MKP-X2

TECHNICAL TERMS EXPLANATION

Rated capacitance

Capacitance referred to 1 kHz, 20 +-1ºC, 65+-2% of relative humidity and 96+- 10 kPa. In case of doubt please refer to IEC 60068-1, sub-clause 5.2.

Capacitance tolerance

Admitted capacitance deviation from the rated capacitance.

Rated Temperature (T_R)

The maximum ambient temperature surrounding the capacitor or hottest contact point (i.e.tracks), whichever is higher, at which the rated voltage may be continuously applied.

Rated voltage (V_R)

The maximum direct voltage or the maximum r.m.s. alternating voltage or the peak value of a pulse voltage which may be continuously applied to a capacitor at any temperature between the lower category temperature and the rated temperature.

Category voltage (V_c)

The maximum direct voltage or the maximum r.m.s. alternating voltage or the peak value of a pulse voltage which may be continuously applied to a capacitor at its upper category temperature.

Temperature derated voltage

The maximum voltage that may be continuously applied to a capacitor for any temperature between the rated temperature and the upper category temperature.

Climatic category

The climatic category which the capacitor belongs to is expressed in numbers (standard IEC 60068-1: example 55/100/21). The first number represents the lower category temperature (example: -55ºC); the second number the upper category temperature (example: +100ºC) and the third number represents the number of days relevant to the damp heat test (example: 21 days).

Temperature coefficent of capacitance (α_i)

The change rate of capacitance with temperature measured over a specified range of temperature. It is normally expressed in parts per million per Celsius degree (10^{-6}/ºC) and referred to 20ºC.

$$\alpha_i = \frac{Ci - Co}{\quad}$$

MKP-X2

$$Co\ (Ti - To)$$

Where: Ci = Capacitance at temperature Ti
Co = Capacitance at temperature 20+-2ºC
For more details please refer to EN-130000.

Variation of capacitance with humidity
The capacitance of a plastic film capacitor changes with the ambient humidity. The capacitance change depends upon the dielectric type.

Dissipation factor (tg_δ)
The dissipation factor is the ratio between the resistive and the reactive part of the impedance of the capacitor submitted to a sinusoidal voltage of specified frequency.

Insulation resistance (I_r) / time constant
The insulation resistance is the ratio between an applied D.C. voltage and the resulting leakage current after a minute of charge. It is expressed in MΩ. The time constant is expressed in seconds with the following formula:

$$t\ [s] = Ir\ [M\Omega]\ X\ C\ [\mu F].$$

It states the time necessary to reduce the voltage to the teminals of the capacitor at 37% of a fully charged capacitor value.

Pulse rise time (dv/dt)
The pulse rise time defines the capability of a capacitor to withstand high current peaks due to fast voltage changes. The peak current is defined by the following formula:

$$I_P(\text{peak current}) = C \times dv/dt$$

Where: I_P in A; C in µF; dv/dt in V/µs

MKP-X2

GENERAL TECHNICAL DATA

Applications: Interference suppression.
Dielectric: Polypropylene film, self-regenerating.

Plates: Aluminium layer deposited by evaporation under vacuum.
Winding: Non-inductive type.
Leads: Tinned wire.
Marking: Manufactured's logo, capacitance, tolerance and voltage, climatic category, approvals.
Protection: Plastic case, epoxy resin filled. Box material is solvent resistant and flame retardant according to UL94V0.
Climatic category: (IEC 68-1) 40/100/21
Operating temperature range: -40 to 100º C

ELECTRICAL CHARACTERISTIC

Nominal voltage (Vn): 275 Vac 50/60 Hz
Capacitance range: 0.01□F to 2.2 □F
Dissipation Factor (Df at 25ºC): tg =< 10 x 10-4 at 1 Khz
Insulation Resistance (Ri):

Test conditions
Temperature: 20ºC
Voltage charge: 1 min.
C<= 0,33µF; >= 15.000 Mohm
C > 0,33µF; >= 5.000 s

Test Voltage between terminations (on all pieces):

1500 Vac for 1s + 2200 Vdc for 1s at 25 ºC

MKP-X2

Life test:

Temperature: 100ºC

Duration: 1.000 hours

Voltage: 1,25 x Vn(ac) + 1000 Vac during 0.1 sec. every hour

GENERAL INFORMATION

Across-the-line and interference suppression applications

1) When a capacitor is used for this of application it may be subject to a mains voltage on a permanent basis and to surges caused, for example, by lightning, power commutations, ect.

