

**Rectifier diodes
ultrafast**

BYQ28X series

GENERAL DESCRIPTION

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

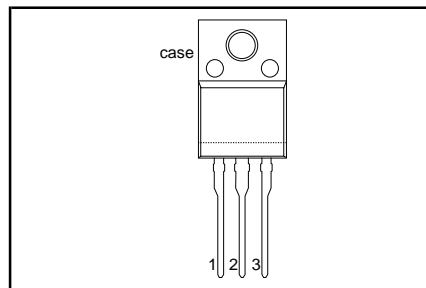
QUICK REFERENCE DATA

| SYMBOL | PARAMETER | MAX. | MAX. | MAX. | UNIT |
|-------------|---|------------|------------|------------|------|
| V_{RRM} | Repetitive peak reverse voltage | 100 | 150 | 200 | V |
| | | 100 | 150 | 200 | |
| V_F | Forward voltage | 0.895 | 0.895 | 0.895 | V |
| $I_{O(AV)}$ | Output current (both diodes conducting) | 10 | 10 | 10 | A |
| t_{rr} | Reverse recovery time | 25 | 25 | 25 | ns |

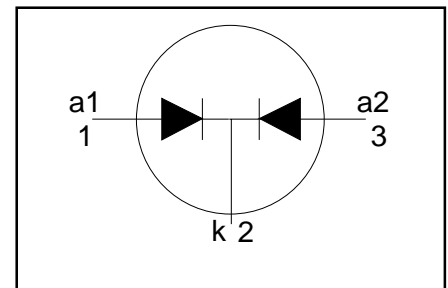
PINNING - SOT186A

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

PIN CONFIGURATION



SYMBOL



LIMITING VALUES

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | | | UNIT |
|--------------|--|--|------|------|------|------|------------------|
| | | | | -100 | -150 | -200 | |
| V_{RRM} | Repetitive peak reverse voltage | | - | 100 | 150 | 200 | V |
| V_{RWM} | Crest working reverse voltage | | - | 100 | 150 | 200 | V |
| V_R | Continuous reverse voltage ¹ | | - | 100 | 150 | 200 | V |
| $I_{O(AV)}$ | Output current (both diodes conducting) ² | square wave | - | 10 | | | A |
| | | $\delta = 0.5; T_{hs} \leq 92^\circ\text{C}$ | - | 9 | | | A |
| $I_{O(RMS)}$ | RMS forward current | sinusoidal | - | 14 | | | A |
| I_{FRM} | Repetitive peak forward current per diode | $a = 1.57; T_{hs} \leq 95^\circ\text{C}$ | - | 10 | | | A |
| I_{FSM} | Non-repetitive peak forward current per diode | $t = 25\ \mu\text{s}; \delta = 0.5;$ | - | 50 | | | A |
| | | $T_{hs} \leq 92^\circ\text{C}$ | - | 55 | | | A |
| I^2t | I^2t for fusing | $t = 10\ \text{ms}$ | - | 12.5 | | | A ² s |
| T_{stg} | Storage temperature | sinusoidal; with reapplied | -40 | 150 | | | °C |
| T_j | Operating junction temperature | $V_{RWM(max)}$ | - | 150 | | | °C |
| | | $t = 10\ \text{ms}$ | | | | | |

1 $T_{hs} \leq 148^\circ\text{C}$ for thermal stability.

2 Neglecting switching and reverse current losses

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ISOLATION LIMITING VALUE & CHARACTERISTIC

$T_{hs} = 25\text{ °C}$ unless otherwise specified

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|------------|--|--|------|------|------|------|
| V_{isol} | R.M.S. isolation voltage from all three terminals to external heatsink | $f = 50\text{-}60\text{ Hz}$; sinusoidal waveform; $R.H. \leq 65\%$; clean and dustfree | - | | 2500 | V |
| C_{isol} | Capacitance from T2 to external heatsink | $f = 1\text{ MHz}$ | - | 10 | - | pF |

THERMAL RESISTANCES

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-----------------------|---|--|------|------|------|------|
| $R_{th\ j\text{-}hs}$ | Thermal resistance junction to heatsink | with heatsink compound | - | - | 5.7 | K/W |
| $R_{th\ j\text{-}a}$ | Thermal resistance junction to ambient | without heatsink compound in free air | - | 55 | 6.7 | K/W |

