

TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process) (Bias Resistor built-in Transistor)

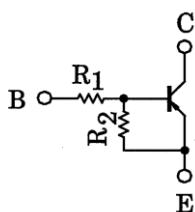
# RN2314, RN2315, RN2316, RN2317, RN2318

Unit: mm

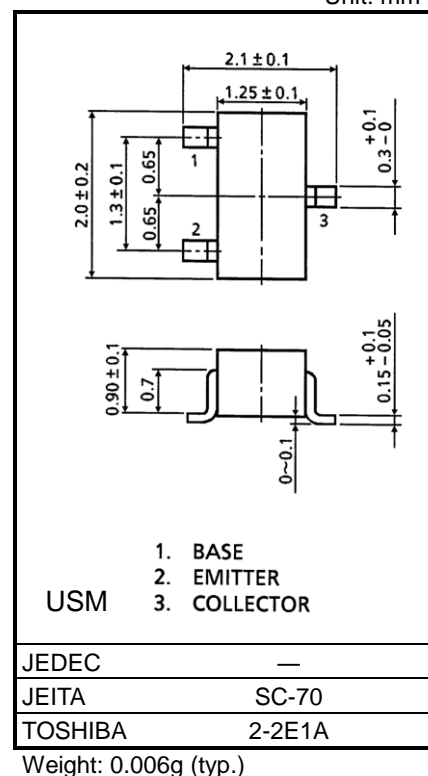
Switching, Inverter Circuit, Interface Circuit and Driver Circuit

- With built-in bias resistors.
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process and miniaturize equipment.
- Various resistance values are available to suit various circuit designs.
- Complementary to RN1314 to RN1318

## Equivalent Circuit and Bias Resistor Values



Type No.	R <sub>1</sub> (kΩ)	R <sub>2</sub> (kΩ)
RN2314	1	10
RN2315	2.2	10
RN2316	4.7	10
RN2317	10	4.7
RN2318	47	10



## Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Collector-base voltage	V <sub>CB0</sub>	-50	V
Collector-emitter voltage	V <sub>CEO</sub>	-50	V
Emitter-base voltage	V <sub>EBO</sub>	-5	V
		-6	
		-7	
		-15	
		-25	
Collector current	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 to 150	°C

