VERY FAST RECOVERY RECTIFIER DIODES

Glass-passivated, high-efficiency rectifier diodes in DO-5 metal envelopes, featuring low forward voltage drop, very fast reverse recovery times, very low stored charge and non-snap-off. They are intended for use in switched-mode power supplies and high-frequency inverter circuits in general, where low conduction and switching losses are essential. The series consists of normal polarity (cathode-to-stud) types.

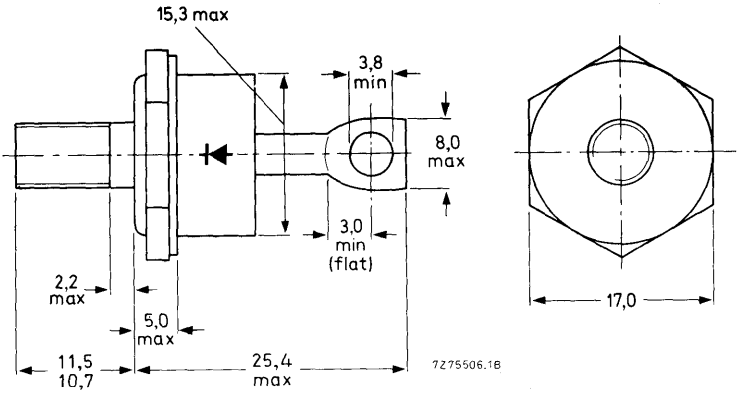
QUICK REFERENCE DATA

			BYW92-50	100	150	
Repetitive peak reverse voltage	V_{RRM}	max.	50	100	150	V
Average forward current	$I_{F(AV)}$	max.		35		A
Forward voltage	V_F	<		0,95		V
Reverse recovery time	t_{rr}	<		50		ns

MECHANICAL DATA

Dimensions in mm

Fig. 1 DO-5: with metric M6 stud (ϕ 6 mm); e.g. BYW92-50.
with ¼ in x 28UNF stud (ϕ 6,35mm); e.g. BYW92-50U.



Net mass: 22 g
Diameter of clearance hole: max. 6,5 mm
Torque on nut: min. 1,7 Nm (17 kg cm)
max. 3,5 Nm (35 kg cm)

Supplied with device: 1 nut, 1 lock washer
Nut dimensions across the flats;
M6: 10 mm
¼ in x 28UNF: 11,1 mm
Supplied on request: accessories 56264A (mica washer, insulating ring, tag)

Products approved to CECC 50 009-003, available on request.

RATINGS

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

Voltages*		BYW92-	50	100	150	
Non-repetitive peak reverse voltage	V_{RSM}	max.	50	100	150	V
Repetitive peak reverse voltage	V_{RRM}	max.	50	100	150	V
Crest working reverse voltage	V_{RWM}	max.	50	100	150	V
Continuous reverse voltage	V_R	max.	50	100	150	V

Currents				
Average forward current; switching losses negligible up to 500 kHz				
sinusoidal; up to T_{mb} = 105 °C	$I_{F(AV)}$	max.	35	A
sinusoidal; at T_{mb} = 125 °C	$I_{F(AV)}$	max.	23	A
square wave; δ = 0,5; up to T_{mb} = 102 °C	$I_{F(AV)}$	max.	40	A
square wave; δ = 0,5; at T_{mb} = 125 °C	$I_{F(AV)}$	max.	23	A
R.M.S. forward current	$I_{F(RMS)}$	max.	55	A
Repetitive peak forward current	I_{FRM}	max.	500	A
Non-repetitive peak forward current; t = 10 ms; half sine-wave; T_j = 150 °C prior to surge; with re-applied V_{RWMmax}	I_{FSM}	max.	500	A
I^2t for fusing (t = 10 ms)	I^2t	max.	1250	A^2s
Temperatures				
Storage temperature	T_{stg}	−55 to +150		°C
Junction temperature	T_j	max.	150	°C

THERMAL RESISTANCE

From junction to mounting base	$R_{th\ j\text{-}mb}$	=	1,0 °C/W
From mounting base to heatsink			
a. with heatsink compound	$R_{th\ mb\text{-}h}$	=	0,3 °C/W
b. without heatsink compound	$R_{th\ mb\text{-}h}$	=	0,5 °C/W
Transient thermal impedance; t = 1 ms	$Z_{th\ j\text{-}mb}$	=	0,2 °C/W

MOUNTING INSTRUCTIONS

The top connector should neither be bent nor twisted; it should be soldered into the circuit so that there is no strain on it.

