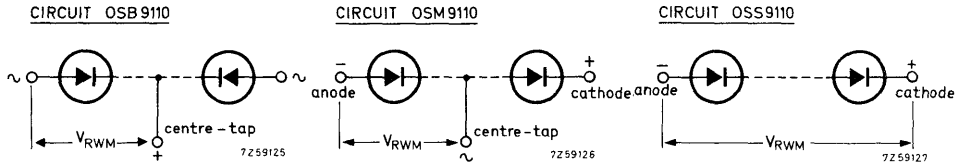
HIGH VOLTAGE RECTIFIER STACKS

The OSB9110, OSM9110 and OSS9110series are ranges of high voltage rectifier assemblies, incorporating controlled avalanche diodes mounted on fire proof triangular formers. The OSB9110series is intended for application in two phase half wave rectifier circuits. The OSM9110series is intended for application in single phase or three phase bridges or in voltage doubler circuits.
The OSS9110series is intended for all kinds of high voltage rectification. The assemblies are supplied with M6 studs or with standard valve bases. The OSB9110-series and OSM9110series are supplied with a centre tap (8-32UNC). The maximum crest working voltages of the OSB9110 and OSM9110series cover the range from 2 kV to 15 kV, and of the OSS9110series the range from 3 kV to 30 kV, in 1 kV steps.



QUICK REFERENCE DATA

		OSB9110	-4	-6	...	-28	-30	
		OSM9110	-4	-6	...	-28	-30	
Crest working reverse voltage from centre tap to end	V_{RWM}	max.	2	3	...	14	15	kV
		OSS9110	-3	-4	...	-29	-30	
Crest working reverse voltage	V_{RWM}	max.	3	4	...	29	30	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 pages 4 and 5.

All information applies to frequencies up to 400 Hz

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

		OSB9110	-4	-6	...	-28	-30		
Voltages		OSM9110	-4	-6	...	-28	-30		
Crest working reverse voltage	V_{RWM}	max.	2	3	...	14	15	kV	
		OSS9110	-3	-4	...	-29	-30		
Crest working reverse voltage	V_{RWM}	max.	3	4	...	29	30	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									
		OSB9110	-4	-6	...	-28	-30		
Repetitive peak reverse power		OSM9110	-4	-6	...	-28	-30		
t = 10 µs (square wave; f = 50 Hz) T_j = 175 °C	P_{RRM}	max.	1.2	1.8	...	8.4	9	kW	
Non-repetitive peak reverse power t = 10 µs (square wave)									
T_j = 25 °C prior to surge	P_{RSM}	max.	6	9	...	42	45	kW	
T_j = 125 °C prior to surge	P_{RSM}	max.	1.2	1.8	...	8.4	9	kW	
		OSS9110	-3	-4	...	-29	-30		
Repetitive peak reverse power dissipation t = 10 µs (square wave; f = 50 Hz) T_j = 175 °C	P_{RRM}	max.	1.8	2.4	...	17.4	18	kW	
Non-repetitive peak reverse power dissipation t = 10 µs (square wave)									
T_j = 25 °C prior to surge	P_{RSM}	max.	9	12	...	87	90	kW	
T_j = 175 °C prior to surge	P_{RSM}	max.	1.8	2.4		17.4	18	kW	
Temperatures									
Storage temperature	T_{stg}					-55 to +175		°C	
Junction temperature	T_j	max.				175		°C	

CHARACTERISTICS (See note 1)

			OSB9110 -4	-6	...	-28	-30	
			OSM9110-4	-6	...	-28	-30	
Forward voltage								
I_F = 20 A; T_j = 25 °C	V_F	<	4	6	...	28	30	V
Reverse avalanche breakdown voltage [1]								
I_R = 5 mA; T_j = 25 °C	$V_{(BR)R}$	>	2.5	3.75	...	17.5	18.75	kV
		<	3.76	5.64	...	26.32	28.2	kV

			OSS9110 -3	-4	...	-29	-30	
Forward voltage								
I_F = 20 A; T_j = 25 °C	V_F	<	6	8	...	58	60	V
Reverse avalanche breakdown voltage [1]								
I_R = 5 mA; T_j = 25 °C	$V_{(BR)R}$	>	3.75	5.0	...	36.25	37.5	kV
		<	5.64	7.52	...	54.52	56.4	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 OSS9110series)

2. Type number suffix

   The suffix consists of a figure indicating the total number of diodes, followed by a letter indicating the base.
   A = M6 studs at the ends
   B = 4 pin Super Jumbo (B4D)
   C = Goliath
   E = 4 pin Jumbo (B4F)
   F = A3-20

3. Operating position

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

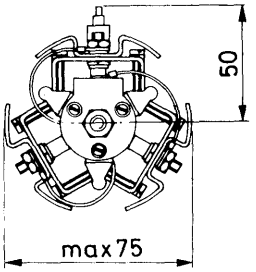
[1]) The breakdown voltage increases by approximately 0.1 % per °C with increasing junction temperature.

