

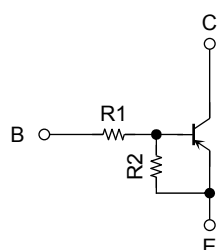
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT process) (Bias Resistor built-in Transistor)

RN2967CT, RN2968CT, RN2969CT

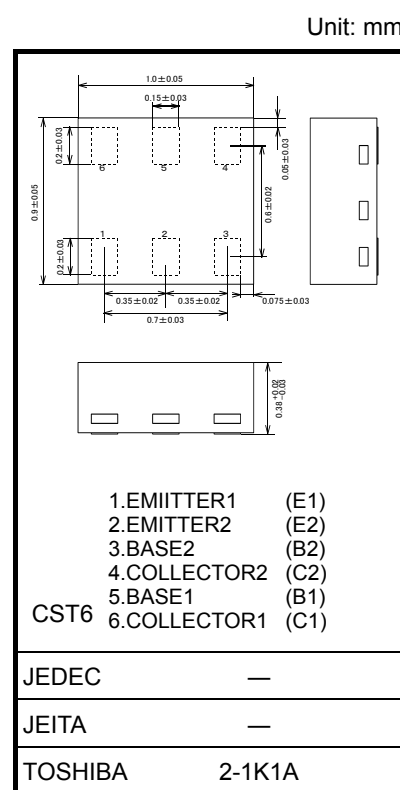
Switching, Inverter Circuit, Interface Circuit and
Driver Circuit Applications

- Two devices are incorporated into a fine pitch Small Mold (6 pin) package.
- 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 RN1967CT to RN1969CT

Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN2967 CT	10	47
RN2968 CT	22	47
RN2969 CT	47	22



Weight: 1.0 mg (typ.)

Absolute Maximum Ratings (Ta = 25°C) (Q1, Q2 common)

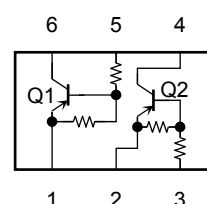
Characteristics	Symbol	Rating	Unit
Collector-base voltage	RN2967CT to RN2969CT V_{CBO}	-20	V
Collector-emitter voltage	V_{CEO}	-20	V
Emitter-base voltage	RN2967CT	-6	V
	RN2968CT	-7	
	RN2969CT	-15	
Collector current	I_C	-50	mA
Collector power dissipation	RN2967CT to RN2969CT P_C (Note1)	50	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	-55 to 150	°C

Note 1: Total rating

Note 2: 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).