   In these working conditions the capacitor must be a component with a safety margin able top satisfy the main International Standards:

   IEC 384-14 (2^{ND} Ed. 1993 + amendment 1-95) (International Standard)

   EN 132400 (similar to the previous) (European Standard)

   UL 1414, UL 1283 (USA Standards)

   CSA C22.2 Nr1 (Canadian Standards)

   For safety reasons it is advisable to use components approved according to the above mentioned standards.

2) When using capacitors Class X2 for across-the-line and interference suppression applications (connected in parallel to the main supply), it is important to make sure that there are no peak pulses exceeding 630 V (Vpp) for a rated of 250 to 275 Vac.

MKP-X2

Otherwise we suggest to add a surge suppressor in parallel to the capacitor (e.g. varistor).

Special working conditions

1) Humid ambient

   If used for a long time in a humid ambient, the capacitor might absorb humidity and oxidise the electrodes causing breakage of the capacitor.

2) Resin

   If the capacitor is placed in resin, the following situations might occur:

   -the solvent contained in the resin might deteriorate the caracteristics of the capacitor.

   -the heat generated during the polymerisation might damage the capacitor.

3) Adhesive curing oven

   Do not place the polypropylene capacitor in the polymerisation oven of the resin used to glue SMD components: the heat combined with length of stay in the oven might damage the dielectric ot the capacitor with risk of short circuit.

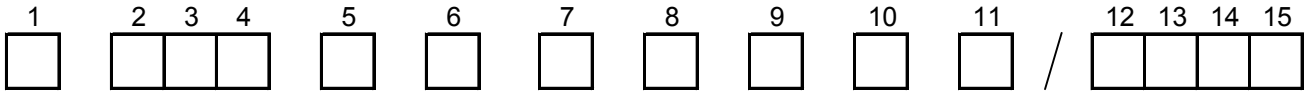
   When the polypropylene capacitor is used together with SMD components, always fit it after he SMD gluing process.

SCOPE

This specification covers the requirement for metallized polypropylene dielectric fixed capacitor Class X2

MKP-X2

CODING SYSTEM



Digit 1: Internal code.

Digit 2-4: Series code

RX2 (MKP)

Digit 5: Presentation

S = Boxes

Digit 6: Version

0 = lead length 4,5 +/- 0.5 mm.

A = lead length 30 +/- 0.5 mm.

B = lead length insulated 30 +/- 0.5 mm.

Digit 7: Tension

H = 275

Digit 8: Type of current

A = Alternating

Digit 9: Tolerance

Digit 10: Pitch

D = 10

E = 15

H = 22.5

J = 27.5

Digit 11 to 15: capacitance coding

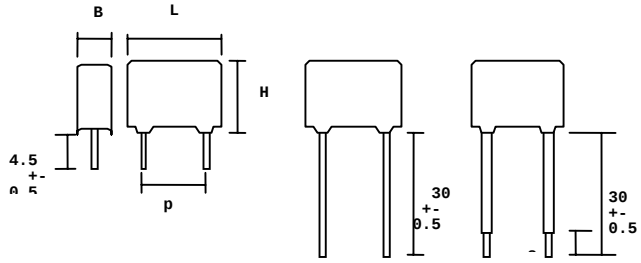
Digit 11: Capacitance coding: total number of digits to express the capacitance in pF.

Digit 12-15: Capacitance:

Significant digits of the capacitance expressed without zeros of the right.

