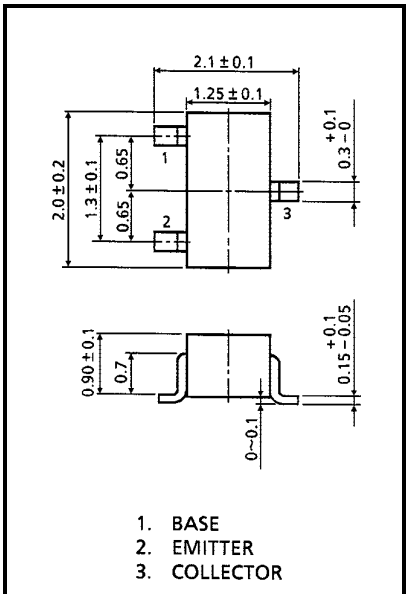
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

RN2301,RN2302,RN2303
RN2304,RN2305,RN2306

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 RN1301~1306

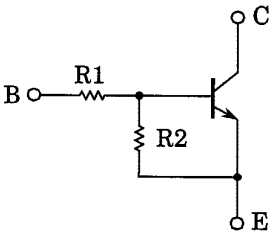
Unit: mm



JEDEC	—
EIAJ	SC-70
TOSHIBA	2-2E1A

Weight: 0.006g

Equivalent Circuit



Bias Resistor Values

Type No.	R1 (kΩ)	R2 (kΩ)
RN2301	4.7	4.7
RN2302	10	10
RN2303	22	22
RN2304	47	47
RN2305	2.2	47
RN2306	4.7	47

Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
Collector-base voltage	RN2301~2306	V_{CBO}	−50	V
Collector-emitter voltage		V_{CEO}	−50	V
Emitter-base voltage	RN2301~2304	V_{EBO}	−10	V
	RN2305, 2306		−5	
Collector current	RN2301~2306	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

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Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN2301~2306	I_{CBO}	—	V_{CB} = −50V, I_E = 0	—	—	−100	nA
		I_{CEO}	—	V_{CE} = −50V, I_B = 0	—	—	−500	
Emitter cut-off current	RN2301	I_{EBO}	—	V_{EB} = −10V, I_C = 0	−0.82	—	−1.52	mA
	RN2302		—		−0.38	—	−0.71	
	RN2303		—		−0.17	—	−0.33	
	RN2304		—		−0.082	—	−0.15	
	RN2305		—	V_{EB} = −5V, I_C = 0	−0.078	—	−0.145	
	RN2306		—		−0.074	—	−0.138	
DC current gain	RN2301	h_{FE}	—	V_{CE} = −5V I_C = −10mA	30	—	—	—
	RN2302		—		50	—	—	
	RN2303		—		70	—	—	
	RN2304		—		80	—	—	
	RN2305		—		80	—	—	
	RN2306		—		80	—	—	
Collector-emitter saturation voltage	RN2301~2306	$V_{CE\ (sat)}$	—	I_C = −5mA I_B = −0.25mA	—	−0.1	−0.3	V
Input voltage (ON)	RN2301	$V_{I\ (ON)}$	—	V_{CE} = −0.2V I_C = −5mA	−1.1	—	−2.0	V
	RN2302		—		−1.2	—	−2.4	
	RN2303		—		−1.3	—	−3.0	
	RN2304		—		−1.5	—	−5.0	
	RN2305		—		−0.6	—	−1.1	
	RN2306		—		−0.7	—	−1.3	
Input voltage (OFF)	RN2301~2304	$V_{I\ (OFF)}$	—	V_{CE} = −5V, I_C = −0.1mA	−1.0	—	−1.5	V
	RN2305, 2306		—		−0.5	—	−0.8	
Translation frequency	RN2301~2306	f_T	—	V_{CE} = −10V, I_C = −5mA	—	200	—	MHz
Collector output capacitance	RN2301~2306	C_{ob}	—	V_{CB} = −10V, I_E = 0 f = 1MHz	—	3	6	pF
Input resistor	RN2301	R1	—	—	3.29	4.7	6.11	kΩ
	RN2302		—		7	10	13	
	RN2303		—		15.4	22	28.6	
	RN2304		—		32.9	47	61.1	
	RN2305		—		1.54	2.2	2.86	
	RN2306		—		3.29	4.7	6.11	
Resistor ratio	RN2301~2304	R1/R2	—	—	0.9	1.0	1.1	—
	RN2305		—		0.0421	0.0468	0.0515	
	RN2306		—		0.09	0.1	0.11	

