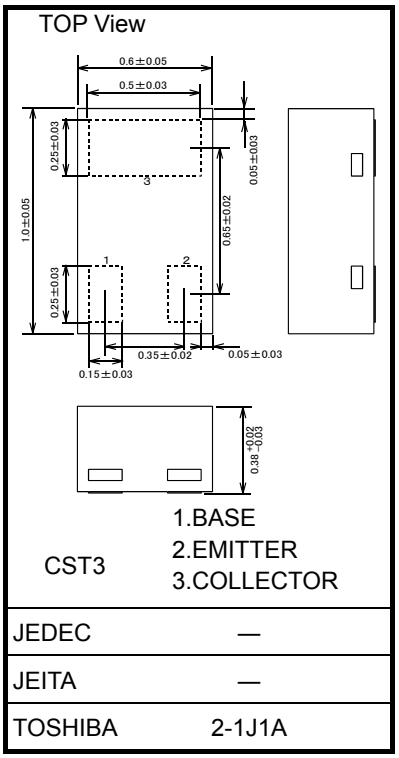
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process) (Bias Resistor built-in Transistor)

RN1107ACT, RN1108ACT, RN1109ACT

Switching, Inverter Circuit, Interface Circuit and
Driver Circuit Applications

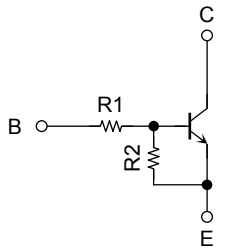
- Extra small package(CST3) is applicable for extra high density fabrication.
- Incorporating a bias resistor into a transistor reduces the number of parts, which enables the manufacture of ever more compact equipment and saves assembly cost.
- Complementary to RN2107ACT to RN2109ACT

Unit: mm



Weight: 0.75 mg (typ.)

Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN1107ACT	10	47
RN1108ACT	22	47
RN1109ACT	47	22

Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Collector-base voltage	RN1107ACT to RN1109ACT	V_{CBO}	50	V
Collector-emitter voltage		V_{CEO}	50	V
Emitter-base voltage	RN1107ACT	V_{EBO}	6	V
	RN1108ACT		7	
	RN1109ACT		15	
Collector current	RN1107ACT to RN1109ACT	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

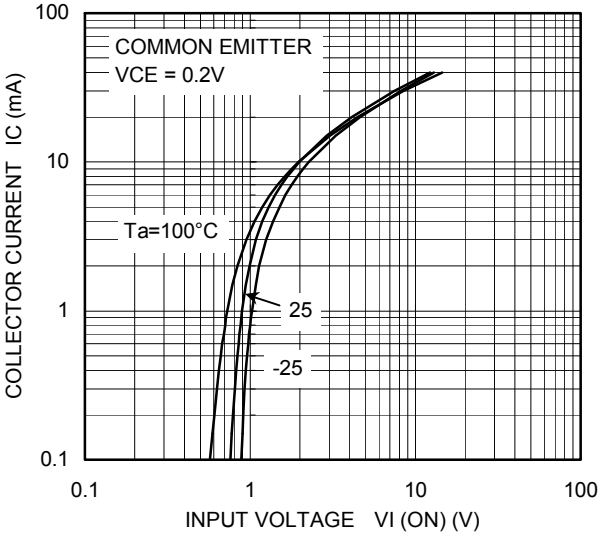
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

