

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process)

## 2SC4738

### Audio Frequency General Purpose Amplifier Applications

- High voltage and high current:  $V_{CE0} = 50\text{ V}$ ,  $I_C = 150\text{ mA}$  (max)
- Excellent  $h_{FE}$  linearity:  $h_{FE} (I_C = 0.1\text{ mA}) / h_{FE} (I_C = 2\text{ mA}) = 0.95$  (typ.)
- High  $h_{FE}$ :  $h_{FE} = 120 \sim 700$
- Complementary to 2SA1832
- Small package

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

| Characteristics             | Symbol    | Rating         | Unit             |
|-----------------------------|-----------|----------------|------------------|
| Collector-base voltage      | $V_{CBO}$ | 60             | V                |
| Collector-emitter voltage   | $V_{CEO}$ | 50             | V                |
| Emitter-base voltage        | $V_{EBO}$ | 5              | V                |
| Collector current           | $I_C$     | 150            | mA               |
| Base current                | $I_B$     | 30             | mA               |
| Collector power dissipation | $P_C$     | 100            | mW               |
| Junction temperature        | $T_j$     | 125            | $^\circ\text{C}$ |
| Storage temperature range   | $T_{stg}$ | $-55 \sim 125$ | $^\circ\text{C}$ |

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).

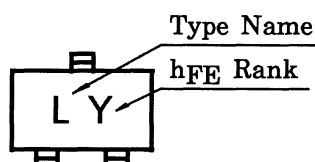
### Electrical Characteristics ( $T_a = 25^\circ\text{C}$ )

| Characteristics                      | Symbol               | Test Condition                                          | Min | Typ. | Max  | Unit          |
|--------------------------------------|----------------------|---------------------------------------------------------|-----|------|------|---------------|
| Collector cut-off current            | $I_{CBO}$            | $V_{CB} = 60\text{ V}$ , $I_E = 0$                      | —   | —    | 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                      | $h_{FE}$<br>(Note)   | $V_{CE} = 6\text{ V}$ , $I_C = 2\text{ mA}$             | 120 | —    | 700  |               |
| Collector-emitter saturation voltage | $V_{CE}(\text{sat})$ | $I_C = 100\text{ mA}$ , $I_B = 10\text{ mA}$            | —   | 0.1  | 0.25 | V             |
| Transition frequency                 | $f_T$                | $V_{CE} = 10\text{ V}$ , $I_C = 1\text{ mA}$            | 80  | —    | —    | MHz           |
| Collector output capacitance         | $C_{ob}$             | $V_{CB} = 10\text{ V}$ , $I_E = 0$ , $f = 1\text{ MHz}$ | —   | 2.0  | 3.5  | pF            |

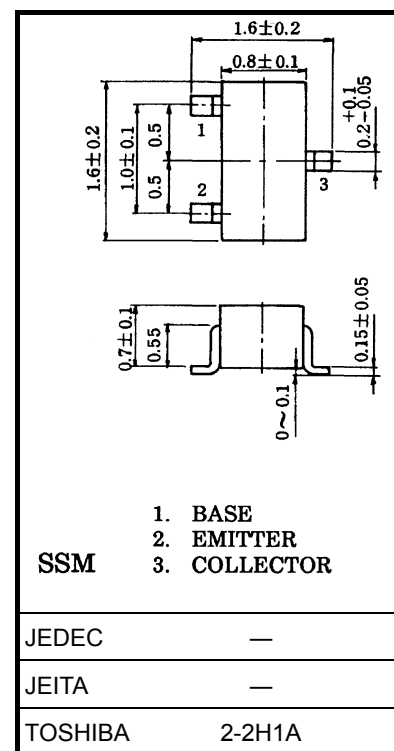
Note:  $h_{FE}$  classification Y (Y): 120~240, GR (G): 200~400, BL (L): 350~700

