

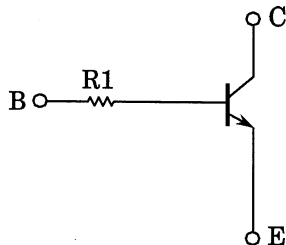
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

RN1970, RN1971

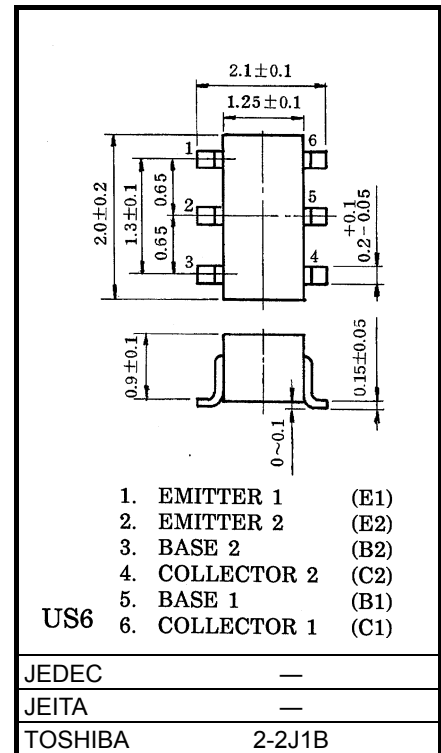
Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

- Including two devices in US6 (ultra super mini type 6 leads)
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN2970 to RN2971

Equivalent Circuit



Unit: mm



Weight: 6.8mg (typ.)

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

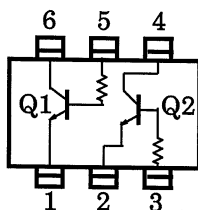
Characteristic	Symbol	Rating	Unit
Collector-base voltage	V _{CB0}	50	V
Collector-emitter voltage	V _{CEO}	50	V
Emitter-base voltage	V _{EBO}	5	V
Collector current	I _C	100	mA
Collector power dissipation	P _C *	200	mW
Junction temperature	T _j	150	°C
Storage temperature range	T _{stg}	-55 to 150	°C

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).

*: Total rating

Equivalent Circuit (Top View)

