

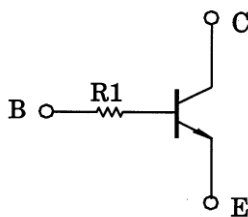
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)(Bias Resistor built-in Transistor)

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

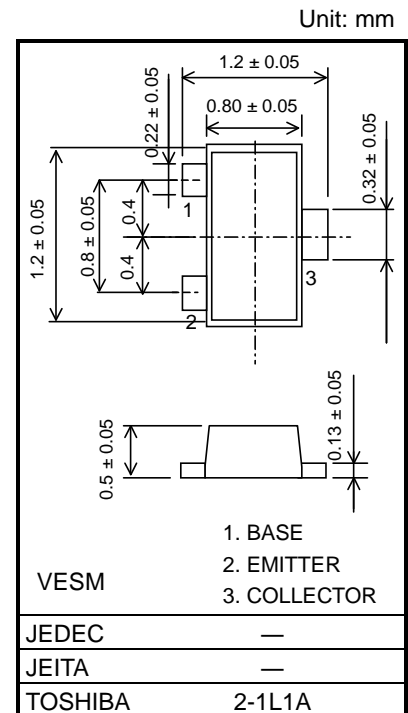
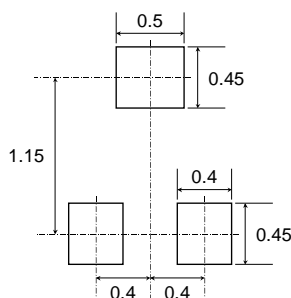
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

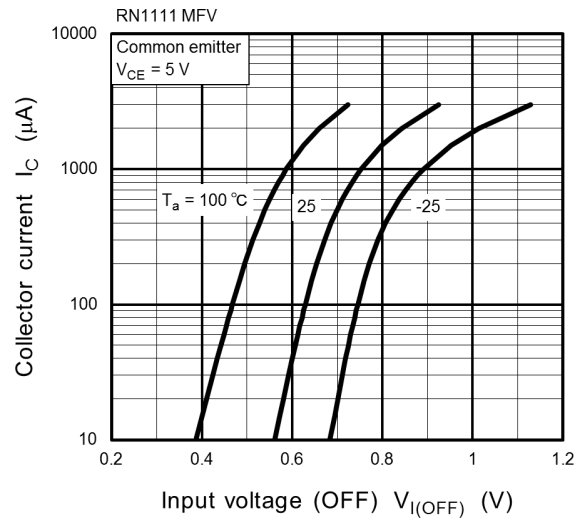
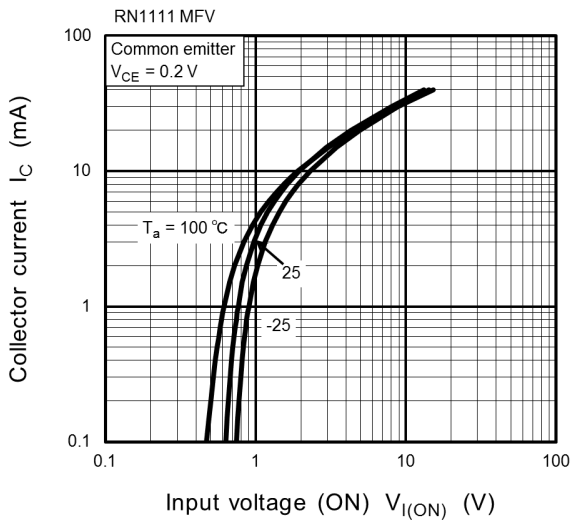
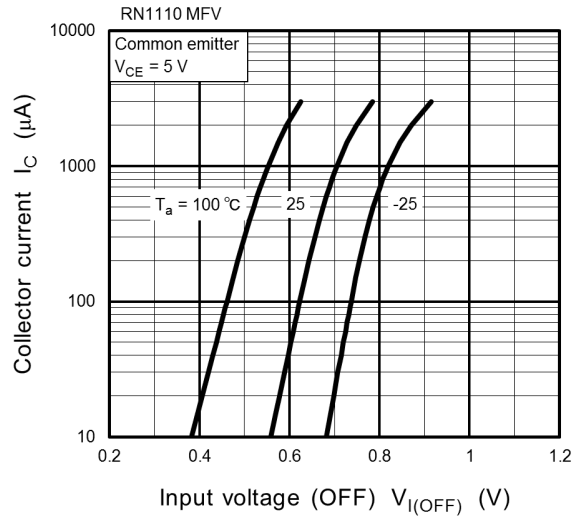
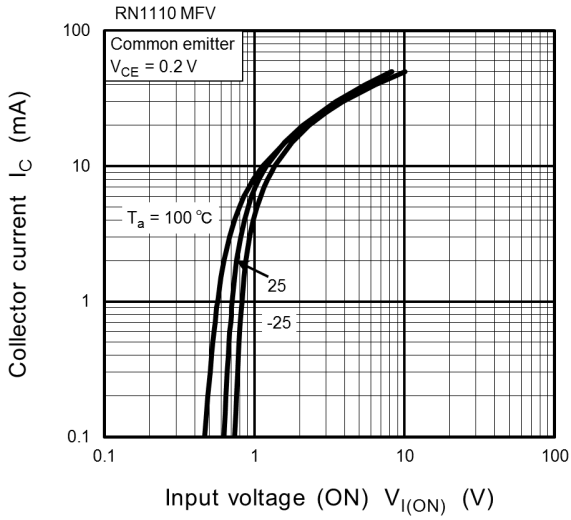


