

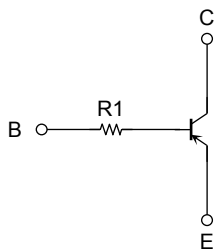
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process) (Bias Resistor Built-in Transistor)

## RN2970FE, RN2971FE

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 RN1970FE, RN1971FE

### Equivalent Circuit and Bias Resistor Values



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

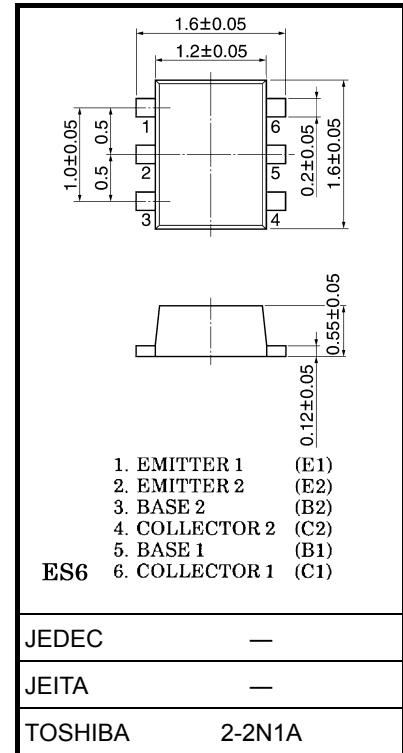
Characteristics	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	-50	V
Collector-emitter voltage	$V_{CEO}$	-50	V
Emitter-base voltage	$V_{EBO}$	-5	V
Collector current	$I_C$	-100	mA
Collector power dissipation	$P_C$ (Note 1)	100	mW
Junction temperature	$T_j$	150	°C
Storage temperature range	$T_{stg}$	-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.).

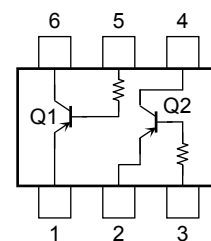
Note 1: Total rating

Unit: mm



Weight: 0.003 g (typ.)

