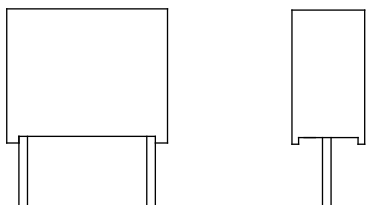


## AC and Pulse Film/Foil Capacitors Radial Potted Type



### FEATURES

- Material categorization:  
For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### APPLICATIONS

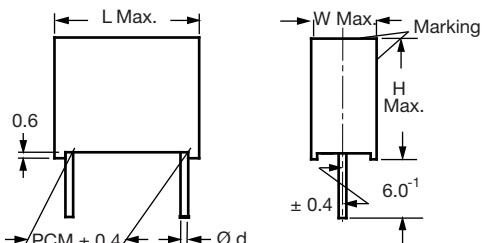
- High voltage, very high current and high pulse operations, deflection circuits in TV sets (fly-back tuning)
- Electronic ballasts, protection circuits in SMPS's
- Snubber and SCR commutating circuits

### QUICK REFERENCE DATA

|                                                        |                                                                                                                      |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| Capacitance range                                      | 100 pF to 0.22 $\mu$ F                                                                                               |
| Capacitance tolerances                                 | $\pm 10\%$ (K), $\pm 5\%$ (J)                                                                                        |
| Climatic testing class according to IEC 60068          | 55/100/56                                                                                                            |
| Dielectric                                             | Polypropylene film                                                                                                   |
| Electrodes                                             | Aluminum foil                                                                                                        |
| Construction                                           | Extended aluminum foil, internal series connection, double-sided metallized, polyester carrier film                  |
| Leads                                                  | Tinned wire                                                                                                          |
| Marking                                                | Manufacturer's logo, type, C-value, rated voltage, tolerance, data of manufacture                                    |
| Coating                                                | Flame retardant plastic case (UL-class 94 V-0), epoxy resin sealed                                                   |
| Insulation resistance                                  | Measured at 500 V <sub>DC</sub> after one minute<br>100 000 M $\Omega$ minimum value (1000 G $\Omega$ typical value) |
| Operating temperature range                            | - 55 °C to + 100 °C                                                                                                  |
| Rated DC voltages                                      | 630 V <sub>DC</sub> , 1000 V <sub>DC</sub> , 1250 V <sub>DC</sub> , 1600 V <sub>DC</sub> , 2000 V <sub>DC</sub>      |
| Permissible AC voltages (RMS) up to 60 Hz              | 300 V <sub>AC</sub> , 350 V <sub>AC</sub> , 400 V <sub>AC</sub> , 500 V <sub>AC</sub> , 600 V <sub>AC</sub>          |
| Test voltages (electrode/electrode)                    | 2 x U <sub>R</sub> for 2 s                                                                                           |
| Temperature coefficient                                | - 250 x 10 <sup>-6</sup> /°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 <sub>C</sub> | At + 85 °C: U <sub>C</sub> = 1.0 U <sub>R</sub><br>At + 100 °C: U <sub>C</sub> = 0.7 U <sub>R</sub>                  |
| 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 > 300 000 h<br>Failure rate < 1 FIT (0.5 x U <sub>R</sub> and 40 °C)                                |

#### Note

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

**DIMENSIONS** in millimeters


| W    | Ø d |
|------|-----|
| ≥ 16 | 1.0 |
| < 16 | 0.8 |

**MAXIMUM PULSE RISE TIME**

| PCM<br>(mm) | MAXIMUM PULSE RISE TIME dV/dt [V/µs] |                      |                      |                      |                      |
|-------------|--------------------------------------|----------------------|----------------------|----------------------|----------------------|
|             | 630 V <sub>DC</sub>                  | 1000 V <sub>DC</sub> | 1250 V <sub>DC</sub> | 1600 V <sub>DC</sub> | 2000 V <sub>DC</sub> |
| 15          | 6500                                 | 8200                 | 11 100               | 13 900               | 13 900               |
| 22.5        | 2600                                 | 3200                 | 4600                 | 6000                 | 9800                 |
| 27.5        | 1800                                 | 2300                 | 3100                 | 4000                 | 6000                 |
| 37.5        | 1200                                 | 1500                 | 1900                 | 2400                 | 3500                 |

**Note**

- If the maximum pulse voltage is less than the rated voltage higher dV/dt values can be permitted.

