Bipolar Transistors Silicon NPN Triple-Diffused Type

TTC018

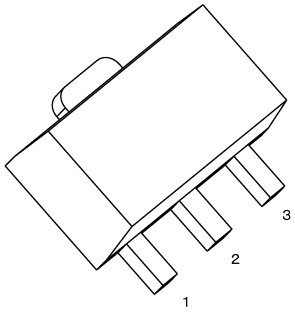
1. Applications

- High-Voltage Switching

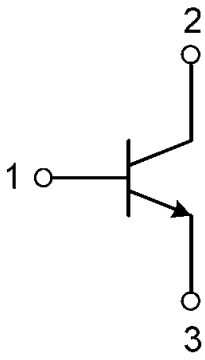
2. Features

(1) High collector voltage: V_{CEO} = 500 V (min)
(2) High DC current gain: h_{FE} = 100 to 300 (V_{CE} = 10 V, I_C = 20 mA)
(3) Low collector-emitter saturation voltage: $V_{CE(sat)}$ = 0.3 V (max) (I_C = 20 mA, I_B = 2 mA)

3. Packaging and Internal Circuit



PW-Mini



1. Base
2. Collector (Heatsink)
3. Emitter

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

Characteristics		Symbol	Rating	Unit
Collector-base voltage		V_{CBO}	500	V
Collector-emitter voltage		V_{CEO}	500	V
Emitter-base voltage		V_{EBO}	7	V
Collector current (DC)	(Note 1)	I_C	100	mA
Collector current (pulsed)	(Note 1)	I_{CP}	200	mA
Base current		I_B	50	mA
Collector power dissipation	(Note 2)	P_C	1	W
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: Ensure that the junction temperature does not exceed 150 °C.

Note 2: Device mounted on a 25.4 mm × 25.4 mm × 1.6 mm FR-4 glass epoxy board (with a dissipating copper surface of 645 mm^2)

Start of commercial production
2019-07

5. Electrical Charcteristics

5.1. Static Charcteristics (Unless otherwise specified, T_a = 25 °C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = 500 V, I_E = 0 A	—	—	1	μA
Emitter cut-off current	I_{EBO}	V_{EB} = 7 V, I_C = 0 A	—	—	100	nA
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	I_C = 1 mA, I_B = 0 A	500	—	—	V
DC current gain	$h_{FE(1)}$	V_{CE} = 10 V, I_C = 20 mA	100	—	300	—
	$h_{FE(2)}$	V_{CE} = 10 V, I_C = 100 mA	10	—	—	
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C = 20 mA, I_B = 2 mA	—	—	0.3	V
Base-emitter saturation voltage	$V_{BE(sat)}$	I_C = 20 mA, I_B = 2 mA	—	—	1.0	V

5.2. Dynamic Charcteristics (Unless otherwise specified, T_a = 25 °C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector output capacitance	C_{ob}	V_{CB} = 10 V, I_E = 0 A, f = 1 MHz	—	8	—	pF

6. Marking (Note)

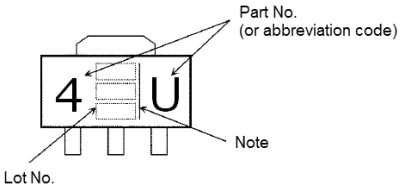


Fig. 6.1 Marking (Note)

Note: A line beside 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)

