



## Film Capacitors

### Metallized Polypropylene Film Capacitors (MKP)

**Series/Type:** B32671P ... B32673P

**Date:** December 2012

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**Power Factor Correction**
**Typical applications**

- PFC (Power Factor Correction)

**Climatic**

- Max. operating temperature: 125 °C
- Climatic category (IEC 60068-1): 55/110/56

**Construction**

- Dielectric: polypropylene (PP)
- Wound capacitor technology
- Plastic case (UL 94 V-0)
- Epoxy resin sealing

**Features**

- Very compact design
- Very small dimensions
- Very high ripple and peak current
- High frequency AC operation capability
- High voltage capability
- Excellent self-healing property
- RoHS-compatible
- Halogen-free capacitors available on request

**Terminals**

- Parallel wire leads, lead free, tinned

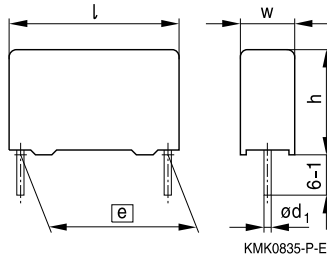
**Marking**

- Manufacturer's logo
- Lot number, series number
- Rated capacitance (coded)
- Capacitance tolerance (code letter)
- Rated DC voltage
- Date of manufacture (coded)

**Delivery mode**

- Bulk (untaped)
- Taped (Ammo pack or reel)

For notes on taping, refer to chapter "Taping and packing".

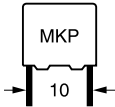
**Dimensional drawing**


Dimensions in mm

Lead spacing	Lead diameter	Type
$e \pm 0.4$	$d_1$	
10	0.6	B32671P
15	0.8	B32672P
22.5	0.8	B32673P

**Overview of available types**

Lead spacing	10 mm			15 mm			22.5 mm		
Type	B32671P			B32672P			B32673P		
Page	4			5			6		
$V_{RMS}$ (V AC)	160	200	200	160	200	200	160	200	200
$V_R$ (V DC)	450	520	630	450	520	630	450	520	630
$C_R$ ( $\mu$ F)									
0.068									
0.082									
0.10									
0.15									
0.18									
0.22									
0.27									
0.33									
0.39									
0.47									
0.56									
0.68									
1.0									
1.5									
2.0									
2.2									


**B32671P**
**Power Factor Correction**
**Ordering codes and packing units (lead spacing 10 mm)**

$V_R$ V DC	$V_{RMS}$ $f \leq 1$ kHz V AC	$C_R$ $\mu F$	Ordering code (composition see below)	Max. dimensions $w \times h \times l$ mm	Ammo pack pcs./MOQ	Reel pcs./MOQ	Untaped pcs./MOQ
450	160	0.10	B32671P4104+***	4.0 × 9.0 × 13.0	4000	6800	4000
		0.15	B32671P4154+***	4.0 × 9.0 × 13.0	4000	6800	4000
		0.18	B32671P4184+***	5.0 × 11.0 × 13.0	3320	5200	4000
		0.22	B32671P4224+***	5.0 × 11.0 × 13.0	3320	5200	4000
		0.27	B32671P4274+***	5.0 × 11.0 × 13.0	3320	5200	4000
		0.33	B32671P4334+***	6.0 × 12.0 × 13.0	2720	4400	4000
		0.39	B32671P4394+***	6.0 × 12.0 × 13.0	2720	4400	4000
		0.47	B32671P4474+***	6.0 × 14.0 × 13.0	2720	4400	4000
		0.68	B32671P4684+***	7.0 × 16.0 × 13.0			4000
		1.0	B32671P4105+***	8.0 × 17.5 × 13.0			4000
520	200	0.082	B32671P5823+***	4.0 × 9.0 × 13.0	4000	6800	4000
		0.10	B32671P5104+***	5.0 × 11.0 × 13.0	3320	5200	4000
		0.15	B32671P5154+***	5.0 × 11.0 × 13.0	3320	5200	4000
		0.22	B32671P5224+***	6.0 × 12.0 × 13.0	2720	4400	4000
		0.33	B32671P5334+***	7.0 × 16.0 × 13.0			4000
		0.47	B32671P5474+***	8.0 × 17.5 × 13.0			4000
630	200	0.068	B32671P6683+***	4.0 × 9.0 × 13.0	4000	6800	4000
		0.082	B32671P6823+***	5.0 × 11.0 × 13.0	3320	5200	4000
		0.10	B32671P6104+***	5.0 × 11.0 × 13.0	3320	5200	4000
		0.15	B32671P6154+***	6.0 × 12.0 × 13.0	2720	4400	4000
		0.18	B32671P6184+***	6.0 × 12.0 × 13.0	2720	4400	4000
		0.22	B32671P6224+***	6.0 × 14.0 × 13.0	2720	4400	4000
		0.33	B32671P6334+***	8.0 × 17.5 × 13.0			4000
		0.39	B32671P6394+***	8.0 × 17.5 × 13.0			4000

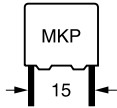
**MOQ = Minimum Order Quantity, consisting of 4 packing units.**
**Further E series, intermediate capacitance values and closer tolerance on request.**
**Composition of ordering code**

+ = Capacitance tolerance code:

