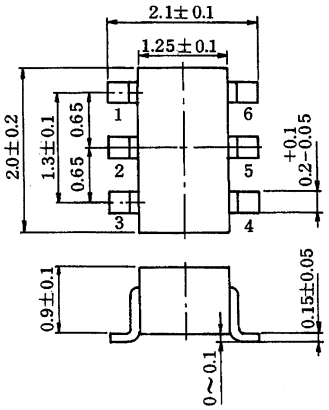
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

# HN1C01FU

Audio Frequency General Purpose Amplifier Applications

- Small package (Dual type)
- High voltage and high current
  : $V_{CEO}$ = 50V, $I_C$ = 150mA (max)
- High $h_{FE}$ : $h_{FE}$ = 120~400
- Excellent $h_{FE}$ linearity
  : $h_{FE}$ ($I_C$ = 0.1mA) / $h_{FE}$ ($I_C$ = 2mA) = 0.95 (typ.)

Unit: mm




1. EMITTER 1 (E1)
2. BASE 1 (B1)
3. COLLECTOR 2 (C2)
4. EMITTER 2 (E2)
5. BASE 2 (B2)
6. COLLECTOR 1 (C1)

US6

| | |
|---|---|
| JEDEC | — |
| EIAJ | — |
| TOSHIBA | 2-2J1A |

Weight: 6.8mg

## Absolute Maximum Ratings (Ta = 25°C) (Q1, Q2 Common)

| Characteristic | 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 | $P_C$* | 200 | mW |
| Junction temperature | $T_j$ | 125 | °C |
| Storage temperature range | $T_{stg}$ | −55~125 | °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).

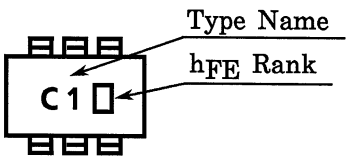
* Total rating

## Electrical Characteristics (Ta = 25°C) (Q1,Q2 Common)

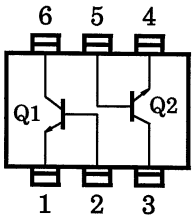
| Characteristic | Symbol | Test Circuit | Test Condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|
| Collector cut-off current | $I_{CBO}$ | — | $V_{CB}$ = 60V, $I_E$ = 0 | — | — | 0.1 | μA |
| Emitter cut-off current | $I_{EBO}$ | — | $V_{EB}$ = 5V, $I_C$ = 0 | — | — | 0.1 | μA |
| DC current gain | $h_{FE\ (Note)}$ | — | $V_{CE}$ = 6V, $I_C$ = 2mA | 120 | — | 400 | |
| Collector-emitter saturation voltage | $V_{CE\ (sat)}$ | — | $I_C$ = 100mA, $I_B$ = 10mA | — | 0.1 | 0.25 | V |
| Transition frequency | $f_T$ | — | $V_{CE}$ = 10V, $I_C$ = 1mA | 80 | — | — | MHz |
| Collector output capacitance | $C_{ob}$ | — | $V_{CB}$ = 10V, $I_E$ = 0, f = 1MHz | — | 2 | 3.5 | pF |

