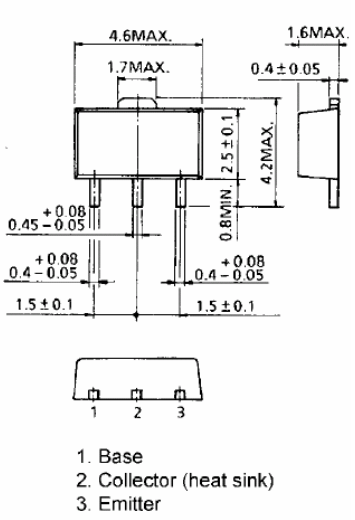
TOSHIBA Transistor Silicon NPN Epitaxial Type

2SC6125

High-Speed Switching Applications
Power Amplifier Applications

Unit : mm



JEDEC	—
JEITA	SC-62
TOSHIBA	2-5K1A

Weight: 0.05 g (typ.)

- High DC current gain: h_{FE} = 180 to 390 (I_C = 0.5 A)
- Low collector-emitter saturation: $V_{CE\ (sat)}$ = 0.2 V (max)
- High-speed switching: t_f = 15 ns (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
Collector-base voltage		V_{CBO}	40	V
Collector-emitter voltage		V_{CEO}	20	V
Emitter-base voltage		V_{EBO}	6	V
Collector current (Note 1)	DC	I_C	4	A
	Pulse	I_{CP}	7	
Base current		I_B	0.4	A
Collector power dissipation (Note 2)	DC	P_C	1	W
	t = 10 s	P_C	2.5	
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55 to 150	°C

Note 1: Ensure that the channel temperature does not exceed 150°C during use of the device.

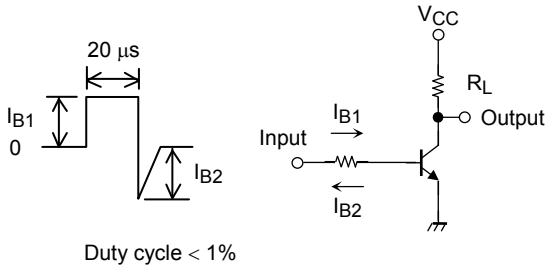
Note 2: Mounted on an FR4 board (glass-epoxy; 1.6 mm thick; Cu area, 645 mm^2)

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)

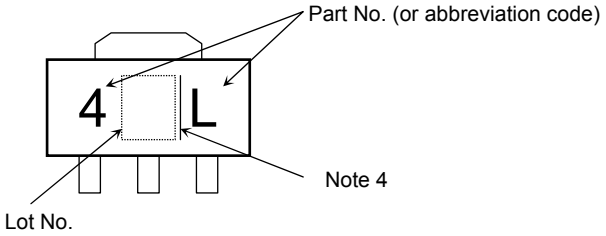
Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cutoff current		I_{CBO}	V_{CB} = 40 V, I_E = 0	—	—	100	nA
Emitter cutoff current		I_{EBO}	V_{EB} = 6 V, I_C = 0	—	—	100	nA
Collector-emitter breakdown voltage		$V_{(BR)\ CEO}$	I_C = 10 mA, I_B = 0	20	—	—	V
DC current gain		h_{FE} (1)	V_{CE} = 2 V, I_C = 0.5 A	180	—	390	
		h_{FE} (2)	V_{CE} = 0.8 V, I_C = 2 A	100	—	—	
Collector emitter saturation voltage		$V_{CE\ (sat)}$	I_C = 1.6 A, I_B = 53 mA	—	—	0.2	V
Base-emitter saturation voltage		$V_{BE\ (sat)}$	I_C = 1.6 A, I_B = 53 mA	—	—	1.1	V
Collector output capacitance		Cob	V_{CB} = 10 V, I_E =0 ,f=1MHz	—	18	—	pF
Switching time	Rise time	t_r	See Figure 1 circuit diagram	—	70	—	ns
	Storage time	t_{stg}	V_{CC} ≈ 12 V、R_L = 7.5 Ω	—	160	—	
	Fall time	t_f	I_{B1} = I_{B2} = 53 mA	—	15	—	

