

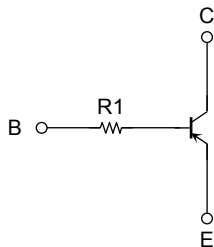
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT process) (Bias Resistor Built-in Transistor)

RN2970HFE, RN2971HFE

Switching, Inverter Circuit, Interface Circuit and
Driver Circuit Applications

- Two devices are incorporated into an Extreme-Super-Mini (6-pin) package.
- Incorporating a bias resistor into a transistor reduces parts count. Reducing the parts count enables the manufacture of ever more compact equipment and lowers assembly cost.
- Complementary to RN1970HFE, RN1971HFE

Equivalent Circuit and Bias Resistor Values



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

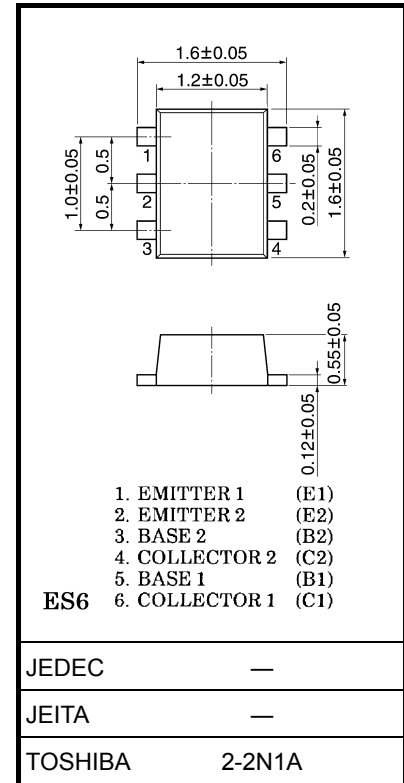
Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	-30	V
Collector-emitter voltage	V_{CEO}	-30	V
Emitter-base voltage	V_{EBO}	-5	V
Collector current	I_C	-100	mA
Collector power dissipation	P_C (Note 1)	100	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	-55~150	°C

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.).

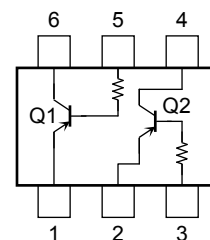
Note 1: Total rating

Unit: mm



Weight: 0.003g (typ.)

