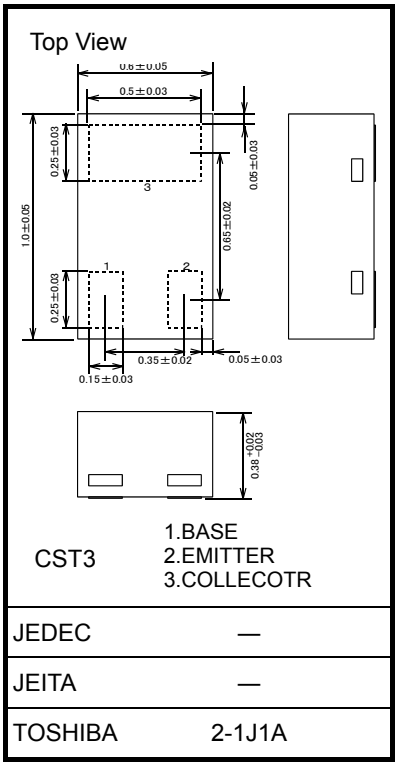
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT process) (Bias Resistor built-in Transistor)

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

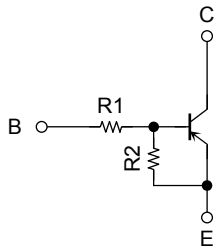
Unit: mm



CST3	1.BASE 2.EMITTER 3.COLLECOTR
JEDEC	—
JEITA	—
TOSHIBA	2-1J1A

Weight: 0.75 mg (typ.)

Equivalent Circuit and Bias Resistor Values



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

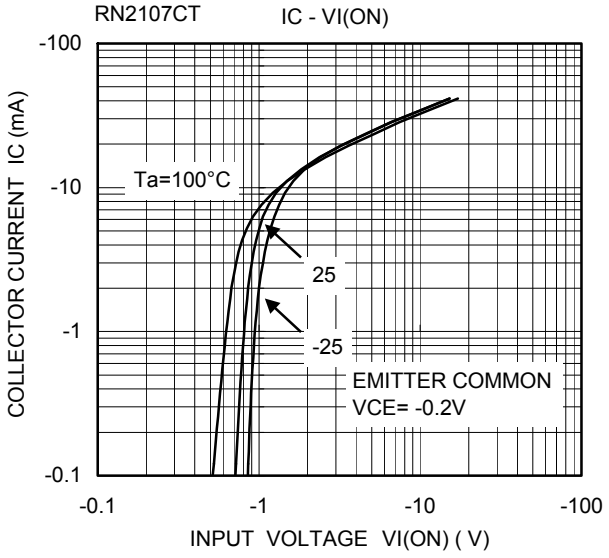
Absolute Maximum Ratings (Ta = 25°C)

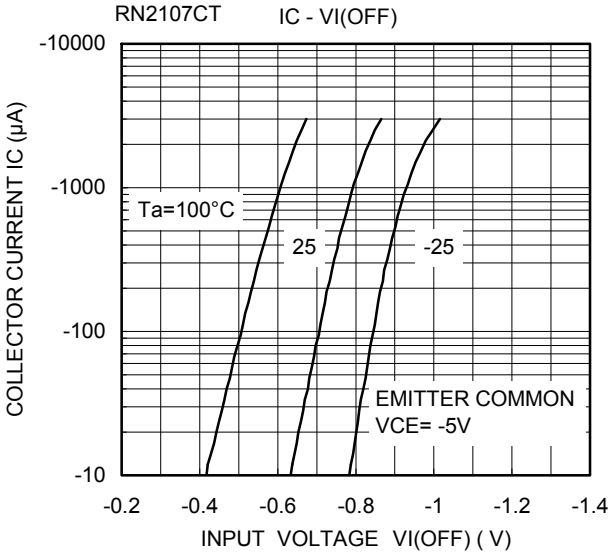
Characteristics		Symbol	Rating	Unit
Collector-base voltage	RN2107CT to RN2109CT	V_{CBO}	−20	V
Collector-emitter voltage		V_{CEO}	−20	V
Emitter-base voltage	RN2107CT	V_{EBO}	−6	V
	RN2108CT		−7	
	RN2109CT		−15	
Collector current	RN2107CT to RN2109CT	I_C	−50	mA
Collector power dissipation		P_C	50	mW
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55 to 150	°C

