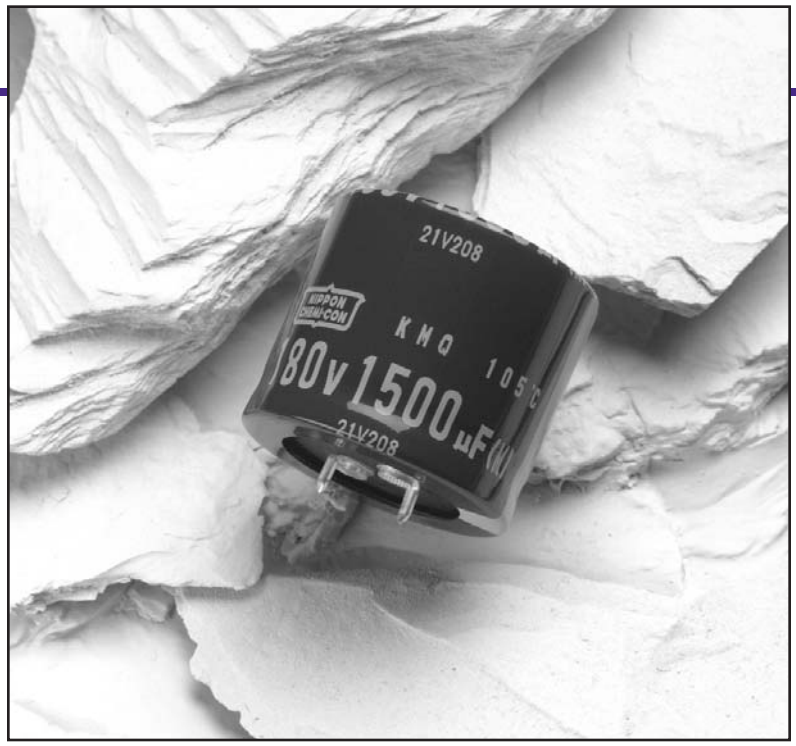
NEW SERIES
Engineering Bulletin Jul 03

KMQ Series

UNITED CHEMI-CON

- **Snap Mount**
- **Downsize**
- **Large Capacitance**
- **+105°C Maximum Temperature**



The KMQ series is a new high voltage snap-in capacitor series from United Chemi-Con that offers downsized versions of the current miniaturized KMM series. These capacitors have a rated lifetime of 2,000 hours at +105°C with the rated ripple current applied. With high ripple current capability and higher CV per case size than the KMM series, the KMQ capacitors are suitable for many downsized power supply circuits. The KMQ capacitors have a standard 2-pin snap-in terminal style. As an option the KMQ series is available with environmentally friendly PET (polyester) sleeves and Pb-free materials.

The standard KMQ 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-pin snap-in terminals.**
- **Capacitance range: 68 to 3,300μF.**
- **Voltage range: 160 to 450VDC.**
- **Category temperature range: −25°C to +105°C.**
- **Leakage current: $3\sqrt{CV}$ (μA) maximum after 5 minutes at +20°C.**
- **Standard capacitance tolerance: ±20%**
- **Nominal case size (D×L): 22×25mm to 35×50mm.**
- **Rated lifetime: 2,000 hours at +105°C with the rated ripple current applied.**

KMQ Specifications

Item	Characteristics
Category Temperature Range	−25 to +105°C
Rated Voltage Range	160 to 450VDC
Capacitance Range	68 to 3,300μF
Capacitance Tolerance	±20% (M) at +20°C, 120Hz
Leakage Current	$I \le 3\sqrt{CV}$ (μA) after 5 minutes at +20°C. Where I = Max. leakage current (μA), C = Nominal capacitance (μF) and V = Rated voltage (V)
Dissipation Factor (Tan δ)	At +20°C, 120Hz Rated Voltage (V): 160-250 | 315-400 | 450 Tan δ (DF): 0.15 max. | 0.15 max. | 0.20 max.
Low Temperature Characteristics	At 120Hz, impedance (Z) ratio between the −25°C value and +20°C value shall not exceed the values given below. Rated Voltage (V): 160-250 | 315-400 | 450 Z(−25°C)/Z(+20°C): 4 | 8 | 8
Rated Ripple Current Multipliers *Refer to Section 4 of the Mini-Glossary for explanation of Rated Ripple Current Multipliers.*	Frequency (Hz) 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 2,000 hours 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. Capacitance change: ≤ ±20% of initial measured value Tan δ (DF) : ≤ 200% of initial specified value Leakage current : ≤ initial specified value
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: ≤ ±15% of initial measured value Tan δ (DF) : ≤ 150% of initial specified value Leakage current : ≤ initial specified value

