规 格 承 认 书
SPECIFICATIONS FOR APPROVAL

客　户 CUSTOMER	：	佳世达
项　目 ITEM	：	**Metallized Polypropylene Film AC Capacitor (Interference Suppressors Class-X2)　TYPE: MPX2**
客　戶　料　号 CUSTOMER'S PART NO	：	
优　普　料　号 EUROPTRONIC'S P/N	：	**MPX2104K30B15LWND10** **MPX2224K30B15LWND30　（Halogen Free Product）**
日　期 ISSUED DATE	：	**2018-4-13**
版　本　号 EDITION	：	**A**

※ This specification will be invalidated assuming that it is not accepted when it is not returned within one year from the date of issue.

CUSTOMER'S ISSUED :

优普电子(苏州)有限公司
EUROPTRONIC (SUZHOU) CO., LTD.

REVISION LIST

NO.	DATE	CHANGE CONTENT	REMARK
1	2018-4-13	First Editon	A
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PRODUCT SPECIFICATIONS

ISSUED DATE : **2018-4-13**

CUSTOMER	:	佳世达
CUSTOMER'S REFERENCE	:	
DESCRIPTIONS	:	**Metallized Polypropylene Film AC Capacitor (Interference Suppressors Class-X2)**
EUROPTRONIC TYPE	:	**MPX2104K30B15LWND10** **MPX2224K30B15LWND30**

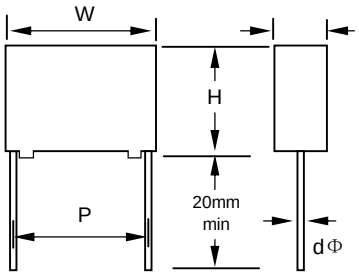


Fig. 1

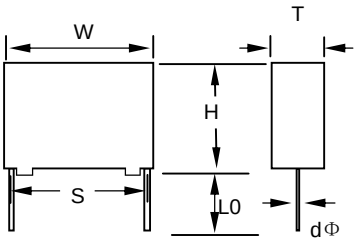


Fig. 2

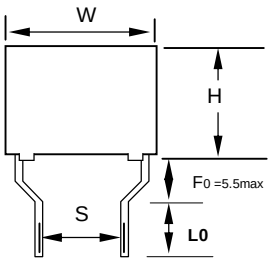


Fig. 3

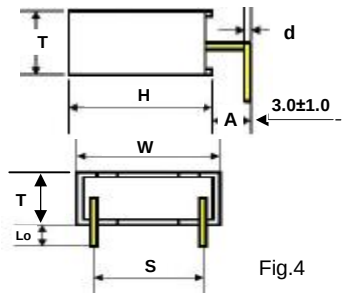


Fig.4

PRODUCT DIMENSIONS :

unit : mm

CUSTOMER'S PART NO.	CAP uF	Tol. ±%	R.V. VAC	T.V. VDC	W ±1.0	H ±1.0	T ±1.0	P ±1.0	S ±0.5	dΦ ±0.1	L0 ±0.5	Fig.	CASE	EUROPTRONIC PART NO.
	0.10	10	305	1312	18.0	11.0	5.0	----	15.0	0.6	3.0	2	D10	MPX2104K30B15LWND10
	0.22	10	305	1312	18.0	13.5	7.5	----	15.0	0.8	3.0	2	D30	MPX2224K30B15LWND30

PREPARED BY: 刘盼	CHECKED BY : 陈益珊	APPROVED BY :周小毛

PART NUMBERING

TYPE : MPX2

订 购 基 本 规 格

EXAMPLE : MPX2 0.1uF ±10% 305 VAC Lead Space:15.0mm

MPX2	104	K	30	B	15	L	W	N	D10
1	2	3	4	5	6	7	8	9	10

1. TYPE OF CAPACITOR :

TYPE	MPX2	MPX
CODE	MPX2	MPX-

2. CAPACITANCE (EIA Code) :

The first 2 digits indicate significant figures, and the third digit specifies the number of zero to follow. This gives the capacitance in picofarads. For examples:

102 = 1,000pF =1.0nF = 0.001uF

103 = 10,000pF =10nF = 0.01uF

104 = 100,000pF =100nF = 0.1uF

105 = 1,000,000pF =1,000nF = 1.0uF

106 = 10,000,000pF =10,000nF = 10uF

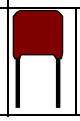
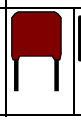
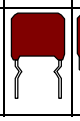
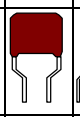
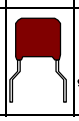
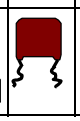
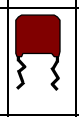
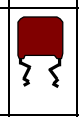
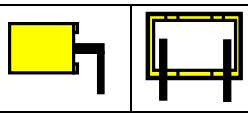
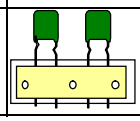
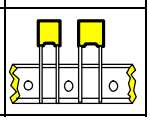
3. TOLERANCE (EIA Code) :

TOLERANCE	± 1%	± 2%	± 3%	± 5%	± 10%	± 20%	+80%-20%	+100%-0%
CODE	F	G	H	J	K	M	Z	P

4. RATED VOLTAGE :

VAC	250	275	305
CODE	25	27	30

5. LEAD CONFIGURATION : Expressed in 1-letter code

CODE	L	B	C	D	E	F	G	H	Y	T	U
LEAD TYPE											

6. LEAD SPACE : Expressed in 2-digit or 1-digit-1-letter code Unit : mm

LEAD SPACE	7.5	10.0	12.5	15.0	17.5	20.0	22.5	25.0	27.5	30.0	32.5	35.0	37.5	36.5	42.5	52.5
CODE	7P	10	12	15	17	20	22	25	27	30	32	35	37	36	42	52

7. LEAD FORMING PITCH : Expressed in 1-letter code

LEAD PITCH	5.0	7.5	10.0	12.5	15.0	17.5	20.0	22.5	25.0	27.5	30.0	35.0	37.5	Others	N/A
CODE	A	H	B	G	C	N	D	W	E	F	U	V	Z	X	L

8. LEAD LENGTH (Straight): Expressed in 1-letter code Unit : mm

LEAD LENGTH	2.2	2.7	3.0	3.1	3.2	3.4	3.5	3.8	4.0	4.5	5.0	5.5	8.0	6.0	6.5	7.0	7.5
CODE	A	Q	W	1	X	Y	2	B	3	4	5	6	8	C	T	D	7

LEAD LENGTH	9.0	11.5	12.0	13.0	15.0	20	22	25	26	27	28	29	30	35	40	其它	
CODE	9	E	F	G	H	U	J	K	V	L	P	S	M	N	R	0	

9.Environmental protection

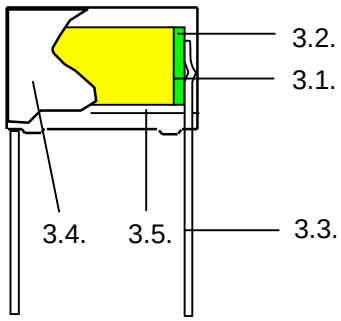
Environmental	RoHs	Halogen free
CODE	A	N

