

Philips Semiconductors

Product specification

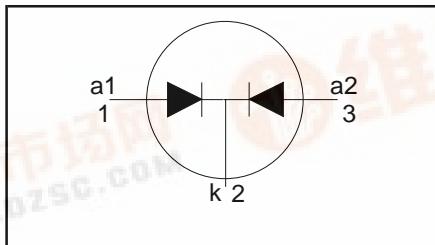
Rectifier diodes
Schottky barrier

PBYR345CTD series

FEATURES

- Low forward volt drop
- Fast switching
- Reverse surge capability
- High thermal cycling performance
- Low thermal resistance

SYMBOL



QUICK REFERENCE DATA

$V_R = 40 \text{ V} / 45 \text{ V}$
 $I_{O(AV)} = 3 \text{ A}$
 $V_F \leq 0.57 \text{ V}$

GENERAL DESCRIPTION

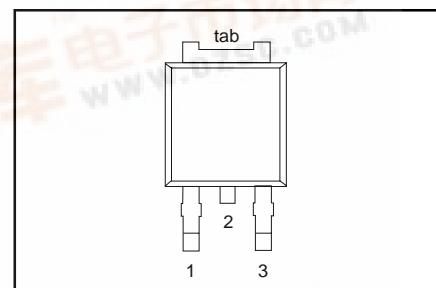
Dual schottky rectifier diodes intended for use as output rectifiers in low voltage, high frequency switched mode power supplies.

The PBYR345CTD series is supplied in the SOT428 surface mounting package.

PINNING

| PIN | DESCRIPTION |
|-----|----------------------|
| 1 | anode 1 |
| 2 | cathode ¹ |
| 3 | anode 2 |
| tab | cathode |

SOT428



LIMITING VALUES

Limiting values in accordance with the Absolute Maximum System (IEC 134)

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-------------|---|--|--------|---------------|------------------|
| V_{RRM} | Peak repetitive reverse voltage | PBYR3 | - | 40 CTD | 45 CTD |
| V_{RWM} | Working peak reverse voltage | | - | 40 | 45 |
| V_R | Continuous reverse voltage | $T_{mb} \leq 115 \text{ }^\circ\text{C}$ | - | 40 | 45 |
| $I_{O(AV)}$ | Average rectified output current (both diodes conducting) | square wave; $\delta = 0.5$; $T_{mb} \leq 142 \text{ }^\circ\text{C}$ | - | 3 | A |
| I_{FRM} | Repetitive peak forward current per diode | square wave; $\delta = 0.5$; $T_{mb} \leq 142 \text{ }^\circ\text{C}$ | - | 3 | A |
| I_{FSM} | Non-repetitive peak forward current per diode | $t = 10 \text{ ms}$ $t = 8.3 \text{ ms}$ sinusoidal; $T_j = 125 \text{ }^\circ\text{C}$ prior to surge; with reapplied $V_{RRM(max)}$ pulse width and repetition rate limited by $T_{j max}$ | - - | 55 60 | A |
| I_{RRM} | Peak repetitive reverse surge current per diode | | - | 1 | A |
| T_j | Operating junction temperature | | - | 150 | $^\circ\text{C}$ |
| T_{stg} | Storage temperature | | -65 | 175 | $^\circ\text{C}$ |

¹ it is not possible to make connection to pin 2 of the SOT428 package

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THERMAL RESISTANCES

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-----------------------|--|--|------|------|------|------|
| $R_{th\ j\text{-}mb}$ | Thermal resistance junction to mounting base | per diode | - | - | 5 | K/W |
| $R_{th\ j\text{-}a}$ | Thermal resistance junction to ambient | both diodes pcb mounted, minimum footprint, FR4 board | - | 50 | 4 | K/W |

ELECTRICAL CHARACTERISTICSAll characteristics are per diode at $T_j = 25^\circ\text{C}$ unless otherwise specified