J = ±5%  
 K = ±10%  
 M = ±20%

\*\*\* = Packaging code:

289 = Straight terminal, Ammo pack  
 189 = Straight terminal, Reel  
 240 = Crimped from LS10 to LS7.5, Ammo pack  
 140 = Crimped from LS10 to LS7.5, Reel  
 000 = Untaped (lead length 6 – 1 mm)


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

$V_R$ V DC	$V_{RMS}$ f ≤ 1 kHz V AC	$C_R$ μF	Ordering code (composition see below)	Max. dimensions w × h × l mm	Ammo pack pcs./MOQ	Reel pcs./MOQ	Untaped pcs./MOQ
450	160	0.10	B32672P4104+***	5.0 × 10.5 × 18.0	4680	5200	4000
		0.22	B32672P4224+***	5.0 × 10.5 × 18.0	4680	5200	4000
		0.33	B32672P4334+***	5.0 × 10.5 × 18.0	4680	5200	4000
		0.47	B32672P4474+***	5.0 × 10.5 × 18.0	4680	5200	4000
		0.56	B32672P4564+***	6.0 × 11.0 × 18.0	3840	4400	4000
		0.68	B32672P4684+***	6.0 × 12.0 × 18.0	3840	4400	4000
		1.0	B32672P4105+***	7.0 × 12.5 × 18.0	3320	3600	4000
		1.5	B32672P4155+***	9.0 × 17.5 × 18.0	2560	2800	2000
		2.0	B32672P4205+***	9.0 × 17.5 × 18.0	2560	2800	2000
		2.2	B32672P4225+***	11.0 × 18.5 × 18.0		2200	1200
520	200	0.15	B32672P5154+***	5.0 × 10.5 × 18.0	4680	5200	4000
		0.22	B32672P5224+***	5.0 × 10.5 × 18.0	4680	5200	4000
		0.33	B32672P5334+***	6.0 × 11.0 × 18.0	3840	4400	4000
		0.47	B32672P5474+***	7.0 × 12.5 × 18.0	3320	3600	4000
		0.68	B32672P5684+***	8.5 × 14.5 × 18.0	2720	2800	2000
		1.0	B32672P5105+***	9.0 × 17.5 × 18.0	2560	2800	2000
		1.5	B32672P5155+***	11.0 × 18.5 × 18.0		2200	1000
630	200	0.15	B32672P6154+***	5.0 × 10.5 × 18.0	4680	5200	4000
		0.22	B32672P6224+***	6.0 × 11.0 × 18.0	3840	4400	4000
		0.33	B32672P6334+***	7.0 × 12.5 × 18.0	3320	3600	4000
		0.47	B32672P6474+***	8.0 × 14.0 × 18.0	2920	3000	2000
		0.68	B32672P6684+***	9.0 × 17.5 × 18.0	2560	2800	2000
		1.0	B32672P6105+***	11.0 × 18.5 × 18.0		2200	1000

**MOQ = Minimum Order Quantity, consisting of 4 packing units.**
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M = ±20%

\*\*\* = Packaging code:

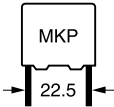
289 = Straight terminal, Ammo pack

189 = Straight terminal, Reel

255 = Crimped from LS15 to LS7.5, Ammo pack

150 = Crimped from LS15 to LS7.5, Reel

000 = Untaped (lead length 6 – 1 mm)


**B32673P**
**Power Factor Correction**
**Ordering codes and packing units (lead spacing 22.5 mm)**

$V_R$ V DC	$V_{RMS}$ f ≤ 1 kHz V AC	$C_R$ μF	Ordering code (composition see below)	Max. dimensions w × h × l mm	Ammo pack pcs./MOQ	Reel pcs./MOQ	Untaped pcs./MOQ
450	160	1.0	B32673P4105+***	6.0 × 15.0 × 26.5	2720	2800	2880
		1.5	B32673P4155+***	7.0 × 16.0 × 26.5	2320	2400	2520
		2.2	B32673P4225+***	8.5 × 16.5 × 26.5	1920	2000	2040
520	200	0.47	B32673P5474+***	6.0 × 15.0 × 26.5	2720	2800	2880
		0.56	B32673P5564+***	6.0 × 15.0 × 26.5	2720	2800	2880
		0.68	B32673P5684+***	6.0 × 15.0 × 26.5	2720	2800	2880
		1.0	B32673P5105+***	7.0 × 16.0 × 26.5	2320	2400	2520
		1.5	B32673P5155+***	10.5 × 16.5 × 26.5	1560	1600	2160
		2.2	B32673P5225+***	10.5 × 20.5 × 26.5			2160
630	200	0.33	B32673P6334+***	6.0 × 15.0 × 26.5	2720	2800	2880
		0.47	B32673P6474+***	6.0 × 15.0 × 26.5	2720	2800	2880
		0.56	B32673P6564+***	6.0 × 15.0 × 26.5	2720	2800	2880
		0.68	B32673P6684+***	7.0 × 16.0 × 26.5	2320	2400	2520
		1.0	B32673P6105+***	8.5 × 16.5 × 26.5	1920	2000	2040
		1.5	B32673P6155+***	10.5 × 18.5 × 26.5	1560	1600	2160
		2.2	B32673P6225+***	12.0 × 22.0 × 26.5			1800

