

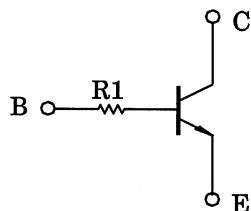
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process) (Bias Resistor built-in Transistor)

# RN1110, RN1111

Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

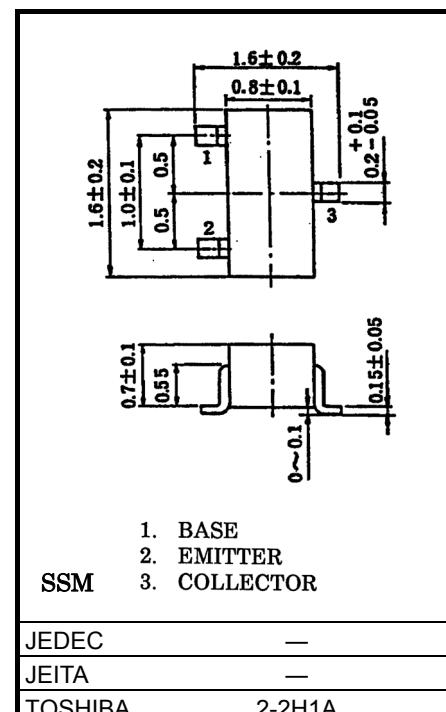
- With built-in bias resistors
- Simplified circuit design
- Reduced number of parts and simplified manufacturing process
- Complementary to RN2110 and RN2111

## Equivalent Circuit



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

Characteristic	Symbol	Rating	Unit
Collector-base voltage	V <sub>CBO</sub>	50	V
Collector-emitter voltage	V <sub>CEO</sub>	50	V
Emitter-base voltage	V <sub>EBO</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



JEDEC	—
JEITA	—
TOSHIBA	2-2H1A

Weight: 2.4mg (typ.)

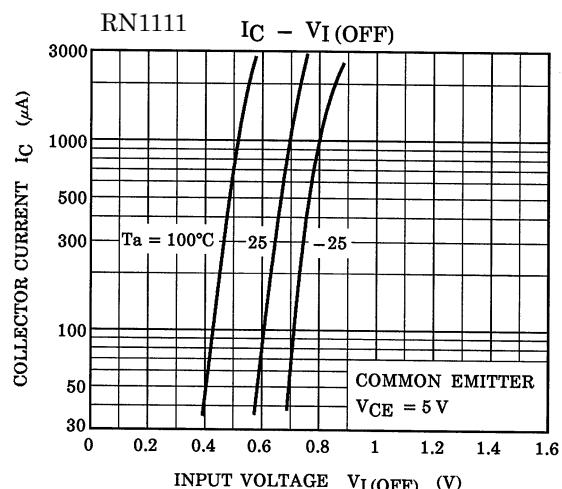
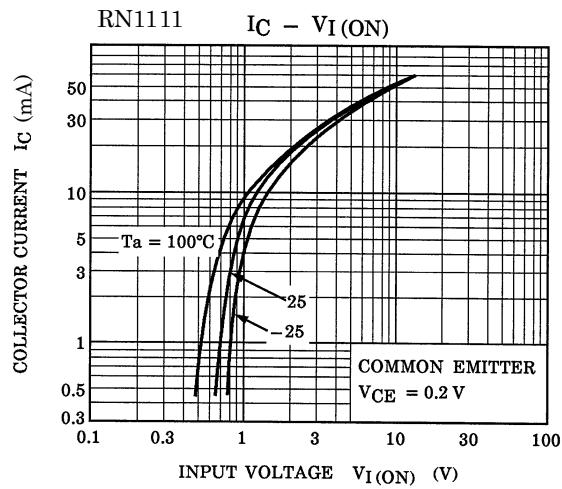
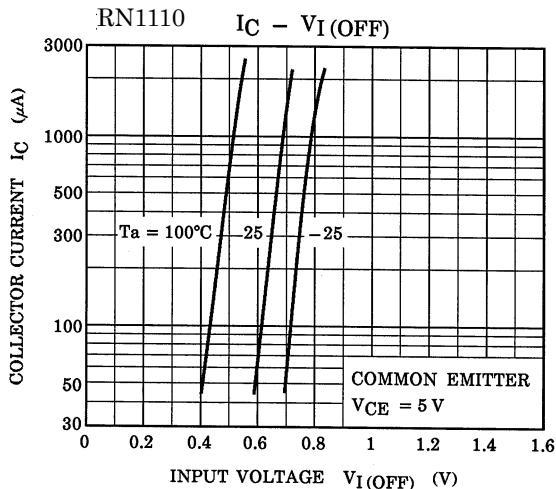
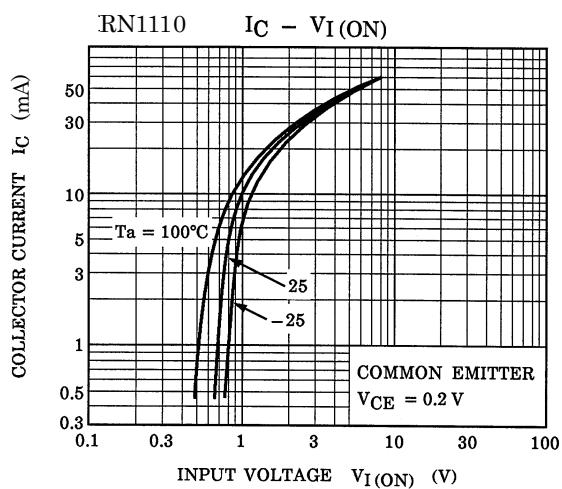
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

