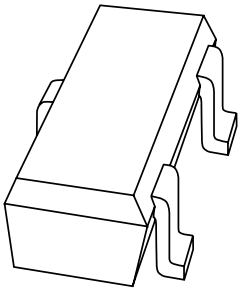
# DATA SHEET





# 2PB709AW

## PNP general purpose transistor

Product data sheet

2002 Jun 26

founded by Philips

# PNP general purpose transistor 2PB709AW

## FEATURES

- High collector current (max. 100 mA)
- Low collector-emitter saturation voltage (max. 500 mV).

## APPLICATIONS

- General purpose switching and amplification.

## DESCRIPTION

PNP transistor in an SC-70 (SOT323) plastic package.
NPN complement: 2PD601AW

## MARKING

| TYPE NUMBER | MARKING CODE(1) |
|---|---|
| 2PB709AQW | N5* |
| 2PB709ARW | N7* |
| 2PB709ASW | N9* |

**Note**

1. * = p: made in Hong Kong.
   * = t: made in Malaysia.

## PINNING

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

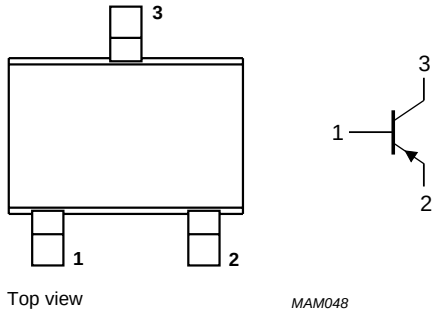



Fig.1 Simplified outline SC-70 (SOT323) and symbol.

## LIMITING VALUES

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| $V_{CBO}$ | collector-base voltage | open emitter | – | –45 | V |
| $V_{CEO}$ | collector-emitter voltage | open base | – | –45 | V |
| $V_{EBO}$ | emitter-base voltage | open collector | – | –6 | V |
| $I_C$ | collector current (DC) | | – | –100 | mA |
| $I_{CM}$ | peak collector current | | – | –200 | mA |
| $P_{tot}$ | total power dissipation | $T_{amb} \leq 25$ °C; note 1 | – | 200 | mW |
| $T_{stg}$ | storage temperature | | –65 | +150 | °C |
| $T_j$ | junction temperature | | – | 150 | °C |
| $T_{amb}$ | operating ambient temperature | | –65 | +150 | °C |

**Note**

1. For mounting conditions, see *"Thermal considerations and footprint design for SOT323 in the General Part of Data Handbook SC18".*

## THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---|---|---|---|---|
| $R_{th\ j\text{-}a}$ | thermal resistance from junction to ambient | note 1 | 625 | K/W |

**Note**

1. For mounting conditions, see *"Thermal considerations and footprint design for SOT323 in the General Part of Data Handbook SC18".*

## CHARACTERISTICS

$T_{amb}$ = 25 °C unless otherwise specified.

