EPITAXIAL AVALANCHE DIODES

Glass passivated epitaxial rectifier diodes in hermetically sealed axial-leaded glass envelopes. They feature low forward voltage drop, very fast recovery, very low stored charge, non-snap-off switching characteristics and are capable of absorbing reverse transient energy (e.g. during flashover in a picture tube). These properties make the diodes very suitable for use in switched-mode power supplies and in general high-frequency circuits, where low conduction and switching losses are essential.

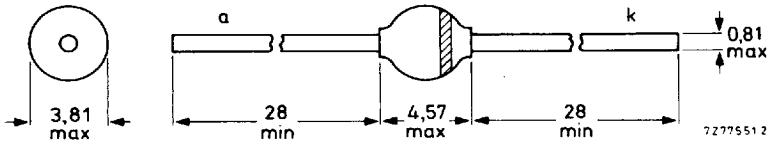
QUICK REFERENCE DATA

		BYV27-	50	100	150	200	
Repetitive peak reverse voltage	V_{RRM}	max.	50	100	150	200	V
Continuous reverse voltage	V_R	max.	50	100	150	200	V
Average forward current	$I_{F(AV)}$	max.		2			A
Non-repetitive peak reverse energy	E_{RSM}	max.		40			mJ
Reverse recovery time	t_{rr}	<		25			ns

MECHANICAL DATA

Dimensions in mm

Fig. 1 SOD-57.



The marking band indicates the cathode.

RATINGS

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

			BYV27-50	100	150	200	
Repetitive peak reverse voltage	V_{RRM}	max.	50	100	150	200	V
Continuous reverse voltage	V_R	max.	50	100	150	200	V
Average forward current (switching losses negligible up to 200 kHz) square wave, $\delta = 0,5$							
$T_{tp} = 85\ ^oC$; lead length = 10 mm	$I_{F(AV)}$	max.			2		A
$T_{amb} = 60\ ^oC$; Fig. 2	$I_{F(AV)}$	max.			1,3		A
Repetitive peak forward current	I_{FRM}	max.			15		A
Non-repetitive peak forward current ($t = 10$ ms; half sine-wave) $T_j = T_{j\,max}$ prior to surge; with reapplied V_{RRM}	I_{FSM}	max.			50		A
Non-repetitive peak reverse avalanche energy with inductive load switched off:							
$I_R = 820$ mA at $T_j = 25\ ^oC$, prior to surge	E_{RSM}	max.			40		mJ
$I_R = 580$ mA at $T_j = T_{j\,max}$, prior to surge	E_{RSM}	max.			20		mJ
Storage temperature	T_{stg}				−65 to +175		°C
Junction temperature	T_j	max.			175		°C

THERMAL RESISTANCE

Influence of mounting method

1. Thermal resistance from junction to tie-point at a lead length of 10 mm	$R_{th\,j\text{-}tp}$	=	46	K/W
2. Thermal resistance from junction to ambient when mounted on a 1,5 mm thick epoxy-glass printed-circuit board; Cu-thickness $\geqslant 40\ \mu m$; Fig. 2 (see "Thermal model")	$R_{th\,j\text{-}a}$	=	100	K/W

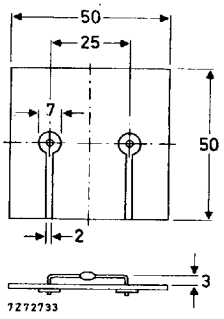


Fig. 2 Mounted on a printed-circuit board.

