

# Alchip™-MHS Series

- Downsizing, High capacitance
- Endurance : 5,000 hours at 125°C
- For high temperature and high reliability applications (Base station equipment, etc)
- High temperature reflow soldering (3 times)
- Solvent resistant type(see PRECAUTIONS AND GUIDELINES)
- Vibration resistant structure
- RoHS2 Compliant
- AEC-Q200 compliant : Please contact Chemi-Con for more details, test data, information.



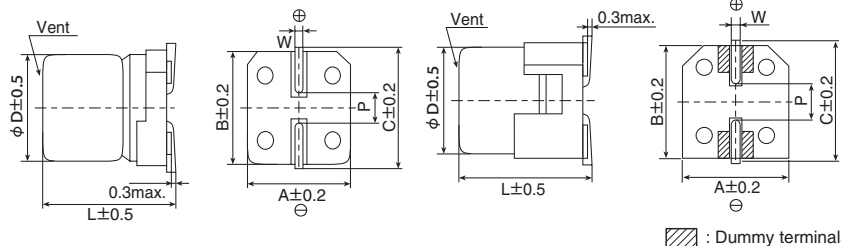
## SPECIFICATIONS

| Items                                                        | Characteristics                                                                                                                                                                                                                                                                         |                                      |      |      |      |      |      |      |            |
|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|------|------|------------|
| Category                                                     | -40 to +125°C                                                                                                                                                                                                                                                                           |                                      |      |      |      |      |      |      |            |
| Temperature Range                                            |                                                                                                                                                                                                                                                                                         |                                      |      |      |      |      |      |      |            |
| Rated Voltage Range                                          | 16 to 100V <sub>dc</sub>                                                                                                                                                                                                                                                                |                                      |      |      |      |      |      |      |            |
| Capacitance Tolerance                                        | ±20%(M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                |                                      |      |      |      |      |      |      |            |
| Leakage Current                                              | I=0.03CV<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                                                         |                                      |      |      |      |      |      |      |            |
| Dissipation Factor<br>(tan δ)                                | Rated voltage(V <sub>dc</sub> )                                                                                                                                                                                                                                                         | 16V                                  | 25V  | 35V  | 50V  | 63V  | 80V  | 100V |            |
|                                                              | tan δ (Max.)                                                                                                                                                                                                                                                                            | 0.18                                 | 0.14 | 0.14 | 0.14 | 0.14 | 0.12 | 0.10 |            |
|                                                              | When nominal capacitance exceeds 1,000 μ F, add 0.02 to the value above for each 1,000 μ F increase. (at 20°C, 120Hz)                                                                                                                                                                   |                                      |      |      |      |      |      |      |            |
| Low Temperature<br>Characteristics<br>(Max. impedance Ratio) | Rated voltage(V <sub>dc</sub> )                                                                                                                                                                                                                                                         | 16V                                  | 25V  | 35V  | 50V  | 63V  | 80V  | 100V |            |
|                                                              | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 3                                    | 2    | 2    | 2    | 2    | 2    | 2    |            |
|                                                              | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 6                                    | 4    | 3    | 3    | 3    | 3    | 3    |            |
|                                                              |                                                                                                                                                                                                                                                                                         |                                      |      |      |      |      |      |      | (at 120Hz) |
| Endurance                                                    | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 5,000 hours at 125°C.                                                                                                                                   |                                      |      |      |      |      |      |      |            |
|                                                              | Capacitance change                                                                                                                                                                                                                                                                      | ≤ ±30% of the initial value          |      |      |      |      |      |      |            |
|                                                              | D.F. (tan δ)                                                                                                                                                                                                                                                                            | ≤300% of the initial specified value |      |      |      |      |      |      |            |
|                                                              | Leakage current                                                                                                                                                                                                                                                                         | ≤ The 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 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. |                                      |      |      |      |      |      |      |            |
|                                                              | Capacitance change                                                                                                                                                                                                                                                                      | ≤ ±30% of the initial value          |      |      |      |      |      |      |            |
|                                                              | D.F. (tan δ)                                                                                                                                                                                                                                                                            | ≤300% of the initial specified value |      |      |      |      |      |      |            |
|                                                              | Leakage current                                                                                                                                                                                                                                                                         | ≤ The initial specified value        |      |      |      |      |      |      |            |

