



## Film Capacitors

### Metallized Polypropylene Film Capacitors (MKP)

**Series/Type:** B32651 ... B32656  
**Date:** August 2004

© EPCOS AG 2004. Reproduction, publication and dissemination of this data sheet, enclosures hereto and the information contained therein without EPCOS' prior express consent is prohibited.

Purchase orders are subject to the General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry recommended by the ZVEI (German Electrical and Electronic Manufacturers' Association), unless otherwise agreed.

**High pulse (wound)**
**Typical applications**

- TV (S-correction/flyback)
- Electronic ballasts

**Climatic**

- Max. operating temperature: 105 °C
- Climatic category (IEC 60068-1): 55/100/56

**Construction**

- Dielectric: polypropylene (PP)
- 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
- Small dimensions

**Terminals**

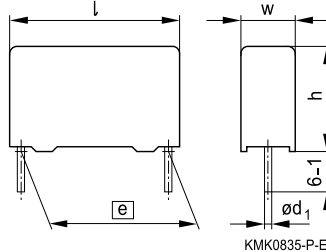
- Parallel wire leads, lead-free tinned
- Special lead lengths available on request

**Marking**

Manufacturer's logo,  
 lot number ( $\boxed{e}$   $\leq 27.5$  mm), series number  
 (e.g. 651),  
 rated capacitance (coded), cap. tolerance (code letter),  
 rated DC voltage  
 (AC voltage for 1600 VDC/700 VAC and  
 2000 VDC/1000 VAC),  
 date of manufacture (coded)

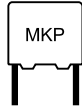
**Delivery mode**

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

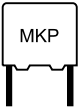
**Dimensional drawing**


Dimensions in mm

Lead spacing $\boxed{e}$ $\pm 0.4$	Lead diameter $d_1$	Type
10	0.6	B32651
15	0.8	B32652
22.5	0.8	B32653
27.5	0.8	B32654
37.5	1.0	B32656


**Overview of available types**

Lead spacing	10 mm	15 mm							
Type	B32651	B32652							
Page	6	7							
$V_R$ (VDC)	1250	250	400	630	1000	1250	1600	1600	2000
$V_{rms}$ (VAC)	450	160	200	250	250	500	500	700	700
$C_R$ (nF)									
1.0									
1.5									
2.2									
3.3									
4.7									
6.8									
10									
15									
22									
33									
47									
68									
100									
150									
220									
330									
470									
680									

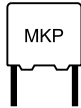


**B32651 ... B32656**

**High pulse (wound)**

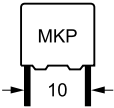
**Overview of available types**

Lead spacing	22.5 mm								27.5 mm						
Type	B32653								B32654						
Page	9								11						
$V_R$ (VDC)	250	400	630	1000	1250	1600	2000	2000	250	400	630	1000	1250	1600	2000
$V_{rms}$ (VAC)	160	200	250	250	500	500	700	1000	160	200	250	250	500	500	700
$C_R$ (nF)															
2.2															
3.3															
4.7															
6.8															
10															
15															
22															
33															
47															
68															
100															
150															
220															
330															
470															
680															
1000															
1500															
2200															
3300															
4700															



**Overview of available types**

Lead spacing	37.5 mm				
Type	B32656				
Page	12				
$V_R$ (VDC)	850	1000	1250	1600	2000
$V_{rms}$ (VAC)	450	500	500	600	700
$C_R$ (nF)					
100					
150					
220					
330					
470					
680					
1000					


**B32651**
**High pulse (wound)**
**Ordering codes and packing units (lead spacing 10 mm)**

$V_R$	$V_{rms}$ $f \leq 1$ kHz	$C_R$	Max. dimensions $w \times h \times l$ mm	Ordering code (composition see below)	Ammo pack pcs./unit	Reel pcs./unit	Untaped pcs./unit
VDC <sup>1)</sup>	VAC	nF					
1250	450	2.2	4.0 × 9.0 × 13.0	B32651A7222+***	1000	1700	1000
		3.3	5.0 × 11.0 × 13.0	B32651A7332+***	830	1300	1000
		4.7	5.0 × 11.0 × 13.0	B32651A7472+***	830	1300	1000
		6.8	6.0 × 12.0 × 13.0	B32651A7682+***	680	1100	1000

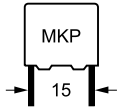
Further E series and intermediate capacitance values on request.

**Composition of ordering code**

+ = Capacitance tolerance code:  
 K = ±10%  
 J = ±5%  
 on request = ±3.5%

\*\*\* = Packaging code:  
 289 = Ammo pack  
 189 = Reel  
 000 = Untaped (lead length 6 – 1 mm)

1) For pulse loads (pulse width ≤ 1000 μs), a peak voltage of 1400  $V_p$  can be permitted.


**Ordering codes and packing units (lead spacing 15 mm)**

$V_R$	$V_{rms}$ $f \leq 1$ kHz VAC	$C_R$ nF	Max. dimensions $w \times h \times l$ mm	Ordering code (composition see below)	Ammo pack pcs./unit	Reel pcs./unit	Untaped pcs./unit
250	160	150	$5.0 \times 10.5 \times 18.0$	B32652A3154+***	1170	1300	1000
		220	$6.0 \times 11.0 \times 18.0$	B32652A3224+***	960	1100	1000
		330	$7.0 \times 12.5 \times 18.0$	B32652A3334+***	830	900	1000
		470	$8.5 \times 14.5 \times 18.0$	B32652A3474+***	680	700	500
		680	$9.0 \times 17.5 \times 18.0$	B32652A3684+***	640	700	500
400	200	68	$5.0 \times 10.5 \times 18.0$	B32652A4683+***	1170	1300	1000
		100	$5.0 \times 10.5 \times 18.0$	B32652A4104+***	1170	1300	1000
		150	$6.0 \times 11.0 \times 18.0$	B32652A4154+***	960	1100	1000
		220	$7.0 \times 12.5 \times 18.0$	B32652A4224+***	830	900	1000
		330	$8.5 \times 14.5 \times 18.0$	B32652A4334+***	680	700	500
630	250	470	$9.0 \times 17.5 \times 18.0$	B32652A4474+***	640	700	500
		33	$5.0 \times 10.5 \times 18.0$	B32652A6333+***	1170	1300	1000
		47	$5.0 \times 10.5 \times 18.0$	B32652A6473+***	1170	1300	1000
		68	$6.0 \times 11.0 \times 18.0$	B32652A6683+***	960	1100	1000
		100	$7.0 \times 12.5 \times 18.0$	B32652A6104+***	830	900	1000
1000	250	150	$8.5 \times 14.5 \times 18.0$	B32652A6154+***	680	700	500
		220	$9.0 \times 17.5 \times 18.0$	B32652A6224+***	640	700	500
		10	$5.0 \times 10.5 \times 18.0$	B32652A0103+***	1170	1300	1000
		15	$5.0 \times 10.5 \times 18.0$	B32652A0153+***	1170	1300	1000
		22	$5.0 \times 10.5 \times 18.0$	B32652A0223+***	1170	1300	1000
1250	500	33	$6.0 \times 11.0 \times 18.0$	B32652A0333+***	960	1100	1000
		47	$7.0 \times 12.5 \times 18.0$	B32652A0473+***	830	900	1000
		68	$8.5 \times 14.5 \times 18.0$	B32652A0683+***	680	700	500
		100	$9.0 \times 17.5 \times 18.0$	B32652A0104+***	640	700	500
		6.8	$5.0 \times 10.5 \times 18.0$	B32652A7682+***	1170	1300	1000
		10	$6.0 \times 11.0 \times 18.0$	B32652A7103+***	960	1100	1000
		15	$7.0 \times 12.5 \times 18.0$	B32652A7153+***	830	900	1000
		22	$8.5 \times 14.5 \times 18.0$	B32652A7223+***	680	700	500
		33	$9.0 \times 17.5 \times 18.0$	B32652A7333+***	640	700	500

Further E series and intermediate capacitance values on request.

