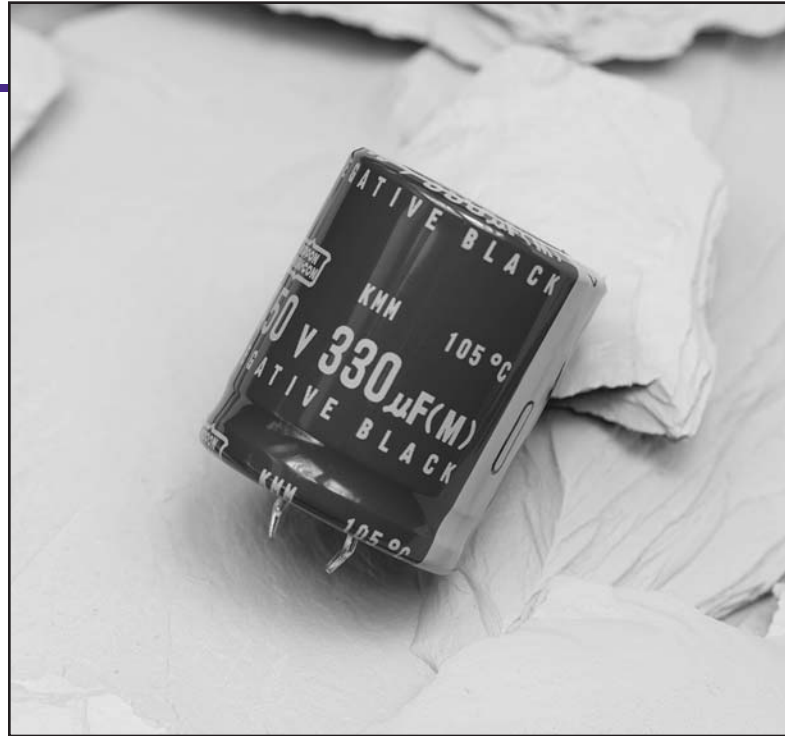


- Snap Mount
- Downsize
- High Voltage
- High Ripple
- +105°C  
Maximum  
Temperature



The KMM series is a high voltage snap-in capacitor series that offers downsized versions of the KMH series. The KMM capacitors have smaller case sizes and an extended rated lifetime compared to the KMH capacitors. These characteristics plus high ripple current capability make the KMM capacitors ideal for use in power supply filter circuits. The KMM capacitors are available in 2 or 4-pin snap-in styles and 3 or 4-pin straight terminals with or without standoffs. As an option the KMM series is available with environmentally friendly PET (polyester) sleeves and Pb-free materials.

The standard KMM 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

- PC board 2 or 4-pin snap-in; optional 3 or 4-pin straight terminals.
- Capacitance range: 39 to 3,300 $\mu$ F.
- Voltage range: 160 to 450VDC.
- Category temperature range: -25°C to +105°C.
- Leakage current:  $3\sqrt{CV}$  ( $\mu$ A) maximum after 5 minutes at +20°C.
- Standard capacitance tolerance:  $\pm 20\%$
- Nominal case size (D  $\times$  L): 20  $\times$  20mm to 35  $\times$  60mm.
- Rated lifetime: 2,000 to 3,000 hours at +105°C with the rated ripple current applied, depending on case size.

## KMM Specifications

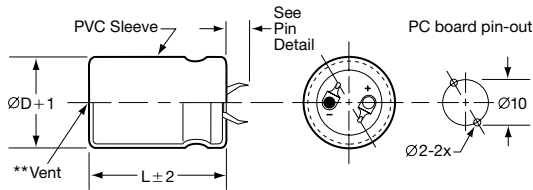
Item	Characteristics																															
Category Temperature Range	- 25 to +105°C																															
Rated Voltage Range	160 to 450VDC																															
Capacitance Range	39 to 3,300 $\mu$ F																															
Capacitance Tolerance	$\pm 20\%$ (M) at +20°C, 120Hz																															
Leakage Current	$I \leq 3\sqrt{CV}$ ( $\mu$ A) after 5 minutes at +20°C. Where I = Max. leakage current ( $\mu$ A), C = Nominal capacitance ( $\mu$ F) and V = Rated voltage (V)																															
Dissipation Factor (Tan $\delta$ )	At +20°C, 120Hz <table border="1" style="margin-left: 20px;"> <tr> <td>Rated Voltage (V)</td> <td>160-400</td> <td>420-450</td> </tr> <tr> <td>Tan <math>\delta</math> (DF)</td> <td>0.15</td> <td>0.20</td> </tr> </table>	Rated Voltage (V)	160-400	420-450	Tan $\delta$ (DF)	0.15	0.20																									
Rated Voltage (V)	160-400	420-450																														
Tan $\delta$ (DF)	0.15	0.20																														
Low Temperature Characteristics	At 120Hz, impedance (Z) ratio between the - 25°C value and +20°C value shall not exceed the values given below. <table border="1" style="margin-left: 20px;"> <tr> <td>Rated Voltage (V)</td> <td>160-400</td> <td>420-450</td> </tr> <tr> <td>Z (-25°C) / Z (+20°C)</td> <td>4</td> <td>8</td> </tr> </table>	Rated Voltage (V)	160-400	420-450	Z (-25°C) / Z (+20°C)	4	8																									
Rated Voltage (V)	160-400	420-450																														
Z (-25°C) / Z (+20°C)	4	8																														
Rated Ripple Current Multipliers <i>Refer to Section 4 of the Mini-Glossary for explanation of Rated Ripple Current Multipliers.</i>	Ambient Temperature (°C) <table border="1" style="margin-left: 20px;"> <tr> <td>+45°C</td> <td>+60°C</td> <td>+70°C</td> <td>+85°C</td> <td>+105°C</td> </tr> <tr> <td>2.64</td> <td>2.23</td> <td>2.12</td> <td>1.73</td> <td>1.00</td> </tr> </table> Frequency (Hz) <table border="1" style="margin-left: 20px;"> <tr> <td>DC Rated Voltage</td> <td>50Hz</td> <td>120Hz</td> <td>300Hz</td> <td>1kHz</td> <td>10kHz</td> <td>50kHz</td> </tr> <tr> <td>160-250V</td> <td>0.81</td> <td>1.00</td> <td>1.17</td> <td>1.32</td> <td>1.45</td> <td>1.50</td> </tr> <tr> <td>315-450V</td> <td>0.77</td> <td>1.00</td> <td>1.16</td> <td>1.30</td> <td>1.41</td> <td>1.43</td> </tr> </table>	+45°C	+60°C	+70°C	+85°C	+105°C	2.64	2.23	2.12	1.73	1.00	DC Rated Voltage	50Hz	120Hz	300Hz	1kHz	10kHz	50kHz	160-250V	0.81	1.00	1.17	1.32	1.45	1.50	315-450V	0.77	1.00	1.16	1.30	1.41	1.43
+45°C	+60°C	+70°C	+85°C	+105°C																												
2.64	2.23	2.12	1.73	1.00																												
DC Rated Voltage	50Hz	120Hz	300Hz	1kHz	10kHz	50kHz																										
160-250V	0.81	1.00	1.17	1.32	1.45	1.50																										
315-450V	0.77	1.00	1.16	1.30	1.41	1.43																										
Endurance (Load Life)	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 border="1" style="margin-left: 20px;"> <tr> <td>Case Diameter</td> <td><math>\varnothing 20</math>mm</td> <td><math>\varnothing 22</math>mm &amp; Above</td> </tr> <tr> <td>Test Time</td> <td>2,000 Hours</td> <td>3,000 Hours</td> </tr> </table> Capacitance change: $\leq \pm 20\%$ of initial measured value Tan $\delta$ (DF) : $\leq 200\%$ of initial specified value Leakage current : $\leq$ initial specified value	Case Diameter	$\varnothing 20$ mm	$\varnothing 22$ mm & Above	Test Time	2,000 Hours	3,000 Hours																									
Case Diameter	$\varnothing 20$ mm	$\varnothing 22$ mm & Above																														
Test Time	2,000 Hours	3,000 Hours																														
Shelf Life	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.                     Capacitance change: $\leq \pm 15\%$ of initial measured value Tan $\delta$ (DF) : $\leq 150\%$ of initial specified value Leakage current : $\leq$ initial specified value																															

