TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

HN1B26FS

General-Purpose Amplifier Applications

Q1

High voltage and high current

: V_{CEO} = 50 V, I_C = 100 mA (max)

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

Q2

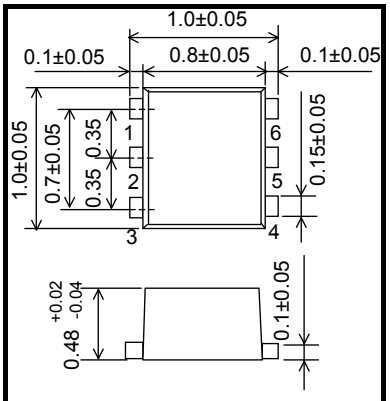
High voltage and high current

: V_{CEO} = −50 V, I_C = −100 mA (max)

- Excellent h_{FE} linearity :

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

Unit: mm



1.EMITTER1	(E1)
2.BASE1	(B1)
3.COLLECTOR2	(C2)
4.EMITTER2	(E2)
fS6 5.BASE2	(B2)
6.COLLECTOR1	(C1)

JEDEC	—
JEITA	—
TOSHIBA	2-1F1D

Weight: 0.0008 g (typ.)

Q1 Absolute Maximum Ratings (Ta = 25°C)

Characteristics	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)

Characteristics	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)

Characteristics	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

Q1 Electrical Characteristics (Ta = 25°C)

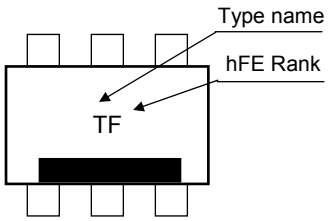
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cutoff current	I_{CBO}	V_{CB} = 60 V, I_E = 0	—	—	0.1	μA
Emitter cutoff current	I_{EBO}	V_{EB} = 5 V, I_C = 0	—	—	0.1	μA
DC current gain	h_{FE} (Note)	V_{CE} = 6 V, I_C = 2 mA	120	—	400	—
Collector-emitter saturation voltage	$V_{CE\ (sat)}$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

Q2 Electrical Characteristics (Ta = 25°C)

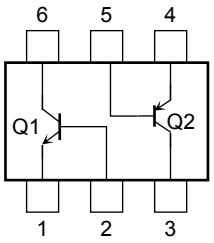
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cutoff current	I_{CBO}	V_{CB} = −50 V, I_E = 0	—	—	−0.1	μA
Emitter cutoff current	I_{EBO}	V_{EB} = −5 V, I_C = 0	—	—	−0.1	μA
DC current gain	h_{FE} (Note)	V_{CE} = −6 V, I_C = −2 mA	120	—	400	—
Collector-emitter saturation voltage	$V_{CE\ (sat)}$	I_C = −100 mA, I_B = −10 mA	—	−0.18	−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	—	1.6	—	pF

