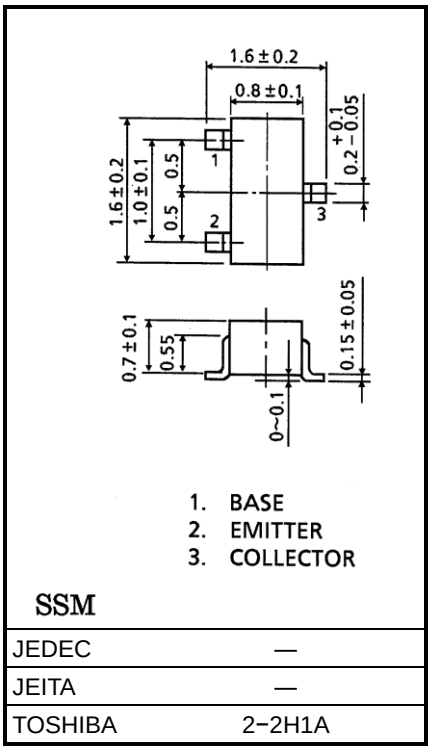
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process) (Bias Resistor built-in Transistor)

RN2114, RN2115, RN2116, RN2117, RN2118

Switching, Inverter Circuit, Interface Circuit and Driver Circuit

- Built-in bias resistors
- Simplified circuit design
- Fewer parts and simplified manufacturing process and miniaturized equipment
- Complementary to RN1114 to RN1118

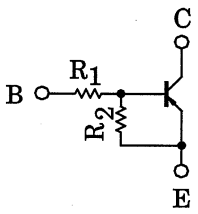
Unit: mm



SSM	
JEDEC	—
JEITA	—
TOSHIBA	2−2H1A

Weight: 2.4mg (typ.)

Equivalent Circuit and Bias Resistor Values



Part No.	R1 (kΩ)	R2 (kΩ)
RN2114	1	10
RN2115	2.2	10
RN2116	4.7	10
RN2117	10	4.7
RN2118	47	10

Absolute Maximum Ratings (Ta = 25°C)

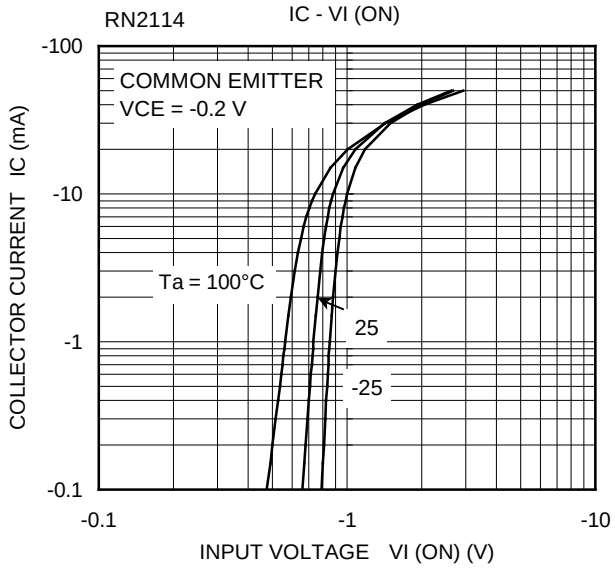
Characteristic		Symbol	Rating	Unit
Collector-base voltage	RN2114 to RN2118	V_{CBO}	−50	V
Collector-emitter voltage		V_{CEO}	−50	V
Emitter-base voltage	RN2114	V_{EBO}	−5	V
	RN2115		−6	
	RN2116		−7	
	RN2117		−15	
	RN2118		−25	
Collector current	RN2114 to RN2118	I_C	−100	mA
Collector power dissipation		P_C	100	mW
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55 to 150	°C

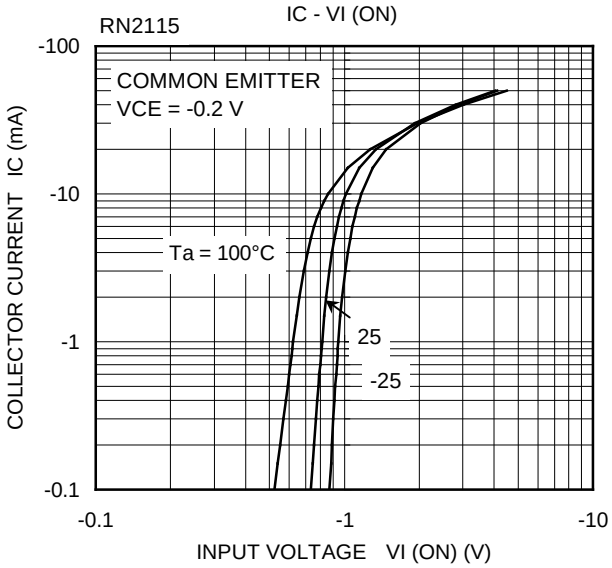
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