## Diagram of Dimensions

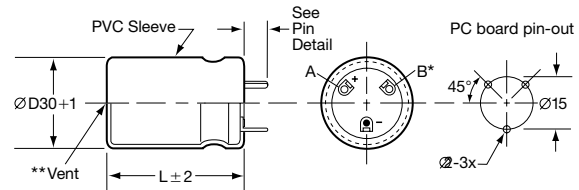
### Snap Mount

Unit: mm

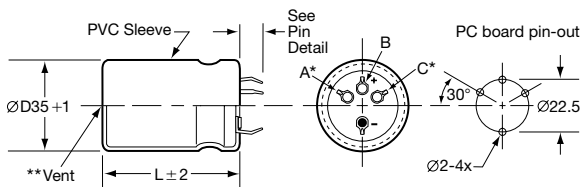
Types **VS-T2**  $\varnothing 20\sim\varnothing 35$ ; **VN-T2**  $\varnothing 22\sim\varnothing 35$



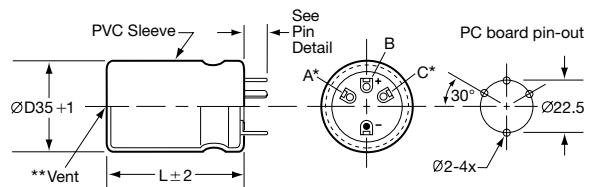
Type **VR-T3**  $\varnothing 30$



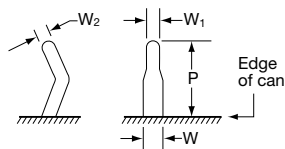
Type **VN-T4**  $\varnothing 35$



Type **VR-T4**  $\varnothing 35$



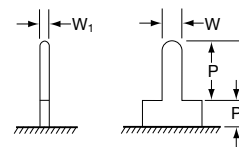
### VS & VN Pin Dimensions



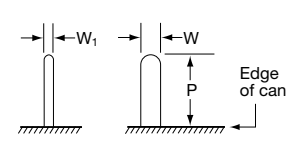
Type	P	W	W <sub>1</sub>	W <sub>2</sub>
<b>VS -T2</b> $\varnothing 20\sim\varnothing 30$	$4.0 \pm 0.5$	$1.5 \pm 0.2$	1.0	1.0
<b>VS -T2</b> $\varnothing 35$	$3.5 \pm 0.5$			
<b>VN -T2</b> $\varnothing 20\sim\varnothing 35$	$5.8 \pm 1.0$			
<b>VN -T4</b> $\varnothing 35$	$5.8 \pm 1.0$			

### VR Pin Dimensions

Standoff Pin (Standard)\*\*\*



Straight Pin



Type	P	P <sub>1</sub>	W	W <sub>1</sub>
<b>VR (Standoff Pin)</b>	$3.75 \pm 1.0$	2.0 max.	$1.5 \pm 0.1$	0.7
<b>VR (Straight Pin)</b>	$5.50 \pm 1.0$	—		

### CAUTION:

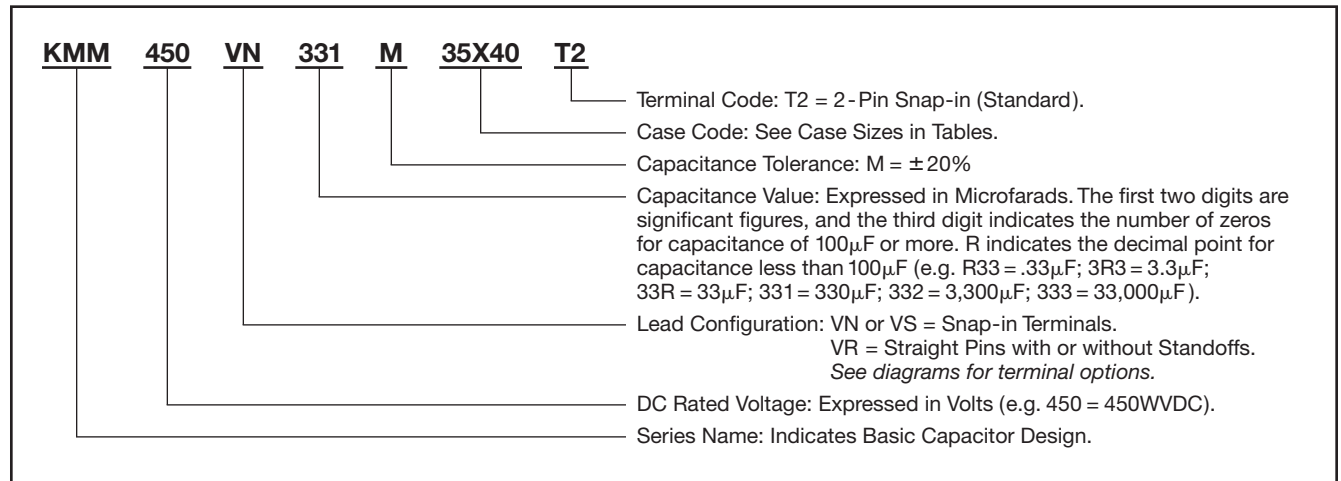
\* Use the blank terminals for mechanical support only. The blank terminals must not be connected to a solder trace on the PC board, but be electrically isolated from the negative or positive terminal.

