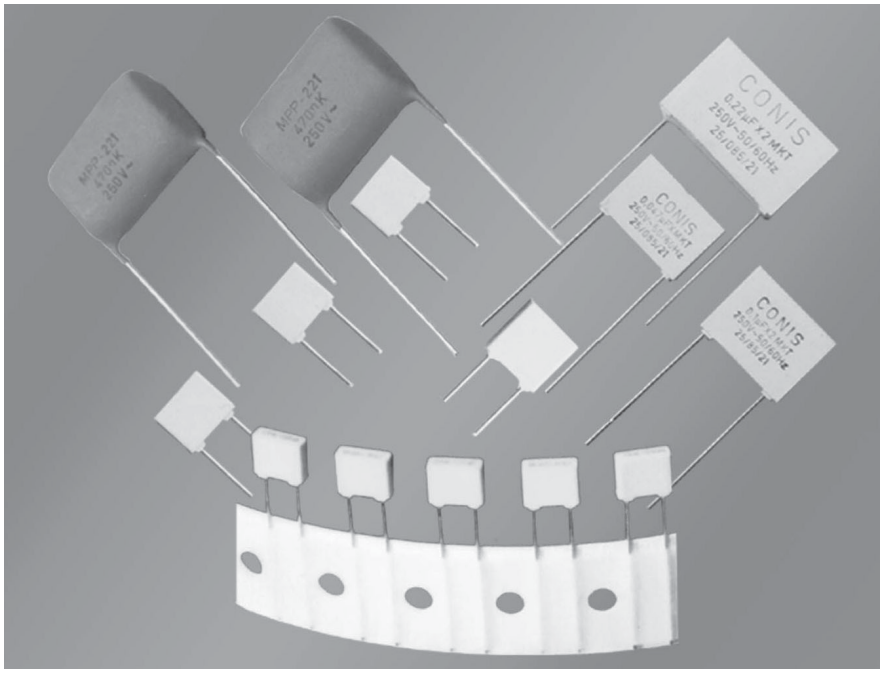
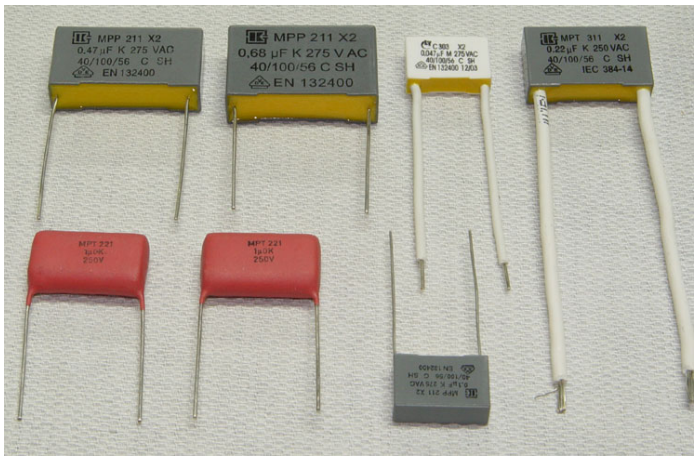
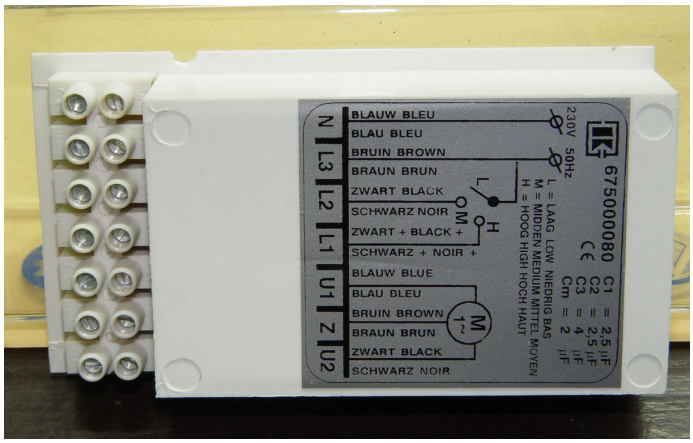
CONIS COMPANY Ltd.
CAPACITORS
EMI and RFI FILTERS

PLASTIC FILM CAPACITORS





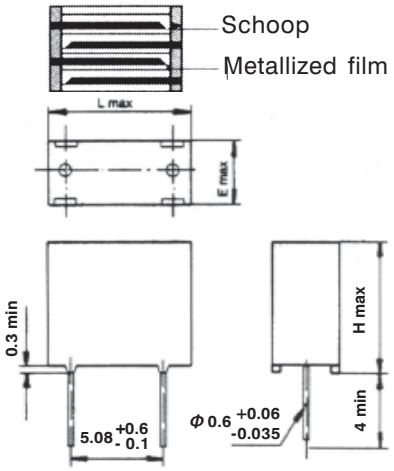


CONTENTS

NEW

MULTILAYER CAPACITORS WITH METALLIZED POLYESTER DIELECTRIC

SCHEMATIC CROSS SECTION



APPLICABLE SPECIFICATIONS

Non inductive winding with metallized polyester film.
Radial lead capacitors for use on printed circuit boards.
Thermoplastic case with stand-offs. Epoxy resin sealed.
Lead spacing: 5.08 mm.
For bandoliering (automatic insertion) please consult us.
Flame retardant plastic case and epoxy resin according to UL94V0

Some examples of use:

Supply decoupling, filter, integrator, treatment of analog signals. rejection of line perturbation, etc.

Standartization

Conform to the requirements of specifications:
CECC 30000/30400; IEC 384-1/384-2

GENERAL SPECIFICATIONS

Climatic category: 55/100/56
Capacitance range: C_R = 1 nF to 1µF (E6 and E12)
Capacitance tolerance: ±5; ±10; ±20%
Rated voltage: U_R = 63; 100; 250; 400 VDC
Category voltage: U_C = 0.80 U_R/100 °C
Test voltage: U_e = 1.6 U_R/ 2 s at 25 °C
Dissipation factor: tgδ ≤ 0.01/1kHz (typical: 50 x 10^{-4})

Insulation resistance at 20 °C

		$C_R \leq 0.33$ µF	$C_R > 0.33$ µF
Between terminals	$U_R \leq 100$ V	Ri ≥ 3750 MΩ	Ri x $C_R \geq$ 1250 s
	$U_R >$100 V	Ri ≥ 7500 MΩ	
Between terminals and ground	≥3000 MΩ		

Max. voltage gradient:

U_R (VDC)	63	100	250	400
du/dt max (V/µs)	38	40	110	270

Humidity test: ΔC/C ≤ 5%; Δtgδ ≤ 50 x 10^{-4} at 1 kHz
insulation resistance ≥ 50% of initial limit after 56 days (40 °C/95% RH)

Life test: ΔC/C ≤ 8%; Δtgδ ≤ 50 x 10^{-4} at 10 kHz
insulation resistance ≥ 50% of initial limit after 1000 h (100 °C) 1.25 x U_C

Heat behaviour to soldering operation: Bath temperature: 260 °C
immersion time 1 nF to 100 nF: 5 s
150 nF to 1 µF: 10 s
Performance: ΔC/C ≤ 2%; Δtgδ ≤ 50 x 10^{-4}

Main parameters Changes: Typical results see curves 1 to 4

Marking: On the upper side: LOGO CONIS
Rated capacitance in nF or µF
Capacitance tolerance J (5%); K (10%); M (20%)
DC rated voltage

Example: 100 n K 63 — 100 nF ± 10% 63V
2n2 M 100 — 2.2 nF ± 20% 100V

Capacitance values (C_R) and rated voltages (U_R) depending on the cases

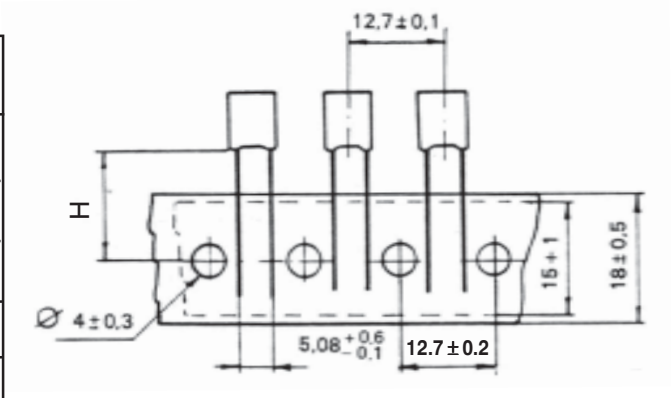
Leter code	C	D	F	G
Capacitance range C_R/nF/	63 VDC 40 VAC	100 VDC 63 VAC	250 VDC 160 VAC	400 VDC 200 VAC
	Case code			
1.0	01	01	01	01
1.5				
2.2				
3.3				
4.7				
6.8				07
10			07	
15				
22				
33				
47				
68				
100				
150	01	07		
220				
330	07			
470				
680				
1000				

Case code	Dimensions (mm)		
	L max	H max	E max
01	7.5	6.5	2.5
07	7.5	8.5	5.0

- Packaging Bulk
Taping on reel or ammopack
for automatic insertion

Suffix	Dimensions H (mm)	Packaging
O	16.5 ± 0.3	Ammopack
P	Panasert	Reel
Q	19.5 ± 0.5	Ammopack
R	Avisert	Reel
S	18.0 ± 0.5	Ammopack

