

# XP01216

## Silicon NPN epitaxial planar type

For digital circuits

### ■ Features

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

### ■ Basic Part Number

- UNR2216 × 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               | $P_T$     | 150         | mW               |
| Junction temperature                  | $T_j$     | 150         | $^\circ\text{C}$ |
| Storage temperature                   | $T_{stg}$ | -55 to +150 | $^\circ\text{C}$ |

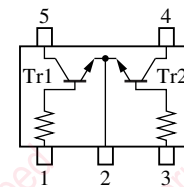
### ■ Package

- Code  
SMini5-G1
- Pin Name
 

|               |                    |
|---------------|--------------------|
| 1: Base (Tr1) | 4: Collector (Tr2) |
| 2: Emitter    | 5: Collector (Tr1) |
| 3: Base (Tr2) |                    |

### ■ Marking Symbol: 9N

### ■ Internal Connection

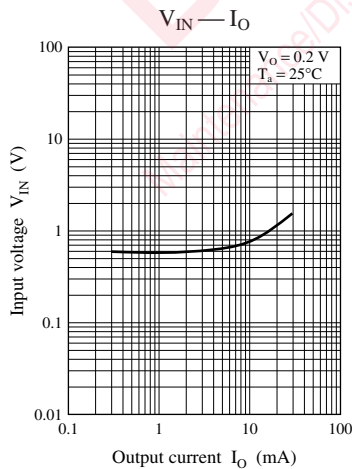
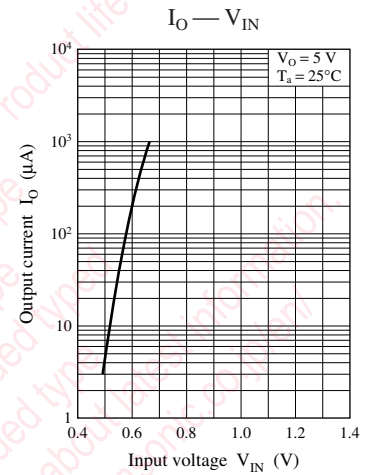
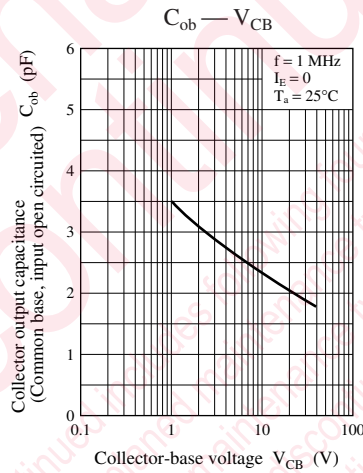
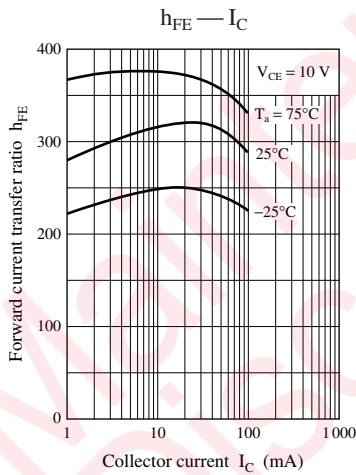
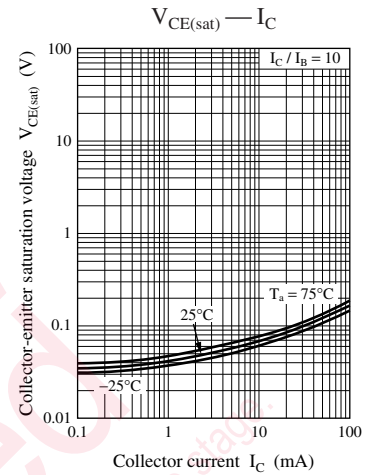
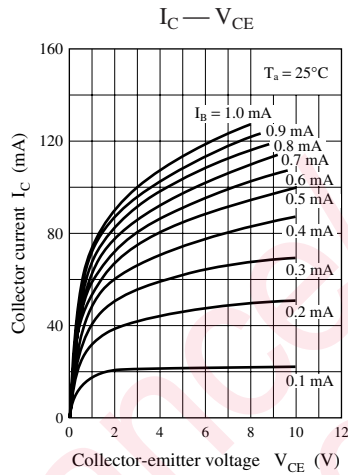
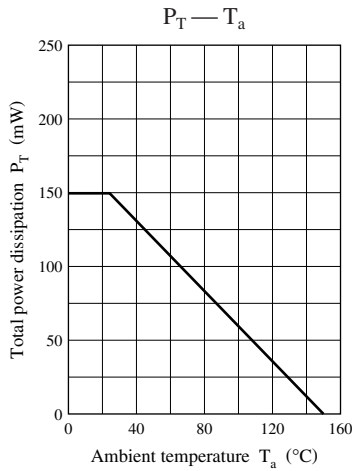


