Unit: mm

#### TOSHIBA Transistor Silicon NPN Epitaxial Type

# 2SC6125

# High-Speed Switching Applications Power Amplifier Applications

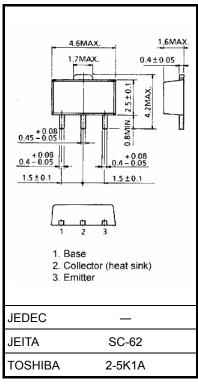
• High DC current gain:  $h_{FE}$  = 180 to 390 ( $I_{C}$  = 0.5 A)

• Low collector-emitter saturation: V<sub>CE</sub> (sat) = 0.2 V (max)

• High-speed switching:  $t_f = 15 \text{ ns (typ.)}$ 

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

Characteristic		Symbol	Rating	Unit	
Collector-base voltage		V <sub>CBO</sub>	40	V	
Collector-emitter voltage		V <sub>CEO</sub>	20	V	
Emitter-base voltage		V <sub>EBO</sub>	6	V	
Collector current	DC	IC	4	Α	
(Note 1)	Pulse	I <sub>CP</sub>	7		
Base current		Ι <sub>Β</sub>	0.4	Α	
Collector power dissipation (Note 2)	DC	PC	1	W	
	t = 10 s	PC	2.5		
Junction temperature		Tj	150	°C	
Storage temperature range		T <sub>stg</sub>	-55 to 150	°C	



Weight: 0.05 g (typ.)

- Note 1: Ensure that the channel temperature does not exceed 150°C during use of the device.
- Note 2: Mounted on an FR4 board (glass-epoxy; 1.6 mm thick; Cu area, 645 mm<sup>2</sup>)
- Note 3: 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.

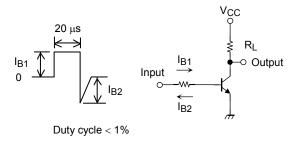
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).



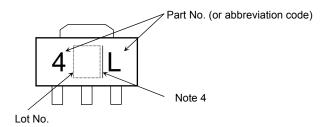
# **Electrical Characteristics (Ta = 25°C)**

Chara	acteristic	Symbol	Test Condition	Min	Тур.	Max	Unit
Collector cutoff current		I <sub>CBO</sub>	$V_{CB} = 40 \text{ V}, I_{E} = 0$	_	_	100	nA
Emitter cutoff currer	nt	I <sub>EBO</sub>	V <sub>EB</sub> = 6 V, I <sub>C</sub> = 0	_	_	100	nA
Collector-emitter bre	eakdown voltage	V (BR) CEO	I <sub>C</sub> = 10 mA, I <sub>B</sub> = 0	20	_	_	V
DC current gain		h <sub>FE</sub> (1)	V <sub>CE</sub> = 2 V, I <sub>C</sub> = 0.5 A	180	_	390	
		h <sub>FE</sub> (2)	V <sub>CE</sub> = 0.8 V, I <sub>C</sub> = 2 A	100	_	_	
Collector emitter saturation voltage		V <sub>CE</sub> (sat)	I <sub>C</sub> = 1.6 A, I <sub>B</sub> = 53 mA	_	_	0.2	V
Base-emitter saturation voltage		V <sub>BE</sub> (sat)	I <sub>C</sub> = 1.6 A, I <sub>B</sub> = 53 mA	_	_	1.1	V
Collector output capacitance		Cob	V <sub>CB</sub> = 10 V, I <sub>E</sub> =0 ,f=1MHz	_	18	_	pF
Switching time	Rise time	t <sub>r</sub>	See Figure 1 circuit diagram $V_{CC} \approx 12 \text{ V}, \text{ R}_L = 7.5 \Omega$ $I_{B1} = I_{B2} = 53 \text{ mA}$	_	70	_	ns
	Storage time	t <sub>stg</sub>		_	160	_	
	Fall time	t <sub>f</sub>		_	15	_	

Figure 1. Switching Time Test Circuit & Timing Chart



# Marking

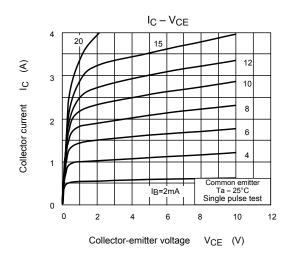


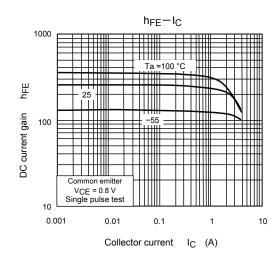
Note 4: A line beside a Lot No. identifies the indication of product Labels. [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

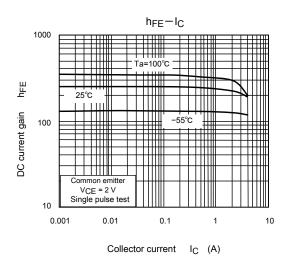
Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product.

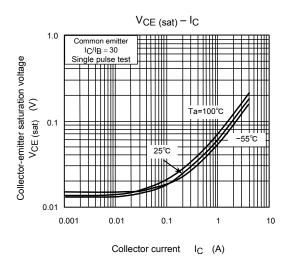
The RoHS is the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

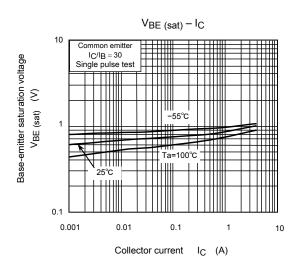
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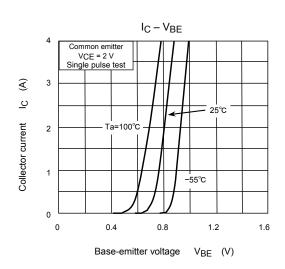


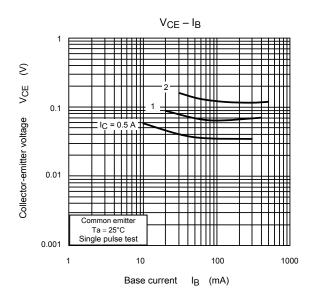


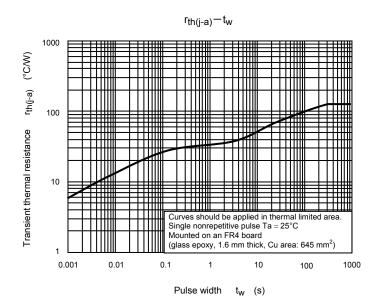




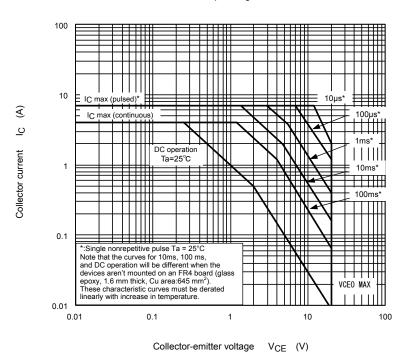








#### Safe Operating Area



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