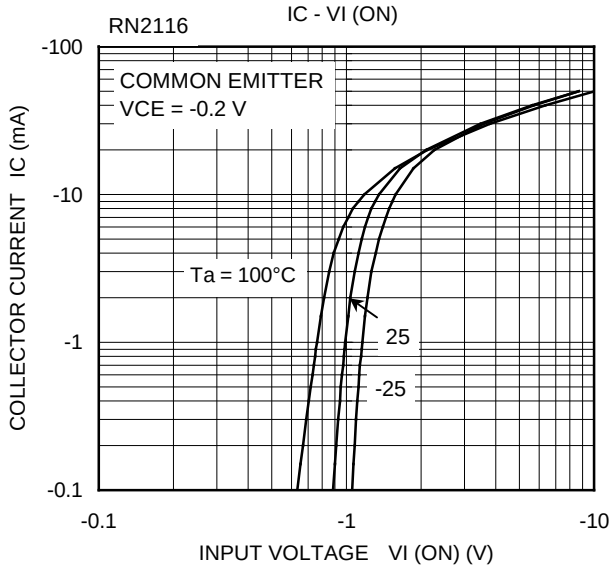
Start of commercial production
1994-08

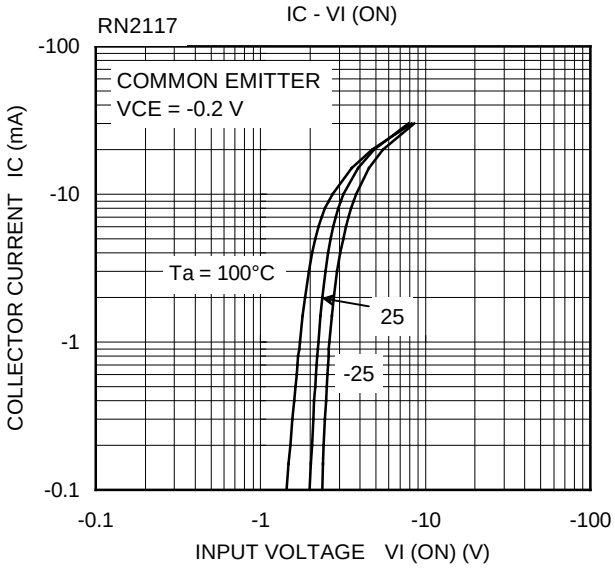
Electrical Characteristics (Ta = 25°C)

