# Film Capacitors

## Metallized Polypropylene Film Capacitors (MKP)

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

### 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

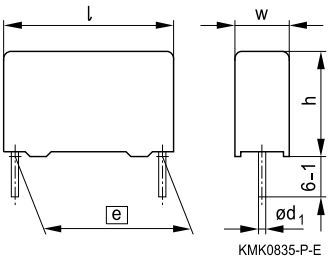
### Features

- High pulse strength
- High contact reliability
- Small dimensions

### Terminals

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

### Dimensional drawing




Dimensions in mm

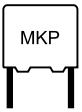
| Lead spacing e ±0.4 | Lead diameter $d_1$ | Type |
|---|---|---|
| 10 | 0.6 | B32651 |
| 15 | 0.8 | B32652 |
| 22.5 | 0.8 | B32653 |
| 27.5 | 0.8 | B32654 |
| 37.5 | 1.0 | B32656 |

### Marking

Manufacturer's logo,
lot number (e ≤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)

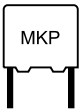
### Delivery mode

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




**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 | | | | | | | | | |

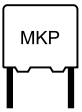



**B32651 ... B32656**

**High pulse (wound)**

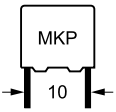
**Overview of available types**

| 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 ≤1 kHz | $C_R$ | Max. dimensions w × h × l | Ordering code (composition see | Ammo pack | Reel | Untaped |
|---|---|---|---|---|---|---|---|
| VDC[1)] | VAC | nF | mm | below) | pcs./unit | pcs./unit | pcs./unit |
| 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 |

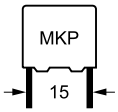
Further E series and intermediate capacitance values on request.

**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)**

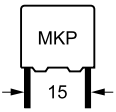
| $V_R$ VDC | $V_{rms}$ f ≤1 kHz VAC | $C_R$ nF | Max. dimensions w × h × l mm | Ordering code (composition see below) | Ammo pack pcs./unit | Reel pcs./unit | Untaped pcs./unit |
|---|---|---|---|---|---|---|---|
| 250 | 160 | 150 | 5.0 × 10.5 × 18.0 | B32652A3154+*** | 1170 | 1300 | 1000 |
| | | 220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

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)




**B32652**

**High pulse (wound)**

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

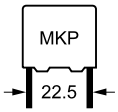
| $V_R$ | $V_{rms}$ f ≤1 kHz | $C_R$ | Max. dimensions w × h × l | Ordering code (composition see | Ammo pack | Reel | Untaped |
|---|---|---|---|---|---|---|---|
| VDC | VAC | nF | mm | below) | pcs./unit | pcs./unit | pcs./unit |
| 1600 | 500 | 3.3 | 5.0 × 10.5 × 18.0 | B32652A1332+*** | 1170 | 1300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

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)




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

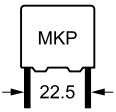
| $V_R$ VDC | $V_{rms}$ f ≤1 kHz VAC | $C_R$ nF | Max. dimensions w × h × l mm | Ordering code (composition see below) | Ammo pack pcs./unit | Reel pcs./unit | Untaped pcs./unit |
|---|---|---|---|---|---|---|---|
| 250 | 160 | 220 | 6.0 × 15.0 × 26.5 | B32653A3224+*** | 680 | 700 | 720 |
| | | 330 |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

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)




**B32653**

**High pulse (wound)**

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

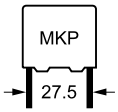
| $V_R$ | $V_{rms}$ f ≤1 kHz | $C_R$ | Max. dimensions w × h × l | Ordering code (composition see | Ammo pack | Reel | Untaped |
|---|---|---|---|---|---|---|---|
| VDC | VAC | nF | mm | below) | pcs./unit | pcs./unit | pcs./unit |
| 1600 | 500 | 6.8 | 6.0 × 15.0 × 26.5 | B32653A1682+*** | 680 | 700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

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)




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

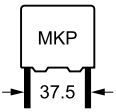
| $V_R$ VDC | $V_{rms}$ f ≤1 kHz VAC | $C_R$ nF | Max. dimensions w × h × l mm | Ordering code (composition see below) | Ammo pack pcs./unit | Reel pcs./unit | Untaped pcs./unit |
|---|---|---|---|---|---|---|---|
| 250 | 160 | 1500 | 11.0 × 21.0 × 31.5 | B32654A3155+*** | – | 350 | 320 |
| | | 2200 | 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 ≤1 kHz | $C_R$ | Max. dimensions w × h × l | Ordering code (composition see | Untaped |
|---|---|---|---|---|---|
| VDC | VAC | nF | mm | below) | pcs./unit |
| 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.

