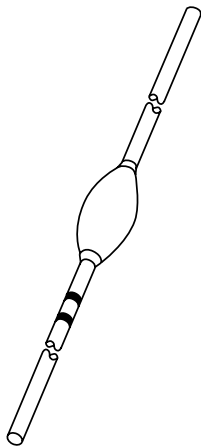


# DATA SHEET



## **BY8100 series**

Very fast high-voltage soft-recovery  
controlled avalanche rectifiers

Product specification  
Supersedes data of October 1994

1996 May 24

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

## BY8100 series

### FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- Soft-recovery switching characteristics
- Compact construction.

### APPLICATIONS

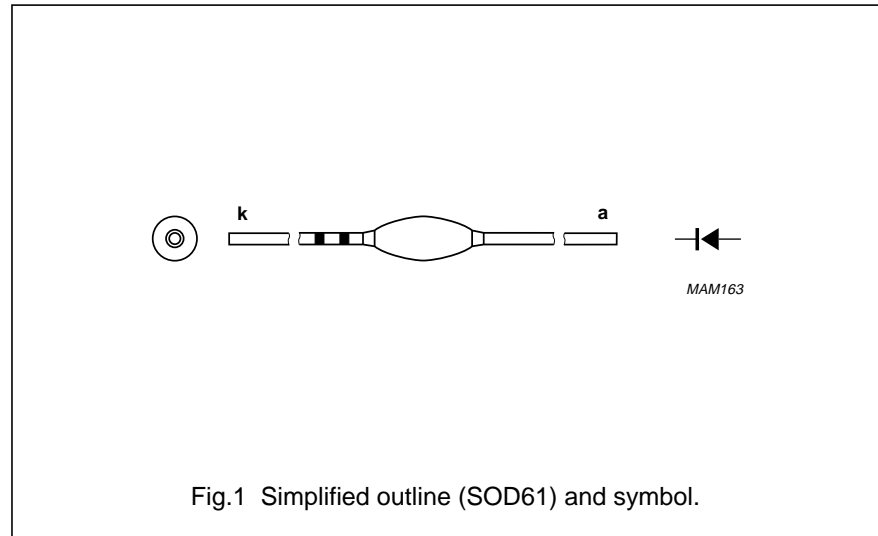
- For colour television and monitors up to 128 kHz
- High-voltage applications for:
  - Multipliers
  - Layer-wound diode-split-transformers where controlled avalanche is required.

### DESCRIPTION

Rugged glass package, using 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 is designed to be used in an insulating medium such as resin, oil or SF6 gas.



### MARKING

#### Cathode band colour codes

| TYPE NUMBER | PACKAGE CODE | INNER BAND | OUTER BAND |
|-------------|--------------|------------|------------|
| BY8104      | SOD61AC      | orange     | black      |
| BY8106      | SOD61AD      | orange     | green      |
| BY8108      | SOD61AE      | orange     | red        |
| BY8110      | SOD61AF      | orange     | violet     |
| BY8112      | SOD61AH      | orange     | orange     |
| BY8114      | SOD61AI      | orange     | lilac      |
| BY8116      | SOD61AJ      | orange     | grey       |

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

## BY8100 series

### 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 |   |  |      |      |    |
|                    | BY8104                          |   | –  | 5    | kV   |    |
|                    | BY8106                          |   | –  | 8    | kV   |    |
|                    | BY8108                          |   | –  | 10   | kV   |    |
|                    | BY8110                          |   | –  | 12   | kV   |    |
|                    | BY8112                          |   | –  | 14   | kV   |    |
|                    | BY8114                          |   | –  | 17   | kV   |    |
| V <sub>RW</sub>    | working reverse voltage         |   |  |      |      |    |
|                    | BY8104                          |   | –  | 4    | kV   |    |
|                    | BY8106                          |   | –  | 6    | kV   |    |
|                    | BY8108                          |   | –  | 8    | kV   |    |
|                    | BY8110                          |   | –  | 10   | kV   |    |
|                    | BY8112                          |   | –  | 12   | kV   |    |
|                    | BY8114                          |   | –  | 14   | kV   |    |
| I <sub>F(AV)</sub> | average forward current         | averaged over any<br>20 ms period;<br>see Figs 2 to 8 |  |      |      |    |
|                    | BY8104                          |   | –  | 20   | mA   |    |
|                    | BY8106                          |   | –  | 10   | mA   |    |
|                    | BY8108                          |   | –  | 5    | mA   |    |
|                    | BY8110                          |   | –  | 5    | mA   |    |
|                    | BY8112                          |   | –  | 5    | mA   |    |
|                    | BY8114                          |   | –  | 5    | mA   |    |
| I <sub>FRM</sub>   | repetitive peak forward current | note 1  | –  | 500  | mA   |    |
|                    | P <sub>RSM</sub>                | non-repetitive peak reverse power dissipation         | t = 20 μs half sinewave;<br>T <sub>j</sub> = T <sub>j max</sub> prior to surge |      |      |    |
|                    |                                 | BY8104  |  | –    | 1.7  | kW |
|                    |                                 | BY8106  |  | –    | 2.5  | kW |
|                    |                                 | BY8108  |  | –    | 3.0  | kW |
|                    |                                 | BY8110  |  | –    | 3.8  | kW |
|                    |                                 | BY8112  |  | –    | 5.0  | kW |
| BY8114             |                                 | –   | 5.5  | kW   |      |    |
| T <sub>stg</sub>   | storage temperature             |   | –65  | +120 | °C   |    |
|                    | T <sub>j</sub>                  | junction temperature                                  | –65  | +120 | °C   |    |

