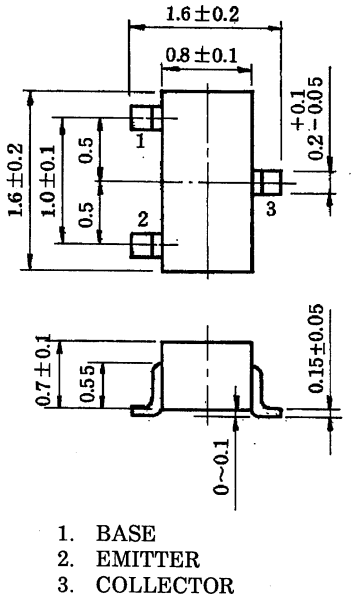
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

RN2107,RN2108,RN2109

Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN1107~RN1109

Unit: mm

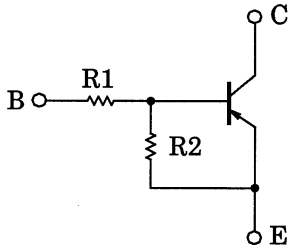


1. BASE
2. EMITTER
3. COLLECTOR

JEDEC	—
EIAJ	—
TOSHIBA	2-2H1A

Weight: 2.4mg

Equivalent Circuit and Bias Resister Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN2107	10	47
RN2108	22	47
RN2109	47	22

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

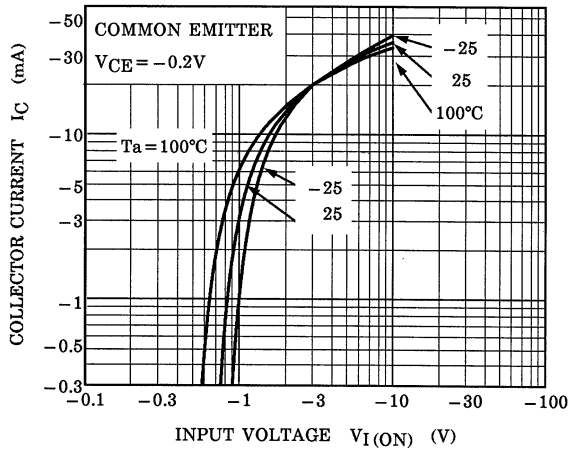
Characteristic		Symbol	Rating	Unit
Collector-base voltage	RN2107~RN2109	V_{CBO}	−50	V
Collector-emitter voltage		V_{CEO}	−50	V
Emitter-base voltage	RN2107	V_{EBO}	−6	V
	RN2108		−7	
	RN2109		−15	
Collector current	RN2107~RN2109	I_C	−100	mA
Collector power dissipation		P_{C*}	100	mW
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55~150	°C

*: Total rating

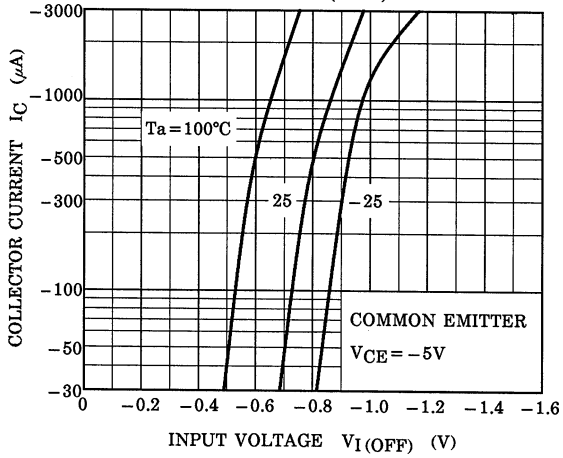
Electrical Characteristics (Ta = 25°C) (Q1, Q2 Common)

Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN2107 ~RN2109	I_{CBO}	—	V_{CB} = −50V, I_E = 0	—	—	−100	nA
		I_{CEO}		V_{CE} = −50V, I_B = 0	—	—	−500	nA
Emitter cut-off current	RN2107	I_{EBO}	—	V_{EB} = −6V, I_C = 0	−0.081	—	−0.15	mA
	RN2108			V_{EB} = −7V, I_C = 0	−0.078	—	−0.145	
	RN2109			V_{EB} = −15V, I_C = 0	−0.167	—	−0.311	
DC current gain	RN2107	h_{FE}	—	V_{CE} = −5V, I_C = −10mA	80	—	—	—
	RN2108				80	—	—	
	RN2109				70	—	—	
Collector-emitter saturation voltage	RN2107 ~RN2109	$V_{CE\ (sat)}$	—	I_C = −5mA, I_B = −0.25mA	—	−0.1	−0.3	V
Input voltage (ON)	RN2107	$V_{I\ (ON)}$	—	V_{CE} = −0.2V, I_C = −5mA	−0.7	—	−1.8	V
	RN2108				−1.0	—	−2.6	
	RN2109				−2.2	—	−5.8	
Input voltage (OFF)	RN2107	$V_{I\ (OFF)}$	—	V_{CE} = −5V, I_C = −0.1mA	−0.5	—	−1.0	V
	RN2108				−0.6	—	−1.16	
	RN2109				−1.5	—	−2.6	
Transition frequency	RN2107 ~RN2109	f_T	—	V_{CE} = −10V, I_C = −5mA	—	200	—	MHz
Collector Output capacitance	RN2107 ~RN2109	C_{ob}	—	V_{CB} = −10V, I_E = 0, f = 1MHz	—	3	6	pF
Input resistor	RN2107	R1	—	—	7	10	13	kΩ
	RN2108				15.4	22	28.6	
	RN2109				32.9	47	61.1	
Resistor ratio	RN2107	R1/R2	—	—	0.191	0.213	0.232	—
	RN2108				0.421	0.468	0.515	
	RN2109				1.92	2.14	2.35	

