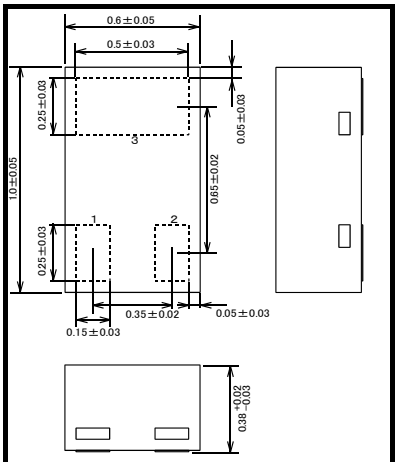
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT process) (Bias Resistor built-in Transistor)

RN2101ACT,RN2102ACT,RN2103ACT RN2104ACT,RN2105ACT,RN2106ACT

Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

- Extra small package (CST3) is applicable for extra high density fabrication.
- Incorporating a bias resistor into a transistor reduces parts count. Reducing the parts count enable the manufacture of ever more compact equipment and save assembly cost.
- Complementary to RN1101ACT to RN1106ACT

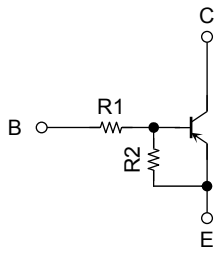
Unit: mm



CST3	1.BASE 2.EMITTER 3.COLLECOTR
JEDEC	—
JEITA	—
TOSHIBA	2-1J1A

Weight: 0.75 mg (typ.)

Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN2101ACT	4.7	4.7
RN2102ACT	10	10
RN2103ACT	22	22
RN2104ACT	47	47
RN2105ACT	2.2	47
RN2106ACT	4.7	47

Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Collector-base voltage	RN2101ACT to 2106ACT	V_{CBO}	−50	V
Collector-emitter voltage		V_{CEO}	−50	V
Emitter-base voltage	RN2101ACT to 2104ACT	V_{EBO}	−10	V
	RN2105ACT, 2106ACT		−5	
Collector current	RN2101ACT to 2106ACT	I_C	−80	mA
Collector power dissipation		P_C	100*	mW
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55 to 150	°C

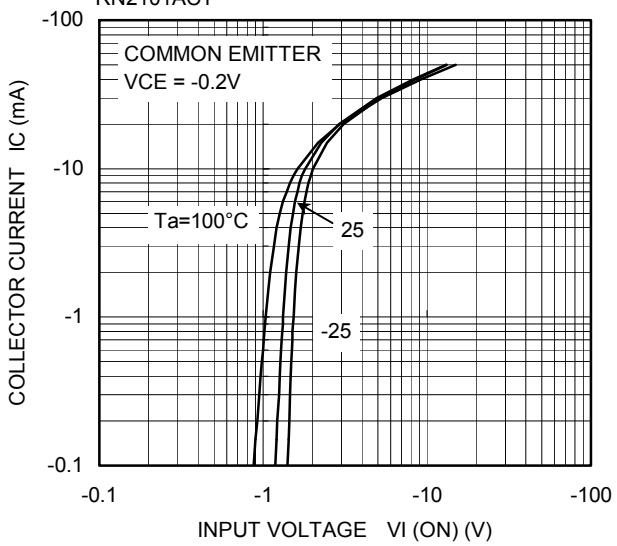
* : Mounted on FR4 board (10 mm × 10 mm × 1 mmt)

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.operatingtemperature/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).

