

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process)

TTC4116FU

Audio Frequency General Purpose Amplifier Applications

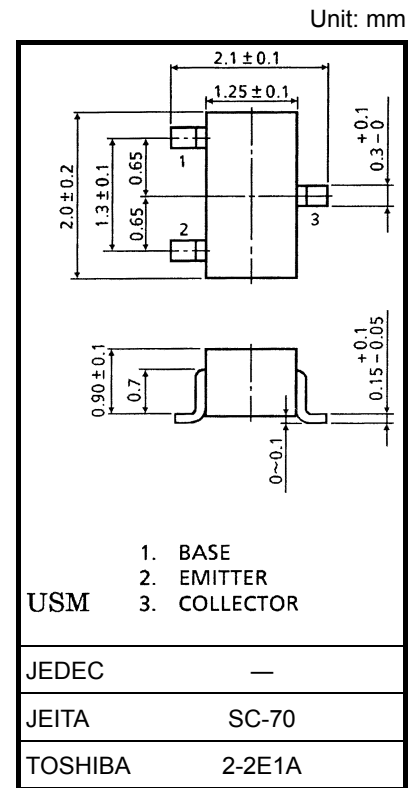
- High voltage and high current: $V_{CE0} = 50\text{ V}$, $I_C = 150\text{ mA}$ (max)
- Excellent h_{FE} linearity: $h_{FE}(I_C = 0.1\text{ mA})/h_{FE}(I_C = 2\text{ mA}) = 0.95$ (typ.)
- High h_{FE} : $h_{FE} = 120$ to 400
- Low noise: $NF = 1\text{ dB}$ (typ.), 10 dB (max)
- Small package

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

| Characteristics | Symbol | Rating | Unit |
|-----------------------------|-----------|------------|------------------|
| Collector-base voltage | V_{CB0} | 60 | V |
| Collector-emitter voltage | V_{CE0} | 50 | V |
| Emitter-base voltage | V_{EB0} | 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 | 150 | $^\circ\text{C}$ |
| Storage temperature range | T_{stg} | -55 to 150 | $^\circ\text{C}$ |

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).

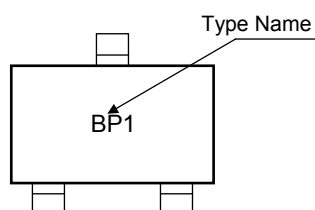


Weight: 6.0 mg (typ.)