\*\* Vent may be located either on the bottom or side of the can.

\*\*\* Please add an "H" to the end of the part number for standoffs.

## Part Numbering System for KMM Series

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



## Standard Voltage Ratings - VS & VN/Snap Mount

Rated Voltage (WVDC)	Capacitance (µF)	Catalog Part Number	Nominal Case Size* D x L (mm)	Maximum ESR (Ω) at +20°C, 120Hz	Rated Ripple Current (A rms) at +105°C, 120Hz
160 Volts 200 Volts Surge	180	KMM160VS181M20X20T2	20 x 20	1.381	0.68
	220	KMM160VS221M20X25T2	20 x 25	1.13	0.85
	270	KMM160VS271M20X25T2	20 x 25	0.921	1.1
	330	KMM160VS331M20X30T2	20 x 30	0.753	1.2
	390	KMM160VS391M20X30T2	20 x 30	0.638	1.3
	470	KMM160VS471M20X35T2	20 x 35	0.529	1.34
	560	KMM160VS561M20X40T2	20 x 40	0.444	1.5
	680	KMM160VS681M20X45T2	20 x 45	0.366	1.7
	220	KMM160VN221M22X20T2	22 x 20	1.13	0.81
	330	KMM160VN331M22X25T2	22 x 25	0.753	1.2
	390	KMM160VN391M22X30T2	22 x 30	0.638	1.3
	470	KMM160VN471M22X30T2	22 x 30	0.529	1.55
	560	KMM160VN561M22X35T2	22 x 35	0.444	1.67
	680	KMM160VN681M22X40T2	22 x 40	0.366	1.82
	820	KMM160VN821M22X45T2	22 x 45	0.303	2.04
	1,000	KMM160VN102M22X50T2	22 x 50	0.249	2.25
	270	KMM160VN271M25X20T2	25.4 x 20	0.921	0.98
	330	KMM160VN331M25X20T2	25.4 x 20	0.753	1.02
	390	KMM160VN391M25X25T2	25.4 x 25	0.638	1.26
	470	KMM160VN471M25X25T2	25.4 x 25	0.529	1.55
	560	KMM160VN561M25X30T2	25.4 x 30	0.444	1.67
	680	KMM160VN681M25X30T2	25.4 x 30	0.366	1.82
	820	KMM160VN821M25X35T2	25.4 x 35	0.303	2.04
	1,000	KMM160VN102M25X40T2	25.4 x 40	0.249	2.25
	1,200	KMM160VN122M25X45T2	25.4 x 45	0.207	2.49
	1,500	KMM160VN152M25X60T2	25.4 x 60	0.166	2.97
	390	KMM160VN391M30X20T2	30 x 20	0.638	1.25
	470	KMM160VN471M30X20T2	30 x 20	0.529	1.3
	560	KMM160VN561M30X25T2	30 x 25	0.444	1.67
	680	KMM160VN681M30X25T2	30 x 25	0.366	1.82
820	KMM160VN821M30X30T2	30 x 30	0.303	2.04	
1,000	KMM160VN102M30X30T2	30 x 30	0.249	2.25	
1,200	KMM160VN122M30X35T2	30 x 35	0.207	2.49	
1,500	KMM160VN152M30X40T2	30 x 40	0.166	2.84	
1,800	KMM160VN182M30X45T2	30 x 45	0.138	3.32	
2,200	KMM160VN222M30X60T2	30 x 60	0.113	3.86	

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

## Standard Voltage Ratings - VS & VN/Snap Mount

Rated Voltage (WVDC)	Capacitance (µF)	Catalog Part Number	Nominal Case Size* D × L (mm)	Maximum ESR (Ω) at +20°C, 120Hz	Rated Ripple Current (A rms) at +105°C, 120Hz
<b>160 Volts</b> 200 Volts Surge	560	KMM160VN561M35X20T2	35 × 20	0.444	1.46
	680	KMM160VN681M35X20T2	35 × 20	0.366	1.51
	820	KMM160VN821M35X25T2	35 × 25	0.303	2.04
	1,000	KMM160VN102M35X25T2	35 × 25	0.249	2.25
	1,200	KMM160VN122M35X30T2	35 × 30	0.207	2.49
	1,500	KMM160VN152M35X35T2	35 × 35	0.166	2.84
	1,800	KMM160VN182M35X35T2	35 × 35	0.138	3.0
	2,200	KMM160VN222M35X45T2	35 × 45	0.113	3.5
	2,700	KMM160VN272M35X50T2	35 × 50	0.092	4.0
3,300	KMM160VN332M35X60T2	35 × 60	0.075	4.63	
<b>180 Volts</b> 225 Volts Surge	150	KMM180VS151M20X20T2	20 × 20	1.658	0.62
	180	KMM180VS181M20X25T2	20 × 25	1.381	0.77
	220	KMM180VS221M20X25T2	20 × 25	1.13	1.0
	270	KMM180VS271M20X30T2	20 × 30	0.921	1.1
	330	KMM180VS331M20X30T2	20 × 30	0.753	1.2
	390	KMM180VS391M20X35T2	20 × 35	0.638	1.3
	470	KMM180VS471M20X40T2	20 × 40	0.529	1.4
	560	KMM180VS561M20X45T2	20 × 45	0.444	1.55
	680	KMM180VS681M20X50T2	20 × 50	0.366	1.75
	180	KMM180VN181M22X20T2	22 × 20	1.381	0.8
	270	KMM180VN271M22X25T2	22 × 25	0.921	1.0
	330	KMM180VN331M22X30T2	22 × 30	0.753	1.2
	390	KMM180VN391M22X30T2	22 × 30	0.638	1.35
	470	KMM180VN471M22X35T2	22 × 35	0.529	1.5
	560	KMM180VN561M22X40T2	22 × 40	0.444	1.67
	680	KMM180VN681M22X45T2	22 × 45	0.366	1.78
	820	KMM180VN821M22X50T2	22 × 50	0.303	2.04
	220	KMM180VN221M25X20T2	25.4 × 20	1.13	0.9
	270	KMM180VN271M25X20T2	25.4 × 20	0.921	0.95
	330	KMM180VN331M25X25T2	25.4 × 25	0.753	1.16
	390	KMM180VN391M25X25T2	25.4 × 25	0.638	1.35
	470	KMM180VN471M25X30T2	25.4 × 30	0.529	1.5
	560	KMM180VN561M25X30T2	25.4 × 30	0.444	1.67
	680	KMM180VN681M25X35T2	25.4 × 35	0.366	1.78
	820	KMM180VN821M25X40T2	25.4 × 40	0.303	2.04
	1,000	KMM180VN102M25X45T2	25.4 × 45	0.249	2.3
	1,200	KMM180VN122M25X50T2	25.4 × 50	0.207	2.55
	330	KMM180VN331M30X20T2	30 × 20	0.753	1.15
	390	KMM180VN391M30X20T2	30 × 20	0.638	1.2
	470	KMM180VN471M30X25T2	30 × 25	0.529	1.5
	560	KMM180VN561M30X25T2	30 × 25	0.444	1.67
	680	KMM180VN681M30X30T2	30 × 30	0.366	1.78
	820	KMM180VN821M30X30T2	30 × 30	0.303	2.04
	1,000	KMM180VN102M30X35T2	30 × 35	0.249	2.3
	1,200	KMM180VN122M30X40T2	30 × 40	0.207	2.55
	1,500	KMM180VN152M30X45T2	30 × 45	0.166	2.9
	1,800	KMM180VN182M30X60T2	30 × 60	0.138	3.49
	470	KMM180VN471M35X20T2	35 × 20	0.529	1.36
	560	KMM180VN561M35X20T2	35 × 20	0.444	1.43
	680	KMM180VN681M35X25T2	35 × 25	0.366	1.83
	820	KMM180VN821M35X25T2	35 × 25	0.303	2.04
	1,000	KMM180VN102M35X30T2	35 × 30	0.249	2.3
	1,200	KMM180VN122M35X30T2	35 × 30	0.207	2.55
1,500	KMM180VN152M35X35T2	35 × 35	0.166	2.9	
1,800	KMM180VN182M35X40T2	35 × 40	0.138	3.3	
2,200	KMM180VN222M35X50T2	35 × 50	0.113	3.65	
2,700	KMM180VN273M35X60T2	35 × 60	0.092	4.19	

