

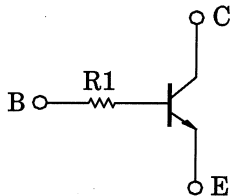
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process) (Bias Resistor built-in Transistor)

## RN1912FS, RN1913FS

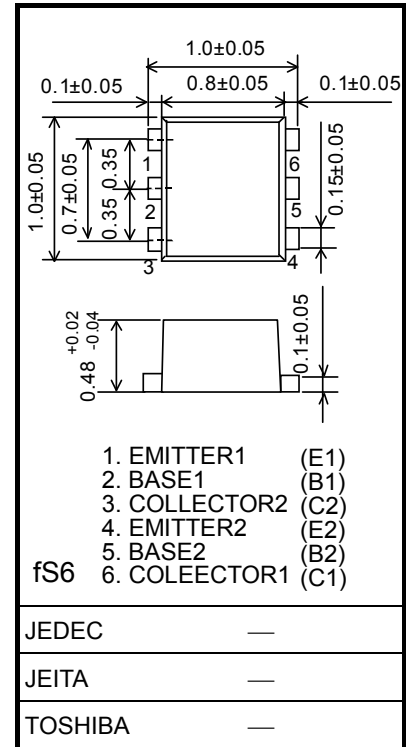
Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications.

- Two devices are incorporated into a fine pitch Small Mold (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 RN2912FS, RN2913FS

### Equivalent Circuit and Bias Resistor Values



Unit: mm



Weight: 0.001g (typ.)

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

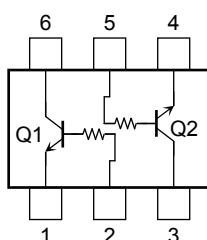
Characteristics	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	20	V
Collector-emitter voltage	$V_{CEO}$	20	V
Emitter-base voltage	$V_{EBO}$	5	V
Collector current	$I_C$	50	mA
Collector power dissipation	$P_C$ (Note 1)	50	mW
Junction temperature	$T_j$	150	°C
Storage temperature range	$T_{stg}$	-55~150	°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).

Note 1: Total rating

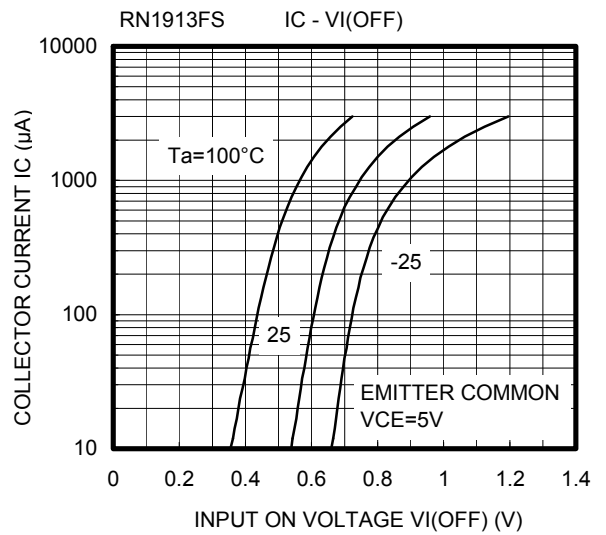
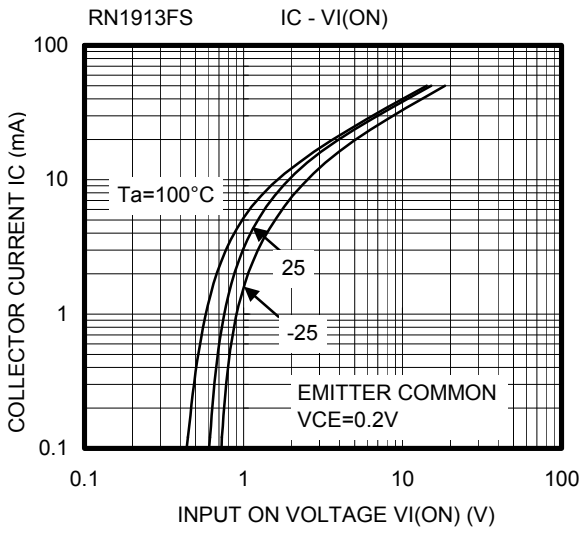
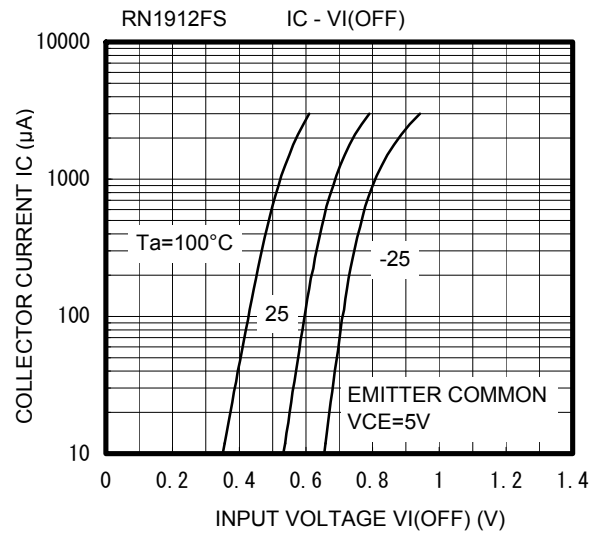
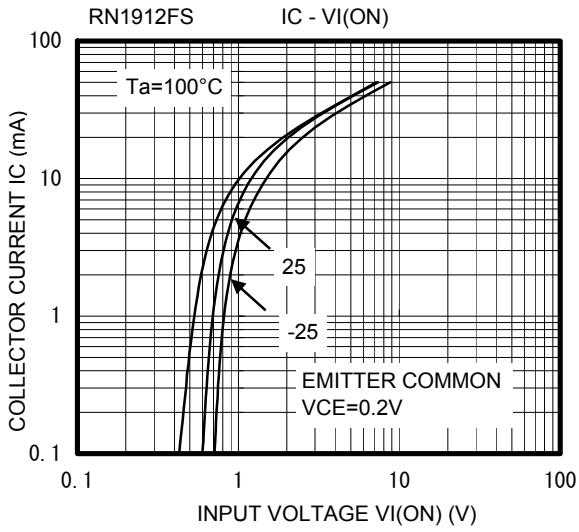
### Equivalent Circuit (Top View)



