



DURA 'TECH' '@@7'

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 stability.
- Industrial.

DIELECTRIC ABSORPTION(DA)

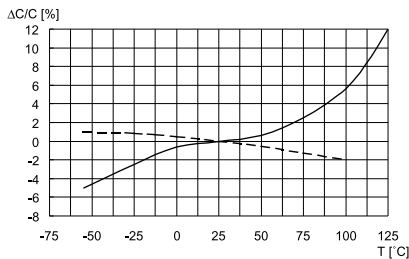
Typical Value 1KHz:

- * Polyester: 0.5
- * Polypropylene: 0.05

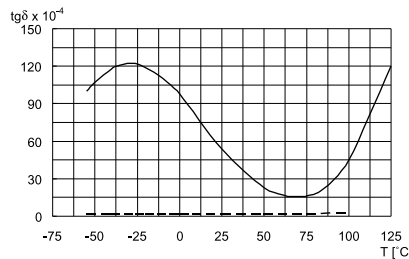
TYPICAL GRAPHS:

————— Polyester

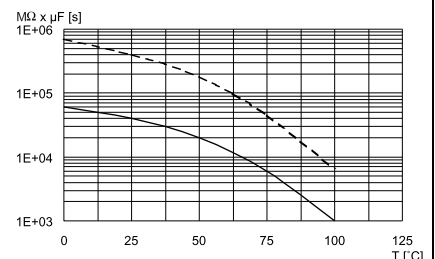
----- Polypropylene



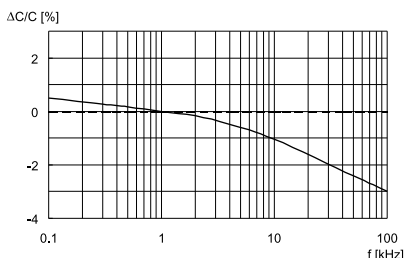
Capacitance change vs. temperature at 1kHz



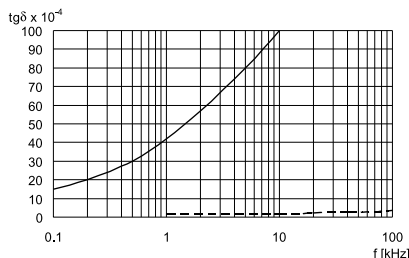
Dissipation factor vs. temperature at 1kHz



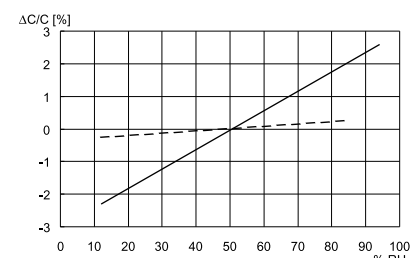
Time constant vs. temperature



Capacitance change vs. frequency (Room temperature)



Dissipation factor vs. frequency (Room temperature)



Capacitance change vs. relative humidity (RH)

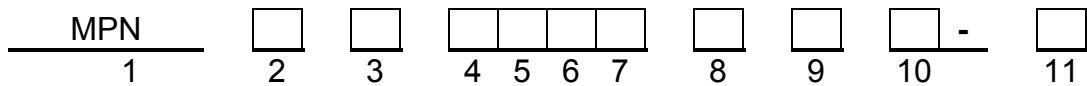


Product

MPN series / Metalized Polypropylene Film Capacitors, Resin dipped. Reduced size.

PRODUCT CODE SYSTEM

The part number is for MPN as follows:



- Digit 1 Series name.
- Digit 2 D.C. rated voltage
X = 450V; V = 520V
- Digit 3 Pitch: (mm)
D=7.5; F=10; G=12.5; I=15; J=17.5; K=20; N=22.5;
- 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; L = 3.5±0.5mm;
- Digit 9 Capacitance tolerance:
J = ±5%; K = ±10%; M = ±20%
- 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: Flame-retardant epoxy resin coating (UL94V-0).
- Marking: Capacitance, tolerance, DC rated voltage and Series name(for pitch = 7.5mm or higher only).
- Related standard: IEC 60384-2



