SILICON BRIDGE RECTIFIER

Plastic-encapsulated bridge rectifier comprising four silicon double-diffused diodes. It is primarily intended for equipment drawing its power from mains with frequencies up to 400 Hz.

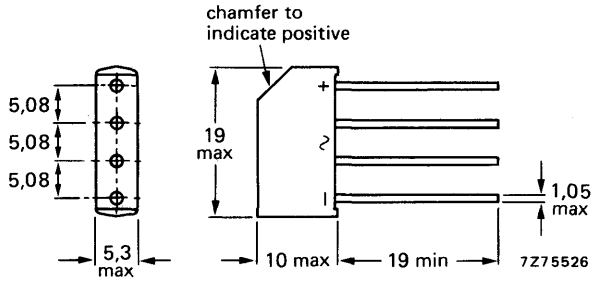
QUICK REFERENCE DATA

Input				
R.M.S. voltage	$V_{I(RMS)}$	max.	280	V
Repetitive peak voltage	V_{IRM}	max.	800	V
Non-repetitive peak current	I_{ISM}	max.	25	A
Output				
Average current	$I_{O(AV)}$	max.	1	A

MECHANICAL DATA

Dimensions in mm

Fig.1 SOD-28



The sealing of the plastic envelope withstands the accelerated damp heat test of IEC recommendation 68-2 (test D, severity IV, 6 cycles).

RATINGS

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

Input				
R.M.S. voltage	$V_{I(RMS)}$	max.	280	V
Crest working voltage	V_{IWM}	max.	400	V
Repetitive peak voltage	V_{IRM}	max.	800	V
Non repetitive peak voltage; $t \leqslant 10$ ms	V_{ISM}	max.	800	V
Non repetitive peak current (see also Fig.8)	I_{ISM}	max.	25	A
Output				
Average current with C load	See Figs 3, 6			
Average current with R and L load up to T_{amb} = 40 °C (see also Fig.5)	$I_{O(AV)}$	max.	1	A
Repetitive peak current	I_{ORM}	max.	5	A
Temperatures				
Storage temperature	T_{stg}		−55 to +125	°C
Junction temperature	T_j	max.	125	°C

THERMAL RESISTANCE

Influence of mounting method

The quoted values of $R_{th\ j\text{-}a}$ should be used only when no leads of other dissipating components run to the same tie-point

1. Mounted to solder tags at a lead-length a > 5 mm. $R_{th\ j\text{-}a}$ = 40 °C/W
2. Mounted on printed-wiring board at a = maximum lead-length. $R_{th\ j\text{-}a}$ = 50 °C/W
3. Mounted on printed-wiring board at a lead-length a = 5 mm. $R_{th\ j\text{-}a}$ = 55 °C/W
4. Mounted on printed-wiring board at a lead length a = 1.5 mm. $R_{th\ j\text{-}a}$ = 60 °C/W (distance -a- includes printed-wiring board thickness)

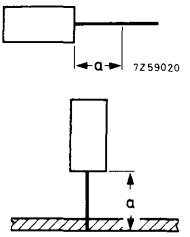


Fig.2

MOUNTING INSTRUCTIONS

1. The maximum permissible temperature of the soldering iron or bath is 270 °C; it must not be in contact with the joint for more than 3 seconds.
2. Avoid hot spots due to handling or mounting; the body of the device must not come into contact with or be exposed to a temperature higher than 150 °C.
3. Exert no axial pull when bending.

CHARACTERISTICS

Forward voltage (2 diodes in series)

I_F = 2 A; T_j = 25 °C	V_F	<	2.2	V*

*Measured under pulse conditions to avoid excessive dissipation.