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

## Standard Voltage Ratings - VS & VN/Snap Mount

Rated Voltage (WVDC)	Capacitance (µF)	Catalog Part Number	Nominal Case Size* D × L (mm)	Maximum ESR (Ω) at +20°C, 120Hz	Rated Ripple Current (A rms) at +105°C, 120Hz
<b>200 Volts 250 Volts Surge</b>	120	KMM200VS121M20X20T2	20 × 20	2.072	0.56
	150	KMM200VS151M20X25T2	20 × 25	1.658	0.71
	180	KMM200VS181M20X25T2	20 × 25	1.381	0.77
	220	KMM200VS221M20X25T2	20 × 25	1.13	1.0
	270	KMM200VS271M20X30T2	20 × 30	0.921	1.1
	330	KMM200VS331M20X35T2	20 × 35	0.753	1.2
	390	KMM200VS391M20X40T2	20 × 40	0.638	1.31
	470	KMM200VS471M20X45T2	20 × 45	0.529	1.45
	560	KMM200VS561M20X50T2	20 × 50	0.444	1.58
	150	KMM200VN151M22X20T2	22 × 20	1.658	0.73
	180	KMM200VN181M22X20T2	22 × 20	1.381	0.8
	270	KMM200VN271M22X25T2	22 × 25	0.921	1.1
	330	KMM200VN331M22X30T2	22 × 30	0.753	1.25
	390	KMM200VN391M22X30T2	22 × 30	0.638	1.35
	470	KMM200VN471M22X35T2	22 × 35	0.529	1.5
	560	KMM200VN561M22X40T2	22 × 40	0.444	1.67
	680	KMM200VN681M22X45T2	22 × 45	0.366	1.78
	220	KMM200VN221M25X20T2	25.4 × 20	1.13	0.85
	330	KMM200VN331M25X25T2	25.4 × 25	0.753	1.25
	390	KMM200VN391M25X25T2	25.4 × 25	0.638	1.35
	470	KMM200VN471M25X30T2	25.4 × 30	0.529	1.5
	560	KMM200VN561M25X35T2	25.4 × 35	0.444	1.67
	680	KMM200VN681M25X40T2	25.4 × 40	0.366	1.78
	820	KMM200VN821M25X45T2	25.4 × 45	0.303	2.04
	1,000	KMM200VN102M25X50T2	25.4 × 50	0.249	2.3
	1,200	KMM200VN122M25X60T2	25.4 × 60	0.207	2.66
	270	KMM200VN271M30X20T2	30 × 20	0.921	1.05
	330	KMM200VN331M30X20T2	30 × 20	0.753	1.1
	470	KMM200VN471M30X25T2	30 × 25	0.529	1.5
	560	KMM200VN561M30X25T2	30 × 25	0.444	1.67
	680	KMM200VN681M30X30T2	30 × 30	0.366	1.78
	820	KMM200VN821M30X35T2	30 × 35	0.303	2.04
	1,000	KMM200VN102M30X40T2	30 × 40	0.249	2.3
	1,200	KMM200VN122M30X45T2	30 × 45	0.207	2.65
	1,500	KMM200VN152M30X50T2	30 × 50	0.166	3.08
	1,800	KMM200VN182M30X60T2	30 × 60	0.138	3.49
	390	KMM200VN391M35X20T2	35 × 20	0.638	1.3
	470	KMM200VN471M35X20T2	35 × 20	0.529	1.41
	680	KMM200VN681M35X25T2	35 × 25	0.366	1.78
	820	KMM200VN821M35X30T2	35 × 30	0.303	2.04
1,000	KMM200VN102M35X30T2	35 × 30	0.249	2.3	
1,200	KMM200VN122M35X35T2	35 × 35	0.207	2.65	
1,500	KMM200VN152M35X40T2	35 × 40	0.166	3.08	
1,800	KMM200VN182M35X45T2	35 × 45	0.138	3.48	
2,200	KMM200VN222M35X60T2	35 × 60	0.113	3.78	
<b>220 Volts 275 Volts Surge</b>	120	KMM220VS121M20X20T2	20 × 20	2.072	0.56
	150	KMM220VS151M20X25T2	20 × 25	1.658	0.73
	180	KMM220VS181M20X25T2	20 × 25	1.381	0.9
	220	KMM220VS221M20X30T2	20 × 30	1.13	1.0
	270	KMM220VS271M20X35T2	20 × 35	0.921	1.15
	330	KMM220VS331M20X40T2	20 × 40	0.753	1.25
	390	KMM220VS391M20X45T2	20 × 45	0.638	1.4
	470	KMM220VS471M20X50T2	20 × 50	0.529	1.51
	150	KMM220VN151M22X20T2	22 × 20	1.658	0.67
	220	KMM220VN221M22X25T2	22 × 25	1.13	1.0
	270	KMM220VN271M22X30T2	22 × 30	0.921	1.15
	330	KMM220VN331M22X35T2	22 × 35	0.753	1.25

