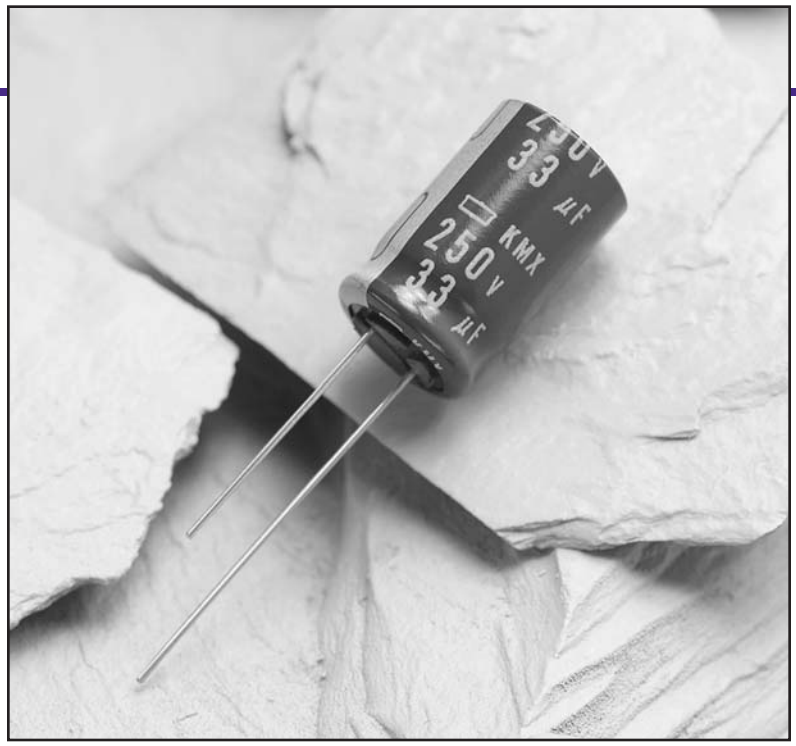
# KMX Series

UNITED CHEMI-CON



- Miniature
- Low Impedance
- Long Life 8k-10k Hours
- For Electronic Ballasts
- +105°C Maximum Temperature




The KMX is a long life, low impedance series from United Chemi-Con. These capacitors have a load life of 8,000 to 10,000 hours at +105°C with the full rated ripple current applied and a voltage range from 160 to 450 volts. The KMX capacitors are ideal for use in electronic ballasts or any other high voltage application where a very long lifetime is required. The KMX series capacitors are available in slender case sizes with 10 to 18mm diameters and 20 to 60mm lengths.

The KMX series capacitors are non-solvent proof. Refer to the Mini-Glossary for cleaning guidelines and recommended cleaning agents that are compatible with United Chemi-Con products.

## Summary of Specifications

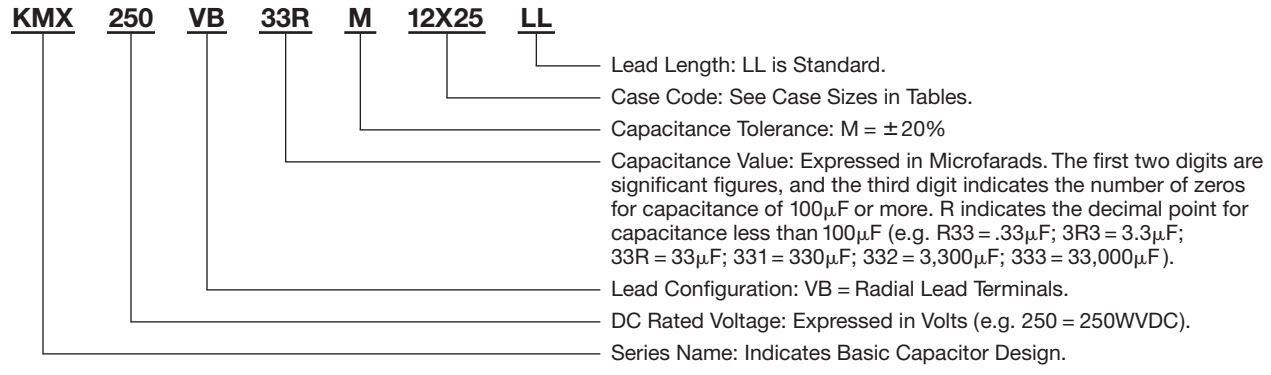
- **Radial lead terminals.**
- **Capacitance range: 3.3 to 680μF.**
- **Voltage range: 160 to 450VDC.**
- **Category temperature range: −40°C to +105°C for 160 to 400V; −25°C to +105°C for 450V.**
- **Leakage current: 0.1CV+40μA after 1 minute or 0.03CV+15μA after 5 minutes for 1,000CV or less; 0.04CV+100μA after 1 minute or 0.02CV+25μA after 5 minutes for more than 1,000CV at +20°C.**
- **Standard capacitance tolerance: ±20%**
- **Nominal case size (D×L): 10×20mm to 18×60mm.**
- **Rated lifetime: 8,000 to 10,000 hours at +105°C with the rated ripple current applied, depending on case size.**

