

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

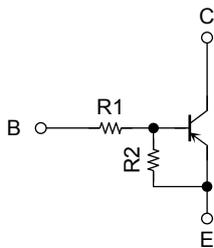
## RN2107ACT, RN2108ACT, RN2109ACT

Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

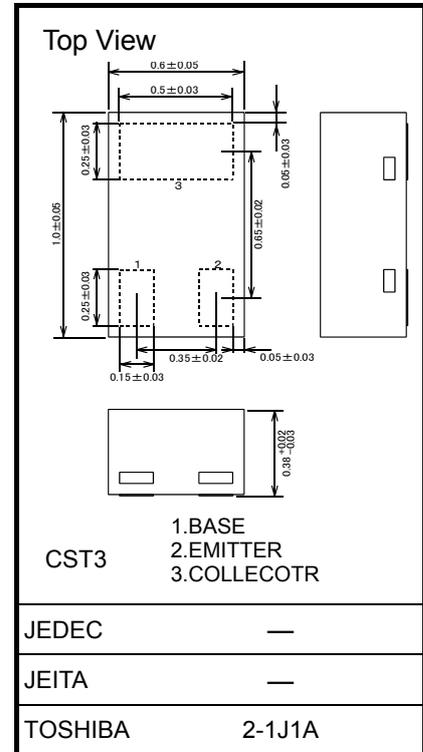
Unit: mm

- Extra small package (CST3) is applicable for extra high density fabrication.
- 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 RN1107ACT to RN1109ACT

### Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN2107ACT	10	47
RN2108ACT	22	47
RN2109ACT	47	22



Weight: 0.75 mg (typ.)