LEAD TAPING AND PACKAGING FOR AUTOMATIC INSERTION

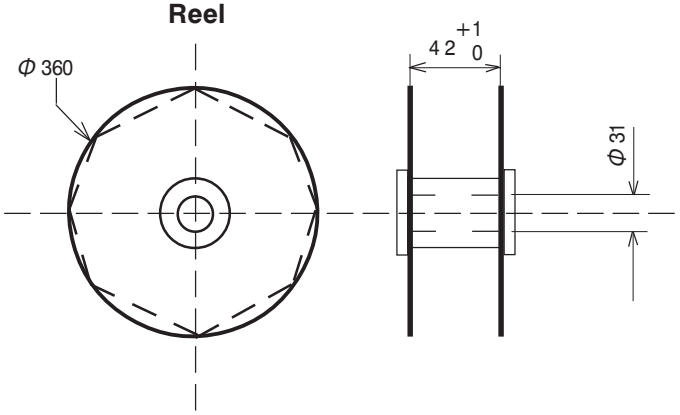


Dimensions (mm)
Technical terms: IEC 286-2

Packaging

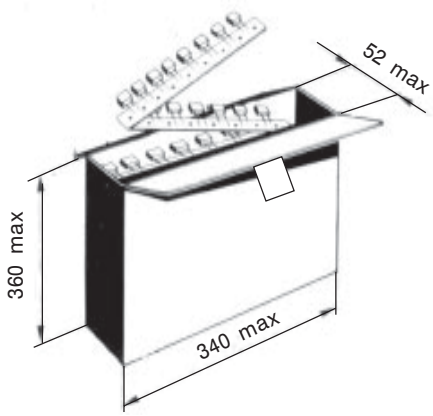
Case	Quantity	
	Reel or Ammopack	Bulk
01	3500	5000
07	1800	2500

Reel



Dimensions (mm))

Ammopack



Dimensions (mm)

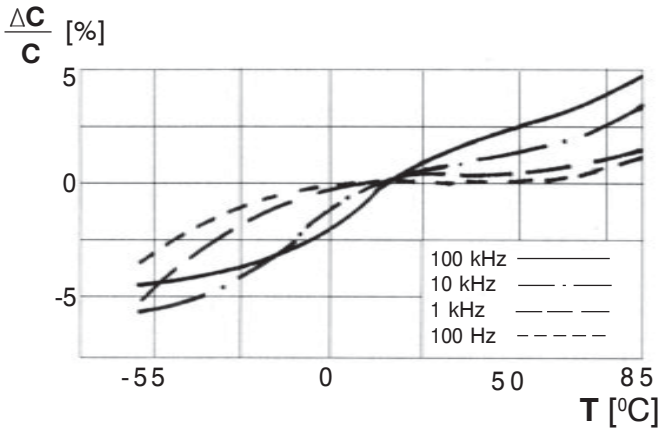
Ordering code

MPT 111 2 473 K D 0

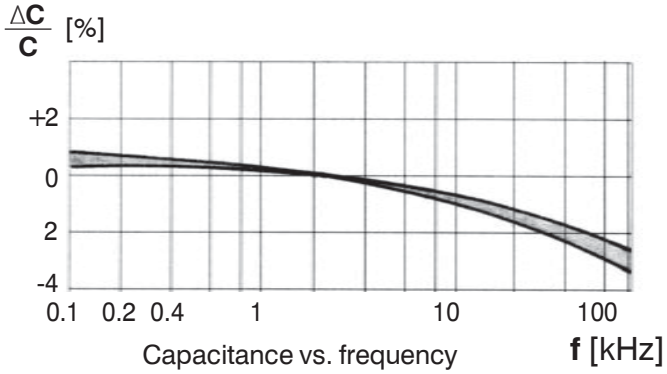
- Type
- Class 2
- * Capacitance (pF) 47000
- Tolerance 10%
- Voltage (V) 100V
- Suffix H=16.5 ± 0.3

*** The last figure indicates the number of zeroes**

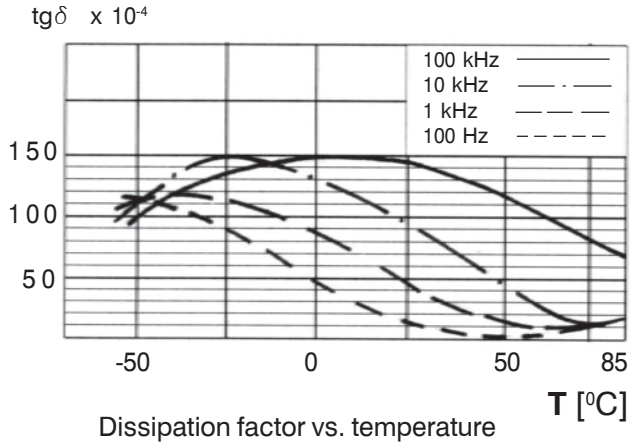
CHARACTERISTICS CURVES



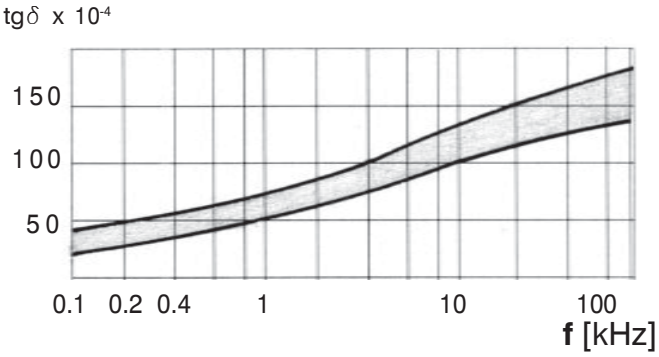
Capacitance vs. temperature



Capacitance vs. frequency

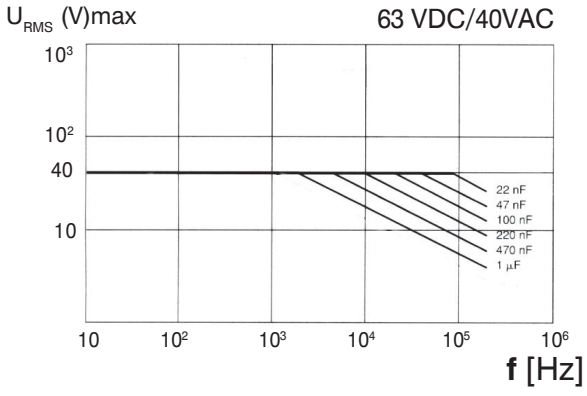


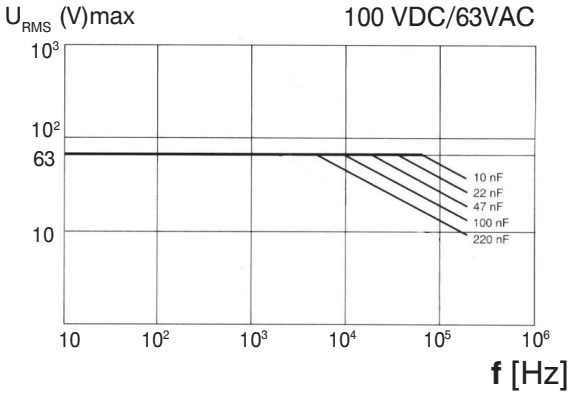
Dissipation factor vs. temperature



Dissipation factor vs. frequency

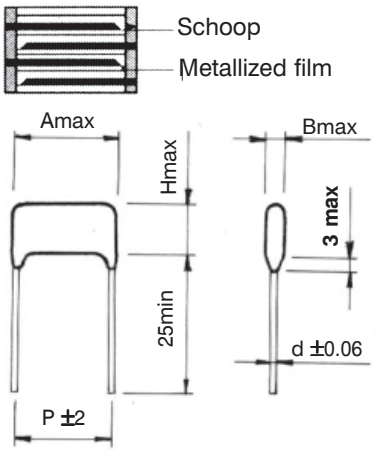
RATED RMS VOLTAGE VERSUS FREQUENCY





METALLIZED POLYESTER FILM CAPACITORS

SCHEMATIC CROSS SECTION



TYPICAL APPLICATIONS: blocking, coupling, decoupling, by-passing, interference suppression in low voltage applications.

GENERAL TECHNICAL DATA

Dielectric: Polyester film (polyethylene terephthalate)
Plates: aluminium layer deposited by evaporation under vacuum.
Protection: phenol-formaldechide resin
Climatic category: 40/85/21 IEC 68-1
Related documents: IEC 384-2

ELECTRICAL CHARACTERISTICS

Capacitance range:	C_R = 4.7 nF to 5**µ**F (E12)
Capacitance tolerance:	±5; ±10; ±20%
Rated voltage:	U_R = 63; 160; 250; 400; 630 VDC
Category voltage:	$U_C = 0.80\ U_R/100\ ^0C$
Test voltage:	$U_e = 1.4\ U_R/2$ s at 25 ^{0}C
Dissipation factor:	tg$\delta \leq 100 \times 10^{-4}$ at 1kHz
Insulation resistance at 20 ^{0}C	

		$C_R \leq$ 0.33 **µ**F	$C_R >$ 0.33 **µ** F
Between terminals	$U_R <$ 100 V	$R_I \geq$ 3.75 GΩ	$R_I \times C_R \geq$ 1250 s
	$U_R >$ 100 V	$R_I \geq$ 7.5 GΩ	$R_I \times C_R \geq$ 2500 s
Between terminals and capacitor body		$R_I \geq$ 30 GΩ	

Max pulse rise time (dv/dt)

U_R	Lead spacing „P“ (mm) 10	12.5	17.5	22.5	32.5	
63	3	3	1.5	1	1	dv/dt (V/**µ**s)
160	8	5	5	3	2	dv/dt (V/**µ**s)
250	11	7	4	3	3	dv/dt (V/**µ**s)
400	20	10	5.5	5	5	dv/dt (V/**µ**s)
630	30	30	15	8	7	dv/dt (V/**µ**s)

TEST METHOD AND PERFORMANCE

Damp heat, steady state:

Test conditions
Temperature: + 40 ^{0}C ±2 ^{0}C
Relative humidity (RH): 93% ± 2%
Test duration: 21 days
Performance
Capacitance change ΔC/C: ≤ ±5%
DF change Δtgδ: ≤ 50 x 10^{-4} at 1 kHz
Insulation resistance: ≥ 50% of initial limit

Endurance:

Test conditions
Temperature: + 85 ^{0}C ±2 ^{0}C
Test duration: 1000 h
Voltage applied: 1.25 x U_R
Performance
Capacitance change ΔC/C:≤ ±5%
DF change Δtgδ : ≤50 x 10^{-4} at 10 kHz for C ≤ 1**µ**F
≤30 x 10^{-4} at 1 kHz for C > 1**µ**F
Insulation resistance: ≥ 50% of initial limit

Resistance to soldering heat:

Test conditions
Solder bath temperature: + 260 ^{0}C ±5 ^{0}C
Dipping time (with heat screen): 10 ±1 s
Performance
Capacitance change ΔC/C:≤ ±2%
DF change Δtgδ : ≤50 x 10^{-4} at 10 kHz for C ≤ 1**µ**F
≤30 x 10^{-4} at 1 kHz for C > 1**µ**F
Insulation resistance: ≥ initial limit

Ordering code

MPT 221 2 104 K C

Type
Class 2
Capacitance (pF) 100 000*
Tolerance 10%
Voltage (V) 63V

*** The last figure indicates the number of zeroes**

- Marking: Type
Rated capacitance in nF or **µ**F
Capacitance tolerance J (5%); K (10%); M (20%)
DC rated voltage

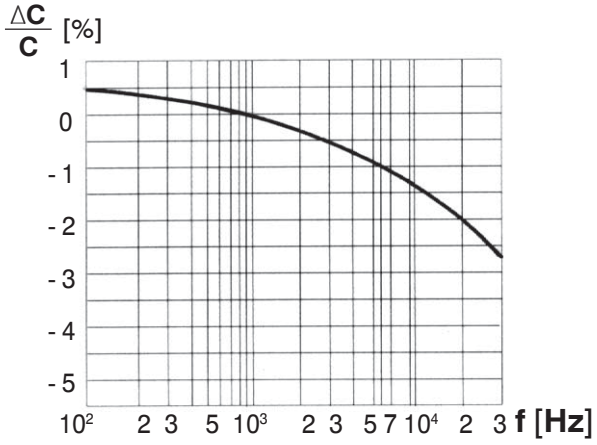
Example: 100 n K 63 100 nF ± 10% 63V
2**µ**2 M 250 2.2 **µ**F ± 20% 250V

CAPACITANCE VALUE (C_R) RATED VOLTAGE (U_R) AND DIMENSIONS (mm)

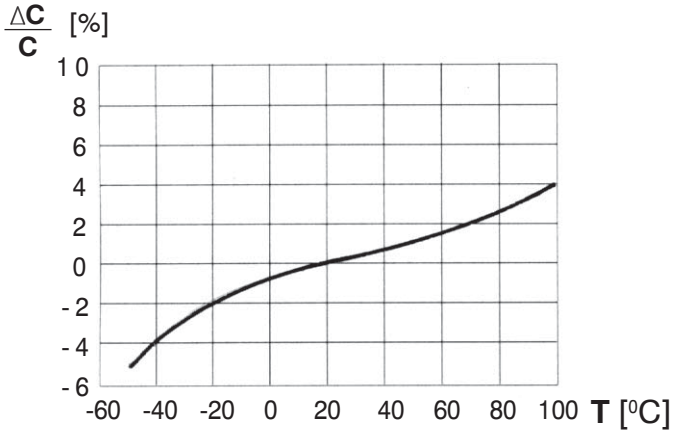
U_R(VDC)	63 and 160				250				400				630			
Letter code	C E				F				G				I			
C_R(µF)	Amax	Bmax	Hmax	P	Amax	Bmax	Hmax	P	Amax	Bmax	Hmax	P	Amax	Bmax	Hmax	P
0.0047					15.0	5.6	10.0	12.5	15.0	5.6	10.0	12.5	15.0	5.6	10.0	12.5
0.0051					15.0	5.8	10.2	12.5	15.0	5.8	10.2	12.5	15.0	5.8	10.2	12.5
0.0068					15.0	5.9	10.3	12.5	15.0	5.9	10.3	12.5	15.0	6.5	10.9	12.5
0,010	15,0	5,0	8,2	12,5	15,0	5,0	8,2	12,5	15,0	5,0	8,2	12,5	15,0	5,0	8,2	12,5
	13,0	5,2	8,6	10,0	13,0	5,2	6,6	10,0	13,0	5,2	8,6	10,0				
0,015	15.0	4.7	8.3	12.5	15.0	4.7	8.3	12.5	15.0	4.7	8.3	12.5	15.0	4.7	8.3	12.5
	13.0	5.2	8.6	10.0	13.0	5.2	8.6	10.0	13.0	5.2	8.6	10.0				
0.022	15.0	4.9	8.5	12.5	15.0	4.9	8.5	12.5	15.0	4.9	8.5	12.5	15.0	4.9	8.5	12.5
	13.0	5.2	8.6	10.0	13.0	5.4	8.8	10.0	13.0	5.4	8.8	10.0				
0.033	15.0	5.8	10.0	12.5	15.0	5.8	10.0	12.5	15.0	5.8	10.0	12.5	15.0	6.0	10.4	12.5
					13.0	5.0	10.6	10.0	13.0	6.0	10.6	10.0				
0.047	15.0	6.0	10.4	12.5	15.0	6.0	10.4	12.5	15.0	6.0	10.4	12.5	20.0	6.0	10.6	17.5
					13.0	6.4	10.6	10.0	13.0	6.4	10.6	10.0				
0.068	15.0	4.8	8.3	12.5	15.0	4.8	8.3	12.5	15.0	7.1	11.5	12.5	20.0	6.6	11.6	17.5
					13.0	5.4	8.4	10.0	13.0	6.4	11.9	10.0				
0.10	15.0	5.4	8.9	12.5	15.0	5.4	8.9	12.5	20.0	6.2	11.4	17.5	20.0	7.3	12.0	17.5
					13.0	5.6	9.2	10.0								
0.12	15.0	5.9	9.5	12.5	15.0	5.9	9.5	12.5	20.0	6.8	12.0	17.5	25.0	6.2	11.5	22.5
					13.0	6.2	9.8	10.0								
0.15	15.0	6.7	10.6	12.5	15.0	6.7	10.6	12.5	20.0	7.6	12.8	17.5	25.0	6.6	12.3	22.5
					13.0	6.9	11.4	10.0								
0.18	15.0	6.3	10.7	12.5	20.0	5.5	9.8	17.5	20.0	8.1	13.2	17.5	25.0	7.0	13.5	22.5
0.22	15.0	6.7	11.0	12.5	20.0	5.9	10.1	17.5	25.0	9.2	13.5	22.5	25.0	8.1	14.2	22.5
0.33	20.0	6.0	11.2	17.5	20.0	6.9	11.5	17.5	25.0	9.8	14.3	22.5				
0.39	20.0	6.5	11.7	17.5	20.0	7.3	12.4	17.5	25.0	10.2	15.2	22.5				
0.47	20.0	6.8	12.0	17.5	25.0	6.5	12.2	22.5	25.0	10.5	16.9	22.5				
0.56	20.0	7.4	12.6	17.5	25.0	7.0	12.8	22.5	25.0	11.8	17.9	22.5				
0.68	20.0	7.9	13.1	17.5	25.0	7.4	13.0	22.5	35.0	8.6	16.2	32.5				
0.82	20.0	8.3	13.5	17.5	25.0	8.1	13.7	22.5	35.0	9.7	17.0	32.5				
1.0	25.0	7.5	12.7	22.5	25.0	8.7	14.5	22.5	35.0	10.0	18.0	32.5				
1.2	25.0	8.6	13.8	22.5	25.0	9.5	15.3	22.5								
1.5	25.0	8.8	15.5	22.5	25.0	10.0	16.3	22.5								
2.2	25.0	10.2	17.1	22.5	35.0	9.0	19.0	32.5								
4.0	35.0	11.2	20.3	32.5	40.0	11.3	20.3	37.5								
5.0	35.0	11.3	21.2	32.5												

