

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

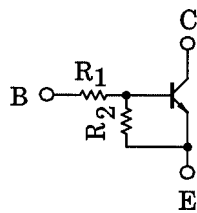
## RN1114,RN1115,RN1116,RN1117,RN1118

Switching, Inverter Circuit, Interface Circuit  
And Driver Circuit Applications

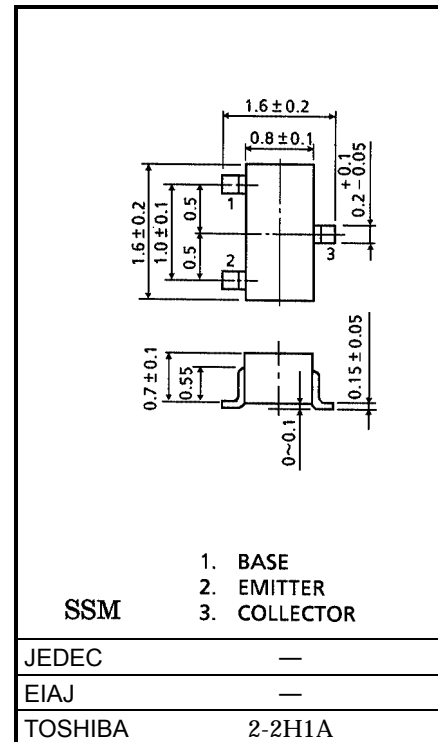
Unit in mm

- With built-in bias resistors.
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN2114~2118

### Equivalent Circuit and Bias Resistor Values



Type No.	R <sub>1</sub> (kΩ)	R <sub>2</sub> (kΩ)
RN1114	1	10
RN1115	2.2	10
RN1116	4.7	10
RN1117	10	4.7
RN1118	47	10



