



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

BYV44 series
Dual rectifier diodes
ultrafast

Product specification

October 1998



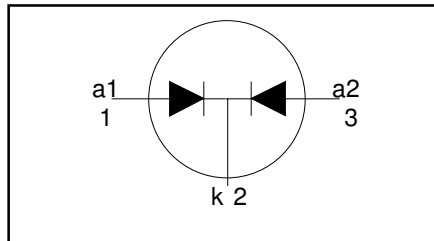
Dual rectifier diodes ultrafast

BYV44 series

FEATURES

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

SYMBOL



QUICK REFERENCE DATA

| |
|--|
| $V_R = 300\text{ V} / 400\text{ V} / 500\text{ V}$ |
| $V_F \leq 1.12\text{ V}$ |
| $I_{O(AV)} = 30\text{ A}$ |
| $t_{tr} \leq 60\text{ ns}$ |

GENERAL DESCRIPTION

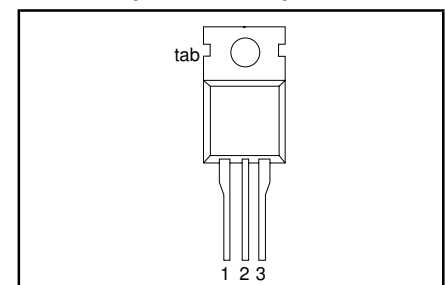
Dual, common cathode, ultra-fast, epitaxial rectifier diodes intended for use as output rectifiers in high frequency switched mode power supplies.

The BYV44 series is supplied in the conventional leaded SOT78 (TO220AB) package.

PINNING

| PIN | DESCRIPTION |
|-----|-------------|
| 1 | anode 1 |
| 2 | cathode |
| 3 | anode 2 |
| tab | cathode |

SOT78 (TO220AB)



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 | BYV44 $T_{mb} \leq 136\text{ }^\circ\text{C}$ | - | -300 | -400 | -500 | V |
| V_{RWM} | Crest working reverse voltage | | - | 300 | 400 | 500 | V |
| V_R | Continuous reverse voltage | | - | 300 | 400 | 500 | V |
| $I_{O(AV)}$ | Average rectified output current (both diodes conducting) ¹ | square wave; $\delta = 0.5$; $T_{mb} \leq 94\text{ }^\circ\text{C}$ | - | 30 | | | A |
| I_{FRM} | Repetitive peak forward current per diode | $t = 25\text{ }\mu\text{s}$; $\delta = 0.5$; $T_{mb} \leq 94\text{ }^\circ\text{C}$ | - | 30 | | | A |
| I_{FSM} | Non-repetitive peak forward current per diode. | $t = 10\text{ ms}$ | - | 150 | | | A |
| | | $t = 8.3\text{ ms}$ sinusoidal; with reapplied $V_{RRM(max)}$ | - | 160 | | | A |
| T_{stg} | Storage temperature | | -40 | 150 | | | $^\circ\text{C}$ |
| T_j | Operating junction temperature | | - | 150 | | | $^\circ\text{C}$ |

THERMAL RESISTANCES

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|----------------|---|------------------------|------|------|------|------|
| $R_{th\ j-hs}$ | Thermal resistance junction to heatsink | per diode | - | - | 2.4 | K/W |
| $R_{th\ j-a}$ | Thermal resistance junction to ambient | both diodes conducting | - | - | 1.4 | K/W |
| | | in free air. | - | 60 | - | K/W |

¹ Neglecting switching and reverse current losses.

For output currents in excess of 20 A, the cathode connection should be made to the metal mounting tab.

