

# Silicon Dual Diode

## **BYV32F-150**

150V/12A

# DATASHEET

OEM – Philips

Source: Philips Databook 1999

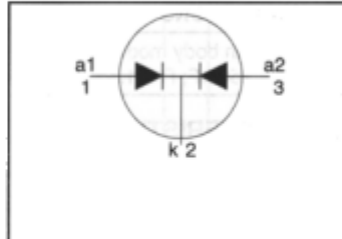
## Rectifier diodes ultrafast, rugged

## BYV32F, BYV32EX series

### FEATURES

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

### SYMBOL



### QUICK REFERENCE DATA

$$V_R = 150 \text{ V} / 200 \text{ V}$$

$$V_F \leq 0.85 \text{ V}$$

$$I_{O(AV)} = 12 \text{ A}$$

$$I_{RRM} = 0.2 \text{ A}$$

$$t_{rr} \leq 25 \text{ ns}$$

### GENERAL DESCRIPTION

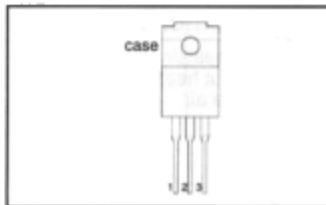
Dual, ultra-fast, epitaxial rectifier diodes intended for use as output rectifiers in high frequency switched mode power supplies.

The BYV32F series is supplied in the SOT186 package.  
The BYV32EX series is supplied in the SOT186A package.

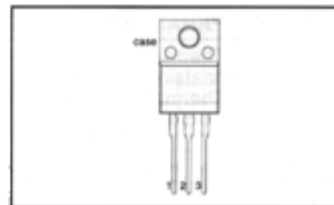
### PINNING

| PIN | DESCRIPTION |
|-----|-------------|
| 1   | anode 1 (a) |
| 2   | cathode (k) |
| 3   | anode 2 (a) |
| tab | isolated    |

### SOT186



### SOT186A



### 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  | BYV32F / BYV32EX  | -    | -150 | -200 | V                |
| $V_{RWM}$   | Crest working reverse voltage  |   | -    | 150  | 200  | V                |
| $V_R$       | Continuous reverse voltage   |   | -    | 150  | 200  | V                |
| $I_{O(AV)}$ | Average rectified output current (both diodes conducting) <sup>1</sup> | square wave<br>$\delta = 0.5$ ; $T_{ns} \leq 95 \text{ }^\circ\text{C}$                     | -    | 12   |      | A                |
| $I_{FRM}$   | Repetitive peak forward current per diode                              | $t = 25 \text{ } \mu\text{s}$ ; $\delta = 0.5$ ;<br>$T_{ns} \leq 95 \text{ }^\circ\text{C}$ | -    | 20   |      | A                |
| $I_{FSM}$   | Non-repetitive peak forward current per diode                          | $t = 10 \text{ ms}$   | -    | 125  |      | A                |
|             |  | $t = 8.3 \text{ ms}$<br>sinusoidal; with reapplied  | -    | 137  |      | A                |
| $I_{RRM}$   | Repetitive peak reverse current per diode                              | $V_{RWM(max)}$<br>$t_p = 2 \text{ } \mu\text{s}$ ; $\delta = 0.001$                         | -    | 0.2  |      | A                |
| $I_{RSM}$   | Non-repetitive peak reverse current per diode                          | $t_p = 100 \text{ } \mu\text{s}$  | -    | 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

$T_{ns} = 25 \text{ }^\circ\text{C}$  unless otherwise specified

| SYMBOL     | PARAMETER  | CONDITIONS  | MIN. | TYP. | MAX. | UNIT |
|------------|--|---|------|------|------|------|
| $V_{isol}$ | R.M.S. isolation voltage from all three terminals to external heatsink | SOT186A package; $f = 50\text{-}60 \text{ Hz}$ ;<br>sinusoidal waveform; R.H. $\leq 65\%$ ;<br>clean and dustfree | -    |      | 2500 | V    |
| $V_{isol}$ | Repetitive peak voltage from all three terminals to external heatsink  | SOT186 package; R.H. $\leq 65\%$ ;<br>clean and dustfree  | -    |      | 1500 | V    |
| $C_{isol}$ | Capacitance from pin 2 to external heatsink                            | $f = 1 \text{ MHz}$   | -    | 10   | -    | pF   |

#### THERMAL RESISTANCES

| SYMBOL      | PARAMETER   | CONDITIONS                               | MIN. | TYP. | MAX. | UNIT |
|-------------|---|--|------|------|------|------|
| $R_{thjhs}$ | Thermal resistance junction to heatsink (per diode) | with heatsink compound                   | -    | -    | 5.0  | K/W  |
| $R_{thja}$  | Thermal resistance junction to ambient              | without heatsink compound<br>in free air | -    | 55   | 7.0  | K/W  |

