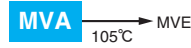


Alchip™ **MVA** Series *Upgrade!*

- φ 4 through φ 18 case sizes are fully lined up
- Endurance : 2,000 hours at 85°C
- Suitable to fit for downsized equipment
- Solvent resistant type except 100 to 450V<sub>dc</sub> (see PRECAUTIONS AND GUIDELINES)
- RoHS2 Compliant



◆ SPECIFICATIONS

| Items   | Characteristics  |   |      |      |                                      |      |      |                                      |      |      |             |            |   |
|---|--|---|------|------|--------------------------------------|------|------|--------------------------------------|------|------|-------------|------------|---|
| Category  | -40 to +85°C   |   |      |      |                                      |      |      |                                      |      |      |             |            |   |
| Temperature Range   | -40 to +85°C   |   |      |      |                                      |      |      |                                      |      |      |             |            |   |
| Rated Voltage Range   | 4 to 450V <sub>dc</sub>  |   |      |      |                                      |      |      |                                      |      |      |             |            |   |
| Capacitance Tolerance   | ±20% (M) (at 20°C, 120Hz)  |   |      |      |                                      |      |      |                                      |      |      |             |            |   |
| Leakage Current   | Rated voltage (V <sub>dc</sub> )   | 4 to 100V   |      |      |                                      |      |      | 160 to 450V                          |      |      |             |            |   |
|   | D55 to JA0   | I=0.01CV or 3μA, whichever is greater.(after 2 minutes) |      |      |                                      |      |      | -                                    |      |      |             |            |   |
|   | KE0 to MN0   | I=0.03CV or 4μA, whichever is greater.(after 1 minute)  |      |      |                                      |      |      | I=0.04CV+100μA max.(after 1 minute)  |      |      |             |            |   |
| Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C)               |  |   |      |      |                                      |      |      |                                      |      |      |             |            |   |
| Dissipation Factor (tan δ)  | Rated voltage (V <sub>dc</sub> )   | 4V  | 6.3V | 10V  | 16V                                  | 25V  | 35V  | 50V                                  | 63V  | 100V | 160 to 250V | 400 & 450V |   |
|   | tan δ (Max.)   | D55 to JA0  | 0.42 | 0.35 | 0.30                                 | 0.26 | 0.16 | 0.14                                 | 0.12 | 0.12 | 0.12        | -          | - |
|   | KE0 to MN0   | -   | 0.38 | 0.34 | 0.30                                 | 0.26 | 0.22 | 0.18                                 | 0.14 | 0.10 | 0.20        | 0.25       | - |
| When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz) |  |   |      |      |                                      |      |      |                                      |      |      |             |            |   |
| Low Temperature Characteristics (Max. Impedance Ratio)  | Rated voltage (V <sub>dc</sub> )   | 4V  | 6.3V | 10V  | 16V                                  | 25V  | 35V  | 50V                                  | 63V  | 100V | 160 to 250V | 400 & 450V |   |
|   | D55 to JA0   | Z(-25°C)/Z(+20°C)                                       | 7    | 4    | 3                                    | 2    | 2    | 2                                    | 2    | 2    | 3           | -          | - |
|   |  | Z(-40°C)/Z(+20°C)                                       | 17   | 10   | 8                                    | 6    | 4    | 3                                    | 3    | 3    | 4           | -          | - |
|   | KE0 to MN0   | Z(-25°C)/Z(+20°C)                                       | -    | 5    | 4                                    | 3    | 2    | 2                                    | 2    | 2    | 2           | 3          | 6 |
| Z(-40°C)/Z(+20°C)   |  | -   | 12   | 10   | 8                                    | 5    | 4    | 3                                    | 3    | 3    | 6           | 10         |   |
| (at 120Hz)  |  |   |      |      |                                      |      |      |                                      |      |      |             |            |   |
| Endurance   | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 85°C.   |   |      |      |                                      |      |      |                                      |      |      |             |            |   |
|   | Size code  | D55 to JA0  |      |      | D55 to JA0                           |      |      | KE0 to MN0                           |      |      |             |            |   |
|   | Rated voltage (V <sub>dc</sub> )   | 4V & 6.3V   |      |      | 10 to 100V                           |      |      | 6.3 to 450V                          |      |      |             |            |   |
|   | Capacitance change   | ≤ ±30% of the initial value                             |      |      | ≤ ±20% 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 |      |      | ≤200% of the initial specified value |      |      |             |            |   |
|   | Leakage current  | ≤The initial specified value                            |      |      | ≤The initial specified value         |      |      | ≤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 85°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. |   |      |      |                                      |      |      |                                      |      |      |             |            |   |
|   | Size code  | D55 to JA0  |      |      | D55 to JA0                           |      |      | KE0 to MN0                           |      |      |             |            |   |
|   | Rated voltage  | 4V & 6.3V   |      |      | 10 to 100V                           |      |      | 6.3 to 450V                          |      |      |             |            |   |
|   | Capacitance change   | ≤ ±30% of the initial value                             |      |      | ≤ ±20% 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 |      |      | ≤200% of the initial specified value |      |      |             |            |   |
|   | Leakage current  | ≤The initial specified value                            |      |      | ≤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