Dual rectifier diodes
ultrafast

BYV44 series

ELECTRICAL CHARACTERISTICS

characteristics are per diode at $T_j = 25\text{ }^\circ\text{C}$ unless otherwise stated

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-----------|-------------------------------|---|------|------|------|---------------|
| V_F | Forward voltage | $I_F = 15\text{ A}; T_j = 150\text{ }^\circ\text{C}$ | - | 0.95 | 1.12 | V |
| | | $I_F = 15\text{ A}$ | - | 1.08 | 1.25 | V |
| | | $I_F = 30\text{ A}$ | - | 1.15 | 1.36 | V |
| I_R | Reverse current | $V_R = V_{RRM}$ | - | 10 | 50 | μA |
| | | $V_R = V_{RRM}; T_j = 100\text{ }^\circ\text{C}$ | - | 0.3 | 0.8 | mA |
| Q_s | Reverse recovery charge | $I_F = 2\text{ A to } V_R \geq 30\text{ V};$ $di_F/dt = 20\text{ A}/\mu\text{s}$ | - | 40 | 60 | nC |
| t_{rr} | Reverse recovery time | $I_F = 1\text{ A to } V_R \geq 30\text{ V};$ $di_F/dt = 100\text{ A}/\mu\text{s}$ | - | 50 | 60 | ns |
| I_{rrm} | Peak reverse recovery current | $I_F = 10\text{ A to } V_R \geq 30\text{ V};$ $di_F/dt = 50\text{ A}/\mu\text{s}; T_j = 100\text{ }^\circ\text{C}$ | - | 4.2 | 5.2 | A |
| V_{fr} | Forward recovery voltage | $I_F = 10\text{ A}; di_F/dt = 10\text{ A}/\mu\text{s}$ | - | 2.5 | - | V |

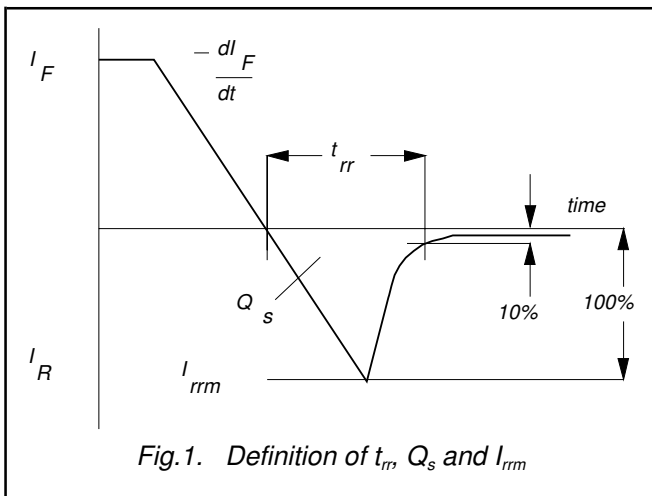


Fig.1. Definition of t_{rr} , Q_s and I_{rrm}

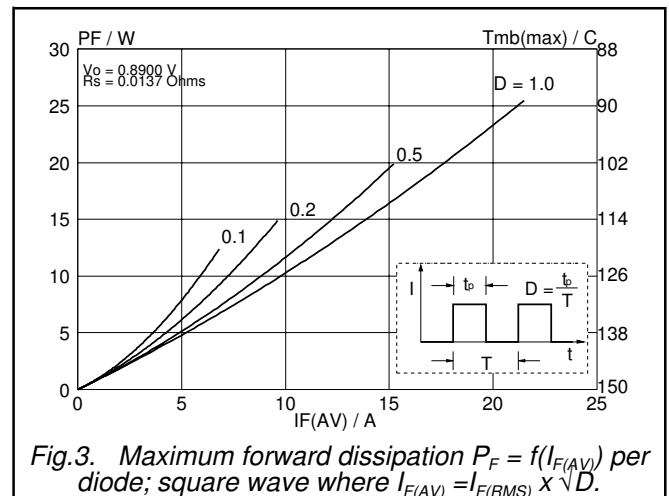


Fig.3. Maximum forward dissipation $P_F = f(I_{F(AV)})$ per diode; square wave where $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$.