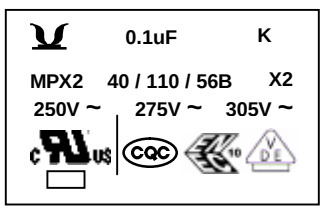
10.Case Code:

CASE	B10~B90	C10~C90	G10~G90	D10~D80	E10~E90	F10~F90	J10~J90
PITCH	7.5	10	12.5	15	22.5	27.5	37.5

PRODUCT SPECIFICATIONS **TYPE : MPX2**

NO.	ITEM	DESCRIPTIONS
1.	**SCOPE**	This specifications cover the requirements of EUROPTRONIC's Metallized Polypropylene Film AC Capacitor (Interference Suppressors Class-X2), Type : MPX2
2.	**STANDARD ATMOSPHERIC CONDITIONS FOR MAKING MEASUREMENTS**	
2.1.	AMBIENT TEMPERATURE	15℃ to 35℃ (If there is any doubt on the results, the measurements shall be made at +20 +/- 5℃.)
2.2.	RELATIVE HUMIDITY (R.H.)	45% to 75% (If there is any doubt on the results, the measurements shall be made at 60% to 70%.)
2.3.	AIR PRESSURE	86 kpa to 106 kpa.
2.4.	OPERATING TEMPERATURE RANGE	Operating temperature range to capacitors shall be -40℃~+110℃ (85 ℃~110℃, decreasing factor 1.25% per ℃ for Urms)
3.	**CONSTRUCTION**	
3.1.	DIELECTRIC	Metallized Polypropylene Film
3.2.	METAL SPRAY	Special Solder
3.3.	LEAD WIRE	Copper-clad Steel Wire
3.4.	PLASTIC CASE	UL94V-0
3.5.	EPOXY RESIN	UL94V-0
4.	**MARKING**	
4.1.	MANUFACTURER'S SYMBOL	stands for EUROPTRONIC .
4.2.	TYPE OR MATERIAL	"MPX2" stands for MPX2 type.
4.3.	CAPACITOR CLASS	"X2" stands for X2 class
4.4.	NOMINAL CAPACITANCE	Capacitance value in uF.
4.5.	TOLERANCE	"K" for +/-10%; "M" for +/-20%.
4.6.	RATED VOLTAGE	in VAC rating.
4.7.	APPROVAL BRANDS	UL/C-UL,VDE,ENEC,.CQC
4.8.	MANUFACTURER CODE	



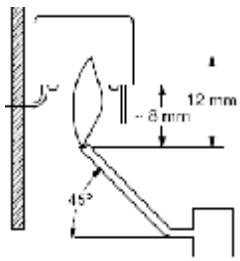


5.	ELECTRICAL CHARACTERISTICS			
NO.	ITEM		PERFORMANCE	TEST CONDITIONS
5.1.	Withstand Voltage (TV)	Between Terminals	Shall be no abnormality.	Apply 1312VDC for 60 sec or 2000VDC for 2 sec, Charge current must be 1A max. Withstanding (DC) voltage (cut off current 10mA), rise time 100V/S .
		Between Terminals & Enclosure	Shall be no abnormality.	Apply 2110VAC for 60sec.
5.2.	Insulation Resistance (I.R.)		>= 15,000 MOhm (C <= 0.33uF) >= 5,000 MOhm*uF/C (C> 0.33uF)	Apply 100V+/-15%for 60+/-5sec.at+20+/-2℃.
5.3.	Capacitance (CAP)		Within the tolerance specified. (at +20 +/- 5℃).	Measuring Frequency : 1 KHz +/- 10%. Measuring Voltage : 1 Vrms.max.
5.4.	Dissipation Factor (DF)		0.001 (0.1%)max. at 1 KHz.	Measuring Frequency : 1 KHz +/- 10%. Measuring Voltage : 1 Vrms.max.
5.5.	Solderability		More than 95% of circumferential surface of lead wire shall be covered with new solder.	Testing method per IEC 68-2-20 Ta. Soldering temperature : +245 +/- 5℃. Immersion duration : 2 +/- 0.5 sec.
5.6.	pulse slope (dU/dt)		400 V 300 V 150 V 100 V 50V	Pitch = 10 mm Pitch = 15 mm Pitch = 22.5 mm Pitch = 37.5 mm Pitch = 52.5 mm
5.7.	Permisssible DC voltage (URDC)		630 V	

6.	MECHANICAL CHARACTERISTICS			
NO.	ITEM		PERFORMANCE	TEST CONDITIONS
6.1.	Terminal Strength	Tensile	Shall be no abnormality.	Testing method per IEC 68-2-21. Apply 1.0 kg for 10 +/- 1sec. to the terminal in the axial direction, and acting in a direction away from the body.
		Bending	Shall be no abnormality.	Apply 0.5 kg for 2 cycles. Each cycle includes: 90° once, return to its initial position for 2-3 sec., and then to the opposite direction once.

7.	ENDURANCE CHARACTERISTICS			
NO.	ITEM		PERFORMANCE	TEST CONDITIONS
7.1.	Temperature Cycle	Appearance	Shall be no remarkable change.	Test Temperature Cycle : Total 5 cycles. Each cycle includes : 1. +20 +/- 2℃ for 3min. 2. -40 +0/-3 ℃ for 30 min. 3. +20 +/- 2℃ for 3min. 4. +110 +3/-0 ℃ for 30 min. 5. +20 +/- 2℃ for 3 min.
		Withstand Voltage	Shall satisfy No. 5.1.	
		Capacitance Change Rate (△C/C)	Within +/- 5% of the value before test.	
		DF change(△tgδ)	<=80*10^{-4} at 1 KHz.	
		Insulation Resistance (I.R.)	>= 50% of the limit value of No. 5.2.	

