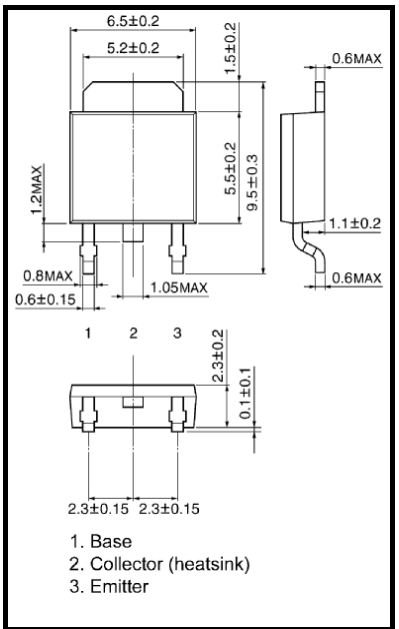
TOSHIBA Transistor Silicon NPN Epitaxial Type

2SC5886A

High-Speed Switching Applications
DC/DC Converter Applications

- High DC current gain: h_{FE} = 400 to 1000 (I_C = 0.5 A)
- Low collector-emitter saturation: $V_{CE\ (sat)}$ = 0.22 V (max)
- High-speed switching: t_f = 95 ns (typ.)

Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	2-7J1A

Weight: 0.36 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
Collector-base voltage		V_{CBO}	120	V
Collector-emitter voltage		V_{CEX}	100	V
		V_{CEO}	50	
Emitter-base voltage		V_{EBO}	9	V
Collector current	DC	I_C	5	A
	Pulse	I_{CP}	10	
Base current		I_B	0.5	A
Collector power dissipation	Ta = 25°C	P_C	1	W
	Tc = 25°C		20	
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55 to 150	°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).

Start of commercial production
2004-05

Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cutoff current		I_{CBO}	V_{CB} = 120 V, I_E = 0	—	—	100	nA
Emitter cutoff current		I_{EBO}	V_{EB} = 9 V, I_C = 0	—	—	100	nA
Collector-emitter breakdown voltage		$V_{(BR)\ CEO}$	I_C = 10 mA, I_B = 0	50	—	—	V
DC current gain		h_{FE} (1)	V_{CE} = 2 V, I_C = 0.5 A	400	—	1000	
		h_{FE} (2)	V_{CE} = 2 V, I_C = 1.6 A	200	—	—	
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	I_C = 1.6 A, I_B = 32 mA	—	—	0.22	V
Base-emitter saturation voltage		$V_{BE\ (sat)}$	I_C = 1.6 A, I_B = 32 mA	—	—	1.10	V
Switching time	Rise time	t_r	See Figure 1. $V_{CC} \simeq$ 24 V, R_L = 15 Ω I_{B1} = 32 mA, I_{B2} = − 53 mA	—	60	—	ns
	Storage time	t_{stg}		—	500	—	
	Fall time	t_f		—	95	—	

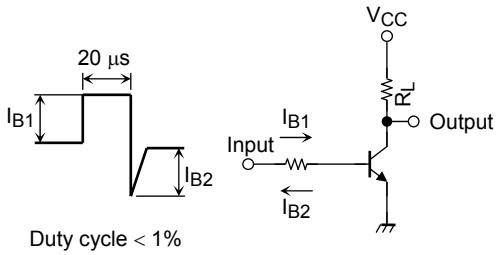
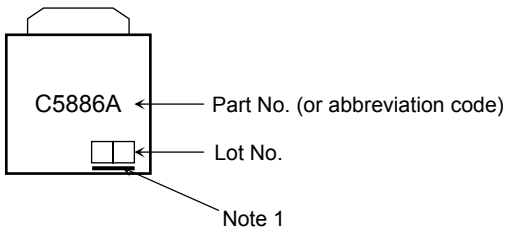


