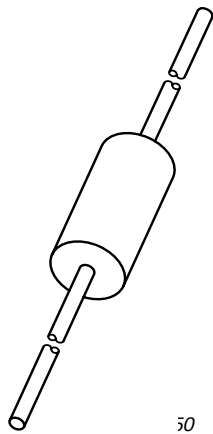


# DATA SHEET



50

## **BY8200 series**

Ultra fast high-voltage soft-recovery  
controlled avalanche rectifiers

Product specification

1998 Jul 16

Ultra fast high-voltage soft-recovery  
controlled avalanche rectifiers

BY8200 series

FEATURES

- Plastic package
- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- 40% overvoltage allowed during 5 sec
- Guaranteed avalanche energy absorption capability
- Very low reverse recovery time
- Soft-recovery switching characteristics
- Compact construction.

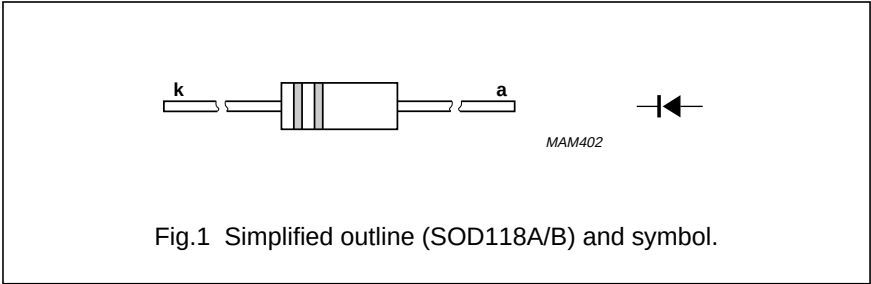
DESCRIPTION

Plastic package, using glass passivation and a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of

expansion of all used parts are matched.

The package should be used in an insulating medium such as resin, oil or SF6 gas.



APPLICATIONS

- For colour television and monitors up to 90 kHz (indication)
- High-voltage applications for:
  - multipliers
  - diode-split-transformers (FBT's).

MARKING

Cathode band colour codes

| TYPE NUMBER | PACKAGE CODE | INNER BAND | OUTER BAND |
|-------------|--------------|------------|------------|
| BY8206      | SOD118A      | green      | green      |
| BY8208      | SOD118A      | red        | green      |
| BY8210      | SOD118B      | violet     | green      |
| BY8212      | SOD118B      | orange     | green      |

LIMITING VALUES

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

| SYMBOL            | PARAMETER                       | CONDITIONS     | MIN. | MAX. | UNIT |
|-------------------|---------------------------------|----------------|------|------|------|
| V <sub>RRM1</sub> | repetitive peak reverse voltage |                |      |      |      |
|                   | BY8206                          |                | –    | 6    | kV   |
|                   | BY8208                          |                | –    | 8    | kV   |
|                   | BY8210                          |                | –    | 10   | kV   |
| V <sub>RRM2</sub> | repetitive peak reverse voltage | max. 5 seconds |      |      |      |
|                   | BY8206                          |                | –    | 8.4  | kV   |
|                   | BY8208                          |                | –    | 11.2 | kV   |
|                   | BY8210                          |                | –    | 14.0 | kV   |
|                   | BY8212                          |                | –    | 16.8 | kV   |

# Ultra fast high-voltage soft-recovery controlled avalanche rectifiers

## BY8200 series

| SYMBOL      | PARAMETER                       | CONDITIONS                                         | MIN. | MAX. | UNIT |
|-------------|---------------------------------|----------------------------------------------------|------|------|------|
| $I_{F(AV)}$ | average forward current         | averaged over any<br>20 ms period; see Figs 2 to 5 |      |      |      |
|             | BY8206                          |                                                    | –    | 10   | mA   |
|             | BY8208                          |                                                    | –    | 5    | mA   |
|             | BY8210                          |                                                    | –    | 5    | mA   |
|             | BY8212                          |                                                    | –    | 5    | mA   |
| $I_{FRM}$   | repetitive peak forward current | note 1                                             | –    | 500  | mA   |
| $T_{stg}$   | storage temperature             |                                                    | –65  | +175 | °C   |
| $T_j$       | junction temperature            |                                                    |      |      |      |
|             | BY8206                          |                                                    | –65  | +160 | °C   |
|             | BY8208                          |                                                    | –65  | +155 | °C   |
|             | BY8210                          |                                                    | –65  | +150 | °C   |
|             | BY8212                          |                                                    | –65  | +145 | °C   |