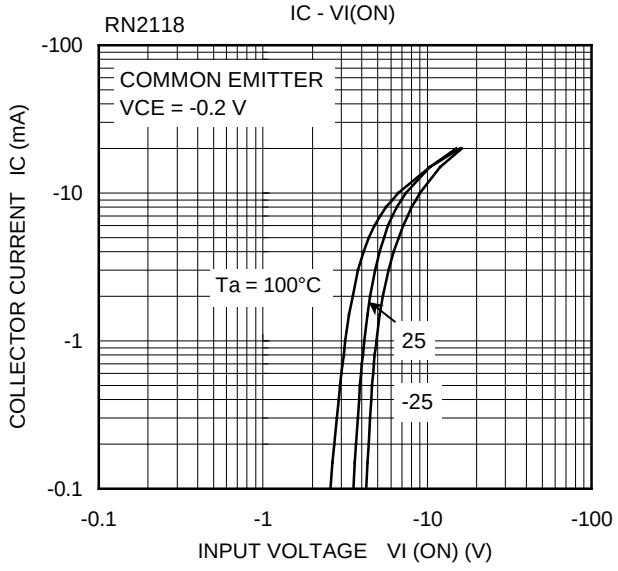
Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN2114 to 2118	I_{CBO}	V_{CB} = −50 V, I_E = 0 mA	—	—	−100	nA
	RN2114 to 2118	I_{CEO}	V_{CE} = −50 V, I_B = 0 mA	—	—	−500	nA
Emitter cut-off current	RN2114	I_{EBO}	V_{EB} = −5 V, I_C = 0 mA	−0.35	—	−0.65	mA
	RN2115		V_{EB} = −6 V, I_C = 0 mA	−0.37	—	−0.71	
	RN2116		V_{EB} = −7 V, I_C = 0 mA	−0.36	—	−0.68	
	RN2117		V_{EB} = −15 V, I_C = 0 mA	−0.78	—	−1.46	
	RN2118		V_{EB} = −25 V, I_C = 0 mA	−0.33	—	−0.63	
DC current gain	RN2114 to 2116, RN2118	h_{FE}	V_{CE} = −5 V, I_C = −10 mA	50	—	—	—
	RN2117			30	—	—	
Collector-emitter saturation voltage	RN2114 to 2118	$V_{CE\ (sat)}$	I_C = −5 mA, I_B = −0.25 mA	—	−0.1	−0.3	V
Input voltage (ON)	RN2114	$V_{I\ (ON)}$	V_{CE} = −0.2 V, I_C = −5 mA	−0.5	—	−2.0	V
	RN2115			−0.6	—	−2.5	
	RN2116			−0.7	—	−2.5	
	RN2117			−1.5	—	−3.5	
	RN2118			−2.5	—	−10.0	
Input voltage (OFF)	RN2114	$V_{I\ (OFF)}$	V_{CE} = −5 V, I_C = −0.1 mA	−0.3	—	−0.9	V
	RN2115			−0.3	—	−1.0	
	RN2116			−0.3	—	−1.1	
	RN2117			−0.3	—	−3.0	
	RN2118			−0.5	—	−5.7	
Transition frequency	RN2114 to 2118	f_T	V_{CE} = −10 V, I_C = −5 mA	—	200	—	MHz
Collector Output capacitance	RN2114 to 2118	C_{ob}	V_{CB} = −10 V, I_E = 0 mA, f = 1 MHz	—	3.0	6.0	pF
Input resistor	RN2114	R1	—	0.7	1.0	1.3	kΩ
	RN2115			1.54	2.2	2.86	
	RN2116			3.29	4.7	6.11	
	RN2117			7.0	10.0	13.0	
	RN2118			32.9	47.0	61.1	
Resistor ratio	RN2114	R1/R2	—	—	0.1	—	—
	RN2115			—	0.22	—	
	RN2116			—	0.47	—	
	RN2117			—	2.13	—	
	RN2118			—	4.7	—	











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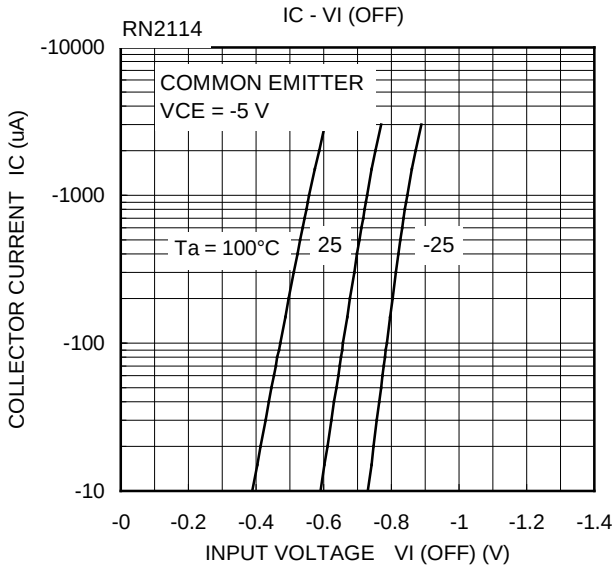

