

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

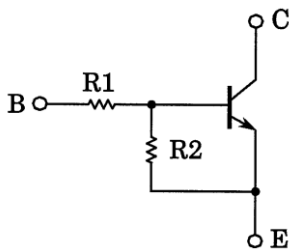
# RN1907, RN1908, RN1909

Switching, Inverter Circuit, Interface Circuit and Driver Circuit

- AEC-Q101 Qualified (Note1)
- Including two devices in US6 (ultra super mini type with 6 leads).
- With built-in bias resistors.
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process and miniaturize equipment.
- Various resistance values are available to suit various circuit designs.
- Complementary to RN2907 to RN2909

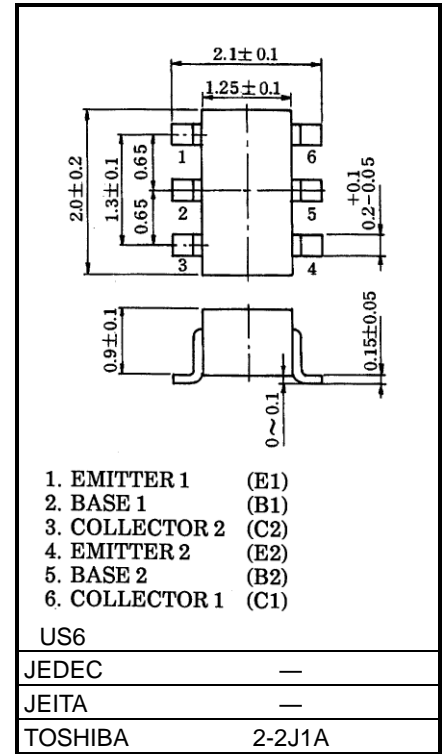
Note1: For detail information, please contact to our sales.

### Equivalent Circuit and Bias Resistor Values



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

Unit: mm

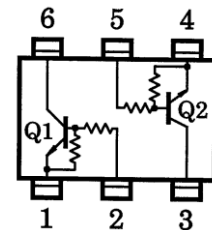


Weight: 6.8mg(typ.)

### Equivalent Circuit (Top View)

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

Characteristic	Symbol	Rating	Unit
Collector-base voltage	V <sub>CB0</sub>	50	V
Collector-emitter voltage			
Emitter-base voltage	V <sub>EBO</sub>	6	V
		7	
		15	
Collector current	I <sub>C</sub>	100	mA
Collector power dissipation	P <sub>C</sub> *	200	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature range	T <sub>stg</sub>	-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).