### Note

1. Withstands peak currents during flash-over in a picture tube.

### ELECTRICAL CHARACTERISTICS

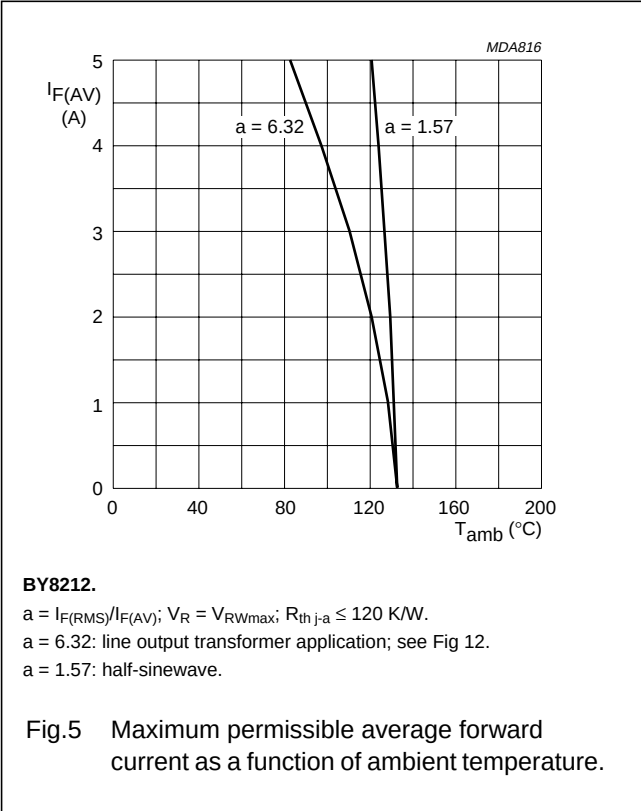
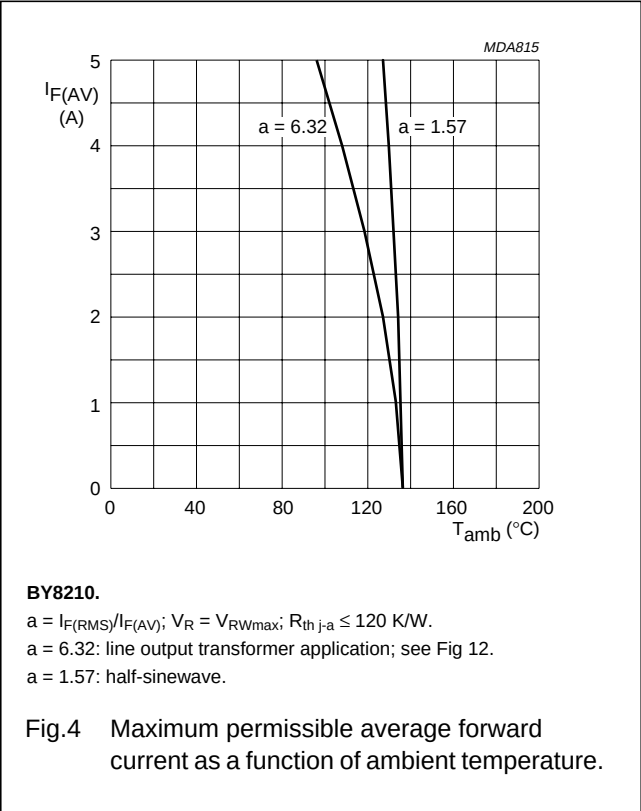
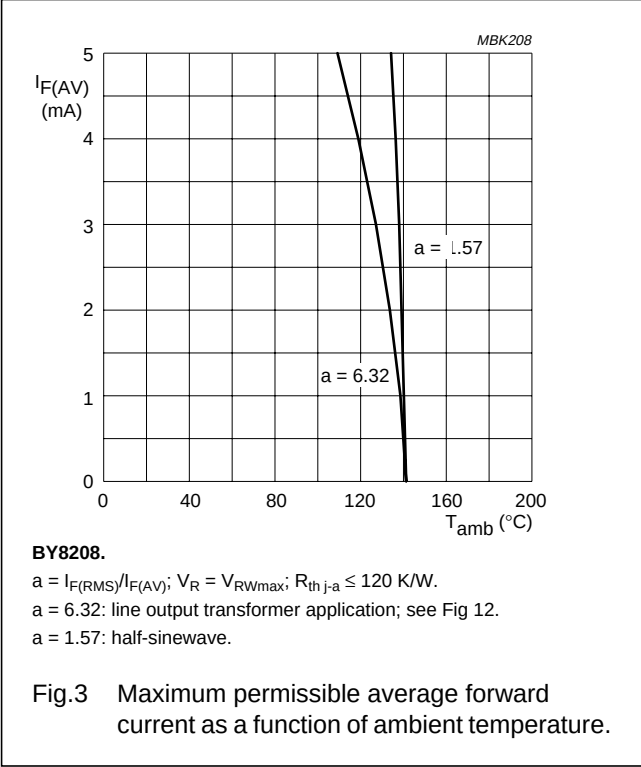
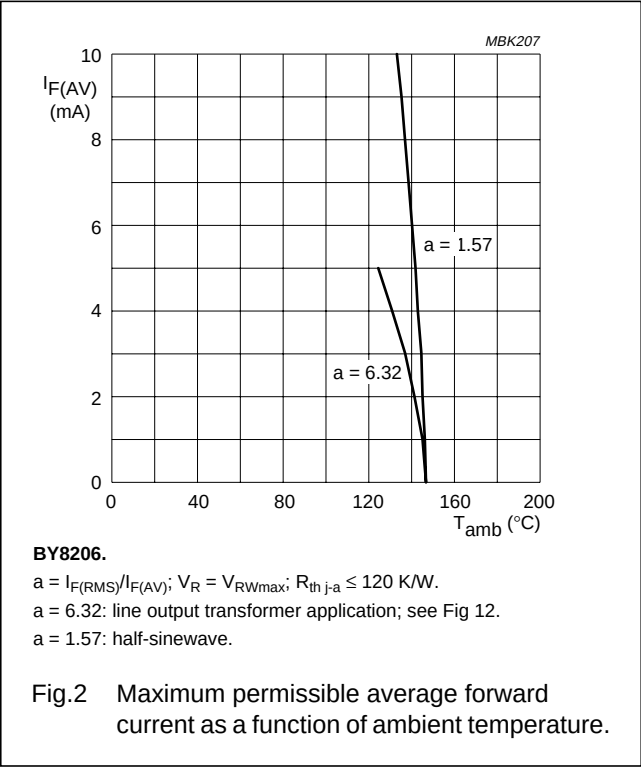
$T_j = 25\text{ °C}$  unless otherwise specified.