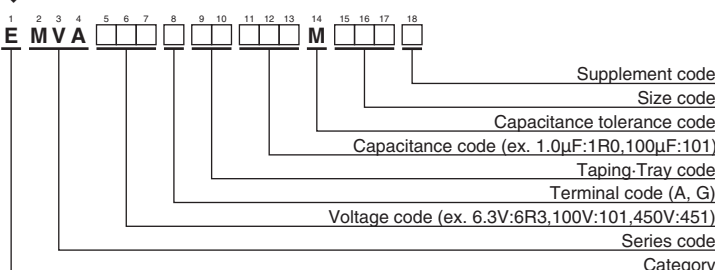
▨ : Dummy terminals

| 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



◆ PART NUMBERING SYSTEM



◆ RATED RIPPLE CURRENT MULTIPLIERS

● Frequency Multipliers

| Size code  | Capacitance(μF) | Frequency(Hz) |      |      |      |
|------------|-----------------|---------------|------|------|------|
|            |                 | 1.0           | 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 | 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 10,000 | 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.

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

◆ **STANDARD RATINGS**

□ is not solvent resistant.

| WV (V <sub>dc</sub> ) | Cap (μF) | Size code | tan δ | Rated ripple current (mArms/85°C, 120Hz) | Part No.           | WV (V <sub>dc</sub> ) | Cap (μF)           | Size code | tan δ              | Rated ripple current (mArms/85°C, 120Hz) | Part No.           |                    |                    |
|-----------------------|----------|-----------|-------|--|--------------------|-----------------------|--------------------|-----------|--------------------|--|--------------------|--------------------|--------------------|
| 4                     | 33       | D55       | 0.42  | 25                                       | EMVA4R0ARA330MD55G | 35                    | 33                 | F55       | 0.14               | 54                                       | EMVA350ARA330MF55G |                    |                    |
|                       | 47       | D55       | 0.42  | 30                                       | EMVA4R0ARA470MD55G |                       | 100                | F80       | 0.14               | 120                                      | EMVA350□RA101MF80G |                    |                    |
|                       | 100      | E55       | 0.42  | 50                                       | EMVA4R0ARA101ME55G |                       | 150                | HA0       | 0.14               | 210                                      | EMVA350□RA151MHA0G |                    |                    |
|                       | 220      | F55       | 0.42  | 80                                       | EMVA4R0ARA221MF55G |                       | 220                | HA0       | 0.14               | 260                                      | EMVA350□RA221MHA0G |                    |                    |
|                       | 330      | F80       | 0.42  | 135                                      | EMVA4R0□RA331MF80G |                       | 330                | JA0       | 0.14               | 360                                      | EMVA350□RA331MJA0G |                    |                    |
|                       | 470      | F80       | 0.42  | 150                                      | EMVA4R0□RA471MF80G |                       | 470                | KE0       | 0.22               | 600                                      | EMVA350□RA471MKE0S |                    |                    |
|                       | 1,000    | HA0       | 0.42  | 320                                      | EMVA4R0□RA102MHA0G |                       | 1,000              | LH0       | 0.22               | 1,100                                    | EMVA350□RA102MLH0S |                    |                    |
| 6.3                   | 33       | D55       | 0.35  | 30                                       | EMVA6R3ARA330MD55G | 50                    | 2,200              | MN0       | 0.24               | 1,700                                    | EMVA350□RA222MMN0S |                    |                    |
|                       | 47       | D55       | 0.35  | 33                                       | EMVA6R3ARA470MD55G |                       | 3.3                | D55       | 0.12               | 15                                       | EMVA500ARA3R3MD55G |                    |                    |
|                       | 100      | E55       | 0.35  | 55                                       | EMVA6R3ARA101ME55G |                       | 4.7                | D55       | 0.12               | 18                                       | EMVA500ARA4R7MD55G |                    |                    |
|                       | 220      | F55       | 0.35  | 88                                       | EMVA6R3ARA221MF55G |                       | 10                 | E55       | 0.12               | 30                                       | EMVA500ARA100ME55G |                    |                    |
|                       | 330      | F80       | 0.35  | 135                                      | EMVA6R3□RA331MF80G |                       | 22                 | F55       | 0.12               | 47                                       | EMVA500ARA220MF55G |                    |                    |
|                       | 470      | HA0       | 0.35  | 280                                      | EMVA6R3□RA471MHA0G |                       | 33                 | F80       | 0.12               | 70                                       | EMVA500□RA330MF80G |                    |                    |
|                       | 680      | HA0       | 0.35  | 290                                      | EMVA6R3□RA681MHA0G |                       | 47                 | F80       | 0.12               | 85                                       | EMVA500□RA470MF80G |                    |                    |
