HIGH-VOLTAGE RECTIFIER STACKS

Ranges of high-voltage rectifier assemblies, incorporating controlled avalanche diodes mounted on fire-proof triangular formers. They are supplied with M6 studs.
The OSB9415 series is intended for application in two-phase half-wave rectifier circuits.
The OSM9415 series is intended for application in single-phase or three-phase bridges or in voltage doubler circuits.
The OSS9415 series is intended for all kinds of high-voltage rectification.
The OSB9415 series and OSM9415 series are supplied with a centre tap (8–32UNC).
The maximum crest working voltages of the OSB9415 and OSM9415 series cover the range from 3 kV to 27 kV, and of the OSS9415 series the range from 4.5 kV to 54 kV, in 1.5 kV steps.

Configuration:

Fig. 1 OSB9415 . . . . A

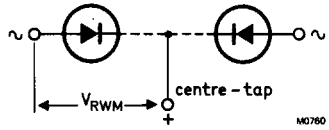


Fig. 2 OSM9415 . . . . A

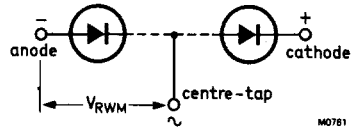
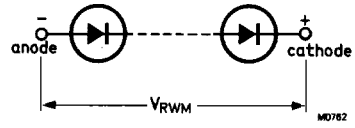


Fig. 3 OSS9415 . . . . A



QUICK REFERENCE DATA

		OSB9415	−4	−6	. . .	−34	−36A	
		OSM9415	−4	−6	. . .	−34	−36A	
Crest working reverse voltage from centre tap to end	V_{RWM}	max.	3	4.5		25.5	27	kV
		OSS9415	−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.	10	A
in oil up to T_{oil} = 35 °C	$I_{F(AV)}$	max.	30	A
Non-repetitive peak forward current t = 10 ms; half sine wave; T_j = 175 °C prior to surge	I_{FSM}	max.	800	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		OSB9415 / OSM9415	−4 / −4	−6 / −6	. . .	−34 / −34	−36A / −36A	
Crest working reverse voltage	V_{RWM}	max.	3	4.5	. . .	25.5	27	kV
		OSS9415	−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.	10		A
in oil up to T_{oil} = 35 °C	$I_{F(AV)}$	max.	30		A
Repetitive peak forward current	I_{FRM}	max.	450		A
Non-repetitive peak forward current t = 10 ms; half sine-wave; T_j = 175 °C prior to surge	I_{FSM}	max.	800		A

Reverse power dissipation

		OSB9415 / OSM9415	−4 / −4	−6 / −6	. . .	−34 / −34	−36A / −36A	
Repetitive peak reverse power dissipation t = 10 μs (square-wave; f = 50 Hz) T_j = 175 °C	P_{RRM}	max.	9	13.5	. . .	76.5	81	kW
Non-repetitive peak reverse power dissipation t = 10 μs (square-wave)								
T_j = 25 °C prior to surge	P_{RSM}	max.	55	82	. . .	467	495	kW
T_j = 175 °C prior to surge	P_{RSM}	max.	8.5	13	. . .	72	77	kW
		OSS9415	−3	−4	. . .	−35	−36A	
Repetitive peak reverse power dissipation t = 10 μs (square-wave; f = 50 Hz) T_j = 175 °C	P_{RRM}	max.	13.5	18	. . .	157	162	kW
Non-repetitive peak reverse power dissipation t = 10 μs (square-wave)								
T_j = 25 °C prior to surge	P_{RSM}	max.	80	105	. . .	919	945	kW
T_j = 175 °C prior to surge	P_{RSM}	max.	13	17	. . .	149	153	kW

Temperatures

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

CHARACTERISTICS (See note 1)

			OSB9415 / OSM9415	−4 / −4	−6 / −6	. . .	−34 / −34	−36A / −36A	
Forward voltage									
I_F = 150 A; T_j = 25 °C	V_F	<		3.6	5.4	. . .	30.6	32.4	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

			OSS9415	−3	−4	. . .	−35	−36A	
Forward voltage									
I_F = 150 A; T_j = 25 °C	V_F	<		5.4	7.2	. . .	63	64.8	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	86.4	kV

Reverse current					
$V_{RM} = V_{RWMmax}$; T_j = 125 °C	I_{RM}	<	1.6		mA

NOTES

1. The Ratings and Characteristics given apply **from centre tap to end.**.(Not for OSS9415 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.

