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

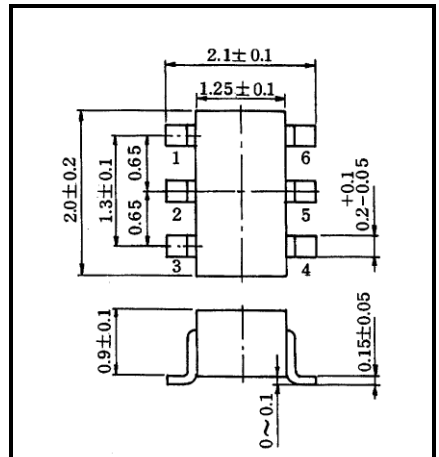
RN1907, RN1908, RN1909

Unit: mm

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.



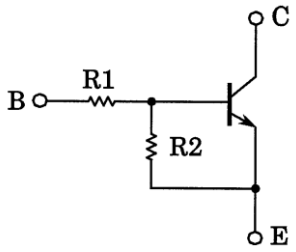
1. EMITTER 1 (E1)
2. BASE 1 (B1)
3. COLLECTOR 2 (C2)
4. EMITTER 2 (E2)
5. BASE 2 (B2)
6. COLLECTOR 1 (C1)

US6

JEDEC	—
JEITA	—
TOSHIBA	2-2J1A

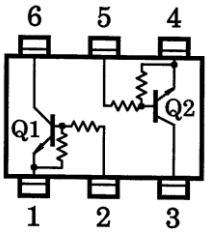
Weight: 6.8mg(typ.)

Equivalent Circuit and Bias Resistor Values



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

Equivalent Circuit (Top View)



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

Characteristic		Symbol	Rating	Unit
Collector-base voltage	RN1907 to 1909	V_{CBO}	50	V
Collector-emitter voltage	RN1907 to 1909	V_{CEO}	50	V
Emitter-base voltage	RN1907	V_{EBO}	6	V
	RN1908		7	
	RN1909		15	
Collector current	RN1907 to 1909	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).