**MOQ = Minimum Order Quantity, consisting of 4 packing units.**
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K = ±10%

M = ±20%

\*\*\* = Packaging code:

289 = Straight terminal, Ammo pack

189 = Straight terminal, Reel

000 = Untaped (lead length 6 – 1 mm)

**Technical data**

Operating temperature range	Max. operating temperature $T_{op, max}$	+125 °C	
	Upper category temperature $T_{max}$	+110 °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)	1 kHz	1.0	
	10 kHz	2.5	
	100 kHz	25.0	
Insulation resistance $R_{ins}$ at 100 V and 20 °C, rel. humidity $\leq 65\%$ (minimum as-delivered values)	> 30 G $\Omega$ ( $C_R \leq 0.33 \mu F$ ) > 10000 s ( $C_R > 0.33 \mu F$ )		
DC test voltage	1.4 · $V_R$ , 2 s		
Category voltage $V_C$ (continuous operation with $V_{DC}$ or $V_{AC}$ at $f \leq 1$ kHz) For 85 °C < $T_A$ the derating is 1.28% per °C	$T_{op} \leq 85$	DC voltage derating	AC voltage derating
	85 < $T_{op} \leq 100$	$V_C = V_R$	$V_{C,RMS} = V_{RMS}$
	100 < $T_{op} \leq 110$	$V_C = 0.81 \cdot V_R$	$V_{C,RMS} = 0.81 \cdot V_{RMS}$
	110 < $T_{op} \leq 125$	$V_C = 0.68 \cdot V_R$	$V_{C,RMS} = 0.68 \cdot V_{RMS}$
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)
	$T_A \leq 100$	$V_{op} = 1.1 \times V_C$ (1000 h)	$V_{op} = 1.0 \times V_{C,RMS}$ (1000 h)
	110 < $T_A \leq 125$	$V_{op} = 1.0 \times V_C$ (1000 h)	$V_{op} = 1.0 \times V_{C,RMS}$ (1000 h)
Reliability: Failure rate $\lambda$ Service life $t_{SL}$	24 fit ( $\leq 1 \cdot 10^{-7}/h$ ) at 0.5 · $V_R$ , 40 °C 200000 h at 0.5 · $V_R$ , 85 °C For conversion to other operating conditions and temperatures, refer to chapter "Quality, 2 Reliability"		
Failure criteria: Total failure	Short circuit or open circuit		
Failure due to variation of parameters	Capacitance change $ \Delta C/C $	> 10%	
	Dissipation factor $\tan \delta$	> 4 × upper limit values	
	Insulation resistance $R_{ins}$	< 150 M $\Omega$ ( $C_R \leq 0.33 \mu F$ )	
	Or time constant $\tau$	< 50 s ( $C_R \geq 0.33 \mu F$ )	



**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. For a train of pulse, please refer to AC voltage vs frequency.*

**dV/dt values**

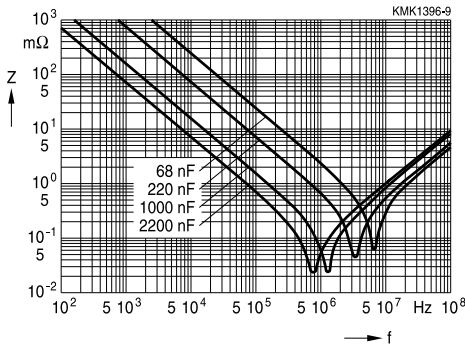
Lead spacing		10 mm	15 mm	22.5 mm
V <sub>R</sub> V DC	V <sub>RMS</sub> V AC	dV/dt in V/ $\mu$ s		
450	160	140	120	100
520	200	200	160	110
630	200	250	180	130

**k<sub>0</sub> values**

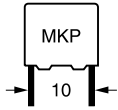
Lead spacing		10 mm	15 mm	22.5 mm
V <sub>R</sub> V DC	V <sub>RMS</sub> V AC	k <sub>0</sub> in V <sup>2</sup> / $\mu$ s		
450	160	126000	108000	90000
520	200	208000	166000	114000
630	200	315000	226000	163000

**Impedance Z versus frequency f**

(typical values)



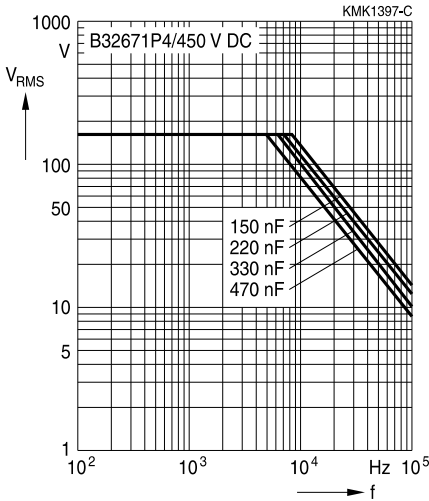




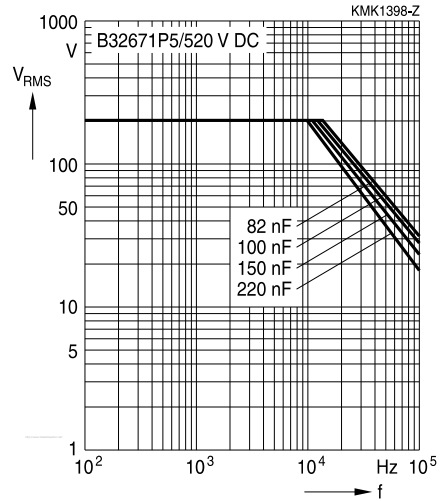
**Permissible AC voltage  $V_{RMS}$  versus frequency  $f$  (for sinusoidal waveforms  $T_{op} \leq 100\text{ }^{\circ}\text{C}$ )**