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

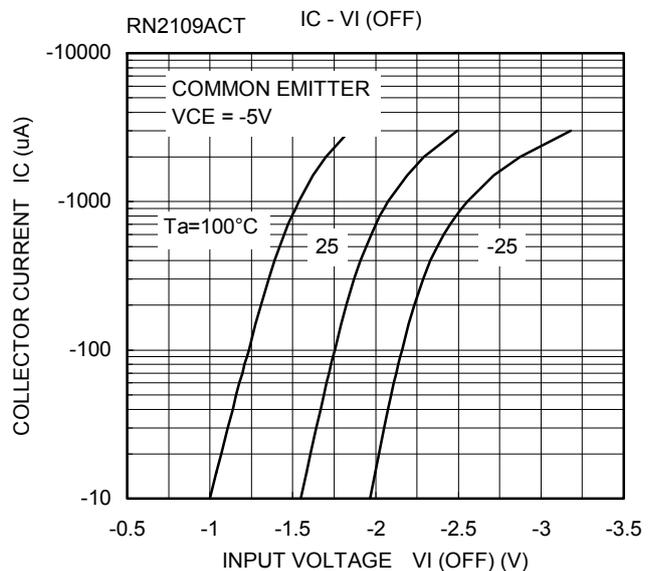
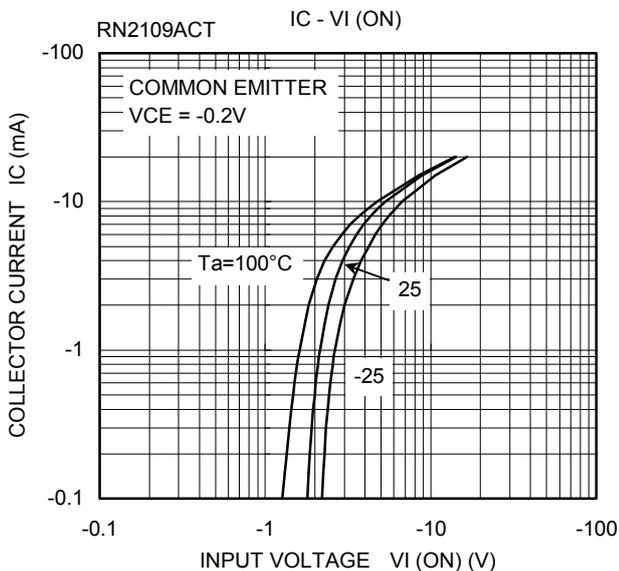
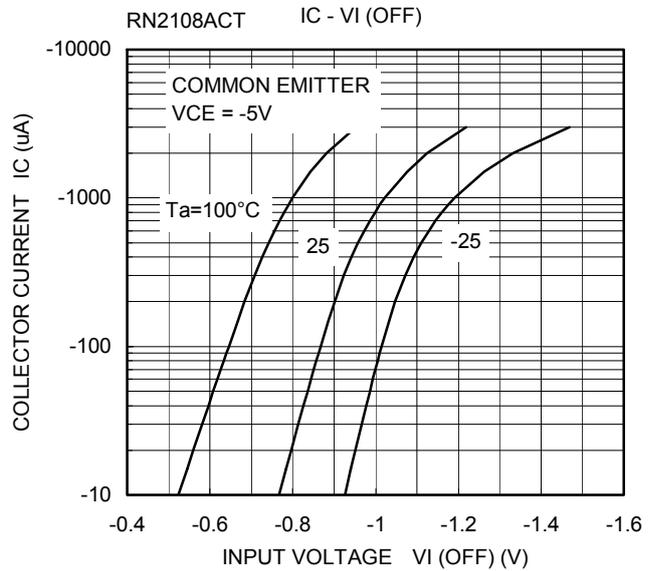
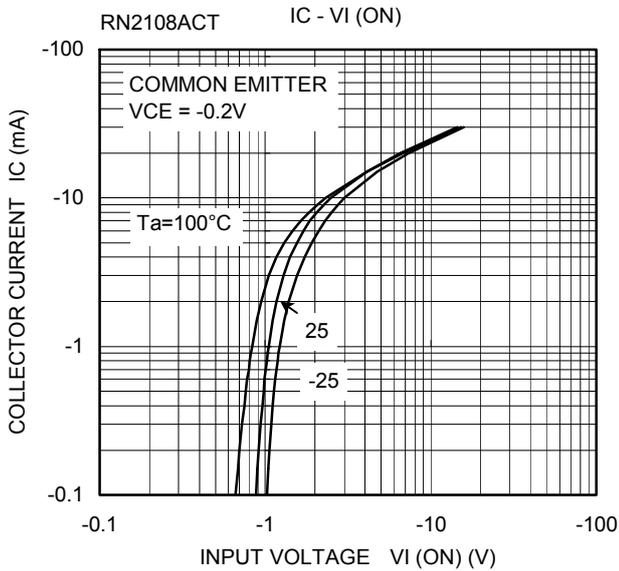
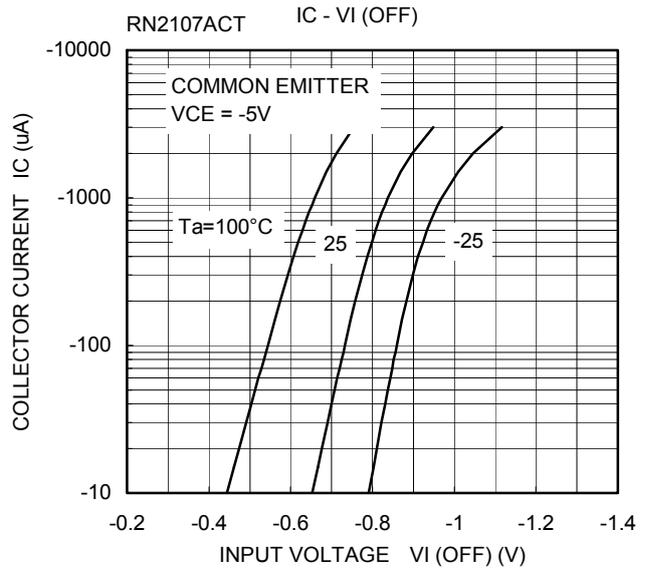
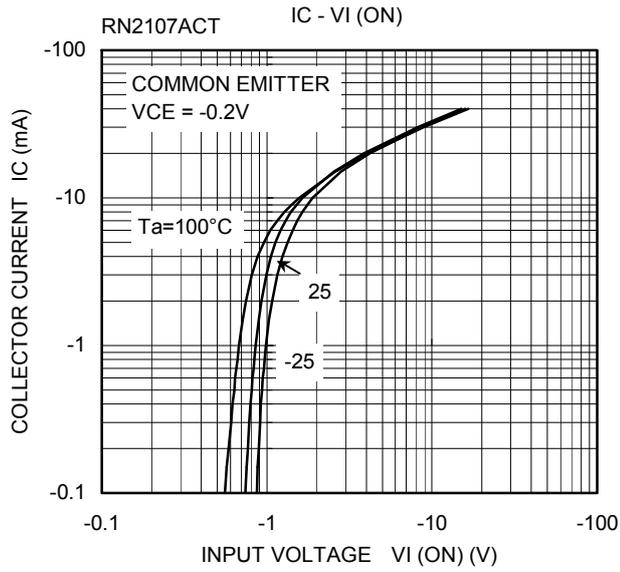
Characteristics		Symbol	Rating	Unit
Collector-base voltage	RN2107ACT to RN2109ACT	V <sub>CBO</sub>	-50	V
Collector-emitter voltage		V <sub>CEO</sub>	-50	V
Emitter-base voltage	RN2107ACT	V <sub>EBO</sub>	-6	V
	RN2108ACT		-7	
	RN2109ACT		-15	
Collector current	RN2107ACT to RN2109ACT	I <sub>C</sub>	-80	mA
Collector power dissipation		P <sub>C</sub>	100*	mW
Junction temperature		T <sub>j</sub>	150	°C
Storage temperature range		T <sub>stg</sub>	-55 to 150	°C

