Metallized polyester film capacitors MKT 470

MKT RADIAL POTTED CAPACITORS PITCH 5 mm

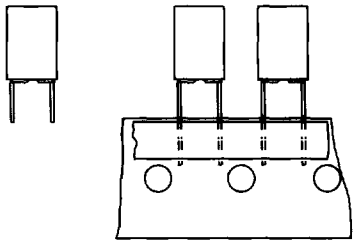


Fig.1 Simplified outlines.

FEATURES

- Low-inductive wound cell of metallized (PETP) film
- Potted with epoxy resin in a flame-retardant case
- Radial leads of solder-coated fecuma wire
- Withstands thermal shocks, oils, solvents and rinsing liquids
- Small stand-off pips to allow removal of solder flux
- Suitable for high density packaging.

APPLICATIONS

- Blocking and coupling of signals
- Bypass and energy reservoir
- Filter networks
- Pulse circuits
- Heavy duty and automotive
- Where high reliability is required.

QUICK REFERENCE DATA

DESCRIPTION	VALUE
Capacitance range (E12 series)	0.001 to 1.2 µF
Capacitance tolerance	±10%; ±5%
Rated voltage (DC)	63 V; 100 V; 250 V; 400 V
Climatic category	55/125/56
Maximum application temperature	125 °C
Rated temperature	85 °C
Tangent of loss angle at 100 kHz	150×10^{-4}
Reference specification	IEC 384-2
Performance grade	grade 1 (long life)

Metallized polyester film capacitors — MKT 470

MKT 470 GENERAL DATA — PITCH 5 mm

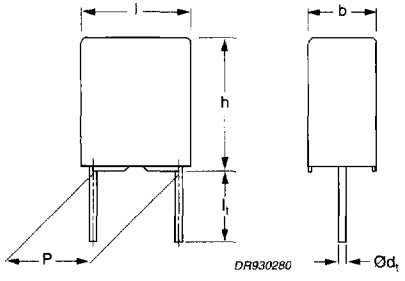


Fig.2 Outline.

Specific reference data for the 63 V DC capacitors

DESCRIPTION	VALUE		
	at 1 kHz	at 10 kHz	at 100 kHz
Tangent of loss angle:			
$C \leq 0.1\ \mu F$	$\leq 60 \times 10^{-4}$	$\leq 120 \times 10^{-4}$	$\leq 200 \times 10^{-4}$
$0.1\ \mu F < C \leq 0.47\ \mu F$	$\leq 60 \times 10^{-4}$	$\leq 120 \times 10^{-4}$	$\leq 240 \times 10^{-4}$
$0.47\ \mu F < C \leq 1.2\ \mu F$	$\leq 60 \times 10^{-4}$	$\leq 120 \times 10^{-4}$	–
Rated voltage pulse slope $(dU/dt)_R$ at U_{Rdc}	100 V/µs		
R between leads, for $C \leq 0.33\ \mu F$	>15000 MΩ		
RC between leads, for $C > 0.33\ \mu F$	>5000 s		

Available 63 V DC versions

PACKAGING	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Ammopack	H = 18.5 mm; note 1	±10%	2222 470 75...	preferred
		±5%	2222 470 76...	preferred
Loose in box	l_t = 4.0 +1.0/–0.5 mm	±10%	2222 470 11...	on request
		±5%	2222 470 12...	on request
	l_t = 26.0 ±1.0 mm	±10%	2222 470 15...	on request
		±5%	2222 470 16...	on request
Taped on reel	H = 18.5 mm; note 1	±10%	2222 470 18...	on request
		±5%	2222 470 19...	on request

Note

1. H = in-tape height; for detailed specifications refer to this handbook, Chapter *"Packaging"*.

Metallized polyester film capacitors MKT 470

U_{Rdc} = 63 V; U_{Rac} = 40 V **loose and taped**

C (µF)	DIMENSIONS b × h × l (mm)	MASS (g)	CATALOGUE NUMBER 2222 470 ..... AND PACKAGING					
			AMMOPACK			REEL	LOOSE IN BOX	
			H = 18.5 mm				l_t = 4.0 mm	l_t = 26.0 mm
			last 5 digits of catalogue number(1)		SPQ	SPQ	SPQ	SPQ
			C-tol = ±10%	C-tol = ±5%				
Pitch = 5.0 ±0.3 mm; d_t = 0.50 ±0.05 mm								
0.068	2.5 × 6.5 × 7.2	0.25	75683	76683	2000	2000	2000	1000
0.082			75823	76823				
0.1			75104	76104				
0.12	3.5 × 8.0 × 7.2	0.35	75124	76124	1500	1500	2000	1000
0.15			75154	76154				
0.18			75184	76184				
0.22			75224	76224				
0.27			75274	76274				
0.33			75334	76334				
0.39			75394	76394				
0.47	4.5 × 9.5 × 7.2	0.45	75474	76474	1000	1000	2000	1000
0.56			75564	76564				
0.68			75684	76684				
0.82	6.0 × 11.0 × 7.2	0.60	75824	76824	750	1000	2000	1000
1			75105	76105				
1.2			75125	76125				

Note

1. The shading indicates preferred types.

Metallized polyester film capacitors | MKT 470

MKT 470 GENERAL DATA **PITCH 5 mm**

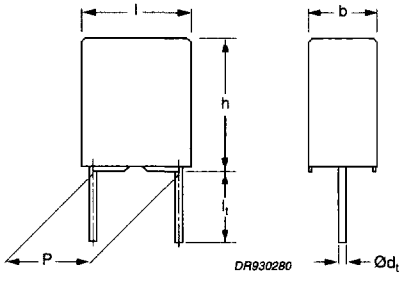


Fig.3 Outline.

