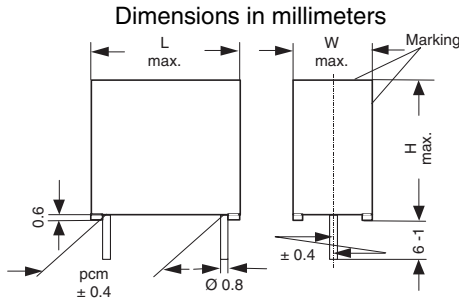


# Metallized Polypropylene Capacitor, Mini-Version (-M)

## Related Document: CECC 31 200



| PCM       | W           | $\varnothing d$ |
|-----------|-------------|-----------------|
| 5         |             | 0.5             |
| 7.5 - 10  |             | 0.6             |
| 15 - 37.5 | < 16.0      | 0.8             |
| 15 - 37.5 | $\geq 16.0$ | 1.0             |

### MAIN APPLICATIONS

High frequency and pulse operations. Deflection circuits in TV-sets (S-correction). SMPS, loudspeaker crossover networks, electronic ballast, storage, filter, timing and sample and hold circuits.

### MARKING

Manufacturer's logo / type / C-value / rated voltage / tolerance / date of manufacture

### DIELECTRIC

Polypropylene film

### ELECTRODES

Vacuum deposited

### COATING

Flame retardant plastic case material (UL-class 94 V-0), color blue, epoxy resin sealed

### CONSTRUCTION

Extended metallized film, (Pb)-free, internal series connection (1000 VDC to 2000 VDC), selfhealing

### CONTACTS

Tinned wire (Pb)-free

### IEC TEST CLASSIFICATION

55/100/56, according to IEC 60068

### OPERATING TEMPERATURE RANGE

- 55 °C to + 100 °C

### CAPACITANCE RANGE

1000 pF to 6.8  $\mu$ F

### MAXIMUM PULSE RISE TIME

| PCM<br>(mm) | Maximum Pulse Rise Time $d_v/d_t$ [V/ $\mu$ s] |         |         |          |          |          |
|-------------|--|---------|---------|----------|----------|----------|
|             | 250 VDC  | 400 VDC | 630 VDC | 1000 VDC | 1600 VDC | 2000 VDC |
| 5           | 360  | 540     | 1080    | —        | —        | —        |
| 7.5         | 215  | 325     | 510     | —        | —        | —        |
| 10          | 150  | 240     | 340     | 1365     | 4100     | —        |
| 15          | 90   | 135     | 185     | 680      | 1340     | 3075     |
| 22.5        | 55   | 80      | 110     | 370      | 620      | 1365     |
| 27.5        | 40   | 65      | 85      | 285      | 455      | —        |
| 37.5        | 30   | 45      | 60      | 195      | 300      | —        |

If the maximum pulse voltage is less than the rated voltage higher  $d_v/d_t$  values can be permitted.

### FEATURES

Product is completely lead (Pb)-free  
Product is RoHS compliant  
Miniaturized with extensive voltage, pitch and capacitance ranges

### CAPACITANCE TOLERANCES

$\pm 10\%$  (K),  $\pm 5\%$  (J),  $\pm 2.5\%$  (H)

### RATED VOLTAGES ( $U_R$ )

250 VDC, 400 VDC, 630 VDC, 1000 VDC, 1600 VDC, 2000 VDC

### PERMISSIBLE AC VOLTAGES (RMS) UP TO 60 Hz

160 VAC, 220 VAC, 250 VAC, 400 VAC, 500 VAC, 600 VAC, 700 VAC

### TEST VOLTAGE

$1.6 \times U_R$  for 2 s

### INSULATION RESISTANCE

Measured at 100 VDC after one minute

#### For $C \leq 0.33 \mu$ F:

100000 M $\Omega$  minimum value (150000 M $\Omega$  typical value)

#### TIME CONSTANT

Measured at 100 VDC after one minute

#### For $C > 0.33 \mu$ F:

30000 s minimum value (50000 s typical value)

