

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

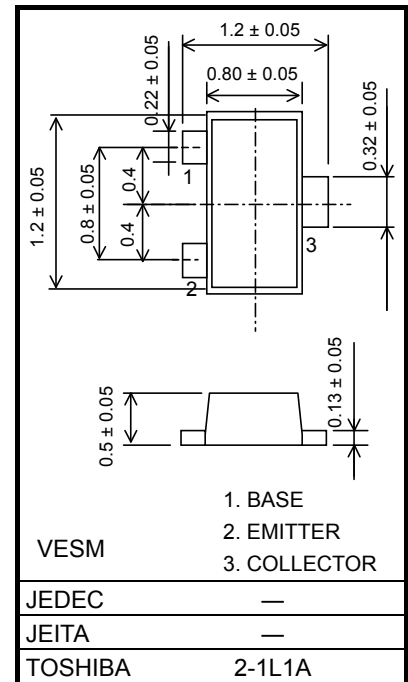
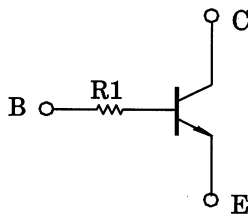
## RN1110MFV, RN1111MFV

Unit: mm

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



Weight: 1.5 mg (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> (Note 1)	150	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature range	T <sub>stg</sub>	-55 to 150	°C

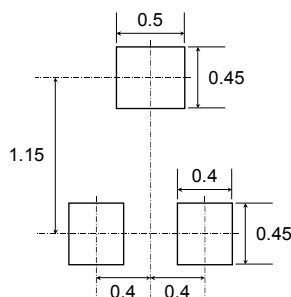
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

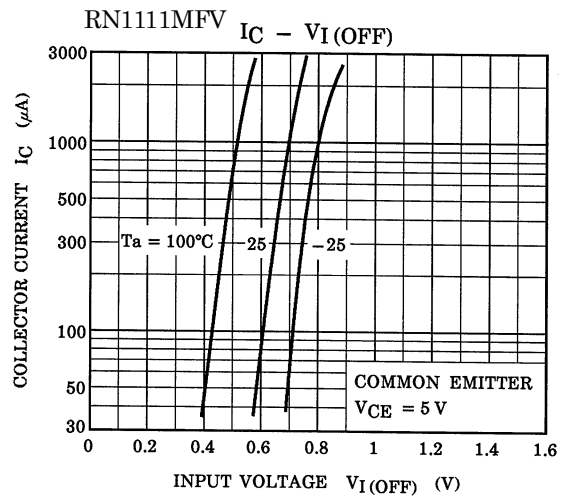
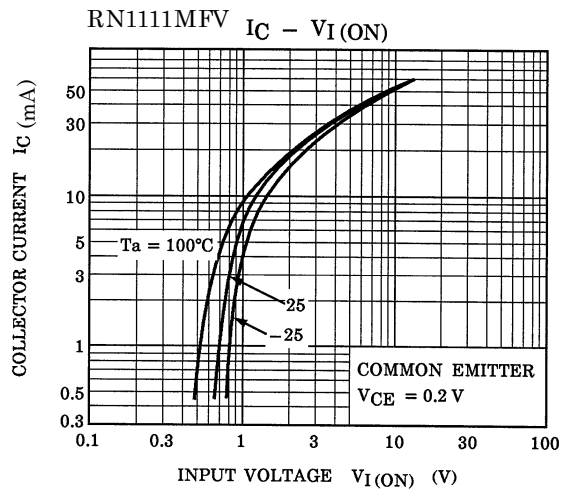
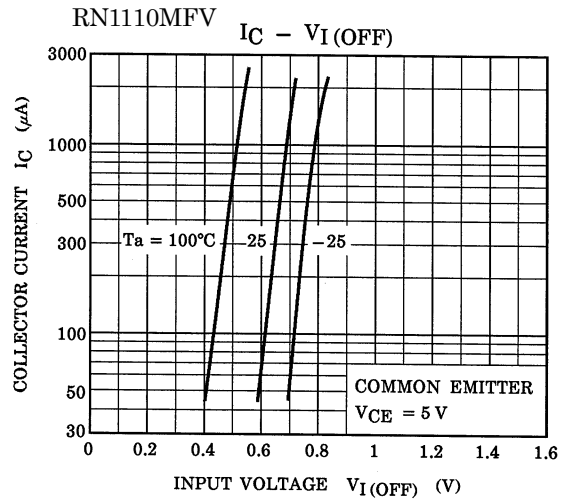
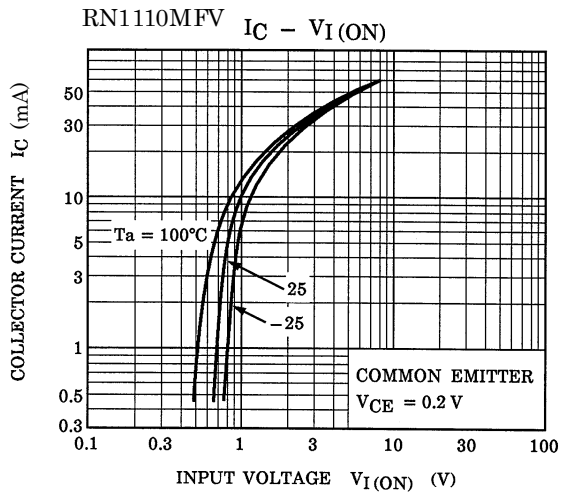
### Pad Dimension (Reference)

