Film Capacitors

Metallized Polypropylene Film Capacitors (MFP)

Series/Type: **B32686C**
Date: August 2004

Typical applications

- Smoothing
- Snubbering
- Filtering

Climatic

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

Construction

- Dielectric: polypropylene (PP)
- Film metallized on one side and metal foils internally connected in series
- Plastic case (UL 94 V-0)
- Epoxy resin sealing (UL 94 V-0)

Features

- Very high pulse strength, high current
- Highest possible contact reliability
- Self-healing properties

Terminals

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

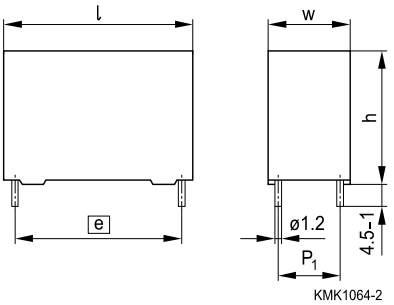
Marking

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

Delivery mode

Bulk (untaped)

Dimensional drawing

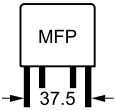


Dimensions in mm

Lead spacing e ±0.4	Pin spacing P_1	Pin code
37.5	16.0	580
	20.3	590

Overview of available types

Lead spacing	37.5 mm			
Type	B32686C			
V_R (VDC)	1000	1250	1600	2000
V_{rms} (VAC)	400	450	450	500
C_R (nF)				
120				
150				
220				
270				
330				
390				
470				
560				
680				



B32686C

4 pins (wound)

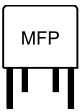
Electrical specifications, ordering codes and packing units

V_R VDC	V_{rms} f≤1kHz VAC	C_R nF	Max. dimensions w × h × l mm	I_{rms} 100 kHz A	ESR 100 kHz mΩ	Ordering code (composition see below)	Pin spacing P_1	pcs./ unit
1000	400	470	28.0 × 37.0 × 42.0	10.0	5	B32686C0474+580	16.0	27
		470	28.0 × 37.0 × 42.0	10.0	5	B32686C0474+590	20.3	27
		560	28.0 × 37.0 × 42.0	11.0	3	B32686C0564+580	16.0	27
		560	28.0 × 37.0 × 42.0	11.0	3	B32686C0564+590	20.3	27
		680	30.0 × 45.0 × 42.0	12.0	3	B32686C0684+580	16.0	27
		680	30.0 × 45.0 × 42.0	12.0	3	B32686C0684+590	20.3	27
1250	450	330	28.0 × 37.0 × 42.0	10.0	5	B32686C7334+580	16.0	27
		330	28.0 × 37.0 × 42.0	10.0	5	B32686C7334+590	20.3	27
		390	28.0 × 37.0 × 42.0	11.0	5	B32686C7394+580	16.0	27
		390	28.0 × 37.0 × 42.0	11.0	5	B32686C7394+590	20.3	27
		470	30.0 × 45.0 × 42.0	12.0	5	B32686C7474+580	16.0	27
		470	30.0 × 45.0 × 42.0	12.0	5	B32686C7474+590	20.3	27
1600	450	220	28.0 × 37.0 × 42.0	10.5	7	B32686C1224+580	16.0	27
		220	28.0 × 37.0 × 42.0	10.5	7	B32686C1224+590	20.3	27
		270	28.0 × 37.0 × 42.0	11.5	7	B32686C1274+580	16.0	27
		270	28.0 × 37.0 × 42.0	11.5	7	B32686C1274+590	20.3	27
2000	500	120	28.0 × 37.0 × 42.0	9.0	13	B32686C2124+580	16.0	27
		120	28.0 × 37.0 × 42.0	9.0	13	B32686C2124+590	20.3	27
		150	28.0 × 37.0 × 42.0	10.0	10	B32686C2154+580	16.0	27
		150	28.0 × 37.0 × 42.0	10.0	10	B32686C2154+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%



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 δ at 20 °C (upper limit values)	$1.0 \cdot 10^{-3}$ (at 10 kHz)		
	$3.0 \cdot 10^{-3}$ (at 10 kHz)		
Insulation resistance R_{ins} or time constant $\tau = C_R \cdot R_{ins}$ at 20 °C, rel. humidity ≤ 65% (minimum as-delivered values)	$C_R \leq 0.33$ µF	$C_R > 0.33$ µF	
	100 GΩ	30000 s	
DC test voltage	$2.0 \cdot V_R$, 2 s		
Category voltage V_C (continuous operation with V_{DC} or V_{AC} at f ≤ 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 ≤ 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 $\lvert\Delta C/C\rvert$		≤ 2%
	Dissipation factor change Δ tan δ		$\leq 1.0 \cdot 10^{-3}$ (at 10 kHz)
	Insulation resistance R_{ins} or time constant $\tau = C_R \cdot R_{ins}$		≥ 50% of minimum as-delivered values
Reliability:			
Failure rate λ	1 fit (≤ $1 \cdot 10^{-9}$ /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 $\lvert\Delta C/C\rvert$		> 10%
	Dissipation factor tan δ		4 · upper limit value
	Insulation resistance R_{ins}		< 1500 MΩ ($C_R \leq 0.33$ µF)
	or time constant $\tau = C_R \cdot R_{ins}$		< 500 s ($C_R > 0.33$ µF)

