

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

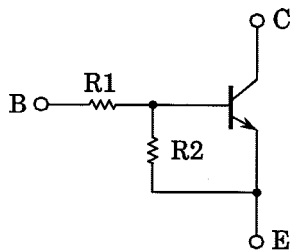
## RN1201, RN1202, RN1203, RN1204, RN1205, RN1206

Switching, Inverter Circuit, Interface Circuit  
And Driver Circuit Applications

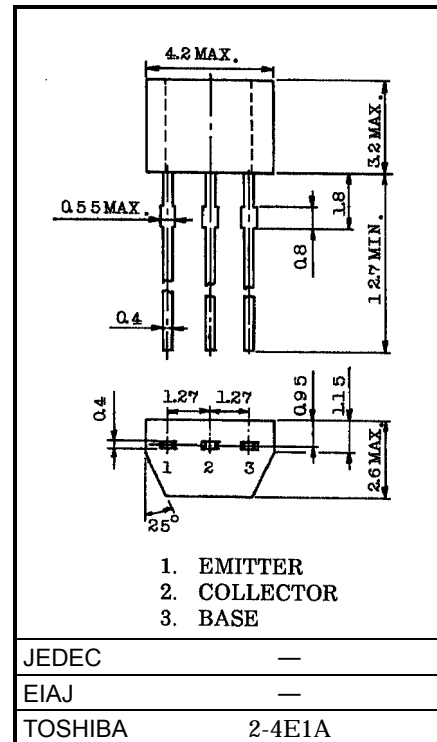
Unit in mm

- With built-in bias resistors.
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN2201~2206

### Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN1201	4.7	4.7
RN1202	10	10
RN1203	22	22
RN1204	47	47
RN1205	2.2	47
RN1206	4.7	47



Weight: 0.13g

### Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit	
Collector-base voltage	RN1201~1206	$V_{CBO}$	50	V
Collector-emitter voltage		$V_{CEO}$	50	V
Emitter-base voltage	RN1201~1204	$V_{EBO}$	10	V
			RN1205, 1206	
Collector current	RN1201~1206	$I_c$	100	mA
Collector power dissipation		$P_c$	300	mW
Junction temperature		$T_j$	150	°C
Storage temperature range		$T_{stg}$	-55~150	°C

961001EAA2

- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

## Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN1201~1206	$I_{CBO}$	—	$V_{CB} = 50V, I_E = 0$	—	—	100	nA
		$I_{CEO}$	—	$V_{CE} = 50V, I_B = 0$	—	—	500	nA
Emitter cut-off current	RN1201	$I_{EBO}$	—	$V_{EB} = 10V, I_C = 0$	0.82	—	1.52	mA
	RN1202		—		0.38	—	0.71	
	RN1203		—		0.17	—	0.33	
	RN1204		—	0.082	—	0.15		
	RN1205		$V_{EB} = 5V, I_C = 0$	—	0.078	—	0.145	
	RN1206			—	0.074	—	0.138	
DC current gain	RN1201	$h_{FE}$	—	$V_{CE} = 5V, I_C = 10mA$	30	—	—	—
	RN1202		—		50	—	—	
	RN1203		—		70	—	—	
	RN1204		—		80	—	—	
	RN1205		—		80	—	—	
	RN1206		—		80	—	—	
Collector-emitter saturation voltage	RN1201~1206	$V_{CE(sat)}$	—	$I_C = 5mA, I_B = 0.25mA$	—	0.1	0.3	V
Input voltage (ON)	RN1201	$V_{I(ON)}$	—	$V_{CE} = 0.2V, I_C = 5mA$	1.1	—	2.0	V
	RN1202		—		1.2	—	2.4	
	RN1203		—		1.3	—	3.0	
	RN1204		—		1.5	—	5.0	
	RN1205		—		0.6	—	1.1	
	RN1206		—		0.7	—	1.3	
Input voltage (OFF)	RN1201~1204	$V_{I(OFF)}$	—	$V_{CE} = 5V, I_C = 0.1mA$	1.0	—	1.5	V
	RN1205~1206		—		0.5	—	0.8	
Translation frequency	RN1201~1206	$f_T$	—	$V_{CE} = 10V, I_C = 5mA$	—	250	—	MHz
Collector output capacitance	RN1201~1206	$C_{ob}$	—	$V_{CB} = 10V, I_E = 0, f = 1MHz$	—	3	6	pF
Input Resistor	RN1201	R1	—	—	3.29	4.7	6.11	kΩ
	RN1202		—		7	10	13	
	RN1203		—		15.4	22	28.6	
	RN1204		—		32.9	47	61.1	
	RN1205		—		1.54	2.2	2.86	
	RN1206		—		3.29	4.7	6.11	
Resistor Ratio	RN1201~1205	R1/R2	—	—	0.9	1.0	1.1	—
	RN1205		—		0.0421	0.0468	0.0515	
	RN1206		—		0.09	0.1	0.11	

