# Rectifier diodes ultrafast

# BYV72F series

## GENERAL DESCRIPTION

Glass passivated, high efficiency, dual, 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.

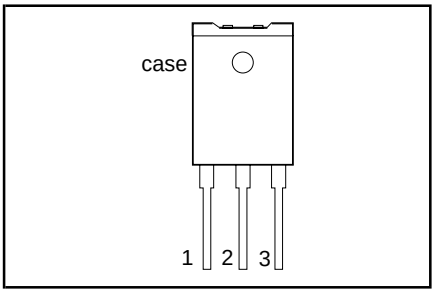
## QUICK REFERENCE DATA

| SYMBOL | PARAMETER | MAX. | MAX. | MAX. | UNIT |
|---|---|---|---|---|---|
| | **BYV72F-** | **100** | **150** | **200** | |
| $V_{RRM}$ | Repetitive peak reverse voltage | 100 | 150 | 200 | V |
| $V_F$ | Forward voltage | 0.90 | 0.90 | 0.90 | V |
| $I_{O(AV)}$ | Output current (both diodes conducting) | 20 | 20 | 20 | A |
| $t_{rr}$ | Reverse recovery time | 28 | 28 | 28 | ns |

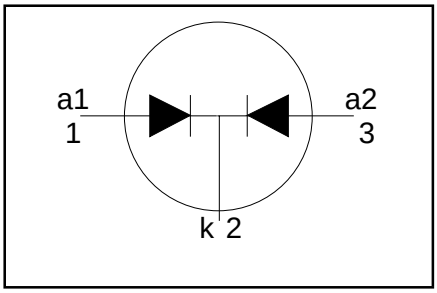
## PINNING - SOT199

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

## 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; $\delta = 0.5$; $T_{hs} \leq 78$ ˚C | - | 20 | | | A |
| | | sinusoidal; a = 1.57; $T_{hs} \leq 78$ ˚C | - | 20 | | | A |
| $I_{O(RMS)}$ | RMS forward current | | - | 20 | | | A |
| $I_{FRM}$ | Repetitive peak forward current per diode | t = 25 µs; $\delta = 0.5$; $T_{hs} \leq 78$ ˚C | - | 30 | | | A |
| $I_{FSM}$ | Non-repetitive peak forward current per diode | t = 10 ms | - | 150 | | | A |
| | | t = 8.3 ms sinusoidal; with reapplied $V_{RWM(max)}$ | - | 160 | | | A |
| $I^2t$ | $I^2t$ for fusing | t = 10 ms | - | 112 | | | $A^2s$ |
| $T_{stg}$ | Storage temperature | | -40 | 150 | | | ˚C |
| $T_j$ | Operating junction temperature | | - | 150 | | | ˚C |

**1** $T_{hs} \leq 125$˚C for thermal stability.

**2** Neglecting switching and reverse current losses.

## ISOLATION LIMITING VALUE & CHARACTERISTIC

$T_{hs}$ = 25 ˚C unless otherwise specified

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| $V_{isol}$ | Repetitive peak voltage from all three terminals to external heatsink | R.H. ≤ 65 % ; clean and dustfree | - | | 2500 | V |
| $C_{isol}$ | Capacitance from T2 to external heatsink | f = 1 MHz | - | 22 | - | pF |

## THERMAL RESISTANCES

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| $R_{th\ j\text{-}hs}$ | Thermal resistance junction to heatsink | both diodes conducting | | | | |
| | | with heatsink compound | - | - | 4.0 | K/W |
| | | without heatsink compound | - | - | 8.0 | K/W |
| | | per diode | | | | |
| | | with heatsink compound | - | - | 5.0 | K/W |
| | | without heatsink compound | - | - | 9.0 | K/W |
| $R_{th\ j\text{-}a}$ | Thermal resistance junction to ambient | in free air | - | 35 | - | K/W |