**Lead spacing 10 mm**

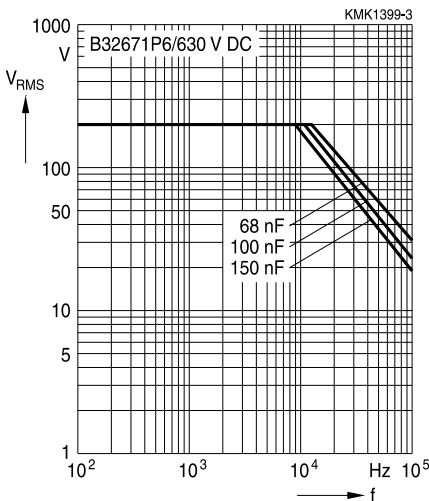
**450 V DC/160 V AC**

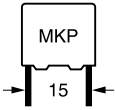


**520 V DC/200 V AC**



**630 V DC/200 V AC**





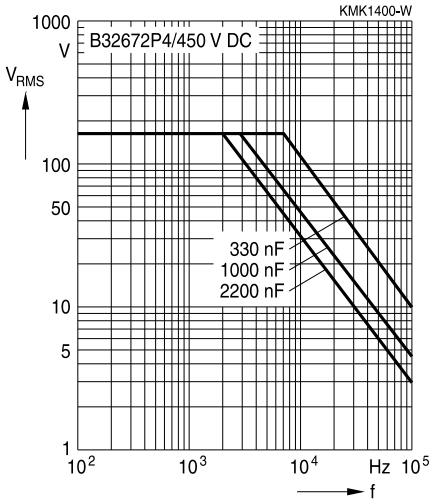
**B32672P**

**Power Factor Correction**

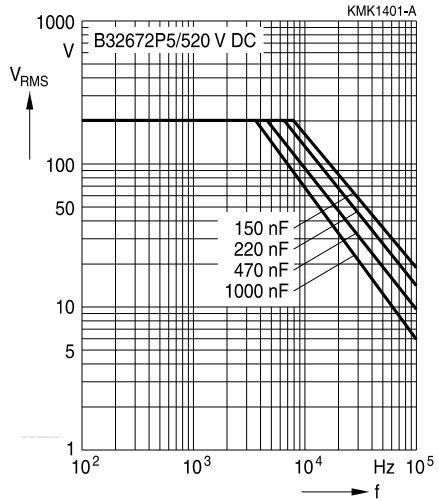
**Permissible AC voltage  $V_{RMS}$  versus frequency  $f$  (for sinusoidal waveforms  $T_{op} \leq 100\text{ }^\circ\text{C}$ )**

**Lead spacing 15 mm**

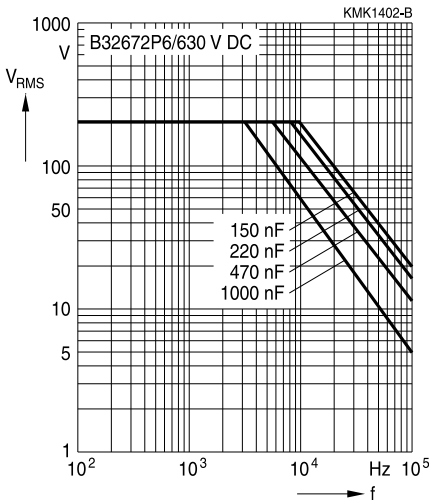
**450 V DC/160 V AC**

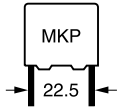


**520 V DC/200 V AC**



**630 V DC/200 V AC**

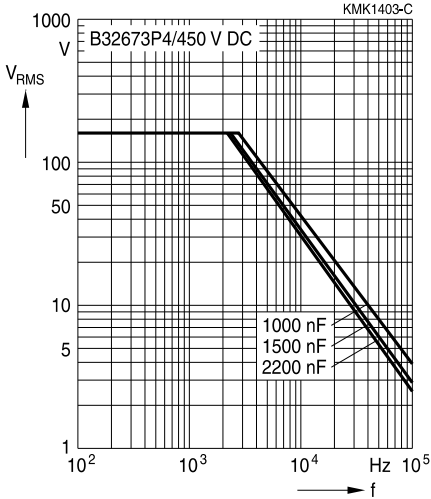




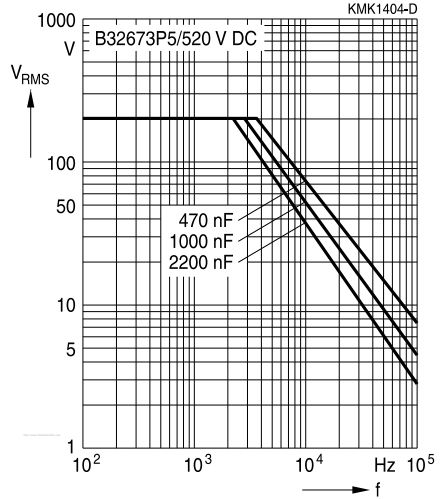
**Permissible AC voltage  $V_{RMS}$  versus frequency  $f$  (for sinusoidal waveforms  $T_{op} \leq 100\text{ }^\circ\text{C}$ )**

