



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



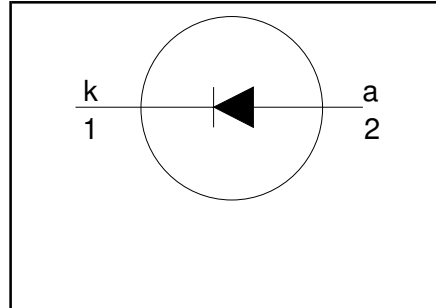
**Damper diode  
fast, high-voltage**

**BY459X-1500, BY459X-1500S**

**FEATURES**

- Low forward volt drop
- Fast switching
- Soft recovery characteristic
- High thermal cycling performance
- Isolated mounting tab

**SYMBOL**



**QUICK REFERENCE DATA**

|  |
|--|
| $V_R = 1500\text{ V}$                              |
| $V_F \leq 1.2\text{ V} / 1.25\text{ V}$            |
| $I_{F(\text{peak})} = 12\text{ A}$ (f = 48 kHz)    |
| $I_{F(\text{peak})} = 10\text{ A}$ (f = 82 kHz)    |
| $I_{\text{FSM}} \leq 100\text{ A}$                 |
| $t_{\text{tr}} \leq 350\text{ ns} / 220\text{ ns}$ |

**GENERAL DESCRIPTION**

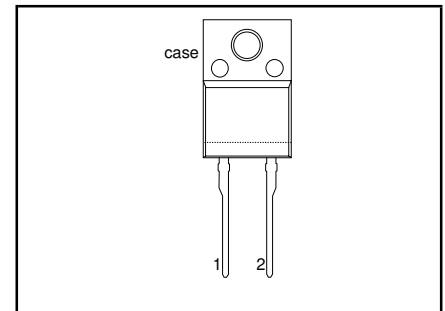
Glass-passivated double diffused rectifier diode featuring fast forward recovery and low forward recovery voltage. The device is intended for use in HDTV receivers and multi-sync monitor horizontal deflection circuits.

The BY459X series is supplied in the conventional leaded SOD113 package.

**PINNING**

| PIN | DESCRIPTION |
|-----|-------------|
| 1   | cathode     |
| 2   | anode       |
| tab | isolated    |

**SOD113**



**LIMITING VALUES**

Limiting values in accordance with the Absolute Maximum System (IEC 134).

| SYMBOL                      | PARAMETER                           | CONDITIONS  | MIN. | MAX.  | UNIT |
|-----------------------------|-------------------------------------|---|------|-------|------|
| $V_{\text{RSM}}$            | Peak non repetitive reverse voltage |   | -    | 1500  | V    |
| $V_{\text{RRM}}$            | Peak repetitive reverse voltage     |   | -    | 1500  | V    |
| $V_{\text{RWM}}$            | Crest working reverse voltage       |   | -    | 1300  | V    |
| $I_{\text{F}(\text{peak})}$ | Peak working forward current        | f = 48 kHz;   | -    | -1500 | A    |
|                             |                                     | f = 82 kHz;   | -    | 12    | A    |
|                             |                                     | t = 100 μs  | -    | -     | 10   |
| $I_{\text{FRM}}$            | Peak repetitive forward current     |   | -    | 100   | A    |
| $I_{\text{F}(\text{RMS})}$  | RMS forward current                 |   | -    | 30    | A    |
| $I_{\text{FSM}}$            | Peak non-repetitive forward current | t = 10 ms   | -    | 100   | A    |
|                             |                                     | t = 8.3 ms  | -    | 110   | A    |
|                             |                                     | sinusoidal; $T_j = 150\text{ °C}$ prior to surge; with reapplied $V_{\text{RWM}(\text{max})}$ |      |       |      |
| $T_{\text{stg}}$            | Storage temperature                 |   | -40  | 150   | °C   |
| $T_j$                       | Operating junction temperature      |   | -    | 150   | °C   |

## Damper diode fast, high-voltage

## BY459X-1500, BY459X-1500S

### ISOLATION LIMITING VALUE & CHARACTERISTIC

$T_{hs} = 25\text{ °C}$  unless otherwise specified

| SYMBOL     | PARAMETER   | CONDITIONS   | MIN. | TYP. | MAX. | UNIT |
|------------|---|--|------|------|------|------|
| $V_{isol}$ | R.M.S. isolation voltage from both terminals to external heatsink | $f = 50\text{-}60\text{ Hz}$ ; sinusoidal waveform;<br>R.H. $\leq 65\%$ ; clean and dustfree | -    |      | 2500 | V    |
| $C_{isol}$ | Capacitance from both terminals to external heatsink              | $f = 1\text{ MHz}$   | -    | 10   | -    | pF   |

