Unit: mm

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process)

# 2SC3803

High Frequency Amplifier Applications Video Amplifier Applications High Speed Switching Applications

- High transition frequency: f<sub>T</sub> = 200 MHz (typ.)
- Low collector output capacitance: Cob = 3.5 pF (typ.)
- Complementary to 2SA1483

### **Absolute Maximum Ratings (Ta = 25°C)**

Characteristics	Symbol	Rating	Unit	
Collector-base voltage	$V_{CBO}$	60	V	
Collector-emitter voltage	V <sub>CEO</sub>	45	V	
Emitter-base voltage	V <sub>EBO</sub>	5	V	
Continuous collector current	IC	200	mA	
Continuous base current	ΙB	50	mA	
Collector power dissipation	PC	500	mW	
	P <sub>C</sub> (Note 1)	1000		
Junction temperature	Tj	150	°C	
Storage temperature range	T <sub>stg</sub>	−55 to 150	°C	

1.6MAX. 1.6MAX. 1.6MAX. 1.6MAX. 1.7MAX. 0.4±0.05 1.7MAX.

Weight: 0.05 g (typ.)

Note 1: Mounted on a ceramic substrate (250 mm<sup>2</sup> × 0.8 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.

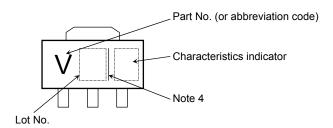
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

## Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Тур.	Max	Unit
Collector cut-off current		I <sub>CBO</sub>	V <sub>CB</sub> = 45 V, I <sub>E</sub> = 0	_	_	0.1	μΑ
Emitter cut-off current		I <sub>EBO</sub>	V <sub>EB</sub> = 5 V, I <sub>C</sub> = 0	_	-	0.1	μΑ
DC current gain		h <sub>FE (1)</sub> (Note 3)	V <sub>CE</sub> = 1 V, I <sub>C</sub> = 10 mA	40	_	240	
		h <sub>FE (2)</sub>	V <sub>CE</sub> = 3 V, I <sub>C</sub> = 200 mA	20	_	_	
Collector-emitter s	saturation voltage	V <sub>CE</sub> (sat)	I <sub>C</sub> = 100 mA, I <sub>B</sub> = 10 mA	_	_	0.3	V
Base-emitter saturation voltage		V <sub>BE</sub> (sat)	I <sub>C</sub> = 100 mA, I <sub>B</sub> = 10 mA	_	_	1.0	V
Transition frequency		f <sub>T</sub>	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 10 mA	100	200	_	MHz
Input impedance (real part)		Re (h <sub>ie</sub> )	V <sub>CE</sub> = 10 V, I <sub>E</sub> = −10 mA, f = 200 MHz	_	_	120	Ω
Collector output capacitance		C <sub>ob</sub>	V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0, f = 1 MHz	_	3.5	5.0	pF
Switching time	Turn-on time	t <sub>on</sub>	OUTPUT  INPUT 680 Ω  O  O  O  O  O  O  O  O  O  O  O  O  O		40	_	
	Storage time	t <sub>stg</sub>		_	250	_	ns
	Fall time	t <sub>f</sub>			30	_	

Note 3: h<sub>FE (1)</sub> classification R: 40 to 80, O: 70 to 140, Y: 120 to 240

### Marking



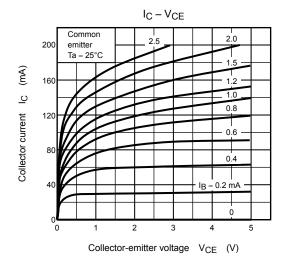
Note 4: A line to the right of a Lot No. identifies the indication of product Labels. Without a line: [[Pb]]/INCLUDES > MCV

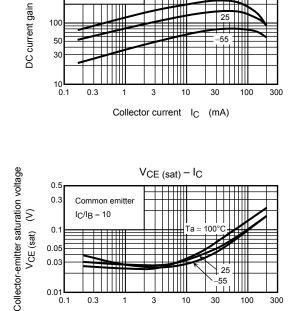
With a line: [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product. The RoHS is the Directive 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.

2

300





h<sub>FE</sub> - I<sub>C</sub>

1000

500 hFE

300

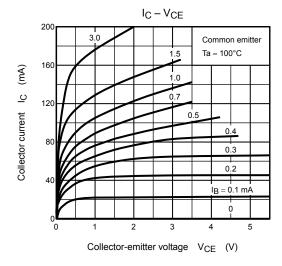
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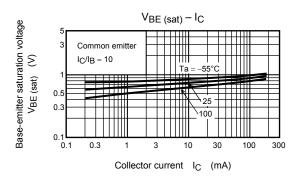
0.01

3

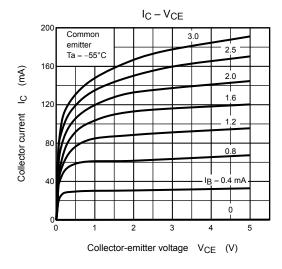
Common emitter

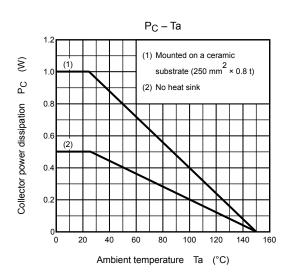
VCE = 3 V





Collector current I<sub>C</sub> (mA)





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