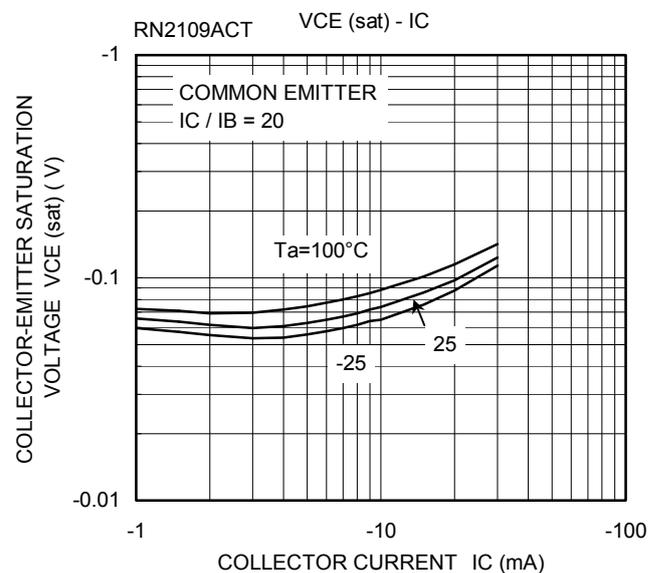
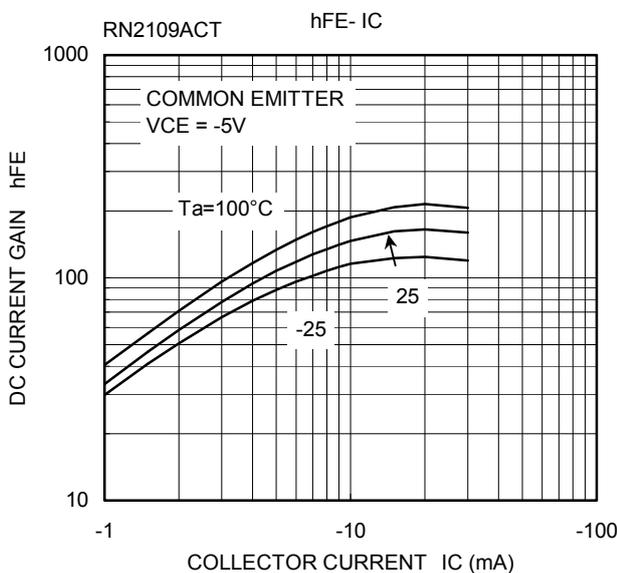
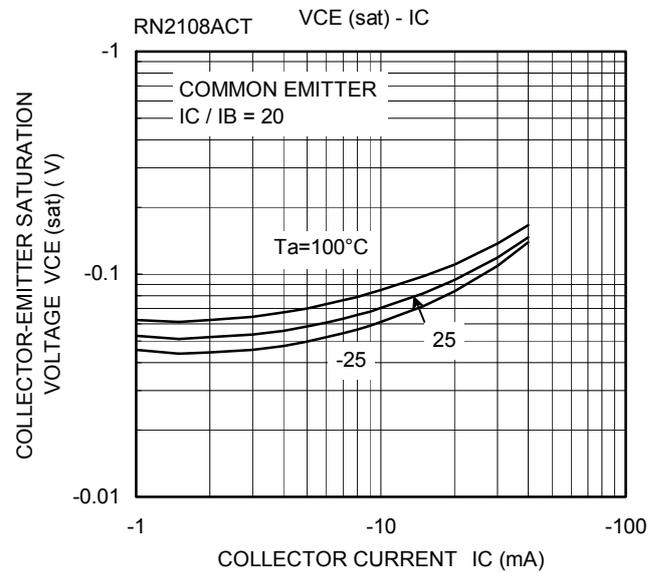
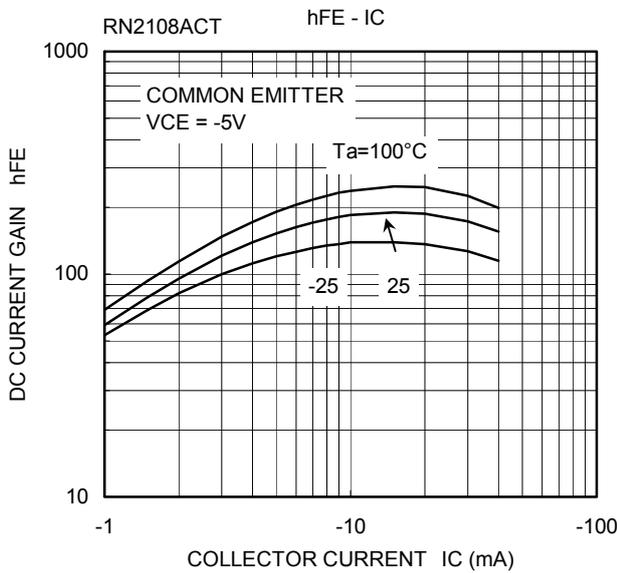
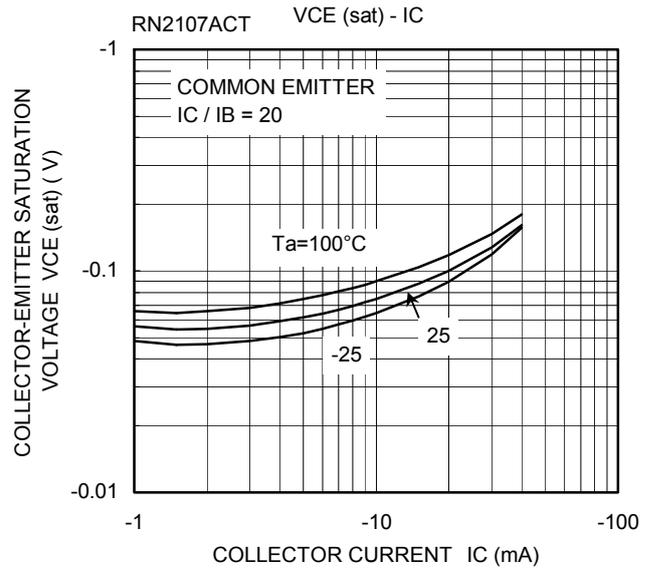
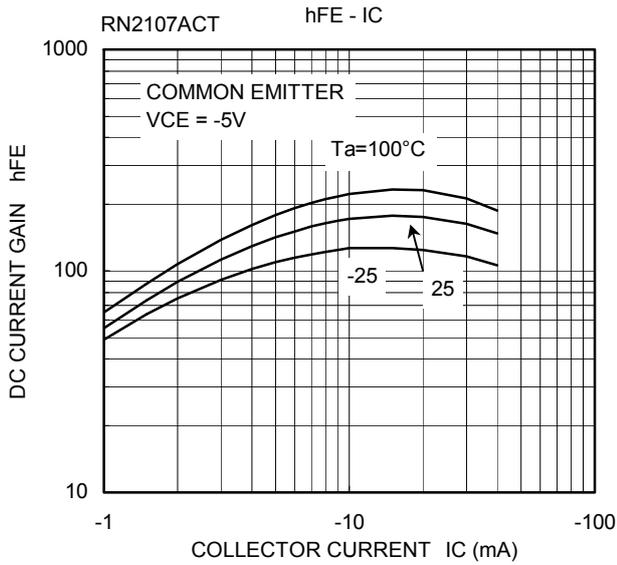
\* : Mounted on FR4 board (10 mm × 10 mm × 1 mm)

