

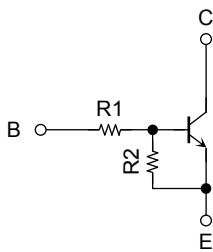
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process) (Bias Resistor built-in Transistor)

RN1107CT, RN1108CT, RN1109CT

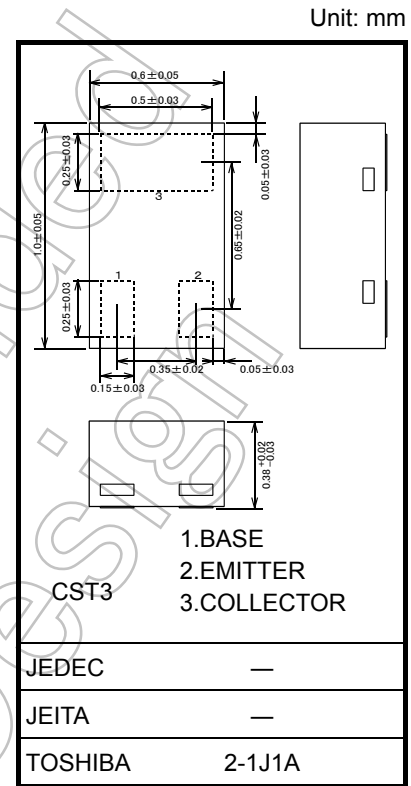
- Switching Applications
- Inverter Circuit Applications
- Interface Circuit Applications
- Driver Circuit Applications

- Incorporating a bias resistor into a transistor reduces the number of parts, which enable the manufacture of ever more compact equipment and saves assembly cost.
- Complementary to RN2107CT to RN2109CT

Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN1107CT	10	47
RN1108CT	22	47
RN1109CT	47	22



Weight: 0.75 mg (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	20	V
Collector-emitter voltage	V_{CEO}	20	V
Emitter-base voltage	V_{EBO}	6	V
		7	
		15	
Collector current	I_C	50	mA
Collector power dissipation	P_C	50	mW
Junction temperature	T_j	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. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

