

# Metallized Polypropylene Film Capacitors (MKP) in Plastic Case

B 32 651 ... B 32 656

400 4140

## Wound MKP capacitors Very small dimensions

### Construction

- Dielectric: polypropylene
- Wound capacitor technology with internal series connection for  $V_R \geq 1250$  Vdc
- Plastic case (UL 94 V-0)
- Epoxy resin sealing

### Features

- High pulse strength
- High contact reliability
- Very small dimensions

### Typical applications

- TV S-correction
- TV flyback
- Electronic ballast circuits

### Terminals

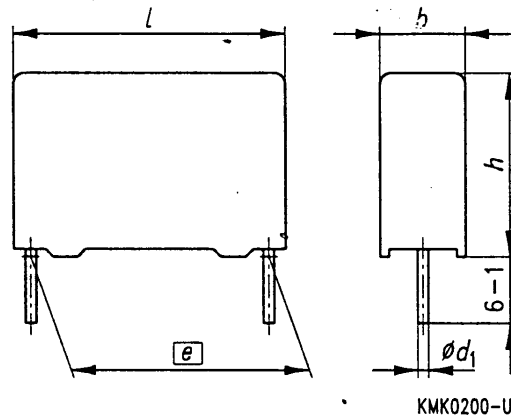
- Parallel wire leads, tinned
- Also available with  $(3,2 \pm 0,3)$  mm lead length

### Marking

Manufacturer's logo,  
lot number for lead spacing  $\leq 27,5$  mm  
style (MKP),  
rated capacitance (coded),  
capacitance tolerance (code letter),  
rated dc voltage  
(ac voltage for 1600 Vdc/700 Vac and  
2000 Vdc/1000 Vac)  
date of manufacture (coded)

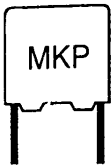
### Delivery mode

Bulk  
Taped (Ammo pack or reel)  
For notes on taping refer to page 279.



Dimensions in mm

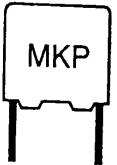
Lead spacing $e \pm 0,4$	Diameter $d_1$	Type
10,0	0,6	B 32 651
15,0	0,8	B 32 652
22,5	0,8	B 32 653
27,5	0,8	B 32 654
37,5	1,0	B 32 656



# B 32 651 ... B 32 656

## Overview of available types

Lead spacing	10 mm	15 mm						22,5 mm
Type	B 32 651	B 32 652						B 32 653
Page	146	147						149
1,0 nF								
1,5 nF								
2,2 nF	1250 Vdc							
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								
0,47 µF								
0,68 µF								
1,0 µF								
1,5 µF								
2,2 µF								
3,3 µF								
4,7 µF								



Overview of available types

Lead spacing	27,5 mm										37,5 mm									
Type	B 32 654										B 32 656									
Page	151										152									
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																				
0,47 µF																				
0,68 µF																				
1,0 µF																				
1,5 µF																				
2,2 µF																				
3,3 µF																				
4,7 µF																				

250 Vdc

400 Vdc

630 Vdc

1000 Vdc

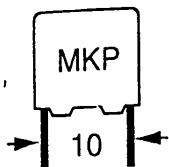
1250 Vdc

1600 Vdc

2000 Vdc

1000 Vdc

1250 Vdc



B 32 651

Ordering codes and packing units, lead spacing 10 mm

$V_R$ ( $V_{rms}$ $f \leq 1$ kHz)	$C_R$	Maximum dimensions $b \times h \times l$ (mm)	Ordering code <sup>1)</sup>	Packing units (pcs)		
				Ammo pack	Reel	Untaped
1250 Vdc <sup>2)</sup> (500 Vac)	2,2 nF	4,0 × 9,0 × 13,0	B32651-A7222-+***	1000	1700	1000
	3,3 nF	5,0 × 11,0 × 13,0	B32651-A7332-+***	830	1300	1000
	4,7 nF	5,0 × 11,0 × 13,0	B32651-A7472-+***	830	1300	1000
	6,8 nF	6,0 × 12,0 × 13,0	B32651-A7682-+***	680	1100	1000

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

Order

$V_R$   
( $V_{rms}$   
 $f \leq 1$  kHz)

250 V  
(160 V)

400 V  
(200 V)

630 V  
(250 V)

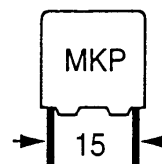
1000 V  
(250 V)

1250 V  
(500 V)

1600 V  
(500 V)

- 1) Replace the + by the code letter for the required capacitance tolerance.  
 Replace the \*\*\* by the code number for the required packing: Ammo pack = 289, reel = 189  
 The ordering code for untaped components ends after the tolerance code letter.  
 For capacitors with 3,2 mm lead length, append code number "3" to the tolerance code, e.g: B32651-A7222-K3
- 2) For pulse loads (pulse width  $\leq 1000 \mu s$ ), a peak voltage of 1400  $V_p$  can be permitted.

