



Metallized Polypropylene Film Capacitors (MFP)	B 32 692
Coated (Powder Dipped)	... B 32 694

MFP pulse capacitors

Construction

- Dielectric: polypropylene
- Film metallized on one side and metal foils internally connected in series
- Wound capacitor technology
- Epoxy resin coating (UL 94 V-0)

Features

- Very high pulse strength
- Self-healing properties

Typical applications

- High-frequency sinusoidal ac current loads
- Electronic ballast
- Ignition devices

Terminals

- Crimped wire leads, tinned, lead length (6 – 1) mm or min. 20 mm
- Double crimped wire leads, tinned
- Different lead spacings (reduced and enlarged) available, lead length (6 – 1) mm

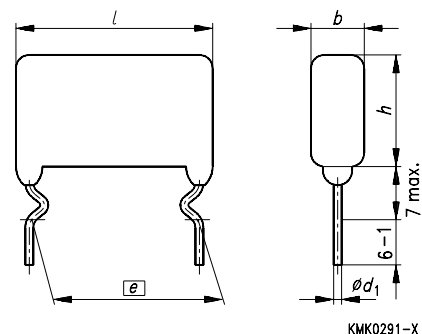
Marking

Manufacturer's logo,
style and type (P6xx),
rated capacitance,
capacitance tolerance (code letter),
rated dc voltage
date of manufacture (coded)

Delivery mode

Bulk (untaped)
Taped (Ammo pack or reel)
For notes on taping,
refer to chapter "Taping and packing", page 161

Crimped version



Dimensions in mm

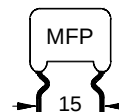
Lead spacing $e \pm 0,8$	Diameter d_1	Type
15,0	0,8	B 32 692
22,5	0,8	B 32 693
27,5	0,8	B 32 694


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Overview of available types

Lead spacing	15 mm					22,5 mm					27,5 mm				
Type	B 32 692					B 32 693					B 32 694				
Page	123					125					127				
0,22 nF															
0,33 nF															
0,47 nF															
0,68 nF															
1,0 nF															
1,5 nF															
2,2 nF															
3,3 nF															
4,7 nF															
6,8 nF															
10 nF															
15 nF															
22 nF															
33 nF															
47 nF															
68 nF															
0,10 µF															
0,15 µF															
0,22 µF															
0,33 µF															
Standard lead spacing															
Reduced lead spacing															
Enlarged lead spacing															



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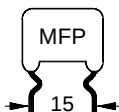
Ordering codes and packing units, lead spacing 15 mm

V_R (V_{rms} , $f \leq 1$ kHz) ($V_{peak\ to\ peak}$)	C_R	Maximum dimensions $b \times h \times l$ (mm)	Ordering code	Packing unit (pcs)		
				Ammo pack	Reel	Untaped
630 Vdc (300 Vac) (560 V_{pp})	2,2 nF	6,0 × 11,5 × 19,0	B32692-A6222-+***	960	1100	1000
	3,3 nF	6,0 × 11,5 × 19,0	B32692-A6332-+***	960	1100	1000
	4,7 nF	6,0 × 11,5 × 19,0	B32692-A6472-+***	960	1100	1000
	6,8 nF	6,0 × 11,5 × 19,0	B32692-A6682-+***	960	1100	1000
	10 nF	6,0 × 11,5 × 19,0	B32692-A6103-+***	960	1100	1000
	15 nF	7,0 × 12,0 × 19,0	B32692-A6153-+***	830	900	1000
	22 nF	8,0 × 13,5 × 19,0	B32692-A6223-+***	680	700	1000
	33 nF	9,5 × 15,5 × 19,0	B32692-A6333-+***	640	700	500
1000 Vdc (400 Vac) (800 V_{pp})	47 nF	12,0 × 17,0 × 19,0	B32692-A6473-+***	480	550	500
	2,2 nF	6,5 × 12,0 × 19,0	B32692-A0222-+***	960	1100	1000
	3,3 nF	7,0 × 12,5 × 19,0	B32692-A0332-+***	830	900	1000
	4,7 nF	7,0 × 12,5 × 19,0	B32692-A0472-+***	830	900	1000
	6,8 nF	7,5 × 14,0 × 19,0	B32692-A0682-+***	830	900	1000
	10 nF	9,0 × 15,5 × 19,0	B32692-A0103-+***	640	700	500
1250 Vdc (450 Vac) (900 V_{pp})	15 nF	12,0 × 16,5 × 19,0	B32692-A0153-+***	480	550	500
	1,0 nF	6,5 × 11,5 × 19,0	B32692-A7102-+***	960	1100	1000
	1,5 nF	6,5 × 11,5 × 19,0	B32692-A7152-+***	960	1100	1000
	2,2 nF	6,5 × 12,0 × 19,0	B32692-A7222-+***	960	1100	1000
	3,3 nF	7,0 × 12,5 × 19,0	B32692-A7332-+***	830	900	1000
	4,7 nF	7,0 × 12,5 × 19,0	B32692-A7472-+***	830	900	1000
	6,8 nF	7,5 × 14,0 × 19,0	B32692-A7682-+***	830	900	1000
	10 nF	9,0 × 15,5 × 19,0	B32692-A7103-+***	640	700	500
	15 nF	12,0 × 16,5 × 19,0	B32692-A7153-+***	480	550	500
*** Code number for packing (taped version)				289	189	see table below
+ Code letter for capacitance tolerance						

