



Film Capacitors

Metallized Polypropylene Film Capacitors (MKP)

Series/Type: B32620 ... B32621

Date: August 2004

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High pulse (stacked)

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

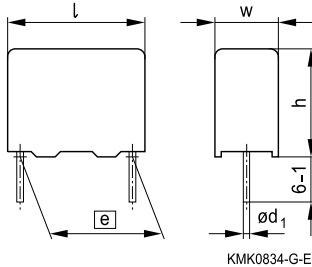
Marking

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



Dimensions in mm

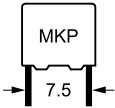
Lead spacing	Lead diameter	Type
$e \pm 0.4$	d_1	
7.5	0.5	B32620
10.0	0.6 ¹⁾	B32621

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 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
160	90	33	$4.0 \times 8.5 \times 10.0$	B32620A5333+***	2000	1800	1500
		47	$4.0 \times 8.5 \times 10.0$	B32620A5473+***	2000	1800	1500
		68	$5.0 \times 10.5 \times 10.0$	B32620A5683+***	1600	1400	1000
		100	$5.0 \times 10.5 \times 10.0$	B32620A5104+***	1600	1400	1000
		150	$6.0 \times 12.0 \times 10.3$	B32620A5154+***	1300	1100	750
250	140	22	$4.0 \times 8.5 \times 10.0$	B32620A3223+***	2000	1800	1500
		33	$4.0 \times 8.5 \times 10.0$	B32620A3333+***	2000	1800	1500
		47	$5.0 \times 10.5 \times 10.0$	B32620A3473+***	1600	1400	1000
		68	$5.0 \times 10.5 \times 10.0$	B32620A3683+***	1600	1400	1000
		100	$6.0 \times 12.0 \times 10.3$	B32620A3104+***	1300	1100	750
400	200	6.8	$4.0 \times 8.5 \times 10.0$	B32620A4682+***	2000	1800	1500
		10	$4.0 \times 8.5 \times 10.0$	B32620A4103+***	2000	1800	1500
		15	$5.0 \times 10.5 \times 10.0$	B32620A4153+***	1600	1400	1000
		22	$5.0 \times 10.5 \times 10.0$	B32620A4223+***	1600	1400	1000
		33	$6.0 \times 12.0 \times 10.3$	B32620A4333+***	1300	1100	750
630	400	1.5	$4.0 \times 8.5 \times 10.0$	B32620A6152+***	2000	1800	1500
		2.2	$4.0 \times 8.5 \times 10.0$	B32620A6222+***	2000	1800	1500
		3.3	$4.0 \times 8.5 \times 10.0$	B32620A6332+***	2000	1800	1500
		4.7	$4.0 \times 8.5 \times 10.0$	B32620A6472+***	2000	1800	1500
		6.8	$5.0 \times 10.5 \times 10.0$	B32620A6682+***	1600	1400	1000
		10	$5.0 \times 10.5 \times 10.0$	B32620A6103+***	1600	1400	1000
		15	$6.0 \times 12.0 \times 10.3$	B32620A6153+***	1300	1100	750
1000	500	1.5	$4.0 \times 8.5 \times 10.0$	B32620A0152+***	2000	1800	1500
		2.2	$4.0 \times 8.5 \times 10.0$	B32620A0222+***	2000	1800	1500
		3.3	$5.0 \times 10.5 \times 10.0$	B32620A0332+***	1600	1400	1000
		4.7	$5.0 \times 10.5 \times 10.0$	B32620A0472+***	1600	1400	1000
		6.8	$6.0 \times 12.0 \times 10.3$	B32620A0682+***	1300	1100	750

Further E series and intermediate capacitance values on request.