NO.	ITEM		PERFORMANCE	TEST CONDITIONS
7.2.	High Temperature Loading	Appearance	Shall be no remarkable change.	Testing method per IEC 60384-14. Refer to JIS C 5102-1994. Test Temperature : +110 +/-2 ℃. Apply 125% of rated voltage for 1,000 +24/-0 hrs; After test, allow it stay alone for 4 hrs at standard temperature and humidity before making measurements.
		Withstand Voltage	Shall satisfy No. 5.1.	
		Capacitance Change Rate (△C/C)	Within +/-10% of the value before test.	
		DF change(△tgδ)	<=80*10^{-4} at 1 KHz.	
		Insulation Resistance (I.R.)	>= 50% of the limit value of No. 5.2.	
7.3.	Humidity Resistance	Appearance	Shall be no remarkable change.	Testing method per IEC 68-2-3 Ca. Refer to JIS C 0022. Test Temperature : +40 +/- 2℃. Test Humidity : 90% to 95% R.H. Test Duration : 500 +24/-0 hrs After test, allow it stay alone 4 hrs at standard temperature and humidity before making measurements.
		Withstand Voltage	Shall satisfy No. 5.1.	
		Capacitance Change Rate (△C/C)	Within +/- 10% of the value before test.	
		DF change(△tgδ)	<=80*10^{-4} at 1 KHz.	
		Insulation Resistance	>= 50% of the limit value of No. 5.2.	
7.4.	Humidity Resistance Loading	Appearance	Shall be no remarkable change.	Testing method per IEC 68-2-3 Ca. Refer to JIS C 0022. Test Temperature : +40 +/- 2℃. Test Humidity : 90% to 95% R.H. Test Voltage : 240VAC Test Duration : 500 +24/-0 hrs After test, allow it stay alone 4 hrs at standard temperature and humidity before making measurements.
		Withstand Voltage	Shall satisfy No. 5.1.	
		Capacitance Change Rate (△C/C)	Within +/- 10% of the value before test.	
		DF change(△tgδ)	<=80*10^{-4} at 1 KHz.	
		Insulation Resistance	>= 50% of the limit value of No. 5.2.	
7.5.	Soldering Heat Resistance	Appearance	Shall be no remarkable change. The marking shall be legible.	1) Flow soldering: Preheat temp 100～120℃ Preheat Duration :100sec.max. Soldering Temperature : +260 +/- 5℃. Immersion Duration :≤ 10 sec. Immersion Depth : 1.5 +/- 0.5 mm from roots. 2) Iron soldering Soldering Temperature : +400℃. . Immersion Duration :≤ 3 sec. After test, allow it stay alone for 1.5 +/- 0.5 hrs. at standard temperature and humidity before making measurements.
		Withstand Voltage Between Terminals	Shall satisfy No. 5.1.	
		Capacitance Change Rate (△C/C)	Within +/- 5% of the value before test.	
		DF change(△tgδ)	<=80*10^{-4} at 1 KHz.	
		Insulation Resistance (I.R.)	>= 50% of the limit value of No. 5.2.	
		Connection of Element	Shall be stable.	
7.6.	Dry Heat Resistance	Appearance	Shall be no remarkable change.	Test Temperature : +110+/- 2℃ Test Duration : 16 +1/-0 hrs.
		Withstand Voltage	Shall satisfy No. 5.1.	
		Capacitance Change Rate (△C/C)	Within +/- 5% of the value before test.	
		DF change(△tgδ)	<=80*10^{-4} at 1 KHz.	
		Insulation Resistance (I.R.)	>= 50% of the limit value of No. 5.2.	

NO.	ITEM		PERFORMANCE	TEST CONDITIONS
7.7.	Cold Resistance	Appearance	Shall be no remarkable change.	Test Temperature : -40 +/-2 ℃ Test Duration : 2 +1/-0 hrs.
		Withstand Voltage	Shall satisfy No. 5.1.	
		Capacitance Change Rate (△C/C)	Within +/- 5% of the value before test.	
		DF change(△tgδ)	<=80*10^{-4} at 1 KHz.	
		Insulation Resistance (I.R.)	>= 50% of the limit value of No. 5.2.	
7.8.	Vibration Resistance	Connection Strength	Shall be no open nor short-circuiting. The connection shall be stable.	Testing method per IEC 68-2-6 Fc. Frequency Change : 10--55--10 Hz. Vibration Distance : 1.5 mm. Test Direction : X, Y, Z. Test Duration : 2 +1/- 0 hrs each direction.
		Appearance	Shall be no mechanical damage.	
7.9.	Rapid Temperature Change	Appearance	Shall be no remarkable change.	Testing method per IEC 68-2-14 Na. Test Temperature Cycle : Total 5 cycles. High Temperature : +110+/-5 ℃ Low Temperature : -40 +/-5℃ 30 min +/- 10% for each temperature.
		Withstand Voltage	Shall satisfy No. 5.1.	
		Capacitance Change Rate (△C/C)	Within +/- 5% of the value before test.	
		DF change(△tgδ)	<=80*10^{-4} at 1 KHz.	
		Insulation Resistance	>= 50% of the limit value of No. 5.2.	
7.10.	Charge and discharge	Appearance	Shall be no remarkable change.	10000 cycles . Charge to 435 VDC . Discharge resistance: . $R \quad \frac{435\ V_{DC}}{1.25 \times C\ (dU/dt)}$
		Withstand Voltage	Shall satisfy No. 5.1.	
		Capacitance Change Rate (△C/C)	Within +/- 10% of the value before test.	
		DF change(△tgδ)	<=80*10^{-4} at 1 KHz.	
		Insulation Resistance	>= 50% of the limit value of No. 5.2.	
7.11.	Passive flammability	Class B	After removing test flame from capacitor, the capacitor must not continue to burn for more than 10 s. No burning particle must drop from the sample.	Bore of gas jet: Ø 0.5 mm Fuel: Butane Test duration for actual volume V in mm^3: V ⩽ 250: 10 s 250 < V ⩽ 500: 20 s 500 < V ⩽1750: 30 s V > 1750: 60 s One flame application 
7.12.	Active flammability	The cheese cloth around the capacitors shall not burn with a flame.No electrical measurements are required.		20 cycles of 2.5 kV discharges on the test capacitor connected to URAC
7.13.	Impulse voltage	No selfhealing breakdowns or flashover		3 successive impulses, full wave, peak voltage: X2: 2.5 kV for C 1 µF X2: 2.5 kV/ C for C > 1 µF Max. 24 pulses .

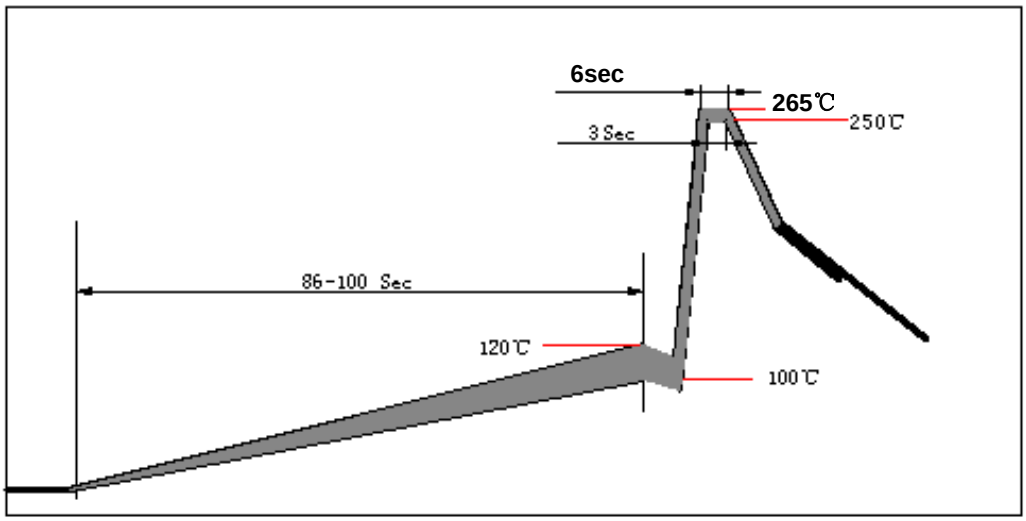
8. ACCEPTABLE QUALITY LEVEL (AQL)

