

TOSHIBA Transistor Silicon PNP Triple Diffused Type

2SA1971

High-Voltage Switching Applications

- High breakdown voltage: $V_{CEO} = -400\text{ V}$

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

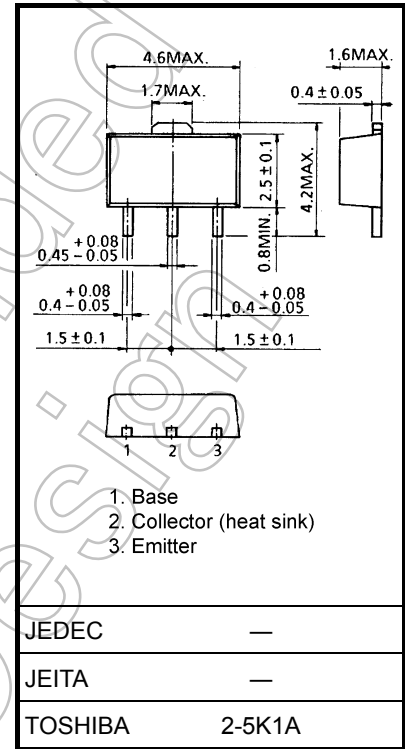
Characteristics		Symbol	Rating	Unit
Collector-base voltage		V_{CBO}	-400	V
Collector-emitter voltage		V_{CEO}	-400	V
Emitter-base voltage		V_{EBO}	-7	V
Collector current	DC	I_C	-0.5	A
	Pulse	I_{CP}	-1	
Base current		I_B	-0.25	A
Collector power dissipation	$T_a = 25^\circ\text{C}$	P_C	500	mW
	$T_a = 25^\circ\text{C}$ (Note 1)		1000	
Junction temperature		T_j	150	$^\circ\text{C}$
Storage temperature range		T_{stg}	-55 to 150	$^\circ\text{C}$

Note 1: Mounted on a ceramic substrate $250\text{ mm}^2 \times 0.8\text{ t}$

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



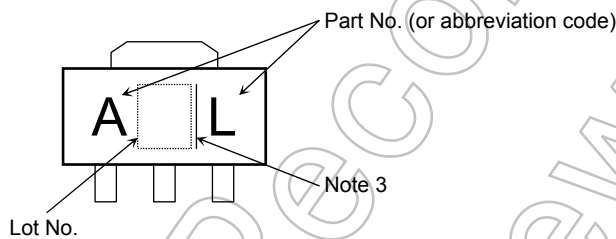
Weight: 0.05 g (typ.)

Start of commercial production
1995-07

Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	$V_{CB} = -400\text{ V}, I_E = 0$	—	—	-10	μA
Emitter cut-off current		I_{EBO}	$V_{EB} = -7\text{ V}, I_C = 0$	—	—	-1	μA
Collector-emitter breakdown voltage		$V_{(BR)CEO}$	$I_C = -10\text{ mA}, I_B = 0$	-400	—	—	V
DC current gain		$h_{FE(1)}$	$V_{CE} = -5\text{ V}, I_C = -20\text{ mA}$	140	—	450	
		$h_{FE(2)}$	$V_{CE} = -5\text{ V}, I_C = -100\text{ mA}$	140	—	400	
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = -100\text{ mA}, I_B = -10\text{ mA}$	—	-0.4	-1.0	V
Base-emitter saturation voltage		$V_{BE(sat)}$	$I_C = -100\text{ mA}, I_B = -10\text{ mA}$	—	-0.76	-0.9	V
Transition frequency		f_T	$V_{CE} = -5\text{ V}, I_C = -50\text{ mA}$	—	35	—	MHz
Collector output capacitance		C_{ob}	$V_{CB} = -10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	18	—	pF
Switching time	Turn-on time	t_{on}	<p>Part No. I_{B1} I_{B2} Output $V_{CC} = -200\text{ V}$ $I_{B1} = 10\text{ mA}, I_{B2} = 20\text{ mA},$ duty cycle $\leq 1\%$</p>	—	0.2	—	μs
	Storage time	t_{stg}		—	2.3	—	
	Fall time	t_f		—	0.2	—	

