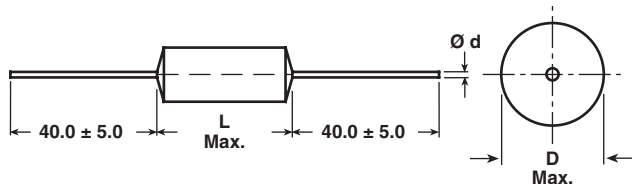


# Metallized Polypropylene Film Capacitor

## Related Document: IEC 60384-16

Dimensions in millimeters



| D      | Ø d |
|--------|-----|
| ≤ 7.0  | 0.7 |
| < 16.0 | 0.8 |
| ≥ 16.0 | 1.0 |

### MAIN APPLICATIONS

High voltage, high current and high pulse operations, deflection circuits in TV sets (S-correction and fly-back tuning). Protection circuits in SMPS's. Snubber and electronic ballast circuits. Input and output filtering in SPS designs, storage, timing and integrating circuits.

### MARKING

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

### DIELECTRIC

Polypropylene film

### ELECTRODES

Vacuum deposited aluminum

### COATING

Metal-foil-wrapped, insulated, epoxy resin sealed, flame retardant

### CONSTRUCTION

Extended double-sided metallized polyester film, internal series connection (630 to 2000 VDC), double-sided metallized polyester carrier film, (refer to general information)

### LEADS

Tinned wire

### IEC TEST CLASSIFICATION

55/100/56, according to IEC 60068

### OPERATING TEMPERATURE RANGE

- 55 °C to + 100 °C

### CAPACITANCE RANGE

1000 pF to 4.7 µF

### FEATURES

Product is completely lead (Pb)-free.  
Product is RoHS compliant.

### CAPACITANCE TOLERANCES

± 20 % (M), ± 10 % (K), ± 5 % (J)

### RATED VOLTAGES (U<sub>R</sub>):

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

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

100 VAC, 160 VAC, 220 VAC, 400 VAC, 600 VAC, 650 VAC,  
700 VAC

### TEST VOLTAGE (ELECTRODE/ELECTRODE)

1.6 x U<sub>R</sub> for 2 s

### INSULATION RESISTANCE

Measured at 100 VDC after one minute

For C ≤ 0.33 µF:

100000 MΩ minimum value (150000 MΩ typical value)

### TIME CONSTANT

Measured at 100 VDC after one minute

For C > 0.33 µF:

30000 s minimum value (50000 s typical value)

### TEMPERATURE COEFFICIENT

- 250 x 10<sup>-6</sup>/°C (typical value)

### CAPACITANCE DRIFT

Up to + 40 °C, ± 0.5 % for a period of two years

### DERATING FOR DC AND AC CATEGORY VOLTAGE U<sub>C</sub>

At + 85 °C: U<sub>C</sub> = 1.0 U<sub>R</sub>

At + 100 °C: U<sub>C</sub> = 0.7 U<sub>R</sub>

### SELF INDUCTANCE

~ 12 nH measured with 6mm long leads

### PULL TEST ON LEADS

≥ 20 N in direction of leads according to IEC 60068-2-21

### BEND TEST ON LEADS

2 bends through 90 °C with half of the force used in pull test

### RELIABILITY

Operational life > 300000 h

Failure rate < 10 FIT (40 °C and 0.5 x U<sub>R</sub>)

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



**RoHS**  
COMPLIANT

### MAXIMUM PULSE RISE TIME

| CAPACITOR LENGTH (MM) | Maximum Pulse Rise Time d <sub>v</sub> /d <sub>t</sub> [V/µs] |         |         |         |          |          |          |
|-----------------------|---------------------------------------------------------------|---------|---------|---------|----------|----------|----------|
|                       | 160 VDC                                                       | 250 VDC | 400 VDC | 630 VDC | 1000 VDC | 1600 VDC | 2000 VDC |
| 17                    | 900                                                           | 1140    | 1840    | —       | —        | —        | —        |
| 22                    | 450                                                           | 560     | 910     | 3430    | —        | —        | —        |
| 29                    | 260                                                           | 320     | 520     | 2120    | 2800     | 3800     | 6200     |
| 34                    | 202                                                           | 240     | 400     | 1524    | 2000     | 2680     | 4200     |
| 44                    | 140                                                           | 170     | 280     | 980     | 1280     | 1690     | 2600     |

If the maximum pulse voltage is less than the rated voltage higher d<sub>v</sub>/d<sub>t</sub> values can be permitted.

