GENERAL INFORMATION

TYPICAL PROPERTIES AND APPLICATIONS.

POLYESTER FILM
Typical Properties:

- High dielectric constant.
- Very good ratio box and dip size capacitance.
- Very wide operating temperature range.
- Good stability.
- Excellent self-healing properties.

Typical Applications:

- Blocking and coupling.
- Decoupling.
- Timing.
- Low filtering.
- By-passing.
- Market sector with professional characteristics.

POLYPROPYLENE FILM
Typical Properties:

- Very low dielectric absorption.
- Good behaviour in frequency.
- Very high insulation resistance.
- Very good stability.
- Excellent self-healing properties.

Typical Applications:

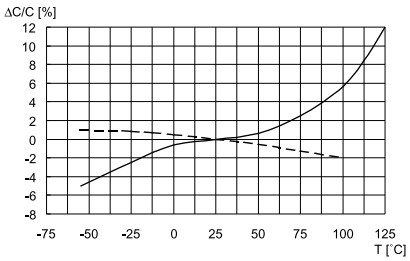
- Pulse applications.
- High current.
- AC Applications.
- SMPS & TV Set.
- Lighting.
- DC-LINK and filtering high Q.
- Timing with high stabililty.
- Industrial.

DIELECTRIC ABSORPTION(DA)
Typical Value 1KHz:

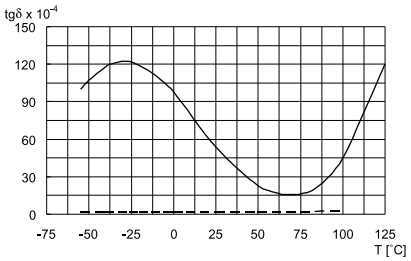
- Polyester: 0.5
- Polypropylene: 0.05

TYPICAL GRAPHS:

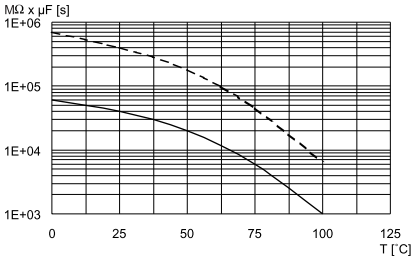
——— Polyester - - - - - - - - Polypropylene



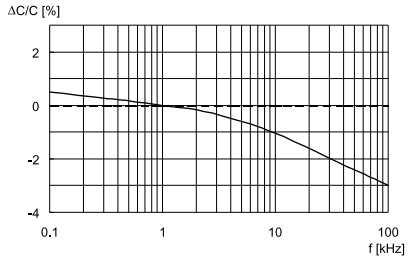
Capacitance change vs. temperature at 1kHz



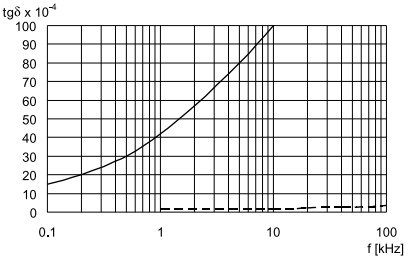
Dissipation factor vs. temperature at 1kHz



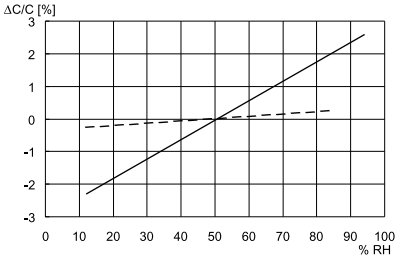
Time constant vs. temperature



Capacitance change vs. frequency (Room temperature)



Dissipation factor vs. frequency (Room temperature)



Capacitance change vs. relative humidity (RH)

Product

MPA series / Metalized Polypropylene Film Capacitors, Box type.

PRODUCT CODE SYSTEM

The part number is for MPA as follows:

MPA									
1	2	3	4	5	6	7	8	9	10

Digit 1 MPA Standard Series name.

Digit 2 D.C. rated voltage
G = 160V; I = 250V; M = 400V; P = 630V; Q = 1000V.

Digit 3 Pitch: (mm)
D=7.5; F=10; G=12.5; I=15; J=17.5; K=20;
N=22.5; M=25; R=27.5; T=32.5; Z=Special

Digit 4 to 7 Digits 5-6-7 indicate the first three digits of capacitance value and 4th digit indicates the number of zeros that must be added to obtain the rated capacitance in pF.

