

# DATA SHEET

**BYR29 series**  
Rectifier diodes  
ultrafast

Product specification

September 2018



**WeEn**  
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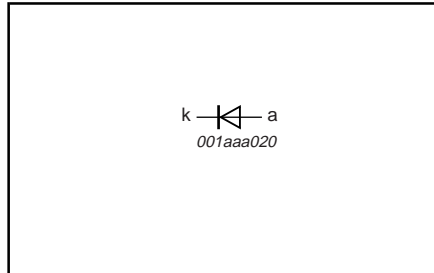
**Rectifier diodes  
ultrafast**

**BYR29 series**

**FEATURES**

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

**SYMBOL**



**QUICK REFERENCE DATA**

|   |
|---|
| $V_R = 500\text{ V} / 600\text{ V} / 700\text{ V} / 800\text{ V}$ |
| $V_F \leq 1.5\text{ V}$   |
| $I_{F(AV)} = 8\text{ A}$  |
| $t_{tr} \leq 75\text{ ns}$  |

**GENERAL DESCRIPTION**

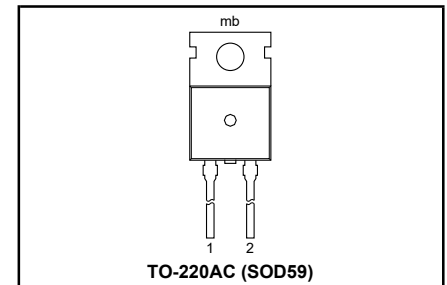
Ultra-fast, epitaxial rectifier diodes intended for use as output rectifiers in high frequency switched mode power supplies.

The BYR29 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             |
|-------------|--------------------------------------|---|------|------|------|------|------|------------------|
|             |                                      |   |      | -500 | -600 | -700 | -800 |                  |
| $V_{RRM}$   | Peak repetitive reverse voltage      | <b>BYR29</b>  | -    | 500  | 600  | 700  | 800  | V                |
| $V_{RWM}$   | Crest working reverse voltage        |   | -    | 500  | 600  | 700  | 800  | V                |
| $V_R$       | Continuous reverse voltage           |   | -    | 500  | 600  | 700  | 800  | V                |
| $I_{F(AV)}$ | Average forward current <sup>1</sup> | square wave;<br>$\delta = 0.5$ ;<br>$T_{mb} \leq 115\text{ }^\circ\text{C}$               | -    | 8    |      |      |      | A                |
| $I_{FRM}$   | Repetitive peak forward current      | $t = 25\text{ }\mu\text{s}$ ; $\delta = 0.5$ ;<br>$T_{mb} \leq 115\text{ }^\circ\text{C}$ | -    | 16   |      |      |      | A                |
| $I_{FSM}$   | Non-repetitive peak forward current  | $t = 10\text{ ms}$  | -    | 60   |      |      |      | A                |
|             |                                      | $t = 8.3\text{ ms}$   | -    | 66   |      |      |      | A                |
| $T_{stg}$   | Storage temperature                  | sinusoidal; with reappplied $V_{RRM(max)}$  | -40  | 150  |      |      |      | $^\circ\text{C}$ |
| $T_j$       | Operating junction temperature       |   | -    | 150  |      |      |      | $^\circ\text{C}$ |

**THERMAL RESISTANCES**

| SYMBOL         | PARAMETER                                    | CONDITIONS   | MIN. | TYP. | MAX. | UNIT |
|----------------|--|--------------|------|------|------|------|
| $R_{th\ j-mb}$ | Thermal resistance junction to mounting base | in free air. | -    | -    | 2.5  | K/W  |
| $R_{th\ j-a}$  | Thermal resistance junction to ambient       |              | -    | 60   | -    | K/W  |

