

TOSHIBA Transistor Silicon PNP Epitaxial Type

2SA2070

High-Speed Switching Applications

DC-DC Converter Applications

- High DC current gain: $h_{FE} = 200$ to 500 ($I_C = -0.1$ A)
- Low collector-emitter saturation voltage: $V_{CE(sat)} = -0.20$ V (max)
- High-speed switching: $t_f = 70$ ns (typ.)

Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

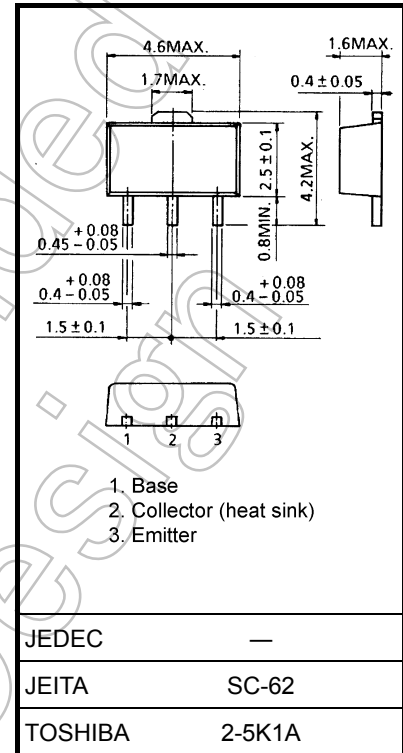
Characteristics		Symbol	Rating	Unit
Collector-base voltage		V_{CBO}	-50	V
Collector-emitter voltage		V_{CEO}	-50	V
Emitter-base voltage		V_{EBO}	-7	V
Collector current	DC	I_C	-1.0	A
	Pulse	I_{CP}	-2.0	
Base current		I_B	-0.1	A
Collector power dissipation	DC	P_C (Note 1)	1.0	W
	$t = 10$ s		2.0	
Junction temperature		T_j	150	$^\circ\text{C}$
Storage temperature range		T_{stg}	-55 to 150	$^\circ\text{C}$

Note 1: Mounted on an FR4 board (glass epoxy, 1.6 mm thick, Cu area: 645 mm²)

Note 2: 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.).

Unit: mm



Weight: 0.05 g (typ.)

Start of commercial production
2001-09

Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	$V_{CB} = -50 \text{ V}, I_E = 0$	—	—	-100	nA
Emitter cut-off current		I_{EBO}	$V_{EB} = -7 \text{ V}, I_C = 0$	—	—	-100	nA
Collector-emitter breakdown voltage		$V_{(BR) CEO}$	$I_C = -10 \text{ mA}, I_B = 0$	-50	—	—	V
DC current gain		$h_{FE} (1)$	$V_{CE} = -2 \text{ V}, I_C = -0.1 \text{ A}$	200	—	500	
		$h_{FE} (2)$	$V_{CE} = -2 \text{ V}, I_C = -0.3 \text{ A}$	125	—	—	
Collector-emitter saturation voltage		$V_{CE (sat)}$	$I_C = -0.3 \text{ A}, I_B = -0.01 \text{ A}$	—	—	-0.20	V
Base-emitter saturation voltage		$V_{BE (sat)}$	$I_C = -0.3 \text{ A}, I_B = -0.01 \text{ A}$	—	—	-1.10	V
Collector output capacitance		C_{ob}	$V_{CB} = -10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$	—	8	—	pF
Switching time	Rise time	t_r	See Figure 1. $V_{CC} \approx -30 \text{ V}, R_L = 100 \ \Omega$ $I_{B1} = 10 \text{ mA}, I_{B2} = 10 \text{ mA}$	—	60	—	ns
	Storage time	t_{stg}		—	280	—	
	Fall time	t_f		—	70	—	

