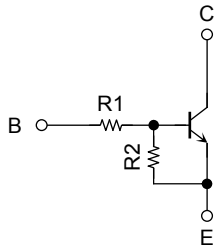
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process) (Bias Resistor built-in Transistor)

RN1101ACT,RN1102ACT,RN1103ACT RN1104ACT,RN1105ACT,RN1106ACT

Switching Applications
Inverter Circuit Applications
Interface Circuit Applications
Driver Circuit Applications

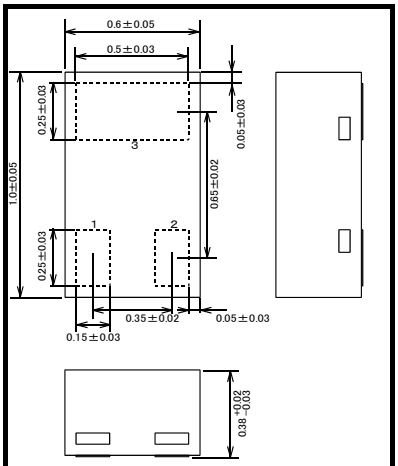
- Incorporating a bias resistor into a transistor reduces the number of parts, which enables the manufacture of ever more compact equipment and saves assembly cost.
- Complementary to RN2101ACT to RN2106ACT

Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN1101ACT	4.7	4.7
RN1102ACT	10	10
RN1103ACT	22	22
RN1104ACT	47	47
RN1105ACT	2.2	47
RN1106ACT	4.7	47

Unit: mm



CST3

1.BASE
2. EMITTER
3.COLLECTOR

JEDEC	—
JEITA	—
TOSHIBA	2-1J1A

Weight: 0.75 mg (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Collector-base voltage	RN1101ACT to 1106ACT	V_{CBO}	50	V
Collector-emitter voltage		V_{CEO}	50	V
Emitter-base voltage	RN1101ACT to 1104ACT	V_{EBO}	10	V
	RN1105ACT, 1106ACT		5	
Collector current	RN1101ACT to 1106ACT	I_C	80	mA
Collector power dissipation		P_C (Note1)	100	mW
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55 to 150	°C

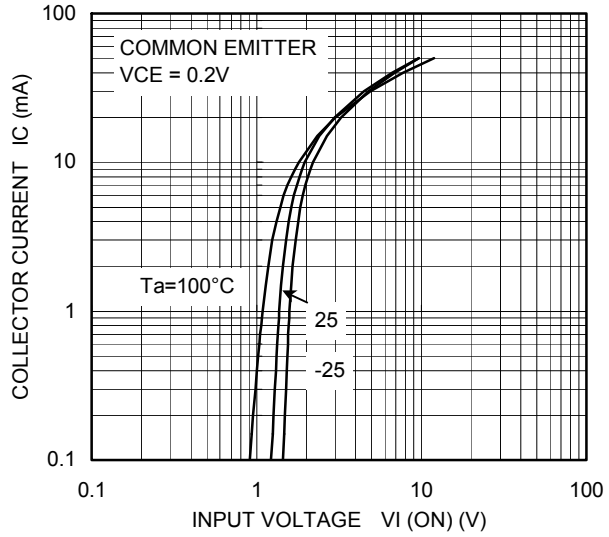
Note1: Mounted on FR4 board (10 mm × 10 mm × 1 mm)

Note2: 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).

