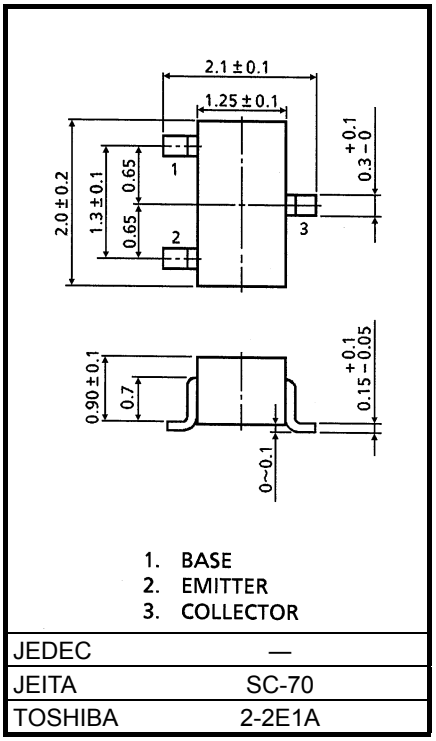
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

RN2307,RN2308,RN2309

Unit: mm

Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

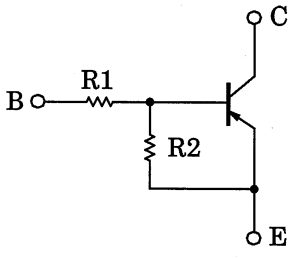
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN1307~RN1309



JEDEC	—
JEITA	SC-70
TOSHIBA	2-2E1A

Weight: 0.006 g (typ.)

Equivalent Circuit



Bias Resistor Values

Type No.	R1 (kΩ)	R2 (kΩ)
RN2307	10	47
RN2308	22	47
RN2309	47	22

Absolute Maximum Ratings (Ta = 25°C)

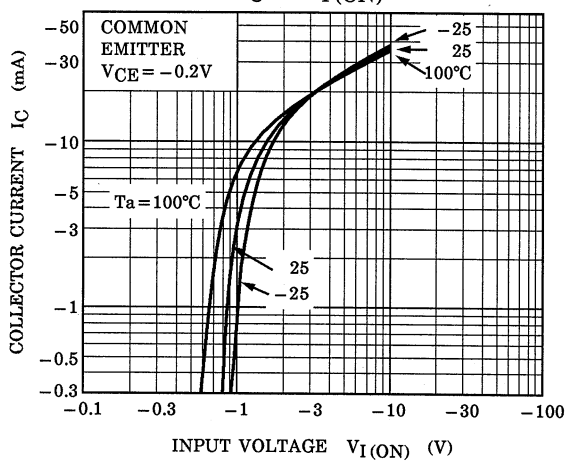
Characteristic		Symbol	Rating	Unit
Collector-base voltage		V_{CBO}	−50	V
Collector-emitter voltage		V_{CEO}	−50	V
Emitter-base voltage	RN2307	V_{EBO}	−6	V
	RN2308		−7	
	RN2309		−15	
Collector current		I_C	−100	mA
Collector power dissipation		P_C	100	mW
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55~150	°C

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).

