

DATA SHEET



BYD17 series General purpose controlled avalanche rectifiers

Product specification
Supersedes data of 1999 Nov 11

2001 Oct 26

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.

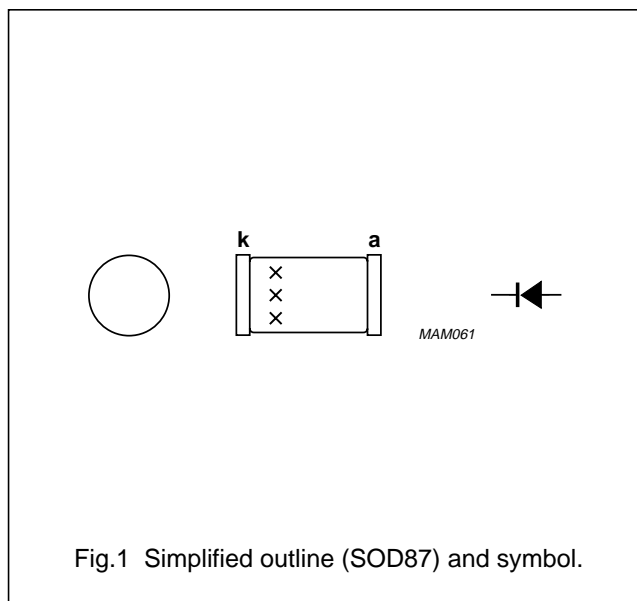


Fig.1 Simplified outline (SOD87) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-----------|---------------------------------|------------|------|------|------|
| V_{RRM} | repetitive peak reverse voltage | | | | |
| | BYD17D | | – | 200 | V |
| | BYD17G | | – | 400 | V |
| | BYD17J | | – | 600 | V |
| | BYD17K | | – | 800 | V |
| V_{RWM} | crest working reverse voltage | | | | |
| | BYD17D | | – | 200 | V |
| | BYD17G | | – | 400 | V |
| | BYD17J | | – | 600 | V |
| | BYD17K | | – | 800 | V |
| V_R | continuous reverse voltage | | | | |
| | BYD17D | | – | 200 | V |
| | BYD17G | | – | 400 | V |
| | BYD17J | | – | 600 | V |
| | BYD17K | | – | 800 | V |
| | BYD17M | | – | 1000 | V |

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| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-------------|--|---|------|------|------|
| $I_{F(AV)}$ | average forward current | $T_{tp} = 105\text{ °C}$; averaged over any 20 ms period; see Figs 2 and 4 | – | 1.5 | A |
| | | $T_{amb} = 65\text{ °C}$; PCB mounting (see Fig.9); averaged over any 20 ms period; see Figs 3 and 4 | – | 0.6 | A |
| I_{FSM} | non-repetitive peak forward current | $t = 10\text{ ms}$ half sinewave; $T_j = T_{j\text{ max}}$ prior to surge; $V_R = V_{RRM\text{ max}}$ | – | 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 $I_R = 1\text{ A}$; 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 |
|----------------|---|------------|-------|------|
| $R_{th\ j-tp}$ | thermal resistance from junction to tie-point | | 30 | K/W |
| $R_{th\ j-a}$ | thermal resistance from junction to ambient | note 1 | 150 | K/W |

