



## Film Capacitors

### Metallized Polypropylene Film Capacitors (MKP)

**Series/Type:** B32656C  
**Date:** August 2004

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**4 pins (wound)**
**Typical applications**

- Snubbing
- Filtering

**Climatic**

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

**Construction**

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

**Features**

- High pulse strength
- High contact reliability
- Very low inductance

**Terminals**

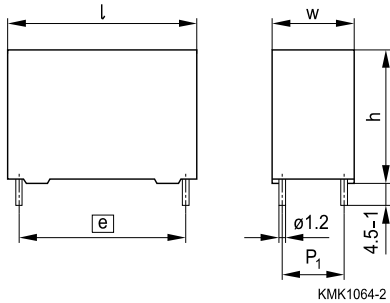
- 4 pins
- Parallel wire leads, lead-free tinned
- Special lead lengths available on request

**Marking**

Manufacturer's logo, series number, style (MKP), rated capacitance, cap. tolerance (code letter), rated DC voltage, date of manufacture (coded)

**Delivery mode**

Bulk

**Dimensional drawing**


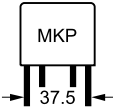
Dimensions in mm

Lead spacing	Pin spacing	Pin code
$e \pm 0.4$	$P_1$	
37.5	16.0	580
	20.3	590



**Overview of available types**

Lead spacing	37.5 mm				
Type	B32656C				
Page	4				
$V_R$ (VDC)	850	1000	1250	1600	2000
$V_{rms}$ (VAC)	450	480	500	750	800
$C_R$ (nF)					
270					
330					
390					
470					
560					
680					
750					
820					
1000					
1200					
1400					
1500					
1800					
2000					
2200					
2500					


**B32656C**
**4 pins (wound)**
**Electrical specifications, ordering codes and packing units**

$V_R$	$V_{rms}$ $f \leq 1 \text{ kHz}$ VAC	$C_R$ nF	Max. dimensions $w \times h \times l$ mm	$I_{rms}$ 100 kHz A	ESR 100 kHz m $\Omega$	Ordering code (composition see below)	Pin spacing $P_1$	pcs./ unit
850	450	1500	31.0 × 26.5 × 43.6	13	5.0	B32656C8155+580	16.0	32
		1500	31.0 × 26.5 × 43.6	13	5.0	B32656C8155+590	20.3	32
		1800	28.0 × 37.0 × 42.0	15	4.5	B32656C8185+580	16.0	27
		1800	28.0 × 37.0 × 42.0	15	4.5	B32656C8185+590	20.3	27
		2000	28.0 × 37.0 × 42.0	16	4.0	B32656C8205+580	16.0	27
		2000	28.0 × 37.0 × 42.0	16	4.0	B32656C8205+590	20.3	27
		2200	30.0 × 45.0 × 42.0	17	3.5	B32656C8225+580	16.0	27
		2200	30.0 × 45.0 × 42.0	17	3.5	B32656C8225+590	20.3	27
		2500	30.0 × 45.0 × 42.0	18	3.0	B32656C8255+580	16.0	27
		2500	30.0 × 45.0 × 42.0	18	3.0	B32656C8255+590	20.3	27
1000	480	1400	28.0 × 37.0 × 42.0	13	5.0	B32656C0145+580	16.0	27
		1400	28.0 × 37.0 × 42.0	13	5.0	B32656C0145+590	20.3	27
		1500	30.0 × 45.0 × 42.0	15	5.0	B32656C0155+580	16.0	27
		1500	30.0 × 45.0 × 42.0	15	5.0	B32656C0155+590	20.3	27
		1800	30.0 × 45.0 × 42.0	16	4.5	B32656C0185+580	16.0	27
		1800	30.0 × 45.0 × 42.0	16	4.5	B32656C0185+590	20.3	27
		2000	30.0 × 45.0 × 42.0	17	3.5	B32656C0205+580	16.0	27
		2000	30.0 × 45.0 × 42.0	17	3.5	B32656C0205+590	20.3	27
1250	500	750	28.0 × 37.0 × 42.0	10	6.0	B32656C7754+580	16.0	27
		750	28.0 × 37.0 × 42.0	10	6.0	B32656C7754+590	20.3	27
		820	28.0 × 37.0 × 42.0	11	6.0	B32656C7824+580	16.0	27
		820	28.0 × 37.0 × 42.0	11	6.0	B32656C7824+590	20.3	27
		1000	28.0 × 37.0 × 42.0	13	6.0	B32656C7105+580	16.0	27
		1000	28.0 × 37.0 × 42.0	13	6.0	B32656C7105+590	20.3	27
		1200	30.0 × 45.0 × 42.0	14	5.0	B32656C7125+580	16.0	27
		1200	30.0 × 45.0 × 42.0	14	5.0	B32656C7125+590	20.3	27
		1400	30.0 × 45.0 × 42.0	14	5.0	B32656C7145+580	16.0	27
		1400	30.0 × 45.0 × 42.0	14	5.0	B32656C7145+590	20.3	27

