

# UP01213

## Silicon NPN epitaxial planar type

For digital circuits

### ■ Features

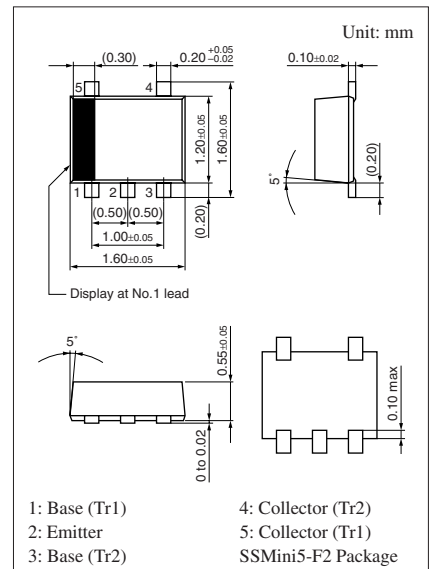
- Two elements incorporated into one package  
(Transistors with built-in resistor)
- Reduction of the mounting area and assembly cost by one half

### ■ Basic Part Number

- UNR1213 × 2

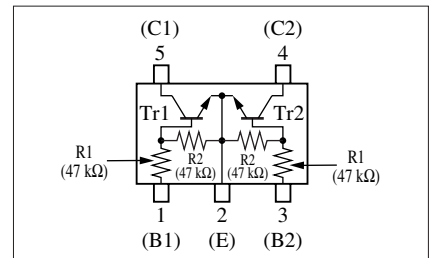
### ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Collector-base voltage (Emitter open)	$V_{CBO}$	50	V
Collector-emitter voltage (Base open)	$V_{CEO}$	50	V
Collector current	$I_C$	100	mA
Total power dissipation	$P_T$	125	mW
Junction temperature	$T_j$	125	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +125	$^\circ\text{C}$



Marking Symbol: 9L

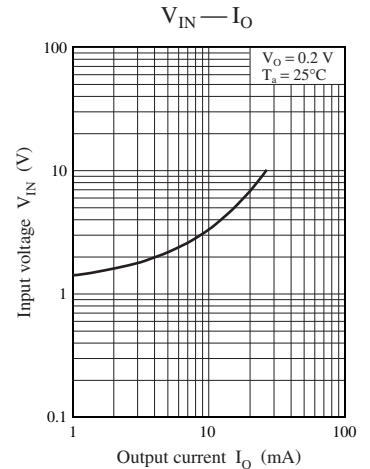
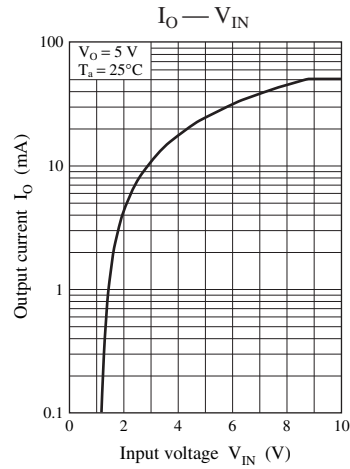
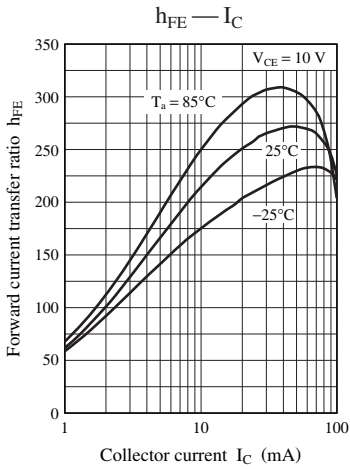
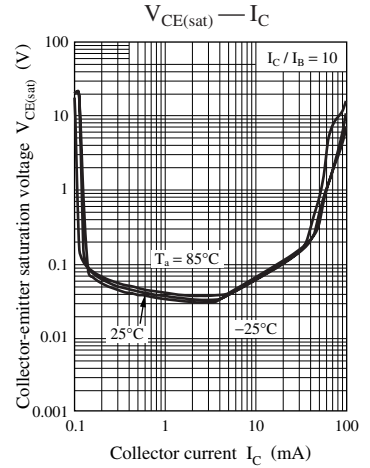
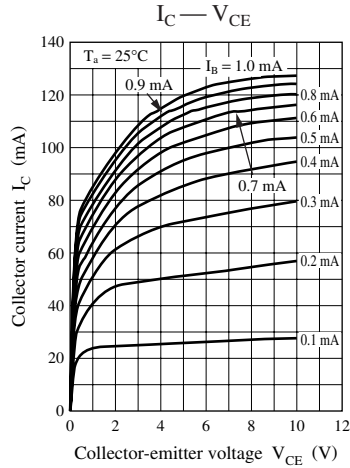
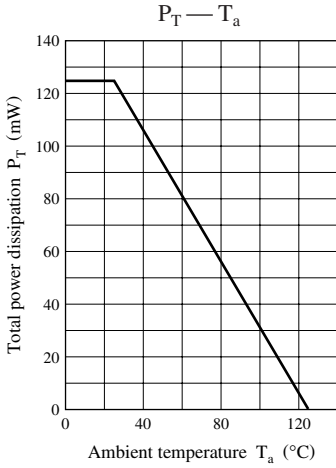
Internal Connection



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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)	$V_{CBO}$	$I_C = 10 \mu\text{A}$ , $I_E = 0$	50			V
Collector-emitter voltage (Base open)	$V_{CEO}$	$I_C = 2 \text{ mA}$ , $I_B = 0$	50			V
Collector-base cutoff current (Emitter open)	$I_{CBO}$	$V_{CB} = 50 \text{ V}$ , $I_E = 0$			0.1	$\mu\text{A}$
Collector-emitter cutoff current (Base open)	$I_{CEO}$	$V_{CE} = 50 \text{ V}$ , $I_B = 0$			0.5	$\mu\text{A}$
Emitter-base cutoff current (Collector open)	$I_{EBO}$	$V_{EB} = 6 \text{ V}$ , $I_C = 0$			0.1	mA
Forward current transfer ratio	$h_{FE}$	$V_{CE} = 10 \text{ V}$ , $I_C = 5 \text{ mA}$	80			—
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 10 \text{ mA}$ , $I_B = 0.3 \text{ mA}$			0.25	V
Output voltage high-level	$V_{OH}$	$V_{CC} = 5 \text{ V}$ , $V_B = 0.5 \text{ V}$ , $R_L = 1 \text{ k}\Omega$	4.9			V
Output voltage low-level	$V_{OL}$	$V_{CC} = 5 \text{ V}$ , $V_B = 3.5 \text{ V}$ , $R_L = 1 \text{ k}\Omega$			0.2	V
Input resistance	$R_I$		-30%	47	+30%	$\text{k}\Omega$
Resistance ratio	$R_I / R_2$		0.8	1.0	1.2	—
Transition frequency	$f_T$	$V_{CB} = 10 \text{ V}$ , $I_E = -2 \text{ mA}$ , $f = 200 \text{ MHz}$		150		MHz

Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.



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