

TOSHIBA Transistor Silicon PNP Epitaxial Type

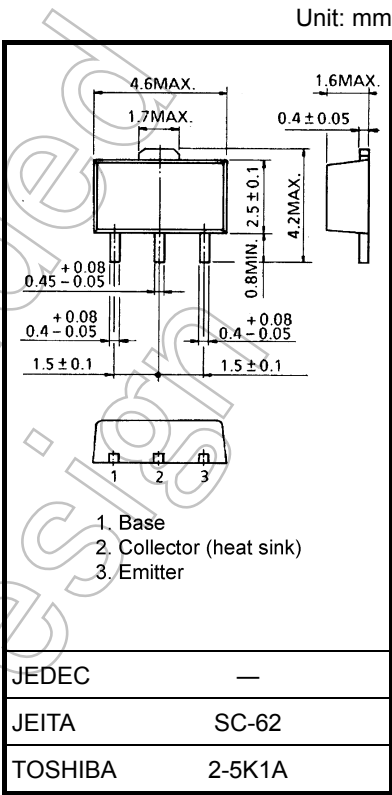
2SA2060

High-Speed Switching Applications
DC-DC Converter Applications
Strobe Applications

- High DC current gain: $h_{FE} = 200$ to 500 ($I_C = -0.3$ A)
- Low collector-emitter saturation voltage: $V_{CE(sat)} = -0.2$ V (max)
- High-speed switching: $t_f = 90$ ns (typ.)

Absolute Maximum Ratings (Ta = 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}	-7	V
Collector current	DC	I_C	-2.0	A
	Pulse	I_{CP}	-3.5	
Base current		I_B	-200	mA
Collector power dissipation	t = 10 s	P_C (Note 1)	2.5	W
	DC		1.0	
Junction temperature		T_J	150	°C
Storage temperature range		T_{stg}	-55 to 150	°C



Weight: 0.05 g (typ.)

- 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).

Start of commercial production
2000-03

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		$h_{FE} (1)$	$V_{CE} = -2 \text{ V}, I_C = -0.3 \text{ A}$	200	—	500	
		$h_{FE} (2)$	$V_{CE} = -2 \text{ V}, I_C = -1.0 \text{ A}$	100	—	—	
Collector-emitter saturation voltage		$V_{CE (sat)}$	$I_C = -1.0 \text{ A}, I_B = -0.033 \text{ A}$	—	—	-0.2	V
Base-emitter saturation voltage		$V_{BE (sat)}$	$I_C = -1.0 \text{ A}, I_B = -0.033 \text{ A}$	—	—	-1.1	V
Collector output capacitance		C_{ob}	$V_{CB} = -10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$	—	20	—	pF
Switching time	Rise time	t_r	See Figure 1 circuit diagram.	—	60	—	ns
	Storage time	t_{stg}	$V_{CC} \approx -30 \text{ V}, R_L = 30 \Omega$	—	250	—	
	Fall time	t_f	$I_{B1} = 33 \text{ mA}, I_{B2} = 33 \text{ mA}$	—	90	—	