Further E series and intermediate capacitance values on request.

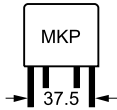
**Composition of ordering code**

+ = Capacitance tolerance code:

M = ±20%

K = ±10%

J = ±5%


**Electrical specifications, ordering codes and packing units**

$V_R$	$V_{rms}$ $f \leq 1\text{kHz}$	$C_R$	Max. dimensions $w \times h \times l$ mm	$I_{rms}$ 100 kHz A	ESR 100 kHz $m\Omega$	Ordering code (composition see below)	Pin spa- cing $P_1$	pcs./ unit
VDC	VAC	nF						
1600	750	390	$28.0 \times 37.0 \times 42.0$	11	8.0	B32656C1394+580	16.0	27
		390	$28.0 \times 37.0 \times 42.0$	11	8.0	B32656C1394+590	20.3	27
		470	$28.0 \times 37.0 \times 42.0$	12	8.0	B32656C1474+580	16.0	27
		470	$28.0 \times 37.0 \times 42.0$	12	8.0	B32656C1474+590	20.3	27
		560	$30.0 \times 45.0 \times 42.0$	13	7.0	B32656C1564+580	16.0	27
		560	$30.0 \times 45.0 \times 42.0$	13	7.0	B32656C1564+590	20.3	27
		680	$30.0 \times 45.0 \times 42.0$	14	6.0	B32656C1684+580	16.0	27
		680	$30.0 \times 45.0 \times 42.0$	14	6.0	B32656C1684+590	20.3	27
2000	800	270	$28.0 \times 37.0 \times 42.0$	11	9.0	B32656C2274+580	16.0	27
		270	$28.0 \times 37.0 \times 42.0$	11	9.0	B32656C2274+590	20.3	27
		330	$28.0 \times 37.0 \times 42.0$	12	9.0	B32656C2334+580	16.0	27
		330	$28.0 \times 37.0 \times 42.0$	12	9.0	B32656C2334+590	20.3	27
		390	$30.0 \times 45.0 \times 42.0$	13	8.0	B32656C2394+580	16.0	27
		390	$30.0 \times 45.0 \times 42.0$	13	8.0	B32656C2394+590	20.3	27
		470	$30.0 \times 45.0 \times 42.0$	15	8.0	B32656C2474+580	16.0	27
		470	$30.0 \times 45.0 \times 42.0$	15	8.0	B32656C2474+590	20.3	27

Further E series and intermediate capacitance values on request.