## KMX Specifications

<table>
<tr><th>Item</th><th>Characteristics</th></tr>
<tr><td>Category Temperature Range</td><td>−40 to +105°C for 160 to 400VDC; −25 to +105°C for 450VDC</td></tr>
<tr><td>Rated Voltage Range</td><td>160 to 450VDC</td></tr>
<tr><td>Capacitance Range</td><td>3.3 to 680μF</td></tr>
<tr><td>Capacitance Tolerance</td><td>±20% (M) at +20°C, 120Hz</td></tr>
<tr><td>Leakage Current</td><td>At +20°C
<table>
<tr><td>CV Product</td><td>After 1 Minute</td><td>After 5 Minutes</td></tr>
<tr><td>CV ≤ 1,000</td><td>I = 0.1CV + 40μA</td><td>I = 0.03CV + 15μA</td></tr>
<tr><td>CV > 1,000</td><td>I = 0.04CV + 100μA</td><td>I = 0.02CV + 25μA</td></tr>
</table>
Where I = Max. leakage current (μA), C = Nominal capacitance (μF) and V = Rated voltage (V)</td></tr>
<tr><td>Dissipation Factor (Tan δ)</td><td>At +20°C, 120Hz
<table>
<tr><td>Rated Voltage (V)</td><td>160</td><td>200</td><td>250</td><td>350</td><td>400</td><td>450</td></tr>
<tr><td>Tan δ (DF)</td><td>0.20</td><td>0.20</td><td>0.20</td><td>0.24</td><td>0.24</td><td>0.24</td></tr>
</table></td></tr>
<tr><td>Low Temperature Characteristics</td><td>At 120Hz, impedance (Z) ratio between the −25°C or −40°C value and +20°C value shall not exceed the values given below.
<table>
<tr><td>Rated Voltage (V)</td><td>160</td><td>200</td><td>250</td><td>350</td><td>400</td><td>450</td></tr>
<tr><td>Z(−25°C)/Z(+20°C)</td><td>3</td><td>3</td><td>3</td><td>5</td><td>5</td><td>6</td></tr>
<tr><td>Z(−40°C)/Z(+20°C)</td><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td><td>–</td></tr>
</table></td></tr>
<tr><td>Endurance (Load Life)</td><td>The following specifications shall be satisfied when the capacitors are restored to +20°C after subjecting them to DC voltage for the specified test time at +105°C with the rated ripple current applied. The sum of the DC voltage and peak AC voltage must not exceed the full rated voltage of the capacitors.
<table>
<tr><td>Case Diameter</td><td>Ø10mm</td><td>Ø12.5mm & Above</td></tr>
<tr><td>Test Time</td><td>8,000 Hours</td><td>10,000 Hours</td></tr>
</table>
Capacitance change: ≤ ±20% of initial measured value<br>Tan δ (DF) : ≤ 200% of initial specified value<br>Leakage current : ≤ initial specified value</td></tr>
<tr><td>Shelf Life</td><td>The following specifications shall be satisfied when the capacitors are restored to +20°C after exposing them for 1,000 hours at +105°C without voltage applied. The rated voltage shall be applied to the capacitors for a minimum of 30 minutes, at least 24 hours and not more than 48 hours before the measurements.<br>Capacitance change: ≤ ±20% of initial measured value<br>Tan δ (DF) : ≤ 200% of initial specified value<br>Leakage current : ≤ 500% of initial specified value</td></tr>
</table>

