

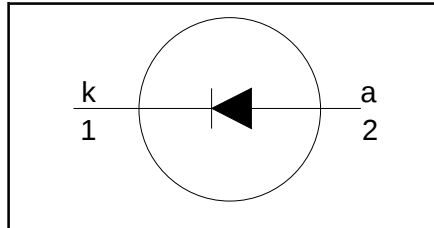
# Rectifier diodes fast, soft-recovery

## BY229 series

### FEATURES

- Low forward volt drop
- Fast switching
- Soft recovery characteristic
- High thermal cycling performance
- Low thermal resistance

### SYMBOL



### QUICK REFERENCE DATA

 $V_R = 200 \text{ V} / 400 \text{ V} / 600 \text{ V} / 800 \text{ V}$ 
 $I_{F(AV)} = 8 \text{ A}$ 
 $I_{FSM} \leq 60 \text{ A}$ 
 $t_{rr} \leq 135 \text{ ns}$ 

### GENERAL DESCRIPTION

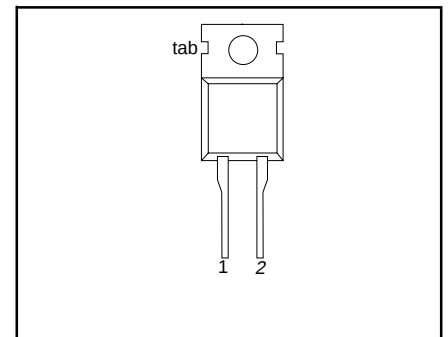
Glass-passivated double diffused rectifier diodes featuring low forward voltage drop, fast reverse recovery and soft recovery characteristic. The devices are intended for use in TV receivers, monitors and switched mode power supplies.

The BY229 series is supplied in the conventional leaded SOD59 (TO220AC) package.

### PINNING

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

### SOD59 (TO220AC)



### 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  | BY229                                                                                                                                  | -    | -200 | -400 | -600 | -800 | V                 |
| $V_{RRM}$    | Peak repetitive reverse voltage      |                                                                                                                                        | -    | 200  | 400  | 600  | 800  | V                 |
| $V_{RWM}$    | Crest working reverse voltage        |                                                                                                                                        | -    | 150  | 300  | 500  | 600  | V                 |
| $V_R$        | Continuous reverse voltage           |                                                                                                                                        | -    | 150  | 300  | 500  | 600  | V                 |
| $I_{F(AV)}$  | Average forward current <sup>1</sup> | square wave;<br>$\delta = 0.5$ ;<br>$T_{mb} \leq 122^\circ \text{C}$                                                                   | -    | 8    |      |      |      | A                 |
|              |                                      | sinusoidal;<br>$a = 1.57$ ;<br>$T_{mb} \leq 125^\circ \text{C}$                                                                        | -    | 7    |      |      |      | A                 |
| $I_{F(RMS)}$ | RMS forward current                  |                                                                                                                                        | -    | 11   |      |      |      | A                 |
| $I_{FRM}$    | Repetitive peak forward current      | $t = 25 \mu\text{s}$ ; $\delta = 0.5$ ;<br>$T_{mb} \leq 122^\circ \text{C}$                                                            | -    | 16   |      |      |      | A                 |
| $I_{FSM}$    | Non-repetitive peak forward current. | $t = 10 \text{ ms}$<br>$t = 8.3 \text{ ms}$<br>sinusoidal;<br>$T_j = 150^\circ \text{C}$ prior to surge; with reapplied $V_{RWM(max)}$ | -    | 60   |      |      |      | A                 |
|              |                                      | $t = 10 \text{ ms}$                                                                                                                    | -    | 66   |      |      |      | A                 |
| $I^2t$       | $I^2t$ for fusing                    |                                                                                                                                        | -    | 18   |      |      |      | A <sup>2</sup> s  |
| $T_{stg}$    | Storage temperature                  |                                                                                                                                        | -40  | 150  |      |      |      | $^\circ \text{C}$ |
| $T_j$        | Operating junction temperature       |                                                                                                                                        | -    | 150  |      |      |      | $^\circ \text{C}$ |

<sup>1</sup> Neglecting switching and reverse current losses.