During soldering the heat conduction to the junction should be kept to a minimum.

* To ensure thermal stability: $R_{th\ j\text{-}a} \leqslant 6$ °C/W (continuous reverse voltage).

CHARACTERISTICS

Forward voltage			
I_F = 35 A; T_j = 100 °C	V_F	<	0,95 V*
I_F = 100 A; T_j = 25 °C	V_F	<	1,3 V*
Reverse current			
$V_R = V_{RWMmax}$; T_j = 100 °C	I_R	<	2,5 mA
Reverse recovery when switched from			
I_F = 1 A to $V_R \geqslant 30$ V with $-dI_F/dt$ = 50 A/μs; T_j = 25 °C			
Recovery time	t_{rr}	<	50 ns
I_F = 2 A to $V_R \geqslant 30$ V with $-dI_F/dt$ = 20 A/μs; T_j = 25 °C			
Recovered charge	Q_s	<	20 nC
Forward recovery when switched to I_F = 10 A with dI_F/dt = 10 A/μs			
Recovery voltage	V_{fr}	typ.	1,0 V

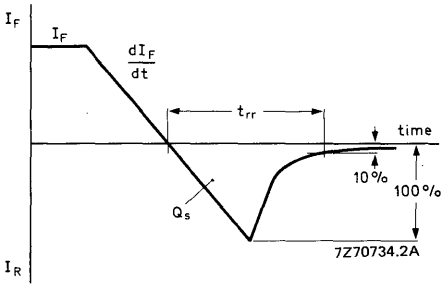


Fig. 2 Definitions of t_{rr} and Q_s.

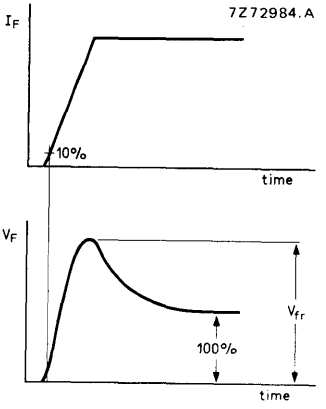


Fig. 3 Definition of V_{fr}.

* Measured under pulse conditions to avoid excessive dissipation.

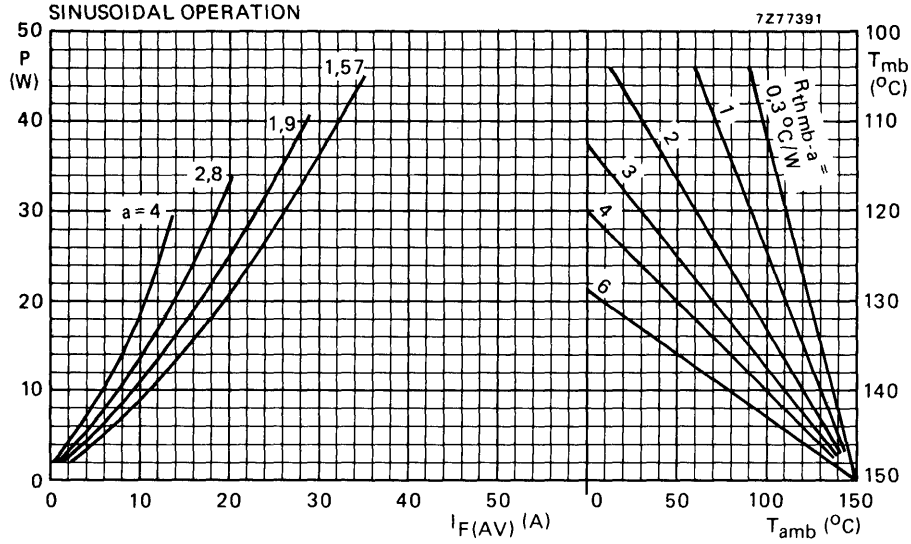


Fig. 4 P = power including reverse current losses and switching losses up to f = 500 kHz.
a = form factor = $I_{F(RMS)}/I_{F(AV)}$.

