

DISCRETE SEMICONDUCTORS

DATA SHEET



BYD67 Ripple blocking diode

Product specification
Supersedes data of 1998 Nov 20

1999 Oct 20

Ripple blocking diode

BYD67

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 package.

DESCRIPTION

Cavity free cylindrical glass SOD87 package through Implotec™⁽¹⁾ technology. The SOD87 is

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

(1) Implotec is a trademark of Philips.

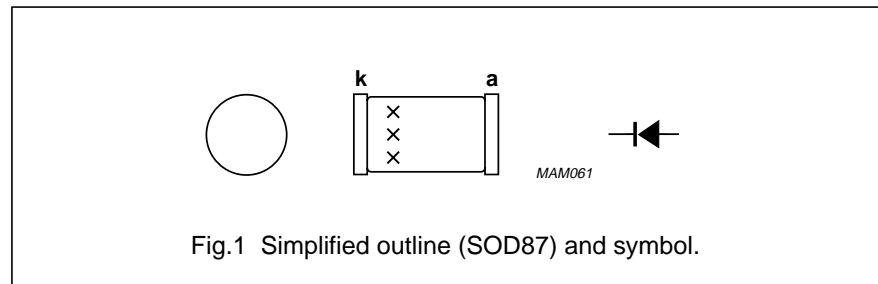


Fig.1 Simplified outline (SOD87) and symbol.

LIMITING VALUES

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-------------|-------------------------------------|--|------|------|------|
| V_{RRM} | repetitive peak reverse voltage | | – | 300 | V |
| V_R | continuous reverse voltage | | – | 300 | V |
| $I_{F(AV)}$ | average forward current | $T_{tp} = 85\text{ °C}$; see Fig.2; averaged over any 20 ms period; see also Fig.4 | – | 1.2 | A |
| | | $T_{amb} = 60\text{ °C}$; PCB mounting (see Fig.8); see Fig.3; averaged over any 20 ms period; see also Fig.4 | – | 0.4 | A |
| I_{FRM} | repetitive peak forward current | $T_{tp} = 85\text{ °C}$ | – | 11 | A |
| | | $T_{amb} = 60\text{ °C}$ | – | 3.7 | A |
| I_{FSM} | non-repetitive peak forward current | $t = 10\text{ ms}$ half sine wave; $T_j = 25\text{ °C}$ prior to surge; $V_R = V_{RRMmax}$ | – | 5.0 | A |
| T_{stg} | storage temperature | | –65 | +175 | °C |
| T_j | junction temperature | | –65 | +175 | °C |

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ELECTRICAL CHARACTERISTICS $T_j = 25\text{ }^\circ\text{C}$ 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.5 | – | – | 1.7 | V |
| | | $I_F = 1\text{ A}$; see Fig.5 | – | – | 2.3 | V |
| I_R | reverse current | $V_R = V_{RRM\text{max}}$; see Fig.6 | – | – | 1 | μA |
| | | $V_R = V_{RRM\text{max}}$; $T_j = 165\text{ }^\circ\text{C}$; see Fig.6 | – | – | 100 | μA |
| t_{fr} | forward recovery time | when switched to $I_F = 1\text{ A}$ in 50 ns; see Fig.9 | – | – | 350 | ns |
| t_{on} | turn-on time | when switched from $V_F = 0$ to $V_F = 3\text{ V}$; measured between 10% and 90% of $I_{F\text{max}}$; see Fig.11 | 500 | – | – | ns |
| 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.11 | – | – | 150 | ns |
| C_d | diode capacitance | $f = 1\text{ MHz}$; $V_R = 0$; see Fig.7 | – | 17 | – | 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 |