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

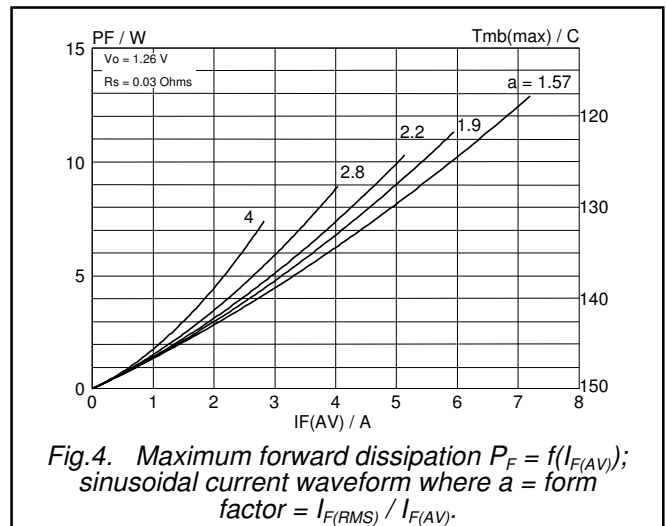
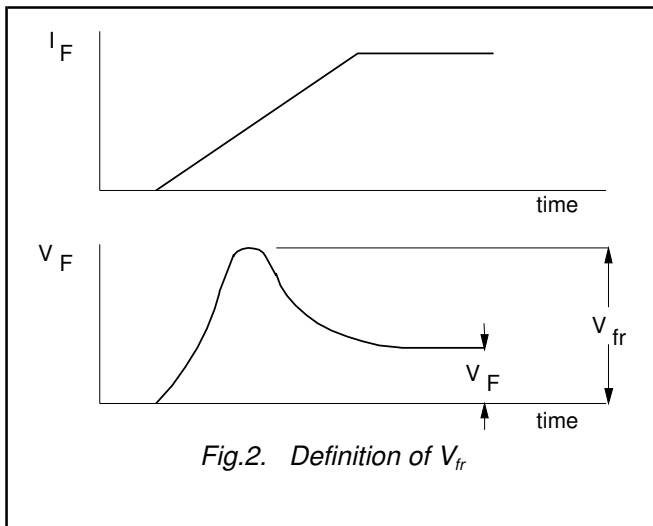
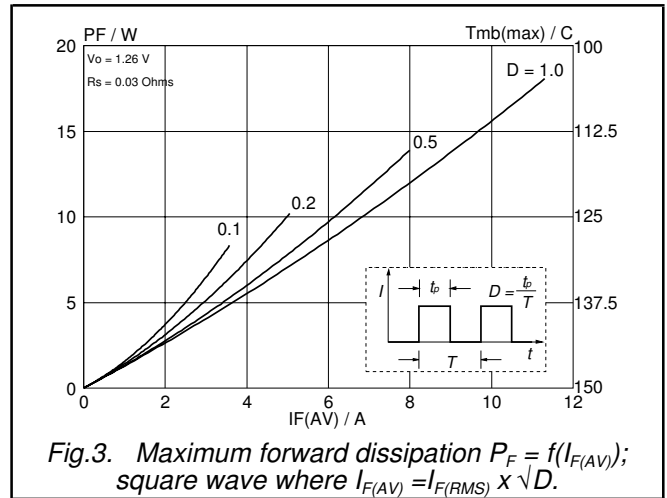
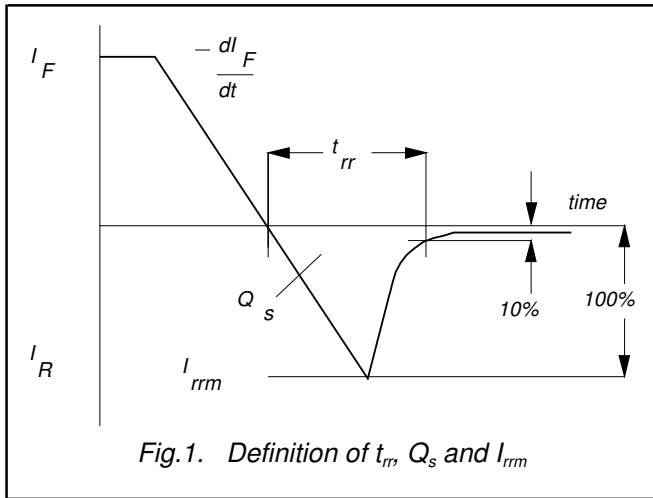
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**ELECTRICAL CHARACTERISTICS**

