

# DATA SHEET

## **BYR29 series** Rectifier diodes ultrafast

Product specification

September 1998



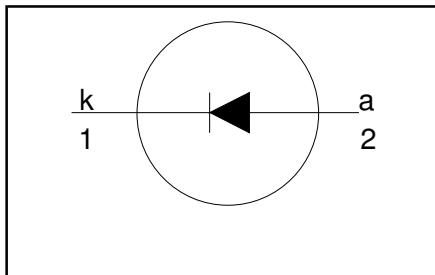
## Rectifier diodes ultrafast

## 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

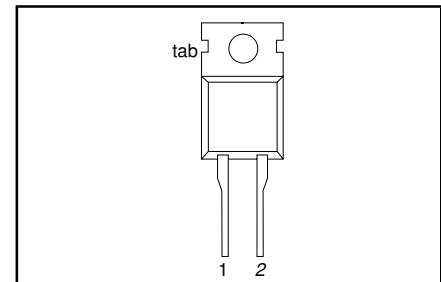
Ultra-fast, epitaxial rectifier diodes intended for use as output rectifiers in high frequency switched mode power supplies.

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
$V_{RRM}$	Peak repetitive reverse voltage	BYR29	-	-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; $\delta = 0.5$ ; $T_{mb} \leq 115 \text{ }^\circ\text{C}$ $t = 25 \mu\text{s}$ ; $\delta = 0.5$ ; $T_{mb} \leq 115 \text{ }^\circ\text{C}$ $t = 10 \text{ ms}$ $t = 8.3 \text{ ms}$ sinusoidal; with reapplied $V_{RRM(\text{max})}$	-	8				A
$I_{FRM}$	Repetitive peak forward current		-	16				A
$I_{FSM}$	Non-repetitive peak forward current		-	60				A
$T_{stg}$	Storage temperature		-40	150				°C
$T_j$	Operating junction temperature		-	150				°C