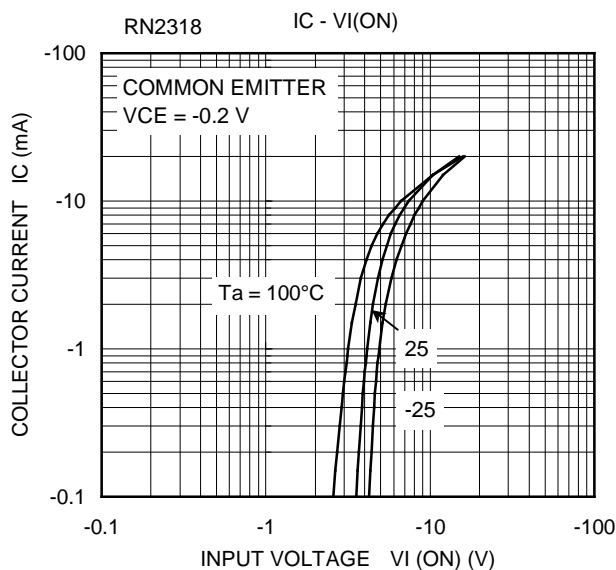
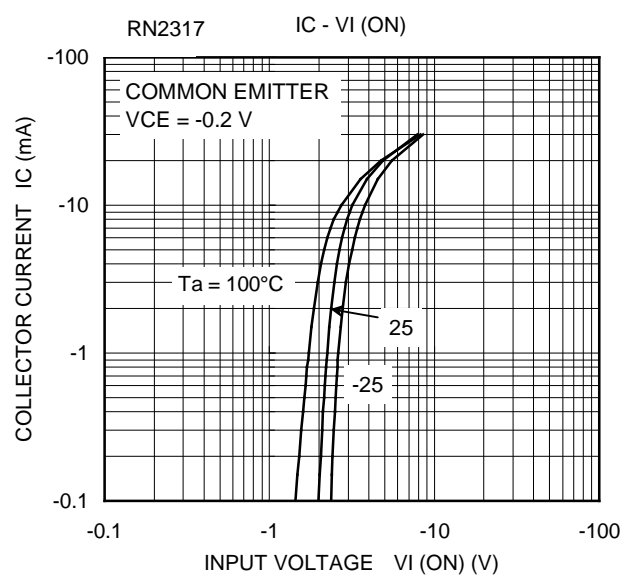
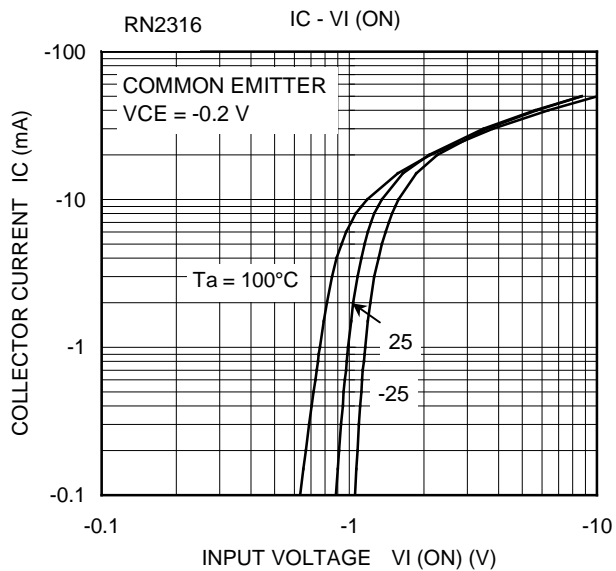
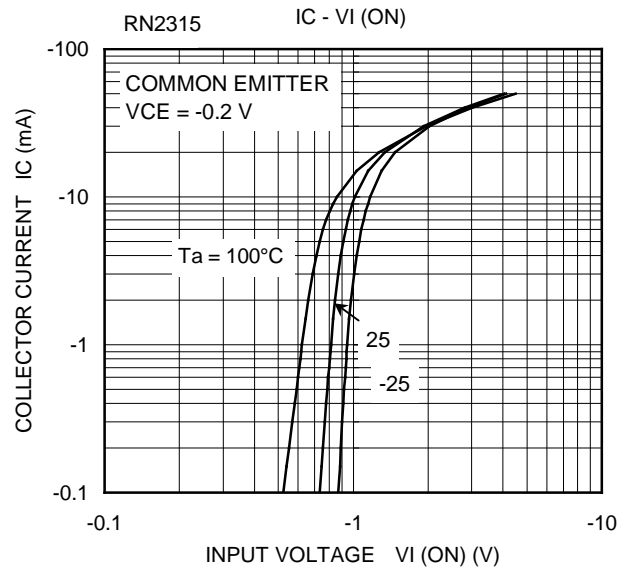
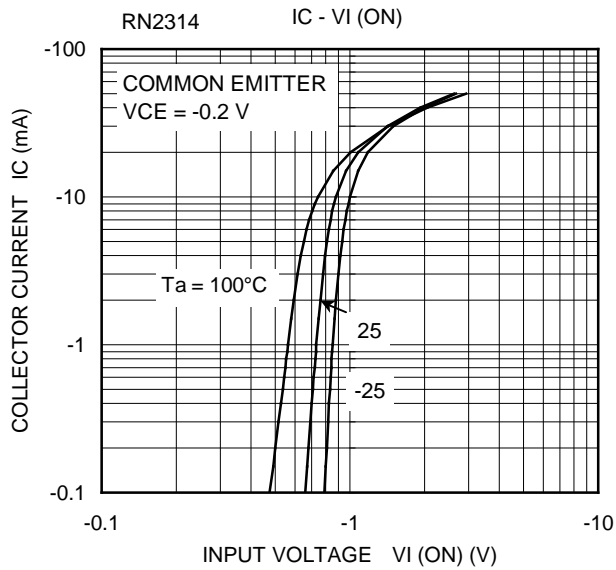
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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.).