Composition of ordering code

+ = Capacitance tolerance code:

M = $\pm 20\%$

K = $\pm 10\%$

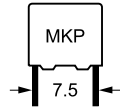
J = $\pm 5\%$

*** = 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} $f \leq 1 \text{ kHz}$	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					
1000	600	0.47	$4.0 \times 8.5 \times 10.0$	B32620J0471+***	2000	1800	1500
		0.68	$5.0 \times 10.5 \times 10.0$	B32620J0681+***	1600	1400	1000
		1.0	$5.0 \times 10.5 \times 10.0$	B32620J0102+***	1600	1400	1000
		1.5	$5.0 \times 10.5 \times 10.0$	B32620J0152+***	1600	1400	1000
		2.2	$5.0 \times 10.5 \times 10.0$	B32620J0222+***	1600	1400	1000
		3.3	$5.0 \times 10.5 \times 10.0$	B32620J0332+***	1600	1400	1000
		4.7	$6.0 \times 12.0 \times 10.3$	B32620J0472+***	1300	1100	750

Further E series and intermediate capacitance values on request.

Composition of ordering code

+ = Capacitance tolerance code:

M = $\pm 20\%$

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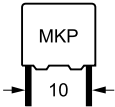
J = $\pm 5\%$

*** = Packaging code:

289 = Ammo pack

189 = Reel

000 = Untaped (lead length 6 – 1 mm)


B32621
High pulse (stacked)
Ordering codes and packing units (lead spacing 10 mm)

V_R VDC	V_{rms} $f \leq 1 \text{ kHz}$ 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
160	90	47	$4.0 \times 7.0 \times 13.0$	B32621A5473+***	1000	1700	1000
		68	$4.0 \times 9.0 \times 13.0$	B32621A5683+***	1000	1700	1000
		100	$5.0 \times 11.0 \times 13.0$	B32621A5104+***	830	1300	1000
		150	$5.0 \times 11.0 \times 13.0$	B32621A5154+***	830	1300	1000
		220	$6.0 \times 12.0 \times 13.0$	B32621A5224+***	680	1100	1000
250	140	2.2	$4.0 \times 7.0 \times 13.0$	B32621A3222+***	1000	1700	1000
		3.3	$4.0 \times 9.0 \times 13.0$	B32621A3332+***	1000	1700	1000
		4.7	$4.0 \times 9.0 \times 13.0$	B32621A3472+***	1000	1700	1000
		6.8	$4.0 \times 9.0 \times 13.0$	B32621A3682+***	1000	1700	1000
		10	$4.0 \times 9.0 \times 13.0$	B32621A3103+***	1000	1700	1000
		15	$4.0 \times 9.0 \times 13.0$	B32621A3153+***	1000	1700	1000
		22	$4.0 \times 9.0 \times 13.0$	B32621A3223+***	1000	1700	1000
		33	$4.0 \times 9.0 \times 13.0$	B32621A3333+***	1000	1700	1000
		47	$4.0 \times 9.0 \times 13.0$	B32621A3473+***	1000	1700	1000
		68	$5.0 \times 11.0 \times 13.0$	B32621A3683+***	830	1300	1000
		100	$6.0 \times 12.0 \times 13.0$	B32621A3104+***	680	1100	1000
400	200	10	$4.0 \times 9.0 \times 13.0$	B32621A4103+***	1000	1700	1000
		15	$4.0 \times 9.0 \times 13.0$	B32621A4153+***	1000	1700	1000
		22	$5.0 \times 11.0 \times 13.0$	B32621A4223+***	830	1300	1000
		33	$5.0 \times 11.0 \times 13.0$	B32621A4333+***	830	1300	1000
		47	$6.0 \times 12.0 \times 13.0$	B32621A4473+***	680	1100	1000
630	400	2.2	$4.0 \times 7.0 \times 13.0$	B32621A6222+***	1000	1700	1000
		3.3	$4.0 \times 9.0 \times 13.0$	B32621A6332+***	1000	1700	1000
		4.7	$4.0 \times 9.0 \times 13.0$	B32621A6472+***	1000	1700	1000
		6.8	$4.0 \times 9.0 \times 13.0$	B32621A6682+***	1000	1700	1000
		10	$4.0 \times 9.0 \times 13.0$	B32621A6103+***	1000	1700	1000
		15	$5.0 \times 11.0 \times 13.0$	B32621A6153+***	830	1300	1000
		22	$6.0 \times 12.0 \times 13.0$	B32621A6223+***	680	1100	1000
		33	$6.0 \times 12.0 \times 13.0$	B32621A6333+***	680	1100	1000

Further E series and intermediate capacitance values on request.

