

TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT process)

## 2SA1587

## Audio Frequency General Purpose Amplifier Applications

- AEC-Q101 Qualified (Note1)
- High voltage:  $V_{CEO} = -120\text{ V}$
- Excellent  $h_{FE}$  linearity:  $h_{FE}(I_C = -0.1\text{ mA})/h_{FE}(I_C = -2\text{ mA}) = 0.95$  (typ.)
- High  $h_{FE}$ :  $h_{FE} = 200$  to  $700$
- Low noise:  $NF = 1\text{ dB}$  (typ.),  $10\text{ dB}$  (max)
- Complementary to 2SC4117
- Small package

Note1: For detail information, please contact our sales.

Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

| Characteristics             | Symbol             | Rating     | Unit             |
|-----------------------------|--------------------|------------|------------------|
| Collector-base voltage      | $V_{CBO}$          | -120       | V                |
| Collector-emitter voltage   | $V_{CEO}$          | -120       | V                |
| Emitter-base voltage        | $V_{EBO}$          | -5         | V                |
| Collector current           | $I_C$              | -100       | mA               |
| Base current                | $I_B$              | -20        | mA               |
| Collector power dissipation | $P_C$ (Note 2, 4)  | 200        | mW               |
|                             | $P_C$ (Note 3)     | 100        |                  |
| Junction temperature        | $T_j$ (Note 2)     | 150        | $^\circ\text{C}$ |
|                             | $T_j$ (Note 3)     | 125        |                  |
| Storage temperature range   | $T_{stg}$ (Note 2) | -55 to 150 | $^\circ\text{C}$ |
|                             | $T_{stg}$ (Note 3) | -55 to 125 |                  |

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.

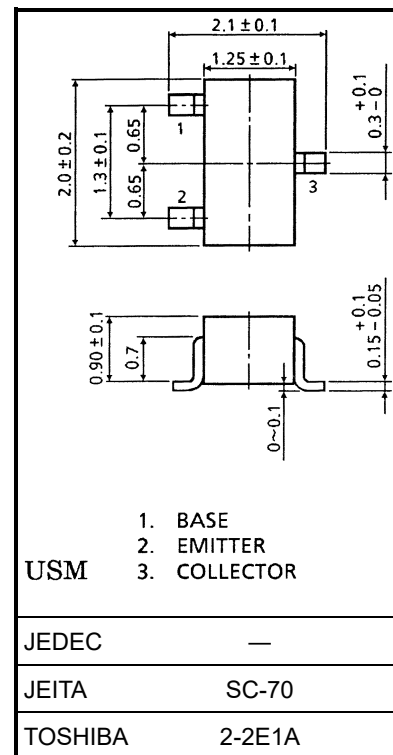
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Note 2: For devices with the ordering part number ending in LF(T).

Note 3: For devices with the ordering part number in other than LF(T).

Note 4: Mounted on a FR4 board. (25.4 mm × 25.4 mm × 1.6 mm, Cu pad: 0.5 mm<sup>2</sup> × 3)

Unit: mm



Weight: 0.006 g (typ.)

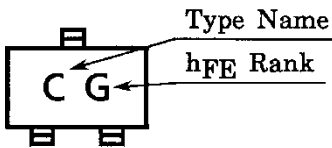
Start of commercial production  
1987-01

Electrical Characteristics (Ta = 25°C)

