



## Film Capacitors

### Metallized Polypropylene Film Capacitors (MKP)

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

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**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**

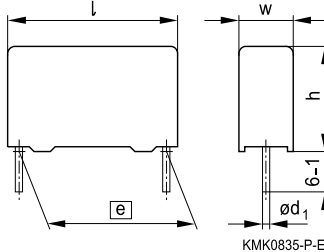
- Parallel wire leads, lead-free tinned
- Special lead lengths available on request

**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".

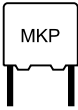
**Dimensional drawing**


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									

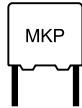


**B32651 ... B32656**

**High pulse (wound)**

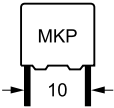
**Overview of available types**

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

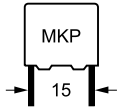
Further E series and intermediate capacitance values on request.

**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	$C_R$	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	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
		470	$9.0 \times 17.5 \times 18.0$	B32652A4474+***	640	700	500
630	250	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
		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
1000	250	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
		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
1250	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 =  $\pm 5\%$

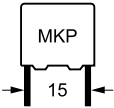
on request =  $\pm 3.5\%$

\*\*\* = 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	$C_R$	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					
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 =  $\pm 3.5\%$

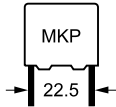
\*\*\* = Packaging code:

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 =  $\pm 5\%$

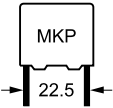
on request =  $\pm 3.5\%$

\*\*\* = 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 =  $\pm 5\%$ 

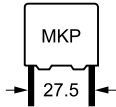
 on request =  $\pm 3.5\%$ 

\*\*\* = 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%

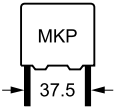
J = ±5%

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%

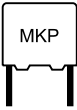
on request = ±3.5%

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)		



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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:*

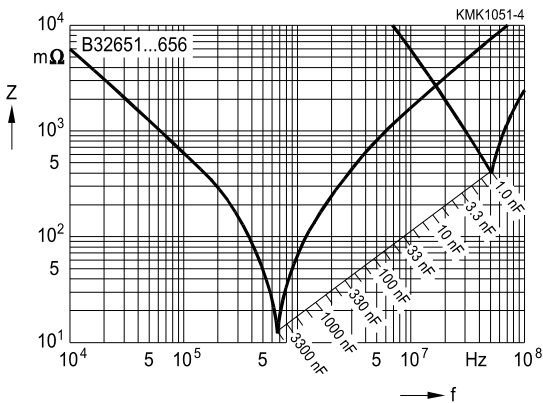
*The values of dV/dt and k<sub>0</sub> provided below must not be exceeded in order to avoid damaging the capacitor.*

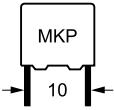
**dV/dt values**

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**

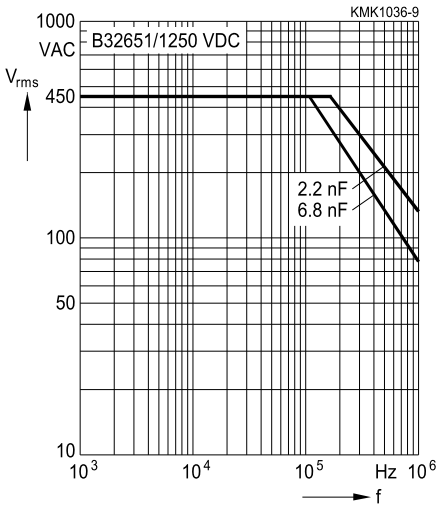
**High pulse (wound)**

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

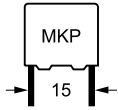
For  $T_A > 90^\circ\text{C}$ , please refer to "General technical information", section 3.2.3.

