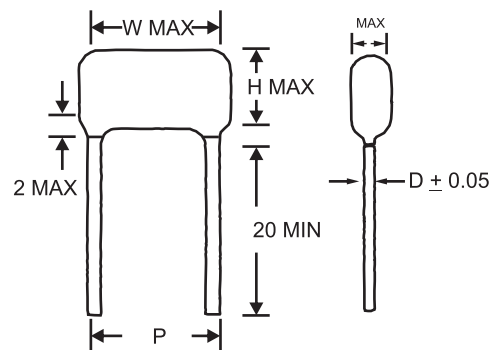


### INTRODUCTION

MPP series are constructed with metalized polypropylene film dielectric, copperplated lead and flame retardant epoxy resin coating. The MPP series is smaller than the PMD series. Suitable blocking, by-pass, coupling, decoupling, filtering, timing, tuning, temperature compensation and ideal for use in ballasts, switching power supplies, telecommunication equipment, industrial instruments, automatic control systems and other general electronic equipment.

### FEATURES

- Low dissipation factor at high frequency
- High capacitance and dissipation factor stability
- Non-inductive construction
- Self-healing
- Flame retardant epoxy resin coating (compliant to UL 94V-0)



(Can be box encapsulated. See MPB series.)

### SPECIFICATIONS

| Items                                              | Performance                                                                                                                                               |                    |                          |                          |                          |                         |
|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------------|--------------------------|--------------------------|-------------------------|
| Operating Voltage Range                            | 100Vdc, 250Vdc, 400Vdc, 630Vdc                                                                                                                            |                    |                          |                          |                          |                         |
| Rated Temperature                                  | -40 °C ~ +85°C                                                                                                                                            |                    |                          |                          |                          |                         |
| Usable Upper Category Temperature                  | +105°C<br>(Derating ratio of rated voltage over +85 °C ~ +110°C: 1.5% per °C of Rated Voltage)                                                            |                    |                          |                          |                          |                         |
| Capacitance Range                                  | 0.01 $\mu$ F ~ 10 $\mu$ F                                                                                                                                 |                    |                          |                          |                          |                         |
| Capacitance Tolerance                              | $\pm 3\%$ (H), $\pm 5\%$ (J), $\pm 10\%$ (K)                                                                                                              |                    |                          |                          |                          |                         |
| Dissipation Factor                                 | KHz                                                                                                                                                       | $C \leq 0.1 \mu F$ | $0.1 < C \leq 1.0 \mu F$ | $1.0 < C \leq 3.0 \mu F$ | $3.0 < C \leq 5.0 \mu F$ | $5.0 < C \leq 10 \mu F$ |
|                                                    | 1                                                                                                                                                         | $\leq 0.10\%$      |                          |                          |                          |                         |
|                                                    | 100                                                                                                                                                       | $\leq 0.40\%$      | $\leq 0.70\%$            | $\leq 1.20\%$            | $\leq 1.80\%$            | $\leq 2.80\%$           |
| Insulation Resistance Terminal to Terminal         | Voltage Charge: 100Vdc x 1min (at 20°C $\pm$ 5°C)<br>$\geq 30,000M\Omega$ for $C \leq 0.33\mu F$<br>$\geq 10,000M\Omega \times \mu F$ for $C > 0.33\mu F$ |                    |                          |                          |                          |                         |
| Withstand Voltage                                  | Terminal to Terminal: (at 20°C $\pm$ 5°C)                                                                                                                 |                    |                          |                          |                          |                         |
| Rated Voltage<br>Pulse Slope dV/dt<br>(V/ $\mu$ s) | Pitch                                                                                                                                                     | 7.5mm              | 10mm                     | 15mm                     | 22.5mm                   | 27.5mm                  |
|                                                    | VR                                                                                                                                                        |                    |                          |                          |                          |                         |
|                                                    | 100Vdc                                                                                                                                                    | 130                | 110                      | 100                      | 70                       | 50                      |
|                                                    | 250Vdc                                                                                                                                                    | 240                | 220                      | 200                      | 130                      | 100                     |
|                                                    | 400Vdc                                                                                                                                                    | --                 | 350                      | 300                      | 200                      | 150                     |
|                                                    | 630Vdc                                                                                                                                                    | --                 | 420                      | 400                      | 250                      | 180                     |

