

# PU3123, PU4123, PU4423

Silicon NPN Triple-Diffused Planar Darlington Type

Power Amplifier, Switching

## ■ Features

- Built-in 60V Zener diode between C and B
- Very small fluctuation in breakdown voltage
- Large energy handling capability
- High speed switching
- PU3123: 3 NPN elements
- PU4123: 4 NPN elements
- PU4423: 2 NPN elements

## ■ Absolute Maximum Ratings (Tc=25°C)

| Item                      | Symbol    | Value           | Unit |
|---------------------------|-----------|-----------------|------|
| Collector-base voltage    | $V_{CBO}$ | $60 \pm 10$     | V    |
| Collector-emitter voltage | $V_{CEO}$ | $60 \pm 10$     | V    |
| Emitter-base voltage      | $V_{EBO}$ | 5               | V    |
| Peak collector current    | $I_{CP}$  | 4               | A    |
| Collector current         | $I_C$     | 2               | A    |
| Power dissipation         | $P_D$     | 15              | W    |
| Junction temperature      | $T_j$     | 150             | °C   |
| Storage temperature       | $T_{stg}$ | $-55 \sim +150$ | °C   |

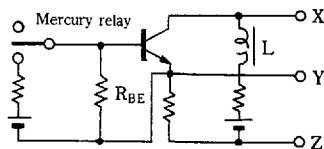
## ■ Electrical Characteristics (Tc=25°C)

| Item                                 | Symbol         | Condition                                 | min. | typ. | max.  | Unit    |
|--------------------------------------|----------------|-------------------------------------------|------|------|-------|---------|
| Collector cutoff current             | $I_{CBO}$      | $V_{CBO} = 50V, I_E = 0$                  |      |      | 100   | $\mu A$ |
| Emitter cutoff current               | $I_{EBO}$      | $V_{EB} = 5V, I_C = 0$                    |      |      | 2     | mA      |
| Collector-emitter voltage            | $V_{CEO}$      | $I_C = 5mA, I_B = 0$                      | 50   |      | 70    | V       |
| DC current gain                      | $h_{FE1}$      | $V_{CE} = 4V, I_C = 1A$                   | 1000 |      |       |         |
|                                      | $h_{FE2}^{*1}$ | $V_{CE} = 4V, I_C = 2A$                   | 1000 |      | 10000 |         |
| Collector-emitter saturation voltage | $V_{CE(sat)}$  | $I_C = 2A, I_B = 8mA$                     |      |      | 2.5   | V       |
| Base-emitter saturation voltage      | $V_{BE(sat)}$  | $I_C = 2A, I_B = 8mA$                     |      |      | 2.5   | V       |
| Transition frequency                 | $f_T$          | $V_{CE} = 10V, I_C = 0.5A, f = 1MHz$      |      | 20   |       | MHz     |
| Turn-on time                         | $t_{on}$       | $I_C = 2A, I_{B1} = 8mA, I_{B2} = -8mA$   |      | 0.4  |       | $\mu s$ |
| Storage time                         | $t_{stg}$      |                                           |      | 3    |       | $\mu s$ |
| Fall time                            | $t_f$          |                                           |      | 1    |       | $\mu s$ |
| Energy handling capability           | $E_{sb}^{*2}$  | $I_C = 1A, L = 100mH, R_{BE} = 100\Omega$ | 25   |      |       | mJ      |

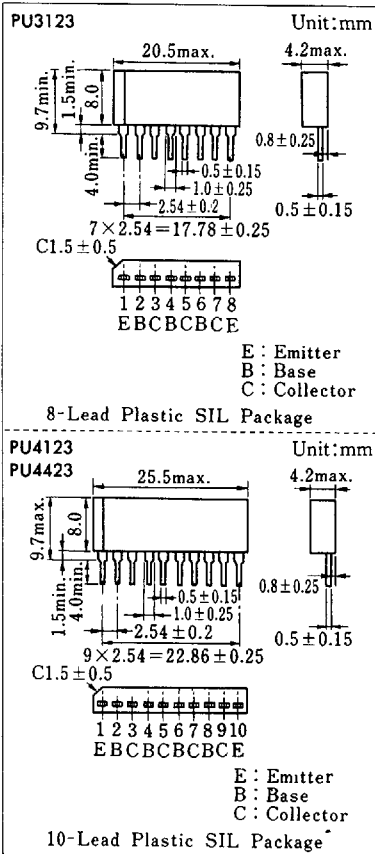
$^{*1} h_{FE2}$  Classifications

| Class     | Free         | Q           | P            |
|-----------|--------------|-------------|--------------|
| $h_{FE2}$ | 1000 ~ 10000 | 1000 ~ 5000 | 2000 ~ 10000 |