Weight: 2.4mg

### Maximum Ratings (Ta = 25°C)

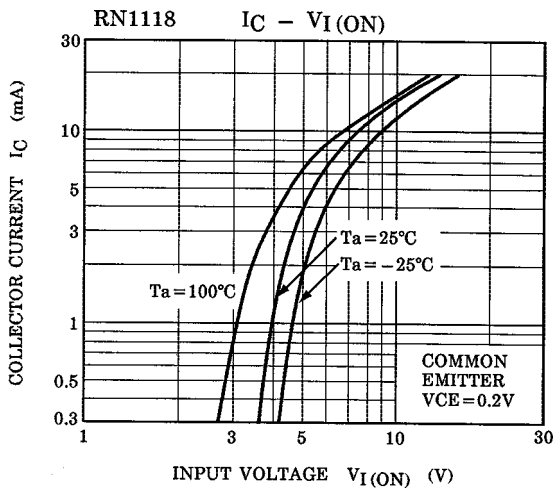
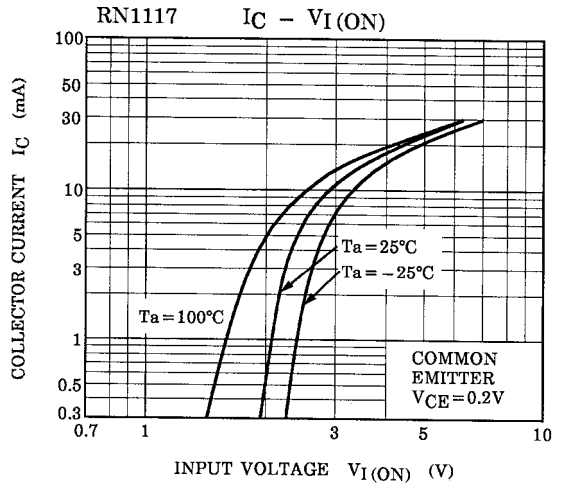
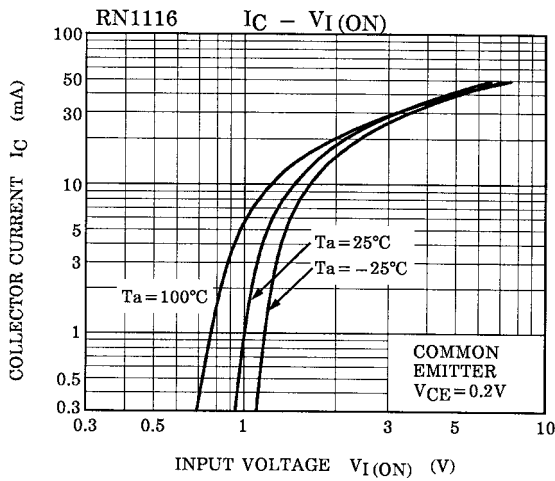
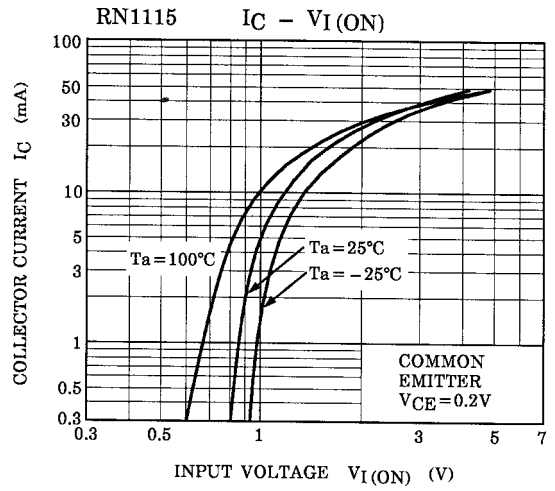
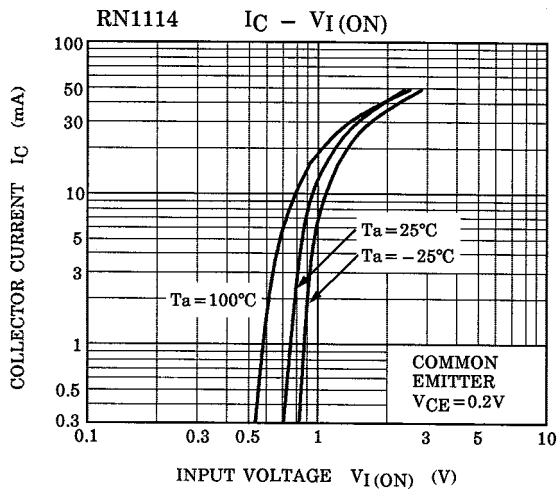
Characteristic		Symbol	Rating	Unit
Collector-base voltage	RN1114~1118	V <sub>CBO</sub>	50	V
Collector-emitter voltage		V <sub>CEO</sub>	50	V
Emitter-base voltage	RN1114	V <sub>EBO</sub>	5	V
	RN1115		6	
	RN1116		7	
	RN1117		15	
	RN1118		25	
Collector current	RN1114~1118	I <sub>c</sub>	100	mA
Collector power dissipation		P <sub>c</sub>	100	mW
Junction temperature		T <sub>j</sub>	150	°C
Storage temperature range		T <sub>stg</sub>	-55~150	°C

