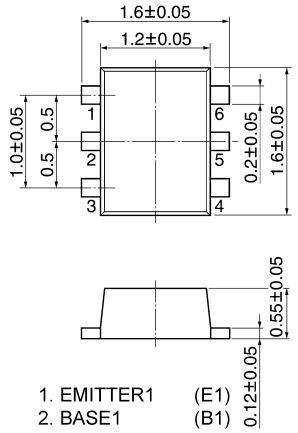
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process) (Bias Resistor Built-in Transistor)

RN2907FE,RN2908FE,RN2909FE

Switching, Inverter Circuit, Interface Circuit and
Driver Circuit Applications

- Two devices are incorporated into an Extreme-Super-Mini (6-pin) package.
- Incorporating a bias resistor into a transistor reduces parts count.
  Reducing the parts count enables the manufacture of ever more compact equipment and lowers assembly cost.
- Complementary to RN1907FE~RN1909FE

Unit: mm

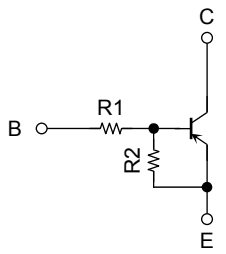


ES6

JEDEC	—
JEITA	—
TOSHIBA	2-2N1G

Weight: 0.003 g (typ.)

Equivalent Circuit and Bias Resistor Values

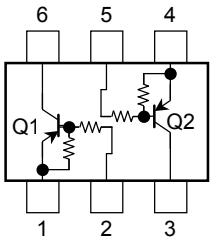


Type No.	R1 (kΩ)	R2 (kΩ)
RN2907FE	10	47
RN2908FE	22	47
RN2909FE	47	22

Absolute Maximum Ratings (Ta = 25°C) (Q1, Q2 common)

Characteristics		Symbol	Rating	Unit
Collector-base voltage	RN2907FE~ RN2909FE	V_{CBO}	−50	V
Collector-emitter voltage		V_{CEO}	−50	V
Emitter-base voltage	RN2907FE	V_{EBO}	−6	V
	RN2908FE		−7	
	RN2909FE		−15	
Collector current	RN2907FE~ RN2909FE	I_C	−100	mA
Collector power dissipation		P_C (Note 1)	100	mW
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55~150	°C

Equivalent Circuit (top view)



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).

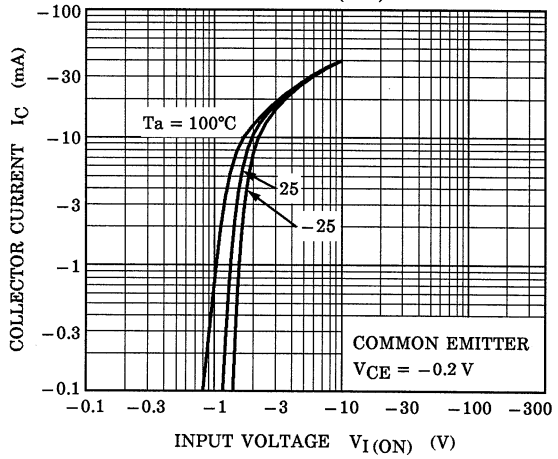
Note 1: Total rating

Electrical Characteristics (Ta = 25°C) (Q1, Q2 common)