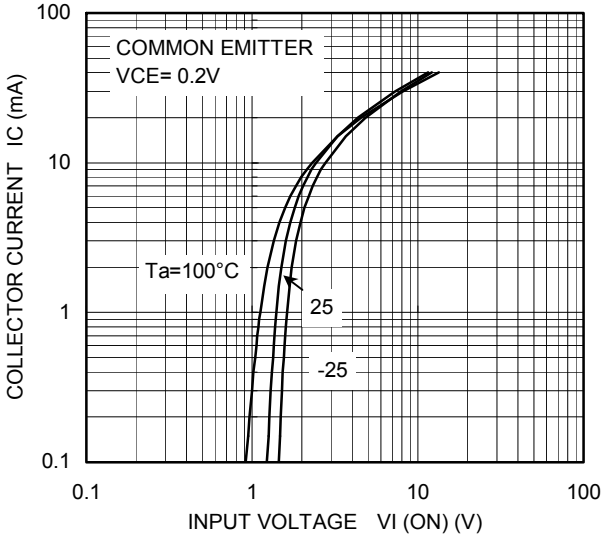
Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN1101ACT to 1106ACT	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	RN1101ACT	I_{EBO}	V_{EB} = 10 V, I_C = 0	0.89	—	1.33	mA
	RN1102ACT			0.41	—	0.63	
	RN1103ACT			0.18	—	0.29	
	RN1104ACT			0.088	—	0.133	
	RN1105ACT		V_{EB} = 5 V, I_C = 0	0.085	—	0.127	
	RN1106ACT			0.08	—	0.121	
DC current gain	RN1101ACT	h_{FE}	V_{CE} = 5 V, I_C = 10 mA	30	—	—	
	RN1102ACT			50	—	—	
	RN1103ACT			70	—	—	
	RN1104ACT			80	—	—	
	RN1105ACT			80	—	—	
	RN1106ACT			80	—	—	
Collector-emitter saturation voltage	RN1101ACT	$V_{CE\ (sat)}$	I_C = 5 mA, I_B = 0.5 mA	—	—	0.15	V
	RN1102ACT to 1106ACT		I_C = 5 mA, I_B = 0.25 mA				
Input voltage (ON)	RN1101ACT	$V_{I\ (ON)}$	V_{CE} = 0.2 V, I_C = 5 mA	1.2	—	2.2	V
	RN1102ACT			1.2	—	2.6	
	RN1103ACT			1.3	—	3.5	
	RN1104ACT			1.5	—	5.0	
	RN1105ACT			0.6	—	1.1	
	RN1106ACT			0.7	—	1.3	
Input voltage (OFF)	RN1101ACT to 1104ACT	$V_{I\ (OFF)}$	V_{CE} = 5 V, I_C = 0.1 mA	0.8	—	1.5	V
	RN1105ACT, 1106ACT			0.5	—	0.8	
Collector output capacitance	RN1101ACT~1106ACT	C_{ob}	V_{CB} = 10 V, I_E = 0, f = 1 MHz	—	0.7	—	pF
Input resistor	RN1101ACT	R1	—	3.76	4.7	5.64	kΩ
	RN1102ACT			8	10	12	
	RN1103ACT			17.6	22	26.4	
	RN1104ACT			37.6	47	56.4	
	RN1105ACT			1.76	2.2	2.64	
	RN1106ACT			3.76	4.7	5.64	
Resistor ratio	RN1101ACT to 1104ACT	R1/R2	—	0.8	1.0	1.2	
	RN1105ACT			0.0376	0.0468	0.0562	
	RN1106ACT			0.08	0.1	0.12	

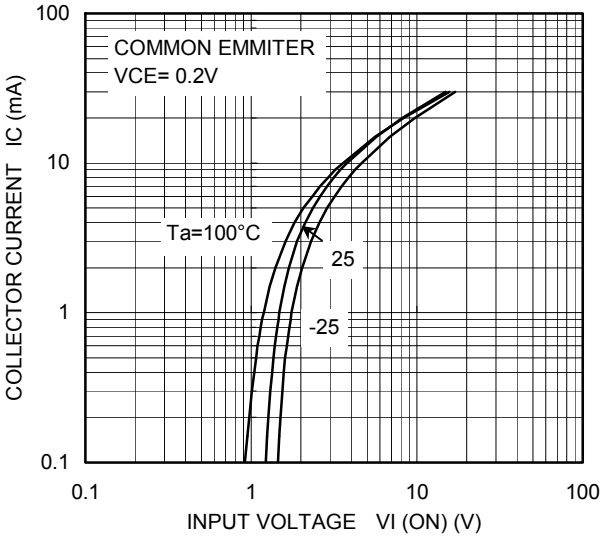
RN1101ACT IC - VI(ON)



