

NPN SILICON TRANSISTORS

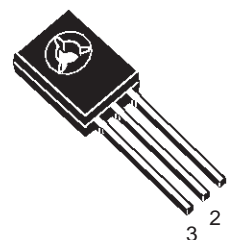
| Type | Marking |
|----------|----------|
| BD135 | BD135 |
| BD135-10 | BD135-10 |
| BD135-16 | BD135-16 |
| BD139 | BD139 |
| BD139-10 | BD139-10 |
| BD139-16 | BD139-16 |

- STMicroelectronics PREFERRED SALESTYPES

DESCRIPTION

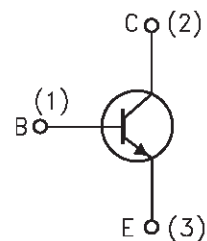
The BD135 and BD139 are silicon Epitaxial Planar NPN transistors mounted in Jedec SOT-32 plastic package, designed for audio amplifiers and drivers utilizing complementary or quasi-complementary circuits.

The complementary PNP types are BD136 and BD140 respectively.



SOT-32

INTERNAL SCHEMATIC DIAGRAM



SC08960

ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | | Unit |
|-----------|--|------------|-------|------------------|
| | | BD135 | BD139 | |
| V_{CBO} | Collector-Base Voltage ($I_E = 0$) | 45 | 80 | V |
| V_{CEO} | Collector-Emitter Voltage ($I_B = 0$) | 45 | 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 $T_c \leq 25\text{ }^\circ\text{C}$ | 12.5 | | W |
| P_{tot} | Total Dissipation at $T_{amb} \leq 25\text{ }^\circ\text{C}$ | 1.25 | | W |
| T_{stg} | Storage Temperature | -65 to 150 | | $^\circ\text{C}$ |
| T_j | Max. Operating Junction Temperature | 150 | | $^\circ\text{C}$ |

BD135 / BD139

THERMAL DATA

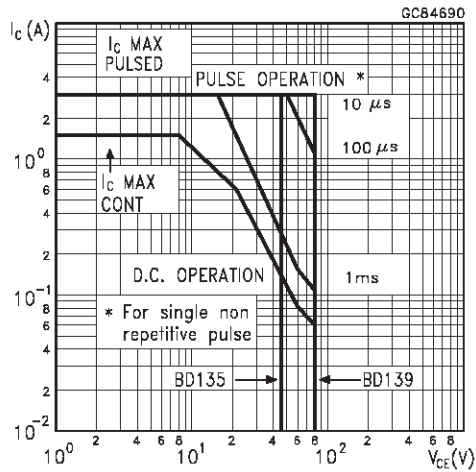
| | | | | |
|-----------------------|----------------------------------|-----|----|------|
| R _{thj-case} | Thermal Resistance Junction-case | Max | 10 | °C/W |
|-----------------------|----------------------------------|-----|----|------|

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|------------------------|---|--|----------------|------|------------|----------|
| I _{CBO} | Collector Cut-off Current (I _E = 0) | V _{CB} = 30 V V _{CB} = 30 V T _C = 125 °C | | | 0.1 10 | μA μA |
| I _{EBO} | Emitter Cut-off Current (I _C = 0) | V _{EB} = 5 V | | | 10 | μA |
| V _{CEO(sus)*} | Collector-Emitter Sustaining Voltage (I _B = 0) | I _C = 30 mA for BD135 for BD139 | 45 80 | | | V V |
| V _{CE(sat)*} | Collector-Emitter Saturation Voltage | I _C = 0.5 A I _B = 0.05 A | | | 0.5 | V |
| V _{BE*} | Base-Emitter Voltage | I _C = 0.5 A V _{CE} = 2 V | | | 1 | V |
| h _{FE*} | DC Current Gain | I _C = 5 mA V _{CE} = 2 V I _C = 150 mA V _{CE} = 2 V I _C = 0.5 A V _{CE} = 2 V | 25 40 25 | | 250 | |
| h _{FE} | h _{FE} Groups | I _C = 150 mA V _{CE} = 2 V for BD135/BD139 group-10 for BD135/BD139 group-16 | 63 100 | | 160 250 | |