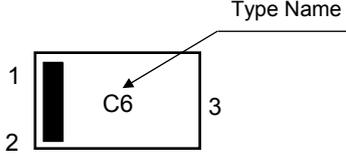
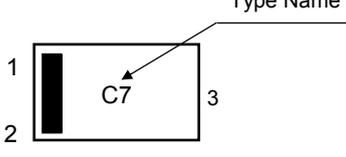
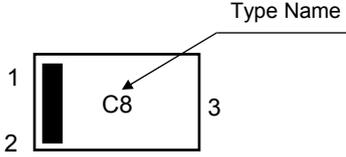
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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	RN2107ACT to 2109ACT	$I_{CBO}$	$V_{CB} = -50\text{ V}, I_E = 0$	—	—	-100	nA
		$I_{CEO}$	$V_{CE} = -50\text{ V}, I_B = 0$	—	—	-500	
Emitter cut-off current	RN2107ACT	$I_{EBO}$	$V_{EB} = -6\text{ V}, I_C = 0$	-0.088	—	-0.131	mA
	RN2108ACT			-0.085	—	-0.126	
	RN2109ACT			-0.182	—	-0.271	
DC current gain	RN2107ACT	$h_{FE}$	$V_{CE} = -5\text{ V},$ $I_C = -10\text{ mA}$	80	—	—	—
	RN2108ACT			80	—	—	
	RN2109ACT			70	—	—	
Collector-emitter saturation voltage	RN2107ACT to 2109ACT	$V_{CE(sat)}$	$I_C = -5\text{ mA},$ $I_B = -0.25\text{ mA}$	—	—	-0.15	V
Input voltage (ON)	RN2107ACT	$V_I(ON)$	$V_{CE} = -0.2\text{ V},$ $I_C = -5\text{ mA}$	-0.8	—	-1.8	V
	RN2108ACT			-1.0	—	-3.0	
	RN2109ACT			-2.0	—	-6.4	
Input voltage (OFF)	RN2107ACT	$V_I(OFF)$	$V_{CE} = -5\text{ V},$ $I_C = -0.1\text{ mA},$	-0.6	—	-0.9	V
	RN2108ACT			-0.7	—	-1.2	
	RN2109ACT			-1.5	—	-2.6	
Collector output capacitance	RN2107ACT to 2109ACT	$C_{ob}$	$V_{CB} = -10\text{ V}, I_E = 0,$ $f = 1\text{ MHz}$	—	0.9	—	pF
Input resistor	RN2107ACT	R1	—	8	10	12	k $\Omega$
	RN2108ACT			17.6	22	26.4	
	RN2109ACT			37.6	47	56.4	
Resistor ratio	RN2107ACT	R1/R2	—	0.17	0.213	0.255	—
	RN2108ACT			0.374	0.468	0.562	
	RN2109ACT			1.71	2.14	2.56	





Type Name	Marking
RN2107ACT	 <p>The diagram shows a rectangular marking area with a thick black bar on the left side. The bar is labeled '1' at the top and '2' at the bottom. To the right of the bar, the text 'C6' is printed. Further to the right, the number '3' is printed. An arrow labeled 'Type Name' points from the top right corner of the rectangle to the text 'Type Name' above it.</p>
RN2108ACT	 <p>The diagram shows a rectangular marking area with a thick black bar on the left side. The bar is labeled '1' at the top and '2' at the bottom. To the right of the bar, the text 'C7' is printed. Further to the right, the number '3' is printed. An arrow labeled 'Type Name' points from the top right corner of the rectangle to the text 'Type Name' above it.</p>
RN2109ACT	 <p>The diagram shows a rectangular marking area with a thick black bar on the left side. The bar is labeled '1' at the top and '2' at the bottom. To the right of the bar, the text 'C8' is printed. Further to the right, the number '3' is printed. An arrow labeled 'Type Name' points from the top right corner of the rectangle to the text 'Type Name' above it.</p>

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