

**Features:**

- Chip type operating over wide temperature range of to -55°C to +105°C
- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine using carrier tape

Specifications:

Items	Characteristics							
Capacitance Tolerance	± 20% (120Hz, 20°C)							
Operating Temperature Range	-55°C to +105°C							
Rated Voltage Range	4 to 63V DC							
Capacitance Range	0.1 to 1,500μF							
Leakage Current	After 2 minutes application of rated voltage, leakage current is not more than 0.01CV or 3(μA), whichever is greater.							
Dissipation Factor (tan δ)	Measurement Frequency: 120Hz. Temperature: 20°C							
	Rated Voltage(V)	6.3	10	16	25	35	50	63
	tan δ(Max)	0.26	0.2	0.16	0.14	0.12	0.12	0.12
Low Temperature Stability Impedance Ratio(Max)	Measurement Frequency: 120Hz.							
	Rated Voltage(V)	4	6.3	10	16	25	35	50
	Z(-25°C)/Z(20°C)	7	4	3	2	2	2	2
	Z(-40°C)/Z(20°C)	15	8	8	4	4	3	3
Load Life	2000 hours,with application of rated voltage at 105°C							
	Capacitance Change	Within ±25% of Initial Value						
	tan δ	200% or less of Initial Specified Value						
	Leakage Current	Initial Specified Value or less						
Shelf Life	After leaving capacitors under no load at 105°C for 1,000 hours, they meet the specified value for load life characteristics listed above.							
Resistance to Soldering Heat	The capacitors shall be kept on the hot plate maintained at 250°C for 30 seconds. After removing from the hot plate and restored at room temperature they meet the characteristics requirements listed at right.				Capacitance Change	Within ± 10% of Initial Value		
					tan δ	Initial Specified Value		
					Leakage Current	Initial Specified Value or less		
Marking	Black print on the case top							

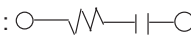
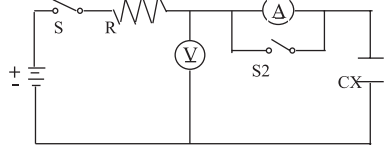
Frequency Coefficient of Permissible Ripple Current

Frequency (Hz)	50	120	300	1K	≥10K
Coefficient	0.7	1	1.17	1.36	1.5

Scope

This specification applies to aluminium electrolytic capacitor, used in electronic equipment.

Electrical Characteristics

Item	Test Method	Specification															
Rated Voltage		Voltage range, capacitance range, see specification of this series.															
Capacitance	Measuring frequency : 120 ±12Hz	Voltage range, capacitance range, see specification of this series. Dissipation factor, leakage current, see specification of this series.															
Dissipation factor	Measuring voltage : ≤0.5Vrms + 0.5 ~ 2V DC Measurement circuit : 																
Leakage current	DC leakage current shall be measured after 1~2 minutes application of the DC rated working voltage through the 1000Ω resistor at 20°C  R : 1000 ±100Ω S1 : Switch A : DC current meter S2 : Switch for protect of current meter V : DC voltage meter CX : Testing capacitor	Dissipation factor leakage current, see specification of this series.															
Temperature characteristics	<table border="1"> <thead> <tr> <th>Step</th><th>Temperature</th><th>Storage Time</th></tr> </thead> <tbody> <tr> <td>1</td><td>20 ±2°C</td><td>30 minutes</td></tr> <tr> <td>2</td><td>-40 ±3°C</td><td>2 hours</td></tr> <tr> <td>3</td><td>20 ±2°C</td><td>15 minutes</td></tr> <tr> <td>4</td><td>105 ±2°C</td><td>2 hours</td></tr> </tbody> </table> Step 1. Measure the capacitance and impedance. (Z_{r0}) (Z, 20°C, 120Hz ±10%) Step 2. Measure the impedance at thermal balance after 2 hours. (Z, 20°C, 120Hz ±10%) Step 4. Measure the capacitance and leakage current at thermal balance after 2 hours.	Step	Temperature	Storage Time	1	20 ±2°C	30 minutes	2	-40 ±3°C	2 hours	3	20 ±2°C	15 minutes	4	105 ±2°C	2 hours	Step 2. Impedance ratio (Z_r / Z_{r0}) less than specified value. Step 4. Capacitance change : within ± 20% of the initial measured value. Leakage current : Less than 10 times of initial specified value .
Step	Temperature	Storage Time															
1	20 ±2°C	30 minutes															
2	-40 ±3°C	2 hours															
3	20 ±2°C	15 minutes															
4	105 ±2°C	2 hours															
Surge test	Rated surge voltage shall be applied (switch on) for 30 ±5 seconds and then shall be applied (switch off) with discharge for 5 ±0.5 min at room temperature . This cycle shall be repeated for 1000 cycles. Duration of one cycle is 6 ± 0.5 minutes .	Capacitance change : within ± 20% of the initial specified value. Dissipation factor : less than 200% of the initial specified value. Leakage current : within initial specified value.															
Applicable Ripple Current	The maximum A.C. current having frequency of 100k Hz which can be applied to the capacitor at 105 ±2°C continuously. Peak voltage not to exceed rated D.C. voltage.																

