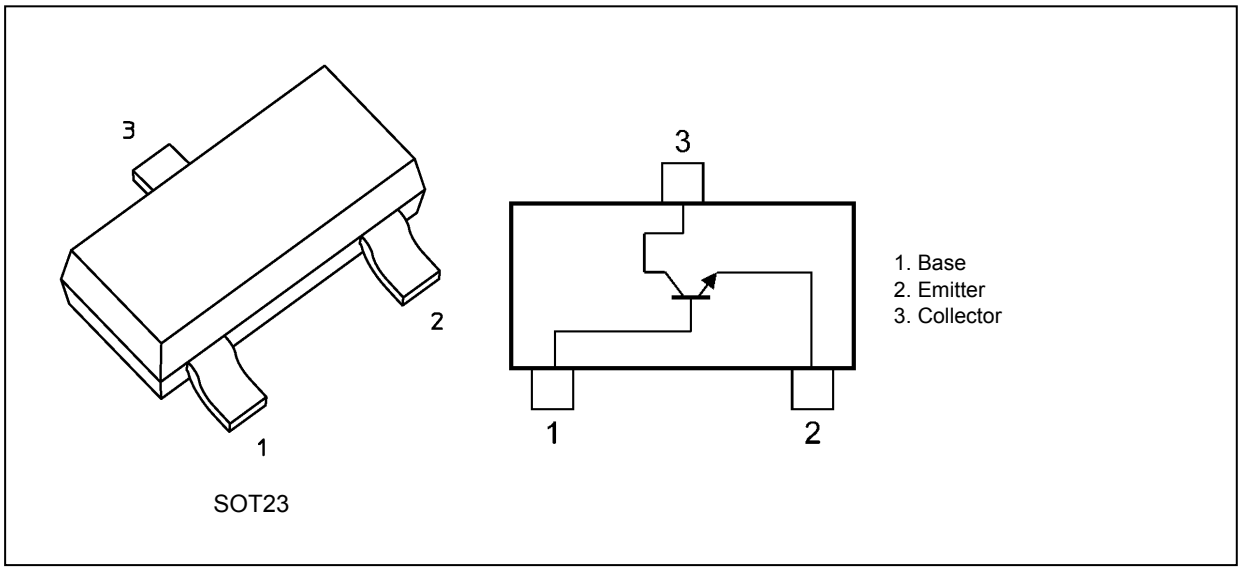
Bipolar Transistors Silicon NPN Epitaxial Type

TBC847

1. Applications

- Low-Frequency 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}	60	V
Collector-emitter voltage	V_{CEO}	50	V
Emitter-base voltage	V_{EBO}	6	V
Collector current (DC)	I_C	150	mA
Collector current (pulsed)	I_{CP}	200	
Base current	I_B	30	mA
Collector power dissipation (Note 1)	P_C	320	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)

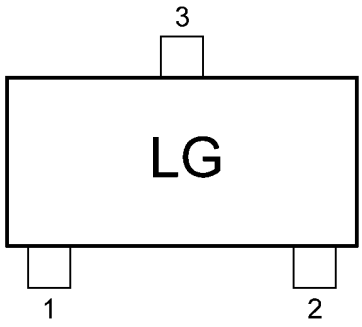
Start of commercial production
2016-05

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} = 30 V, I_E = 0 mA	—	—	30	nA
Emitter cut-off current	I_{EBO}		V_{EB} = 6 V, I_C = 0 mA	—	—	0.1	μA
DC current gain	h_{FE}	(Note 1)	V_{CE} = 5 V, I_C = 10 μA	—	280	—	—
			V_{CE} = 5 V, I_C = 2 mA	200	290	450	
Collector-emitter saturation voltage	$V_{CE(sat)}$		I_C = 10 mA, I_B = 0.5 mA	—	0.06	0.2	V
			I_C = 100 mA, I_B = 5 mA	—	0.17	0.4	
Base-emitter saturation voltage	$V_{BE(sat)}$		I_C = 10 mA, I_B = 0.5 mA	—	0.7	—	V
			I_C = 100 mA, I_B = 5 mA	—	0.9	—	
Base-emitter voltage	V_{BE}		I_C = 2 mA, V_{CE} = 5 V	0.58	0.66	0.7	V
			I_C = 10 mA, V_{CE} = 5 V	—	—	0.77	
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	—	—	3.5	pF
Emitter input capacitance	C_{ib}		V_{EB} = 0.5 V, I_C = 0 mA, f = 1 MHz	—	11	—	pF
Noise figure	NF		V_{CE} = 6 V, I_C = 100 μA, f = 1 kHz, R_G = 10 kΩ	—	1.0	10	dB