Capacitance tolerance: $\pm 10\% \triangleq K$, $\pm 5\% \triangleq J$, $\pm 3,5\% \triangleq A$ ($\pm 2,5\%$ upon request)

*** Code number for untaped versions (for Ammo pack and reel see table above):

Untaped versions (bulk)	Enlarged, standard or reduced lead spacings				
	7,5 mm	10 mm	12,5 mm	15,0 mm	17,5 mm
Lead length (6 – 1) mm	030	040	050	010	060
Lead length min. 20 mm				011	



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Ordering codes and packing units, lead spacing 15 mm

V_R (V_{rms} , $f \leq 1$ kHz) ($V_{peak\ to\ peak}$)	C_R	Maximum dimensions $b \times h \times l$ (mm)	Ordering code	Packing unit (pcs)		
				Ammo pack	Reel	Untaped
1600 Vdc (450 Vac) (1100 V_{pp})	0,22 nF	6,0 × 11,5 × 19,0	B32692-A1221-+***	960	1100	1000
	0,33 nF	6,0 × 11,5 × 19,0	B32692-A1331-+***	960	1100	1000
	0,47 nF	6,0 × 11,5 × 19,0	B32692-A1471-+***	960	1100	1000
	0,68 nF	6,0 × 11,5 × 19,0	B32692-A1681-+***	960	1100	1000
	1,0 nF	6,0 × 11,5 × 19,0	B32692-A1102-+***	960	1100	1000
	1,5 nF	6,0 × 11,5 × 19,0	B32692-A1152-+***	960	1100	1000
	2,2 nF	7,0 × 12,0 × 19,0	B32692-A1222-+***	830	900	1000
	3,3 nF	8,0 × 13,5 × 19,0	B32692-A1332-+***	680	700	1000
	4,7 nF	9,5 × 15,5 × 19,0	B32692-A1472-+***	640	700	1000
	6,8 nF	10,5 × 16,0 × 19,0	B32692-A1682-+***	570	630	500
	10 nF	12,5 × 17,5 × 19,0	B32692-A1103-+***	480	550	500
	15 nF	15,5 × 19,0 × 19,0	B32692-A1153-+***	400	500	500
2000 Vdc (500 Vac) (1350 V_{pp})	0,22 nF	6,5 × 11,5 × 19,0	B32692-A2221-+***	960	1100	1000
	0,33 nF	6,5 × 11,5 × 19,0	B32692-A2331-+***	960	1100	1000
	0,47 nF	6,5 × 11,5 × 19,0	B32692-A2471-+***	960	1100	1000
	0,68 nF	6,5 × 12,5 × 19,0	B32692-A2681-+***	960	1100	1000
	1,0 nF	6,5 × 12,5 × 19,0	B32692-A2102-+***	960	1100	1000
	1,5 nF	6,5 × 12,5 × 19,0	B32692-A2152-+***	960	1100	1000
	2,2 nF	7,0 × 13,5 × 19,0	B32692-A2222-+***	830	900	500
	3,3 nF	8,5 × 15,0 × 19,0	B32692-A2332-+***	640	700	500
	4,7 nF	10,5 × 16,0 × 19,0	B32692-A2472-+***	570	630	500
	6,8 nF	12,5 × 17,5 × 19,0	B32692-A2682-+***	480	550	500
	8,2 nF	14,0 × 18,0 × 19,0	B32692-A2822-+***	400	500	250
	10 nF	15,0 × 18,5 × 19,0	B32692-A2103-+***	330	440	250
*** Code number for packing (taped version)				289	189	see table below
+ Code letter for capacitance tolerance						

