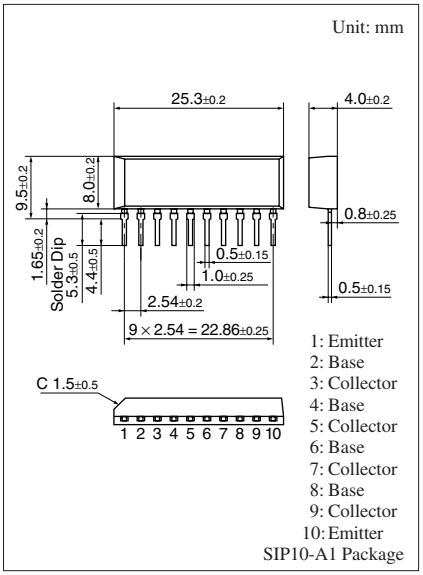
# PUB4120 (PU4120), PUB4420 (PU4420)

## Silicon NPN triple diffusion planar type darlington

For power amplification

Complementary to PUB4220 (PU4220), PUB4520 (PU4520)




### ■ Features

- High forward current transfer ratio $h_{FE}$
- High-speed switching
- PUB4120 (PU4120): NPN 4 elements
  PUB4420 (PU4420): NPN 2 elements × 2

### ■ Absolute Maximum Ratings $T_C = 25°C$

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Collector-base voltage (Emitter open) | $V_{CBO}$ | 60 | V |
| Collector-emitter voltage (Base open) | $V_{CEO}$ | 60 | V |
| Emitter-base voltage (Collector open) | $V_{EBO}$ | 5 | V |
| Collector current | $I_C$ | 4 | A |
| Peak collector current | $I_{CP}$ | 8 | A |
| Collector power dissipation | $P_C$ | 15 | W |
| $T_a = 25°C$ | | 3.5 | |
| Junction temperature | $T_j$ | 150 | °C |
| Storage temperature | $T_{stg}$ | −55 to +150 | °C |

### ■ Electrical Characteristics $T_C = 25°C \pm 3°C$

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Collector-emitter voltage (Base open) | $V_{CEO}$ | $I_C$ = 30 mA, $I_B$ = 0 | 60 | | | V |
| Base-emitter voltage | $V_{BE}$ | $V_{CE}$ = 3 V, $I_C$ = 3 A | | | 2.5 | V |
| Collector-base cutoff current (Emitter open) | $I_{CBO}$ | $V_{CB}$ = 60 V, $I_E$ = 0 | | | 200 | μA |
| Collector-emitter cutoff current (Base open) | $I_{CEO}$ | $V_{CE}$ = 30 V, $I_B$ = 0 | | | 500 | μA |
| Emitter-base cutoff current (Collector open) | $I_{EBO}$ | $V_{EB}$ = 5 V, $I_C$ = 0 | | | 2 | mA |
| Forward current transfer ratio | $h_{FE1}$ | $V_{CE}$ = 3 V, $I_C$ = 0.5 A | 1 000 | | | — |
| | $h_{FE2}$ * | $V_{CE}$ = 3 V, $I_C$ = 3 A | 1 000 | | 10 000 | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C$ = 3 A, $I_B$ = 12 mA | | | 2.0 | V |
| Transition frequency | $f_T$ | $V_{CE}$ = 10 V, $I_C$ = 0.5 A, f = 1 MHz | | 20 | | MHz |
| Turn-on time | $t_{on}$ | $I_C$ = 3 A | | 0.5 | | μs |
| Storage time | $t_{stg}$ | $I_{B1}$ = 12 mA, $I_{B2}$ = −12 mA | | 4.0 | | μs |
| Fall time | $t_f$ | $V_{CC}$ = 50 V | | 1.0 | | μs |

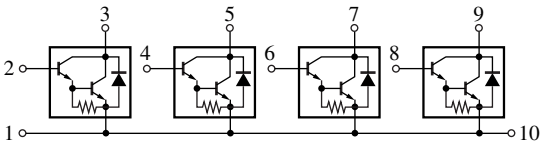
Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

2. *: Rank classification

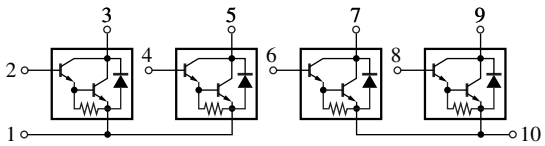
| Rank | Free | P | Q |
|---|---|---|---|
| $h_{FE}$ | 1 000 to 10 000 | 2 000 to 10 000 | 1 000 to 5 000 |

