

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

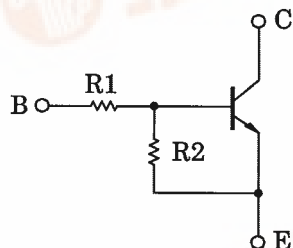
**RN1301,RN1302,RN1303
RN1304,RN1305,RN1306**

Switching, Inverter Circuit, Interface Circuit
And Driver Circuit Applications

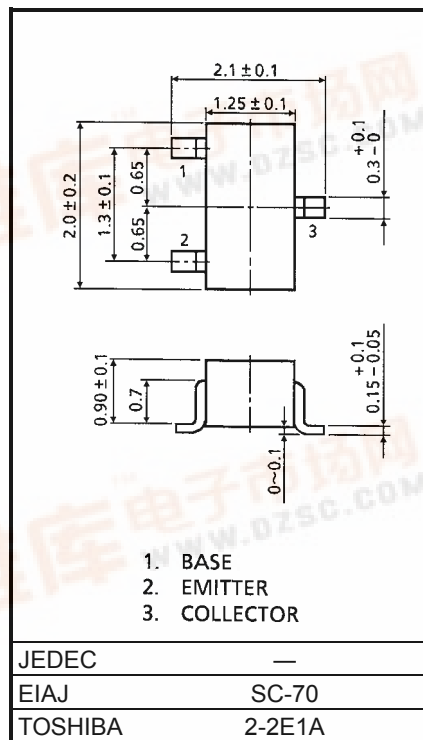
Unit: mm

- With built-in bias resistors.
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN2301~RN2306

Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN1301	4.7	4.7
RN1302	10	10
RN1303	22	22
RN1304	47	47
RN1305	2.2	47
RN1306	4.7	47