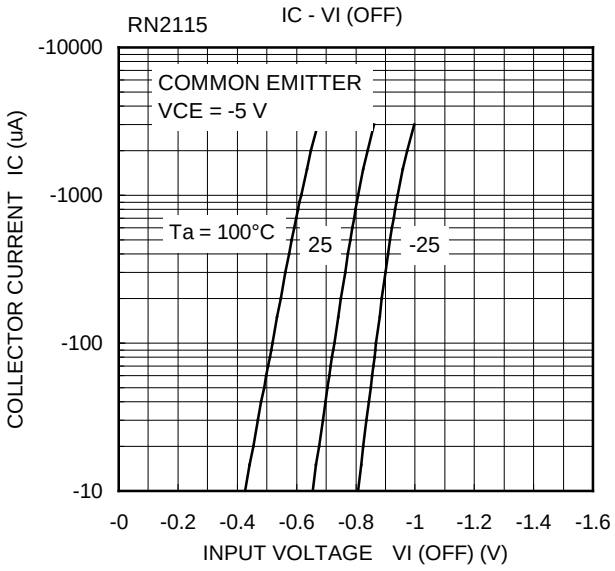

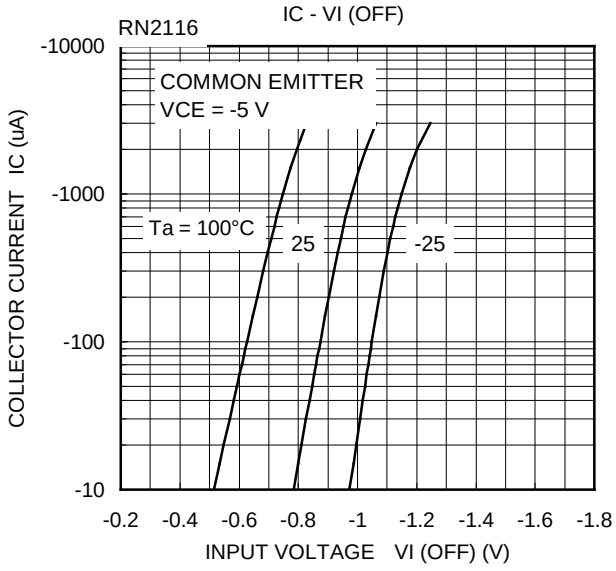

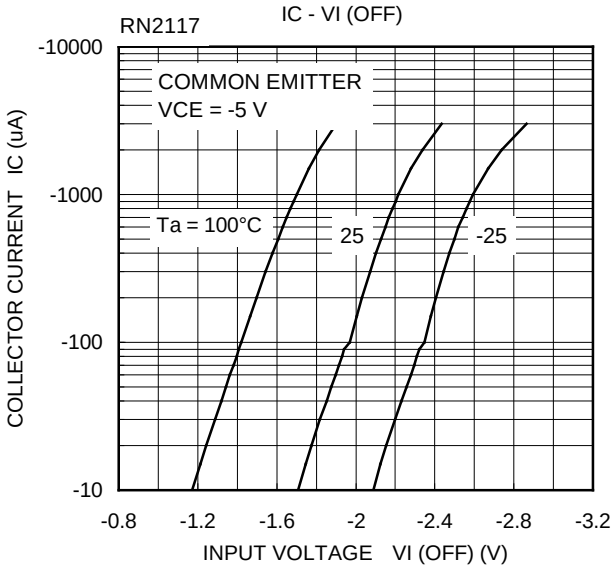

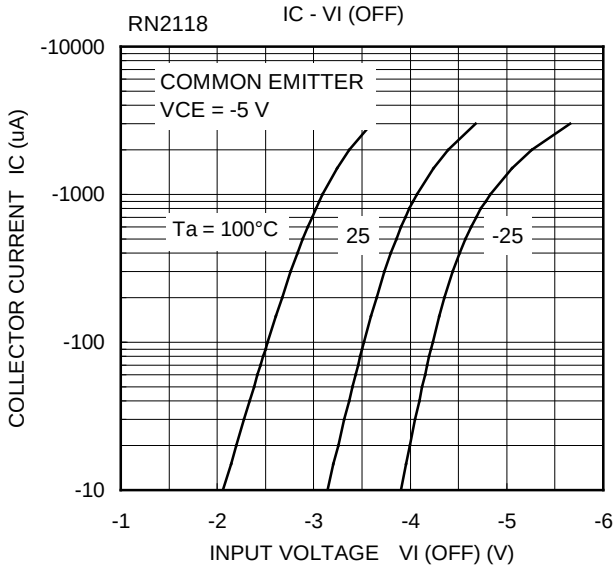

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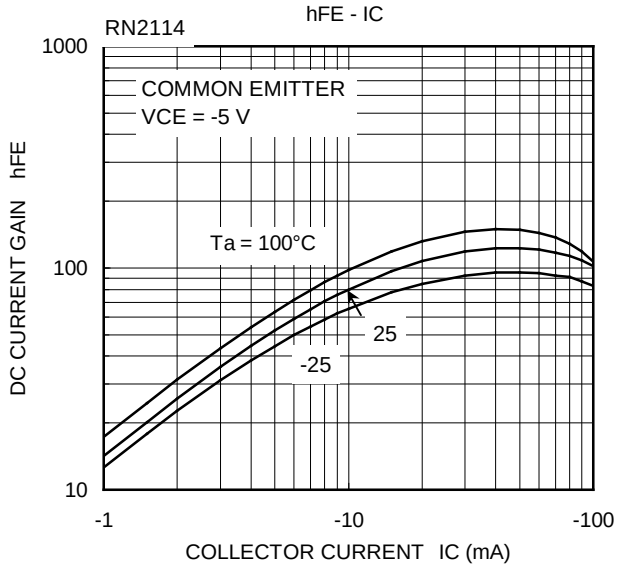