STATIC CHARACTERISTICS

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|--------|-----------------------------|--|------|------|-------|---------------|
| V_F | Forward voltage (per diode) | $I_F = 5\text{ A}$; $T_j = 150\text{ °C}$ | - | 0.80 | 0.895 | V |
| | | $I_F = 5\text{ A}$ | - | 0.95 | 1.10 | V |
| | | $I_F = 10\text{ A}$ | - | 1.10 | 1.25 | V |
| I_R | Reverse current (per diode) | $V_R = V_{RWM}$; $T_j = 100\text{ °C}$ | - | 0.1 | 0.2 | mA |
| | | $V_R = V_{RWM}$ | - | 2 | 10 | μA |

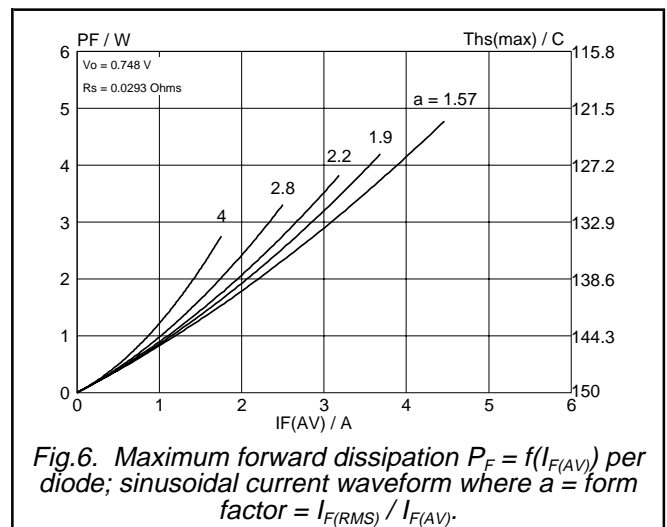
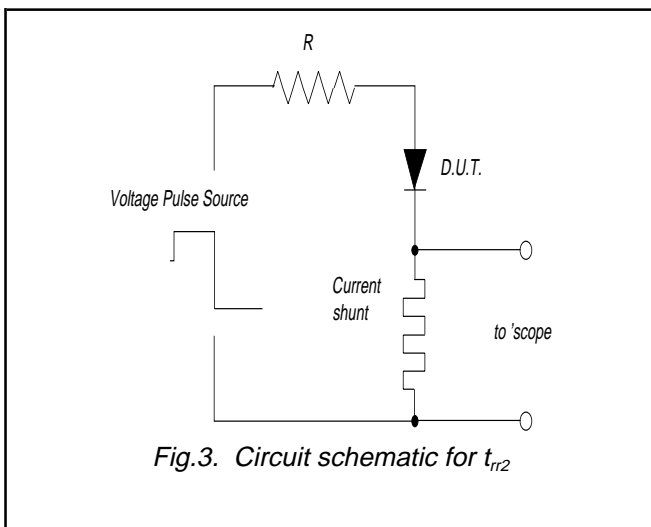
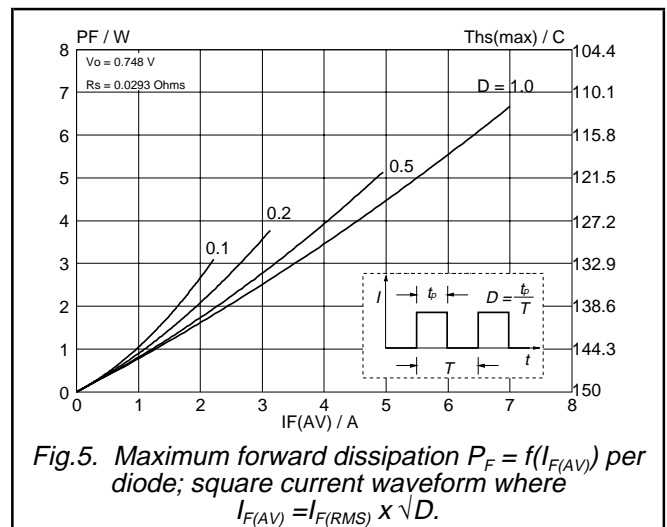
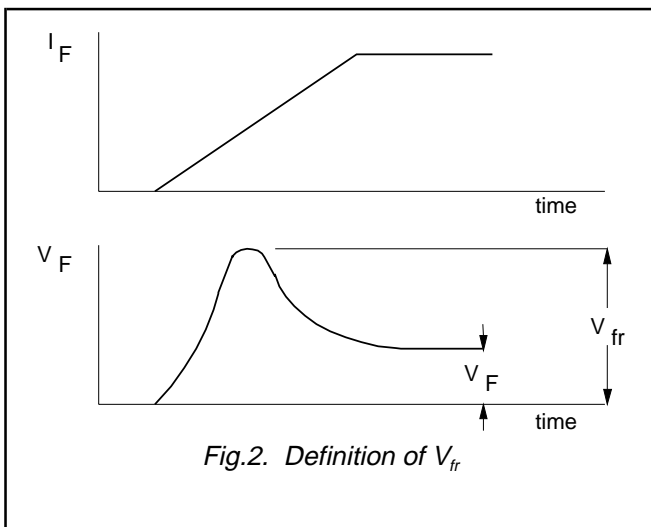
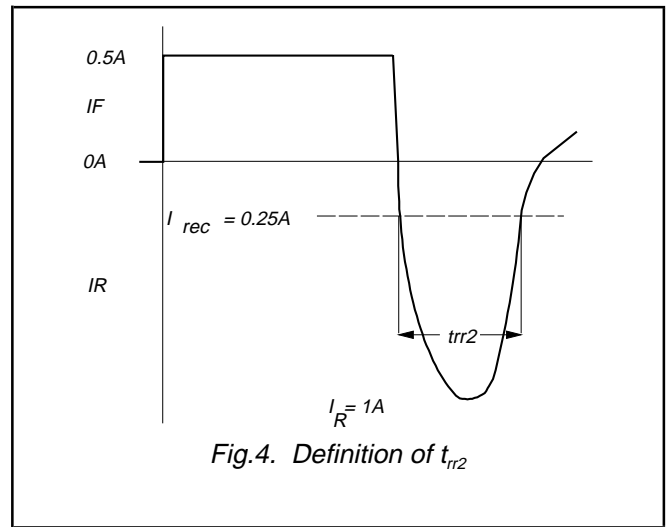
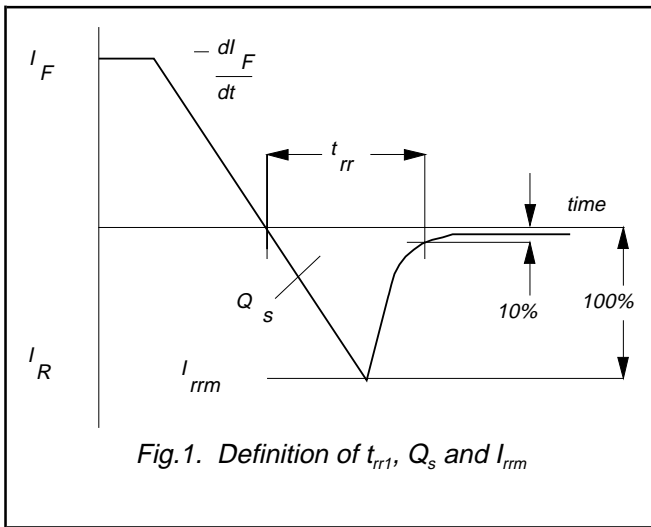
DYNAMIC CHARACTERISTICS