**Composition of ordering code**

+ = Capacitance tolerance code:

K =  $\pm 10\%$

J =  $\pm 5\%$

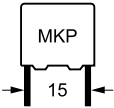
on request =  $\pm 3.5\%$

\*\*\* = Packaging code:

289 = Ammo pack

189 = Reel

000 = Untaped (lead length 6 – 1 mm)


**B32652**
**High pulse (wound)**
**Ordering codes and packing units (lead spacing 15 mm)**

$V_R$	$V_{rms}$ $f \leq 1$ kHz VDC VAC	$C_R$ nF	Max. dimensions $w \times h \times l$ mm	Ordering code (composition see below)	Ammo pack pcs./unit	Reel pcs./unit	Untaped pcs./unit
1600	500	3.3	$5.0 \times 10.5 \times 18.0$	B32652A1332+***	1170	1300	1000
		4.7	$6.0 \times 11.0 \times 18.0$	B32652A1472+***	960	1100	1000
		6.8	$7.0 \times 12.5 \times 18.0$	B32652A1682+***	830	900	1000
		10	$8.5 \times 14.5 \times 18.0$	B32652A1103+***	680	700	500
		15	$9.0 \times 17.5 \times 18.0$	B32652A1153+***	640	700	500
1600	700	2.2	$5.0 \times 10.5 \times 18.0$	B32652J1222+***	1170	1300	1000
		3.3	$6.0 \times 11.0 \times 18.0$	B32652J1332+***	960	1100	1000
		4.7	$7.0 \times 12.5 \times 18.0$	B32652J1472+***	830	900	1000
		6.8	$8.5 \times 14.5 \times 18.0$	B32652J1682+***	680	700	500
		10	$9.0 \times 17.5 \times 18.0$	B32652J1103+***	640	700	500
2000	700	1.0	$5.0 \times 10.5 \times 18.0$	B32652A2102+***	1170	1300	1000
		1.5	$6.0 \times 11.0 \times 18.0$	B32652A2152+***	960	1100	1000
		2.2	$7.0 \times 12.5 \times 18.0$	B32652A2222+***	830	900	1000
		3.3	$8.5 \times 14.5 \times 18.0$	B32652A2332+***	680	700	500
		4.7	$9.0 \times 17.5 \times 18.0$	B32652A2472+***	640	700	500

Further E series and intermediate capacitance values on request.

**Composition of ordering code**

+ = Capacitance tolerance code:

K =  $\pm 10\%$

J =  $\pm 5\%$

on request =  $\pm 3.5\%$

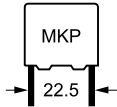
\*\*\* = Packaging code:

289 = Ammo pack

189 = Reel

000 = Untaped (lead length 6 – 1 mm)




**Ordering codes and packing units (lead spacing 22.5 mm)**

$V_R$	$V_{rms}$ $f \leq 1 \text{ kHz}$	$C_R$	Max. dimensions $w \times h \times l$ mm	Ordering code (composition see below)	Ammo pack pcs./unit	Reel pcs./unit	Untaped pcs./unit
VDC	VAC	nF					
250	160	220	$6.0 \times 15.0 \times 26.5$	B32653A3224+***	680	700	720
		330	$6.0 \times 15.0 \times 26.5$	B32653A3334+***	680	700	720
		470	$7.0 \times 16.0 \times 26.5$	B32653A3474+***	580	600	630
		680	$8.5 \times 16.5 \times 26.5$	B32653A3684+***	480	500	510
		1000	$10.5 \times 16.5 \times 26.5$	B32653A3105+***	390	400	540
400	200	150	$6.0 \times 15.0 \times 26.5$	B32653A4154+***	680	700	720
		220	$6.0 \times 15.0 \times 26.5$	B32653A4224+***	680	700	720
		330	$7.0 \times 16.0 \times 26.5$	B32653A4334+***	580	600	630
		470	$8.5 \times 16.5 \times 26.5$	B32653A4474+***	480	500	510
		680	$10.5 \times 16.5 \times 26.5$	B32653A4684+***	390	400	540
		1000	$11.0 \times 20.5 \times 26.5$	B32653A4105+***	370	350	510
630	250	100	$6.0 \times 15.0 \times 26.5$	B32653A6104+***	680	700	720
		150	$6.0 \times 15.0 \times 26.5$	B32653A6154+***	680	700	720
		220	$8.5 \times 16.5 \times 26.5$	B32653A6224+***	480	500	510
		330	$10.5 \times 16.5 \times 26.5$	B32653A6334+***	390	400	540
		470	$11.0 \times 20.5 \times 26.5$	B32653A6474+***	370	350	510
1000	250	33	$6.0 \times 15.0 \times 26.5$	B32653A0333+***	680	700	720
		47	$6.0 \times 15.0 \times 26.5$	B32653A0473+***	680	700	720
		68	$6.0 \times 15.0 \times 26.5$	B32653A0683+***	680	700	720
		100	$8.5 \times 16.5 \times 26.5$	B32653A0104+***	480	500	510
		150	$10.5 \times 16.5 \times 26.5$	B32653A0154+***	390	400	540
		220	$11.0 \times 20.5 \times 26.5$	B32653A0224+***	370	350	510
1250	500	22	$6.0 \times 15.0 \times 26.5$	B32653A7223+***	680	700	720
		33	$6.0 \times 15.0 \times 26.5$	B32653A7333+***	680	700	720
		47	$8.5 \times 16.5 \times 26.5$	B32653A7473+***	480	500	510
		68	$10.5 \times 16.5 \times 26.5$	B32653A7683+***	390	400	540
		100	$11.0 \times 20.5 \times 26.5$	B32653A7104+***	370	350	510

Further E series and intermediate capacitance values on request.

**Composition of ordering code**

+ = Capacitance tolerance code:

K =  $\pm 10\%$

J =  $\pm 5\%$

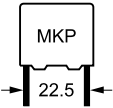
on request =  $\pm 3.5\%$

\*\*\* = Packaging code:

289 = Ammo pack

189 = Reel

000 = Untaped (lead length 6 – 1 mm)


**B32653**
**High pulse (wound)**
**Ordering codes and packing units (lead spacing 22.5 mm)**

$V_R$ VDC	$V_{rms}$ $f \leq 1$ kHz VAC	$C_R$ nF	Max. dimensions $w \times h \times l$ mm	Ordering code (composition see below)	Ammo pack pcs./unit	Reel pcs./unit	Untaped pcs./unit
1600	500	6.8	$6.0 \times 15.0 \times 26.5$	B32653A1682+***	680	700	720
		10	$6.0 \times 15.0 \times 26.5$	B32653A1103+***	680	700	720
		15	$7.0 \times 16.0 \times 26.5$	B32653A1153+***	580	600	630
		22	$8.5 \times 16.5 \times 26.5$	B32653A1223+***	480	500	510
		33	$10.5 \times 16.5 \times 26.5$	B32653A1333+***	390	400	540
		47	$11.0 \times 20.5 \times 26.5$	B32653A1473+***	370	350	510
2000	700	3.3	$6.0 \times 15.0 \times 26.5$	B32653A2332+***	680	700	720
		4.7	$6.0 \times 15.0 \times 26.5$	B32653A2472+***	680	700	720
		6.8	$8.5 \times 16.5 \times 26.5$	B32653A2682+***	480	500	510
		10	$10.5 \times 16.5 \times 26.5$	B32653A2103+***	390	400	540
		15	$11.0 \times 20.5 \times 26.5$	B32653A2153+***	370	350	510
2000	1000	2.2	$6.0 \times 15.0 \times 26.5$	B32653A8222+***	680	700	720
		3.3	$6.0 \times 15.0 \times 26.5$	B32653A8332+***	680	700	720
		4.7	$8.5 \times 16.5 \times 26.5$	B32653A8472+***	480	500	510
		6.8	$10.5 \times 16.5 \times 26.5$	B32653A8682+***	390	400	540
		10	$10.5 \times 20.5 \times 26.5$	B32653A8103+***	390	400	540

Further E series and intermediate capacitance values on request.