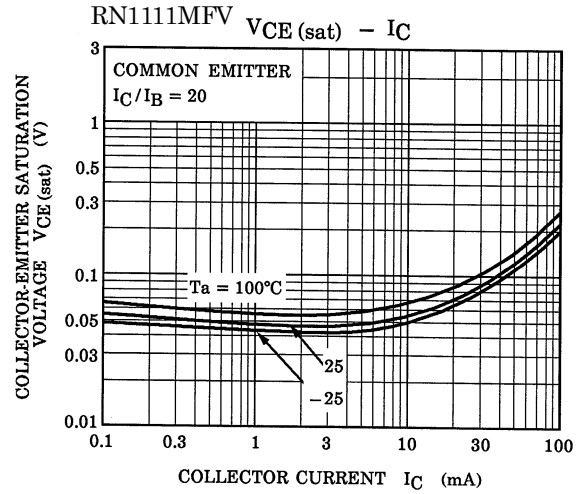
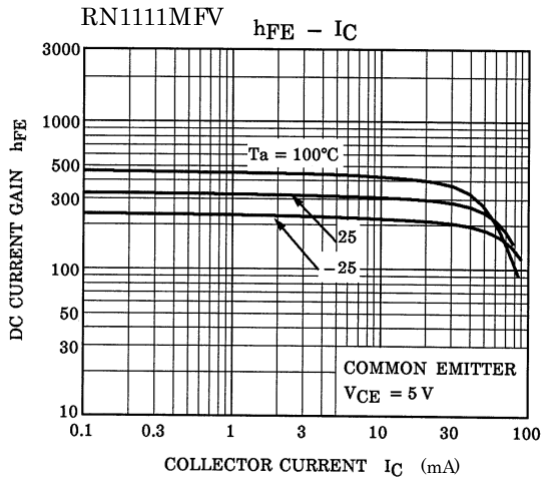
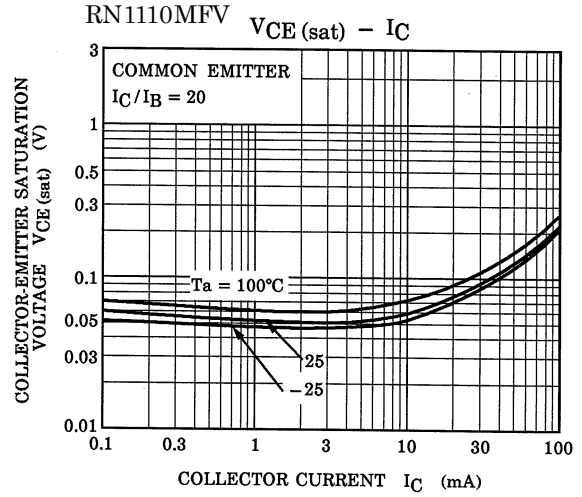
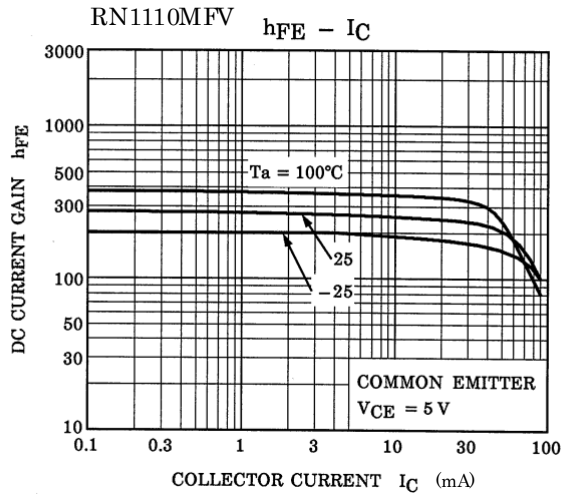
Unit : mm



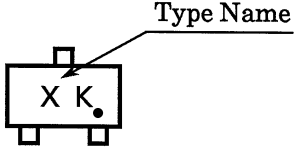
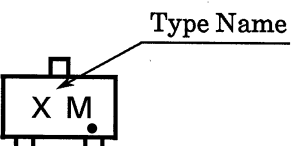
## Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cutoff current	$I_{CBO}$	—	$V_{CB} = 50\text{ V}, I_E = 0$	—	—	100	nA
Emitter cutoff current	$I_{EBO}$	—	$V_{EB} = 5\text{ V}, I_C = 0$	—	—	100	nA
DC current gain	$h_{FE}$	—	$V_{CE} = 5\text{ V}, I_C = 1\text{ mA}$	120	—	700	—
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	$I_C = 5\text{ mA}, I_B = 0.5\text{ mA}$	—	0.1	0.3	V
Collector output capacitance	$C_{ob}$	—	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	0.7	—	pF
Input resistor	RN1110MFV	R1	—	3.29	4.7	6.11	kΩ
	RN1111MFV			7	10	13	





## Marking

Type Name	Marking
RN1110MFV	 A schematic diagram of a transformer core with a top tap and two bottom taps. The core is labeled 'X K' with a dot to the right of the 'K'. An arrow points from the text 'Type Name' to the 'X K' marking.
RN1111MFV	 A schematic diagram of a transformer core with a top tap and two bottom taps. The core is labeled 'X M' with a dot to the right of the 'M'. An arrow points from the text 'Type Name' to the 'X M' marking.

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