### THERMAL RESISTANCES

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

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

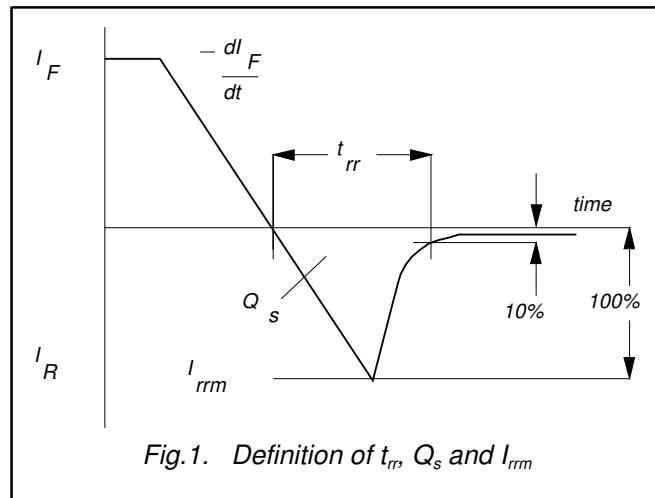
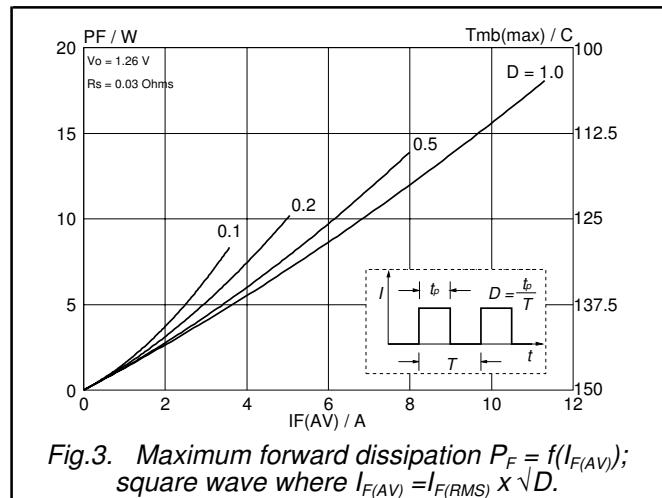
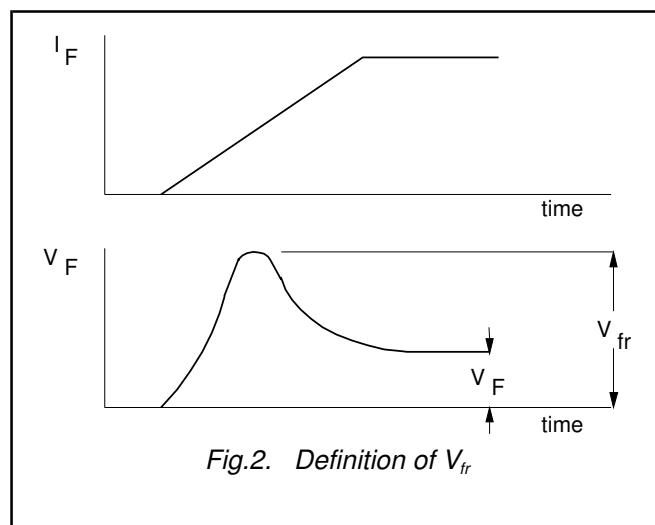
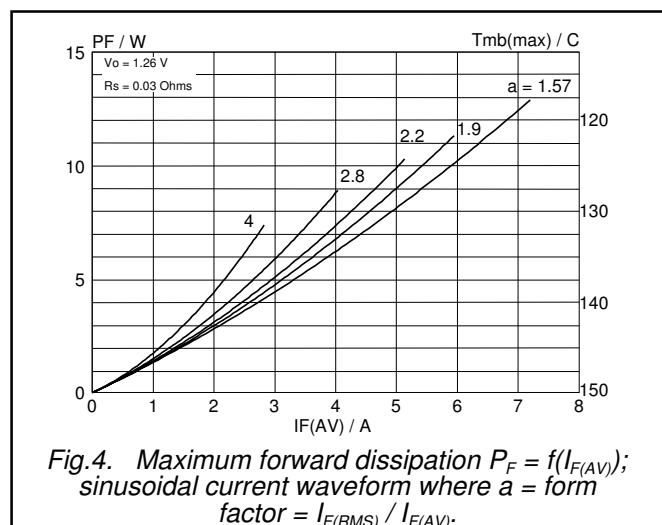
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BYR29 series

