

TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

# 2SA1020

Power Amplifier Applications  
Power Switching Applications

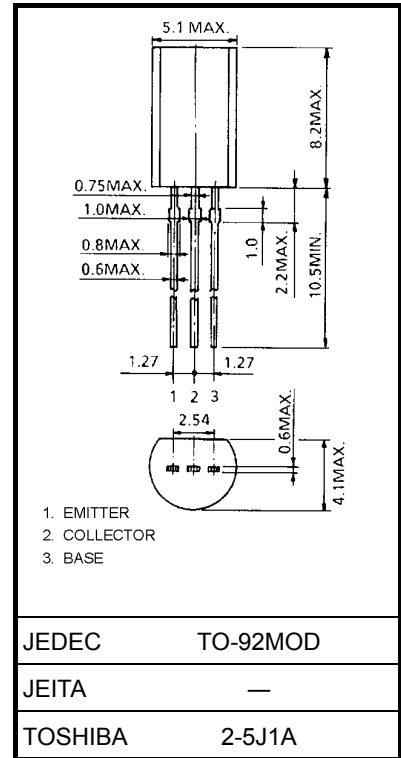
- Low Collector saturation voltage:  $V_{CE(sat)} = -0.5 \text{ V (max)}$  ( $I_C = -1 \text{ A}$ )
- High collector power dissipation:  $P_C = 900 \text{ mW}$
- High-speed switching:  $t_{stg} = 1.0 \mu\text{s (typ.)}$
- Complementary to 2SC2655

### 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	$V_{EBO}$	-5	V
Collector current	$I_C$	-2	A
Base current	$I_B$	-0.2	A
Collector power dissipation	$P_C$	900	mW
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature range	$T_{stg}$	-55 to 150	$^\circ\text{C}$

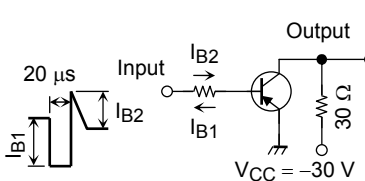
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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).

Unit: mm



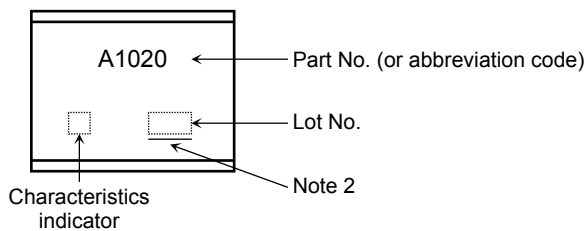
Weight: 0.36 g (typ.)

## Electrical Characteristics (T<sub>a</sub> = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I <sub>CBO</sub>	V <sub>CB</sub> = -50 V, I <sub>E</sub> = 0	—	—	-1	μA
Emitter cut-off current		I <sub>EBO</sub>	V <sub>EB</sub> = -5 V, I <sub>C</sub> = 0	—	—	-1	μA
Collector-emitter breakdown voltage		V <sub>(BR) CEO</sub>	I <sub>C</sub> = -10 mA, I <sub>B</sub> = 0	-50	—	—	V
DC current gain		h <sub>FE</sub> (1)	V <sub>CE</sub> = -2 V, I <sub>C</sub> = -0.5 A	70	—	240	
		h <sub>FE</sub> (2)	V <sub>CE</sub> = -2 V, I <sub>C</sub> = -1.5 A	40	—	—	
Collector-emitter saturation voltage		V <sub>CE (sat)</sub>	I <sub>C</sub> = -1 A, I <sub>B</sub> = -0.05 A	—	—	-0.5	V
Base-emitter saturation voltage		V <sub>BE (sat)</sub>	I <sub>C</sub> = -1 A, I <sub>B</sub> = -0.05 A	—	—	-1.2	V
Transition frequency		f <sub>T</sub>	V <sub>CE</sub> = -2 V, I <sub>C</sub> = -0.5 A	—	100	—	MHz
Collector output capacitance		C <sub>ob</sub>	V <sub>CB</sub> = -10 V, I <sub>E</sub> = 0, f = 1 MHz	—	40	—	pF
Switching time	Turn-on time	t <sub>on</sub>		—	0.1	—	μs
	Storage time	t <sub>stg</sub>		—	1	—	
	Fall time	t <sub>f</sub>		I <sub>B1</sub> = 0.05 A, I <sub>B2</sub> = 0.05 A DUTY CYCLE ≤ 1%	—	0.1	