**Lead spacing 10 mm**

1250 VDC/450 VAC





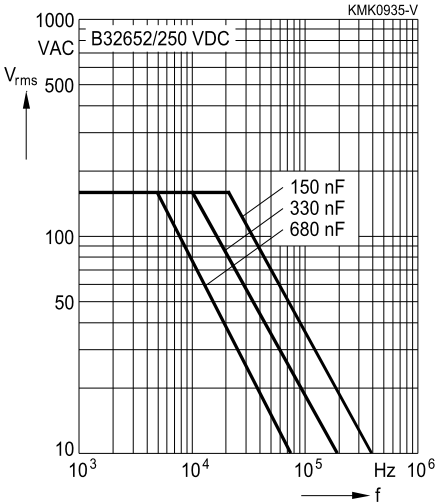


**Permissible AC voltage  $V_{rms}$  versus frequency  $f$  (for sinusoidal waveforms,  $T_A \leq 90^\circ C$ )**

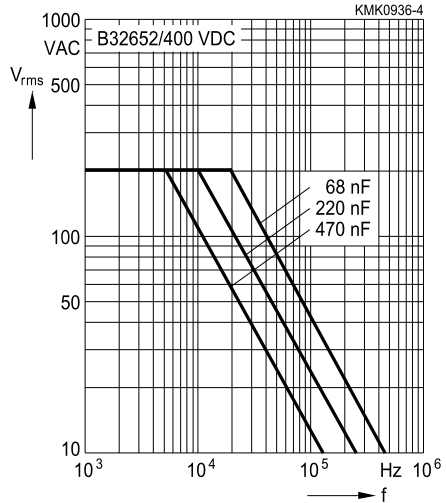
For  $T_A > 90^\circ C$ , please refer to "General technical information", section 3.2.3.

**Lead spacing 15 mm**

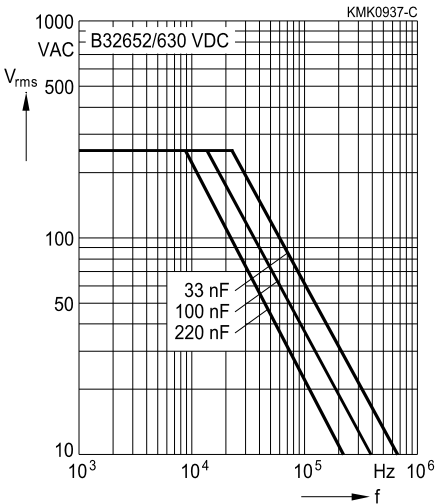
250 VDC/160 VAC



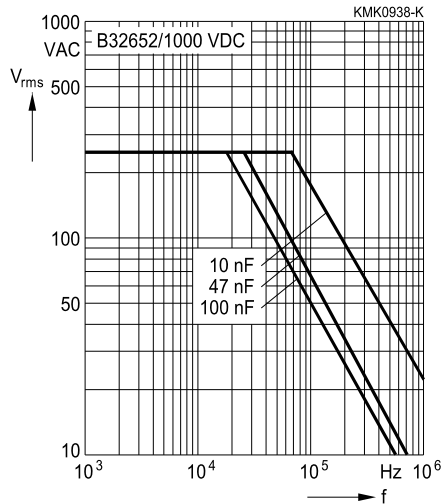
400 VDC/200 VAC

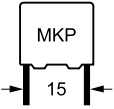


630 VDC/250 VAC



1000 VDC/250 VAC





**B32652**

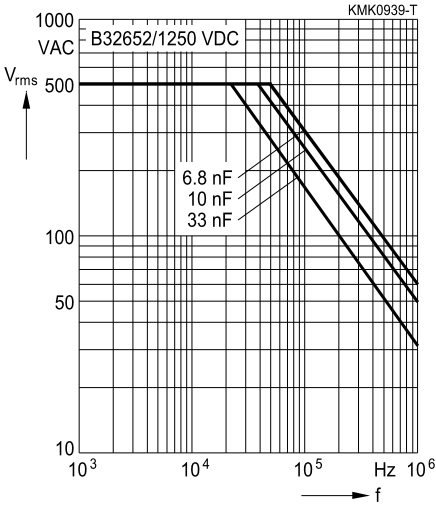
**High pulse (wound)**

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

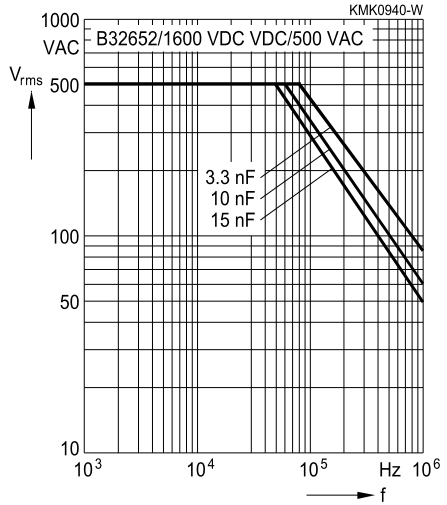
For  $T_A > 90^\circ C$ , please refer to "General technical information", section 3.2.3.