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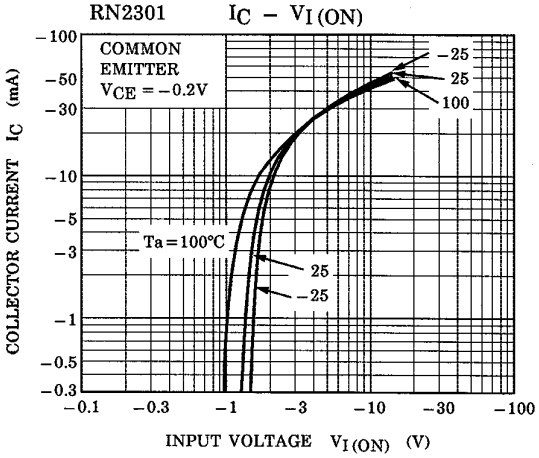
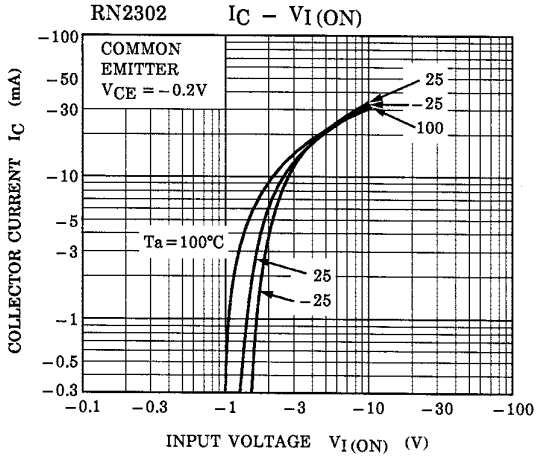
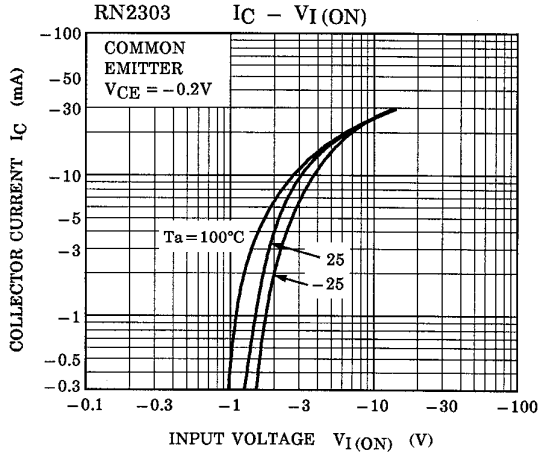
RN2301 I_C – $V_{I(ON)}$