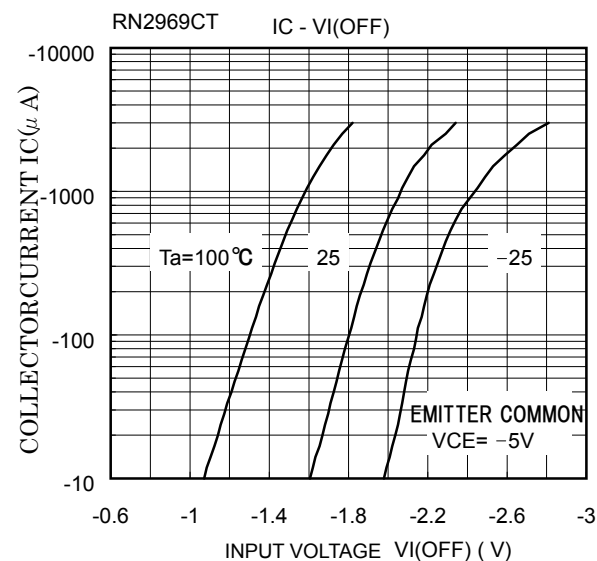
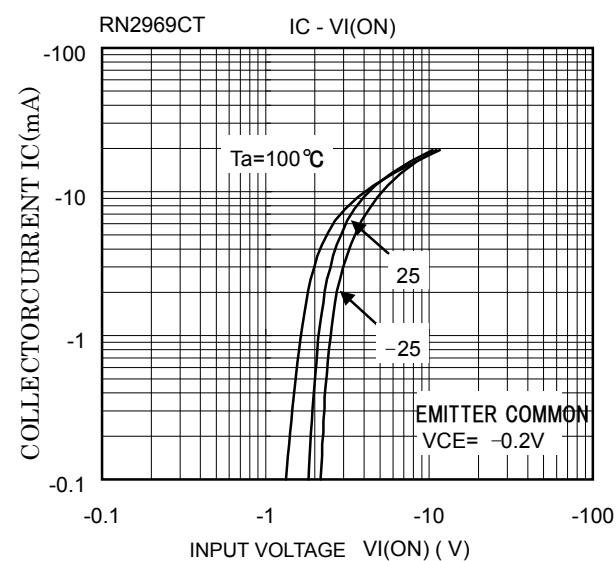
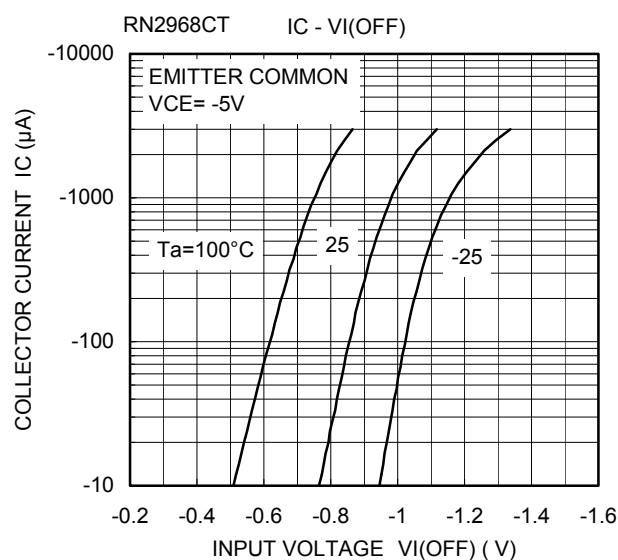
