

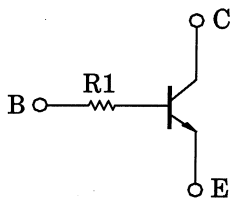
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process) (Bias Resistor Built-in Transistor)

# RN1112FS, RN1113FS

Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

- Incorporating a bias resistor into a transistor reduces parts count. Reducing the parts count enables the manufacture of ever more compact equipment and lowers assembly cost.
- Complementary to RN2112FS, RN2113FS

## Equivalent Circuit and Bias Resistor Values



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

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V <sub>CB0</sub>	20	V
Collector-emitter voltage	V <sub>CEO</sub>	20	V
Emitter-base voltage	V <sub>EB0</sub>	5	V
Collector current	I <sub>C</sub>	50	mA
Collector power dissipation	P <sub>C</sub>	50	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature range	T <sub>stg</sub>	-55~150	°C

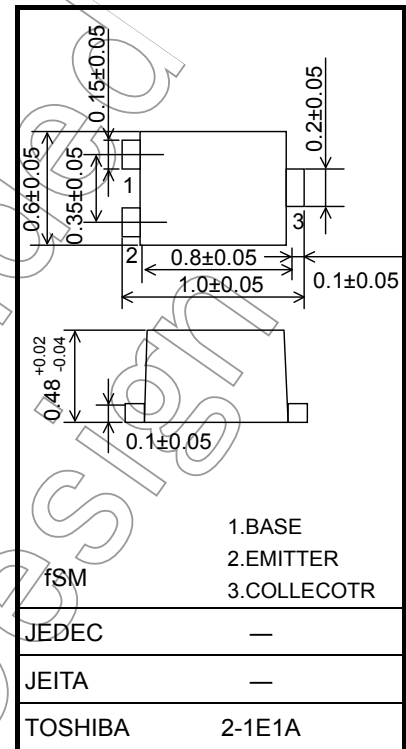
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