MECHANICAL DATA

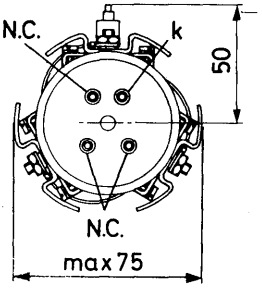
Dimensions in mm

n = total number of diodes

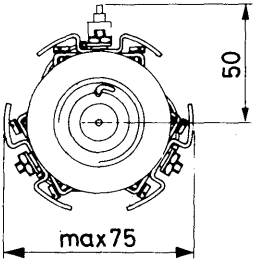
OSM9110-nA

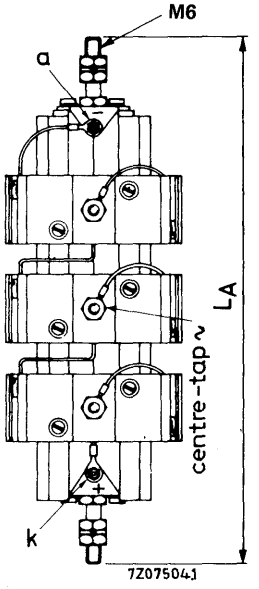


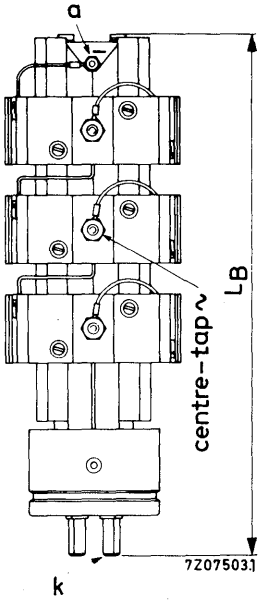
OSM9110-nB

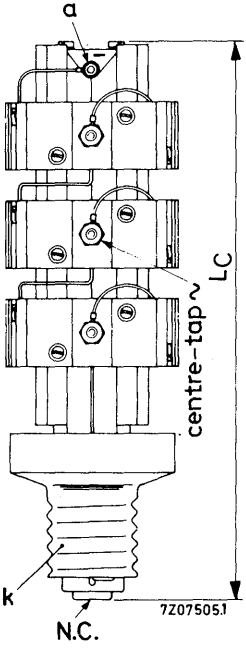


OSM9110-nC









The drawings show the OSM9110series; the OSB9110 and OSS9110series differ in the following respects:

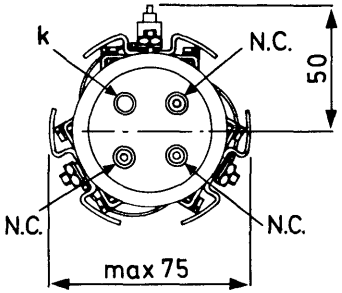
OSB9110series – terminals marked a(-) and k(+) in the drawings are both marked ∿ ; the centre-tap is marked + (instead of ∿ as in the drawings).

OSS9110series – has no centre-tap.

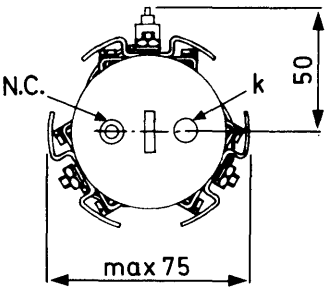
MECHANICAL DATA (continued)

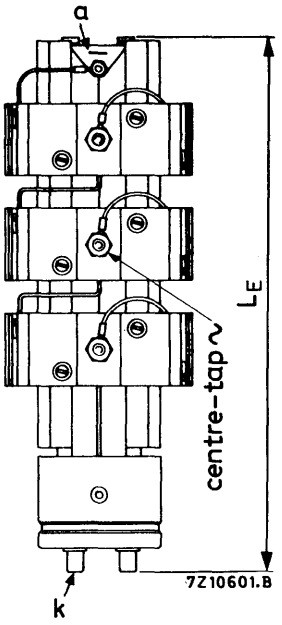
n = total number of diodes.