## DIMENSIONS [mm]

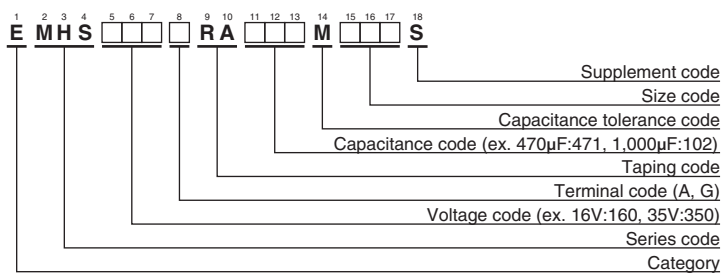
- Terminal Code : A
- Size code : KE0 to MN0

- Terminal Code : G(Vibration resistant structure)
- Size code : KE0 to MN0



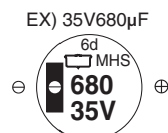
| Size code | φD   | L    | A    | B    | C    | W          | P   |
|-----------|------|------|------|------|------|------------|-----|
| KE0       | 12.5 | 13.5 | 13.0 | 13.0 | 13.7 | 1.0 to 1.3 | 4.2 |
| KG5       | 12.5 | 16.0 | 13.0 | 13.0 | 13.7 | 1.0 to 1.3 | 4.2 |
| LH0       | 16   | 16.5 | 17.0 | 17.0 | 18.0 | 1.0 to 1.3 | 6.5 |
| LN0       | 16   | 21.5 | 17.0 | 17.0 | 18.0 | 1.0 to 1.3 | 6.5 |
| MH0       | 18   | 16.5 | 19.0 | 19.0 | 20.0 | 1.0 to 1.3 | 6.5 |
| MN0       | 18   | 21.5 | 19.0 | 19.0 | 20.0 | 1.0 to 1.3 | 6.5 |

