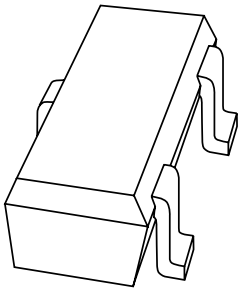
# DATA SHEET



# 2PD602A
## NPN general purpose transistor

Product specification
Supersedes data of 1997 Jun 20

1999 Apr 23

Philips
Semiconductors

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# NPN general purpose transistor 2PD602A

## FEATURES

- High current (max. 500 mA)
- Low voltage (max. 50 V).

## APPLICATIONS

- General purpose switching and amplification.

## DESCRIPTION

NPN transistor in an SC-59 plastic package.
PNP complement: 2PB710A.

## MARKING

| TYPE NUMBER | MARKING CODE |
|---|---|
| 2PD602AQ | XQ |
| 2PD602AR | XR |
| 2PD602AS | XS |

## PINNING

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

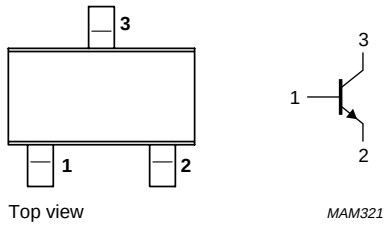



Fig.1 Simplified outline (SC-59) and symbol.

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| $V_{CBO}$ | collector-base voltage | open emitter | – | 60 | V |
| $V_{CEO}$ | collector-emitter voltage | open base | – | 50 | V |
| $V_{EBO}$ | emitter-base voltage | open collector | – | 5 | V |
| $I_C$ | collector current (DC) | | – | 500 | mA |
| $I_{CM}$ | peak collector current | | – | 1 | A |
| $I_{BM}$ | peak base current | | – | 200 | mA |
| $P_{tot}$ | total power dissipation | $T_{amb} \leq 25$ °C; note 1 | – | 250 | mW |
| $T_{stg}$ | storage temperature | | –65 | +150 | °C |
| $T_j$ | junction temperature | | – | 150 | °C |
| $T_{amb}$ | operating ambient temperature | | –65 | +150 | °C |

**Note**

1. Transistor mounted on an FR4 printed-circuit board.

## THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---|---|---|---|---|
| $R_{th\ j\text{-}a}$ | thermal resistance from junction to ambient | note 1 | 500 | K/W |