*** For P <22.5 mm d=0.6 mm**
*** For P ≥22.5 mm d=0.8 mm**

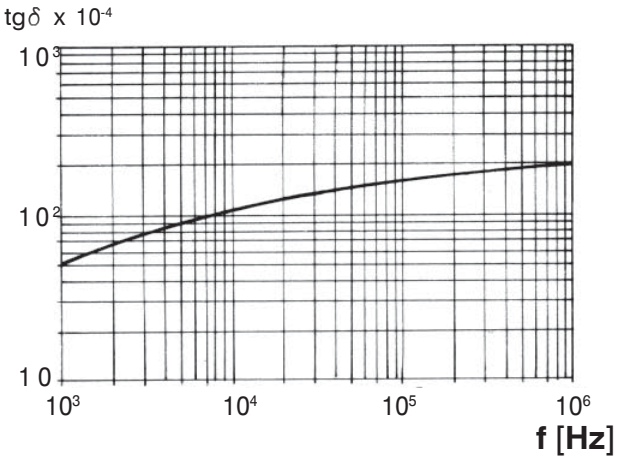
CHARACTERISTICS CURVES



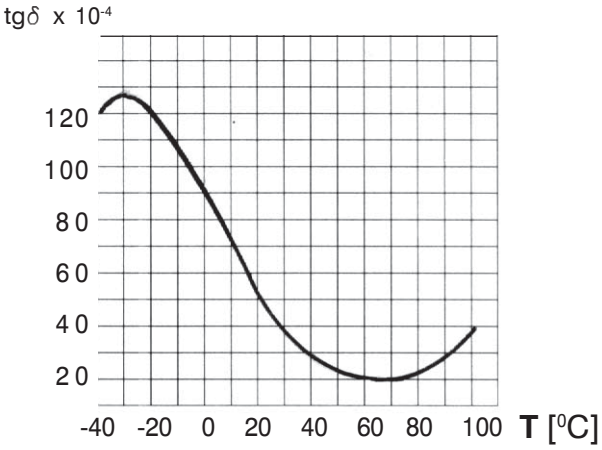
Capacitance vs. frequency



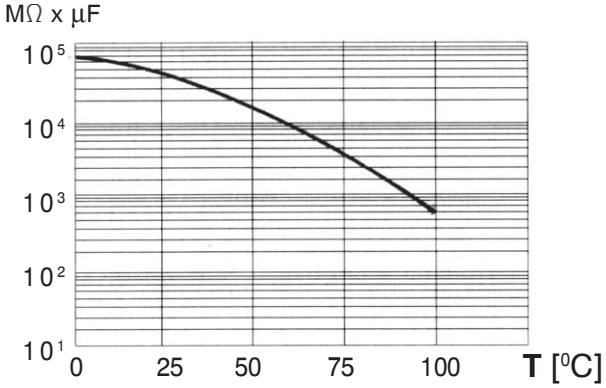
Capacitance vs. temperature at 1 kHz



Dissipation factor vs. frequency



Dissipation factor vs. temperature

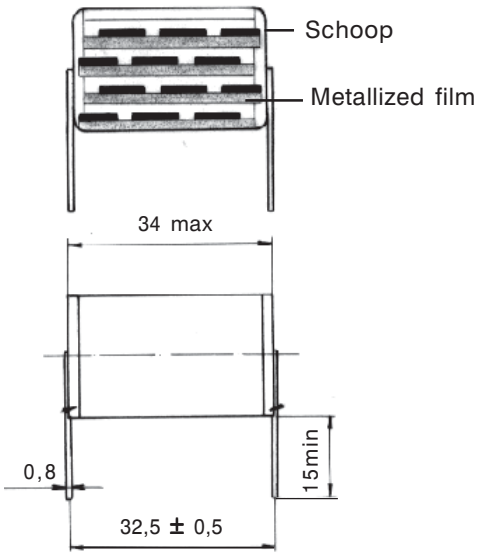


Time constant vs. temperature

MPT 301 RADIAL LEADS
MPT 300 WITHOUT LEADS

METALLIZED POLYESTER FILM CAPACITORS

SCHEMATIC CROSS SECTION



TYPICAL APPLICATIONS:

The capacitor is intended for building-up in:
Module for High Voltage Multiplication
Direct Current and Ripple Current Circuits
Continuous and impulse Duty
The capacitor is a bare type or with a PVC cover, cilindrical with radial leads, with internal connected in series capacitors.

GENERAL TECHNICAL DATA

Dielectric: Polyester film (polyethylene terephthalate)
Plates: Aluminium layer deposited by evaporation under vacuum.
Temperature range: -20 ºC + 75 ºC
Related documents: Internal standard confirmed

ELECTRICAL CHARACTERISTICS

Capacitance range:	C_R = 0,001 µF to 0,01µF
Capacitance tolerance:	±10% /K/ and ± 20%/M/**- 1 kHz**
Rated voltage:	U_R = 10 kV, 15 kV
Test voltage:	between terminals 1,2U_R DC for 60+1 s
Dissipation factor:	tg**δ** ≤ 100 x 10^{-4} at 1kHz
Insulation resistance between terminals:	≥ 100 000 MΩ et 25 ºC 100VDC 1min

Capacitance value and dimensions

C_R (µF)	Dimensions (mm)		
	L max	Φmax	P ± 0.4
0.0010	34	7,5	32,5
0.0025	34	10	32,5
0.0047	34	13	32,5
0.0100	34	16	32,5

Other capacitances values on request

ORDERING CODE

MPT 301/300 **102** **K** **10/15**

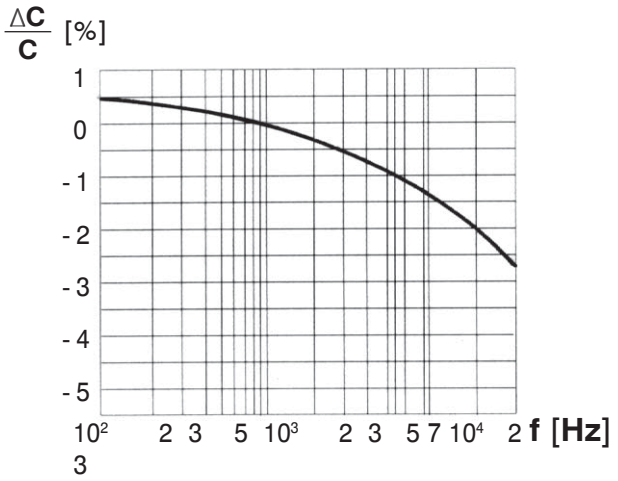
Type
Capacitance (pF) 1000*
Tolerance 10%
Voltage (kV)

* The last figure indicates the number of zeroes

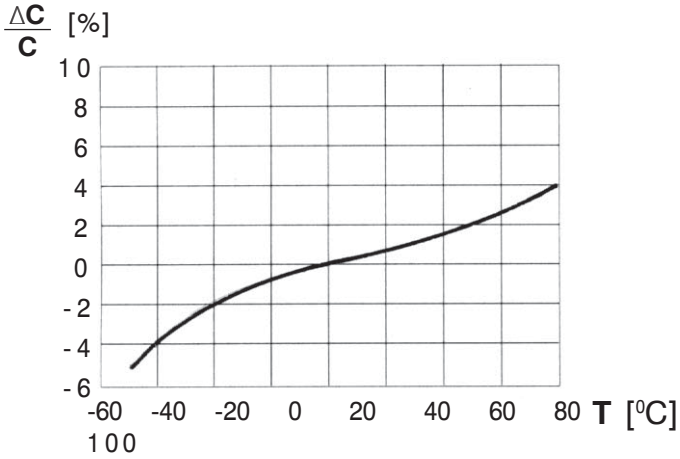
ENDURANCE:

Test conditions	
Temperature:	+ 75 ºC ±2 ºC
Test duration:	1000 h
Voltage applied:	1.2 x U_R
Performance	
Capacitance change ΔC/C:	≤ ±30%
DF change Δtgδ:	≤ 1,2 x 10^{-2}
Insulation resistance:	≥ 5000 MΩ

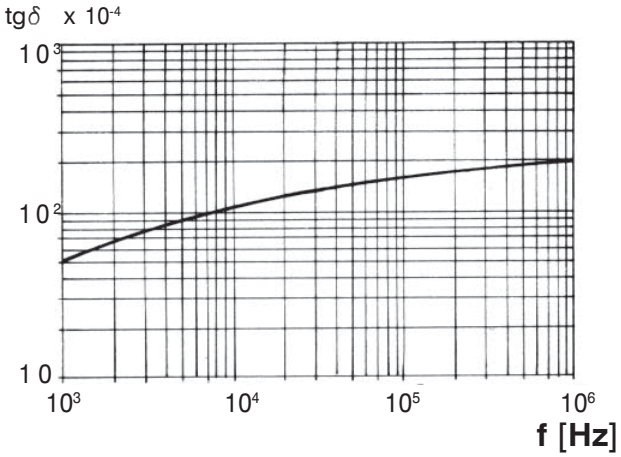
CHARACTERISTICS CURVES



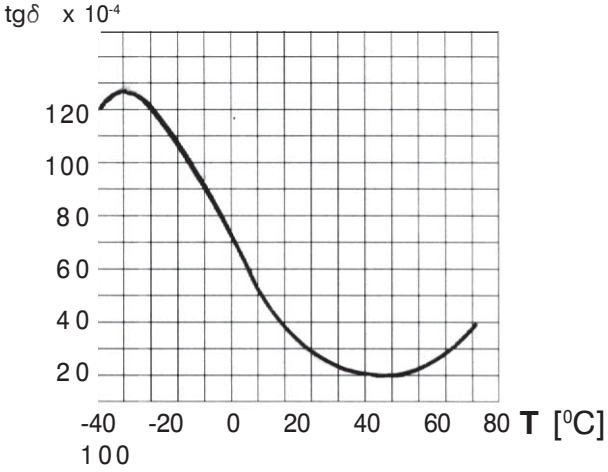
Capacitance vs. frequency



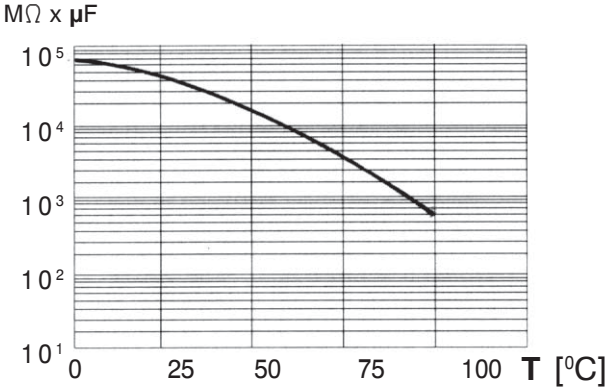
Capacitance vs. temperature at 1 kHz



Dissipation factor vs. frequency



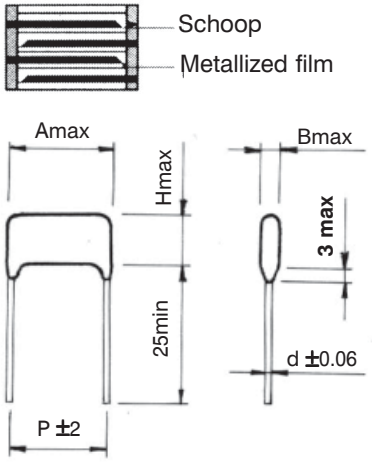
Dissipation factor vs. temperature



Time constant vs. temperature

METALLIZED POLYPROPYLENE FILM CAPACITORS

SCHEMATIC CROSS SECTION



TYPICAL APPLICATIONS: Temperature compensation circuits, timing oscillator circuits, power factor correction and coupling capacitor in SMPS applications.