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

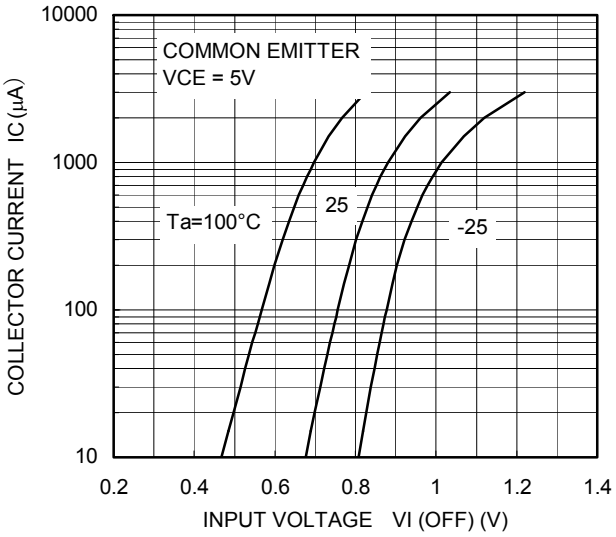
Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN1107ACT to 1109ACT	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	RN1107ACT	I_{EBO}	V_{EB} = 6 V, I_C = 0	0.088	—	0.131	mA
	RN1108ACT		V_{EB} = 7 V, I_C = 0	0.085	—	0.126	
	RN1109ACT		V_{EB} = 15 V, I_C = 0	0.182	—	0.271	
DC current gain	RN1107ACT	h_{FE}	V_{CE} = 5 V, I_C = 10 mA	80	—	—	
	RN1108ACT			80	—	—	
	RN1109ACT			70	—	—	
Collector-emitter saturation voltage	RN1107ACT to 1109ACT	$V_{CE\ (sat)}$	I_C = 5 mA, I_B = 0.25 mA	—	—	0.15	V
Input voltage (ON)	RN1107ACT	$V_{I\ (ON)}$	V_{CE} = 0.2 V, I_C = 5 mA	0.8	—	1.8	V
	RN1108ACT			1.0	—	3.0	
	RN1109ACT			2.0	—	6.4	
Input voltage (OFF)	RN1107ACT	$V_{I\ (OFF)}$	V_{CE} = 5 V, I_C = 0.1 mA	0.6	—	0.9	V
	RN1108ACT			0.7	—	1.2	
	RN1109ACT			1.5	—	2.6	
Collector output capacitance	RN1107ACT to 1109ACT	C_{ob}	V_{CB} = 10 V, I_E = 0, f = 1 MHz	—	0.7	—	pF
Input resistor	RN1107ACT	R1	—	8	10	12	kΩ
	RN1108ACT			17.6	22	26.4	
	RN1109ACT			37.6	47	56.4	
Resistor ratio	RN1107ACT	R1/R2	—	0.17	0.213	0.255	
	RN1108ACT			0.374	0.468	0.562	
	RN1109ACT			1.71	2.14	2.56	

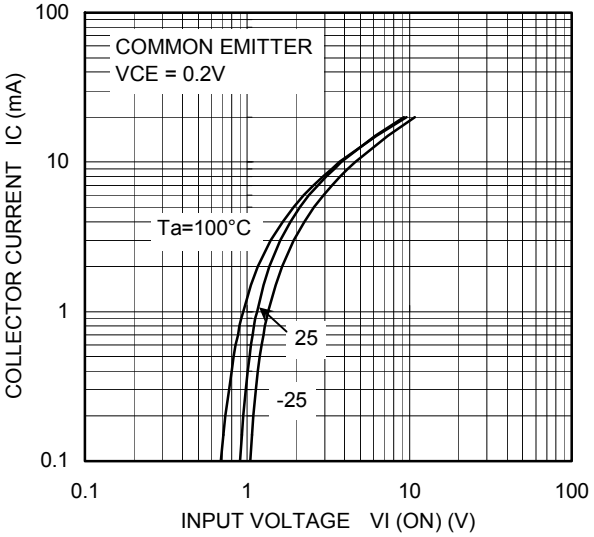
RN1107ACT IC - VI (ON)



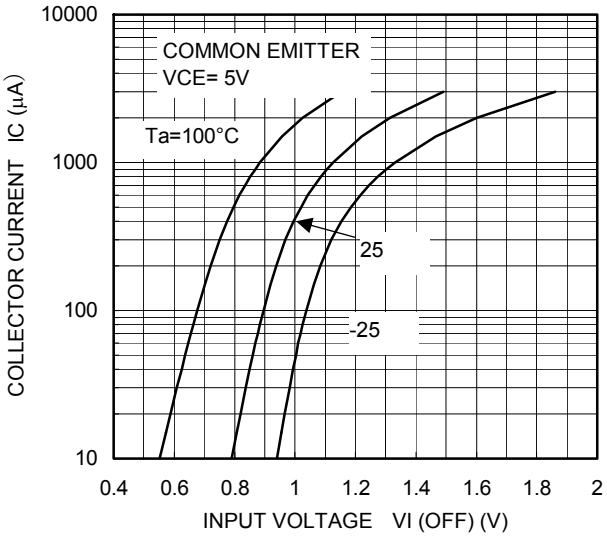
RN1107ACT IC - VI (OFF)



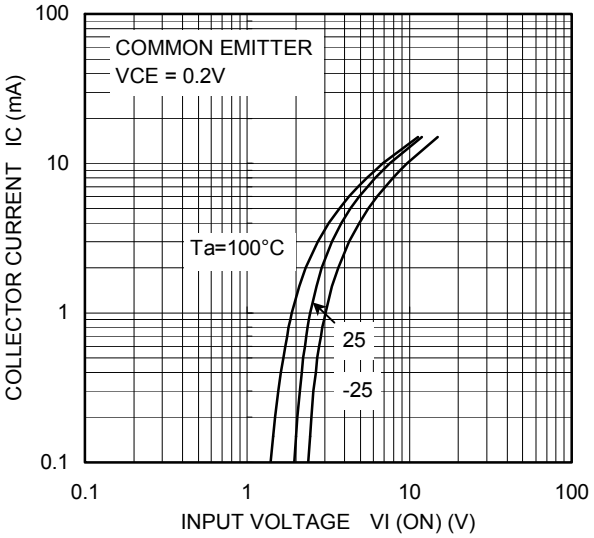
RN1108ACT IC - VI (ON)