## STATIC CHARACTERISTICS

$T_j$ = 25 ˚C unless otherwise stated

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| $V_F$ | Forward voltage (per diode) | $I_F$ = 15 A; $T_j$ = 150˚C | - | 0.83 | 0.90 | V |
| | | $I_F$ = 15 A | - | 0.95 | 1.05 | V |
| | | $I_F$ = 30 A | - | 1.00 | 1.20 | V |
| $I_R$ | Reverse current (per diode) | $V_R = V_{RWM}$; $T_j$ = 100 ˚C | - | 0.5 | 1 | mA |
| | | $V_R = V_{RWM}$ | - | 10 | 100 | µA |

## DYNAMIC CHARACTERISTICS

$T_j$ = 25 ˚C unless otherwise stated

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| $Q_s$ | Reverse recovery charge (per diode) | $I_F$ = 2 A; $V_R \geq$ 30 V; $-dI_F/dt$ = 20 A/µs | - | 6 | 15 | nC |
| $t_{rr}$ | Reverse recovery time (per diode) | $I_F$ = 1 A; $V_R \geq$ 30 V; $-dI_F/dt$ = 100 A/µs | - | 20 | 28 | ns |
| $I_{rrm}$ | Peak reverse recovery current (per diode) | $I_F$ = 10 A; $V_R \geq$ 30 V; $-dI_F/dt$ = 50 A/µs; $T_j$ = 100 ˚C | - | 2 | 2.4 | A |
| $V_{fr}$ | Forward recovery voltage (per diode) | $I_F$ = 1 A; $dI_F/dt$ = 10 A/µs | - | 1 | - | V |

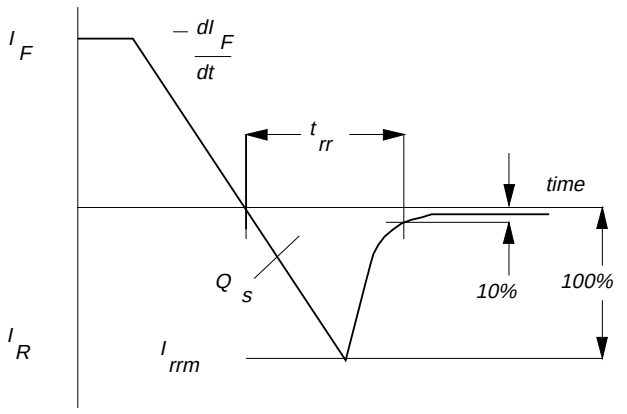



*Fig.1. Definition of $t_{rr}$, $Q_s$ and $I_{rrm}$*

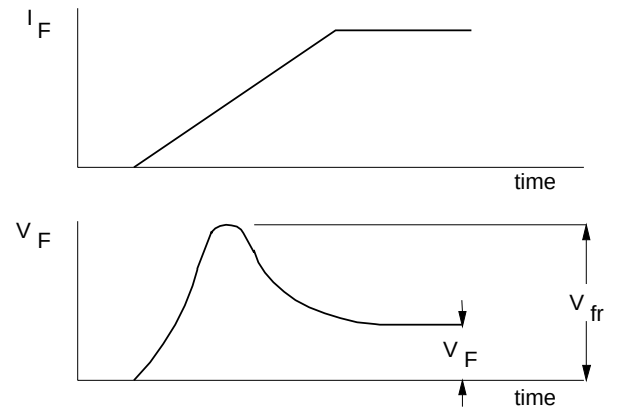



*Fig.2. Definition of $V_{fr}$*

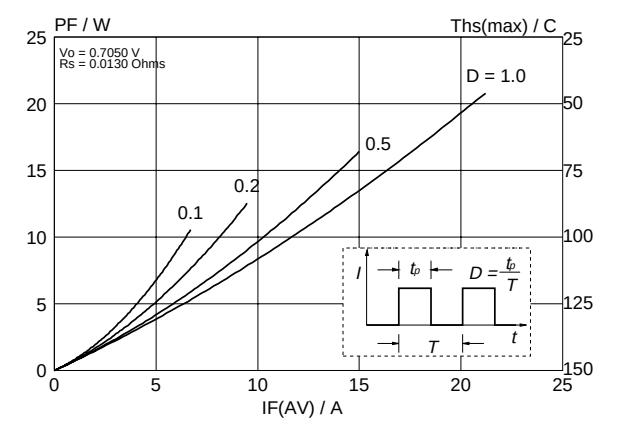



*Fig.3. Maximum forward dissipation $P_F = f(I_{F(AV)})$ per diode; square current waveform where $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$.*