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### THERMAL RESISTANCES

| SYMBOL         | PARAMETER                                    | CONDITIONS   | MIN. | TYP. | MAX. | UNIT |
|----------------|----------------------------------------------|--------------|------|------|------|------|
| $R_{th\ j-mb}$ | Thermal resistance junction to mounting base | in free air. | -    | -    | 2.0  | K/W  |
| $R_{th\ j-a}$  | Thermal resistance junction to ambient       |              | -    | 60   | -    | K/W  |

### STATIC CHARACTERISTICS

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

| SYMBOL | PARAMETER       | CONDITIONS                                 | MIN. | TYP. | MAX. | UNIT |
|--------|-----------------|--------------------------------------------|------|------|------|------|
| $V_F$  | Forward voltage | $I_F = 20\ \text{A}$                       | -    | 1.5  | 1.85 | V    |
| $I_R$  | Reverse current | $V_R = V_{RWM}; T_j = 125\ ^\circ\text{C}$ | -    | 0.1  | 0.4  | mA   |

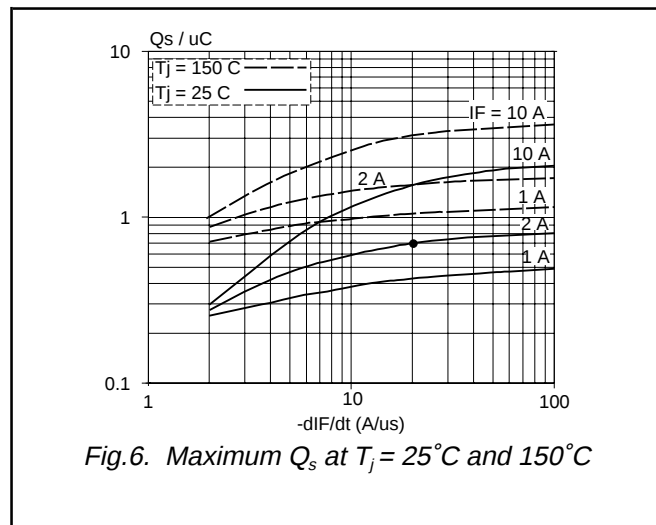
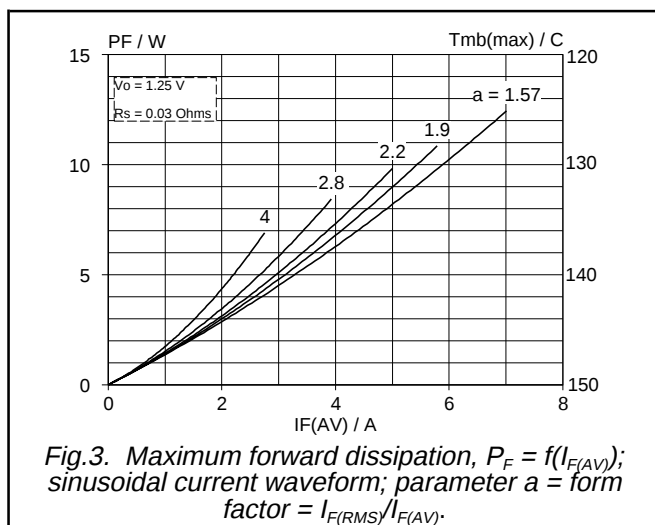
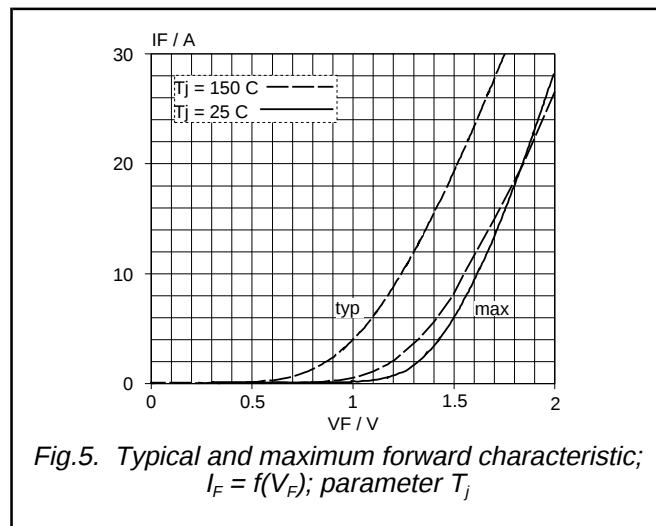
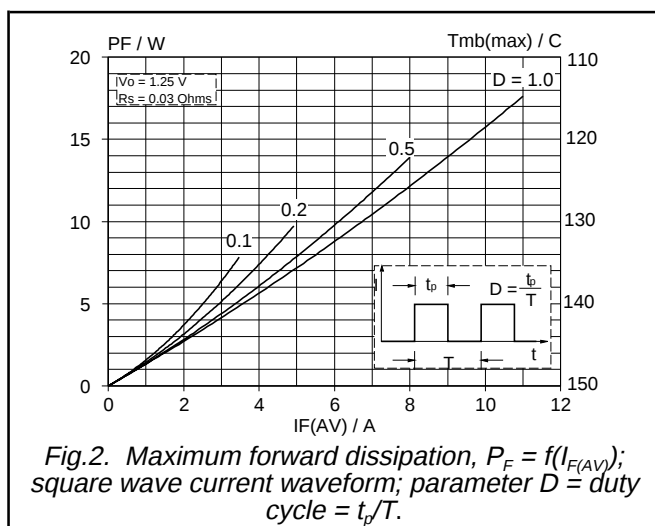
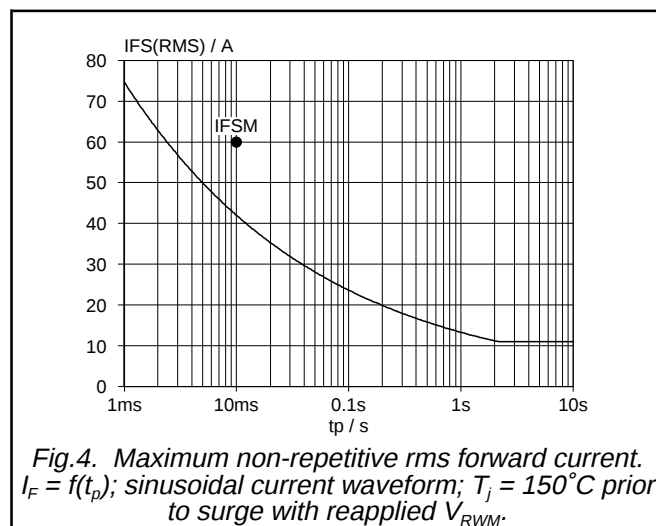
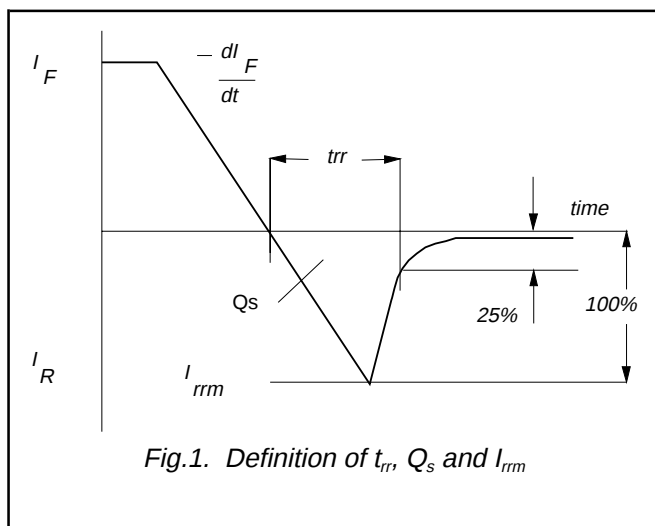
### DYNAMIC CHARACTERISTICS