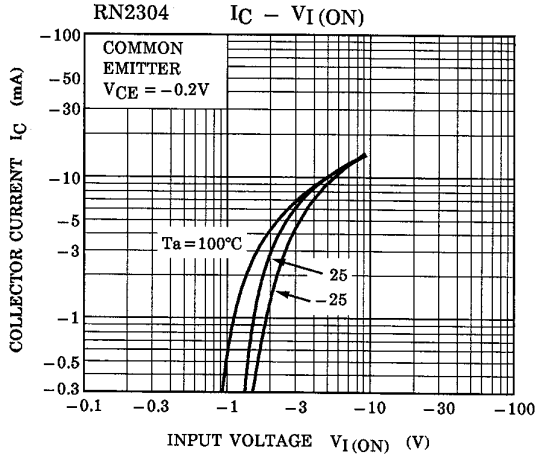
RN2302 I_C – $V_{I(ON)}$



RN2303 I_C – $V_{I(ON)}$



RN2304 I_C – $V_{I(ON)}$



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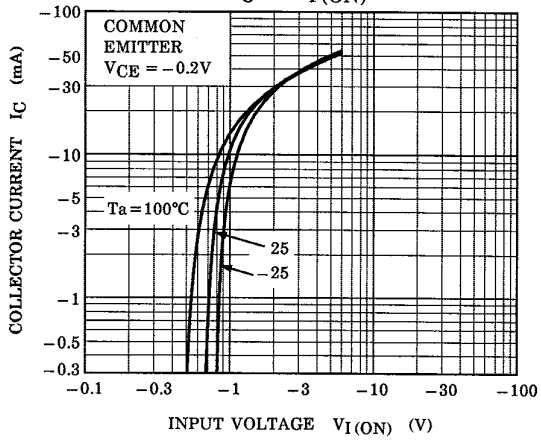
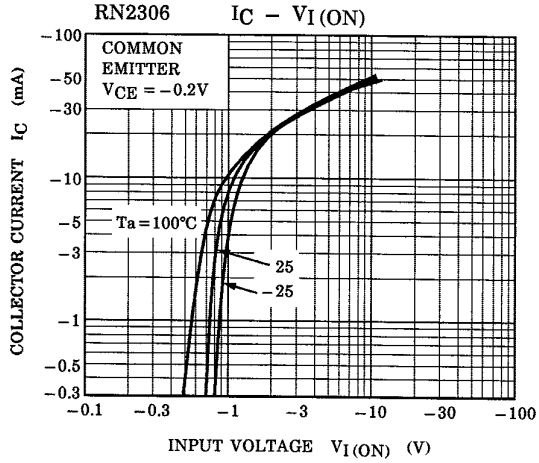


RN2306 I_C – $V_{I(ON)}$



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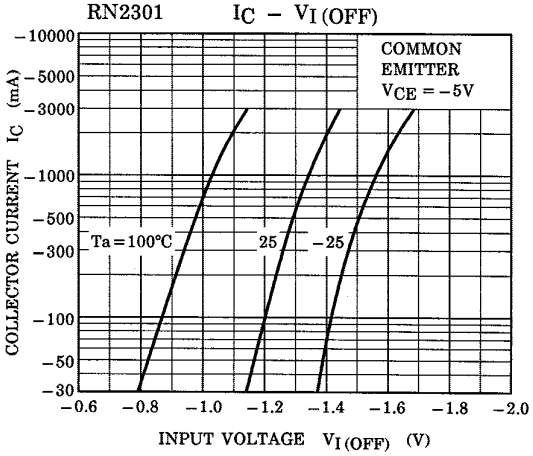
RN2301 $I_C - V_{I(OFF)}$



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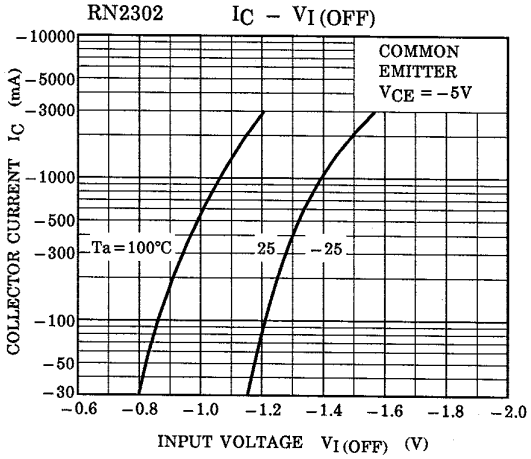

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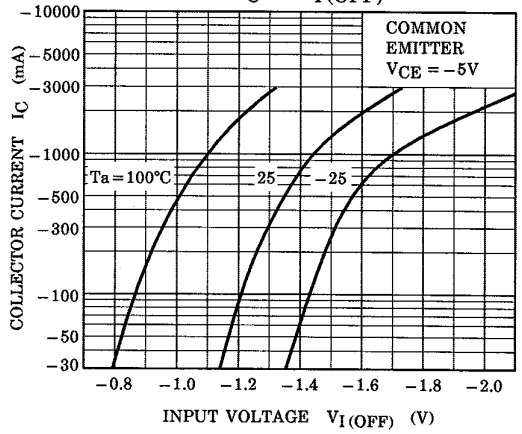