**Lead spacing 15 mm**

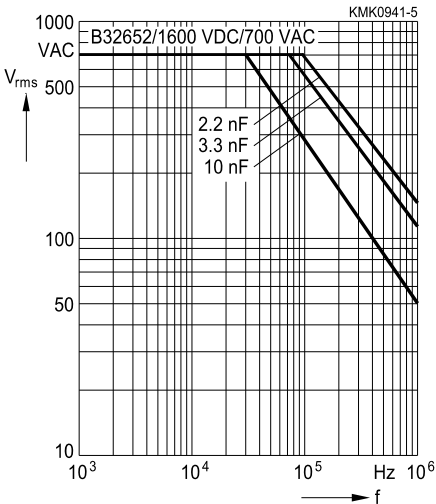
**1250 VDC/500 VAC**



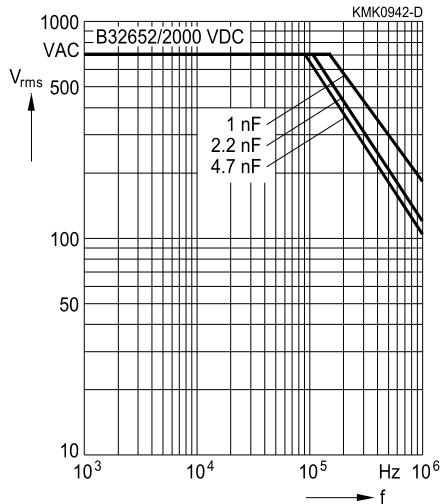
**1600 VDC/500 VAC**

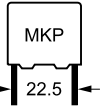


**1600 VDC/700 VAC**



**2000 VDC/700 VAC**



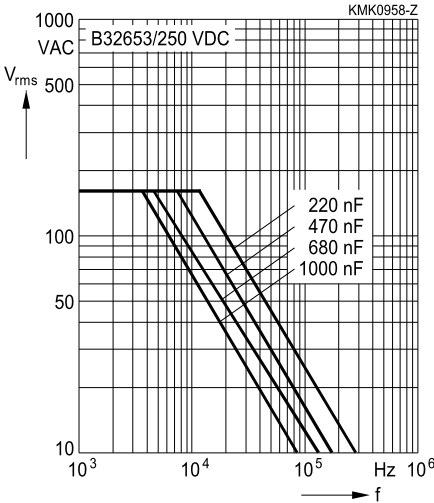


**Permissible AC voltage  $V_{rms}$  versus frequency  $f$  (for sinusoidal waveforms,  $T_A \leq 90^\circ C$ )**

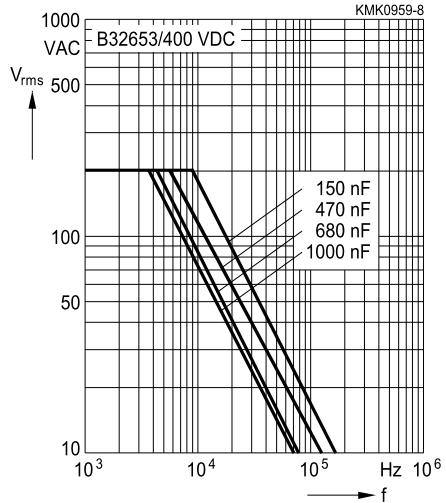
For  $T_A > 90^\circ C$ , please refer to "General technical information", section 3.2.3.