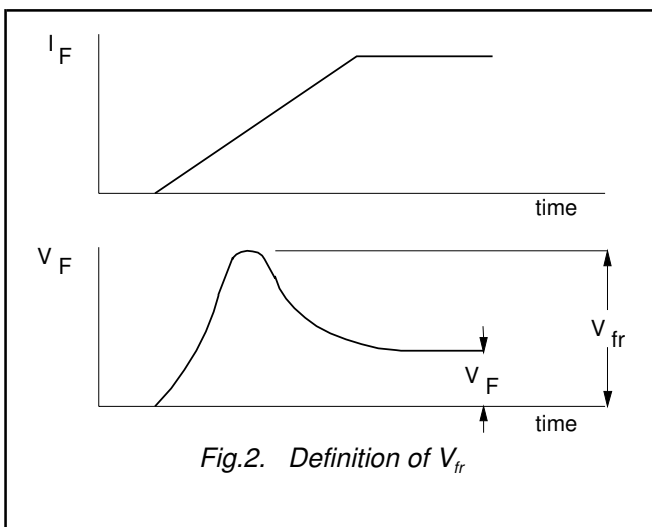


Fig.2. Definition of V_{fr}

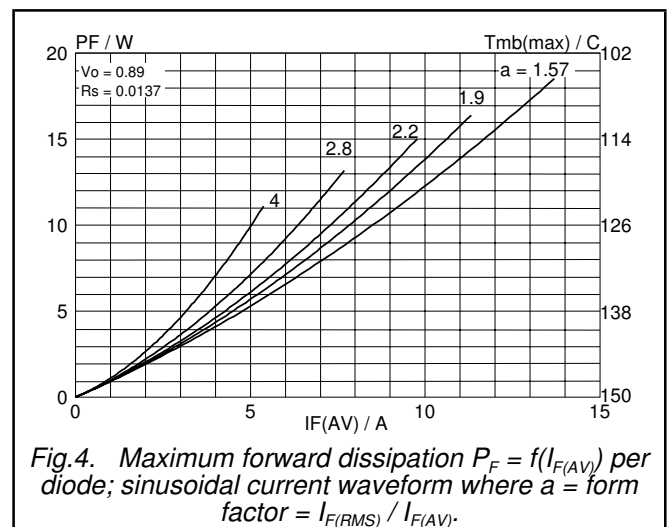
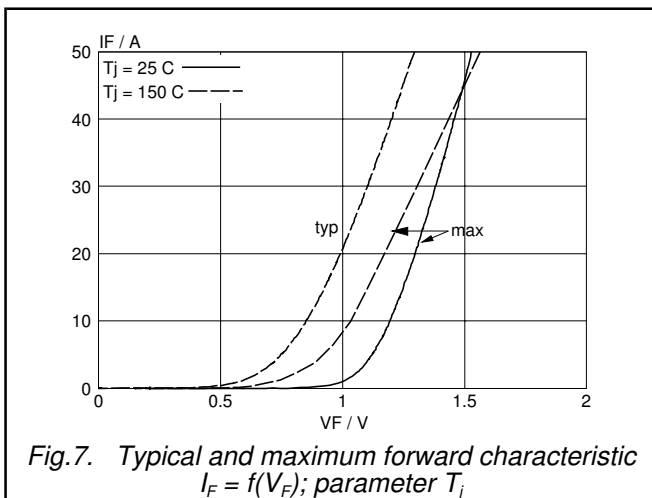
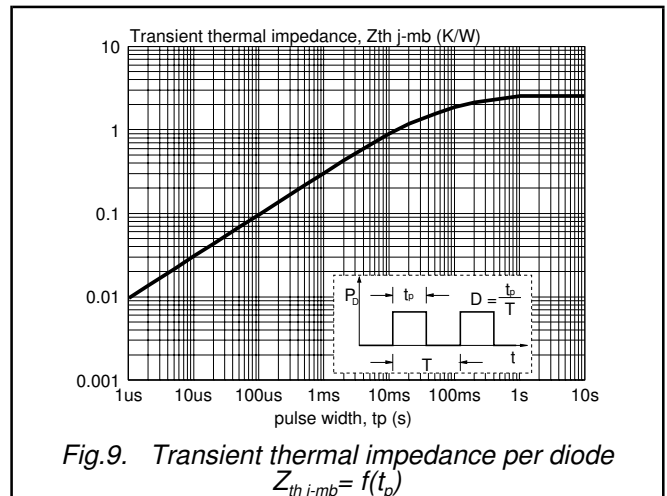
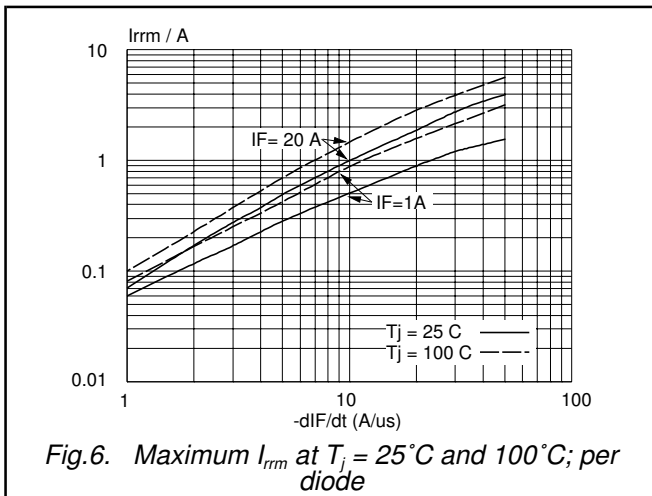