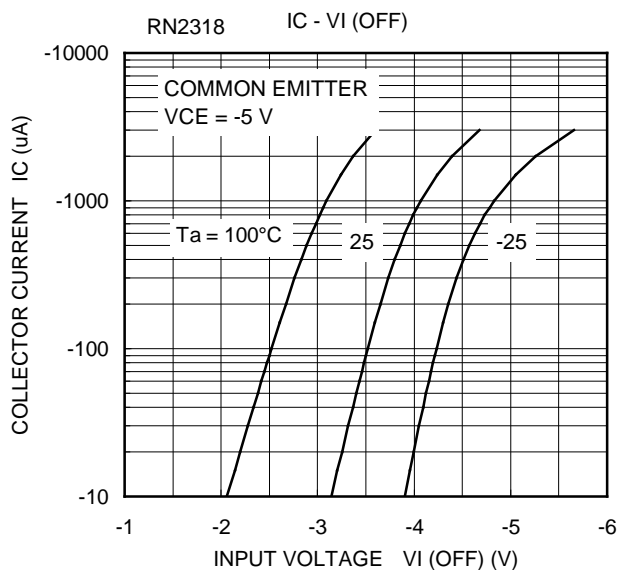
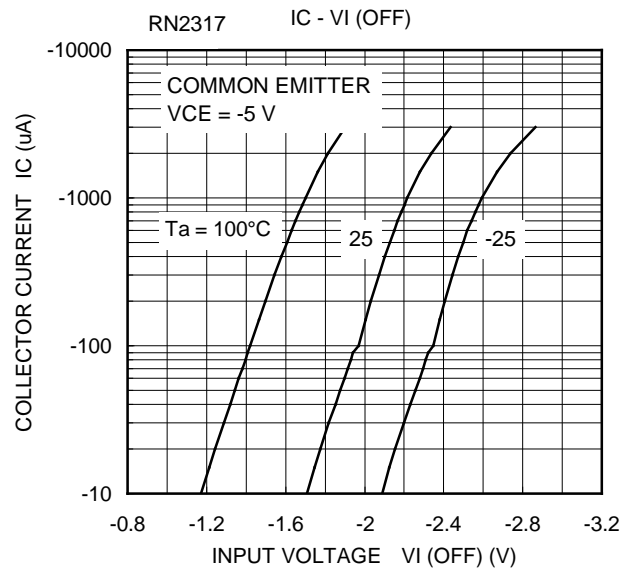
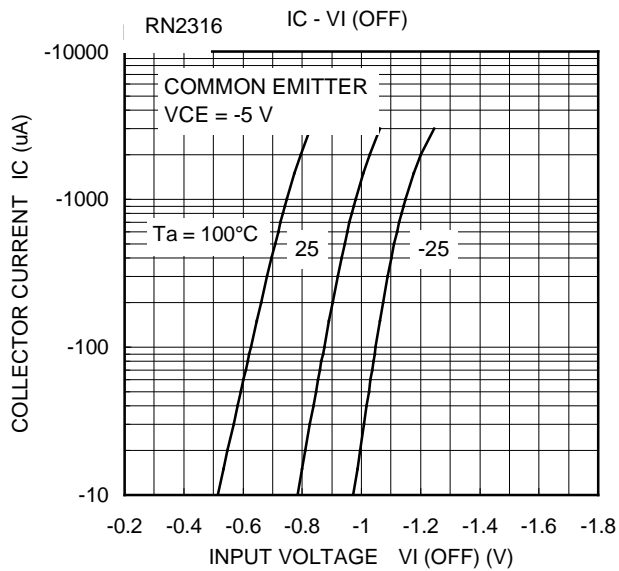
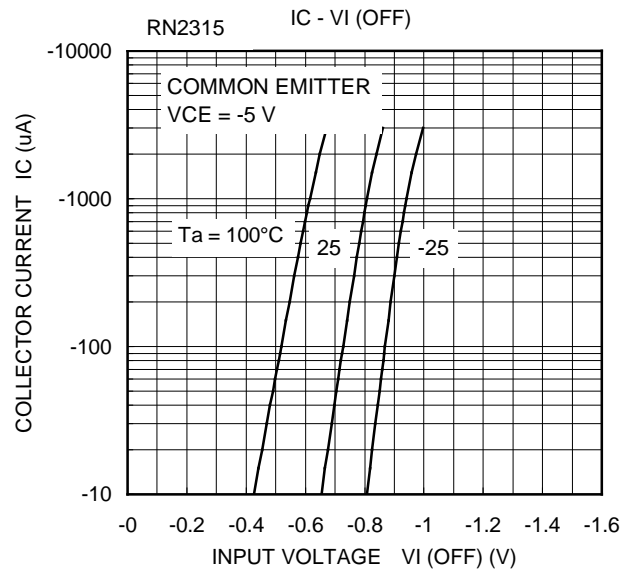
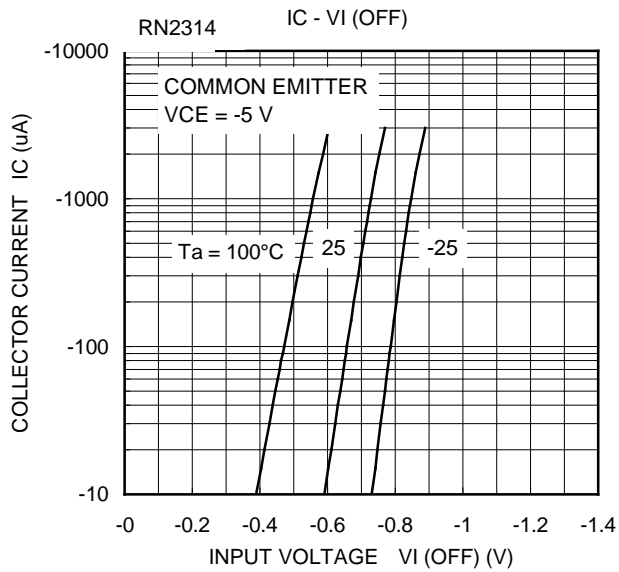
Start of commercial production  
1999-01

