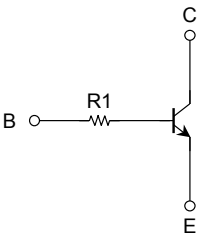
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process) (Bias Resistor built-in Transistor)

RN1544

For use in Muting and Switching Applications

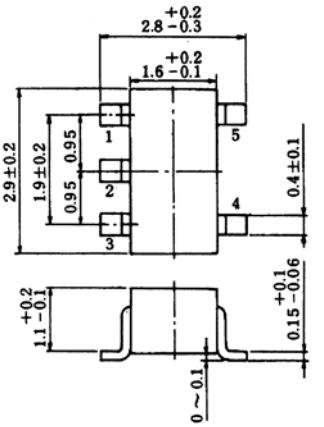
- Emitter-base voltage is high: V_{EBO} = 25 V (max)
- Incorporating a bias resistor into a transistor reduces parts count.
  Reducing the parts count enable the manufacture of ever more compact equipment and save assembly cost.

Equivalent Circuit



h_{FE} classification	A	B
Marking	44A	44B

Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	2-3L1A

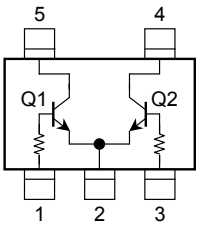
Weight: 0.014g (typ.)

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

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	50	V
Collector-emitter voltage	V_{CEO}	20	V
Emitter-base voltage	V_{EBO}	25	V
Collector current	I_C	300	mA
Collector power dissipation	P_C (Note1)	300	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	−55~150	°C

Note1: Total rating

Equivalent Circuit (top view)

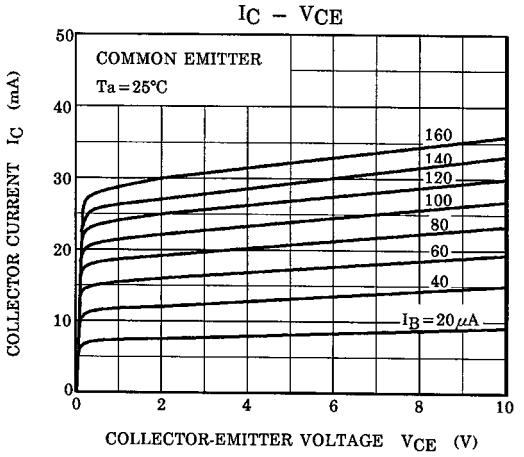


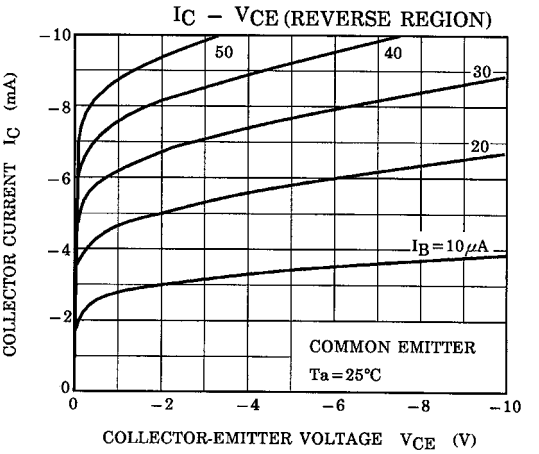
Electrical Characteristics (Ta = 25°C) (Q1, Q2 common)

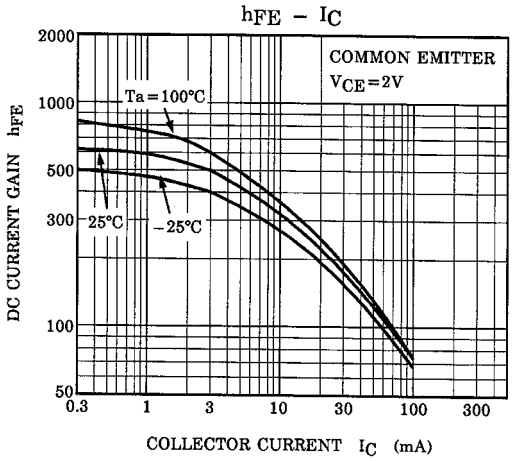
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = 50 V, I_E = 0	—	—	100	nA
Emitter cut-off current	I_{EBO}	V_{EB} = 25 V, I_C = 0	—	—	100	nA
DC current gain	h_{FE} (Note2)	V_{CE} = 2 V, I_C = 4 mA	200	—	1200	
Collector-emitter saturation voltage	$V_{CE\ (sat)}$	I_C = 10 mA, I_B = 1 mA	—	—	0.1	V
Transition frequency	f_T	V_{CE} = 6 V, I_C = 4 mA	—	30	—	MHz
Collector output capacitance	C_{ob}	V_{CB} = 10 V, I_E = 0, f = 1 MHz	—	—	7	pF
Input resistor	R1	—	1.54	2.2	2.86	kΩ

