

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

RN1112CT, RN1113CT

Switching Applications

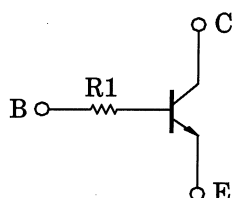
Inverter Circuit Applications

Interface Circuit Applications

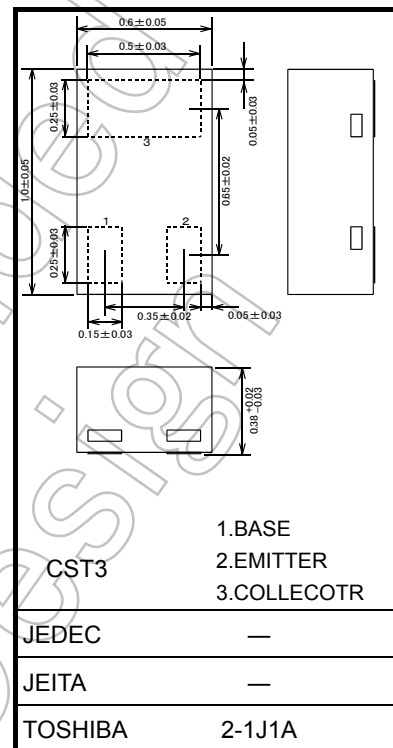
Driver Circuit Applications

- 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 RN2112CT, RN2113CT

Equivalent Circuit



Unit: mm



Weight: 0.75 mg (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CB0}	20	V
Collector-emitter voltage	V_{CEO}	20	V
Emitter-base voltage	V_{EB0}	5	V
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.

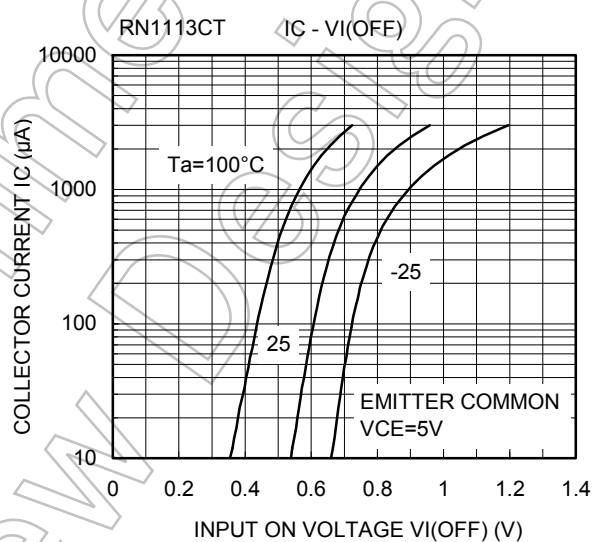
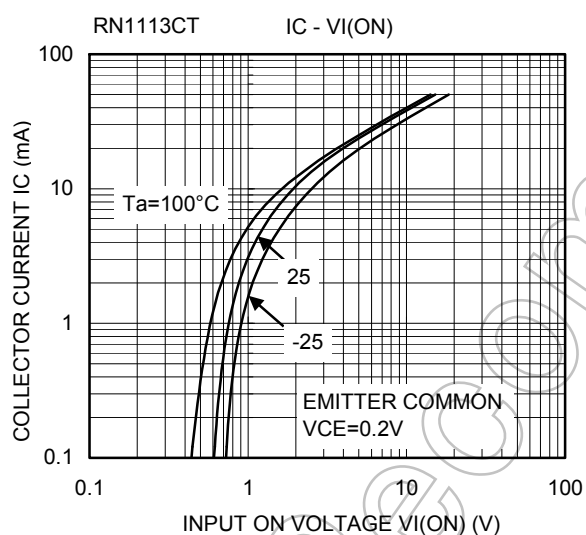
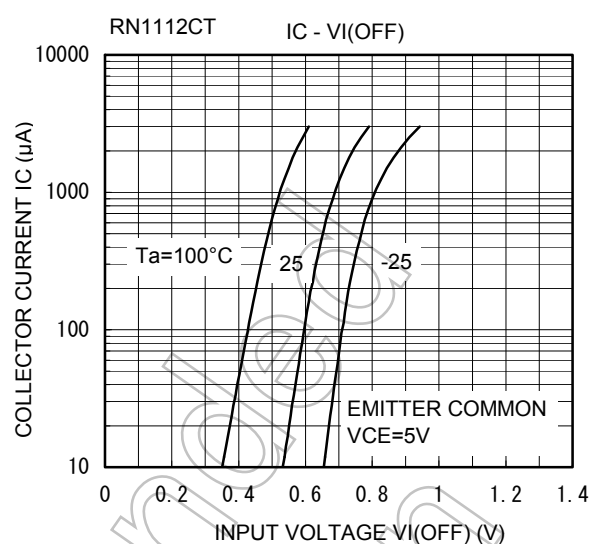
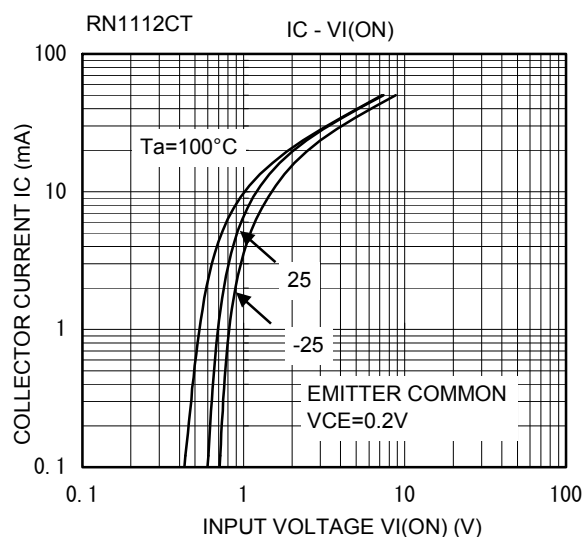
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc.).