| SYMBOL   | PARAMETER             | CONDITIONS                                                                                                                        | MIN. | TYP. | MAX. | UNIT |
|----------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------|------|------|------|------|
| $V_F$    | forward voltage       | $I_F = 10\text{ mA}$ ; see Figs 6 to 9                                                                                            |      |      |      |      |
|          | BY8206                |                                                                                                                                   | –    | –    | 19   | V    |
|          | BY8208                |                                                                                                                                   | –    | –    | 23   | V    |
|          | BY8210                |                                                                                                                                   | –    | –    | 29   | V    |
|          | BY8212                |                                                                                                                                   | –    | –    | 35   | V    |
| $I_R$    | reverse current       | $V_R = V_{RRM1}$ ; $T_j = 120\text{ °C}$                                                                                          | –    | –    | 3    | μA   |
| $Q_r$    | recovery charge       | when switched from $I_F = 100\text{ mA}$ to<br>$V_R \geq 100\text{ V}$ and $dI_F/dt = -200\text{ mA}/\mu\text{s}$ ;<br>see Fig 10 | –    | 0.2  | –    | nC   |
| $t_{rr}$ | reverse recovery time | when switched from $I_F = 2\text{ mA}$ to<br>$I_R = 4\text{ mA}$ ; measured at $I_R = 1\text{ mA}$ ;<br>see Fig 11                | –    | –    | < 45 | ns   |
| $C_d$    | diode capacitance     | $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$                                                                                           |      |      |      |      |
|          | BY8206                |                                                                                                                                   | –    | 0.50 | –    | pF   |
|          | BY8208                |                                                                                                                                   | –    | 0.42 | –    | pF   |
|          | BY8210                |                                                                                                                                   | –    | 0.35 | –    | pF   |
|          | BY8212                |                                                                                                                                   | –    | 0.30 | –    | pF   |

