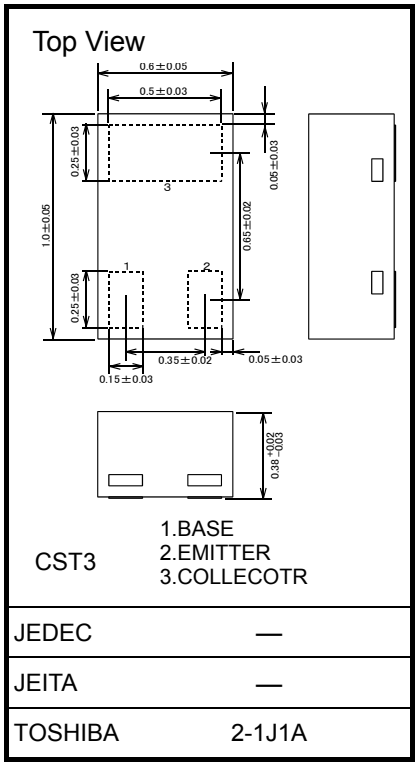
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT process) (Bias Resistor built-in Transistor)

RN2107ACT, RN2108ACT, RN2109ACT

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 RN1107ACT to RN1109ACT

Unit: mm



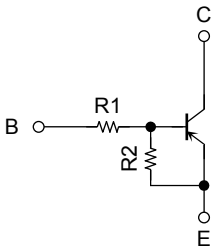
CST3

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)
RN2107ACT	10	47
RN2108ACT	22	47
RN2109ACT	47	22

Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Collector-base voltage	RN2107ACT to RN2109ACT	V_{CBO}	−50	V
Collector-emitter voltage		V_{CEO}	−50	V
Emitter-base voltage	RN2107ACT	V_{EBO}	−6	V
	RN2108ACT		−7	
	RN2109ACT		−15	
Collector current	RN2107ACT to RN2109ACT	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

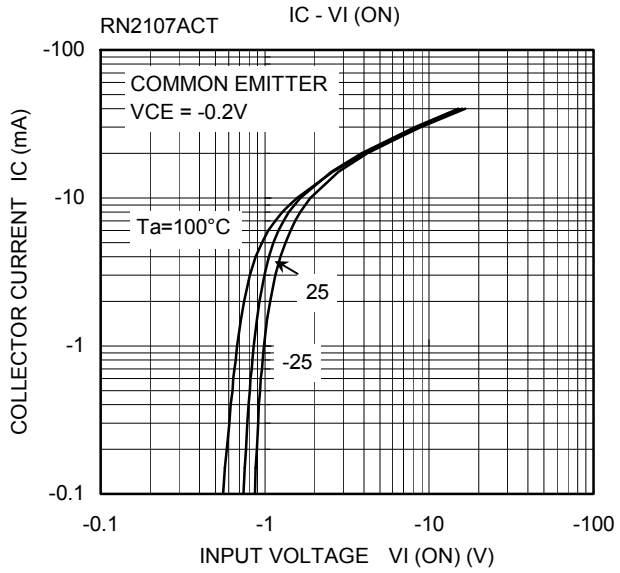
* : Mounted on FR4 board (10 mm × 10 mm × 1 mm)

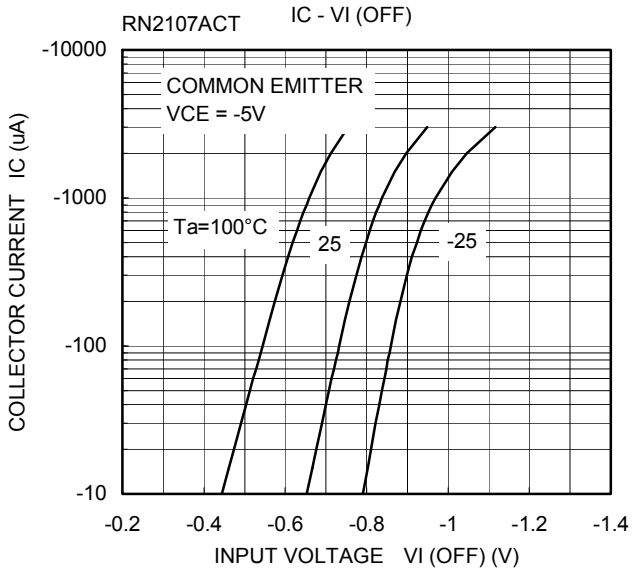
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e.operatingtemperature/current/voltage, etc.) are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

