

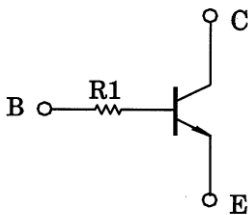
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)(Bias Resistor built-in Transistor)

# RN1110MFV, RN1111MFV

Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

- Ultra-small package, suited to very high density mounting
- Incorporating a bias resistor into the transistor reduces the number of parts, so enabling the manufacture of ever more compact equipment and lowering assembly cost.
- A wide range of resistor values is available for use in various circuits.
- Complementary to the RN2110MFV, RN2111MFV

### Equivalent Circuit



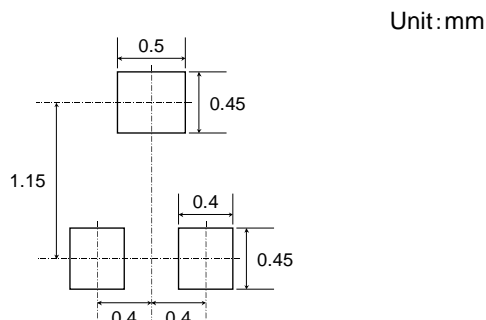
### Absolute Maximum Ratings (Ta = 25°C)

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> (Note 1)	150	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature range	T <sub>stg</sub>	-55 to 150	°C

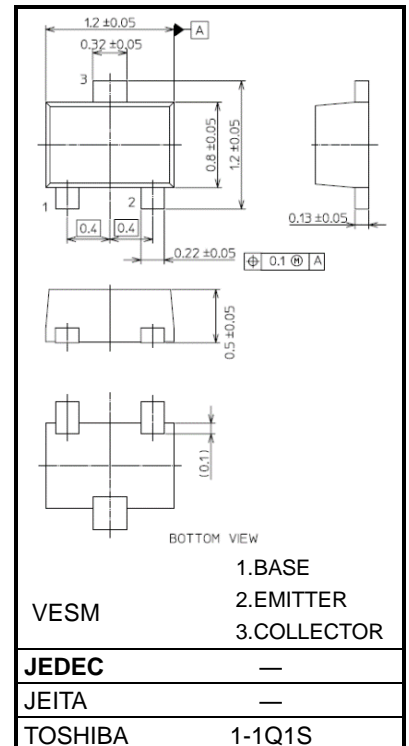
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

Note 1: Mounted on an FR4 board (25.4 mm × 25.4 mm × 1.6 mm)