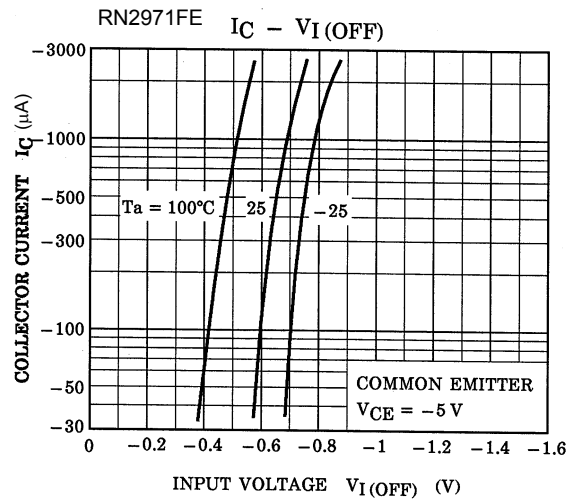
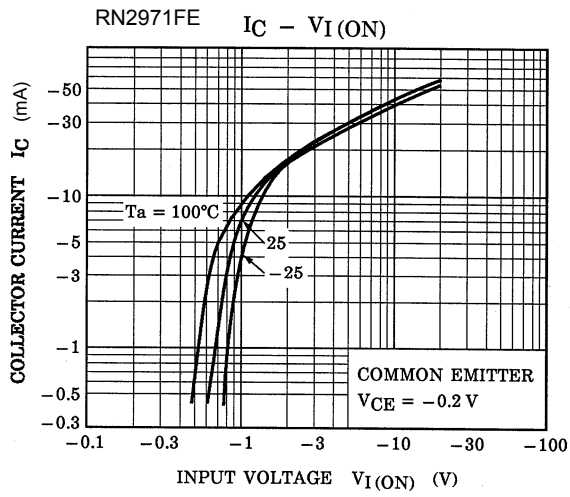
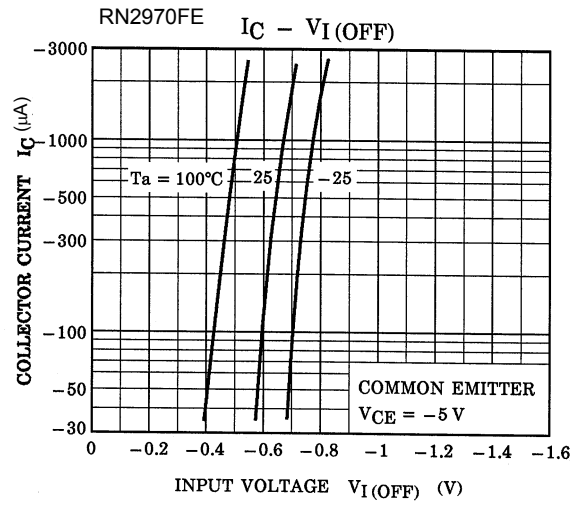
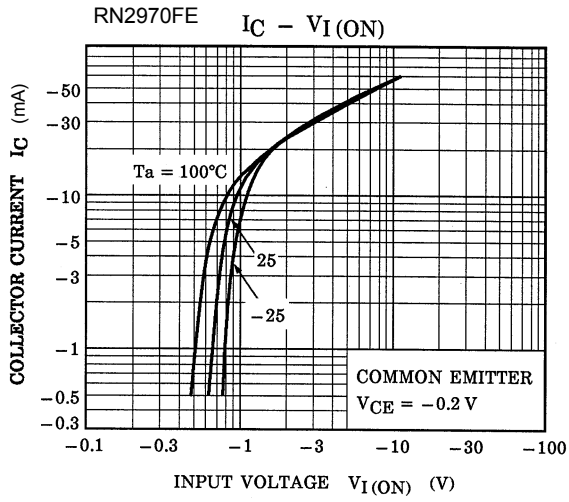
### Equivalent Circuit (top view)



