

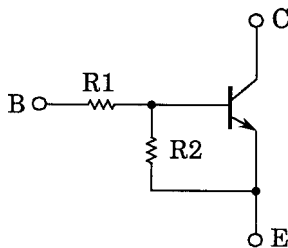
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

## RN1101F, RN1102F, RN1103F RN1104F, RN1105F, RN1106F

Switching, Inverter Circuit, Interface Circuit  
And Driver Circuit Applications

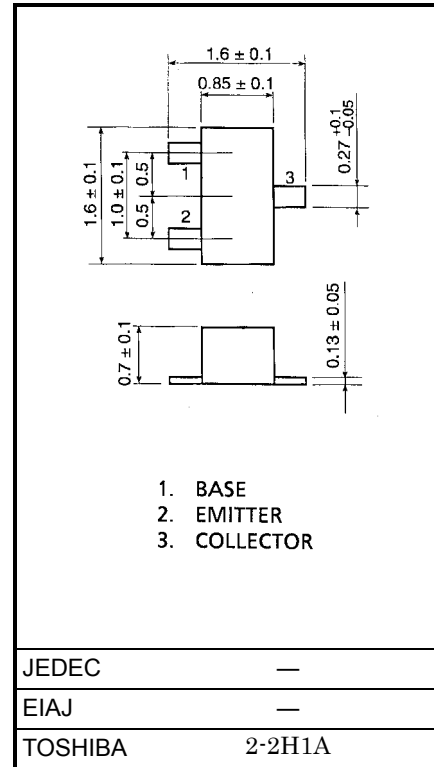
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN2101F~RN2106F

### 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

Unit in mm



Weight: 2.3 mg

### 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	$P_C$	100	mW
Junction temperature	$T_j$	150	°C
