

TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

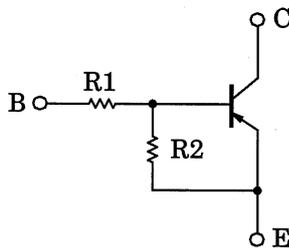
RN2307, RN2308, RN2309

Unit: mm

Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

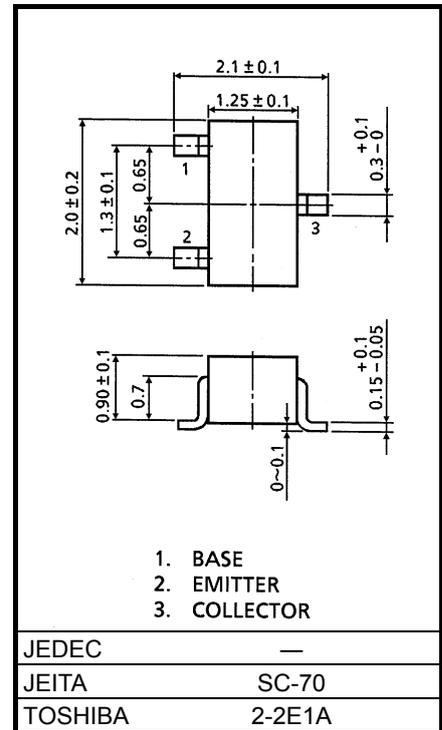
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN1307~RN1309

