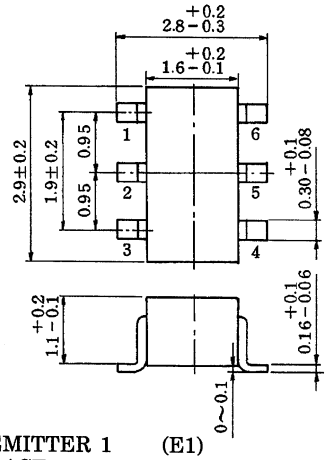
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

HN1A01F

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}	−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	°C
Storage temperature range	T_{stg}	−55 to 125	°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

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} = −50 V, I_E = 0	—	—	−0.1	μA
Emitter cut-off current	I_{EBO}	—	V_{EB} = −5 V, I_C = 0	—	—	−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	−0.3	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, f = 1 MHz	—	4	7	pF

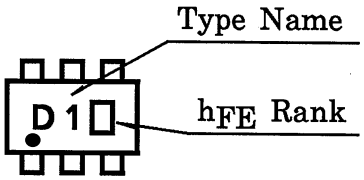
Note:hFE Classification

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

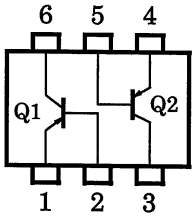
( ) Marking Symbol

Start of commercial production
1988-11

Marking

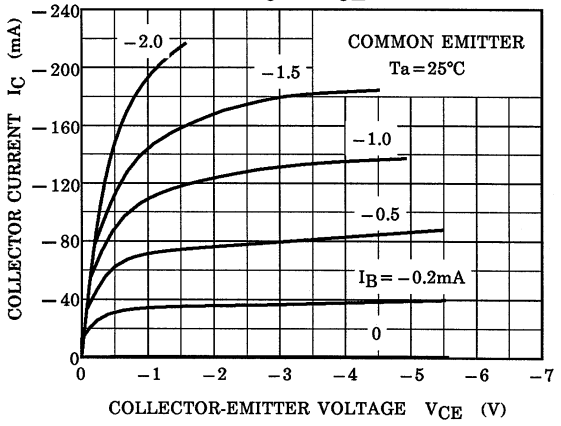


Equivalent Circuit (Top View)

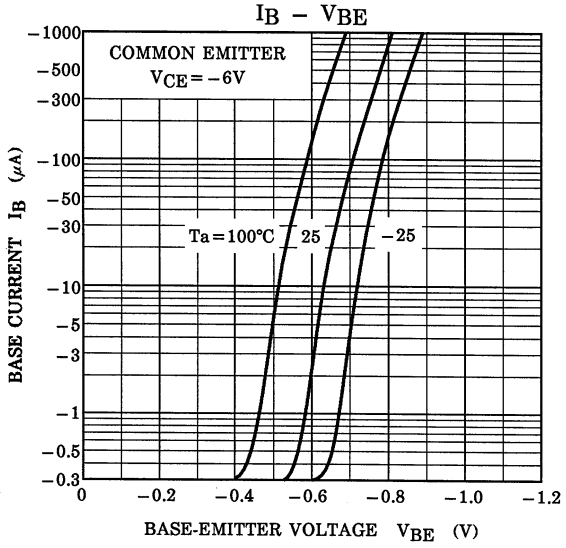


(Q1, Q2 Common)

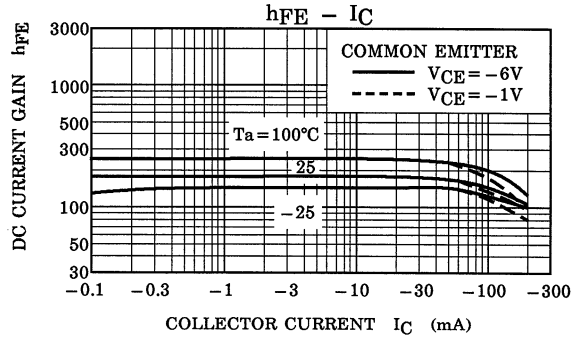
$I_C - V_{CE}$



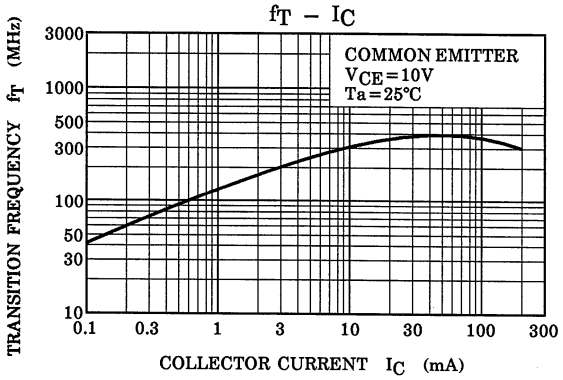
$I_B - V_{BE}$



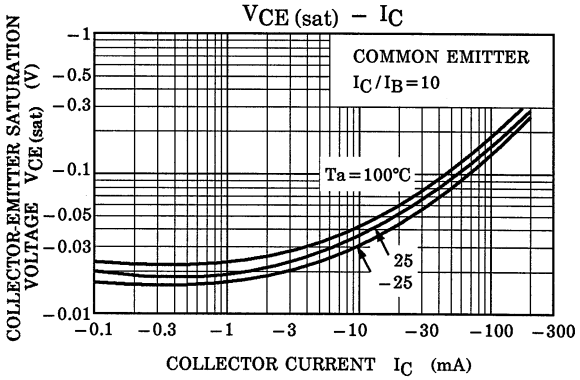
$h_{FE} - I_C$



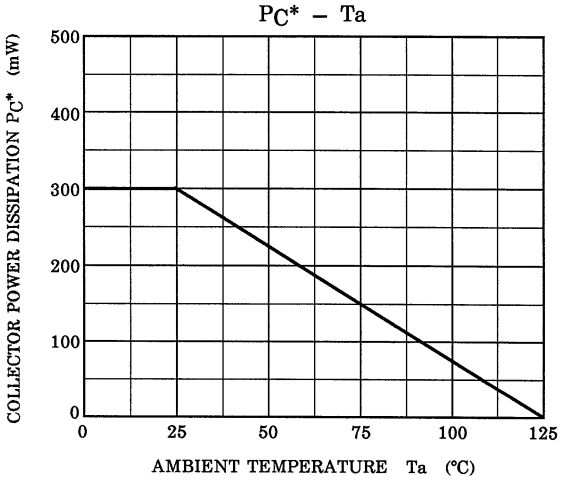
$f_T - I_C$



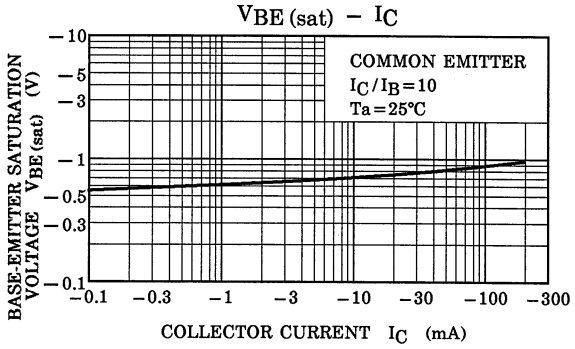
$V_{CE\,(sat)} - I_C$



$P_C^* - Ta$



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



* : Total Rating

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