### Note

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

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### ELECTRICAL CHARACTERISTICS

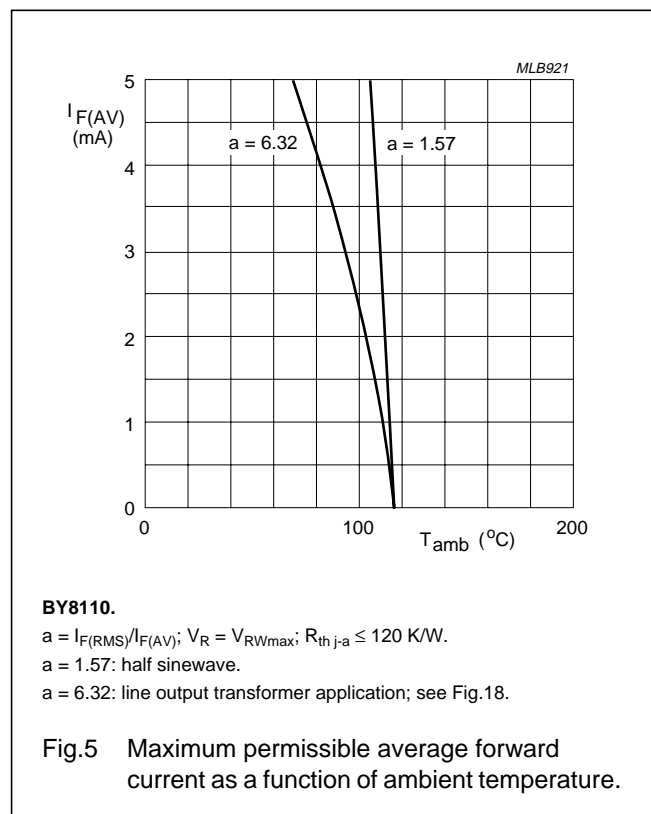
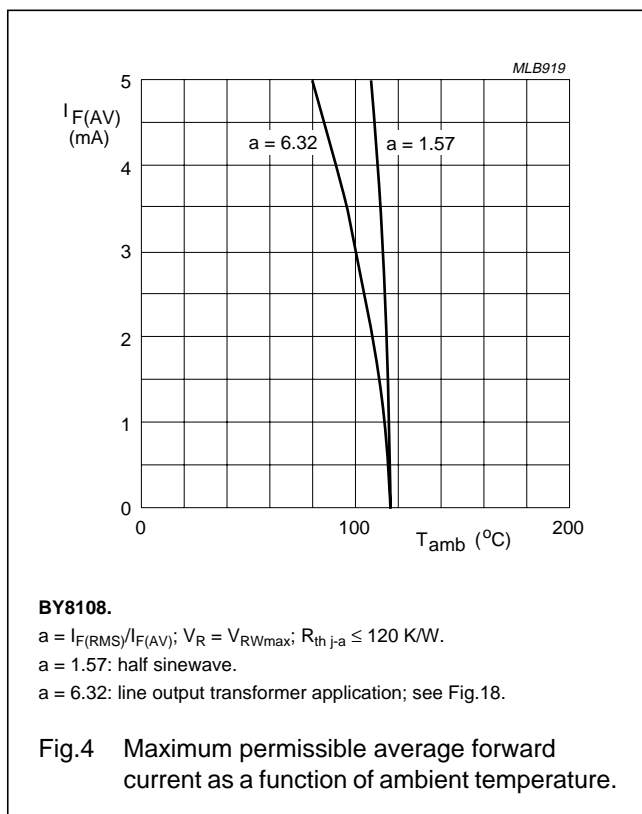
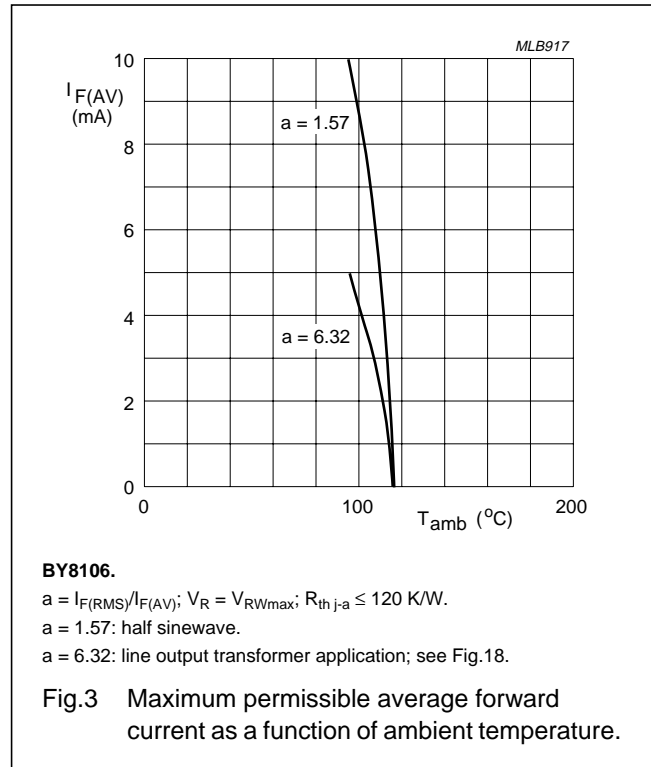
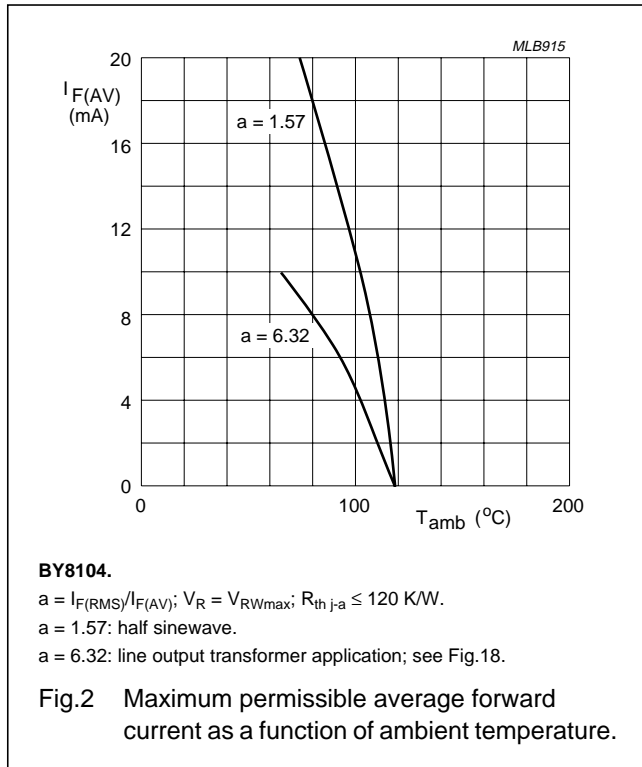
$T_j = 25\text{ °C}$ ; unless otherwise specified.

