

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

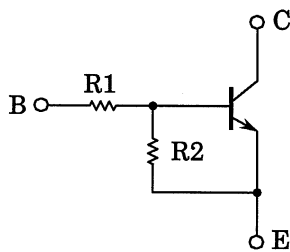
RN1507, RN1508, RN1509

Unit: mm

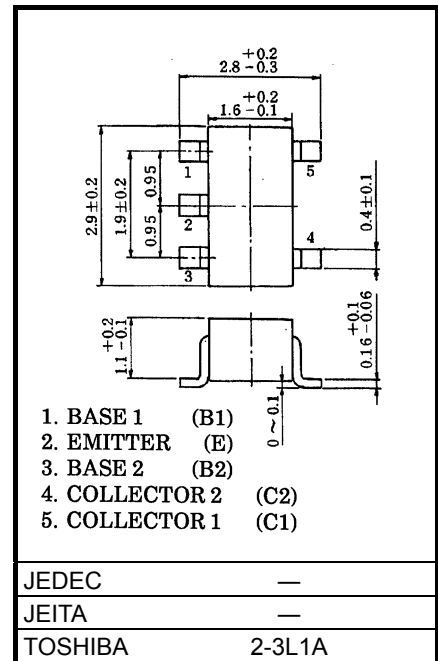
Switching, Inverter Circuit, Interface Circuit
And Driver Circuit Applications

- 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 RN2507~RN2509

Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN1907	10	47
RN1908	22	47
RN1909	47	22

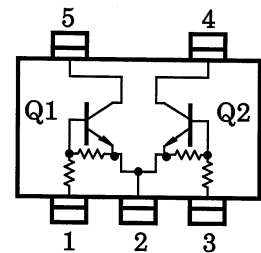


Weight: 0.014g (typ.)

Equivalent Circuit (Top View)

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

Characteristic	Symbol	Rating	Unit	
Collector-base voltage	RN1507~1509	V_{CB0}	50	V
Collector-emitter voltage		V_{CEO}	50	V
Emitter-base voltage	V_{EBO}	RN1507	6	V
		RN1508	7	
		RN1509	15	
Collector current	RN1507~1509	I_C	100	mA
Collector power dissipation		P_C^*	300	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.