Note 1: h_{FE} classification: B rank

5. Marking



6. Characteristics Curves (Note)

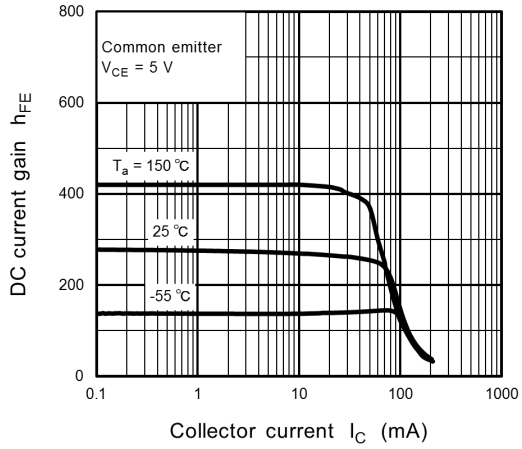


Fig. 6.1 h_{FE} - I_C

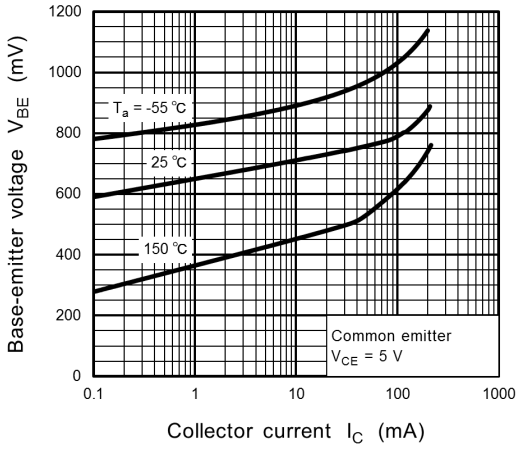


Fig. 6.2 V_{BE} - I_C

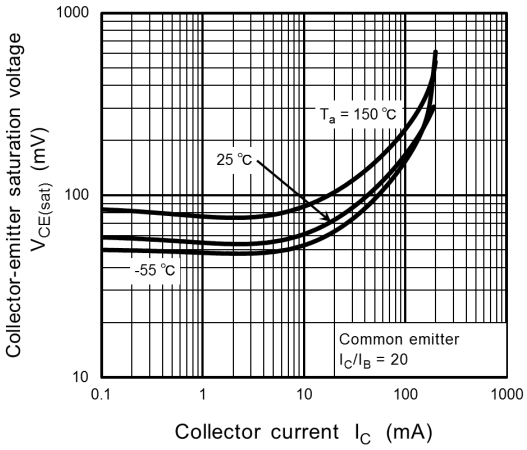


Fig. 6.3 $V_{CE(sat)}$ - I_C

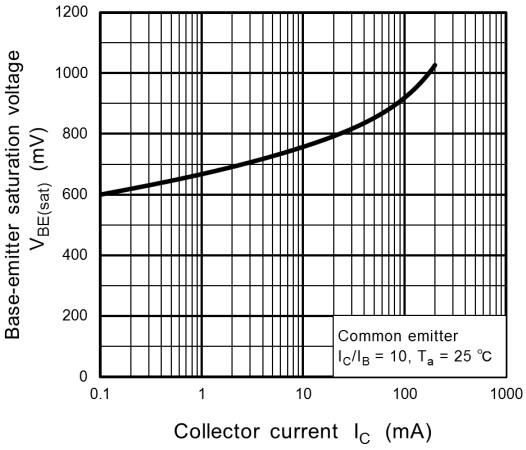


