

TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

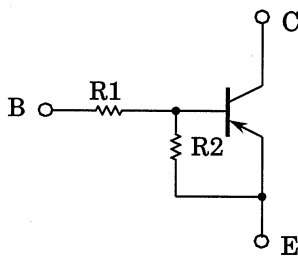
RN2001,RN2002,RN2003 RN2004,RN2005,RN2006

Switching, Inverter Circuit, Interface Circuit
And Driver Circuit Applications

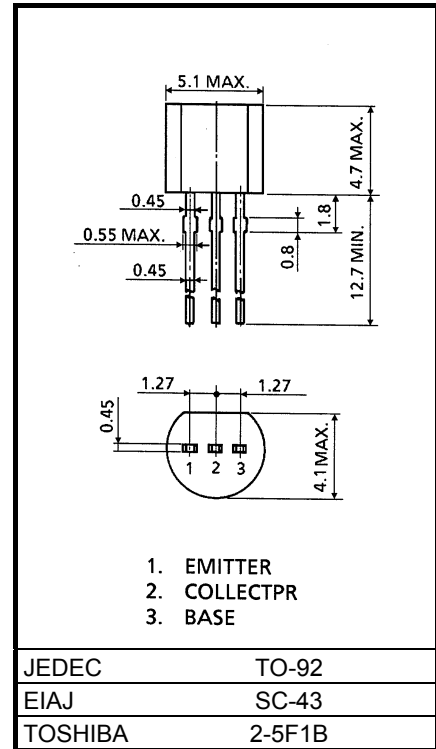
Unit: mm

- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN1001~RN1006

Equivalent Circuit and Bias Resister Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN2001	4.7	4.7
RN2002	10	10
RN2003	22	22
RN2004	47	47
RN2005	2.2	47
RN2006	4.7	47



Weight: 0.21g

Absolute Maximum Ratings (Ta = 25°C)