**DISSIPATION FACTOR tan δ**

| MEASURED AT    | C ≤ 0.1 µF             | C > 1.0 µF             |
|----------------|------------------------|------------------------|
| 1 kHz          | 0.3 x 10 <sup>-3</sup> | 0.3 x 10 <sup>-3</sup> |
| 10 kHz         | 0.4 x 10 <sup>-3</sup> | 0.4 x 10 <sup>-3</sup> |
| 100 kHz        | 1 x 10 <sup>-3</sup>   | -                      |
| Maximum values |                        |                        |

**ELECTRICAL DATA**

| U <sub>RDC</sub><br>(V) | CAP.<br>(µF) | CAPACITANCE<br>CODE | VOLTAGE<br>CODE | V <sub>AC</sub> | DIMENSIONS<br>(W x H x L) | PCM  |
|-------------------------|--------------|---------------------|-----------------|-----------------|---------------------------|------|
| 630                     | 0.0027       | -227                | 63              | 300             | 5.5 x 10.5 x 18.0         | 15   |
|                         | 0.0033       | -233                |                 |                 | 5.5 x 10.5 x 18.0         | 15   |
|                         | 0.0039       | -239                |                 |                 | 6.5 x 12.5 x 18.0         | 15   |
|                         | 0.0047       | -247                |                 |                 | 6.5 x 12.5 x 18.0         | 15   |
|                         | 0.0056       | -256                |                 |                 | 7.5 x 13.5 x 18.0         | 15   |
|                         | 0.0068       | -268                |                 |                 | 7.5 x 13.5 x 18.0         | 15   |
|                         | 0.0082       | -282                |                 |                 | 8.5 x 14.5 x 18.0         | 15   |
|                         | 0.010        | -310                |                 |                 | 8.5 x 14.5 x 18.0         | 15   |
|                         | 0.012        | -312                |                 |                 | 8.5 x 17.5 x 18.0         | 15   |
|                         | 0.015        | -315                |                 |                 | 10.5 x 17.5 x 18.0        | 15   |
|                         | 0.018        | -318                |                 |                 | 7.5 x 15.5 x 26.5         | 22.5 |
|                         | 0.022        | -322                |                 |                 | 7.5 x 15.5 x 26.5         | 22.5 |
|                         | 0.027        | -327                |                 |                 | 8.5 x 16.5 x 26.5         | 22.5 |
|                         | 0.033        | -333                |                 |                 | 10.5 x 18.5 x 26.5        | 22.5 |
|                         | 0.039        | -339                |                 |                 | 10.5 x 18.5 x 26.5        | 22.5 |
|                         | 0.047        | -347                |                 |                 | 10.5 x 18.5 x 26.5        | 22.5 |
|                         | 0.056        | -356                |                 |                 | 11.5 x 20.5 x 31.5        | 27.5 |
|                         | 0.068        | -368                |                 |                 | 11.5 x 20.5 x 31.5        | 27.5 |
|                         | 0.082        | -382                |                 |                 | 11.5 x 20.5 x 31.5        | 27.5 |
|                         | 0.10         | -410                |                 |                 | 13.5 x 23.5 x 31.5        | 27.5 |
|                         | 0.12         | -412                |                 |                 | 12.5 x 22.5 x 41.5        | 37.5 |
|                         | 0.15         | -415                |                 |                 | 12.5 x 22.5 x 41.5        | 37.5 |
|                         | 0.18         | -418                |                 |                 | 14.5 x 24.5 x 41.5        | 37.5 |
|                         | 0.22         | -422                |                 |                 | 14.5 x 24.5 x 41.5        | 37.5 |