RN1108ACT IC - VI (OFF)



RN1109ACT IC- VI (ON)



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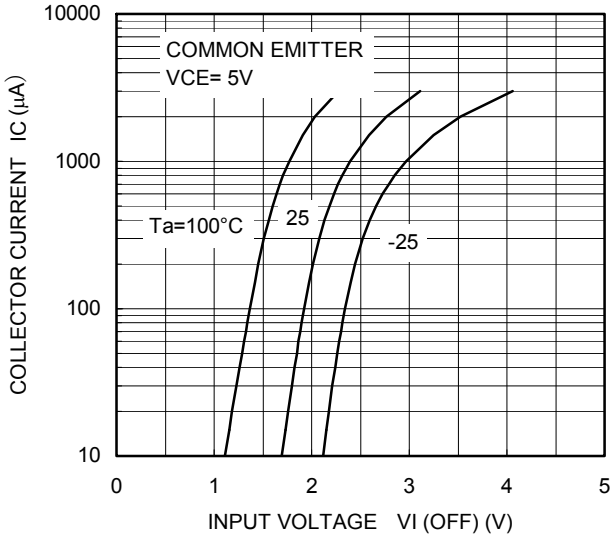
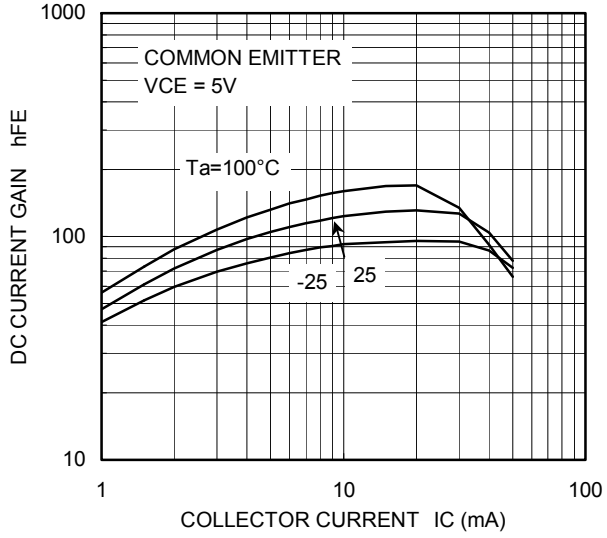
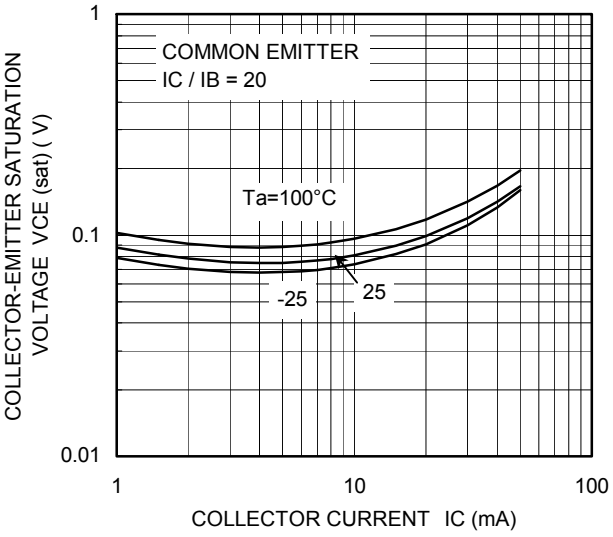


RN1107ACT hFE - IC



RN1107ACT VCE (sat) - IC



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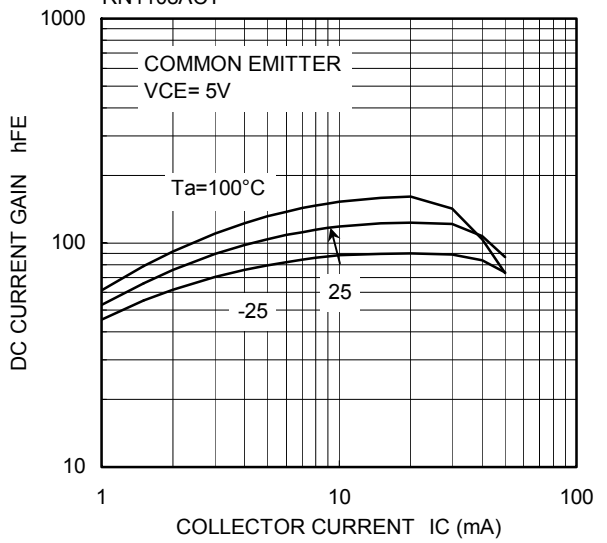

