

# 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.

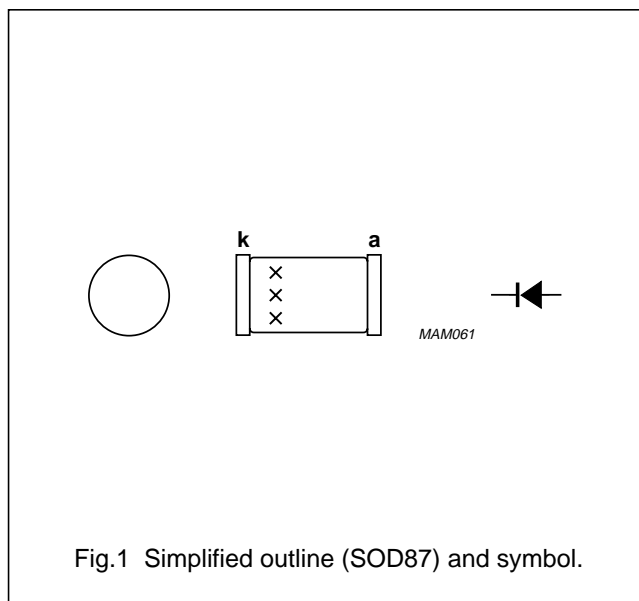


Fig.1 Simplified outline (SOD87) and symbol.

### LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <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
	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
$R_{th\ j\text{-tp}}$	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