Storage temperature range	$T_{stg}$	-55~150	°C

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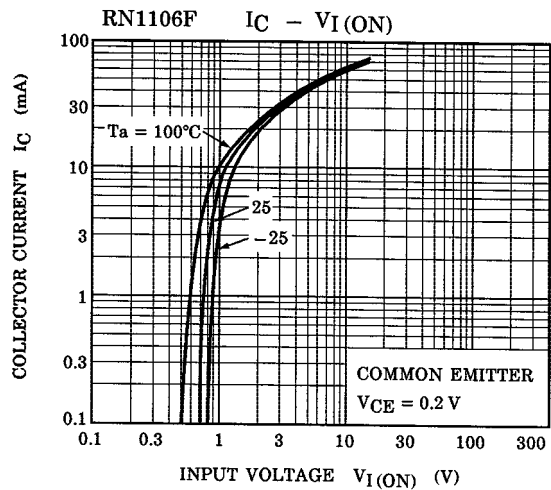
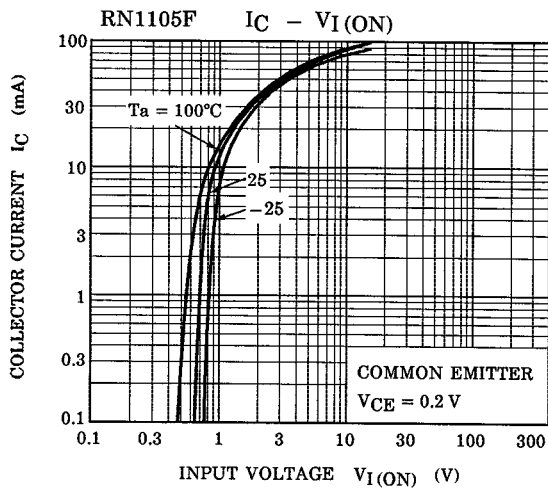
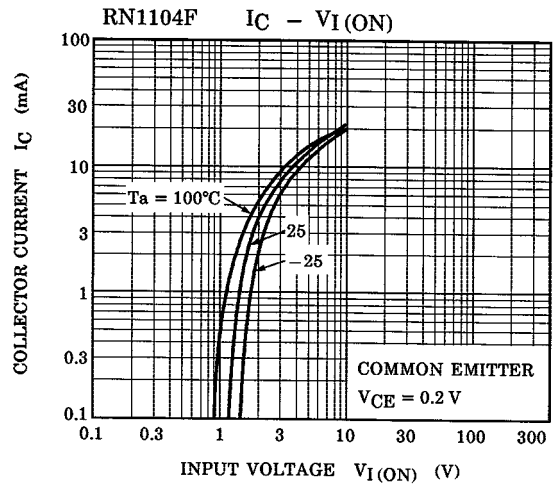
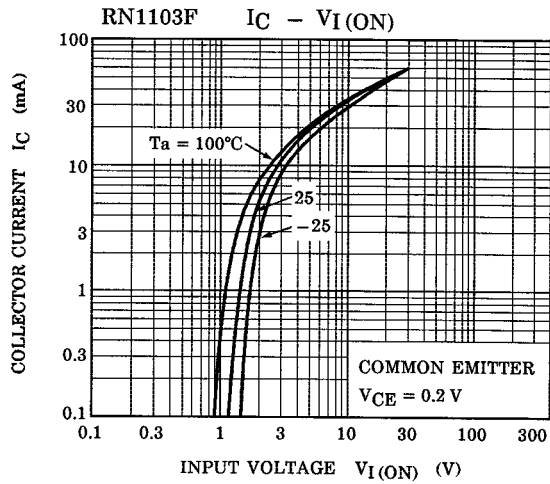
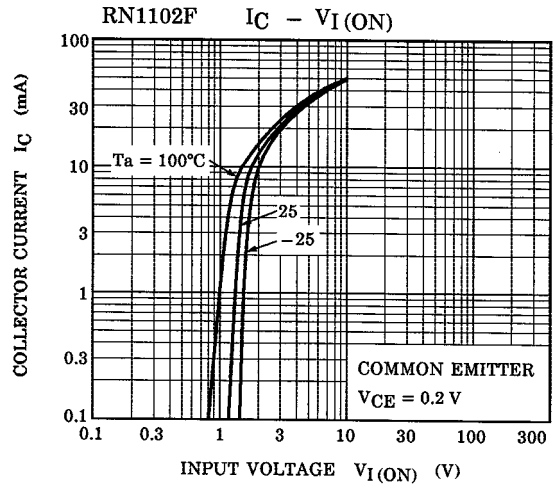
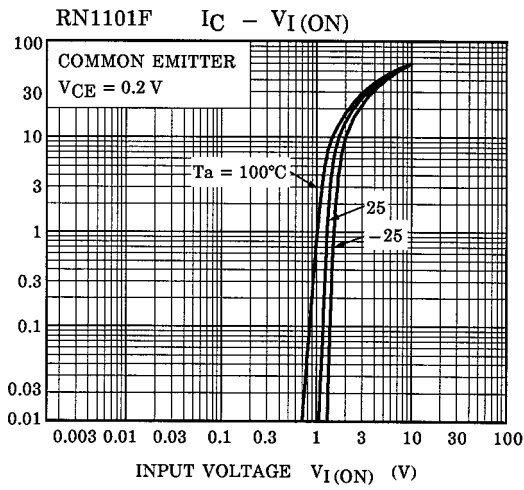
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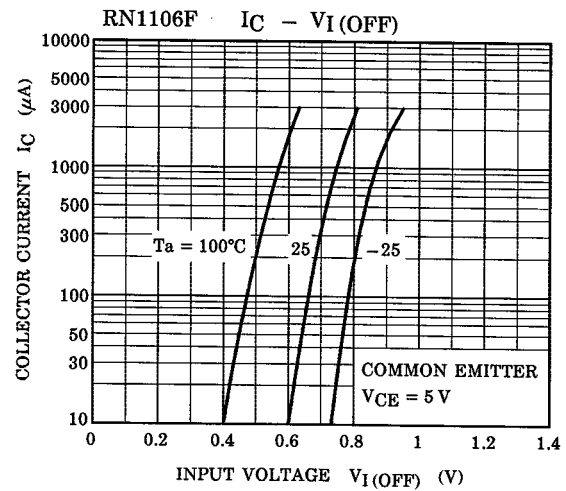
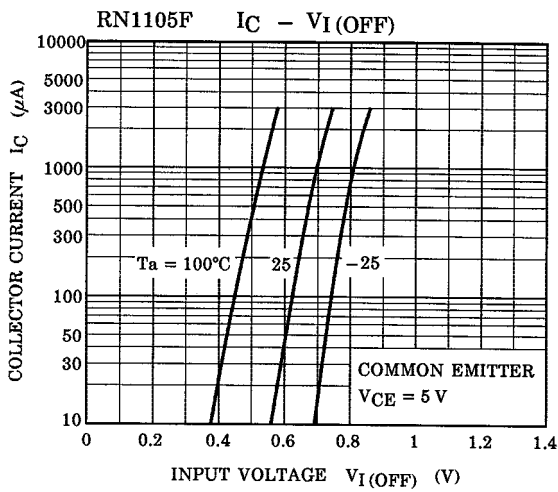
