Film Capacitors

Metallized Polypropylene Film Capacitors (MKP)

Series/Type: **B32620 ... B32621**
Date: August 2004

Typical applications

- Compact fluorescent lamps (CFL)
- SMPS

Climatic

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

Construction

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

Features

- Very high pulse strength
- Very good self-healing properties
- Smallest possible dimensions
- High contact reliability

Terminals

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

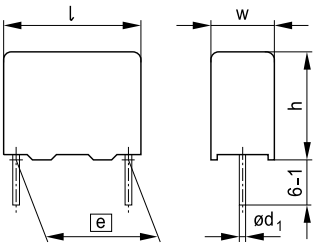
Marking

Manufacturer's logo,
rated capacitance (coded),
cap. tolerance (code letter), rated voltage,
date of manufacture (coded),
for lead spacing 7.5 mm: style (MKP),
for lead spacing 10 mm: lot number, series number (621)

Delivery mode

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

Dimensional drawing

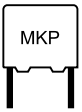


KMK0834-G-E

Dimensions in mm

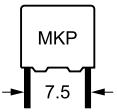
Lead spacing e ±0.4	Lead diameter d_1	Type
7.5	0.5	B32620
10.0	0.6[1)]	B32621

1) 0.5 mm for capacitor width w = 4 mm



Overview of available types

Lead spacing	7.5 mm						10.0 mm				
Type	B32620						B32621				
Page	4						6				
V_R (VDC)	160	250	400	630	1000	1000	160	250	400	630	1000
V_{rms} (VAC)	90	140	200	400	500	600	90	140	200	400	500
C_R (nF)											
0.47											
0.68											
1.0											
1.5											
2.2											
3.3											
4.7											
6.8											
10											
15											
22											
33											
47											
68											
100											
150											
220											



B32620

High pulse (stacked)

Ordering codes and packing units (lead spacing 7.5 mm)

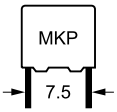
V_R	V_{rms} f ≤1 kHz	C_R	Max. dimensions w × h × l	Ordering code (composition see	Ammo pack	Reel	Untaped
VDC	VAC	nF	mm	below)	pcs./unit	pcs./unit	pcs./unit
160	90	33	4.0 × 8.5 × 10.0	B32620A5333+***	2000	1800	1500
		47	4.0 × 8.5 × 10.0	B32620A5473+***	2000	1800	1500
		68	5.0 × 10.5 × 10.0	B32620A5683+***	1600	1400	1000
		100	5.0 × 10.5 × 10.0	B32620A5104+***	1600	1400	1000
		150	6.0 × 12.0 × 10.3	B32620A5154+***	1300	1100	750
250	140	22	4.0 × 8.5 × 10.0	B32620A3223+***	2000	1800	1500
		33	4.0 × 8.5 × 10.0	B32620A3333+***	2000	1800	1500
		47	5.0 × 10.5 × 10.0	B32620A3473+***	1600	1400	1000
		68	5.0 × 10.5 × 10.0	B32620A3683+***	1600	1400	1000
		100	6.0 × 12.0 × 10.3	B32620A3104+***	1300	1100	750
400	200	6.8	4.0 × 8.5 × 10.0	B32620A4682+***	2000	1800	1500
		10	4.0 × 8.5 × 10.0	B32620A4103+***	2000	1800	1500
		15	5.0 × 10.5 × 10.0	B32620A4153+***	1600	1400	1000
		22	5.0 × 10.5 × 10.0	B32620A4223+***	1600	1400	1000
		33	6.0 × 12.0 × 10.3	B32620A4333+***	1300	1100	750
630	400	1.5	4.0 × 8.5 × 10.0	B32620A6152+***	2000	1800	1500
		2.2	4.0 × 8.5 × 10.0	B32620A6222+***	2000	1800	1500
		3.3	4.0 × 8.5 × 10.0	B32620A6332+***	2000	1800	1500
		4.7	4.0 × 8.5 × 10.0	B32620A6472+***	2000	1800	1500
		6.8	5.0 × 10.5 × 10.0	B32620A6682+***	1600	1400	1000
		10	5.0 × 10.5 × 10.0	B32620A6103+***	1600	1400	1000
		15	6.0 × 12.0 × 10.3	B32620A6153+***	1300	1100	750
1000	500	1.5	4.0 × 8.5 × 10.0	B32620A0152+***	2000	1800	1500
		2.2	4.0 × 8.5 × 10.0	B32620A0222+***	2000	1800	1500
		3.3	5.0 × 10.5 × 10.0	B32620A0332+***	1600	1400	1000
		4.7	5.0 × 10.5 × 10.0	B32620A0472+***	1600	1400	1000
		6.8	6.0 × 12.0 × 10.3	B32620A0682+***	1300	1100	750