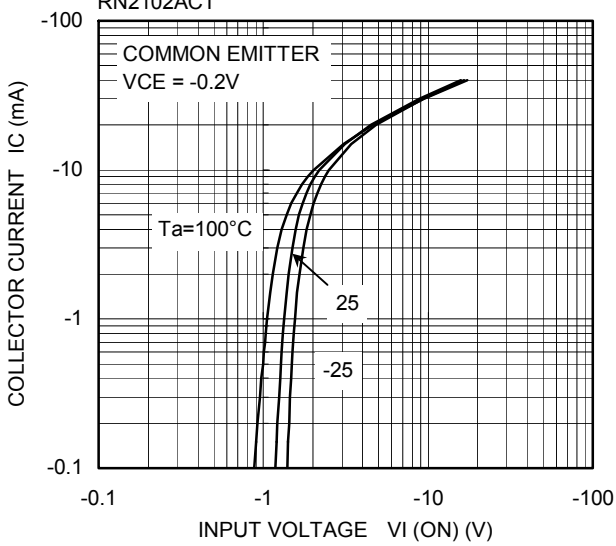
Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN2101ACT to 2106ACT	I_{CBO}	V_{CB} = −50 V, I_E = 0	—	—	−100	nA
		I_{CEO}	V_{CE} = −50 V, I_B = 0	—	—	−500	
Emitter cut-off current	RN2101ACT	I_{EBO}	V_{EB} = −10 V, I_C = 0	−0.89	—	−1.33	mA
	RN2102ACT			−0.41	—	−0.63	
	RN2103ACT			−0.18	—	−0.29	
	RN2104ACT			−0.088	—	−0.133	
	RN2105ACT		V_{EB} = −5 V, I_C = 0	−0.085	—	−0.127	
	RN2106ACT			−0.08	—	−0.121	
DC current gain	RN2101ACT	h_{FE}	V_{CE} = −5 V, I_C = −10 mA	30	—	—	
	RN2102ACT			50	—	—	
	RN2103ACT			70	—	—	
	RN2104ACT			80	—	—	
	RN2105ACT			80	—	—	
	RN2106ACT			80	—	—	
Collector-emitter saturation voltage	RN2101ACT	$V_{CE\ (sat)}$	I_C = −5 mA, I_B = −0.5 mA	—	—	−0.15	V
	RN2102ACT to 2106ACT		I_C = −5 mA, I_B = −0.25 mA				
Input voltage (ON)	RN2101ACT	$V_{I\ (ON)}$	V_{CE} = −0.2 V, I_C = −5 mA	−1.2	—	−2.2	V
	RN2102ACT			−1.2	—	−2.6	
	RN2103ACT			−1.3	—	−3.5	
	RN2104ACT			−1.5	—	−5.0	
	RN2105ACT			−0.6	—	−1.1	
	RN2106ACT			−0.7	—	−1.3	
Input voltage (OFF)	RN2101ACT to 2104ACT	$V_{I\ (OFF)}$	V_{CE} = −5 V, I_C = −0.1 mA	−0.8	—	−1.5	V
	RN2105ACT, 2106ACT			−0.5	—	−0.8	
Collector output capacitance	RN2101ACT to 2106ACT	C_{ob}	V_{CB} = −10 V, I_E = 0, f = 1 MHz	—	0.9	—	pF
Input resistor	RN2101ACT	R1	—	3.76	4.7	5.64	kΩ
	RN2102ACT			8	10	12	
	RN2103ACT			17.6	22	26.4	
	RN2104ACT			37.6	47	56.4	
	RN2105ACT			1.76	2.2	2.64	
	RN2106ACT			3.76	4.7	5.64	
Resistor ratio	RN2101ACT to 2104ACT	R1/R2	—	0.8	1.0	1.2	
	RN2105ACT			0.0376	0.0468	0.0562	
	RN2106ACT			0.08	0.1	0.12	

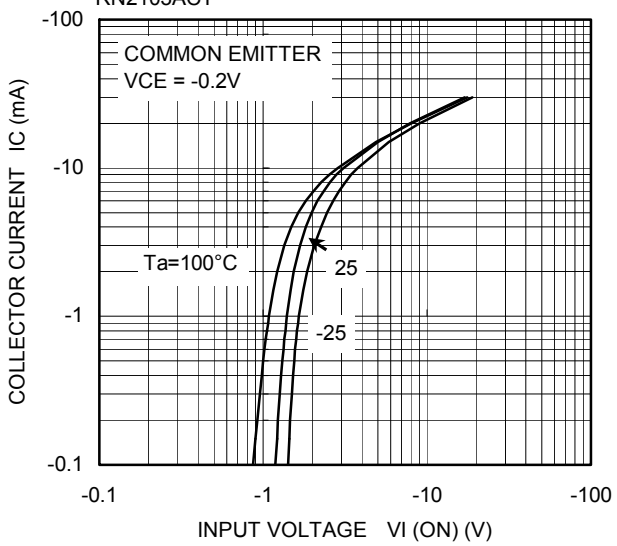
RN2101ACT IC - VI (ON)



