

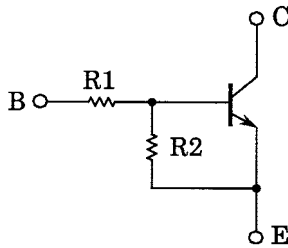
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

RN1967, RN1968, RN1969

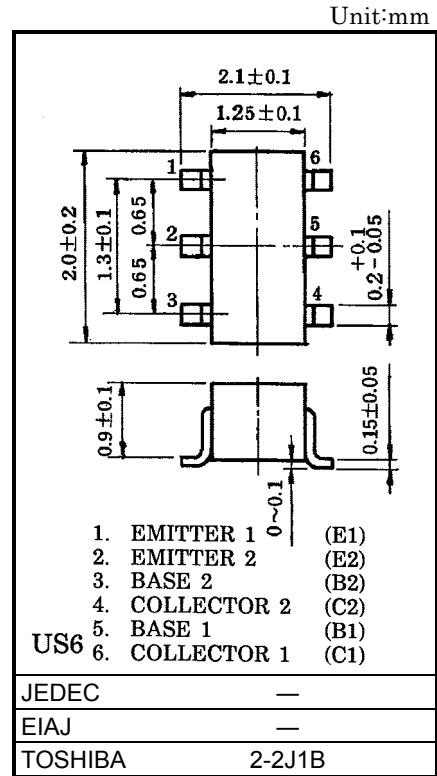
Switching, Inverter Circuit, Interface Circuit
And Driver Circuit Applications

- 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 RN2967~RN2969

Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN1967	10	47
RN1968	22	47
RN1969	47	22

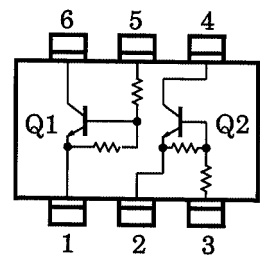


Equivalent Circuit (Top View)

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

Characteristic	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	50	V
Collector-emitter voltage	V_{CEO}	50	V
Emitter-base voltage	V_{EBO}	6	V
		7	
		15	
Collector current	I_C	100	mA
Collector power dissipation	P_C^*	200	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	-55~150	°C

