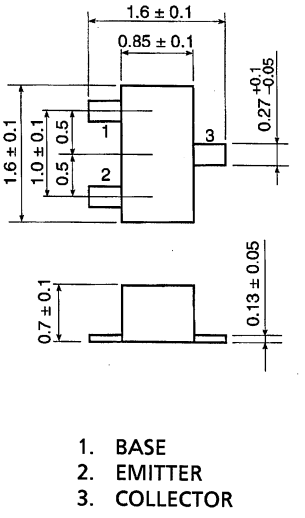
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

RN1101F,RN1102F,RN1103F RN1104F,RN1105F,RN1106F

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 RN2101F~RN2106F

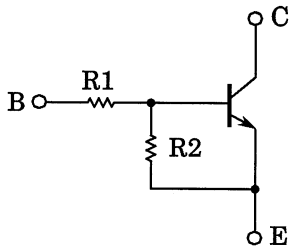
Unit in mm



JEDEC	—
EIAJ	—
TOSHIBA	2-2H1A

Weight: 2.3 mg

Equivalent Circuit And Bias Resister Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN1101F	4.7	4.7
RN1102F	10	10
RN1103F	22	22
RN1104F	47	47
RN1105F	2.2	47
RN1106F	4.7	47

Absolute Maximum Ratings (Ta = 25°C)

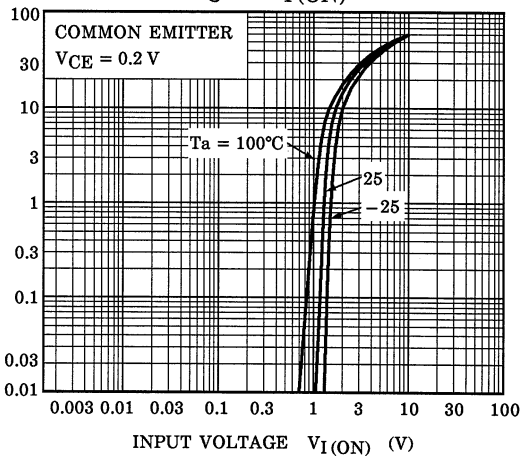
Characteristic		Symbol	Rating	Unit
Collector-base voltage	RN1101F~1106F	V_{CBO}	50	V
Collector-emitter voltage		V_{CEO}	50	V
Emitter-base voltage	RN1101F~1104F	V_{EBO}	10	V
	RN1105F, 1106F		5	
Collector current	RN1101F~1106F	I_C	100	mA
Collector power dissipation		P_C	100	mW
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55~150	°C

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).

