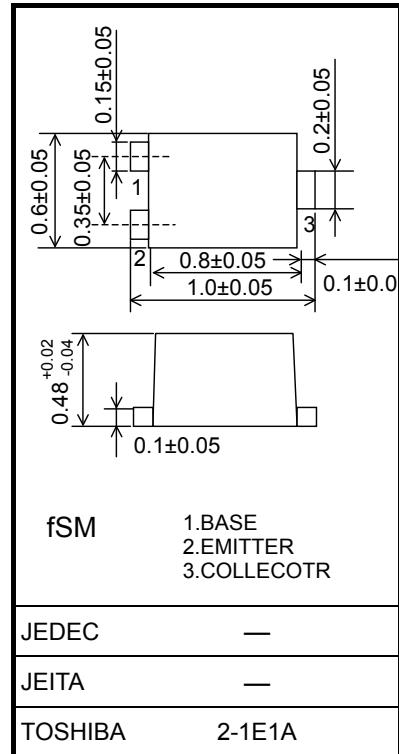
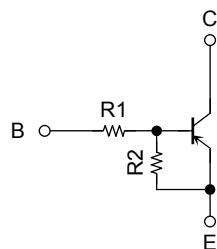


TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT process) (Bias Resistor built-in Transistor)

**RN2107FS,RN2108FS,RN2109FS**Switching, Inverter Circuit, Interface Circuit and  
Driver Circuit Applications

Unit: mm

- Incorporating a bias resistor into a transistor reduces parts count.
- Reducing the parts count enable the manufacture of ever more compact equipment and save assembly cost.
- Complementary to RN1107FS to RN1109FS

**Equivalent Circuit and Bias Resistor Values**

Type No.	R1 (kΩ)	R2 (kΩ)
RN2107FS	10	47
RN2108FS	22	47
RN2109FS	47	22

Weight: 0.6 mg (typ.)

