

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

RN2107CT,RN2108CT,RN2109CT

Switching Applications

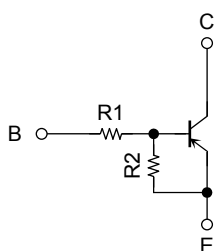
Inverter Circuit Applications

Interface Circuit Applications

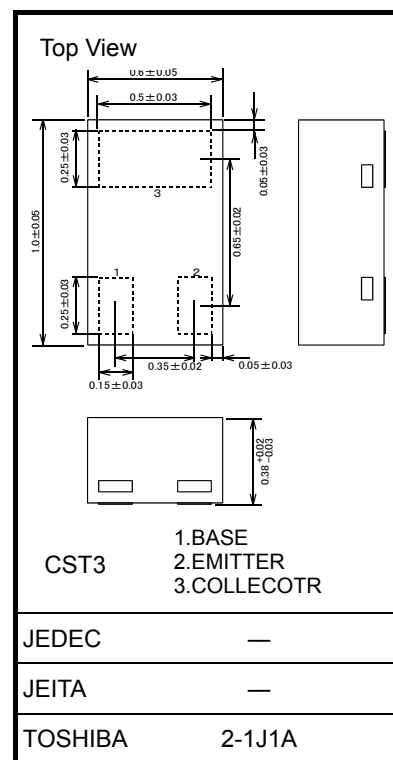
Driver Circuit Applications

- 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 RN1107CT to RN1109CT

Equivalent Circuit and Bias Resistor Values



Type No.	R1 (k Ω)	R2 (k Ω)
RN2107CT	10	47
RN2108CT	22	47
RN2109CT	47	22



Weight: 0.75 mg (typ.)