Mechanical characteristics

Item	Test Method	Specification								
Lead strength	(A) Tensile strength : wire lead terminal : <table><tr><td>d (mm)</td><td>≤0.45</td><td>0.5 ~ 0.8</td><td>0.8<d ≤1.25</td></tr><tr><td>Load (kg)</td><td>0.51</td><td>1</td><td>2</td></tr></table>	d (mm)	≤0.45	0.5 ~ 0.8	0.8<d ≤1.25	Load (kg)	0.51	1	2	When the capacitance is measured, there shall be no intermittent contacts, or open- or short-circuiting. There shall be no such mechanical damage as terminal damage etc.
	d (mm)	≤0.45	0.5 ~ 0.8	0.8<d ≤1.25						
	Load (kg)	0.51	1	2						
	Snap-in terminal <table><tr><td>d (mm)</td><td>snap-in terminal</td></tr><tr><td>Load (kg)</td><td>2</td></tr></table>	d (mm)	snap-in terminal	Load (kg)	2					
	d (mm)	snap-in terminal								
	Load (kg)	2								
	The capacitor shall withstand the constant tensile force specified between the body and each lead for 10 seconds without damage either mechanical or electrical.									
	(B) Bending strength : wire lead terminal : <table><tr><td>d (mm)</td><td>≤0.45</td><td>0.5 ~ 0.8</td><td>0.8<d ≤1.25</td></tr><tr><td>Load (kg)</td><td>0.25</td><td>0.51</td><td>1</td></tr></table>	d (mm)	≤0.45	0.5 ~ 0.8	0.8<d ≤1.25	Load (kg)	0.25	0.51	1	
	d (mm)	≤0.45	0.5 ~ 0.8	0.8<d ≤1.25						
	Load (kg)	0.25	0.51	1						
Snap-in terminal <table><tr><td>Cross section area of terminal</td><td>Force (kg)</td></tr><tr><td>0.5<S≤1</td><td>1</td></tr><tr><td>S>1</td><td>2.5</td></tr></table>	Cross section area of terminal	Force (kg)	0.5<S≤1	1	S>1	2.5				
Cross section area of terminal	Force (kg)									
0.5<S≤1	1									
S>1	2.5									
With the capacitor in a vertical position apply the load specified axially to each lead. The capacitor shall be rotated slowly from the vertical to the horizontal position, back to the vertical position. The 90° in the opposite direction and back the original position. Performance of capacitor shall not have changed and leads shall be undamaged										
Vibration resistance	The frequency of the vibration shall vary uniformly within the range 10 to 55 Hz with the amplitude of 1.5mm, completing the cycle in the interval of one minute. The capacitor shall be securely mounted by its leads with hold the body of capacitor. The capacitor shall be vibrated in three mutually perpendicular directions for a period of 2 hours in each direction .	Capacitance : no unsteady. Appearance : no abnormal. Capacitance change : within ± 5% of initial measured value .								
Solderability	The leads are dipped in the solder bath of Sn at 260 ±5°C for 2 ± 0.5 seconds . The dipping depth should be set at 1.5 ~ 2mm .	The solder alloy shall cover the 95% or more of the dipped lead's area .								