### TEMPERATURE COEFFICIENT

-  $250 \times 10^{-6}/^{\circ}\text{C}$  (typical value)

### CAPACITANCE DRIFT

Up to + 40 °C,  $\pm 0.5\%$  for a period of two years

### DERATING FOR DC AND AC CATEGORY VOLTAGE $U_C$

At + 85 °C:  $U_C = 1.0 U_R$

At + 100 °C:  $U_C = 0.7 U_R$

### SELF INDUCTANCE

~ 6 nH measured with 2 mm long leads

### PULL TEST ON LEADS

$\geq 30$  N in direction of leads according to IEC 60068-2-21

### RELIABILITY

Operational life > 300000 h

Failure rate < 5 FIT (40 °C and  $0.5 U_R$ )

For further details, please refer to the general information available at [www.vishay.com/doc?26033](http://www.vishay.com/doc?26033).



**RoHS**  
COMPLIANT

# MKP 1840.../...-M

Vishay Roederstein Metallized Polypropylene Capacitor, Mini-Version (-M)  
 Related Document: CECC 31 200



## MAXIMUM PULSE RISE TIME

| MEASURED AT    | $C \leq 0.1 \mu\text{F}$ | $0.1 \mu\text{F} < C \leq 1.0 \mu\text{F}$ | $C > 1.0 \mu\text{F}$ |
|----------------|--------------------------|--|-----------------------|
| 1 kHz          | $0.4 \times 10^{-3}$     | $0.4 \times 10^{-3}$                       | $1.0 \times 10^{-3}$  |
| 10 kHz         | $0.6 \times 10^{-3}$     | $0.6 \times 10^{-3}$                       | —                     |
| 100 kHz        | $4.0 \times 10^{-3}$     | —  | —                     |
| Maximum values |                          |  |                       |