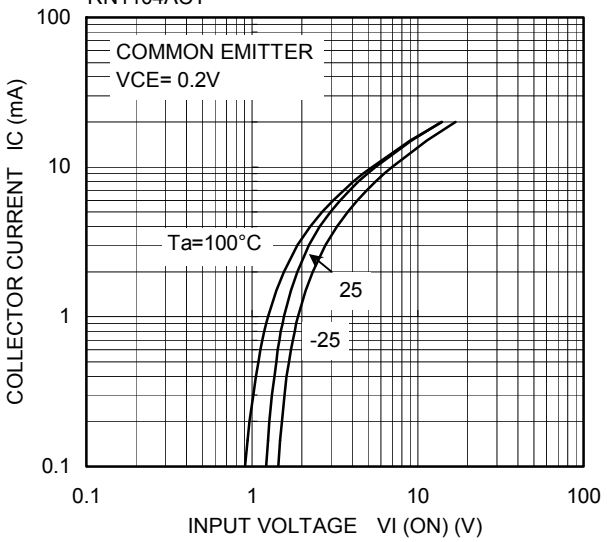
RN1102ACT IC - VI (ON)



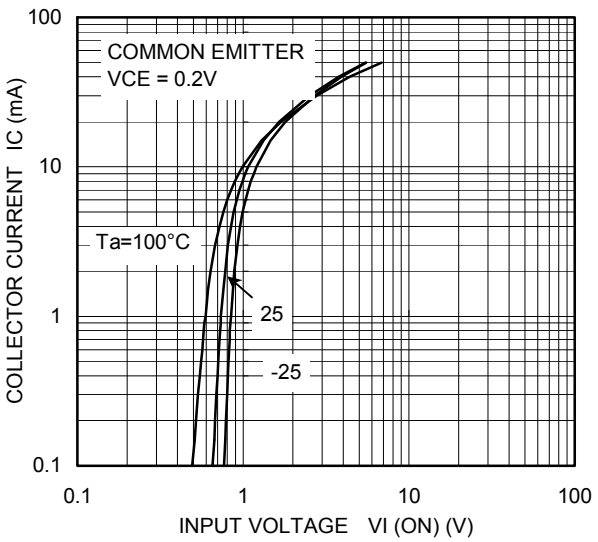
RN1103ACT IC - VI (ON)



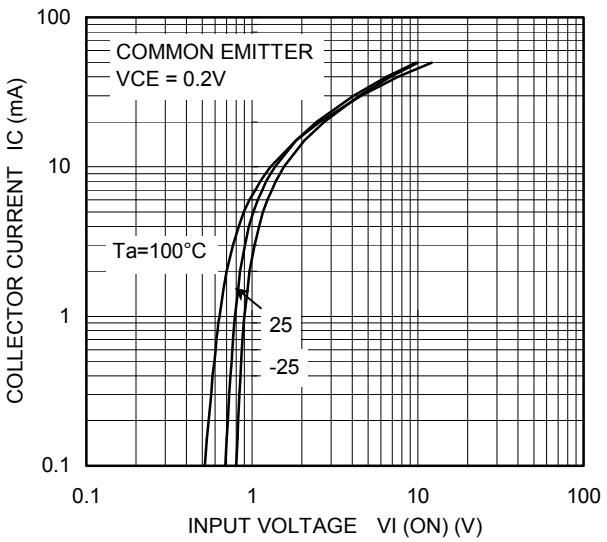
RN1104ACT IC - VI (ON)



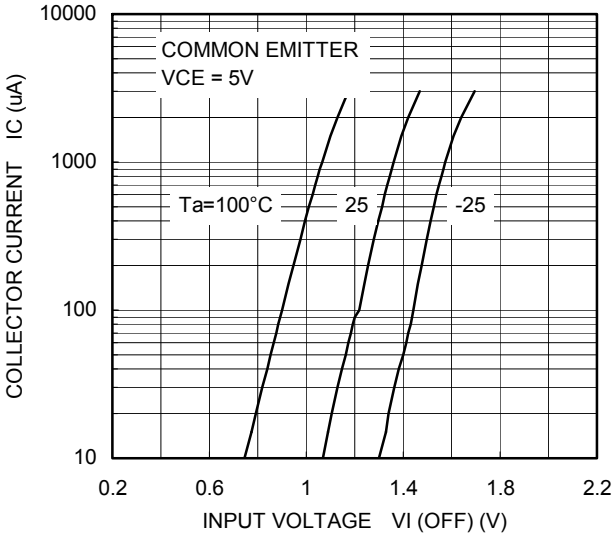
RN1105ACT IC - VI (ON)