Specific reference data for the 100 V DC capacitors

DESCRIPTION	VALUE		
	at 1 kHz	at 10 kHz	at 100 kHz
Tangent of loss angle:			
$C \leq 0.1\ \mu F$	$\leq 60 \times 10^{-4}$	$\leq 120 \times 10^{-4}$	$\leq 200 \times 10^{-4}$
$0.1\ \mu F < C \leq 0.47\ \mu F$	$\leq 60 \times 10^{-4}$	$\leq 120 \times 10^{-4}$	$\leq 240 \times 10^{-4}$
$0.47\ \mu F < C \leq 0.56\ \mu F$	$\leq 60 \times 10^{-4}$	$\leq 120 \times 10^{-4}$	–
Rated voltage pulse slope $(dU/dt)_R$ at U_{Rdc}	160 V/µs		
R between leads, for $C \leq 0.33\ \mu F$	>15000 MΩ		
RC between leads, for $C > 0.33\ \mu F$	>5000 s		

Available 100 V DC versions

PACKAGING	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Ammopack	H = 18.5 mm; note 1	±10%	2222 470 85...	preferred
		±5%	2222 470 86...	preferred
Loose in box	l_t = 4.0 +1.0/–0.5 mm	±10%	2222 470 21...	on request
		±5%	2222 470 22...	on request
	l_t = 26.0 ±1.0 mm	±10%	2222 470 25...	on request
		±5%	2222 470 26...	on request
Taped on reel	H = 18.5 mm; note 1	±10%	2222 470 28...	on request
		±5%	2222 470 29...	on request

Note

1. H = in-tape height; for detailed specifications refer to this handbook, Chapter *"Packaging"*.

U_{Rdc} = 100 V; U_{Rac} = 63 V **loose and taped**

C (µF)	DIMENSIONS b × h × l (mm)	MASS (g)	CATALOGUE NUMBER 2222 470 ..... AND PACKAGING					
			AMMOPACK			REEL	LOOSE IN BOX	
			H = 18.5 mm				l_t = 4.0 mm	l_t = 26.0 mm
			last 5 digits of catalogue number(1)		SPQ	SPQ	SPQ	SPQ
			C-tol = ±10%	C-tol = ±5%				
Pitch = 5.0 ±0.3 mm; d_t = 0.50 ±0.05 mm								
0.022	2.5 × 6.5 × 7.2	0.25	85223	86223	2000	2000	2000	1000
0.027			85273	86273				
0.033			85333	86333				
0.039			85393	86393				
0.047			85473	86473				
0.056			85563	86563				
0.068	3.5 × 8.0 × 7.2	0.35	85683	86683	1500	1500	2000	1000
0.082			85823	86823				
0.1			85104	86104				
0.12			85124	86124				
0.15	4.5 × 9.5 × 7.2	0.45	85154	86154	1000	1000	2000	1000
0.18			85184	86184				
0.22			85224	86224				
0.27	6.0 × 11.0 × 7.2	0.65	85274	86274	750	1000	2000	1000
0.33			85334	86334				
0.39			85394	86394				
0.47			85474	86474				
0.56			85564	86564				

Note

1. The shading indicates preferred types.

MKT 470 GENERAL DATA **PITCH 5 mm**

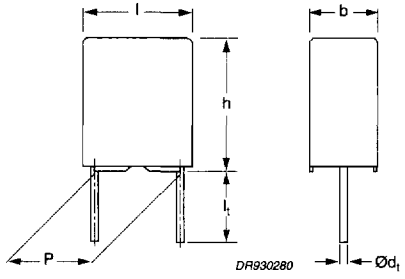


Fig.4 Outline.

Specific reference data for the 250 V DC capacitors

DESCRIPTION	VALUE		
	at 1 kHz	at 10 kHz	at 100 kHz
Tangent of loss angle:			
$C \leq 0.1\ \mu F$	$\leq 60 \times 10^{-4}$	$\leq 120 \times 10^{-4}$	$\leq 200 \times 10^{-4}$
$0.1\ \mu F < C \leq 0.12\ \mu F$	$\leq 60 \times 10^{-4}$	$\leq 120 \times 10^{-4}$	$\leq 240 \times 10^{-4}$
Rated voltage pulse slope $(dU/dt)_R$ at U_{Rdc}	400 V/µs		
R between leads	>15000 MΩ		

Available 250 V DC versions

PACKAGING	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Ammopack	H = 18.5 mm; note 1	±10%	2222 470 35...	preferred
		±5%	2222 470 36...	preferred
Loose in box	l_t = 4.0 +1.0/–0.5 mm	±10%	2222 470 41...	on request
		±5%	2222 470 42...	on request
	l_t = 26.0 ±1.0 mm	±10%	2222 470 45...	on request
		±5%	2222 470 46...	on request
Taped on reel	H = 18.5 mm; note 1	±10%	2222 470 48...	on request
		±5%	2222 470 49...	on request

Note

1. H = in-tape height; for detailed specifications refer to this handbook, Chapter *"Packaging"*.

Metallized polyester film capacitors MKT 470

U_{Rdc} = 250 V; U_{Rac} = 160 V **loose and taped**

C (µF)	DIMENSIONS b × h × l (mm)	MASS (g)	CATALOGUE NUMBER 2222 470 ..... AND PACKAGING					
			AMMOPACK			REEL	LOOSE IN BOX	
			H = 18.5 mm				l_t = 4.0 mm	l_t = 26.0 mm
			last 5 digits of catalogue number(1)		SPQ	SPQ	SPQ	SPQ
			C-tol = ±10%	C-tol = ±5%				
Pitch = 5.0 ±0.3 mm; d_t = 0.50 ±0.05 mm								
0.01	2.5 × 6.5 × 7.2	0.25	35103	36103	2000	2000	2000	1000
0.012			35123	36123				
0.015			35153	36153				
0.018			35183	36183				
0.022	3.5 × 8.0 × 7.2	0.35	35223	36223	1500	1500	2000	1000
0.027			35273	36273				
0.033			35333	36333				
0.039			35393	36393				
0.047	4.5 × 9.5 × 7.2	0.45	35473	36473	1000	1000	2000	1000
0.056			35563	36563				
0.068			35683	36683				
0.082	6.0 × 11.0 × 7.2	0.60	35823	36823	750	1000	2000	1000
0.1			35104	36104				
0.12			35124	36124				

Note

1. The shading indicates preferred types.

MKT 470 GENERAL DATA **PITCH 5 mm**

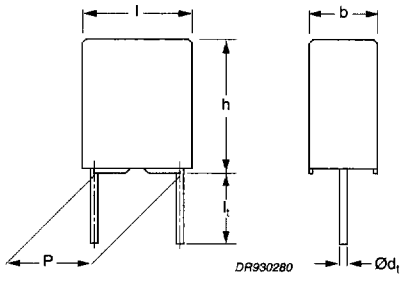


Fig.5 Outline.