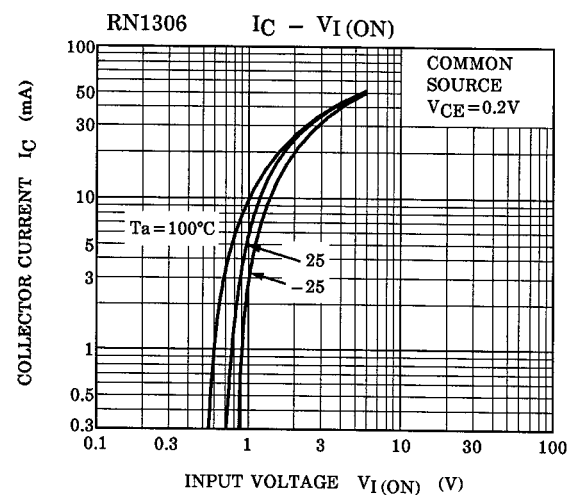
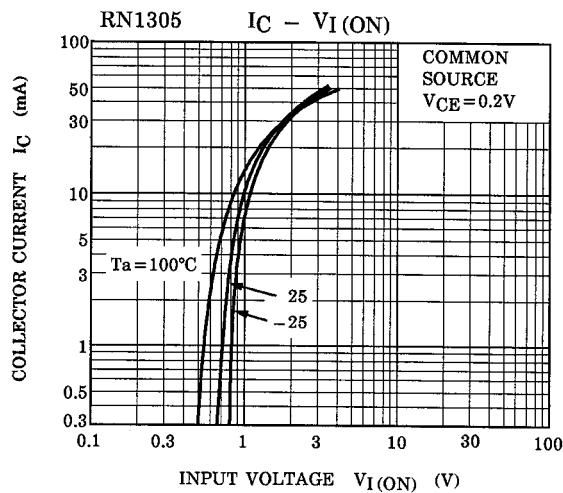
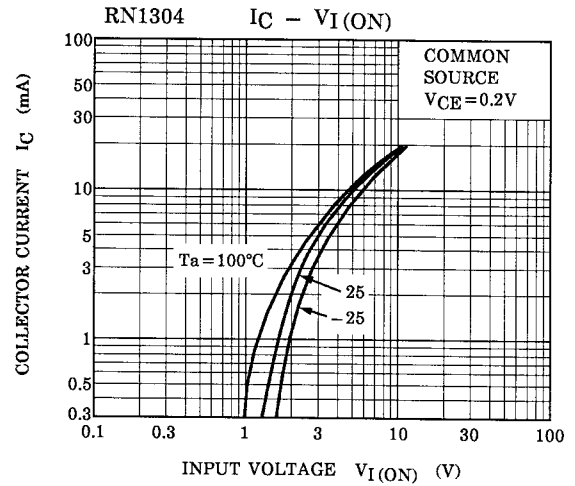
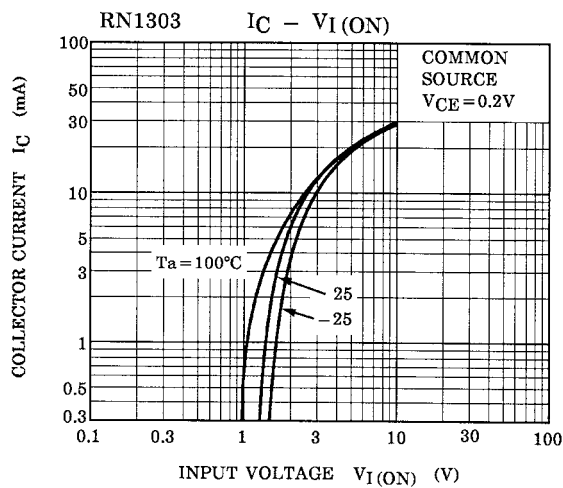
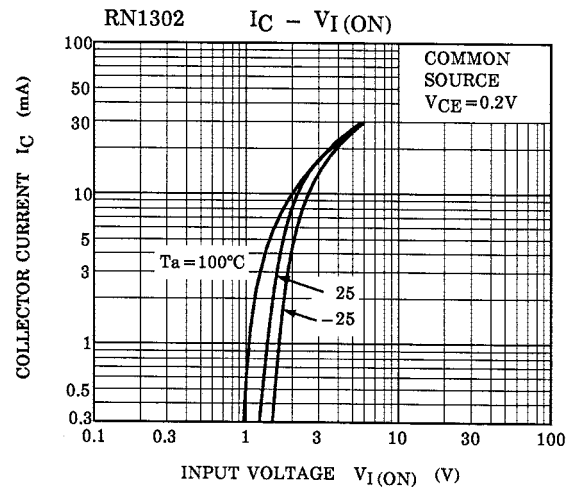
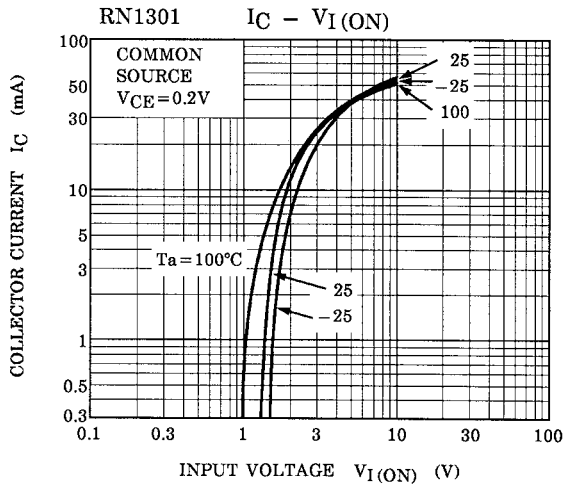
Maximum Ratings (Ta = 25°C)