**Composition of ordering code**

+ = Capacitance tolerance code:

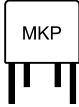
M =  $\pm 20\%$

K =  $\pm 10\%$

J =  $\pm 5\%$


**B32656C**
**4 pins (wound)**
**Technical data**

Operating temperature range	Max. operating temperature $T_{op,max}$		+100 °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	$C_R \leq 0.1 \mu F$	$0.1 \mu F < C_R \leq 1 \mu F$	$C_R > 1 \mu F$
	1 kHz	—	0.5	0.5
	10 kHz	—	0.8	1.5
	100 kHz	5.0	—	—
Insulation resistance $R_{ins}$ or time constant $\tau = C_R \cdot R_{ins}$ at 20 °C, rel. humidity $\leq 65\%$ (minimum as-delivered values)	$C_R \leq 0.33 \mu F$		$C_R > 0.33 \mu F$	
	100 G $\Omega$		30000 s	
DC test voltage	$1.6 \cdot V_R, 2 s$			
Category voltage $V_C$ (continuous operation with $V_{DC}$ or $V_{AC}$ at $f \leq 1 kHz$ )	$T_A$ (°C)	DC voltage derating		AC voltage derating
	$T_A \leq 85$ $85 < T_A \leq 100$	$V_C = V_R$ $V_C = V_R \cdot (165 - T_A)/80$		$V_{C,rms} = V_{rms}$ $V_{C,rms} = V_{rms} \cdot (165 - T_A)/80$
Operating voltage $V_{op}$ for short operating periods ( $V_{DC}$ or $V_{AC}$ at $f \leq 1 kHz$ )	$T_A$ (°C)	DC voltage (max. hours)		AC voltage (max. hours)
	$T_A \leq 85$ $85 < T_A \leq 100$	$V_{op} = 1.25 \cdot V_C$ (2000 h) $V_{op} = 1.25 \cdot V_C$ (1000 h)		$V_{op} = 1.0 \cdot V_{C,rms}$ (2000 h) $V_{op} = 1.0 \cdot V_{C,rms}$ (1000 h)
Damp heat test Limit values after damp heat test	56 days/40 °C/93% relative humidity			
	Capacitance change $ \Delta C/C $		$\leq 3\%$	
	Dissipation factor change $\Delta \tan \delta$		$\leq 0.5 \cdot 10^{-3}$ (at 1 kHz) $\leq 1.0 \cdot 10^{-3}$ (at 10 kHz)	
	Insulation resistance $R_{ins}$ or time constant $\tau = C_R \cdot R_{ins}$		$\geq 50\%$ of minimum as-delivered values	
Reliability: Failure rate $\lambda$ Service life $t_{SL}$	1 fit ( $\leq 1 \cdot 10^{-9}/h$ ) at $0.5 \cdot V_R, 40 °C$ 200 000 h at $1.0 \cdot V_R, 40 °C$ For conversion to other operating conditions and temperatures, refer to chapter "Quality assurance", page .			
Failure criteria: Total failure Failure due to variation of parameters	Short circuit or open circuit			
	Capacitance change $ \Delta C/C $		$> 10\%$	
	Dissipation factor $\tan \delta$		$> 4 \cdot$ upper limit value	
	Insulation resistance $R_{ins}$ or time constant $\tau = C_R \cdot R_{ins}$		$< 1500 M\Omega$ ( $C_R \leq 0.33 \mu F$ ) $< 500 s$ ( $C_R > 0.33 \mu F$ )	



**Pulse handling capability**

"dV/dt" represents the maximum permissible voltage change per unit of time for non-sinusoidal voltages, expressed in V/μs.

"k<sub>0</sub>" represents the maximum permissible pulse characteristic of the waveform applied to the capacitor, expressed in V<sup>2</sup>/μs.

*Note:*

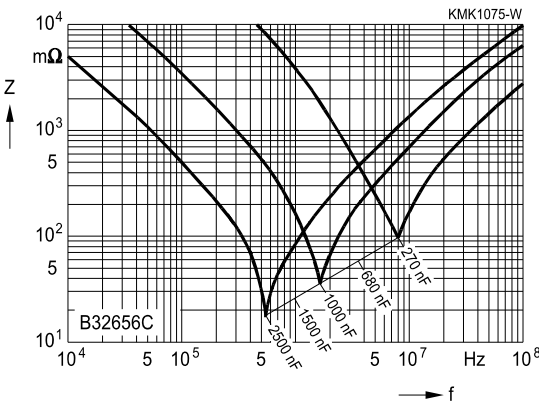
The values of dV/dt and k<sub>0</sub> provided below must not be exceeded in order to avoid damaging the capacitor.

