

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process) (Bias Resistor built-in Transistor)

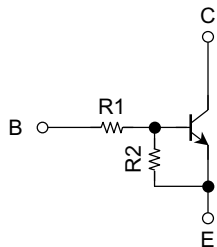
## RN1101FT, RN1102FT, RN1103FT RN1104FT, RN1105FT, RN1106FT

Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications.

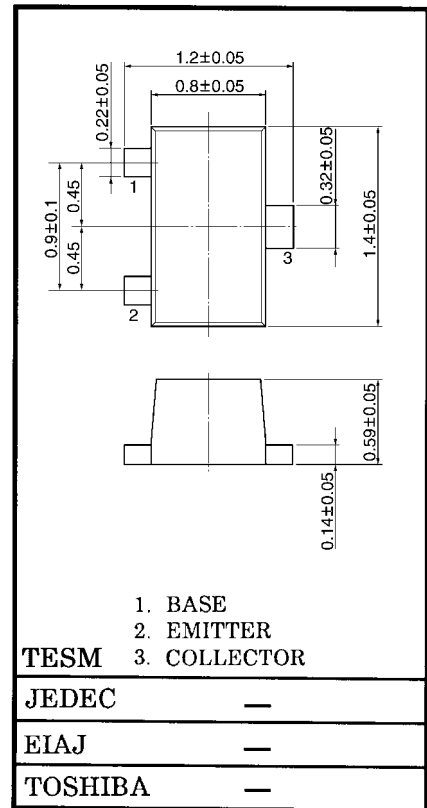
Unit in mm

- High-density mount is possible because of devices housed in very thin TSM packages.
- Incorporating a bias resistor into a transistor reduces parts count. Reducing the parts count enable the manufacture of ever more compact equipment and save assembly cost.
- Wide range of resistor values are available to use in various circuit designs.
- Complementary to RN2101FT~2106FT

### Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN1101FT	4.7	4.7
RN1102FT	10	10
RN1103FT	22	22
RN1104FT	47	47
RN1105FT	2.2	47
RN1106FT	4.7	47



### Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V <sub>CBO</sub>	50	V
Collector-emitter voltage	V <sub>CEO</sub>	50	V
Emitter-base voltage	V <sub>EBO</sub>	10	V
		5	V
Collector current	I <sub>C</sub>	100	mA
Collector power dissipation	P <sub>C</sub> (Note)	100	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature range	T <sub>stg</sub>	-55~150	°C

Note: Total rating

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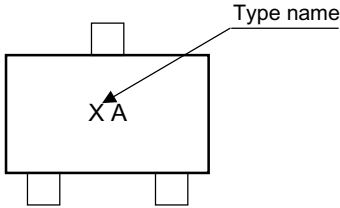
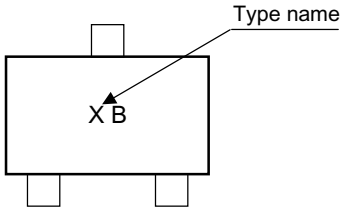
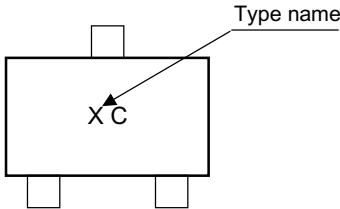
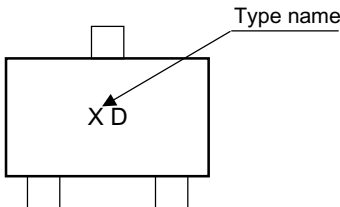
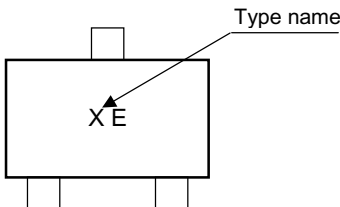
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## Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN1101FT~1106FT	$I_{CBO}$	$V_{CB} = 50\text{ V}, I_E = 0$	—	—	100	nA
		$I_{CEO}$	$V_{CE} = 50\text{ V}, I_B = 0$	—	—	500	
Emitter cut-off current	RN1101FT	$I_{EBO}$	$V_{EB} = 10\text{ V}, I_C = 0$	0.82	—	1.52	mA
	RN1102FT			0.38	—	0.71	
	RN1103FT			0.17	—	0.33	
	RN1104FT			0.082	—	0.15	
	RN1105FT	$I_{EBO}$	$V_{EB} = 5\text{ V}, I_C = 0$	0.078	—	0.145	
	RN1106FT			0.074	—	0.138	
DC current gain	RN1101FT	$h_{FE}$	$V_{CE} = 5\text{ V}, I_C = 10\text{ mA}$	30	—	—	
	RN1102FT			50	—	—	
	RN1103FT			70	—	—	
	RN1104FT			80	—	—	
	RN1105FT			80	—	—	
	RN1106FT			80	—	—	
Collector-emitter saturation voltage	RN1101FT~1106FT	$V_{CE(sat)}$	$I_C = 5\text{ mA}, I_B = 0.25\text{ mA}$	—	0.1	0.3	V
Input voltage (ON)	RN1101FT	$V_{I(ON)}$	$V_{CE} = 0.2\text{ V}, I_C = 5\text{ mA}$	1.1	—	2.0	V
	RN1102FT			1.2	—	2.4	
	RN1103FT			1.3	—	3.0	
	RN1104FT			1.5	—	5.0	
	RN1105FT			0.6	—	1.1	
	RN1106FT			0.7	—	1.3	
Input voltage (OFF)	RN1101FT~1104FT	$V_{I(OFF)}$	$V_{CE} = 5\text{ V}, I_C = 0.1\text{ mA}$	1.0	—	1.5	V
	RN1105FT, 1106FT			0.5	—	0.8	
Transition frequency	RN1101FT~1106FT	$f_T$	$V_{CE} = 10\text{ V}, I_C = 5\text{ mA}$	—	250	—	MHz
Collector output capacitance	RN1101FT~1106FT	$C_{ob}$	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	3	6	pF
Input resistor	RN1101FT	R1	—	3.29	4.7	6.11	kΩ
	RN1102FT			7	10	13	
	RN1103FT			15.4	22	28.6	
	RN1104FT			32.9	47	61.1	
	RN1105FT			1.54	2.2	2.86	
	RN1106FT			3.29	4.7	6.11	
Resistor ratio	RN1101FT~1104FT	R1/R2	—	0.9	1.0	1.1	
	RN1105FT			0.0421	0.0468	0.0515	
	RN1106FT			0.09	0.1	0.11	

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Type Name	Marking
RN1101FT	
RN1102FT	
RN1103FT	
RN1104FT	
RN1105FT	
RN1106FT	