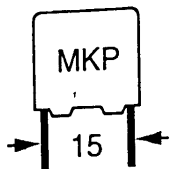
1)



## Ordering codes and packing units, lead spacing 15 mm

$V_R$ ( $V_{rms}$ $f \leq 1$ kHz)	$C_R$	Maximum dimensions $b \times h \times l$ (mm)	Ordering code <sup>1)</sup>	Packing units (pcs)		
				Ammo pack	Reel	Untaped
250 Vdc (160 Vac)	0,15 $\mu$ F	5,0 $\times$ 10,5 $\times$ 18,0	B32652-A3154-+***	1170	1300	1000
	0,22 $\mu$ F	6,0 $\times$ 11,0 $\times$ 18,0	B32652-A3224-+***	960	1100	1000
	0,33 $\mu$ F	7,0 $\times$ 12,5 $\times$ 18,0	B32652-A3334-+***	830	900	1000
	0,47 $\mu$ F	8,5 $\times$ 14,5 $\times$ 18,0	B32652-A3474-+***	680	700	500
	0,68 $\mu$ F	9,0 $\times$ 17,5 $\times$ 18,0	B32652-A3684-+***	640	700	500
400 Vdc (200 Vac)	68 nF	5,0 $\times$ 10,5 $\times$ 18,0	B32652-A4683-+***	1170	1300	1000
	0,10 $\mu$ F	5,0 $\times$ 10,5 $\times$ 18,0	B32652-A4104-+***	1170	1300	1000
	0,15 $\mu$ F	6,0 $\times$ 11,0 $\times$ 18,0	B32652-A4154-+***	960	1100	1000
	0,22 $\mu$ F	7,0 $\times$ 12,5 $\times$ 18,0	B32652-A4224-+***	830	900	1000
	0,33 $\mu$ F	8,5 $\times$ 14,5 $\times$ 18,0	B32652-A4334-+***	680	700	500
	0,47 $\mu$ F	9,0 $\times$ 17,5 $\times$ 18,0	B32652-A4474-+***	640	700	500
630 Vdc (250 Vac)	33 nF	5,0 $\times$ 10,5 $\times$ 18,0	B32652-A6333-+***	1170	1300	1000
	47 nF	5,0 $\times$ 10,5 $\times$ 18,0	B32652-A6473-+***	1170	1300	1000
	68 nF	6,0 $\times$ 11,0 $\times$ 18,0	B32652-A6683-+***	960	1100	1000
	0,10 $\mu$ F	7,0 $\times$ 12,5 $\times$ 18,0	B32652-A6104-+***	830	900	1000
	0,15 $\mu$ F	8,5 $\times$ 14,5 $\times$ 18,0	B32652-A6154-+***	680	700	500
	0,22 $\mu$ F	9,0 $\times$ 17,5 $\times$ 18,0	B32652-A6224-+***	640	700	500
1000 Vdc (250 Vac)	10 nF	5,0 $\times$ 10,5 $\times$ 18,0	B32652-A103-+***	1170	1300	1000
	15 nF	5,0 $\times$ 10,5 $\times$ 18,0	B32652-A153-+***	1170	1300	1000
	22 nF	5,0 $\times$ 10,5 $\times$ 18,0	B32652-A223-+***	1170	1300	1000
	33 nF	6,0 $\times$ 11,0 $\times$ 18,0	B32652-A333-+***	960	1100	1000
	47 nF	7,0 $\times$ 12,5 $\times$ 18,0	B32652-A473-+***	830	900	1000
	68 nF	8,5 $\times$ 14,5 $\times$ 18,0	B32652-A683-+***	680	700	500
	0,10 $\mu$ F	9,0 $\times$ 17,5 $\times$ 18,0	B32652-A104-+***	640	700	500
1250 Vdc (500 Vac)	6,8 nF	5,0 $\times$ 10,5 $\times$ 18,0	B32652-A7682-+***	1170	1300	1000
	10 nF	6,0 $\times$ 11,0 $\times$ 18,0	B32652-A7103-+***	960	1100	1000
	15 nF	7,0 $\times$ 12,5 $\times$ 18,0	B32652-A7153-+***	830	900	1000
	22 nF	8,5 $\times$ 14,5 $\times$ 18,0	B32652-A7223-+***	680	700	500
	33 nF	9,0 $\times$ 17,5 $\times$ 18,0	B32652-A7333-+***	640	700	500
1600 Vdc (500 Vac)	3,3 nF	5,0 $\times$ 10,5 $\times$ 18,0	B32652-A1332-+***	1170	1300	1000
	4,7 nF	6,0 $\times$ 11,0 $\times$ 18,0	B32652-A1472-+***	960	1100	1000
	6,8 nF	7,0 $\times$ 12,5 $\times$ 18,0	B32652-A1682-+***	830	900	1000
	10 nF	8,5 $\times$ 14,5 $\times$ 18,0	B32652-A1103-+***	680	700	500
	15 nF	9,0 $\times$ 17,5 $\times$ 18,0	B32652-A1153-+***	640	700	500

1) For instruction on how to determine the ordering code, see next page.



# B 32 652

## Ordering codes and packing units, lead spacing 15 mm

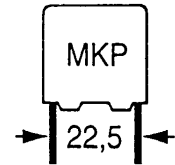
$V_R$ ( $V_{rms}$ $f \leq 1$ kHz)	$C_R$	Maximum dimensions $b \times h \times l$ (mm)	Ordering code <sup>1)</sup>	Packing units (pcs)		
				Ammo pack	Reel	Untaped
1600 Vdc <sup>2)</sup> (700Vac)	2,2 nF	5,0 × 10,5 × 18,0	B32652-J1222-+***	1170	1300	1000
	3,3 nF	6,0 × 11,0 × 18,0	B32652-J1332-+***	960	1100	1000
	4,7 nF	7,0 × 12,5 × 18,0	B32652-J1472-+***	830	900	1000
	6,8 nF	8,5 × 14,5 × 18,0	B32652-J1682-+***	680	700	500
	10 nF	9,0 × 17,5 × 18,0	B32652-J1103-+***	640	700	500
2000 Vdc (700 Vac)	1,0 nF	5,0 × 10,5 × 18,0	B32652-A2102-+***	1170	1300	1000
	1,5 nF	6,0 × 11,0 × 18,0	B32652-A2152-+***	960	1100	1000
	2,2 nF	7,0 × 12,5 × 18,0	B32652-A2222-+***	830	900	1000
	3,3 nF	8,5 × 14,5 × 18,0	B32652-A2332-+***	680	700	500
	4,7 nF	9,0 × 17,5 × 18,0	B32652-A2472-+***	640	700	500