| SYMBOL   | PARAMETER             | CONDITIONS  | MIN. | TYP. | MAX. | UNIT          |
|----------|-----------------------|---|------|------|------|---------------|
| $V_F$    | forward voltage       | $I_F = 100\text{ mA}$ ; $T_j = T_{j\text{ max}}$ ;<br>see Figs 9 to 15  | -    | -    | 26   | V             |
|          | BY8104                |   |      |      |      |               |
|          | BY8106                |   |      |      |      |               |
|          | BY8108                |   |      |      |      |               |
|          | BY8110                |   |      |      |      |               |
|          | BY8112                |   |      |      |      |               |
|          | BY8114                |   |      |      |      |               |
| BY8116   |                       |   |      |      |      |               |
| $I_R$    | reverse current       | $V_R = V_{RW\text{ max}}$ ; $T_j = 120\text{ °C}$   | -    | -    | 3    | $\mu\text{A}$ |
| $Q_r$    | 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.16 | -    | -    | 0.4  | nC            |
| $t_f$    | fall time             | 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.16 | 40   | -    | -    | ns            |
| $t_{rr}$ | 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.17                | -    | -    | 60   | ns            |
| $C_d$    | diode capacitance     | $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$   | -    | 0.90 | -    | pF            |
|          | BY8104                |   |      |      |      |               |
|          | BY8106                |   |      |      |      |               |
|          | BY8108                |   |      |      |      |               |
|          | BY8110                |   |      |      |      |               |
|          | BY8112                |   |      |      |      |               |
|          | BY8114                |   |      |      |      |               |
| BY8116   |                       |   |      |      |      |               |