NO.	ITEM	AQL	SAMPLING PLAN
8.1.	Appearance AQL	0.65	According to MIL-STD-105E level II. GB2828-2003 level II. By lot outgoing inspection.
8.2.	Dimension AQL	0.65	
8.3.	Mechanical Characteristics AQL	0.40	
8.4.	Electrical Characteristics AQL		
	CAP, DF,	0.04	
	TV, IR,	Zero Defect	

APPROVALS:

Mark	structure	File no
	UL / CUL	E211347
	VDE	40025981
	ENEC	40025981
	CQC	CQC09001029511
	KTL	SU03025-1001、SU03025-1002、SU03025-1003、SU03025-1004、

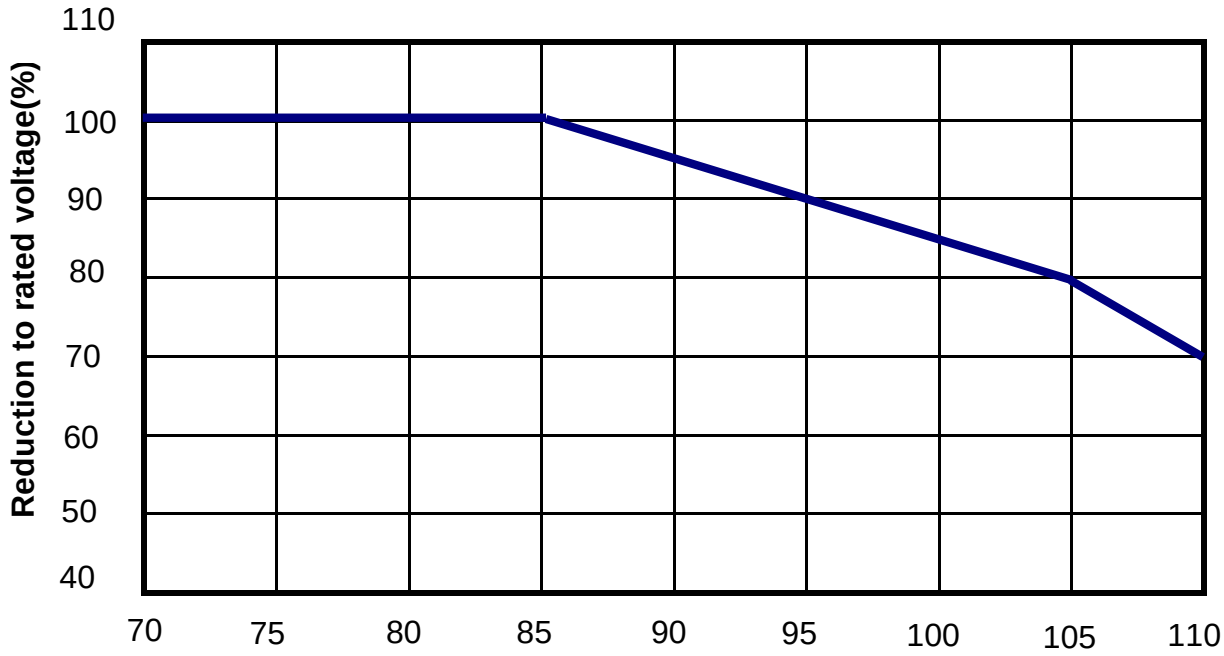
Lead free wave soldering curve



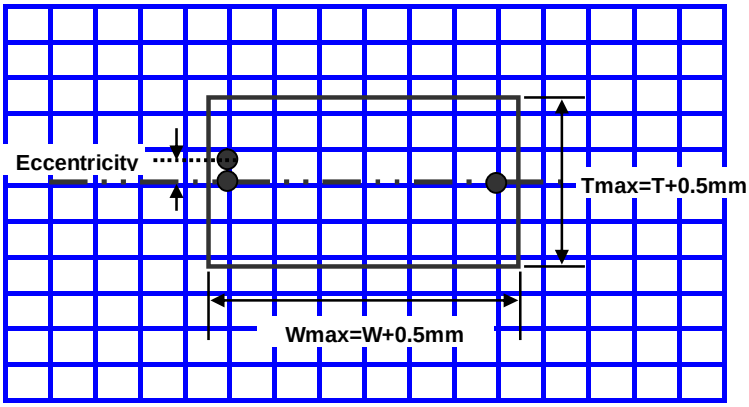
Time(sec)

Note: Don't suitable for reflow soldering operations

DERATING OF RATED VOLTAGE TO TEMPERATURE **TYPE : MPX2**



The maximum length and width of film capacitors are shown in the following drawing



