

Bipolar Transistors Silicon NPN Epitaxial Type (PCT Process)(Bias Resistor built-in Transistor)

# RN1910,RN1911

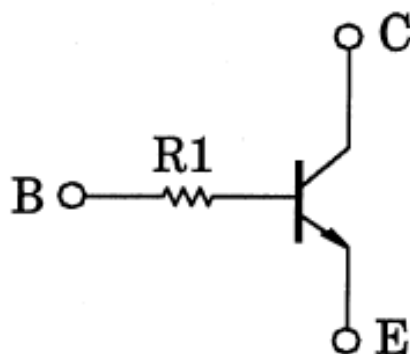
## 1. Applications

- Switching
- Inverter Circuits
- Interfacing
- Driver Circuits

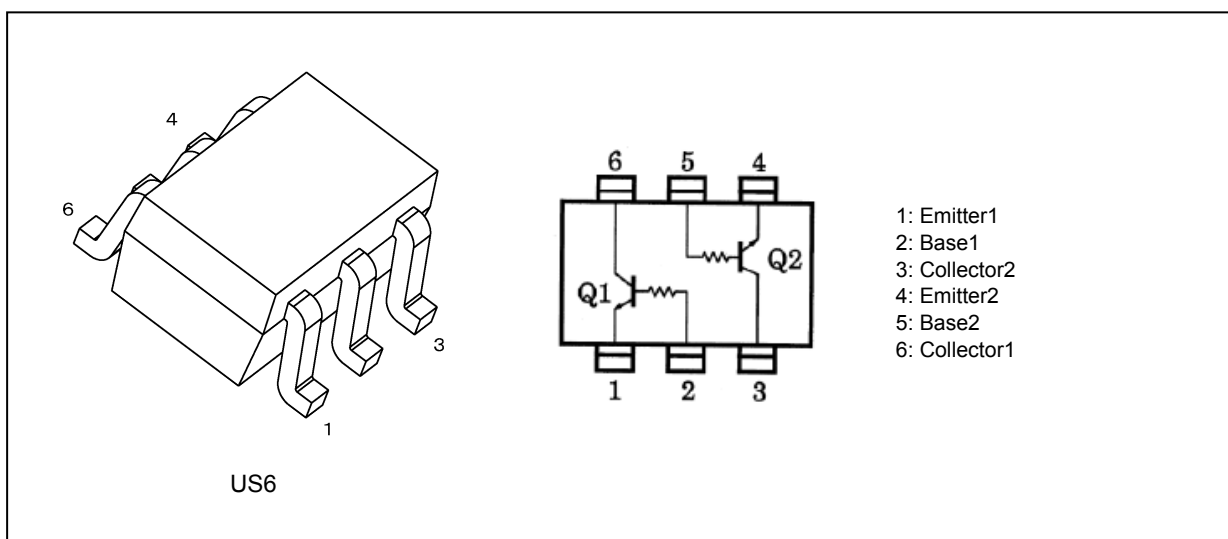
## 2. Features

- (1) AEC-Q101 qualified (Please see the orderable part number list)
- (2) Small package (Dual type)
- (3) The integrated bias resistor reduces the number of external parts required, making it possible to reduce system size and assembly time.
- (4) Toshiba offers transistors with a wide range of resistance to accommodate various circuit designs.
- (5) Complementary to RN2910 to RN2911

## 3. Equivalent Circuit



## 4. Packaging and Pin Assignment



Start of commercial production

1990-12

## 5. Orderable part number

Orderable part number		AEC-Q101	Note
RN1910	RN1910,LF	—	General Use
	RN1910,LXGF	YES (Note 1)	Unintended Use (Note 1)
	RN1910,LXHF	YES	Automotive Use
RN1911	RN1911,LF	—	General Use
	RN1911,LXGF	YES (Note 1)	Unintended Use (Note 1)
	RN1911,LXHF	YES	Automotive Use

Note 1: For more information, please contact our sales or use the inquiry form on our website.

