

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

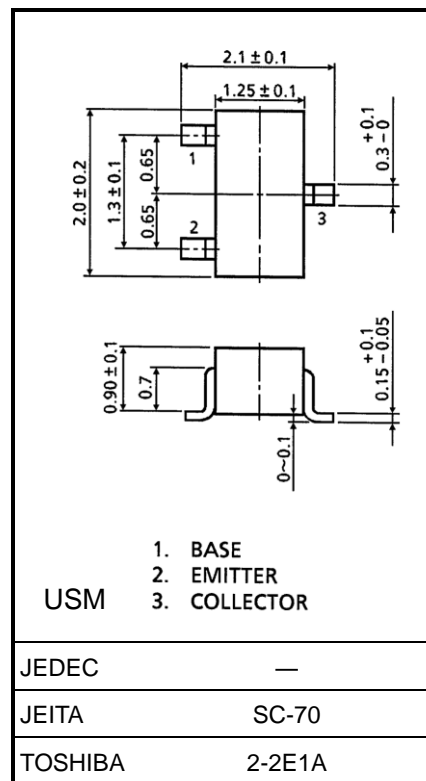
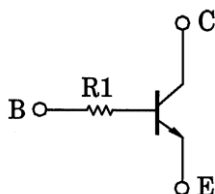
RN1312, RN1313

Switching, Inverter Circuit, Interface Circuit and Driver Circuit

Unit: mm

- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process and miniaturize equipment.
- Various resistance values are available to suit various circuit designs.
- Complementary to RN2312, RN2313

Equivalent Circuit



Weight: 0.006g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

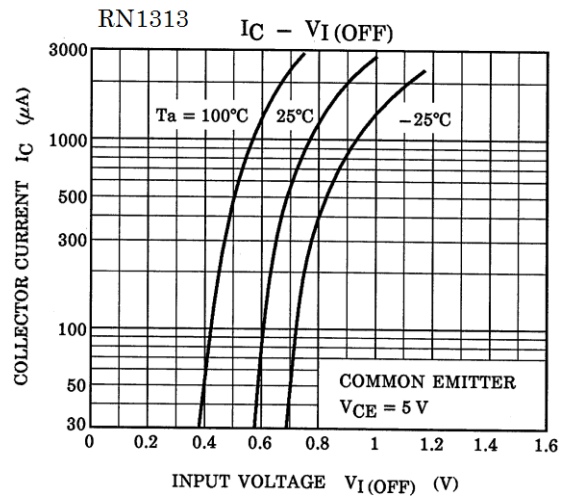
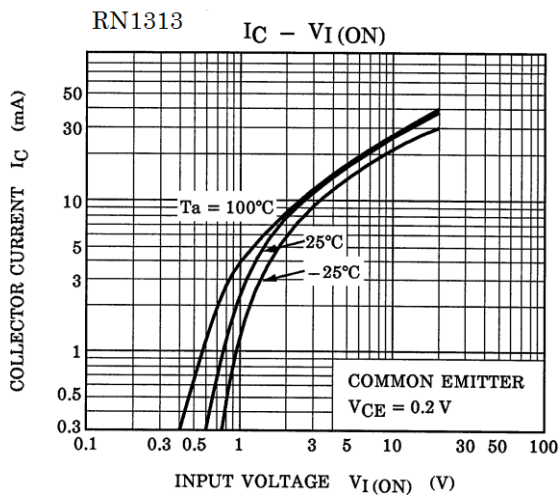
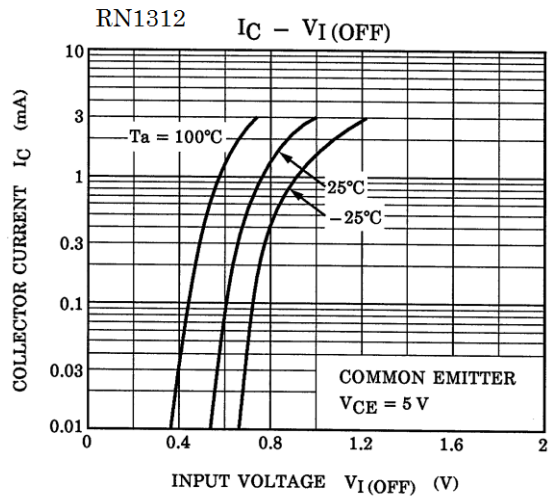
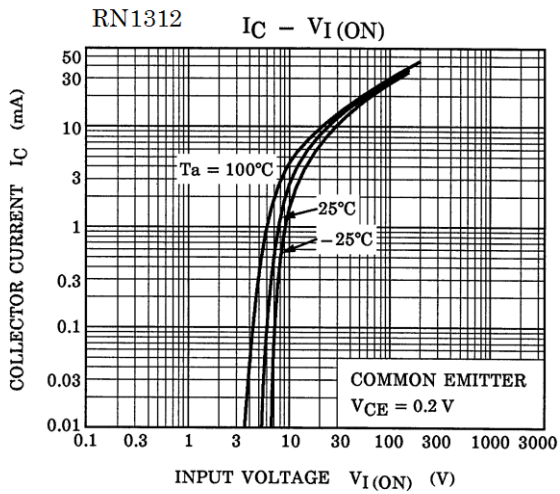
Characteristic	Symbol	Rating	Unit
Collector-base voltage	V _{CB0}	50	V
Collector-emitter voltage	V _{CEO}	50	V
Emitter-base voltage	V _{EBO}	5	V
Collector current	I _C	100	mA
Collector power dissipation	P _C	100	mW
Junction temperature	T _j	150	°C
Storage temperature range	T _{stg}	-55 to 150	°C