Composition of ordering code

+ = Capacitance tolerance code:

 M = $\pm 20\%$

 K = $\pm 10\%$

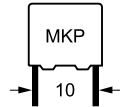
 J = $\pm 5\%$

*** = Packaging code:

289 = Ammo pack

189 = Reel

000 = Untaped (lead length 6 – 1 mm)


Ordering codes and packing units (lead spacing 10 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					
1000	500	2.2	$4.0 \times 7.0 \times 13.0$	B32621A0222+***	1000	1700	1000
		3.3	$4.0 \times 9.0 \times 13.0$	B32621A0332+***	1000	1700	1000
		4.7	$4.0 \times 9.0 \times 13.0$	B32621A0472+***	1000	1700	1000
		6.8	$5.0 \times 11.0 \times 13.0$	B32621A0682+***	830	1300	1000
		10	$6.0 \times 12.0 \times 13.0$	B32621A0103+***	680	1100	1000

Further E series and intermediate capacitance values on request.

Composition of ordering code

+ = Capacitance tolerance code:

M = $\pm 20\%$

K = $\pm 10\%$

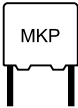
J = $\pm 5\%$

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289 = Ammo pack

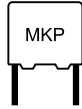
189 = Reel

000 = Untaped (lead length 6 – 1 mm)


B32620 ... B32621
High pulse (stacked)

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	$C_R \leq 0.1 \mu F$	$0.1 \mu F < C_R \leq 0.22 \mu F$
	1 kHz	—	1.0
	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 $\leq 65\%$ (minimum as-delivered values)	100 GΩ		
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
	$T_A \leq 85$	$V_C = V_R$	$V_{C,rms} = V_{rms}$
	$85 < T_A \leq 100$	$V_C = V_R \cdot (165 - T_A)/80$	$V_{C,rms} = V_{rms} \cdot (165 - T_A)/80$
Operating voltage V_{op} 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)
	$T_A \leq 85$	$V_{op} = 1.25 \cdot V_C$ (2000 h)	$V_{op} = 1.0 \cdot V_{C,rms}$ (2000 h)
	$85 < T_A \leq 100$	$V_{op} = 1.25 \cdot V_C$ (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 $ \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}		$\geq 50\%$ of minimum as-delivered values
Reliability:			
Failure rate λ	1 fit ($\leq 1 \cdot 10^{-9}/h$) at $0.5 \cdot V_R$, 40 °C		
Service life t_{SL}	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	Short circuit or open circuit		
Failure due to variation of parameters	Capacitance change $ \Delta C/C $		$> \pm 10\%$
	Dissipation factor $\tan \delta$		$> 4 \cdot$ 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/ μ s.

"k₀" represents the maximum permissible pulse characteristic of the waveform applied to the capacitor, expressed in V²/ μ s.

Note:

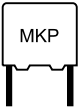
The values of dV/dt and k₀ provided below must not be exceeded in order to avoid damaging the capacitor.

dV/dt values

Lead spacing		7.5 mm	10 mm
V _R VDC	V _{rms} VAC	dV/dt in V/ μ s	
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	—

k₀ values

Lead spacing		7.5 mm	10 mm
V _R VDC	V _{rms} VAC	k ₀ in V ² / μ 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	—