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

## Standard Voltage Ratings - VS & VN/Snap Mount

Rated Voltage (WVDC)	Capacitance (µF)	Catalog Part Number	Nominal Case Size* D × L (mm)	Maximum ESR (Ω) at +20°C, 120Hz	Rated Ripple Current (A rms) at +105°C, 120Hz
<b>220 Volts</b> 275 Volts Surge	390	KMM220VN391M22X35T2	22 × 35	0.638	1.4
	470	KMM220VN471M22X40T2	22 × 40	0.529	1.51
	560	KMM220VN561M22X45T2	22 × 45	0.444	1.7
	180	KMM220VN181M25X20T2	25.4 × 20	1.381	0.76
	220	KMM220VN221M25X20T2	25.4 × 20	1.13	0.84
	270	KMM220VN271M25X25T2	25.4 × 25	0.921	1.08
	330	KMM220VN331M25X25T2	25.4 × 25	0.753	1.25
	390	KMM220VN391M25X30T2	25.4 × 30	0.638	1.4
	470	KMM220VN471M25X35T2	25.4 × 35	0.529	1.54
	560	KMM220VN561M25X40T2	25.4 × 40	0.444	1.72
	680	KMM220VN681M25X45T2	25.4 × 45	0.366	1.94
	820	KMM220VN821M25X50T2	25.4 × 50	0.303	2.18
	1,000	KMM220VN102M25X60T2	25.4 × 60	0.249	2.54
	270	KMM220VN271M30X20T2	30 × 20	0.921	0.98
	390	KMM220VN391M30X25T2	30 × 25	0.638	1.36
	470	KMM220VN471M30X25T2	30 × 25	0.529	1.5
	560	KMM220VN561M30X30T2	30 × 30	0.444	1.7
	680	KMM220VN681M30X35T2	30 × 35	0.366	1.93
	820	KMM220VN821M30X40T2	30 × 40	0.303	2.19
	1,000	KMM220VN102M30X45T2	30 × 45	0.249	2.5
	1,200	KMM220VN122M30X50T2	30 × 50	0.207	2.81
	1,500	KMM220VN152M30X60T2	30 × 60	0.166	3.3
	330	KMM220VN331M35X20T2	35 × 20	0.753	1.13
	390	KMM220VN391M35X20T2	35 × 20	0.638	1.23
	560	KMM220VN561M35X25T2	35 × 25	0.444	1.71
	680	KMM220VN681M35X25T2	35 × 25	0.366	1.89
	820	KMM220VN821M35X30T2	35 × 30	0.303	2.16
	1,000	KMM220VN102M35X35T2	35 × 35	0.249	2.44
	1,200	KMM220VN122M35X40T2	35 × 40	0.207	2.79
	1,500	KMM220VN152M35X45T2	35 × 45	0.166	3.22
1,800	KMM220VN182M35X50T2	35 × 50	0.138	3.63	
2,200	KMM220VN222M35X60T2	35 × 60	0.113	4.23	
<b>250 Volts</b> 300 Volts Surge	100	KMM250VS101M20X20T2	20 × 20	2.486	0.51
	120	KMM250VS121M20X25T2	20 × 25	2.072	0.58
	150	KMM250VS151M20X25T2	20 × 25	1.658	0.79
	180	KMM250VS181M20X30T2	20 × 30	1.381	0.9
	220	KMM250VS221M20X30T2	20 × 30	1.13	1.0
	270	KMM250VS271M20X35T2	20 × 35	0.921	1.1
	330	KMM250VS331M20X40T2	20 × 40	0.753	1.2
	390	KMM250VS391M20X50T2	20 × 50	0.638	1.45
	120	KMM250VN121M22X20T2	22 × 20	2.072	0.6
	180	KMM250VN181M22X25T2	22 × 25	1.381	0.78
	220	KMM250VN221M22X30T2	22 × 30	1.13	1.0
	270	KMM250VN271M22X30T2	22 × 30	0.921	1.18
	330	KMM250VN331M22X35T2	22 × 35	0.753	1.3
	390	KMM250VN391M22X40T2	22 × 40	0.638	1.49
	470	KMM250VN471M22X45T2	22 × 45	0.529	1.65
	560	KMM250VN561M22X50T2	22 × 50	0.444	1.67
	150	KMM250VN151M25X20T2	25.4 × 20	1.658	0.74
	180	KMM250VN181M25X20T2	25.4 × 20	1.381	0.75
	220	KMM250VN221M25X25T2	25.4 × 25	1.13	0.95
	270	KMM250VN271M25X25T2	25.4 × 25	0.921	1.18
	330	KMM250VN331M25X30T2	25.4 × 30	0.753	1.3
	390	KMM250VN391M25X35T2	25.4 × 35	0.638	1.49
	470	KMM250VN471M25X35T2	25.4 × 35	0.529	1.65
	560	KMM250VN561M25X40T2	25.4 × 40	0.444	1.8