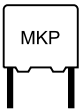
**Composition of ordering code**

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




**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/µs.

"$k_0$" represents the maximum permissible pulse characteristic of the waveform applied to the capacitor, expressed in $V^2$/µs.

*Note:*
*The values of dV/dt and $k_0$ provided below must not be exceeded in order to avoid damaging the capacitor.*

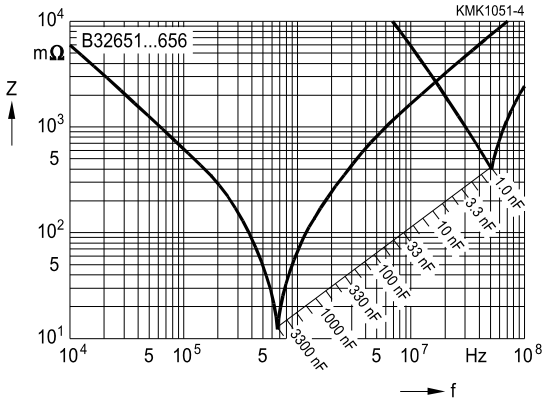
**dV/dt values**

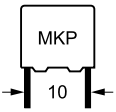
| Lead spacing | | 10 mm | 15 mm | 22.5 mm | 27.5 mm | 37.5 mm |
|---|---|---|---|---|---|---|
| $V_R$ VDC | $V_{rms}$ VAC | dV/dt in V/µs | | | | |
| 250 | 160 | – | 200 | 120 | 50 | – |
| 400 | 200 | – | 300 | 180 | 100 | – |
| 630 | 250 | – | 400 | 300 | 150 | – |
| 850 | 450 | – | – | – | – | 90 |
| 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 V²/µs | | | | |
| 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)





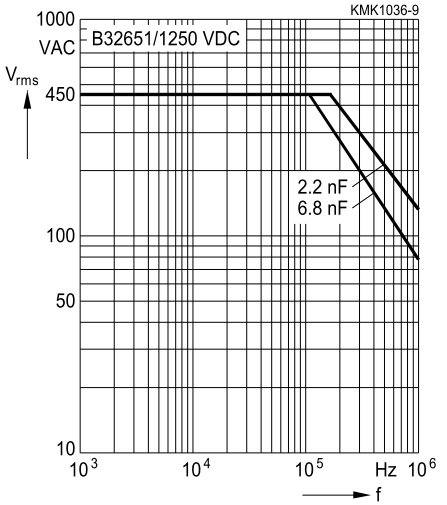

**B32651**

**High pulse (wound)**

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

**Lead spacing 10 mm**

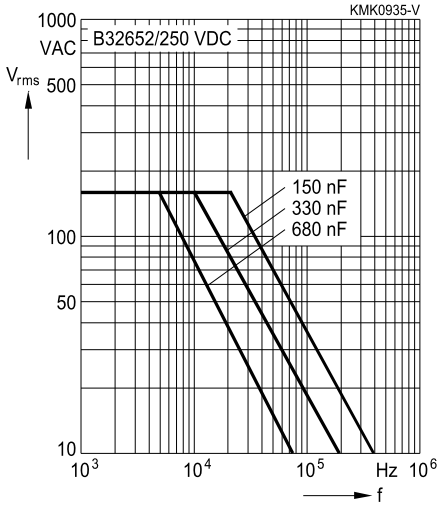
1250 VDC/450 VAC



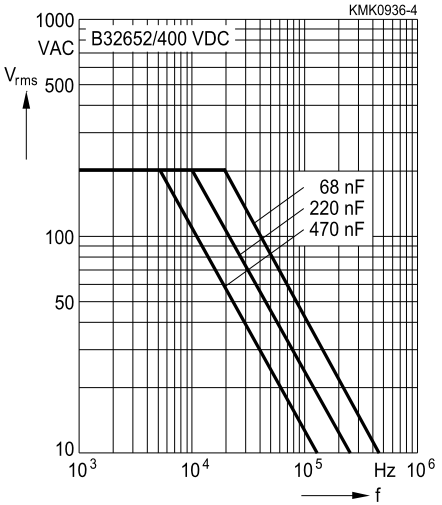
**Permissible AC voltage $V_{rms}$ versus frequency f (for sinusoidal waveforms, $T_A \leq 90$ °C)**
For $T_A$ >90 °C, please refer to "General technical information", section 3.2.3.

