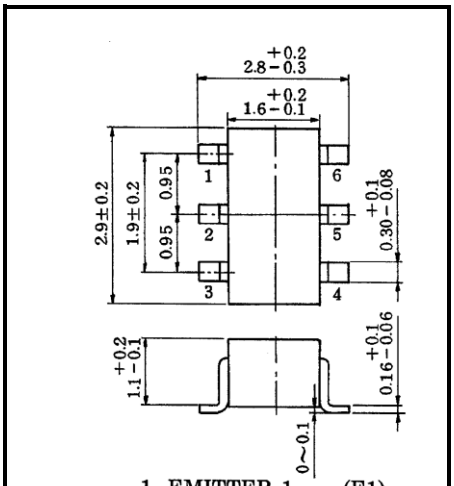
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process)

HN1C01F

Audio Frequency General Purpose Amplifier Applications

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

Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	2-3N1A

Weight: 0.015 g (typ.)

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*	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.

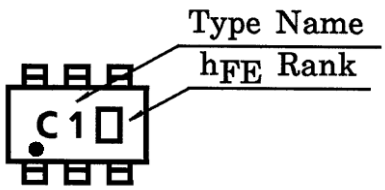
Electrical Characteristics (Ta = 25°C) (Q1, Q2 Common)

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

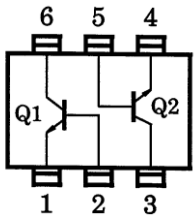
Note: h_{FE} Classification
Y (Y): 120 to 240, GR (G): 200 to 400
( ) Marking symbol

Start of commercial production
1988-01

Marking

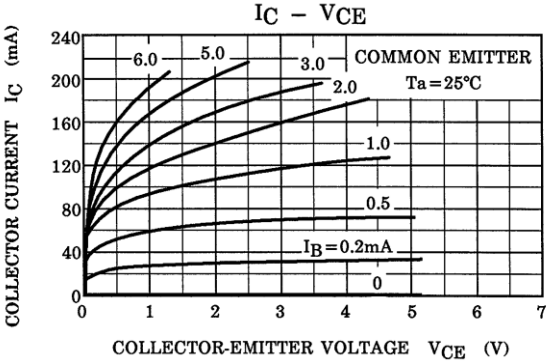


Equivalent Circuit (Top View)

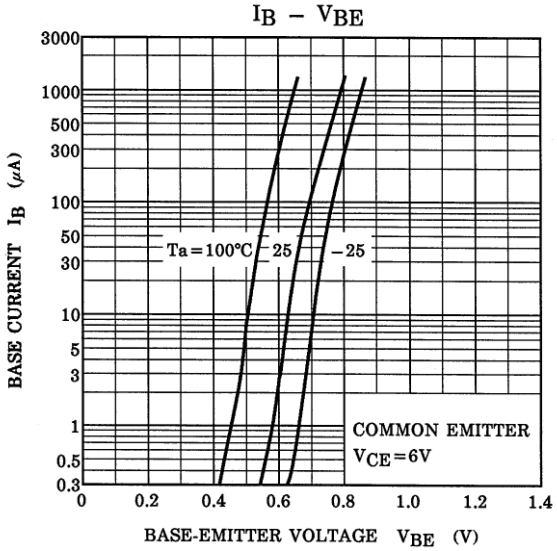


Characteristics Curves (Q1, Q2 Common)

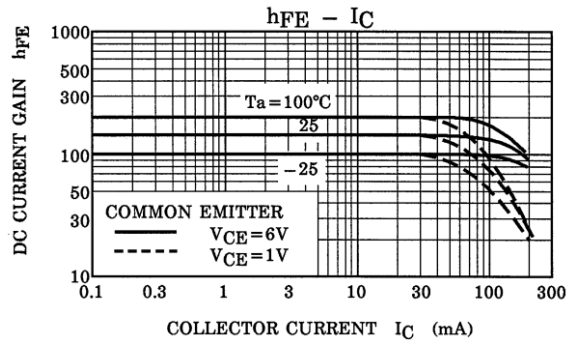
I_C – V_{CE}



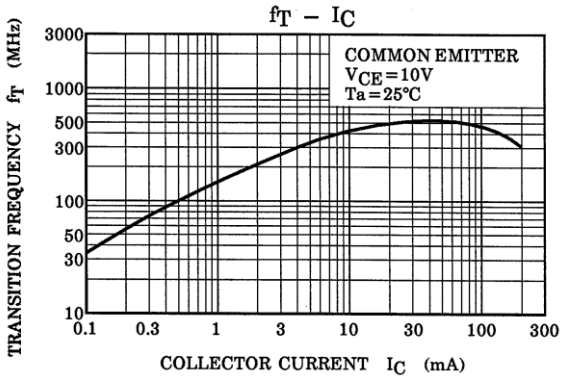
I_B – V_{BE}



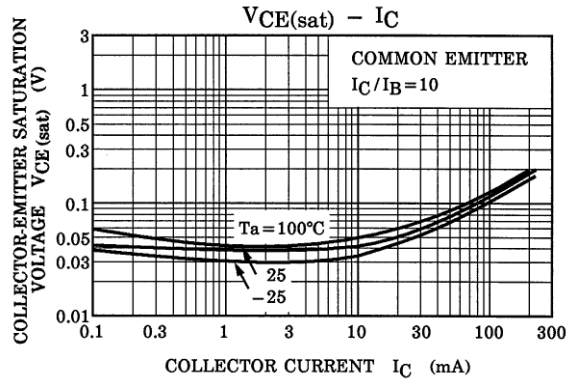
h_{FE} – I_C



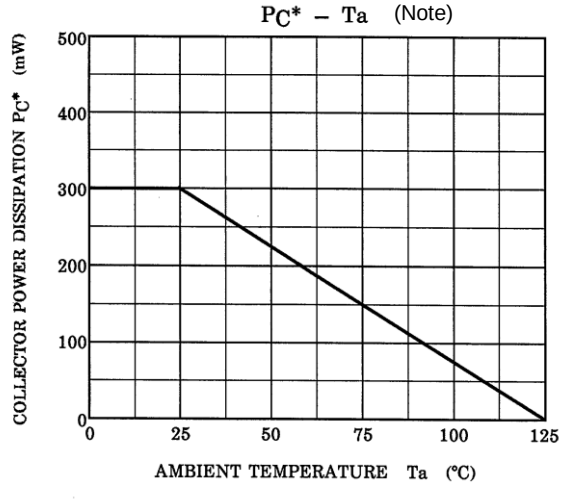
f_T – I_C



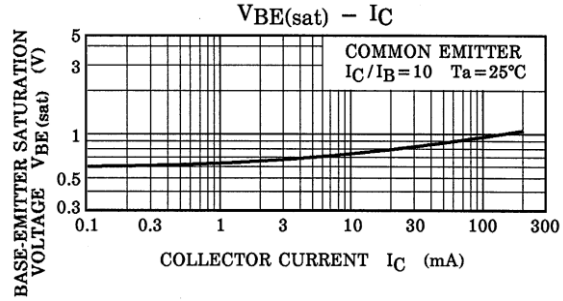
$V_{CE(sat)}$ – I_C



P_C* – Ta (Note)



$V_{BE(sat)}$ – I_C



* : Total Rating

Note: Rreference only with T_j of 125 °C.

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

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