MKP-X2

CAPACITANCE RANGE AND DIMENSIONS



	Standard Leads	Long Leads	Insulated rigid Leads
Version	0	A	B

Capacitance µf	Voltage	Dimensions max B	H	L	p	dV/dt V/µs	Code
0,0047	275 Vac	5,0	10,0	13,0	10,0	400	dRX2S*HA*D4/47
0,0056		5,0	10,0	13,0	10,0	400	dRX2S*HA*D4/56
0,0068		5,0	10,0	13,0	10,0	400	dRX2S*HA*D4/68
0,0082		5,0	10,0	13,0	10,0	400	dRX2S*HA*D4/82
0,010		5,0	10,0	13,0	10,0	400	dRX2S*HA*D5/1
0,012		5,0	10,0	13,0	10,0	400	dRX2S*HA*D5/12
0,015		5,0	11,0	13,0	10,0	400	dRX2S*HA*D5/15
0,018		5,0	11,0	13,0	10,0	400	dRX2S*HA*D5/18
0,022		5,0	11,0	13,0	10,0	400	dRX2S*HA*D5/22
0,027		5,0	11,0	13,0	10,0	400	dRX2S*HA*D5/27
0,033		5,0	11,0	13,0	10,0	400	dRX2S*HA*D5/33
0,039		5,0	11,0	13,0	10,0	400	dRX2S*HA*D5/39
0,047		5,0	11,0	13,0	10,0	400	dRX2S*HA*D5/47
0,056		5,0	11,0	13,0	10,0	400	dRX2S*HA*D5/56
0,068		5,0	11,0	13,0	10,0	400	dRX2S*HA*D5/68
0,082		6,0	12,0	13,0	10,0	400	dRX2S*HA*D5/82
0,100		6,0	12,0	13,0	10,0	400	dRX2S*HA*D6/1
0,120		7,0	13,0	13,0	10,0	400	dRX2S*HA*D6/12
0,150		8,0	14,0	13,0	10,0	400	dRX2S*HA*D6/15

MKP-X2

Capacitance µf	Voltage	Dimensions max				dV/dt V/µs	Code
		B	H	L	p		
0,010	275 Vac	5,0	11,0	18,0	15,0	300	dRX2S*HA*E5/1
0,015		5,0	11,0	18,0	15,0	300	dRX2S*HA*E5/15
0,022		5,0	11,0	18,0	15,0	300	dRX2S*HA*E5/22
0,033		5,0	11,0	18,0	15,0	300	dRX2S*HA*E5/33
0,039		5,0	11,0	18,0	15,0	300	dRX2S*HA*E5/39
0,047		5,0	11,0	18,0	15,0	300	dRX2S*HA*E5/47
0,056		5,0	11,0	18,0	15,0	300	dRX2S*HA*E5/56
0,068		5,0	11,0	18,0	15,0	300	dRX2S*HA*E5/68
0,082		5,0	11,0	18,0	15,0	300	dRX2S*HA*E5/82
0,10		5,0	11,0	18,0	15,0	300	dRX2S*HA*E6/1
0,12		6,0	12,0	18,0	15,0	300	dRX2S*HA*E6/12
0,15		6,0	12,0	18,0	15,0	300	dRX2S*HA*E6/15
0,18		6,0	12,0	18,0	15,0	300	dRX2S*HA*E6/18
0,22		7,0	13,0	18,0	15,0	300	dRX2S*HA*E6/22
0,27		7,5	14,5	18,0	15,0	300	dRX2S*HA*E6/27
0,33		8,0	15,5	18,0	15,0	300	dRX2S*HA*E6/33
0,33		10,0	13,5	18,0	15,0	300	dRX2S*HA*E6/33
0,39		8,0	17,0	18,0	15,0	300	dRX2S*HA*E6/39
0,47		9,0	18,0	18,0	15,0	300	dRX2S*HA*E6/47
0,56		10,0	19,0	18,0	15,0	300	dRX2S*HA*E6/56
0,15	275 Vac	6,0	14,5	26,0	22,5	180	dRX2S*HA*H6/15
0,18		6,0	14,5	26,0	22,5	180	dRX2S*HA*H6/18
0,22		6,0	15,0	26,0	22,5	180	dRX2S*HA*H6/22
0,33		7,5	16,5	26,0	22,5	180	dRX2S*HA*H6/33
0,39		7,5	16,5	26,0	22,5	180	dRX2S*HA*H6/39
0,47		7,5	16,5	26,0	22,5	180	dRX2S*HA*H6/47
0,56		7,5	16,5	26,0	22,5	180	dRX2S*HA*H6/56
0,68		8,0	17,0	26,0	22,5	180	dRX2S*HA*H6/68
0,82		9,0	18,0	26,0	22,5	180	dRX2S*HA*H6/82
1,00		10,0	19,0	26,0	22,5	180	dRX2S*HA*H7/1
1,20		11,5	20,0	26,0	22,5	180	dRX2S*HA*H7/12
1,50		12,0	22,0	26,0	22,5	180	dRX2S*HA*H7/15
1,80		14,0	24,0	26,0	22,5	180	dRX2S*HA*H7/18
2,20		15,0	25,0	26,0	22,5	180	dRX2S*HA*H7/22
0,47	275 Vac	9,0	18,0	31,0	27,5	130	dRX2S*HA*J6/47
0,56		10,0	20,0	31,0	27,5	130	dRX2S*HA*J6/56
0,68		10,0	20,0	31,0	27,5	130	dRX2S*HA*J6/68
0,82		11,0	20,0	31,0	27,5	130	dRX2S*HA*J6/82
1,0		11,0	20,0	31,0	27,5	130	dRX2S*HA*J7/1
1,5		14,0	23,5	31,0	27,5	130	dRX2S*HA*J7/15
2,2		18,0	26,0	31,0	27,5	130	dRX2S*HA*J7/22