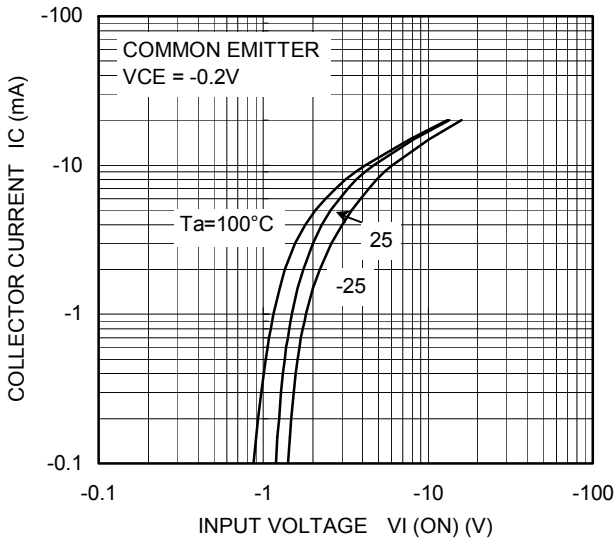
RN2102ACT IC - VI (ON)



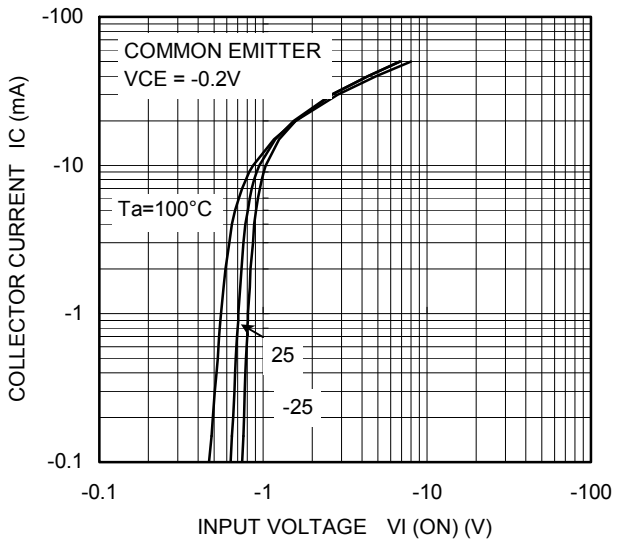
RN2103ACT IC - VI (ON)



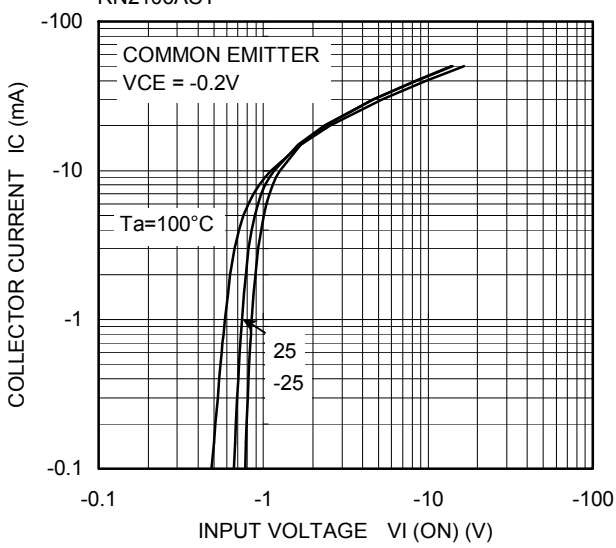
RN2104ACT IC - VI (ON)



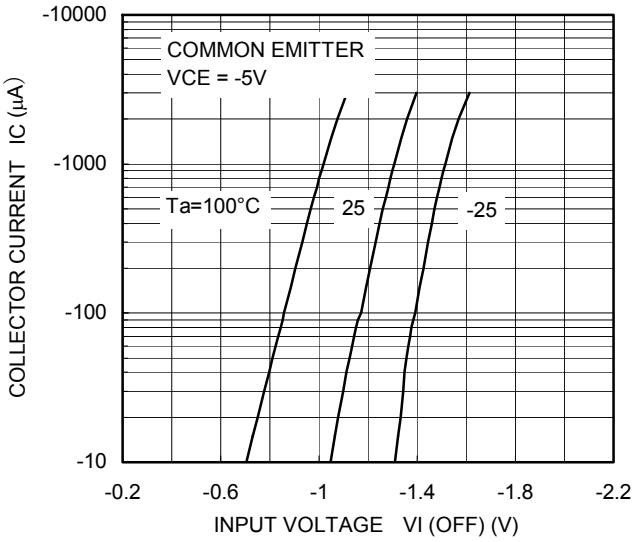
RN2105ACT IC - VI (ON)