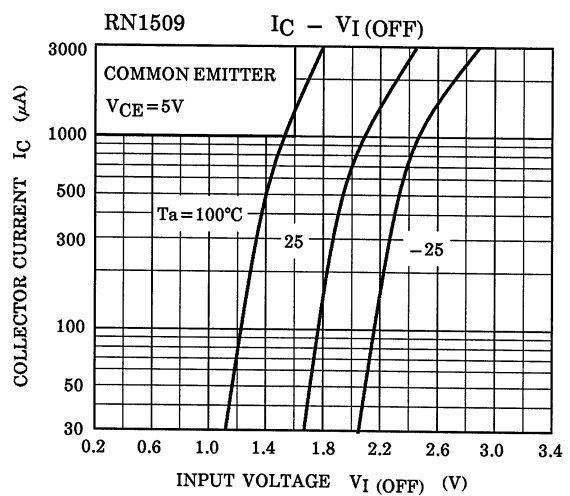
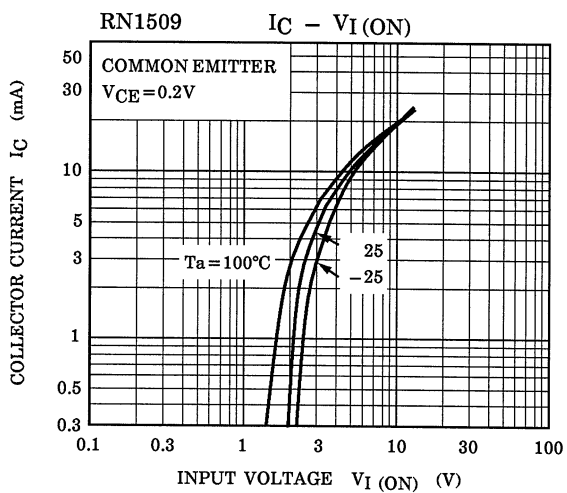
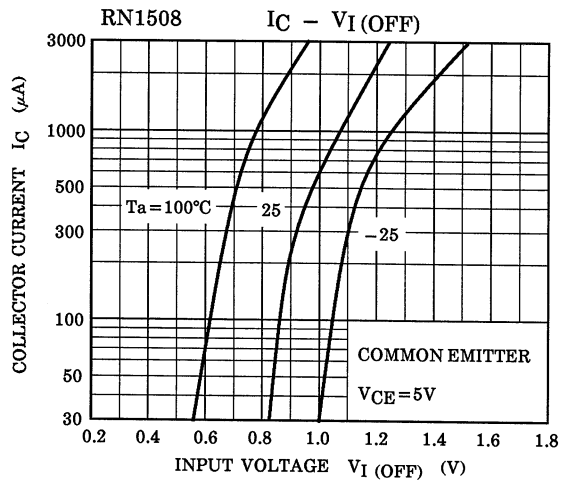
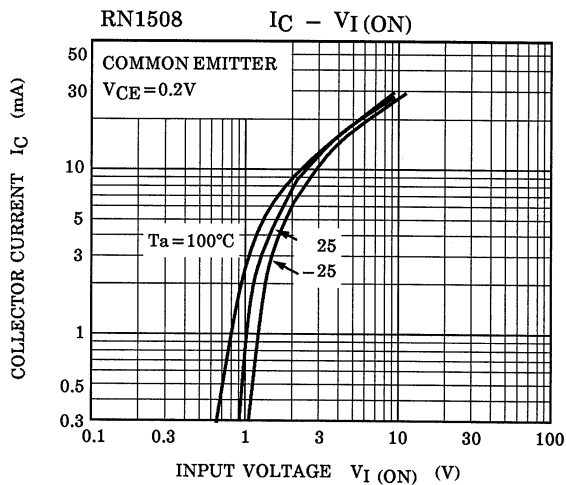
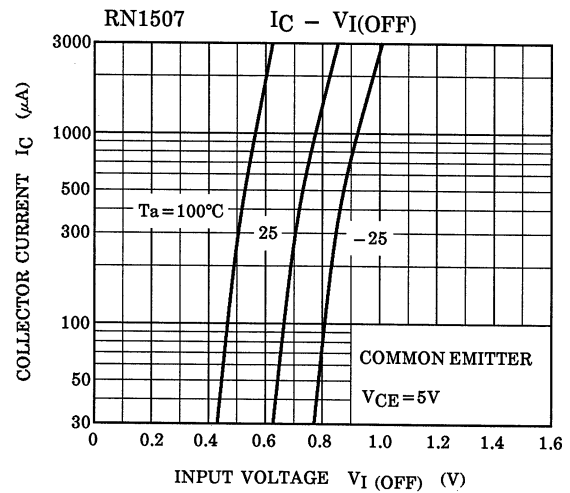
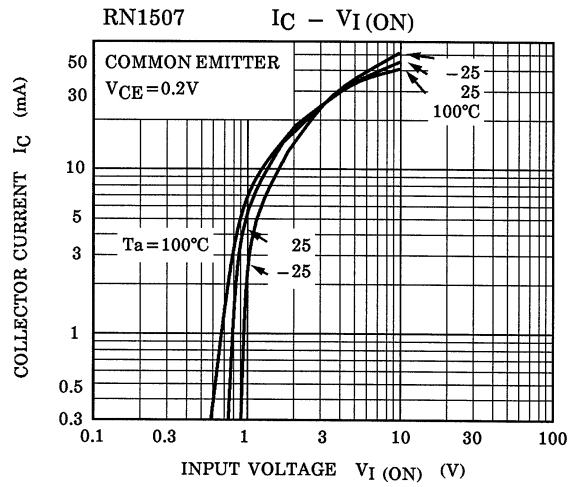
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

* : Total rating

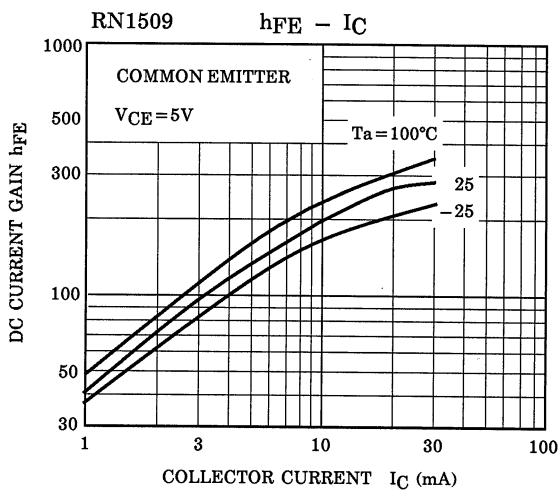
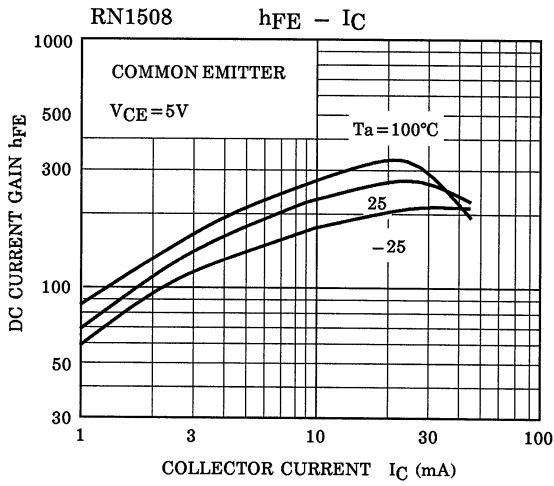
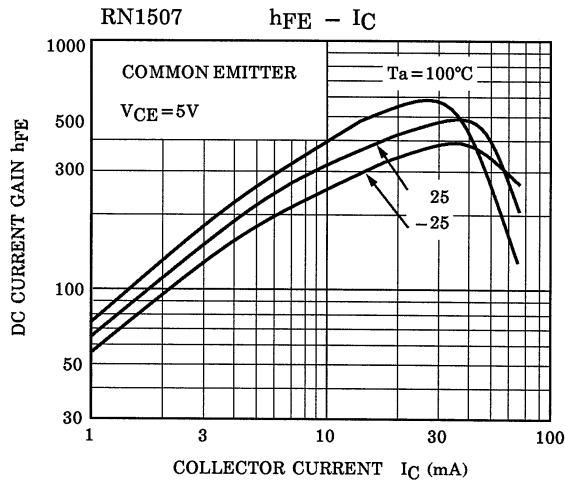
Electrical Characteristics (Ta = 25°C) (Q1, Q2 Common)