## Part Numbering System for KMX Series

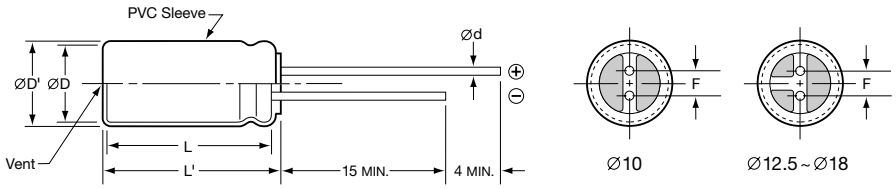
When ordering, always specify complete catalog number for KMX Series.



## Diagram of Dimensions

**VB/Radial Lead**

Unit: mm




Gas escape end seal for all case diameters.

Refer to Packaging section for Miniature taping and ammo box specifications and Lead Configurations section for Miniature radial lead cut and lead forming options.

| ØD | ØD' max. | L' max. | Ød | F ± 0.5 |
|---|---|---|---|---|
| 10 | ØD + 0.5 | L + 1.5 | 0.6 | 5.0 |
| 12.5 | ØD + 0.5 | L + 1.5 | 0.6 | 5.0 |
| 16 | ØD + 0.5 | L + 1.5 | 0.8 | 7.5 |
| 18 | ØD + 0.5 | L + 1.5 | 0.8 | 7.5 |

## Standard Voltage Ratings - VB/Radial Lead

| Rated Voltage (WVDC) | Capacitance (µF) | Catalog Part Number | Nominal Case Size* D × L (mm) | Maximum Impedance (Ω) at +20°C, 100kHz | Rated Ripple Current (mA rms) at +105°C | |
|---|---|---|---|---|---|---|
| | | | | | 120Hz | 100kHz |
| **160 Volts** **200 Volts Surge** | 33 | KMX160VB33RM10X20LL | 10 × 20 | 1.3 | 210 | 565 |
| | 47 | KMX160VB47RM12X20LL | 12.5 × 20 | 0.91 | 270 | 725 |
| | 68 | KMX160VB68RM12X25LL | 12.5 × 25 | 0.63 | 350 | 950 |
| | 68 | KMX160VB68RM16X20LL | 16 × 20 | 0.47 | 430 | 970 |
| | 100 | KMX160VB101M16X25LL | 16 × 25 | 0.27 | 475 | 1,280 |
| | 100 | KMX160VB101M18X20LL | 18 × 20 | 0.31 | 465 | 1,180 |
| | 150 | KMX160VB151M10X50LL | 10 × 50 | 0.77 | 545 | 1,020 |
| | 150 | KMX160VB151M16X25LL | 16 × 25 | 0.27 | 580 | 1,300 |
| | 220 | KMX160VB221M12X45LL | 12.5 × 45 | 0.52 | 740 | 1,200 |
| | 220 | KMX160VB221M16X31LL | 16 × 31.5 | 0.22 | 750 | 1,300 |
| | 220 | KMX160VB221M18X25LL | 18 × 25 | 0.23 | 725 | 1,300 |
| | 330 | KMX160VB331M16X40LL | 16 × 40 | 0.35 | 990 | 1,540 |
| | 330 | KMX160VB331M18X31LL | 18 × 31.5 | 0.22 | 960 | 1,700 |
| | 470 | KMX160VB471M16X55LL | 16 × 55 | 0.25 | 1,220 | 1,870 |
| | 560 | KMX160VB561M16X60LL | 16 × 60 | 0.23 | 1,350 | 2,140 |
| | 680 | KMX160VB681M18X55LL | 18 × 55 | 0.20 | 1,480 | 2,330 |
| **200 Volts** **250 Volts Surge** | 22 | KMX200VB22RM10X20LL | 10 × 20 | 1.5 | 165 | 440 |
| | 33 | KMX200VB33RM12X20LL | 12.5 × 20 | 0.91 | 230 | 590 |
| | 47 | KMX200VB47RM12X20LL | 12.5 × 20 | 0.91 | 270 | 780 |
| | 68 | KMX200VB68RM12X25LL | 12.5 × 25 | 0.63 | 350 | 950 |
| | 68 | KMX200VB68RM16X20LL | 16 × 20 | 0.47 | 430 | 970 |
| | 100 | KMX200VB101M10X50LL | 10 × 50 | 0.73 | 430 | 930 |
| | 100 | KMX200VB101M16X25LL | 16 × 25 | 0.27 | 425 | 1,280 |
| | 100 | KMX200VB101M18X20LL | 18 × 20 | 0.31 | 465 | 1,180 |
| | 150 | KMX200VB151M12X40LL | 12.5 × 40 | 0.56 | 615 | 1,200 |
| | 150 | KMX200VB151M16X25LL | 16 × 25 | 0.27 | 580 | 1,300 |
| | 220 | KMX200VB221M12X55LL | 12.5 × 55 | 0.39 | 790 | 1,420 |
| | 220 | KMX200VB221M18X31LL | 18 × 31.5 | 0.22 | 780 | 1,700 |
| | 330 | KMX200VB331M16X50LL | 16 × 50 | 0.28 | 1,020 | 1,870 |
| | 470 | KMX200VB471M18X50LL | 18 × 50 | 0.23 | 1,230 | 2,180 |
| | 560 | KMX200VB561M18X60LL | 18 × 60 | 0.18 | 1,330 | 2,390 |