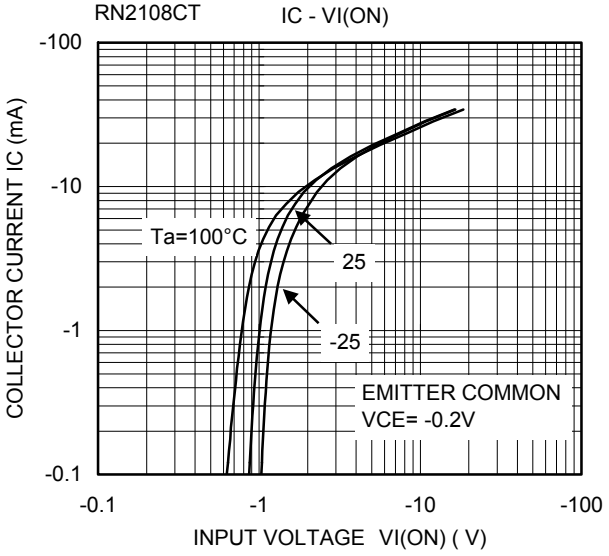
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e.operatingtemperature/current/voltage, etc.) are 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).

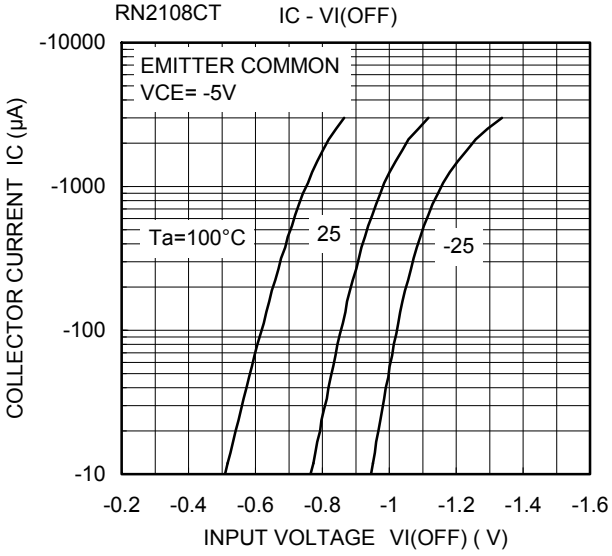
Electrical Characteristics (Ta = 25°C)

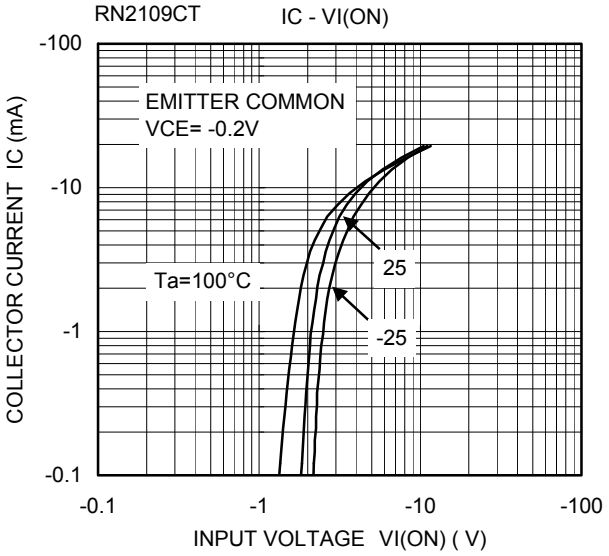
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN2107CT to 2109CT	I_{CBO}	V_{CB} = −20 V, I_E = 0	—	—	−100	nA
		I_{CEO}	V_{CE} = −20 V, I_B = 0	—	—	−500	
Emitter cut-off current	RN2107CT	I_{EBO}	V_{EB} = −6 V, I_C = 0	−0.088	—	−0.131	mA
	RN2108CT		V_{EB} = −7 V, I_C = 0	−0.085	—	−0.126	
	RN2109CT		V_{EB} = −15 V, I_C = 0	−0.182	—	−0.271	
DC current gain	RN2107CT	h_{FE}	V_{CE} = −5 V, I_C = −10 mA	120	—	—	—
	RN2108CT			120	—	—	
	RN2109CT			100	—	—	
Collector-emitter saturation voltage	RN2107CT to 2109CT	$V_{CE\ (sat)}$	I_C = −5 mA, I_B = −0.25 mA	—	—	−0.15	V
Input voltage (ON)	RN2107CT	$V_{I\ (ON)}$	V_{CE} = −0.2 V, I_C = −5 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 V, I_C = −0.1 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 V, I_E = 0, f = 1 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	

