

## Alchip™-MVE Series Upgrade!

- Endurance : 1,000 to 2,000 hours at 105°C
- Case size range :  $\phi 4 \times 5.2\text{L}$  to  $\phi 18 \times 21.5\text{L}$
- Solvent resistant type except 100 to 450V<sub>dc</sub> (see PRECAUTIONS AND GUIDELINES)
- RoHS2 Compliant
- AEC-Q200 compliant : Please contact Chemi-Con for more details, test data, information.

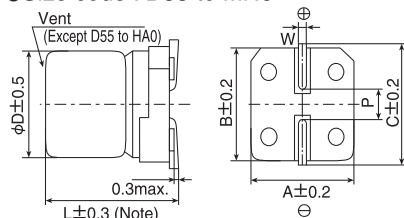
### ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                                                       |                                                   |     |     |     |     |                                      |                          |      |             |             |                 |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-----|-----|-----|-----|--------------------------------------|--------------------------|------|-------------|-------------|-----------------|
| Category                                               | -40 to +105℃                                                                                                                                                                                                                                                                                                          |                                                   |     |     |     |     |                                      |                          |      |             |             |                 |
| Temperature Range                                      | -40 to +105℃                                                                                                                                                                                                                                                                                                          |                                                   |     |     |     |     |                                      |                          |      |             |             |                 |
| Rated Voltage Range                                    | 6.3 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                                                             |                                                   |     |     |     |     |                                      |                          |      |             |             |                 |
| Capacitance Tolerance                                  | ±20%(M)                                                                                                                                                                                                                                                                                                               |                                                   |     |     |     |     |                                      |                          |      |             |             | (at 20℃, 120Hz) |
| Leakage Current                                        | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                                                      | 6.3 to 100V                                       |     |     |     |     |                                      | 160 to 450V              |      |             |             |                 |
|                                                        | D55 to JA0                                                                                                                                                                                                                                                                                                            | I=0.01CV or 3μA, whichever is greater (2 minutes) |     |     |     |     |                                      | —                        |      |             |             |                 |
|                                                        | KE0 to MN0                                                                                                                                                                                                                                                                                                            | I=0.03CV or 4μA, whichever is greater (1 minute)  |     |     |     |     |                                      | I=0.04CV+100μA (1minute) |      |             |             |                 |
|                                                        | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃)                                                                                                                                                                                                                    |                                                   |     |     |     |     |                                      |                          |      |             |             |                 |
| Dissipation Factor (tan δ)                             | See STANDARD RATINGS (at 20℃, 120Hz)                                                                                                                                                                                                                                                                                  |                                                   |     |     |     |     |                                      |                          |      |             |             |                 |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                                                      | 6.3V                                              | 10V | 16V | 25V | 35V | 50V                                  | 63V                      | 100V | 160 to 250V | 400 to 450V | (at 120Hz)      |
|                                                        | D55 to JA0                                                                                                                                                                                                                                                                                                            | Z(-25℃)/Z(+20℃)                                   | 4   | 3   | 2   | 2   | 2                                    | 2                        | 3    | —           | —           |                 |
|                                                        |                                                                                                                                                                                                                                                                                                                       | Z(-40℃)/Z(+20℃)                                   | 12  | 8   | 6   | 4   | 3                                    | 3                        | 4    | —           | —           |                 |
|                                                        | KE0 to MN0                                                                                                                                                                                                                                                                                                            | Z(-25℃)/Z(+20℃)                                   | 5   | 4   | 3   | 2   | 2                                    | 2                        | 2    | 3           | 6           |                 |
|                                                        |                                                                                                                                                                                                                                                                                                                       | Z(-40℃)/Z(+20℃)                                   | 10  | 8   | 6   | 4   | 3                                    | 3                        | 3    | 6           | 10          |                 |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for the specified period of time at 105℃.                                                                                                                                                  |                                                   |     |     |     |     |                                      |                          |      |             |             |                 |
|                                                        | Size code                                                                                                                                                                                                                                                                                                             | D55 to F80                                        |     |     |     |     | HA0 to MN0                           |                          |      |             |             |                 |
|                                                        | Time                                                                                                                                                                                                                                                                                                                  | 1,000 hours                                       |     |     |     |     | 2,000 hours                          |                          |      |             |             |                 |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                                                    | ≤ ±30% of the initial value                       |     |     |     |     | ≤ ±20% of the initial value          |                          |      |             |             |                 |
|                                                        | D.F. (tan δ)                                                                                                                                                                                                                                                                                                          | ≤300% of the initial specified value              |     |     |     |     | ≤200% of the initial specified value |                          |      |             |             |                 |
|                                                        | Leakage current                                                                                                                                                                                                                                                                                                       | ≤The initial specified value                      |     |     |     |     | ≤The initial specified value         |                          |      |             |             |                 |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours (500 hours for B55 to F80 size) at 105℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                                   |     |     |     |     |                                      |                          |      |             |             |                 |
|                                                        | Size code                                                                                                                                                                                                                                                                                                             | D55 to F80                                        |     |     |     |     | HA0 to MN0                           |                          |      |             |             |                 |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                                                    | ≤ ±25% of the initial value                       |     |     |     |     | ≤ ±20% of the initial value          |                          |      |             |             |                 |
|                                                        | D.F. (tan δ)                                                                                                                                                                                                                                                                                                          | ≤200% of the initial specified value              |     |     |     |     | ≤200% of the initial specified value |                          |      |             |             |                 |
|                                                        | Leakage current                                                                                                                                                                                                                                                                                                       | ≤The initial specified value                      |     |     |     |     | ≤The initial specified value         |                          |      |             |             |                 |
|                                                        |                                                                                                                                                                                                                                                                                                                       |                                                   |     |     |     |     |                                      |                          |      |             |             |                 |

