

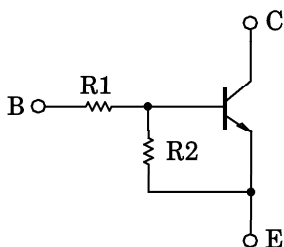
TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL TYPE (PCT PROCESS)

**RN1001, RN1002, RN1003  
RN1004, RN1005, RN1006**

SWITCHING, INVERTER CIRCUIT, INTERFACE CIRCUIT AND DRIVER  
CIRCUIT APPLICATIONS

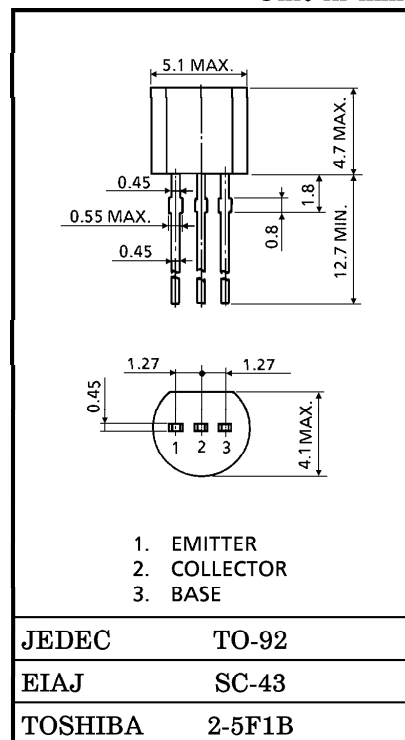
- With Built-in Bias Resistors
- Simplify Circuit Design
- Reduce a Quantity of Parts and Manufacturing Process
- Complementary to RN2001~RN2006

EQUIVALENT CIRCUIT AND BIAS RESISTOR VALUES



TYPE No.	R1 (kΩ)	R2 (kΩ)
RN1001	4.7	4.7
RN1002	10	10
RN1003	22	22
RN1004	47	47
RN1005	2.2	47
RN1006	4.7	47

Unit in mm



1. EMITTER
2. COLLECTOR
3. BASE

JEDEC	TO-92
EIAJ	SC-43
TOSHIBA	2-5F1B

Weight : 0.21g

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage	RN1001~1006	V <sub>CBO</sub>	50	V
Collector-Emitter Voltage		V <sub>CEO</sub>	50	V
Emitter-Base Voltage	RN1001~1004	V <sub>EBO</sub>	10	V
	RN1005, 1006		5	
Collector Current	RN1001~1006	I <sub>C</sub>	100	mA
Collector Power Dissipation		P <sub>C</sub>	400	mW
Junction Temperature		T <sub>j</sub>	150	°C
Storage Temperature Range		T <sub>stg</sub>	-55~150	°C

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## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	RN1001~1006	ICBO	V <sub>CB</sub> = 50V, I <sub>E</sub> = 0	—	—	100	nA
		ICEO	V <sub>CE</sub> = 50V, I <sub>B</sub> = 0	—	—	500	
Emitter Cut-off Current	RN1001	I <sub>EBO</sub>	V <sub>EB</sub> = 10V, I <sub>C</sub> = 0	0.82	—	1.52	mA
	RN1002			0.38	—	0.71	
	RN1003			0.17	—	0.33	
	RN1004		0.082	—	0.15		
	RN1005		V <sub>EB</sub> = 5V, I <sub>C</sub> = 0	0.078	—	0.145	
	RN1006			0.074	—	0.138	
DC Current Gain	RN1001	h <sub>FE</sub>	V <sub>CE</sub> = 5V, I <sub>C</sub> = 10mA	30	—	—	—
	RN1002			50	—	—	
	RN1003			70	—	—	
	RN1004			80	—	—	
	RN1005			80	—	—	
	RN1006			80	—	—	
Collector-Emitter Saturation Voltage	RN1001~1006	V <sub>CE(sat)</sub>	I <sub>C</sub> = 5mA, I <sub>B</sub> = 0.25mA	—	0.1	0.3	V
Input Voltage (ON)	RN1001	V <sub>I(ON)</sub>	V <sub>CE</sub> = 0.2V, I <sub>C</sub> = 5mA	1.1	—	2.0	V
	RN1002			1.2	—	2.4	
	RN1003			1.3	—	3.0	
	RN1004			1.5	—	5.0	
	RN1005			0.6	—	1.1	
	RN1006			0.7	—	1.3	
Input Voltage (OFF)	RN1001~1004	V <sub>I(OFF)</sub>	V <sub>CE</sub> = 5V, I <sub>C</sub> = 0.1mA	1.0	—	1.5	V
	RN1005, 1006			0.5	—	0.8	
Transition Frequency	RN1001~1006	f <sub>T</sub>	V <sub>CE</sub> = 10V, I <sub>C</sub> = 5mA	—	250	—	MHz
Collector Output Capacitance	RN1001~1006	C <sub>ob</sub>	V <sub>CB</sub> = 10V, I <sub>E</sub> = 0, f = 1MHz	—	3	6	pF
Input Resistor	RN1001	R <sub>1</sub>		3.29	4.7	6.11	kΩ
	RN1002			7	10	13	
	RN1003			15.4	22	28.6	
	RN1004			32.9	47	61.1	
	RN1005			1.54	2.2	2.86	
	RN1006			3.29	4.7	6.11	
Resistor Ratio	RN1001~1004	R <sub>1</sub> / R <sub>2</sub>		0.9	1.0	1.1	—
	RN1005			0.0421	0.0468	0.0515	
	RN1006			0.09	0.1	0.11	