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

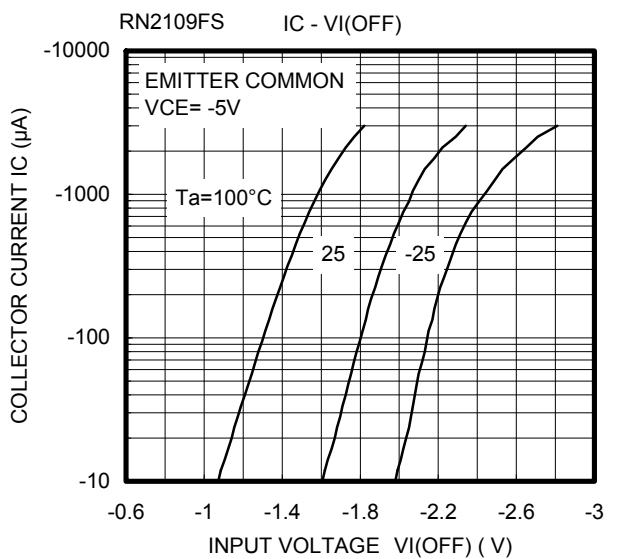
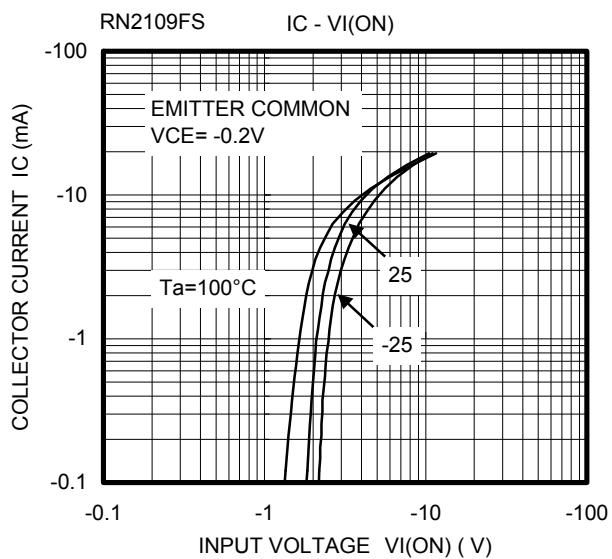
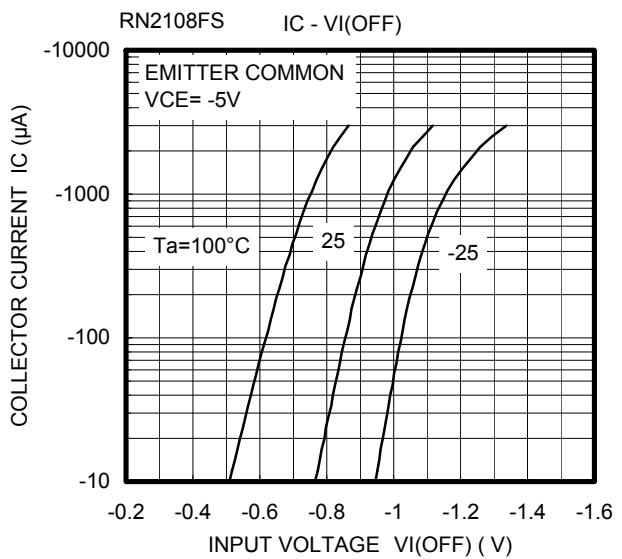
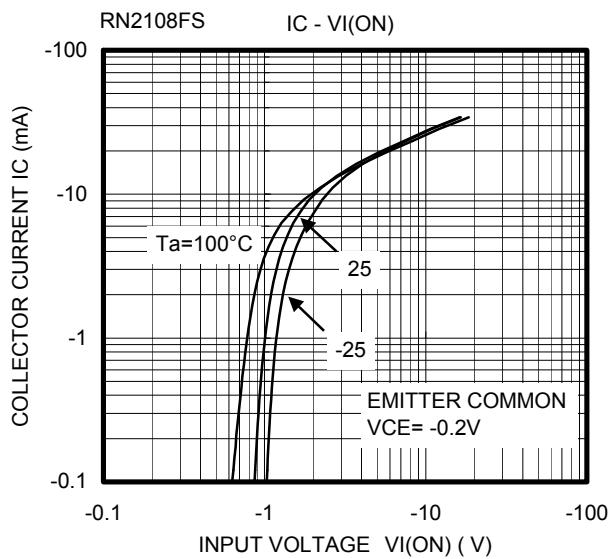
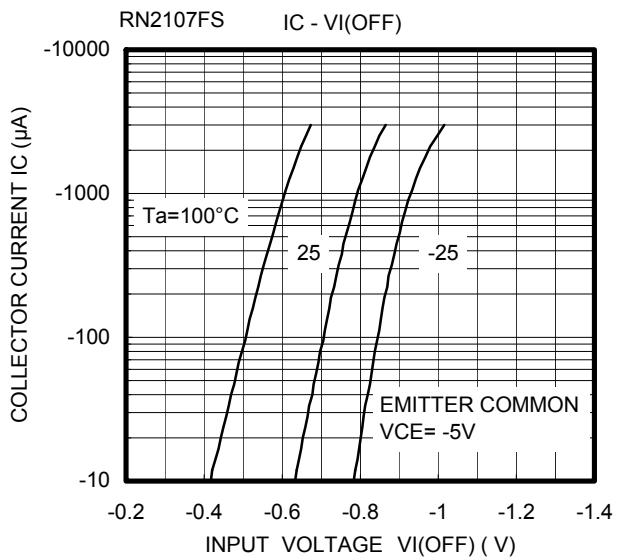
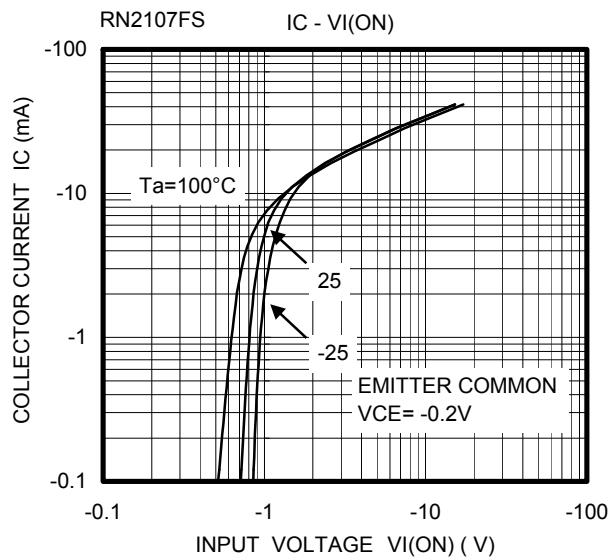
Characteristics		Symbol	Rating	Unit
Collector-base voltage	RN2107FS to RN2109FS	V <sub>CBO</sub>	-20	V
Collector-emitter voltage		V <sub>CCEO</sub>	-20	V
Emitter-base voltage	RN2107FS	V <sub>EBO</sub>	-6	V
			-7	
			-15	
Collector current	RN2107FS to RN2109FS	I <sub>C</sub>	-50	mA
Collector power dissipation		P <sub>C</sub>	50	mW
Junction temperature		T <sub>j</sub>	150	°C
Storage temperature range		T <sub>stg</sub>	-55 to 150	°C