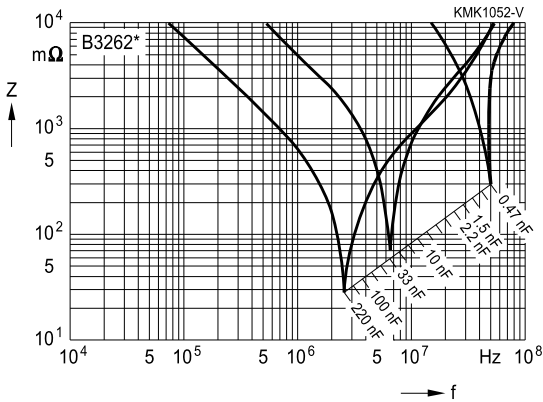


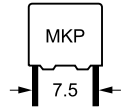
B32620 ... B32621

High pulse (stacked)

Impedance Z versus frequency f

(typical values)



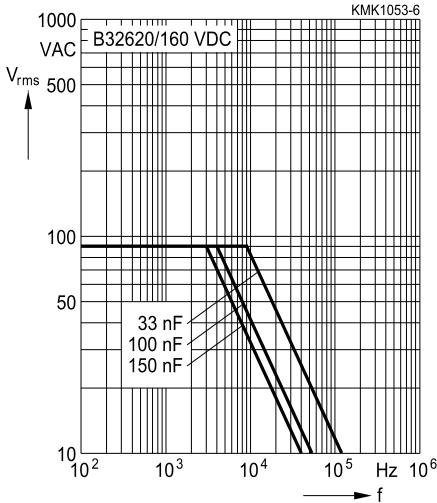


Permissible AC voltage V_{rms} versus frequency f (for sinusoidal waveforms, $T_A \leq 90^\circ\text{C}$)

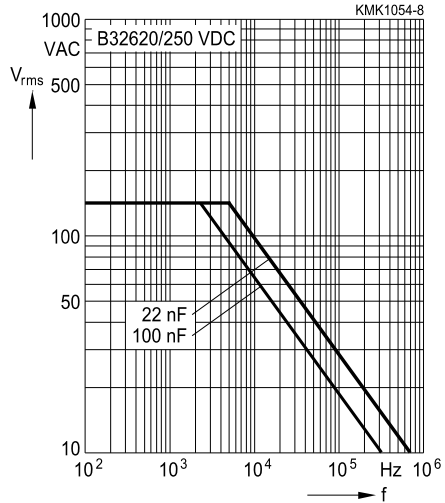
For $T_A > 90^\circ\text{C}$, please refer to "General technical information", section 3.2.3.

