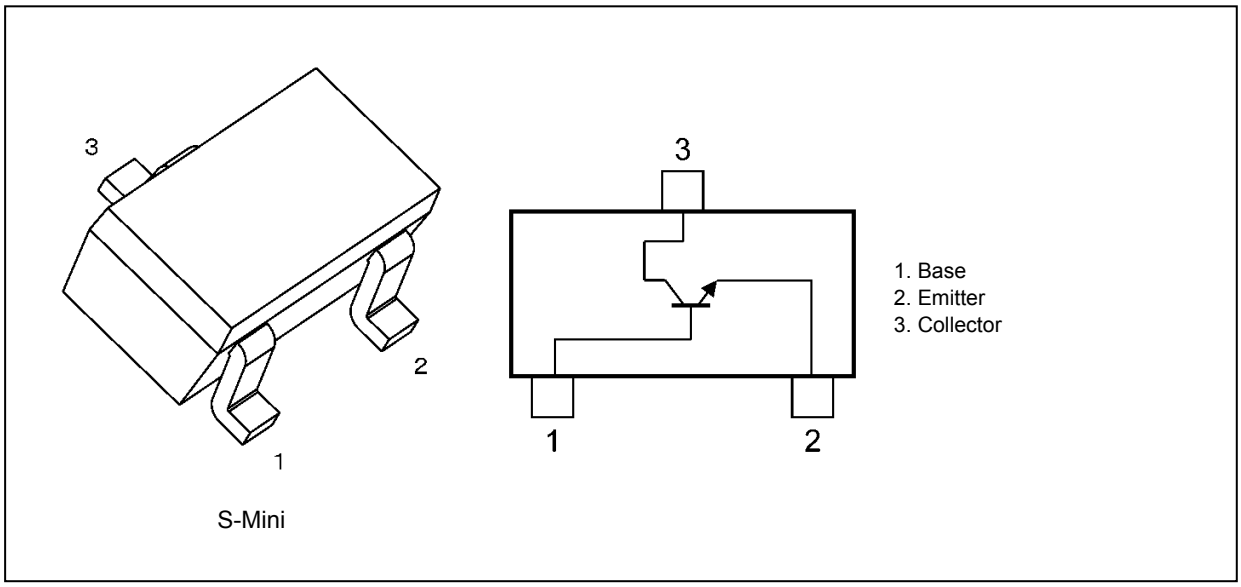
Bipolar Transistors Silicon NPN Epitaxial Type

TTC1949

1. Applications

- Low-Frequency Power Amplifiers

2. Packaging and Internal Circuit



3. Absolute Maximum Ratings (Note) (Unless otherwise specified, T_a = 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	500	mA
Base current	I_B	50	mA
Collector power dissipation (Note 1)	P_C	200	mW
Junction temperature	T_j	150	°C
Storage temperature	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).

Note 1: Device mounted on a 25.4 mm × 25.4 mm × 1.6 mm FR4 glass epoxy board (Cu pad: 0.42 mm^2 × 3)

Start of commercial production
2017-06

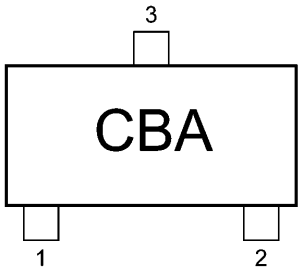
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4. Electrical Characteristics (Unless otherwise specified, T_a = 25 °C)

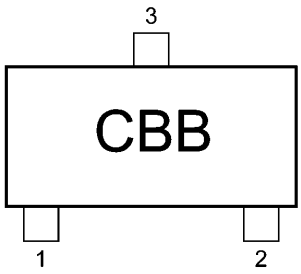
Characteristics	Symbol	Note	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}		V_{CB} = 50 V , I_E = 0 mA	—	—	100	nA
Emitter cut-off current	I_{EBO}		V_{EB} = 5 V, I_C = 0 mA	—	—	100	nA
DC current gain	h_{FE}(1)	(Note 1)	V_{CE} = 1 V, I_C = 100 mA	120	—	390	—
	h_{FE}(2)		V_{CE} = 1 V, I_C = 500 mA	40	—	—	—
Collector-emitter saturation voltage	$V_{CE(sat)}$		I_C = 500 mA, I_B = 50 mA	—	—	0.4	V
Base-emitter voltage	V_{BE}		V_{CE} = 1 V, I_C = 100 mA	—	—	1.0	V
Transition frequency	f_T		V_{CE} = 5 V, I_C = 10 mA, f = 100 MHz	100	—	—	MHz
Collector output capacitance	C_{ob}		V_{CB} = 10 V , I_E = 0 mA, f = 1 MHz	—	3	—	pF

