

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process)

## HN1C01F

### Audio Frequency General Purpose Amplifier Applications

- 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	$T_j$ (Note 1)	150	°C
	$T_j$ (Note 2)	125	
Storage temperature range	$T_{stg}$ (Note 1)	-55 to 150	°C
	$T_{stg}$ (Note 2)	-55 to 125	

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

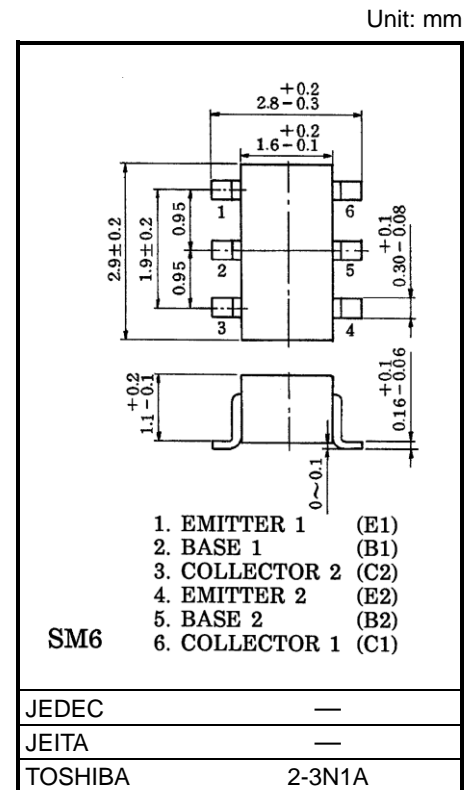
Note 2: For devices with the ordering part number ending in LF(T).

Note 3: For devices with the ordering part number in other than LF(T).

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

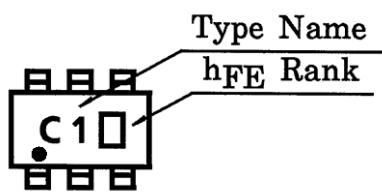
Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	—	$V_{CB} = 60\text{ V}$ , $I_E = 0\text{ A}$	—	—	0.1	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	—	$V_{EB} = 5\text{ V}$ , $I_C = 0\text{ A}$	—	—	0.1	$\mu\text{A}$
DC current gain	$h_{FE}$ (Note)	—	$V_{CE} = 6\text{ V}$ , $I_C = 2\text{ mA}$	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	$C_{ob}$	—	$V_{CB} = 10\text{ V}$ , $I_E = 0\text{ A}$ , $f = 1\text{ MHz}$	—	2	3.5	pF

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

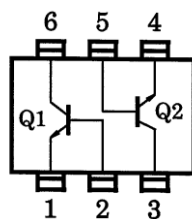


Weight: 0.015 g (typ.)

