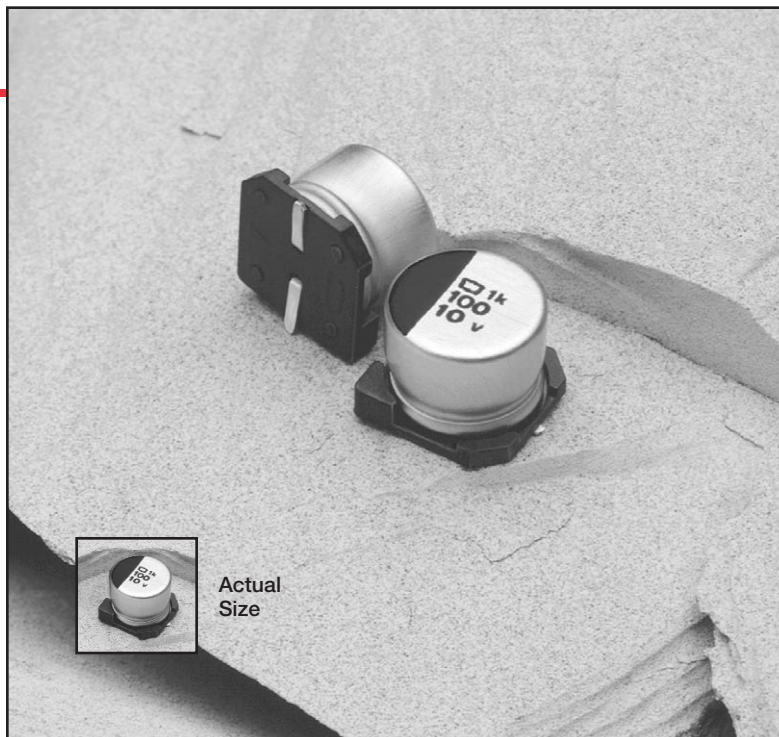


MVK Series



- **Surface Mount**
- **Low Profile Vertical Chip**
- **Solvent Proof**
- **+105°C Maximum Temperature**



The MVK series capacitors are the standard vertical chip capacitors designed for reflow soldering. The maximum height for most of these capacitors is 5.5mm, making them ideal for use in low profile situations.

The MVK series capacitors were developed to withstand HCFC cleaning agents for five minutes by ultrasonic, vapor or immersion. This solvent proof design allows all circuit board components to be cleaned together, at the same time, without resorting to more expensive epoxy end-sealed capacitors. Refer to the Mini-Glossary for recommended cleaning conditions.

