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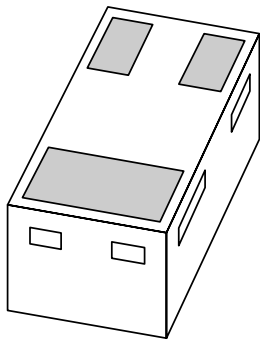
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Team Nexperia

# DATA SHEET



## **2PA1774M series** PNP general purpose transistor

Product data sheet

2004 Feb 19

## PNP general purpose transistor

## 2PA1774M series

## FEATURES

- Leadless ultra small plastic package (1 mm × 0.6 mm × 0.5 mm)
- Board space 1.3 mm × 0.9 mm
- Power dissipation comparable to SOT23.

## APPLICATIONS

- General purpose small signal DC
- Low and medium frequency AC applications
- Mobile communications, digital (still) cameras, PDAs, PCMCIA cards.

## DESCRIPTION

PNP general purpose transistor in a SOT883 leadless ultra small plastic package.

NPN complement: 2PC4617M series.

## MARKING

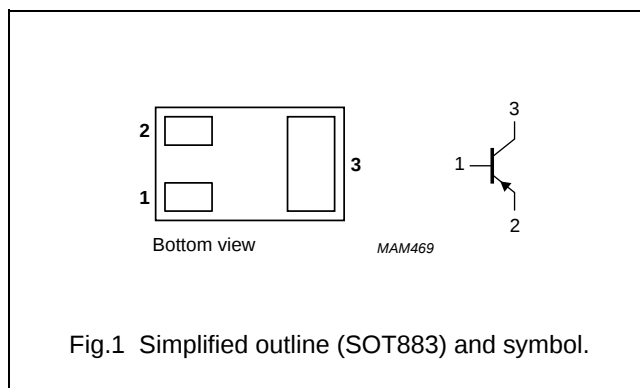
| TYPE NUMBER | MARKING CODE |
|-------------|--------------|
| 2PA1774QM   | PB           |
| 2PA1774RM   | PA           |
| 2PA1774SM   | PC           |

## QUICK REFERENCE DATA

| SYMBOL    | PARAMETER                 | MAX. | UNIT |
|-----------|---------------------------|------|------|
| $V_{CEO}$ | collector-emitter voltage | −40  | V    |
| $I_C$     | collector current (DC)    | −100 | mA   |
| $I_{CM}$  | peak collector current    | −200 | mA   |

## PINNING

| PIN | DESCRIPTION |
|-----|-------------|
| 1   | base        |
| 2   | emitter     |
| 3   | collector   |



## ORDERING INFORMATION

| TYPE NUMBER | PACKAGE |                                                                               |         |
|-------------|---------|-------------------------------------------------------------------------------|---------|
|             | NAME    | DESCRIPTION                                                                   | VERSION |
| 2PA1774QM   | —       | leadless ultra small plastic package; 3 solder lands; body 1.0 x 0.6 x 0.5 mm | SOT883  |
| 2PA1774RM   | —       |                                                                               |         |
| 2PA1774SM   | —       |                                                                               |         |

## PNP general purpose transistor

## 2PA1774M series

**LIMITING VALUES**

In accordance with the Absolute Maximum System (IEC 60134).

| SYMBOL    | PARAMETER                     | CONDITIONS                                      | MIN.   | MAX.       | UNIT     |
|-----------|-------------------------------|-------------------------------------------------|--------|------------|----------|
| $V_{CBO}$ | collector-base voltage        | open emitter                                    | –      | –50        | V        |
| $V_{CEO}$ | collector-emitter voltage     | open base                                       | –      | –40        | V        |
| $V_{EBO}$ | emitter-base voltage          | open collector                                  | –      | –5         | V        |
| $I_C$     | collector current (DC)        |                                                 | –      | –100       | mA       |
| $I_{CM}$  | peak collector current        |                                                 | –      | –200       | mA       |
| $I_{BM}$  | peak base current             |                                                 | –      | –100       | mA       |
| $P_{tot}$ | total power dissipation       | $T_{amb} \leq 25\text{ °C}$<br>note 1<br>note 2 | –<br>– | 250<br>430 | mW<br>mW |
| $T_{stg}$ | storage temperature           |                                                 | –65    | +150       | °C       |
| $T_j$     | junction temperature          |                                                 | –      | 150        | °C       |
| $T_{amb}$ | operating ambient temperature |                                                 | –65    | +150       | °C       |

**Notes**

1. Refer to SOT883 standard mounting conditions (footprint), FR4 with 60 µm copper strip line.
2. Device mounted on a FR4 printed-circuit board, single-sided copper, mounting pad for collector 1 cm<sup>2</sup>.

