

# DATA SHEET



## **BYD17 series** General purpose controlled avalanche rectifiers

Product specification  
Supersedes data of 1996 Sep 26

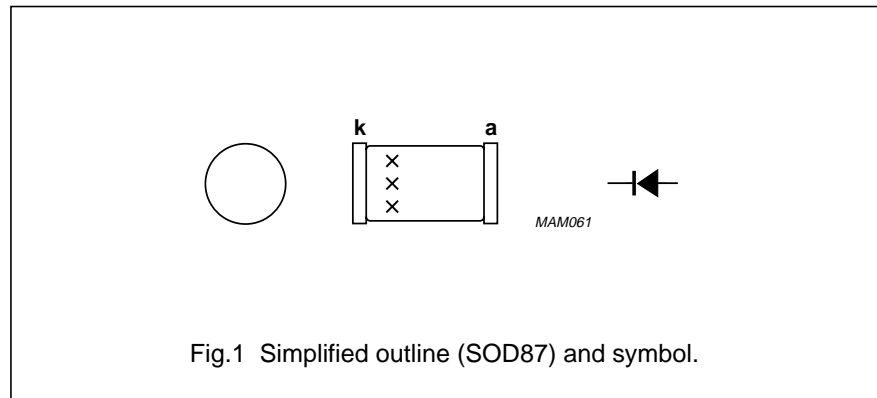
1999 Nov 11

# General purpose controlled avalanche rectifiers

## BYD17 series

### FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Shipped in 8 mm embossed tape
- Smallest surface mount rectifier outline.



### DESCRIPTION

Cavity free cylindrical glass package through Implotec™(1) technology.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

(1) Implotec is a trademark of Philips.

### MARKING

| TYPE NUMBER | MARKING CODE |
|-------------|--------------|
| BYD17D      | 17D PH       |
| BYD17G      | 17G PH       |
| BYD17J      | 17J PH       |
| BYD17K      | 17K PH       |
| BYD17M      | 17M PH       |

### LIMITING VALUES

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

| SYMBOL           | PARAMETER                       | CONDITIONS | MIN. | MAX. | UNIT |
|------------------|---------------------------------|------------|------|------|------|
| V <sub>RRM</sub> | repetitive peak reverse voltage |            |      |      |      |
|                  | BYD17D                          |            | –    | 200  | V    |
|                  | BYD17G                          |            | –    | 400  | V    |
|                  | BYD17J                          |            | –    | 600  | V    |
|                  | BYD17K                          |            | –    | 800  | V    |
| V <sub>RWM</sub> | crest working reverse voltage   |            |      |      |      |
|                  | BYD17D                          |            | –    | 200  | V    |
|                  | BYD17G                          |            | –    | 400  | V    |
|                  | BYD17J                          |            | –    | 600  | V    |
|                  | BYD17K                          |            | –    | 800  | V    |
| V <sub>R</sub>   | continuous reverse voltage      |            |      |      |      |
|                  | BYD17D                          |            | –    | 200  | V    |
|                  | BYD17G                          |            | –    | 400  | V    |
|                  | BYD17J                          |            | –    | 600  | V    |
|                  | BYD17K                          |            | –    | 800  | V    |

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| SYMBOL      | PARAMETER                                    | CONDITIONS  | MIN. | MAX. | UNIT |
|-------------|--|---|------|------|------|
| $I_{F(AV)}$ | average forward current                      | $T_{tp} = 105\text{ °C}$ ;<br>averaged over any 20 ms period;<br>see Figs 2 and 4                           | –    | 1.5  | A    |
|             |  | $T_{amb} = 65\text{ °C}$ ; PCB mounting (see Fig.9);<br>averaged over any 20 ms period;<br>see Figs 3 and 4 | –    | 0.6  | A    |
| $I_{FSM}$   | non-repetitive peak forward current          | $t = 10\text{ ms}$ half sinewave;<br>$T_j = T_{j\text{ max}}$ prior to surge;<br>$V_R = V_{RRM\text{ max}}$ | –    | 20   | A    |
| $E_{RSM}$   | non-repetitive peak reverse avalanche energy | $L = 120\text{ mH}$ ; $T_j = T_{j\text{ max}}$ prior to surge; inductive load switched off                  | –    | 7    | mJ   |
| $T_{stg}$   | storage temperature                          |   | –65  | +175 | °C   |
| $T_j$       | junction temperature                         | see Fig.5   | –65  | +175 | °C   |

### ELECTRICAL CHARACTERISTICS

$T_j = 25\text{ °C}$ ; unless otherwise specified.

