

# Alchip™-MVH Series

- Lower ESR, Higher ripple current
- Endurance : 1,000 to 5,000 hours at 125°C
- Suitable to fit for automotive equipment
- Solvent resistant type except 63 to 100V<sub>dc</sub> (see PRECAUTIONS AND GUIDELINES)
- Vibration resistant structure
- RoHS2 Compliant
- AEC-Q200 compliant : Please contact Chemi-Con for more details, test data, information.

MVH

↑ 125°C  
MVE

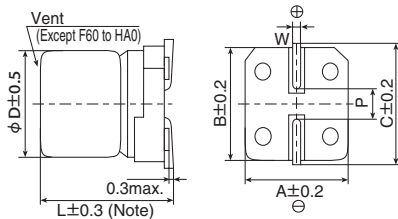


## ◆ SPECIFICATIONS

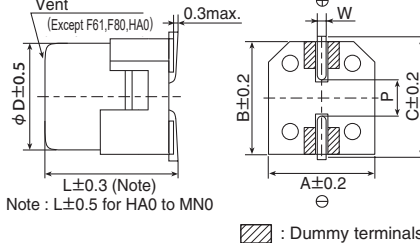
| Items   | Characteristics   |   |      |      |                                       |      |      |      |      |      |
|---|---|---|------|------|---------------------------------------|------|------|------|------|------|
| <b>Category</b>   | -40 to +125°C   |   |      |      |                                       |      |      |      |      |      |
| <b>Temperature Range</b>  | -40 to +125°C   |   |      |      |                                       |      |      |      |      |      |
| <b>Rated Voltage Range</b>  | 10 to 100V <sub>dc</sub>  |   |      |      |                                       |      |      |      |      |      |
| <b>Capacitance Tolerance</b>  | ±20% (M) (at 20°C, 120Hz)   |   |      |      |                                       |      |      |      |      |      |
| <b>Leakage Current</b>  | F60 to JA0  | I=0.01CV or 3μA, whichever is greater.  |      |      |                                       |      |      |      |      |      |
|   | KE0 to MN0  | I=0.03CV or 4μA, whichever is greater.  |      |      |                                       |      |      |      |      |      |
| Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes) |   |   |      |      |                                       |      |      |      |      |      |
| <b>Dissipation Factor (tan δ)</b>   | Rated voltage (V <sub>dc</sub> )  | 10V   | 16V  | 25V  | 35V                                   | 50V  | 63V  | 80V  | 100V |      |
|   | tan δ (Max.)  | F60 to JA0  | 0.24 | 0.20 | 0.16                                  | 0.14 | 0.14 | 0.12 | 0.12 | 0.10 |
|   |   | KE0 to MN0  | 0.22 | 0.18 | 0.16                                  | 0.14 | 0.12 | 0.14 | —    | 0.10 |
| When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz)   |   |   |      |      |                                       |      |      |      |      |      |
| <b>Low Temperature Characteristics (Max. Impedance Ratio)</b>   | Rated voltage (V <sub>dc</sub> )  | 10V   | 16V  | 25V  | 35V                                   | 50V  | 63V  | 80V  | 100V |      |
|   | F60 to JA0  | Z(-25°C)/Z(+20°C)   | 3    | 2    | 2                                     | 2    | 2    | 2    | 2    | 2    |
|   |   | Z(-40°C)/Z(+20°C)   | 6    | 4    | 4                                     | 3    | 3    | 3    | 3    | 3    |
|   | KE0 to MN0  | Z(-25°C)/Z(+20°C)   | 4    | 3    | 2                                     | 2    | 2    | 2    | —    | 2    |
| Z(-40°C)/Z(+20°C)   |   | 8   | 6    | 4    | 3                                     | 3    | 3    | —    | 3    |      |
| (at 120Hz)  |   |   |      |      |                                       |      |      |      |      |      |
| <b>Endurance</b>  | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for the specified time at 125°C.  |   |      |      |                                       |      |      |      |      |      |
|   | Time  | F60 to H63 (10 to 100V <sub>dc</sub> ) : 1,000hours<br>HA0 to JA0 (10 to 100V <sub>dc</sub> ) : 2,000hours<br>KE0 to MN0 (10 to 100V <sub>dc</sub> ) : 5,000hours |      |      |                                       |      |      |      |      |      |
|   | Capacitance change  | ≤ ±30% of the initial value   |      |      |                                       |      |      |      |      |      |
|   | D.F. (tan δ)  | ≤ 300% of the initial specified value   |      |      |                                       |      |      |      |      |      |
|   | Leakage current   | ≤ The initial specified value   |      |      |                                       |      |      |      |      |      |
| <b>Shelf Life</b>   | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 125°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |   |      |      |                                       |      |      |      |      |      |
|   | Rated voltage (V <sub>dc</sub> )  | 10 to 50V <sub>dc</sub>   |      |      | 63 to 100V <sub>dc</sub>              |      |      |      |      |      |
|   | Capacitance change  | ≤ ±30% of the initial value   |      |      | ≤ ±30% of the initial value           |      |      |      |      |      |
|   | D.F. (tan δ)  | ≤ 300% of the initial specified value   |      |      | ≤ 300% of the initial specified value |      |      |      |      |      |
|   | Leakage current   | ≤ The initial specified value   |      |      | ≤ 500% of the initial specified value |      |      |      |      |      |