Specific reference data for the 400 V DC capacitors

DESCRIPTION	VALUE		
	at 1 kHz	at 10 kHz	at 100 kHz
Tangent of loss angle: $C \leq 0.047\ \mu F$	$\leq 60 \times 10^{-4}$	$\leq 120 \times 10^{-4}$	$\leq 200 \times 10^{-4}$
Rated voltage pulse slope $(dU/dt)_R$ at U_{Rdc}	800 V/μs		
R between leads	>15000 MΩ		

Available 400 V DC versions

PACKAGING	DIMENSIONS	C-tol	FIRST 9 DIGITS OF CATALOGUE NUMBER	ORDERING
Ammopack	H = 18.5 mm; note 1	±10%	2222 470 65...	preferred
		±5%	2222 470 66...	preferred
Loose in box	l_t = 4.0 +1.0/−0.5 mm	±10%	2222 470 51...	on request
		±5%	2222 470 52...	on request
	l_t = 26.0 ±1.0 mm	±10%	2222 470 55...	on request
		±5%	2222 470 56...	on request
Taped on reel	H = 18.5 mm; note 1	±10%	2222 470 58...	on request
		±5%	2222 470 59...	on request

Note

1. H = in-tape height; for detailed specifications refer to this handbook, Chapter *"Packaging"*.

Metallized polyester film capacitors MKT 470

U_{Rdc} = 400 V; U_{Rac} = 220 V **loose and taped**

C (µF)	DIMENSIONS b × h × l (mm)	MASS (g)	CATALOGUE NUMBER 2222 470 ..... AND PACKAGING					
			AMMOPACK			REEL	LOOSE IN BOX	
			H = 18.5 mm				l_t = 4.0 mm	l_t = 26.0 mm
			last 5 digits of catalogue number(1)		SPQ	SPQ	SPQ	SPQ
			C-tol = ±10%	C-tol = ±5%				
Pitch = 5.0 ±0.3 mm; d_t = 0.50 ±0.05 mm								
0.001	2.5 × 6.5 × 7.2	0.25	65102	66102	2000	2000	2000	1000
0.0012			65122	66122				
0.0015			65152	66152				
0.0018			65182	66182				
0.0022			65222	66222				
0.0027			65272	66272				
0.0033			65332	66332				
0.0039			65392	66392				
0.0047			65472	66472				
0.0056			65562	66562				
0.0068			65682	66682				
0.0082			65822	66822				
0.01	3.5 × 8.0 × 7.2	0.35	65103	66103	1500	1500	2000	1000
0.012			65123	66123				
0.015			65153	66153				
0.018	4.5 × 9.5 × 7.2	0.45	65183	66183	1000	1000	2000	1000
0.022			65223	66223				
0.027			65273	66273				
0.033	6.0 × 11.0 × 7.2	0.60	65333	66333	750	1000	2000	1000
0.039			65393	66393				
0.047			65473	66473				

Note

1. The shading indicates preferred types.

Metallized polyester film capacitors MKT 470

CONSTRUCTION

Description

- Low-inductive wound cell of metallized polyethylene terephthalate (PETP) film, potted with epoxy resin in a flame-retardant case
- Radial leads, copper clad iron wire
- Small stand-off pips allow removal of solder flux etc. during cleaning of the printed-circuit board.

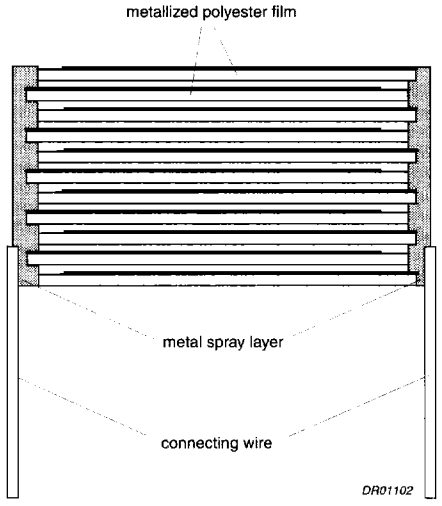


Fig.6 Construction.

Mounting

NORMAL USE

The capacitors are designed for mounting on printed-circuit boards. The capacitors packed in bandoliers are designed for mounting on printed-circuit boards by automatic insertion machines.
For detailed tape specifications refer to this handbook, Chapter *"Packaging"*.

SPECIFIC METHOD OF MOUNTING TO WITHSTAND VIBRATION AND SHOCK TEST

In order to withstand vibration and shock tests, it must be ensured that the stand-off pips are in good contact with the printed-circuit board.

SPACE REQUIREMENTS ON PRINTED-CIRCUIT BOARD

The maximum length and width of film capacitors is shown in Fig.7:

- Eccentricity see Fig.7. The maximum eccentricity is smaller than or equal to the wire diameter of the product concerned.
- Product height with seating plane as given by *"IEC 717"* as reference: $h_{max} \leq h + 0.3$ mm.

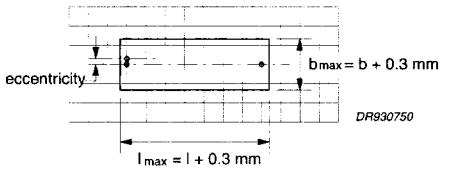


Fig.7 Lay-out.

RATINGS AND CHARACTERISTICS

Unless otherwise specified, all electrical values apply to an ambient free air temperature of 23 ±1°C, an atmospheric pressure of 86 to 106 kPa and a relative humidity of 50 ±2%.

