

TOSHIBA Transistor Silicon NPN Epitaxial Type

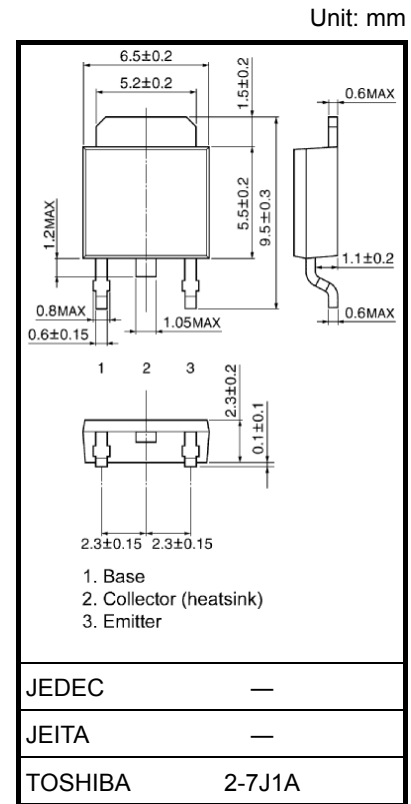
# 2SC6052

High-Speed Switching Applications  
Power Amplifier Applications

- High DC current gain:  $h_{FE} = 180$  to  $390$  ( $I_C = 0.5$  A)
- Low collector-emitter saturation:  $V_{CE(sat)} = 0.20$  V (max)
- High-speed switching:  $t_f = 15$  ns (typ.)

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

Characteristics		Symbol	Rating	Unit
Collector-base voltage		$V_{CBO}$	40	V
Collector-emitter voltage		$V_{CEO}$	20	V
Emitter-base voltage		$V_{EBO}$	7	V
Collector current	DC	$I_C$	5	A
	Pulse	$I_{CP}$	10	
Base current		$I_B$	0.4	A
Collector power dissipation	$T_a = 25^\circ\text{C}$	$P_C$	1	W
	$T_c = 25^\circ\text{C}$		10	
Junction temperature		$T_j$	150	$^\circ\text{C}$
Storage temperature range		$T_{stg}$	-55 to 150	$^\circ\text{C}$



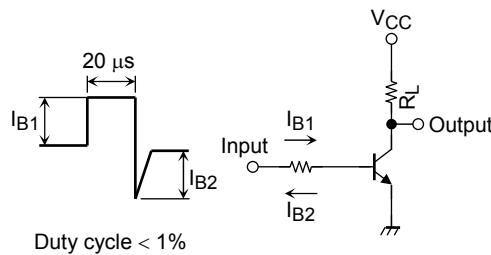
Weight: 0.36 g (typ.)

Note1 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).

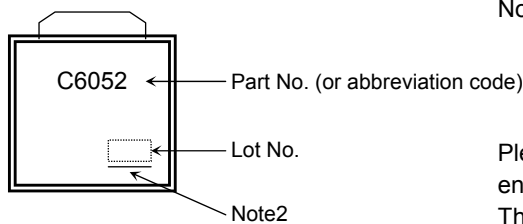
**Electrical Characteristics (Ta = 25°C)**

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cutoff current		$I_{CBO}$	$V_{CB} = 40\text{ V}, I_E = 0$	—	—	100	nA
Emitter cutoff current		$I_{EBO}$	$V_{EB} = 7\text{ V}, I_C = 0$	—	—	100	nA
Collector-emitter breakdown voltage		$V_{(BR) CEO}$	$I_C = 10\text{ mA}, I_B = 0$	20	—	—	V
DC current gain		$h_{FE} (1)$	$V_{CE} = 2\text{ V}, I_C = 0.5\text{ A}$	180	—	390	
		$h_{FE} (2)$	$V_{CE} = 0.8\text{ V}, I_C = 2.0\text{ A}$	100	—	—	
Collector emitter saturation voltage		$V_{CE} (sat)$	$I_C = 1.8\text{ A}, I_B = 53\text{ mA}$	—	—	0.20	V
Base-emitter saturation voltage		$V_{BE} (sat)$	$I_C = 1.8\text{ A}, I_B = 53\text{ mA}$	—	—	1.10	V
Collector output capacitance		$C_{ob}$	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	18	—	pF
Switching time	Rise time	$t_r$	See Figure 1 circuit diagram	—	70	—	ns
	Storage time	$t_{stg}$	$V_{CC} \approx 12\text{ V}, R_L = 7.5\ \Omega$ $I_{B1} = 53\text{ mA}, I_{B2} = 53\text{ mA}$	—	160	—	
	Fall time	$t_f$		—	15	—	