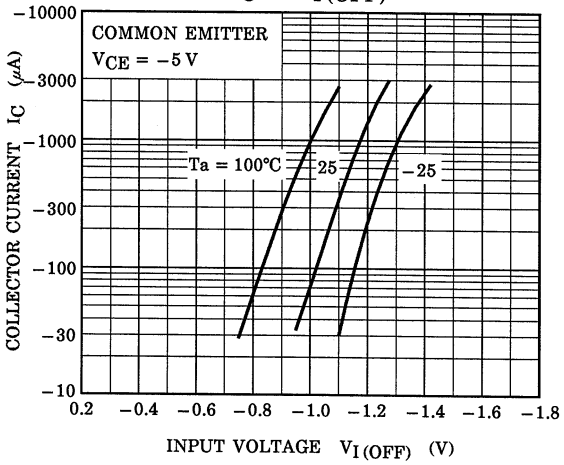
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN2907FE~2909FE	I_{CBO}	V_{CB} = –50 V, I_E = 0	—	—	–100	nA
		I_{CEO}	V_{CE} = –50 V, I_B = 0	—	—	–500	
Emitter cut-off current	RN2907FE	I_{EBO}	V_{EB} = –6 V, I_C = 0	–0.081	—	–0.15	mA
	RN2908FE		V_{EB} = –7 V, I_C = 0	–0.078	—	–0.145	
	RN2909FE		V_{EB} = –15 V, I_C = 0	–0.167	—	–0.311	
DC current gain	RN2907FE	h_{FE}	V_{CE} = –5 V, I_C = –10 mA	80	—	—	
	RN2908FE			80	—	—	
	RN2909FE			70	—	—	
Collector-emitter saturation voltage	RN2907FE~2909FE	$V_{CE\ (sat)}$	I_C = –5 mA, I_B = –0.25 mA	—	–0.1	–0.3	V
Input voltage (ON)	RN2907FE	$V_{I\ (ON)}$	V_{CE} = –0.2 V, I_C = –5 mA	–0.7	—	–1.8	V
	RN2908FE			–1.0	—	–2.6	
	RN2909FE			–2.2	—	–5.8	
Input voltage (OFF)	RN2907FE	$V_{I\ (OFF)}$	V_{CE} = –5 V, I_C = –0.1 mA	–0.5	—	–1.0	V
	RN2908FE			–0.6	—	–1.16	
	RN2909FE			–1.5	—	–2.6	
Transition frequency	RN2907FE~2909FE	f_T	V_{CE} = –10 V, I_C = –5 mA	—	200	—	MHz
Collector output capacitance	RN2907FE~2909FE	C_{ob}	V_{CB} = –10 V, I_E = 0, f = 1 MHz	—	3	6	pF
Input resistor	RN2907FE	R1	—	7	10	13	kΩ
	RN2908FE			15.4	22	28.6	
	RN2909FE			32.9	47	61.1	
Resistor ratio	RN2907FE	R1/R2	—	0.191	0.213	0.232	
	RN2908FE			0.421	0.468	0.515	
	RN2909FE			1.92	2.14	2.35	

