

# RT1N231X SERIES

〈Transistor〉

Transistor With Resistor  
For Switching Application  
Silicon NPN Epitaxial Type

## DESCRIPTION

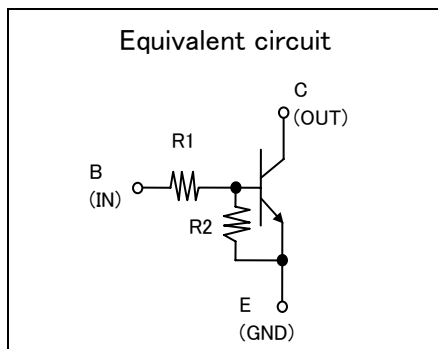
RT1N231X is a one chip transistor with built-in bias resistor, PNP type is RT1P231X.

## FEATURE

• Built-in bias resistor ( $R1=2.2k\Omega$ ,  $R2=2.2k\Omega$ ).

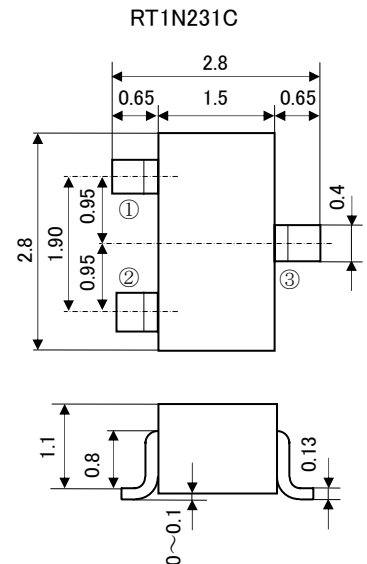
## APPLICATION

Inverted circuit, switching circuit, interface circuit, driver circuit.