**Lead spacing 15 mm**

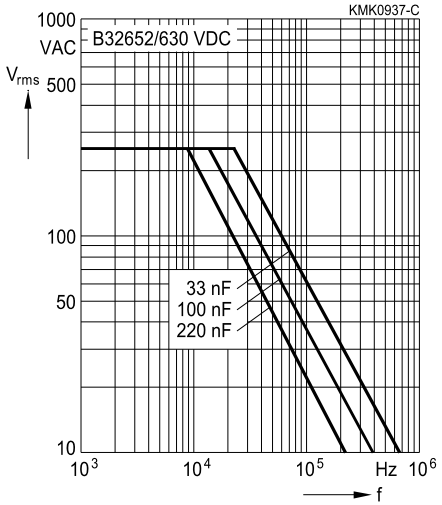
250 VDC/160 VAC



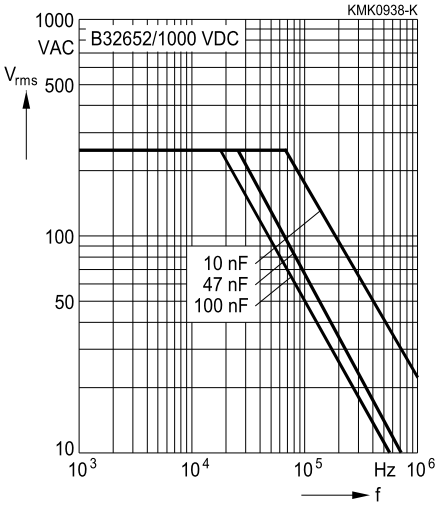

400 VDC/200 VAC

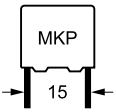



630 VDC/250 VAC




1000 VDC/250 VAC



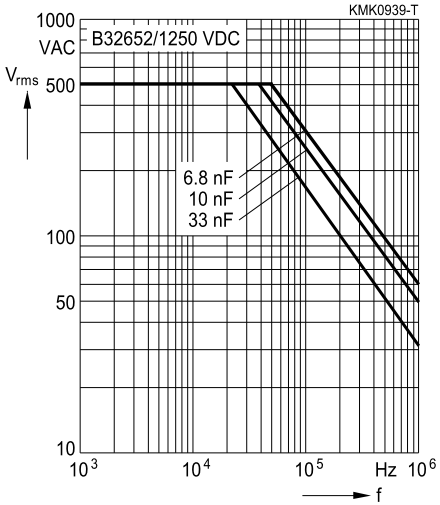




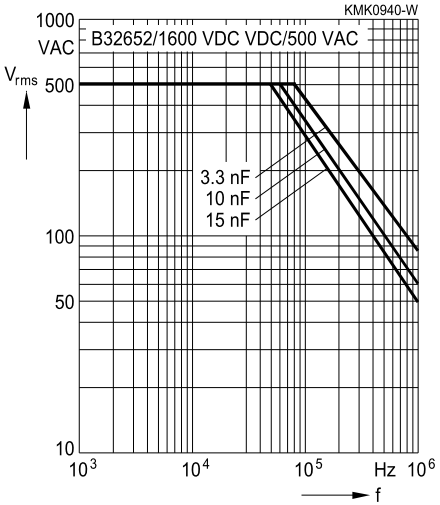

**Permissible AC voltage $V_{rms}$ versus frequency f (for sinusoidal waveforms, $T_A \leq 90$ °C)**
For $T_A$ >90 °C, please refer to "General technical information", section 3.2.3.