| ELECTRICAL DATA         |              |                     |                 |                 |                           |      |
|-------------------------|--------------|---------------------|-----------------|-----------------|---------------------------|------|
| U <sub>RDC</sub><br>(V) | CAP.<br>(μF) | CAPACITANCE<br>CODE | VOLTAGE<br>CODE | V <sub>AC</sub> | DIMENSIONS<br>(W x H x L) | PCM  |
| 1000                    | 0.0018       | -218                | 10              | 350             | 5.5 x 10.5 x 18.0         | 15   |
|                         | 0.0022       | -222                |                 |                 | 5.5 x 10.5 x 18.0         | 15   |
|                         | 0.0027       | -227                |                 |                 | 6.5 x 12.5 x 18.0         | 15   |
|                         | 0.0033       | -233                |                 |                 | 6.5 x 12.5 x 18.0         | 15   |
|                         | 0.0039       | -239                |                 |                 | 7.5 x 13.5 x 18.0         | 15   |
|                         | 0.0047       | -247                |                 |                 | 7.5 x 13.5 x 18.0         | 15   |
|                         | 0.0056       | -256                |                 |                 | 8.5 x 14.5 x 18.0         | 15   |
|                         | 0.0068       | -268                |                 |                 | 8.5 x 14.5 x 18.0         | 15   |
|                         | 0.0082       | -282                |                 |                 | 6.5 x 14.5 x 26.5         | 22.5 |
|                         | 0.010        | -310                |                 |                 | 6.5 x 14.5 x 26.5         | 22.5 |
|                         | 0.012        | -312                |                 |                 | 7.5 x 15.5 x 26.5         | 22.5 |
|                         | 0.015        | -315                |                 |                 | 7.5 x 15.5 x 26.5         | 22.5 |
|                         | 0.018        | -318                |                 |                 | 8.5 x 16.5 x 26.5         | 22.5 |
|                         | 0.022        | -322                |                 |                 | 8.5 x 16.5 x 26.5         | 22.5 |
|                         | 0.027        | -327                |                 |                 | 10.5 x 18.5 x 26.5        | 22.5 |
|                         | 0.033        | -333                |                 |                 | 11.5 x 20.5 x 31.5        | 27.5 |
|                         | 0.039        | -339                |                 |                 | 11.5 x 20.5 x 31.5        | 27.5 |
|                         | 0.047        | -347                |                 |                 | 11.5 x 20.5 x 31.5        | 27.5 |
|                         | 0.056        | -356                |                 |                 | 12.5 x 22.5 x 41.5        | 37.5 |
|                         | 0.068        | -368                |                 |                 | 12.5 x 22.5 x 41.5        | 37.5 |
|                         | 0.082        | -382                |                 |                 | 12.5 x 22.5 x 41.5        | 37.5 |
|                         | 0.10         | -410                |                 |                 | 14.5 x 24.5 x 41.5        | 37.5 |
|                         | 0.12         | -412                |                 |                 | 14.5 x 24.5 x 41.5        | 37.5 |
|                         | 0.15         | -415                |                 |                 | 16.0 x 28.5 x 41.5        | 37.5 |
|                         | 0.18         | -418                |                 |                 | 16.0 x 28.5 x 41.5        | 37.5 |
|                         | 0.22         | -422                |                 |                 | 18.0 x 32.5 x 41.5        | 37.5 |