### THERMAL RESISTANCES

| SYMBOL                | PARAMETER                               | CONDITIONS                                | MIN. | TYP. | MAX. | UNIT |
|-----------------------|---|---|------|------|------|------|
| $R_{th\ j\text{-}hs}$ | Thermal resistance junction to heatsink | with heatsink compound                    | -    | -    | 4.8  | K/W  |
| $R_{th\ j\text{-}a}$  | Thermal resistance junction to ambient  | without heatsink compound<br>in free air. | -    | 55   | 5.9  | K/W  |
|                       |   |   | -    |      | -    | K/W  |

### STATIC CHARACTERISTICS

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

| SYMBOL | PARAMETER       | CONDITIONS   | TYP. |       | MAX. |       | UNIT          |
|--------|-----------------|--|------|-------|------|-------|---------------|
|        |                 |  | 1500 | 1500S | 1500 | 1500S |               |
| $V_F$  | Forward voltage | <b>BY459X-</b><br>$I_F = 6.5\text{ A}$   | 0.95 | 1.05  | 1.30 | 1.35  | V             |
| $I_R$  | Reverse current | $I_F = 6.5\text{ A}; T_j = 125\text{ °C}$<br>$V_R = 1300\text{ V}$<br>$V_R = 1300\text{ V}; T_j = 125\text{ °C}$ | 0.85 | 0.95  | 1.20 | 1.25  | V             |
|        |                 |  | -    | -     | 250  | 250   | $\mu\text{A}$ |
|        |                 |  | -    | -     | 1    | 1     | mA            |