**Composition of ordering code**

+ = Capacitance tolerance code:

 K =  $\pm 10\%$ 

 J =  $\pm 5\%$ 

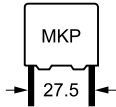
 on request =  $\pm 3.5\%$ 

\*\*\* = Packaging code:

289 = Ammo pack

189 = Reel

000 = Untaped (lead length 6 – 1 mm)


**Ordering codes and packing units (lead spacing 27.5 mm)**

$V_R$	$V_{rms}$ $f \leq 1$ kHz	$C_R$	Max. dimensions $w \times h \times l$ mm	Ordering code (composition see below)	Ammo pack pcs./unit	Reel pcs./unit	Untaped pcs./unit
VDC	VAC	nF					
250	160	1500	11.0 × 21.0 × 31.5	B32654A3155+***	–	350	320
		2200	12.5 × 21.5 × 31.5	B32654A3225+***	–	300	280
		3300	15.0 × 24.5 × 31.5	B32654A3335+000	–	–	240
		4700	18.0 × 27.5 × 31.5	B32654A3475+000	–	–	200
400	200	1000	11.0 × 21.0 × 31.5	B32654A4105+***	–	350	320
		1500	12.5 × 21.5 × 31.5	B32654A4155+***	–	300	280
		2200	14.0 × 24.5 × 31.5	B32654A4225+000	–	–	260
		3300	19.0 × 30.0 × 31.5	B32654A4335+000	–	–	180
630	250	680	11.0 × 21.0 × 31.5	B32654A6684+***	–	350	320
		1000	13.5 × 23.0 × 31.5	B32654A6105+***	–	250	260
		1500	18.0 × 27.5 × 31.5	B32654A6155+000	–	–	200
1000	250	220	11.0 × 21.0 × 31.5	B32654A0224+***	–	350	320
		330	11.0 × 21.0 × 31.5	B32654A0334+***	–	350	320
		470	14.0 × 24.5 × 31.5	B32654A0474+000	–	–	260
		680	18.0 × 27.5 × 31.5	B32654A0684+000	–	–	200
1250	500	100	11.0 × 21.0 × 31.5	B32654A7104+***	–	350	320
		150	11.0 × 21.0 × 31.5	B32654A7154+***	–	350	320
		220	14.0 × 24.5 × 31.5	B32654A7224+000	–	–	260
		330	18.0 × 27.5 × 31.5	B32654A7334+000	–	–	200
1600	500	47	11.0 × 21.0 × 31.5	B32654A1473+***	–	350	320
		68	11.0 × 21.0 × 31.5	B32654A1683+***	–	350	320
		100	14.0 × 24.5 × 31.5	B32654A1104+000	–	–	260
		150	18.0 × 27.5 × 31.5	B32654A1154+000	–	–	200
2000	700	22	11.0 × 21.0 × 31.5	B32654A2223+***	–	350	320
		33	13.5 × 23.0 × 31.5	B32654A2333+***	–	250	260
		47	18.0 × 27.5 × 31.5	B32654A2473+000	–	–	200
		68	19.0 × 30.0 × 31.5	B32654A2683+000	–	–	180

Further E series and intermediate capacitance values on request.

**Composition of ordering code**

+ = Capacitance tolerance code:

K = ±10%

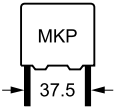
J = ±5%

on request = ±3.5%

\*\*\* = Packaging code:

189 = Reel

000 = Untaped (lead length 6 – 1 mm)


**B32656**
**High pulse (wound)**
**Ordering codes and packing units (lead spacing 37.5 mm)**

$V_R$	$V_{rms}$ $f \leq 1$ kHz	$C_R$	Max. dimensions $w \times h \times l$ mm	Ordering code (composition see below)	Untaped pcs./unit
VDC	VAC	nF			
850	450	220	12.0 × 22.0 × 42.0	B32656A8224+000	72
		330	12.0 × 22.0 × 42.0	B32656A8334+000	72
		470	12.0 × 22.0 × 42.0	B32656A8474+000	72
		680	16.0 × 28.5 × 42.0	B32656A8684+000	48
		1000	18.0 × 32.5 × 42.0	B32656A8105+000	32
1000	500	470	14.0 × 25.0 × 42.0	B32656A0474+000	56
		680	16.0 × 28.5 × 42.0	B32656A0684+000	48
		1000	20.0 × 39.5 × 42.0	B32656A0105+000	32
1250	500	220	14.0 × 25.0 × 42.0	B32656A7224+000	56
		330	16.0 × 28.5 × 42.0	B32656A7334+000	48
		470	18.0 × 32.5 × 42.0	B32656A7474+000	48
		680	20.0 × 39.5 × 42.0	B32656A7684+000	32
1600	600	100	12.0 × 22.0 × 42.0	B32656J1104+000	72
		150	14.0 × 25.0 × 42.0	B32656J1154+000	56
		220	16.0 × 28.5 × 42.0	B32656J1224+000	48
2000	700	100	14.0 × 25.0 × 42.0	B32656J2104+000	56
		150	18.0 × 32.5 × 42.0	B32656J2154+000	48
		220	20.0 × 39.5 × 42.0	B32656J2224+000	32

Further E series and intermediate capacitance values on request.

**Composition of ordering code**

+ = Capacitance tolerance code:

K = ±10%

J = ±5%

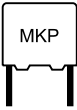
on request = ±3.5%

Packaging code:

000 = Untaped (lead length 6 – 1 mm)