Digit 8 Mechanical version
4 = 18mm Min ; 5 = 25+5mm; J = 4.3±0.3mm; K = 3.2±0.3mm;
C= 5±0.5mm;

Digit 9 Capacitance tolerance:
G = ±2%, H = ±3%, J = ±5%; K = ±10%.

Digit 10 Internal use for same pitch Special size : Internal +1..Internal+2…etc,

Digit 11 Internal use for Halogen Free code is A.

GENERAL TECHNICAL DATA

Dielectric: Polypropylene film

Plates: Aluminum layer deposited by evaporation under vacuum.

Winding: Non-inductive type

Leads: Tinned wire

Protection: Plastic case, epoxy filled. Box material is solvent resistant and flame retardant according to UL94V-0

Marking: Capacitance, tolerance, DC rated voltage and Series name (for pitch = 7.5mm or higher only).

Related standard: IEC 60384-16

Specification of MPA Series

Electrical characteristics

Rated voltage (Vr)	160Vdc, 250Vdc, 400Vdc, 630Vdc.
Capacitance Range	160Vdc. 0.068～10.0uf. 250Vdc. 0.033～5.6uf. 400Vdc. 0.033～2.2uf. 630V dc. 0.0047～1.0uf.
Rated temperature	-40℃ ~ +85℃.(+105℃)
Capacitance tolerance Temperature: +25℃ Frequency: 1KHz.	±3%, ±5%, ±10%,
D.F value Temperature: +25℃	C＞1μF, D.F≦0.001 at 1Khz C≦1μF, D.F≦0.001 at 1Khz and D.F≦0.0025 at 10Khz
Insulation Resistance 100Vdc Temperature: +25℃. Duration: 1 minute.	≧ 30000MΩ for C≦0.33μF. ≧ 10000MΩ for C＞0.33μF.
Dielectric strength	1.6 x Vr applied for 2 sec at +25℃

Temperature derated voltage:

* For temperature between +85℃ and +105℃ decreasing factor of 2.0% at per each 1℃. on the rated voltage Vr dc & decreasing factor of 1.25% at per each 1℃ Vr ac.

1. When using capacitors at temperatures higher than the normally specified maximum temperature, it is necessary to reduce the working voltage .

Specification of MPA Series

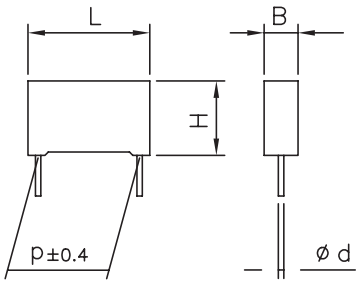
Test Item and performance

Test item	Test condition	Performance
Damp heat, steady state	Temperature: +40℃ Humidity: 93% Duration:	|△C/C| ≦ 3% D.F increase ≦ 0.0005 at 1Khz I.R ≦ 50% of initial value
Dry heat test	Temperature: +85℃ Duration: 16Hrs Removal from chamber for test less 4hrs for temperature recovery	|△C/C| ≦ 3% C＞1μF, D.F change≦0.0005 at 1Khz C≦1μF, D.F change≦0.0008 at 10Khz I.R ≦ 50% of initial value
Cold test	Temperature: -40℃ Duration: 2Hrs Removal from chamber for test less 4hrs for temperature recovery	|△C/C| ≦ 3% C＞1μF, D.F change≦0.0005 at 1Khz C≦1μF, D.F change≦0.0008 at 10Khz I.R ≦ 50% of initial value
Solder ability	Soldering temperature: 230±5℃. Duration: 2±0.5 seconds Dipping/removing speed: 25mm/ sec	Leads shall be covered with solder more than 95%.
Soldering heat resistance	Soldering temperature: 260±5℃. Duration: 10 ± 1 seconds	|△C/C| ≦ 3% C＞1μF, D.F change≦0.0005 at 1Khz C≦1μF, D.F change≦0.0008 at 10Khz I.R ≦ 50% of initial value
Vibration resistance	It should be no short circuits or open circuits in the element and state of the connection shall be stable. It should be no anomalies in appearance after test.	The frequency shall be varied uniformly from 10Hz to 55Hz at 0.75mm amplitude and back to 10Hz in approximately 1 min intervals. The test shall be applied 2 Hrs per each direction, total 6 Hrs.
Termination strength	Without mechanical damage. as break of terminal damage.	The capacitors shall be fixed and unless otherwise specified. a tensile force of 10N shall be gradually applied to the axial of leads. Then maintained for 30±5 seconds.
Load life test (Endurance)	Temperature: +85℃ Test voltage: 1.25x Vr Duration: 500Hrs Removal from chamber for test less 4hrs for temperature recovery	|△C/C| ≦ 3% C＞1μF, D.F change≦0.0005 at 1Khz C≦1μF, D.F change≦0.0008 at 10Khz I.R ≦ 50% of initial value
Long term stability	Temperature: -40℃ ~ +85℃ Humidity≦70% for yearly average Duration≦12 months	|△C/C| ≦ 2%