Very fast high-voltage soft-recovery controlled avalanche rectifiers

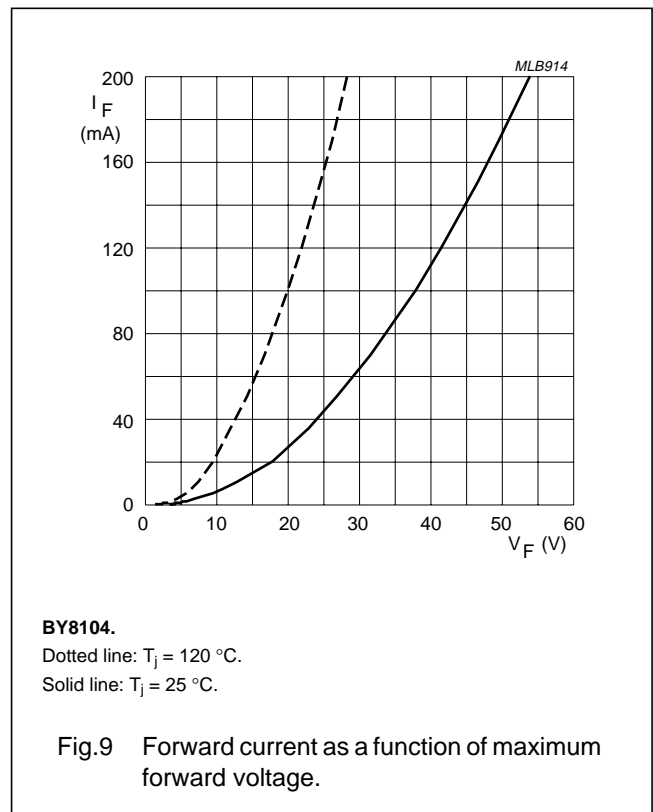
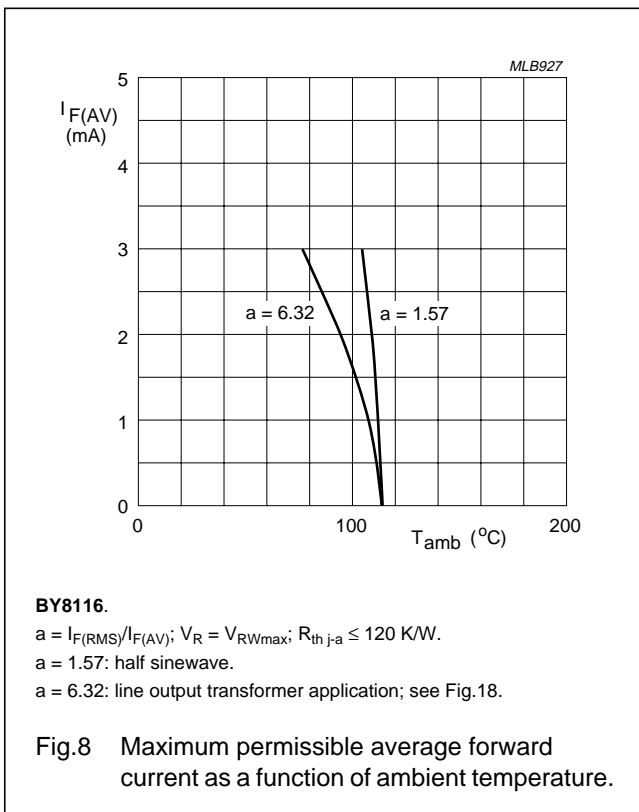
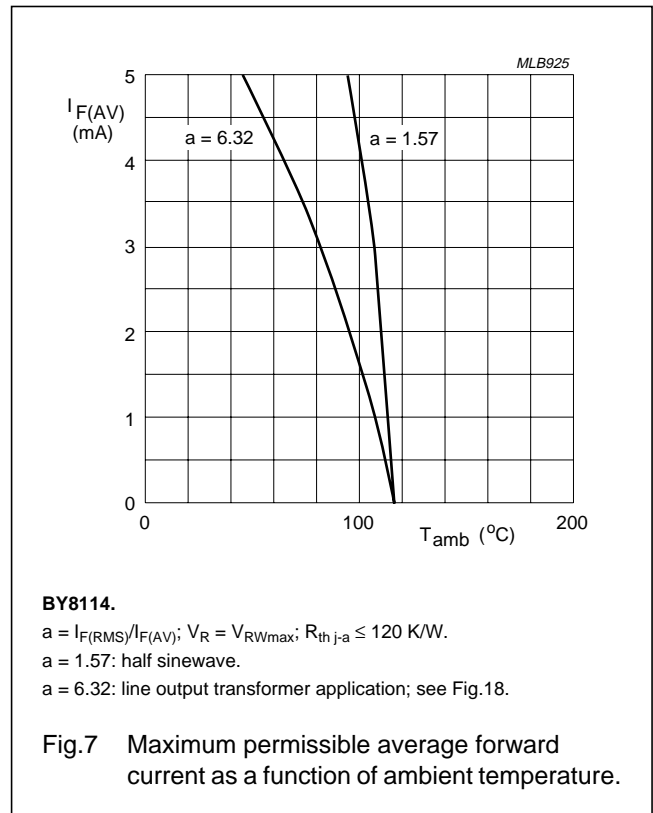
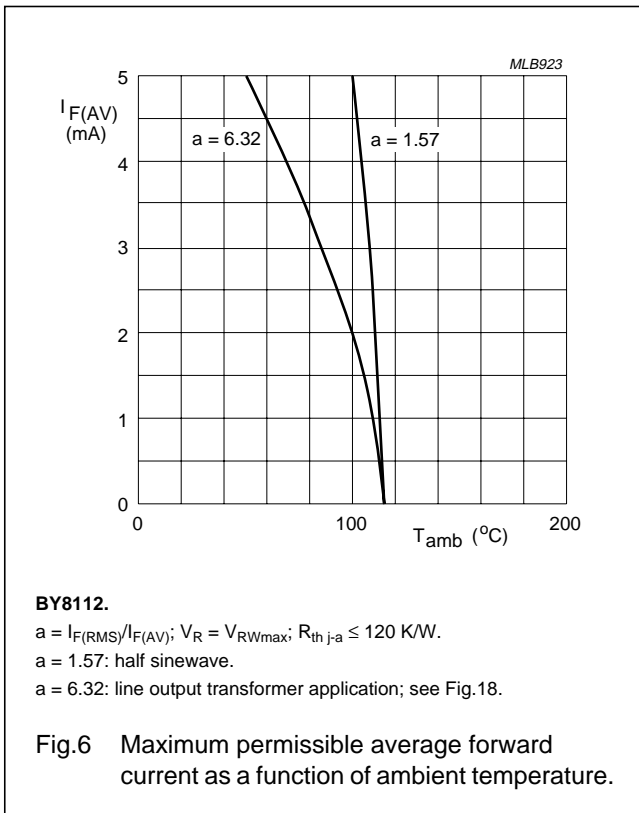
BY8100 series