**Technical data**

Operating temperature range	Max. operating temperature $T_{op,max}$		+105 °C		
	Upper category temperature $T_{max}$		+100 °C		
	Lower category temperature $T_{min}$		-55 °C		
	Rated temperature $T_R$		+85 °C		
Dissipation factor $\tan \delta$ (in $10^{-3}$ ) at 20 °C (upper limit values)	at	$\leq 27$ nF	$27$ nF $< C_R \leq 0.1$ $\mu$ F	$0.1$ $\mu$ F $< C_R \leq 1$ $\mu$ F	$> 1$ $\mu$ F
	1 kHz	0.8	0.8	0.8	0.8
	10 kHz	1.0	1.0	1.0	—
	100 kHz	2.0	3.0	—	—
Insulation resistance $R_{ins}$ or time constant $\tau = C_R \cdot R_{ins}$ at 20 °C, rel. humidity $\leq 65\%$ (minimum as-delivered values)	$C_R \leq 0.33$ $\mu$ F		$C_R > 0.33$ $\mu$ F		
	100 G $\Omega$		30000 s		
DC test voltage	$1.6 \cdot V_R, 2$ s				
Category voltage $V_C$ (continuous operation with $V_{DC}$ or $V_{AC}$ at $f \leq 1$ kHz)	$T_A$ (°C)	DC voltage derating		AC voltage derating	
	$T_A \leq 85$ $85 < T_A \leq 100$	$V_C = V_R$ $V_C = V_R \cdot (165 - T_A)/80$		$V_{C,rms} = V_{rms}$ $V_{C,rms} = V_{rms} \cdot (165 - T_A)/80$	
Operating voltage $V_{op}$ for short operating periods ( $V_{DC}$ or $V_{AC}$ at $f \leq 1$ kHz)	$T_A$ (°C)	DC voltage (max. hours)		AC voltage (max. hours)	
	$T_A \leq 85$ $85 < T_A \leq 100$	$V_{op} = 1.25 \cdot V_C$ (2000 h) $V_{op} = 1.25 \cdot V_C$ (2000 h)		$V_{op} = 1.0 \cdot V_{C,rms}$ (2000 h) $V_{op} = 1.0 \cdot V_{C,rms}$ (2000 h)	
Damp heat test Limit values after damp heat test	56 days/40 °C/93% relative humidity				
	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 $R_{ins}$ or time constant $\tau = C_R \cdot R_{ins}$		$\geq 50\%$ of minimum as-delivered values		
Reliability: Failure rate $\lambda$ Service life $t_{SL}$	1 fit ( $\leq 1 \cdot 10^{-9}$ /h) at $0.5 \cdot V_R, 40$ °C 200 000 h at $1.0 \cdot V_R, 40$ °C For conversion to other operating conditions and temperatures, refer to chapter "Quality assurance", page .				
Failure criteria: Total failure Failure due to variation of parameters	Short circuit or open circuit				
	Capacitance change $ \Delta C/C $		$> 10\%$		
	Dissipation factor $\tan \delta$		$> 4 \cdot$ upper limit value		
	Insulation resistance $R_{ins}$ or time constant $\tau = C_R \cdot R_{ins}$		$< 1500$ M $\Omega$ ( $C_R \leq 0.33$ $\mu$ F) $< 500$ s ( $C_R > 0.33$ $\mu$ F)		



B32651 ... B32656

High pulse (wound)

**Pulse handling capability**

"dV/dt" represents the maximum permissible voltage change per unit of time for non-sinusoidal voltages, expressed in V/ $\mu$ s.

"k<sub>0</sub>" represents the maximum permissible pulse characteristic of the waveform applied to the capacitor, expressed in V<sup>2</sup>/ $\mu$ s.

Note:

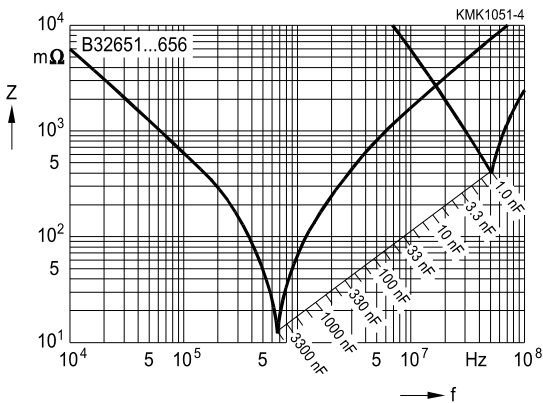
The values of dV/dt and k<sub>0</sub> provided below must not be exceeded in order to avoid damaging the capacitor.

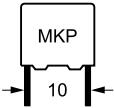
**dV/dt values**

Lead spacing		10 mm	15 mm	22.5 mm	27.5 mm	37.5 mm
V <sub>R</sub> VDC	V <sub>rms</sub> VAC	dV/dt in V/ $\mu$ s				
250	160	–	200	120	50	–
400	200	–	300	180	100	–
630	250	–	400	300	150	–
850	450	–	–	–	–	90
1000	250	–	975	600	300	–
	500	–	–	–	–	100
1250	450	4000	–	–	–	–
	500	–	1850	1150	600	140
1600	500	–	4500	2400	1000	–
	600	–	–	–	–	210
	700	–	5200	–	–	–
2000	700	–	8000	7000	2300	200
	1000	–	–	7500	–	–

**$k_0$  values**

Lead spacing		10 mm	15 mm	22.5 mm	27.5 mm	37.5 mm
$V_R$ VDC	$V_{rms}$ VAC	$k_0$ in $V^2/\mu s$				
250	160	–	10 000	60 000	25 000	–
400	200	–	250 000	200 000	110 000	–
630	250	–	500 000	350 000	250 000	–
850	450	–	–	–	–	153 000
1000	250	–	3 000 000	1 500 000	1 000 000	–
	500	–	–	–	–	180 000
1250	450	25 000 000	–	–	–	–
	500	–	9 000 000	3 750 000	2 000 000	350 000
1600	500	–	20 000 000	10 000 000	4 000 000	–
	600	–	–	–	–	672 000
	700	–	28 000 000	–	–	–
2000	700	–	60 000 000	40 000 000	15 000 000	800 000
	1000	–	–	50 000 000	–	–

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




**B32651**

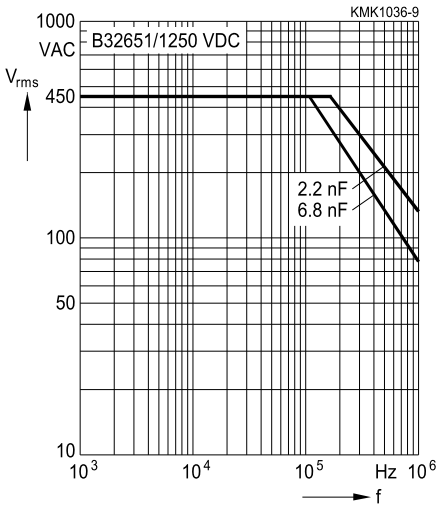
**High pulse (wound)**

**Permissible AC voltage  $V_{rms}$  versus frequency  $f$  (for sinusoidal waveforms,  $T_A \leq 90^\circ\text{C}$ )**

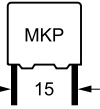
For  $T_A > 90^\circ\text{C}$ , please refer to "General technical information", section 3.2.3.

**Lead spacing 10 mm**

1250 VDC/450 VAC





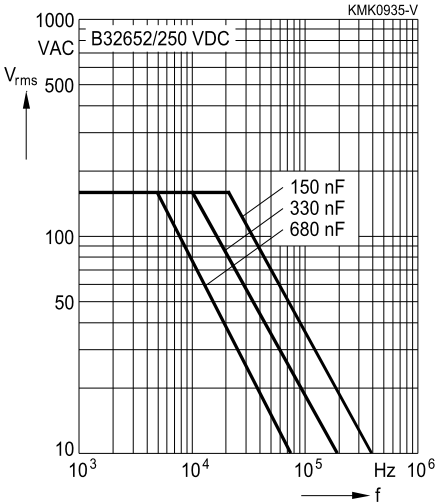


**Permissible AC voltage  $V_{rms}$  versus frequency  $f$  (for sinusoidal waveforms,  $T_A \leq 90^\circ C$ )**

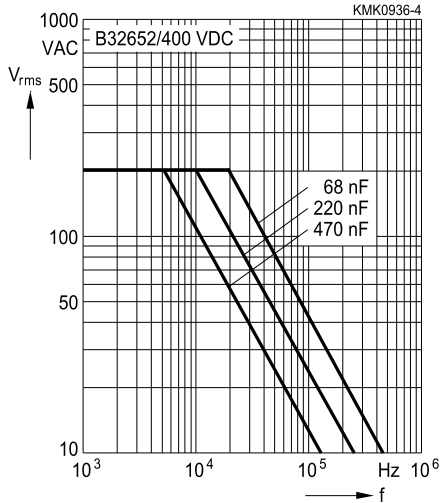
For  $T_A > 90^\circ C$ , please refer to "General technical information", section 3.2.3.