| SYMBOL      | PARAMETER                           | CONDITIONS  | MIN.   | TYP. | MAX. | UNIT |   |
|-------------|-------------------------------------|---|--------|------|------|------|---|
| $V_F$       | forward voltage                     | $I_F = 1\text{ A}$ ; $T_j = T_{j\text{ max}}$ ; see Fig.6   | –      | –    | 0.93 | V    |   |
|             |                                     | $I_F = 1\text{ A}$ ; see Fig.6  | –      | –    | 1.05 | V    |   |
| $V_{(BR)R}$ | reverse avalanche breakdown voltage | $I_R = 0.1\text{ mA}$   |        |      |      |      |   |
|             |                                     |   | BYD17D | 225  | –    | –    | V |
|             |                                     |   | BYD17G | 450  | –    | –    | V |
|             |                                     |   | BYD17J | 650  | –    | –    | V |
|             |                                     |   | BYD17K | 900  | –    | –    | V |
|             |                                     |   | BYD17M | 1100 | –    | –    | V |
| $I_R$       | reverse current                     | $V_R = V_{RRM\text{ max}}$ ; see Fig.7  | –      | –    | 1    | μA   |   |
|             |                                     | $V_R = V_{RRM\text{ max}}$ ; $T_j = 165\text{ °C}$ ; see Fig.7  | –      | –    | 100  | μA   |   |
| $t_{rr}$    | reverse recovery time               | when switched from $I_F = 0.5\text{ A}$ to $I_R = 1\text{ A}$ ;<br>measured at $I_R = 0.25\text{ A}$ ; see Fig.10 | –      | 3    | –    | μs   |   |
| $C_d$       | diode capacitance                   | $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$ ; see Fig.8   | –      | 21   | –    | pF   |   |

### THERMAL CHARACTERISTICS

| SYMBOL                | PARAMETER                                     | CONDITIONS | VALUE | UNIT |
|-----------------------|---|------------|-------|------|
| $R_{th\ j\text{-tp}}$ | thermal resistance from junction to tie-point |            | 30    | K/W  |
| $R_{th\ j\text{-a}}$  | thermal resistance from junction to ambient   | note 1     | 150   | K/W  |