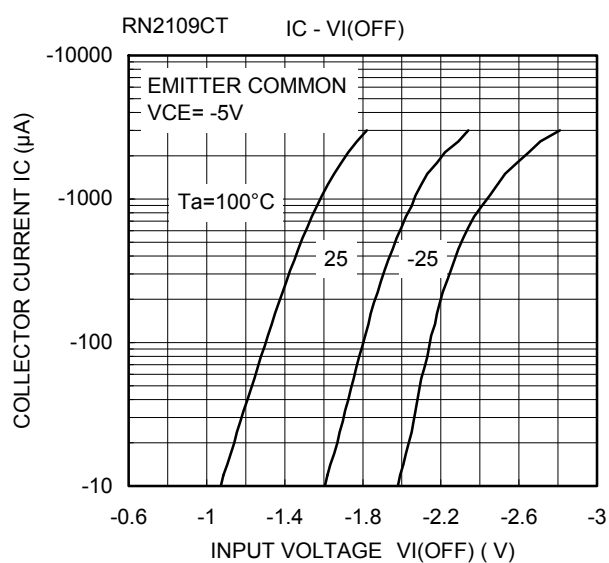
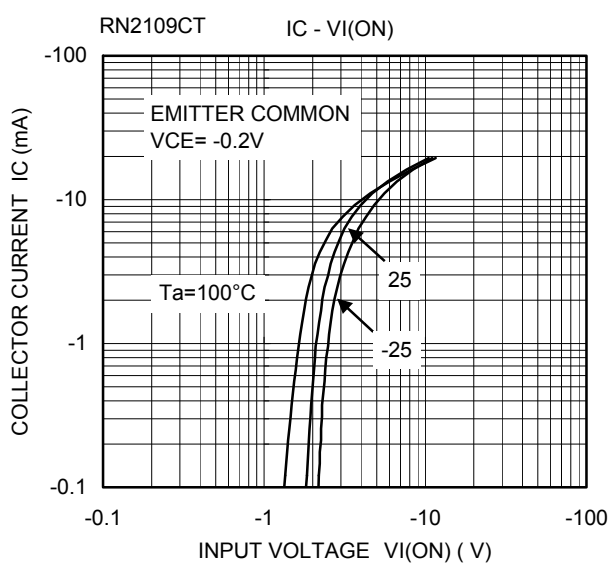
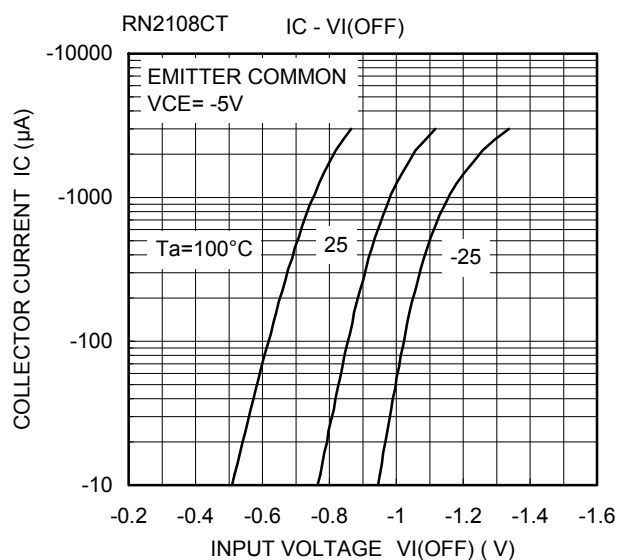
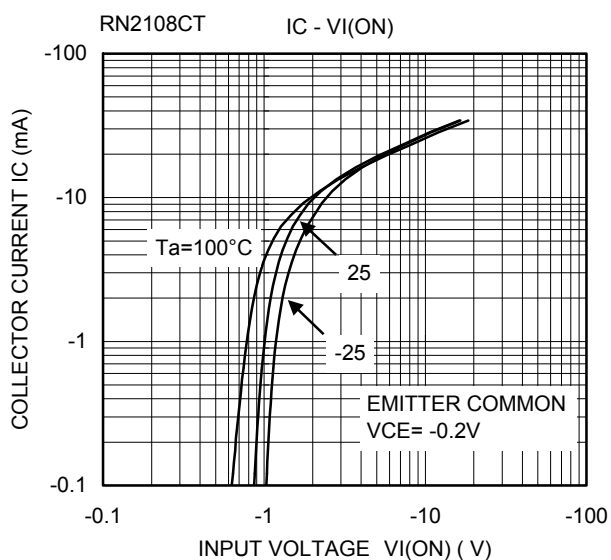
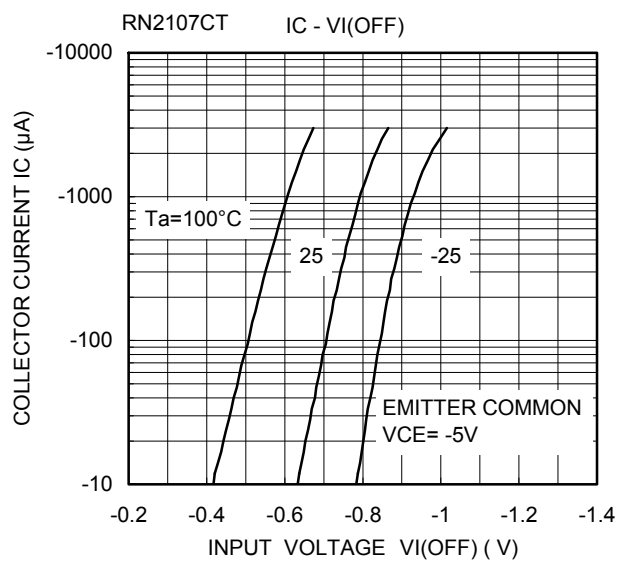
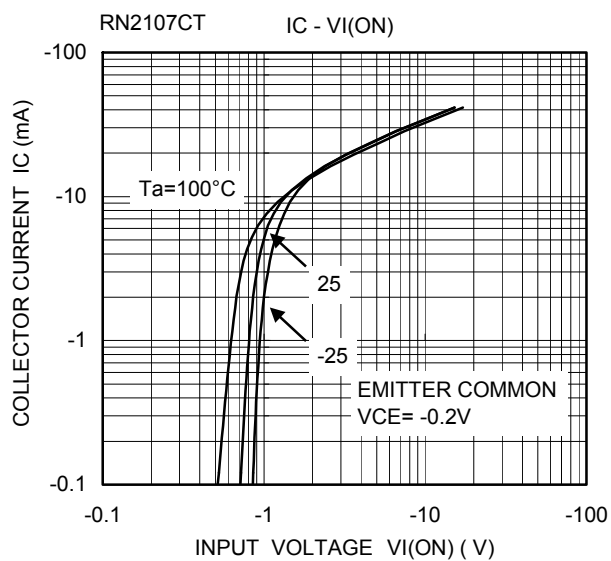
Absolute Maximum Ratings (Ta = 25°C)