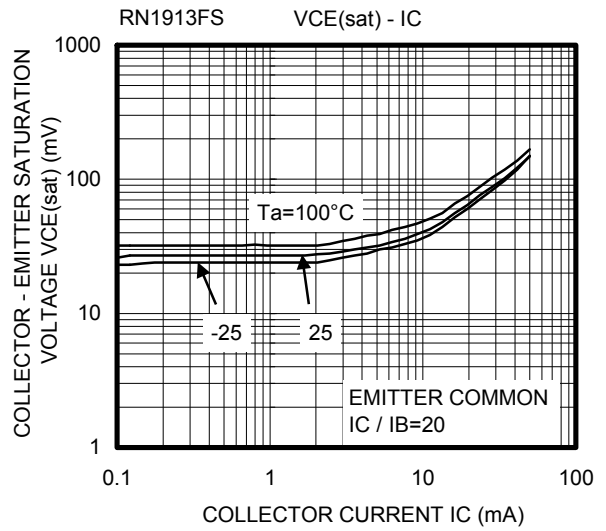
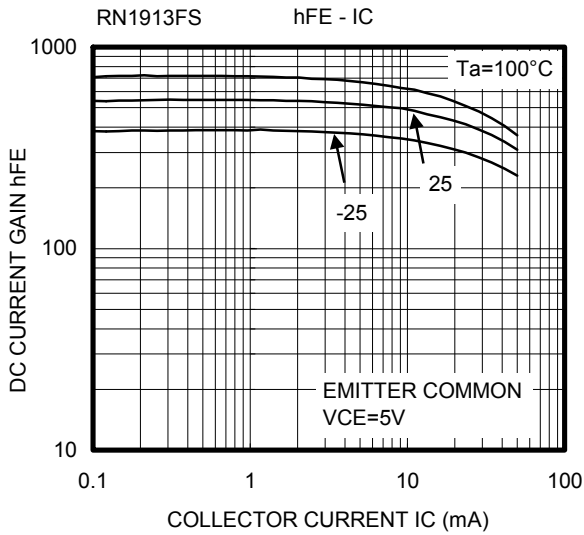
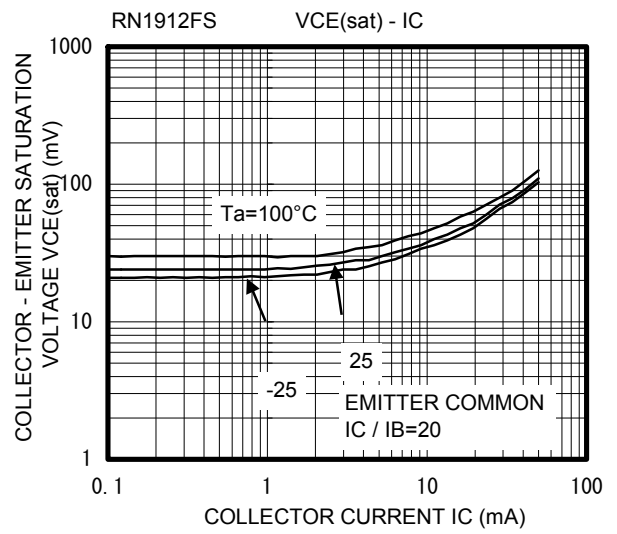
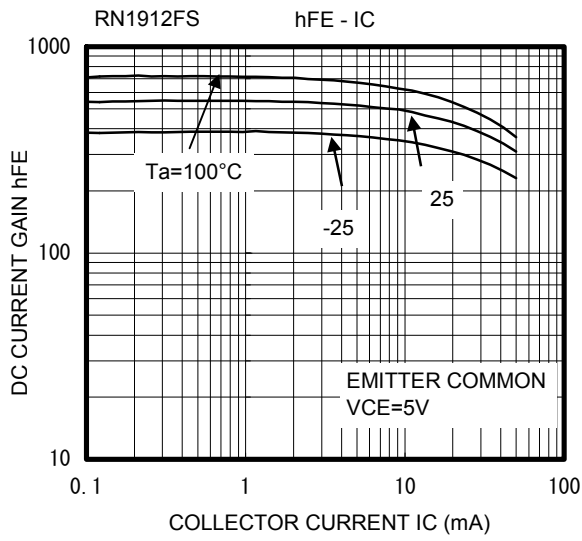
## Electrical Characteristics (Ta =25°C) (Q1,Q2 common)

