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

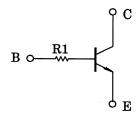
# RN1110MFV,RN1111MFV

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

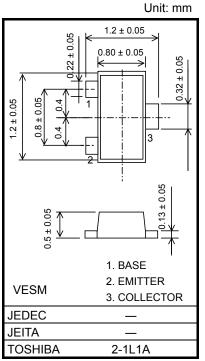
#### **Equivalent Circuit**

Note:



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

Characteristic	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	50	V
Collector-emitter voltage	V <sub>CEO</sub>	50	٧
Emitter-base voltage	V <sub>EBO</sub>	5	V
Collector current	IC	100	mA
Collector power dissipation	P <sub>C</sub> (Note 1)	150	mW
Junction temperature	Tj	150	°C
Storage temperature range	T <sub>stg</sub>	-55 to 150	°C



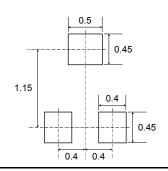
Weight: 1.5 mg (typ.)

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  $\times$  25.4 mm  $\times$  1.6 mmt)

#### Pad Dimension (Reference)



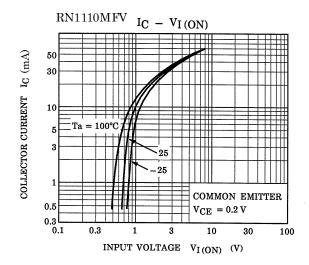
Unit: mm

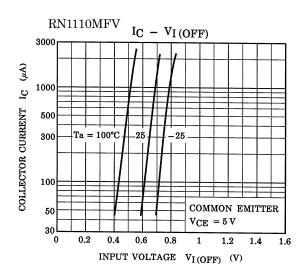


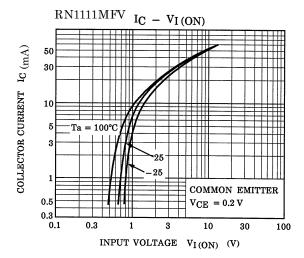
## Electrical Characteristics (Ta = 25°C)

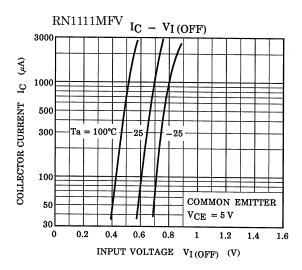
Characteristic		Symbol	Test Circuit	Test Condition	Min	Тур.	Max	Unit
Collector cutoff current		I <sub>CBO</sub>	_	V <sub>CB</sub> = 50 V, I <sub>E</sub> = 0	_	_	100	nA
Emitter cutoff current		I <sub>EBO</sub>	_	V <sub>EB</sub> = 5 V, I <sub>C</sub> = 0	_	_	100	nA
DC current gain		h <sub>FE</sub>	_	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 1 mA	120	_	700	_
Collector-emitter saturation voltage		V <sub>CE</sub> (sat)	_	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, f = 1 MHz	_	0.7	_	pF
Input resistor	RN1110MFV	- R1 —			3.29	4.7	6.11	kΩ
	RN1111MFV		_	7	10	13	K77	

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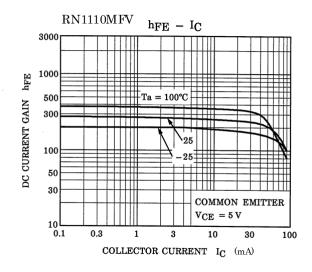


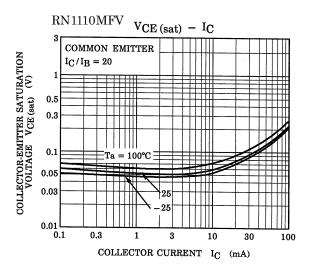


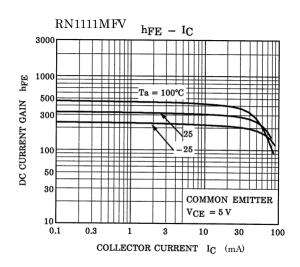


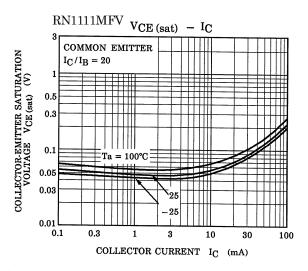


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## Marking

Type Name	Marking	
RN1110MFV	Type Name	
RN1111MFV	Type Name	

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