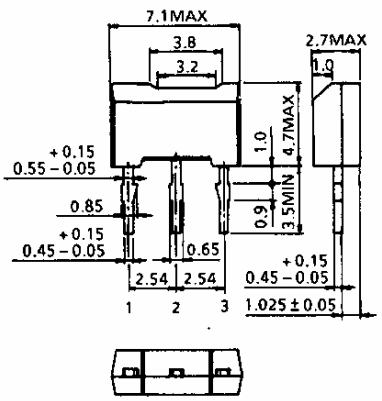
TOSHIBA Transistor Silicon NPN Triple Diffused Type

2SC6034

High-Speed, High-Voltage Switching Applications
Switching Regulator Applications
DC-DC Converter Applications

- High-speed switching: t_f = 0.24 μs (max) (I_C = 0.3 A)

Unit: mm



1. Base
2. Collector
3. Emitter

JEDEC	—
JEITA	—
TOSHIBA	2-7D101A

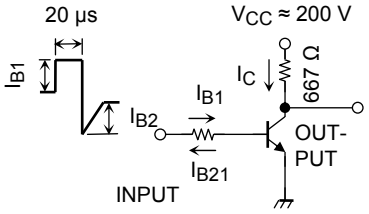
Weight: 0.2 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

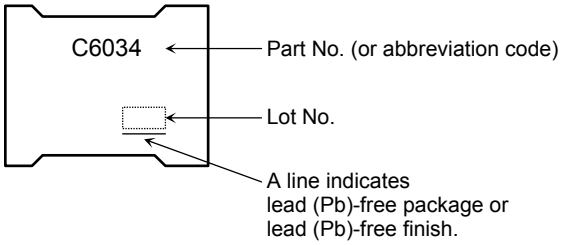
Characteristic		Symbol	Rating	Unit
Collector-base voltage		V_{CBO}	600	V
Collector-emitter voltage		V_{CEO}	285	V
Emitter-base voltage		V_{EBO}	8	V
Collector current	DC	I_C	1.0	A
	Pulse	I_{CP}	2.0	
Base current		I_B	0.5	A
Collector power dissipation	Ta = 25°C	P_C	1.0	W
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55 to 150	°C

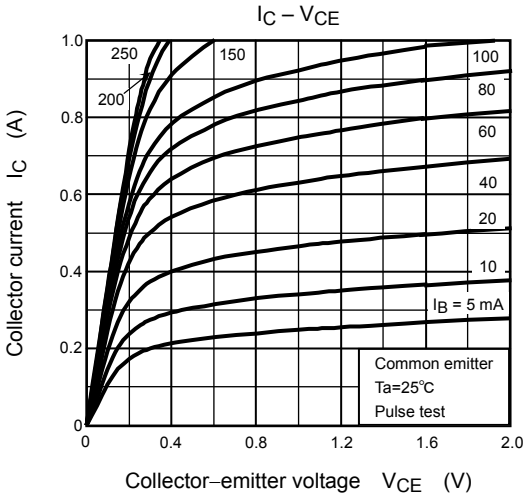
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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).

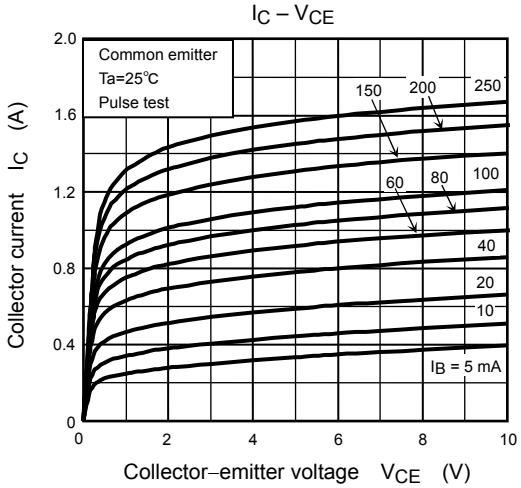
Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	V_{CB} = 600 V, I_E = 0	—	—	100	μA
Emitter cut-off current		I_{EBO}	V_{EB} = 8 V, I_C = 0	—	—	100	μA
Collector-base breakdown voltage		$V_{(BR)\ CBO}$	I_C = 1 mA, I_B = 0	600	—	—	V
Collector-emitter breakdown voltage		$V_{(BR)\ CEO}$	I_C = 10 mA, I_B = 0	285	—	—	V
DC current gain		$h_{FE\ (1)}$	V_{CE} = 5 V, I_C = 1 mA	100	—	250	
		$h_{FE\ (2)}$	V_{CE} = 5 V, I_C = 0.1 A	125	—	250	
		$h_{FE\ (3)}$	V_{CE} = 5 V, I_C = 0.2 A	80	—	—	
Collector emitter saturation voltage		$V_{CE\ (sat)}$	I_C = 0.6 A, I_B = 75 mA	—	—	1.0	V
Base-emitter saturation voltage		$V_{BE\ (sat)}$	I_C = 0.6 A, I_B = 75 mA	—	—	1.3	V
Switching time	Rise time	t_r	 I_{B1} = 20 mA, $-I_{B2}$ = 50 mA DUTY CYCLE ≤ 1%	—	—	0.4	μs
	Storage time	t_{stg}		—	—	3.5	
	Fall time	t_f		—	—	0.24	