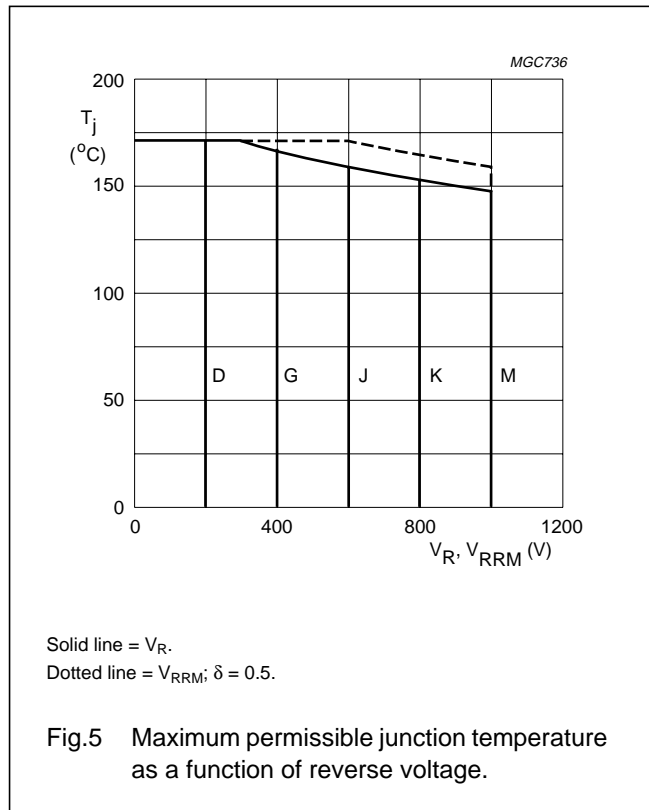
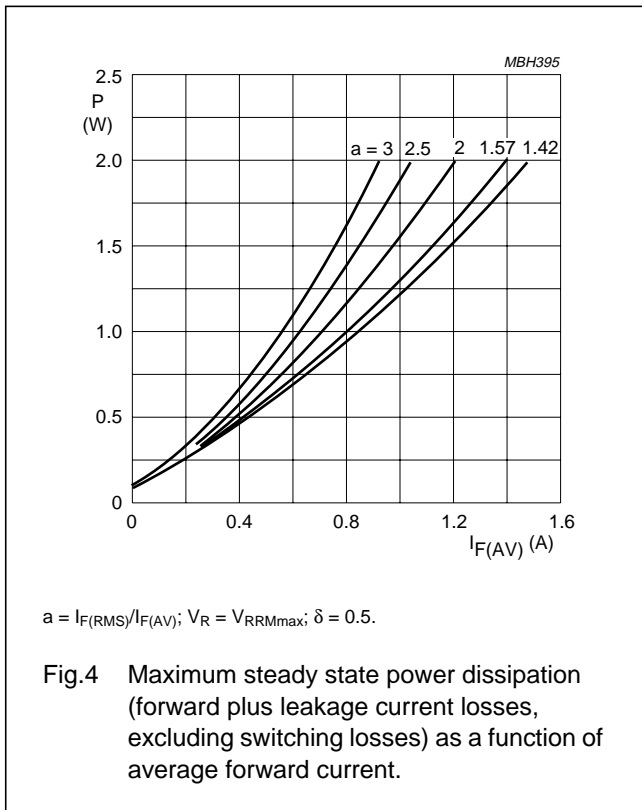
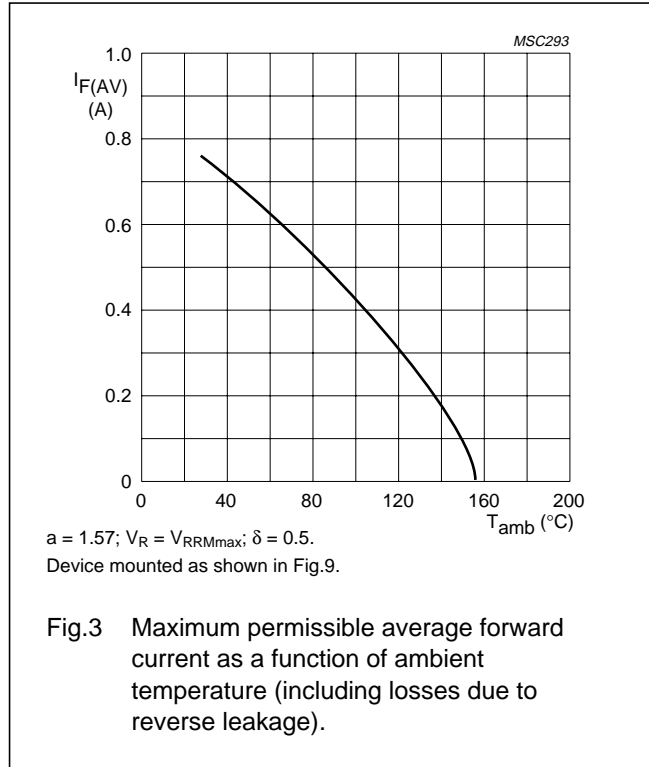
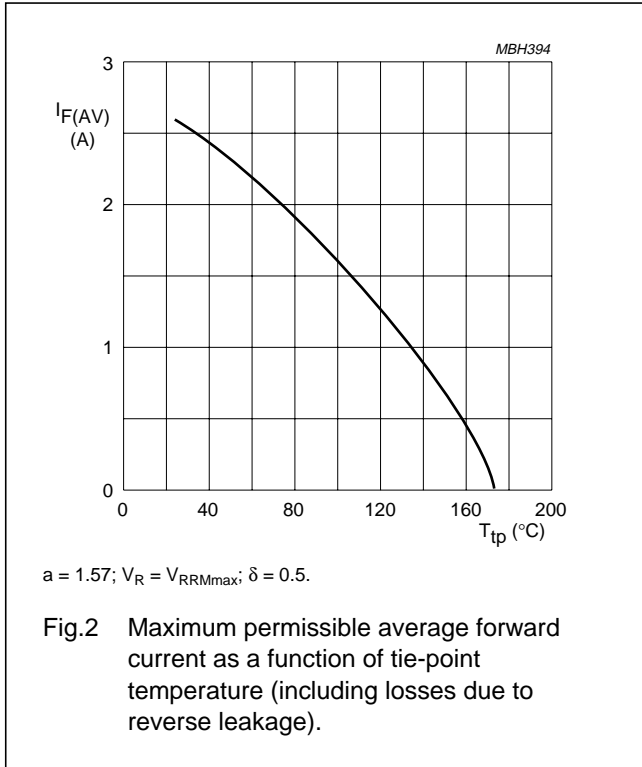
#### Note

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".

