

TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

# HN1A01F

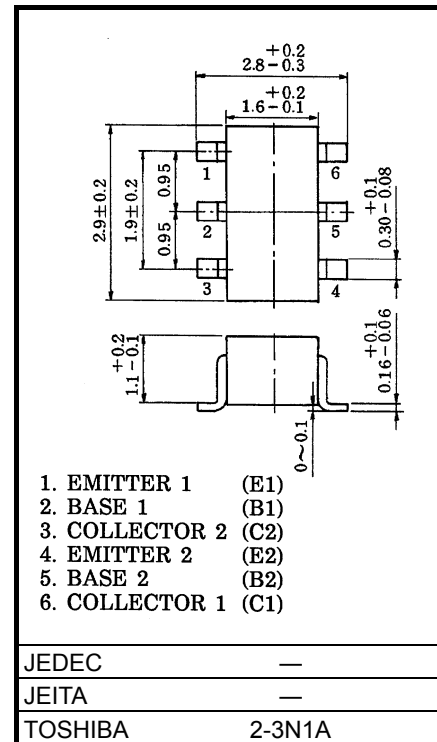
## Audio-Frequency General-Purpose Amplifier Applications

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	$V_{CBO}$	-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	$P_C^*$	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	$I_{CBO}$	—	$V_{CB} = -50\text{ V}$ , $I_E = 0$	—	—	-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	$V_{CE}(\text{sat})$	—	$I_C = -100\text{ mA}$ , $I_B = -10\text{ mA}$	—	-0.1	-0.3	V
Transition frequency	$f_T$	—	$V_{CE} = -10\text{ V}$ , $I_C = -1\text{ mA}$	80	—	—	MHz
Collector output capacitance	$C_{ob}$	—	$V_{CB} = -10\text{ V}$ , $I_E = 0$ , $f = 1\text{ MHz}$	—	4	7	pF

Note:  $h_{FE}$  Classification

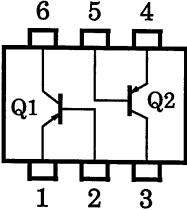
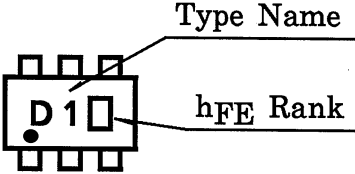
Y (Y): 120 to 240, GR (G): 200 to 400