Marking




IC – VCE
Collector current IC (A)
Collector–emitter voltage VCE (V)
250
200
150
100
80
60
40
20
10
IB = 5 mA
Common emitter
Ta=25°C
Pulse test


IC – VCE
Common emitter
Ta=25°C
Pulse test
Collector current IC (A)
Collector–emitter voltage VCE (V)
150
200
250
60
80
100
40
20
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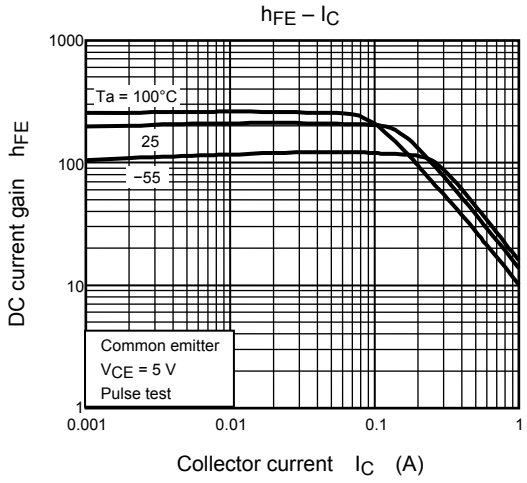
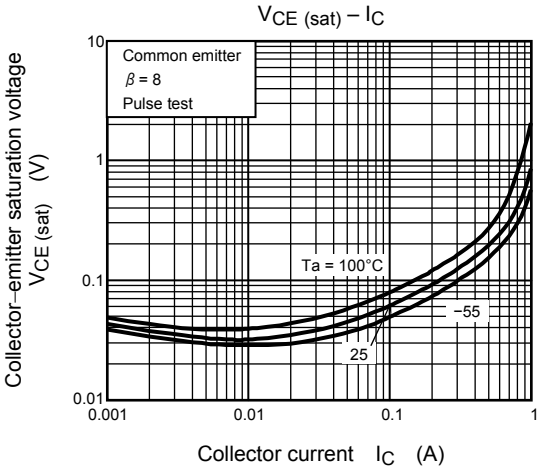
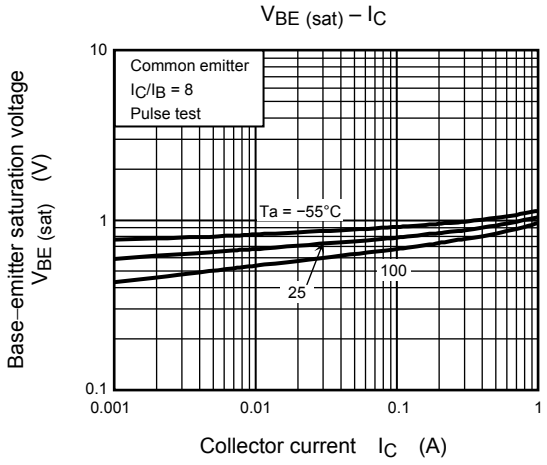
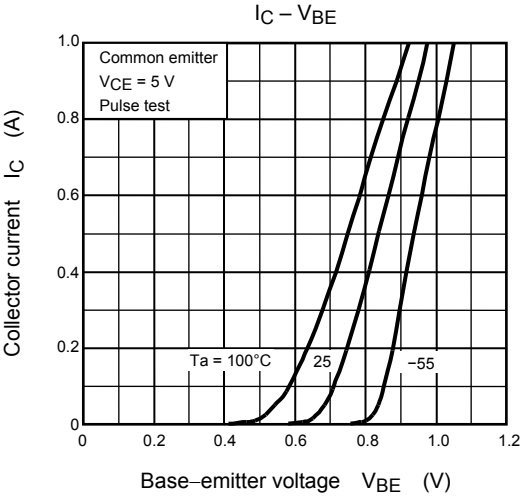
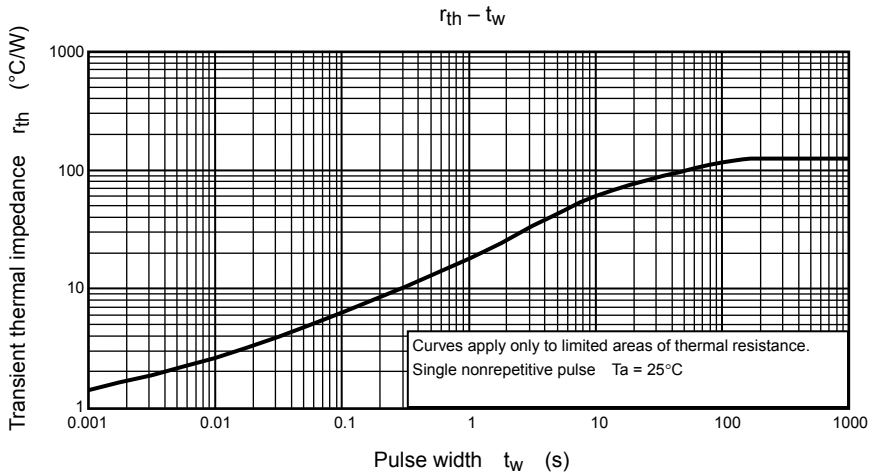
IB = 5 mA

