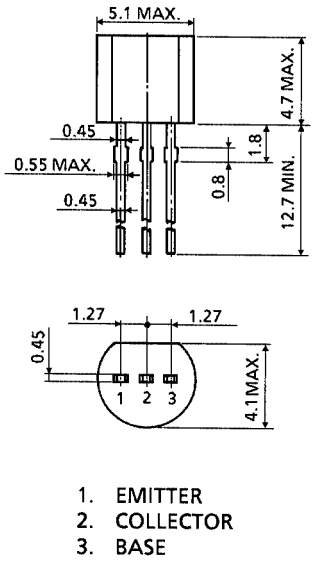
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

RN1001,RN1002,RN1003 RN1004,RN1005,RN1006

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 RN2001~RN2006

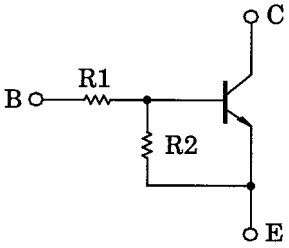
Unit: mm



JEDEC	TO-92
EIAJ	SC-43
TOSHIBA	2-5F1B

Weight: 0.21g

Equivalent Circuit and Bias Resister Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN1001	4.7	4.7
RN1002	10	10
RN1003	22	22
RN1004	47	47
RN1005	2.2	47
RN1006	4.7	47

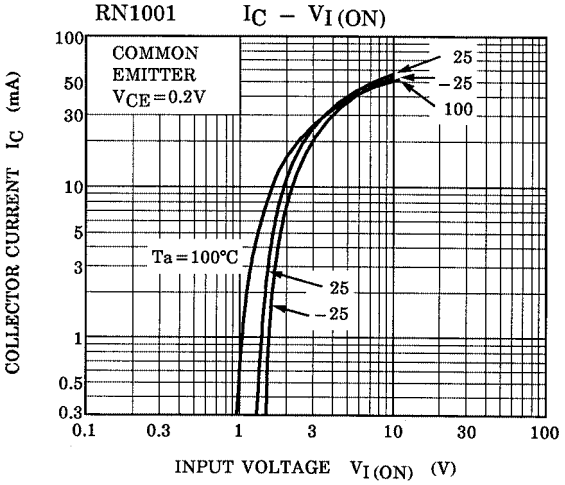
Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
Collector-base voltage	RN1001~1006	V_{CBO}	50	V
Collector-emitter voltage		V_{CEO}	50	V
Emitter-base voltage	RN1001~1004	V_{EBO}	10	V
	RN1005, 1006		5	
Collector current	RN1001~1006	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

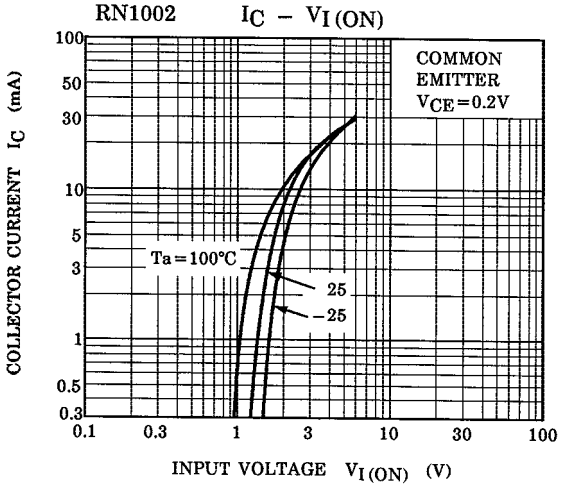
Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN1001~1006	I_{CBO}	—	V_{CB} = 50V, I_E = 0	—	—	100	nA
		I_{CEO}		V_{CE} = 50V, I_B = 0	—	—	500	
Emitter cut-off current	RN1001	I_{EBO}	—	V_{EB} = 10V, I_C = 0	0.82	—	1.52	mA
	RN1002				0.38	—	0.71	
	RN1003				0.17	—	0.33	
	RN1004				0.082	—	0.15	
	RN1005			V_{EB} = 5V, I_C = 0	0.078	—	0.145	
	RN1006				0.074	—	0.138	
DC current gain	RN1001	h_{FE}	—	V_{CE} = 5V, I_C = 10mA	30	—	—	—
	RN1002				50	—	—	
	RN1003				70	—	—	
	RN1004				80	—	—	
	RN1005				80	—	—	
	RN1006				80	—	—	
Collector-emitter saturation voltage	RN1001~1006	$V_{CE\ (sat)}$	—	I_C = 5mA, I_B = 0.25mA	—	0.1	0.3	V
Input voltage (ON)	RN1001	$V_{I\ (ON)}$	—	V_{CE} = 0.2V, I_C = 5mA	1.1	—	2.0	V
	RN1002				1.2	—	2.4	
	RN1003				1.3	—	3.0	
	RN1004				1.5	—	5.0	
	RN1005				0.6	—	1.1	
	RN1006				0.7	—	1.3	
Input voltage (OFF)	RN1001~1004	$V_{I\ (OFF)}$	—	V_{CE} = 5V, I_C = 0.1mA	1.0	—	1.5	V
	RN1005, 1006				0.5	—	0.8	
Transition frequency	RN1001~1006	f_T	—	V_{CE} = 10V, I_C = 5mA	—	250	—	MH_z
Collector Output capacitance	RN1001~1006	C_{ob}	—	V_{CB} = 10V, I_E = 0, f = 1MH_z	—	3	6	pF
Input resistor	RN1001	R1	—		3.29	4.7	6.11	kΩ
	RN1002				7	10	13	
	RN1003				15.4	22	28.6	
	RN1004				32.9	47	61.1	
	RN1005				1.54	2.2	2.86	
	RN1006				3.29	4.7	6.11	
Resistor ratio	RN1001~1004	R1/R2	—		0.9	1.0	1.1	—
	RN1005				0.0421	0.0468	0.0515	
	RN1006				0.09	0.1	0.11	

