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.

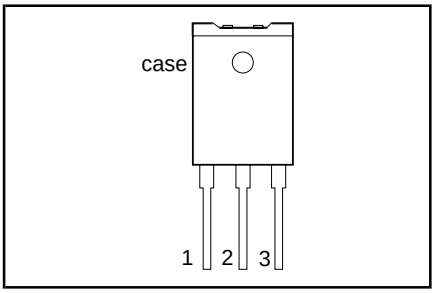
QUICK REFERENCE DATA

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

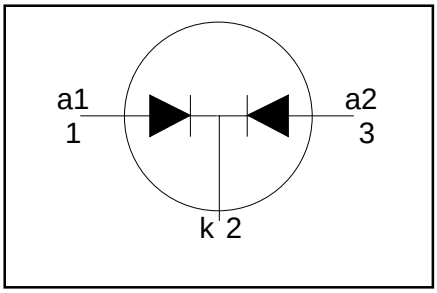
PINNING - SOT199

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

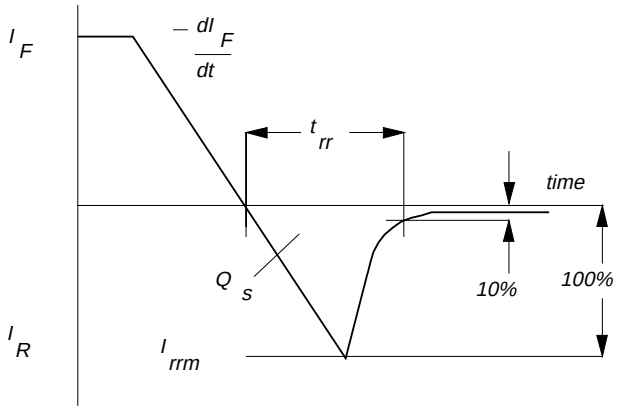


Fig.1. Definition of t_{rr}, Q_s and I_{rrm}

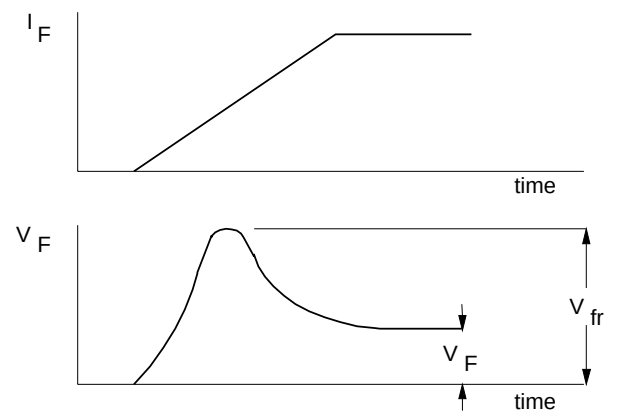


Fig.2. Definition of V_{fr}

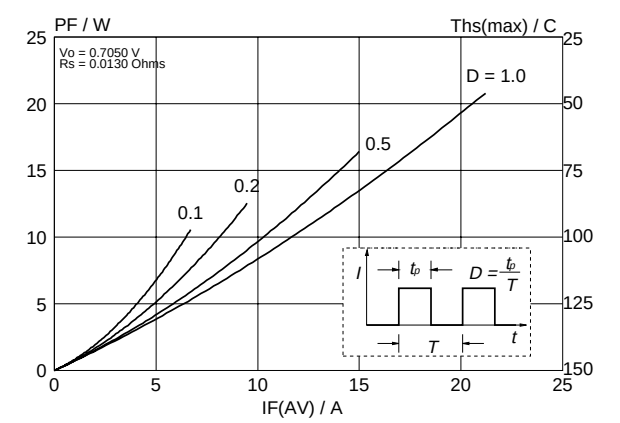


Fig.3. Maximum forward dissipation $P_F = f(I_{F(AV)})$ per diode; square current waveform where $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$.

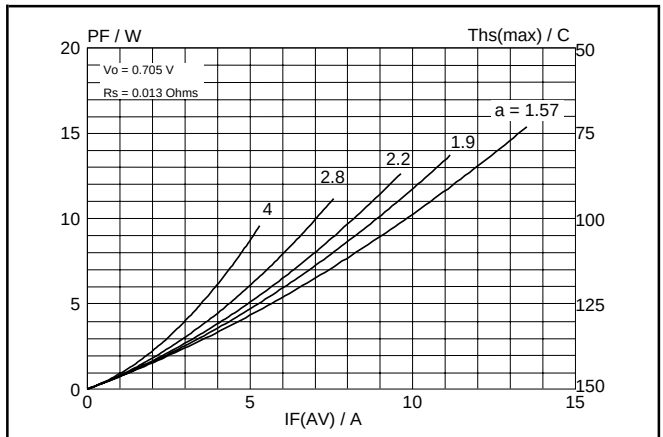


Fig.4. Maximum forward dissipation $P_F = f(I_{F(AV)})$ per diode; sinusoidal current waveform where a = form factor = $I_{F(RMS)} / I_{F(AV)}$.