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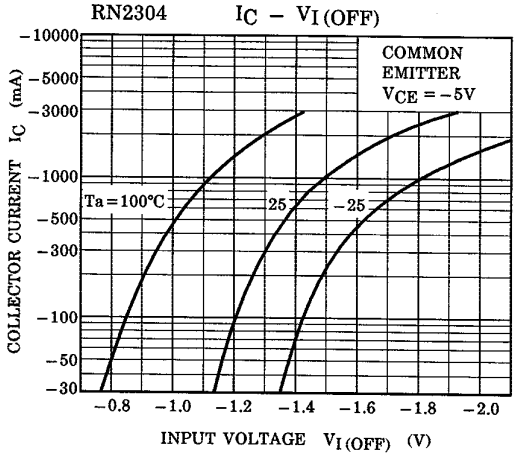

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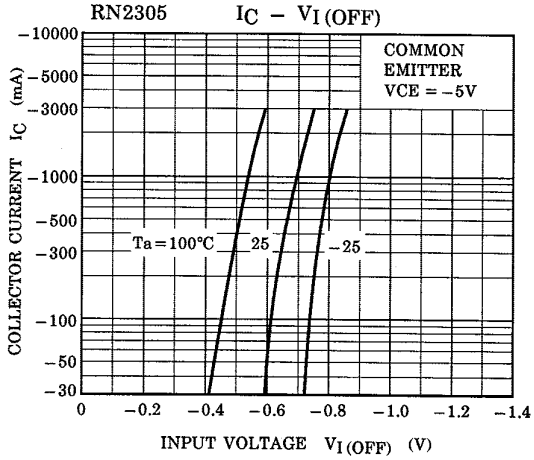
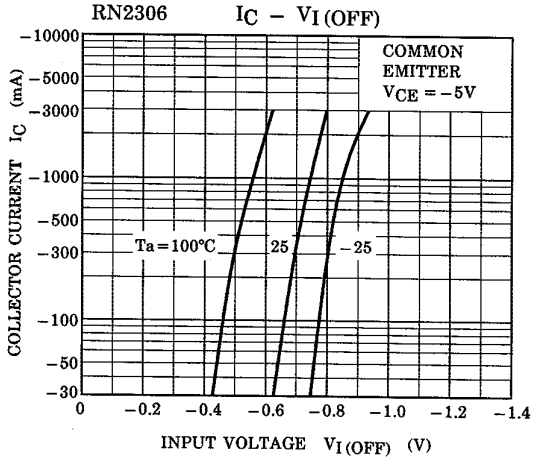


RN2306 $I_C - V_{I(OFF)}$



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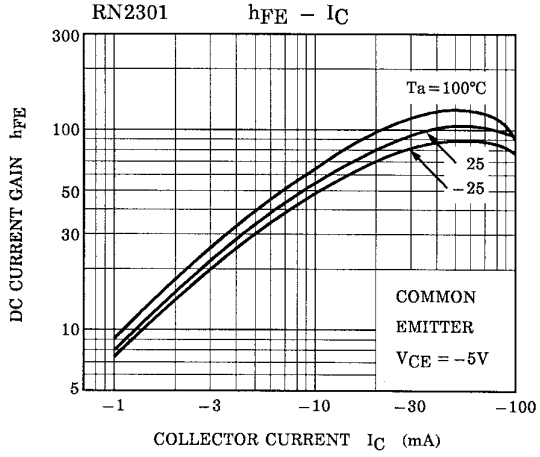
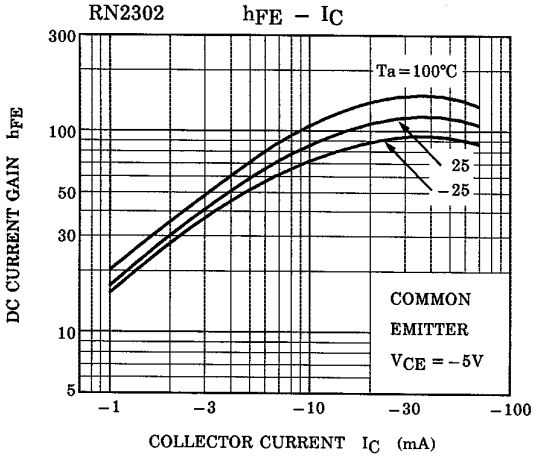
RN2301 h_{FE} – I_C