**Lead spacing 15 mm**

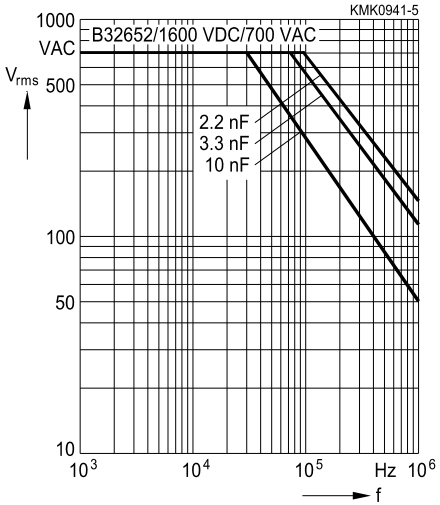
1250 VDC/500 VAC



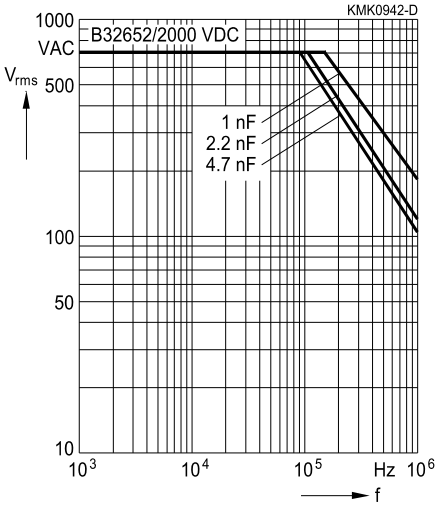

1600 VDC/500 VAC




1600 VDC/700 VAC



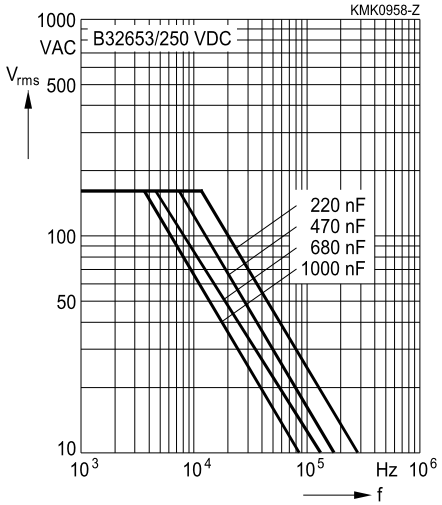

2000 VDC/700 VAC



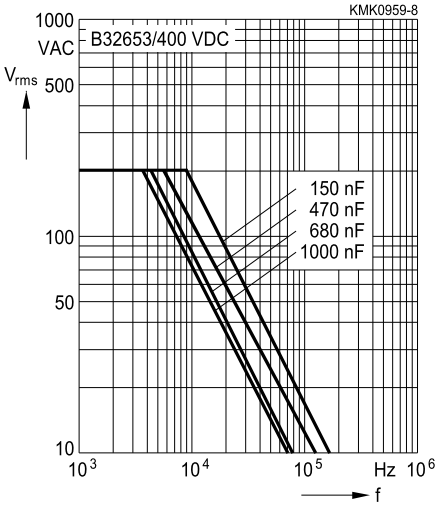
**Permissible AC voltage $V_{rms}$ versus frequency f (for sinusoidal waveforms, $T_A \leq 90$ °C)**
For $T_A$ >90 °C, please refer to "General technical information", section 3.2.3.

**Lead spacing 22.5 mm**

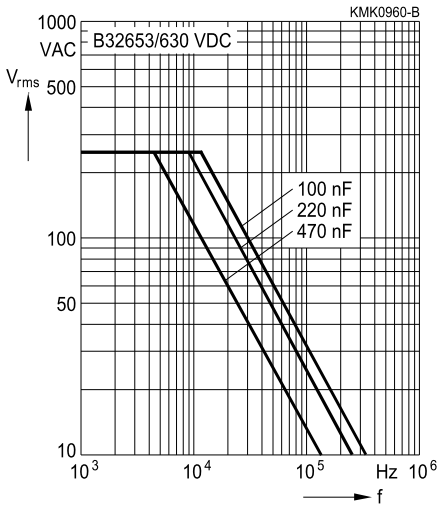
250 VDC/160 VAC



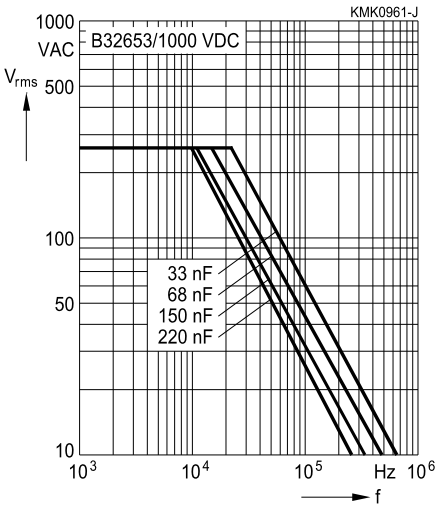

400 VDC/200 VAC

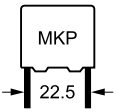



630 VDC/250 VAC




1000 VDC/250 VAC





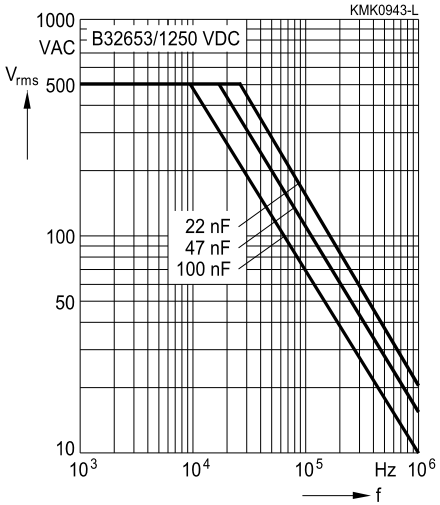

**B32653**

**High pulse (wound)**

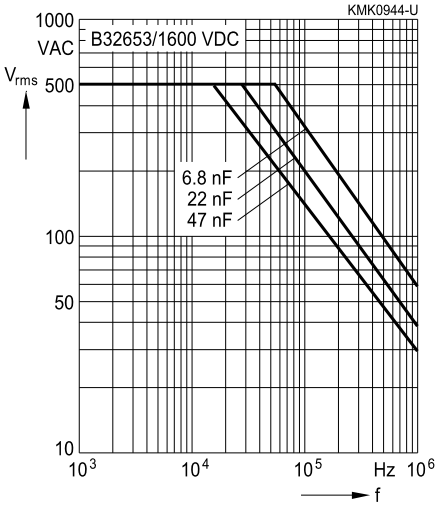
**Permissible AC voltage $V_{rms}$ versus frequency f (for sinusoidal waveforms, $T_A \leq 90$ °C)**
For $T_A$ >90 °C, please refer to "General technical information", section 3.2.3.