Marking

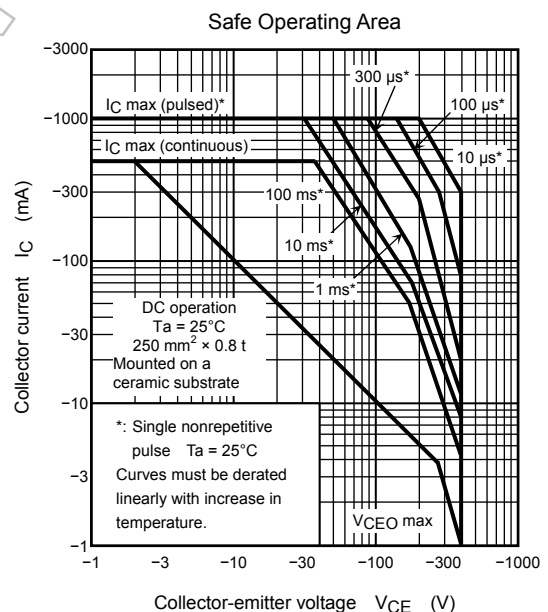
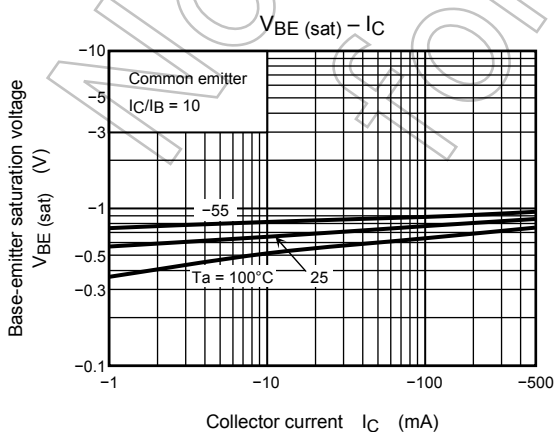
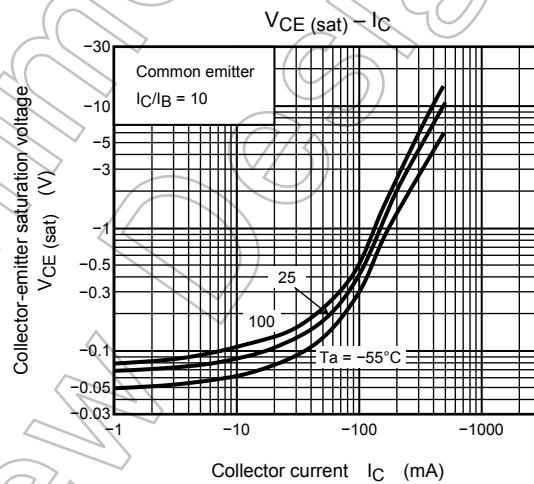
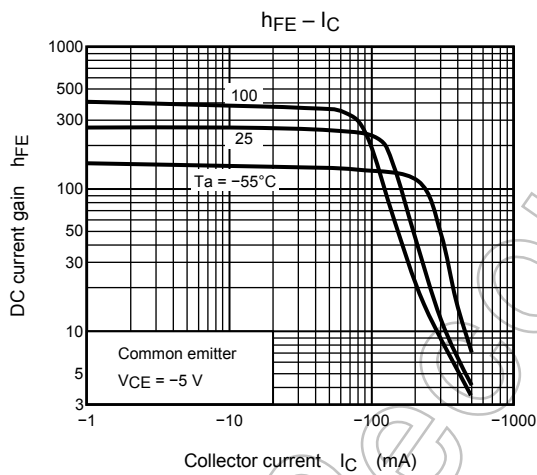
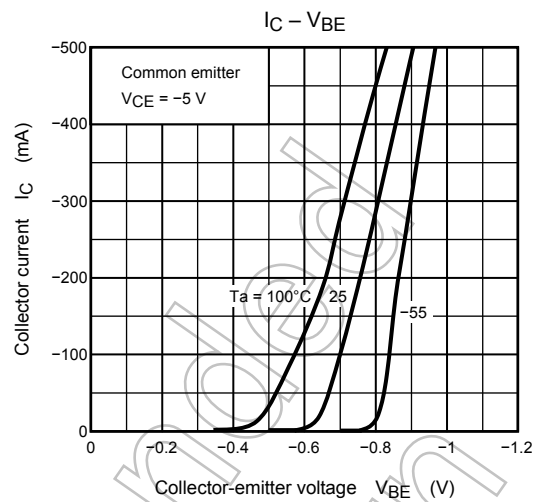
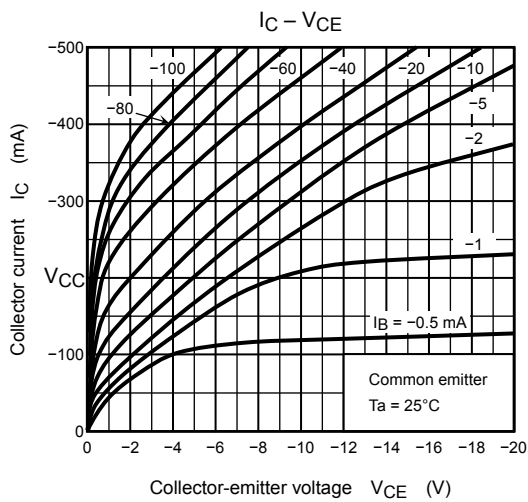


Note 3: A line to the right of a Lot No. identifies the indication of product Labels.

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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