### Land Pattern Dimensions (for reference only)



Unit: mm

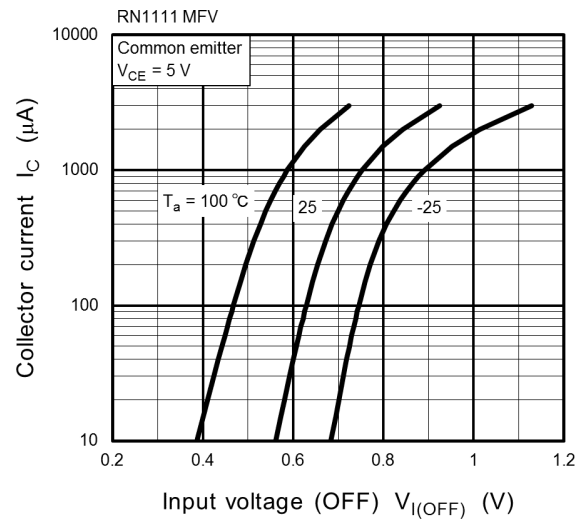
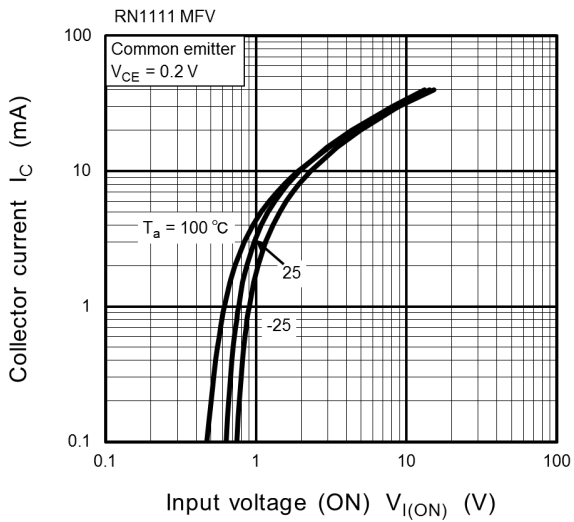
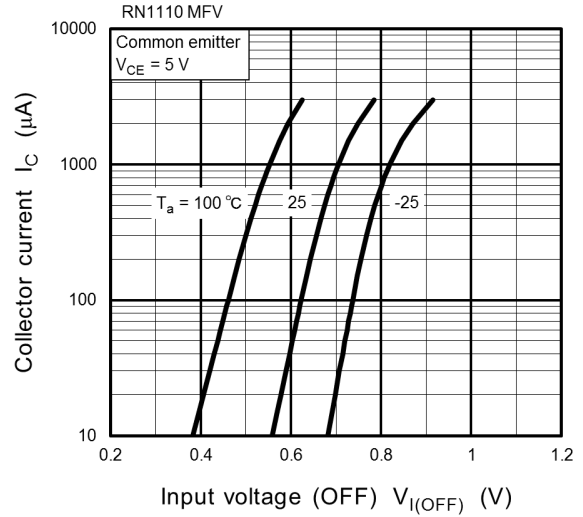
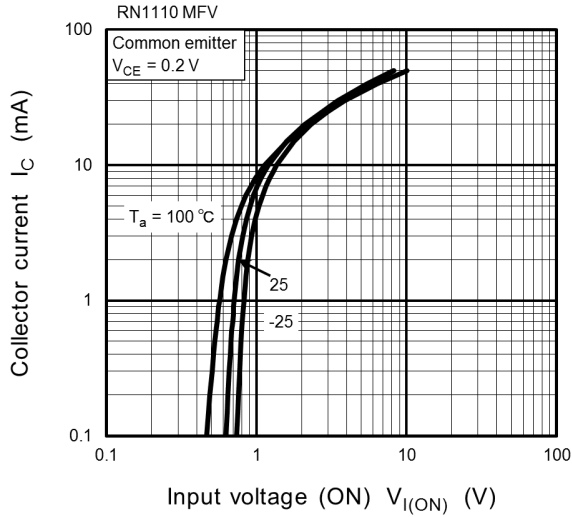