GRAPHICAL DATA



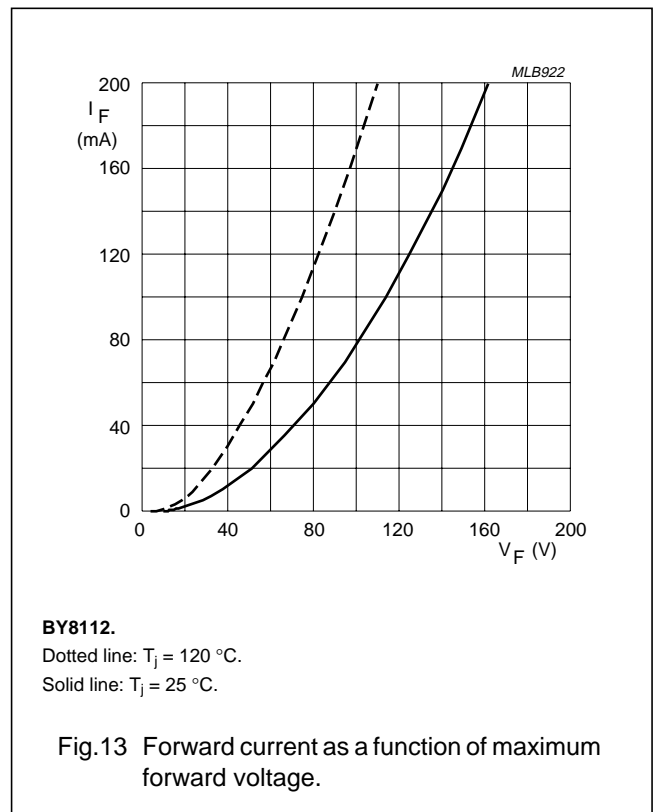
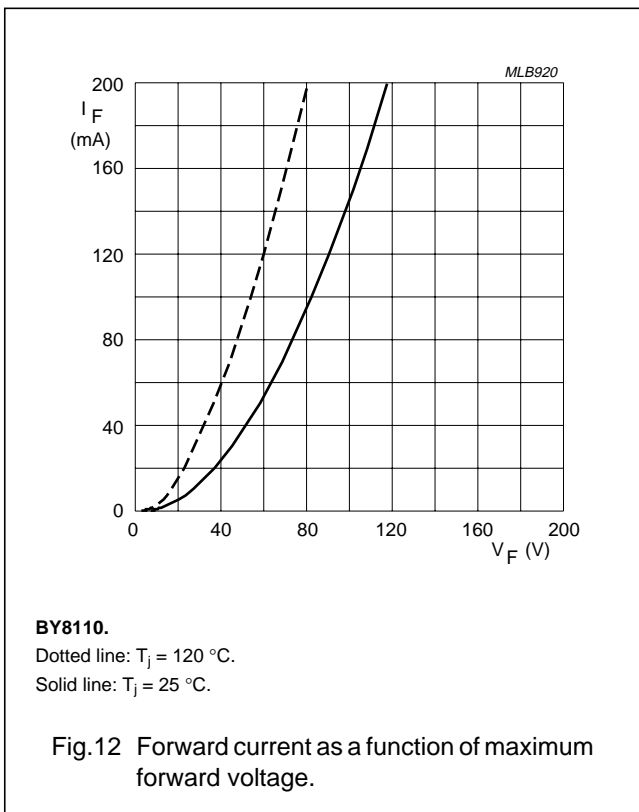
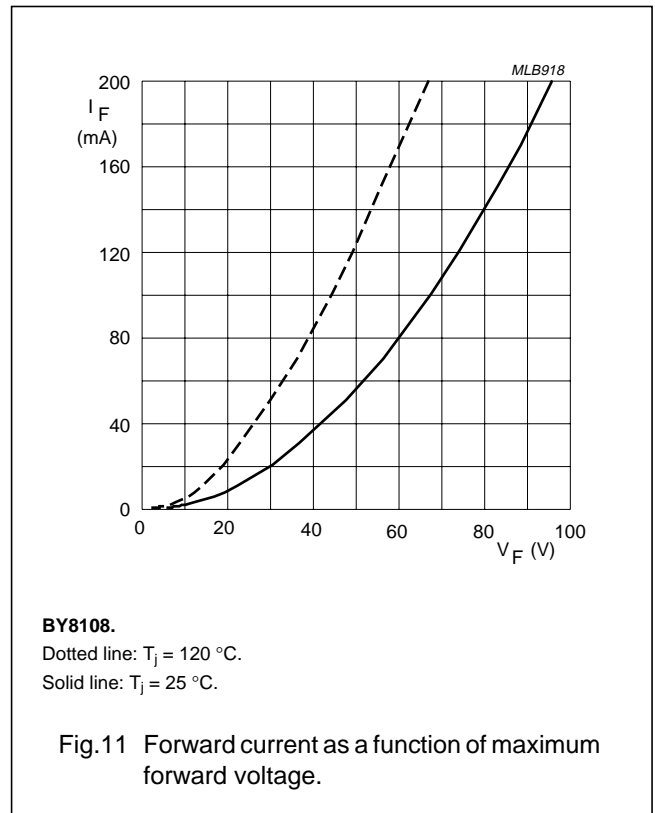
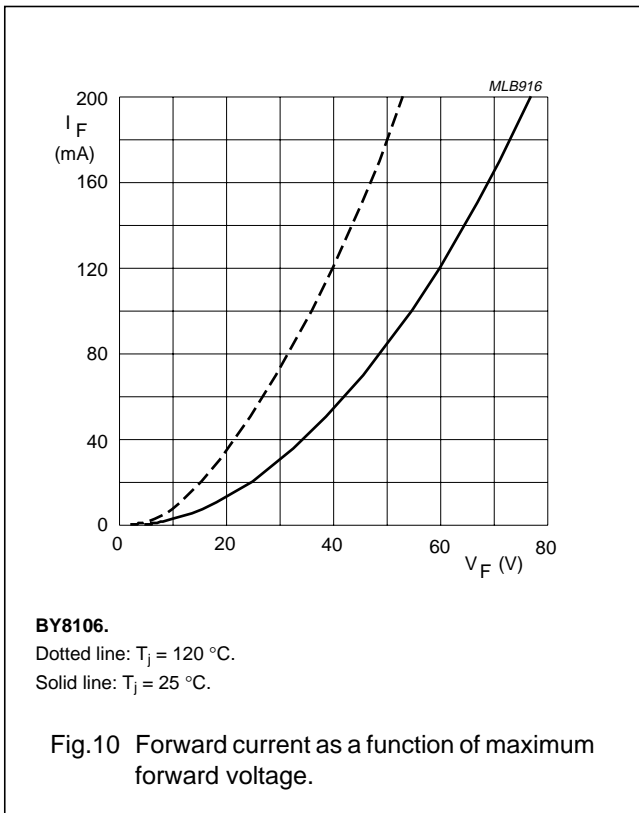
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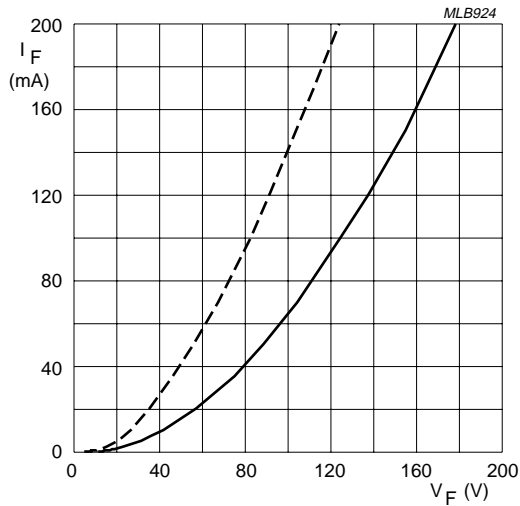
Very fast high-voltage soft-recovery controlled avalanche rectifiers