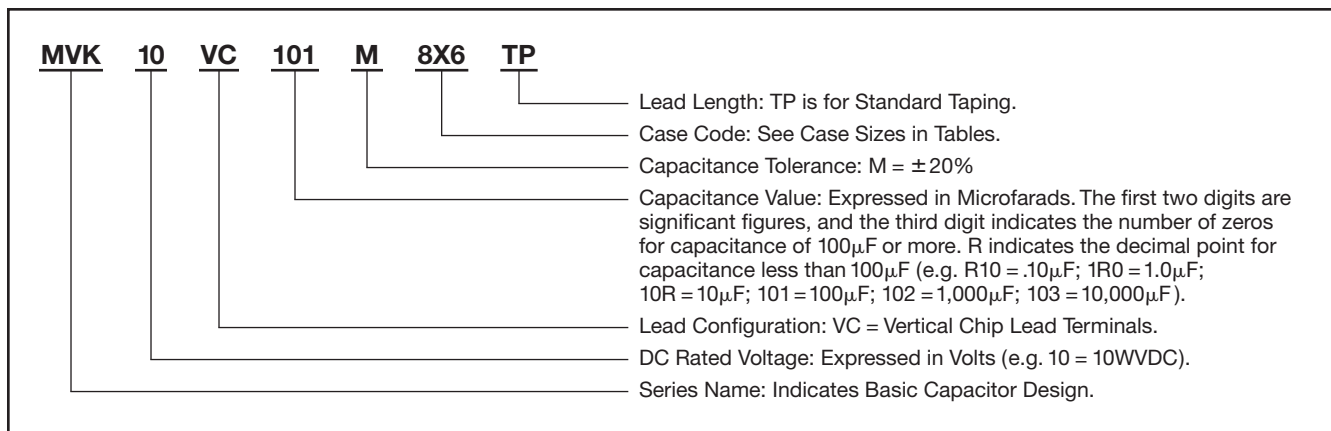
Summary of Specifications

- **Surface mount lead terminals.**
- **Capacitance range: 0.1 to 1,000 μ F.**
- **Voltage range: 6.3 to 50VDC.**
- **Operating temperature range: -40°C to +105°C.**
- **Leakage current: 0.01CV or 3 μ A, whichever is greater, after 2 minutes at +20°C.**
- **Standard capacitance tolerance: \pm 20%**
- **Nominal case size (D \times L): 4 \times 5.2mm to 10 \times 10mm.**
- **Rated lifetime: 1,000 to 2,000 hours at +105°C depending on case size.**

Item	Characteristics																					
Operating Temperature Range	-40 to +105°C																					
Rated Voltage Range	6.3 to 50VDC																					
Capacitance Range	0.1 to 1,000 μ F																					
Capacitance Tolerance	\pm 20% (M) at +20°C, 120Hz																					
Leakage Current	I = 0.01CV or 3 μ A, whichever is greater, after 2 minutes at +20°C. Where I = Leakage current (μ A), C = Nominal capacitance (μ F) and V = Rated voltage (V)																					
Dissipation Factor (Tan δ)	At +20°C, 120Hz <table border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> </tr> </thead> <tbody> <tr> <td>Size \varnothing4-\varnothing6.3</td> <td>0.30</td> <td>0.24</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> </tr> <tr> <td>Size \varnothing8 & \varnothing10</td> <td>0.40</td> <td>0.30</td> <td>0.26</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> </tr> </tbody> </table>	Rated Voltage (V)	6.3	10	16	25	35	50	Size \varnothing 4- \varnothing 6.3	0.30	0.24	0.20	0.16	0.14	0.12	Size \varnothing 8 & \varnothing 10	0.40	0.30	0.26	0.16	0.14	0.12
Rated Voltage (V)	6.3	10	16	25	35	50																
Size \varnothing 4- \varnothing 6.3	0.30	0.24	0.20	0.16	0.14	0.12																
Size \varnothing 8 & \varnothing 10	0.40	0.30	0.26	0.16	0.14	0.12																
Low Temperature Characteristics	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 border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> </tr> </thead> <tbody> <tr> <td>Z(-25°C)/Z(+20°C)</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-40°C)/Z(+20°C)</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> <td>3</td> </tr> </tbody> </table>	Rated Voltage (V)	6.3	10	16	25	35	50	Z(-25°C)/Z(+20°C)	4	3	2	2	2	2	Z(-40°C)/Z(+20°C)	10	8	6	4	3	3
Rated Voltage (V)	6.3	10	16	25	35	50																
Z(-25°C)/Z(+20°C)	4	3	2	2	2	2																
Z(-40°C)/Z(+20°C)	10	8	6	4	3	3																
Load Life	The following specifications shall be satisfied when the capacitors are restored to +20°C after subjecting them to the DC rated voltage for the specified test time at +105°C. The sum of DC voltage and peak AC voltage must not exceed the full rated voltage of the capacitors. Size \varnothing 4- \varnothing 6.3: 1,000 hours Size \varnothing 8 & \varnothing 10: 2,000 hours Capacitance change: Size \varnothing 4- \varnothing 6.3 : $\leq \pm$ 30% of the initial measured value Size \varnothing 8 & \varnothing 10 : $\leq \pm$ 20% of the initial measured value Tan δ (DF): Size \varnothing 4- \varnothing 6.3 : \leq 300% of the initial specified value Size \varnothing 8 & \varnothing 10 : \leq 200% of the initial specified value Leakage current : \leq initial specified value																					
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to +20°C after exposing them for the specified test time 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. Size \varnothing 4- \varnothing 6.3: 500 hours Size \varnothing 8 & \varnothing 10: 1,000 hours Capacitance change: Size \varnothing 4- \varnothing 6.3 : $\leq \pm$ 25% of the initial measured value Size \varnothing 8 & \varnothing 10 : $\leq \pm$ 20% of the initial measured value Tan δ (DF): : \leq 200% of the initial specified value Leakage current : \leq initial specified value																					
Others	Satisfies characteristic W of JIS C5141																					

