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

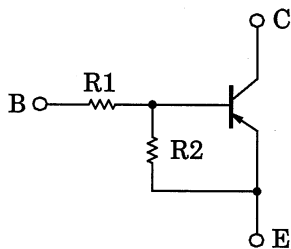
RN2507, RN2508, RN2509

Unit: mm

Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

- Including two devices in SMV (super mini type with 5 leads)
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN1507 to RN1509

Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN2507	10	47
RN2508	22	47
RN2509	47	22

1. BASE 1 (B1)
2. EMITTER (E)
3. BASE 2 (B2)
4. COLLECTOR 2 (C2)
5. COLLECTOR 1 (C1)

SMV

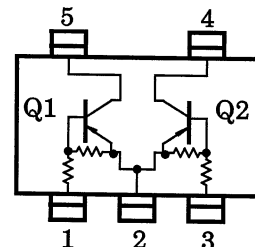
JEDEC	—
JEITA	—
TOSHIBA	2-3L1A

Weight: 14mg (typ.)

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

Characteristics	Symbol	Rating	Unit	
Collector-base voltage	RN2507 to RN2509	V_{CB0}	-50	V
Collector-emitter voltage		V_{CEO}	-50	V
Emitter-base voltage	RN2507 to RN2509	V_{EBO}	-6	V
			-7	
			-15	
Collector current	RN2507 to RN2509	I_C	-100	mA
Collector power dissipation		P_C^*	300	mW
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	-55 to 150	°C

Equivalent Circuit (top view)



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.

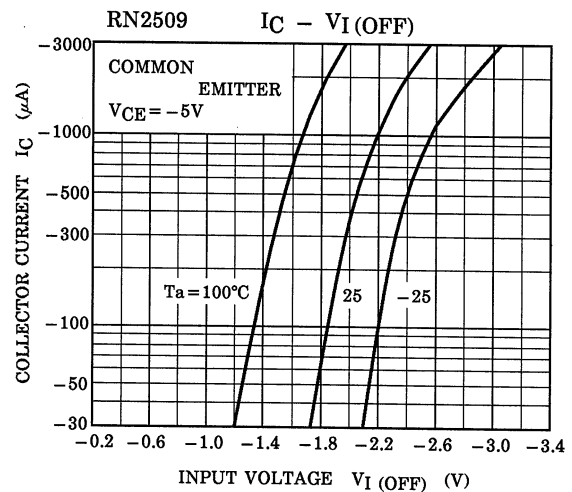
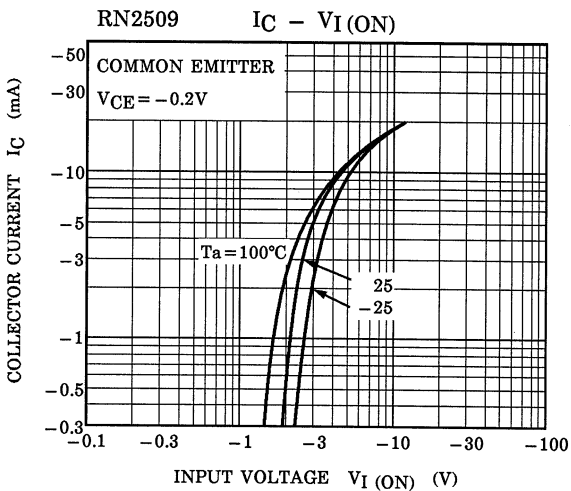
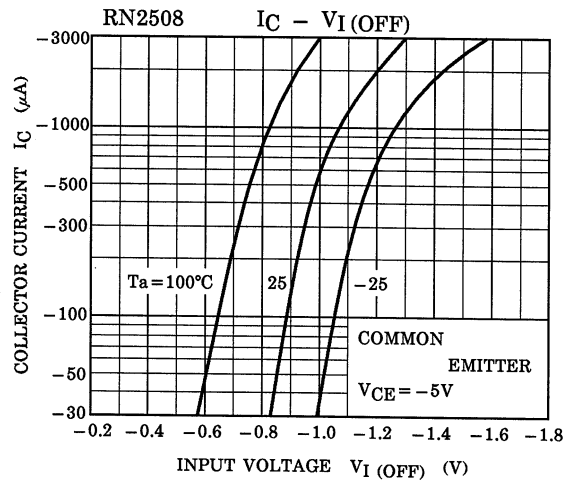
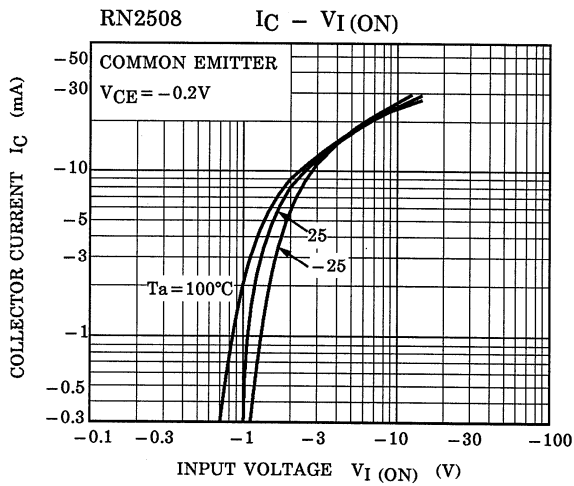
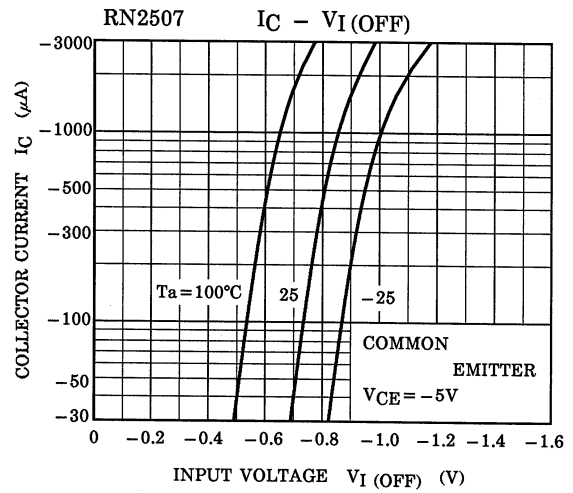
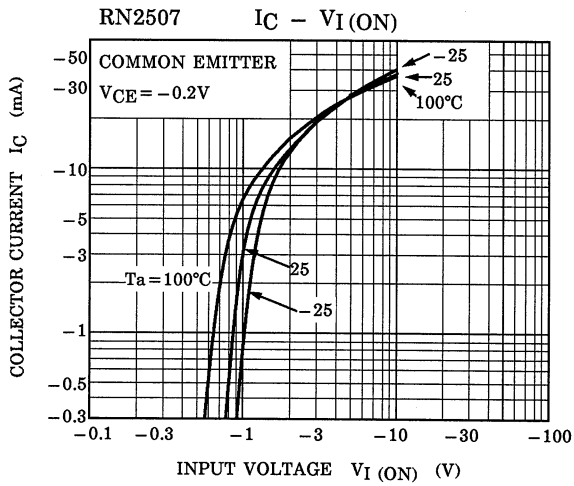
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