**Lead spacing 22.5 mm**

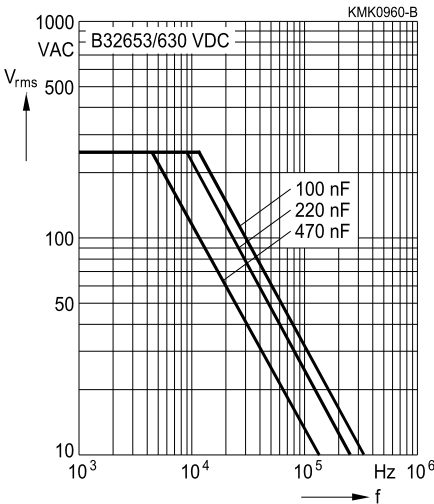
250 VDC/160 VAC



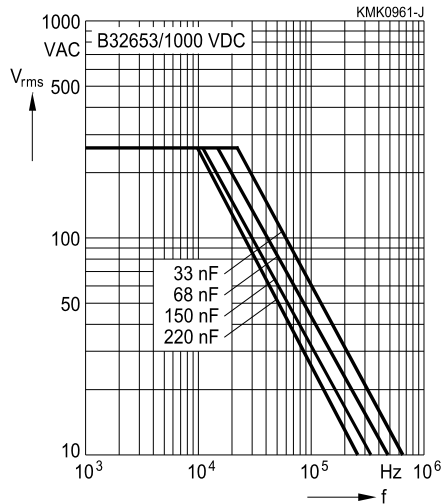
400 VDC/200 VAC

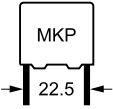


630 VDC/250 VAC



1000 VDC/250 VAC





**B32653**

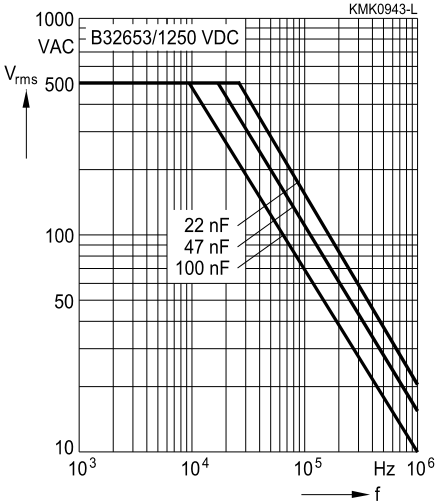
**High pulse (wound)**

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

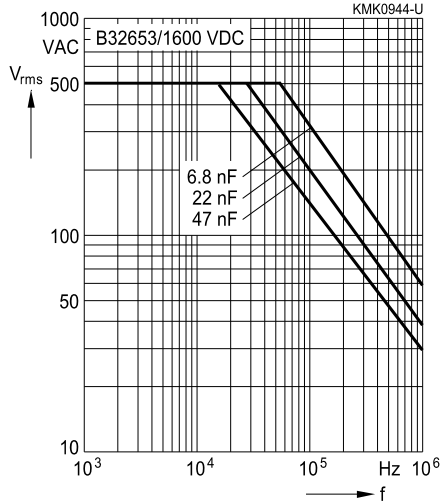
For  $T_A > 90^\circ C$ , please refer to "General technical information", section 3.2.3.