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|--------|----------------------|--|------|------|------|------|
| V_F | Forward voltage | $I_F = 1.5\text{ A}; T_j = 125^\circ\text{C}$ $I_F = 3\text{ A}; T_j = 125^\circ\text{C}$ | - | 0.51 | 0.57 | V |
| I_R | Reverse current | $I_F = 3\text{ A}$ $V_R = V_{RWM}$ | - | 0.62 | 0.7 | V |
| C_d | Junction capacitance | $V_R = V_{RWM}; T_j = 100^\circ\text{C}$ $V_R = 5\text{ V}; f = 1\text{ MHz}, T_j = 25^\circ\text{C to } 125^\circ\text{C}$ | - | 0.71 | 0.84 | mA |
| | | | - | 0.05 | 0.2 | mA |
| | | | - | 3.2 | 8 | pF |
| | | | - | 65 | - | pF |

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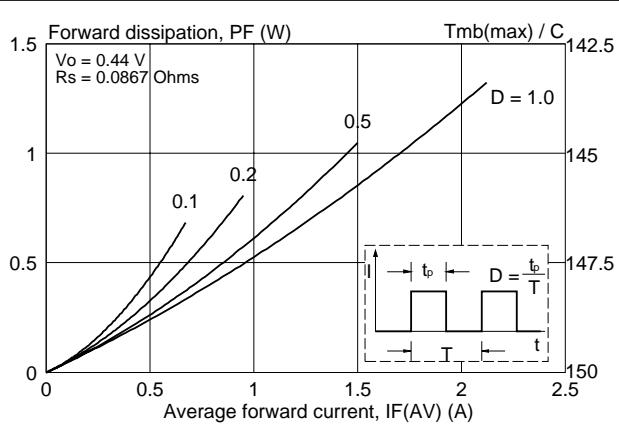


Fig.1. Maximum forward dissipation per diode
 $P_F = f(I_{F(AV)})$; square current waveform where
 $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$.

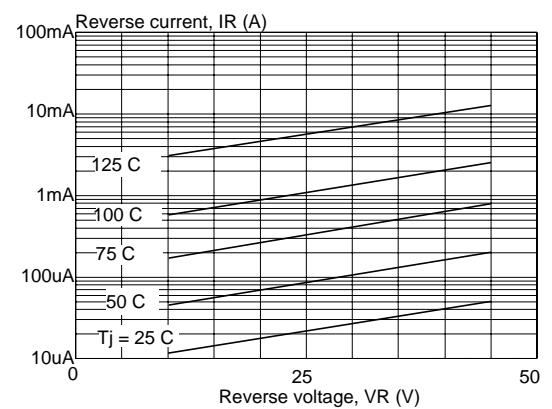


Fig.4. Typical reverse leakage current per diode;
 $I_R = f(V_R)$; parameter T_j

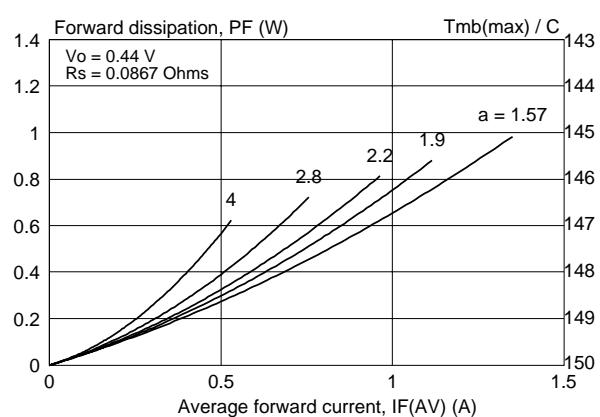


Fig.2. Maximum forward dissipation per diode
 $P_F = f(I_{F(AV)})$; sinusoidal current waveform where
 $a = \text{form factor} = I_{F(RMS)} / I_{F(AV)}$.

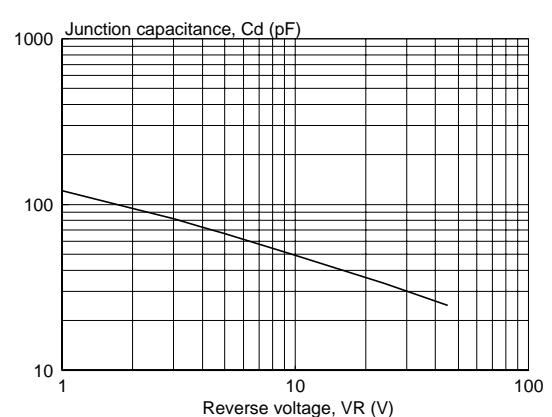


Fig.5. Typical junction capacitance per diode;
 $C_d = f(V_R)$; $f = 1$ MHz; $T_j = 25$ °C to 125 °C.