Further E series and intermediate capacitance values on request.

Composition of ordering code

+ = Capacitance tolerance code:
  M = ±20%
  K = ±10%
  J = ±5%

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



Ordering codes and packing units (lead spacing 7.5 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
1000	600	0.47	4.0 × 8.5 × 10.0	B32620J0471+***	2000	1800	1500
		0.68	5.0 × 10.5 × 10.0	B32620J0681+***	1600	1400	1000
		1.0	5.0 × 10.5 × 10.0	B32620J0102+***	1600	1400	1000
		1.5	5.0 × 10.5 × 10.0	B32620J0152+***	1600	1400	1000
		2.2	5.0 × 10.5 × 10.0	B32620J0222+***	1600	1400	1000
		3.3	5.0 × 10.5 × 10.0	B32620J0332+***	1600	1400	1000
		4.7	6.0 × 12.0 × 10.3	B32620J0472+***	1300	1100	750

Further E series and intermediate capacitance values on request.

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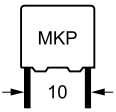

B32621

High pulse (stacked)

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	VAC	nF	mm	below)	pcs./unit	pcs./unit	pcs./unit
160	90	47	4.0 × 7.0 × 13.0	B32621A5473+***	1000	1700	1000
		68	4.0 × 9.0 × 13.0	B32621A5683+***	1000	1700	1000
		100	5.0 × 11.0 × 13.0	B32621A5104+***	830	1300	1000
		150	5.0 × 11.0 × 13.0	B32621A5154+***	830	1300	1000
		220	6.0 × 12.0 × 13.0	B32621A5224+***	680	1100	1000
250	140	2.2	4.0 × 7.0 × 13.0	B32621A3222+***	1000	1700	1000
		3.3	4.0 × 9.0 × 13.0	B32621A3332+***	1000	1700	1000
		4.7	4.0 × 9.0 × 13.0	B32621A3472+***	1000	1700	1000
		6.8	4.0 × 9.0 × 13.0	B32621A3682+***	1000	1700	1000
		10	4.0 × 9.0 × 13.0	B32621A3103+***	1000	1700	1000
		15	4.0 × 9.0 × 13.0	B32621A3153+***	1000	1700	1000
		22	4.0 × 9.0 × 13.0	B32621A3223+***	1000	1700	1000
		33	4.0 × 9.0 × 13.0	B32621A3333+***	1000	1700	1000
		47	4.0 × 9.0 × 13.0	B32621A3473+***	1000	1700	1000
		68	5.0 × 11.0 × 13.0	B32621A3683+***	830	1300	1000
		100	6.0 × 12.0 × 13.0	B32621A3104+***	680	1100	1000
400	200	10	4.0 × 9.0 × 13.0	B32621A4103+***	1000	1700	1000
		15	4.0 × 9.0 × 13.0	B32621A4153+***	1000	1700	1000
		22	5.0 × 11.0 × 13.0	B32621A4223+***	830	1300	1000
		33	5.0 × 11.0 × 13.0	B32621A4333+***	830	1300	1000
		47	6.0 × 12.0 × 13.0	B32621A4473+***	680	1100	1000
630	400	2.2	4.0 × 7.0 × 13.0	B32621A6222+***	1000	1700	1000
		3.3	4.0 × 9.0 × 13.0	B32621A6332+***	1000	1700	1000
		4.7	4.0 × 9.0 × 13.0	B32621A6472+***	1000	1700	1000
		6.8	4.0 × 9.0 × 13.0	B32621A6682+***	1000	1700	1000
		10	4.0 × 9.0 × 13.0	B32621A6103+***	1000	1700	1000
		15	5.0 × 11.0 × 13.0	B32621A6153+***	830	1300	1000
		22	6.0 × 12.0 × 13.0	B32621A6223+***	680	1100	1000
		33	6.0 × 12.0 × 13.0	B32621A6333+***	680	1100	1000