### RELIABILITY TEST

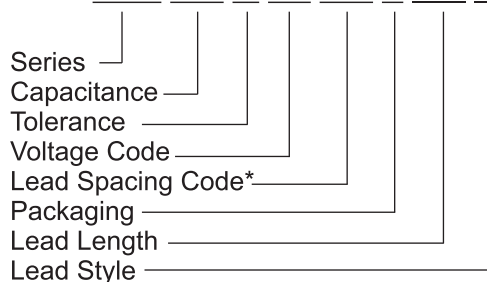
| Item                                           | Test Methods                                                                           | Requirements                                                                                                                 |
|------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Resistance to Soldering Heat<br>IEC 60068-2-20 | Solder Bath: 260°C $\pm$ 5°C<br>Immersion Time: 10sec $\pm$ 1sec                       | Capacitance Change $\Delta C/C$ : $\leq 1\%$<br>DF Change $\Delta \tan \delta$ : 0.1% at 1KHz<br>IR: $\geq$ limit value      |
| Resistance to Vibration<br>IEC 60068-2-6       | Frequency Range: 10Hz to 55Hz<br>Amplitude: 1.5mm<br>Duration: 6 hours                 | There shall be no Visible Damage,<br>No Intermittent Contact,<br>No Open or Short Circuit                                    |
| Damp Heat, Steady State<br>IEC 60068-2-3       | Temperature: 40°C $\pm$ 2°C<br>Relative Humidity: 90% to 95%<br>Duration: 1,000 hours  | Capacitance Change $\Delta C/C$ : $\leq 3\%$<br>DF Change $\Delta \tan \delta$ : 0.1% at 1KHz<br>IR: $\geq 50\%$ limit value |
| Electrical Endurance<br>IEC 60384-17           | Temperature: 85°C $\pm$ 2°C<br>Voltage Applied: 1.25 x Vr(DC)<br>Duration: 2,000 hours | Capacitance Change $\Delta C/C$ : $\leq 3\%$<br>DF Change $\Delta \tan \delta$ : 0.1% at 1KHz<br>IR: $\geq 50\%$ limit value |