**THERMAL CHARACTERISTICS**

| SYMBOL        | PARAMETER                                   | CONDITIONS                      | VALUE      | UNIT       |
|---------------|---------------------------------------------|---------------------------------|------------|------------|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air<br>note 1<br>note 2 | 500<br>290 | K/W<br>K/W |

**Notes**

1. Refer to SOT883 standard mounting conditions (footprint), FR4 with 60 µm copper strip line.
2. Device mounted on a FR4 printed-circuit board, single-sided copper, mounting pad for collector 1 cm<sup>2</sup>.

PNP general purpose transistor

2PA1774M series

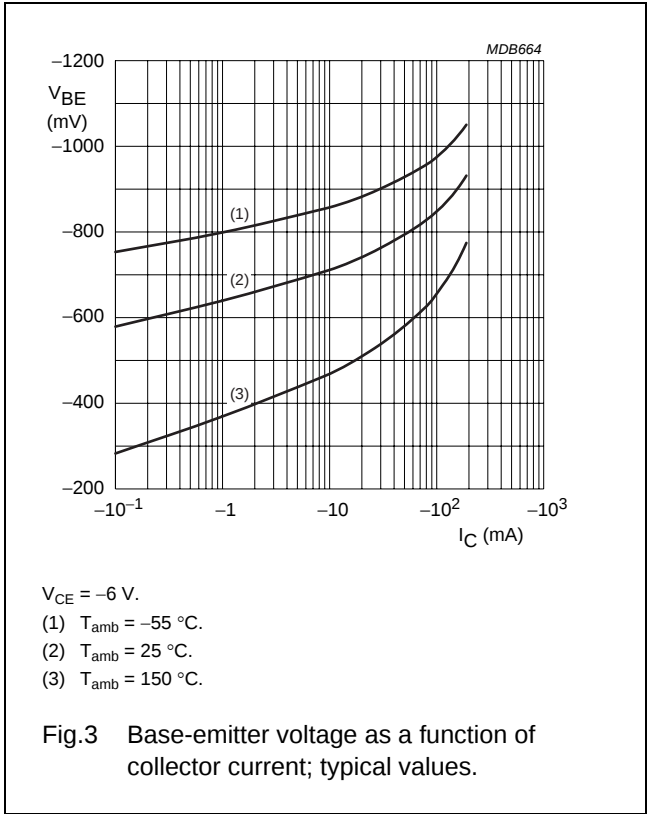
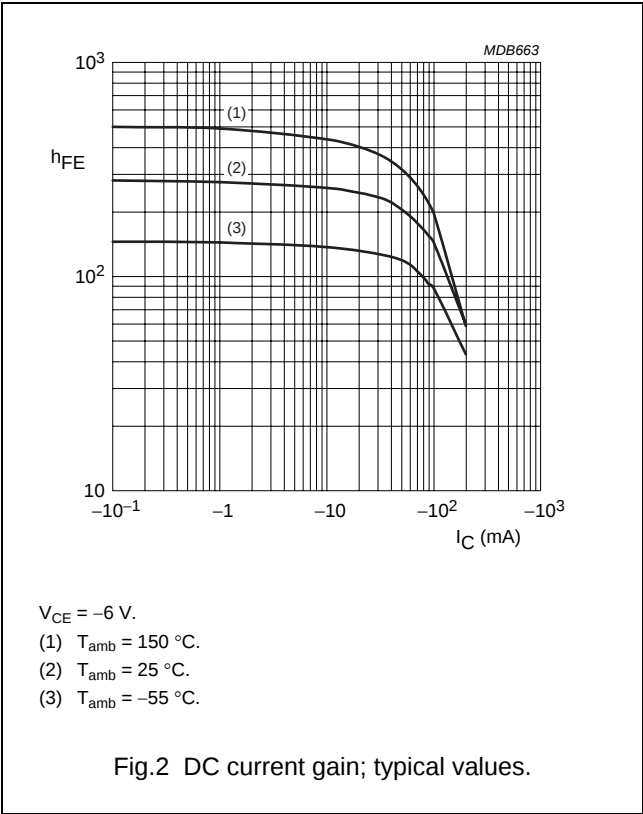
CHARACTERISTICS