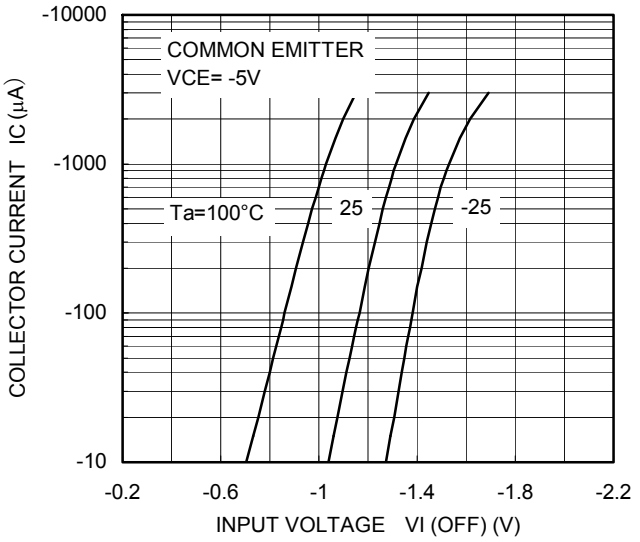
RN2106ACT IC - VI (ON)



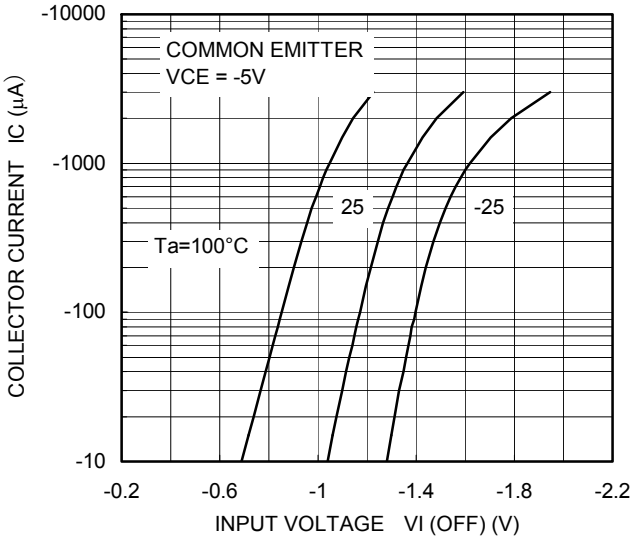
RN2101ACT IC - VI (OFF)