DISSIPATION FACTOR TAN  $\delta$ 

| 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          | $0.3 \times 10^{-3}$     | $0.3 \times 10^{-3}$                       | $0.3 \times 10^{-3}$  |
| 10 kHz         | $0.4 \times 10^{-3}$     | $0.4 \times 10^{-3}$                       | -                     |
| 100 kHz        | $1.5 \times 10^{-3}$     | -                                          | -                     |
| Maximum values |                          |                                            |                       |

| CAPACITANCE         | CAPACITANCE CODE | VOLTAGE CODE 16<br>160 VDC/100 VAC |      | VOLTAGE CODE 25<br>250 VDC/160 VAC |      | VOLTAGE CODE 40<br>400 VDC/220 VAC |      | VOLTAGE CODE 63<br>630 VDC/250 VAC |      |
|---------------------|------------------|------------------------------------|------|------------------------------------|------|------------------------------------|------|------------------------------------|------|
|                     |                  | D                                  | L    | D                                  | L    | D                                  | L    | D                                  | L    |
| 1000 pF             | - 210            | -                                  | -    | -                                  | -    | -                                  | -    | -                                  | -    |
| 1500 pF             | - 215            | -                                  | -    | -                                  | -    | -                                  | -    | -                                  | -    |
| 2200 pF             | - 222            | -                                  | -    | -                                  | -    | -                                  | -    | -                                  | -    |
| 3300 pF             | - 233            | -                                  | -    | -                                  | -    | -                                  | -    | -                                  | -    |
| 4700 pF             | - 247            | -                                  | -    | -                                  | -    | -                                  | -    | -                                  | -    |
| 6800 pF             | - 268            | -                                  | -    | -                                  | -    | -                                  | -    | -                                  | -    |
| 0.01 $\mu\text{F}$  | - 310            | -                                  | -    | -                                  | -    | 6.0                                | 17.0 | 7.0                                | 22.0 |
| 0.015 $\mu\text{F}$ | - 315            | -                                  | -    | -                                  | -    | 6.5                                | 17.0 | 8.0                                | 22.0 |
| 0.022 $\mu\text{F}$ | - 322            | -                                  | -    | 6.0                                | 17.0 | 7.5                                | 17.0 | 9.5                                | 22.0 |
| 0.033 $\mu\text{F}$ | - 333            | 6.0                                | 17.0 | 7.0                                | 17.0 | 7.0                                | 22.0 | 9.0                                | 29.0 |
| 0.047 $\mu\text{F}$ | - 347            | 6.5                                | 17.0 | 8.0                                | 17.0 | 8.0                                | 22.0 | 10.5                               | 29.0 |
| 0.068 $\mu\text{F}$ | - 368            | 7.5                                | 17.0 | 7.0                                | 22.0 | 9.0                                | 22.0 | 12.5                               | 29.0 |
| 0.1 $\mu\text{F}$   | - 410            | 7.0                                | 22.0 | 8.0                                | 22.0 | 11.0                               | 22.0 | 12.5                               | 34.0 |
| 0.15 $\mu\text{F}$  | - 415            | 8.0                                | 22.0 | 9.5                                | 22.0 | 10.0                               | 29.0 | 15.0                               | 34.0 |
| 0.22 $\mu\text{F}$  | - 422            | 9.5                                | 22.0 | 9.0                                | 29.0 | 12.0                               | 29.0 | 14.5                               | 44.0 |
| 0.33 $\mu\text{F}$  | - 433            | 9.0                                | 29.0 | 10.5                               | 29.0 | 13.5                               | 29.0 | 17.5                               | 44.0 |
| 0.47 $\mu\text{F}$  | - 447            | 10.0                               | 29.0 | 12.0                               | 29.0 | 15.0                               | 34.0 | 21.0                               | 44.0 |
| 0.68 $\mu\text{F}$  | - 468            | 12.0                               | 29.0 | 13.0                               | 34.0 | 17.5                               | 34.0 | 25.0                               | 44.0 |
| 1.0 $\mu\text{F}$   | - 510            | 12.5                               | 34.0 | 15.5                               | 34.0 | 17.5                               | 44.0 | -                                  | -    |
| 1.5 $\mu\text{F}$   | - 515            | 15.5                               | 34.0 | 15.5                               | 44.0 | 21.5                               | 44.0 | -                                  | -    |
| 2.2 $\mu\text{F}$   | - 522            | 15.5                               | 44.0 | 18.5                               | 44.0 | 26.0                               | 44.0 | -                                  | -    |
| 3.3 $\mu\text{F}$   | - 533            | 18.5                               | 44.0 | 22.5                               | 44.0 | -                                  | -    | -                                  | -    |
| 4.7 $\mu\text{F}$   | - 547            | 22.0                               | 44.0 | -                                  | -    | -                                  | -    | -                                  | -    |

Further C-values on request.

pcm = L + 3.5.