Part Numbering System for KMQ Series

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

KMQ 180 VS 152 M 35X30 T2

- T2: Terminal Code: T2 = 2-Pin Snap-in (Standard).
- 35X30: Case Code: See Case Sizes in Tables.
- M: Capacitance Tolerance: M = ±20%
- 152: Capacitance Value: Expressed in Microfarads. The first two digits are significant figures, and the third digit indicates the number of zeros for capacitance of 100μF or more. R indicates the decimal point for capacitance less than 100μF (e.g. R15 = .15μF; 1R5 = 1.5μF; 15R = 15μF; 151 = 150μF; 152 = 1,500μF; 153 = 15,000μF).
- VS: Lead Configuration: VS = 2-Pin Snap-in Terminals.
- 180: DC Rated Voltage: Expressed in Volts (e.g. 180 = 180WVDC).
- KMQ: Series Name: Indicates Basic Capacitor Design.

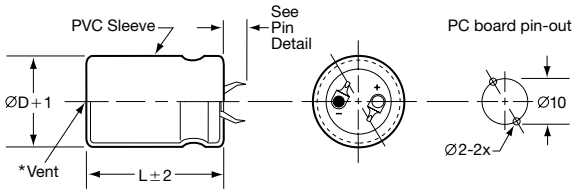
KMQ
SNAP MOUNT-105°C

Diagram of Dimensions

Snap Mount

Unit: mm

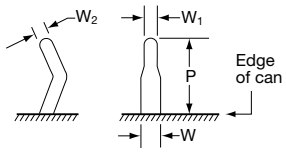
Type VS-T2 Ø22~Ø35



Standard design does not have a plastic disk.

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

VS Pin Dimensions



Type	P	W	W_1	W_2
VS-T2	4.0±0.5	1.5±0.2	1.0	1.0

Standard Voltage Ratings - VS/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
160 Volts 200 Volts Surge	470	KMQ160VS471M22X25T2	22 × 25	0.529	1.4
	560	KMQ160VS561M22X30T2	22 × 30	0.444	1.5
	680	KMQ160VS681M22X30T2	22 × 30	0.366	1.7
	820	KMQ160VS821M22X35T2	22 × 35	0.303	2.0
	1,000	KMQ160VS102M22X40T2	22 × 40	0.249	2.2
	680	KMQ160VS681M25X25T2	25.4 × 25	0.366	1.7
	820	KMQ160VS821M25X30T2	25.4 × 30	0.303	2.0
	1,000	KMQ160VS102M25X35T2	25.4 × 35	0.249	2.2
	1,200	KMQ160VS122M25X40T2	25.4 × 40	0.207	2.3
	1,500	KMQ160VS152M25X45T2	25.4 × 45	0.166	2.5
	1,800	KMQ160VS182M25X50T2	25.4 × 50	0.138	2.7
	820	KMQ160VS821M30X25T2	30 × 25	0.303	2.0
	1,000	KMQ160VS102M30X25T2	30 × 25	0.249	2.2
	1,200	KMQ160VS122M30X30T2	30 × 30	0.207	2.3
	1,500	KMQ160VS152M30X35T2	30 × 35	0.166	2.5
	1,800	KMQ160VS182M30X40T2	30 × 40	0.138	2.7
	2,200	KMQ160VS222M30X45T2	30 × 45	0.113	2.9
	2,700	KMQ160VS272M30X50T2	30 × 50	0.092	3.1
	1,200	KMQ160VS122M35X25T2	35 × 25	0.207	2.3
	1,500	KMQ160VS152M35X30T2	35 × 30	0.166	2.5
	1,800	KMQ160VS182M35X30T2	35 × 30	0.138	2.7
	2,200	KMQ160VS222M35X35T2	35 × 35	0.113	2.9
	2,700	KMQ160VS272M35X40T2	35 × 40	0.092	3.1
	3,300	KMQ160VS332M35X50T2	35 × 50	0.075	3.3
180 Volts 225 Volts Surge	390	KMQ180VS391M22X25T2	22 × 25	0.638	1.3
	470	KMQ180VS471M22X30T2	22 × 30	0.529	1.4
	560	KMQ180VS561M22X30T2	22 × 30	0.444	1.5
	680	KMQ180VS681M22X35T2	22 × 35	0.366	1.7
	820	KMQ180VS821M22X40T2	22 × 40	0.303	2.0
	1,000	KMQ180VS102M22X45T2	22 × 45	0.249	2.2
	560	KMQ180VS561M25X25T2	25.4 × 25	0.444	1.5
	680	KMQ180VS681M25X30T2	25.4 × 30	0.366	1.7
	820	KMQ180VS821M25X30T2	25.4 × 30	0.303	2.0

