

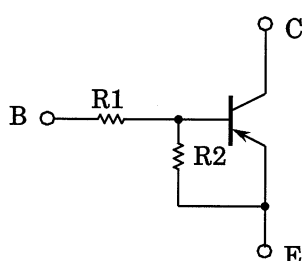
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

# RN2007, RN2008, RN2009

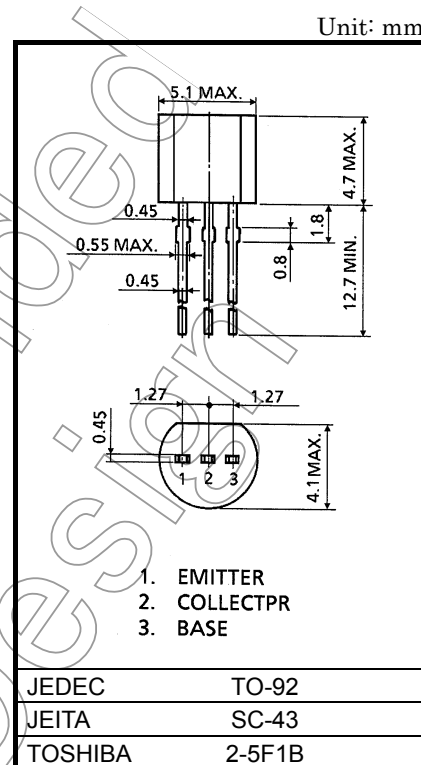
Switching, Inverter Circuit, Interface Circuit  
and Driver Circuit Applications

- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN1007~RN1009

## Equivalent Circuit and Bias Resister Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN2007	10	47
RN2008	22	47
RN2009	47	22



Weight: 0.21g (typ.)