***The case sizes in table are with no sleeve, refer to diagram for case sizes with sleeve.**

# KMX Series



## Standard Voltage Ratings - VB/Radial Lead

| Rated Voltage (WVDC) | Capacitance (µF) | Catalog Part Number | Nominal Case Size* D × L (mm) | Maximum Impedance (Ω) at +20°C, 100kHz | Rated Ripple Current (mA rms) at +105°C | |
|---|---|---|---|---|---|---|
| | | | | | 120Hz | 100kHz |
| **250 Volts** 300 Volts Surge | 10 | KMX250VB10RM10X20LL | 10 × 20 | 3.5 | 110 | 300 |
| | 22 | KMX250VB22RM12X20LL | 12.5 × 20 | 2.3 | 185 | 480 |
| | 33 | KMX250VB33RM12X25LL | 12.5 × 25 | 1.7 | 250 | 630 |
| | 47 | KMX250VB47RM12X25LL | 12.5 × 25 | 1.7 | 295 | 630 |
| | 47 | KMX250VB47RM16X20LL | 16 × 20 | 1.1 | 300 | 750 |
| | 68 | KMX250VB68RM10X50LL | 10 × 50 | 0.73 | 340 | 840 |
| | 68 | KMX250VB68RM16X25LL | 16 × 25 | 0.78 | 390 | 1,000 |
| | 68 | KMX250VB68RM18X20LL | 18 × 20 | 0.90 | 385 | 900 |
| | 100 | KMX250VB101M12X40LL | 12.5 × 40 | 0.56 | 500 | 1,200 |
| | 100 | KMX250VB101M16X31LL | 16 × 31.5 | 0.63 | 520 | 1,400 |
| | 100 | KMX250VB101M18X25LL | 18 × 25 | 0.63 | 500 | 1,345 |
| | 150 | KMX250VB151M12X55LL | 12.5 × 55 | 0.39 | 650 | 1,420 |
| | 150 | KMX250VB151M18X31LL | 18 × 31.5 | 0.42 | 640 | 1,450 |
| | 220 | KMX250VB221M16X50LL | 16 × 50 | 0.28 | 820 | 1,710 |
| | 220 | KMX250VB221M18X40LL | 18 × 40 | 0.35 | 820 | 1,485 |
| | 330 | KMX250VB331M18X50LL | 18 × 50 | 0.23 | 1,030 | 2,140 |
| **350 Volts** 400 Volts Surge | 22 | KMX350VB22RM12X20LL | 12.5 × 20 | 2.1 | 185 | 270 |
| | 33 | KMX350VB33RM16X20LL | 16 × 20 | 0.91 | 250 | 600 |
| | 47 | KMX350VB47RM10X50LL | 10 × 50 | 1.2 | 270 | 705 |
| | 47 | KMX350VB47RM16X25LL | 16 × 25 | 0.73 | 325 | 700 |
| | 47 | KMX350VB47RM18X20LL | 18 × 20 | 0.75 | 350 | 750 |
| | 68 | KMX350VB68RM12X40LL | 12.5 × 40 | 1.1 | 335 | 895 |
| | 68 | KMX350VB68RM16X31LL | 16 × 31.5 | 0.49 | 420 | 1,100 |
| | 68 | KMX350VB68RM18X25LL | 18 × 25 | 0.53 | 400 | 875 |
| | 100 | KMX350VB101M12X55LL | 12.5 × 55 | 0.71 | 435 | 1,050 |
| | 100 | KMX350VB101M18X31LL | 18 × 31.5 | 0.40 | 530 | 1,170 |