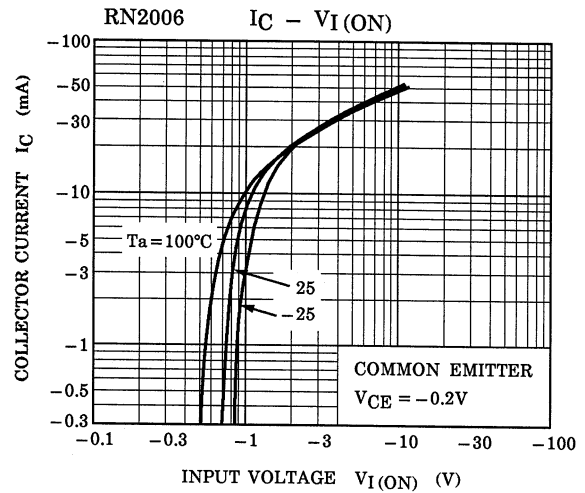
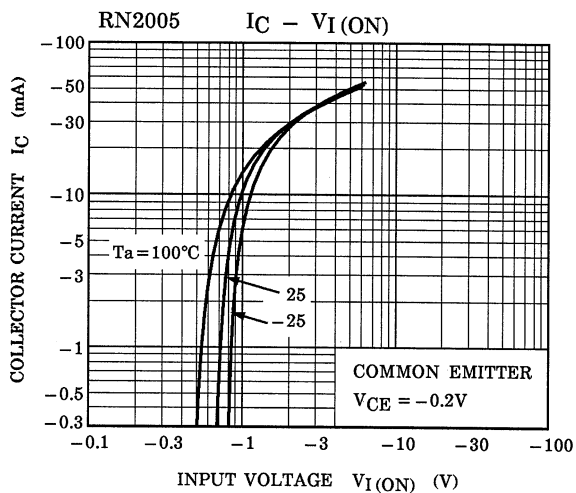
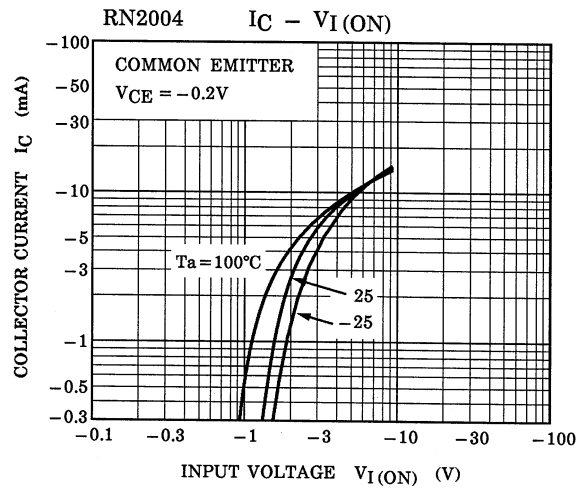
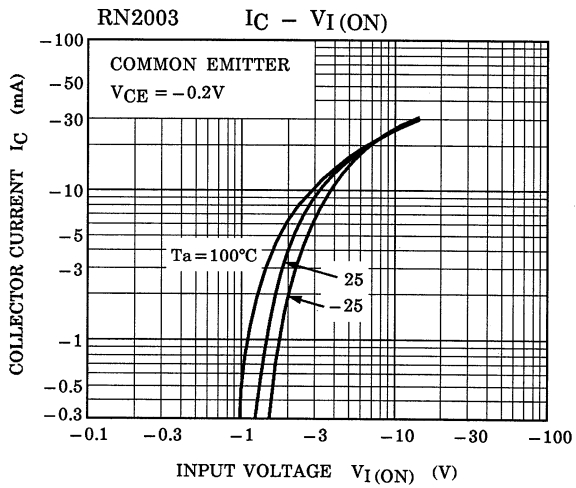
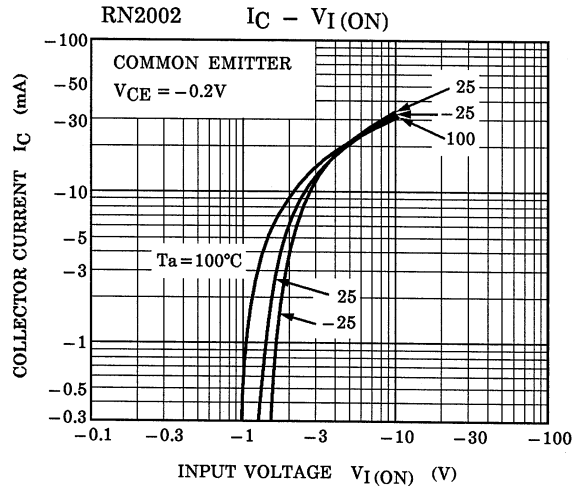
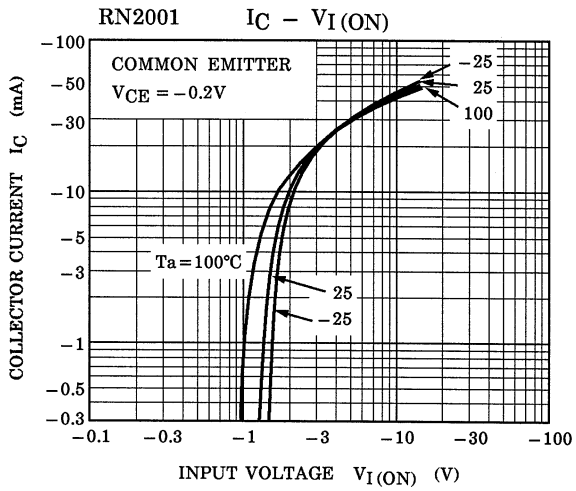
Characteristic	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	-50	V
Collector-emitter voltage	V_{CEO}	-50	V
Emitter-base voltage	V_{EBO}	-10	V
		-5	
Collector current	I_C	-100	mA
Collector power dissipation	P_C	400	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	-55~150	°C

