

**Rectifier diodes  
ultrafast, rugged**

**BYV32EX series**

**GENERAL DESCRIPTION**

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

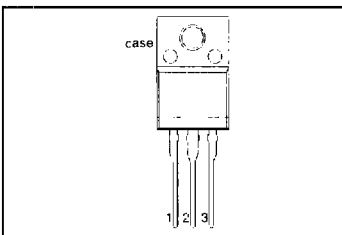
**QUICK REFERENCE DATA**

SYMBOL	PARAMETER	MAX.	MAX.	MAX.	UNIT
$V_{RRM}$	Repetitive peak reverse voltage	<b>100</b>	<b>150</b>	<b>200</b>	V
		100	150	200	
$V_F$	Forward voltage	0.85	0.85	0.85	V
$I_{O(AV)}$	Output current (both diodes conducting)	12	12	12	A
$t_{rr}$	Reverse recovery time	25	25	25	ns
$I_{FRM}$	Repetitive peak reverse current per diode	0.2	0.2	0.2	A

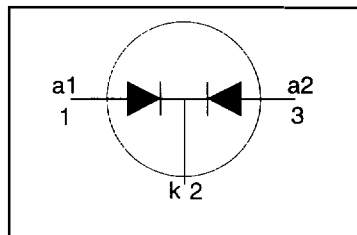
**PINNING - SOT186A**

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		-	100	150	200	V
$I_{O(AV)}$	Output current (both diodes conducting) <sup>1</sup>	square wave	-	12			A
		$\delta = 0.5; T_{hs} \leq 95^\circ\text{C}$ sinusoidal	-	12			A
$I_{O(RMS)}$	RMS forward current		-	20			A
$I_{FRM}$	Repetitive peak forward current per diode	$t = 25 \mu\text{s}; \delta = 0.5;$ $T_{hs} \leq 95^\circ\text{C}$	-	20			A
$I_{FSM}$	Non-repetitive peak forward current per diode	$t = 10 \text{ ms}$	-	125			A
		$t = 8.3 \text{ ms}$ sinusoidal; with reapplied	-	137			A
$I^2t$	$I^2t$ for fusing	$V_{RWM(max)}$ $t = 10 \text{ ms}$	-	78			A <sup>2</sup> s
$I_{RRM}$	Repetitive peak reverse current per diode	$t_p = 2 \mu\text{s}; \delta = 0.001$	-	0.2			A
$I_{RSM}$	Non-repetitive peak reverse current per diode	$t_p = 100 \mu\text{s}$	-	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; $C = 250 \text{ pF}$ ; $R = 1.5 \text{ k}\Omega$	-	8	kV

### ISOLATION LIMITING VALUE & CHARACTERISTIC

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{iscl}$	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 (per diode)	with heatsink compound	-	-	5.0	K/W
$R_{th\ j\text{-}a}$	Thermal resistance junction to ambient	without heatsink compound in free air	-	55	7.0	K/W

### STATIC CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_F$	Forward voltage (per diode)	$I_F = 8 \text{ A}$ ; $T_j = 150 \text{ }^\circ\text{C}$	-	0.72	0.85	V
$I_R$	Reverse current (per diode)	$I_F = 20 \text{ A}$ $V_R = V_{RWM}$ ; $T_j = 100 \text{ }^\circ\text{C}$ $V_R = V_{RWM}$	-	1.00	1.15	V
			-	0.2	0.6	mA
			-	6	30	$\mu\text{A}$

### DYNAMIC CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$Q_s$	Reverse recovery charge (per diode)	$I_F = 2 \text{ A}$ ; $V_R \geq 30 \text{ V}$ ; $-dI_F/dt = 20 \text{ A}/\mu\text{s}$	-	8	12.5	nC
$t_{rr1}$	Reverse recovery time (per diode)	$I_F = 1 \text{ A}$ ; $V_R \geq 30 \text{ V}$ ; $-dI_F/dt = 100 \text{ A}/\mu\text{s}$	-	20	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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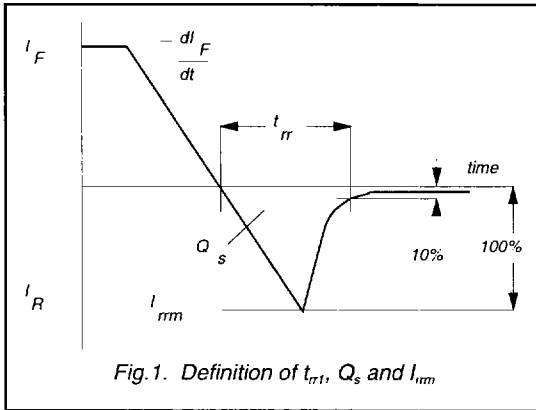