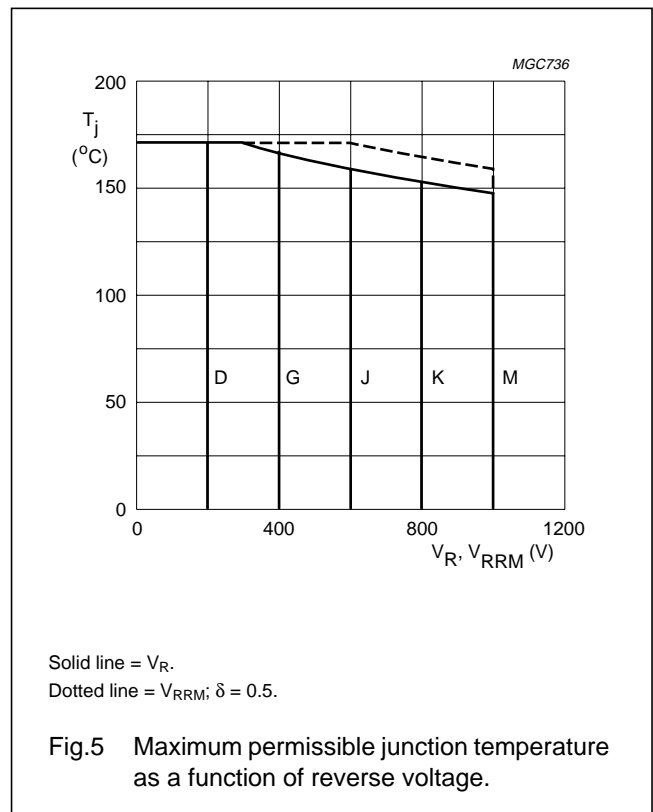
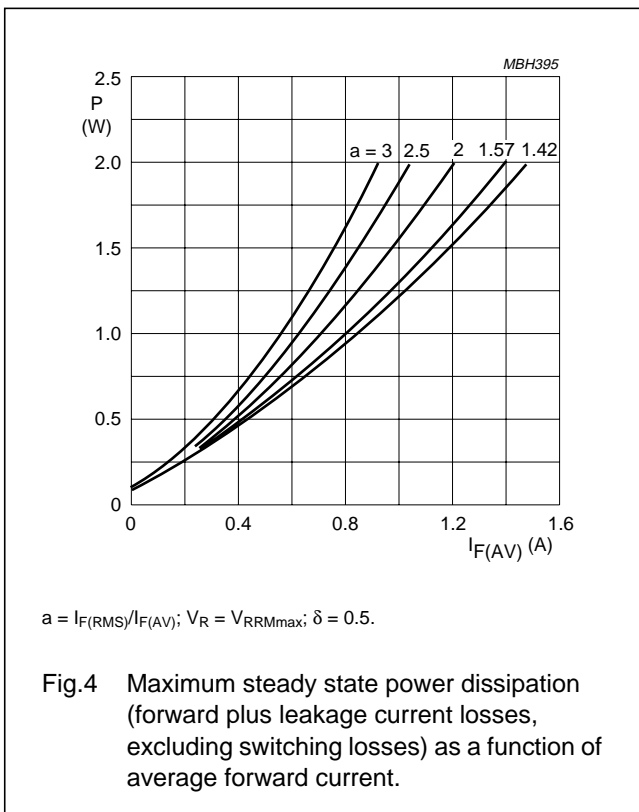
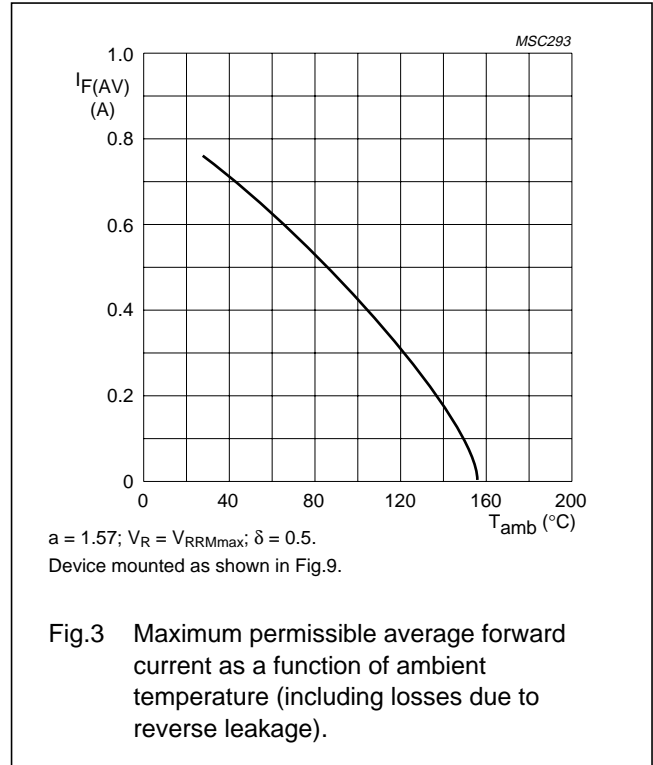
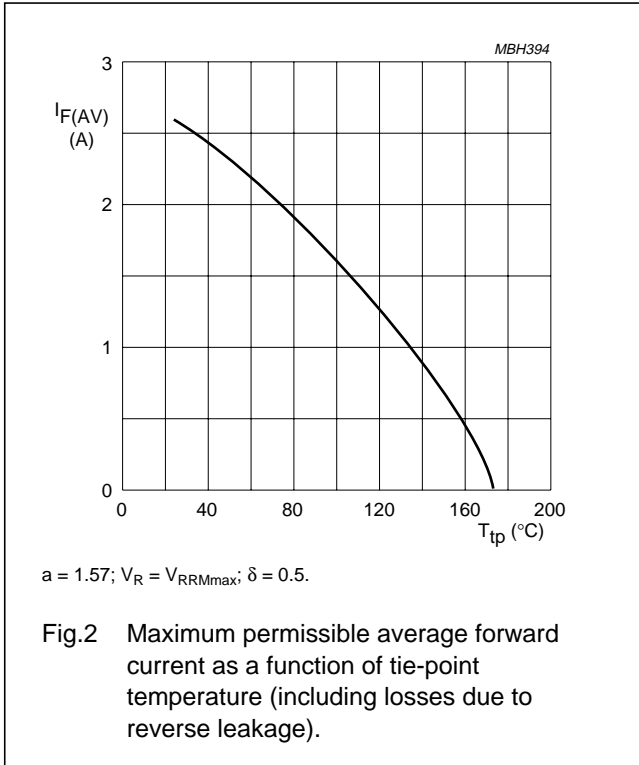
#### Note

1. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper  $\geq 40\text{ μm}$ , see Fig.9. For more information please refer to the "General Part of associated Handbook".