**Lead spacing 22.5 mm**

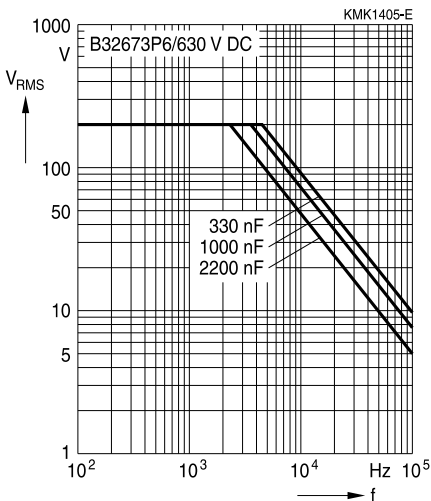
**450 V DC/160 V AC**

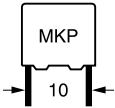


**520 V DC/200 V AC**



**630 V DC/200 V AC**





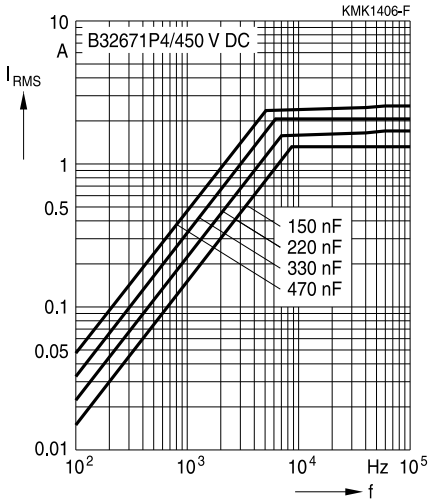
**B32671P**

**Power Factor Correction**

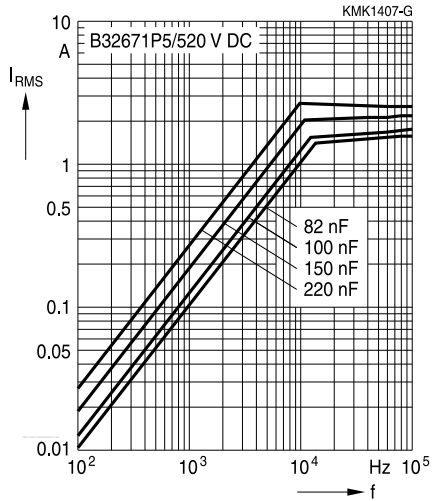
**Permissible current  $I_{RMS}$  versus frequency  $f$  (for sinusoidal waveforms  $T_{op} \leq 100\text{ }^{\circ}\text{C}$ )**

**Lead spacing 10 mm**

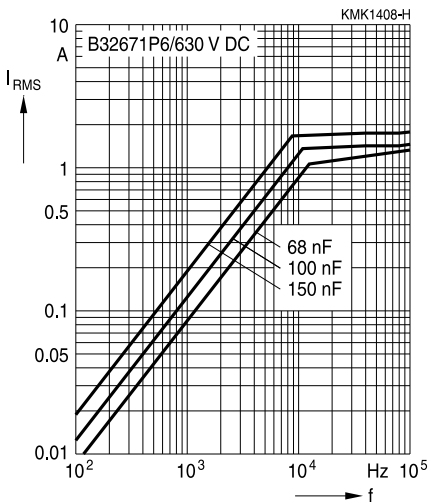
**450 V DC/160 V AC**

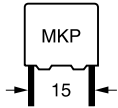
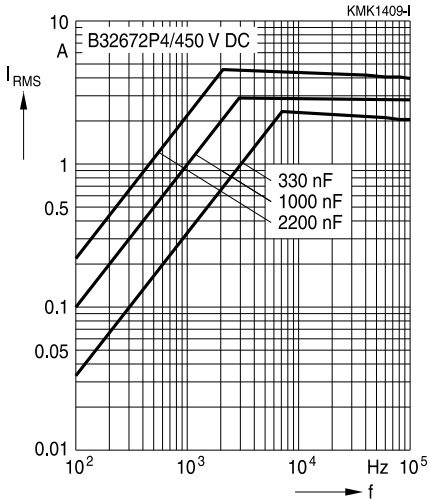
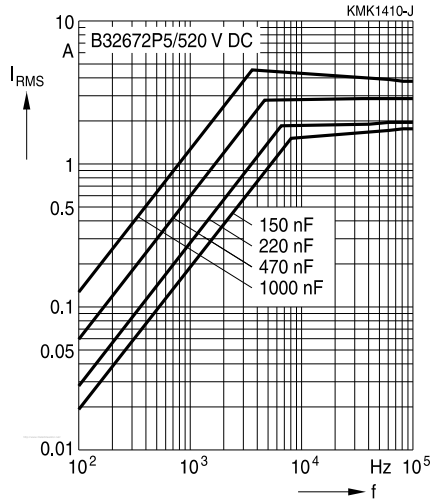
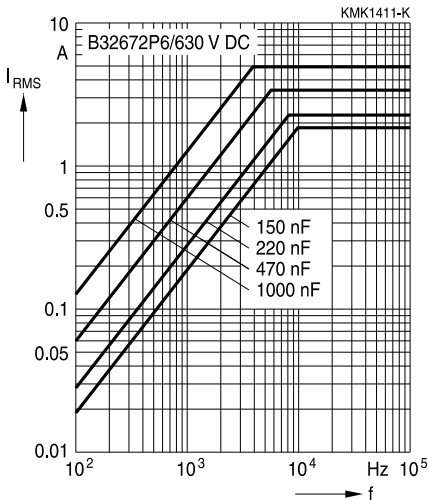


