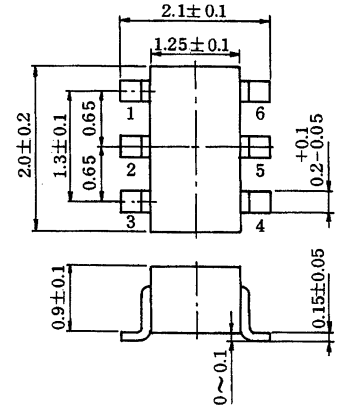
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process) (Bias Resistor built-in Transistor)

RN1910, RN1911

Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

- Including two devices in US6 (ultra super mini type 6 leads)
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN2910 and RN2911

Unit: mm

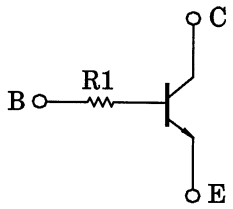


1. EMITTER 1	(E1)
2. BASE 1	(B1)
3. COLLECTOR 2	(C2)
4. EMITTER 2	(E2)
5. BASE 2	(B2)
US6 6. COLLECTOR 1	(C1)

JEDEC	—
JEITA	—
TOSHIBA	2-2J1A

Weight: 6.8 mg (typ.)

Equivalent Circuit



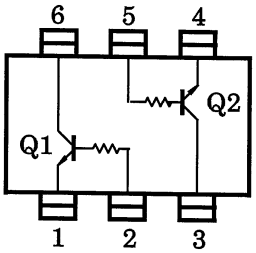
Absolute Maximum Ratings (Ta = 25°C) (Q1, Q2 Common)

Characterisstic	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*	100	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	−55 to150	°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

Equivalent Circuit (Top View)