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

1) Replace the + by the code letter for the required capacitance tolerance.  
 Replace the \*\*\* by the code number for the required packing: Ammo pack = 289, reel = 189  
 The ordering code for untaped components ends after the tolerance code letter.  
 For capacitors with 3,2 mm lead length, append code number "3" to the tolerance code, e.g: B32652-J1222-K3

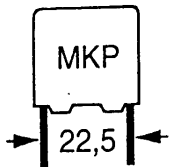
2) Additional capacitance ratings upon request

Or  
 $V_F$   
 $(V_i$   
 $f \leq$   
 25  
 (16  
 40  
 (20  
 63  
 (25  
 100  
 (25  
 125  
 (50  
 160  
 (50  
 1)


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

$V_R$ ( $V_{rms}$ $f \leq 1$ kHz)	$C_R$	Maximum dimensions $b \times h \times l$ (mm)	Ordering code <sup>1)</sup>	Packing units (pcs)		
				Ammo pack	Reel	Untaped
250 Vdc (160 Vac)	0,22 $\mu$ F	6,0 $\times$ 15,0 $\times$ 26,5	B32653-A3224-+***	680	700	720
	0,33 $\mu$ F	6,0 $\times$ 15,0 $\times$ 26,5	B32653-A3334-+***	680	700	720
	0,47 $\mu$ F	7,0 $\times$ 16,0 $\times$ 26,5	B32653-A3474-+***	580	600	630
	0,68 $\mu$ F	8,5 $\times$ 16,5 $\times$ 26,5	B32653-A3684-+***	480	500	510
	1,0 $\mu$ F	10,5 $\times$ 16,5 $\times$ 26,5	B32653-A3105-+***	390	400	610
400 Vdc (200 Vac)	0,15 $\mu$ F	6,0 $\times$ 15,0 $\times$ 26,5	B32653-A4154-+***	680	700	720
	0,22 $\mu$ F	6,0 $\times$ 15,0 $\times$ 26,5	B32653-A4224-+***	680	700	720
	0,33 $\mu$ F	7,0 $\times$ 16,0 $\times$ 26,5	B32653-A4334-+***	580	600	630
	0,47 $\mu$ F	8,5 $\times$ 16,5 $\times$ 26,5	B32653-A4474-+***	480	500	510
	0,68 $\mu$ F	10,5 $\times$ 16,5 $\times$ 26,5	B32653-A4684-+***	390	400	610
	1,0 $\mu$ F	11,0 $\times$ 20,5 $\times$ 26,5	B32653-A4105-+***	370	350	510
630 Vdc (250 Vac)	0,10 $\mu$ F	6,0 $\times$ 15,0 $\times$ 26,5	B32653-A6104-+***	680	700	720
	0,15 $\mu$ F	6,0 $\times$ 15,0 $\times$ 26,5	B32653-A6154-+***	680	700	720
	0,22 $\mu$ F	8,5 $\times$ 16,5 $\times$ 26,5	B32653-A6224-+***	480	500	510
	0,33 $\mu$ F	10,5 $\times$ 16,5 $\times$ 26,5	B32653-A6334-+***	390	400	610
	0,47 $\mu$ F	11,0 $\times$ 20,5 $\times$ 26,5	B32653-A6474-+***	370	350	510
1000 Vdc (250 Vac)	33 nF	6,0 $\times$ 15,0 $\times$ 26,5	B32653-A333-+***	680	700	720
	47 nF	6,0 $\times$ 15,0 $\times$ 26,5	B32653-A473-+***	680	700	720
	68 nF	6,0 $\times$ 15,0 $\times$ 26,5	B32653-A683-+***	680	700	720
	0,10 $\mu$ F	8,5 $\times$ 16,5 $\times$ 26,5	B32653-A104-+***	480	500	510
	0,15 $\mu$ F	10,5 $\times$ 16,5 $\times$ 26,5	B32653-A154-+***	390	400	610
	0,22 $\mu$ F	11,0 $\times$ 20,5 $\times$ 26,5	B32653-A224-+***	370	350	510
1250 Vdc (500 Vac)	22 nF	6,0 $\times$ 15,0 $\times$ 26,5	B32653-A7223-+***	680	700	720
	33 nF	6,0 $\times$ 15,0 $\times$ 26,5	B32653-A7333-+***	680	700	720
	47 nF	8,5 $\times$ 16,5 $\times$ 26,5	B32653-A7473-+***	480	500	510
	68 nF	10,5 $\times$ 16,5 $\times$ 26,5	B32653-A7683-+***	390	400	610
	0,10 $\mu$ F	11,0 $\times$ 20,5 $\times$ 26,5	B32653-A7104-+***	370	350	510
1600 Vdc (500 Vac)	6,8 nF	6,0 $\times$ 15,0 $\times$ 26,5	B32653-A1682-+***	680	700	720
	10 nF	6,0 $\times$ 15,0 $\times$ 26,5	B32653-A1103-+***	680	700	720
	15 nF	7,0 $\times$ 16,0 $\times$ 26,5	B32653-A1153-+***	580	600	630
	22 nF	8,5 $\times$ 16,5 $\times$ 26,5	B32653-A1223-+***	480	500	510
	33 nF	10,5 $\times$ 16,5 $\times$ 26,5	B32653-A1333-+***	390	400	610
	47 nF	11,0 $\times$ 20,5 $\times$ 26,5	B32653-A1473-+***	370	350	510

<sup>1)</sup> For instructions on how to determine the ordering code, see next page.