CHARACTERISTICS

T_j = 25 °C unless otherwise specified

			BYV27-50	100	150	200	
Reverse avalanche breakdown voltage							
I_R = 0,1 mA	$V_{(BR)R}$	>	55	110	165	220	V
Forward voltage*							
I_F = 3 A; $T_j = T_{j\,max}$	V_F	<		0,88			V
I_F = 3 A	V_F	<		1,07			V
Reverse current							
$V_R = V_{RRMmax}$	I_R	<		1			μA
$V_R = V_{RRMmax}$; T_j = 165 °C	I_R	<		150			μA
Reverse recovery time when switched from I_F = 0,5 A to I_R = 1 A; measured at I_R = 0,25 A for definition see Figs 3 and 4	t_{rr}	<		25			ns

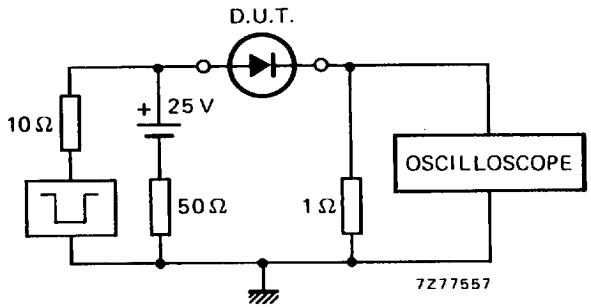


Fig. 3 Test circuit.
Input impedance oscilloscope 1 MΩ; 22 pF. Rise time ≤ 7 ns.
Source impedance 50 Ω. Rise time ≤ 15 ns.

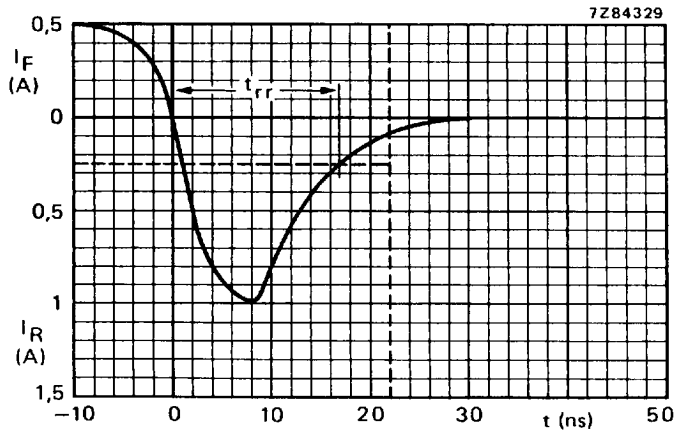


Fig. 4 Reverse recovery time characteristic.

* Measured under pulse conditions to avoid excessive dissipation.

Reverse recovery when switched from
$I_F = 1$ A to $V_R \geqslant 30$ V with
$-dI_F/dt = 20$ A/μs (see Fig. 5)

recovered charge	Q_s	<	15 nC
recovery time	t_{rr}	<	50 ns

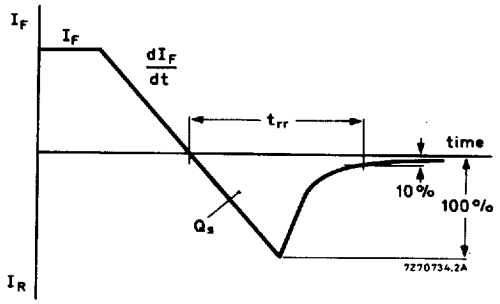


Fig. 5 Definitions of t_{rr} and Q_s.

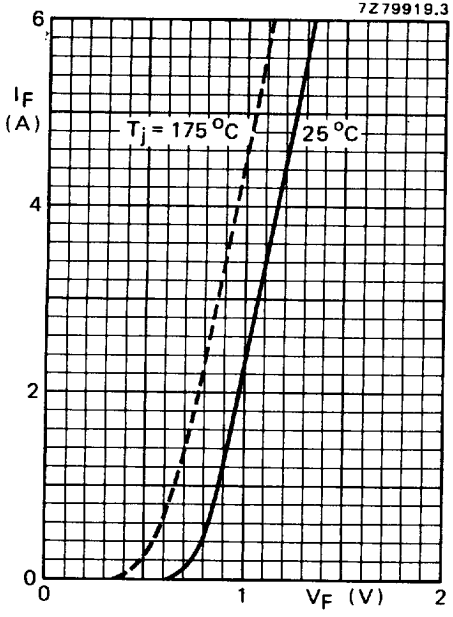


Fig. 6 Maximum forward voltage (V_F) curve.