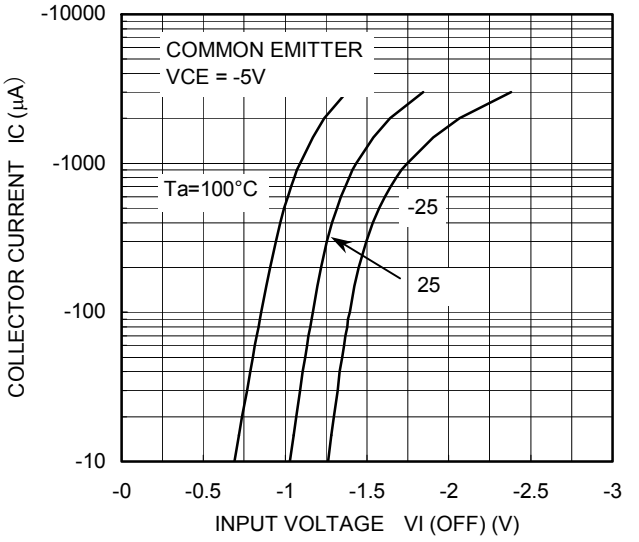
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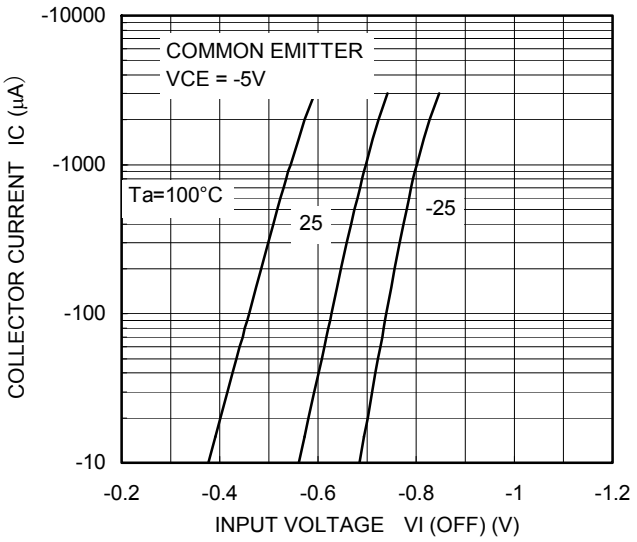
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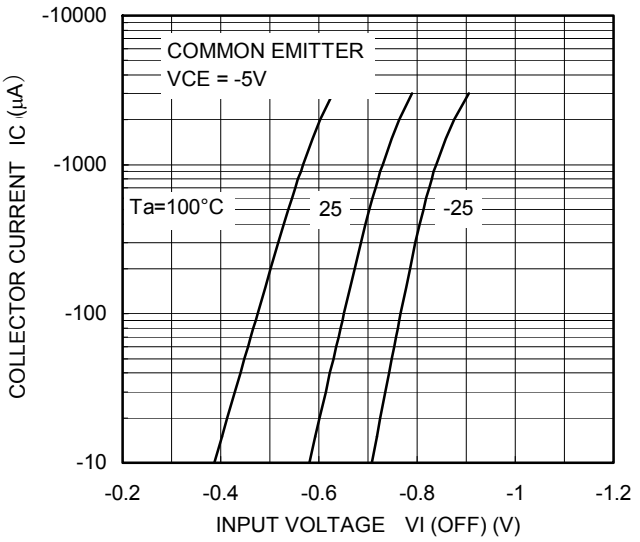
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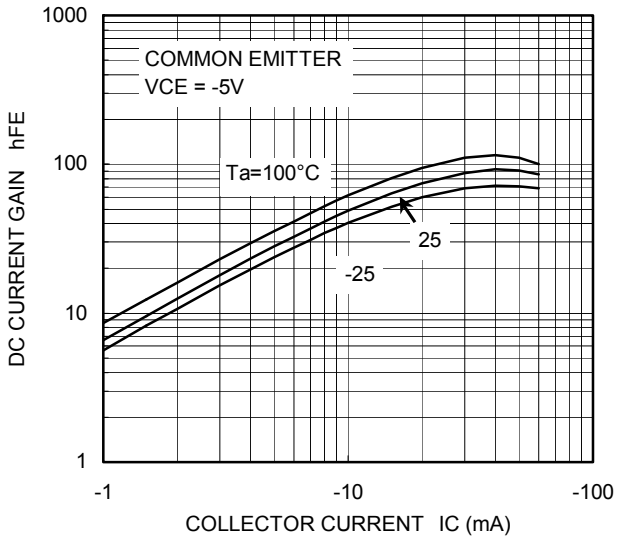
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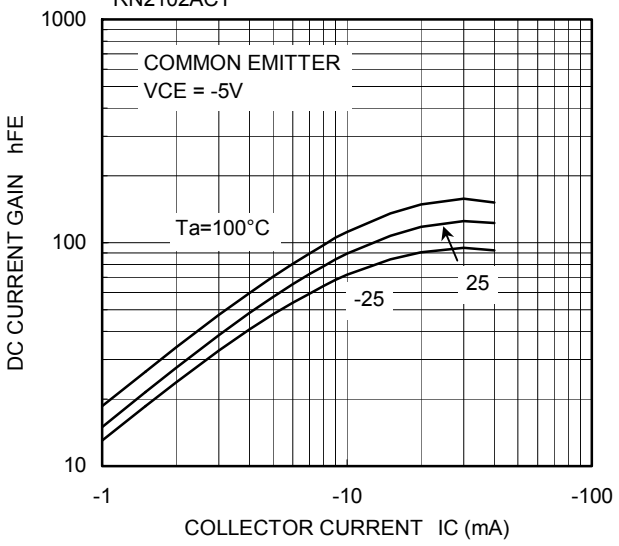
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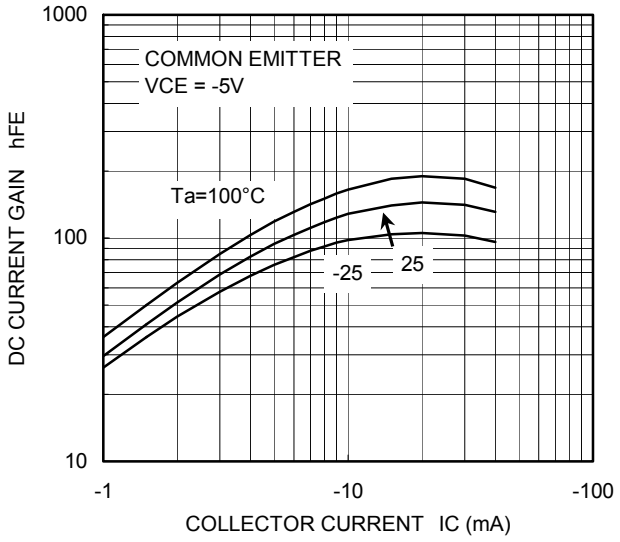
RN2101ACT hFE- IC