## ◆ DIMENSIONS [mm]

- Terminal Code : A
- Size code : F60 to MN0

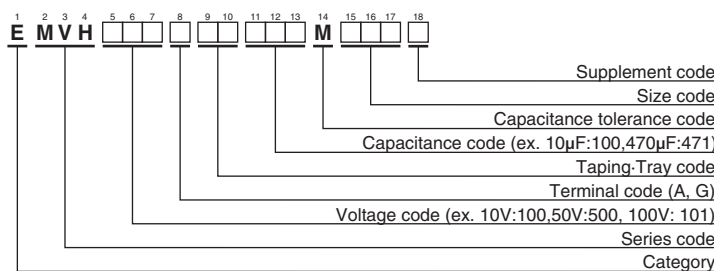


- Terminal Code : G (Vibration resistant structure)
- Size code : F61, F80, HA0 to MN0

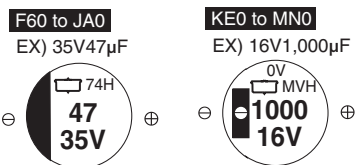


| Size code | D    | L    | A    | B    | C    | W         | P   |
|-----------|------|------|------|------|------|-----------|-----|
| F60       | 6.3  | 5.7  | 6.6  | 6.6  | 7.2  | 0.5 ~ 0.8 | 1.9 |
| F61       | 6.3  | 5.8  | 6.6  | 6.6  | 7.2  | 0.5 ~ 0.8 | 1.9 |
| F80       | 6.3  | 7.7  | 6.6  | 6.6  | 7.2  | 0.5 ~ 0.8 | 1.9 |
| H63       | 8    | 6.3  | 8.3  | 8.3  | 9    | 0.5 ~ 0.8 | 2.3 |
| HA0       | 8    | 10   | 8.3  | 8.3  | 9    | 0.7 ~ 1.1 | 3.1 |
| JA0       | 10   | 10   | 10.3 | 10.3 | 11   | 0.7 ~ 1.1 | 4.5 |
| KE0       | 12.5 | 13.5 | 13.0 | 13.0 | 13.7 | 1.0 ~ 1.3 | 4.2 |
| KG5       | 12.5 | 16.0 | 13.0 | 13.0 | 13.7 | 1.0 ~ 1.3 | 4.2 |
| LH0       | 16   | 16.5 | 17.0 | 17.0 | 18.0 | 1.0 ~ 1.3 | 6.5 |
| LN0       | 16   | 21.5 | 17.0 | 17.0 | 18.0 | 1.0 ~ 1.3 | 6.5 |
| MH0       | 18   | 16.5 | 19.0 | 19.0 | 20.0 | 1.0 ~ 1.3 | 6.5 |

## ◆ PART NUMBERING SYSTEM



## ◆ MARKING



Please refer to "Product code guide (surface mount type)"



