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COMPLEMENTARY SILICON POWER TRANSISTORS

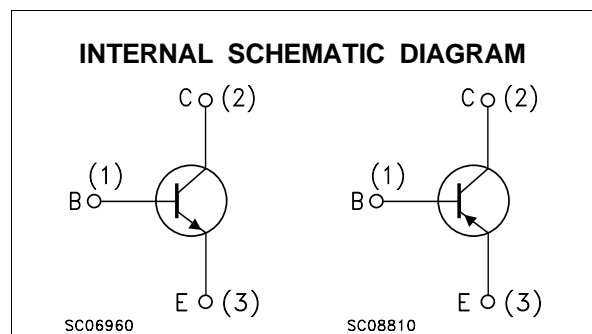
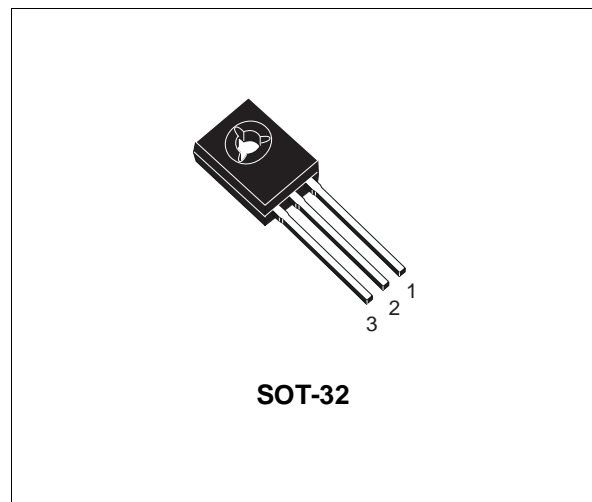
- SGS-THOMSON PREFERRED SALESTYPES
- COMPLEMENTARY PNP - NPN DEVICES

DESCRIPTION

The BD433, BD435, and BD437 are silicon epitaxial-base NPN power transistors in Jedec SOT-32 plastic package, intended for use in medium power linear and switching applications.

The BD433 is especially suitable for use in car-radio output stages.

The complementary PNP types are BD434, BD436, and BD438 respectively.



ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | | | | Unit |
|-----------|--|-------|------------|-------|-------|------|
| | | NPN | BD433 | BD435 | BD437 | |
| | | PNP | BD434 | BD436 | BD438 | |
| V_{CBO} | Collector-Base Voltage ($I_E = 0$) | | 22 | 32 | 45 | V |
| V_{CES} | Collector-Emitter Voltage ($V_{BE} = 0$) | | 22 | 32 | 45 | V |
| V_{CEO} | Collector-Emitter Voltage ($I_B = 0$) | | 22 | 32 | 45 | V |
| V_{EBO} | Emitter-Base Voltage ($I_C = 0$) | | 5 | | | V |
| I_C | Collector Current | | 4 | | | A |
| I_{CM} | Collector Peak Current ($t \leq 10$ ms) | | 7 | | | A |
| I_B | Base Current | | 1 | | | A |
| P_{tot} | Total Dissipation at $T_c \leq 25$ °C | | 36 | | | W |
| T_{stg} | Storage Temperature | | -65 to 150 | | | °C |
| T_j | Max. Operating Junction Temperature | | 150 | | | °C |

For PNP types voltage and current values are negative.

BD433/434/435/436/437/438

THERMAL DATA

| | | | | |
|-----------------------|-------------------------------------|-----|-----|------|
| R _{thj-case} | Thermal Resistance Junction-case | Max | 3.5 | °C/W |
| R _{thj-amb} | Thermal Resistance Junction-ambient | Max | 100 | °C/W |