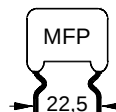
Capacitance tolerance: $\pm 10\% \triangleq K$, $\pm 5\% \triangleq J$, $\pm 3,5\% \triangleq A$ ($\pm 2,5\%$ upon request)

*** Code number for untaped versions (for Ammo pack and reel see table above):

Untaped versions (bulk)	Enlarged, standard or reduced lead spacings				
	7,5 mm	10 mm	12,5 mm	15,0 mm	17,5 mm
Lead lengths (6 – 1) mm	030	040	050	010	060
Lead length min. 20 mm				011	



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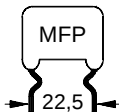
Ordering codes and packing units, lead spacing 22,5 mm

V_R (V_{rms} , $f \leq 1$ kHz) ($V_{peak\ to\ peak}$)	C_R	Maximum dimensions $b \times h \times l$ (mm)	Ordering code	Packing unit (pcs)		
				Ammo pack	Reel	Untaped
630 Vdc (300 Vac) (560 V_{pp})	22 nF	6,5 × 12,5 × 27,5	B32693-A6223-+***	680	700	1000
	33 nF	7,0 × 15,0 × 27,5	B32693-A6333-+***	580	600	500
	47 nF	8,0 × 17,0 × 27,5	B32693-A6473-+***	480	550	500
	68 nF	9,5 × 17,5 × 27,5	B32693-A6683-+***	390	400	500
	0,10 μ F	11,5 × 19,5 × 27,5	B32693-A6104-+***	370	350	250
1250 Vdc (450 Vac) (900 V_{pp})	10 nF	7,0 × 15,0 × 27,5	B32693-A7103-+***	580	600	500
	15 nF	8,0 × 16,0 × 27,5	B32693-A7153-+***	480	500	500
	22 nF	10,0 × 17,5 × 27,5	B32693-A7223-+***	390	400	500
	33 nF	12,0 × 19,5 × 27,5	B32693-A7333-+***	310	320	250
	47 nF	14,0 × 21,0 × 27,5	B32693-A7473-+***	230	240	250
1600 Vdc (450 Vac) (1100 V_{pp})	3,3 nF	7,0 × 13,0 × 27,5	B32693-A1332-+***	580	600	1000
	4,7 nF	7,0 × 13,0 × 27,5	B32693-A1472-+***	580	600	1000
	6,8 nF	7,0 × 16,0 × 27,5	B32693-A1682-+***	580	600	500
	10 nF	8,0 × 17,0 × 27,5	B32693-A1103-+***	480	500	500
	15 nF	9,5 × 17,5 × 27,5	B32693-A1153-+***	390	400	250
	22 nF	11,5 × 19,5 × 27,5	B32693-A1223-+***	310	320	250
	33 nF	15,5 × 22,5 × 27,5	B32693-A1333-+***	220	230	250
2000 Vdc (500 Vac) (1350 V_{pp})	2,2 nF	7,0 × 14,0 × 27,5	B32693-A2222-+***	580	600	1000
	3,3 nF	7,0 × 14,0 × 27,5	B32693-A2332-+***	580	600	1000
	4,7 nF	7,0 × 15,5 × 27,5	B32693-A2472-+***	580	600	500
	6,8 nF	9,0 × 16,5 × 27,5	B32693-A2682-+***	390	400	500
	10 nF	10,5 × 17,5 × 27,5	B32693-A2103-+***	390	400	250
	15 nF	13,0 × 20,5 × 27,5	B32693-A2153-+***	310	320	250
	22 nF	15,5 × 22,5 × 27,5	B32693-A2223-+***	220	230	250
*** Code number for packing (taped version)				289	189	see table below
+ Code letter for capacitance tolerance						