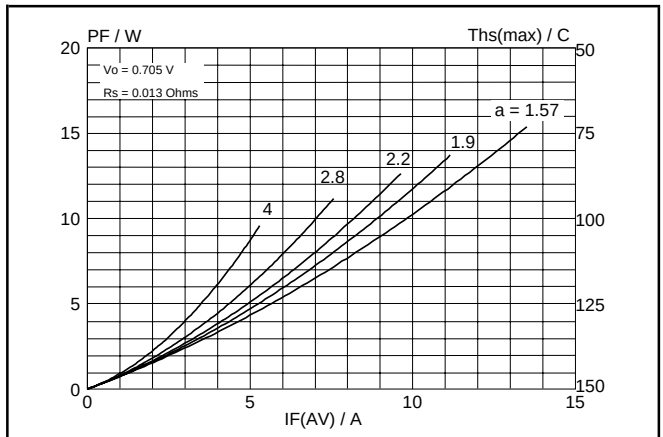



*Fig.4. Maximum forward dissipation $P_F = f(I_{F(AV)})$ per diode; sinusoidal current waveform where a = form factor = $I_{F(RMS)} / I_{F(AV)}$.*

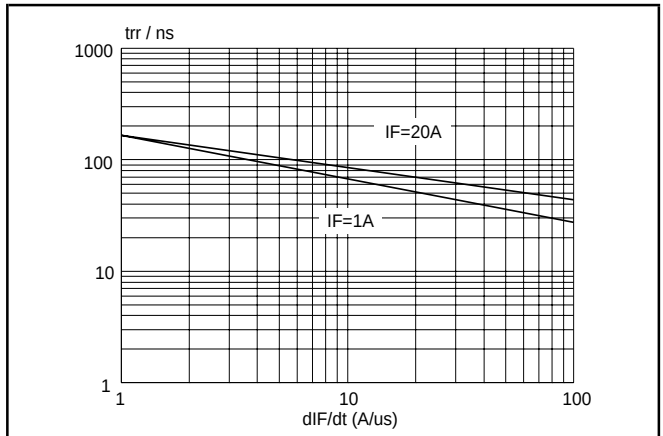



*Fig.5. Maximum $t_{rr}$ at $T_j$ = 25 ˚C; per diode*

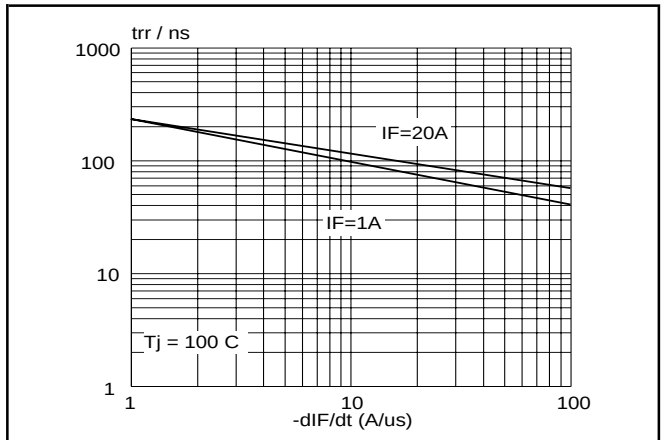



*Fig.6. Maximum $t_{rr}$ at $T_j$ = 100 ˚C; per diode*

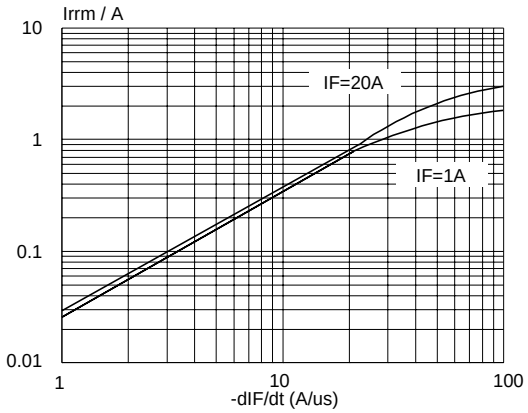



*Fig.7. Maximum $I_{rrm}$ at $T_j$ = 25 ˚C; per diode*