## METALLIZED POLYPROPYLENE FILM CAPACITOR, MKP 1840, MINI-VERSION (-M) RELATED DOCUMENT: CECC 31 200

| CAPACITANCE         | CAPACITANCE CODE | VOLTAGE CODE 25<br>250 VDC / 160 VAC** |      |      |      | VOLTAGE CODE 40<br>400 VDC / 220 VAC** |      |      |      | VOLTAGE CODE 63<br>630 VDC / 250 VAC** |      |      |      | VOLTAGE CODE 63<br>630 VDC / 400 VAC** |      |      |       |
|---------------------|------------------|--|------|------|------|--|------|------|------|--|------|------|------|--|------|------|-------|
|                     |                  | W                                      | H    | L    | PCM  | W                                      | H    | L    | PCM  | W                                      | H    | L    | PCM  | W                                      | H    | L    | PCM   |
| 1000 pF             | - 210            | —                                      | —    | —    | —    | —                                      | —    | —    | —    | 3.0                                    | 6.5  | 7.5  | 5.0  | —                                      | —    | —    | —     |
| 1500 pF             | - 215            | —                                      | —    | —    | —    | —                                      | —    | —    | —    | 3.0                                    | 6.5  | 7.5  | 5.0  | —                                      | —    | —    | —     |
| 2200 pF             | - 222            | —                                      | —    | —    | —    | —                                      | —    | —    | —    | 3.5                                    | 8.5  | 7.5  | 5.0  | —                                      | —    | —    | —     |
| 3300 pF             | - 233            | —                                      | —    | —    | —    | —                                      | —    | —    | —    | 3.0                                    | 8.5  | 10.0 | 7.5  | —                                      | —    | —    | —     |
| 4700 pF             | - 247            | —                                      | —    | —    | —    | —                                      | —    | —    | —    | 3.0                                    | 8.5  | 10.0 | 7.5  | —                                      | —    | —    | —     |
| 6800 pF             | - 268            | —                                      | —    | —    | —    | 3.0                                    | 6.5  | 7.5  | 5.0  | 3.0                                    | 8.5  | 10.0 | 7.5  | —                                      | —    | —    | —     |
| 0.01 $\mu\text{F}$  | - 310            | 3.0                                    | 6.5  | 7.5  | 5.0  | 3.5                                    | 8.5  | 7.5  | 5.0  | 4.0                                    | 9.0  | 10.0 | 7.5  | 4.5                                    | 9.5  | 13.0 | 10*   |
| 0.015 $\mu\text{F}$ | - 315            | 3.0                                    | 6.5  | 7.5  | 5.0  | 3.0                                    | 8.5  | 10.0 | 7.5  | 4.5                                    | 9.5  | 10.3 | 7.5  | 5.5                                    | 10.5 | 13.0 | 10*   |
| 0.022 $\mu\text{F}$ | - 322            | 3.5                                    | 8.5  | 7.5  | 5.0  | 4.0                                    | 9.0  | 10.0 | 7.5  | 4.5                                    | 9.5  | 13.0 | 10.0 | 6.5                                    | 11.5 | 13.0 | 10*   |
| 0.033 $\mu\text{F}$ | - 333            | 3.5                                    | 8.5  | 7.5  | 5.0  | 4.5                                    | 9.5  | 10.3 | 7.5  | 5.5                                    | 10.5 | 13.0 | 10.0 | 5.5                                    | 10.5 | 18.0 | 15*   |
| 0.047 $\mu\text{F}$ | - 347            | 4.0                                    | 9.0  | 10.0 | 7.5  | 5.0                                    | 10.5 | 10.3 | 7.5  | 6.5                                    | 11.5 | 13.0 | 10.0 | 6.5                                    | 12.5 | 18.0 | 15*   |
| 0.068 $\mu\text{F}$ | - 368            | 4.0                                    | 9.0  | 10.0 | 7.5  | 5.7                                    | 11.5 | 10.3 | 7.5  | 6.0                                    | 12.0 | 18.0 | 15.0 | 7.5                                    | 13.5 | 18.0 | 15*   |
| 0.10 $\mu\text{F}$  | - 410            | 5.0                                    | 10.5 | 10.3 | 7.5  | 5.5                                    | 10.5 | 18.0 | 15.0 | 6.0                                    | 12.0 | 18.0 | 15.0 | 6.5                                    | 14.5 | 26.5 | 22.5* |
| 0.15 $\mu\text{F}$  | - 415            | 5.5                                    | 10.5 | 13.0 | 10.0 | 6.0                                    | 12.0 | 18.0 | 15.0 | 8.5                                    | 14.5 | 18.0 | 15.0 | 7.5                                    | 15.5 | 26.5 | 22.5* |
| 0.22 $\mu\text{F}$  | - 422            | 6.5                                    | 11.5 | 13.0 | 10.0 | 7.5                                    | 13.5 | 18.0 | 15.0 | 8.5                                    | 17.5 | 18.0 | 15.0 | 8.5                                    | 16.5 | 26.5 | 22.5* |
| 0.33 $\mu\text{F}$  | - 433            | 6.5                                    | 12.5 | 18.0 | 15.0 | 8.5                                    | 17.5 | 18.0 | 15.0 | 9.0                                    | 17.0 | 26.5 | 22.5 | 11.0                                   | 21.0 | 26.5 | 22.5* |
| 0.47 $\mu\text{F}$  | - 447            | 7.5                                    | 13.5 | 18.0 | 15.0 | 7.5                                    | 15.5 | 26.5 | 22.5 | 10.5                                   | 18.5 | 26.5 | 22.5 | 11.5                                   | 20.5 | 31.5 | 27.5* |
| 0.68 $\mu\text{F}$  | - 468            | 8.5                                    | 14.5 | 18.0 | 15.0 | 10.5                                   | 18.5 | 26.5 | 22.5 | 11.5                                   | 20.5 | 31.5 | 27.5 | 13.5                                   | 23.5 | 31.5 | 27.5* |
| 1.0 $\mu\text{F}$   | - 510            | 8.5                                    | 16.5 | 26.5 | 22.5 | 11.0                                   | 21.0 | 26.5 | 22.5 | 13.5                                   | 23.5 | 31.5 | 27.5 | 16.5                                   | 29.5 | 31.5 | 27.5* |
| 1.5 $\mu\text{F}$   | - 515            | 10.5                                   | 18.5 | 26.5 | 22.5 | 13.5                                   | 23.5 | 31.5 | 27.5 | 16.5                                   | 29.5 | 31.5 | 27.5 | —                                      | —    | —    | —     |
| 2.2 $\mu\text{F}$   | - 522            | 11.0                                   | 21.0 | 26.5 | 22.5 | 15.0                                   | 24.5 | 31.5 | 27.5 | 18.0                                   | 33.0 | 31.5 | 27.5 | —                                      | —    | —    | —     |
| 3.3 $\mu\text{F}$   | - 533            | 13.5                                   | 23.5 | 31.5 | 27.5 | 18.0                                   | 28.0 | 31.5 | 27.5 | 20.0                                   | 40.0 | 42.5 | 37.5 | —                                      | —    | —    | —     |
| 4.7 $\mu\text{F}$   | - 547            | 15.0                                   | 24.5 | 31.5 | 27.5 | 18.0                                   | 32.5 | 41.5 | 37.5 | 20.0                                   | 40.0 | 42.5 | 37.5 | —                                      | —    | —    | —     |
| 6.8 $\mu\text{F}$   | - 568            | 14.5                                   | 24.5 | 41.5 | 37.5 | 20.0                                   | 40.0 | 42.5 | 37.5 | —                                      | —    | —    | —    | —                                      | —    | —    | —     |