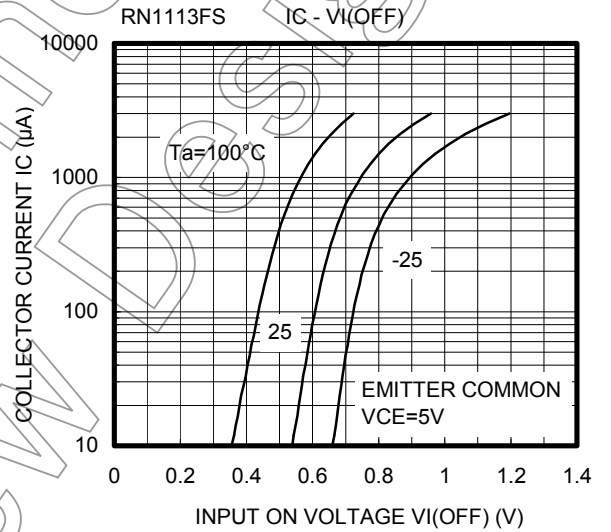
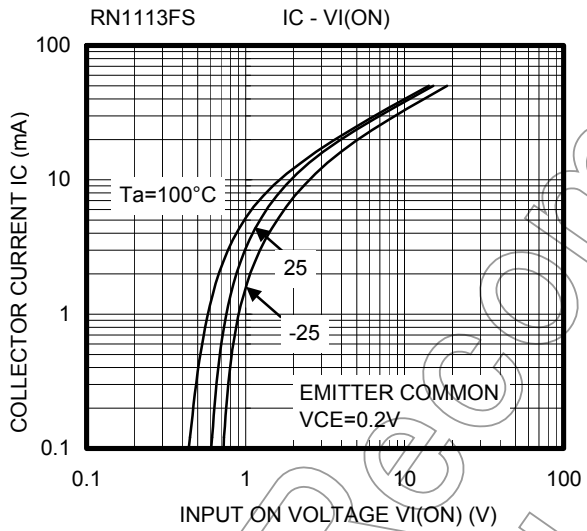
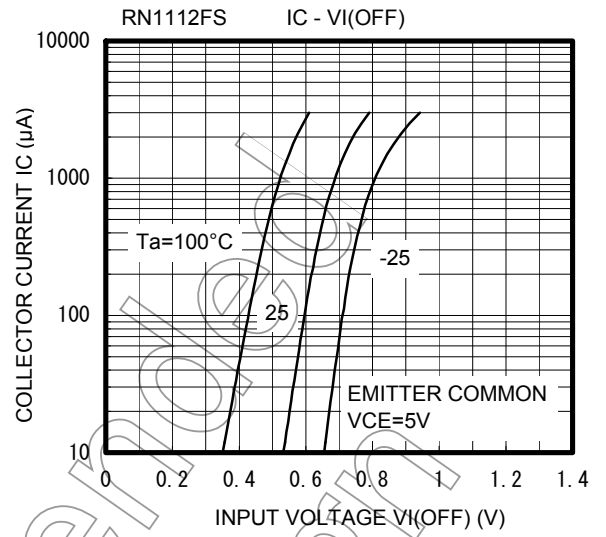
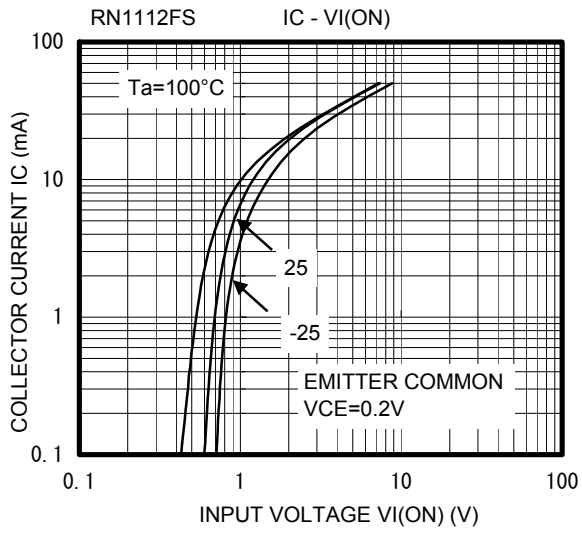
## Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit	
Collector cut-off current	I <sub>CBO</sub>	V <sub>CB</sub> = 20 V, I <sub>E</sub> = 0	—	—	100	nA	
Emitter cut-off 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	300	—	—		
Collector-emitter saturation voltage	V <sub>CE (sat)</sub>	I <sub>C</sub> = 5 mA, I <sub>B</sub> = 0.25 mA	—	—	0.15	V	
Collector output capacitance	C <sub>ob</sub>	V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0, f = 1 MHz	—	1.2	—	pF	
Input resistor	RN1112FS	R1	—	17.6	22	26.4	kΩ
	RN1113FS			37.6	47	56.4	