*Total rating

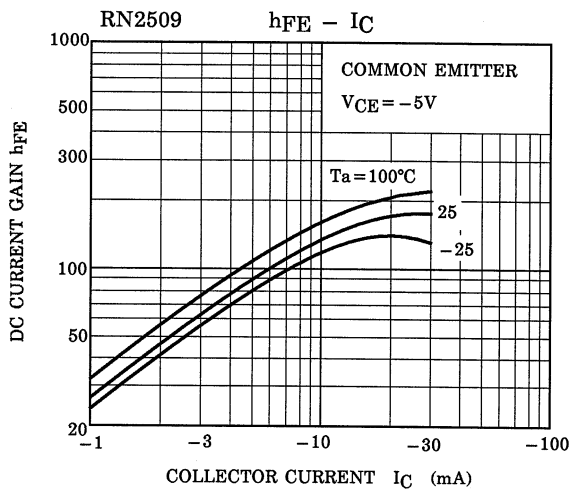
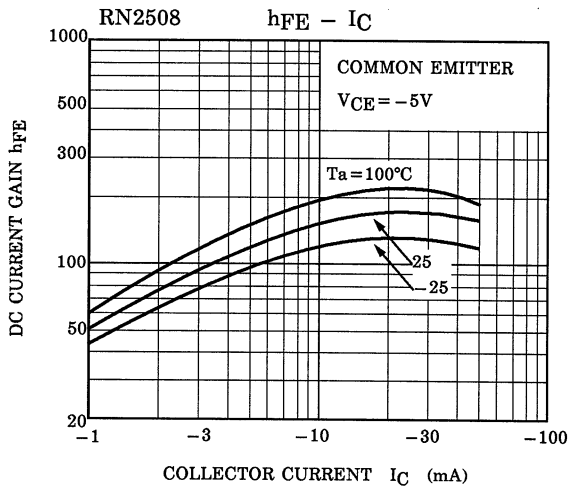
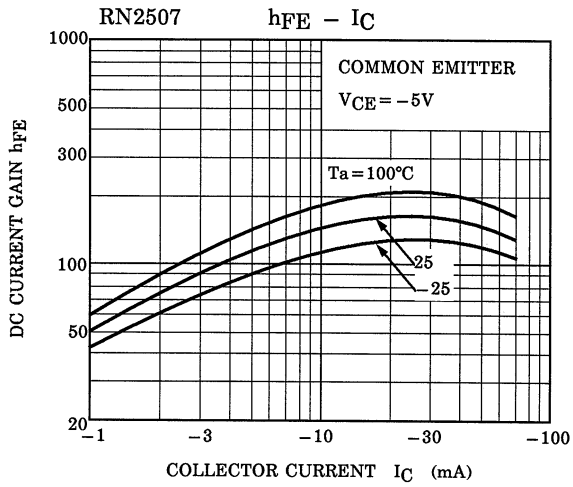
Electrical Characteristics (Ta = 25°C) (Q1, Q2 Common)