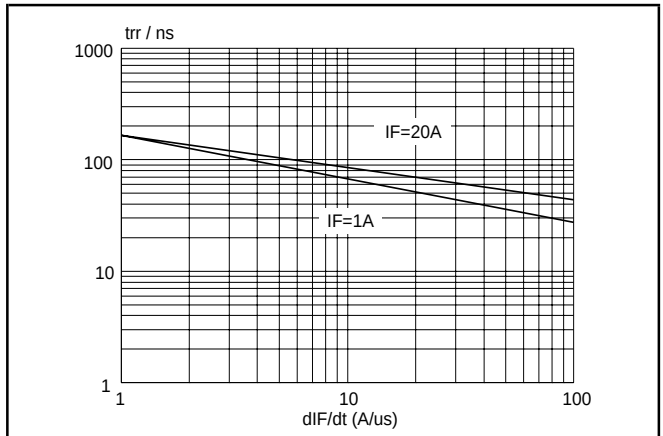


Fig.5. Maximum t_{rr} at T_j = 25 ˚C; per diode

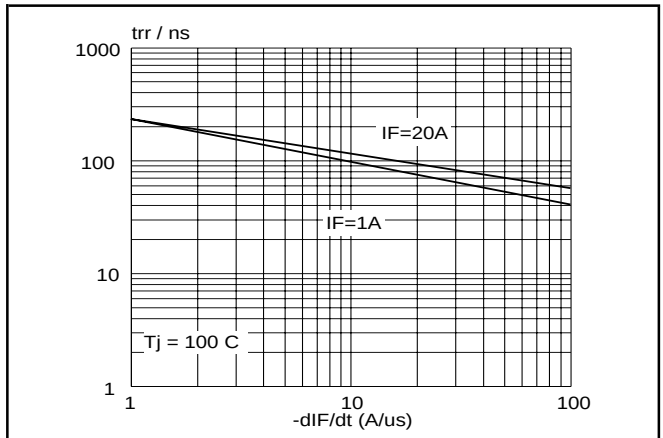


Fig.6. Maximum t_{rr} at T_j = 100 ˚C; per diode

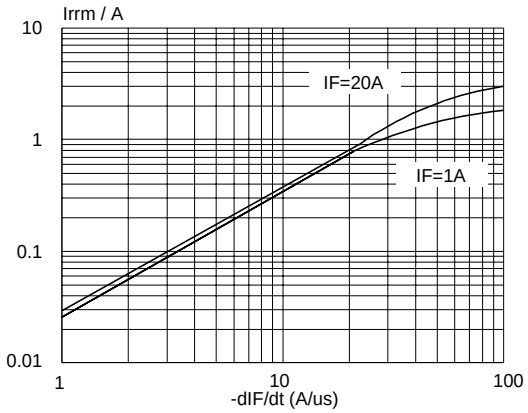


Fig.7. Maximum I_{rrm} at T_j = 25 ˚C; per diode

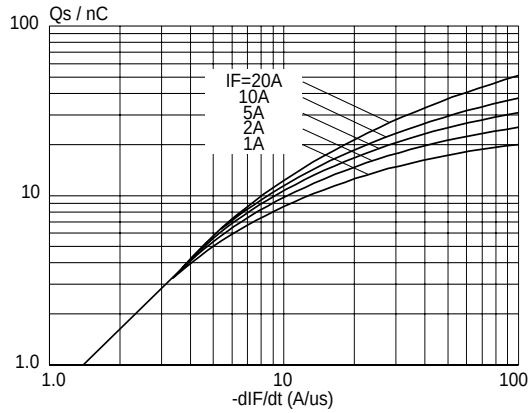


Fig.10. Maximum Q_s at T_j = 25 ˚C; per diode

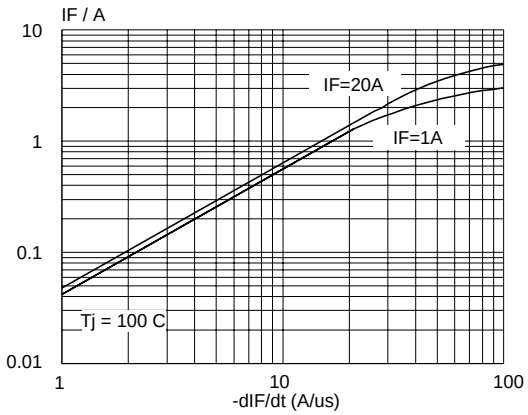


Fig.8. Maximum I_{rrm} at T_j = 100 ˚C; per diode

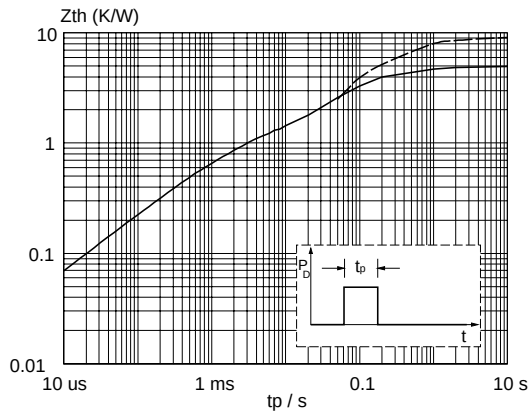


Fig.11. Transient thermal impedance; per diode; $Z_{th\ j\text{-}hs} = f(t_p)$.