BY8100 series



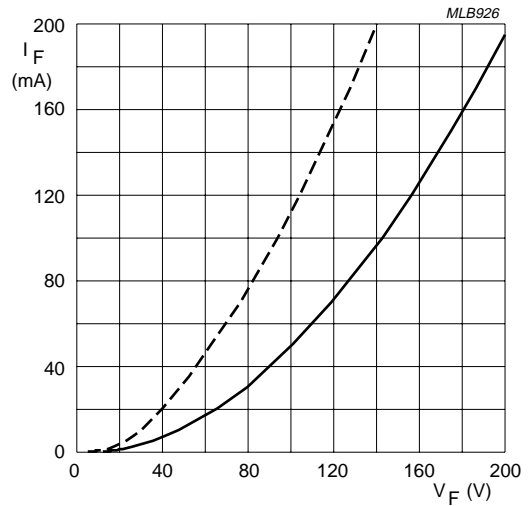
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**BY8114.**  
Dotted line:  $T_j = 120\text{ }^\circ\text{C}$ .  
Solid line:  $T_j = 25\text{ }^\circ\text{C}$ .

Fig. 14 Forward current as a function of maximum forward voltage.



**BY8116.**  
Dotted line:  $T_j = 120\text{ }^\circ\text{C}$ .  
Solid line:  $T_j = 25\text{ }^\circ\text{C}$ .

Fig. 15 Forward current as a function of maximum forward voltage.