| 1250                    | 0.0012       | -212                | 12              | 400             | 5.5 x 10.5 x 18.0         | 15   |
|                         | 0.0015       | -215                |                 |                 | 5.5 x 10.5 x 18.0         | 15   |
|                         | 0.0018       | -218                |                 |                 | 6.5 x 12.5 x 18.0         | 15   |
|                         | 0.0022       | -222                |                 |                 | 6.5 x 12.5 x 18.0         | 15   |
|                         | 0.0027       | -227                |                 |                 | 7.5 x 13.5 x 18.0         | 15   |
|                         | 0.0033       | -233                |                 |                 | 7.5 x 13.5 x 18.0         | 15   |
|                         | 0.0039       | -239                |                 |                 | 6.5 x 14.5 x 26.5         | 22.5 |
|                         | 0.0047       | -247                |                 |                 | 6.5 x 14.5 x 26.5         | 22.5 |
|                         | 0.0056       | -256                |                 |                 | 6.5 x 14.5 x 26.5         | 22.5 |
|                         | 0.0068       | -268                |                 |                 | 6.5 x 14.5 x 26.5         | 22.5 |
|                         | 0.0082       | -282                |                 |                 | 57.5 x 15.5 x 26.5        | 22.5 |
|                         | 0.010        | -310                |                 |                 | 7.5 x 15.5 x 26.5         | 22.5 |
|                         | 0.012        | -312                |                 |                 | 10.5 x 18.5 x 26.5        | 22.5 |
|                         | 0.015        | -315                |                 |                 | 10.5 x 18.5 x 26.5        | 22.5 |
|                         | 0.018        | -318                |                 |                 | 11.0 x 21.0 x 26.5        | 22.5 |
|                         | 0.022        | -322                |                 |                 | 11.0 x 21.0 x 26.5        | 22.5 |
|                         | 0.027        | -327                |                 |                 | 11.0 x 21.0 x 31.0        | 27.5 |
|                         | 0.033        | -333                |                 |                 | 11.0 x 21.0 x 31.0        | 27.5 |
|                         | 0.039        | -339                |                 |                 | 13.5 x 23.5 x 31.5        | 27.5 |
|                         | 0.047        | -347                |                 |                 | 13.5 x 23.5 x 31.5        | 27.5 |
|                         | 0.056        | -356                |                 |                 | 12.5 x 23.5 x 41.5        | 37.5 |
|                         | 0.068        | -368                |                 |                 | 12.5 x 22.5 x 41.5        | 37.5 |
|                         | 0.082        | -382                |                 |                 | 14.5 x 24.5 x 41.5        | 37.5 |
|                         | 0.10         | -410                |                 |                 | 14.5 x 24.5 x 41.5        | 37.5 |
|                         | 0.12         | -412                |                 |                 | 16.0 x 28.5 x 41.5        | 37.5 |
|                         | 0.15         | -415                |                 |                 | 16.0 x 28.5 x 41.5        | 37.5 |
|                         | 0.18         | -418                |                 |                 | 20.0 x 40.0 x 42.5        | 37.5 |
|                         | 0.22         | -422                |                 |                 | 20.0 x 40.0 x 42.5        | 37.5 |