GENERAL TECHNICAL DATA

Dielectric: Polypropylene film
Plates: Aluminium layer deposited by evaporation under vacuum.
Protection: Phenol-formaldechide resin
Climatic category: 40/85/21 IEC 68-1
Related documents: IEC 384-16

ELECTRICAL CHARACTERISTICS

Capacitance range:	C_R = 33 nF to 1**µ**F (E6)
Capacitance tolerance:	±5; ±10; ±20%
Rated voltage:	U_R = 160; 250; 400; 630 VDC U_R = 90; 160; 220; 250 VAC
Category voltage:	up to +85 °C $U_C = U_R$
Test voltage:	$U_e = 1.6\ U_R/2$ s at 25 °C
Dissipation factor:	tg$\delta \leq 20 \times 10^{-4}$ at 1kHz
Insulation resistance between terminals:	≥ 100 000 MΩ for C ≤ 0.33 **µ**F > 30 000 MΩ for C > 0.33 **µ**F

- Max pulse rise time (dv/dt)

U_R	Lead spacing „P“ (mm) 12.5	17.5	22.5	32.5	
160	4	2	1.5	1	dv/dt (V/**µ**s)
250		7	4	3	dv/dt (V/**µ**s)
400		10	5.5	5	dv/dt (V/**µ**s)
630		15	8	7	dv/dt (V/**µ**s)

TEST METHOD AND PERFORMANCE

Damp heat, steady state:

Test conditions
Temperature: + 40 °C ±2 °C
Relative humidity (RH): 93% ± 2%
Test duration: 21 days
Performance
Capacitance change ΔC/C:≤ ±5%
DF change Δtgδ: ≤ 20 x 10^{-4} at 1 kHz
Insulation resistance: ≥ 50% of initial limit

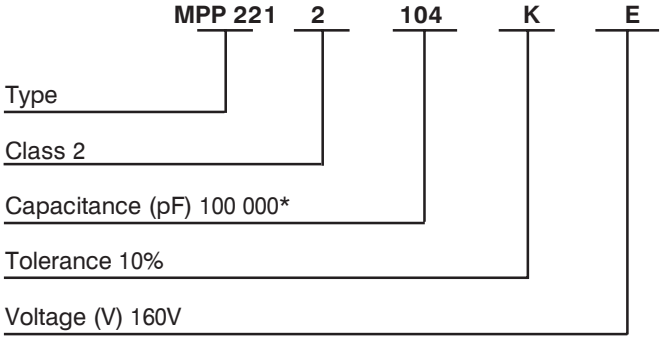
Endurance:

Test conditions
Temperature: + 85 °C ±2 °C
Test duration: 1000 h
Voltage applied: 1.25 x VR
Performance
Capacitance change ΔC/C: ≤ ±5%
DF change Δtgδ: ≤ 40 x 10^{-4} at 10 kHz for C ≤ 1**µ**F
≤ 40 x 10^{-4} at 1 kHz for C > 1**µ**F
Insulation resistance: ≥ 50% of initial limit

Resistance to soldering heat:

Test conditions
Solder bath temperature: + 260 °C ±5 °C
Dipping time (with heat screen): 10 s ±1 s
Performance
Capacitance change ΔC/C:≤ ±3%
DF change Δtgδ: ≤40 x 10^{-4} at 10 kHz for C ≤ 1**µ**F
≤40 x 10^{-4} at 1 kHz for C > 1**µ**F
Insulation resistance: ≥ initial limit

ORDERING CODE



* The last figure indicates the number of zeroes

Marking: Type
Rated capacitance in nF or **µ**F
Capacitance tolerance J (5%); K (10%); M (20%)
DC rated voltage

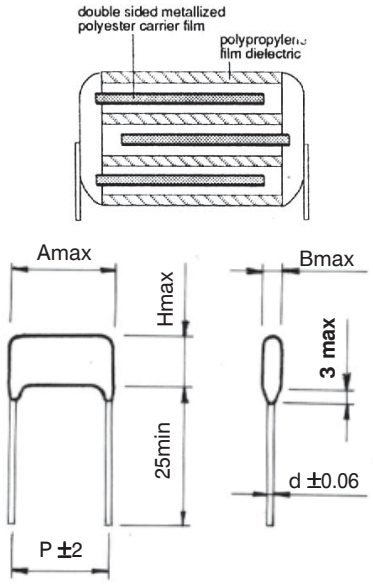
Example: 100 n K 160 — 100 nF ± 10% 160V
1**µ**0 M 250 — 1.0 **µ**F ± 20% 250V

CAPACITANCE VALUE (C_R) RATED VOLTAGE (U_R)

Cap. µF	Rated voltage VDC/VAC	Dimensions /mm/				
		Lmax	Bmax	Hmax	P ± 2	d
0.047	160/90	15	6.5	9.5	12.5	0.6
0.100	250/160	20	5.5	8.5	17.5	
0.150		20	9.0	13.0		
0.220		20	9.0	13.0		
0.330		25	8.0	13.0	22.5	0.8
0.430		25	8.0	13.0		
0.470		25	9.0	15.0		
0.680		25	11.0	18.0		
1.000		25	13.0	19.0		
0.033	400/220	15	4.8	8.5	12.5	0.6
0.047		15	6.0	10.2		
0.068		15	6.6	11.2		
0.100		20	6.2	10.3	17.5	
0.120		25	5.3	10.9	22.5	0.8
0.150		25	5.8	11.5		
0.180		25	6.4	11.8		
0.220		25	7.1	13.1		
0.270		25	7.8	13.9		
0.330		25	8.7	15.0		
0.390		25	9.5	15.8		
0.470		25	10.3	18.0		
0.680		35	8.3	16.6	32.5	
1.000		35	11.5	21.0		
0.027	630/250	15	7.5	11.0	12.5	0.6
0.033		20	6.5	11.0	17.5	
0.047		20	7.0	11.5		
0.330		25	9.7	17.0	22.5	0.8
0.470		25	12.3	19.0		

POLYPROPYLENE CAPACITORS WITH DOUBLE SIDED METALLIZED FILM ELECTRODES

SCHEMATIC CROSS SECTION



TYPICAL APPLICATIONS: Polypropylene capacitors type MPT-PP 221 are intended for use in electrical circuits with direct and alternating current. Also they may work in pulse regime.

GENERAL TECHNICAL DATA

Dielectric: Polypropylene film
Plates: Double sided metallized polyester film
Climatic category: 40/85/21 IEC 68-1
Related documents: IEC 384-16

ELECTRICAL CHARACTERISTICS

Capacitance range:	C_R = 27 nF to 330 nF
Capacitance tolerance:	±5; ±10; ±20%
Rated voltage:	U_R = 630 VDC U_R = 250 VAC
Category voltage:	up to +85 °C $U_C = U_R$
Test voltage:	$U_e = 1.6\ U_R/2$ s at 25 °C
Dissipation factor:	$tg\delta \le 20 \times 10^{-4}$ 1kHz
Insulation resistance between terminals:	≥ 100 000 MΩ

Max pulse rise time dv/dt (V/µs)

U_R	Lead spacing „P“ (mm)	
	17.5	22.5
160	2	1.5
250	7	4
400	10	5.5
630	15	8

Cap. µF	Rated voltage VDC/VAC	Dimensions /mm/				
		A max	Bmax	Hmax	P±2	d
0.027	630/250	20	5	11	17.5	0.6
0.047			6	12		
0.100		25	8	13	22.5	0.8
0.220			12.5	10.5		
0.330			13.5	22.5		

TEST METHOD AND PERFORMANCE

Damp heat, steady state:

Test conditions
Temperature: + 40 °C ±2 °C
Relative humidity (RH): 93% ± 2%
Test duration: 21 days
Performance
Capacitance change ΔC/C:≤ ±5%
DF change $\Delta tg\delta$: ≤20 x 10^{-4} at 1 kHz
Insulation resistance: ≥ 50% of initial limit

Endurance:

Test conditions
Temperature: + 85 °C ±2 °C
Test duration: 1000 h
Voltage applied: 1.25 x U_R
Performance
Capacitance change ΔC/C: ≤ ±5%
DF change $\Delta tg\delta$: ≤ 40 x 10^{-4} at 10 kHz for C ≤ 1µF
≤ 40 x 10^{-4} at 1 kHz for C>1µF
Insulation resistance: ≥ 50% of initial limit

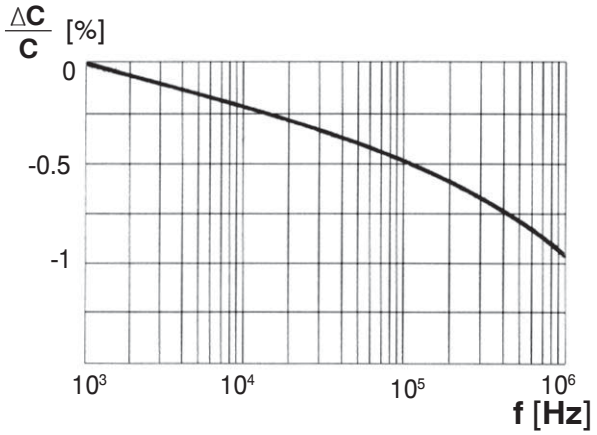
Resistance to soldering heat:

Test conditions
Solder bath temperature: + 260 °C ±5 °C
Dipping time (with heat screen): 10 s ±1 s
Performance
Capacitance change ΔC/C: ≤ ±3%
DF change $\Delta tg\delta$: ≤40 x 10^{-4} at 10 kHz for C≤1µF
≤40 x 10^{-4} at 1 kHz for C > 1µF
Insulation resistance: ≥ initial limit

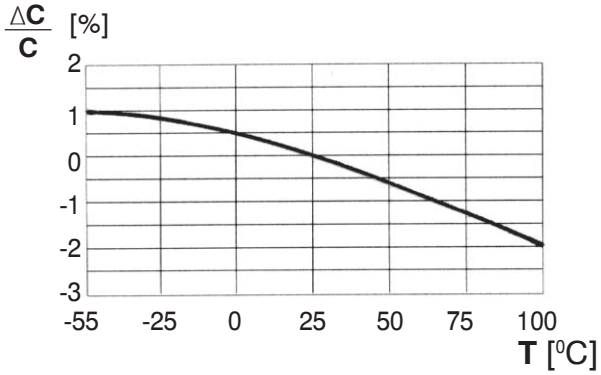
Marking: Type
Rated capacitance in nF or µF
Capacitance tolerance J (5%); K (10%); M (20%)
DC rated voltage

Example: 100 n K 630 100 nF ± 10% 630V

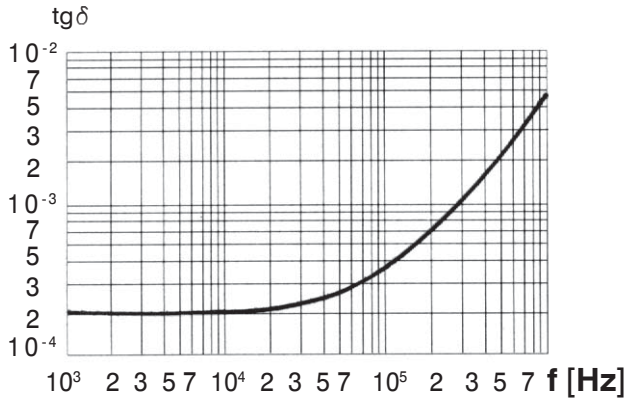
CHARACTERISTICS CURVES



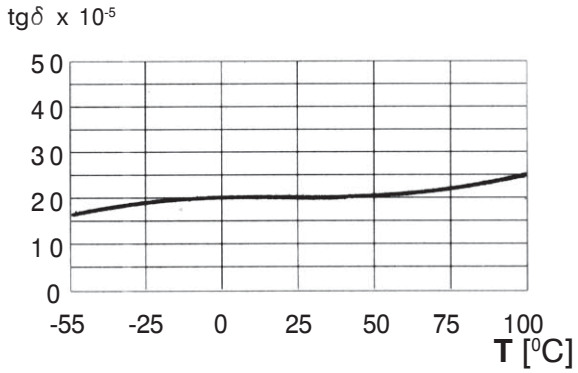
Capacitance vs. frequency



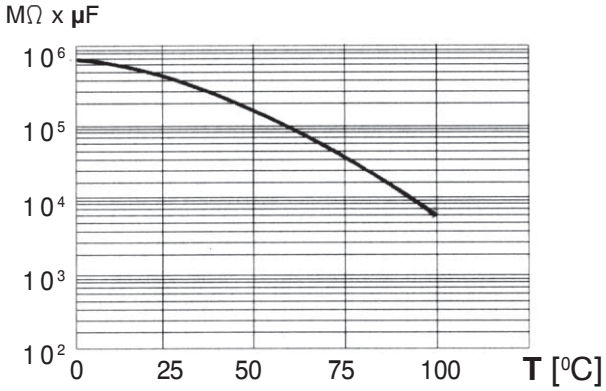
Capacitance vs. temperature at 1 kHz



Dissipation factor vs. frequency



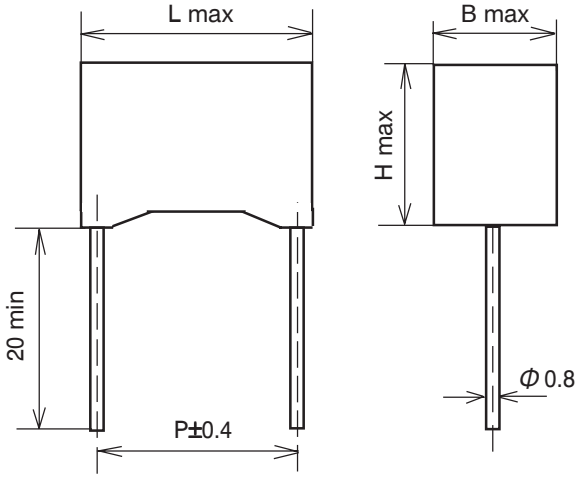
Dissipation factor vs. temperature at 1 kHz



Time constant vs. temperature

METALLIZED POLYPROPYLEN FILM CAPACITORS

SCHEMATIC CROSS SECTION



TYPICAL APPLICATIONS:

Interference suppression and across-the-line applications. Suitable for use in situations where failure of the capacitor would not lead to danger of electric shock.

GENERAL TECHNICAL DATA

Dielectric: Polypropylene film
Plates: Metal layer deposited by evaporation under vacuum.
Leads: Tinned wire or insulated tigid leads
Protection: Plastic case flame retardant and epoxi resin-according to UL 94 V0
Climatic category: 40/100/56 IEC 60068-1
Related documents: EN 132400

APPROVAL

ELECTRICAL CHARACTERISTICS

Capacitance range: C_R = 0.022 **µF** to 4,7**µF**
Capacitance tolerance: ±10% (K); ±20% (M) at 1 kHz
Rated voltage: U_R = 275 VAC
Test voltage between terminals: 1500 VAC for 1 s +2200 VDC for 1 s at +25 °C ± 5 °C
Dissipation factor: tg**δ** ≤ 20 x 10^{-4} at 25 °C ± 5 °C and 1kHz
Insulation resistance at 25°C ±5°C and 100VDC - 1 min: ≥ 1.10^5 MΩ for C ≤ 0.33 **µF**; ≥ 30 000 s for C >0.33 **µF**
Max pulse rise time dv/dt (V/**µ**s): 100 V/**µ**s at 390VDC

Rated capacitance µF	Dimensions (mm)			
	max B	max H	max L	P±0.4
0.022	5.0	11.0	18.0	15.0
0.047	5.0	11.0	18.0	15.0
0.068	5.0	11.0	18.0	15.0
0.100	6.0	12.0	18.0	15.0
0.220	6.0	15.0	26.5	22.5
0.330	7.0	16.0	26.5	22.5
0.470	9.0	17.0	32.0	27.5
0.680	10.0	20.0	32.0	27.5
1.000	11.0	20.0	32.0	27.5
1.500	15.0	24.5	32.0	27.5
2.200	13.0	24.0	41.5	37.5
3.300	16.0	28.5	41.5	37.5
3.750	19.0	32.0	41.5	37.5
4.400	19.0	32.0	41.5	37.5
4.700	19.0	32.0	41.5	37.5

TEST METHOD AND PERFORMANCE

Damp heat, steady state:

Test conditions
Temperature: + 40 °C ±2 °C
Relative humidity (RH): 93% ± 2%
Test duration: 56 days
Performance
Dielectric strength: no dielectric breakdown or flashover at 66% of 4.3 x U_R (DC)/1 min
Capacitance change: ΔC/C: ≤ ±5%
Insulation resistance: ≥ 50% of initial limit

Endurance:

Test conditions
Temperature: + 100 °C ±2 °C
Test duration: 1000 h
Voltage applied: 1.25 x U_R + 1000 U_{AC} 0.1 s/h
Performance
Dielectric strength: no dielectric breakdown or flashover at 66% of 4.3 x U_R (DC)/1 min
Capacitance change: ΔC/C: ≤ ±10%
Insulation resistance: ≥ 50% of initial limit

Resistance to soldering heat:

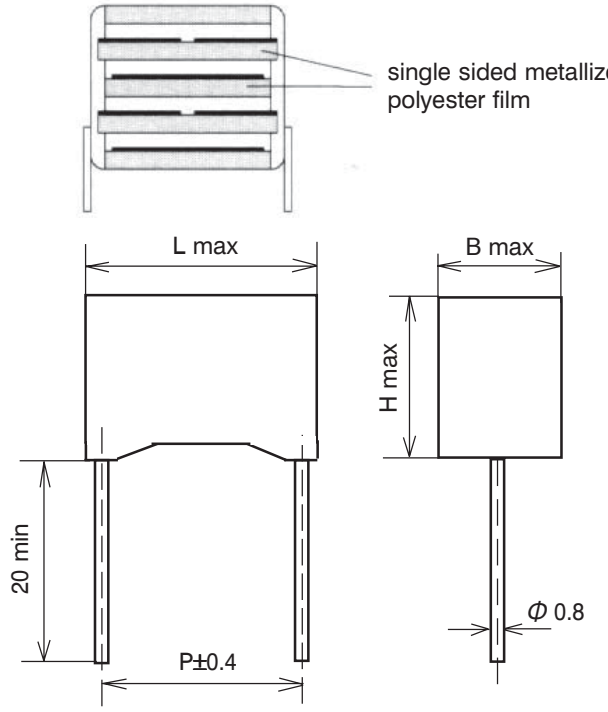
Test conditions
Solder bath temperature: + 260 °C ±5 °C
Dipping time (with heat screen): 10 s ±1 s
Performance
Capacitance change: ΔC/C:≤ ±3%

Marking:

Manufacturer's logo. series, capacitance, tolerance rated voltage, capacitor class, dielectric code, climatic category.