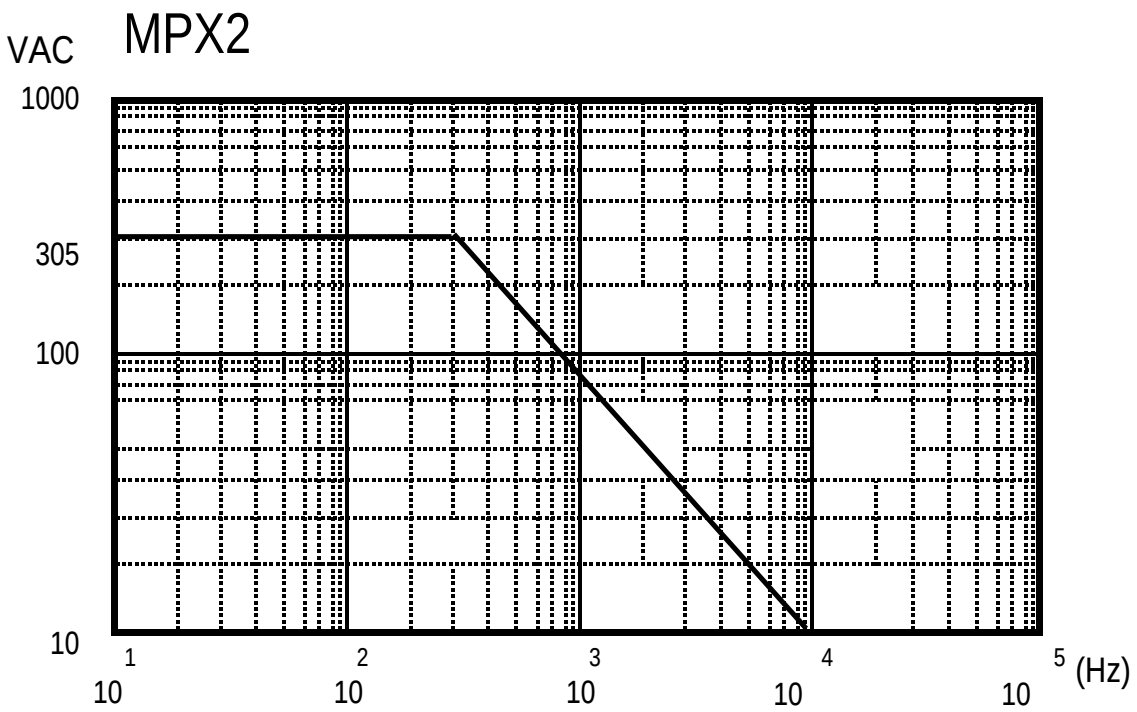
Eccentricity as in drawing

The maximum eccentricity is smaller than or equal to the lead diameter of the product concerned.

AC Voltage VS Frequency Curves

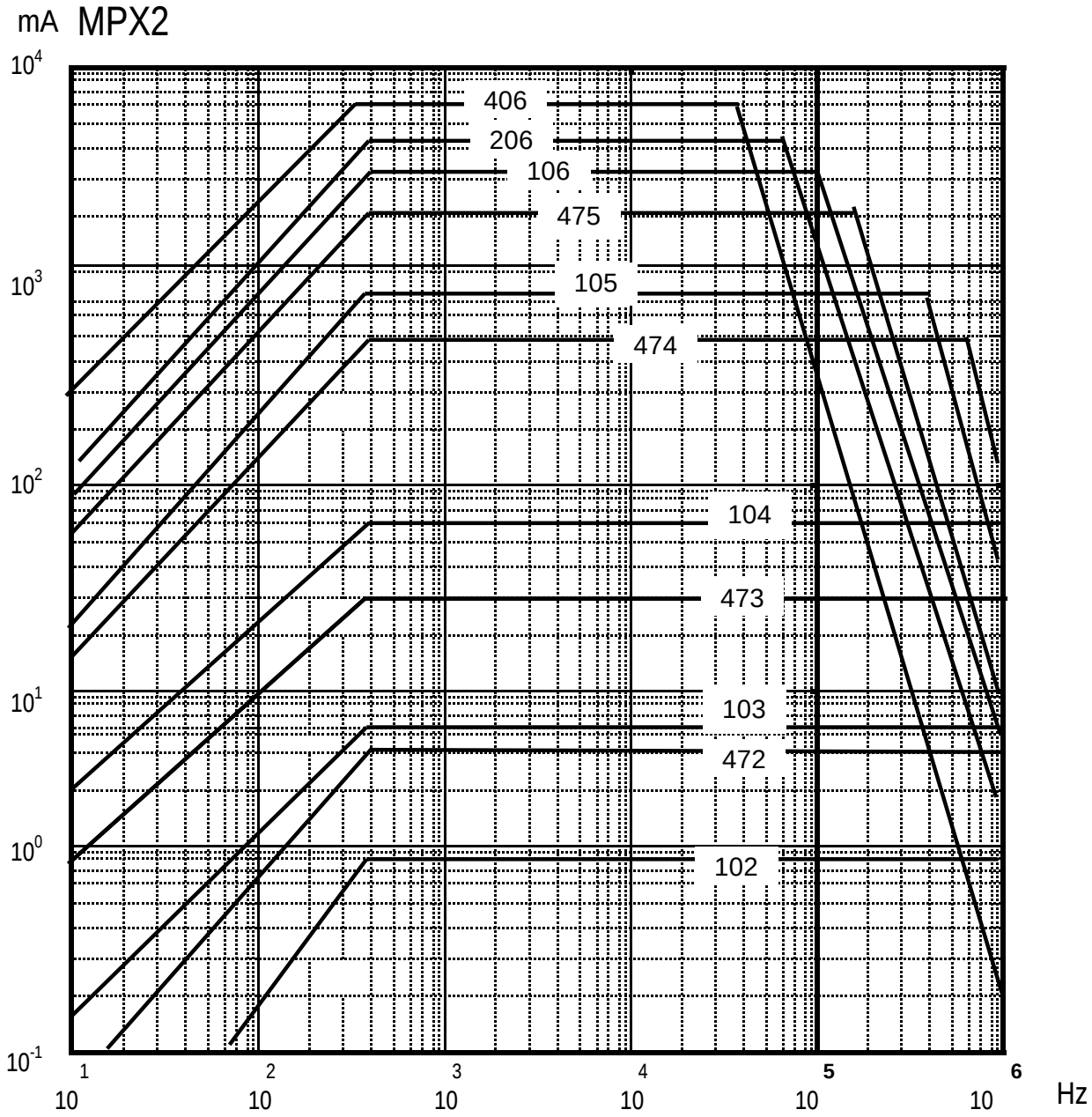
TPYE: **MPX2**

Max. RMS Voltage as a function of frequency (typical curve)