#### ■ MAXIMUM DIMENSIONS

| (μF)  | W.V. | 100V <sub>DC</sub> (2A) |      |      |      |     | 250V <sub>DC</sub> (2E) |      |      |      |     | 400V <sub>DC</sub> (2G)/450V <sub>DC</sub> (2W) |      |      |      |     | 630V <sub>DC</sub> (2J) |      |      |      |     |
|-------|------|-------------------------|------|------|------|-----|-------------------------|------|------|------|-----|-------------------------------------------------|------|------|------|-----|-------------------------|------|------|------|-----|
|       | Code | W                       | H    | T    | P    | d   | W                       | H    | T    | P    | d   | W                                               | H    | T    | P    | d   | W                       | H    | T    | P    | d   |
| 0.010 | 103  |                         |      |      |      |     |                         |      |      |      |     | 10.5                                            | 7.5  | 4.0  | 7.5  | 0.6 | 10.5                    | 9.0  | 5.5  | 7.5  | 0.6 |
| 0.012 | 123  |                         |      |      |      |     |                         |      |      |      |     | 10.5                                            | 8.5  | 4.0  | 7.5  | 0.6 | 10.5                    | 9.5  | 6.0  | 7.5  | 0.6 |
| 0.015 | 153  |                         |      |      |      |     |                         |      |      |      |     | 10.5                                            | 9.0  | 4.5  | 7.5  | 0.6 | 10.5                    | 10.5 | 6.0  | 7.5  | 0.6 |
| 0.018 | 183  |                         |      |      |      |     |                         |      |      |      |     | 10.5                                            | 9.5  | 4.5  | 7.5  | 0.6 | 10.5                    | 11.0 | 6.5  | 7.5  | 0.6 |
| 0.022 | 223  |                         |      |      |      |     | 10.5                    | 7.5  | 4.0  | 7.5  | 0.6 | 10.5                                            | 10.0 | 5.0  | 7.5  | 0.6 | 13.0                    | 10.0 | 6.0  | 10.0 | 0.6 |
| 0.027 | 273  |                         |      |      |      |     | 10.5                    | 8.0  | 4.0  | 7.5  | 0.6 | 10.5                                            | 10.5 | 5.5  | 7.5  | 0.6 | 13.0                    | 11.0 | 6.5  | 10.0 | 0.6 |
| 0.033 | 333  |                         |      |      |      |     | 10.5                    | 8.5  | 4.5  | 7.5  | 0.6 | 10.5                                            | 11.0 | 6.0  | 7.5  | 0.6 | 13.0                    | 11.5 | 7.0  | 10.0 | 0.6 |
| 0.039 | 393  |                         |      |      |      |     | 10.5                    | 9.0  | 4.5  | 7.5  | 0.6 | 13.0                                            | 11.0 | 5.5  | 10.0 | 0.6 | 13.0                    | 12.0 | 8.0  | 10.0 | 0.6 |
| 0.047 | 473  | 10.5                    | 7.5  | 4.0  | 7.5  | 0.6 | 10.5                    | 10.0 | 4.5  | 7.5  | 0.6 | 13.0                                            | 11.0 | 5.5  | 10.0 | 0.6 | 13.0                    | 13.0 | 8.0  | 10.0 | 0.6 |
| 0.056 | 563  | 10.5                    | 8.0  | 4.0  | 7.5  | 0.6 | 10.5                    | 10.5 | 5.0  | 7.5  | 0.6 | 13.0                                            | 11.5 | 6.0  | 10.0 | 0.6 | 13.0                    | 14.0 | 9.0  | 10.0 | 0.6 |
| 0.068 | 683  | 10.5                    | 9.0  | 4.5  | 7.5  | 0.6 | 10.5                    | 11.0 | 5.5  | 7.5  | 0.6 | 13.0                                            | 12.5 | 6.5  | 10.0 | 0.6 | 18.0                    | 12.5 | 7.0  | 15.0 | 0.8 |
| 0.082 | 823  | 10.5                    | 9.5  | 4.5  | 7.5  | 0.6 | 10.5                    | 11.5 | 6.0  | 7.5  | 0.6 | 13.0                                            | 13.0 | 7.0  | 10.0 | 0.6 | 18.0                    | 13.0 | 7.5  | 15.0 | 0.8 |
| 0.10  | 104  | 10.5                    | 10.0 | 5.0  | 7.5  | 0.6 | 10.5                    | 12.0 | 6.5  | 7.5  | 0.6 | 13.0                                            | 13.5 | 8.0  | 10.0 | 0.6 | 18.0                    | 14.0 | 8.0  | 15.0 | 0.8 |
| 0.12  | 124  | 10.5                    | 10.0 | 5.5  | 7.5  | 0.6 | 13.0                    | 11.5 | 6.0  | 10.0 | 0.6 | 18.0                                            | 12.0 | 6.0  | 15.0 | 0.8 | 18.0                    | 15.5 | 8.0  | 15.0 | 0.8 |
| 0.15  | 154  | 10.5                    | 11.0 | 6.0  | 7.5  | 0.6 | 13.0                    | 12.0 | 6.5  | 10.0 | 0.6 | 18.0                                            | 12.5 | 7.0  | 15.0 | 0.8 | 18.0                    | 16.5 | 9.0  | 15.0 | 0.8 |
