

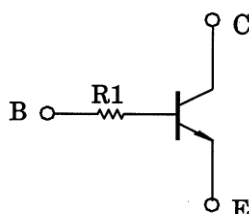
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)(Bias Resistor built-in Transistor)

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 _{CBO}	50	V
Collector-emitter voltage	V _{CEO}	50	V
Emitter-base voltage	V _{EB0}	5	V
Collector current	I _C	100	mA
Collector power dissipation	P _C (Note 1)	150	mW
Junction temperature	T _j	150	°C
Storage temperature range	T _{stg}	-55 to 150	°C

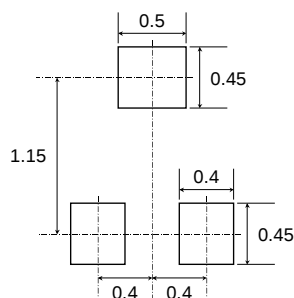
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

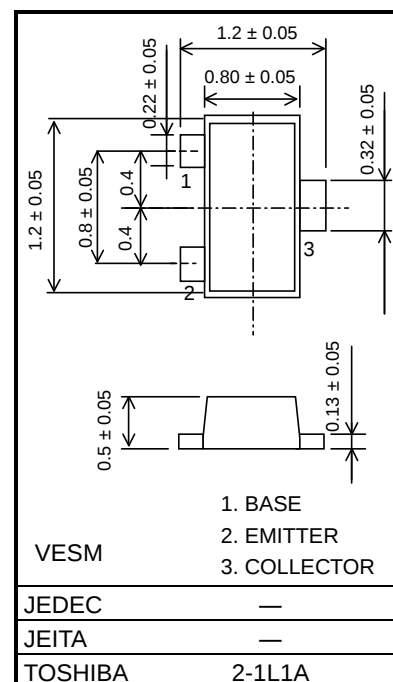
Note 1: Mounted on an FR4 board (25.4 mm × 25.4 mm × 1.6 mm)

Pad Dimension (Reference)