**Lead spacing 22.5 mm**

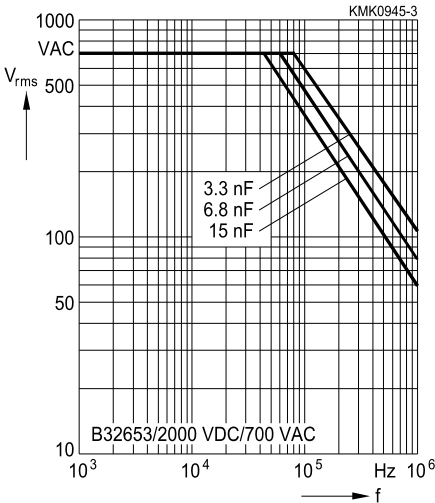
**1250 VDC/500 VAC**



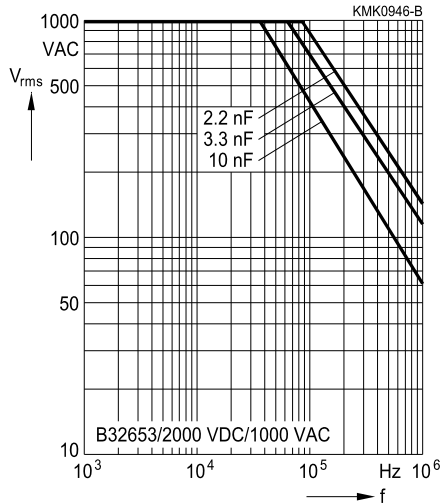
**1600 VDC/500 VAC**

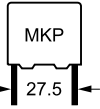


**2000 VDC/700 VAC**



**2000 VDC/1000 VAC**

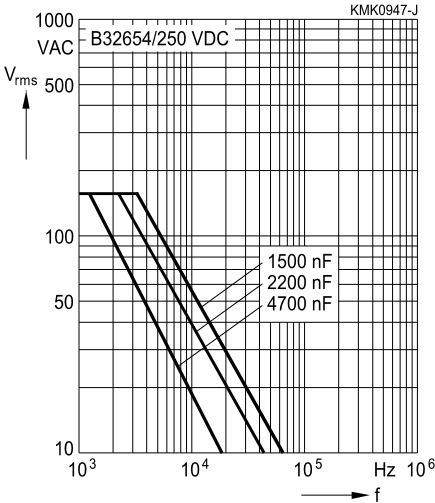




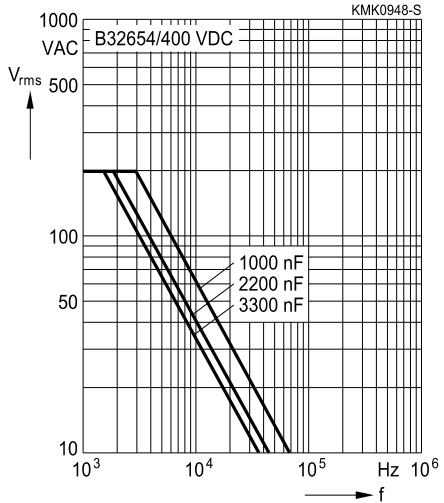
**Permissible AC voltage  $V_{rms}$  versus frequency  $f$  (for sinusoidal waveforms,  $T_A \leq 90^\circ\text{C}$ )**  
 For  $T_A > 90^\circ\text{C}$ , please refer to "General technical information", section 3.2.3.