T<sub>amb</sub> = 25 °C unless otherwise specified.

| SYMBOL             | PARAMETER                            | CONDITIONS                                                              | MIN. | MAX. | UNIT |
|--------------------|--------------------------------------|-------------------------------------------------------------------------|------|------|------|
| I <sub>CBO</sub>   | collector-base cut-off current       | V <sub>CB</sub> = -30 V; I <sub>E</sub> = 0                             | –    | –100 | nA   |
|                    |                                      | V <sub>CB</sub> = -30 V; I <sub>E</sub> = 0; T <sub>j</sub> = 150 °C    | –    | –5   | μA   |
| I <sub>EBO</sub>   | emitter-base cut-off current         | V <sub>EB</sub> = -4 V; I <sub>C</sub> = 0                              | –    | –100 | nA   |
| h <sub>FE</sub>    | DC current gain                      | V <sub>CE</sub> = -6 V; I <sub>C</sub> = -1 mA                          |      |      |      |
|                    |                                      |                                                                         |      |      |      |
|                    |                                      |                                                                         |      |      |      |
|                    |                                      |                                                                         |      |      |      |
| V <sub>CEsat</sub> | collector-emitter saturation voltage | I <sub>C</sub> = -50 mA; I <sub>B</sub> = -5 mA; note 1                 | –    | –200 | mV   |
| C <sub>c</sub>     | collector capacitance                | I <sub>E</sub> = i <sub>e</sub> = 0; V <sub>CB</sub> = -12 V; f = 1 MHz | –    | 2.2  | pF   |
| f <sub>T</sub>     | transition frequency                 | V <sub>CE</sub> = -12 V; I <sub>C</sub> = -2 mA;<br>f = 100 MHz         | 100  | –    | MHz  |

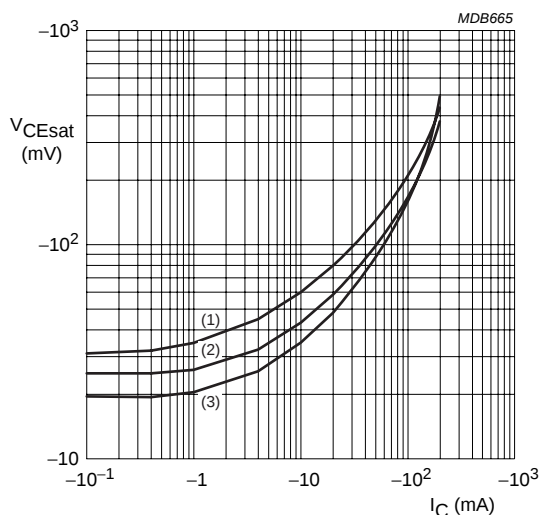
Note

1. Pulse test: t<sub>p</sub> ≤ 300 μs; δ ≤ 0.02.



## PNP general purpose transistor

## 2PA1774M series



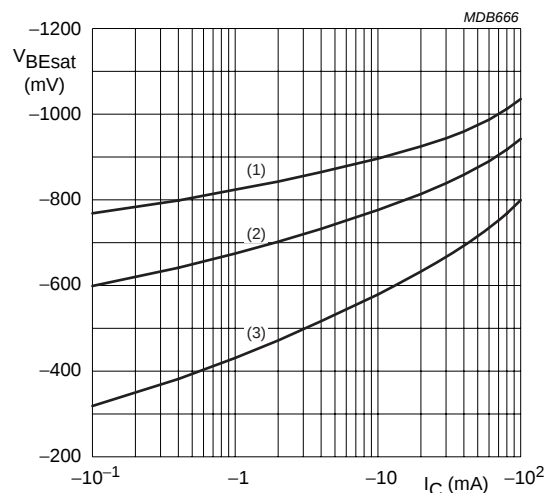
$I_C/I_B = 10$ .

(1)  $T_{amb} = 150\text{ }^{\circ}\text{C}$ .

(2)  $T_{amb} = 25\text{ }^{\circ}\text{C}$ .

(3)  $T_{amb} = -55\text{ }^{\circ}\text{C}$ .

Fig.4 Collector-emitter saturation voltage as a function of collector current; typical values.