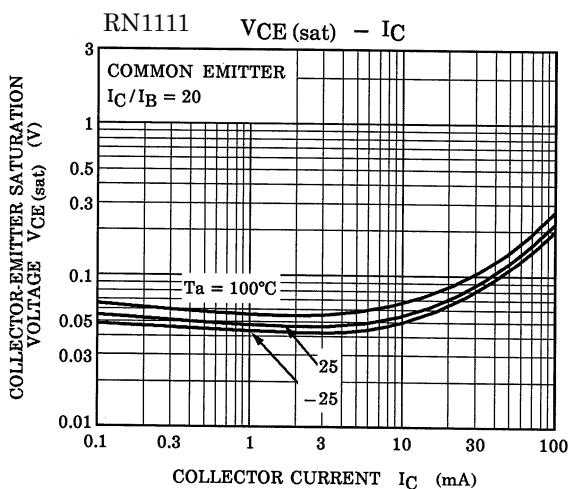
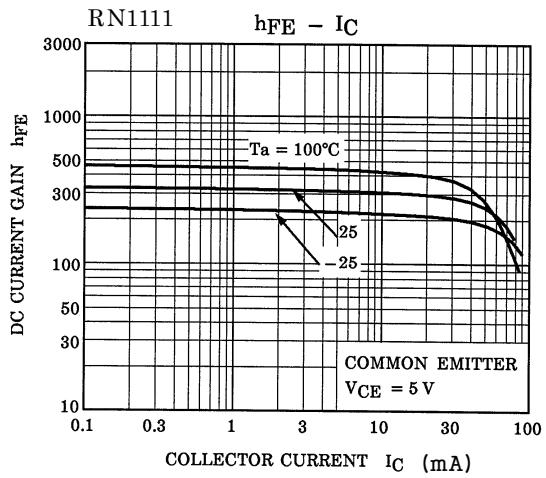
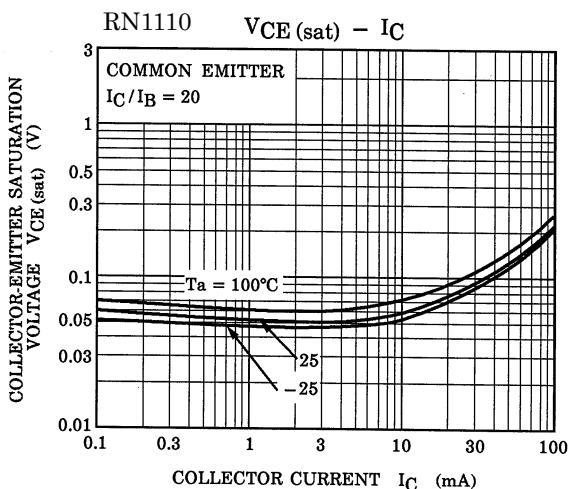
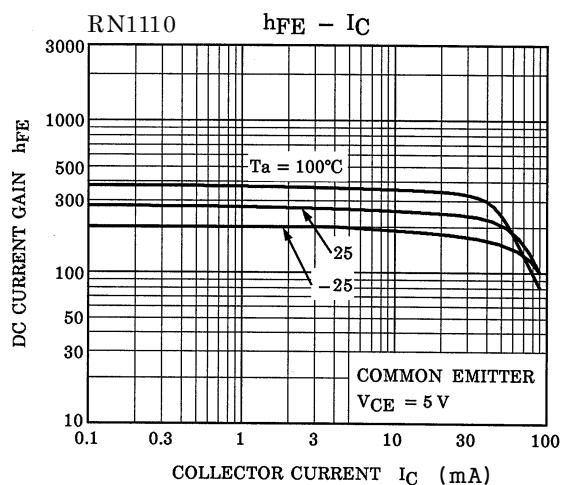
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc.).

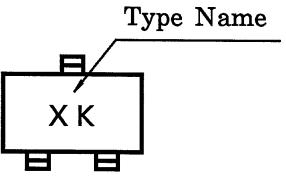
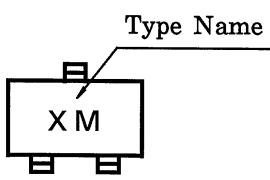
Start of commercial production  
1990-12

## 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	$V_{CE} \text{ (sat)}$	—	$I_C = 5 \text{ mA}, I_B = 0.25 \text{ mA}$	—	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	kΩ
	RN1111				7	10	13	





Type Name	Marking
RN1110	
RN1111	

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