

Silicon NPN Power Transistor

BD139

DESCRIPTION

- DC Current Gain -
: $h_{FE} = 40(\text{Min}) @ I_C = 0.15A$
- Collector-Emitter Sustaining Voltage -
: $V_{CEO(SUS)} = 80V(\text{Min})$
- Complement to type BD140

APPLICATIONS

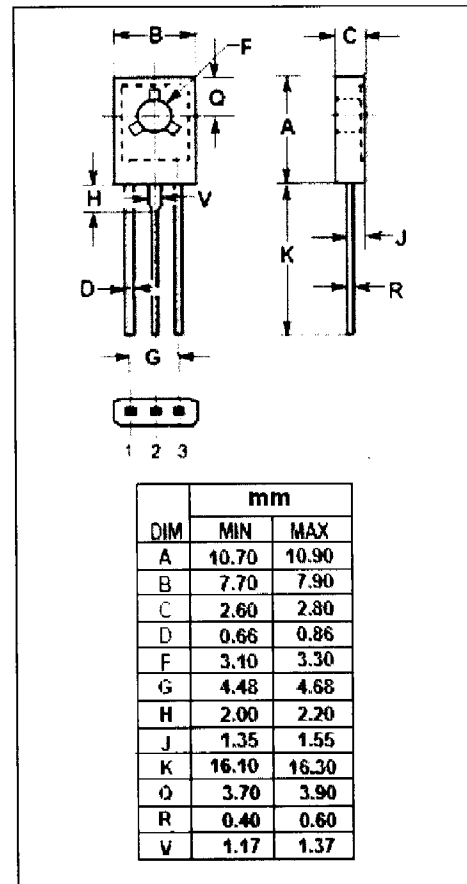
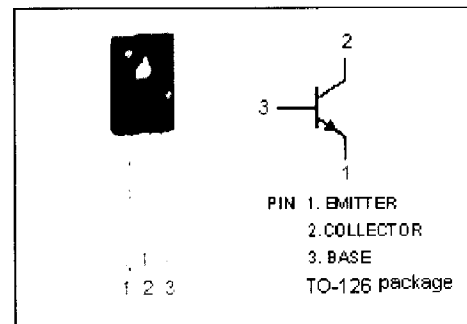
- Designed for use as audio amplifiers and drivers utilizing complementary or quasi complementary circuits.

ABSOLUTE MAXIMUM RATINGS($T_a=25^\circ\text{C}$)

| SYMBOL | PARAMETER | VALUE | UNIT |
|-----------|---|---------|------------------|
| V_{CBO} | Collector-Base Voltage | 100 | V |
| V_{CEO} | Collector-Emitter Voltage | 80 | V |
| V_{EBO} | Emitter-Base Voltage | 5 | V |
| I_C | Collector Current-Continuous | 1.5 | A |
| I_B | Base Current-Continuous | 0.5 | A |
| P_C | Collector Power Dissipation @ $T_a=25^\circ\text{C}$ | 1.25 | W |
| | Collector Power Dissipation @ $T_c=25^\circ\text{C}$ | 12.5 | |
| T_J | Junction Temperature | 150 | $^\circ\text{C}$ |
| T_{stg} | Storage Temperature Range | -55~150 | $^\circ\text{C}$ |

THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | MAX | UNIT |
|---------------|---|-----|--------------------|
| $R_{th\ j-c}$ | Thermal Resistance, Junction to Case | 10 | $^\circ\text{C/W}$ |
| $R_{th\ j-a}$ | Thermal Resistance, Junction to Ambient | 100 | $^\circ\text{C/W}$ |