**Lead spacing 27.5 mm**

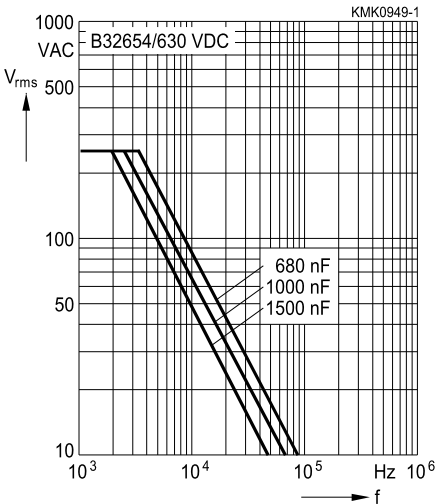
250 VDC/160 VAC



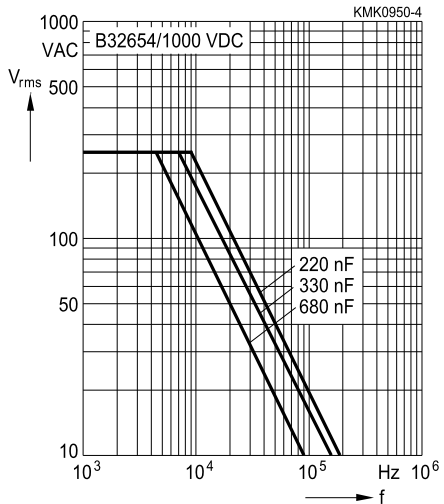
400 VDC/200 VAC

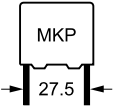


630 VDC/250 VAC



1000 VDC/250 VAC





**B32654**

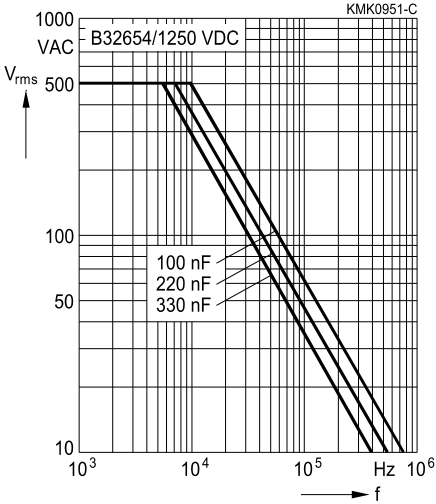
**High pulse (wound)**

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

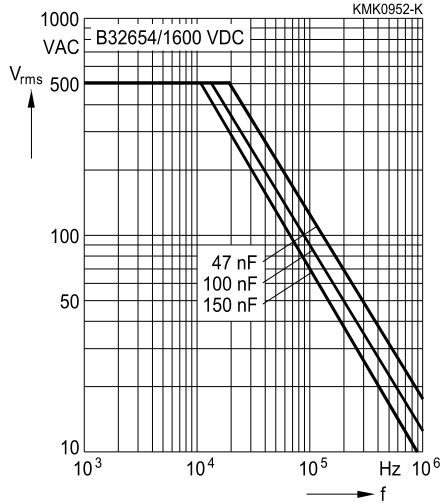
For  $T_A > 90^\circ\text{C}$ , please refer to "General technical information", section 3.2.3.

**Lead spacing 27.5 mm**

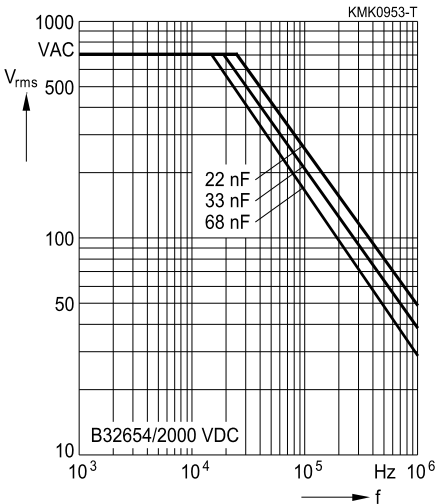
**1250 VDC/500 VAC**

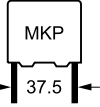


**1600 VDC/500 VAC**



**2000 VDC/700 VAC**

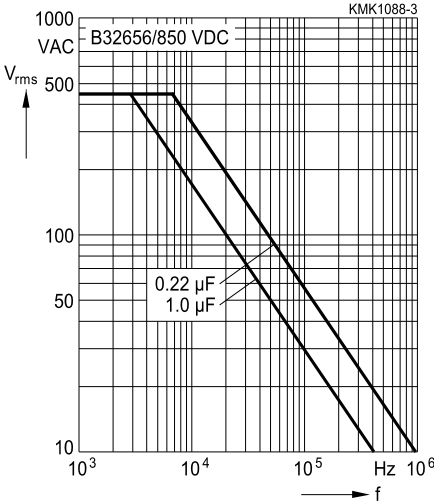




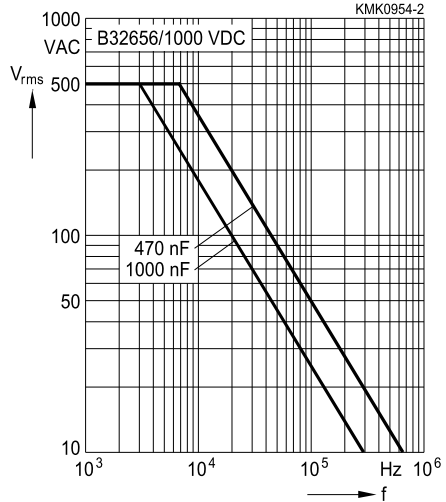
Permissible AC voltage  $V_{rms}$  versus frequency  $f$  (for sinusoidal waveforms,  $T_A \leq 90^\circ\text{C}$ )  
 For  $T_A > 90^\circ\text{C}$ , please refer to "General technical information", section 3.2.3.