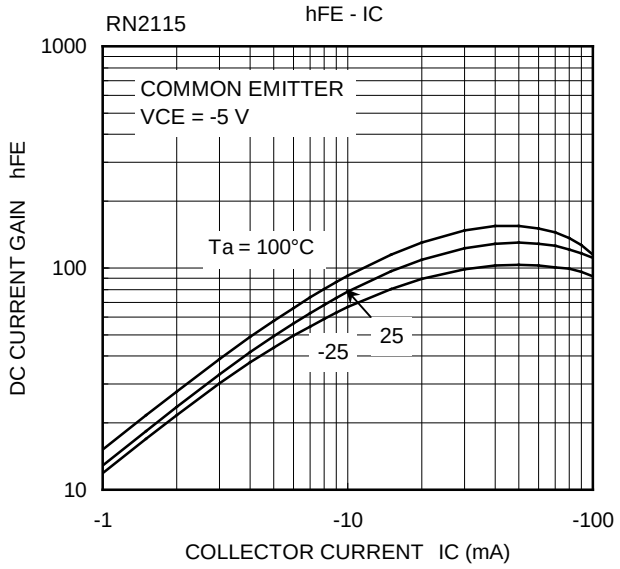

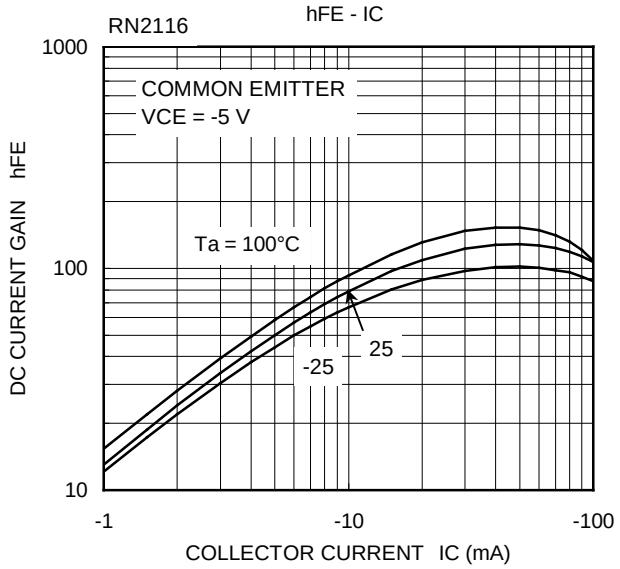

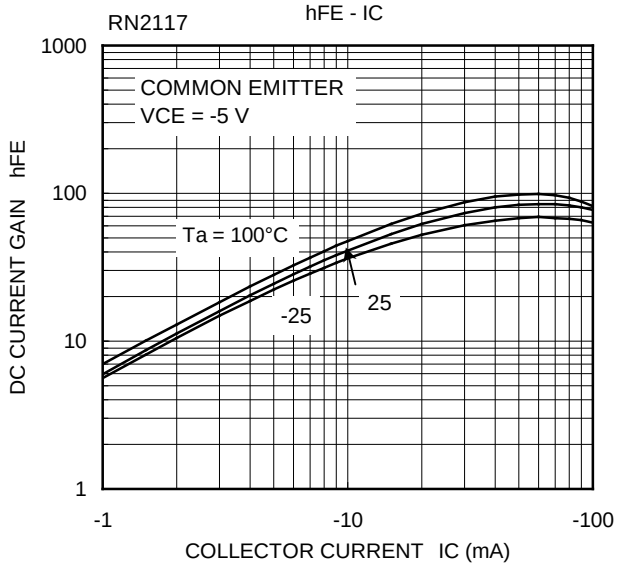