## RECOMMENDED PACKAGING

| LETTER CODE | TYPE OF PACKAGING       | REEL DIAMETER (mm) | ORDERING CODE EXAMPLES |   |
|-------------|-------------------------|--------------------|------------------------|---|
| G           | AMMO                    | -                  | MKP 1845-310-135-G     | X |
| R           | REEL                    | 350                | MKP 1845-310-135-R     | X |
| -           | BULK<br>for L > 31.5 mm | -                  | MKP 1845-410-135       | X |



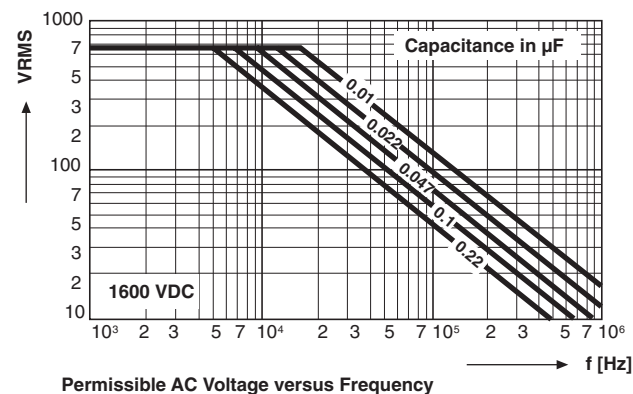
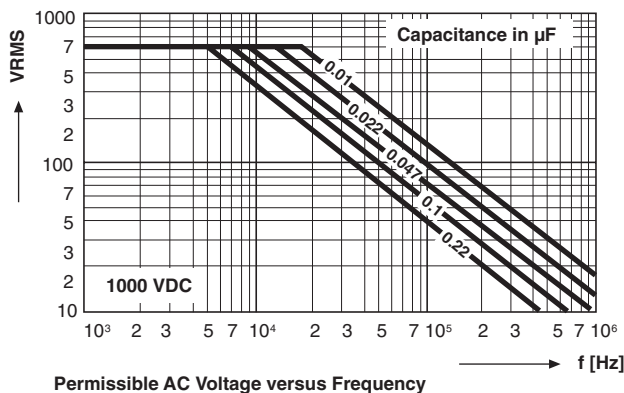
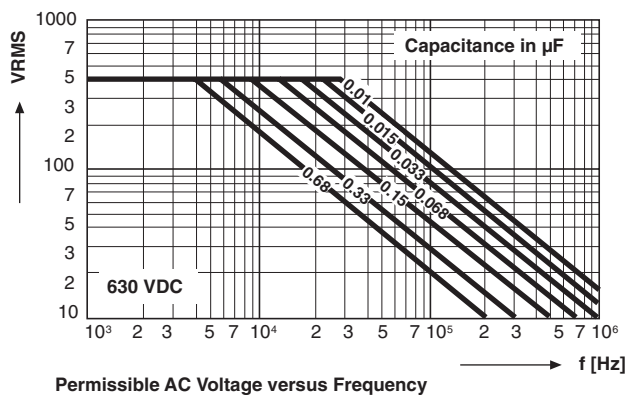
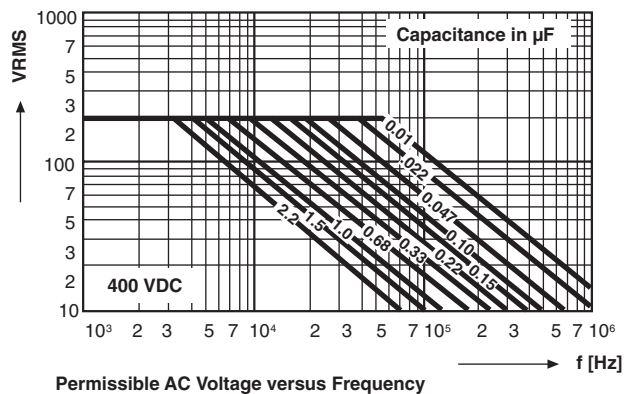
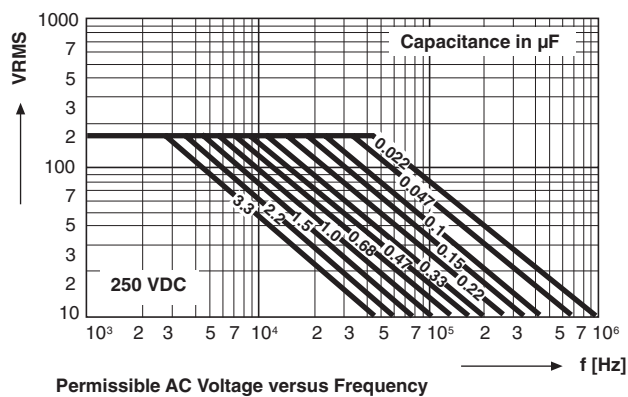
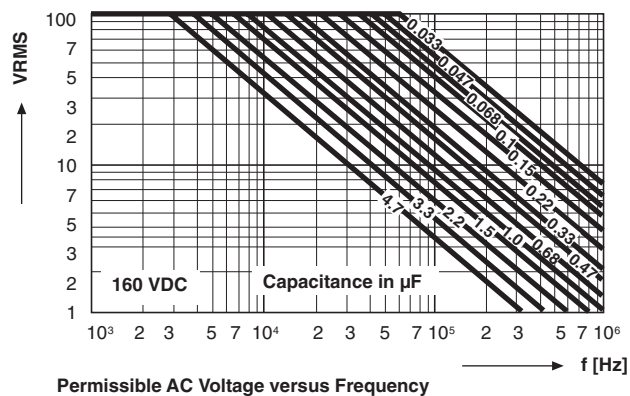
| CAPACITANCE   | CAPACITANCE CODE | VOLTAGE CODE 10<br>1000 VDC/600VAC |      | VOLTAGE CODE 13<br>1600 VDC/650 VAC |      | VOLTAGE CODE 20<br>2000 VDC/700 VAC |      |
|---------------|------------------|------------------------------------|------|-------------------------------------|------|-------------------------------------|------|
|               |                  | D                                  | L    | D                                   | L    | D                                   | L    |
| 1000 pF       | - 210            | -                                  | -    | -                                   | -    | 6.5                                 | 29.0 |
| 1500 pF       | - 215            | -                                  | -    | -                                   | -    | 6.5                                 | 29.0 |
| 2200 pF       | - 222            | -                                  | -    | -                                   | -    | 6.5                                 | 29.0 |
| 3300 pF       | - 233            | -                                  | -    | -                                   | -    | 7.0                                 | 29.0 |
| 4700 pF       | - 247            | -                                  | -    | -                                   | -    | 8.0                                 | 29.0 |
| 6800 pF       | - 268            | -                                  | -    | -                                   | -    | 9.5                                 | 29.0 |
| 0.01 $\mu$ F  | - 310            | 6.5                                | 29.0 | 8.0                                 | 29.0 | 11.0                                | 29.0 |
| 0.015 $\mu$ F | - 315            | 8.0                                | 29.0 | 9.5                                 | 29.0 | 11.5                                | 34.0 |
