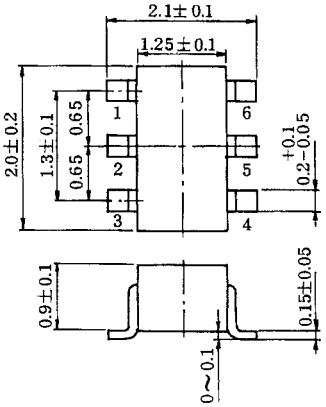
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

RN1901,RN1902,RN1903
RN1904,RN1905,RN1906

Switching, Inverter Circuit, Interface Circuit
And Driver Circuit Applications

- Including two devices in US6 (ultra super mini type with 6 leads)
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN2901~RN2906

Unit: mm

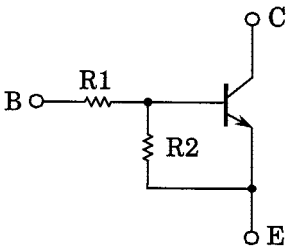


1. EMITTER 1 (E1)
2. BASE 1 (B1)
3. COLLECTOR 2 (C2)
4. EMITTER 2 (E2)
5. BASE 2 (B2)
6. COLLECTOR 1 (C1)

JEDEC	—
EIAJ	—
TOSHIBA	2-2J1A

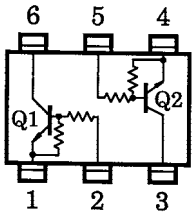
Weight: 6.8mg

Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN1901	4.7	4.7
RN1902	10	10
RN1903	22	22
RN1904	47	47
RN1905	2.2	47
RN1906	4.7	47

Equivalent Circuit (Top View)



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

Characteristic		Symbol	Rating	Unit
Collector-base voltage	RN1901~1906	V_{CBO}	50	V
Collector-emitter voltage		V_{CEO}	50	V
Emitter-base voltage	RN1901~1904	V_{EBO}	10	V
	RN1905, 1906		5	
Collector current	RN1901~1906	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

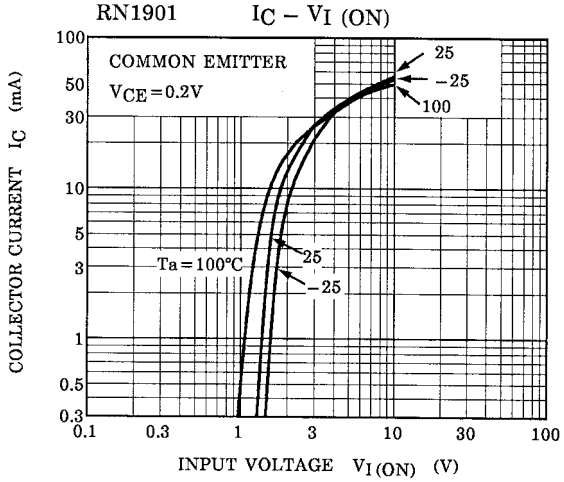
*: Total rating

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

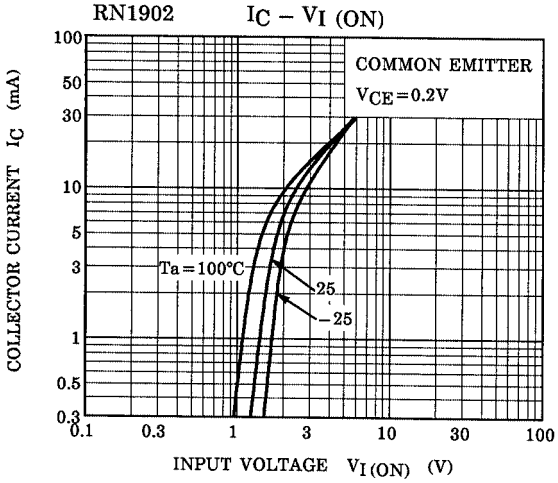
Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN1901~1906	I_{CBO}	—	V_{CB} = 50V, I_E = 0	—	—	100	nA
		I_{CEO}	—	V_{CE} = 50V, I_B = 0	—	—	500	
Emitter cut-off current	RN1901	I_{EBO}	—	V_{EB} = 10V, I_C = 0	0.82	—	1.52	mA
	RN1902		—		0.38	—	0.71	
	RN1903		—		0.17	—	0.33	
	RN1904		—		0.082	—	0.15	
	RN1905		—	V_{EB} = 5V, I_C = 0	0.078	—	0.145	
	RN1906		—		0.074	—	0.138	
DC current gain	RN1901	h_{FE}	—	V_{CE} = 5V, I_C = 10mA	30	—	—	—
	RN1902		—		50	—	—	
	RN1903		—		70	—	—	
	RN1904		—		80	—	—	
	RN1905		—		80	—	—	
	RN1906		—		80	—	—	
Collector-emitter saturation voltage	RN1901~1906	$V_{CE\ (sat)}$	—	I_C = 5mA, I_B = 0.25mA	—	0.1	0.3	V
Input voltage (ON)	RN1901	$V_{I\ (ON)}$	—	V_{CE} = 0.2V, I_C = 5mA	1.1	—	2.0	V
	RN1902		—		1.2	—	2.4	
	RN1903		—		1.3	—	3.0	
	RN1904		—		1.5	—	5.0	
	RN1905		—		0.6	—	1.1	
	RN1906		—		0.7	—	1.3	
Input voltage (OFF)	RN1901~1904	$V_{I\ (OFF)}$	—	V_{CE} = 5V, I_C = 0.1mA	1.0	—	1.5	V
	RN1905, 1906		—		0.5	—	0.8	
Translation frequency	RN1901~1906	f_T	—	V_{CE} = 10V, I_C = 5mA	—	250	—	MHz
Collector output capacitance	RN1901~1906	C_{ob}	—	V_{CB} = 10V, I_E = 0, f = 1MHz	—	3	6	pF
Input resistor	RN1901	R1	—	—	3.29	4.7	6.11	kΩ
	RN1902		—		7	10	13	
	RN1903		—		15.4	22	28.6	
	RN1904		—		32.9	47	61.1	
	RN1905		—		1.54	2.2	2.86	
	RN1906		—		3.29	4.7	6.11	
Resistor ratio	RN1901~1904	R1/R2	—	—	0.9	1.0	1.1	—
	RN1905		—		0.0421	0.0468	0.0515	
	RN1906		—		0.09	0.1	0.11	