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



## Standard Voltage Ratings - VS & VN/Snap Mount

Rated Voltage (WVDC)	Capacitance (µF)	Catalog Part Number	Nominal Case Size* D × L (mm)	Maximum ESR (Ω) at +20°C, 120Hz	Rated Ripple Current (A rms) at +105°C, 120Hz
<b>250 Volts</b> 300 Volts Surge	680	KMM250VN681M25X50T2	25.4 × 50	0.366	2.0
	820	KMM250VN821M25X60T2	25.4 × 60	0.303	2.2
	220	KMM250VN221M30X20T2	30 × 20	1.13	0.95
	270	KMM250VN271M30X20T2	30 × 20	0.921	1.0
	330	KMM250VN331M30X25T2	30 × 25	0.753	1.3
	390	KMM250VN391M30X25T2	30 × 25	0.638	1.49
	470	KMM250VN471M30X30T2	30 × 30	0.529	1.65
	560	KMM250VN561M30X30T2	30 × 30	0.444	1.8
	680	KMM250VN681M30X35T2	30 × 35	0.366	2.0
	820	KMM250VN821M30X40T2	30 × 40	0.303	2.3
	1,000	KMM250VN102M30X50T2	30 × 50	0.249	2.47
	1,200	KMM250VN122M30X60T2	30 × 60	0.207	2.85
	330	KMM250VN331M35X20T2	35 × 20	0.753	1.16
	470	KMM250VN471M35X25T2	35 × 25	0.529	1.65
	560	KMM250VN561M35X25T2	35 × 25	0.444	1.8
	680	KMM250VN681M35X30T2	35 × 30	0.366	2.0
	820	KMM250VN821M35X35T2	35 × 35	0.303	2.3
	1,000	KMM250VN102M35X40T2	35 × 40	0.249	2.47
	1,200	KMM250VN122M35X45T2	35 × 45	0.207	2.6
	1,500	KMM250VN152M35X50T2	35 × 50	0.166	3.0
1,800	KMM250VN182M35X60T2	35 × 60	0.138	3.42	
<b>315 Volts</b> 365 Volts Surge	56	KMM315VS56RM20X20T2	20 × 20	4.44	0.38
	68	KMM315VS68RM20X25T2	20 × 25	3.656	0.47
	82	KMM315VS82RM20X25T2	20 × 25	3.032	0.64
	100	KMM315VS101M20X30T2	20 × 30	2.486	0.69
	120	KMM315VS121M20X30T2	20 × 30	2.072	0.75
	150	KMM315VS151M20X35T2	20 × 35	1.658	0.82
	180	KMM315VS181M20X40T2	20 × 40	1.381	0.9
	220	KMM315VS221M20X50T2	20 × 50	1.13	1.0
	68	KMM315VN68RM22X20T2	22 × 20	3.656	0.45
	82	KMM315VN82RM22X20T2	22 × 20	3.032	0.47
	100	KMM315VN101M22X25T2	22 × 25	2.486	0.61
	120	KMM315VN121M22X30T2	22 × 30	2.072	0.75
	150	KMM315VN151M22X35T2	22 × 35	1.658	0.82
	180	KMM315VN181M22X35T2	22 × 35	1.381	0.92
	220	KMM315VN221M22X40T2	22 × 40	1.13	1.04
	270	KMM315VN271M22X45T2	22 × 45	0.921	1.16
	330	KMM315VN331M22X50T2	22 × 50	0.753	1.33
	100	KMM315VN101M25X20T2	25.4 × 20	2.486	0.56
	120	KMM315VN121M25X20T2	25.4 × 20	2.072	0.62
	150	KMM315VN151M25X25T2	25.4 × 25	1.658	0.82
	180	KMM315VN181M25X30T2	25.4 × 30	1.381	0.92
	220	KMM315VN221M25X35T2	25.4 × 35	1.13	1.04
	270	KMM315VN271M25X40T2	25.4 × 40	0.921	1.16
	330	KMM315VN331M25X45T2	25.4 × 45	0.753	1.33
	390	KMM315VN391M25X50T2	25.4 × 50	0.638	1.47
	470	KMM315VN471M25X60T2	25.4 × 60	0.529	1.7
	120	KMM315VN121M30X20T2	30 × 20	2.072	0.65
	150	KMM315VN151M30X20T2	30 × 20	1.658	0.7
	180	KMM315VN181M30X25T2	30 × 25	1.381	0.9
	220	KMM315VN221M30X25T2	30 × 25	1.13	1.04
	270	KMM315VN271M30X25T2	30 × 25	0.921	1.16
	330	KMM315VN331M30X30T2	30 × 30	0.753	1.33
	390	KMM315VN391M30X35T2	30 × 35	0.638	1.47
	470	KMM315VN471M30X40T2	30 × 40	0.529	1.7
	560	KMM315VN561M30X45T2	30 × 45	0.444	2.05
	680	KMM315VN681M30X50T2	30 × 50	0.366	2.17

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



## Standard Voltage Ratings - VS & VN/Snap Mount

Rated Voltage (WVDC)	Capacitance (µF)	Catalog Part Number	Nominal Case Size* D × L (mm)	Maximum ESR (Ω) at +20°C, 120Hz	Rated Ripple Current (A rms) at +105°C, 120Hz
<b>315 Volts</b> 365 Volts Surge	180	KMM315VN181M35X20T2	35 × 20	1.381	0.85
	220	KMM315VN221M35X20T2	35 × 20	1.13	0.9
	270	KMM315VN271M35X25T2	35 × 25	0.921	1.15
	330	KMM315VN331M35X30T2	35 × 30	0.753	1.33
	390	KMM315VN391M35X30T2	35 × 30	0.638	1.47
	470	KMM315VN471M35X35T2	35 × 35	0.529	1.7
	560	KMM315VN561M35X40T2	35 × 40	0.444	2.05
	680	KMM315VN681M35X45T2	35 × 45	0.366	2.17
	820	KMM315VN821M35X50T2	35 × 50	0.303	2.20
1,000	KMM315VN102M35X60T2	35 × 60	0.249	2.55	
<b>350 Volts</b> 400 Volts Surge	47	KMM350VS47RM20X20T2	20 × 20	5.29	0.35
	56	KMM350VS56RM20X25T2	20 × 25	4.44	0.43
	68	KMM350VS68RM20X25T2	20 × 25	3.656	0.47
	82	KMM350VS82RM20X30T2	20 × 30	3.032	0.54
	100	KMM350VS101M20X30T2	20 × 30	2.486	0.6
	120	KMM350VS121M20X35T2	20 × 35	2.072	0.68
	150	KMM350VS151M20X40T2	20 × 40	1.658	0.78
	180	KMM350VS181M20X45T2	20 × 45	1.381	0.87
	220	KMM350VS221M20X50T2	20 × 50	1.13	1.0
	56	KMM350VN56RM22X20T2	22 × 20	4.44	0.41
	82	KMM350VN82RM22X25T2	22 × 25	3.032	0.55
	100	KMM350VN101M22X25T2	22 × 25	2.486	0.69
	120	KMM350VN121M22X30T2	22 × 30	2.072	0.75
	150	KMM350VN151M22X35T2	22 × 35	1.658	0.82
	180	KMM350VN181M22X40T2	22 × 40	1.381	0.92
	220	KMM350VN221M22X45T2	22 × 45	1.13	1.05
	270	KMM350VN271M22X50T2	22 × 50	0.921	1.16
	68	KMM350VN68RM25X20T2	25.4 × 20	3.656	0.46
	82	KMM350VN82RM25X20T2	25.4 × 20	3.032	0.51
	120	KMM350VN121M25X25T2	25.4 × 25	2.072	0.75
	150	KMM350VN151M25X30T2	25.4 × 30	1.658	0.83
	180	KMM350VN181M25X30T2	25.4 × 30	1.381	0.92
	220	KMM350VN221M25X35T2	25.4 × 35	1.13	1.04
	270	KMM350VN271M25X40T2	25.4 × 40	0.921	1.18
	330	KMM350VN331M25X45T2	25.4 × 45	0.753	1.29
	390	KMM350VN391M25X50T2	25.4 × 50	0.638	1.51
	470	KMM350VN471M25X60T2	25.4 × 60	0.529	1.66
	100	KMM350VN101M30X20T2	30 × 20	2.486	0.6
	120	KMM350VN121M30X20T2	30 × 20	2.072	0.65
	150	KMM350VN151M30X25T2	30 × 25	1.658	0.82
	180	KMM350VN181M30X25T2	30 × 25	1.381	0.9
	220	KMM350VN221M30X30T2	30 × 30	1.13	1.02
	270	KMM350VN271M30X30T2	30 × 30	0.921	1.17
	330	KMM350VN331M30X35T2	30 × 35	0.753	1.34
	390	KMM350VN391M30X40T2	30 × 40	0.638	1.51
	470	KMM350VN471M30X45T2	30 × 45	0.529	1.65
	560	KMM350VN561M30X50T2	30 × 50	0.444	1.85
	680	KMM350VN681M30X60T2	30 × 60	0.366	2.15
	150	KMM350VN151M35X20T2	35 × 20	1.658	0.76
	220	KMM350VN221M35X25T2	35 × 25	1.13	1.04
270	KMM350VN271M35X25T2	35 × 25	0.921	1.2	
330	KMM350VN331M35X30T2	35 × 30	0.753	1.22	
390	KMM350VN391M35X35T2	35 × 35	0.638	1.47	
470	KMM350VN471M35X35T2	35 × 35	0.529	1.69	
560	KMM350VN561M35X40T2	35 × 40	0.444	1.9	
680	KMM350VN681M35X50T2	35 × 50	0.366	1.99	
820	KMM350VN821M35X60T2	35 × 60	0.303	2.31	