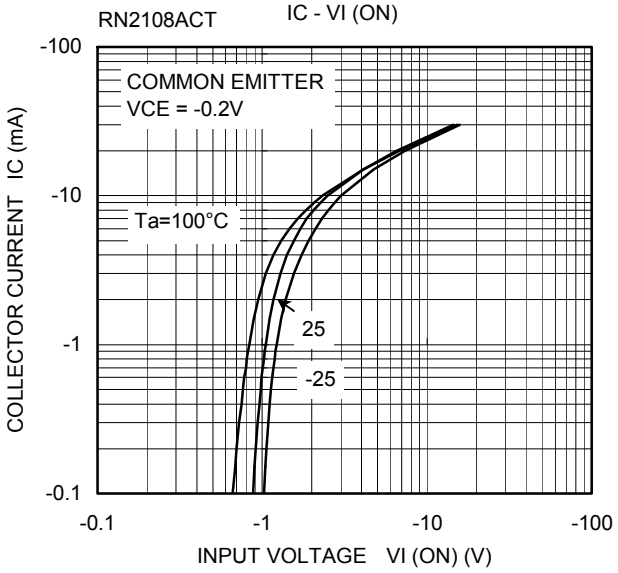
Start of commercial production
2004-08

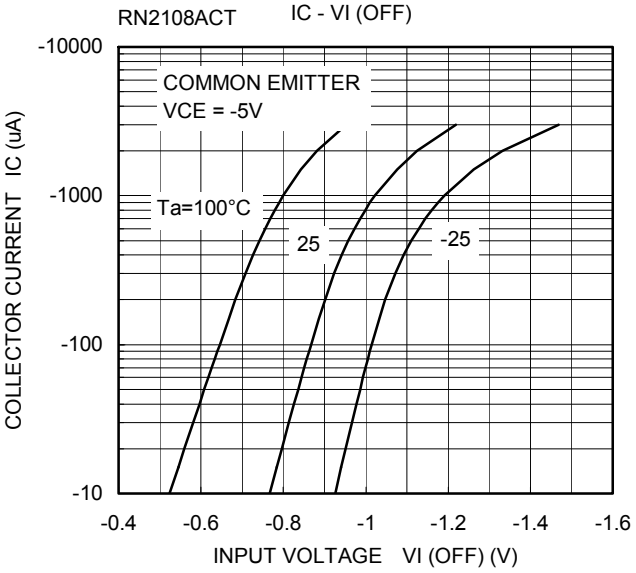
Electrical Characteristics (Ta = 25°C)