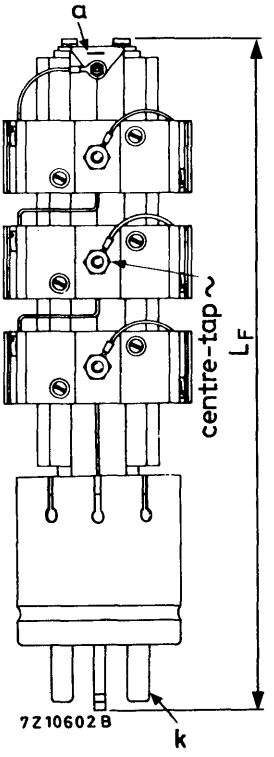
OSM9110-nE



OSM9110-nF





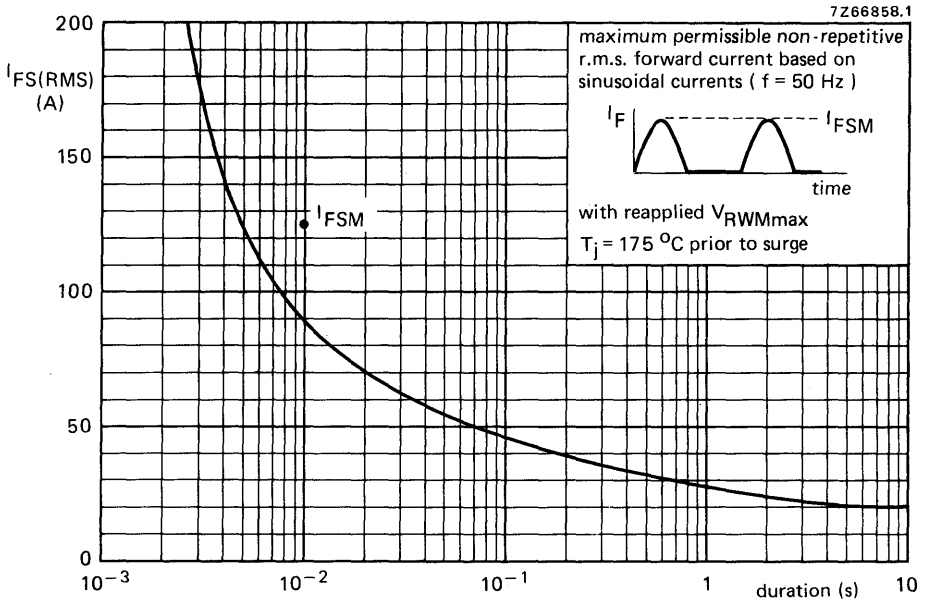


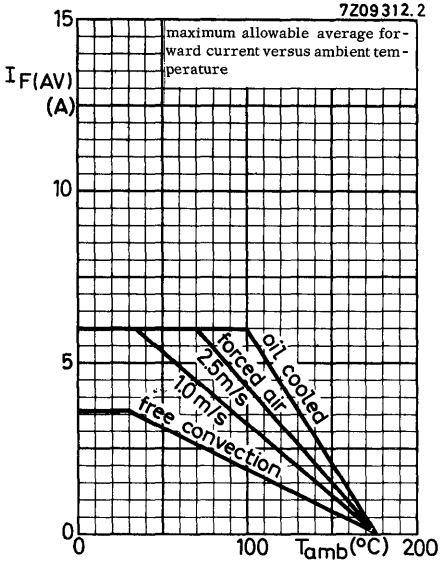
For lengths and weights see table on page 6.

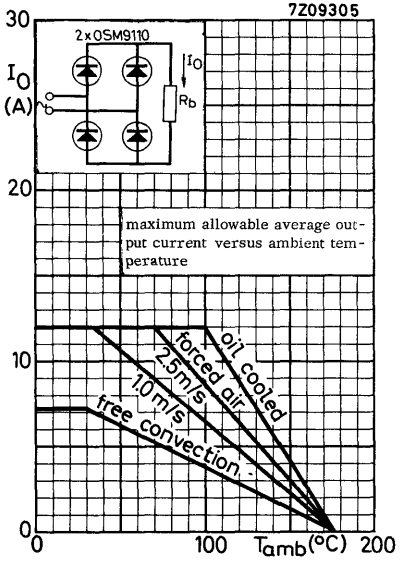
Table of lengths and weights (mm and g)