Ultra fast high-voltage soft-recovery  
controlled avalanche rectifiers

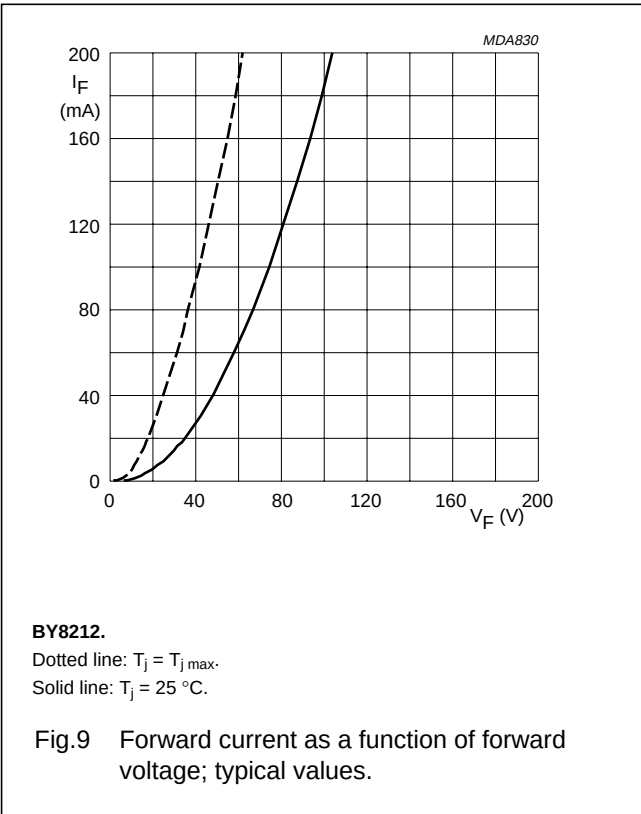
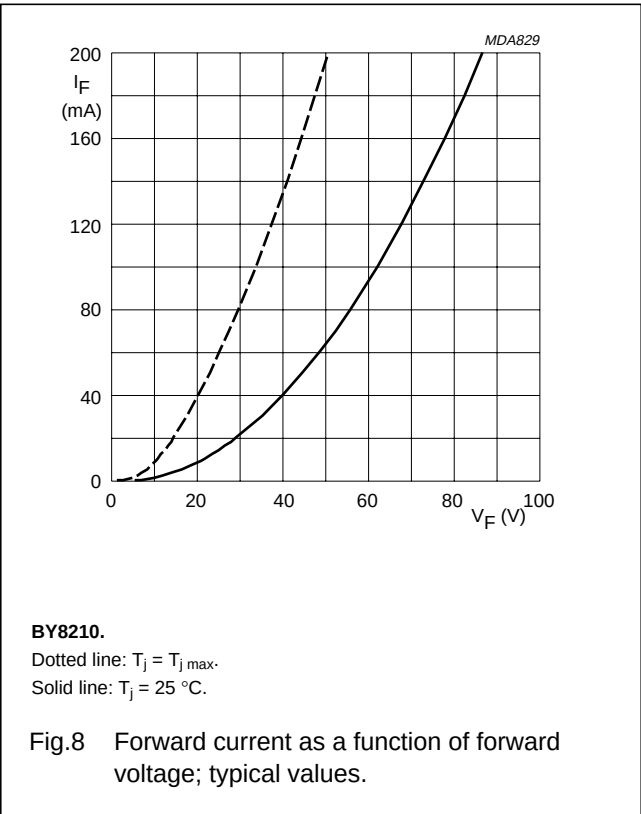
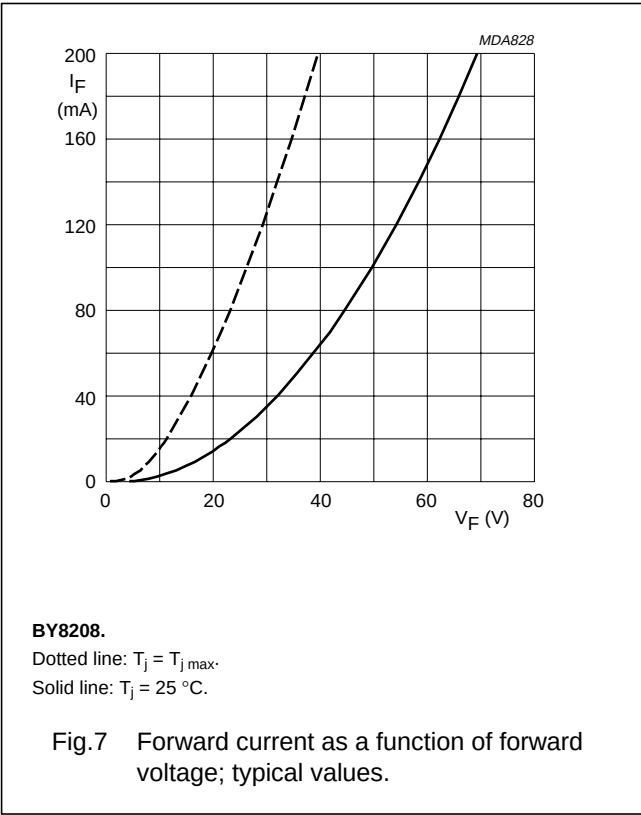
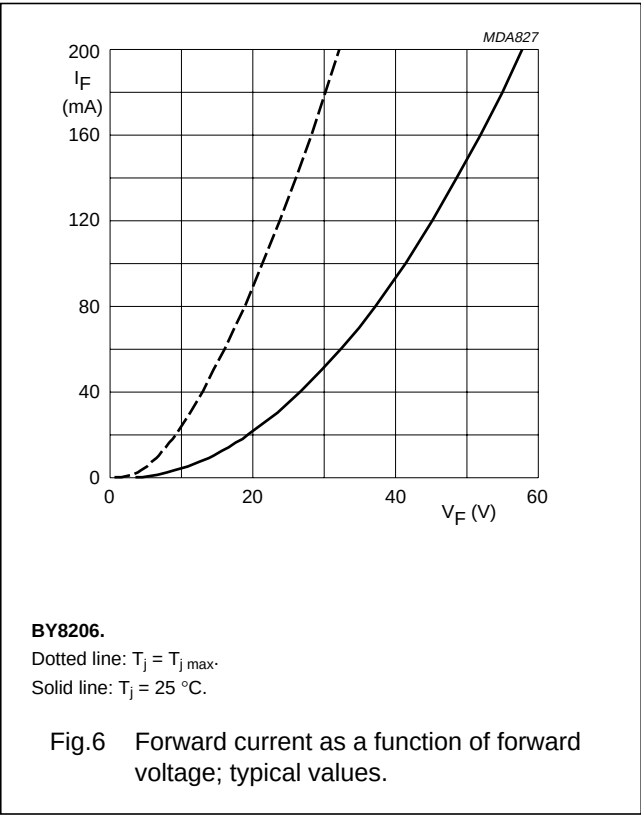
BY8200 series

