Bipolar Transistors Silicon PNP Triple-Diffused Type

2SA2034

1. Applications

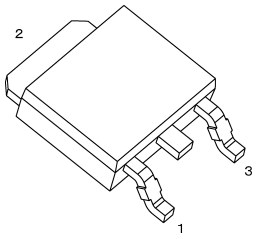
- High-Voltage Switching

2. Features

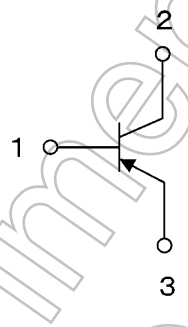
(1) High collector voltage: V_{CEO} = -400 V (min)

(2) High-speed switching: t_f = 0.3 μs (max) (I_C = -1.0 A)

3. Packaging and Internal Circuit



New PW-Mold



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}	-400	V
Collector-emitter voltage		V_{CEO}	-400	
Emitter-base voltage		V_{EBO}	-7	
Collector current (DC)	(Note 1)	I_C	-2	A
Collector current (pulsed)	(Note 1)	I_{CP}	-4	
Base current		I_B	-1	
Collector power dissipation	(T_a = 25 °C)	P_C	1	W
Collector power dissipation	(T_c = 25 °C)	P_C	15	
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.

Start of commercial production
2000-02

5. Thermal Characteristics

Characteristics	Symbol	Max	Unit
Junction-to-case thermal resistance	$R_{th(j-c)}$	8.33	°C/W
Junction-to-ambient thermal resistance	$R_{th(j-a)}$	125	

6. Electrical Characteristics

6.1. Static Characteristics (Unless otherwise specified, T_a = 25 °C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = -400 V, I_E = 0 A	—	—	-10	μA
Emitter cut-off current	I_{EBO}	V_{EB} = -7 V, I_C = 0 A	—	—	-1	
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	I_C = -10 mA, I_B = 0 A	-400	—	—	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	80	—	240	—
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C = -0.5 A, I_B = -0.1 A	—	—	-1.0	V
Base-emitter saturation voltage	$V_{BE(sat)}$	I_C = -0.5 A, I_B = -0.1 A	—	—	-1.5	

6.2. Dynamic Characteristics (Unless otherwise specified, T_a = 25 °C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Switching time (rise time)	t_r	See Fig. 6.2.1	—	—	0.3	μs
Switching time (storage time)	t_{stg}	V_{CC} ≈ -200 V, R_L = 200 Ω, I_{B1} = -0.2 A, I_{B2} = 0.2 A,	—	—	2.5	μs
Switching time (fall time)	t_f		—	—	0.3	μs

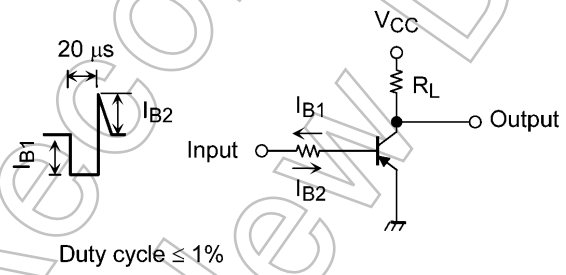


Fig. 6.2.1 Switching Time Test Circuit

7. Marking (Note)

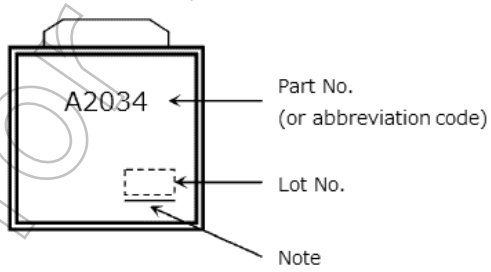


Fig. 7.1 Marking

Note: A line under a Lot No. identifies the indication of product Labels.
Not underlined: [[Pb]]/INCLUDES > MCV
Underlined: [[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.