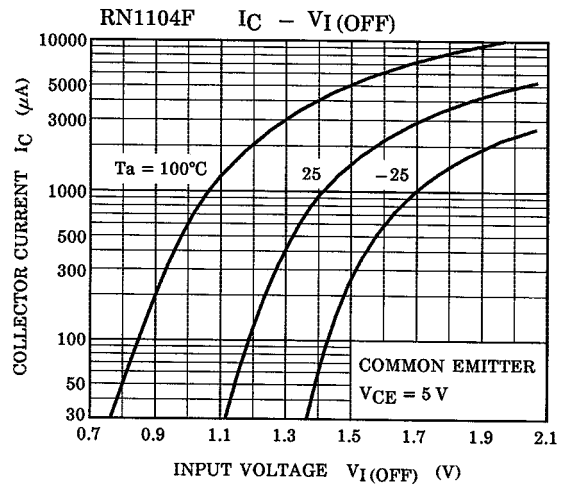
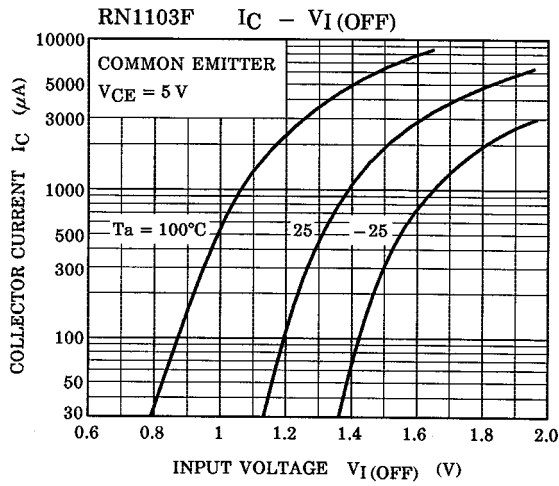
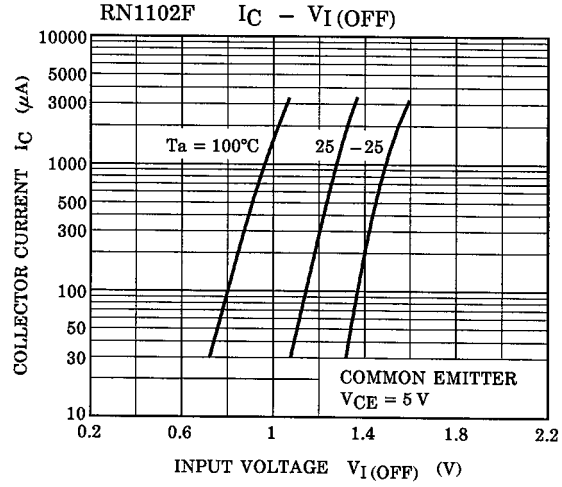
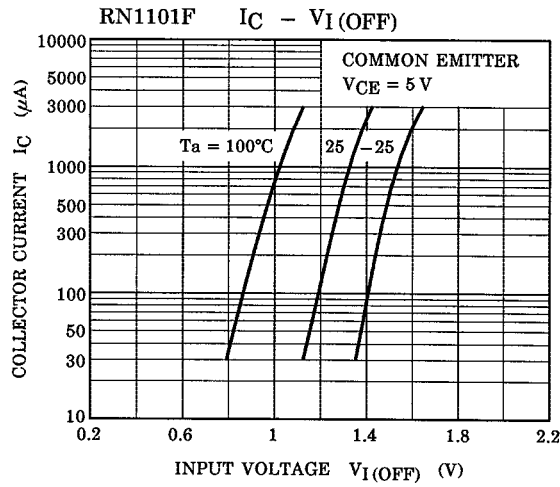
## Electrical Characteristics (Ta = 25°C)

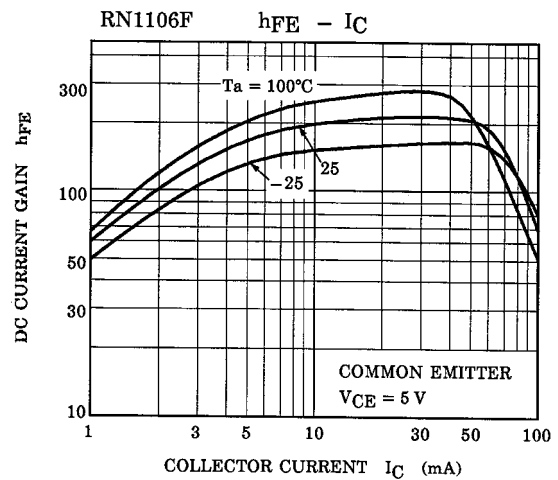
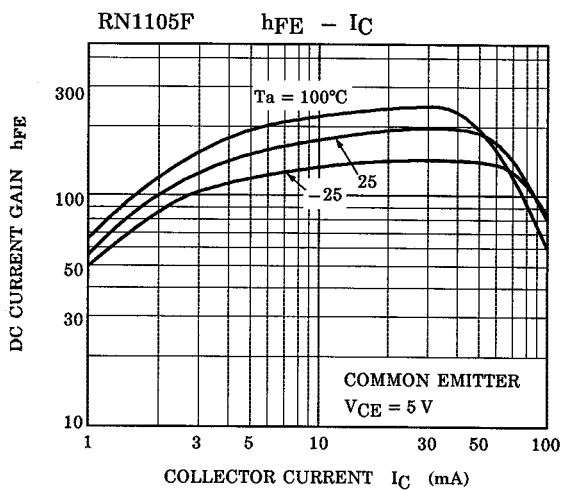
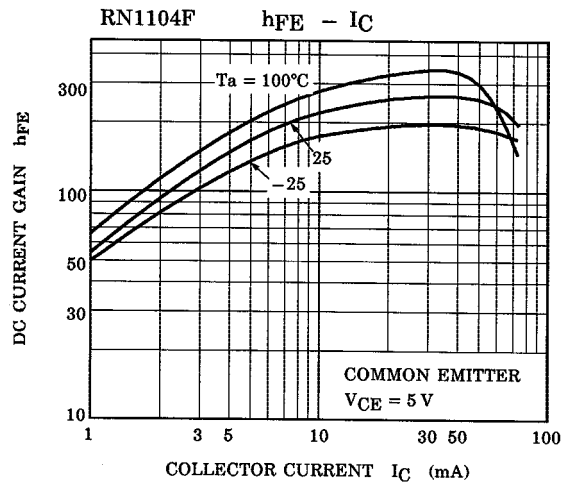
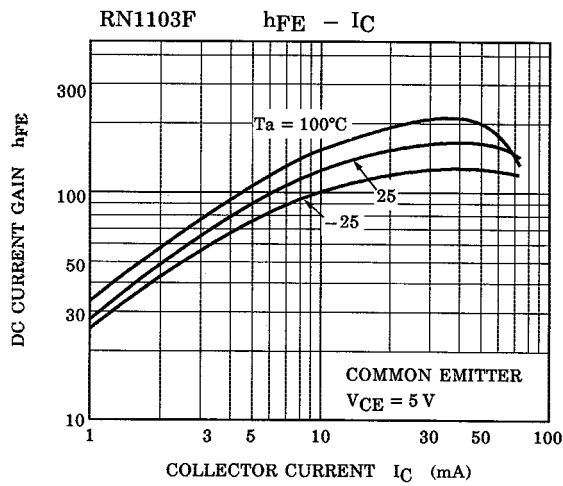
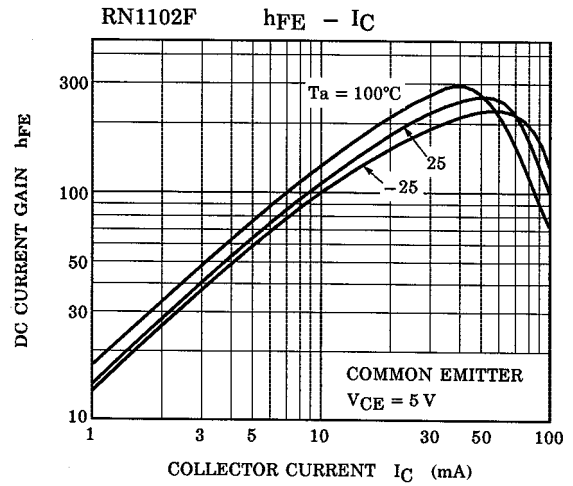
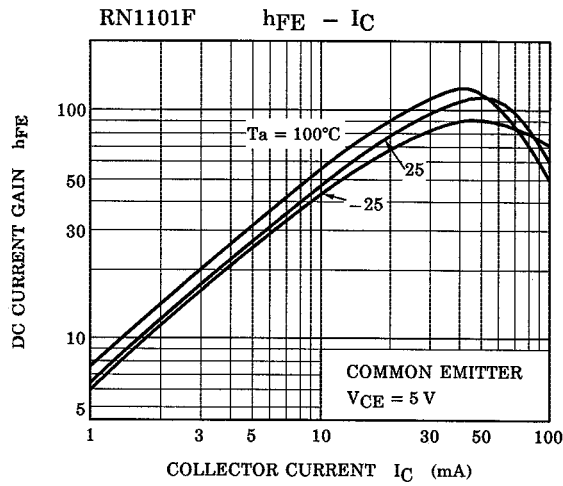
Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN1101F ~1106F	I <sub>CBO</sub>	—	V <sub>CB</sub> = 50V, I <sub>E</sub> = 0	—	—	100	nA