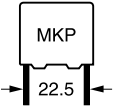
**520 V DC/200 V AC**



**630 V DC/200 V AC**




**Permissible current  $I_{RMS}$  versus frequency  $f$  (for sinusoidal waveforms  $T_{op} \leq 100\text{ }^\circ\text{C}$ )**
**Lead spacing 15 mm**
**450 V DC/160 V AC**

**520 V DC/200 V AC**

**630 V DC/200 V AC**




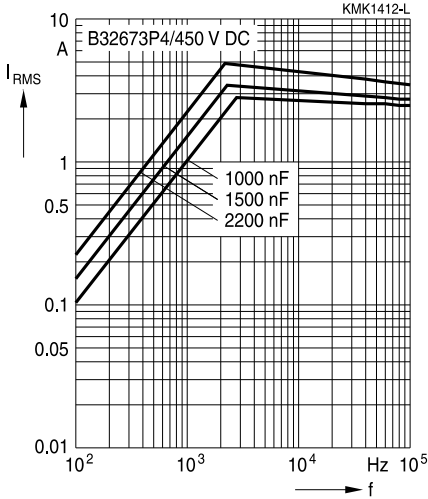
**B32673P**

**Power Factor Correction**

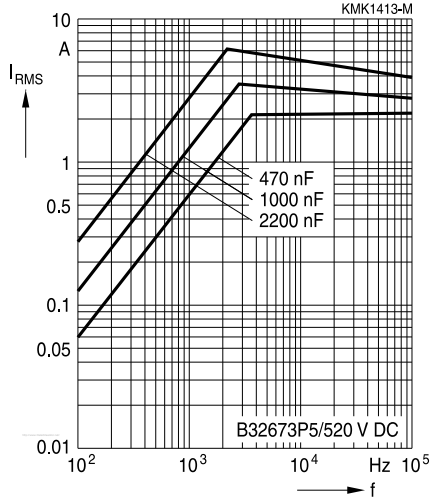
**Permissible current  $I_{RMS}$  versus frequency  $f$  (for sinusoidal waveforms  $T_{op} \leq 100\text{ }^{\circ}\text{C}$ )**

**Lead spacing 22.5 mm**

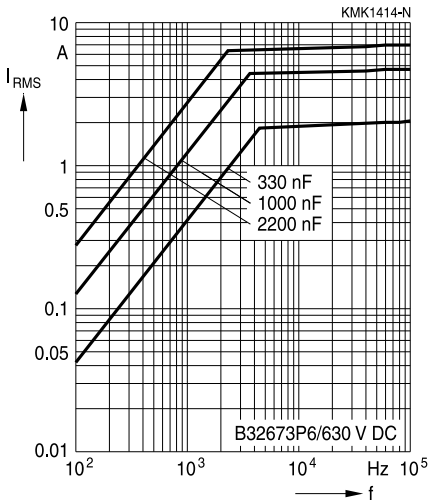
**450 V DC/160 V AC**

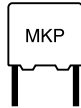


**520 V DC/200 V AC**



**630 V DC/200 V AC**





## Mounting guidelines

### 1 Soldering

#### 1.1 Solderability of leads

The solderability of terminal leads is tested to IEC 60068-2-20, test Ta, method 1.

Before a solderability test is carried out, terminals are subjected to accelerated ageing (to IEC 60068-2-2, test Ba: 4 h exposure to dry heat at 155 °C). Since the ageing temperature is far higher than the upper category temperature of the capacitors, the terminal wires should be cut off from the capacitor before the ageing procedure to prevent the solderability being impaired by the products of any capacitor decomposition that might occur.

Solder bath temperature	235 ±5 °C
Soldering time	2.0 ±0.5 s
Immersion depth	2.0 +0/-0.5 mm from capacitor body or seating plane
Evaluation criteria:	
Visual inspection	Wetting of wire surface by new solder ≥90%, free-flowing solder

#### 1.2 Resistance to soldering heat

Resistance to soldering heat is tested to IEC 60068-2-20, test Tb, method 1A.