**Lead spacing 22.5 mm**

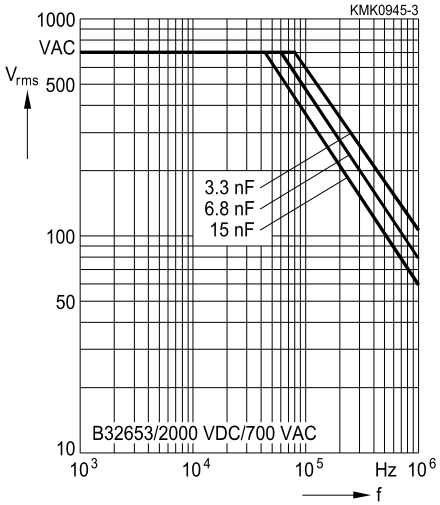
1250 VDC/500 VAC



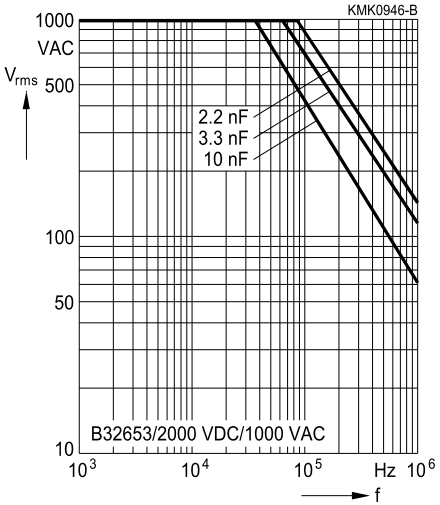

1600 VDC/500 VAC




2000 VDC/700 VAC



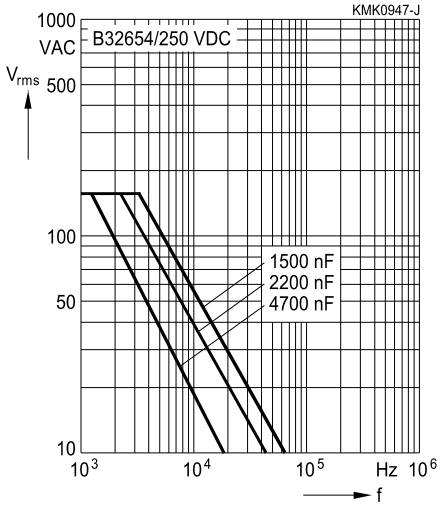

2000 VDC/1000 VAC



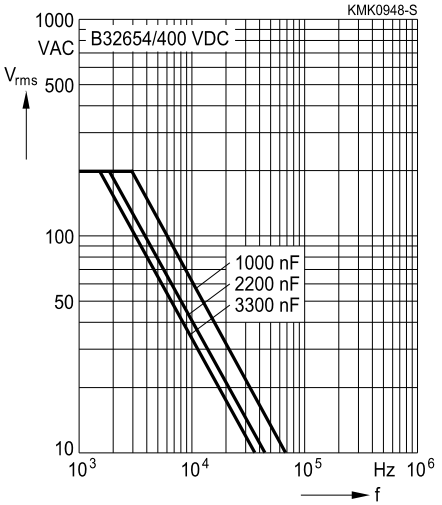
**Permissible AC voltage $V_{rms}$ versus frequency f (for sinusoidal waveforms, $T_A \leq 90$ °C)**
For $T_A$ >90 °C, please refer to "General technical information", section 3.2.3.