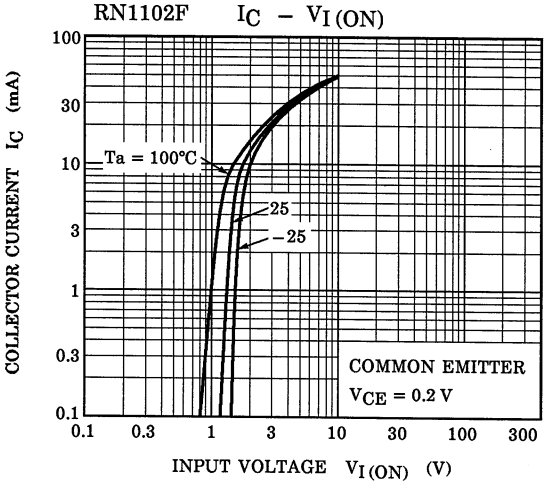
Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN1101F ~1106F	I_{CBO}	—	V_{CB} = 50V, I_E = 0	—	—	100	nA
		I_{CEO}		V_{CE} = 50V, I_B = 0	—	—	500	
Emitter cut-off current	RN1101F	I_{EBO}	—	V_{EB} = 10V, I_C = 0	0.82	—	1.52	mA
	RN1102F				0.38	—	0.71	
	RN1103F				0.17	—	0.33	
	RN1104F				0.082	—	0.15	
	RN1105F			V_{EB} = 5V, I_C = 0	0.078	—	0.145	
	RN1106F				0.074	—	0.138	
DC current gain	RN1101F	h_{FE}	—	V_{CE} = 5V, I_C = 10mA	30	—	—	—
	RN1102F				50	—	—	
	RN1103F				70	—	—	
	RN1104F				80	—	—	
	RN1105F				80	—	—	
	RN1106F				80	—	—	
Collector-emitter saturation voltage	RN1101F ~1106F	$V_{CE\ (sat)}$	—	I_C = 5mA, I_B = 0.25mA	—	0.1	0.3	V
Input voltage (ON)	RN1101F	$V_{I\ (ON)}$	—	V_{CE} = 0.2V, I_C = 5mA	1.1	—	2.0	V
	RN1102F				1.2	—	2.4	
	RN1103F				1.3	—	3.0	
	RN1104F				1.5	—	5.0	
	RN1105F				0.6	—	1.1	
	RN1106F				0.7	—	1.3	
Input voltage (OFF)	RN1101F ~1104F	$V_{I\ (OFF)}$	—	V_{CE} = 5V, I_C = 0.1mA	1.0	—	1.5	V
	RN1105F, 1106F				0.5	—	0.8	
Transition frequency	RN1101F ~1106F	f_T	—	V_{CE} = 10V, I_C = 5mA	—	250	—	MH_z
Collector Output capacitance	RN1101F ~1106F	C_{ob}	—	V_{CB} = 10V, I_E = 0, f = 1MH_z	—	3	6	pF
Input resistor	RN1101F	R1	—	—	3.29	4.7	6.11	kΩ
	RN1102F				7	10	13	
	RN1103F				15.4	22	28.6	
	RN1104F				32.9	47	61.1	
	RN1105F				1.54	2.2	2.86	
	RN1106F				3.29	4.7	6.11	
Resistor ratio	RN1101F ~1104F	R1/R2	—	—	0.9	1.0	1.1	
	RN1105F				0.0421	0.0468	0.0515	
	RN1106F				0.09	0.1	0.11	