For reference testing, a conditioning period shall be applied over 96 ±4 hours by heating the products in a circulating air oven at the rated temperature and a relative humidity not exceeding 20%.

Capacitance

All capacitance values are specified at 1 kHz.

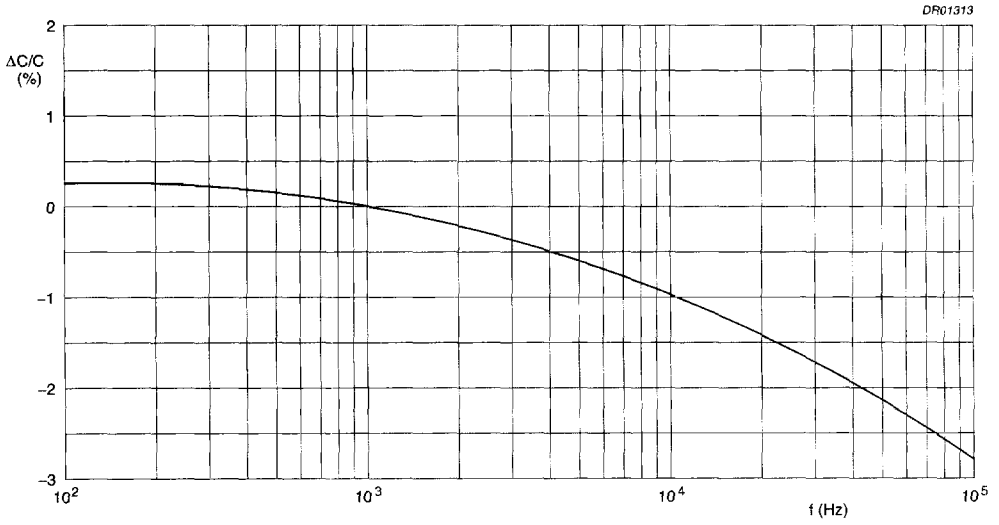


Fig.8 Capacitance change as a function of frequency; typical curve.

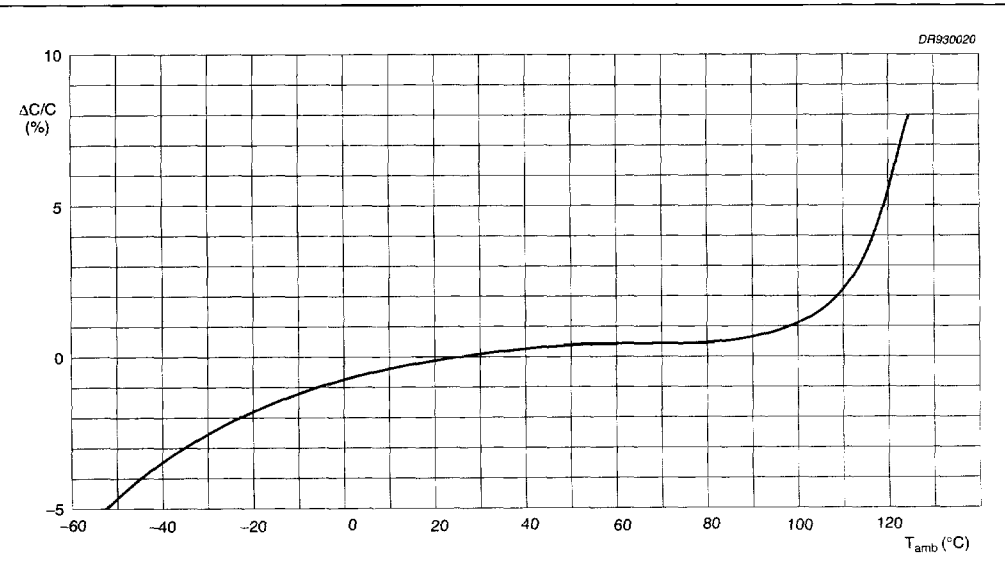


Fig.9 Capacitance change as a function of temperature; typical curve.

Impedance

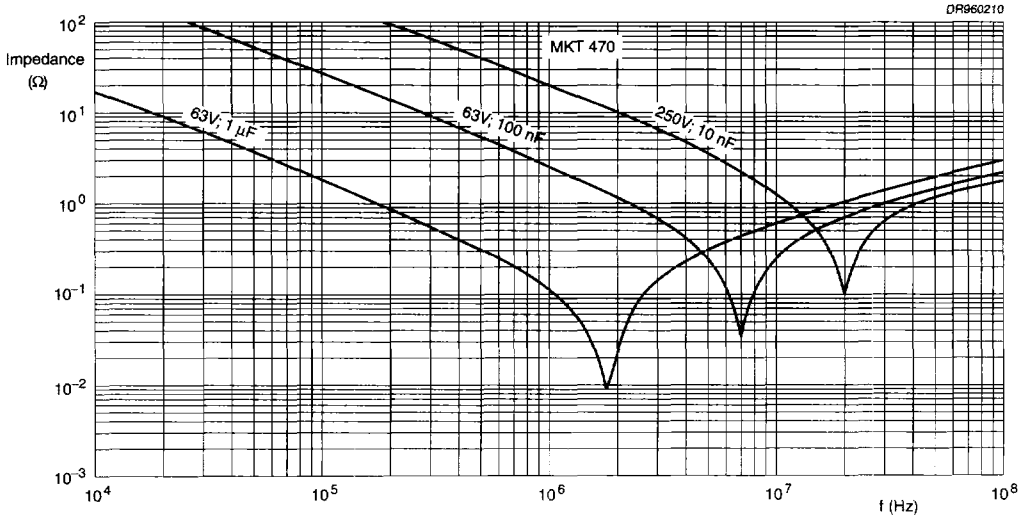


Fig.10 Impedance as a function of frequency; typical curves.

Temperature

- Storage temperature: T_{stg} = −25 to +40 °C with RH maximum 80% without condensation.