### ◆ DIMENSIONS [mm]

● Terminal Code : A

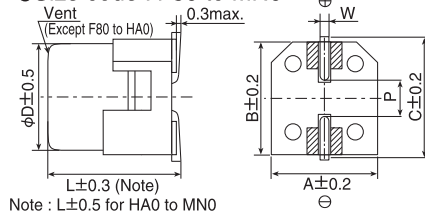
● Size code : D55 to MN0



Note : L±0.5 for HA0 to MN0

● Terminal Code : G (Vibration resistant structure)

● Size code : F80 to MN0



Note : L±0.5 for HA0 to MN0

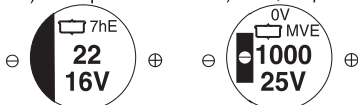
▨ : Dummy terminals

| Size code | D    | L    | A    | B    | C    | W          | P   |
|-----------|------|------|------|------|------|------------|-----|
| D55       | 4    | 5.2  | 4.3  | 4.3  | 5.1  | 0.5 to 0.8 | 1.0 |
| E55       | 5    | 5.2  | 5.3  | 5.3  | 5.9  | 0.5 to 0.8 | 1.4 |
| F55       | 6.3  | 5.2  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| F80       | 6.3  | 7.7  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| HA0       | 8    | 10.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| JA0       | 10   | 10.0 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |
| 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 |