**Note**

1. Transistor mounted on an FR4 printed-circuit board.

## CHARACTERISTICS

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

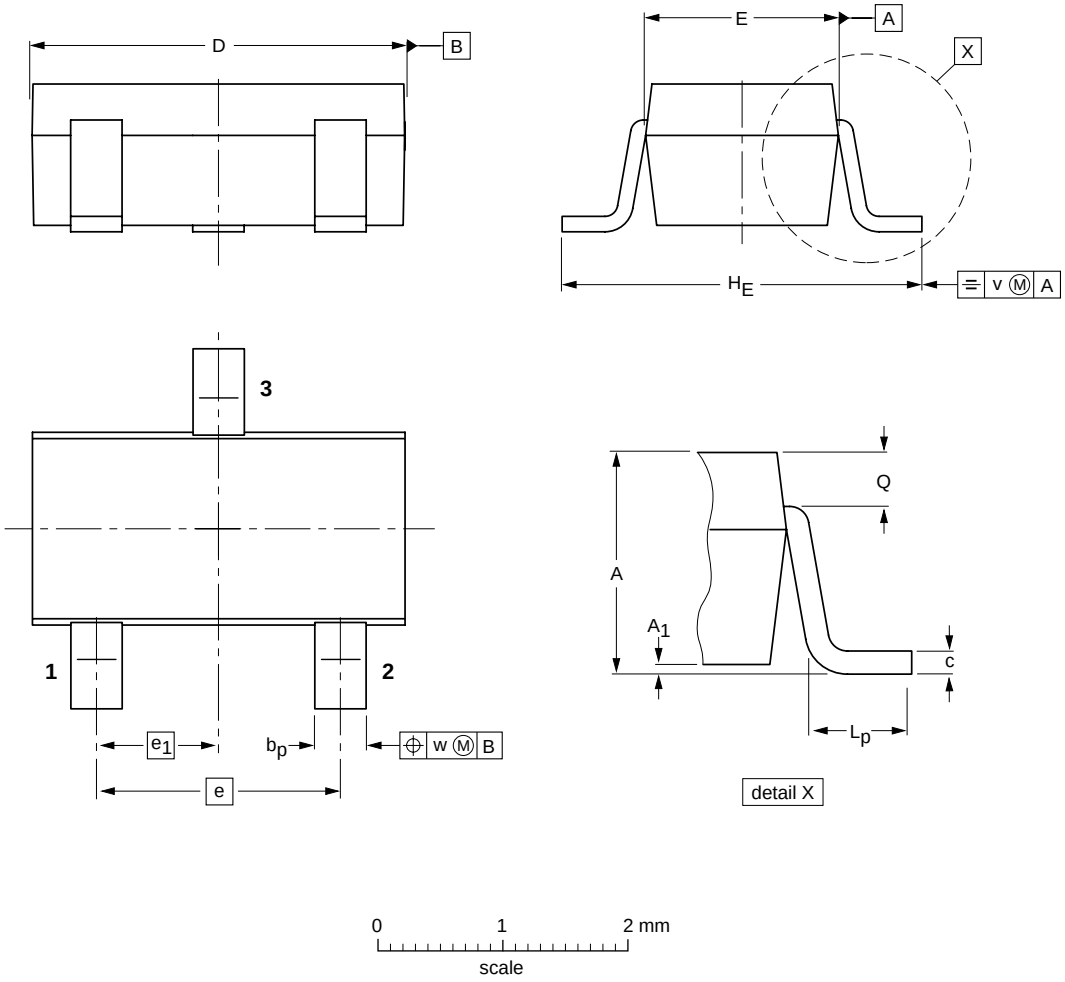
| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| $I_{CBO}$ | collector cut-off current | $I_E$ = 0; $V_{CB}$ = 60 V | – | 10 | nA |
| | | $I_E$ = 0; $V_{CB}$ = 60 V; $T_j$ = 150 °C | – | 5 | μA |
| $I_{EBO}$ | emitter cut-off current | $I_C$ = 0; $V_{EB}$ = 4 V | – | 10 | nA |
| $h_{FE}$ | DC current gain | $I_C$ = 150 mA; $V_{CE}$ = 10 V; note 1 | | | |
| | 2PD602AQ | | 85 | 170 | |
| | 2PD602AR | | 120 | 240 | |
| | 2PD602AS | | 170 | 340 | |
| | DC current gain | $I_C$ = 500 mA; $V_{CE}$ = 10 V; note 1 | 40 | – | |
| $V_{CEsat}$ | collector-emitter saturation voltage | $I_C$ = 300 mA; $I_B$ = 30 mA; note 1 | – | 600 | mV |
| $C_c$ | collector capacitance | $I_E = i_e$ = 0; $V_{CB}$ = 10 V; f = 1 MHz | – | 15 | pF |
| $f_T$ | transition frequency | $I_C$ = 50 mA; $V_{CE}$ = 10 V; f = 100 MHz; note 1 | | | |
| | 2PD602AQ | | 140 | – | MHz |
| | 2PD602AR | | 160 | – | MHz |
| | 2PD602AS | | 180 | – | MHz |

**Note**

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

## PACKAGE OUTLINE

**Plastic surface mounted package; 3 leads** **SOT346**




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

| UNIT | A | $A_1$ | $b_p$ | c | D | E | e | $e_1$ | $H_E$ | $L_p$ | Q | v | w |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 1.3<br>1.0 | 0.1<br>0.013 | 0.50<br>0.35 | 0.26<br>0.10 | 3.1<br>2.7 | 1.7<br>1.3 | 1.9 | 0.95 | 3.0<br>2.5 | 0.6<br>0.2 | 0.33<br>0.23 | 0.2 | 0.2 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | EIAJ | | | |
| SOT346 | | TO-236 | SC-59 | | | 98-07-17 |

## DEFINITIONS

| Data Sheet Status | |
|---|---|
| Objective specification | This data sheet contains target or goal specifications for product development. |
| Preliminary specification | This data sheet contains preliminary data; supplementary data may be published later. |
| Product specification | This data sheet contains final product specifications. |
| **Limiting values** | |
| Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability. | |
| **Application information** | |
| Where application information is given, it is advisory and does not form part of the specification. | |

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**NOTES**

**NOTES**

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Printed in The Netherlands 115002/00/04/pp8 Date of release: 1999 Apr 23 Document order number: 9397 750 05396


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