

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process) (Bias Resistor built-in Transistor)

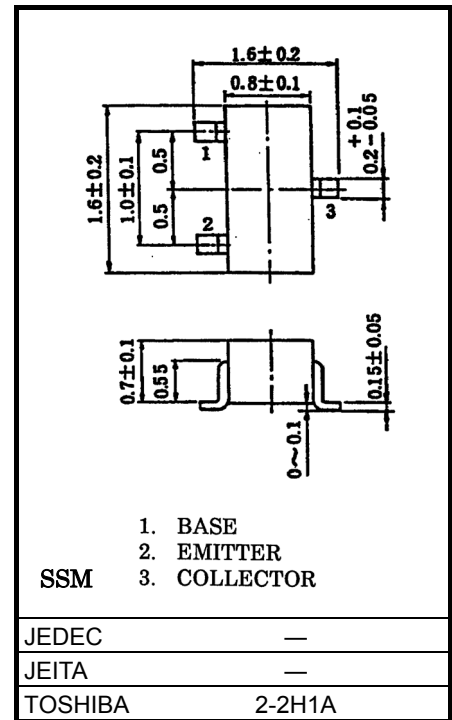
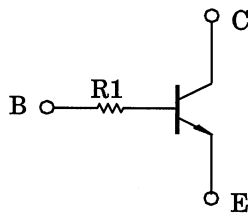
# RN1110, RN1111

Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

Unit: mm

- With built-in bias resistors
- Simplified circuit design
- Reduced number of parts and simplified manufacturing process
- Complementary to RN2110 and RN2111

## Equivalent Circuit



Weight: 2.4mg (typ.)

## Absolute Maximum Ratings (Ta = 25°C)

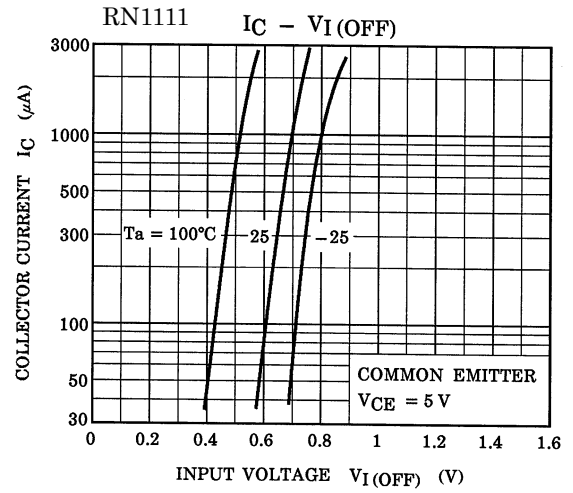
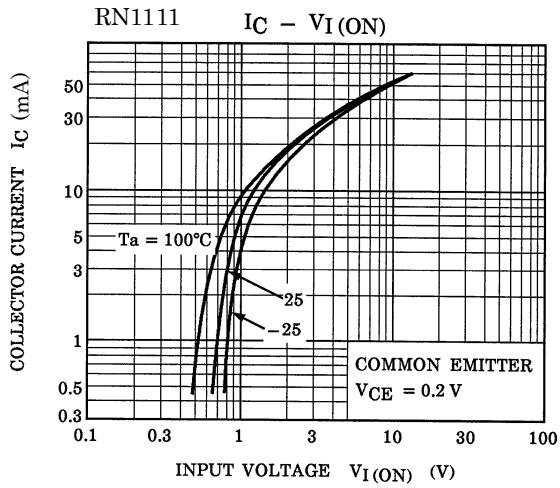
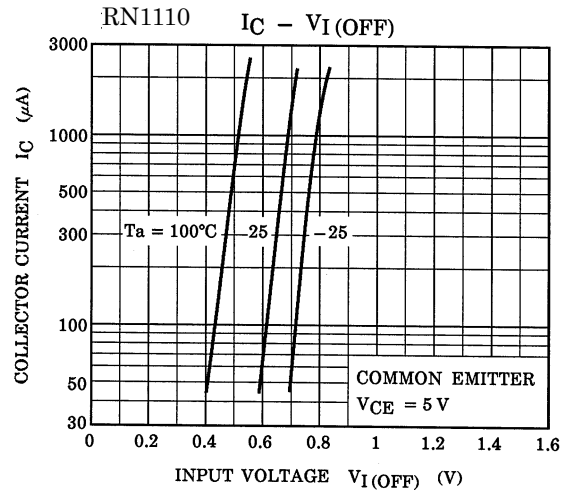
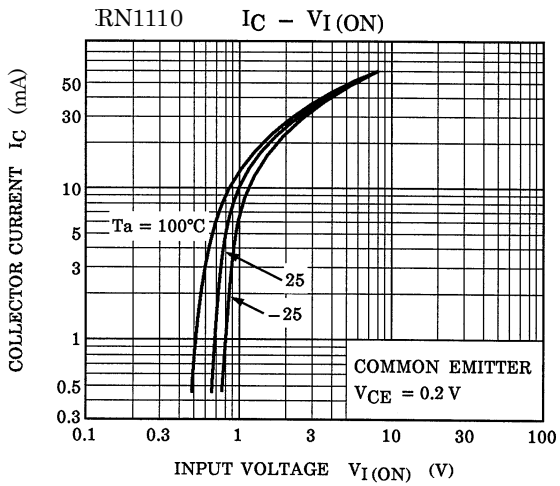
Characteristic	Symbol	Rating	Unit
Collector-base voltage	V <sub>CB0</sub>	50	V
Collector-emitter voltage	V <sub>CEO</sub>	50	V
Emitter-base voltage	V <sub>EB0</sub>	5	V
Collector current	I <sub>c</sub>	100	mA
Collector power dissipation	P <sub>c</sub>	100	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature range	T <sub>stg</sub>	-55 to 150	°C

