

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

HN1B26FS

General-Purpose Amplifier Applications

Q1

- High voltage and high current
: $V_{CEO} = 50\text{ V}$, $I_C = 100\text{ mA}$ (max)
- Excellent h_{FE} linearity : $h_{FE} (I_C = 0.1\text{ mA})/h_{FE} (I_C = 2\text{ mA}) = 0.95$ (typ.)
- High h_{FE} : $h_{FE} = 120\sim 400$

Q2

- High voltage and high current
: $V_{CEO} = -50\text{ V}$, $I_C = -100\text{ mA}$ (max)
- Excellent h_{FE} linearity :
 $h_{FE} (I_C = -0.1\text{ mA})/h_{FE} (I_C = -2\text{ mA}) = -0.95$ (typ.)
- High h_{FE} : $h_{FE} = 120\sim 400$

Q1 Absolute Maximum Ratings (Ta = 25°C)

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	100	mA
Base current	I_B	30	mA

Q2 Absolute Maximum Ratings (Ta = 25°C)

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	-100	mA
Base current	I_B	-30	mA

Q1, Q2 Common Absolute Maximum Ratings (Ta = 25°C)

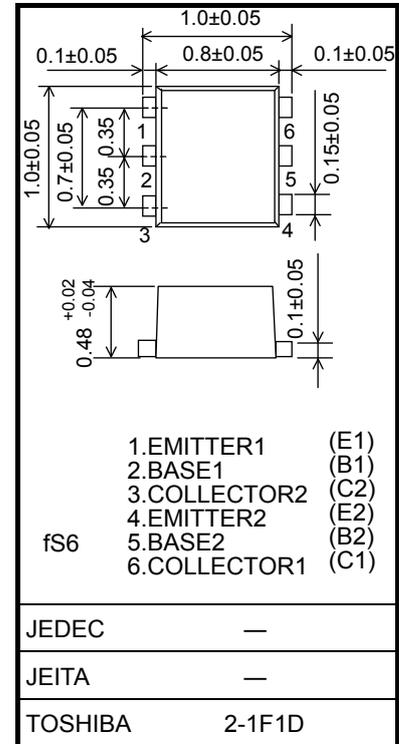
Characteristic	Symbol	Rating	Unit
Collector power dissipation	P_C	50*	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	-55~150	°C

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

Unit: mm



Weight: 0.0008 g (typ.)

Q1 Electrical Characteristics (Ta = 25°C)

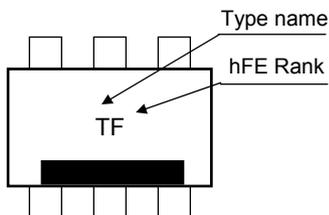
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cutoff current	I_{CBO}	$V_{CB} = 60\text{ V}, I_E = 0$	—	—	0.1	μA
Emitter cutoff current	I_{EBO}	$V_{EB} = 5\text{ V}, I_C = 0$	—	—	0.1	μA
DC current gain	h_{FE} (Note)	$V_{CE} = 6\text{ V}, I_C = 2\text{ mA}$	120	—	400	—
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 100\text{ mA}, I_B = 10\text{ mA}$	—	0.1	0.25	V
Transition frequency	f_T	$V_{CE} = 10\text{ V}, I_C = 1\text{ mA}$	60	—	—	MHz
Collector output capacitance	C_{ob}	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	0.95	—	pF

Q2 Electrical Characteristics (Ta = 25°C)

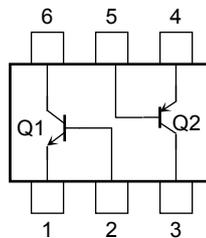
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cutoff current	I_{CBO}	$V_{CB} = -50\text{ V}, I_E = 0$	—	—	-0.1	μA
Emitter cutoff current	I_{EBO}	$V_{EB} = -5\text{ V}, I_C = 0$	—	—	-0.1	μA
DC current gain	h_{FE} (Note)	$V_{CE} = -6\text{ V}, I_C = -2\text{ mA}$	120	—	400	—
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -100\text{ mA}, I_B = -10\text{ mA}$	—	-0.18	-0.3	V
Transition frequency	f_T	$V_{CE} = -10\text{ V}, I_C = -1\text{ mA}$	80	—	—	MHz
Collector output capacitance	C_{ob}	$V_{CB} = -10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	1.6	—	pF