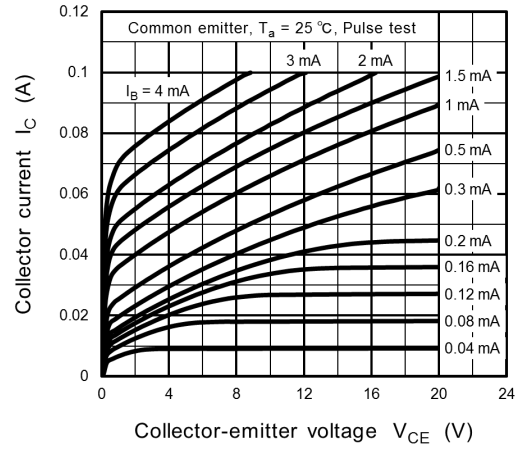


Fig. 7.1 I_C - V_{CE}

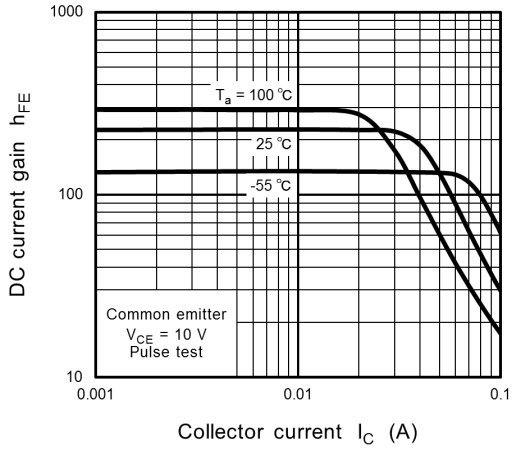


Fig. 7.2 h_{FE} - I_C

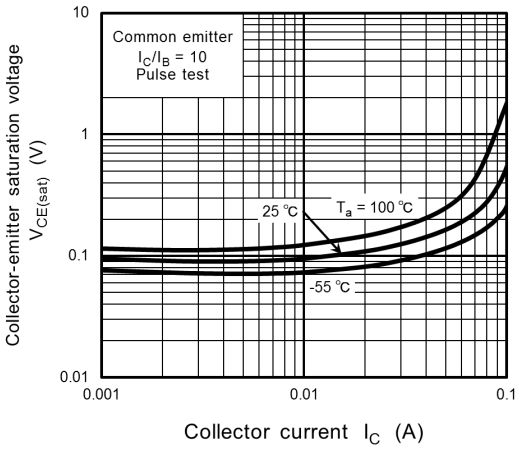


Fig. 7.3 $V_{CE(sat)}$ - I_C

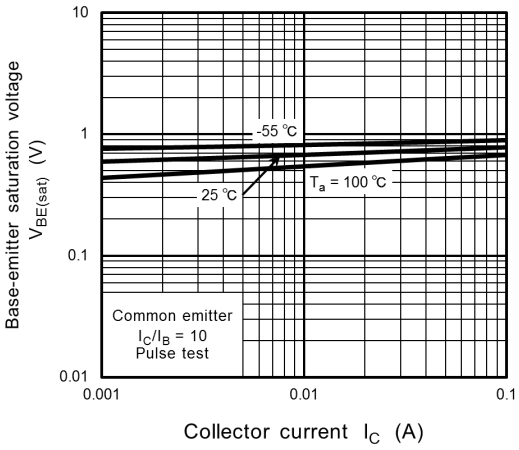


Fig. 7.4 $V_{BE(sat)}$ - I_C

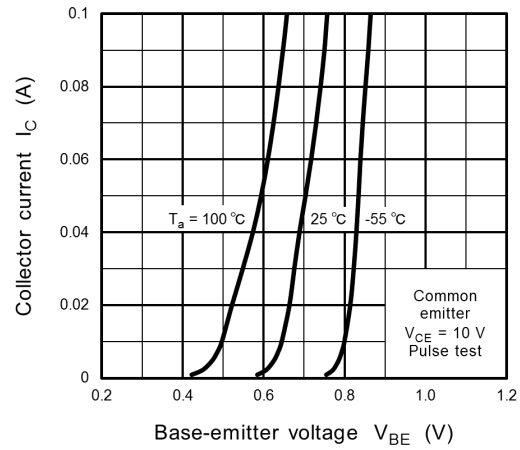


Fig. 7.5 I_C - V_{BE}

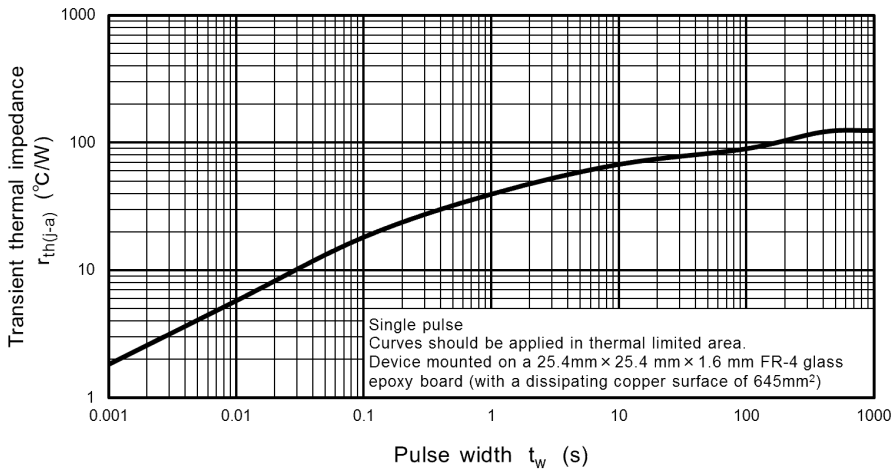


Fig. 7.6 r_{th} - t_w
(Guaranteed Maximum)