Specification of MPA Series

Dimension

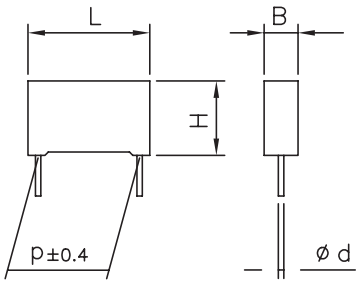
Part Number	Cap(μF)	160Vdc/90vac					
		L	H	T	P	d	dv/dt
MPAGF2680___	0.068	13.0	9.0	4.0	10.0	0.6	160
MPAGF2820___	0.082	13.0	9.0	4.0	10.0	0.6	160
MPAGF3100___	0.1	13.0	11.0	5.0	10.0	0.6	160
MPAGF3120___	0.12	13.0	11.0	5.0	10.0	0.6	160
MPAGF3150___	0.15	13.0	12.0	6.0	10.0	0.6	160
MPAGF3180___	0.18	13.0	12.0	6.0	10.0	0.6	160
MPAGF3220___	0.22	13.0	12.0	6.0	10.0	0.6	160
MPAGI 3220___	0.22	18.0	11.0	5.0	15.0	0.8	100
MPAGI 3270___	0.27	18.0	12.0	6.0	15.0	0.8	100
MPAGI 3330___	0.33	18.0	12.0	6.0	15.0	0.8	100
MPAGI 3390___	0.39	18.0	13.5	7.5	15.0	0.8	100
MPAGI 3470___	0.47	18.0	13.5	7.5	15.0	0.8	100
MPAGI 3560___	0.56	18.0	14.5	8.5	15.0	0.8	100
MPAGI 3680___	0.68	18.0	14.5	8.5	15.0	0.8	100
MPAGN3820___	0.82	26.5	16.5	7.0	22.5	0.8	60
MPAGN4100___	1	26.5	17.0	8.5	22.5	0.8	60
MPAGN4120___	1.2	26.5	17.0	8.5	22.5	0.8	60
MPAGR4120___	1.5	26.5	19.0	10.0	22.5	0.8	60
MPAGR4180___	1.8	32.0	20.0	11.0	27.5	0.8	50
MPAGR4220___	2.2	32.0	20.0	11.0	27.5	0.8	50
MPAGR4270___	2.7	32.0	20.0	11.0	27.5	0.8	50
MPAGR4330___	3.3	32.0	22.0	13.0	27.5	0.8	50
MPAGR4390___	3.9	32.0	22.0	13.0	27.5	0.8	50
MPAGR4470___	4.7	32.0	25.0	14.0	27.5	0.8	50
MPAGR4560___	5.6	32.0	30.0	15.0	27.5	0.8	50
MPAGR4680___	6.8	32.0	30.0	15.0	27.5	0.8	50
MPAGR4820___	8.2	32.0	33.0	18.0	27.5	0.8	50
MPAGR5100___	10	32.0	33.0	18.0	27.5	0.8	50