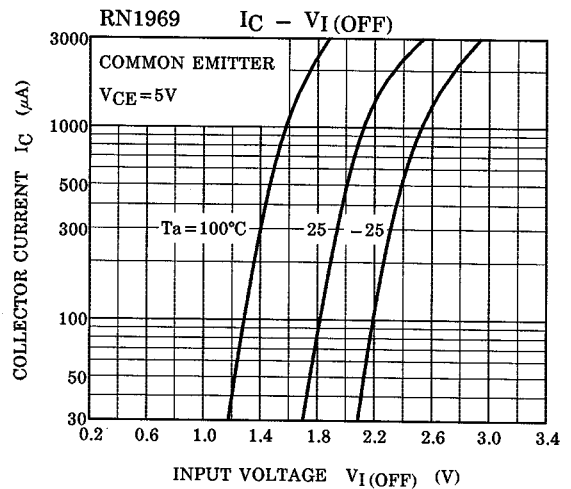
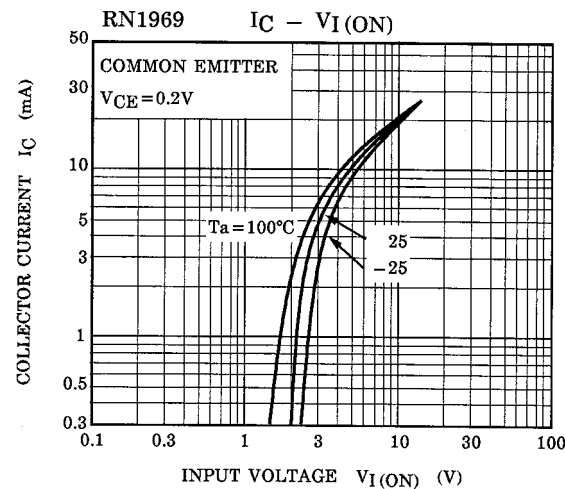
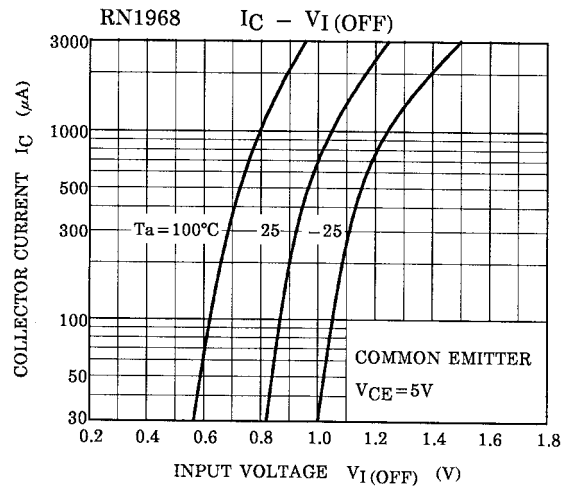
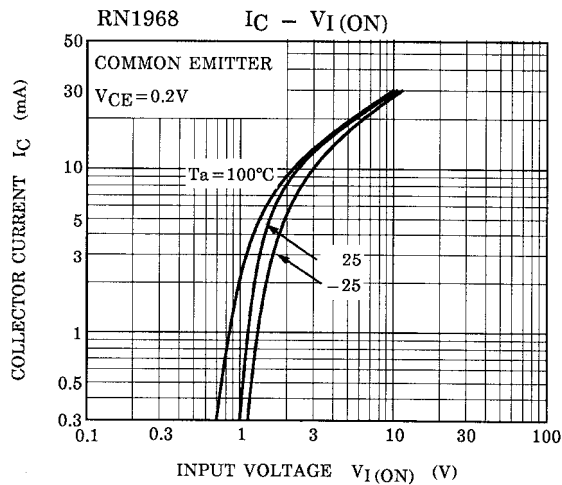
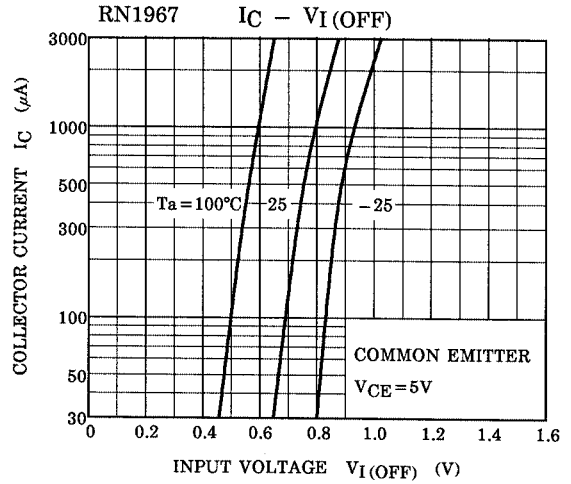
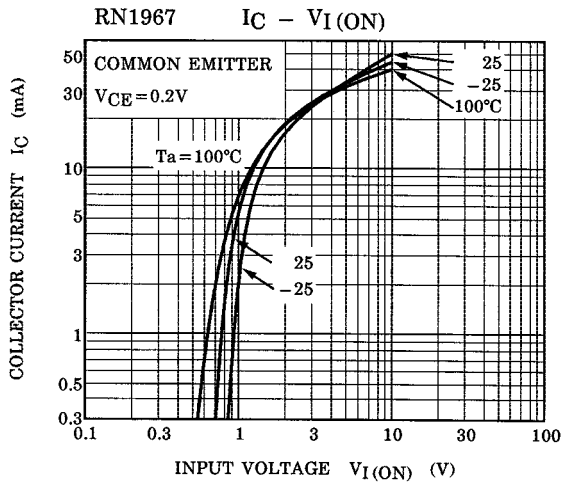
*: Total rating



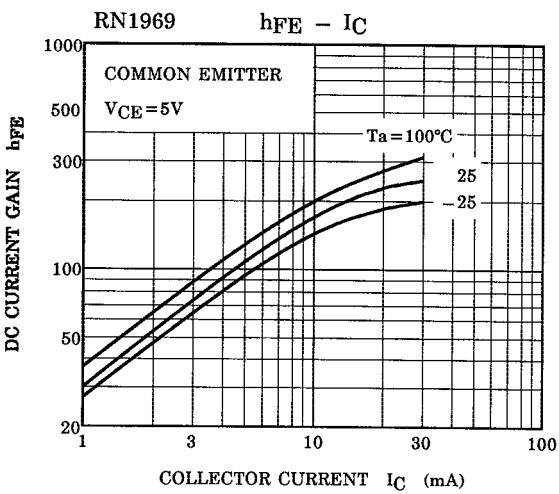
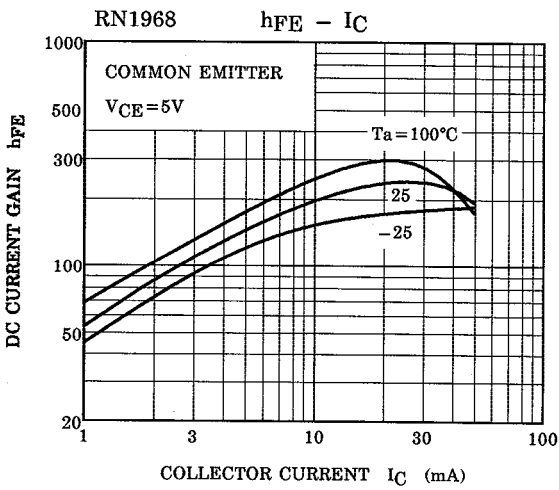
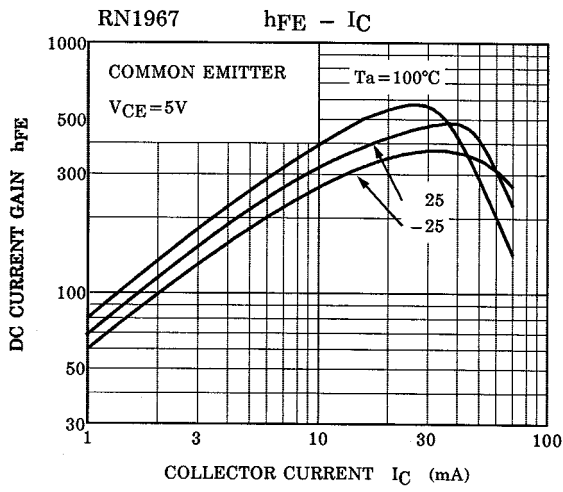
Electrical Characteristics (Ta = 25°C) (Q1, Q2 Common)