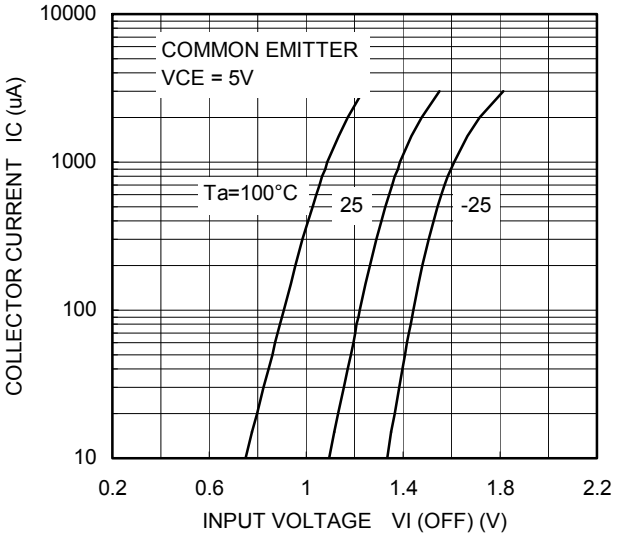
RN1106ACT IC - VI (ON)



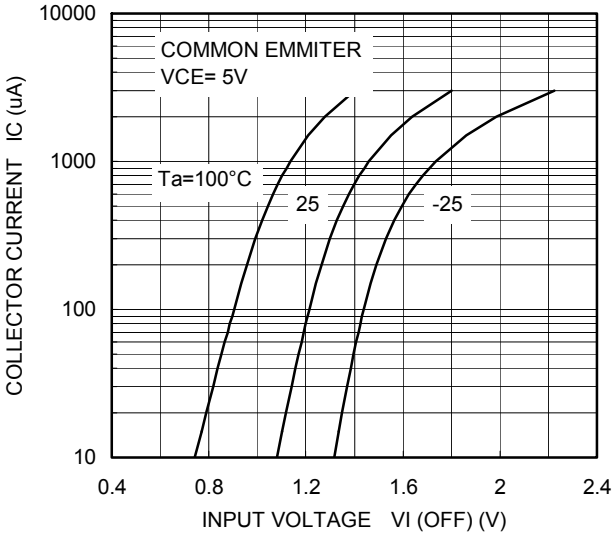
RN1101ACT IC - VI(OFF)