Characteristics		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN2507 to RN2509	ICBO	—	V _{CB} = -50V, I _E = 0	—	—	-100	nA
		ICEO	—	V _{CE} = -50V, I _B = 0	—	—	-500	nA
Emitter cut-off current	RN2507	IEBO	—	V _{EB} = -6V, I _C = 0	-0.081	—	-0.15	mA
	RN2508		—	V _{EB} = -7V, I _C = 0	-0.078	—	-0.145	
	RN2509		—	V _{EB} = -15V, I _C = 0	-0.167	—	-0.311	
DC current gain	RN2507	h _{FE}	—	V _{CE} = -5V, I _C = -10mA	80	—	—	—
	RN2508		—		80	—	—	
	RN2509		—		70	—	—	
Collector-emitter saturation voltage	RN2507 to RN2509	V _{CE (sat)}	—	I _C = -5mA, I _B = -0.25mA	—	-0.1	-0.3	V
Input voltage (ON)	RN2507	V _{I (ON)}	—	V _{CE} = -0.2V, I _C = -5mA	-0.7	—	-1.8	V
	RN2508		—		-1.0	—	-2.6	
	RN2509		—		-2.2	—	-5.8	
Input voltage (OFF)	RN2507	V _{I (OFF)}	—	V _{CE} = -5V, I _C = -0.1mA	-0.5	—	-1.0	V
	RN2508		—		-0.6	—	-1.16	
	RN2509		—		-1.5	—	-2.6	
Transition frequency	RN2507 to RN2509	f _T	—	V _{CE} = -10V, I _C = -5mA	—	200	—	MHz
Collector output capacitance	RN2507 to RN2509	C _{ob}	—	V _{CB} = -10V, I _E = 0 f = 1MHz	—	3	6	pF
Input resistor	RN2507	R1	—	—	7	10	13	kΩ
	RN2508		—		15.4	22	28.6	
	RN2509		—		32.9	47	61.1	
Resistor ratio	RN2507	R1/R2	—	—	0.191	0.213	0.232	—
	RN2508		—		0.421	0.468	0.515	
	RN2509		—		1.92	2.14	2.35	

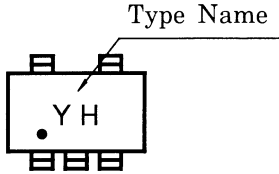
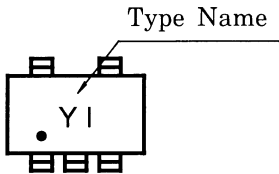
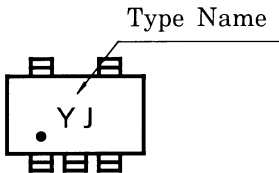
(Q1, Q2 Common)



(Q1, Q2 Common)



Marking

Type Name	Marking
RN2507	 <p>The diagram shows a rectangular component with two pins on top and four pins on the bottom. A line points from the text 'Type Name' to the top-right pin. The marking 'YH' is printed on the component, with a small dot to the left of the 'Y'.</p>
RN2508	 <p>The diagram shows a rectangular component with two pins on top and four pins on the bottom. A line points from the text 'Type Name' to the top-right pin. The marking 'YI' is printed on the component, with a small dot to the left of the 'Y'.</p>
RN2509	 <p>The diagram shows a rectangular component with two pins on top and four pins on the bottom. A line points from the text 'Type Name' to the top-right pin. The marking 'YJ' is printed on the component, with a small dot to the left of the 'Y'.</p>

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