Lead spacing 7.5 mm

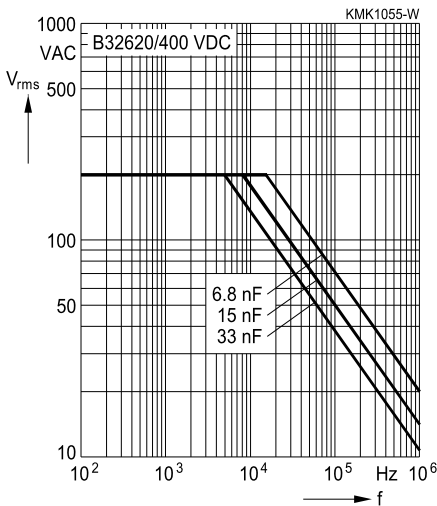
160 VDC/90 VAC



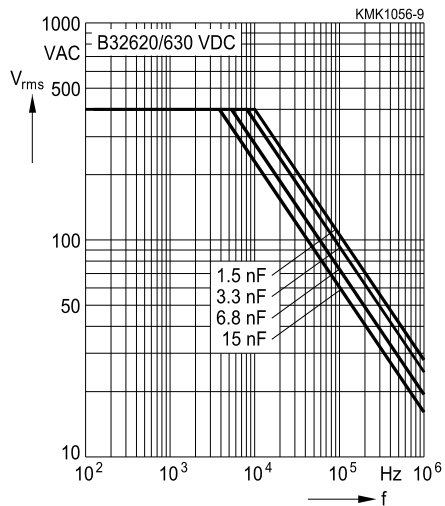
250 VDC/140 VAC

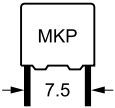


400 VDC/200 VAC



630 VDC/400 VAC





B32620

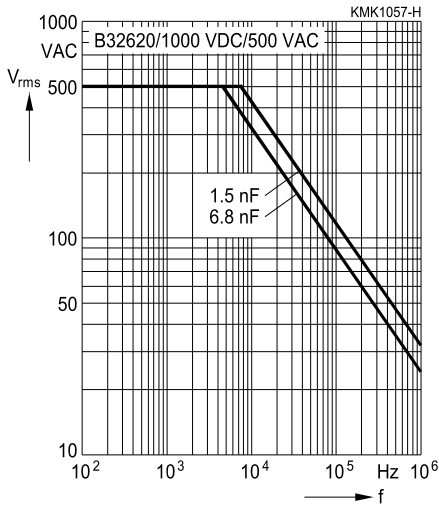
High pulse (stacked)

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

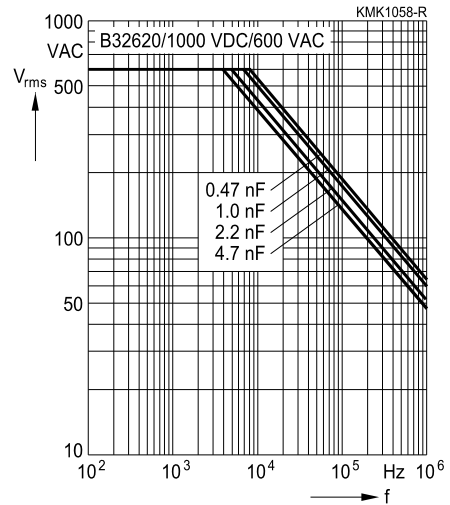
For $T_A > 90^\circ\text{C}$, please refer to "General technical information", section 3.2.3.

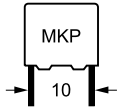
Lead spacing 7.5 mm

1000 VDC/500 VAC



1000 VDC/600 VAC



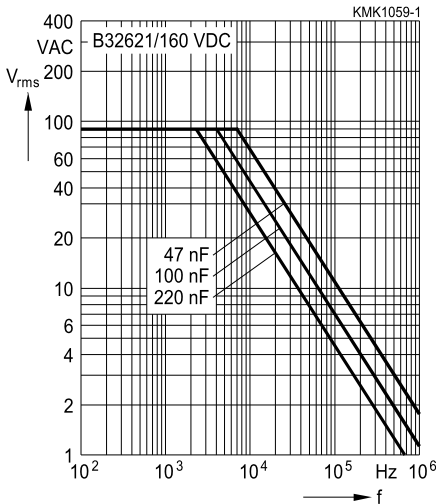


Permissible AC voltage V_{rms} versus frequency f (for sinusoidal waveforms, $T_A \leq 90^\circ\text{C}$)

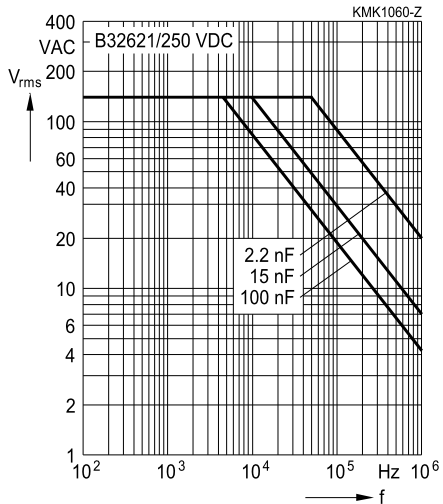
For $T_A > 90^\circ\text{C}$, please refer to "General technical information", section 3.2.3.