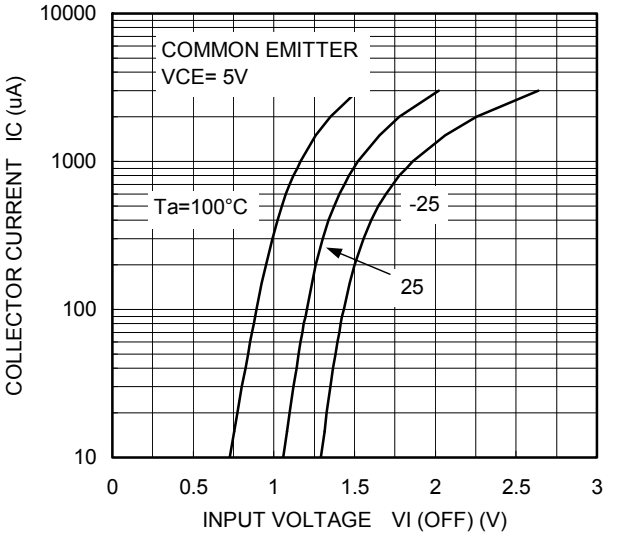
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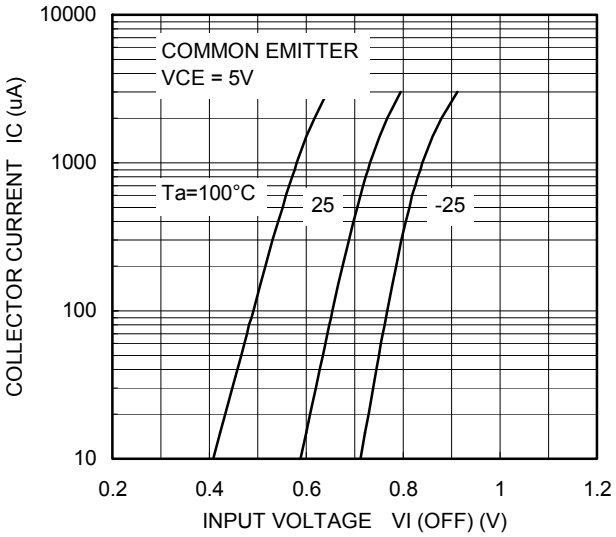
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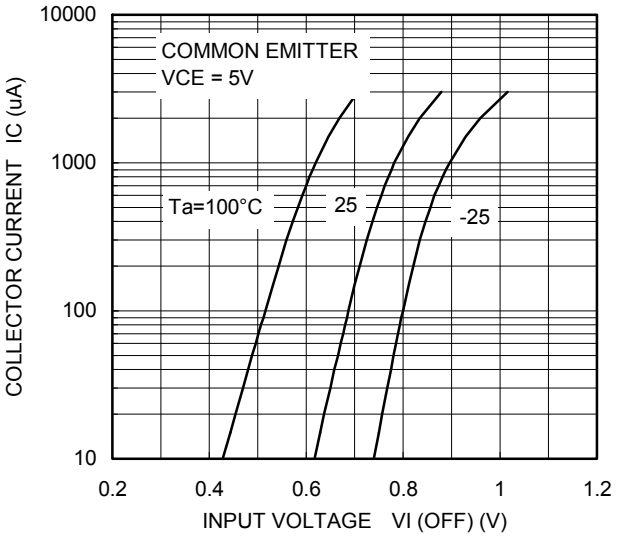
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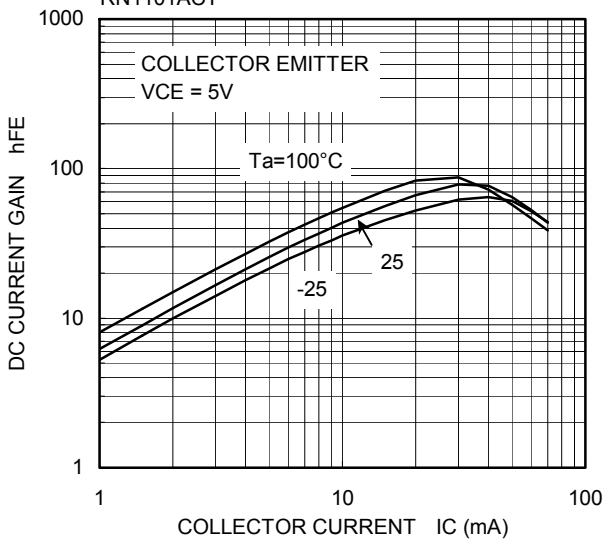
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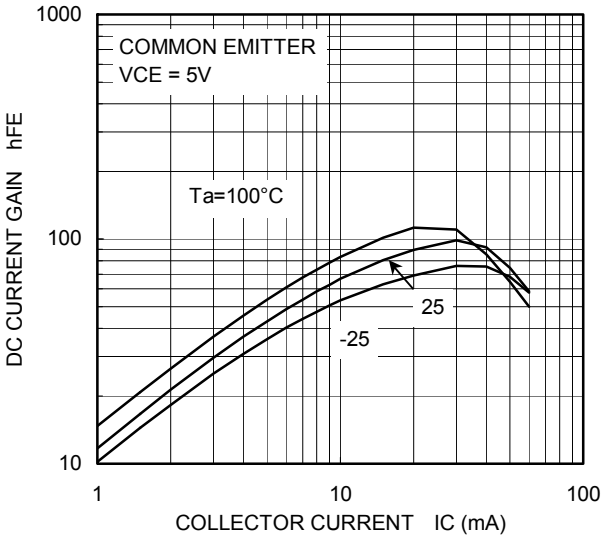
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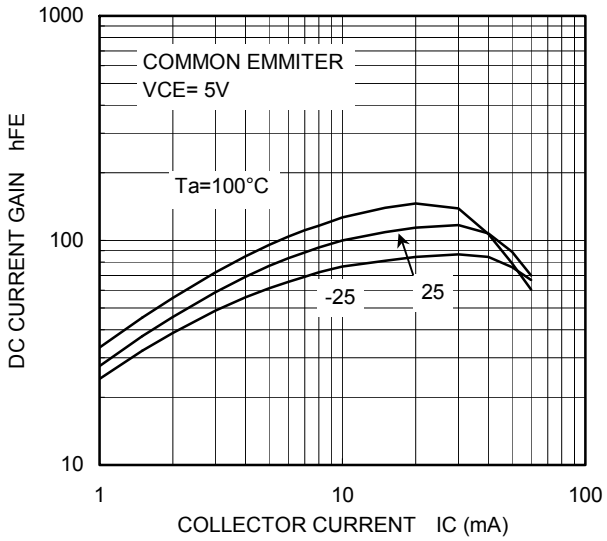
RN1101ACT hFE - IC



