

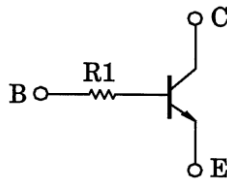
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

# RN1610, RN1611

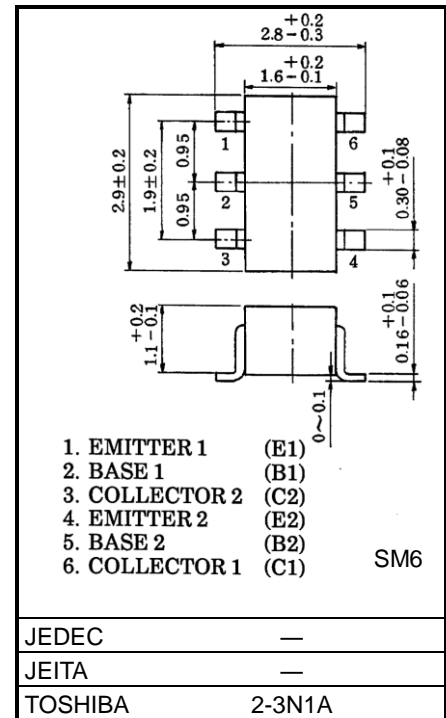
Switching, Inverter Circuit,  
Interface Circuit and Driver Circuit

- Including two devices in SM6 (super-mini-type with six (6) leads)
- With built-in bias resistors
- Simplified circuit design
- Reduce a quantity of parts and manufacturing process and miniaturize equipment.
- Various resistance values are available to suit various circuit designs.
- Complementary to RN2610 and RN2611

### Equivalent Circuit



Unit: mm



Weight: 15 mg (typ.)

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

Characteristic	Symbol	Rating	Unit
Collector-base voltage	V <sub>CB0</sub>	50	V
Collector-emitter voltage	V <sub>CE0</sub>	50	V
Emitter-base voltage	V <sub>EB0</sub>	5	V
Collector current	I <sub>C</sub>	100	mA
Collector power dissipation	P <sub>C</sub> *	300	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature range	T <sub>stg</sub>	-55 to 150	°C

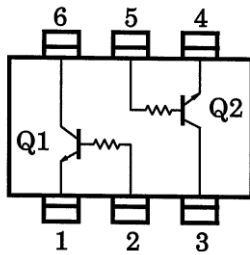
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