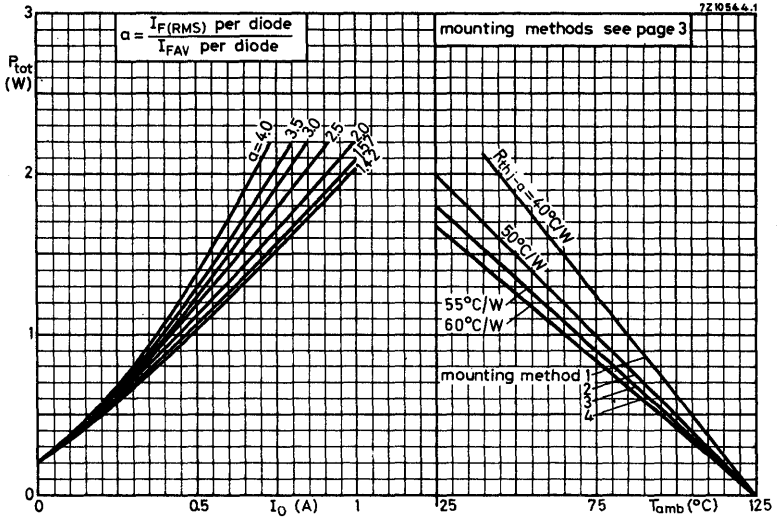


Fig.3

From the left-hand graph the total power dissipation can be found as a function of the average output current.

The parameter $a = \frac{I_{F(RMS)} \text{ per diode}}{I_{F(AV)} \text{ per diode}}$ depends on $\omega R_L C_L$ and $\frac{R_t + R_{diff}}{R_L}$ and can be found from existing graphs.

See Application Book: RECTIFIER DIODES

Once the power dissipation is known, the max. permissible ambient temperature follows from the right-hand graph.

For the series resistance, added to limit the initial peak rectifier current, the required minimum value can be found from Fig.7.
R_{diff} is shown in Fig.4.