## PART NUMBERING SYSTEM



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

## MARKING



## ◆STANDARD RATINGS

| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Size code | ESR (Ω max./100kHz) |       | Rated ripple current<br>(mA <sub>rms</sub> /125°C, 100kHz) | Part No.           |
|--------------------------|-------------|-----------|---------------------|-------|------------------------------------------------------------|--------------------|
|                          |             |           | 20°C                | −40°C |                                                            |                    |
| 16                       | 1,500       | KE0       | 0.087               | 1.1   | 1,060                                                      | EMHS160□RA152MKE0S |
|                          | 2,000       | KG5       | 0.070               | 0.84  | 1,160                                                      | EMHS160□RA202MKG5S |
|                          | 2,700       | LH0       | 0.057               | 0.59  | 1,900                                                      | EMHS160□RA272MLH0S |
|                          | 3,600       | MH0       | 0.055               | 0.44  | 2,000                                                      | EMHS160□RA362MMH0S |
|                          | 4,700       | LN0       | 0.037               | 0.39  | 2,520                                                      | EMHS160□RA472MLN0S |
|                          | 6,200       | MN0       | 0.036               | 0.28  | 2,570                                                      | EMHS160□RA622MMN0S |
| 25                       | 1,000       | KE0       | 0.087               | 1.1   | 1,060                                                      | EMHS250□RA102MKE0S |
|                          | 1,300       | KG5       | 0.070               | 0.84  | 1,160                                                      | EMHS250□RA132MKG5S |
|                          | 1,800       | LH0       | 0.057               | 0.59  | 1,900                                                      | EMHS250□RA182MLH0S |
|                          | 2,400       | MH0       | 0.055               | 0.44  | 2,000                                                      | EMHS250□RA242MMH0S |
|                          | 3,300       | LN0       | 0.037               | 0.39  | 2,520                                                      | EMHS250□RA332MLN0S |
|                          | 4,300       | MN0       | 0.036               | 0.28  | 2,570                                                      | EMHS250□RA432MMN0S |
| 35                       | 680         | KE0       | 0.087               | 1.1   | 1,060                                                      | EMHS350□RA681MKE0S |
|                          | 820         | KG5       | 0.070               | 0.84  | 1,160                                                      | EMHS350□RA821MKG5S |
|                          | 1,200       | LH0       | 0.057               | 0.59  | 1,900                                                      | EMHS350□RA122MLH0S |
|                          | 1,500       | MH0       | 0.055               | 0.44  | 2,000                                                      | EMHS350□RA152MMH0S |
|                          | 2,000       | LN0       | 0.037               | 0.39  | 2,520                                                      | EMHS350□RA202MLN0S |
|                          | 2,400       | MN0       | 0.036               | 0.28  | 2,570                                                      | EMHS350□RA242MMN0S |
| 50                       | 360         | KE0       | 0.16                | 2.0   | 880                                                        | EMHS500□RA361MKE0S |
|                          | 470         | KG5       | 0.12                | 1.5   | 970                                                        | EMHS500□RA471MKG5S |
|                          | 560         | LH0       | 0.088               | 0.94  | 1,640                                                      | EMHS500□RA561MLH0S |
|                          | 750         | MH0       | 0.085               | 0.78  | 1,720                                                      | EMHS500□RA751MMH0S |
|                          | 1,000       | LN0       | 0.056               | 0.61  | 2,230                                                      | EMHS500□RA102MLN0S |
|                          | 1,300       | MN0       | 0.053               | 0.45  | 2,300                                                      | EMHS500□RA132MMN0S |
| 63                       | 240         | KE0       | 0.17                | 2.5   | 920                                                        | EMHS630□RA241MKE0S |
|                          | 330         | KG5       | 0.13                | 1.8   | 1,030                                                      | EMHS630□RA331MKG5S |
|                          | 430         | LH0       | 0.098               | 1.3   | 1,640                                                      | EMHS630□RA431MLH0S |
|                          | 560         | MH0       | 0.091               | 0.98  | 1,720                                                      | EMHS630□RA561MMH0S |
|                          | 680         | LN0       | 0.063               | 0.80  | 2,230                                                      | EMHS630□RA681MLN0S |
|                          | 910         | MN0       | 0.059               | 0.59  | 2,300                                                      | EMHS630□RA911MMN0S |
| 80                       | 180         | KE0       | 0.17                | 2.5   | 920                                                        | EMHS800□RA181MKE0S |
|                          | 240         | KG5       | 0.13                | 1.8   | 1,030                                                      | EMHS800□RA241MKG5S |
|                          | 270         | LH0       | 0.098               | 1.3   | 1,640                                                      | EMHS800□RA271MLH0S |
|                          | 360         | MH0       | 0.091               | 0.98  | 1,720                                                      | EMHS800□RA361MMH0S |
|                          | 430         | LN0       | 0.063               | 0.80  | 2,230                                                      | EMHS800□RA431MLN0S |
|                          | 560         | MN0       | 0.059               | 0.59  | 2,300                                                      | EMHS800□RA561MMN0S |
| 100                      | 110         | KE0       | 0.17                | 2.5   | 920                                                        | EMHS101□RA111MKE0S |
|                          | 150         | KG5       | 0.13                | 1.8   | 1,030                                                      | EMHS101□RA151MKG5S |
|                          | 160         | LH0       | 0.098               | 1.3   | 1,640                                                      | EMHS101□RA161MLH0S |
|                          | 200         | MH0       | 0.091               | 0.98  | 1,720                                                      | EMHS101□RA201MMH0S |
|                          | 240         | LN0       | 0.063               | 0.80  | 2,230                                                      | EMHS101□RA241MLN0S |
|                          | 330         | MN0       | 0.059               | 0.59  | 2,300                                                      | EMHS101□RA331MMN0S |

□ : Enter the appropriate terminal code.

## ◆RATED RIPPLE CURRENT MULTIPLIERS

### ●Frequency Multipliers

| Capacitance(μF) | Frequency(Hz) |      |      |      |
|-----------------|---------------|------|------|------|
|                 | 120           | 1k   | 10k  | 100k |
| 110 to 200      | 0.40          | 0.75 | 0.90 | 1.00 |
| 240 to 560      | 0.50          | 0.85 | 0.94 | 1.00 |
| 680 to 2,000    | 0.60          | 0.87 | 0.95 | 1.00 |
| 2,400 to 4,300  | 0.75          | 0.90 | 0.95 | 1.00 |
| 4,700 to 6,200  | 0.85          | 0.95 | 0.98 | 1.00 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.