## ELECTRICAL CHARACTERISTICS

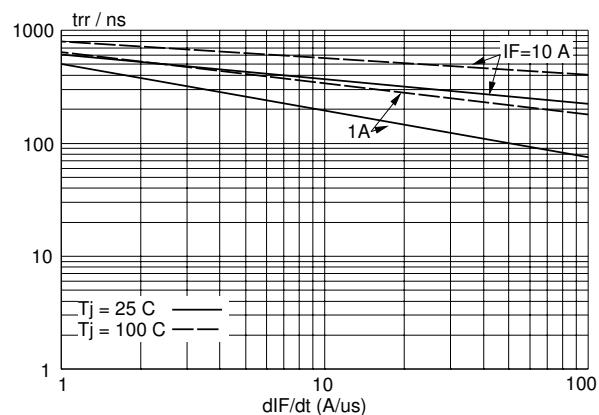
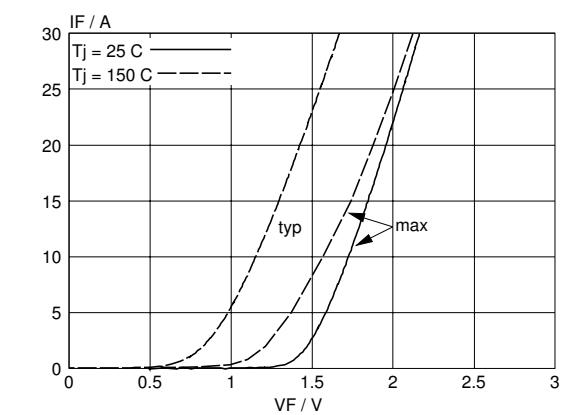
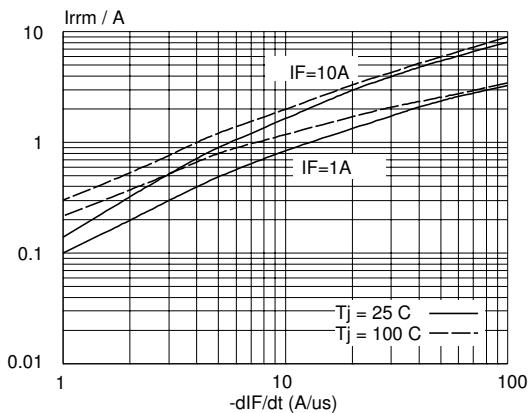
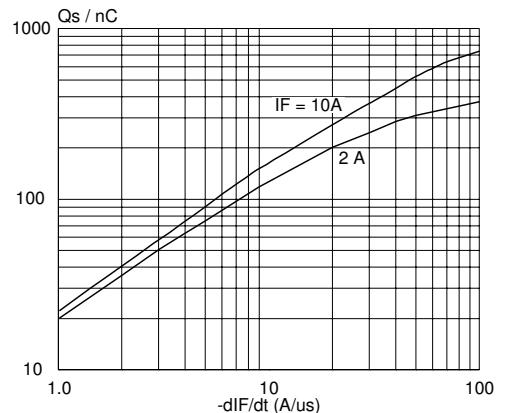
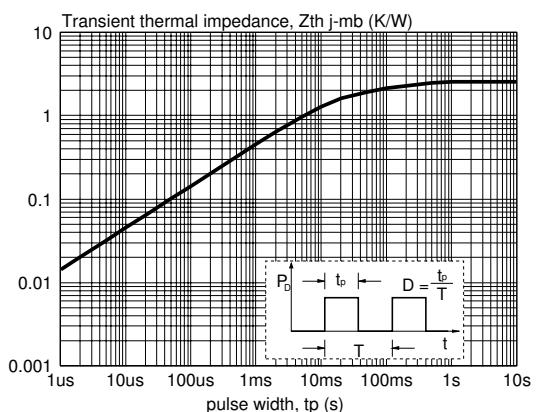
 $T_j = 25^\circ\text{C}$  unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_F$	Forward voltage	$I_F = 8 \text{ A}; T_j = 150^\circ\text{C}$	-	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	$V_R = V_{RRM}; T_j = 100^\circ\text{C}$	-	0.1	0.2	mA
$t_{rr}$	Reverse recovery time	$I_F = 2 \text{ A} \text{ to } V_R \geq 30 \text{ V};$ $dI_F/dt = 20 \text{ A}/\mu\text{s}$	-	150	200	nC
		$I_F = 1 \text{ A} \text{ to } V_R \geq 30 \text{ V};$ $dI_F/dt = 100 \text{ A}/\mu\text{s}$	-	60	75	ns
$I_{rrm}$	Peak reverse recovery current	$I_F = 10 \text{ A} \text{ to } V_R \geq 30 \text{ V};$ $dI_F/dt = 50 \text{ A}/\mu\text{s}; T_j = 100^\circ\text{C}$	-	-	6	A
$V_{fr}$	Forward recovery voltage	$I_F = 10 \text{ A}; dI_F/dt = 10 \text{ A}/\mu\text{s}$	-	5.0	-	V

Fig.1. Definition of  $t_{rr}$ ,  $Q_s$  and  $I_{rrm}$ Fig.3. Maximum forward dissipation  $P_F = f(I_{F(AV)})$ ;  
square wave where  $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$ .Fig.2. Definition of  $V_{fr}$ Fig.4. Maximum forward dissipation  $P_F = f(I_{F(AV)})$ ;  
sinusoidal current waveform where  $a = \text{form factor} = I_{F(RMS)} / I_{F(AV)}$ .