## 6. Absolute Maximum Ratings (Note) (Unless otherwise specified, $T_a = 25^\circ\text{C}$ ) (Q1, Q2 Common)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	50	V
Collector-emitter voltage	$V_{CEO}$	50	
Emitter-base voltage	$V_{EBO}$	5	
Collector current	$I_C$	100	mA
Collector power dissipation (Note 1)	$P_C$	200	mW
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to 150	

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

## 7. Electrical Characteristics (Unless otherwise specified, $T_a = 25\text{ }^{\circ}\text{C}$ ) (Q1, Q2 Common)

Characteristics	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	
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	RN1910	-	3.29	4.7	6.11	k $\Omega$
	RN1911		7	10	13	

## 8. Marking

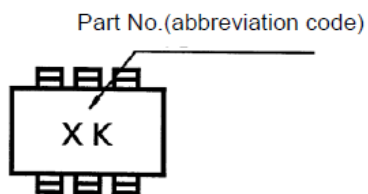


Fig. 8.1 Marking RN1910

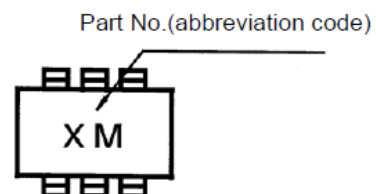


Fig. 8.2 Marking RN1911

## 9. Characteristics Curves (Note)(Q1, Q2 Common)

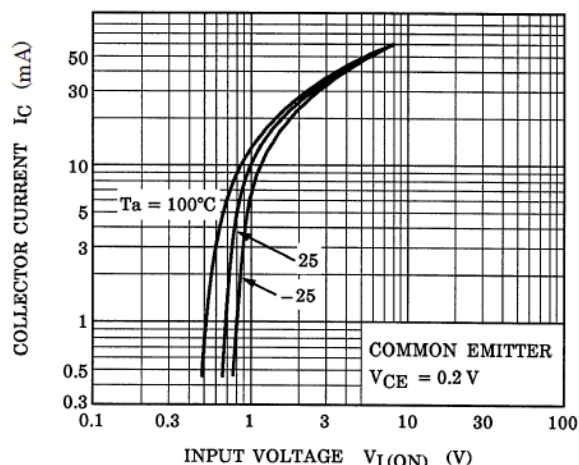


Fig. 9.1 RN1910  $I_C$ - $V_{I(ON)}$

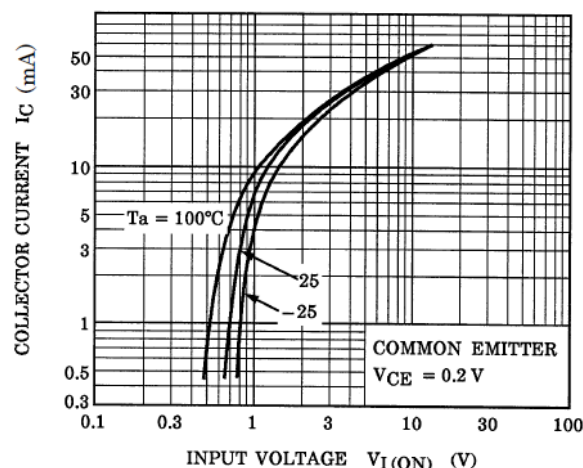


Fig. 9.2 RN1911  $I_C$ - $V_{I(ON)}$

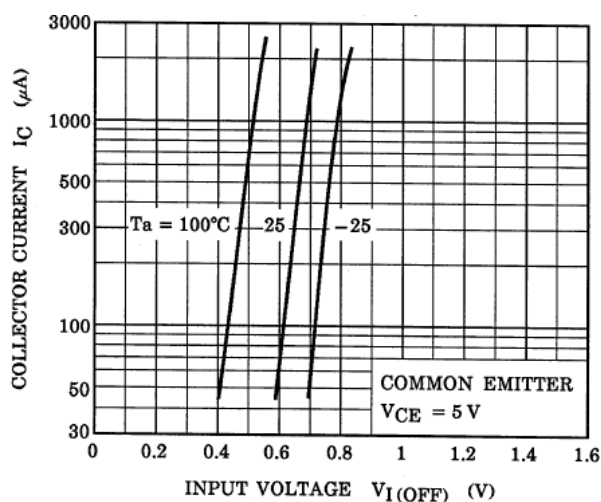


Fig. 9.3 RN1910  $I_C$ - $V_{I(OFF)}$

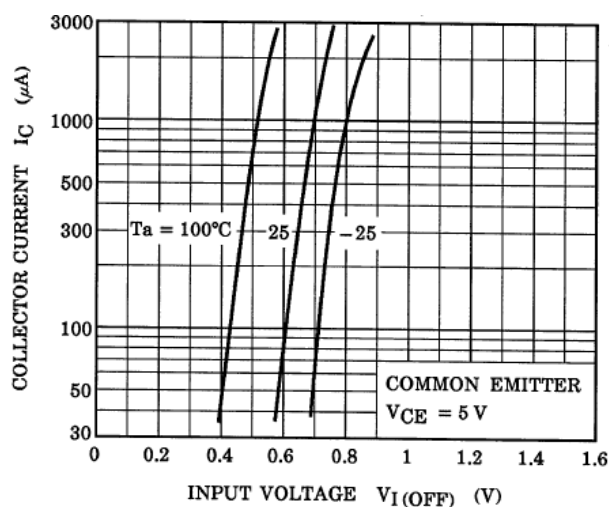


