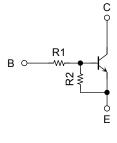
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process) (Bias Resistor built-in Transistor)

RN1101CT,RN1102CT,RN1103CT RN1104CT,RN1105CT,RN1106CT

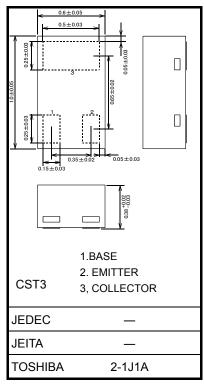
Switching Applications Inverter Circuit Applications Interface Circuit Applications Driver Circuit Applications

- 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 RN2101CT to RN2106CT

Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN1101CT	4.7	4.7
RN1102CT	10	10
RN1103CT	22	22
RN1104CT	47	47
RN1105CT	2.2	47
RN1106CT	4.7	47



Weight: 0.75 mg (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit	
Collector-base voltage	RN1101CT to 1106CT	V _{CBO}	20	V	
Collector-emitter voltage		V _{CEO}	20) V	
Emitter-base voltage	RN1101CT to 1104CT	Veno	10	V	
	RN1105CT, 1106CT	V _{EBO}	5		
Collector current		Ι _C	50	mA	
Collector power dissipation	RN1101CT ro 1106CT	P _C	50	mW	
Junction temperature		Tj	150	°C	
Storage temperature range		T _{stg}	-55 to 150	°C	

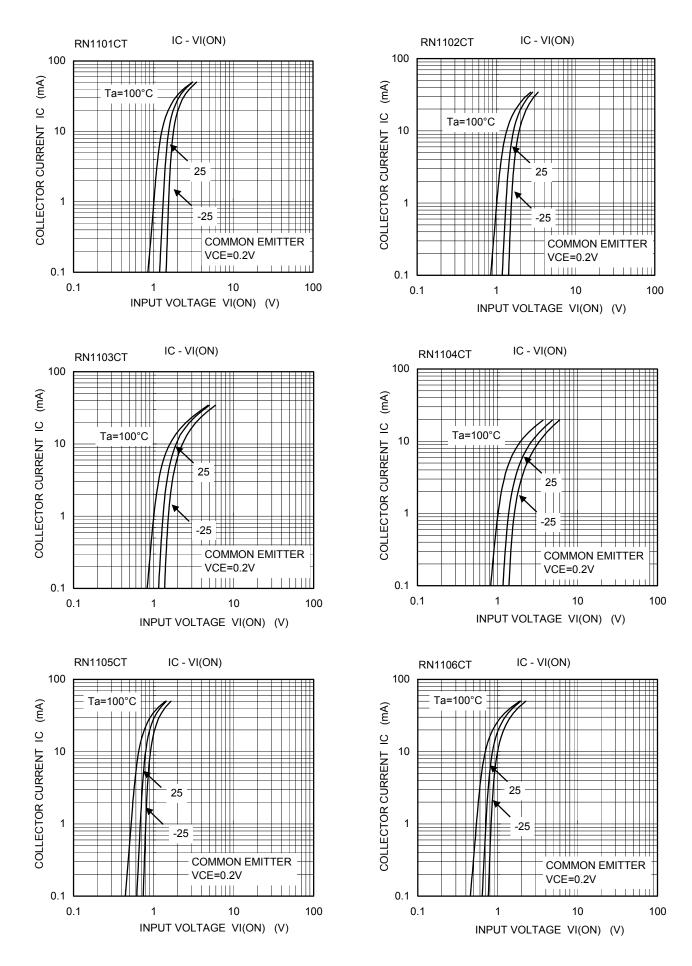
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e.operatingtemperature/current/voltage, etc.) are 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	Тур.	Max	Unit
Collector cut-off current	RN1101CT to 1106CT	I _{CBO}	$V_{CB} = 20 \text{ V}, \text{ I}_{E} = 0$			100	nA
		I _{CEO}	$V_{CE}=20\ V,\ I_B=0$	_	_	500	nA
Emitter cut-off current	RN1101CT	I _{EBO}	V _{EB} = 10 V, I _C = 0	0.89	_	1.33	- mA
	RN1102CT			0.41		0.63	
	RN1103CT			0.18		0.29	
	RN1104CT			0.088		0.133	
	RN1105CT			0.085	_	0.127	
	RN1106CT		$V_{EB} = 5 V, I_{C} = 0$	0.08	_	0.121	
	RN1101CT			30		_	
	RN1102CT			60	_	_	
DC ourront gain	RN1103CT		$\lambda = 5 \lambda = 10 m \Lambda$	100	_	_	
DC current gain	RN1104CT	h _{FE}	$V_{CE} = 5 V, I_{C} = 10 mA$	120	_	_	
	RN1105CT	-		120			
	RN1106CT			120			
Collector-emitter saturation voltage	RN1101CT to 1106CT	V _{CE (sat)}	$\begin{array}{l} I_C = 5 \text{ mA}, \\ I_B = 0.25 \text{ mA} \end{array}$	_	_	0.15	V
	RN1101CT		$V_{CE} = 0.2 \text{ V}, \text{ I}_{C} = 5 \text{ mA}$	1.0		2.0	V
	RN1102CT			1.0		2.2	
	RN1103CT			1.1		2.7	
Input voltage (ON)	RN1104CT	V _{I (ON)}		1.2		3.6	
	RN1105CT			0.6		1.1	
	RN1106CT			0.6	_	1.2	
Input voltage (OFF)	RN1101CT to 1104CT	N	$V_{CE} = 5 V, I_C = 0.1 mA$	0.8		1.5	v
	RN1105CT, 1106CT	VI (OFF)		0.4		0.8	
Collector output capacitance	RN1101CT to 1106CT	C _{ob}	$\begin{array}{l} V_{CB}=10 \ V, \ I_{E}=0, \\ f=1 \ MHz \end{array}$	_	1.2	_	pF
Input resistor	RN1101CT			3.76	4.7	5.64	kΩ
	RN1102CT	- R1		8	10	12	
	RN1103CT			17.6	22	26.4	
	RN1104CT			37.6	47	56.4	
	RN1105CT			1.76	2.2	2.64	
	RN1106CT			3.76	4.7	5.64	
	RN1101CT to 1104CT		_	0.8	1.0	1.2	-
Resistor ratio	RN1105CT	R1/R2		0.0376	0.0468	0.0562	
	RN1106CT			0.08	0.1	0.12	