Conditions:

Series	Solder bath temperature	Soldering time
MKT boxed (except 2.5 × 6.5 × 7.2 mm) coated uncoated (lead spacing > 10 mm)	260 ±5 °C	10 ±1 s
MFP MKP (lead spacing > 7.5 mm)		
MKT boxed (case 2.5 × 6.5 × 7.2 mm)		5 ±1 s
MKP (lead spacing ≤ 7.5 mm)		< 4 s
MKT uncoated (lead spacing ≤ 10 mm) insulated (B32559)		recommended soldering profile for MKT uncoated (lead spacing ≤ 10 mm) and insulated (B32559)



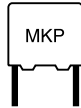
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**Power Factor Correction**



Immersion depth	2.0 +0/−0.5 mm from capacitor body or seating plane
Shield	Heat-absorbing board, (1.5 ±0.5) mm thick, between capacitor body and liquid solder
Evaluation criteria:	
Visual inspection	No visible damage
$\Delta C/C_0$	2% for MKT/MKP/MFP 5% for EMI suppression capacitors
$\tan \delta$	As specified in sectional specification





### 1.3 General notes on soldering

Permissible heat exposure loads on film capacitors are primarily characterized by the upper category temperature  $T_{max}$ . Long exposure to temperatures above this type-related temperature limit can lead to changes in the plastic dielectric and thus change irreversibly a capacitor's electrical characteristics. For short exposures (as in practical soldering processes) the heat load (and thus the possible effects on a capacitor) will also depend on other factors like:

- Pre-heating temperature and time
- Forced cooling immediately after soldering
- Terminal characteristics:
  - diameter, length, thermal resistance, special configurations (e.g. crimping)
- Height of capacitor above solder bath
- Shadowing by neighboring components
- Additional heating due to heat dissipation by neighboring components
- Use of solder-resist coatings

The overheating associated with some of these factors can usually be reduced by suitable countermeasures. For example, if a pre-heating step cannot be avoided, an additional or reinforced cooling process may possibly have to be included.

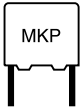
EPCOS recommends the following conditions:

- Pre-heating with a maximum temperature of 110 °C
- Temperature inside the capacitor should not exceed the following limits:
  - MKP/MFP 110 °C
  - MKT 160 °C
- When SMD components are used together with leaded ones, the leaded film capacitors should not pass into the SMD adhesive curing oven. The leaded components should be assembled after the SMD curing step.
- Leaded film capacitors are not suitable for reflow soldering.

#### Uncoated capacitors

For uncoated MKT capacitors with lead spacings  $\leq 10$  mm (B32560/B32561) the following measures are recommended:

- pre-heating to not more than 110 °C in the preheater phase
- rapid cooling after soldering

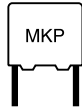


### Cautions and warnings

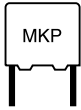
- Do not exceed the upper category temperature (UCT).
- Do not apply any mechanical stress to the capacitor terminals.
- Avoid any compressive, tensile or flexural stress.
- Do not move the capacitor after it has been soldered to the PC board.
- Do not pick up the PC board by the soldered capacitor.
- Do not place the capacitor on a PC board whose PTH hole spacing differs from the specified lead spacing.
- Do not exceed the specified time or temperature limits during soldering.
- Avoid external energy inputs, such as fire or electricity.
- Avoid overload of the capacitors.

The table below summarizes the safety instructions that must always be observed. A detailed description can be found in the relevant sections of the chapters "General technical information" and "Mounting guidelines".

Topic	Safety information	Reference chapter "General technical information"
Storage conditions	Make sure that capacitors are stored within the specified range of time, temperature and humidity conditions.	4.5 "Storage conditions"
Flammability	Avoid external energy, such as fire or electricity (passive flammability), avoid overload of the capacitors (active flammability) and consider the flammability of materials.	5.3 "Flammability"
Resistance to vibration	Do not exceed the tested ability to withstand vibration. The capacitors are tested to IEC 60068-2-6. EPCOS offers film capacitors specially designed for operation under more severe vibration regimes such as those found in automotive applications. Consult our catalog "Film Capacitors for Automotive Electronics".	5.2 "Resistance to vibration"

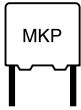


Topic	Safety information	Reference chapter "Mounting guidelines"
Soldering	Do not exceed the specified time or temperature limits during soldering.	1 "Soldering"
Cleaning	Use only suitable solvents for cleaning capacitors.	2 "Cleaning"
Embedding of capacitors in finished assemblies	When embedding finished circuit assemblies in plastic resins, chemical and thermal influences must be taken into account. Caution: Consult us first, if you also wish to embed other uncoated component types!	3 "Embedding of capacitors in finished assemblies"


