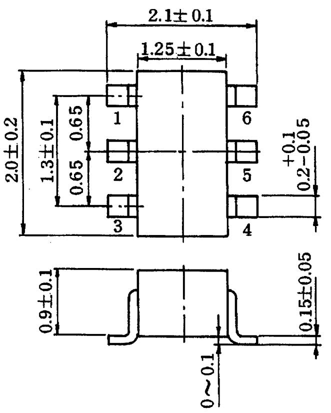
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

RN1907,RN1908,RN1909

Switching, Inverter Circuit, Interface Circuit And Driver Circuit Applications

- 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
- Complementary to RN2907~RN2909

Unit in mm

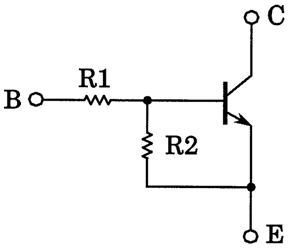


1. EMITTER 1 (E1)
2. BASE 1 (B1)
3. COLLECTOR 2 (C2)
4. EMITTER 2 (E2)
5. BASE 2 (B2)
6. COLLECTOR 1 (C1)

JEDEC	―
EIAJ	―
TOSHIBA	2-2J1A

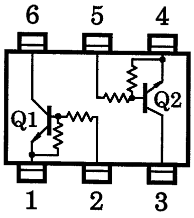
Weight: 6.8mg

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)



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

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

961001EAA2

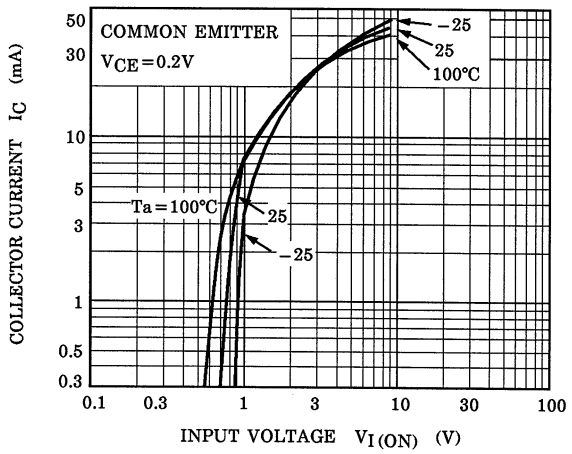
- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

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

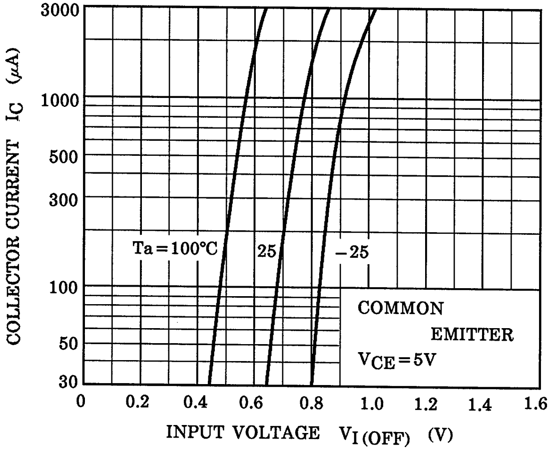
Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN1907~1909	I_{CBO}	—	V_{CB} = 50V, I_E = 0	—	—	100	nA
		I_{CEO}	—	V_{CE} = 50V, I_B = 0	—	—	500	nA
Emitter cut-off current	RN1907	I_{EBO}	—	V_{EB} = 6V, I_C = 0	0.081	—	0.15	mA
	RN1908		—	V_{EB} = 7V, I_C = 0	0.078	—	0.145	
	RN1909		—	V_{EB} = 15V, I_C = 0	0.167	—	0.311	
DC current gain	RN1907	h_{FE}	—	V_{CE} = 5V, I_C = 10mA	80	—	—	—
	RN1908		—		80	—	—	
	RN1909		—		70	—	—	
Collector-emitter saturation voltage	RN1907~1909	$V_{CE\ (sat)}$	—	I_C = 5mA, I_B = 0.25mA	—	0.1	0.3	V
Input voltage (ON)	RN1907	$V_{I\ (ON)}$	—	V_{CE} = 0.2V, I_C = 5mA	0.7	—	1.8	V
	RN1908		—		1.0	—	2.6	
	RN1909		—		2.2	—	5.8	
Input voltage (OFF)	RN1907	$V_{I\ (OFF)}$	—	V_{CE} = 5V, I_C = 0.1mA	0.5	—	1.0	V
	RN1908		—		0.6	—	1.16	
	RN1909		—		1.5	—	2.6	
Translation frequency	RN1907~1909	f_T	—	V_{CE} = 10V, I_C = 5mA	—	250	—	MHz
Collector output capacitance	RN1907~1909	C_{ob}	—	V_{CB} = 10V, I_E = 0, 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	