|                       | 820      | HA0       | 0.35  | 320                                      | EMVA6R3□RA821MHA0G |                       | 100                | HA0       | 0.12               | 190                                      | EMVA500□RA101MHA0G |                    |                    |
|                       | 1,000    | JA0       | 0.35  | 430                                      | EMVA6R3□RA102MJA0G |                       | 220                | JA0       | 0.12               | 320                                      | EMVA500□RA221MJA0G |                    |                    |
|                       | 1,500    | JA0       | 0.35  | 480                                      | EMVA6R3□RA152MJA0G |                       | 330                | KE0       | 0.18               | 600                                      | EMVA500□RA331MKE0S |                    |                    |
|                       | 2,200    | KE0       | 0.40  | 890                                      | EMVA6R3□RA222MKE0S |                       | 470                | KG5       | 0.18               | 740                                      | EMVA500□RA471MKG5S |                    |                    |
|                       | 3,300    | KG5       | 0.42  | 1,000                                    | EMVA6R3□RA332MKG5S |                       | 470                | LH0       | 0.18               | 850                                      | EMVA500□RA471MLH0S |                    |                    |
|                       | 3,300    | LH0       | 0.42  | 1,200                                    | EMVA6R3□RA332MLH0S |                       | 1,000              | LN0       | 0.18               | 1,300                                    | EMVA500□RA102MLN0S |                    |                    |
|                       | 4,700    | LH0       | 0.44  | 1,400                                    | EMVA6R3□RA472MLH0S |                       | 1,000              | MN0       | 0.18               | 1,400                                    | EMVA500□RA102MMN0S |                    |                    |
|                       | 6,800    | LN0       | 0.48  | 1,750                                    | EMVA6R3□RA682MLN0S |                       | 63                 | 1.0       | D55                | 0.12                                     | 8.0                | EMVA630ARA1R0MD55G |                    |
| 6,800                 | MH0      | 0.48      | 1,700 | EMVA6R3□RA682MMH0S                       | 2.2                | D55                   |                    | 0.12      | 12                 | EMVA630ARA2R2MD55G                       |                    |                    |                    |
| 10,000                | MN0      | 0.56      | 2,000 | EMVA6R3□RA103MMN0S                       | 3.3                | E55                   |                    | 0.12      | 17                 | EMVA630ARA3R3ME55G                       |                    |                    |                    |
| 10                    | 22       | D55       | 0.30  | 26                                       | EMVA100ARA220MD55G | 4.7                   |                    | E55       | 0.12               | 20                                       | EMVA630ARA4R7ME55G |                    |                    |
|                       | 33       | D55       | 0.30  | 30                                       | EMVA100ARA330MD55G | 10                    |                    | F55       | 0.12               | 32                                       | EMVA630ARA100MF55G |                    |                    |
|                       | 47       | E55       | 0.30  | 44                                       | EMVA100ARA470ME55G | 22                    |                    | F80       | 0.12               | 60                                       | EMVA630□RA220MF80G |                    |                    |
|                       | 100      | F55       | 0.30  | 70                                       | EMVA100ARA101MF55G | 33                    |                    | HA0       | 0.12               | 110                                      | EMVA630□RA330MHA0G |                    |                    |
|                       | 150      | F55       | 0.30  | 79                                       | EMVA100ARA151MF55G | 47                    |                    | HA0       | 0.12               | 130                                      | EMVA630□RA470MHA0G |                    |                    |
|                       | 220      | F80       | 0.30  | 130                                      | EMVA100□RA221MF80G | 56                    |                    | JA0       | 0.12               | 160                                      | EMVA630□RA560MJA0G |                    |                    |
|                       | 330      | HA0       | 0.30  | 270                                      | EMVA100□RA331MHA0G | 68                    |                    | JA0       | 0.12               | 170                                      | EMVA630□RA680MJA0G |                    |                    |
|                       | 470      | HA0       | 0.30  | 280                                      | EMVA100□RA471MHA0G | 100                   |                    | KE0       | 0.14               | 380                                      | EMVA630□RA101MKE0S |                    |                    |
|                       | 1,000    | JA0       | 0.30  | 430                                      | EMVA100□RA102MJA0G | 220                   |                    | KE0       | 0.14               | 580                                      | EMVA630□RA221MKE0S |                    |                    |
