

2SA1313

Audio Frequency Low Power Amplifier Applications  
Driver Stage Amplifier Applications  
Switching Applications

- Excellent hFE linearity: hFE (2) = 25 (min)  
at VCE = -6 V, IC = -400 mA
- High voltage: VCEO = -50 V (min)
- Complementary to 2SC3325
- Small package

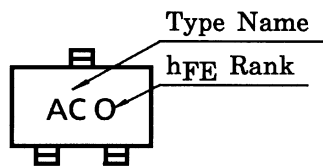
Absolute Maximum Ratings (Ta = 25°C)

| Characteristics             | Symbol           | Rating     | Unit |
|-----------------------------|------------------|------------|------|
| Collector-base voltage      | V <sub>CBO</sub> | -50        | V    |
| Collector-emitter voltage   | V <sub>CEO</sub> | -50        | V    |
| Emitter-base voltage        | V <sub>EBO</sub> | -5         | V    |
| Collector current           | I <sub>C</sub>   | -500       | mA   |
| Base current                | I <sub>B</sub>   | -50        | mA   |
| Collector power dissipation | P <sub>C</sub>   | 200        | mW   |
| Junction temperature        | T <sub>j</sub>   | 150        | °C   |
| Storage temperature range   | T <sub>stg</sub> | -55 to 150 | °C   |

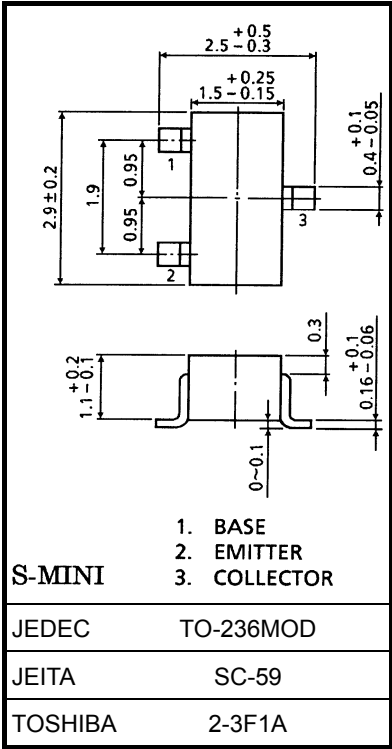
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Marking



Unit: mm



Weight: 0.012 g (typ.)