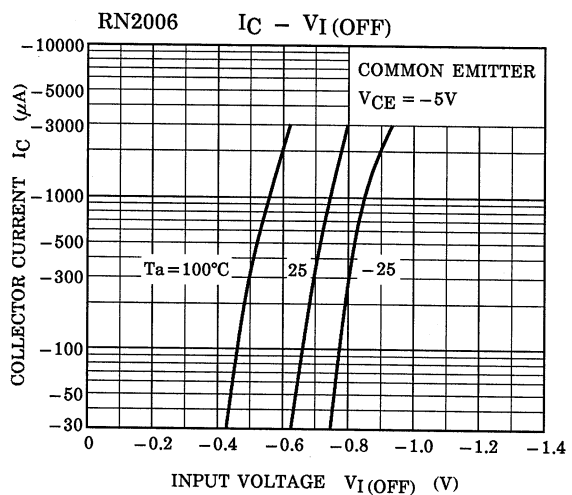
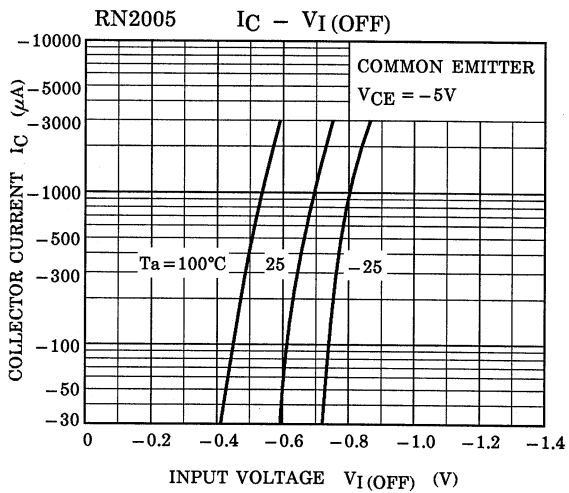
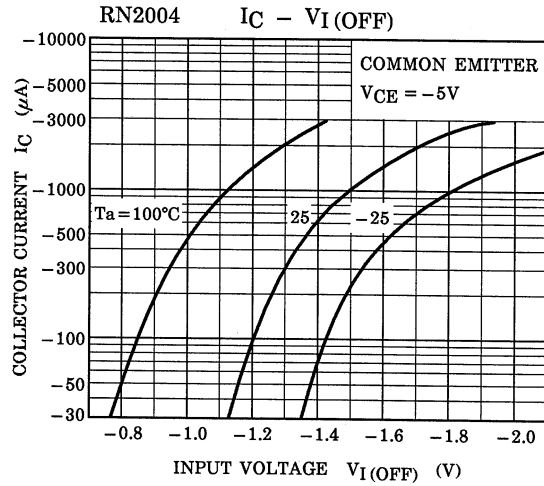
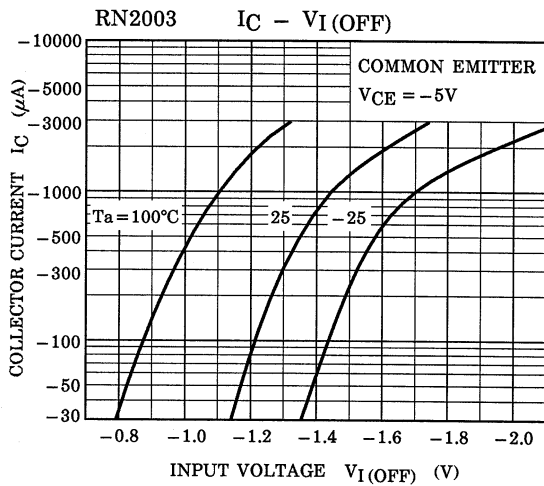
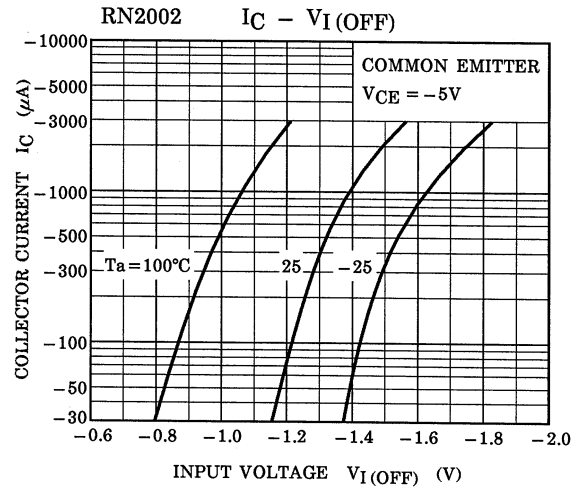
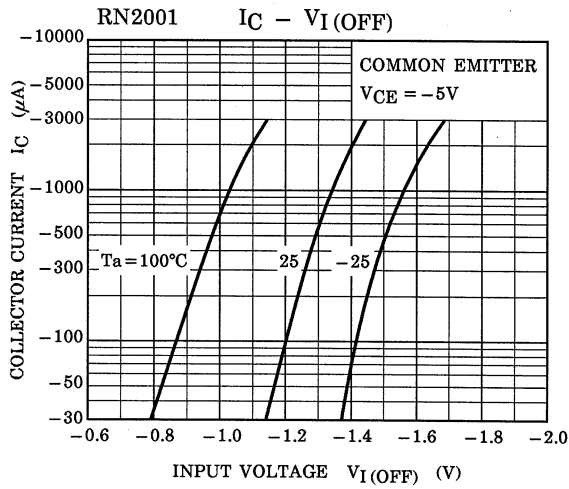
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