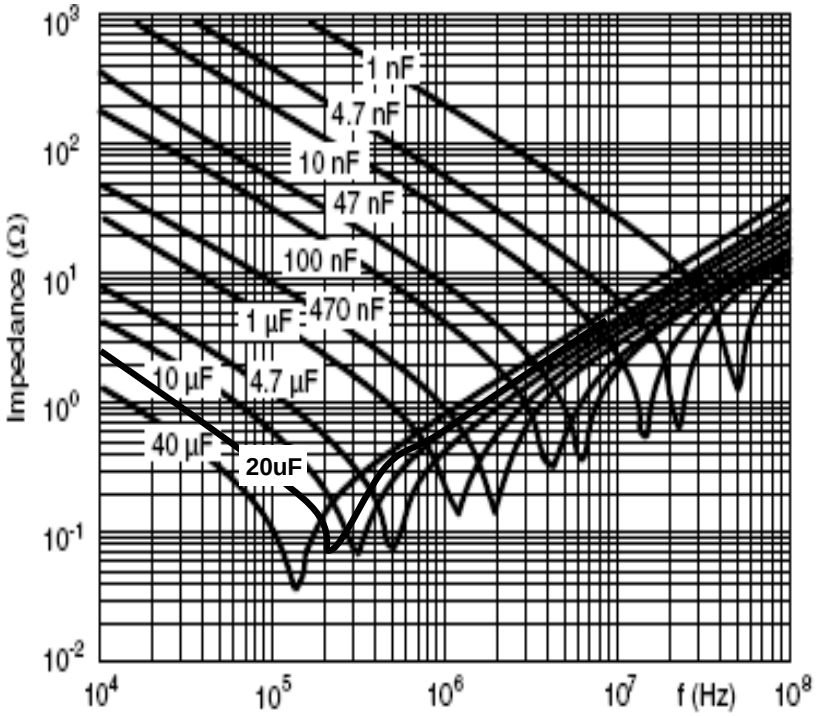


Irms Current VS frequency Curves TYPE: MPX2

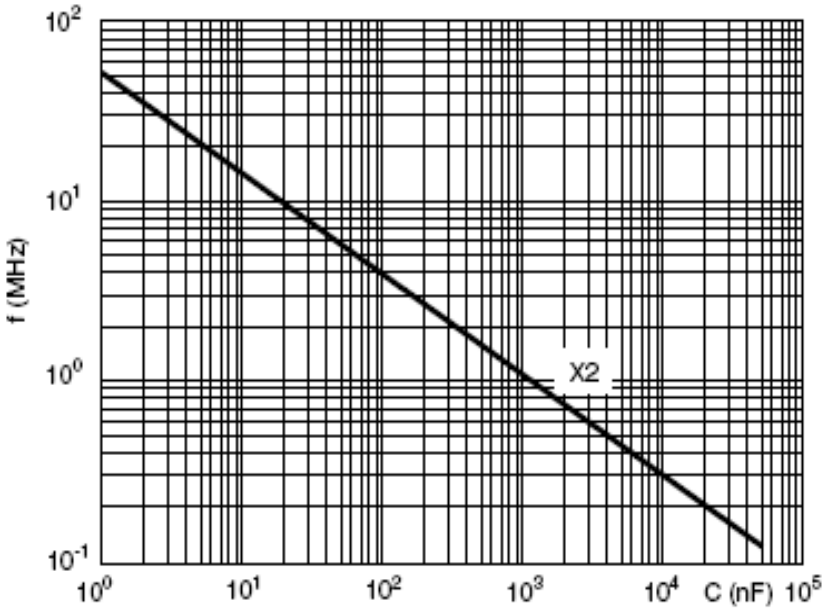
Max. RMS Current as a function of frequency (typical curve)



Impedance as a function of frequency

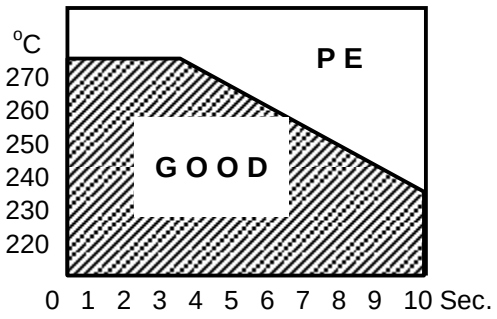


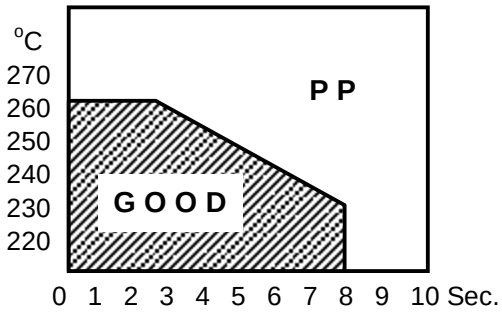
Resonant frequency as a function of capacitance