\*Ordering Code - 2M (e.g. MKP 1840 410 635-2M)



| CAPACITANCE | CAPACITANCE CODE | VOLTAGE CODE 10<br>1000 VDC / 500 VAC** |      |      |      | VOLTAGE CODE 13<br>1600 VDC / 600 VAC** |      |      |      | VOLTAGE CODE 20<br>2000 VDC / 700 VAC** |      |      |      |
|-------------|------------------|---|------|------|------|---|------|------|------|---|------|------|------|
|             |                  | W                                       | H    | L    | PCM  | W                                       | H    | L    | PCM  | W                                       | H    | L    | PCM  |
| 1000 pF     | - 210            | —                                       | —    | —    | —    | —                                       | —    | —    | —    | 5.5                                     | 10.5 | 18.0 | 15   |
| 1500 pF     | - 215            | —                                       | —    | —    | —    | —                                       | —    | —    | —    | 5.5                                     | 10.5 | 18.0 | 15   |
| 2200 pF     | - 222            | —                                       | —    | —    | —    | —                                       | —    | —    | —    | 5.5                                     | 10.5 | 18.0 | 15   |
| 3300 pF     | - 233            | —                                       | —    | —    | —    | —                                       | —    | —    | —    | 6.0                                     | 12.0 | 18.0 | 15   |
| 4700 pF     | - 247            | 4.0                                     | 9.0  | 13.0 | 10   | —                                       | —    | —    | —    | 6.0                                     | 12.0 | 18.0 | 15   |
| 6800 pF     | - 268            | 4.0                                     | 9.0  | 13.0 | 10   | 5.5                                     | 10.5 | 18.0 | 15   | 7.5                                     | 13.5 | 18.0 | 15   |
| 0.01 µF     | - 310            | 5.5                                     | 10.5 | 13.0 | 10   | 6.5                                     | 12.5 | 18.0 | 15   | 6.5                                     | 14.5 | 26.5 | 22.5 |
| 0.015 µF    | - 315            | 6.5                                     | 11.5 | 13.0 | 10   | 7.5                                     | 13.5 | 18.0 | 15   | 7.5                                     | 15.5 | 26.5 | 22.5 |
| 0.022 µF    | - 322            | 5.5                                     | 10.5 | 18.0 | 15   | 8.5                                     | 14.5 | 18.0 | 15   | 8.5                                     | 16.5 | 26.5 | 22.5 |
| 0.033 µF    | - 333            | 6.0                                     | 12.0 | 18.0 | 15   | 8.5                                     | 17.5 | 18.0 | 15   | 10.5                                    | 18.5 | 26.5 | 22.5 |
| 0.047 µF    | - 347            | 7.5                                     | 13.5 | 18.0 | 15   | 7.5                                     | 15.5 | 26.5 | 22.5 | 11.0                                    | 21.0 | 26.5 | 22.5 |
| 0.068 µF    | - 368            | 8.5                                     | 14.5 | 18.0 | 15   | 8.5                                     | 16.5 | 26.5 | 22.5 | —                                       | —    | —    | —    |
| 0.10 µF     | - 410            | 7.5                                     | 15.5 | 26.5 | 22.5 | 10.5                                    | 18.5 | 26.5 | 22.5 | —                                       | —    | —    | —    |
| 0.15 µF     | - 415            | 9.0                                     | 17.0 | 26.5 | 22.5 | 11.5                                    | 20.5 | 31.5 | 27.5 | —                                       | —    | —    | —    |
| 0.22 µF     | - 422            | 10.5                                    | 18.5 | 26.5 | 22.5 | 13.5                                    | 23.5 | 31.5 | 27.5 | —                                       | —    | —    | —    |
| 0.33 µF     | - 433            | 11.5                                    | 20.5 | 31.5 | 27.5 | 16.5                                    | 29.5 | 31.5 | 27.5 | —                                       | —    | —    | —    |
| 0.47 µF     | - 447            | 13.5                                    | 23.5 | 31.5 | 27.5 | 18.0                                    | 33.0 | 31.5 | 27.5 | —                                       | —    | —    | —    |
| 0.68 µF     | - 468            | 16.5                                    | 29.5 | 31.5 | 27.5 | 18.0                                    | 32.5 | 41.5 | 37.5 | —                                       | —    | —    | —    |
| 1.0 µF      | - 510            | 18.0                                    | 33.0 | 31.5 | 27.5 | —                                       | —    | —    | —    | —                                       | —    | —    | —    |
| 1.5 µF      | - 515            | 18.0                                    | 32.5 | 41.5 | 37.5 | —                                       | —    | —    | —    | —                                       | —    | —    | —    |

