

DATA SHEET

2PD601A series

**NPN general purpose transistors;
50 V, 100 mA**

Product specification
Supersedes data of 2002 Jun 26

2004 Feb 12

NPN general purpose transistors; 50 V, 100 mA

2PD601A series

FEATURES

- Available in SOT323 (SC-70) and SOT346 (SC-59) packages
- Available in three different DC current gain versions (Q, R, S).

APPLICATIONS

- General purpose switching and amplification.

DESCRIPTION

NPN general purpose transistors (see “Simplified outline, symbol and pinning” for package details).

QUICK REFERENCE DATA

| SYMBOL | PARAMETER | MIN. | MAX. | UNIT |
|-----------|---------------------------|------|------|------|
| V_{CE0} | collector-emitter voltage | – | 50 | V |
| I_C | collector current (DC) | – | 100 | mA |
| h_{FE} | DC current gain | | | |
| | group Q | 160 | 260 | |
| | group R | 210 | 340 | |
| | group S | 290 | 460 | |

PRODUCT OVERVIEW

| TYPE NUMBER | PACKAGE | | MARKING CODE | h_{FE} GROUP |
|-------------|---------|-------|--------------|----------------|
| | PHILIPS | EIAJ | | |
| 2PD601AQ | SOT346 | SC-59 | ZQ | Q |
| 2PD601AR | SOT346 | SC-59 | ZR | R |
| 2PD601AS | SOT346 | SC-59 | ZS | S |
| 2PD601AQW | SOT323 | SC-70 | *6D | Q |
| 2PD601ARW | SOT323 | SC-70 | *6E | R |
| 2PD601ASW | SOT323 | SC-70 | *6F | S |

Note

- * = p: Made in Hong Kong.
 * = t: Made in Malaysia.
 * = W: Made in China.

SIMPLIFIED OUTLINE, SYMBOL AND PINNING

| TYPE NUMBER | SIMPLIFIED OUTLINE AND SYMBOL | PINNING | |
|---|-------------------------------|-------------|------------------------------|
| | | PIN | DESCRIPTION |
| 2PD601AQ 2PD601AR 2PD601AS 2PD601AQW 2PD601ARW 2PD601ASW | <p>Top view</p> <p>MAM321</p> | 1 2 3 | base emitter collector |

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ORDERING INFORMATION

| TYPE NUMBER | PACKAGE | | |
|-------------|---------|--|---------|
| | NAME | DESCRIPTION | VERSION |
| 2PD601AQ | – | plastic surface mounted package; 3 leads | SOT346 |
| 2PD601AR | | | |
| 2PD601AS | | | |
| 2PD601AQW | – | plastic surface mounted package; 3 leads | SOT323 |
| 2PD601ARW | | | |
| 2PD601ASW | | | |

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 | – | 60 | V |
| V_{CEO} | collector-emitter voltage | open base | – | 50 | 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 | $T_{amb} \leq 25\text{ °C}$; note 1 | | | |
| | SOT346 | | – | 250 | mW |
| | SOT323 | | – | 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. Refer to SOT346 (SC-59) and SOT323 (SC-70) standard mounting conditions.

THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---------------|---|------------|-------|------|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | note 1 | | |
| | SOT346 | | 500 | K/W |
| | SOT323 | | 625 | K/W |

Note

1. Refer to SOT346 (SC-59) and SOT323 (SC-70) standard mounting conditions.

Soldering

Reflow soldering is the only recommended soldering method.