|                       | 2,200    | KE0       | 0.36  | 960                                      | EMVA100□RA222MKE0S | 330                   |                    | KG5       | 0.14               | 720                                      | EMVA630□RA331MKG5S |                    |                    |
|                       | 3,300    | LH0       | 0.38  | 1,300                                    | EMVA100□RA332MLH0S | 330                   |                    | LH0       | 0.14               | 820                                      | EMVA630□RA331MLH0S |                    |                    |
|                       | 4,700    | LN0       | 0.40  | 1,550                                    | EMVA100□RA472MLN0S | 470                   |                    | LH0       | 0.14               | 950                                      | EMVA630□RA471MLH0S |                    |                    |
|                       | 4,700    | MH0       | 0.40  | 1,600                                    | EMVA100□RA472MMH0S | 470                   | MH0                | 0.14      | 1,000              | EMVA630□RA471MMH0S                       |                    |                    |                    |
|                       | 6,800    | MN0       | 0.44  | 1,850                                    | EMVA100□RA682MMN0S | 100                   | 22                 | HA0       | 0.12               | 90                                       | EMVA101□RA220MHA0G |                    |                    |
|                       | 16       | 22        | D55   | 0.26                                     | 26                 |                       | EMVA160ARA220MD55G | 33        | JA0                | 0.12                                     | 120                | EMVA101□RA330MJA0G |                    |
| 33                    |          | E55       | 0.26  | 37                                       | EMVA160ARA330ME55G |                       | 68                 | KE0       | 0.10               | 380                                      | EMVA101□RA680MKE0S |                    |                    |
| 47                    |          | E55       | 0.26  | 44                                       | EMVA160ARA470ME55G |                       | 100                | KE0       | 0.10               | 440                                      | EMVA101□RA101MKE0S |                    |                    |
| 100                   |          | F55       | 0.26  | 70                                       | EMVA160ARA101MF55G |                       | 220                | LN0       | 0.10               | 850                                      | EMVA101□RA221MLN0S |                    |                    |
| 150                   |          | F80       | 0.26  | 110                                      | EMVA160□RA151MF80G |                       | 220                | MH0       | 0.10               | 800                                      | EMVA101□RA221MMH0S |                    |                    |
| 220                   |          | F80       | 0.26  | 130                                      | EMVA160□RA221MF80G |                       | 330                | MN0       | 0.10               | 1,000                                    | EMVA101□RA331MMN0S |                    |                    |
| 330                   |          | HA0       | 0.26  | 270                                      | EMVA160□RA331MHA0G |                       | 160                | 47        | KG5                | 0.20                                     | 370                | EMVA161□RA470MKG5S |                    |
| 470                   |          | HA0       | 0.26  | 280                                      | EMVA160□RA471MHA0G |                       |                    | 68        | LH0                | 0.20                                     | 500                | EMVA161□RA680MLH0S |                    |
| 680                   |          | JA0       | 0.26  | 380                                      | EMVA160□RA681MJA0G |                       |                    | 100       | LN0                | 0.20                                     | 590                | EMVA161□RA101MLN0S |                    |
| 1,000                 |          | KE0       | 0.30  | 710                                      | EMVA160□RA102MKE0S |                       |                    | 100       | MH0                | 0.20                                     | 590                | EMVA161□RA101MMH0S |                    |
| 2,200                 |          | LH0       | 0.32  | 1,150                                    | EMVA160□RA222MLH0S |                       |                    | 200       | 22                 | KE0                                      | 0.20               | 240                | EMVA201□RA220MKE0S |
| 3,300                 |          | LN0       | 0.34  | 1,450                                    | EMVA160□RA332MLN0S |                       |                    |           | 33                 | KG5                                      | 0.20               | 310                | EMVA201□RA330MKG5S |
| 3,300                 |          | MH0       | 0.34  | 1,450                                    | EMVA160□RA332MMH0S |                       |                    |           | 47                 | LH0                                      | 0.20               | 420                | EMVA201□RA470MLH0S |