Note: h<sub>FE</sub> (1) classification O: 70 to 140, Y: 120 to 240

## Marking

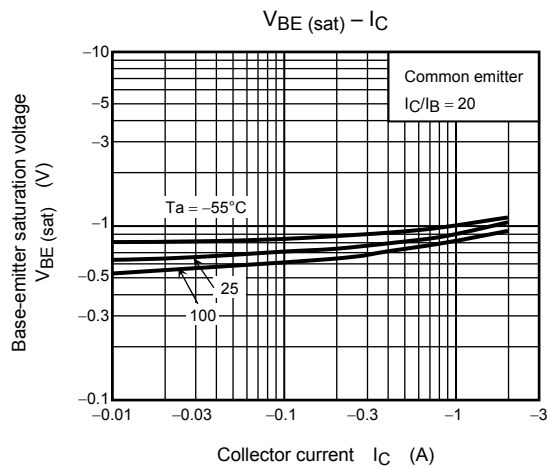
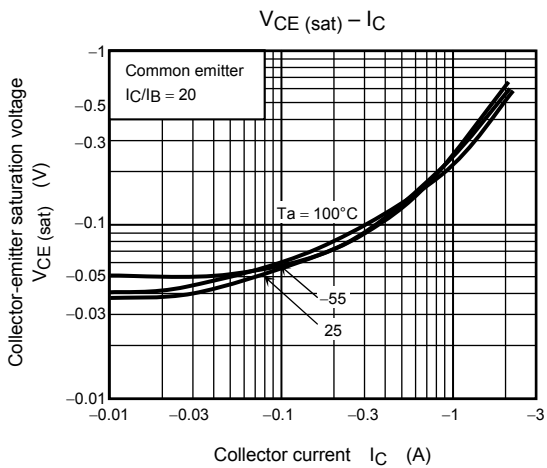
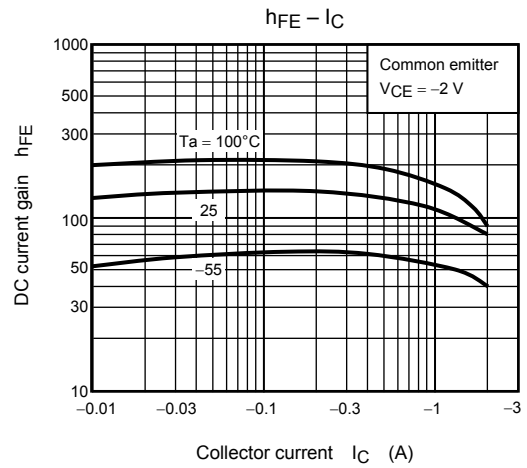
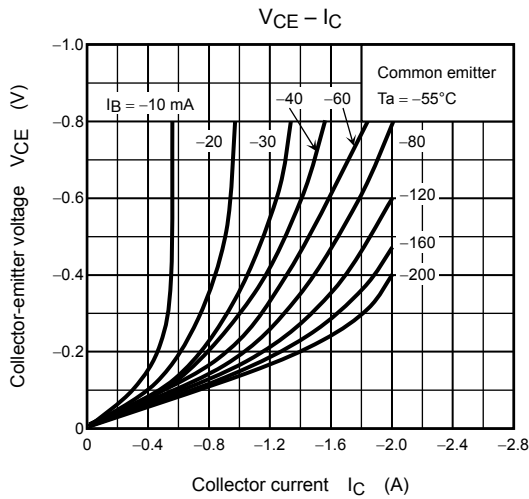
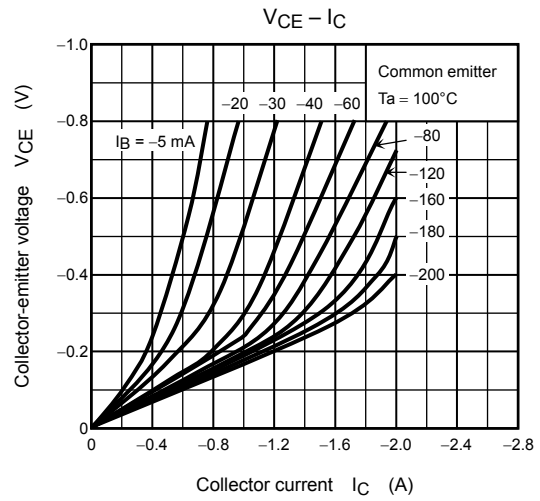
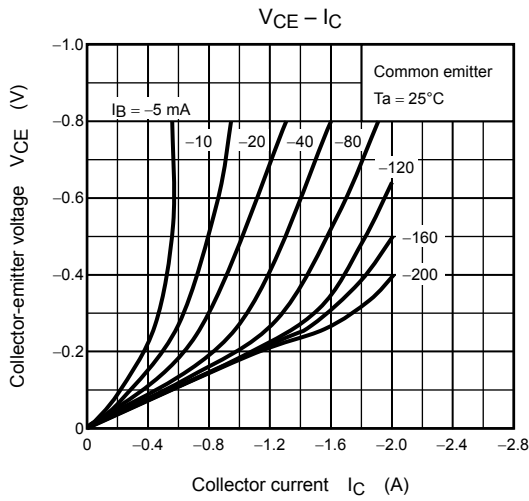