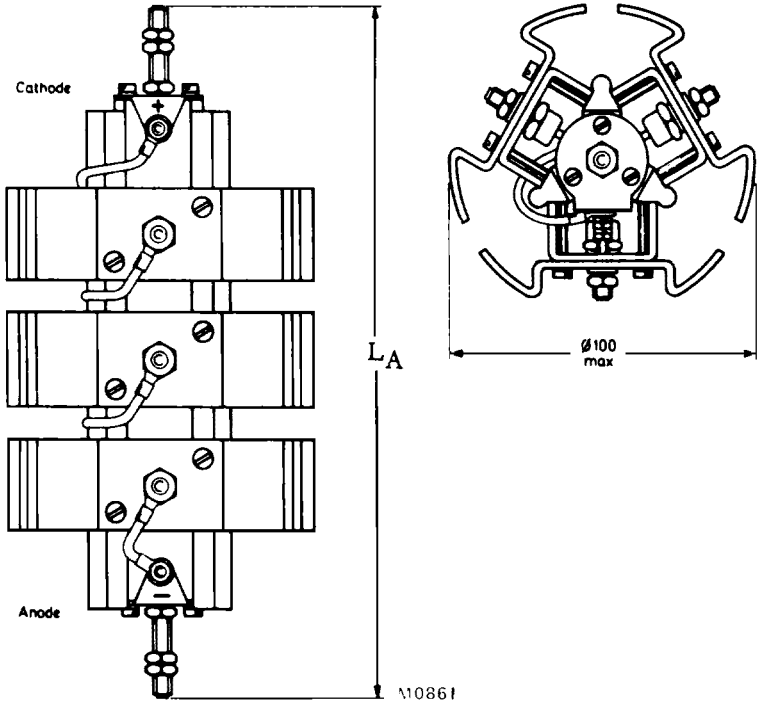
* The breakdown voltage increases, by approximately 0.1% per °C with increasing junction temperature.

MECHANICAL DATA

Dimensions in mm

n = total number of diodes.

Fig.4 OSS9415-nA



The drawing shows the OSS9415 series.
The OSB9415 and OSM9415 series differ in the following respects:
OSB9415 series — has a centre tap marked +; anode and cathode terminals are both marked ∿.
OSM9415 series — has a centre tap marked ∿.

Table of lengths and weights (mm and g)

number of diodes	n	3	4 to 6	7 to 9	10 to 12	13 to 15
maximum lengths	L_A	143	184	224	264	305
weights	W_A	215	413	611	809	1007

number of diodes	n	16 to 18	19 to 21	22 to 24	25 to 27	28 to 30	31 to 33	34 to 36
maximum lengths	L_A	345	385	426	466	506	546	586
weights	W_A	1208	1406	1604	1802	2000	2198	2396