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 $V^2/\mu s$.

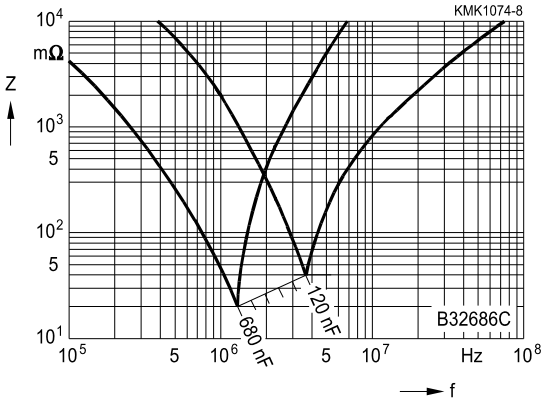
Note:
The values of dV/dt and k_0 provided below must not be exceeded in order to avoid damaging the capacitor.

dV/dt and k_0 values

Lead spacing		37.5 mm	
V_R (VDC)	V_{rms} (VAC)	dV/dt in V/µs	k_0 in $V^2/\mu s$
1000	400	2 000	4 000 000
1250	450	2 800	7 000 000
1600	450	3 500	11 000 000
2000	500	4 500	18 000 000

Impedance Z versus frequency f

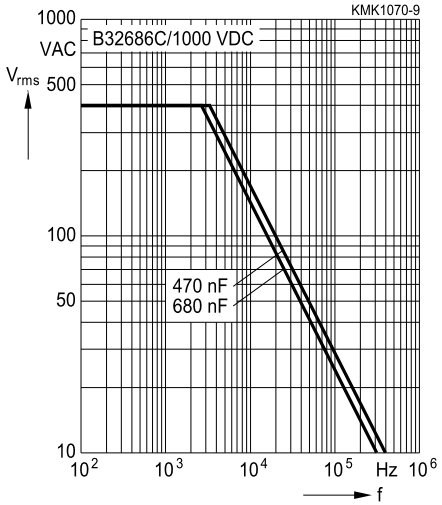
(typical values)



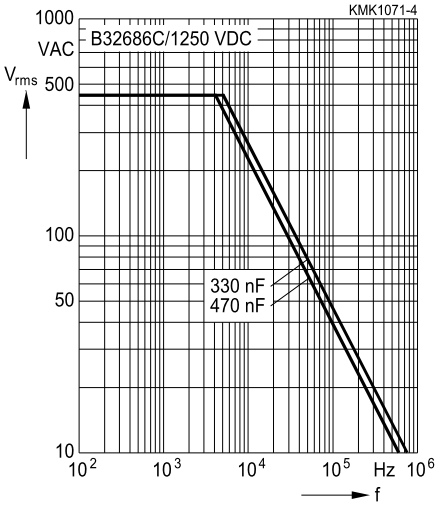
Permissible AC voltage V_{rms} versus frequency f (for sinusoidal waveforms, $T_A \leq 90$ °C)
For T_A >90 °C, please refer to "General technical information", section 3.2.3.

Lead spacing 37.5 mm

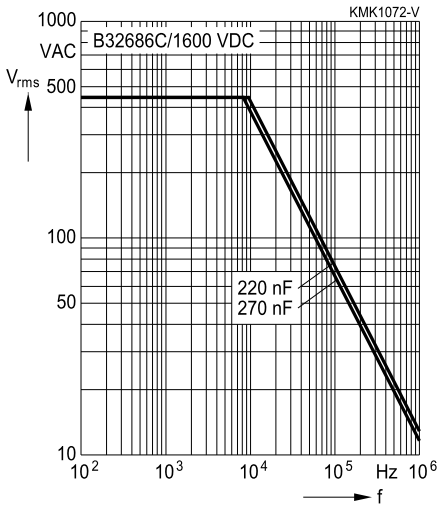
1000 VDC/400 VAC



1250 VDC/450 VAC



1600 VDC/450 VAC



2000 VDC/500 VAC