Unit : mm



Unit: mm



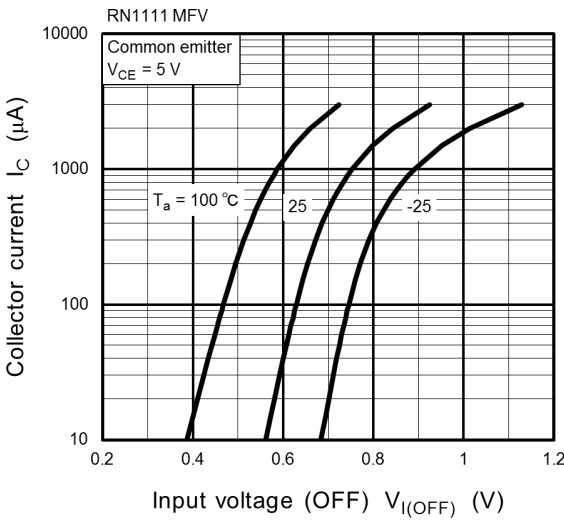
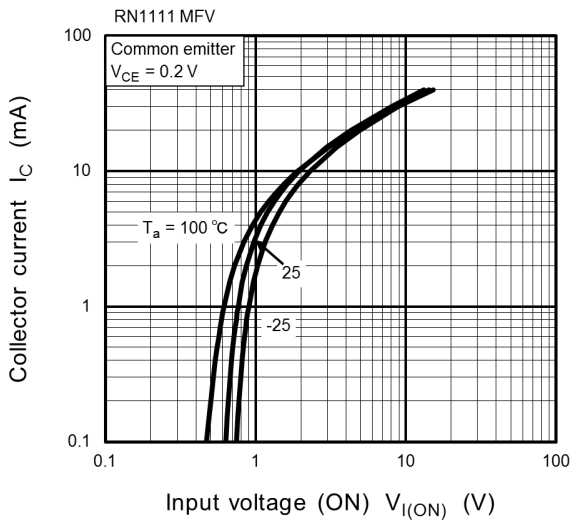
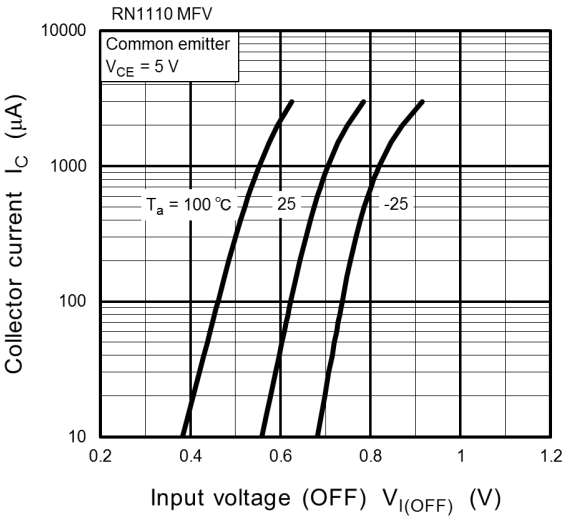
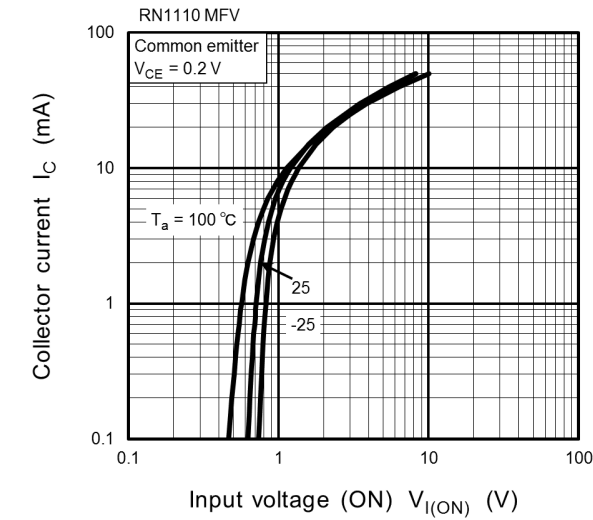
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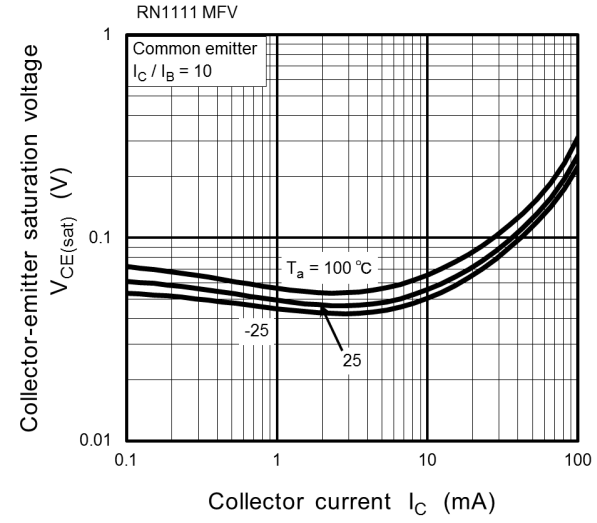
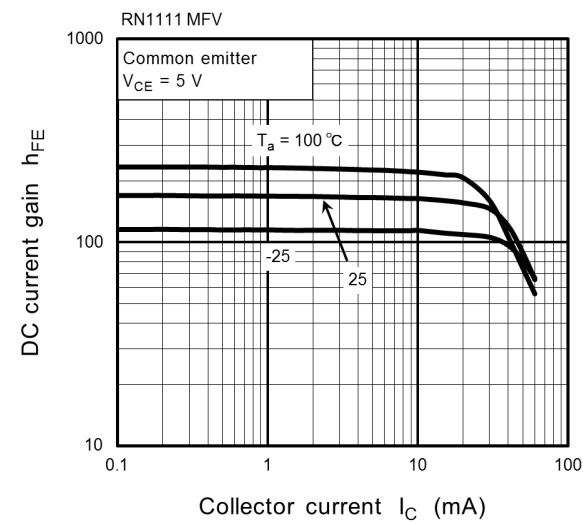
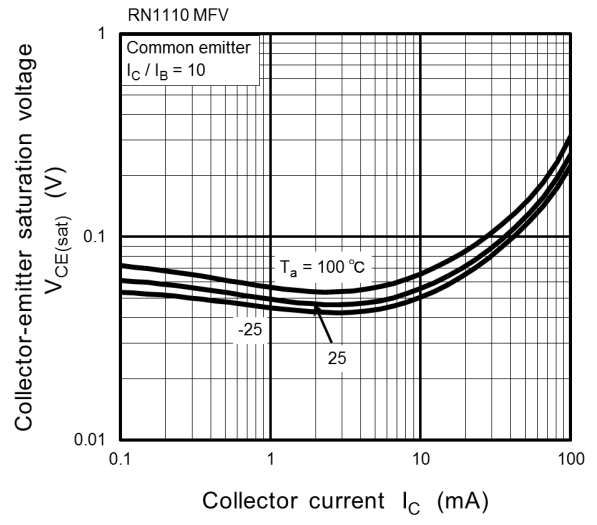
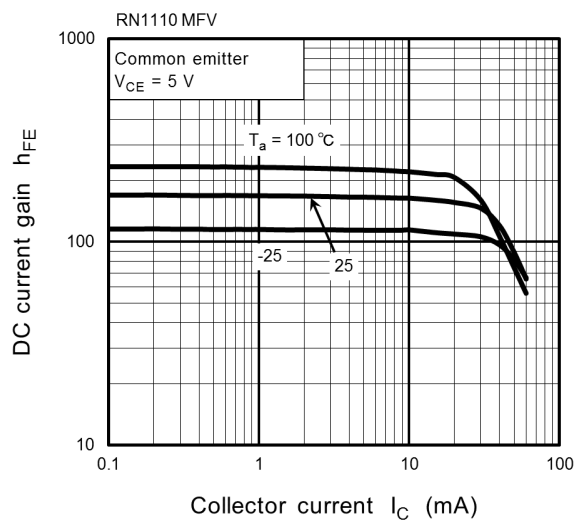
Weight: 1.5 mg (typ.)

