



| Ø<br>d ±0.05 | p = 7.5 | p = 10 | p = 15      | 15 < p ≤ 27.5 | p = 37.5 |
|--------------|---------|--------|-------------|---------------|----------|
|              | 0.5     | 0.6    | 0.6 or 0.8* | 0.8           | 1        |

\* See size table.  
All dimensions are in mm.

**GENERAL TECHNICAL DATA**

**Dielectric:** polypropylene film.  
**Plates:** metal layer deposited by evaporation under vacuum.  
**Winding:** non-inductive type.  
**Leads:** Ø ≥ 0.6 tinned wire.  
 Ø = 0.5 tinned wire, low thermal conductivity.  
**Protection:** plastic case, thermosetting resin filled. Box material is solvent resistant and flame retardant according to UL94 V0.  
**Marking:** Manufacturer's logo, series, capacitance, tolerance, rated voltage, capacitor class, dielectric code, climatic category, passive flammability category, manufacturing date code, approvals, manufacturing plant.  
**Climatic category:** 40/110/56 IEC 60068-1

**Operating temperature range:** -40 to +110°C  
**Related documents:** IEC 60384-14, EN 60384-14.

**ELECTRICAL CHARACTERISTICS**

**Rated voltage (V<sub>R</sub>):** 300Vac / 1000Vdc; 50/60Hz  
**Capacitance range:** 1000pF to 1.0µF  
**Capacitance values:** E6 series (IEC 60063 Norm).  
**Capacitance tolerances** (measured at 1 kHz):  
 ±10% (K); ±20% (M).

**Dissipation factor (DF):**  
 tgδ x 10<sup>-4</sup> at +25°C ±5°C: ≤30 (20)\* at 1kHz  
 \* Typical value

**Insulation resistance:**

**Test conditions**  
 Temperature: +25°C±5°C  
 Voltage charge time: 1 min  
 Voltage charge: 100 Vdc

**Performance**  
 ≥1 x 10<sup>5</sup> MΩ (5 x 10<sup>5</sup> MΩ)\* for C ≤ 0.33µF  
 ≥30000 s (150000 s)\* for C > 0.33µF  
 \* Typical value

**Test voltage between terminations** (on all pieces):  
 2500Vac for 1 s + 5000Vdc for 1 s at +25°C±5°C

**Y2 / X1 CLASS (IEC 60384-14) MKP Series METALLIZED POLYPROPYLENE FILM CAPACITOR SELF-HEALING PROPERTIES**

**Typical applications:** Interference suppression and «across-the-line» applications. Suitable for use in situations where failure of the capacitor could lead to danger of electric shock.  
**PRODUCT CODE: R41**

**Note:** R.41 series has replaced the R73 series (available only upon request). For new design we suggest the use of the R.41 series.

| Pitch<br>(mm) | Box thickness (B)<br>(mm) | Maximum dimensions (mm) |        |        |
|---------------|---------------------------|-------------------------|--------|--------|
|               |                           | B max                   | H max  | L max  |
| 7.5           | All                       | B +0.1                  | H +0.1 | L +0.2 |
| 10.0          | All                       | B +0.2                  | H +0.1 | L +0.2 |
| 15.0          | <7.5                      | B +0.2                  | H +0.1 | L +0.3 |
| 15.0          | ≥7.5                      | B +0.2                  | H +0.1 | L +0.5 |
| 22.5          | All                       | B +0.2                  | H +0.1 | L +0.3 |
| 27.5          | All                       | B +0.2                  | H +0.1 | L +0.3 |
| 37.5          | All                       | B +0.3                  | H +0.1 | L +0.3 |

**TEST METHOD AND PERFORMANCE**

**Damp heat, steady state:**

**Test conditions**  
 Temperature: +40±2°C  
 Relative humidity (RH): 93 ±2%  
 Test duration: 56 days

**Performance**  
 Dielectric strength: no dielectric breakdown or flashover at 1500Vac/1 min  
 Capacitance change |ΔC/C|: ≤5%  
 Insulation resistance: ≥50% of initial limit.

**Endurance:**

**Test conditions**  
 Temperature: 110°C±2°C  
 Test duration: 1000 h  
 Voltage applied: 1.7 x V<sub>R</sub> + 1000Vac 0.1 s/h

**Performance**  
 Dielectric strength: no dielectric breakdown or flashover at 1500Vac/1 min  
 Capacitance change |ΔC/C|: ≤10%  
 Insulation resistance: ≥50% of initial limit.