**Lead spacing 15 mm**

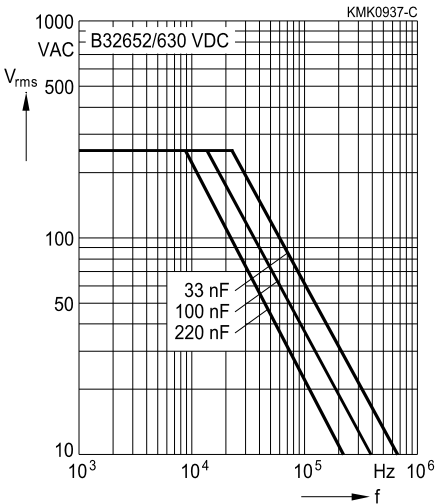
250 VDC/160 VAC



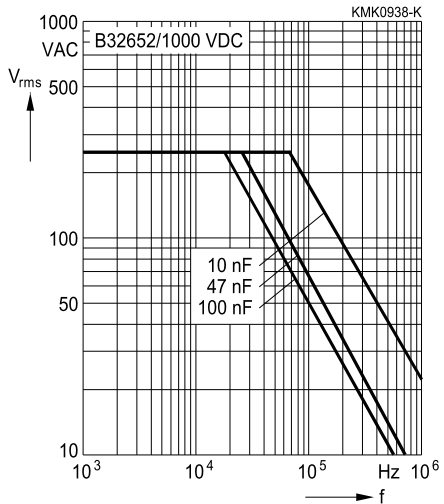
400 VDC/200 VAC

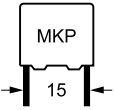


630 VDC/250 VAC



1000 VDC/250 VAC





**B32652**

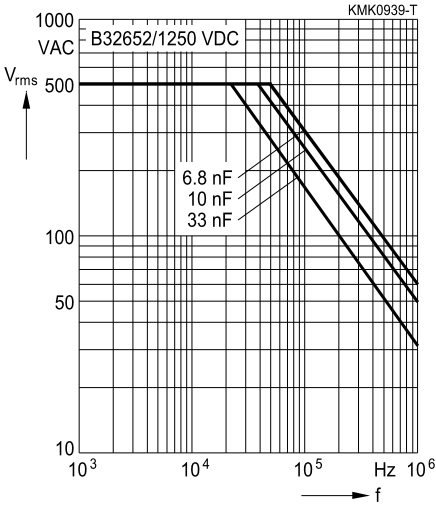
**High pulse (wound)**

**Permissible AC voltage  $V_{rms}$  versus frequency  $f$  (for sinusoidal waveforms,  $T_A \leq 90^\circ C$ )**

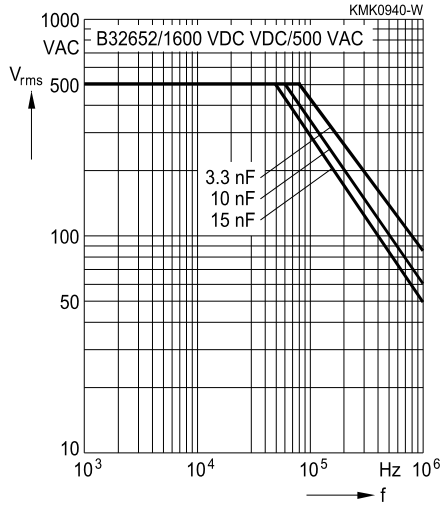
For  $T_A > 90^\circ C$ , please refer to "General technical information", section 3.2.3.

**Lead spacing 15 mm**

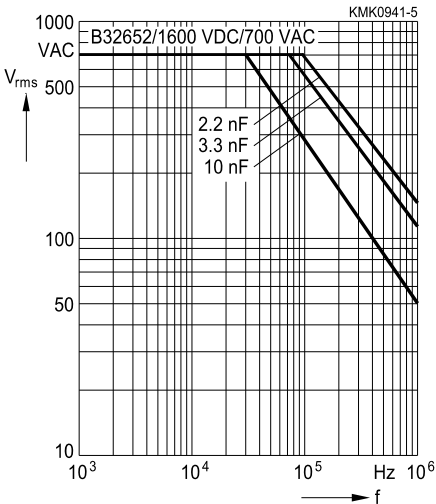
**1250 VDC/500 VAC**



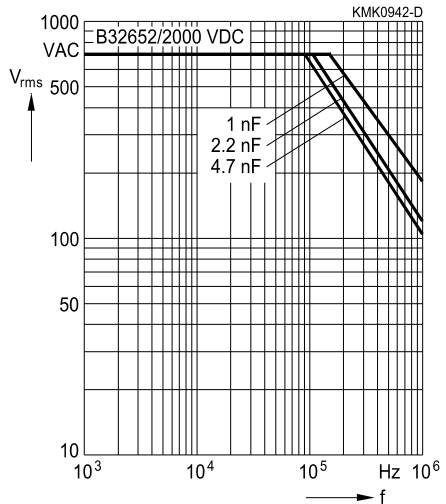
**1600 VDC/500 VAC**

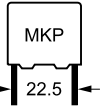


**1600 VDC/700 VAC**



**2000 VDC/700 VAC**



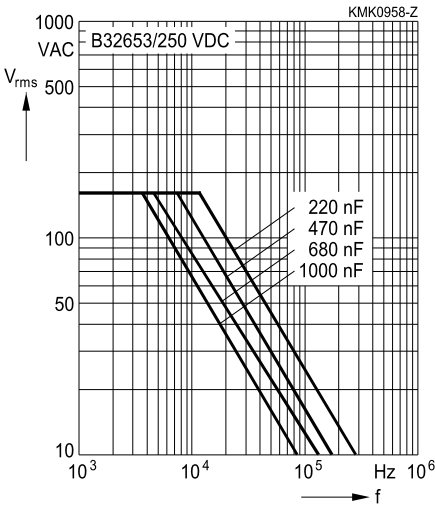


**Permissible AC voltage  $V_{rms}$  versus frequency  $f$  (for sinusoidal waveforms,  $T_A \leq 90^\circ\text{C}$ )**

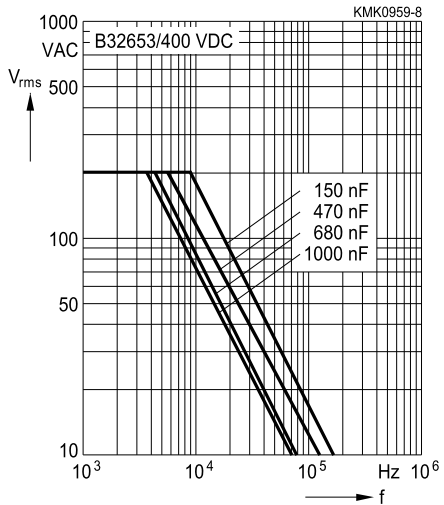
For  $T_A > 90^\circ\text{C}$ , please refer to "General technical information", section 3.2.3.