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

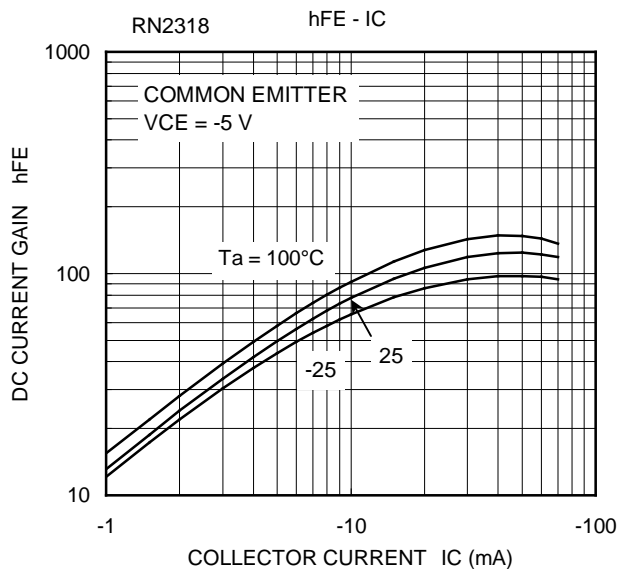
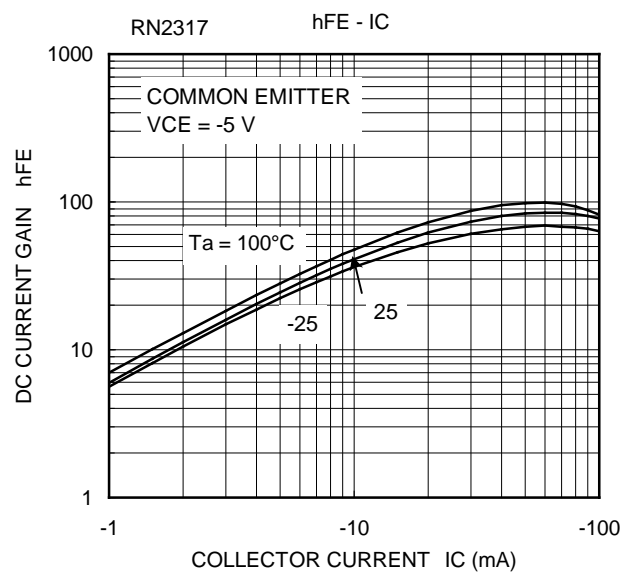
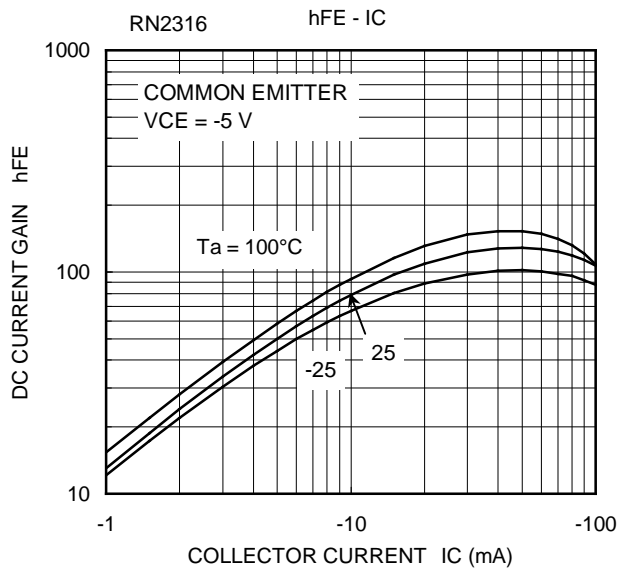
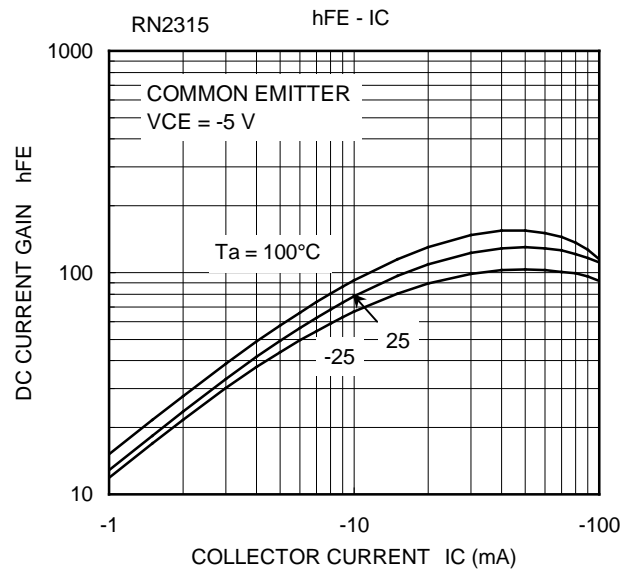
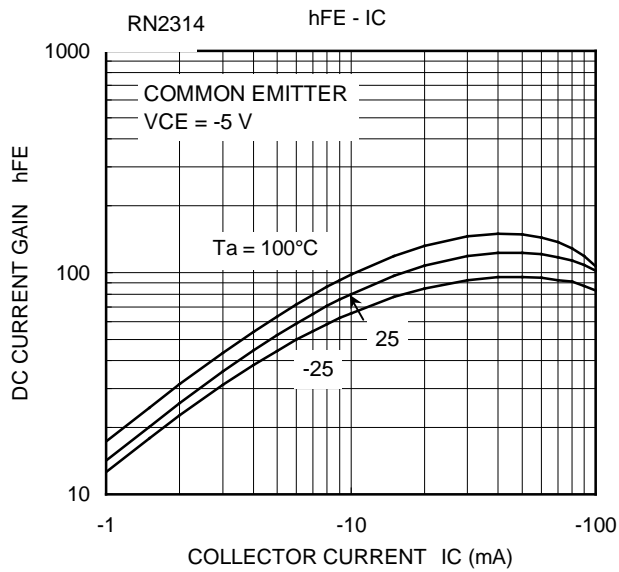
Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN2314 to 2318	$I_{CBO}$	—	$V_{CB} = -50\text{ V}$ , $I_E = 0\text{ mA}$	—	—	-100	nA
	RN2314 to 2318	$I_{CEO}$	—	$V_{CE} = -50\text{ V}$ , $I_B = 0\text{ mA}$	—	—	-500	nA
Emitter cut-off current	RN2314	$I_{EBO}$	—	$V_{EB} = -5\text{ V}$ , $I_C = 0\text{ mA}$	-0.35	—	-0.65	mA
	RN2315		—	$V_{EB} = -6\text{ V}$ , $I_C = 0\text{ mA}$	-0.37	—	-0.71	
	RN2316		—	$V_{EB} = -7\text{ V}$ , $I_C = 0\text{ mA}$	-0.36	—	-0.68	
	RN2317		—	$V_{EB} = -15\text{ V}$ , $I_C = 0\text{ mA}$	-0.78	—	-1.46	
	RN2318		—	$V_{EB} = -25\text{ V}$ , $I_C = 0\text{ mA}$	-0.33	—	-0.63	
DC current gain	RN2314 to 16, RN2318	$h_{FE}$	—	$V_{CE} = -5\text{ V}$ , $I_C = -10\text{ mA}$	50	—	—	—
	RN2317		—		30	—	—	