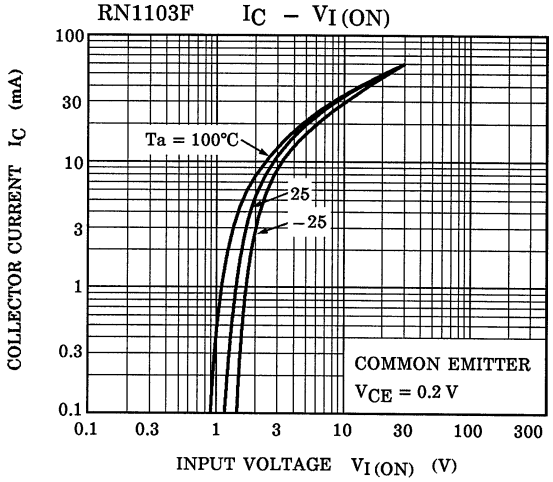
RN1101F I_C – $V_{I(ON)}$



RN1102F I_C – $V_{I(ON)}$



RN1103F I_C – $V_{I(ON)}$



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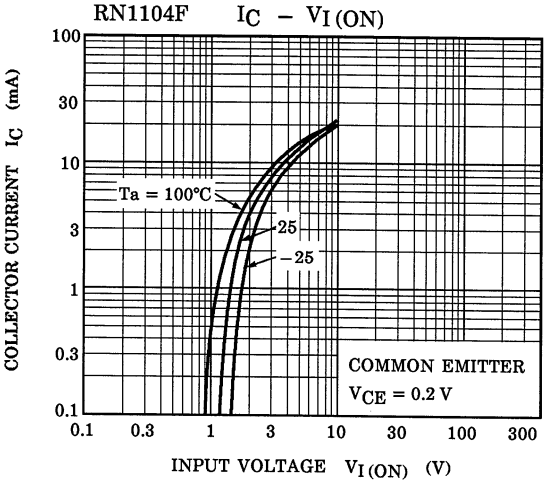
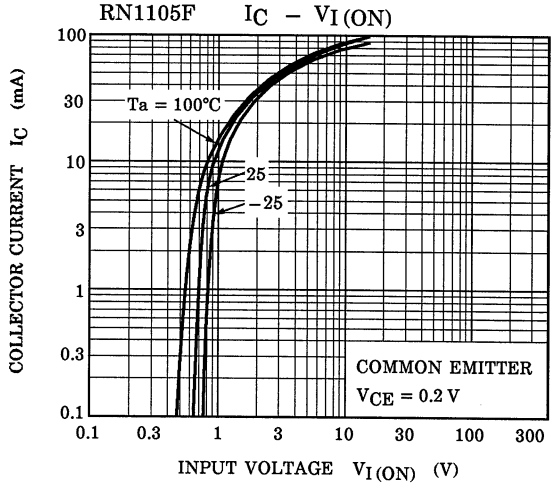
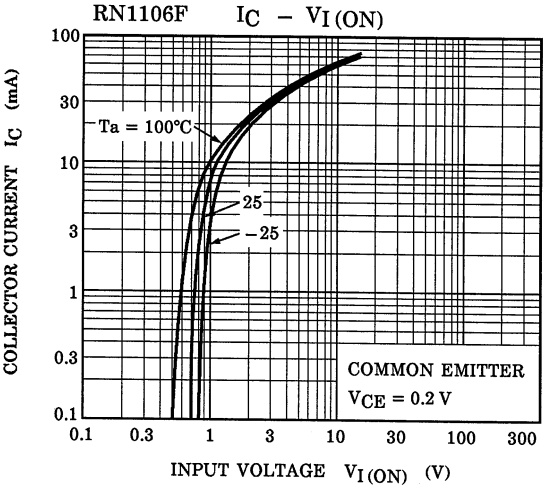


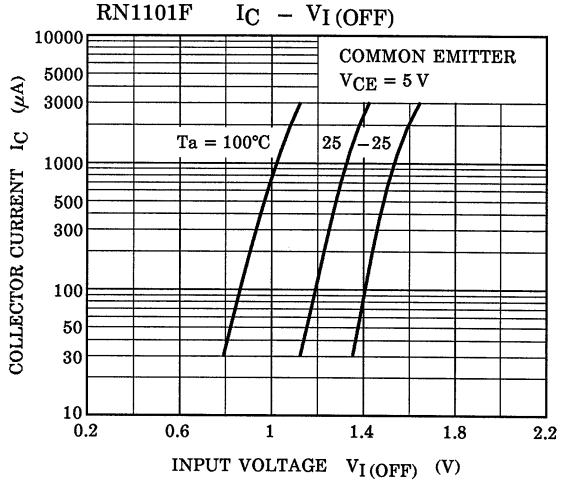
RN1105F I_C – $V_{I(ON)}$



RN1106F I_C – $V_{I(ON)}$



RN1101F I_C – $V_{I(OFF)}$



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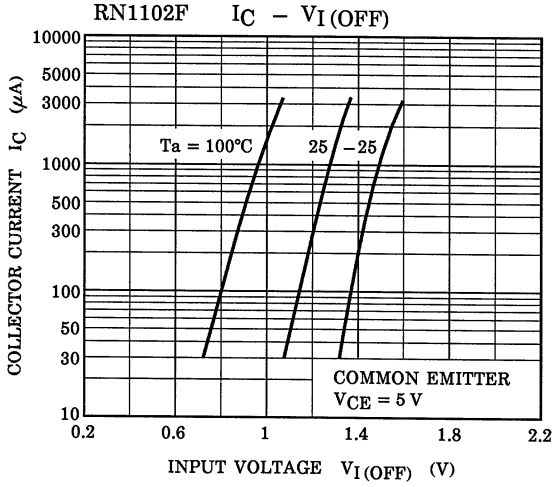

