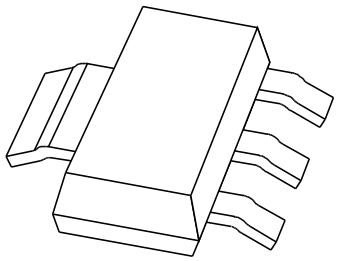
# DATA SHEET



# PBYR2100CT series
## Schottky barrier double diodes

Product specification
Supersedes data of 1996 May 03
File under Discrete Semiconductors, SC01

1996 Oct 14

Philips
Semiconductors

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# Schottky barrier double diodes PBYR2100CT series

## FEATURES

- Low switching losses
- High breakdown voltage
- Fast recovery time
- Guard ring protected
- Plastic SMD package.

## APPLICATIONS

- Low power, switched-mode power supplies
- Rectification
- Polarity protection.

## DESCRIPTION

The PBYR2100CT series consists of Schottky barrier double diodes, fabricated in planar technology, and encapsulated in SOT223 plastic SMD packages.

## PINNING

| PIN | DESCRIPTION |
|---|---|
| 1 | anode ($a_1$) |
| 2 | common cathode |
| 3 | anode ($a_2$) |
| 4 | common cathode |

## MARKING

| TYPE NUMBER | MARKING CODE |
|---|---|
| PBYR280CT | BYR28 |
| PBYR290CT | BYR29 |
| PBYR2100CT | BYR210 |

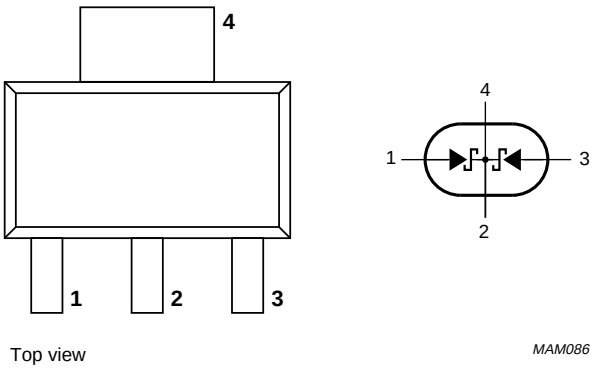



Fig.1 Simplified outline (SOT223), pin configuration and symbol.

## LIMITING VALUES

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| **Per diode** | | | | | |
| $V_R$ | continuous reverse voltage | | | | |
| | PBYR280CT | | – | 80 | V |
| | PBYR290CT | | – | 90 | V |
| | PBYR2100CT | | – | 100 | V |
| $V_{RRM}$ | repetitive peak reverse voltage | | | | |
| | PBYR280CT | | – | 80 | V |
| | PBYR290CT | | – | 90 | V |
| | PBYR2100CT | | – | 100 | V |
| $V_{RWM}$ | crest working reverse voltage | | | | |
| | PBYR280CT | | – | 80 | V |
| | PBYR290CT | | – | 90 | V |
| | PBYR2100CT | | – | 100 | V |
| $I_{F(AV)}$ | average forward current | $T_{amb}$ = 85 °C; see Fig.2; $R_{th\ j\text{-}a}$ = 70 K/W; note 1; $V_{R(equiv)}$ = 0.2 V; note 2 | – | 1 | A |
| $I_{FSM}$ | non-repetitive peak forward current | t = 8.3 ms half sine wave; JEDEC method | – | 10 | A |
| $I_{RSM}$ | non-repetitive peak reverse current | $t_p$ = 100 μs | – | 0.5 | A |
| $T_{stg}$ | storage temperature | | −65 | +150 | °C |
| $T_j$ | junction temperature | | −65 | +150 | °C |
| $T_{amb}$ | operating ambient temperature | | – | 85 | °C |

**Notes**

1. Refer to SOT223 standard mounting conditions.
2. For Schottky barrier diodes thermal run-away has to be considered, as in some applications, the reverse power losses $P_R$ are a significant part of the total power losses. Nomograms for determination of the reverse power losses $P_R$ and $I_{F(AV)}$ rating will be available on request.

## ELECTRICAL CHARACTERISTICS

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| **Per diode** | | | | | | |
| $V_F$ | forward voltage | see Fig.3 | | | | |
| | | $I_F$ = 1 A; note 1 | – | – | 790 | mV |
| | | $I_F$ = 1 A; $T_j$ = 100 °C; note 1 | – | – | 690 | mV |
| $I_R$ | reverse current | $V_R = V_{RRMmax}$; note 1; see Fig.4 | – | – | 0.5 | mA |
| | | $V_R = V_{RRMmax}$; $T_j$ = 100 °C; note 1; see Fig.4 | – | – | 5 | mA |
| $C_d$ | diode capacitance | $V_R$ = 4 V; f = 1 MHz; see Fig.5 | – | – | 100 | pF |

**Note**

1. Pulsed test: $t_p$ = 300 μs; δ = 0.02.

## THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---|---|---|---|---|
| $R_{th\ j\text{-}a}$ | thermal resistance from junction to ambient | note 1 | 70 | K/W |