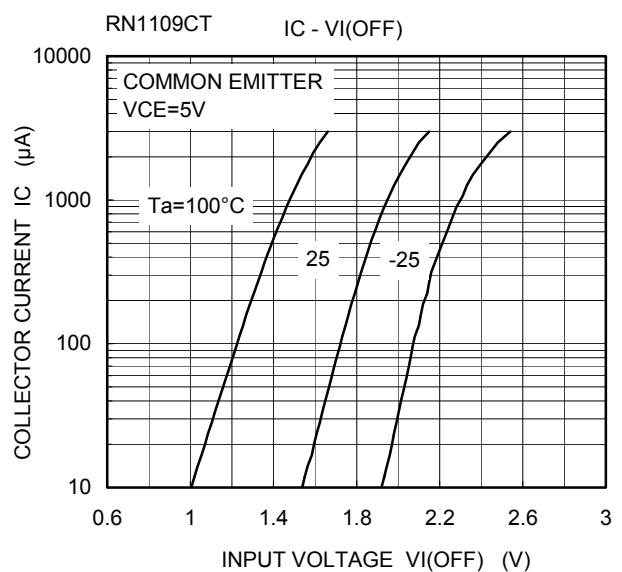
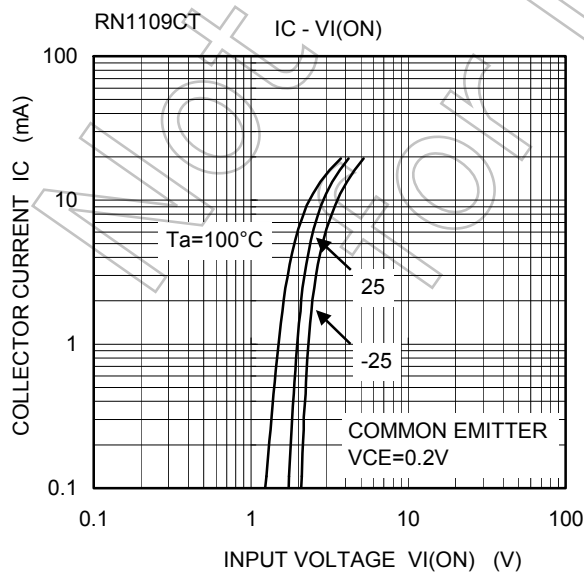
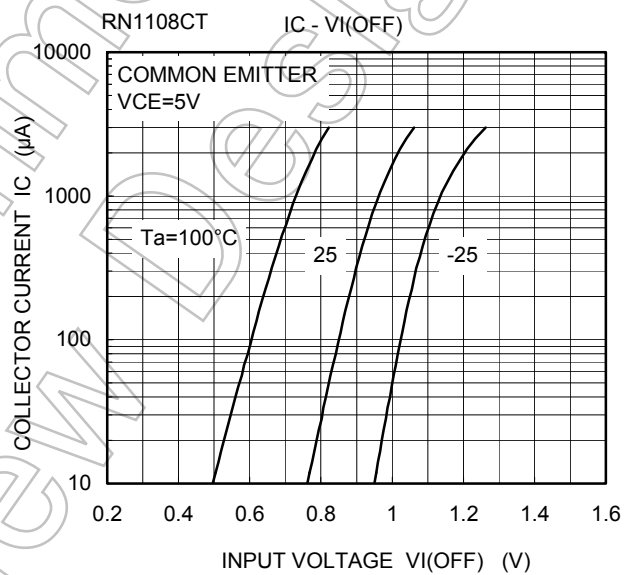
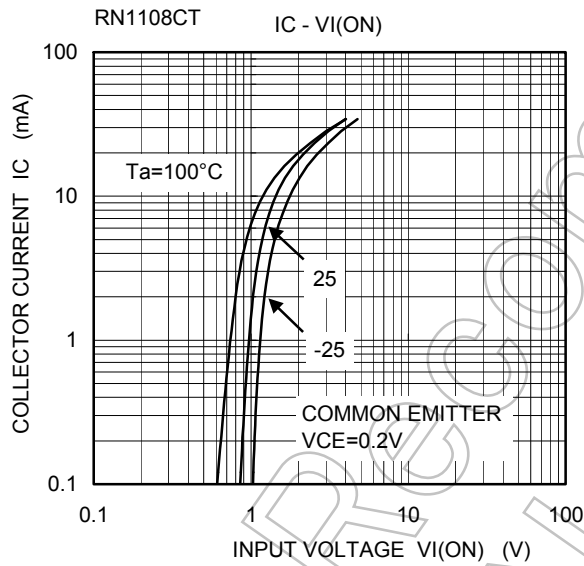
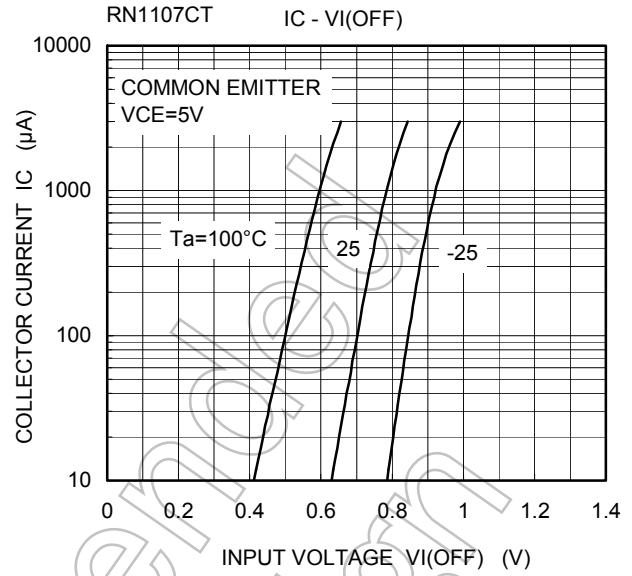
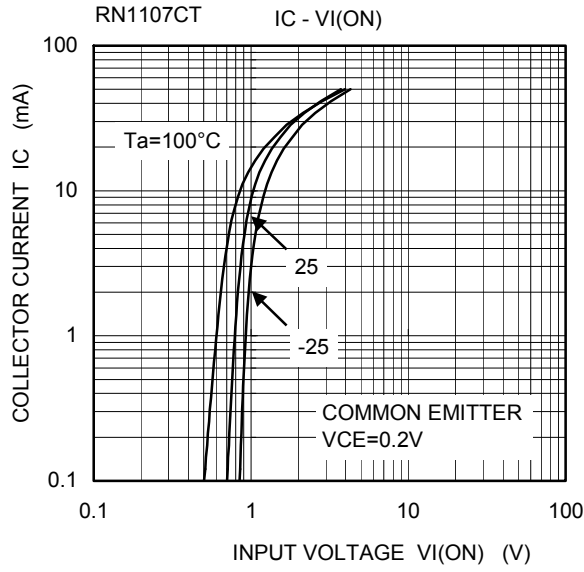
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