Specification of MPN Series

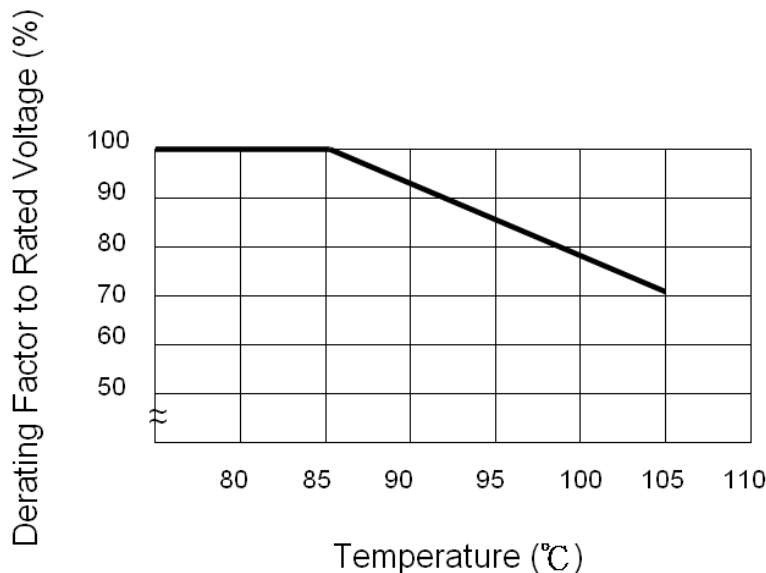
Electrical characteristics

Rated voltage (Vr)	450Vdc, 520Vdc,
Capacitance Range	450Vdc. 0.1~1.5uf 520Vdc. 0.047~2.2uf
Rated temperature	-40°C ~ +85°C. (+105°C)
Capacitance tolerance Temperature: +25°C Frequency: 1KHz.	±5%, ±10%, ±20%,
D.F value Temperature: +25°C	C > 1μF, D.F ≤ 0.001 at 1Khz C ≤ 1 μF, D.F ≤ 0.001 at 1Khz and D.F ≤ 0.0025 at 10Khz
Insulation Resistance 100Vdc Temperature: +25°C. Duration: 1 minute.	≥ 30000MΩ for C ≤ 0.33 μF. ≥ 10000MΩ for C > 0.33μF.

Temperature derated voltage:

* For temperature between +85°C and +105°C decreasing factor of 1.25% at per each 1°C. on the rated voltage Vr (dc & ac). has to applied.

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





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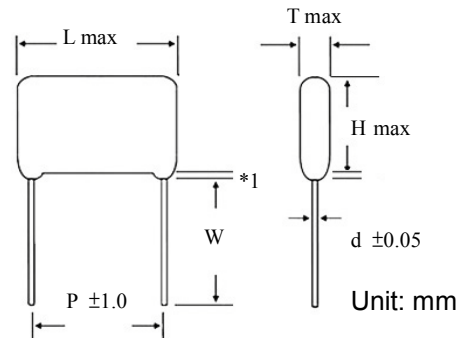
Test Item and performance

Test item	Test condition	Performance
Damp heat, steady state	Temperature: +40°C Humidity: 93% Duration:	$ \Delta C/C \leq 3\%$ D.F increase ≤ 0.0005 at 1Khz I.R $\leq 50\%$ of initial value
Dry heat test	Temperature: +85°C Duration: 16Hrs Removal from chamber for test less 4hrs for temperature recovery	$ \Delta C/C \leq 3\%$ $C > 1\mu F$, D.F change ≤ 0.0005 at 1Khz $C \leq 1\mu F$, D.F change ≤ 0.0008 at 10Khz I.R $\leq 50\%$ of initial value
Cold test	Temperature: -40°C Duration: 2Hrs Removal from chamber for test less 4hrs for temperature recovery	$ \Delta C/C \leq 3\%$ $C > 1\mu F$, D.F change ≤ 0.0005 at 1Khz $C \leq 1\mu F$, D.F change ≤ 0.0008 at 10Khz I.R $\leq 50\%$ of initial value
Solder ability	Soldering temperature: 230±5°C. 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°C. Duration: 10 ± 1 seconds	$ \Delta C/C \leq 3\%$ $C > 1\mu F$, D.F change ≤ 0.0005 at 1Khz $C \leq 1\mu F$, D.F change ≤ 0.0008 at 10Khz I.R $\leq 50\%$ 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°C Test voltage: 1.25x Vr Duration: 500Hrs Removal from chamber for test less 4hrs for temperature recovery	$ \Delta C/C \leq 3\%$ $C > 1\mu F$, D.F change ≤ 0.0005 at 1Khz $C \leq 1\mu F$, D.F change ≤ 0.0008 at 10Khz I.R $\leq 50\%$ of initial value
Long term stability	Temperature: -40°C ~ +85°C Humidity $\leq 70\%$ for yearly average Duration ≤ 12 months	$ \Delta C/C \leq 2\%$