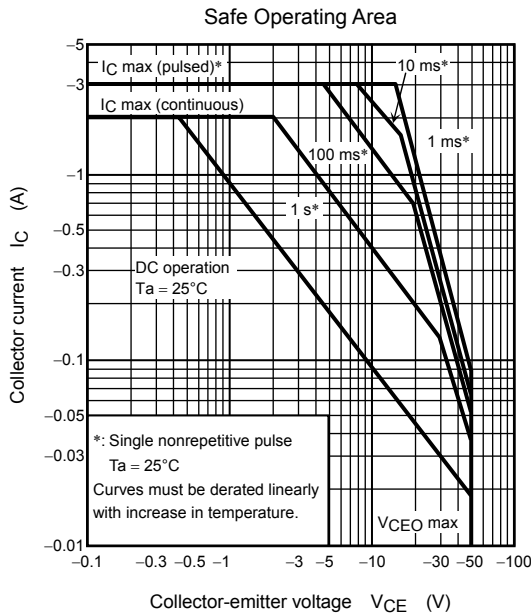
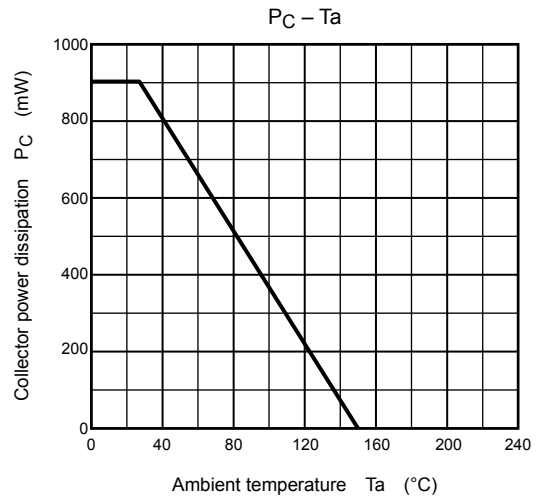
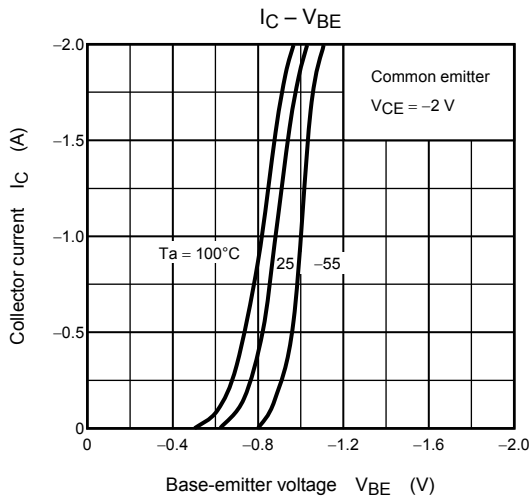
Note 2: A line under a Lot No. identifies the indication of product Labels.

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 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.





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