Voltage

- Up to 85 °C: operating voltage = rated voltage
- Above 85 °C, DC and AC voltage derating is 1.25%/°C
- Category voltage: $U_c = 0.5 \times U_{Rdc}$
- Test voltage between leads: $1.6 \times U_{Rdc}$
- Test voltage between interconnected leads and case (foil method): $2 \times U_{Rdc}$ (min. 200 V).

Maximum RMS voltage (sinewave) as a function of frequency for $T_{amb} \leq 85$ °C

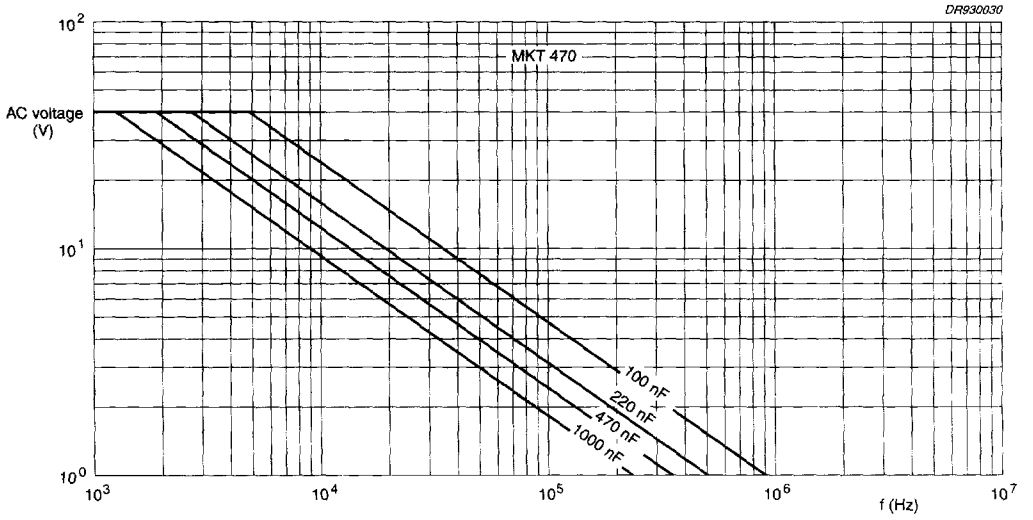


Fig.11 AC voltage (RMS value) as a function of frequency at $T_{amb} \leq 85$ °C for $U_{Rdc} = 63$ V.

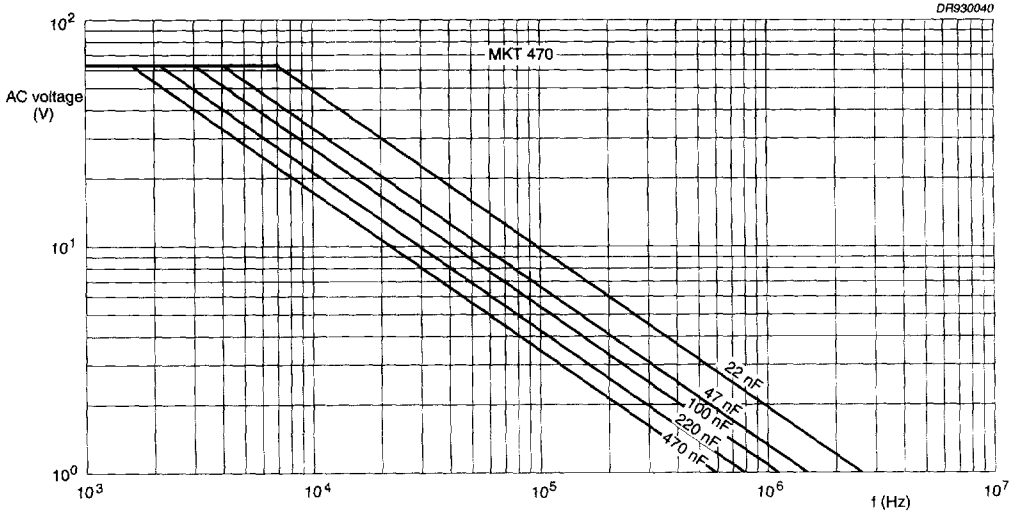


Fig.12 AC voltage (RMS value) as a function of frequency at $T_{amb} \leq 85$ °C for $U_{Rdc} = 100$ V.

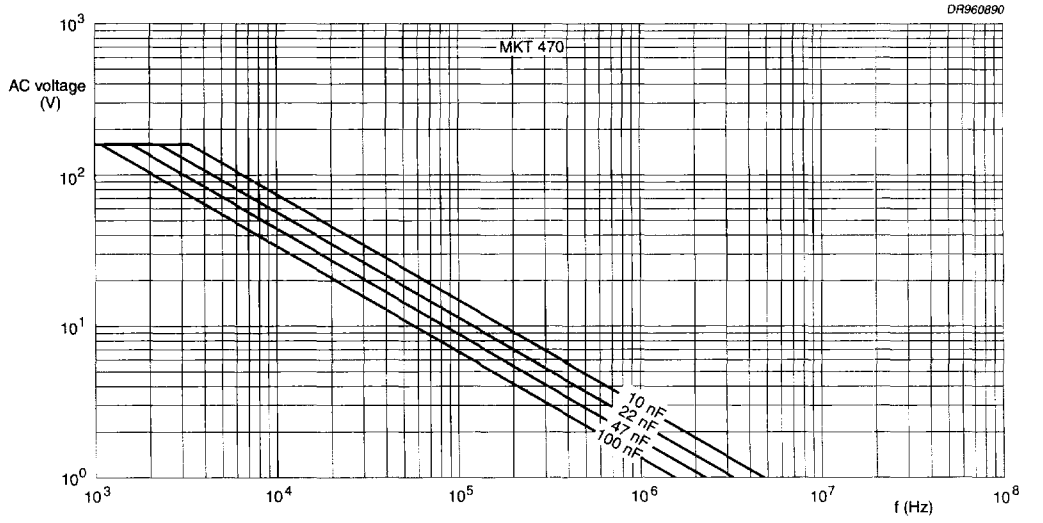


Fig.13 AC voltage (RMS value) as a function of frequency at $T_{amb} \leq 85$ °C for $U_{Rdc} = 250$ V.