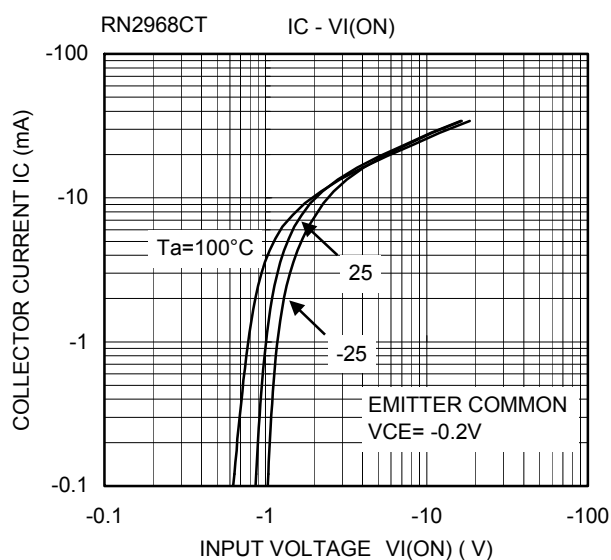
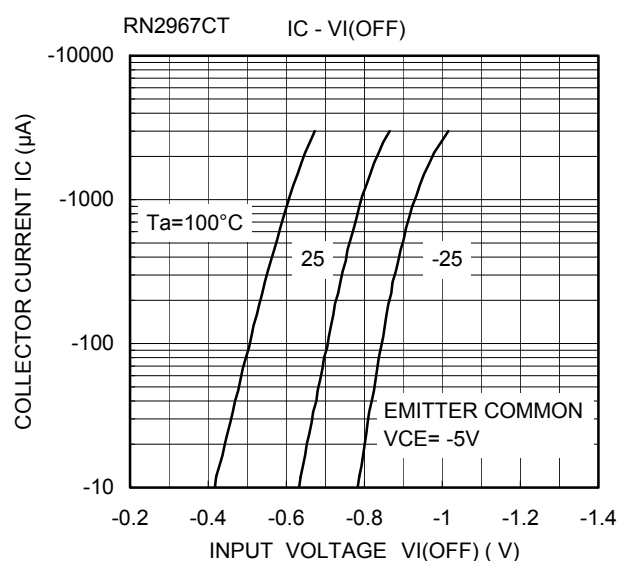
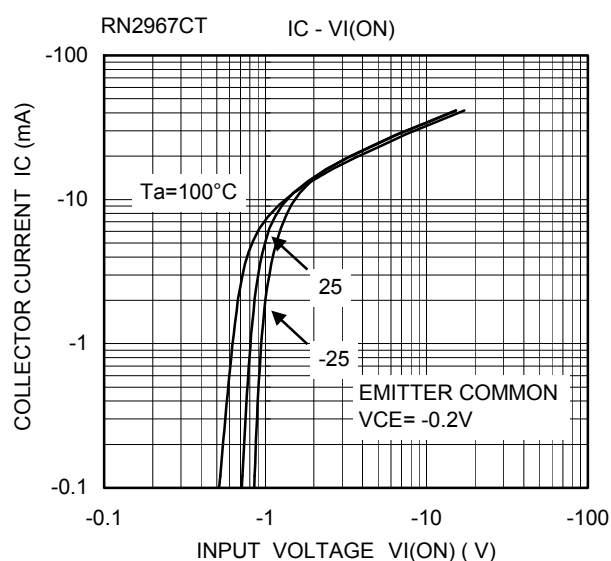
Equivalent Circuit (top view)