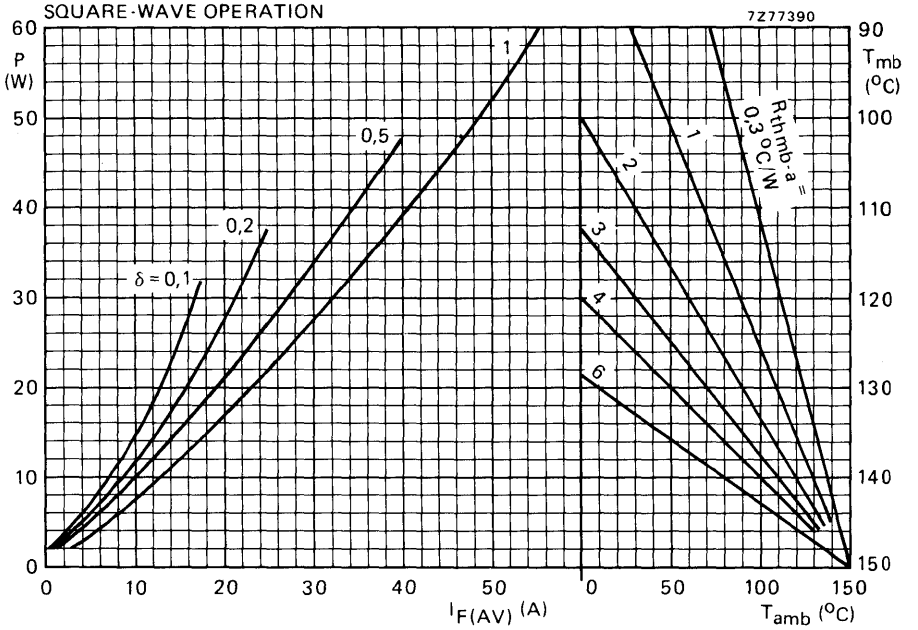
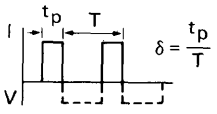


Fig. 5 P = power including reverse current losses and switching losses up to f = 500 kHz.



$$I_{F(AV)} = I_{F(RMS)} \times \sqrt{\delta}$$

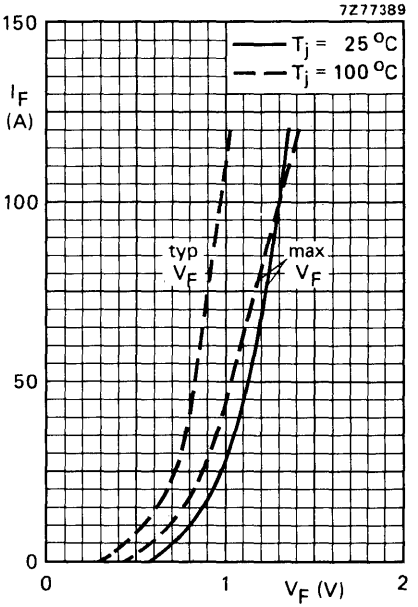


Fig. 6.