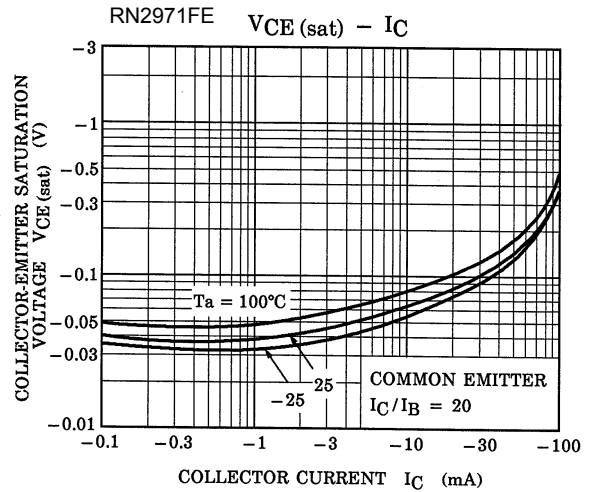
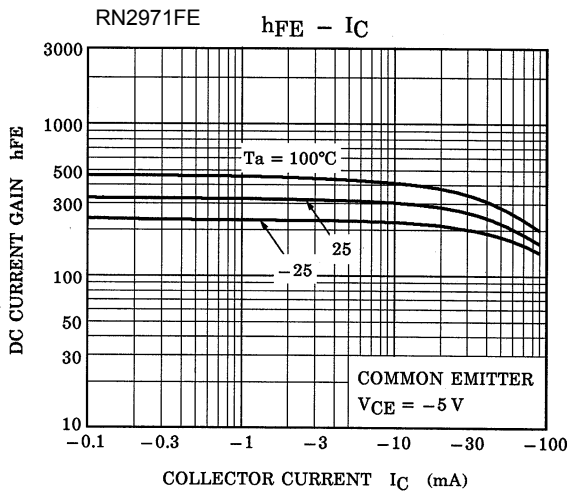
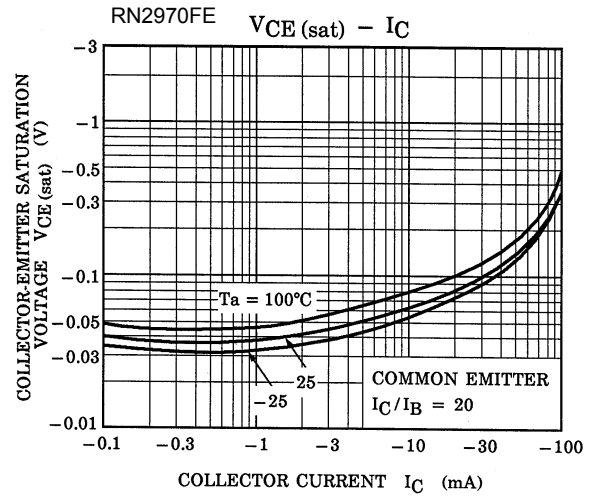
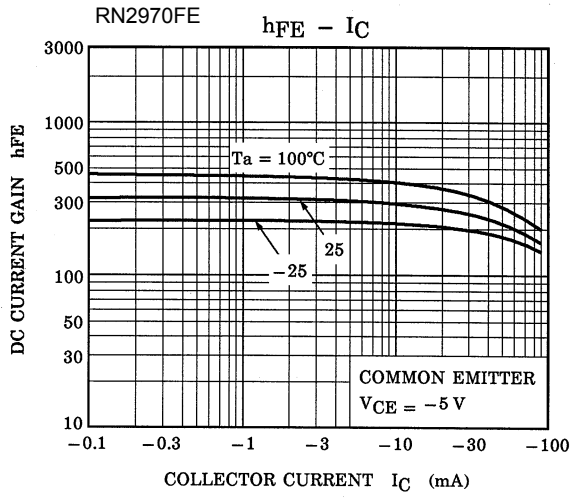
## Electrical Characteristics (Ta = 25°C) (Q1, Q2 common)

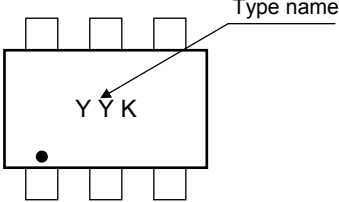
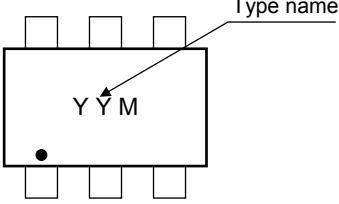
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit	
Collector cut-off current	$I_{CBO}$	$V_{CB} = -50\text{ V}, I_E = 0$	—	—	-100	nA	
Emitter cut-off current	$I_{EBO}$	$V_{EB} = -5\text{ V}, I_C = 0$	—	—	-100	nA	
DC current gain	$h_{FE}$	$V_{CE} = -5\text{ V}, I_C = -1\text{ mA}$	120	—	400		
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -5\text{ mA}, I_B = -0.25\text{ mA}$	—	-0.1	-0.3	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	6	pF	
Input resistor	RN2970FE	R1	—	3.29	4.7	6.11	kΩ
	RN2971FE			7	10	13	

## Q1, Q2 Common



## Q1, Q2 Common



Type Name	Marking
RN2970FE	 <p>The diagram shows a rectangular component with six pins (three on top, three on bottom). The marking 'Y Y K' is printed on the top surface. A small black dot is located on the bottom-left corner. An arrow labeled 'Type name' points to the 'Y Y K' marking.</p>
RN2971FE	 <p>The diagram shows a rectangular component with six pins (three on top, three on bottom). The marking 'Y Y M' is printed on the top surface. A small black dot is located on the bottom-left corner. An arrow labeled 'Type name' points to the 'Y Y M' marking.</p>

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