Lead spacing 10 mm

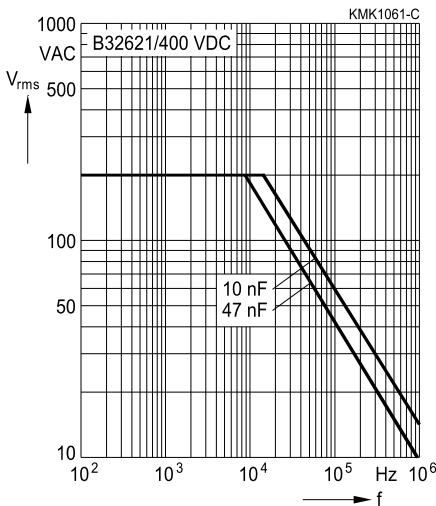
160 VDC/90 VAC



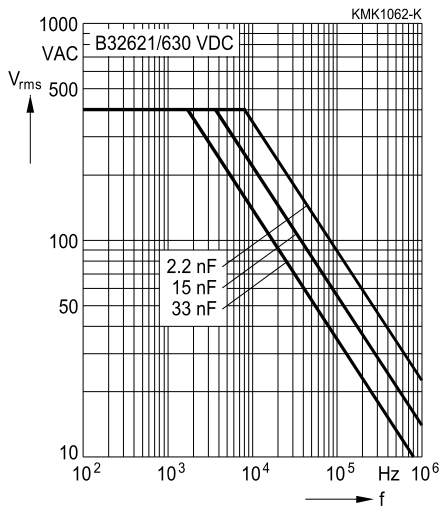
250 VDC/140 VAC

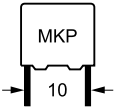


400 VDC/200 VAC



630 VDC/400 VAC





B32621

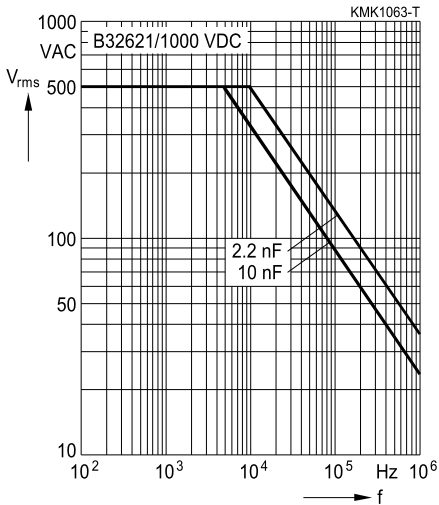
High pulse (stacked)

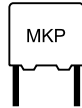
Permissible AC voltage V_{rms} versus frequency f (for sinusoidal waveforms, $T_A \leq 90^\circ\text{C}$)

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

Lead spacing 10 mm

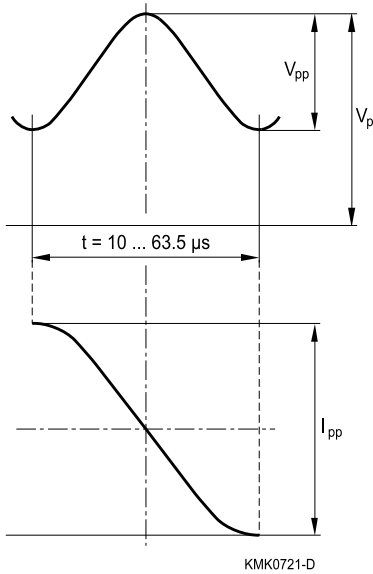
1000 VDC/500 VAC

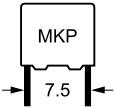




Sinus-wave application, lighting

Permissible voltage and current / waveform





B32620

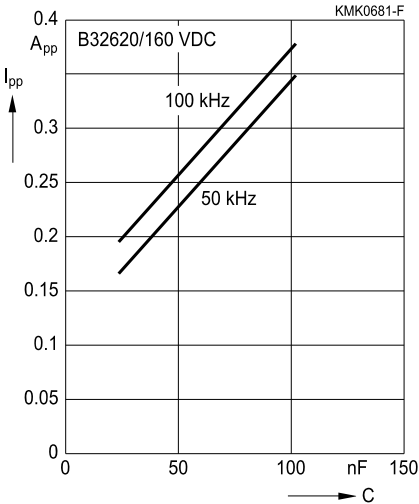
High pulse (stacked)