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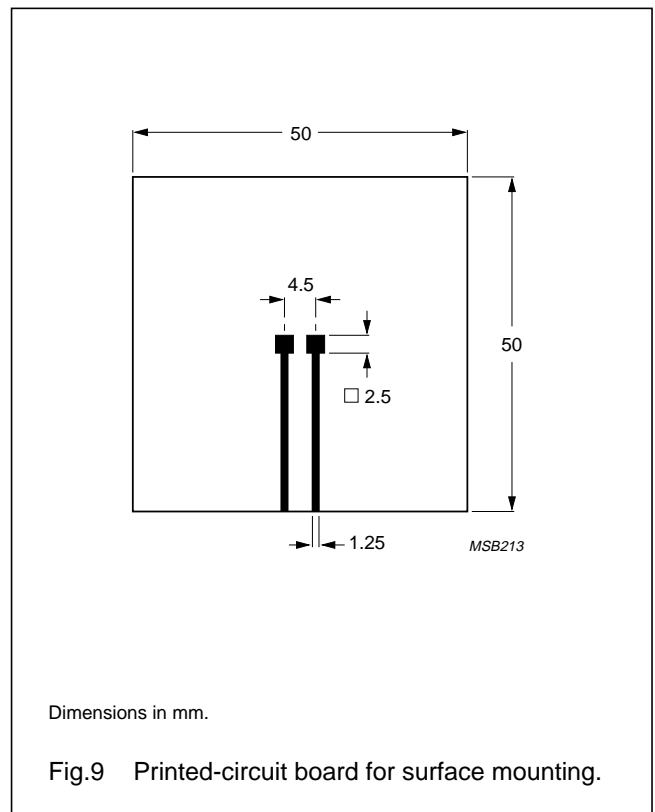
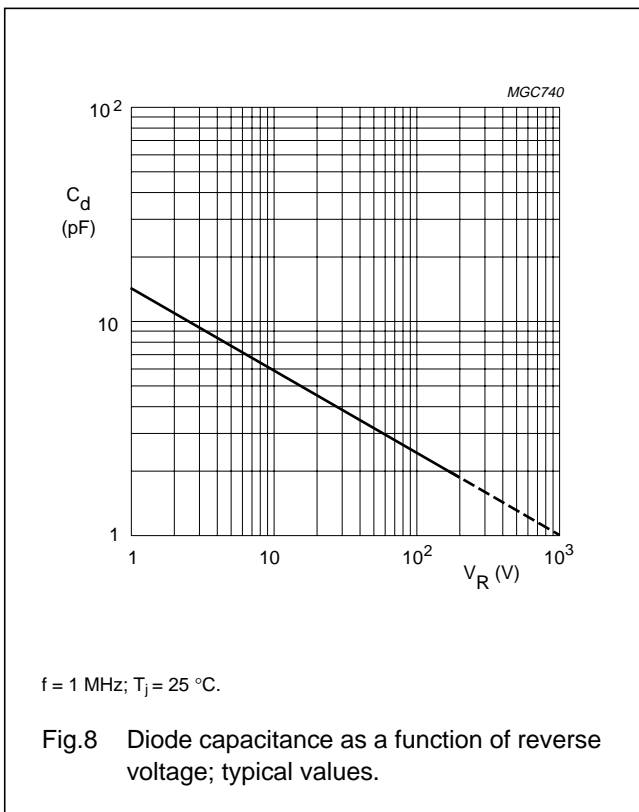
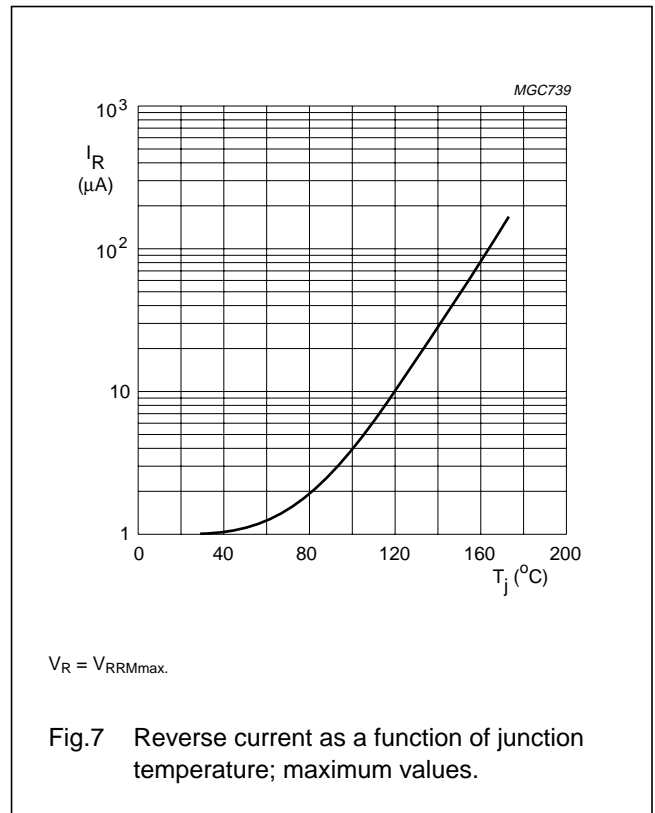
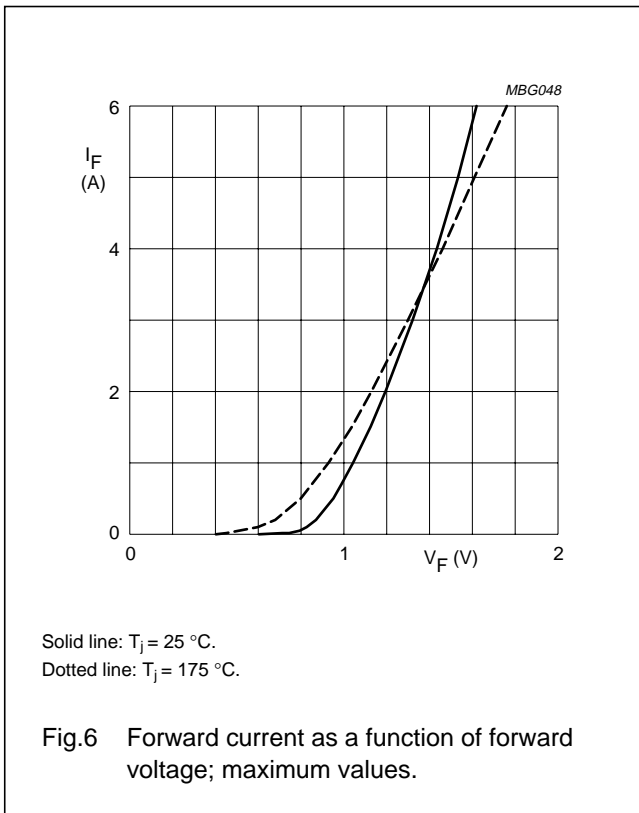
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GRAPHICAL DATA