## Absolute Maximum Ratings (Ta = 25°C)

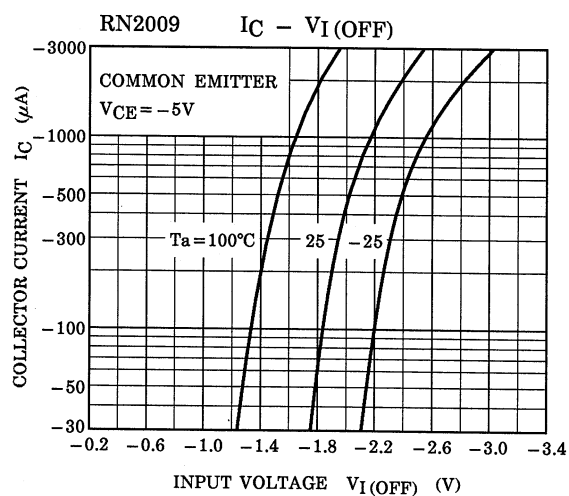
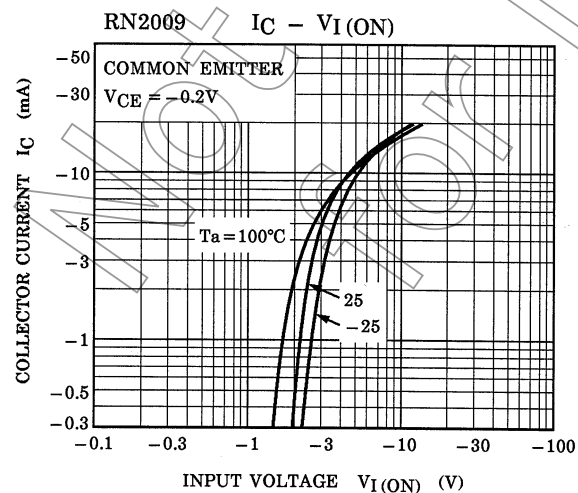
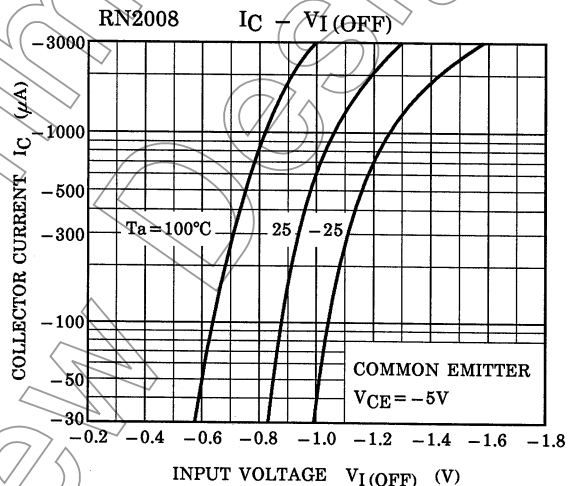
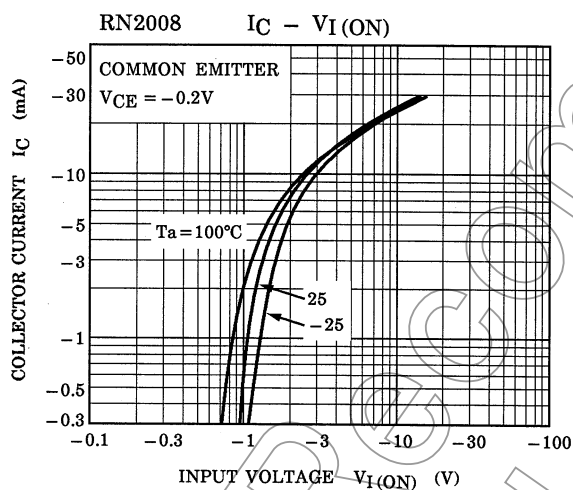
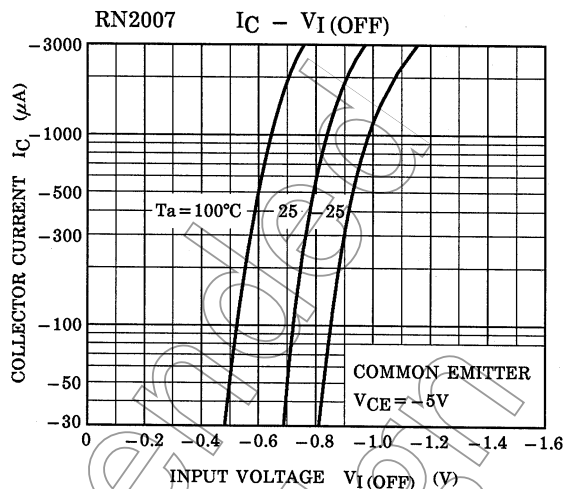
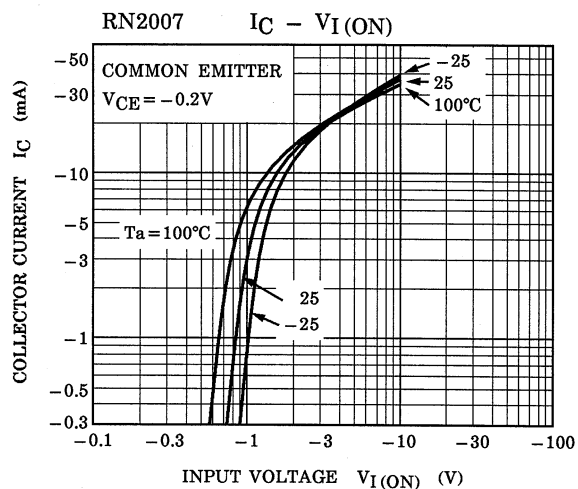
Characteristic	Symbol	Rating	Unit
Collector-base voltage	V <sub>CB0</sub>	-50	V
Collector-emitter voltage	V <sub>CEO</sub>	-50	V
Emitter-base voltage	RN2007	-6	V
	RN2008	-7	
	RN2009	-15	
Collector current	I <sub>C</sub>	-100	mA
Collector power dissipation	P <sub>C</sub>	400	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature range	T <sub>stg</sub>	-55~150	°C