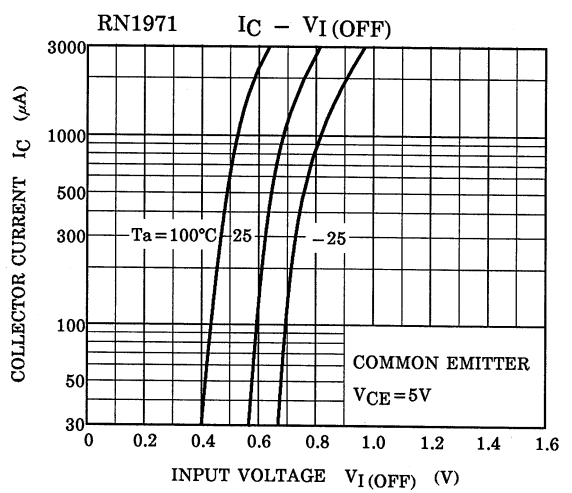
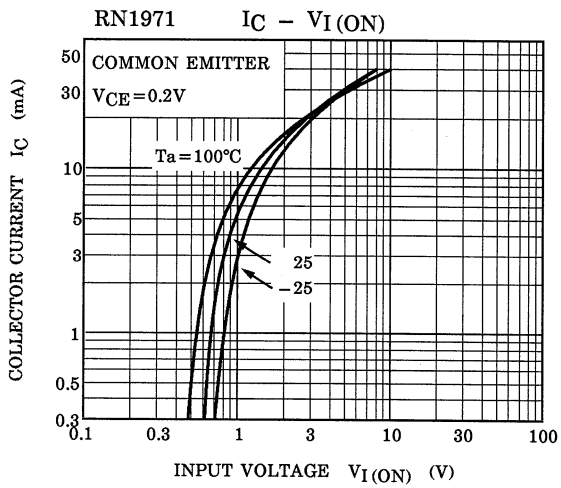
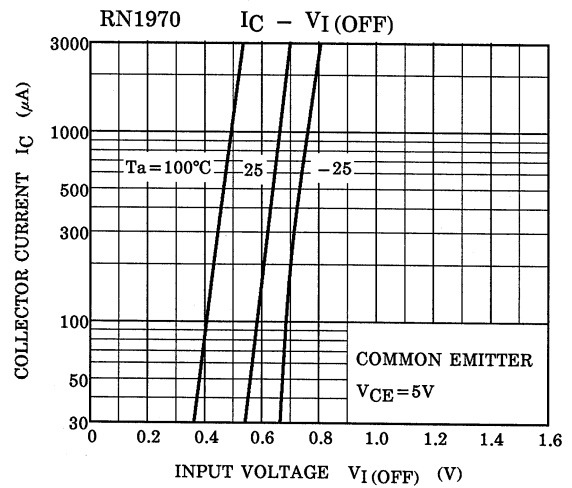
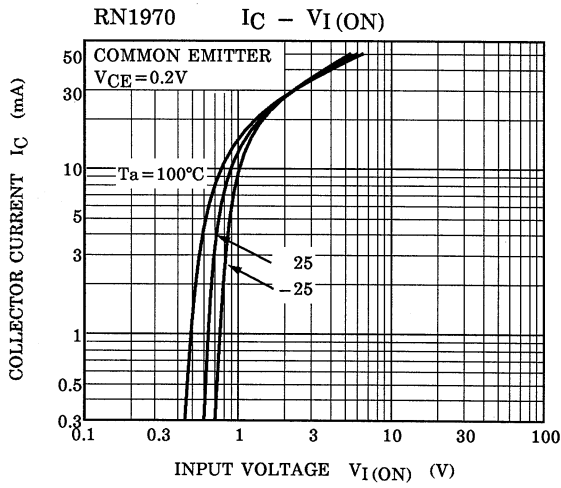