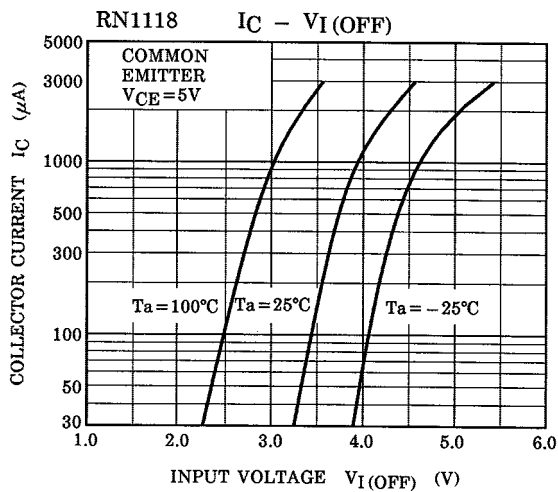
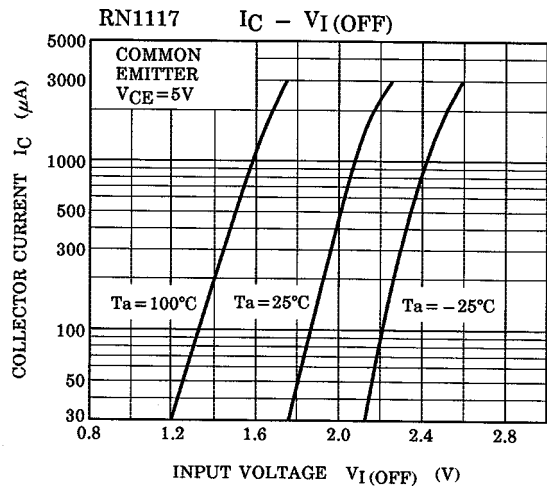
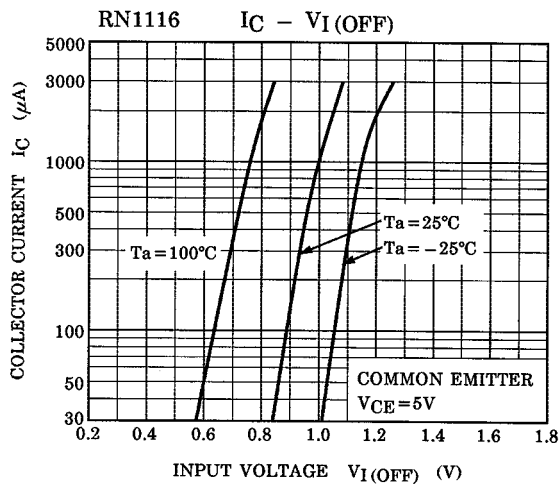
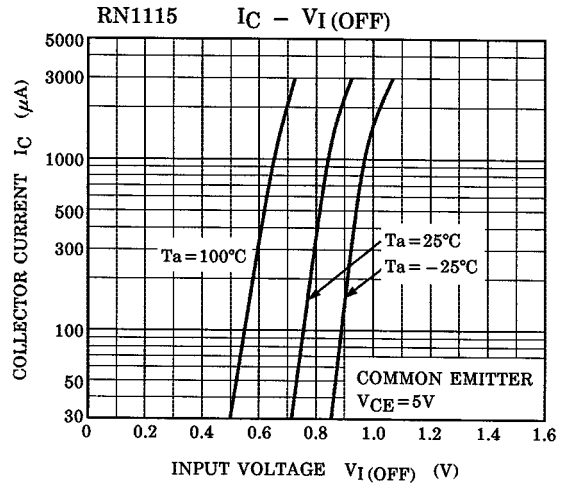
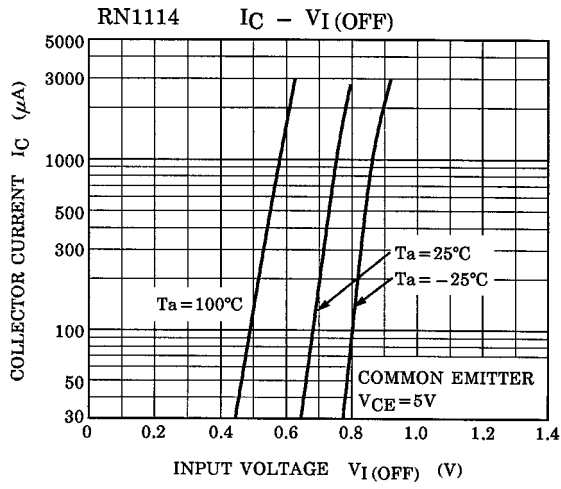
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