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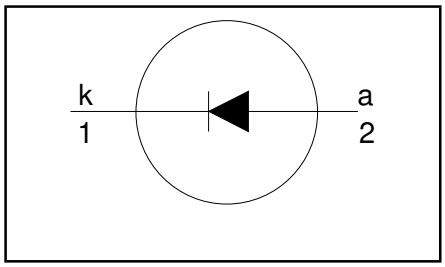
# Damper diode fast, high-voltage

# BY359X-1500, BY359X-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 V

$V_F \leq$ 1.8 V / 2 V

$I_{F(RMS)}$ = 15.7 A

$I_{FSM} \leq$ 60 A

$t_{rr} \leq$ 600 ns / 350 ns

## GENERAL DESCRIPTION

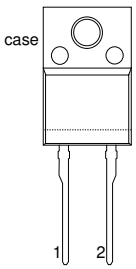
Glass-passivated double diffused rectifier diode in a plastic envelope featuring low forward voltage drop, fast reverse recovery and soft recovery characteristic. The device is intended for use in TV receivers and PC monitors.

The BY359X 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 |
|---|---|---|---|---|---|---|
| $V_{RSM}$ | Peak non-repetitive reverse voltage | | | - | 1500 | V |
| $V_{RRM}$ | Peak repetitive reverse voltage | | | - | 1500 | V |
| $V_{RWM}$ | Crest working reverse voltage | | | - | 1300 | V |
| $I_{F(peak)}$ | Peak forward current | 16-32kHz TV | BY359X-1500 | - | 10 | A |
| | | 31-70kHz monitor | BY359X-1500S | - | 7 | A |
| $I_{F(RMS)}$ | RMS forward current | | | - | 15.7 | A |
| $I_{FRM}$ | Peak repetitive forward current | sinusoidal; a = 1.57 | | - | 60 | A |
| $I_{FSM}$ | Peak non-repetitive forward current | t = 10 ms | | - | 60 | A |
| | | t = 8.3 ms | | - | 66 | A |
| | | sinusoidal; $T_j$ = 150 ˚C prior to surge; with reapplied $V_{RWM(max)}$ | | | | |
| $T_{stg}$ | Storage temperature | | | -40 | 150 | ˚C |
| $T_j$ | Operating junction temperature | | | - | 150 | ˚C |

## ISOLATION LIMITING VALUE & CHARACTERISTIC

$T_{hs}$ = 25 ˚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 = 50-60 Hz; sinusoidal waveform; R.H. ≤ 65% ; clean and dustfree | - | | 2500 | V |
| $C_{isol}$ | Capacitance from both terminals to external heatsink | f = 1 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 |
| | | without heatsink compound | - | - | 5.9 | K/W |
| $R_{th\ j\text{-}a}$ | Thermal resistance junction to ambient | in free air. | - | 55 | - | K/W |

## STATIC CHARACTERISTICS

$T_j$ = 25 ˚C unless otherwise stated

| | | | BY359X-1500 | | BY359X-1500S | | |
|---|---|---|---|---|---|---|---|
| SYMBOL | PARAMETER | CONDITIONS | TYP. | MAX. | TYP. | MAX. | UNIT |
| $V_F$ | Forward voltage | $I_F$ = 20 A | 1.3 | 1.8 | 1.5 | 2.0 | V |
| | | $I_F$ = 10 A; $T_j$ = 150˚C | 1.00 | 1.5 | 1.25 | 1.75 | V |
| $I_R$ | Reverse current | $V_R$ = 1300 V | 10 | 100 | 10 | 100 | µA |
| | | $V_R$ = 1300 V; $T_j$ = 100 ˚C | 50 | 300 | 100 | 600 | µA |

## DYNAMIC CHARACTERISTICS

$T_j$ = 25 ˚C unless otherwise stated

| | | | BY359X-1500 | | BY359X-1500S | | |
|---|---|---|---|---|---|---|---|
| SYMBOL | PARAMETER | CONDITIONS | TYP. | MAX. | TYP. | MAX. | UNIT |
| $t_{rr}$ | Reverse recovery time | $I_F$ = 2 A; $V_R \geq$ 30 V; | 0.47 | 0.60 | 0.28 | 0.35 | µs |
| $Q_s$ | Reverse recovery charge | $-dI_F/dt$ = 20 A/µs | 1.6 | 2.0 | 0.70 | 0.95 | µC |
| $V_{fr}$ | Peak forward recovery voltage | $I_F$ = 10 A; $dI_F/dt$ = 30 A/µs | 11.0 | - | 17.0 | - | V |