MKP-X2

Note: E12 values availables upon request

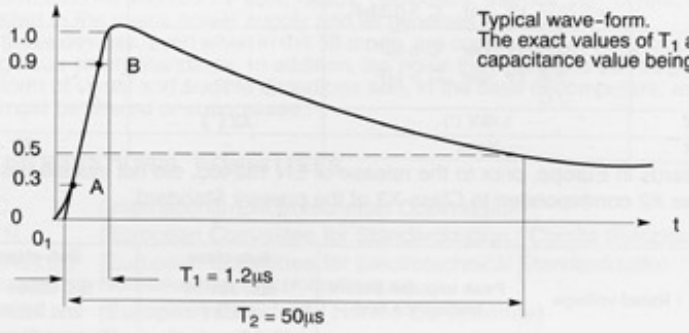
CLASS X2 CAPACITORS

TEST RELATED TO IEC 384-14 (2nd EDITION 1993 PLUS AMENDMENT A1:1995) and EN132400

MKP-X2

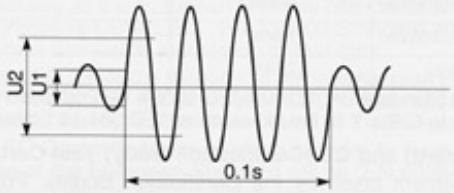
According to IEC 60384-14 (2nd Edition 1993 plus amendment A1: 1995) and EN132400 our X2 and Y2 suppression capacitors withstand the following tests (type test):

- IMPULSE VOLTAGE TEST (before ENDURANCE TEST)
  V_{PEAK} = 2.5kV (Class X2)
  V_{PEAK} = 5.0kV (Class Y2)



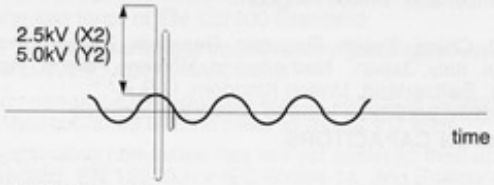
Typical wave-form.
The exact values of T_1 and T_2 depend on the capacitance value being tested.

- ENDURANCE TEST
  The capacitors are tested for 1000 hours at upper category temperature with a voltage of 1.25 × V_R for Class X2 and 1.7 × V_R for Class Y2.
  Every hour the test voltage is increased up to 1000 V_{RMS}/50Hz for a period of 0.1 s.