Further E series and intermediate capacitance values on request.

Composition of ordering code

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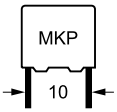

Ordering codes and packing units (lead spacing 10 mm)

V_R	V_{rms} f ≤1 kHz	C_R	Max. dimensions w × h × l	Ordering code (composition see	Ammo pack	Reel	Untaped
VDC	VAC	nF	mm	below)	pcs./unit	pcs./unit	pcs./unit
1000	500	2.2	4.0 × 7.0 × 13.0	B32621A0222+***	1000	1700	1000
		3.3	4.0 × 9.0 × 13.0	B32621A0332+***	1000	1700	1000
		4.7	4.0 × 9.0 × 13.0	B32621A0472+***	1000	1700	1000
		6.8	5.0 × 11.0 × 13.0	B32621A0682+***	830	1300	1000
		10	6.0 × 12.0 × 13.0	B32621A0103+***	680	1100	1000

Further E series and intermediate capacitance values on request.

Composition of ordering code

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J = ±5%

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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	$C_R \leq 0.1$ µF	0.1 µF < $C_R \leq 0.22$ µF
at 20 °C	1 kHz	–	1.0
(upper limit values)	10 kHz	–	1.5
	100 kHz	4.0	–
Insulation resistance R_{ins} or time constant $\tau = C_R \cdot R_{ins}$ at 20 °C, rel. humidity ≤ 65% (minimum as-delivered values)	100 GΩ		
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}	$T_A \leq 85$	$V_C = V_R$	$V_{C,rms} = V_{rms}$
or V_{AC} at f ≤ 1 kHz)	$85 < T_A \leq 100$	$V_C = V_R \cdot (165 - T_A)/80$	$V_{C,rms} = V_{rms} \cdot (165 - T_A)/80$
Operating voltage V_{op}	T_A (°C)	DC voltage (max. hours)	AC voltage (max. hours)
for short operating periods	$T_A \leq 85$	$V_{op} = 1.25 \cdot V_C$ (2000 h)	$V_{op} = 1.0 \cdot V_{C,rms}$ (2000 h)
V_{DC} or V_{AC} at f ≤ 1 kHz)	$85 < T_A \leq 100$	$V_{op} = 1.25 \cdot V_C$ (1000 h)	$V_{op} = 1.0 \cdot V_{C,rms}$ (1000 h)
Damp heat test	56 days/40 °C/93% relative humidity		
Limit values after damp heat test	Capacitance change $\lvert\Delta C/C\rvert$		≤ 3%
	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 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 of parameters	Capacitance change $\lvert\Delta C/C\rvert$		> ±10%
	Dissipation factor tan δ		> 4 · upper limit value
	Insulation resistance R_{ins}		< 1500 MΩ

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 $V^2/\mu s$.

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		7.5 mm	10 mm
V_R VDC	V_{rms} VAC	dV/dt in V/µs	
160	90	750	600
250	140	1 200	900
400	200	1 500	1 050
630	400	2 700	1 800
1 000	500	3 200	2 400
1 000	600	4 000	–