\* Total rating

Start of commercial production  
1988-11

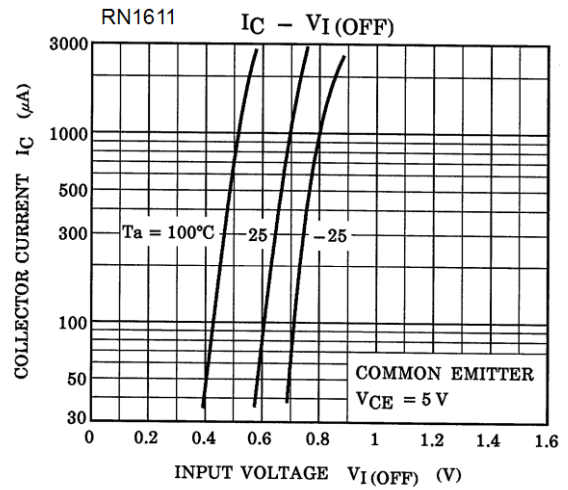
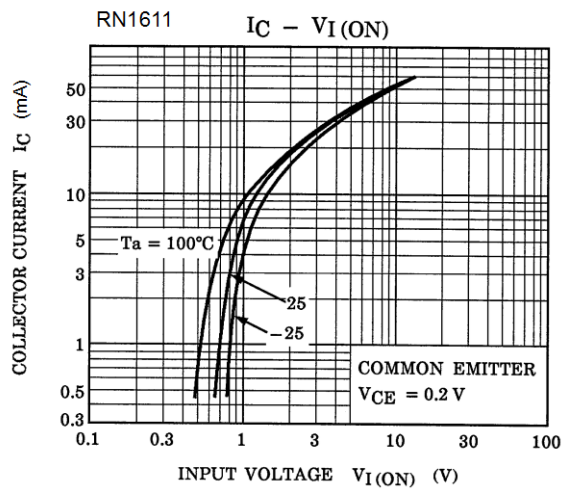
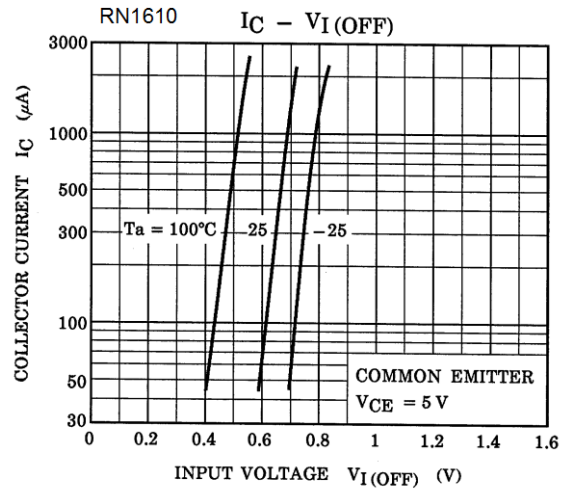
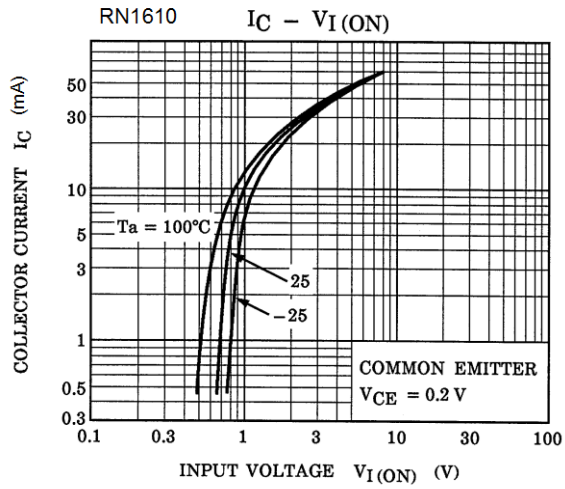
## Equivalent Circuit (Top View)