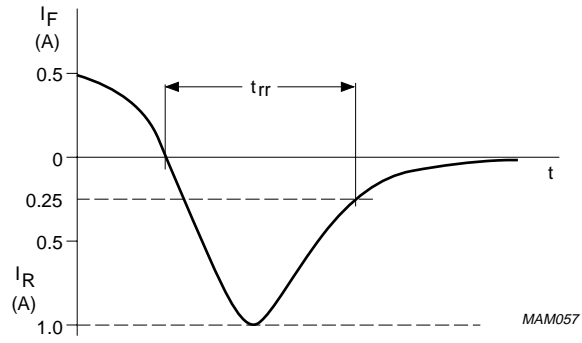
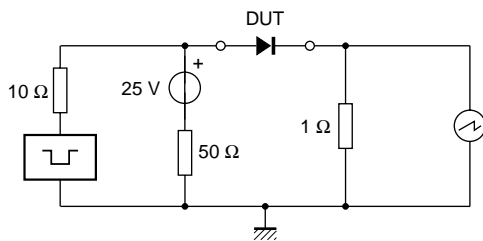
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Input impedance oscilloscope: 1 MΩ, 22 pF;  $t_r \leq 7$  ns.  
Source impedance: 50 Ω;  $t_r \leq 15$  ns.

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

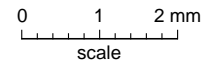
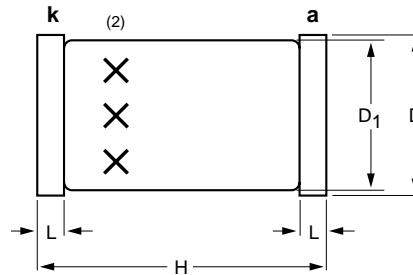
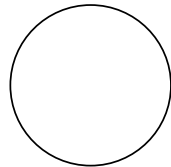
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PACKAGE OUTLINE

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 <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITIONS
Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
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