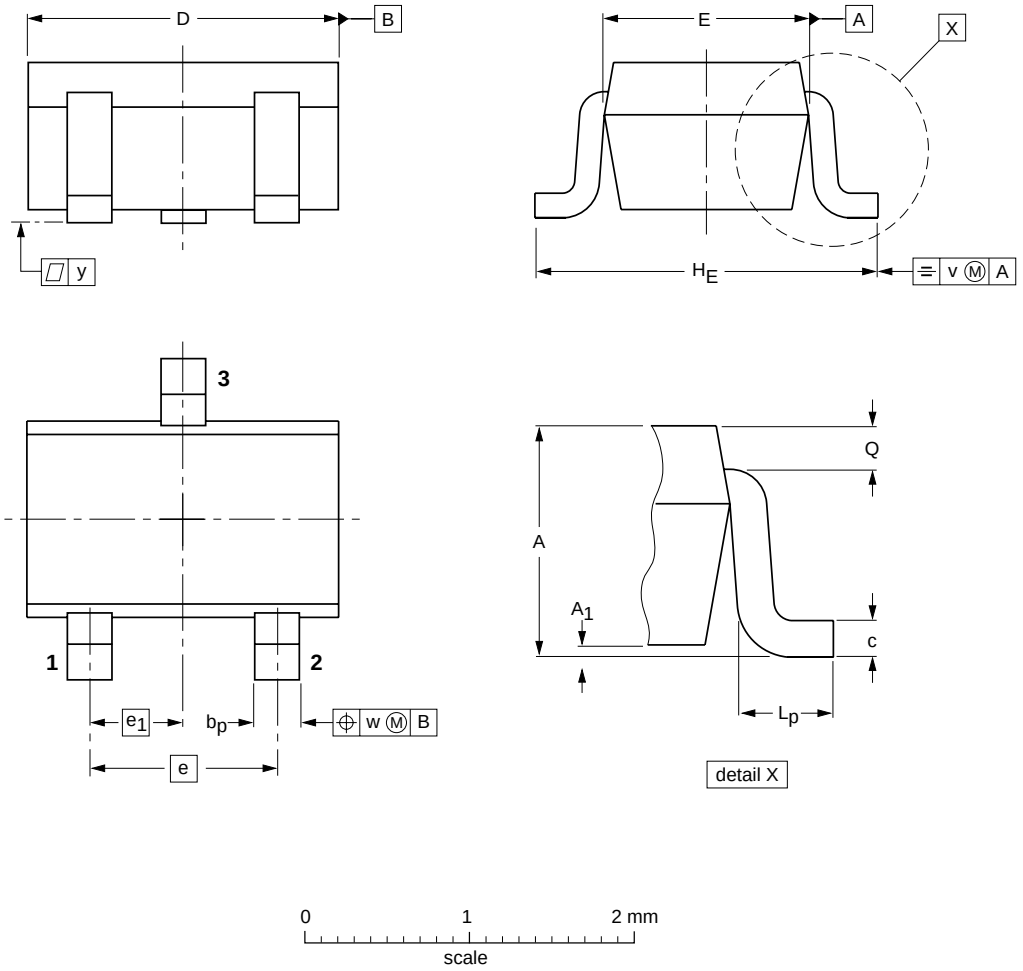
| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| $I_{CBO}$ | collector-base cut-off current | $I_E = 0$; $V_{CB} = -45$ V | – | –10 | nA |
| | | $I_E = 0$; $V_{CB} = -45$ V; $T_j = 150$ °C | – | –5 | μA |
| $I_{EBO}$ | emitter-base cut-off current | $I_C = 0$; $V_{EB} = -5$ V | – | –10 | nA |
| $h_{FE}$ | DC current gain | $I_C = -2$ mA; $V_{CE} = -10$ V | | | |
| | 2PB709AQW | | 160 | 260 | |
| | 2PB709ARW | | 210 | 340 | |
| | 2PB709ASW | | 290 | 460 | |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C = -100$ mA; $I_B = -10$ mA; note 1 | – | –500 | mV |
| $C_c$ | collector capacitance | $I_E = i_e = 0$; $V_{CB} = -10$ V; f = 1 MHz | – | 5 | pF |
| $f_T$ | transition frequency | $I_C = -1$ mA; $V_{CE} = -10$ V; f = 100 MHz | | | |
| | 2PB709AQW | | 60 | – | MHz |
| | 2PB709ARW | | 70 | – | MHz |
| | 2PB709ASW | | 80 | – | MHz |

**Note**

1. Pulse test: $t_p \leq 300$ μs; $\delta \leq 0.02$.

## PACKAGE OUTLINE

**Plastic surface mounted package; 3 leads** **SOT323**




**DIMENSIONS (mm are the original dimensions)**

| UNIT | A | $A_1$ max | $b_p$ | c | D | E | e | $e_1$ | $H_E$ | $L_p$ | Q | v | w |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 1.1<br>0.8 | 0.1 | 0.4<br>0.3 | 0.25<br>0.10 | 2.2<br>1.8 | 1.35<br>1.15 | 1.3 | 0.65 | 2.2<br>2.0 | 0.45<br>0.15 | 0.23<br>0.13 | 0.2 | 0.2 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | EIAJ | | | |
| SOT323 | | | SC-70 | | | 97-02-28 |

## DATA SHEET STATUS

| DOCUMENT STATUS[1] | PRODUCT STATUS[2] | 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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