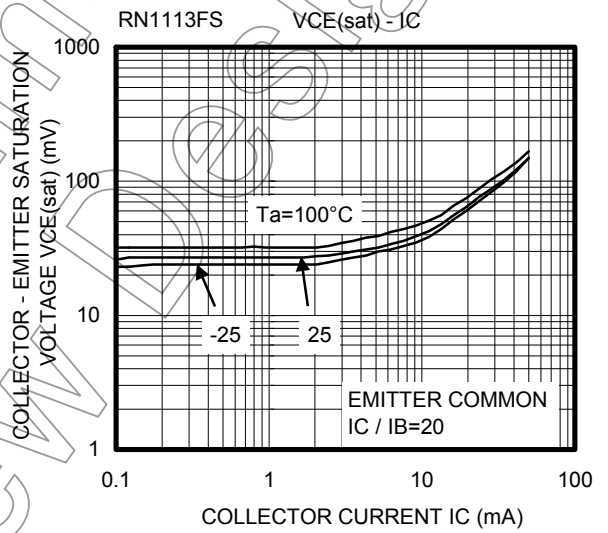
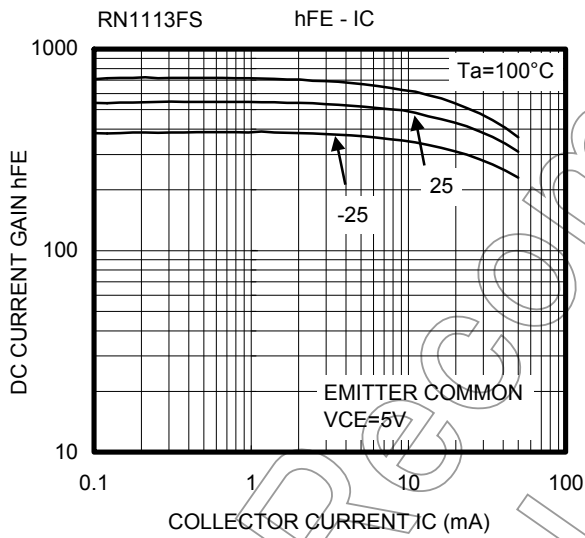
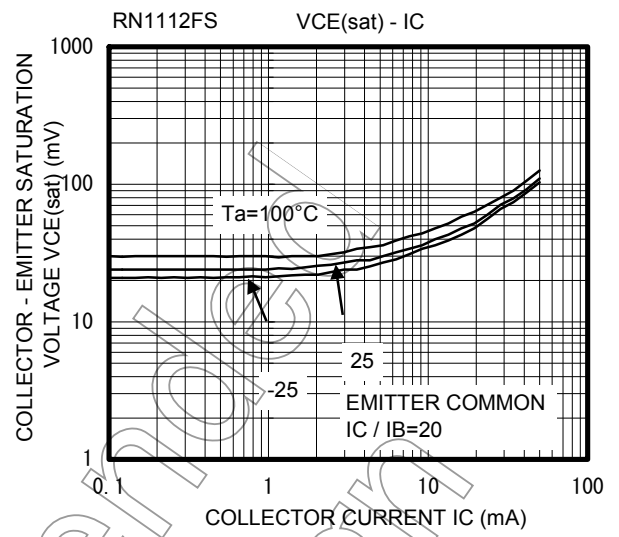
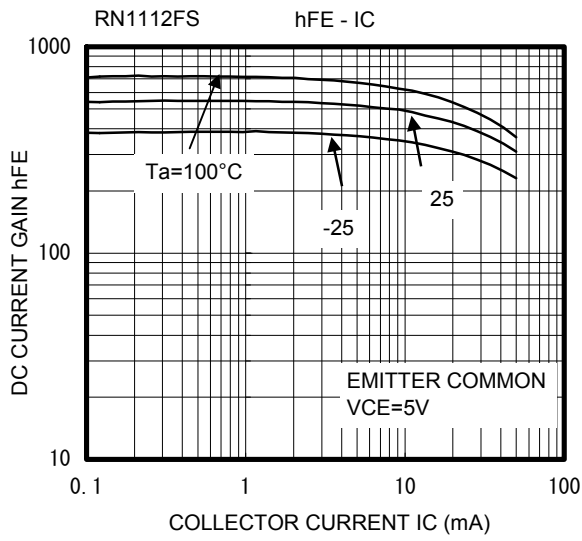
Unit: mm



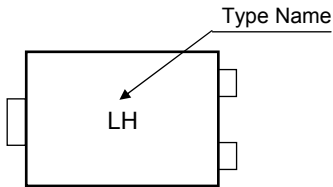
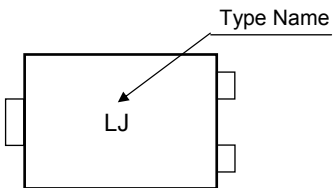
Weight: 0.0006 g (typ.)



Not for New



Not for New

Type Name	Marking
RN1112FS	 <p>The diagram shows a rectangular component with a notch on the left side and two pins on the right side. The marking 'LH' is located in the center. An arrow labeled 'Type Name' points to the 'LH' marking.</p>
RN1113FS	 <p>The diagram shows a rectangular component with a notch on the left side and two pins on the right side. The marking 'LJ' is located in the center. An arrow labeled 'Type Name' points to the 'LJ' marking.</p>

**Handling Precaution**

When handling individual devices (which are not yet mounted on a circuit board), be sure that the environment is protected against electrostatic discharge. Operators should wear anti-static clothing, and containers and other objects that come into direct contact with devices should be made of anti-static materials.

Not Recommended for New Design

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