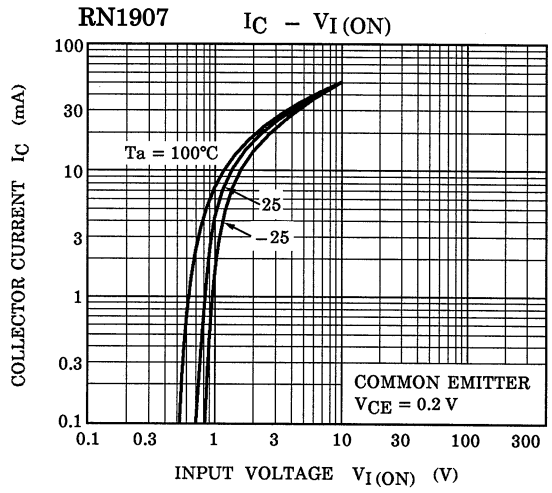
*: Total rating

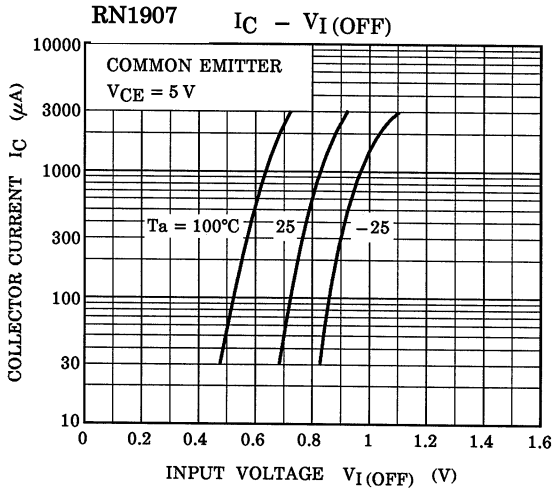
Start of commercial production
1990-12

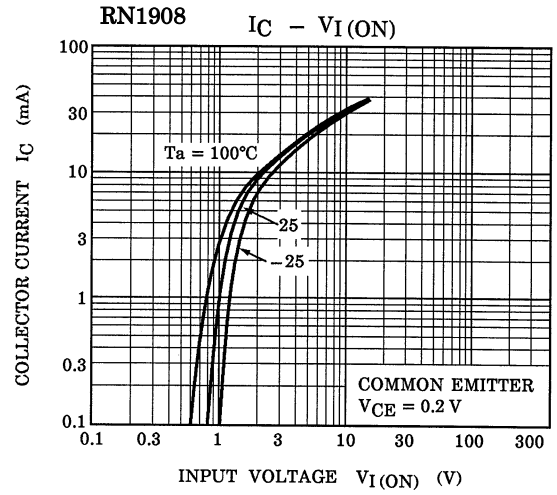
Electrical Characteristics (Ta = 25°C) (Q1, Q2 Common)

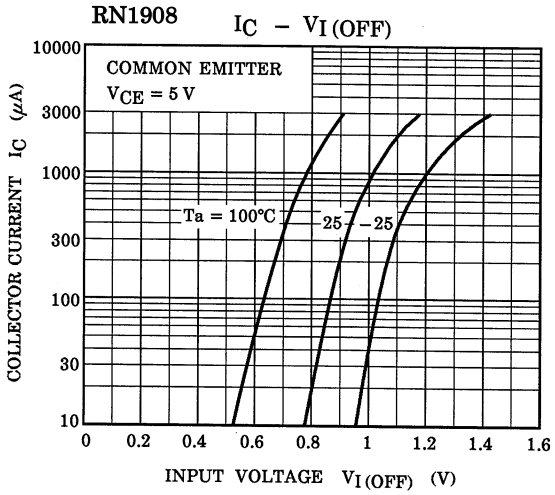
Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN1907 to 1909	I_{CBO}	V_{CB} = 50 V, I_E = 0 mA	—	—	100	nA
		I_{CEO}	V_{CE} = 50 V, I_B = 0 mA	—	—	500	nA
Emitter cut-off current	RN1907	I_{EBO}	V_{EB} = 6 V, I_C = 0 mA	0.081	—	0.15	mA
	RN1908		V_{EB} = 7 V, I_C = 0 mA	0.078	—	0.145	
	RN1909		V_{EB} = 15 V, I_C = 0 mA	0.167	—	0.311	
DC current gain	RN1907	h_{FE}	V_{CE} = 5 V, I_C = 10 mA	80	—	—	—
	RN1908			80	—	—	
	RN1909			70	—	—	
Collector-emitter saturation voltage	RN1907 to 1909	$V_{CE\ (sat)}$	I_C = 5 mA, I_B = 0.25 mA	—	0.1	0.3	V
Input voltage (ON)	RN1907	$V_{I\ (ON)}$	V_{CE} = 0. 2 V, I_C = 5 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 V, I_C = 0.1 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 V, I_C = 5 mA	—	250	—	MHz
Collector output capacitance	RN1907 to 1909	C_{ob}	V_{CB} = 10 V, I_E = 0 mA, f = 1MHz	—	3	6	pF
Input resistor	RN1907	R1	—	7	10	13	kΩ
	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	

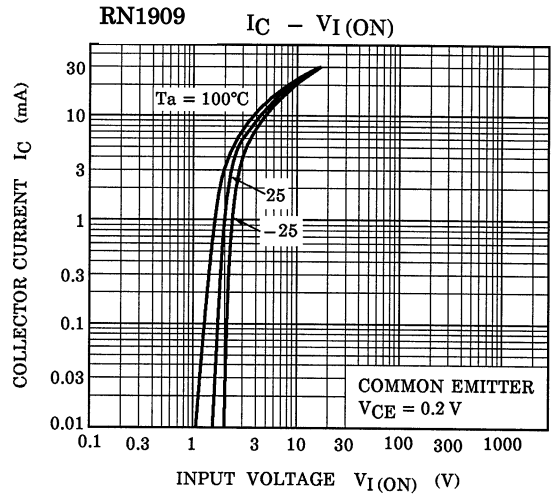
Characteristics Curves (Q1, Q2 Common)