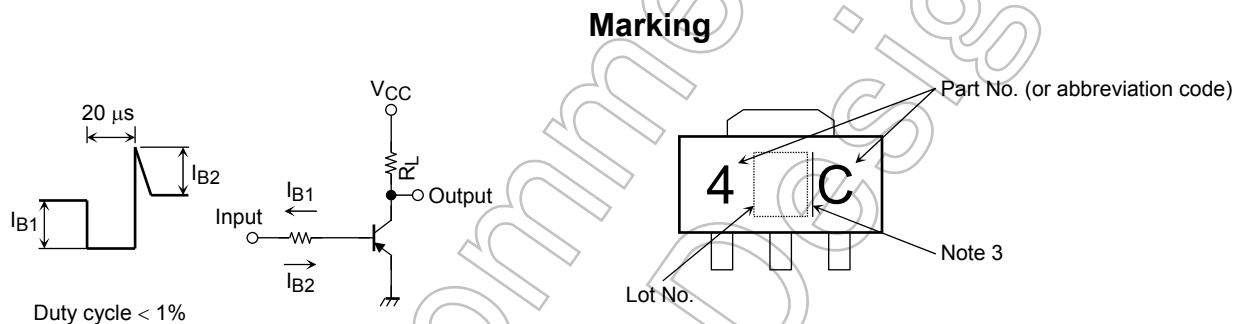


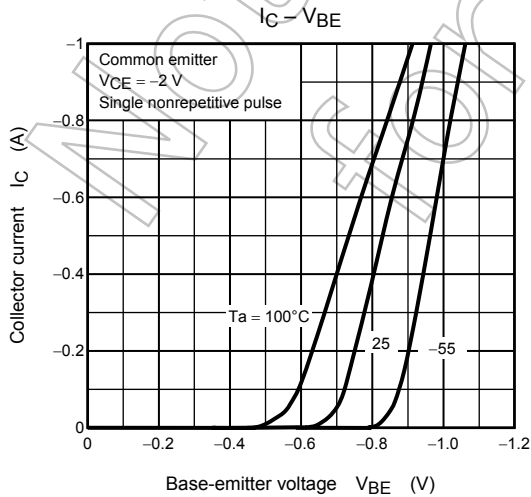
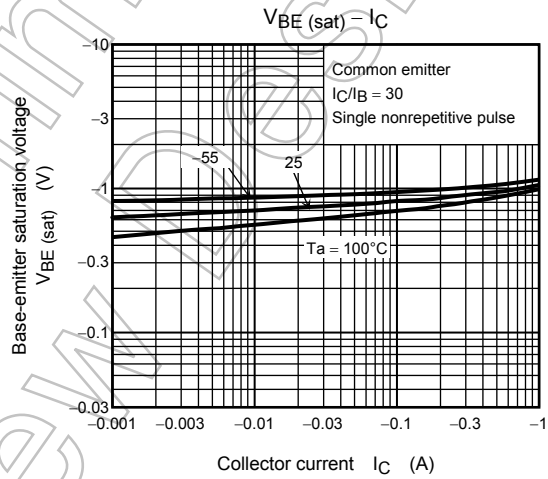
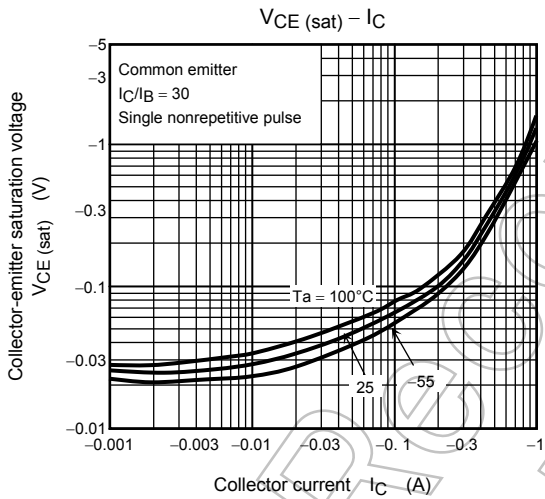
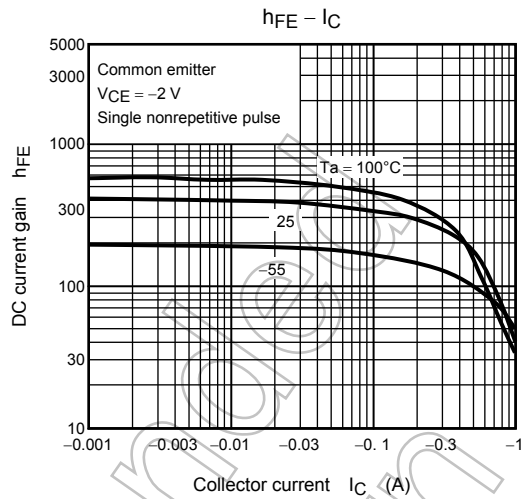
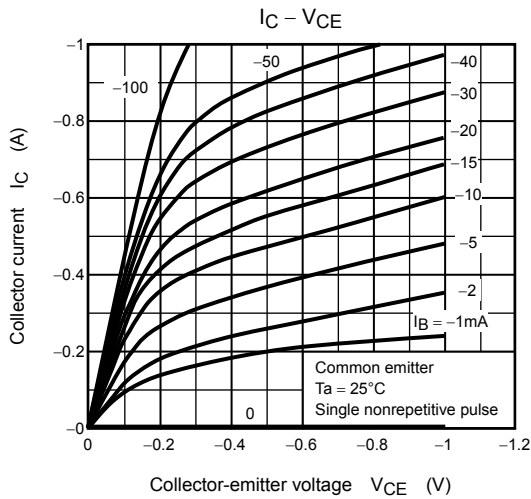
Figure 1 Switching Time Test Circuit & Timing Chart

