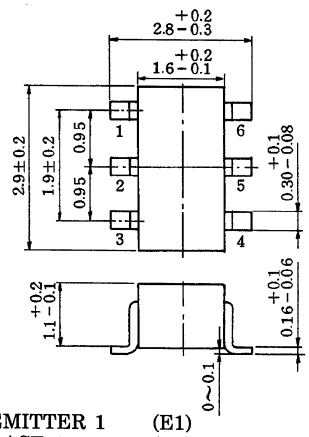
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

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} = 120~400
- Excellent h_{FE} linearity
  : h_{FE} (I_C = −0.1 mA) / h_{FE} (I_C = −2 mA) = 0.95 (typ.)

Unit: mm



1. EMITTER 1 (E1)
2. BASE 1 (B1)
3. COLLECTOR 2 (C2)
4. EMITTER 2 (E2)
5. BASE 2 (B2)
6. COLLECTOR 1 (C1)

JEDEC	—
JEITA	—
TOSHIBA	2-3N1A

Weight: 0.015 g (typ.)

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}	−55~125	°C

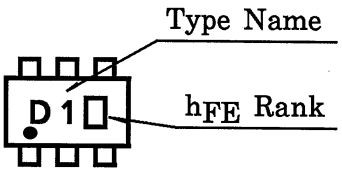
*Total rating

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

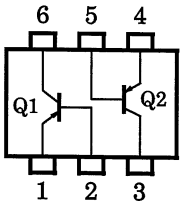
Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	—	V_{CB} = −50 V, I_E = 0	—	—	−0.1	μA
Emitter cut-off current	I_{EBO}	—	V_{EB} = −5 V, I_C = 0	—	—	−0.1	μA
DC current gain	$h_{FE\ (note)}$	—	V_{CE} = −6 V, I_C = −2 mA	120	—	400	—
Collector-emitter 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): 120~240, GR (G): 200~400
( ) Marking Symbol

Marking

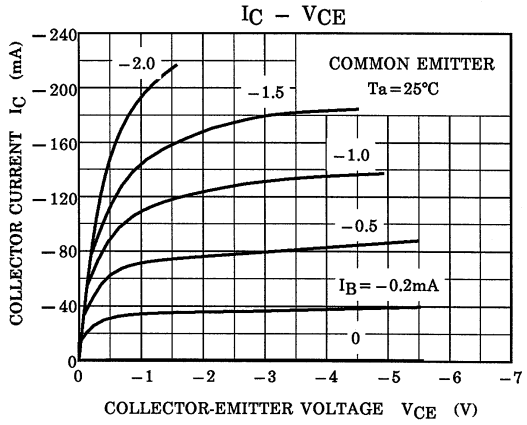


Equivalent Circuit (Top View)

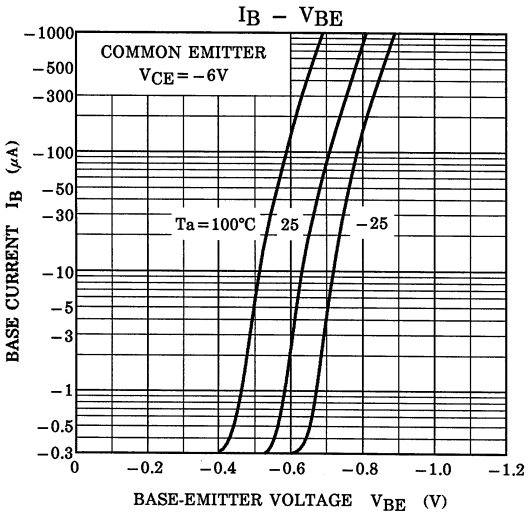


(Q1, Q2 Common)

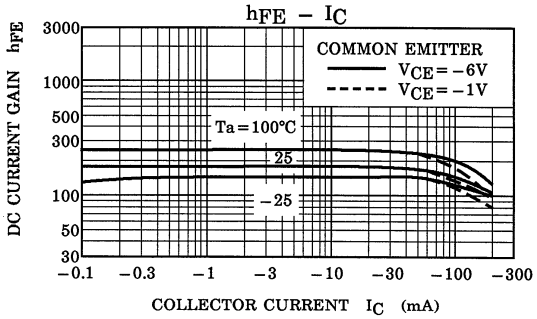
I_C – V_{CE}



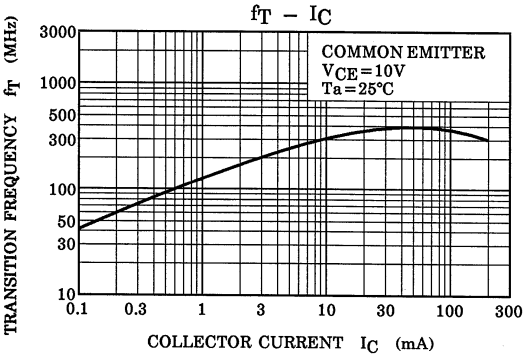
I_B – V_{BE}



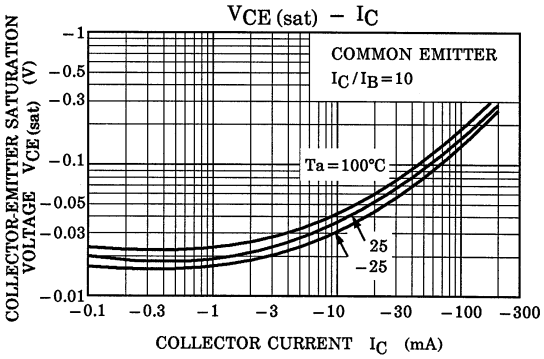
h_{FE} – I_C



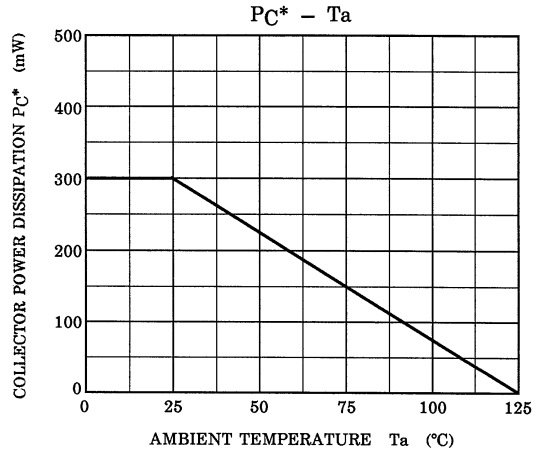
f_T – I_C



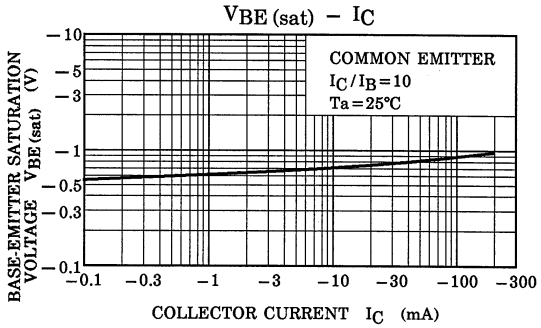
$V_{CE\,(sat)}$ – I_C



P_C* – Ta



$V_{BE\,(sat)}$ – I_C



* : Total Rating

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