8. Characteristics Curves (Note)

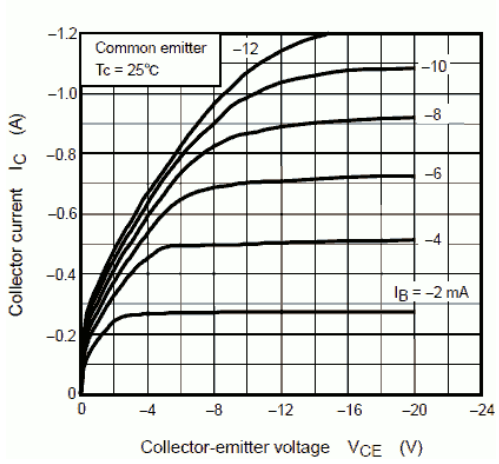


Fig. 8.1 I_C - V_{CE}

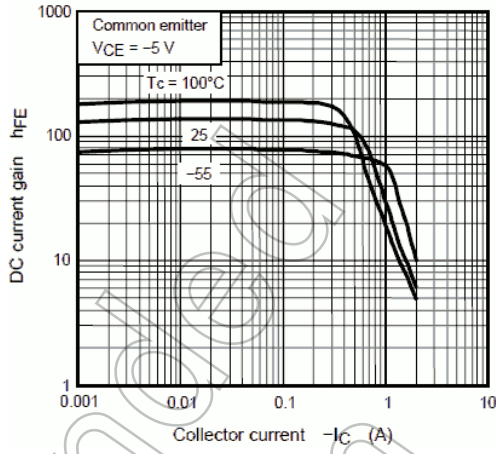


Fig. 8.2 h_{FE} - I_C

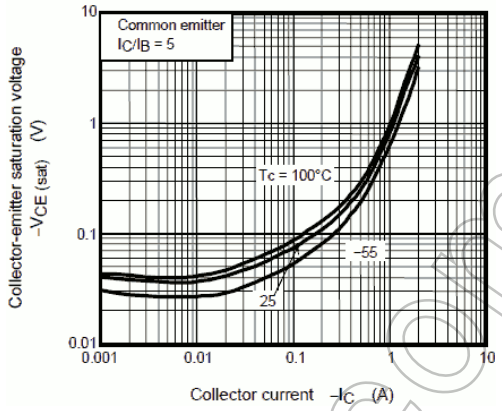


Fig. 8.3 $V_{CE(sat)}$ - I_C

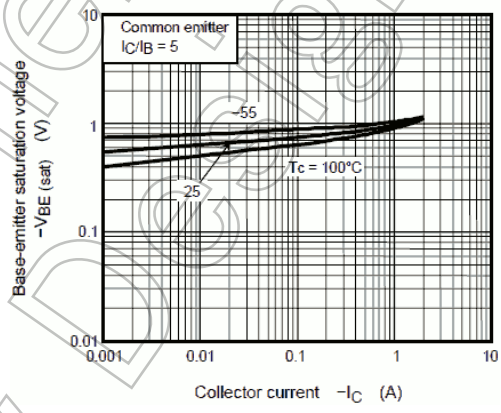


Fig. 8.4 $V_{BE(sat)}$ - I_C

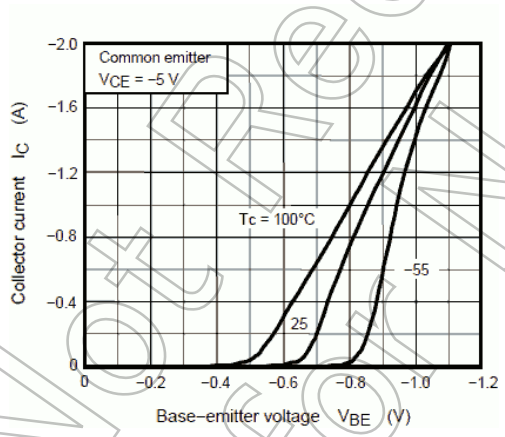


Fig. 8.5 I_C - V_{BE}

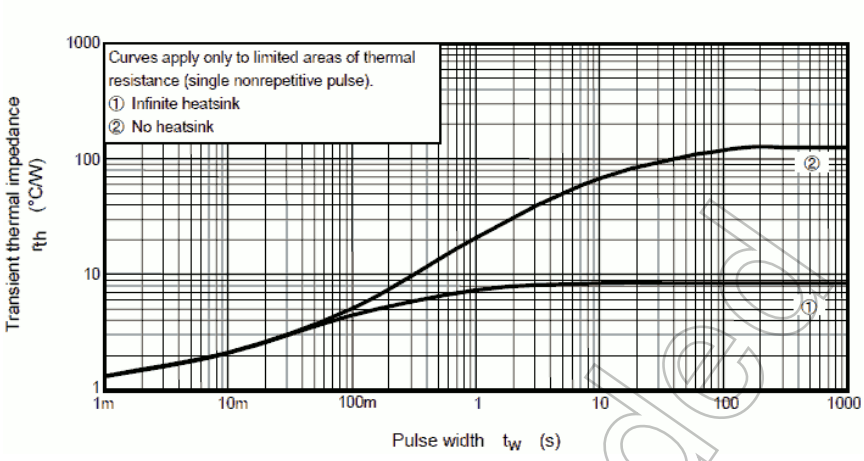


Fig. 8.6 $r_{th(j-a)}$ - t_w (Guaranteed Maximum)