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

Standard Voltage Ratings - VS/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
180 Volts 225 Volts Surge	1,000	KMQ180VS102M25X40T2	25.4 × 40	0.249	2.2
	1,200	KMQ180VS122M25X45T2	25.4 × 45	0.207	2.3
	1,500	KMQ180VS152M25X50T2	25.4 × 50	0.166	2.5
	820	KMQ180VS821M30X25T2	30 × 25	0.303	2.0
	1,000	KMQ180VS102M30X30T2	30 × 30	0.249	2.2
	1,200	KMQ180VS122M30X35T2	30 × 35	0.207	2.3
	1,500	KMQ180VS152M30X40T2	30 × 40	0.166	2.5
	1,800	KMQ180VS182M30X45T2	30 × 45	0.138	2.7
	2,200	KMQ180VS222M30X50T2	30 × 50	0.113	2.9
	1,000	KMQ180VS102M35X25T2	35 × 25	0.249	2.2
	1,200	KMQ180VS122M35X30T2	35 × 30	0.207	2.3
	1,500	KMQ180VS152M35X30T2	35 × 30	0.166	2.5
	1,800	KMQ180VS182M35X35T2	35 × 35	0.138	2.7
	2,200	KMQ180VS222M35X40T2	35 × 40	0.113	2.9
	2,700	KMQ180VS272M35X50T2	35 × 50	0.092	3.1
200 Volts 250 Volts Surge	390	KMQ200VS391M22X25T2	22 × 25	0.638	1.31
	470	KMQ200VS471M22X30T2	22 × 30	0.529	1.45
	560	KMQ200VS561M22X30T2	22 × 30	0.444	1.67
	680	KMQ200VS681M22X40T2	22 × 40	0.366	1.75
	820	KMQ200VS821M22X45T2	22 × 45	0.303	2.04
	1,000	KMQ200VS102M22X50T2	22 × 50	0.249	2.3
	560	KMQ200VS561M25X25T2	25.4 × 25	0.444	1.67
	680	KMQ200VS681M25X30T2	25.4 × 30	0.366	1.75
	820	KMQ200VS821M25X35T2	25.4 × 35	0.303	2.04
	1,000	KMQ200VS102M25X45T2	25.4 × 45	0.249	2.3
	1,200	KMQ200VS122M25X50T2	25.4 × 50	0.207	2.65
	820	KMQ200VS821M30X25T2	30 × 25	0.303	2.04
	1,000	KMQ200VS102M30X30T2	30 × 30	0.249	2.3
	1,200	KMQ200VS122M30X35T2	30 × 35	0.207	2.65
	1,500	KMQ200VS152M30X40T2	30 × 40	0.166	2.8
	1,800	KMQ200VS182M30X45T2	30 × 45	0.138	3.08
	1,000	KMQ200VS102M35X25T2	35 × 25	0.249	2.3
	1,200	KMQ200VS122M35X30T2	35 × 30	0.207	2.65
	1,500	KMQ200VS152M35X30T2	35 × 30	0.166	2.8
	1,800	KMQ200VS182M35X40T2	35 × 40	0.138	3.08
	2,200	KMQ200VS222M35X45T2	35 × 45	0.113	3.48
250 Volts 300 Volts Surge	220	KMQ250VS221M22X25T2	22 × 25	1.13	1.0
	270	KMQ250VS271M22X25T2	22 × 25	0.921	1.1
	330	KMQ250VS331M22X30T2	22 × 30	0.754	1.2
	390	KMQ250VS391M22X35T2	22 × 35	0.638	1.3
	470	KMQ250VS471M22X40T2	22 × 40	0.529	1.4
	560	KMQ250VS561M22X45T2	22 × 45	0.444	1.5
	680	KMQ250VS681M22X50T2	22 × 50	0.366	1.7
	330	KMQ250VS331M25X25T2	25.4 × 25	0.754	1.2
	390	KMQ250VS391M25X25T2	25.4 × 25	0.638	1.3
	470	KMQ250VS471M25X30T2	25.4 × 30	0.529	1.4
	560	KMQ250VS561M25X35T2	25.4 × 35	0.444	1.5
	680	KMQ250VS681M25X40T2	25.4 × 40	0.366	1.7
	820	KMQ250VS821M25X45T2	25.4 × 45	0.303	2.0
	470	KMQ250VS471M30X25T2	30 × 25	0.529	1.4
	560	KMQ250VS561M30X25T2	30 × 25	0.444	1.5
	680	KMQ250VS681M30X30T2	30 × 30	0.366	1.7
	820	KMQ250VS821M30X35T2	30 × 35	0.303	2.0
	1,000	KMQ250VS102M30X40T2	30 × 40	0.249	2.2
	1,200	KMQ250VS122M30X45T2	30 × 45	0.207	2.3
	680	KMQ250VS681M35X25T2	35 × 25	0.366	1.7
	820	KMQ250VS821M35X30T2	35 × 30	0.303	2.0