Part Numbering System for MVK Series

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



MVK Series

Diagram of Dimensions

Vertical Chip Lead Terminals

VC Type

Unit: mm

Recommended Solder Pad on PC Board

For tape and reel packaging and reflow soldering conditions, refer to the beginning of the Surface Mount section.

Case and Solder Pad Dimensions

Case Code	ØD ±0.5	L	A ±0.2	B ±0.2	C ±0.2	W	P	a	b	c
D55	Ø4	5.2±0.3	4.3	4.3	5.1	0.5-0.8	1.0	1.0	2.6	1.6
E55	Ø5	5.2±0.3	5.3	5.3	5.9	0.5-0.8	1.4	1.4	3.0	1.6
F55	Ø6.3	5.2±0.3	6.6	6.6	7.2	0.5-0.8	1.9	1.9	3.5	1.6
8X6	Ø8	6.3±0.5	8.3	8.3	9.0	0.5-0.8	2.3	2.3	4.5	1.6
8X10	Ø8	10±0.5	8.3	8.3	9.0	0.7-1.1	3.1	3.1	4.2	2.2
10X10	Ø10	10±0.5	10.3	10.3	11.0	0.7-1.1	4.5	4.5	4.4	2.2

Standard Voltage Ratings - Surface Mount

Rated Voltage (WVDC)	Capacitance (µF)	Catalog Part Number	Nominal Case Size* D × L (mm)	Case Code	Maximum ESR (Ω) at +20°C, 120Hz	Maximum Ripple Current (mA rms) at +105°C, 120Hz
6.3 Volts 8 Volts Surge	22	MVK6.3VC22RMD55TP	4 × 5.2	D55	22.602	21
	47	MVK6.3VC47RME55TP	5 × 5.2	E55	10.58	36
	100	MVK6.3VC101MF55TP	6.3 × 5.2	F55	4.973	56
	330	MVK6.3VC331M8X10TP	8 × 10	8X10	2.009	290
	1,000	MVK6.3VC102M10X10TP	10 × 10	10X10	0.663	410
10 Volts 13 Volts Surge	33	MVK10VC33RME55TP	5 × 5.2	E55	12.055	34
	100	MVK10VC101M8X6TP	8 × 6.3	8X6	4.973	90
	220	MVK10VC221M8X10TP	8 × 10	8X10	2.26	180
16 Volts 20 Volts Surge	10	MVK16VC10RMD55TP	4 × 5.2	D55	33.15	16
	22	MVK16VC22RME55TP	5 × 5.2	E55	15.068	30
	47	MVK16VC47RMF55TP	6.3 × 5.2	F55	7.053	48
	470	MVK16VC471M10X10TP	10 × 10	10X10	0.917	460
25 Volts 32 Volts Surge	33	MVK25VC33RMF55TP	6.3 × 5.2	F55	8.036	45
	47	MVK25VC47RM8X6TP	8 × 6.3	8X6	5.643	80
	100	MVK25VC101M8X10TP	8 × 10	8X10	2.652	180
	330	MVK25VC331M10X10TP	10 × 10	10X10	0.804	450

*Refer to diagrams for detailed case size dimensions.