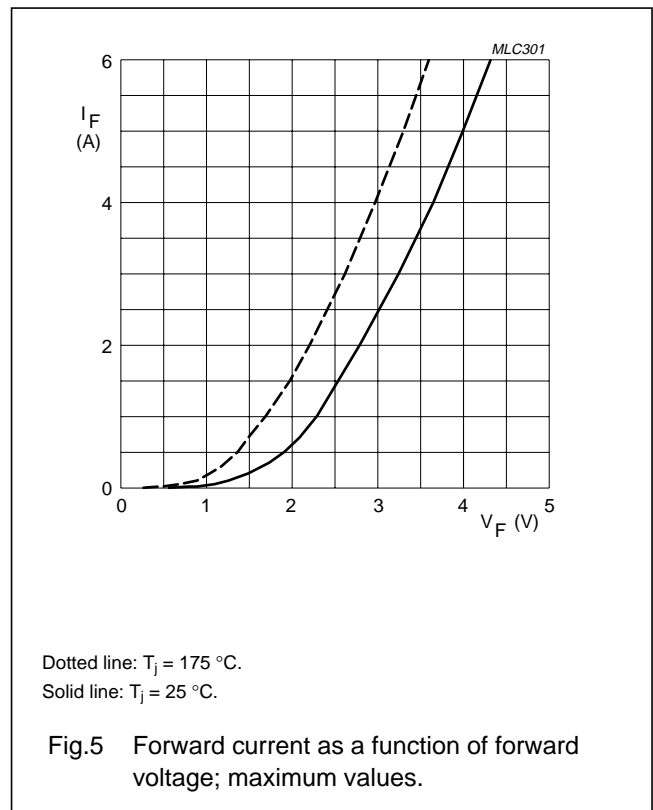
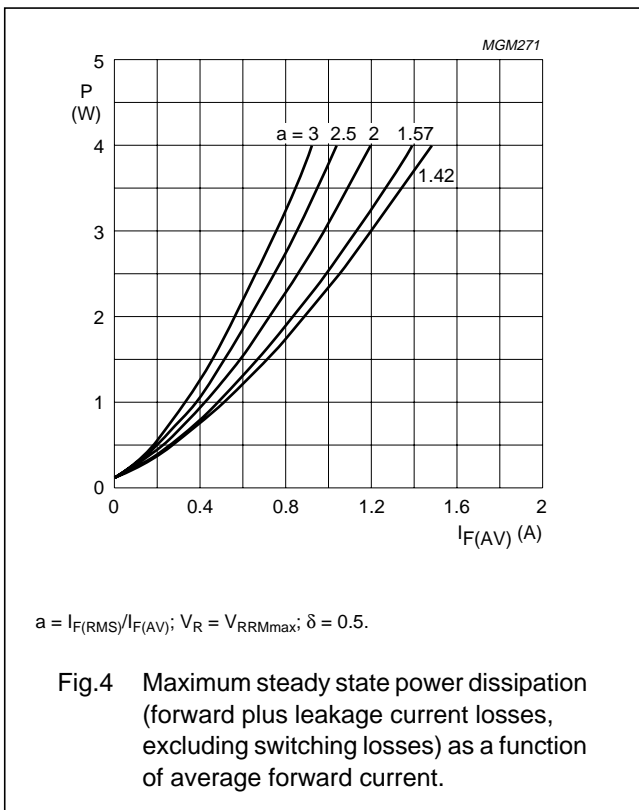
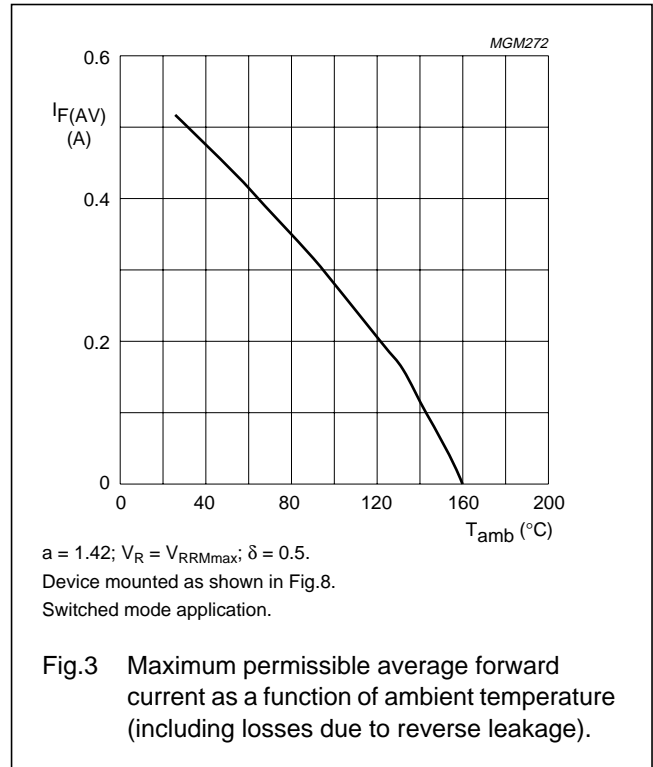
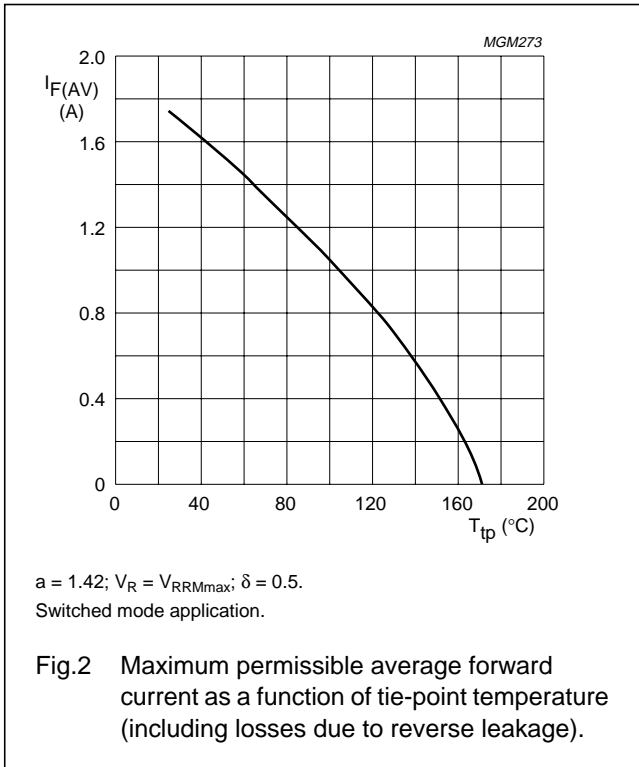
Note

