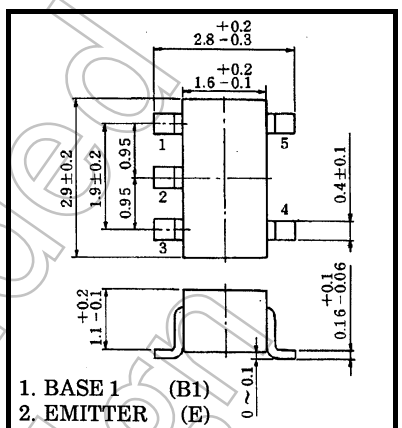
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process) (Bias Resistor built-in Transistor)

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.

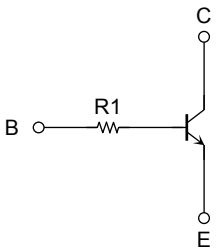
Unit: mm



SMV	
JEDEC	—
JEITA	—
TOSHIBA	2-3L1A

Weight: 0.014g (typ.)

Equivalent Circuit



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

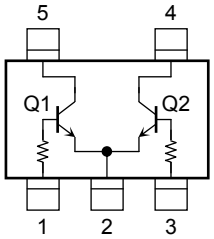
Absolute Maximum Ratings (Ta = 25°C) (Q1, Q2 common)

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 to 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).

Note1: Total rating

Equivalent Circuit (top view)



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

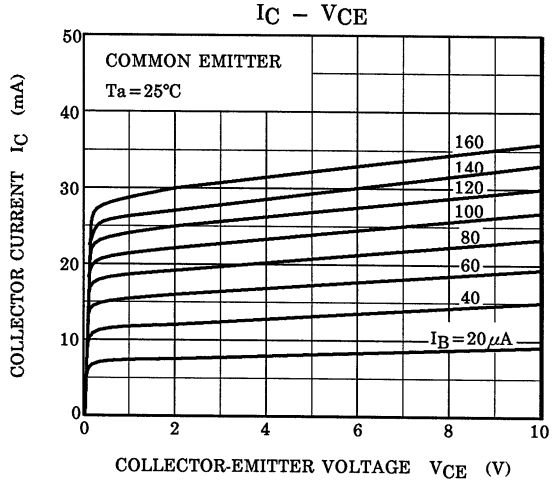
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = 50 V, I_E = 0	—	—	100	nA
Emitter cut-off current	I_{EBO}	V_{EB} = 25 V, I_C = 0	—	—	100	nA
DC current gain	h_{FE} (Note2)	V_{CE} = 2 V, I_C = 4 mA	200	—	1200	
Collector-emitter saturation voltage	$V_{CE\ (sat)}$	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 to 700, B: 350 to 1200

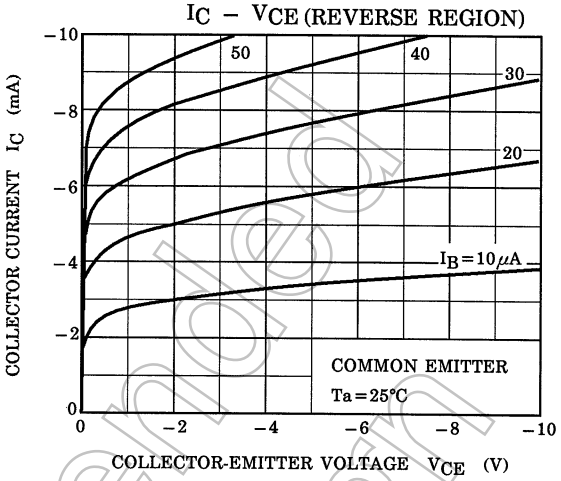
Start of commercial production
2000-04

Q1, Q2 Common

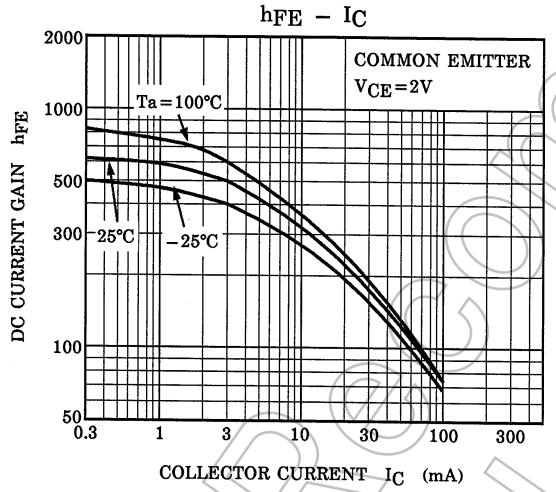
$I_C - V_{CE}$



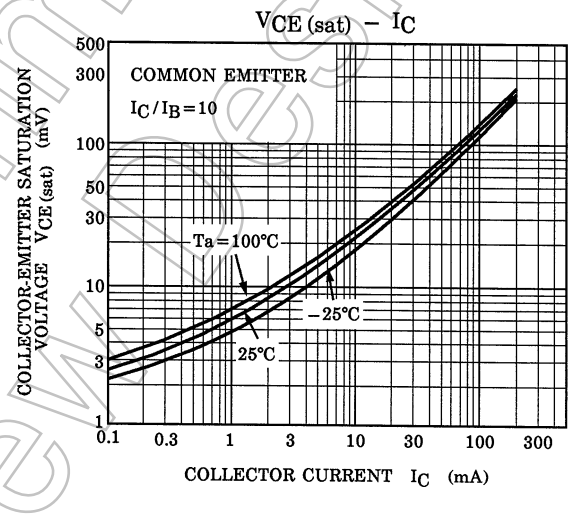
$I_C - V_{CE}$ (REVERSE REGION)