GRAPHICAL DATA



Ultra fast high-voltage soft-recovery  
controlled avalanche rectifiers

BY8200 series



Ultra fast high-voltage soft-recovery  
controlled avalanche rectifiers

BY8200 series

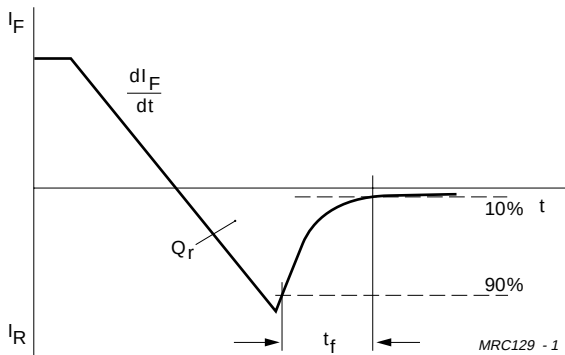
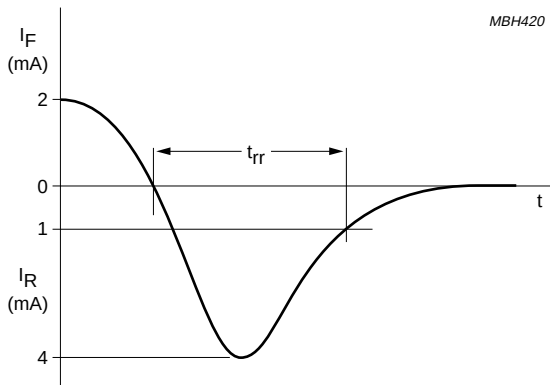
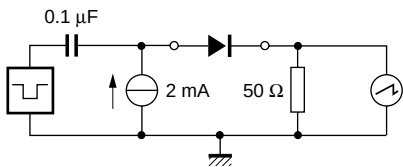