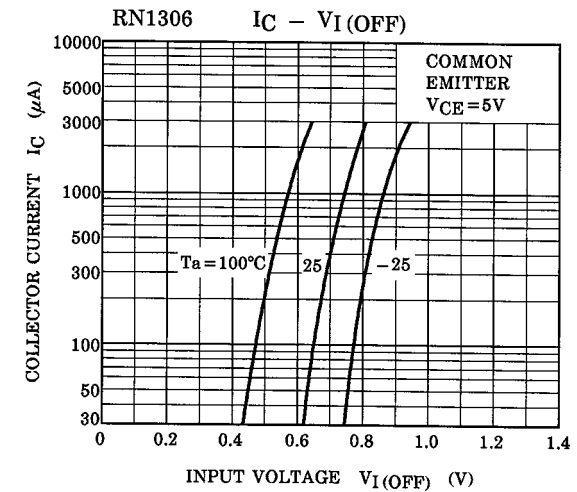
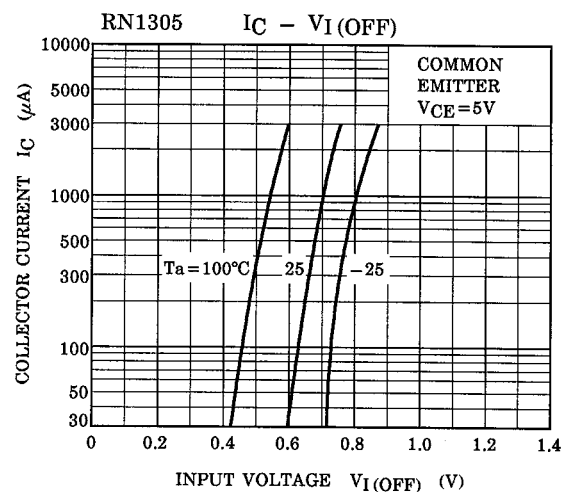
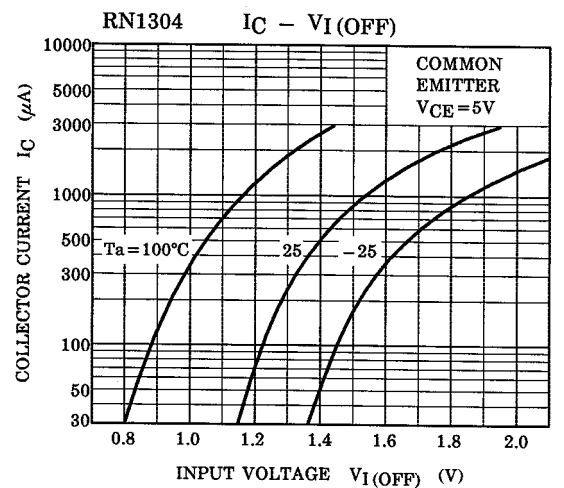
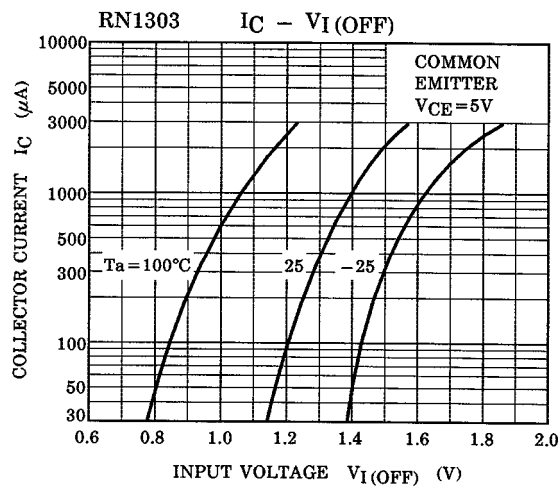
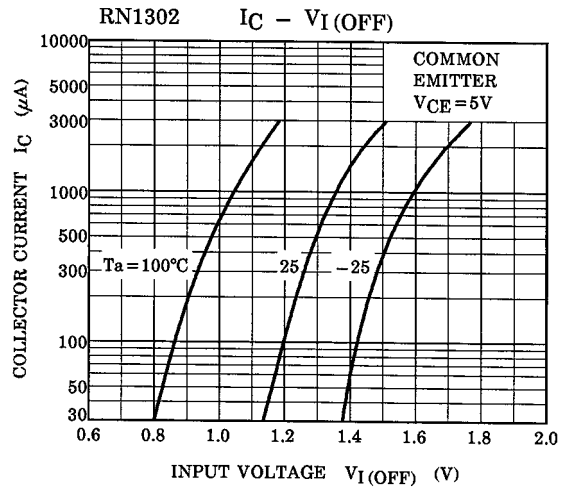
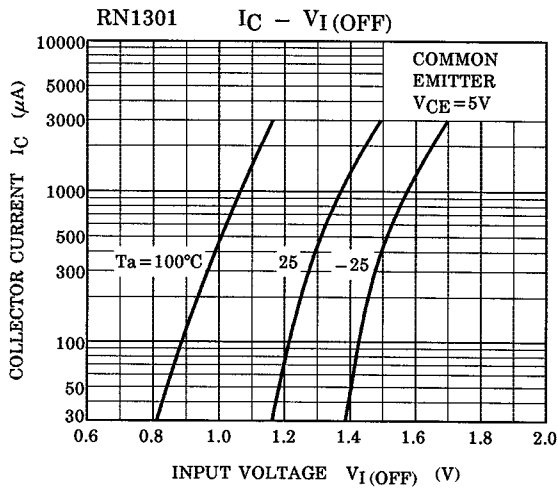
Characteristic	Symbol	Rating	Unit	
Collector-base voltage	RN1301~1306	V_{CB0}	50	V
Collector-emitter voltage		V_{CE0}	50	V
Emitter-base voltage	RN1301~1304	V_{EBO}	10	V
	RN1305, 1306		5	
Collector current	I_c	100	mA	
Collector power dissipation	RN1301~1306	P_c	100	mW
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	-55~150	°C

