

# IMPORTANT NOTICE

10 December 2015

## 1. Global joint venture starts operations as WeEn Semiconductors

Dear customer,

As from November 9th, 2015 NXP Semiconductors N.V. and Beijing JianGuang Asset Management Co. Ltd established Bipolar Power joint venture (JV), **WeEn Semiconductors**, which will be used in future Bipolar Power documents together with new contact details.

In this document where the previous NXP references remain, please use the new links as shown below.

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Thank you for your cooperation and understanding,

WeEn Semiconductors

# DATA SHEET

## **BYW29EX series**

Rectifier diodes  
ultrafast, rugged

Product specification

October 1998



## Rectifier diodes ultrafast, rugged

## BYW29EX series

### GENERAL DESCRIPTION

Glass passivated epitaxial rectifier diodes in a full pack plastic envelope, featuring low forward voltage drop, ultra-fast recovery times, soft recovery characteristic and guaranteed reverse surge and ESD capability. They are intended for use in switched mode power supplies and high frequency circuits in general where low conduction and switching losses are essential.

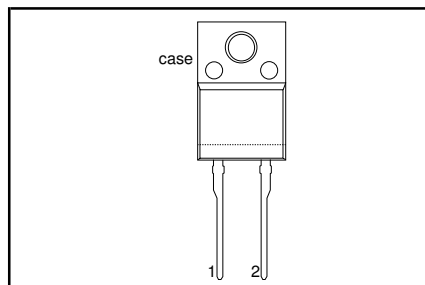
### QUICK REFERENCE DATA

| SYMBOL      | PARAMETER                                          | MAX.              | MAX.              | UNIT |
|-------------|----------------------------------------------------|-------------------|-------------------|------|
| $V_{RRM}$   | <b>BYW29EX-</b><br>Repetitive peak reverse voltage | <b>150</b><br>150 | <b>200</b><br>200 | V    |
| $V_F$       | Forward voltage                                    | 0.895             | 0.895             | V    |
| $I_{F(AV)}$ | Forward current                                    | 8                 | 8                 | A    |
| $t_{rr}$    | Reverse recovery time                              | 25                | 25                | ns   |
| $I_{RRM}$   | Repetitive peak reverse current                    | 0.2               | 0.2               | A    |

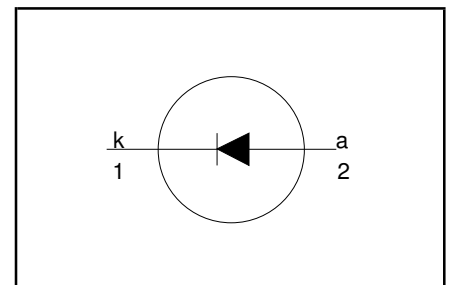
### PINNING - SOD113

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

### PIN CONFIGURATION



### SYMBOL



### LIMITING VALUES

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

| SYMBOL       | PARAMETER                            | CONDITIONS                                                                                                                      | MIN. | MAX.               |                    | UNIT             |
|--------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------|--------------------|--------------------|------------------|
| $V_{RRM}$    | Repetitive peak reverse voltage      |                                                                                                                                 | -    | <b>-150</b><br>150 | <b>-200</b><br>200 | V                |
| $V_{RWM}$    | Crest working reverse voltage        |                                                                                                                                 | -    | 150                | 200                | V                |
| $V_R$        | Continuous reverse voltage           |                                                                                                                                 | -    | 150                | 200                | V                |
| $I_{F(AV)}$  | Average forward current <sup>1</sup> | square wave; $\delta = 0.5$ ;<br>$T_{hs} \leq 106^\circ\text{C}$<br>sinusoidal; $a = 1.57$ ;<br>$T_{hs} \leq 109^\circ\text{C}$ | -    | 8                  |                    | A                |
| $I_{F(RMS)}$ | RMS forward current                  |                                                                                                                                 | -    | 7.3                |                    | A                |
| $I_{FRM}$    | Repetitive peak forward current      | $t = 25\ \mu\text{s}$ ; $\delta = 0.5$ ;<br>$T_{hs} \leq 106^\circ\text{C}$                                                     | -    | 11.3               |                    | A                |
| $I_{FSM}$    | Non-repetitive peak forward current  | $t = 10\ \text{ms}$<br>$t = 8.3\ \text{ms}$<br>sinusoidal; with reapplied<br>$V_{RWM(max)}$                                     | -    | 80                 |                    | A                |
| $I^2t$       | $I^2t$ for fusing                    | $t = 10\ \text{ms}$                                                                                                             | -    | 32                 |                    | A <sup>2</sup> s |
| $I_{RRM}$    | Repetitive peak reverse current      | $t_p = 2\ \mu\text{s}$ ; $\delta = 0.001$                                                                                       | -    | 0.2                |                    | A                |
| $I_{RSM}$    | Non-repetitive peak reverse current  | $t_p = 100\ \mu\text{s}$                                                                                                        | -    | 0.2                |                    | A                |
| $T_{stg}$    | 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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### ESD LIMITING VALUE