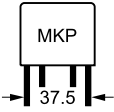
**dV/dt and k<sub>0</sub> values**

V <sub>R</sub> (VDC)	V <sub>rms</sub> (VAC)	dV/dt in V/μs	k <sub>0</sub> in V <sup>2</sup> /μs
850	450	90	153 000
1000	480	100	200 000
1250	500	140	350 000
1600	750	170	544 000
2000	800	200	800 000

**Impedance Z versus frequency f**

(typical values)





**B32656C**

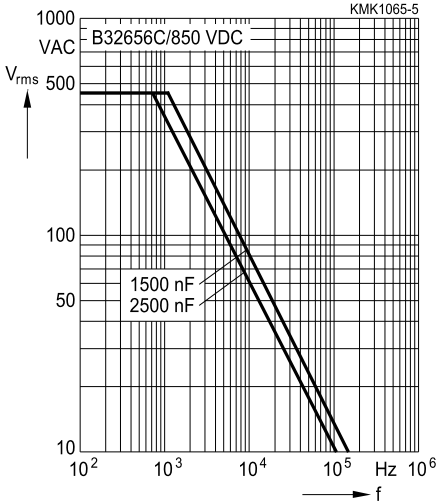
**4 pins (wound)**

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

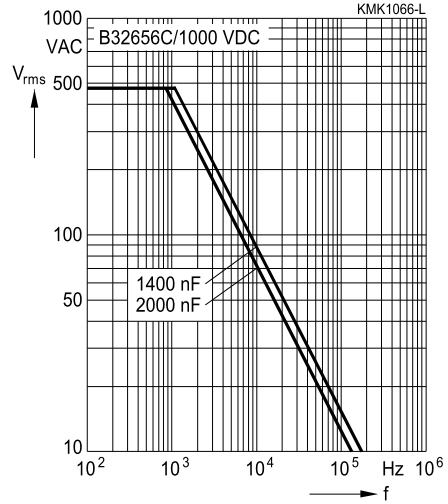
For  $T_A > 90^\circ\text{C}$ , please refer to "General technical information", section 3.2.3.

**Lead spacing 37.5 mm**

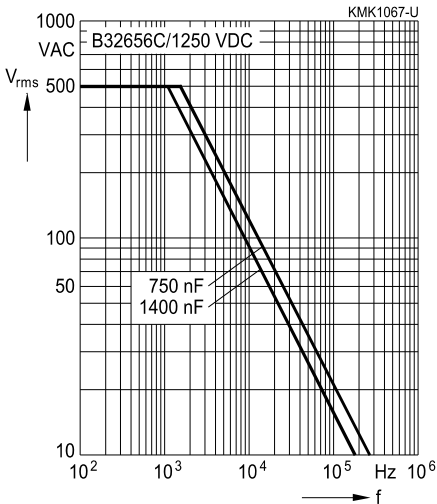
**850 VDC/450 VAC**



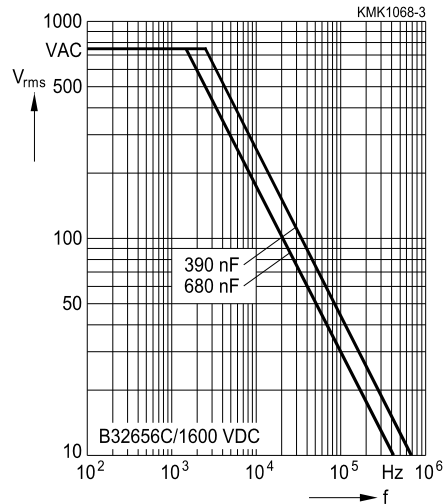
**1000 VDC/480 VAC**



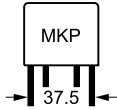
**1250 VDC/500 VAC**



**1600 VDC/750 VAC**







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

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

**Lead spacing 37.5 mm**

2000 VDC/800 VAC