		I <sub>CEO</sub>		V <sub>CE</sub> = 50V, I <sub>B</sub> = 0	—	—	500	
Emitter cut-off current	RN1101F	I <sub>EBO</sub>	—	V <sub>EB</sub> = 10V, I <sub>C</sub> = 0	0.82	—	1.52	mA
	RN1102F				0.38	—	0.71	
	RN1103F				0.17	—	0.33	
	RN1104F				0.082	—	0.15	
	RN1105F			V <sub>EB</sub> = 5V, I <sub>C</sub> = 0	0.078	—	0.145	
	RN1106F				0.074	—	0.138	
DC current gain	RN1101F	h <sub>FE</sub>	—	V <sub>CE</sub> = 5V, I <sub>C</sub> = 10mA	30	—	—	—
	RN1102F				50	—	—	
	RN1103F				70	—	—	
	RN1104F				80	—	—	
	RN1105F				80	—	—	
	RN1106F				80	—	—	
Collector-emitter saturation voltage	RN1101F ~1106F	V <sub>CE (sat)</sub>	—	I <sub>C</sub> = 5mA, I <sub>B</sub> = 0.25mA	—	0.1	0.3	V
Input voltage (ON)	RN1101F	V <sub>I (ON)</sub>	—	V <sub>CE</sub> = 0.2V, I <sub>C</sub> = 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 <sub>I (OFF)</sub>	—	V <sub>CE</sub> = 5V, I <sub>C</sub> = 0.1mA	1.0	—	1.5	V
	RN1105F, 1106F				0.5	—	0.8	