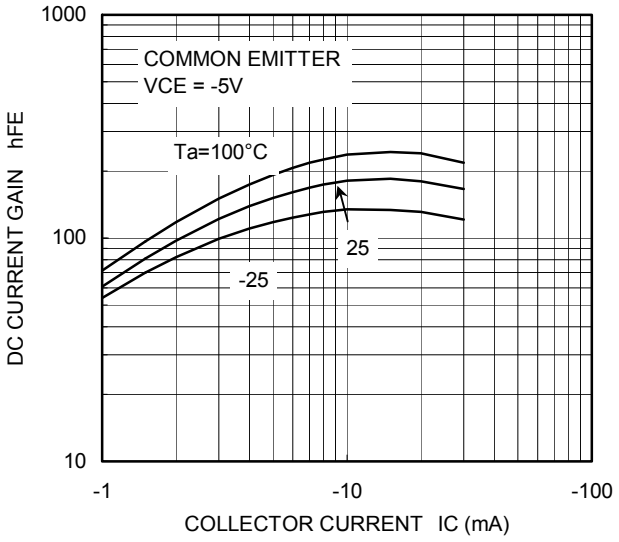
RN2102ACT hFE - IC



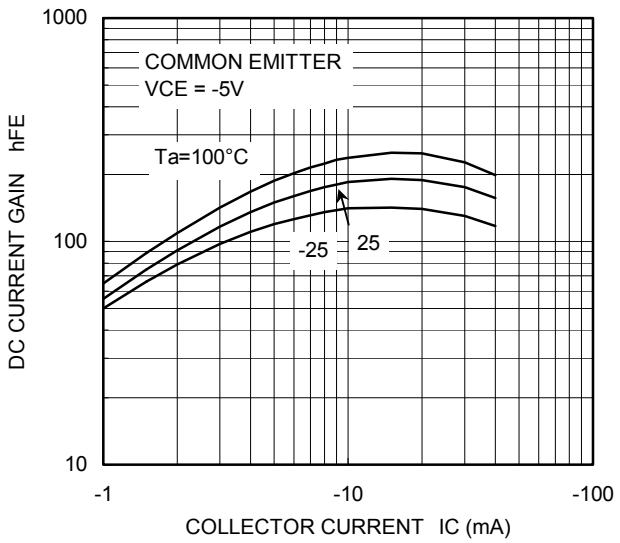
RN2103ACT hFE- IC



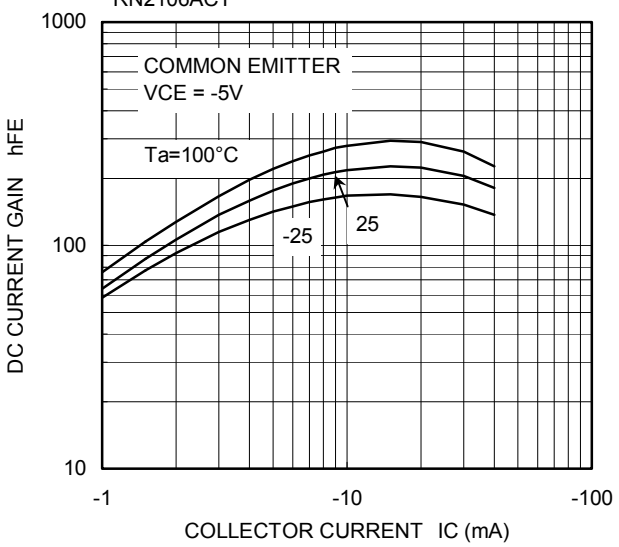
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