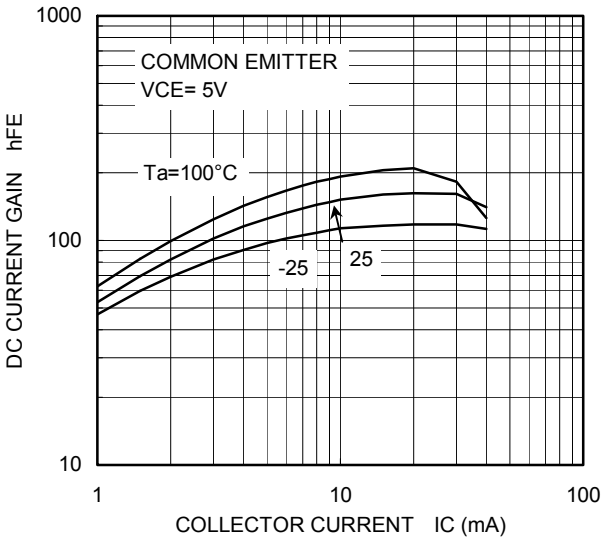
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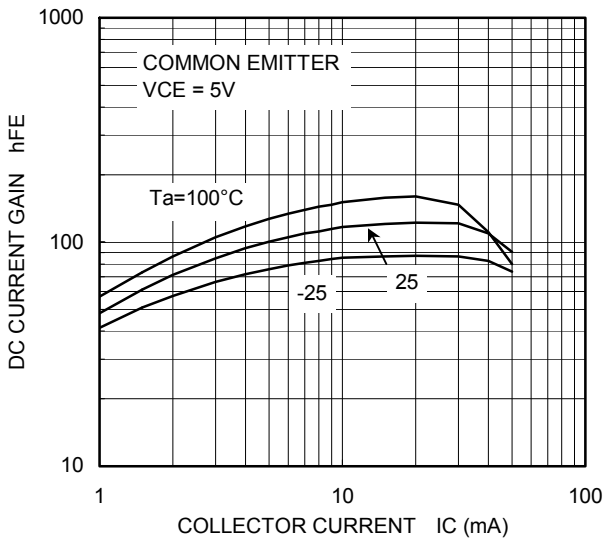
RN1103ACT hFE - IC



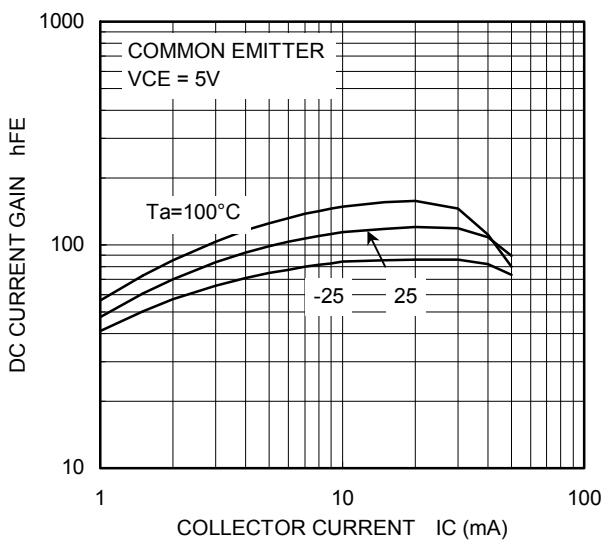
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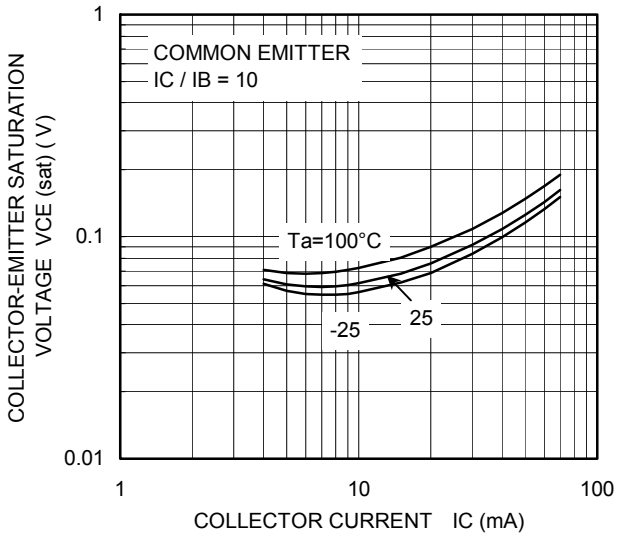
RN1105ACT hFE - IC