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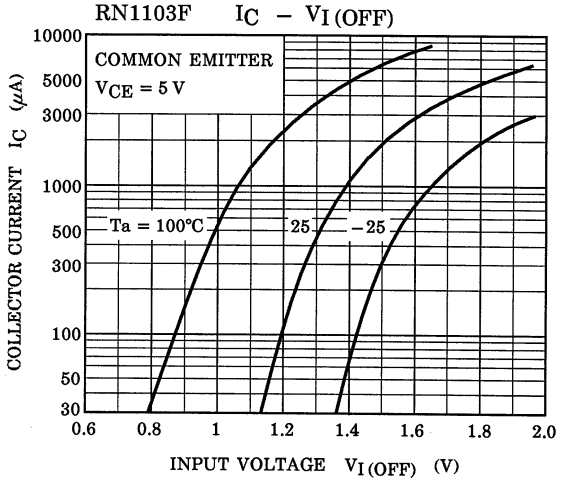

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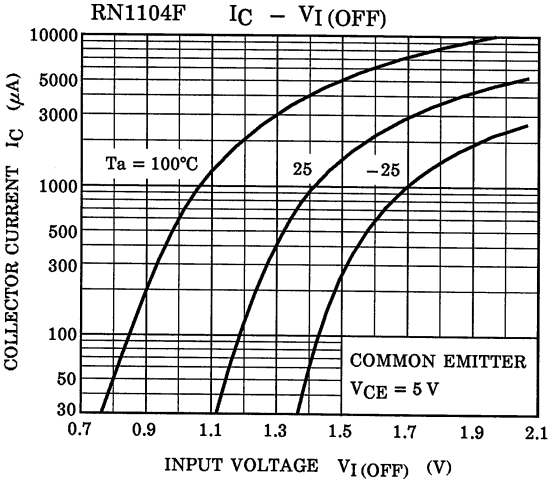

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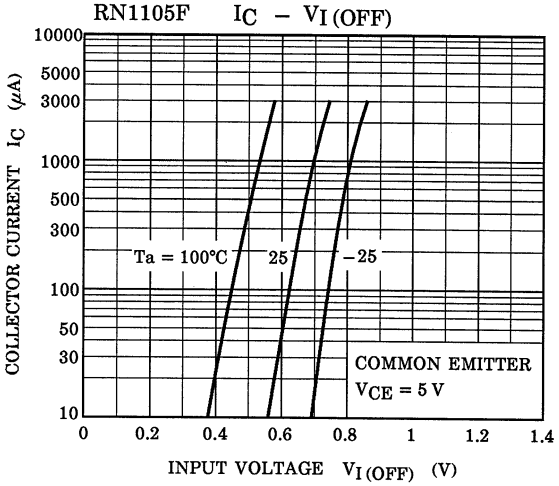

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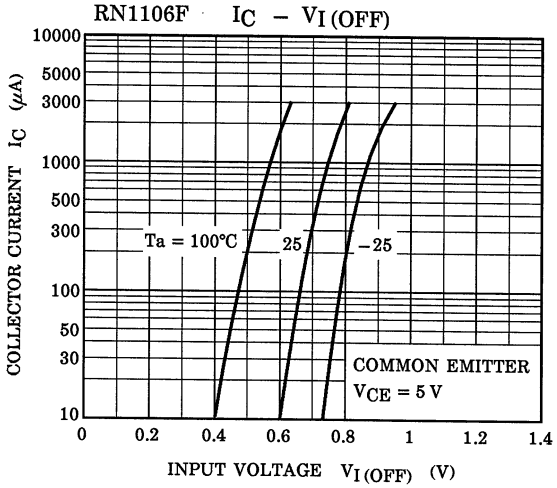
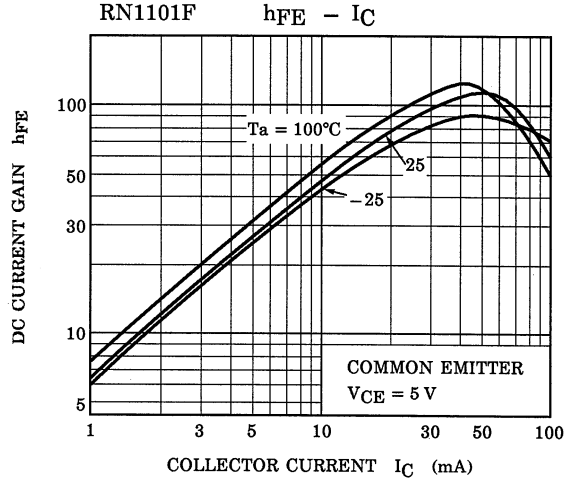