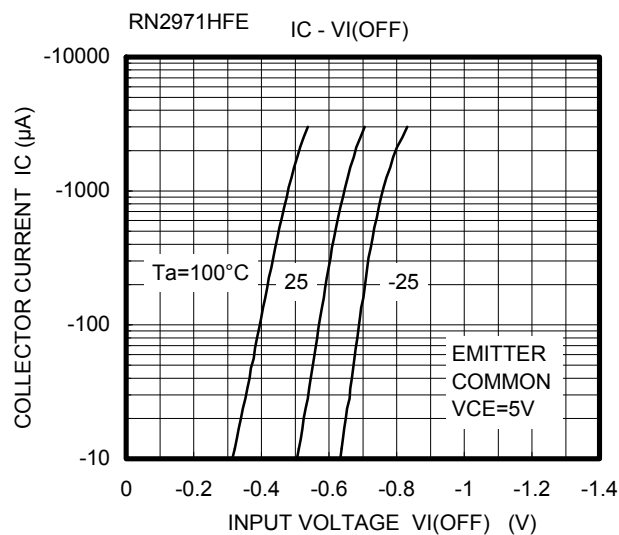
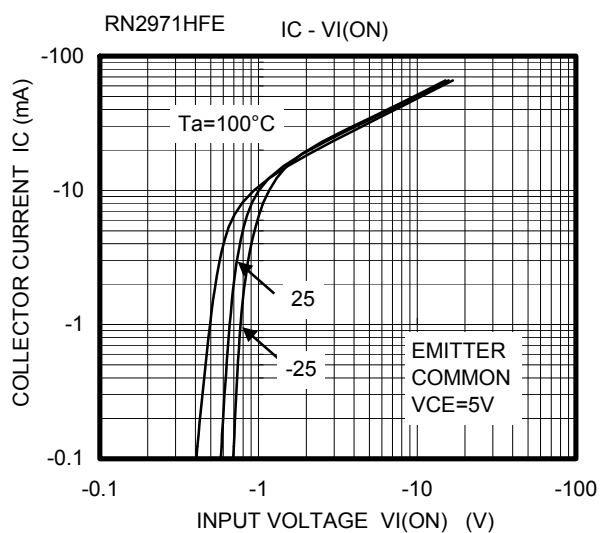
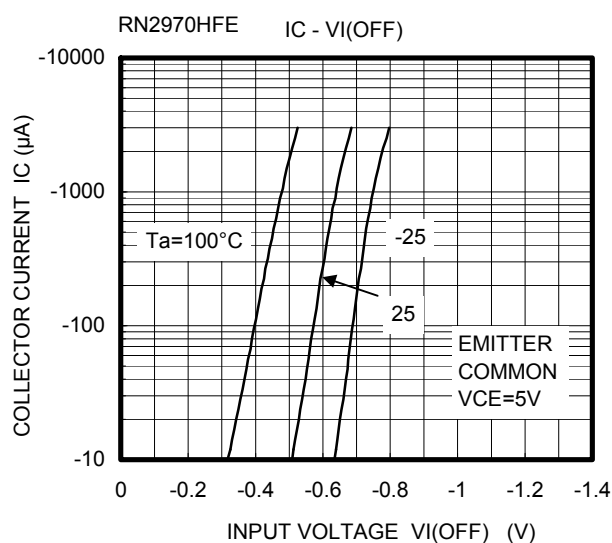
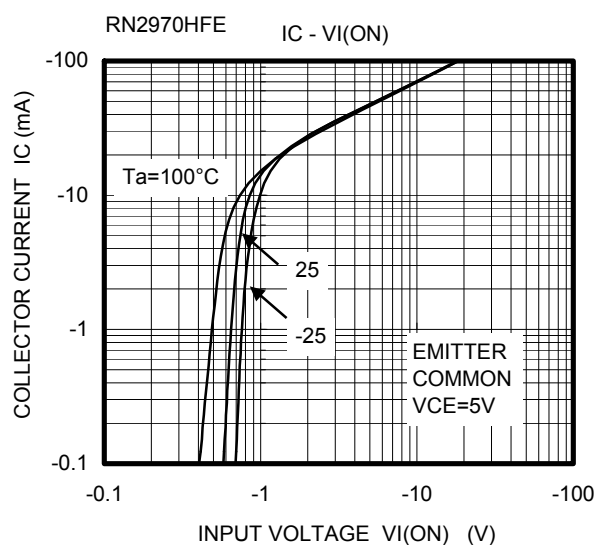
Equivalent Circuit (top view)