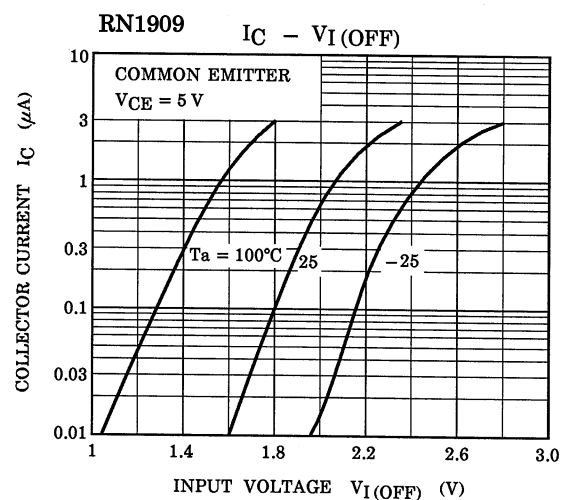
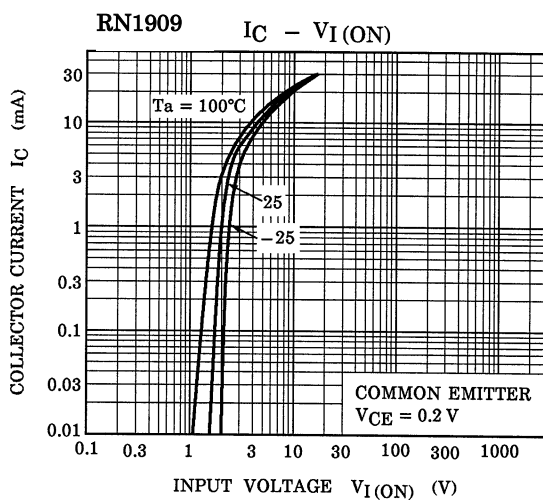
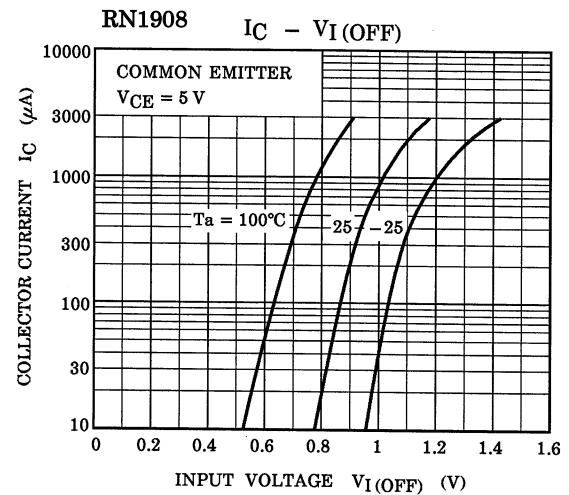
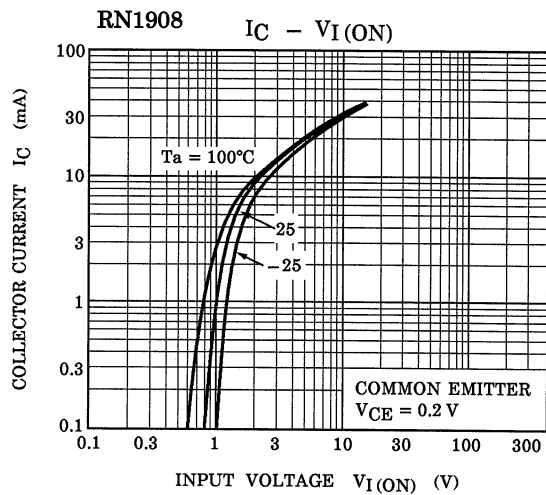
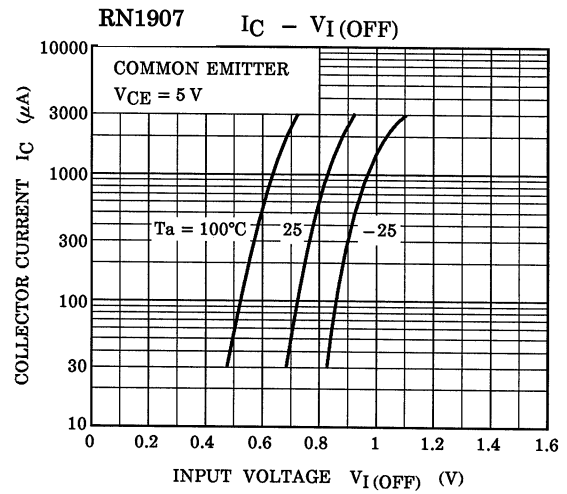
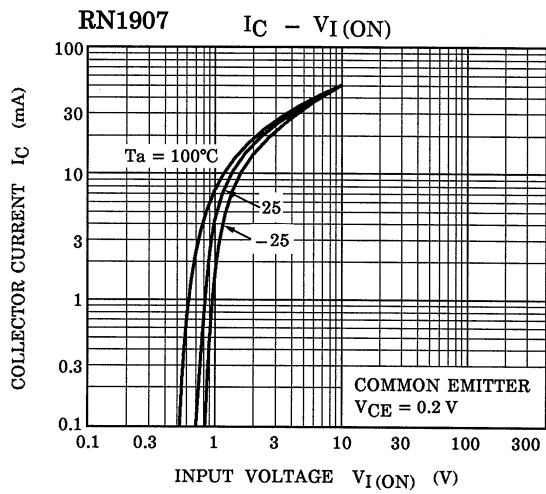
\*: Total rating