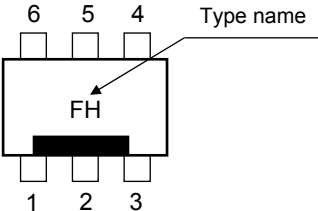
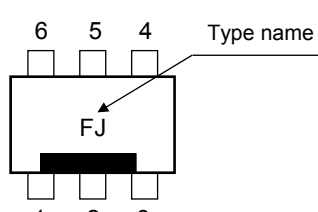
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		$I_{CBO}$	$V_{CB} = 20\text{ V}, I_E = 0$	—	—	100	nA
Emitter cut-off current		$I_{EBO}$	$V_{EB} = 5\text{ V}, I_C = 0$	—	—	100	nA
DC current gain		$h_{FE}$	$V_{CE} = 5\text{ V}, I_C = 1\text{ mA}$	300	—	—	
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = 5\text{ mA}, I_B = 0.25\text{ mA}$	—	—	0.15	V
Collector output capacitance		$C_{ob}$	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	1.2	—	pF
Input resistor	RN1912FS	R1	—	17.6	22	26.4	kΩ
	RN1913FS			37.6	47	56.4	

(Q1, Q2 common)



(Q1, Q2 common)



Type Name	Marking
RN1912FS	 <p>The diagram shows a rectangular component with six pins. Pins 1, 2, and 3 are on the bottom edge, and pins 4, 5, and 6 are on the top edge. The marking 'FH' is located in the center of the component. An arrow labeled 'Type name' points to the 'FH' marking.</p>
RN1913FS	 <p>The diagram shows a rectangular component with six pins. Pins 1, 2, and 3 are on the bottom edge, and pins 4, 5, and 6 are on the top edge. The marking 'FJ' is located in the center of the component. An arrow labeled 'Type name' points to the 'FJ' marking.</p>

## Handling Precaution

When handling individual devices (which are not yet mounted on a circuit board), be sure that the environment is protected against electrostatic electricity. Operators should wear anti-static clothing, and containers and other objects that come into direct contact with devices should be made of anti-static materials.

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