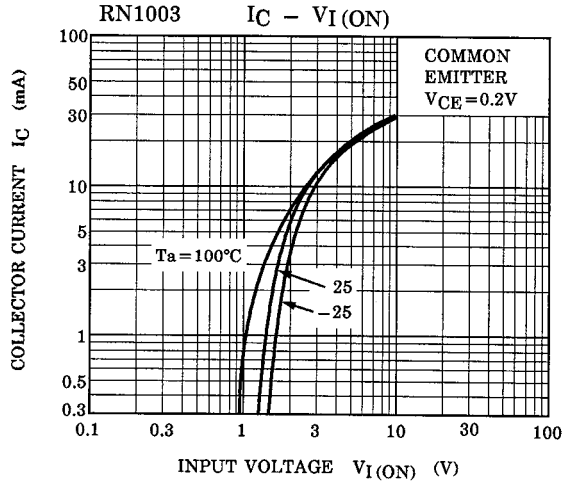
RN1001 $I_C - V_{I(ON)}$



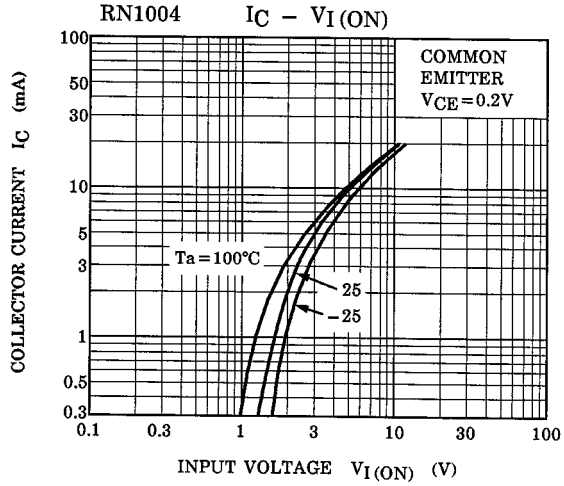
RN1002 $I_C - V_{I(ON)}$



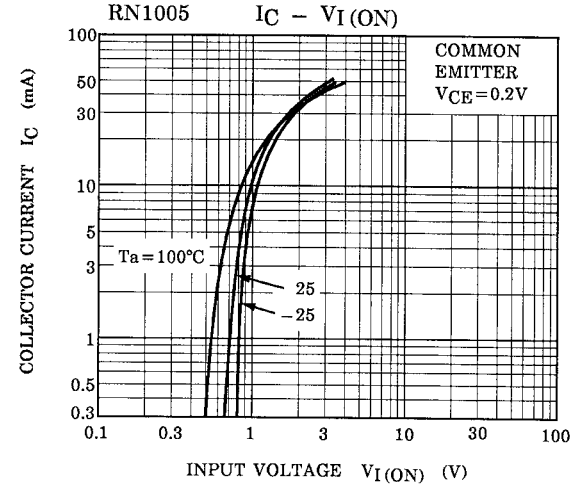
RN1003 $I_C - V_{I(ON)}$



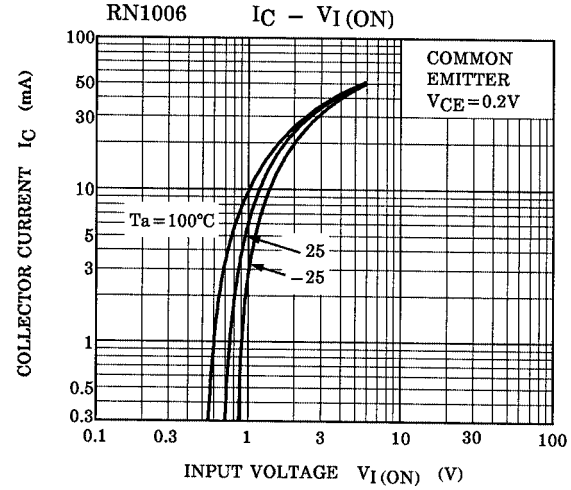
RN1004 $I_C - V_{I(ON)}$



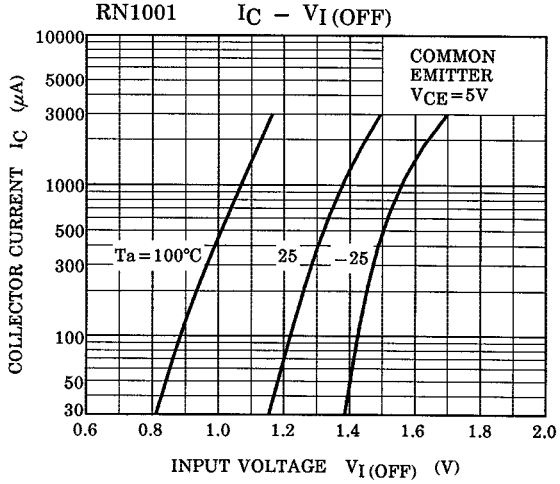