Note: h_{FE} classification Y (F): 120~240, GR (H): 200~400
 () marking symbol

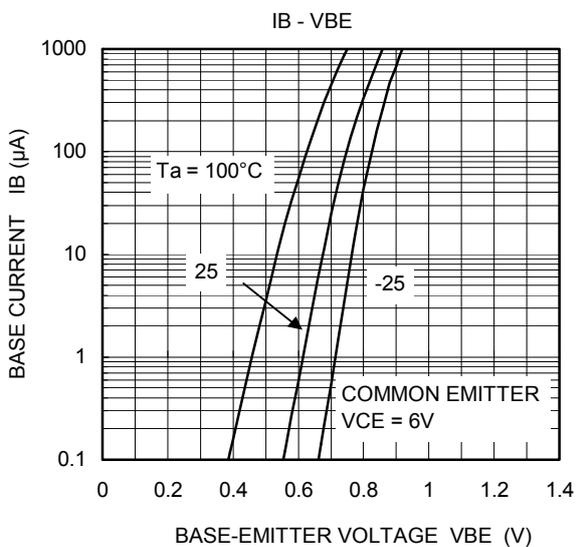
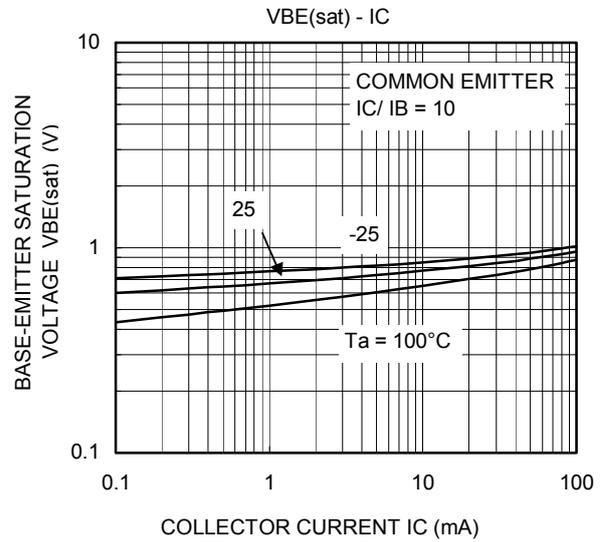
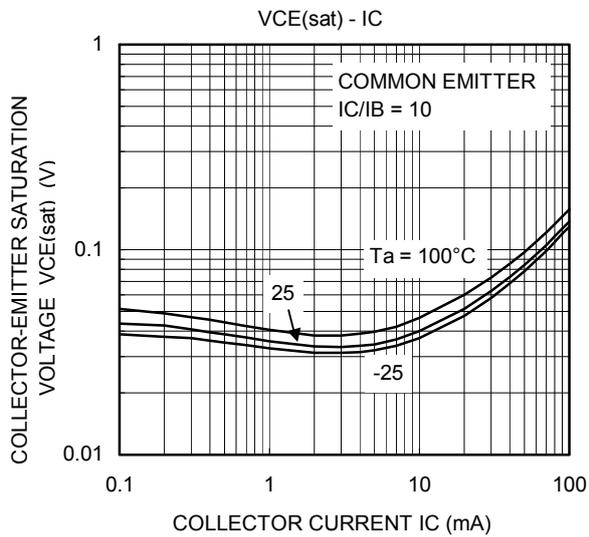
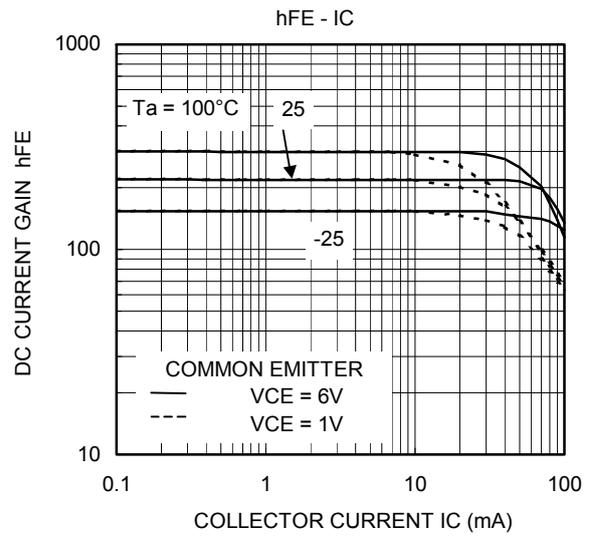
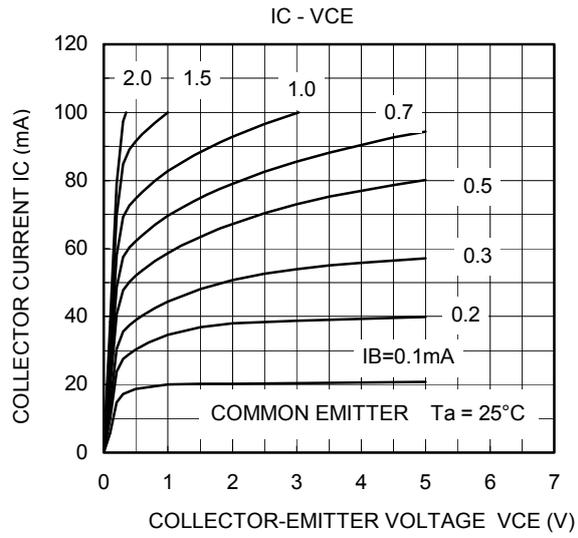
Marking (top view)



