VERY FAST SOFT-RECOVERY DIODES

High-efficiency rectifier diodes in DO-5 metal envelopes, featuring low forward voltage drop, high reverse voltage capability, very fast reverse recovery times and non-snap-off characteristics.
They are intended for use in switched-mode power supplies and high-frequency inverter circuits, in general, where high output voltages and low conduction and switching losses are essential.
The series consists of the following types:
Normal polarity (cathode to stud): BYV92–200, BYV92–300 and BYV92–400.
Reverse polarity (anode to stud): BYV92–200R, BYV92–300R and BYV92–400R.

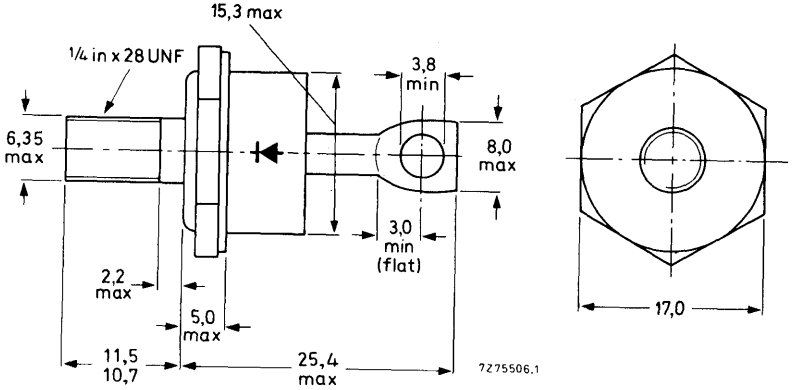
QUICK REFERENCE DATA

			BYV92–200(R)	300(R)	400(R)	
Repetitive peak reverse voltage	V_{RRM}	max.	200	300	400	V
Average forward current	$I_{F(AV)}$	max.		35		A
Forward voltage	V_F	<		1.05		V
Reverse recovery time	t_{rr}	<		100		ns

MECHANICAL DATA

Dimensions in mm

Fig.1 DO-5; Supplied with device: 1 nut, 1 lock-washer
Nut dimensions across the flats: 11.1 mm



Net mass: 22 g
Diameter of clearance hole: max. 6.5 mm
Accessories supplied on request:
56264A (mica washer, insulating ring, tag)

Torque on nut:
min. 1.7 Nm (17 kg cm)
max. 2.5 Nm (25 kg cm)

RATINGS

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

Voltages*

			BYV92–200(R)	300(R)	400(R)	
Non-repetitive peak reverse voltage	V_{RSM}	max.	200	300	400	V
Repetitive peak reverse voltage	V_{RRM}	max.	200	300	400	V
Crest working reverse voltage	V_{RWM}	max.	200	300	400	V
Continuous reverse voltage	V_R	max.	200	300	400	V

Currents

Average forward current assuming zero switching losses;				
sinusoidal; up to T_{mb} = 100 °C	$I_{F(AV)}$	max.	35	A
sinusoidal; at T_{mb} = 125 °C	$I_{F(AV)}$	max.	20	A
square wave; δ = 0.5; up to T_{mb} = 95 °C	$I_{F(AV)}$	max.	40	A
square wave; δ = 0.5; at T_{mb} = 125 °C	$I_{F(AV)}$	max.	19	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 temperatures	T_{stg}		−55 to +150	°C
Junction tempeature	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				
with heatsink compound	$R_{th\ mb\text{-}h}$	=	0.3	°C/W
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) up to T_{amb} = 110 °C

CHARACTERISTICS

Forward voltage				
I_F = 100 A; T_j = 25 °C	V_F	<	1.4	V*
I_F = 35 A; T_j = 100 °C	V_F	<	1.05	V*
Reverse current				
$V_R = V_{RWMmax}$; T_j = 100 °C	I_R	<	1.5	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}	<	100	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	<	100	nC
Maximum slope of the reverse recovery current when switched from I_F = 1 A to $V_R \geqslant$ 30 V; with $-dI_F/dt$ = 2 A/μs; T_j = 25 °C	$\lvert dI_R/dt \rvert$	<	5	A/μs

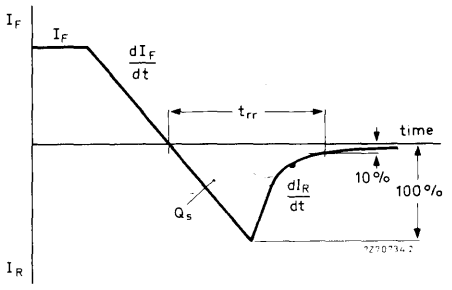


Fig. 2 Definitions of t_{rr} and Q_s.

*Measured under pulse conditions to avoid excessive dissipation.