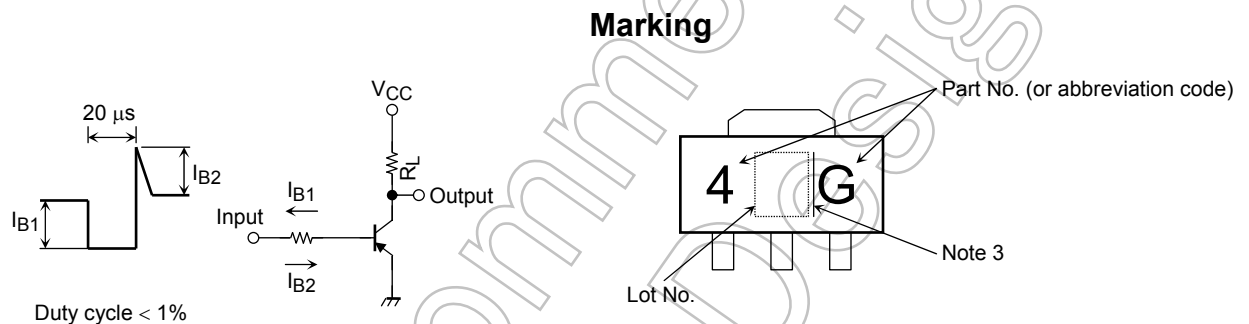


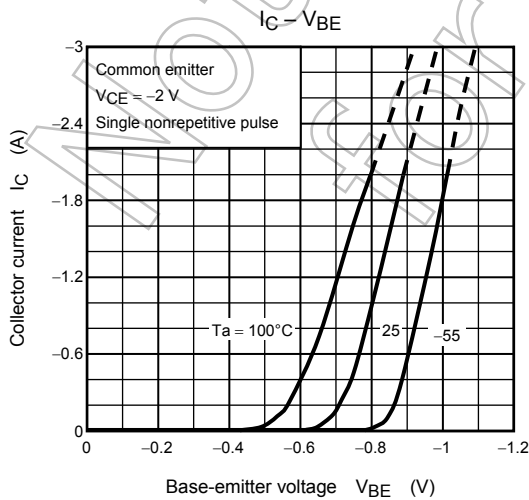
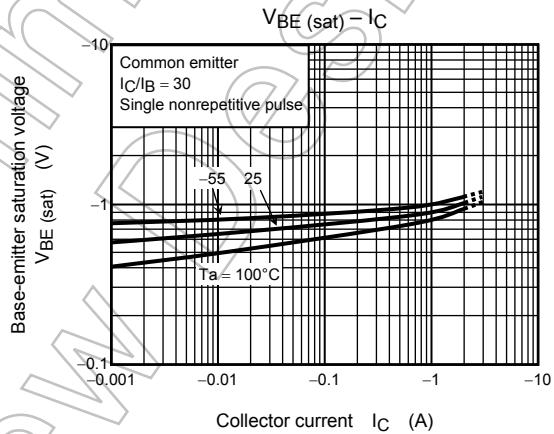
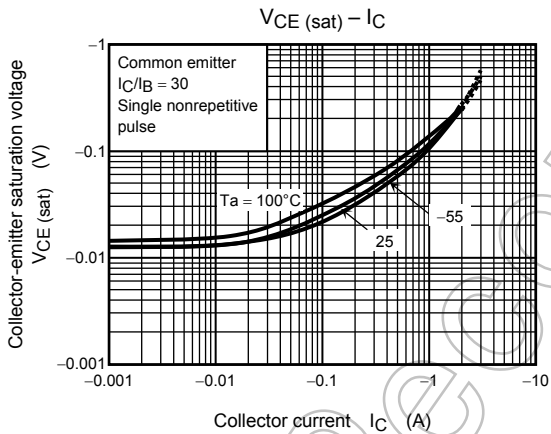
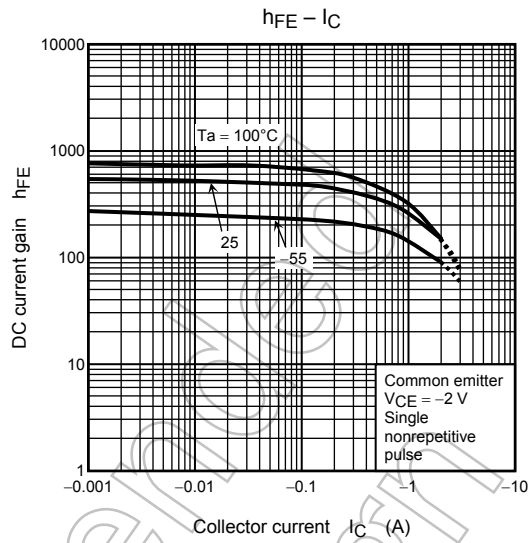
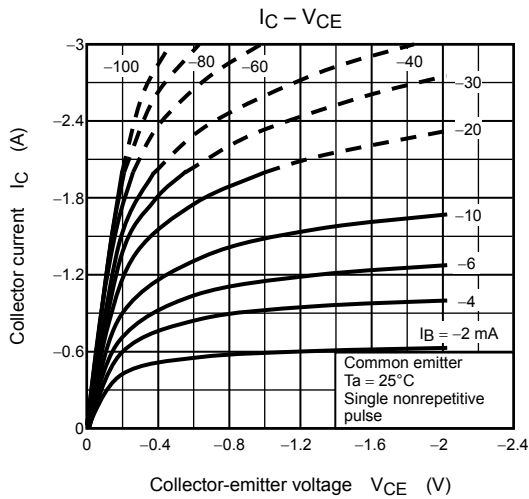
Figure 1 Switching Time Test Circuit & Timing Chart

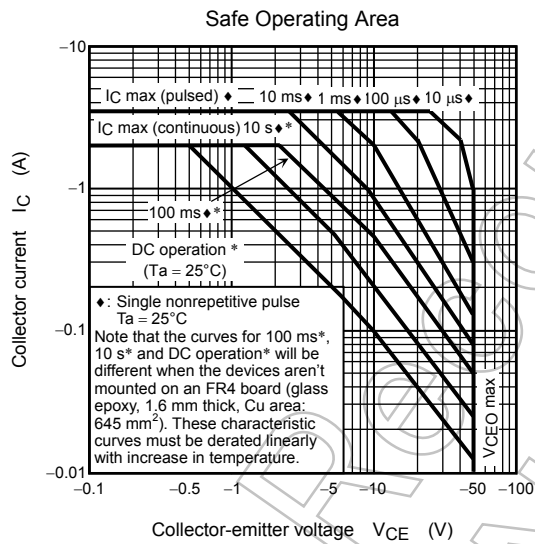
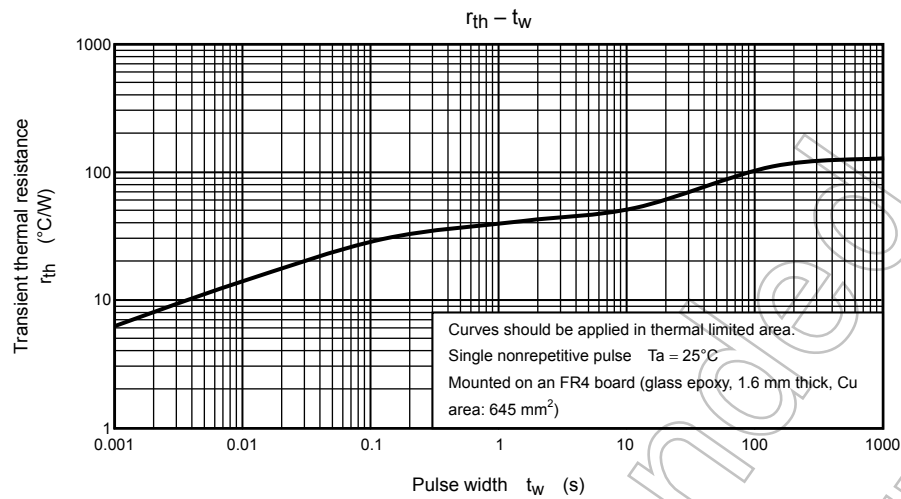
Note 3: A line to the right of a Lot No. identifies the indication of product Labels.

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

With a line: [[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.





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