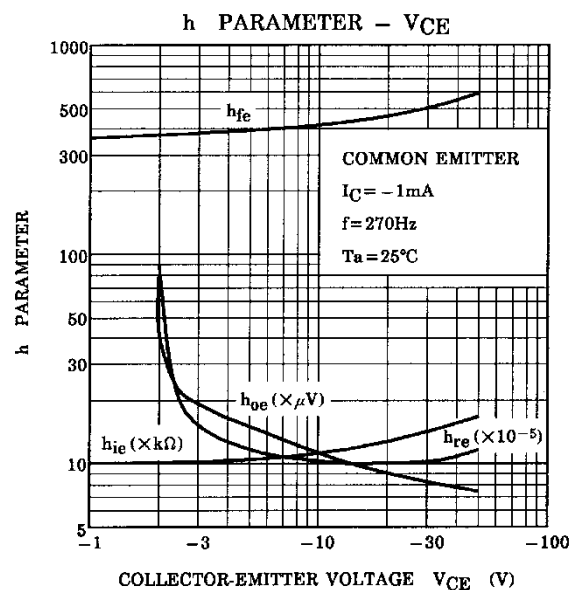
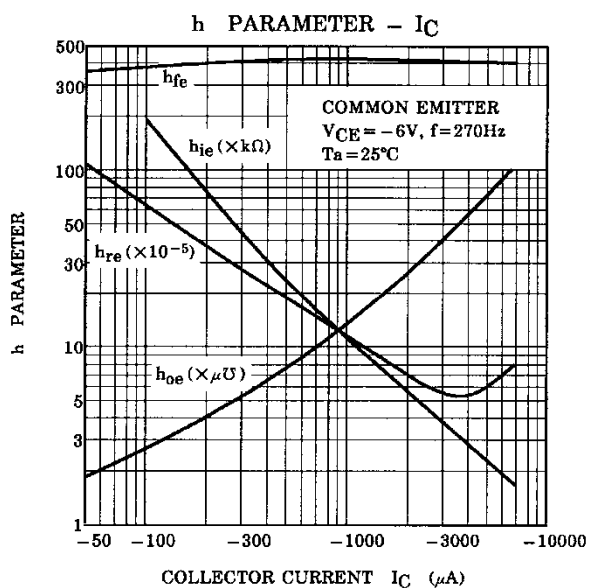
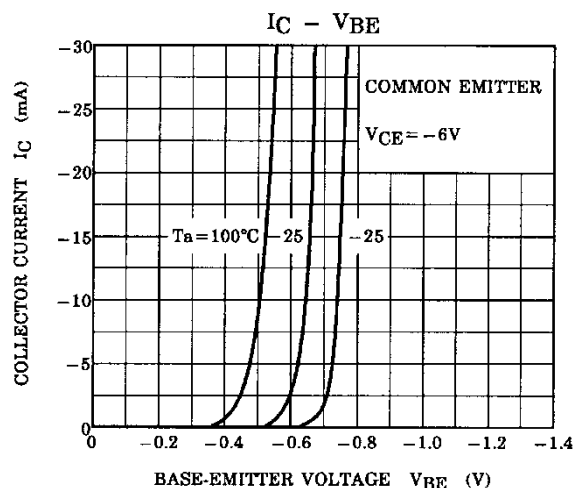
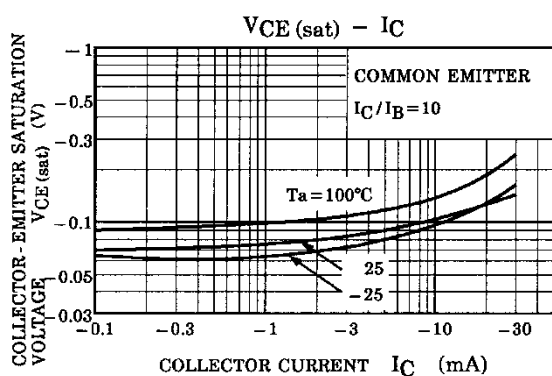
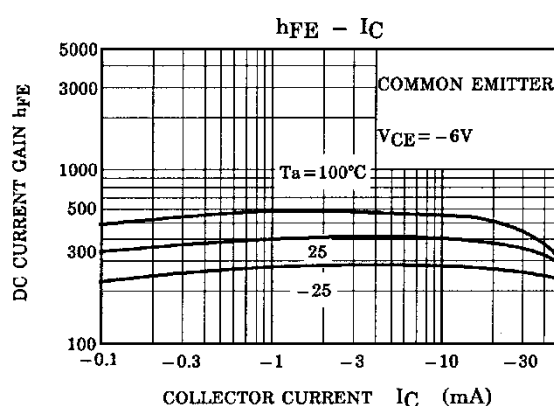
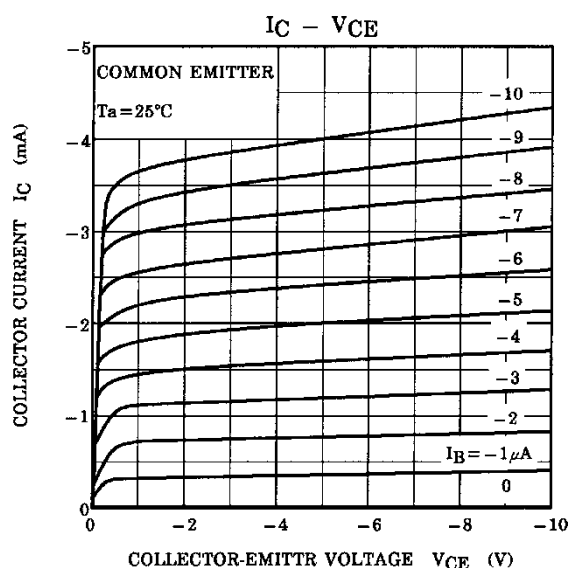
| Characteristics                      | Symbol                    | Test Condition                                                                         | Min | Typ. | Max  | Unit |
|--------------------------------------|---------------------------|----------------------------------------------------------------------------------------|-----|------|------|------|
| Collector cut-off current            | ICBO                      | V <sub>CB</sub> = -120 V, I <sub>E</sub> = 0 A                                         | —   | —    | -0.1 | μA   |
| Emitter cut-off current              | IEBO                      | V <sub>EB</sub> = -5 V, I <sub>C</sub> = 0 A                                           | —   | —    | -0.1 | μA   |
| DC current gain                      | h <sub>FE</sub><br>(Note) | V <sub>CE</sub> = -6 V, I <sub>C</sub> = -2 mA                                         | 200 | —    | 700  | —    |
| Collector-emitter saturation voltage | V <sub>CE (sat)</sub>     | I <sub>C</sub> = -10 mA, I <sub>B</sub> = -1 mA                                        | —   | —    | -0.3 | V    |
| Transition frequency                 | f <sub>T</sub>            | V <sub>CE</sub> = -6 V, I <sub>C</sub> = -1 mA                                         | —   | 100  | —    | MHz  |
| Collector output capacitance         | C <sub>ob</sub>           | V <sub>CB</sub> = -10 V, I <sub>E</sub> = 0 A, f = 1 MHz                               | —   | 4    | —    | pF   |
| Noise figure                         | NF                        | V <sub>CE</sub> = -6 V, I <sub>C</sub> = -0.1 mA, f = 1 kHz,<br>R <sub>G</sub> = 10 kΩ | —   | 1.0  | 10   | dB   |