| 0.022 $\mu$ F | - 322            | 9.0                                | 29.0 | 11.0                                | 29.0 | 13.0                                | 34.0 |
| 0.033 $\mu$ F | - 333            | 11.0                               | 29.0 | 11.5                                | 34.0 | 16.0                                | 34.0 |
| 0.047 $\mu$ F | - 347            | 11.0                               | 34.0 | 13.5                                | 34.0 | 15.0                                | 44.0 |
| 0.068 $\mu$ F | - 368            | 13.0                               | 34.0 | 16.0                                | 34.0 | 18.0                                | 44.0 |
| 0.1 $\mu$ F   | - 410            | 15.5                               | 34.0 | 15.0                                | 44.0 | 21.0                                | 44.0 |
| 0.15 $\mu$ F  | - 415            | 15.0                               | 44.0 | 18.5                                | 44.0 | -                                   | -    |
| 0.22 $\mu$ F  | - 422            | 18.0                               | 44.0 | 22.0                                | 44.0 | -                                   | -    |
| 0.33 $\mu$ F  | - 433            | -                                  | -    | -                                   | -    | -                                   | -    |
| 0.47 $\mu$ F  | - 447            | -                                  | -    | -                                   | -    | -                                   | -    |
| 0.68 $\mu$ F  | - 468            | -                                  | -    | -                                   | -    | -                                   | -    |
| 1.0 $\mu$ F   | - 510            | -                                  | -    | -                                   | -    | -                                   | -    |
| 1.5 $\mu$ F   | - 515            | -                                  | -    | -                                   | -    | -                                   | -    |
| 2.2 $\mu$ F   | - 522            | -                                  | -    | -                                   | -    | -                                   | -    |
| 3.3 $\mu$ F   | - 533            | -                                  | -    | -                                   | -    | -                                   | -    |
| 4.7 $\mu$ F   | - 547            | -                                  | -    | -                                   | -    | -                                   | -    |