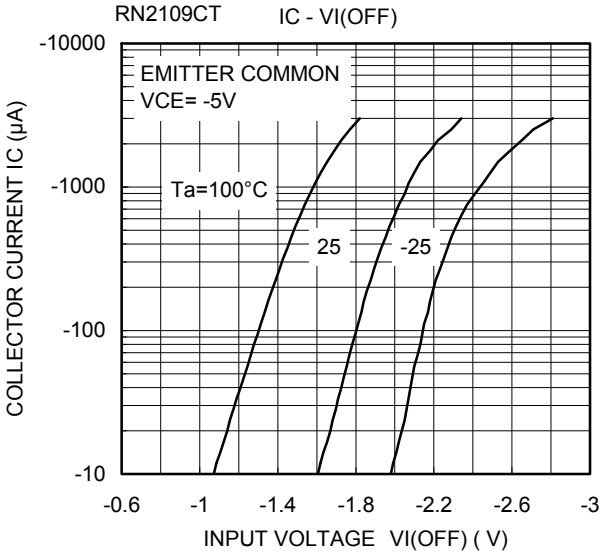

RN2107CT
IC - VI(ON)
COLLECTOR CURRENT IC (mA)
-100
-10
-1
-0.1
Ta=100°C
25
-25
EMITTER COMMON
VCE= -0.2V
-0.1
-1
-10
-100
INPUT VOLTAGE VI(ON) (V)

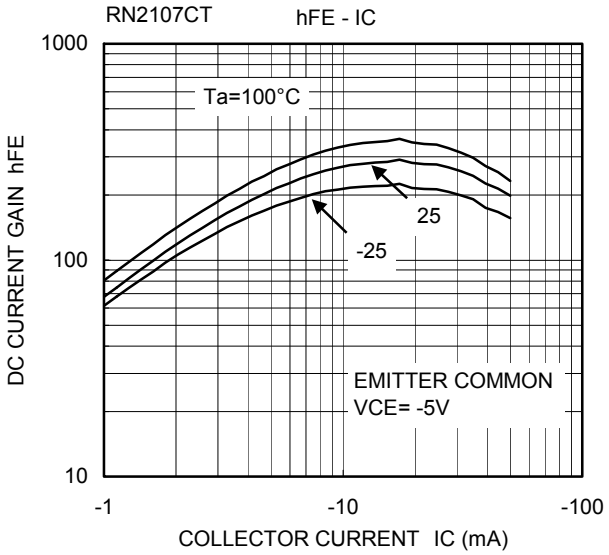

RN2107CT
IC - VI(OFF)
COLLECTOR CURRENT IC (μA)
-10000
-1000
-100
-10
Ta=100°C
25
-25
EMITTER COMMON
VCE= -5V
-0.2
-0.4
-0.6
-0.8
-1
-1.2
-1.4
INPUT VOLTAGE VI(OFF) (V)

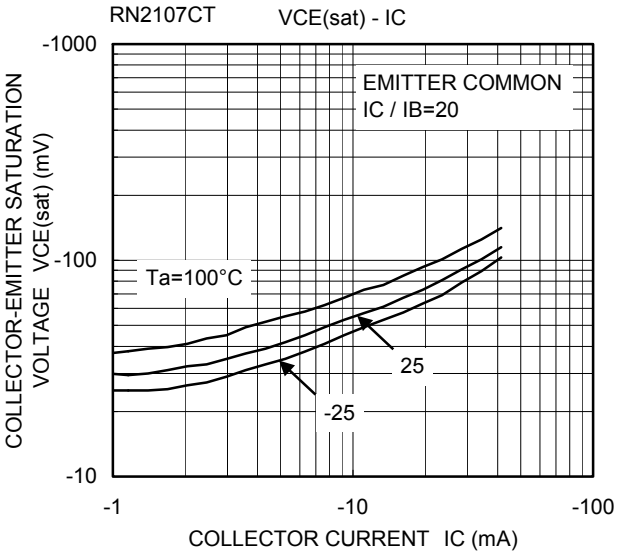

RN2108CT
IC - VI(ON)
COLLECTOR CURRENT IC (mA)
-100
-10
-1
-0.1
Ta=100°C
25
-25
EMITTER COMMON
VCE= -0.2V
-0.1
-1
-10
-100
INPUT VOLTAGE VI(ON) (V)