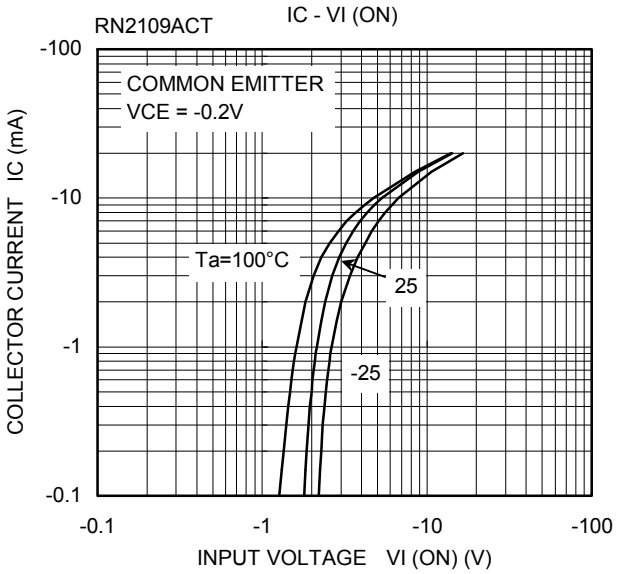
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN2107ACT to 2109ACT	I_{CBO}	V_{CB} = −50 V, I_E = 0	—	—	−100	nA
		I_{CEO}	V_{CE} = −50 V, I_B = 0	—	—	−500	
Emitter cut-off current	RN2107ACT	I_{EBO}	V_{EB} = −6 V, I_C = 0	−0.088	—	−0.131	mA
	RN2108ACT		V_{EB} = −7 V, I_C = 0	−0.085	—	−0.126	
	RN2109ACT		V_{EB} = −15 V, I_C = 0	−0.182	—	−0.271	
DC current gain	RN2107ACT	h_{FE}	V_{CE} = −5 V, I_C = −10 mA	80	—	—	—
	RN2108ACT			80	—	—	
	RN2109ACT			70	—	—	
Collector-emitter saturation voltage	RN2107ACT to 2109ACT	$V_{CE\ (sat)}$	I_C = −5 mA, I_B = −0.25 mA	—	—	−0.15	V
Input voltage (ON)	RN2107ACT	$V_{I\ (ON)}$	V_{CE} = −0.2 V, I_C = −5 mA	−0.8	—	−1.8	V
	RN2108ACT			−1.0	—	−3.0	
	RN2109ACT			−2.0	—	−6.4	
Input voltage (OFF)	RN2107ACT	$V_{I\ (OFF)}$	V_{CE} = −5 V, I_C = −0.1 mA	−0.6	—	−0.9	V
	RN2108ACT			−0.7	—	−1.2	
	RN2109ACT			−1.5	—	−2.6	
Collector output capacitance	RN2107ACT to 2109ACT	C_{ob}	V_{CB} = −10 V, I_E = 0, f = 1 MHz	—	0.9	—	pF
Input resistor	RN2107ACT	R1	—	8	10	12	kΩ
	RN2108ACT			17.6	22	26.4	
	RN2109ACT			37.6	47	56.4	
Resistor ratio	RN2107ACT	R1/R2	—	0.17	0.213	0.255	—
	RN2108ACT			0.374	0.468	0.562	
	RN2109ACT			1.71	2.14	2.56	

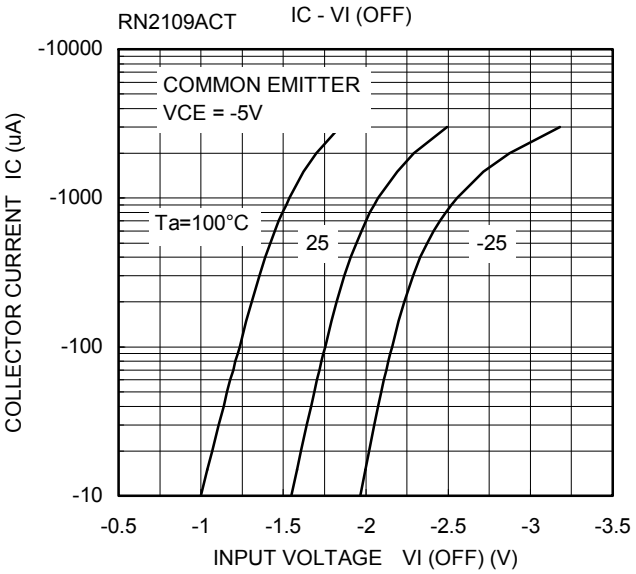

RN2107ACT
IC - VI (ON)
COMMON EMITTER
VCE = -0.2V
Ta=100°C
25
-25
COLLECTOR CURRENT IC (mA)
INPUT VOLTAGE VI (ON) (V)
-100
-10
-1
-0.1
-0.1
-1
-10
-100


RN2107ACT
IC - VI (OFF)
COMMON EMITTER
VCE = -5V
Ta=100°C
25
-25
COLLECTOR CURRENT IC (uA)
INPUT VOLTAGE VI (OFF) (V)
-10000
-1000
-100
-10
-0.2
-0.4
-0.6
-0.8
-1
-1.2
-1.4

