

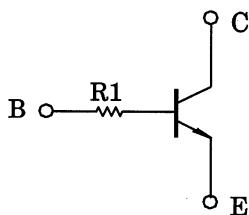
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)  
(Bias Resistor built-in Transistor)

# RN1112MFV, RN1113MFV

Switching, Inverter Circuit, Interface Circuit and  
Driver Circuit Applications

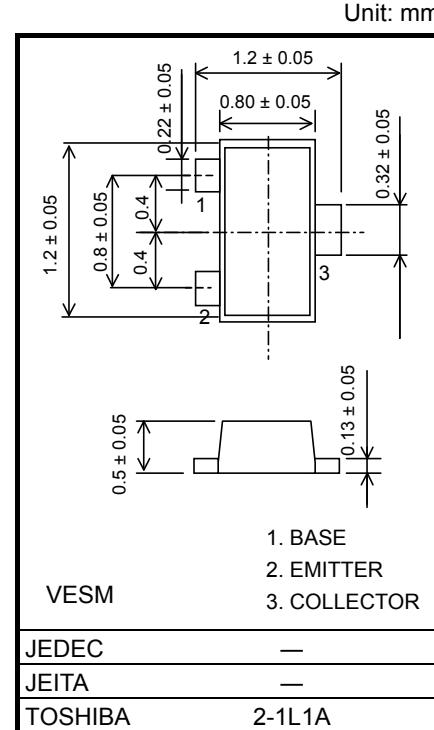
- Ultra-small package, suited to very high density mounting
- Incorporating a bias resistor into the transistor reduces the number of parts, so enabling the manufacture of ever more compact equipment and lowering assembly cost.
- A wide range of resistor values is available for use in various circuits.
- Complementary to the RN1112MFV and RN1113MFV

## 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



Weight: 1.5 mg (typ.)

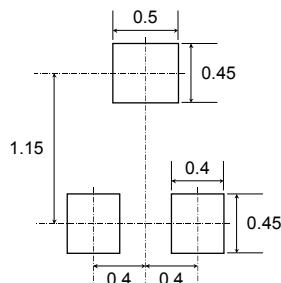
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

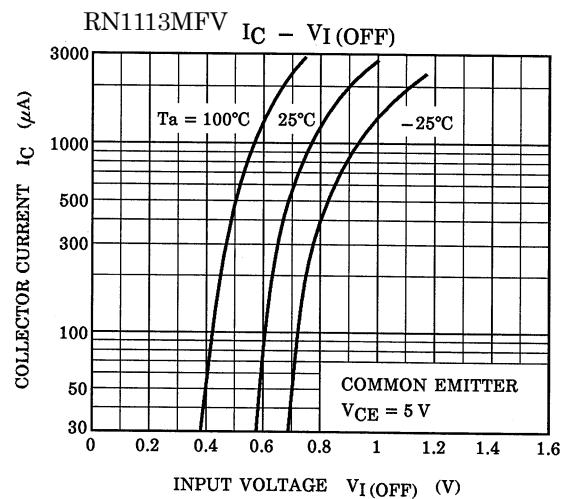
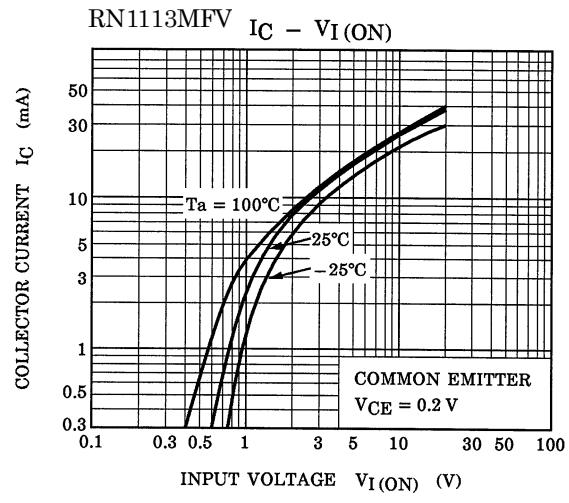
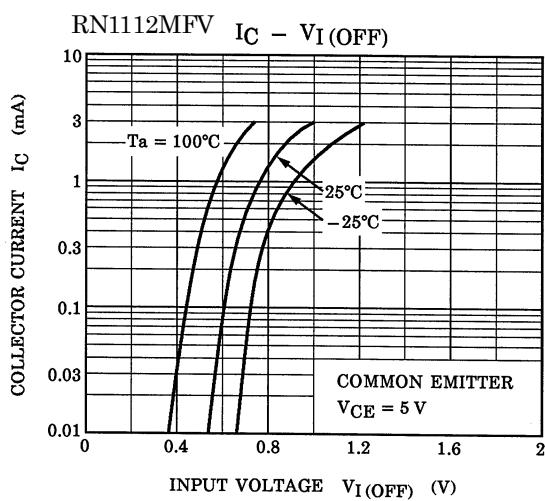
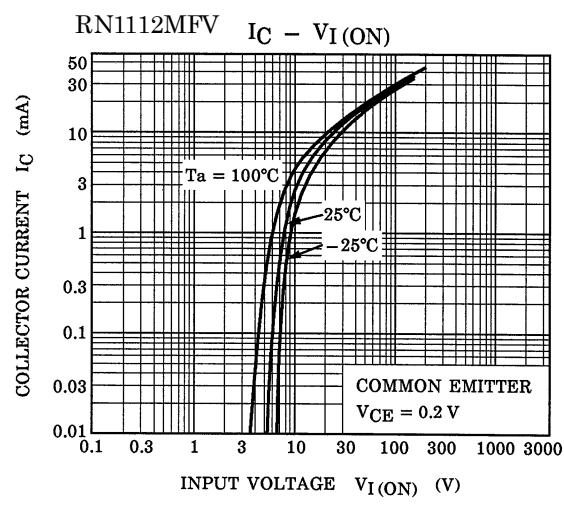
Unit : mm

