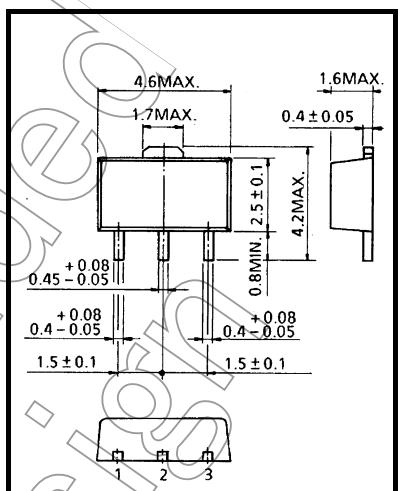
TOSHIBA Transistor Silicon NPN Triple Diffused Type (PCT process)

2SC3515

HIGH Voltage Control Applications
Plasma Display, Nixie Tube Driver Applications
Cathode Ray Tube Brightness Control Applications

- High voltage: V_{CBO} = 300 V, V_{CEO} = 300 V
- Low saturation voltage: $V_{CE\ (sat)}$ = 0.5 V (max)
- Small collector output capacitance: C_{ob} = 3 pF (typ.)
- Complementary to 2SA1384
- Small flat package
- P_C = 1.0 to 2.0 W (mounted on a ceramic substrate)

Unit: mm



1. Base
2. Collector (heat sink)
3. Emitter

PW-MINI	
JEDEC	—
JEITA	SC-62
TOSHIBA	2-5K1A

Weight: 0.05 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	300	V
Collector-emitter voltage	V_{CEO}	300	V
Emitter-base voltage	V_{EBO}	6	V
Collector current	I_C	100	mA
Base current	I_B	20	mA
Collector power dissipation	P_C	500	mW
	P_C (Note 1)	1000	
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	−55 to 150	°C

Note 1: Mounted on a ceramic substrate (250 mm^2 × 0.8 mmt)

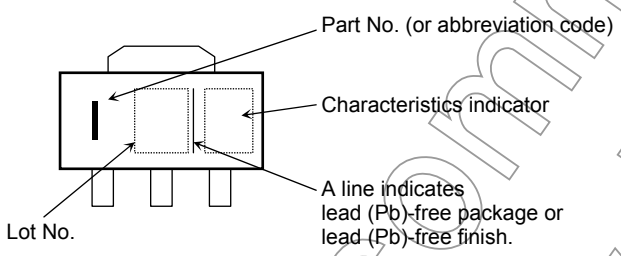
Note 2: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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)

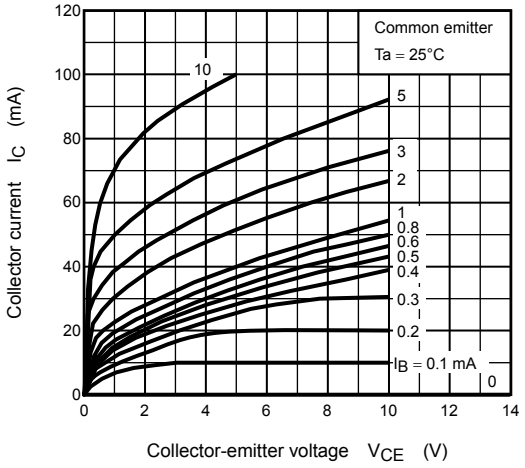
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = 300 V, I_E = 0	—	—	0.1	μA
Emitter cut-off current	I_{EBO}	V_{EB} = 6 V, I_C = 0	—	—	0.1	μA
Collector-base breakdown voltage	$V_{(BR)\ CBO}$	I_C = 0.1 mA, I_E = 0	300	—	—	V
Collector-emitter breakdown voltage	$V_{(BR)\ CEO}$	I_C = 1 mA, I_B = 0	300	—	—	V
DC current gain	$h_{FE\ (1)}$ (Note 3)	V_{CE} = 10 V, I_C = 20 mA	30	—	150	—
	$h_{FE\ (2)}$	V_{CE} = 10 V, I_C = 20 mA	20	—	—	
Collector-emitter saturation voltage	$V_{CE\ (sat)}$	I_C = 20 mA, I_B = 2 mA	—	—	0.5	V
Base-emitter saturation voltage	$V_{BE\ (sat)}$	I_C = 20 mA, I_B = 2 mA	—	—	1.0	V
Transition frequency	f_T	V_{CE} = 10 V, I_C = 20 mA	50	80	—	MHz
Collector output capacitance	C_{ob}	V_{CB} = 20 V, I_E = 0, f = 1 MHz	—	3	4	pF