RN1005 $I_C - V_{I(ON)}$



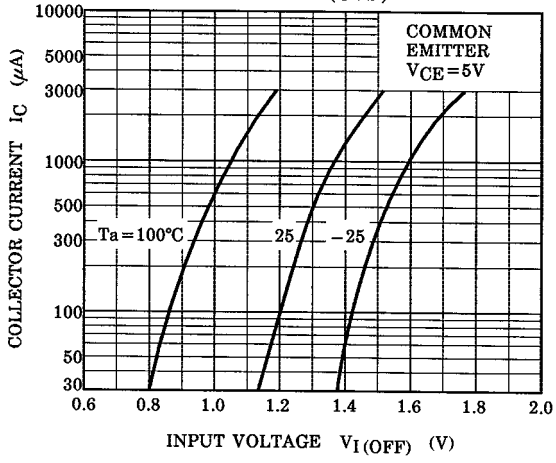
RN1006 $I_C - V_{I(ON)}$



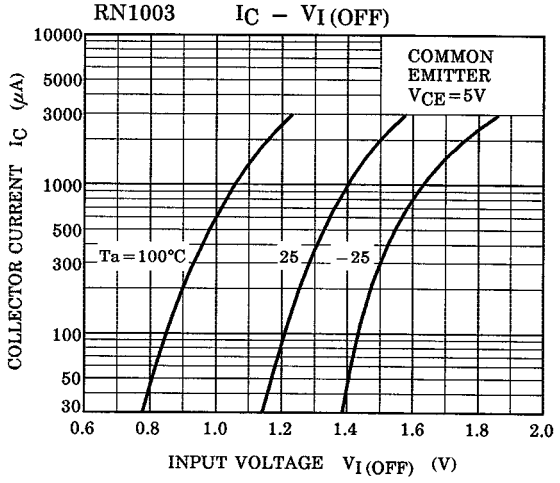
RN1001 $I_C - V_{I(OFF)}$



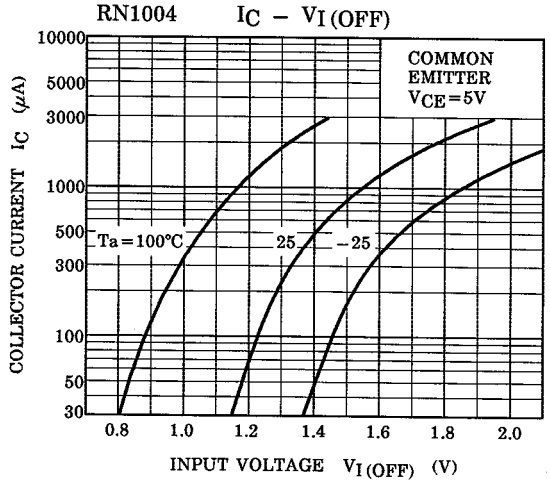
RN1002 $I_C - V_{I(OFF)}$



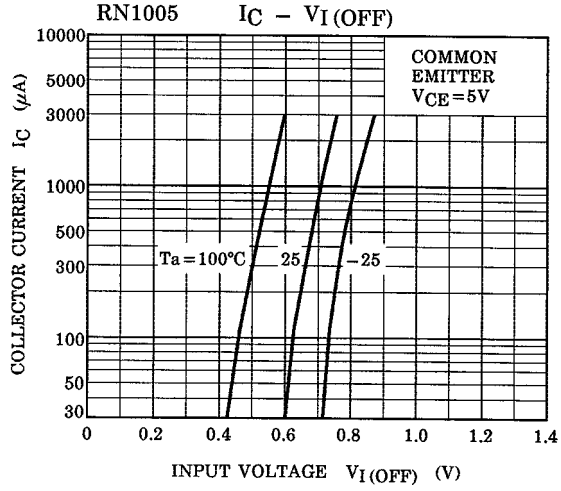