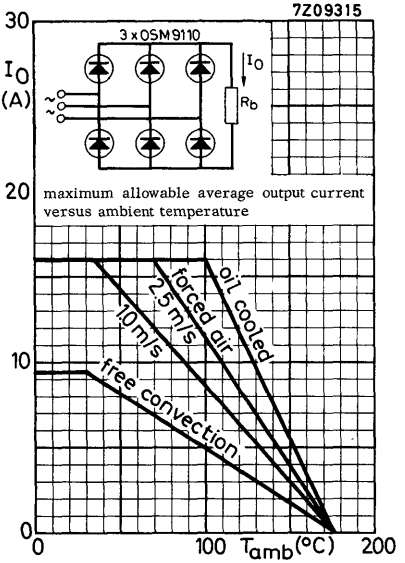
number of diodes	n	3	4 to 6	7 to 9	10 to 12	13 to 15
maximum lengths	L_A	143	184	224	264	305
	L_B	147	188	228	268	309
	L_C	159	199	239	279	320
	L_E	132	173	213	253	294
	L_F	184	225	265	305	346
weights	W_A	153	286	419	552	685
$W_B = W_C =$	W_E	218	351	484	617	750
	W_F	379	512	645	778	911

number of diodes	n	16 to 18	19 to 21	22 to 24	25 to 27	28 to 30
maximum lengths	L_A	345	385	426	466	506
	L_B	349	389	430	470	510
	L_C	360	400	441	481	521
	L_E	334	374	415	455	495
	L_F	386	426	467	507	547
weights	W_A	818	951	1048	1217	1350
$W_B = W_C =$	W_E	883	1016	1149	1282	1415
	W_F	1044	1177	1310	1443	1576


7Z66858.1
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
$I_{FS(RMS)}$ (A)
200
150
100
50
0
I_{FSM}
10^{-3}
10^{-2}
10^{-1}
1
10
duration (s)

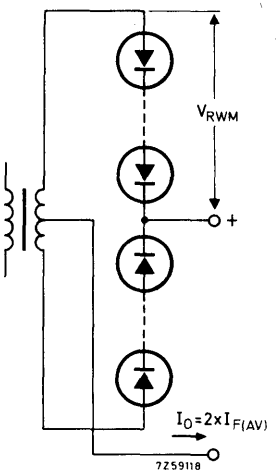

7Z09312.2
maximum allowable average forward current versus ambient temperature
$I_{F(AV)}$ (A)
15
10
5
0
0
100
T_{amb}(°C)
200
oil cooled
forced air
2.5 m/s
1.0 m/s
free convection


7Z09305
2 x OSM9110
I_O
R_b
I_O (A)
30
20
10
0
maximum allowable average output current versus ambient temperature
0
100
T_{amb}(°C)
200
oil cooled
forced air
2.5 m/s
1.0 m/s
free convection

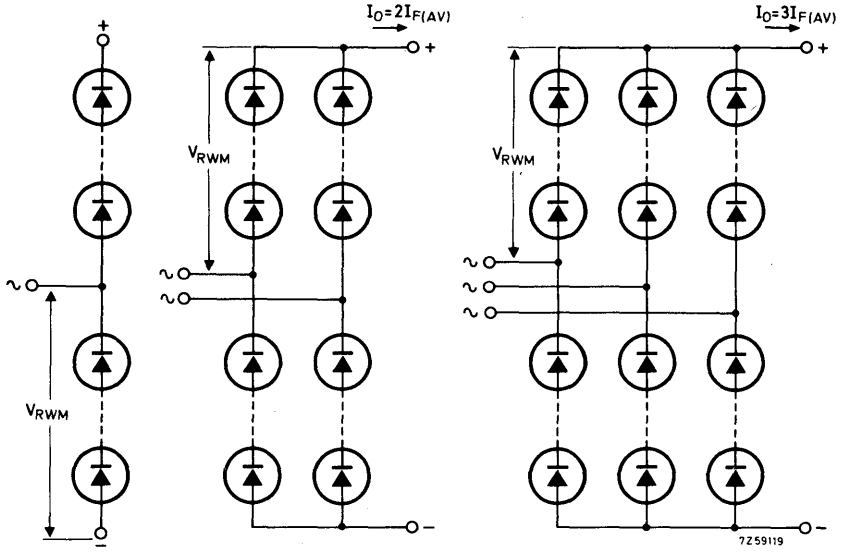

7Z09315
3 x OSM9110
I_O
R_b
I_O (A)
30
20
10
0
maximum allowable average output current versus ambient temperature
0
100
T_{amb}(°C)
200
oil cooled
forced air
2.5 m/s
1.0 m/s
free convection

APPLICATION INFORMATION

OSB9110-4



OSM9110series



voltage doubler 1x OSM 9110

rectifier circuits with 2x OSM 9110 and 3x OSM 9110 respectively