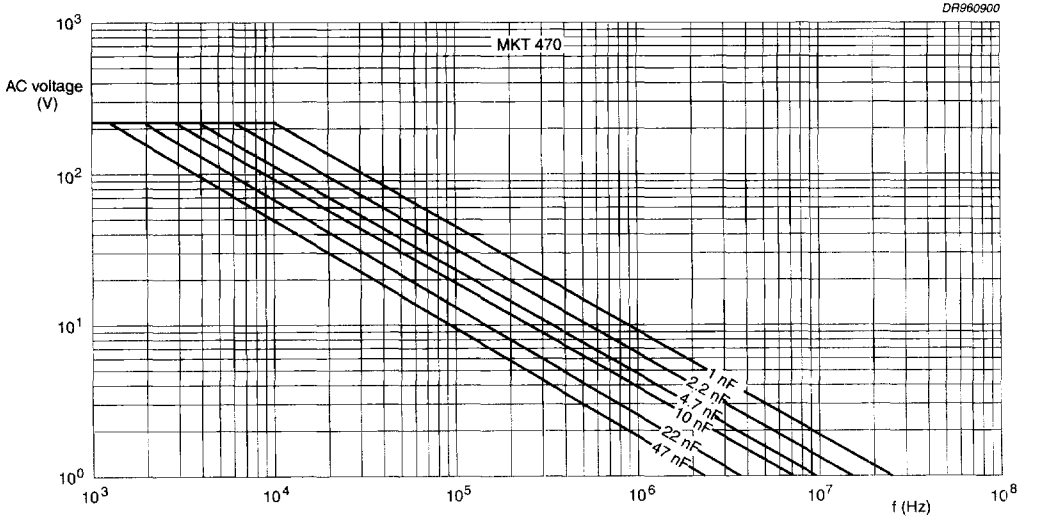


Fig.14 AC voltage (RMS value) as a function of frequency at $T_{amb} \leq 85$ °C for $U_{Rdc} = 400$ V.

Maximum RMS voltage (sinewave) as a function of frequency for T_{amb} > 85 °C

The maximum RMS voltage in Figs 11 to 14 has to be multiplied by a factor given in Fig.15.

The power dissipation has to be checked, and must not exceed the maximum allowed power shown in Fig.18.

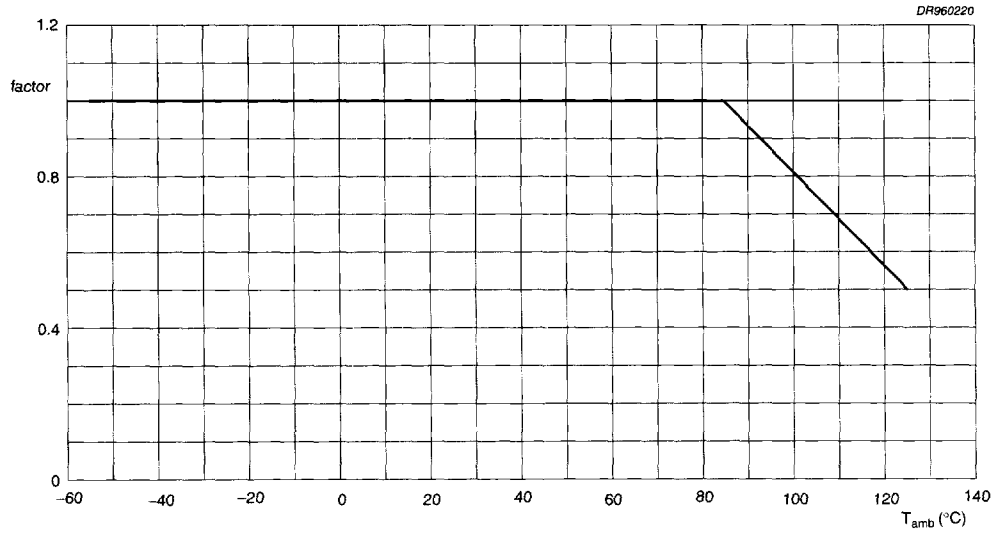


Fig.15 Multiplying factor as a function of temperature.

Tangent of loss angle

CAPACITANCE	TANGENT OF LOSS ANGLE		
	at 1 kHz	at 10 kHz	at 100 kHz
$C \leq 0.1\ \mu F$	$\leq 60 \times 10^{-4}$	$\leq 120 \times 10^{-4}$	$\leq 200 \times 10^{-4}$
$0.1\ \mu F < C \leq 0.47\ \mu F$	$\leq 60 \times 10^{-4}$	$\leq 120 \times 10^{-4}$	$\leq 240 \times 10^{-4}$
$0.47\ \mu F < C \leq 1.2\ \mu F$	$\leq 60 \times 10^{-4}$	$\leq 120 \times 10^{-4}$	–

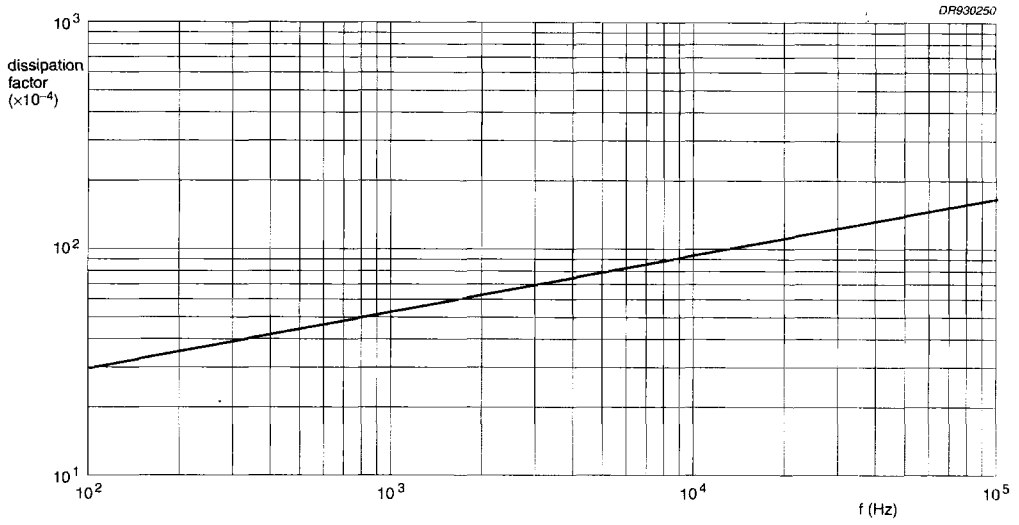


Fig.16 Tangent of loss angle as a function of frequency; typical curve.