**Lead spacing 22.5 mm**

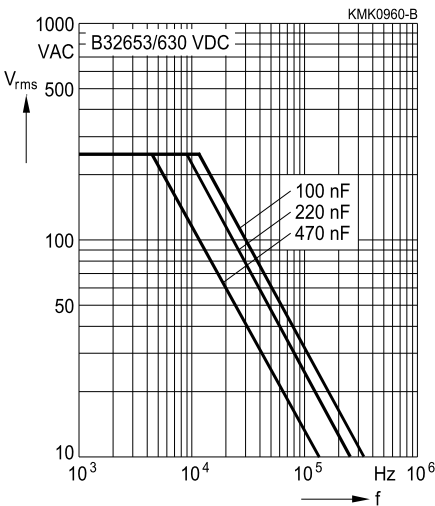
250 VDC/160 VAC



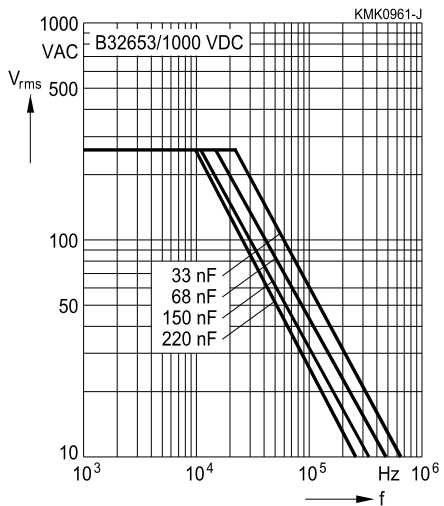
400 VDC/200 VAC

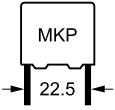


630 VDC/250 VAC



1000 VDC/250 VAC





**B32653**

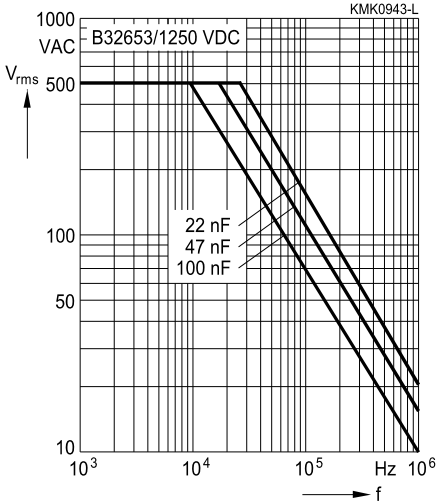
**High pulse (wound)**

**Permissible AC voltage  $V_{rms}$  versus frequency  $f$  (for sinusoidal waveforms,  $T_A \leq 90^\circ C$ )**

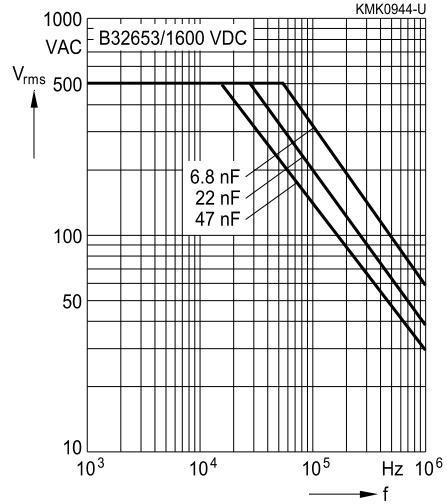
For  $T_A > 90^\circ C$ , please refer to "General technical information", section 3.2.3.

**Lead spacing 22.5 mm**

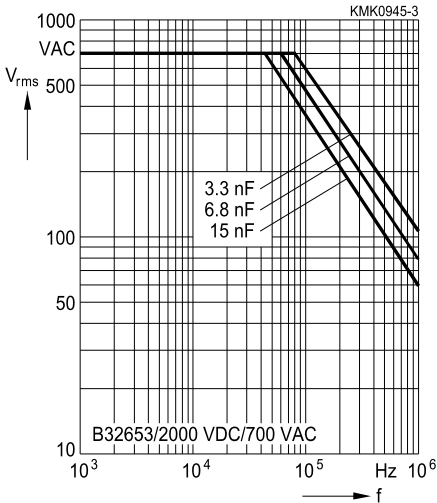
**1250 VDC/500 VAC**



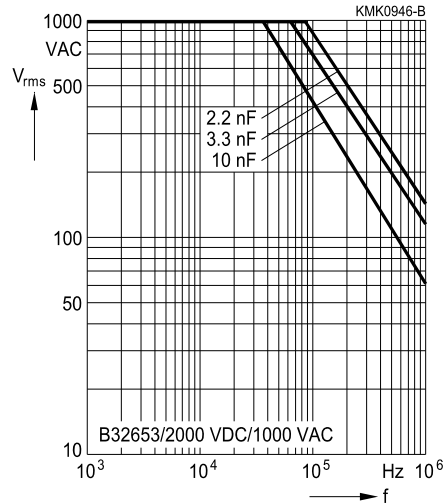
**1600 VDC/500 VAC**

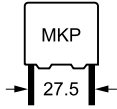


**2000 VDC/700 VAC**



**2000 VDC/1000 VAC**

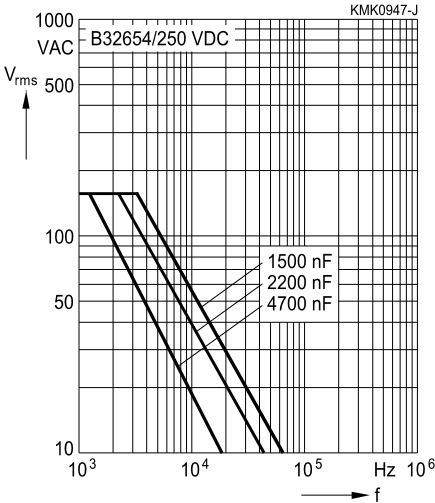




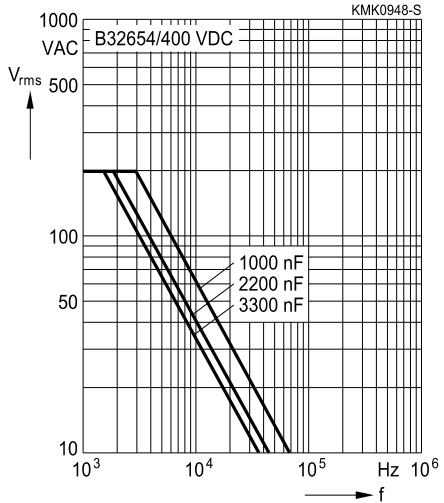
Permissible AC voltage  $V_{rms}$  versus frequency  $f$  (for sinusoidal waveforms,  $T_A \leq 90^\circ\text{C}$ )  
 For  $T_A > 90^\circ\text{C}$ , please refer to "General technical information", section 3.2.3.