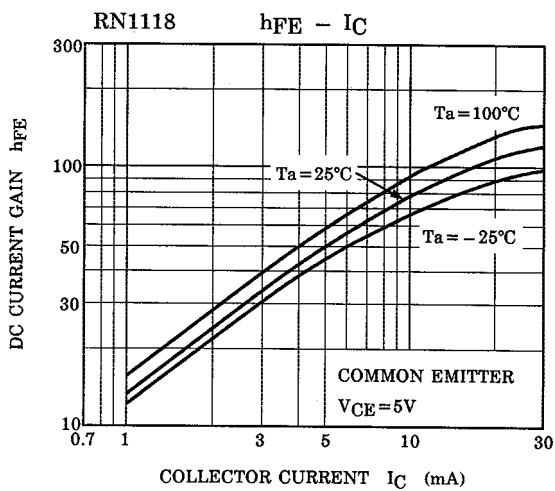
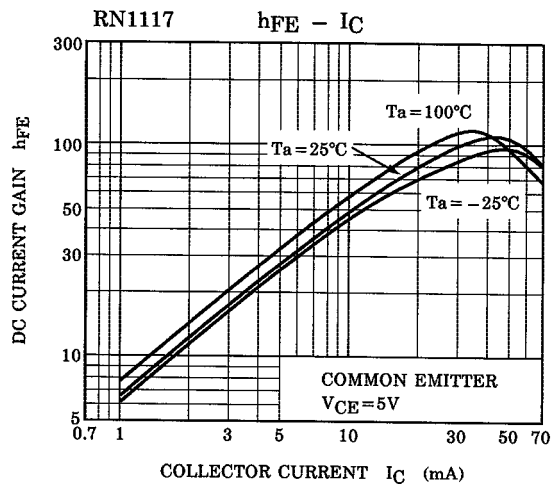
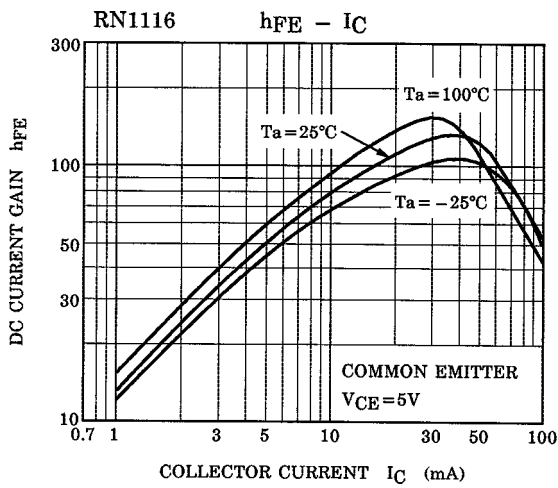
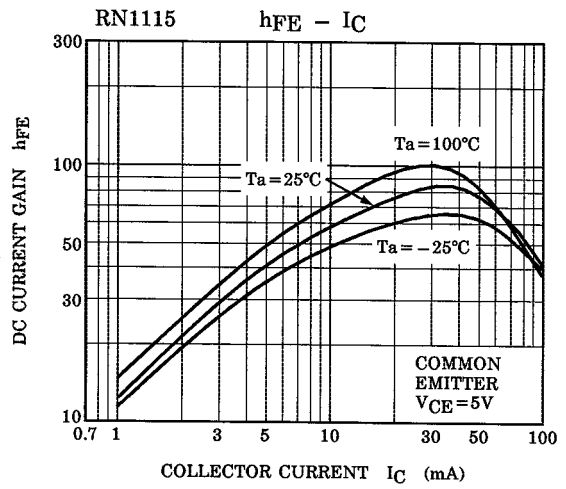
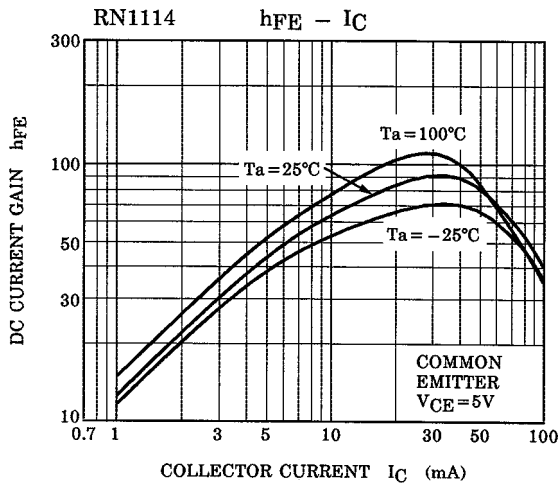
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