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

KMQ Series

Standard Voltage Ratings - VS/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
250 Volts 300 Volts Surge	1,000	KMQ250VS102M35X30T2	35 × 30	0.249	2.2
	1,200	KMQ250VS122M35X35T2	35 × 35	0.207	2.3
	1,500	KMQ250VS152M35X45T2	35 × 45	0.166	2.5
	1,800	KMQ250VS182M35X50T2	35 × 50	0.138	2.7
315 Volts 365 Volts Surge	150	KMQ315VS151M22X25T2	22 × 25	1.658	0.82
	180	KMQ315VS181M22X30T2	22 × 30	1.382	0.9
	220	KMQ315VS221M22X30T2	22 × 30	1.13	1.0
	270	KMQ315VS271M22X35T2	22 × 35	0.921	1.1
	330	KMQ315VS331M22X45T2	22 × 45	0.754	1.2
	390	KMQ315VS391M22X45T2	22 × 45	0.638	1.3
	220	KMQ315VS221M25X25T2	25.4 × 25	1.13	1.0
	270	KMQ315VS271M25X30T2	25.4 × 30	0.921	1.1
	330	KMQ315VS331M25X35T2	25.4 × 35	0.754	1.2
	390	KMQ315VS391M25X40T2	25.4 × 40	0.638	1.3
	470	KMQ315VS471M25X45T2	25.4 × 45	0.529	1.4
	560	KMQ315VS561M25X50T2	25.4 × 50	0.444	1.5
	330	KMQ315VS331M30X25T2	30 × 25	0.754	1.2
	390	KMQ315VS391M30X30T2	30 × 30	0.638	1.3
	470	KMQ315VS471M30X35T2	30 × 35	0.529	1.4
	560	KMQ315VS561M30X40T2	30 × 40	0.444	1.5
	680	KMQ315VS681M30X45T2	30 × 45	0.366	1.7
	820	KMQ315VS821M30X50T2	30 × 50	0.303	2.0
	390	KMQ315VS391M35X25T2	35 × 25	0.638	1.3
	470	KMQ315VS471M35X25T2	35 × 25	0.529	1.4
	560	KMQ315VS561M35X30T2	35 × 30	0.444	1.5
	680	KMQ315VS681M35X35T2	35 × 35	0.366	1.7
	820	KMQ315VS821M35X40T2	35 × 40	0.303	2.0
	1,000	KMQ315VS102M35X45T2	35 × 45	0.249	2.3
350 Volts 400 Volts Surge	120	KMQ350VS121M22X25T2	22 × 25	2.072	0.75
	150	KMQ350VS151M22X30T2	22 × 30	1.658	0.82
	180	KMQ350VS181M22X30T2	22 × 30	1.382	0.9
	220	KMQ350VS221M22X35T2	22 × 35	1.13	1.0
	270	KMQ350VS271M22X40T2	22 × 40	0.921	1.1
	330	KMQ350VS331M22X45T2	22 × 45	0.754	1.2
	180	KMQ350VS181M25X25T2	25.4 × 25	1.382	0.9
	220	KMQ350VS221M25X30T2	25.4 × 30	1.13	1.0
	270	KMQ350VS271M25X30T2	25.4 × 30	0.921	1.1
	330	KMQ350VS331M25X40T2	25.4 × 40	0.754	1.2
	390	KMQ350VS391M25X45T2	25.4 × 45	0.638	1.3
	470	KMQ350VS471M25X50T2	25.4 × 50	0.529	1.4
	270	KMQ350VS271M30X25T2	30 × 25	0.921	1.1
	330	KMQ350VS331M30X30T2	30 × 30	0.754	1.2
	390	KMQ350VS391M30X35T2	30 × 35	0.638	1.3
	470	KMQ350VS471M30X35T2	30 × 35	0.529	1.4
	560	KMQ350VS561M30X45T2	30 × 45	0.444	1.5
	680	KMQ350VS681M30X50T2	30 × 50	0.366	1.7
	470	KMQ350VS471M35X30T2	35 × 30	0.529	1.4
	560	KMQ350VS561M35X35T2	35 × 35	0.444	1.5
	680	KMQ350VS681M35X40T2	35 × 40	0.366	1.7
	820	KMQ350VS821M35X45T2	35 × 45	0.303	1.9
400 Volts 450 Volts Surge	100	KMQ400VS101M22X25T2	22 × 25	2.487	0.7
	120	KMQ400VS121M22X30T2	22 × 30	2.072	0.75
	150	KMQ400VS151M22X30T2	22 × 30	1.658	0.88
	180	KMQ400VS181M22X35T2	22 × 35	1.382	0.95
	220	KMQ400VS221M22X45T2	22 × 45	1.13	1.1
	270	KMQ400VS271M22X50T2	22 × 50	0.921	1.22