Specification of MPN Series

Dimension

Part Number	Cap(uF)	450Vdc/200vac				
		L	H	T	P	d
MPNXF3100	0.1	13.0	9.0	5.0	10.0	0.6
MPNXF3150	0.15	13.0	11.0	4.5	10.0	0.6
MPNXF3220	0.22	13.0	11.8	6.0	10.0	0.6
MPNXF3330	0.33	13.0	14.0	6.5	10.0	0.6
MPNXF3470	0.47	13.0	16.5	7.3	10.0	0.6
MPNXF4100	1	13.0	16.5	8.0	10.0	0.6
MPNXI3560	0.56	18.5	14.5	6.5	15.0	0.8
MPNXI3680	0.68	18.5	14.5	7.0	15.0	0.8
MPNXI4100	1	18.5	16.8	8.0	15.0	0.8
MPNXI4150	1.5	18.5	16.5	8.7	15.0	0.8
MPNXN4150	1.5	25.5	16.5	7.7	22.5	0.8



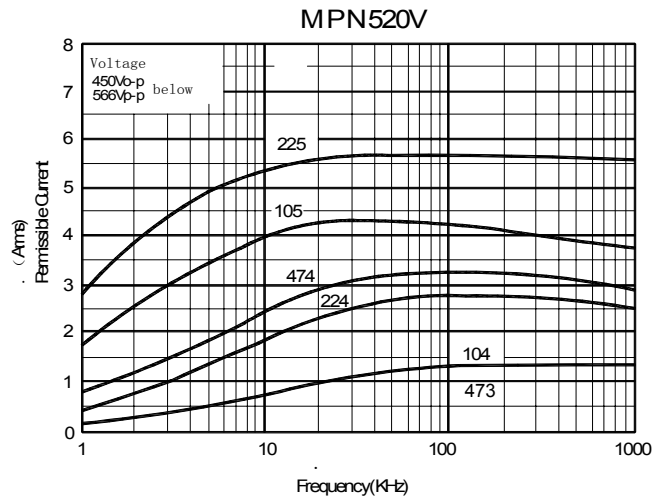
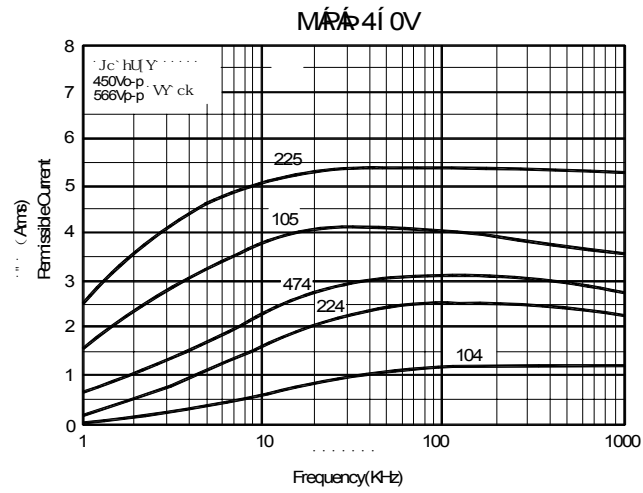
*1 : Max value 1.5mm
 W : Please refer to the mechanical Version in the product code system.