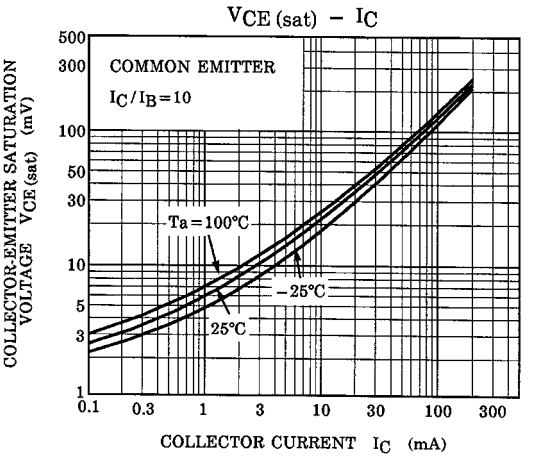
Note2: h_{FE} classification A: 200~700, B: 350~1200

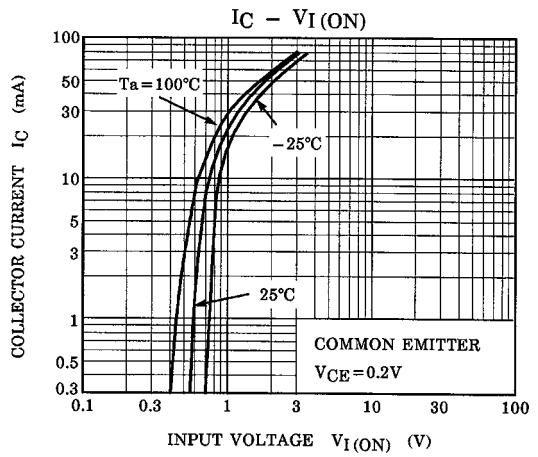
Q1,Q2 Common

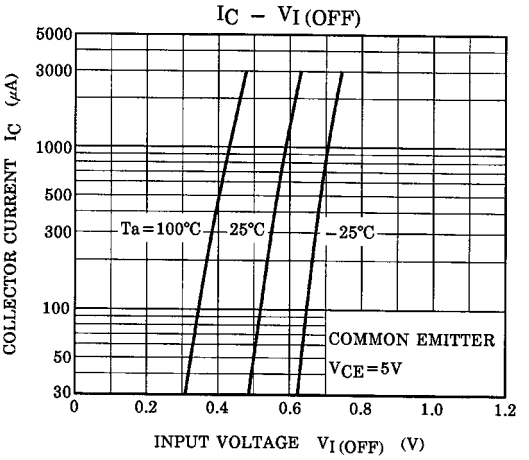

I_C – V_{CE}
COMMON EMITTER
Ta = 25°C
160
140
120
100
80
60
40
I_B = 20 μA
COLLECTOR CURRENT I_C (mA)
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)


I_C – V_{CE} (REVERSE REGION)
50
40
30
20
I_B = 10 μA
COMMON EMITTER
Ta = 25°C
COLLECTOR CURRENT I_C (mA)
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)


h_{FE} – I_C
COMMON EMITTER
V_{CE} = 2V
Ta = 100°C
25°C
−25°C
DC CURRENT GAIN h_{FE}
COLLECTOR CURRENT I_C (mA)


V_{CE} (sat) – I_C
COMMON EMITTER
I_C / I_B = 10
Ta = 100°C
25°C
−25°C
COLLECTOR-EMITTER SATURATION VOLTAGE V_{CE} (sat) (mV)
COLLECTOR CURRENT I_C (mA)


I_C – $V_{I (ON)}$
Ta = 100°C
−25°C
25°C
COMMON EMITTER
V_{CE} = 0.2V
COLLECTOR CURRENT I_C (mA)
INPUT VOLTAGE $V_{I (ON)}$ (V)


I_C – $V_{I (OFF)}$
Ta = 100°C
25°C
−25°C
COMMON EMITTER
V_{CE} = 5V
COLLECTOR CURRENT I_C (μA)
INPUT VOLTAGE $V_{I (OFF)}$ (V)