### ■ Internal Connection

• PUB4120

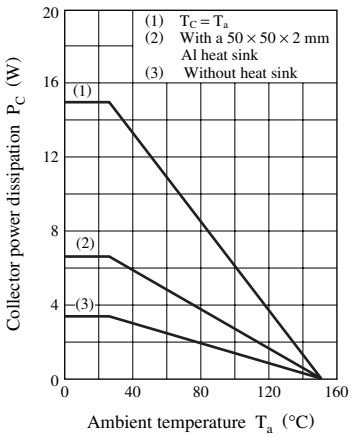



• PUB4420

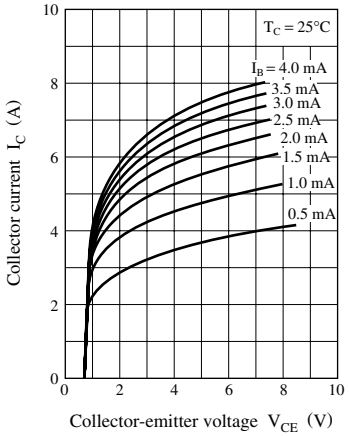



Note) The part numbers in the parenthesis show conventional part number.

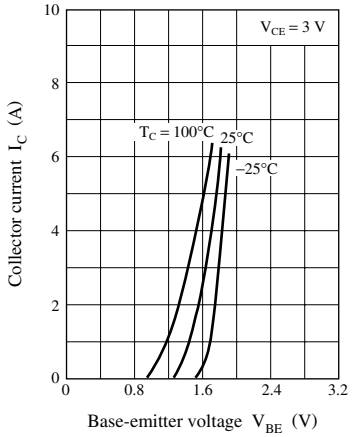
$P_C$ — $T_a$



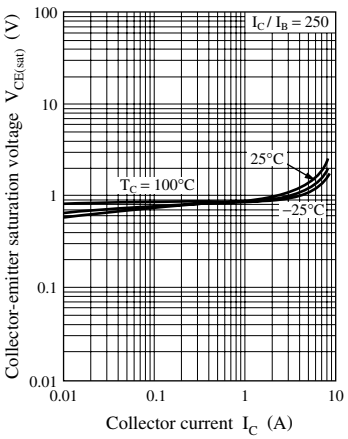

$I_C$ — $V_{CE}$



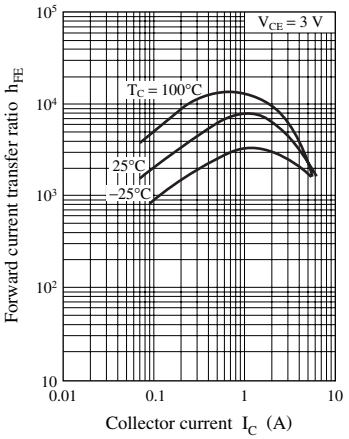

$I_C$ — $V_{BE}$



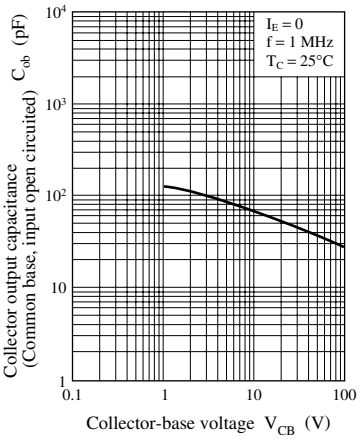

$V_{CE(sat)}$ — $I_C$



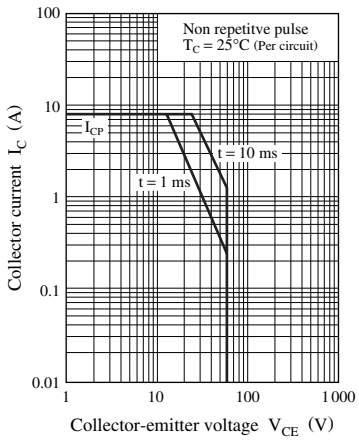

$h_{FE}$ — $I_C$




$C_{ob}$ — $V_{CB}$




Safe operation area



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