| 0.18  | 184  | 10.5                    | 11.5 | 6.5  | 7.5  | 0.6 | 13.0                    | 12.5 | 7.0  | 10.0 | 0.6 | 18.0                                            | 13.5 | 8.5  | 15.0 | 0.8 | 18.0                    | 17.5 | 10.0 | 15.0 | 0.8 |
| 0.22  | 224  | 13.0                    | 11.5 | 6.0  | 10.0 | 0.6 | 13.0                    | 13.0 | 7.5  | 10.0 | 0.6 | 18.0                                            | 15.0 | 8.0  | 15.0 | 0.8 | 18.0                    | 18.5 | 11.5 | 15.0 | 0.8 |
| 0.27  | 274  | 13.0                    | 12.0 | 6.5  | 10.0 | 0.6 | 18.0                    | 13.0 | 6.0  | 15.0 | 0.8 | 18.0                                            | 16.0 | 8.5  | 15.0 | 0.8 | 25.5                    | 18.0 | 9.0  | 22.5 | 0.8 |
| 0.33  | 334  | 13.0                    | 13.0 | 7.0  | 10.0 | 0.6 | 18.0                    | 14.0 | 6.5  | 15.0 | 0.8 | 18.0                                            | 17.0 | 9.5  | 15.0 | 0.8 | 25.5                    | 19.0 | 10.0 | 22.5 | 0.8 |
| 0.39  | 394  | 13.0                    | 13.5 | 7.5  | 10.0 | 0.6 | 18.0                    | 14.5 | 7.0  | 15.0 | 0.8 | 18.0                                            | 18.0 | 10.5 | 15.0 | 0.8 | 25.5                    | 20.0 | 11.0 | 22.5 | 0.8 |
| 0.47  | 474  | 13.0                    | 14.0 | 8.5  | 10.0 | 0.6 | 18.0                    | 15.0 | 8.0  | 15.0 | 0.8 | 25.5                                            | 16.0 | 9.0  | 22.5 | 0.8 | 20.5                    | 20.5 | 12.0 | 17.5 | 0.8 |
|       |      |                         |      |      |      |     |                         |      |      |      |     |                                                 |      |      |      |     | 25.5                    | 21.0 | 12.0 | 22.5 | 0.8 |
| 0.56  | 564  | 18.0                    | 14.0 | 7.0  | 15.0 | 0.8 | 18.0                    | 16.0 | 8.5  | 15.0 | 0.8 | 25.5                                            | 17.0 | 10.0 | 22.5 | 0.8 | 25.5                    | 22.5 | 13.5 | 22.5 | 0.8 |
| 0.68  | 684  | 18.0                    | 15.0 | 7.5  | 15.0 | 0.8 | 18.0                    | 17.0 | 9.5  | 15.0 | 0.8 | 25.5                                            | 18.0 | 11.0 | 22.5 | 0.8 | 25.5                    | 24.0 | 15.0 | 22.5 | 0.8 |
| 0.82  | 824  | 18.0                    | 15.5 | 8.0  | 15.0 | 0.8 | 18.0                    | 18.5 | 10.0 | 15.0 | 0.8 | 25.5                                            | 20.0 | 11.0 | 22.5 | 0.8 | 25.5                    | 25.5 | 16.5 | 22.5 | 0.8 |
| 1.00  | 105  | 18.0                    | 16.5 | 9.0  | 15.0 | 0.8 | 18.0                    | 20.0 | 11.0 | 15.0 | 0.8 | 25.5                                            | 21.5 | 12.5 | 22.5 | 0.8 | 26.0                    | 16.5 | 12.0 | 22.5 | 0.8 |
|       |      |                         |      |      |      |     |                         |      |      |      |     |                                                 |      |      |      |     | 31.5                    | 25.0 | 16.0 | 27.5 | 0.8 |
| 1.20  | 125  | 18.0                    | 17.5 | 10.0 | 15.0 | 0.8 | 25.5                    | 18.0 | 9.0  | 22.5 | 0.8 | 25.5                                            | 23.0 | 14.0 | 22.5 | 0.8 | 31.5                    | 27.0 | 18.0 | 27.5 | 0.8 |
| 1.50  | 155  | 18.0                    | 18.5 | 11.5 | 15.0 | 0.8 | 25.5                    | 19.5 | 10.5 | 22.5 | 0.8 | 25.5                                            | 24.5 | 15.5 | 22.5 | 0.8 |                         |      |      |      |     |
| 1.80  | 185  | 25.5                    | 18.0 | 9.0  | 22.5 | 0.8 | 25.5                    | 20.5 | 11.5 | 22.5 | 0.8 |                                                 |      |      |      |     |                         |      |      |      |     |
| 2.20  | 225  | 25.5                    | 19.0 | 10.0 | 22.5 | 0.8 | 25.5                    | 22.0 | 13.0 | 22.5 | 0.8 |                                                 |      |      |      |     |                         |      |      |      |     |
| 2.70  | 275  | 25.5                    | 20.0 | 11.5 | 22.5 | 0.8 | 25.5                    | 23.5 | 14.5 | 22.5 | 0.8 |                                                 |      |      |      |     |                         |      |      |      |     |
| 3.30  | 335  | 25.5                    | 24.5 | 15.5 | 22.5 | 0.8 | 25.5                    | 25.5 | 16.0 | 22.5 | 0.8 |                                                 |      |      |      |     |                         |      |      |      |     |