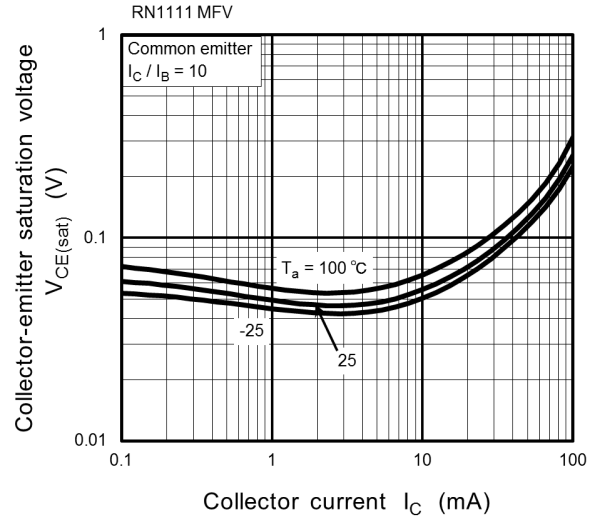
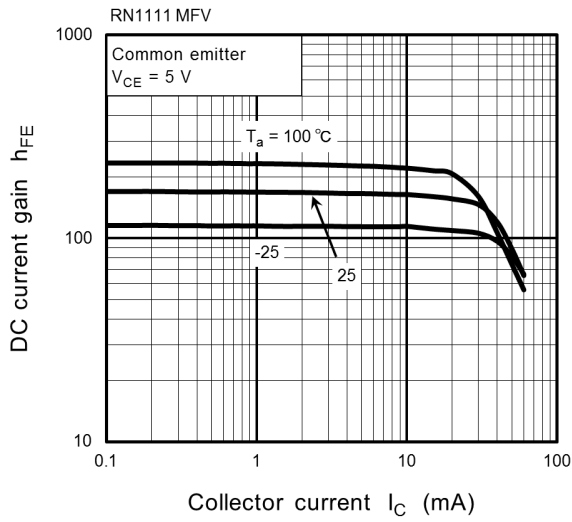
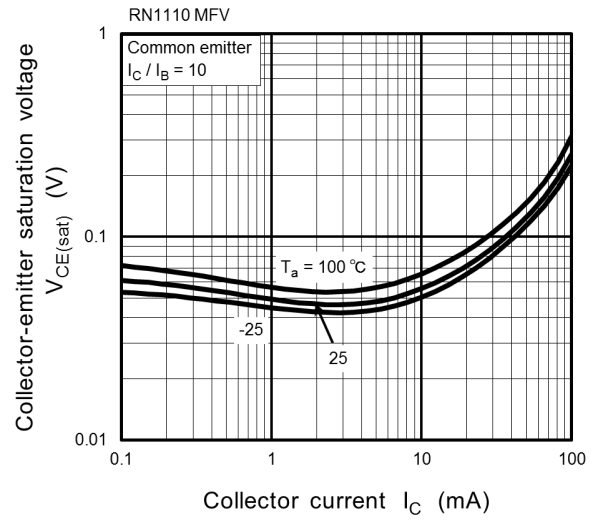
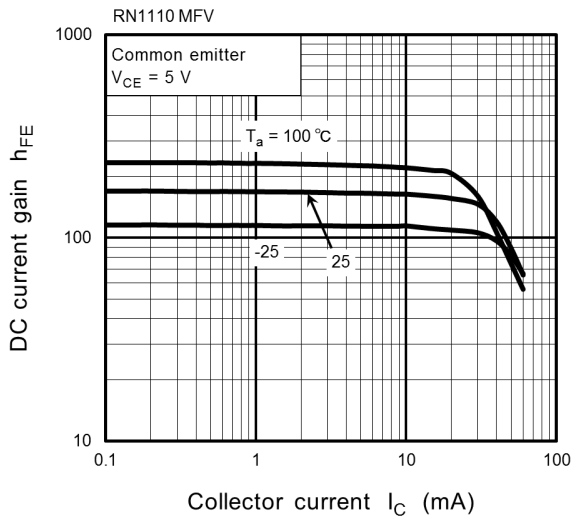
Weight: 1.5 mg (typ.)

Start of commercial production
2005-02

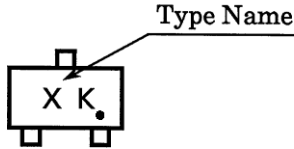
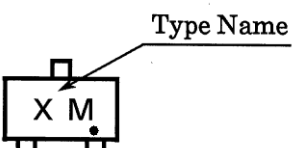
Electrical Characteristics (Ta = 25°C)

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		hFE	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	 A diagram of a rectangular component with a small square protrusion on top and two small square protrusions on the bottom. The component is marked with 'X K' and a small dot. An arrow points from the text 'Type Name' to the top protrusion.
RN1111MFV	 A diagram of a rectangular component with a small square protrusion on top and two small square protrusions on the bottom. The component is marked with 'X M' and a small dot. An arrow points from the text 'Type Name' to the top protrusion.

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