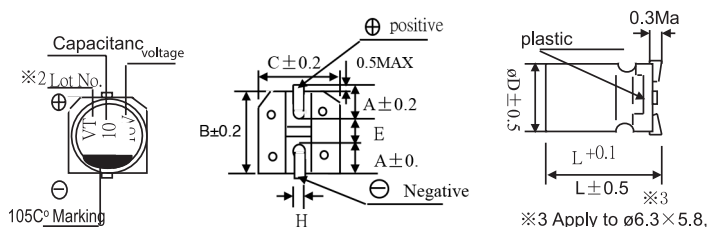
Reliability

Item	Test Method	Specification
Soldering heat resistance	The leads immerse in the solder bath of Sn at $260 \pm 5^\circ\text{C}$ for 10 ± 1 seconds until a distance of 1.5 ~ 2mm from the case.	No damage or leakage of electrolyte. Capacitance change : within $\pm 10\%$ of the initial measured value. Tan δ : less than specified value. Leakage current : less than specified value.
Damp heat (Steady state)	Subject the capacitors to $40 \pm 2^\circ\text{C}$ and 90% to 95% relative humidity for 240 ± 8 hours.	Capacitance change : within $\pm 10\%$ of the initial measured value. Tan δ : less than specified value. Leakage current : less than specified value.
Load life	After X hours continuous application of DC rated working voltage at $105 \pm 2^\circ\text{C}$, the measurements shall meet the following limits. Measurements shall be performed after 2 hours exposed at room temperature .	Standard of judgement is according to requirement of this series.
Shelf life	After storage for Y hours at $105 \pm 2^\circ\text{C}$ without voltage application , the measurements shall meet the following limits. Measurements shall be performed after exposed for 1 to 2 hrs at room temperature after application of DC rated voltage to the capacitor for Z minutes .	
Storage at Low Temperature	The capacitor shall be stored at temperature of $-40 \pm 3^\circ\text{C}$ for 240 ± 8 hours, during which time no voltage shall be applied. And then the capacitor shall be subjected to standard atmospheric conditions for 16 hours or more, after which measurements shall be made.	Capacitance change : within $\pm 10\%$ of the initial value. Tan δ : less than specified value. Leakage current : less than specified value Appearance : no abnormal.

MCVVT Series

Dimensions:

Chip Type



*1. Voltage mark for 6.3V is [6V] Capacitance mark for 10 is 10 μF .

*2. Lot No. mark for H3, "H" is series name ; "3" is month code.

D×L	4×5.4	5×5.4	6.3×5.4/7.7	8×6.2	8×10.5	10×10.5/13.5	12.5×13.5/16	16×16.5/21.5
A	1.8	2.1	2.4	3.3	2.9	3.2	4.7	5.5
B	4.3	5.3	6.6	8.3	8.3	10.3	13	17
C	4.3	5.3	6.6	8.3	8.3	10.3	13	17
E	1.0	1.5	2.2	2.2	3.1	4.4	4.4	6.7
L	5.4	5.4	5.4/7.7	6.2	10.5	10.5/13.5	13.5/16	16.5/21.5

Dimensions : Millimetres

Standard Ratings:

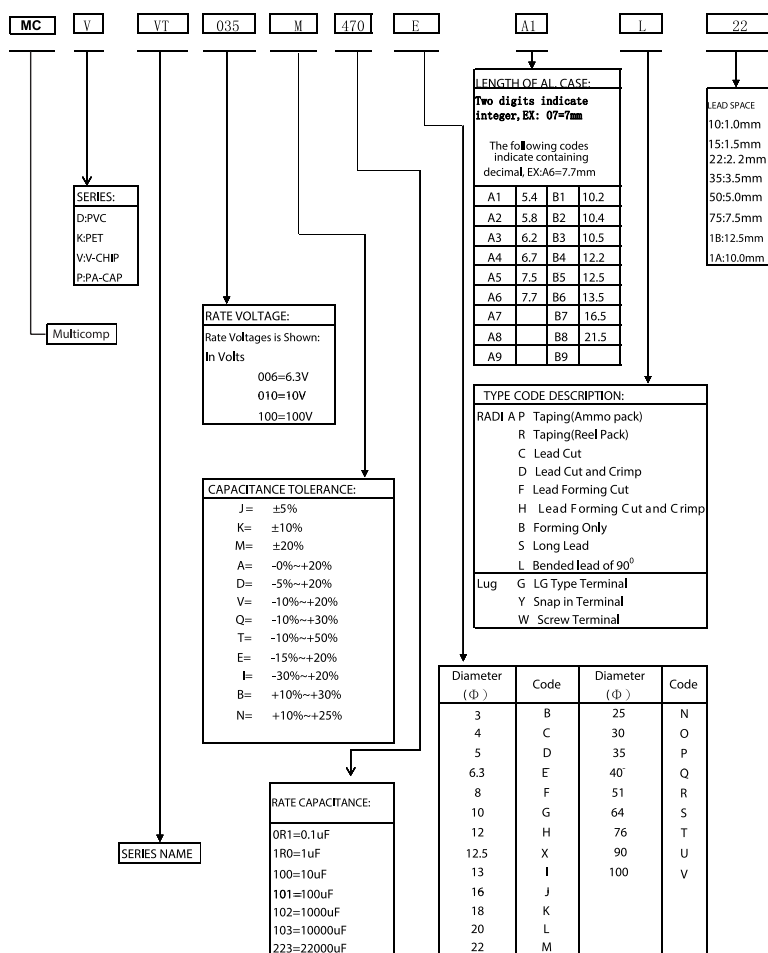
D×L(mm) ; R.C.(mA rms) at 105°C, 120Hz

Cap (uF)	WV (V)	4		6.3		10		16	
	Item	D×L	R.C.	D×L	R.C.	D×L	R.C.	D×L	R.C.
10								4×5.4	18
22		4×5.4	22	4×5.4	22	5×5.4	25	4×5.4	22
33		5×5.4	30	5×5.4	27	5×5.4	30	6.3×5.4	40
47		5×5.4	26	5×5.4	28	5×5.4	30	5×5.4	40
100		6.3×5.4	60	6.3×5.4	50	6.3×5.4	53	6.3×5.4	60
150		6.3×5.4	52	6.3×5.4	55	6.3×5.4	62	6.3×7.7	95
220		6.3×5.4	57	6.3×5.4	67	6.3×5.4	95	6.3×7.7	105
330		6.3×7.7	100	6.3×7.7	105	8×10.5	196	8×10.5	195
470		6.3×7.7	105	6.3×7.7	120	8×10.5	210	8×10.5	230
680		8×10.5	210	8×10.5	210	10×10.5	270	10×10.5	315
1000		8×10.5	230	8×10.5	230	10×10.5	315	10×10.5	340
1500		10×10.5	315	10×10.5	310	10×13.5	460		

Cap (uF)	WV (V)	25		35		50	
	Item	D×L	R.C.	D×L	R.C.	D×L	R.C.
0.1						4×5.4	0.7
0.22						4×5.4	1.6
0.33						4×5.4	2.5
0.47						4×5.4	3.5
1						4×5.4	7
2.2						4×5.4	11
3.3				4×5.4	13	4×5.4	13
4.7		4×5.4	13	4×5.4	14	5×5.4	16
10		5×5.4	20	4×5.4	18	6.3×5.4	24
22		6.3×5.4	36	6.3×5.4	38	6.3×5.4	42
33		6.3×5.4	44	6.3×5.4	42	6.3×7.7	60
47		6.3×5.4	48	6.3×5.4	50	6.3×7.7	63

Cap (uF)	WV (V)	25		35		50	
	Item	D×L	R.C.	D×L	R.C.	D×L	R.C.
100		8×10.5	135	6.3×7.7	70	8×10.5	140
150		8×10.5	140	8×10.5	155	10×10.5	170
220		8×10.5	175	8×10.5	190	10×10.5	220
330		8×10.5	220	10×10.5	245	10×13.5	295
470		10×10.5	280	10×10.5	280		

Explanation of parts numbers



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