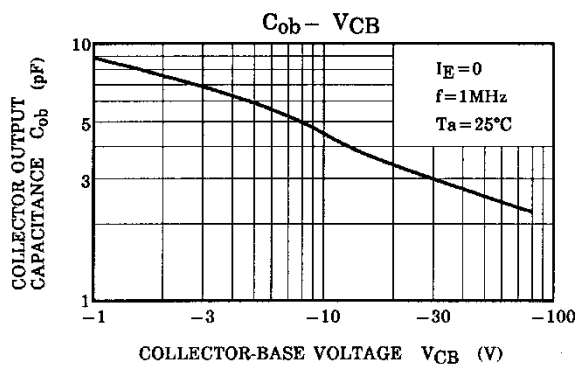
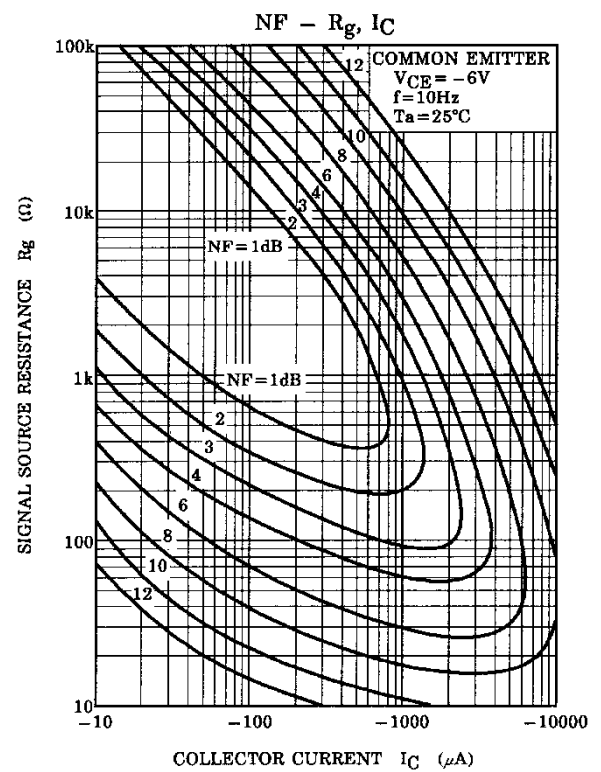
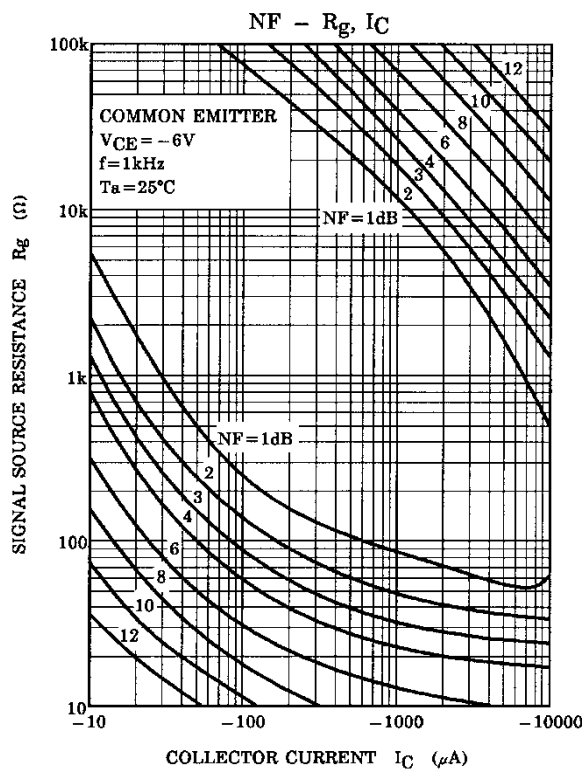
Note: h<sub>FE</sub> classification GR (G): 200 to 400, BL (L): 350 to 700 ( ) marking symbol

