

# XP0121M

## Silicon NPN epitaxial planar type

For switching/digital circuits

### ■ Features

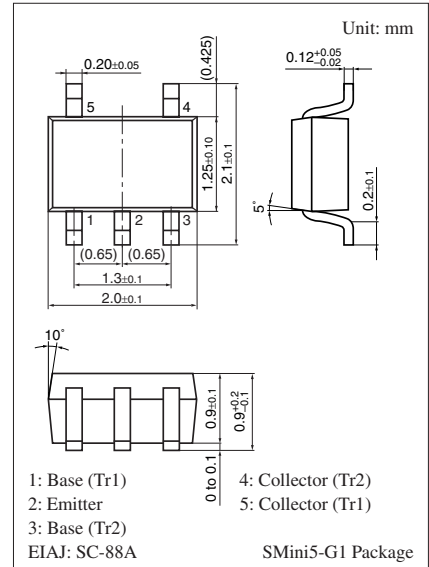
- Two elements incorporated into one package  
(Emitter-coupled transistors with built-in resistor)
- Reduction of the mounting area and assembly cost by one half

### ■ Basic Part Number

- UNR221M × 2

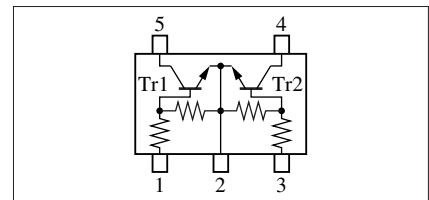
### ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

| 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 | $^\circ\text{C}$ |



Marking Symbol: EM

Internal Connection

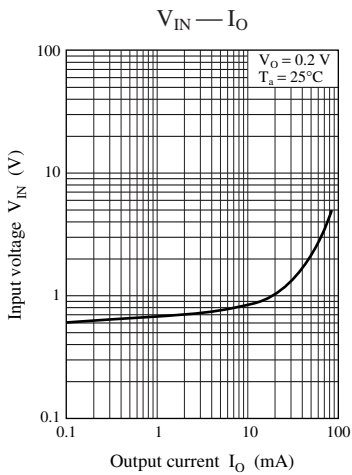
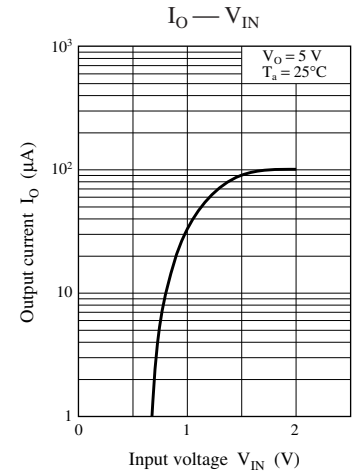
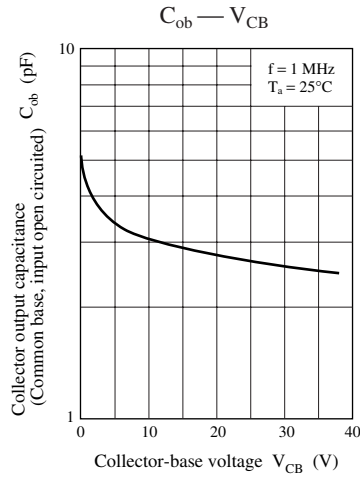
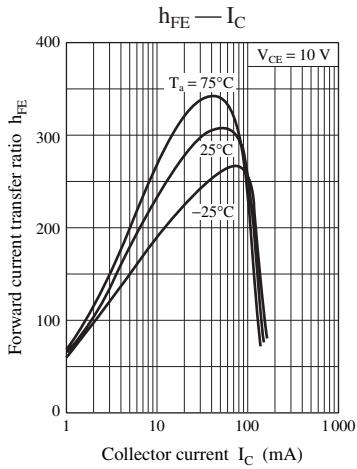
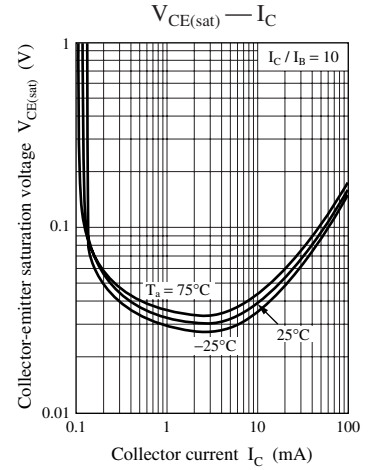
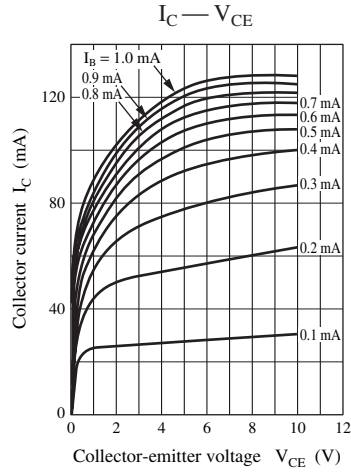
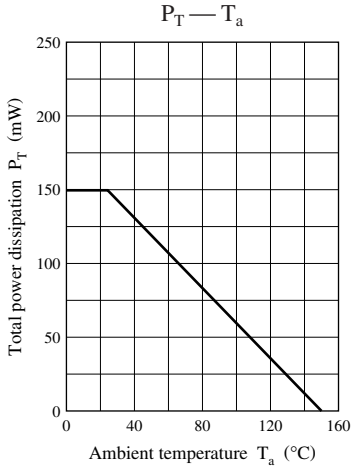


### ■ Electrical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

| 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) | $I_{EBO}$                                     | $V_{EB} = 6 \text{ V}, I_C = 0$                                      |      |       | 0.2  | mA               |
| Forward current transfer ratio               | $h_{FE}$                                      | $V_{CE} = 10 \text{ V}, I_C = 5 \text{ mA}$                          | 80   |       |      | —                |
| $h_{FE}$ Ratio *                             | $h_{FE(\text{Small})} / h_{FE(\text{Large})}$ | $V_{CE} = 10 \text{ V}, I_C = 5 \text{ mA}$                          | 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% | 2.2   | +30% | $\text{k}\Omega$ |
| Resistance ratio                             | $R_I / R_2$                                   |  |      | 0.047 |      | —                |
| 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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