Note 1: h_{FE} classification: Y rank 120 to 270, GR rank 180 to 390

5. Marking



h_{FE} rank: Y



h_{FE} rank: GR

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6. Characteristics Curves (Note)

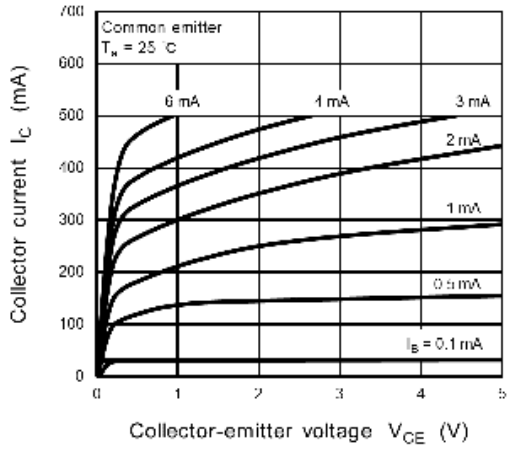


Fig. 6.1 I_C - V_{CE}

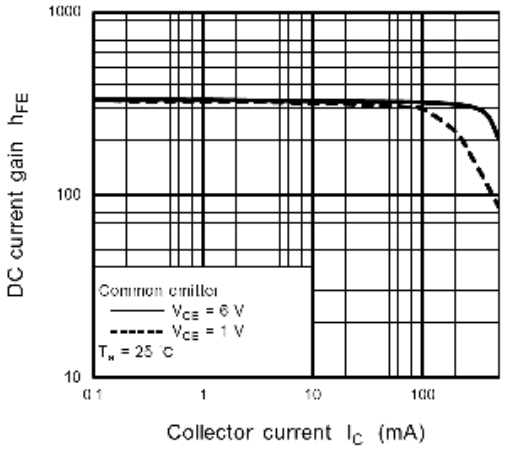


Fig. 6.2 h_{FE} - I_C

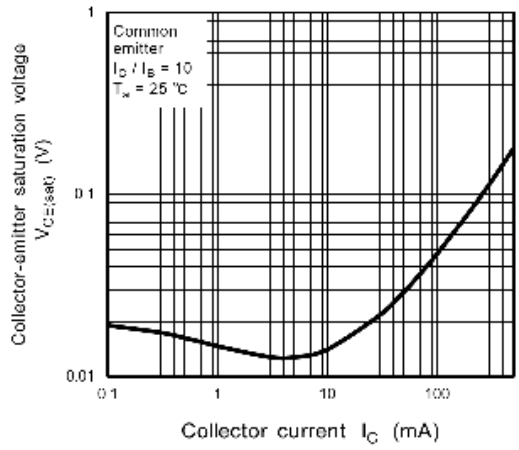