Q1, Q2 Common

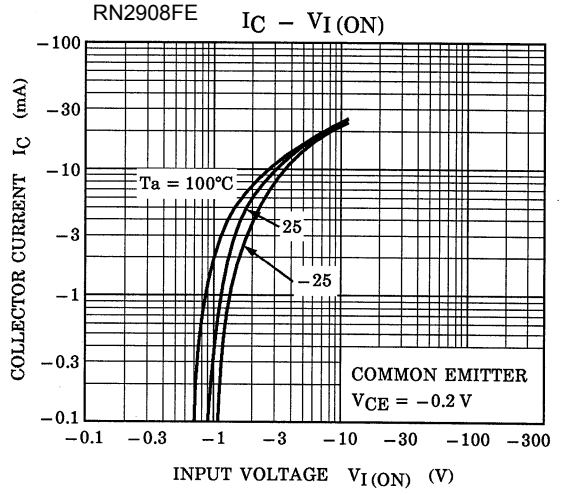
RN2907FE $I_C - V_{I(ON)}$



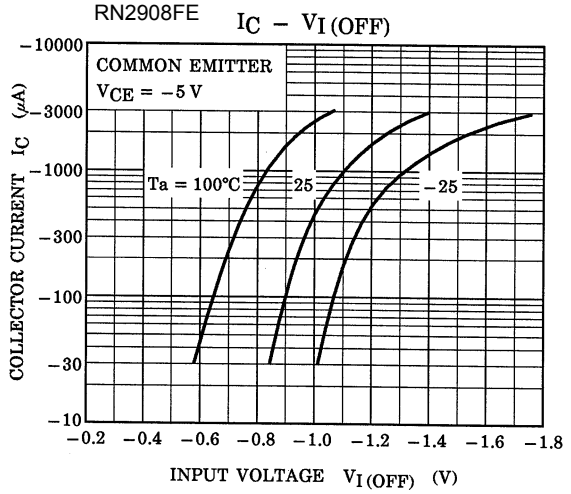
RN2907FE $I_C - V_{I(OFF)}$



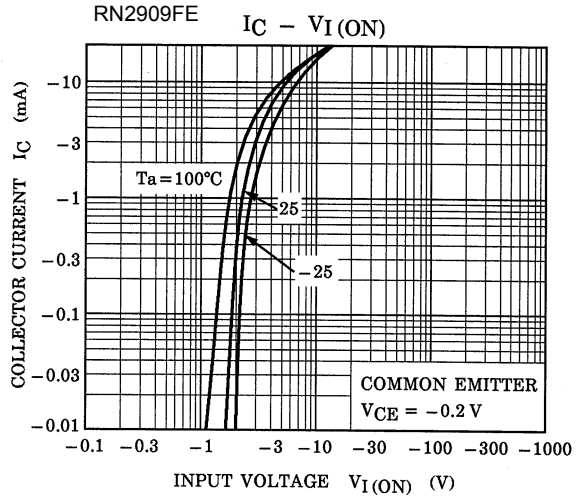
RN2908FE $I_C - V_{I(ON)}$



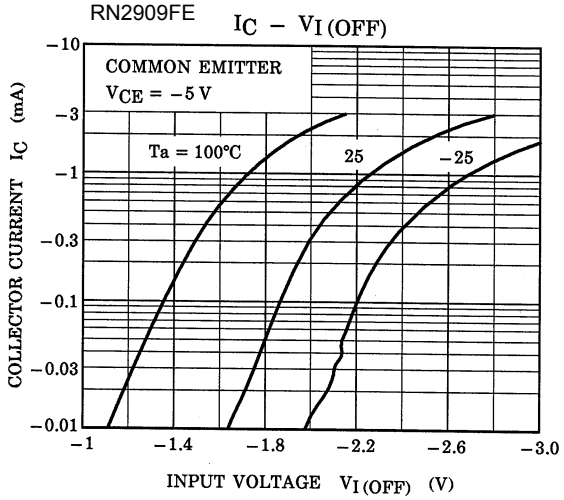
RN2908FE $I_C - V_{I(OFF)}$



RN2909FE $I_C - V_{I(ON)}$

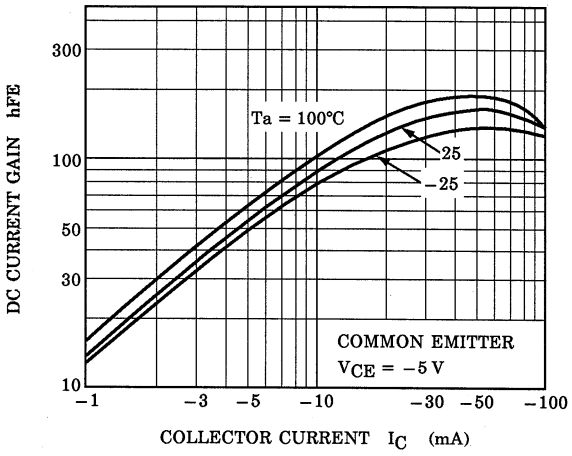


RN2909FE $I_C - V_{I(OFF)}$

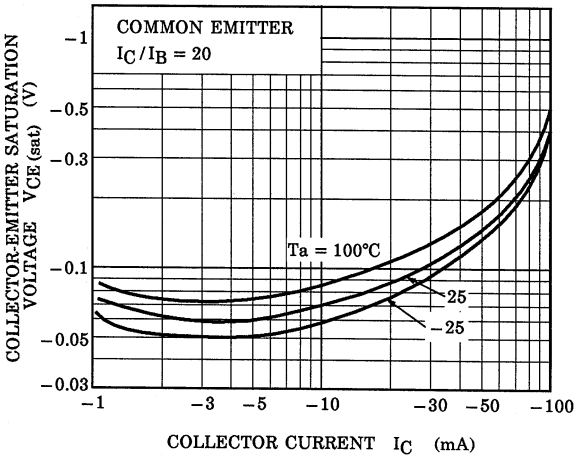


Q1, Q2 Common

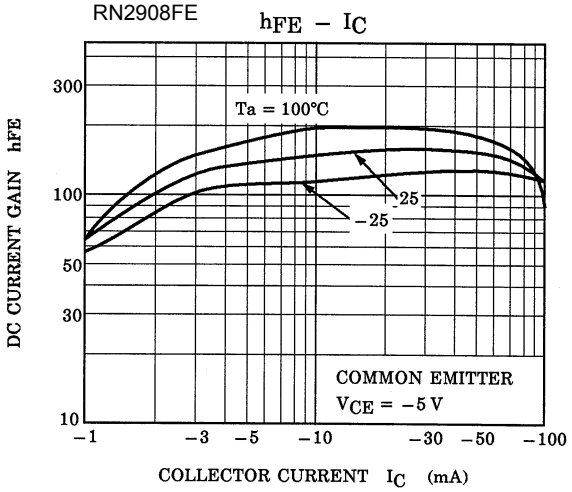