**Figure 1. Switching Time Test Circuit & Timing Chart**



**Marking**

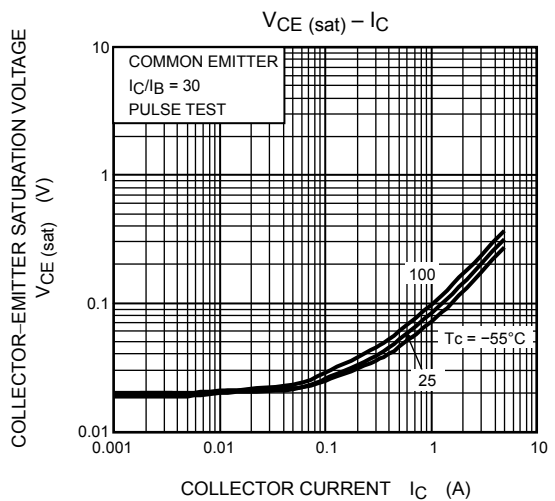
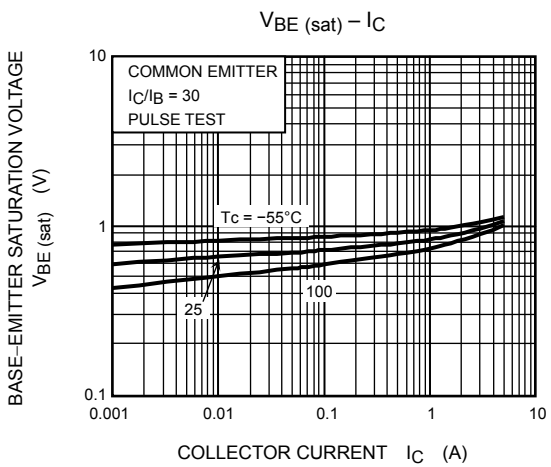
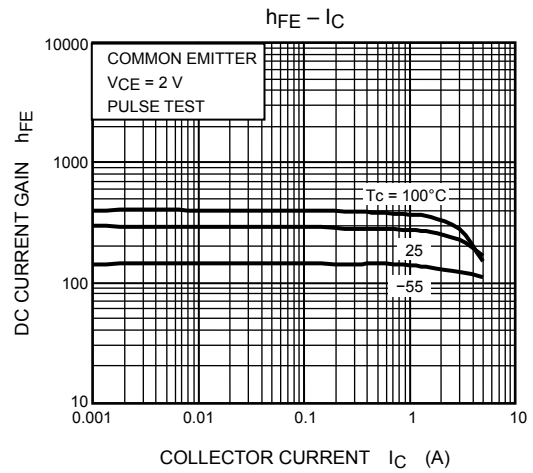
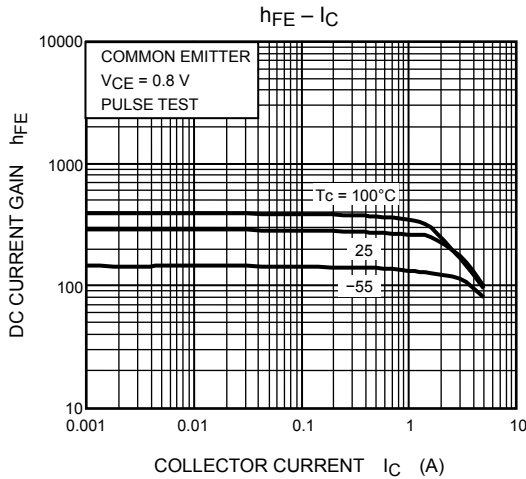
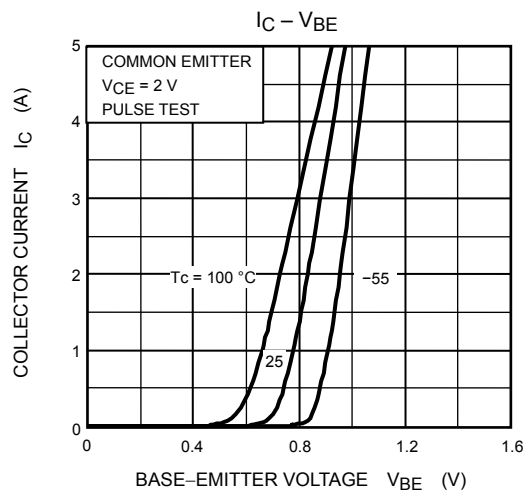
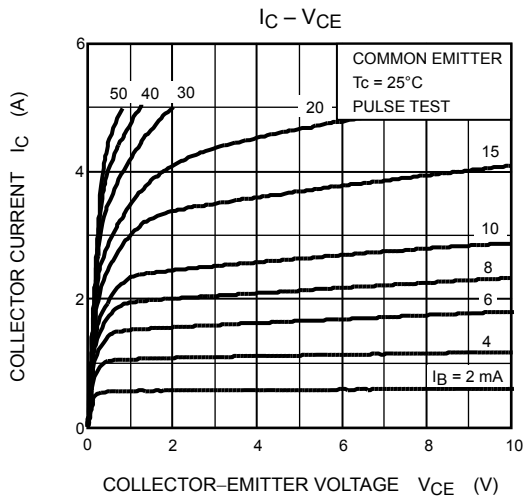