| 4,700                 |          | MN0       | 0.36  | 1,750                                    | EMVA160□RA472MMN0S |                       |                    |           | 68                 | LN0                                      | 0.20               | 510                | EMVA201□RA680MLN0S |
| 25                    |          | 10        | D55   | 0.16                                     | 24                 | EMVA250ARA100MD55G    |                    |           | 68                 | MH0                                      | 0.20               | 510                | EMVA201□RA680MMH0S |
|                       | 22       | E55       | 0.16  | 41                                       | EMVA250ARA220ME55G | 100                   |                    |           | MN0                | 0.20                                     | 590                | EMVA201□RA101MMN0S |                    |
|                       | 33       | E55       | 0.16  | 47                                       | EMVA250ARA330ME55G | 250                   |                    |           | 10                 | KE0                                      | 0.20               | 150                | EMVA251□RA100MKE0S |
|                       | 47       | F55       | 0.16  | 60                                       | EMVA250ARA470MF55G |                       |                    |           | 22                 | KG5                                      | 0.20               | 240                | EMVA251□RA220MKG5S |
|                       | 56       | F55       | 0.16  | 66                                       | EMVA250ARA560MF55G |                       |                    |           | 33                 | LH0                                      | 0.20               | 340                | EMVA251□RA330MLH0S |
|                       | 100      | F80       | 0.16  | 120                                      | EMVA250□RA101MF80G |                       |                    |           | 47                 | LN0                                      | 0.20               | 420                | EMVA251□RA470MLN0S |
|                       | 150      | HA0       | 0.16  | 210                                      | EMVA250□RA151MHA0G |                       |                    |           | 47                 | MH0                                      | 0.20               | 420                | EMVA251□RA470MMH0S |
|                       | 220      | HA0       | 0.16  | 260                                      | EMVA250□RA221MHA0G |                       | 68                 |           | MN0                | 0.20                                     | 490                | EMVA251□RA680MMN0S |                    |
|                       | 330      | HA0       | 0.16  | 300                                      | EMVA250□RA331MHA0G |                       | 400                |           | 4.7                | KE0                                      | 0.25               | 120                | EMVA401□RA4R7MKE0S |
|                       | 470      | JA0       | 0.16  | 400                                      | EMVA250□RA471MJA0G |                       |                    |           | 10                 | LH0                                      | 0.25               | 140                | EMVA401□RA100MLH0S |
|                       | 1,000    | KE0       | 0.26  | 820                                      | EMVA250□RA102MKE0S |                       |                    |           | 22                 | LN0                                      | 0.25               | 280                | EMVA401□RA220MLN0S |
|                       | 2,200    | LN0       | 0.28  | 1,450                                    | EMVA250□RA222MLN0S |                       |                    | 22        | MH0                | 0.25                                     | 280                | EMVA401□RA220MMH0S |                    |
|                       | 2,200    | MH0       | 0.28  | 1,400                                    | EMVA250□RA222MMH0S |                       |                    | 33        | MN0                | 0.25                                     | 350                | EMVA401□RA330MMN0S |                    |
|                       | 3,300    | MN0       | 0.30  | 1,800                                    | EMVA250□RA332MMN0S |                       |                    | 450       | 4.7                | KE0                                      | 0.25               | 120                | EMVA451□RA4R7MKE0S |
|                       | 35       | 4.7       | D55   | 0.14                                     | 18                 |                       |                    |           | EMVA350ARA4R7MD55G | 10                                       | LH0                | 0.25               | 140                |
| 10                    |          | D55       | 0.14  | 24                                       | EMVA350ARA100MD55G |                       |                    |           | 22                 | LN0                                      | 0.25               | 280                | EMVA451□RA220MLN0S |
| 22                    |          | E55       | 0.14  | 41                                       | EMVA350ARA220ME55G |                       |                    |           | 33                 | MN0                                      | 0.25               | 350                | EMVA451□RA330MMN0S |

□ : Enter the appropriate terminal code.