Capacitance tolerance: $\pm 10\% \triangleq K$, $\pm 5\% \triangleq J$, $\pm 3,5\% \triangleq A$ ($\pm 2,5\%$ upon request)

*** Code number for untaped versions (for Ammo pack and reel see table above):

Untaped versions (bulk)	Enlarged, standard or reduced lead spacings			
	17,5 mm	20 mm	22,5 mm	25 mm
Lead lengths (6 – 1) mm	060	070	010	080
Lead length min. 20 mm			011	



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Ordering codes and packing units, lead spacing 22,5 mm

V_R (V_{rms} , $f \leq 1$ kHz) ($V_{peak\ to\ peak}$)	C_R	Maximum dimensions $b \times h \times l$ (mm)	Ordering code	Packing unit (pcs)		
				Ammo pack	Reel	Untaped
2500 Vdc (750 Vac) (1500 V _{pp})	1,0 nF	7,5 × 14,0 × 27,5	B32693-A3102-+***	580	600	1000
	1,5 nF	7,5 × 15,0 × 27,5	B32693-A3152-+***	580	600	1000
	2,2 nF	8,0 × 16,0 × 27,5	B32693-A3222-+***	480	500	500
	3,3 nF	9,5 × 16,0 × 27,5	B32693-A3332-+***	390	400	500
	4,7 nF	10,0 × 18,5 × 27,5	B32693-A3472-+***	390	400	500
	6,8 nF	12,0 × 20,5 × 27,5	B32693-A3682-+***	310	320	250
	10 nF	14,0 × 23,0 × 27,5	B32693-A3103-+***	220	230	250
	15 nF	17,0 × 26,0 × 27,5	B32693-A3153-+***	200	200	200
*** Code number for packing (taped version)				289	189	see table below
+ Code letter for capacitance tolerance						

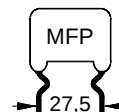
Capacitance tolerance: $\pm 10\ \% \hat{=} K$, $\pm 5\ \% \hat{=} J$, $\pm 3,5\ \% \hat{=} A$ ($\pm 2,5\ \%$ upon request)

*** Code number for untaped versions (for Ammo pack and reel see table above):

Untaped versions (bulk)	Enlarged, standard or reduced lead spacings			
	17,5 mm	20 mm	22,5 mm	25 mm
Lead lengths (6 – 1) mm	060	070	010	080
Lead length min. 20 mm			011	



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Ordering codes and packing units, lead spacing 27,5 mm

V_R (V_{rms} , $f \leq 1$ kHz) ($V_{peak\ to\ peak}$)	C_R	Maximum dimensions $b \times h \times l$ (mm)	Ordering code	Packing unit (pcs) Untaped
630 Vdc (300 Vac) (560 V_{pp})	0,10 μF	9,5 × 18,0 × 32,5	B32694-A6104-+***	250
	0,15 μF	12,0 × 22,0 × 32,5	B32694-A6154-+***	200
	0,22 μF	13,5 × 22,5 × 32,5	B32694-A6224-+***	200
	0,33 μF	16,0 × 25,5 × 32,5	B32694-A6334-+***	150
1250 Vdc (450 Vac) (900 V_{pp})	33 nF	9,5 × 18,0 × 32,5	B32694-A7333-+***	250
	47 nF	11,5 × 20,0 × 32,5	B32694-A7473-+***	250
	68 nF	13,0 × 23,0 × 32,5	B32694-A7683-+***	200
	0,10 μF	16,0 × 26,0 × 32,5	B32694-A7104-+***	150
1600 Vdc (450 Vac) (1100 V_{pp})	10 nF	8,5 × 15,5 × 32,5	B32694-A1103-+***	500
	15 nF	8,5 × 17,0 × 32,5	B32694-A1153-+***	500
	22 nF	10,0 × 18,5 × 32,5	B32694-A1223-+***	250
	33 nF	12,0 × 22,0 × 32,5	B32694-A1333-+***	250
	47 nF	14,0 × 22,5 × 32,5	B32694-A1473-+***	200
	68 nF	16,0 × 25,5 × 32,5	B32694-A1683-+***	150
2000 Vdc (500 Vac) (1350 V_{pp})	10 nF	8,5 × 17,0 × 32,5	B32694-A2103-+***	500
	15 nF	10,0 × 20,0 × 32,5	B32694-A2153-+***	250
	22 nF	12,0 × 22,0 × 32,5	B32694-A2223-+***	250
	33 nF	15,0 × 25,0 × 32,5	B32694-A2333-+***	200