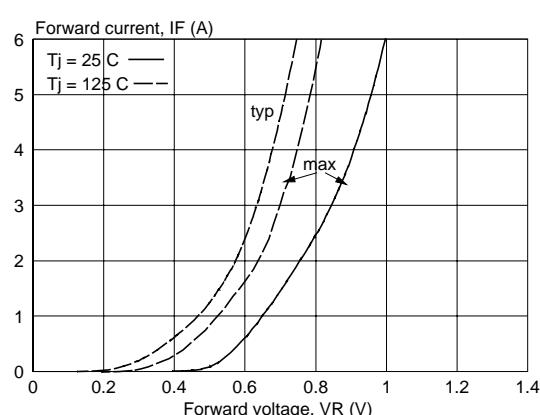


Fig.3. Typical and maximum forward characteristic per diode $I_F = f(V_F)$; parameter T_j

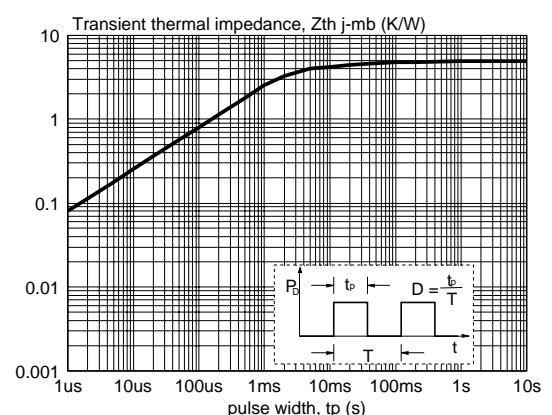


Fig.6. Transient thermal impedance per diode;
 $Z_{th j-mb} = f(t_p)$.

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MECHANICAL DATA

Dimensions in mm : Net Mass: 1.4 g

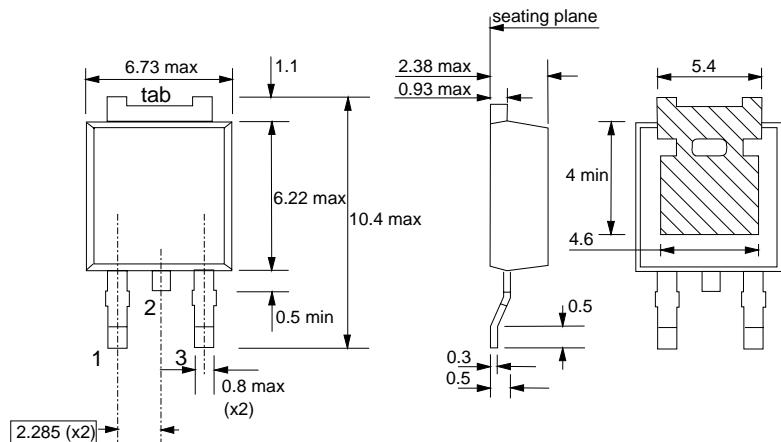


Fig.7. SOT428 : centre pin connected to mounting base.

MOUNTING INSTRUCTIONS

Dimensions in mm

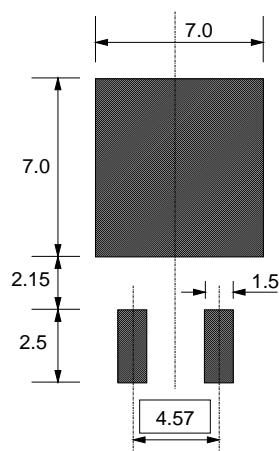


Fig.8. SOT428 : soldering pattern for surface mounting.

Notes

1. Observe the general handling precautions for electrostatic-discharge sensitive devices (ESDs) to prevent damage to MOS gate oxide.
2. Epoxy meets UL94 V0 at 1/8".

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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 are given 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 this 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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