MVK Series

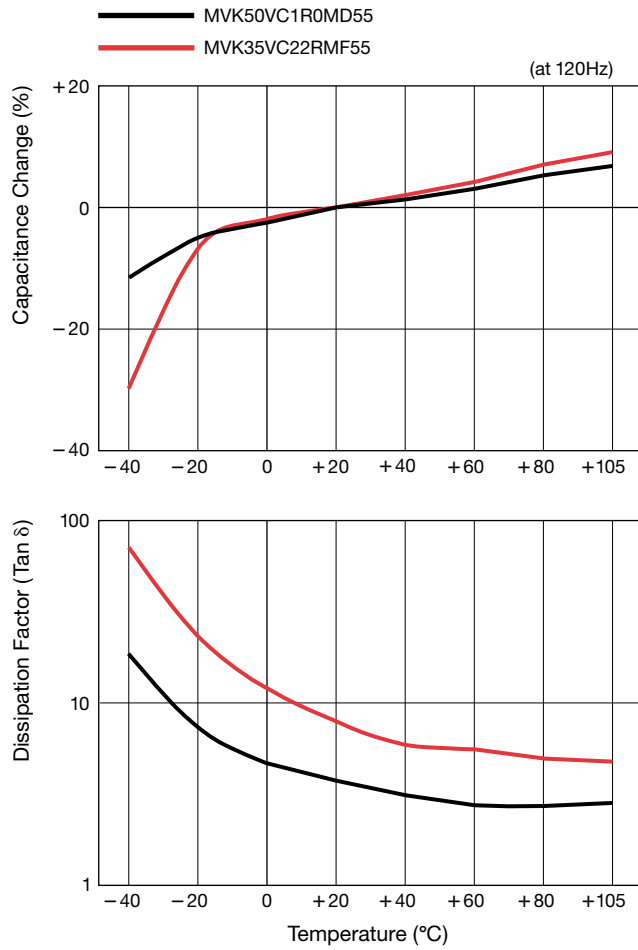
Standard Voltage Ratings - Surface Mount

Rated Voltage (WVDC)	Capacitance (μF)	Catalog Part Number	Nominal Case Size* D × L (mm)	Case Code	Maximum ESR (Ω) at +20°C, 120Hz	Maximum Ripple Current (mA rms) at +105°C, 120Hz
35 Volts 44 Volts Surge	4.7	MVK35VC4R7MD55TP	4 × 5.2	D55	49.372	15
	10	MVK35VC10RME55TP	5 × 5.2	E55	23.205	25
	22	MVK35VC22RMF55TP	6.3 × 5.2	F55	10.548	40
	33	MVK35VC33RM8X6TP	8 × 6.3	8X6	7.032	80
	220	MVK35VC221M10X10TP	10 × 10	10X10	1.055	375
50 Volts 63 Volts Surge	0.1	MVK50VCR10MD55TP	4 × 5.2	D55	1,989.0	1.3
	0.22	MVK50VCR22MD55TP	4 × 5.2	D55	904.091	2.6
	0.33	MVK50VCR33MD55TP	4 × 5.2	D55	602.727	3.2
	0.47	MVK50VCR47MD55TP	4 × 5.2	D55	423.191	3.8
	1.0	MVK50VC1R0MD55TP	4 × 5.2	D55	198.9	5.6
	2.2	MVK50VC2R2MD55TP	4 × 5.2	D55	90.409	10
	3.3	MVK50VC3R3MD55TP	4 × 5.2	D55	60.273	14
	4.7	MVK50VC4R7ME55TP	5 × 5.2	E55	42.319	19
	10	MVK50VC10RMF55TP	6.3 × 5.2	F55	19.89	29
	22	MVK50VC22RM8X6TP	8 × 6.3	8X6	9.041	70
	33	MVK50VC33RM8X10TP	8 × 10	8X10	6.027	140
	47	MVK50VC47RM8X10TP	8 × 10	8X10	4.232	170
	100	MVK50VC101M10X10TP	10 × 10	10X10	1.989	310