| SYMBOL | PARAMETER                                 | CONDITIONS                                                            | MIN. | MAX. | UNIT |
|--------|-------------------------------------------|-----------------------------------------------------------------------|------|------|------|
| $V_C$  | Electrostatic discharge capacitor voltage | Human body model;<br>$C = 250 \text{ pF}$ ; $R = 1.5 \text{ k}\Omega$ | -    | 8    | kV   |

### ISOLATION LIMITING VALUE & CHARACTERISTIC

$T_{hs} = 25 \text{ }^\circ\text{C}$  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 |
|----------------|-----------------------------------------|------------------------------------------|------|------|------|------|
| $R_{th\ j-hs}$ | Thermal resistance junction to heatsink | with heatsink compound                   | -    | -    | 5.5  | K/W  |
| $R_{th\ j-a}$  | Thermal resistance junction to ambient  | without heatsink compound<br>in free air | -    | -    | 7.2  | K/W  |
|                |                                         |                                          | -    | 55   | -    | K/W  |

### STATIC CHARACTERISTICS

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

| SYMBOL | PARAMETER       | CONDITIONS                                               | MIN. | TYP. | MAX.  | UNIT          |
|--------|-----------------|----------------------------------------------------------|------|------|-------|---------------|
| $V_F$  | Forward voltage | $I_F = 8 \text{ A}$ ; $T_j = 150 \text{ }^\circ\text{C}$ | -    | 0.80 | 0.895 | V             |
|        |                 | $I_F = 8 \text{ A}$                                      | -    | 0.92 | 1.05  | V             |
|        |                 | $I_F = 20 \text{ A}$                                     | -    | 1.1  | 1.3   | V             |
| $I_R$  | Reverse current | $V_R = V_{RWM}$ ; $T_j = 100 \text{ }^\circ\text{C}$     | -    | 0.2  | 0.6   | mA            |
|        |                 | $V_R = V_{RWM}$                                          | -    | 2    | 10    | $\mu\text{A}$ |