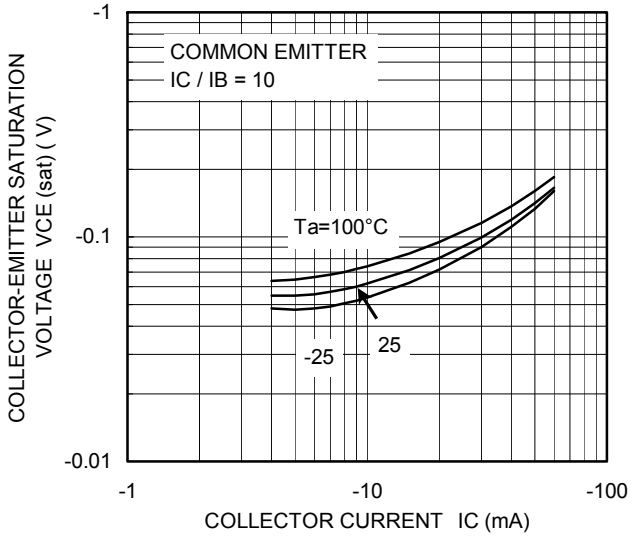
RN2105ACT hFE - IC



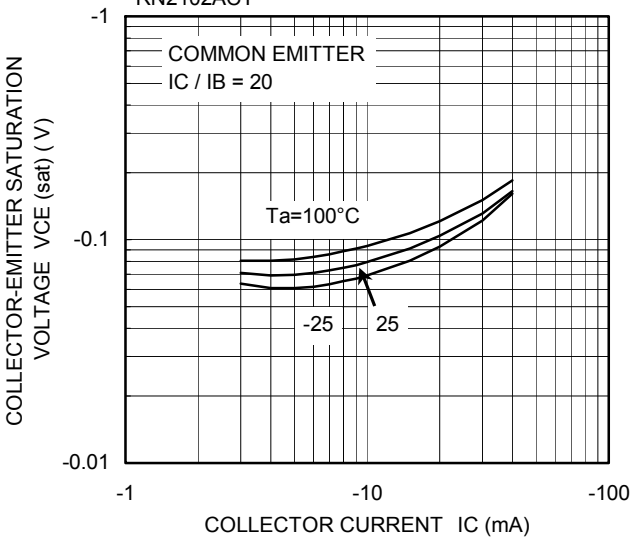
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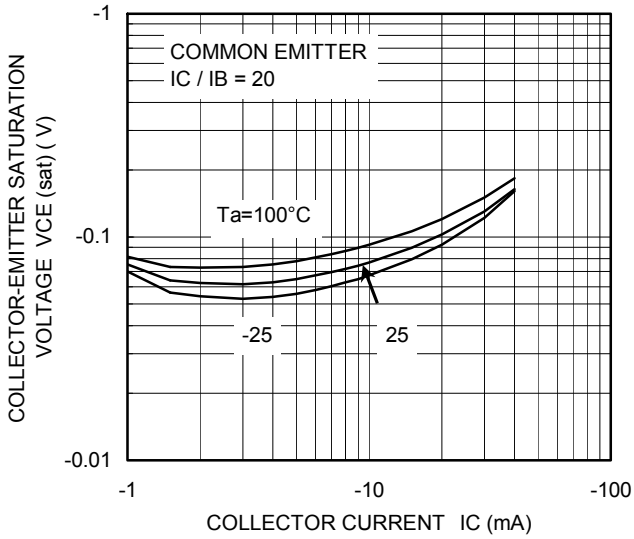
RN2101ACT VCE (sat) - IC



