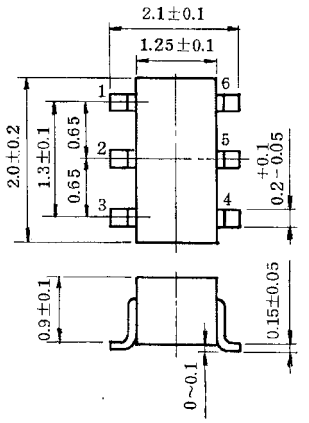
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

RN1970,RN1971

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 RN2970~RN2971

Unit: mm



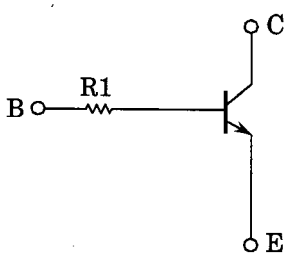
1. EMITTER 1 (E1)
2. EMITTER 2 (E2)
3. BASE 2 (B2)
4. COLLECTOR 2 (C2)
5. BASE 1 (B1)
6. COLLECTOR 1 (C1)

US6

JEDEC	—
JEITA	—
TOSHIBA	2-2J1B

Weight: 6.8mg(typ.)

Equivalent Circuit

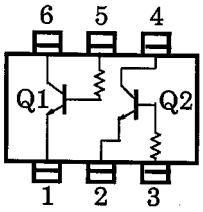


Maximum Ratings (Ta = 25°C) (Q1, Q2 Common)

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*	200	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	−55~150	°C

*: Total rating

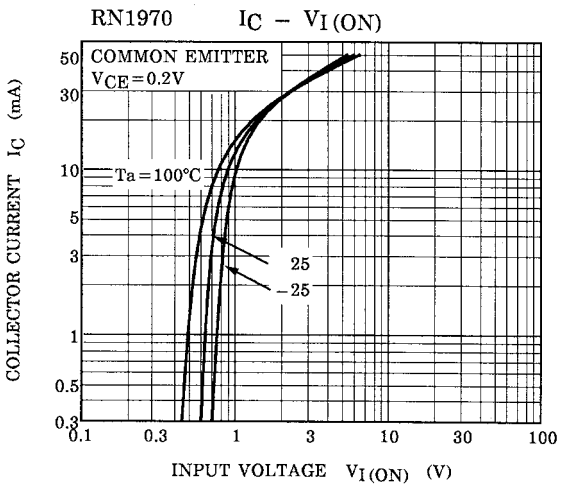
Equivalent Circuit (Top View)

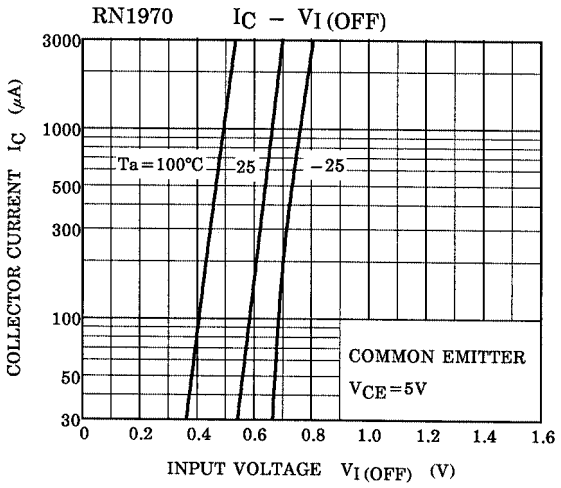


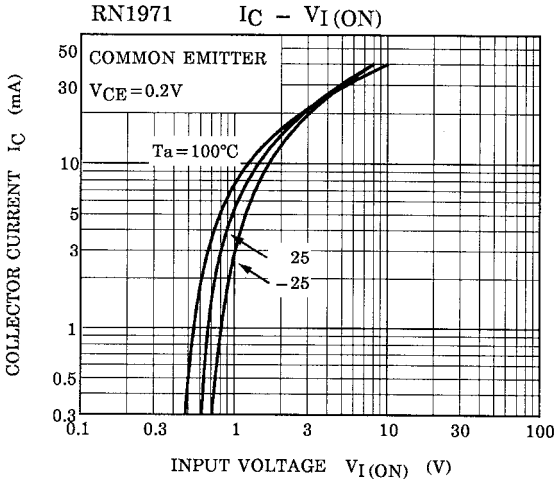
Electrical Characteristics (Ta = 25°C) (Q1, Q2 Common)