$^{*2} E_{sb}$  Test circuit (1 circuit) [www.DataSheet4U.com](http://www.DataSheet4U.com)



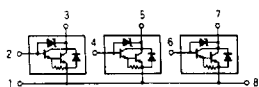
## ■ Package Dimensions



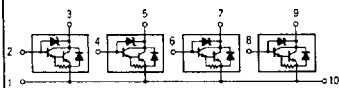
6932852 0017012 987

## ■ Inner Circuit

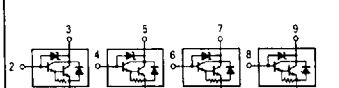
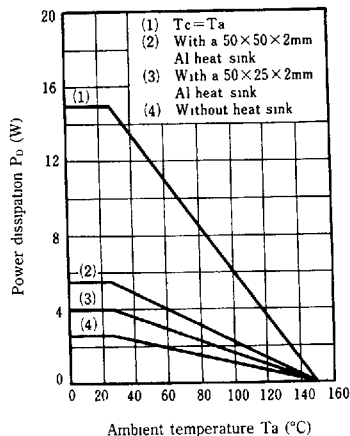
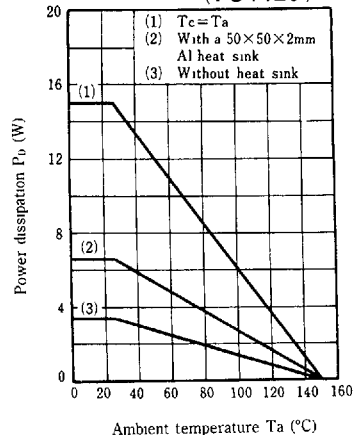
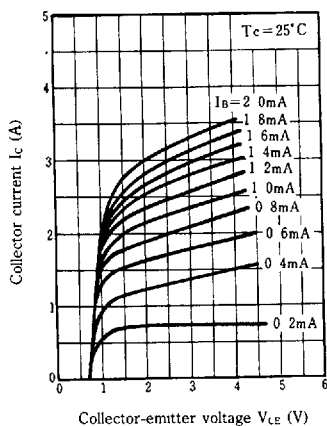
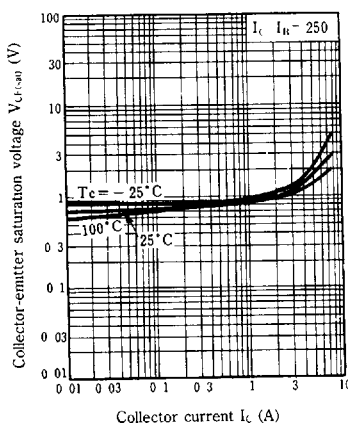
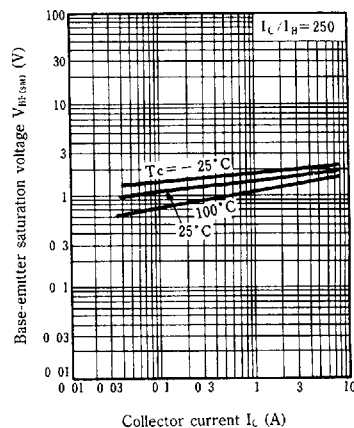
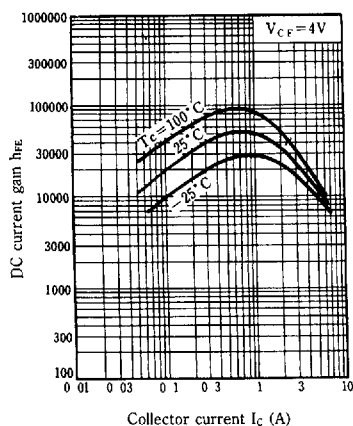
PU3123



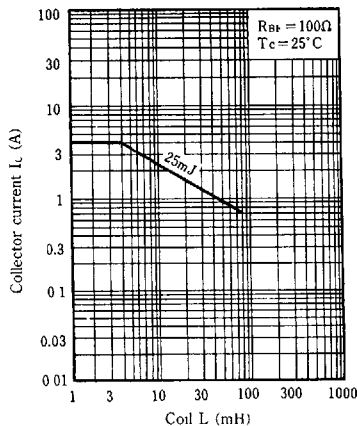
PU4123



PU4423

 $P_D - T_a$  (PU3123) $P_D - T_a$  (PU4123, PU4423) $I_C - V_{CE}$  $V_{CE(sat)} - I_C$  $V_{BE(sat)} - I_C$  $h_{FE} - I_C$ 

Induced load



Area of safe operation (ASO)