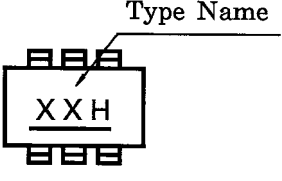
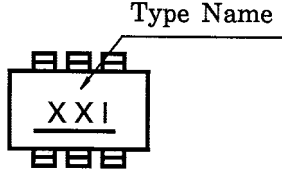
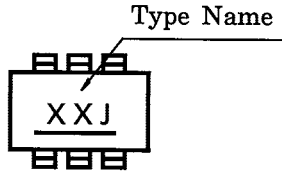
Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN1967~1969	I_{CBO}	—	$V_{CB} = 50V, I_E = 0$	—	—	100	nA
		I_{CEO}	—	$V_{CE} = 50V, I_B = 0$	—	—	500	nA
Emitter cut-off current	RN1967	I_{EBO}	—	$V_{EB} = 6V, I_C = 0$	0.081	—	0.15	mA
	RN1968		—	$V_{EB} = 7V, I_C = 0$	0.078	—	0.145	
	RN1969		—	$V_{EB} = 15V, I_C = 0$	0.167	—	0.311	
DC current gain	RN1967	h_{FE}	—	$V_{CE} = 5V, I_C = 10mA$	80	—	—	—
	RN1968		—		80	—	—	
	RN1969		—		70	—	—	
Collector-emitter saturation voltage	RN1967~1969	$V_{CE(sat)}$	—	$I_C = 5mA, I_B = 0.25mA$	—	0.1	0.3	V
Input voltage (ON)	RN1967	$V_{I(ON)}$	—	$V_{CE} = 0.2V, I_C = 5mA$	0.7	—	1.8	V
	RN1968		—		1.0	—	2.6	
	RN1969		—		2.2	—	5.8	
Input voltage (OFF)	RN1967	$V_{I(OFF)}$	—	$V_{CE} = 5V, I_C = 0.1mA$	0.5	—	1.0	V
	RN1968		—		0.6	—	1.16	
	RN1969		—		1.5	—	2.6	
Transition frequency	RN1967~1969	f_T	—	$V_{CE} = 10V, I_C = 5mA$	—	250	—	MHz
Collector output capacitance	RN1967~1969	C_{ob}	—	$V_{CB} = 10V, I_E = 0$ $f = 1MHz$	—	3	6	pF
Input resistor	RN1967	R1	—	—	7	10	13	kΩ
	RN1968		—		15.4	22	28.6	
	RN1969		—		32.9	47	61.1	
Resistor ratio	RN1967	R1/R2	—	—	0.191	0.213	0.232	—
	RN1968		—		0.421	0.468	0.515	
	RN1969		—		1.92	2.14	2.35	

(Q1, Q2 Common)



(Q1, Q2 Common)



Type Name	Marking
RN1967	 <p>The diagram shows a rectangular component with four pins. The top two pins are labeled 'BBB' and the bottom two are labeled 'BBB'. In the center, the text 'XXH' is printed and underlined. A line points from the text 'Type Name' to the 'XXH' marking.</p>
RN1968	 <p>The diagram shows a rectangular component with four pins. The top two pins are labeled 'BBB' and the bottom two are labeled 'BBB'. In the center, the text 'XXI' is printed and underlined. A line points from the text 'Type Name' to the 'XXI' marking.</p>
RN1969	 <p>The diagram shows a rectangular component with four pins. The top two pins are labeled 'BBB' and the bottom two are labeled 'BBB'. In the center, the text 'XXJ' is printed and underlined. A line points from the text 'Type Name' to the 'XXJ' marking.</p>

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