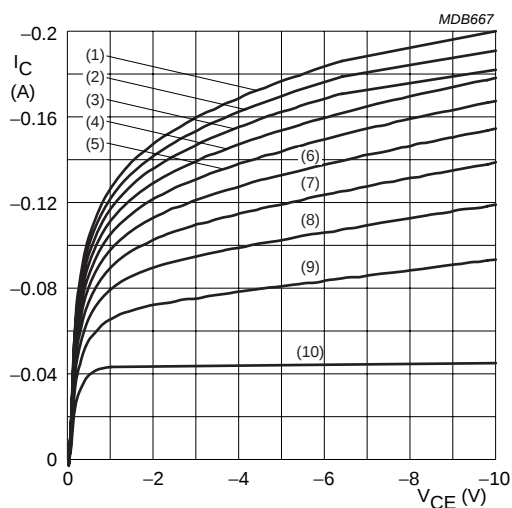
$I_C/I_B = 10$ .

(1)  $T_{amb} = -55\text{ }^{\circ}\text{C}$ .

(2)  $T_{amb} = 25\text{ }^{\circ}\text{C}$ .

(3)  $T_{amb} = 150\text{ }^{\circ}\text{C}$ .

Fig.5 Base-emitter saturation voltage as a function of collector current; typical values.



(1)  $I_B = -2.7\text{ mA}$ .

(5)  $I_B = -1.62\text{ mA}$ .

(9)  $I_B = -0.54\text{ mA}$ .

(2)  $I_B = -2.43\text{ mA}$ .

(6)  $I_B = -1.35\text{ mA}$ .

(10)  $I_B = -0.27\text{ mA}$ .

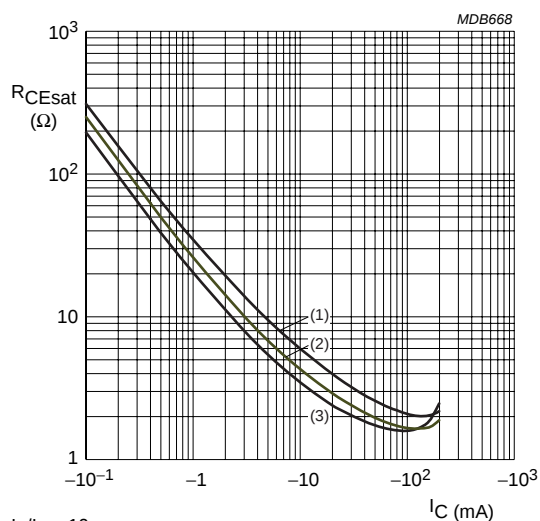
(3)  $I_B = -2.16\text{ mA}$ .

(7)  $I_B = -1.08\text{ mA}$ .

(4)  $I_B = -1.89\text{ mA}$ .

(8)  $I_B = -0.81\text{ mA}$ .

Fig.6 Collector current as a function of collector-emitter voltage; typical values.



$I_C/I_B = 10$ .

(1)  $T_{amb} = 150\text{ }^{\circ}\text{C}$ .

(2)  $T_{amb} = 25\text{ }^{\circ}\text{C}$ .

(3)  $T_{amb} = -55\text{ }^{\circ}\text{C}$ .

Fig.7 Collector-emitter equivalent on-resistance as a function of collector current; typical values.