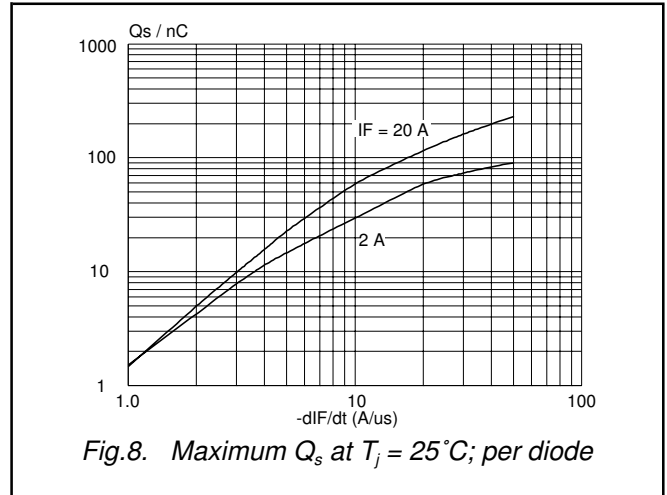
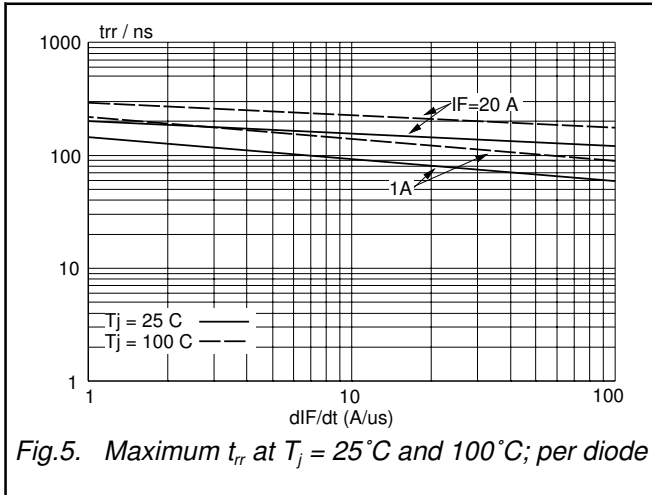


Fig.4. Maximum forward dissipation $P_F = f(I_{F(AV)})$ per diode; sinusoidal current waveform where $a = \text{form factor} = I_{F(RMS)} / I_{F(AV)}$.