## B 32 653

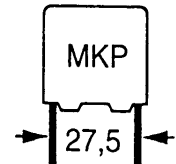
### Ordering codes and packing units, lead spacing 22,5 mm

$V_R$ ( $V_{rms}$ $f \leq 1$ kHz)	$C_R$	Maximum dimensions $b \times h \times l$ (mm)	Ordering code <sup>1)</sup>	Packing units (pcs)		
				Ammo pack	Reel	Untaped
2000 Vdc (700 Vac)	3,3 nF	6,0 × 15,0 × 26,5	B32653-A2332-+***	680	700	720
	4,7 nF	6,0 × 15,0 × 26,5	B32653-A2472-+***	680	700	720
	6,8 nF	8,5 × 16,5 × 26,5	B32653-A2682-+***	480	500	510
	10 nF	10,5 × 16,5 × 26,5	B32653-A2103-+***	390	400	610
	15 nF	11,0 × 20,5 × 26,5	B32653-A2153-+***	370	350	510
2000 Vdc (1000 Vac)	2,2 nF	6,0 × 15,0 × 26,5	B32653-A8222-+***	680	700	720
	3,3 nF	6,0 × 15,0 × 26,5	B32653-A8332-+***	680	700	720
	4,7 nF	8,5 × 16,5 × 26,5	B32653-A8472-+***	480	500	510
	6,8 nF	10,5 × 16,5 × 26,5	B32653-A8682-+***	390	400	610
	10 nF	10,5 × 20,5 × 26,5	B32653-A8103-+***	390	400	540

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

1) Replace the + by the code letter for the required capacitance tolerance.  
 Replace the \*\*\* by the code number for the required packing: Ammo pack = 289, reel = 189  
 The ordering code for untaped components ends after the tolerance code letter.  
 For capacitors with 3,2 mm lead length, append code number "3" to the tolerance code, e.g.: B32653-A2332-K3



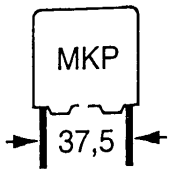


## Ordering codes and packing units, lead spacing 27,5 mm

$V_R$ ( $V_{rms}$ $f \leq 1$ kHz)	$C_R$	Maximum dimensions $b \times h \times l$ (mm)	Ordering code <sup>1)</sup>	Packing units (pcs)		
				Ammo pack	Reel	Untaped
250 Vdc (160 Vac)	1,5 $\mu$ F	11,0 $\times$ 21,0 $\times$ 31,5	B32654-A3155-+***	—	350	320
	2,2 $\mu$ F	12,5 $\times$ 21,5 $\times$ 31,5	B32654-A3225-+***	—	300	280
	3,3 $\mu$ F	15,0 $\times$ 24,5 $\times$ 31,5	B32654-A3335-+***	—	—	240
	4,7 $\mu$ F	18,0 $\times$ 27,5 $\times$ 31,5	B32654-A3475-+***	—	—	200
400 Vdc (200 Vac)	1,0 $\mu$ F	11,0 $\times$ 21,0 $\times$ 31,5	B32654-A4105-+***	—	350	320
	1,5 $\mu$ F	12,5 $\times$ 21,5 $\times$ 31,5	B32654-A4155-+***	—	300	280
	2,2 $\mu$ F	14,0 $\times$ 24,5 $\times$ 31,5	B32654-A4225-+***	—	—	260
	3,3 $\mu$ F	19,0 $\times$ 30,0 $\times$ 31,5	B32654-A4335-+***	—	—	180
630 Vdc (250 Vac)	0,68 $\mu$ F	11,0 $\times$ 21,0 $\times$ 31,5	B32654-A6684-+***	—	350	320
	1,0 $\mu$ F	13,5 $\times$ 23,0 $\times$ 31,5	B32654-A6105-+***	—	250	260
	1,5 $\mu$ F	18,0 $\times$ 27,5 $\times$ 31,5	B32654-A6155-+***	—	—	200
1000 Vdc (250 Vac)	0,22 $\mu$ F	11,0 $\times$ 21,0 $\times$ 31,5	B32654-A224-+***	—	350	320
	0,33 $\mu$ F	11,0 $\times$ 21,0 $\times$ 31,5	B32654-A334-+***	—	350	320
	0,47 $\mu$ F	14,0 $\times$ 24,5 $\times$ 31,5	B32654-A474-+***	—	—	260
	0,68 $\mu$ F	18,0 $\times$ 27,5 $\times$ 31,5	B32654-A684-+***	—	—	200
1250 Vdc (500 Vac)	0,10 $\mu$ F	11,0 $\times$ 21,0 $\times$ 31,5	B32654-A7104-+***	—	350	320
	0,15 $\mu$ F	11,0 $\times$ 21,0 $\times$ 31,5	B32654-A7154-+***	—	350	320
	0,22 $\mu$ F	14,0 $\times$ 24,5 $\times$ 31,5	B32654-A7224-+***	—	—	260
	0,33 $\mu$ F	18,0 $\times$ 27,5 $\times$ 31,5	B32654-A7334-+***	—	—	200
1600 Vdc (500 Vac)	47 nF	11,0 $\times$ 21,0 $\times$ 31,5	B32654-A1473-+***	—	350	320
	68 nF	11,0 $\times$ 21,0 $\times$ 31,5	B32654-A1683-+***	—	350	320
	0,10 $\mu$ F	14,0 $\times$ 24,5 $\times$ 31,5	B32654-A1104-+***	—	—	260
	0,15 $\mu$ F	18,0 $\times$ 27,5 $\times$ 31,5	B32654-A1154-+***	—	—	200
2000 Vdc (700 Vac)	22 nF	11,0 $\times$ 21,0 $\times$ 31,5	B32654-A2223-+***	—	350	320
	33 nF	13,5 $\times$ 23,0 $\times$ 31,5	B32654-A2333-+***	—	250	260
	47 nF	18,0 $\times$ 27,5 $\times$ 31,5	B32654-A2473-+***	—	—	200
	68 nF	19,0 $\times$ 30,0 $\times$ 31,5	B32654-A2683-+***	—	—	180