Equivalent Circuit



Bias Resistor Values

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



Weight: 0.006 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

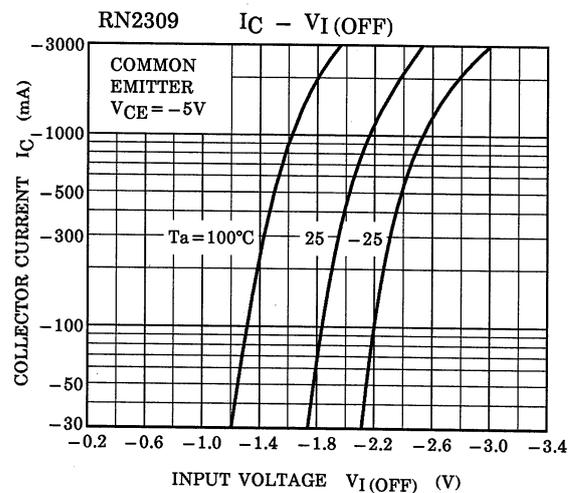
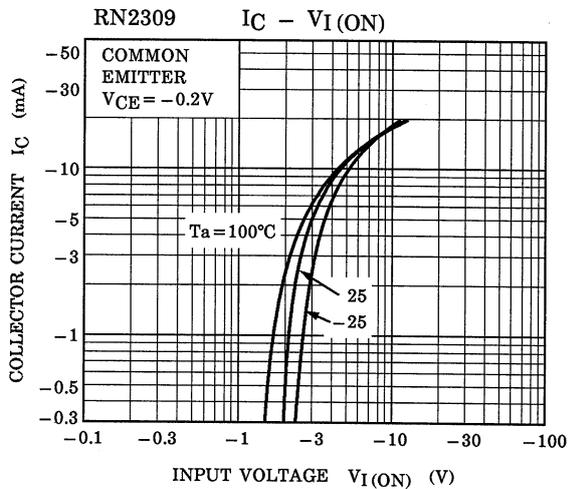
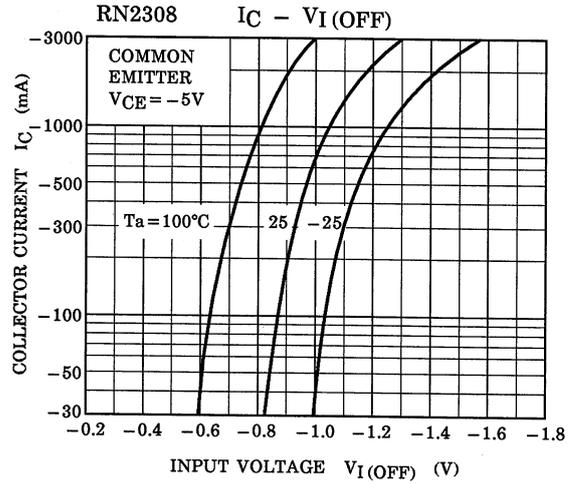
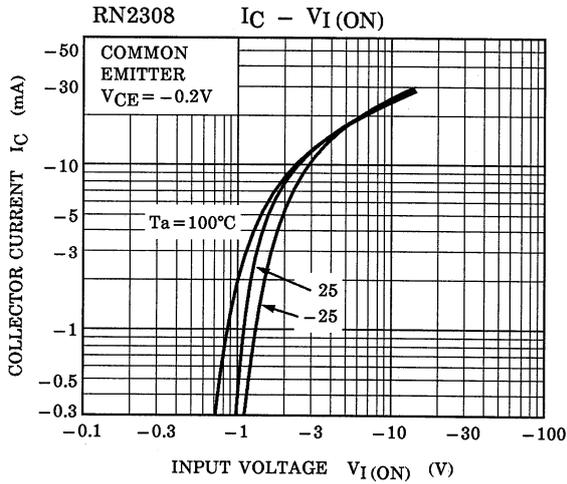
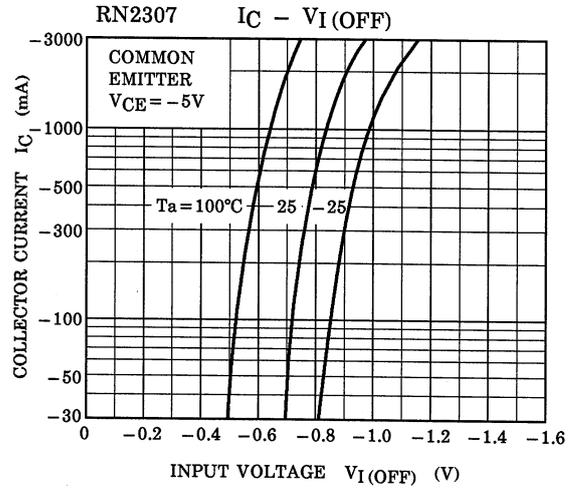
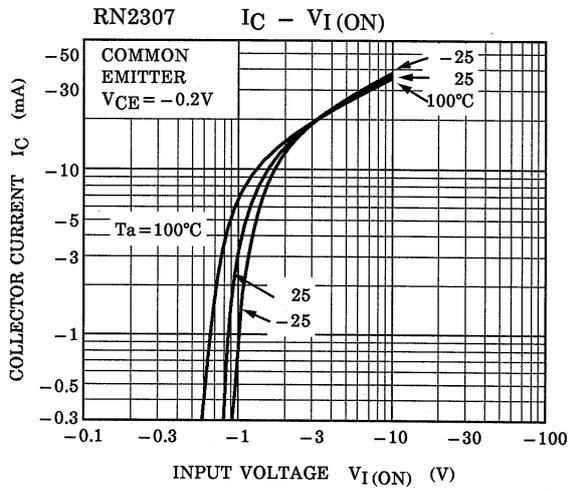
Characteristic	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	-50	V
Collector-emitter voltage	V_{CEO}	-50	V
Emitter-base voltage	V_{EBO}	-6	V
		-7	
		-15	
Collector current	I_C	-100	mA
Collector power dissipation	P_C	100	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	-55~150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