Fig. 6.3 $V_{CE(sat)}$ - I_C

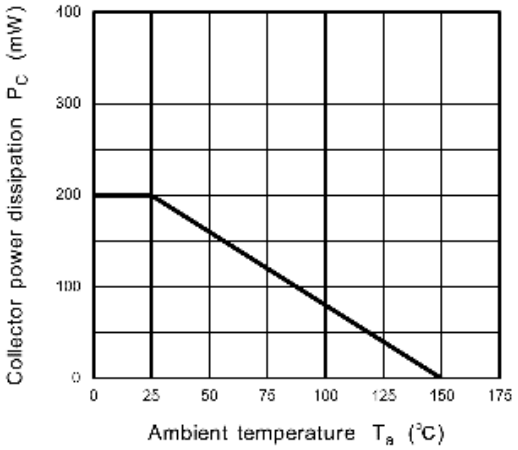


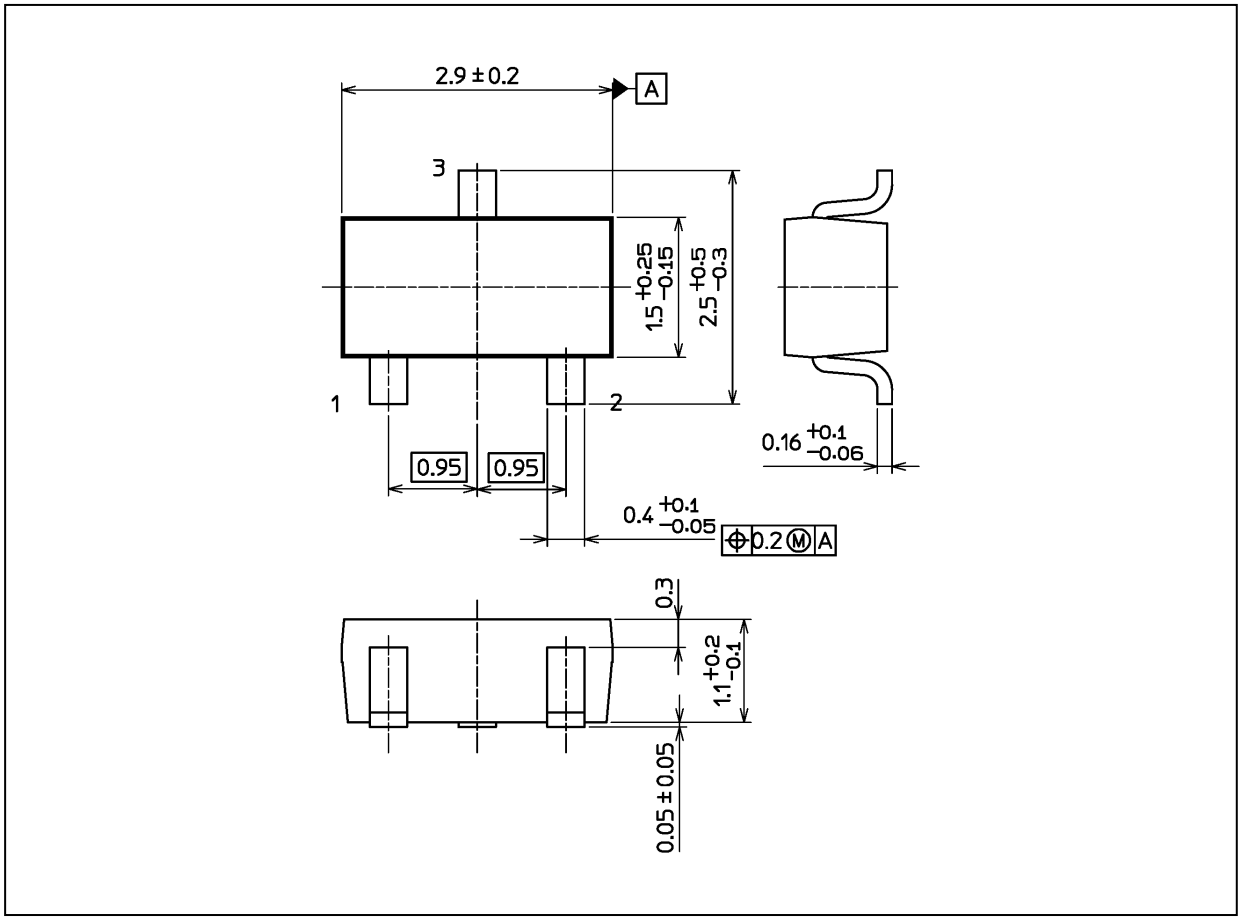
Fig. 6.4 P_C - T_a

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

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Package Dimensions

Unit: mm



Weight: 12 mg (typ.)

Package Name(s)
Nickname: S-Mini

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