Fig.10 Reverse recovery definitions.



Rise time oscilloscope:  $t_r < 7 \text{ ns}$ .  
Generator pulse width: 1.0  $\mu\text{s}$ .

Fig.11 Test circuit and reverse recovery time waveform and definition.

# Ultra fast high-voltage soft-recovery controlled avalanche rectifiers

BY8200 series

## APPLICATION INFORMATION

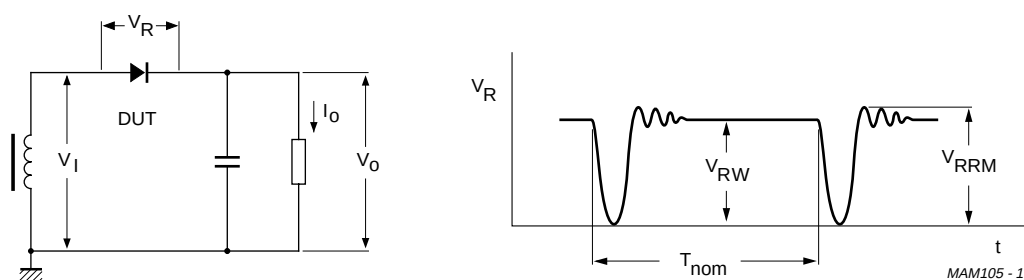


Fig.12 Typical operation circuit and voltage waveform.

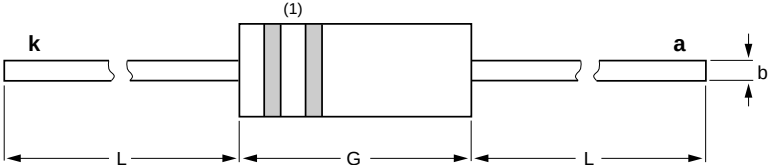
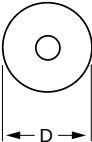
Ultra fast high-voltage soft-recovery  
controlled avalanche rectifiers

BY8200 series

PACKAGE OUTLINES

Hermetically sealed plastic package; axial leaded; 2 leads

SOD118A



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

| UNIT | b   | D          | G          | L<br>min. |
|------|-----|------------|------------|-----------|
| mm   | 0.5 | 2.6<br>2.4 | 6.7<br>6.3 | 31        |

02.55mm

scale

**Note**

1. The marking bands indicate the cathode.

| OUTLINE<br>VERSION | REFERENCES |       |      |  | EUROPEAN<br>PROJECTION                                                                | ISSUE DATE |
|--------------------|------------|-------|------|--|---------------------------------------------------------------------------------------|------------|
|                    | IEC        | JEDEC | EIAJ |  |                                                                                       |            |
| SOD118A            |            |       |      |  |  | 98-05-28   |

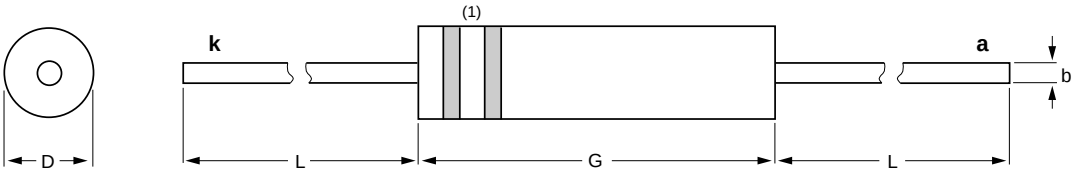


Ultra fast high-voltage soft-recovery  
controlled avalanche rectifiers

BY8200 series

Hermetically sealed plastic package; axial leaded; 2 leads

SOD118B



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

| UNIT | b   | D          | G           | L<br>min. |
|------|-----|------------|-------------|-----------|
| mm   | 0.5 | 2.6<br>2.4 | 10.5<br>9.5 | 29        |