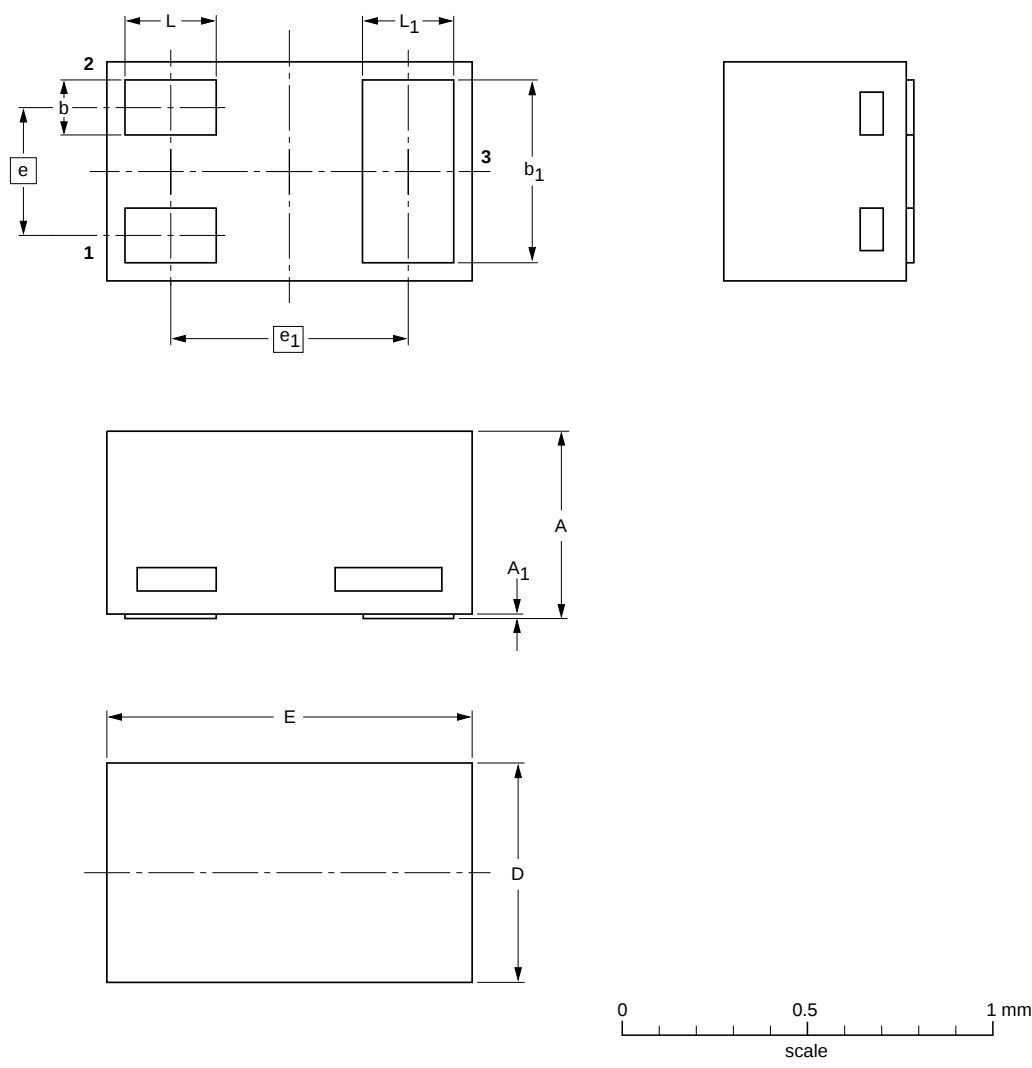
PNP general purpose transistor

2PA1774M series

PACKAGE OUTLINE

Leadless ultra small plastic package; 3 solder lands; body 1.0 x 0.6 x 0.5 mm

SOT883



DIMENSIONS (mm are the original dimensions)

| UNIT | A <sup>(1)</sup> | A <sub>1</sub><br>max. | b            | b <sub>1</sub> | D            | E            | e    | e <sub>1</sub> | L            | L <sub>1</sub> |
|------|------------------|------------------------|--------------|----------------|--------------|--------------|------|----------------|--------------|----------------|
| mm   | 0.50<br>0.46     | 0.03                   | 0.20<br>0.12 | 0.55<br>0.47   | 0.62<br>0.55 | 1.02<br>0.95 | 0.35 | 0.65           | 0.30<br>0.22 | 0.30<br>0.22   |

Note

1. Including plating thickness

| OUTLINE<br>VERSION | REFERENCES |       |        |  | EUROPEAN<br>PROJECTION                                                                | ISSUE DATE           |
|--------------------|------------|-------|--------|--|---------------------------------------------------------------------------------------|----------------------|
|                    | IEC        | JEDEC | JEITA  |  |                                                                                       |                      |
| SOT883             |            |       | SC-101 |  |  | 03-02-05<br>03-04-03 |

## PNP general purpose transistor

## 2PA1774M series

## DATA SHEET STATUS

| DOCUMENT STATUS <sup>(1)</sup> | PRODUCT STATUS <sup>(2)</sup> | DEFINITION                                                                            |
|--------------------------------|-------------------------------|---------------------------------------------------------------------------------------|
| Objective data sheet           | Development                   | This document contains data from the objective specification for product development. |
| Preliminary data sheet         | Qualification                 | This document contains data from the preliminary specification.                       |
| Product data sheet             | Production                    | This document contains the product specification.                                     |

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