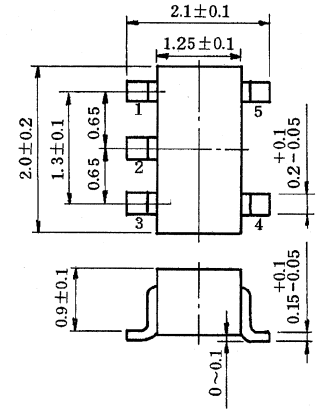
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

# HN4A56JU

Audio Frequency General Purpose Amplifier Applications

- Small Package (Dual Type)
- High Voltage and High Current
  : $V_{CEO}$= −50V, $I_C$ = −150mA (max)
- High $h_{FE}$
- Excellent $h_{FE}$ Linearity
  : $h_{FE}$ ($I_C$ = −0.1mA) / $h_{FE}$ ($I_C$ = −2mA) = 0.95 (typ.)

Unit: mm




1.EMITTER1 (E1)
2.BASE (B)
3.EMITTER2 (E2)
4.COLLECTOR2 (C2)
5.COLLECTOR1 (C1)

USV

| | |
|---|---|
| JEDEC | — |
| JEITA | — |
| TOSHIBA | 2-2L1C |

Weight: 0.0062g (typ.)

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

| Characteristic | Symbol | Rating | Unit |
|---|---|---|---|
| Collector-base voltage | $V_{CBO}$ | −50 | 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 | $T_j$ | 150 | °C |
| Storage temperature range | $T_{stg}$ | −55 to 150 | °C |

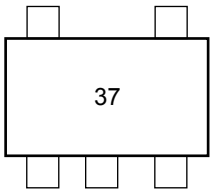
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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: Power dissipation per element should not exceed 130mW.

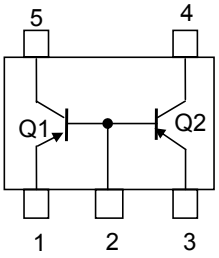
## Electrical Characteristics (Ta = 25°C) (Q1,Q2 Common)

| Characteristic | Symbol | Test Circuit | Test Condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|
| Collector cut-off current | $I_{CBO}$ | — | $V_{CB}$ = −50V, $I_E$ = 0 | — | — | −0.1 | μA |
| Emitter cut-off current | $I_{EBO}$ | — | $V_{EB}$ = −5V, $I_C$ = 0 | — | — | −0.1 | μA |
| DC current gain | $h_{FE}$ | — | $V_{CE}$ = −6V, $I_C$ = −2mA | 120 | — | 400 | |
| Collector-emitter saturation voltage | $V_{CE}$ | — | $I_C$ = −100mA, $I_B$ = −10mA | — | −0.1 | −0.3 | V |
| Transition frequency | $f_T$ | — | $V_{CE}$ = −10V, $I_C$ = −1mA | 60 | — | — | MHz |
| Collector output capacitance | $C_{ob}$ | — | $V_{CB}$ = −10V, $I_E$ = 0, f = 1MHz | — | 4 | — | pF |

## Marking



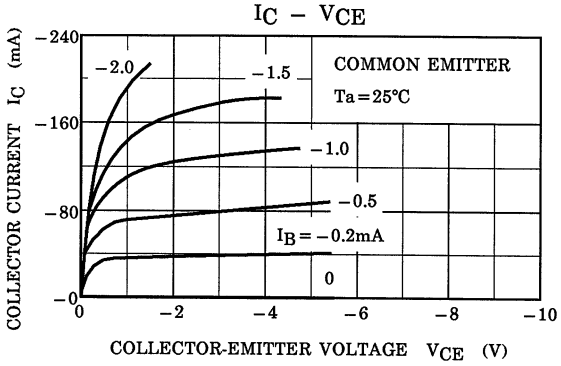

## Equivalent Circuit (Top View)



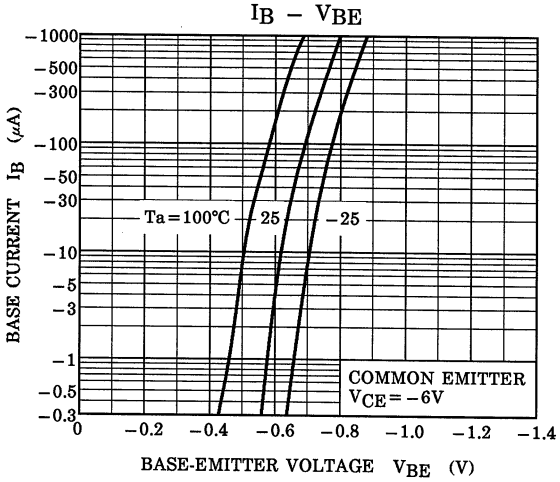

Start of commercial production
2000-09

(Q1, Q2 Common)