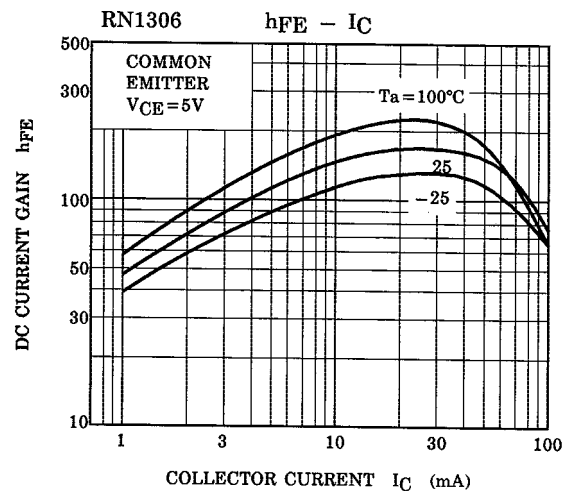
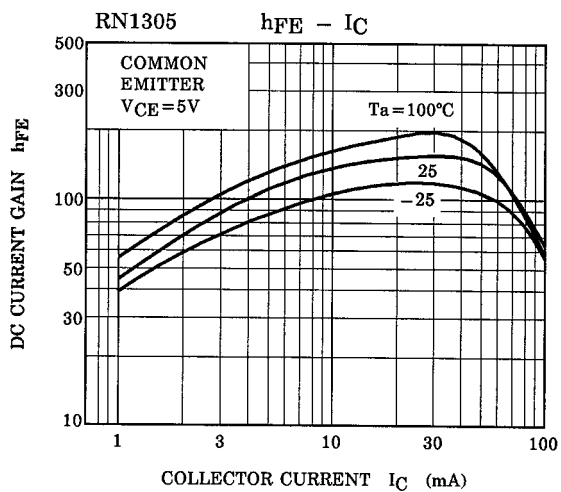
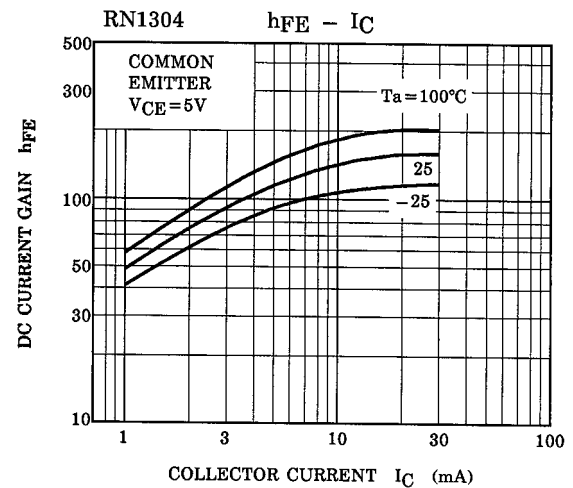
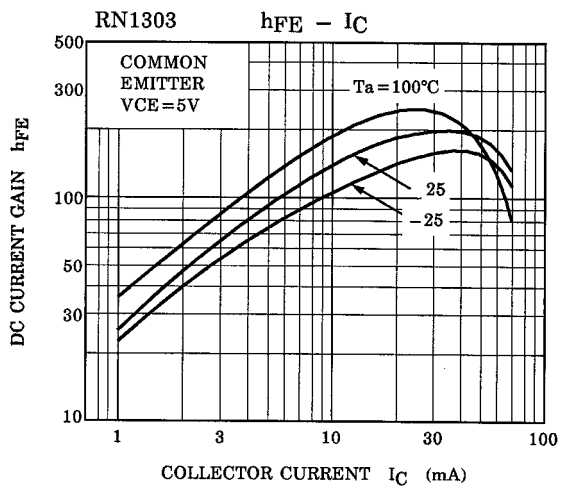
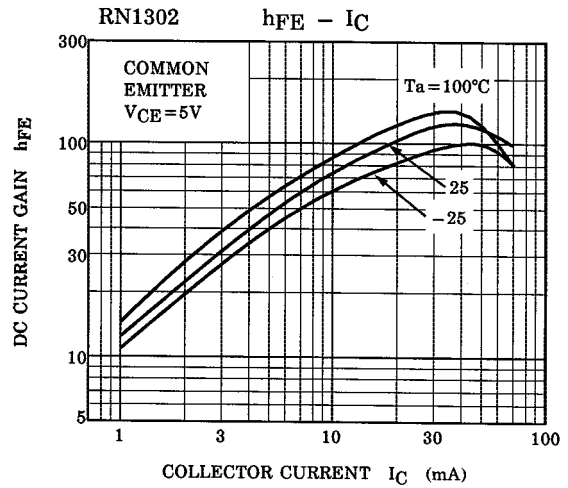
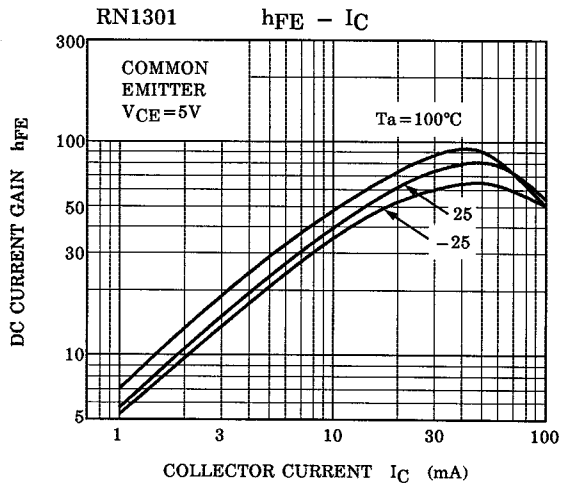