(Q1, Q2 Common)

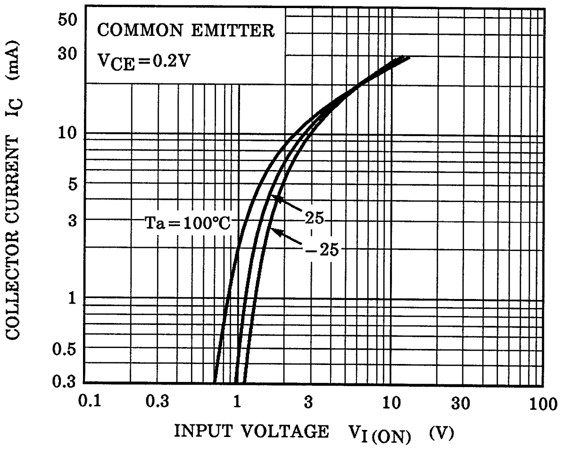
RN1907 $I_C - V_I$ (ON)



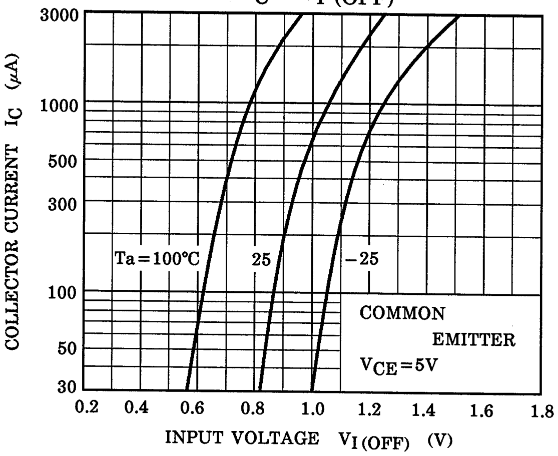
RN1907 $I_C - V_I$ (OFF)



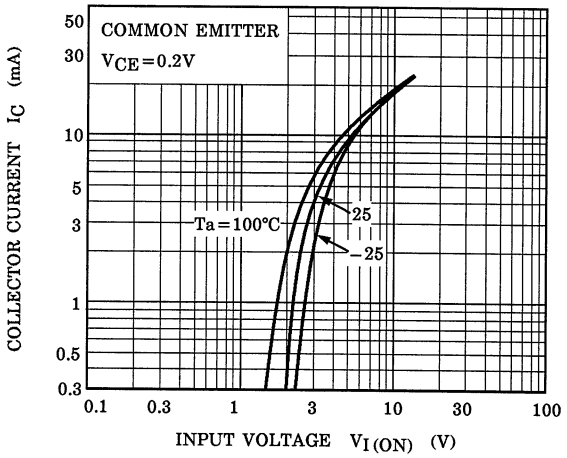
RN1908 $I_C - V_I$ (ON)