SQUARE-WAVE OPERATION

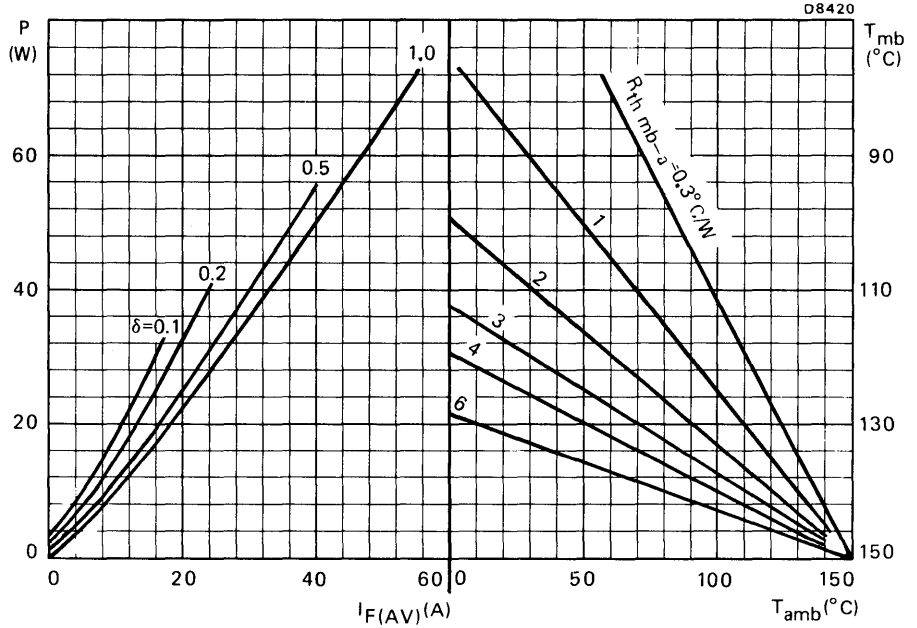
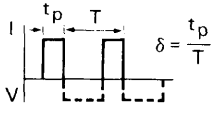


Fig.3 The right-hand part shows the interrelationship between the power (derived from the left-hand part) and the maximum permissible temperatures.
P = power including reverse current losses but excluding switching losses.



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

SINUSOIDAL OPERATION

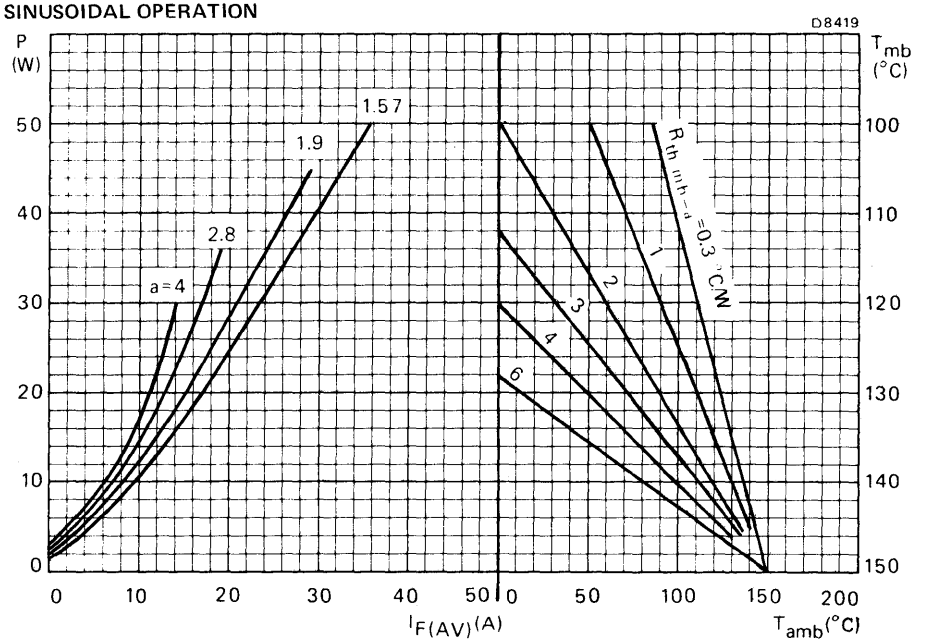


Fig.4 The right-hand part shows the interrelationship between the power (derived from the left-hand part) and the maximum permissible temperatures.
P = power including reverse current losses but excluding switching losses.
a = form factor = $I_{F(RMS)}/I_{F(AV)}$.