Start of commercial production  
1990-12

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

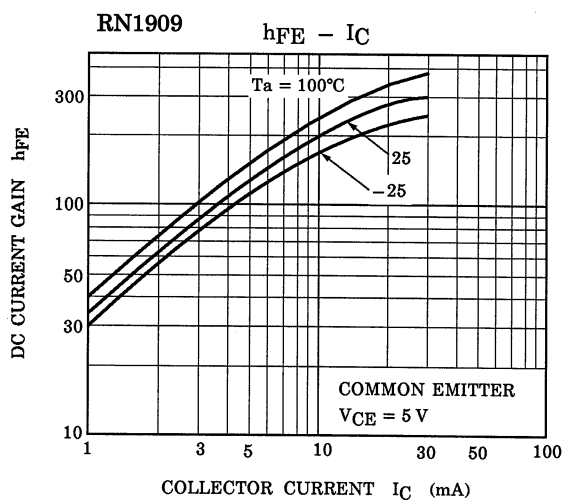
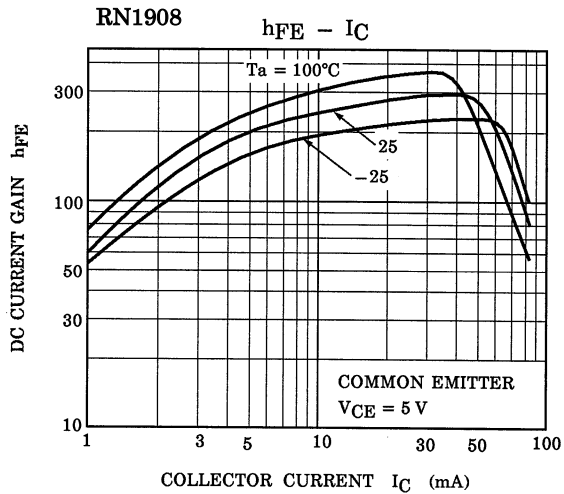
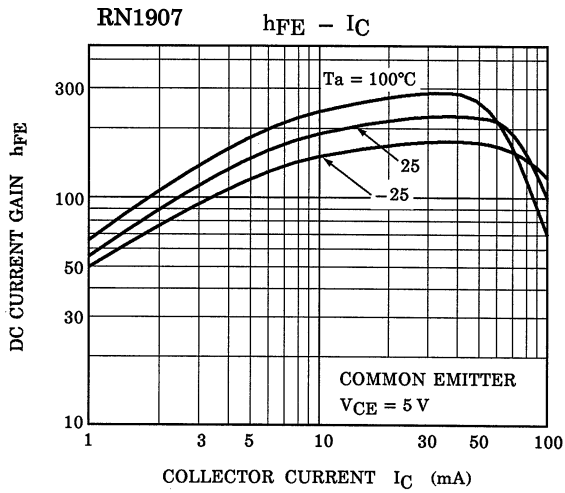
Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN1907 to 1909	$I_{CBO}$	$V_{CB} = 50\text{ V}, I_E = 0\text{ mA}$	—	—	100	nA
		$I_{CEO}$	$V_{CE} = 50\text{ V}, I_B = 0\text{ mA}$	—	—	500	nA
Emitter cut-off current	RN1907	$I_{EBO}$	$V_{EB} = 6\text{ V}, I_C = 0\text{ mA}$	0.081	—	0.15	mA
	RN1908			0.078	—	0.145	
	RN1909			0.167	—	0.311	
DC current gain	RN1907	$h_{FE}$	$V_{CE} = 5\text{ V}, I_C = 10\text{ mA}$	80	—	—	—
	RN1908			80	—	—	
	RN1909			70	—	—	
Collector-emitter saturation voltage	RN1907 to 1909	$V_{CE(sat)}$	$I_C = 5\text{ mA}, I_B = 0.25\text{ mA}$	—	0.1	0.3	V
Input voltage (ON)	RN1907	$V_{I(ON)}$	$V_{CE} = 0.2\text{ V}, I_C = 5\text{ mA}$	0.7	—	1.8	V
	RN1908			1.0	—	2.6	
	RN1909			2.2	—	5.8	
Input voltage (OFF)	RN1907	$V_{I(OFF)}$	$V_{CE} = 5\text{ V}, I_C = 0.1\text{ mA}$	0.5	—	1.0	V
	RN1908			0.6	—	1.16	
	RN1909			1.5	—	2.6	
Transition frequency	RN1907 to 1909	$f_T$	$V_{CE} = 10\text{ V}, I_C = 5\text{ mA}$	—	250	—	MHz
Collector output capacitance	RN1907 to 1909	$C_{ob}$	$V_{CB} = 10\text{ V}, I_E = 0\text{ mA}, f = 1\text{ MHz}$	—	3	6	pF
Input resistor	RN1907	R1	—	7	10	13	k $\Omega$
	RN1908			15.4	22	28.6	
	RN1909			32.9	47	61.1	
Resistor ratio	RN1907	R1/R2	—	0.191	0.213	0.232	—
	RN1908			0.421	0.468	0.515	
	RN1909			1.92	2.14	2.35	

### Characteristics Curves (Q1, Q2 Common)



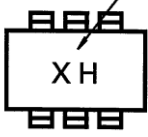
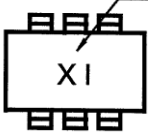
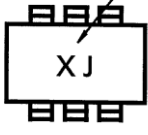
The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

### Characteristics Curves (Q1, Q2 Common)



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### Marking

Part No.	Marking
RN1907	<p data-bbox="571 309 831 338">Part No.(abbreviation code)</p> 
RN1908	<p data-bbox="571 548 831 577">Part No.(abbreviation code)</p> 
RN1909	<p data-bbox="571 788 831 817">Part No.(abbreviation code)</p> 

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