RN2302 h_{FE} – I_C



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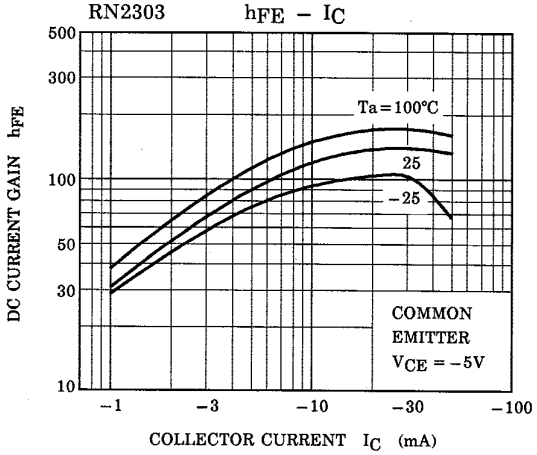

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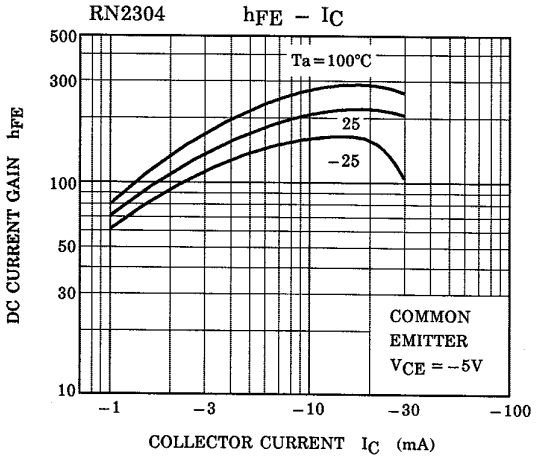

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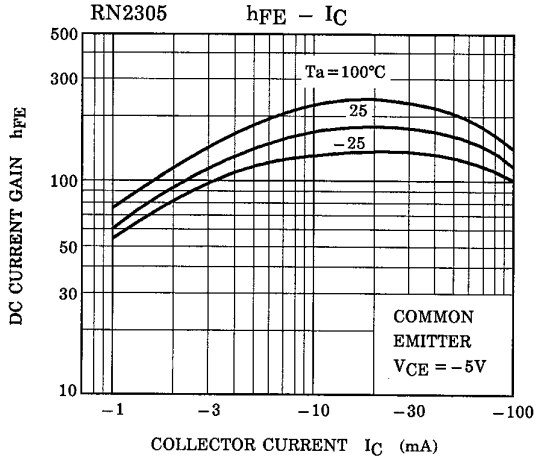
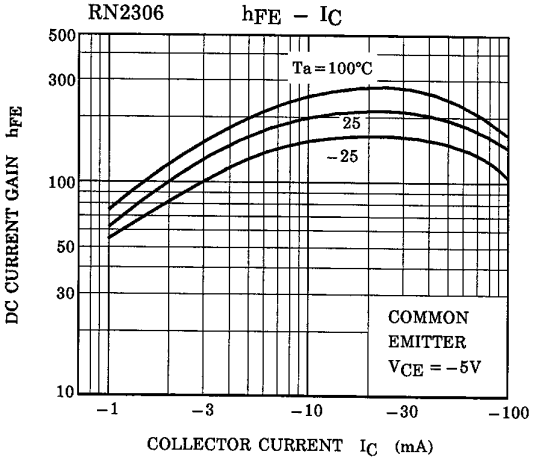


RN2306 h_{FE} – I_C



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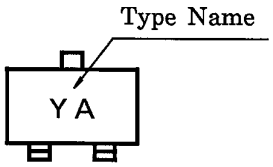
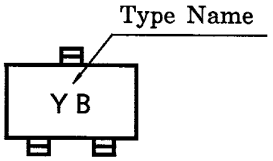
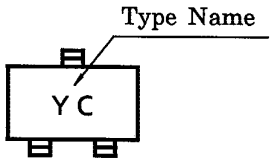
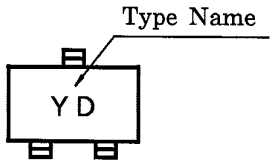
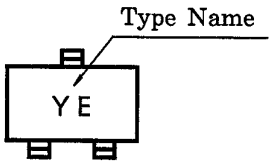
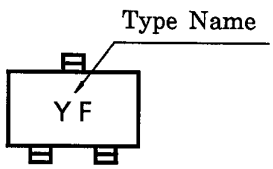
RN2301	
RN2302	
RN2303	
RN2304	
RN2305	
RN2306	

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