

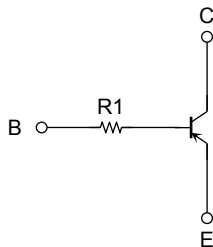
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process) (Bias Resistor Built-in Transistor)

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)

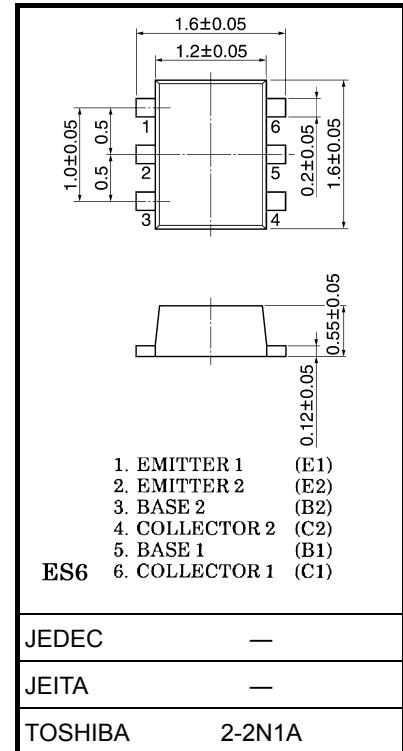
Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	-50	V
Collector-emitter voltage	V_{CEO}	-50	V
Emitter-base voltage	V_{EBO}	-5	V
Collector current	I_C	-100	mA
Collector power dissipation	P_C (Note 1)	100	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	-55~150	°C

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).

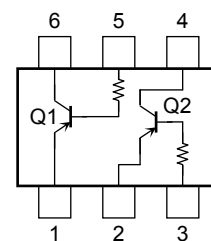
Note 1: Total rating

Unit: mm



Weight: 0.003 g (typ.)

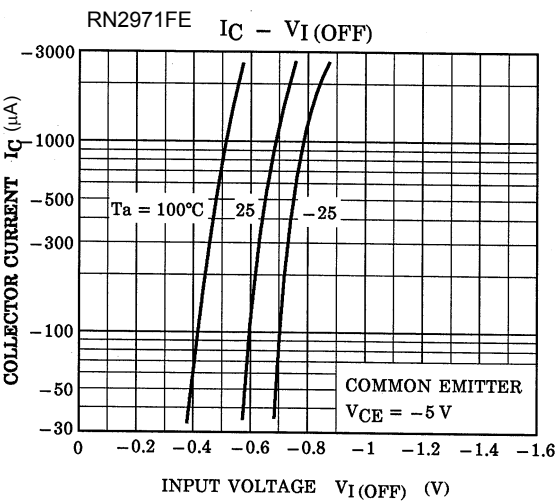
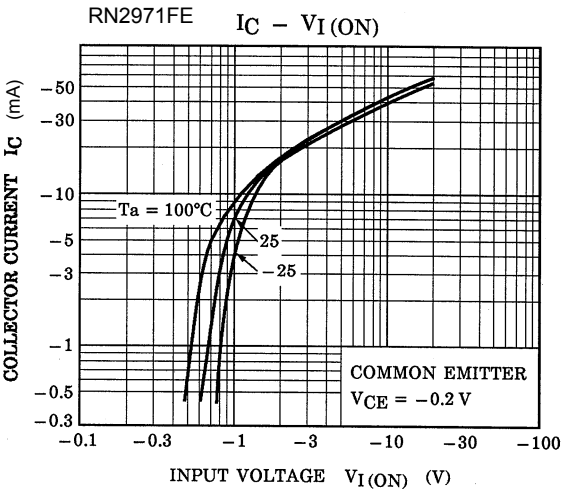
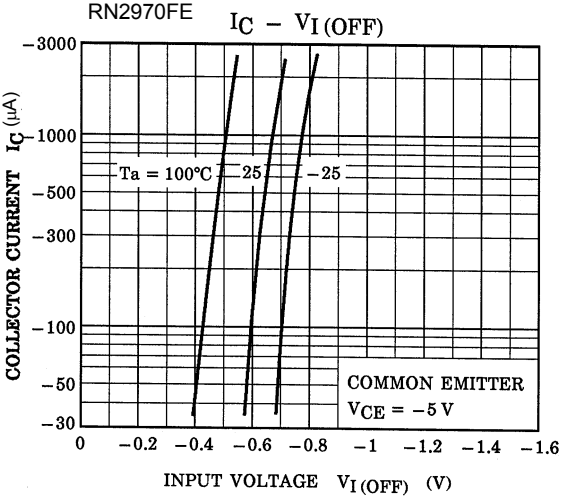
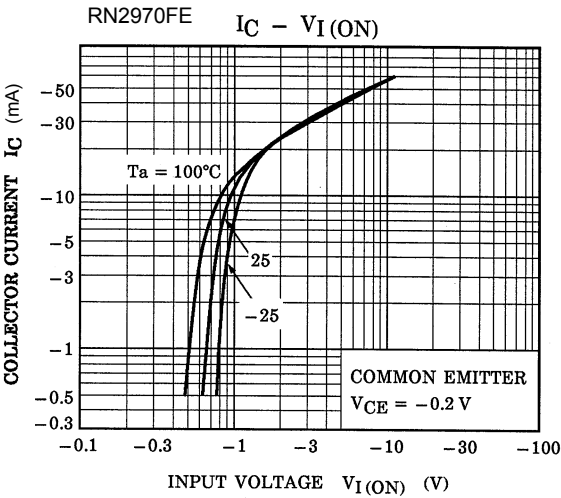
Equivalent Circuit (top view)