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

| SYMBOL    | PARAMETER                     | CONDITIONS  | MIN. | TYP. | MAX. | UNIT          |
|-----------|-------------------------------|---|------|------|------|---------------|
| $V_F$     | Forward voltage               | $I_F = 8\text{ A}; T_j = 150\text{ }^\circ\text{C}$   | -    | 1.07 | 1.50 | V             |
|           |                               | $I_F = 20\text{ A}$   | -    | 1.75 | 1.95 | V             |
| $I_R$     | Reverse current               | $V_R = V_{RRM}$   | -    | 1.0  | 10   | $\mu\text{A}$ |
| $Q_s$     | Reverse recovery charge       | $V_R = V_{RRM}; T_j = 100\text{ }^\circ\text{C}$<br>$I_F = 2\text{ A to } V_R \geq 30\text{ V};$<br>$di_F/dt = 20\text{ A}/\mu\text{s}$ | -    | 0.1  | 0.2  | mA            |
| $t_{rr}$  | Reverse recovery time         | $I_F = 2\text{ A to } V_R \geq 30\text{ V};$<br>$di_F/dt = 100\text{ A}/\mu\text{s}$  | -    | 60   | 75   | ns            |
| $I_{rrm}$ | Peak reverse recovery current | $I_F = 10\text{ A to } V_R \geq 30\text{ V};$<br>$di_F/dt = 50\text{ A}/\mu\text{s}; T_j = 100\text{ }^\circ\text{C}$                   | -    | -    | 6    | A             |
| $V_{fr}$  | Forward recovery voltage      | $I_F = 10\text{ A}; di_F/dt = 10\text{ A}/\mu\text{s}$  | -    | 5.0  | -    | V             |



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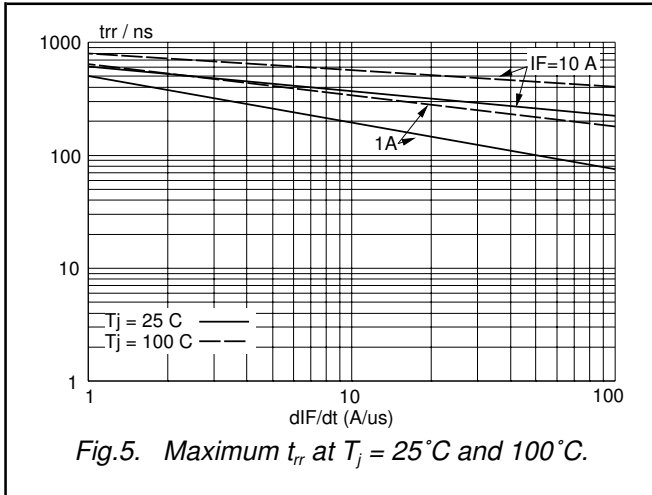


Fig.5. Maximum  $t_{rr}$  at  $T_j = 25\text{ C}$  and  $100\text{ C}$ .

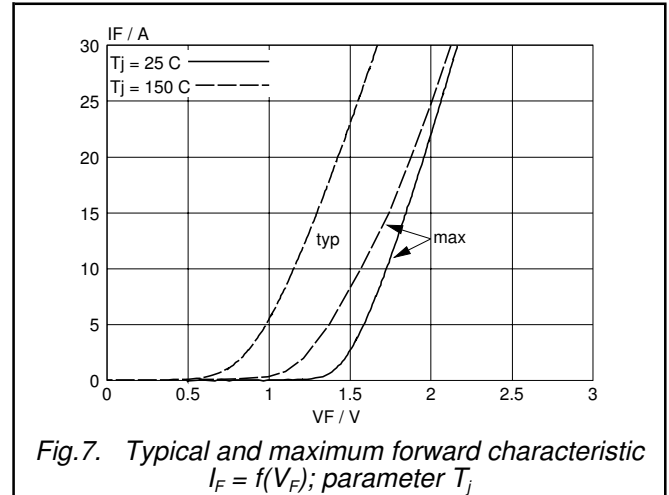


Fig.7. Typical and maximum forward characteristic  $I_F = f(V_F)$ ; parameter  $T_j$