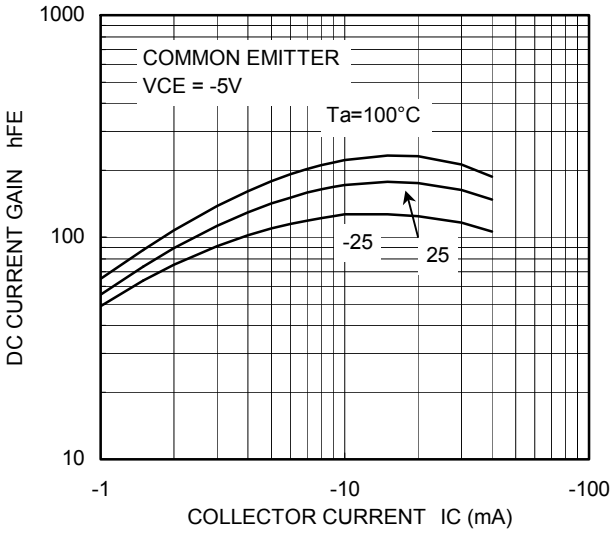

RN2108ACT
IC - VI (ON)
COMMON EMITTER
VCE = -0.2V
Ta=100°C
25
-25
COLLECTOR CURRENT IC (mA)
INPUT VOLTAGE VI (ON) (V)
-100
-10
-1
-0.1
-0.1
-1
-10
-100


RN2108ACT
IC - VI (OFF)
COMMON EMITTER
VCE = -5V
Ta=100°C
25
-25
COLLECTOR CURRENT IC (uA)
INPUT VOLTAGE VI (OFF) (V)
-10000
-1000
-100
-10
-0.4
-0.6
-0.8
-1
-1.2
-1.4
-1.6

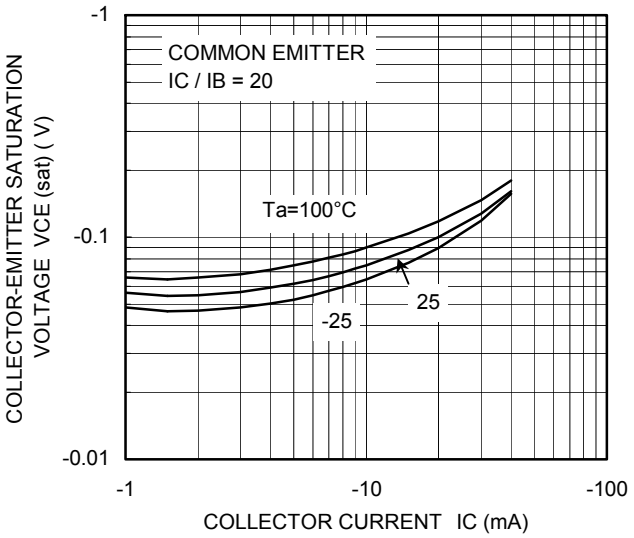

RN2109ACT
IC - VI (ON)
COMMON EMITTER
VCE = -0.2V
Ta=100°C
25
-25
COLLECTOR CURRENT IC (mA)
INPUT VOLTAGE VI (ON) (V)
-100
-10
-1
-0.1
-0.1
-1
-10
-100


RN2109ACT
IC - VI (OFF)
COMMON EMITTER
VCE = -5V
Ta=100°C
25
-25
COLLECTOR CURRENT IC (uA)
INPUT VOLTAGE VI (OFF) (V)
-10000
-1000
-100
-10
-0.5
-1
-1.5
-2
-2.5
-3
-3.5

