HIGH-VOLTAGE RECTIFIER STACKS

The OSB9115, OSM9115 and OSS9115 series are ranges of high-voltage rectifier assemblies incorporating controlled avalanche diodes mounted on fire-proof triangular formers.
They are supplied with M6 studs.
The OSB9115 series is intended for application in two-phase half-wave rectifier circuits.
The OSM9115 series is intended for application in single-phase or three-phase bridges or in voltage doubler circuits.
The OSS9115 series is intended for all kinds of high-voltage rectification.
The OSB9115 series and OSM9115 series are supplied with a centre tap (8-32UNC).
The maximum crest working voltages of the OSB9115 and OSM9115 series cover the range from 3 kV to 27 kV, and of the OSS9115 series the range from 4.5 kV to 54 kV in 1.5 kV steps.

Configuration:

Fig. 1 OSB9115 . . . . A

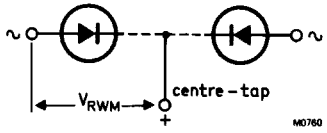


Fig. 2 OSM9115 . . . . A

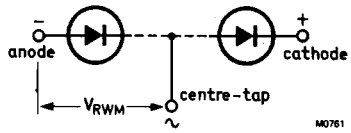
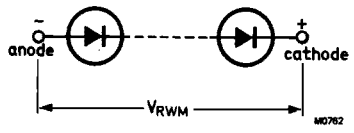


Fig. 3 OSS9115 . . . . A



QUICK REFERENCE DATA

		OSB9115	−4	−6	. . .	−34	−36A	
		OSM9115	−6	−6	. . .	−34	−36A	
Crest working reverse voltage from centre tap to end	V_{RWM}	max.	3	4.5	. . .	25.5	27	kV
		OSS9115	−3	−4	. . .	−35	−36A	
Crest working reverse voltage	V_{RWM}	max.	4.5	6	. . .	52.5	54	kV

Average forward current with R and L load (averaged over any 20 ms period)				
in free air up to T_{amb} = 35 °C	$I_{F(AV)}$	max.	3.5	A
in oil up to T_{oil} = 100 °C	$I_{F(AV)}$	max.	6	A
Non-repetitive peak forward current t = 10 ms; half sine-wave; T_j = 175 °C prior to surge	I_{FSM}	max.	125	A

MECHANICAL DATA see page 4

All information applies to frequencies up to 400 Hz

RATINGS

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

Voltages

			OSB9115	–4	–6	. . .	–34	–36A	
			OSM9115	–4	–6	. . .	–34	–36A	
Crest working reverse voltage	V_{RWM}	max.		3	4.5	. . .	25.5	27	kV
			OSS9115	–3	–4	. . .	–35	–36A	
Crest working reverse voltage	V_{RWM}	max.		4.5	6	. . .	52.5	54	kV

Currents

Average forward current (averaged over any 20 ms period)				
in free air up to T_{amb} = 35 °C	$I_{F(AV)}$	max.	3.5	A
in oil up to T_{oil} = 100 °C	$I_{F(AV)}$	max.	6	A
Repetitive peak forward current	I_{FRM}	max.	120	A
Non-repetitive peak forward current t = 10 ms; half sine-wave; T_j = 175 °C prior to surge	I_{FSM}	max.	125	A

Reverse power dissipation

			OSB9115	–4	–6	. . .	–34	–36A	
			OSM9115	–4	–6	. . .	–34	–36A	
Repetitive peak reverse power t = 10 μs (square-wave; f = 50 Hz) T_j = 175 °C	P_{RRM}	max.		1.2	1.8	. . .	10.2	10.8	kW
Non-repetitive peak reverse power t = 10 μs (square -wave)									
T_j = 25 °C prior to surge	P_{RSM}	max.		6	9	. . .	51	54	kW
T_j = 125 °C prior to surge	P_{RSM}	max.		1.2	1.8	. . .	10.2	10.8	kW
			OSS9115	–3	–4	. . .	–35	–36A	
Repetitive peak reverse power dissipation t = 10 μs (square-wave; f = 50 Hz) T_j = 175 °C	P_{RRM}	max.		1.8	2.4	. . .	21	21.6	kW
Non-repetitive peak reverse power dissipation t = 10 μs (square-wave)									
T_j = 25 °C prior to surge	P_{RSM}	max.		9	12	. . .	105	108	kW
T_j = 175 °C prior to surge	P_{RSM}	max.		1.8	2.4	. . .	21	21.6	kW