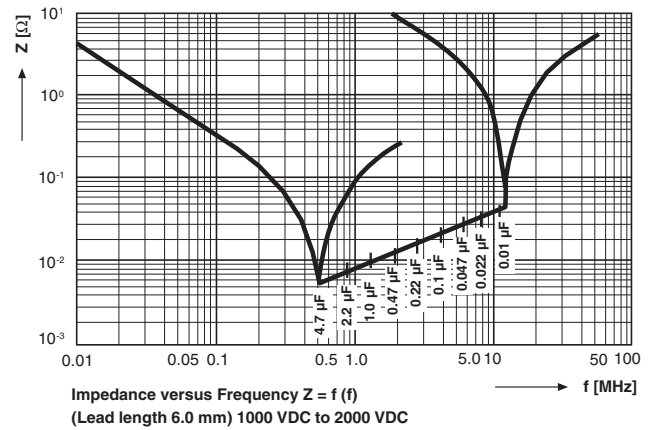
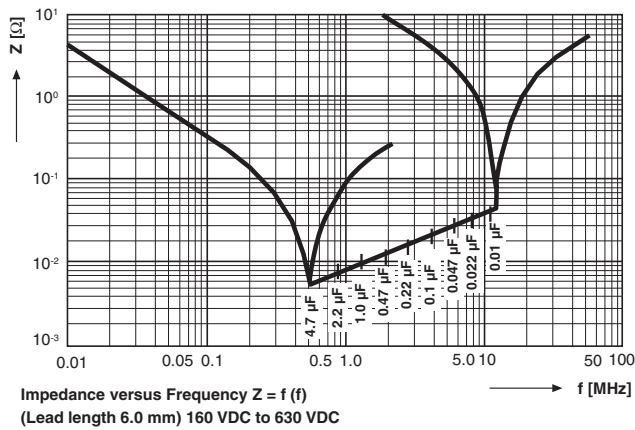
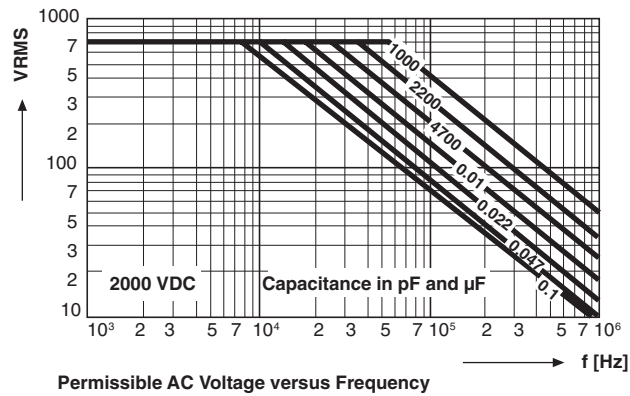
Further C-values on request.

pcm = L + 3.5.

**RECOMMENDED PACKAGING**

| LETTER CODE | TYPE OF PACKAGING       | REEL DIAMETER (mm) | ORDERING CODE EXAMPLES |   |
|-------------|-------------------------|--------------------|------------------------|---|
| G           | AMMO                    | -                  | MKP 1845-310-135-G     | X |
| R           | REEL                    | 350                | MKP 1845-310-135-R     | X |
| -           | BULK<br>for L > 31.5 mm | -                  | MKP 1845-410-135       | X |







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