Collector-emitter saturation voltage	RN2314 to 2318	$V_{CE(sat)}$	—	$I_C = -5\text{ mA}$ , $I_B = -0.25\text{ mA}$	—	-0.1	-0.3	V
Input voltage (ON)	RN2314	$V_{I(ON)}$	—	$V_{CE} = -0.2\text{ V}$ , $I_C = -5\text{ mA}$	-0.5	—	-2.0	V
	RN2315		—		-0.6	—	-2.5	
	RN2316		—		-0.7	—	-2.5	
	RN2317		—		-1.5	—	-3.5	
	RN2318		—		-2.5	—	-10.0	
Input voltage (OFF)	RN2314	$V_{I(OFF)}$	—	$V_{CE} = -5\text{ V}$ , $I_C = -0.1\text{ mA}$	-0.3	—	-0.9	V
	RN2315		—		-0.3	—	-1.0	
	RN2316		—		-0.3	—	-1.1	
	RN2317		—		-0.3	—	-3.0	
	RN2318		—		-0.5	—	-5.7	
Translation frequency	RN2314 to 2318	$f_T$	—	$V_{CE} = -10\text{ V}$ , $I_C = -5\text{ mA}$	—	200	—	MHz
Collector output capacitance	RN2314 to 2318	$C_{ob}$	—	$V_{CB} = -10\text{ V}$ , $I_E = 0\text{ mA}$ , $f = 1\text{ MHz}$	—	3.0	6.0	pF
Input resistor	RN2314	$R_1$	—	—	0.7	1.0	1.3	kΩ
	RN2315		—		1.54	2.2	2.86	
	RN2316		—		3.29	4.7	6.11	
	RN2317		—		7.0	10.0	13.0	
	RN2318		—		32.9	47.0	61.1	
Resistor ratio	RN2314	$R_1/R_2$	—	—	—	0.1	—	—
	RN2315		—		—	0.22	—	
	RN2316		—		—	0.47	—	
	RN2317		—		—	2.13	—	
	RN2318		—		—	4.7	—	