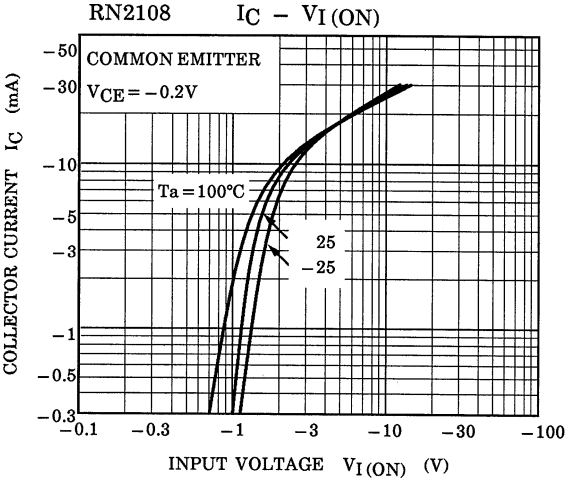
RN2107 $I_C - V_{I(ON)}$



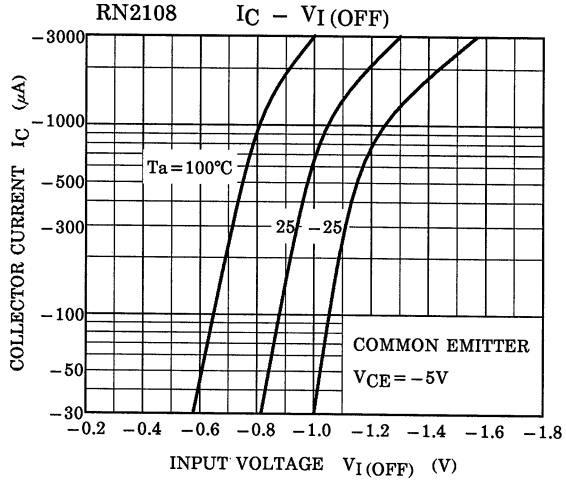
RN2107 $I_C - V_{I(OFF)}$



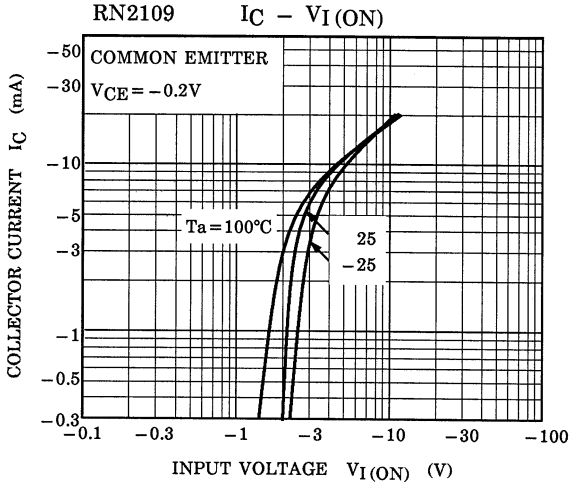
RN2108 $I_C - V_{I(ON)}$



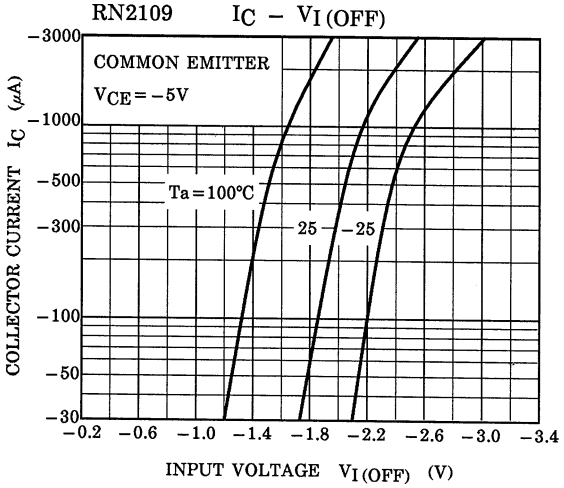
RN2108 $I_C - V_{I(OFF)}$



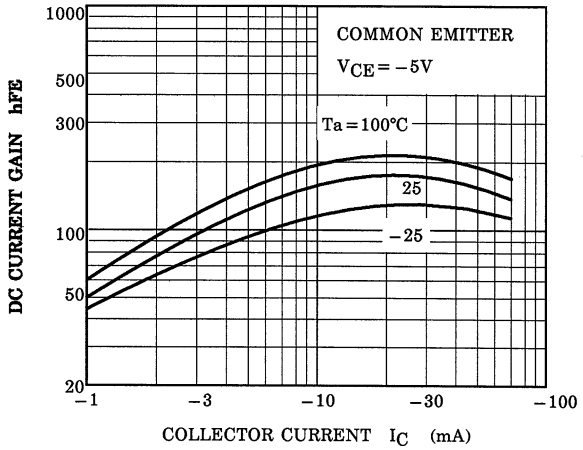
RN2109 $I_C - V_{I(ON)}$



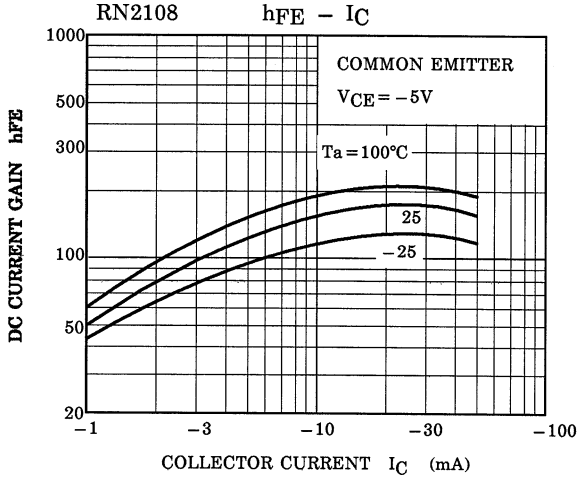
RN2109 $I_C - V_{I(OFF)}$



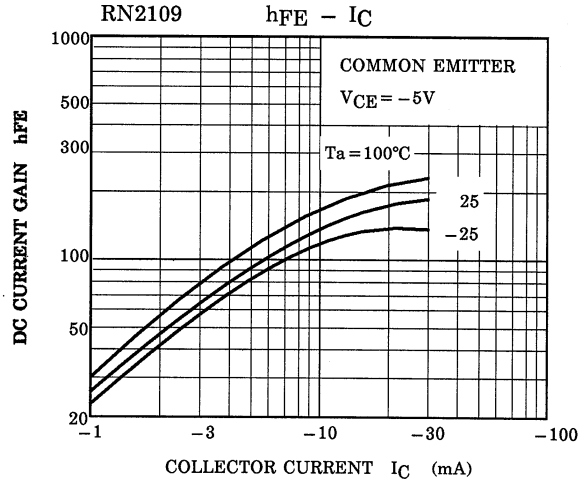
RN2107 h_{FE} – I_C

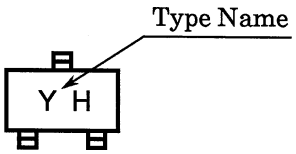
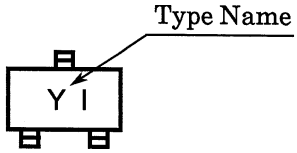
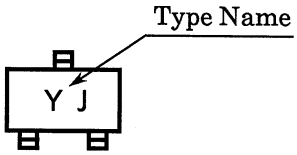


RN2108 h_{FE} – I_C



RN2109 h_{FE} – I_C



Type Name	Marking
RN2107	
RN2108	
RN2109	

RESTRICTIONS ON PRODUCT USE

000707EAA

- TOSHIBA is continually working to improve the quality and 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 comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products 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 TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the “Handling Guide for Semiconductor Devices,” or “TOSHIBA Semiconductor Reliability Handbook” etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury (“Unintended Usage”). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer’s own risk.
- 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.