( ) marking symbol

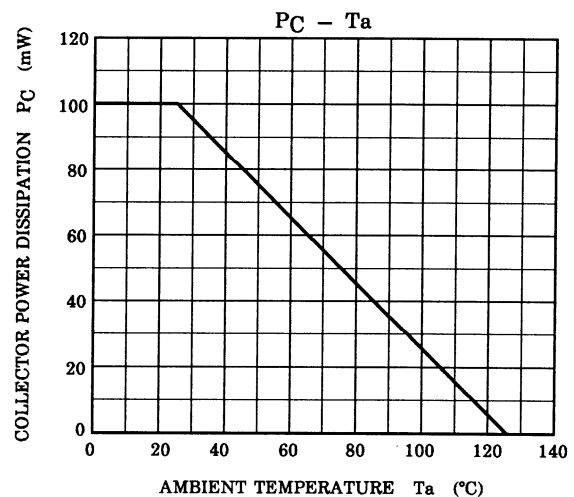
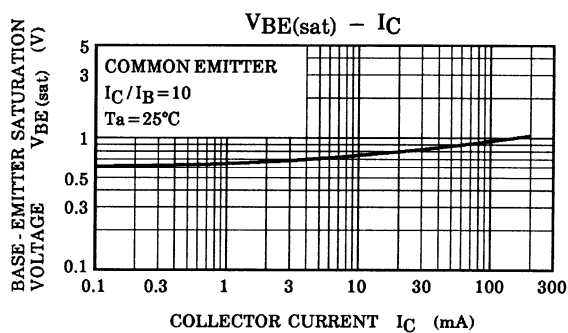
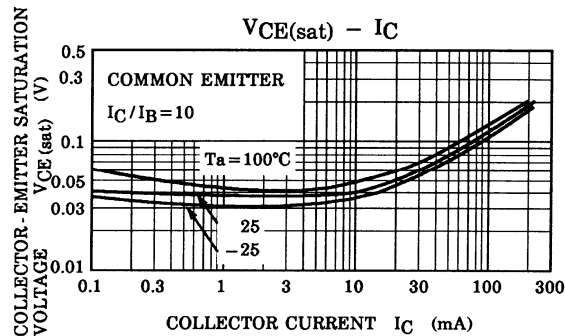
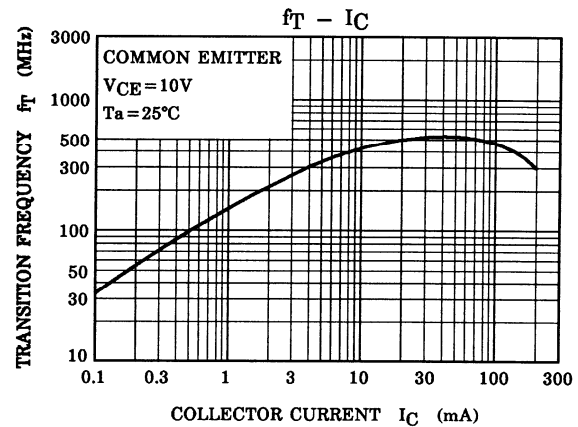
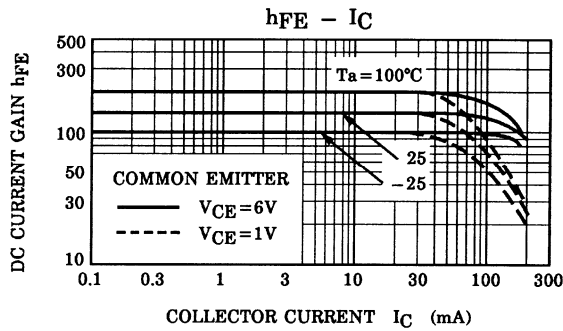
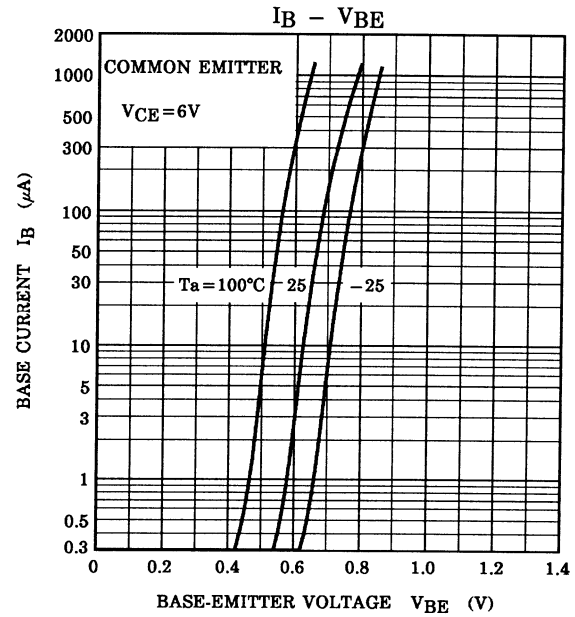
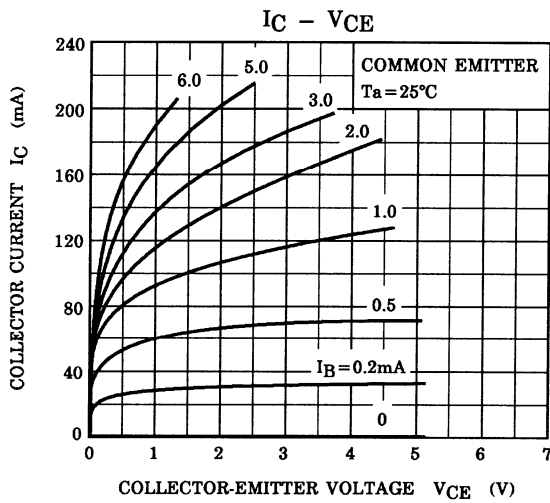
### Marking



Unit: mm



Weight: 2.4 mg (typ.)



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