Lead spacing 27.5 mm

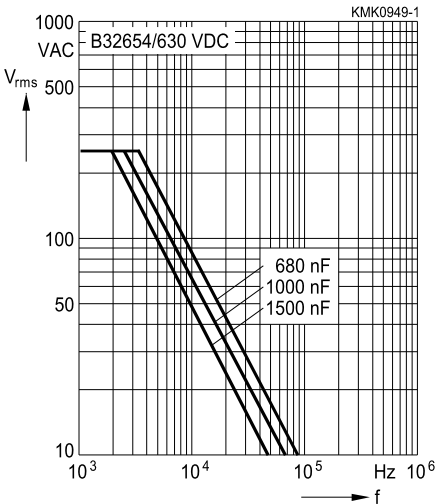
250 VDC/160 VAC



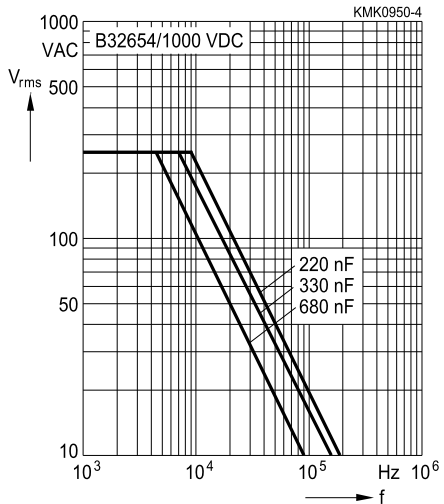
400 VDC/200 VAC

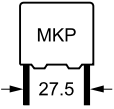


630 VDC/250 VAC



1000 VDC/250 VAC





**B32654**

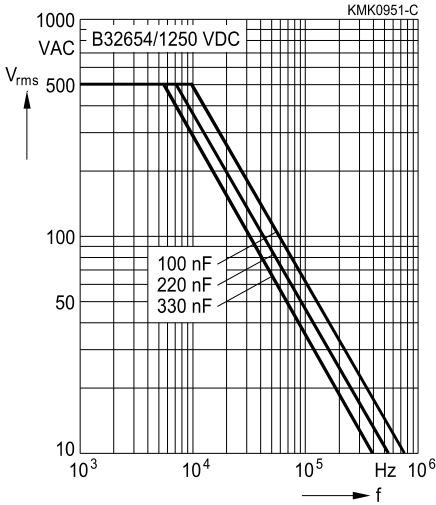
**High pulse (wound)**

**Permissible AC voltage  $V_{rms}$  versus frequency  $f$  (for sinusoidal waveforms,  $T_A \leq 90^\circ\text{C}$ )**

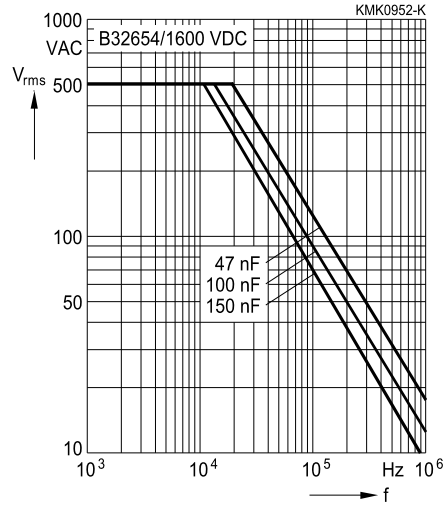
For  $T_A > 90^\circ\text{C}$ , please refer to "General technical information", section 3.2.3.

**Lead spacing 27.5 mm**

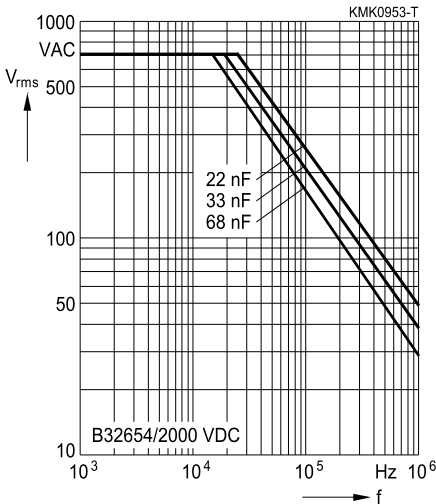
**1250 VDC/500 VAC**

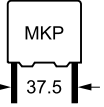


**1600 VDC/500 VAC**



**2000 VDC/700 VAC**

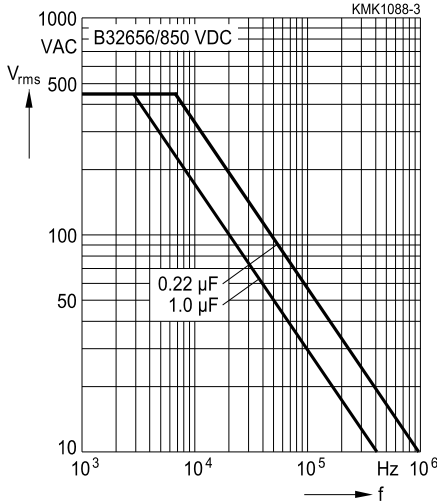




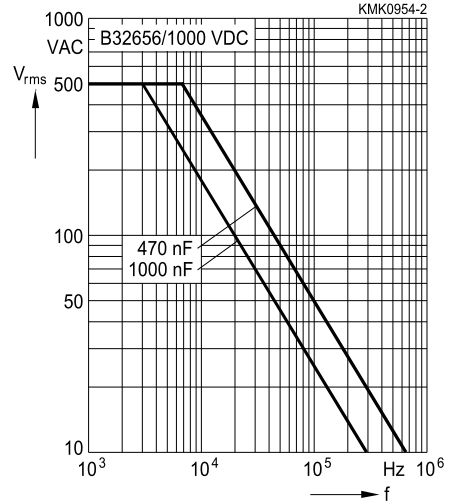
Permissible AC voltage  $V_{rms}$  versus frequency  $f$  (for sinusoidal waveforms,  $T_A \leq 90^\circ\text{C}$ )  
 For  $T_A > 90^\circ\text{C}$ , please refer to "General technical information", section 3.2.3.

Lead spacing 37.5 mm

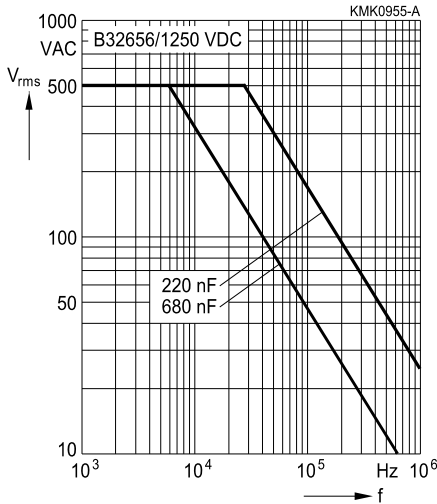
850 VDC/450 VAC



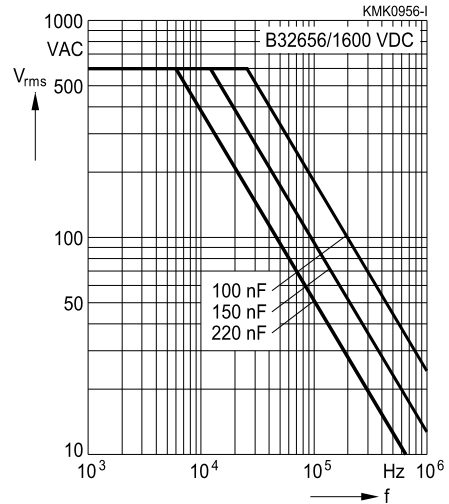
1000 VDC/500 VAC

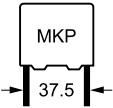


1250 VDC/500 VAC



1600 VDC/600 VAC





**B32656**

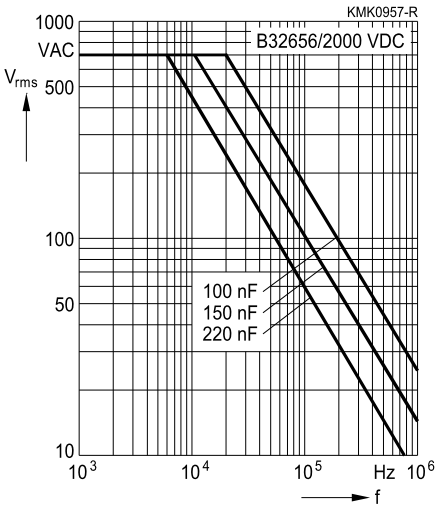
**High pulse (wound)**

**Permissible AC voltage  $V_{rms}$  versus frequency  $f$  (for sinusoidal waveforms,  $T_A \leq 90^\circ\text{C}$ )**

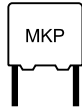
For  $T_A > 90^\circ\text{C}$ , please refer to "General technical information", section 3.2.3.