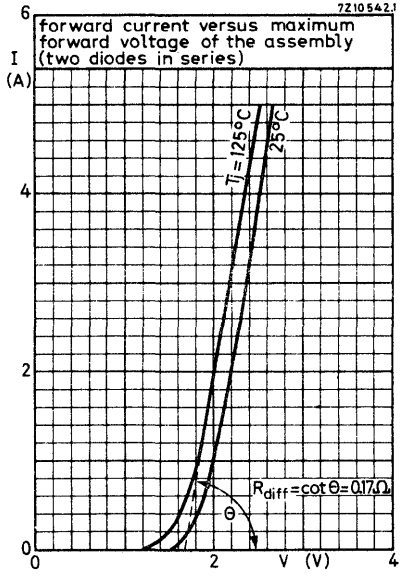


Fig.4

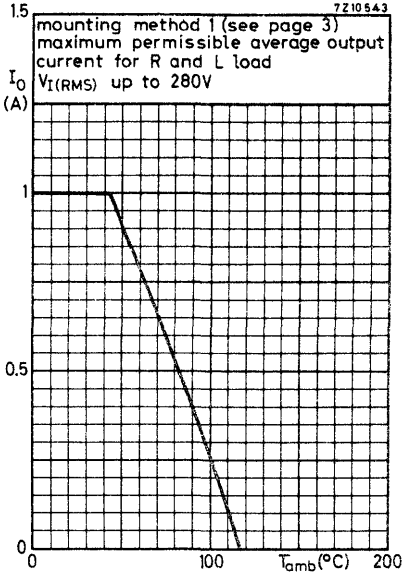


Fig.5

Example: Rectifier with C load

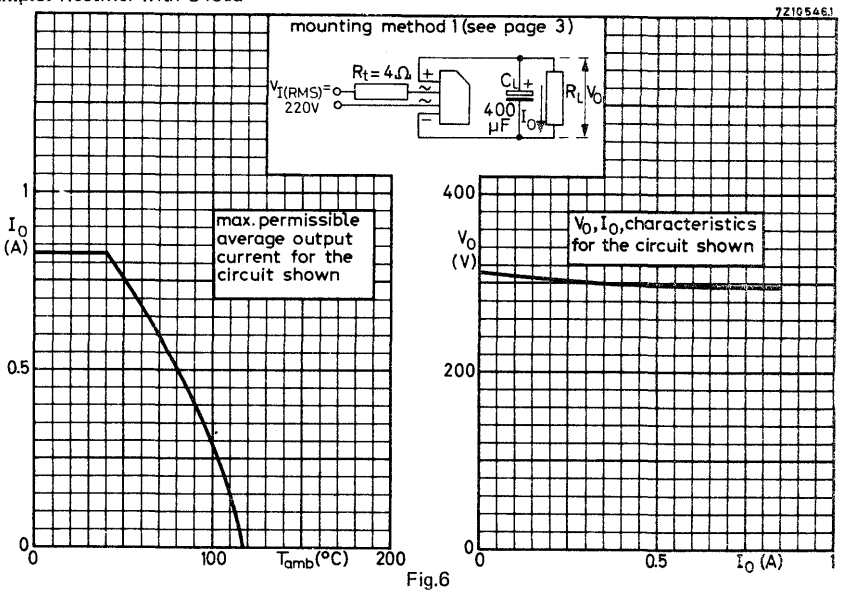


Fig.6

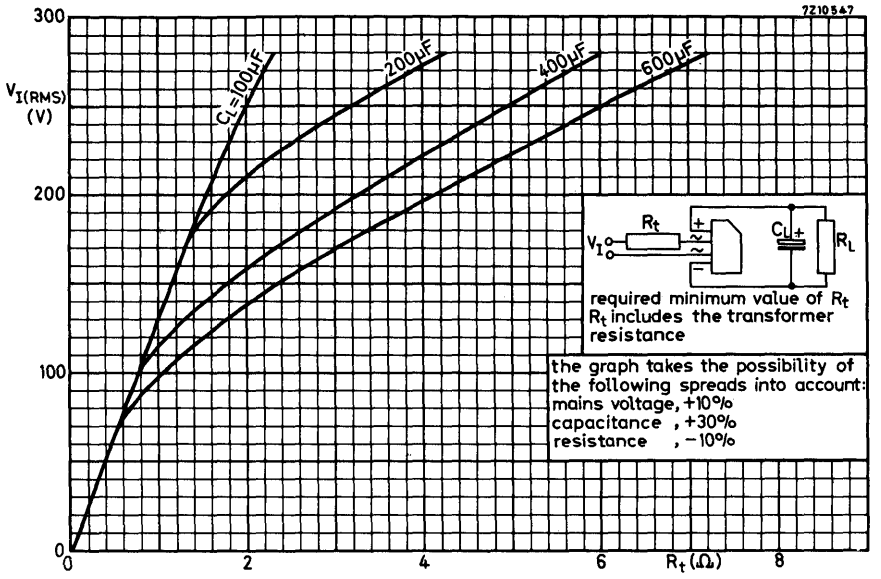

7Z10547
300
200
100
0
$V_{I(RMS)}$ (V)
C_L=100μF
200μF
400μF
600μF
0
2
4
6
R_t (Ω)
8
R_t
V_I
C_L
R_L
required minimum value of R_t
R_t includes the transformer resistance
the graph takes the possibility of the following spreads into account:
mains voltage, +10%
capacitance , +30%
resistance , −10%

Fig.7

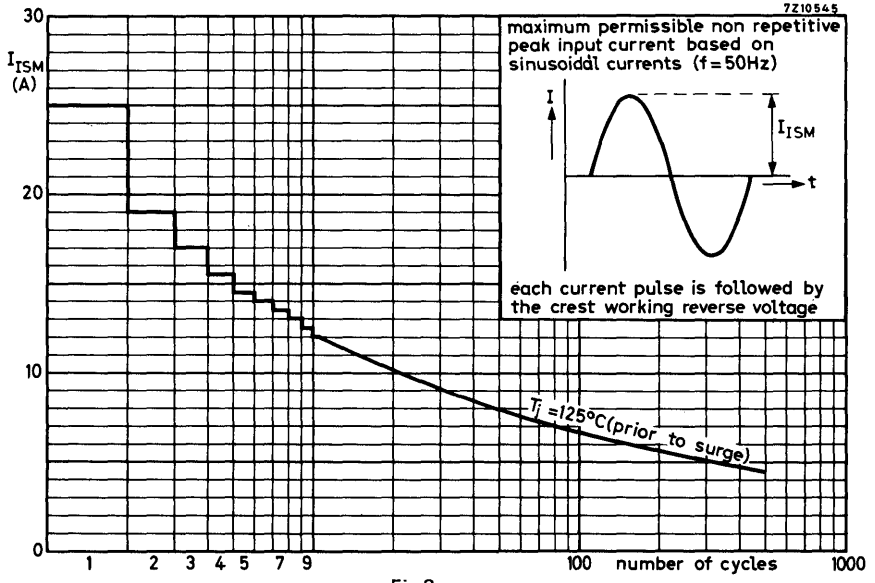

7Z10545
30
20
10
0
I_{ISM} (A)
maximum permissible non repetitive peak input current based on sinusoidal currents (f=50Hz)
I
I_{ISM}
t
each current pulse is followed by the crest working reverse voltage
T_j =125°C(prior to surge)
1
2
3
4
5
7
9
100
number of cycles
1000

Fig.8