Fig. 1. Definition of  $t_{rr}$ ,  $Q_s$  and  $I_{rm}$

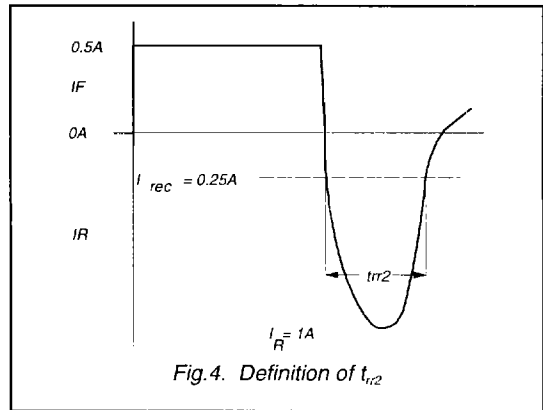


Fig. 4. Definition of  $t_{rr2}$

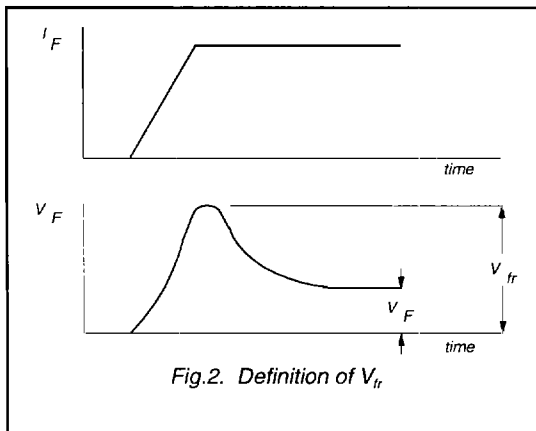


Fig. 2. Definition of  $V_{fr}$

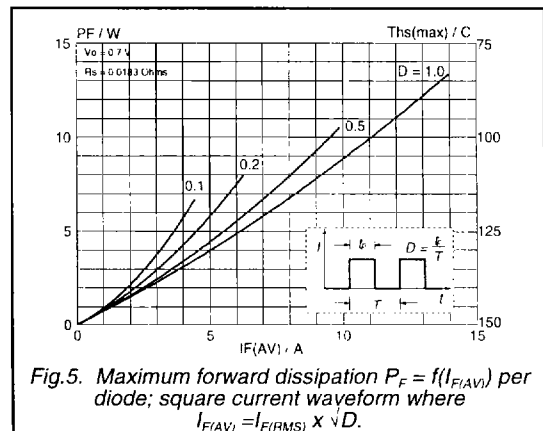


Fig. 5. Maximum forward dissipation  $P_F = f(I_{F(AV)})$  per diode; square current waveform where  $I_{F(AV)} = I_{F(RMS)} \times \sqrt{D}$ .

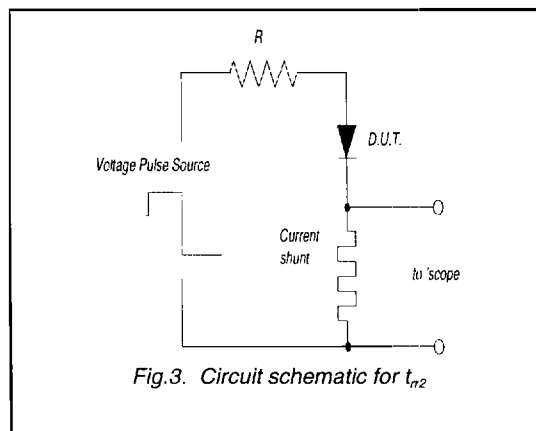


Fig. 3. Circuit schematic for  $t_{rr2}$

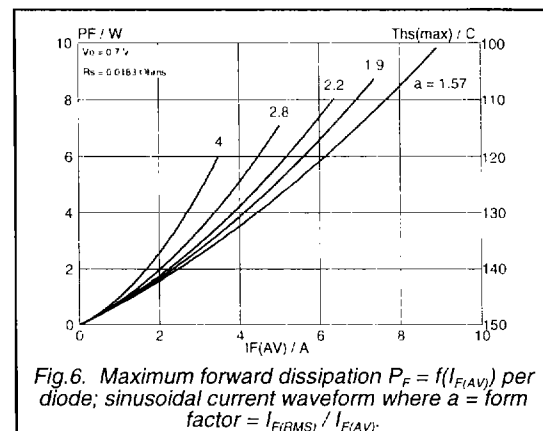


Fig. 6. Maximum forward dissipation  $P_F = f(I_{F(AV)})$  per diode; sinusoidal current waveform where  $a = \text{form factor} = I_{F(RMS)} / I_{F(AV)}$ .