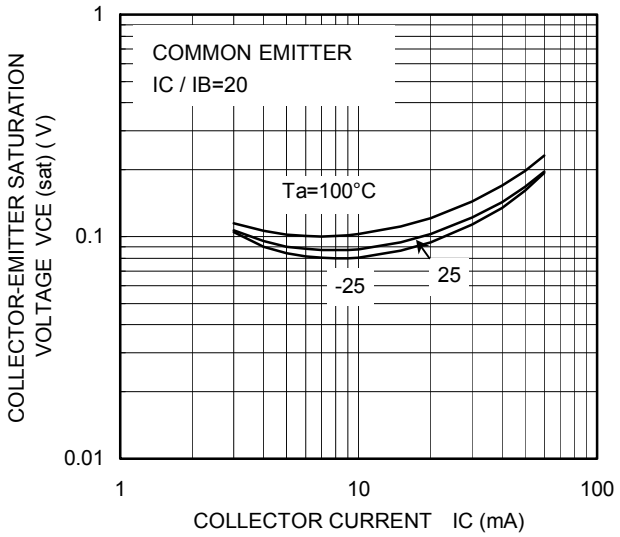
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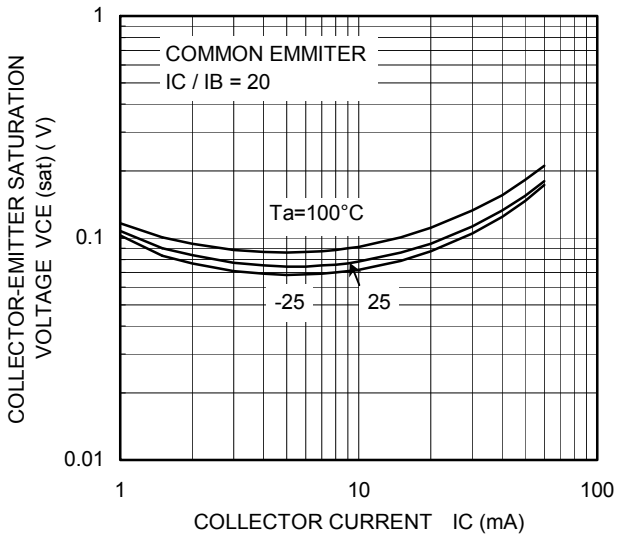
RN1101ACT VCE (sat) - IC



