Bipolar Transistors Silicon NPN Epitaxial Type

TTC004B

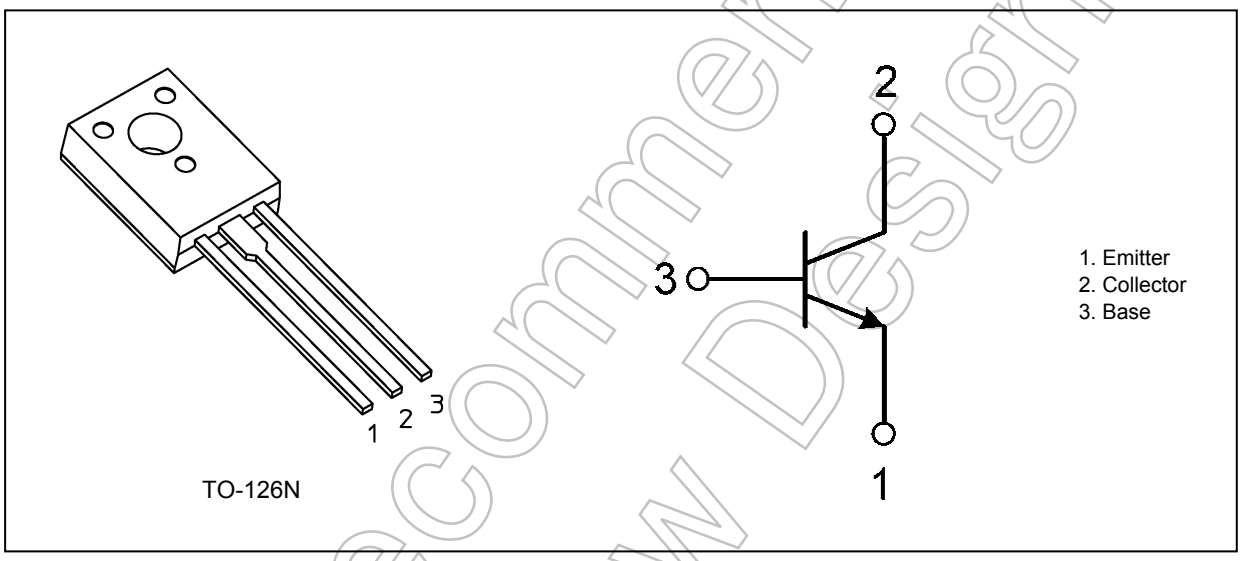
1. Applications

- Audio-Frequency Amplifiers

2. Features

(1) High collector voltage: V_{CEO} = 160 V (min)
(2) Complementary to TTA004B
(3) Small collector output capacitance: C_{ob} = 12 pF (typ.)
(4) High transition frequency: f_T = 100 MHz (typ.)

3. Packaging and Internal Circuit (Note)



Note: Although this device is encapsulated in epoxy resin, it does not provide any guarantee to the maximum isolation voltage. Therefore, as with the case with non-isolated devices, care should be taken with regard to electrical isolation from surrounding parts.

Start of commercial production
2013-05

4. Absolute Maximum Ratings (Note) (T_a = 25 °C unless otherwise specified)

Characteristics		Symbol	Rating	Unit
Collector-base voltage		V_{CBO}	160	V
Collector-emitter voltage		V_{CEO}	160	
Emitter-base voltage		V_{EBO}	6	
Collector current (DC)	(Note 1)	I_C	1.5	A
Collector current (pulsed)	(Note 1)	I_{CP}	2.5	
Base current		I_B	0.5	
Collector power dissipation		P_C	1.5	W
Collector power dissipation	(T_c = 25 °C)	P_C	10	
Junction temperature		T_j	150	°C
Storage temperature		T_{stg}	-55 to 150	

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).

Note 1: Ensure that the junction temperature does not exceed 150 °C.

5. Electrical Characteristics

5.1. Static Characteristics (T_a = 25 °C unless otherwise specified)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = 160 V, I_E = 0 A	—	—	100	nA
Emitter cut-off current	I_{EBO}	V_{EB} = 6 V, I_C = 0 A	—	—	100	
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	I_C = 10 mA, I_B = 0 A	160	—	—	V
DC current gain	$h_{FE(1)}$	V_{CE} = 5 V, I_C = 1 mA	80	—	—	—
	$h_{FE(2)}$	V_{CE} = 5 V, I_C = 0.1 A	140	—	280	
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C = 0.5 A, I_B = 50 mA	—	—	0.5	V
Base-emitter saturation voltage	$V_{BE(sat)}$	I_C = 0.5 A, I_B = 50 mA	—	—	1.3	V