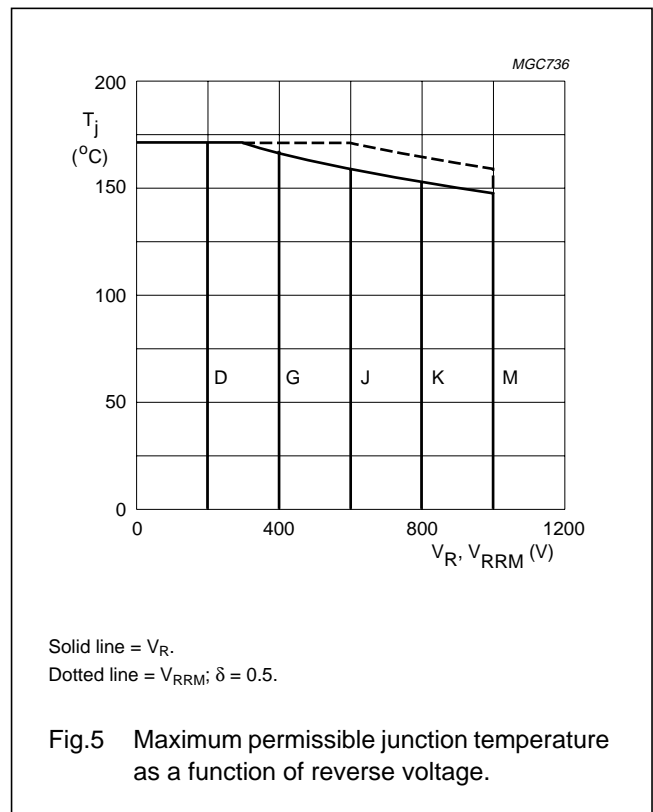
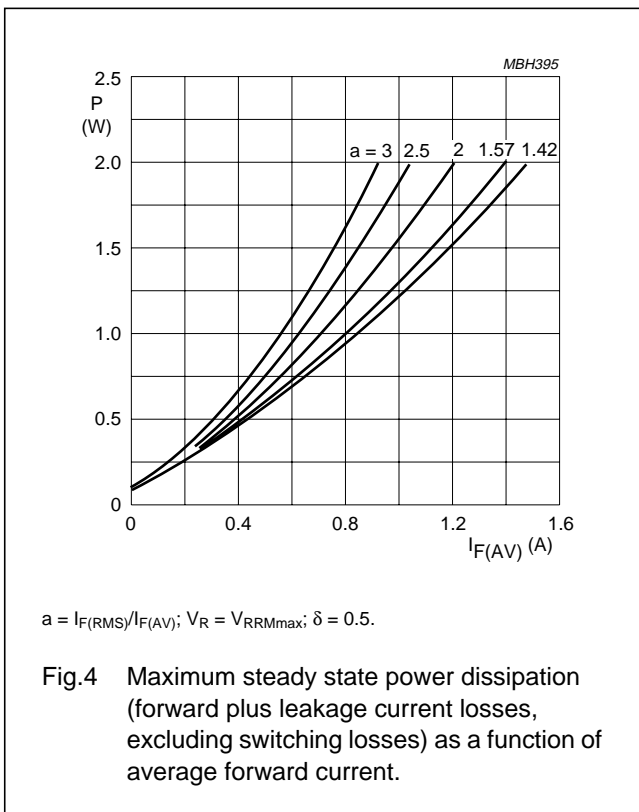
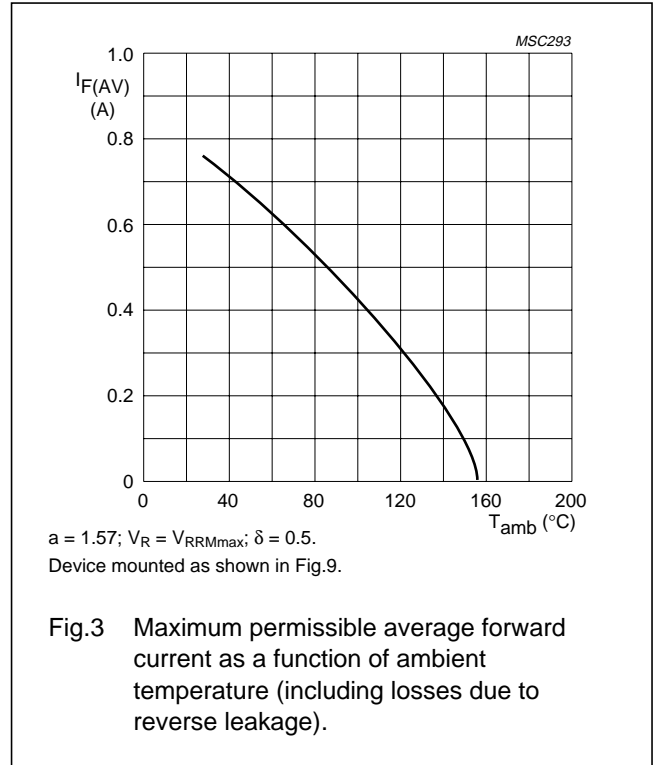
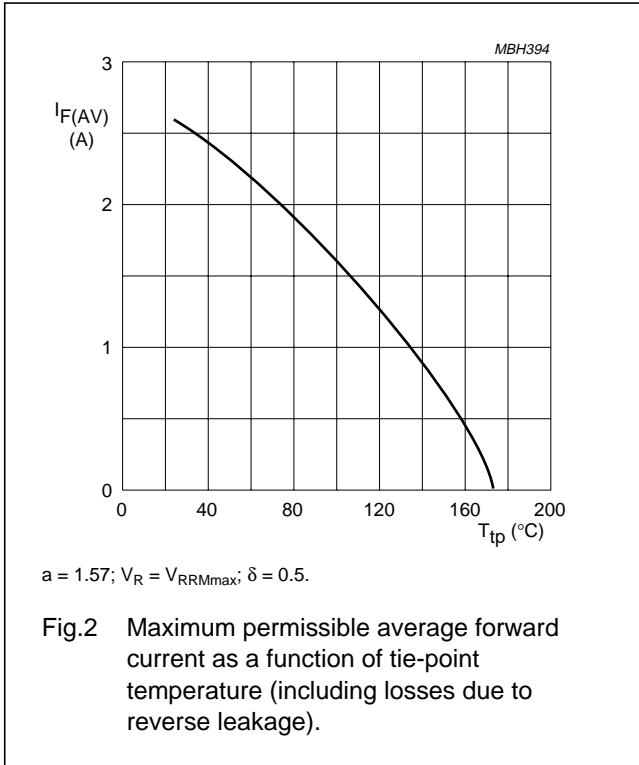
Note

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".