## OUTLINE DRAWING

UNIT : mm

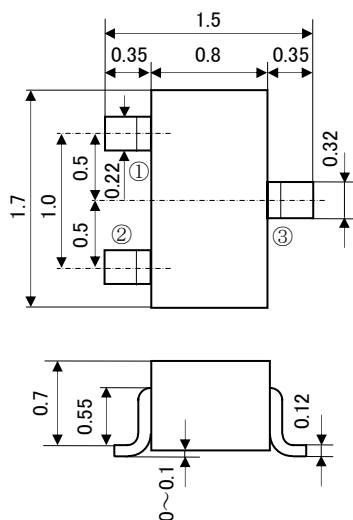


JEITA: SC-59  
JEDEC: Similar to TO-236

Terminal Connector

- ①: Base
- ②: Emitter
- ③: Collector

**RT1N231U**

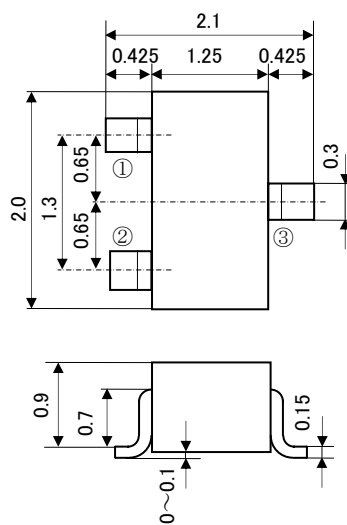


JEITA: SC-75A  
JEDEC: —

Terminal Connector

- ①: Base
- ②: Emitter
- ③: Collector

**RT1N231M**

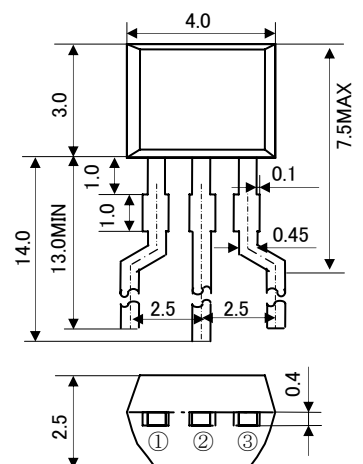


JEITA: SC-70  
JEDEC: —

Terminal Connector

- ①: Base
- ②: Emitter
- ③: Collector

**RT1N231S**



JEITA: —  
JEDEC: —

Terminal Connector

- ①: Emitter
- ②: Collector
- ③: Base

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## MARKING

RT1N231C RT1N231M RT1N231U	RT1N231S

## MAXIMUM RATING (Ta=25°C)

SYMBOL	PARAMETER	RATING				UNIT
		RT1N231U	RT1N231M	RT1N231C	RT1N231S	
V <sub>CBO</sub>	Collector to Base voltage	50				V
V <sub>EBO</sub>	Emitter to Base voltage	10				V
V <sub>CEO</sub>	Collector to Emitter voltage	50				V
V <sub>IN</sub>	Input voltage	12				V
I <sub>C</sub>	Collector current	100				mA
I <sub>CM</sub>	Peak Collector current	200				mA
P <sub>C</sub>	Collector dissipation(Ta=25°C)	150	200	450	mW	
T <sub>j</sub>	Junction temperature	+150				°C
T <sub>stg</sub>	Storage temperature	-55~+150				°C