5.2. Dynamic Characteristics (T_a = 25 °C unless otherwise specified)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector output capacitance	C_{ob}	V_{CB} = 10 V, I_E = 0 A, f = 1 MHz	—	12	—	pF
Transition frequency	f_T	V_{CE} = 10 V, I_C = 100 mA	—	100	—	MHz

6. Marking (Note)

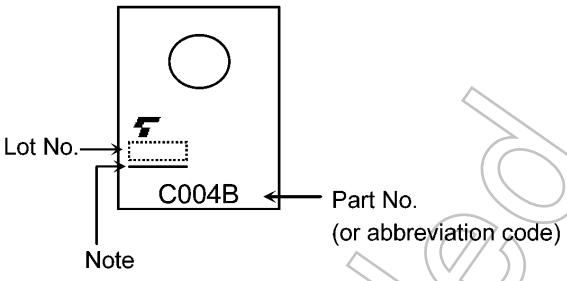


Fig. 6.1 Marking

Note: A line under a Lot No. identifies the indication of product Labels.
[[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]
Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product.
The RoHS is the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

7. Characteristics Curves (Note)

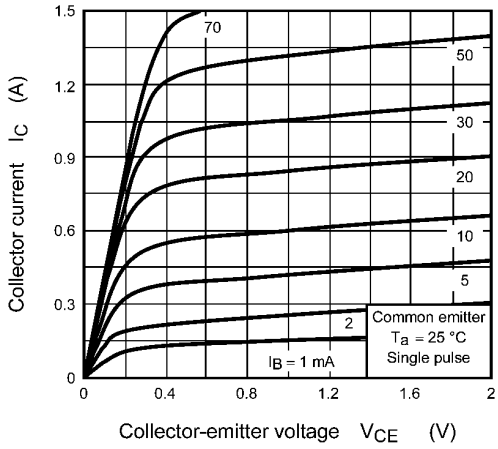


Fig. 7.1 I_C - V_{CE}

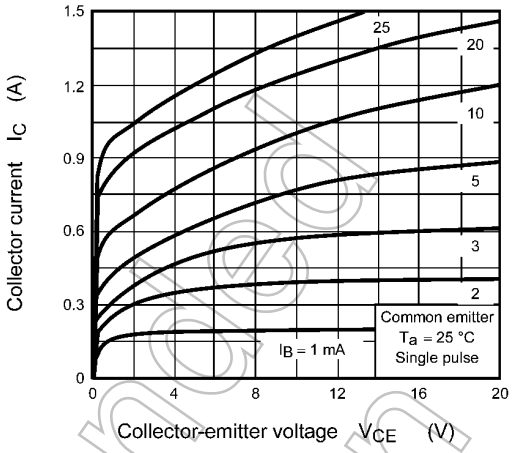


Fig. 7.2 I_C - V_{CE}

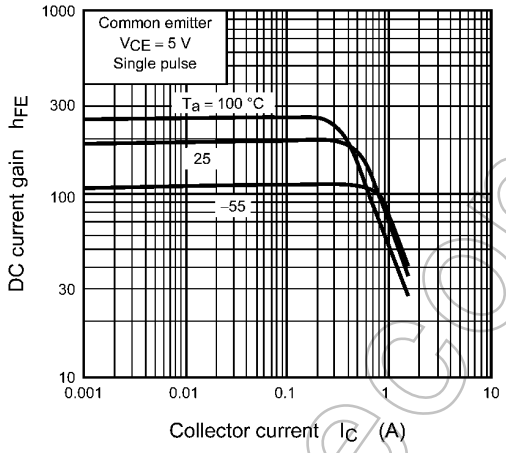


Fig. 7.3 h_{FE} - I_C

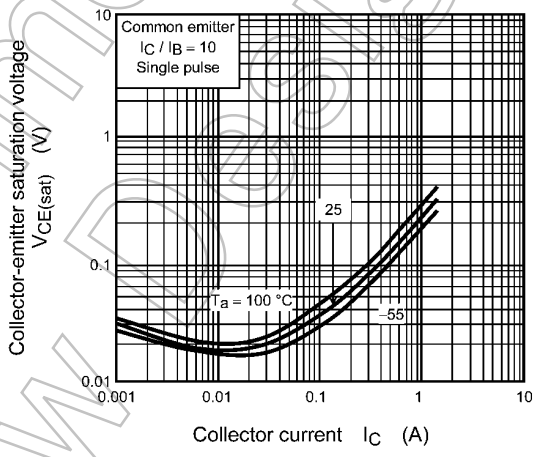


Fig. 7.4 $V_{CE(sat)}$ - I_C

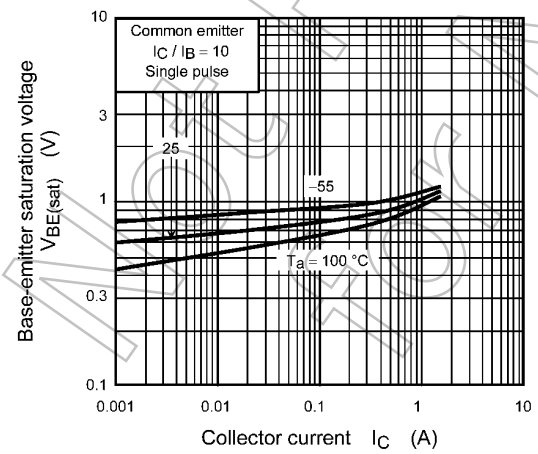


Fig. 7.5 $V_{BE(sat)}$ - I_C

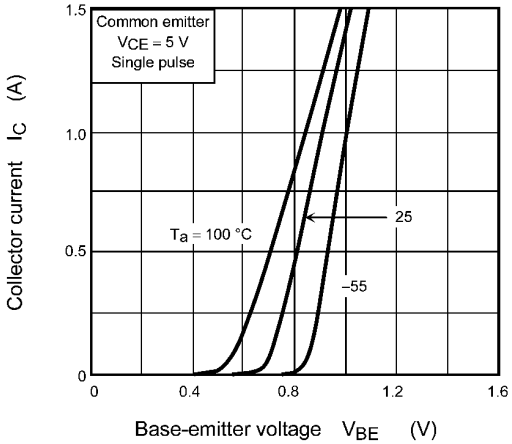


Fig. 7.6 I_C - V_{BE}

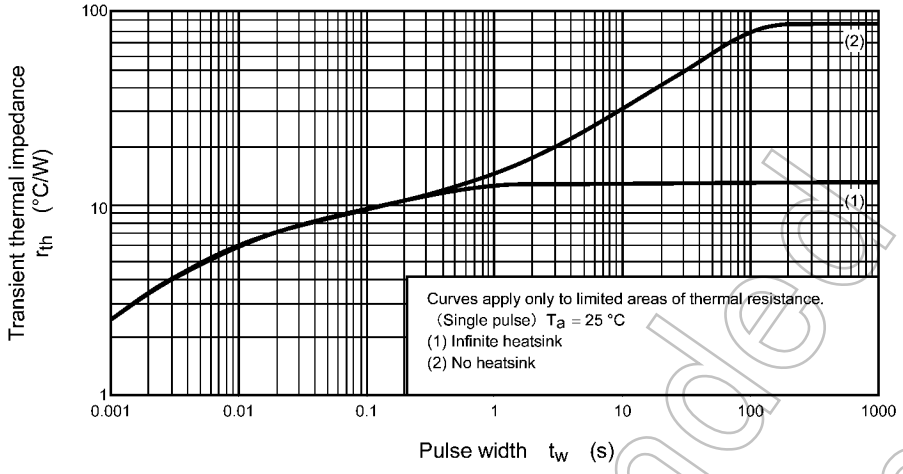


Fig. 7.7 r_{th} - t_w (Guaranteed Maximum)

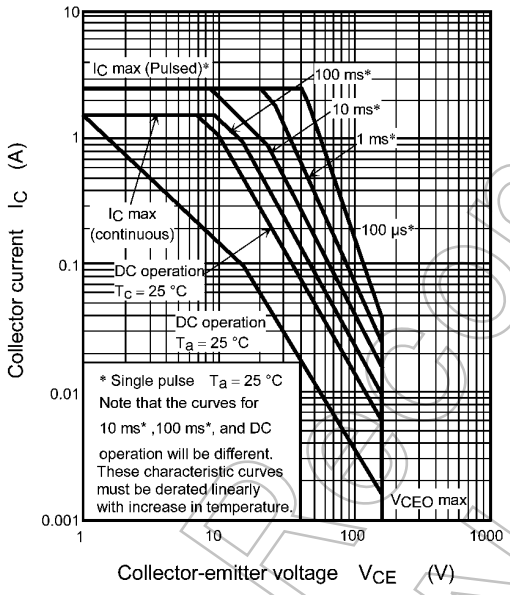


Fig. 7.8 Safe Operating Area (Guaranteed Maximum)