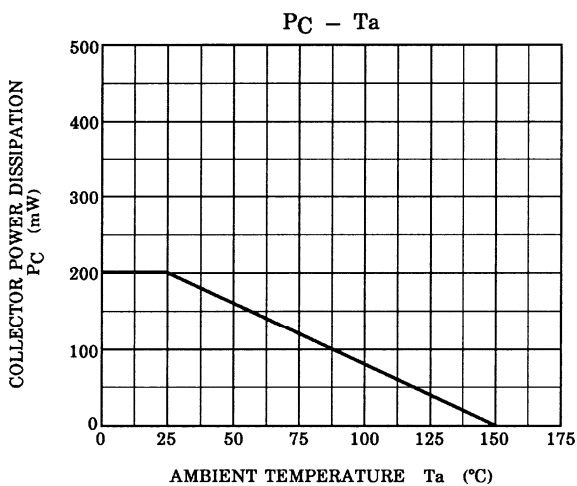
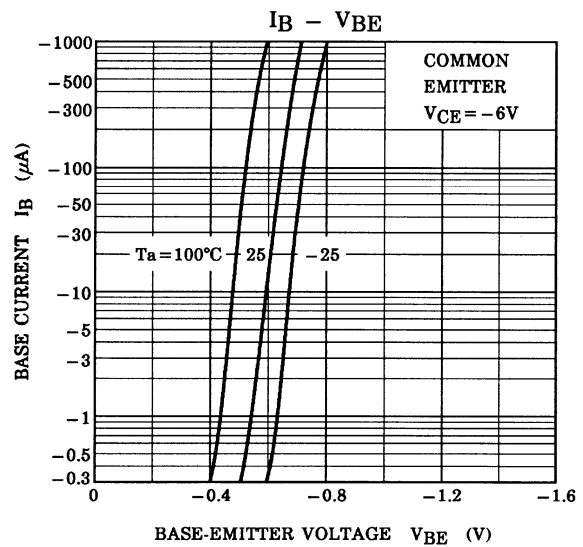
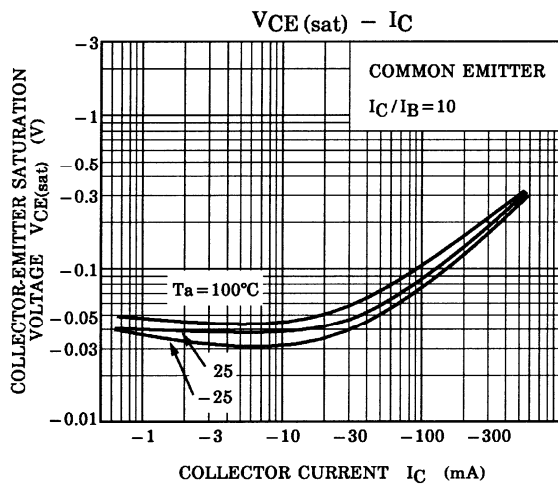
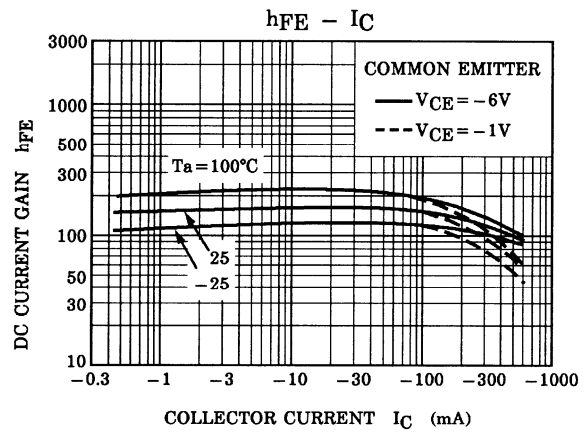
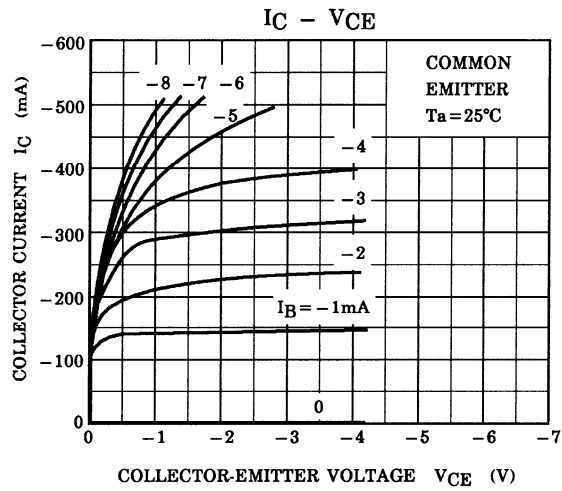
Start of commercial production  
1982-12

## Electrical Characteristics (Ta = 25°C)

| Characteristics                      | Symbol                | Test Condition                                    | Min | Typ. | Max   | Unit          |
|--------------------------------------|-----------------------|---------------------------------------------------|-----|------|-------|---------------|
| Collector cut-off current            | $I_{CBO}$             | $V_{CB} = -50\text{ V}, I_E = 0$                  | —   | —    | -0.1  | $\mu\text{A}$ |
| Emitter cut-off current              | $I_{EBO}$             | $V_{EB} = -5\text{ V}, I_C = 0$                   | —   | —    | -0.1  | $\mu\text{A}$ |
| DC current gain                      | $h_{FE(1)}$<br>(Note) | $V_{CE} = -1\text{ V}, I_C = -100\text{ mA}$      | 70  | —    | 240   |               |
|                                      | $h_{FE(2)}$<br>(Note) | $V_{CE} = -6\text{ V}, I_C = -400\text{ mA}$      | 25  | —    | —     |               |
| Collector-emitter saturation voltage | $V_{CE(sat)}$         | $I_C = -100\text{ mA}, I_B = -10\text{ mA}$       | —   | -0.1 | -0.25 | V             |
| Base-emitter voltage                 | $V_{BE}$              | $V_{CE} = -1\text{ V}, I_C = -100\text{ mA}$      | —   | -0.8 | -1.0  | V             |
| Transition frequency                 | $f_T$                 | $V_{CE} = -6\text{ V}, I_C = -20\text{ mA}$       | —   | 200  | —     | MHz           |
| Collector output capacitance         | $C_{ob}$              | $V_{CB} = -6\text{ V}, I_E = 0, f = 1\text{ MHz}$ | —   | 13   | —     | pF            |

Note:  $h_{FE(1)}$  classification O: 70~140, Y: 120~240

$h_{FE(2)}$  classification O: 25 (min), Y: 40 (min)



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