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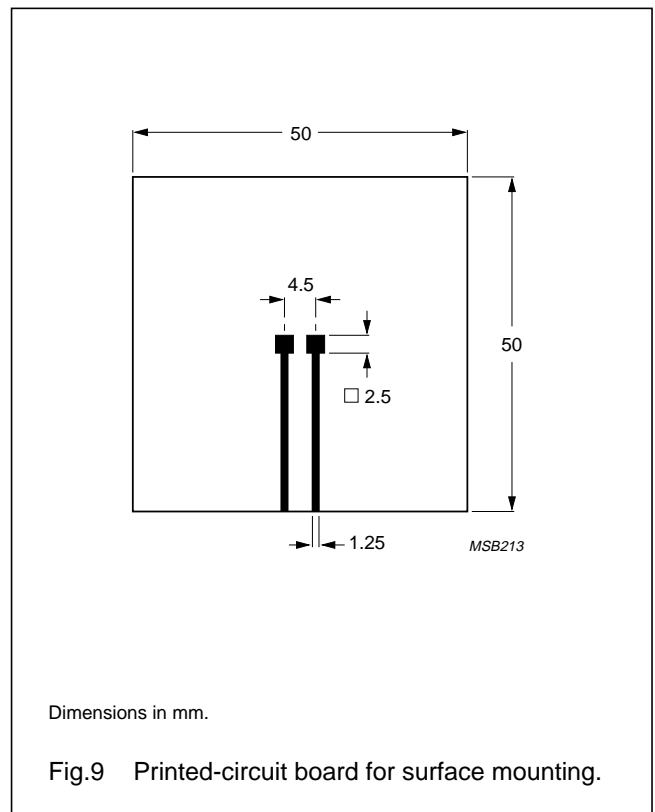
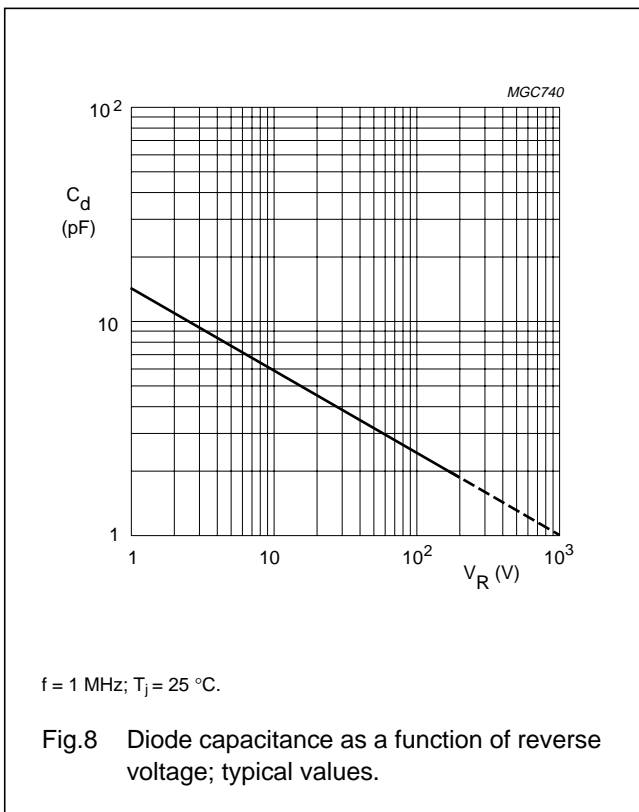
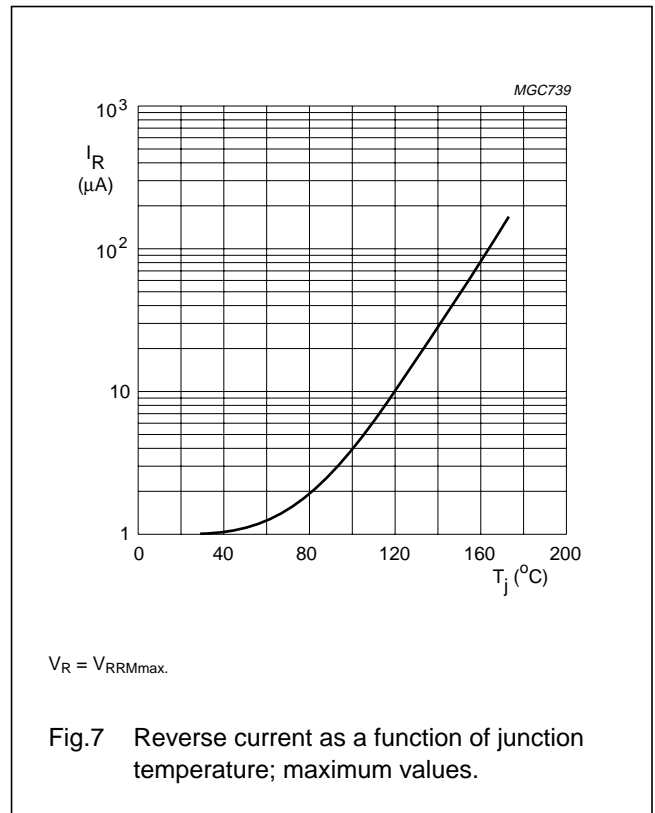
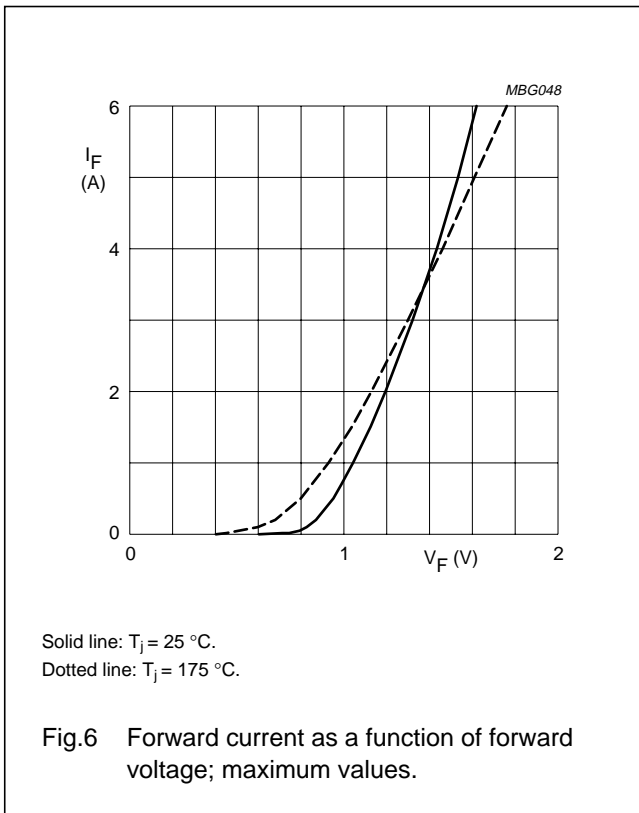
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GRAPHICAL DATA



