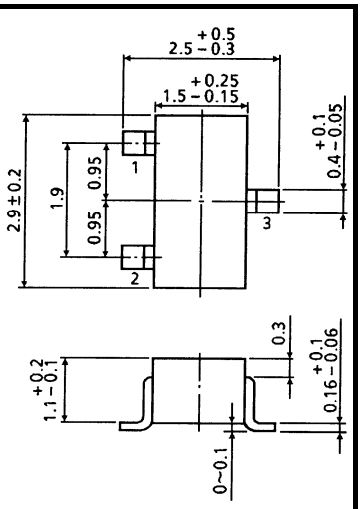
TOSHIBA Transistor Silicon PNP Triple Diffused (PCT process)

2SA1255

High Voltage Switching Applications

- High voltage: V_{CBO} = −200 V (min)
  V_{CEO} = −200 V (min)
- Small package
- Complementary to 2SC3138

Unit: mm



S-MINI	1. BASE 2. EMITTER 3. COLLECTOR
JEDEC	TO-236MOD
JEITA	SC-59
TOSHIBA	2-3F1A

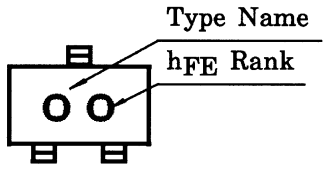
Weight: 0.012 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	−200	V
Collector-emitter voltage	V_{CEO}	−200	V
Emitter-base voltage	V_{EBO}	−5	V
Collector current	I_C	−50	mA
Base current	I_B	−20	mA
Collector power dissipation	P_C	150	mW
Junction temperature	T_j	125	°C
Storage temperature range	T_{stg}	−55~125	°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).

Marking

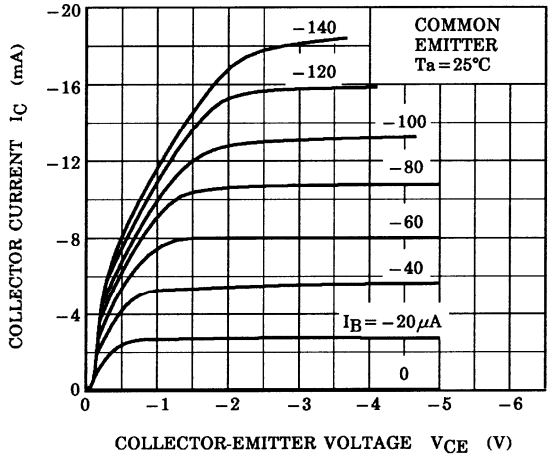


Electrical Characteristics (Ta = 25°C)

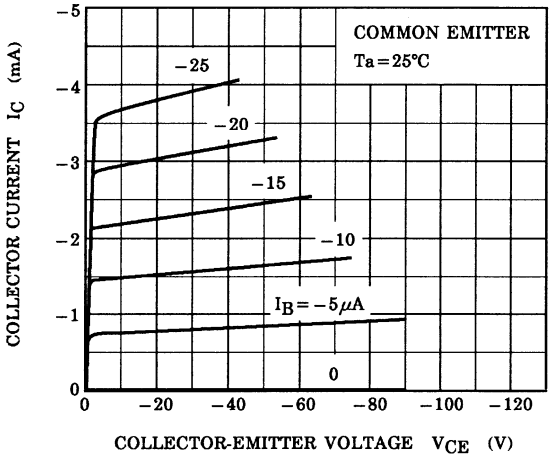
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	V_{CB} = −200 V, I_E = 0	—	—	−0.1	μA
Emitter cut-off current		I_{EBO}	V_{EB} = −5 V, I_C = 0	—	—	−0.1	μA
Collector-base breakdown voltage		$V_{(BR)\ CBO}$	I_C = −0.1 mA, I_E = 0	−200	—	—	V
Collector-emitter breakdown voltage		$V_{(BR)\ CEO}$	I_C = −1 mA, I_B = 0	−200	—	—	V
DC current gain		h_{FE} (Note)	V_{CE} = −3 V, I_C = −10 mA	70	—	240	
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	I_C = −10 mA, I_B = −1 mA	—	−0.2	−1	V
Base-emitter saturation voltage		$V_{BE\ (sat)}$	I_C = −10 mA, I_B = −1 mA	—	−0.75	−1.5	V
Transition frequency		f_T	V_{CE} = −10 V, I_C = −2 mA	50	100	—	MHz
Collector output capacitance		C_{ob}	V_{CB} = −10 V, I_E = 0, f = 1 MHz	—	3	7	pF
Switching time	Turn-on time	t_{on}	V_{CC} = −50 V, I_C = −6 mA $-I_{B1} = I_{B2}$ = 0.6 mA Pulse width = 5 μs Duty cycle ≦ 2%	—	0.3	—	μs
	Storage time	t_{stg}		—	2	—	
	Fall time	t_f		—	0.4	—	

Note: h_{FE} classification O: 70~140, Y: 120~240

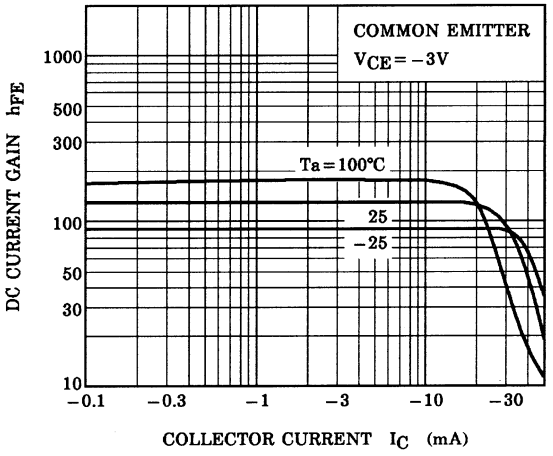
$I_C - V_{CE}$ (LOW VOLTAGE REGION)