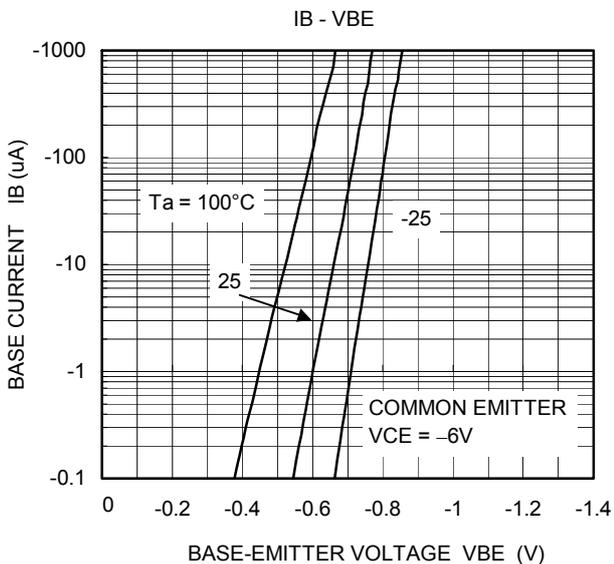
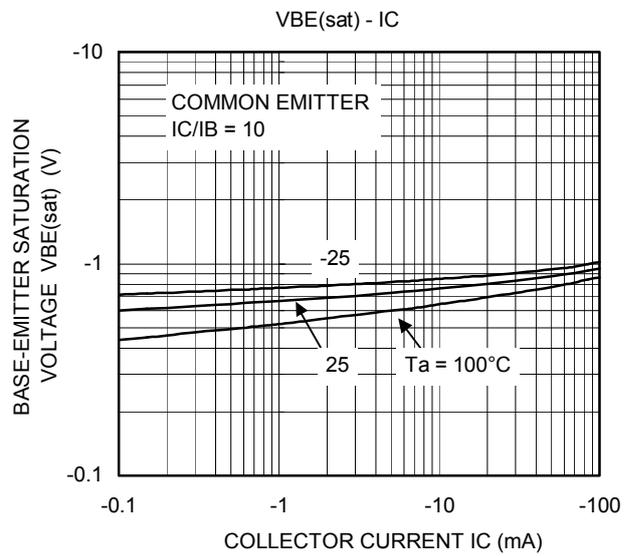
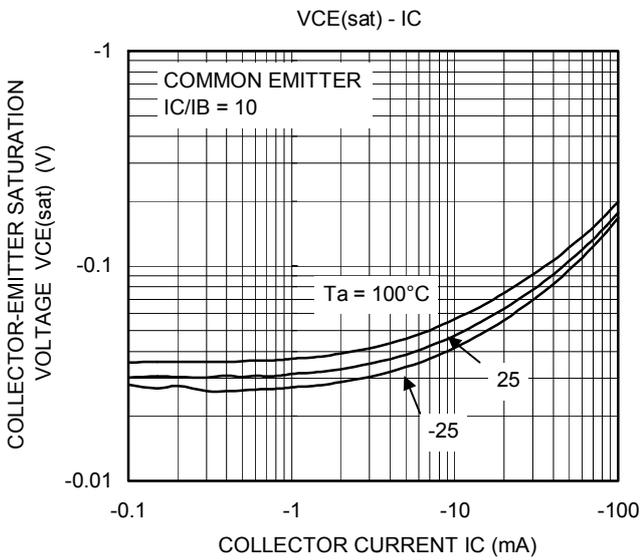
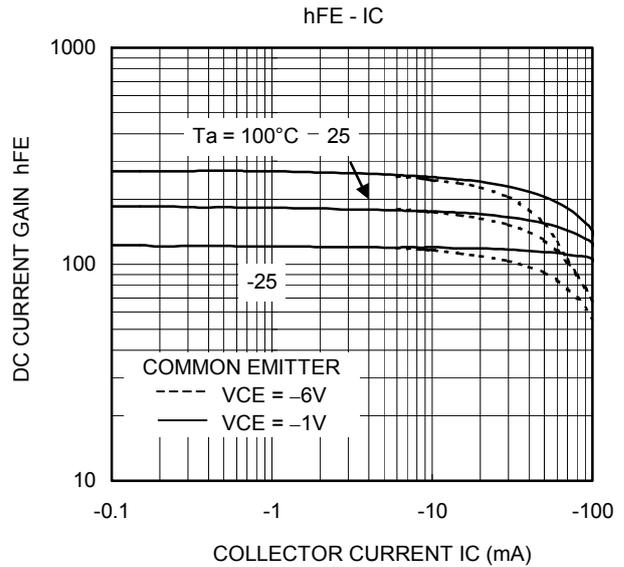
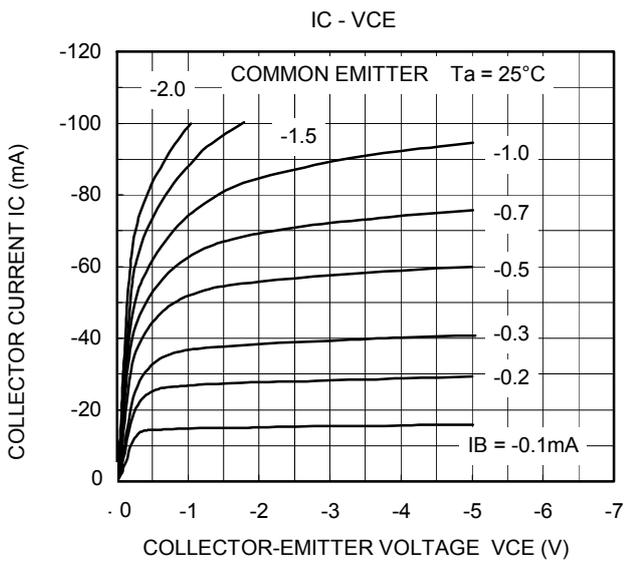
Equivalent Circuit



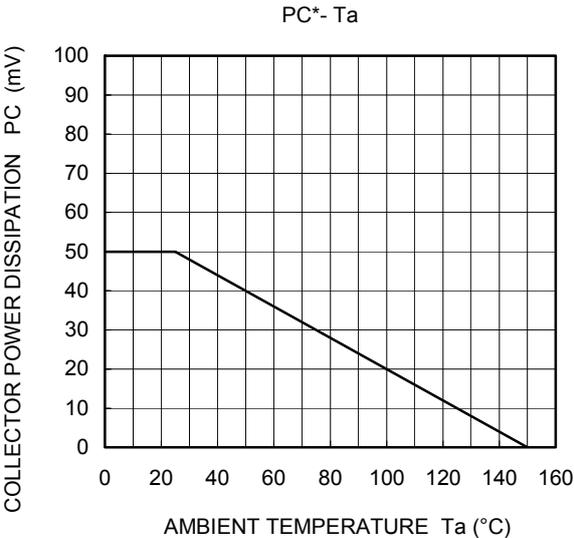
Q1



Q2



Q1, Q2 COMMON



*: Total rating

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20070701-EN GENERAL

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