Temperatures

Storage temperature	T_{stg}		–55 to +150	°C
Junction temperature	T_j	max.	175	°C

CHARACTERISTICS (See note 1)

			OSB9115 –4	–6	. . .	–34	–36A	
			OSM9115 –4	–6	. . .	–34	–36A	
Forward voltage								
I_F = 20 A; T_j = 25 °C	V_F	<	4	6	. . .	34	36	V
Reverse avalanche breakdown voltage*								
I_R = 5 mA; T_j = 25 °C	$V_{(BR)R}$	>	3.3	4.95	. . .	28	29.7	kV
		<	4.8	7.2	. . .	40.8	43.2	kV
			OSS9115 –3	–4	. . .	–35	–36A	
Forward voltage								
I_F = 20 A; T_j = 25 °C	V_F	<	6	8	. . .	70	72	V
Reverse avalanche breakdown voltage*								
I_R = 5 mA; T_j = 25 °C	$V_{(BR)R}$	>	4.95	6.6	. . .	57.8	59.4	kV
		<	7.2	9.6	. . .	84	68.4	kV
Reverse current								
$V_{RM} = V_{RWM\ max}$; T_j = 125 °C	I_{RM}	<	0.6					mA

NOTES

1. The Ratings and Characteristics given apply **from centre tap to end.** (Not for OSS9115 series).
2. **Type number suffix**

   The suffix consists of a figure indicating the total number of diodes, and the letter 'A' denoting M6 studs at the ends.
3. **Operating position**

   The rectifier units can be operated at their maximum ratings when mounted in any position.

*The breakdown voltage increases by approximately 0.1% per °C with increasing junction temperature.

MECHANICAL DATA

Dimensions in mm

n = total number of diodes

Fig.4 OSM9115 –nA

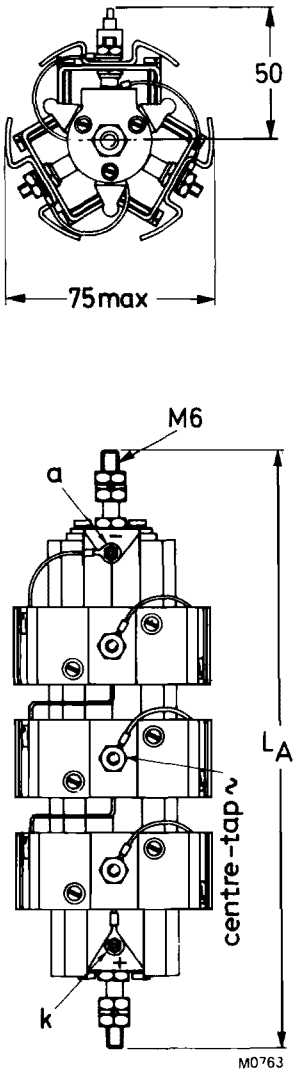


Table of lengths and weights (mm and g)

number of diodes n	maximum lengths L_A	weights W_A
3	143	153
4 to 6	184	286
7 to 9	224	419
10 to 12	264	552
13 to 15	305	685
16 to 18	345	818
19 to 21	385	951
22 to 24	426	1048
25 to 27	466	1217
28 to 30	506	1350
31 to 33	546	1483
34 to 36	586	1616

The drawings show the OSM9115 series; the OSB9115 and OSS9115 series differ in the following respects:

OSB9115 series – terminals marked a (–) and k (+) in the drawings are both marked ∿; the centre-tap is marked + (instead of ∿ as in the drawings).

OSS9115 series – has no centre-tap.