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

| SYMBOL    | PARAMETER                                     | CONDITIONS                                                                      | MIN. | TYP. | MAX. | UNIT                   |
|-----------|-----------------------------------------------|---------------------------------------------------------------------------------|------|------|------|------------------------|
| $t_{rr}$  | Reverse recovery time                         | $I_F = 1\ \text{A}; V_R \geq 30\ \text{V}; -di_F/dt = 50\ \text{A}/\mu\text{s}$ | -    | 100  | 135  | ns                     |
| $Q_s$     | Reverse recovery charge                       | $I_F = 2\ \text{A}; V_R \geq 30\ \text{V}; -di_F/dt = 20\ \text{A}/\mu\text{s}$ | -    | 0.5  | 0.7  | $\mu\text{C}$          |
| $di_R/dt$ | Maximum slope of the reverse recovery current | $I_F = 2\ \text{A}; -di_F/dt = 20\ \text{A}/\mu\text{s}$                        | -    | 50   | 60   | $\text{A}/\mu\text{s}$ |

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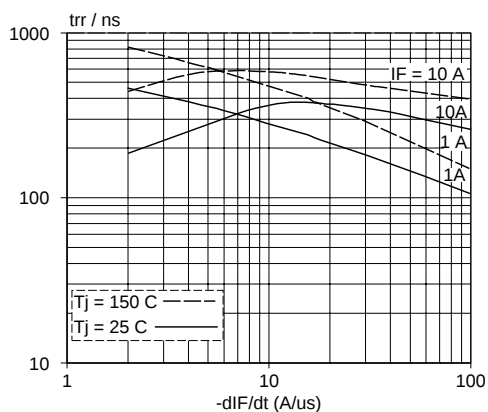


Fig.7. Maximum  $t_{rr}$  measured to 25% of  $I_{rm}$ ;  $T_j = 25^\circ\text{C}$  and  $150^\circ\text{C}$

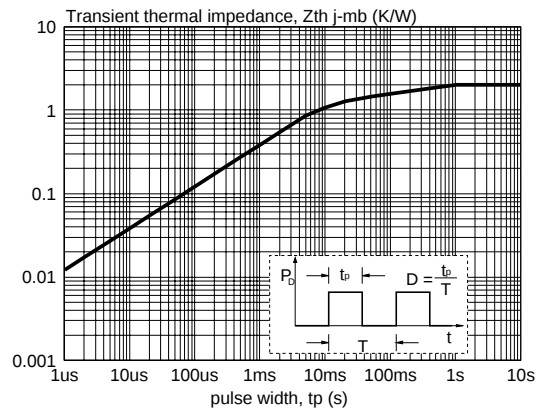


Fig.9. Transient thermal impedance  $Z_{th} = f(t_p)$

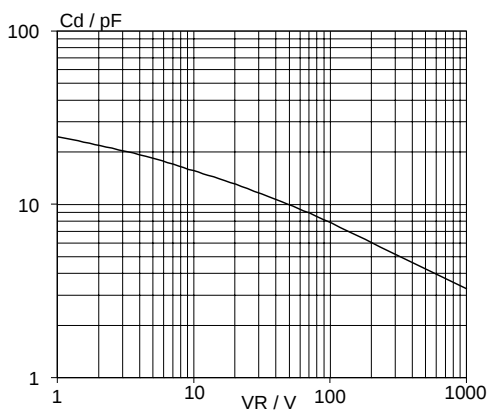


Fig.8. Typical junction capacitance  $C_d$  at  $f = 1\text{ MHz}$ ;  $T_j = 25^\circ\text{C}$