k_0 values

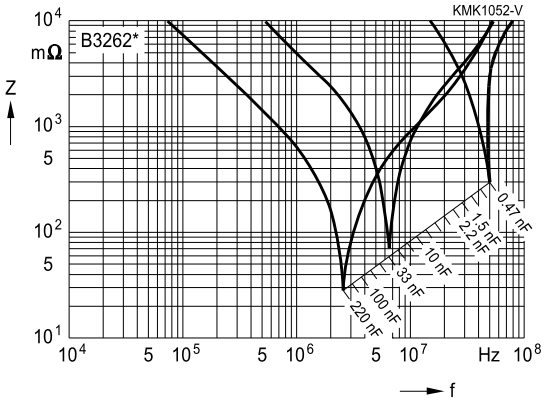
Lead spacing		7.5 mm	10 mm
V_R VDC	V_{rms} VAC	k_0 in $V^2/\mu s$	
160	90	240 000	190 000
250	140	600 000	450 000
400	200	1 200 000	840 000
630	400	3 400 000	2 250 000
1 000	500	6 400 000	4 800 000
1 000	600	8 000 000	–

MKP

B32620 ... B32621

High pulse (stacked)

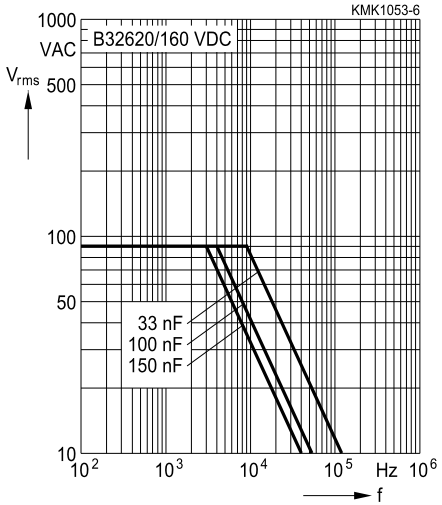
Impedance Z versus frequency f
(typical values)



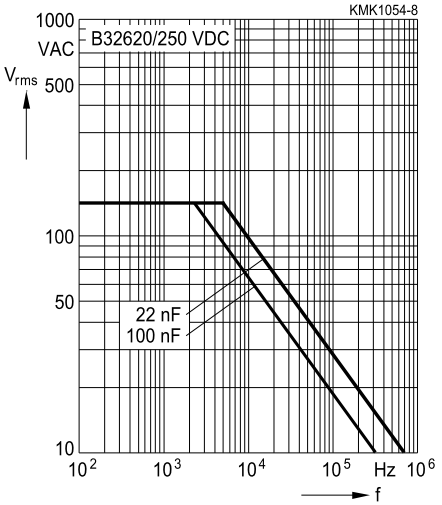
Permissible AC voltage V_{rms} versus frequency f (for sinusoidal waveforms, $T_A \leq 90$ °C)
For T_A >90 °C, please refer to "General technical information", section 3.2.3.