Fig. 6.4 $V_{BE(sat)}$ - I_C

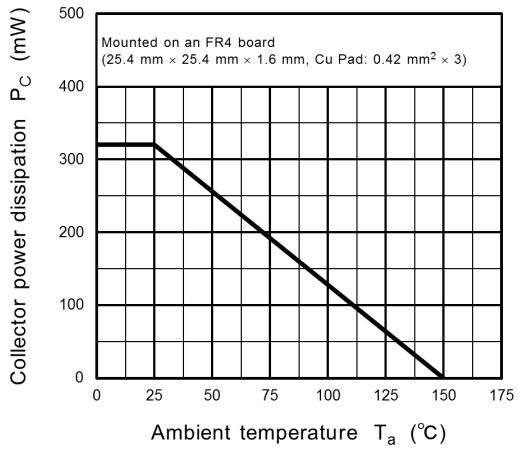
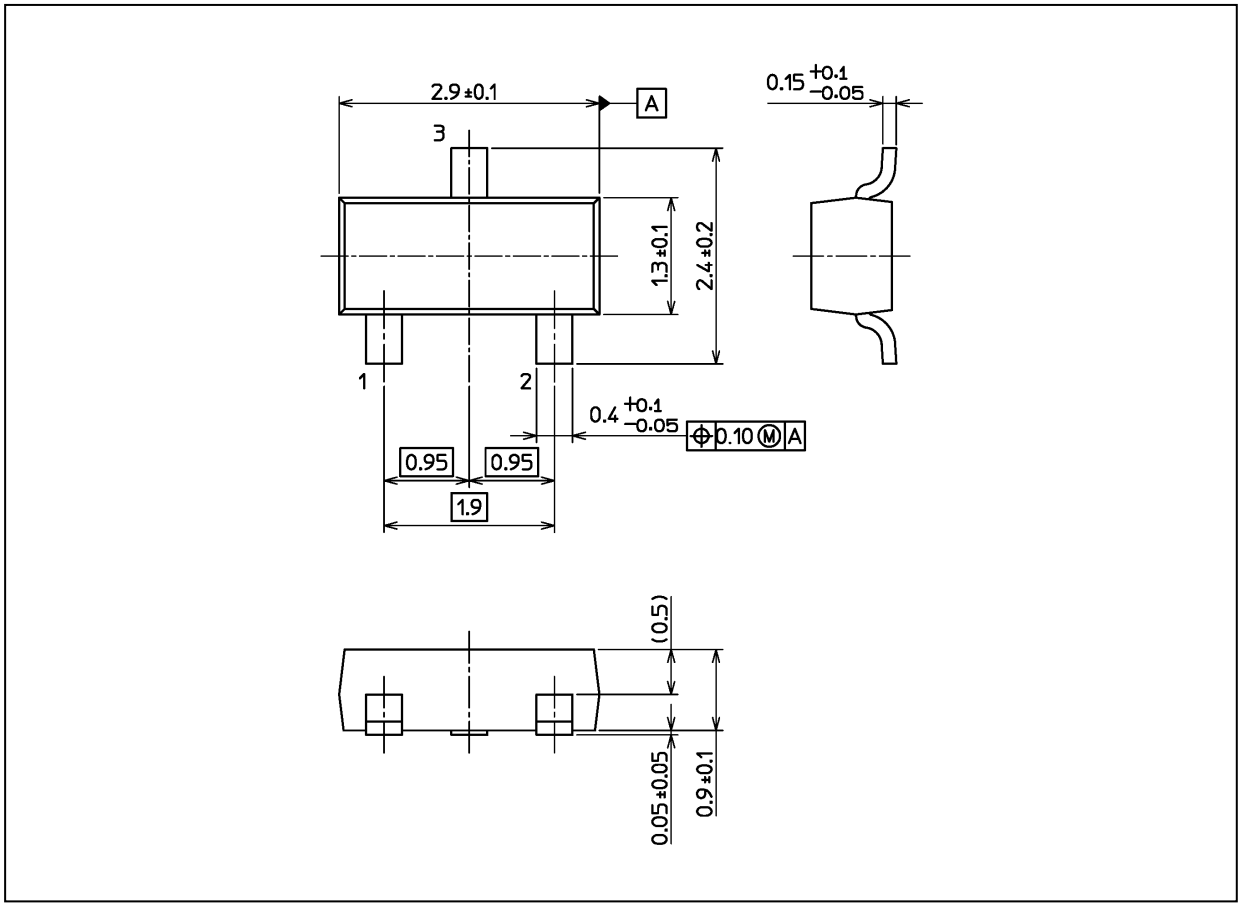


Fig. 6.5 P_C - T_a

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

Package Dimensions

Unit: mm



Weight: 0.009 g (typ.)

Package Name(s)
TOSHIBA: 2-3AB1A
Nickname: SOT23

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