(Q1, Q2 Common)

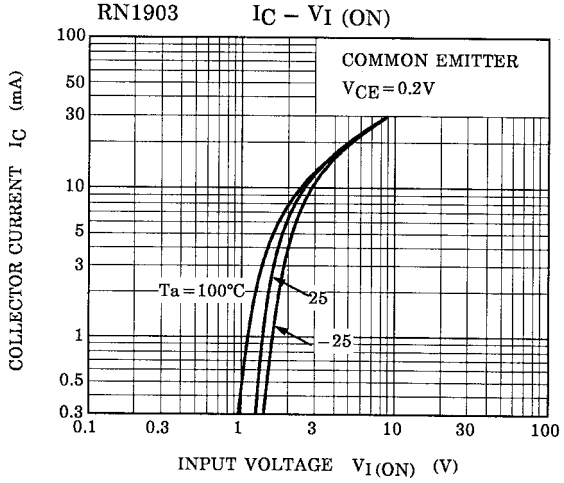
RN1901 $I_C - V_I$ (ON)



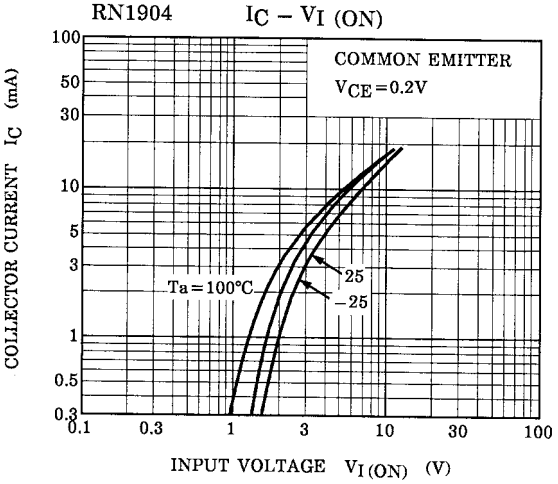
RN1902 $I_C - V_I$ (ON)



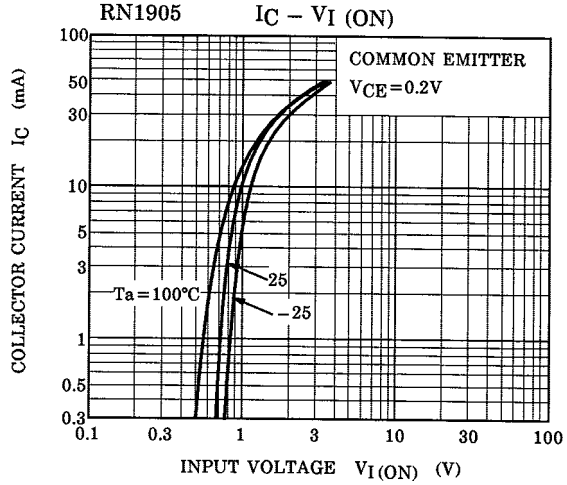
RN1903 $I_C - V_I$ (ON)



RN1904 $I_C - V_I$ (ON)



RN1905 $I_C - V_I$ (ON)



RN1906 $I_C - V_I$ (ON)