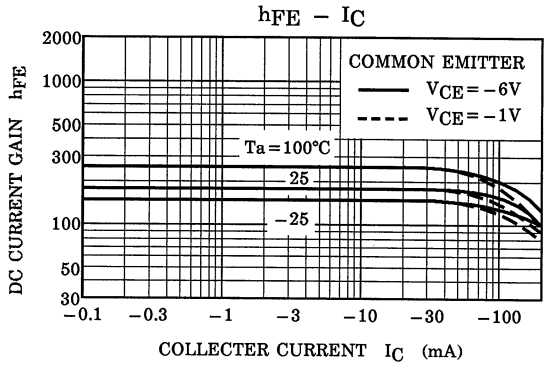
$I_C - V_{CE}$




$I_B - V_{BE}$

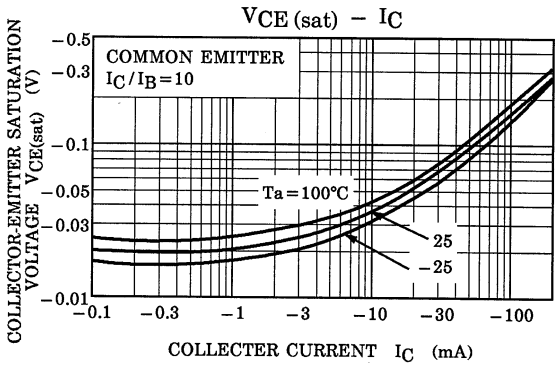



$h_{FE} - I_C$



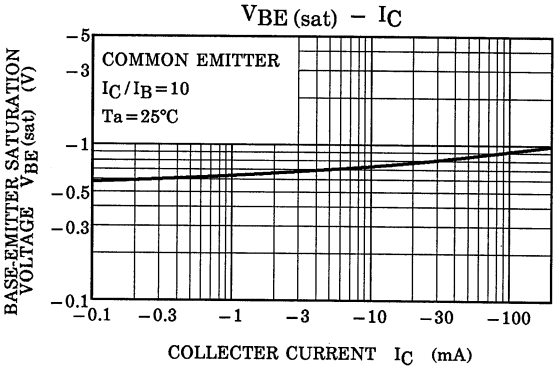

COLLECTOR

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



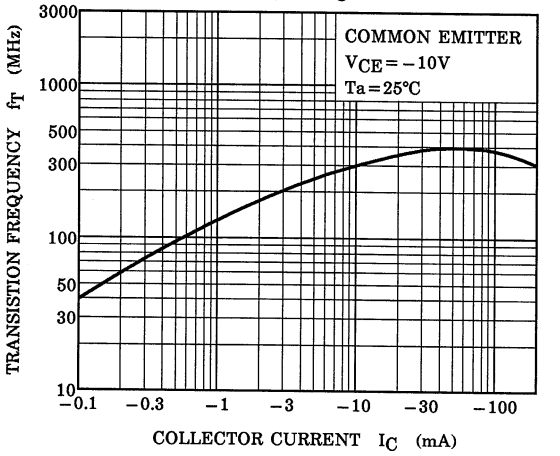

COLLECTOR

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

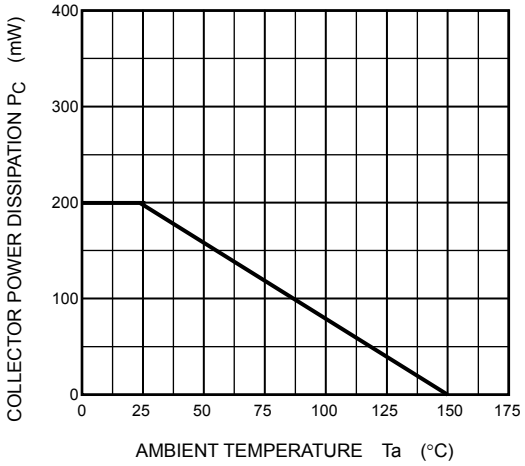



COLLECTOR

$f_T - I_C$




$P_C^* - Ta$




*:Total Rating

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