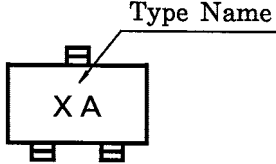
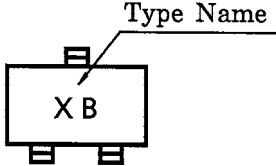
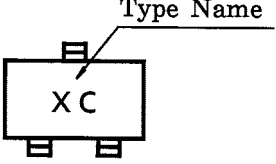
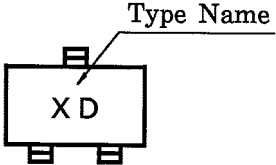
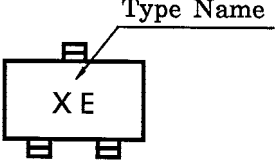
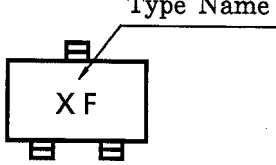
Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN1301~1306	I_{CBO}	—	$V_{CB} = 50V, I_E = 0$	—	—	100	nA
		I_{CEO}	—	$V_{CE} = 50V, I_B = 0$	—	—	500	
Emitter cut-off current	RN1301	I_{EBO}	—	$V_{EB} = 10V, I_C = 0$	0.82	—	1.52	mA
	RN1302		—		0.38	—	0.71	
	RN1303		—		0.17	—	0.33	
	RN1304		—		0.082	—	0.15	
	RN1305		—	$V_{EB} = 5V, I_C = 0$	0.078	—	0.145	
	RN1306		—		0.074	—	0.138	
DC current gain	RN1301	h_{FE}	—	$V_{CE} = 5V, I_C = 10mA$	30	—	—	—
	RN1302		—		50	—	—	
	RN1303		—		70	—	—	
	RN1304		—		80	—	—	
	RN1305		—		80	—	—	
	RN1306		—		80	—	—	
Collector-emitter saturation voltage	RN1301~1306	$V_{CE(sat)}$	—	$I_C = 5mA, I_B = 0.25mA$	—	0.1	0.3	V
Input voltage (ON)	RN1301	$V_{I(ON)}$	—	$V_{CE} = 0.2V, I_C = 5mA$	1.1	—	2.0	V
	RN1302		—		1.2	—	2.4	
	RN1303		—		1.3	—	3.0	
	RN1304		—		1.5	—	5.0	
	RN1305		—		0.6	—	1.1	
	RN1306		—		0.7	—	1.3	
Input voltage (OFF)	RN1301~1304	$V_{I(OFF)}$	—	$V_{CE} = 5V, I_C = 0.1mA$	1.0	—	1.5	V
	RN1305, 1306		—		0.5	—	0.8	
Transition frequency	RN1301~1306	f_T	—	$V_{CE} = 10V, I_C = 5mA$	—	250	—	MHz
Collector output capacitance	RN1301~1306	C_{ob}	—	$V_{CB} = 10V, I_E = 0, f = 1MHz$	—	3	6	pF
Input resistor	RN1301	R1	—	—	3.29	4.7	6.11	kΩ
	RN1302		—		7	10	13	
	RN1303		—		15.4	22	28.6	
	RN1304		—		32.9	47	61.1	
	RN1305		—		1.54	2.2	2.86	
	RN1306		—		3.29	4.7	6.11	
Resistor ratio	RN1301~1305	R1/R2	—	—	0.9	1.0	1.1	—
	RN1305		—		0.0421	0.0468	0.0515	
	RN1306		—		0.09	0.1	0.11	







Type Name	Marking
RN1301	
RN1302	
RN1303	
RN1304	
RN1305	
RN1306	

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