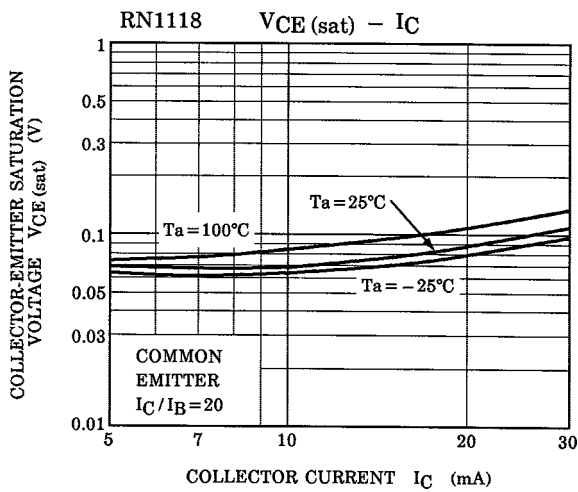
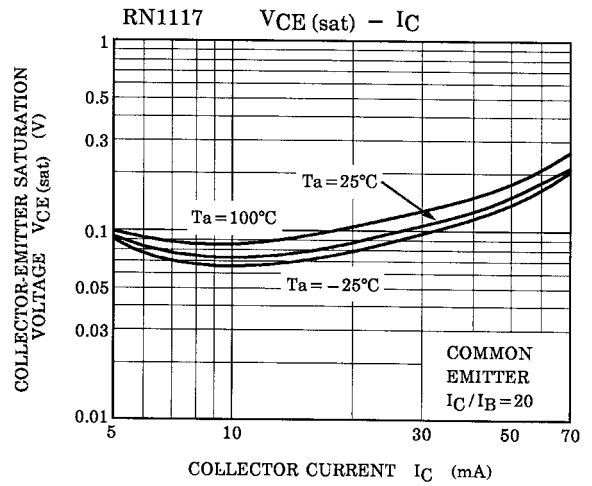
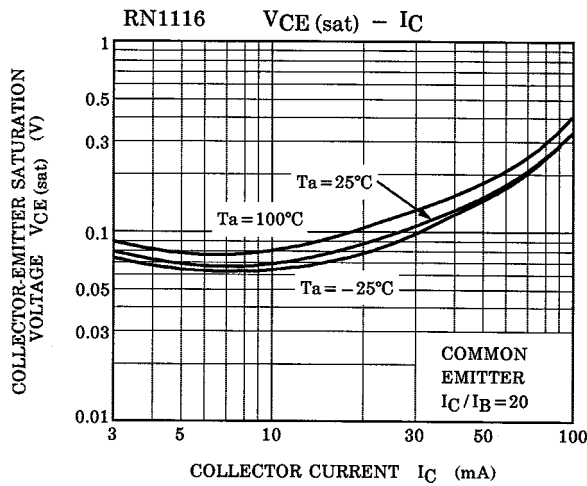
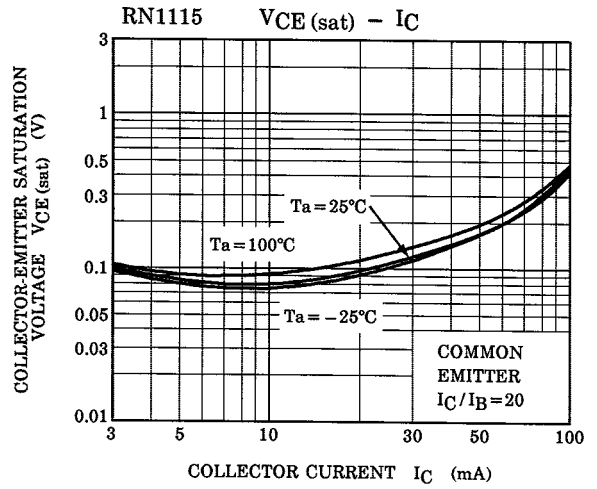
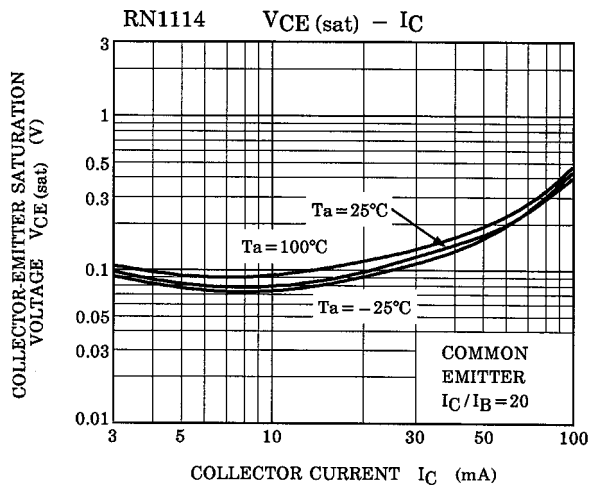
**Electrical Characteristics (Ta = 25°C)**