**Lead spacing 37.5 mm**

2000 VDC/700 VAC



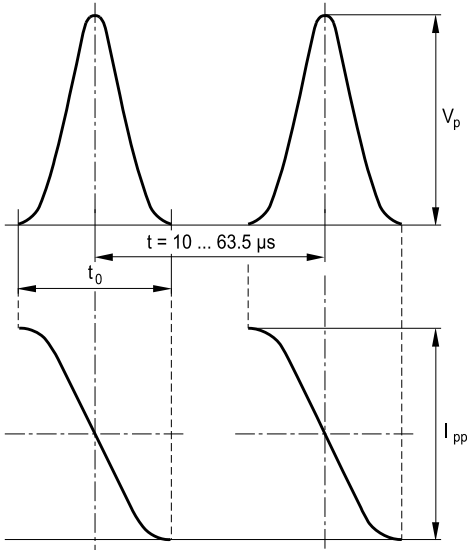




**Flyback application**

**Permissible voltage and current / waveform**

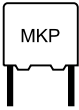
Permissible current  $I_{pp}$  versus frequency  $f$  for a duty cycle of 20% ( $t_0/t = 0.2$ ):



KMK0720-5

Approximation formular for duty cycle higher than 20%:

$$I'_{pp} = I_{pp} \cdot \sqrt{\frac{t_0^3}{t_0'^3}}$$



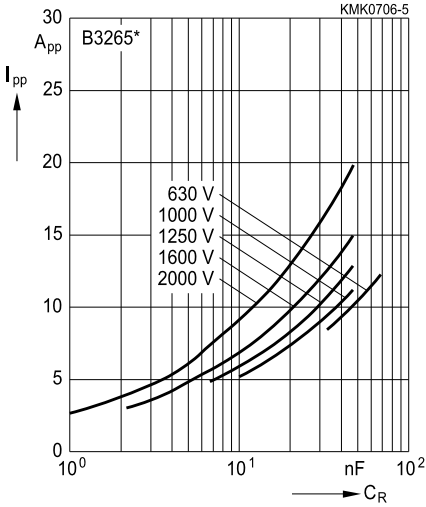
B32651 ... B32656

High pulse (wound)

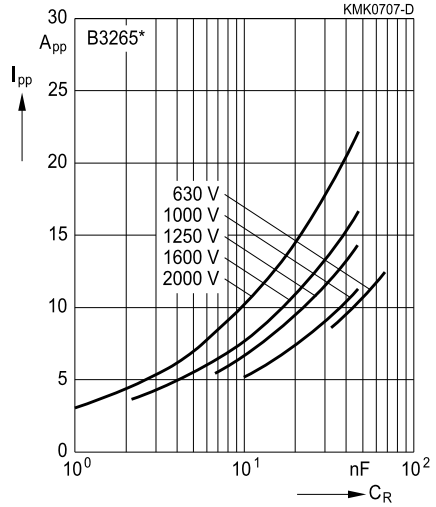
**Flyback application**

**Permissible current  $I_{pp}$  versus rated capacitance  $C_R$**

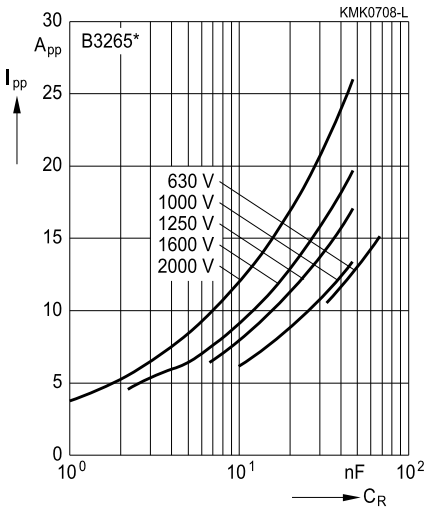
Frequency = 15.75 kHz

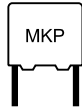


Frequency = 31.5 kHz



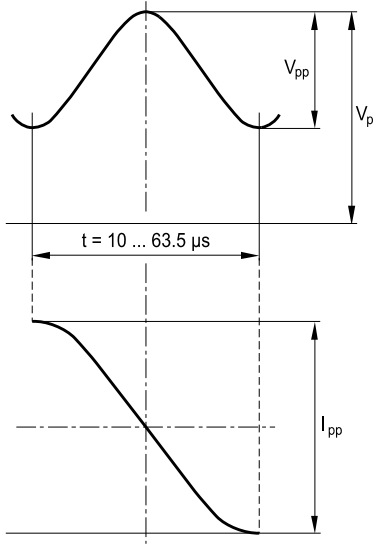
Frequency = 95 kHz



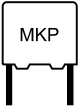


### S-correction application

#### Permissible voltage and current / waveform



KMK0721-D



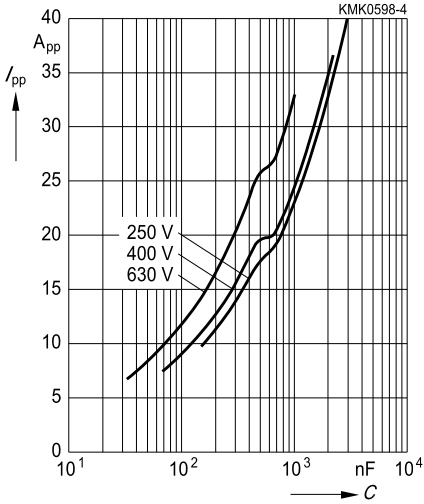
B32651 ... B32656

High pulse (wound)

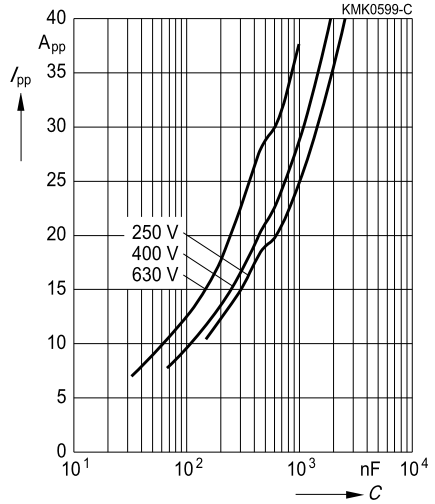
**S-correction application**

**Permissible current  $I_{pp}$  versus rated capacitance  $C_R$**

Frequency = 15.75 kHz



Frequency = 31.75 kHz



Frequency = 95 kHz