Further C-values upon request  
Other PCM on request

\*\*Not suitable for mains applications.

Please refer to X-capacitors in our catalog “RFI Suppression Components”

**RECOMMENDED PACKAGING**

| LETTER CODE | TYPE OF PACKAGING | HEIGHT (H) (mm) | REEL DIAMETER (mm) | ORDERING CODE EXAMPLES | PCM ≤ 15 | PCM 22.5 - 27.5 | PCM 37.5 |
|-------------|-------------------|-----------------|--------------------|------------------------|----------|-----------------|----------|
| D           | AMMO              | 16.5            | S*                 | MKP 1840-410/404-MD    | X        | —               | —        |
| G           | AMMO              | 18.5            | S*                 | MKP 1840-410/404-MG    | X        | —               | —        |
| F           | REEL              | 16.5            | 350                | MKP 1840-410/404-MF    | X        | —               | —        |
| W           | REEL              | 18.5            | 350                | MKP 1840-410/404-MW    | X        | —               | —        |
| V           | REEL              | 18.5            | 500                | MKP 1840-510/254-MV    | —        | X               | —        |
| G           | AMMO              | 18.5            | L*                 | MKP 1840-510/254-MG    | —        | X               | —        |
| —           | BULK              | —               | —                  | MKP 1840-510/254-M     | X        | X               | X        |

\*S = box size 55 x 210 x 340 mm (W x H x L)  
\*L = box size 60 x 360 x 510 mm (W x H x L)

**EXAMPLE OF ORDERING CODE**

| TYPE   | CAPACITANCE CODE | VOLTAGE CODE | TOLERANCE CODE | MINI | PACKAGING CODE |
|--|------------------|--------------|----------------|------|----------------|
| MKP 1840   | 447              | 63           | 4              | M    | G              |
| Tolerance codes: 4 = 5 % (J); 5 = 10 % (K); 3 = 2.5 % (H); |                  |              |                |      |                |