Part Number	Cap(uF)	520Vdc/220Vac				
		L	H	T	P	d
MPNVD2100	0.001	10.0	9.0	5.5	7.5	0.6
MPNVF2470	0.047	12.5	8.5	5.0	10.0	0.6
MPNVF3100	0.1	12.5	9.5	5.5	10.0	0.6
MPNVF3150	0.15	13.0	10.6	5.8	10.0	0.6
MPNVF3220	0.22	13.0	11.7	6.0	10.0	0.6
MPNVF3330	0.33	13.0	14.0	6.5	10.0	0.6
MPNVF3470	0.47	13.0	16.2	7.3	10.0	0.6
MPNVF3680	0.68	13.0	15.2	7.0	10.0	0.8
MPNVI3220	0.22	18.0	10.5	5.8	15.0	0.8
MPNVI3470	0.47	18.5	13.2	6.0	15.0	0.6
MPNVI3680	0.68	18.5	14.5	7.0	15.0	0.8
MPNVI3680	0.68	18.5	16.0	7.5	15.0	0.8
MPNVI4100	1	18.5	16.8	8.0	15.0	0.8
MPNVI4150	1.5	18.5	16.5	11.5	15.0	0.8
MPNVN4150	1.5	25.5	16.5	8.7	22.5	0.8
MPNVN4220	2.2	25.5	19.0	8.8	22.5	0.8



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Soldering suggestions

1. Max soldering temperature:

Max temperature (T-Max) for MKT (Pitch $\geq 7.5\text{mm}$): $265\pm 5^\circ\text{C}$ for 4 seconds.

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

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

Temperature

Pre-Heating

Temperature

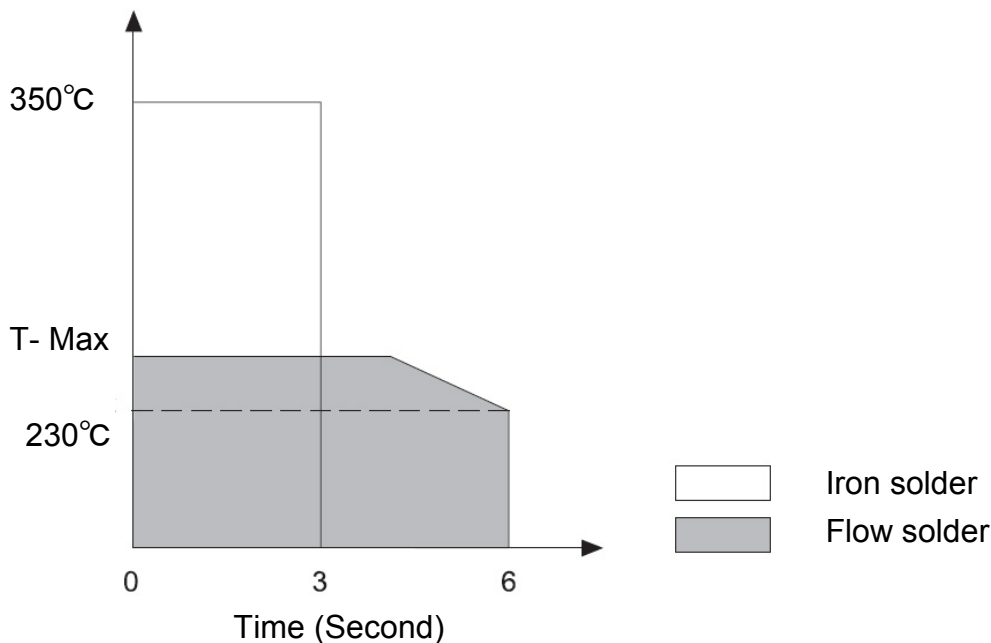
Time

110°C

1 Min

100°C

1 Min for KP & MKP $\leq P:7.5\text{mm}$



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°C .

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°C to 80°C .

Humidity: $\leq 70\%$.



Specification of MPN 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.