Alchip™-MVH Series

◆STANDARD RATINGS

| WV (Vdc) | Cap (μF) | Size code | ESR (Ω max./100kHz) |       | Rated ripple current (mA rms/125°C, 100kHz) | Part No.             | WV (Vdc)             | Cap (μF)  | Size code | ESR (Ω max./100kHz) |       | Rated ripple current (mA rms/125°C, 100kHz) | Part No.             |                      |
|----------|----------|-----------|---------------------|-------|---|----------------------|----------------------|-----------|-----------|---------------------|-------|---|----------------------|----------------------|
|          |          |           | 20°C                | -40°C |   |                      |                      |           |           | 20°C                | -40°C |   |                      |                      |
| 10       | 100      | F80       | 0.90                | 14.0  | 110   | EMVH100 □ RA101MF80G | 35                   | 100       | JA0       | 0.30                | 4.5   | 296   | EMVH350 □ RA101MJA0G |                      |
|          | 100      | H63       | 0.90                | 14.0  | 110   | EMVH100ARA101MH63G   |                      | 220       | JA0       | 0.30                | 4.5   | 296   | EMVH350 □ RA221MJA0G |                      |
|          | 220      | F80       | 0.90                | 14.0  | 110   | EMVH100 □ RA221MF80G |                      | 330       | KE0       | 0.14                | 2.1   | 750   | EMVH350 □ RA331MKE0S |                      |
|          | 220      | H63       | 0.90                | 14.0  | 110   | EMVH100ARA221MH63G   |                      | 330       | LH0       | 0.10                | 1.5   | 1,000                                       | EMVH350 □ RA331MLH0S |                      |
|          | 220      | HA0       | 0.40                | 6.0   | 220   | EMVH100 □ RA221MHA0G |                      | 470       | KG5       | 0.11                | 1.5   | 900   | EMVH350 □ RA471MKG5S |                      |
|          | 330      | HA0       | 0.40                | 6.0   | 220   | EMVH100 □ RA331MHA0G |                      | 470       | LH0       | 0.10                | 1.5   | 1,000                                       | EMVH350 □ RA471MLH0S |                      |
|          | 330      | JA0       | 0.30                | 4.5   | 296   | EMVH100 □ RA331MJA0G |                      | 680       | MH0       | 0.10                | 1.5   | 1,200                                       | EMVH350 □ RA681MMH0S |                      |
|          | 470      | JA0       | 0.30                | 4.5   | 296   | EMVH100 □ RA471MJA0G |                      | 50        | 10        | F60                 | 2.8   | 42.0  | 51                   | EMVH500ARA100MF60G   |
|          | 1,000    | KE0       | 0.14                | 2.1   | 750   | EMVH100 □ RA102MKE0S |                      |           | 10        | F61                 | 2.8   | 42.0  | 51                   | EMVH500 □ RA100MF61G |
|          | 2,200    | LH0       | 0.10                | 1.5   | 1,000                                       | EMVH100 □ RA222MLH0S |                      |           | 10        | H63                 | 1.6   | 30.0  | 83                   | EMVH500ARA100MH63G   |
|          | 2,200    | MH0       | 0.10                | 1.5   | 1,200                                       | EMVH100 □ RA222MMH0S |                      |           | 22        | F80                 | 2.0   | 30.0  | 83                   | EMVH500 □ RA220MF80G |
|          | 3,300    | MH0       | 0.10                | 1.5   | 1,200                                       | EMVH100 □ RA332MMH0S |                      |           | 22        | H63                 | 1.6   | 30.0  | 83                   | EMVH500ARA220MH63G   |
|          | 4,700    | MN0       | 0.058               | 0.87  | 1,550                                       | EMVH100 □ RA472MMN0S |                      |           | 33        | F80                 | 2.0   | 30.0  | 83                   | EMVH500 □ RA330MF80G |
| 16       | 47       | F60       | 1.6                 | 24.0  | 69  | EMVH160ARA470MF60G   | 33                   |           | H63       | 1.6                 | 30.0  | 83  | EMVH500ARA330MH63G   |                      |
|          | 47       | F61       | 1.6                 | 24.0  | 69  | EMVH160 □ RA470MF61G | 33                   |           | HA0       | 0.70                | 11.0  | 160   | EMVH500 □ RA330MHA0G |                      |
|          | 100      | HA0       | 0.40                | 6.0   | 220   | EMVH160 □ RA101MHA0G | 47                   |           | HA0       | 0.70                | 11.0  | 160   | EMVH500 □ RA470MHA0G |                      |
|          | 220      | HA0       | 0.40                | 6.0   | 220   | EMVH160 □ RA221MHA0G | 47                   |           | JA0       | 0.50                | 7.5   | 247   | EMVH500 □ RA470MJA0G |                      |
|          | 220      | JA0       | 0.30                | 4.5   | 296   | EMVH160 □ RA221MJA0G | 100                  |           | JA0       | 0.50                | 7.5   | 247   | EMVH500 □ RA101MJA0G |                      |
|          | 330      | JA0       | 0.30                | 4.5   | 296   | EMVH160 □ RA331MJA0G | 100                  |           | KE0       | 0.23                | 3.5   | 550   | EMVH500 □ RA101MKE0S |                      |
|          | 470      | KE0       | 0.14                | 2.1   | 750   | EMVH160 □ RA471MKE0S | 220                  |           | KE0       | 0.23                | 3.5   | 550   | EMVH500 □ RA221MKE0S |                      |
|          | 680      | KE0       | 0.14                | 2.1   | 750   | EMVH160 □ RA681MKE0S | 220                  | LH0       | 0.15      | 2.3                 | 850   | EMVH500 □ RA221MLH0S                        |                      |                      |
|          | 680      | LH0       | 0.10                | 1.5   | 1,000                                       | EMVH160 □ RA681MLH0S | 330                  | KG5       | 0.18      | 2.7                 | 700   | EMVH500 □ RA331MKG5S                        |                      |                      |
|          | 1,000    | MH0       | 0.10                | 1.5   | 1,200                                       | EMVH160 □ RA102MMH0S | 330                  | LH0       | 0.15      | 2.3                 | 850   | EMVH500 □ RA331MLH0S                        |                      |                      |