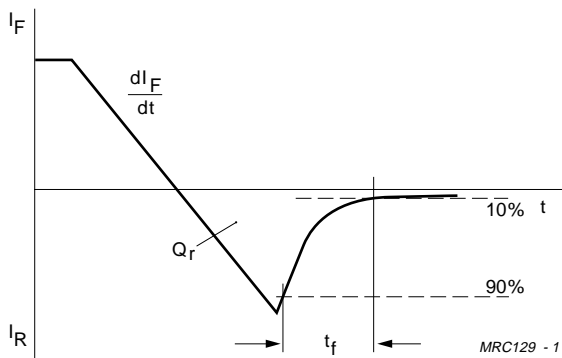
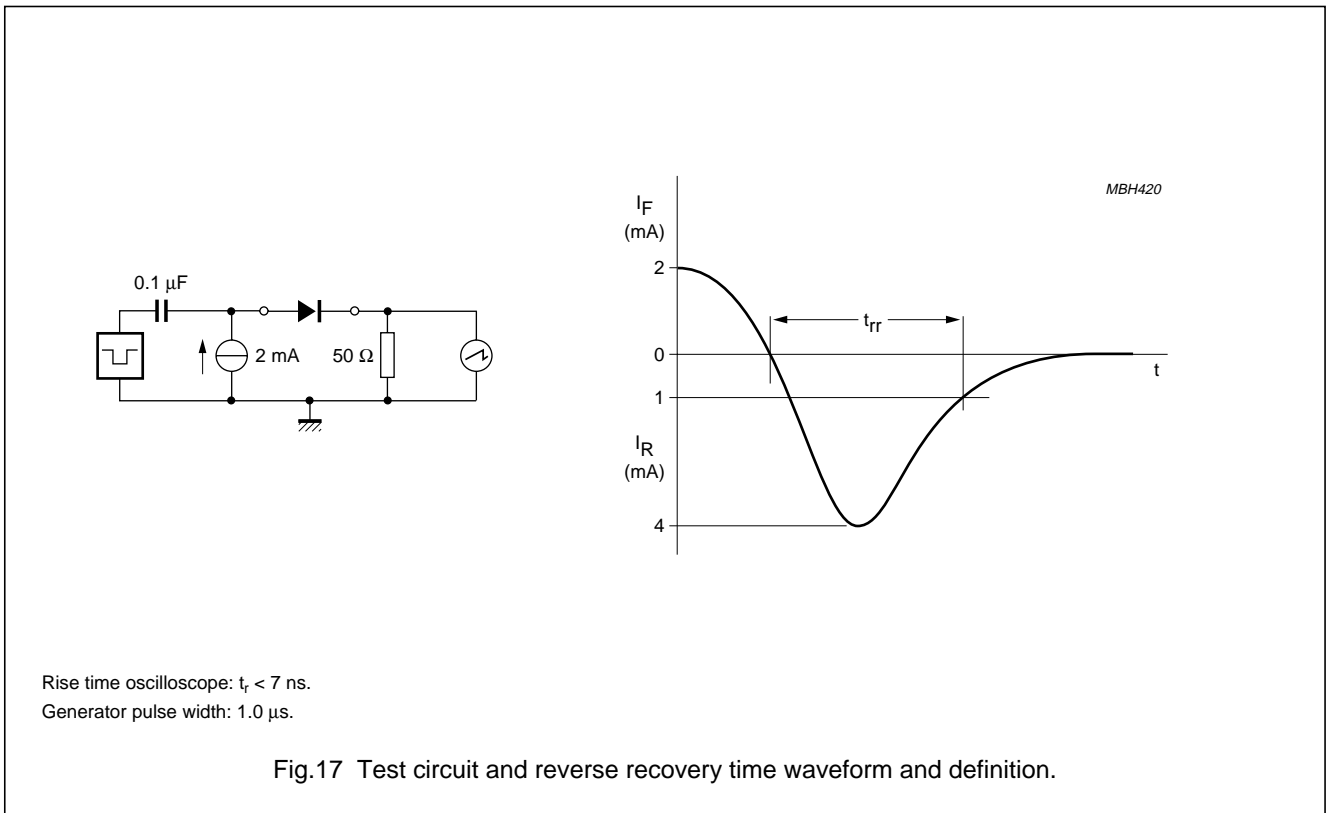


Fig. 16 Reverse recovery definitions.