| ELECTRICAL DATA         |              |                     |                 |                 |                           |      |
|-------------------------|--------------|---------------------|-----------------|-----------------|---------------------------|------|
| U <sub>RDC</sub><br>(V) | CAP.<br>(μF) | CAPACITANCE<br>CODE | VOLTAGE<br>CODE | V <sub>AC</sub> | DIMENSIONS<br>(W x H x L) | PCM  |
| 1600                    | 0.00068      | -168                | 13              | 500             | 5.5 x 10.5 x 18.0         | 15   |
|                         | 0.0010       | -210                |                 |                 | 5.5 x 10.5 x 18.0         | 15   |
|                         | 0.0012       | -212                |                 |                 | 6.5 x 12.5 x 18.0         | 15   |
|                         | 0.0015       | -215                |                 |                 | 6.5 x 12.5 x 18.0         | 15   |
|                         | 0.0018       | -218                |                 |                 | 6.5 x 14.5 x 26.5         | 22.5 |
|                         | 0.0022       | -222                |                 |                 | 6.5 x 14.5 x 26.5         | 22.5 |
|                         | 0.0027       | -227                |                 |                 | 6.5 x 14.5 x 26.5         | 22.5 |
|                         | 0.0033       | -233                |                 |                 | 6.5 x 14.5 x 26.5         | 22.5 |
|                         | 0.0039       | -239                |                 |                 | 7.5 x 15.5 x 26.5         | 22.5 |
|                         | 0.0047       | -247                |                 |                 | 7.5 x 15.5 x 26.5         | 22.5 |
|                         | 0.0056       | -256                |                 |                 | 8.5 x 16.5 x 26.5         | 22.5 |
|                         | 0.0068       | -268                |                 |                 | 8.5 x 16.5 x 26.5         | 22.5 |
|                         | 0.0082       | -282                |                 |                 | 10.5 x 18.5 x 26.5        | 22.5 |
|                         | 0.010        | -310                |                 |                 | 10.5 x 18.5 x 26.5        | 22.5 |
|                         | 0.012        | -312                |                 |                 | 11.5 x 20.5 x 31.5        | 27.5 |
|                         | 0.015        | -315                |                 |                 | 11.5 x 20.5 x 31.5        | 27.5 |
|                         | 0.018        | -318                |                 |                 | 11.5 x 20.5 x 31.5        | 27.5 |
|                         | 0.022        | -322                |                 |                 | 11.5 x 20.5 x 31.5        | 27.5 |
|                         | 0.027        | -327                |                 |                 | 13.5 x 23.5 x 31.5        | 27.5 |
|                         | 0.033        | -333                |                 |                 | 13.5 x 23.5 x 31.5        | 27.5 |
|                         | 0.039        | -339                |                 |                 | 12.5 x 22.5 x 41.5        | 37.5 |
|                         | 0.047        | -347                |                 |                 | 12.5 x 22.5 x 41.5        | 37.5 |
|                         | 0.056        | -356                |                 |                 | 14.5 x 24.5 x 41.5        | 37.5 |
|                         | 0.068        | -368                |                 |                 | 14.5 x 24.5 x 41.5        | 37.5 |
|                         | 0.082        | -382                |                 |                 | 16.0 x 28.5 x 41.5        | 37.5 |
|                         | 0.10         | -410                |                 |                 | 16.0 x 28.5 x 41.5        | 37.5 |
| 2000                    | 0.00010      | -110                | 20              | 600             | 5.5 x 10.5 x 18.0         | 15   |
|                         | 0.00015      | -115                |                 |                 | 5.5 x 10.5 x 18.0         | 15   |
|                         | 0.00022      | -122                |                 |                 | 5.5 x 10.5 x 18.0         | 15   |
|                         | 0.00033      | -133                |                 |                 | 5.5 x 10.5 x 18.0         | 15   |
|                         | 0.00047      | -147                |                 |                 | 5.5 x 10.5 x 18.0         | 15   |
|                         | 0.00068      | -168                |                 |                 | 5.5 x 10.5 x 18.0         | 15   |
|                         | 0.0010       | -210                |                 |                 | 6.5 x 14.5 x 26.5         | 22.5 |
|                         | 0.0012       | -212                |                 |                 | 6.5 x 14.5 x 26.5         | 22.5 |
|                         | 0.0015       | -215                |                 |                 | 6.5 x 14.5 x 26.5         | 22.5 |
|                         | 0.0018       | -218                |                 |                 | 6.5 x 14.5 x 26.5         | 22.5 |
|                         | 0.0022       | -222                |                 |                 | 6.5 x 14.5 x 26.5         | 22.5 |
|                         | 0.0027       | -227                |                 |                 | 7.5 x 15.5 x 26.5         | 22.5 |
|                         | 0.0033       | -233                |                 |                 | 7.5 x 15.5 x 26.5         | 22.5 |
|                         | 0.0039       | -239                |                 |                 | 10.5 x 18.5 x 26.5        | 22.5 |
|                         | 0.0047       | -247                |                 |                 | 10.5 x 18.5 x 26.5        | 22.5 |
|                         | 0.0056       | -256                |                 |                 | 10.5 x 18.5 x 26.5        | 22.5 |
|                         | 0.0068       | -268                |                 |                 | 11.5 x 20.5 x 31.5        | 27.5 |
|                         | 0.0082       | -282                |                 |                 | 11.5 x 20.5 x 31.5        | 27.5 |
|                         | 0.010        | -310                |                 |                 | 11.5 x 20.5 x 31.5        | 27.5 |
|                         | 0.012        | -312                |                 |                 | 13.5 x 23.5 x 31.5        | 27.5 |
|                         | 0.015        | -315                |                 |                 | 13.5 x 23.5 x 31.5        | 27.5 |
|                         | 0.018        | -318                |                 |                 | 15.0 x 24.5 x 31.5        | 27.5 |
|                         | 0.022        | -322                |                 |                 | 15.0 x 24.5 x 31.5        | 27.5 |
|                         | 0.027        | -327                |                 |                 | 14.5 x 24.5 x 41.5        | 37.5 |
|                         | 0.033        | -333                |                 |                 | 14.5 x 24.5 x 41.5        | 37.5 |
|                         | 0.039        | -339                |                 |                 | 16.0 x 28.5 x 41.5        | 37.5 |
|                         | 0.047        | -347                |                 |                 | 16.0 x 28.5 x 41.5        | 37.5 |