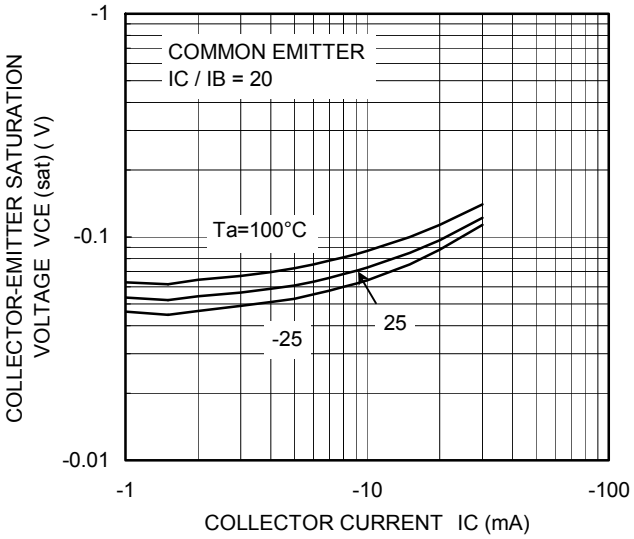
RN2102ACT VCE (sat) - IC



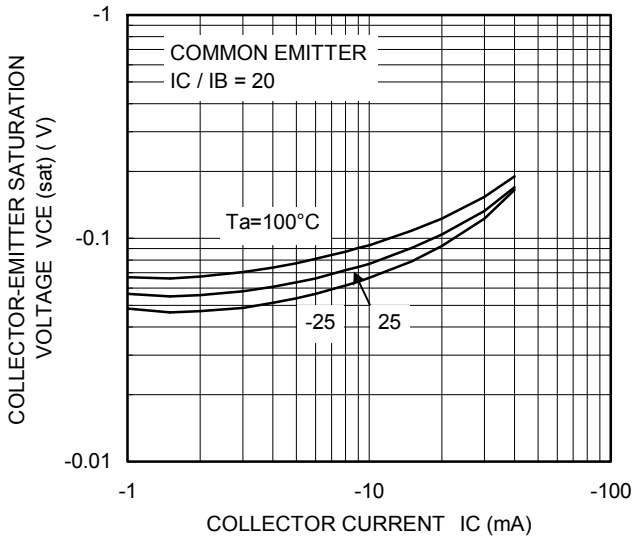
RN2103ACT VCE (sat) - IC



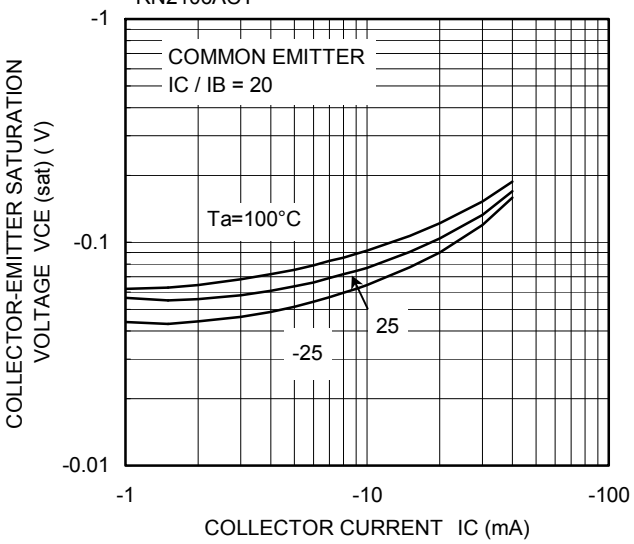
RN2104ACT VCE (sat) - IC

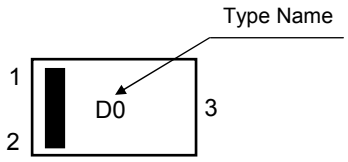
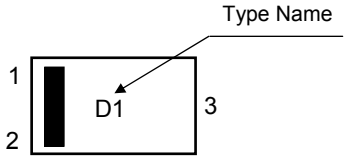
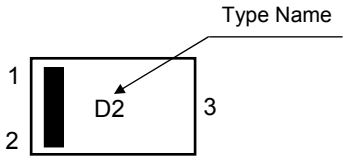
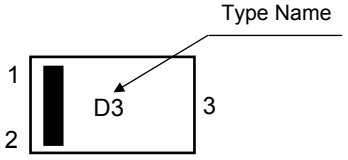
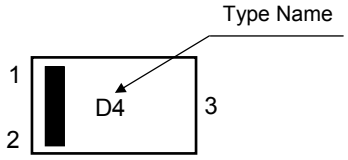
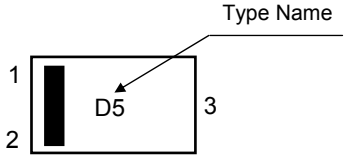


RN2105ACT VCE (sat) - IC



RN2106ACT VCE (sat) - IC



Type Name	Marking
RN2101ACT	
RN2102ACT	
RN2103ACT	
RN2104ACT	
RN2105ACT	
RN2106ACT	

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