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

## Standard Voltage Ratings - VS & VN/Snap Mount

Rated Voltage (WVDC)	Capacitance (µF)	Catalog Part Number	Nominal Case Size* D × L (mm)	Maximum ESR (Ω) at +20°C, 120Hz	Rated Ripple Current (A rms) at +105°C, 120Hz
<b>400 Volts</b> 450 Volts Surge	39	KMM400VS39RM20X20T2	20 × 20	6.375	0.32
	47	KMM400VS47RM20X25T2	20 × 25	5.29	0.39
	56	KMM400VS56RM20X25T2	20 × 25	4.44	0.51
	68	KMM400VS68RM20X30T2	20 × 30	3.656	0.56
	82	KMM400VS82RM20X30T2	20 × 30	3.032	0.64
	100	KMM400VS101M20X35T2	20 × 35	2.486	0.7
	120	KMM400VS121M20X40T2	20 × 40	2.072	0.75
	150	KMM400VS151M20X45T2	20 × 45	1.658	0.83
	47	KMM400VN47RM22X20T2	22 × 20	5.29	0.37
	68	KMM400VN68RM22X25T2	22 × 25	3.656	0.5
	82	KMM400VN82RM22X25T2	22 × 25	3.032	0.64
	100	KMM400VN101M22X30T2	22 × 30	2.486	0.7
	120	KMM400VN121M22X35T2	22 × 35	2.072	0.75
	150	KMM400VN151M22X40T2	22 × 40	1.658	0.88
	180	KMM400VN181M22X45T2	22 × 45	1.381	0.98
	220	KMM400VN221M22X50T2	22 × 50	1.13	1.1
	56	KMM400VN56RM25X20T2	25.4 × 20	4.44	0.42
	68	KMM400VN68RM25X20T2	25.4 × 20	3.656	0.46
	100	KMM400VN101M25X25T2	25.4 × 25	2.486	0.7
	120	KMM400VN121M25X30T2	25.4 × 30	2.072	0.75
	150	KMM400VN151M25X30T2	25.4 × 30	1.658	0.88
	180	KMM400VN181M25X35T2	25.4 × 35	1.381	0.98
	220	KMM400VN221M25X40T2	25.4 × 40	1.13	1.1
	270	KMM400VN271M25X45T2	25.4 × 45	0.921	1.22
	330	KMM400VN331M25X50T2	25.4 × 50	0.753	1.44
	390	KMM400VN391M25X60T2	25.4 × 60	0.638	1.51
	82	KMM400VN82RM30X20T2	30 × 20	3.032	0.55
	100	KMM400VN101M30X20T2	30 × 20	2.486	0.6
	120	KMM400VN121M30X25T2	30 × 25	2.072	0.73
	150	KMM400VN151M30X25T2	30 × 25	1.658	0.82
	180	KMM400VN181M30X30T2	30 × 30	1.381	0.98
	220	KMM400VN221M30X30T2	30 × 30	1.13	1.1
	270	KMM400VN271M30X35T2	30 × 35	0.921	1.22
	330	KMM400VN331M30X40T2	30 × 40	0.753	1.44
	390	KMM400VN391M30X45T2	30 × 45	0.638	1.6
	470	KMM400VN471M30X50T2	30 × 50	0.529	1.9
	560	KMM400VN561M30X60T2	30 × 60	0.444	2.1
	120	KMM400VN121M35X20T2	35 × 20	2.072	0.75
	150	KMM400VN151M35X20T2	35 × 20	1.658	0.8
	220	KMM400VN221M35X25T2	35 × 25	1.13	1.1
	270	KMM400VN271M35X30T2	35 × 30	0.921	1.22
	330	KMM400VN331M35X35T2	35 × 35	0.753	1.44
390	KMM400VN391M35X35T2	35 × 35	0.638	1.6	
470	KMM400VN471M35X40T2	35 × 40	0.529	1.9	
560	KMM400VN561M35X45T2	35 × 45	0.444	2.12	
680	KMM400VN681M35X60T2	35 × 60	0.366	2.27	
<b>420 Volts</b> 470 Volts Surge	39	KMM420VS39RM20X20T2	20 × 20	8.5	0.32
	47	KMM420VS47RM20X25T2	20 × 25	7.053	0.39
	56	KMM420VS56RM20X25T2	20 × 25	5.92	0.51
	68	KMM420VS68RM20X30T2	20 × 30	4.875	0.56
	82	KMM420VS82RM20X35T2	20 × 35	4.043	0.64
	100	KMM420VS101M20X35T2	20 × 35	3.315	0.7
	120	KMM420VS121M20X40T2	20 × 40	2.763	0.75
	150	KMM420VS151M20X50T2	20 × 50	2.21	0.88
	47	KMM420VN47RM22X20T2	22 × 20	7.053	0.37
	68	KMM420VN68RM22X25T2	22 × 25	4.875	0.5
	82	KMM420VN82RM22X25T2	22 × 25	4.043	0.64