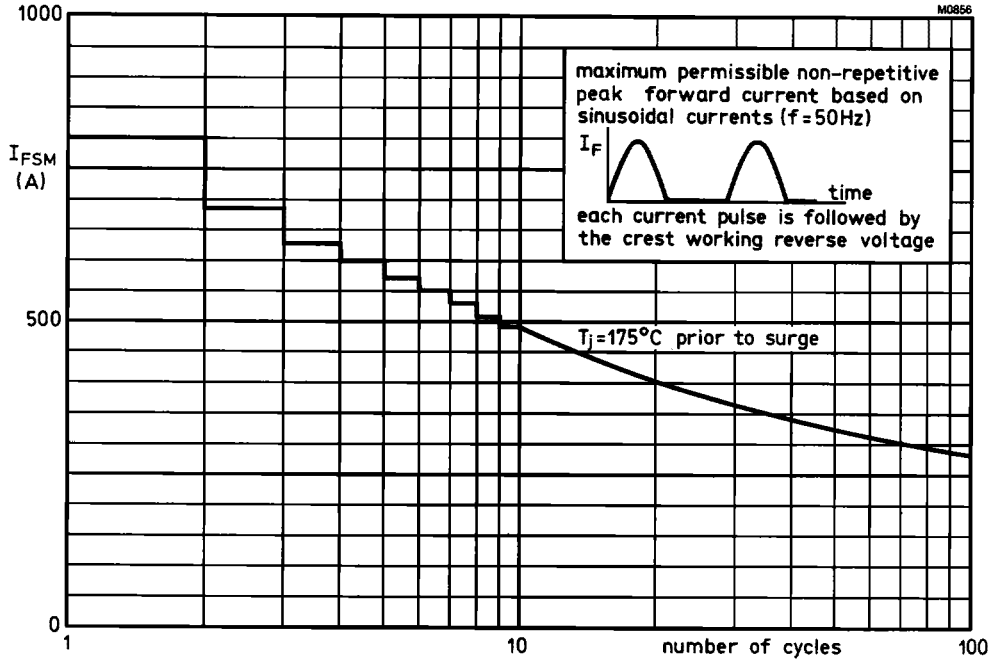

M0856
1000
500
0
I_{FSM} (A)
maximum permissible non-repetitive peak forward current based on sinusoidal currents (f=50Hz)
I_F
time
each current pulse is followed by the crest working reverse voltage
T_j=175°C prior to surge
1
10
number of cycles
100

Fig.5

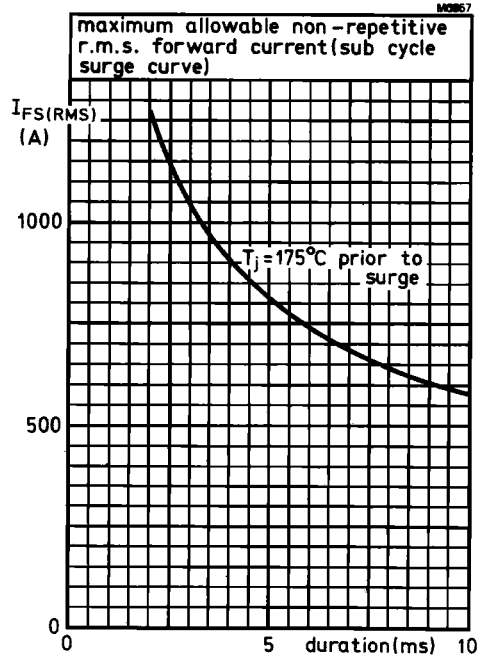

M0857
maximum allowable non-repetitive r.m.s. forward current(sub cycle surge curve)
$I_{FS(RMS)}$ (A)
1000
500
0
T_j=175°C prior to surge
0
5
duration(ms)
10