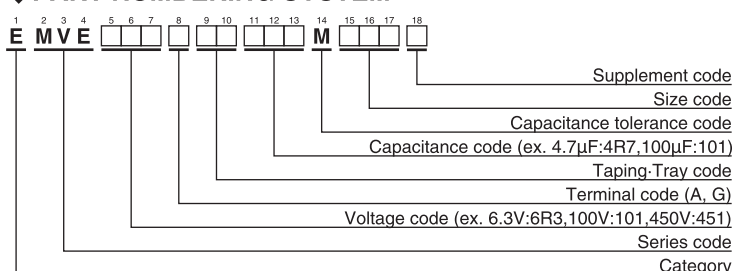
### ◆ MARKING

D55 to JA0  
Ex) 16V22μF

KE0 to MN0  
Ex) 25V1,000μF



### ◆ PART NUMBERING SYSTEM



### ◆ RATED RIPPLE CURRENT MULTIPLIERS

● Frequency Multipliers

| Size code  | Capacitance(μF) | Frequency(Hz) | 120  | 1k   | 10k  | 100k |
|------------|-----------------|---------------|------|------|------|------|
| D55 to JA0 | 1.0             |               | 1.00 | 1.50 | 1.75 | 1.80 |
|            | 2.2 to 10       |               | 1.00 | 1.30 | 1.40 | 1.50 |
|            | 22 to 1,500     |               | 1.00 | 1.05 | 1.08 | 1.08 |
| KE0 to MN0 | 3.3 to 4.7      |               | 1.00 | 1.75 | 2.30 | 2.50 |
|            | 10 to 68        |               | 1.00 | 1.50 | 1.75 | 1.80 |
|            | 100 to 1,000    |               | 1.00 | 1.30 | 1.40 | 1.50 |
|            | 2,200 to 6,800  |               | 1.00 | 1.05 | 1.08 | 1.08 |

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.

◆ STANDARD RATINGS

□ is not solvent resistant.

| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Size code | tan δ | Rated ripple<br>current<br>(mA <sub>rms</sub> /<br>105°C, 120Hz) | Part No.           | WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Size code | tan δ | Rated ripple<br>current<br>(mA <sub>rms</sub> /<br>105°C, 120Hz) | Part No.           |
|--------------------------|-------------|-----------|-------|------------------------------------------------------------------|--------------------|--------------------------|-------------|-----------|-------|------------------------------------------------------------------|--------------------|
| 6.3                      | 22          | D55       | 0.30  | 22                                                               | EMVE6R3ARA220MD55G | 35                       | 330         | JA0       | 0.16  | 450                                                              | EMVE350□RA331MJA0G |
|                          | 33          | E55       | 0.30  | 34                                                               | EMVE6R3ARA330ME55G |                          | 470         | KE0       | 0.22  | 520                                                              | EMVE350□RA471MKE0S |
|                          | 47          | E55       | 0.30  | 38                                                               | EMVE6R3ARA470ME55G |                          | 470         | LH0       | 0.22  | 650                                                              | EMVE350□RA471MLH0S |
|                          | 100         | F55       | 0.30  | 69                                                               | EMVE6R3ARA101MF55G |                          | 1,000       | LH0       | 0.22  | 750                                                              | EMVE350□RA102MLH0S |
|                          | 220         | F80       | 0.45  | 120                                                              | EMVE6R3□RA221MF80G |                          | 1,000       | MH0       | 0.22  | 1,000                                                            | EMVE350□RA102MMH0S |
|                          | 330         | HA0       | 0.40  | 290                                                              | EMVE6R3□RA331MHA0G |                          | 2,200       | MN0       | 0.24  | 1,450                                                            | EMVE350□RA222MMN0S |
|                          | 470         | HA0       | 0.45  | 320                                                              | EMVE6R3□RA471MHA0G | 50                       | 1.0         | D55       | 0.12  | 8.0                                                              | EMVE500ARA1ROMD55G |
|                          | 680         | HA0       | 0.45  | 340                                                              | EMVE6R3□RA681MHA0G |                          | 2.2         | D55       | 0.12  | 12                                                               | EMVE500ARA2R2MD55G |
|                          | 1,000       | JA0       | 0.40  | 410                                                              | EMVE6R3□RA102MJA0G |                          | 3.3         | D55       | 0.12  | 15                                                               | EMVE500ARA3R3MD55G |
|                          | 1,500       | JA0       | 0.45  | 550                                                              | EMVE6R3□RA152MJA0G |                          | 4.7         | E55       | 0.12  | 20                                                               | EMVE500ARA4R7ME55G |
|                          | 2,200       | KE0       | 0.40  | 680                                                              | EMVE6R3□RA222MKE0S |                          | 10          | F55       | 0.12  | 32                                                               | EMVE500ARA100MF55G |
|                          | 2,200       | LH0       | 0.40  | 840                                                              | EMVE6R3□RA222MLH0S |                          | 33          | F80       | 0.14  | 65                                                               | EMVE500□RA330MF80G |
|                          | 3,300       | KG5       | 0.42  | 850                                                              | EMVE6R3□RA332MKG5S |                          | 47          | F80       | 0.14  | 80                                                               | EMVE500□RA470MF80G |
|                          | 3,300       | MH0       | 0.42  | 1,000                                                            | EMVE6R3□RA332MMH0S |                          | 100         | HA0       | 0.14  | 230                                                              | EMVE500□RA101MHA0G |
|                          | 4,700       | LN0       | 0.44  | 1,200                                                            | EMVE6R3□RA472MLN0S |                          | 220         | JA0       | 0.14  | 375                                                              | EMVE500□RA221MJA0G |
|                          | 4,700       | MH0       | 0.44  | 1,200                                                            | EMVE6R3□RA472MMH0S |                          | 330         | KE0       | 0.18  | 500                                                              | EMVE500□RA331MKE0S |
|                          | 6,800       | LN0       | 0.48  | 1,200                                                            | EMVE6R3□RA682MLN0S |                          | 330         | LH0       | 0.18  | 600                                                              | EMVE500□RA331MLH0S |
|                          | 6,800       | MN0       | 0.48  | 1,350                                                            | EMVE6R3□RA682MMN0S |                          | 470         | LH0       | 0.18  | 700                                                              | EMVE500□RA471MLH0S |
| 10                       | 22          | E55       | 0.24  | 30                                                               | EMVE100ARA220ME55G |                          | 470         | MH0       | 0.18  | 750                                                              | EMVE500□RA471MMH0S |
|                          | 33          | E55       | 0.24  | 34                                                               | EMVE100ARA330ME55G |                          | 1,000       | MN0       | 0.18  | 1,200                                                            | EMVE500□RA102MMN0S |
|                          | 47          | F55       | 0.24  | 48                                                               | EMVE100ARA470MF55G | 63                       | 1.0         | D55       | 0.12  | 8.0                                                              | EMVE630ARA1ROMD55G |
|                          | 100         | F55       | 0.30  | 69                                                               | EMVE100ARA101MF55G |                          | 2.2         | D55       | 0.12  | 12                                                               | EMVE630ARA2R2MD55G |