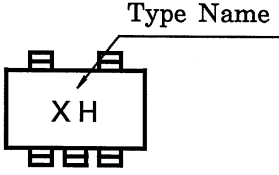
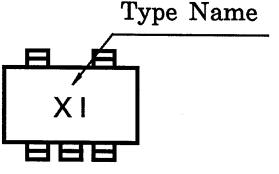
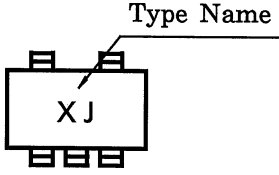
Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN1507~1509	I_{CBO}	—	$V_{CB} = 50V, I_E = 0$	—	—	100	nA
		I_{CEO}		$V_{CE} = 50V, I_B = 0$	—	—	500	nA
Emitter cut-off current	RN1507	I_{EBO}	—	$V_{EB} = 6V, I_C = 0$	0.081	—	0.15	mA
	RN1508			$V_{EB} = 7V, I_C = 0$	0.078	—	0.145	
	RN1509			$V_{EB} = 15V, I_C = 0$	0.167	—	0.311	
DC current gain	RN1507	h_{FE}	—	$V_{CE} = 5V, I_C = 10mA$	80	—	—	
	RN1508				80	—	—	
	RN1509				70	—	—	
Collector-emitter saturation voltage	RN1507~1509	$V_{CE(sat)}$	—	$I_C = 5mA, I_B = 0.25mA$	—	0.1	0.3	V
Input voltage (ON)	RN1507	$V_{I(ON)}$	—	$V_{CE} = 0.2V, I_C = 5mA$	0.7	—	1.8	V
	RN1508				1.0	—	2.6	
	RN1509				2.2	—	5.8	
Input voltage (OFF)	RN1507	$V_{I(OFF)}$	—	$V_{CE} = 5V, I_C = 0.1mA$	0.5	—	1.0	V
	RN1508				0.6	—	1.16	
	RN1509				1.5	—	2.6	
Transition frequency	RN1507~1509	f_T	—	$V_{CE} = 10V, I_C = 5mA$	—	250	—	MHz
Collector Output capacitance	RN1507~1509	C_{ob}	—	$V_{CB} = 10V, I_E = 0, f = 1MHz$	—	3	6	pF
Input resistor	RN1507	R1	—		7	10	13	kΩ
	RN1508				15.4	22	28.6	
	RN1509				32.9	47	61.1	
Resistor ratio	RN1507	R1/R2	—		0.191	0.213	0.232	
	RN1508				0.421	0.468	0.515	
	RN1509				1.92	2.14	2.35	

Q1, Q2 Common



Q1, Q2 Common



Type Name	Marking
RN1507	 <p>The diagram shows a rectangular component with two pins on the top edge and four pins on the bottom edge. The marking 'XH' is printed in the center. A line points from the text 'Type Name' to the 'H' in 'XH'.</p>
RN1508	 <p>The diagram shows a rectangular component with two pins on the top edge and four pins on the bottom edge. The marking 'XI' is printed in the center. A line points from the text 'Type Name' to the 'I' in 'XI'.</p>
RN1509	 <p>The diagram shows a rectangular component with two pins on the top edge and four pins on the bottom edge. The marking 'XJ' is printed in the center. A line points from the text 'Type Name' to the 'J' in 'XJ'.</p>

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