Figure 1 Switching Time Test Circuit & Timing Chart

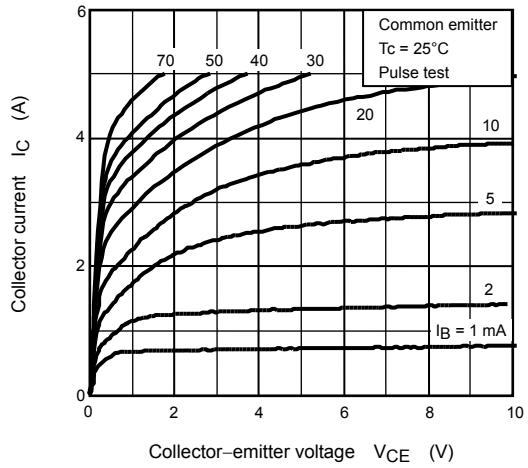
Marking



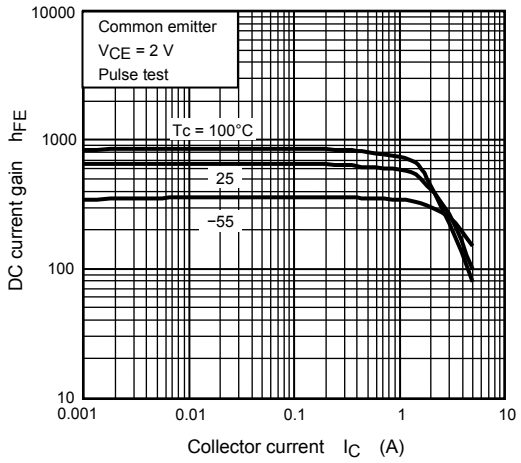
Note 1: A line under a Lot No. identifies the indication of product Labels.
Not underlined: [[Pb]]/INCLUDES > MCV
Underlined: [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