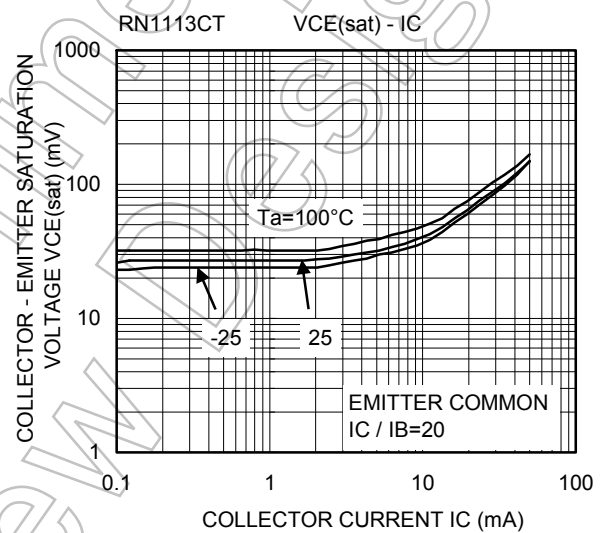
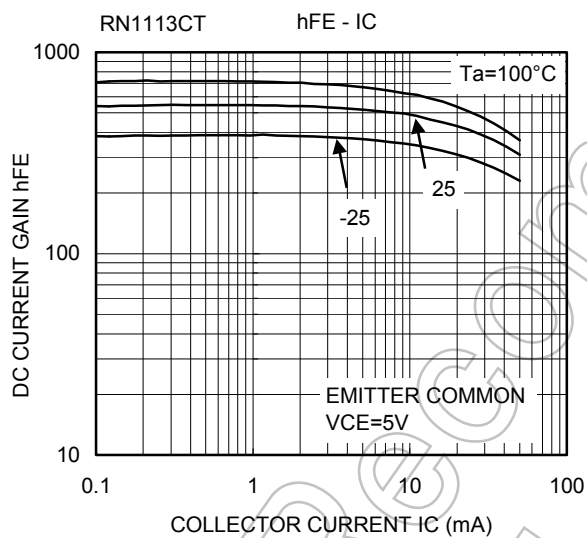
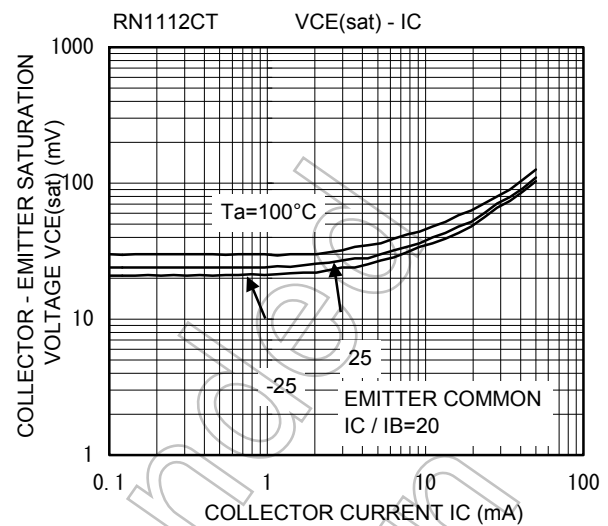
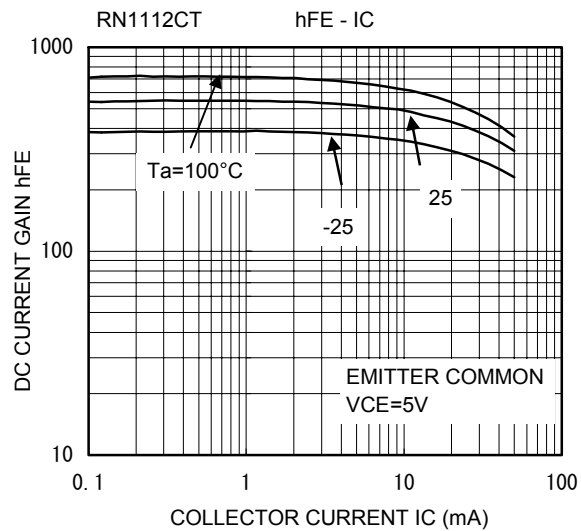
Start of commercial production
2004-10