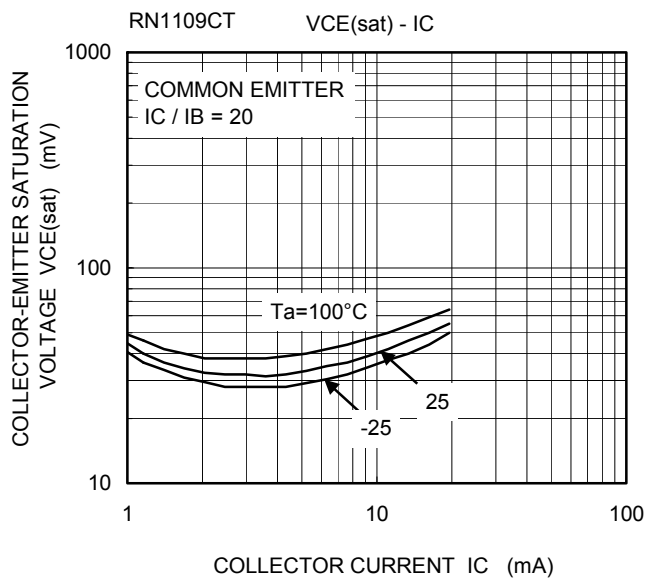
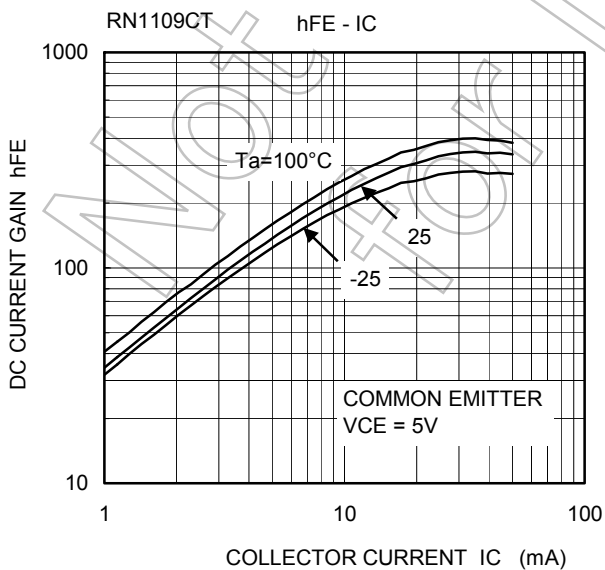
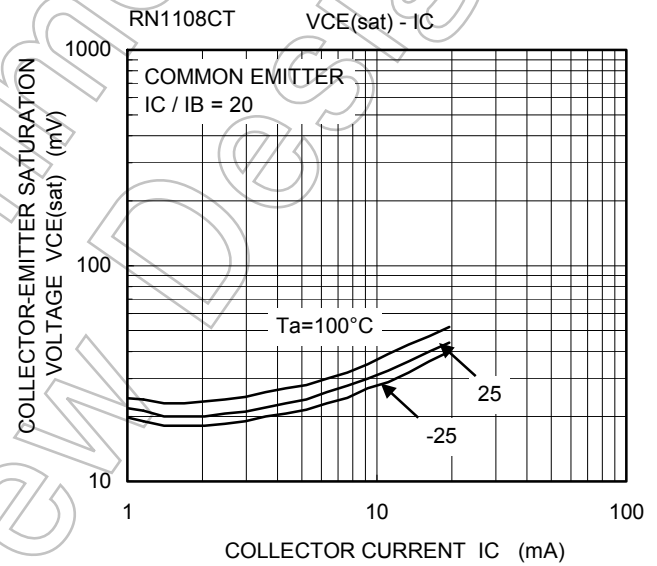
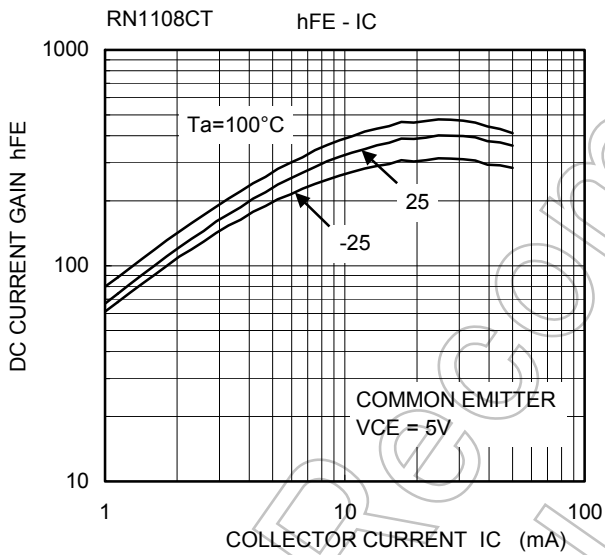
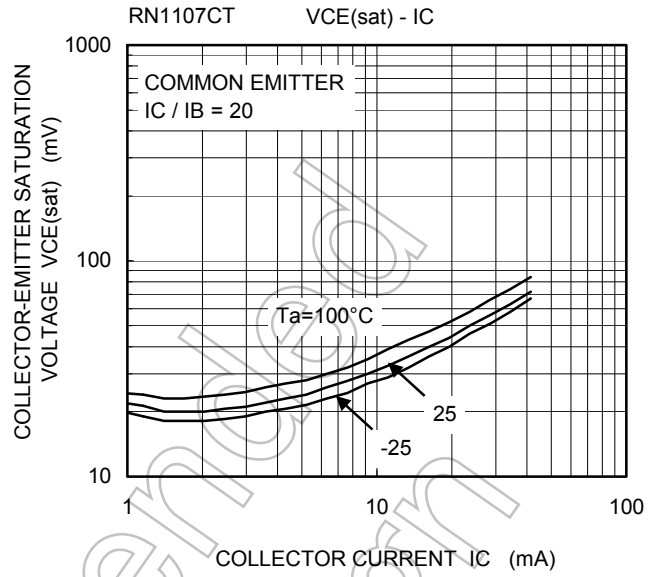
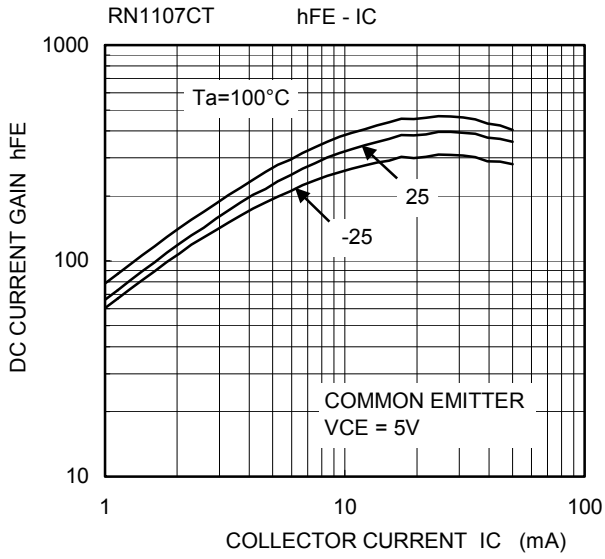
Start of commercial production
2004-10

Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN1107CT to 1109CT	I_{CBO}	$V_{CB} = 20\text{ V}, I_E = 0$	—	—	100	nA
		I_{CEO}	$V_{CE} = 20\text{ V}, I_B = 0$	—	—	500	
Emitter cut-off current	RN1107CT	I_{EBO}	$V_{EB} = 6\text{ V}, I_C = 0$	0.088	—	0.131	mA
	RN1108CT			0.085	—	0.126	
	RN1109CT			0.182	—	0.271	
DC current gain	RN1107CT	h_{FE}	$V_{CE} = 5\text{ V}, I_C = 10\text{ mA}$	120	—	—	
	RN1108CT			120	—	—	
	RN1109CT			100	—	—	
Collector-emitter saturation voltage	RN1107CT to 1109CT	$V_{CE(sat)}$	$I_C = 5\text{ mA}, I_B = 0.25\text{ mA}$	—	—	0.15	V
Input voltage (ON)	RN1107CT	$V_{I(ON)}$	$V_{CE} = 0.2\text{ V}, I_C = 5\text{ mA}$	0.7	—	1.5	V
	RN1108CT			0.8	—	2.2	
	RN1109CT			1.6	—	5.0	
Input voltage (OFF)	RN1107CT	$V_{I(OFF)}$	$V_{CE} = 5\text{ V}, I_C = 0.1\text{ mA}$	0.5	—	1.0	V
	RN1108CT			0.6	—	1.1	
	RN1109CT			1.3	—	2.6	
Collector output capacitance	RN1107CT to 1109CT	C_{ob}	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	1.2	—	pF
Input resistor	RN1107CT	R1	—	8	10	12	kΩ
	RN1108CT			17.6	22	26.4	
	RN1109CT			37.6	47	56.4	
Resistor ratio	RN1107CT	R1/R2	—	0.17	0.213	0.255	
	RN1108CT			0.374	0.468	0.562	
	RN1109CT			1.71	2.14	2.56	

Not Recommended for New





Type Name	Marking
RN1107CT	
RN1108CT	
RN1109CT	

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.

Not Recommended for New Design

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