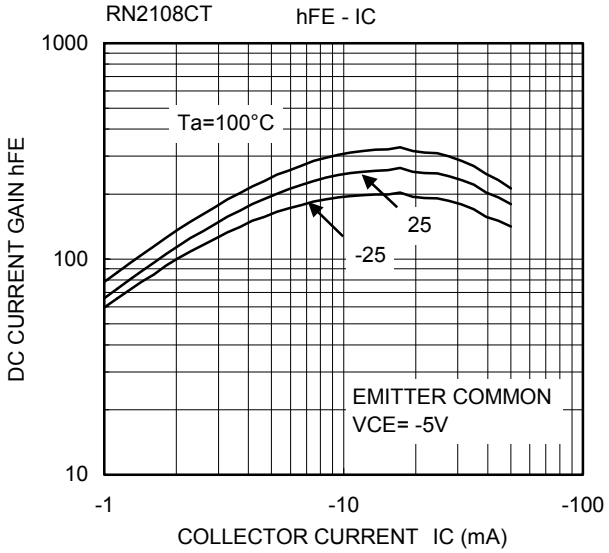

RN2108CT
IC - VI(OFF)
COLLECTOR CURRENT IC (μA)
-10000
-1000
-100
-10
EMITTER COMMON
VCE= -5V
Ta=100°C
25
-25
-0.2
-0.4
-0.6
-0.8
-1
-1.2
-1.4
-1.6
INPUT VOLTAGE VI(OFF) (V)

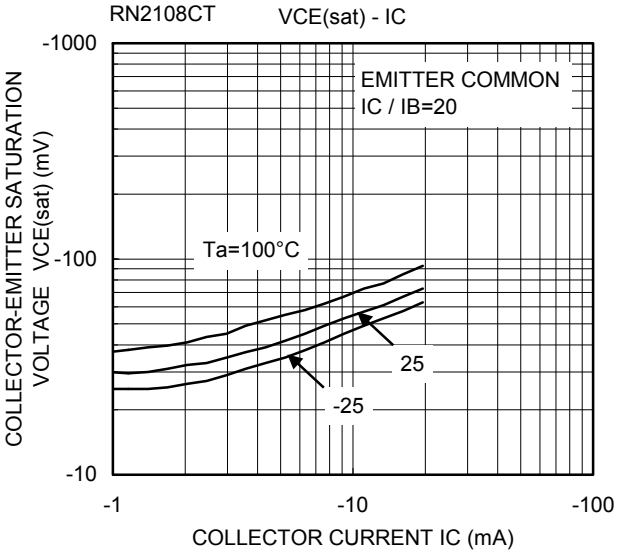

RN2109CT
IC - VI(ON)
COLLECTOR CURRENT IC (mA)
-100
-10
-1
-0.1
EMITTER COMMON
VCE= -0.2V
Ta=100°C
25
-25
-0.1
-1
-10
-100
INPUT VOLTAGE VI(ON) (V)