RN1003 $I_C - V_{I(OFF)}$



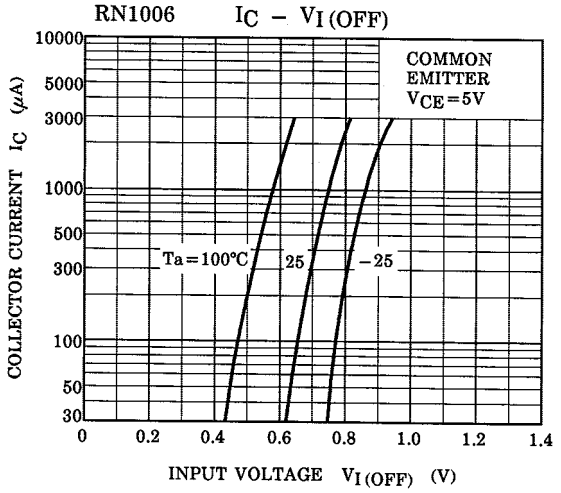
RN1004 $I_C - V_{I(OFF)}$



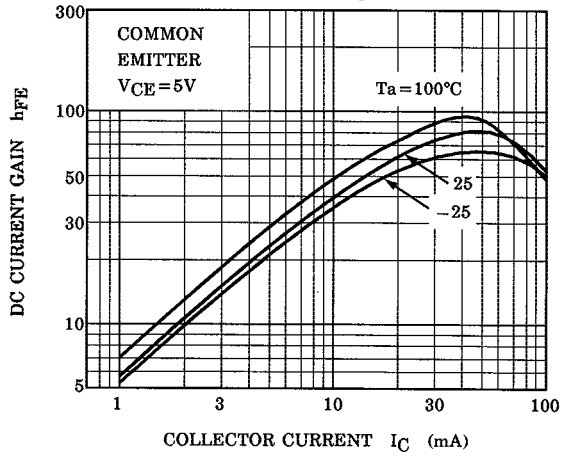
RN1005 $I_C - V_{I(OFF)}$



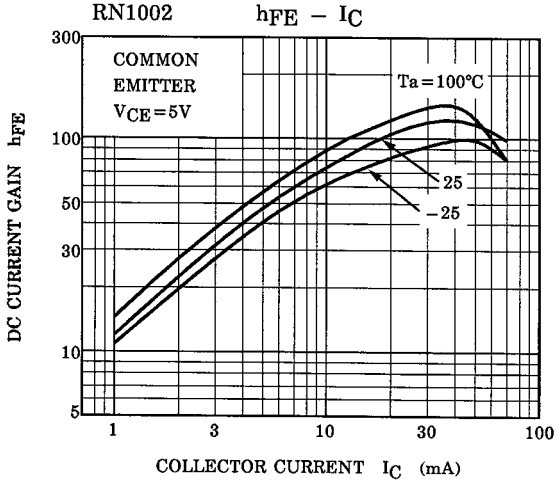
RN1006 $I_C - V_{I(OFF)}$



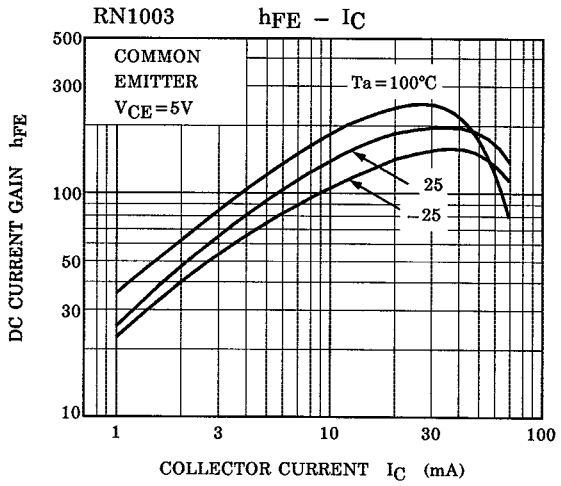
RN1001 h_{FE} – I_C