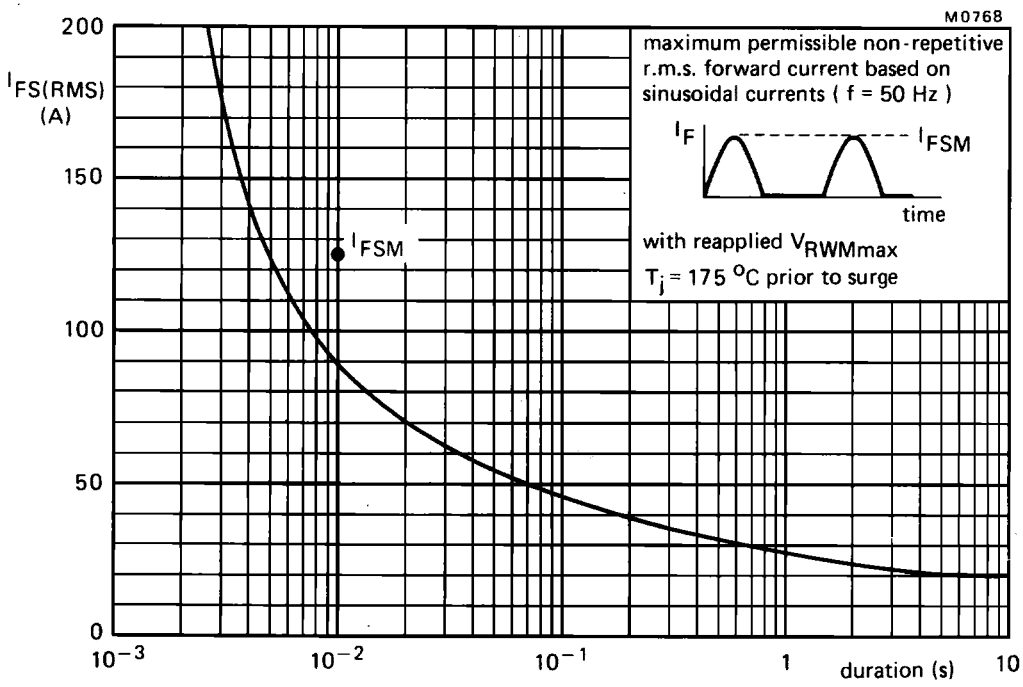

M0768
200
$I_{FS(RMS)}$ (A)
150
100
50
0
10^{-3}
10^{-2}
10^{-1}
1
10
duration (s)
I_{FSM}
maximum permissible non-repetitive r.m.s. forward current based on sinusoidal currents (f = 50 Hz)
I_F
I_{FSM}
time
with reapplied V_{RWMmax}
T_j = 175 °C prior to surge