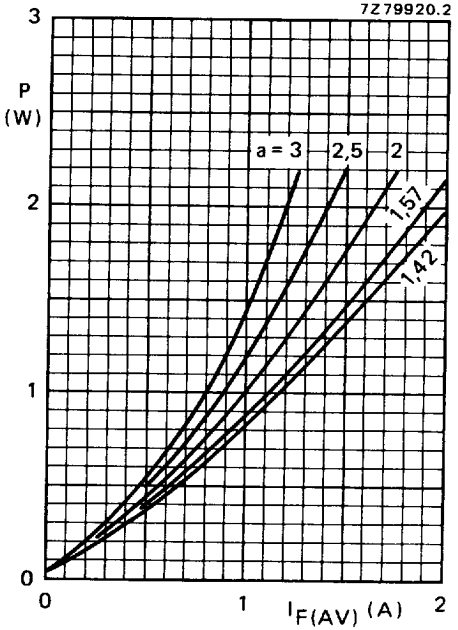


Fig. 7 $a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RRMmax}$.
Pulsed reverse voltage; $\delta = 0{,}5$.
(Including reverse current losses and switching losses up to f = 200 kHz).

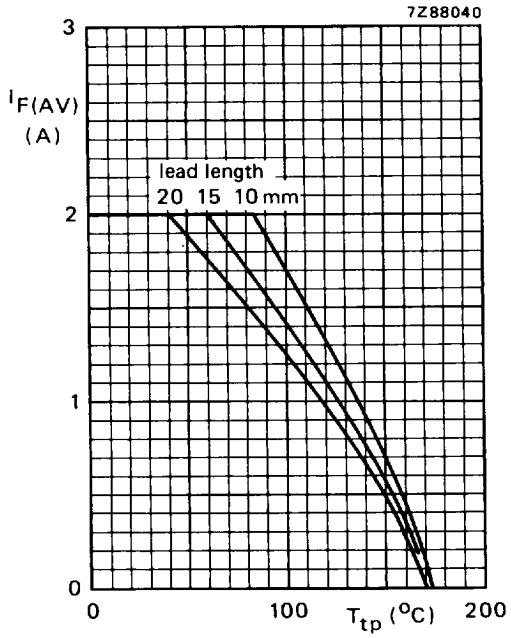


Fig. 8 Maximum average forward current.
The curves include losses due to reverse current and switching up to f = 200 kHz.
Pulsed reverse voltage, δ = 0,5.
$V_R = V_{RRMmax}$.
Square wave current, a = 1,42.

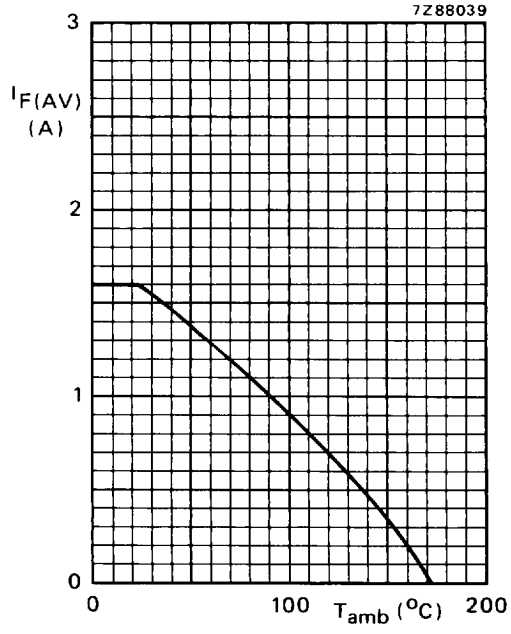


Fig. 9 Maximum average forward current.
The curve includes losses due to reverse current and switching up to f = 200 kHz.
Mounting method see Fig. 2.
Pulsed reverse voltage, δ = 0,5
$V_R = V_{RRMmax}$.
Square wave current, a = 1,42.