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

1) Replace the + by the code letter for the required capacitance tolerance.  
 Replace the \*\*\* by the code number for the required packing: reel = 189  
 The ordering code for untaped components ends after the tolerance code letter.  
 For capacitors with 3,2 mm lead length, append code number "3" to the tolerance code, e.g.: B32654-A4105-K3



**B 32 656**

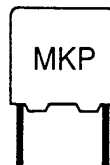
**Ordering codes and packing units, lead spacing 37,5 mm**

$V_R$ ( $V_{rms}$ $f \leq 1$ kHz)	$C_R$	Maximum dimensions $b \times h \times l$ (mm)	Ordering code <sup>1)</sup>	Packing units (pcs)		
				Ammo pack	Reel	Untaped
1000 Vdc (500 Vac)	0,47 $\mu$ F	14,0 $\times$ 25,0 $\times$ 41,5	B32656-A474-+	—	—	115
	0,68 $\mu$ F	16,0 $\times$ 28,5 $\times$ 41,5	B32656-A684-+	—	—	100
	1,0 $\mu$ F	20,0 $\times$ 39,5 $\times$ 41,5	B32656-A105-+	—	—	75
1250 Vdc (500 Vac)	0,33 $\mu$ F	16,0 $\times$ 28,5 $\times$ 41,5	B32656-A7334-+	—	—	100
	0,47 $\mu$ F	18,0 $\times$ 32,5 $\times$ 41,5	B32656-A7474-+	—	—	90
	0,68 $\mu$ F	20,0 $\times$ 39,5 $\times$ 41,5	B32656-A7684-+	—	—	75

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

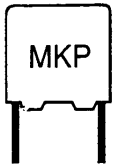
1) Replace the + by the code letter for the required capacitance tolerance.  
For capacitors with 3,2 mm wire leads, append code number "3" to the tolerance code, e.g.: B32656-A474-K3

Tecl  
 Clim  
 in ac  
 Low  
 Upp  
 Dam  
 Limi  
 heat  
 Reli  
 Refe  
 Fail  
 Ser  
 Fail  
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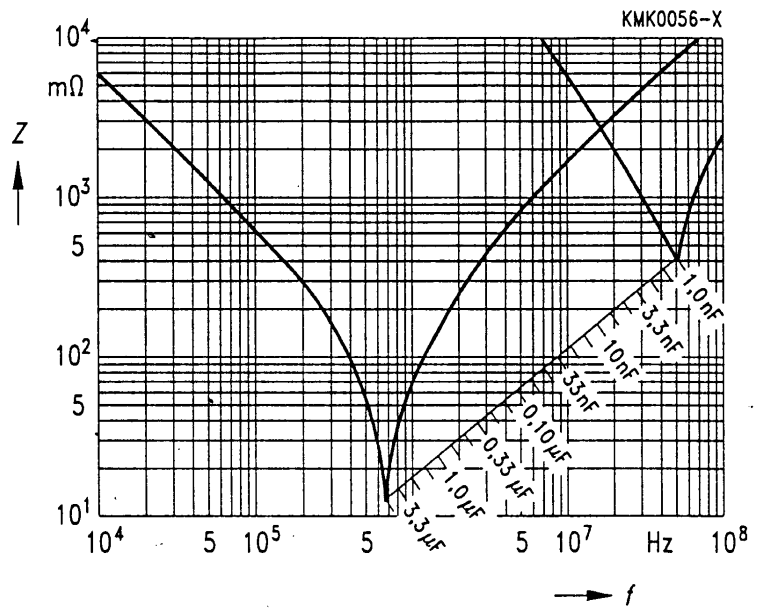
### Technical data