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CHARACTERISTICS

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-------------|--|--|------|------|---------------|
| I_{CBO} | collector-base cut-off current | $I_E = 0; V_{CB} = 60\text{ V}$ | – | 10 | nA |
| | | $I_E = 0; V_{CB} = 60\text{ V}; T_j = 150\text{ °C}$ | – | 5 | μA |
| I_{EBO} | emitter-base cut-off current | $I_C = 0; V_{EB} = 5\text{ V}$ | – | 10 | nA |
| h_{FE} | DC current gain | $I_C = 100\text{ mA}; V_{CE} = 2\text{ V};$ note 1 | 90 | – | |
| h_{FE} | DC current gain group Q group R group S | $I_C = 2\text{ mA}; V_{CE} = 10\text{ V}$ | 160 | 260 | |
| | | | 210 | 340 | |
| | | | 290 | 460 | |
| V_{CEsat} | collector-emitter saturation voltage | $I_C = 100\text{ mA}; I_B = 10\text{ mA};$ note 1 | – | 250 | mV |
| C_c | collector capacitance | $I_E = i_e = 0; V_{CB} = 10\text{ V}; f = 1\text{ MHz}$ | – | 3 | pF |
| f_T | transition frequency | $I_C = 2\text{ mA}; V_{CE} = 10\text{ V};$ $f = 100\text{ MHz}$ | 100 | – | MHz |

Note

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

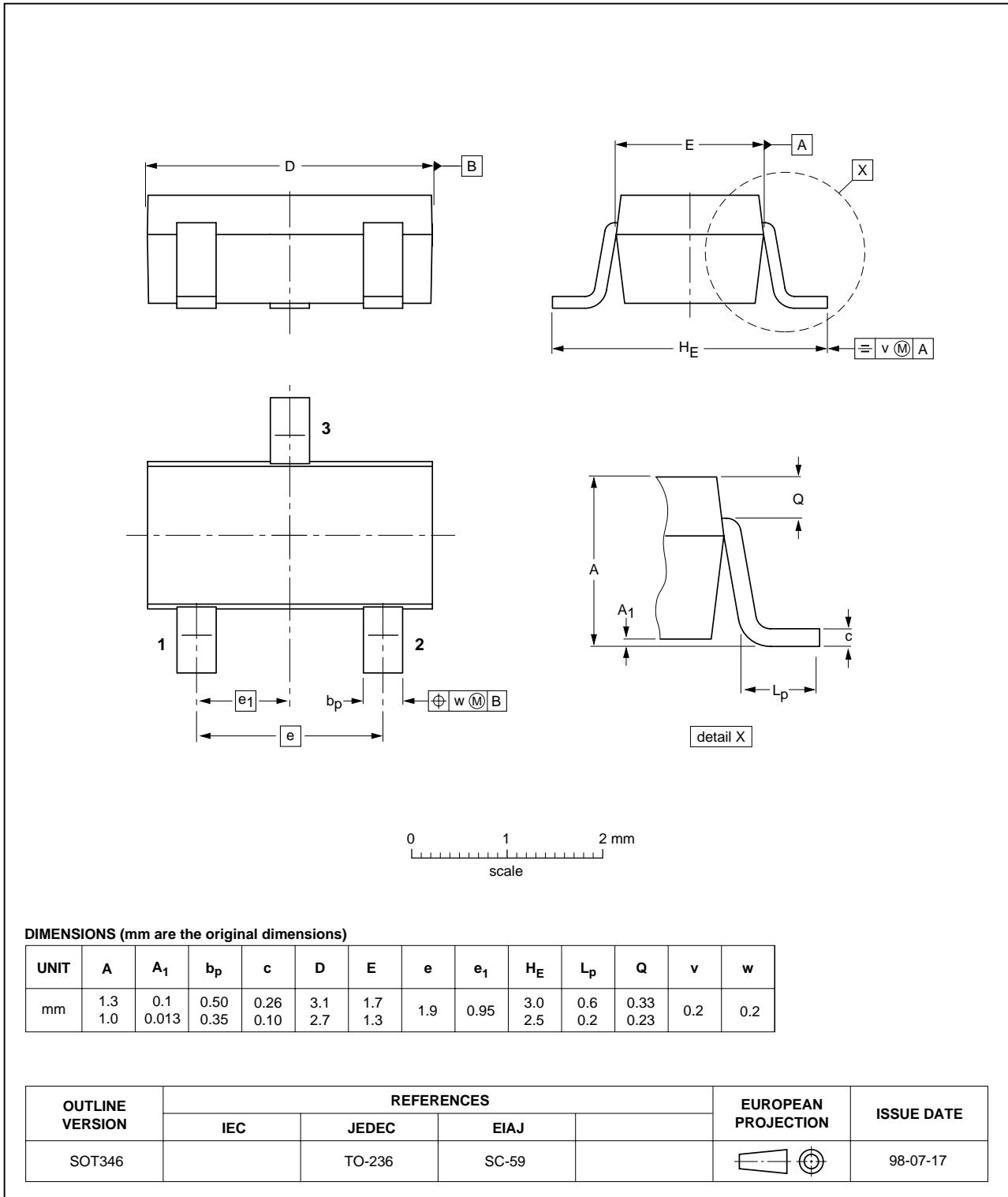
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PACKAGE OUTLINES