Sinus-wave application, lighting

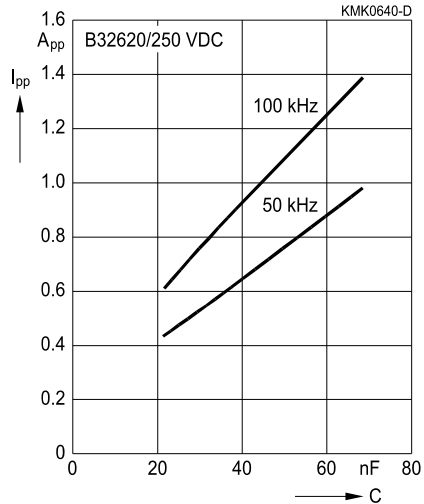
Permissible current I_{pp} versus rated capacitance C_R

Lead spacing 7.5 mm

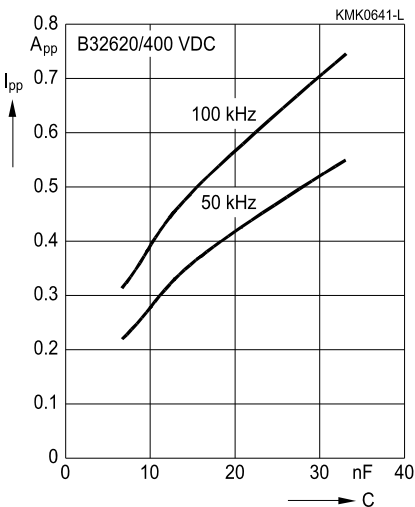
160 VDC/90 VAC



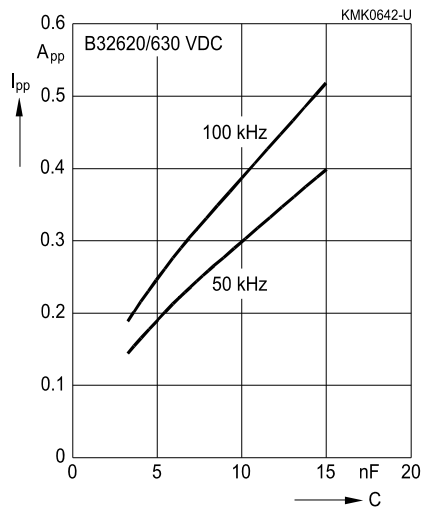
250 VDC/140 VAC

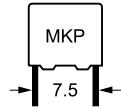


400 VDC/200 VAC



630 VDC/400 VAC



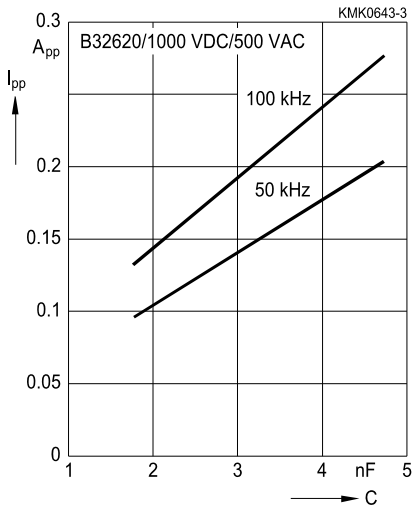


Sinus-wave application, lighting

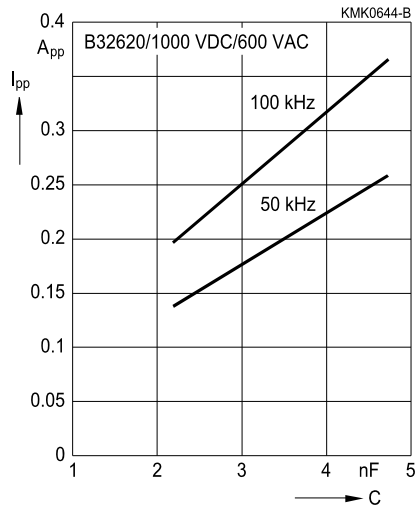
Permissible current I_{pp} versus rated capacitance C_R