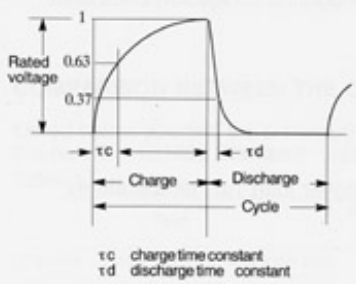


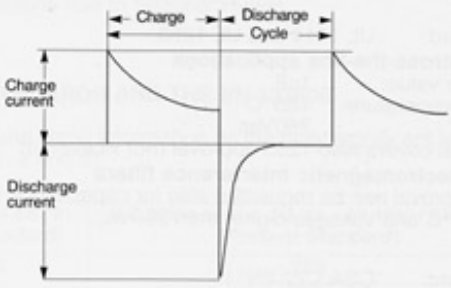
U1 = Rated Voltage
U2 = 1000V_{RMS}

- ACTIVE FLAMMABILITY TEST
  The capacitors are tested at the rated voltage (Vac) at 50 Hz with superimposed 20 pulses at 2.5kV for Class X2 and 5kV for Class Y2 with an interval between the successive pulses of 5 seconds.
  The rated voltage is kept for 2 min after the last discharge. At the end of the test the capacitor does not burn (control made with the cheese-cloth wrapped on the body of capacitors).



- CHARGE AND DISCHARGE TEST
  The capacitors are subjected to 10000 cycles of charge and discharge at the rate of approximately one operation per second.





MKP-X2

PERFORMANCE AND TEST METHOD

PRODUCT RANGE

Operating tº range:	– 40 to 100ºC (IEC384-14)
	85 º C max (UL, CSA)
	(including temperature rise on unit surface)
Rated voltage	275 Vac (IEC384-14)
	250 Vac (UL, CSA)
Capacitance range	0.01 □F- 2.2 □F
Capacitance tolerance	10% or 20%

CONSTRUCTION

The capacitor has a non-inductive, wound with metallized polypropylene film dielectric. The capacitor is enclosed in noncombustible plastic case, filled with noncumbustible filling resin, (UL94 V0) and has two leads.

CONDITIONAL STANDARD TEST

The test shall be conducted at a temperature of from 15ºC to 35ºC, a humidity of from 45% to 75%.

However the test shall be conducted at a temperature of 20 □2ºC, a humidity of 65º □5%, when doubt is entertained about judgment.

TEST VOLTAGE

Between terminations:

Nothing abnormal shall be found, when applied a voltage specified below for 1 minute.

MKP-X2

C □ 0.0068 □F: AC 1500 V – DC 2121 V

C □ 0.0068 □F: AC 1000 V – DC 1768 V

1. Cut- off Current

AC: 2 A

DC: 10 mA

2. Test Must Be Connected Current Limiting Resistance of 1 □/ V

3. Slow-up voltage speed: 100V/sec

Between terminations and enclosure

Nothing abnormal shall be found, when applied a voltage of 2050 VAC for 1 minute.

Testing method

IEC 384-14-4.2.1

(IEC 384-1 4.6)

INSULATION RESISTANCE

Between terminations:

□ 15.000 M□ (when C<= 0,33µF) at DC 100 V

□ 5.000 s (when C<= 0,33µF) at DC 100 V

Between terminations and enclosure

> 30000 M□ at DC 100 V

> 500 M□ at DC 500 V

When the reading of measuring instrument becomes steady at a value after applying a voltage of DC 100 □15 V or DC 500 □50 V for 1 minute □□second, at 20º C.

Testing method

IEC 384-14-4.2.5

(IEC 384-1 4.5)

MKP-X2

CAPACITANCE

Within a range of specified value.

Measured at a frecuency of 1 Khz, at 20º C, 1 Vrms.

Testing method

IEC 384-14-4.2.2

(IEC 384-1 4.7)

DISSIPATION FACTOR

DF =< 10 x 10-4

Measured at a frecuency of 1 Khz, at 20º C, 1 Vrms.

Testing method

IEC 384-14-4.2.3

(IEC 384-1 4.8)

TERMINATION STRENGTH

Tensile strength

The load specified below shall be applied to the termination in its draw-out direction gradually up to the specified value and held thus for 10 □1 seconds.

After test, no breaking or loosenning of the termination shall be found.

Lead wire diameter over 0.5 to 0.8 (mm)

Tensile force 10.0 (N)

Bending strength

While applying the load specified below to the lead wire, the body of the capacitor shall be bent 90º and returned to the original position.

MKP-X2

This operation shall be conducted in a few seconds.

Then the body shall be bent 90º, at the same speed in the opposite direction and returned to the original position.

After the test, no breaking or loosening of the termination shall be found.

Lead wire diameter over 0.5 to 0.8 (mm)

Bending force 5.0 (N)

Testing method

IEC 384-14-4.3

(IEC 384-1-4.13)

IEC 68-2-21

Test Ua1

VIBRATION PROOF

The following vibration shall be applied to the capacitor.

