SCHOTTKY-BARRIER RECTIFIER DIODES

High-efficiency rectifier diodes in DO–4 metal envelopes, featuring low forward voltage drop, low capacitance, absence of stored charge and high temperature stability. They are intended for use in low output voltage switched-mode power supplies and high-frequency circuits in general, where low conduction and switching losses are important.
The series consists of normal polarity (cathode to stud) types: BYV21–30, BYV21–35, BYV21–40 and BYV21–45.

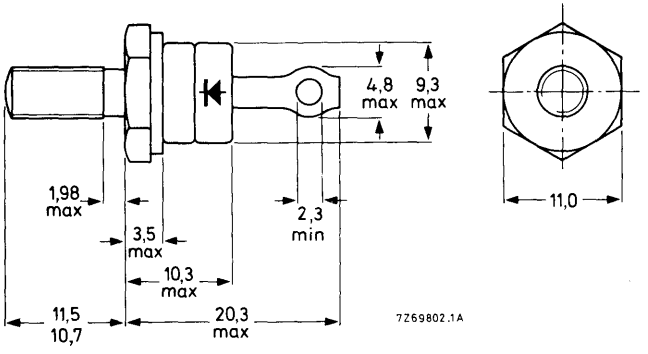
QUICK REFERENCE DATA

			BYV21–	30	35	40	45	
Repetitive peak reverse voltage	V_{RRM}	max.		30	35	40	45	V
Average forward current	$I_{F(AV)}$	max.			28			A
Forward voltage	V_F	<			0.55			V

MECHANICAL DATA

Dimensions in mm

Fig.1 DO–4 with 10–32 UNF stud (ϕ4.83 mm) as standard.
Metric M5 stud (ϕ5 mm) is available on request.



Net mass: 7 g

Diameter of clearance hole: 5.2 mm

Accessories supplied on request: 56295
(PTFE bush, 2 mica washers, plain washer, tag).

Supplied with device: 1 nut, 1 lock washer.

Nut dimensions across the flats: M5, 8.0 mm
10–32 UNF, 9.5 mm

Torque on nut:
min. 0.9 (9 kg cm),
max. 1.7 (17 kg cm).

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC134).

Voltages			BYV21–30	35	40	45	
Non-repetitive peak reverse voltage	V_{RSM}	max.	36	42	48	54	V
Repetitive peak reverse voltage*	V_{RRM}	max.	30	35	40	45	V
Crest working reverse voltage	V_{RWM}	max.	30	35	40	45	V
Continuous reverse voltage**	V_R	max.	30	35	40	45	V

Currents				
Average forward current; switching losses negligible				
sinusoidal; up to T_{mb} = 100 °C	$I_{F(AV)}$	max.	25	A
square-wave; up to T_{mb} = 100 °C; δ = 0.5	$I_{F(AV)}$	max.	28	A
R.M.S. forward current	$I_{F(RMS)}$	max.	40	A
Non-repetitive peak forward current t = 10 ms; half sine-wave; T_j = 125 °C prior to surge; with reapplied V_{RWMmax}	I_{FSM}	max.	600	A
I^2t for fusing	I^2t	max.	1800	A^2s

Temperatures			
Storage temperature	T_{stg}	−55 to +150	°C
Junction temperature; with full applied continuous reverse voltage V_{Rmax}	T_j	max. 125	°C

THERMAL RESISTANCE

From junction to mounting base	$R_{th\ j\text{-}mb}$	<	1	°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	$Z_{th\ j\text{-}mb}$	=	0.15	°C/W

MOUNTING INSTRUCTIONS

The top connector should be neither 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.

* For t_p = 200 ns a 20% increase in V_{RRM} is allowed.

** To ensure thermal stability: $R_{th\ j\text{-}a} < 2$ °C/W

CHARACTERISTICS

Forward voltage				
I_F = 30 A; T_j = 100 °C	V_F	<	0.55	V*
I_F = 80 A; T_j = 25 °C	V_F	<	0.88	V*
Rate of rise of reverse voltage				
$V_R = V_{RWMmax}$	$\frac{dV_R}{dt}$	<	1500	V/μs
Reverse current				
$V_R = V_{RWMmax}$; T_j = 125 °C	I_R	<	150	mA
Capacitance at f = 1 MHz				
V_R = 5 V; T_j = 25 to 125 °C	C_d	typ.	900	pF

*Measured under pulse conditions to avoid excessive dissipation.