General purpose  
controlled avalanche rectifiers

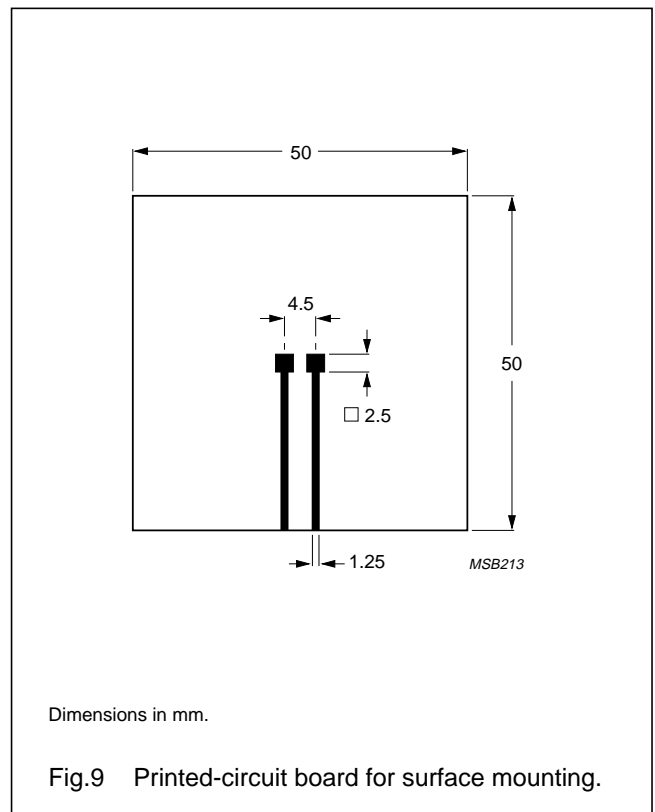
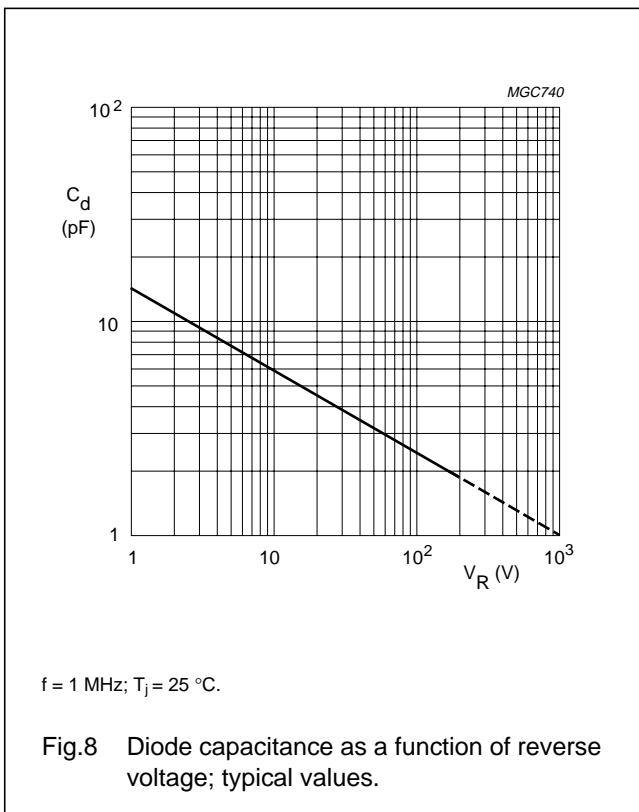
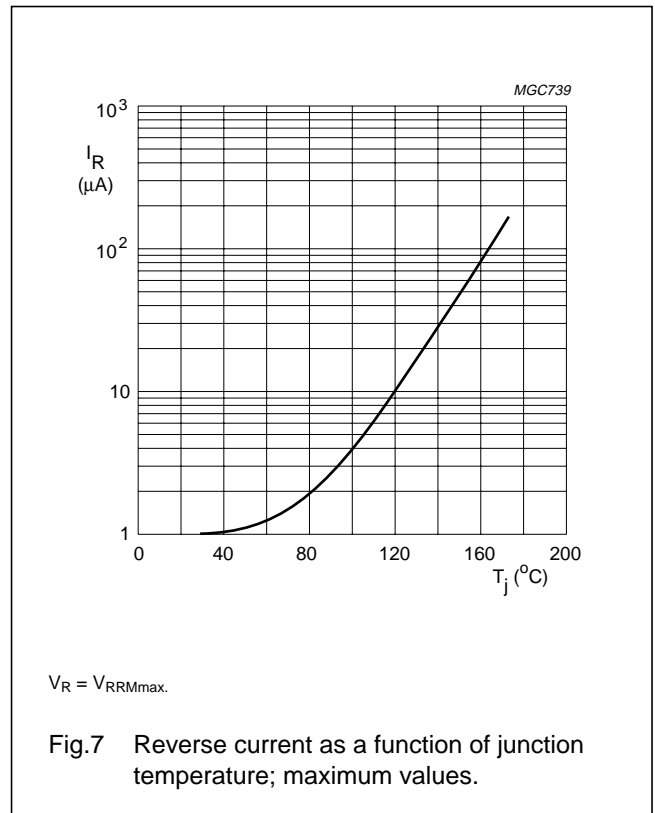
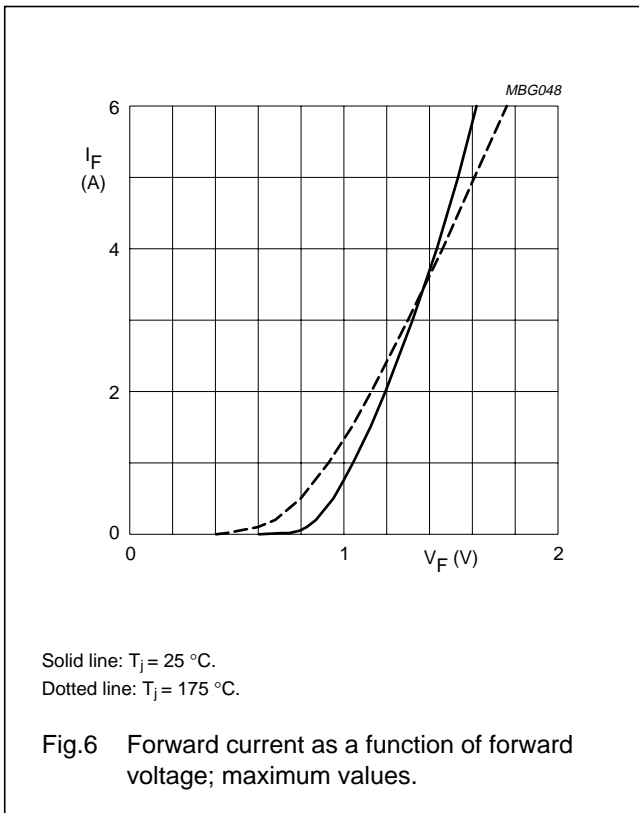
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GRAPHICAL DATA