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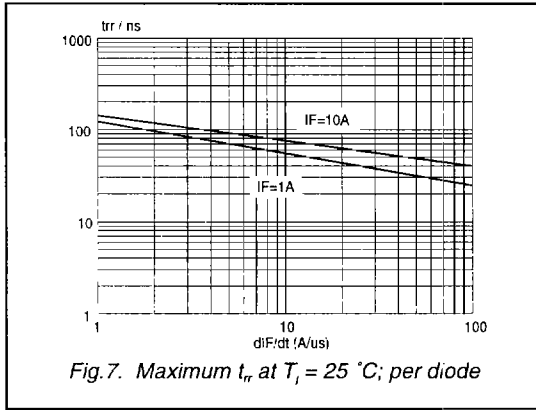


Fig.7. Maximum  $t_r$ , at  $T_j = 25^\circ C$ ; per diode

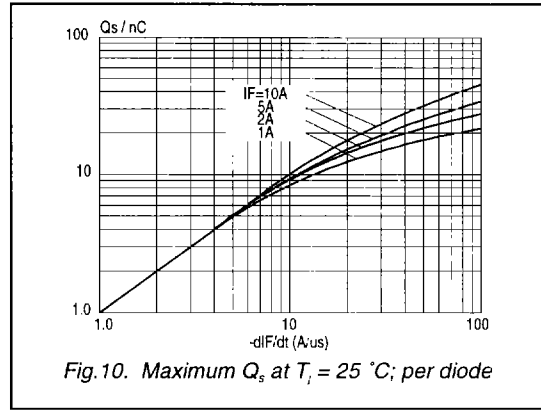


Fig.10. Maximum  $Q_s$ , at  $T_j = 25^\circ C$ ; per diode

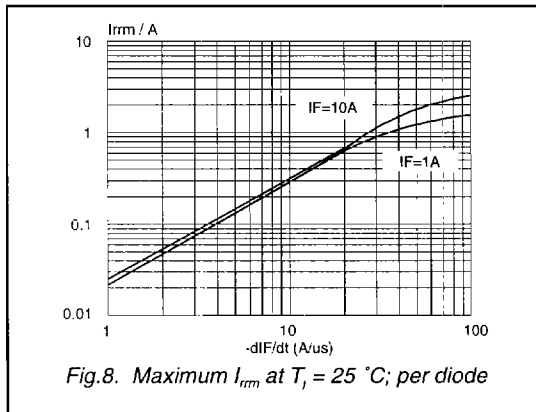


Fig.8. Maximum  $I_{rms}$  at  $T_j = 25^\circ C$ ; per diode

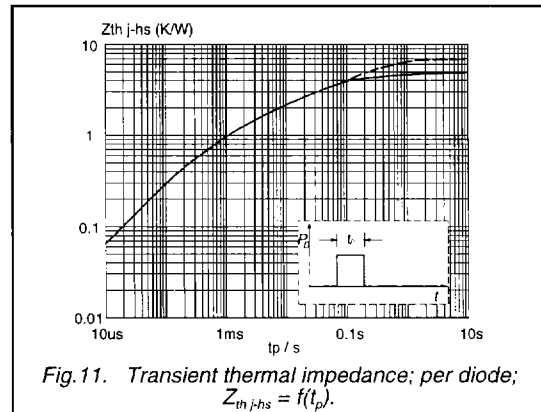


Fig.11. Transient thermal impedance; per diode;  
 $Z_{th j-hs} = f(t_p)$ .

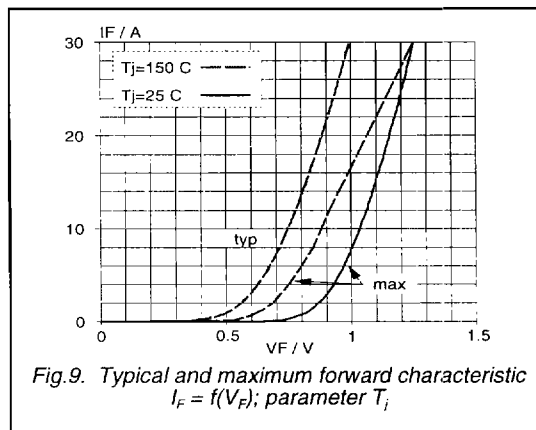


Fig.9. Typical and maximum forward characteristic  
 $I_F = f(V_F)$ ; parameter  $T_j$