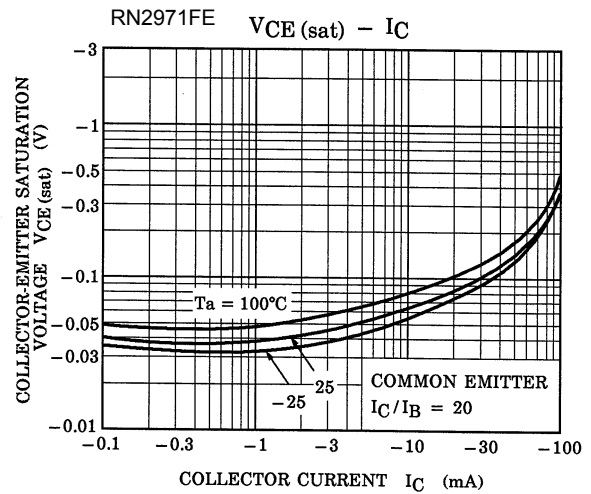
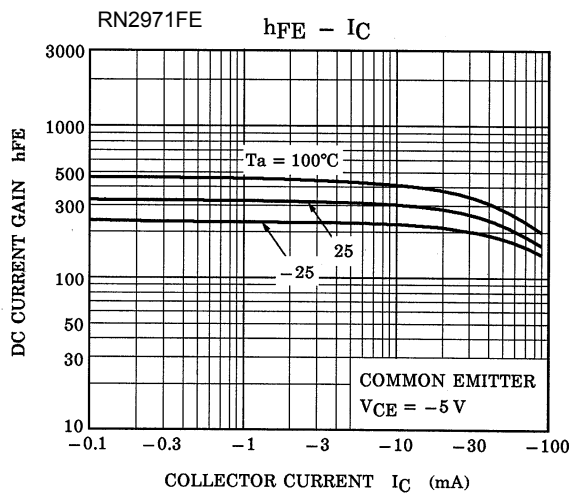
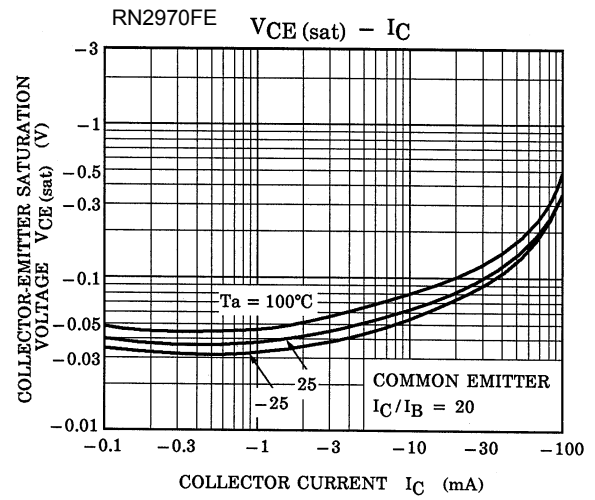
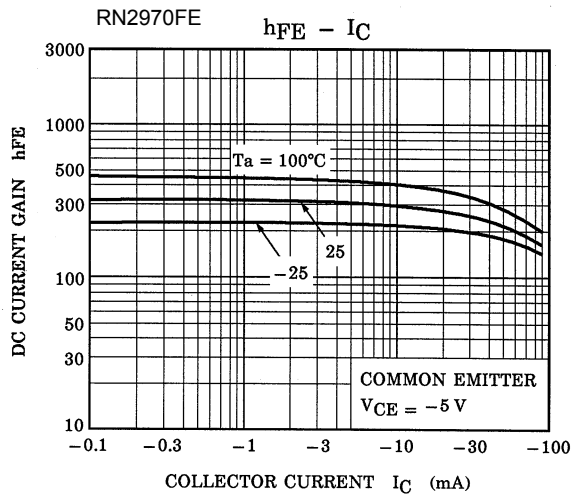
Electrical Characteristics (Ta = 25°C) (Q1, Q2 common)

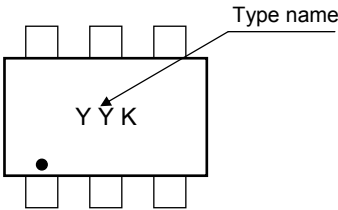
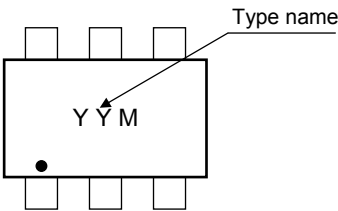
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	$V_{CB} = -50\text{ V}, I_E = 0$	—	—	-100	nA
Emitter cut-off current		I_{EBO}	$V_{EB} = -5\text{ V}, I_C = 0$	—	—	-100	nA
DC current gain		h_{FE}	$V_{CE} = -5\text{ V}, I_C = -1\text{ mA}$	120	—	400	
Collector-emitter 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	$k\Omega$
	RN2971FE			7	10	13	

Q1, Q2 Common



Q1, Q2 Common



Type Name	Marking
RN2970FE	 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, with an arrow pointing to the second 'Y'. A small dot is located on the bottom-left corner. A label 'Type name' with an arrow points to the top-right corner of the component.
RN2971FE	 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, with an arrow pointing to the second 'Y'. A small dot is located on the bottom-left corner. A label 'Type name' with an arrow points to the top-right corner of the component.

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