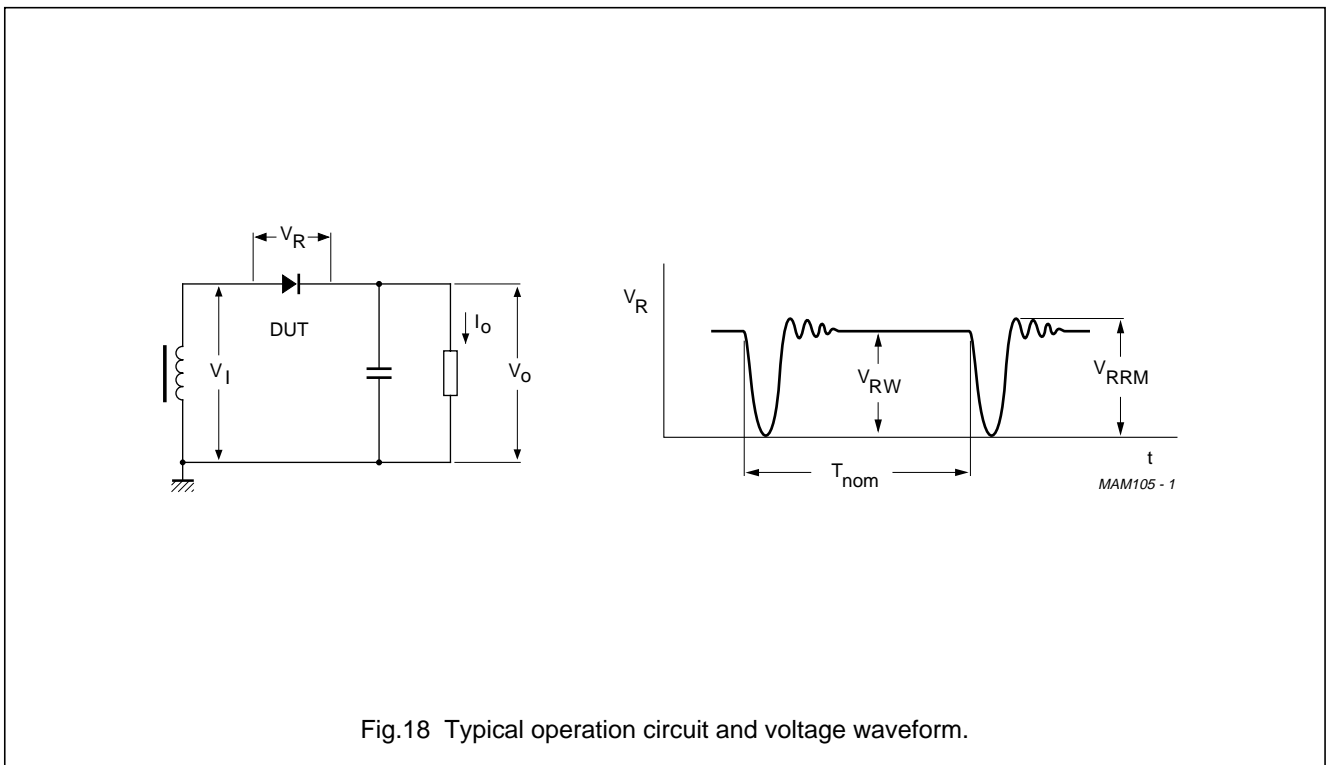


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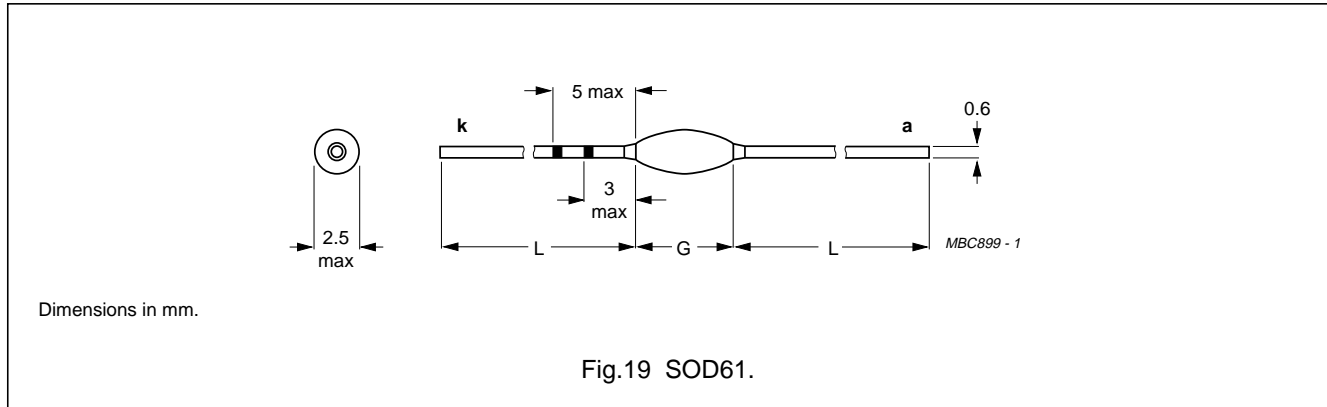
APPLICATION INFORMATION



Very fast high-voltage soft-recovery  
controlled avalanche rectifiers

BY8100 series

PACKAGE OUTLINE



SOD61 package specification

| TYPE NUMBER | PACKAGE CODE | L <sub>min</sub> (mm) | G <sub>max</sub> (mm) |
|-------------|--------------|-----------------------|-----------------------|
| BY8104      | SOD61AC      | 30.4                  | 8.3                   |
| BY8106      | SOD61AD      | 30.2                  | 8.7                   |
| BY8108      | SOD61AE      | 30.0                  | 9.1                   |
| BY8110      | SOD61AF      | 29.8                  | 9.5                   |
| BY8112      | SOD61AH      | 29.3                  | 10.5                  |
| BY8114      | SOD61AI      | 28.8                  | 11.5                  |
| BY8116      | SOD61AJ      | 28.3                  | 12.5                  |

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.   |   |

LIFE SUPPORT APPLICATIONS

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