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

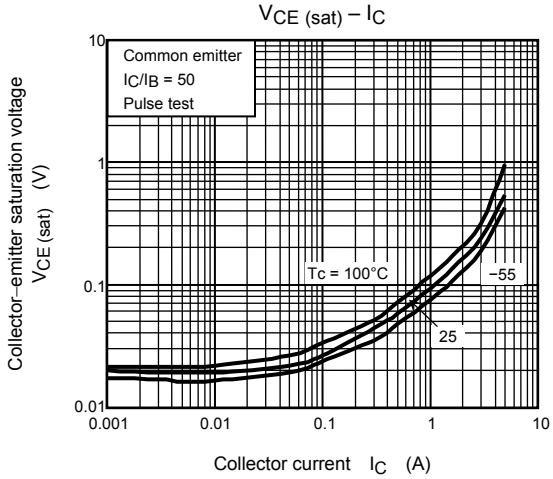
$I_C - V_{CE}$



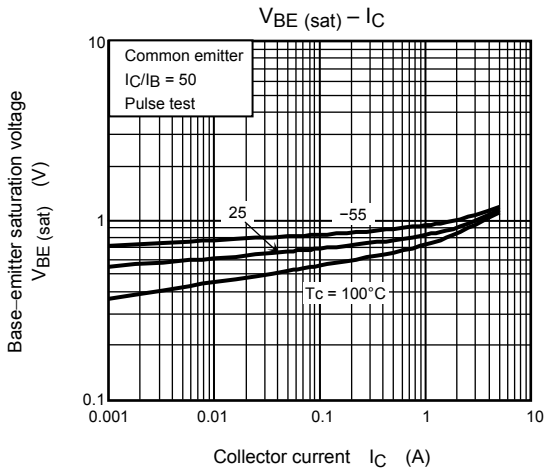
$h_{FE} - I_C$



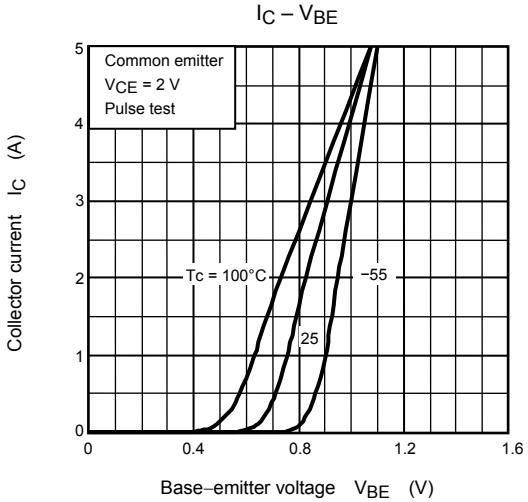
$V_{CE\ (sat)} - I_C$



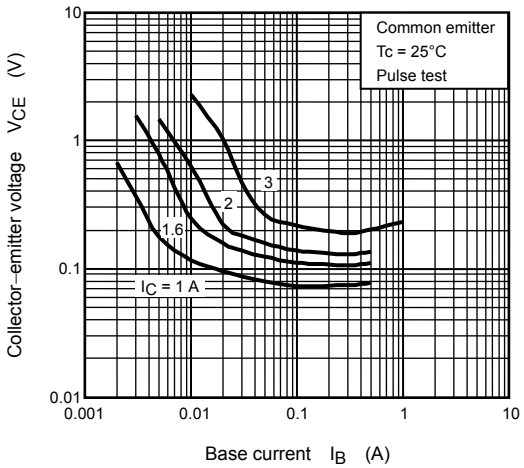
$V_{BE\ (sat)} - I_C$

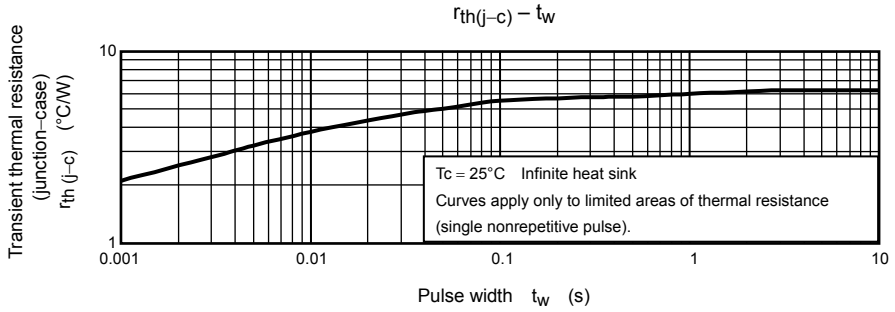


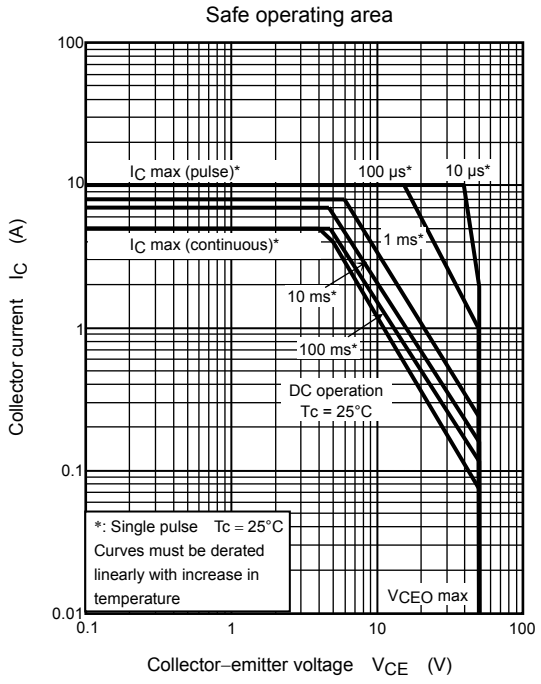
$I_C - V_{BE}$



$V_{CE} - I_B$




$r_{th(j-c)} - t_w$
Transient thermal resistance (junction−case) $r_{th\ (j-c)}$ (°C/W)
10
1
0.001
0.01
0.1
1
10
Tc = 25°C Infinite heat sink
Curves apply only to limited areas of thermal resistance
(single nonrepetitive pulse).
Pulse width t_w (s)


Safe operating area
100
10
1
0.1
0.01
I_C max (pulse)*
100 μs*
10 μs*
I_C max (continuous)*
1 ms*
10 ms*
100 ms*
DC operation
Tc = 25°C
*: Single pulse Tc = 25°C
Curves must be derated
linearly with increase in
temperature
V_{CEO} max
0.1
1
10
100
Collector current I_C (A)
Collector−emitter voltage V_{CE} (V)

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