#### ■ PART NUMBER EXAMPLE - BULK

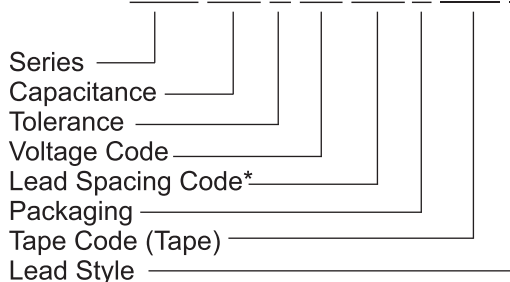
MPP 103 M 2G 075 B 100 S



\* Leadspace is straight lead non-formed original leadspace.

#### ■ PART NUMBER EXAMPLE - RADIAL TAPED

MPP 103 K 2G 075 A RT2 K



#### ■ CAPACITANCE

| μF   | 0.01   | 0.047  | 0.1     | 0.47    | 1.0 | 3.3 |
|------|--------|--------|---------|---------|-----|-----|
| pF   | 10,000 | 47,000 | 100,000 | 470,000 | —   | —   |
| Code | 103    | 473    | 104     | 474     | 105 | 335 |

#### ■ TOLERANCE CODE

| Code | Tolerance |
|------|-----------|
| J    | ± 5%      |
| K    | ± 10%     |
| M    | ± 20%     |

#### RATED VOLTAGE

| W.V. | 100 | 250 | 400 | 630 |
|------|-----|-----|-----|-----|
| Code | 2A  | 2E  | 2G  | 2J  |

#### RADIAL LEAD SPACING

\* Leadspace is straight lead non-form original leadspace.

| mm   | 7.5 | 10  | 15  | 22.5 | 27.5 |
|------|-----|-----|-----|------|------|
| Code | 075 | 100 | 150 | 225  | 275  |

#### PACKAGING

| Method | Bulk | Ammo | Reel |
|--------|------|------|------|
| Code   | B    | A    | R    |

#### RADIAL TAPING CODE DIAGRAM

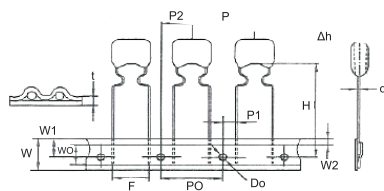


Fig. 1  
F=7.5mm  
(RT2)

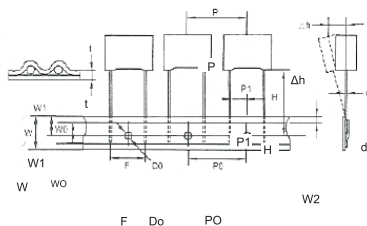


Fig. 3 Box  
Fitch=7.5mm  
Ammo Only  
(RT2)

#### TAPE CODE (See Diagrams)

| Spacing | 7.5mm  | 10mm | 15mm |
|---------|--------|------|------|
| Packing | A or R | A    | A    |
| Code    | RT2    | RT3  | RT4  |