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## BYR29 series

Fig.5. Maximum  $t_{rr}$  at  $T_j = 25^\circ\text{C}$  and  $100^\circ\text{C}$ .Fig.7. Typical and maximum forward characteristic  
 $I_F = f(V_F)$ ; parameter  $T_j$ Fig.6. Maximum  $I_{rrm}$  at  $T_j = 25^\circ\text{C}$  and  $100^\circ\text{C}$ .Fig.8. Maximum  $Q_s$  at  $T_j = 25^\circ\text{C}$ Fig.9. Transient thermal impedance  $Z_{th} = f(t_p)$

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## MECHANICAL DATA

*Dimensions in mm*

Net Mass: 2 g

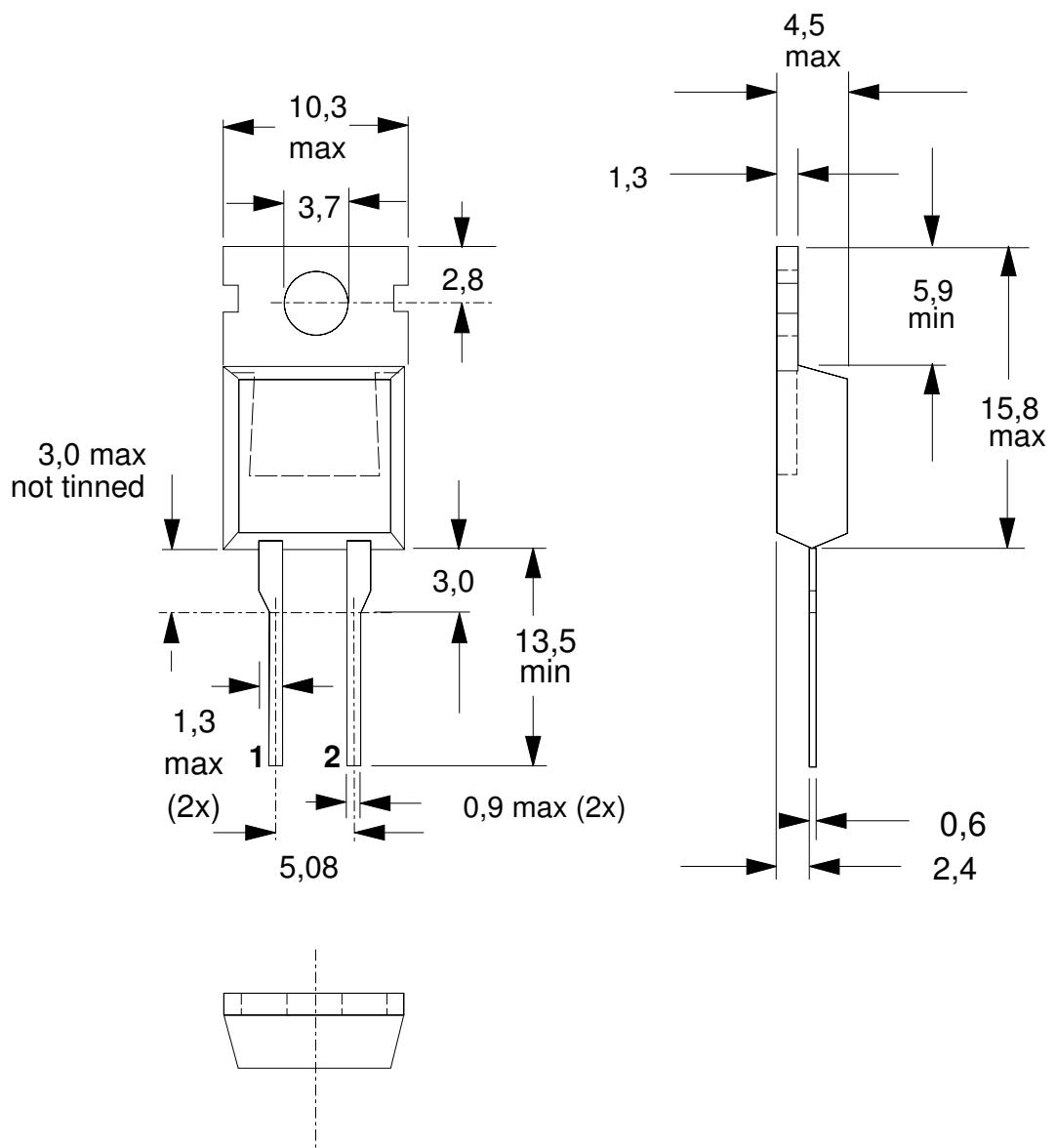


Fig.10. SOD59 (TO220AC). pin 1 connected to mounting base.

**Notes**

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

## Legal information

### DATA SHEET STATUS

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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