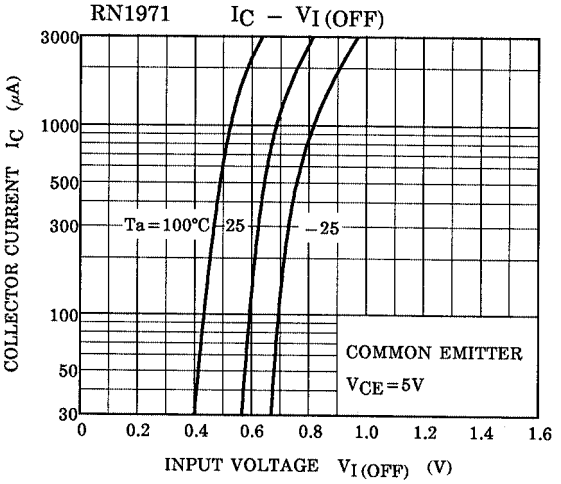
Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	—	V_{CB} = 5V, I_E = 0	—	—	100	nA
Emitter cut-off current		I_{EBO}	—	V_{EB} = 5V, I_C = 0	—	—	100	nA
DC current gain		h_{FE}	—	V_{CE} = 5V, I_C = 1mA	120	—	700	—
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	—	I_C = 5mA, I_B = 0.25mA	—	0.1	0.3	V
Translation frequency		f_T	—	V_{CE} = 10V, I_C = 5mA	—	250	—	MHz
Collector output capacitance		C_{ob}	—	V_{CB} = 10V, I_E = 0, f = 1MHz	—	3	6	pF
Input resistor	RN1970	R1	—	—	3.29	4.7	6.11	kΩ
	RN1971				7	10	13	

(Q1, Q2 Common)


RN1970 I_C – $V_{I(ON)}$
COMMON EMITTER
V_{CE} = 0.2V
Ta = 100°C
25
−25
COLLECTOR CURRENT I_C (mA)
INPUT VOLTAGE $V_{I(ON)}$ (V)
50
30
10
5
3
1
0.5
0.3
0.1
0.3
1
3
10
30
100

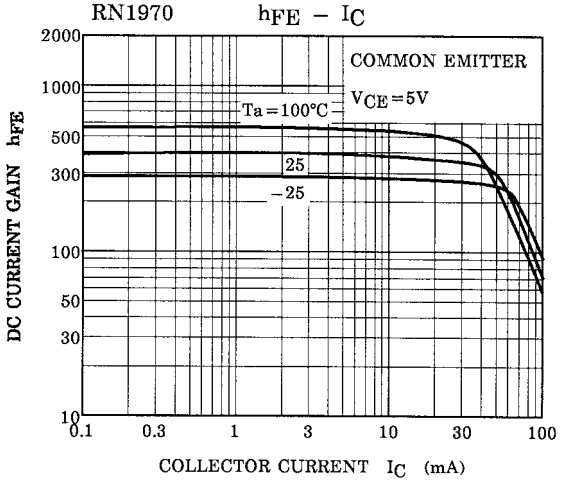

RN1970 I_C – $V_{I(OFF)}$
Ta = 100°C
25
−25
COMMON EMITTER
V_{CE} = 5V
COLLECTOR CURRENT I_C (μA)
INPUT VOLTAGE $V_{I(OFF)}$ (V)
3000
1000
500
300
100
50
30
0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6


RN1971 I_C – $V_{I(ON)}$
COMMON EMITTER
V_{CE} = 0.2V
Ta = 100°C
25
−25
COLLECTOR CURRENT I_C (mA)
INPUT VOLTAGE $V_{I(ON)}$ (V)
50
30
10
5
3
1
0.5
0.3
0.1
0.3
1
3
10
30
100