Capacitance tolerance: $\pm 10\%$ $\triangleq$ K, $\pm 5\%$ $\triangleq$ J, $\pm 3,5\%$ $\triangleq$ A ($\pm 2,5\%$ upon request)

+ Code letter for capacitance tolerance.

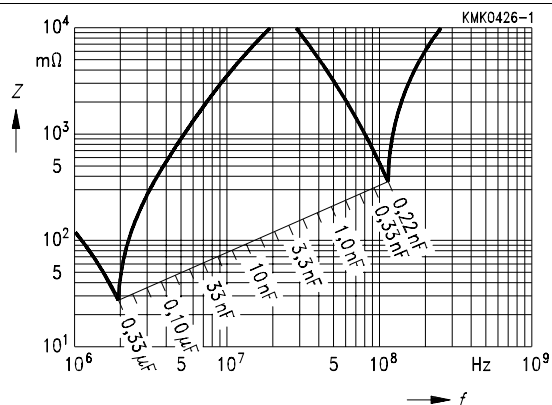
*** Code number for untaped versions:

Untaped versions (bulk)	Enlarged, standard or reduced lead spacings	
	25 mm	27,5 mm
Lead lengths (6 – 1) mm	090	010
Lead length min. 20 mm		011


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Technical data

Climatic category in accordance with IEC 60068-1	55/100/56
Lower category temperature $T_{\min}$	– 55 °C
Upper category temperature $T_{\max}$	+ 100 °C
Damp heat test	56 days/40 °C/93 % relative humidity
Limit values after damp heat test	Capacitance change $ \Delta C/C $ $\leq 2 \%$ Dissipation factor change $\Delta \tan \delta$ $\leq 1,0 \cdot 10^{-3}$ (at 10 kHz) Insulation resistance R_{is} $\geq 50 \%$ of minimum as-delivered values
Reliability:	
Reference conditions	$0,5 \cdot V_R$; 40 °C
Failure rate	$2 \cdot 10^{-9}/\text{h} = 2 \text{ fit}$
Service life	200 000 h
Failure criteria:	
Total failure	Short circuit or open circuit
Failure due to variation of parameters	Capacitance change $ \Delta C/C $ $> 10 \%$ Dissipation factor $\tan \delta$ $4 \cdot$ upper limit values Insulation resistance R_{is} $< 1500 \text{ M}\Omega$
DC test voltage	$2,0 \cdot V_R$, 2 s
Category voltage V_C Operation with dc voltage or ac voltage V_{rms} up to 1 kHz	$T \leq 85 \text{ °C}$: $V_C = 1,0 \cdot V_R$ or $1,0 \cdot V_{\text{rms}}$
Dissipation factor $\tan \delta$ at 20 °C (upper limit values)	$1,0 \cdot 10^{-3}$ (at 10 kHz)
Insulation resistance R_{is} at 20 °C, rel. humidity $\leq 65 \%$ (minimum as-delivered values)	100 G Ω

Impedance Z
versus
frequency f
(typical values)



Pulse handling capability

Maximum permissible voltage change per unit of time for non-sinusoidal voltages
(pulse, sawtooth)

V_R	Max. rate of voltage rise V_{pp}/τ in V/ μ s (for $V_{pp} = V_R$)		
	Lead spacing		
	15 mm	22,5 mm	27,5 mm
630 Vdc	5 000	3 000	2 000
1000 Vdc	8 000	5 000	3 000
1250 Vdc	12 000	7 000	4 500
1600 Vdc	14 000	9 000	5 500
2000 Vdc	17 000	12 000	7 000
2500 Vdc	—	14 000	—

For $V_{pp} < V_R$, the permissible voltage rise rate value V_{pp}/τ may be multiplied by the factor V_R/V_{pp} .
Also refer to the calculation example in chapter "General technical information", page 169.