Note 3: $h_{FE\ (1)}$ classification R: 30 to 90, O: 50 to 150

Marking



$I_C - V_{CE}$
(low voltage region)



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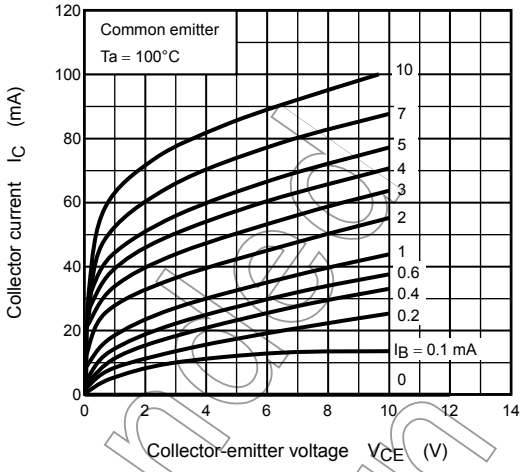

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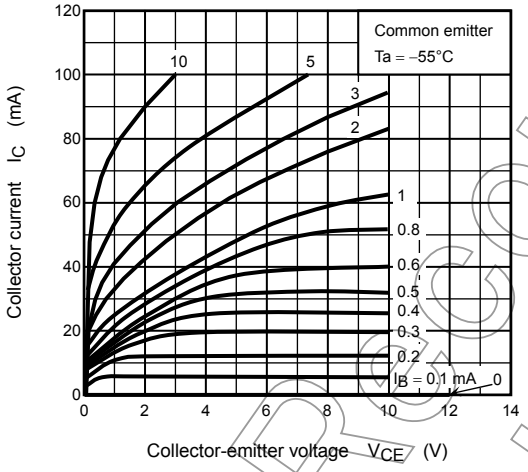
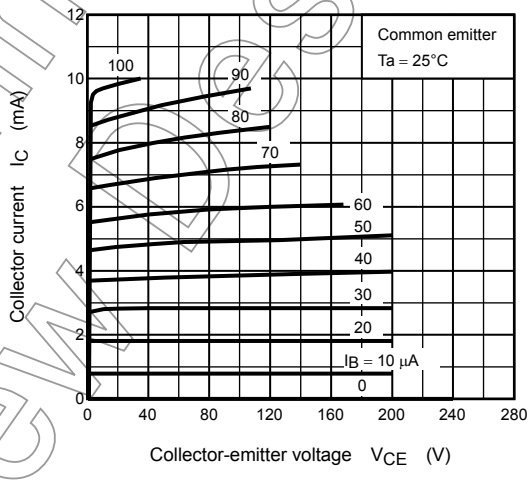


$I_C - V_{CE}$
(low current region)



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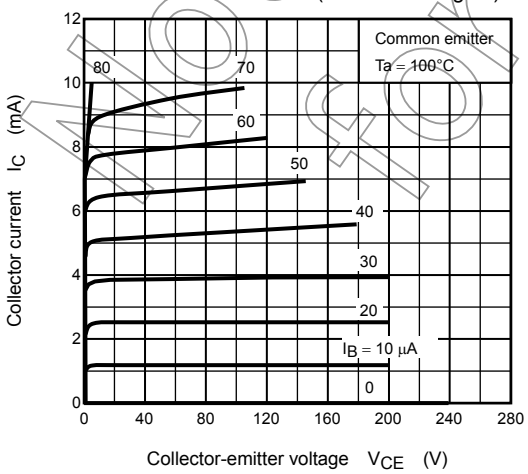
(low current region)



