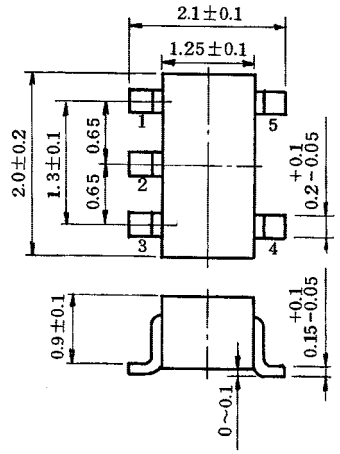
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

RN1710,RN1711

Switching, Inverter Circuit, Interface Circuit
And Driver Circuit Applications

- Including two devices in USV (ultra super mini type with 5 leads)
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN2710~RN2711

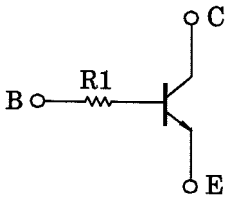
Unit: mm



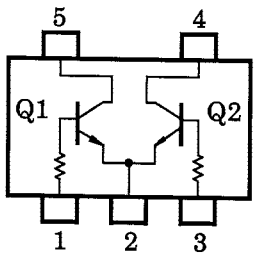
1. BASE 1	(B1)
2. EMITTER	(E)
3. BASE 2	(B2)
4. COLLECTOR 2	(C2)
5. COLLECTOR 1	(C1)
JEDEC	—
EIAJ	—
TOSHIBA	2−2L1A

Weight: 6.2mg

Equivalent Circuit



Equivalent Circuit (Top View)



Maximum Ratings (Ta = 25°C)

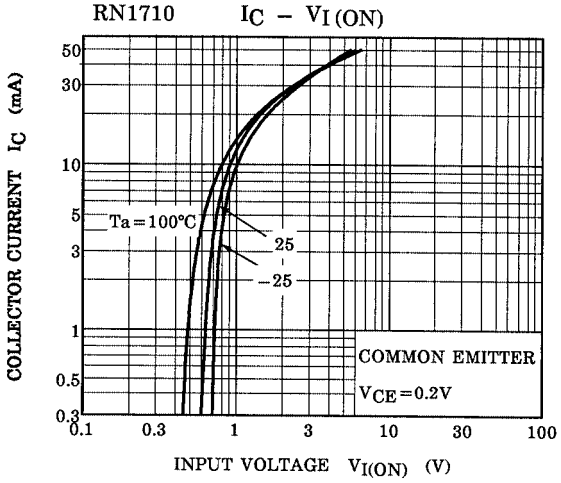
Characterisstic	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	50	V
Collector-emitter voltage	V_{CEO}	50	V
Emitter-base voltage	V_{EBO}	5	V
Collector current	I_C	100	mA
Collector power dissipation	P_C*	200	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	−55~150	°C

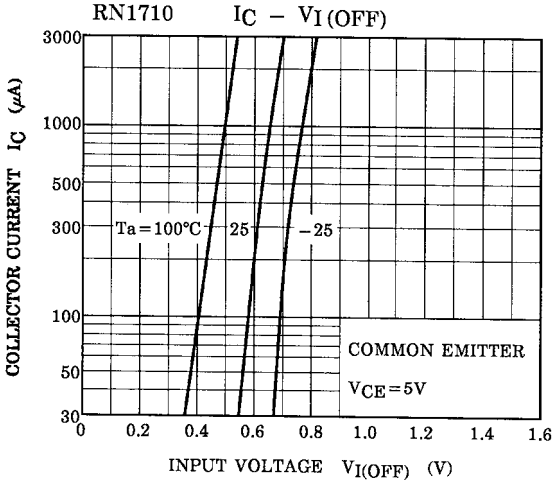
*: Total rating

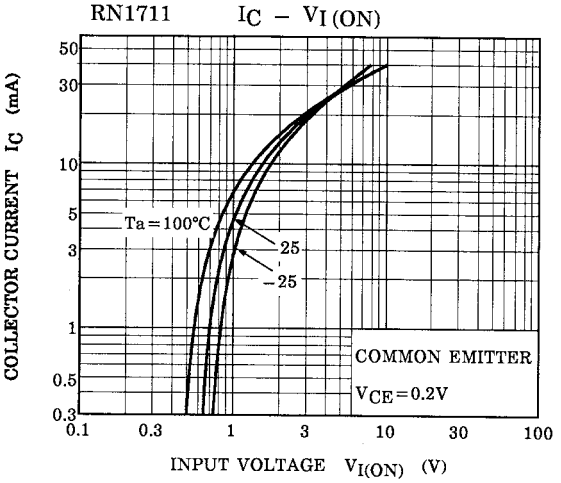
Electrical Characteristics (Ta = 25°C)

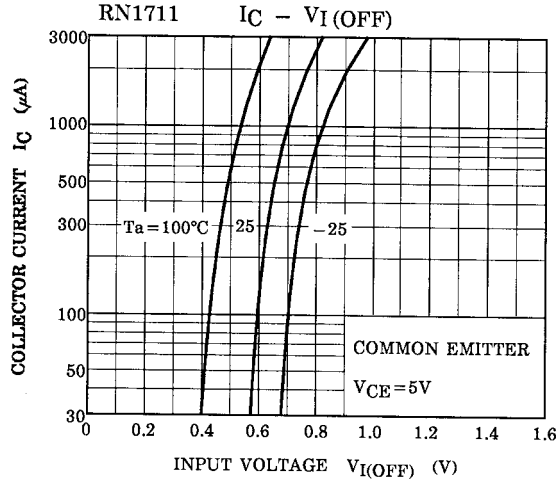
Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	—	V_{CB} = 50V, I_E = 0	—	—	100	nA
Emitter cut-off current		I_{EBO}	—	V_{EB} = 5V, I_C = 0	—	—	100	nA
DC current gain		h_{FE}	—	V_{CE} = 5V, I_C = 1mA	120	—	700	—
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	—	I_C = 5mA, I_B = 0.25mA	—	0.1	0.3	V
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	RN1710	R1	—	—	3.29	4.7	6.11	kΩ
	RN1711				7	10	13	

(Q1, Q2 Common)


RN1710 I_C – $V_{I(ON)}$
COLLECTOR CURRENT I_C (mA)
50
30
10
5
3
1
0.5
0.3
Ta = 100°C
25
−25
COMMON EMITTER
V_{CE} = 0.2V
0.1
0.3
1
3
10
30
100
INPUT VOLTAGE $V_{I(ON)}$ (V)


RN1710 I_C – $V_{I(OFF)}$
COLLECTOR CURRENT I_C (μA)
3000
1000
500
300
100
50
30
Ta = 100°C
25
−25
COMMON EMITTER
V_{CE} = 5V
0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
INPUT VOLTAGE $V_{I(OFF)}$ (V)


RN1711 I_C – $V_{I(ON)}$
COLLECTOR CURRENT I_C (mA)
50
30
10
5
3
1
0.5
0.3
Ta = 100°C
25
−25
COMMON EMITTER
V_{CE} = 0.2V
0.1
0.3
1
3
10
30
100
INPUT VOLTAGE $V_{I(ON)}$ (V)


RN1711 I_C – $V_{I(OFF)}$
COLLECTOR CURRENT I_C (μA)
3000
1000
500
300
100
50
30
Ta = 100°C
25
−25
COMMON EMITTER
V_{CE} = 5V
0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
INPUT VOLTAGE $V_{I(OFF)}$ (V)