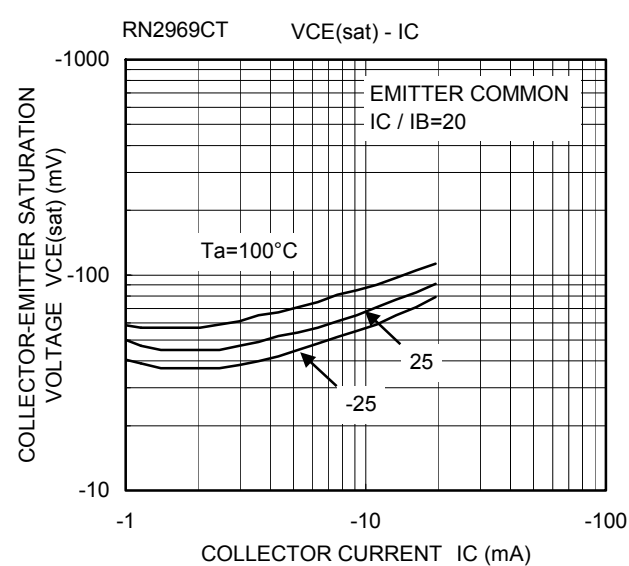
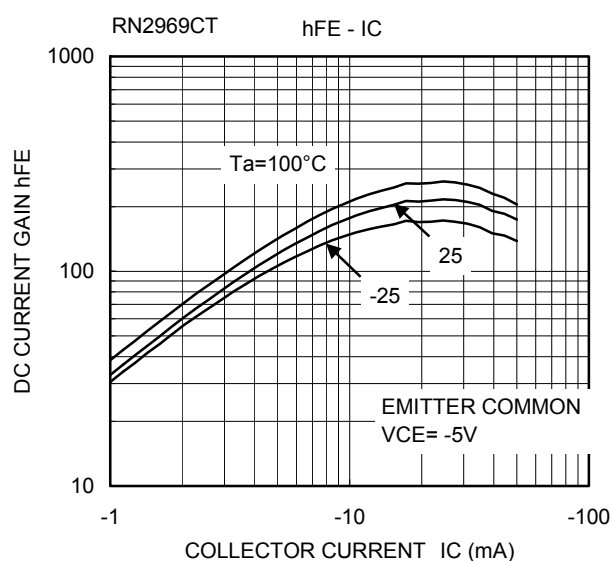
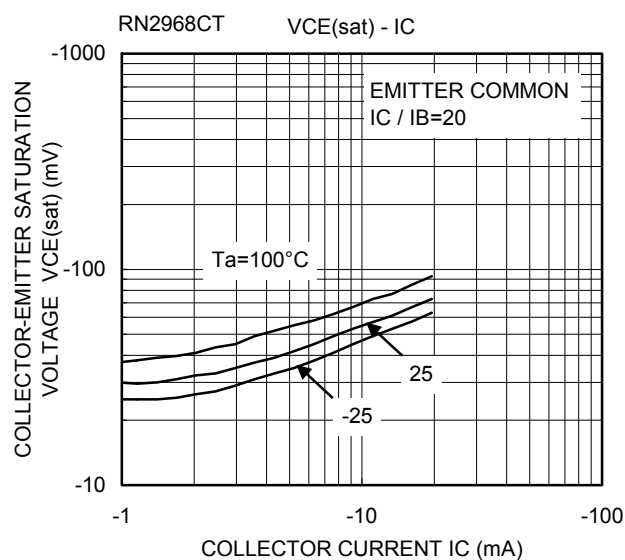
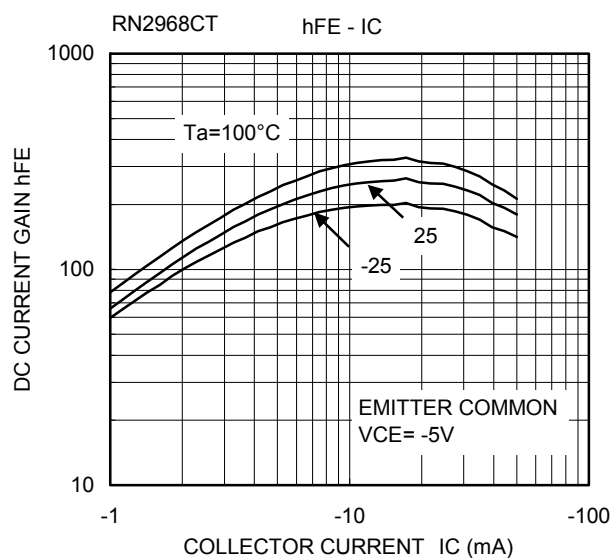
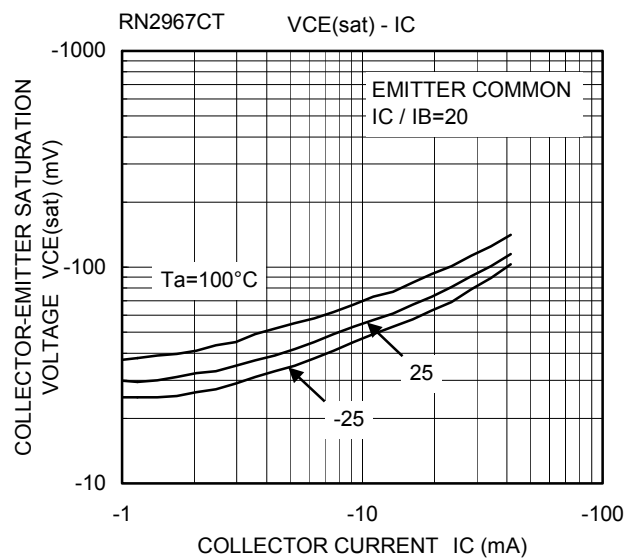
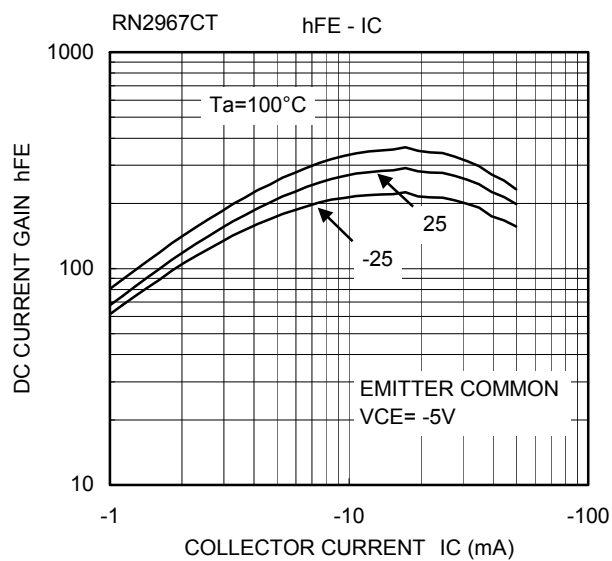
Electrical Characteristics (Ta = 25°C) (Q1, Q2 common)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN2967CT to 2969CT	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	RN2967CT	I_{EBO}	$V_{EB} = -6\text{ V}, I_C = 0$	-0.088	—	-0.131	mA
	RN2968CT		$V_{EB} = -7\text{ V}, I_C = 0$	-0.085	—	-0.126	
	RN2969CT		$V_{EB} = -15\text{ V}, I_C = 0$	-0.182	—	-0.271	
DC current gain	RN2967CT	h_{FE}	$V_{CE} = -5\text{ V},$ $I_C = -10\text{ mA}$	120	—	—	—
	RN2968CT			120	—	—	
	RN2969CT			100	—	—	
Collector-emitter saturation voltage	RN2967CT to 2969CT	$V_{CE(sat)}$	$I_C = -5\text{ mA},$ $I_B = -0.25\text{ mA}$	—	—	-0.15	V