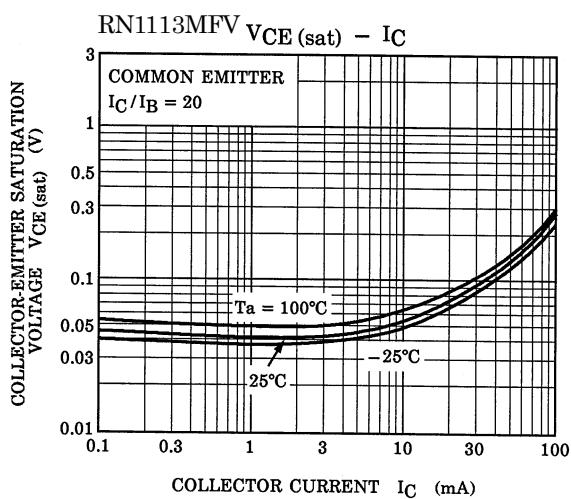
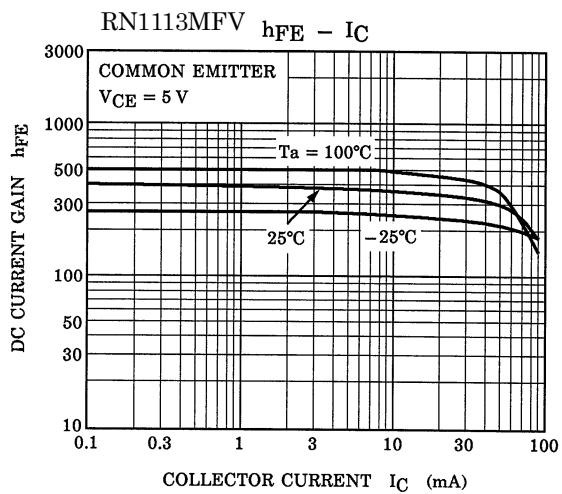
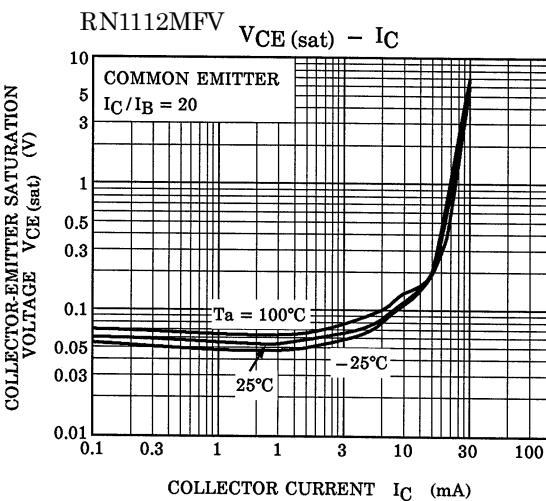
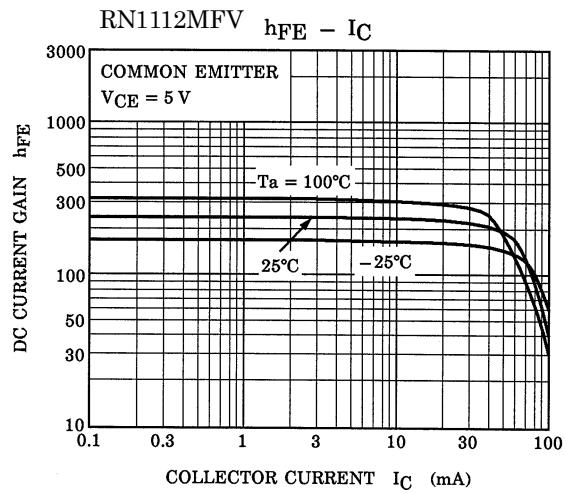


Start of commercial production  
2005-02

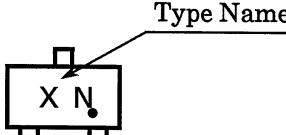
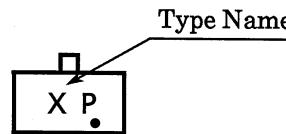
**Electrical Characteristics (Ta = 25°C)**

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	$V_{CE} (\text{sat})$	—	$I_C = 5 \text{ mA}$ , $I_B = 0.5 \text{ mA}$	—	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	RN1112MFV	R1	—	—	15.4	22	28.6	kΩ
	RN1113MFV				32.9	47	61.1	





**Marking**

Type Name	Marking
RN1112MFV	
RN1113MFV	

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