**Resistance to soldering heat:**

**Test conditions**  
 Solder bath temperature: +260°C±5°C  
 Dipping time (with heat screen): 10 s ± 1 s  
**Performance**  
 Capacitance change |ΔC/C|: ≤2%

Y2 / X1 CLASS (IEC 60384-14) MKP Series  
**METALLIZED POLYPROPYLENE FILM CAPACITOR**  
 SELF-HEALING PROPERTIES

**Typical applications:** Interference suppression and across-the-line applications. Suitable for use in situations where failure of the capacitor could lead to danger of electric shock.  
 PRODUCT CODE: **R41**

Table 1

| Rated Cap. | 300 Vac/1000Vdc<br>Std dimensions |      |      |      | Ø d | Max dv/dt at 420Vdc (V/µs) | Part Number          |
|------------|-----------------------------------|------|------|------|-----|----------------------------|----------------------|
|            | B                                 | H    | L    | p    |     |                            |                      |
| 1000 pF    | 4.0                               | 9.0  | 10.0 | 7.5  | 0.5 | 800                        | R413D 1100 - - 00 -  |
| 2200 pF    | 4.0                               | 9.0  | 10.0 | 7.5  | 0.5 | 800                        | R413D 1220 - - 00 -  |
| 3300 pF    | 5.0                               | 10.5 | 10.0 | 7.5  | 0.5 | 800                        | R413D 1330 - - 00 -  |
| 4700 pF    | 6.0                               | 12.0 | 10.5 | 7.5  | 0.5 | 800                        | R413D 1470 - - 00 -  |
| 1000 pF    | 4.0                               | 9.0  | 13.0 | 10.0 | 0.6 | 800                        | R413F 1100 - - 00 -  |
| 1500 pF    | 4.0                               | 9.0  | 13.0 | 10.0 | 0.6 | 800                        | R413F 1150 - - 00 -  |
| 2200 pF    | 4.0                               | 9.0  | 13.0 | 10.0 | 0.6 | 800                        | R413F 1220 - - 00 -  |
| 3300 pF    | 4.0                               | 9.0  | 13.0 | 10.0 | 0.6 | 800                        | R413F 1330 - - M1 -  |
| 4700 pF    | 5.0                               | 11.0 | 13.0 | 10.0 | 0.6 | 800                        | R413F 1470 - - M1 -  |
| 6800 pF    | 6.0                               | 12.0 | 13.0 | 10.0 | 0.6 | 800                        | R413F 1680 - - 00 -  |
| 3300 pF    | 5.0                               | 11.0 | 18.0 | 15.0 | 0.6 | 600                        | R413I 1330 - - 00 -  |
| 4700 pF    | 5.0                               | 11.0 | 18.0 | 15.0 | 0.6 | 600                        | R413I 1470 - - 00 -  |
| 6800 pF    | 5.0                               | 11.0 | 18.0 | 15.0 | 0.6 | 600                        | R413I 1680 - - 00 -  |
| 0.010 µF   | 5.0                               | 11.0 | 18.0 | 15.0 | 0.6 | 600                        | R413I 2100 - - 00 -  |
| 0.015 µF   | 5.0                               | 11.0 | 18.0 | 15.0 | 0.6 | 600                        | R413I 2150 - - M1 -  |
| 0.022 µF   | 6.0                               | 12.0 | 18.0 | 15.0 | 0.6 | 600                        | R413I 2220 - - M1 -  |
| 0.033 µF   | 7.5                               | 13.5 | 18.0 | 15.0 | 0.6 | 600                        | R413I 2330 - - M1 -  |
| 0.047 µF   | 8.5                               | 14.5 | 18.0 | 15.0 | 0.6 | 600                        | R413I 2470 - - M1 -  |
| 0.068 µF   | 11.0                              | 19.0 | 18.0 | 15.0 | 0.8 | 600                        | R413I 2680 - - 00 -  |
| 0.047 µF   | 6.0                               | 15.0 | 26.5 | 22.5 | 0.8 | 500                        | R413N 2470 - - 00 -  |
| 0.068 µF   | 6.0                               | 15.0 | 26.5 | 22.5 | 0.8 | 500                        | R413N 2680 - - M1M - |
| 0.068 µF   | 7.0                               | 16.0 | 26.5 | 22.5 | 0.8 | 500                        | R413N 2680 - - 00 -  |
| 0.10 µF    | 8.5                               | 17.0 | 26.5 | 22.5 | 0.8 | 500                        | R413N 3100 - - M1 -  |
| 0.15 µF    | 10.0                              | 18.5 | 26.5 | 22.5 | 0.8 | 500                        | R413N 3150 - - M1 -  |
| 0.22 µF    | 13.0                              | 22.0 | 26.5 | 22.5 | 0.8 | 500                        | R413N 3220 - - 00 -  |
| 0.22 µF    | 13.0                              | 22.0 | 32.0 | 27.5 | 0.8 | 400                        | R413R 3220 - - 00 -  |
| 0.33 µF    | 14.0                              | 28.0 | 32.0 | 27.5 | 0.8 | 400                        | R413R 3330 - - 00 -  |
| 0.47 µF    | 18.0                              | 33.0 | 32.0 | 27.5 | 0.8 | 400                        | R413R 3470 - - 00 -  |
| 0.68 µF    | 18.0                              | 33.0 | 32.0 | 27.5 | 0.8 | 400                        | R413R 3680 - - 00 -  |
| 0.47 µF    | 13.0                              | 24.0 | 41.5 | 37.5 | 1.0 | 300                        | R413W 3470 - - 00 -  |
| 0.68 µF    | 16.0                              | 28.5 | 41.5 | 37.5 | 1.0 | 300                        | R413W 3680 - - 00 -  |
| 1.0 µF     | 20.0                              | 40.0 | 41.5 | 37.5 | 1.0 | 300                        | R413W 4100 - - 00 -  |