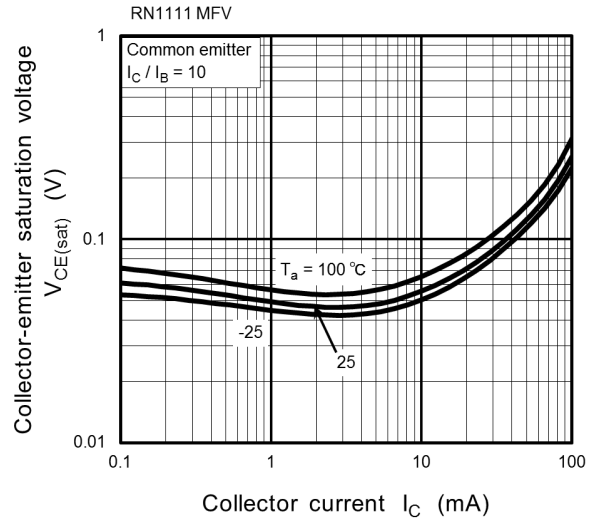
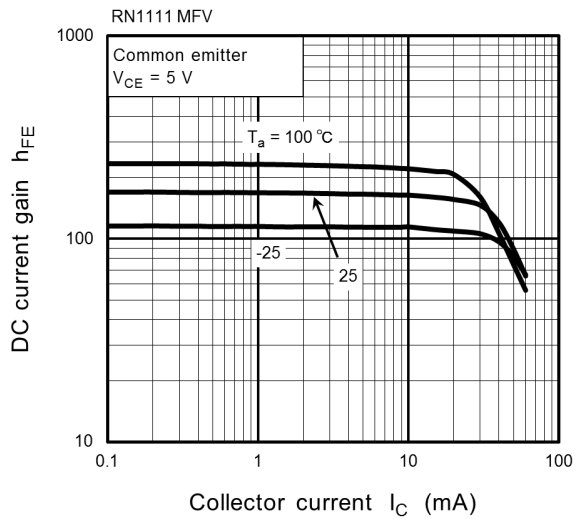
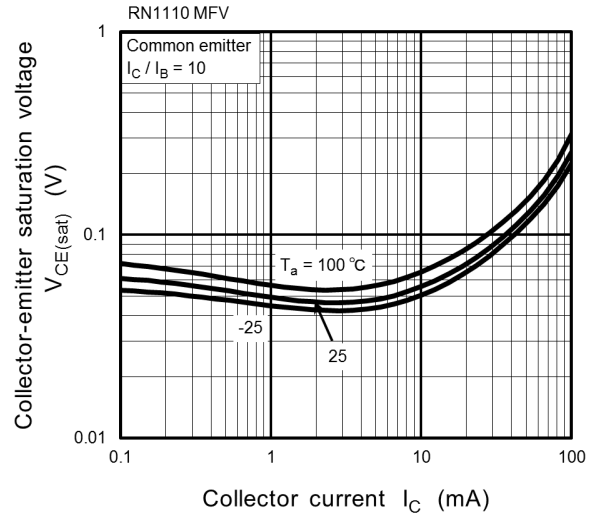
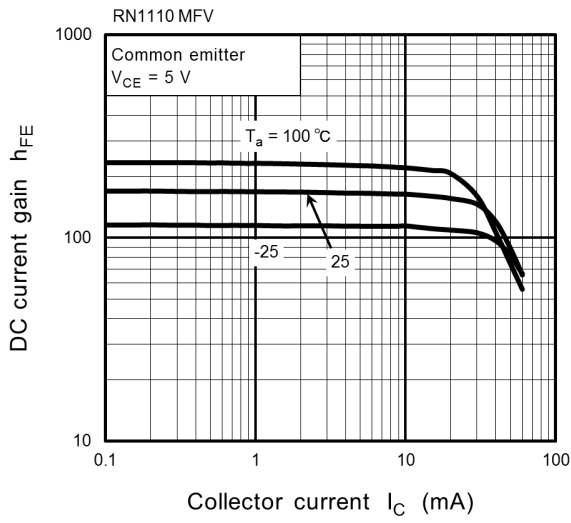
Weight: 1.5 mg (typ.)

Start of commercial production  
2005-02

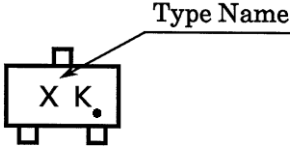
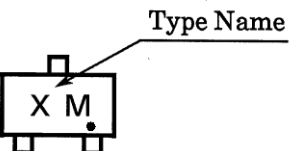
### Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cutoff current	ICBO	V <sub>CB</sub> = 50 V, I <sub>E</sub> = 0 A	—	—	100	nA
Emitter cutoff current	I <sub>EBO</sub>	V <sub>EB</sub> = 5 V, I <sub>C</sub> = 0 A	—	—	100	nA
DC current gain	h <sub>FE</sub>	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 1 mA	120	—	700	—
Collector-emitter saturation voltage	V <sub>CE (sat)</sub>	I <sub>C</sub> = 5 mA, I <sub>B</sub> = 0.5 mA	—	0.1	0.3	V
Collector output capacitance	C <sub>ob</sub>	V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0 A, f = 1 MHz	—	0.7	—	pF
Input resistor	RN1110MFV	—	3.29	4.7	6.11	kΩ
	RN1111MFV		7	10	13	





### Marking

Type Name	Marking
RN1110MFV	 <p>The diagram shows a rectangular component with a small square protrusion on top and two small square protrusions on the bottom. Inside the rectangle, the characters 'X K.' are printed. A line points from the text 'Type Name' to the 'X K.' marking.</p>
RN1111MFV	 <p>The diagram shows a rectangular component with a small square protrusion on top and two small square protrusions on the bottom. Inside the rectangle, the characters 'X M.' are printed. A line points from the text 'Type Name' to the 'X M.' marking.</p>

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