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

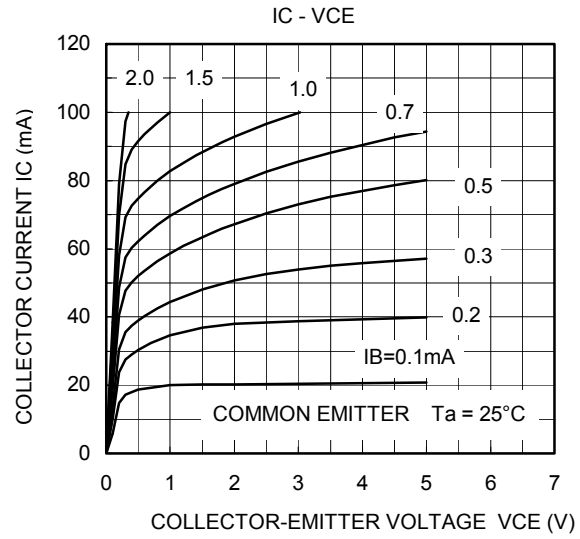
Marking

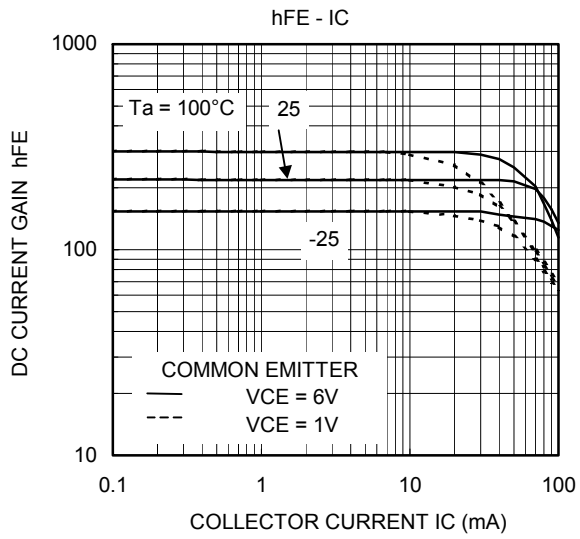


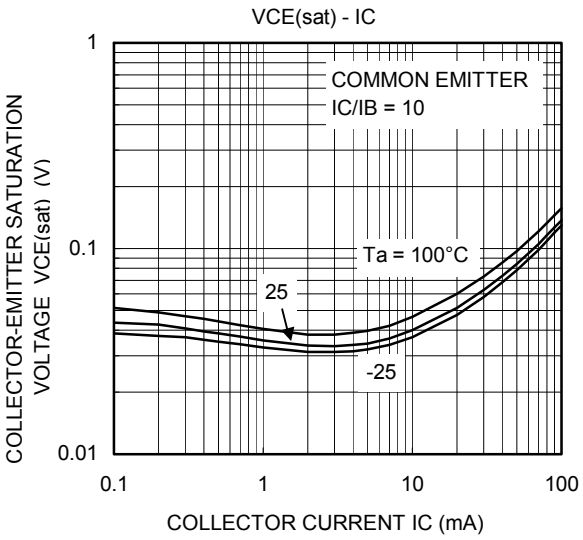
Equivalent Circuit (top view)

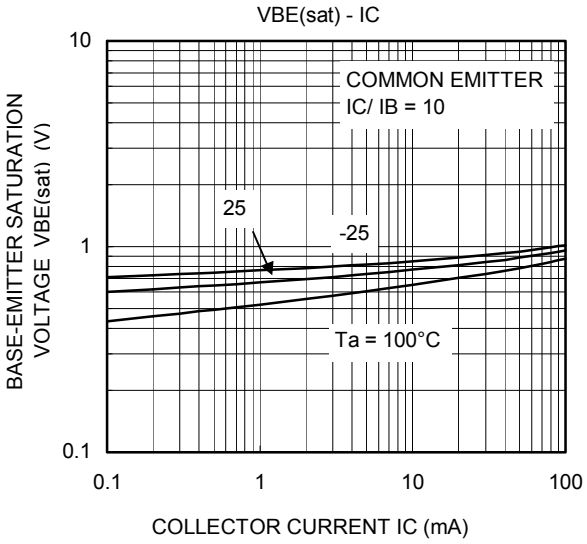


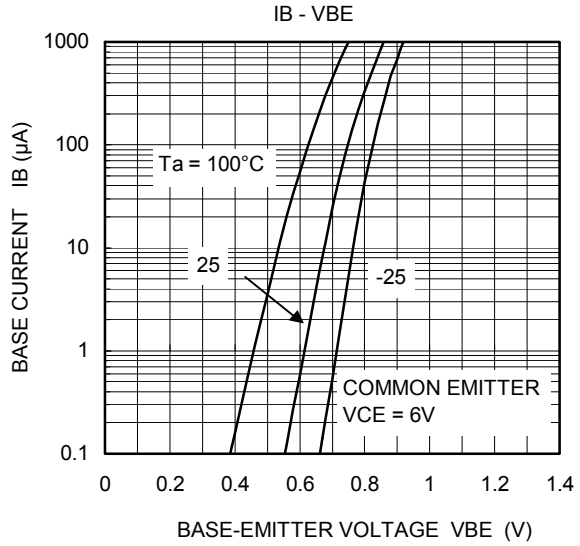
Q1


IC - VCE
COLLECTOR CURRENT IC (mA)
COLLECTOR-EMITTER VOLTAGE VCE (V)
2.0
1.5
1.0
0.7
0.5
0.3
0.2
IB=0.1mA
COMMON EMITTER Ta = 25°C


