

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

# HN1C01F

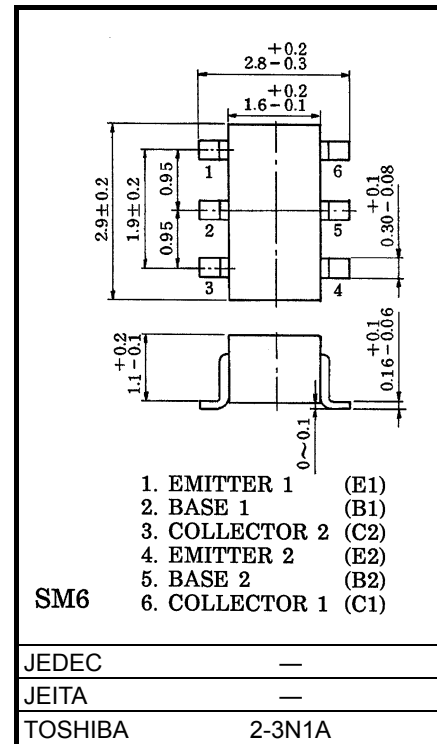
## Audio-Frequency General-Purpose Amplifier Applications

Unit: mm

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

### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ ) (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 | $P_C^*$   | 300        | mW               |
| Junction temperature        | $T_j$     | 125        | $^\circ\text{C}$ |
| Storage temperature range   | $T_{stg}$ | -55 to 125 | $^\circ\text{C}$ |



Weight: 0.015 g (typ.)

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 ( $T_a = 25^\circ\text{C}$ ) (Q1, Q2 Common)

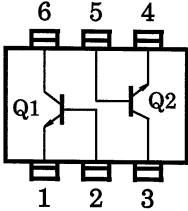
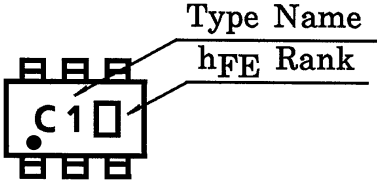
| Characteristic                       | Symbol          | Test Circuit | Test Condition  | Min | Typ. | Max  | Unit          |
|--------------------------------------|-----------------|--------------|---|-----|------|------|---------------|
| Collector cut-off current            | $I_{CBO}$       | —            | $V_{CB} = 60\text{ V}$ , $I_E = 0$                      | —   | —    | 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                      | $h_{FE}$ (Note) | —            | $V_{CE} = 6\text{ V}$ , $I_C = 2\text{ mA}$             | 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    | 3.5  | pF            |