|          | 2,200    | MH0       | 0.10                | 1.5   | 1,200                                       | EMVH160 □ RA222MMH0S | 470                  | MH0       | 0.15      | 2.3                 | 920   | EMVH500 □ RA471MMH0S                        |                      |                      |
|          | 25       | 33        | F60                 | 1.6   | 24.0  | 69                   | EMVH250ARA330MF60G   | ※ 1<br>63 | 10        | F80                 | 2.0   | 100   | 60                   | EMVH630 □ RA100MF80G |
|          |          | 33        | F61                 | 1.6   | 24.0  | 69                   | EMVH250 □ RA330MF61G |           | 10        | H63                 | 2.0   | 110   | 60                   | EMVH630ARA100MH63G   |
| 47       |          | F80       | 0.90                | 14.0  | 110   | EMVH250 □ RA470MF80G | 22                   |           | HA0       | 0.70                | 35.0  | 100   | EMVH630 □ RA220MHA0G |                      |
| 47       |          | H63       | 0.90                | 14.0  | 110   | EMVH250ARA470MH63G   | 33                   |           | HA0       | 0.70                | 35.0  | 100   | EMVH630 □ RA330MHA0G |                      |
| 100      |          | F80       | 0.90                | 14.0  | 110   | EMVH250 □ RA101MF80G | 33                   |           | JA0       | 0.50                | 25.0  | 170   | EMVH630 □ RA330MJA0G |                      |
| 100      |          | H63       | 0.90                | 14.0  | 110   | EMVH250ARA101MH63G   | 47                   |           | HA0       | 0.70                | 35.0  | 100   | EMVH630 □ RA470MHA0G |                      |
| 100      |          | HA0       | 0.40                | 6.0   | 220   | EMVH250 □ RA101MHA0G | 47                   |           | JA0       | 0.50                | 25.0  | 170   | EMVH630 □ RA470MJA0G |                      |
| 220      |          | HA0       | 0.40                | 6.0   | 220   | EMVH250 □ RA221MHA0G | 100                  |           | KE0       | 0.25                | 12.5  | 500   | EMVH630 □ RA101MKE0S |                      |
| 220      |          | JA0       | 0.30                | 4.5   | 296   | EMVH250 □ RA221MJA0G | 220                  |           | KG5       | 0.20                | 10.0  | 600   | EMVH630 □ RA221MKG5S |                      |
| 330      |          | JA0       | 0.30                | 4.5   | 296   | EMVH250 □ RA331MJA0G | 330                  |           | LH0       | 0.18                | 9.0   | 820   | EMVH630 □ RA331MLH0S |                      |
| 330      |          | KE0       | 0.14                | 2.1   | 750   | EMVH250 □ RA331MKE0S | 470                  |           | LN0       | 0.11                | 5.5   | 1,100                                       | EMVH630 □ RA471MLN0S |                      |
| 470      |          | KE0       | 0.14                | 2.1   | 750   | EMVH250 □ RA471MKE0S | ※ 1<br>80            |           | 10        | HA0                 | 0.75  | 50.0  | 70                   | EMVH800 □ RA100MHA0G |
| 470      |          | LH0       | 0.10                | 1.5   | 1,000                                       | EMVH250 □ RA471MLH0S |                      |           | 22        | HA0                 | 0.75  | 50.0  | 70                   | EMVH800 □ RA220MHA0G |
| 680      | LH0      | 0.10      | 1.5                 | 1,000 | EMVH250 □ RA681MLH0S                        | 22                   |                      | JA0       | 0.55      | 35.0                | 115   | EMVH800 □ RA220MJA0G                        |                      |                      |
| 680      | MH0      | 0.10      | 1.5                 | 1,200 | EMVH250 □ RA681MMH0S                        | 33                   |                      | HA0       | 0.75      | 50.0                | 70    | EMVH800 □ RA330MHA0G                        |                      |                      |
| 1,000    | MN0      | 0.058     | 0.87                | 1,550 | EMVH250 □ RA102MMN0S                        | 33                   |                      | JA0       | 0.55      | 35.0                | 115   | EMVH800 □ RA330MJA0G                        |                      |                      |
| 35       | 10       | F60       | 1.6                 | 24.0  | 69  | EMVH350ARA100MF60G   | ※ 1<br>100           | 47        | JA0       | 0.55                | 35.0  | 115   | EMVH800 □ RA470MJA0G |                      |
|          | 10       | F61       | 1.6                 | 24.0  | 69  | EMVH350 □ RA100MF61G |                      | 10        | HA0       | 0.75                | 50.0  | 70  | EMVH101 □ RA100MHA0G |                      |
|          | 22       | F60       | 1.6                 | 24.0  | 69  | EMVH350ARA220MF60G   |                      | 22        | HA0       | 0.75                | 50.0  | 70  | EMVH101 □ RA220MHA0G |                      |
|          | 22       | F61       | 1.6                 | 24.0  | 69  | EMVH350 □ RA220MF61G |                      | 22        | JA0       | 0.55                | 35.0  | 115   | EMVH101 □ RA220MJA0G |                      |
|          | 33       | F80       | 0.90                | 14.0  | 110   | EMVH350 □ RA330MF80G |                      | 33        | JA0       | 0.55                | 35.0  | 115   | EMVH101 □ RA330MJA0G |                      |
|          | 33       | H63       | 0.90                | 14.0  | 110   | EMVH350ARA330MH63G   |                      | 47        | KE0       | 0.33                | 16.5  | 450   | EMVH101 □ RA470MKE0S |                      |
|          | 47       | F80       | 0.90                | 14.0  | 110   | EMVH350 □ RA470MF80G |                      | 68        | KG5       | 0.26                | 13.0  | 550   | EMVH101 □ RA680MKG5S |                      |
|          | 47       | H63       | 0.90                | 14.0  | 110   | EMVH350ARA470MH63G   |                      | 100       | LH0       | 0.24                | 12.0  | 650   | EMVH101 □ RA101MLH0S |                      |
|          | 47       | HA0       | 0.40                | 6.0   | 220   | EMVH350 □ RA470MHA0G |                      | 220       | MN0       | 0.16                | 8.0   | 950   | EMVH101 □ RA221MMN0S |                      |
|          | 100      | HA0       | 0.40                | 6.0   | 220   | EMVH350 □ RA101MHA0G |                      |           |           |                     |       |   |                      |                      |