Lead spacing 7.5 mm

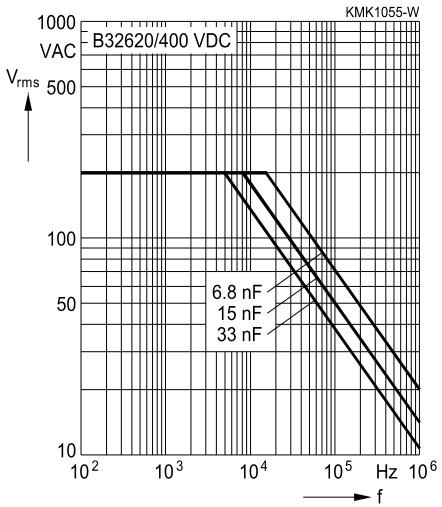
160 VDC/90 VAC



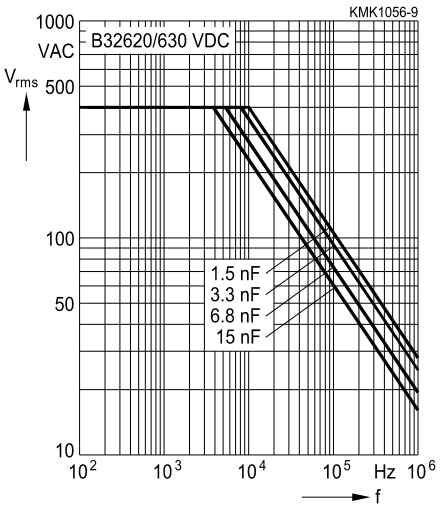
250 VDC/140 VAC

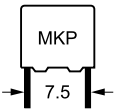


400 VDC/200 VAC



630 VDC/400 VAC





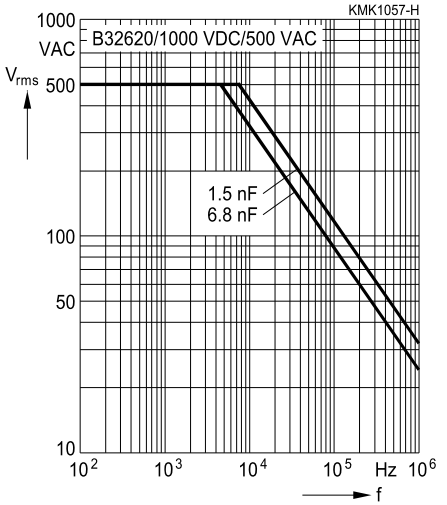
B32620

High pulse (stacked)

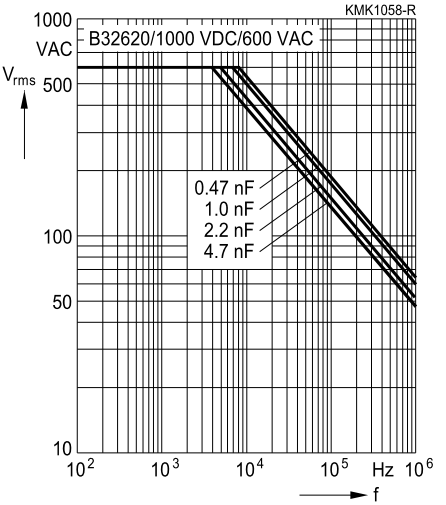
Permissible AC voltage V_{rms} versus frequency f (for sinusoidal waveforms, $T_A \leq 90$ °C)
For T_A >90 °C, please refer to "General technical information", section 3.2.3.

Lead spacing 7.5 mm

1000 VDC/500 VAC



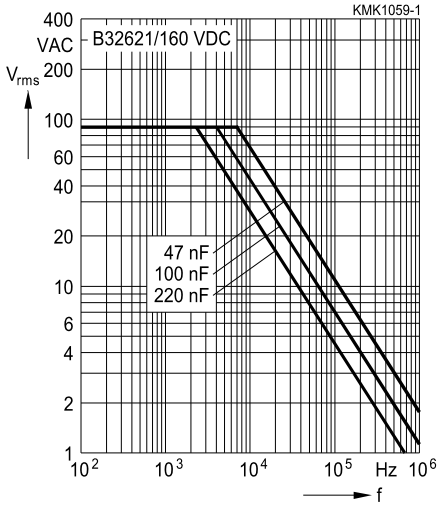
1000 VDC/600 VAC



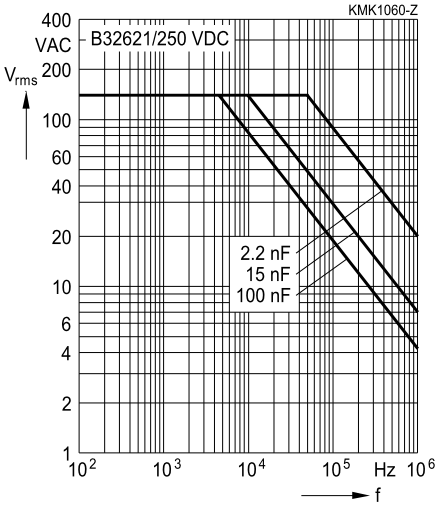
Permissible AC voltage V_{rms} versus frequency f (for sinusoidal waveforms, $T_A \leq 90$ °C)
For T_A >90 °C, please refer to "General technical information", section 3.2.3.