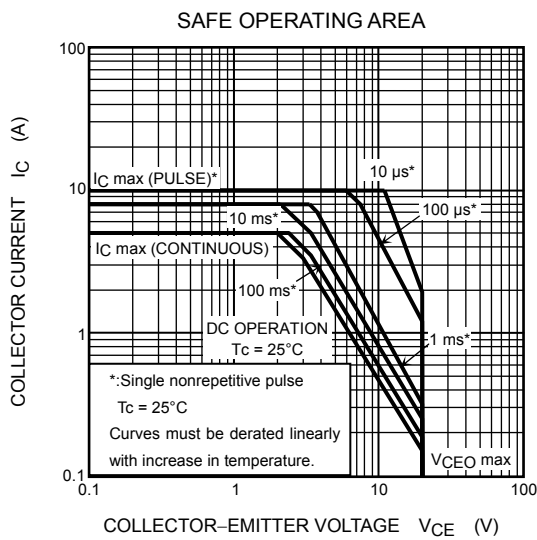
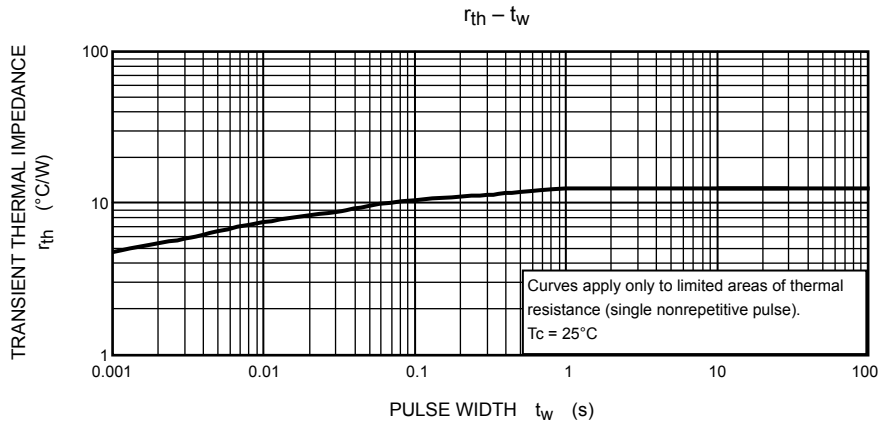
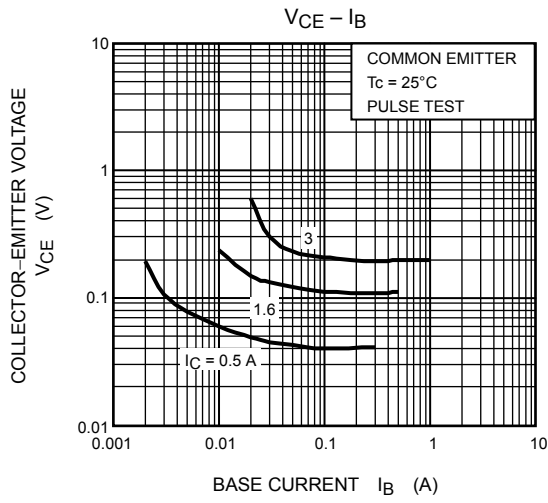
Note2 A line under a Lot No. identifies the indication of product Labels.

Not underlined: [[Pb]]/INCLUDES > MCV

Underlined: [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

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