Figure 1. Switching Time Test Circuit & Timing Chart



Duty cycle < 1%

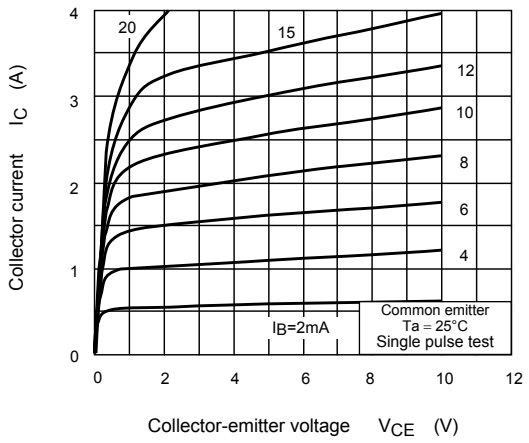
Marking



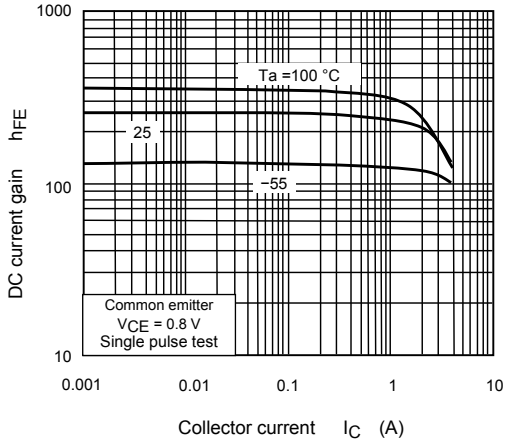
Note 4: A line beside a Lot No. identifies the indication of product Labels.
[[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