Lead spacing 10 mm

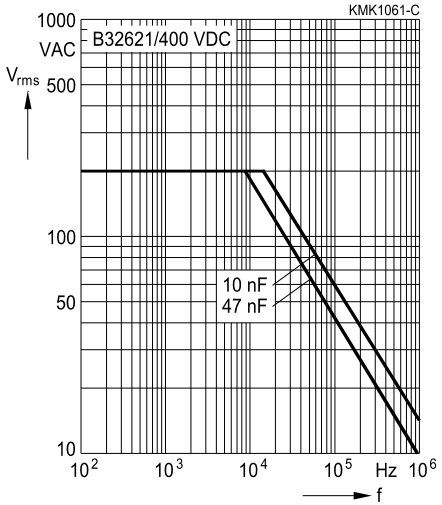
160 VDC/90 VAC



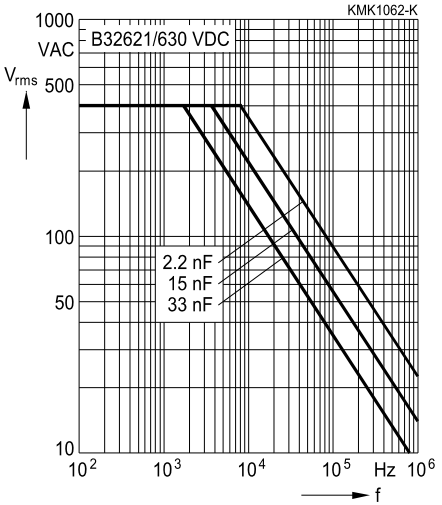
250 VDC/140 VAC

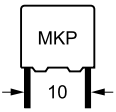


400 VDC/200 VAC



630 VDC/400 VAC





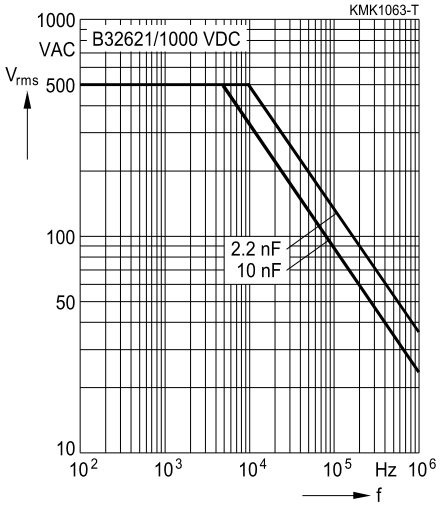
B32621

High pulse (stacked)

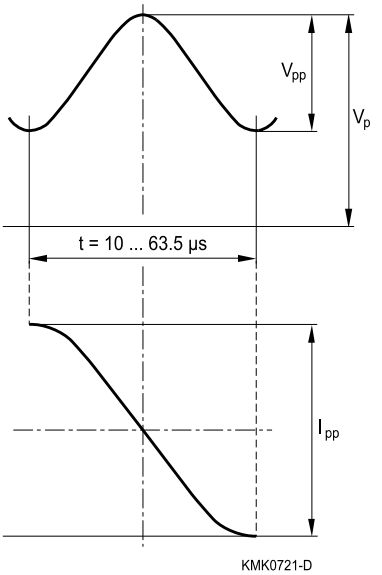
Permissible AC voltage V_{rms} versus frequency f (for sinusoidal waveforms, $T_A \leq 90$ °C)
For T_A >90 °C, please refer to "General technical information", section 3.2.3.