METALLIZED POLYESTER FILM CAPACITORS

SCHEMATIC CROSS SECTION



TYPICAL APPLICATIONS:

Interference suppression and „across-the-line“ applications. Suitable for use in situations where failure of the capacitor would not lead to danger of electric shock.

GENERAL TECHNICAL DATA

Dielectric: Polyester film (polyethylene terephthalate)
Plates: Metal layer deposited by evaporation under vacuum.
Climatic category: 40/100/56 IEC 68-1
Related documents: IEC 384-14; VDE 0565-1

ELECTRICAL CHARACTERISTICS

Capacitance range: C_R = 0.022 µF to 2.2 µF
Capacitance tolerance: ±10% (K); ±20% (M) at 1 kHz
Rated voltage: U_R = 250 VAC
Test voltage: between terminals 4.3U_R DC for 2s at 25 °C ± 5 °C
Dissipation factor: tgδ ≤ 100 x 10^{-4} at 25 °C ± 5 °C and 1kHz
Insulation resistance at 25°C±5°C and 100VDC - 1 min: ≥ 15 000 MΩ for C≤0.33 µF
≥ 5 000 s for C >0.33 µF
Max pulse rise time dv/dt (V/µs): 100 V/µs at 350VDC

Rated capacitance µF	Dimensions (mm)			
	max B	max H	max L	P±0.4
0.022	5.0	10.8	18.0	15.0
0.047	5.0	10.8	18.0	15.0
0.068	7.5	13.5	18.0	15.0
0.100	7.5	13.5	18.0	15.0
0.220	7.0	16.0	26.5	22.5
0.330	10.0	18.5	26.5	22.5
0.470	11.0	20.0	32.0	27.5
0.680	11.0	20.0	32.0	27.5
1.000	13.0	22.0	32.0	27.5
1.500	18.0	33.0	32.0	27.5
2.200	22.0	37.0	32.0	27.5

TEST METHOD AND PERFORMANCE

Damp heat, steady state:

Test conditions
Temperature: + 40 °C ±2 °C
Relative humidity (RH): 93% ± 2%
Test duration: 56 days
Performance
Dielectric strength: no dielectric breakdown or flashover at 66% of 4.3 x U_R (DC)/1 min
Capacitance change ΔC/C: ≤ ±5%
Insulation resistance: ≥ 50% of initial limit

Endurance:

Test conditions
Temperature: + 100 °C ±2 °C
Test duration: 1000 h
Voltage applied: 1.25 x U_R + 1000 VAC 0.1 s/h
Performance
Dielectric strength: no dielectric breakdown or flashover at 66% of 4.3 x U_R (DC)/1 min
Capacitance change ΔC/C: ≤ ±10%
Insulation resistance: ≥ 50% of initial limit

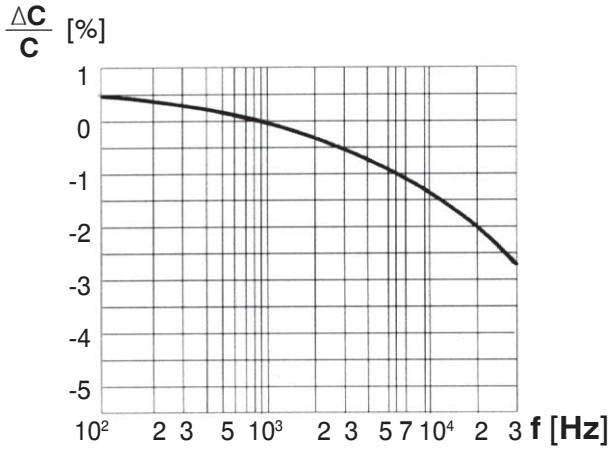
Resistance to soldering heat:

Test conditions
Solder bath temperature: + 260 °C ±5 °C
Dipping time (with heat screen): 10 s ±1 s
Performance
Capacitance change: ΔC/C:≤ ±3%

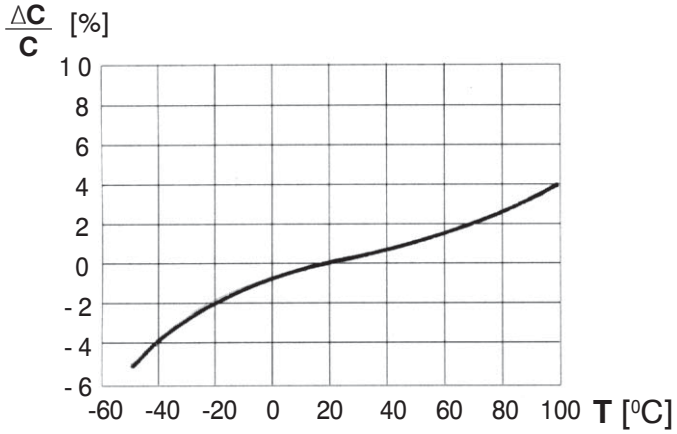
Marking:

Manufacturer’s logo. series, capacitance, tolerance, rated voltage, capacitor class, dielectric code, climatic category.

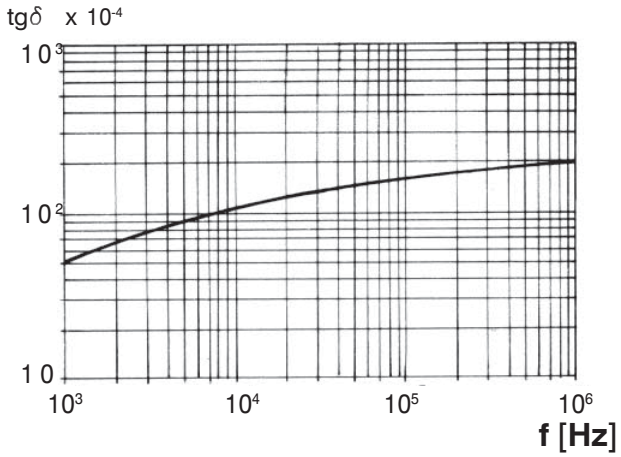
CHARACTERISTICS CURVES



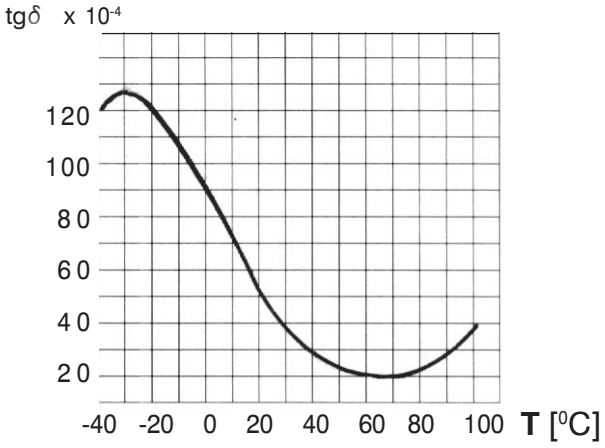
Capacitance vs. frequency



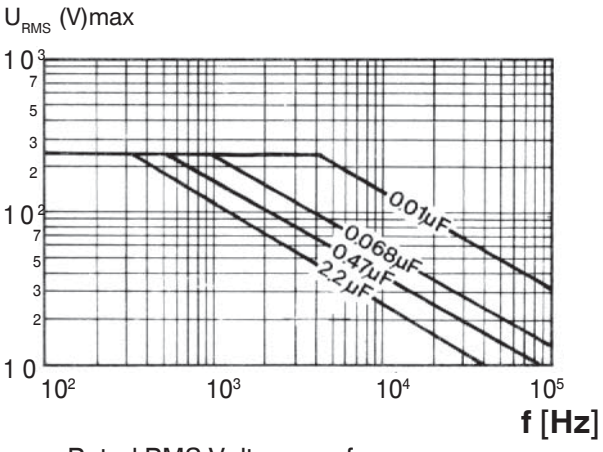
Capacitance vs. temperature at 1 kHz



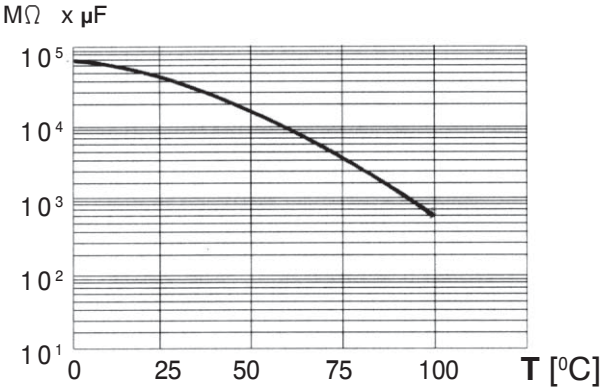
Dissipation factor vs. frequency



Dissipation factor vs. temperature



Rated RMS Voltage vs. frequency

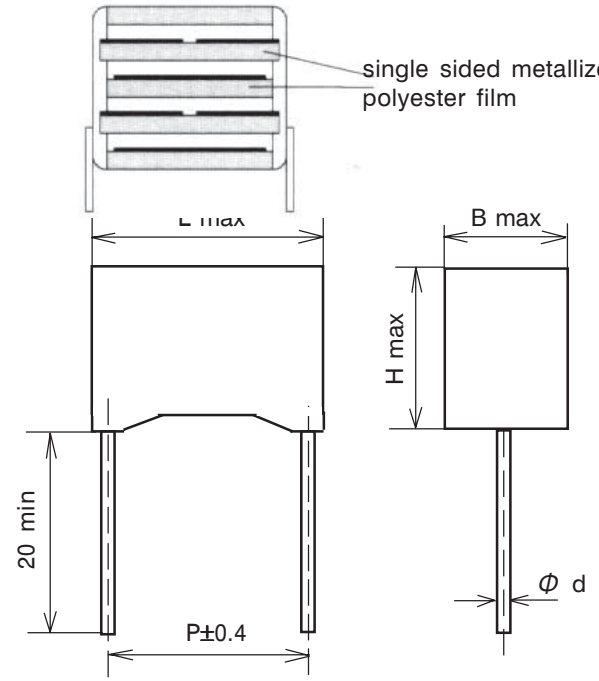


Time constant vs. temperature

METALLIZED POLYESTER FILM CAPACITORS

SELF-HEALING PROPERTIES

SCHEMATIC CROSS SECTION



ϕ d ± 0.05	p=10	p ≥ 15
	0.6	0.8

All dimensions are in mm

TYPICAL APPLICATIONS:
Interference suppression and „across-the-line“ and „line to ground“ applications. Suitable for use in situations where failure of the capacitor would not lead to danger of electric shock.