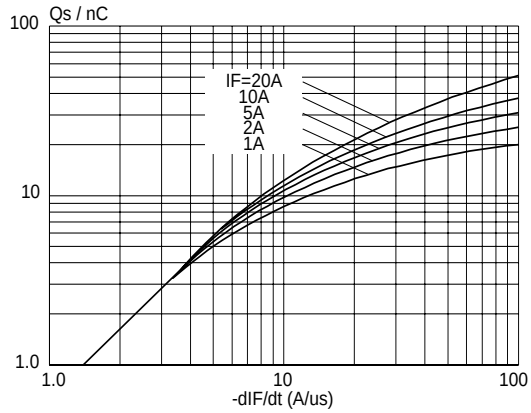



*Fig.10. Maximum $Q_s$ at $T_j$ = 25 ˚C; per diode*

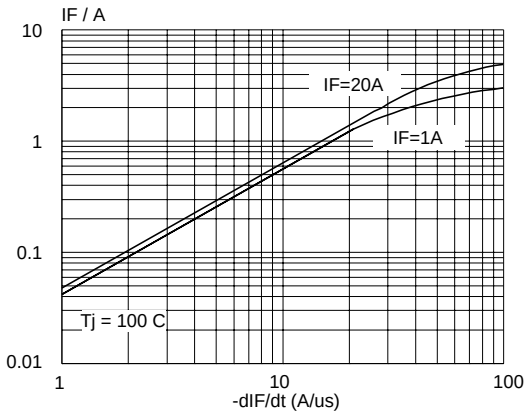



*Fig.8. Maximum $I_{rrm}$ at $T_j$ = 100 ˚C; per diode*

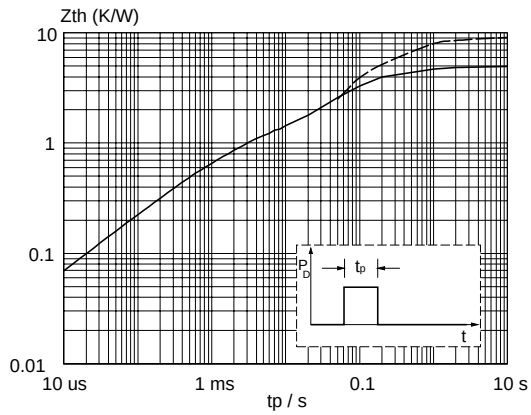



*Fig.11. Transient thermal impedance; per diode; $Z_{th\ j\text{-}hs} = f(t_p)$.*

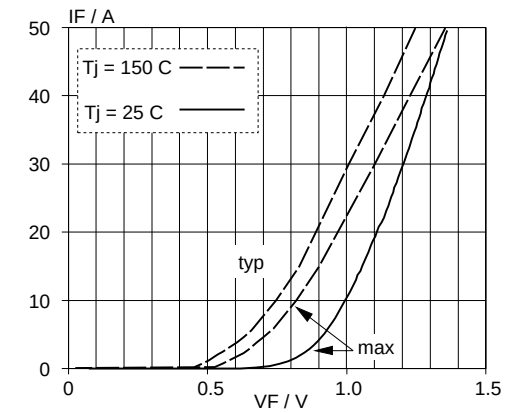



*Fig.9. Typical and maximum forward characteristic $I_F = f(V_F)$; parameter $T_j$*