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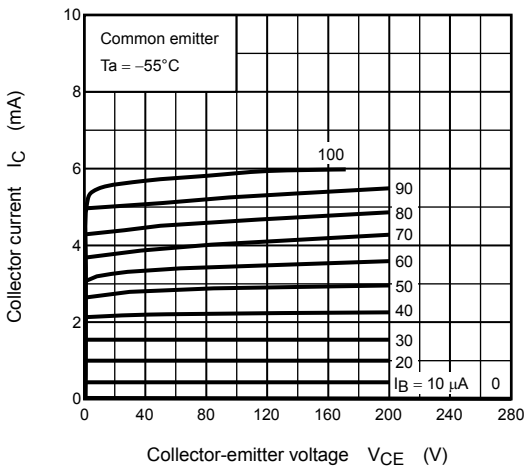
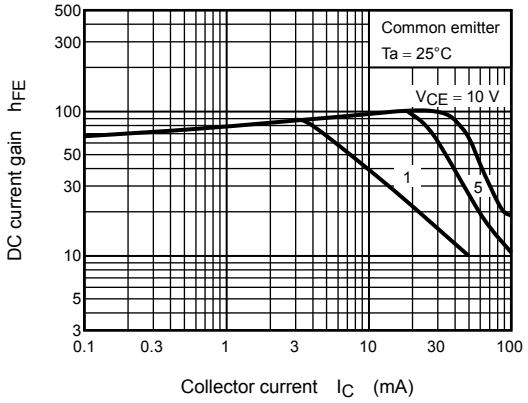


$h_{FE} - I_C$



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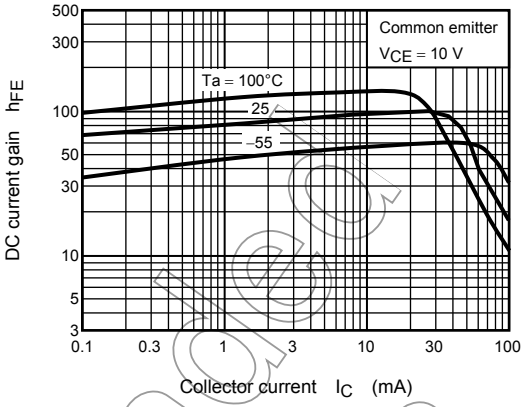
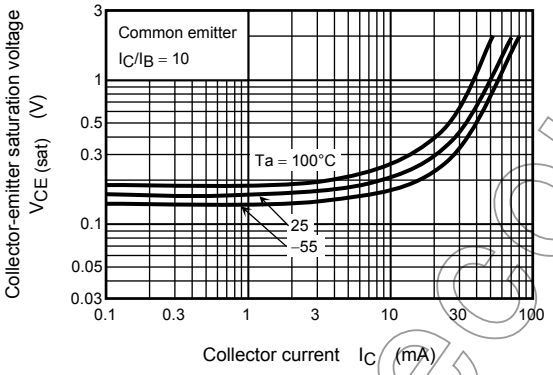
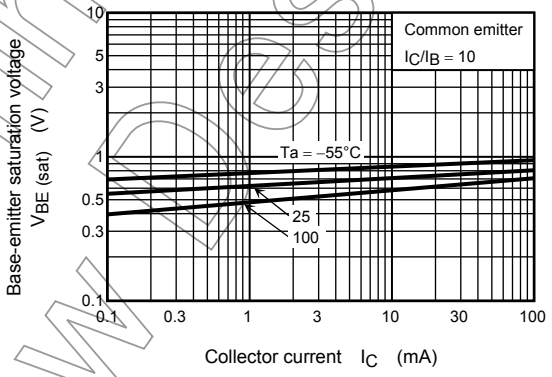