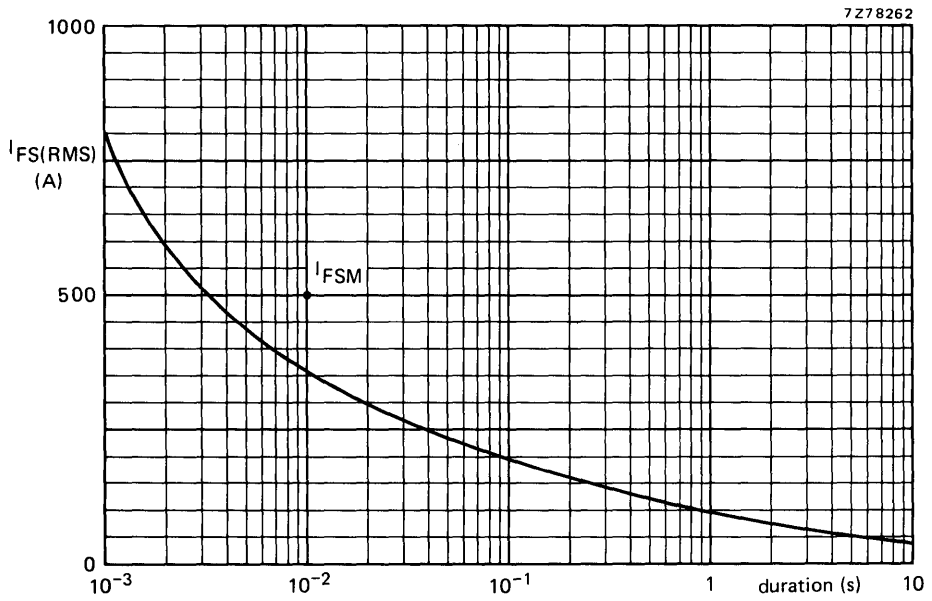
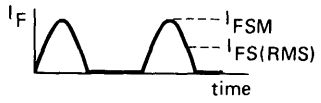


Fig. 7 Maximum permissible non-repetitive r.m.s. forward current based on sinusoidal currents (f = 50 Hz); T_j = 150 °C prior to surge; with reapplied V_{RWMmax}.



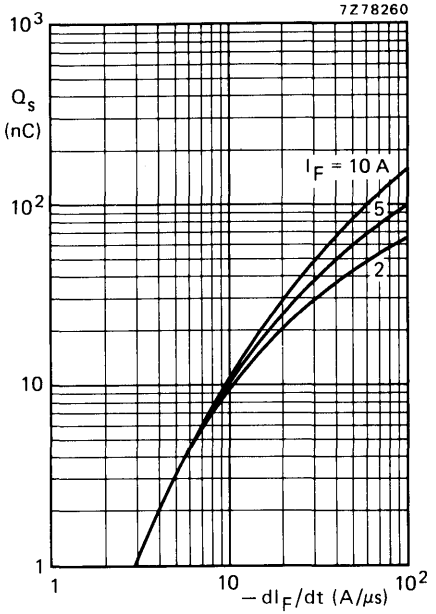


Fig. 8 T_j = 25 °C; maximum values.

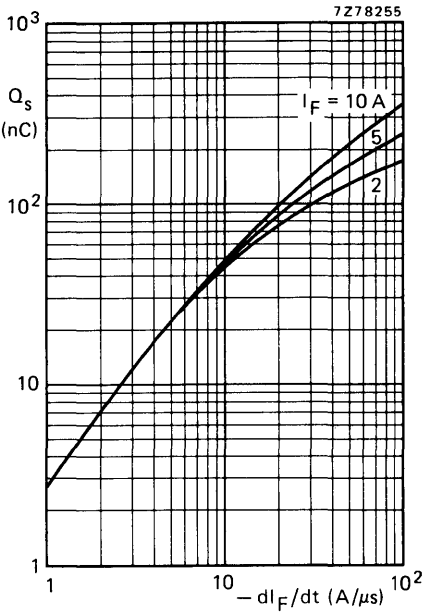
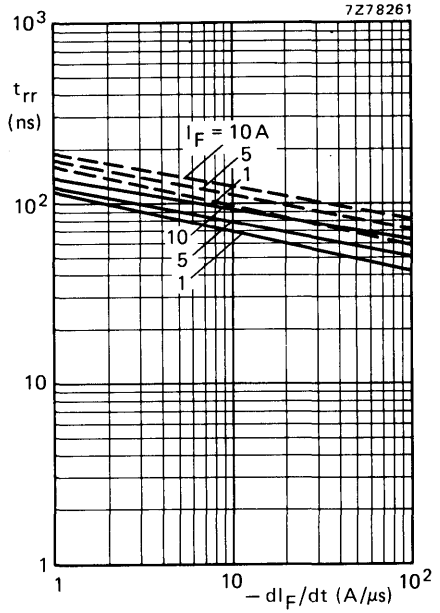
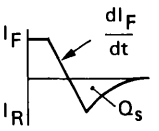


Fig. 9 T_j = 100 °C; maximum values.