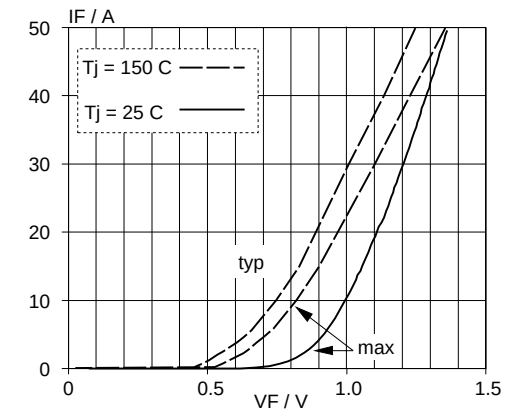


Fig.9. Typical and maximum forward characteristic $I_F = f(V_F)$; parameter T_j

MECHANICAL DATA

Dimensions in mm

Net Mass: 5.5 g

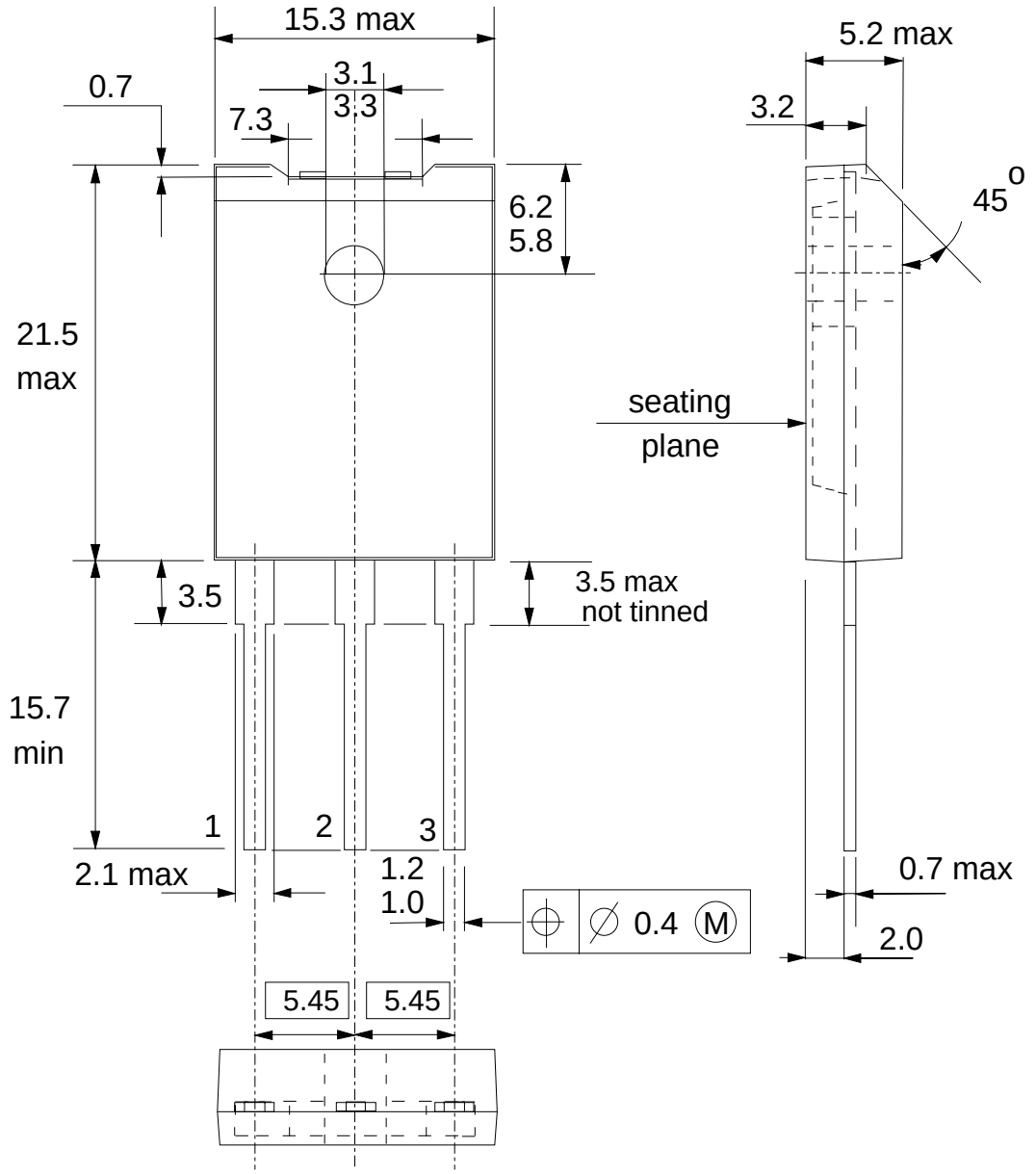


Fig.12. SOT199; The seating plane is electrically isolated from all terminals.

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.	

LIFE SUPPORT APPLICATIONS

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