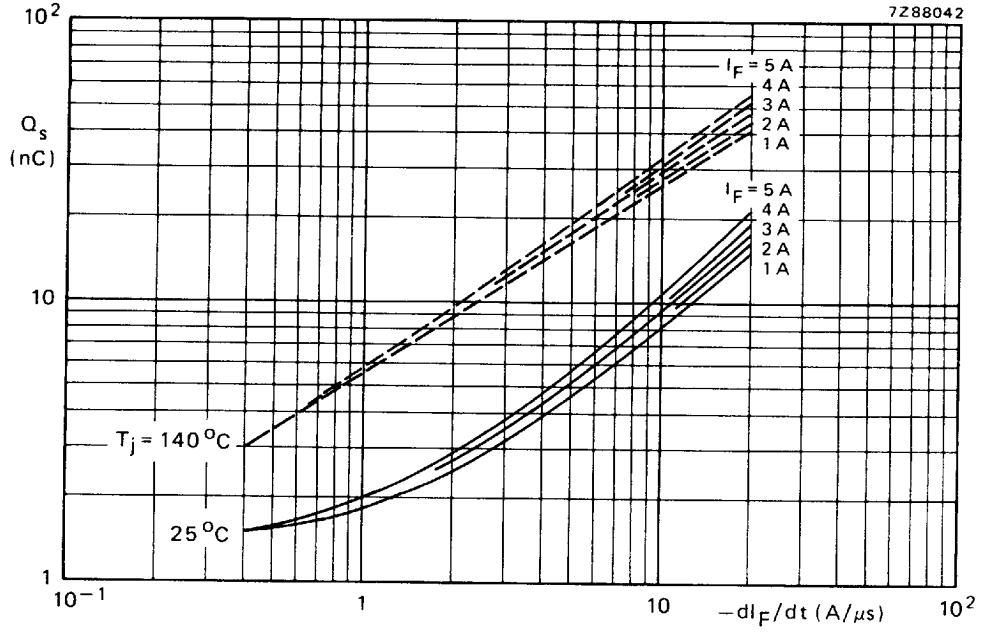


Fig. 10 Maximum values reverse recovery charge. For definition see Fig. 5.