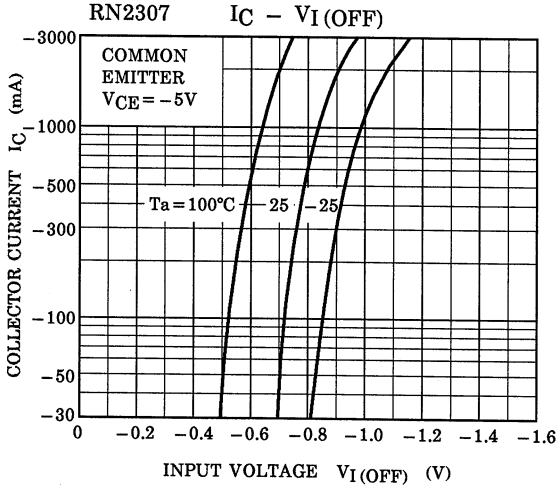
Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	—	V_{CB} = −50V, I_E = 0	—	—	−100	nA
		I_{CEO}	—	V_{CE} = −50V, I_B = 0	—	—	−500	
Emitter cut-off current	RN2307	I_{EBO}	—	V_{EB} = −6V, I_C = 0	−0.081	—	−0.15	mA
	RN2308		—	V_{EB} = −7V, I_C = 0	−0.078	—	−0.145	
	RN2309		—	V_{EB} = −15V, I_C = 0	−0.167	—	−0.311	
DC current gain	RN2307	h_{FE}	—	V_{CE} = −5V, I_C = −10mA	80	—	—	—
	RN2308		—		80	—	—	
	RN2309		—		70	—	—	
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	—	I_C = −5mA, I_B = −0.25mA	—	−0.1	−0.3	V
Input voltage (ON)	RN2307	$V_{I\ (ON)}$	—	V_{CE} = −0.2V, I_C = −5mA	−0.7	—	−1.8	V
	RN2308		—		−1.0	—	−2.6	
	RN2309		—		−2.2	—	−5.8	
Input voltage (OFF)	RN2307	$V_{I\ (OFF)}$	—	V_{CE} = −5V, I_C = −0.1mA	−0.5	—	−1.0	V
	RN2308		—		−0.6	—	−1.16	
	RN2309		—		−1.5	—	−2.6	
Translation frequency		f_T	—	V_{CE} = −10V, I_C = −5mA	—	200	—	MHz
Collector output capacitance		C_{ob}	—	V_{CB} = −10V, I_E = 0, f = 1MHz	—	3	6	pF
Input resistor	RN2307	R1	—	—	7	10	13	kΩ
	RN2308		—		15.4	22	28.6	
	RN2309		—		32.9	47	61.1	
Resistor ratio	RN2307	R1/R2	—	—	0.191	0.213	0.232	—
	RN2308		—		0.421	0.468	0.515	
	RN2309		—		1.92	2.14	2.35	