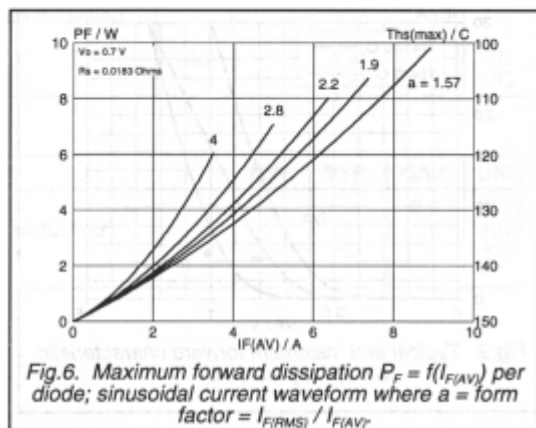
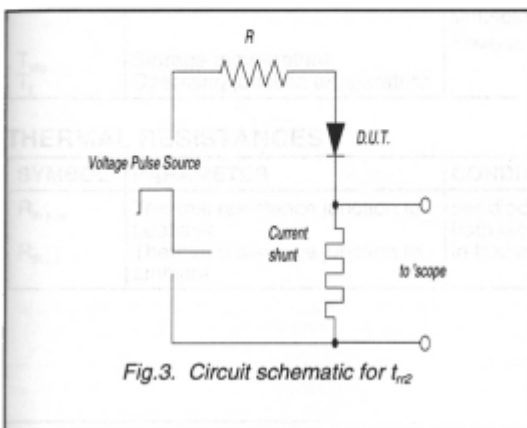
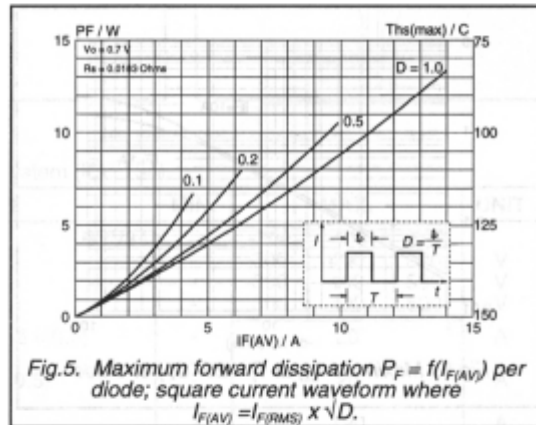
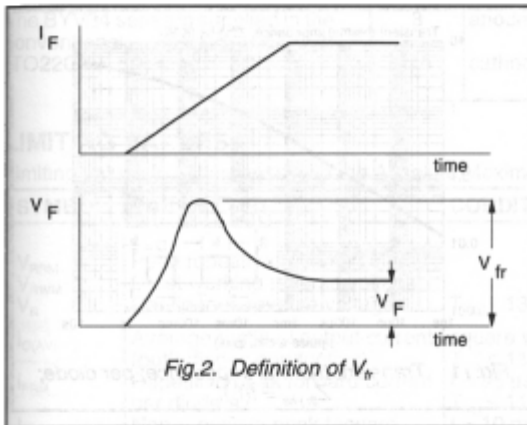
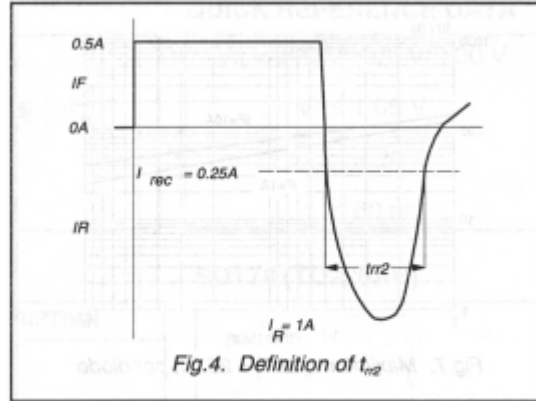
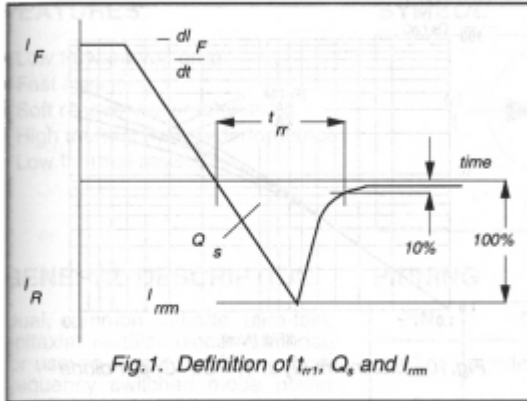
#### ELECTRICAL CHARACTERISTICS

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               | $I_F = 8 \text{ A}$ ; $T_j = 150 \text{ }^\circ\text{C}$  | -    | 0.72 | 0.85 | V             |
|           |                               | $I_F = 20 \text{ A}$  | -    | 1.00 | 1.15 | V             |
| $I_R$     | Reverse current               | $V_R = V_{RWM}$ ; $T_j = 100 \text{ }^\circ\text{C}$  | -    | 0.2  | 0.6  | mA            |
|           |                               | $V_R = V_{RWM}$   | -    | 6    | 30   | $\mu\text{A}$ |
| $Q_s$     | Reverse recovery charge       | $I_F = 2 \text{ A}$ ; $V_R \geq 30 \text{ V}$ ; $-di_F/dt = 20 \text{ A}/\mu\text{s}$   | -    | 8    | 12.5 | 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 $I_R = 1 \text{ A}$ ; $I_{rec} = 0.25 \text{ A}$   | -    | 10   | 20   | ns            |
| $I_{rrm}$ | Peak reverse recovery current | $I_F = 1 \text{ A}$ ; $V_R \geq 30 \text{ V}$ ;<br>$-di_F/dt = 50 \text{ A}/\mu\text{s}$ ; $T_j = 100 \text{ }^\circ\text{C}$ | -    | 1.5  | 2    | A             |
| $V_{tr}$  | Forward recovery voltage      | $I_F = 1 \text{ A}$ ; $di_F/dt = 10 \text{ A}/\mu\text{s}$  | -    | 1    | -    | V             |

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