RN1101F h_{FE} – I_C



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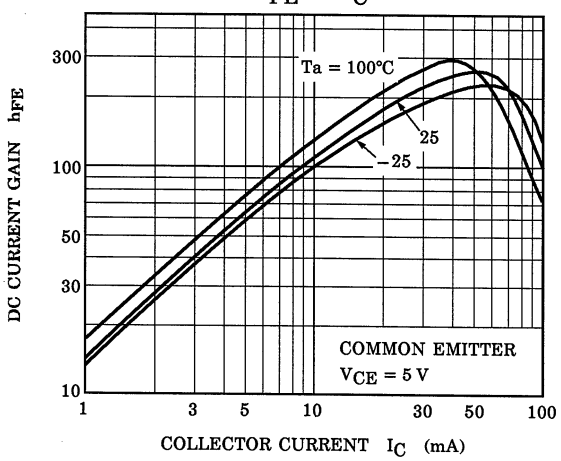

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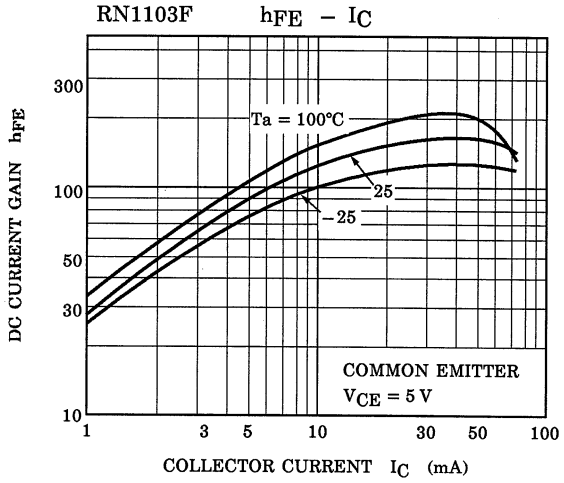

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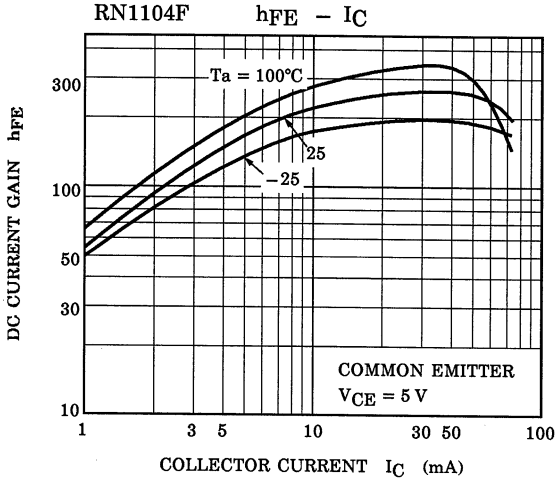