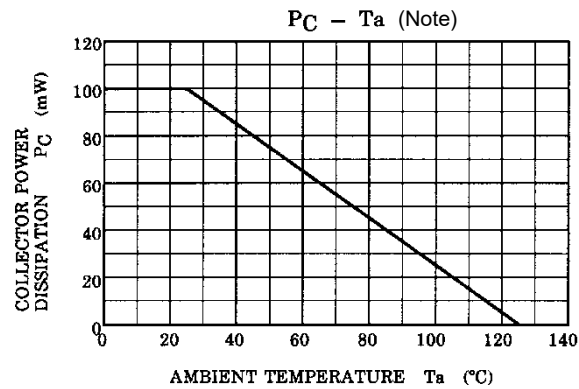
Marking



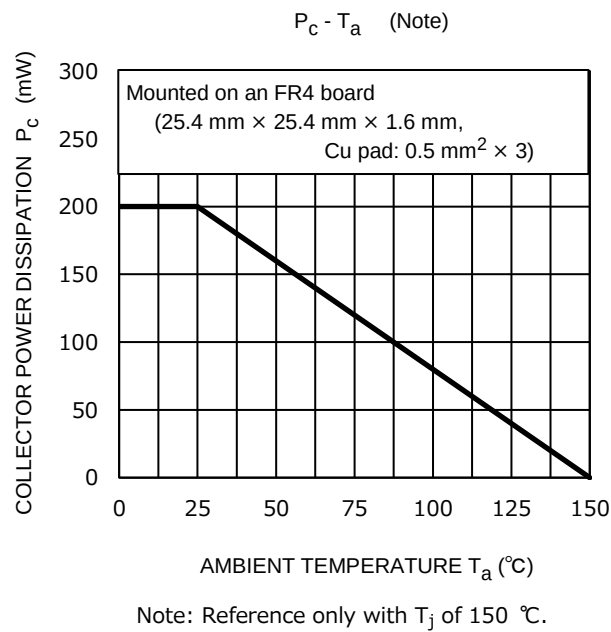
## Characteristics Curves







Note: Reference only with  $T_j$  of 125 °C.



The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

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