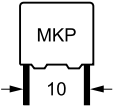
Lead spacing 7.5 mm

1000 VDC/500 VAC



1000 VDC/600 VAC





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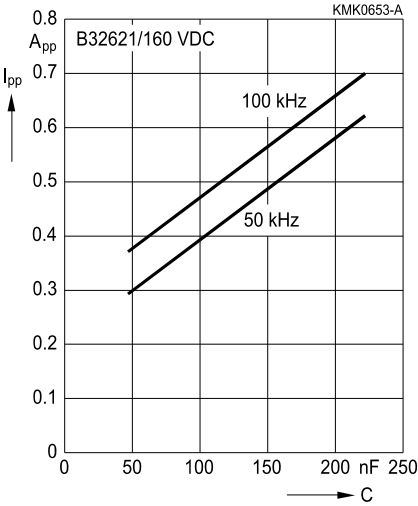
High pulse (stacked)

Sinus-wave application, lighting

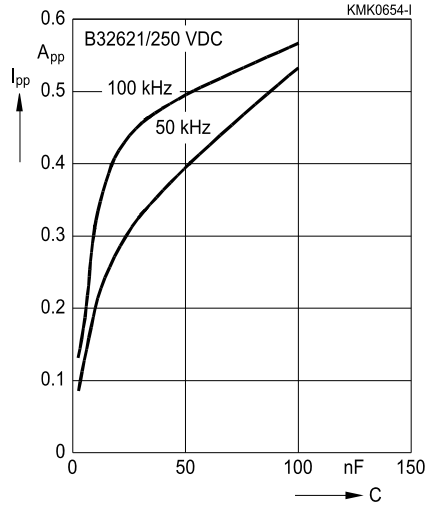
Permissible current I_{pp} versus rated capacitance C_R

Lead spacing 10 mm

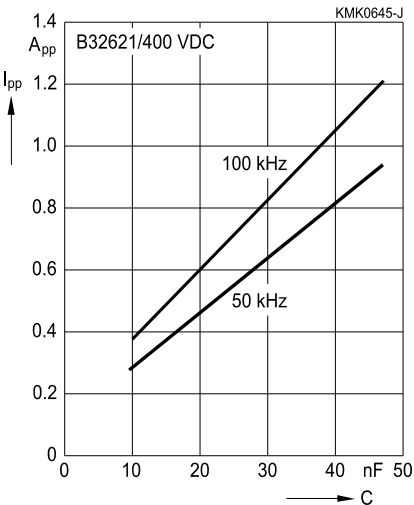
160 VDC/90 VAC



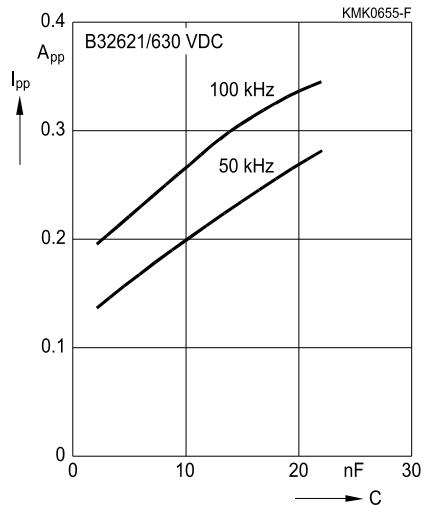
250 VDC/140 VAC

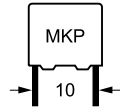


400 VDC/200 VAC



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

