

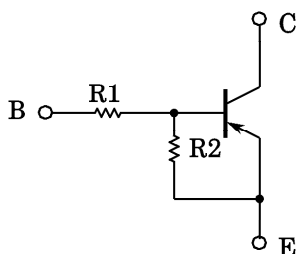
TOSHIBA TRANSISTOR SILICON PNP EPITAXIAL TYPE (PCT PROCESS)

## RN2001, RN2002, RN2003 RN2004, RN2005, RN2006

SWITCHING, INVERTER CIRCUIT, INTERFACE CIRCUIT AND DRIVER  
CIRCUIT APPLICATIONS

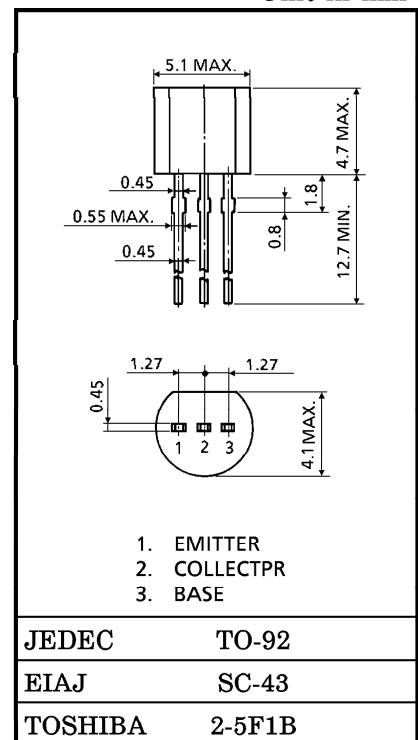
- With Built-in Bias Resistors
- Simplify Circuit Design
- Reduce a Quantity of Parts and Manufacturing Process
- Complementary to RN1001~RN1006

EQUIVALENT CIRCUIT AND BIAS RESISTOR VALUES



TYPE No.	R1 (kΩ)	R2 (kΩ)
RN2001	4.7	4.7
RN2002	10	10
RN2003	22	22
RN2004	47	47
RN2005	2.2	47
RN2006	4.7	47

Unit in mm



Weight : 0.21g

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage	RN2001~2006	V <sub>CBO</sub>	-50	V
Collector-Emitter Voltage		V <sub>CEO</sub>	-50	V
Emitter-Base Voltage	RN2001~2004	V <sub>EBO</sub>	-10	V
	RN2005, 2006		-5	
Collector Current	RN2001~2006	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

961001EAA1

- 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 CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	RN2001~2006	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	RN2001	I <sub>EBO</sub>	V <sub>EB</sub> = -10V, I <sub>C</sub> = 0	-0.82	—	-1.52	mA
	RN2002			-0.38	—	-0.71	
	RN2003			-0.17	—	-0.33	
	RN2004			-0.082	—	-0.15	
	RN2005		V <sub>EB</sub> = -5V, I <sub>C</sub> = 0	-0.078	—	-0.145	
	RN2006			-0.074	—	-0.138	
DC Current Gain	RN2001	h <sub>FE</sub>	V <sub>CE</sub> = -5V, I <sub>C</sub> = -10mA	30	—	—	
	RN2002			50	—	—	
	RN2003			70	—	—	
	RN2004			80	—	—	
	RN2005			80	—	—	
	RN2006			80	—	—	
Collector-Emitter Saturation Voltage	RN2001~2006	V <sub>CE(sat)</sub>	I <sub>C</sub> = -5mA, I <sub>B</sub> = -0.25mA	—	-0.1	-0.3	V
Input Voltage (ON)	RN2001	V <sub>I(ON)</sub>	V <sub>CE</sub> = -0.2V, I <sub>C</sub> = -5mA	-1.1	—	-2.0	V
	RN2002			-1.2	—	-2.4	
	RN2003			-1.3	—	-3.0	
	RN2004			-1.5	—	-5.0	
	RN2005			-0.6	—	-1.1	
	RN2006			-0.7	—	-1.3	
Input Voltage (OFF)	RN2001~2004	V <sub>I(OFF)</sub>	V <sub>CE</sub> = -5V, I <sub>C</sub> = -0.1mA	-1.0	—	-1.5	V
	RN2005, 2006			-0.5	—	-0.8	
Transition Frequency	RN2001~2006	f <sub>T</sub>	V <sub>CE</sub> = -10V, I <sub>C</sub> = -5mA	—	200	—	MHz
Collector Output Capacitance	RN2001~2006	C <sub>ob</sub>	V <sub>CB</sub> = -10V, I <sub>E</sub> = 0, f = 1MHz	—	3	6	pF
Input Resistor	RN2001	R <sub>1</sub>		3.29	4.7	6.11	kΩ
	RN2002			7	10	13	
	RN2003			15.4	22	28.6	
	RN2004			32.9	47	61.1	
	RN2005			1.54	2.2	2.86	
	RN2006			3.29	4.7	6.11	
Resistor Ratio	RN2001~2004	R <sub>1</sub> / R <sub>2</sub>		0.9	1.0	1.1	
	RN2005			0.0421	0.0468	0.0515	
	RN2006			0.09	0.1	0.11	