## ELECTRICAL CHARACTERISTICS (Ta=25°C)

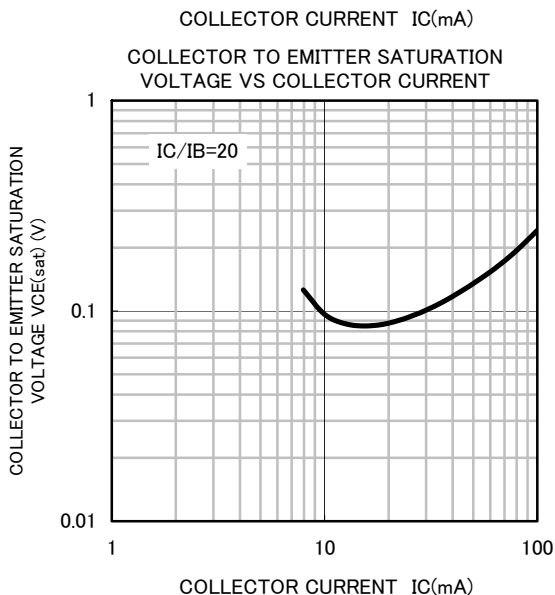
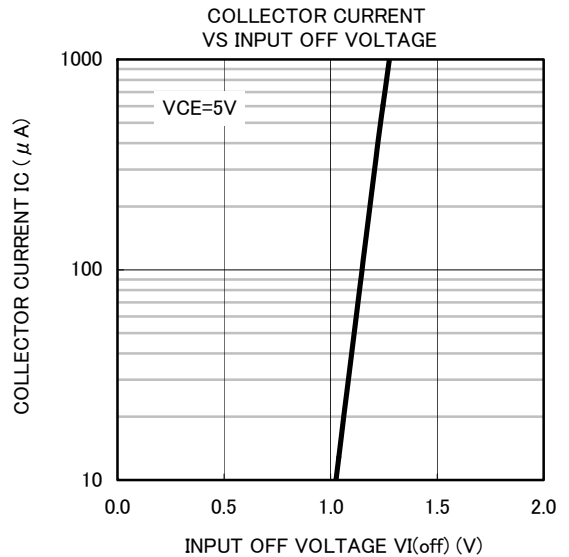
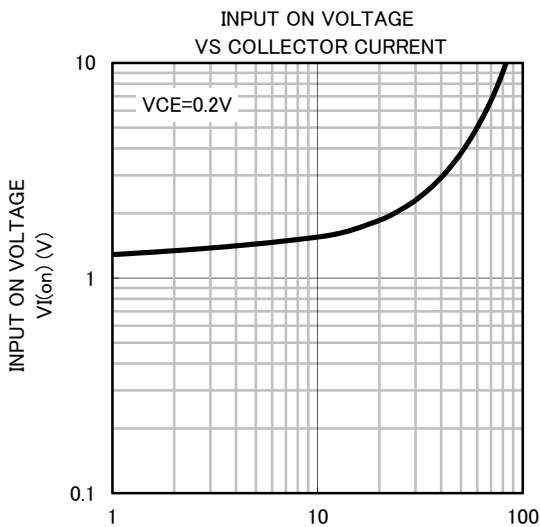
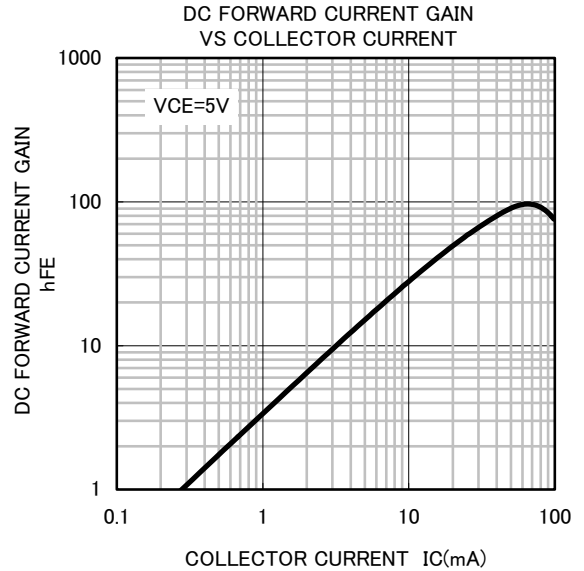
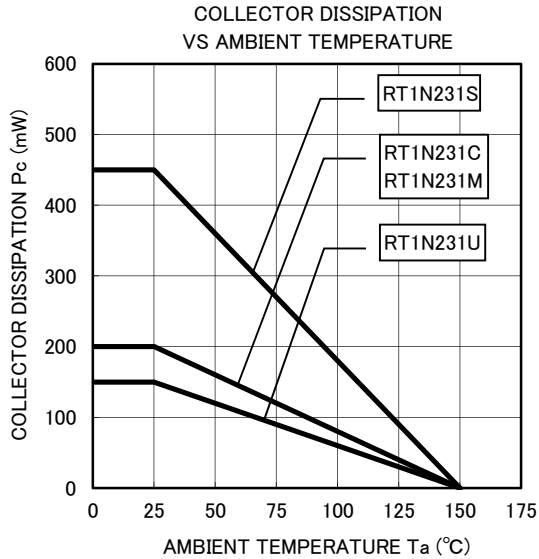
SYMBOL	PARAMETER	TEST CONDITION	LIMIT			UNIT
			MIN	TYP	MAX	
V <sub>(BR)CEO</sub>	C to E break down voltage	I <sub>C</sub> =100 μA, R <sub>BE</sub> =∞	50	—	—	V
I <sub>CBO</sub>	Collector cut off current	V <sub>CB</sub> =50V, I <sub>E</sub> =0	—	—	0.1	μA
I <sub>EBO</sub>	Emitter cut off current	V <sub>EB</sub> =5V, I <sub>C</sub> =0	850	1140	1650	μA
h <sub>FE</sub>	DC forward current gain	V <sub>CE</sub> =5V, I <sub>C</sub> =20mA	20	—	—	—
V <sub>CE(sat)</sub>	C to E saturation voltage	I <sub>C</sub> =10mA, I <sub>B</sub> =0.5mA	—	—	0.3	V
V <sub>I(ON)</sub>	Input on voltage	V <sub>CE</sub> =0.2V, I <sub>C</sub> =5mA	—	1.3	2.2	V
V <sub>I(OFF)</sub>	Input off voltage	V <sub>CE</sub> =5V, I <sub>C</sub> =100 μA	0.7	1.1	—	V
R <sub>1</sub>	Input resistor	—	1.5	2.2	2.9	kΩ
R <sub>2</sub> /R <sub>1</sub>	Resistor ratio	—	0.8	1.0	1.2	—
f <sub>T</sub>	Gain band width product	V <sub>CE</sub> =6V, I <sub>E</sub> =-10mA	—	200	—	MHz

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## TYPICAL CHARACTERISTICS (Ta=25°C)





**Keep safety first in your circuit designs!**

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