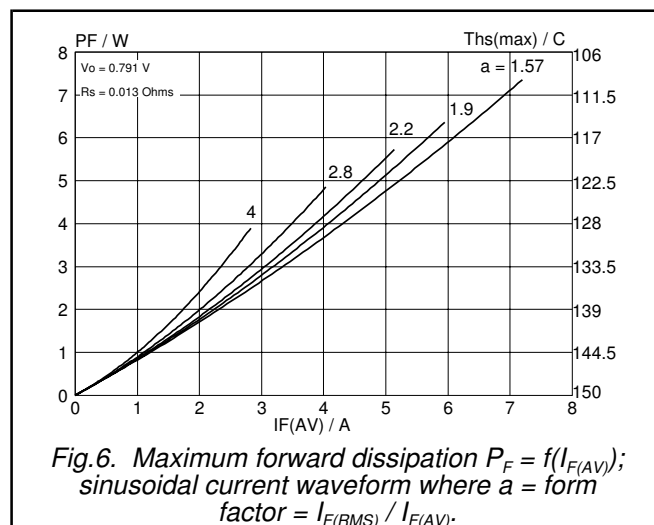
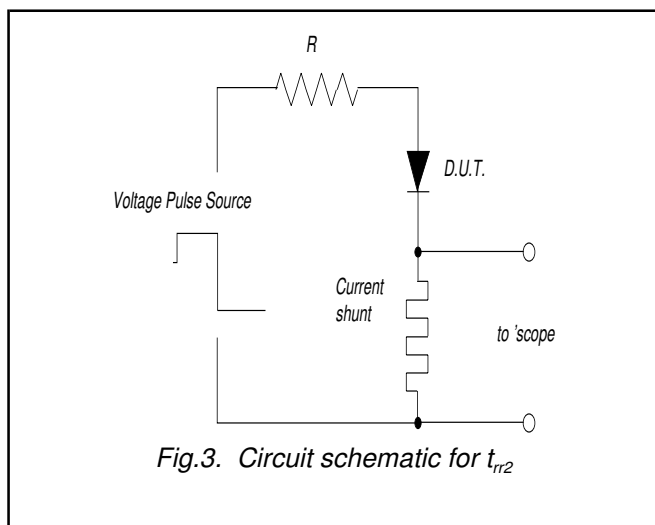
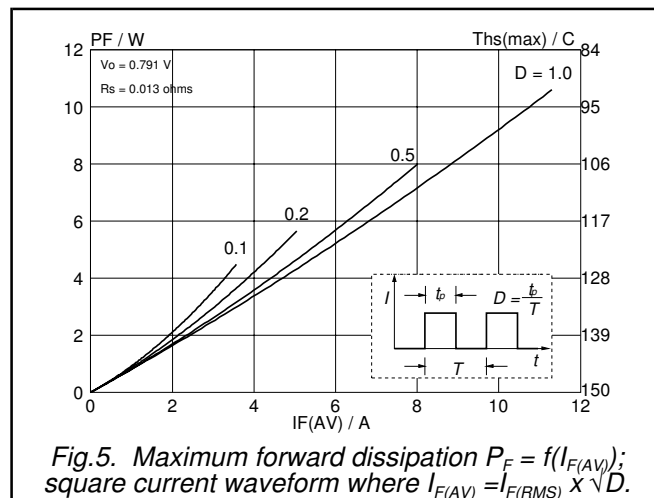
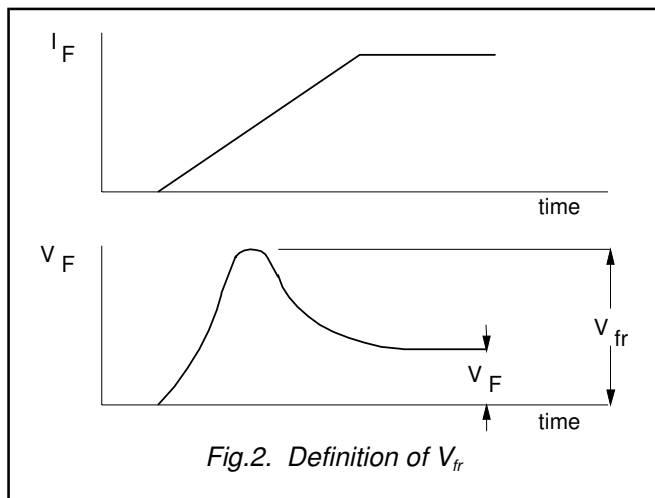
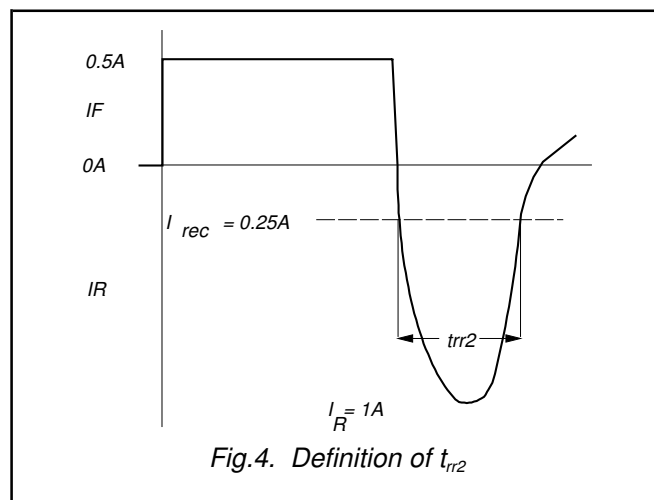
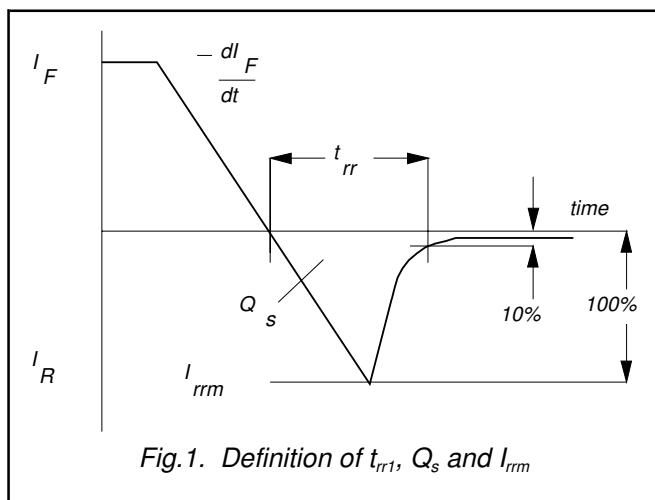
### DYNAMIC CHARACTERISTICS