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).

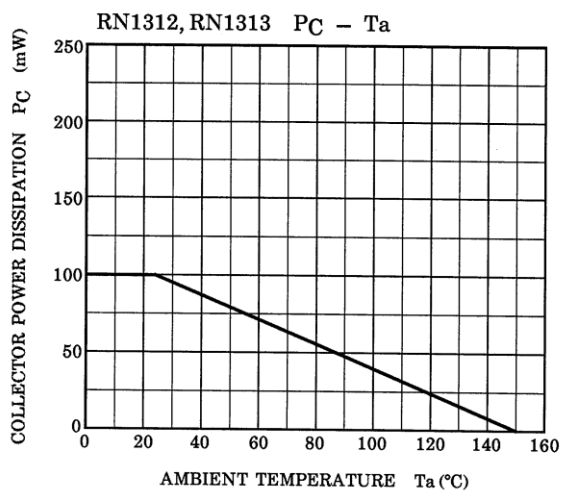
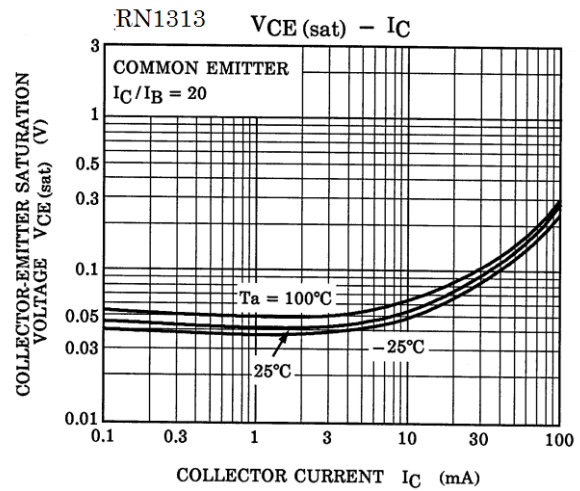
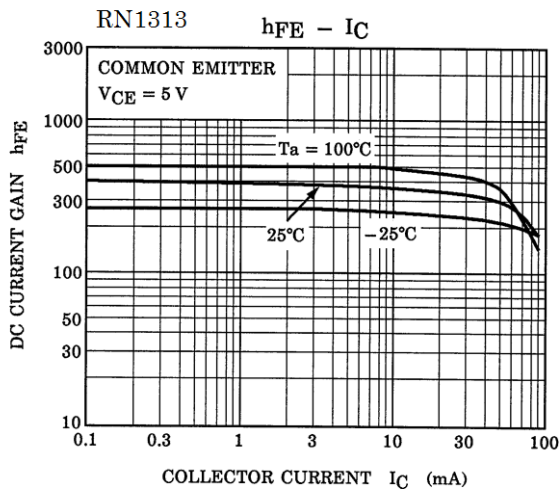
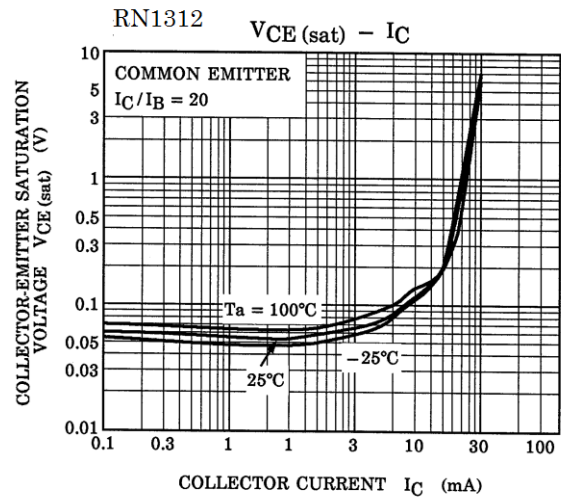
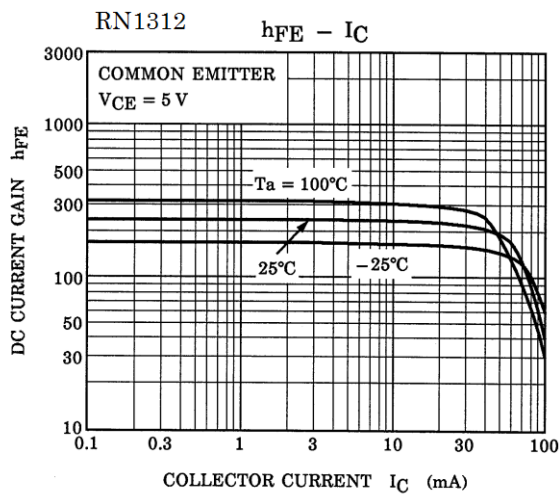
Start of commercial production
1998-02

Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit	
Collector cut-off current	ICBO	V _{CB} = 50 V, I _E = 0 mA	—	—	100	nA	
Emitter cut-off current	IEBO	V _{EB} = 5 V, I _C = 0 mA	—	—	100	nA	
DC current gain	hFE	V _{CE} = 5 V, I _C = 1mA	120	—	700	—	
Collector-emitter saturation voltage	V _{CE (sat)}	I _C = 5 mA, I _B = 0.25 mA	—	0.1	0.3	V	
Transition frequency	f _T	V _{CE} = 10 V, I _C = 5 mA	—	250	—	MHz	
Collector output capacitance	C _{ob}	V _{CB} = 10 V, I _E = 0 mA, f = 1 MHz	—	3	6	pF	
Input resistor	RN1312	R1	—	15.4	22	28.6	kΩ
	RN1313			32.9	47	61.1	

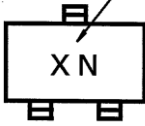
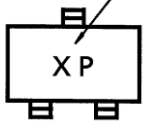


The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.



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Marking

Part No.	Marking
RN1312	<p data-bbox="571 331 831 360">Part No.(abbreviation code)</p>  <p>The diagram shows a rectangular component with the letters 'X N' centered inside. A pointer line originates from the text 'Part No.(abbreviation code)' and points to the top-left corner of the component. There are small rectangular markings on the top and bottom edges of the component.</p>
RN1313	<p data-bbox="571 562 831 591">Part No.(abbreviation code)</p>  <p>The diagram shows a rectangular component with the letters 'X P' centered inside. A pointer line originates from the text 'Part No.(abbreviation code)' and points to the top-left corner of the component. There are small rectangular markings on the top and bottom edges of the component.</p>

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