**Lead spacing 27.5 mm**

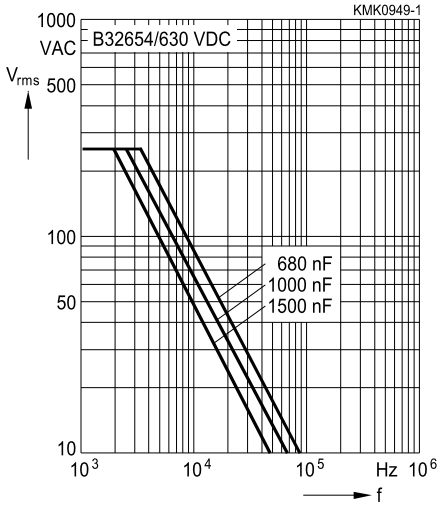
250 VDC/160 VAC



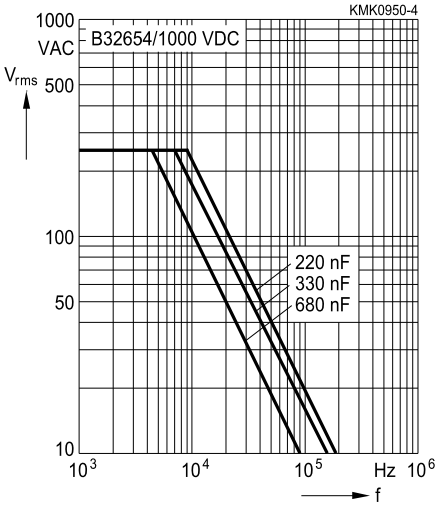

400 VDC/200 VAC

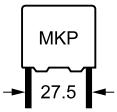



630 VDC/250 VAC




1000 VDC/250 VAC





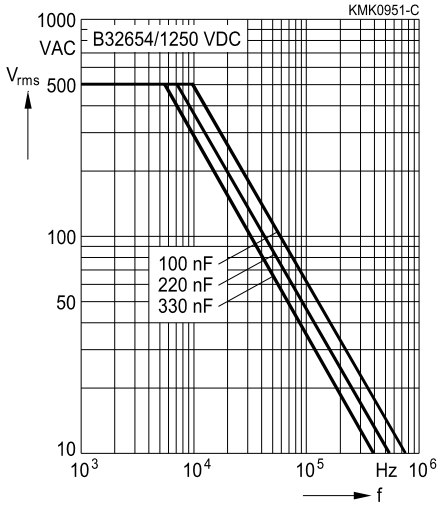

**B32654**

**High pulse (wound)**

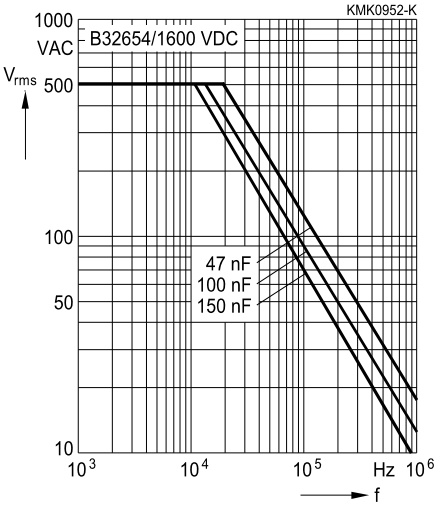
**Permissible AC voltage $V_{rms}$ versus frequency f (for sinusoidal waveforms, $T_A \leq 90$ °C)**
For $T_A$ >90 °C, please refer to "General technical information", section 3.2.3.