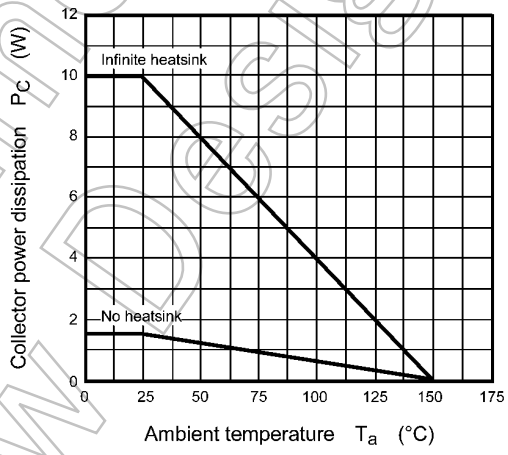
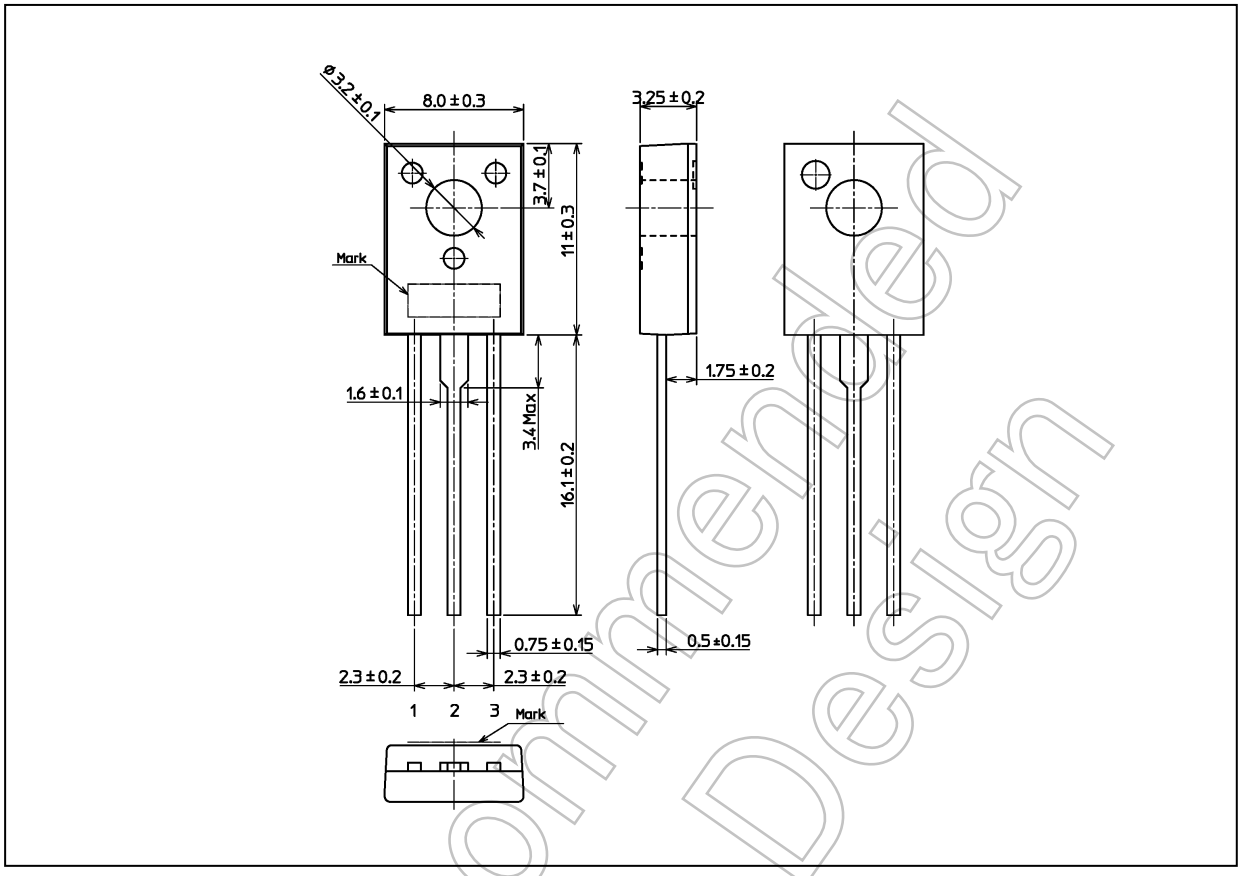


Fig. 7.9 P_C - T_a

Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

Package Dimensions

Unit: mm



Weight: 0.84 g (typ.)

Package Name(s)
TOSHIBA: 2-8U1A
Nickname: TO-126N

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