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

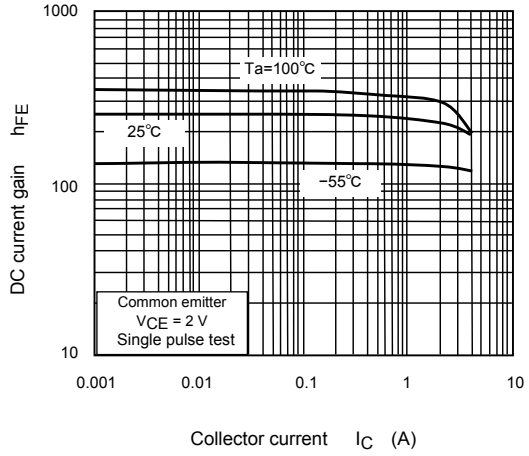
$I_C - V_{CE}$



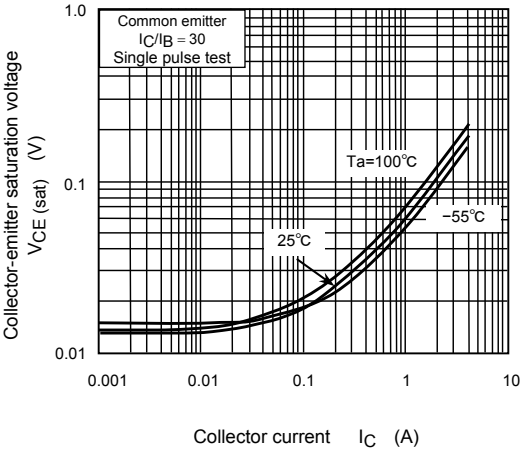
$h_{FE} - I_C$



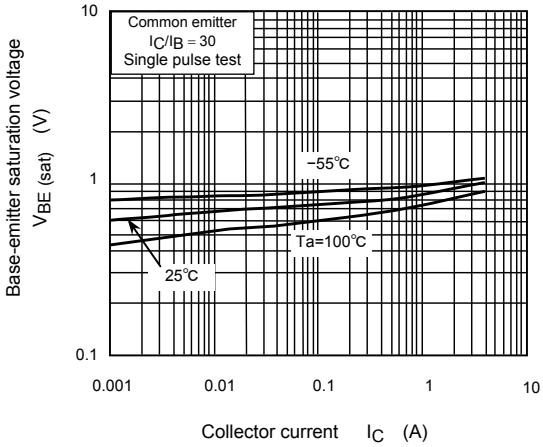
$h_{FE} - I_C$



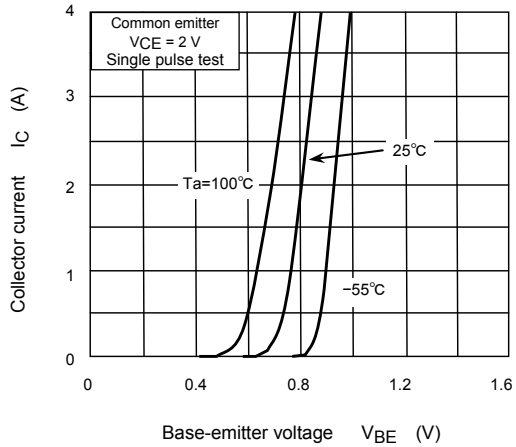
$V_{CE\ (sat)} - I_C$



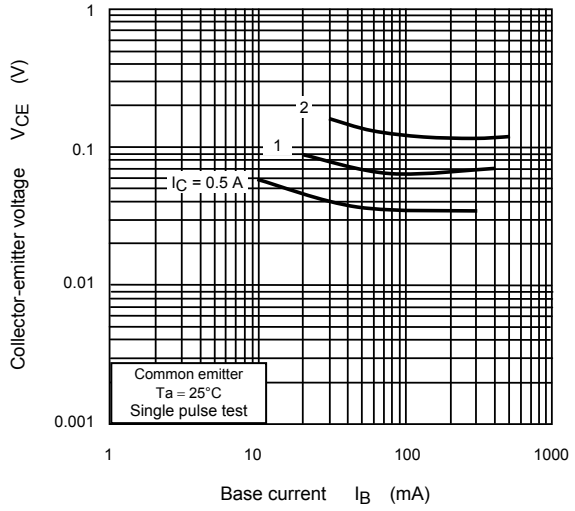
$V_{BE\ (sat)} - I_C$



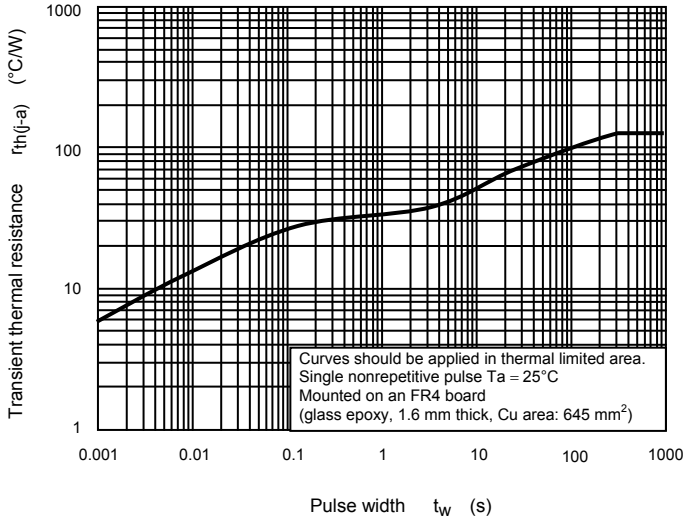
$I_C - V_{BE}$



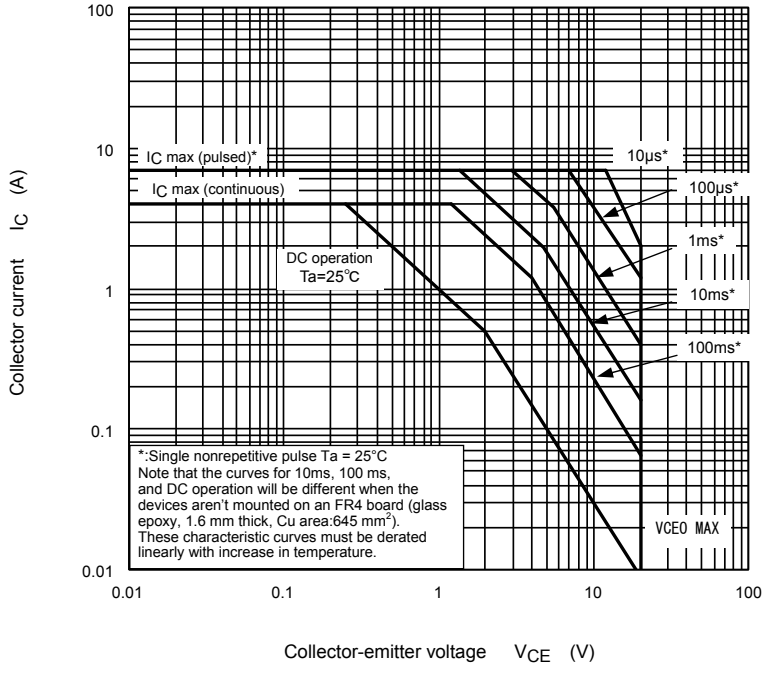
$V_{CE} - I_B$



$r_{th(j-a)} - t_w$



Safe Operating Area



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