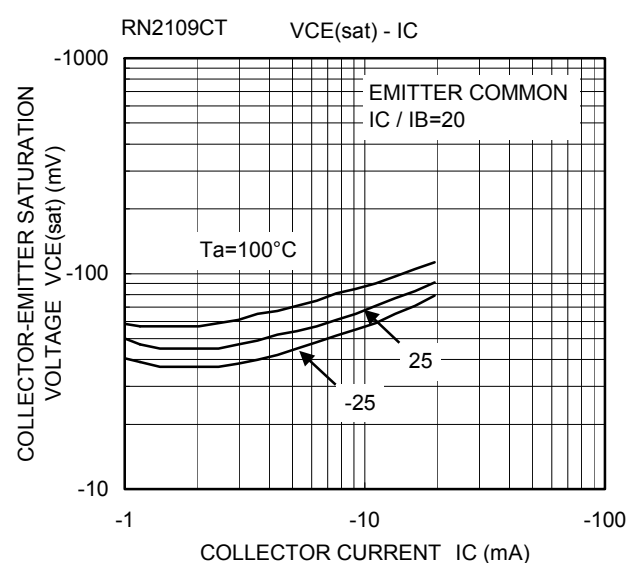
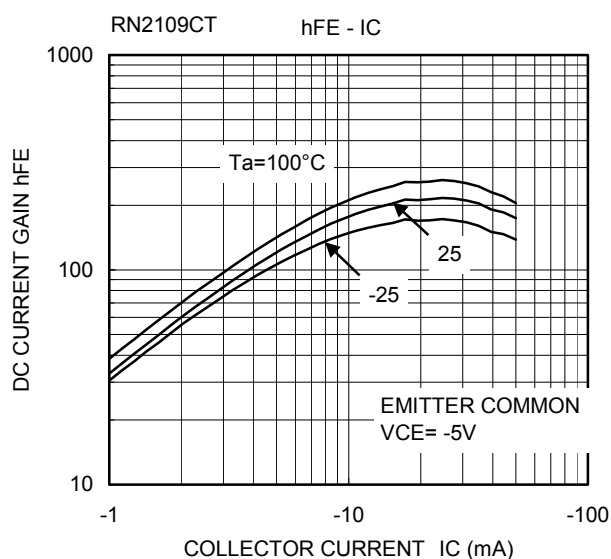
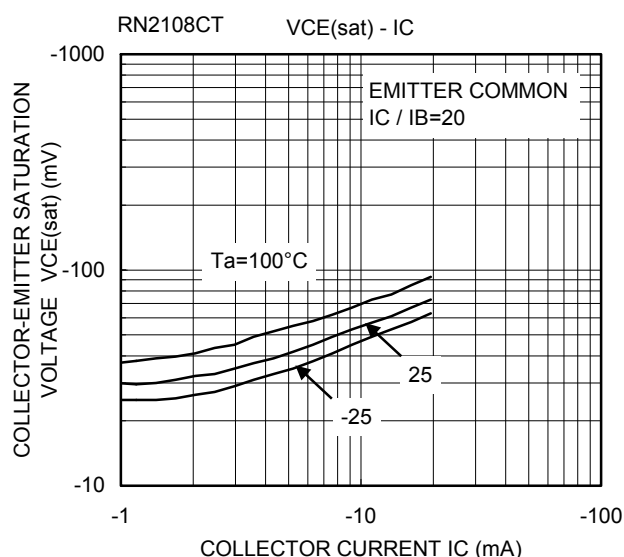
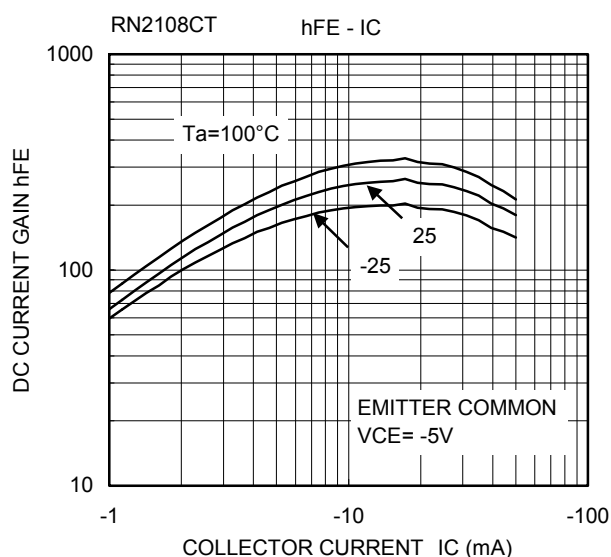
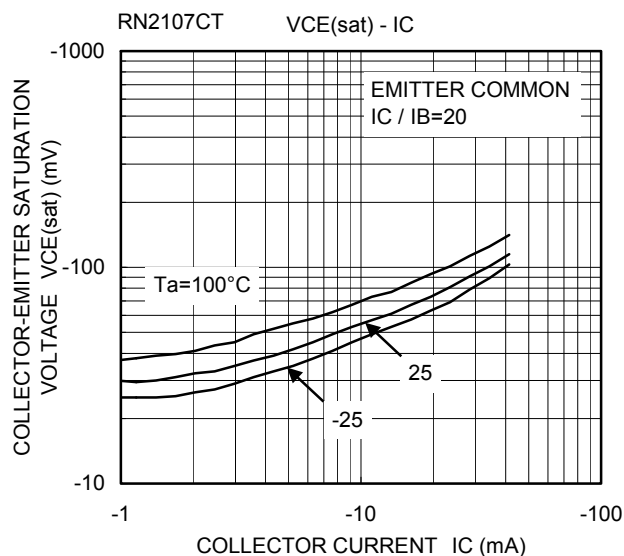
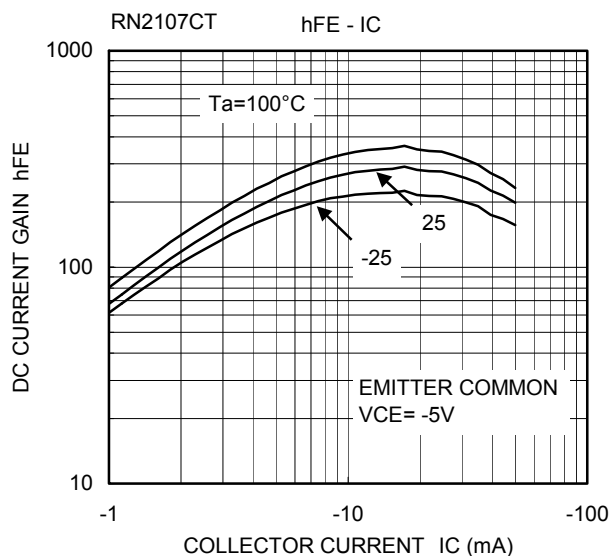
Characteristics		Symbol	Rating	Unit
Collector-base voltage	RN2107CT to RN2109CT	V_{CBO}	−20	V
Collector-emitter voltage		V_{CEO}	−20	V
Emitter-base voltage	RN2107CT	V_{EBO}	−6	V
	RN2108CT		−7	
	RN2109CT		−15	
Collector current	RN2107CT to RN2109CT	I_C	−50	mA
Collector power dissipation		P_C	50	mW
Junction 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.).

Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN2107CT to 2109CT	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	RN2107CT	I_{EBO}	$V_{EB} = -6\text{ V}, I_C = 0$	-0.088	—	-0.131	mA
	RN2108CT		$V_{EB} = -7\text{ V}, I_C = 0$	-0.085	—	-0.126	
	RN2109CT		$V_{EB} = -15\text{ V}, I_C = 0$	-0.182	—	-0.271	
DC current gain	RN2107CT	h_{FE}	$V_{CE} = -5\text{ V},$ $I_C = -10\text{ mA}$	120	—	—	—
	RN2108CT			120	—	—	
	RN2109CT			100	—	—	
Collector-emitter saturation voltage	RN2107CT to 2109CT	$V_{CE(sat)}$	$I_C = -5\text{ mA},$ $I_B = -0.25\text{ mA}$	—	—	-0.15	V
Input voltage (ON)	RN2107CT	$V_{I(ON)}$	$V_{CE} = -0.2\text{ V},$ $I_C = -5\text{ mA}$	-0.7	—	-1.5	V
	RN2108CT			-0.8	—	-2.2	
	RN2109CT			-1.6	—	-5.0	
Input voltage (OFF)	RN2107CT	$V_{I(OFF)}$	$V_{CE} = -5\text{ V},$ $I_C = -0.1\text{ mA},$	-0.5	—	-1.0	V
	RN2108CT			-0.6	—	-1.1	
	RN2109CT			-1.3	—	-2.6	
Collector output capacitance	RN2107CT to 2109CT	C_{ob}	$V_{CB} = -10\text{ V}, I_E = 0,$ $f = 1\text{ MHz}$	—	1.2	—	pF
Input resistor	RN2107CT	R1	—	8	10	12	kΩ
	RN2108CT			17.6	22	26.4	
	RN2109CT			37.6	47	56.4	
Resistor ratio	RN2107CT	R1/R2	—	0.17	0.21	0.26	—
	RN2108CT			0.37	0.47	0.56	
	RN2109CT			1.71	2.14	2.56	





Type Name	Marking
RN2107CT	
RN2108CT	
RN2109CT	

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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