**Symbols and terms**

Symbol	English	German
$\alpha$	Heat transfer coefficient	Wärmeübergangszahl
$\alpha_C$	Temperature coefficient of capacitance	Temperaturkoeffizient der Kapazität
A	Capacitor surface area	Kondensatoroberfläche
$\beta_C$	Humidity coefficient of capacitance	Feuchtekoeffizient der Kapazität
C	Capacitance	Kapazität
$C_R$	Rated capacitance	Nennkapazität
$\Delta C$	Absolute capacitance change	Absolute Kapazitätsänderung
$\Delta C/C$	Relative capacitance change (relative deviation of actual value)	Relative Kapazitätsänderung (relative Abweichung vom Ist-Wert)
$\Delta C/C_R$	Capacitance tolerance (relative deviation from rated capacitance)	Kapazitätstoleranz (relative Abweichung vom Nennwert)
dt	Time differential	Differentielle Zeit
$\Delta t$	Time interval	Zeitintervall
$\Delta T$	Absolute temperature change (self-heating)	Absolute Temperaturänderung (Selbsterwärmung)
$\Delta \tan \delta$	Absolute change of dissipation factor	Absolute Änderung des Verlustfaktors
$\Delta V$	Absolute voltage change	Absolute Spannungsänderung
dV/dt	Time differential of voltage function (rate of voltage rise)	Differentielle Spannungsänderung (Spannungsflankensteilheit)
$\Delta V/\Delta t$	Voltage change per time interval	Spannungsänderung pro Zeitintervall
E	Activation energy for diffusion	Aktivierungsenergie zur Diffusion
ESL	Self-inductance	Eigeninduktivität
ESR	Equivalent series resistance	Ersatz-Serienwiderstand
f	Frequency	Frequenz
$f_1$	Frequency limit for reducing permissible AC voltage due to thermal limits	Grenzfrequenz für thermisch bedingte Reduzierung der zulässigen Wechselspannung
$f_2$	Frequency limit for reducing permissible AC voltage due to current limit	Grenzfrequenz für strombedingte Reduzierung der zulässigen Wechselspannung
$f_r$	Resonant frequency	Resonanzfrequenz
$F_D$	Thermal acceleration factor for diffusion	Therm. Beschleunigungsfaktor zur Diffusion
$F_T$	Derating factor	Deratingfaktor
i	Current (peak)	Stromspitze
$I_C$	Category current (max. continuous current)	Kategoriestrom (max. Dauerstrom)

Symbol	English	German
$I_{RMS}$	(Sinusoidal) alternating current, root-mean-square value	(Sinusförmiger) Wechselstrom
$i_z$	Capacitance drift	Inkonstanz der Kapazität
$k_0$	Pulse characteristic	Impuls Kennwert
$L_S$	Series inductance	Serieninduktivität
$\lambda$	Failure rate	Ausfallrate
$\lambda_0$	Constant failure rate during useful service life	Konstante Ausfallrate in der Nutzungsphase
$\lambda_{test}$	Failure rate, determined by tests	Experimentell ermittelte Ausfallrate
$P_{diss}$	Dissipated power	Abgegebene Verlustleistung
$P_{gen}$	Generated power	Erzeugte Verlustleistung
$Q$	Heat energy	Wärmeenergie
$\rho$	Density of water vapor in air	Dichte von Wasserdampf in Luft
$R$	Universal molar constant for gases	Allg. Molarkonstante für Gas
$R$	Ohmic resistance of discharge circuit	Ohmscher Widerstand des Entladekreises
$R_i$	Internal resistance	Innenwiderstand
$R_{ins}$	Insulation resistance	Isolationswiderstand
$R_p$	Parallel resistance	Parallelwiderstand
$R_S$	Series resistance	Serienwiderstand
$S$	severity (humidity test)	Schärfegrad (Feuchtest)
$t$	Time	Zeit
$T$	Temperature	Temperatur
$\tau$	Time constant	Zeitkonstante
$\tan \delta$	Dissipation factor	Verlustfaktor
$\tan \delta_D$	Dielectric component of dissipation factor	Dielektrischer Anteil des Verlustfaktors
$\tan \delta_P$	Parallel component of dissipation factor	Parallelanteil des Verlustfaktors
$\tan \delta_S$	Series component of dissipation factor	Serienanteil des Verlustfaktors
$T_A$	Ambient temperature	Umgebungstemperatur
$T_{max}$	Upper category temperature	Obere Kategorietemperatur
$T_{min}$	Lower category temperature	Untere Kategorietemperatur
$t_{OL}$	Operating life at operating temperature and voltage	Betriebszeit bei Betriebstemperatur und -spannung
$T_{op}$	Operating temperature	Betriebstemperatur
$T_R$	Rated temperature	Nenntemperatur
$T_{ref}$	Reference temperature	Referenztemperatur
$t_{SL}$	Reference service life	Referenz-Lebensdauer
$V_{AC}$	AC voltage	Wechselspannung


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Symbol	English	German
$V_C$	Category voltage	Kategoriespannung
$V_{C,RMS}$	Category AC voltage	(Sinusförmige) Kategorie-Wechselspannung
$V_{CD}$	Corona-discharge onset voltage	Teilentlade-Einsatzspannung
$V_{ch}$	Charging voltage	Ladespannung
$V_{DC}$	DC voltage	Gleichspannung
$V_{FB}$	Fly-back capacitor voltage	Spannung (Flyback)
$V_i$	Input voltage	Eingangsspannung
$V_o$	Output voltage	Ausgangssspannung
$V_{op}$	Operating voltage	Betriebsspannung
$V_p$	Peak pulse voltage	Impuls-Spitzenspannung
$V_{pp}$	Peak-to-peak voltage Impedance	Spannungshub
$V_R$	Rated voltage	Nennspannung
$\hat{V}_R$	Amplitude of rated AC voltage	Amplitude der Nenn-Wechselspannung
$V_{RMS}$	(Sinusoidal) alternating voltage, root-mean-square value	(Sinusförmige) Wechselspannung
$V_{SC}$	S-correction voltage	Spannung bei Anwendung "S-correction"
$V_{sn}$	Snubber capacitor voltage	Spannung bei Anwendung "Beschaltung"
$Z$	Impedance	Scheinwiderstand
$e$	Lead spacing	Rastermaß

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