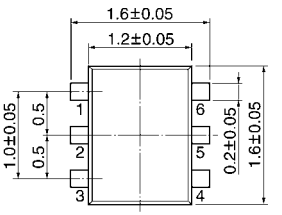
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT process) (Bias Resistor built-in Transistor)

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 enable the manufacture of ever more compact equipment and save assembly cost.
- Complementary to RN1907FE~RN1909FE

Unit: mm



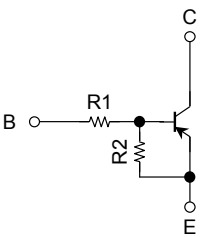
1. EMITTER1 (E1)
2. BASE1 (B1)
3. COLLECTOR2 (C2)
4. EMITTER2 (E2)
5. BASE2 (B2)
6. COLLECTOR1 (C1)

ES6

JEDEC	—
JEITA	—
TOSHIBA	—

Weight: 0.003 g (typ.)

Equivalent Circuit and Bias Resistor Values



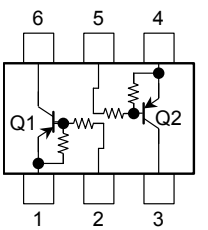
Type No.	R1 (kΩ)	R2 (kΩ)
RN2907FE	10	47
RN2908FE	22	47
RN2909FE	47	22

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)	100	mW
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55~150	°C

Note: Total rating

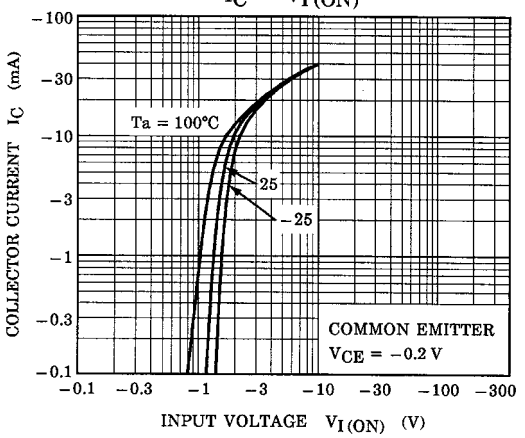
Equivalent Circuit (top view)



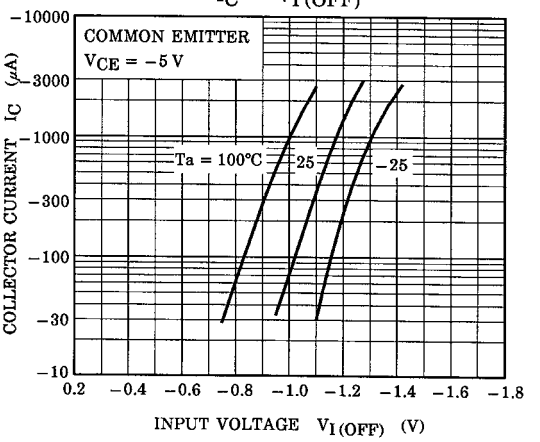
Electrical Characteristics (Ta = 25°C) (Q1, Q2 common)

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	

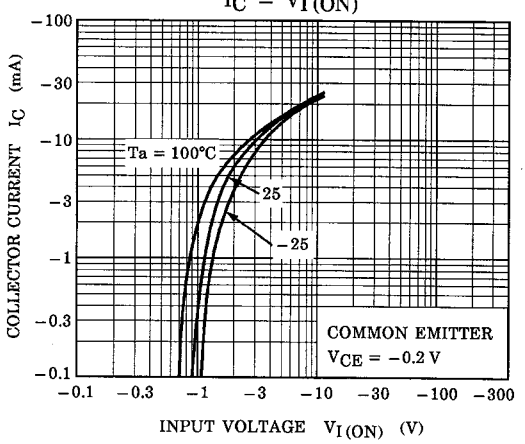
RN2907FE $I_C - V_{I(ON)}$



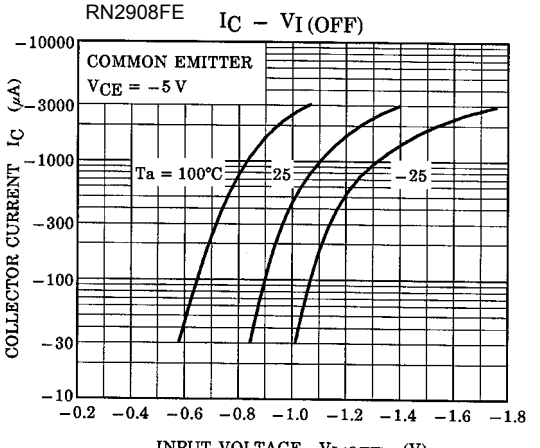
RN2907FE $I_C - V_{I(OFF)}$



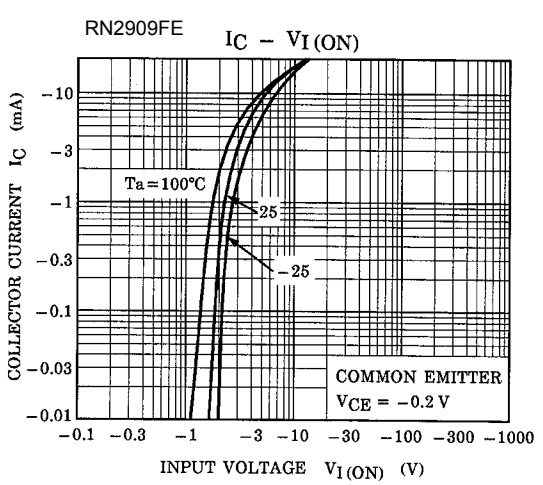
RN2908FE $I_C - V_{I(ON)}$



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



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



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