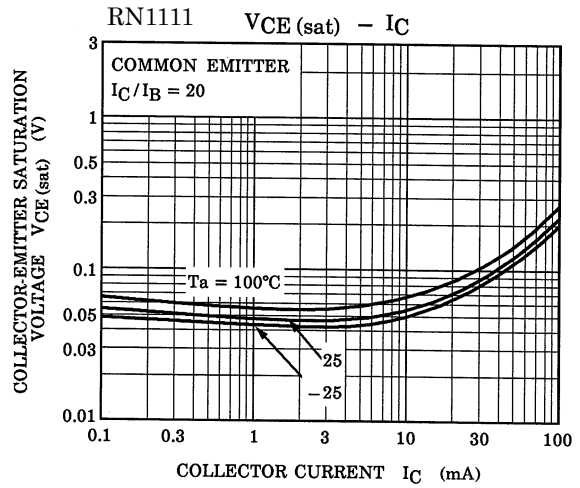
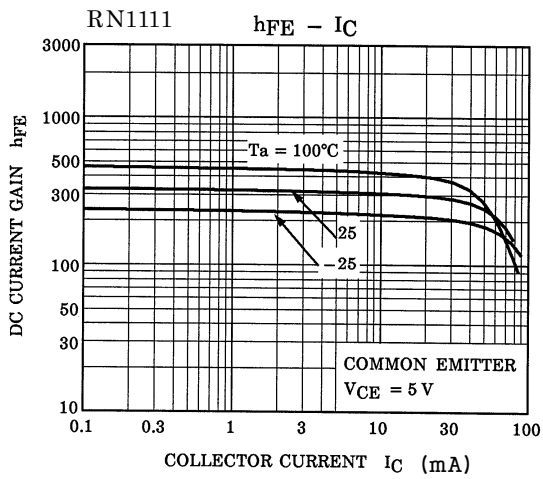
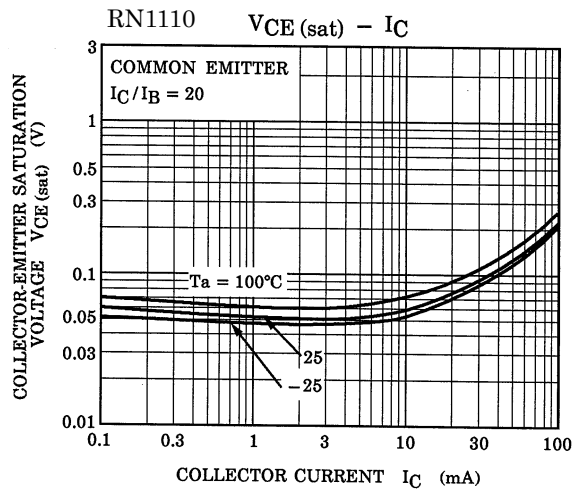
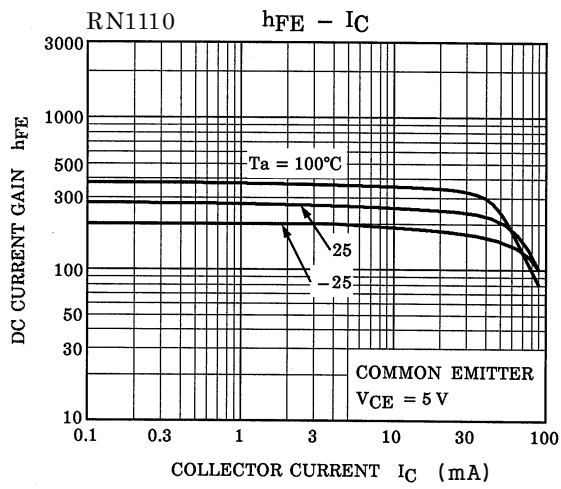
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

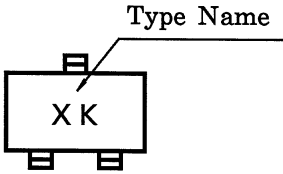
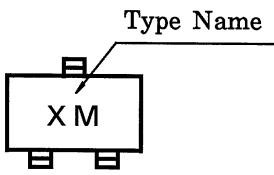
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

## Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	—	$V_{CB} = 50\text{ V}, I_E = 0$	—	—	0.1	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	—	$V_{EB} = 5\text{ V}, I_C = 0$	—	—	0.1	$\mu\text{A}$
DC current gain	$h_{FE}$	—	$V_{CE} = 5\text{ V}, I_C = 1\text{ mA}$	120	—	700	—
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	$I_C = 5\text{ mA}, I_B = 0.25\text{ mA}$	—	0.1	0.3	V
Transition frequency	$f_T$	—	$V_{CE} = 10\text{ V}, I_C = 5\text{ mA}$	—	250	—	MHz
Collector output capacitance	$C_{ob}$	—	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	3	6	pF
Input resistor	RN1110	R1	—	3.29	4.7	6.11	k $\Omega$
	RN1111			7	10	13	





Type Name	Marking
RN1110	 <p>The diagram shows a rectangular component with two pins at the top and two at the bottom. The letters 'X K' are printed in the center. A line points from the text 'Type Name' to the top-left pin.</p>
RN1111	 <p>The diagram shows a rectangular component with two pins at the top and two at the bottom. The letters 'X M' are printed in the center. A line points from the text 'Type Name' to the top-left pin.</p>

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