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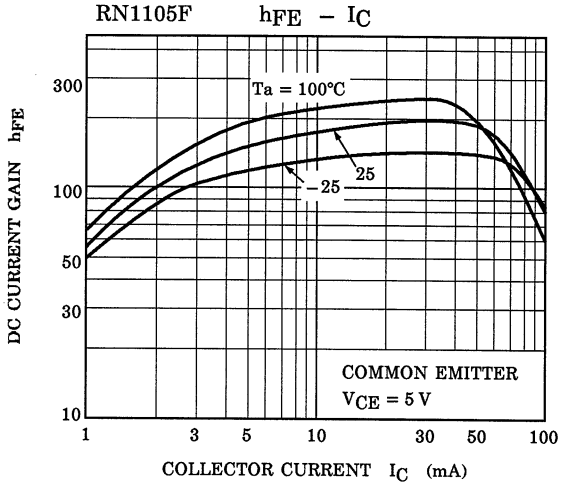
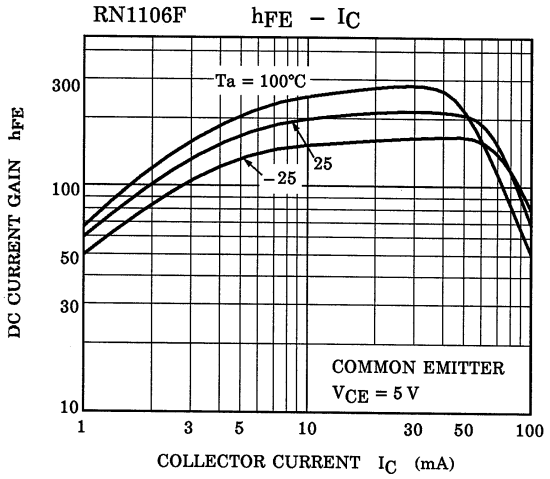
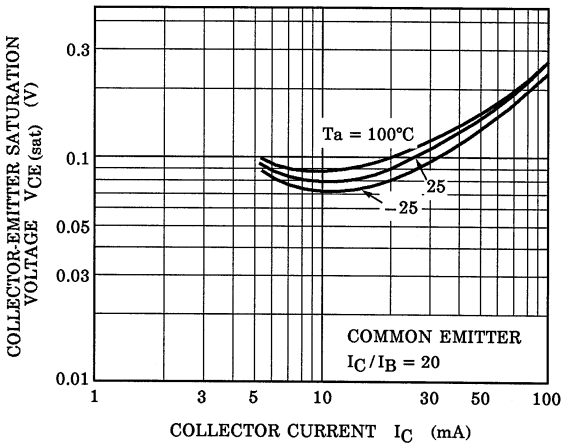