**Note**

1. Refer to SOT223 standard mounting conditions.

## GRAPHICAL DATA

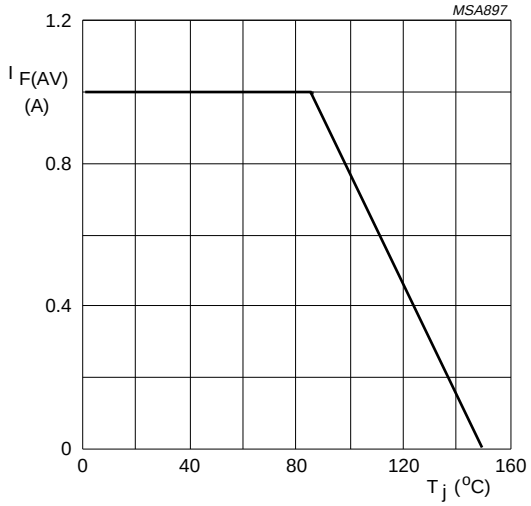
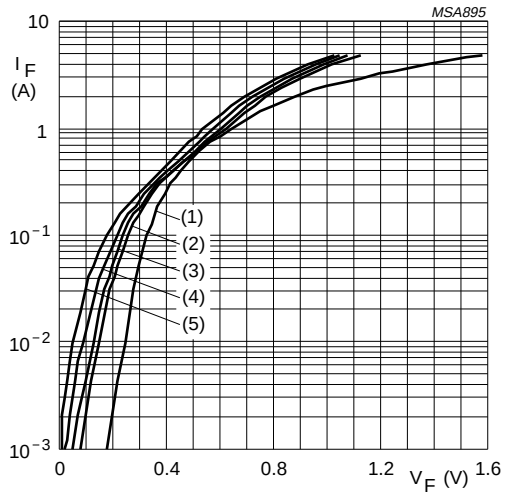
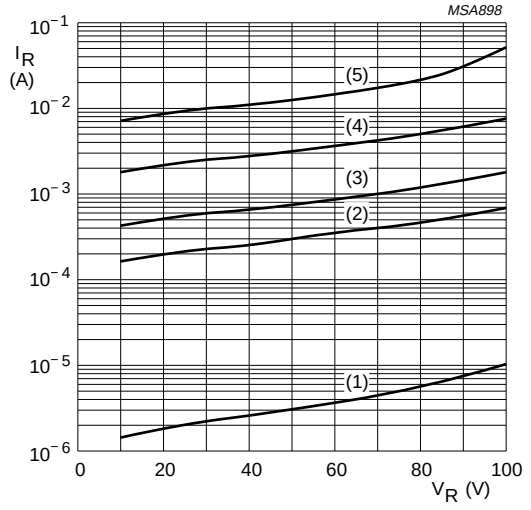



Fig.2 Average forward current derating curve.



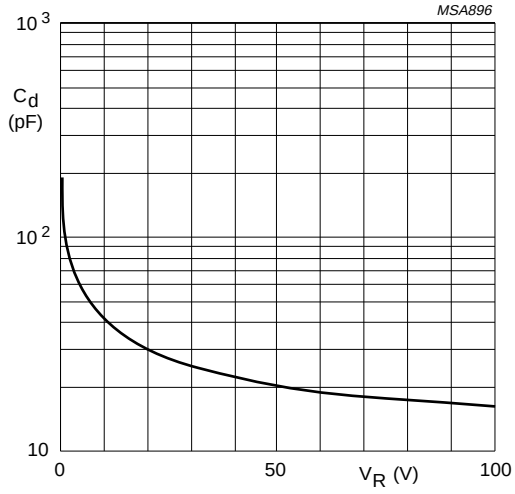

(1) $T_{amb}$ = 25 °C.
(2) $T_{amb}$ = 85 °C.
(3) $T_{amb}$ = 100 °C.
(4) $T_{amb}$ = 125 °C.
(5) $T_{amb}$ = 150 °C.

Fig.3 Forward current as a function of forward voltage; typical values.




(1) $T_{amb}$ = 25 °C.
(2) $T_{amb}$ = 85 °C.
(3) $T_{amb}$ = 100 °C.
(4) $T_{amb}$ = 125 °C.
(5) $T_{amb}$ = 150 °C.

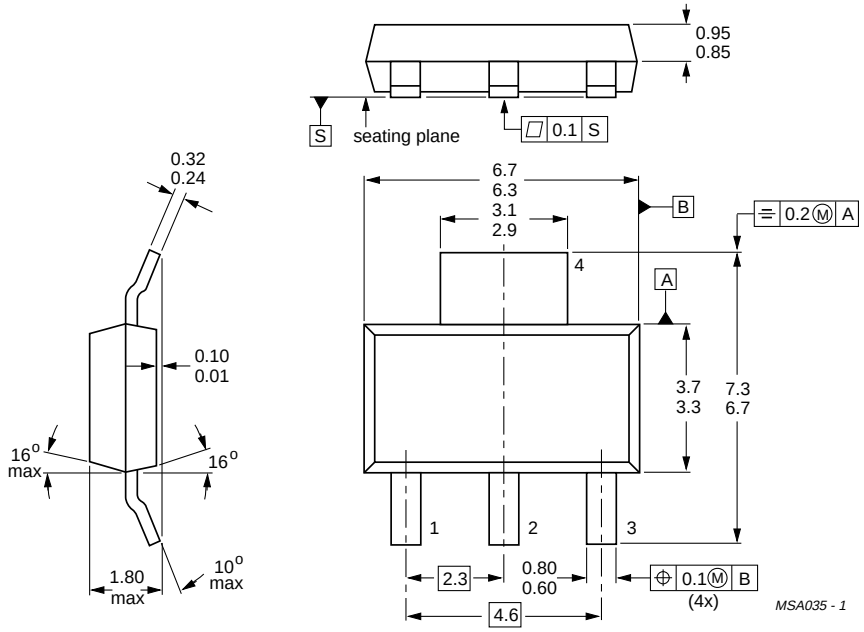
Fig.4 Reverse current as a function of reverse voltage; typical values.




f = 1 MHz.

Fig.5 Diode capacitance as a function of reverse voltage; typical values.

**PACKAGE OUTLINE**




Dimensions in mm.

Fig.6 SOT223.

## 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. | |

## LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.