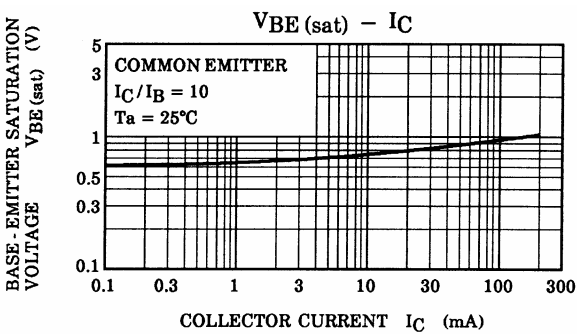
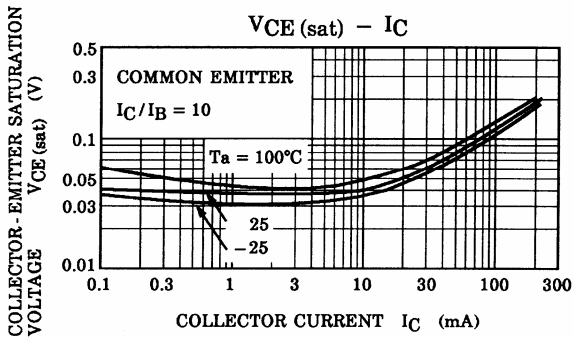
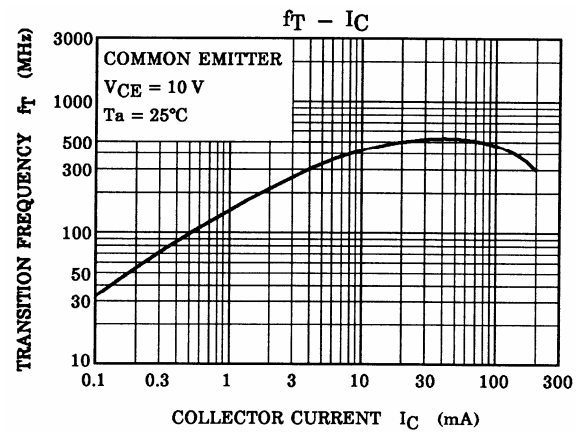
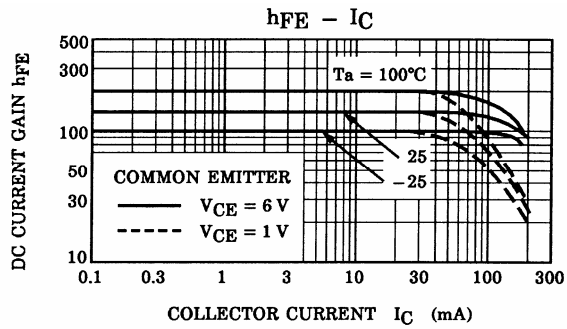
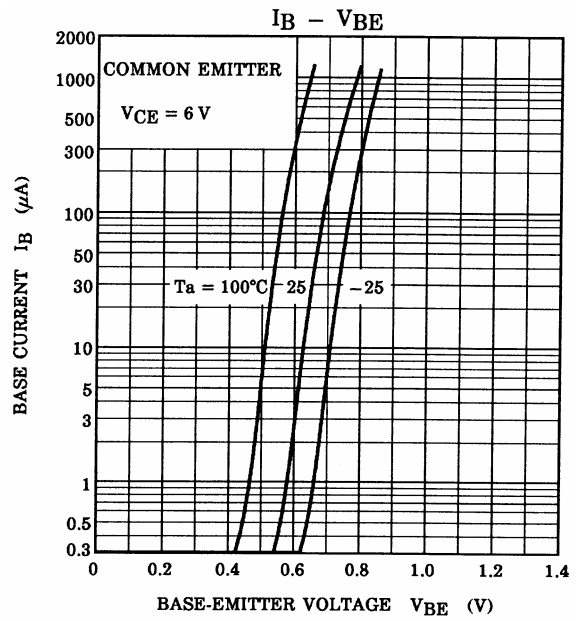
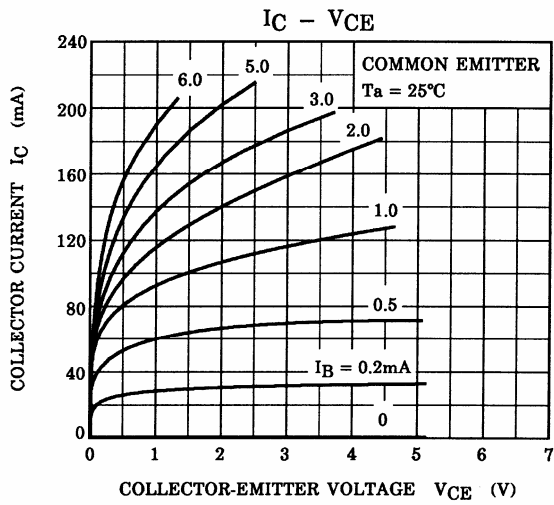
Electrical Characteristics ($T_a = 25^\circ\text{C}$)

| Characteristics | Symbol | Test Condition | Min | Typ. | Max | Unit |
|--------------------------------------|---------------|---|-----|------|------|---------------|
| Collector cut-off current | I_{CBO} | $V_{CB} = 60\text{ V}$, $I_E = 0$ | — | — | 0.1 | μA |
| Emitter cut-off current | I_{EBO} | $V_{EB} = 5\text{ V}$, $I_C = 0$ | — | — | 0.1 | μA |
| DC current gain | h_{FE} | $V_{CE} = 6\text{ V}$, $I_C = 2\text{ mA}$ | 120 | — | 400 | — |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = 100\text{ mA}$, $I_B = 10\text{ mA}$ | — | 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 |
| Noise figure | NF | $V_{CE} = 6\text{ V}$, $I_C = 0.1\text{ mA}$, $f = 1\text{ kHz}$, $R_g = 10\text{ k}\Omega$, | — | 1.0 | 10 | dB |

Marking



Start of commercial production
2009-09



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