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

| SYMBOL    | PARAMETER                | CONDITIONS                                                                                | MIN. | TYP. | MAX. | UNIT |
|-----------|--------------------------|-------------------------------------------------------------------------------------------|------|------|------|------|
| $Q_s$     | Reverse recovery charge  | $I_F = 2 \text{ A}$ ; $V_R \geq 30 \text{ V}$ ; $-di_F/dt = 20 \text{ A}/\mu\text{s}$     | -    | 4    | 11   | nC   |
| $t_{rr1}$ | Reverse recovery time    | $I_F = 1 \text{ A}$ ; $V_R \geq 30 \text{ V}$ ;<br>$-di_F/dt = 100 \text{ A}/\mu\text{s}$ | -    | 20   | 25   | ns   |
| $t_{rr2}$ | Reverse recovery time    | $I_F = 0.5 \text{ A}$ to $I_R = 1 \text{ A}$ ; $I_{rec} = 0.25 \text{ A}$                 | -    | 15   | 20   | ns   |
| $V_{fr}$  | Forward recovery voltage | $I_F = 1 \text{ A}$ ; $di_F/dt = 10 \text{ A}/\mu\text{s}$                                | -    | 1    | -    | V    |

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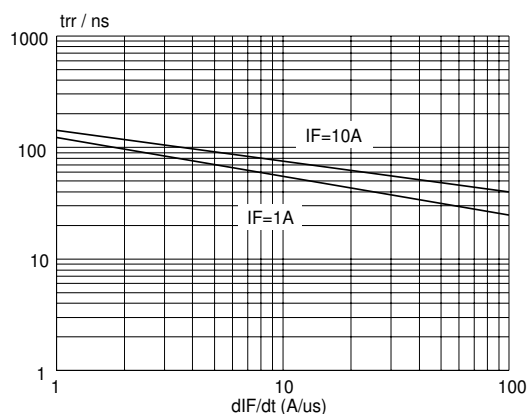


Fig.7. Maximum  $t_{rr}$  at  $T_j = 25\text{ }^{\circ}\text{C}$ .

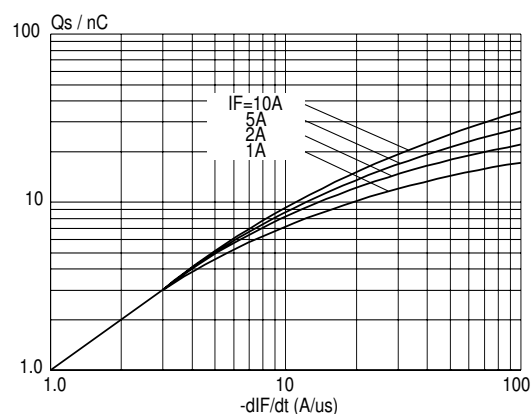


Fig.10. Maximum  $Q_s$  at  $T_j = 25\text{ }^{\circ}\text{C}$ .

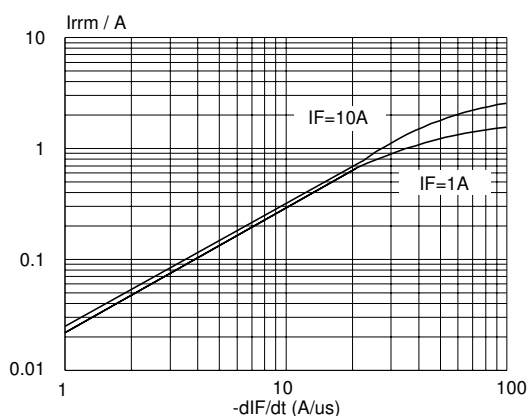


Fig.8. Maximum  $I_{rrm}$  at  $T_j = 25\text{ }^{\circ}\text{C}$ .

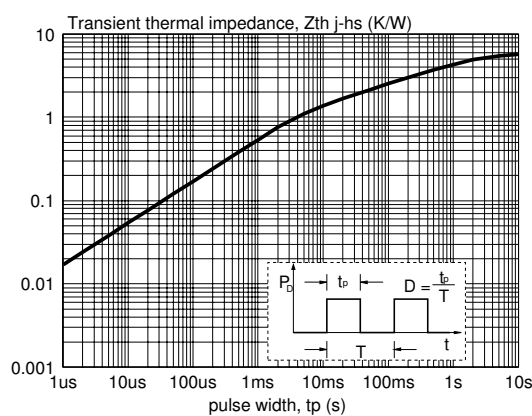


Fig.11. Transient thermal impedance;  $Z_{th\ j-hs} = f(t_p)$ .