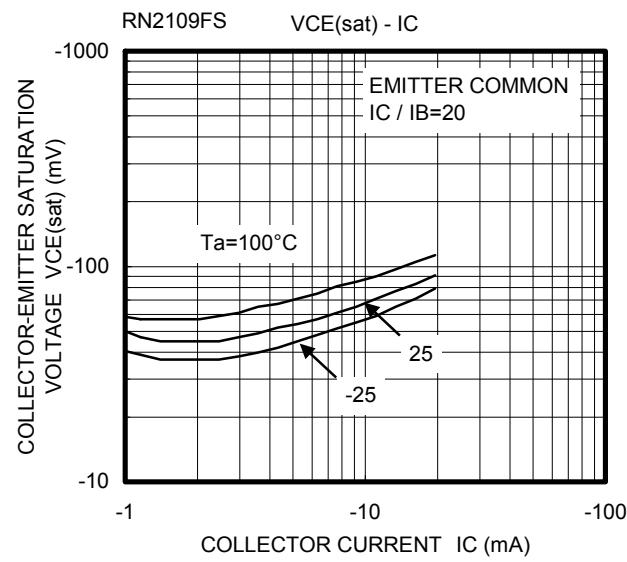
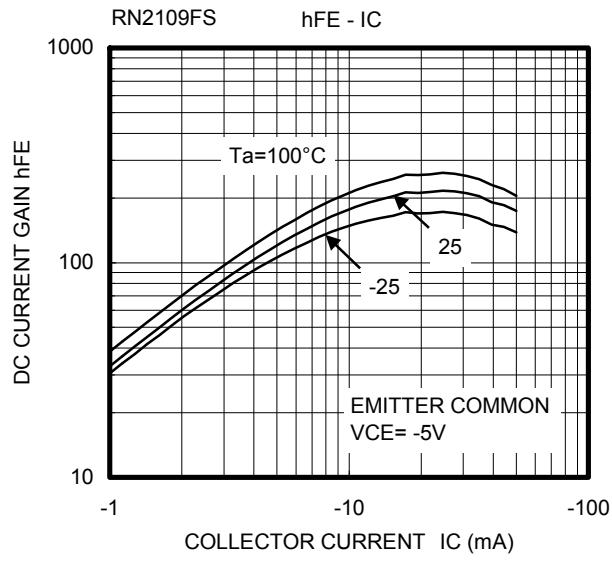
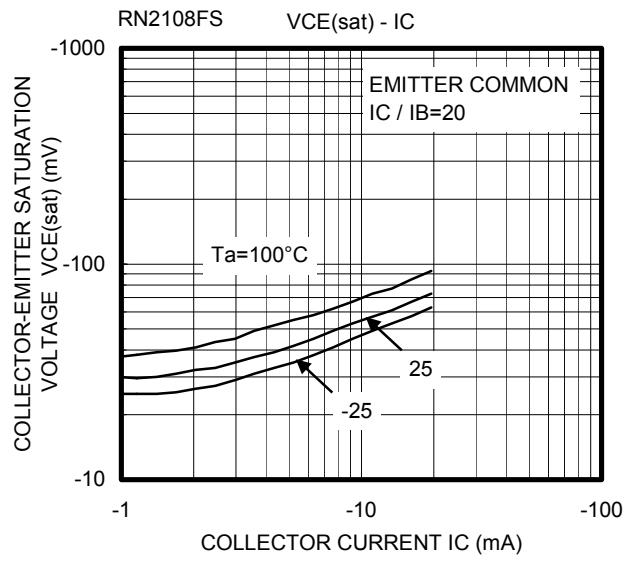
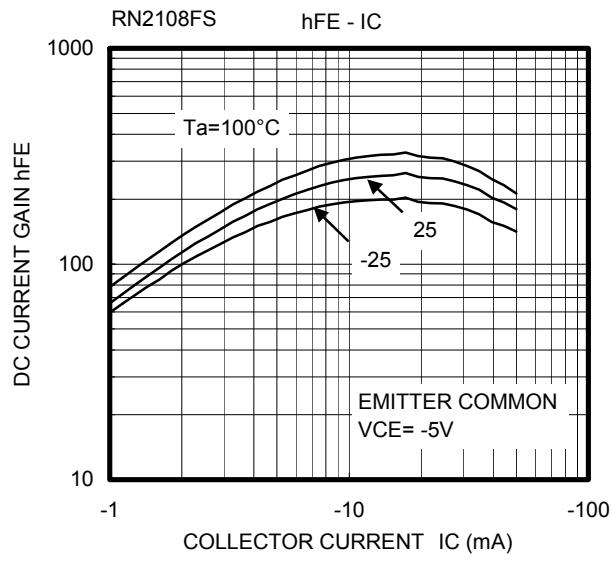
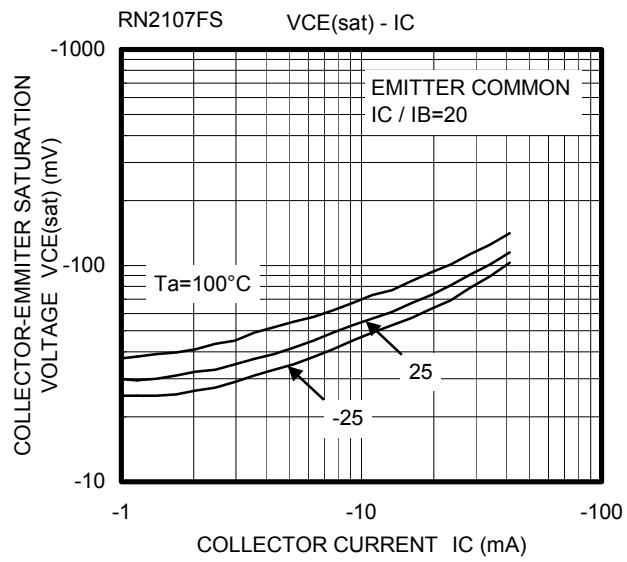
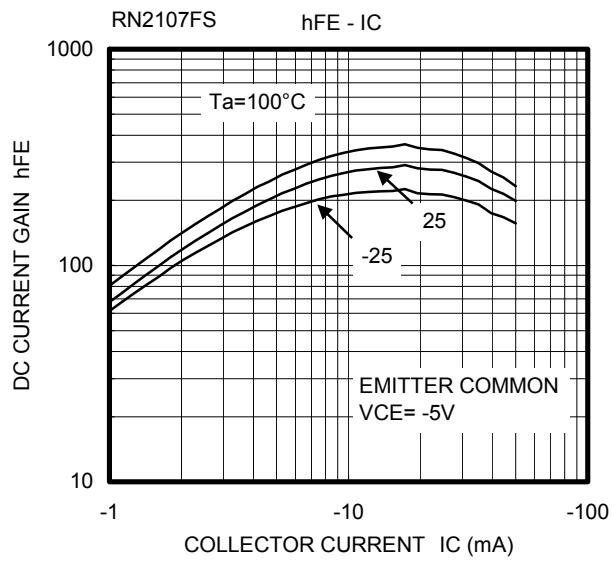
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

