

TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

HN1A02F

Audio Frequency Power Amplifier Applications
Switching applications

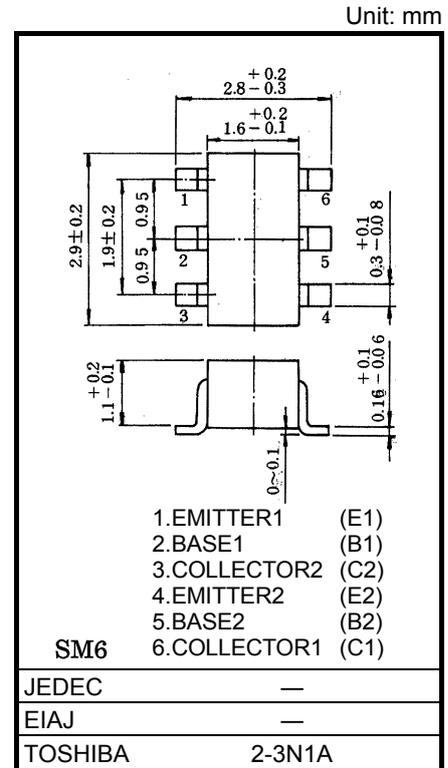
- High h_{FE} : $h_{FE(1)} = 120\sim 400$
- Low $V_{CE(sat.)}$: $V_{CE(sat)} = -0.2\text{ V (max.)}$ ($I_C = -400\text{ mA}$, $I_B = -8\text{ mA}$)
- Small Power Motor Driver Application.

Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$) (Q1, Q2 Common)

Characteristic	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	-15	V
Collector-emitter voltage	V_{CEO}	-15	V
Emitter-base voltage	V_{EBO}	-5	V
Collector current	I_C	-800	mA
Base current	I_B	-160	mA
Collector power dissipation	P_C^*	300	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature range	T_{stg}	-55~150	$^\circ\text{C}$

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. Power dissipation per element should not exceed 200mW.



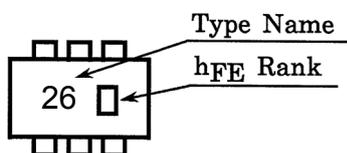
Weight: 0.015mg(typ)

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

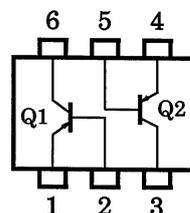
Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	—	$V_{CB} = -15\text{V}$, $I_E = 0$	—	—	-100	nA
Emitter cut-off current	I_{EBO}	—	$V_{EB} = -5\text{V}$, $I_C = 0$	—	—	-100	nA
Collector-Emitter Brakedown Voltage	$V_{(BR)CEO}$	—	$I_C = -10\text{mA}$, $I_B = 0$	-15	—	—	V
DC current gain	$h_{FE(1)}$ (Note)	—	$V_{CE} = -1\text{V}$, $I_C = -100\text{mA}$	120	—	400	
	$h_{FE(2)}$	—	$V_{CE} = -1\text{V}$, $I_C = -800\text{mA}$	40	—	—	
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	$I_C = -400\text{mA}$, $I_B = -8\text{mA}$	—	—	-0.2	V
Base-Emitter voltage	V_{BE}	—	$V_{CE} = -5\text{V}$, $I_C = -10\text{mA}$	-0.5	—	-0.8	V
Transition frequency	f_T	—	$V_{CE} = -5\text{V}$, $I_C = -10\text{mA}$	—	120	—	MHz
Collector output capacitance	C_{ob}	—	$V_{CB} = -10\text{V}$, $I_E = 0$, $f = 1\text{MHz}$	—	13	—	pF