hFE - IC
DC CURRENT GAIN hFE
COLLECTOR CURRENT IC (mA)
Ta = 100°C
25
-25
COMMON EMITTER
VCE = 6V
VCE = 1V

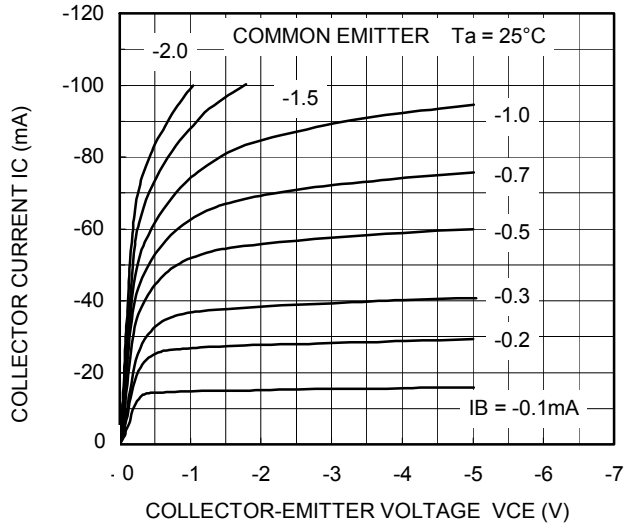

VCE(sat) - IC
COLLECTOR-EMITTER SATURATION VOLTAGE VCE(sat) (V)
COLLECTOR CURRENT IC (mA)
COMMON EMITTER
IC/IB = 10
Ta = 100°C
25
-25


VBE(sat) - IC
BASE-EMITTER SATURATION VOLTAGE VBE(sat) (V)
COLLECTOR CURRENT IC (mA)
COMMON EMITTER
IC/ IB = 10
25
-25
Ta = 100°C