## MECHANICAL DATA

*Dimensions in mm*

*Net Mass: 5.5 g*

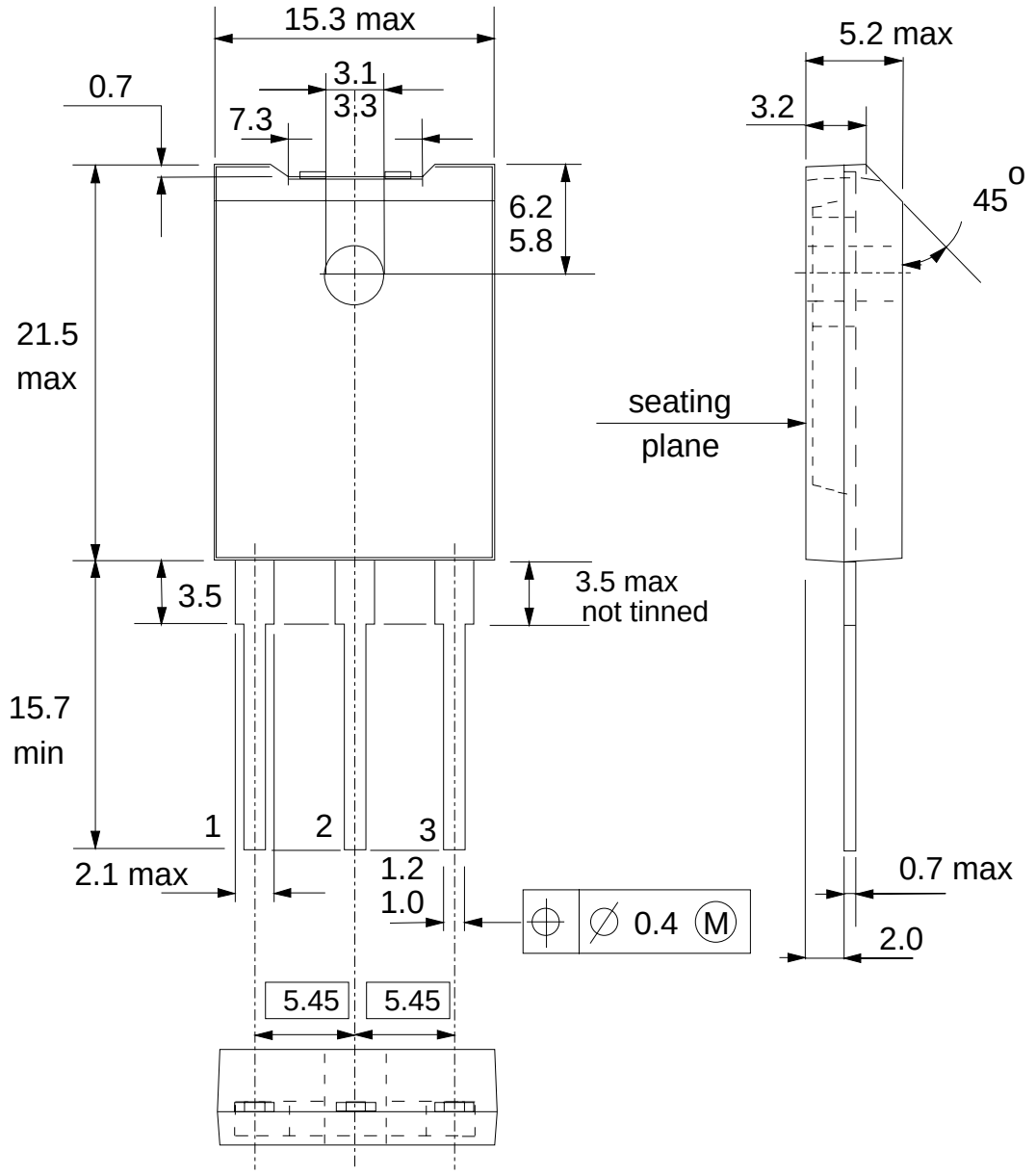



*Fig.12. SOT199; The seating plane is electrically isolated from all terminals.*

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

## 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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