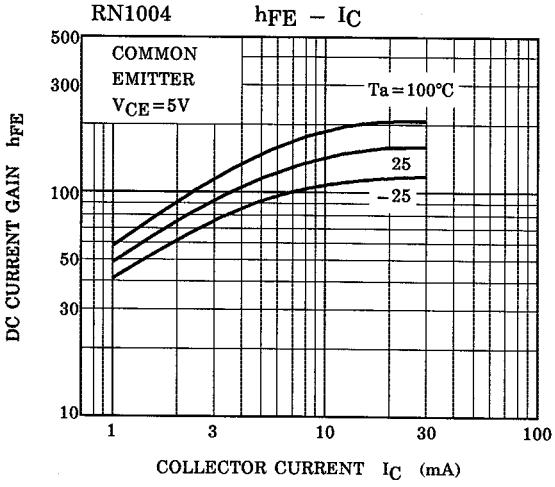
RN1002 h_{FE} – I_C



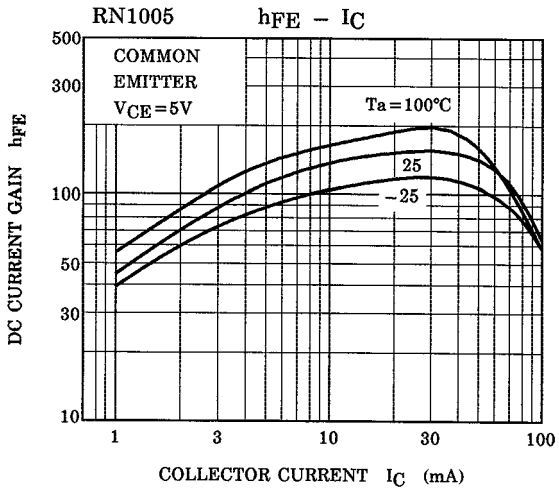
RN1003 h_{FE} – I_C



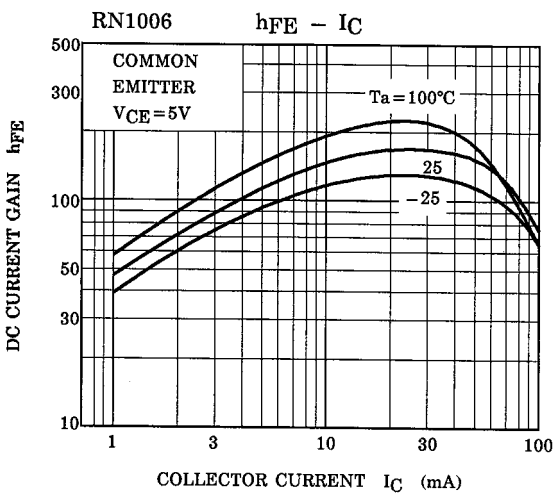
RN1004 h_{FE} – I_C



RN1005 h_{FE} – I_C



RN1006 h_{FE} – I_C



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