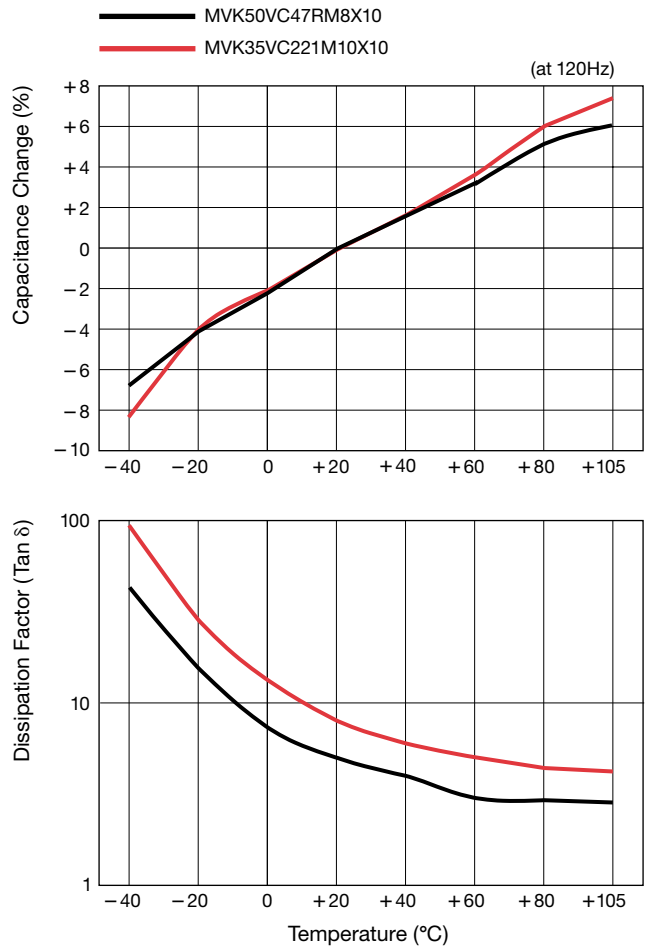
* Refer to diagrams for detailed case size dimensions.

MVK Series

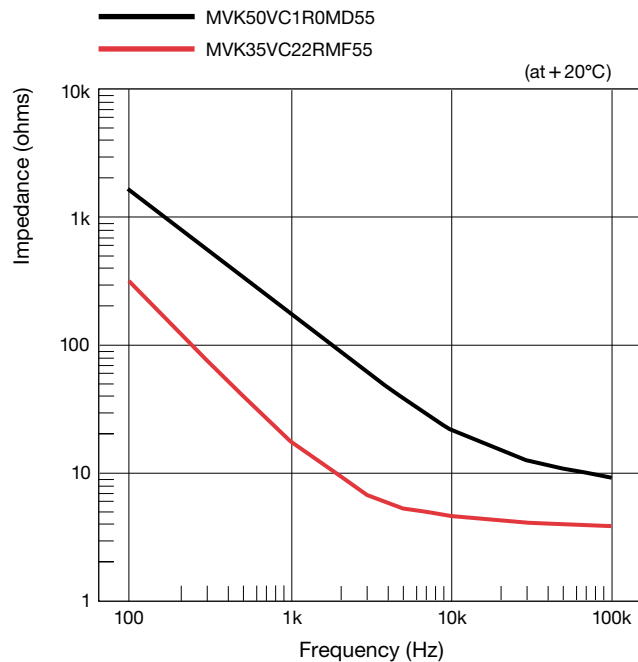
Temperature Characteristics



Temperature Characteristics



Impedance - Frequency Characteristics



Impedance - Frequency Characteristics