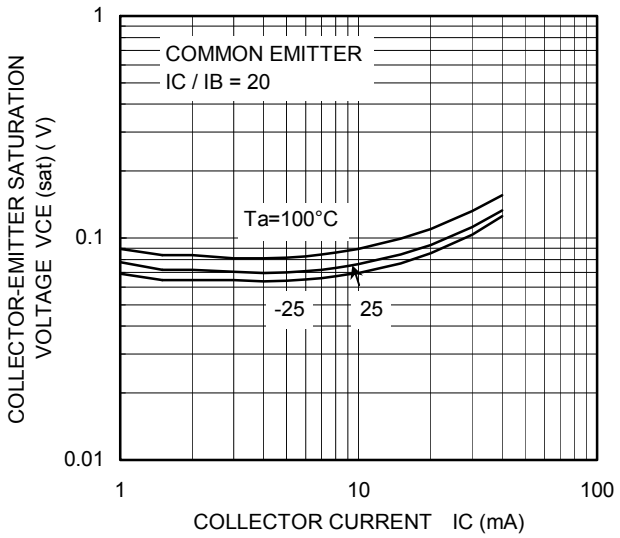
RN1102ACT VCE (sat) - IC



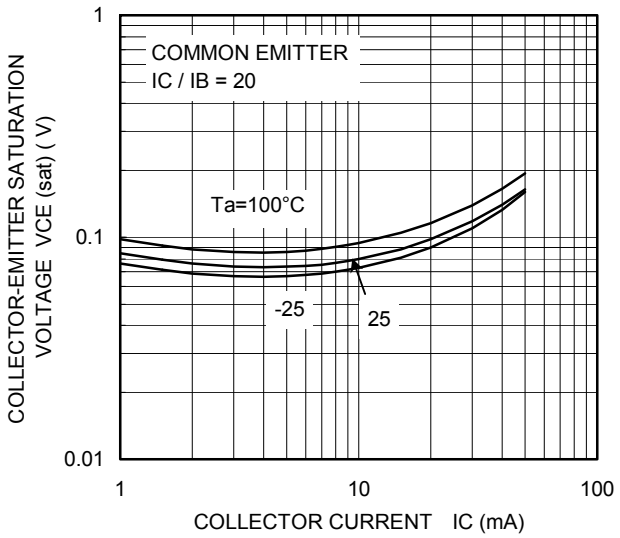
RN1103ACT VCE (sat) - IC



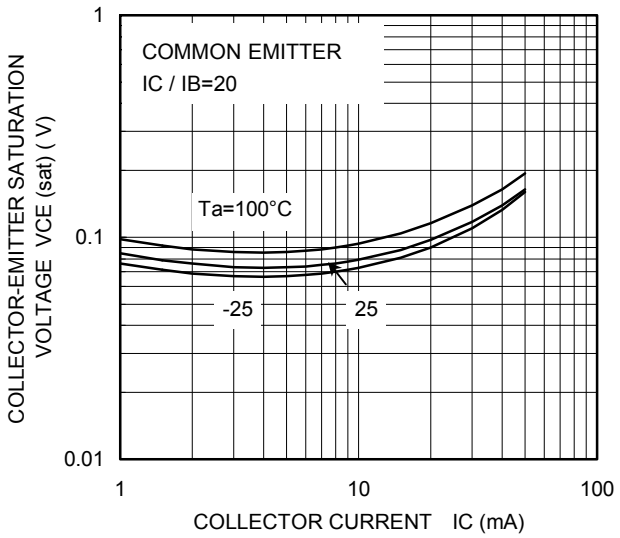
RN1104ACT VCE(sat) - IC

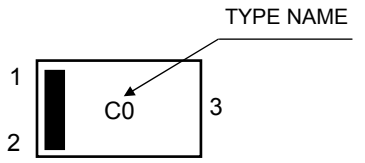
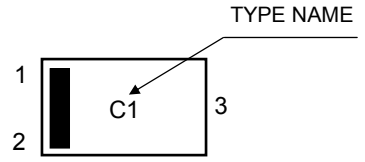
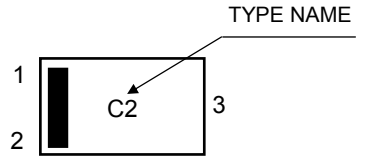
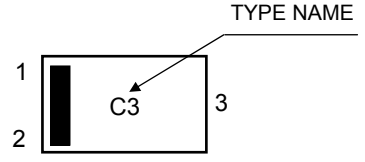
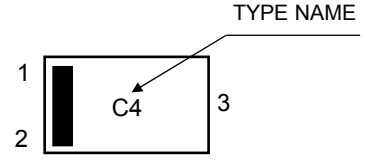
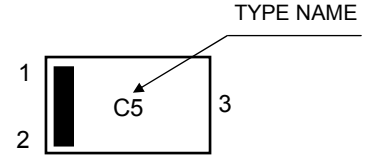


RN1105ACT VCE (sat) - IC



RN1106ACT VCE (sat) - IC



Type Name	Marking
RN1101ACT	
RN1102ACT	
RN1103ACT	
RN1104ACT	
RN1105ACT	
RN1106ACT	

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