

# UNR221W

## Silicon NPN epitaxial planer type

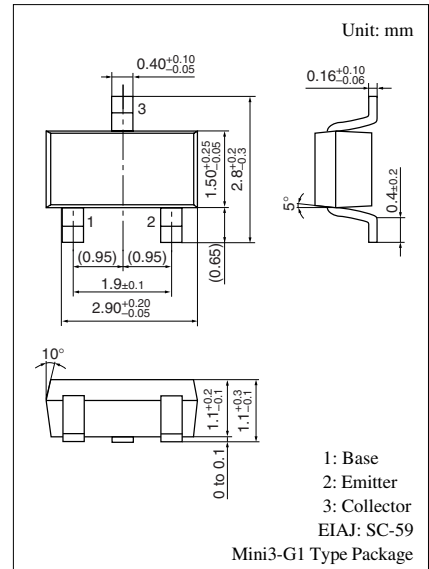
For digital circuit

### ■ Features

- $R_{EB} = 100\text{ k}\Omega$ , without  $R_B$ , built-in high-resistor between emitter and base.
- Mini-type package, allowing downsizing of the equipment.
- Allowing automatic insertion through tape packing.

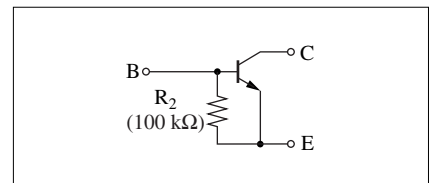
### ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Collector to base voltage	$V_{CBO}$	50	V
Collector to emitter voltage	$V_{CEO}$	50	V
Collector current	$I_C$	100	mA
Total power dissipation	$P_T$	200	mW
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$



Marking Symbol: 9F

Internal Connection



### ■ Electrical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector cutoff current	$I_{CBO}$	$V_{CB} = 50\text{ V}, I_E = 0$			0.1	$\mu\text{A}$
	$I_{CEO}$	$V_{CE} = 50\text{ V}, I_B = 0$			0.5	$\mu\text{A}$
Emitter cutoff current	$I_{EBO}$	$V_{EB} = 6\text{ V}, I_C = 0$			100	$\mu\text{A}$
Collector to base voltage	$V_{CBO}$	$I_C = 10\text{ }\mu\text{A}, I_E = 0$	50			V
Collector to emitter voltage	$V_{CEO}$	$I_C = 2\text{ mA}, I_B = 0$	50			V
Forward current transfer ratio	$h_{FE}$	$V_{CE} = 10\text{ V}, I_C = 5\text{ mA}$	80			
Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_C = 10\text{ mA}, I_B = 0.3\text{ mA}$			0.25	V
Input resistance	$R_2$		-30%	100	+30%	k $\Omega$
Transition frequency	$f_T$	$V_{CB} = 10\text{ V}, I_E = -2\text{ mA}, f = 200\text{ MHz}$		100		MHz

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