Note: $h_{FE}$ Classification
Y (Y): 120~240, GR (G): 200~400
( ) Marking Symbol

**Marking**

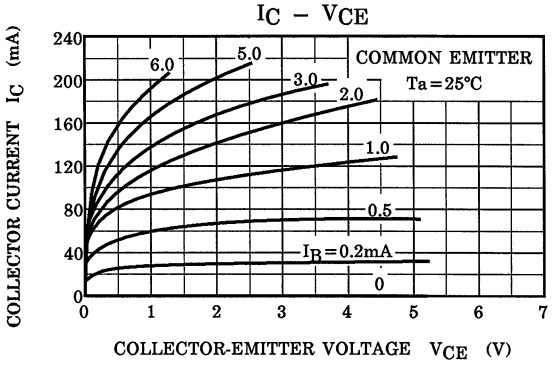



**Equivalent Circuit (Top View)**

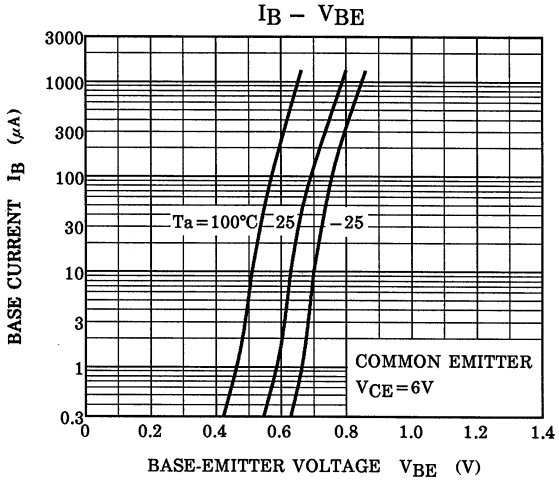


**(Q1,Q2 Common)**

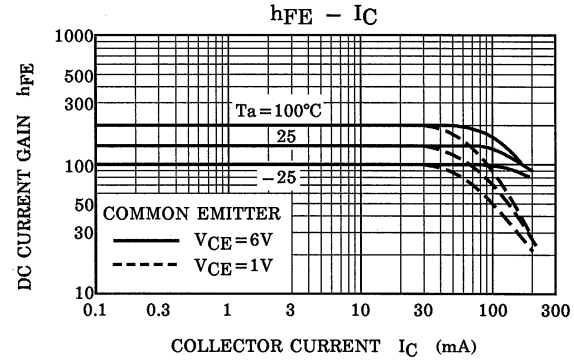
$I_C - V_{CE}$



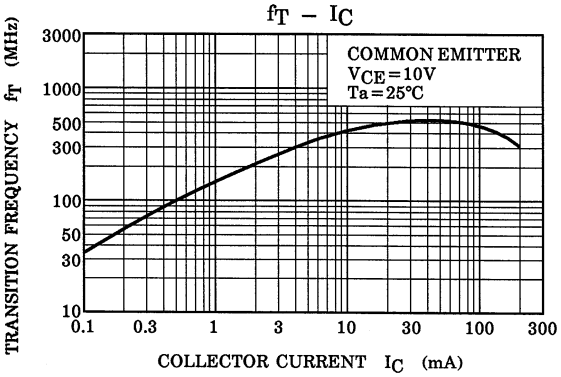

$I_B - V_{BE}$



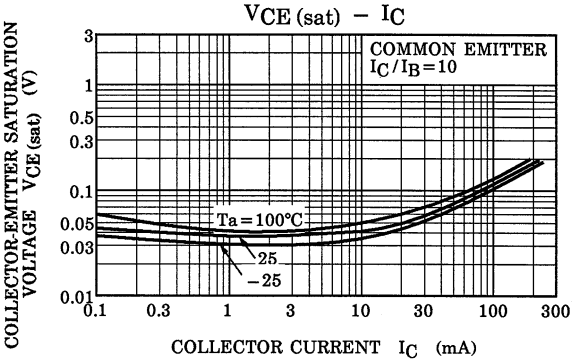

$h_{FE} - I_C$



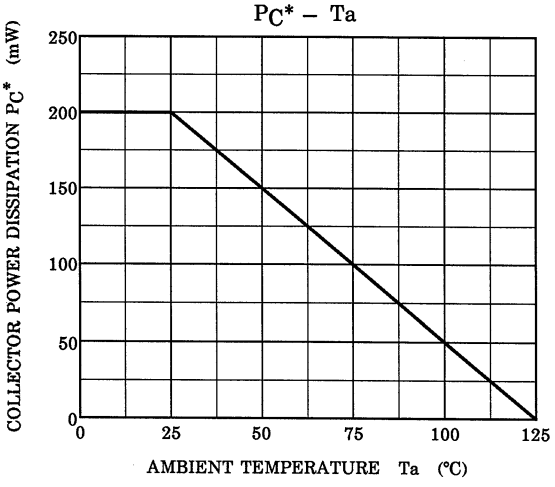

$f_T - I_C$



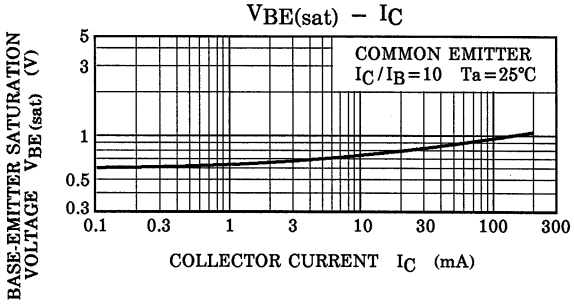

$V_{CE\,(sat)} - I_C$




$P_C^* - Ta$




$V_{BE(sat)} - I_C$




*: Total Rating

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20070701-EN GENERAL

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