Rated voltage pulse slope $(dU/dt)_R$

RATED VOLTAGE U_R (V)	MAXIMUM RATED PULSE LOAD (V/µs)[1][2]
63	100
100	160
250	400
400	800

Notes

1. The maximum pulse load values are valid for voltages equal to the rated voltage. For peak-to-peak voltages lower than U_{Rdc}, the given values may be multiplied by U_{Rdc} and divided by the applied voltage.
2. If the pulse requirement is satisfied, a check must be made to ensure that the maximum dissipation is not exceeded.

Insulation resistance

The insulation resistance is measured after a voltage has been applied for 1 minute ±5 seconds, the voltage being 10 ±1 V for the 63 V version, and 100 ±15 V for the 100, 250 and 400 V versions:

- Resistance between leads, for C ≤ 0.33 μF: >15000 MΩ
- RC time between leads, for C > 0.33 μF: >5000 s
- Resistance between interconnected leads and case (foil method): >30000 MΩ.

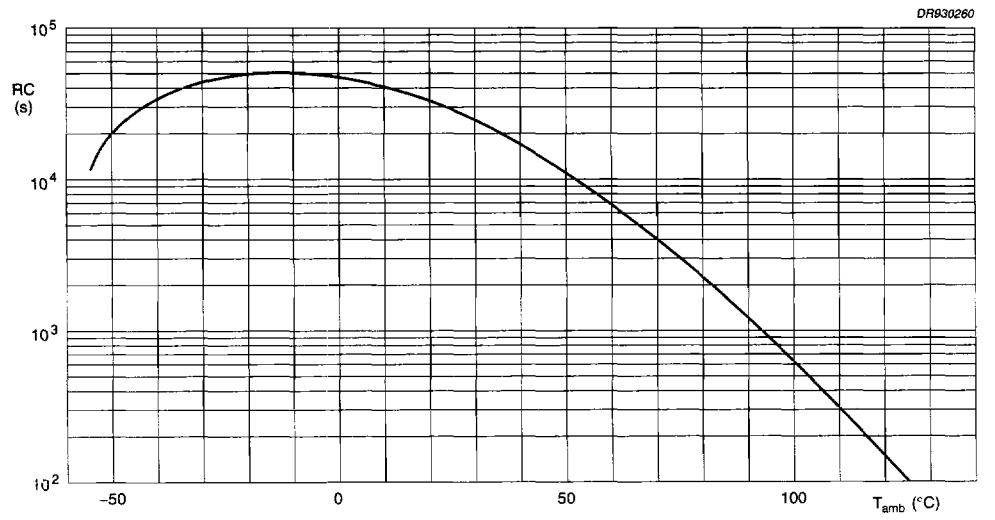


Fig.17 RC product as a function of temperature; typical curve.

Maximum dissipation

Power dissipation curves as a function of pitch and capacitor thickness (see Fig.18)

b_{max} (mm)	5 mm pitch
2.5	1
3.5	2
4.5	3
6.0	4

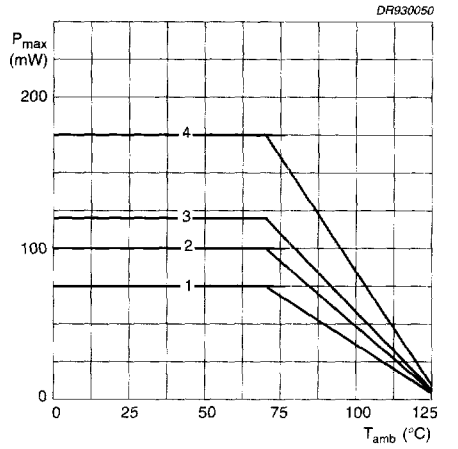


Fig.18 Maximum permissible power dissipation as a function of ambient temperature, at various capacitor dimensions.

Application note

To select the capacitor for a certain application, the following conditions must be checked:

1. The peak voltage (U_p) shall not be greater than the rated DC voltage (U_{Rdc}).
2. The peak-to-peak voltage (U_{p-p}) shall not be greater than $2 \times \sqrt{2}$ times the rated AC voltage (U_{Rac}) to avoid the ionisation inception level.
3. The peak current (I_p) shall not exceed the maximum peak current, defined as maximum voltage pulse slope (dU/dt) multiplied by the capacitance:

$$I_p max = C\left(\frac{dU}{dt}\right)max$$

   Or the voltage pulse slope shall not exceed the rated voltage pulse slope. If the pulse voltage is lower than the rated voltage, the values (see Section "Rated voltage pulse slope (dU/dt)R" for more details) may be multiplied by U_{Rdc} and divided by the applied voltage.
4. The dissipated power shall not be greater than the maximum permissible power dissipation stated in Fig.18.
5. The free air ambient temperature for the capacitor does not exceed the category temperature.
6. Since all metallized polyethylene terephthalate film capacitors have an intrinsically active flammability risk after a capacitor breakdown (short circuit), it is recommended that for MKT styles the power to the component is limited to 10 times the maximum allowed power dissipation (P_{max}) during the short circuit failure mode of the capacitor.

MARKING

Product marking

CAPACITORS WITH PITCH 5 mm:

The capacitors are marked by inkjet print on the side with the following information:

1. Capacitance code in accordance with "*IEC 62*": n = nF; μ = μF
2. Tolerance on rated capacitance: K = ±10%; J = ±5%
3. Rated voltage (DC) (e.g. 63 V)
4. Manufacturer (PHILIPS).