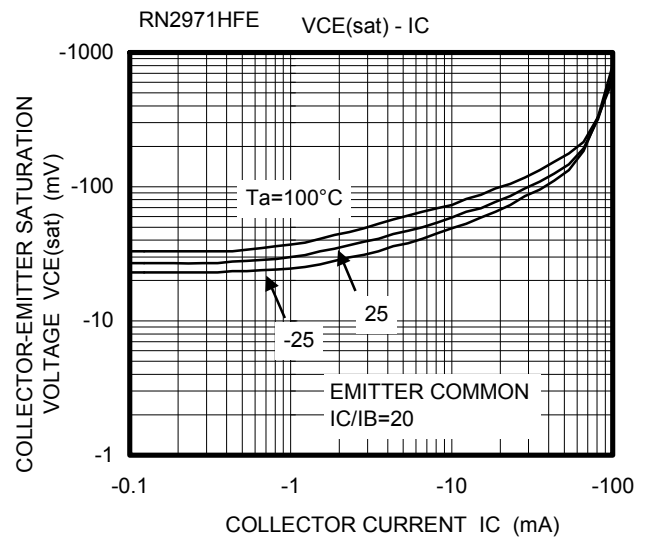
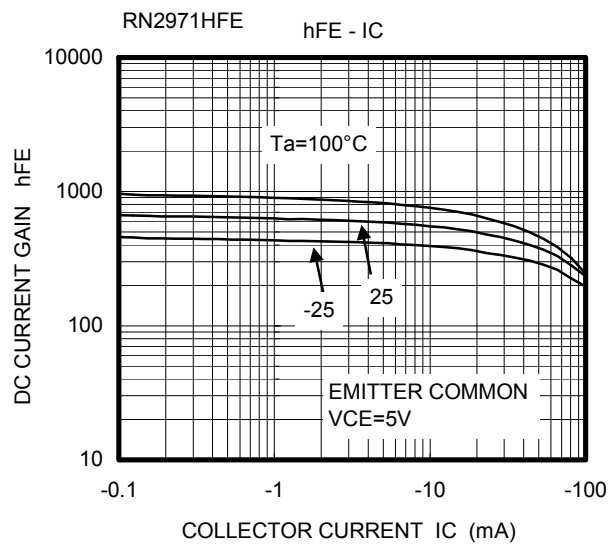
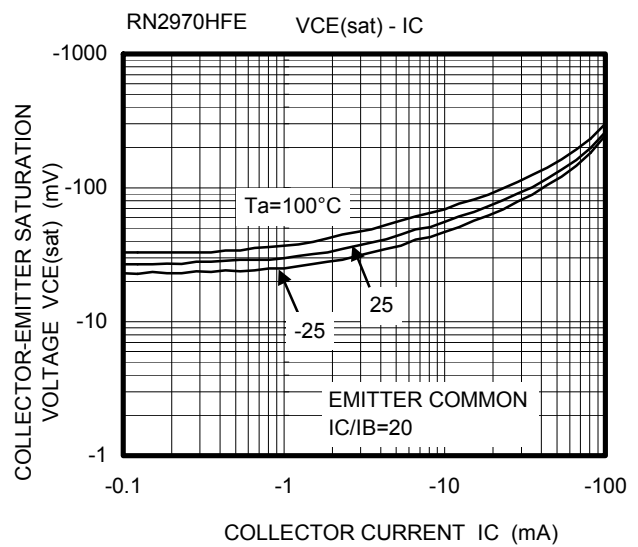
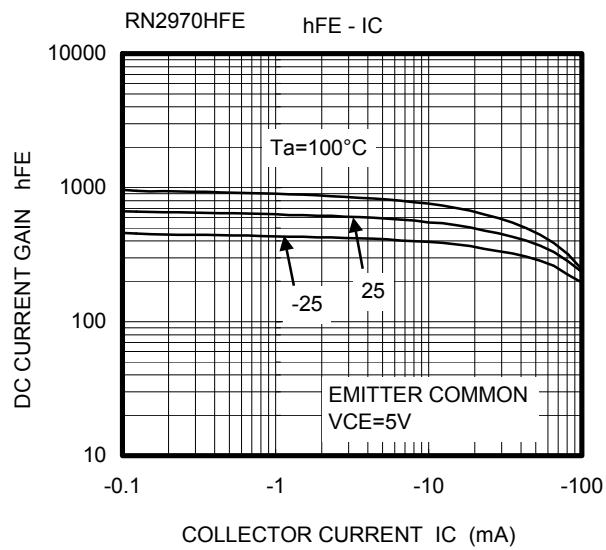
Electrical Characteristics (Ta = 25°C) (Q1, Q2 common)

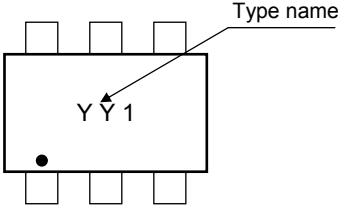
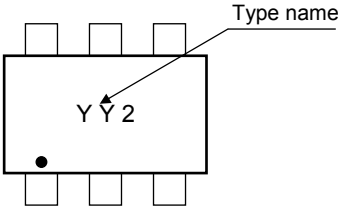
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	$V_{CB} = -30\text{ V}, I_E = 0$	—	—	-100	nA
Emitter cut-off current		I_{EBO}	$V_{EB} = -5\text{ V}, I_C = 0$	—	—	-100	nA
DC current gain		h_{FE}	$V_{CE} = -5\text{ V}, I_C = -1\text{ mA}$	300	—	—	
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = -5\text{ mA}, I_B = -0.25\text{ mA}$	—	-0.06	-0.15	V
Transition frequency		f_T	$V_{CE} = -10\text{ V}, I_C = -5\text{ mA}$	—	200	—	MHz
Collector output capacitance		C_{ob}	$V_{CB} = -10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	3	—	pF
Input resistor	RN2970HFE	R1	—	3.76	4.7	5.64	kΩ
	RN2971HFE			8	10	12	

Q1, Q2 Common



Q1, Q2 Common



Type Name	Marking
RN2970HFE	 The diagram shows a rectangular component with six pins (three on top, three on bottom). Inside the rectangle, the text 'Y Y 1' is printed. A small dot is located at the bottom left corner of the rectangle. An arrow points from the text 'Type name' to the 'Y Y' part of the marking.
RN2971HFE	 The diagram shows a rectangular component with six pins (three on top, three on bottom). Inside the rectangle, the text 'Y Y 2' is printed. A small dot is located at the bottom left corner of the rectangle. An arrow points from the text 'Type name' to the 'Y Y' part of the marking.

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20070701-EN GENERAL

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