Specification of MPA Series

Dimension

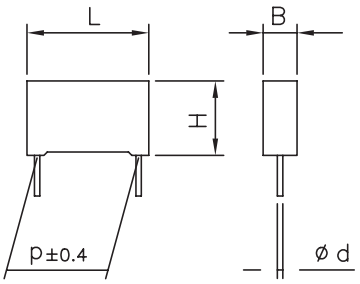
Part Number	Cap(μF)	250Vdc/160vac					
		L	H	T	P	d	dv/dt
MPAIF2330___	0.033	13.0	9.0	4.0	10.0	0.6	200
MPAIF2390___	0.039	13.0	11.0	5.0	10.0	0.6	200
MPAIF2470___	0.047	13.0	11.0	5.0	10.0	0.6	200
MPAIF2560___	0.056	13.0	12.0	6.0	10.0	0.6	200
MPAIF2680___	0.068	13.0	12.0	6.0	10.0	0.6	200
MPAIF3220___	0.22	13.0	12.0	6.0	10.0	0.6	200
MPAII 2280___	0.082	18.0	11.0	5.0	15.0	0.8	150
MPAII 3100___	0.1	18.0	11.0	5.0	15.0	0.8	150
MPAII 3120___	0.12	18.0	11.0	5.0	15.0	0.8	150
MPAII 3150___	0.15	18.0	12.0	6.0	15.0	0.8	150
MPAII 3180___	0.18	18.0	12.0	6.0	15.0	0.8	150
MPAII 3220___	0.22	18.0	13.5	7.5	15.0	0.8	150
MPAII 3270___	0.27	18.0	13.5	7.5	15.0	0.8	150
MPAII 4100___	1	18.0	14.5	8.5	15.0	0.8	100
MPAIK4220___	2.2	23.0	20.5	11.5	20.0	0.8	100
MPAIN3330___	0.33	26.5	15.0	6.0	22.5	0.8	100
MPAIN3390___	0.39	26.5	15.0	6.0	22.5	0.8	100
MPAIN3470___	0.47	26.5	16.5	7.0	22.5	0.8	100
MPAIN3560___	0.56	26.5	16.5	7.0	22.5	0.8	100
MPAIN3680___	0.68	26.5	17.0	8.5	22.5	0.8	100
MPAIR4100___	1	26.5	16.5	7.0	22.5	0.8	100
MPAIR3820___	0.82	32.0	20.0	11.0	27.5	0.8	80
MPAIR4100___	1	32.0	20.0	11.0	27.5	0.8	80
MPAIR4120___	1.2	32.0	20.0	11.0	27.5	0.8	80
MPAIR4150___	1.5	32.0	20.0	11.0	27.5	0.8	80
MPAIR4180___	1.8	32.0	22.0	13.0	27.5	0.8	80
MPAIR4220___	2.2	32.0	22.0	13.0	27.5	0.8	80
MPAIR4270___	2.7	32.0	25.0	14.0	27.5	0.8	80
MPAIR4330___	3.3	32.0	30.0	15.0	27.5	0.8	80
MPAIR4390___	3.9	32.0	30.0	15.0	27.5	0.8	80
MPAIR4470___	4.7	32.0	33.0	18.0	27.5	0.8	80
MPAIR4560___	5.6	32.0	33.0	18.0	27.5	0.8	80



Specification of MPA Series

Dimension

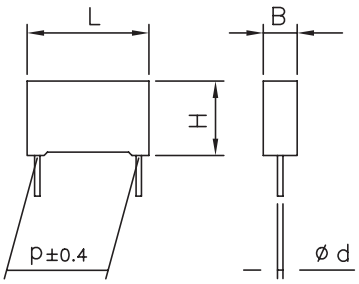
Part Number	Cap(μF)	400Vdc/220vac					
		L	H	T	P	d	dv/dt
MPAMD2330___	0.033	10.5	10.0	6.0	7.5	0.6	425
MPAMF2150___	0.015	13.0	9.0	4.0	10.0	0.6	400
MPAMF2180___	0.018	13.0	9.0	4.0	10.0	0.6	400
MPAMF2220___	0.022	13.0	11.0	5.0	10.0	0.6	400
MPAMF2270___	0.027	13.0	11.0	5.0	10.0	0.6	400
MPAMF2330___	0.033	13.0	12.0	6.0	10.0	0.6	400
MPAMF2390___	0.039	13.0	12.0	6.0	10.0	0.6	400
MPAMF2470___	0.047	13.0	12.0	6.0	10.0	0.6	400
MPAMF3100___	0.1	13.0	11.0	5.0	10.0	0.6	400
MPAMI 2560___	0.056	18.0	12.0	6.0	15.0	0.8	280
MPAMI 2680___	0.068	18.0	12.0	6.0	15.0	0.8	280
MPAMI 2820___	0.082	18.0	12.0	6.0	15.0	0.8	280
MPAMI 3100___	0.1	18.0	13.5	7.5	15.0	0.8	280
MPAMI 3120___	0.12	18.0	13.5	7.5	15.0	0.8	280
MPAMI 3150___	0.15	18.0	14.5	8.5	15.0	0.8	280
MPAMI 3180___	0.18	18.0	16.0	10.0	15.0	0.8	280
MPAMI 3220___1	0.22	18.0	12.0	6.0	15.0	0.8	280
MPAMI 3220___	0.22	18.0	16.0	10.0	15.0	0.8	280
MPAMN3180___	0.18	26.5	16.5	7.0	22.5	0.8	165
MPAMN3220___	0.22	26.5	16.5	7.0	22.5	0.8	165
MPAMN3270___	0.27	26.5	17.0	8.5	22.5	0.8	165
MPAMN3330___	0.33	26.5	17.0	8.5	22.5	0.8	165
MPAMN3390___	0.39	26.5	19.0	10.0	22.5	0.8	165
MPAMN3470___	0.47	26.5	19.0	10.0	22.5	0.8	165
MPAMR3390___	0.39	32.0	20.0	11.0	27.5	0.8	120
MPAMR3470___	0.47	32.0	20.0	11.0	27.5	0.8	120
MPAMR3560___	0.56	32.0	20.0	11.0	27.5	0.8	120
MPAMR3680___	0.68	32.0	20.0	11.0	27.5	0.8	120
MPAMR3820___	0.82	32.0	22.0	13.0	27.5	0.8	120
MPAMR4100___	1	32.0	25.0	14.0	27.5	0.8	120
MPAMR4120___	1.2	32.0	30.0	15.0	27.5	0.8	120
MPAMR4150___	1.5	32.0	30.0	15.0	27.5	0.8	120
MPAMR4180___	1.8	32.0	33.0	18.0	27.5	0.8	120
MPAMR4220___	2.2	32.0	33.0	18.0	27.5	0.8	120