02.55mm

scale

**Note**

1. The marking bands indicate the cathode.

| OUTLINE<br>VERSION | REFERENCES |       |      |  | EUROPEAN<br>PROJECTION                                                                | ISSUE DATE |
|--------------------|------------|-------|------|--|---------------------------------------------------------------------------------------|------------|
|                    | IEC        | JEDEC | EIAJ |  |                                                                                       |            |
| SOD118B            |            |       |      |  |  | 98-05-28   |

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**Ultra fast high-voltage soft-recovery  
controlled avalanche rectifiers**

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**BY8200 series****DEFINITIONS**

| <b>Data Sheet Status</b>                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 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.                                |
| <b>Limiting values</b>                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                       |
| 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. |                                                                                       |
| <b>Application information</b>                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                       |
| Where application information is given, it is advisory and does not form part of the specification.                                                                                                                                                                                                                                                                                                                                                       |                                                                                       |

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These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.

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Ultra fast high-voltage soft-recovery  
controlled avalanche rectifiers

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BY8200 series

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# Philips Semiconductors – a worldwide company

**Argentina:** see South America

**Australia:** 34 Waterloo Road, NORTH RYDE, NSW 2113,  
Tel. +61 2 9805 4455, Fax. +61 2 9805 4466

**Austria:** Computerstr. 6, A-1101 WIEN, P.O. Box 213, Tel. +43 160 1010,  
Fax. +43 160 101 1210

**Belarus:** Hotel Minsk Business Center, Bld. 3, r. 1211, Volodarski Str. 6,  
220050 MINSK, Tel. +375 172 200 733, Fax. +375 172 200 773

**Belgium:** see The Netherlands

**Brazil:** see South America

**Bulgaria:** Philips Bulgaria Ltd., Energoproject, 15th floor,  
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Tel. +359 2 689 211, Fax. +359 2 689 102

**Canada:** PHILIPS SEMICONDUCTORS/COMPONENTS,  
Tel. +1 800 234 7381

**China/Hong Kong:** 501 Hong Kong Industrial Technology Centre,  
72 Tat Chee Avenue, Kowloon Tong, HONG KONG,  
Tel. +852 2319 7888, Fax. +852 2319 7700

**Colombia:** see South America

**Czech Republic:** see Austria

**Denmark:** Prags Boulevard 80, PB 1919, DK-2300 COPENHAGEN S,  
Tel. +45 32 88 2636, Fax. +45 31 57 0044

**Finland:** Sinikalliontie 3, FIN-02630 ESPOO,  
Tel. +358 9 615800, Fax. +358 9 61580920

**France:** 51 Rue Carnot, BP317, 92156 SURESNES Cedex,  
Tel. +33 1 40 99 6161, Fax. +33 1 40 99 6427

**Germany:** Hammerbrookstraße 69, D-20097 HAMBURG,  
Tel. +49 40 23 53 60, Fax. +49 40 23 536 300

**Greece:** No. 15, 25th March Street, GR 17778 TAVROS/ATHENS,  
Tel. +30 1 4894 339/239, Fax. +30 1 4814 240

**Hungary:** see Austria

**India:** Philips INDIA Ltd, Band Box Building, 2nd floor,  
254-D, Dr. Annie Besant Road, Worli, MUMBAI 400 025,  
Tel. +91 22 493 8541, Fax. +91 22 493 0966

**Indonesia:** PT Philips Development Corporation, Semiconductors Division,  
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Tel. +62 21 794 0040 ext. 2501, Fax. +62 21 794 0080

**Ireland:** Newstead, Clonskeagh, DUBLIN 14,  
Tel. +353 1 7640 000, Fax. +353 1 7640 200

**Israel:** RAPAC Electronics, 7 Kehilat Saloniki St, PO Box 18053,  
TEL AVIV 61180, Tel. +972 3 645 0444, Fax. +972 3 649 1007