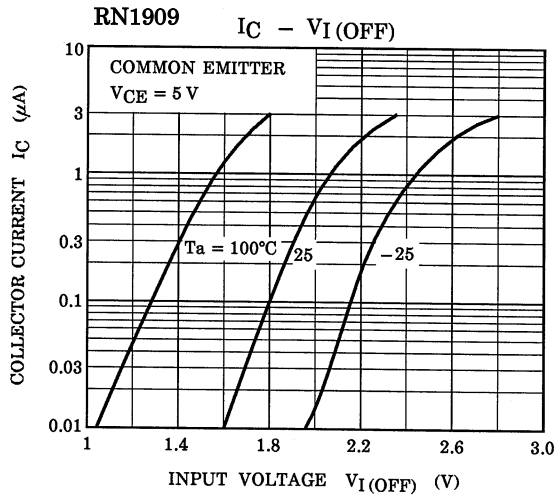








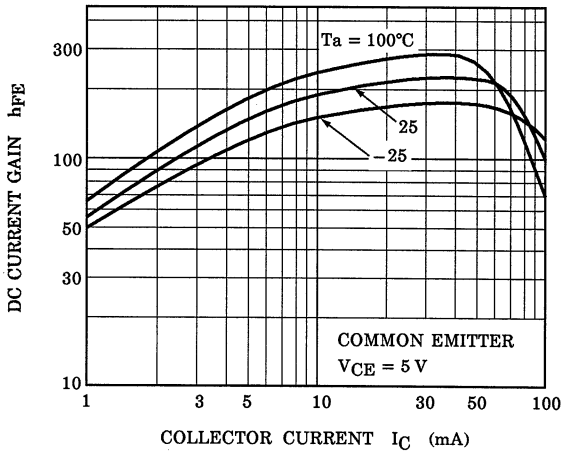




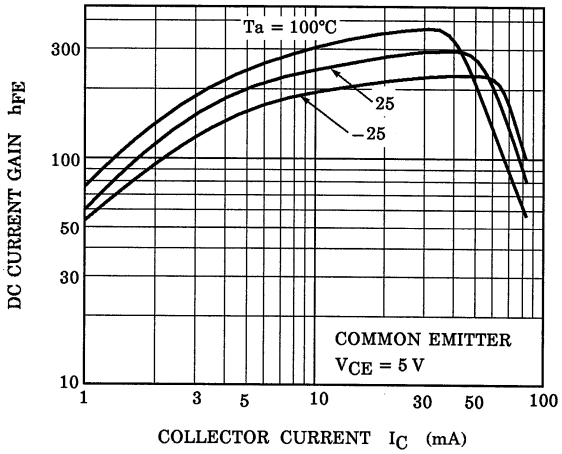
The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

Characteristics Curves (Q1, Q2 Common)

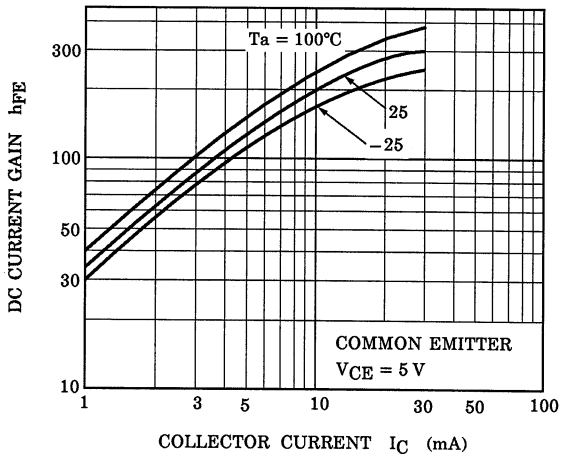
RN1907 h_{FE} – I_C



RN1908 h_{FE} – I_C



RN1909 h_{FE} – I_C



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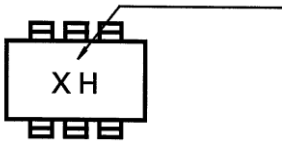
Marking

Part No.	Marking
RN1907	Part No.(abbreviation code) 
RN1908	Part No.(abbreviation code) 
RN1909	Part No.(abbreviation code) 

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