Range of vibration frequency 10 to 55 Hz total amplitude 1.5 mm, rate of frequency vibration to be such as to vary from 10 to 55 Hz and return to 10 Hz in about 1 minute and thus repeated.

Thus shall be conducted for 2 hours each (total 6 hours) in 3 mutually perpendicular directions.

The connection shall not get short-circuit or open when examined the connection of the element in compliance with the previous item (connection of the element) during the last 30 minutes of the test.

Testing method

IEC 384-14-4.7

(IEC 384-1-4.17)

IEC 68-2-6

Test Fc

MKP-X2

SOLDERING PROPERTY

The lead wire shall be immersed in methanol solution of resin (about 25%) and its depth of dipping shall be up to 1.5 + 0.5/-0 mm from the root of the termination in the solder bath at a temperature of 235 □5º C for 2 □0.5 seconds, by using a heat shielding plate.
After test immersion, the solder shall be stacked to more than 95% in the circumferentional direction of lead wire.

Testing method

IEC 384-14-4.5
(IEC 384-1-4.15)
IEC 68-2-20
Test Ta

SOLDERING HEAT RESISTANCE

The lead wire shall be immersed in methanol solution of resin (about 25%) and its depth of dipping shall be up to 1.5 + 0.5/-0 mm from the root of the termination in the solder bath at a temperature of 350 □10º C for 3.5 □0.5 seconds, or 260 □5º C for 10 □1 seconds using a heat shielding plate.
After the inmersion is finished, the capacitor shall be let alone at ordinary temperature and humidity for 1 □0.5 hours.
After this, the capacitor shall be satisfied with the following performace.

Apperance: No remarkable change.

Test voltage:

Nothing abnormal shall be found, when applied a voltage specified.

Insulation resistance:

Insualtion resistance shall be specified.

Change rate of capacitance:

□C/C □ □ 2% of the value before the test.

MKP-X2

Testing method

IEC 384-14-4.4

(IEC 384-1-4.14)

IEC 68-2-20

Test Tb

COLD RESISTANCE

Change rate of capacitance at –40ºC □ 3% for 2 +1/-0 hours.

After the test, the capacitor shall be let alone at ordinary condition for 1.5 □ 0.5 hours.

□C/C □ □ 5% ot the value before the test.

Testing method

IEC 384-14-4.11.4

IEC 68-2-1

Test Aa

DRY HEAT RESISTANCE

The testing oven at 100 □ 2º C for 2 +1/-0 hours.

After test, the capacitor shall be let alone at the ordinary condition for 1.5 □ 0.5 hours, and shall be satisfied with the following performance.

Insulation resistance:

≥ 50% ot the inicial specified value.

Change rate of capacitance

□C/C □ □ 5% of the value before the test.

Testing method

IEC 384-14-4.11.2

MKP-X2

(IEC 384-1-4.21.2)

IEC 68-2-2

Test Ba

HUMIDITY RESISTANCE

The capacitor under test shall be put in the testing oven and kept at condition of the temperature +40 □ 2º C and the humidity at 90 to 95 %for 500 +24/-0 hours and then shall be let alone at ordinary condition for 1.5 □ 0.5 hours.

After the test, the capacitor shall be satisfied with the following performace.

Appearance: No remarkable change

Test voltage:

Between terminations

Nothing abnormal shall be found, when applied a voltage specified below for 1 minute.

C □ 0.0068 □F: AC 1500 V

C □ 0.0068 □F: DC 1075 V

Between terminaions and enclosure

Nothing abnormal shall be found, when applied a voltage of 2050 VAC for 1 minute.

Insulation resistance:

Between terminations

> 7500 M□(when C □ 0.33 □F) at DC 100V

> 2500 s(when C > 0.33 □F) at DC 100V

Between terminations and enclosure

> 15000 M□at DC 100V

MKP-X2

Change rate of capacitance:

□C/C □ □ 5% of the value before the test.

Dissipation factor:

□ □ 0.15%

Testing method

IEC 384-14-4.12

(IEC 384-1-4.22)

IEC 68-2-3

Test Ca

RAPID CHANGE OF TEMPERATURE

The capacitor under the test shall be kept in the testing oven and kept at condition of the temperature of –40 □ 3º C for 30 □ 3 minutes.