Climatic category in accordance with IEC 68-1	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 $	$\leq 3 \%$		
	Dissipation factor change $\Delta \tan \delta$	$\leq 0,5 \cdot 10^{-3}$ (at 1 kHz) $\leq 1,0 \cdot 10^{-3}$ (at 10 kHz)		
	Insulation resistance $R_{is}$ or time constant $\tau = C_R \cdot R_{is}$	$\geq 50 \%$ of minimum as-delivered values		
Reliability:				
Reference conditions	$0,5 \cdot V_R; 40 \text{ °C}$			
Failure rate	$1 \cdot 10^{-9}/h = 1 \text{ fit}$			
	For a conversion table for other operating conditions and temperatures, refer to page 276.			
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 $R_{is}$ or time constant $\tau = C_R \cdot R_{is}$	$< 1500 \text{ M}\Omega$ ( $C_R \leq 0,33 \mu\text{F}$ ) $< 500 \text{ s}$ ( $C_R > 0,33 \mu\text{F}$ )		
DC test voltage	$1,6 \cdot V_R, 2 \text{ s}$			
Category voltage $V_C$	$T \leq 85 \text{ °C}: V_C = 1,0 \cdot V_R$ or $1,0 \cdot V_{\text{rms}}$			
Operation with Vdc voltage or ac voltage $V_{\text{rms}}$ up to 1 kHz	$T = 100 \text{ °C}: V_C = 0,7 \cdot V_R$ or $0,7 \cdot V_{\text{rms}}$			
Dissipation factor $\tan \delta$ (in $10^{-3}$ ) at 20 °C (upper limit values)		$C_R \leq 0,1 \mu\text{F}$	$0,1 \mu\text{F} < C_R \leq 1 \mu\text{F}$	$C_R > 1 \mu\text{F}$
	at 1 kHz	–	0,5	0,5
	10 kHz	–	0,8	1,5
	100 kHz	5,0	–	–
Insulation resistance $R_{is}$ or time constant $\tau = C_R \cdot R_{is}$ at 20 °C, rel. humidity $\leq 65 \%$ (minimum as-delivered values)	$C_R \leq 0,33 \mu\text{F}$	$C_R > 0,33 \mu\text{F}$		
	100 G $\Omega$	30 000 s		



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Impedance  $Z$   
versus  
frequency  $f$   
(typical values)



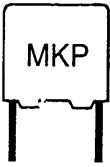
**Pulse handling capability**

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

$V_R$	Max. rate of voltage rise $V_{pp}/\tau$ in $V/\mu s$ (for $V_{pp} = V_R$ )				
	Lead spacing				
	10 mm	15 mm	22,5 mm	27,5 mm	37,5 mm
250 Vdc	–	140	80	50	–
400 Vdc	–	200	100	70	–
630 Vdc	–	270	140	100	–
1000 Vdc	–	400	230	150	90
1250 Vdc	2000	800	500	400	140
1600 Vdc (500 Vac)	–	1500	1000	700	–
1600 Vdc (700 Vac)	–	1900	–	–	–
2000 Vdc (700 Vac)	–	2200	1400	900	–
2000 Vdc (1000 Vac)	–	–	2000	–	–
2500 Vdc	–	–	–	–	–

For  $V_{pp} < V_R$ , the permissible voltage rise rate value  $V_{pp}/\tau$  may be multiplied by the factor  $V_R/V_{pp}$ . Also refer to the calculation example on page 250.

$V_R$	Pulse characteristic $k_0$ in $V^2/\mu s$ (for $V_{pp} \leq V_R$ )				
	Lead spacing				
	10 mm	15 mm	22,5 mm	27,5 mm	37,5 mm
250 Vdc	–	70 000	40 000	25 000	–
400 Vdc	–	160 000	80 000	55 000	–
630 Vdc	–	340 000	170 000	120 000	–
1000 Vdc	–	800 000	450 000	300 000	180 000
1250 Vdc	6 400 000	2 000 000	1 250 000	1 000 000	350 000
1600 Vdc (500 Vac)	–	4 800 000	3 200 000	2 200 000	–
1600 Vdc (700 Vac)	–	6 100 000	–	–	–
2000 Vdc (700 Vac)	–	8 800 000	5 600 000	3 600 000	–
2000 Vdc (1000 Vac)	–	–	10 000 000	–	–
2500 Vdc	–	–	–	–	–



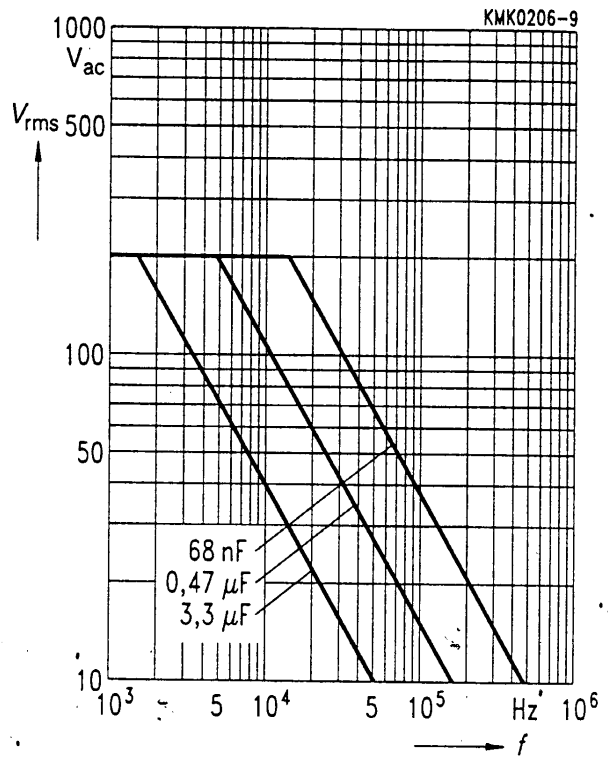
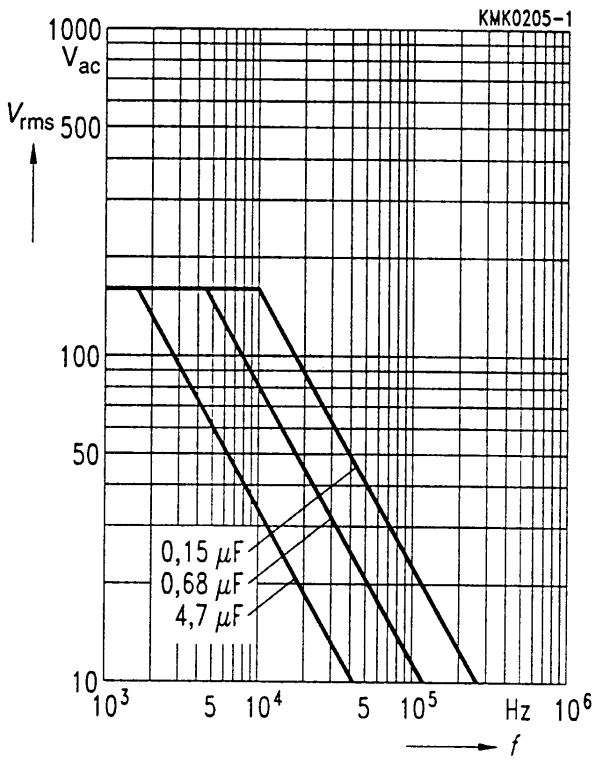
B 32 651 ... B 32 656