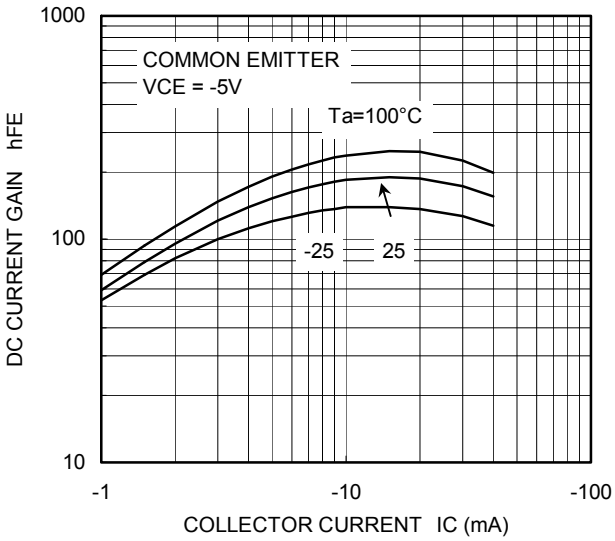
RN2107ACT hFE - IC



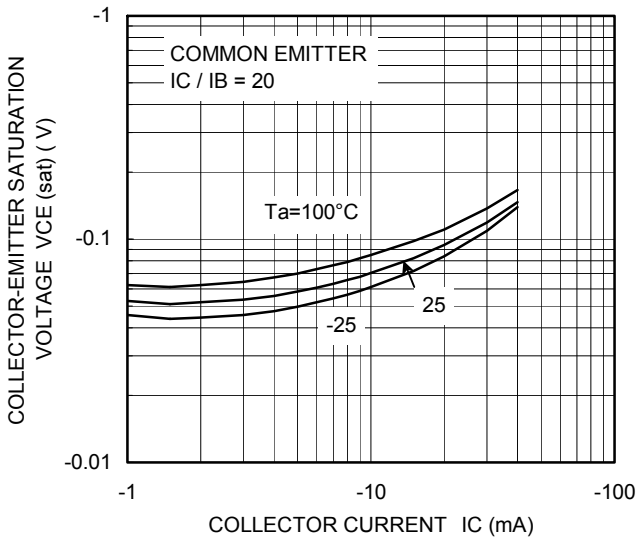
RN2107ACT VCE (sat) - IC



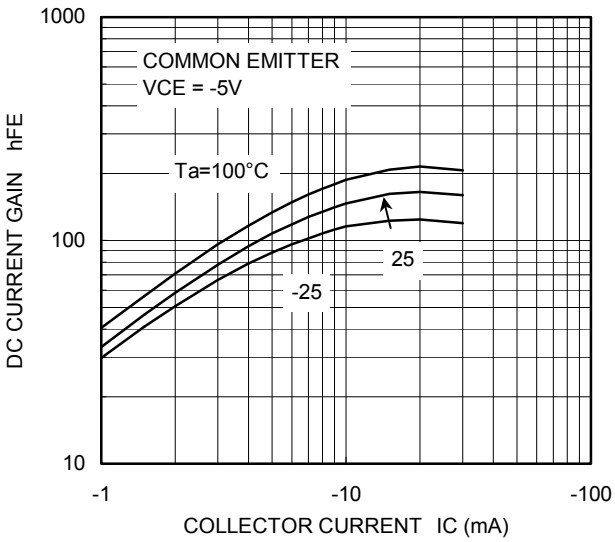
RN2108ACT hFE - IC



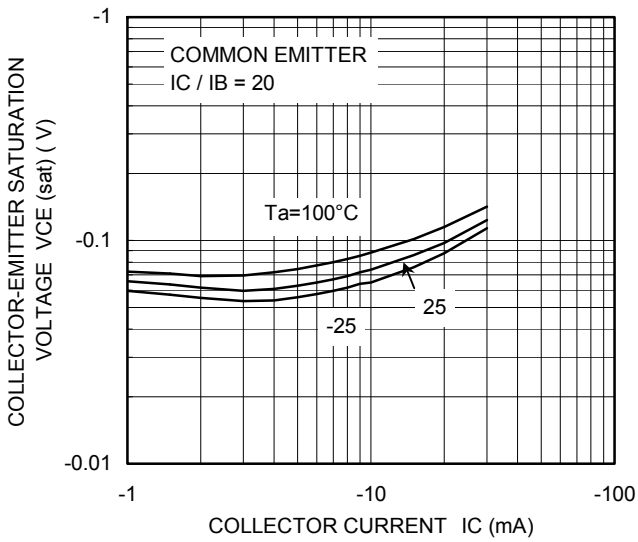
RN2108ACT VCE (sat) - IC

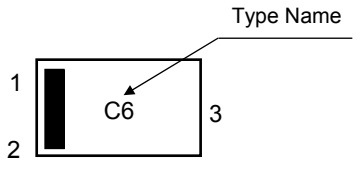
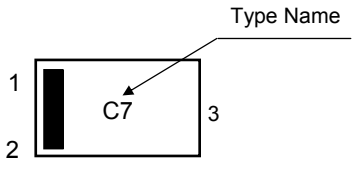
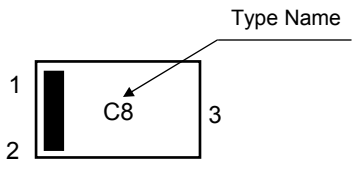


RN2109ACT hFE- IC



RN2109ACT VCE (sat) - IC



Type Name	Marking
RN2107ACT	
RN2108ACT	
RN2109ACT	

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