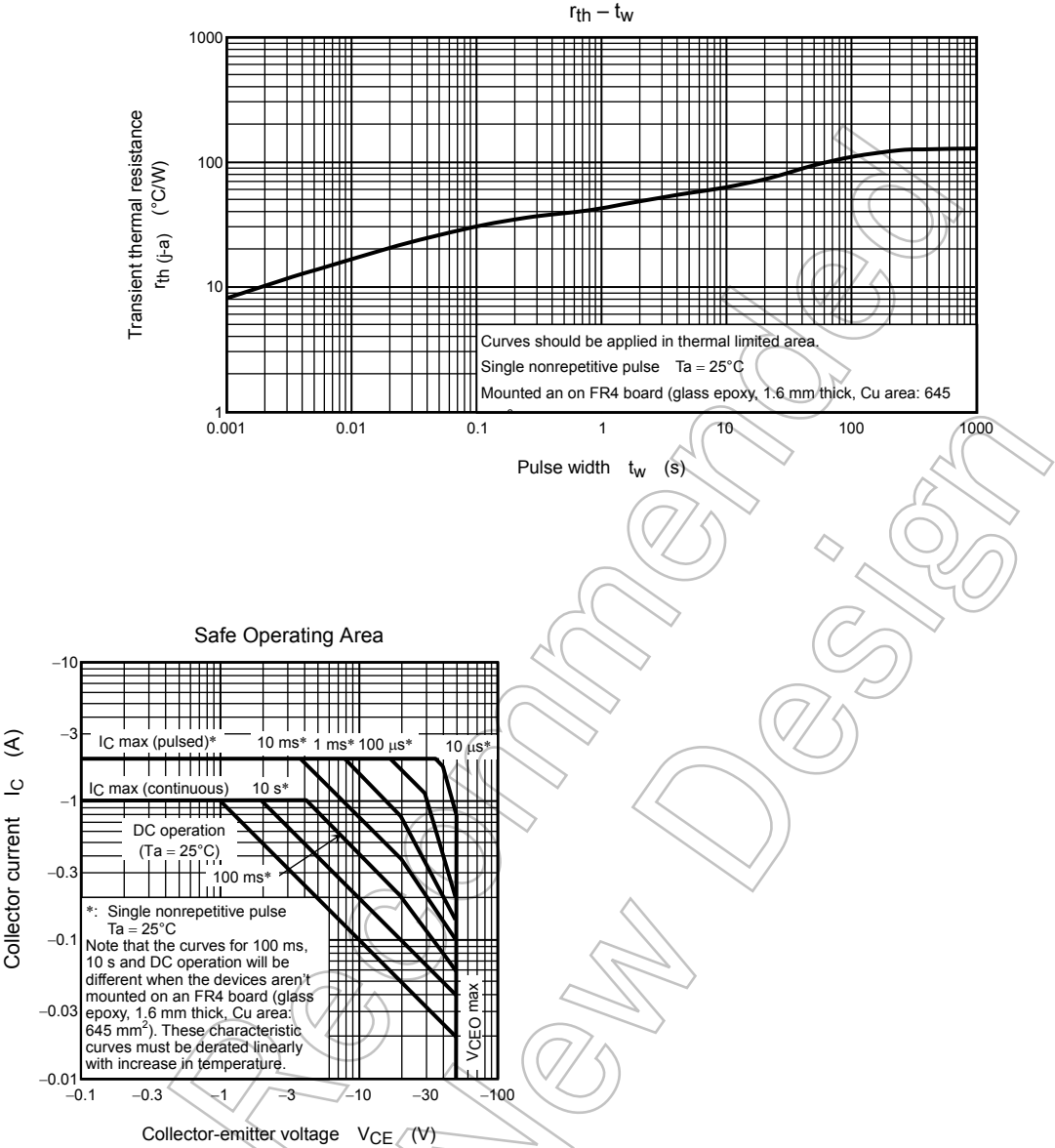
Note 3: A line beside a Lot No. identifies the indication of product Labels.

Without a line: $[[Pb]]/INCLUDES > MCV$

With a line: $[[G]]/RoHS \text{ COMPATIBLE}$ 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.





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