Start of commercial production
1992-01

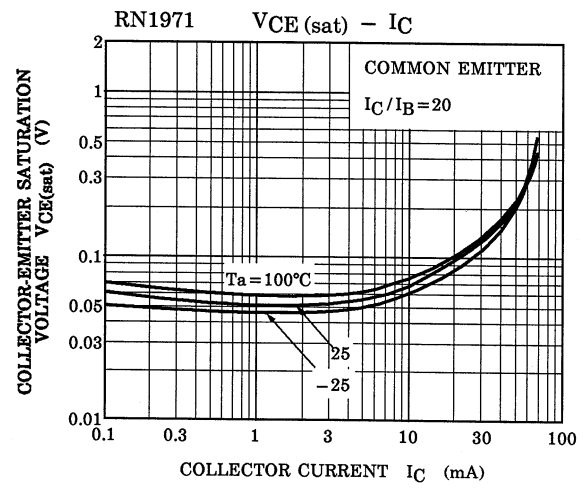
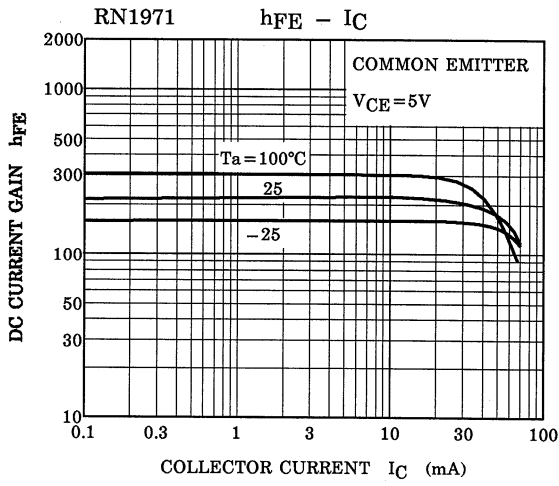
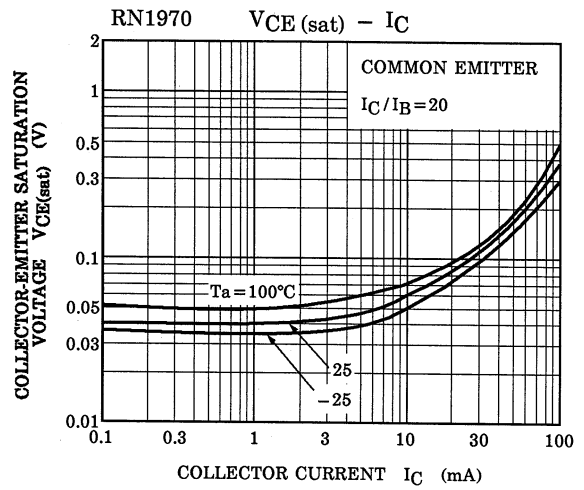
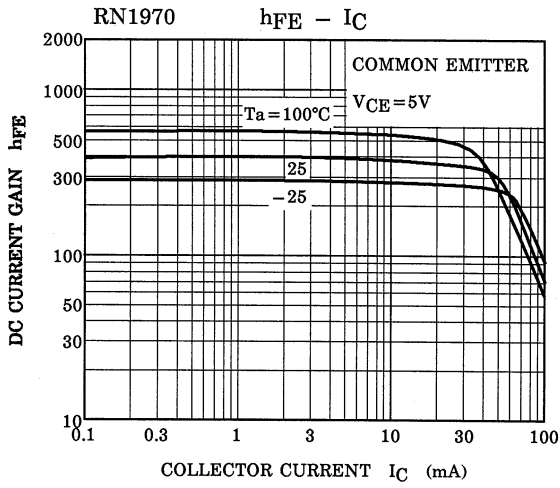
Electrical Characteristics (Ta = 25°C) (Q1, Q2 Common)

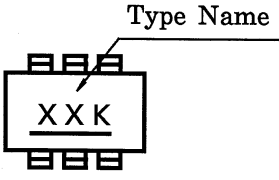
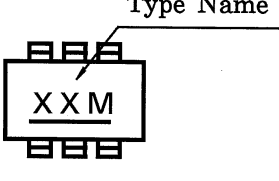
Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	—	$V_{CB} = 5V, I_E = 0$	—	—	100	nA
Emitter cut-off current	I_{EBO}	—	$V_{EB} = 5V, I_C = 0$	—	—	100	nA
DC current gain	h_{FE}	—	$V_{CE} = 5V, I_C = 1mA$	120	—	700	—
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	$I_C = 5mA, I_B = 0.25mA$	—	0.1	0.3	V
Translation frequency	f_T	—	$V_{CE} = 10V, I_C = 5mA$	—	250	—	MHz
Collector output capacitance	C_{ob}	—	$V_{CB} = 10V, I_E = 0, f = 1MHz$	—	3	6	pF
Input resistor	RN1970	R1	—	3.29	4.7	6.11	kΩ
	RN1971			7	10	13	

(Q1, Q2 Common)



(Q1, Q2 Common)



Type Name	Marking
RN1970	 <p>The diagram shows a rectangular marking on a component. At the top, there are three '8' characters. Below them is a horizontal line. Under the line are the characters 'X X K'. Below that is another horizontal line, and at the bottom are three '8' characters. A label 'Type Name' with a pointer line indicates the 'X X K' characters.</p>
RN1971	 <p>The diagram shows a rectangular marking on a component. At the top, there are three '8' characters. Below them is a horizontal line. Under the line are the characters 'X X M'. Below that is another horizontal line, and at the bottom are three '8' characters. A label 'Type Name' with a pointer line indicates the 'X X M' characters.</p>

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Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.