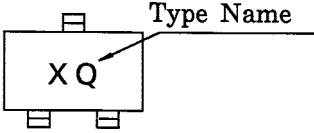
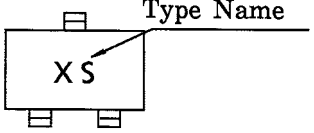
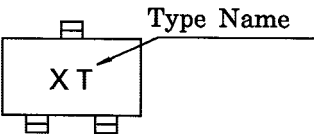
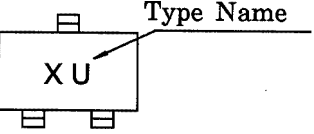
Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN1114~1118	$I_{CBO}$	—	$V_{CB} = 50V, I_E = 0$	—	—	100	nA
	RN1114~1118	$I_{CEO}$	—	$V_{CE} = 50V, I_B = 0$	—	—	500	nA
Emitter cut-off current	RN1114	$I_{EBO}$	—	$V_{EB} = 5V, I_C = 0$	0.35	—	0.65	mA
	RN1115		—	$V_{EB} = 6V, I_C = 0$	0.37	—	0.71	
	RN1116		—	$V_{EB} = 7V, I_C = 0$	0.36	—	0.68	
	RN1117		—	$V_{EB} = 15V, I_C = 0$	0.78	—	1.46	
	RN1118		—	$V_{EB} = 25V, I_C = 0$	0.33	—	0.63	
DC current gain	RN1114~16, 18	$h_{FE}$	—	$V_{CE} = 5V, I_C = 10mA$	50	—	—	—
	RN1117		—		30	—	—	
Collector-emitter saturation voltage	RN1114~1118	$V_{CE(sat)}$	—	$I_C = 5mA, I_B = 0.25mA$	—	0.1	0.3	V
Input voltage (ON)	RN1114	$V_{I(ON)}$	—	$V_{CE} = 0.2V, I_C = 5mA$	0.6	—	2.0	V
	RN1115		—		0.7	—	2.5	
	RN1116		—		0.8	—	2.5	
	RN1117		—		1.5	—	3.5	
	RN1118		—		2.5	—	10.0	
Input voltage (OFF)	RN1114	$V_{I(OFF)}$	—	$V_{CE} = 5V, I_C = 0.1mA$	0.3	—	0.9	V
	RN1115		—		0.3	—	1.0	
	RN1116		—		0.3	—	1.1	
	RN1117		—		0.3	—	2.3	
	RN1118		—		0.5	—	5.7	
Translation Frequency	RN1114~1118	$f_T$	—	$V_{CE} = 10V, I_C = 5mA$	—	250	—	MHz
Collector output capacitance	RN1114~1118	$C_{ob}$	—	$V_{CB} = 10V, I_E = 0, f = 1MHz$	—	3.0	6.0	pF
Input Resistor	RN1114	$R_1$	—	—	0.7	1.0	1.3	kΩ
	RN1115		—		1.54	2.2	2.86	
	RN1116		—		3.29	4.7	6.11	
	RN1117		—		7.0	10.0	13.0	
	RN1118		—		32.9	47.0	61.1	
Resistor Ratio	RN1114	$R_1/R_2$	—	—	—	0.1	—	—
	RN1115		—		—	0.22	—	
	RN1116		—		—	0.47	—	
	RN1117		—		—	2.13	—	
	RN1118		—		—	4.7	—	









Type Name	Marking
RN1114	
RN1115	
RN1116	
RN1117	
RN1118	