Dual rectifier diodes
ultrafast

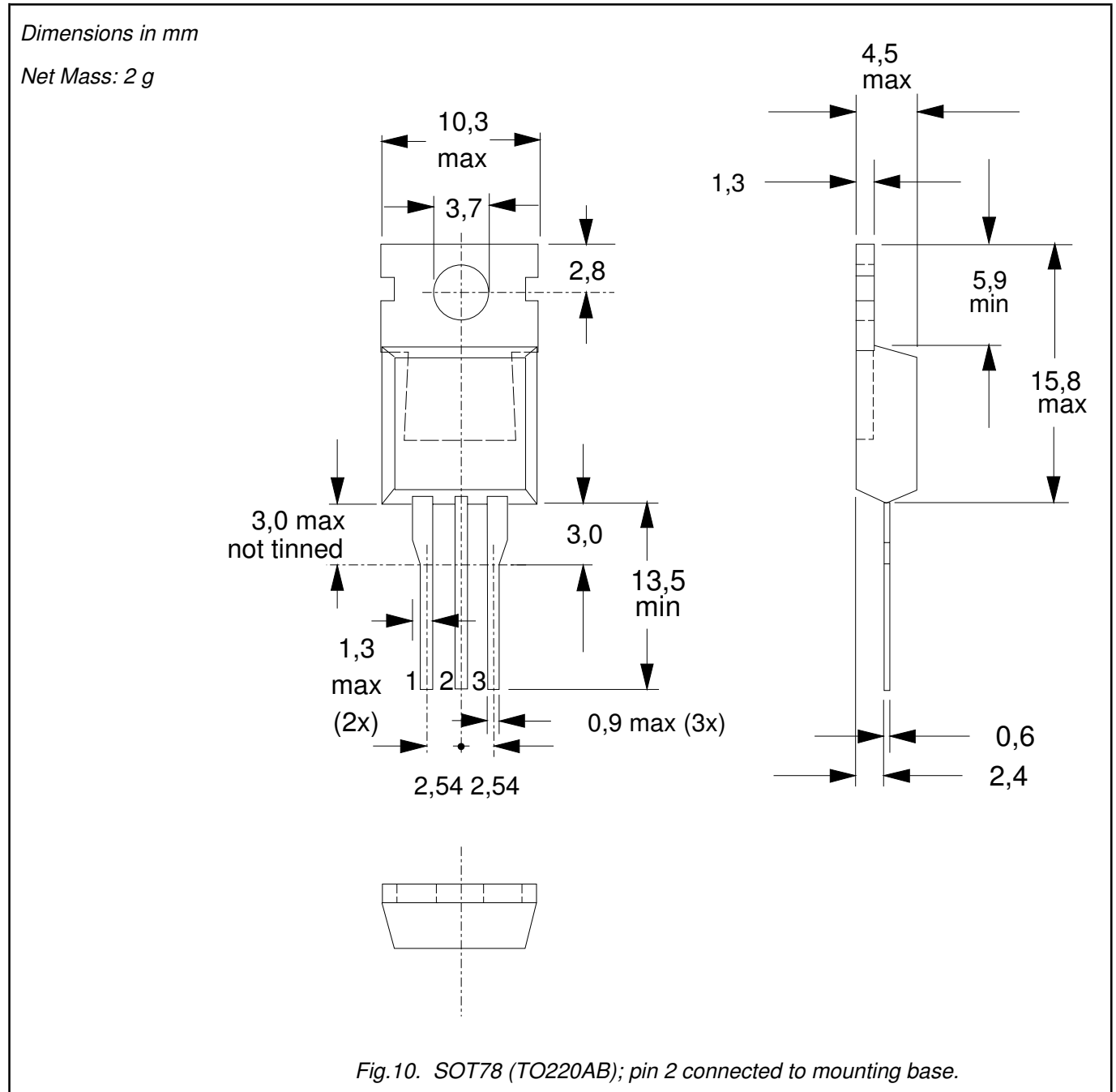
BYV44 series



Dual rectifier diodes
ultrafast

BYV44 series

MECHANICAL DATA



Notes

1. Refer to mounting instructions for SOT78 (TO220) envelopes.
2. Epoxy meets UL94 V0 at 1/8".

Legal information

DATA SHEET STATUS

| DOCUMENT STATUS ⁽¹⁾ | PRODUCT STATUS ⁽²⁾ | 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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Contact information

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