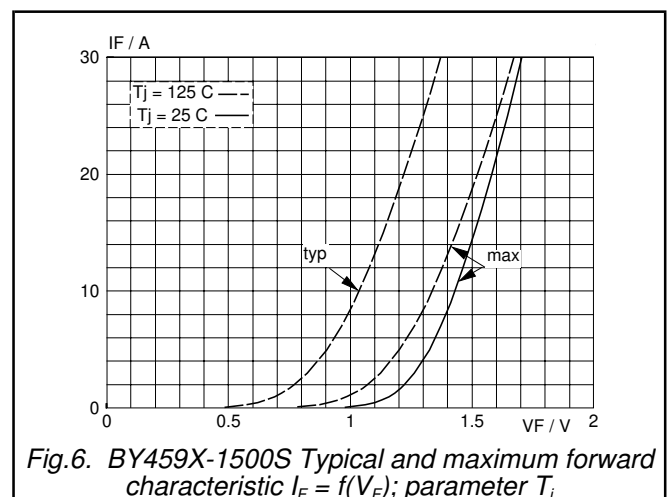
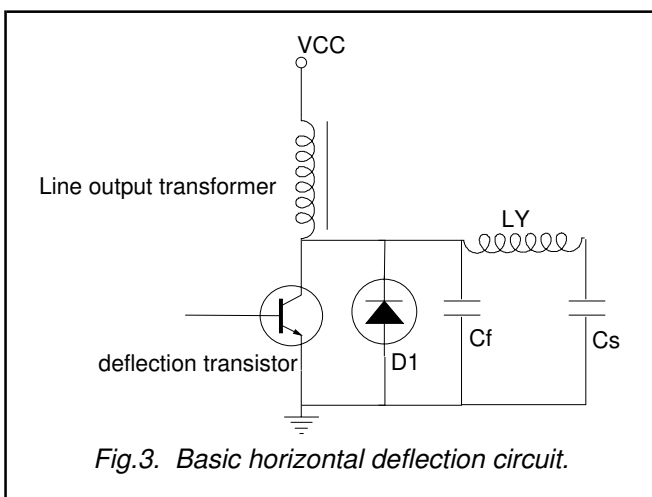
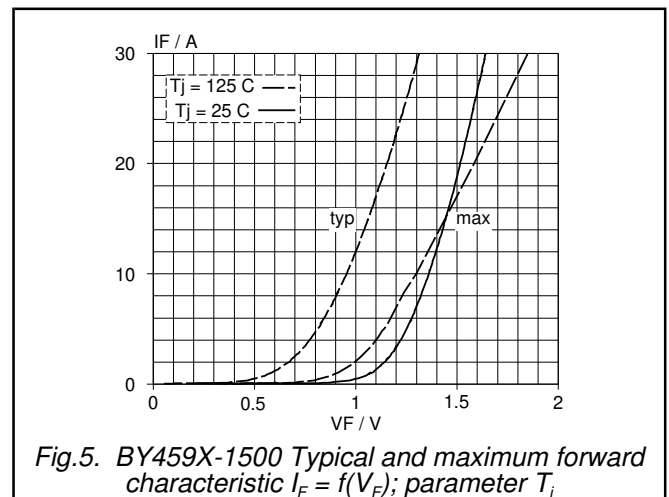
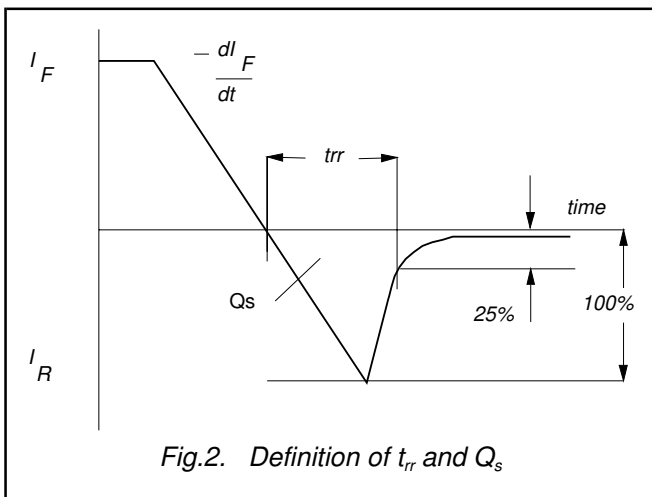
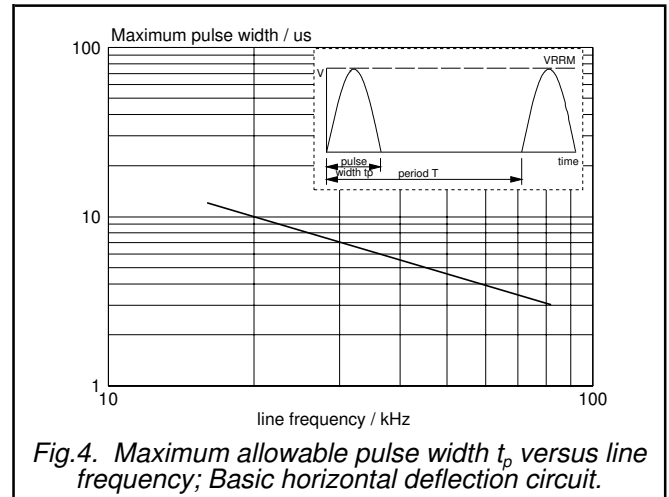
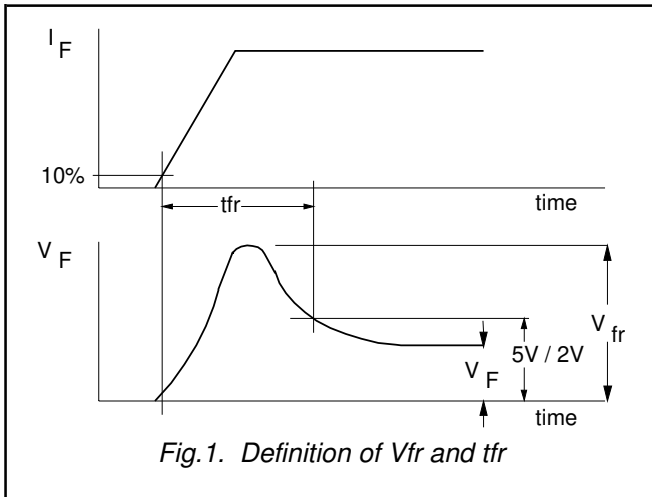
### DYNAMIC CHARACTERISTICS