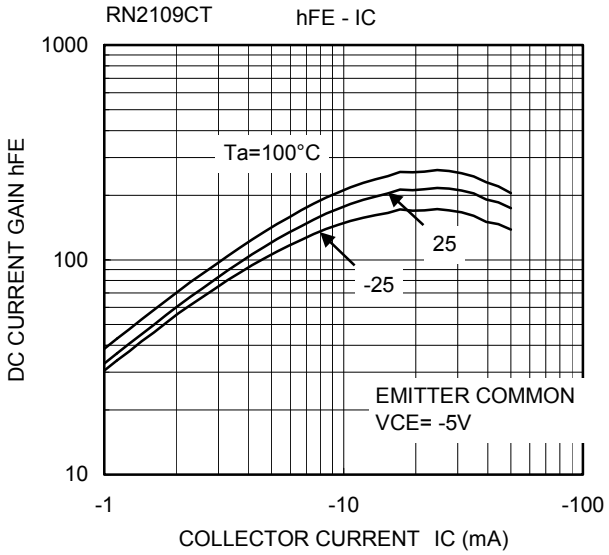

RN2109CT
IC - VI(OFF)
COLLECTOR CURRENT IC (μA)
-10000
-1000
-100
-10
EMITTER COMMON
VCE= -5V
Ta=100°C
25
-25
-0.6
-1
-1.4
-1.8
-2.2
-2.6
-3
INPUT VOLTAGE VI(OFF) (V)

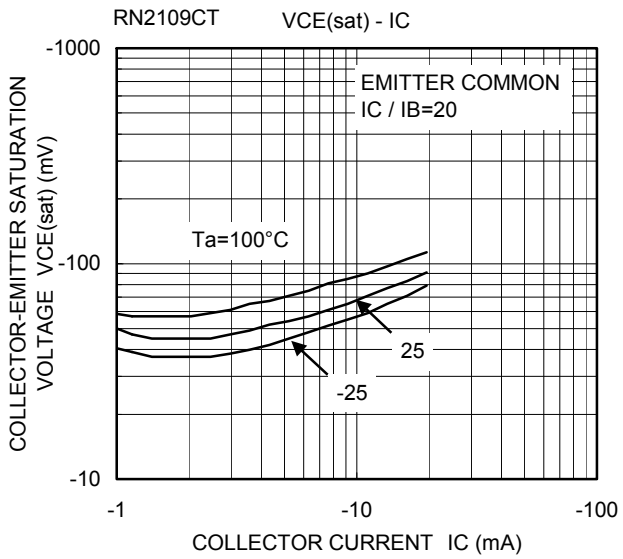

RN2107CT
hFE - IC
1000
100
10
Ta=100°C
25
-25
EMITTER COMMON
VCE= -5V
DC CURRENT GAIN hFE
-1
-10
-100
COLLECTOR CURRENT IC (mA)

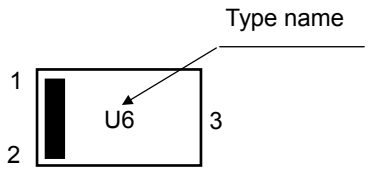
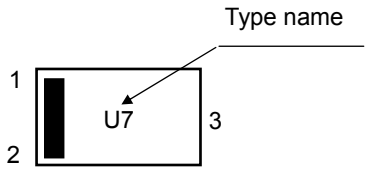
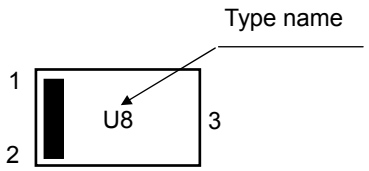

RN2107CT
VCE(sat) - IC
-1000
-100
-10
EMITTER COMMON
IC / IB=20
Ta=100°C
25
-25
COLLECTOR-EMITTER SATURATION VOLTAGE VCE(sat) (mV)
-1
-10
-100
COLLECTOR CURRENT IC (mA)


RN2108CT
hFE - IC
1000
100
10
Ta=100°C
25
-25
EMITTER COMMON
VCE= -5V
DC CURRENT GAIN hFE
-1
-10
-100
COLLECTOR CURRENT IC (mA)


RN2108CT
VCE(sat) - IC
-1000
-100
-10
EMITTER COMMON
IC / IB=20
Ta=100°C
25
-25
COLLECTOR-EMITTER SATURATION VOLTAGE VCE(sat) (mV)
-1
-10
-100
COLLECTOR CURRENT IC (mA)


RN2109CT
hFE - IC
1000
100
10
Ta=100°C
25
-25
EMITTER COMMON
VCE= -5V
DC CURRENT GAIN hFE
-1
-10
-100
COLLECTOR CURRENT IC (mA)


RN2109CT
VCE(sat) - IC
-1000
-100
-10
EMITTER COMMON
IC / IB=20
Ta=100°C
25
-25
COLLECTOR-EMITTER SATURATION VOLTAGE VCE(sat) (mV)
-1
-10
-100
COLLECTOR CURRENT IC (mA)

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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