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

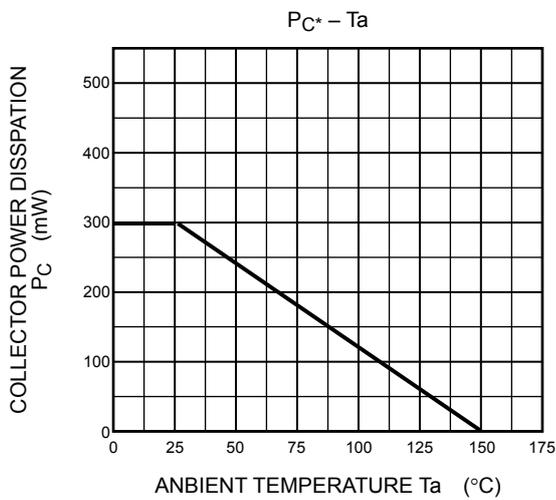
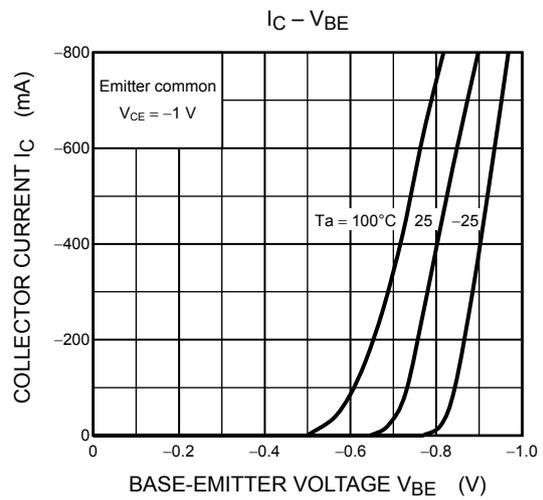
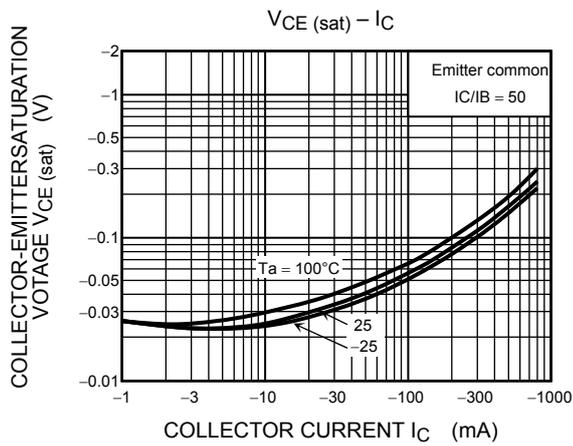
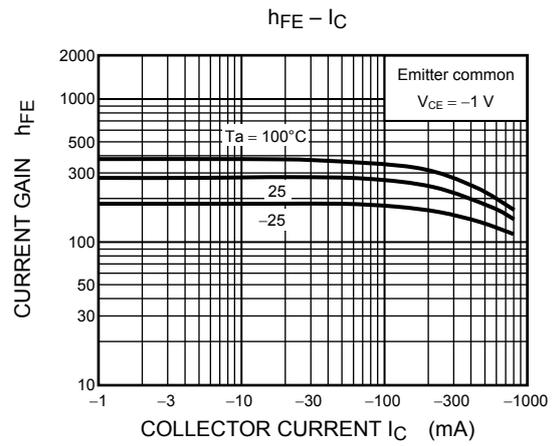
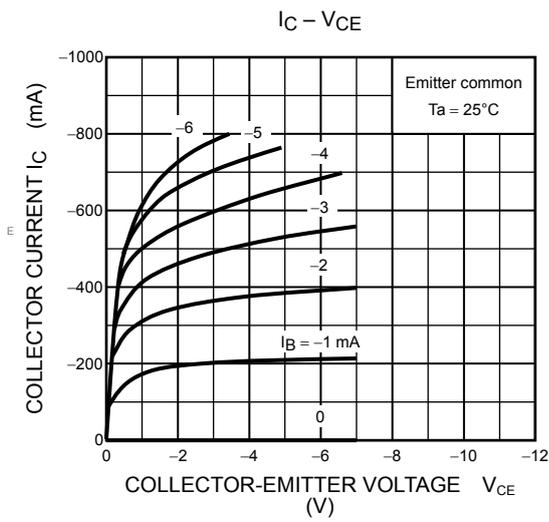
Marking



Equivalent Circuit (Top View)



(Q1,Q2 Common)



*Total Rating.

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20070701-EN GENERAL

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