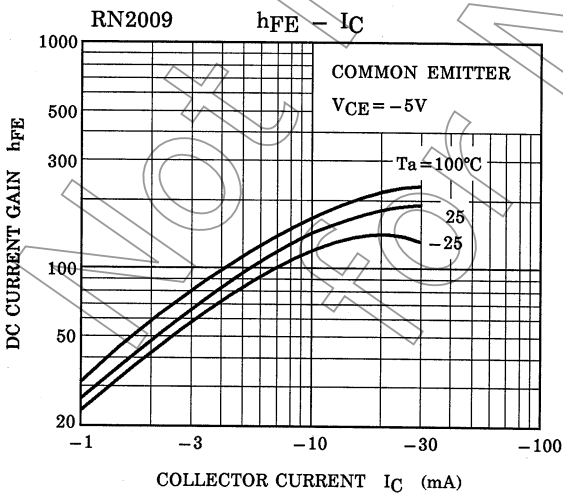
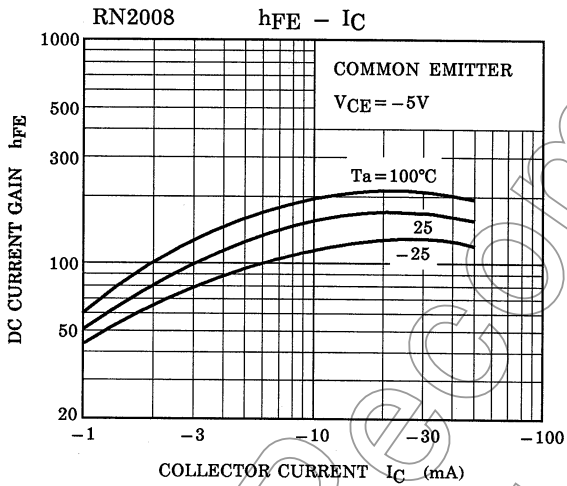
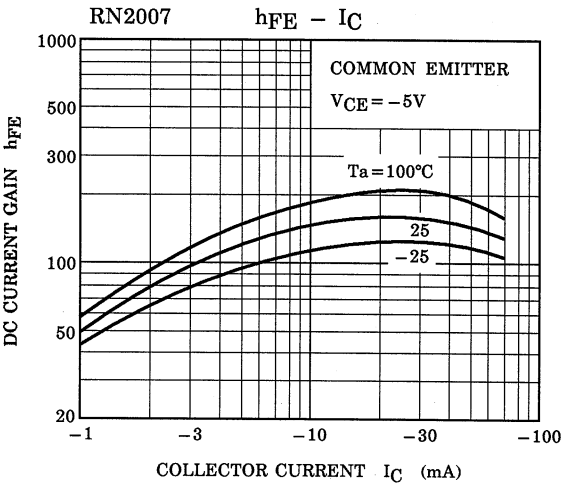
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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	RN2007	$I_{EBO}$	—	$V_{EB} = -6V, I_C = 0$	-0.081	—	-0.15	mA
	RN2008			$V_{EB} = -7V, I_C = 0$	-0.078	—	-0.145	
	RN2009			$V_{EB} = -15V, I_C = 0$	-0.167	—	-0.311	
DC current gain	RN2007	$h_{FE}$	—	$V_{CE} = -5V, I_C = -10mA$	80	—	—	
	RN2008				80	—	—	
	RN2009				70	—	—	
Collector-emitter saturation voltage		$V_{CE(sat)}$	—	$I_C = -5mA, I_B = -0.25mA$	—	-0.1	-0.3	V
Input voltage (ON)	RN2007	$V_I(ON)$	—	$V_{CE} = -0.2V, I_C = -5mA$	-0.7	—	-1.8	V
	RN2008				-1.0	—	-2.6	
	RN2009				-2.2	—	-5.8	
Input voltage (OFF)	RN2007	$V_I(OFF)$	—	$V_{CE} = -5V, I_C = -0.1mA$	-0.5	—	-1.0	V
	RN2008				-0.6	—	-1.16	
	RN2009				-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	RN2007	$R_1$	—		7	10	13	kΩ
	RN2008				15.4	22	28.6	
	RN2009				32.9	47	61.1	
Resistor ratio	RN2007	$R_1/R_2$	—		0.191	0.213	0.232	
	RN2008				0.421	0.468	0.515	
	RN2009				1.92	2.14	2.35	





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