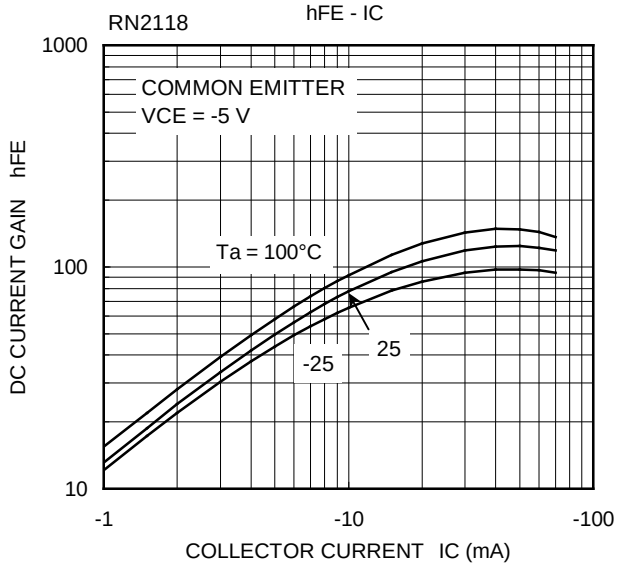

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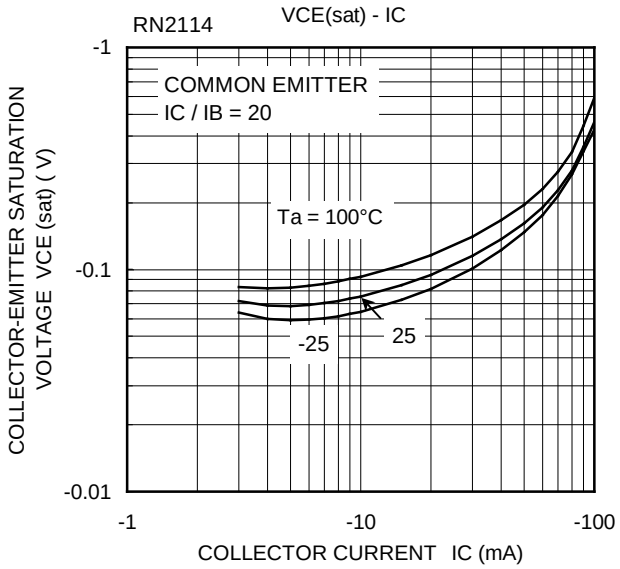