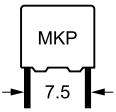
Lead spacing 10 mm

1000 VDC/500 VAC



Sinus-wave application, lighting
Permissible voltage and current / waveform





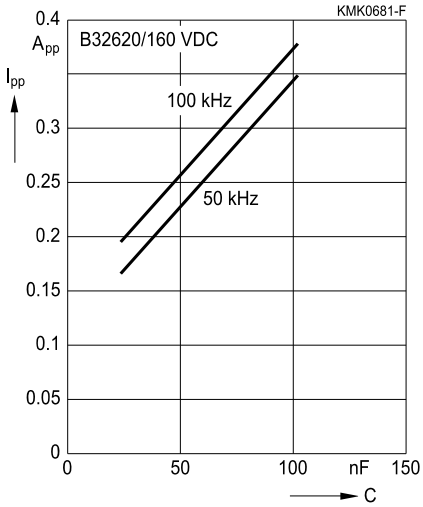
B32620

High pulse (stacked)

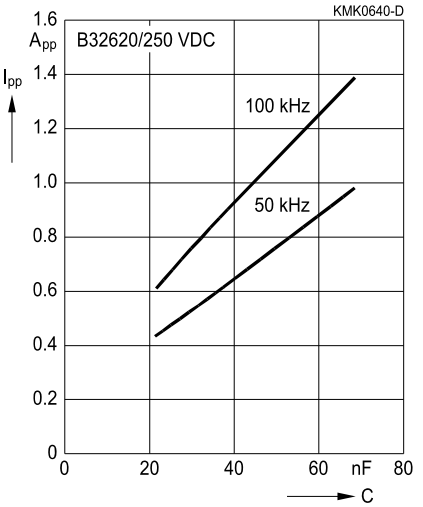
Sinus-wave application, lighting
Permissible current I_{pp} versus rated capacitance C_R

Lead spacing 7.5 mm

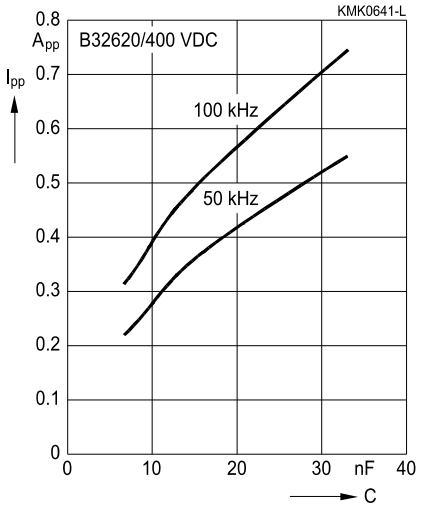
160 VDC/90 VAC



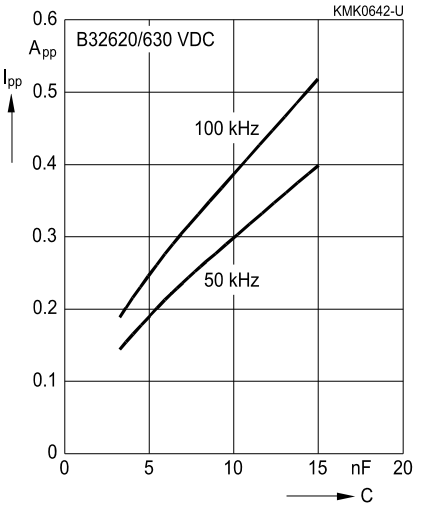
250 VDC/140 VAC



400 VDC/200 VAC



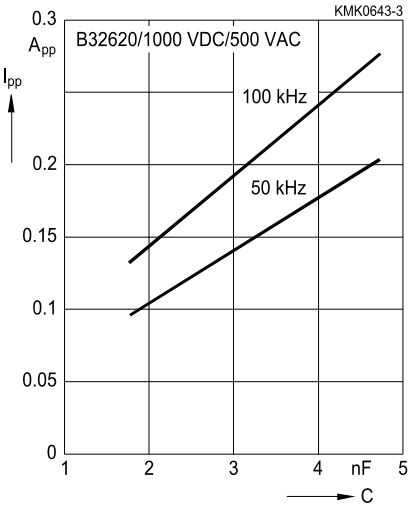
630 VDC/400 VAC



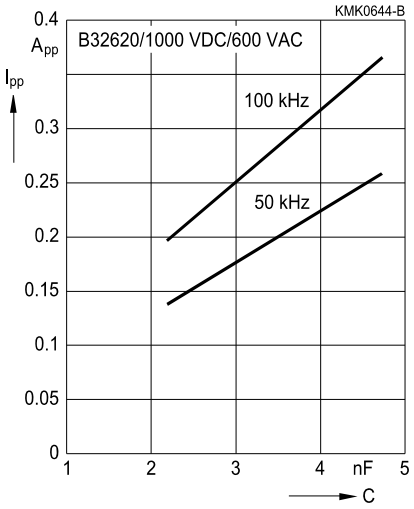
Sinus-wave application, lighting
Permissible current I_{pp} versus rated capacitance C_R