|                          | 150         | F80       | 0.35  | 100                                                              | EMVE100□RA151MF80G |                          | 3.3         | E55       | 0.12  | 17                                                               | EMVE630ARA3R3ME55G |
|                          | 220         | F80       | 0.35  | 120                                                              | EMVE100□RA221MF80G |                          | 4.7         | F55       | 0.12  | 22                                                               | EMVE630ARA4R7MF55G |
|                          | 330         | HA0       | 0.35  | 290                                                              | EMVE100□RA331MHA0G |                          | 10          | F55       | 0.12  | 32                                                               | EMVE630ARA100MF55G |
|                          | 470         | HA0       | 0.35  | 320                                                              | EMVE100□RA471MHA0G |                          | 22          | F80       | 0.12  | 58                                                               | EMVE630□RA220MF80G |
|                          | 1,000       | JA0       | 0.35  | 410                                                              | EMVE100□RA102MJA0G |                          | 33          | HA0       | 0.12  | 140                                                              | EMVE630□RA330MHA0G |
|                          | 2,200       | KG5       | 0.36  | 750                                                              | EMVE100□RA222MKG5S |                          | 47          | HA0       | 0.12  | 170                                                              | EMVE630□RA470MHA0G |
|                          | 2,200       | LH0       | 0.36  | 850                                                              | EMVE100□RA222MLH0S |                          | 100         | JA0       | 0.12  | 310                                                              | EMVE630□RA101MJA0G |
|                          | 3,300       | LH0       | 0.38  | 1,000                                                            | EMVE100□RA332MLH0S |                          | 220         | KE0       | 0.14  | 470                                                              | EMVE630□RA221MKE0S |
|                          | 3,300       | MH0       | 0.38  | 1,100                                                            | EMVE100□RA332MMH0S |                          | 220         | LH0       | 0.14  | 560                                                              | EMVE630□RA221MLH0S |
|                          | 4,700       | LN0       | 0.40  | 1,300                                                            | EMVE100□RA472MLN0S |                          | 330         | LH0       | 0.14  | 700                                                              | EMVE630□RA331MLH0S |
|                          | 4,700       | MN0       | 0.40  | 1,350                                                            | EMVE100□RA472MMN0S |                          | 330         | MH0       | 0.14  | 750                                                              | EMVE630□RA331MMH0S |
| 16                       | 10          | D55       | 0.20  | 17                                                               | EMVE160ARA100MD55G |                          | 470         | LN0       | 0.14  | 900                                                              | EMVE630□RA471MLN0S |
|                          | 22          | E55       | 0.20  | 30                                                               | EMVE160ARA220ME55G | 100                      | 470         | MH0       | 0.14  | 900                                                              | EMVE630□RA471MMH0S |
|                          | 33          | F55       | 0.20  | 45                                                               | EMVE160ARA330MF55G |                          | 22          | HA0       | 0.12  | 100                                                              | EMVE101□RA220MHA0G |
|                          | 47          | F55       | 0.20  | 48                                                               | EMVE160ARA470MF55G |                          | 33          | JA0       | 0.12  | 150                                                              | EMVE101□RA330MJA0G |
|                          | 100         | F55       | 0.26  | 69                                                               | EMVE160ARA101MF55G |                          | 47          | KE0       | 0.10  | 250                                                              | EMVE101□RA470MKE0S |
|                          | 150         | F80       | 0.28  | 100                                                              | EMVE160□RA151MF80G |                          | 68          | KE0       | 0.10  | 300                                                              | EMVE101□RA680MKE0S |
|                          | 220         | F80       | 0.28  | 120                                                              | EMVE160□RA221MF80G |                          | 100         | KE0       | 0.10  | 380                                                              | EMVE101□RA101MKE0S |
|                          | 330         | HA0       | 0.28  | 290                                                              | EMVE160□RA331MHA0G |                          | 100         | LH0       | 0.10  | 450                                                              | EMVE101□RA101MLH0S |
|                          | 470         | HA0       | 0.28  | 320                                                              | EMVE160□RA471MHA0G |                          | 220         | LN0       | 0.10  | 750                                                              | EMVE101□RA221MLN0S |
|                          | 680         | JA0       | 0.28  | 470                                                              | EMVE160□RA681MJA0G |                          | 220         | MH0       | 0.10  | 750                                                              | EMVE101□RA221MMH0S |
|                          | 1,000       | KE0       | 0.30  | 550                                                              | EMVE160□RA102MKE0S |                          | 330         | MN0       | 0.10  | 980                                                              | EMVE101□RA331MMN0S |
|                          | 1,000       | LH0       | 0.30  | 650                                                              | EMVE160□RA102MLH0S | 160                      | 33          | KE0       | 0.15  | 95                                                               | EMVE161□RA330MKE0S |