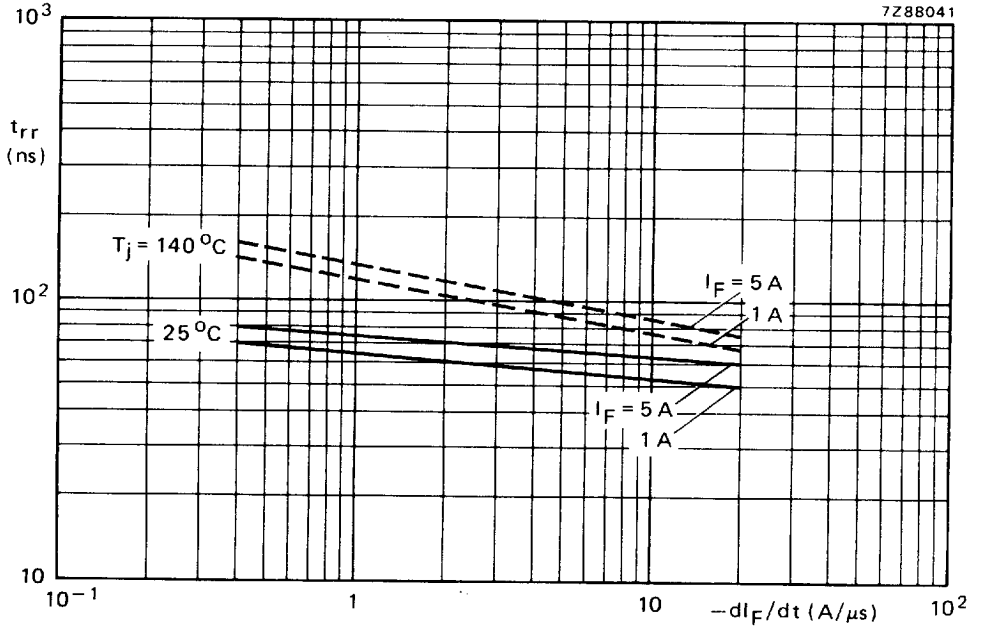


Fig. 11 Maximum values reverse recovery time. For definition see Fig. 5.

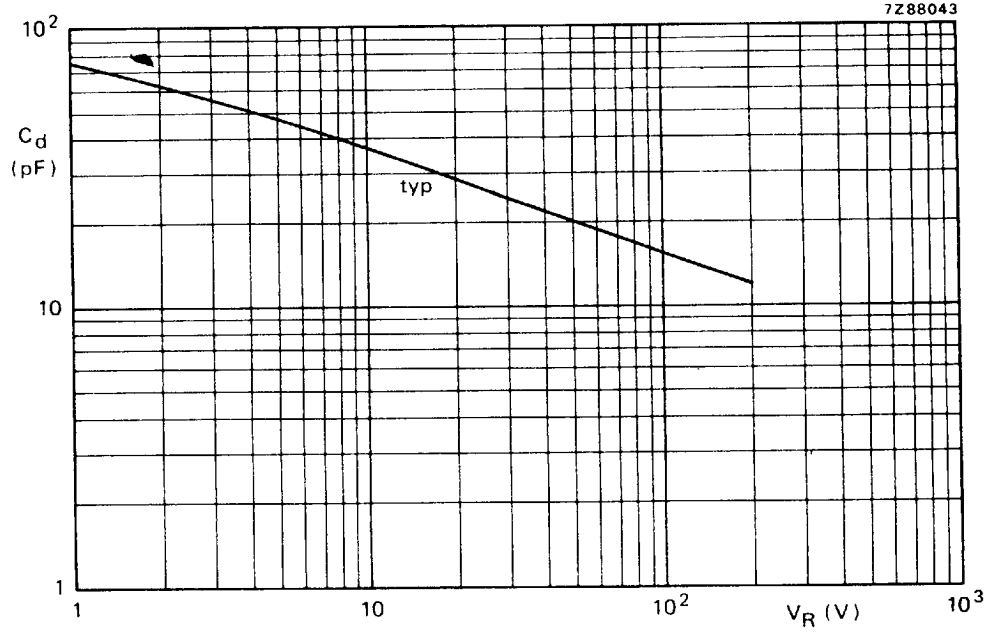


Fig. 12 Typical values diode capacitance at f = 1 MHz; T_j = 25 °C.

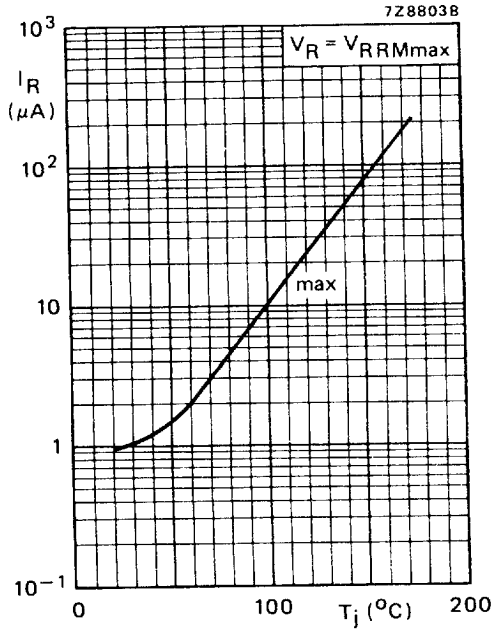


Fig. 13 Maximum values reverse current.