Specification of MPA Series

Dimension

Part Number	Cap(μF)	630Vdc/250vac					
		L	H	T	P	d	dv/dt
MPAPF1470___	0.0047	13.0	9.0	4.0	10.0	0.6	380
MPAPF1560___	0.0056	13.0	9.0	4.0	10.0	0.6	380
MPAPF1680___	0.0068	13.0	9.0	4.0	10.0	0.6	380
MPAPF1820___	0.0082	13.0	9.0	4.0	10.0	0.6	380
MPAPF1820___1	0.0082	13.0	11.0	5.0	10.0	0.6	380
MPAPF2100___	0.01	13.0	11.0	5.0	10.0	0.6	380
MPAPF2120___	0.012	13.0	11.0	5.0	10.0	0.6	380
MPAPF2150___	0.015	13.0	11.0	5.0	10.0	0.6	380
MPAPF2150___1	0.015	13.0	12.0	6.0	10.0	0.6	380
MPAPF2180___	0.018	13.0	11.0	7.0	10.0	0.6	380
MPAPF2220___	0.022	13.0	11.0	5.0	10.0	0.6	380
MPAPF2270___1	0.027	13.0	11.0	5.0	10.0	0.6	380
MPAPF2270___	0.027	13.0	12.0	7.0	10.0	0.6	380
MPAPF2330___	0.033	13.0	11.0	5.0	10.0	0.6	380
MPAPF2390___	0.039	13.0	11.0	7.0	10.0	0.6	380
MPAPF2470___	0.047	13.0	10.0	7.0	10.0	0.6	380
MPAPF2470___	0.047	13.0	11.0	7.0	10.0	0.6	380
MPAPF2680___	0.068	13.0	14.0	9.0	10.0	0.6	380
MPAPI 2180___	0.018	18.0	11.0	5.0	15.0	0.8	220
MPAPI 2220___	0.022	18.0	12.0	6.0	15.0	0.8	220
MPAPI 2270___	0.027	18.0	12.0	6.0	15.0	0.8	220
MPAPI 2330___	0.033	18.0	12.0	6.0	15.0	0.8	220
MPAPI 2390___	0.039	18.0	12.0	7.0	15.0	0.8	220
MPAPI 2470___	0.047	18.0	13.5	7.5	15.0	0.8	220
MPAPI 2560___	0.056	18.0	13.5	7.5	15.0	0.8	220
MPAPI 2680___	0.068	18.0	15.0	9.0	15.0	0.8	220
MPAPN2820___	0.082	26.5	15.0	6.0	22.5	0.8	140
MPAPN3100___	0.1	26.5	15.0	6.0	22.5	0.8	140
MPAPN3120___	0.12	26.5	15.0	6.0	22.5	0.8	140
MPAPN3150___1	0.15	26.5	15.0	6.0	22.5	0.8	140
MPAPN3150___	0.15	26.5	17.0	8.5	22.5	0.8	140
MPAPN3220___	0.22	26.5	17.0	8.5	22.5	0.8	140
MPAPN3470___	0.47	26.5	18.5	8.5	22.5	0.8	140
MPAPN3680___	0.68	26.5	18.5	10.0	22.5	0.8	140
MPAPN4100___	1	26.5	19.0	10.0	22.5	0.8	140
MPAPR3180___	0.18	32.0	20.0	11.0	27.5	0.8	105
MPAPR3220___	0.22	32.0	20.0	11.0	27.5	0.8	105
MPAPR3270___	0.27	32.0	20.0	11.0	27.5	0.8	105
MPAPR3330___	0.33	32.0	22.0	13.0	27.5	0.8	105
MPAPR3390___	0.39	32.0	22.0	13.0	27.5	0.8	105
MPAPR3470___	0.47	32.0	25.0	14.0	27.5	0.8	105
MPAPR3560___	0.56	32.0	30.0	15.0	27.5	0.8	105
MPAPR3680___	0.68	32.0	30.0	15.0	27.5	0.8	105
MPAPR3820___	0.82	32.0	33.0	18.0	27.5	0.8	105
MPAPR4100___	1	32.0	33.0	18.0	27.5	0.8	105