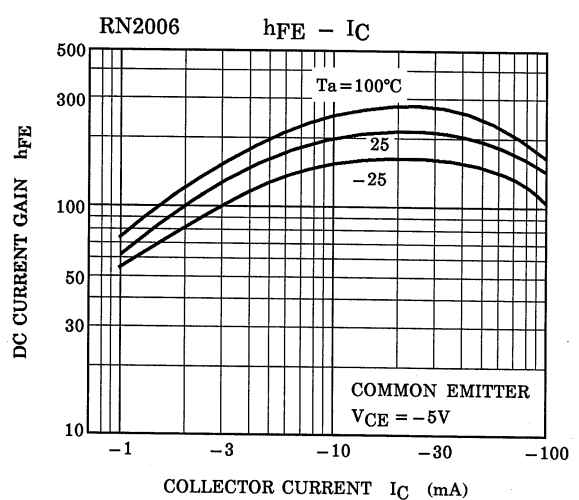
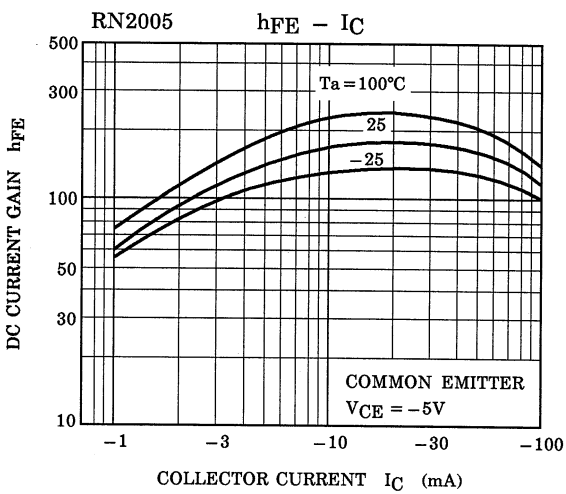
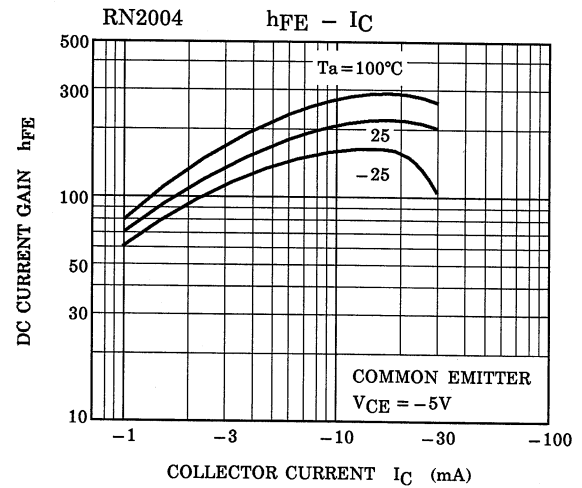
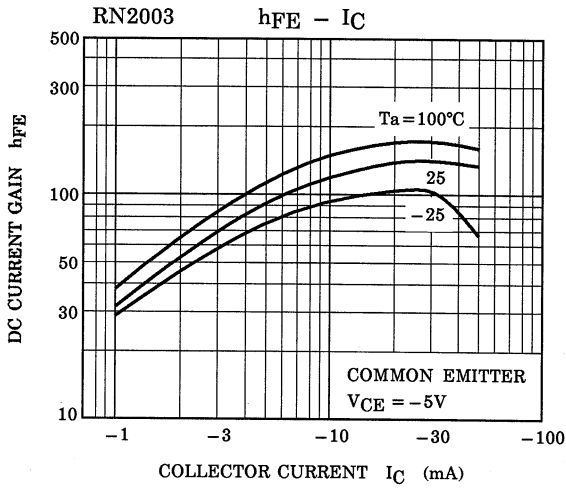
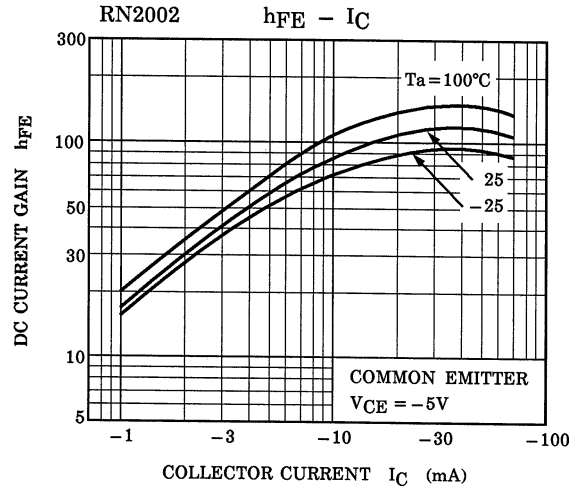
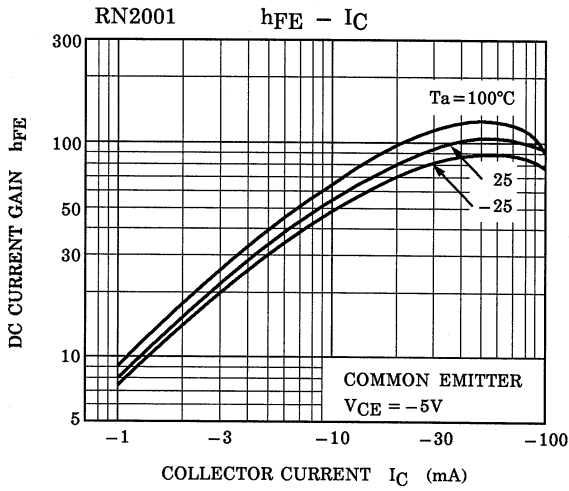
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN2001~2006	I_{CBO}	—	$V_{CB} = -50V, I_E = 0$	—	—	-100	nA
		I_{CEO}		$V_{CE} = -50V, I_B = 0$	—	—	-500	
Emitter cut-off current	RN2001	I_{EBO}	—	$V_{EB} = -10V, I_C = 0$	-0.82	—	-1.52	mA
	RN2002				-0.38	—	-0.71	
	RN2003				-0.17	—	-0.33	
	RN2004				-0.082	—	-0.15	
	RN2005			$V_{EB} = -5V, I_C = 0$	-0.078	—	-0.145	
	RN2006				-0.074	—	-0.138	
DC current gain	RN2001	h_{FE}	—	$V_{CE} = -5V, I_C = -10mA$	30	—	—	
	RN2002				50	—	—	
	RN2003				70	—	—	
	RN2004				80	—	—	
	RN2005				80	—	—	
	RN2006				80	—	—	
Collector-emitter saturation voltage	RN2001~2006	$V_{CE(sat)}$	—	$I_C = -5mA, I_B = -0.25mA$	—	-0.1	-0.3	V