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

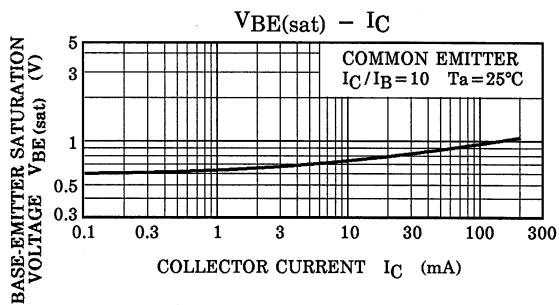
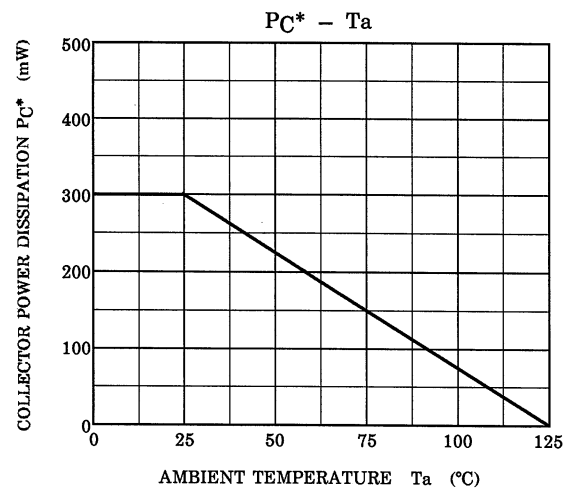
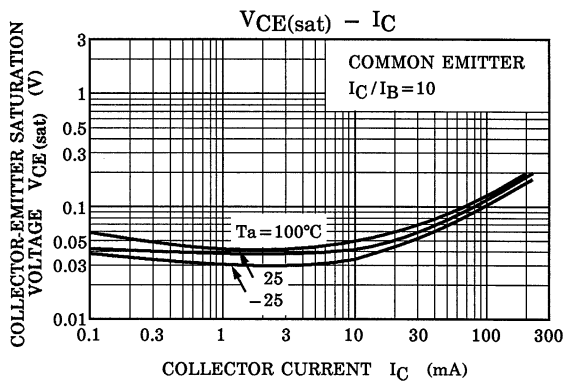
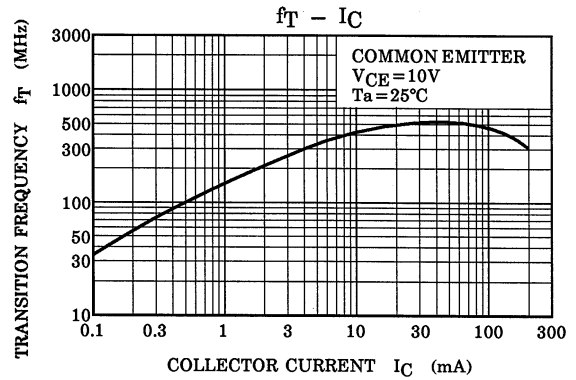
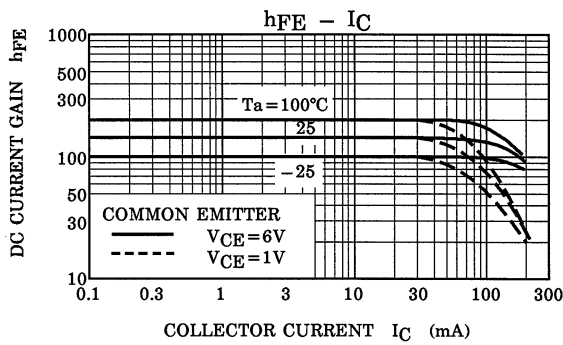
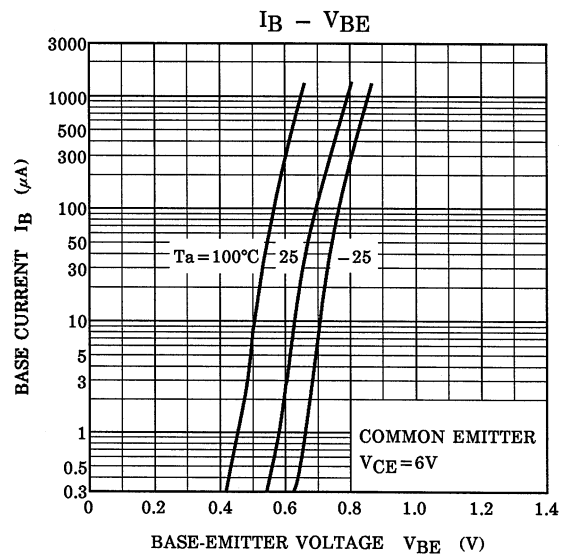
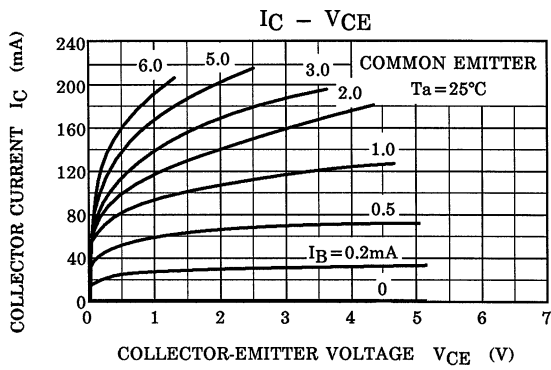
Start of commercial production  
1988-01

**Marking**

**Equivalent Circuit (Top View)**



(Q1, Q2 Common)



\* : Total Rating

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