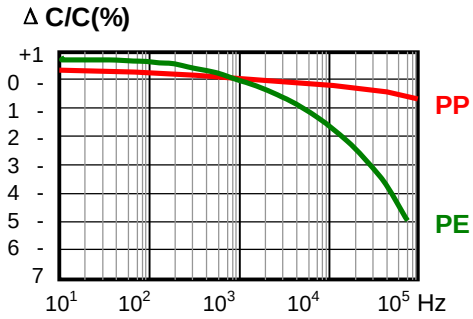
CHARACTERISTICS REFERENCE

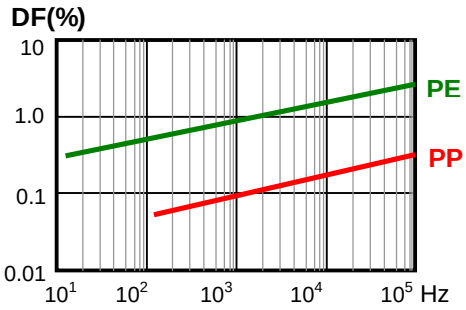
Soldering Temperature VS Time



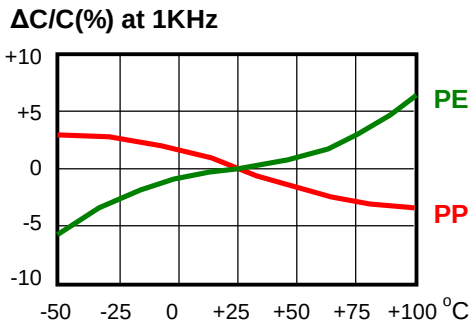


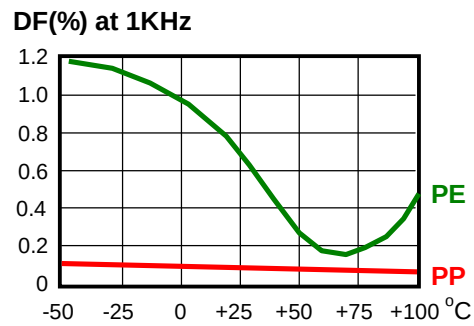
Frequency Characteristics

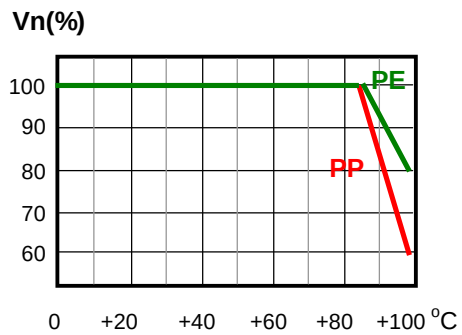


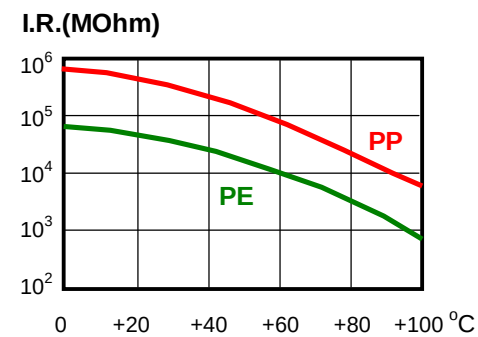


Temperature Characteristics

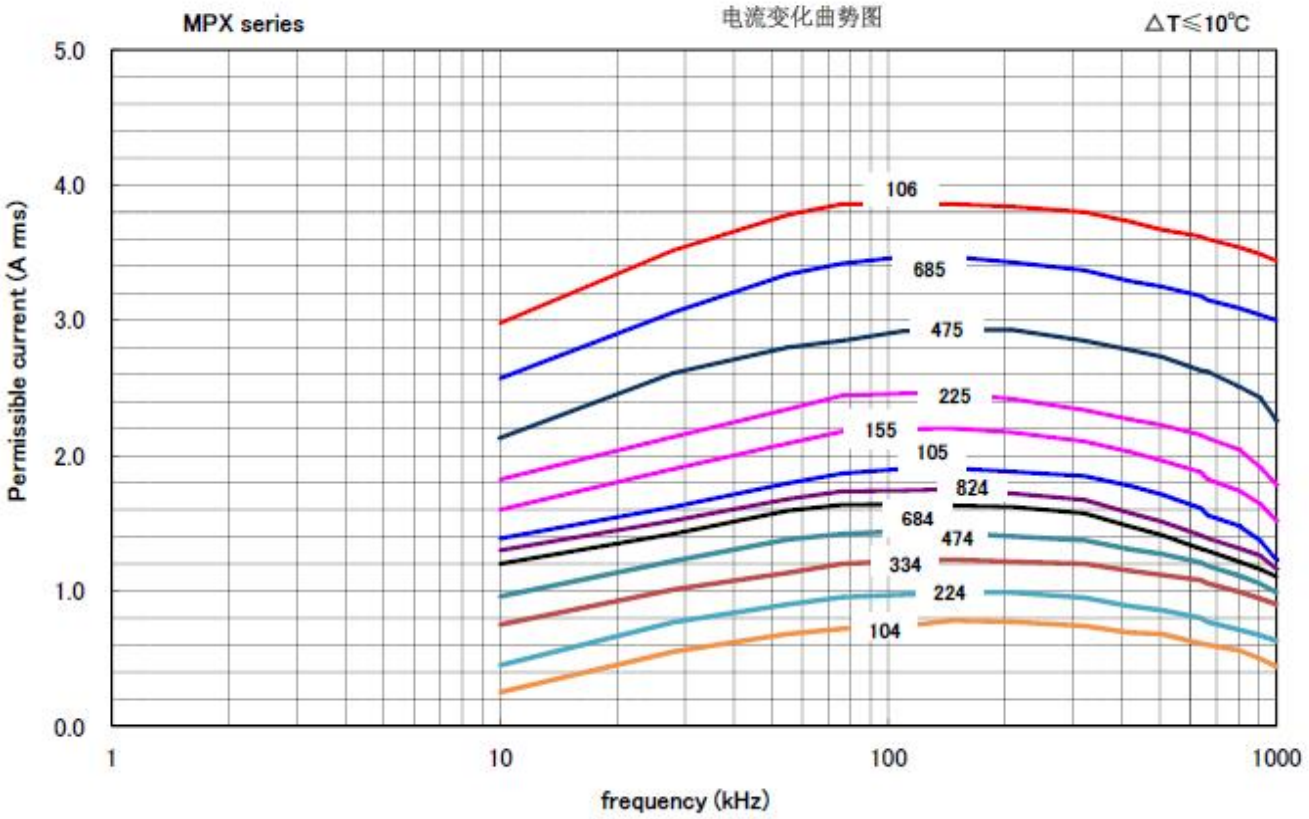




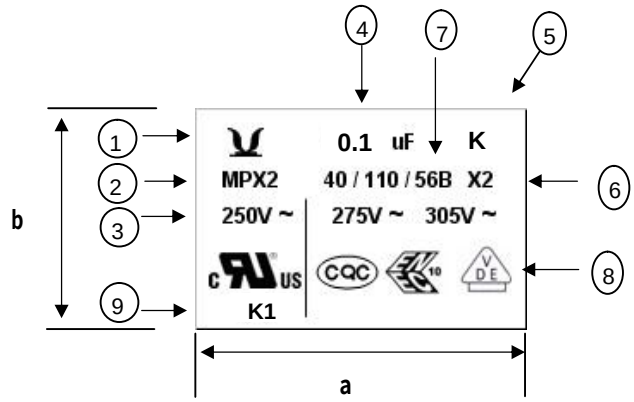




Permissible current vs frequency



MARKING **TPYE: MPX2**



1 **MANUFACTURER'S LOGO:** stands for EUROPTRONIC.

2 **TYPE OF MATERIAL:** "MPX2" stands for MPX2 type.

3 **RATED VOLTAGE :** in VAC rating.

4 **NOMINAL CAPACITANCE:** Capacitance value in uF.

5 **TOLERANCE:** in EIA 1-letter code (Please refer to"PART NUMBERING"）.

6 **CAPACITOR CLASS:** "X2" stands for X2 class

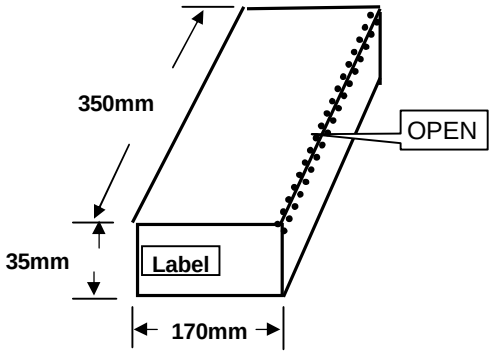
7 **CLIMATIC CATEGORY:** "40/110/56B " stand for the climate category

8 **APPROVAL BRANDS:** UL,CUL,VDE,ENEC,CQC.

9 **DATE CODE:** Year&Month (ExampleK1: 2018,January)

Year	code	Month	code	Year	code	Month	code
2000	M	1	1	2012	C	1	1
2001	N	2	2	2013	D	2	2
2002	P	3	3	2014	E	3	3
2003	R	4	4	2015	F	4	4
2004	S	5	5	2016	H	5	5
2005	T	6	6	2017	J	6	6
2006	U	7	7	2018	K	7	7
2007	V	8	8	2019	L	8	8
2008	W	9	9	2020	M	9	9
2009	X	10	A			10	A
2010	A	11	E			11	E
2011	B	12	H			12	H

Inner Box (Lead Cut)

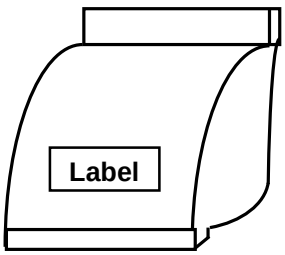


Lead Cut

Label:

1.Customer P/N
2.Europtronic P/N
3.Specification
4.Quantity
5.Net weight
6.Date

Inner Bag (Long Lead)