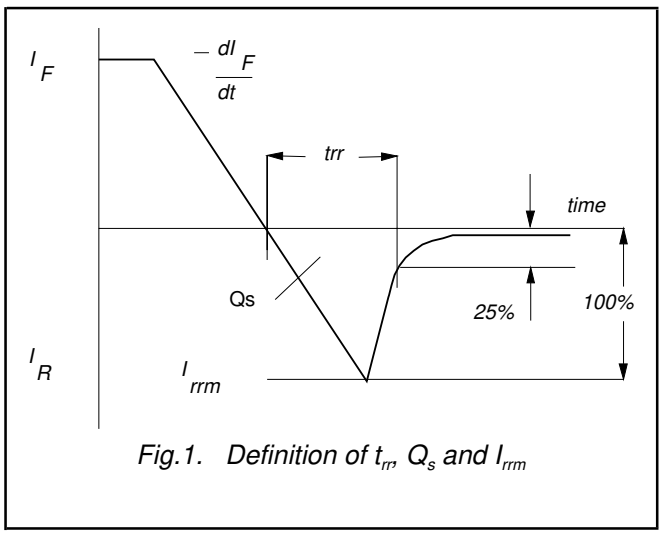



*Fig.1. Definition of $t_{rr}$, $Q_s$ and $I_{rrm}$*

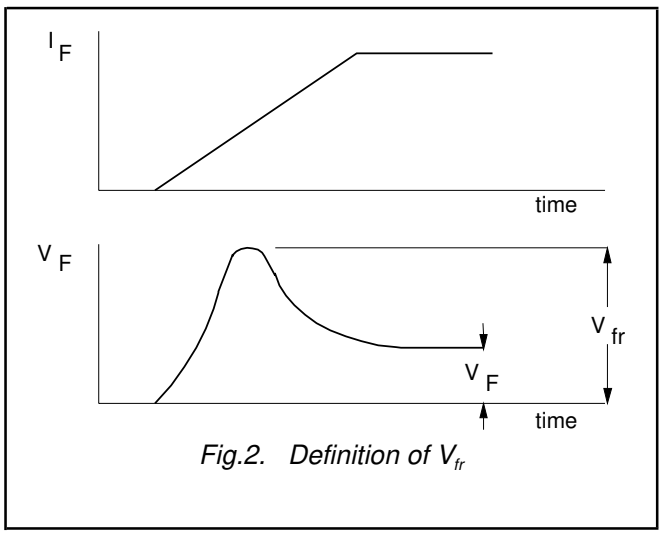



*Fig.2. Definition of $V_{fr}$*

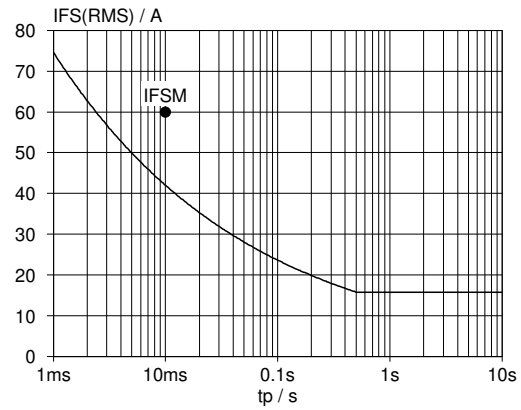



*Fig.3. Maximum non-repetitive rms forward current. $I_F = f(t_p)$; sinusoidal current waveform; $T_j$ = 150˚C prior to surge with reapplied $V_{RWM}$.*