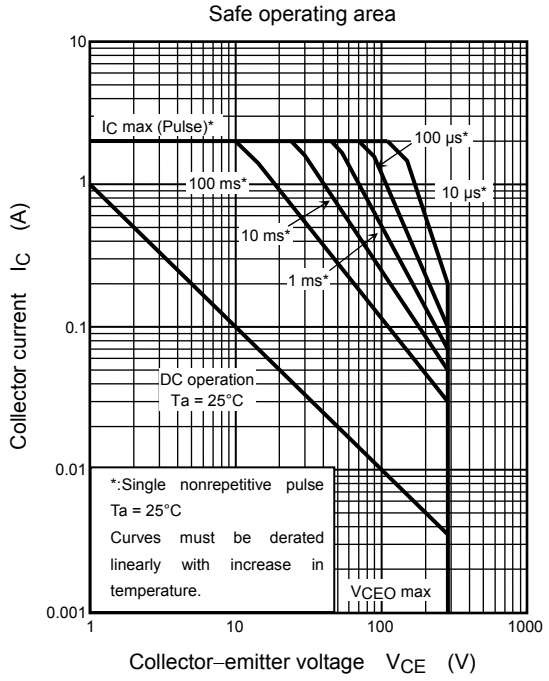

hFE – IC
DC current gain hFE
Collector current IC (A)
Ta = 100°C
25
−55
Common emitter
VCE = 5 V
Pulse test

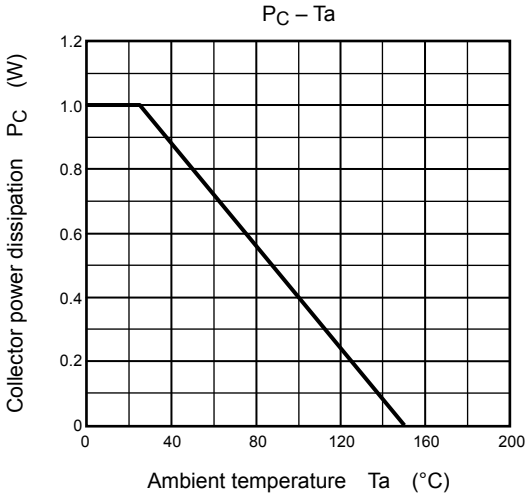

VCE (sat) – IC
Common emitter
β = 8
Pulse test
Collector–emitter saturation voltage VCE (sat) (V)
Collector current IC (A)
Ta = 100°C
−55
25


VBE (sat) – IC
Common emitter
IC/IB = 8
Pulse test
Base–emitter saturation voltage VBE (sat) (V)
Collector current IC (A)
Ta = −55°C
100
25


IC – VBE
Common emitter
VCE = 5 V
Pulse test
Collector current IC (A)
Base–emitter voltage VBE (V)
Ta = 100°C
25
−55


rth – tw
Transient thermal impedance rth (°C/W)
1000
100
10
1
0.001
0.01
0.1
1
10
100
1000
Pulse width tw (s)
Curves apply only to limited areas of thermal resistance.
Single nonrepetitive pulse Ta = 25°C


Safe operating area
Collector current IC (A)
10
1
0.1
0.01
0.001
1
10
100
1000
Collector–emitter voltage VCE (V)
IC max (Pulse)*
100 μs*
100 ms*
10 μs*
10 ms*
1 ms*
DC operation
Ta = 25°C
*:Single nonrepetitive pulse
Ta = 25°C
Curves must be derated linearly with increase in temperature.
VCEO max


PC – Ta
Collector power dissipation PC (W)
1.2
1.0
0.8
0.6
0.4
0.2
0
0
40
80
120
160
200
Ambient temperature Ta (°C)

RESTRICTIONS ON PRODUCT USE

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