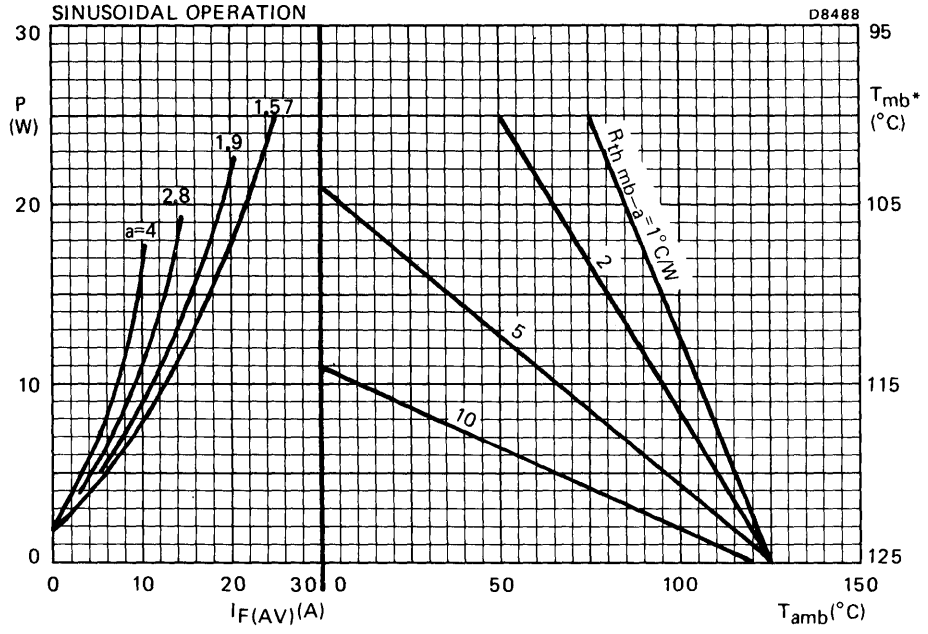


Fig.2 The right-hand part shows the interrelationship between the power (derived from the left-hand part) and the maximum permissible temperatures.
a = form factor = $I_{F(RMS)}/I_{F(AV)}$.

*T_{mb} scale is for comparison purpose and is correct only for $R_{th\ mb-a} < 6.4$ °C/W.

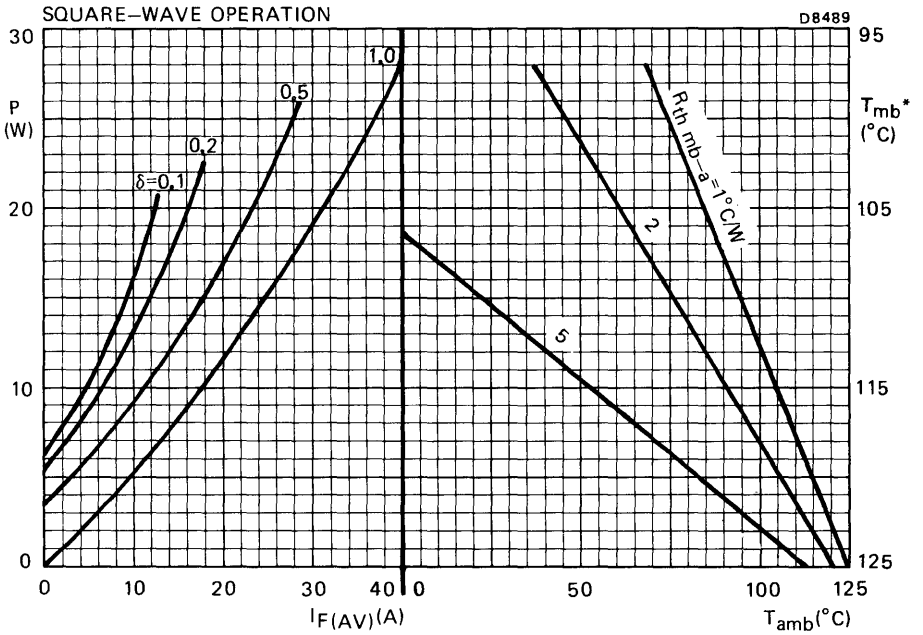
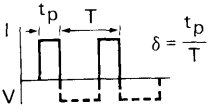


Fig.3 The right-hand part shows the interrelationship between the power (derived from the left-hand part) and the maximum permissible temperatures.



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

*T_{mb} scale is for comparison purpose and is correct only for $R_{th\ mb\text{-}a} < 6.4$ °C/W.

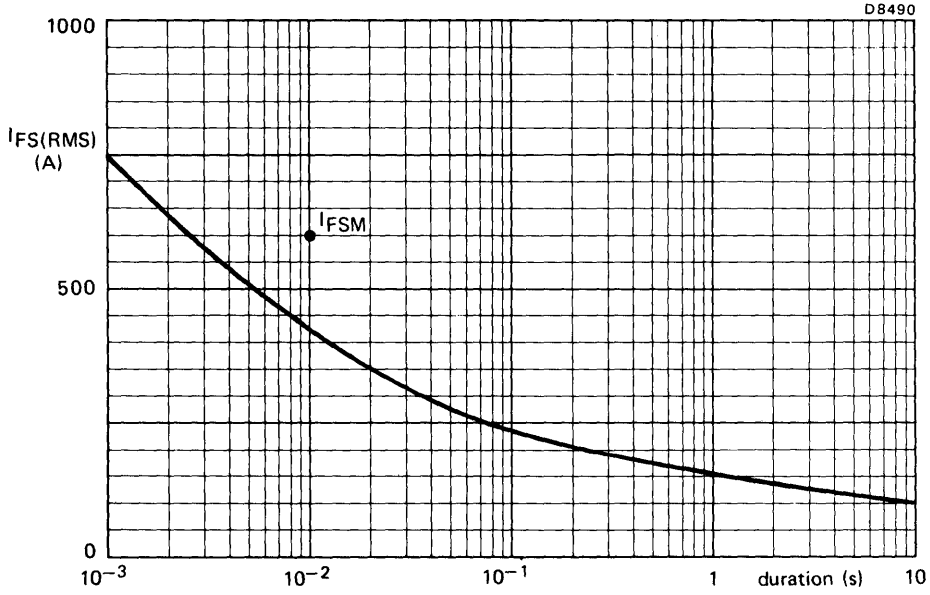
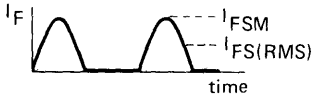