Plastic surface mounted package; 3 leads

SOT346

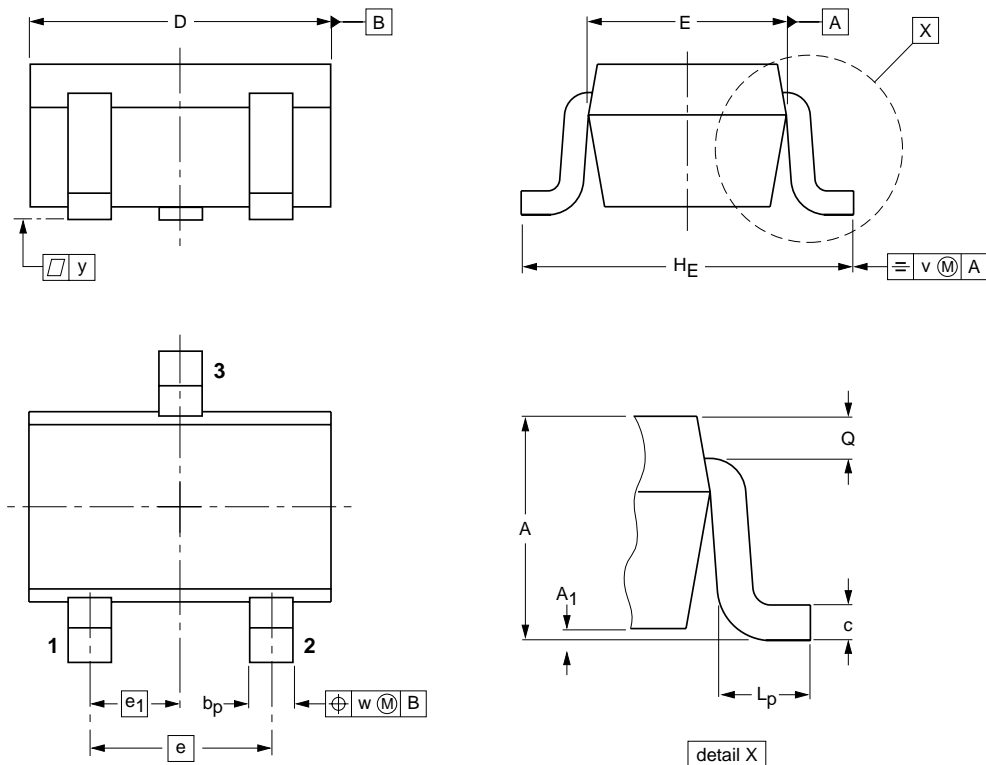


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Plastic surface mounted package; 3 leads

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 0.8 | 0.1 | 0.4 0.3 | 0.25 0.10 | 2.2 1.8 | 1.35 1.15 | 1.3 | 0.65 | 2.2 2.0 | 0.45 0.15 | 0.23 0.13 | 0.2 | 0.2 |

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

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| LEVEL | DATA SHEET STATUS ⁽¹⁾ | PRODUCT STATUS ⁽²⁾⁽³⁾ | DEFINITION |
|-------|----------------------------------|----------------------------------|--|
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