| Standard packaging style   | Lead length (mm)                        | Taping style        |            |            | Ordering code (Digit 10 to 11) |
|----------------------------|---|---------------------|------------|------------|--------------------------------|
|                            |   | P <sub>2</sub> (mm) | Fig. (No.) | Pitch (mm) |                                |
| AMMO-PACK                  |   | 6.35                | 1          | 7.5        | DQ                             |
| AMMO-PACK                  |   | 12.70               | 1          | 10.0/15.0  | DQ                             |
| AMMO-PACK                  |   | 19.05               | 2          | 22.5       | DQ                             |
| REEL Ø 355mm               |   | 6.35                | 1          | 7.5        | CK                             |
| REEL Ø 500mm               |   | 12.70               | 1          | 10.0/15.0  | CK                             |
| REEL Ø 500mm               |   | 19.05               | 2          | 22.5/27.5  | CK                             |
| Loose, short leads         | 4 <sup>+2</sup>                         |                     |            |            | 00                             |
| Loose, long leads (p<10mm) | 17 <sup>+1/-2</sup>                     |                     |            |            | Z3                             |
| Loose, long leads (p=10mm) | 25 <sup>±1</sup>                        |                     |            |            | JY                             |
| Loose, long leads (p≥15mm) | 25 <sup>+2/-1</sup><br>30 <sup>+5</sup> |                     |            |            | 50<br>40                       |

Note: Ammo-pack is the preferred packaging for taped version

APPROVALS

|  |                         |                                      |   |
|--|-------------------------|--------------------------------------|---|
|  | ENEC IEC 60384-14 (*)   | Class Y2 / X1                        | File No. V4160 (in progress for pitch 7.5 mm)                   |
|  | CSA C22.2 N°1 (250Vac)  | Across-the-line                      | File No. LR83890 (in progress for pitch 7.5 mm)                 |
|  | UL 1283 (300 Vac 110°C) | Electromagnetic Interference Filters | File No. E85238 in progress                                     |
|  | UL 1414 (85°C; 250Vac)  | Across-the-line                      | File No. E 97797 (in progress for pitch 7.5 mm)                 |
|  | GB IT 14472             | Class Y2 / X1                        | File CQC3001006820 CQC3001006821 (in progress for pitch 7.5 mm) |

Approved according to IEC 60384-14 (ex-former EN 132400) According to IEC 60065.

(\*) ENEC mark has replaced all the following European National marks:



Mechanical version and packaging (Table1) \_\_\_\_\_  
 Tolerance: K (±10%); M (±20%) \_\_\_\_\_

E12 Series available upon request

All dimensions are in mm.