Start of commercial production
2005-02

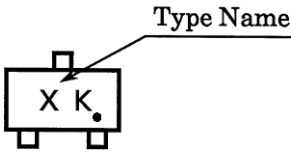
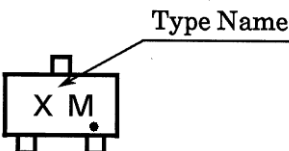
Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cutoff current		ICBO	V _{CB} = 50 V, I _E = 0 A	—	—	100	nA
Emitter cutoff current		IEBO	V _{EB} = 5 V, I _C = 0 A	—	—	100	nA
DC current gain		h _{FE}	V _{CE} = 5 V, I _C = 1 mA	120	—	700	—
Collector-emitter saturation voltage		V _{CE (sat)}	I _C = 5 mA, I _B = 0.5 mA	—	0.1	0.3	V
Collector output capacitance		C _{ob}	V _{CB} = 10 V, I _E = 0 A, f = 1 MHz	—	0.7	—	pF
Input resistor	RN1110MFV	R1	—	3.29	4.7	6.11	kΩ
	RN1111MFV			7	10	13	





Marking

Type Name	Marking
RN1110MFV	 The diagram shows a rectangular marking area with a small square notch at the top center and two small square feet at the bottom. Inside the rectangle, the text 'X K.' is printed. An arrow points from the text 'Type Name' to the 'K' in the marking.
RN1111MFV	 The diagram shows a rectangular marking area with a small square notch at the top center and two small square feet at the bottom. Inside the rectangle, the text 'X M.' is printed. An arrow points from the text 'Type Name' to the 'M' in the marking.

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