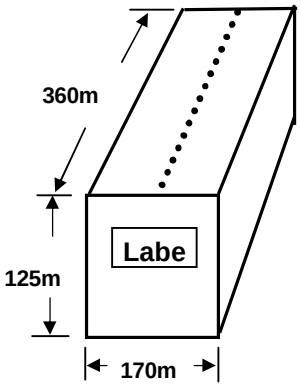


Long Lead

Label:

1.Customer P/N
2.Europtronic P/N
3.Specification
4.Quantity
5.Net weight
6.Date

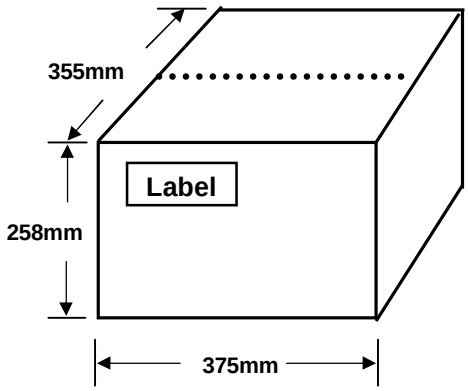
Container



Label:

1.Customer P/N
2.Europtronic P/N
3.Specification
4.Quantity
5.Net weight
6.Date

Carton



1. (1) Lead Cut: 14 Inner Box PER CARTON
   (2) Long Lead: 4 Inner Box PER CARTON

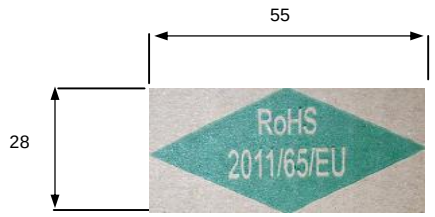
2. Label:
   A. Customer P/N
   B. Europtronic P/N
   C. Specification
   D. Quantity
   E. Net weight
   F. Date

RoHS Marking and Barcode Marking

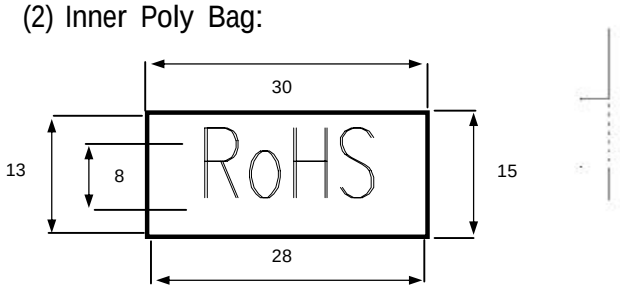
1. Size of Marking

Units: mm

(1) Outer Inner Carton,T/P
(Large / Medium Carton)

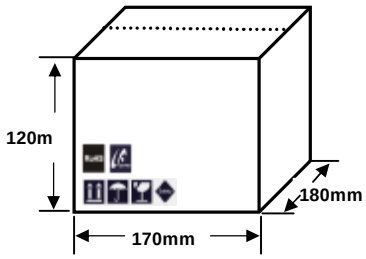


(2) Inner Poly Bag:

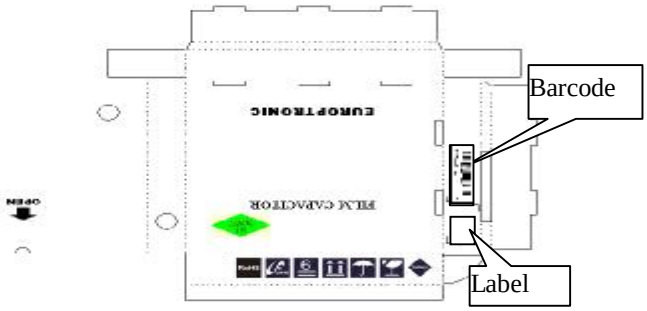


2. Position of Marking

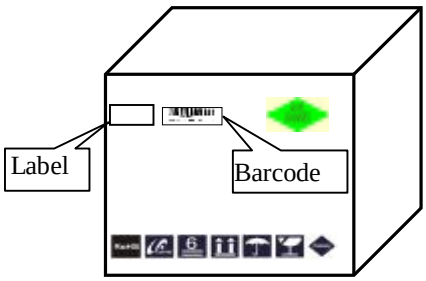
(1) Inner Box :



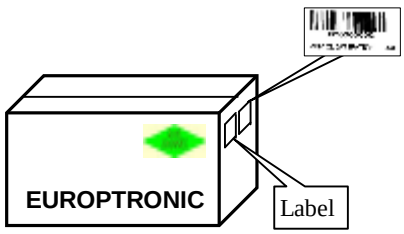
(2) Inner Box(Lead cut) T/P



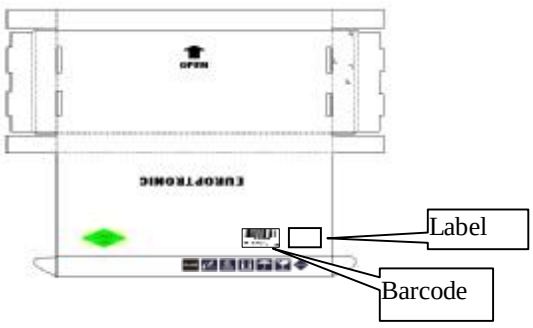
(3) Outer Carton (Large / Medium Carton)



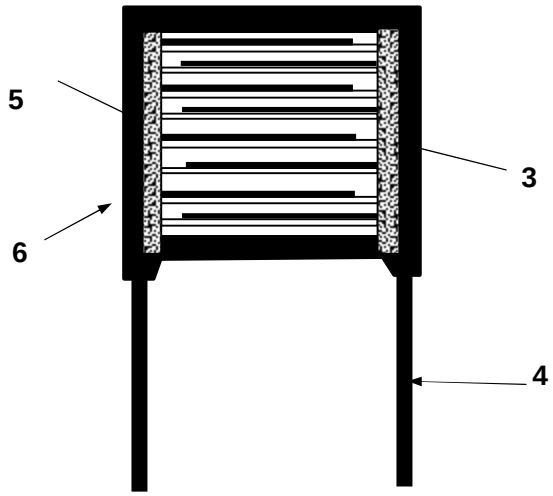
(4) Inner Carton :

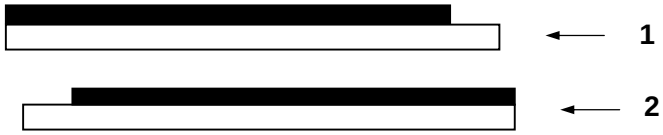


(5) Inner Box(Lead cut) X2



CONSTRUCTION & MATERIAL LIST :





NO.	Item	Materials
1	DIELECTRIC FILM	Metallized Polypropylene Film
2	DIELECTRIC FILM	Metallized Polypropylene Film
3	METAL SPRAY	Special Solder
4	LEAD WIRE	Copper-clad Steel Wire
5	RESIN	Epoxy Resin(UL94V-0)
6	CASE	Plastic Case(UL94V-0)