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ELECTRICAL CHARACTERISTICS

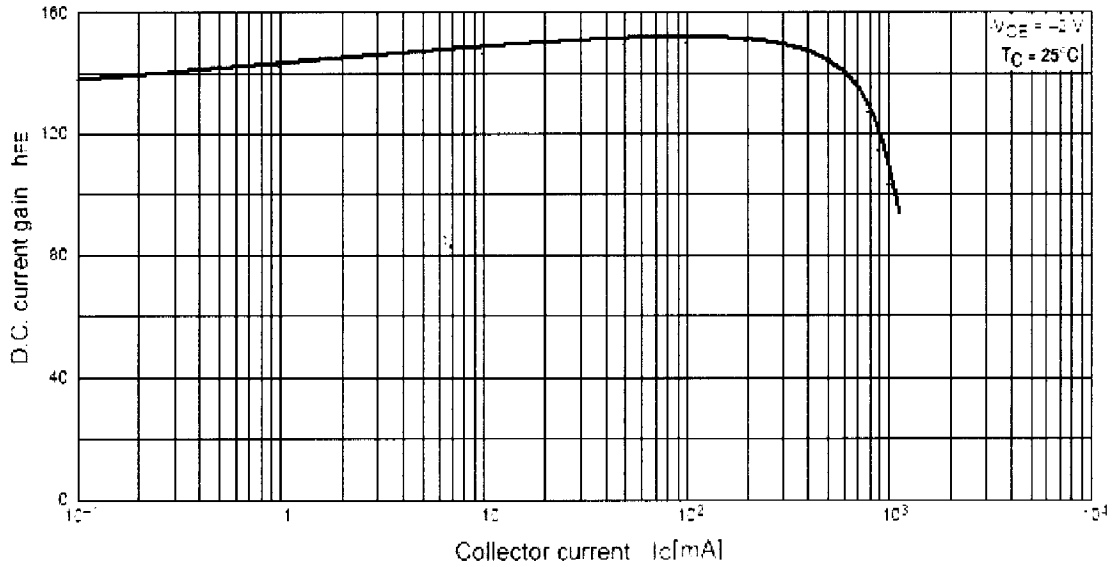
$T_C=25^\circ\text{C}$ unless otherwise specified

| SYMBOL | PARAMETER | CONDITIONS | MIN | TYP. | MAX | UNIT |
|----------------|--------------------------------------|---|-----|------|-----------|---------------|
| $V_{CEO(SUS)}$ | Collector-Emitter Sustaining Voltage | $I_C = 30\text{mA}; I_B = 0$ | 80 | | | V |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C = 0.5\text{A}; I_B = 50\text{mA}$ | | | 0.5 | V |
| $V_{BE(on)}$ | Base-Emitter On Voltage | $I_C = 0.5\text{A}; V_{CE} = 2\text{V}$ | | | 1.0 | V |
| I_{CBO} | Collector Cutoff Current | $V_{CB} = 30\text{V}; I_E = 0$ $V_{CB} = 30\text{V}; I_E = 0, T_C = 125^\circ\text{C}$ | | | 0.1 10 | μA |
| I_{EBO} | Emitter Cutoff Current | $V_{EB} = 5\text{V}; I_C = 0$ | | | 10 | μA |
| h_{FE-1} | DC Current Gain | $I_C = 5\text{mA}; V_{CE} = 2\text{V}$ | 25 | | | |
| h_{FE-2} | DC Current Gain | $I_C = 0.5\text{A}; V_{CE} = 2\text{V}$ | 25 | | | |
| h_{FE-3} | DC Current Gain | $I_C = 0.15\text{A}; V_{CE} = 2\text{V}$ | 40 | | 250 | |

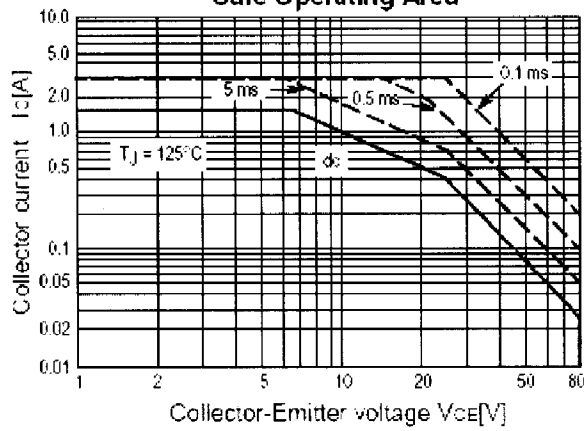
◆ h_{FE-3} Classifications

| | | |
|--------|--------|---------|
| 6 | 10 | 16 |
| 40-100 | 63-160 | 100-250 |

$h_{FE}-I_C$ Characteristics



Safe Operating Area



Power Derating