After this, the capacitor shall be let alone at the ordinary temperature for 3 minutes or less. After this, the capacitor under the test shall be kept in the testing oven and kept at condition of the temperature of +100 □ 2º C for 30 □ 3 minutes. Then the capacitor shall be let alone at the ordinary temperature for 3 minutes or less. This operation shall be counted as 1 cycle, and it shall be repeated for 5 cycles successively.

After the test, the capacitor shall be let alone at the ordinary condition for 1.5 □ 0.5 hours, and shall be satisfied whith the following performace.

Apperance: No remarkable change.

Insulation resistance:

≥ 50% of the initial specified value.

Change rate of capacitance

□C/C □ □ 10% of the value before the test.

Dissipation factor:

MKP-X2

□ □ 0.12%

Testing method

EC 384-14-4.6

(IEC 384-1-4.6)

IEC 68-2-14

Test Na

HIGH TEMPERATURE LOADING

The capacitor shall be submitted to an endurace of 1000h at 100ºC at a voltage 125% of rated voltage, except that once every hour the voltage shall be increased to 1000 Vrms for 0.1 second.

After the test, the capacitor shall be satisfied with the following performace.

Appearance: No remarkable change

Test voltage:

Between terminations

Nothing abnormal shall be found, when applied a voltage specified below for 1 minute.

C □ 0.0068 □F: AC 1500 V

C □ 0.0068 □F: DC 1075 V

Between terminations and enclosure

Nothing abnormal shall be found, when applied a voltage of 2050 VAC for 1 minute.

Insulation resistance:

Between terminations

> 7500 M□(when C □ 0.33 □F) at DC 100V

> 2500 s(when C > 0.33 □F) at DC 100V

Between terminations and enclosure

> 3000 M□at DC 100V

Change rate of capacitance:

MKP-X2

□C/C □ □ 10% of the value before the test.

Dissipation factor:

□ □ 0.15%

Testing method

IEC 384-14-4.14

IMPULSE VOLTAGE

The capacitor shall be subjected to a maximunm 24 impulses of the same polarity. If any three successive impulse are shown by the monitor to have had a waveform indicating that no self-healing breakdowns have occurred, then capacitor shall be no more subjected to impulses.

Impulse voltage (X2): When C □1 □F Up = 2.5 Kv

When C > 1 □F Up = 2.5/□C Kv

Appearance: No remarkable change.

Others: There shall be no permanent breakdown or flashover.

After impulse voltage, the capacitor shall be subjected to high temperature loading.

Testing method

IEC 384-14-4.13

ACTIVE FLAMMABILITY TEST

The capacitor shall be wrapped in at least one not more than two complete layers of cheesecloth.

The capacitor shall be subjected to 20 discharged from a tank capacitor, charged to a voltage that, when discharged, places a peak voltage across the capacitor under test.

The interval between successive discharged shall be 5 seconds. Throughout the test, rated voltage Ur shall be applied across the capacitor under test and shall be maintained for 2 minutes after the last discharged, unless a blown fuse causes an open circuit.

The cheesecloth around the capacitor shall not burn with a flame.

MKP-X2

Rated voltage Ur = 275 VAC

Peak voltage Ui = 2.5 Kv

Testing method

IEC 384-14-4.18

INTERNATIONAL APPROVAL MKP-X2

VDE ENEC

- Reference standard:	EN132400
- Subject:	Fixed capacitors for interference suppression and connection to the supply mains.
- File:	138332 L
- Type:	MKP-X2
- Climatic category:	40/100/21/C

UL

- Reference standard:	UL 1414 (up to 1µF)
- Subject:	Across-the-line Capacitors, Antenna-coupling and Line-bypass Components.
- File:	E196710
- Type:	MKP-X2

- Reference standard:	UL 1283 (1,5µF & 2,2 µF)
- Subject:	Electromagnetic Interference Filters
- File:	E196710
- Type:	MKP-X2

MKP-X2

CSA

- Reference standard: C 22.2 n°1
- Subject: Across-the-line Capacitors
- File: 213327
- Type: MKP-X2