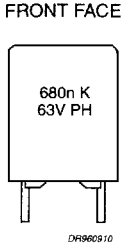
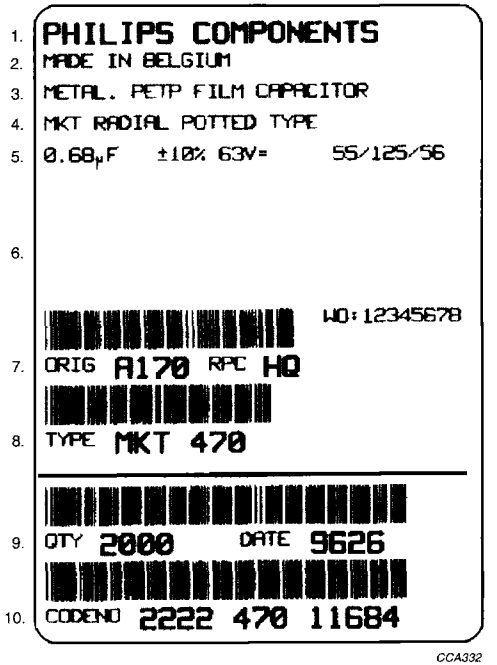


Fig.19 Example of marking.

Package marking

The package containing the capacitors is marked as shown in Fig.20.



Barcode label marking

LINE	MARKING EXPLANATION
1	Manufacturer's name
2	Country of origin
3	Sub-family
4	Type description
5	Capacitance value, tolerance and climatic category *("IEC 68-1")*
6	–
7	Preference origin code: A Country of origin in code: 170 (Belgium) Responsible production centre: HQ Work order: WO
8	Product type description
9	Quantity and production period, year and week code
10	Product code (12NC)

Fig.20 Barcode label.

QUICK REFERENCE TEST REQUIREMENTS (see note 1)

TEST	PROCEDURE (quick reference)	REQUIREMENTS
Robustness of leads		
Tensile and bending: *"IEC 68-2-21"*		no visible damage legible marking
Resistance to soldering heat: *"IEC 68-2-20"*	solder bath: 260 °C; 10 s	$\lvert\Delta C/C\rvert \leq 2\%$
Component solvent resistance	isopropyl alcohol; 23 °C; 5 minutes	$\Delta\tan\delta \leq 30 \times 10^{-4}$ ($C \leq 470$ nF) $\Delta\tan\delta \leq 20 \times 10^{-4}$ ($C > 470$ nF)
Robustness of component		
Vibration: *"IEC 68-2-6"*	10 to 55 Hz; amplitude 0.75 mm or acceleration 98 m/s^2; 6 hours	$\lvert\Delta C/C\rvert \leq 3\%$
Shock: *"IEC 68-2-27"*	half sinewave; 490 m/s^2; 11 ms	$\Delta\tan\delta \leq 30 \times 10^{-4}$ ($C \leq 470$ nF) $\Delta\tan\delta \leq 20 \times 10^{-4}$ ($C > 470$ nF)
Climatic sequence		
Dry heat: *"IEC 68-2-2"*	16 hours; 125 °C	$\lvert\Delta C/C\rvert \leq 3\%$
Damp heat, cyclic, test Db, first cycle: *"IEC 68-2-30"*		$\Delta\tan\delta \leq 50 \times 10^{-4}$ ($C \leq 470$ nF) $\Delta\tan\delta \leq 30 \times 10^{-4}$ ($C > 470$ nF)
Cold: *"IEC 68-2-1"*	2 hours; –55 °C	$R_{ins} \geq 50\%$ of specified value
Damp heat, cyclic, test Db, remaining cycles: *"IEC 68-2-30"*		
Other applicable tests		
Damp heat steady state: *"IEC 68-2-3"*	56 days; 40 °C; 90 to 95% RH	$\lvert\Delta C/C\rvert \leq 5\%$ $\Delta\tan\delta \leq 50 \times 10^{-4}$ ($C \leq 470$ nF) $\Delta\tan\delta \leq 30 \times 10^{-4}$ ($C > 470$ nF) $R_{ins} \geq 50\%$ of specified value
Endurance (DC): *"IEC 384-2"*	2000 hours; $1.25 \times U_{Rdc}$; 85 °C $1.25 \times U_{Cdc}$; 125 °C	$\lvert\Delta C/C\rvert \leq 5\%$ $\Delta\tan\delta \leq 50 \times 10^{-4}$ ($C \leq 470$ nF) $\Delta\tan\delta \leq 30 \times 10^{-4}$ ($C > 470$ nF) $R_{ins} \geq 50\%$ of specified value
Heat storage: *"IEC 384-2"*	2000 hours; 125 °C	$\lvert\Delta C/C\rvert \leq 3\%$ $\Delta\tan\delta \leq 30 \times 10^{-4}$ ($C \leq 470$ nF) $\Delta\tan\delta \leq 20 \times 10^{-4}$ ($C > 470$ nF)

TEST	PROCEDURE (quick reference)	REQUIREMENTS
Resistance to detergents: *"IEC 384-2"*		$\lvert\Delta C/C\rvert \leq 1\%$ $\Delta\tan\delta \leq 30 \times 10^{-4}$ ($C \leq 470$ nF) $\Delta\tan\delta \leq 20 \times 10^{-4}$ ($C > 470$ nF) $R_{ins} \geq 50\%$ of specified value
Resistance to soldering heat with preheating: *"IEC 384-2"*	body temperature: 125 °C bath temperature: 260 °C dwell time: 5 s	$\lvert\Delta C/C\rvert \leq 1\%$ $\Delta\tan\delta \leq 30 \times 10^{-4}$ ($C \leq 470$ nF) $\Delta\tan\delta \leq 20 \times 10^{-4}$ ($C > 470$ nF)
Passive flammability: *"IEC 695-2-2"*	class C	no burning

Note

1. For detailed information, see *"Type specification"*.