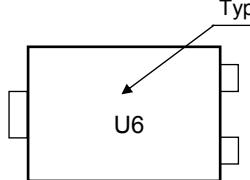
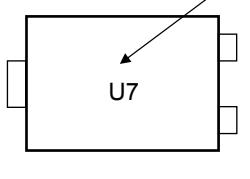
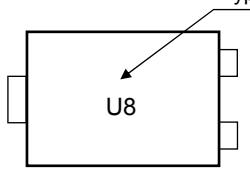
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc.).

## Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN2107FS to 2109FS	I <sub>CBO</sub>	V <sub>CB</sub> = -20 V, I <sub>E</sub> = 0	—	—	-100	nA
		I <sub>CEO</sub>	V <sub>CE</sub> = -20 V, I <sub>B</sub> = 0	—	—	-500	
Emitter cut-off current	RN2107FS	I <sub>EBO</sub>	V <sub>EB</sub> = -6 V, I <sub>C</sub> = 0	-0.088	—	-0.131	mA
	RN2108FS		V <sub>EB</sub> = -7 V, I <sub>C</sub> = 0	-0.085	—	-0.126	
	RN2109FS		V <sub>EB</sub> = -15 V, I <sub>C</sub> = 0	-0.182	—	-0.271	
DC current gain	RN2107FS	h <sub>FE</sub>	V <sub>CE</sub> = -5 V, I <sub>C</sub> = -10 mA	120	—	—	—
	RN2108FS			120	—	—	
	RN2109FS			100	—	—	
Collector-emitter saturation voltage	RN2107FS to 2109FS	V <sub>CE</sub> (sat)	I <sub>C</sub> = -5 mA, I <sub>B</sub> = -0.25 mA	—	—	-0.15	V
Input voltage (ON)	RN2107FS	V <sub>I</sub> (ON)	V <sub>CE</sub> = -0.2 V, I <sub>C</sub> = -5 mA	-0.7	—	-1.5	V
	RN2108FS			-0.8	—	-2.2	
	RN2109FS			-1.6	—	-5.0	
Input voltage (OFF)	RN2107FS	V <sub>I</sub> (OFF)	V <sub>CE</sub> = -5 V, I <sub>C</sub> = -0.1 mA,	-0.5	—	-1.0	V
	RN2108FS			-0.6	—	-1.1	
	RN2109FS			-1.3	—	-2.6	
Collector output capacitance	RN2107FS to 2109FS	C <sub>ob</sub>	V <sub>CB</sub> = -10 V, I <sub>E</sub> = 0, f = 1 MHz	—	1.2	—	pF
Input resistor	RN2107FS	R1	—	8	10	12	kΩ
	RN2108FS			17.6	22	26.4	
	RN2109FS			37.6	47	56.4	
Resistor ratio	RN2107FS	R1/R2	—	0.17	0.213	0.255	—
	RN2108FS			0.374	0.468	0.562	
	RN2109FS			1.71	2.14	2.56	





Type Name	Marking
RN2107FS	
RN2108FS	
RN2109FS	

## Handling Precaution

When handling individual devices (which are not yet mounted on a circuit board), be sure that the environment is protected against electrostatic electricity. 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.

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