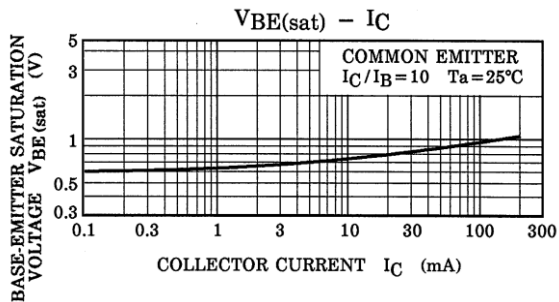
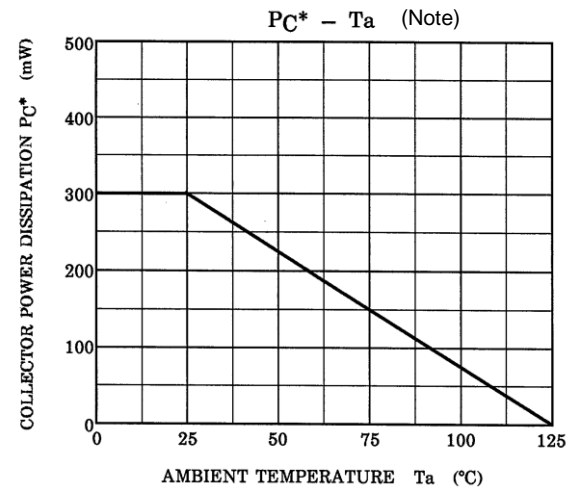
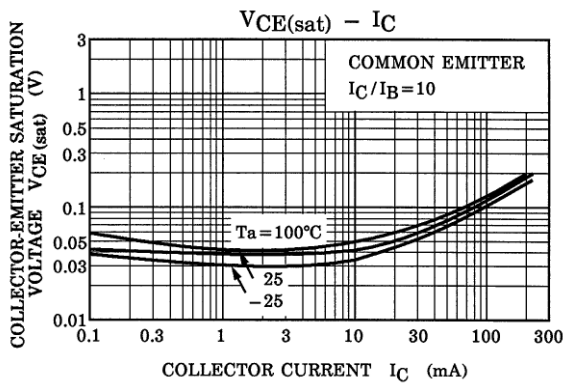
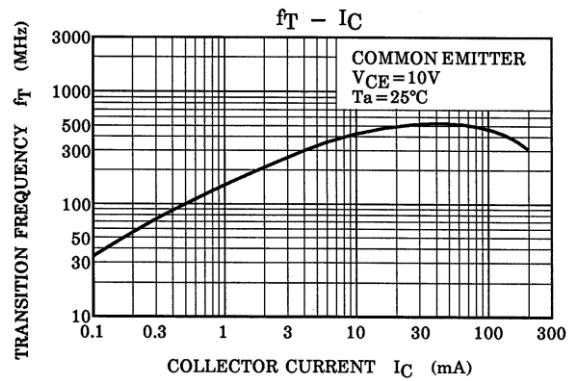
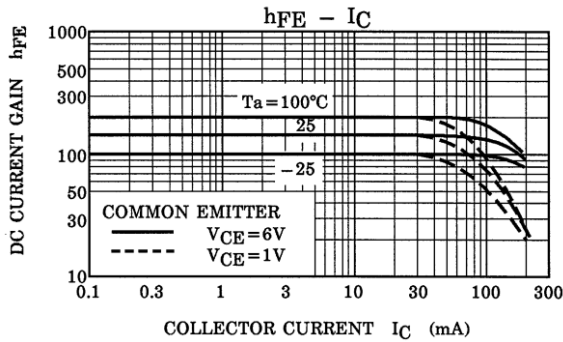
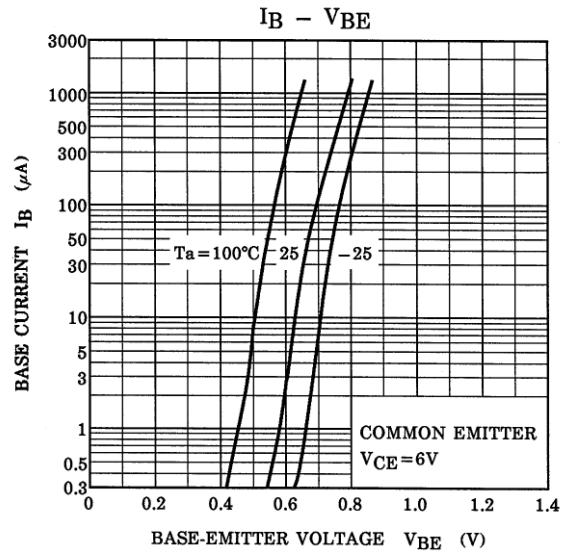
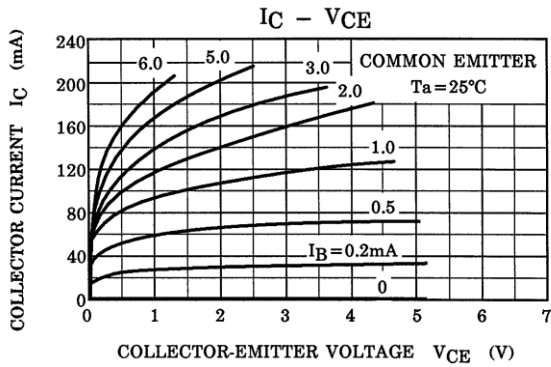
### Marking



### Equivalent Circuit (Top View)



## Characteristics Curves (Q1, Q2 Common)



\* : Total Rating

Note: Reference only with  $T_j$  of  $125^\circ\text{C}$ .

The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

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