|                          | 2,200       | LH0       | 0.32  | 950                                                              | EMVE160□RA222MLH0S |                          | 47          | LH0       | 0.15  | 260                                                              | EMVE161□RA470MLH0S |
|                          | 2,200       | MH0       | 0.32  | 1,000                                                            | EMVE160□RA222MMH0S |                          | 68          | LN0       | 0.15  | 320                                                              | EMVE161□RA680MLN0S |
|                          | 3,300       | LN0       | 0.34  | 1,200                                                            | EMVE160□RA332MLN0S |                          | 68          | MH0       | 0.15  | 320                                                              | EMVE161□RA680MMH0S |
|                          | 3,300       | MH0       | 0.34  | 1,200                                                            | EMVE160□RA332MMH0S |                          | 100         | LN0       | 0.15  | 380                                                              | EMVE161□RA101MLN0S |
| 25                       | 10          | E55       | 0.16  | 27                                                               | EMVE250ARA100ME55G | 200                      | 10          | KE0       | 0.15  | 80                                                               | EMVE201□RA100MKE0S |
|                          | 22          | F55       | 0.16  | 44                                                               | EMVE250ARA220MF55G |                          | 22          | KG5       | 0.15  | 110                                                              | EMVE201□RA220MKG5S |
|                          | 33          | F55       | 0.16  | 50                                                               | EMVE250ARA330MF55G |                          | 33          | LH0       | 0.15  | 220                                                              | EMVE201□RA330MLH0S |
|                          | 47          | F55       | 0.16  | 60                                                               | EMVE250ARA470MF55G |                          | 47          | LN0       | 0.15  | 270                                                              | EMVE201□RA470MLN0S |
|                          | 100         | F80       | 0.18  | 100                                                              | EMVE250□RA101MF80G |                          | 47          | MH0       | 0.15  | 270                                                              | EMVE201□RA470MMH0S |
|                          | 150         | HA0       | 0.18  | 240                                                              | EMVE250□RA151MHA0G |                          | 68          | MN0       | 0.15  | 330                                                              | EMVE201□RA680MMN0S |
|                          | 220         | HA0       | 0.18  | 320                                                              | EMVE250□RA221MHA0G | 250                      | 4.7         | KE0       | 0.15  | 65                                                               | EMVE251□RA477MKE0S |
|                          | 330         | JA0       | 0.16  | 450                                                              | EMVE250□RA331MJA0G |                          | 10          | KG5       | 0.15  | 105                                                              | EMVE251□RA100MKG5S |
|                          | 470         | JA0       | 0.18  | 490                                                              | EMVE250□RA471MJA0G |                          | 22          | LH0       | 0.15  | 180                                                              | EMVE251□RA220MLH0S |
|                          | 1,000       | LH0       | 0.26  | 820                                                              | EMVE250□RA102MLH0S |                          | 33          | LN0       | 0.15  | 230                                                              | EMVE251□RA330MLN0S |
|                          | 1,000       | MH0       | 0.26  | 880                                                              | EMVE250□RA102MMH0S |                          | 33          | MH0       | 0.15  | 230                                                              | EMVE251□RA330MMH0S |
|                          | 2,200       | LN0       | 0.28  | 1,250                                                            | EMVE250□RA222MLN0S |                          | 47          | MN0       | 0.15  | 280                                                              | EMVE251□RA470MMN0S |
|                          | 2,200       | MN0       | 0.28  | 1,300                                                            | EMVE250□RA222MMN0S | 400                      | 4.7         | KG5       | 0.20  | 50                                                               | EMVE401□RA477MKG5S |
| 35                       | 4.7         | D55       | 0.14  | 16                                                               | EMVE350ARA477MD55G |                          | 10          | LH0       | 0.20  | 85                                                               | EMVE401□RA100MLH0S |
|                          | 10          | E55       | 0.14  | 27                                                               | EMVE350ARA100ME55G |                          | 22          | MN0       | 0.20  | 130                                                              | EMVE401□RA220MMN0S |
|                          | 22          | F55       | 0.14  | 44                                                               | EMVE350ARA220MF55G | 450                      | 3.3         | KE0       | 0.20  | 40                                                               | EMVE451□RA333MKE0S |
|                          | 47          | F80       | 0.16  | 80                                                               | EMVE350□RA470MF80G |                          | 4.7         | KG5       | 0.20  | 50                                                               | EMVE451□RA477MKG5S |
|                          | 100         | F80       | 0.16  | 100                                                              | EMVE350□RA101MF80G |                          | 10          | LH0       | 0.20  | 85                                                               | EMVE451□RA100MLH0S |
|                          | 150         | HA0       | 0.16  | 260                                                              | EMVE350□RA151MHA0G |                          | 22          | MN0       | 0.20  | 130                                                              | EMVE451□RA220MMN0S |
|                          | 220         | JA0       | 0.16  | 375                                                              | EMVE350□RA221MJA0G |                          |             |           |       |                                                                  |                    |