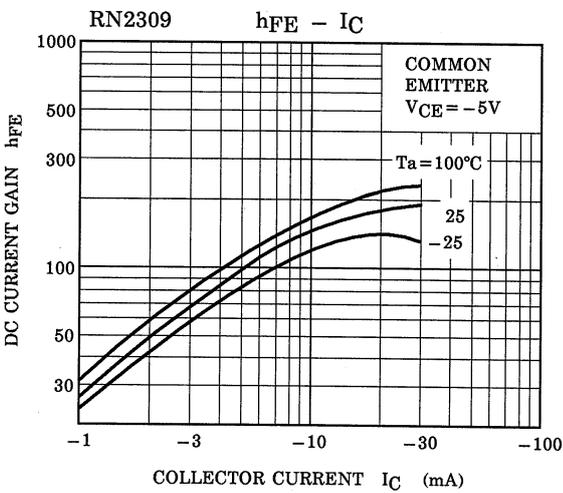
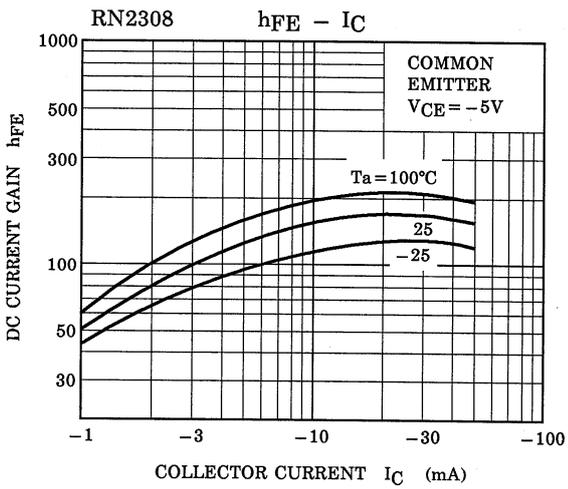
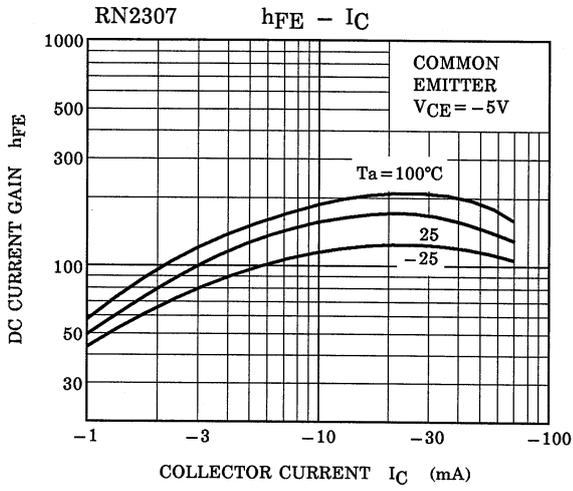
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

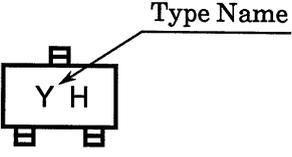
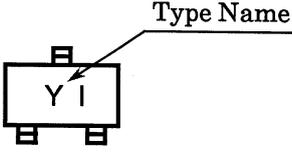
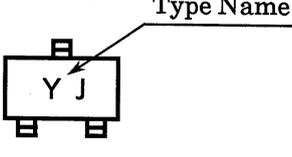
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

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	—	$V_{EB} = -6V, I_C = 0$	-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	—	$V_{CE} = -5V, I_C = -10mA$	80	—	—	—	
		RN2308	—		h_{FE}	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	—	$V_{CE} = -0.2V, I_C = -5mA$	-0.7	—	-1.8	V	
		RN2308	—		$V_{I(ON)}$	-1.0	—		-2.6
		RN2309	—		—	-2.2	—		-5.8
Input voltage (OFF)		RN2307	—	$V_{CE} = -5V, I_C = -0.1mA$	-0.5	—	-1.0	V	
		RN2308	—		$V_{I(OFF)}$	-0.6	—		-1.16
		RN2309	—		—	-1.5	—		-2.6
Transition 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	—	—	7	10	13	kΩ	
		RN2308	—		R_1	15.4	22		28.6
		RN2309	—		—	32.9	47		61.1
Resistor ratio		RN2307	—	—	0.191	0.213	0.232	—	
		RN2308	—		R_1/R_2	0.421	0.468		0.515
		RN2309	—		—	1.92	2.14		2.35





Type Name	Marking
RN2307	
RN2308	
RN2309	

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