Transition frequency	RN1101F ~1106F	f <sub>T</sub>	—	V <sub>CE</sub> = 10V, I <sub>C</sub> = 5mA	—	250	—	MHz
Collector Output capacitance	RN1101F ~1106F	C <sub>ob</sub>	—	V <sub>CB</sub> = 10V, I <sub>E</sub> = 0, f = 1MHz	—	3	6	pF
Input resistor	RN1101F	R <sub>1</sub>	—	—	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	R <sub>1</sub> /R <sub>2</sub>	—	—	0.9	1.0	1.1	
	RN1105F				0.0421	0.0468	0.0515	
	RN1106F				0.09	0.1	0.11	

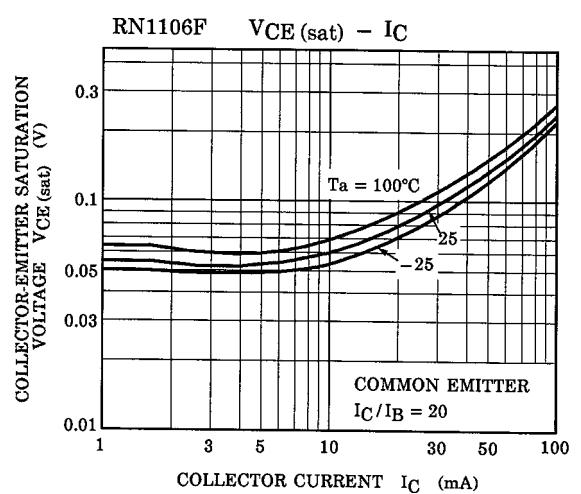
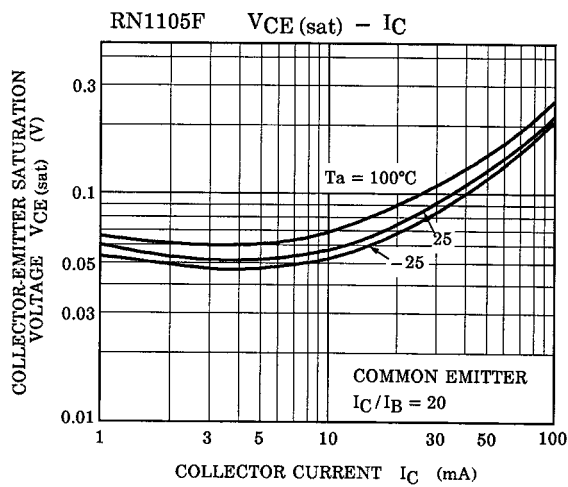
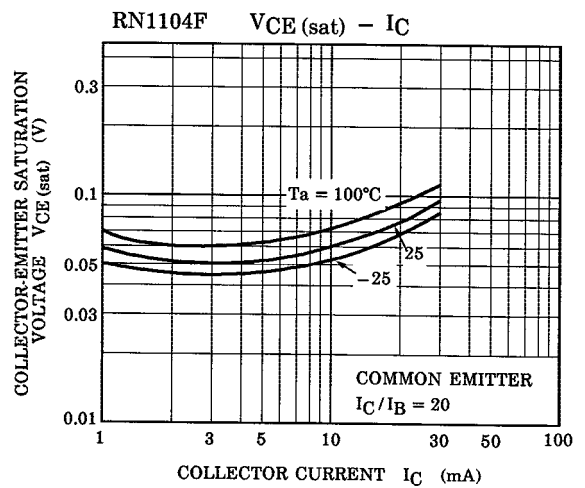