Lead spacing 37.5 mm

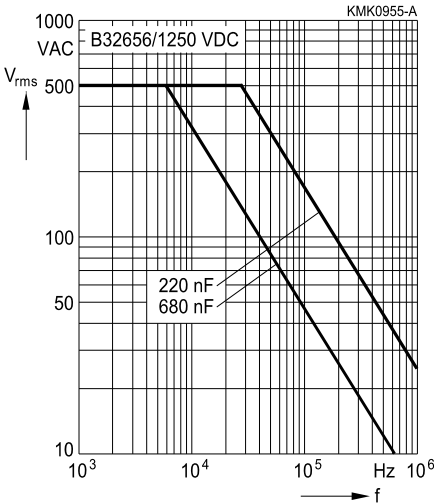
850 VDC/450 VAC



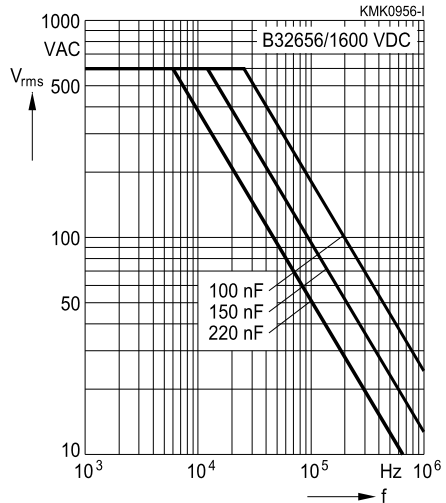
1000 VDC/500 VAC

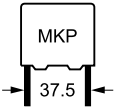


1250 VDC/500 VAC



1600 VDC/600 VAC





**B32656**

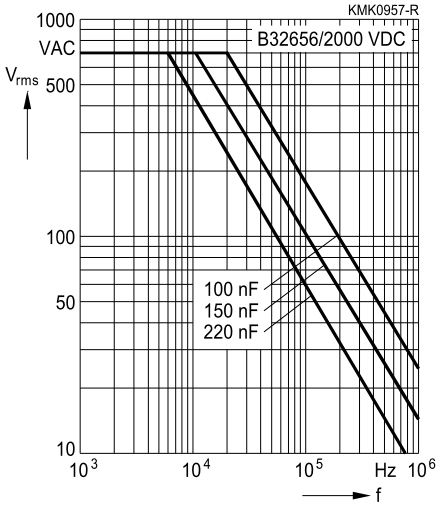
**High pulse (wound)**

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

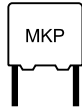
For  $T_A > 90^\circ\text{C}$ , please refer to "General technical information", section 3.2.3.

**Lead spacing 37.5 mm**

2000 VDC/700 VAC



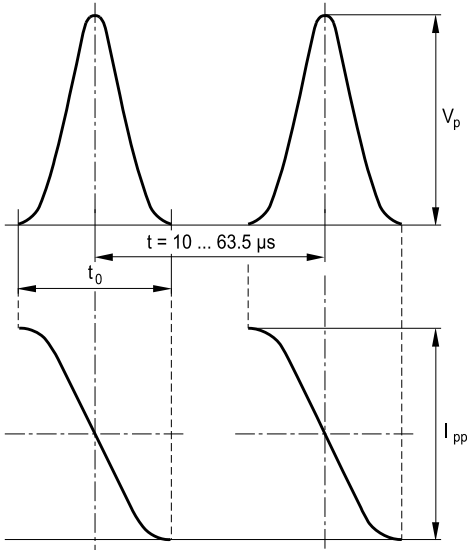




**Flyback application**

**Permissible voltage and current / waveform**

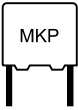
Permissible current  $I_{pp}$  versus frequency  $f$  for a duty cycle of 20% ( $t_0/t = 0.2$ ):



KMK0720-5

Approximation formular for duty cycle higher than 20%:

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



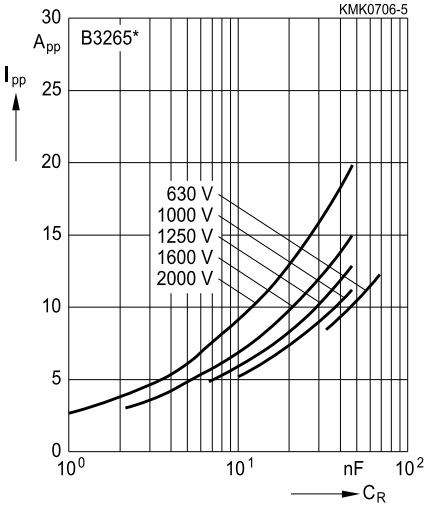
B32651 ... B32656

High pulse (wound)