Definition of Q_s in Figs 8 and 9.

Fig. 10 Maximum values; —— T_j = 25 °C; ---- T_j = 100 °C.

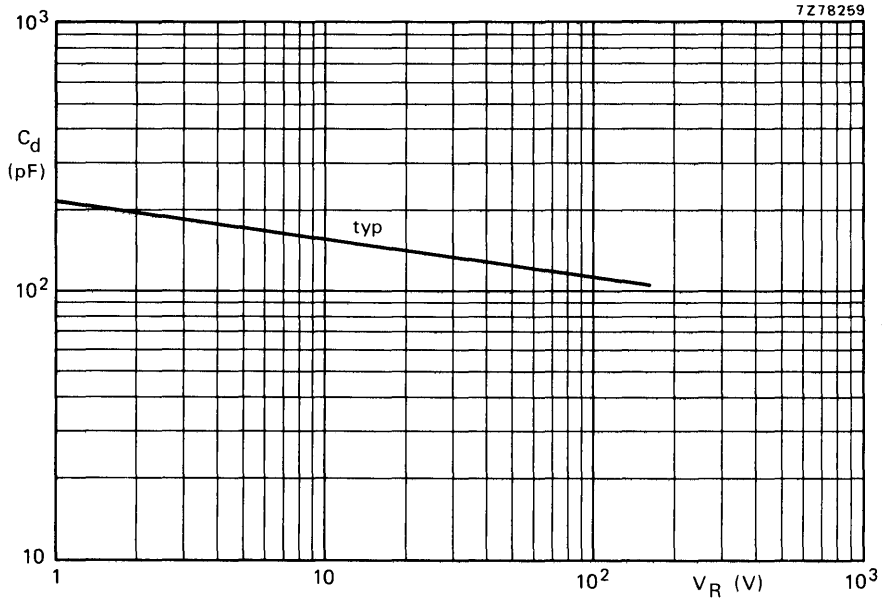


Fig. 11 f = 1 MHz; T_j = 25 °C.

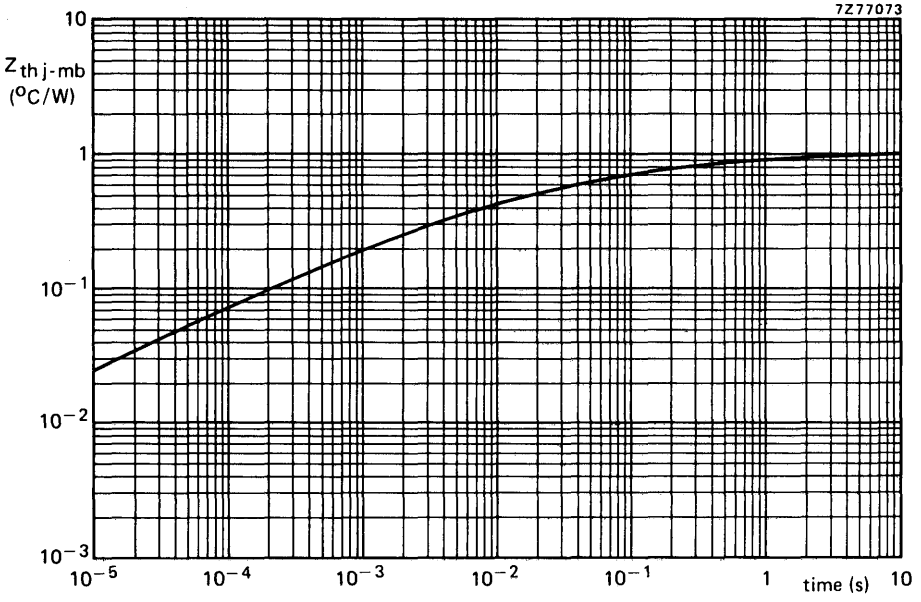


Fig. 12.