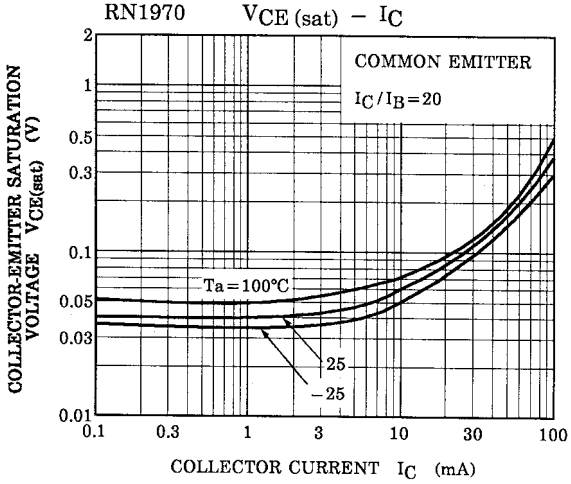

RN1971 I_C – $V_{I(OFF)}$
Ta = 100°C
25
−25
COMMON EMITTER
V_{CE} = 5V
COLLECTOR CURRENT I_C (μA)
INPUT VOLTAGE $V_{I(OFF)}$ (V)
3000
1000
500
300
100
50
30
0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6

(Q1, Q2 Common)

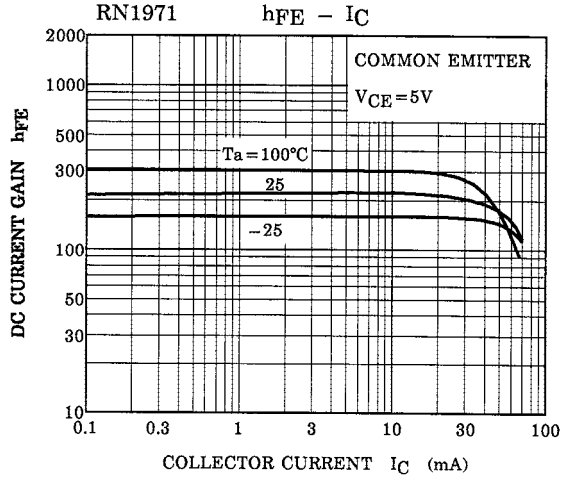
RN1970 h_{FE} – I_C



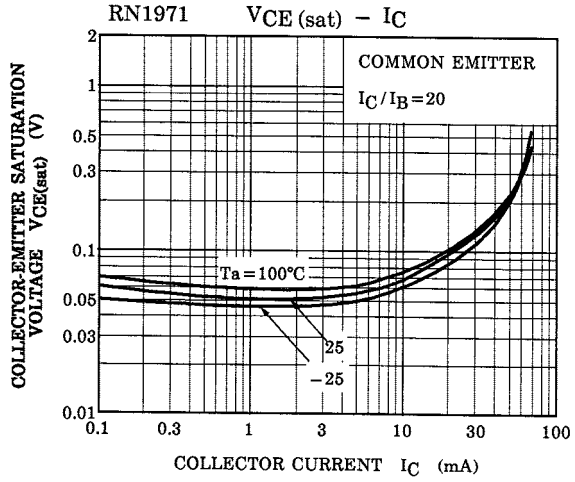
RN1970 $V_{CE\,(sat)}$ – I_C

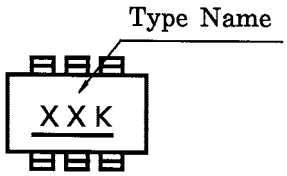
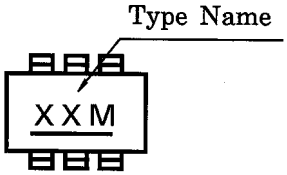


RN1971 h_{FE} – I_C



RN1971 $V_{CE\,(sat)}$ – I_C



Type Name	Marking
RN1970	
RN1971	

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