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-----------|--------------------------------------|--|------|------|------|------|
| Q_s | Reverse recovery charge (per diode) | $I_F = 2\text{ A}$; $V_R \geq 30\text{ V}$; $-di_F/dt = 20\text{ A}/\mu\text{s}$ | - | 4 | 9 | nC |
| t_{rr1} | Reverse recovery time (per diode) | $I_F = 1\text{ A}$; $V_R \geq 30\text{ V}$; $-di_F/dt = 100\text{ A}/\mu\text{s}$ | - | 15 | 25 | ns |
| t_{rr2} | Reverse recovery time (per diode) | $I_F = 0.5\text{ A}$ to $I_R = 1\text{ A}$; $I_{rec} = 0.25\text{ A}$ | - | 10 | 20 | ns |
| V_{fr} | Forward recovery voltage (per diode) | $I_F = 1\text{ A}$; $di_F/dt = 10\text{ A}/\mu\text{s}$ | - | 1 | - | V |

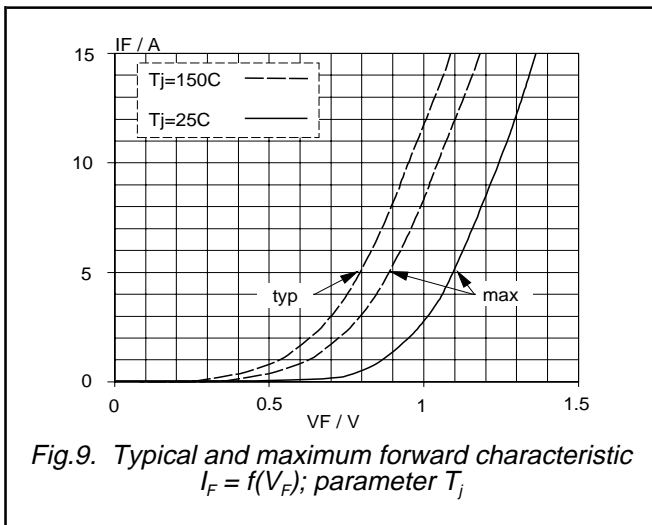
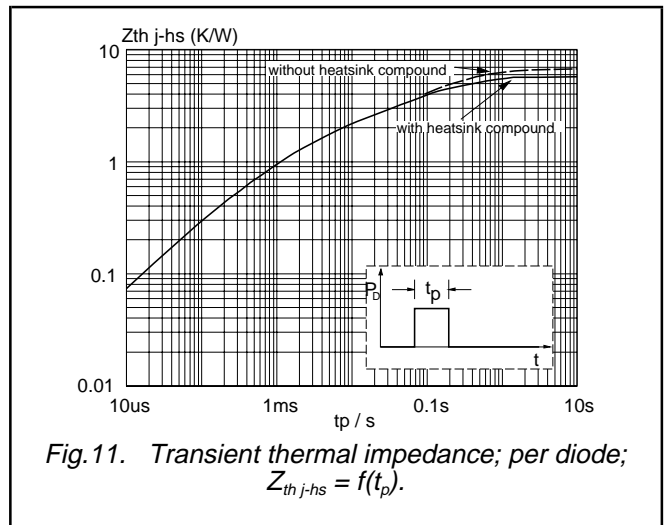
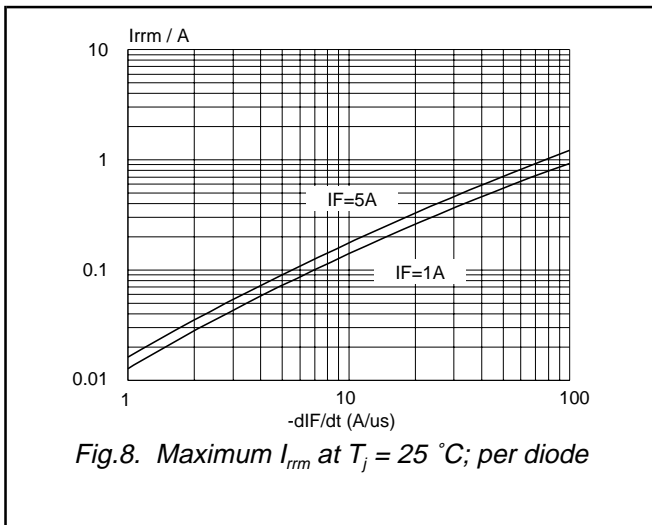
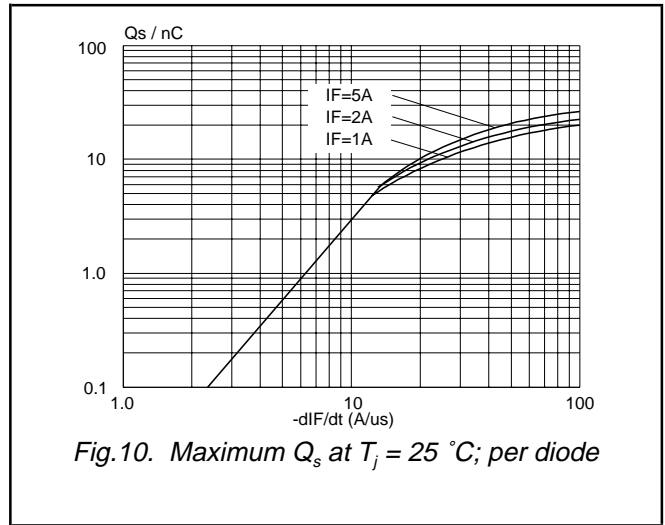
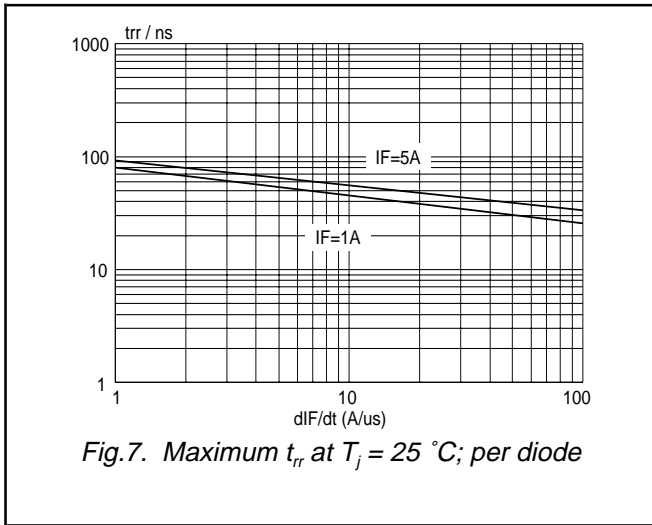
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MECHANICAL DATA