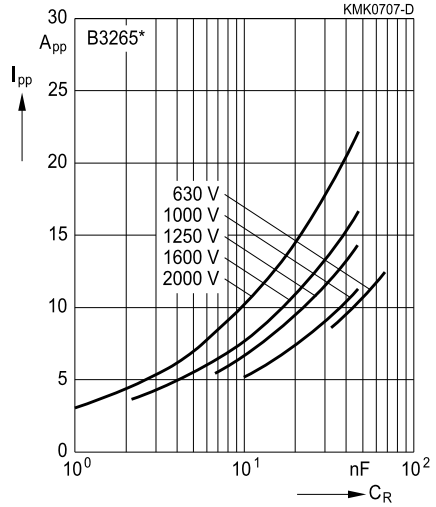
**Flyback application**

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

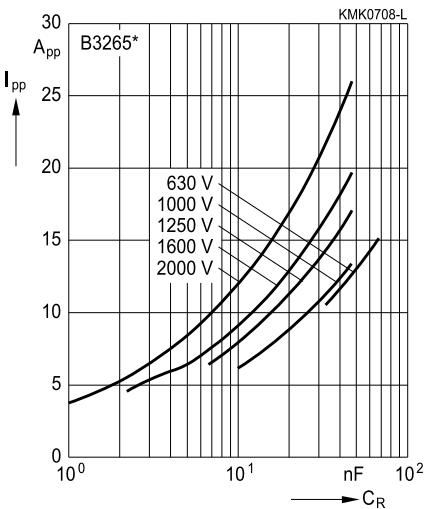
Frequency = 15.75 kHz

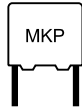


Frequency = 31.5 kHz



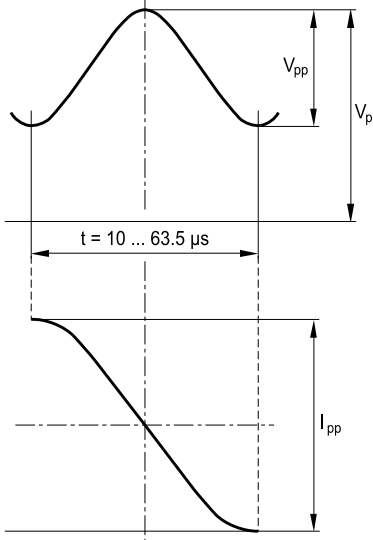
Frequency = 95 kHz



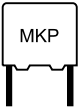


### S-correction application

#### Permissible voltage and current / waveform



KMK0721-D



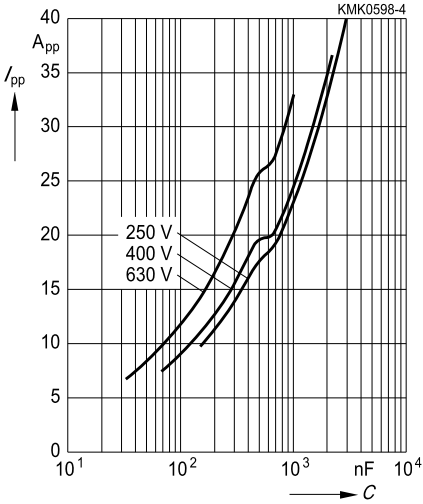
B32651 ... B32656

High pulse (wound)

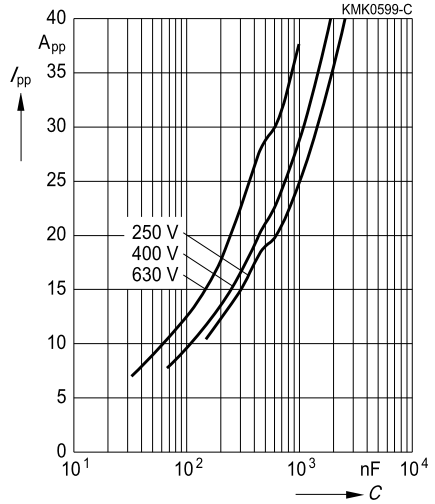
**S-correction application**

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

Frequency = 15.75 kHz



Frequency = 31.75 kHz



Frequency = 95 kHz