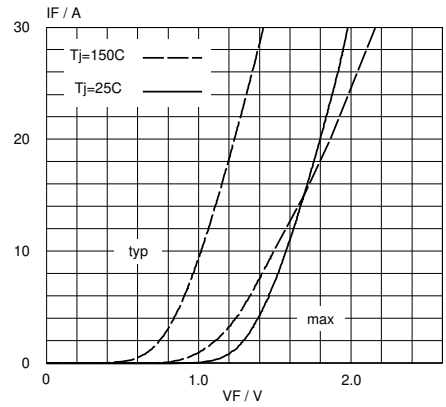



*Fig.5. BY359X-1500 forward characteristic $I_F = f(V_F)$; parameter $T_j$*

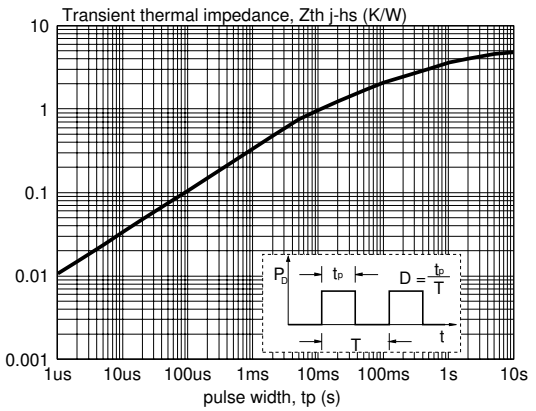



*Fig.4. Transient thermal impedance $Z_{th} = f(t_p)$*

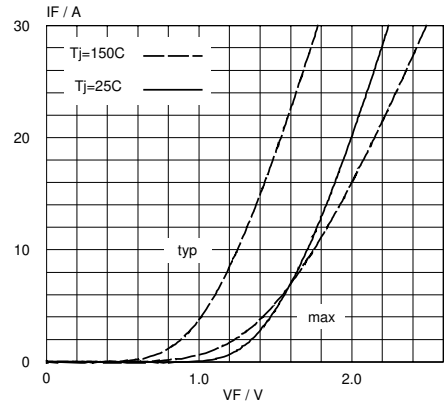



*Fig.6. BY359X-1500S forward characteristic $I_F = f(V_F)$; parameter $T_j$*

## MECHANICAL DATA

*Dimensions in mm*

*Net Mass: 2 g*

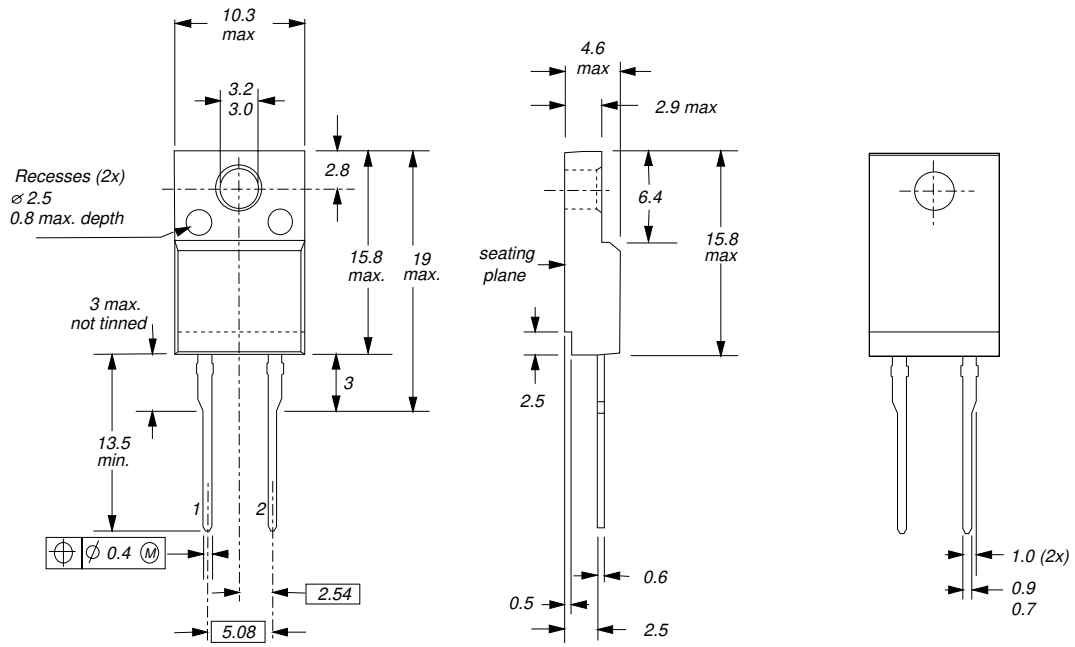



*Fig.7. SOD113; The seating plane is electrically isolated from all terminals.*

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

## 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 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. | |
| **Application information** | |
| Where application information is given, it is advisory and does not form part of the specification. | |
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|  | |

## LIFE SUPPORT APPLICATIONS

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