( ) Marking Symbol

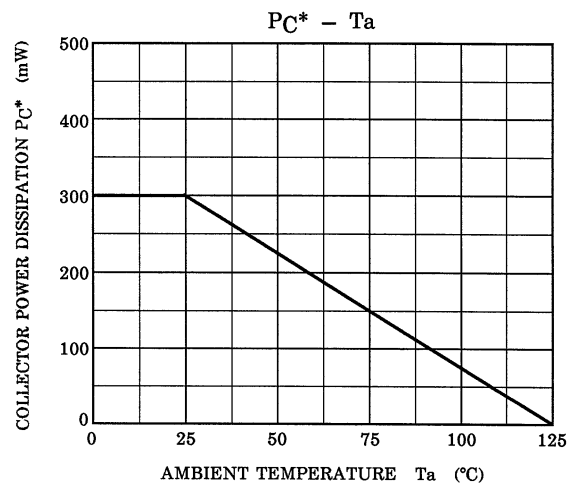
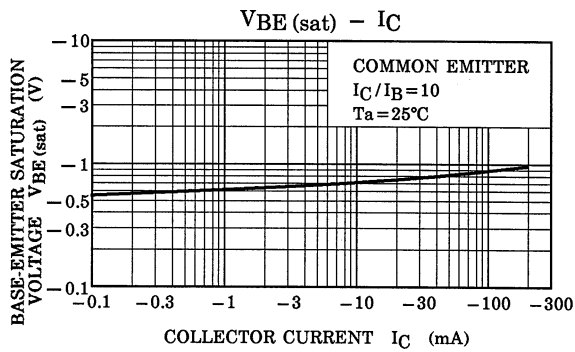
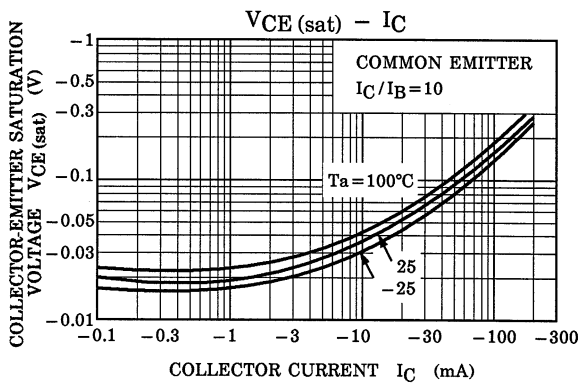
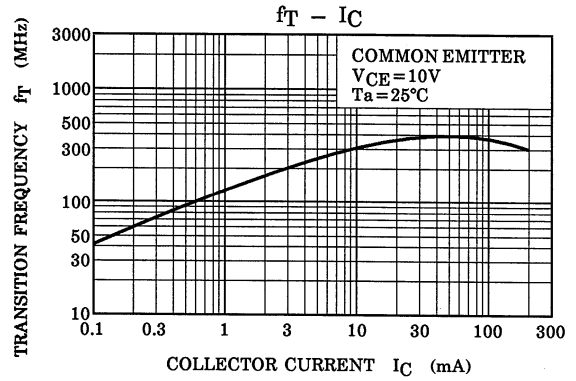
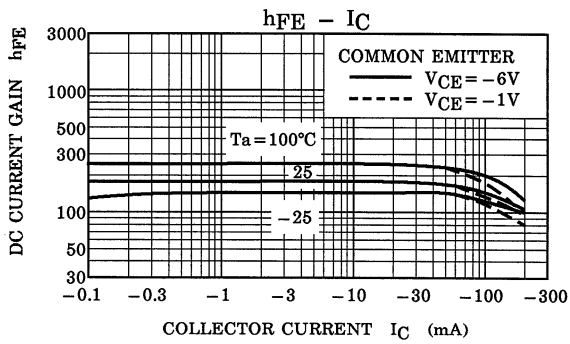
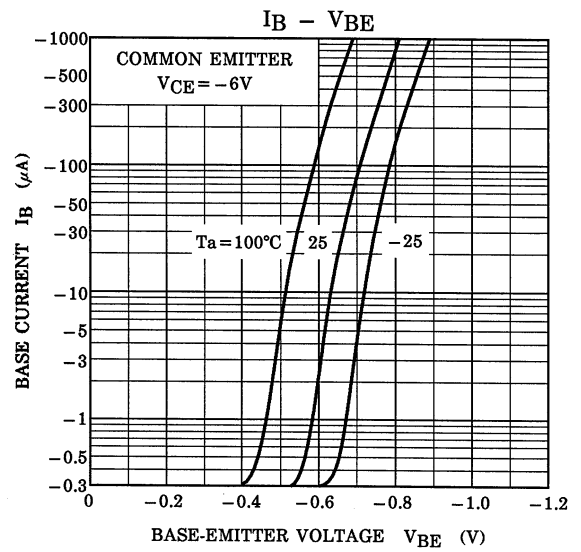
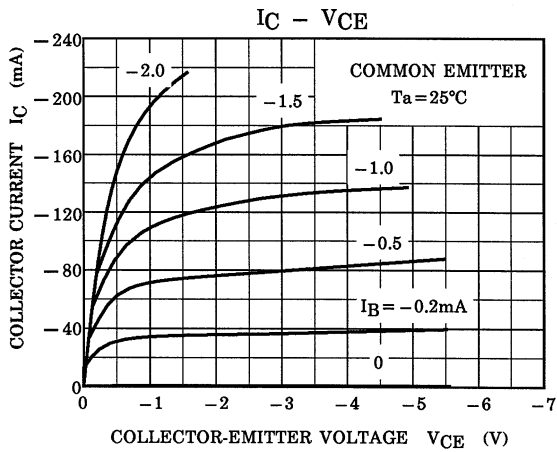
Start of commercial production  
1988-11

**Marking**

**Equivalent Circuit (Top View)**



(Q1, Q2 Common)



\* : Total Rating

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