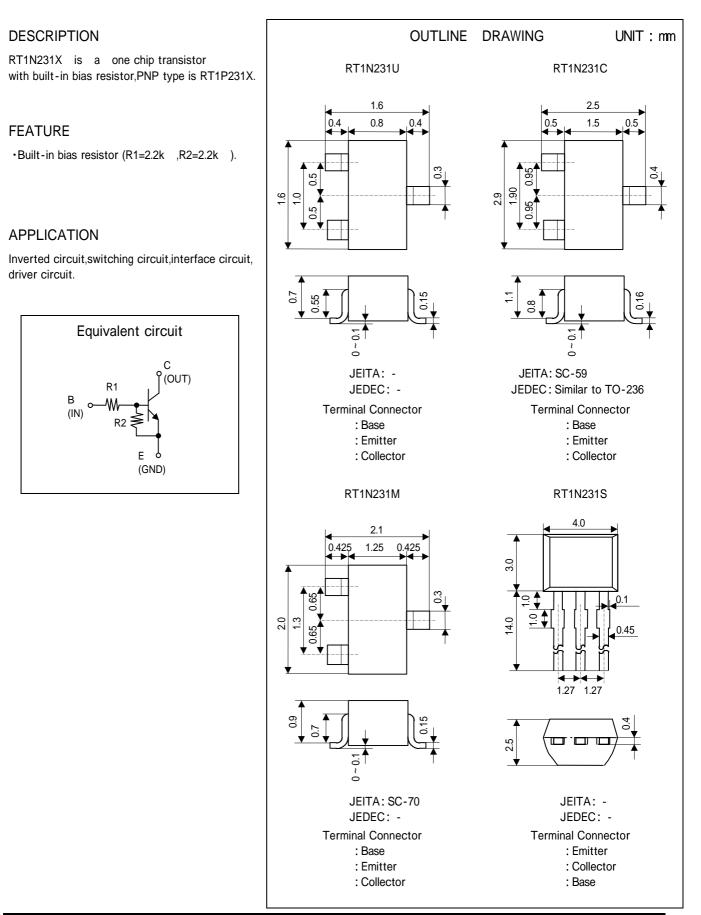
# RT1N231X SERIES

Transistor Transistor With Resistor For Switching Application Silicon NPN Epitaxial Type



**ISAHAYA ELECTRONICS CORPORATION** 

# RT1N231X SERIES

Transistor With Resistor For Switching Application Silicon NPN Epitaxial Type

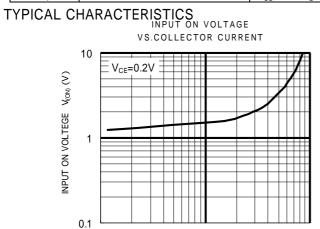
### MAXIMUM RATING (Ta=25 )

SYMBOL	PARAMETER	RATING				UNIT
		RT1N231U	RT1N231M	RT1N231C	RT1N231S	UNIT
V <sub>CBO</sub>	Collector to Base voltage	50				
V <sub>EBO</sub>	Emitter to Base voltage	10				
V <sub>CEO</sub>	Collector to Emitter voltage	50				V
Ι <sub>c</sub>	Collector current	100				
I <sub>CM</sub>	Peak Collector current	200				mA
P <sub>c</sub>	Collector dissipation(Ta=25)	150	2	00	450	mW
Tj	Junction temperature	+150	+150			
Tstg	Storage temperature	-55 ~ +150	-55 ~ +150			

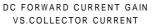
# ELECTRICAL CHARACTERISTICS (Ta=25)

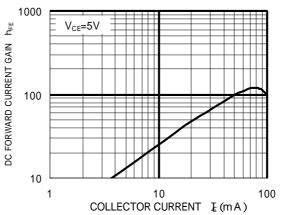
SYMBOL	PARAMETER	TEST CONDITION	LIMIT			UNIT
		TEST CONDITION	MIN	TYP	MAX	UNIT
V <sub>(BR)CEO</sub>	C to E break down voltage	Ι <sub>c</sub> =100 μ A , R <sub>BE</sub> =	50			V
I <sub>CBO</sub>	Collector cut off current	V <sub>CB</sub> =50V , I <sub>E</sub> =0			0.1	μA
h <sub>FE</sub>	DC forward current gain	$V_{CE}$ =5V , I <sub>C</sub> =20mA	20			-
$V_{CE(sat)}$	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	$V_{CE}$ =5V , I <sub>C</sub> =100 $\mu$ A	0.7	1.1		V
R <sub>1</sub>	Input resistance		1.5	2.2	2.9	k
$R_2/R_1$	Resistance 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

1



 $\begin{array}{c} 10\\ \text{COLLECTOR CURRENT} \quad I_c \ (m \, A \,) \end{array}$ 





COLLECTOR CURRENT VS.INPUT OFF VOLTAGE 1000 V<sub>CE</sub>=5V COLLECTOR CURRENT  $I_{c}$  ( $\mu$  A) 100 10 0 1.2 2 0.4 0.8 1.6 INPUT OFF VOLTAGE  $V_{I(OFF)}(V)$ 

100



Marketing division, Marketing planning department

6-41 Tsukuba, Isahaya, Nagasaki, 854-0065 Japan

## Keep safety first in your circuit designs!

ISAHAYA Electronics Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage. Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (1) placement of substitutive, auxiliary, (2) use of non-farmable material or (3) prevention against any malfunction or mishap.

## Notes regarding these materials

These materials are intended as a reference to our customers in the selection of the ISAHAYA products best suited to the customer's application; they don't convey any license under any intellectual property rights, or any other rights, belonging

Customer's application; they don't convey any license under any intellectual property rights, or any other rights, belonging ISAHAYA or third party. ISAHAYA Flectronics Corporation assumes no responsibility for any damage, or infringement of any third party's rights, originating in the use of any product data, diagrams, charts or circuit application examples contained in these materials. •All information contained in these materials, including product data, diagrams and charts, represent information on products at the time of publication of these materials, and are subject to change by ISAHAYA Electronics Corporation without notice due to product improvements or other reasons. It is therefore recommended that customers contact ISAHAYA Electronics Corporation or an authorized ISAHAYA products distributor for the latest product information before purchasing product listed backing. hereir

ISAHAYA Electronics Corporation products are not designed or manufactured for use in a device or system that is used under circumstances in which human life is potentially at stake. Please contact ISAHAYA electronics corporation or an authorized ISAHAYA products distributor when considering the use of a product contained herein for any specific purposes, such as apparatus or systems for transportation, vehicular, medical, aerospace, nuclear, or undersea repeater use.
The prior written approval of ISAHAYA Electronics Corporation is necessary to reprint or reproduce in whole or in part these

materials.

If these products or technologies are subject to the Japanese export control restrictions, they must be exported under a license from the Japanese government and cannot be imported into a country other than the approved destination. Any diversion or re-export contrary to be export control laws and regulations of Japan and/or the country of destination is prohibited. •Please contact ISAHAYA Electronics Corporation or authorized ISAHAYA products distributor for further details on these

materials or the products contained therein.