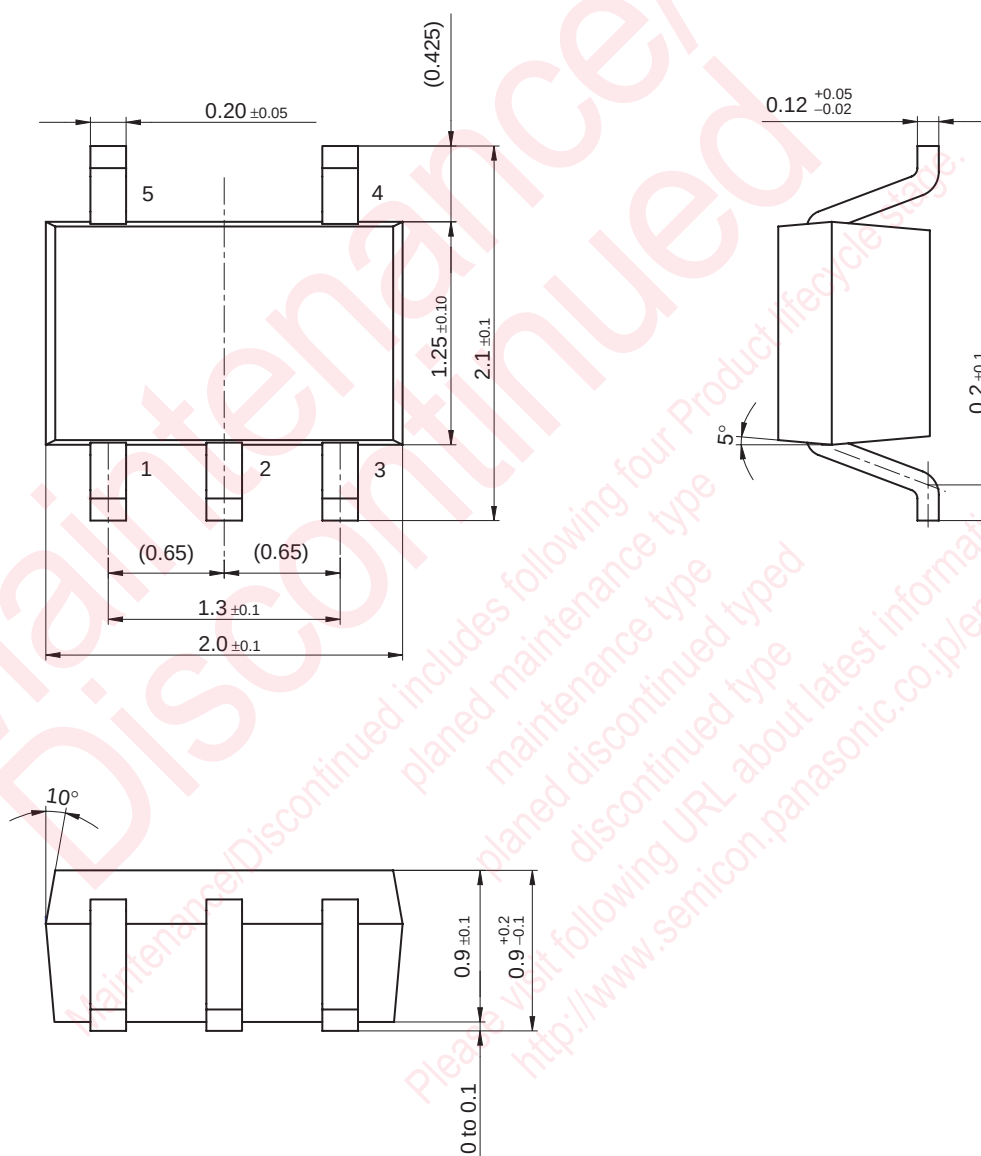
### ■ Electrical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

| 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) | $I_{EBO}$                           | $V_{EB} = 6\ \text{V}$ , $I_C = 0$                                         |      |      | 0.01 | mA               |
| Forward current transfer ratio               | $h_{FE}$                            | $V_{CE} = 10\ \text{V}$ , $I_C = 5\ \text{mA}$                             | 160  |      | 460  | —                |
| $h_{FE}$ Ratio *                             | $h_{FE(\text{Small}/\text{Large})}$ | $V_{CE} = 10\ \text{V}$ , $I_C = 5\ \text{mA}$                             | 0.50 | 0.99 |      | —                |
| Collector-emitter saturation voltage         | $V_{CE(\text{sat})}$                | $I_C = 10\ \text{mA}$ , $I_B = 0.3\ \text{mA}$                             |      |      | 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                     | $V_{OL}$                            | $V_{CC} = 5\ \text{V}$ , $V_B = 2.5\ \text{V}$ , $R_L = 1\ \text{k}\Omega$ |      |      | 0.2  | V                |
| Input resistance                             | $R_i$                               |                                                                            | -30% | 4.7  | +30% | $\text{k}\Omega$ |
| Transition frequency                         | $f_T$                               | $V_{CB} = 10\ \text{V}$ , $I_E = -2\ \text{mA}$ , $f = 200\ \text{MHz}$    |      | 150  |      | MHz              |

Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

2. \*: Ratio between 2 elements





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