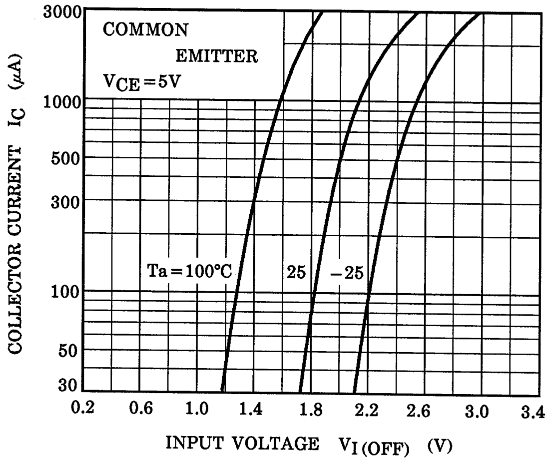
RN1908 $I_C - V_I$ (OFF)



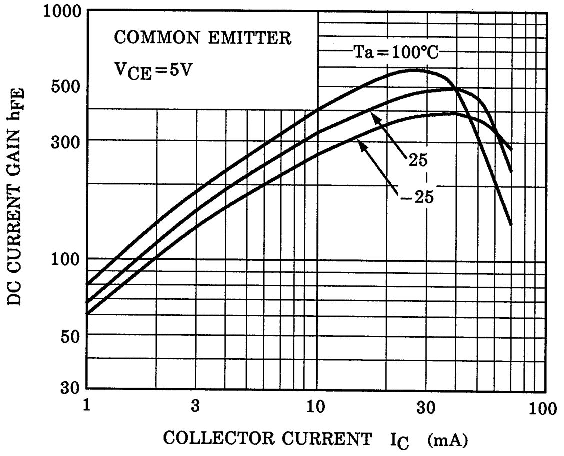
RN1909 $I_C - V_I$ (ON)



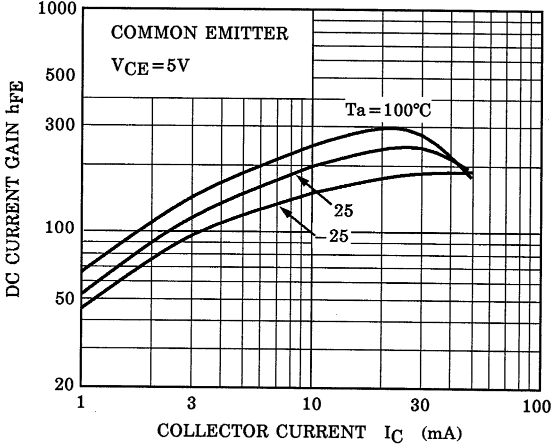
RN1909 $I_C - V_I$ (OFF)



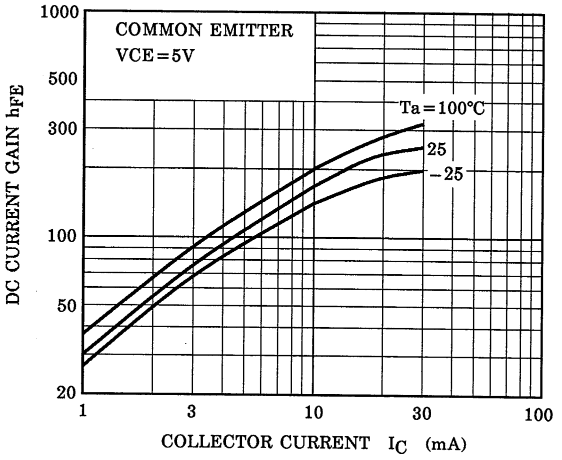
(Q1, Q2 Common)



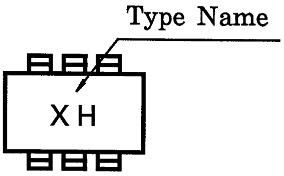
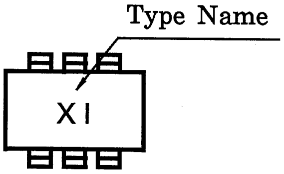
RN1907 h_{FE} − I_C



RN1908 h_{FE} − I_C



RN1909 h_{FE} − I_C

Type Name	Marking
RN1907	
RN1908	
RN1909