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

KMQ Series

Standard Voltage Ratings - VS/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
400 Volts 450 Volts Surge	150	KMQ400VS151M25X25T2	25.4 × 25	1.658	0.88
	180	KMQ400VS181M25X30T2	25.4 × 30	1.382	0.95
	220	KMQ400VS221M25X35T2	25.4 × 35	1.13	1.1
	270	KMQ400VS271M25X40T2	25.4 × 40	0.921	1.22
	330	KMQ400VS331M25X45T2	25.4 × 45	0.754	1.44
	390	KMQ400VS391M25X50T2	25.4 × 50	0.638	1.55
	220	KMQ400VS221M30X25T2	30 × 25	1.13	1.1
	270	KMQ400VS271M30X30T2	30 × 30	0.921	1.22
	330	KMQ400VS331M30X35T2	30 × 35	0.754	1.44
	390	KMQ400VS391M30X40T2	30 × 40	0.638	1.55
	470	KMQ400VS471M30X45T2	30 × 45	0.529	1.68
	560	KMQ400VS561M30X50T2	30 × 50	0.444	1.9
	270	KMQ400VS271M35X25T2	35 × 25	0.921	1.22
	330	KMQ400VS331M35X30T2	35 × 30	0.754	1.44
	390	KMQ400VS391M35X30T2	35 × 30	0.638	1.55
	470	KMQ400VS471M35X35T2	35 × 35	0.529	1.68
	560	KMQ400VS561M35X40T2	35 × 40	0.444	1.9
	680	KMQ400VS681M35X45T2	35 × 45	0.366	2.12
450 Volts 500 Volts Surge	68	KMQ450VS68RM22X25T2	22 × 25	4.876	0.5
	82	KMQ450VS82RM22X30T2	22 × 30	4.043	0.56
	100	KMQ450VS101M22X30T2	22 × 30	3.316	0.64
	120	KMQ450VS121M22X35T2	22 × 35	2.763	0.72
	150	KMQ450VS151M22X40T2	22 × 40	2.21	0.79
	180	KMQ450VS181M22X45T2	22 × 45	1.842	0.87
	100	KMQ450VS101M25X25T2	25.4 × 25	3.316	0.64
	120	KMQ450VS121M25X30T2	25.4 × 30	2.763	0.72
	150	KMQ450VS151M25X30T2	25.4 × 30	2.21	0.79
	180	KMQ450VS181M25X40T2	25.4 × 40	1.842	0.87
	220	KMQ450VS221M25X45T2	25.4 × 45	1.507	1.0
	270	KMQ450VS271M25X50T2	25.4 × 50	1.228	1.19
	150	KMQ450VS151M30X25T2	30 × 25	2.21	0.79
	180	KMQ450VS181M30X30T2	30 × 30	1.842	0.87
	220	KMQ450VS221M30X30T2	30 × 30	1.507	1.0
	270	KMQ450VS271M30X40T2	30 × 40	1.228	1.19
	330	KMQ450VS331M30X45T2	30 × 45	1.005	1.38
	390	KMQ450VS391M30X50T2	30 × 50	0.85	1.55
	220	KMQ450VS221M35X25T2	35 × 25	1.507	1.0
	270	KMQ450VS271M35X30T2	35 × 30	1.228	1.19
	330	KMQ450VS331M35X35T2	35 × 35	1.005	1.38
	390	KMQ450VS391M35X40T2	35 × 40	0.85	1.55
	470	KMQ450VS471M35X45T2	35 × 45	0.705	1.74
	560	KMQ450VS561M35X50T2	35 × 50	0.592	1.9

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