Fig. 9.4 RN1911  $I_C$ - $V_{I(OFF)}$

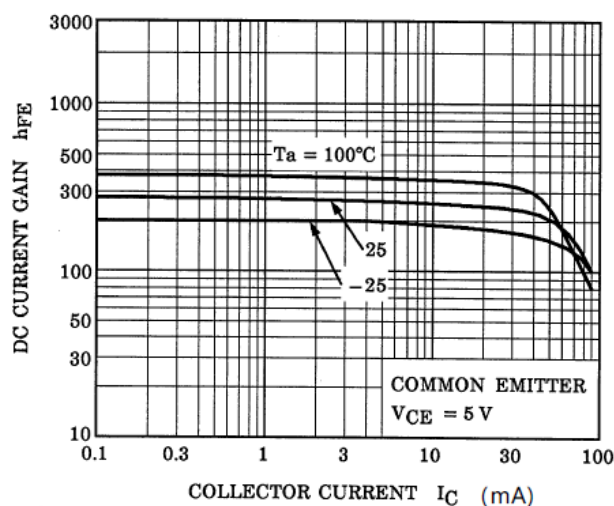


Fig. 9.5 RN1910  $h_{FE}$ - $I_C$

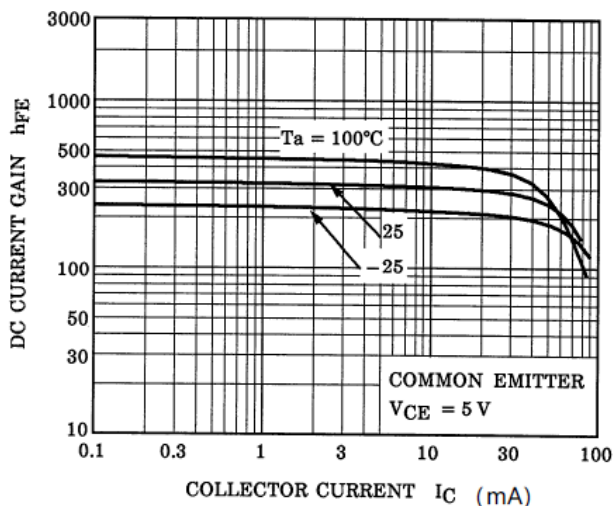


Fig. 9.6 RN1911  $h_{FE}$ - $I_C$

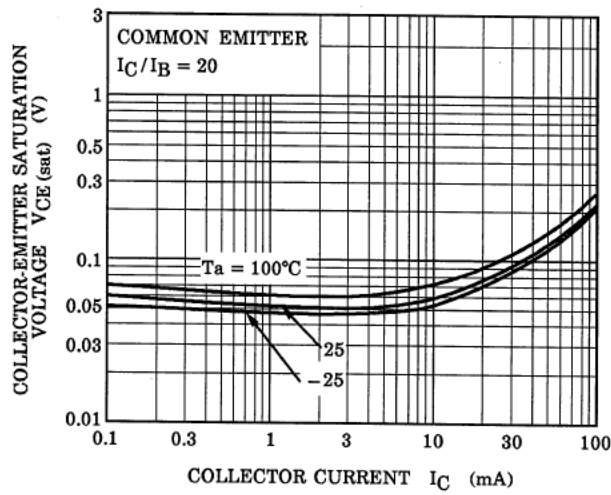


Fig. 9.7 RN1910  $V_{CE(sat)}-I_C$

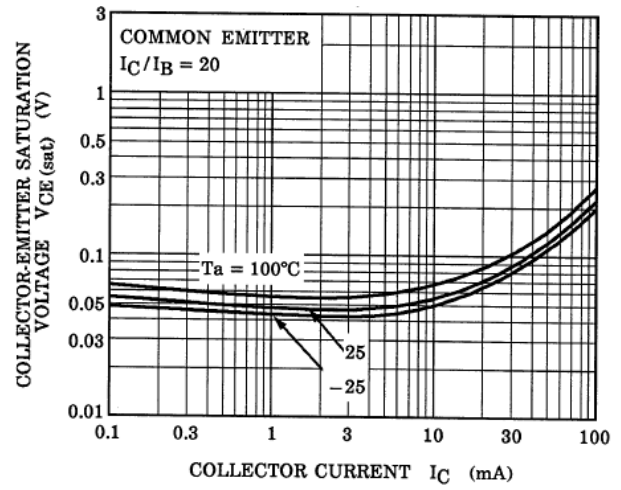
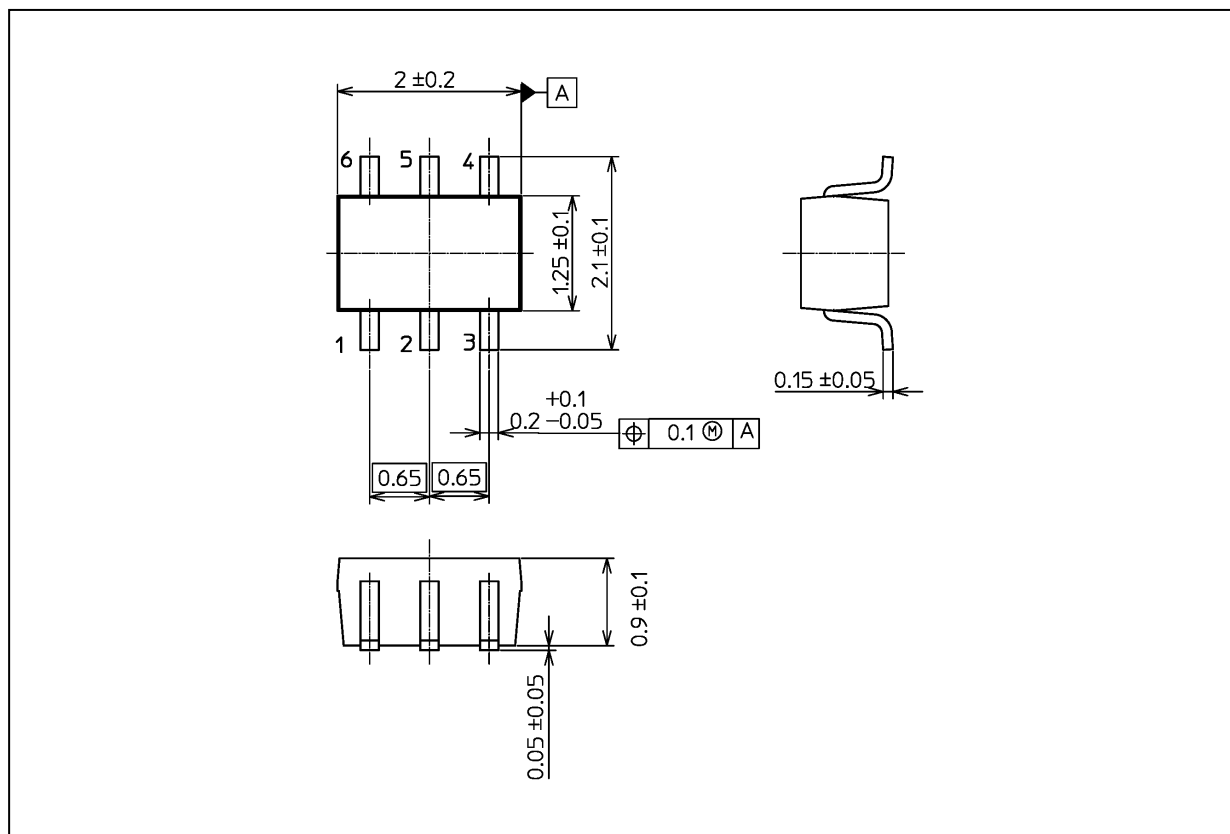


Fig. 9.8 RN1911  $V_{CE(sat)}-I_C$

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

### Package Dimensions

Unit: mm



Weight: 6.8 mg (typ.)

Package Name(s)
TOSHIBA: 1-2T1S
Nickname: US6

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