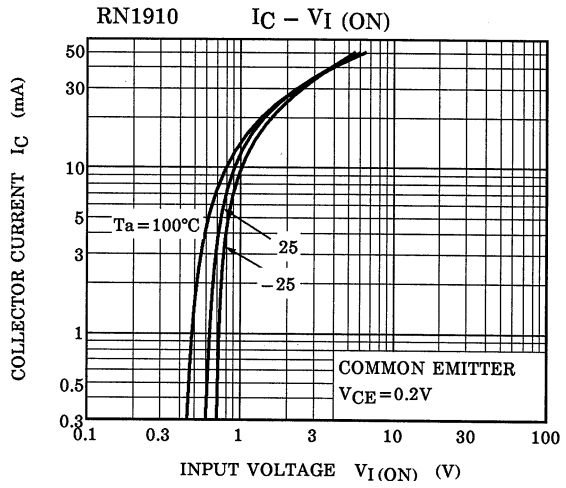


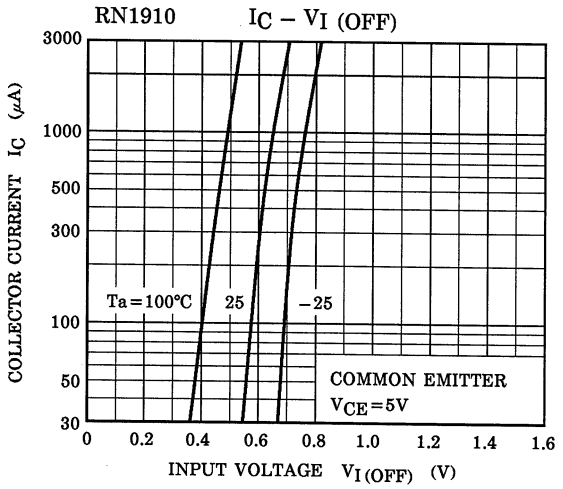
Start of commercial production
1990-12

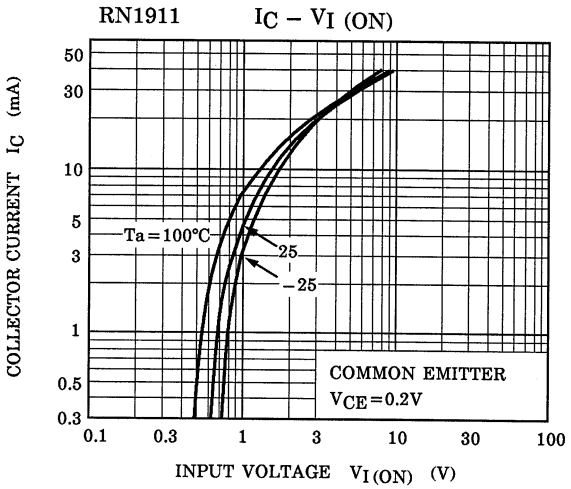
Electrical Characteristics (Ta = 25°C) (Q1, Q2 Common)

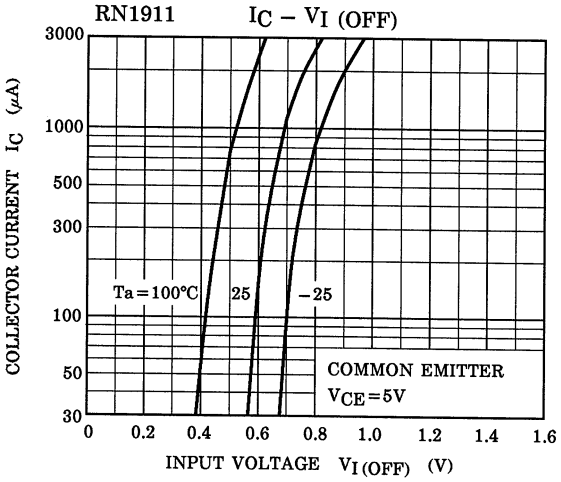
Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	—	V_{CB} = 50V, I_E = 0	—	—	100	nA
Emitter cut-off current		I_{EBO}	—	V_{EB} = 5V, I_C = 0	—	—	100	nA
DC current gain		h_{FE}	—	V_{CE} = 5V, I_C = 1mA	120	—	700	—
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	—	I_C = 5mA, I_B = 0.25mA	—	0.1	0.3	V
Transition frequency		f_T	—	V_{CE} = 10V, I_C = 5mA	—	250	—	MHz
Collector output capacitance		C_{ob}	—	V_{CB} = 10V, I_E = 0V, f = 1MHz	—	3	6	pF
Input resistor	RN1910	R1	—	—	3.29	4.7	6.11	kΩ
	RN1911				7	10	13	

(Q1, Q2 Common)