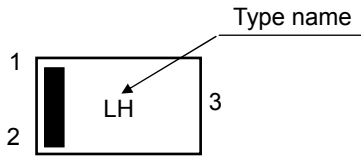
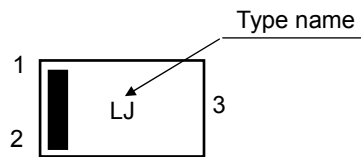
Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	$V_{CB} = 20\text{ V}, I_E = 0$	—	—	100	nA
Emitter cut-off current		I_{EBO}	$V_{EB} = 5\text{ V}, I_C = 0$	—	—	100	nA
DC current gain		h_{FE}	$V_{CE} = 5\text{ V}, I_C = 1\text{ mA}$	300	—	—	
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = 5\text{ mA}, I_B = 0.25\text{ mA}$	—	—	0.15	V
Collector output capacitance		C_{ob}	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	1.2	—	pF
Input resistor	RN1112CT	R1	—	17.6	22	26.4	kΩ
	RN1113CT			37.6	47	56.4	

Not Recommended for New Design





Type Name	Marking
RN1112CT	 The diagram shows a rectangular marking area with a vertical bar on the left. The bar is divided into two sections labeled 1 and 2. The top section (1) is black, and the bottom section (2) is white. The letters 'LH' are printed in the center of the bar. The number 3 is printed to the right of the bar. An arrow points from the text 'Type name' to the 'LH' marking.
RN1113CT	 The diagram shows a rectangular marking area with a vertical bar on the left. The bar is divided into two sections labeled 1 and 2. The top section (1) is black, and the bottom section (2) is white. The letters 'LJ' are printed in the center of the bar. The number 3 is printed to the right of the bar. An arrow points from the text 'Type name' to the 'LJ' marking.

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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