Input voltage (ON)	RN2001	$V_I(ON)$	—	$V_{CE} = -0.2V, I_C = -5mA$	-1.1	—	-2.0	V
	RN2002				-1.2	—	-2.4	
	RN2003				-1.3	—	-3.0	
	RN2004				-1.5	—	-5.0	
	RN2005				-0.6	—	-1.1	
	RN2006				-0.7	—	-1.3	
Input voltage (OFF)	RN2001~2004	$V_I(OFF)$	—	$V_{CE} = -5V, I_C = -0.1mA$	-1.0	—	-1.5	V
	RN2005, 2006				-0.5	—	-0.8	
Transition frequency	RN2001~2006	f_T	—	$V_{CE} = -10V, I_C = -5mA$	—	200	—	MHz
Collector Output capacitance	RN2001~2006	C_{ob}	—	$V_{CB} = -10V, I_E = 0, f = 1MHz$	—	3	6	pF
Input resistor	RN2001	R1	—		3.29	4.7	6.11	kΩ
	RN2002				7	10	13	
	RN2003				15.4	22	28.6	
	RN2004				32.9	47	61.1	
	RN2005				1.54	2.2	2.86	
	RN2006				3.29	4.7	6.11	
Resistor ratio	RN2001~2004	R1/R2	—		0.9	1.0	1.1	
	RN2005				0.0421	0.0468	0.0515	
	RN2006				0.09	0.1	0.11	







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20070701-EN GENERAL

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