RN2907FE h_{FE} – I_C



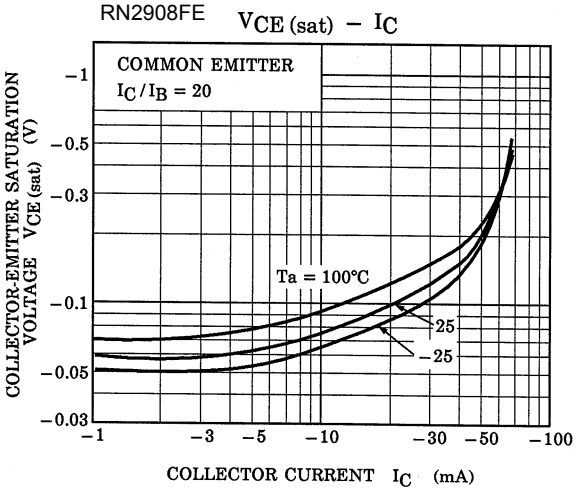
RN2907FE $V_{CE\,(sat)}$ – I_C



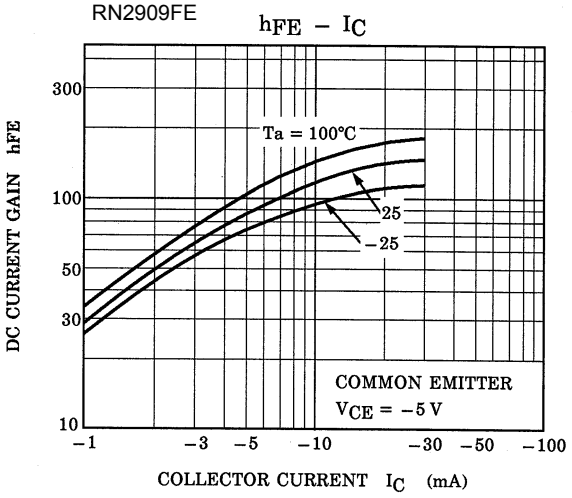
RN2908FE h_{FE} – I_C



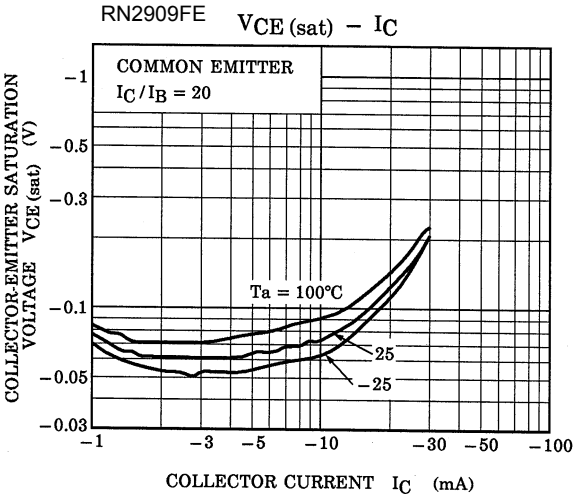
RN2908FE $V_{CE\,(sat)}$ – I_C

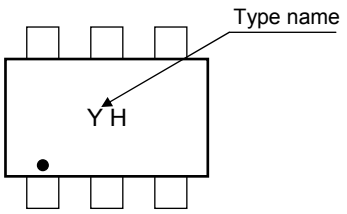
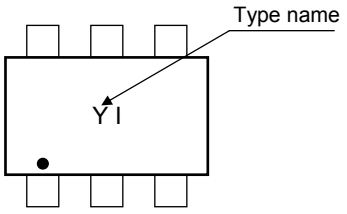
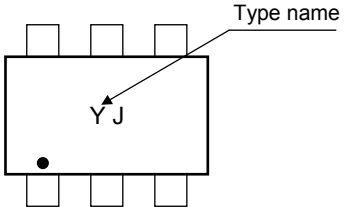


RN2909FE h_{FE} – I_C



RN2909FE $V_{CE\,(sat)}$ – I_C



Type Name	Marking
RN2907FE	
RN2908FE	
RN2909FE	

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