Fig. 5

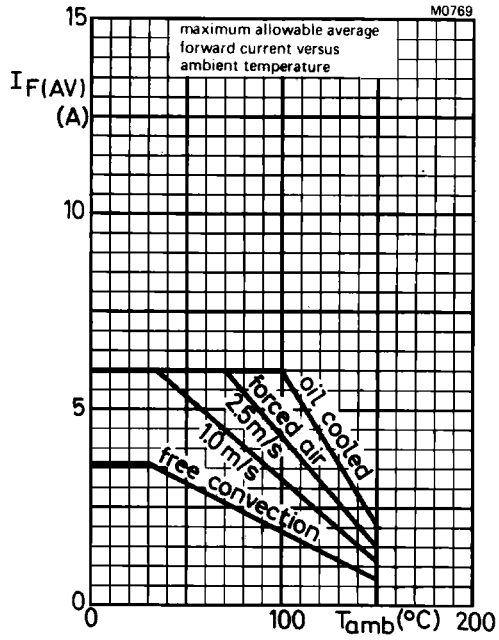


Fig. 6

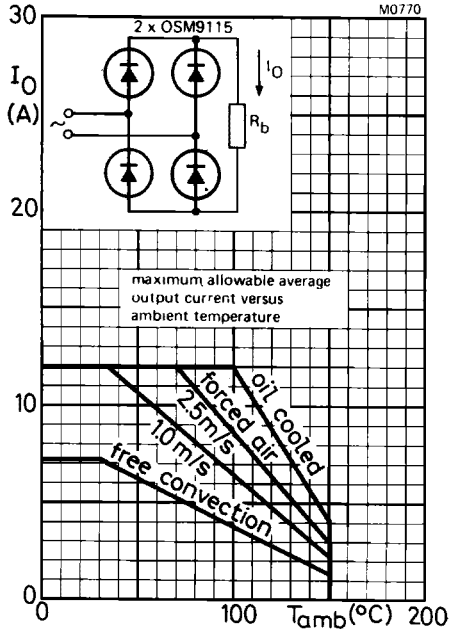


Fig. 7

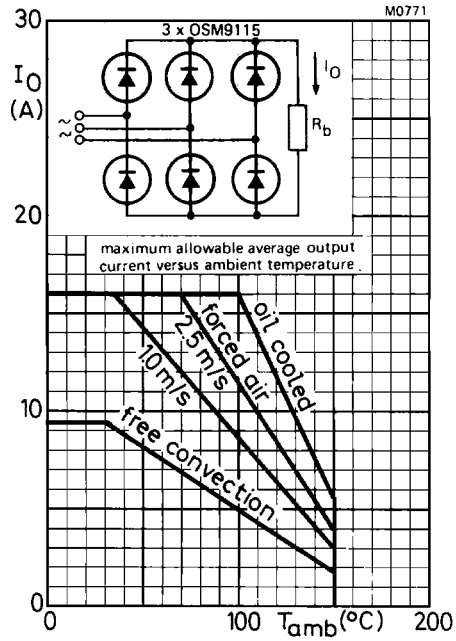


Fig. 8

APPLICATION INFORMATION

Fig. 9 OSB9115 -4

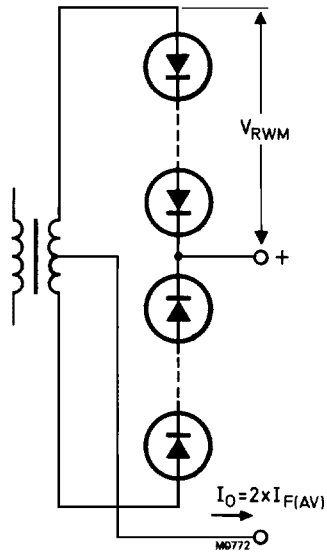
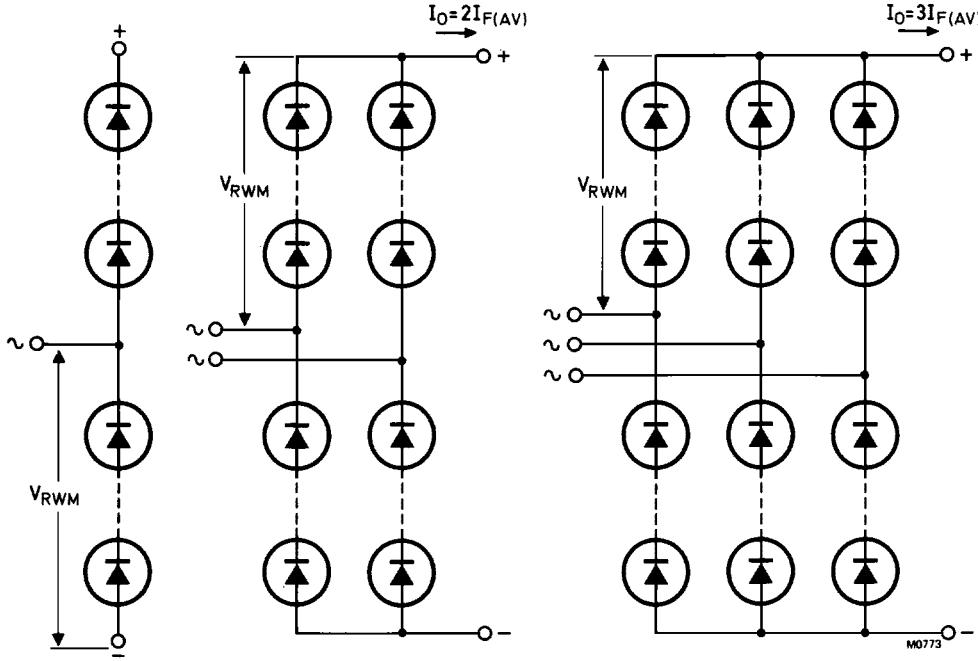


Fig. 10 OSM9115 series



voltage doubler
1 x OSM9115

rectifier circuits with respectively
2 x OSM9115 and 3 x OSM9115