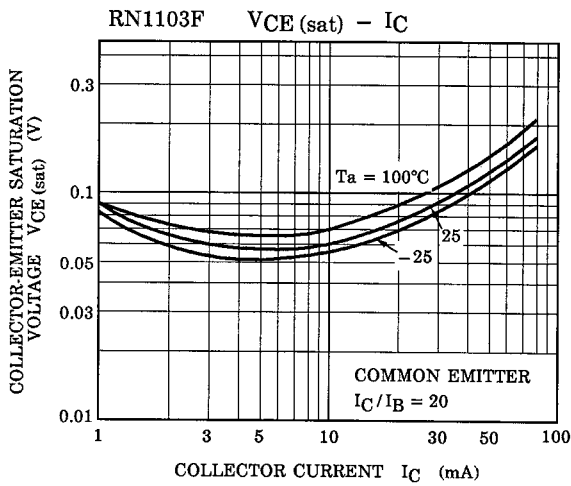
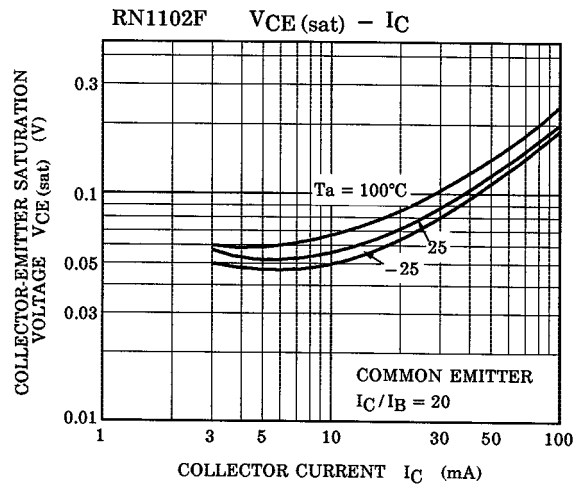
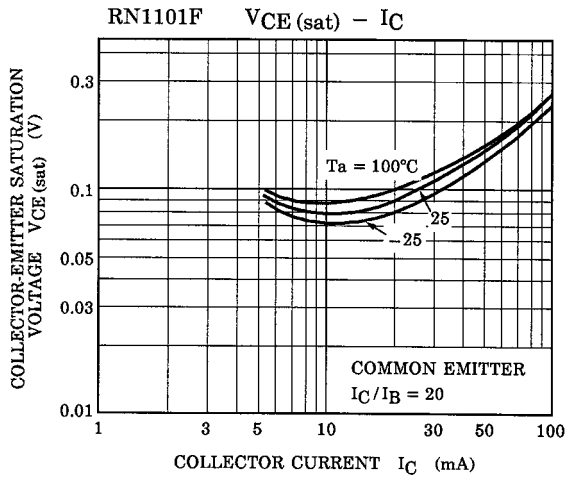
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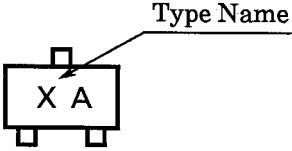
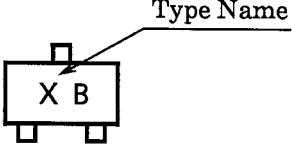
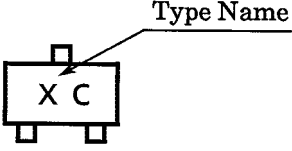
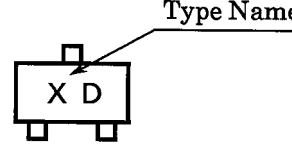
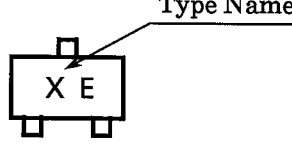
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Type Name	Marking
RN1101F	
RN1102F	
RN1103F	
RN1104F	
RN1105F	
RN1106F	