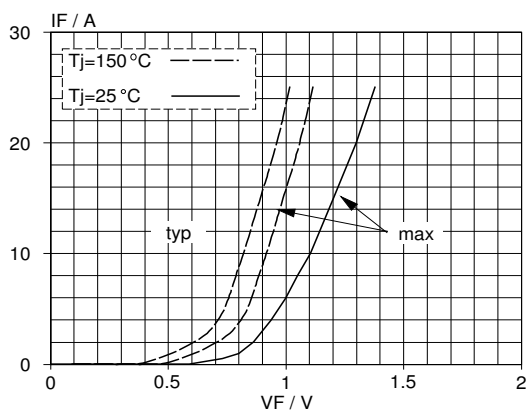
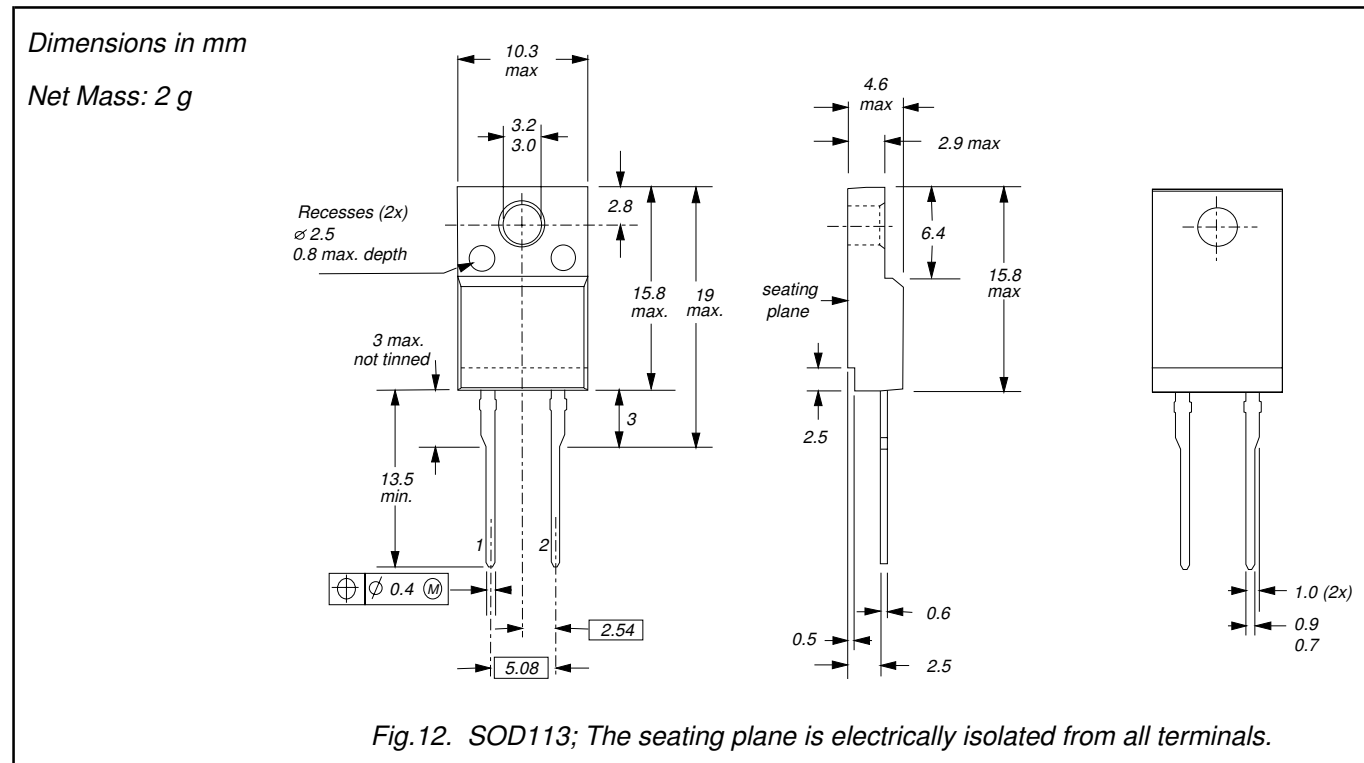


Fig.9. Typical and maximum forward characteristic  $I_F = f(V_F)$ ; parameter  $T_j$

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## BYW29EX series

### MECHANICAL DATA



#### Notes

1. Refer to mounting instructions for F-pack 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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