  |      |       | 0.087 |       |
| e3   | 4.15 |      | 4.65 | 0.163 |       | 0.183 |
| F    |      | 3.8  |      |       | 0.150 |       |
| G    | 3    |      | 3.2  | 0.118 |       | 0.126 |
| H    |      |      | 2.54 |       |       | 0.100 |
| H2   |      | 2.15 |      |       | 0.084 |       |



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