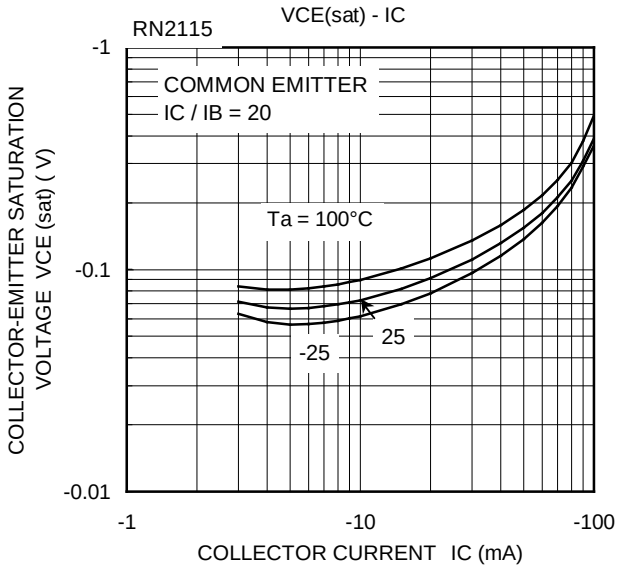

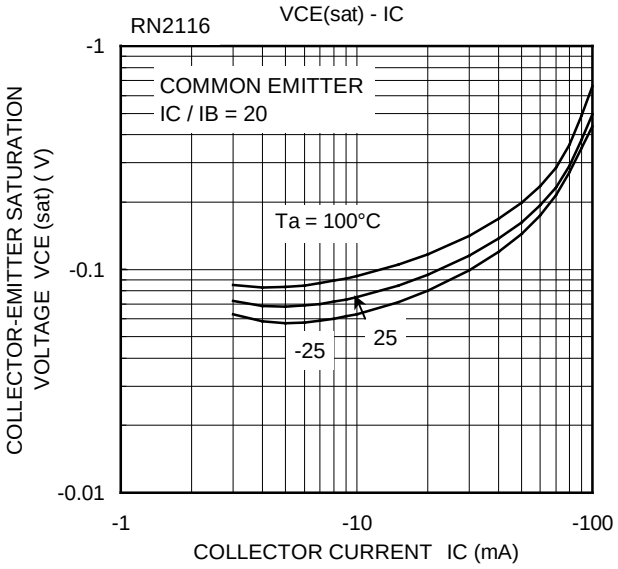

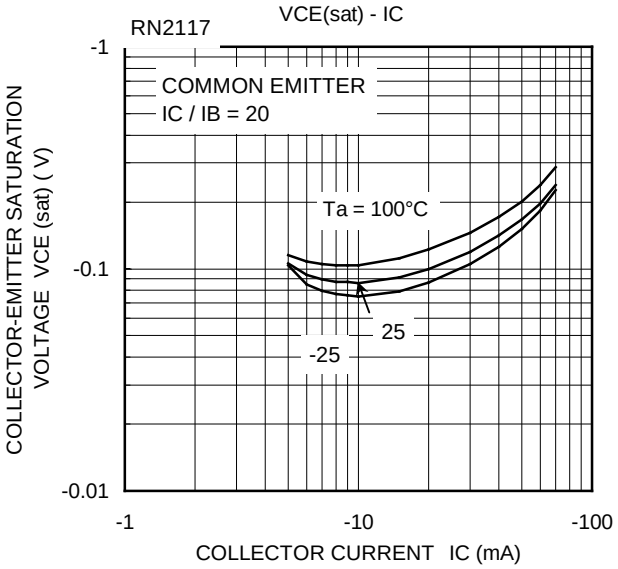

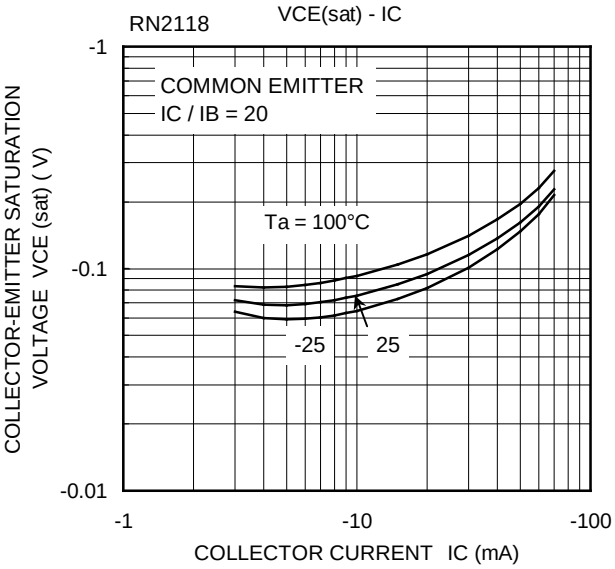

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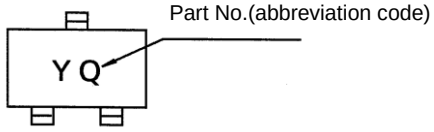
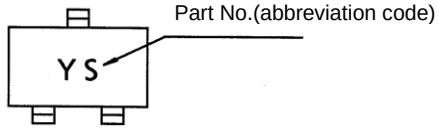
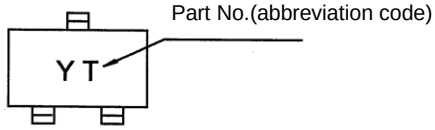
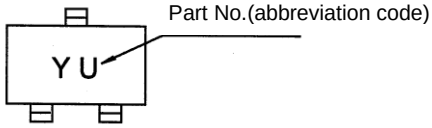
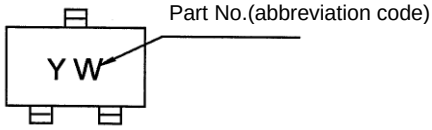
Marking

Part No.	Marking
RN2114	
RN2115	
RN2116	
RN2117	
RN2118	

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