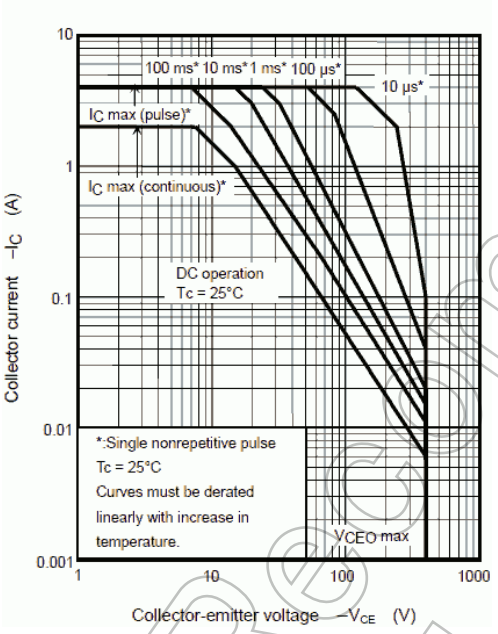
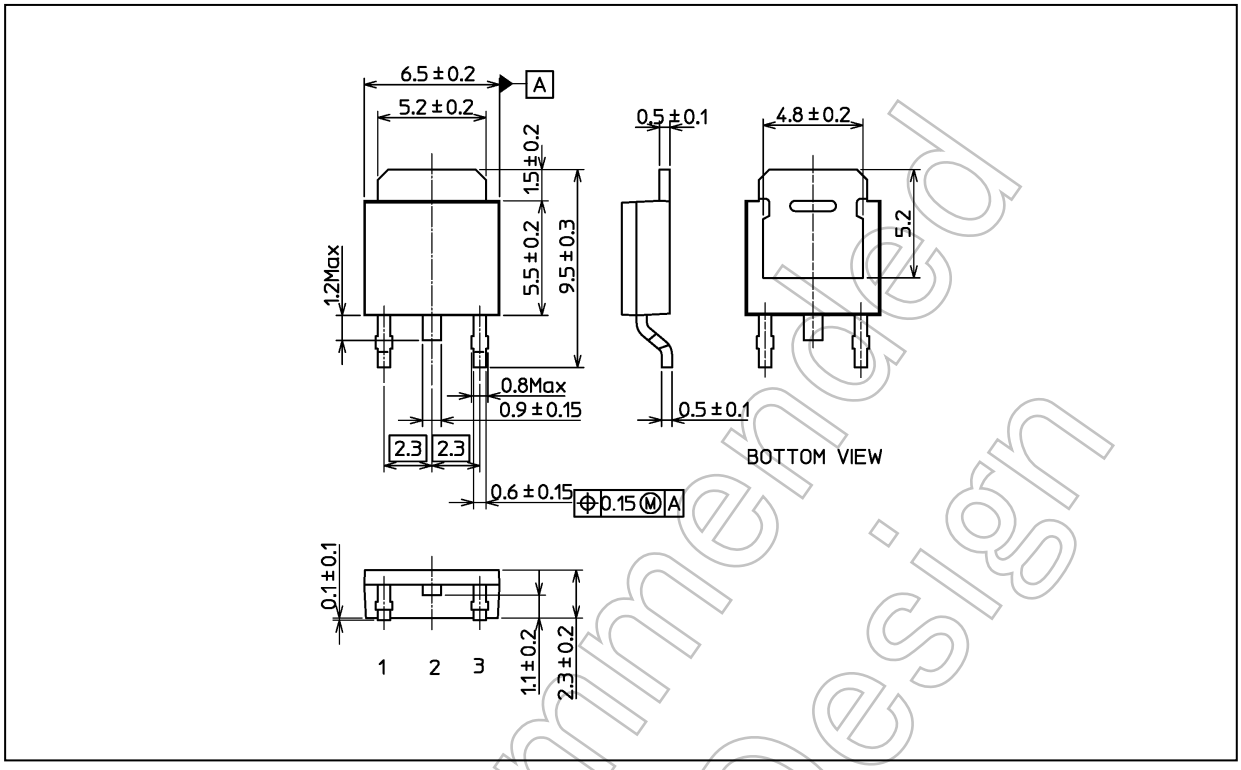


Fig. 8.7 Safe Operating Area (Guaranteed Maximum)

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

Package Dimensions

Unit: mm



Weight: 0.36 g (typ.)

Package Name(s)
TOSHIBA: 2-7J1S
Nickname: New PW-Mold

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