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

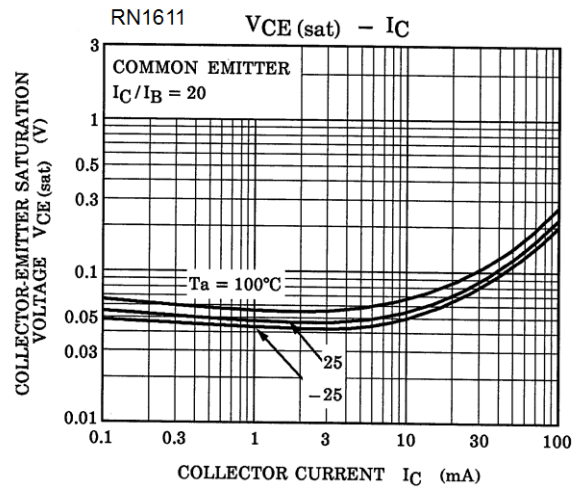
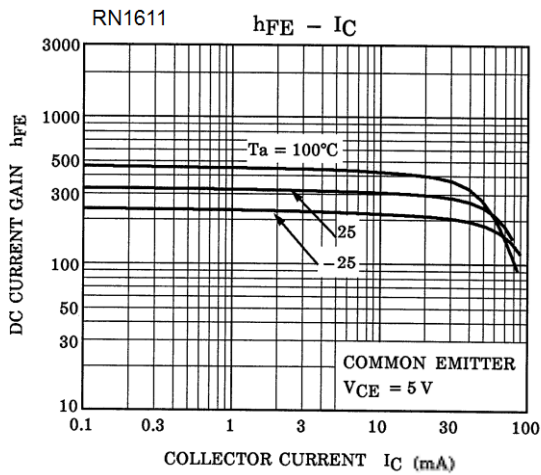
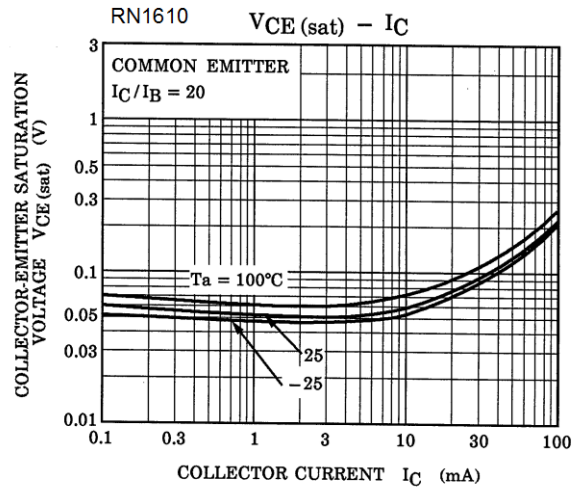
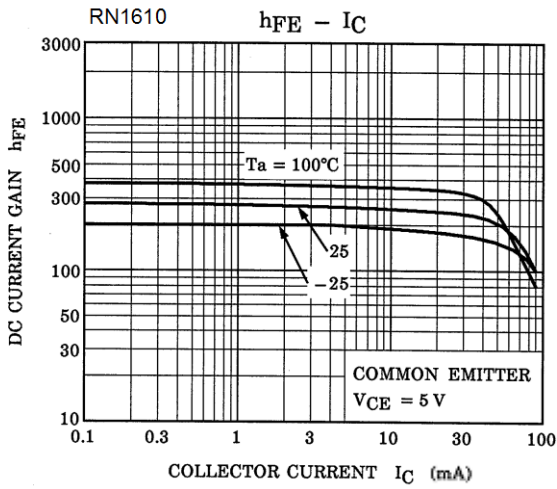
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit	
Collector cut-off current	$I_{CBO}$	$V_{CB} = 50\text{ V}$ , $I_E = 0\text{ mA}$	—	—	100	nA	
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 5\text{ V}$ , $I_C = 0\text{ mA}$	—	—	100	nA	
DC current gain	$h_{FE}$	$V_{CE} = 5\text{ V}$ , $I_C = 1\text{ mA}$	120	—	700	—	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 5\text{ mA}$ , $I_B = 0.25\text{ mA}$	—	0.1	0.3	V	
Transition frequency	$f_T$	$V_{CE} = 10\text{ V}$ , $I_C = 5\text{ mA}$	—	250	—	MHz	
Collector output capacitance	$C_{ob}$	$V_{CB} = 10\text{ V}$ , $I_E = 0\text{ mA}$ , $f = 1\text{ MHz}$	—	3	6	pF	
Input resistance	RN1610	R1	—	3.29	4.7	6.11	kΩ
	RN1611			7	10	13	

### Characteristics Curves (Q1, Q2 Common)



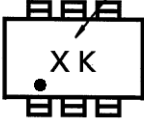
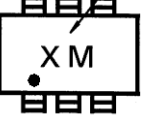
The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

### Characteristics Curves (Q1, Q2 Common)



The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

## Marking

Part No.	Marking
RN1610	<p data-bbox="603 344 868 371">Part No.(abbreviation code)</p>  <p>The diagram shows a rectangular component with a central box containing the characters 'X K'. A small dot is located to the left of the 'X'. Above and below the central box are two rows of three small rectangular protrusions. A line from the text 'Part No.(abbreviation code)' points to the top row of these protrusions.</p>
RN1611	<p data-bbox="603 595 868 622">Part No.(abbreviation code)</p>  <p>The diagram shows a rectangular component with a central box containing the characters 'X M'. A small dot is located to the left of the 'X'. Above and below the central box are two rows of three small rectangular protrusions. A line from the text 'Part No.(abbreviation code)' points to the top row of these protrusions.</p>

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