Fig.6

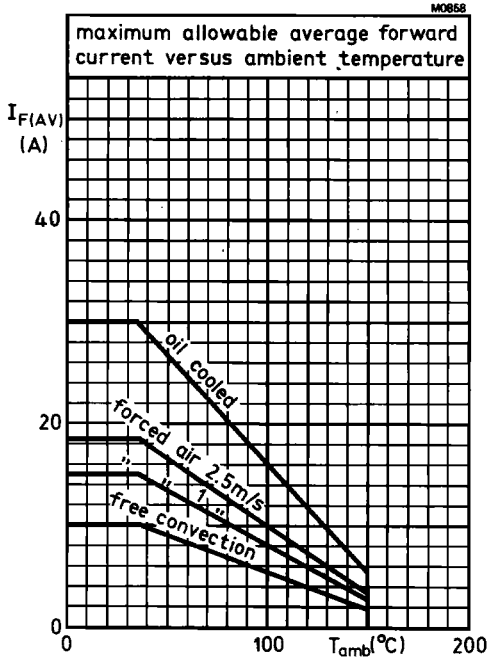


Fig.7

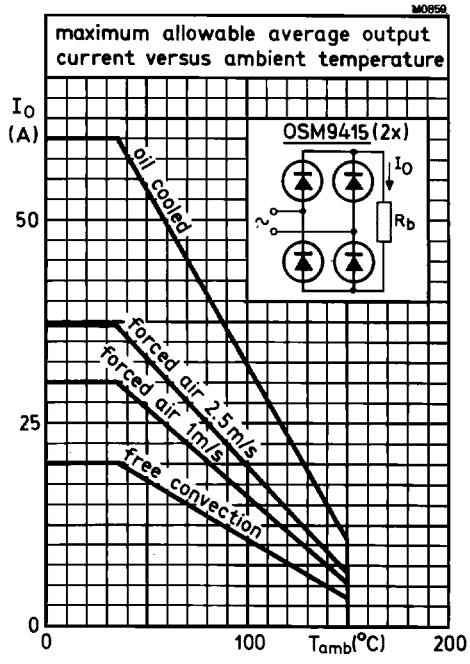


Fig.8

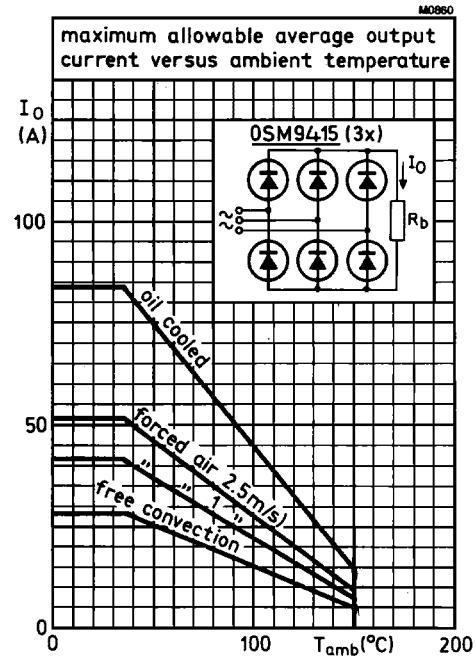


Fig.9

APPLICATION INFORMATION

Fig.10 OSB9415 series

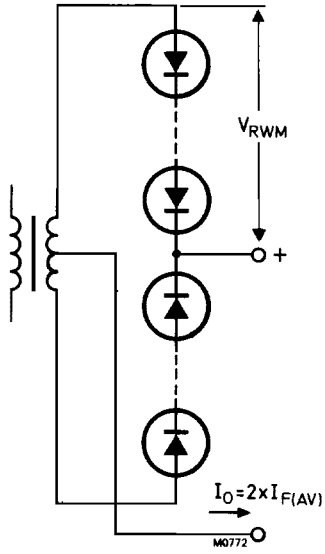
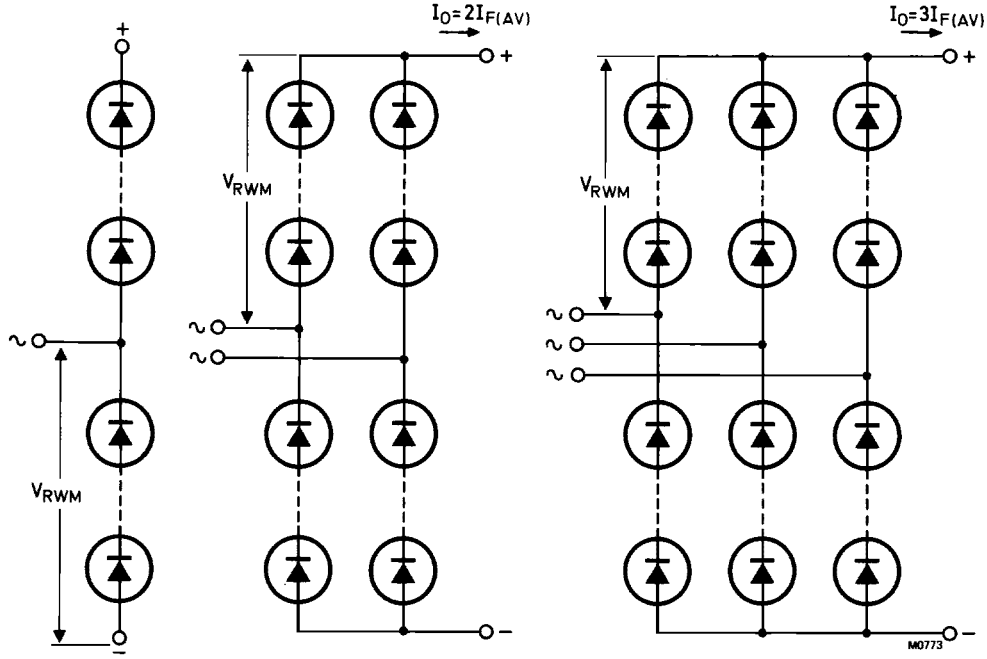


Fig.11 OSM9415 series



voltage doubler
1 x OSM9415

rectifier circuits with respectively
2 x OSM9415 and 3 x OSM9415