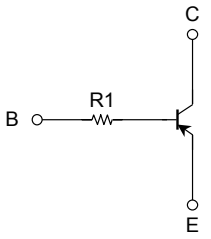
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process) (Bias Resistor Built-in Transistor)

RN2970FE,RN2971FE

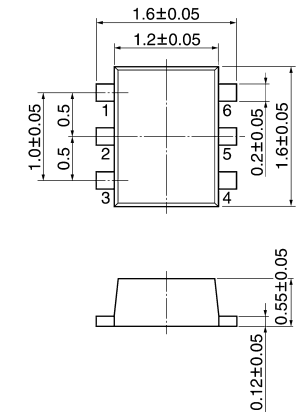
Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

- 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 RN1970FE, RN1971FE

Equivalent Circuit and Bias Resistor Values



Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	2-2N1A

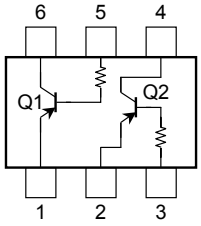
Weight: 0.003 g (typ.)

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

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	−50	V
Collector-emitter voltage	V_{CEO}	−50	V
Emitter-base voltage	V_{EBO}	−5	V
Collector current	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

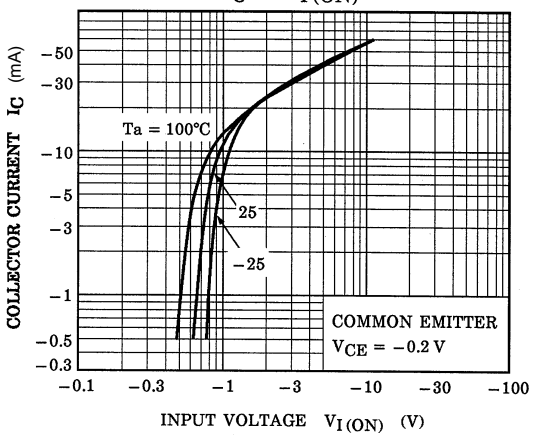
Equivalent Circuit (top view)



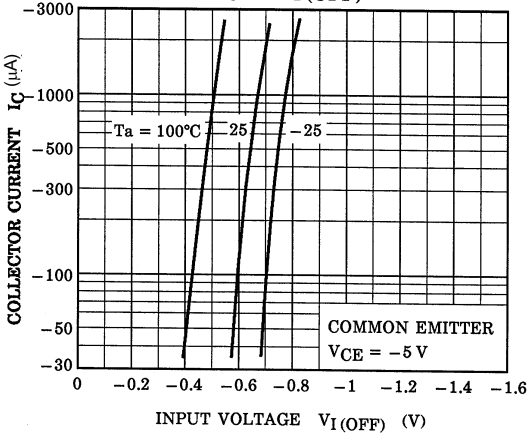
Electrical Characteristics (Ta = 25°C) (Q1, Q2 common)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	V_{CB} = −50 V, I_E = 0	—	—	−100	nA
Emitter cut-off current		I_{EBO}	V_{EB} = −5 V, I_C = 0	—	—	−100	nA
DC current gain		h_{FE}	V_{CE} = −5 V, I_C = −1 mA	120	—	400	
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	I_C = −5 mA, I_B = −0.25 mA	—	−0.1	−0.3	V
Transition frequency		f_T	V_{CE} = −10 V, I_C = −5 mA	—	200	—	MHz
Collector output capacitance		C_{ob}	V_{CB} = −10 V, I_E = 0, f = 1 MHz	—	3	6	pF
Input resistor	RN2970FE	R1	—	3.29	4.7	6.11	kΩ
	RN2971FE			7	10	13	

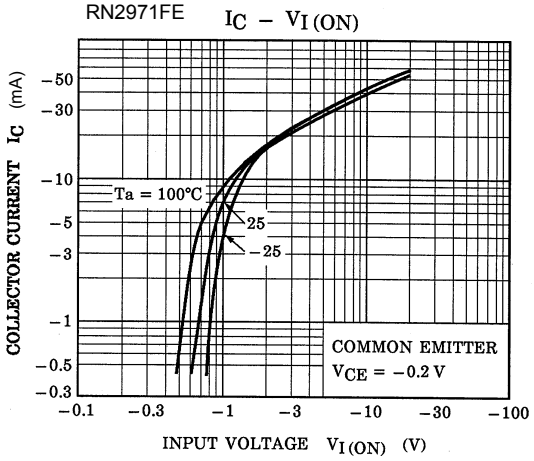
RN2970FE $I_C - V_{I(ON)}$



RN2970FE $I_C - V_{I(OFF)}$



RN2971FE $I_C - V_{I(ON)}$



RN2971FE $I_C - V_{I(OFF)}$