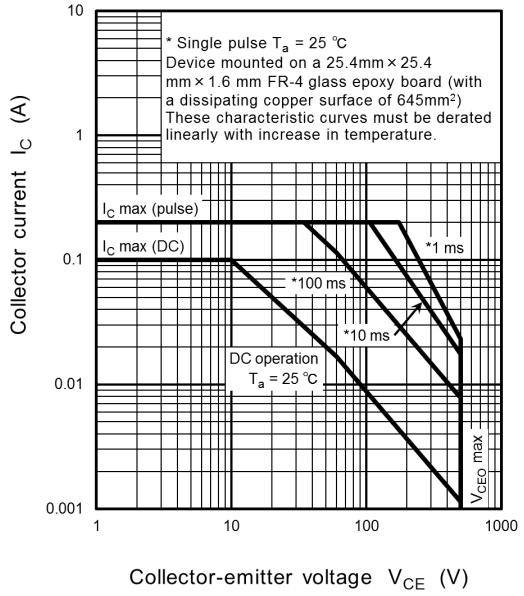
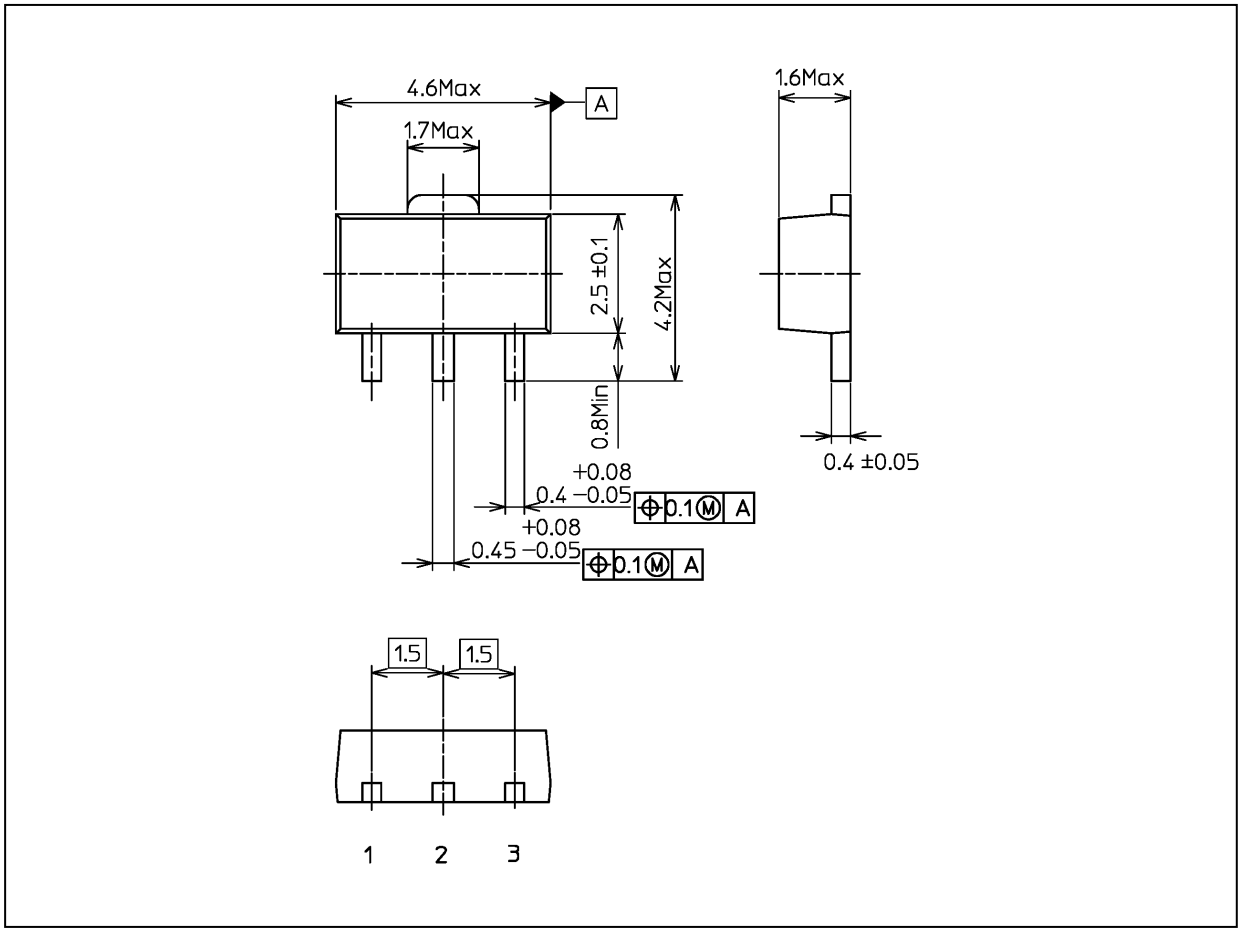


Fig. 7.7 Safe Operating Area
(Guaranteed Maximum)

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

Package Dimensions

Unit: mm



Weight: 0.05 g (typ.)

Package Name(s)
TOSHIBA: 2-5K1S
Nickname: PW-Mini

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