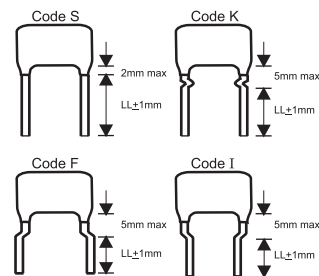
#### LEAD LENGTH FROM SEATING PLANE

| mm   | 5   | 10  | 15  | 20  | 25  |
|------|-----|-----|-----|-----|-----|
| Code | 050 | 100 | 150 | 200 | 250 |

#### LEAD STYLE

| Code | Style               |
|------|---------------------|
| S    | Straight            |
| K    | Kink-In (Stand Off) |
| F    | Form Out            |
| I    | Form In             |

#### LEAD STYLE EXAMPLES



(For LL over 20mm spec is minimum)

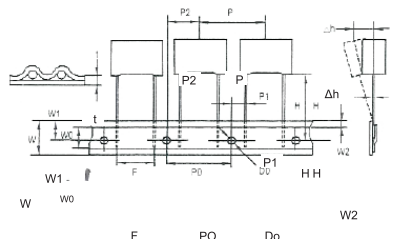


Fig. 2  
F=7.5mm  
(RT2)

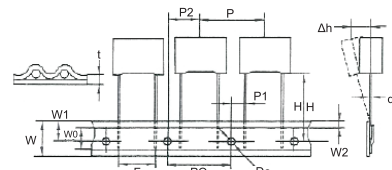


Fig. 4 Box or Epoxy Coated  
F=10 - Ammo Only  
F=15 Every other space skipped because  
of Larger body - Ammo Only  
(RT3 or RT4)

#### SPECIFICATIONS

| Description                          | Letter | Dimension (mm) |            |      |           |             | Description             | Letter | Dimension (mm) |          |     |      |           |
|--------------------------------------|--------|----------------|------------|------|-----------|-------------|-------------------------|--------|----------------|----------|-----|------|-----------|
|                                      |        | RT1            | RT2        | RT3  | RT4       | Tol.        |                         |        | RT1            | RT2      | RT3 | RT4  | Tol.      |
| Lead Wire Diameter                   | d      | 0.5 / 0.6      | 0.5 / 0.6  | 0.6  | 0.6 / 0.8 | ± 0.05      | Carrier Tape Width      | W      | 18             | 18       | 18  | 18   | ± 1; -0.5 |
| Tape Pitch                           | P      | 12.7           | 12.7       | 12.7 | 25.4      | ± 1         | Hold Down Tape Width    | WO     | 6              | 6        | 9   | 10   | Min       |
| Feed Hole Pitch                      | PO     | 12.7           | 12.87      | 12.7 | 12.7      | ± 0.2       | Hole Position           | W1     | 9              | 9        | 9   | 9    | ± 0.5     |
| Centering of the Lead Wire           | P1     | 3.85           | 2.6 / 3.75 | 7.7  | 5.2       | ± 0.7       | Hold Down Tape Position | W2     | 3              | 3        | 3   | 3    | Max       |
| Centering of the Body                | P2     | 6.35           | 6.35       | 12.7 | 12.7      | ± 1.3       | Feed Hole Diameter      | Do     | 4              | 4        | 4   | 4    | ± 0.2     |
| Lead Spacing (Pitch)                 | F      | 5              | 7.5        | 10   | 15        | ± 0.6; -0.1 | Tape Thickness          | t      | 0.7            | 0.7      | 0.7 | 0.07 | ± 0.2     |
| Component Alignment                  | Δh     | 0              | 0          | 0    | 0         | ± 2         | Figure                  | fig    | 1 or 2         | 1.2 or 3 | 4   | 4    |           |
| Height of Component from Tape Center | H      | 18.5           | 18.5       | 18.5 | 18.5      | ± 0.5       |                         |        |                |          |     |      |           |

Remark: \* Allowance of accumulated pitch less than 1mm at the sum of 20 pitches.

\* Continuous empty component less than 3 consecutive pieces.

\* Total empty on one reel less than 1%.