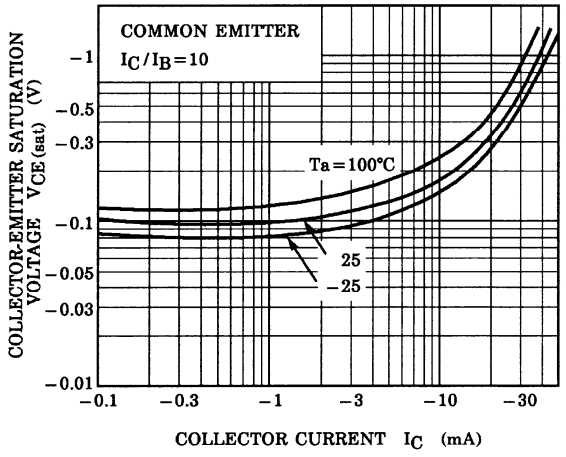
$I_C - V_{CE}$ (LOW CURRENT REGION)



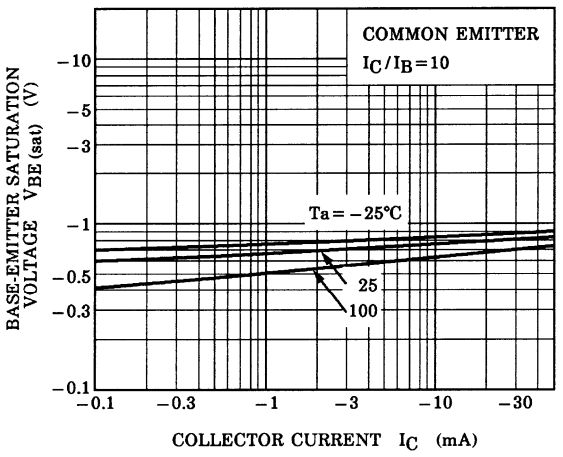
$h_{FE} - I_C$



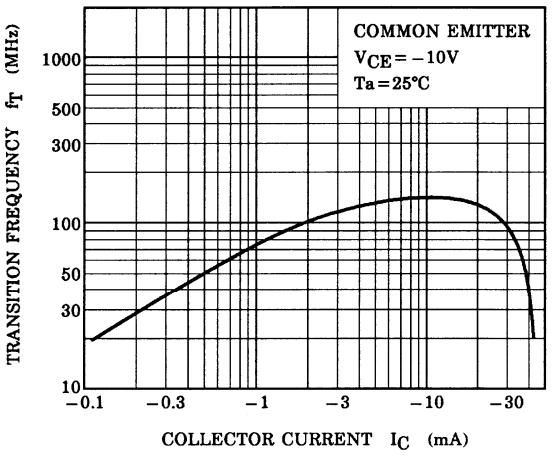
$V_{CE\,(sat)} - I_C$

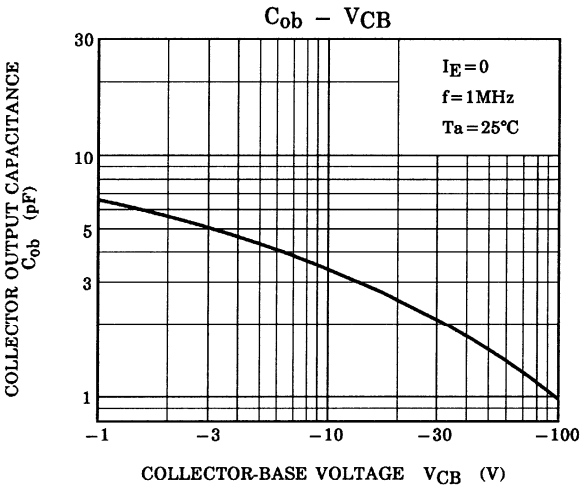


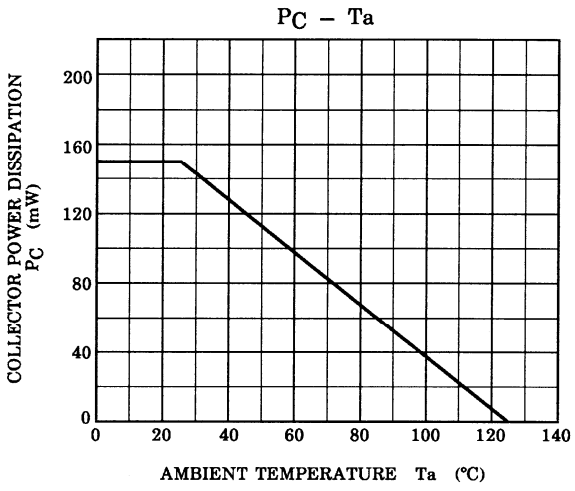
$V_{BE\,(sat)} - I_C$



$f_T - I_C$




C_{ob} – V_{CB}
$I_E = 0$
f = 1MHz
Ta = 25°C
COLLECTOR OUTPUT CAPACITANCE C_{ob} (pF)
30
10
5
3
1
−1
−3
−10
−30
−100
COLLECTOR-BASE VOLTAGE V_{CB} (V)


P_C – Ta
COLLECTOR POWER DISSIPATION P_C (mW)
200
160
120
80
40
0
0
20
40
60
80
100
120
140
AMBIENT TEMPERATURE Ta (°C)

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