

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL TYPE (PCT PROCESS)

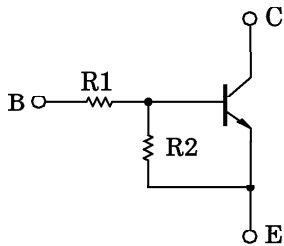
## RN1221, RN1222, RN1223, RN1224 RN1225, RN1226, RN1227

SWITCHING, INVERTER CIRCUIT, INTERFACE CIRCUIT AND DRIVER  
CIRCUIT APPLICATIONS

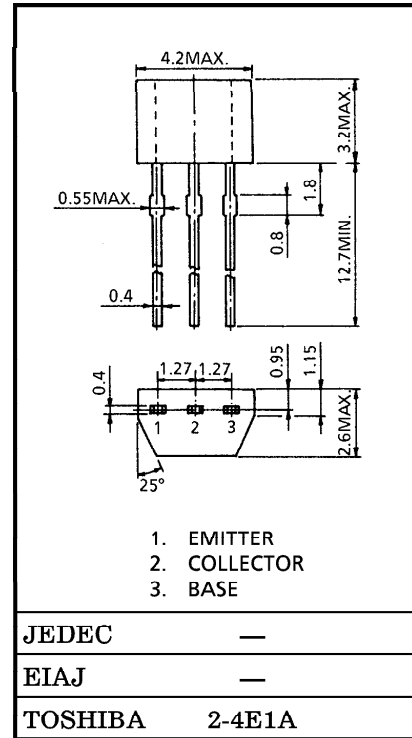
Unit in mm

- High Current Type ( $I_C$  (MAX) = 800mA)
- With Built-in Bias Resistors
- Simplify Circuit Design
- Reduce a Quantity of Parts Manufacturing Process
- Low  $V_{CE}$  (sat)
- Complementary to RN2221~2227

### EQUIVALENT CIRCUIT



TYPE No.	R1 (kΩ)	R2 (kΩ)
RN1221	1	1
RN1222	2.2	2.2
RN1223	4.7	4.7
RN1224	10	10
RN1225	0.47	10
RN1226	1	10
RN1227	2.2	10



Weight : 0.13g

### MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	$V_{CBO}$	50	V
Collector-Emitter Voltage	$V_{CEO}$	50	V
Emitter-Base Voltage	$V_{EBO}$	10	V
		5	
		6	
Collector Current	$I_C$	800	mA
Collector Power Dissipation	$P_C$	300	mW
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55~150	$^\circ\text{C}$

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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Collector Cut-off Current	RN1221~1227	$I_{CBO}$	$V_{CB}=50V, I_E=0$	—	—	100	nA
		$I_{CEO}$	$V_{CE}=50V, I_B=0$	—	—	500	
Emitter Cut-off Current	RN1221	$I_{EBO}$	$V_{EB}=10V, I_C=0$	3.85	—	7.14	mA
	RN1222			1.75	—	3.25	
	RN1223			0.82	—	1.52	
	RN1224	0.38	—	0.71			
	RN1225	$V_{EB}=5V, I_C=0$	0.365	—	0.682		
	RN1226		0.35	—	0.65		
	RN1227	$V_{EB}=6V, I_C=0$	0.378	—	0.703		
DC Current Gain	RN1221	$h_{FE}$	$V_{CE}=1V, I_C=100mA$	60	—	—	—
	RN1222			65	—	—	
	RN1223			70	—	—	
	RN1224			90	—	—	
	RN1225			90	—	—	
	RN1226			90	—	—	
	RN1227			90	—	—	
Collector-Emitter Saturation Voltage	RN1221	$V_{CE(sat)}$	$I_C=50mA, I_B=2mA$	—	—	0.25	V
	RN1222~1227		$I_C=50mA, I_B=1mA$				
Input Voltage (ON)	RN1221	$V_{I(ON)}$	$V_{CE}=0.2V, I_C=100mA$	1.0	—	3.5	V
	RN1222			1.4	—	4.5	
	RN1223			2.0	—	6.5	
	RN1224			3.0	—	12.0	
	RN1225			0.6	—	2.0	
	RN1226			0.7	—	2.5	
	RN1227			1.0	—	3.0	
Input Voltage (OFF)	RN1221~1224	$V_{I(OFF)}$	$V_{CE}=5V, I_C=0.1mA$	0.8	—	1.3	V
	RN1225, 1226			0.4	—	0.8	
	RN1227			0.5	—	1.0	
Transition Frequency	RN1221~1227	$f_T$	$V_{CE}=5V, I_C=20mA$	—	300	—	MHz
Collector Output Capacitance	RN1221~1227	$C_{ob}$	$V_{CB}=10V, I_E=0, f=1MHz$	—	7	—	pF

## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Resistor	RN1221	R1	—	0.7	1.0	1.3	kΩ
	RN1222			1.54	2.2	2.86	
	RN1223			3.29	4.7	6.11	
	RN1224			7	10	13	
	RN1225			0.329	0.47	0.61	
	RN1226			0.7	1.0	1.3	
	RN1227			1.54	2.2	2.86	
Resistor Ratio	RN1221~1224	R1 / R2	—	0.9	1.0	1.1	—
	RN1225			0.0423	0.047	0.0517	
	RN1226			0.09	0.1	0.11	
	RN1227			0.2	0.22	0.24	