Input voltage (ON)	RN2967CT	$V_I(ON)$	$V_{CE} = -0.2\text{ V},$ $I_C = -5\text{ mA}$	-0.7	—	-1.5	V
	RN2968CT			-0.8	—	-2.2	
	RN2969CT			-1.6	—	-5.0	
Input voltage (OFF)	RN2967CT	$V_I(OFF)$	$V_{CE} = -5\text{ V},$ $I_C = -0.1\text{ mA},$	-0.5	—	-1.0	V
	RN2968CT			-0.6	—	-1.1	
	RN2969CT			-1.3	—	-2.6	
Collector output capacitance	RN2967CT to 2969CT	C_{ob}	$V_{CB} = -10\text{ V}, I_E = 0,$ $f = 1\text{ MHz}$	—	1.2	—	pF
Input resistor	RN2967CT	R1	—	8	10	12	kΩ
	RN2968CT			17.6	22	26.4	
	RN2969CT			37.6	47	56.4	
Resistor ratio	RN2967CT	R1/R2	—	0.17	0.213	0.255	—
	RN2968CT			0.374	0.468	0.562	
	RN2969CT			1.71	2.14	2.56	

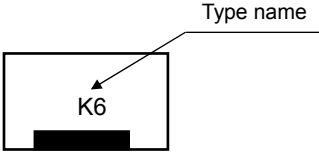
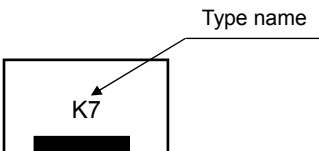
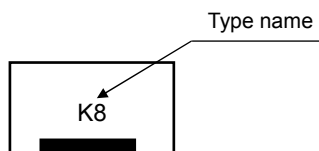
(Q1,Q2 common)



(Q1,Q2 common)



Marking

Type Name	Marking
RN2967CT	
RN2968CT	
RN2969CT	

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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