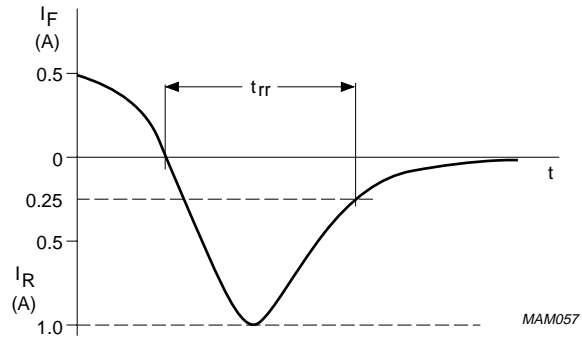
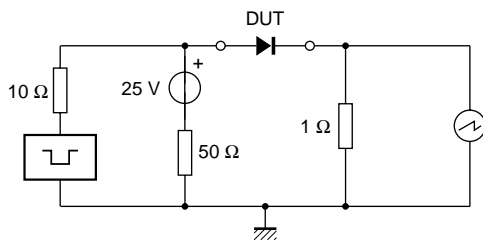
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Input impedance oscilloscope: 1 MΩ, 22 pF;  $t_r \leq 7$  ns.  
Source impedance: 50 Ω;  $t_r \leq 15$  ns.

Fig.10 Test circuit and reverse recovery time waveform and definition.

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PACKAGE OUTLINE

Hermetically sealed glass surface mounted package;  
Implotec™(1) technology; 2 connectors

SOD87

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

| UNIT | D          | D1         | H          | L   |
|------|------------|------------|------------|-----|
| mm   | 2.1<br>2.0 | 2.0<br>1.8 | 3.7<br>3.3 | 0.3 |

**Notes**  
 1. Implotec is a trademark of Philips.  
 2. The marking indicates the cathode.

| OUTLINE VERSION | REFERENCES |       |      |  | EUROPEAN PROJECTION | ISSUE DATE           |
|-----------------|------------|-------|------|--|---------------------|----------------------|
|                 | IEC        | JEDEC | EIAJ |  |                     |                      |
| SOD87           | 100H03     |       |      |  |                     | 99-03-31<br>99-06-04 |

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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