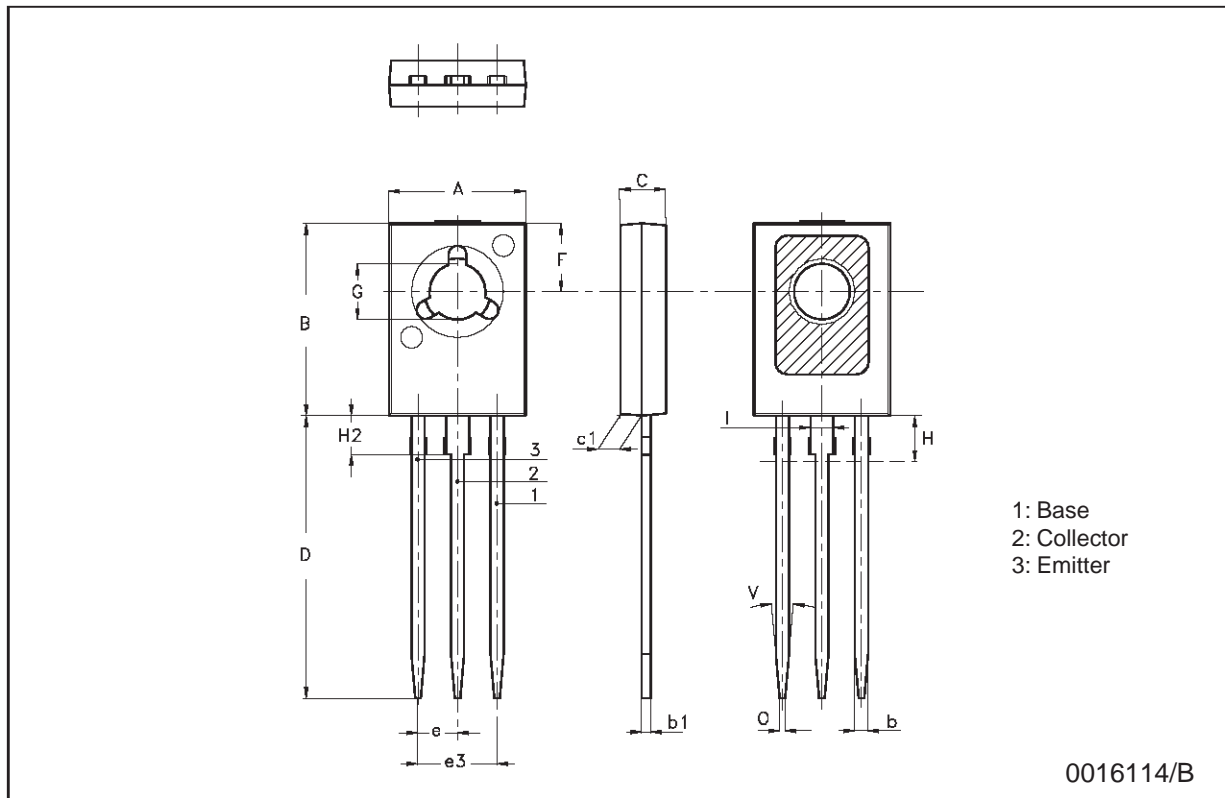
* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %

Safe Operating Area



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 | | 0.425 |
| b | 0.7 | | 0.9 | 0.028 | | 0.035 |
| b1 | 0.40 | | 0.65 | 0.015 | | 0.025 |
| C | 2.4 | | 2.7 | 0.094 | | 0.106 |
| c1 | 1.0 | | 1.3 | 0.039 | | 0.051 |
| D | 15.4 | | 16.0 | 0.606 | | 0.630 |
| e | | 2.2 | | | 0.087 | |
| e3 | | 4.4 | | | 0.173 | |
| F | | 3.8 | | | 0.150 | |
| G | 3 | | 3.2 | 0.118 | | 0.126 |
| H | | | 2.54 | | | 0.100 |
| H2 | | 2.15 | | | 0.084 | |
| I | | 1.27 | | | 0.05 | |
| O | | 0.3 | | | 0.011 | |
| V | | 10° | | | 10° | |



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