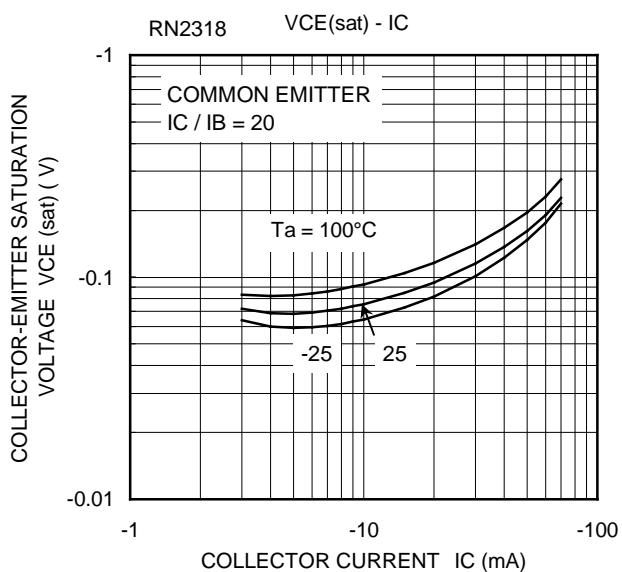
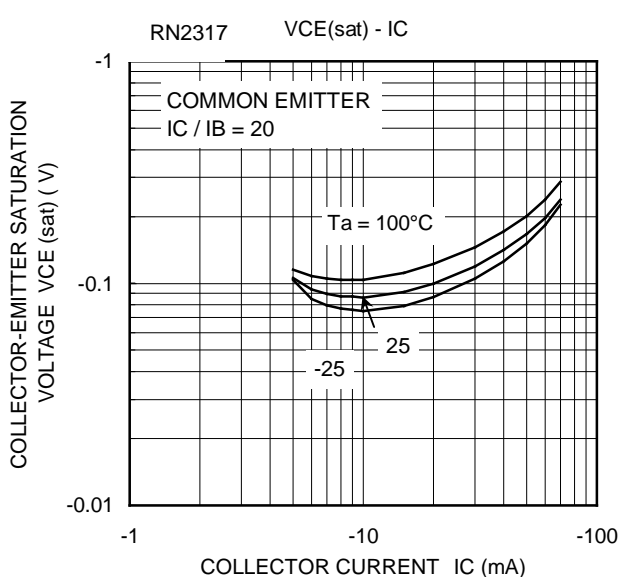
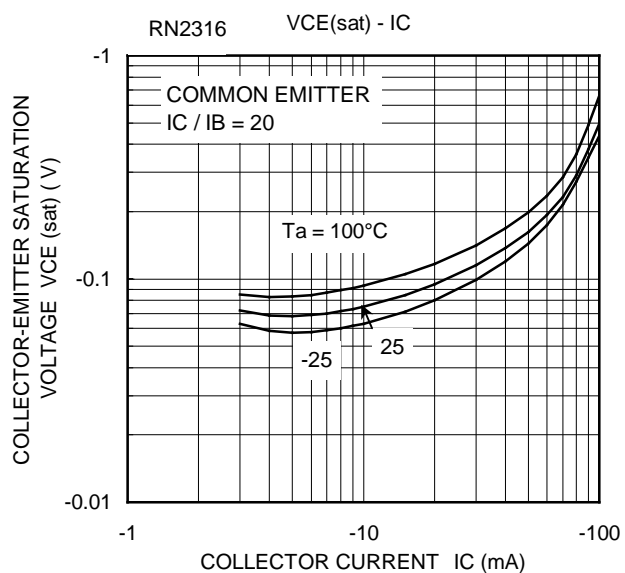
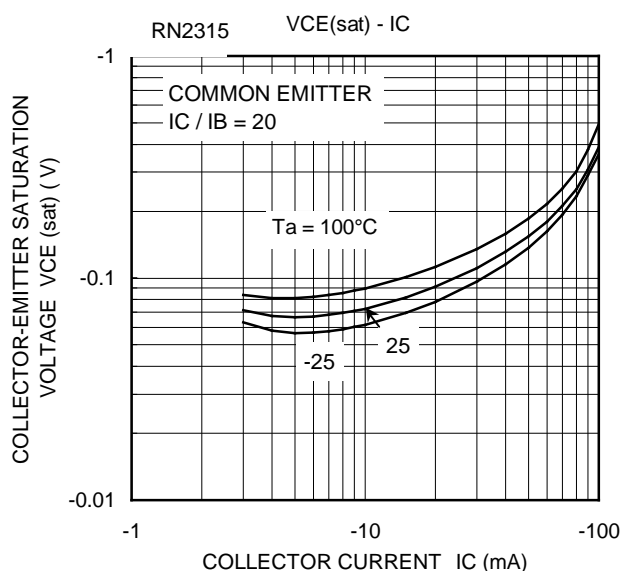
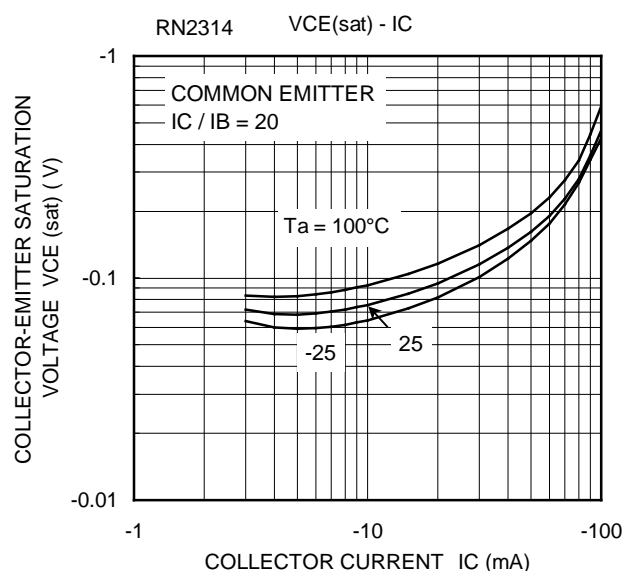
The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.



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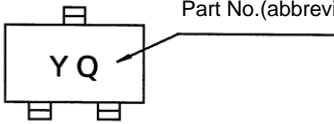
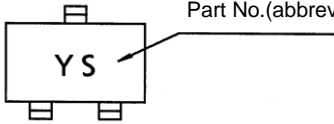
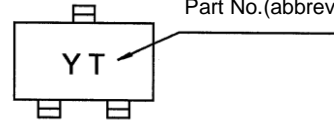
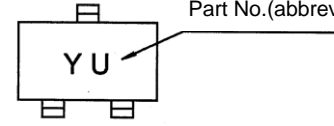
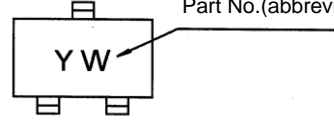


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### Marking

Part No.	Marking
RN2314	
RN2315	
RN2316	
RN2317	
RN2318	

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