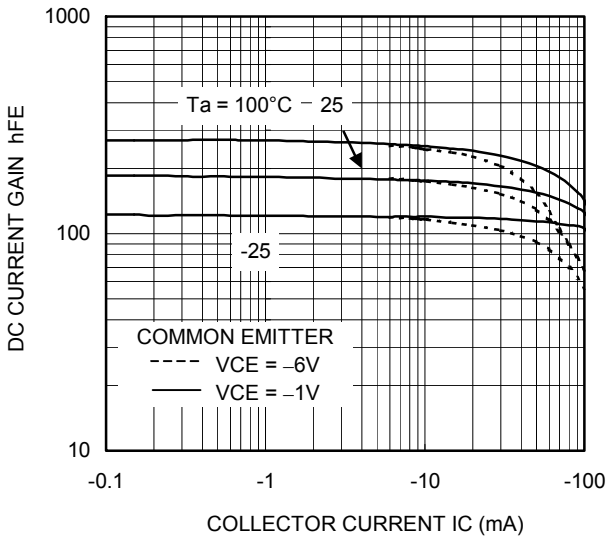

IB - VBE
BASE CURRENT IB (μA)
BASE-EMITTER VOLTAGE VBE (V)
Ta = 100°C
25
-25
COMMON EMITTER
VCE = 6V

Q2

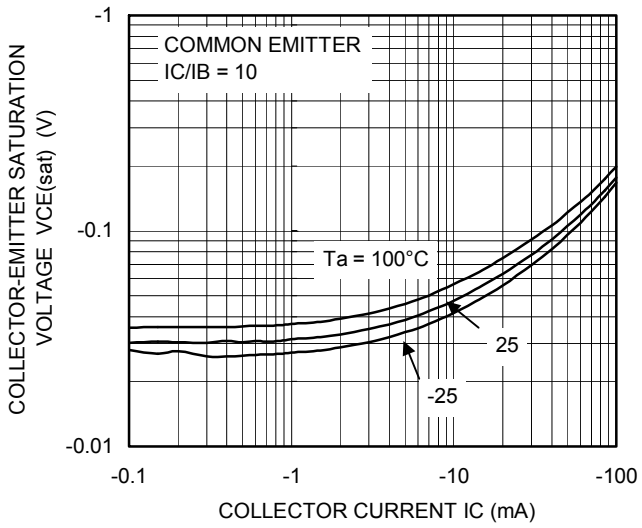
IC - VCE



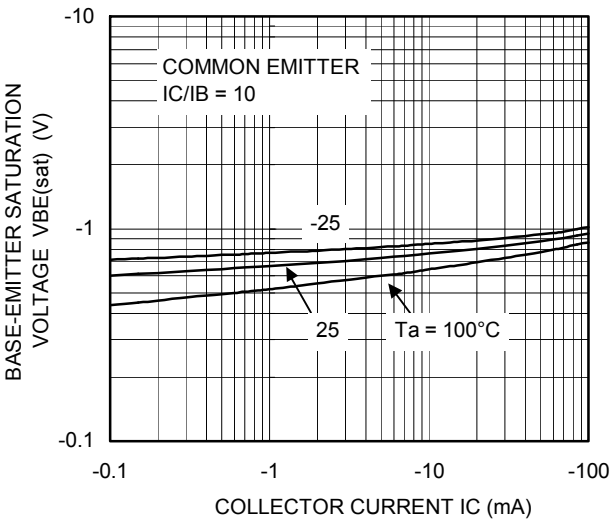
hFE - IC



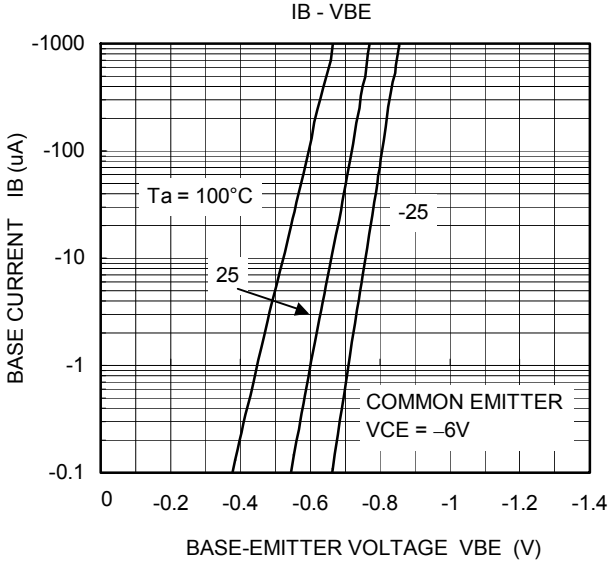
VCE(sat) - IC



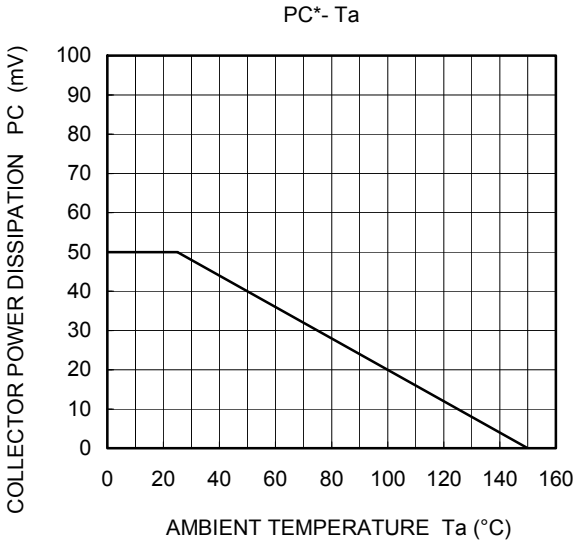
VBE(sat) - IC



IB - VBE



Q1, Q2 COMMON



*: Total rating

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