**Note**

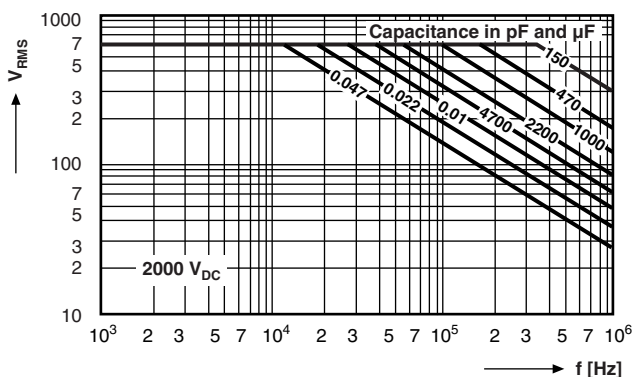
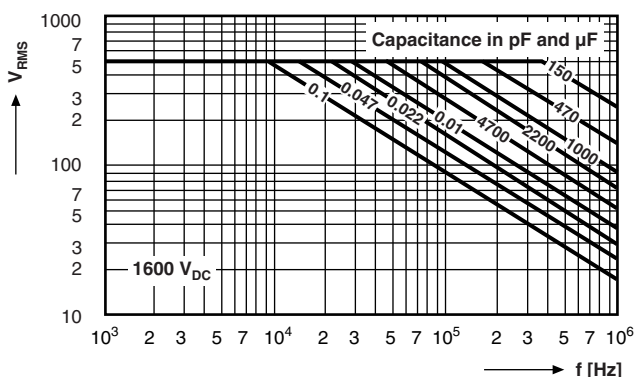
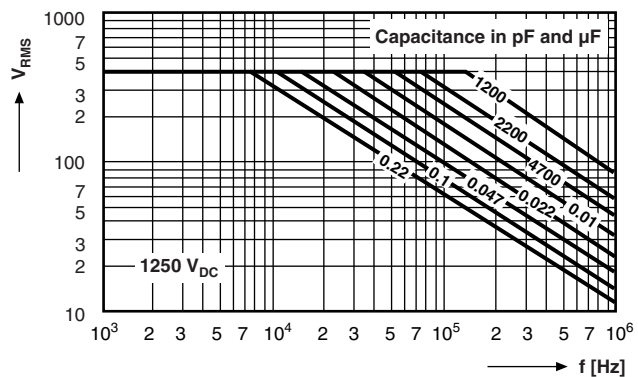
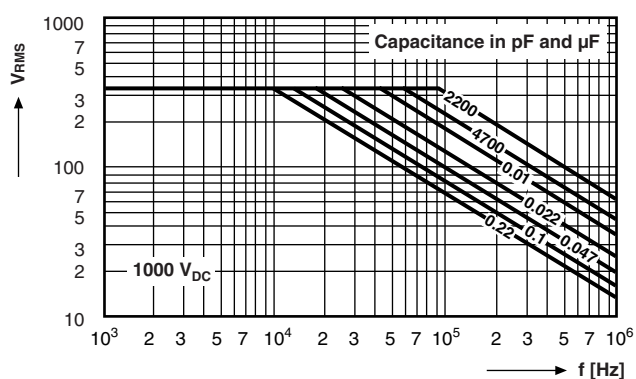
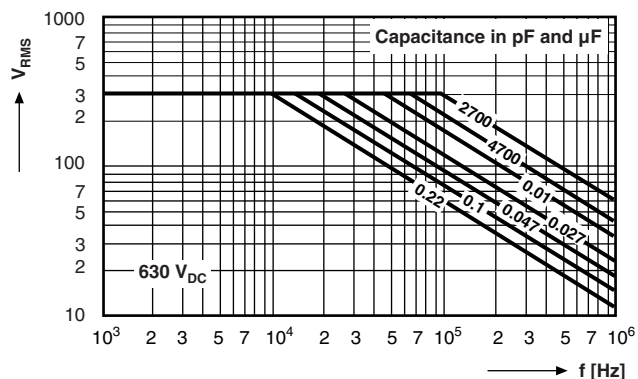
- Further C-values upon request.

**RECOMMENDED PACKAGING**

| LETTER CODE | TYPE OF PACKAGING | HEIGHT (H) (mm) | REEL DIAMETER (mm) | ORDERING CODE EXAMPLES | PCM 15 | PCM 22.5 TO 27.5 | PCM 37.5 |
|-------------|-------------------|-----------------|--------------------|------------------------|--------|------------------|----------|
| D           | Ammo              | 16.5            | S <sup>(1)</sup>   | KP1836-168/205-D       | x      | -                | -        |
| G           | Ammo              | 18.5            | S <sup>(1)</sup>   | KP1836-168/205-G       | x      | -                | -        |
| F           | Reel              | 16.5            | 350                | KP1836-168/205-F       | x      | -                | -        |
| W           | Reel              | 18.5            | 350                | KP1836-168/205-W       | x      | -                | -        |
| V           | Reel              | 18.5            | 500                | KP1836-310/134-V       | x      | x                | -        |
| G           | Ammo              | 18.5            | L <sup>(2)</sup>   | KP1836-310/134-G       | -      | x                | -        |
| -           | Bulk              | -               | -                  | KP1836-310/134         | x      | x                | x        |

**Notes**
<sup>(1)</sup> S = Box size 55 mm x 210 mm x 340 mm (W x H x L)

<sup>(2)</sup> L = Box size 60 mm x 360 mm x 510 mm (W x H x L)

**PERMISSIBLE AC VOLTAGE VS. FREQUENCY**




## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

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Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

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## Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**