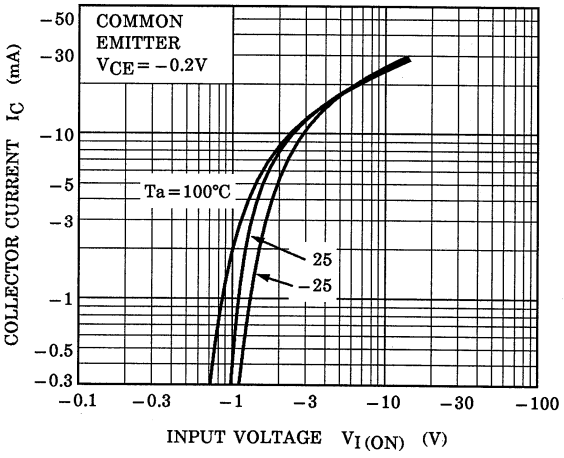
RN2307 $I_C - V_{I(ON)}$



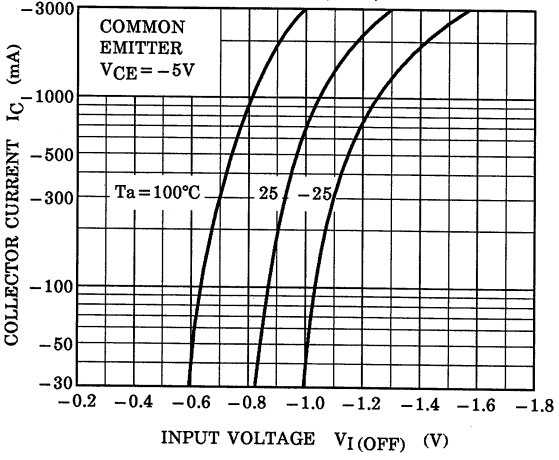
RN2307 $I_C - V_{I(OFF)}$



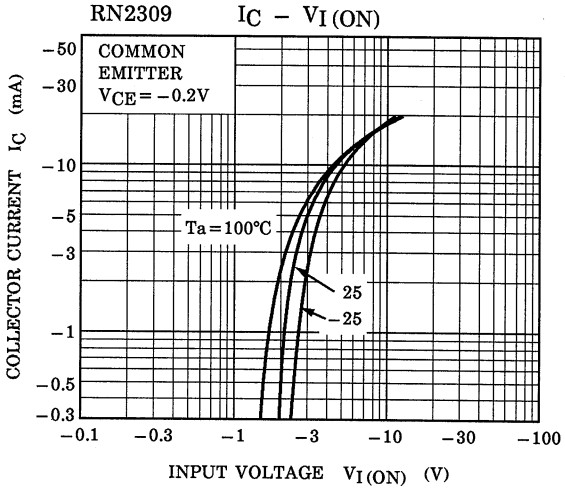
RN2308 $I_C - V_{I(ON)}$



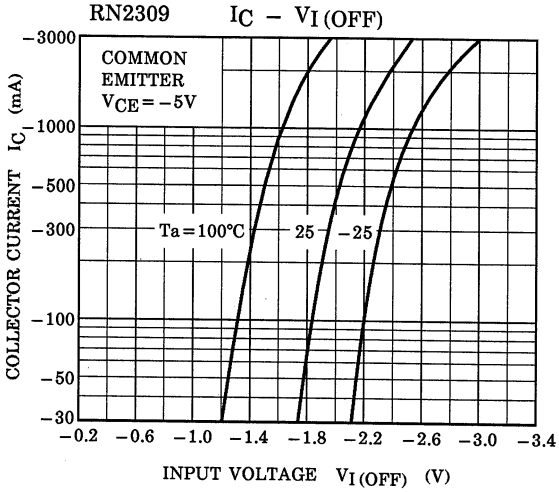
RN2308 $I_C - V_{I(OFF)}$



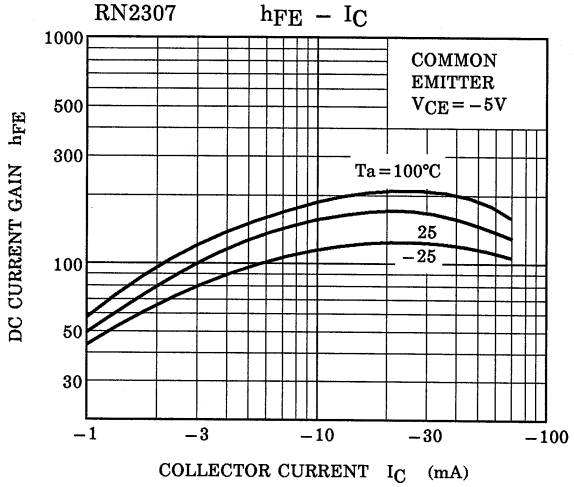
RN2309 $I_C - V_{I(ON)}$



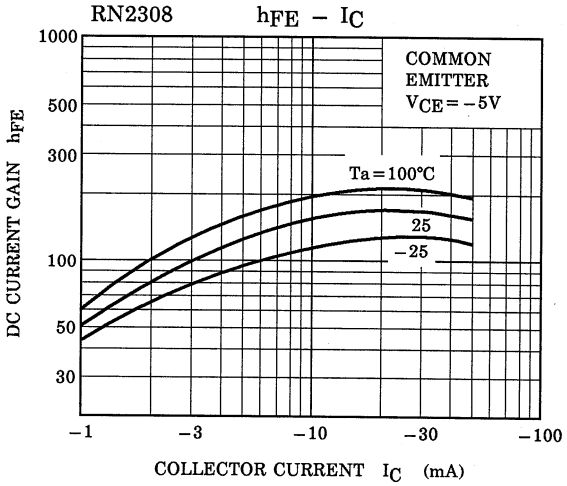
RN2309 $I_C - V_{I(OFF)}$



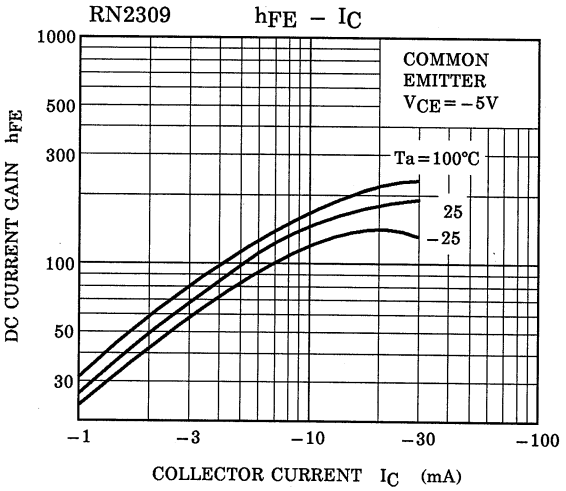
RN2307 h_{FE} – I_C

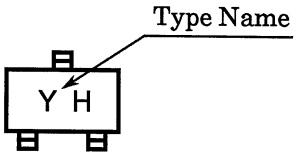
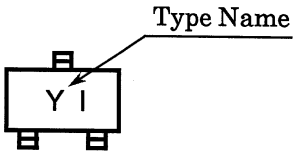
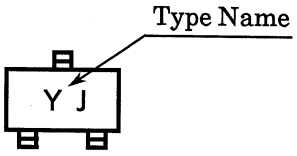


RN2308 h_{FE} – I_C



RN2309 h_{FE} – I_C



Type Name	Marking
RN2307	
RN2308	
RN2309	

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