1. Device mounted on an epoxy-glass printed-circuit board, 1.5 mm thick; thickness of Cu-layer $\geq 40\text{ }\mu\text{m}$, see Fig.8. For more information please refer to the 'General Part of associated Handbook.'

Ripple blocking diode

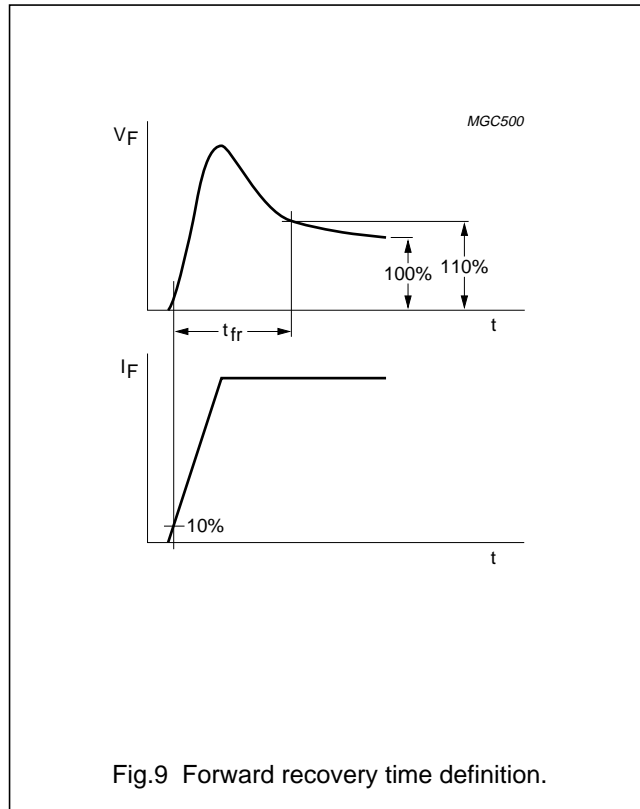
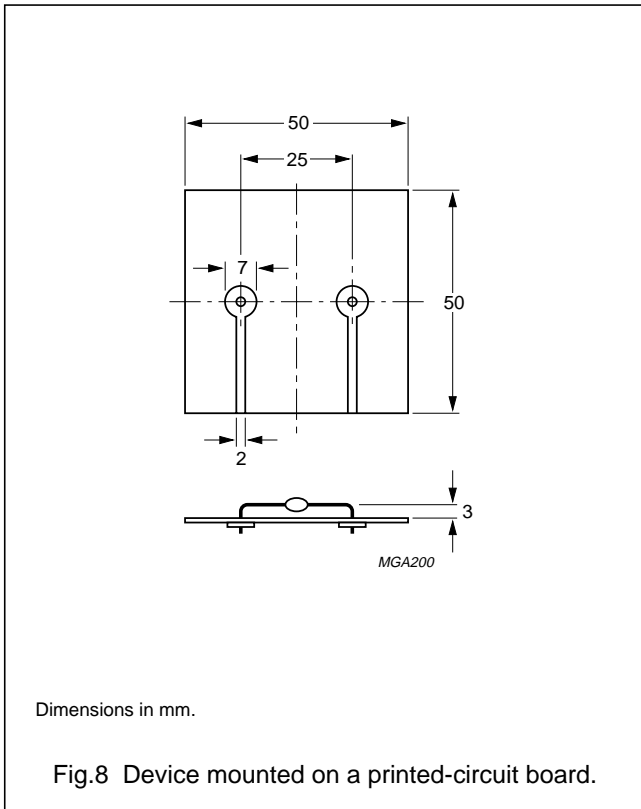
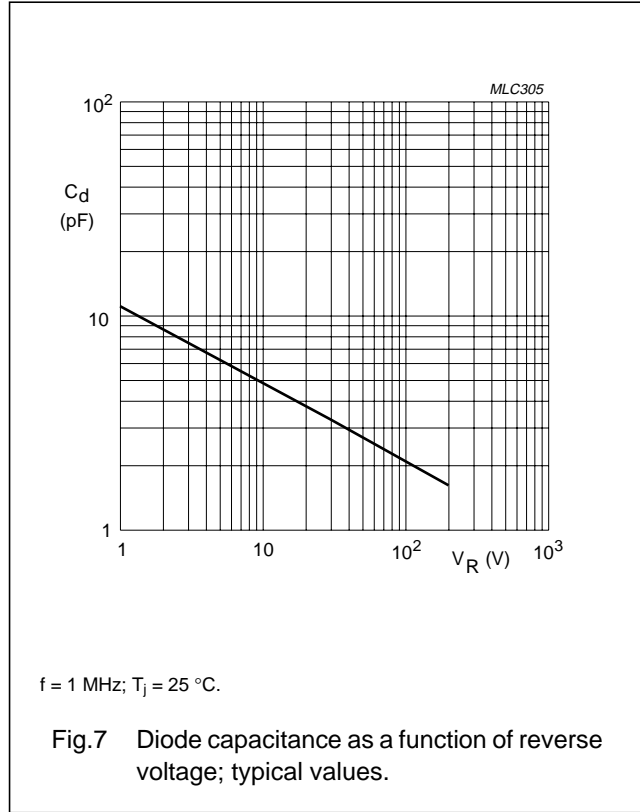
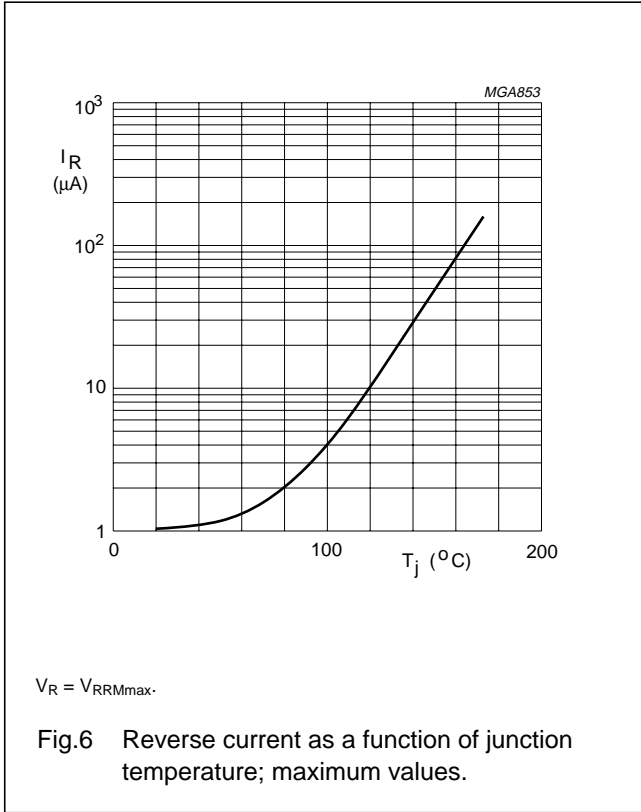
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GRAPHICAL DATA