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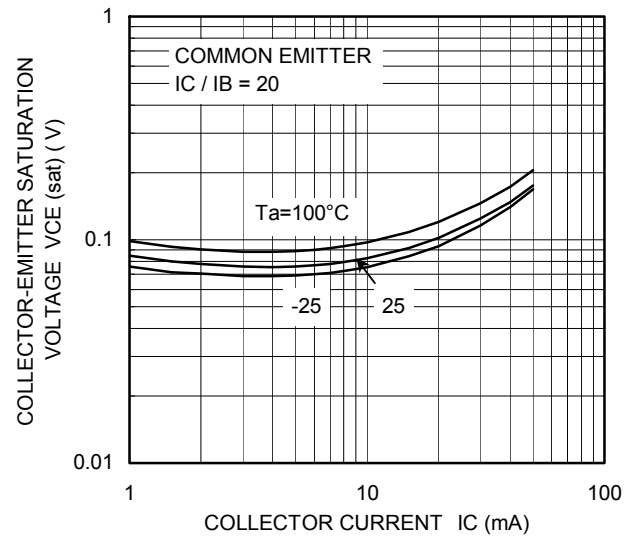

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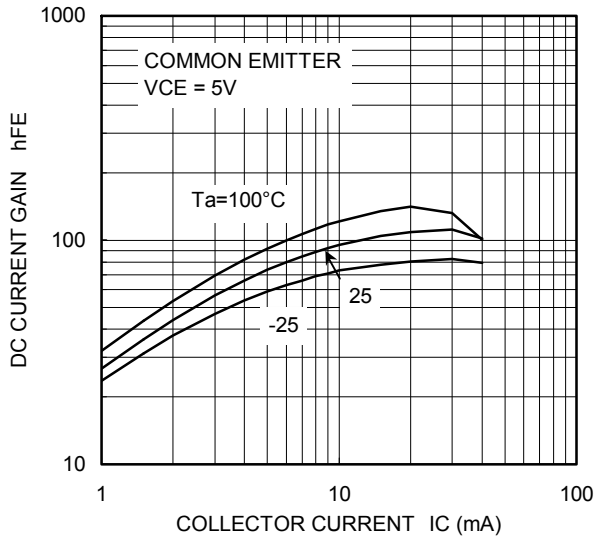
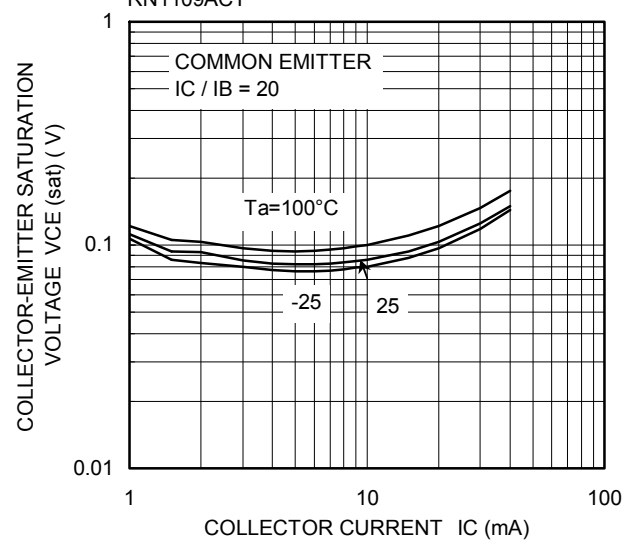
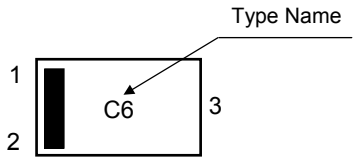
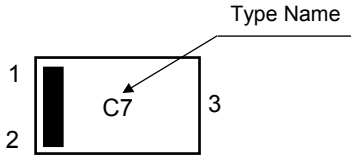
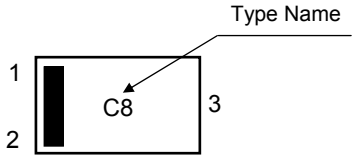


RN1109ACT VCE (sat) - IC



Marking

Type Name	Marking
RN1107ACT	
RN1108ACT	
RN1109ACT	

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