Specification of MPA Series

Soldering suggestions

1. Max soldering temperature:

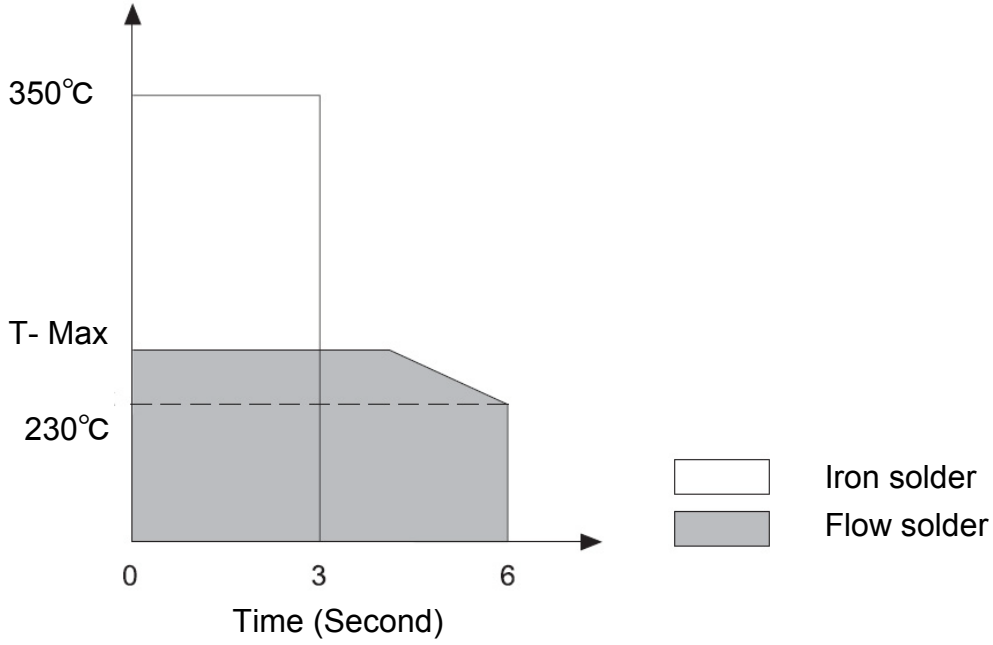
Max temperature (T-Max) for MKT (Pitch ≧ 7.5mm): 265±5℃ for 4 seconds.

Max temperature (T-Max) for MKT (Pitch 5mm): 260℃ for 4 seconds.

Max temperature (T-Max) for MKP: 260℃ for 4 seconds.

Temperature

Pre-Heating	Temperature	T ime
	110℃	1 Min
	100℃	1 Min for KP & MKP≦P:7.5mm



2. Additional condition:

If two time soldering are needed, please apply a recovery time until the temperature on the surface of capacitor is below 50℃.

Avoid applying the reflow soldering with both leaded parts and SMD parts.

Storage suggestions:

In order to keep the electrical characteristic of capacitor in line with the specification, please store the capacitors in the following condition:

Storage duration: ≦ 12 months from the date which showed on the label.

Temperature: -40℃ to 80℃.

Humidity: ≦ 70%.

Specification of MPA Series

Marking:

The marking on each capacitor should contain Capacitance, Tolerance and Rated voltage.

Packing:

For Bulk type, small inner cardboard box / PVC bag with desiccants and label packed in one standard export carton.