| | 150 | KMX350VB151M16X50LL | 16 × 50 | 0.51 | 690 | 1,400 |
| | 220 | KMX350VB221M18X55LL | 18 × 55 | 0.32 | 840 | 1,610 |
| **400 Volts** 450 Volts Surge | 10 | KMX400VB10RM10X20LL | 10 × 20 | 2.9 | 110 | 180 |
| | 22 | KMX400VB22RM12X25LL | 12.5 × 25 | 1.3 | 200 | 300 |
| | 22 | KMX400VB22RM16X20LL | 16 × 20 | 0.91 | 200 | 600 |
| | 33 | KMX400VB33RM10X40LL | 10 × 40 | 1.7 | 215 | 640 |
| | 33 | KMX400VB33RM16X20LL | 16 × 20 | 0.91 | 250 | 600 |
| | 47 | KMX400VB47RM12X40LL | 12.5 × 40 | 1.1 | 280 | 775 |
| | 47 | KMX400VB47RM16X25LL | 16 × 25 | 0.73 | 325 | 700 |
| | 47 | KMX400VB47RM18X20LL | 18 × 20 | 0.75 | 350 | 750 |
| | 68 | KMX400VB68RM12X50LL | 12.5 × 50 | 0.81 | 335 | 895 |
| | 68 | KMX400VB68RM16X31LL | 16 × 31.5 | 0.49 | 420 | 1,100 |
| | 68 | KMX400VB68RM18X25LL | 18 × 25 | 0.53 | 400 | 875 |
| | 100 | KMX400VB101M16X40LL | 16 × 40 | 0.63 | 540 | 1,210 |
| | 100 | KMX400VB101M18X35LL | 18 × 35.5 | 0.34 | 545 | 1,250 |
| | 150 | KMX400VB151M16X60LL | 16 × 60 | 0.41 | 695 | 1,490 |
| **450 Volts** 500 Volts Surge | 3.3 | KMX450VB3R3M10X20LL | 10 × 20 | 6.5 | 60 | 150 |
| | 4.7 | KMX450VB4R7M12X20LL | 12.5 × 20 | 3.6 | 80 | 200 |
| | 10 | KMX450VB10RM12X25LL | 12.5 × 25 | 2.5 | 125 | 315 |
| | 22 | KMX450VB22RM10X45LL | 10 × 45 | 2.3 | 185 | 520 |
| | 22 | KMX450VB22RM16X25LL | 16 × 25 | 1.7 | 210 | 570 |
| | 22 | KMX450VB22RM18X20LL | 18 × 20 | 2.1 | 200 | 550 |
| | 33 | KMX450VB33RM12X40LL | 12.5 × 40 | 1.3 | 235 | 710 |
| | 33 | KMX450VB33RM16X31LL | 16 × 31.5 | 1.1 | 275 | 620 |
| | 33 | KMX450VB33RM18X25LL | 18 × 25 | 1.1 | 280 | 590 |
| | 47 | KMX450VB47RM12X50LL | 12.5 × 50 | 0.95 | 300 | 845 |
| | 47 | KMX450VB47RM18X31LL | 18 × 31.5 | 0.93 | 340 | 900 |
| | 68 | KMX450VB68RM16X40LL | 16 × 40 | 0.71 | 445 | 985 |
| | 68 | KMX450VB68RM18X35LL | 18 × 35.5 | 0.71 | 420 | 980 |
| | 100 | KMX450VB101M16X60LL | 16 × 60 | 0.45 | 570 | 1,300 |
| | 150 | KMX450VB151M18X60LL | 18 × 60 | 0.41 | 690 | 1,510 |

***The case sizes in table are with no sleeve, refer to diagram for case sizes with sleeve.**