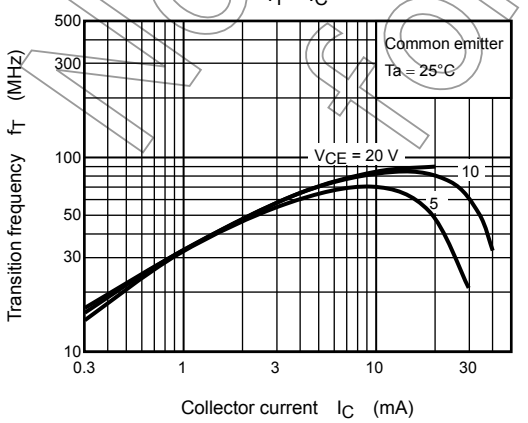
$V_{CE\ (sat)} - I_C$



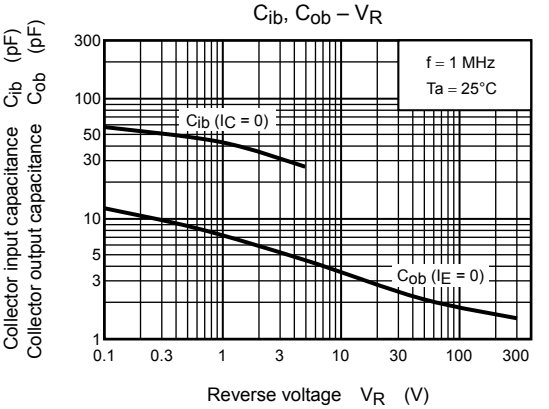
$V_{BE\ (sat)} - I_C$



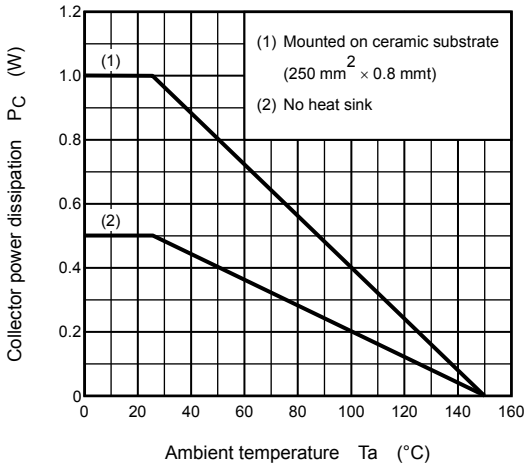
$f_T - I_C$



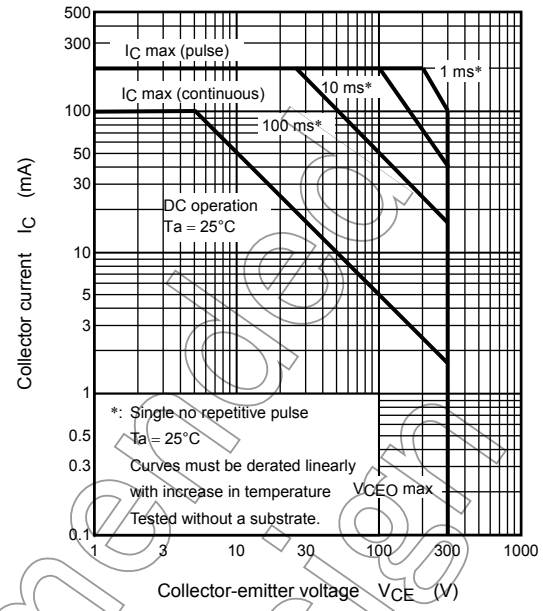
$C_{ib}, C_{ob} - V_R$



P_C – Ta



Safe Operating Area



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