Dimensions in mm

Net Mass: 2 g

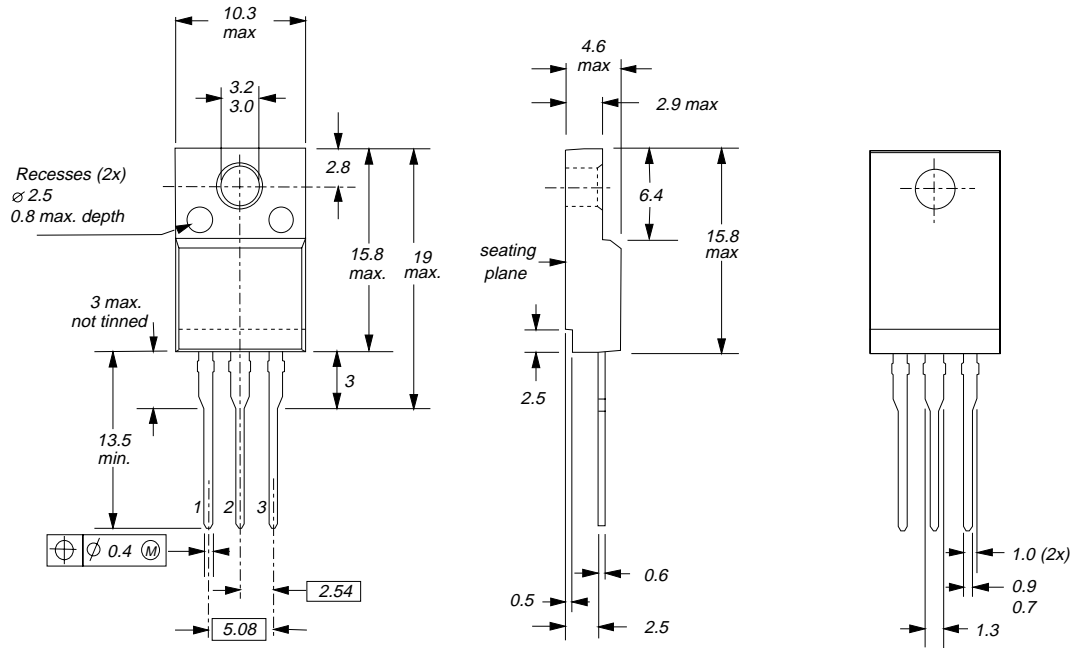


Fig.12. SOT186A; The seating plane is electrically isolated from all terminals.

Notes

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

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DEFINITIONS

| | |
|--|---|
| Data sheet status | |
| Objective specification | This data sheet contains target or goal specifications for product development. |
| Preliminary specification | This data sheet contains preliminary data; supplementary data may be published later. |
| Product specification | This data sheet contains final product specifications. |
| Limiting values | |
| Limiting values are given in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of this specification is not implied. Exposure to limiting values for extended periods may affect device reliability. | |
| Application information | |
| Where application information is given, it is advisory and does not form part of the specification. | |
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