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

| SYMBOL   | PARAMETER                     | CONDITIONS  | TYP. |       | MAX. |       | UNIT          |
|----------|-------------------------------|---|------|-------|------|-------|---------------|
|          |                               |   | 1500 | 1500S | 1500 | 1500S |               |
| $t_{rr}$ | Reverse recovery time         | <b>BY459X-</b><br>$I_F = 1\text{ A}, V_R \geq 30\text{ V};$ | 0.25 | 0.17  | 0.35 | 0.22  | $\mu\text{s}$ |
| $Q_s$    | Reverse recovery charge       | $I_F = 2\text{ A}, -di_F/dt = 20\text{ A}/\mu\text{s}$      | 2.0  | 0.70  | 3.0  | 0.95  | $\mu\text{C}$ |
| $V_{fr}$ | Peak forward recovery voltage | $I_F = 6.5\text{ A}, di_F/dt = 50\text{ A}/\mu\text{s}$     | 8.0  | 11.0  | 14.0 | 19.0  | V             |
| $t_{fr}$ | Forward recovery time         | $I_F = 6.5\text{ A}, di_F/dt = 50\text{ A}/\mu\text{s}$     | 170  | 200   | 250  | 300   | ns            |

Damper diode  
fast, high-voltage

BY459X-1500, BY459X-1500S



Damper diode  
fast, high-voltage

BY459X-1500, BY459X-1500S

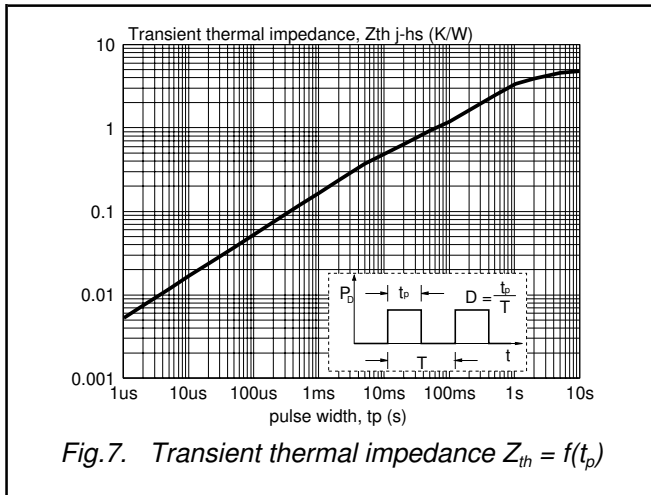


Fig.7. Transient thermal impedance  $Z_{th} = f(t_p)$

Damper diode  
fast, high-voltage

BY459X-1500, BY459X-1500S

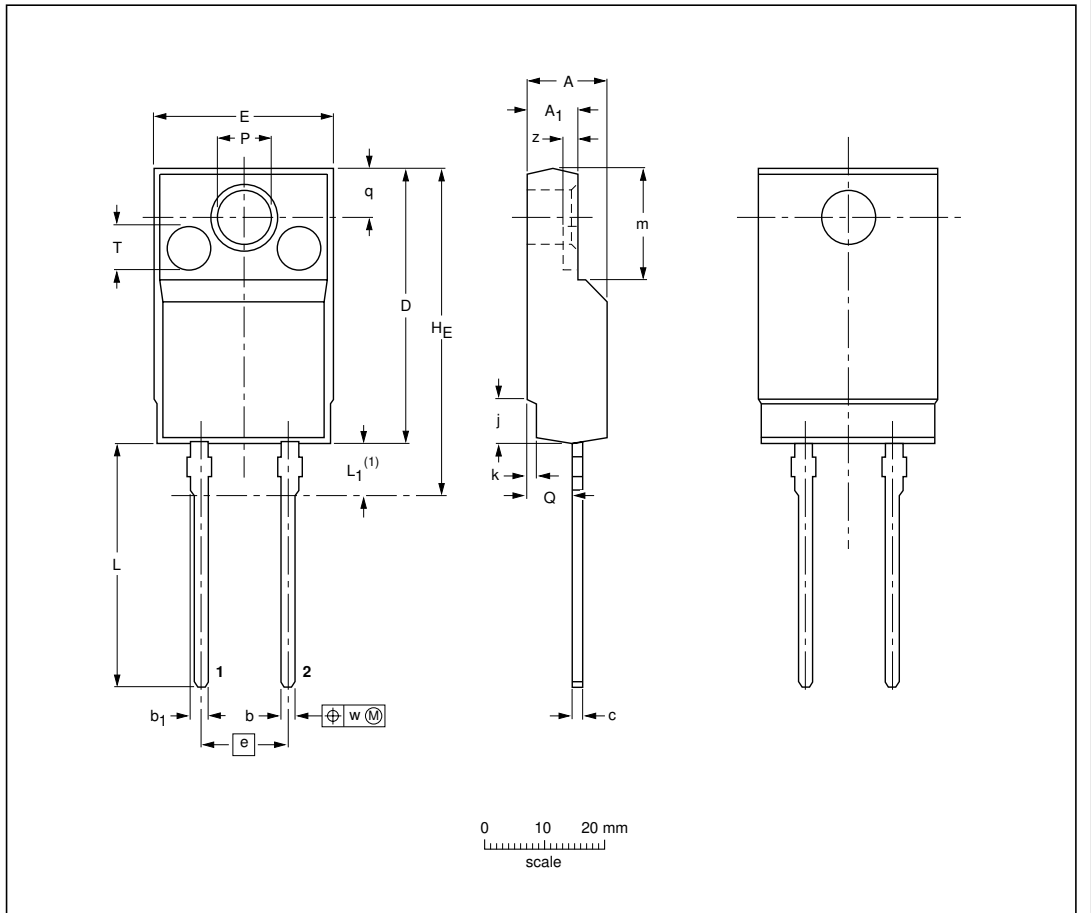
**MECHANICAL DATA**

Dimensions in mm

Net Mass: 2 g

Plastic single-ended package; isolated heatsink mounted;  
1 mounting hole; 2-leads TO-220 'full pack'

SOD113



DIMENSIONS (mm are the original dimensions)

| UNIT | A          | A <sub>1</sub> | b          | b <sub>1</sub> | c          | D            | E           | e    | H <sub>E</sub><br>max. | j          | k          | L            | L <sub>1</sub> <sup>(1)</sup> | m          | P          | Q          | q   | T    | w   | z <sup>(2)</sup> |
|------|------------|----------------|------------|----------------|------------|--------------|-------------|------|------------------------|------------|------------|--------------|-------------------------------|------------|------------|------------|-----|------|-----|------------------|
| mm   | 4.6<br>4.0 | 2.9<br>2.5     | 0.9<br>0.7 | 1.1<br>0.9     | 0.7<br>0.4 | 15.8<br>15.2 | 10.3<br>9.7 | 5.08 | 19.0                   | 2.7<br>2.3 | 0.6<br>0.4 | 14.4<br>13.5 | 3.3<br>2.8                    | 6.5<br>6.3 | 3.2<br>3.0 | 2.6<br>2.3 | 2.6 | 2.55 | 0.4 | 0.8              |