Lead spacing 7.5 mm

1000 VDC/500 VAC



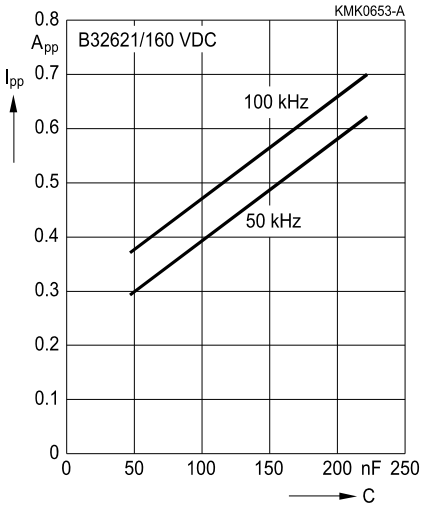
1000 VDC/600 VAC



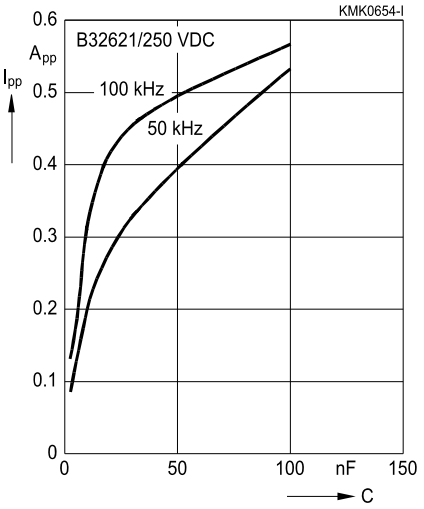
Sinus-wave application, lighting
Permissible current I_{pp} versus rated capacitance C_R

Lead spacing 10 mm

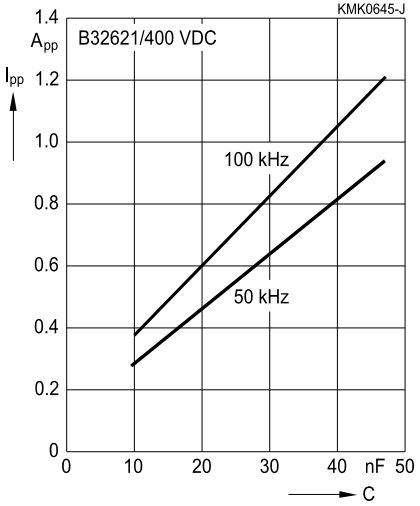
160 VDC/90 VAC



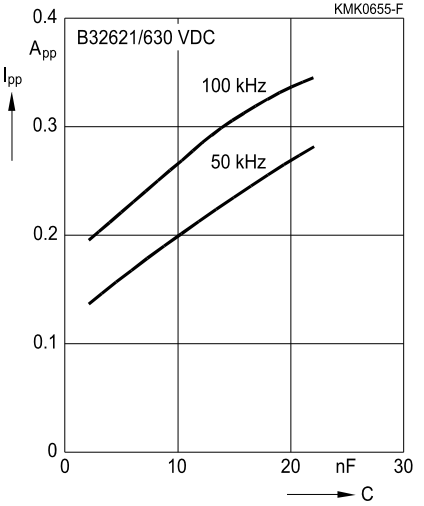
250 VDC/140 VAC



400 VDC/200 VAC



630 VDC/400 VAC



Sinus-wave application, lighting
Permissible current I_{pp} versus rated capacitance C_R

Lead spacing 10 mm

1000 VDC/500 VAC