Permissible ac voltage  $V_{rms}$  versus frequency  $f$

Lead spacing 15 ... 37,5 mm

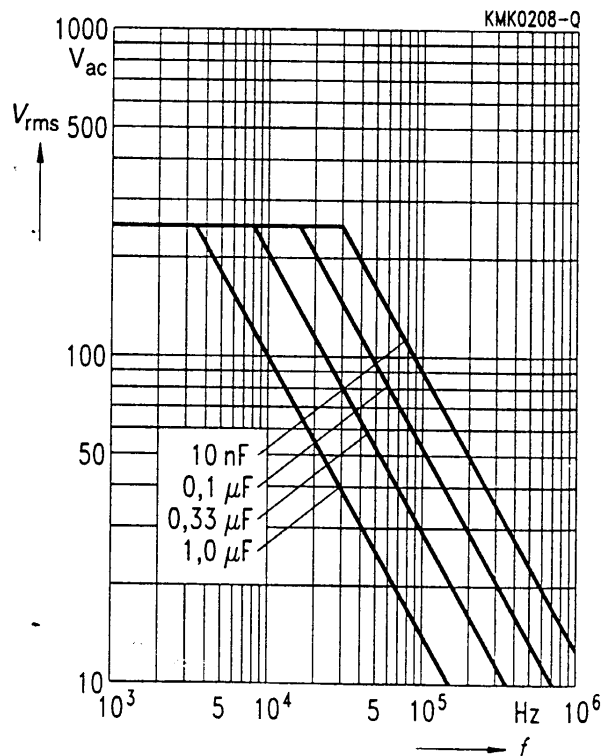
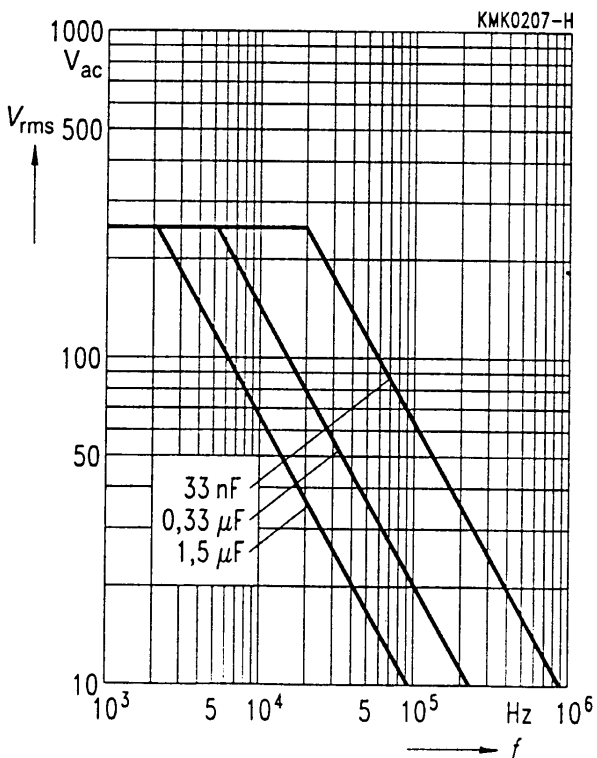
250 Vdc/ 160 Vac