Notes

- 1. Terminals are uncontrolled within zone L<sub>1</sub>.
- 2. z is depth of T.

| OUTLINE<br>VERSION | REFERENCES |               |      |  | EUROPEAN<br>PROJECTION | ISSUE DATE |
|--------------------|------------|---------------|------|--|------------------------|------------|
|                    | IEC        | JEDEC         | EIAJ |  |                        |            |
| SOD113             |            | 2-lead TO-220 |      |  |                        | 97-06-11   |

Fig.8. SOD113; The seating plane is electrically isolated from all terminals.

**Notes**

- 1. Refer to mounting instructions for F-pack envelopes.
- 2. Epoxy meets UL94 V0 at 1/8".

Damper diode  
fast, high-voltage

BY459X-1500, BY459X-1500S

## DEFINITIONS

| 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  |
| Preliminary data   | Qualification               | This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product                                     |
| Product data   | Production                  | This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Changes will be communicated according to the Customer Product/Process Change Notification (CPCN) procedure SNW-SQ-650A |
| <b>Limiting values</b>   |                             |   |
| Limiting values are given 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 this 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.  |                             |   |
| © Philips Electronics N.V. 2002  |                             |   |
| All rights are reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner.  |                             |   |
| The information presented in this document does not form part of any quotation or contract, it is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent or other industrial or intellectual property rights.   |                             |   |

## LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably 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.

<sup>1</sup> Please consult the most recently issued datasheet before initiating or completing a design.

<sup>2</sup> The product status of the device(s) described in this datasheet may have changed since this datasheet was published. The latest information is available on the Internet at URL <http://www.semiconductors.philips.com>.