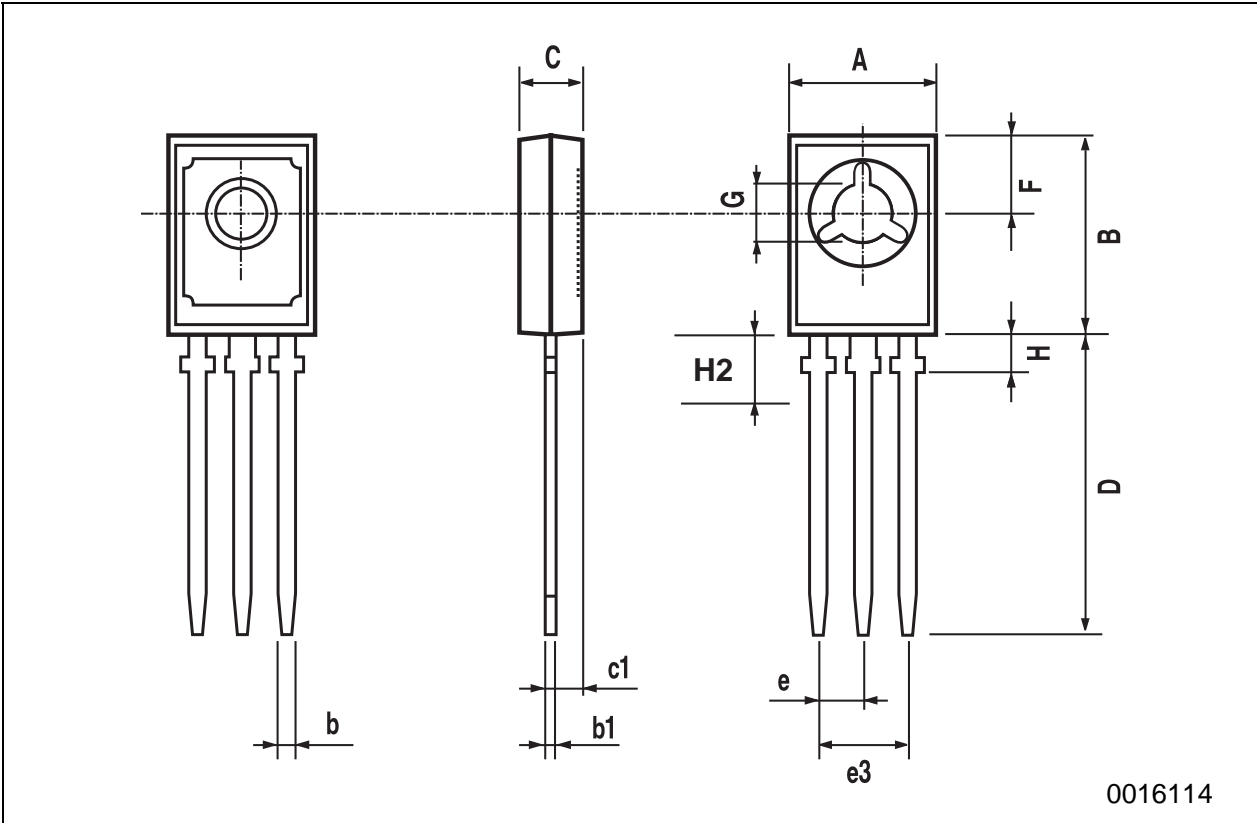
ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|--------------------------------------|---|---|---|--|--------------------------|----------------|
| I _{CBO} | Collector Cut-off Current (I _E = 0) | for BD433/434 V _{CB} = 22 V for BD435/436 V _{CB} = 32 V for BD437/438 V _{CB} = 45 V | | | 100 100 100 | μA μA μA |
| I _{CES} | Collector Cut-off Current (V _{BE} = 0) | for BD433/434 V _{CE} = 22 V for BD435/436 V _{CE} = 32 V for BD437/438 V _{CE} = 45 V | | | 100 100 100 | μA μA μA |
| I _{EBO} | Emitter Cut-off Current (I _C = 0) | V _{EB} = 5 V | | | 1 | mA |
| V _{CEO(sus)*} | Collector-Emitter Sustaining Voltage (I _B = 0) | I _C = 100 mA | for BD433/434 22 for BD435/436 32 for BD437/438 45 | | | V V V |
| V _{CE(sat)*} | Collector-Emitter Saturation Voltage | I _C = 2 A | I _B = 0.2 A for BD433/434 for BD435/436 for BD437/438 | 0.2 0.2 0.2 | 0.5 0.5 0.6 | V V V |
| V _{BE*} | Base-Emitter Voltage | I _C = 10 mA I _C = 2 A | V _{CE} = 5 V V _{CE} = 1 V for BD433/434 for BD435/436 for BD437/438 | 0.58 | 1.1 1.1 1.2 | V V V |
| h _{FE*} | DC Current Gain | I _C = 10 mA I _C = 500 mA I _C = 2 A | V _{CE} = 5 V for BD433/434 for BD435/436 for BD437/438 V _{CE} = 1 V V _{CE} = 1 V for BD433/434 for BD435/436 for BD437/438 | 40 40 30 85 50 50 40 | 130 130 130 140 | |
| h _{FE1} /h _{FE2} * | Matched Pair | I _C = 500 mA | V _{CE} = 1 V | | 1.4 | |
| f _T | Transition frequency | I _C = 250 mA | V _{CE} = 1 V | 3 | | MHz |

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

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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