# MKP 1840.../...-M



Vishay Roederstein Metallized Polypropylene Capacitor, Mini-Version (-M)  
 Related Document: CECC 31 200

## METALLIZED POLYPROPYLENE FILM CAPACITOR, MKP 1840 PCM5, MINI-VERSION (-5M) RELATED DOCUMENT: CECC 31 200

| CAPACITANCE | CAPACITANCE CODE | VOLTAGE CODE 25<br>250 VDC / 160 VAC |      |     |     | VOLTAGE CODE 40<br>400 VDC / 220 VAC* |      |     |     | VOLTAGE CODE 63<br>630 VDC / 250 VAC* |      |     |     |
|-------------|------------------|--------------------------------------|------|-----|-----|---------------------------------------|------|-----|-----|---------------------------------------|------|-----|-----|
|             |                  | W                                    | H    | L   | PCM | W                                     | H    | L   | PCM | W                                     | H    | L   | PCM |
| 3300 pF     | - 233            | —                                    | —    | —   | —   | —                                     | —    | —   | —   | 3.5                                   | 8.5  | 7.5 | 5   |
| 4700 pF     | - 247            | —                                    | —    | —   | —   | —                                     | —    | —   | —   | 3.5                                   | 8.5  | 7.5 | 5   |
| 6800 pF     | - 268            | —                                    | —    | —   | —   | —                                     | —    | —   | —   | 4.5                                   | 9.5  | 7.5 | 5   |
| 0.01 μF     | - 310            | —                                    | —    | —   | —   | —                                     | —    | —   | —   | 4.5                                   | 9.5  | 7.5 | 5   |
| 0.015 μF    | - 315            | —                                    | —    | —   | —   | 4.5                                   | 9.5  | 7.5 | 5   | 5.5                                   | 11.5 | 7.5 | 5   |
| 0.022 μF    | - 322            | —                                    | —    | —   | —   | 4.5                                   | 9.5  | 7.5 | 5   | —                                     | —    | —   | —   |
| 0.033 μF    | - 333            | —                                    | —    | —   | —   | 5.5                                   | 11.5 | 7.5 | 5   | —                                     | —    | —   | —   |
| 0.047 μF    | - 347            | 4.5                                  | 9.5  | 7.5 | 5   | 5.5                                   | 11.5 | 7.5 | 5   | —                                     | —    | —   | —   |
| 0.068 μF    | - 368            | 5.0                                  | 10.0 | 7.5 | 5   | —                                     | —    | —   | —   | —                                     | —    | —   | —   |
| 0.10 μF     | - 410            | 5.5                                  | 11.5 | 7.5 | 5   | —                                     | —    | —   | —   | —                                     | —    | —   | —   |

Further C-values upon request

\*Not suitable for mains applications.

\*S = box size 55 x 210 x 340 mm (W x H x L)

### RECOMMENDED PACKAGING

| LETTER CODE | TYPE OF PACKAGING | HEIGHT (H) (mm) | REEL DIAMETER (mm) | ORDERING CODE EXAMPLES | PCM 5 |
|-------------|-------------------|-----------------|--------------------|------------------------|-------|
| D           | AMMO              | 16.5            | S*                 | MKP 1840-310/404-5MD   | X     |
| G           | AMMO              | 18.5            | S*                 | MKP 1840-310/404-5MG   | X     |
| F           | REEL              | 16.5            | 350                | MKP 1840-310/404-5MF   | X     |
| W           | REEL              | 18.5            | 350                | MKP 1840-310/404-5MW   | X     |
| —           | BULK              | —               | —                  | MKP 1840-310/404-5M    | X     |

### EXAMPLE OF ORDERING CODE

| TYPE     | CAPACITANCE CODE | VOLTAGE CODE | TOLERANCE CODE | MINI | PACKAGING CODE |
|----------|------------------|--------------|----------------|------|----------------|
| MKP 1840 | 347              | 25           | 4              | 5M   | G              |

Tolerance codes: 4 = 5 % (J); 5 = 10 % (K); 3 = 2.5 % (H);