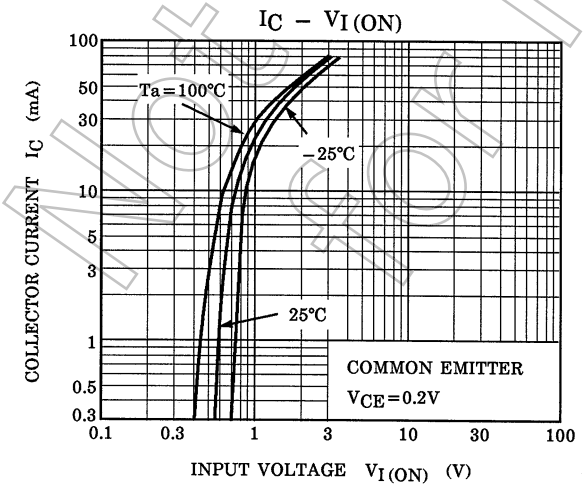
$h_{FE} - I_C$



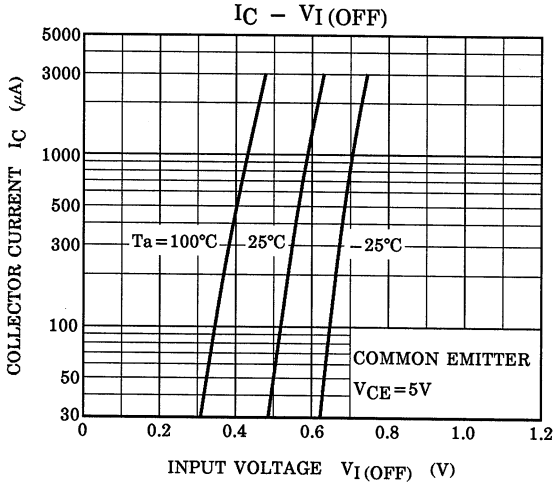
$V_{CE\,(sat)} - I_C$



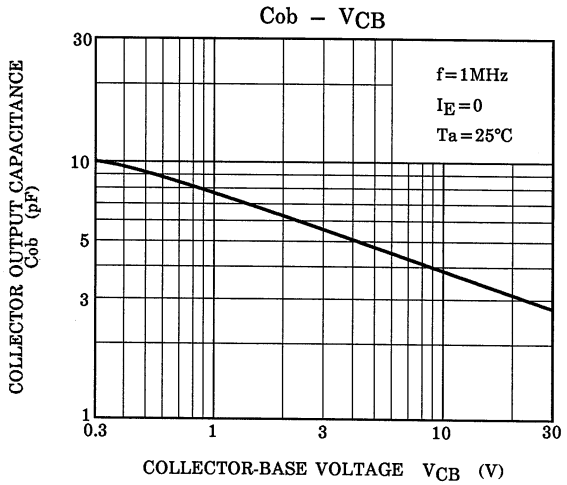
$I_C - V_{I\,(ON)}$

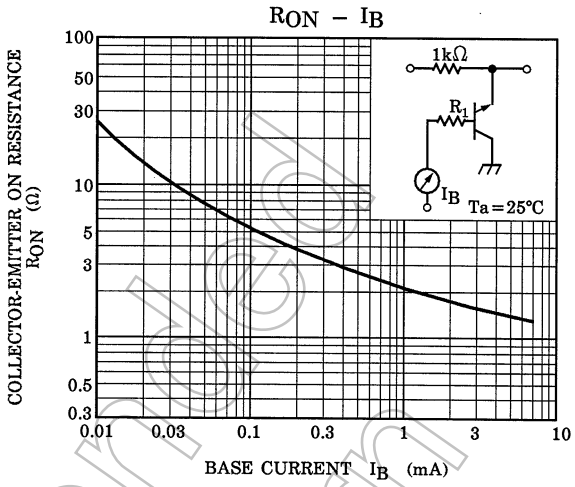


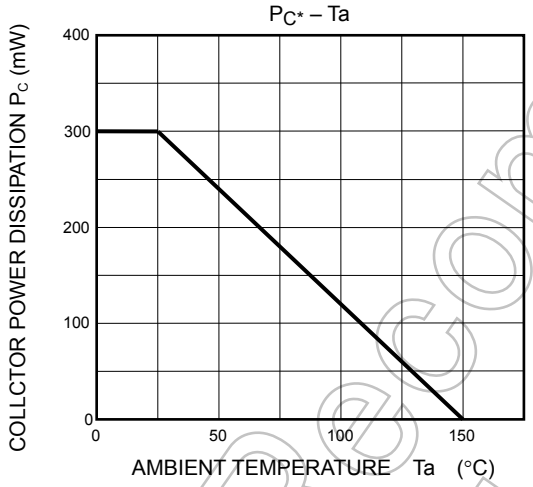
$I_C - V_{I\,(OFF)}$



Q1, Q2 Common







*: Total rating

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