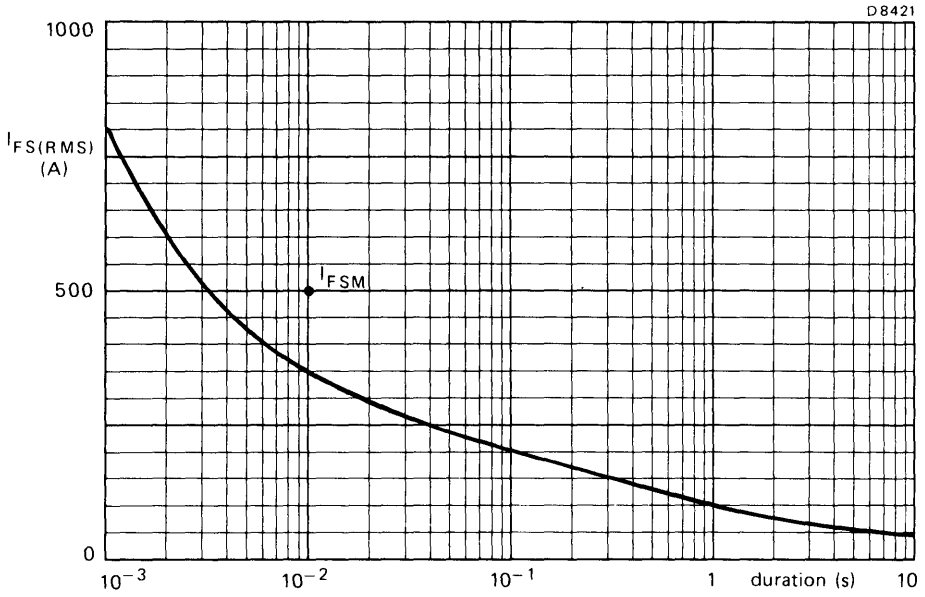
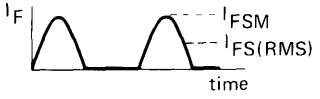


Fig.5 Maximum permissible non-repetitive r.m.s. forward current based on sinusoidal currents (f = 50 Hz); T_j = 150 °C prior to surge; with reapplied V_{RWMmax}.



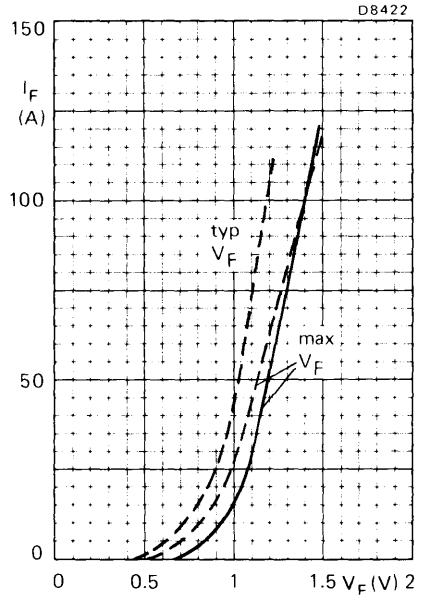


Fig. 6 —— T_j = 25 °C; – – – T_j = 100 °C

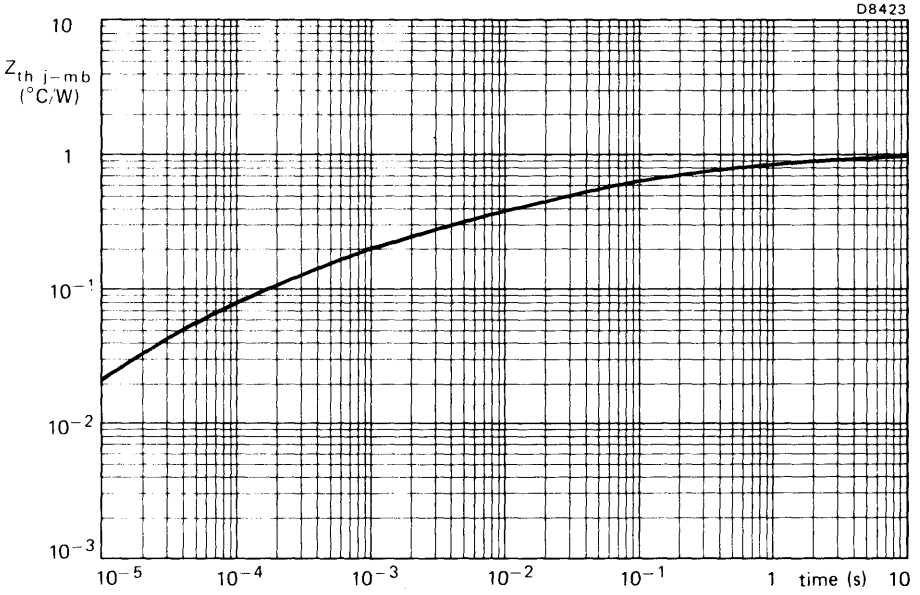


Fig. 7