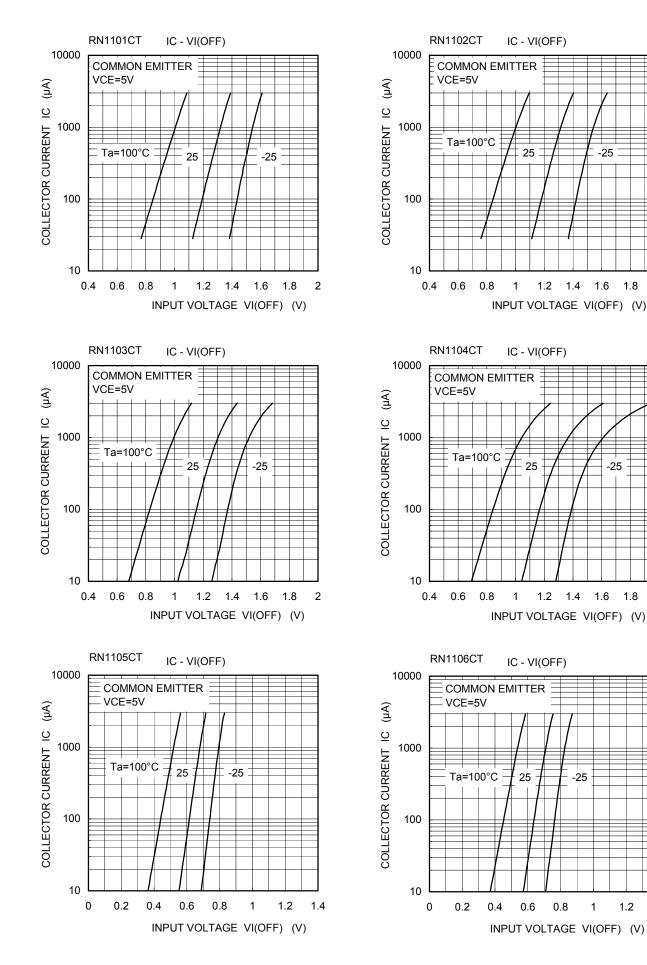
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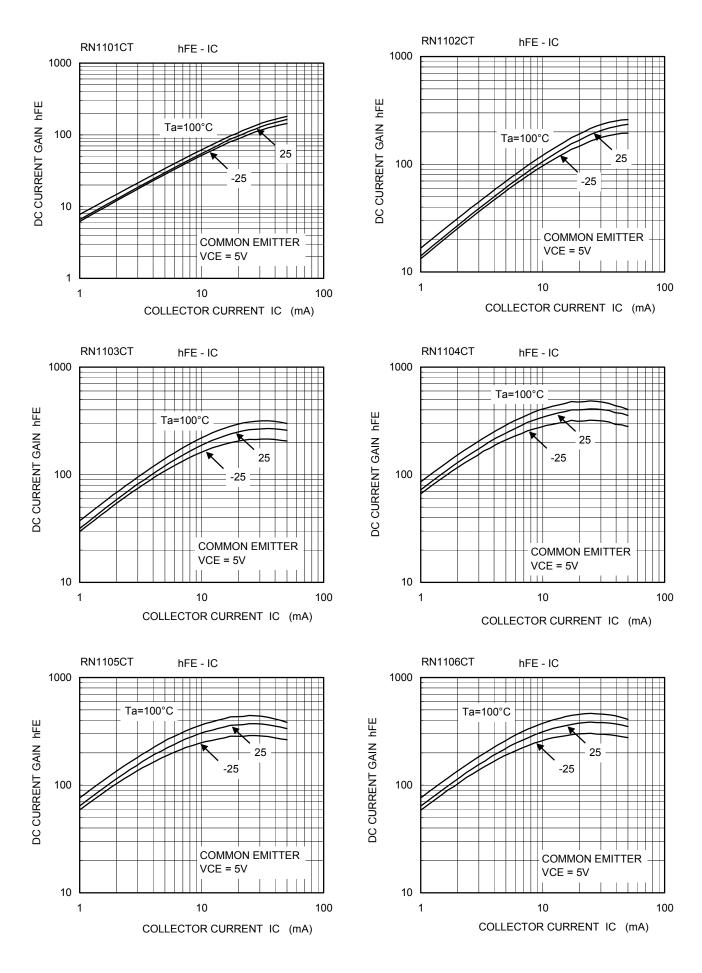
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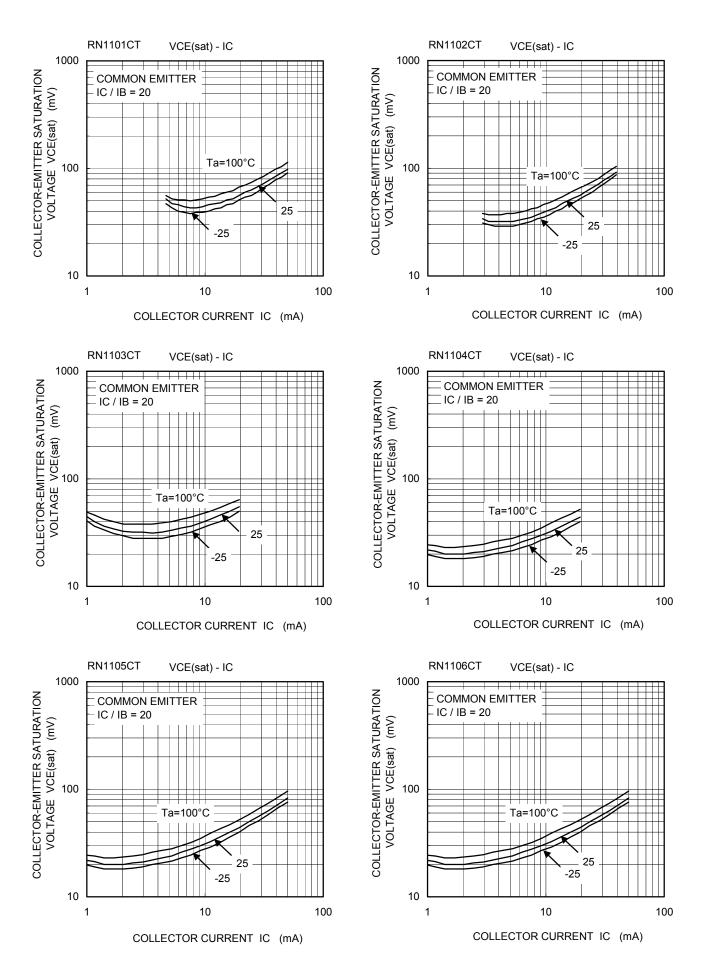
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Type Name	Marking
RN1101CT	Type name
RN1102CT	Type name
RN1103CT	Type name
RN1104CT	Type name
RN1105CT	Type name
RN1106CT	Type name

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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