GENERAL TECHNICAL DATA
Dielectric: Polyester film (polyethylene terephtalate)
Plates: Metal layer deposited by evaporation under vacuum.
Winding: non-inductive tipe
Leads: Tinnet wire.
Protection: plastic case, epoxy resin filled. Box material is solvent resistant and flame retardant according to UL94 V0.
Marking: Manufacturer's logo, series, capacitence, tolerance, reated voltage, capacitor class, climatic categoty, passive flammability category, manufacturing date, approvals.
Climatic category: 40/110/56 IEC 60068-1
Operating temperature range: -40 to +110 ^{0}C
Related documents: IEC 384-14; EN 132400

ELECTRICAL CHARACTERISTICS

Capacitance range: C_R = 0.0022 **µF** to 0.1 **µF**
Capacitance tolerance: ±10% (K); ±20% (M) at 1 kHz
Rated voltage: U_R = 250 VAC; 50/60 Hz
Test voltage: between terminals 2500VAC for 1s + 5000VDC for 1s at 25 ^{0}C ± 5 ^{0}C
Dissipation factor: tgδ ≤ 100 x 10^{-4} at 25 ^{0}C ± 5 ^{0}C and 1kHz
Insulation resistance at 25^{0}C ±5^{0}C and 100VDC - 1 min: ≥ 3x10^4 MΩ

Rated capacitance µF	Dimensions (mm)				
	B	H	L	P	max dv\dt at 350VDC
0.0022	5.0	11.0	13.0	10.0	500
0.0033	5.0	11.0	13.0	10.0	500
0.0047	5.0	11.0	13.0	10.0	500
0.0068	6,0	12,0	13.0	10.0	500
0.010	5.0	11.0	18.0	15.0	500
0.015	6.0	12.0	18.0	15.0	500
0.022	7.5	13.5	18.0	15.0	500
0.033	8.5	14.5	18.0	15.0	500
0.047	6.0	15.0	26.5	22.5	500
0.068	7.0	16.0	26.5	22.5	500
0.100	10.0	18.5	26.5	22.5	500

TEST METHOD AND PERFORMANCE

Damp heat, steady state:
Test conditions
Temperature: + 40 ^{0}C ±2 ^{0}C
Relative humidity (RH): 93% ± 2%
Test duration: 56 days
Performance
Dielectric strength: no dielectric breakdown or flashover at 1500VAC/1min
Capacitance change: $\Delta C/C$: ≤ ±5%
Insulation resistance: ≥ 50% of initial limit

Endurance:
Test conditions
Temperature: + 110 ^{0}C ±2 ^{0}C
Test duration: 1000 h
Voltage applied: 1.7 x U_R + 1000 U_{AC} 0.1 s/h
Performance
Dielectric strength: no dielectric breakdown or flashover at 1500VAC/1min
Capacitance change: $\Delta C/C$: ≤ ±10%
Insulation resistance: ≥ 50% of initial limit

Resistance to soldering heat:
Test conditions
Solder bath temperature: + 260 ^{0}C ±5 ^{0}C
Dipping time (with heat screen): 10 s ±1 s
Performance
Capacitance change: $\Delta C/C$:≤ ±2%

CAPACITORS MODULE

TYPICAL APPLICATIONS: Capacitors moduls are intended for use in ventilation and extraction systems for regulation of three motor speeds with capacitor switching.

PRINCIPLE OF OPERATION: By conecting the motor to a change-over switch, one capacitor circuit ot other is activated , producing different combinations of capacitance and reactance that result in three output levels.

GENERAL TECHNICAL DATA

WINDINGS: Non inductive type
DIELECTRIC: Polypropylene film
PLATES: Aluminium and Zn layer deposited by evaporation under vacuum.
CASE: Plastic materials self-extinguishing grade V0 according to UL 94 standard.
RESIN: Non polluting filling compound made of vegetable oil (non PCB) improving the protection of the winding and the functioning of the capacitor.
CONNECTOR: Polyamid UL 94 - V0 or Polypropylene Ul 94 V0
DISCHARGE RESISTOR: 0,56 MΩ / 0,5 W - 2 pcs or 3 pcs
INTERNAL WIRES: stiff wires, copper - 0.75 mm^2

ELECTRICAL CHARACTERISTICS

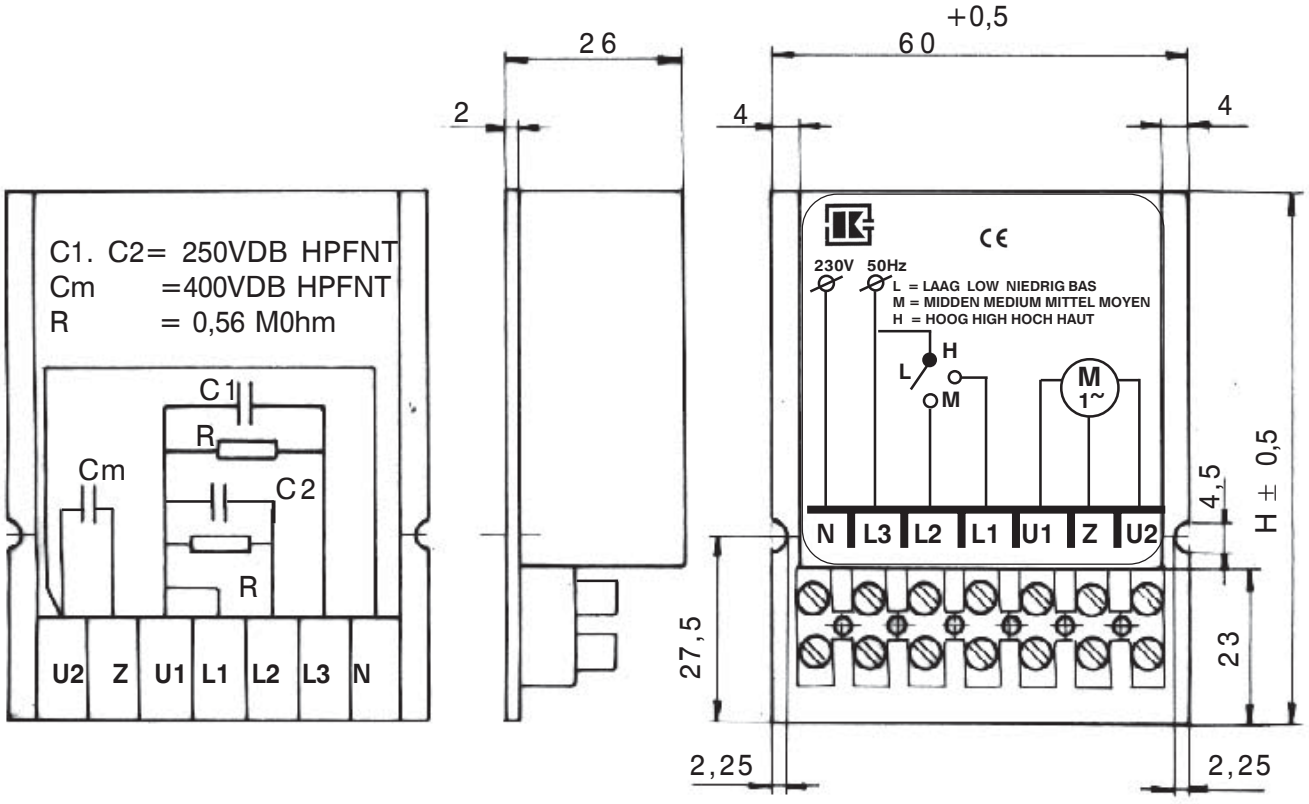
CAPACITANCE RANGE: C1=2µF - 4µF; C2=1µF - 5µF; C3=4µF; C_m = 1,5 µF - 2 µF
CAPACITANCE TOLERANCE: ±5%; ±10%
RATED VOLTAGE: for C1, C2 and C3: U_R = 250 VAC DB HPFNT
Cm: U_R = 400 VAC DB HPFNT
FREQUENCY: 50 Hz
TEST VOLTAGE: $2U_R$ for 2 s at 25 ^{0}C between terminals
CLIMATIC CATEGORY: -25/085/21 - HPF - DIN 40040
EXPECTED LIFE: 10000 h NT (Cl. B)
REFERENCE STANDARD: EN60252 - for motor run capacitors

Dimensions and capacitances values

Code	Capacitance (µF)				Dimension
	250VDB HPFNT			400VDB HPFNT	H±0.5
	C1	C2	C3	Cm	mm
61726730027	2	1		1,5	80
61726730045	2	1		2	80
61726730063	3	2		2	80
61726730081	2,5	2,5	4	2	111
61726730107	3,5	2,5		2	80
61726730125	4	1,5		2	80
61726730143	3	5		2	80
61726730161	4	4		2	80

Other capacitance s values on request

CONSTRUCTION AND DIMENSIONS



Internal connection diagram

External connection diagram