□ : Enter the appropriate terminal code.  
 Production of the products shown in [ ] is scheduled to be discontinued.  
 \*1: Assembly boards with the designated products attached cannot be cleaned.

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

| Size code  | Capacitance(μF) | Frequency(Hz) |      |      |      |
|------------|-----------------|---------------|------|------|------|
|            |                 | 120           | 1k   | 10k  | 100k |
| F60 to JA0 | 10              | 0.66          | 0.86 | 0.93 | 1.00 |
|            | 22 to 470       | 0.93          | 0.97 | 1.00 | 1.00 |
|            | 47 to 100       | 0.40          | 0.75 | 0.90 | 1.00 |
| KE0 to MN0 | 220 to 470      | 0.50          | 0.85 | 0.94 | 1.00 |
|            | 680 to 1,000    | 0.60          | 0.87 | 0.95 | 1.00 |
|            | 2,200 to 3,300  | 0.75          | 0.90 | 0.95 | 1.00 |
|            | 4,700           | 0.85          | 0.95 | 0.98 | 1.00 |

The deterioration of aluminum electrolytic capacitors accelerates their life due to the internal heating produced by ripple current. For details, refer to Section "5-3 Ripple Current Effect on Lifetime" in the catalog, Technical Note.

## Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

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- ⊖ [United Chemi-Con Information](#)

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