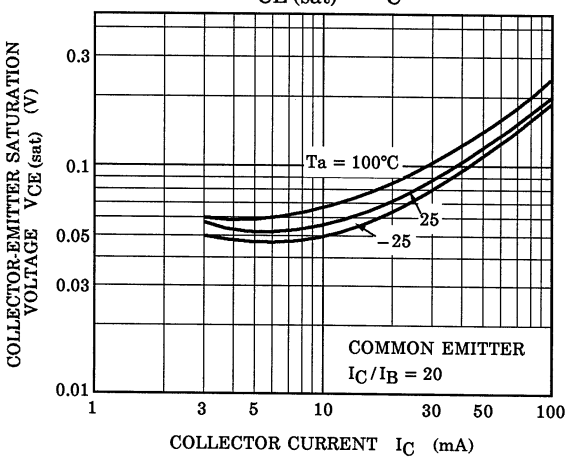
RN1106F h_{FE} – I_C



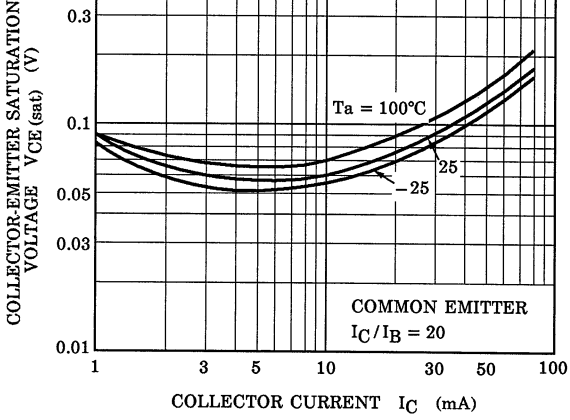
RN1101F $V_{CE\,(sat)}$ – I_C



RN1102F $V_{CE\,(sat)}$ – I_C



RN1103F $V_{CE\,(sat)}$ – I_C



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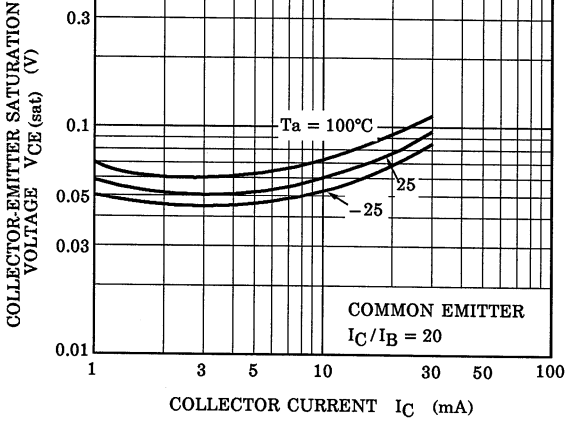

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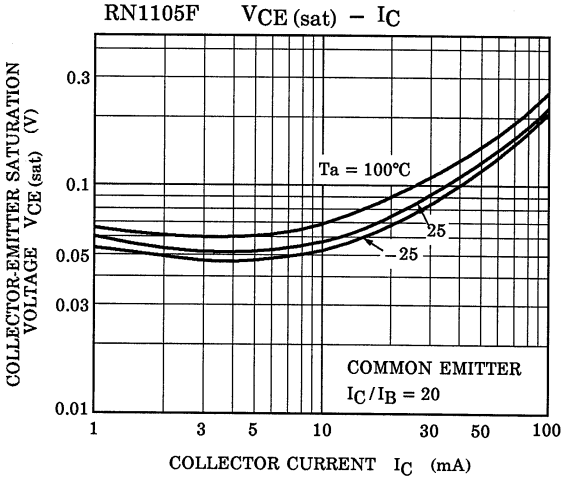

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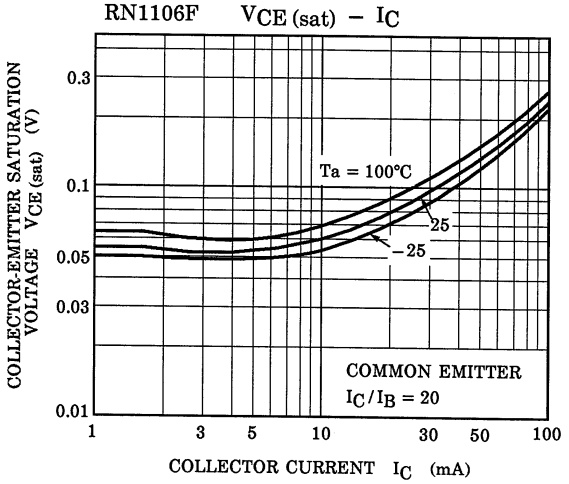
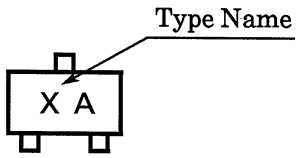
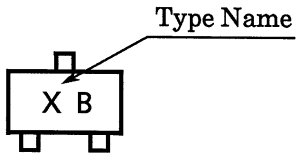
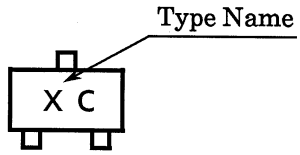
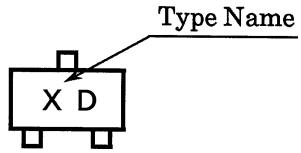
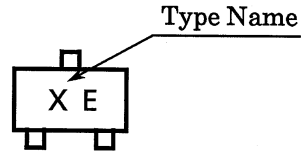
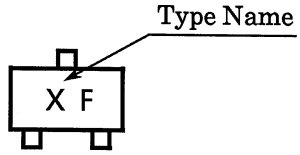


Type Name	Marking
RN1101F	
RN1102F	
RN1103F	
RN1104F	
RN1105F	
RN1106F	

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20070701-EN GENERAL

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