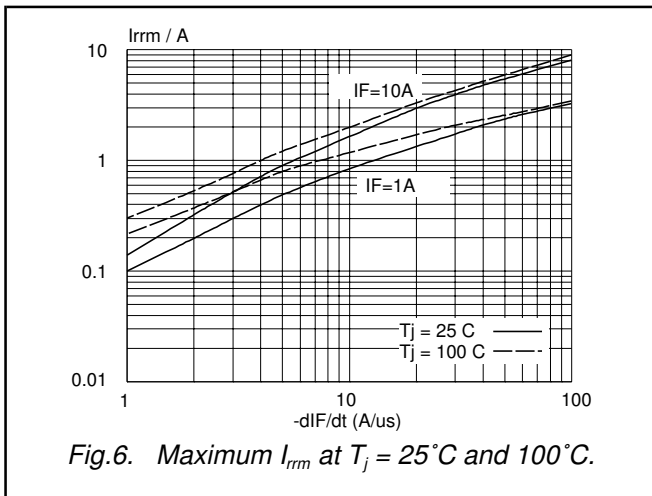


Fig.6. Maximum  $I_{rrm}$  at  $T_j = 25\text{ C}$  and  $100\text{ C}$ .

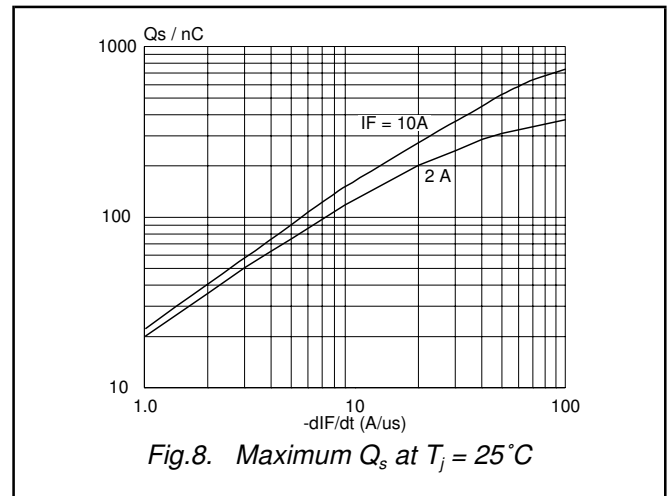


Fig.8. Maximum  $Q_s$  at  $T_j = 25\text{ C}$

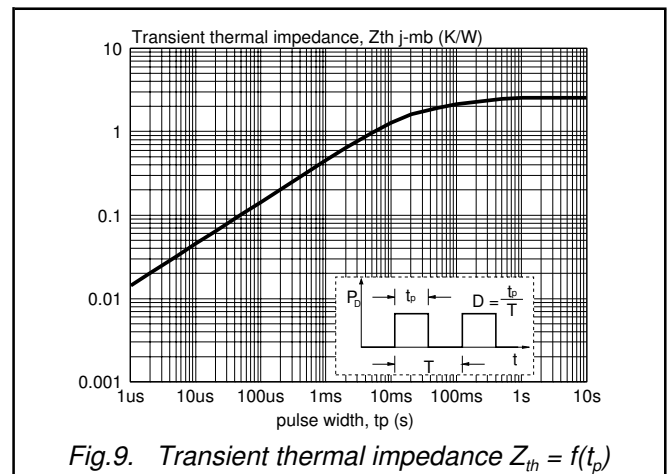


Fig.9. Transient thermal impedance  $Z_{th} = f(t_p)$

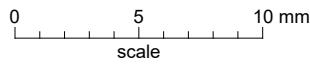
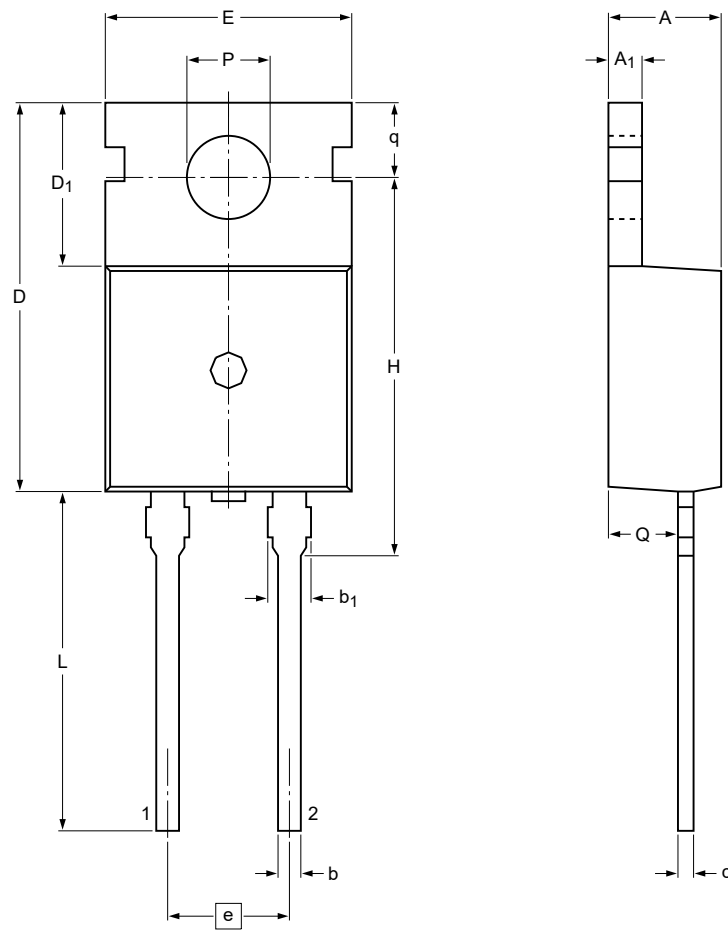
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**MECHANICAL DATA**

Plastic single-ended package; heatsink mounted; 1 mounting hole; 2-lead TO-220AC

SOD59



Dimensions

| Unit | A       | A <sub>1</sub> | b    | b <sub>1</sub> ( <sup>1</sup> ) | c    | D    | D <sub>1</sub> | E     | e     | H     | L    | P    | Q   | q   |
|------|---------|----------------|------|---------------------------------|------|------|----------------|-------|-------|-------|------|------|-----|-----|
| mm   | max 4.7 | 1.40           | 0.95 | 1.7                             | 0.65 | 15.8 | 6.8            | 10.30 | 5.08  | 16.25 | 15.0 | 3.80 | 2.6 | 2.9 |
|      | nom     |                |      |                                 |      |      |                |       | (REF) |       |      |      |     |     |
|      | min 4.3 | 1.15           | 0.70 | 1.3                             | 0.45 | 15.6 | 6.4            | 9.65  |       | 15.70 | 12.5 | 3.65 | 2.2 | 2.7 |

Note

1. Protruded dambar are included in the dimension.

sod059\_po

| Outline version | References      |       |       | European projection | Issue date           |
|-----------------|-----------------|-------|-------|---------------------|----------------------|
|                 | IEC             | JEDEC | JEITA |                     |                      |
| SOD59           | 2-lead TO-220AC |       |       |                     | 09-08-25<br>12-11-27 |

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| Document status [1][2]         | Product status [3] | Definition  |
|--------------------------------|--------------------|---|
| Objective [short] data sheet   | Development        | This document contains data from the objective specification for product development. |
| Preliminary [short] data sheet | Qualification      | This document contains data from the preliminary specification.                       |
| Product [short] data sheet     | Production         | This document contains the product specification.                                     |

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
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