V_R	Pulse characteristic k_0 in V ² / μ s (for $V_{pp} \leq V_R$)		
	Lead spacing		
	15 mm	22,5 mm	27,5 mm
630 Vdc	6 300 000	3 800 000	2 500 000
1000 Vdc	16 000 000	10 000 000	6 000 000
1250 Vdc	30 000 000	17 500 000	11 000 000
1600 Vdc	45 000 000	29 000 000	17 500 000
2000 Vdc	68 000 000	48 000 000	28 000 000
2500 Vdc	—	59 000 000	—



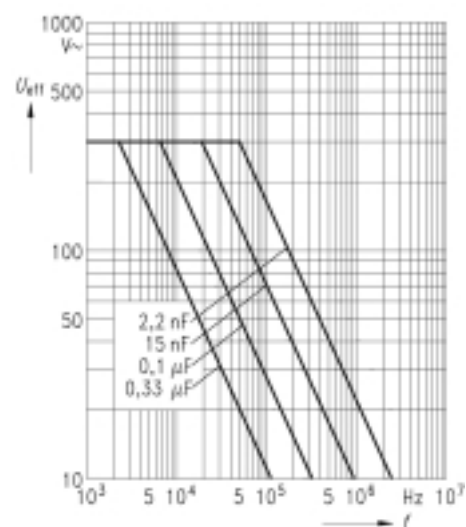
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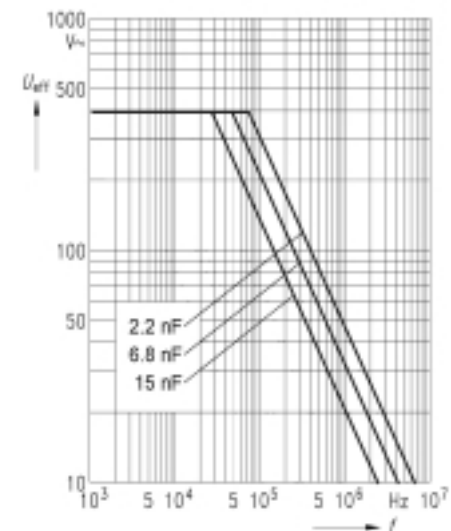
Permissible ac voltage V_{rms} versus frequency f

Lead spacing 15 ... 27,5 mm

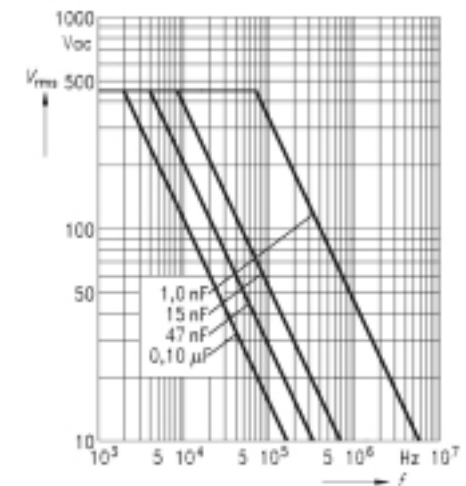
630 Vdc/ 300 Vac



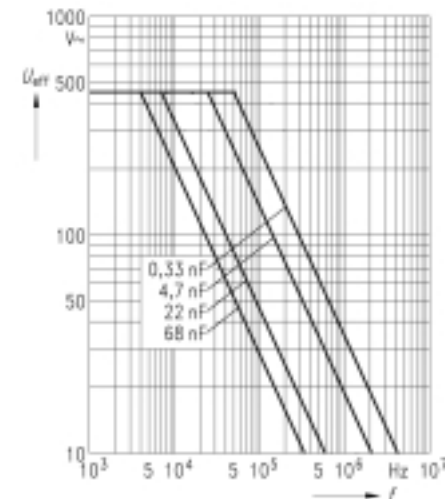
1000 Vdc/ 400 Vac



1250 Vdc/ 450 Vac



1600 Vdc/ 450 Vac



Permissible ac voltage V_{rms} versus frequency f

Lead spacing 15 ... 27,5 mm

2000 Vdc/ 500 Vac