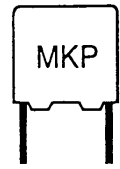
400 Vdc/ 200 Vac



630 Vdc/ 250 Vac

1000 Vdc/ 250 Vac



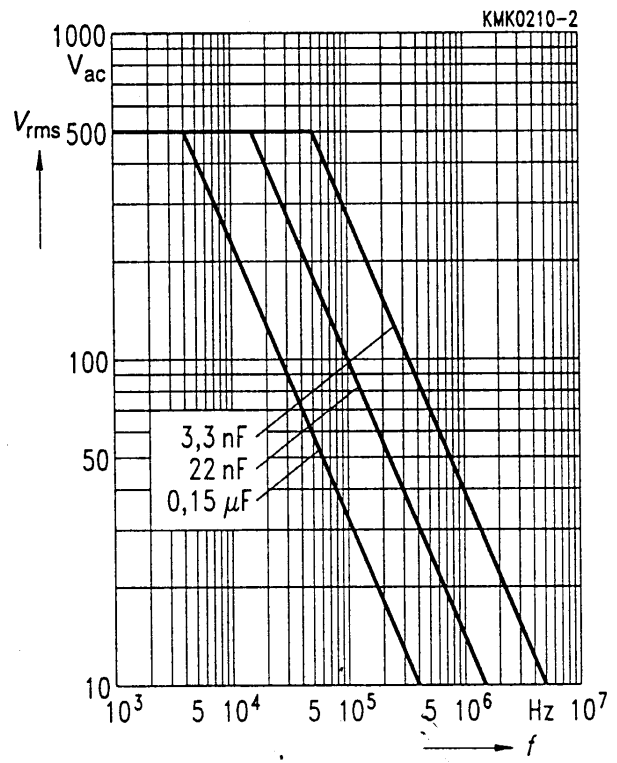
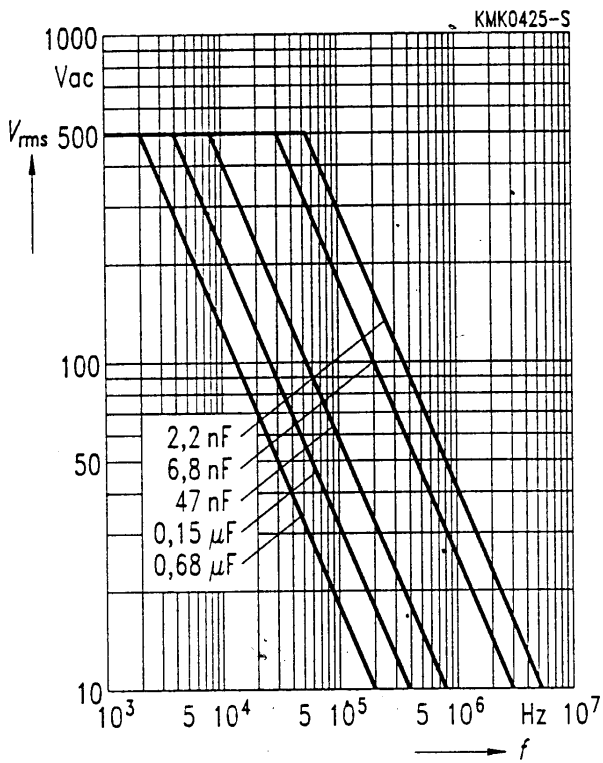


Permissible ac voltage  $V_{rms}$  versus frequency  $f$

Lead spacing 10 ... 37,5 mm

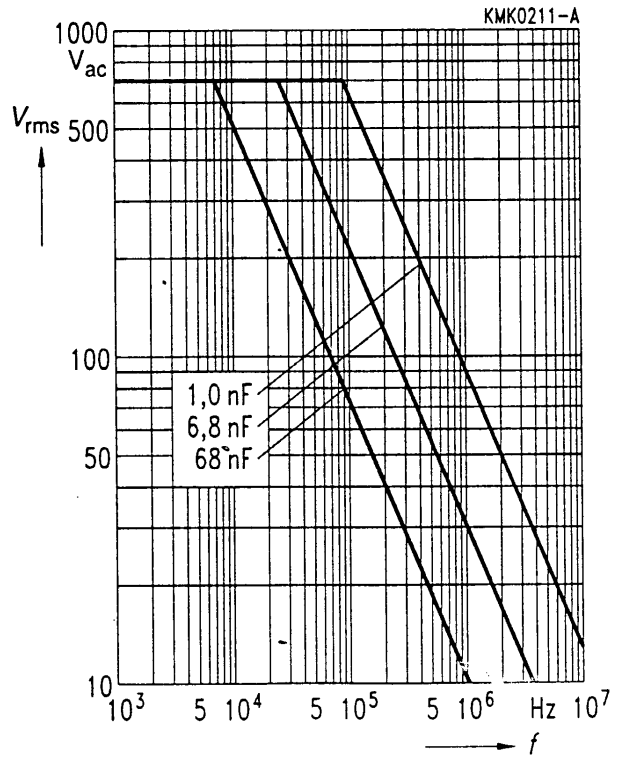
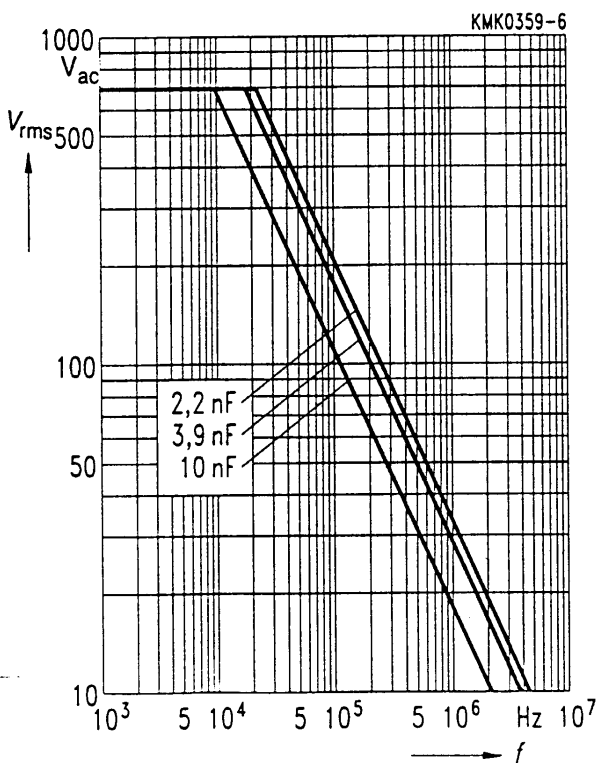
1250 Vdc/ 500 Vac

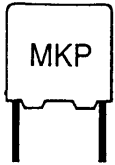
1600 Vdc/ 500 Vac



1600 Vdc/ 700 Vac

2000 Vdc/ 700 Vac





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Permissible ac voltage  $V_{rms}$  versus frequency  $f$

Lead spacing 15 ... 37,5 mm

2000 Vdc/ 1000 Vac