**Lead spacing 27.5 mm**

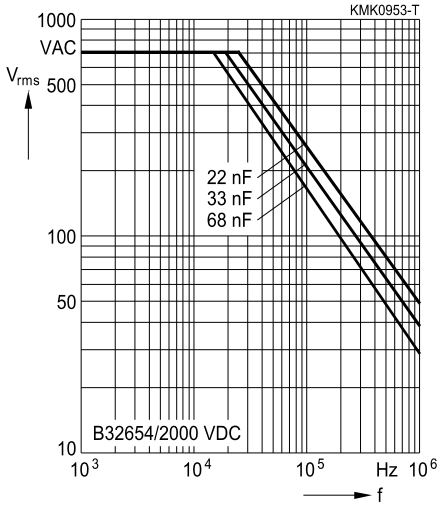
1250 VDC/500 VAC




1600 VDC/500 VAC



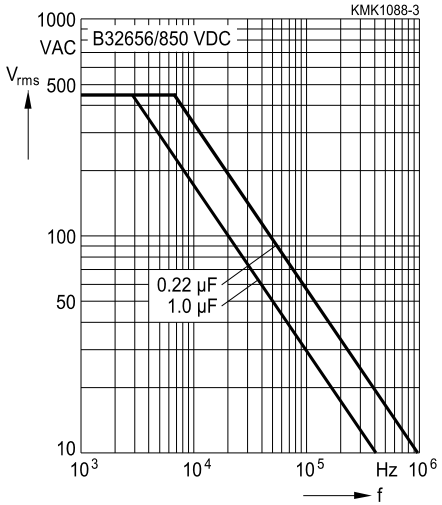

2000 VDC/700 VAC



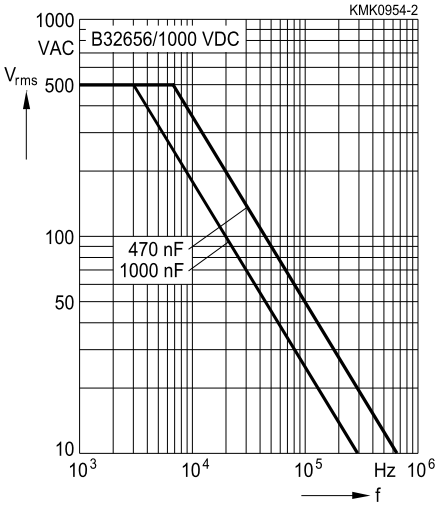
**Permissible AC voltage $V_{rms}$ versus frequency f (for sinusoidal waveforms, $T_A \leq 90$ °C)**
For $T_A$ >90 °C, please refer to "General technical information", section 3.2.3.

**Lead spacing 37.5 mm**

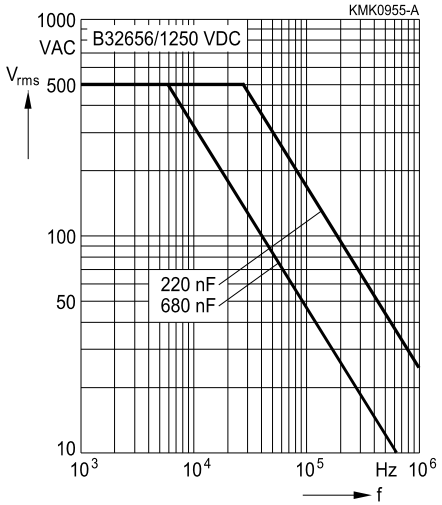
850 VDC/450 VAC



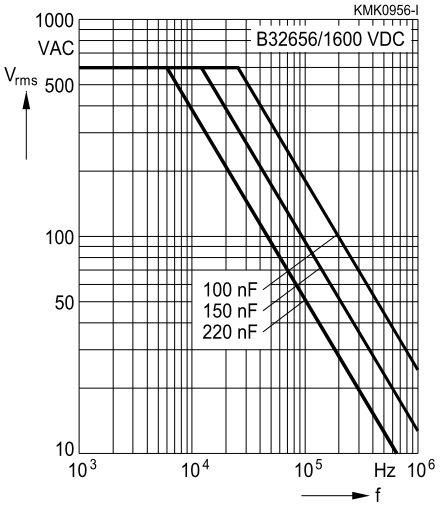

1000 VDC/500 VAC

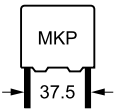



1250 VDC/500 VAC




1600 VDC/600 VAC





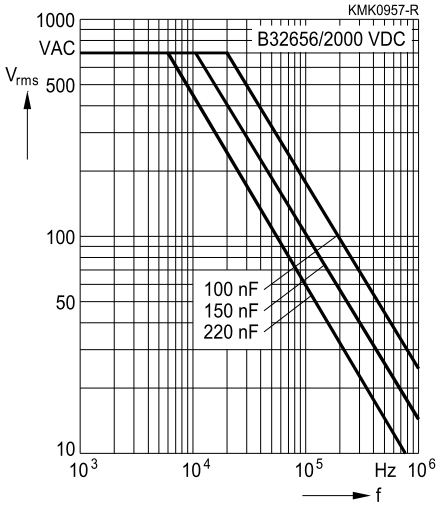

**B32656**

**High pulse (wound)**

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

**Lead spacing 37.5 mm**

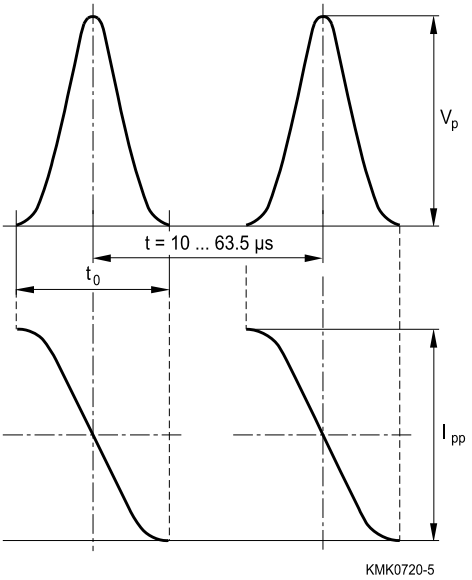
2000 VDC/700 VAC



**Flyback application**

**Permissible voltage and current / waveform**

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



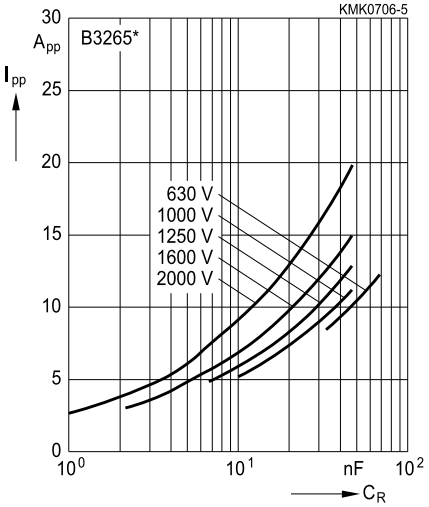

Approximation formular for duty cycle higher than 20%:

$$I'_{pp} = I_{pp} \cdot \sqrt{\frac{t_0^3}{t'^3_0}}$$

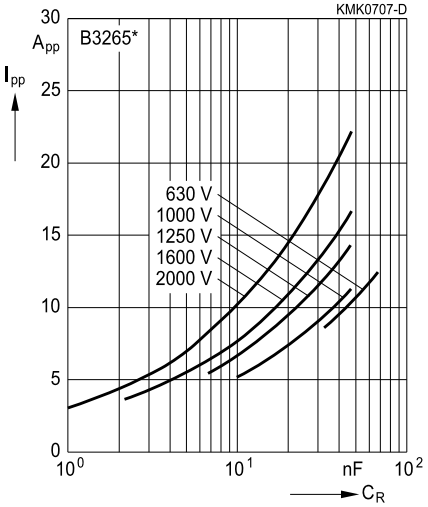
**Flyback application**

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

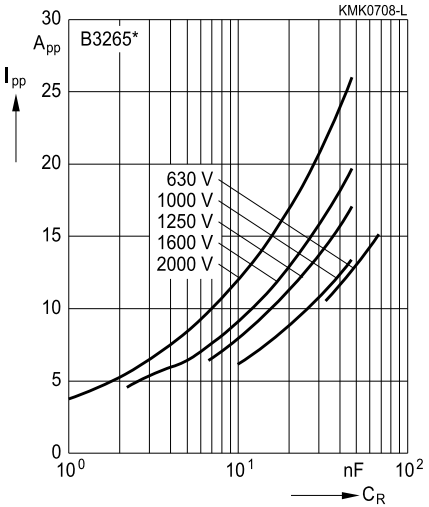
Frequency = 15.75 kHz




Frequency = 31.5 kHz

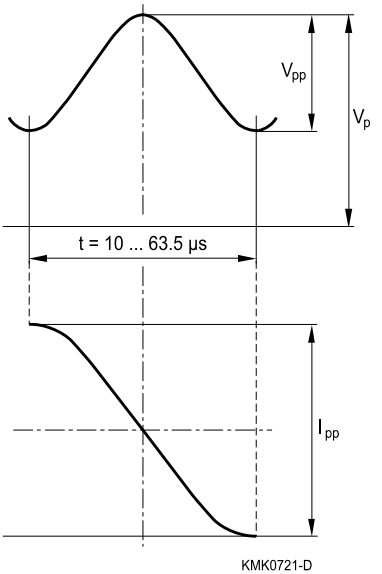



Frequency = 95 kHz



**S-correction application**

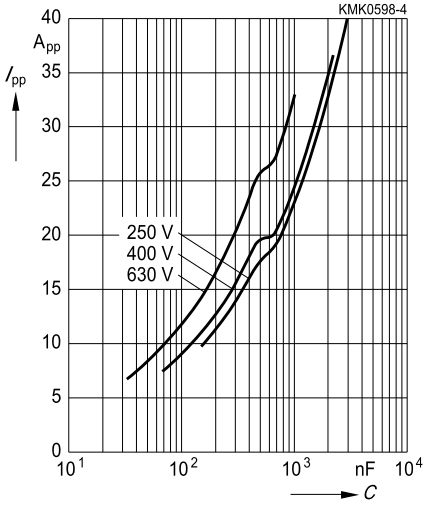
**Permissible voltage and current / waveform**



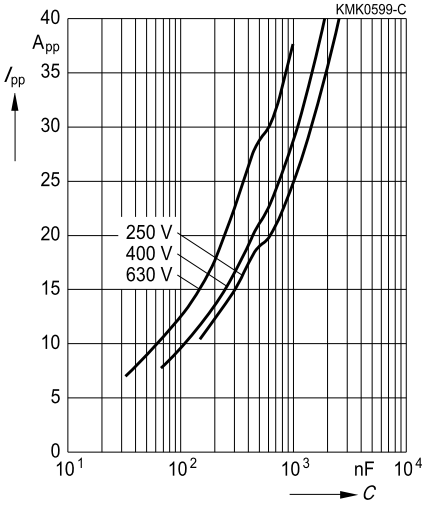
**S-correction application**

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

Frequency = 15.75 kHz




Frequency = 31.75 kHz




Frequency = 95 kHz