**Italy:** PHILIPS SEMICONDUCTORS, Piazza IV Novembre 3,  
20124 MILANO, Tel. +39 2 6752 2531, Fax. +39 2 6752 2557

**Japan:** Philips Bldg 13-37, Kohnan 2-chome, Minato-ku,  
TOKYO 108-8507, Tel. +81 3 3740 5130, Fax. +81 3 3740 5077

**Korea:** Philips House, 260-199 Itaewon-dong, Yongsan-ku, SEOUL,  
Tel. +82 2 709 1412, Fax. +82 2 709 1415

**Malaysia:** No. 76 Jalan Universiti, 46200 PETALING JAYA, SELANGOR,  
Tel. +60 3 750 5214, Fax. +60 3 757 4880

**Mexico:** 5900 Gateway East, Suite 200, EL PASO, TEXAS 79905,  
Tel. +9-5 800 234 7381

**Middle East:** see Italy

**Netherlands:** Postbus 90050, 5600 PB EINDHOVEN, Bldg. VB,  
Tel. +31 40 27 82785, Fax. +31 40 27 88399

**New Zealand:** 2 Wagener Place, C.P.O. Box 1041, AUCKLAND,  
Tel. +64 9 849 4160, Fax. +64 9 849 7811

**Norway:** Box 1, Manglerud 0612, OSLO,  
Tel. +47 22 74 8000, Fax. +47 22 74 8341

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**Philippines:** Philips Semiconductors Philippines Inc.,  
106 Valero St. Salcedo Village, P.O. Box 2108 MCC, MAKATI,  
Metro MANILA, Tel. +63 2 816 6380, Fax. +63 2 817 3474

**Poland:** Ul. Lukiska 10, PL 04-123 WARSZAWA,  
Tel. +48 22 612 2831, Fax. +48 22 612 2327

**Portugal:** see Spain

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**Russia:** Philips Russia, Ul. Usatcheva 35A, 119048 MOSCOW,  
Tel. +7 095 755 6918, Fax. +7 095 755 6919

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Tel. +65 350 2538, Fax. +65 251 6500

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2092 JOHANNESBURG, P.O. Box 7430 Johannesburg 2000,  
Tel. +27 11 470 5911, Fax. +27 11 470 5494

**South America:** Al. Vicente Pinzon, 173, 6th floor,  
04547-130 SÃO PAULO, SP, Brazil,  
Tel. +55 11 821 2333, Fax. +55 11 821 2382

**Spain:** Balmes 22, 08007 BARCELONA,  
Tel. +34 93 301 6312, Fax. +34 93 301 4107

**Sweden:** Kottbygatan 7, Akalla, S-16485 STOCKHOLM,  
Tel. +46 8 5985 2000, Fax. +46 8 5985 2745

**Switzerland:** Allmendstrasse 140, CH-8027 ZÜRICH,  
Tel. +41 1 488 2741 Fax. +41 1 488 3263

**Taiwan:** Philips Semiconductors, 6F, No. 96, Chien Kuo N. Rd., Sec. 1,  
TAIPEI, Taiwan Tel. +886 2 2134 2865, Fax. +886 2 2134 2874

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209/2 Sanpavuth-Bangna Road Prakanong, BANGKOK 10260,  
Tel. +66 2 745 4090, Fax. +66 2 398 0793

**Turkey:** Talatpasa Cad. No. 5, 80640 GÜLTEPE/ISTANBUL,  
Tel. +90 212 279 2770, Fax. +90 212 282 6707

**Ukraine:** PHILIPS UKRAINE, 4 Patrice Lumumba str., Building B, Floor 7,  
252042 KIEV, Tel. +380 44 264 2776, Fax. +380 44 268 0461

**United Kingdom:** Philips Semiconductors Ltd., 276 Bath Road, Hayes,  
MIDDLESEX UB3 5BX, Tel. +44 181 730 5000, Fax. +44 181 754 8421

**United States:** 811 East Arques Avenue, SUNNYVALE, CA 94088-3409,  
Tel. +1 800 234 7381

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International Marketing & Sales Communications, Building BE-p, P.O. Box 218,  
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Printed in The Netherlands

115104/00/01/pp12

Date of release: 1998 Jul 16

Document order number: 9397 750 03955

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