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### MECHANICAL DATA

Dimensions in mm

Net Mass: 2 g

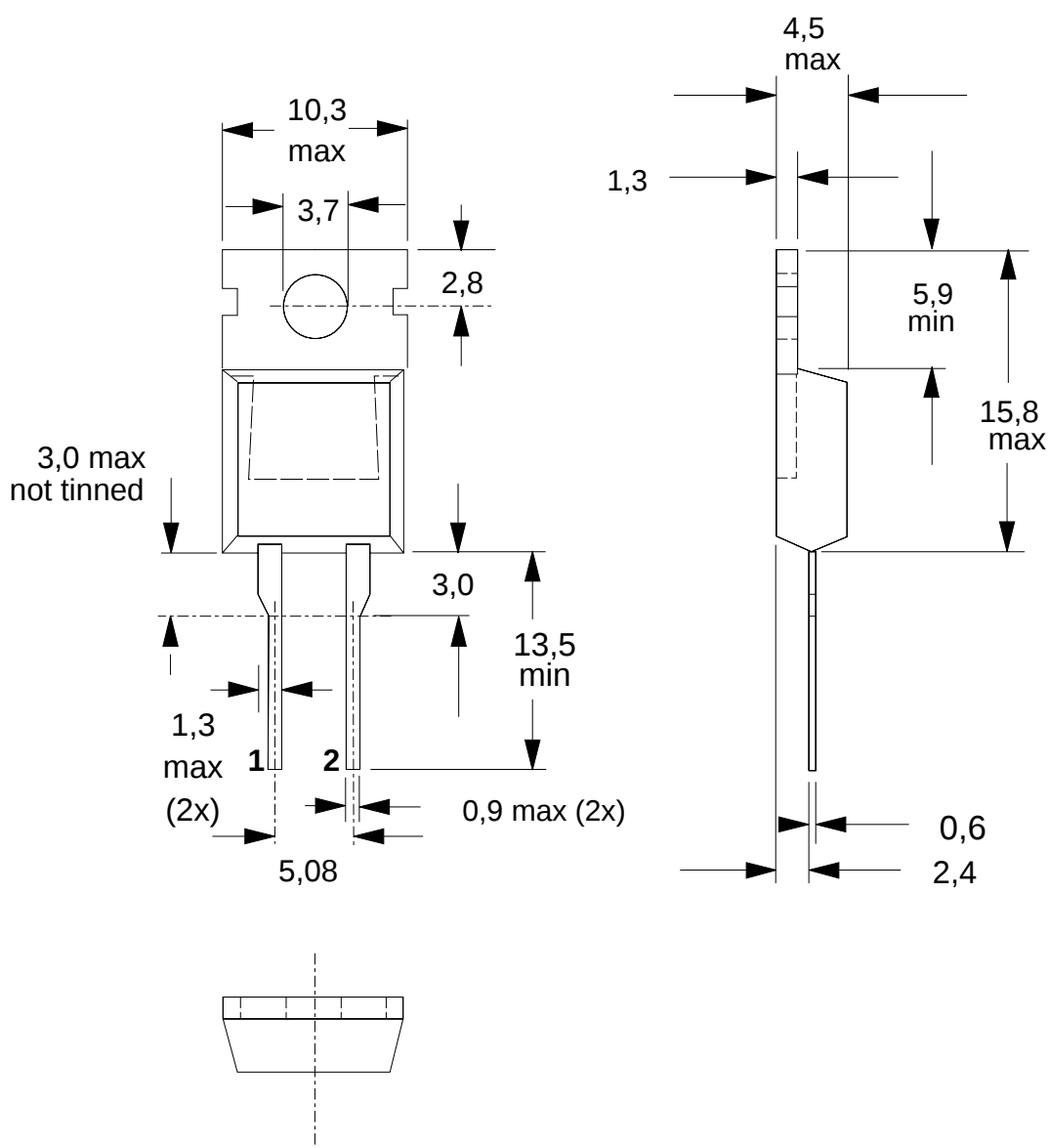


Fig.10. SOD59 (TO220AC). pin 1 connected to mounting base.

#### Notes

1. Refer to mounting instructions for TO220 envelopes.
2. Epoxy meets UL94 V0 at 1/8".

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### 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 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.                                                                                                                                                                                                                                                                                                                                                        |                                                                                       |
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