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

## Standard Voltage Ratings - VS & VN/Snap Mount

Rated Voltage (WVDC)	Capacitance (µF)	Catalog Part Number	Nominal Case Size* D × L (mm)	Maximum ESR (Ω) at +20°C, 120Hz	Rated Ripple Current (A rms) at +105°C, 120Hz
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<b>420 Volts 470 Volts Surge</b>	100	KMM420VN101M22X30T2	22 × 30	3.315	0.7
	120	KMM420VN121M22X35T2	22 × 35	2.763	0.75
	150	KMM420VN151M22X40T2	22 × 40	2.21	0.88
	180	KMM420VN181M22X45T2	22 × 45	1.842	0.95
	220	KMM420VN221M22X50T2	22 × 50	1.507	1.1
	56	KMM420VN56RM25X20T2	25.4 × 20	5.92	0.42
	68	KMM420VN68RM25X20T2	25.4 × 20	4.875	0.46
	82	KMM420VN82RM25X25T2	25.4 × 25	4.043	0.58
	100	KMM420VN101M25X25T2	25.4 × 25	3.315	0.7
	120	KMM420VN121M25X30T2	25.4 × 30	2.763	0.75
	150	KMM420VN151M25X35T2	25.4 × 35	2.21	0.88
	180	KMM420VN181M25X35T2	25.4 × 35	1.842	0.95
	220	KMM420VN221M25X45T2	25.4 × 45	1.507	1.1
	270	KMM420VN271M25X50T2	25.4 × 50	1.228	1.22
	330	KMM420VN331M25X60T2	25.4 × 60	1.005	1.41
	82	KMM420VN82RM30X20T2	30 × 20	4.043	0.53
	100	KMM420VN101M30X20T2	30 × 20	3.315	0.59
	120	KMM420VN121M30X25T2	30 × 25	2.763	0.73
	150	KMM420VN151M30X25T2	30 × 25	2.21	0.88
	180	KMM420VN181M30X30T2	30 × 30	1.842	0.95
	220	KMM420VN221M30X35T2	30 × 35	1.507	1.1
	270	KMM420VN271M30X40T2	30 × 40	1.228	1.22
	330	KMM420VN331M30X45T2	30 × 45	1.005	1.45
	390	KMM420VN391M30X50T2	30 × 50	0.85	1.55
	470	KMM420VN471M30X60T2	30 × 60	0.705	1.79
	120	KMM420VN121M35X20T2	35 × 20	2.763	0.67
	180	KMM420VN181M35X25T2	35 × 25	1.842	0.94
	220	KMM420VN221M35X25T2	35 × 25	1.507	1.1
	270	KMM420VN271M35X30T2	35 × 30	1.228	1.22
	330	KMM420VN331M35X35T2	35 × 35	1.005	1.45
	390	KMM420VN391M35X40T2	35 × 40	0.85	1.55
	470	KMM420VN471M35X45T2	35 × 45	0.705	1.9
	560	KMM420VN561M35X50T2	35 × 50	0.592	2.15
680	KMM420VN681M35X60T2	35 × 60	0.488	2.27	

<b>450 Volts 500 Volts Surge</b>	39	KMM450VS39RM20X25T2	20 × 25	8.5	0.34
	47	KMM450VS47RM20X25T2	20 × 25	7.053	0.39
	56	KMM450VS56RM20X30T2	20 × 30	5.92	0.51
	68	KMM450VS68RM20X35T2	20 × 35	4.875	0.56
	82	KMM450VS82RM20X35T2	20 × 35	4.043	0.64
	100	KMM450VS101M20X45T2	20 × 45	3.315	0.69
	120	KMM450VS121M20X50T2	20 × 50	2.763	0.75
	56	KMM450VN56RM22X25T2	22 × 25	5.92	0.4
	68	KMM450VN68RM22X30T2	22 × 30	4.875	0.53
	82	KMM450VN82RM22X30T2	22 × 30	4.043	0.64
	100	KMM450VN101M22X35T2	22 × 35	3.315	0.69
	120	KMM450VN121M22X40T2	22 × 40	2.763	0.8
	150	KMM450VN151M22X45T2	22 × 45	2.21	0.88
	68	KMM450VN68RM25X25T2	25.4 × 25	4.875	0.5
	82	KMM450VN82RM25X25T2	25.4 × 25	4.043	0.64
	100	KMM450VN101M25X30T2	25.4 × 30	3.315	0.69
	120	KMM450VN121M25X30T2	25.4 × 30	2.763	0.8
	150	KMM450VN151M25X35T2	25.4 × 35	2.21	0.88
	180	KMM450VN181M25X40T2	25.4 × 40	1.842	1.0
	220	KMM450VN221M25X45T2	25.4 × 45	1.507	1.12
	270	KMM450VN271M25X60T2	25.4 × 60	1.228	1.18
	100	KMM450VN101M30X25T2	30 × 25	3.315	0.64
	120	KMM450VN121M30X25T2	30 × 25	2.763	0.8
	150	KMM450VN151M30X30T2	30 × 30	2.21	0.88

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

## Standard Voltage Ratings - VS & VN/Snap Mount

Rated Voltage (WVDC)	Capacitance (μF)	Catalog Part Number	Nominal Case Size* D × L (mm)	Maximum ESR (Ω) at +20°C, 120Hz	Rated Ripple Current (A rms) at +105°C, 120Hz
<b>450 Volts 500 Volts Surge</b>	180	KMM450VN181M30X30T2	30 × 30	1.842	1.0
	220	KMM450VN221M30X35T2	30 × 35	1.507	1.12
	270	KMM450VN271M30X40T2	30 × 40	1.228	1.28
	330	KMM450VN331M30X50T2	30 × 50	1.005	1.45
	390	KMM450VN391M30X60T2	30 × 60	0.85	1.51
	120	KMM450VN121M35X25T2	35 × 25	2.763	0.73
	150	KMM450VN151M35X25T2	35 × 25	2.21	0.75
	220	KMM450VN221M35X30T2	35 × 30	1.507	1.12
	270	KMM450VN271M35X35T2	35 × 35	1.228	1.28
	330	KMM450VN331M35X40T2	35 × 40	1.005	1.45
	390	KMM450VN391M35X40T2	35 × 40	0.85	1.55
	470	KMM450VN471M35X50T2	35 × 50	0.705	1.85
	560	KMM450VN561M35X60T2	35 × 60	0.592	1.91

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