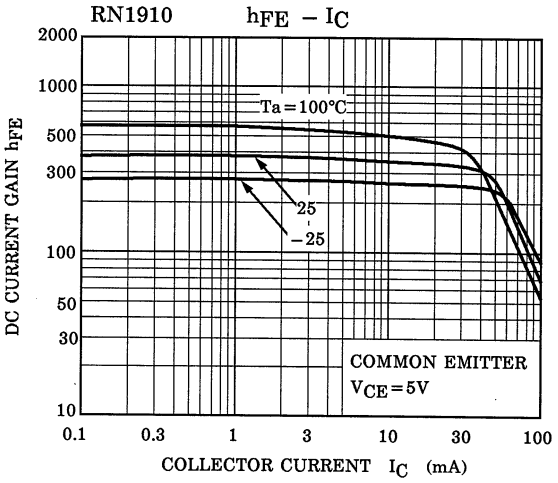


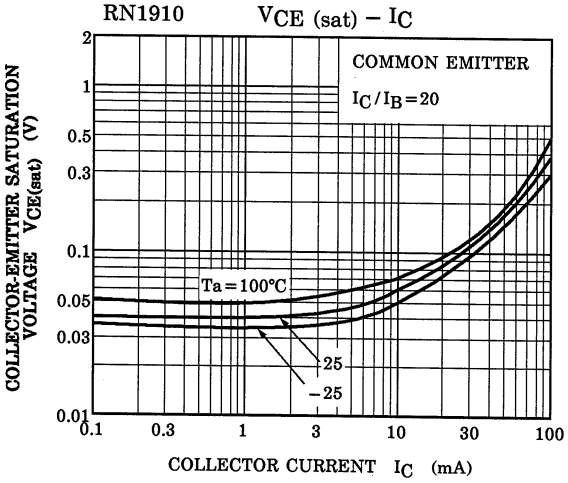


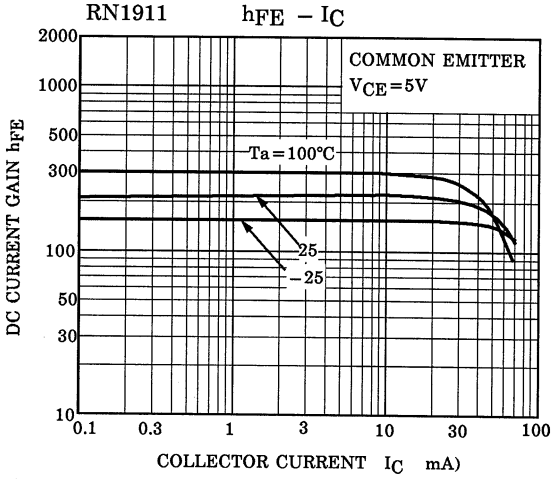


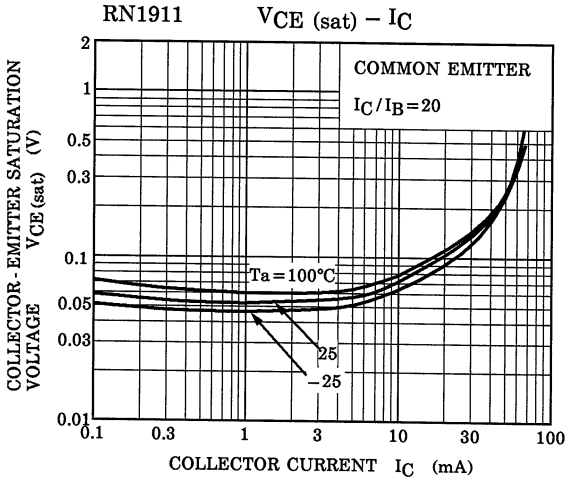


(Q1, Q2 Common)

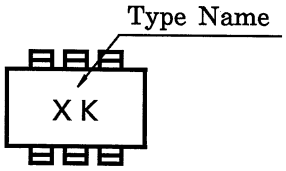
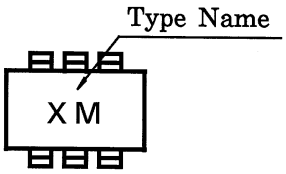

RN1910 hFE – IC
DC CURRENT GAIN hFE
2000
1000
500
300
100
50
30
10
Ta = 100°C
25
−25
COMMON EMITTER
VCE = 5V
0.1
0.3
1
3
10
30
100
COLLECTOR CURRENT IC (mA)


RN1910 VCE (sat) – IC
COLLECTOR-EMITTER SATURATION VOLTAGE VCE(sat) (V)
2
1
0.5
0.3
0.1
0.05
0.03
0.01
COMMON EMITTER
IC / IB = 20
Ta = 100°C
25
−25
0.1
0.3
1
3
10
30
100
COLLECTOR CURRENT IC (mA)


RN1911 hFE – IC
DC CURRENT GAIN hFE
2000
1000
500
300
100
50
30
10
COMMON EMITTER
VCE = 5V
Ta = 100°C
25
−25
0.1
0.3
1
3
10
30
100
COLLECTOR CURRENT IC mA)


RN1911 VCE (sat) – IC
COLLECTOR - EMITTER SATURATION VOLTAGE VCE (sat) (V)
2
1
0.5
0.3
0.1
0.05
0.03
0.01
COMMON EMITTER
IC / IB = 20
Ta = 100°C
25
−25
0.1
0.3
1
3
10
30
100
COLLECTOR CURRENT IC (mA)

Marking

Type Name	Marking
RN1910	
RN1911	

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