Fig.4 Maximum permissible non-repetitive r.m.s. forward current based on sinusoidal currents (f = 50 Hz); T_j = 125 °C prior to surge; with reapplied V_{RWMmax}.



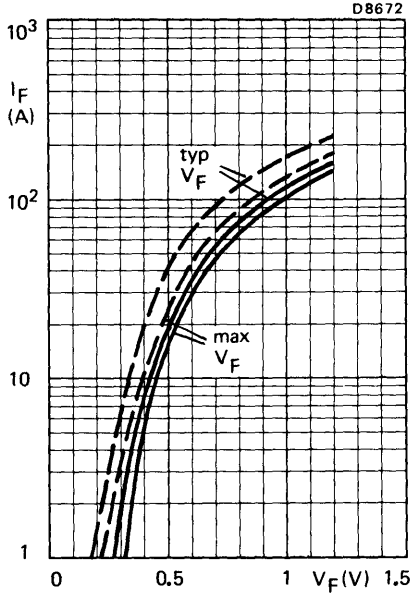


Fig. 5 ——— T_j = 25 °C; – – – T_j = 100 °C.

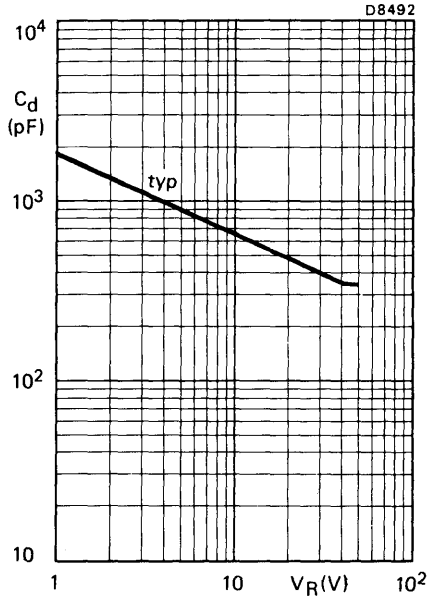


Fig.6 f = 1 MHz; T_j = 25 to 125 °C

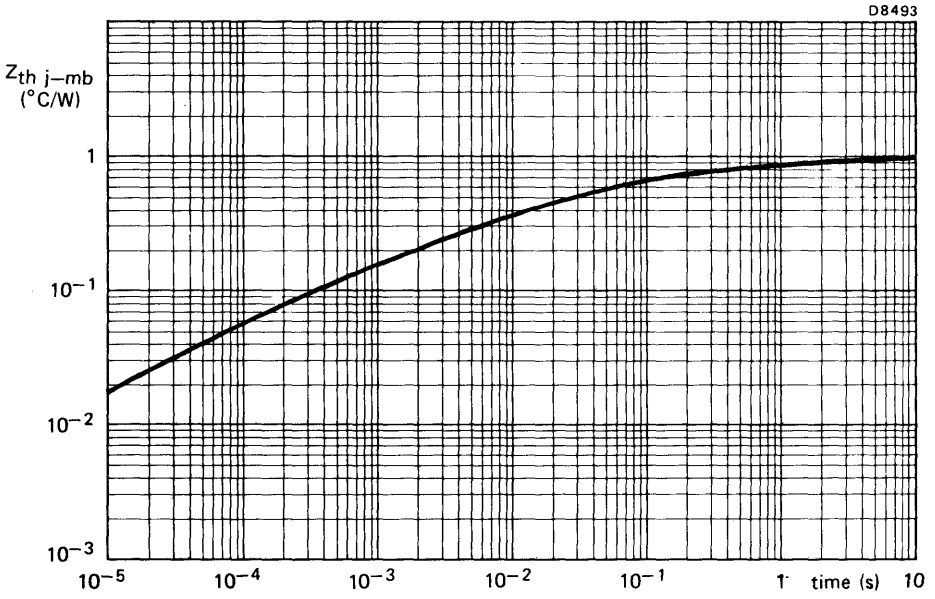


Fig.7