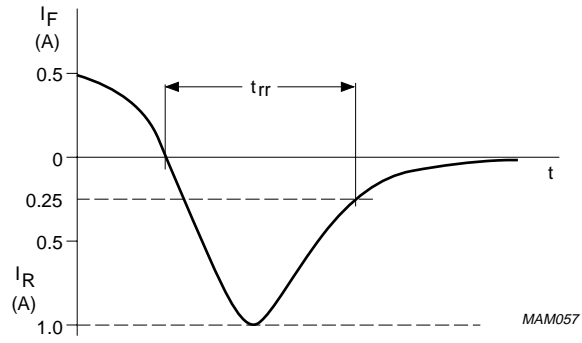
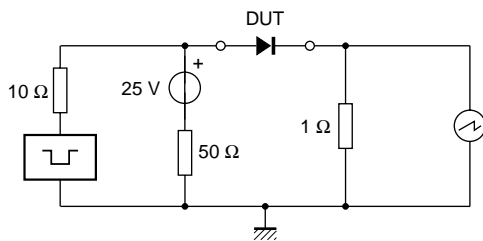
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Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
Source impedance: 50 Ω; $t_r \leq 15$ ns.

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

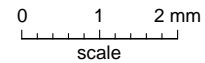
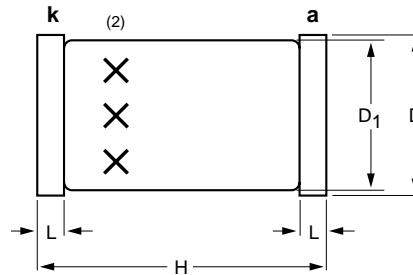
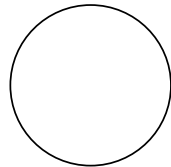
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PACKAGE OUTLINE

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 2.0 | 2.0 1.8 | 3.7 3.3 | 0.3 |

Notes

- Implotec is a trademark of Philips.
- The marking indicates the cathode.

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

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DATA SHEET STATUS

| DATA SHEET STATUS ⁽¹⁾ | PRODUCT STATUS ⁽²⁾ | DEFINITIONS |
|----------------------------------|-------------------------------|--|
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