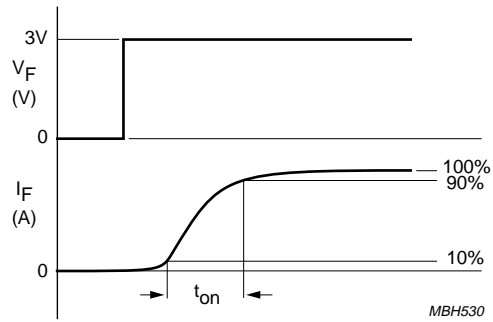
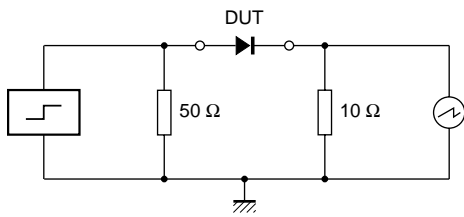
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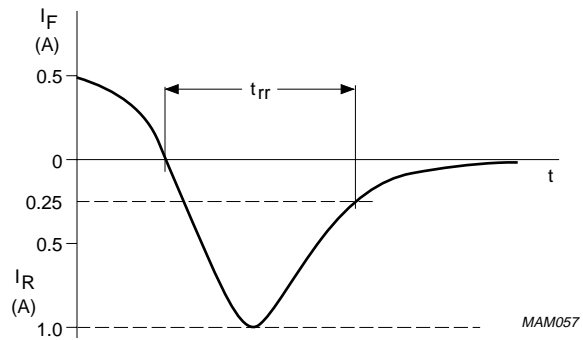
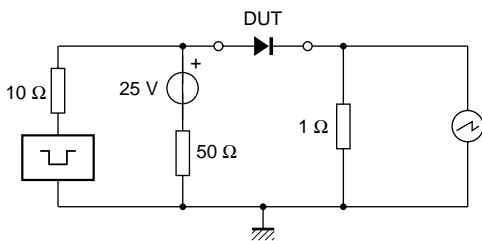
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Input impedance oscilloscope: 1 MΩ, 22 pF; $t_r \leq 7$ ns.
 Source impedance: 50 Ω; $t_r \leq 10$ ns.

Fig.10 Test circuit and turn-on time waveform and definition.



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

Fig.11 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 |

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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